

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

\*Supersedes copy dated 1 October 1995.

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

MODEL	NSN	EIC
TRK, CAR., LMTV, M1078 W/WN W/O WN	2320-01-380-1898 2320-01-354-3385	BHH BHD
TRK, VAN, LMTV, M1079 W/WN W/O WN	2320-01-380-1891 2320-01-364-3384	BHG BHE
TRK, CHAS, LMTV, M1080	2320-01-353-9098	BHC
TRK, CAR., LMN, AIR DROP, M1081 W/WN W/O WN	2320-01-360-1899 2320-01-355-3064	BHJ BHF

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HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE  
17 JUNE 1998

## WARNING SUMMARY

### WARNING

#### EXHAUST GASES CAN KILL

1. **DO NOT** operate your vehicle engine in an enclosed area.
2. **DO NOT** idle vehicle engine with cab windows closed.
3. **DO NOT** drive vehicle with inspection plates or covers removed.
4. **BE ALERT** at all times for exhaust odors.
5. **BE ALERT** for exhaust poisoning symptoms, they are:
  - Headache
  - Dizziness
  - Sleepiness
  - Loss of Muscular Control
6. **IF YOU SEE** another person with exhaust poisoning symptoms:
  - Remove person from area.
  - Expose to open air.
  - Keep person warm.
  - Do not permit person to move.
  - Administer cardiopulmonary resuscitation, if necessary. \*

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

### WARNING

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

### WARNING

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

## WARNING SUMMARY (CONT)

### WARNING

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

### WARNING

- Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100 degrees F (38 degrees C) and for Type II is 130 degrees F (50 degrees C). Failure to comply may result in serious injury or death to personnel.
- If personnel become dizzy while using Dry Cleaning Solvent, immediately get fresh air and medical help. If Dry Cleaning Solvent contacts skin or clothes, flush with cold water. If Dry Cleaning Solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

### WARNING

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

### WARNING

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING SUMMARY (CONT)**

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING SUMMARY (CONT)**

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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



## WARNING SUMMARY (CONT)

### WARNING

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

### WARNING

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

### WARNING

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

### WARNING

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

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

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

### WARNING

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

### WARNING

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

**WARNING**

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

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

**WARNING**

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**

Excess coolant may splash out upon removal of hoses on swingfire tube jacket. Ensure proper eye protection is worn. Failure to comply may result in injury to personnel.

**WARNING**

Excess coolant may splash out upon removal of hoses from swingfire valve. Ensure proper eye protection is worn. Failure to comply may result in injury to personnel.

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING SUMMARY (CONT)**

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

TECHNICAL MANUAL  
 NO. 9-2320-365-20-1

HEADQUARTERS  
 DEPARTMENTS OF THE ARMY  
 AND THE AIR FORCE  
 Washington D.C., 17 June 1998

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

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

MODEL	NSN	EIC
TRK, CAR., LMTV, M1078 W/WN W/O WN	2320-01-360-1898 2320-01-364-3385	BHH BHD
TRK, VAN, LMTV, M1079 W/WN W/O WN	2320-01-360-1891 2320-01-354-3384	BHG BHE
TRK, CHAS, LMTV, M1080	2320-01-363-9098	BHC
TRK, CAR., LMTV, AIR DROP, M1081 W/WN W/O WN	2320-01-360-1899 2320-01-355-3064	BHJ BHF

**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.

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## HOW TO USE THIS MANUAL

### OVERVIEW

This technical manual (TM) is provided to help you maintain the LMTV at the Unit Maintenance level. Because of its size, it is divided into five volumes. Volumes 2, 3, 4, and 5 contain information which will assist you in the performance of Unit Maintenance on the LMTV. Volume 1 contains the following major sections in order of appearance:

- **WARNING SUMMARY.** Provides a summary of the most important warnings that apply throughout the manual.
- **TABLE OF CONTENTS.** Lists, for all volumes, the chapters, sections, appendixes, and indexes with page numbers in order of appearance.
- **CHAPTER 1, INTRODUCTION.** Describes the LMTV and provides equipment data.
- **CHAPTER 2, VEHICLE MAINTENANCE.** This chapter contains information for finding tools; special tools; test, measurement, and diagnostic equipment (TMDE); and repair parts. It also contains the preventive maintenance checks and services (PMCS) and troubleshooting tables.
- **APPENDIX A, REFERENCES.** Lists publications used with the LMTV.
- **APPENDIX B, MAINTENANCE ALLOCATION CHART.** The maintenance allocation chart denotes the level of maintenance which performs specific maintenance tasks and the time required. It also lists tools and special tools required for each task.
- **APPENDIX C, TOOLS IDENTIFICATION LIST.** Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.
- **APPENDIX D, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.
- **APPENDIX E, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the LMTV.
- **APPENDIX F, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.
- **APPENDIX G, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX H, LUBRICATION ORDER.**
- **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**
- **SUBJECT INDEX.** Lists important subjects contained in volumes 1, 2, 3, 4, and 5 in alphabetical order and gives the associated paragraph number.

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, TROUBLESHOOTING (CONT)**

## OVERVIEW (CONT)

- **CHAPTER 3, ENGINE MAINTENANCE**
- **APPENDIX A, REFERENCES.** Lists publications used with the LMTV.
- **APPENDIX B, MAINTENANCE ALLOCATION CHART.** The maintenance allocation chart denotes the level of maintenance which performs specific maintenance tasks and the time required. It also lists tools and special tools required for each task.
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- **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**
- **SUBJECT INDEX.** Lists important subjects contained in volume 2 in alphabetical order and gives the associated paragraph number.

Volume 3 contains the following major sections in order of appearance:

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

- **CHAPTER 4, FUEL SYSTEM MAINTENANCE**
- **CHAPTER 5, EXHAUST SYSTEM MAINTENANCE**
- **CHAPTER 6, COOLING SYSTEM MAINTENANCE**
- **CHAPTER 7, ELECTRICAL SYSTEM MAINTENANCE**
- **CHAPTER 8, TRANSMISSION MAINTENANCE**
- **CHAPTER 9, PROPELLER SHAFT MAINTENANCE**
- **CHAPTER 10, FRONT AND REAR AXLE MAINTENANCE**
- **CHAPTER 11, BRAKE SYSTEM MAINTENANCE**
- **CHAPTER 12, WHEEL, TIRES, AND HUBS MAINTENANCE**
- **CHAPTER 13, STEERING SYSTEM MAINTENANCE**

- **CHAPTER 14, FRAME, TOWING ATTACHMENTS, AND DRAWBARS MAINTENANCE**
- **CHAPTER 15, SUSPENSION SYSTEM MAINTENANCE**
- **APPENDIX A, REFERENCES.** Lists publications used with the LMTV.
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- **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**
- **SUBJECT INDEX.** Lists important subjects contained in volume 3 in alphabetical order and gives the associated paragraph number.

Volume 4 contains the following major sections in order of appearance:

- **WARNING SUMMARY.** Provides a summary of the most important warnings that apply throughout the manual.
- **CHAPTER 16, BODY AND CAB MAINTENANCE**
- **CHAPTER 17, MATERIAL HANDLING CRANES, MAIN WINCHES, AND 11 K SELF-RECOVERY WINCH MAINTENANCE**
- **CHAPTER 18, BODY, CHASSIS, AND ACCESSORY ITEMS MAINTENANCE**
- **CHAPTER 19, HYDRAULIC SYSTEM MAINTENANCE**
- **APPENDIX A, REFERENCES.** Lists publications used with the LMTV.
- **APPENDIX B, MAINTENANCE ALLOCATION CHART.** The maintenance allocation chart denotes the level of maintenance which performs specific maintenance tasks and the time required. It also lists tools and special tools required for each task.
- **APPENDIX C, TOOLS IDENTIFICATION LIST.** Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.

## OVERVIEW (CONT)

- **APPENDIX D, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.
- **APPENDIX E, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the LMTV.
- **APPENDIX F, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.
- **APPENDIX G, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX H, LUBRICATION ORDER.**
- **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**
- **SUBJECT INDEX.** Lists important subjects contained in volume 4 in alphabetical order and gives the associated paragraph number.

Volume 5 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 20, SPECIAL PURPOSE KITS MAINTENANCE**
- **CHAPTER 21, ARMAMENT/SIGHTING AND FIRE CONTROL MATERIEL MAINTENANCE**
- **CHAPTER 22, ELECTRICAL ILLUMINATING EQUIPMENT MAINTENANCE**
- **CHAPTER 23, AIR SYSTEM MAINTENANCE**
- **CHAPTER 24, GAGES (NON-ELECTRICAL) MAINTENANCE**
- **APPENDIX A, REFERENCES.** Lists publications used with the LMTV.
- **APPENDIX B, MAINTENANCE ALLOCATION CHART.** The maintenance allocation chart denotes the level of maintenance which performs specific maintenance tasks and the time required. It also lists tools and special tools required for each task.
- **APPENDIX C, TOOLS IDENTIFICATION LIST.** Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.
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- **APPENDIX G, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX H, LUBRICATION ORDER.**

- **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**
- **SUBJECT INDEX.** Lists important subjects contained in volume 5 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. Preventive Maintenance Checks and Services.** 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.

# CHAPTER 1 INTRODUCTION

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## Section I. GENERAL INFORMATION

### 1-1. SCOPE

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

**a. Type of Manual:** Unit Support Maintenance Instructions, TM 9-2320-365-20-1.

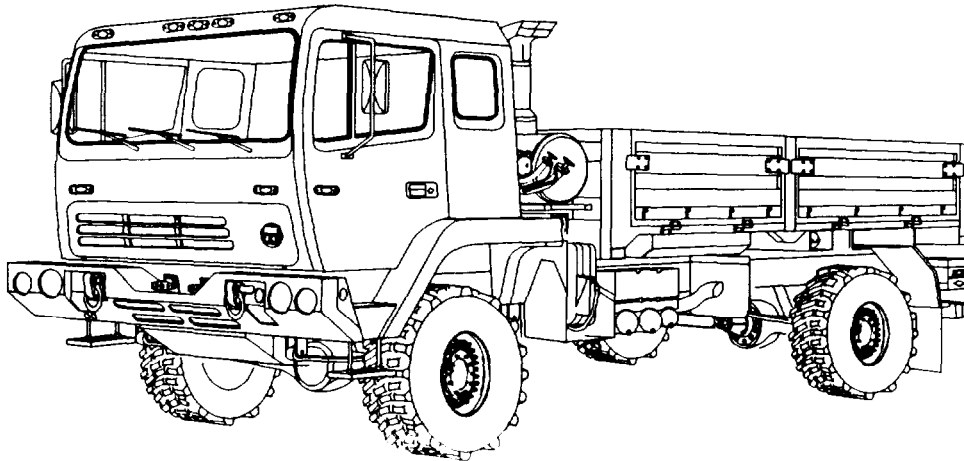
**b. Model Numbers and Equipment Names.** The vehicle model numbers and names are listed below:

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

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

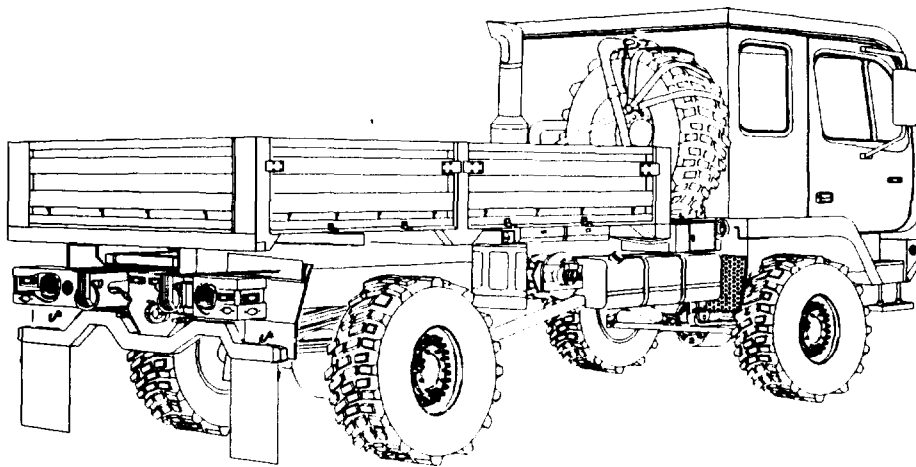
- (1) M1078 - Cargo hauling vehicle; can be outfitted for troop transport when equipped with a troopseat kit.
- (2) M1079 - Van; can be outfitted with communications equipment or shop equipment,
- (3) M1080 - Vehicle chassis; this chassis will accept a cargo bed or may be modified for special missions.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

1-1. SCOPE (CONT)



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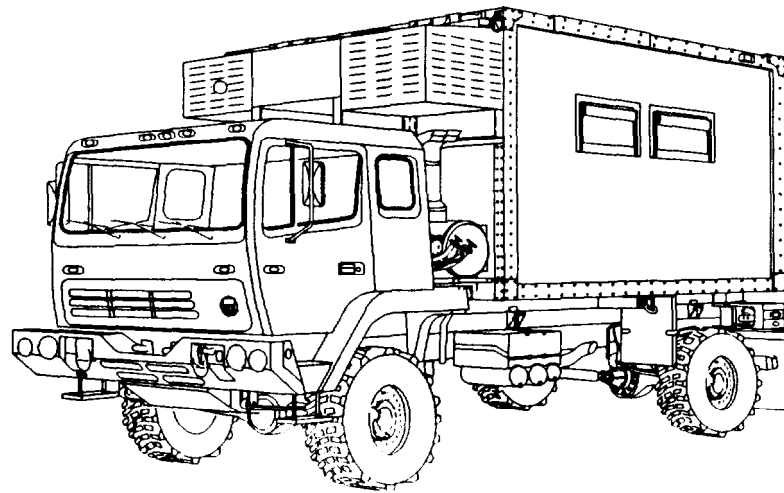
LEFT FRONT VIEW



RIGHT REAR VIEW

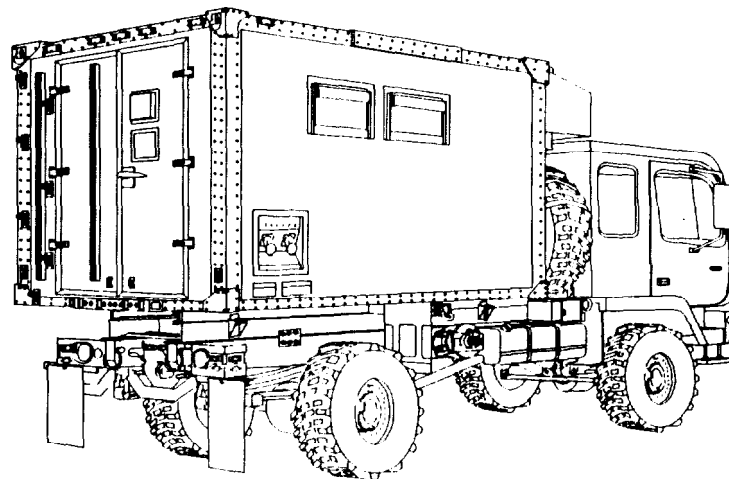
Figure 1-1. M1078 Truck, Cargo: 2 1/2-Ton, 4x4, Dropside





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LEFT FRONT VIEW

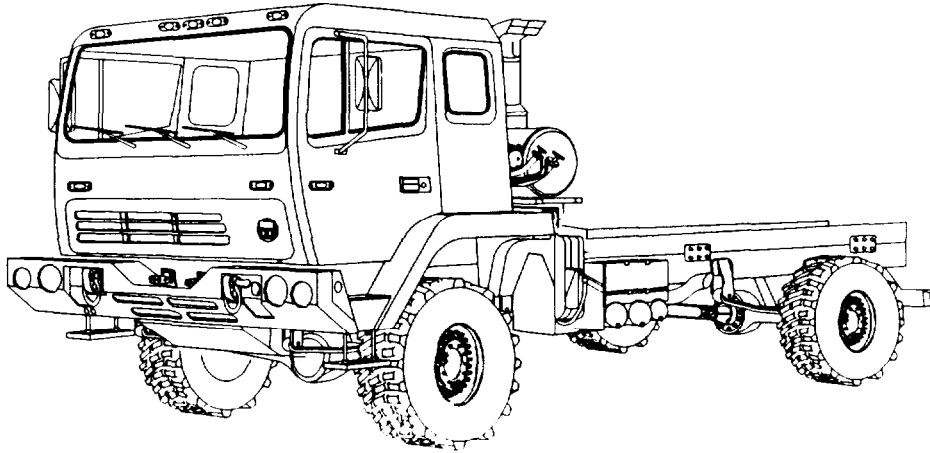


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RIGHT REAR VIEW

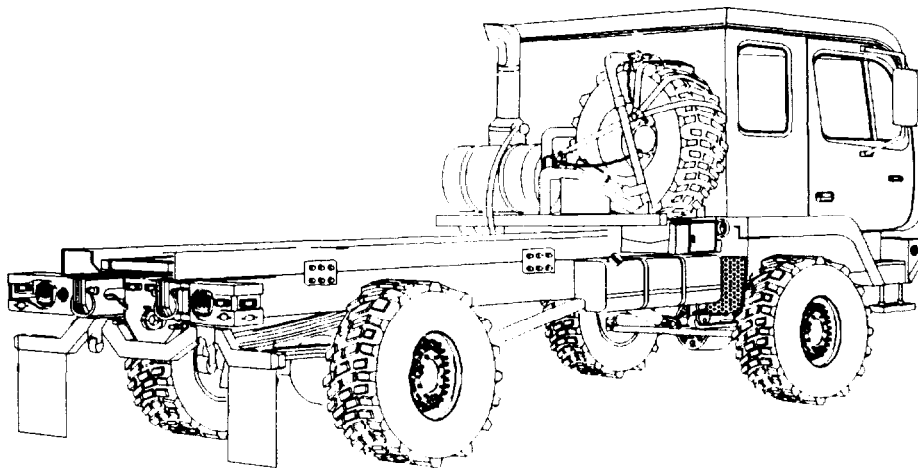
Figure 1-2. M1079 Truck, Van: 2 1/2 Ton, 4x4

1-1. SCOPE (CONT)



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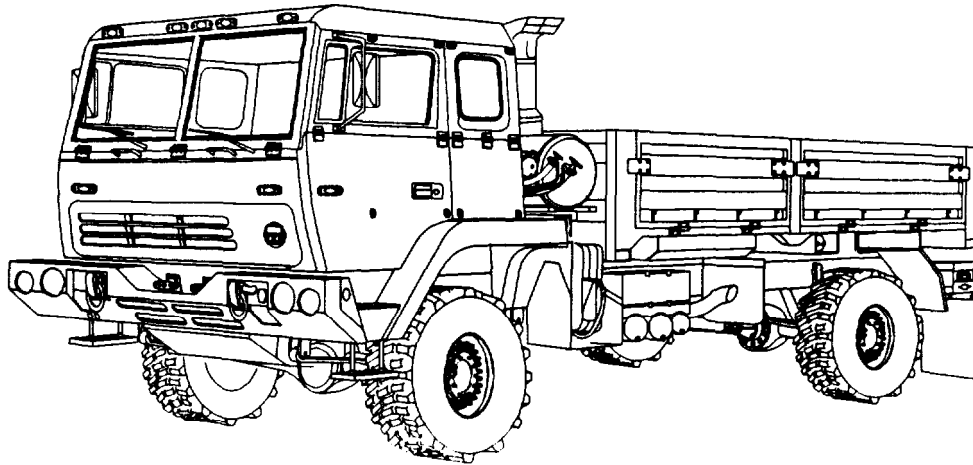
LEFT FRONT VIEW



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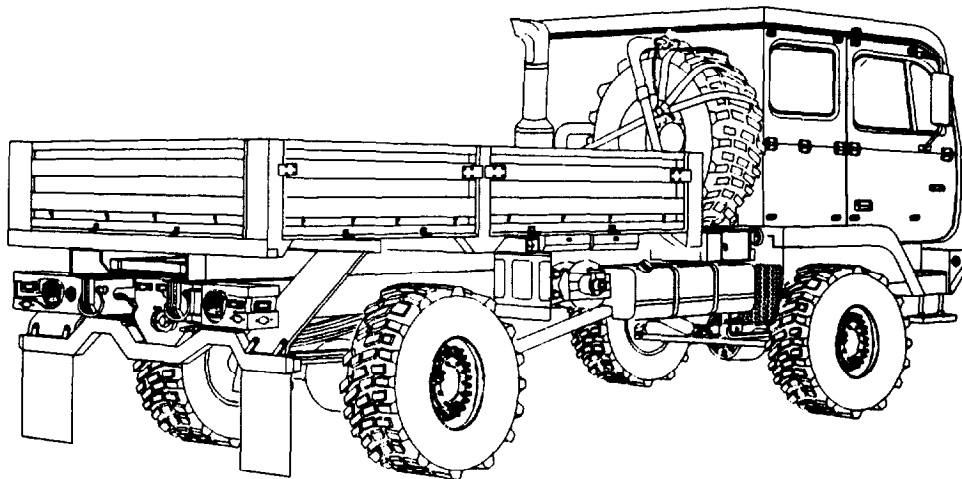
RIGHT REAR VIEW

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



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LEFT FRONT VIEW



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RIGHT REAR VIEW

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

**1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS**

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA Pam 738-750. The Army Maintenance Management Systems (TAMMS); DA Pam 738-751, Functional Users Manual for the Army Maintenance Management Systems; or AR 700-138. Army Logistics Readiness and Sustainability.

**1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE**

Command decision, according to the tactical situation, will determine when the destruction plan of the M1078 vehicles will be accomplished. A destruction plan will be prepared by the using organization unless one has been prepared by a higher authority. For general destruction procedures for this equipment, refer to TM 750-224-6, Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (U.S. Army Tank-automotive and Armaments Command).

**1-4. OFFICIAL NOMENCLATURE, NAMES AND DESIGNATIONS**

Table 1-1 lists the nomenclature cross-reference used in this manual.

Table 1-1. Nomenclature Cross-Reference

Common Name	Official Nomenclature
Cold Start System	Ether Quick-Start System
Engine Coolant	Antifreeze, Ethylene, Glycol, Inhibited
Gladhand	Quick-Disconnect Coupling
Vehicle	Light Medium Tactical Vehicle (LMTV)

**1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)**

If your Light Medium Tactical Vehicle (LMTV) needs improvement, let us know. Send us an ER. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/FMTV/312, Warren, MI 48397-5000. We'll send you a reply.

**1-6. WARRANTY INFORMATION**

Refer to M1078 Series Warranty Program Technical Bulletin, TB 9-2300-365-15, for complete warranty information covering the vehicle. Warranty starts on the date found in block 23, DA Form 2408-9, in the logbook. Report all defects in material or workmanship to your supervisor, who will take appropriate action.

**Section II. EQUIPMENT DESCRIPTION AND DATA**

**1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

Refer to TM 9-2320-365-10 for equipment characteristics, capabilities, and features.

## 1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

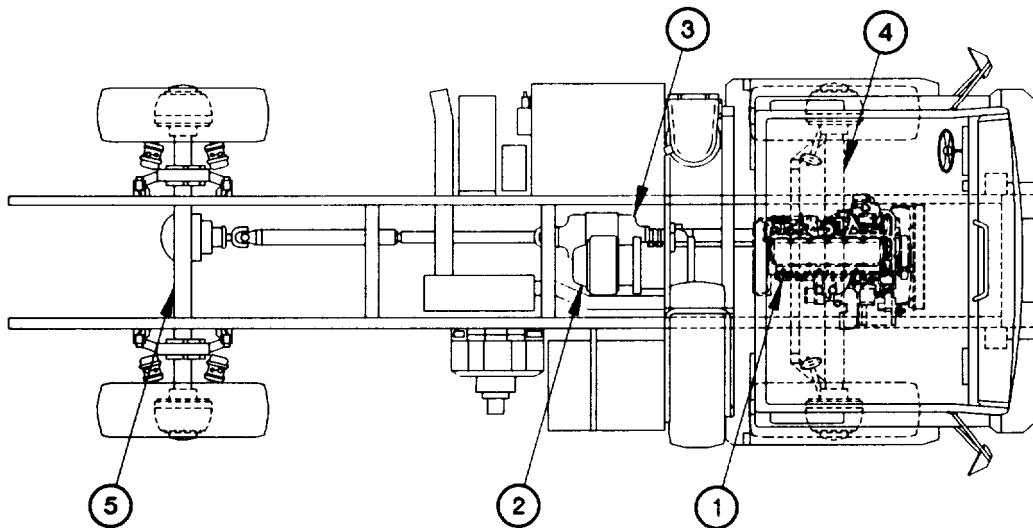
Refer to TM 9-2320-365-10 for location and description of major components.

## 1-9. DIFFERENCES BETWEEN MODELS

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

### Section III. PRINCIPLES OF OPERATION

## 1-10. POWERTRAIN

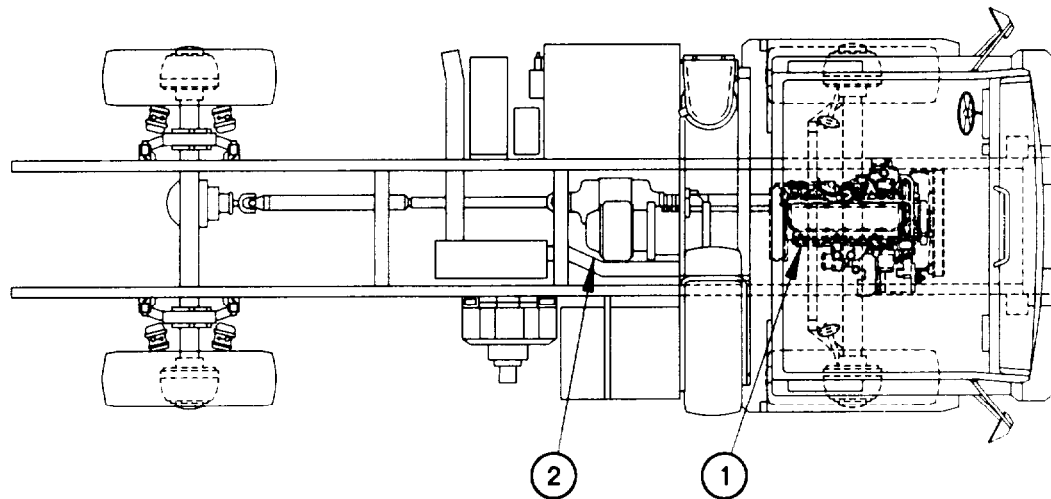


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Figure 1-5. Powertrain

Power for the vehicle is provided by a diesel engine (1, Figure 1-5) which is coupled directly to an automatic transmission (2). Power from the automatic transmission is transferred to the transfer case (3) and on to the front steering and rear drive axles (4 and 5) through a series of drive shafts and universal joints. The vehicle drive train is enhanced by the use of an electronically controlled seven-speed transmission. The primary components of the Allison MD3070PT transmission consist of a control module located directly beneath the transmission main housing; a Throttle Position Sensor (TPS) which detects the percentage of throttle being used; and engine, turbine, and output speed sensors which, in combination with each other, send information to the transmission ECU to provide the smoothest possible shifting and allow the transmission ECU to monitor overall transmission performance. Transmission shift control is provided by one of two types of pushbutton shift selectors: The WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) which contains an integral transmission ECU or the WTEC III Transmission Pushbutton Shift Selector (TPSS) which is coupled to an external transmission ECU.

## 1-10. POWERTRAIN (CONT)



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Figure 1-5. Powertrain (Cont)

- a. Engine. The vehicle is equipped with a Caterpillar diesel engine, model 3116 ATAAC (Air-to Air After Cooler) (1, Figure 1-5), rated at 225 HP.
- b. Transmission. The vehicle is equipped with an Allison automatic transmission, model MD3070PT (2, Figure 1-5). It is a fully automatic electronically controlled seven-speed close-ratio transmission.

(1) The TEPSS contains microprocessor based electronics, and is located in the instrument panel to the driver's left. The TPSS is located in the instrument panel to the driver's left, while the transmission ECU is located behind the kick panel. The ECU receives information, in the form of electrical signals from the various sensors, processes that information, then sends the appropriate signals to the solenoids which control transmission function. The ECU incorporates a diagnostic program which enables it to identify numerous actual and/or potential transmission problems. The TEPSS and TPSS are capable of displaying diagnostic codes in the Light Emitting Diode (LED) display on the pushbutton shift selector. These diagnostic codes are stored in the ECU for later retrieval. The pushbutton shift selector is used for selecting transmission range. The transmission defaults to Neutral (N) whenever electrical power is removed from the vehicle. The Drive (D) gear selection is used for normal driving conditions. The transmission will engage 2nd gear when D is selected and the vehicle is stopped. As the accelerator is depressed and speed increases, the transmission will automatically upshift through 3rd, 4th, 5th, 6th, and 7th gears. Low gear (1st gear), is available only by manual selection. Selecting a specific gear; for example, 3rd; will prevent the transmission upshifting past the selected gear. This is useful if road or load conditions require lower gear range operation. When road conditions improve or load is reduced, the shift selector can be returned to the normal (D) driving position. When electrical power is applied to the TEPSS and a fault is detected in the transmission controls, the TEPSS will emit an eight second series of beeps. When electrical power is applied to the TPSS and a fault is detected in the transmission controls, "--" will appear in the TPSS LED display. In either case, the transmission will not engage a range (forward or reverse) when D or Reverse (R) range is selected on the pushbutton shift selector. TM 9-2320-365-10 provides full operating instructions for the transmission.

(2) The transmission may include a Power Take-Off (PTO). The PTO powers a hydraulic pump which supplies hydraulic pressure for an 11K self-recovery winch (SRW).

- c. **Transfer Case.** The transfer case (3, Figure 1-5) provides the transmission (2) with the seventh gear (low gear, or 1st gear) and delivers power from the transmission to the front and rear driveshafts. In normal driving conditions, the transfer case splits the output torque of the transmission, providing 70 percent of the torque to the rear output drive yoke and 30 percent to the front output drive yoke. In low gear the output torque of the transmission is split evenly, with 50 percent going to the front output yoke and 50 percent going to the rear.
- d. **Suspension.** The suspension system is designed to maintain tire/ground contact in all types of terrain. The vehicle is equipped with 395/85R20 tires. The tires have a tread pattern designed to maximize traction on all types of terrain.
- e. **Axles.** Front and rear axles (4 and 5, Figure 1-5) feature wheel end planetary drives designed to allow the vehicle to carry heavy loads. When the vehicle is operated in MODE, all axles become driving axles. When the vehicle is operated in MODE, 7th gear is unavailable.

### 1-11. ENGINE AIR INTAKE SYSTEM

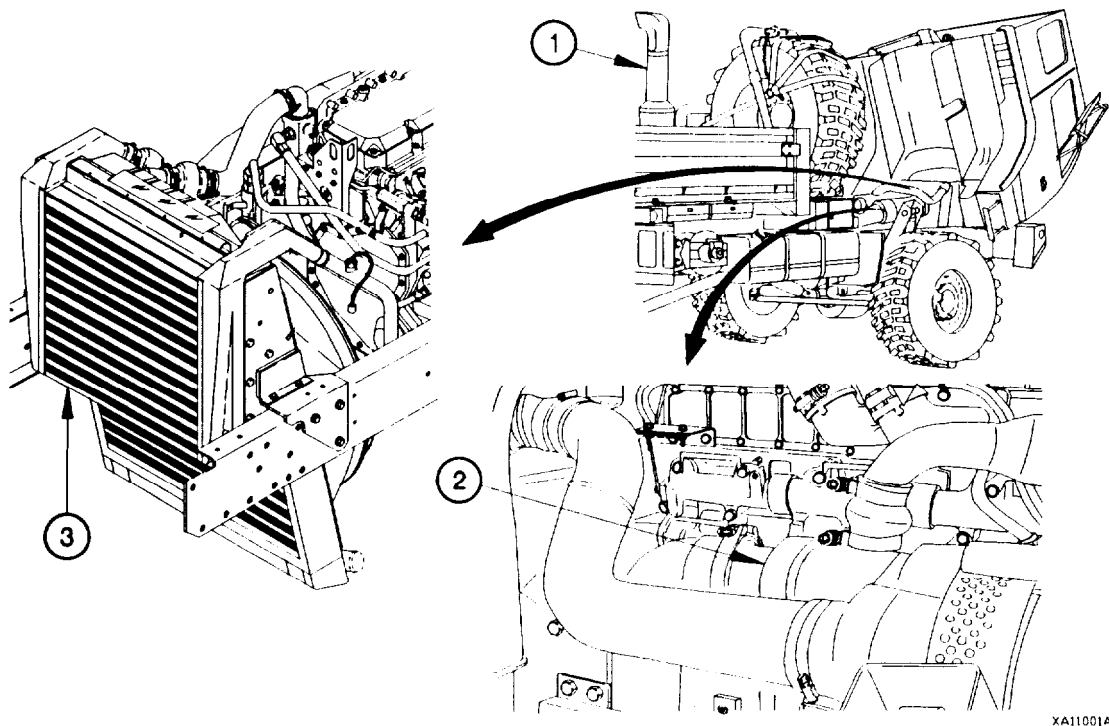


Figure 1-6. Engine Air Intake System

The engine air intake system consists of a dry-type air cleaner (1, Figure 1-6), turbocharger (2), and a charge air cooler (3). The turbocharger increases engine horsepower by delivering a higher volume of air to the engine. Engine exhaust gases flow through the turbocharger, causing a turbine wheel to spin. As the turbine wheel spins, a compressor wheel on the opposite end of the turbine wheel shaft spins and draws fresh air through the air cleaner. The compressor wheel compresses the air and delivers it to the charge air cooler. The air flows through the charge air cooler which cools the air before it is delivered to the engine cylinders. The charge air cooler allows a denser charge of air to be delivered to the engine, which also aids in increasing engine horsepower.

## 1-12. FUEL SYSTEM

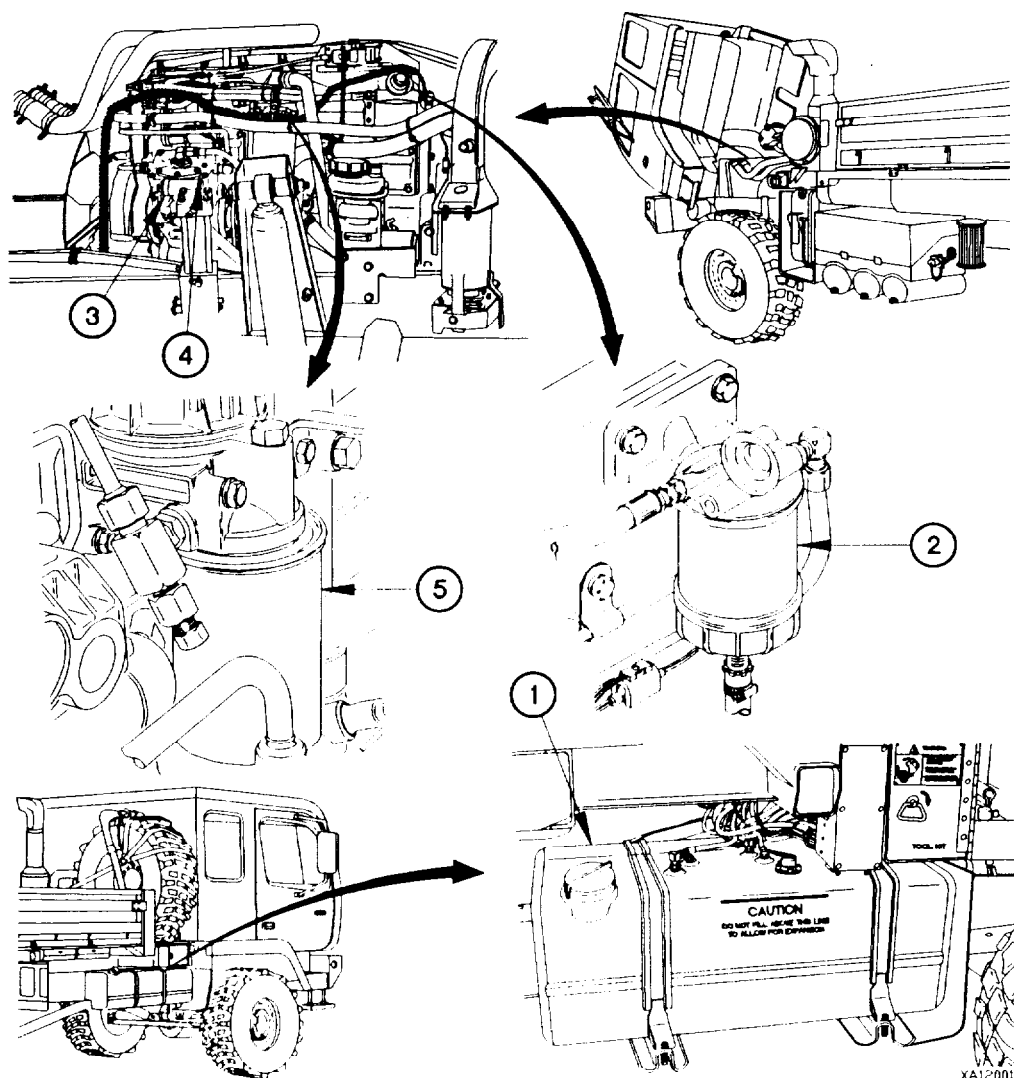
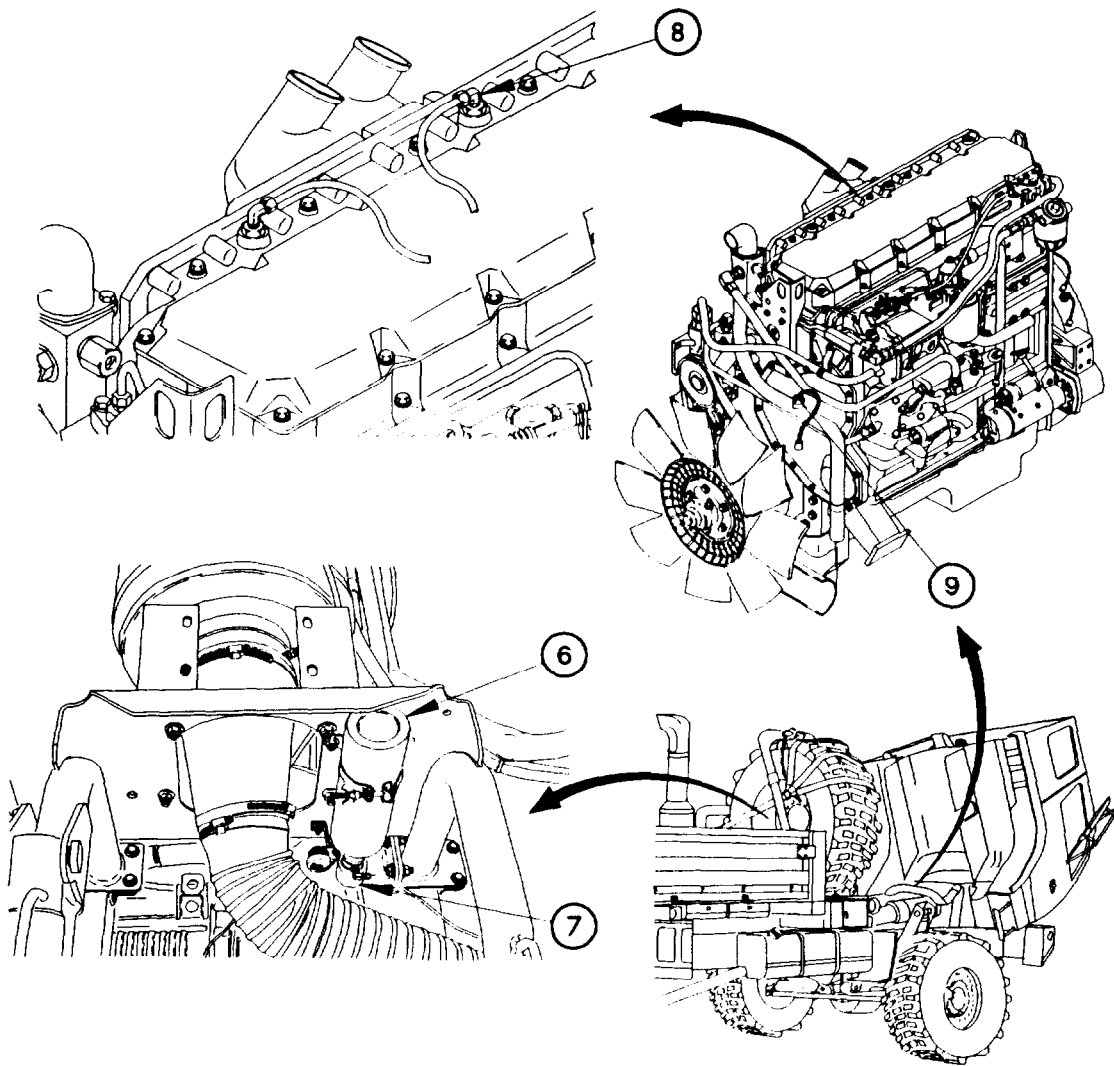


Figure 1-7. Fuel System

The primary components of the fuel system are the fuel tank (1, Figure 1-7), fuel priming pump and fuel/water separator (2), fuel shutoff solenoid (3), engine fuel governor (4), and secondary fuel filter (5). The mechanical fuel pump acts as an engine priming feature. The fuel/water separator removes water and large solid particles from the fuel before it is passed to the engine fuel governor. The fuel shutoff solenoid, when energized, frees the governor output shaft to move to the FUEL ON position. When electrical power is removed from the fuel shutoff solenoid, the governor output shaft is locked in the FUEL OFF position. The engine fuel governor contains a mechanical link to the fuel control linkage and fuel transfer pump. The engine fuel governor responds to input from the accelerator pedal and causes the fuel control rack to rotate, resulting in an increase or decrease in engine speed. The governor adjusts the amount of fuel delivered to the engine as engine speed changes. The secondary fuel filter removes finer particles from the fuel before it reaches the cylinder head. A fuel pressure regulator redirects excess fuel, through a fuel return hose, back to the fuel tank.





XA12002A

Figure 1-7. Fuel System (Cont)

Additionally, the vehicle is equipped with an ether quick start system designed for starting the engine when ambient temperatures are below 32° F (0°C). The ether quick start system is composed of an ether cylinder (6), ether valve (7), two ether nozzles (8), and an ether sensor switch (9). The ether sensor switch detects the temperature of the engine coolant and disables the ether valve above 32° F (0°C). The ether valve delivers a controlled charge of ether to the ether nozzles.

1-13. COOLING SYSTEM
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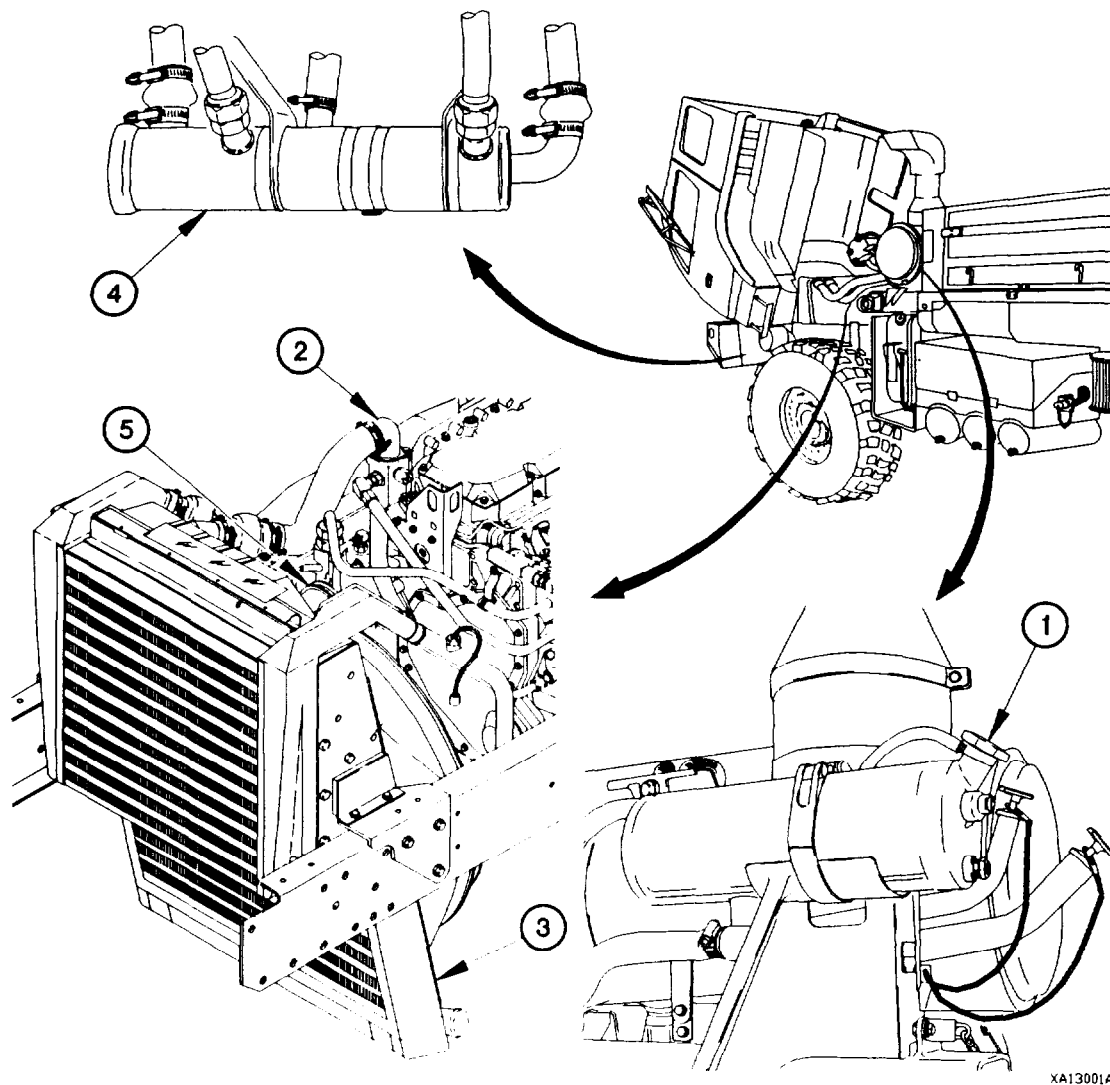


Figure 1-8. Cooling System

a. Cooling System. The pressurized cooling system protects the engine, transmission, and air compressor by providing a means of dissipating heat generated during operation of the vehicle. The radiator pressure cap (1, Figure 1-8), in combination with the ethylene glycol-based antifreeze, effectively raises the boiling point of the coolant to well above 212° F (100°C). The thermostat (2), located in a housing on the right side of the engine, helps the engine to warm up quickly by remaining closed until the coolant temperature reaches approximately 180°F (82°C). When the coolant reaches 199° F (93° C), the thermostat is fully open and coolant is circulated through the water jackets in the engine to maintain the correct operating temperature for the engine. Coolant is drawn from the radiator (3), through the transmission oil cooler (4), and circulated throughout the cooling system by the water *pump* (5). The water pump, located on the front of the engine toward the right side, is driven by two V-belts from the crankshaft pulley.

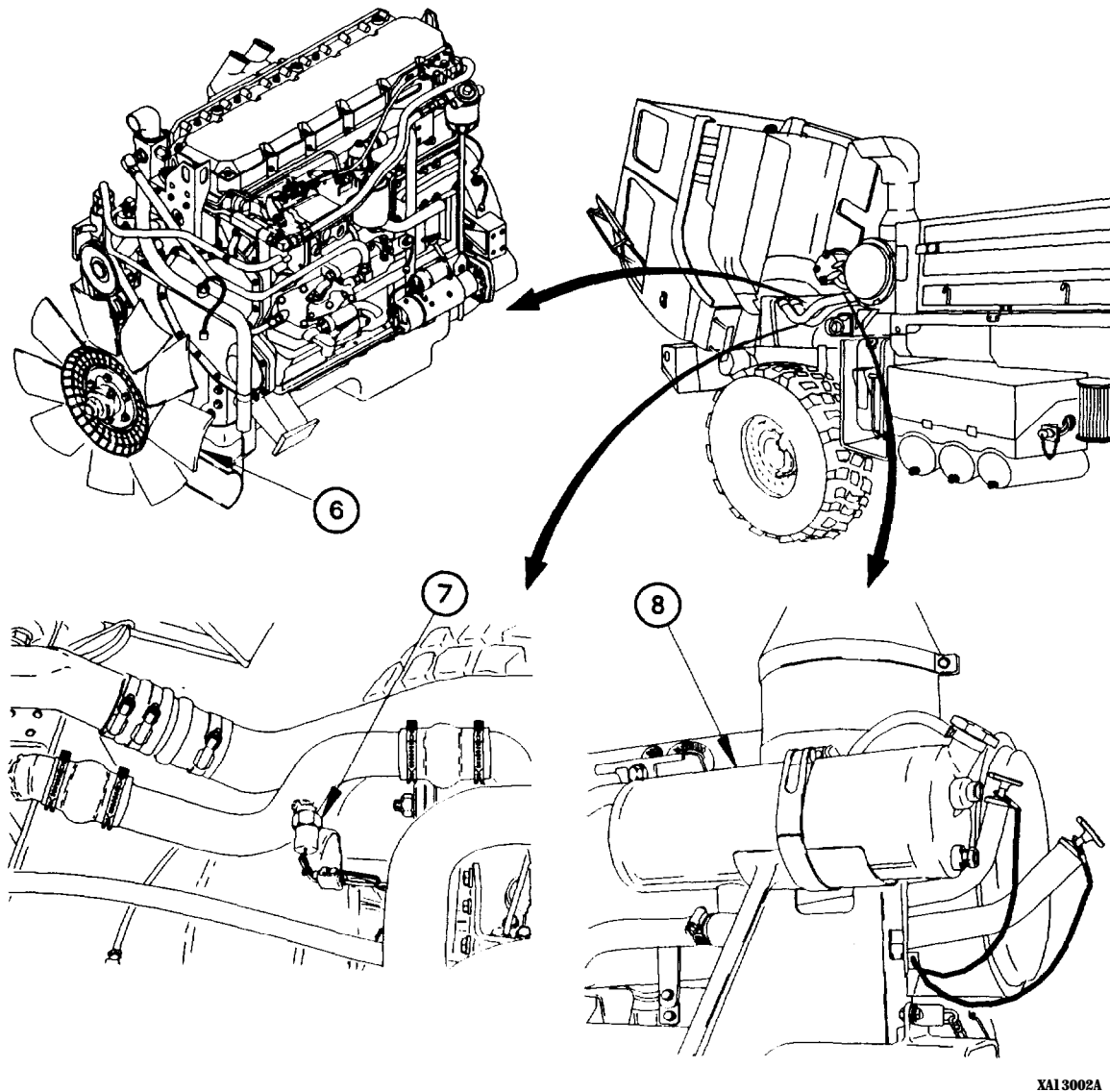
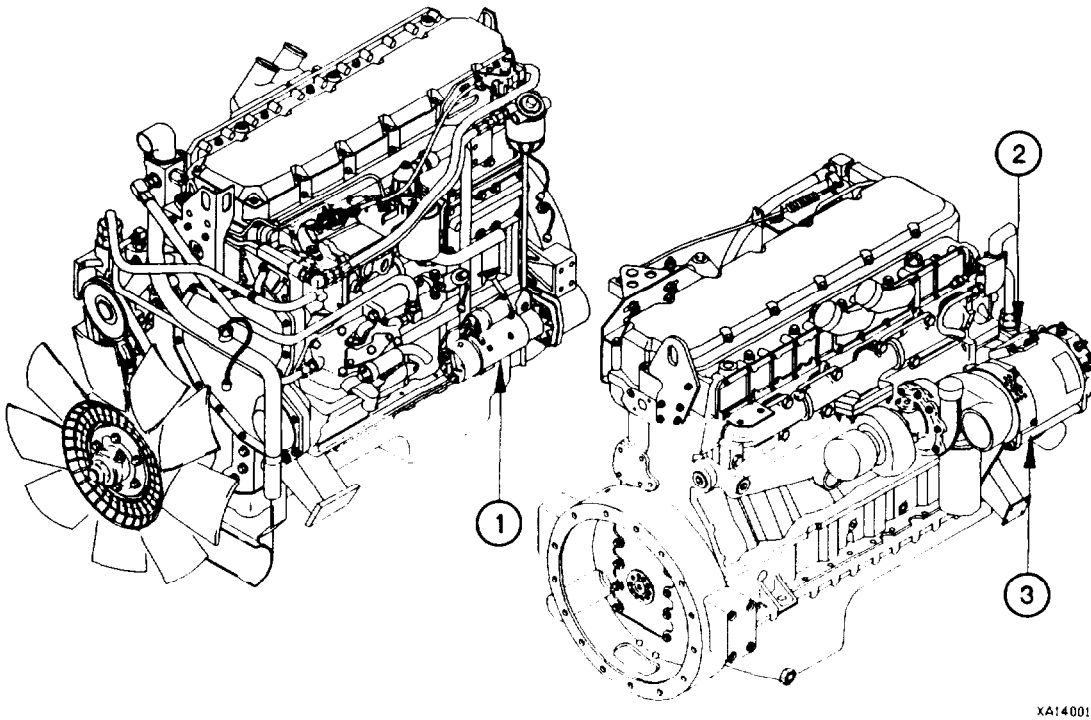


Figure 1-8. Cooling System (Cont)

An engine fan (6) with pneumatic clutch is activated by the water temperature switch (7). When this switch detects a high temperature condition, air pressure is removed from the fan clutch and the engine fan is engaged. Excess heat is drawn from the radiator by the flow of air created by the engine fan over the radiator cooling fins. A radiator overflow tank (8) is provided to allow for expansion of the coolant. The radiator overflow tank also serves as the point where new coolant is introduced into the cooling system.

**1-14. ELECTRICAL SYSTEM**



XA14001A

Figure 1-9. Electrical System

In the Electrical System, a heavy duty starting motor (1, Figure 1-9) is mounted on the engine flywheel housing and provides the cranking power necessary for starting the engine. The voltage regulator (2) maintains both a 14- and 28-volts level for proper battery charging. The alternator (3) provides sufficient amperage to operate all electrical components and charge the batteries during engine idling. Vehicle exterior lights are mounted in protective locations or are protected to prevent damage. Protection is provided for lights during cross country travel. Polycarbonate lenses are provided for all lights except the sealed beam headlights. The electrical system supplies all of the electrical power needed to operate the vehicle and trailer. The complete Electrical System is made up of the following subsystems:

- Power Storage and Generating
- Engine Starting and Stopping
- Service Lighting
- Blackout Lighting
- Accessory Lighting
- Instruments
- Indicator Lights and Alarm
- Troubleshooting Aid

a. Power Storage and Generating. Power storage for the vehicle consists of four 12-volt batteries. The four batteries are divided into two sets. Two batteries in each set are wired in parallel to produce higher amperage. The two sets are then wired in series to produce 24 volts Direct Current (DC). While the batteries can power all of the systems for a limited time, their primary purpose is to supply power to the engine starting system. Once the engine is running, the generating system provides electrical power for all of the systems. The engine driven alternator generates Alternating Current (AC) which is passed through a set of rectifiers that change it into DC current. This DC current is used to charge the batteries and is distributed to the electrical sub-systems of the vehicle. The voltage regulator adjusts alternator output to fit the needs of the electrical system.

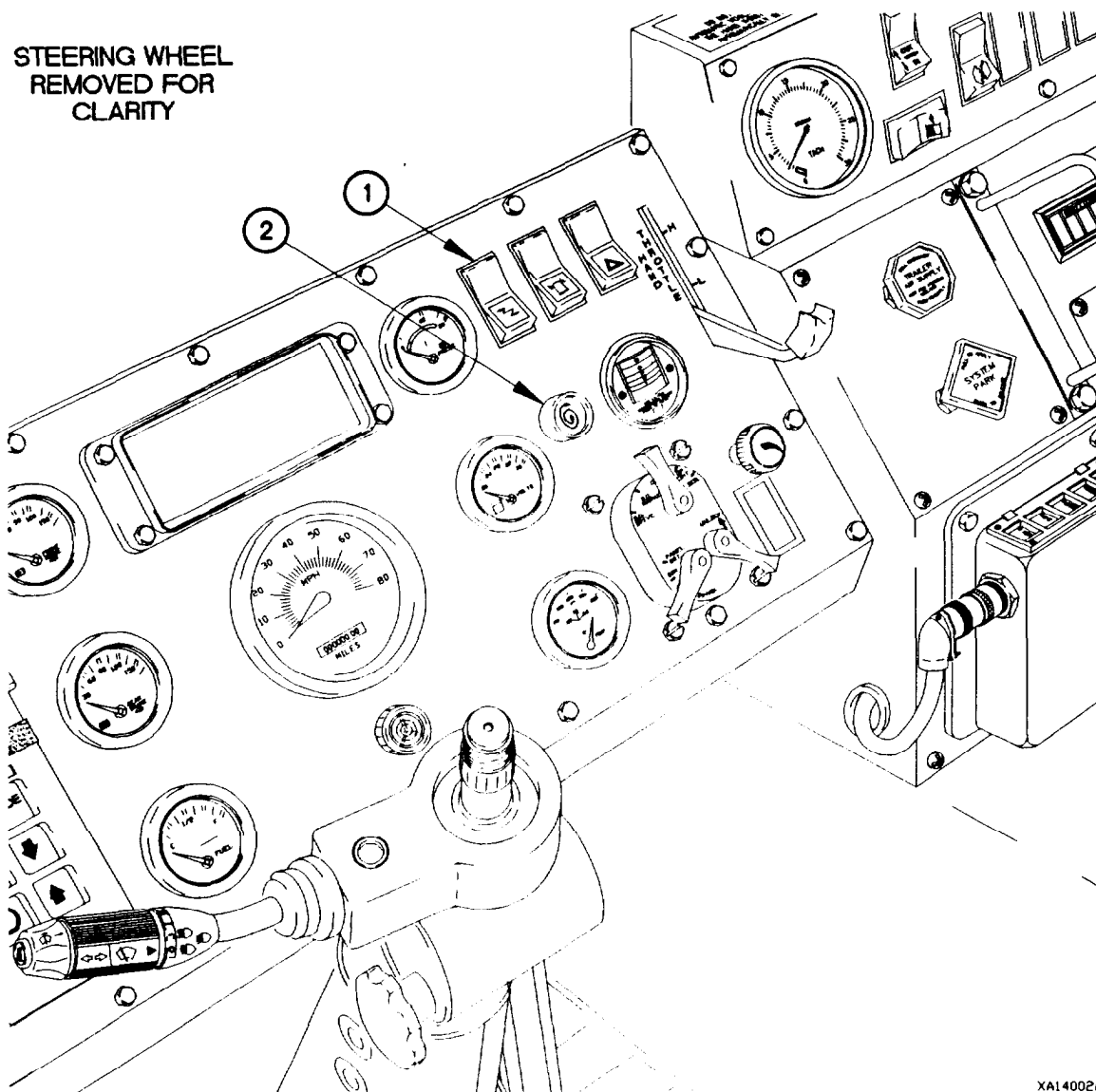
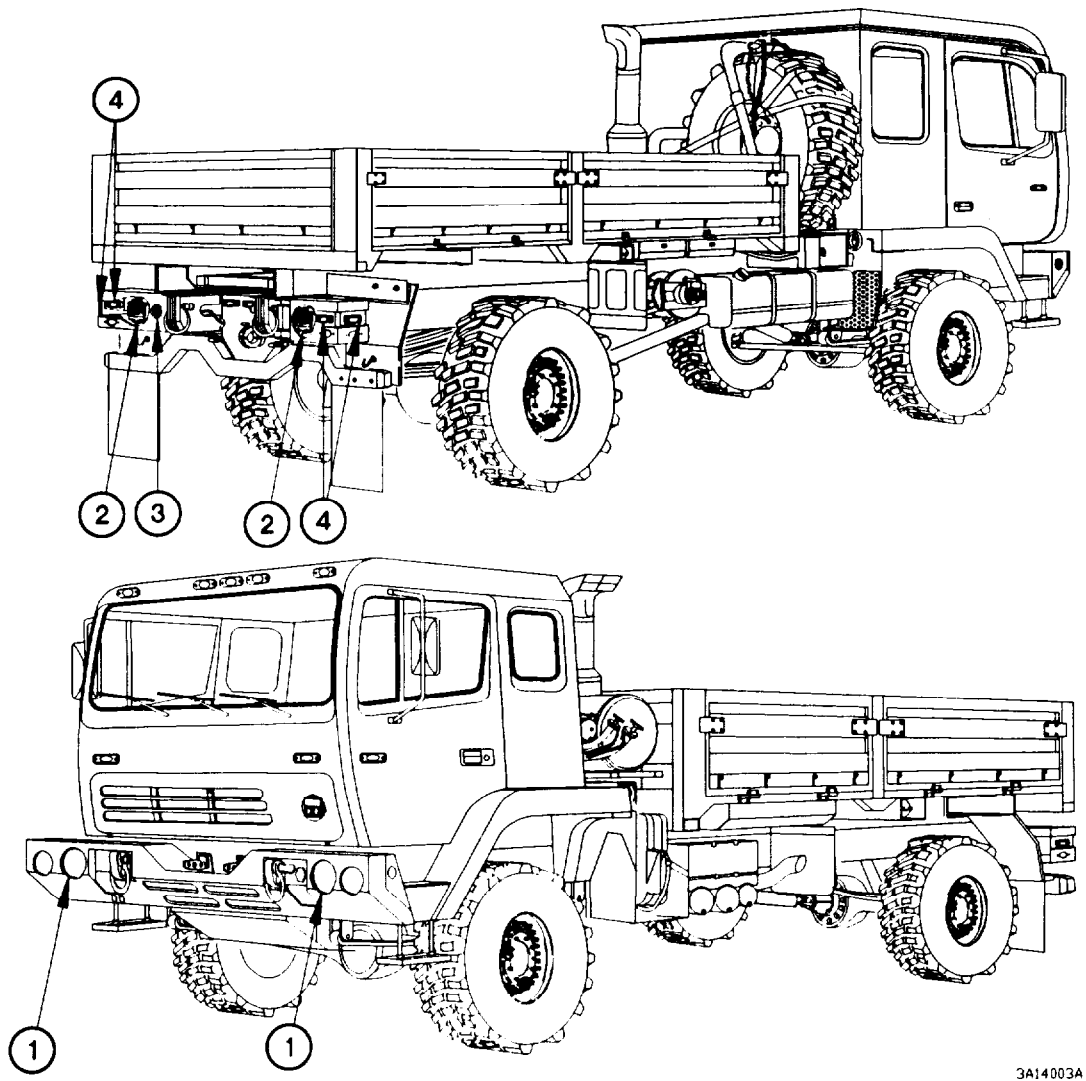


Figure 1-10. Engine Starting System.

b. Engine Starting and Stopping. The Engine Starting System uses the stored electrical energy of the batteries to turn the starting motor. When the master power switch (1, Figure 1-10) is positioned to on and the starter pushbutton switch (2) is depressed, electrical power passes through the starter pushbutton to the auxiliary starter solenoid. The auxiliary starter solenoid draws electrical power directly from the batteries and sends it to the starting motor solenoid. When the starting motor solenoid is energized, electrical power from the batteries is supplied to the starting motor and the engine begins cranking. Positioning the master power switch to off stops the engine.

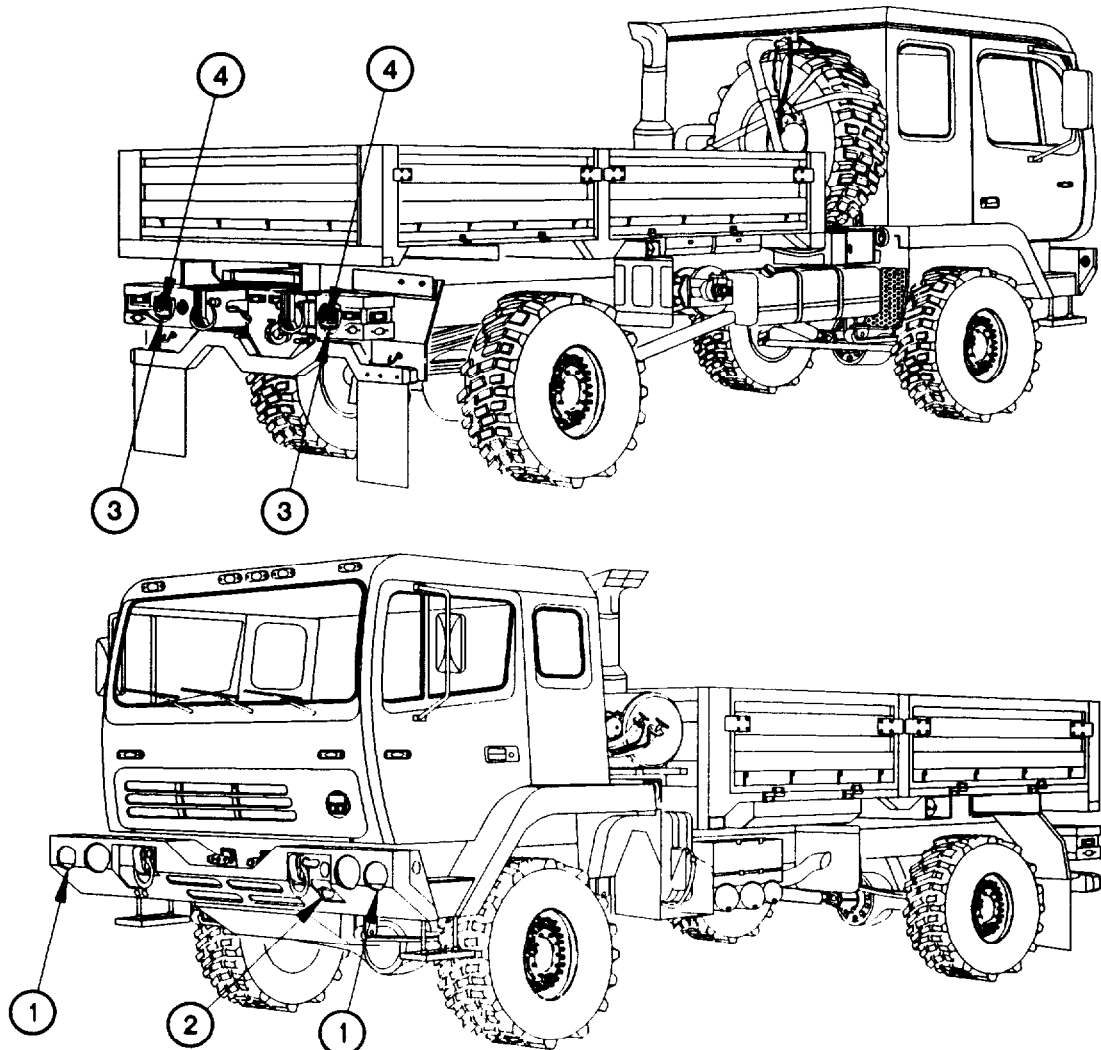
1-14. ELECTRICAL SYSTEM (CONT)



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Figure 1-11. Service Lighting System

c. Service Lighting. The Service Lighting System includes the headlights (1, Figure 1-11), taillights (2), backup light (3), and clearance and marker lights (4). They are energized by positioning the main light switch to the appropriate position (TM 9-2320-365-10).



3A1 4004A

Figure 1-12. Blackout Lighting System

d. Blackout Lighting. The Blackout Lighting System includes the front blackout marker lights (1, Figure 1-12), blackout drive light (2), rear blackout marker lights (3), and blackout stop lights (4). These lights are energized by positioning the main light switch to the appropriate position (TM 9-2320-365-10).

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

**1-14. ELECTRICAL SYSTEM (CONT)**

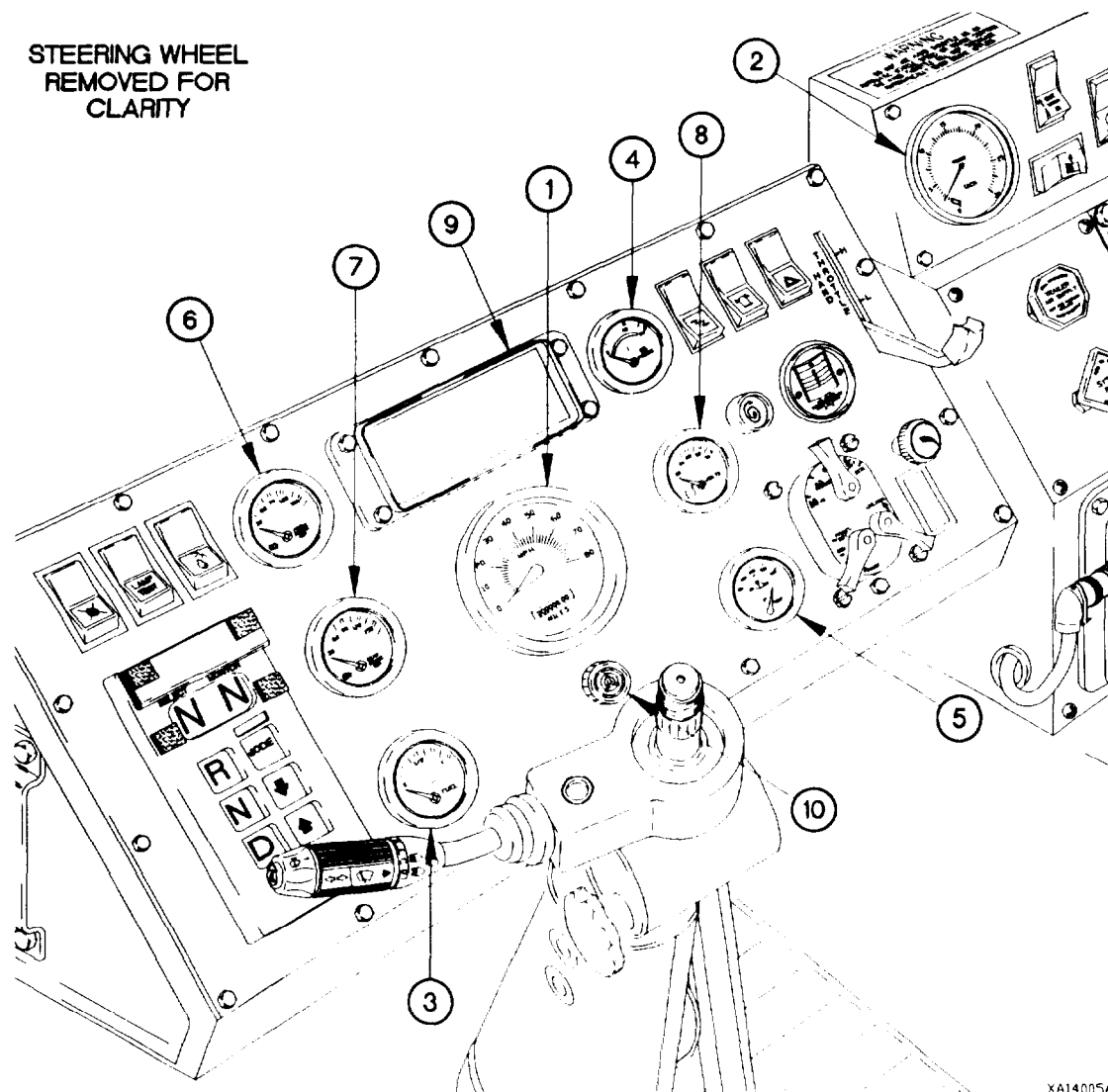


Figure 1-13. Instrument Panel

f. Instruments. The Instrument Panel includes all gages that provide the operator with information about vehicle condition and operating status. The speedometer (1, Figure 1-13) receives electrical input from the WTEC II Vehicle Interface Module (VIM) on vehicles equipped with WTEC II transmission controls. The speedometer receives electrical input from the WTEC III transmission ECU on vehicles equipped with WTEC III transmission controls. The WTEC II VIM and the WTEC III transmission ECU are both located behind the kick panel. Tachometer (2) input is provided by the engine speed sensor located on the engine flywheel housing. The fuel gage (3), oil pressure gage (4), water temperature gage (5), front brake air pressure gage (6), rear brake air pressure gage (7), and volts gage (8) receive electrical signals from sending units. The sending units respond to changes in fluid level, pressure, temperature, and DC current and send this information to the gages.



g. Indicator Lights and Alarms. The lighted indicator display (9) and audible alarm (10), located on the instrument panel assembly, are activated by switches located in various systems. These include, but are not limited to; master stop, low engine oil pressure, low air pressure, high water temperature, engine fan off, and high transmission oil temperature. When any of these switches are activated, they energize the proper indicator and/or alarm, alerting the operator of a potential problem or condition which needs to be monitored.

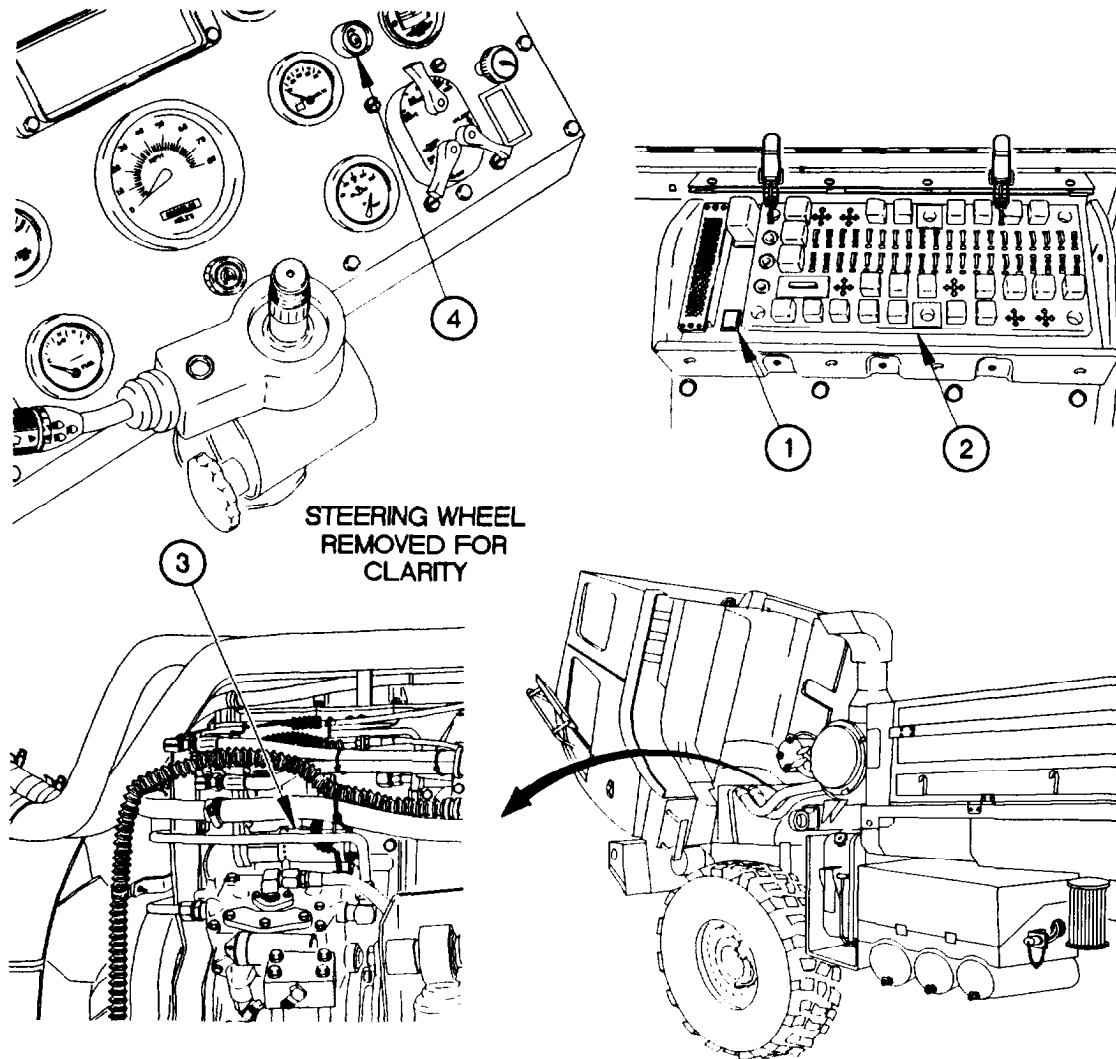
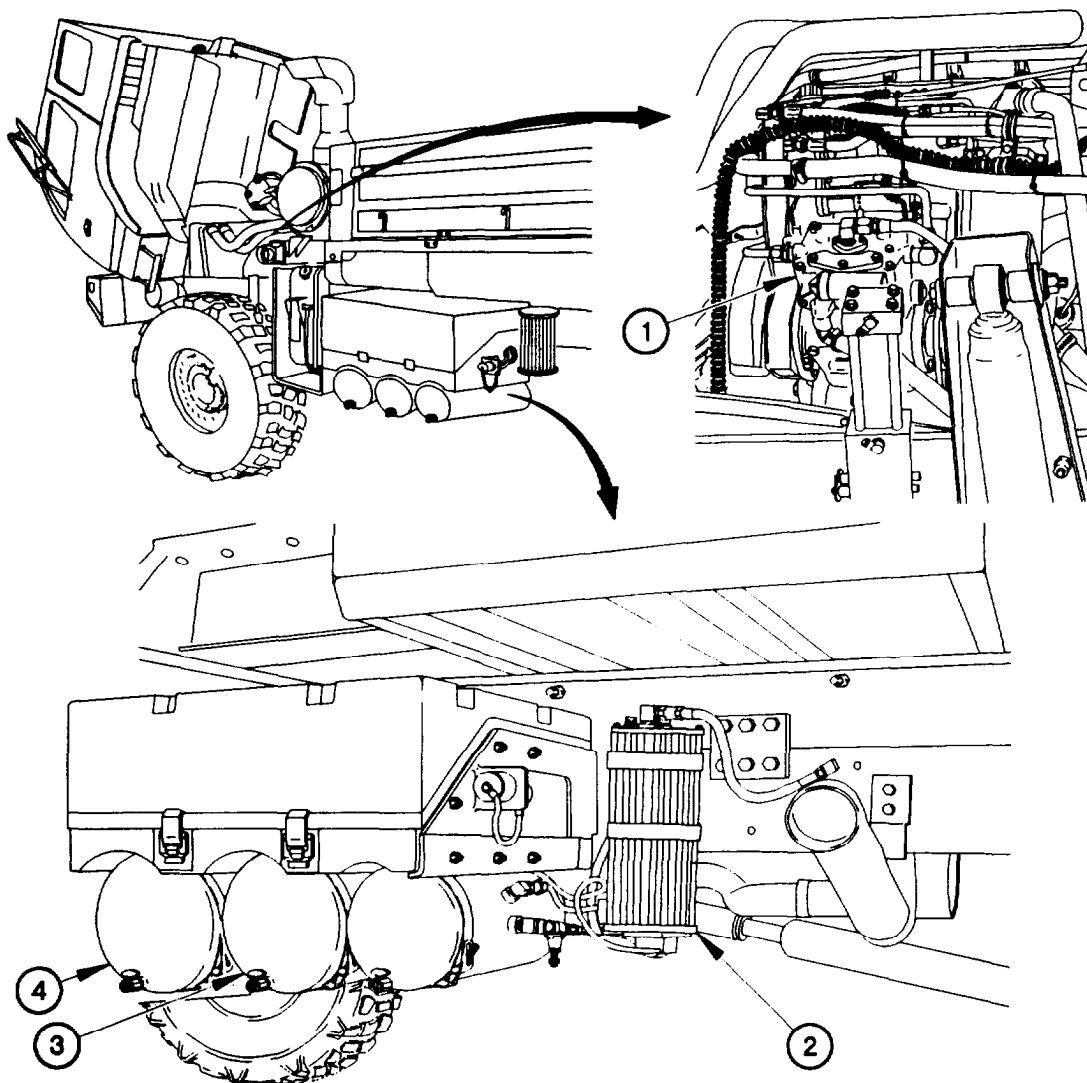


Figure 1-14. Troubleshooting Aid

h. Troubleshooting Aid. A start inhibit switch (1, Figure 1-14), located on the Power Distribution Panel (PDP) (2), is provided as a troubleshooting aid for the Unit and DS Maintenance levels and as a maintenance tool at the GS Maintenance level to stop fuel flow at the fuel shutoff solenoid (3). By pressing the start inhibit switch first, the starter pushbutton (4) can be pressed and the engine cranked without allowing the engine to be started. The start inhibit switch is reset when the master power switch is positioned to off and then to on again.

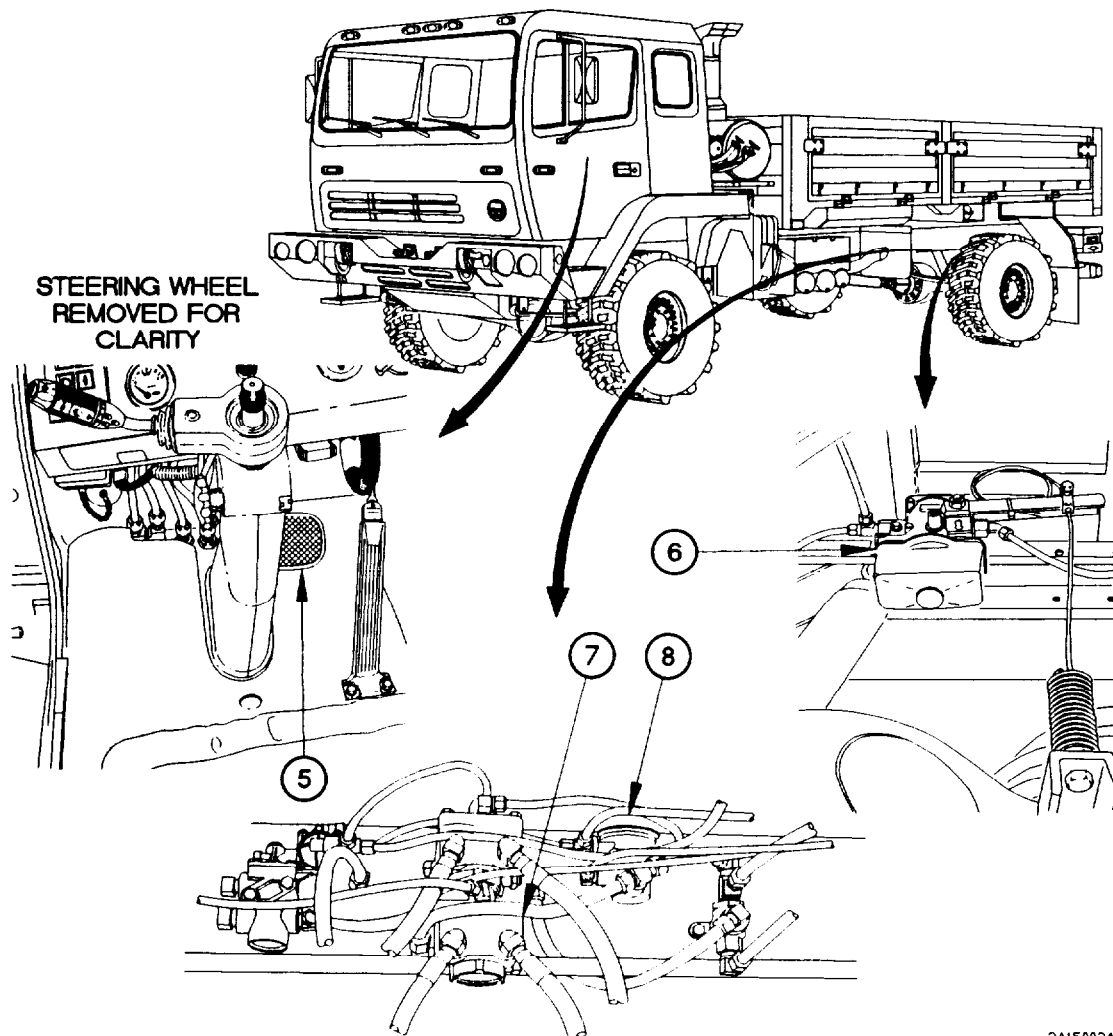
1-15. BRAKE SYSTEM



XA15001A

Figure 1-15. Brake System

The vehicle is equipped with an air brake system which complies with the Federal Motor Vehicle Safety Standard (FMVSS) 121. The brake system is made up of a number of components including an air compressor, air dryer, primary and secondary air tanks, and several valves which control the application and release of the brakes. The air compressor (1, Figure 1-15) supplies approximately 120 psi (827 kPa) to the air dryer (2). The air dryer contains a heating element and a desiccant cartridge to remove moisture from the air before it is delivered to the primary air tank (3) and secondary air tank (4).

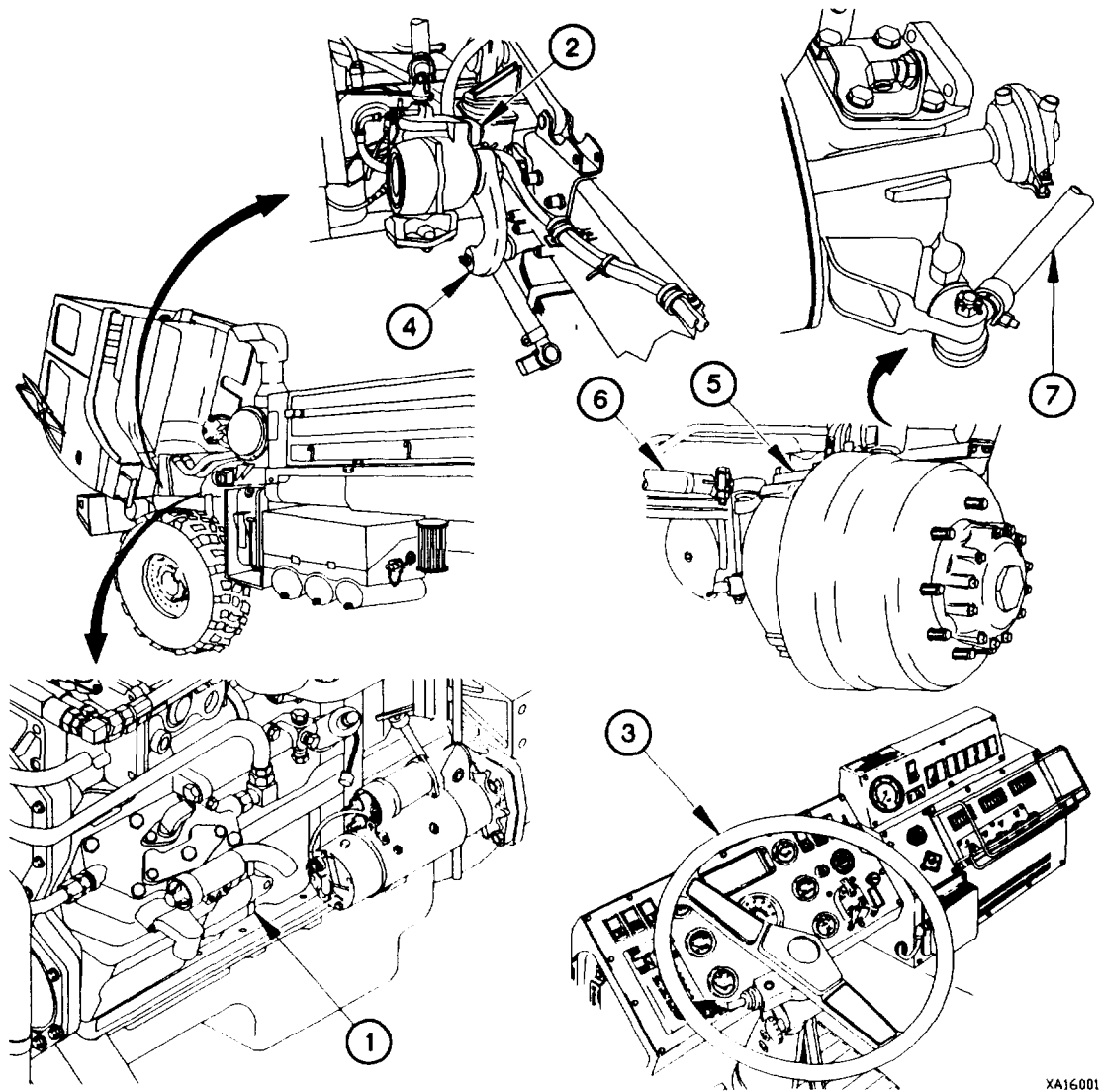


3A15002A

Figure 1-15. Brake System (Cont)

The foot control valve is operated by the brake pedal (5) and receives pressurized air from both the primary and secondary air tanks. The foot control valve is a dual activation design, with one set of ports supplying air to the front brakes from the secondary air tank and another set of ports supplying air to the rear brakes from the primary air tank. The plumbing between the primary and secondary air tanks is designed to allow controlled braking in the event of a failure in either the primary (rear brakes) or secondary (front brakes) brake circuit. Air from the foot control valve is supplied to the load sensing valve (6) which, in turn, controls air delivery to the relay valve (7). The load sensing valve is mounted on a crossmember and connected, by a spring and cable, to the rear axle. The arrangement of the load sensing valve provides a mechanical anti-lock feature to the rear brakes by sending less air to the rear brakes when the vehicle is not heavily loaded. The relay valve is used to provide the Operator with quicker brake response. An inversion valve (8) redirects air from the secondary brake circuit to the primary brake circuit in case of loss of pressure in the primary brake circuit. This feature allows control of the spring brakes and prevents early rear brake lock-up.

**1-16. STEERING SYSTEM**

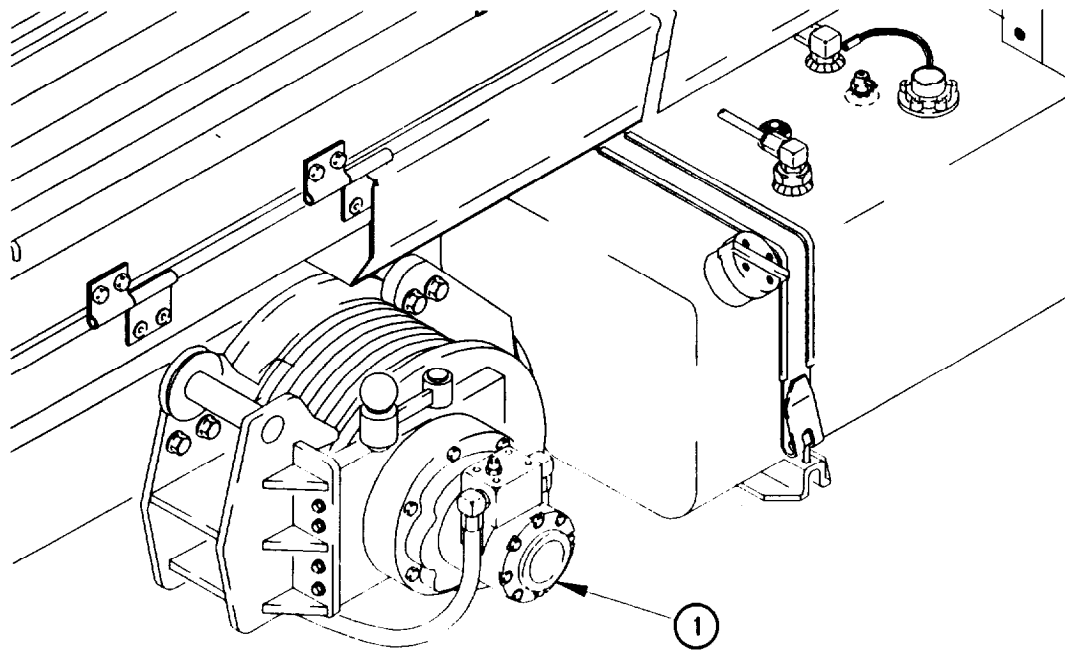


XAJ6001A

Figure 1-16. Steering System

The vehicle is equipped with hydraulically-assisted power steering. The power steering pump (1, Figure 1-16) is driven by a shaft at the rear of the air compressor. The steering gear box (2) is a recirculating ball design. The steering wheel (3) is linked to the steering gear box by a shaft and two universal joints. The power steering pump supplies constant hydraulic pressure to the steering gear box. The steering pitman arm (4) is attached to the left steering knuckle (5) by the drag link (6). The left and right steering knuckles are connected to each other by the tie-rod (7). Turning the steering wheel to the right causes the steering pitman arm to move toward the front of the vehicle and the front wheels to turn right. Turning the steering wheel to the left causes the steering pitman arm to move toward the rear of the vehicle and the front wheels to turn left. The tie-rod allows for front wheel toe-in adjustment.

1-17. 11K SELF-RECOVERY WINCH (SRW)

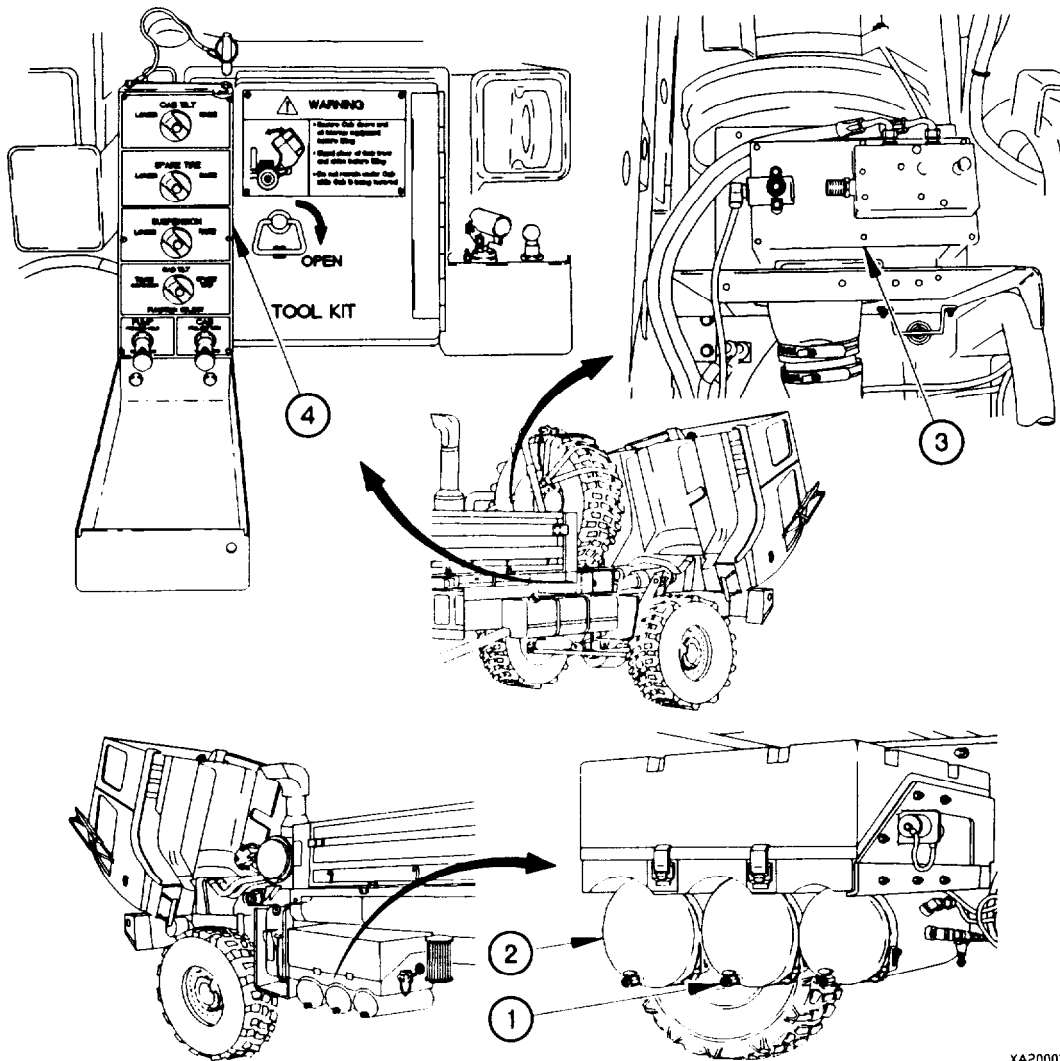


XA17001A

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

When specified, the vehicle is equipped with an 11K Self-Recovery Winch (SRW) (1, Figure 1-17) mounted on the right frame rail. The SRW is rated for 11,000 lbs (48,924 N) pull when the winch drum has one full layer of cable. One full layer of cable is the minimum amount of cable that may be left on the drum when using the SRW. Pulling capacity is reduced with each layer of cable that is added to the winch drum. Pulling capacity with seven full layers of cable on the winch drum is 6,780 lbs (30,157 N). The SRW cable may be routed to the front or rear of the vehicle for recovery operations. The SRW is equipped with a fail-safe brake which is spring applied and hydraulically released. The fail-safe brake is automatically applied when hydraulic pressure falls below 270 psi (1,862 kPa). The fail-safe brake will hold the load until hydraulic pressure is restored. The winch control valve functions as a throttling valve when cable is being payed out. The winch control valve controls the flow of fluid to the winch motor. When cable is being pulled in, the winch control valve acts as a free flow check valve. The winch control valve is preset at the factory and is not to be adjusted under any circumstances.

**1-18. AIR TRANSPORTABILITY HYDRAULIC SYSTEM**



XA200011

Figure 1-18. Air Transportability Hydraulic System

The entire series of M1078 vehicles is equipped with a hydraulic system which allows the vehicle to be prepared for internal air transport in a short time by a minimum number of personnel. Air from the primary and secondary air tanks (1 and 2, Figure 1-18) powers the air/hydraulic power unit (3). The air/hydraulic power unit supplies hydraulic power to the rest of the system. The system is controlled by valves in the hydraulic manifold (4).

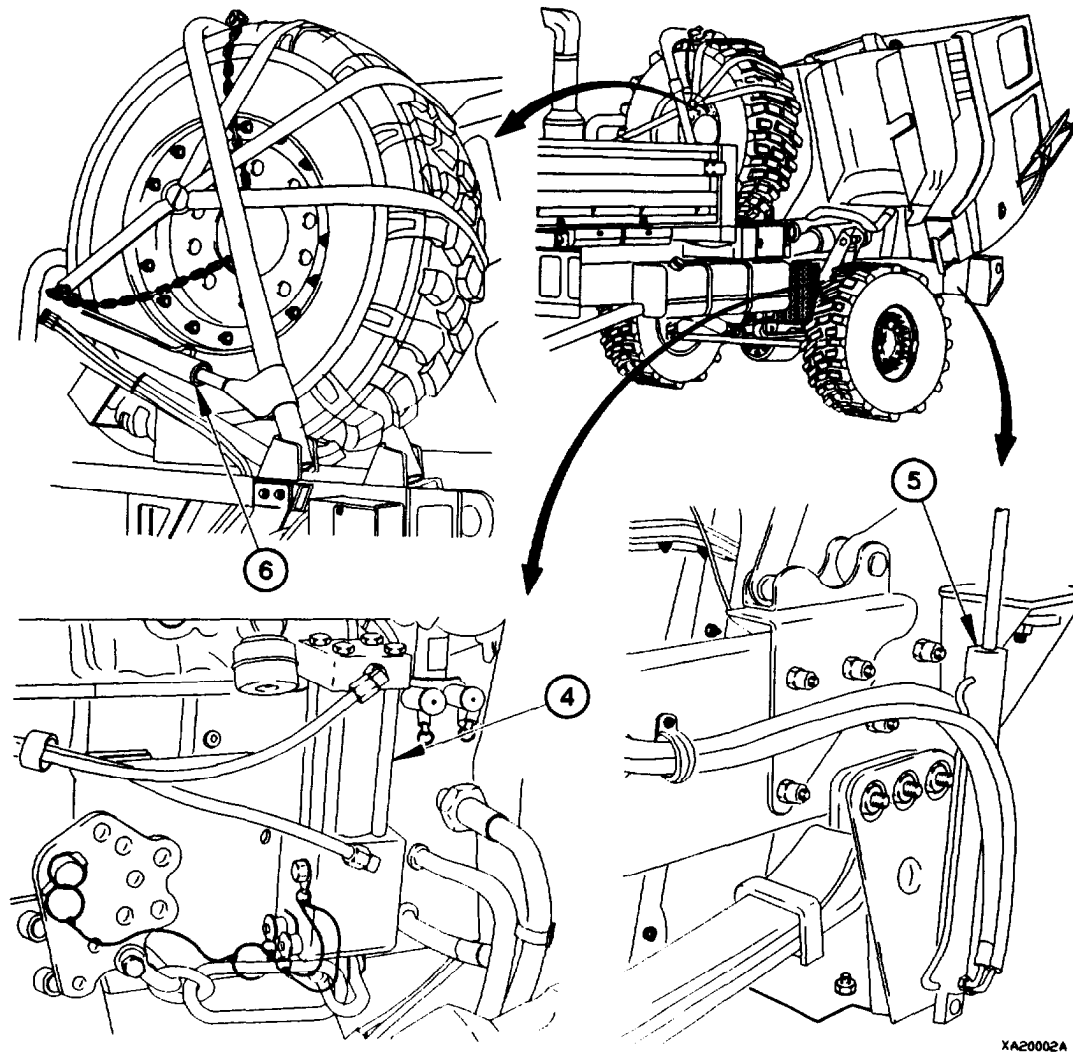


Figure 1-18. Air Transportability Hydraulic System (Cont)

Two suspension cylinders (4) mounted on the frame are used to compress the suspension so that the vehicle can be loaded into an aircraft. Valves on the hydraulic manifold control pressure to the cab tilt cylinder (5); to raise and lower the cab, and the spare tire retainer cylinder (6); to lower and raise the spare tire.

1-19. AIR SYSTEM

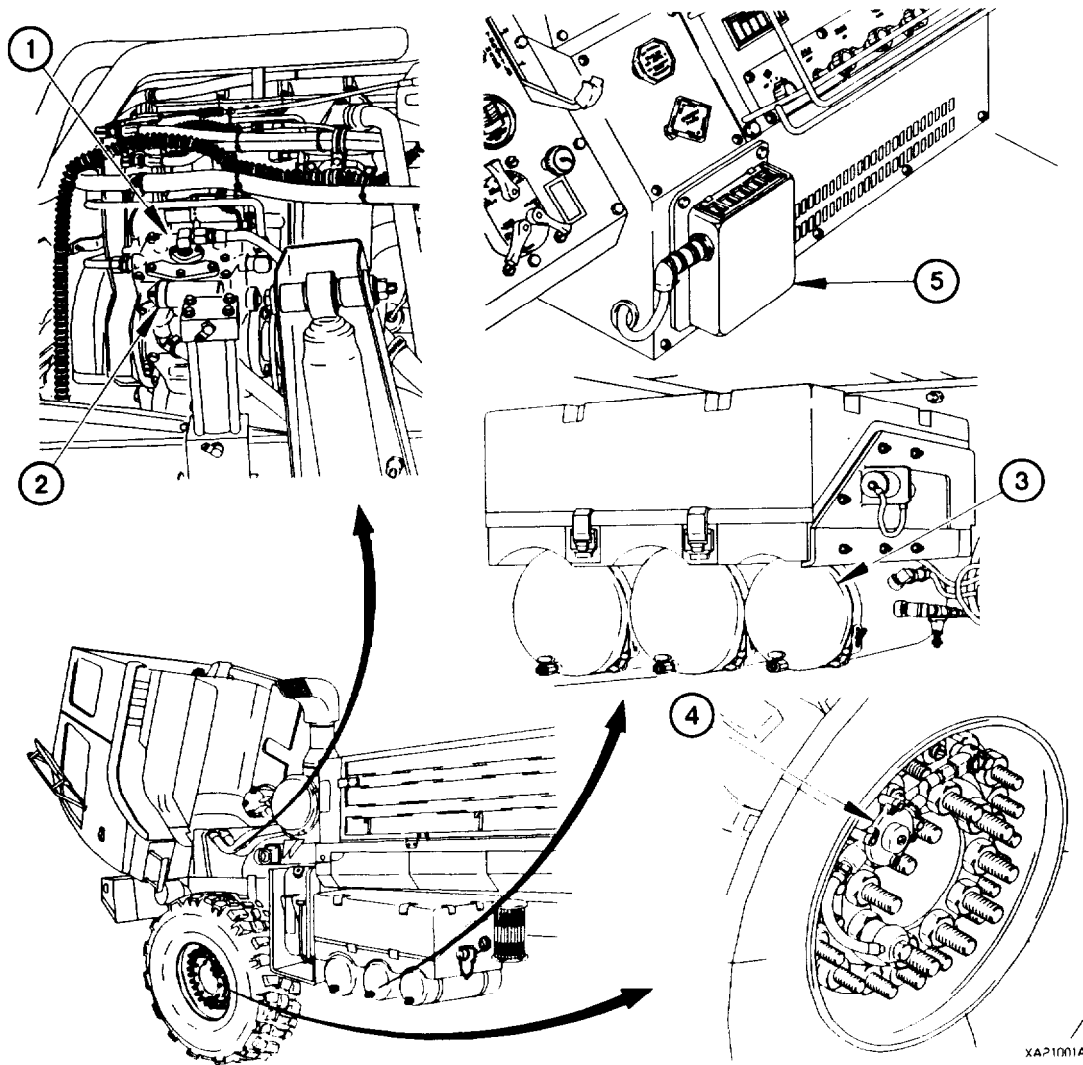


Figure 1-19. Air System

The air system provides clean, dry air for use in the air brake system and the Central Tire Inflation System (CTIS). The air system is pressurized by an engine driven air compressor (1, Figure 1-19) with a nominal output pressure of 125 psi (862 kPa). The system pressure is controlled by an unloading type pressure governor (2) which maintains the output pressure between 105 psi (724 kPa) and 125 psi (862 kPa). Air is supplied to the air brake portion of the air system from the primary and secondary air tanks. Air for the CTIS comes from the wet tank (3) and is supplied to the axles by the CTIS manifold valve (4). Air pressure in the tires is controlled by the CTIS Electronic Control Unit (ECU) (5). The CTIS ECU provides for four tire pressure settings.



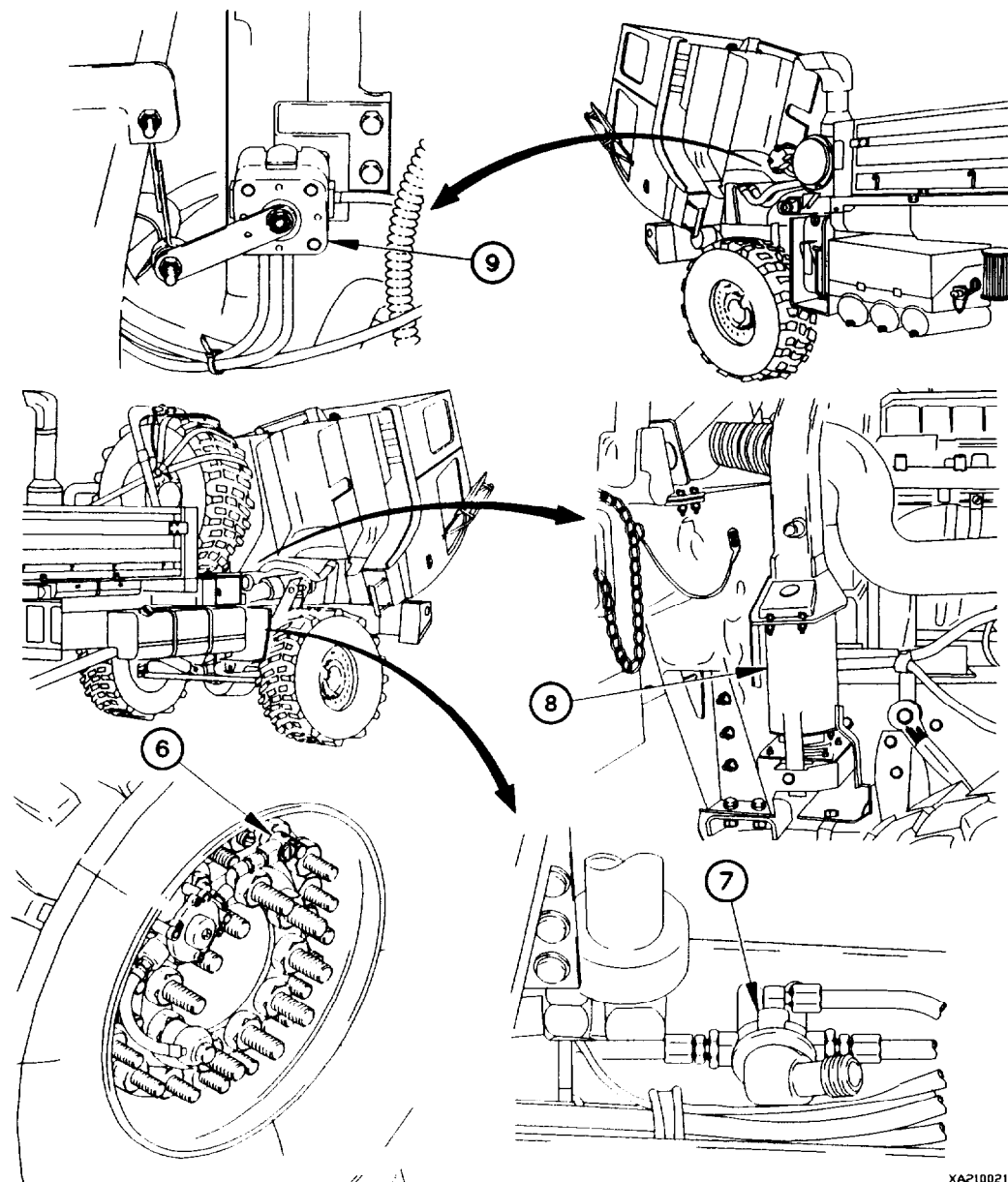


Figure 1-19. Air System (Cont)

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

## CHAPTER 2 VEHICLE MAINTENANCE

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## Section 1. REPAIR PARTS, TOOLS, SPECIAL TOOLS, TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT

### 2-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970, or CTA 8-100 as applicable to your unit.

### 2-2. SPECIAL TOOLS. TMDE. AND SUPPORT EQUIPMENT

For a listing of special tools, TMDE, and support equipment, refer to the Maintenance Allocation Chart (MAC), Appendix B, of this manual and to the Repair Parts and Special Tools List (RPSTL), TM 9-2320-365-24P.

### 2-3. REPAIR PARTS

Mandatory replacement parts are listed in Appendix G. Repair parts are listed and illustrated in the RPSTL, TM 9-2320-365-24P, covering Unit Maintenance repair parts and special tools for vehicle.

## Section II. SERVICE UPON RECEIPT

### 2-4. UNPACKING AND DEPROCESSING

#### WARNING

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

a. **Unpacking.** Upon receipt of a new vehicle, the receiving organization must see if it has been properly prepared for service and is in good condition. Inspect all assemblies, subassemblies, and accessories to be sure they are in proper working order (TM 9-2320-365-10). Secure, clean, and correctly adjust and/or lubricate as needed (Appendix H). Check all tools and equipment to be sure every item is accounted for (TM 9-2320-365-10-HR) in good condition, clean and properly mounted or stowed (TM 9-2320-365-10).

**b. Deprocessing.** Read "Processing and Deprocessing Record of Shipping, Storage and Issue of Vehicles and Spare Engines" tag, (DD Form 1397) and follow all precautions checked. This tag should be attached to the steering wheel or manual throttle control lever.

## 2-5. HAND RECEIPT MANUAL AND INVENTORY OF EQUIPMENT

When a new vehicle is first received by the using organization, it is necessary to inventory the vehicle equipment. For detailed procedures, refer to Hand Receipt Manual, TM 9-2320-365-10-HR.

## 2-6. SERVICE BEFORE OPERATION

### a. General.

(1) Refer to TM 9-2320-365-10 for operating instructions for the vehicle.

(2) Upon receipt of a new, used, or reconditioned vehicle, the receiving organization must see if it has been properly prepared for service and is in good condition (TM 9-2320-365-10). Inspect all assemblies, subassemblies, and accessories to be sure they are in proper working order. Secure, clean, correctly adjust, and/or lubricate (TM 9-2320-365-10 and Appendix H) as needed. Check all tools and equipment to be sure every item is there (TM 9-2320-365-10-HR), in good condition, clean and properly mounted or stowed (TM 9-2320-365-10).

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

### b. Inspection and Servicing Equipment.

#### NOTE

If vehicle has been driven to the using organization, most or all of the following work should have been done.

(1) When vehicle is received, inspect all items for damage that may have occurred during shipping and unloading operations. Pay close attention to any loose or missing nuts, bolts, screws, access plates, drain plugs, draincocks, oil plugs, assemblies, subassemblies, or components that may be easily lost or broken in transit. Check Basic Issue Items (BI) against checklist to make sure all items are accounted for and are in good condition (TM 9-2320-365-10-HR). Carefully list all discrepancies.

#### WARNING

- **Dry Cleaning Solvent P-D-680 is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from open flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using Dry Cleaning Solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

(2) Clean all exterior surfaces coated with rust-preventive compound with Dry Cleaning Solvent (Item 71, Appendix D).

**2-6. SERVICE BEFORE OPERATION (CONT)**

- (3) Perform the Semiannual Preventive Maintenance Checks and Services (PMCS), Table 2-1.
- (4) Lubricate all points shown in Appendix H regardless of interval. Schedule services in accordance with DA Pam 738-750.
- (5) Initial Service Intervals:
  - a. Initial 500 miles (805 km) of operation:
    - (1) Perform Front and Rear Axle oil change.
    - (2) Perform Front Axle Wheel end Planetary Hub oil change.
  - b. Initial 1,000 miles (1,609 km) of operation:  
Tighten self-locking nuts on leaf spring U-bolt to 390-510 lb-ft (529-692 N•m), in 50 lb-ft (68 N•m) increments, in a crisscross pattern.
  - c. Initial 5,000 miles (8,045 km) of operation:
    - (1) Perform Engine oil and filter change.
    - (2) Perform Transmission oil and filter change.
- (6) Activate battery if vehicle is delivered with dry-charged battery (TM 9-6140-200-14).

**WARNING**

**Do not remove radiator cap when the engine is hot; steam and hot coolant can escape and burn personnel.**

(7) Check radiator coolant. Check if solution is adequate for expected climatic conditions. Refer to TB 750-651 for preparation of antifreeze solutions. Put tag near filler cap with type of antifreeze and degree of protection written on tag.

**c. Special Service Instructions.**

- (1) Vehicle Body and Sheet Metal Inspection (TM 9-2320-365-10).
  - (a) Inspect body and sheet metal for evidence of damage during shipment.
  - (b) Check doors, latches, and hinges on compartments for proper operation.
  - (c) Check mounting hardware and tighten as necessary.
- (2) Vehicle Cab Inspection (TM 9-2320-365-10).
  - (a) Inspect cab for evidence of damage during shipment.
  - (b) Inspect windshields and window glass for cracks or other damage.
  - (c) Check door latches, hinges, and windows for proper operation.
  - (d) Check seats and seatbelts mounting hardware to ensure they are securely installed and tighten as necessary.
  - (e) Check operator's seat adjustments to ensure they are functioning properly.

- (3) Engine Inspection (TM 92320-365-10).
  - (a) Inspect engine and cooling hose connections for evidence of leakage.
  - (b) Remove any seals, plugs, or tape used to seal air inlets and ports on the engine during shipping.
  - (c) Check crankcase oil level with dipstick.
  - (d) Examine air cleaner element for dirty or restricted condition.
  - (e) Check for obstructions to cooling air flow to radiator.
- (4) Transmission Inspection (TM 9-2320-365-10).
  - (a) Check fluid level with dipstick.
  - (b) Check external tubes and hoses for evidence of leakage.
- (5) Transfer Case Inspection (TM 9-2320-365-10).
  - (a) Check level of lubricant at fill plug.
  - (b) Inspect lubrication pump and external hoses for evidence of leakage.
  - (c) Operate driveline control and observe drive power to front axle.
  - (d) Inspect bolts on driveline U-joints.
- (6) Electrical System Inspection (TM 9-2320-365-10).
  - (a) Inspect battery cable connections and clean and tighten as necessary.
  - (b) Check all lights for burned out lamps, loose connections, and dirty or broken lenses.
  - (c) Ensure alternator is charging properly.
  - (d) Ensure all electrical equipment functions.
- (7) Air System Inspection (TM 9-2320-365-10).
  - (a) Drain any water from reservoirs.
  - (b) Inspect all accessible air hose and tubing connections for leakage.
- (8) Steering System Inspection (TM 9-2320-365-10).
  - (a) Check steering hydraulic reservoir for proper fluid level.
  - (b) Examine steering linkage and steering gear for damage incurred during shipment.
  - (c) Examine steering hoses and connections for evidence of leakage.
  - (d) Check steering system for proper operation during road test.

## 2-6. SERVICE BEFORE OPERATION (CONT)

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

- (a) Check all lubricant levels.
- (b) Check axle housing pressure vents to ensure freedom from foreign matter.

(10) Tire Inspection.

- (a) Check tire pressure (TM 9-2326-365-10).
- (b) Inspect tires for serious cuts, bubbles, cracks, bruises, dry-rot, foreign objects, or exposure of internal cords. Remove foreign objects lodged between treads (TM 9-2320-365-10).
- (c) Check all wheel mounting nuts for proper torque (para 12-4).

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

- (a) Check fuel level and replenish, if necessary.
- (b) Inspect fuel lines, connections, and filters for evidence of leakage.

(12) Arctic Kit. If vehicle is equipped with an arctic kit, and is going to operate in non-arctic climates, remove arctic alternator belts and replace with standard belts (para 7-3).

## Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

### 2-7. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION

This section contains Unit Maintenance PMCS requirements for the vehicle. The PMCS table contains checks and services necessary to ensure the vehicle is ready for operation. Using the PMCS table, perform maintenance at the specified intervals. Perform preventive maintenance checks and services in TM 9-2320-365-10 before doing the Unit preventive maintenance.

### 2-8. GENERAL MAINTENANCE PROCEDURES

#### WARNING

- **Dry Cleaning Solvent P-D-680 is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from open flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using Dry Cleaning Solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

a. **Cleanliness.** Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Use Dry Cleaning Solvent (Item 71, Appendix D) on metal surfaces and soapy water on rubber.

**b. Bolts, Nuts, and Screws.** Check bolts, nuts, and screws for obvious looseness, missing, bent, or broken condition and replace as necessary. If they cannot be checked with a tool, look for chipped paint, bare metal, or rust around bolt heads.

**c. Welds.** Look for loose or chipped paint, rust, or gaps where parts are welded together. If a bad weld is found, notify your supervisor.

**d. Electric Wires and Connectors.** Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and ensure wires are in good shape.

**e. Fluid Lines and Fittings.** Look for wear, damage, and leaks and make sure clamps and fittings are tight. Wet spots show leaks, but a stain around a fitting or connector can mean a leak. If connector or fitting is loose, tighten it. If something is broken or worn out, repair or replace per applicable procedure.

**f. Fluid Leakage.** It is necessary to know how fluid leakage affects the status of fuel, oil, coolant and the hydraulic systems. The following are definitions of the type/classes of leakage necessary to know in order to determine the status of the vehicle. Learn, then be familiar with them and REMEMBER - WHEN IN DOUBT, NOTIFY THE SUPERVISOR!

**CAUTION**

Equipment operation is allowable with minor leakage (Class I or II). Consideration must be given to the fluid capacity in the item/system being checked/inspected. When in doubt, notify the supervisor. When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS. Class III leaks should be repaired per applicable procedure.

(1) Class I. Seepage of fluid as indicated by wetness or discoloration not great enough to form drops.

(2) Class II. Leakage of fluid great enough to form drops but not enough to cause drops to fall from item being checked/inspected.

(3) Class III. Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

**g. Air System Components.** Look for worn, damaged, or leaking components. Make sure clamps and fittings are tight. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, either repair or replace it.

**h. Damage.** Damage is defined as any condition that affects safety or would make the vehicle unserviceable for mission requirements.

**2-9. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) TABLE**

- a. Do the SEMIANNUAL PREVENTIVE MAINTENANCE (Table 2-1) once every six months.
- b. Refer to the specified technical manuals for preventive maintenance for special purpose kits.
- c. Always do the PREVENTIVE MAINTENANCE in the same order until it gets to be a habit. Once practiced, it will be easy to spot anything wrong in a hurry. Perform the checks and services listed in Table 2-1 in the order listed.
- d. If something does not work, troubleshoot with instructions in Section IV.
- e. If anything looks wrong and is too hard to fix, notify the supervisor.



**2-9. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) TABLE (CONT)**

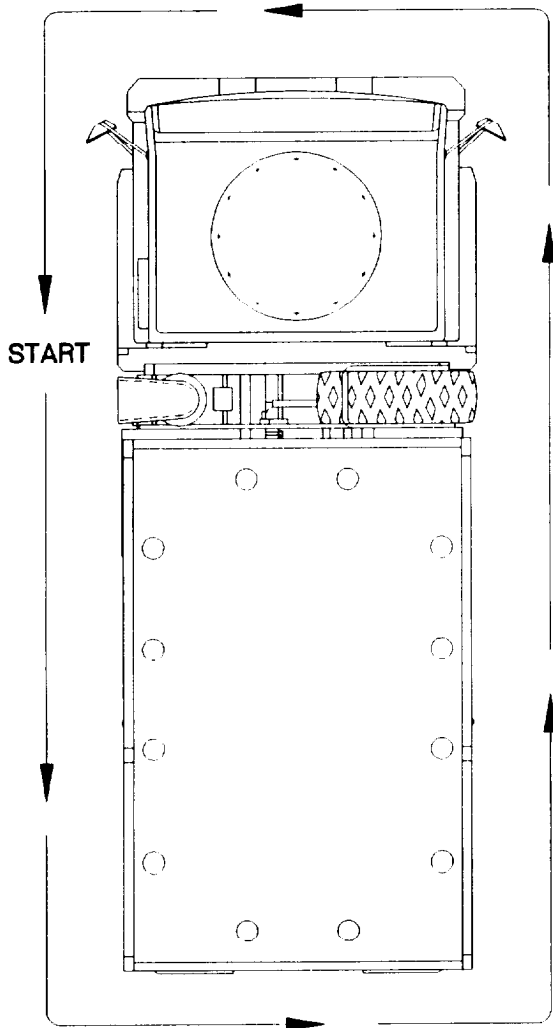
f. When doing preventive maintenance, take along the tools and supplies needed to make all the checks, including a clean cloth or two.

g. The following is a breakdown of the PMCS table:

(1) Item number column. Checks and services are numbered in a logical order for moving around the vehicle. The item number column is used a source of item numbers for the TM Number Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, for recording results of the PMCS.

(2) Items to be inspected. This column identifies the item to be inspected.

(3) Procedures column. This column contains all the information required to do the check/inspection. Art is intertated into the column to aid the user in identifying items. Whenever replacement parts or repair is recommended, reference is made to the applicable maintenance instructions.



3BPM0011

Table 2-1. Preventive Maintenance Checks and Services

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
1	Semiannual	Preservice Checks	<p style="text-align: center;">ROAD TEST</p> <p style="text-align: center;">Maintenance personnel will be with vehicle operator during the road test.</p> <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> <li>● Perform the following during road test.</li> <li>● For road test, vehicle will be driven at least five miles over different ground to give enough time to detect any malfunctions.</li> </ul> <ol style="list-style-type: none"> <li>a. Notice if starter engages smoothly and turns engine at normal cranking speed.</li> <li>b. Listen for unusual engine noise at idle, at operating speeds, and under acceleration. Be alert for excessive vibration and the smell of oil, fuel or exhaust.</li> <li>c. Check for transmission response to shifting and for smoothness of operation in all speed ranges. Be alert for unusual noises and difficulty in shifting in any speed range.</li> <li>d. Test for accelerator response. Observe for sticking pedal.</li> <li>e. With vehicle speed approximately 5 mph (8 kph) turn steering wheel to left, then right, to detect steering backlash, shimmy or freeplay of more than 1-1/2 in. (3.8 cm) in either direction. Vehicle should respond instantly. With vehicle moving on straight, level terrain, lightly hold steering wheel to check for pull and wandering.</li> </ol>	<ol style="list-style-type: none"> <li>a. Starter inoperative or makes excessive grinding sound.</li> <li>b. Engine knocks, rattles or smokes excessively.</li> <li>c. Transmission shifts improperly, does not shift or makes excessive noises.</li> <li>d. Pedal sticking or binding.</li> <li>e. Steering binds, grabs, wanders or freeplay is more than 1-1/2 in. (3.8 cm) in either direction.</li> </ol>

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	<u>Location</u> Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
1	Semiannual	Preservice Checks (CONT)	<p style="text-align: center;">NOTE</p> <p style="text-align: center;">Do not turn tires when turning wheel to check for steering wheel free play.</p> <p>f. Place a strip of tape around steering wheel at 12 O'clock position. Turn steering wheel right until resistance is felt. Place a ruler lightly against outer rim of steering wheel with end of ruler at one edge of tape. Turn steering wheel left until resistance is felt. Measure distance designated edge of tape has traveled. Maximum free play measured at outside rim of steering wheel is 2-1/2 in. (6.4 cm).</p> <p>g. Apply brake pedal with steady force. Vehicle should slow down and stop without pulling to one side <i>or</i> jerking. Release brake pedal. The brakes should release immediately and without difficulty.</p> <p>h. Observe vehicle response to road shocks, side sway or continuous bouncing indicates a malfunction.</p> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>CAUTION</b></p> </div> <p style="text-align: center;">Do not hold steering wheel at full left or right position for longer than 10 seconds. Oil overheating and pump damage can result. Failure to comply may result in damage to equipment.</p> <p>i. With vehicle stopped, turn steering wheel to extreme left, then to extreme right to check for binding or jerking.</p> <p>j. Check engine operation at all speeds. Ensure that engine does not go over engine governed speed - (55 mph or 2600 rpm).</p>	<p>f. Steering wheel exceeds 2-1/2 in. (6.4 cm) free play.</p> <p>e. Brakes chatter, pull to one side, will not release, or do not work.</p> <p>h. Handling is unstable.</p> <p>i. Hard steering is evident.</p> <p>j. Engine exceeds or fails to reach governed speed.</p>

Table 2-1. Preventive Maintenance 'Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked Or Serviced	Procedure	Not Fully Mission Capable If:
2	Semiannual	WHEELS, HUBS, AND CTIS	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"><b>WARNING</b></div> <p>Completely deflate tires before removing from axles only if there is obvious damage to wheel components. Removing damaged tires from axles without deflating tires may cause wheel components to separate. Failure to comply may result in serious injury or death to personnel.</p> <ol style="list-style-type: none"> <li>a. Check wheels for obvious cracks around lug holes. If cracks are found, repair wheel (para 12-2).</li> <li>b. Replace any loose or damaged wheel studs (para 12-3). Tighten lugnuts (para 12-4).</li> <li>c. Check for oil leaks.</li> <li>d. Check and fill wheel end hub (Appendix H).</li> <li>e. Check wheels for CTIS air leaks.</li> <li>f. Remove manifold valve (para 12-5) and inspect manifold filter for damage. Clean any debris from manifold filter.</li> </ol>	<ol style="list-style-type: none"> <li>a. Cracks are found around lug holes.</li> <li>b. More than one lugnut or wheel stud is damaged or missing.</li> <li>c. Class III leak is evident.</li> </ol>

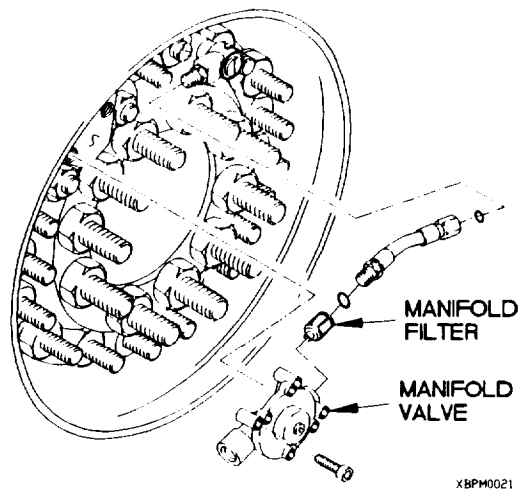
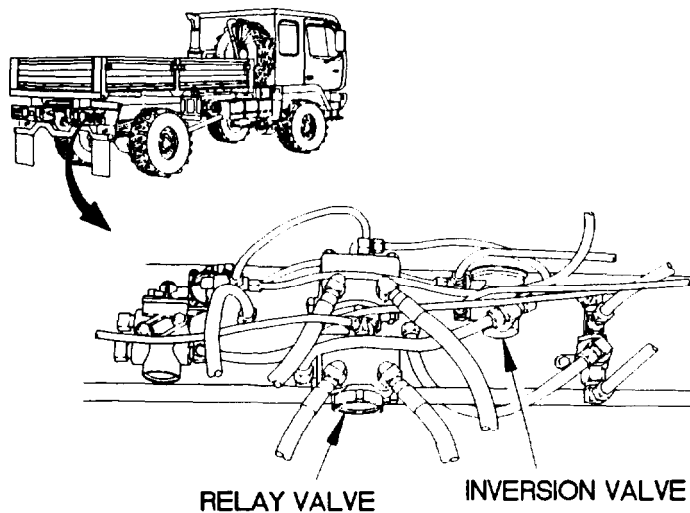


Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
3	Semiannual	SERVICE BRAKES	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"><b>WARNING</b></div> <ul style="list-style-type: none"> <li>● 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.</li> <li>● Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.</li> </ul> <p>a. Shut down engine (TM 9-2320-365-10) and drain primary air tank. Rear service brakes should not apply. If rear service brakes apply, inversion valve is inoperative. Replace inversion valve (para 11-12). If rear brakes are not applied, depress brake pedal. Depressing brake pedal should apply front brakes and control rear spring brakes through inversion valve and modulation of relay valve.</p>	<p>a. Rear portion of brake system fails.</p>



3BPM0031

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
3	Semiannual	SERVICE BRAKES (CONT)	<ul style="list-style-type: none"> <li>b. Inspect load sensing valve for signs of corrosion.</li> <li>c. Check security of mounting hardware.</li> <li>d. Check for air leaks around brake hose fittings.</li> <li>e. Inspect control cable for corrosion and abrasions.</li> <li>f. Check security of control cable upper and lower attaching hardware and adjust (para 11-10).</li> <li>g. Inspect brake air chambers for obvious cracks and corrosion.</li> </ul>	<ul style="list-style-type: none"> <li>d. Air leaks are found.</li> <li>e. Control cable is damaged or missing.</li> <li>g. Brake air chamber leaks.</li> </ul>

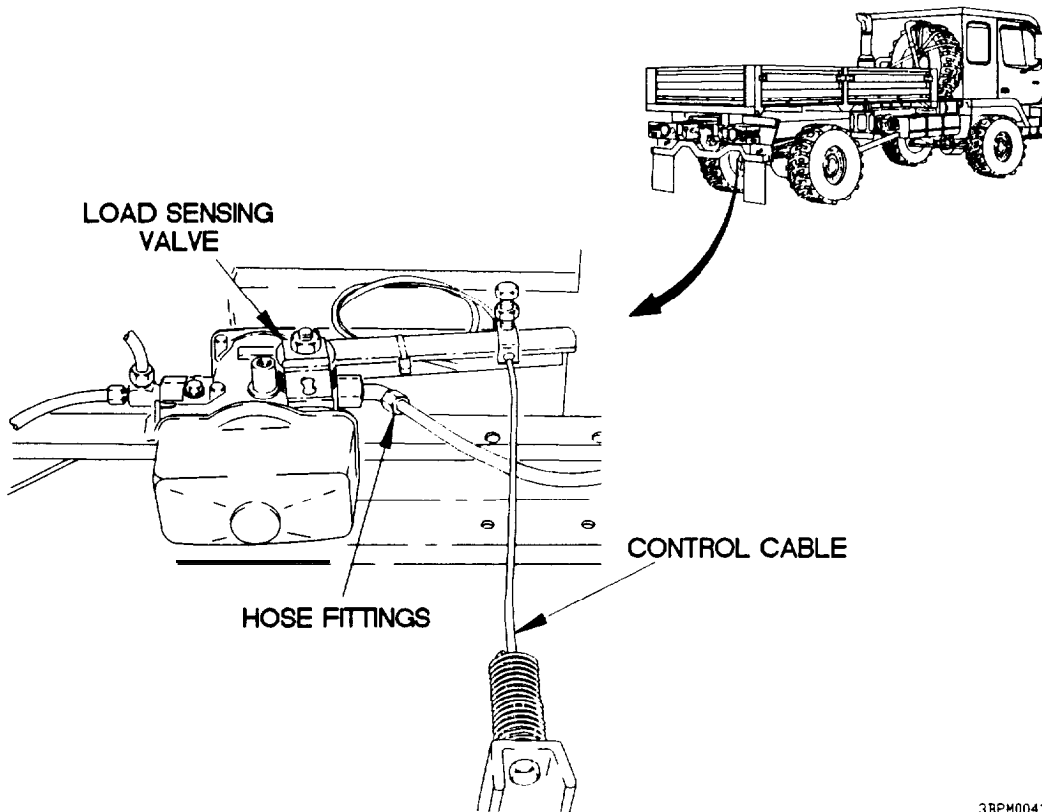
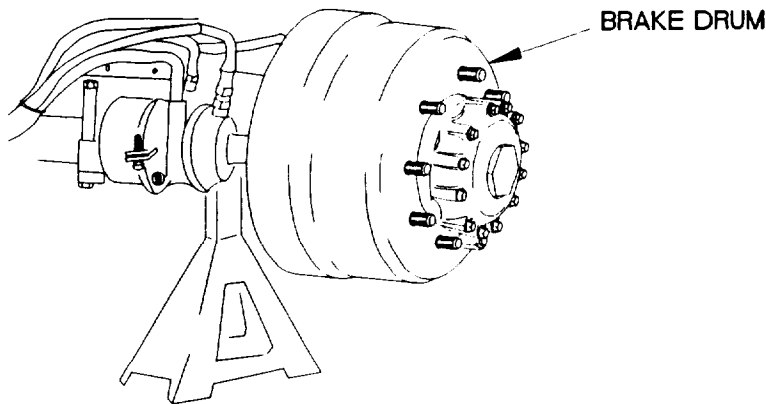


Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
3	Semiannual	SERVICE BRAKES (CONT)	<div style="text-align: center; border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto 10px auto;"><b>WARNING</b></div> <p>Brake drums can become very hot during vehicle operations. Place hand near drum to check for excessive heat but do not touch drum. Failure to comply may result in injury to personnel.</p> <div style="text-align: center; border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto 10px auto;"><b>CAUTION</b></div> <p>Brake drum clearance must be checked along centerline of brake shoe. Failure to comply may result in damage to equipment.</p> <p style="text-align: center;">NOTE</p> <p>Over time a ridge will form on the outer edge of the brake shoes. This is normal and does not affect brake shoe serviceability.</p> <p>h. Examine and compare each brake drum for evidence of overheating. Excessive heating of brake drums may indicate a dragging brake shoe. Cool brake drums could mean improper adjustment, defective, or inoperative brakes, or rust on braking surfaces.</p>	<p>h. Brake drums are excessively hot, cool, or rusted.</p>



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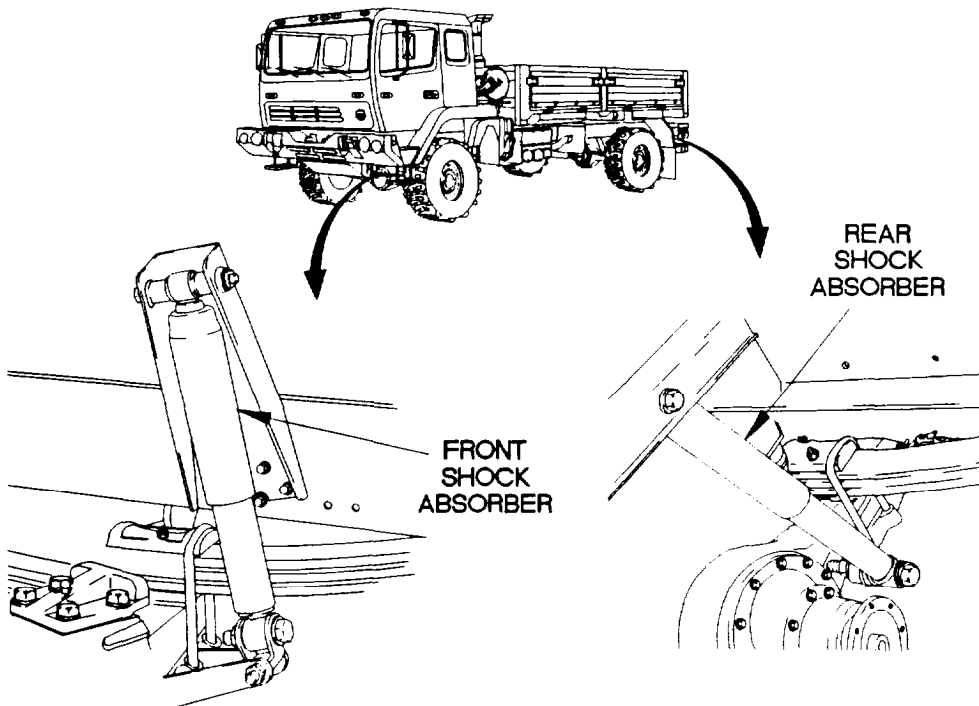
Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
3	Semiannual	SERVICE BRAKES (CONT)	<div> </div> <p>i. Check brake lining to brake drum clearance along centerline of shoe at scallop to ensure automatic adjusters are functioning properly. Clearance should be 0.020-0.040 (0.051-0.102 cm) maximum.</p> <div style="border: 1px solid black; padding: 2px; text-align: center;"> <p><b>WARNING</b></p> </div> <p>Do not allow grease or oil to contact brake linings. Linings can absorb grease and oil, causing early glazing and very poor braking action. Failure to comply may result in serious injury or death to personnel.</p> <p>j. Examine brake shoes for excessive brake lining wear and cracking (para 11-2 and 11-3).</p> <p>k. Inspect brake shoe return springs and hold-down clips for cracks.</p>	<p>i. Brake shoe adjustment is out of tolerance.</p> <p>j. Brake linings are cracked or excessively worn.</p> <p>k. Springs or clips are cracked or broken.</p>



Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
3	Semiannual	SERVICE BRAKES (CONT)	I. Inspect actuator plunger seals for cuts, tears, and leaks. Refer to para 11-4 and/or 11-5.	I. Plunger seals, adjusting pawl assembly, adjusting plunger or actuator are damaged.
4	Semiannual	SHOCK ABSORBERS AND SPRINGS	II. Inspect shock absorbers for oil leaks and damage (para 15-3 and 15-4).	a. Shock absorber is bent or class III leaks are evident.



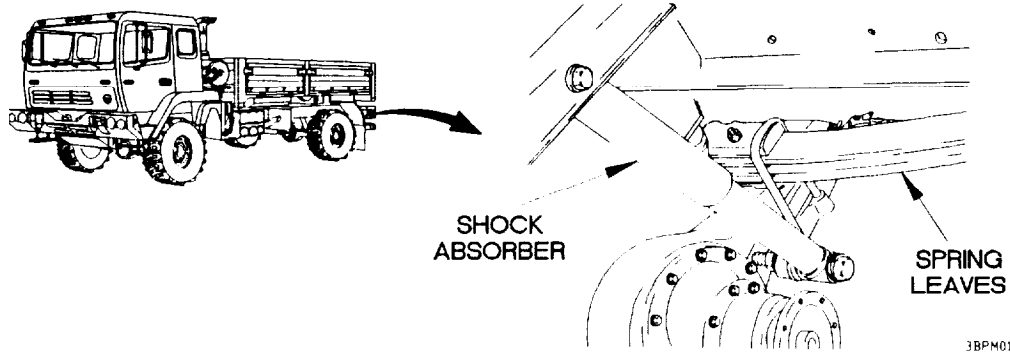
3BPM0091

- b. Check shock absorber mounting hardware for security.
- c. Check rubber bushings for looseness which may result in inner sleeve contacting eye ring of shock absorber (para 15-3 and 15-4).

c. Rubber bushings are loose or inner sleeve is contacting eye ring of shock absorber.

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
4	Semiannual	SHOCK ABSORBERS AND SPRINGS (CONT)	d. Inspect spring leaves, spring clips, saddles, saddle caps, and U-bolts for cracks or breaks.	d. Cracks or breaks are found.



5

Semiannual

AXLES

**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 axles for leaks around wheel end assemblies, pinion seal, drive yoke, and drain Plug.

Class III leak is evident.

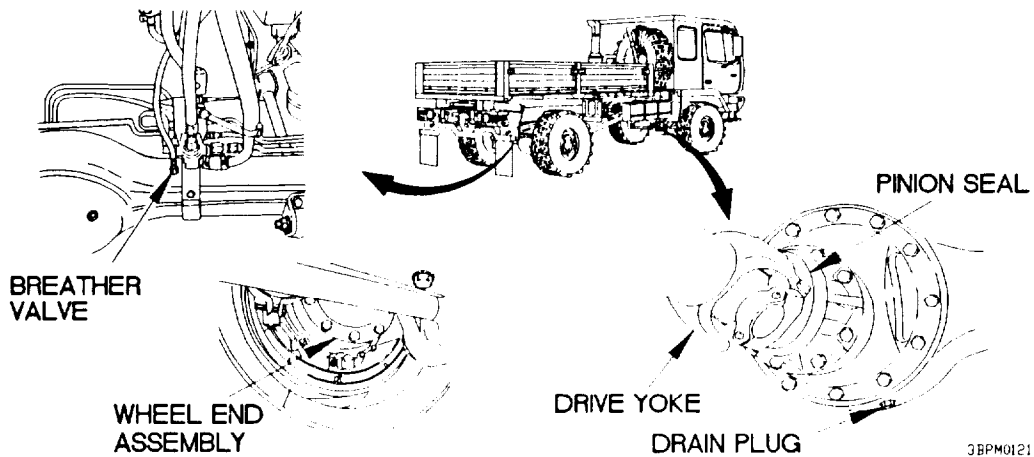


Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
6	Semiannual	AXLE BREATHER VALVES	a. Inspect axle breather valves to ensure up and down movement.	

**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 injury or death to personnel.
- If personnel become dizzy while using 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.

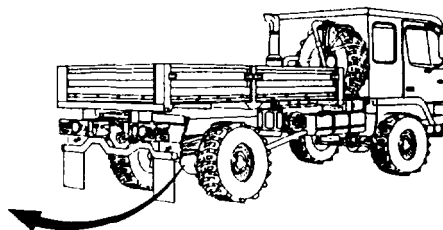
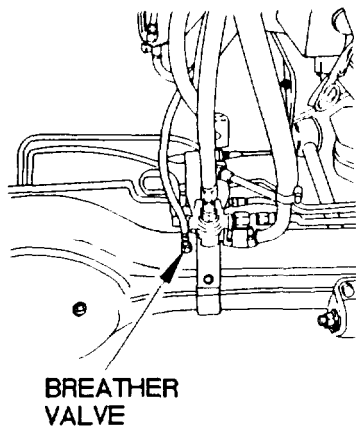
b. Remove axle breather valve from fitting. Wash breather in dry cleaning solvent (Item 71, Appendix D) and allow to air dry.

b. Axle breather valve missing.

**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 well-ventilated area. If adhesive, solvents, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

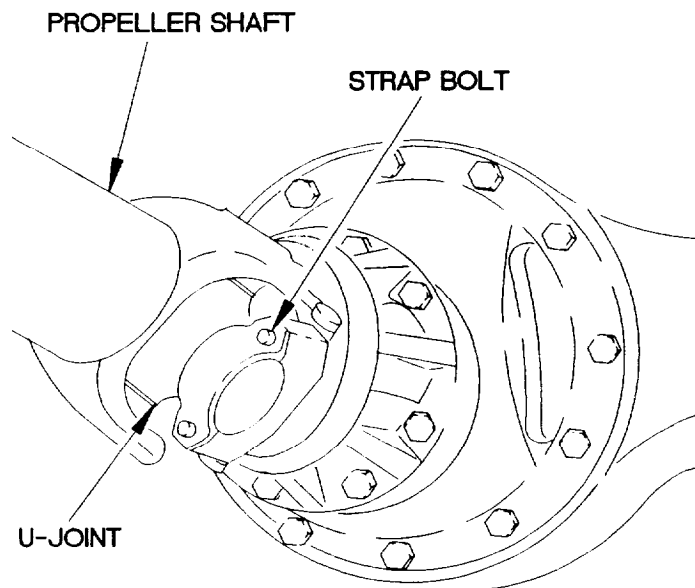
c. Coat threads of axle breather valve with antiseize compound (Item 14, Appendix D) and install axle breather valve in fitting.



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Table 2-1. Preventive Maintenance Checks and Services (Cont)

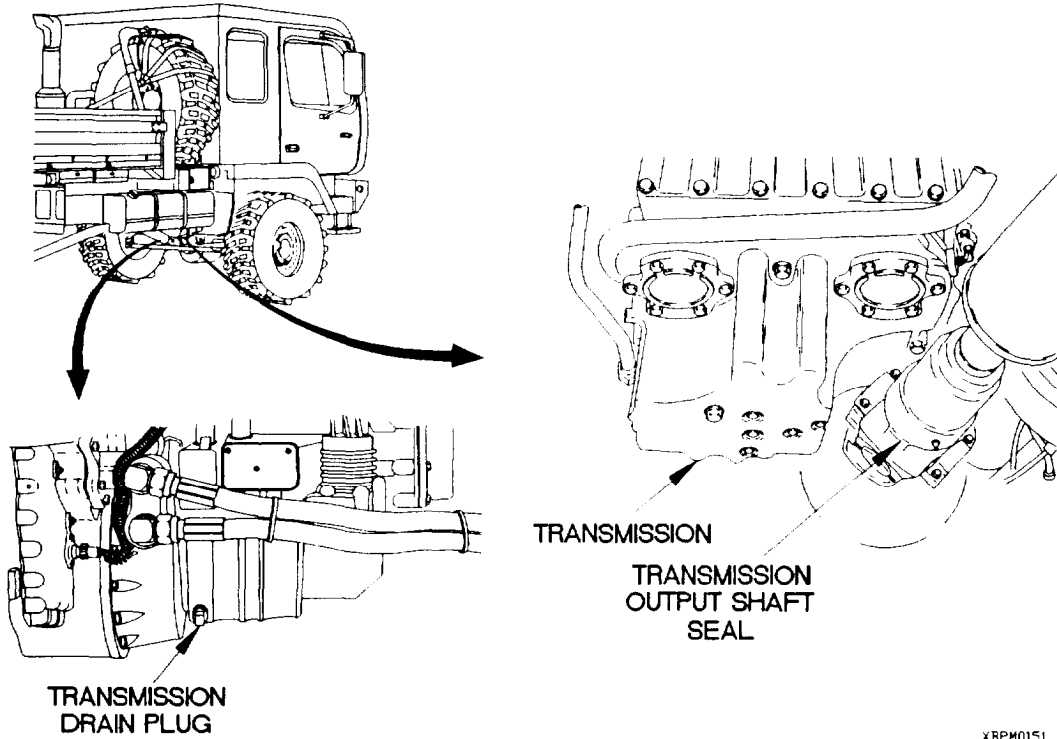
Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
7	Semiannual	PROPELLER SHAFTS	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"><b>WARNING</b></div> <p><b>Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.</b></p> <ol style="list-style-type: none"> <li>a. Inspect U-joints for play, broken and missing lubrication fittings (Appendix H).</li> <li>b. Check torque on propeller shaft strap bolts. Tighten all bolts to 43-53 lb-ft (58-71 N•m).</li> <li>c. Inspect all propeller shafts for bends and cracks.</li> </ol>	<ol style="list-style-type: none"> <li>a. Lubrication fittings, screws or lock tabs are broken or missing, or play is evident.</li> <li>b. Bolt(s) missing or cannot be tightened.</li> <li>c. Bends or cracks are evident.</li> </ol>



XBPM0141

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
8	Semiannual	TRANS-MISSION	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"><b>WARNING</b></div> <p>Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.</p> <ol style="list-style-type: none"> <li>a. Check transmission for cracks, loose bolts, leaks, and damage.</li> <li>b. Check that transmission oil pan bolts and drain plug are tight.</li> <li>c. Inspect transmission output shaft seal for damage or leaks.</li> </ol>	<ol style="list-style-type: none"> <li>a. Cracks, loose or missing bolts, or Class III leaks.</li> <li>b. Oil pan bolts or drain plug are loose or missing.</li> <li>c. Damage or Class III leaks are evident.</li> </ol>



XBP0151

Table 2-1. Preventive Maintenance Checks and Services (Cont)

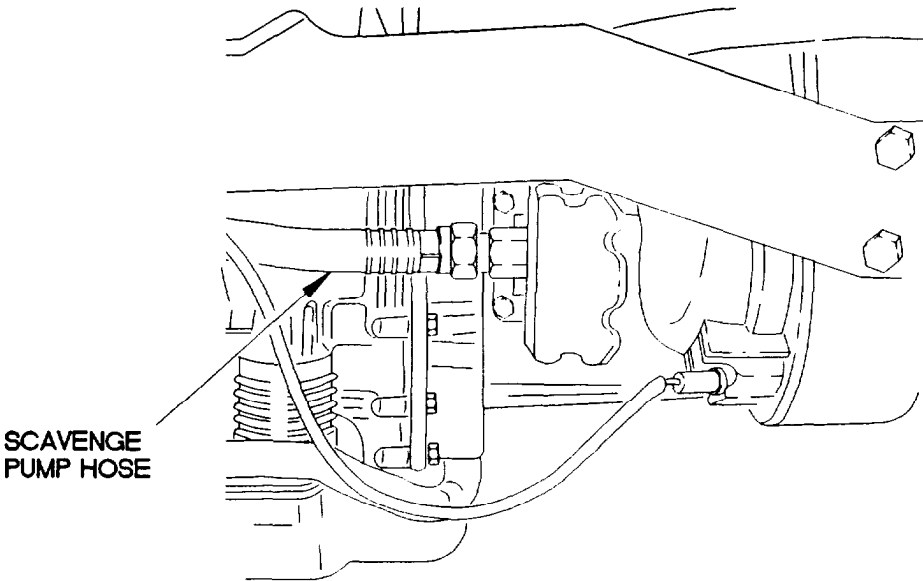
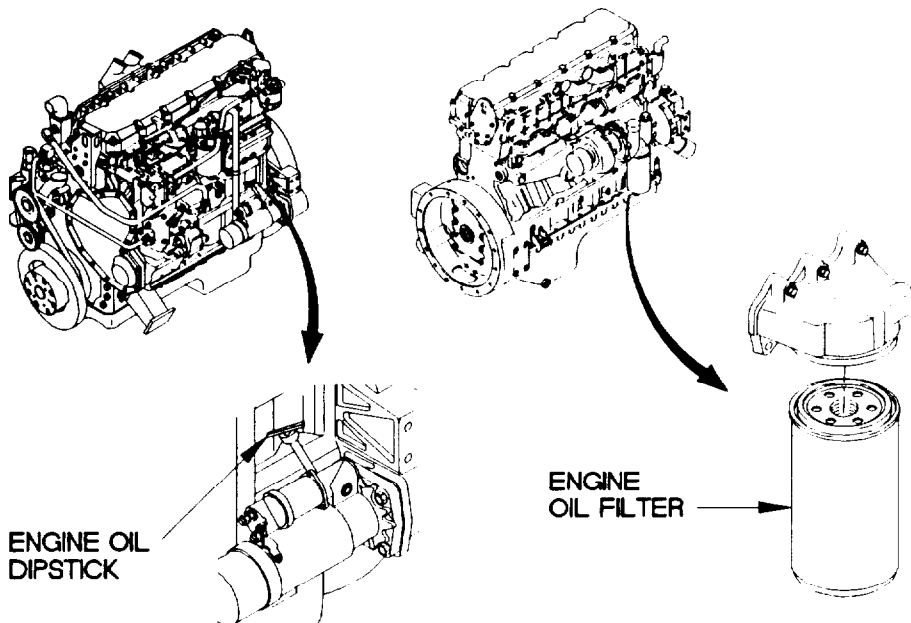
Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
8	Semiannual	TRANSMISSION (Cont)	<p>d. Inspect transmission oil cooler tubes for leaks.</p> <p>e. Inspect scavenge pump hose for leaks.</p>	<p>d. Class III leak is evident.</p> <p>e. Class III leak is evident.</p>
 <p style="text-align: right; margin-right: 50px;">XBPM0161</p>				
9	Semiannual	ENGINE MOUNTS	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p><b>WARNING</b></p> </div> <p><b>Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.</b></p> <p>Check engine mounts for loose hardware or cracks.</p>	<p>Engine mounts are loose or damaged.</p>

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
10	Semiannual	ENGINE CRANK-CASE	<p style="text-align: center;"><b>NOTE</b></p> <p style="text-align: center;">COLD TEMPERATURE OPERATION</p> <p>For operation of equipment in continuous temperatures below 0°F (-18°C), remove lubricants prescribed in the lubrication key for temperatures above 0°F (-18°C). Relubricate with lubricant specified in the lubrication key for temperatures 0°F to -50°F (-18°C to - 46°C).</p> <ol style="list-style-type: none"> <li>a. Start engine (TM 9-2320-365-10) and run for five minutes.</li> <li>b. Check for oil leaks around top of engine oil filter.</li> <li>c. Shut down engine (TM 9-2320-365-10).</li> <li>d. Check oil level on engine oil dipstick.</li> <li>e. Add lubricating oil, if required, to bring oil level to full mark on engine oil dipstick.</li> </ol>	



xBPM0171

Table 2-1. Preventive Maintenance Checks and Services (Cont)

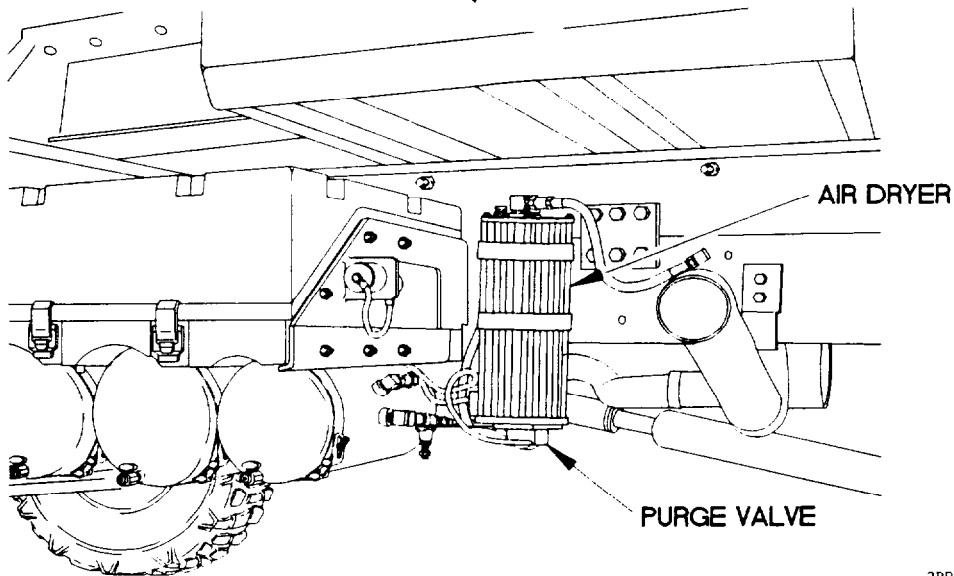
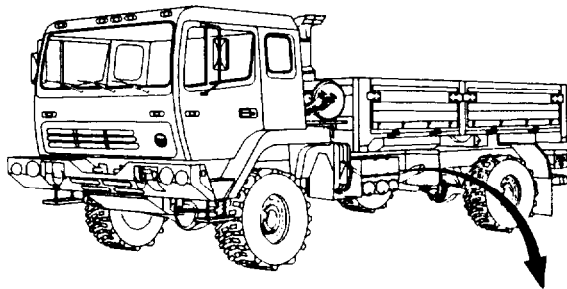
Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
10	Semiannual	ENGINE CRANK-CASE (Cont)	<p>f. Check oil pan bolts and oil pan drain plug for tightness.</p> <p>g. Check valve cover for evidence of oil leaks.</p>	<p>h. Drain plug or oil pan bolts are loose or missing.</p> <p>i. Class III leak is evident.</p>
11	Semiannual	ENGINE WIRING	Check all engine compartment wiring for frays, splits, missing insulation or poor connections.	Insulation missing. Frays, splits, poor connections evident.

XBPM0191



Table 2-1. Preventive Maintenance Checks and Services (Cont)

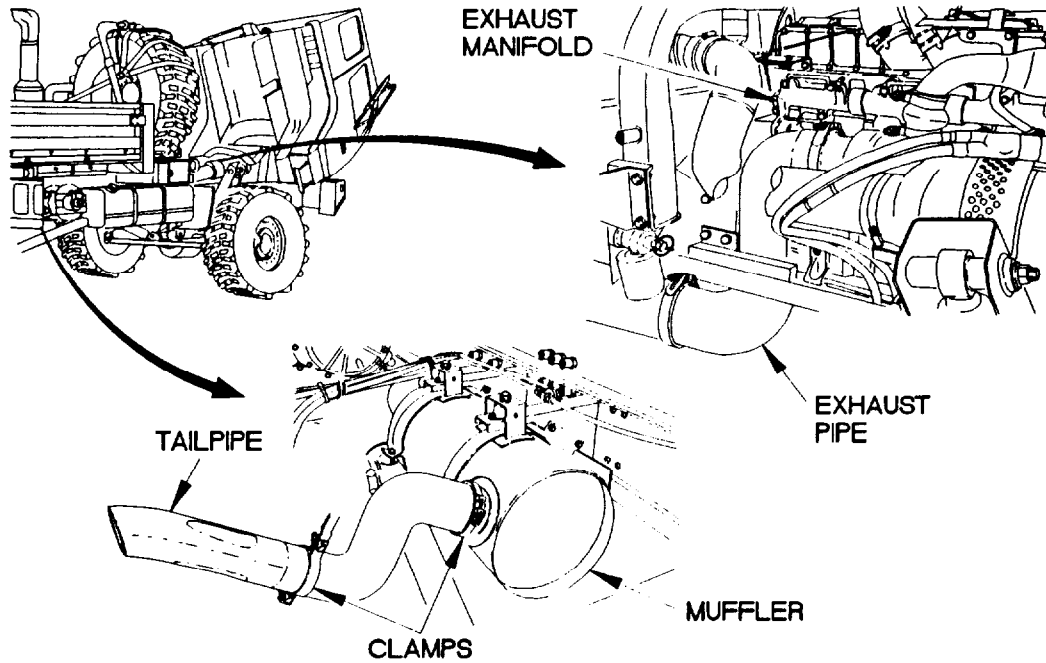
Item No.	Interval	<u>Location</u> Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
12	Semiannual	AIR SYSTEM	<ul style="list-style-type: none"> <li>a. Observe air dryer purge valve operation and ensure proper functioning.</li> <li>b. Inspect purge valve seal for cracks and leaks.</li> <li>c. Check wiring to heater portion of air dryer. Ensure there are no loose connections or frayed wires.</li> </ul>	<ul style="list-style-type: none"> <li>c. Loose connection cannot be tightened or frayed wires are evident.</li> </ul>



3BPM0201

Table 2-1. Preventive Maintenance Checks and Services (Cont)

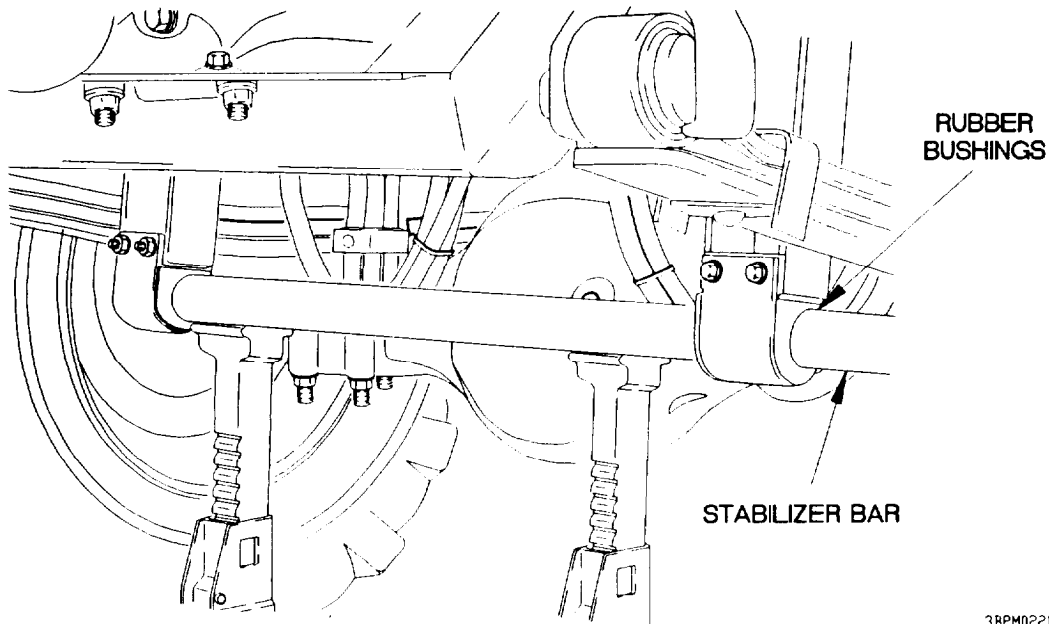
Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
13	Semiannual	EXHAUST SYSTEM	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"><b>WARNING</b></div> <p>The exhaust pipe and muffler can become very hot during vehicle operation. Be careful not to touch these parts with bare hands, or allow body to come in contact with pipe and muffler. Exhaust system parts can become hot enough to cause serious burns. Failure to comply may result in injury to personnel.</p> <p>a. Inspect exhaust manifold, exhaust pipes, muffler, and tailpipe for corrosion, carbon deposits, loose clamps, or leaking gaskets.</p>	



XBPM0211

Table 2-1. Preventive Maintenance Checks and Services (Cont)

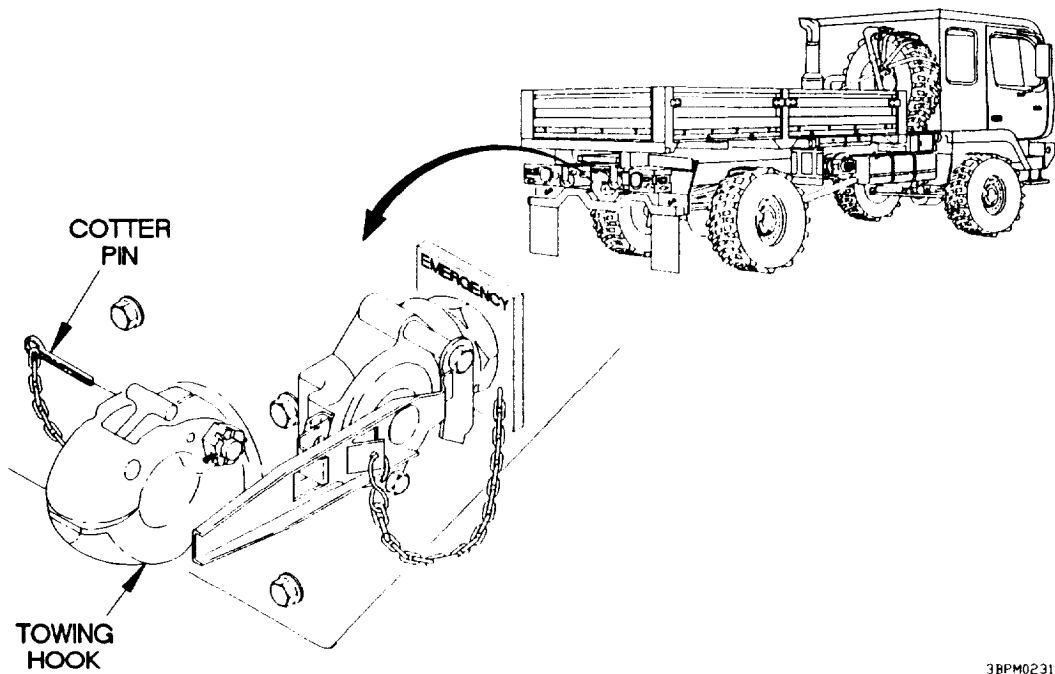
Item No.	Interval	<u>Location</u> Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
14	Semiannual	STABILIZER BAR	a. Check rear stabilizer bar for secure mounting.  b. Inspect stabilizer rubber bushings for cracks and dry rot.	



3BPM0221

Table 2-1. Preventive Maintenance Checks and Services (Cont)

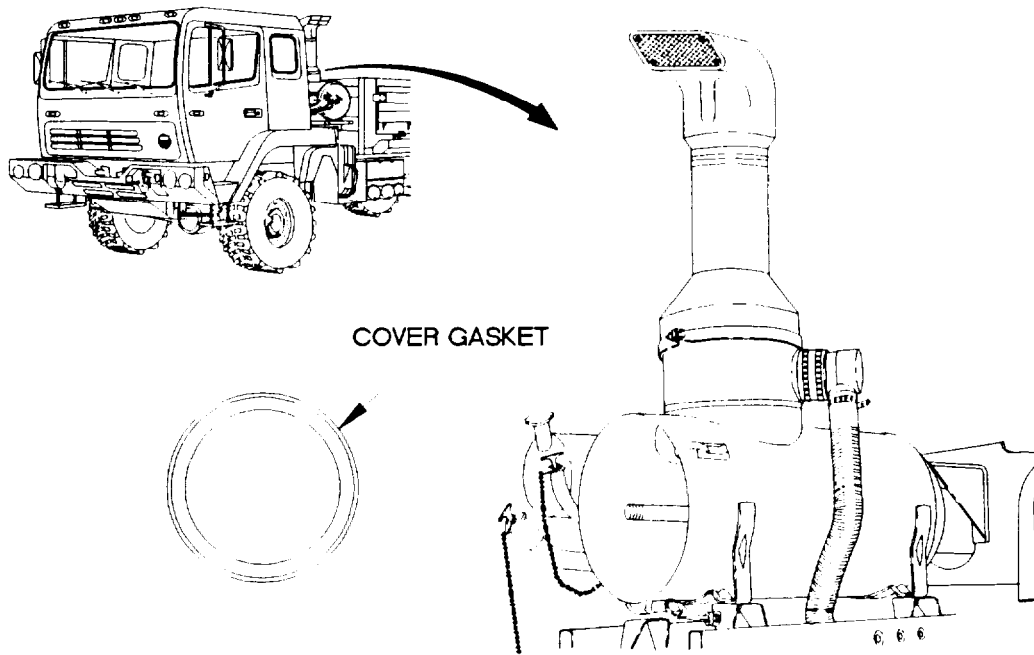
Item No.	Interval	<u>Location</u> Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
15	Semiannual	PINTLE TOWING HOOK	<ul style="list-style-type: none"> <li>a. Check for free rotation and operation of pintle towing hook.</li> <li>b. Inspect pintle towing hook and mounting plate for cracks or loose hardware.</li> <li>c. Inspect pintle cotter pin for presence.</li> </ul>	



3BPM0231

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	<u>Location</u> Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
16	Semiannual	VEHICLE EXTERIOR	Inspect vehicle exterior for evidence of corrosion damage such as surface color change, surface separation, seam separation, blistered paint, rust through, in accordance with TB 43-0213.	
17	Semiannual	AIR CLEANER	a. Remove air cleaner cover and examine air cleaner cover gasket for dry rot and/or missing sections.	a. Cover gasket is not intact or capable of making a good seal.



XBPM0241

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
17	Semiannual	AIR CLEANER (CONT)	<p>b. Inspect air shutter by loosening one hose clamp, removing cover, and ensuring air shutter moves freely without binding or resistance.</p> <p>c. Inspect air shutter gasket for cracking and dry rot.</p> <p>d. Check security of clamps on particle extraction hose between air cleaner and tailpipe. Tighten if loose (35-45 lb-in. (4-5 N•m)), replace if broken. Examine particle extraction hose. Replace if excessively worn.</p>	<p>b. Air shutter binds or is stuck.</p> <p>c. Gasket is broken or dry rotted.</p> <p>d. Particle extraction pathway between air cleaner and tailpipe is not intact.</p>

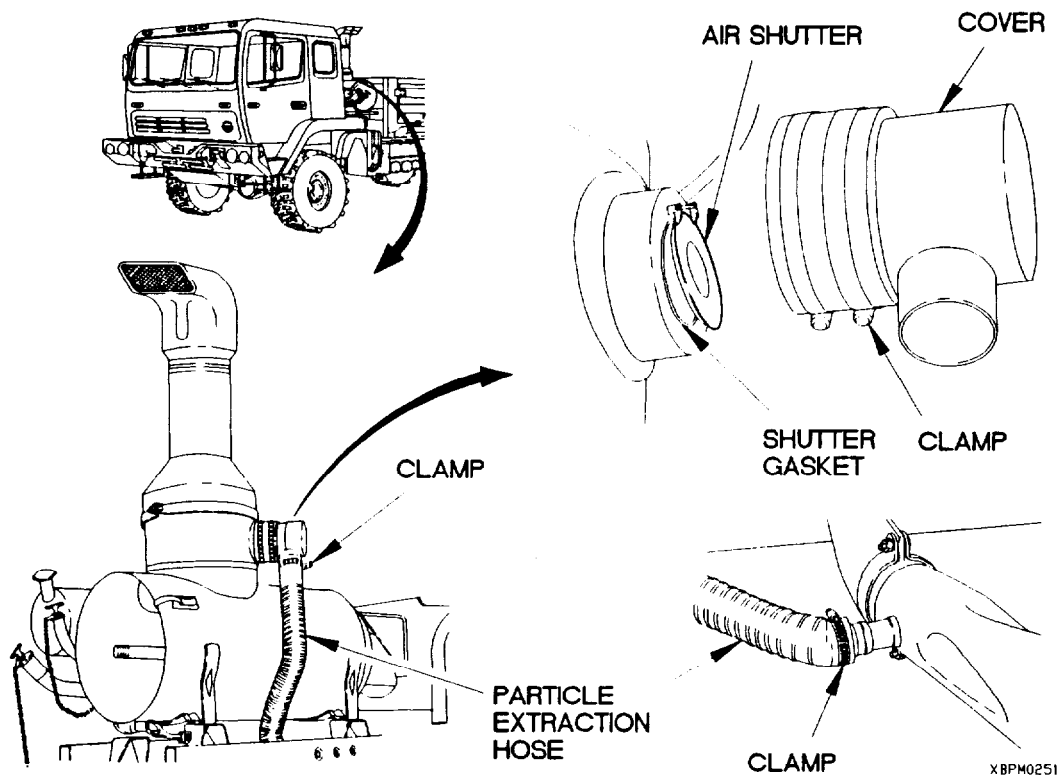
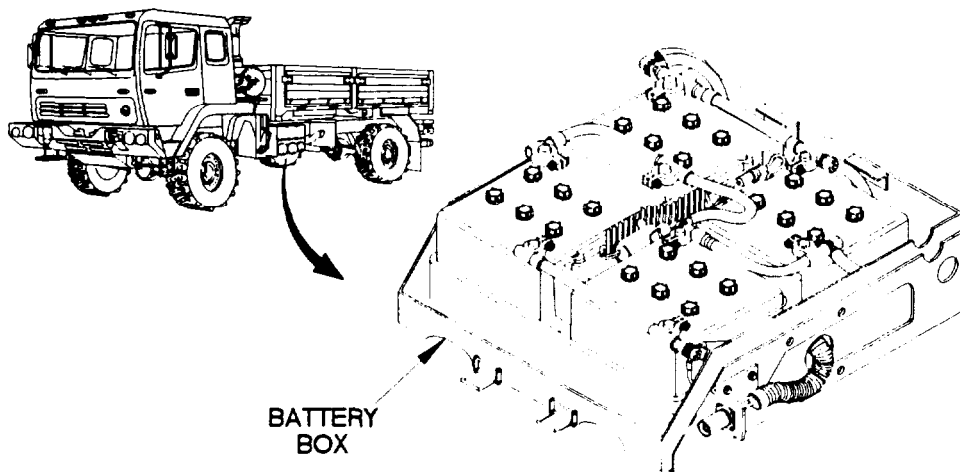


Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
18	Semiannual	BATTERIES AND BATTERY BOX	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"><b>WARNING</b></div> <ul style="list-style-type: none"> <li>● Remove or disconnect batteries prior to performing maintenance in battery area or when working on electrical system. Failure to comply may result in severe electrical shock to personnel or damage to equipment.</li> <li>● Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry contacts battery terminal, a direct short may result in instant heating of tools, damage to equipment, and serious injury or death to personnel. Failure to comply may result in serious injury to personnel.</li> <li>● Wear safety glasses or goggles when checking batteries. Always check electrolyte level with engine shut down. Do not smoke or use exposed flame when checking battery; explosive gases are present and severe injury to personnel can result. Failure to comply may result in injury to personnel.</li> </ul> <p>a. Inspect battery box for obvious signs of corrosion and for loose mounting hardware.</p>	



3BPM0261

Table 2-1. Preventive Maintenance Checks and Services (Cont)

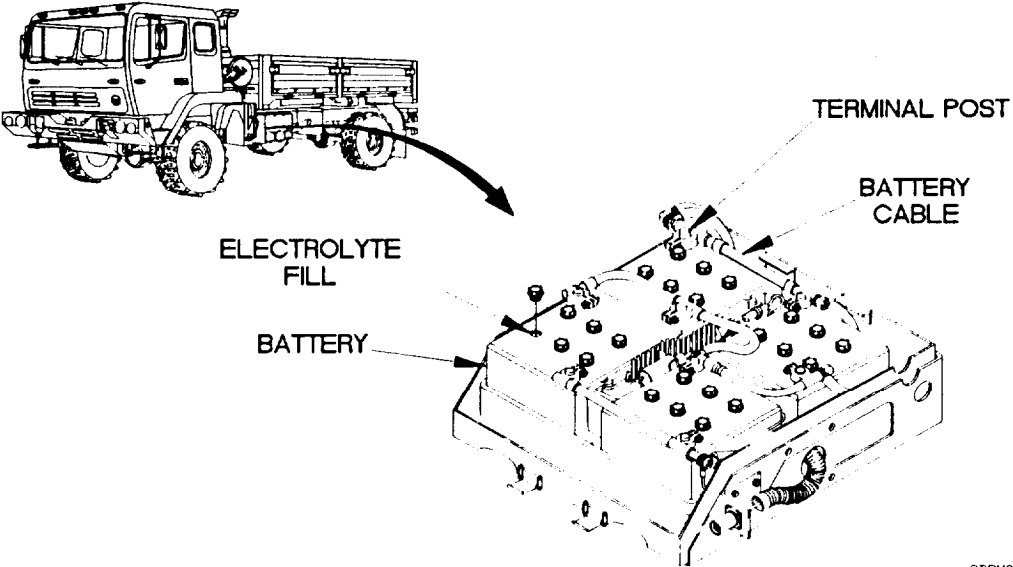
Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
18	Semiannual	BATTER- IES AND BATTERY BOX (CONT)	b. Inspect external condition of batteries; check for cracks and loose or corroded terminal posts.  c. Check and record specific gravity of each cell in all batteries.	b. Batteries cracked.
 <p style="text-align: right; margin-right: 100px;">3BPM0271</p>				
			d. Inspect battery cables for corrosion, frays, splits, chafing and secure attachment.	d. Battery cables are worn, frayed or corroded.



Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
19	Semiannual	SPARE TIRE RETAINER	a. Inspect hydraulic hoses for cracks and abrasions.  b. Inspect hydraulic cylinder for leaks around cylinder rod and fittings. Check cotter pins for presence.	a. Class III leak is evident.  b. Class III leak is evident.

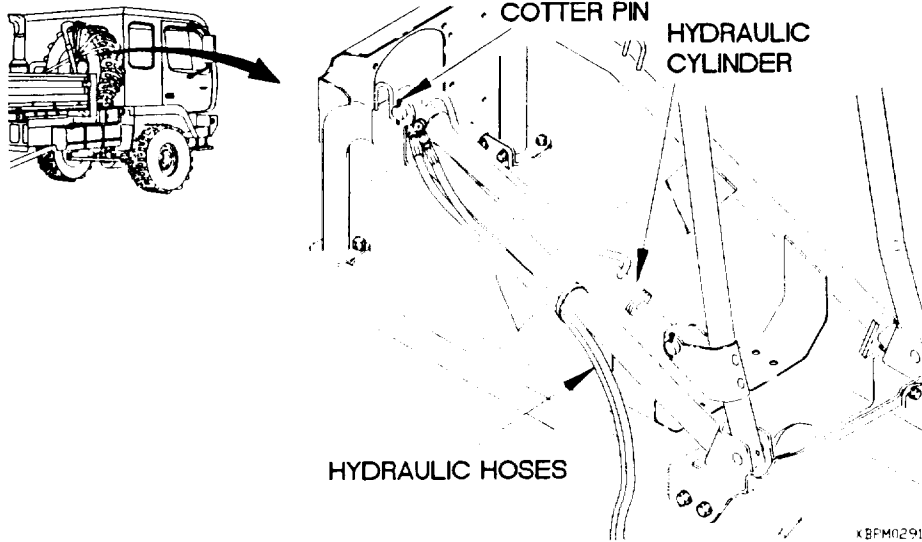
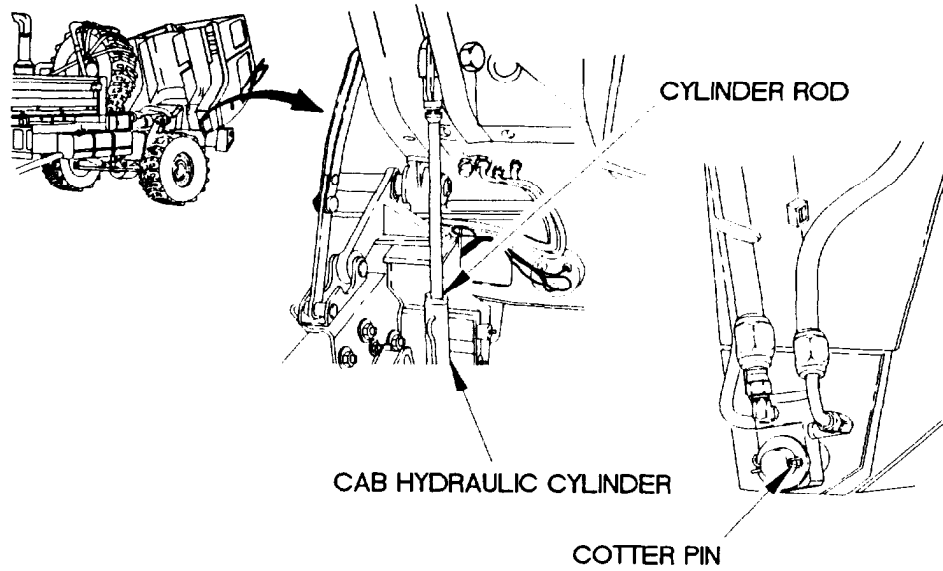


Table 2-1. Preventive Maintenance Checks and Services (Cont)

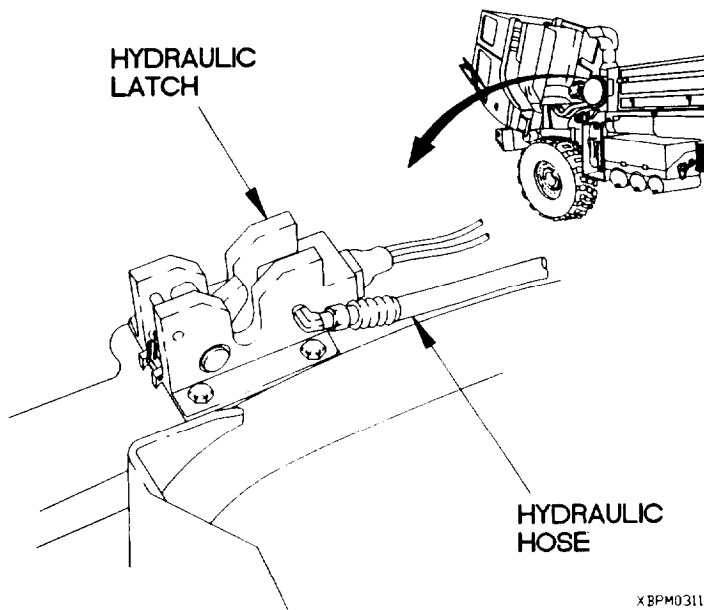
Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
20	Semiannual	CAB HYDRAULIC CYLINDER	a. Inspect cab hydraulic cylinder for leakage around cylinder rod.  b. Check security of attaching hardware at cylinder rod end and cotter pin for presence.	a. Class III leak is evident.  b. Cab hydraulic cylinder is unsecured.



XBPM0301

Table 2-1. Preventive Maintenance Checks and Services (Cont)

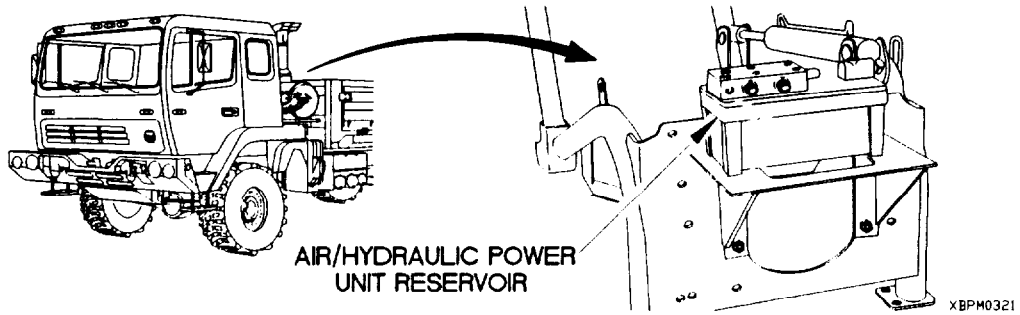
Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
21	Semiannual	CAB HYDRAULIC LATCH	Check security of attaching hardware for hydraulic cab latch.	a. If cab will not securely latch. b. Missing or loose hardware.



XBPM0311

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
22	Semiannual	AIR/ HYDRAU- LIC POWER UNIT	Check air/hydraulic power unit reservoir and refill in accordance with Appendix H.	



23	Semiannual	SUSPEN- SION CYLINDER	Check suspension cylinder for oil leaks and damage.	Class III leak is evident.
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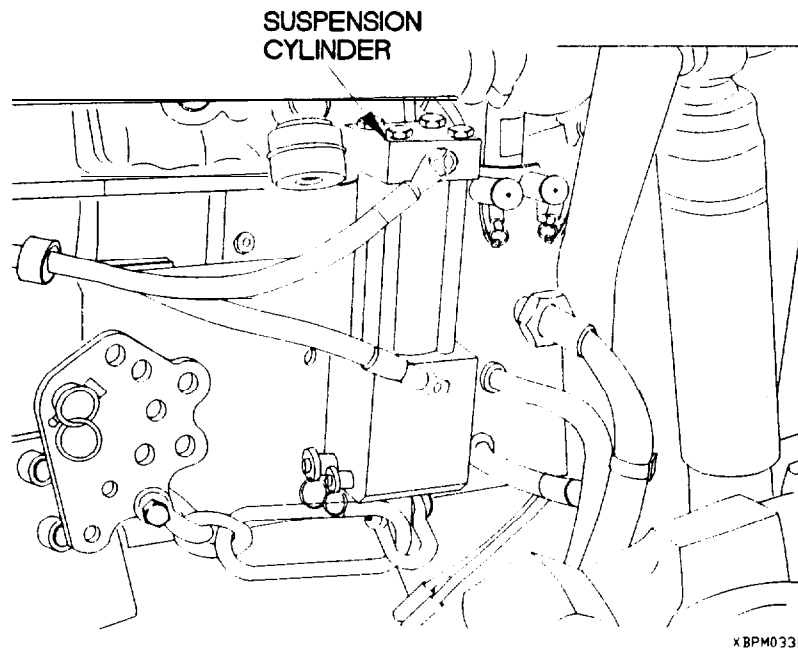


Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
24	Semiannual	STEERING SYSTEM	<p>a. Inspect steering column universal joint attachment hardware for security.</p> <p style="text-align: center;"><b>NOTE</b></p> <p>Wheels must be centered before performing step b.</p> <p>b. Inspect staking of pitman arm attachment nut.</p> <p>c. Inspect power steering hoses for leaks, cracks, and chafing.</p> <p>d. Check steering gear mounting bolts for tightness.</p> <p>e. Check steering column U-joint, steering knuckles, tie rod, drag link, pitman arm, and steering gear for tightness, breaks, cracks, rust, and serviceability.</p>	<p>a. Universal joint is loose, broken, or cracked or hardware is missing.</p> <p>b. Pitman arm nut is loose.</p> <p>c. Class III leak is evident. Chafing is severe or hoses cracked.</p> <p>d. Bolts loose or missing.</p> <p>e. Bolts are loose. Breaks or cracks are evident.</p>

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
25	Semiannual	PULLEY DAMPER	Inspect pulley damper for dents.	Pulley damper is damaged.
26	Semiannual	ALTER-NATOR PULLEY	Inspect alternator pulley for dents, nicks, and cuts in flanges.	Pulley is damaged to the point that it affects belt wear.
27	Semiannual	ALTER-NATOR BRACK-ETS	<ul style="list-style-type: none"> <li>a. Check for loose or cracked mounting hardware on alternator bracket and alternator pulley.</li> <li>b. Check idler pulley for dents, nicks, and cuts in flanges.</li> </ul>	<ul style="list-style-type: none"> <li>a. Alternator bracket or idler pulley is cracked or loose.</li> <li>b. Pulley is damaged to the point that it affects belt wear.</li> </ul>
28	Semiannual	ALTER-NATOR DRIVE BELTS	Check alternator drive belts for cracks, frays, and shiny spots.	Any drive belt has more than one crack 1/8 in. (0.3 cm) in depth or 50 percent of belt thickness, any fray more than 2 in. (5.1 cm) long, or has excessive play.

Table 2-1. Preventive Maintenance Checks and Services (Cont)

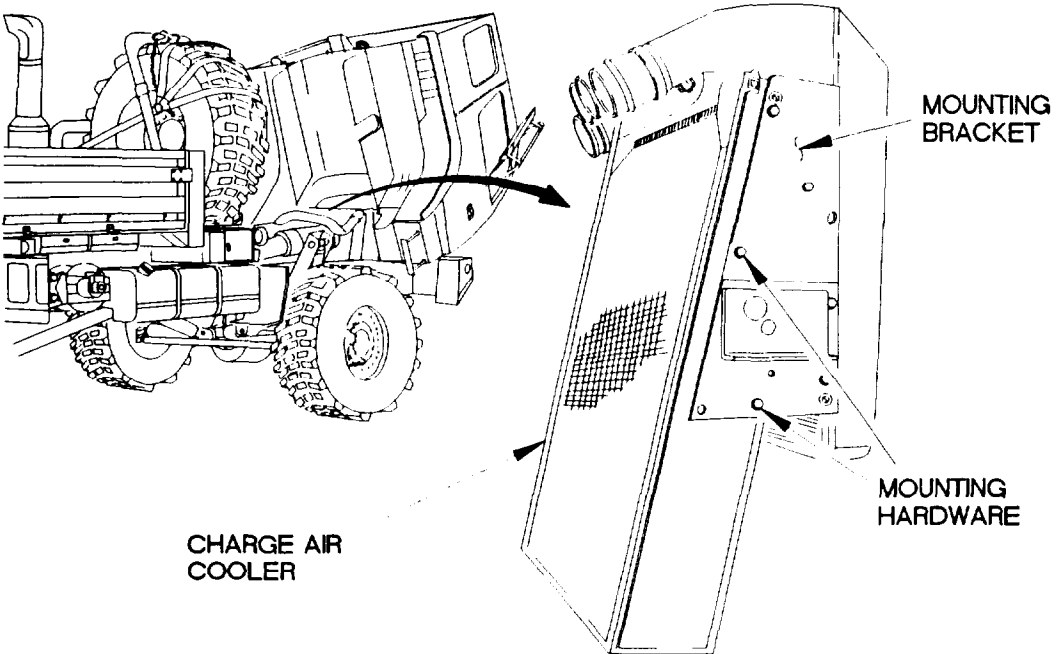
Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
29	Semiannual	THROT- TLE POSITION SENSOR	Check throttle position sensor for secure mounting.	Throttle position sensor is not firmly mounted or securely attached to throttle lever.
30	Semiannual	ENGINE	<ul style="list-style-type: none"> <li>a. Inspect engine speed governor for loose mounting hardware.</li> <li>b. Check for fuel leaks around fittings and for abrasion of fuel hoses.</li> </ul>	<ul style="list-style-type: none"> <li>a. Mounting hardware is loose or missing.</li> <li>b. Fuel leaks are evident.</li> </ul>

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
30	Semiannual	ENGINE (Cont)	c. Check for oil leaks around fittings and for crimps in oil tubes.  d. Check for secure attachment of throttle control cable.	c. Class III leak is evident.  d. Control cable is not securely attached.
<p>The diagram shows a detailed view of engine components. Labels include: CHARGE AIR COOLER, CHARGE AIR COOLER TUBES, CLAMPS, CHARGE AIR COOLER TUBE, and OIL TUBE. An arrow points from the OIL TUBE label to a specific tube in the engine assembly. The reference code XBPM0371 is located at the bottom right of the diagram.</p>				
31	Semiannual	TURBO- CHARGER	Check turbocharger oil tubes for leaks or crimping which would restrict oil flow.	Class III leak is evident.
32	Semiannual	CHARGE AIR COOLER TUBES	a. Inspect charge air cooler tube assembly for obvious signs of corrosion or cracking.	a. Charge air cooler tubing is cracked.



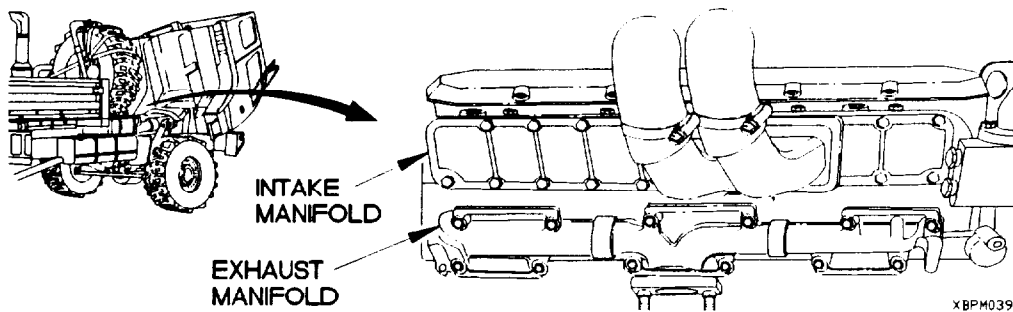
Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
32	Semiannual	CHARGE AIR COOLER TUBES (Cont)	<ul style="list-style-type: none"> <li>b. Check all hose clamps between turbocharger and intake manifold and verify that they are tight (90-100 lb-in. (10-11 N•m)).</li> <li>c. Check turbocharger rubber charge air hoses for cracking and chafing.</li> </ul>	c. Rubber hose(s) is damaged.
 <p>The diagram consists of two parts. On the left, a side-view line drawing of a truck's engine compartment shows the location of the charge air cooler, which is situated behind the front grille. An arrow points from this location to a larger, detailed view on the right. This detailed view shows the charge air cooler's mounting assembly, including a vertical mounting bracket and various mounting hardware (bolts, nuts, and washers) that secure the cooler to the truck's frame. Labels 'CHARGE AIR COOLER', 'MOUNTING BRACKET', and 'MOUNTING HARDWARE' are used to identify the respective components.</p>				
33	Semiannual	CHARGE AIR COOLER	<ul style="list-style-type: none"> <li>a. Inspect charge air cooler for bent or clogged cooling fins.</li> <li>b. Check charge air cooler mounting for security and tighten any loose hardware.</li> <li>c. Inspect mounting brackets for cracks and damage.</li> </ul>	a. Charge air cooler is damaged.

xBPM0381

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
34	Semiannual	EXHAUST AND INTAKE MANIFOLDS	<p>a. Check exhaust manifold for damage, loose mounting bolts and for exhaust leaks.</p> <p>b. Check intake manifold for loose mounting bolts and damage.</p>	<p>a. Exhaust manifold is damaged, exhaust leaks, or mounting hardware is loose.</p> <p>b. Intake manifold is damaged. Mounting hardware is loose.</p>



35	Semiannual	ENGINE CRANKCASE BREATHER	Service crankcase breather in accordance with instructions in Appendix H. Check security of mounting hardware.	Class III leak or loose or missing hardware are evident.
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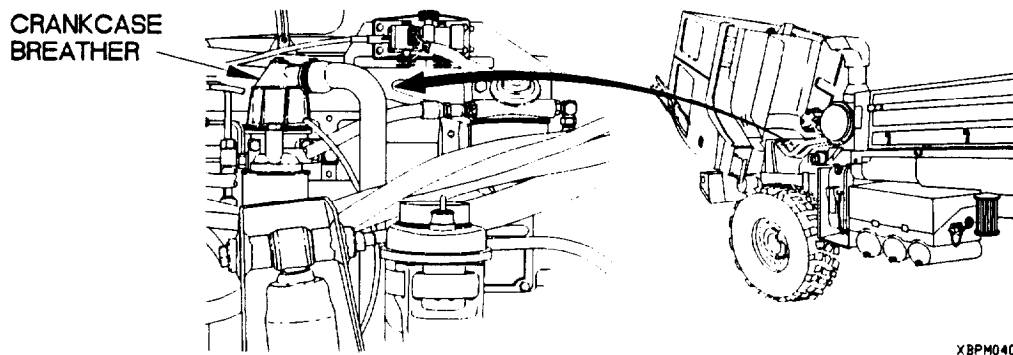


Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
36	Semiannual	ENGINE WIRING	Check all engine wiring for signs of fraying, chafing, cracking, and burnt insulation.	Wiring is burned, cracked, frayed, or broken.
37	Semiannual	AIR COMPRESSOR AND AIR COMPRESSOR GOVERNOR	<ul style="list-style-type: none"> <li>a. Inspect air compressor and air compressor governor for leaks and loose hardware.</li> <li>b. Inspect air compressor oil tube for leaks and kinks/bends which would cause a restriction.</li> <li>c. Check air compressor coolant tubes for leaks and kinks/bends.</li> </ul>	<ul style="list-style-type: none"> <li>a. Class III leak is evident or hardware is missing or loose.</li> <li>b. Class III leak, kinks or bends are evident.</li> <li>c. Class III leak, kinks or bends are evident.</li> </ul>

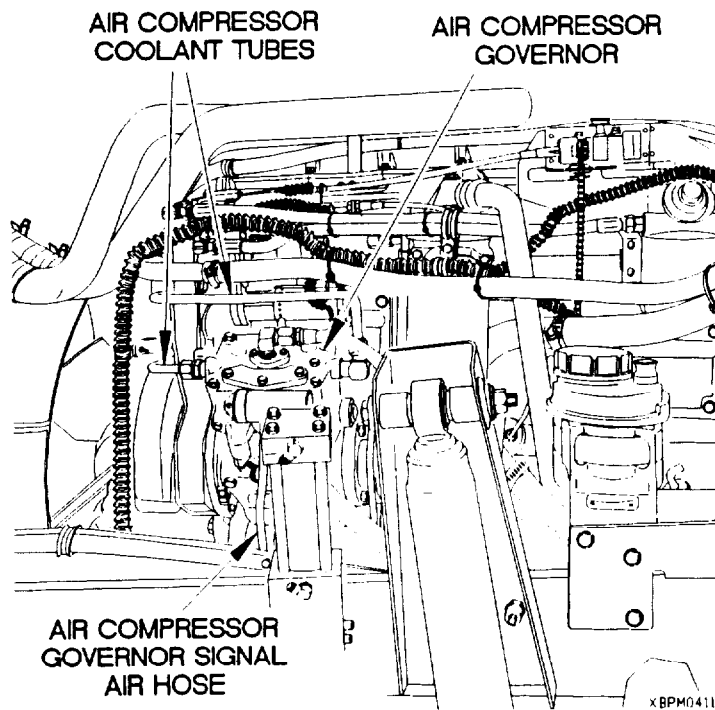


Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
38	Semiannual	COOLING SYSTEM	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"><b>WARNING</b></div> <p>If vehicle has been operating, use extreme care to avoid being burned when removing radiator cap. Use heavy rags or gloves to protect hands. Turn radiator cap only one-quarter turn to the left and allow pressure to be relieved before fully removing cap. Failure to comply may result in injury to personnel.</p> <ol style="list-style-type: none"> <li>a. Check coolant condition. Test coolant to see if draining is necessary (TB 750-651).</li> <li>b. Replace coolant if required (Appendix H).</li> </ol>	

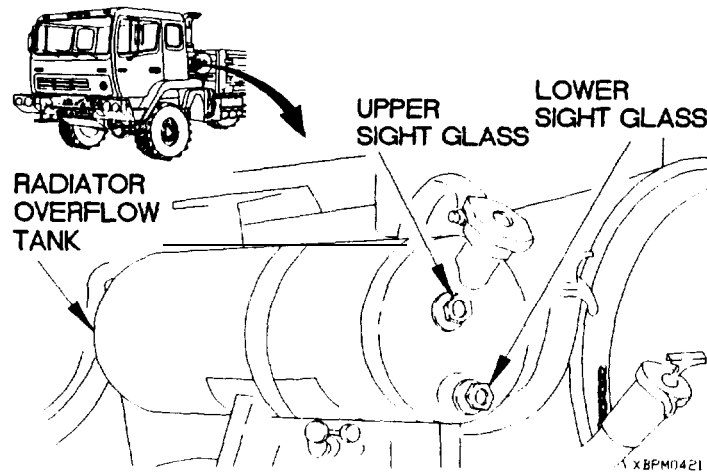
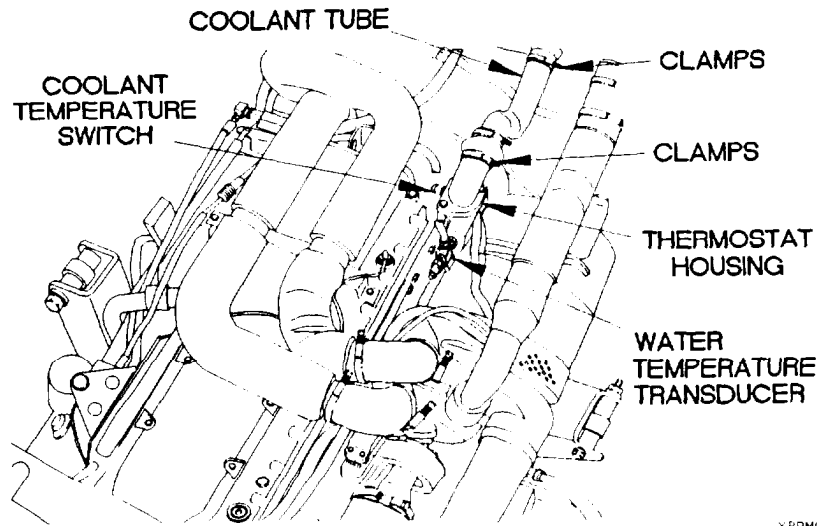


Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
39	Semiannual	THERMOSTAT HOUSING	<ul style="list-style-type: none"> <li>a. Check thermostat housing for loose mounting bolts and leaks around base. Tighten loose mounting bolts.</li> <li>b. Inspect upper coolant tube for cracks and splits. Refer to para 6-9 if clamps are found to be loose.</li> <li>c. Check for leaks around water temperature transducer and coolant temperature switch.</li> </ul>	<ul style="list-style-type: none"> <li>a. Class III leak is evident.</li> <li>c. Class III leak is evident.</li> </ul>



X BPM04 31

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
40	Semiannual	WATER PUMP	<p>a. Check security of water pump attachment bolts and hose clamps. Refer to para 6-12 if clamps are found to be loose.</p> <p>b. Inspect water pump for leaks around impeller shaft.</p> <p>c. Inspect water pump pulley and idler pulley for damage.</p>	<p>a. Bolts are stripped.</p> <p>b. Class III leak is evident.</p> <p>c. Water pump pulley or idler pulley is damaged to the point that it affects belt wear.</p>
			<p>d. Check drive belt for cracks, frays, and shiny spots.</p>	<p>d. Drive belt has more than one crack 1/8 in. (0.3 cm) in depth or 50 percent of belt thickness, any fray more than 2 in. (5.1 cm) long, or has excessive play.</p>

Table 2-1. Preventive Maintenance Checks and Services (Cont)

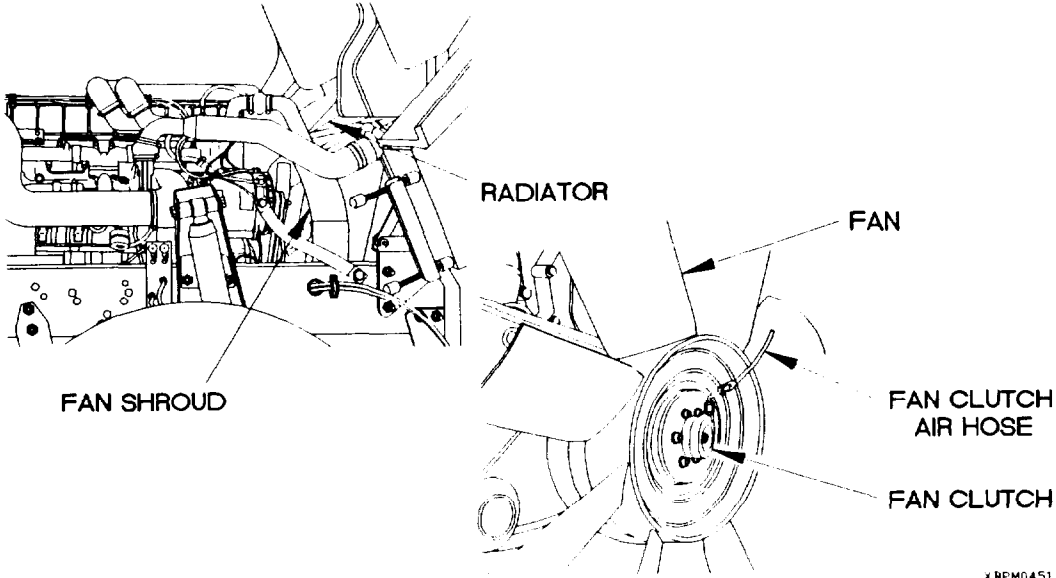
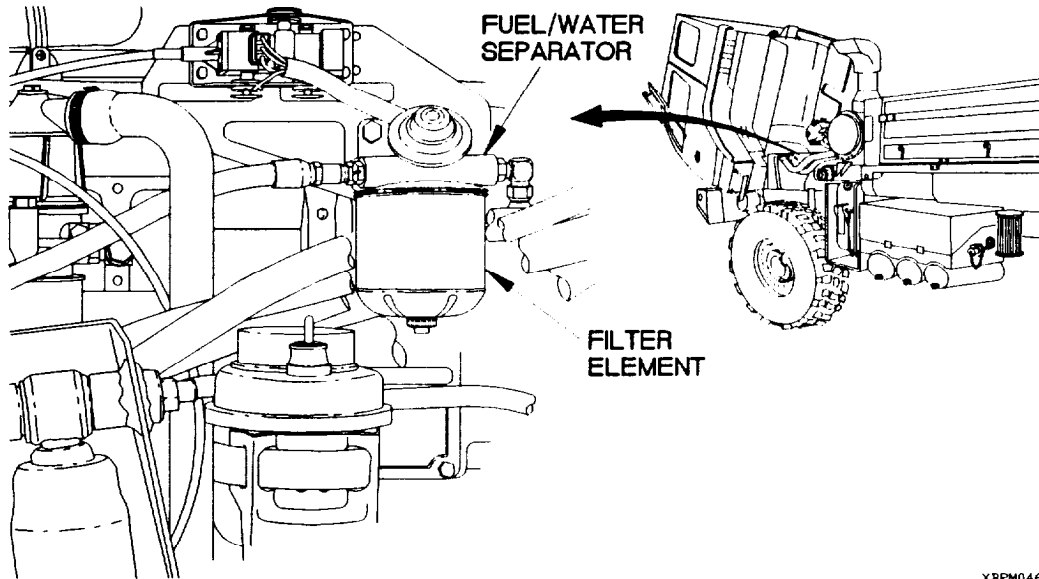
Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
41	Semiannual	FAN BLADE AND CLUTCH	a. Inspect fan for chipping, cracking, and missing fan blades.  b. Inspect fan clutch for loose bolts (para 6-14).  c. Check fan clutch air hose and fitting for leaks.	a. Fan blades chipped, cracked, or missing.  b. Loose or missing bolts.
 <p style="text-align: right; margin-right: 50px;">X BFM0451</p>				
42	Semiannual	RADIATOR	a. Check radiator for leaks and bent or clogged cooling fins.  b. Check fan shroud for cracks and missing pieces.	a. Class III leak is evident.

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
43	Semiannual	FUEL/WA- TER SEPARA- TOR	a. Inspect fuel/water separator assembly for dents and cracks that could cause leaks.  b. Replace filter element every 6,000 miles (9,656 km) or every six months, whichever occurs first (para 4-13).	a. Any leak is evident.



XBPM046L



Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
44	Semiannual	FRONT WHEEL ALIGN- MENT	<p>Check front wheel alignment (para 13-5).</p> <p style="text-align: center;"><b>NOTE</b></p> <p>Do not turn tires when turning wheel to check for steering wheel free play.</p> <p>Place a strip of tape around steering wheel at 12 O'clock position. Turn steering wheel right until resistance is felt. Place a ruler lightly against outer rim of steering wheel with end of ruler at one edge of tape. Turn steering wheel left until resistance is felt. Measure distance designated edge of tape has traveled. Maximum free play measured at outside rim of steering wheel is 2-1/2 in. (6.4 cm).</p>	<p>Front wheels cannot be aligned.</p> <p>Steering wheel exceeds 2-1/2 in. (6.4 cm) free play.</p>

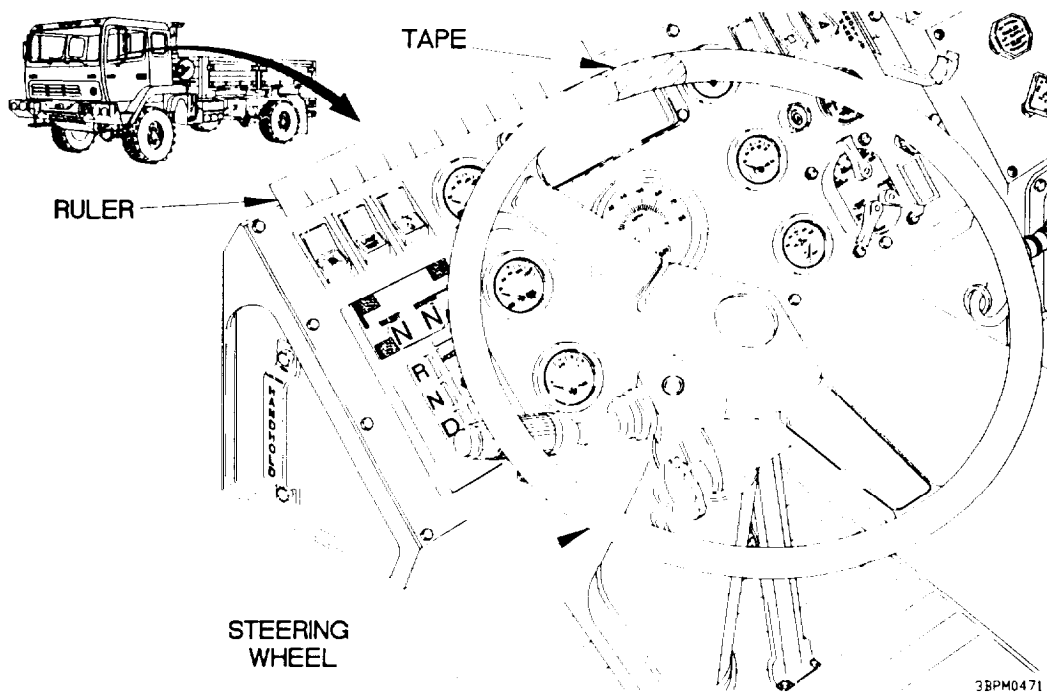
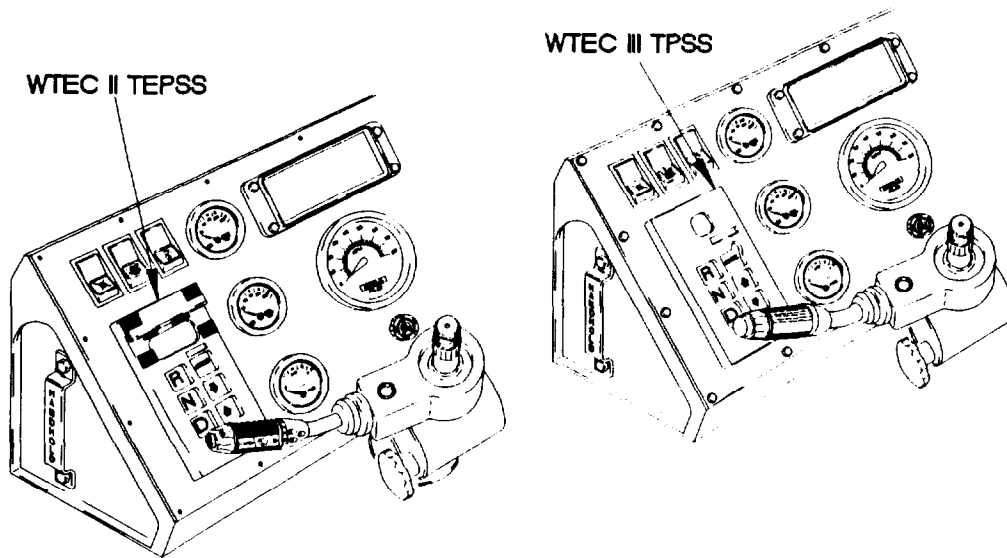


Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	<u>Location</u> Item to be Checked Of Serviced	Procedure	Not Fully Mission Capable If:
45	Semiannual	TRANS-MISSION	<p>Check to see if any diagnostic codes are logged in WTEC II TEPSS (para 8-4) or WTEC III TPSS (para 8-5).</p> <ol style="list-style-type: none"> <li>a. Perform Transmission Troubleshooting para 2-17) for all diagnostic codes logged in WTEC II TEPSS or WTEC III TPSS.</li> <li>b. Clear all diagnostic codes from WTEC II TEPSS (para 8-4) or WTEC III TPSS (para 8-5).</li> </ol>	

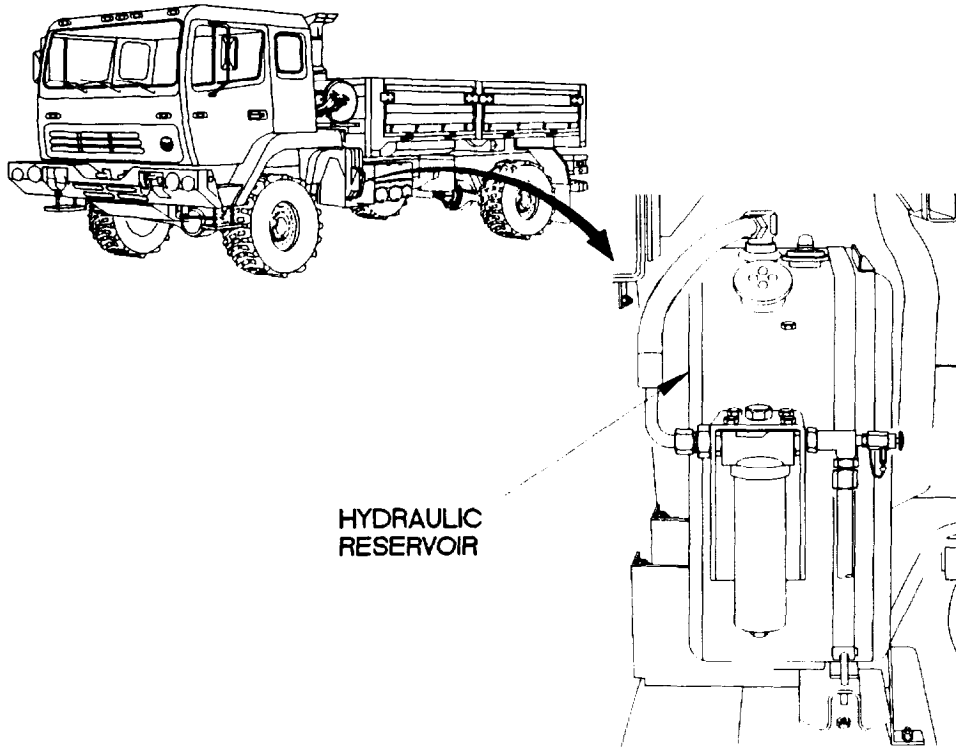


STEERING WHEEL REMOVED FOR CLARITY

3BPM0531

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	<u>Location</u> Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
46	Semiannual	HYDRAULIC RESERVOIR (If Equipped)	Inspect hydraulic reservoir for leaks, cracks, or dents.	Class III is evident.



38PM0481

Table 2-1. Preventive Maintenance Checks and Services (Cont)

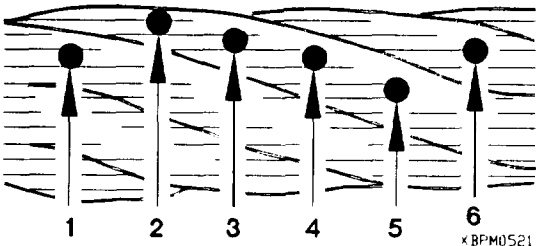
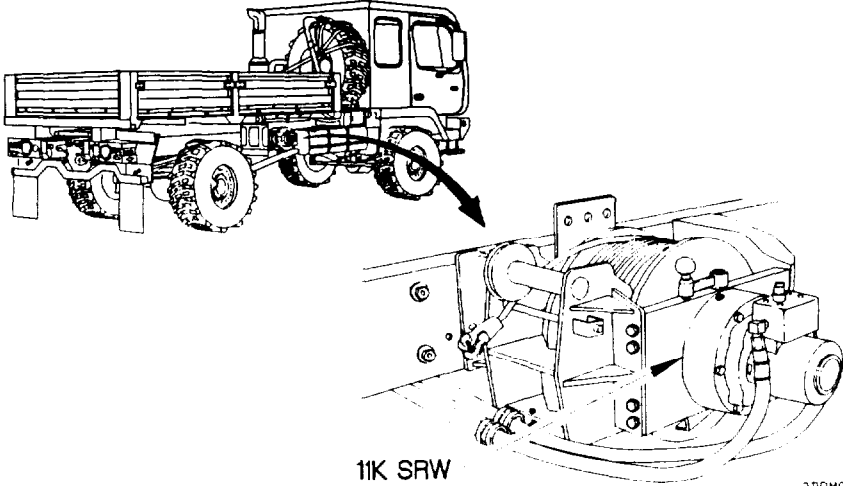
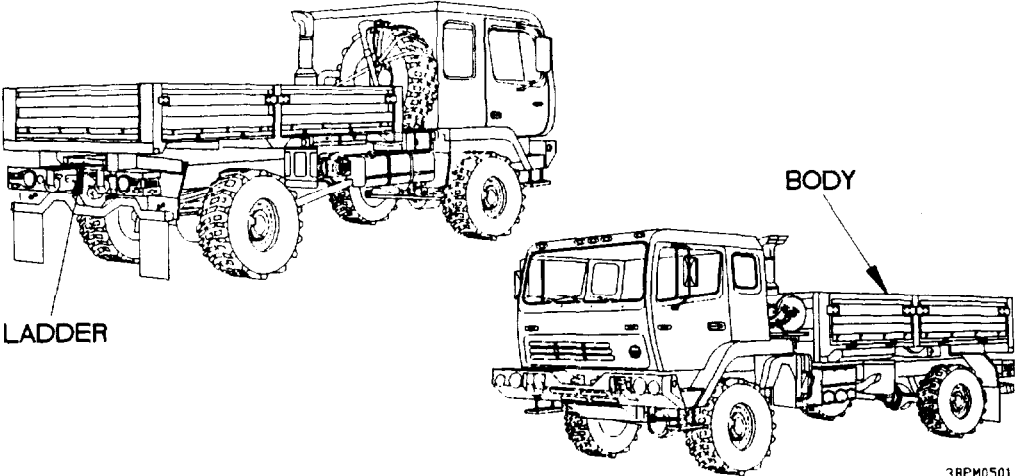
Item No.	Interval	Location Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
47	Semiannual	11K SRW CABLE	<div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto 10px auto;"> <b>WARNING</b> </div> <p>Cable can become frayed or contain broken wires. Wear heavy leather gloves when handling cable. Frayed or broken wires can injure hands. Failure to comply may result in injury to personnel.</p> <ol style="list-style-type: none"> <li>a. Spool out SRW cable completely and inspect for kinks, sharp bends, abrasions, and broken wires (para 17-5).</li> <li>b. Check that there are no more than six randomly distributed broken wires in any six-inch section of cable or three broken wires in one bundle (breaks 3, 4, 5) in a six-inch section.</li> </ol> <div style="text-align: center; margin: 10px 0;">  <p style="text-align: right; font-size: small;">x BPM0521</p> </div> <ol style="list-style-type: none"> <li>c. Kinking, crushing, or any other damage resulting in distortion of the cable structure.</li> </ol>	<ol style="list-style-type: none"> <li>b. More than six broken wires in a six-inch section or three broken wires in one bundle in a six-inch section is evident.</li> </ol>

Table 2-1. Preventive Maintenance Checks and Services (Cont)

Item No.	Interval	<u>Location</u> Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
48	Semiannual	11K SRW	Check security of winch mounting hardware.	Mounting hardware broken or missing.
 <p>11K SRW <span style="float: right;">3BPM0491</span></p>				
49	Semiannual	CARGO BODY	a. Check cargo body for corrosion and damage.  b. Inspect ladder for damage and cracks.	
 <p>LADDER <span style="margin-left: 200px;">BODY</span> <span style="float: right;">3BPM0501</span></p>				

## Section IV. TROUBLESHOOTING

### 2-10. INTRODUCTION TO LOGIC TREE TROUBLESHOOTING

This section contains step-by-step procedures for identifying locating, isolating, and repairing equipment malfunctions.

This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

### 2-11. TROUBLESHOOTING INSTRUCTIONS

a. **Page Layout.** Troubleshooting procedures are divided into logic tree pages and test pages.

- (1) A logic tree page is always a left-hand page, facing the test page on the right. The logic tree page provides the sequence of steps required to isolate a fault to a failed component. All critical information for decision making is on the left-hand page. Each logic tree page contains the following information:
  - (a) **INITIAL SETUP** - This box is located only on the first logic tree page of a fault. INITIAL SETUP lists tools, materials, references, personnel, and equipment needed to troubleshoot the fault.
  - (b) **KNOWN INFO** - This box is located in the top left-hand column. KNOWN INFO lists conditions and information that will eliminate specific components as the cause of the fault.
  - (c) **POSSIBLE PROBLEMS** - This box is located directly below KNOWN INFO. All of the system components that could cause a fault are listed in the POSSIBLE PROBLEMS box. The first component listed in the POSSIBLE PROBLEMS box is the one that will be tested at that step in the logic sequence. When one of the components is tested and found to operational, it is entered at the bottom of the KNOWN INFO box as OK.
  - (d) **QUESTION** - Each question, located in the middle column, refers to the first possible problem listed in POSSIBLE PROBLEMS. If the answer to the question is YES, proceed to the next step. If the answer is NO, follow the NO arrow to obtain directions for correcting the problem. If the step contains a WARNING or CAUTION message, a small shadow box is printed above the question. Text for WARNINGS or CAUTIONS is on the following right-hand page.
  - (e) **TEST OPTIONS** - This box is located in the top right-hand column. TEST OPTIONS lists tests available for testing parts suspected of failing.
  - (f) **REASON FOR QUESTION** - This box is located directly below TEST OPTIONS. It explains the purpose for the question in the middle column.
- (2) A test page is always a right-hand page, facing the logic tree page on the left. The test provides detailed instructions for testing the first component listed in the POSSIBLE PROBLEMS box. This test will also provide an answer for the question in the middle column. Note the arrow connecting the test on the right-hand page to the REASON FOR QUESTION. When possible, illustrations are included to provide visual details. Notes contain additional information for testing.

## 2-11. TROUBLESHOOTING INSTRUCTIONS (CONT)

### b. How to Begin Troubleshooting.

- (1) Determine the symptom or condition that indicates a problem or failure. Troubleshooting is divided into symptoms peculiar to a vehicle system or component, for example: pneumatic system or engine. Refer to the Table 2-2. Vehicle Troubleshooting.
- (2) Go to the referenced page to begin troubleshooting. Open the manual flat so both the left-hand and right-hand pages are displayed before you. The information on both pages is important to resolve the problem or failure. However, the experienced technician can follow the left-hand page instructions and refer to the right-hand page when necessary.
- (3) Follow the Diagnostic Procedure. Answer question No. 1 on the left-hand page and follow the YES or NO path to either the remedy or the next question. If necessary, look on the right-hand page for test instructions and illustrations.
- (4) Observe warnings, cautions, and notes. The formatting and symbols used in this manual for warnings, cautions, and notes are as follows:

**WARNING**

This is the symbol for a warning statement. If you see the word WARNING above a question on the left-hand page, look on the right-hand page for the text of the message. WARNINGS describe a situation which could cause serious injury or death to personnel.

**CAUTION**

This is the symbol for a caution statement. If you see the word CAUTION above a question on the left-hand page, look on the right-hand page for the text of the message. CAUTIONS describe a situation which could cause damage to equipment.

**NOTE**

This is a symbol for a note. Notes are located directly above the test to which they refer. NOTES provide additional information for performing a test.

- c. **Confidence Tests.** Before performing any STE/ICE-R test, a confidence test must be run to ensure proper operation of the STE/ICE-R. In addition, a confidence test must be performed after each use to ensure the STE/ICE-R is performing properly. Refer to TM 9-4910-571-12&P.
- d. **Verifying Repair.** When troubleshooting, there is an additional step that must be performed after taking any corrective action. This step will show that the malfunction has been corrected, or that additional troubleshooting is required, example follows:

On malfunction q1. Wanders, pulls to one side, or shimmies; the question is asked "Are front shock absorbers secure and free from damage?". If the question was answered NO, the damaged shock absorber(s) was replaced. After replacing the damaged shock absorber(s), the vehicle must be checked to determine if the original malfunction is still present. If corrected, troubleshooting is completed. If malfunction is still present, continue troubleshooting.

**Table 2-2. Vehicle Troubleshooting**

	Troubleshooting Procedure (Page)
<u>Malfunction</u>	

**a. ENGINE SYSTEM TROUBLESHOOTING**

a1.	Engine does not crank/24 vdc circuits do not operate	2-64
a2.	Engine cranks but does not start	2-68
a3.	Low engine oil pressure	2-72
a4.	Engine stalls at low rpm	2-74
a5.	Engine overspeeds on start	2-80
a6.	Too much vibration in engine	2-82
a7.	Coolant in engine lubrication oil	2-84
a8.	Excessive engine oil consumption	2-86
a9.	Engine overheats	2-90
a10.	Excessive black or gray exhaust smoke from engine	2-92
a11.	White exhaust smoke from engine	2-96

**b. FUEL SYSTEM TROUBLESHOOTING**

b1.	Engine cranks but does not start or engine stalls after starting	2-102
b2.	Ether starting aid does not operate	2-108
b3.	Fuel consumption too high	2-112
b4.	Accelerator pedal sticks	2-114

**c. EXHAUST SYSTEM TROUBLESHOOTING**

c1.	Exhaust system unusually noisy or vibrates excessively during engine operation	2-120
c2.	Exhaust fumes in cab	2-124

**d. COOLING SYSTEM TROUBLESHOOTING**

d1.	Engine overheats	2-130
d2.	Oil in cooling system	2-142
d3.	Loss of coolant	2-144

**e. ELECTRICAL SYSTEM TROUBLESHOOTING**

e1.	Circuit breaker does not operate	2-150
e2.	Engine does not crank/124 vdc circuits do not operate	2-154
e3.	12 vdc and/or 24 vdc circuits do not operate	2-254
e4.	12 vdc circuits do not operate (100 amp alternator)	2-258
e5.	12 vdc circuits do not operate (200 amp alternator)	2-276
e6.	Engine cranks but does not start	2-300
e7.	Fuel level gage does not operate or is inaccurate	2-308
e8.	Water temperature gage does not operate or is inaccurate	2-314
e9.	Rear brake air pressure gage does not operate or is inaccurate	2-318
e10.	Front brake air pressure gage does not operate or is inaccurate	2-322



**Table 2-2. Vehicle Troubleshooting (Cont)**

<u>Malfunction</u>	Troubleshooting Procedure (Page)
<b>e. ELECTRICAL SYSTEM TROUBLESHOOTING (CONT)</b>	
e11. Engine oil pressure gage does not operate or is inaccurate . . . . .	2-326
e12. Speedometer does not operate or is inaccurate . . . . .	2-332
e13. Volts gage does not operate or is inaccurate . . . . .	2-346
e14. Tachometer does not operate or is inaccurate . . . . .	2-348
e15. Audible alarm does not operate (all models except M1078/M1081) . . . . .	2-358
e16. Audible alarm does not operate (models M1078/M1081) . . . . .	2-362
e17. Lamp test switch does not illuminate . . . . .	2-372
e18. Instrument panel switch does not illuminate . . . . .	2-378
e19. Instrument panel gage does not illuminate . . . . .	2-382
e20. Auxiliary panel, personnel heater, and instrument panel do not illuminate . . . . .	2-386
e21. Tachometer does not illuminate . . . . .	2-390
e22. Auxiliary panel switch does not illuminate . . . . .	2-394
e23. Auxiliary panel does not illuminate . . . . .	2-398
e24. High engine temperature indicator does not operate . . . . .	2-402
e25. CTIS overspeed indicator does not operate . . . . .	2-410
e26. Chemical detector indicator does not operate . . . . .	2-424
e27. Left turn signal indicator does not operate . . . . .	2-428
e28. Right turn signal indicator does not operate . . . . .	2-432
e29. Turn signal indicators and high beams on indicator do not operate . . . . .	2-438
e30. High beams indicator does not operate . . . . .	2-440
e31. Parking brake indicator and/or emergency brake indicator does not operate . . . . .	2-444
e32. PTO indicator does not operate . . . . .	2-460
e33. Fan off indicator does not operate . . . . .	2-472
e34. WTEC II Transmission temperature indicator does not operate . . . . .	2-478
e35. WTEC III Transmission temperature indicator does not operate . . . . .	2-486
e36. Front brake air indicator does not operate . . . . .	2-492
e37. Rear brake air indicator does not operate . . . . .	2-498
e38. Engine oil pressure indicator does not operate . . . . .	2-504
e39. Master stop indicator does not operate . . . . .	2-510
e40. One or both headlights (high and low beams) do not illuminate . . . . .	2-512
e41. One or both headlight low beams do not illuminate . . . . .	2-520
e42. One or both headlight high beams do not illuminate . . . . .	2-526
e43. Parking lights do not illuminate . . . . .	2-534
e44. LH door and/or LH front marker lights do not illuminate . . . . .	2-542
e45. RH door and/or RH front marker lights do not illuminate . . . . .	2-552
e46. One or more cab top marker lights do not illuminate . . . . .	2-562
e47. Side and/or rear marker lights do not illuminate . . . . .	2-576
e48. One or both composite lights do not illuminate . . . . .	2-586
e49. One or both front blackout marker lights do not illuminate . . . . .	2-598
e50. Blackout drive light does not illuminate . . . . .	2-606
e51. One or both rear blackout marker lights do not illuminate . . . . .	2-616
e52. Warning light does not illuminate . . . . .	2-626
e53. Backup light does not illuminate . . . . .	2-638
e54. Blackout marker lights do not illuminate . . . . .	2-676
e55. Rear hazard lights do not operate . . . . .	2-678
e56. Front and rear hazard lights do not operate . . . . .	2-680

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(Page)

e57.	Front and rear turn signals do not operate . . . . .	2-690
e58.	Left or right front turn signals do not operate . . . . .	2-702
e59.	One or both stoplights do not operate . . . . .	2-710
e60.	One or both blackout stoplights do not operate . . . . .	2-728
e61.	Stoplights and blackout stoplights do not operate . . . . .	2-740
e62.	Trailer marker/taillights do not operate . . . . .	2-750
e63.	Trailer right stop/turn light does not operate . . . . .	2-760
e64.	Trailer left stop/turn light does not operate . . . . .	2-770
e65.	Trailer blackout marker lights do not illuminate . . . . .	2-780
e66.	Trailer blackout stoplights do not illuminate . . . . .	2-790
e67.	Intervehicle clearance lights do not operate . . . . .	2-800
e68.	Intervehicle left turn signal does not operate . . . . .	2-804
e69.	Intervehicle right turn signal does not operate . . . . .	2-810
e70.	Intervehicle stoplights do not operate . . . . .	2-816
e71.	Intervehicle taillights do not operate . . . . .	2-822
e72.	Personnel heater control illumination does not operate . . . . .	2-828
e73.	Personnel heater fan does not operate . . . . .	2-832
e74.	Windshield washer does not operate . . . . .	2-838
e75.	Windshield wiper does not operate on low speed . . . . .	2-850
e76.	All windshield wiper speeds do not operate . . . . .	2-858
e77.	Windshield wiper does not operate on intermittent speed . . . . .	2-884
e78.	Windshield wiper does not operate on high speed . . . . .	2-874
e79.	Horn does not operate . . . . .	2-880
e80.	Chemical alarm does not operate . . . . .	2-892
e81.	Chemical detector does not operate . . . . .	2-900
e82.	CTIS does not operate . . . . .	2-906
e83.	CTIS does not inflate tires . . . . .	2-920
e84.	CTIS does not deflate tires . . . . .	2-930
e85.	11K Self-recovery winch (SRW) does not reel in or pay out . . . . .	2-940
e86.	11K Self-recovery winch (SRW) does not reel in . . . . .	2-946
e87.	11K Self-recovery winch (SRW) does not pay out . . . . .	2-958
e88.	PTO does not operate . . . . .	2-970
e89.	Electrical system does not maintain a charge . . . . .	2-1010
e90.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) illumination does not dim . . . . .	2-1018
e91.	Engine fan runs constantly . . . . .	2-1028
e92.	Engine fan does not turn off using deep water fording switch . . . . .	2-1038
e93.	Ether start does not operate . . . . .	2-1044
e94.	Excessive condensation in fuel . . . . .	2-1060
e95.	Radio does not operate . . . . .	2-1064
e96.	Start inhibit pushbutton does not operate . . . . .	2-1070
e97.	Air dryer does not operate . . . . .	2-1076
e98.	Battery tester does not operate . . . . .	2-1082
e99.	M1079 Fan does not operate . . . . .	2-1088
e100.	All M1079 van body marker lights do not operate . . . . .	2-1100
e101.	M1079 Van body marker light does not operate . . . . .	2-1104
e102.	All M1079 fluorescent lights do not operate . . . . .	2-1108
e103.	M1079 Lighting fixture(s) DS80 and/or DS81 do not operate . . . . .	2-1118
e104.	M1079 Lighting fixture(s) DS82 and/or DS83 do not operate . . . . .	2-1134
e105.	M1079 110 VAC outlet J233 does not operate . . . . .	2-1152
e106.	M1079 110 VAC outlet J234 does not operate . . . . .	2-1180

**Table 2-2. Vehicle Troubleshooting (Cont)**

<u>Malfunction</u>	<u>Troubleshooting Procedure (Page)</u>
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**e. ELECTRICAL SYSTEM TROUBLESHOOTING (CONT)**

e107.	M1079 110 VAC outlet J235 does not operate	2-1168
e108.	M1079 110 VAC outlet J232 does not operate in normal mode	2-1176
e109.	M1079 110 VAC outlet J232 and J233 do not operate in blackout override mode	2-1190
e110.	M1079 110 VAC outlet J231 does not operate	2-1194
e111.	M1079 110 VAC outlet J230 does not operate	2-1208
e112.	M1079 Blackout light(s) does not operate	2-1222
e113.	M1079 Emergency light(s) does not operate	2-1230
e114.	M1079 Field phone 1 and/or 2 binding post does not operate	2-1244
e115.	M1079 Air conditioner does not operate	2-1264
e118.	M1079 Heater does not operate	2-1276
e117.	M1079 24 VDC binding post(s) does not operate	2-1296
e118.	M1079 Van door open light does not illuminate and audible alarm does not operate	2-1324
e119.	M1079 110 VAC power does not operate	2-1338
e120.	M1079 Fluorescent lights do not operate in blackout override mode	2-1352

**f. TRANSMISSION SYSTEM TROUBLESHOOTING**

f1.	VVTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) emits eight seconds of beeps and/or transmission does not shift gears	2-1362
f2.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 22 sub code 14	2-1364
f3.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 22 sub code 15	2-1372
f4.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 22 sub code 16	2-1378
f5.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 24 and/or 33 and any sub code	2-1384
f6.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 32 and any sub code	2-1396
f7.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 41, 42, 44, and/or 45 and any sub code.	2-1400
f8.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 43 and any sub code	2-1404
f9.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 52 and any sub code	2-1410
f10.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 57 and any sub code	2-1416
f11.	Transmission unusually noisy when operating	2-1420
f12.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 21 and any sub code	2-1430
f13.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code sub code 10, 12, 21, 43, 45, or 65	2-1444
f14.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 25 and any sub code	2-1448
f15.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 53 and any sub code	2-1452

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f16.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 54 sub code 01, 07, 10, 12, 17, 21, 23, 27, 32, 34, 43, 45, 54, 56, 65, 70, 71, 72, 80, 81, 82, 83, 85, 86, 92, 93, 95, 96, or 97 . . . . .	2-1456
f17.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 55 and any sub code . . . . .	2-1462
f18.	VVTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 56 and any sub code . . . . .	2-1468
f19.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) displays main code 13 and any sub code . . . . .	2-1474
f20.	Metal particles found during transmission oil change . . . . .	2-1484
f21.	Transmission does not shift or is slow to shift when cold . . . . .	2-1486
f22.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 22 sub code 14 . . . . .	2-1488
f23.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 22 sub code 15 . . . . .	2-1494
f24.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 22 sub code 16 . . . . .	2-1498
f25.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 24 and/or 33 and any sub code . . . . .	2-1504
f26.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 32 and any sub code . . . . .	2-1516
f27.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 42, 44, and/or 45 and any sub code . . . . .	2-1522
f28.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 52 and any sub code . . . . .	2-1526
f29.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 57 and any sub code . . . . .	2-1532
f30.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 21 and any sub code . . . . .	2-1536
f31.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code and any sub code . . . . .	2-1550
f32.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 25 and any sub code . . . . .	2-1554
f33.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 53 and any sub code . . . . .	2-1558
f34.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 54 and any sub code . . . . .	2-1562
f35.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 55 and any sub code . . . . .	2-1568
f36.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 56 and any sub code . . . . .	2-1574
f37.	WTEC III Transmission Pushbutton Shift Selector (TPSS) displays main code 13 and any sub code . . . . .	2-1580
f38.	WTEC III Transmission Pushbutton Shift Selector (TPSS) indicator displays "--" and/or transmission does not shift gears . . . . .	2-1594

**g. PROPELLER SHAFT TROUBLESHOOTING**

g1.	Propeller shafts or universal joints unusually noisy when operating . . . . .	2-1598
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**Table 2-2. Vehicle Troubleshooting (Cont)**

<u>Malfunction</u>	<u>Troubleshooting Procedure (Page)</u>
<b>h. POWER TAKE OFF (PTO) TROUBLESHOOTING</b>	
h1. PTO does not engage	2-1604
<b>i. BRAKE SYSTEM TROUBLESHOOTING</b>	
i1. Excessive braking distance	2-1608
i2. Rear brakes do not apply	2-1620
i3. Parking brake(s) will not release	2-1644
i4. Front brakes overheat	2-1670
i5. Vehicle brakes unevenly, brakes pull to one side or grab	2-1676
i6. Front brakes do not apply	2-1690
i7. Rear brakes overheat	2-1700
i8. Parking brake does not apply	2-1708
<b>j. AIR SYSTEM TROUBLESHOOTING</b>	
j1. Air system loses pressure during operation/slow air pressure buildup	2-1714
j2. Large quantity of moisture expelled from air reservoirs	2-1730
j3. Air dryer purges constantly	2-1734
j4. No air pressure or low air pressure present at rear gladhands	2-1738
j5. Air system pressure builds up more than 120 psi (827 kPa) (compressor fails to unload)	2-1744
j6. Noisy air compressor operation	2-1748
<b>k. WHEEL TROUBLESHOOTING</b>	
k1. Tires wear unevenly or excessively	2-1754
k2. Wheel wobbles or shimmies	2-1758
<b>l. HYDRAULIC SYSTEM TROUBLESHOOTING</b>	
l1. Loss of hydraulic pressure (single stage pump)	2-1762
<b>m. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING</b>	
m1. Two steady mode lights illuminate on CTIS ECU	2-1768
m2. Four CTIS ECU indicator lights flashing	2-1798
m3. Five CTIS ECU indicator lights flashing	2-1822
m4. CTIS repeatedly resumes cycling 30 seconds after indicator lights stop flashing	2-1856
m5. CTIS ECU lights work but CTIS fails to inflate or deflate	2-1862
m6. No overspeed warning light and/or overspeed pressure change	2-1874
<b>n. AXLE TROUBLESHOOTING</b>	
n1. Axle differential(s) noisy	2-1896

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**p. STEERING TROUBLESHOOTING**

p1.	Hard to steer . . . . .	2-1904
p2.	Wanders, pulls to one side, or shimmys . . . . .	2-1910
p3.	Excessive play when turning steering wheel . . . . .	2-1916
p4.	No response when turning steering wheel . . . . .	2-1920

**q. SUSPENSION SYSTEM TROUBLESHOOTING**

q1.	Wanders, pulls to one side, or shimmys . . . . .	2-1926
q2.	Leans to one side or rear of vehicle sags . . . . .	2-1940

**r. 11K SELF-RECOVERY WINCH (SRW) SYSTEM TROUBLESHOOTING**

r1.	11K Self-recovery winch (SRW) does not work . . . . .	2-1946
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**s. STEERING HYDRAULIC SYSTEM TROUBLESHOOTING**

s1.	Steering hard or does not work . . . . .	2-1954
-----	--	--------

**t. AIR TRANSPORT TROUBLESHOOTING**

t1.	Cab tilt, spare tire retainer, and suspension compression do not work . . . . .	2-1960
t2.	Suspension does not compress or return to normal properly . . . . .	2-1970
t3.	Cab leveling air springs do not work properly . . . . .	2-1972

**u. SPECIAL PURPOSE KIT TROUBLESHOOTING**

u1.	Cargo arctic heater combustion starts immediately when switched on . . . . .	2-1978
u2.	Cargo arctic heater does not start . . . . .	2-1980
u3.	After cargo arctic heater is switched on, heater switches on and off repeatedly . . . . .	2-1986
u4.	Cargo arctic heater hard to start . . . . .	2-1996
u5.	Cargo arctic heater turns itself off . . . . .	2-2002
u6.	Cargo arctic heater emits black smoke . . . . .	2-2004
u7.	Cargo arctic heater emits white smoke more than 20 seconds after start-up . . . . .	2-2010
u8.	Cargo arctic heater cannot be switched off . . . . .	2-2016
u9.	Cargo and cab arctic heater diagnostic procedure with testing apparatus 440.280 . . . . .	2-2020
u10.	Cab arctic heater combustion starts immediately when switched on . . . . .	2-2030
u11.	Cab arctic heater does not start . . . . .	2-2032
u12.	After cab arctic heater is switched on, heater switches on and off repeatedly . . . . .	2-2038
u13.	Cab arctic heater hard to start . . . . .	2-2050
u14.	Cab arctic heater turns itself off . . . . .	2-2060
u15.	Cab arctic heater emits black smoke . . . . .	2-2062
u16.	Cab arctic heater emits white smoke more than 20 seconds after start-up . . . . .	2-2068
u17.	Cab arctic heater cannot be switched off . . . . .	2-2074
u18.	Troop transport alarm does not operate . . . . .	2-2078
u19.	Light material handling crane (LMHC) does not operate . . . . .	2-2088
u20.	Light material handling crane (LMHC) hoist IN does not operate . . . . .	2-2106
u21.	Light material handling crane (LMHC) hoist OUT does not operate . . . . .	2-2110

**Table 2-2. Vehicle Troubleshooting (Cont)**

<u>Malfunction</u>	Troubleshooting Procedure (Page)
<b>v. CAB TILT AND SPARE TIRE RETAINER TROUBLESHOOTING</b>	
v1. Cab does not raise or lower properly . . . . .	2-2116
v2. Spare tire does not raise or lower properly . . . . .	2-2118
<b>w. FRAME TROUBLESHOOTING</b>	
w1. Tires continue to wear after front end alignment and/or vehicle drives sideways down road . . . . .	2-2122

**2-12. ENGINE SYSTEM TROUBLESHOOTING**

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

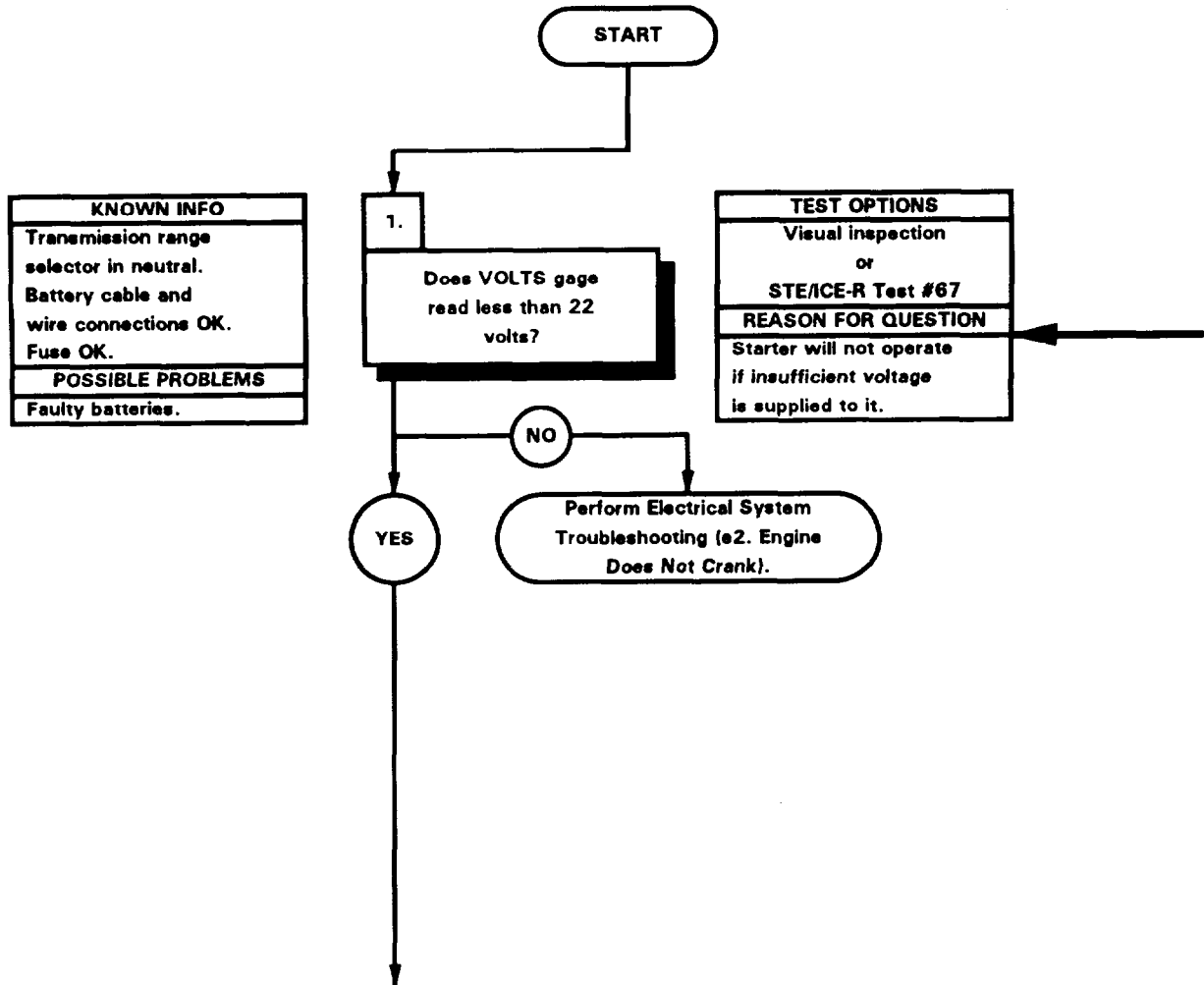
*Table 2-3. Engine System Fault Index*

Fault No.	Description	Page
a1.	Engine does not crank/24 vdc circuits do not operate	2-64
a2.	Engine cranks but does not start	2-68
a3.	Low engine oil pressure	2-72
a4.	Engine stalls at low rpm	2-74
a5.	Engine overspeeds on start	2-80
a6.	Too much vibration in engine	2-82
a7.	Coolant in engine lubrication oil	2-84
a8.	Excessive engine oil consumption	2-86
a9.	Engine overheats	2-90
a10.	Excessive black or gray exhaust smoke from engine	2-92
a11.	White exhaust smoke from engine	2-98

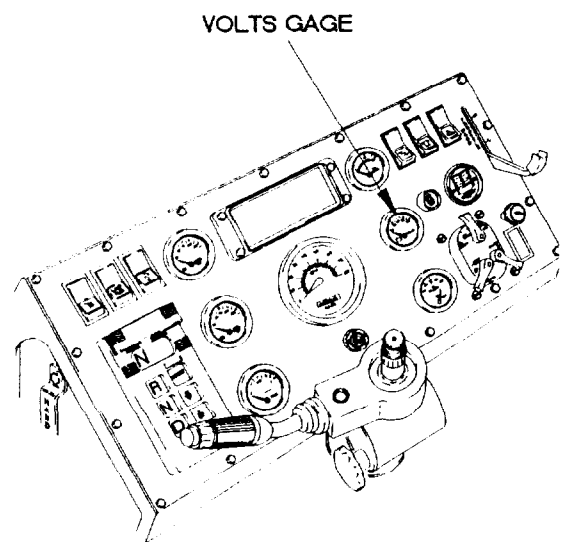




a1. ENGINE DOES NOT CRANK	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Tester, Antifreeze and Battery (Item 41, Appendix C) Goggles, Industrial (Item 15, Appendix C) Gloves, Rubber (Item 13, Appendix C) Apron, Rubber (Item 3, Appendix C)
<b>References</b> TM 9-4910-571-12&P TM 9-6140-200-14	



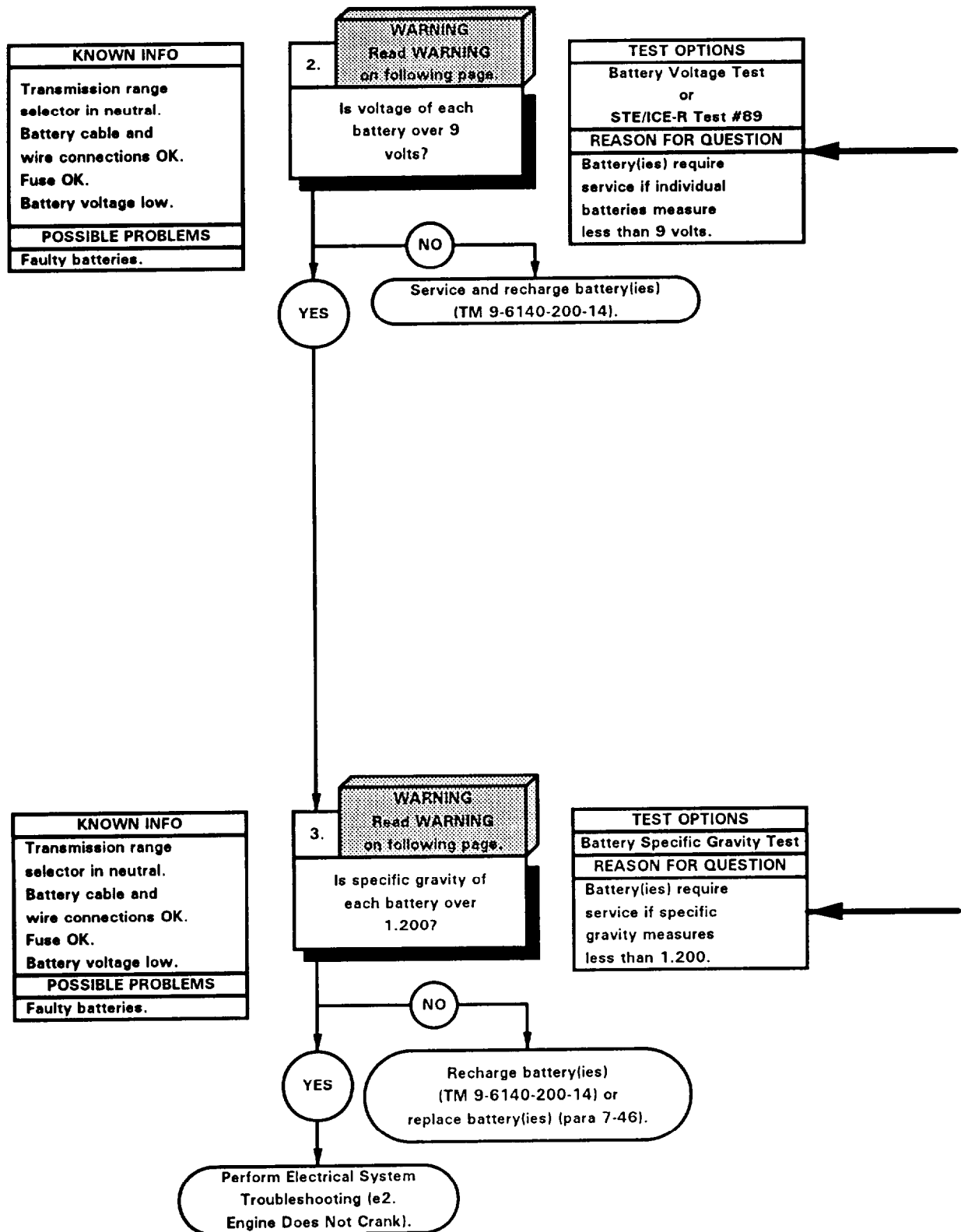
- (1) Position master power switch to on (TM 9-2320-365-10).
- (2) Check VOLTS gage (24 volt system). VOLTS gage should read greater than 22 volts.
- (3) If VOLTS gage reads less than 22 volts, perform Electrical System Troubleshooting (e2. Engine Does Not Crank).
- (4) Position master power switch to off (TM 9-2320-365-10).



STEERING WHEEL  
REMOVED FOR  
CLARITY

x2A0101A

a1. ENGINE DOES NOT CRANK (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.

**BATTERY VOLTAGE TEST**

- (1) Remove battery box cover (TM 9-2320-365-10).

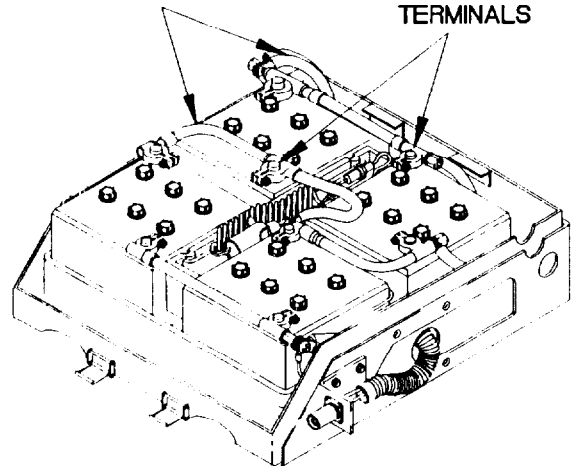
**NOTE**

When performing steps 2 and 3, place probes of multimeter on same battery.

- (2) Place positive (+) probe of multimeter on positive (+) terminal of battery.
- (3) Place negative (-) probe of multimeter on negative (-) terminal of battery and note reading on multimeter.
- (4) Repeat steps (2 and 3) for remaining battery(ies).
- (5) If battery voltage is not over 9 volts, service and recharge battery(ies) (TM 9-6140-200-14).

BATTERY CABLES

TERMINALS



X240102A

**WARNING**

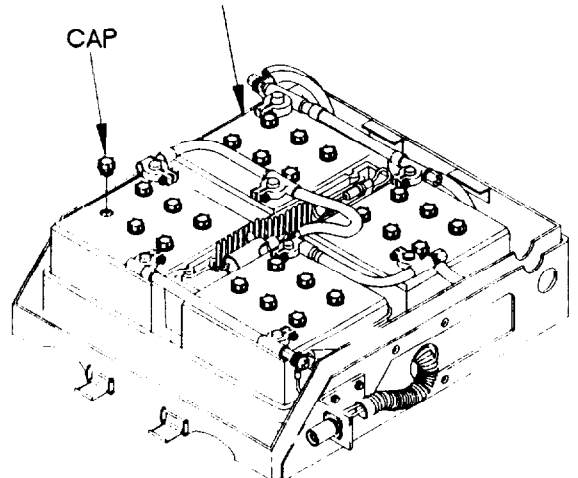
Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and do not smoke when performing maintenance on batteries. Injury will result if acid contacts skin or eyes. Wear rubber apron to prevent clothing being damaged.

**BATTERY SPECIFIC GRAVITY TEST**

- (1) Remove caps from battery.
- (2) Place a few drops of electrolyte on exposed portion of measuring window using black dipstick.
- (3) Point tester toward light source and note reading 1.200 or greater.
- (4) If specific gravity is not over 1.200, recharge (TM 9-6140-200-14) or replace battery(ies) (para 7-46).
- (5) If specific gravity is over 1.200, perform Electrical System Troubleshooting (e2. Engine Does Not Crank).
- (6) Install caps on battery.
- (7) Repeat steps (1 through 4) for remaining battery(ies).
- (8) Install battery box cover (TM 9-2320-365-10).

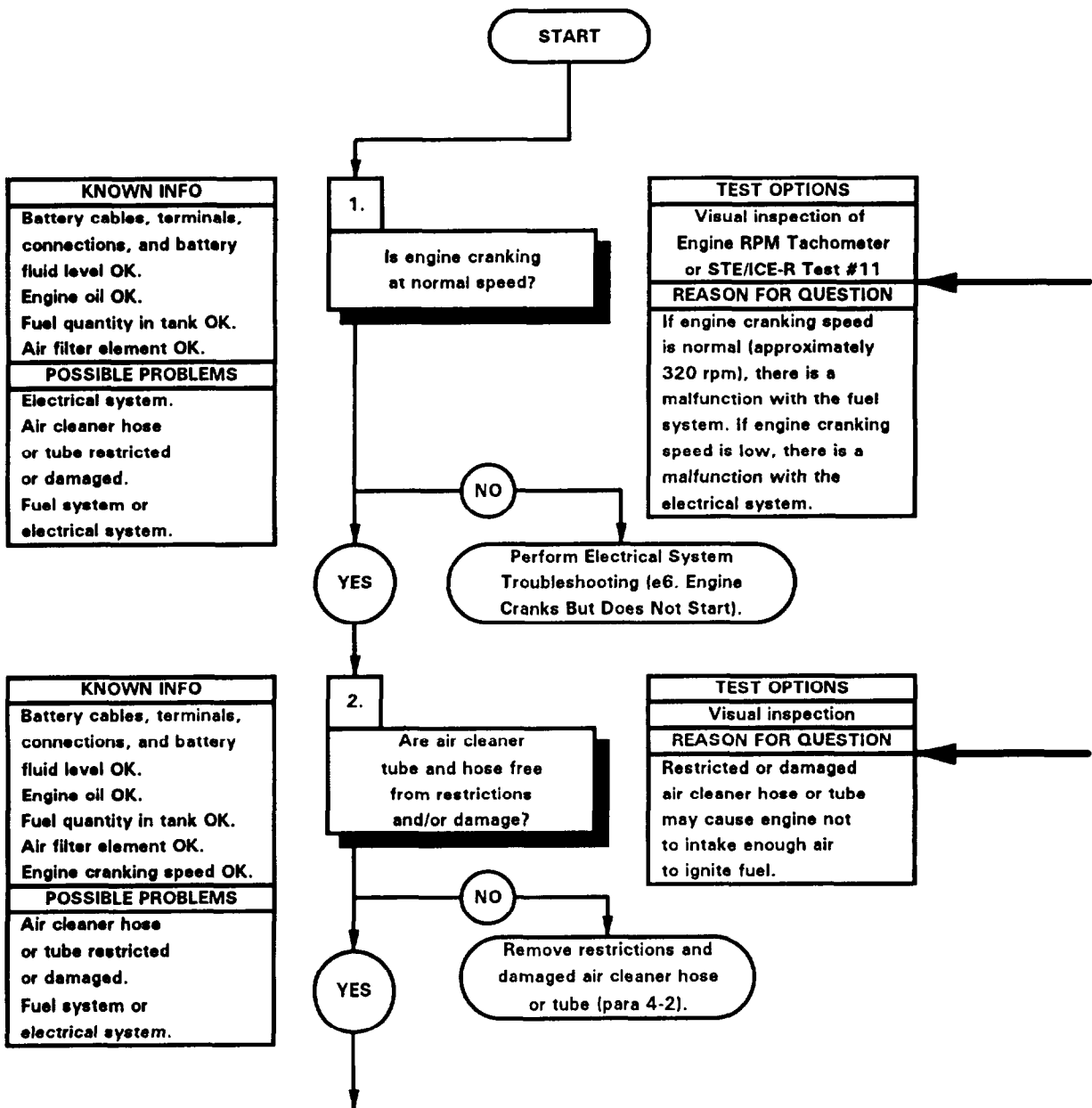
BATTERY

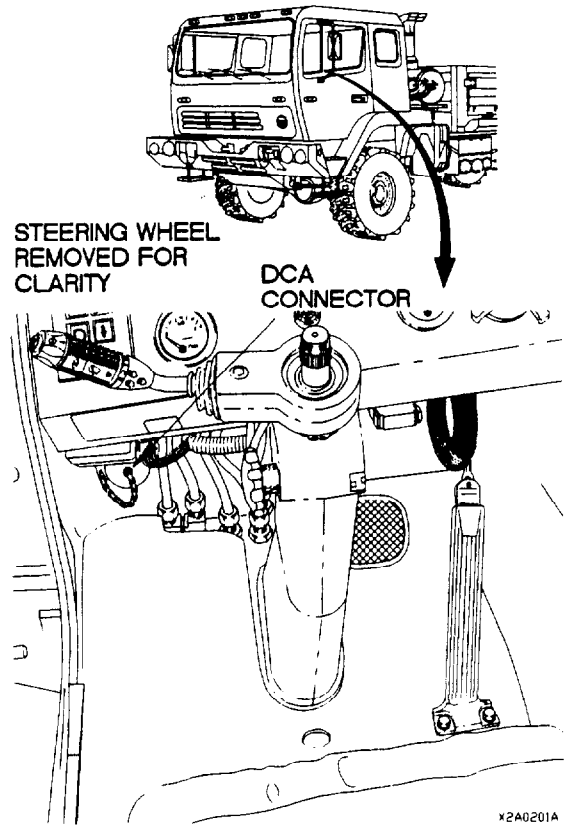
CAP



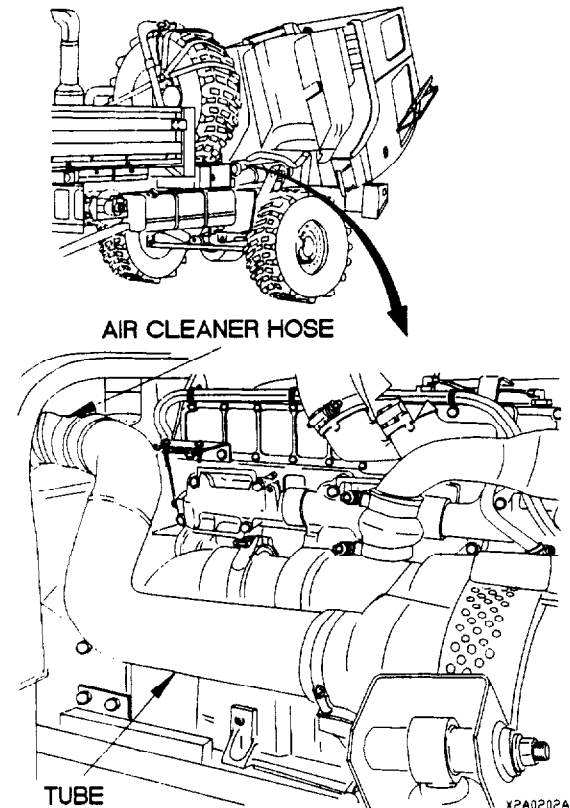
X240103A

a2. ENGINE CRANKS BUT DOES NOT START	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Pan, Drain (Item 24, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



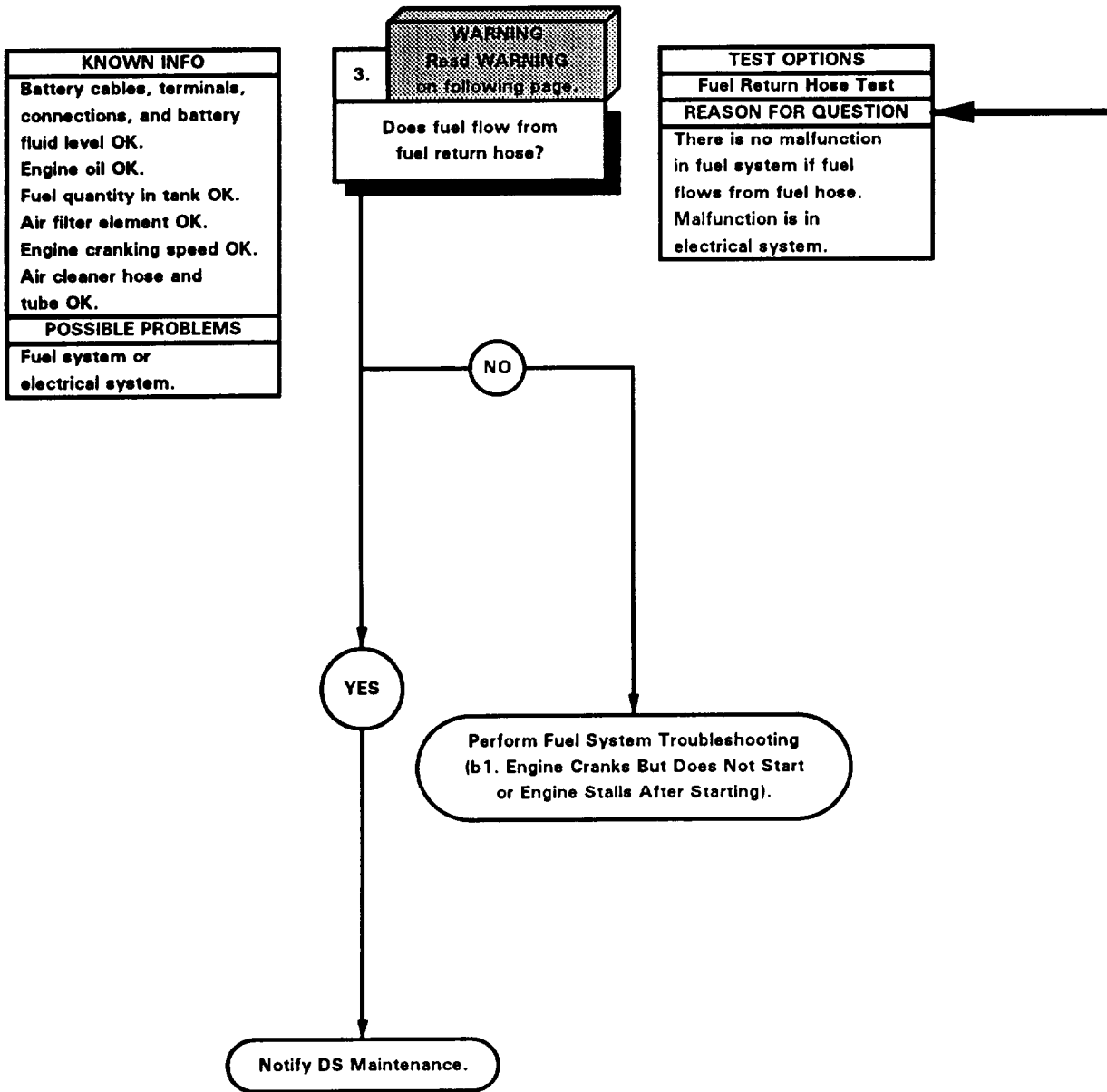


Check engine cranking speed on tachometer, if equipped. If not equipped with tachometer, perform STE/ICE-R Test #11.



Remove air cleaner hose and tube and inspect for restrictions and damage which would cause a loss of intake air (para 4-2).

a2. ENGINE CRANKS BUT DOES NOT START (CONT)



**WARNING**

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep flame away from fuel and keep fire extinguisher within easy reach. When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET OF VEHICLE.

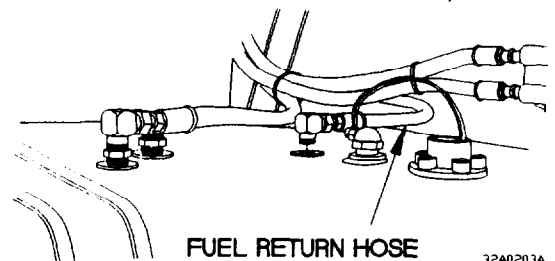
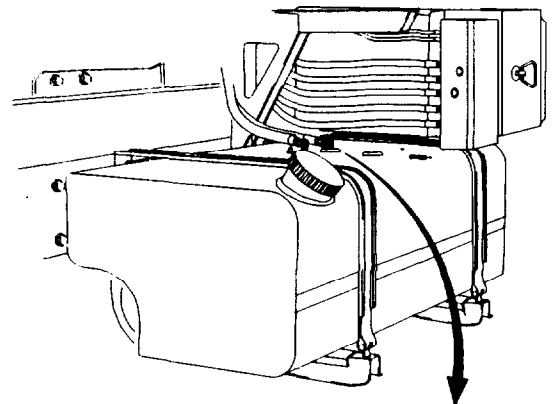
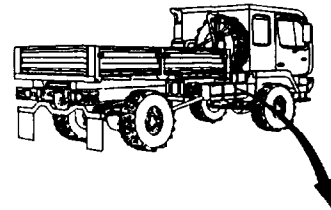
**FUEL RETURN HOSE TEST**

- (1) Remove fuel return hose from fuel tank.
- (2) Place fuel hose in drain pan.

**NOTE**

Fuel should flow freely from fuel hose with no restriction.

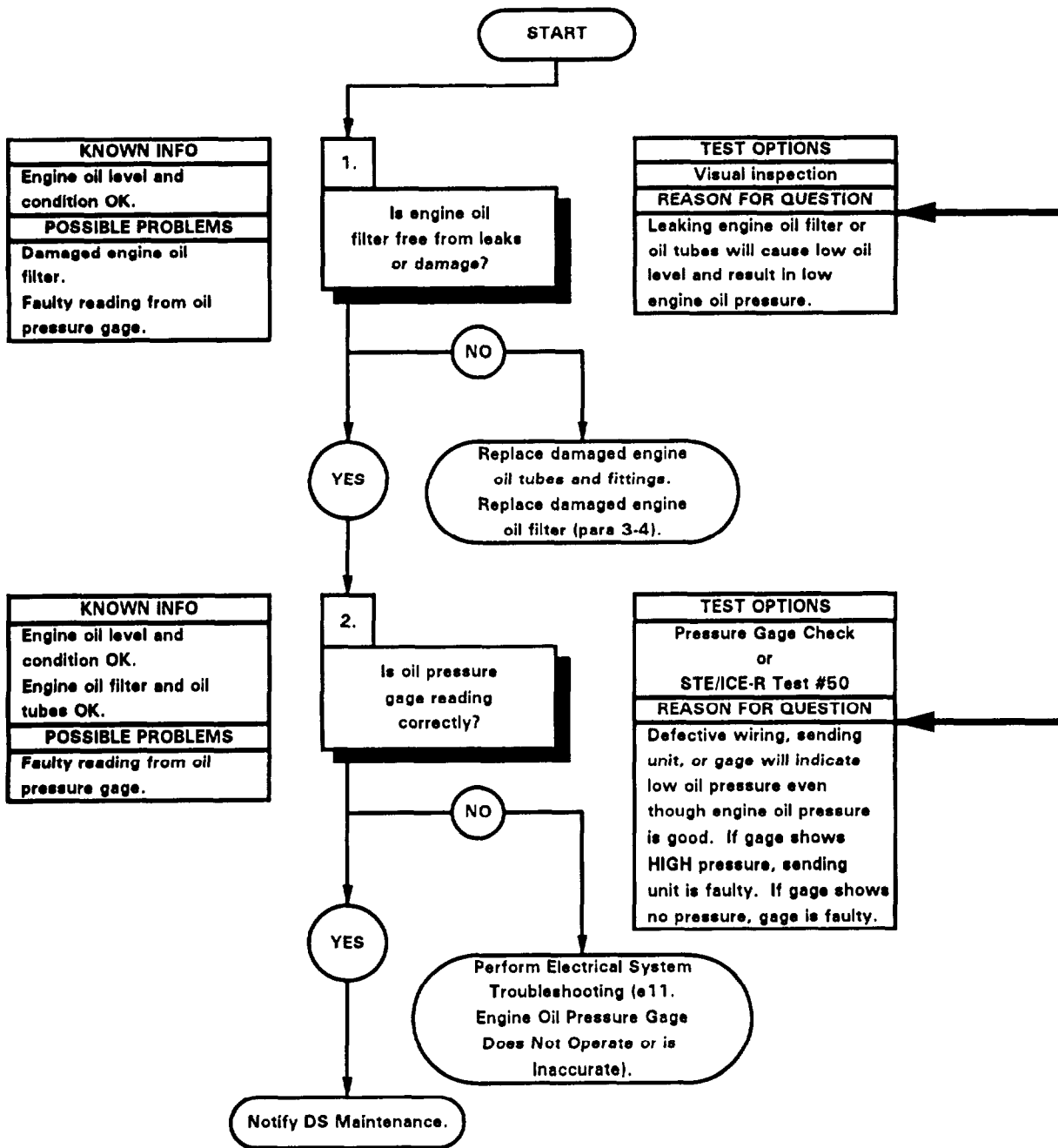
- (3) Attempt to start engine (TM 9-2320-365-10) and observe fuel flow from fuel return hose.
- (4) Install fuel return hose on fuel tank.



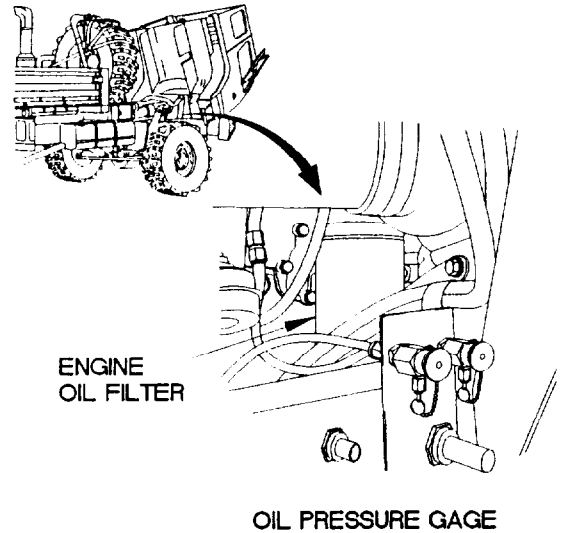
32A0203A



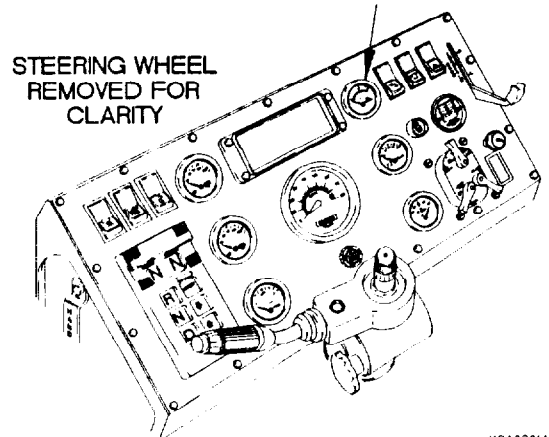
3. LOW ENGINE OIL PRESSURE	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C)
<b>References</b> TM 9-4910-571-12&P	



- (1) Raise cab (TM 9-2320-365-10).
- (2) Check engine oil filter for leaks and damage.
- (3) If engine oil filter is not free from leaks and damage, replace engine oil filter (para 3-4).

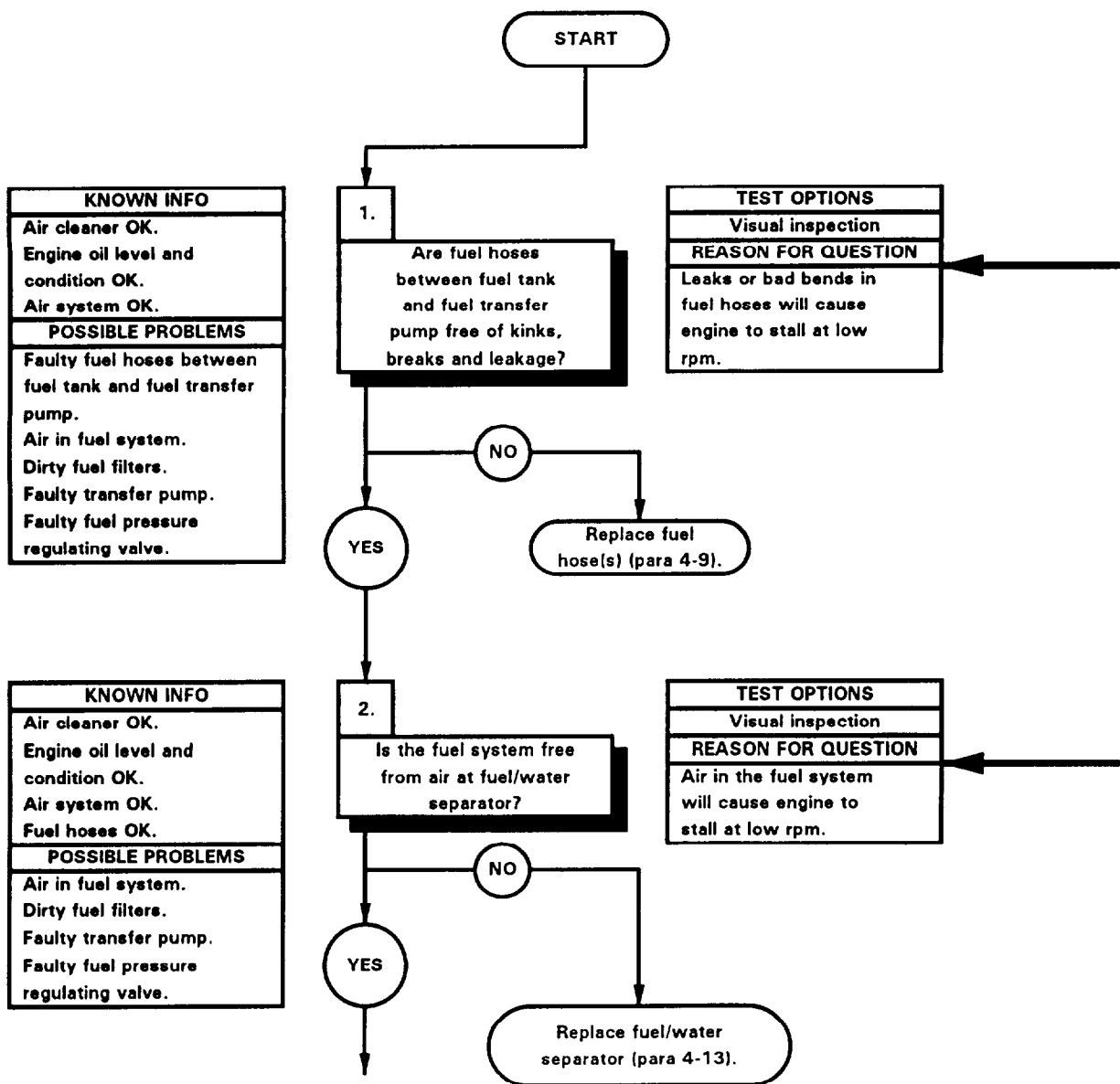


PRESSURE GAGE CHECK
(1) Lower cab (TM 9-2320-365-10).
(2) Start engine (TM 9-2320-365-10).
(3) Perform STE/ICE-R test #50.
(4) Oil pressure gage should read 15 PSI (100 kPa) at 750 RPM and maximum at full load condition of 88 PSI (600 kPa).
(5) If oil pressure gage does not read correctly, perform Electrical System Troubleshooting (e11. Engine Oil Pressure Gage Does Not Operate or is Inaccurate).
(6) If oil pressure gage reads correctly, notify DS Maintenance.
(7) Shut down engine (TM 9-2320-365-10).



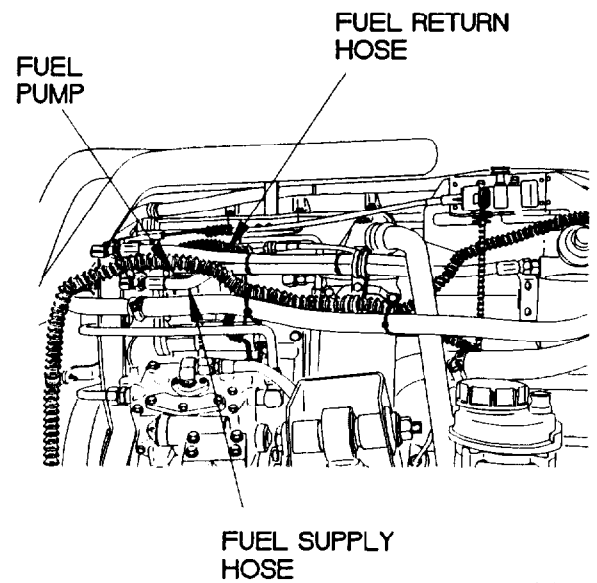
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a4. ENGINE STALLS AT LOW RPM	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C)
<b>References</b> TM 9-4910-571-12&P	

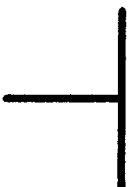




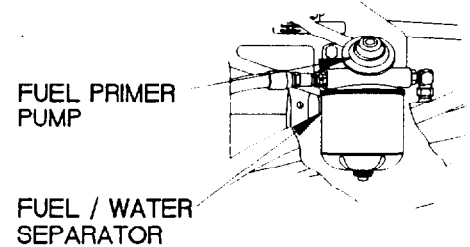
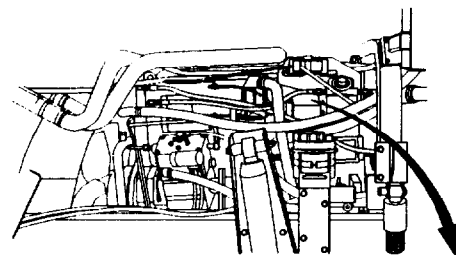
- (1) Raise cab (TM 9-2320-365-10).
- (2) Check fuel tank and fuel transfer pump hoses for kinks, looseness, and leakage.
- (3) If fuel hoses are not free from kinks or leaks, replace fuel hose(s) (para 4-9).



X2A0401-

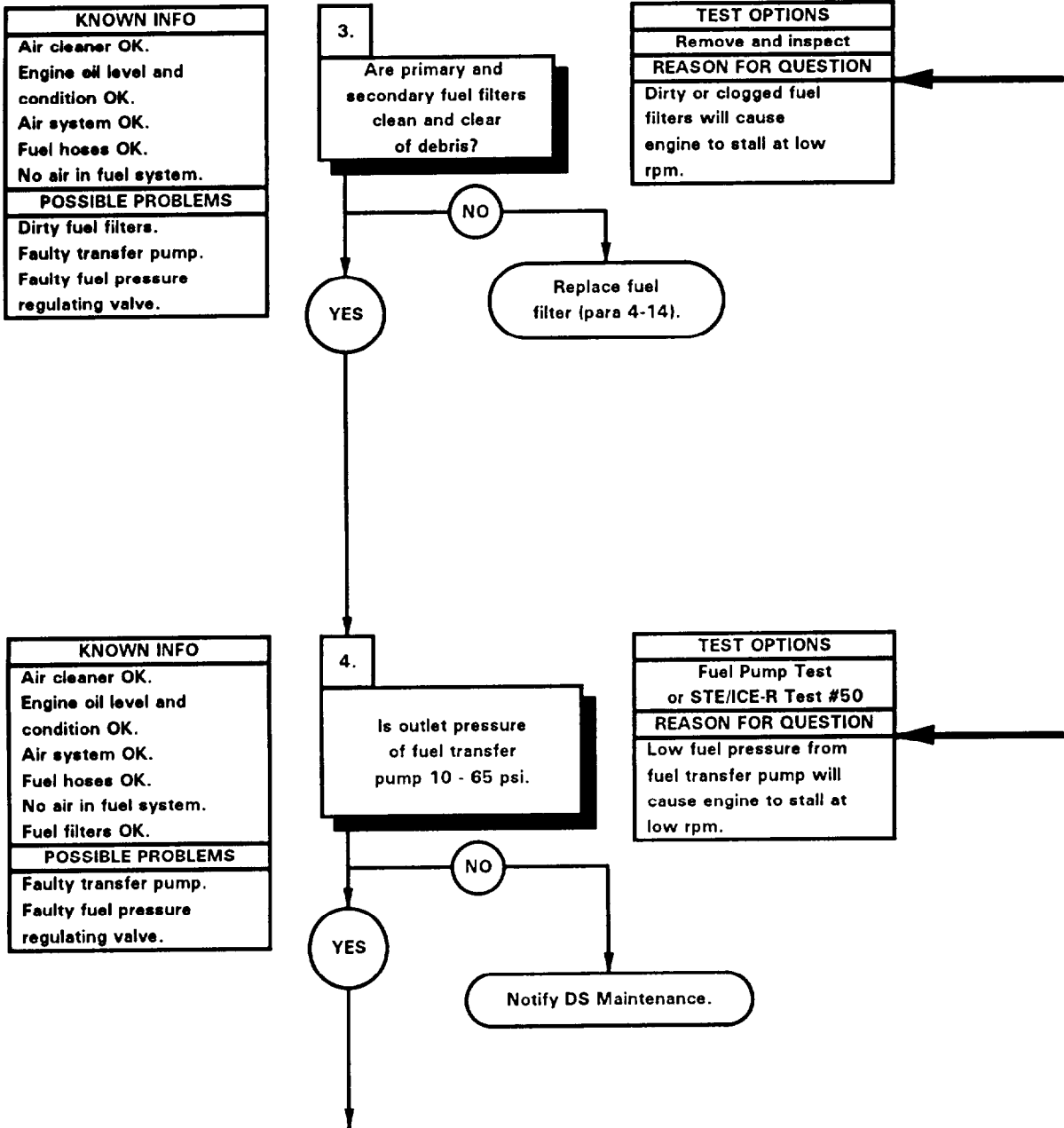


- (1) Push in fuel primer pump on fuel/water separator.
- (2) Pump fuel primer pump until resistance is felt to purge air from fuel system.
- (3) If no resistance is felt, replace fuel/water separator (para 4-13).

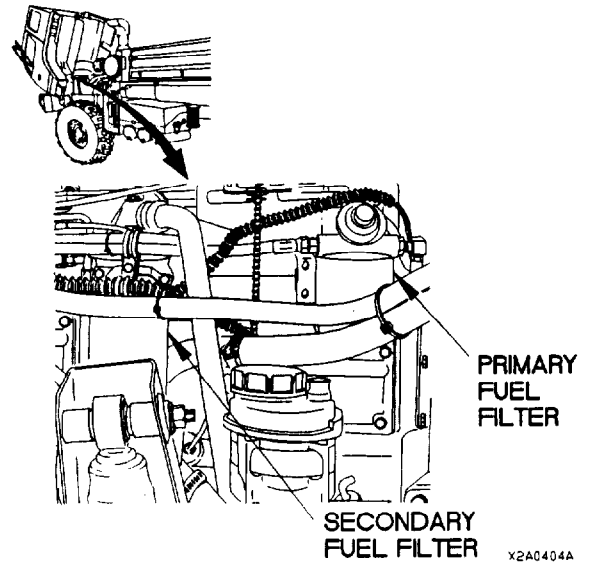


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a4. ENGINE STALLS AT LOW RPM (CONT)

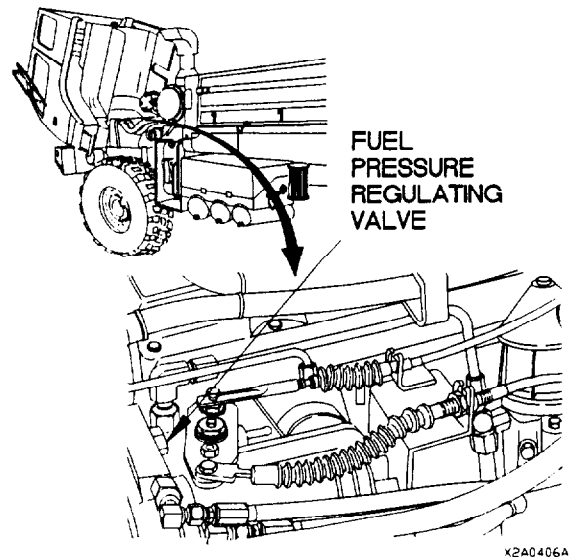


- (1) Check primary and secondary fuel filters for dirt and contamination.
- (2) Position drain pan under filter.
- (3) Remove filter element from base.
- (4) Inspect for clogs and debris.
- (5) If fuel filter is clogged, replace fuel filter (para 4-14).

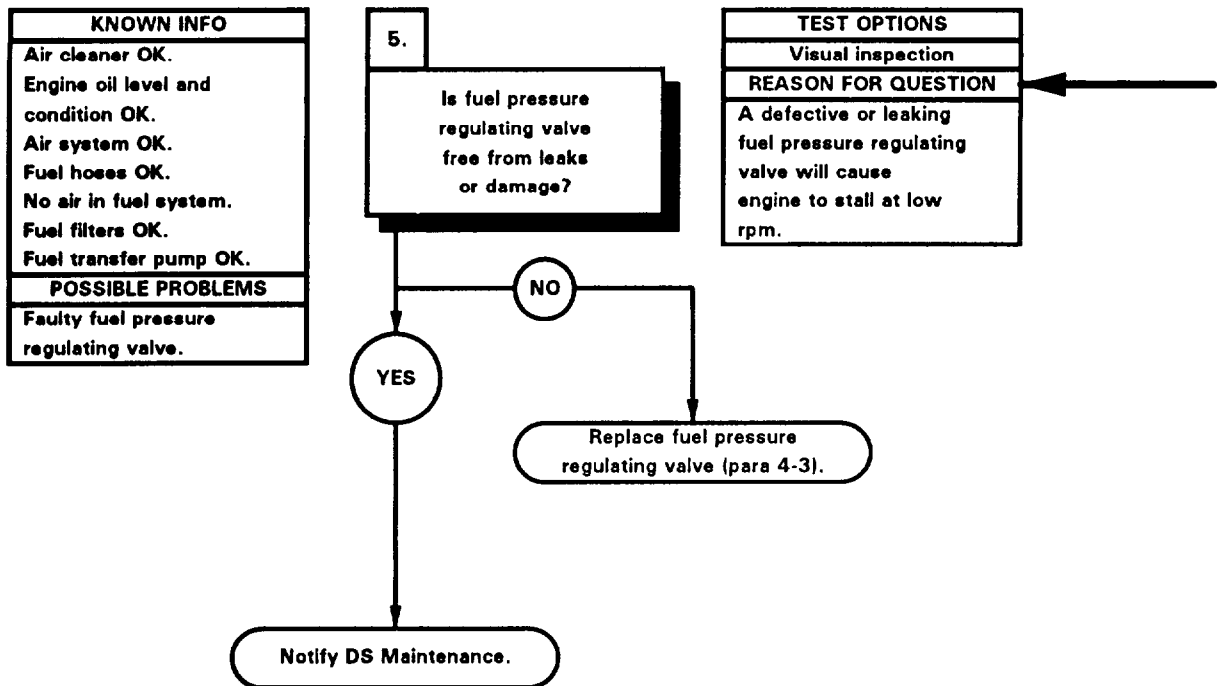


**FUEL PUMP TEST**

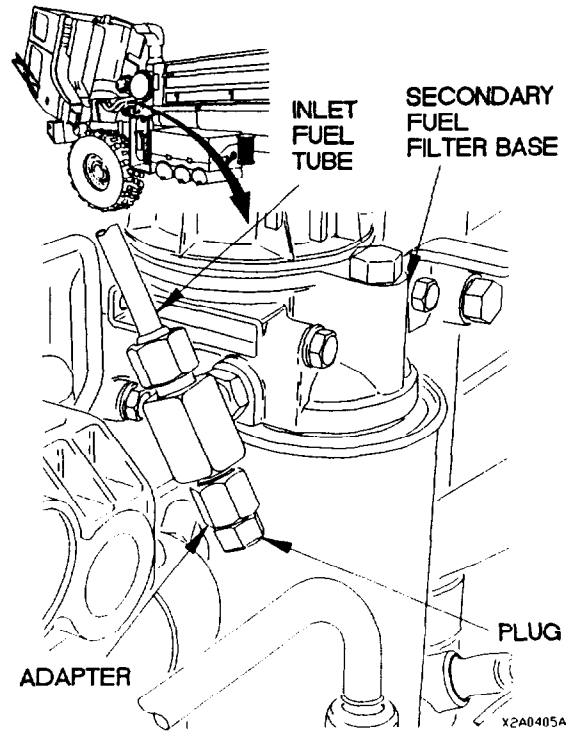
- (1) Remove inlet fuel tube from secondary fuel filter base.
- (2) Position drain pan under inlet fuel tube.
- (3) Attempt to start engine (TM 9-2320-365-10).
- (4) Check for fuel flow from inlet fuel tube while attempting to start engine.
- (5) If fuel does not flow from inlet fuel tube, notify DS Maintenance.
- (6) Install inlet fuel tube on secondary fuel filter base.



a4. ENGINE STALLS AT LOW RPM (CONT)

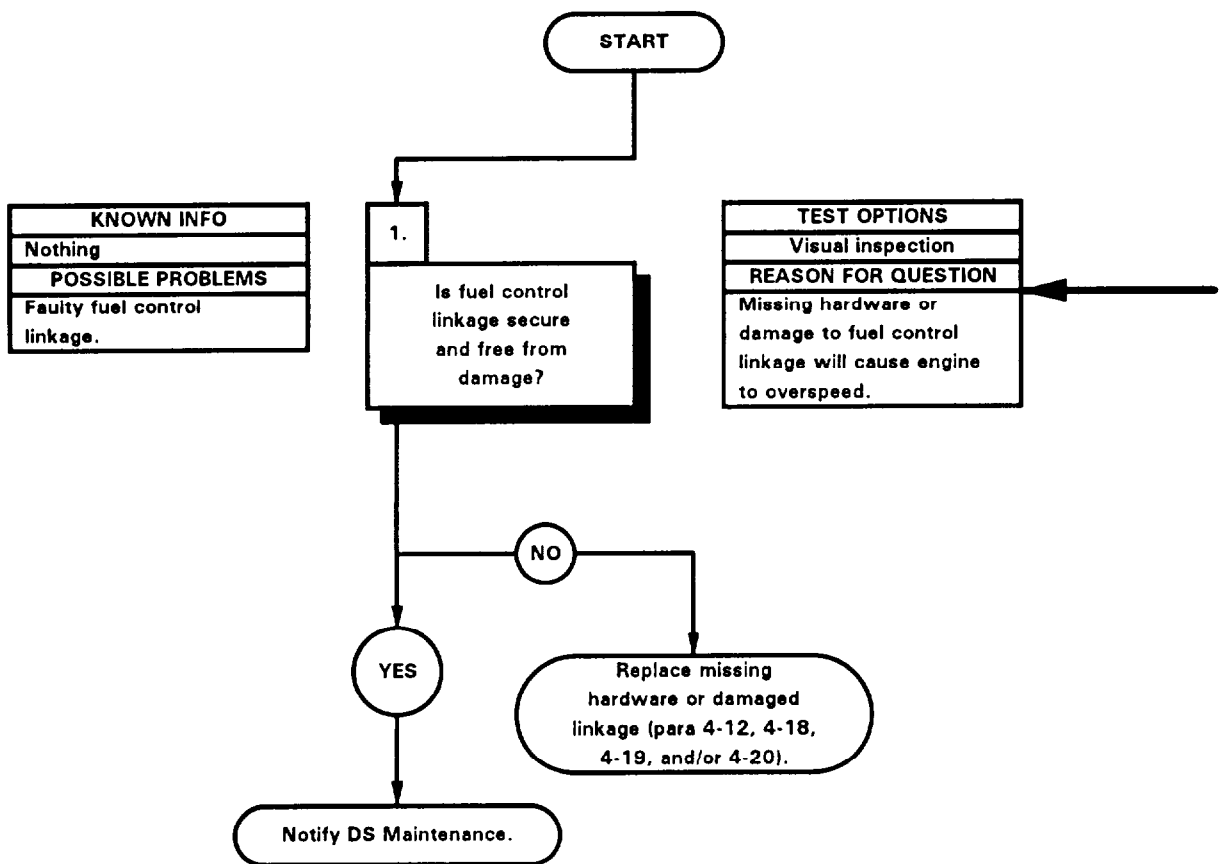


- (1) Check fuel pressure regulating valve for leaks or damage.
- (2) If fuel pressure regulating valve is damaged, replace fuel pressure regulating valve (para 4-3).
- (3) If fuel pressure regulating valve is free from leaks and damage, notify DS Maintenance.
- (4) Lower cab (TM 9-2320-365-10).



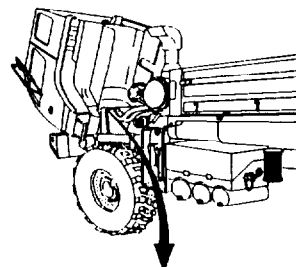
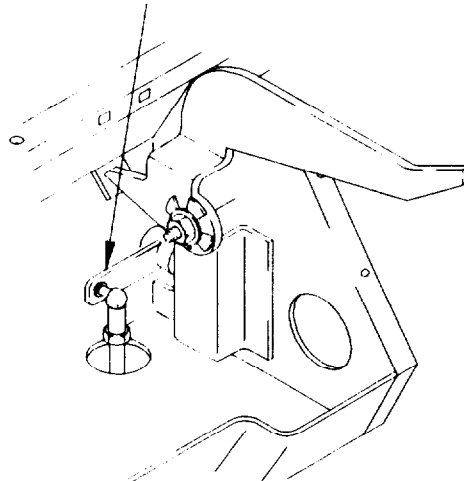


a5. ENGINE OVERSPEEDS ON START	
<b>INITIAL SETUP</b>	
Equipment Conditions Engine shut down (TM 9-2320-365-10).	Tools and Special Tools Tool Kit, Genl Mech (Item 44, Appendix C)

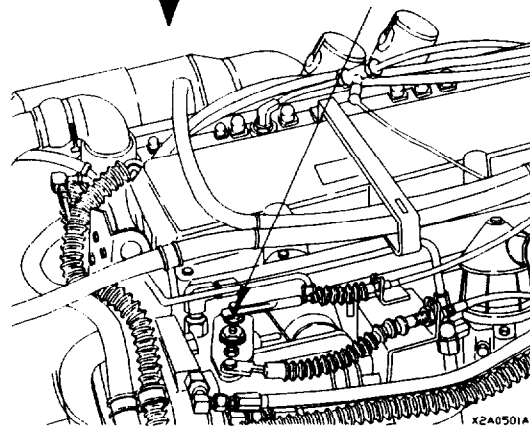


- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Check fuel control linkage for improper assembly, missing hardware, and damaged parts.
- (3) Install instrument panel assembly (para 7-15).
- (4) Raise cab (TM 9-2320-365-10).
- (5) Check fuel control linkage for improper assembly, missing hardware, and damaged parts.
- (6) Lower cab (TM 9-2320-365-10).

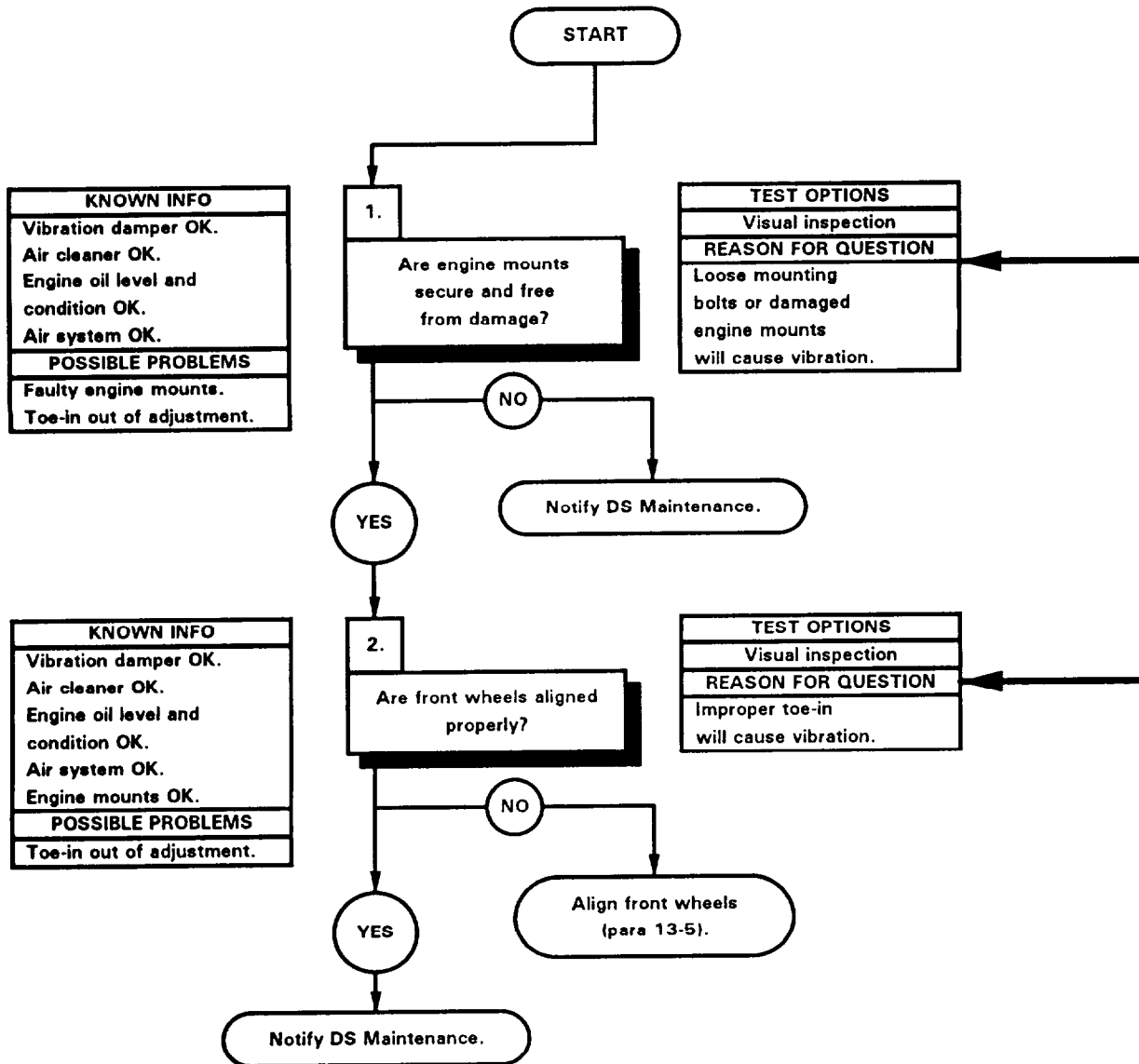
MANUAL THROTTLE CONTROL LEVER

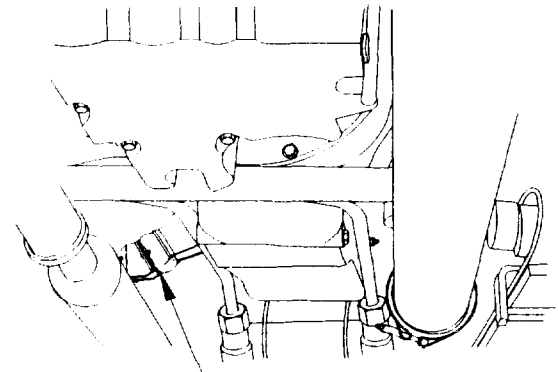
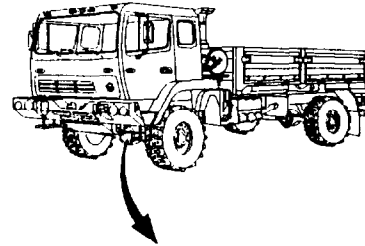


FUEL CONTROL LINKAGE



a6. TOO MUCH ENGINE VIBRATION	
<b>INITIAL SETUP</b>	
Equipment Conditions Engine shut down (TM 9-2320-365-10).	Tools and Special Tools Tool Kit, Genl Mech (Item 44, Appendix C)

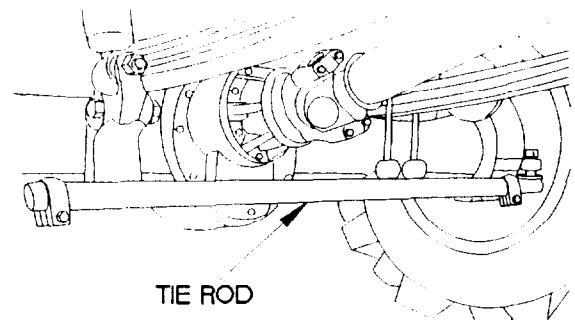
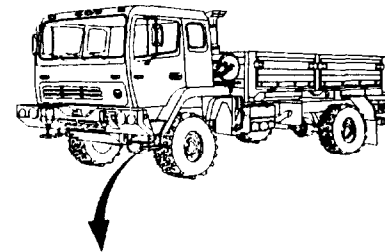




ENGINE MOUNT

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- (1) Check engine mounts for loose mounting hardware and damage.
- (2) If engine mounts are damaged or mounting hardware is loose, notify DS Maintenance.

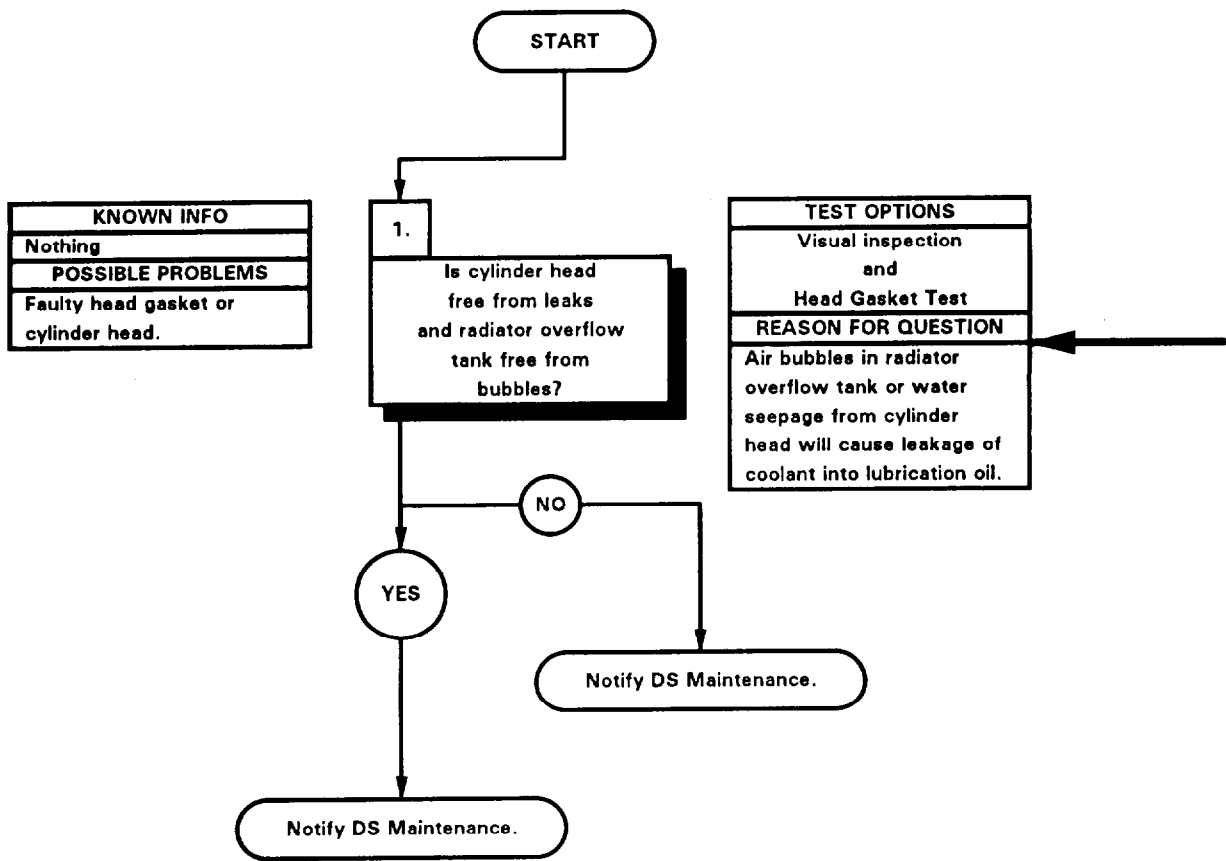


TIE ROD

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- (1) Check tires for uneven tire wear.
- (2) If uneven tire wear is found, align front wheels (para 13-5).
- (3) If front tires do not have uneven wear, notify DS Maintenance.

a7. COOLANT IN ENGINE LUBRICATION OIL	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C)



- (1) Raise cab (TM 9-2320-365-10).
- (2) Check sides of engine block at cylinder head for obvious signs of water leakage.
- (3) Lower cab (TM 9-2320-365-10).

**HEAD GASKET TEST**

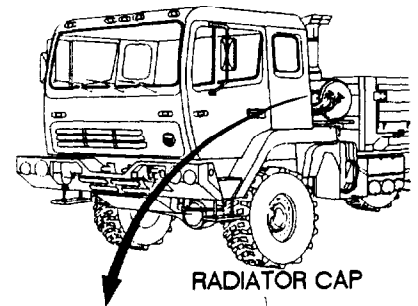
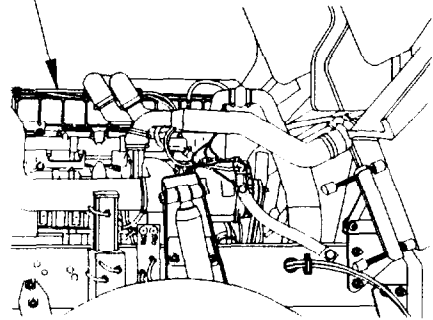
- (1) Remove radiator cap.
- (2) Start engine (TM 9-2320-365-10).

**NOTE**

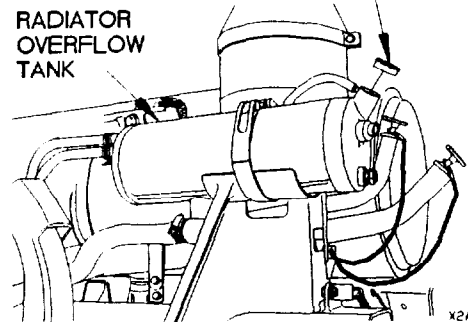
Air bubbles in the coolant are a sign of probable leakage at the head gasket.

- (3) Look for air bubbles in coolant.
- (4) Install radiator cap.
- (5) Shut down engine (TM 9-2320-365-10).

CYLINDER HEAD



RADIATOR OVERFLOW TANK



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**a8. EXCESSIVE ENGINE OIL CONSUMPTION**

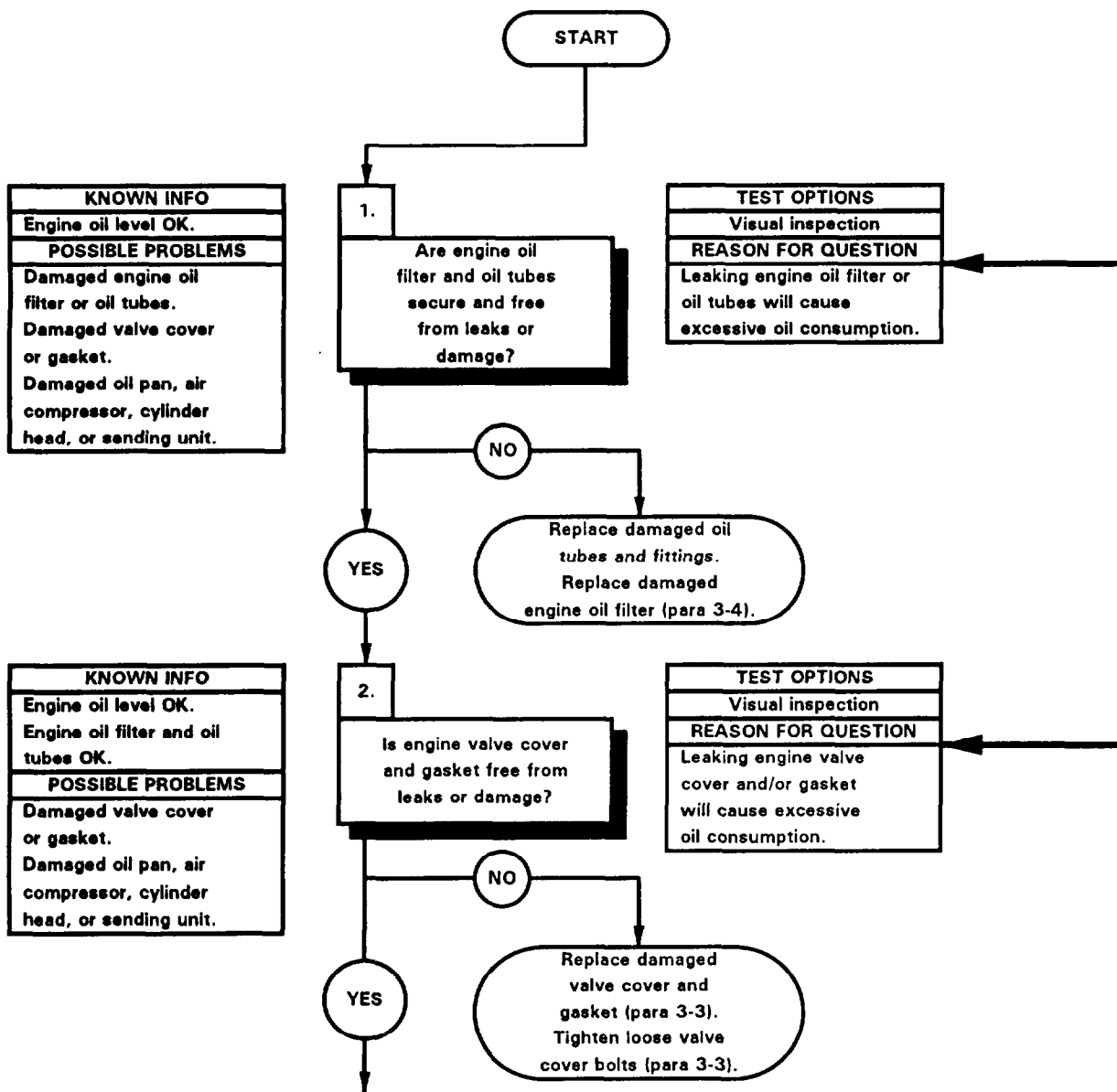
**INITIAL SETUP**

**Equipment Conditions**

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

**Tools and Special Tools**

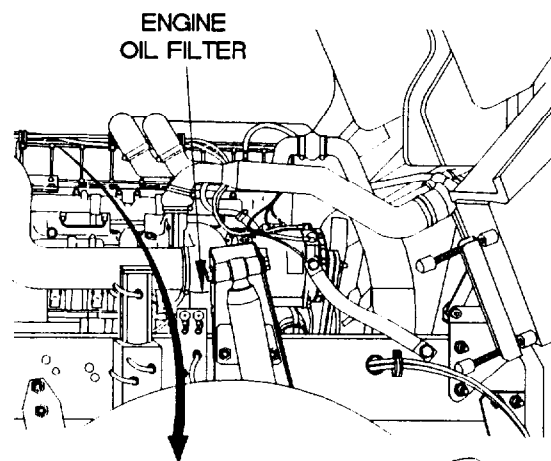
Tool Kit, Genl Mech (Item 44, Appendix C)



**NOTE**

Oil consumption is considered normal up to 12,000 mi (19,308 km) at a rate of one qt (one L) of oil per 45 gal (170 L) of fuel. After 12,000 mi (19,308 km), oil consumption is considered normal at a rate of one qt (one L) of oil per 60 gal (227 L) of fuel.

- (1) Raise cab (TM 9-2320-365-10).
- (2) Check engine oil filter and oil tubes for leakage or damage.
- (3) If engine oil filter is damaged, replace engine oil filter (para 3-4).



VALVE COVER

BOLT

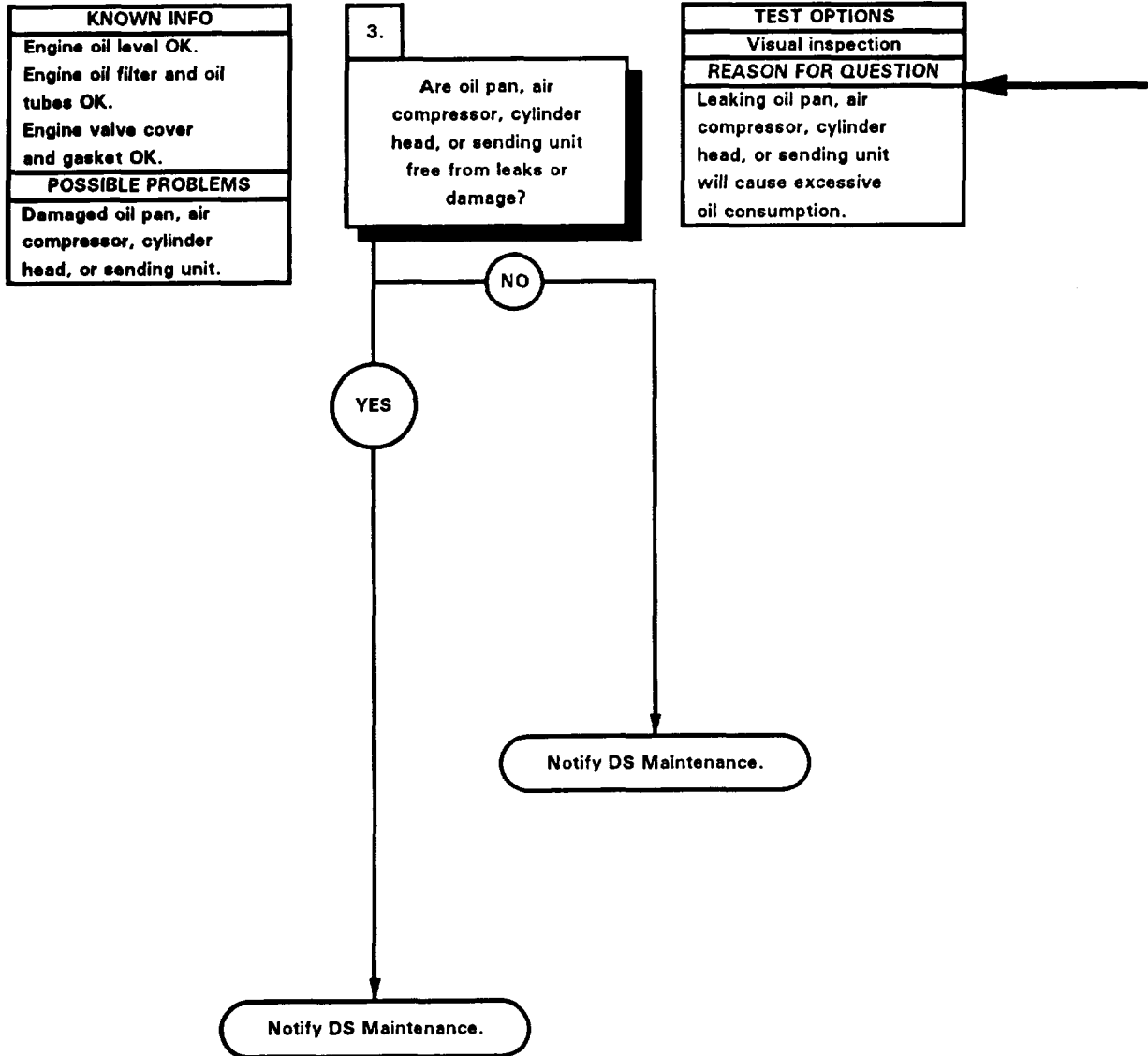
VALVE COVER GASKET

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- (1) Check engine valve cover and gasket for leaks and damage.
- (2) If engine valve cover or gasket leaks, tighten loose valve cover bolts (para 3-3).
- (3) If engine valve cover or gasket is damaged, replace valve cover and gasket (para 3-3).



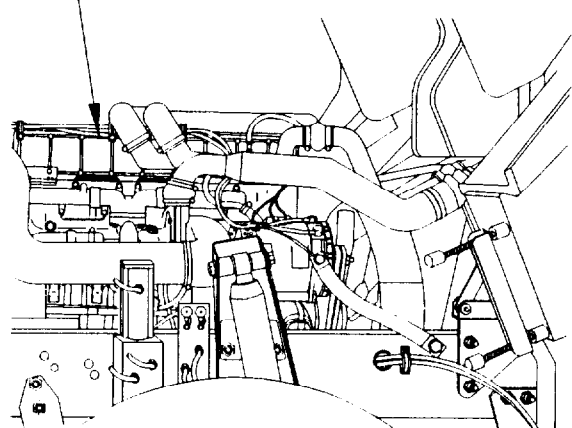
a8. EXCESSIVE ENGINE OIL CONSUMPTION (CONT)



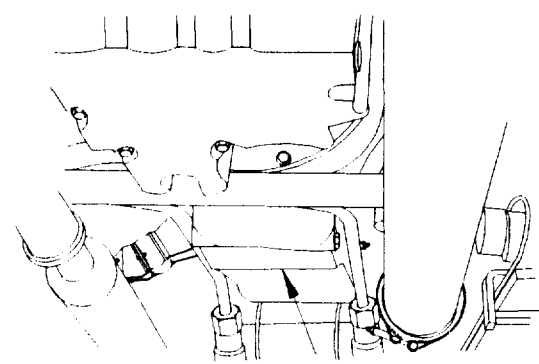


- (1) Check oil pan, air compressor, cylinder head, and sending unit for leakage or damage.
- (2) If oil pan, air compressor, cylinder head, or sending unit is leaking or damaged, notify DS Maintenance.
- (3) If oil pan, air compressor, cylinder head and sending unit are free from leaks and damage, notify DS Maintenance.
- (4) Lower cab (TM 9-2320-365-10).

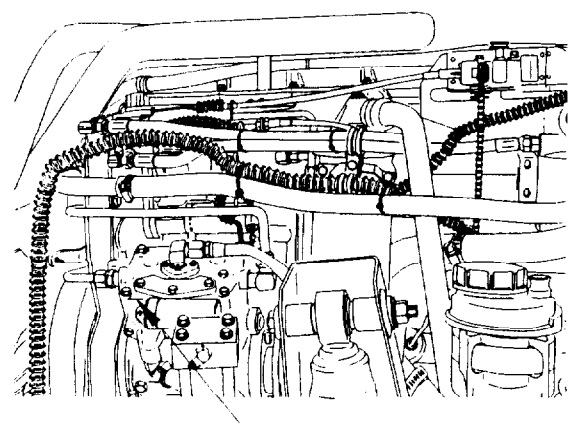
CYLINDER HEAD



x2A0803A



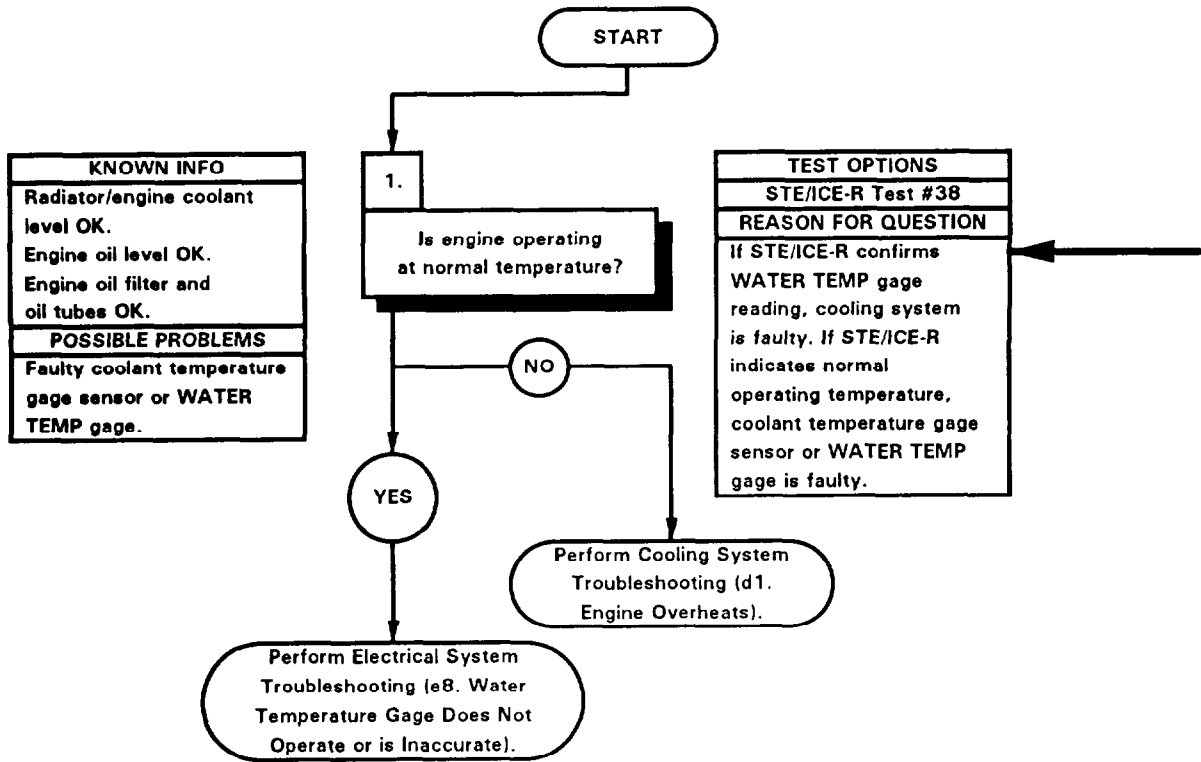
OIL PAN



AIR COMPRESSOR

x2A0802A

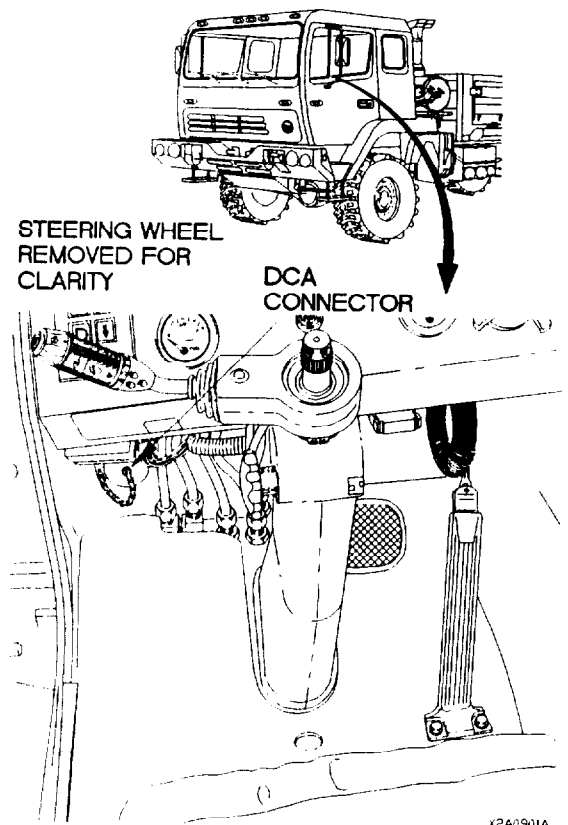
a9. ENGINE OVERHEATS	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C)
<b>References</b> TM 9-4910-571-12&P	



**NOTE**  
**STE/ICE-R Test #38**  
 measures engine  
 coolant temperature.

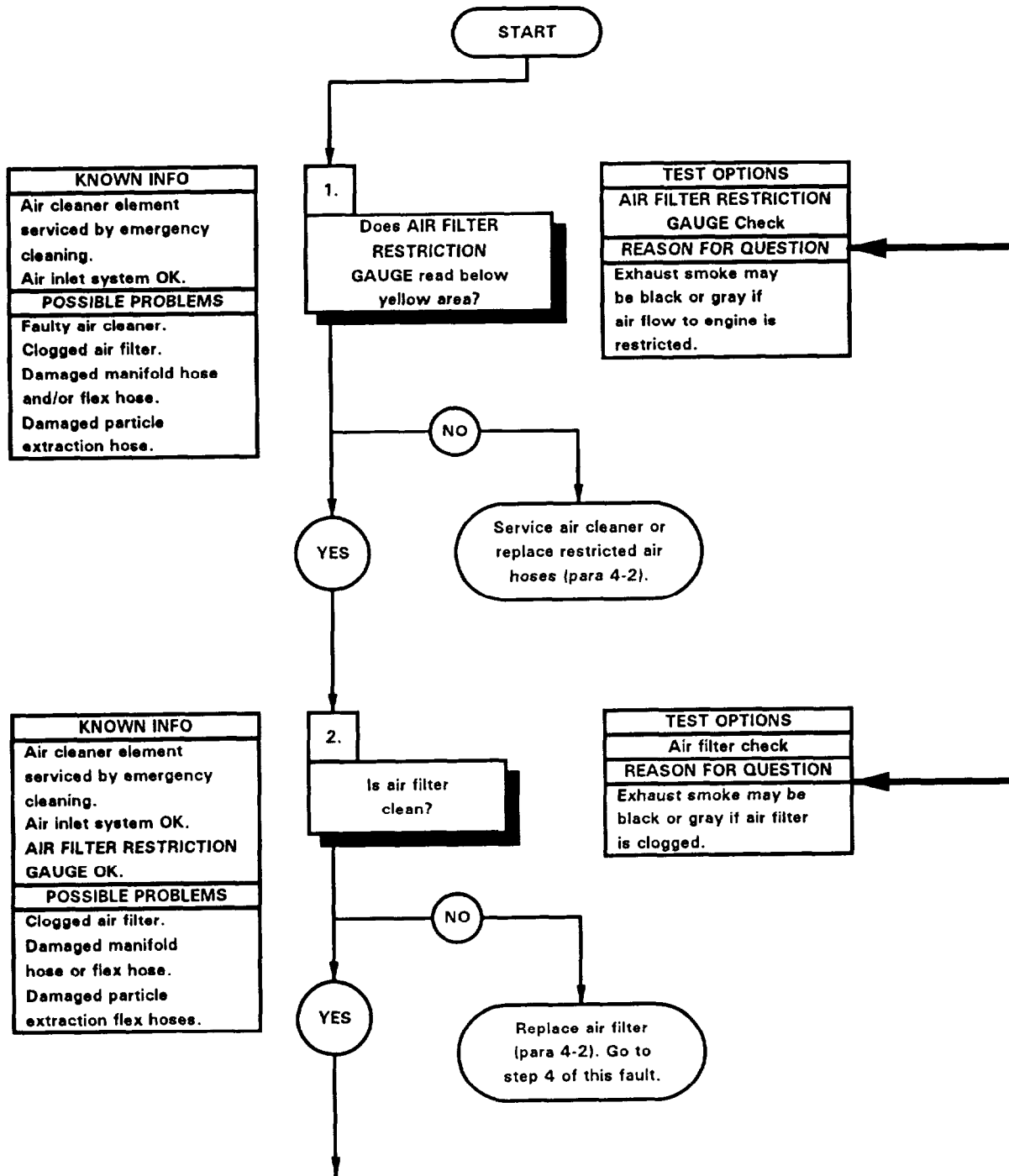
**STE/ICE-R TEST #38**

- (1) Hook up STE/ICE-R to DCA.
- (2) Press and hold the TEST button on the STE/ICE-R until -45 to +45 appears in the display. This will ensure that the test results are accurate.
- (3) Start engine (TM 9-2320-365-10) and raise engine idle until engine is at normal operating temperature, 180-205°F (82-96°C).
- (4) Coolant temperature should read between 160-210°F (71-99°C).
- (5) Record test results.
- (6) If coolant temperature is not 160-210°F (71-99°C), perform Cooling System Troubleshooting (d1. Engine Overheats).
- (7) If coolant temperature is 160-210°F (71-99°C), perform Electrical System Troubleshooting (e8. Water Temperature Gage Does Not Operate or is Inaccurate).
- (8) Shut down engine (TM 9-2320-365-10).
- (9) Remove STE/ICE-R from DCA.



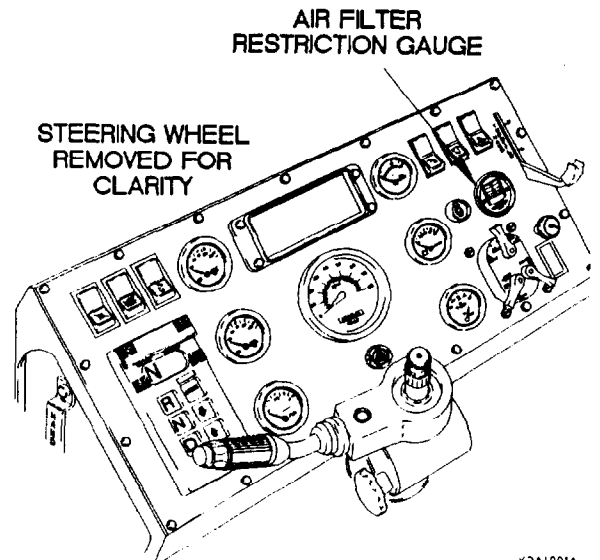
x2A0901A

a10. EXCESSIVE BLACK OR GRAY EXHAUST SMOKE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-365-10).	Tools and Special Tools Tool Kit, Genl Mech (Item 44, Appendix C)



**AIR FILTER RESTRICTION GAUGE CHECK**

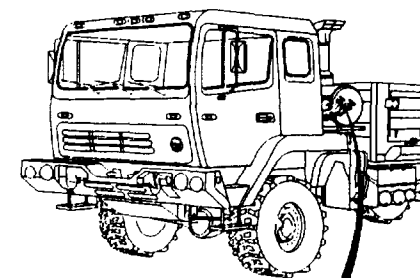
- (1) Check reading on AIR FILTER RESTRICTION GAUGE.
- (2) Press RESET button on AIR FILTER RESTRICTION GAUGE if reading is between 15 and 20 (in yellow area) or above 20 (in red area).
- (3) Start engine (TM 9-2320-365-10) and check AIR FILTER RESTRICTION GAUGE again.
- (4) Shut down engine (TM 9-2320-365-10).



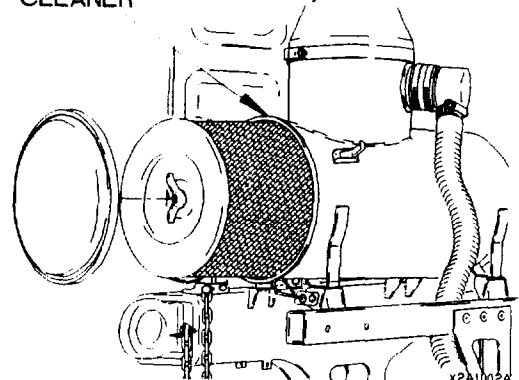
x2A1001A

**AIR FILTER CHECK**

- (1) Release three spring latches on intake air cleaner cover.
- (2) Remove intake air cleaner cover.
- (3) Remove air filter. Replace air filter if clogged (para 4-2).
- (4) Install air filter.
- (5) Install intake air cleaner cover.
- (6) Install three spring latches into intake air cleaner cover.

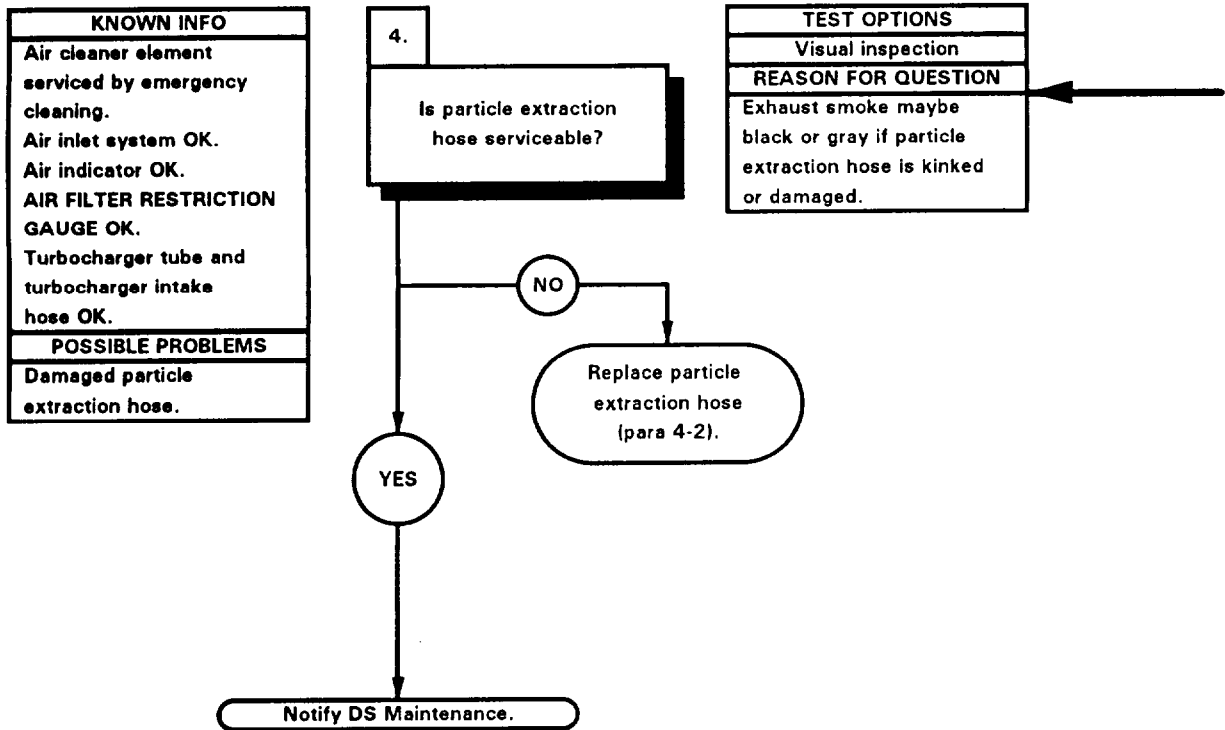
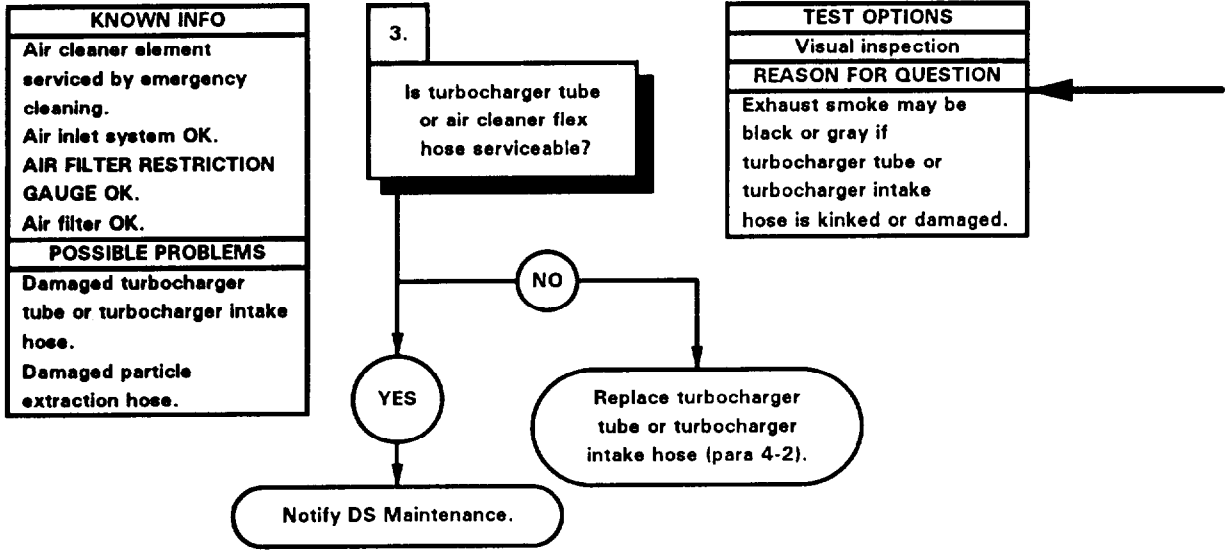


INTAKE AIR CLEANER

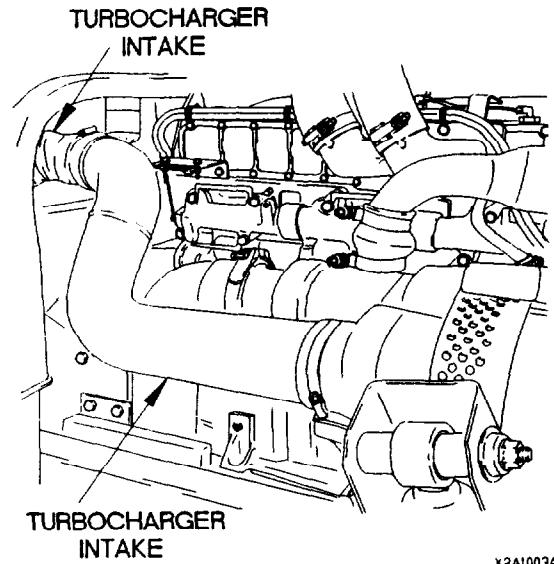


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a10. EXCESSIVE BLACK OR GRAY EXHAUST SMOKE (CONT)

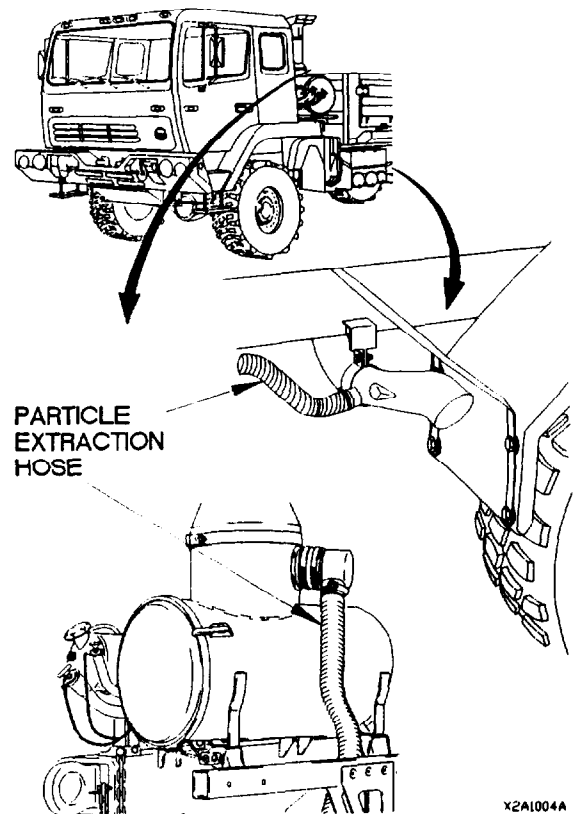


- (1) Raise cab (TM 9-2320-365-10).
- (2) Check turbocharger tube and turbocharger intake hose for kinks and damage.
- (3) If turbocharger tube or turbocharger intake hose is damaged, replace turbocharger tube or turbocharger intake hose (para 4-2).
- (4) If turbocharger tube and turbocharger intake hose are free from kinks and damage, notify DS Maintenance.
- (5) Lower cab (TM 9-2320-365-10).



X2A1003A

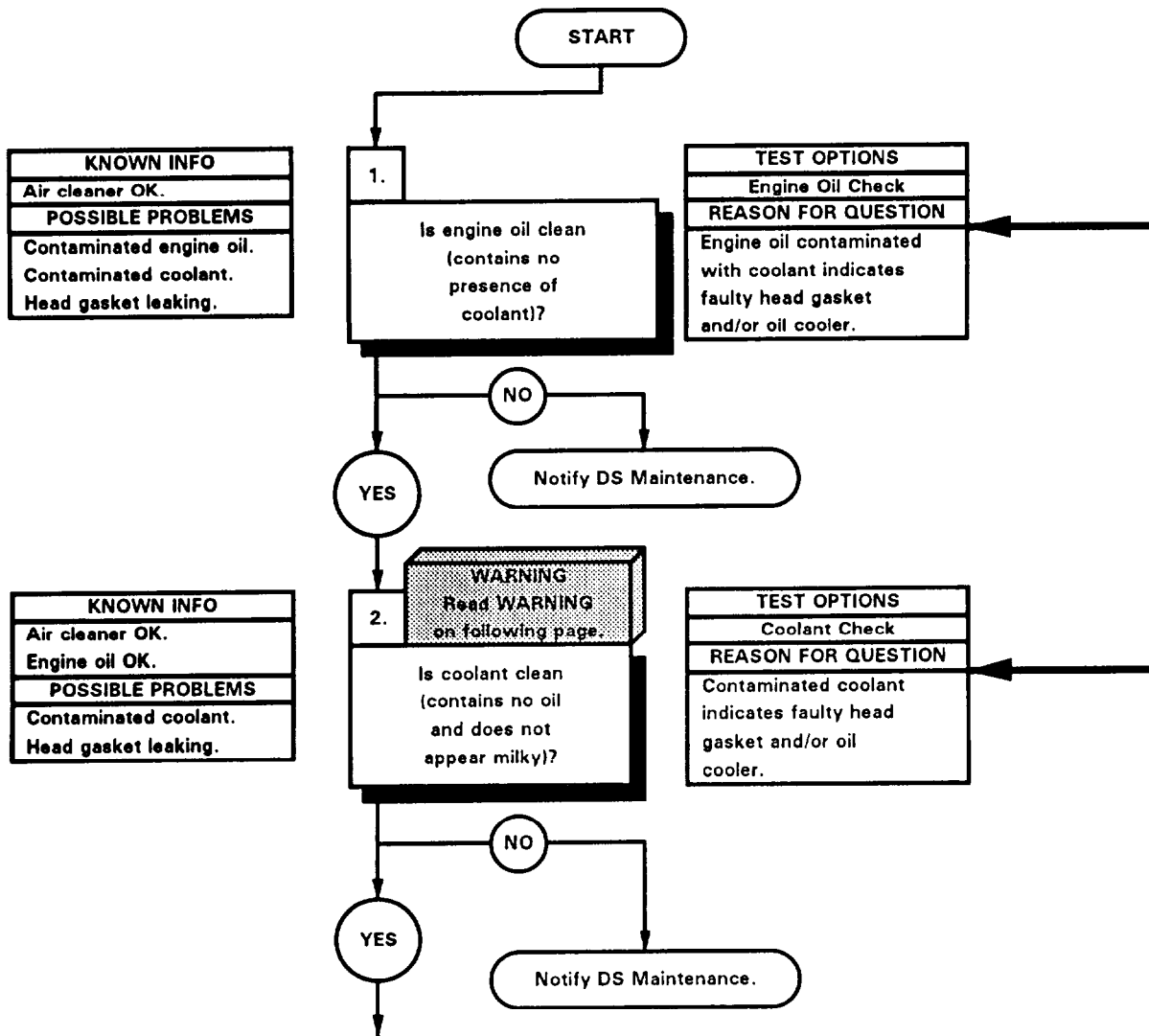
- (1) Check particle extraction hose for kinks and damage.
- (2) If particle extraction hose is damaged, replace particle extraction hose (para 4-2).
- (3) If particle extraction hose is OK, notify DS Maintenance.



X2A1004A

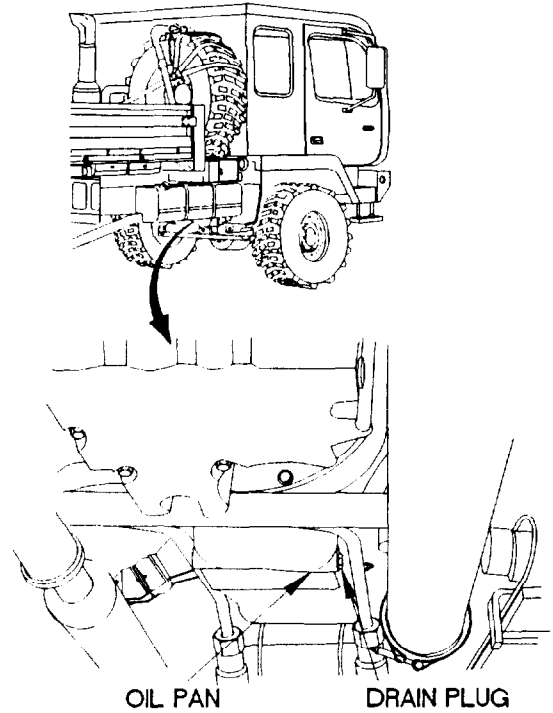


a11. WHITE EXHAUST SMOKE	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) Container (Capacity 40 qt (38L)) Goggles, Industrial (Item 15, Appendix C)



**ENGINE OIL CHECK**

- (1) Position container under engine oil pan.
- (2) Remove drain plug from engine oil pan and drain engine oil.
- (3) Observe condition of engine oil.
- (4) If engine oil is not clean, notify DS Maintenance.
- (5) Install drain plug in engine oil pan.
- (6) Refill engine with oil (Appendix H).



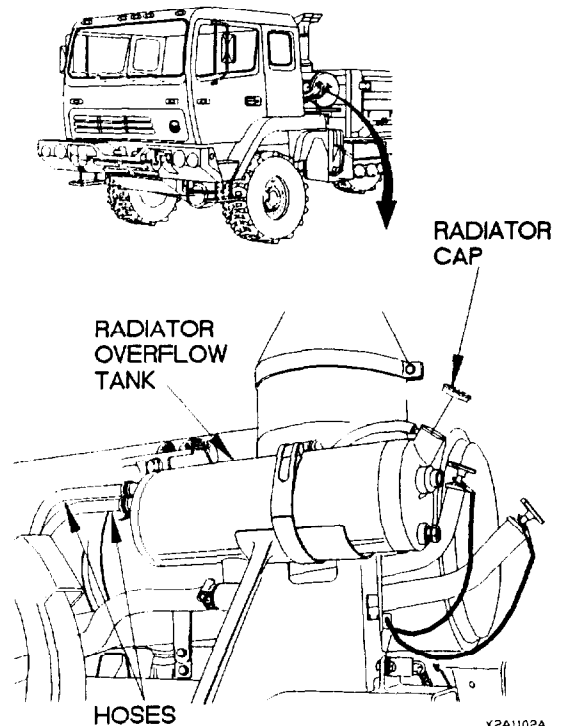
X2A1101A

**COOLANT CHECK**

**WARNING**

Do not remove radiator cap when engine is warm. Coolant may be very hot and under pressure. Failure to comply may result in injury to personnel.

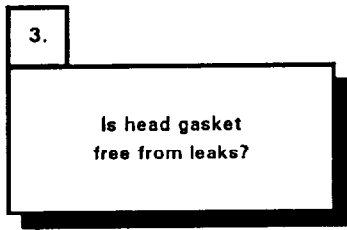
- (1) Remove radiator cap from radiator overflow tank.
- (2) Observe condition of coolant inside radiator overflow tank.
- (3) If coolant is not clean, notify DS Maintenance.
- (4) Install radiator cap on radiator overflow tank.



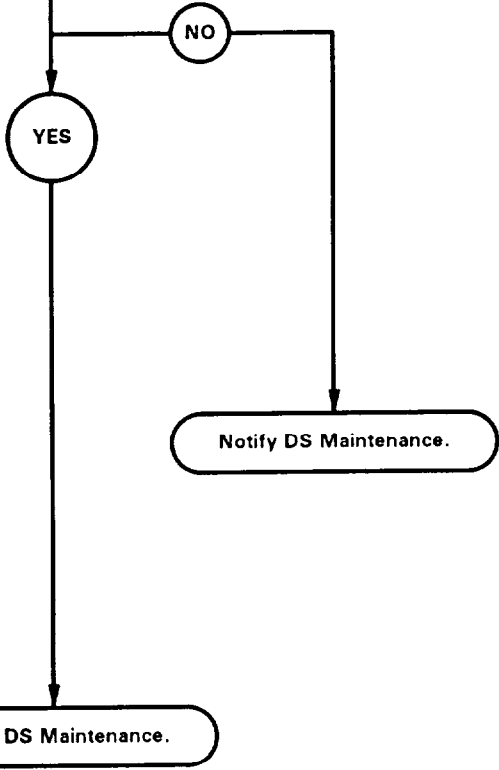
X2A1102A

a11. WHITE EXHAUST SMOKE (CONT)

<b>KNOWN INFO</b>
Air cleaner OK.
Engine oil OK.
Coolant OK.
<b>POSSIBLE PROBLEMS</b>
Head gasket leaking.



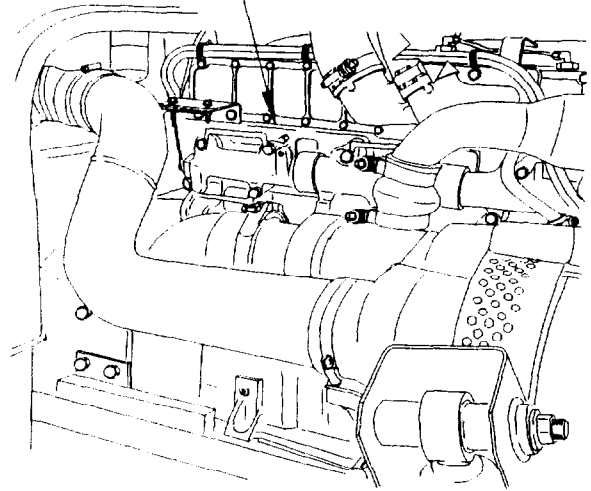
<b>TEST OPTIONS</b>
Head Gasket Check
<b>REASON FOR QUESTION</b>
A faulty head gasket will cause white exhaust smoke.



**HEAD GASKET CHECK**

- (1) Start engine (TM 9-2320-365-10).
- (2) Raise cab (TM 9-2320-365-10).
- (3) Check head gasket for leaks.
- (4) If head gasket is leaking, notify DS Maintenance.
- (5) If head gasket is not leaking and white exhaust smoke still exists, notify DS Maintenance.
- (6) Lower cab (TM 9-2320-365-10).
- (7) Shut down engine (TM 9-2320-365-10).

**HEAD GASKET**



x2A1105-

**2-13. FUEL SYSTEM TROUBLESHOOTING**

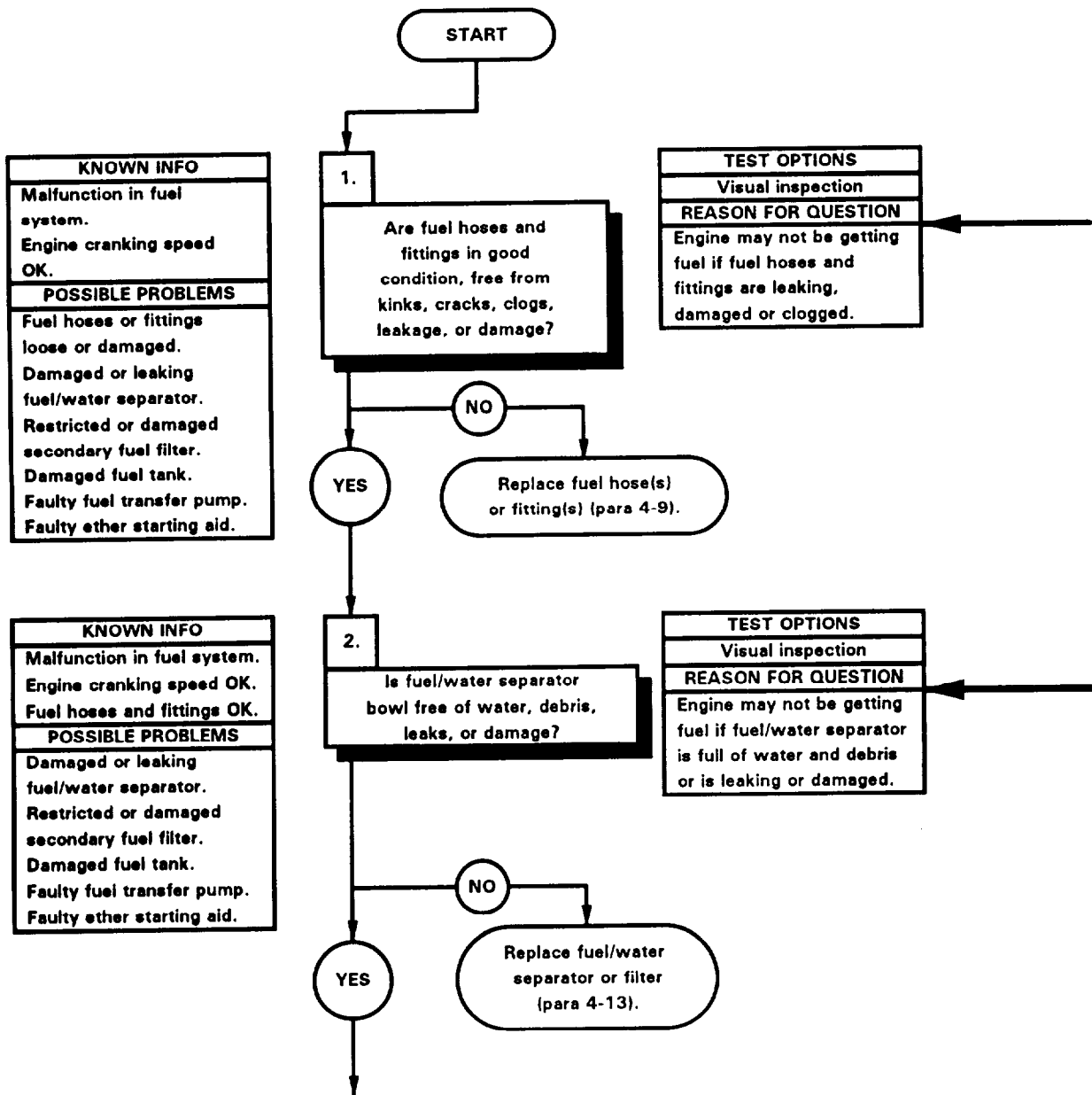
This paragraph covers Fuel System Troubleshooting. The Fuel System Fault Index, Table 2-4, lists faults for the fuel system of the vehicle.

*Table 2-4. Fuel System Fault Index*

Fault No.	Description	Page
b1.	Engine cranks but does not start or engine stalls after starting .....	2-102
b2.	Ether starting aid does not operate .....	2-108
b3.	Fuel consumption too high .....	2-112
b4.	Accelerator pedal sticks .....	2-114

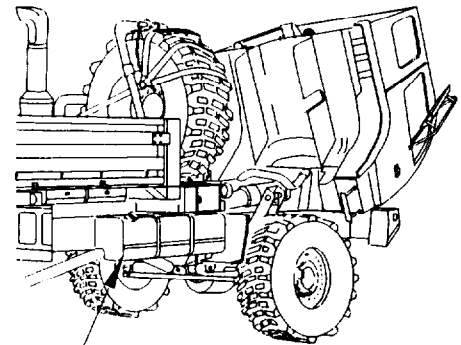


b1. ENGINE CRANKS BUT DOES NOT START OR ENGINE STALLS AFTER STARTING	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10). Cab raised (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Pan, Drain (Item 24, Appendix C)
<b>References</b> TM 9-4910-571-12&P	



**NOTE**

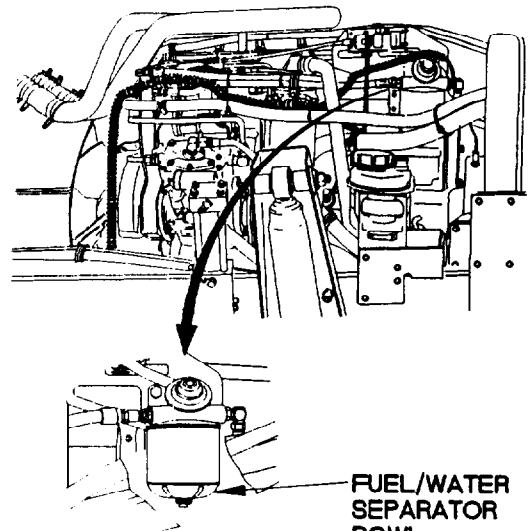
- Perform Engine Troubleshooting (a2. Engine Cranks But Does Not Start) before starting here.
  - Fuel tank hoses and fittings may be loose, allowing air to be drawn into fuel system.
- (1) Check fuel tank hoses and fittings for leakage, damage or clogs.
  - (2) If fuel tank hoses and/or fittings are damaged, replace fuel hose(s) or fitting(s) (para 4-9).



FUEL TANK

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- (1) Check fuel/water separator bowl for water, debris, leaks or damage.
- (2) If fuel/water separator bowl is damaged, replace fuel/water separator (para 4-13).



FUEL/WATER SEPARATOR BOWL

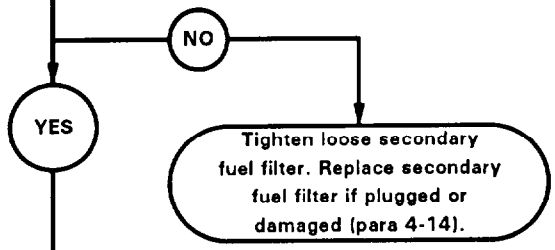
X2B0102A

b1. ENGINE CRANKS BUT DOES NOT START OR ENGINE STALLS AFTER STARTING (CONT)

KNOWN INFO
Malfunction in fuel system. Engine cranking speed OK. Fuel hoses and fittings OK. Fuel/water separator OK.
POSSIBLE PROBLEMS
Restricted or damaged secondary fuel filter. Damaged fuel tank. Faulty fuel transfer pump. Faulty ether starting aid.

3.  
Is secondary fuel filter free from leaks or damage?

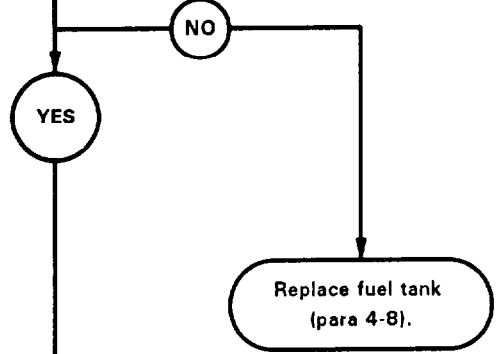
TEST OPTIONS
Visual inspection or STE/ICE-R Test #26
REASON FOR QUESTION
Engine may not be getting fuel if secondary fuel filter is plugged, leaking, or damaged.



KNOWN INFO
Malfunction in fuel system. Engine cranking speed OK. Fuel hoses and fittings OK. Fuel/water separator OK. Secondary fuel filter OK.
POSSIBLE PROBLEMS
Damaged fuel tank. Faulty fuel transfer pump. Faulty ether starting aid.

4. **WARNING**  
Read WARNING on following page.  
Is fuel tank free from leaks and damage?

TEST OPTIONS
Visual inspection
REASON FOR QUESTION
Engine may not be getting fuel if fuel tank is leaking or damaged.





- (1) Check secondary fuel filter for restrictions, leaks, and damage.
- (2) If secondary fuel filter is damaged, replace secondary fuel filter (para 4-12).
- (3) Lower cab (TM 9-2320-365-10).

**NOTE**

- STE/ICE-R Test #26 will display results of restriction test as pass or fail.
- Engine must be running to perform STE/ICE-R Test #26.

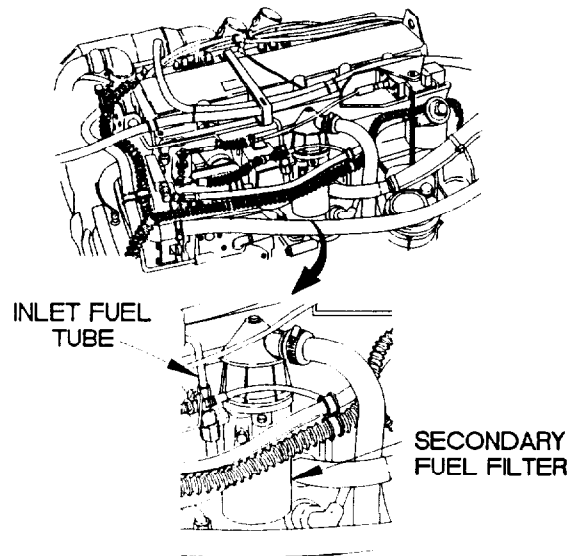
**STE/ICE-R TEST #26**

- (1) Hook up STE/ICE-R to DCA.
- (2) Start engine (TM 9-2320-365-10).
- (3) Test results will read PASS or FAIL.  
Record test results.
- (4) Shut down engine (TM 9-2320-365-10).
- (5) Remove STE/ICE-R from DCA.

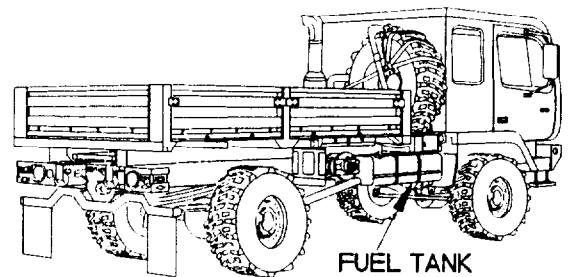
**WARNING**

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

- (1) Check fuel tank for damage, and for loose or missing mounting hardware.
- (2) If fuel tank is damaged, replace fuel tank (para 4-8).



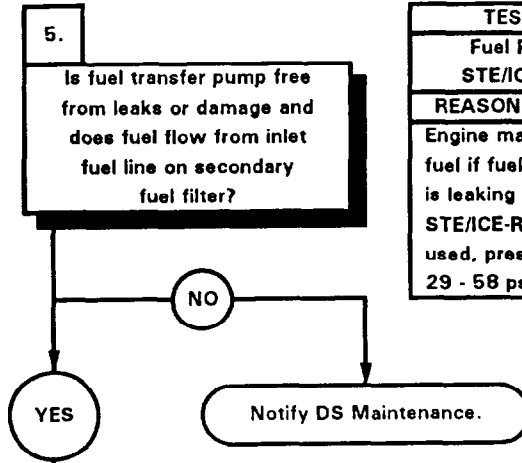
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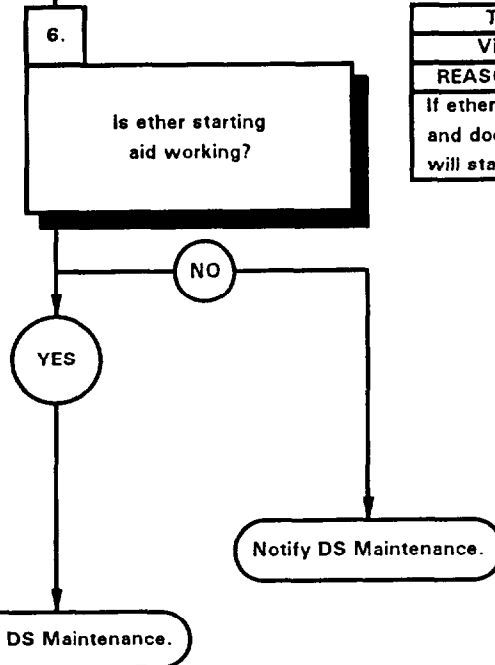
b1. ENGINE CRANKS BUT DOES NOT START OR ENGINE STALLS AFTER STARTING (CONT)

KNOWN INFO
Malfunction in fuel system. Engine cranking speed OK. Fuel hoses and fittings OK. Fuel tank OK. Fuel/water separator OK. Secondary fuel filter OK.
POSSIBLE PROBLEMS
Faulty fuel transfer pump. Faulty ether starting aid.



TEST OPTIONS
Fuel Pump Test or STE/ICE-R Test #24
REASON FOR QUESTION
Engine may not be getting fuel if fuel transfer pump is leaking or damaged. If STE/ICE-R Test #24 is used, pressure should be 29 - 58 psi.

KNOWN INFO
Malfunction in fuel system. Engine cranking speed OK. Fuel hoses and fittings OK. Fuel tank OK. Fuel/water separator OK. Fuel transfer pump OK. Secondary fuel filter OK.
POSSIBLE PROBLEMS
Faulty ether starting aid.



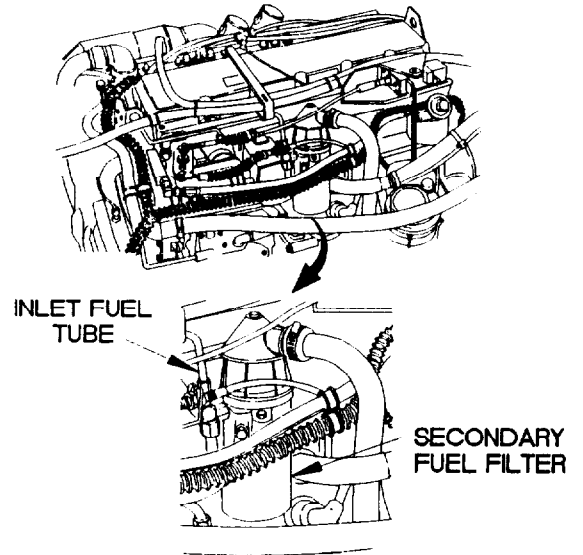
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
If ether start is required and does not work, engine will start hard.

**FUEL PUMP TEST**

- (1) Position drain pan under secondary fuel filter.
- (2) Remove inlet fuel tube from secondary fuel filter.
- (3) Attempt to start engine (TM 9-2320-365-10).
- (4) Check for fuel flow from inlet fuel tube while attempting to start engine.
- (5) Install inlet fuel tube on secondary fuel filter.

**STE/ICE-R TEST #24**

- (1) Lower cab (TM 9-2320-365-10).
- (2) Hook up STE/ICE-R to DCA.
- (3) Press and hold TEST button on STE/ICE-R until -15 to +15 appears in display. This will ensure that test results are accurate.
- (4) Start engine (TM 9-2320-365-10) and raise engine idle to 2600 rpm for 8-29 seconds.
- (5) Pressure should read between 29 psi and 58 psi.
- (6) Record test results.
- (7) Shut down engine (TM 9-2320-365-10).
- (8) Remove STE/ICE-R from DCA.



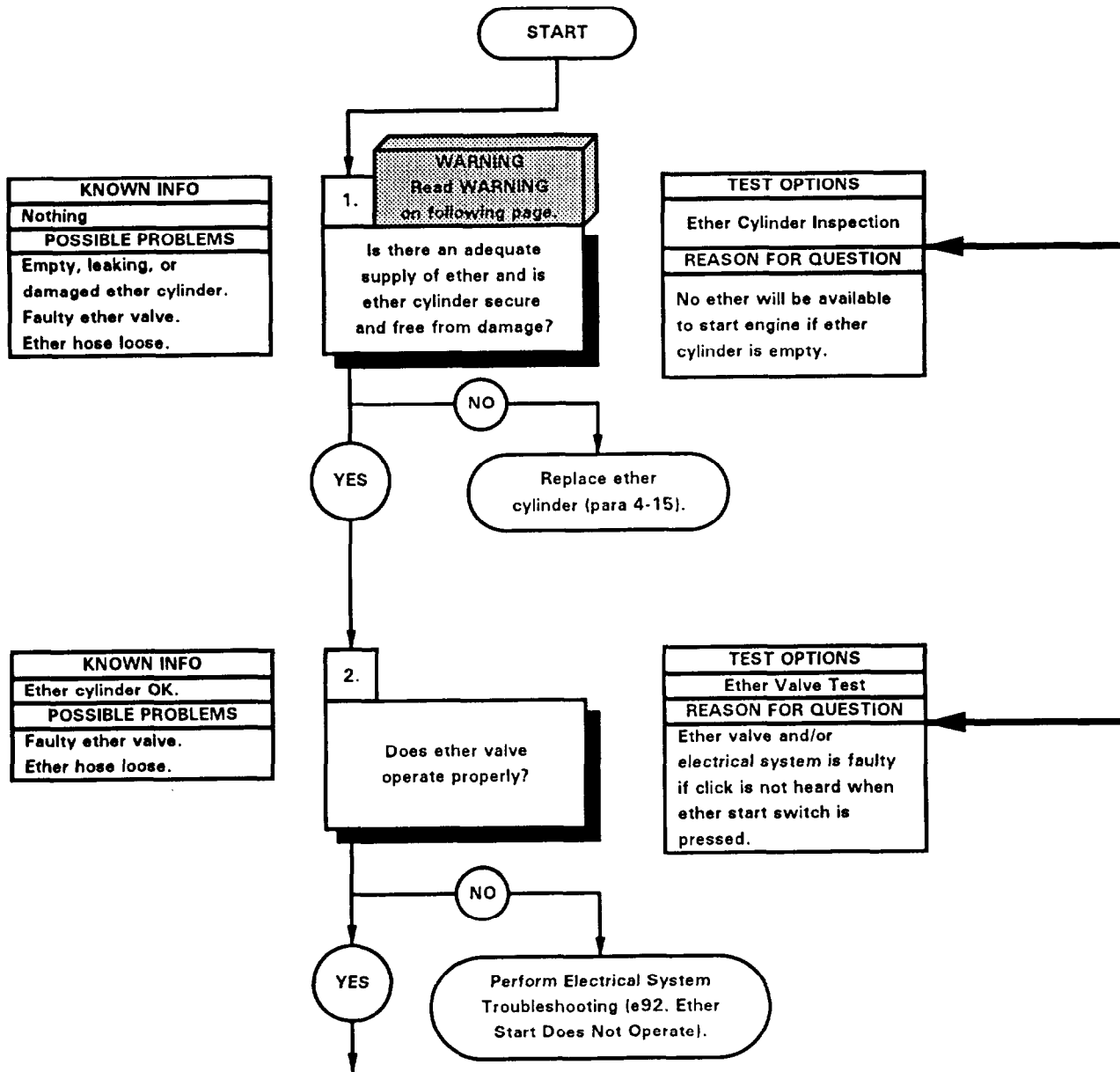
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**NOTE**

- Ether start system has a thermostatic switch that will not let the system work if engine temperature is above 100°F (38°C).
- Ether start is only required below 45°F (7°C).

Attempt to start engine using cold engine starting procedure (TM 9-2320-365-10).

b2. ETHER STARTING AID DOES NOT OPERATE	
INITIAL SETUP	
Equipment Conditions	
Engine shut down (TM 9-2320-365-10).	
Spare tire lowered (TM 9-2320-365-10).	



**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 result in serious injury or death to personnel.

**NOTE**

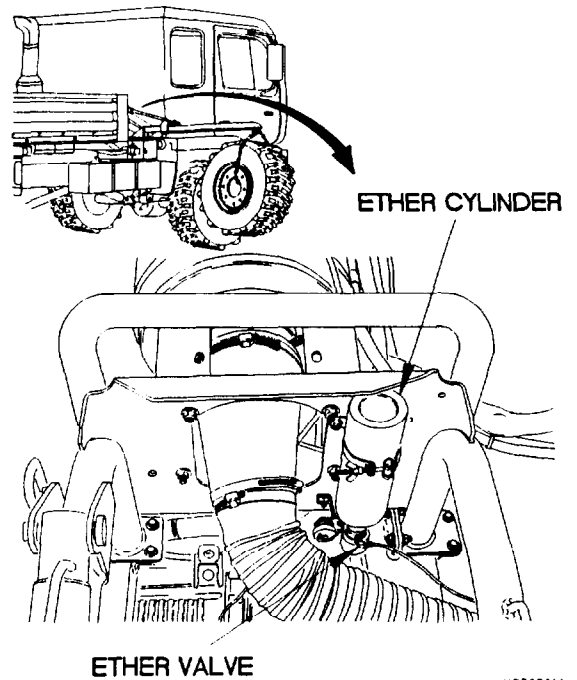
Temperature at engine block must be below 100° F (38° C) before ether starting aid will work.

**ETHER CYLINDER INSPECTION**

- (1) Remove ether cylinder (para 4-15).
- (2) Shake ether cylinder to determine if ether is present.
- (3) Check ether cylinder for damage.
- (4) Install ether cylinder (para 4-15).

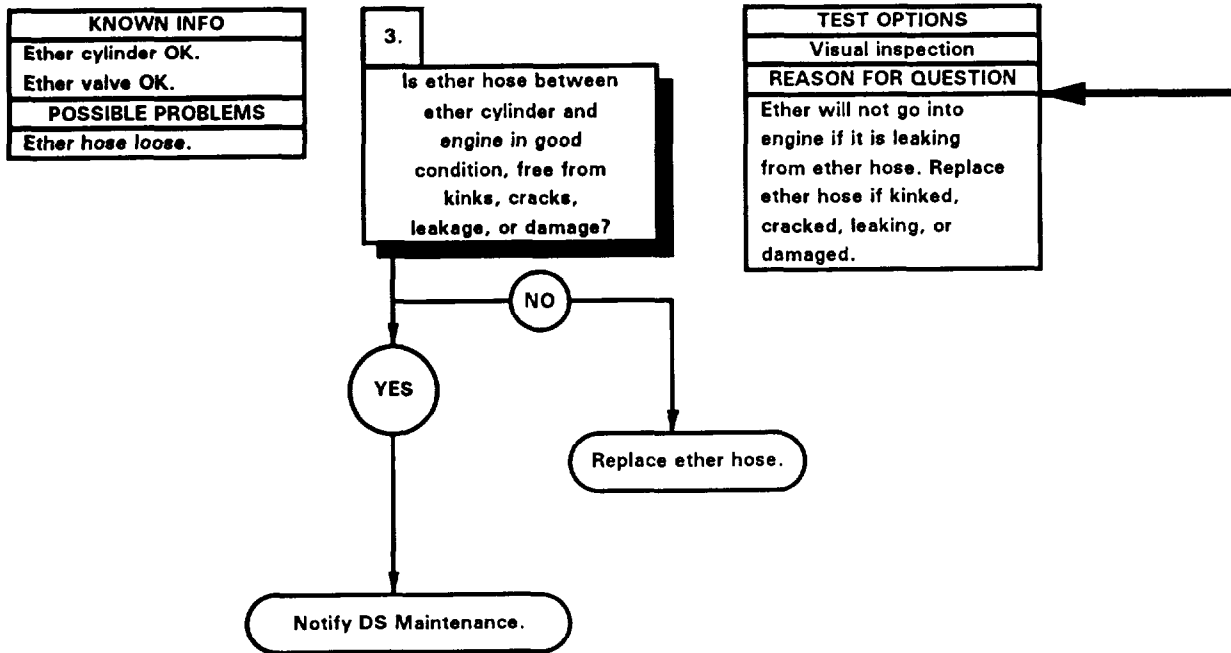
**ETHER VALVE TEST**

- (1) Position master power switch to on (TM 9-2320-365-10).
- (2) Press ether start switch (TM 9-2320-365-10) and listen for ether valve to click.
- (3) Position master power switch to off (TM 9-2320-365-10).



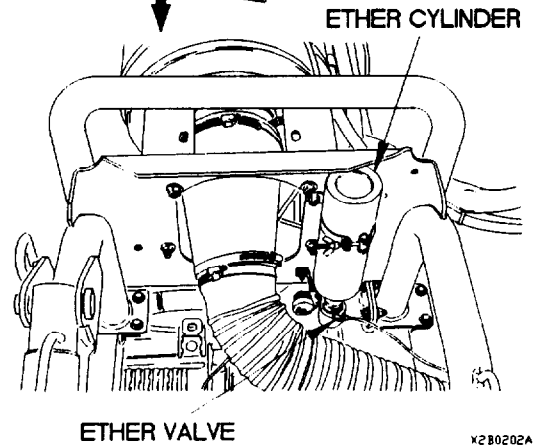
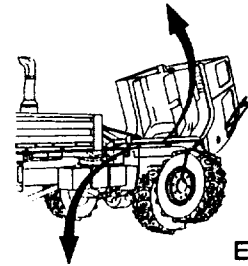
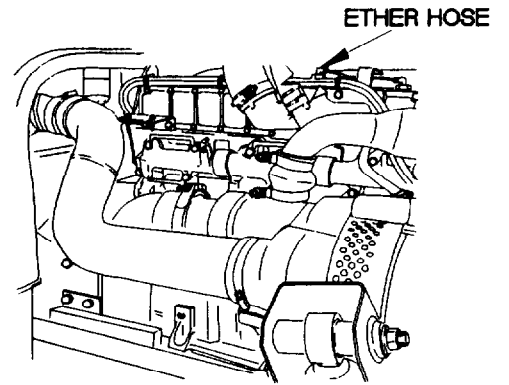
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b2. ETHER STARTING AID DOES NOT OPERATE (CONT)



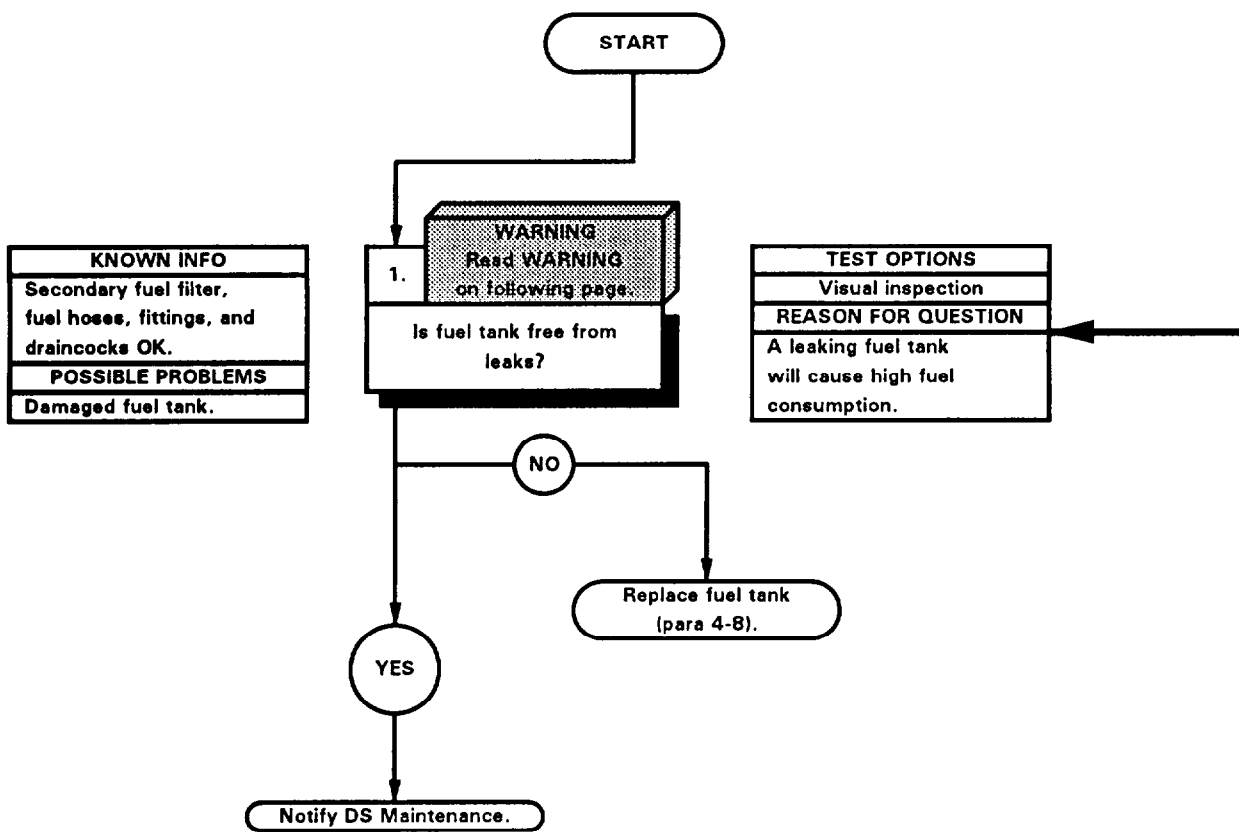


- (1) Raise cab (TM 9-2320-365-10).
- (2) Check ether hose between ether cylinder and engine for leaks and damage.
- (3) Lower cab (TM 9-2320-365-10).



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<b>b3. FUEL CONSUMPTION TOO HIGH</b>
<b>INITIAL SETUP</b>
Equipment Conditions Engine shut down (TM 9-2320-365-10).

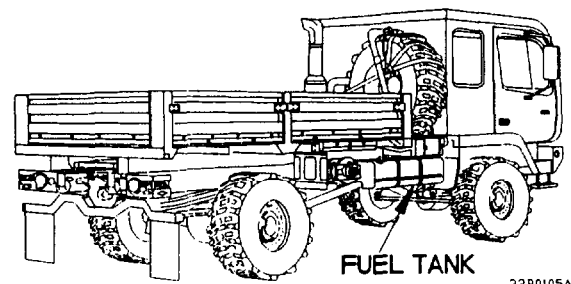




**WARNING**

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

- (1) Check fuel tank for damage, and for loose or missing mounting hardware.**
- (2) If fuel tank is damaged, replace fuel tank (para 4-8).**



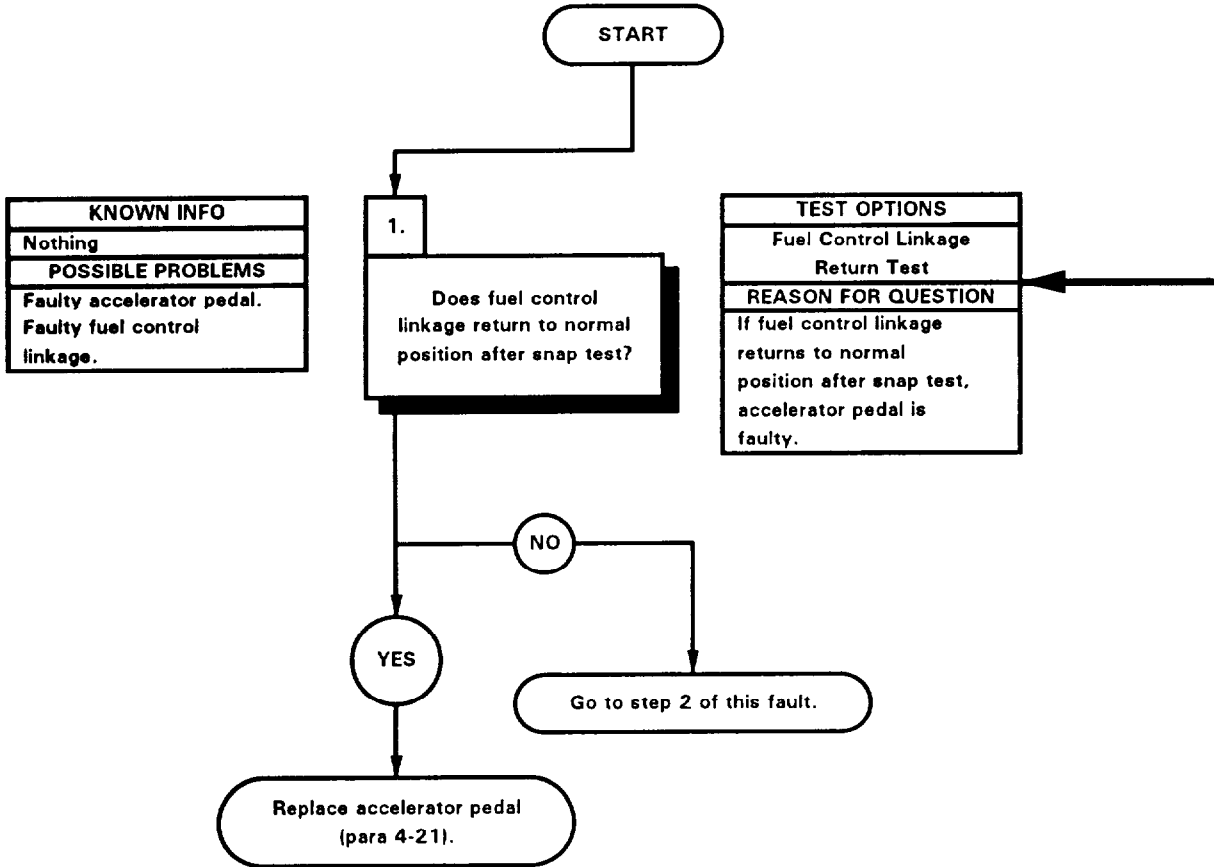
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**b4. ACCELERATOR PEDAL STICKS**

**INITIAL SETUP**

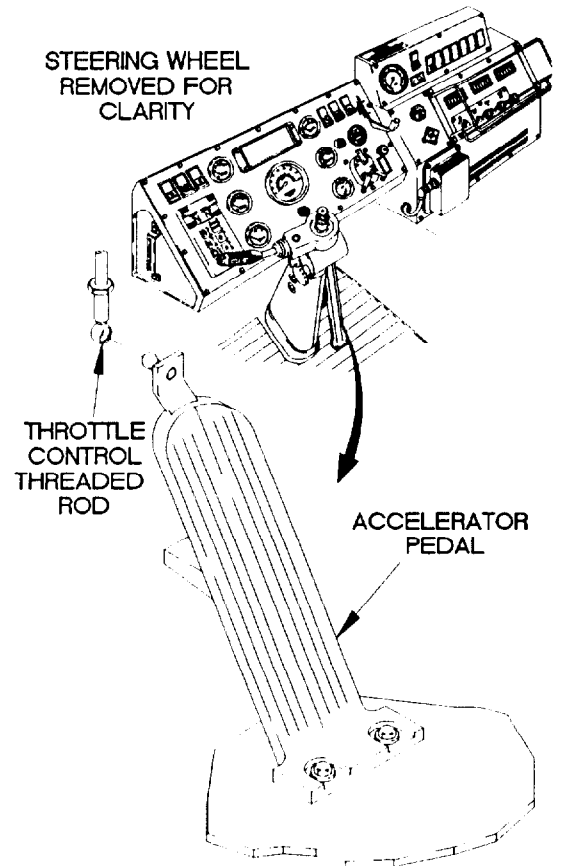
**Equipment Conditions**  
 Engine shut down (TM 9-2320-365-10).

**Tools and Special Tools**  
 Tool Kit, Genl Mech (Item 44, Appendix C)

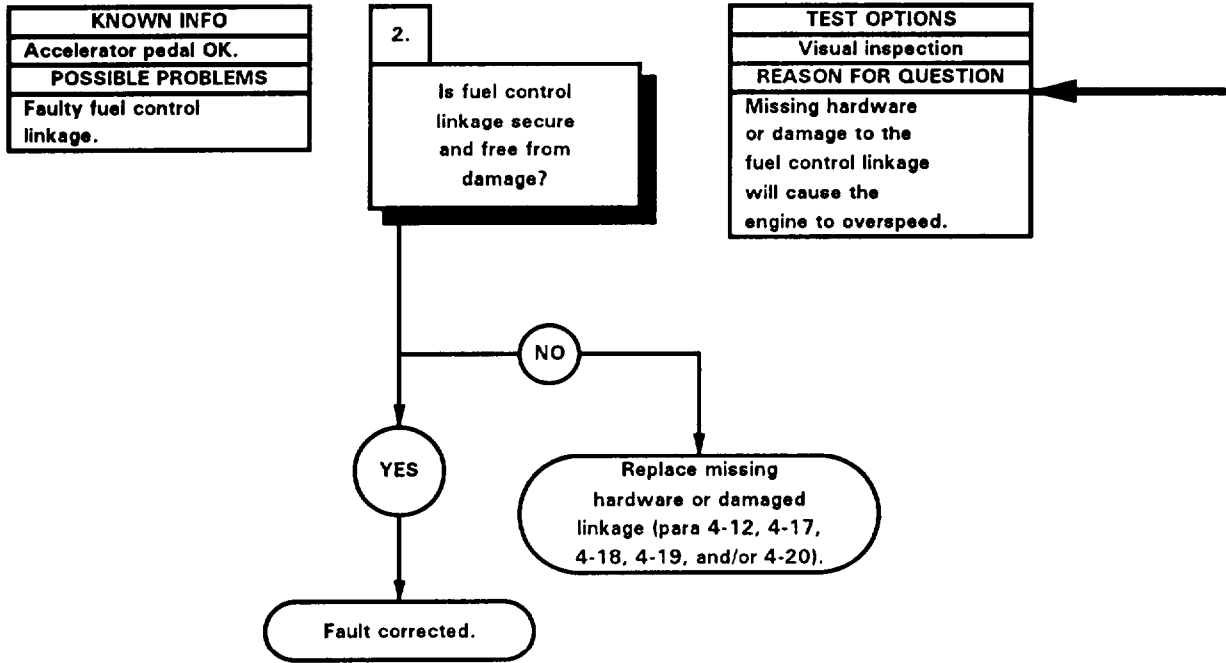


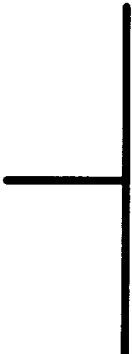
**FUEL CONTROL LINKAGE RETURN TEST**

- (1) Disconnect accelerator pedal from throttle control threaded rod (para 4-21).
- (2) Pull down throttle control threaded rod and release.
- (3) If throttle control threaded rod snapped back to normal position, replace accelerator pedal (para 4-21).
- (4) If throttle control threaded rod did not snap back to normal position, go to step 2 of this fault.
- (5) Connect accelerator pedal to throttle control threaded rod (para 4-21).



b4. ACCELERATOR PEDAL STICKS (CONT)



- 
- (1) Remove instrument panel assembly (para 7-15).
  - (2) Check fuel control linkage for improper assembly, missing hardware, damaged parts, and proper lubrication (para 4-17, 4-19, and 4-20).
  - (3) Install instrument panel assembly (para 7-15).
  - (4) Raise cab (TM 9-2320-365-10).
  - (5) Check fuel control linkage for improper assembly, missing hardware, and damaged parts (para 4-16, 4-12, and 4-18).
  - (6) Lower cab (TM 9-2320-365-10).

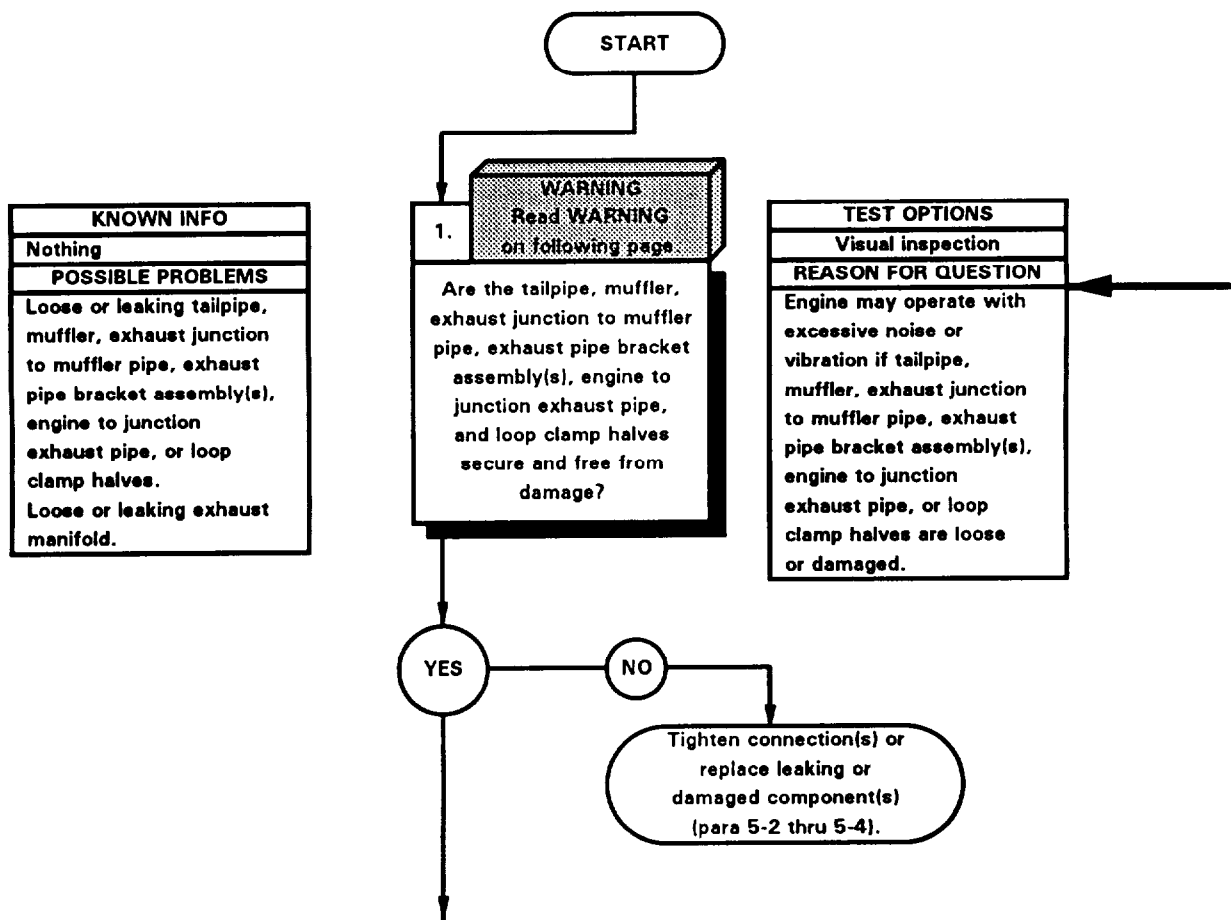
**2-14. EXHAUST SYSTEM TROUBLESHOOTING**

This paragraph covers Exhaust System Troubleshooting. The Exhaust System Fault Index, Table 2-5, lists faults for the exhaust system of the vehicle.

*Table 2-5. Exhaust System Fault Index*

<b>Fault No.</b>	<b>Description</b>	<b>Page</b>
c1.	Exhaust system unusually noisy or vibrates excessively during engine operation . . . . .	2-120
c2.	Exhaust fumes in cab . . . . .	2-124

c1. EXHAUST SYSTEM UNUSUALLY NOISY OR VIBRATES EXCESSIVELY DURING ENGINE OPERATION	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10). Cab raised (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) Goggles, Industrial (Item 15, Appendix C)



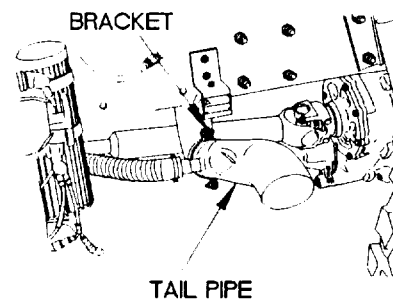
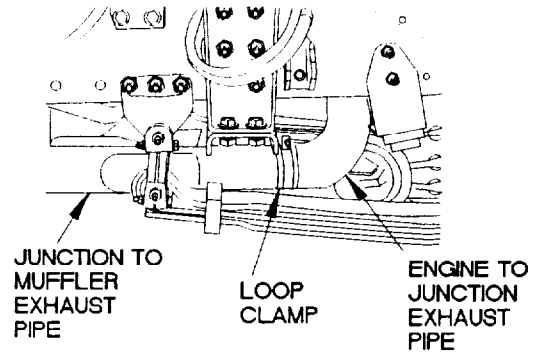
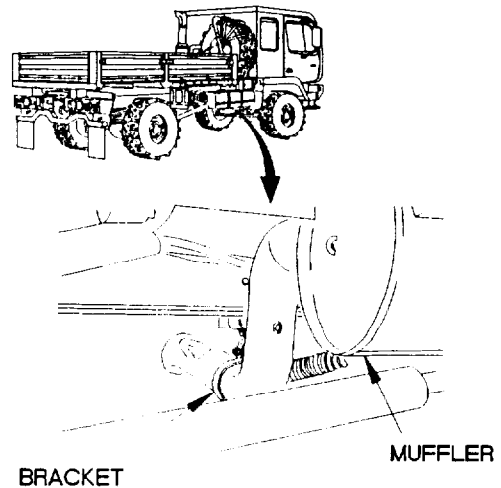
**WARNING**

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

**NOTE**

Exhaust system component hardware has to be torqued. Refer to para 5-2 thru 5-4.

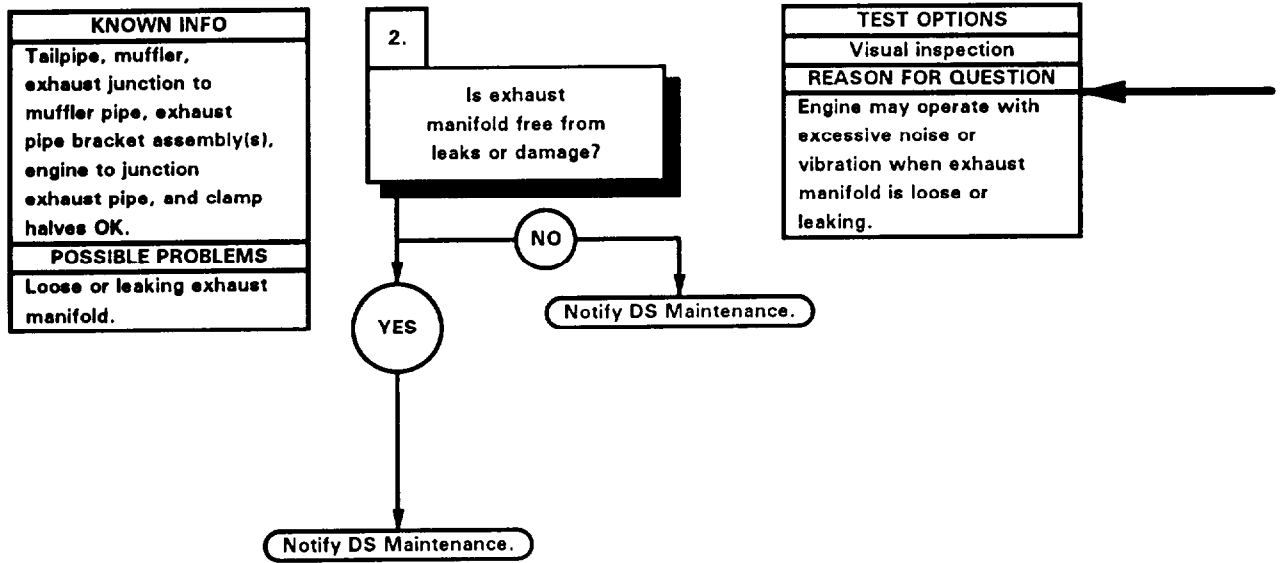
Check tailpipe, muffler, and exhaust pipes for loose connections and damage.




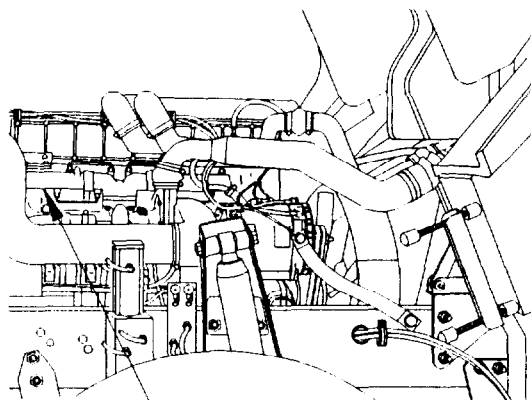
32C0101A



c1. EXHAUST SYSTEM UNUSUALLY NOISY OR VIBRATES EXCESSIVELY DURING ENGINE OPERATION  
(WITHOUT EXHAUST RESTRICTOR) (CONT)



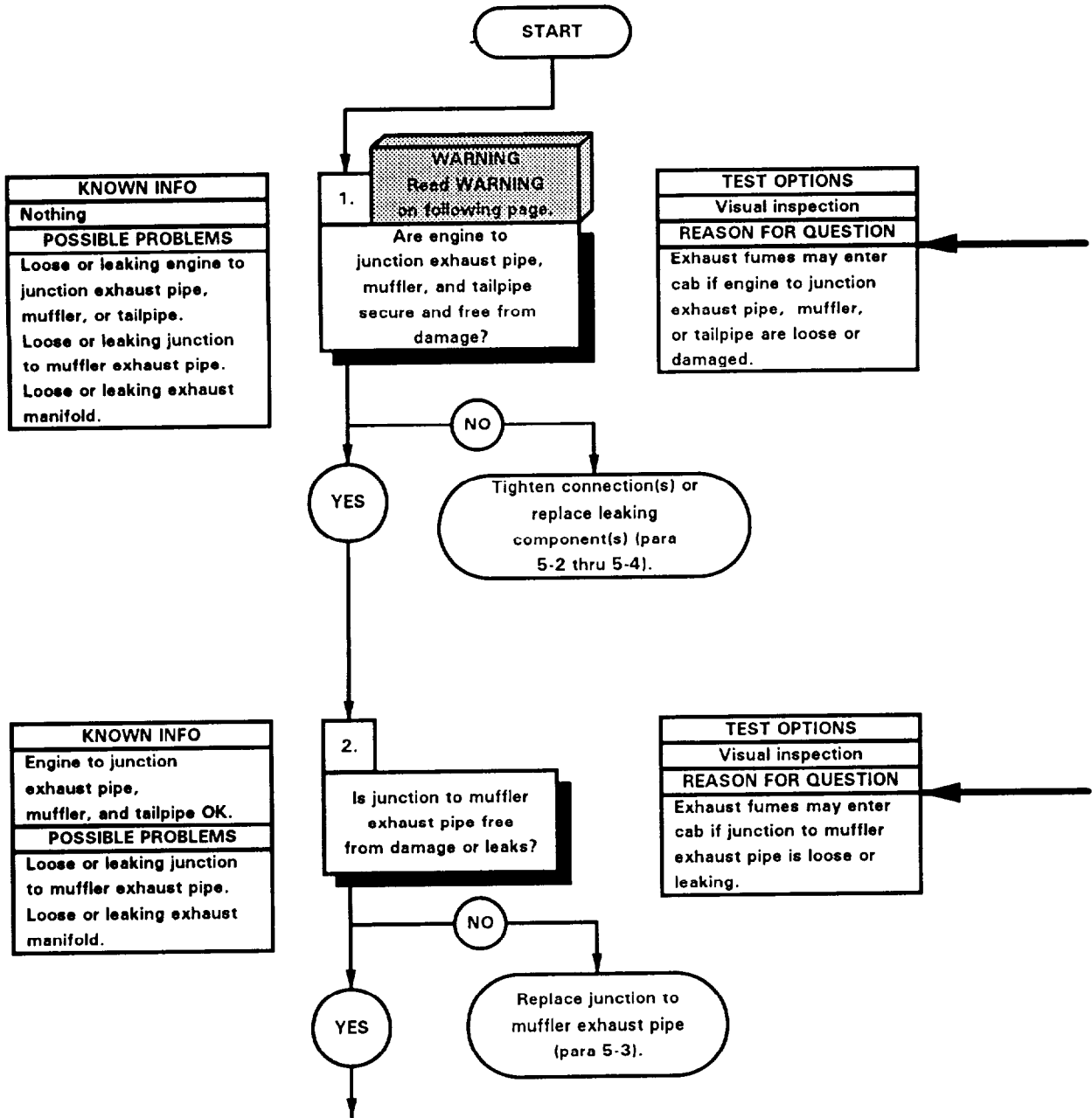
- 
- (1) Start engine (TM 9-2320-365-10).
  - (2) Check exhaust manifold for looseness or evidence of exhaust leakage.
  - (3) Shut down engine (TM 9-2320-365-10).
  - (4) Lower cab (TM 9-2320-365-10).



EXHAUST MANIFOLD

4B2C1BA-

<b>c2. EXHAUST FUMES IN CAB</b>
<b>INITIAL SETUP</b>
Equipment Conditions Engine shut down (TM 9-2320-365-10).



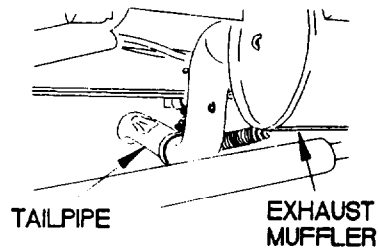
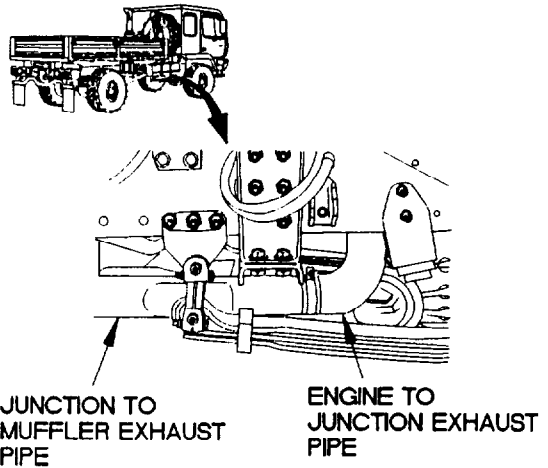
**WARNING**

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

**NOTE**

Exhaust system component hardware has to be torqued. Refer to para 5-2 thru 5-4.

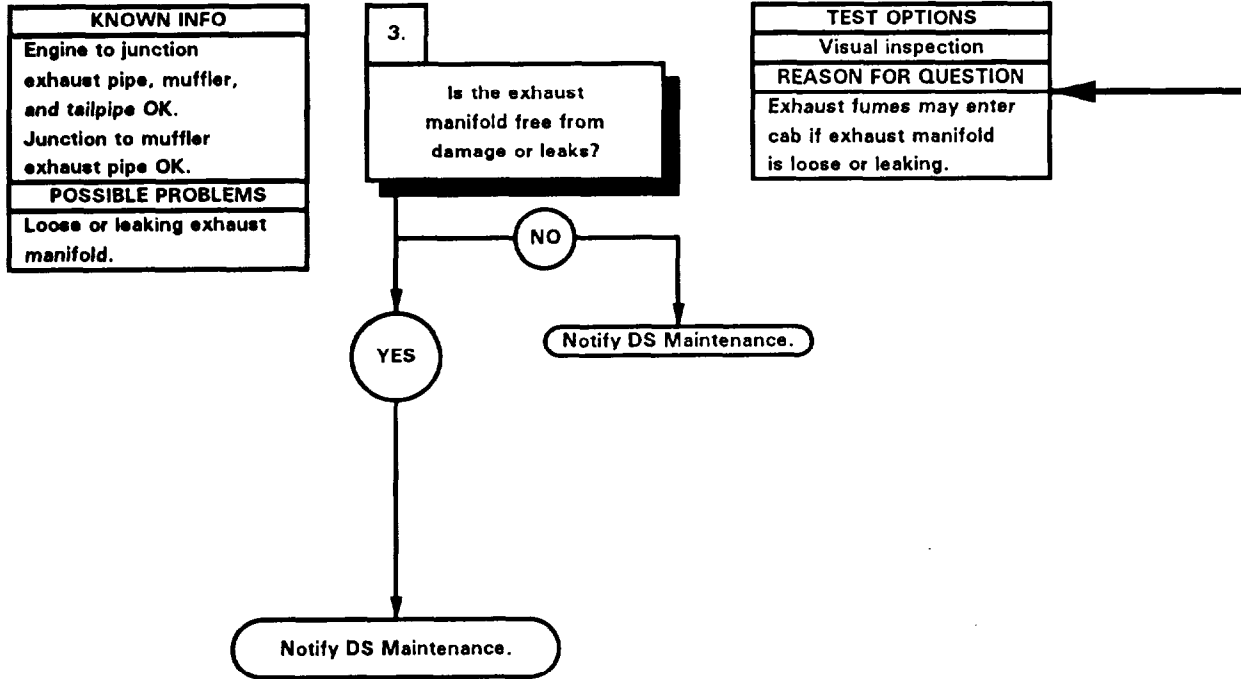
Check junction to muffler exhaust pipe, muffler, and tailpipe for loose connections and leaks.



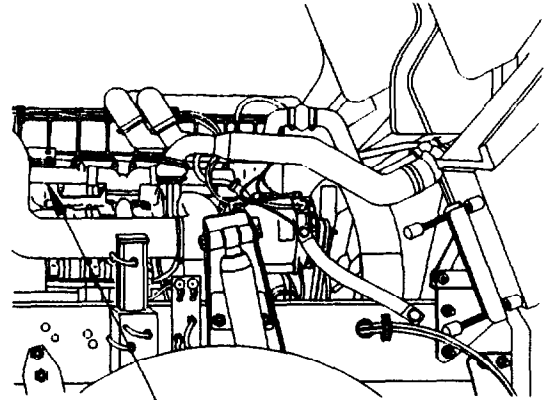
32C0201A

Check engine to junction exhaust pipe for loose connections or leaks.

c2. EXHAUST FUMES IN CAB (WITHOUT EXHAUST RESTRICTOR) (CONT)



- (1) Raise cab (TM 9-2320-365-10).
- (2) Start engine (TM 9-2320-365-10).
- (3) Check exhaust manifold for looseness or leaks.
- (4) Shut down engine (TM 9-2320-365-10).
- (5) Lower cab (TM 9-2320-365-10).



EXHAUST MANIFOLD

482C18A-

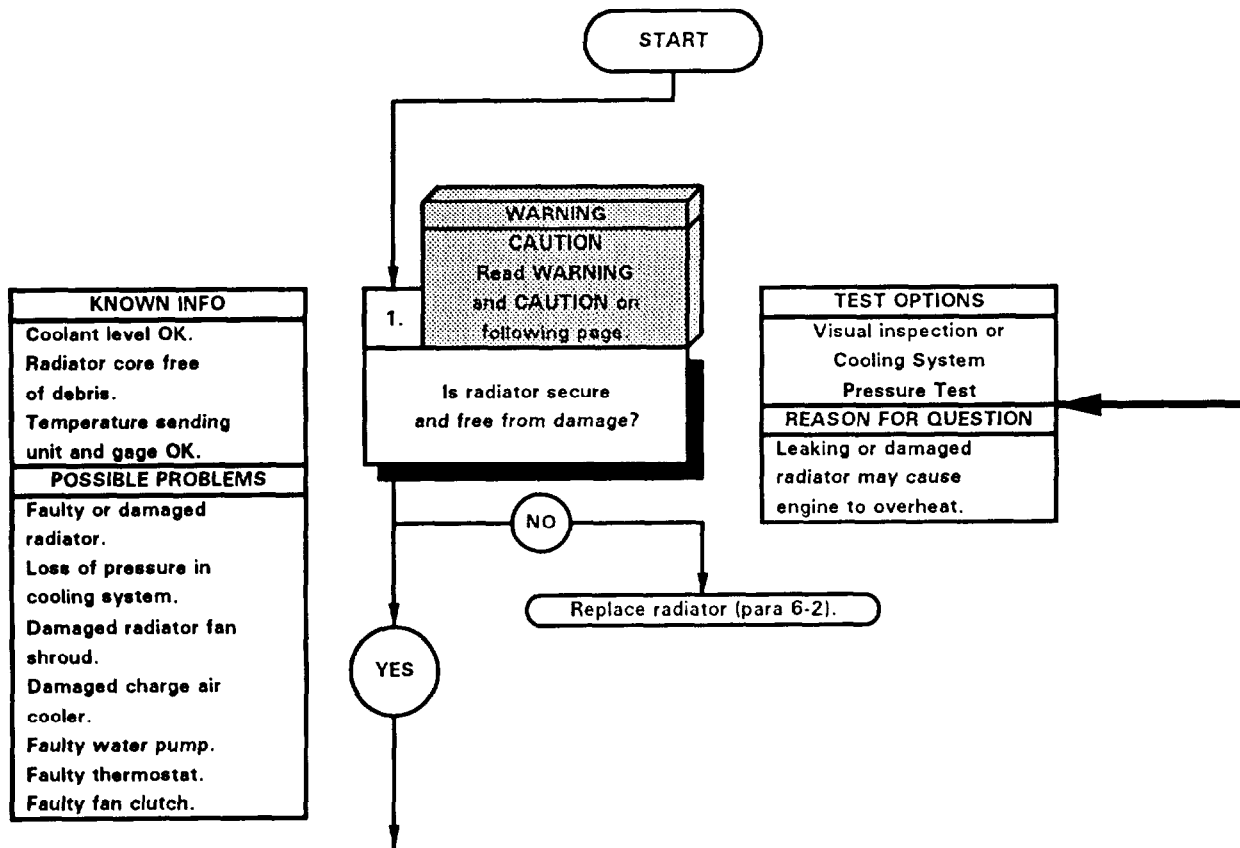
## 2-15. COOLING SYSTEM TROUBLESHOOTING

This paragraph covers Cooling System Troubleshooting. The Cooling System Fault Index, Table 2-6, lists faults for the cooling system of the vehicle.

*Table 2-6. Cooling System Fault Index*

Fault No.	Description	Page
d1.	Engine overheats . . . . .	2-130
d2.	Oil in cooling system . . . . .	2-142
d3.	Loss of coolant . . . . .	2-144

d1. ENGINE OVERHEATS	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) Adapter, Radiator (Item 1, Appendix B) Pressure Tester, Radiator (Item 26, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)





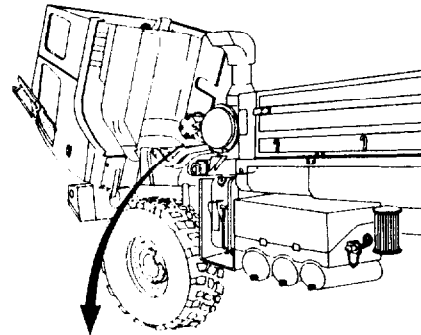
**WARNING**

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.

**NOTE**

Perform Engine Troubleshooting (a9. Engine Overheats) before starting here.

- (1) Raise cab (TM 9-2320-365-10).
- (2) Check radiator for leaks and damage.



**COOLING SYSTEM PRESSURE TEST**

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

**CAUTION**

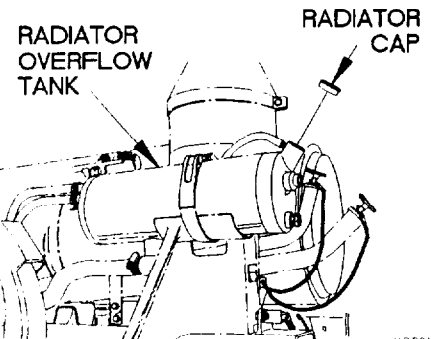
Do not pressurize over 16 psi (110kPa). Failure to comply may result in damage to cooling system.

- (4) Pressurize radiator overflow tank, using tester, to 15 psi (103 kPa).
- (5) Observe radiator for coolant leaks.

**NOTE**

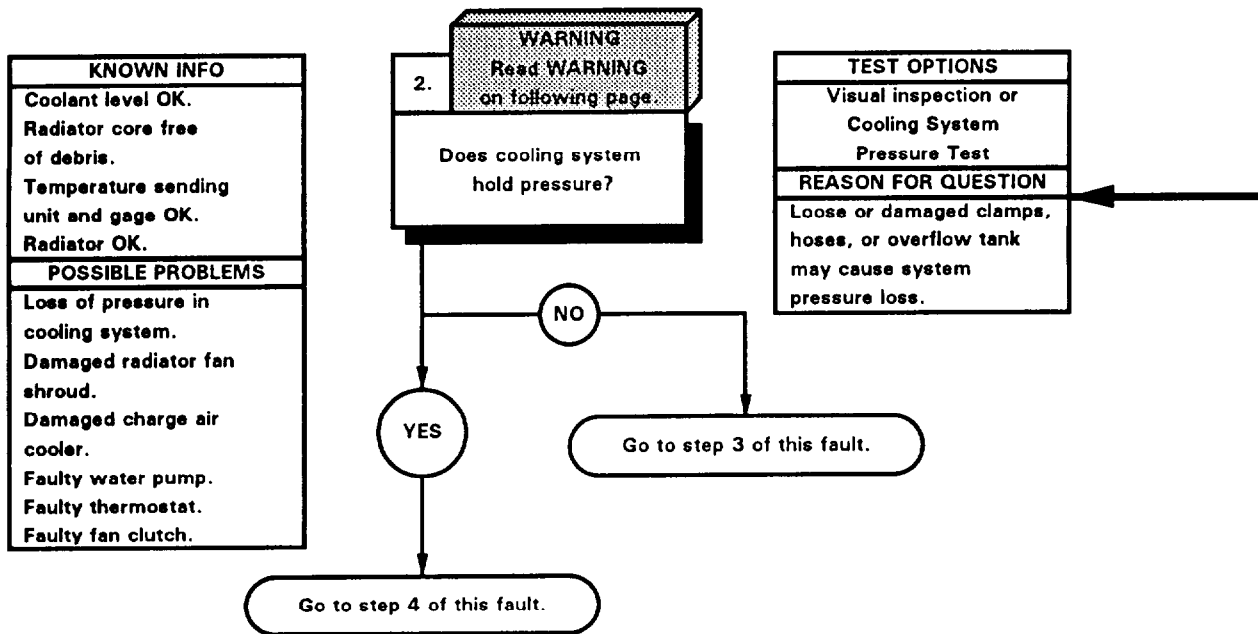
Pressure loss without external leaks indicates engine internal coolant leaks.

- (6) Observe radiator tester for loss of pressure.
- (7) Remove tester and adapter from radiator overflow tank.
- (8) Install radiator cap on radiator overflow tank.



x200101-

d1. ENGINE OVERHEATS (CONT)



**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.

**NOTE**

Check radiator and radiator overflow tank for leaks and damage.

**COOLING SYSTEM PRESSURE TEST**

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

**CAUTION**

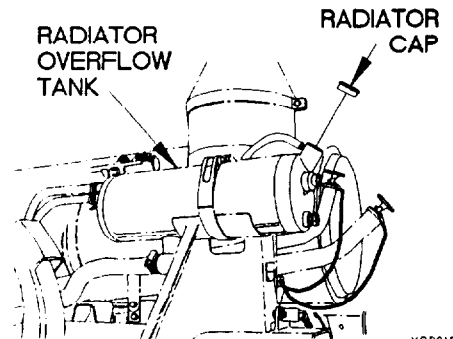
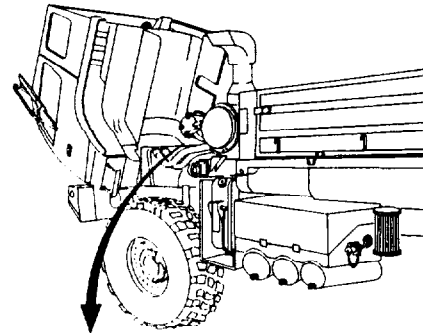
Do not pressurize over 16 psi (110 kPa). Failure to comply may result in damage to cooling system.

- (4) Pressurize radiator overflow tank, using tester, to 15 psi (103 kPa).
- (5) Observe radiator overflow tank for coolant leaks.

**NOTE**

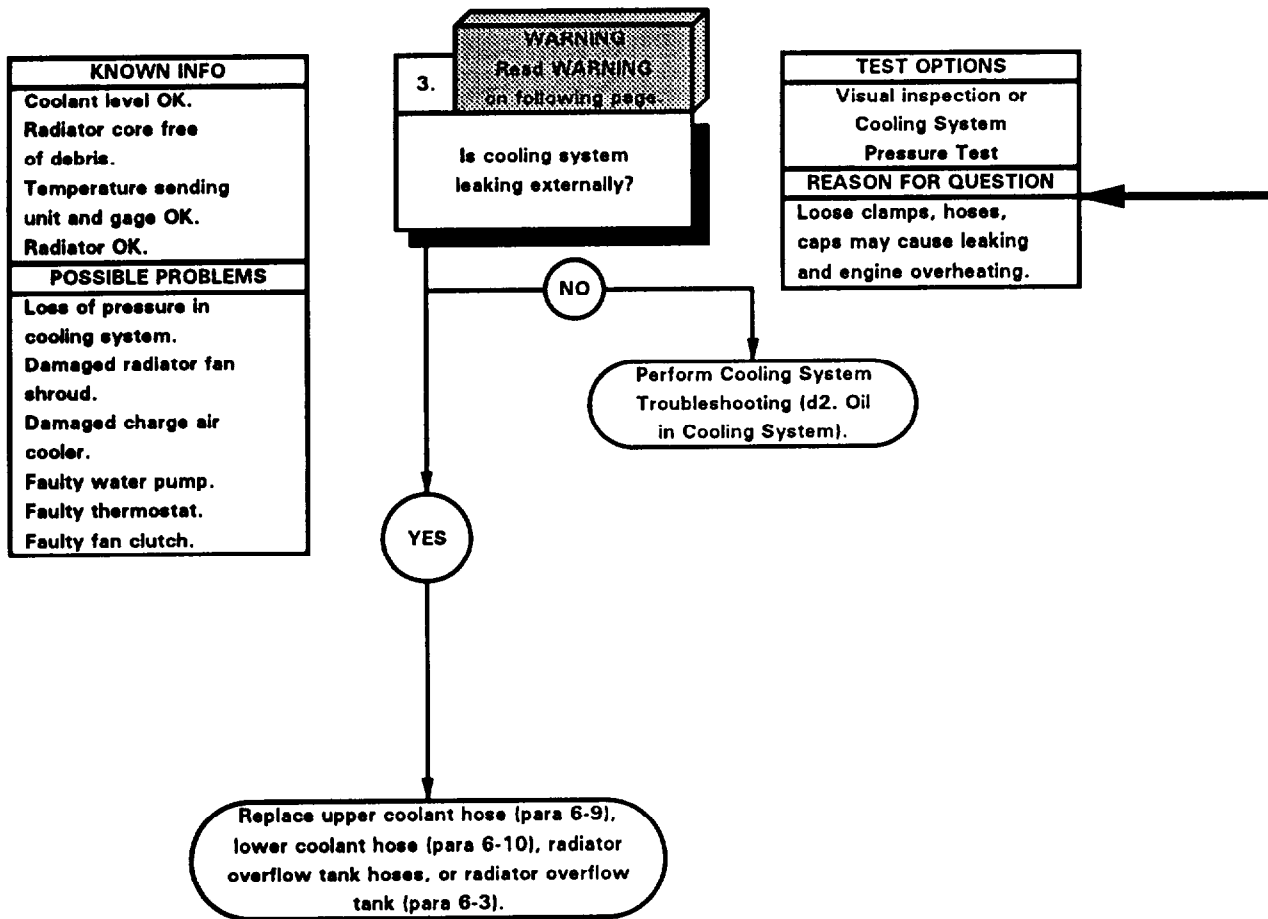
Pressure loss without external leaks indicates internal coolant leaks.

- (6) Observe radiator tester for loss of pressure.
- (7) Remove tester and adapter from radiator overflow tank.
- (8) Install radiator cap on radiator overflow tank.



X2D0101-

d1. ENGINE OVERHEATS (CONT)



**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.

**NOTE**

Check hoses for leaks.

**COOLING SYSTEM PRESSURE TEST**

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

**CAUTION**

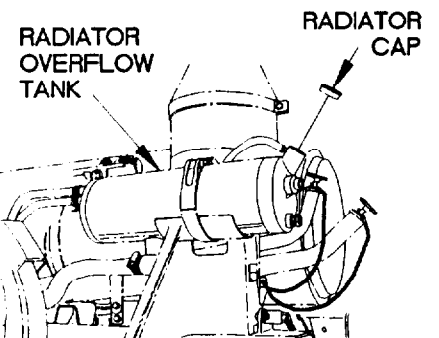
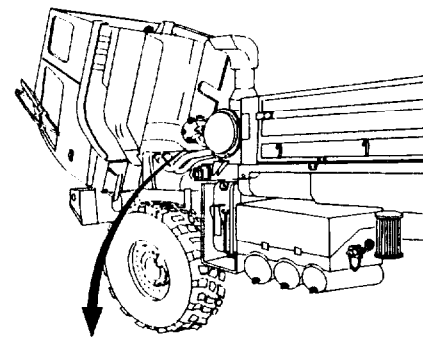
Do not pressurize over 16 psi (110 kPa). Failure to comply may result in damage to cooling system.

- (4) Pressurize radiator overflow tank, using tester, to 15 psi (103 kPa).
- (5) Observe hoses for coolant leaks.

**NOTE**

Pressure loss without external leaks indicates internal coolant leaks.

- (6) Observe radiator tester for loss of pressure.
- (7) Remove tester and adapter from radiator overflow tank.
- (8) Install radiator cap on radiator overflow tank.

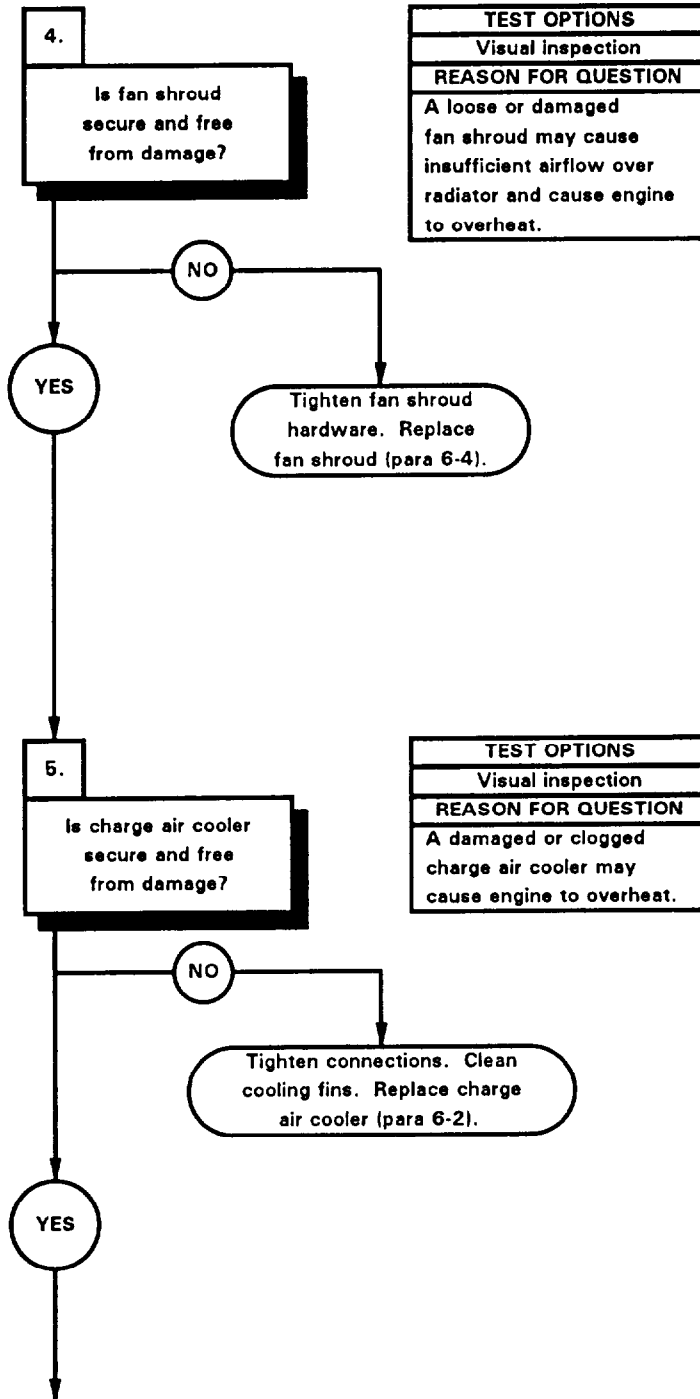


x2D0101-

d1. ENGINE OVERHEATS (CONT)

KNOWN INFO
Coolant level OK. Radiator core free of debris. Upper and lower coolant hoses OK. Radiator cap OK. Radiator overflow tank and hoses OK. Temperature sending unit and gage OK. Radiator OK. Cooling system pressure OK.
POSSIBLE PROBLEMS
Damaged radiator fan shroud. Damaged charge air cooler. Faulty water pump. Faulty thermostat. Faulty fan clutch.

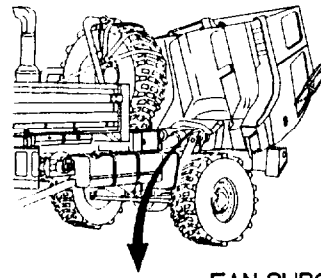
KNOWN INFO
Coolant level OK. Radiator core free of debris. Upper and lower coolant hoses OK. Radiator cap OK. Radiator overflow tank and hoses OK. Temperature sending unit and gage OK. Radiator OK. Cooling system pressure OK. Fan shroud OK.
POSSIBLE PROBLEMS
Damaged charge air cooler. Faulty water pump. Faulty thermostat. Faulty fan clutch.



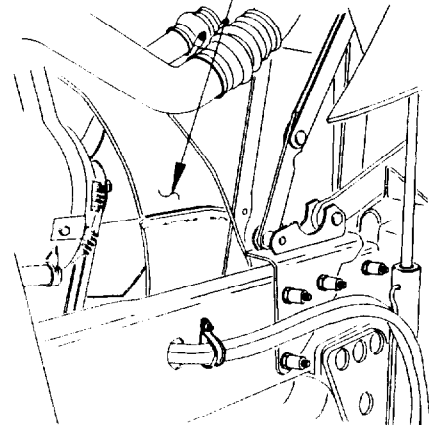
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A loose or damaged fan shroud may cause insufficient airflow over radiator and cause engine to overheat.

TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A damaged or clogged charge air cooler may cause engine to overheat.

Check fan shroud for loose hardware and damage.

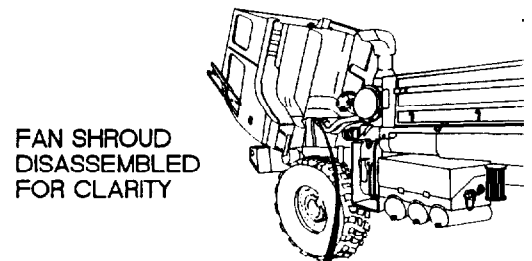


FAN SHROUD



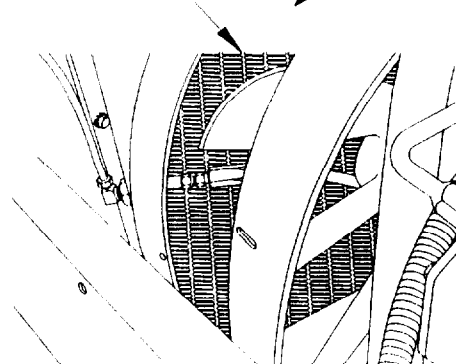
X2D0104A

Check charge air cooler for punctures, cracks, damage, clogged cooling fins, or loose hardware.



FAN SHROUD  
DISASSEMBLED  
FOR CLARITY

CHARGE AIR COOLER

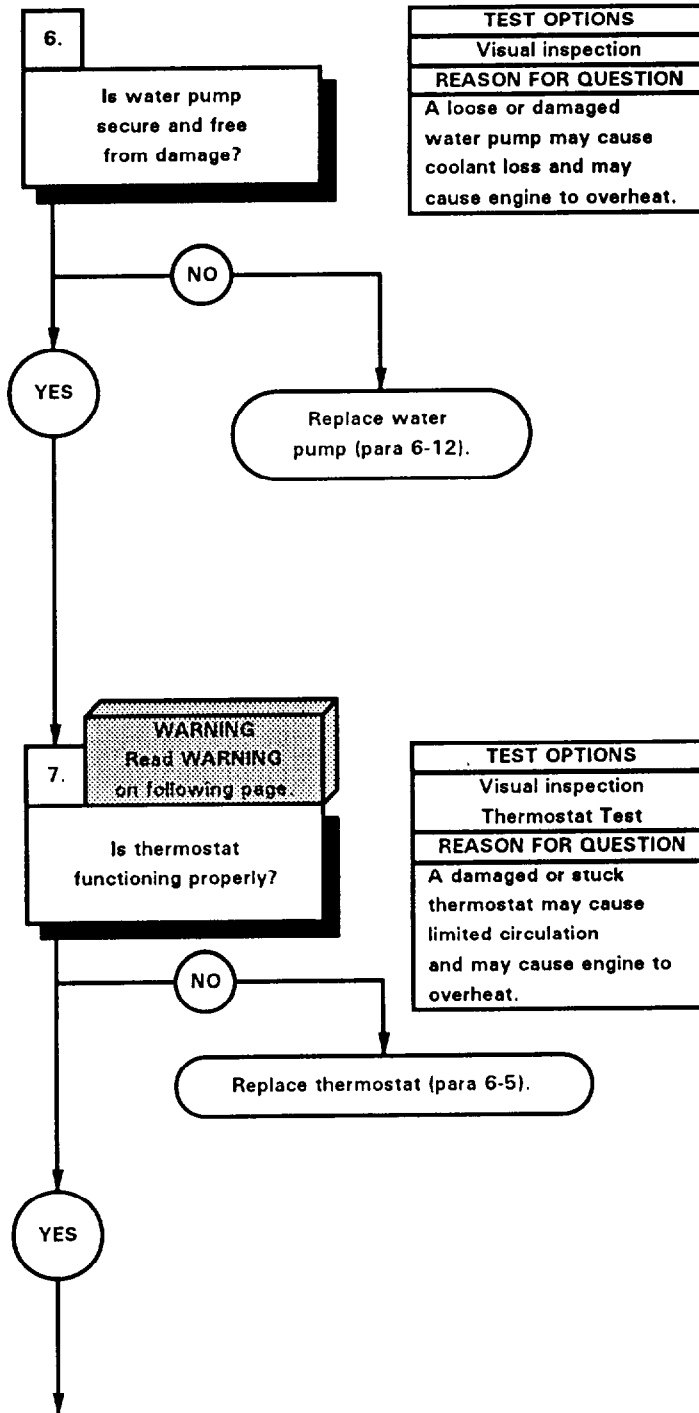


X2D0105 -

d1. ENGINE OVERHEATS (CONT)

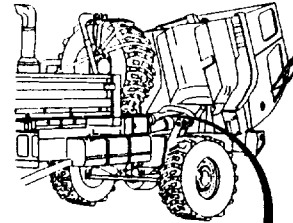
KNOWN INFO
Coolant level OK.
Radiator core free of debris.
Upper and lower coolant hoses OK.
Radiator cap OK.
Radiator overflow tank and hoses OK.
Temperature sending unit and gage OK.
Radiator OK.
Cooling system pressure OK.
Fan shroud OK.
Charge air cooler OK.
POSSIBLE PROBLEMS
Faulty water pump.
Faulty thermostat.
Faulty fan clutch.

KNOWN INFO
Coolant level OK.
Radiator core free of debris.
Upper and lower coolant hoses OK.
Radiator cap OK.
Radiator overflow tank and hoses OK.
Temperature sending unit and gage OK.
Radiator OK.
Cooling system pressure OK.
Fan shroud OK.
Charge air cooler OK.
Water pump OK.
POSSIBLE PROBLEMS
Faulty thermostat.
Faulty fan clutch.



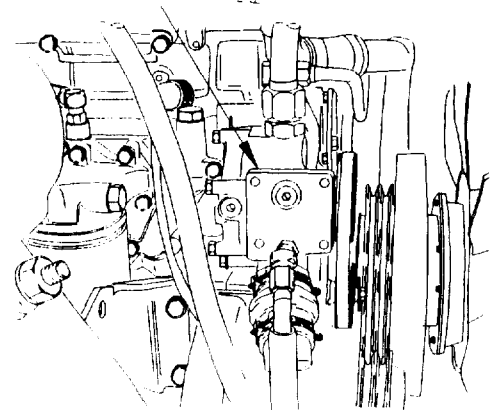


Check water pump for damage and loose or missing mounting hardware.



ALTERNATOR AND ALTERNATOR BRACKET REMOVED FOR CLARITY

WATER PUMP



**THERMOSTAT TEST**

**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.

- (1) Remove coolant hose from overflow tank to radiator (para 6-3).
- (2) Place coolant hose in drain pan lower than thermostat.
- (3) Start engine (TM 9-2320-365-10).

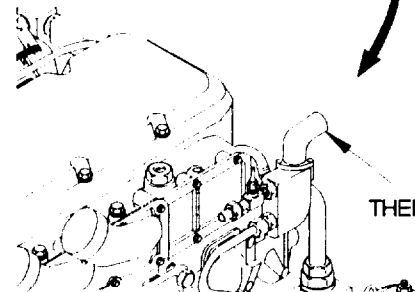
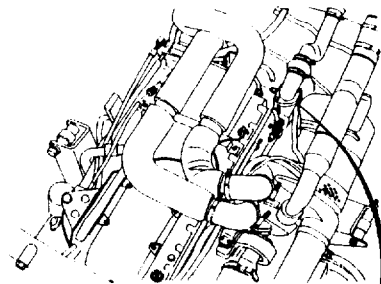
**WARNING**

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

**NOTE**

Coolant flowing constantly through return hose indicates closed thermostat.

- (4) Observe constant flow of coolant from coolant hose.
- (5) Shut down engine (TM 9-2320-365-10).
- (6) Install coolant hose on overflow tank (para 6-3).
- (7) Refill overflow tank to proper level (TM 9-2320-365-10).
- (8) Lower cab (TM 9-2320-365-10).

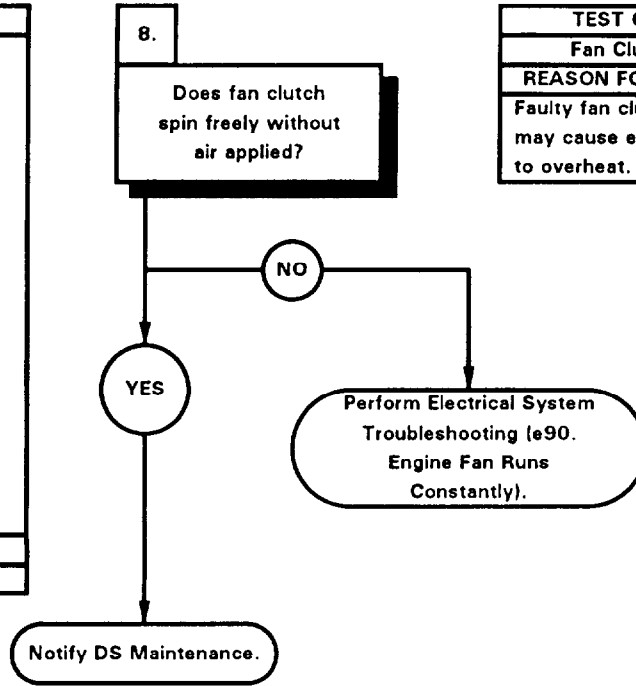


THERMOSTAT

\*2 D0106A

d1. ENGINE OVERHEATS (CONT)

KNOWN INFO
Coolant level OK.
Radiator core free of debris.
Upper and lower coolant hoses OK.
Radiator cap OK.
Radiator overflow tank and hoses OK.
Temperature sending unit and gage OK.
Radiator OK.
Cooling system pressure OK.
Fan shroud OK.
Charge air cooler OK.
Water pump OK.
Thermostat OK.
POSSIBLE PROBLEMS
Faulty fan clutch.



TEST OPTIONS
Fan Clutch Test
REASON FOR QUESTION
Faulty fan clutch may cause engine to overheat.

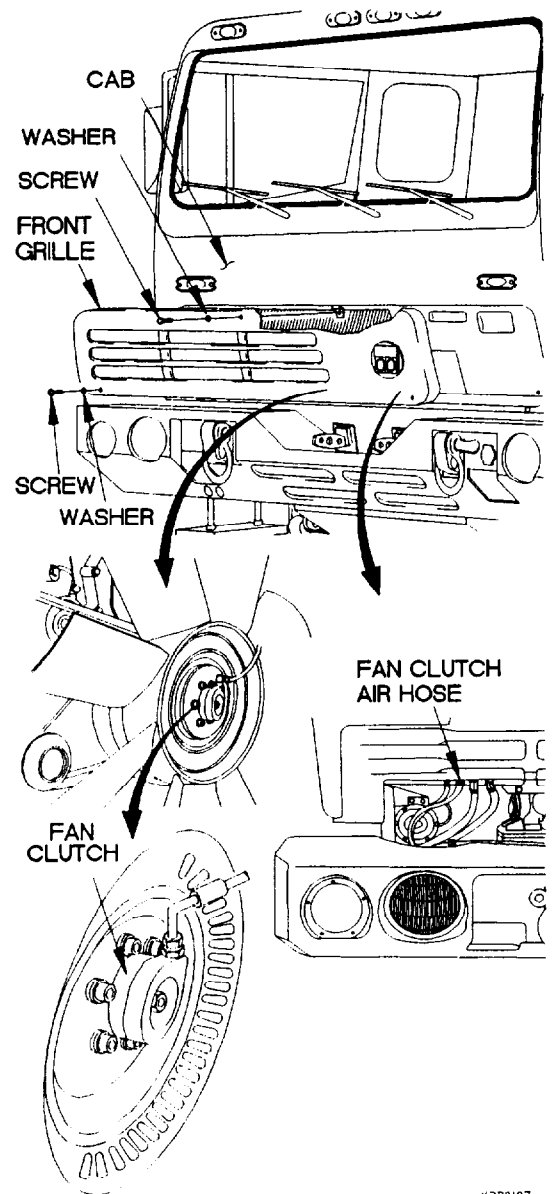
**FAN CLUTCH TEST**

- (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 air hose going to fan clutch.

**NOTE**

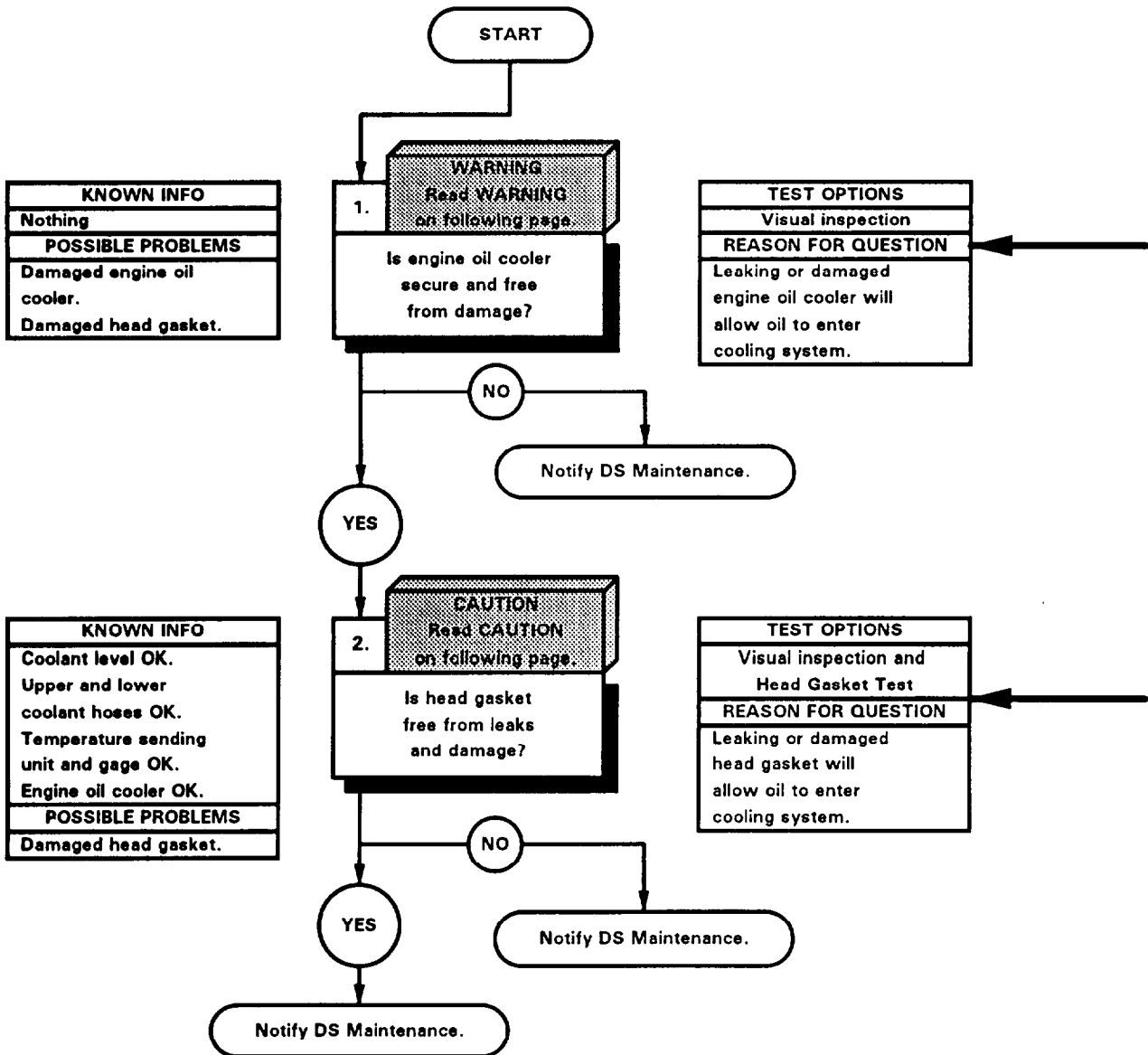
If fan clutch turns freely, fan clutch is defective.

- (4) Ensure fan clutch does not turn freely.
- (6) Connect air hose going to fan clutch.
- (7) Start engine (TM 9-2320-365-10).
- (8) Check for leaks in air hose.
- (9) Shut down engine (TM 9-2320-365-10).
- (10) Position front grille on cab with washer and nut.
- (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).



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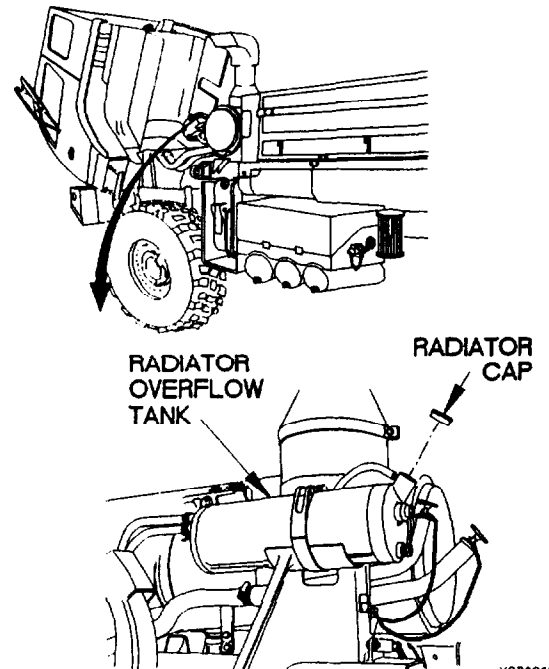
d2. OIL IN COOLING SYSTEM	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) Adapter, Radiator (Item 1, Appendix B) Pressure Tester, Radiator (Item 26, Appendix C)



**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.

- (1) Raise cab (TM 9-2320-365-10).
- (2) Check engine oil cooler for leaks and damage.



X2D0202A

Check head gasket area for obvious signs of leaks and damage.

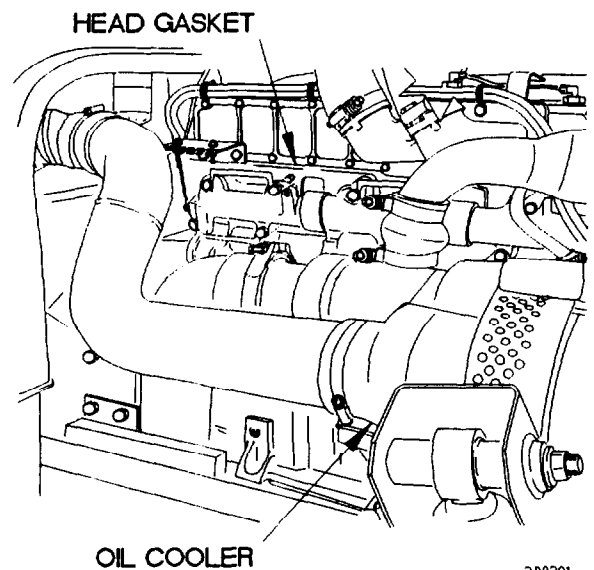
**HEAD GASKET TEST**

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

**CAUTION**

Do not pressurize over 16 psi (110 kPa). Failure to comply may result in damage to cooling system.

- (4) Pressurize cooling system to 15 psi (103 kPa) and check cylinder head for leaks.
- (5) Release pressure and remove pressure tester from adapter.
- (6) Remove adapter from radiator overflow tank.
- (7) Install radiator cap on radiator overflow tank.
- (8) Lower cab (TM 9-2320-365-10).



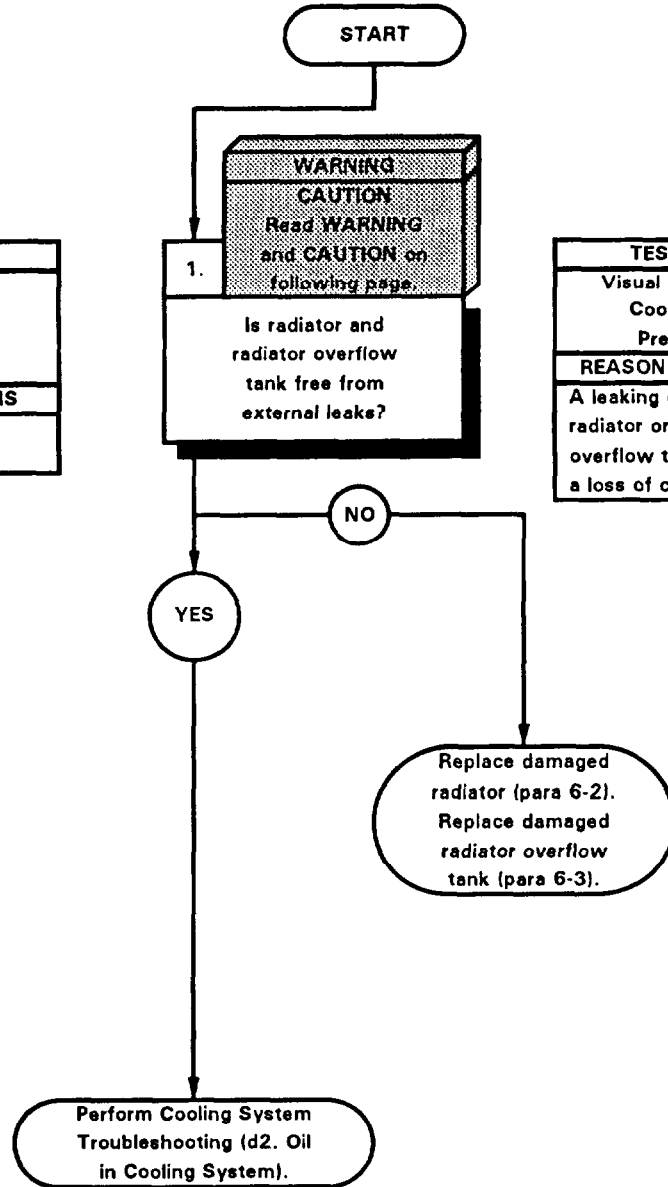
-200201-

d3. LOSS OF COOLANT

<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) Adapter, Radiator (Item 1, Appendix B) Pressure Tester, Radiator (Item 26, Appendix C)

<b>KNOWN INFO</b>
All coolant hoses and connections OK. Water pump OK. Radiator cap OK.
<b>POSSIBLE PROBLEMS</b>
Faulty radiator or radiator overflow tank.

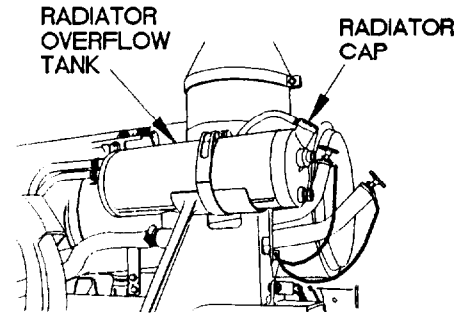
<b>TEST OPTIONS</b>
Visual inspection and Cooling System Pressure Test
<b>REASON FOR QUESTION</b>
A leaking or damaged radiator or radiator overflow tank will cause a loss of coolant.



**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.

- (1) Raise cab (TM 9-2320-365-10).
- (2) Check radiator and radiator overflow tank for leaks and damage.
- (3) Lower cab (TM 9-2320-365-10).



**COOLING SYSTEM PRESSURE TEST**

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

**CAUTION**

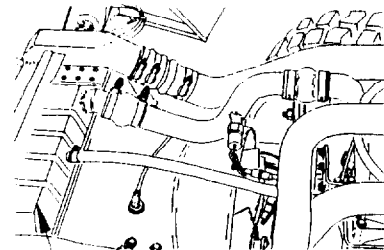
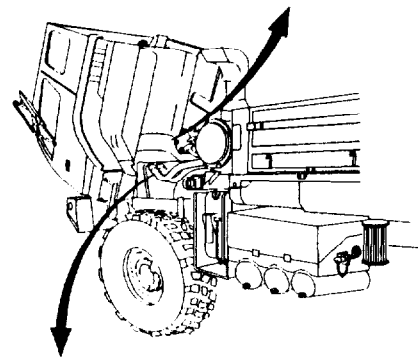
Do not pressurize over 16 psi (110 kPa). Failure to comply may result in damage to cooling system.

- (4) Pressurize radiator overflow tank, using tester, to 15 psi.
- (5) Observe radiator and radiator overflow tank for coolant leaks.

**NOTE**

Pressure loss without external leaks indicates internal coolant leaks.

- (6) Observe radiator tester for loss of pressure.
- (7) Remove pressure tester and adapter from radiator overflow tank.
- (8) Install radiator cap on radiator overflow tank.



RADIATOR

X200301-

## 2-16. ELECTRICAL SYSTEM TROUBLESHOOTING

This paragraph covers Electrical System Troubleshooting. The Electrical System Fault Index, Table 2-7, lists faults for the electrical system of the vehicle.

**Table 2-7. Electrical System Fault Index**

Fault No.	Description	Page
e1.	Circuit breaker does not operate . . . . .	2-150
e2.	Engine does not crank/24 vdc circuits do not operate . . . . .	2-154
e3.	12 vdc and/or 24 vdc circuits do not operate . . . . .	2-254
e4.	12 vdc circuits do not operate (100 amp alternator) . . . . .	2-258
e5.	12 vdc circuits do not operate (200 amp alternator) . . . . .	2-276
e6.	Engine cranks but does not start . . . . .	2-300
e7.	Fuel level gage does not operate or is inaccurate . . . . .	2-308
e8.	Water temperature gage does not operate or is inaccurate . . . . .	2-314
e9.	Rear brake air pressure gage does not operate or is inaccurate . . . . .	2-318
e10.	Front brake air pressure gage does not operate or is inaccurate . . . . .	2-322
e11.	Engine oil pressure gage does not operate or is inaccurate . . . . .	2-326
e12.	Speedometer does not operate or is inaccurate . . . . .	2-332
e13.	Volts gage does not operate or is inaccurate . . . . .	2-346
e14.	Tachometer does not operate or is inaccurate . . . . .	2-348
e15.	Audible alarm does not operate (all models except M1078/M1081) . . . . .	2-358
e16.	Audible alarm does not operate (models M1078/M1081) . . . . .	2-362
e17.	Lamp test switch does not illuminate . . . . .	2-372
e18.	Instrument panel switch does not illuminate . . . . .	2-378
e19.	Instrument panel gage does not illuminate . . . . .	2-382
e20.	Auxiliary panel, personnel heater, and instrument panel do not illuminate . . . . .	2-386
e21.	Tachometer does not illuminate . . . . .	2-390
e22.	Auxiliary panel switch does not illuminate . . . . .	2-394
e23.	Auxiliary panel does not illuminate . . . . .	2-398
e24.	High engine temperature indicator does not operate . . . . .	2-402
e25.	CTIS overspeed indicator does not operate . . . . .	2-410
e26.	Chemical detector indicator does not operate . . . . .	2-424
e27.	Left turn signal indicator does not operate . . . . .	2-428
e28.	Right turn signal indicator does not operate . . . . .	2-432
e29.	Turn signal indicators and high beams on indicator do not operate . . . . .	2-438
e30.	High beams indicator does not operate . . . . .	2-440
e31.	Parking brake indicator and/or emergency brake indicator does not operate . . . . .	2-444
e32.	PTO indicator does not operate . . . . .	2-460
e33.	Fan off indicator does not operate . . . . .	2-472
e34.	WTEC II Transmission temperature indicator does not operate . . . . .	2-478
e35.	WTEC III Transmission temperature indicator does not operate . . . . .	2-486
e36.	Front brake air indicator does not operate . . . . .	2-492
e37.	Rear brake air indicator does not operate . . . . .	2-498
e38.	Engine oil pressure indicator does not operate . . . . .	2-504
e39.	Master stop indicator does not operate . . . . .	2-510
e40.	One or both headlights (high and low beams) do not illuminate . . . . .	2-512
e41.	One or both headlight low beams do not illuminate . . . . .	2-520
e42.	One or both headlight high beams do not illuminate . . . . .	2-526
e43.	Parking lights do not illuminate . . . . .	2-534



**2-16. ELECTRICAL SYSTEM TROUBLESHOOTING (CONT)**

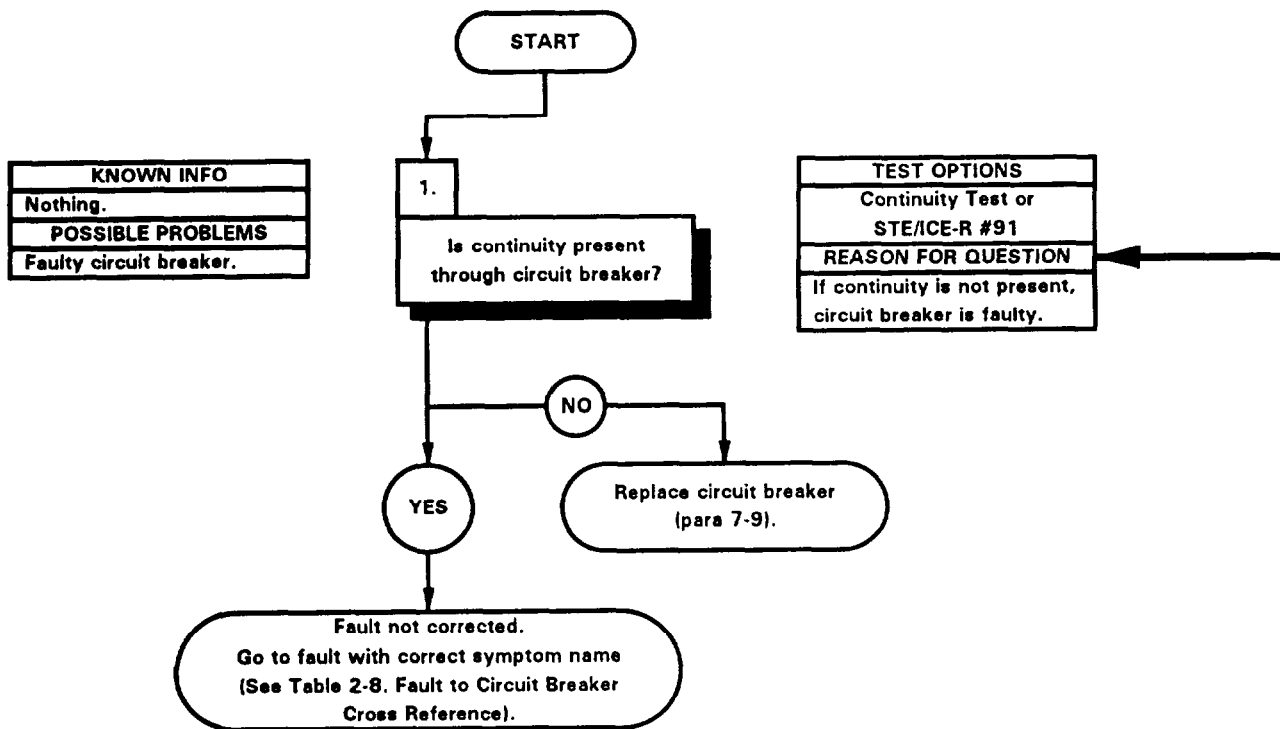
*Table 2-7. Electrical System Fault Index (Cont)*

Fault No.	Description	Page
e44.	LH door and/or LH front marker lights do not illuminate . . . . .	2-542
e45.	RH door and/or RH front marker lights do not illuminate . . . . .	2-552
e46.	One or more cab top marker lights do not illuminate . . . . .	2-562
e47.	Side and/or rear marker lights do not illuminate . . . . .	2-576
e48.	One or both composite lights do not illuminate . . . . .	2-586
e49.	One or both front blackout marker lights do not illuminate . . . . .	2-596
e50.	Blackout drive light does not illuminate . . . . .	2-606
e51.	One or both rear blackout marker lights do not illuminate . . . . .	2-616
e52.	Warning light does not illuminate . . . . .	2-626
e53.	Backup light does not illuminate . . . . .	2-638
e54.	Blackout marker lights do not illuminate . . . . .	2-676
e55.	Rear hazard lights do not operate . . . . .	2-678
e56.	Front and rear hazard lights do not operate . . . . .	2-680
e57.	Front and rear turn signals do not operate . . . . .	2-690
e58.	Left or right front turn signals do not operate . . . . .	2-702
e59.	One or both stoplights do not operate . . . . .	2-710
e60.	One or both blackout stoplights do not operate . . . . .	2-728
e61.	Stoplights and blackout stoplights do not operate . . . . .	2-740
e62.	Trailer marker/taillights do not operate . . . . .	2-750
e63.	Trailer right stop/turn light does not operate . . . . .	2-760
e64.	Trailer left stop/turn light does not operate . . . . .	2-770
e65.	Trailer blackout marker lights do not illuminate . . . . .	2-780
e66.	Trailer blackout stoplights do not illuminate . . . . .	2-790
e67.	Intervehicle clearance lights do not operate . . . . .	2-800
e68.	Intervehicle left turn signal does not operate . . . . .	2-804
e69.	Intervehicle right turn signal does not operate . . . . .	2-810
e70.	Intervehicle stoplights do not operate . . . . .	2-816
e71.	Intervehicle taillights do not operate . . . . .	2-822
e72.	Personnel heater control illumination does not operate . . . . .	2-826
e73.	Personnel heater fan does not operate . . . . .	2-832
e74.	Windshield washer does not operate . . . . .	2-838
e75.	Windshield wiper does not operate on low speed . . . . .	2-850
e76.	All windshield wiper speeds do not operate . . . . .	2-858
e77.	Windshield wiper does not operate on intermittent speed . . . . .	2-864
e78.	Windshield wiper does not operate on high speed . . . . .	2-874
e79.	Horn does not operate . . . . .	2-880
e80.	Chemical alarm does not operate . . . . .	2-892
e81.	Chemical detector does not operate . . . . .	2-900
e82.	CTIS does not operate . . . . .	2-906
e83.	CTIS does not inflate tires . . . . .	2-920
e84.	CTIS does not deflate tires . . . . .	2-930
e85.	11K Self-recovery winch (SRW) does not reel in or pay out . . . . .	2-940
e86.	11K Self-recovery winch (SRW) does not reel in . . . . .	2-946
e87.	11K Self-recovery winch (SRW) does not pay out . . . . .	2-958
e88.	PTO does not operate . . . . .	2-970
e89.	Electrical system does not maintain a charge . . . . .	2-1010

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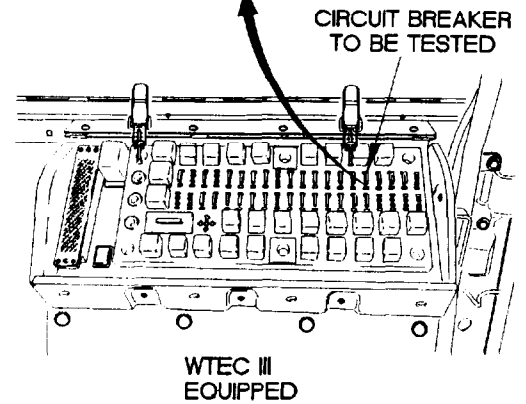
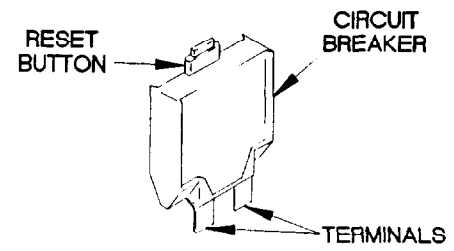
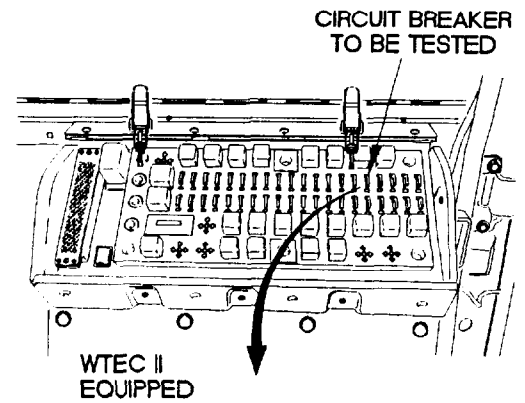
Fault No.	Description	Page
e90.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) illumination does not dim...	2-1018
e91.	Engine fan runs constantly .....	2-1028
e92.	Engine fan does not turn off using deep water fording switch .....	2-1036
e93.	Ether start does not operate .....	2-1044
e94.	Excessive condensation in fuel .....	2-1060
e95.	Radio does not operate .....	2-1064
e96.	Start inhibit pushbutton does not operate .....	2-1070
e97.	Air dryer does not operate .....	2-1076
e98.	Battery tester does not operate .....	2-1082

●1. CIRCUIT BREAKER DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>References</b> TM 9-4910-571-12&P	



**CONTINUITY TEST**

- (1) Remove power distribution panel (PDP) cover (para 16-2).
- (2) Locate circuit breaker to be tested on PDP (see Table 2-8. Fault to Circuit Breaker Cross Reference).
- (3) Check reset button on circuit breaker. If button is up (circuit breaker tripped), press button to reset.
- (4) Remove circuit breaker to be tested from PDP.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to one circuit breaker terminal.
- (7) Connect negative (-) probe of multimeter to other circuit breaker terminal and note reading on multimeter.
- (8) If continuity is not present, replace circuit breaker (para 7-9).
- (9) If continuity is present, fault not corrected. Go to fault with correct symptom name (see Table 2-8. Fault to Circuit Breaker Cross Reference).
- (10) Install tested circuit breaker in PDP.
- (11) Install PDP cover (para 16-2).



x2E010J1

e1. CIRCUIT BREAKER DOES NOT OPERATE (CONT)

TABLE 2-8. FAULT TO CIRCUIT BREAKER CROSS REFERENCE

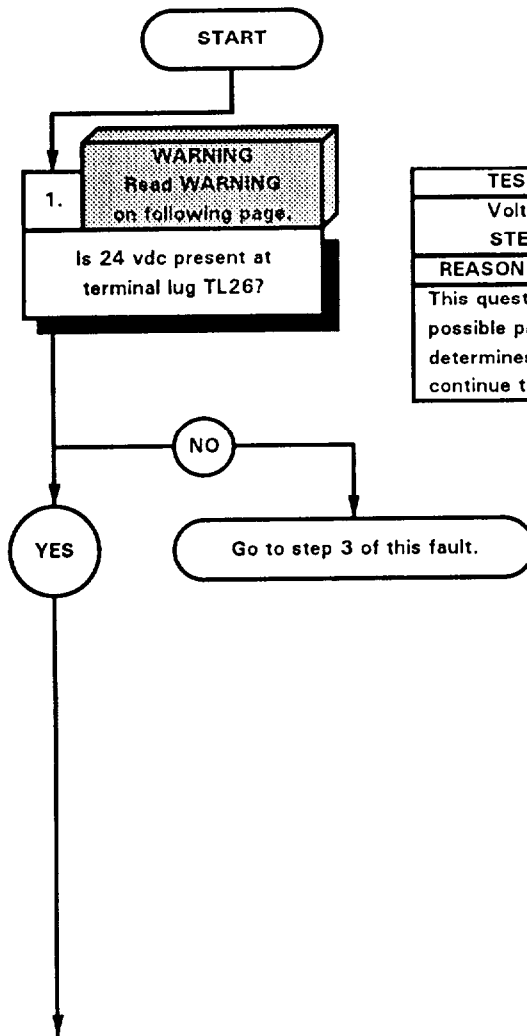
SYMPTOM	CIRCUIT BREAKER
e2. Engine does not crank/24 vdc circuits do not operate.	CB21, CB70, CB77, CB95
e6. Engine cranks but does not start.	CB35, CB79
e7. Fuel level gage does not operate or is inaccurate.	CB77
e8. Water temperature gage does not operate or is inaccurate.	CB77
e9. Rear brake air pressure gage does not operate or is inaccurate.	CB77
e10. Front brake air pressure gage does not operate or is inaccurate.	CB77
e11. Engine oil pressure gage does not operate or is inaccurate.	CB77
e12. Speedometer does not operate or is inaccurate.	CB77
e13. Volts gage does not operate or is inaccurate.	CB77
e14. Tachometer does not operate or is inaccurate.	CB77
e15. Audible alarm does not operate (all models except M1078/M1081).	CB35, CB79
e16. Audible alarm does not operate (models M1078/M1081).	
e18. Instrument panel gage does not illuminate.	CB77
e19. Instrument panel switch does not illuminate.	CB77
e20. Auxillary panel, instrument panel, and personnel heater do not illuminate.	CB23
e21. Tachometer does not illuminate.	CB23
e22. Auxillary panel switch does not illuminate.	CB23
e23. Auxillary panel does not illuminate.	CB23
e24. High engine temperature indicator does not operate.	CB77
e25. CTIS overspeed indicator does not operate.	CB40
e26. Chemical detector indicator does not operate.	CB30
e27. Left turn signal indicator does not operate.	CB74
e28. Right turn signal indicator does not operate.	CB74
e29. Turn signal indicators and high beams on indicator do not operate.	CB61, CB62, CB74
e30. High beams indicator does not operate.	CB74
e31. Parking brake indicator and/or emergency brake indicator does not operate.	CB74
e32. PTO indicator does not operate.	CB49
e33. Fan off indicator does not operate.	CB22
e34. WTEC II transmission temperature indicator does not operate.	CB50
e35. WTEC III transmission temperature indicator does not operate.	
e36. Front brake air indicator does not operate.	CB77
e37. Rear brake air indicator does not operate.	CB77
e38. Engine oil pressure indicator does not operate.	CB77
e39. Master stop indicator does not operate.	CB77
e40. One or both headlights (high and low beams) do not illuminate.	CB61, CB62, CB63, CB64
e41. One or both headlight low beams do not illuminate.	CB63, CB64
e42. One or both headlight high beams do not illuminate.	CB61, CB62/CB76, CB43
e43. Parking lights do not illuminate.	CB65

TABLE 2-8. FAULT TO CIRCUIT BREAKER CROSS REFERENCE (CONT)

SYMPTOM	CIRCUIT BREAKER
e44. LH door and/or LH front marker lights do not illuminate.	CB67
e45. RH door and/or RH front marker lights do not illuminate.	CB67
e46. One or more cab top marker lights do not illuminate.	CB67
e47. Side and/or rear marker lights do not illuminate.	CB67
e48. One or both composite lights do not illuminate.	CB43, CB44, CB67
e49. One or both front blackout marker lights do not illuminate.	CB66
e50. Blackout drive light does not illuminate.	CB54, CB66
e51. One or both rear blackout markers do not illuminate.	CB66
e52. Warning light does not illuminate.	CB38
e53. Backup light does not illuminate.	CB73
e54. Blackout marker lights do not illuminate.	CB66
e55. Rear hazard lights do not operate.	CB71
e56. Front and rear hazard lights do not illuminate.	CB71
e57. Front and rear turn signals do not operate.	CB74
e58. Left or right front turn signal does not operate.	CB74
e59. One or both stoplights do not operate.	CB43, CB44, CB67
e60. One or both blackout stoplights do not operate.	CB76
e61. Stoplights and blackout stoplights do not operate.	CB76
e72. Personnel heater illumination does not operate.	CB23
e73. Personnel heater fan does not operate.	CB23
e74. Windshield washer does not operate.	CB54
e75. Windshield wiper does not operate on low speed.	CB37
e76. All windshield wiper speeds do not operate.	CB37
e77. Windshield wiper does not operate on intermittent speed.	CB37
e78. Windshield wiper does not operate on high speed.	CB37
e79. Horn does not operate.	CB36
e80. Chemical alarm does not operate.	CB30
e81. Chemical detector does not operate.	CB30
e82. CTIS does not operate.	CB40
e83. CTIS does not inflate tires.	CB40
e84. CTIS does not deflate tires.	CB40
e85. 11K Self-recovery winch (SRW) does not reel in or pay out.	CB49
e86. 11K Self-recovery (SRW) winch does not reel in.	CB49
e87. 11K Self-recovery winch (SRW) does not pay out.	CB49
e88. PTO does not operate.	CB49
e89. Electrical system does not maintain a charge.	CB77
e90. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) illumination does not dim.	CB77
e91. Engine fan runs constantly.	CB22
e92. Engine fan does not turn off using deep water fording switch.	CB22
e93. Ether start does not operate.	CB22
e94. Excessive condensation in fuel.	CB79
e95. Radio does not operate.	CB20
e96. Start inhibit pushbutton does not operate.	CB79

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10). Cab raised (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Ties, Cable, Plastic (Item 77, Appendix D)	

KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral.
POSSIBLE PROBLEMS
Faulty starting motor. Faulty start and charging cable assembly. Faulty battery cable. Faulty starter to chassis ground cable. Faulty starter to shunt 24 vdc cable. Faulty shunt. Faulty 100 amp reverse polarity relay. Faulty 100 amp reverse polarity relay to PDP 24 vdc cable. Faulty dashboard cable assembly. Faulty relay K2. Faulty terminal board. Faulty WTEC II VIM. Faulty relay K1. Faulty relay K24. Faulty diode D3B. Faulty starter pushbutton. Faulty auxiliary starter solenoid.



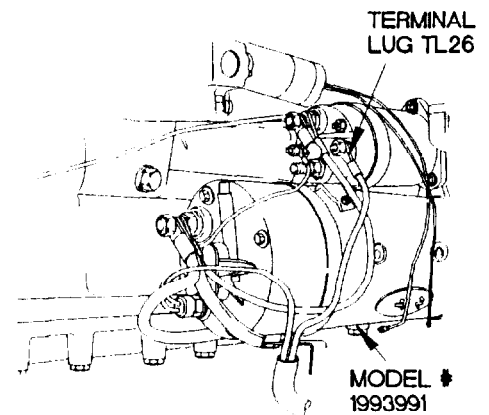
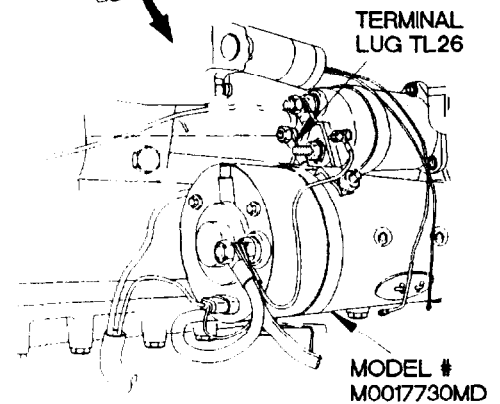
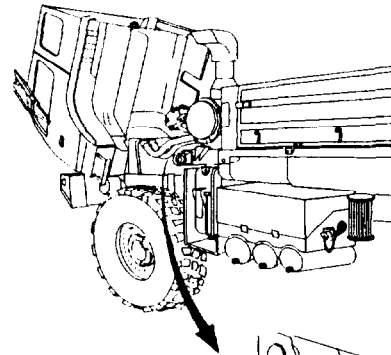
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
This question eliminates possible problems and determines where to continue troubleshooting.

**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 TL26.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Press starter pushbutton (TM 9-2320-365-10) 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 9-2320-365-10).

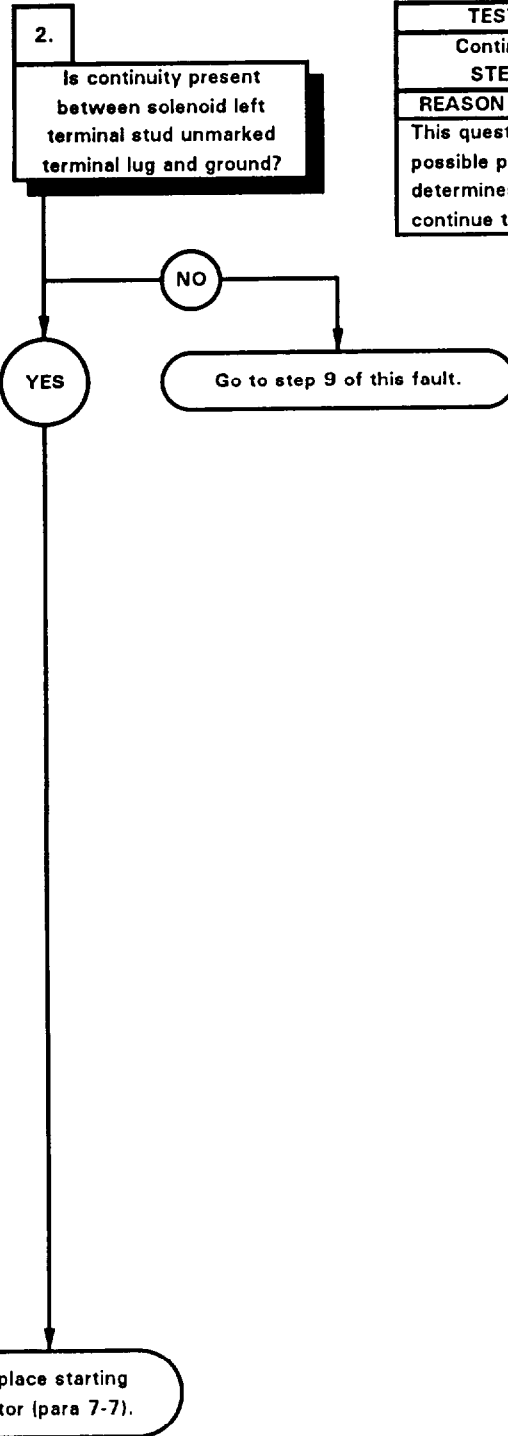


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e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

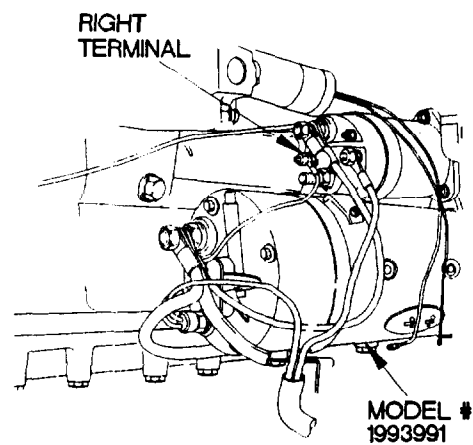
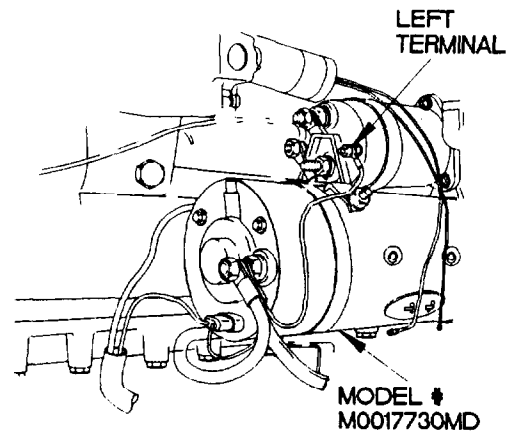
KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral.
POSSIBLE PROBLEMS
Faulty starting motor. Faulty start and charging cable assembly. Faulty battery cable. Faulty starter to chassis ground cable. Faulty starter to shunt 24 vdc cable. Faulty shunt. Faulty 100 amp reverse polarity relay. Faulty 100 amp reverse polarity relay to PDP 24 vdc cable. Faulty dashboard cable assembly. Faulty relay K2. Faulty terminal board. Faulty WTEC II VIM. Faulty relay K1. Faulty relay K24. Faulty diode D3B. Faulty starter pushbutton. Faulty auxiliary starter solenoid.



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

**CONTINUITY TEST**

- (1) Disconnect batteries (para 7-48).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to solenoid left (starting motor M0017730MD) or solenoid right (starting motor 1993991) terminal stud unmarked terminal lug.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, go to step 9 of this fault.
- (6) If continuity is present, replace starting motor (para 7-7).



X2E0202A

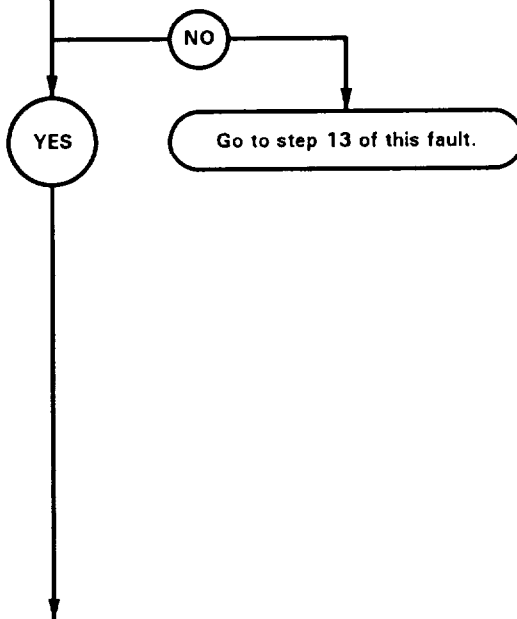
e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral. Starting motor OK. Starter to chassis ground cable OK. Starter to shunt 24 vdc cable OK. Shunt OK.
POSSIBLE PROBLEMS
Faulty battery cable. Faulty 100 amp reverse polarity relay. Faulty 100 amp reverse polarity relay to PDP 24 vdc cable. Faulty dashboard cable assembly. Faulty relay K2. Faulty terminal board. Faulty WTEC II VIM. Faulty start and charging cable assembly. Faulty relay K1. Faulty relay K24. Faulty diode D3B. Faulty starter pushbutton. Faulty auxiliary starter solenoid.

3. **WARNING**  
 Read **WARNING** on following page.

Is 24 vdc present at relay K1 terminal 86?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
This question eliminates possible problems and determines where to continue troubleshooting.

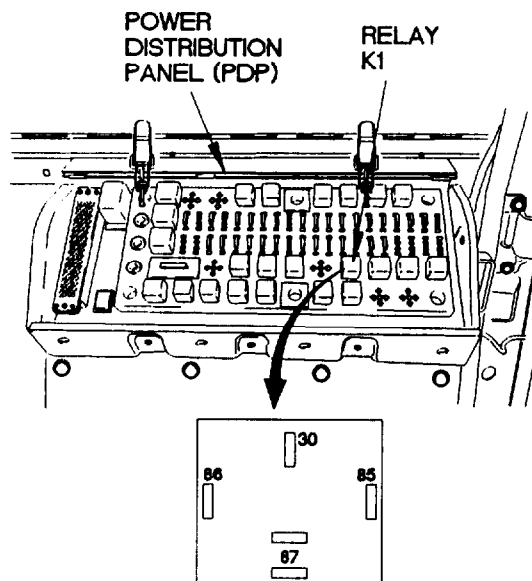


**WARNING**

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 9-2320-365-10).
- (2) Remove Power Distribution Panel (PDP) cover (para 16-2).
- (3) Remove relay K1 from PDP.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to PDP terminal 86, where relay K1 was removed.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, go to step 13 of this fault.
- (9) Position master power switch to off (TM 9-2320-365-10).
- (10) Install relay K1 in PDP.

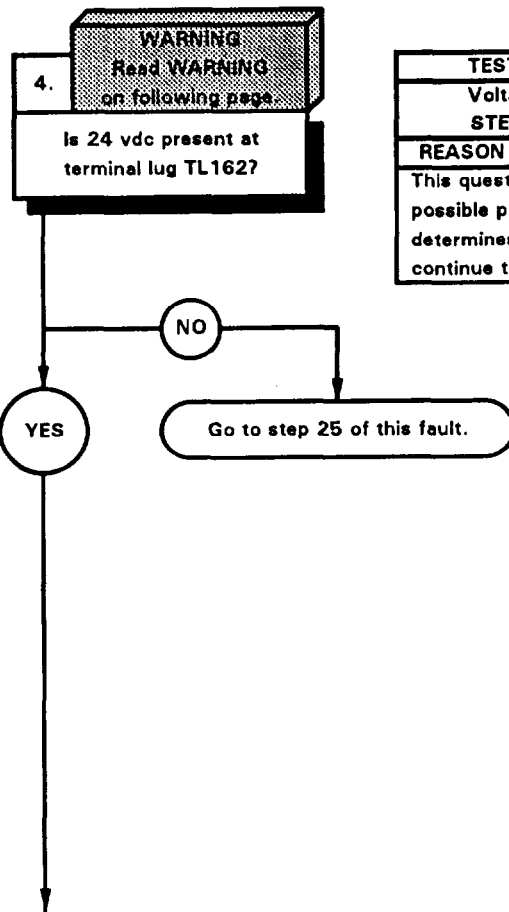


RELAY K1 CAVITY

x2E02031

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
Terminal board OK.
WTEC II VIM OK.
POSSIBLE PROBLEMS
Faulty start and charging cable assembly.
Faulty battery cable.
Faulty relay K1.
Faulty dashboard cable assembly.
Faulty relay K24.
Faulty diode D3B.
Faulty starter pushbutton.
Faulty auxiliary starter solenoid.



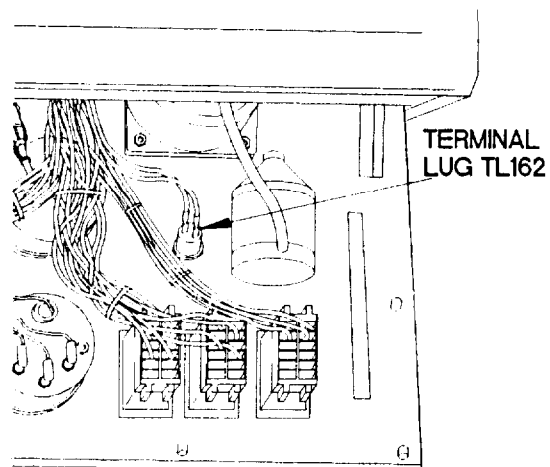
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
This question eliminates possible problems and determines where to continue troubleshooting.

**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**

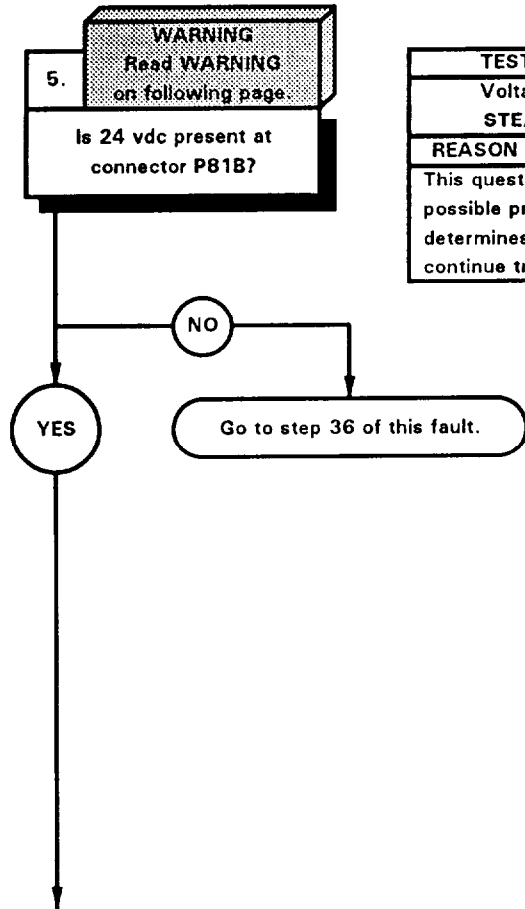
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to terminal lug TL162.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 25 of this fault.
- (7) Position master power switch to off (TM 9-2320-365-10).



X2E0204A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
Terminal board OK.
WTEC II VIM OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
POSSIBLE PROBLEMS
Faulty start and charging cable assembly.
Faulty battery cable.
Faulty dashboard cable assembly.
Faulty relay K1.
Faulty auxiliary starter solenoid.



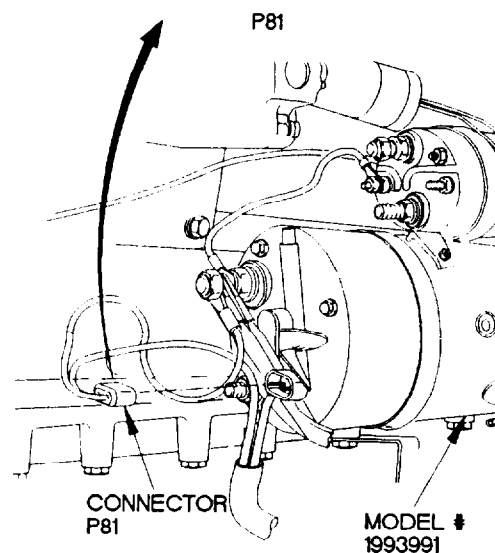
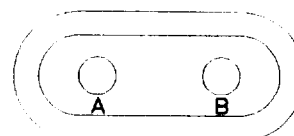
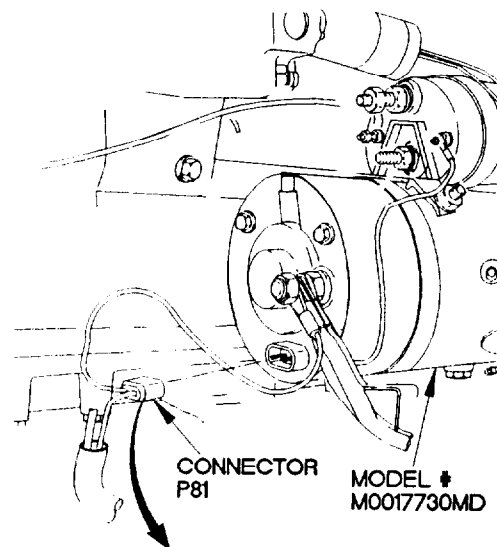
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
This question eliminates possible problems and determines where to continue troubleshooting.

**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 instrument panel assembly (para 7-15).
- (2) Disconnect connector P81 from starting motor.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector P81B.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Press starter pushbutton (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, go to step 36 of this fault.
- (9) Position master power switch to off (TM 9-2320-365-10).

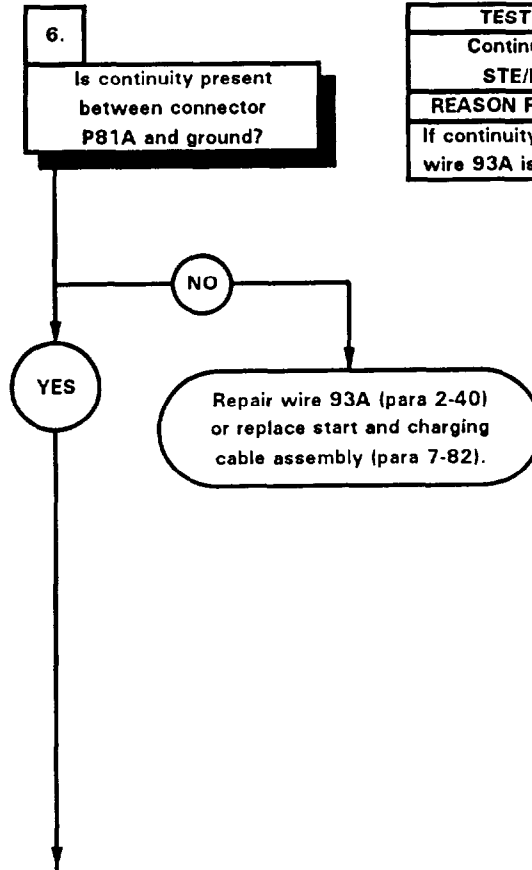


X2E0205A



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
Terminal board OK.
WTEC II VIM OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Dashboard cable assembly OK.
Relay K1 OK.
POSSIBLE PROBLEMS
Faulty start and charging cable assembly.
Faulty battery cable.
Faulty auxiliary starter solenoid.

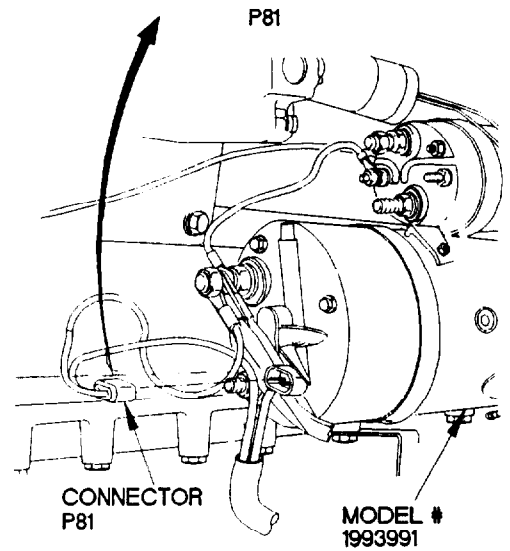
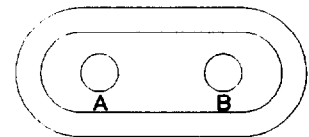
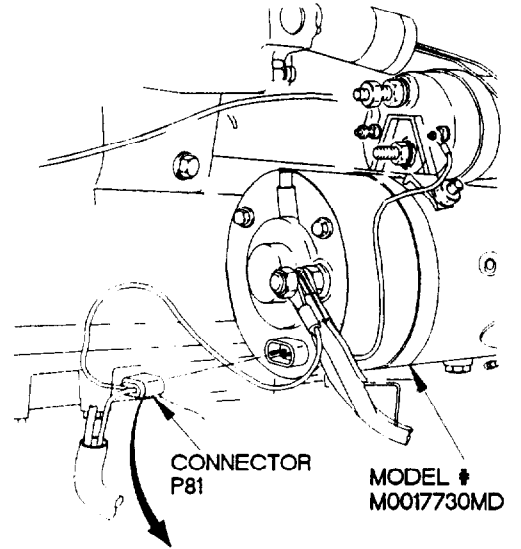


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 93A is faulty.



**CONTINUITY TEST**

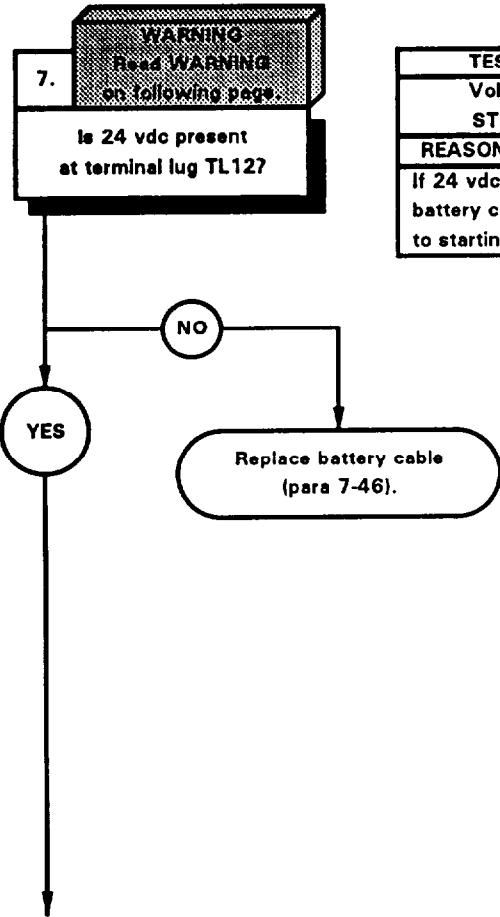
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P81A.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 93A (para 2-40) or replace start and charging cable assembly (para 7-82).
- (5) Connect connector P81 to starting motor.



x20202x

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
Terminal board OK.
WTEC II VIM OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Dashboard cable assembly OK.
Relay K1 OK.
POSSIBLE PROBLEMS
Faulty battery cable.
Faulty start and charging cable assembly.
Faulty auxiliary starter solenoid.



**WARNING**  
Read WARNING on following page.

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, battery cable from BT1-E1 to starting motor is faulty.



**WARNING**

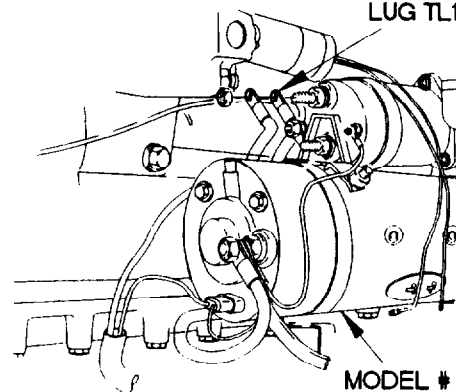
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Raise cab (TM 9-2320-365-10).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to terminal lug TL12.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, replace battery cable (para 7-46).
- (7) Position master power switch to off (TM 9-2320-365-10).

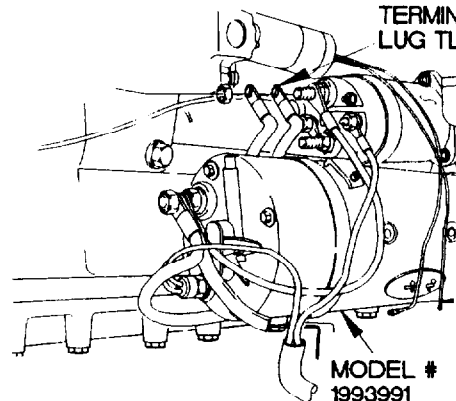
TERMINAL SHOWN  
EXPLODED FOR CLARITY

TERMINAL  
LUG TL12



MODEL #  
M0017730MD

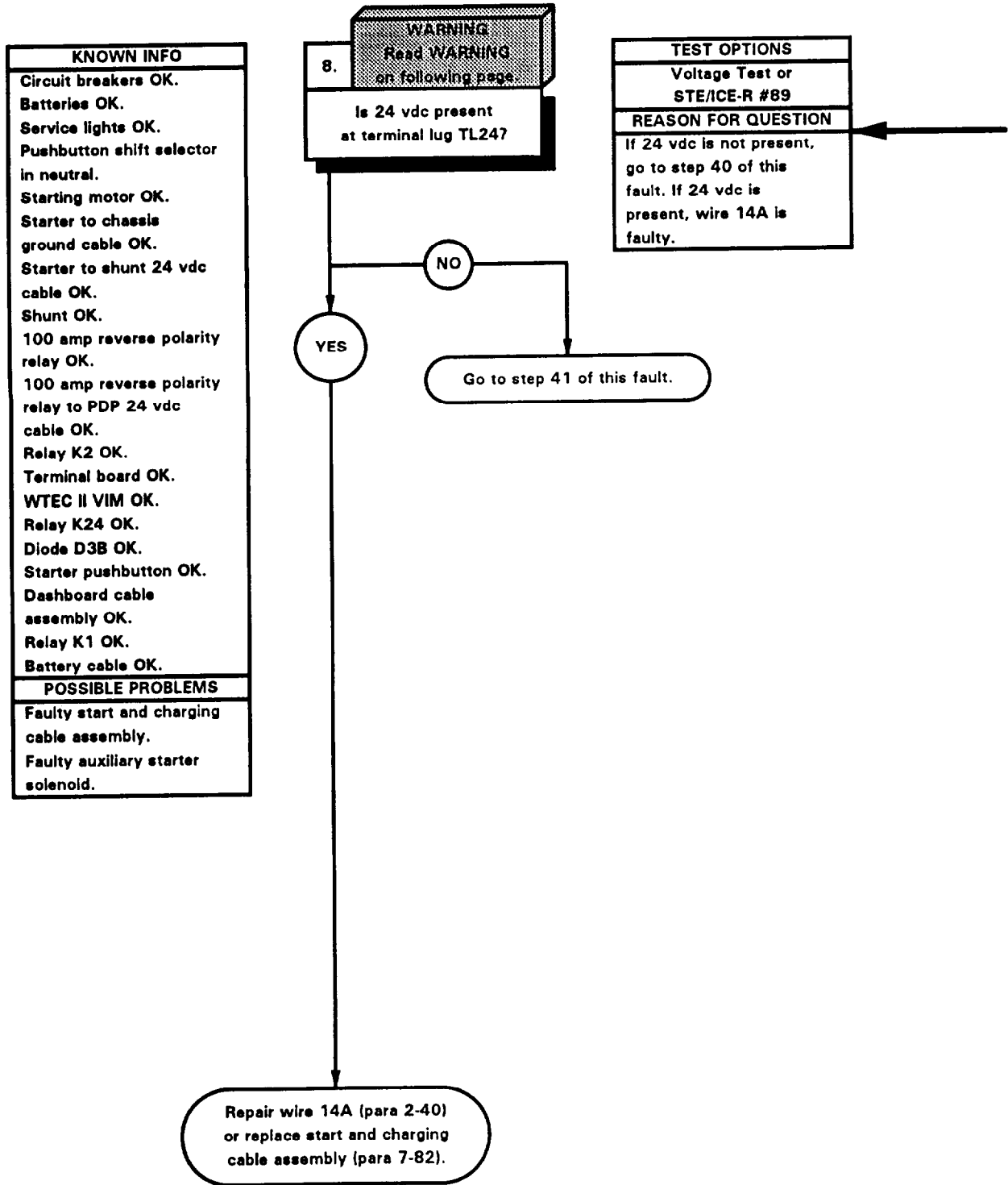
TERMINAL  
LUG TL12



MODEL #  
1993991

X2E0207A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

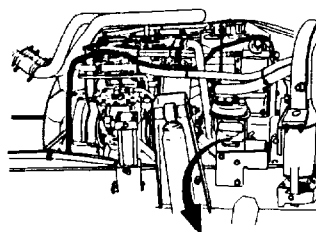


**WARNING**

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.

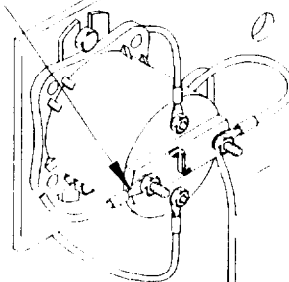
**CONTINUITY TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal lug TL24.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Press starter pushbutton (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 41 of this fault.
- (7) If 24 vdc is present, repair wire 14A (para 2-40) or replace start and charging cable assembly (para 7-82).
- (8) Position master power switch to off (TM 9-2320-365-10).
- (9) Lower cab (TM 9-2320-365-10).
- (10) Install PDP cover (para 16-2).



POWER STEERING PUMP RESERVOIR REMOVED FOR CLARITY

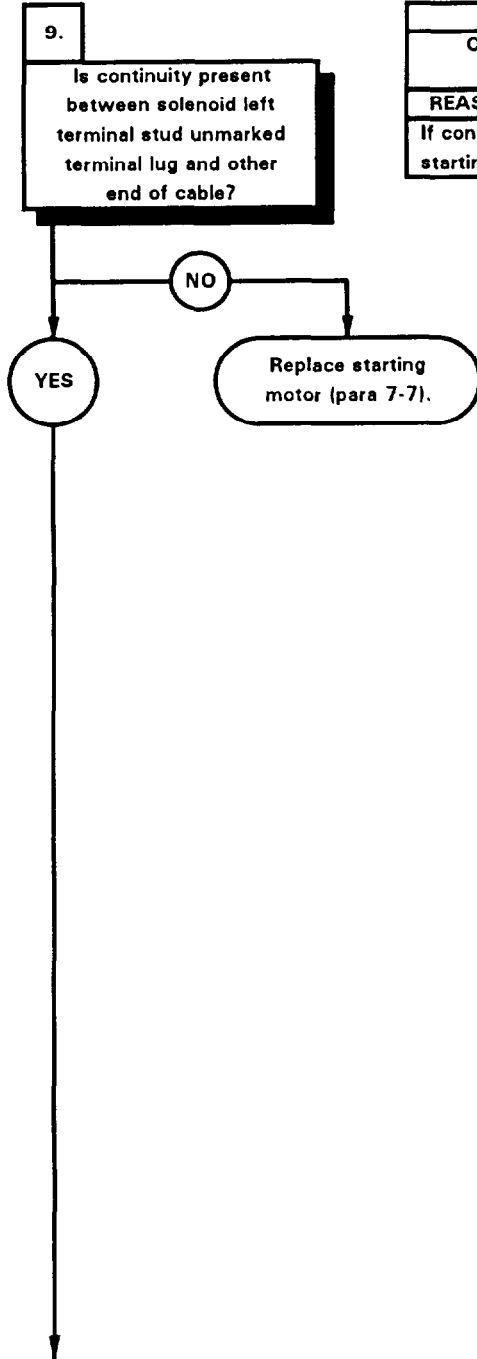
TERMINAL LUG TL24



X2E0208A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Start and charging cable assembly OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Dashboard cable assembly OK.
Relay K2 OK.
Terminal board OK.
WTEC II VIM OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
POSSIBLE PROBLEMS
Faulty starting motor.
Faulty starter to chassis ground cable.
Faulty starter to shunt 24 vdc cable.
Faulty battery cable.
Faulty shunt.

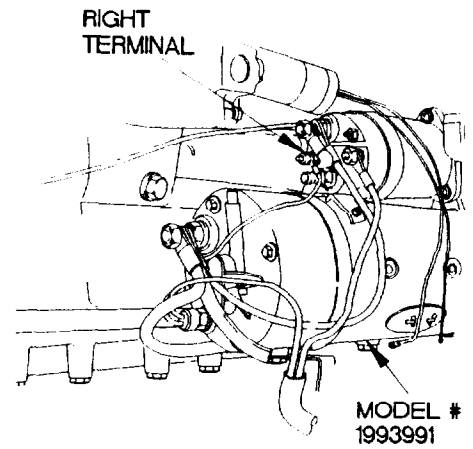
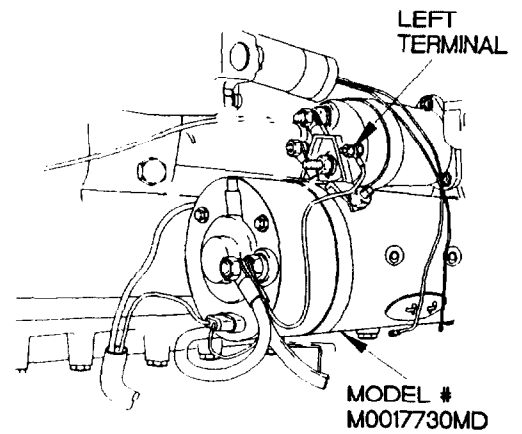


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, starting motor is faulty.



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to solenoid left (starting motor M0017730MD) or solenoid right (starting motor 1993991) terminal stud unmarked terminal lug.
- (3) Connect negative (-) probe of multimeter to other end of cable and note reading on multimeter.
- (4) If continuity is not present, replace starting motor (para 7-7).

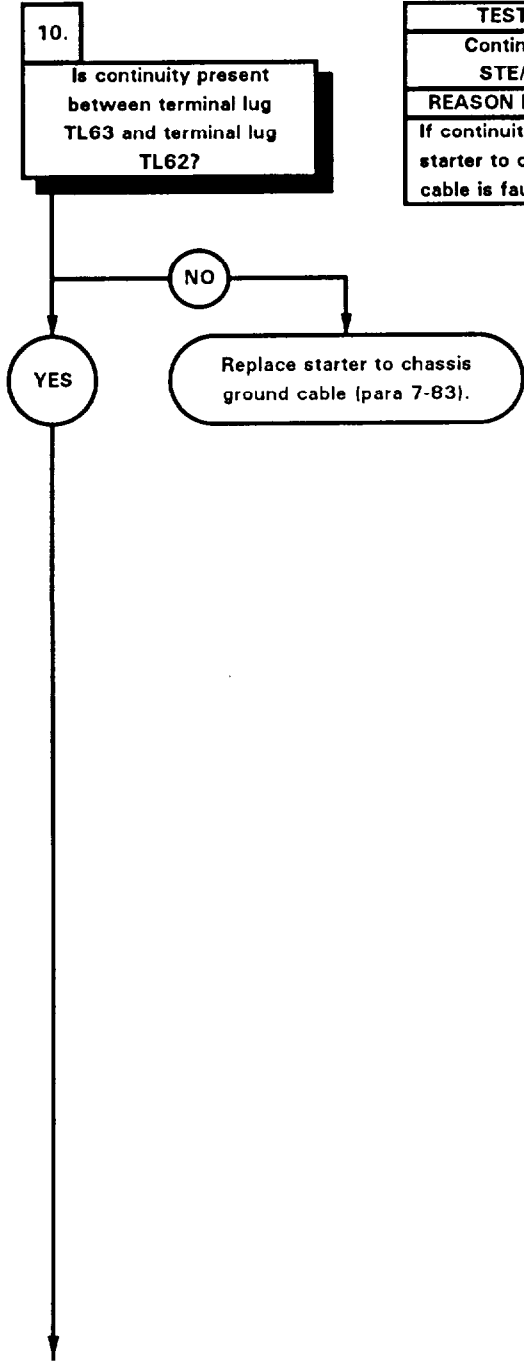


x2E0209A



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

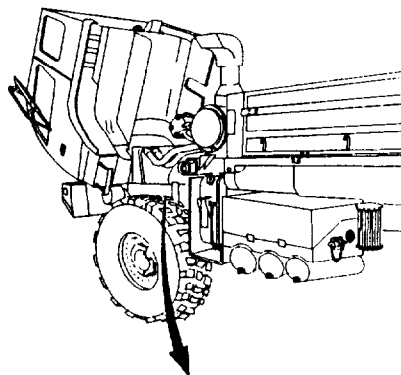
KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Start and charging cable assembly OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Dashboard cable assembly OK.
Relay K2 OK.
Terminal board OK.
WTEC II VIM OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Starting motor OK.
POSSIBLE PROBLEMS
Faulty starter to chassis ground cable.
Faulty starter to shunt 24 vdc cable.
Faulty battery cable.
Faulty shunt.



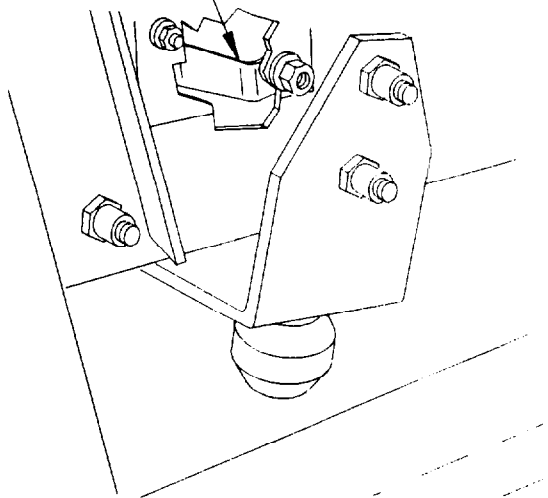
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, starter to chassis ground cable is faulty.

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal lug TL63.
- (3) Connect negative (-) probe of multimeter to terminal lug TL62 and note reading on multimeter.
- (4) If continuity is not present, replace starter to chassis ground cable (para 7-83).

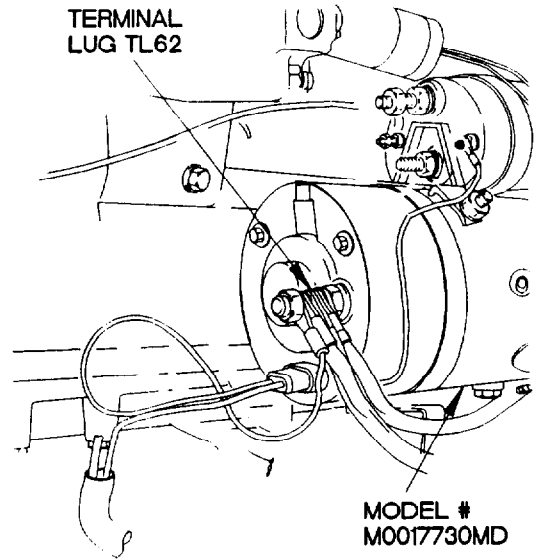


TERMINAL LUG TL63



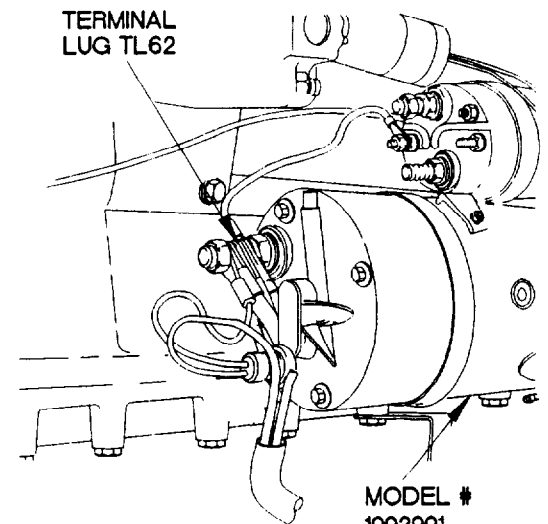
X2E0246A

TERMINAL LUG TL62



MODEL #  
M0017730MD

TERMINAL LUG TL62

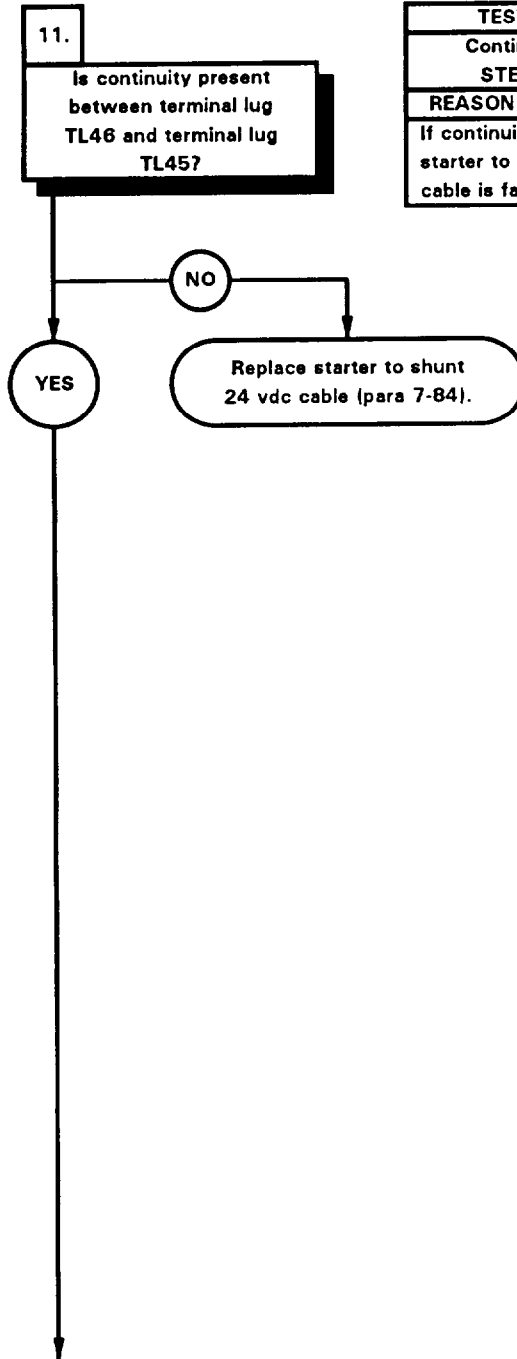


MODEL #  
1993991

X2E0210A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Start and charging cable assembly OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Dashboard cable assembly OK.
Relay K2 OK.
Terminal board OK.
WTEC II VIM OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Starting motor OK.
Starter to chassis ground cable OK.
POSSIBLE PROBLEMS
Faulty starter to 24 vdc shunt cable.
Faulty battery cable.
Faulty shunt.

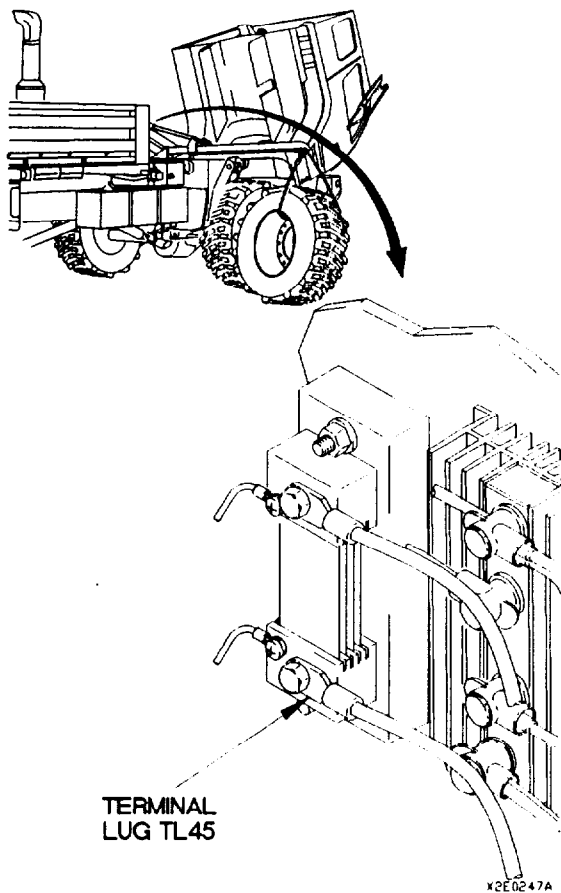
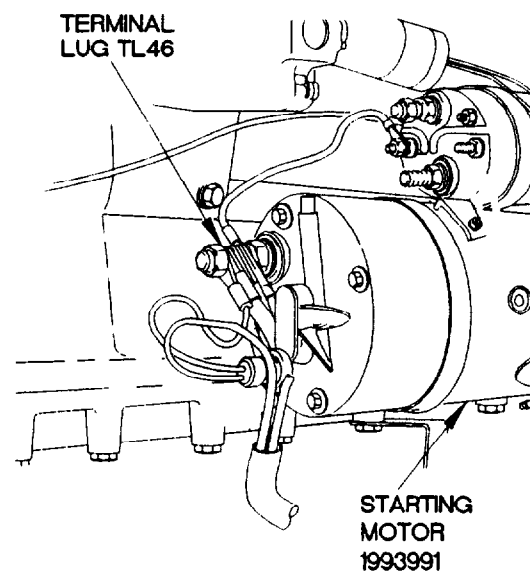
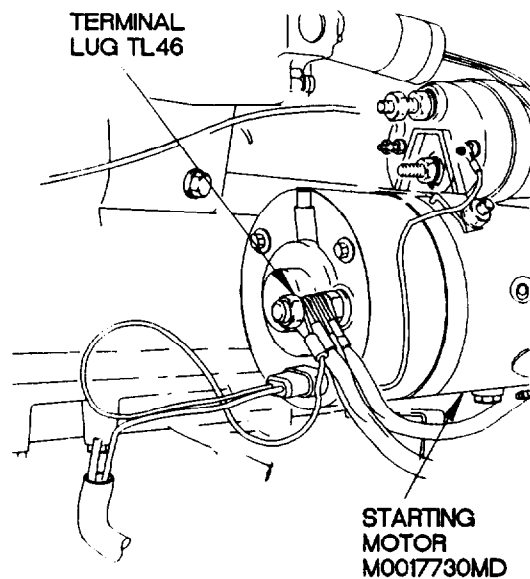


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, starter to shunt 24 vdc cable is faulty.



**CONTINUITY TEST**

- (1) Lower spare tire (TM 9-2320-365-10-1).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to terminal lug TL46.
- (4) Connect negative (-) probe of multimeter to terminal lug TL45 and note reading on multimeter.
- (5) If continuity is not present, replace starter to shunt 24 vdc cable (para 7-84).



X2E0211A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

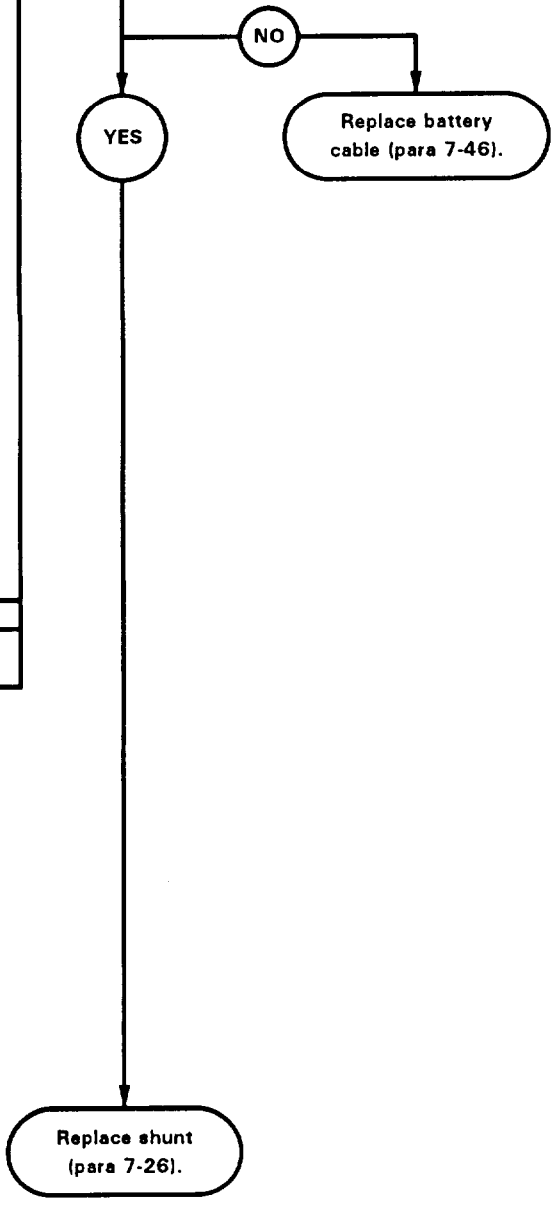
KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Start and charging cable assembly OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Dashboard cable assembly OK.
Relay K2 OK.
Terminal board OK.
WTEC II VIM OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.

POSSIBLE PROBLEMS
Faulty battery cable.
Faulty shunt.

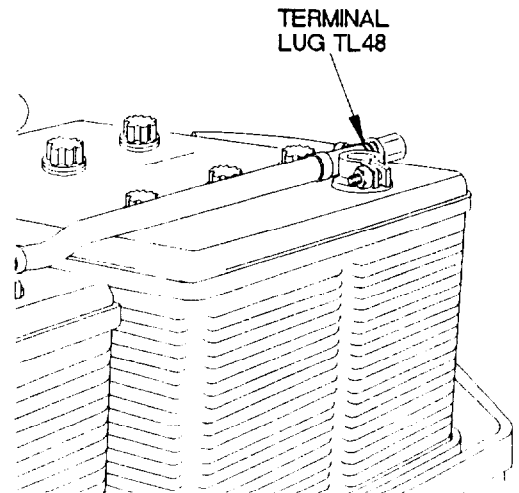
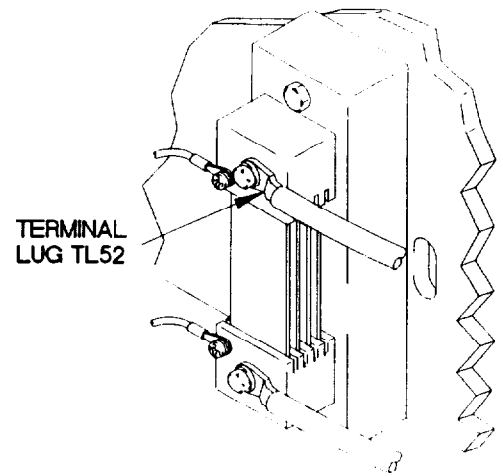
12.  
Is continuity present between terminal lug TL52 and terminal lug TL48?

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



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal lug TL52.
- (3) Connect negative (-) probe of multimeter to terminal lug TL48 and note reading on multimeter.
- (4) If continuity is not present, replace battery cable (para 7-46).
- (5) If continuity is present, replace shunt (para 7-26).
- (6) Connect batteries (para 7-48).



X2E0212A

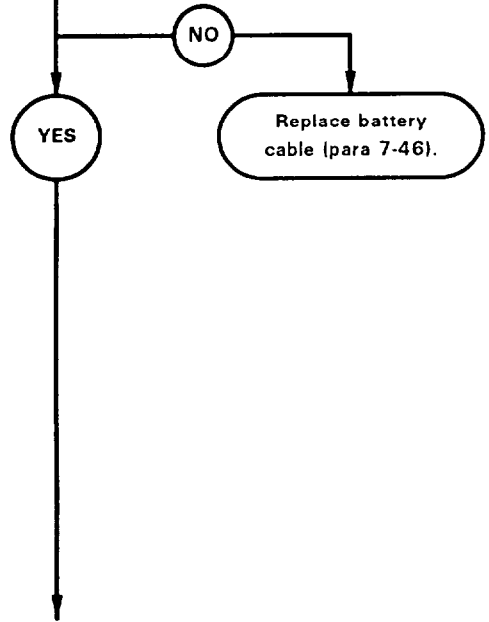
e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral. Starting motor OK. Starter to chassis ground cable OK. Starter to shunt 24 vdc cable OK. Shunt OK. Start and charging cable assembly OK. Relay K1 OK. Relay K24 OK. Diode D3B OK. Starter pushbutton OK. Auxiliary starter solenoid OK.
POSSIBLE PROBLEMS
Faulty battery cable. Faulty 100 amp reverse polarity relay. Faulty 100 amp reverse polarity relay to PDP 24 vdc cable. Faulty dashboard cable assembly. Faulty relay K2. Faulty terminal board. Faulty WTEC II VIM.

13. **WARNING**  
 Read **WARNING** on following page.

Is 24 vdc present at terminal lug TL37?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, battery cable from BT1-E1 to reverse polarity relay is faulty.

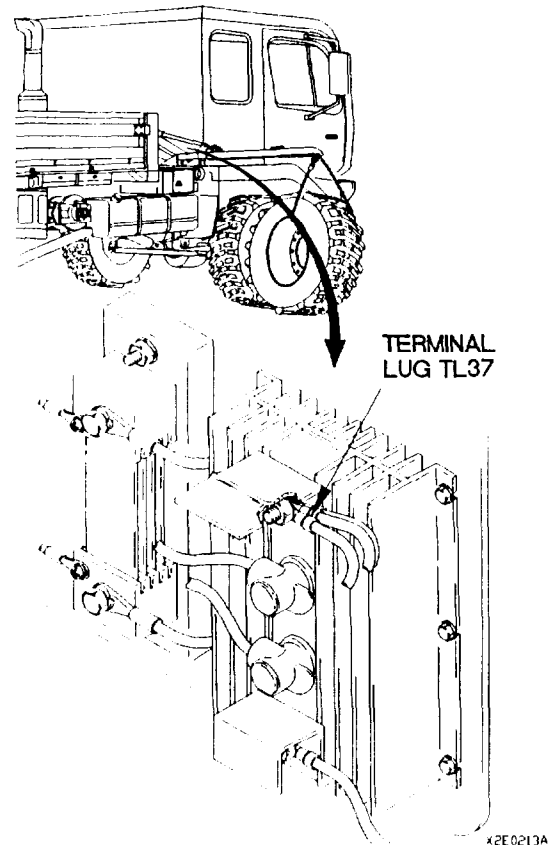


**WARNING**

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

**VOLTAGE TEST**

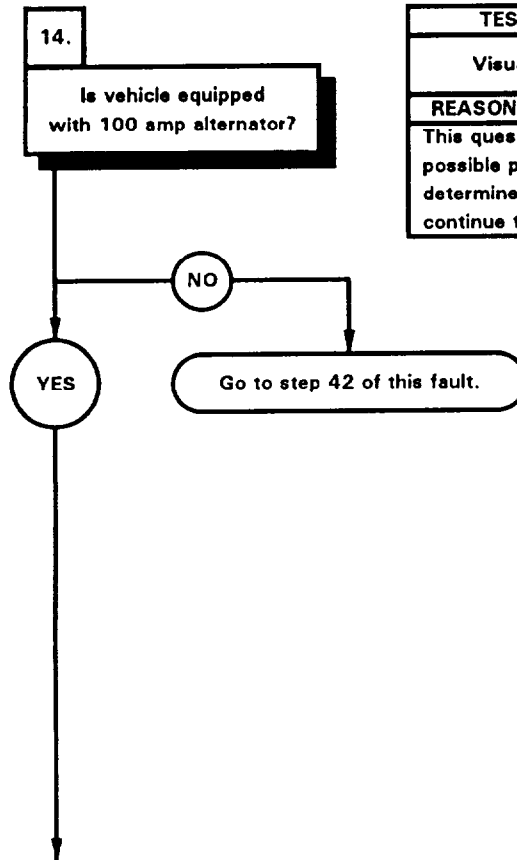
- (1) Lower spare tire (TM 9-2320-365-10).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to terminal lug TL37.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If 24 vdc is not present, replace battery cable (para 7-46).






e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Battery cable OK.
POSSIBLE PROBLEMS
Faulty 100 amp reverse polarity relay.
Faulty 100 amp reverse polarity relay to PDP 24 vdc cable.
Faulty dashboard cable assembly.
Faulty relay K2.
Faulty terminal board.
Faulty WTEC II VIM.

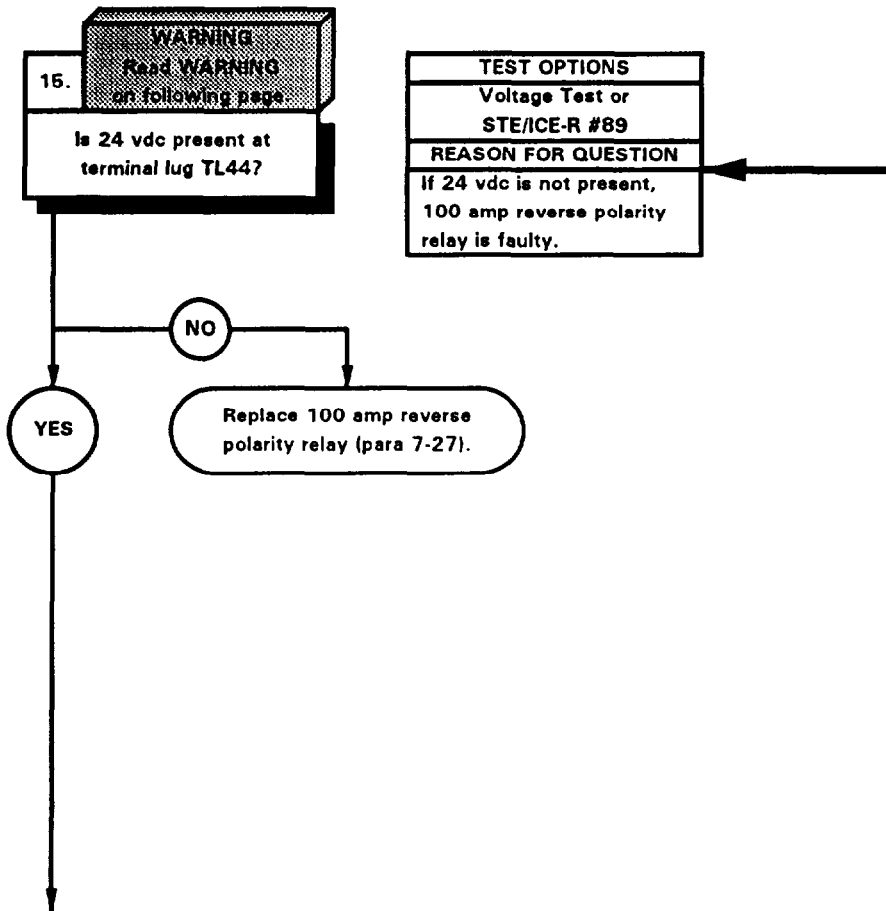


TEST OPTIONS
Visual inspection
REASON FOR QUESTION
This question eliminates possible problems and determines where to continue troubleshooting.

- 
- (1) Raise cab (TM 9-2320-365-10).
  - (2) Check if vehicle is equipped with 100 or 200 amp alternator kit.
  - (3) If vehicle is equipped with 200 amp alternator kit, go to step 42 of this fault.

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Battery cable OK.
POSSIBLE PROBLEMS
Faulty 100 amp reverse polarity relay.
Faulty 100 amp reverse polarity relay to PDP 24 vdc cable.
Faulty dashboard cable assembly.
Faulty relay K2.
Faulty terminal board.
Faulty WTEC II VIM.

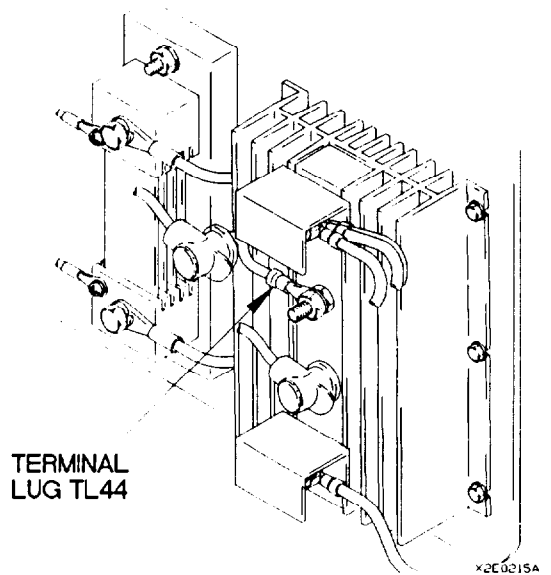


**WARNING**

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.

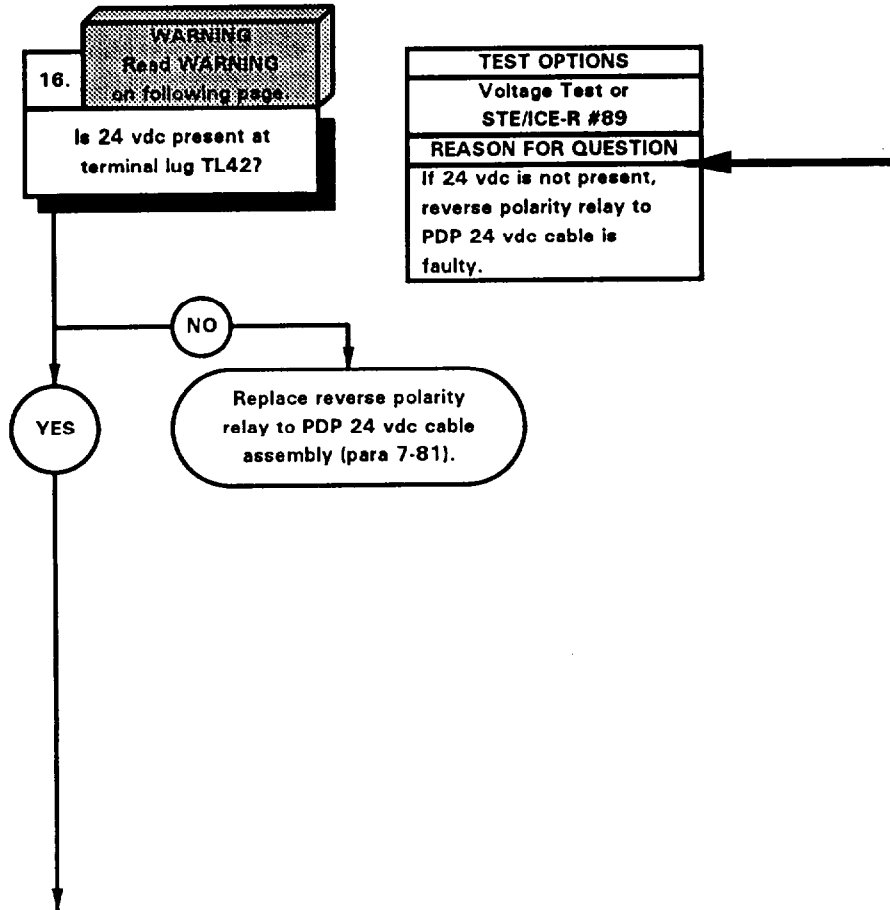
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal lug TL44.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 24 vdc is not present, replace 100 amp reverse polarity relay (para 7-27).
- (5) Lower cab (TM 9-2320-365-10).



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Relay K1 OK.
Relay K24 OK.
Diode D38 OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
POSSIBLE PROBLEMS
Faulty 100 amp reverse polarity relay to PDP 24 vdc cable.
Faulty dashboard cable assembly.
Faulty relay K2.
Faulty terminal board.
Faulty WTEC II VIM.

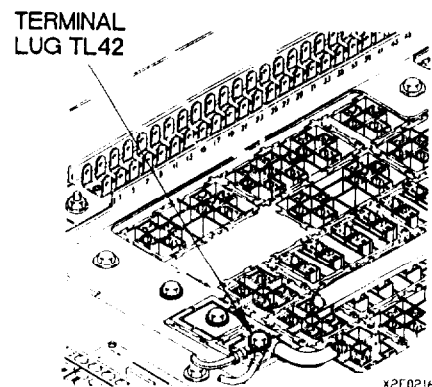
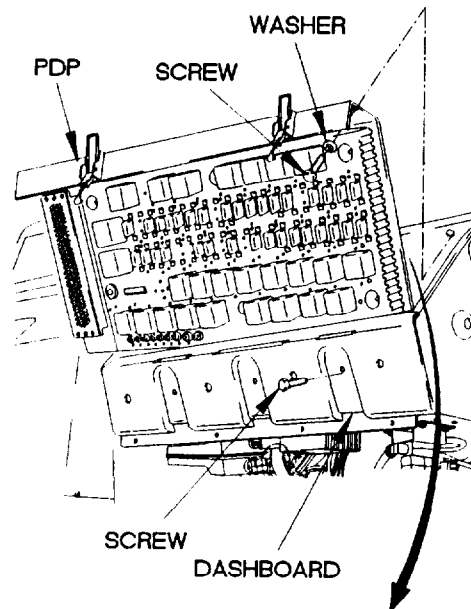


**WARNING**

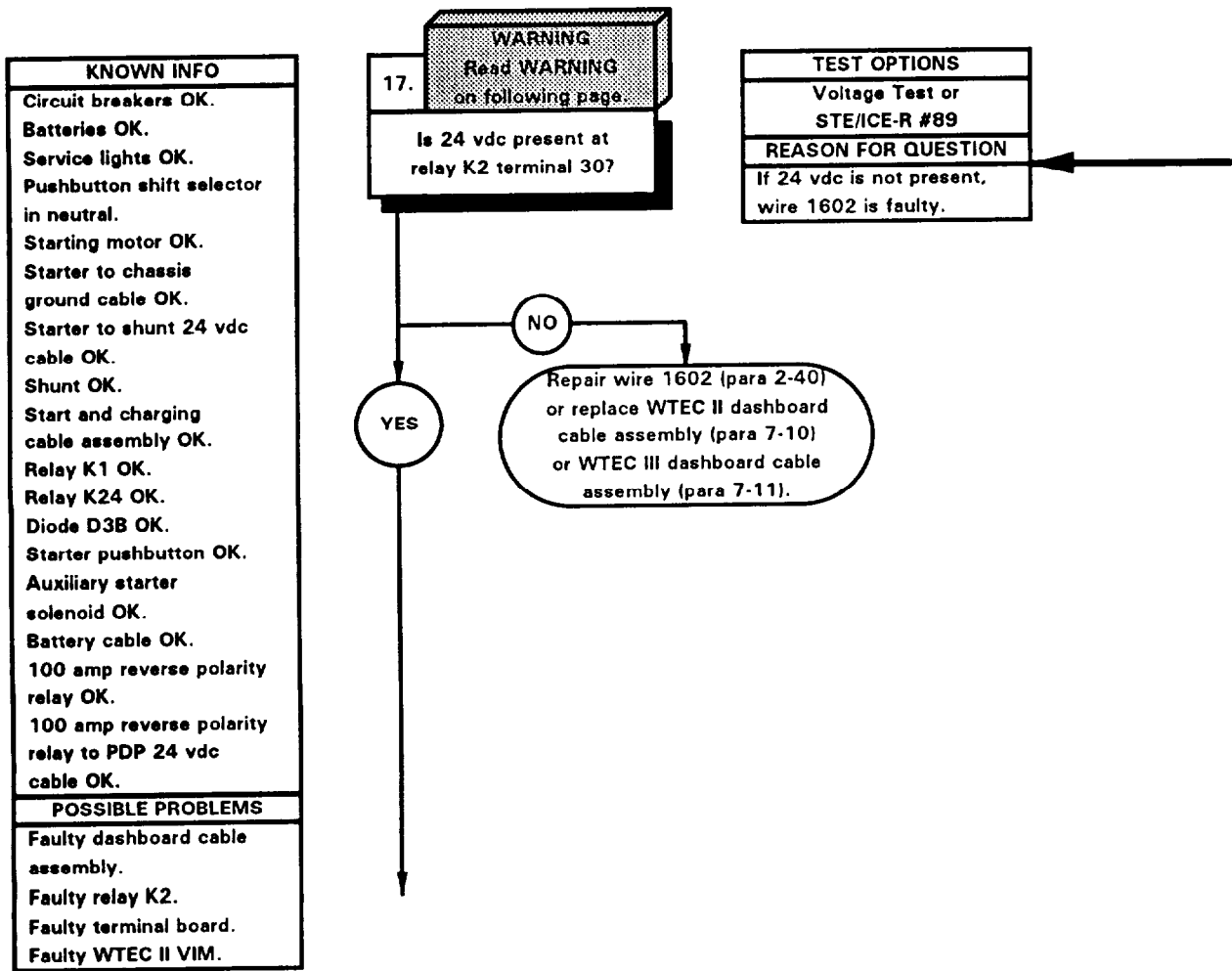
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Remove three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to terminal lug TL42.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If 24 vdc is not present, replace reverse polarity relay to PDP 24 vdc cable (para 7-81).



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

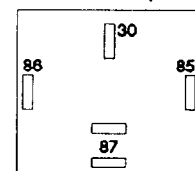
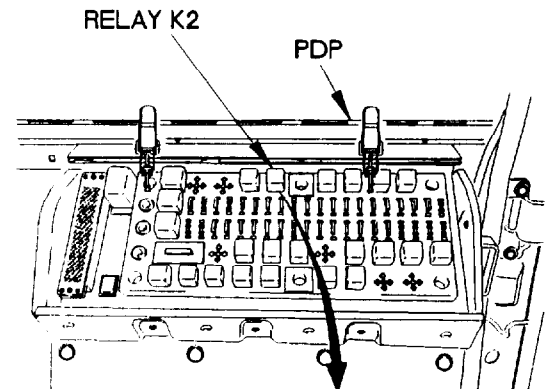


**WARNING**

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 relay K2 from PDP.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to PDP terminal 30, where relay K2 was removed.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1602 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) Install relay K2 in PDP.



RELAY K2 CAVITY

X280297A



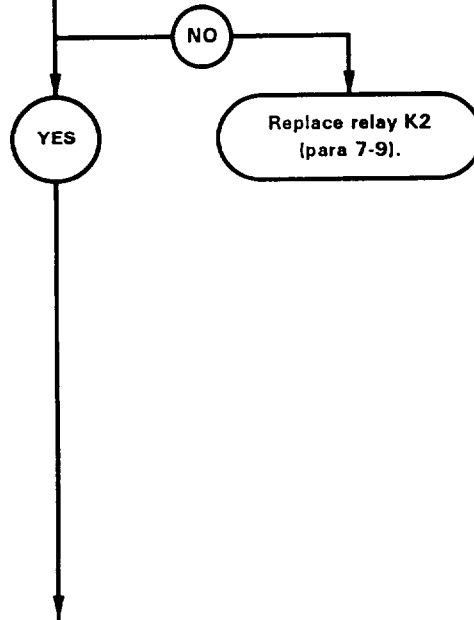
e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
POSSIBLE PROBLEMS
Faulty relay K2.
Faulty dashboard cable assembly.
Faulty terminal board.
Faulty WTEC II VIM.

18. **WARNING**  
Read WARNING on following page.

Is 24 vdc present at relay K2 terminal 877

TEST OPTIONS
Voltage Test or STE/CE-R #89
REASON FOR QUESTION
If 24 vdc is not present, relay K2 is faulty.

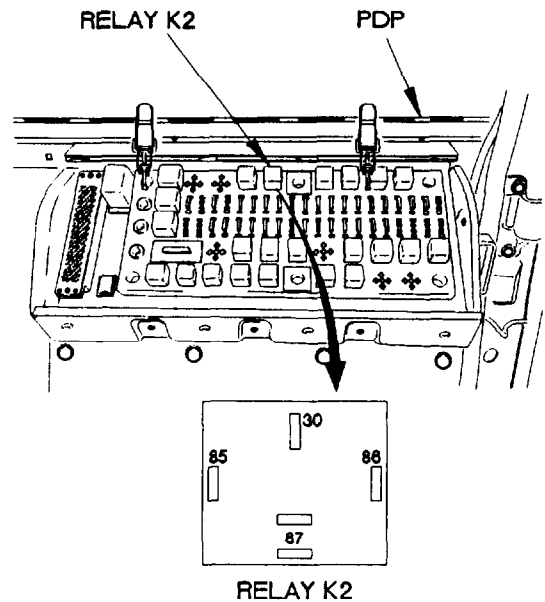


**WARNING**

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

**VOLTAGE TEST**

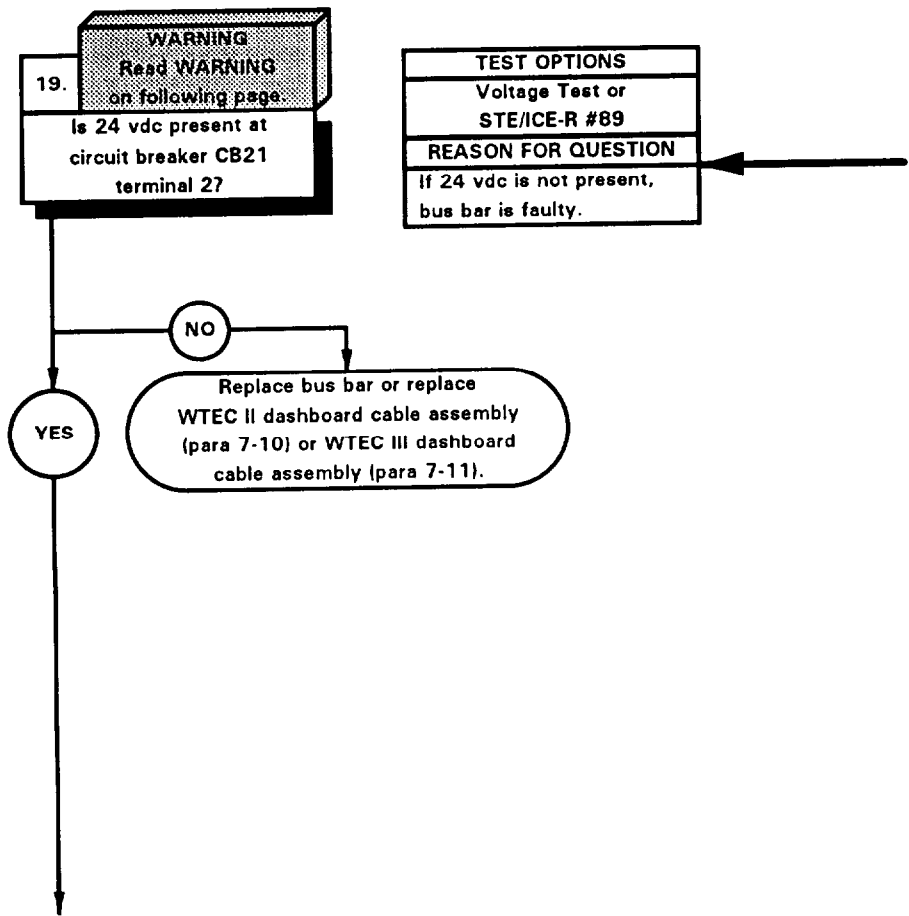
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to back of PDP terminal 87 of relay K2.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, replace relay K2 (para 7-9).
- (6) Position master power switch to off (TM 9-2320-365-10).



KC210228A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty terminal board.
Faulty WTEC II VIM.

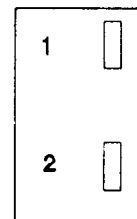
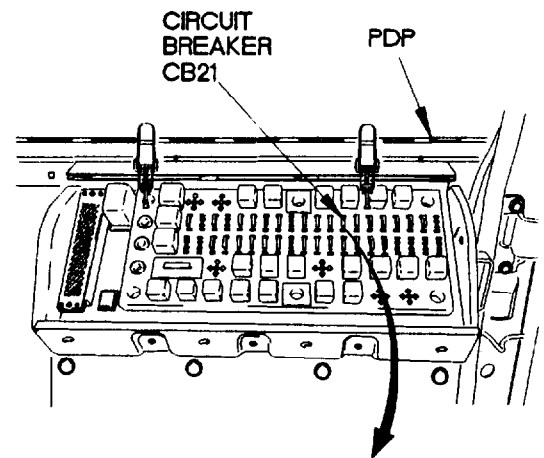


**WARNING**

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 circuit breaker CB21 from PDP.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to terminal 2 of PDP, where circuit breaker CB21 was removed.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, replace bus bar 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 9-2320-365-10).
- (8) Install circuit breaker CB21 in PDP.

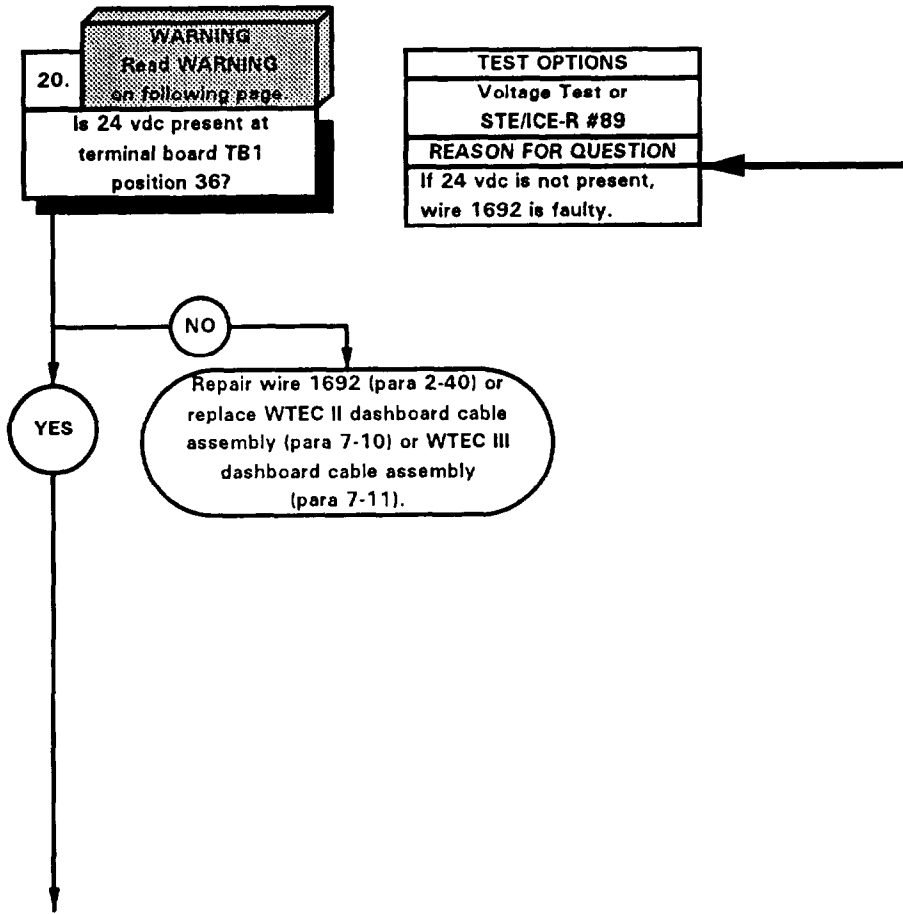


CB21

x2E02191

ø2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty terminal board.
Faulty WTEC II VIM.

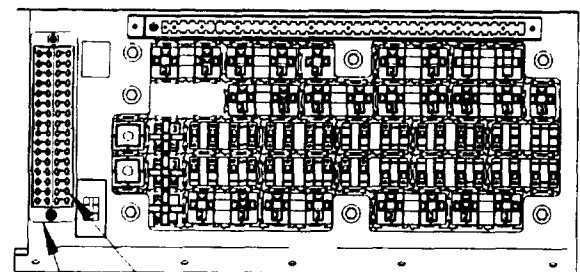


**WARNING**

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**

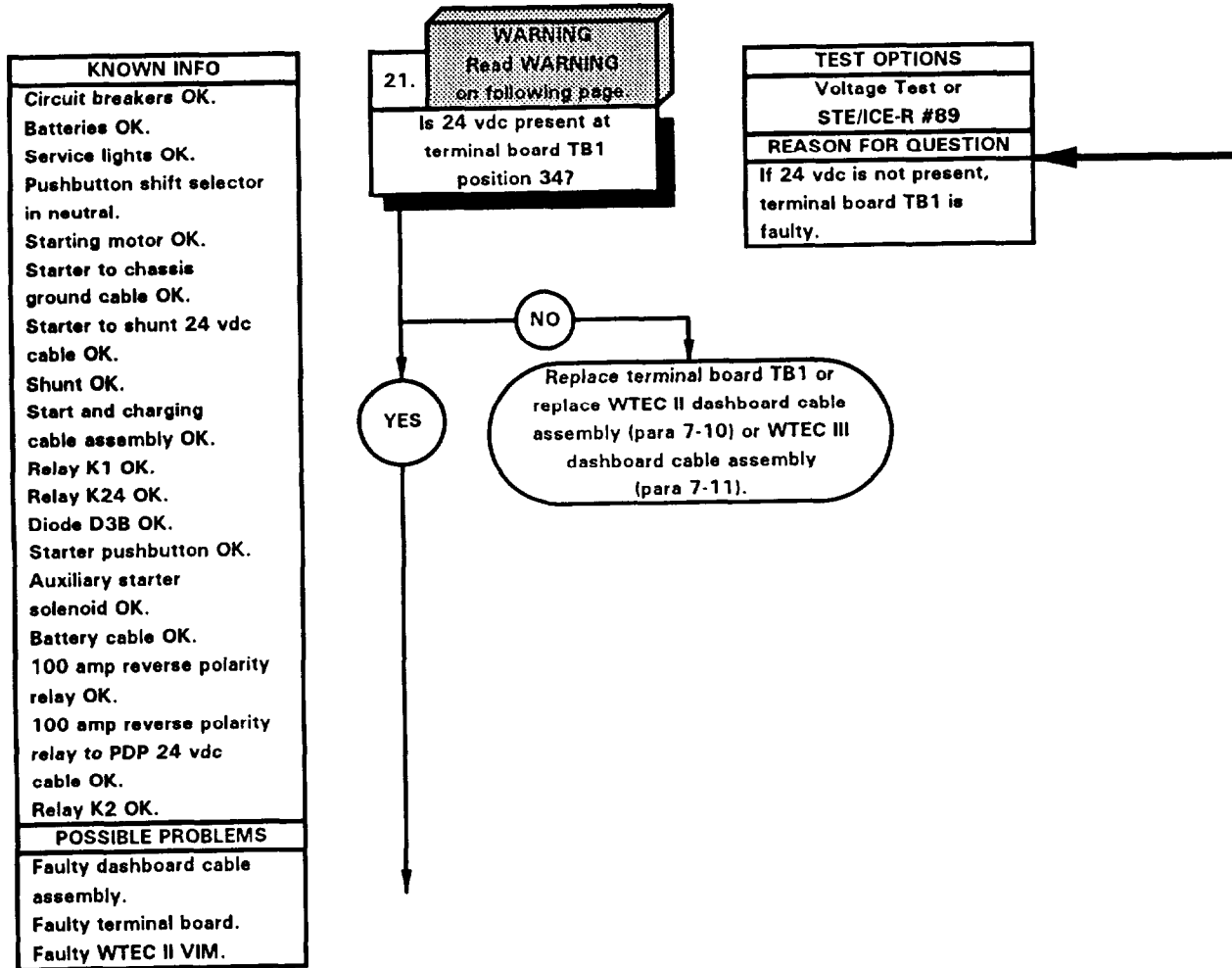
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal board TB1 position 36.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1692 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-11) or WTEC III dashboard cable assembly (para 7-11).
- (6) Position master power switch to off (TM 9-2320-365-10).



TERMINAL BOARD TB1  
POSITION 36

K2E0220A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

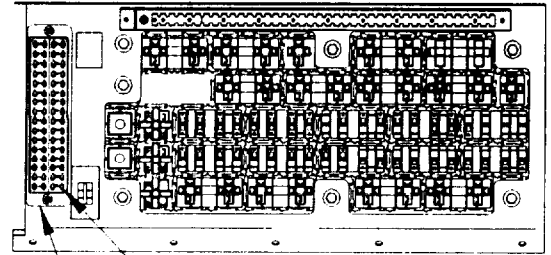


**WARNING**

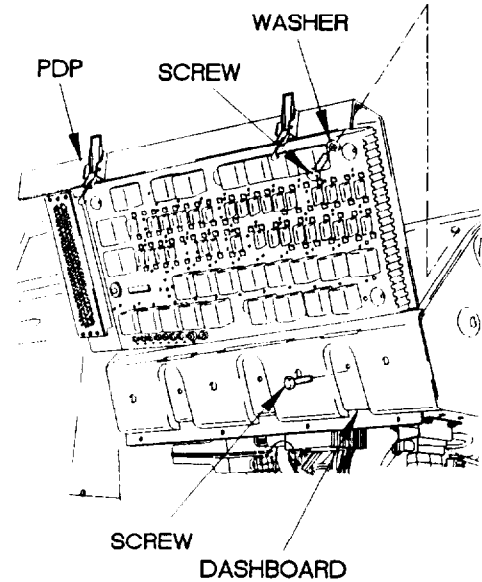
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal board TB1 position 34.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, replace terminal board TB1 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 9-2320-365-10).
- (7) Install PDP in dashboard with three screws.
- (8) Install three washers and screws in PDP.



POSITION 34  
TERMINAL BOARD 1

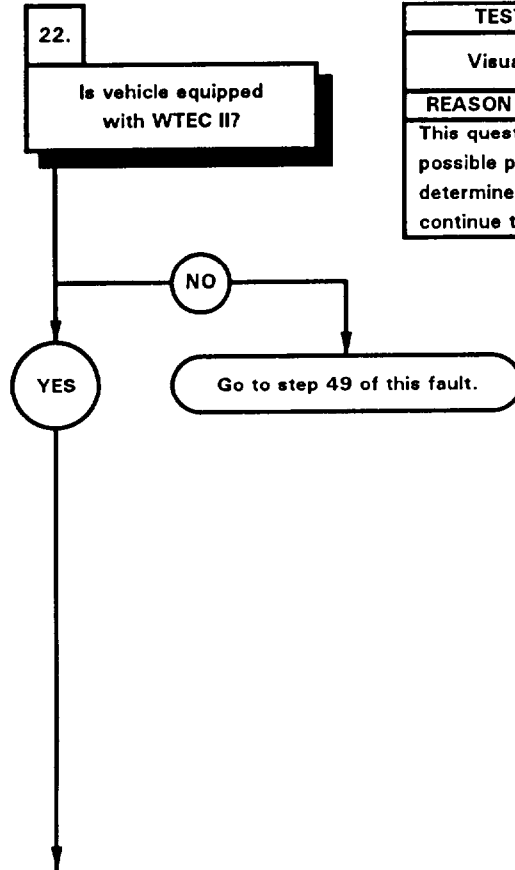


k2E0211



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

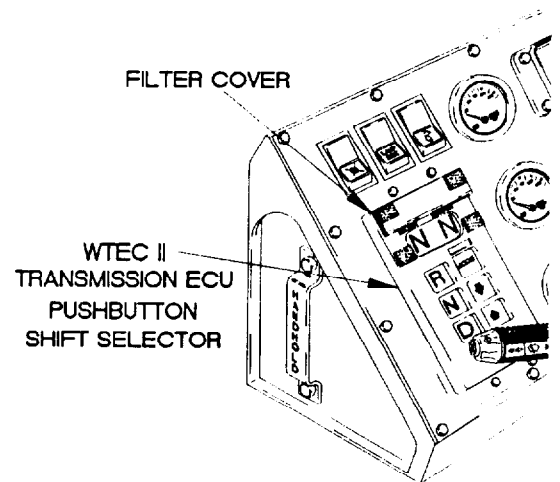
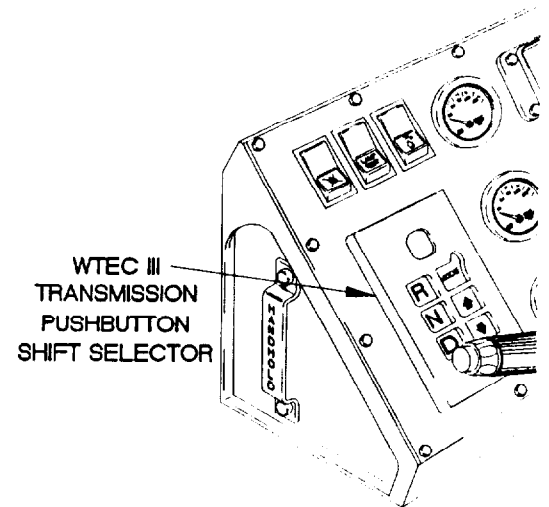
KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Battery cable OK.
POSSIBLE PROBLEMS
Faulty 100 amp reverse polarity relay.
Faulty 100 amp reverse polarity relay to PDP 24 vdc cable.
Faulty dashboard cable assembly.
Faulty relay K2.
Faulty terminal board.
Faulty WTEC II VIM.
Faulty relay K26.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
This question eliminates possible problems and determines where to continue troubleshooting.

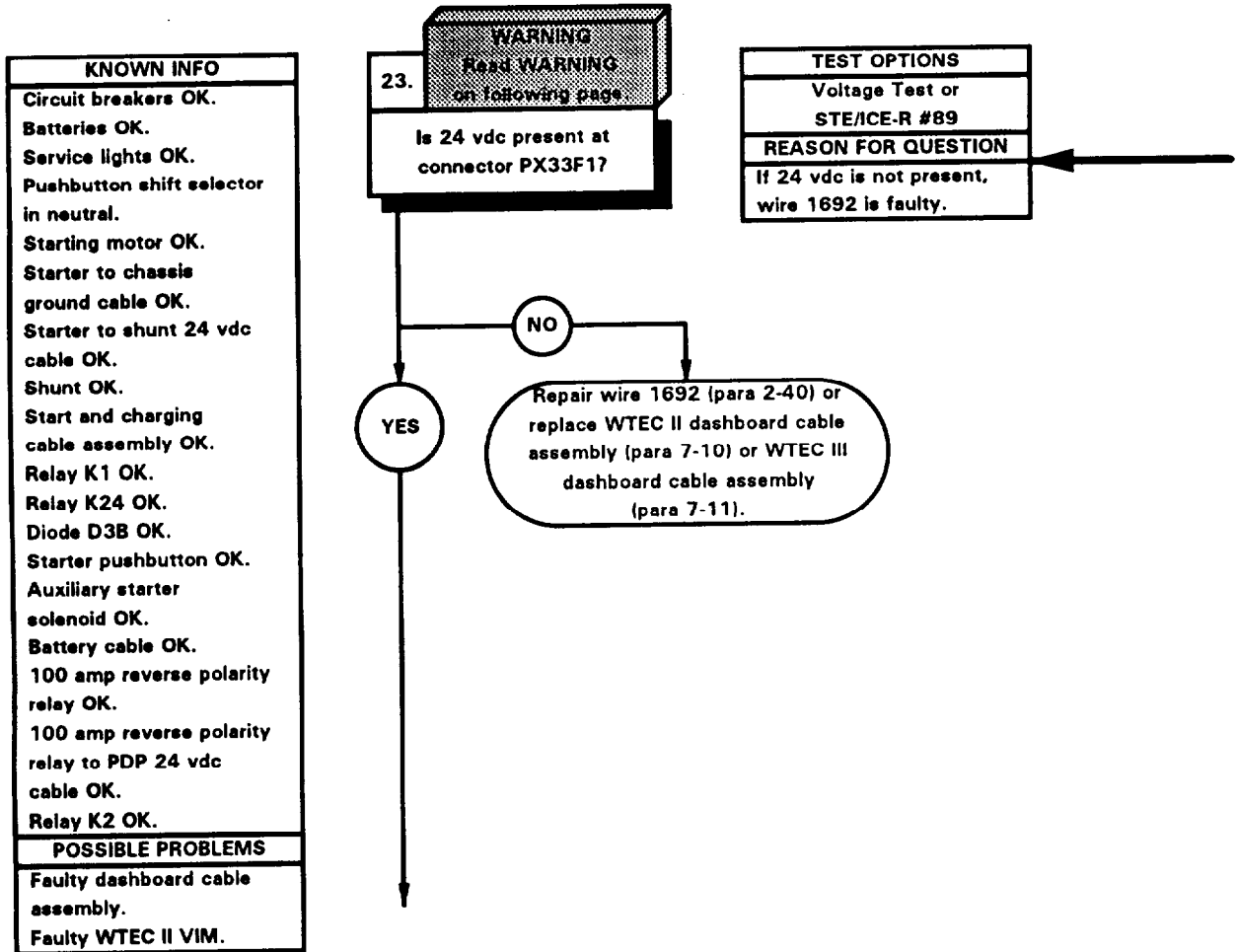


- (1) Check if vehicle is equipped with WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS).
- (2) If TEPSS is mounted with four screws and has a filter cover, go to step 49 of this fault.



x2E02501

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

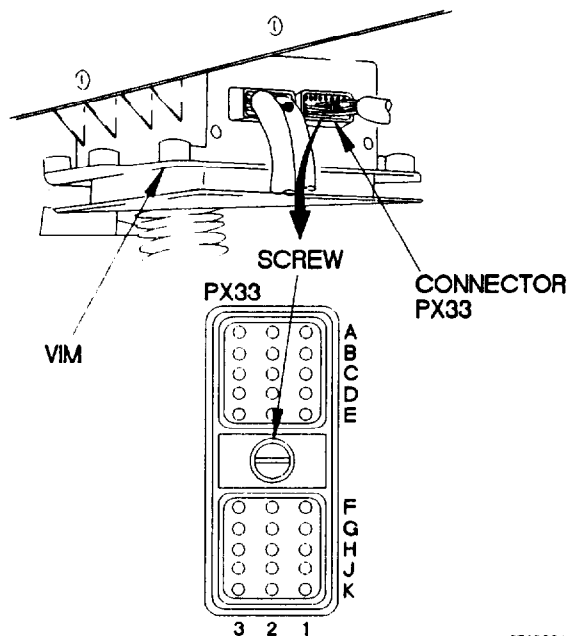


**WARNING**

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) Loosen screw in connector PX33.
- (3) Disconnect connector PX33 from WTEC II VIM.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector PX33F1.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1692 (para 2-40) 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 9-2320-365-10).
- (10) Connector connector PX33 to WTEC II VIM.
- (11) Tighten screw on connector PX33.



x2E0223A

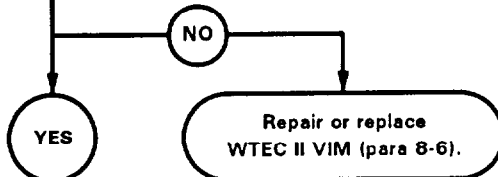
e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

<b>KNOWN INFO</b>
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral. Starting motor OK. Starter to chassis ground cable OK. Starter to shunt 24 vdc cable OK. Shunt OK. Start and charging cable assembly OK. Relay K1 OK. Relay K24 OK. Diode D3B OK. Starter pushbutton OK. Auxiliary starter solenoid OK. Battery cable OK. 100 amp reverse polarity relay OK. 100 amp reverse polarity relay to PDP 24 vdc cable OK. Relay K2 OK.
<b>POSSIBLE PROBLEMS</b>
Faulty WTEC II VIM. Faulty dashboard cable assembly.

24. **WARNING**  
 Read WARNING on following page

Is 24 vdc present at connector PX33G1?

<b>TEST OPTIONS</b>
Voltage Test or STE/ICE-R #89
<b>REASON FOR QUESTION</b>
If 24 vdc is not present, WTEC II VIM is faulty. If 24 vdc is present, wire 1691 is faulty.



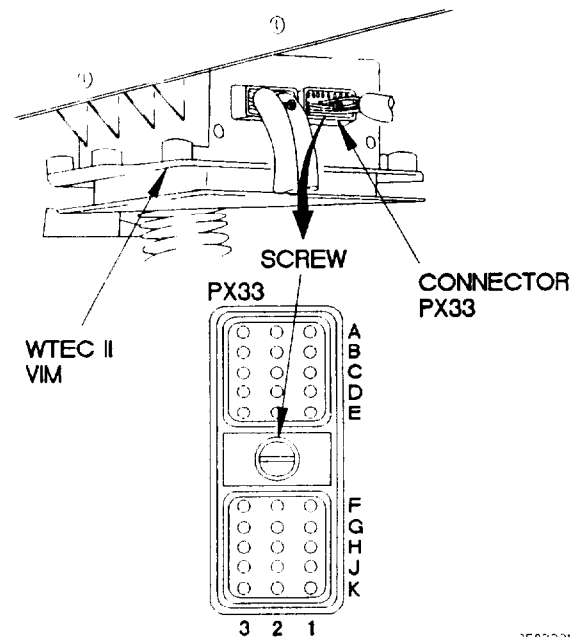
Repair wire 1691 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**WARNING**

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

**VOLTAGE TEST**

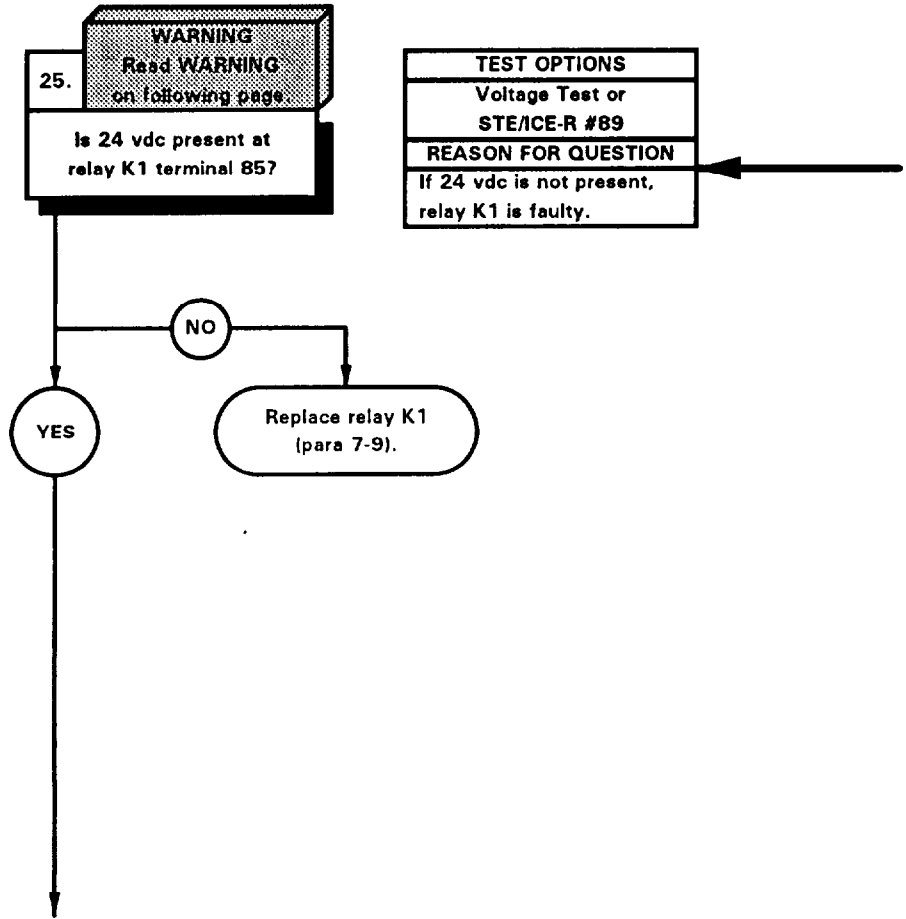
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector PX33G1.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, replace NS relay or WTEC II VIM (para 8-6).
- (6) If 24 vdc is present, repair wire 1691 (para 2-40) 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 9-2320-365-10).
- (8) Install kick panel (para 16-3).



A2E02231

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
WTEC II VIM OK.
POSSIBLE PROBLEMS
Faulty relay K1.
Faulty dashboard cable assembly.
Faulty relay K24.
Faulty diode D3B.
Faulty starter pushbutton.

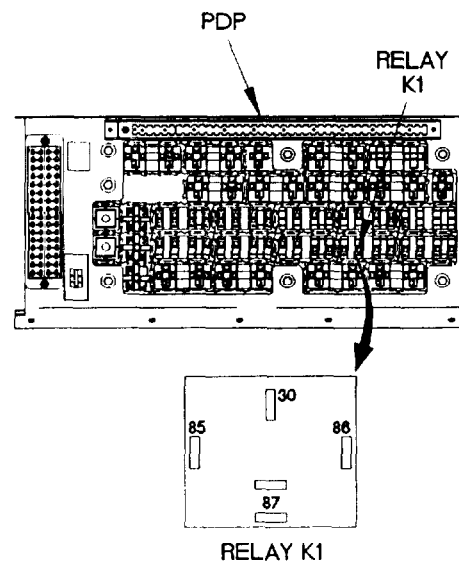
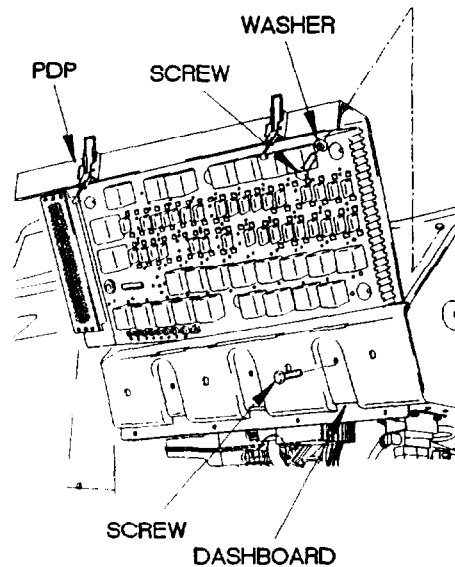


**WARNING**

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 three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to back of PDP terminal 85 of relay K1.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, replace relay K1 (para 7-9).
- (9) Position master power switch to off (TM 9-2320-365-10).

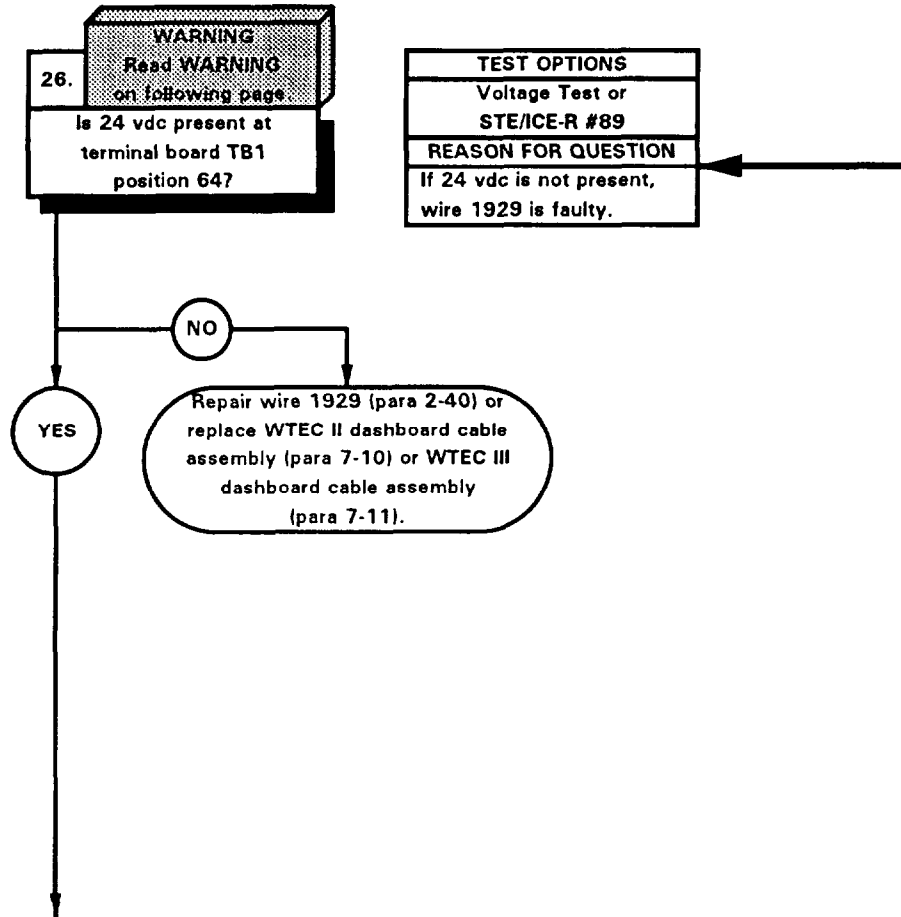


42E02241



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
WTEC II VIM OK.
Relay K1 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K24.
Faulty diode D3B.
Faulty starter pushbutton.

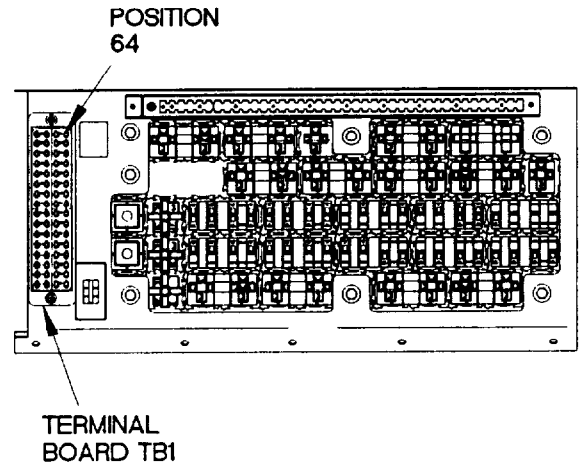


**WARNING**

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.

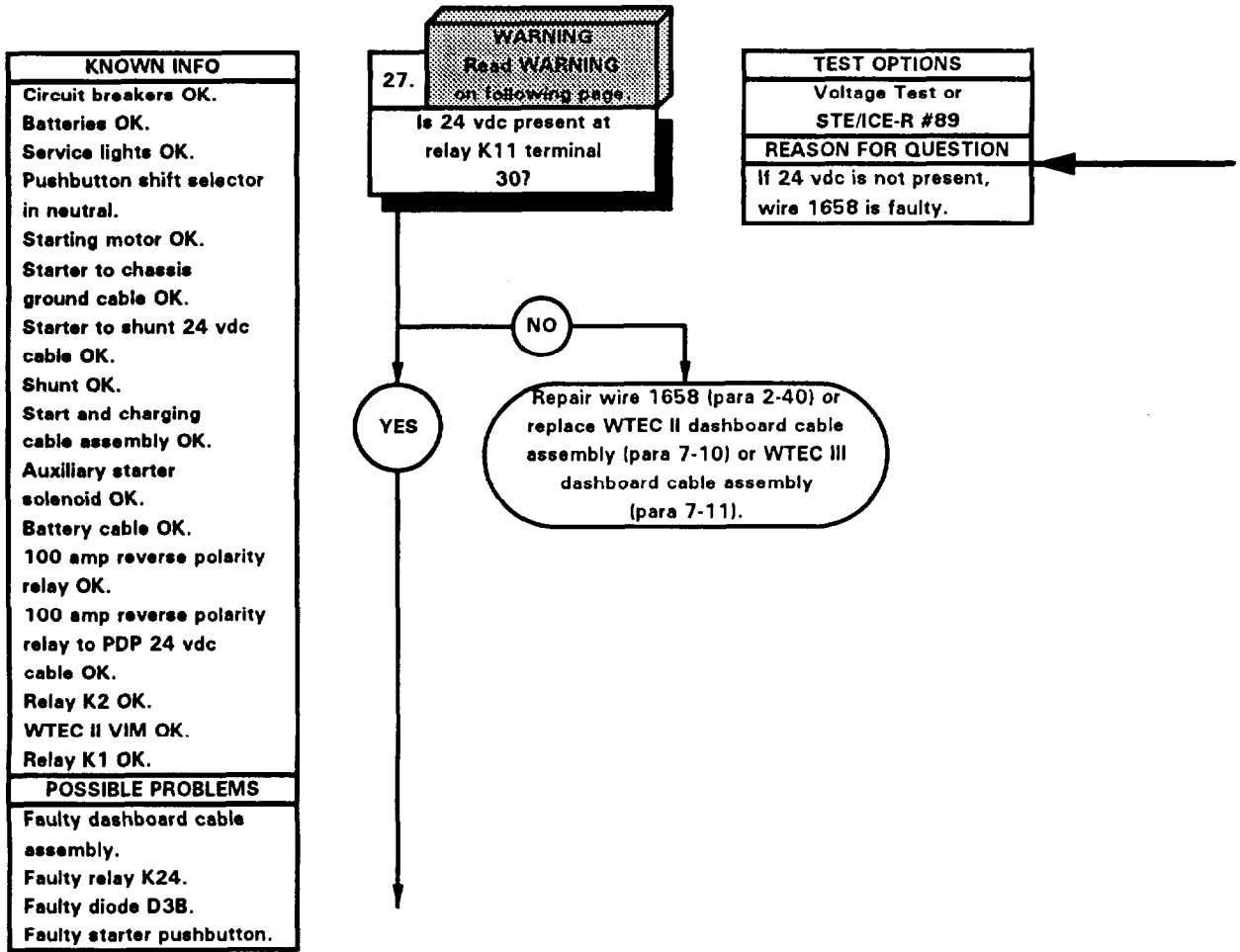
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal board TB1 position 64.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1929 (para 2-40) 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 9-2320-365-10).



x2E0225A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

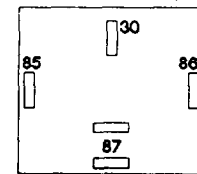
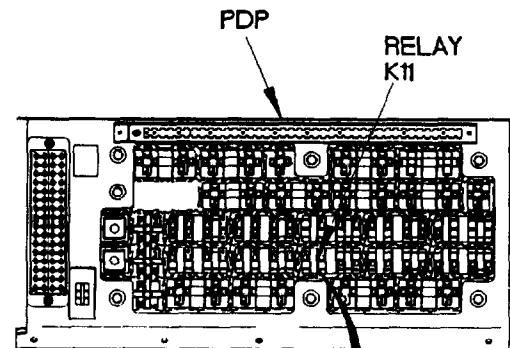


**WARNING**

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 back of PDP terminal 30 of relay K11.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1658 (para 2-40) 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 9-2320-365-10).

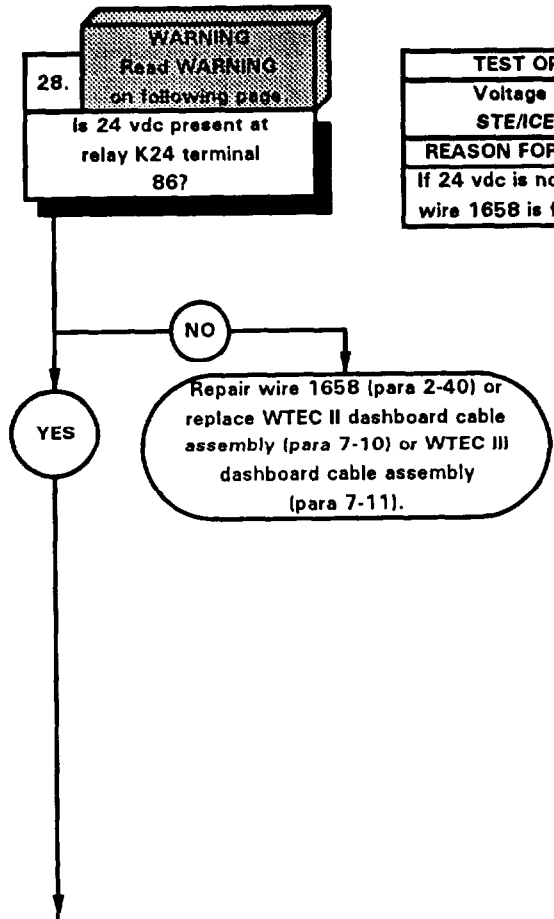


RELAY K11 CAVITY

X2E02261

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
WTEC II VIM OK.
Relay K1 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K24.
Faulty diode D3B.
Faulty starter pushbutton.



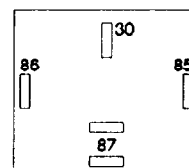
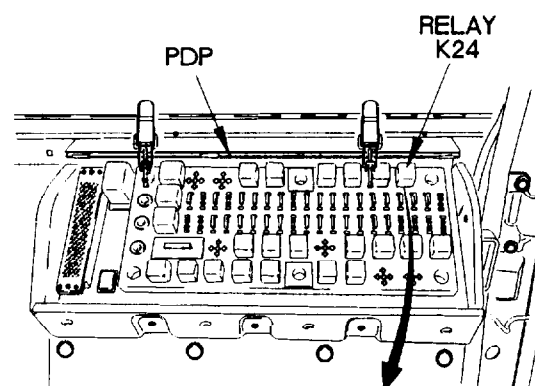
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1658 is faulty.

**WARNING**

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

**VOLTAGE TEST**

- (1) Remove relay K24 from PDP.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to terminal 86 of PDP, where relay K24 was removed.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 1658 (para 2-40) 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 9-2320-365-10).
- (8) Install relay K24 in PDP.

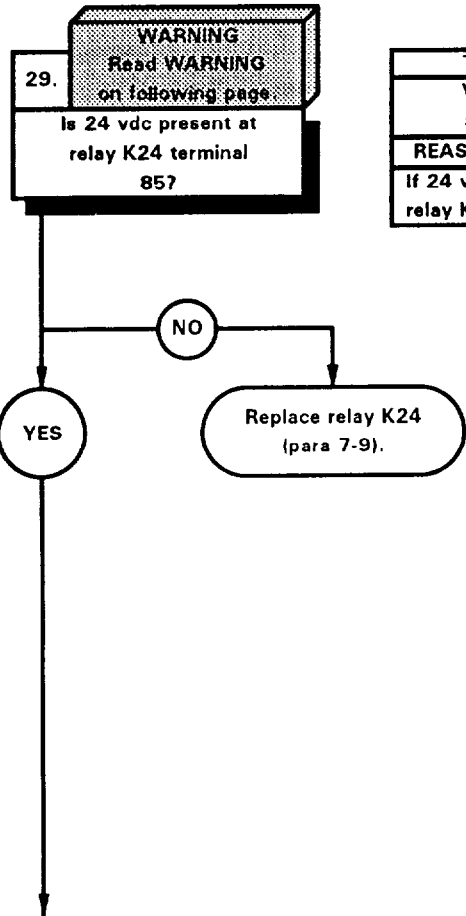


RELAY K24 CAVITY

x2E02271

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
WTEC II VIM OK.
Relay K1 OK.
POSSIBLE PROBLEMS
Faulty relay K24.
Faulty dashboard cable assembly.
Faulty diode D3B.
Faulty starter pushbutton.



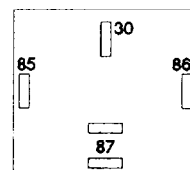
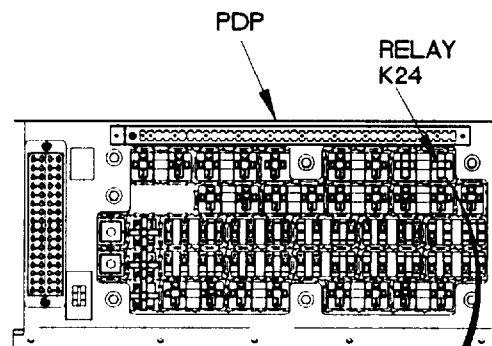
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, relay K24 is faulty.

**WARNING**

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

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to back of PDP terminal 85 of relay K24.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, replace relay K24 (para 7-9).
- (6) Position master power switch to off (TM 9-2320-365-10).



RELAY K24 CAVITY

x2E02081



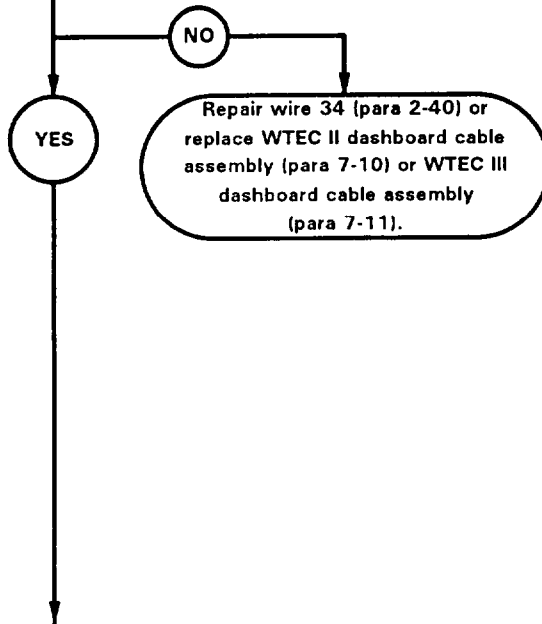
e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
WTEC II VIM OK.
Relay K1 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty diode D3B.
Faulty relay K24.
Faulty starter pushbutton.

30. **WARNING**  
Read **WARNING** on following page.

Is 24 vdc present at diode D3B terminal 47

TEST OPTIONS
Voltage Test or STE/ICE-R #69
REASON FOR QUESTION
If 24 vdc is not present, wire 34 is faulty.

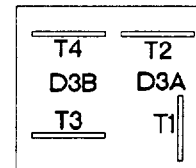
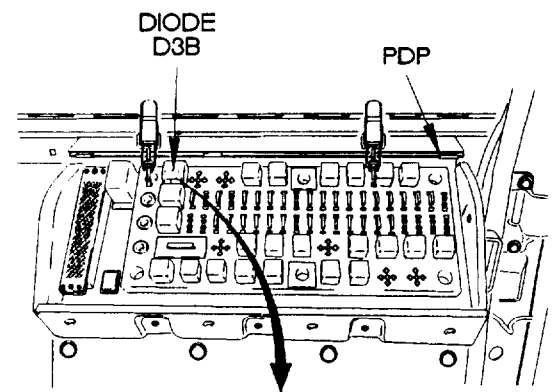


**WARNING**

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

**VOLTAGE TEST**

- (1) Remove diode D3B from PDP.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to PDP terminal 4, where diode D3B was removed.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 34 (para 2-40) 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 9-2320-365-10).
- (8) Install diode D3B in PDP.



DIODE D3B CAVITY

x2E02291

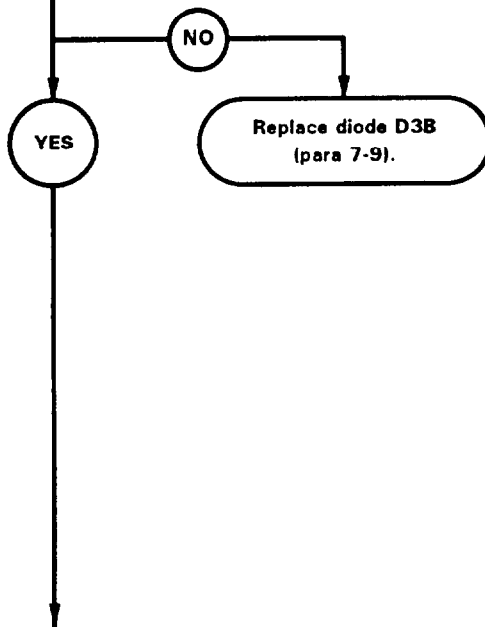
e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral. Starting motor OK. Starter to chassis ground cable OK. Starter to shunt 24 vdc cable OK. Shunt OK. Start and charging cable assembly OK. Auxiliary starter solenoid OK. Battery cable OK. 100 amp reverse polarity relay OK. 100 amp reverse polarity relay to PDP 24 vdc cable OK. Relay K2 OK. WTEC II VIM OK. Relay K1 OK.
POSSIBLE PROBLEMS
Faulty diode D3B. Faulty dashboard cable assembly. Faulty relay K24. Faulty starter pushbutton.

31. **WARNING**  
 Read WARNING on following page.

Is 24 vdc present at diode D3B terminal 37

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, diode D3B is faulty.

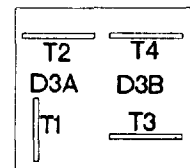
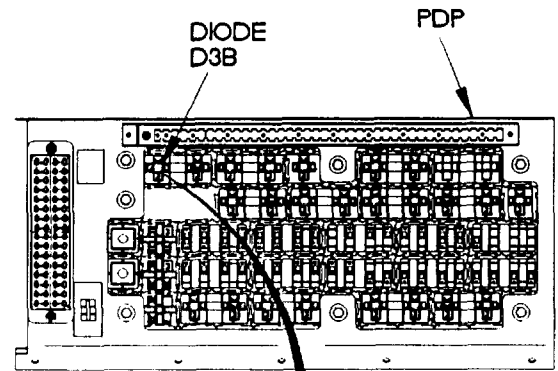


**WARNING**

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

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to back of PDP terminal 3 of diode D3B.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, replace diode D3B (para 7-9).
- (6) Position master power switch to off (TM 9-2320-365-10).

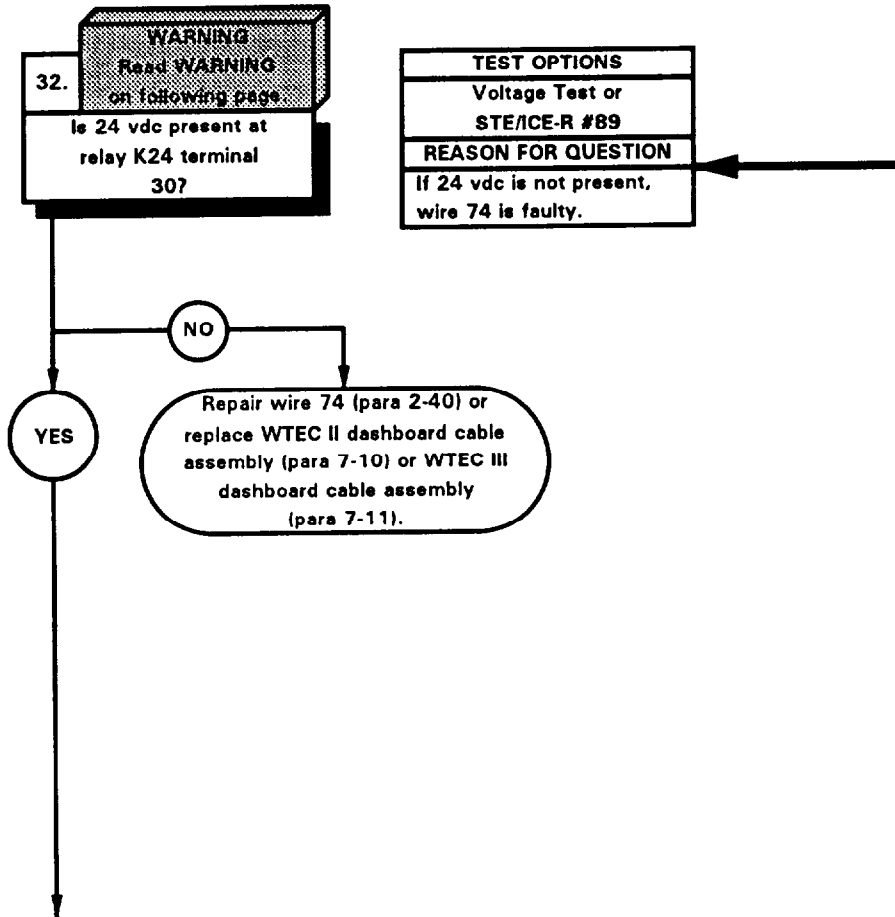


DIODE D3B CAVITY

x2E02301

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
WTEC II VIM OK.
Relay K1 OK.
Diode D3B OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K24.
Faulty starter pushbutton.

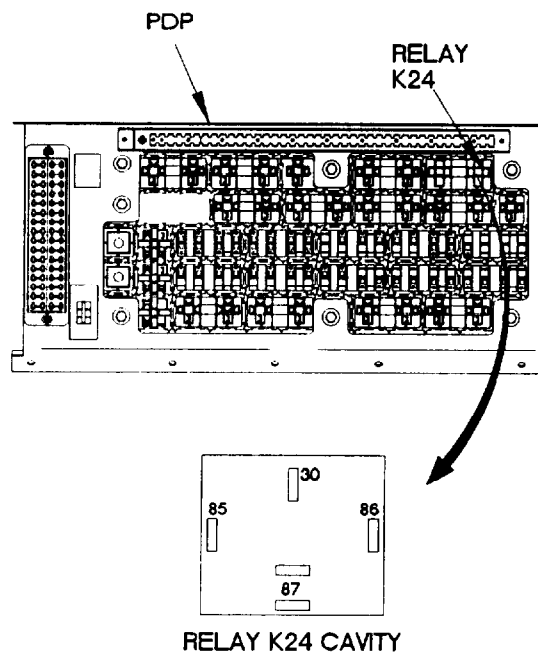


**WARNING**

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**

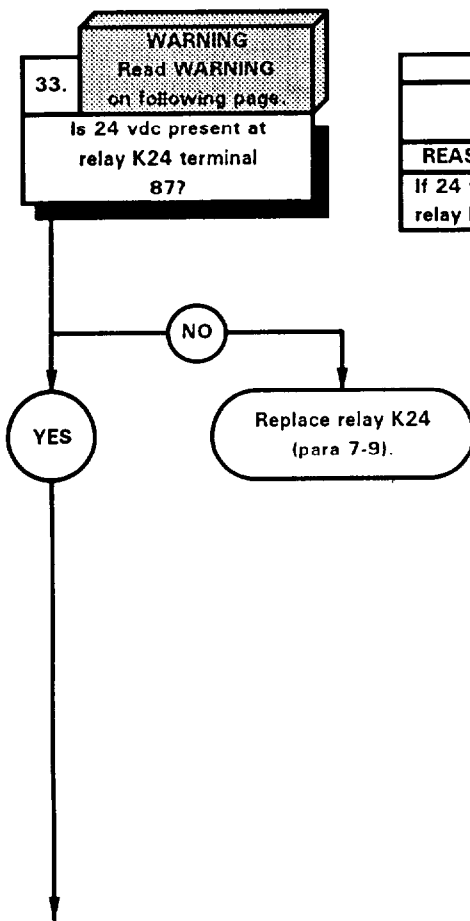
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to back of PDP terminal 30 of relay K24.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 74 (para 2-40) 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 9-2320-365-10).



x2E02311

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Auxiliary starter solenoid OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
WTEC II VIM OK.
Relay K1 OK.
Diode D3B OK.
POSSIBLE PROBLEMS
Faulty relay K24.
Faulty dashboard cable assembly.
Faulty starter pushbutton.



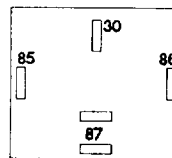
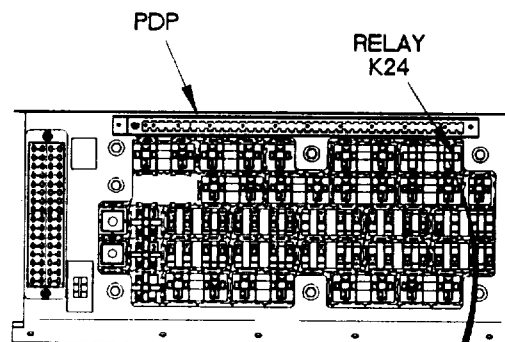
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, relay K24 is faulty.

**WARNING**

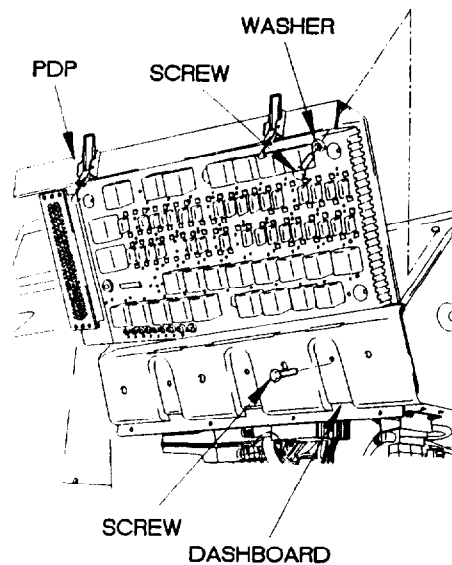
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to back of PDP terminal 87 of relay K24.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, replace relay K24 (para 7-9).
- (6) Position master power switch to off (TM 9-2320-365-10).
- (7) Install PDP in dashboard with three screws.
- (8) Install three washers and screws in PDP.
- (9) Install PDP cover (para 16-2).



RELAY K24 CAVITY

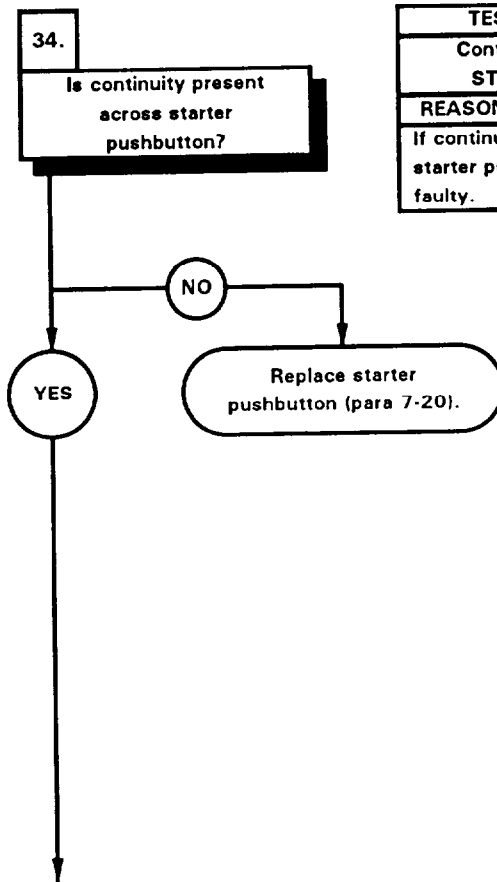


x2E02321



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral. Starting motor OK. Starter to chassis ground cable OK. Starter to shunt 24 vdc cable OK. Shunt OK. Start and charging cable assembly OK. Auxiliary starter solenoid OK. Battery cable OK. 100 amp reverse polarity relay OK. 100 amp reverse polarity relay to PDP 24 vdc cable OK. Relay K2 OK. WTEC II VIM OK. Relay K1 OK. Diode D3B OK. Relay K24 OK.
POSSIBLE PROBLEMS
Faulty starter pushbutton. Faulty dashboard cable assembly.

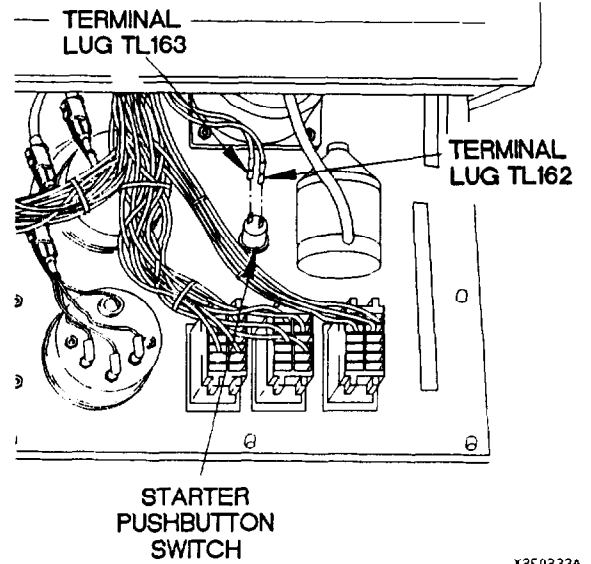


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, starter pushbutton is faulty.

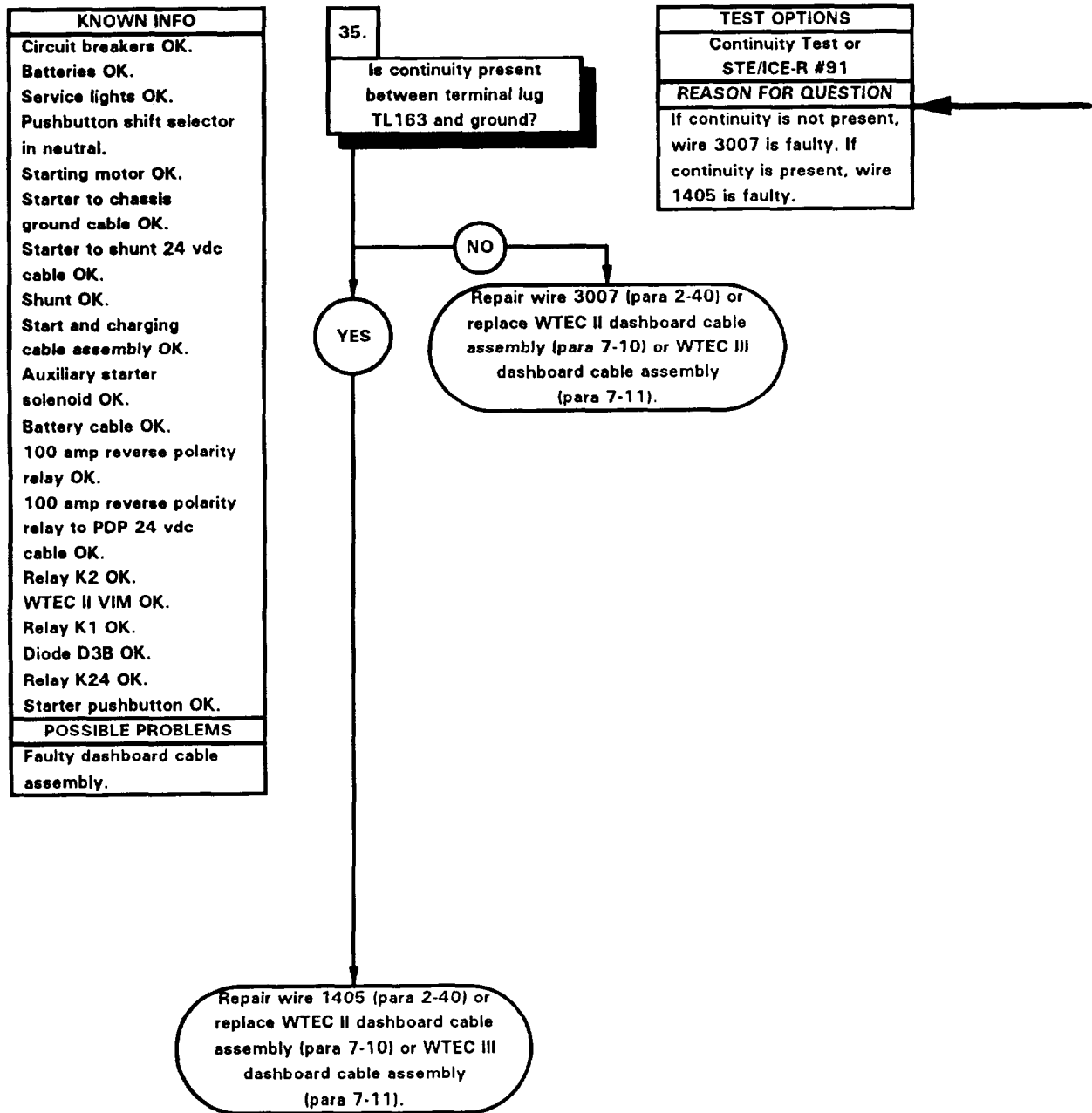


**CONTINUITY TEST**

- (1) Disconnect terminal lugs TL162 and TL163 from starter pushbutton.
- (2) Set multimeter to ohms.
- (3) Connect probes of multimeter across starter pushbutton.
- (4) Press starter pushbutton and note reading on multimeter.
- (5) If continuity is not present, replace starter pushbutton (para 7-20).
- (6) Connect terminal lug TL162 to starter pushbutton.

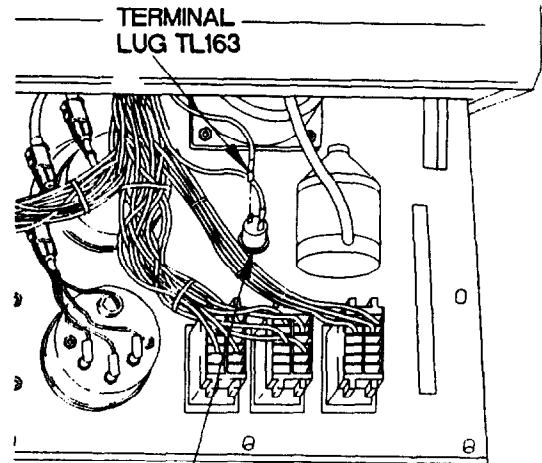


e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal lug TL163.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3007 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-14) or WTEC III dashboard cable assembly (para 7-14A).
- (5) If continuity is present, repair wire 1405 (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 lug TL163 to starter pushbutton.
- (7) Install instrument panel assembly (para 7-15).



**STARTER  
PUSHBUTTON  
SWITCH**

X2C0234A

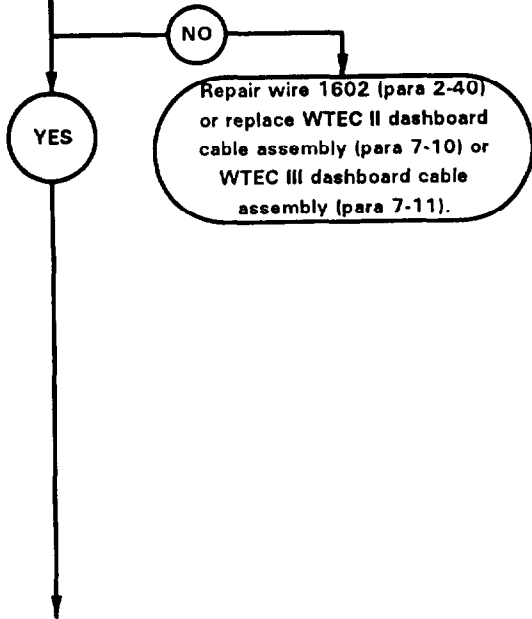
e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
WTEC II VIM OK.
Relay K24 OK.
Starter pushbutton OK.
Diode D3B OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K1.
Faulty start and charging cable assembly.
Faulty auxiliary starter solenoid.

36. **WARNING**  
Read WARNING on following page.

Is 24 vdc present at relay K1 terminal 30?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1602 is faulty.

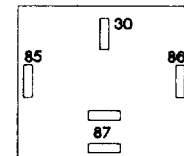
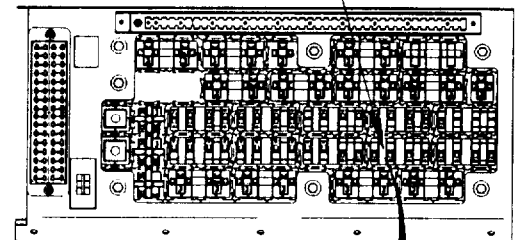
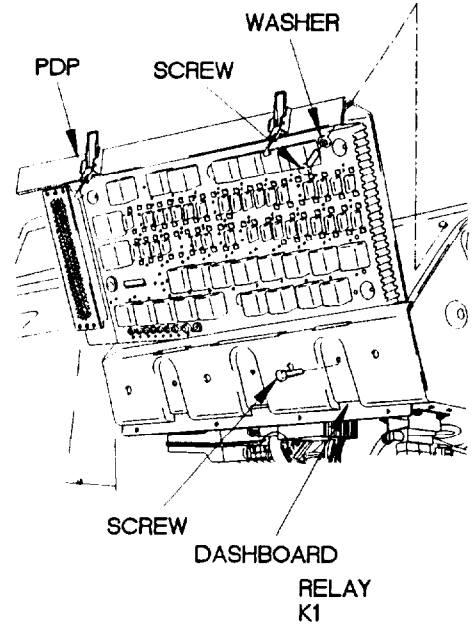


**WARNING**

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

**VOLTAGE TEST**

- (1) Remove three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to back of PDP terminal 30 of relay K1.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1602 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

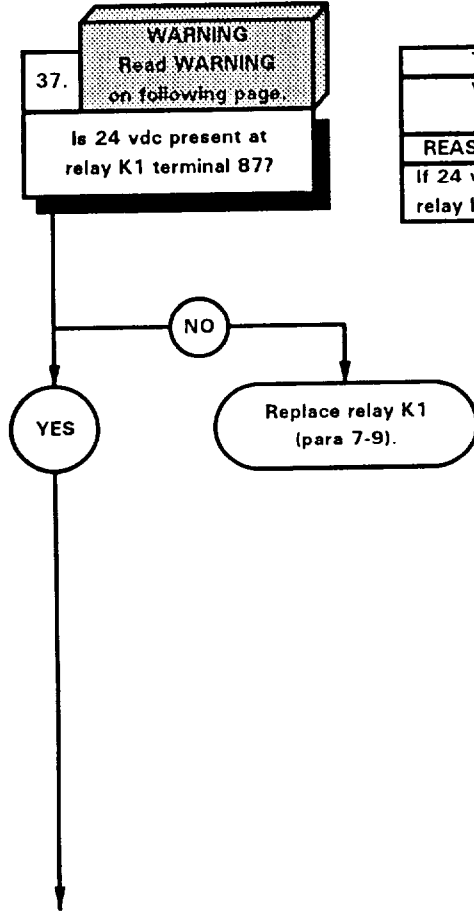


RELAY K1 CAVITY

X2E02351

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
WTEC II VIM OK.
Relay K24 OK.
Starter pushbutton OK.
Diode D3B OK.
POSSIBLE PROBLEMS
Faulty relay K1.
Faulty dashboard cable assembly.
Faulty start and charging cable assembly.
Faulty auxiliary starter solenoid.



TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, relay K1 is faulty.

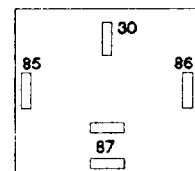
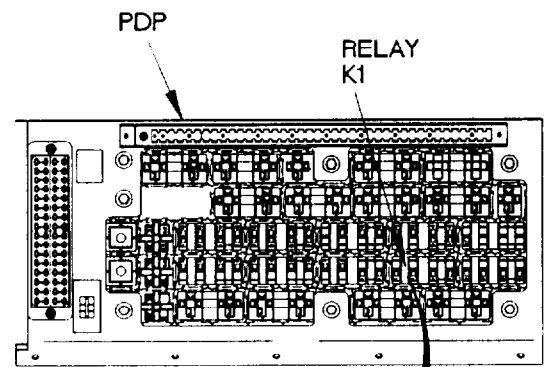


**WARNING**

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

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to back of PDP terminal 87 of relay K1.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Press starter pushbutton (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, replace relay K1 (para 7-9).
- (7) Position master power switch to off (TM 9-2320-365-10).



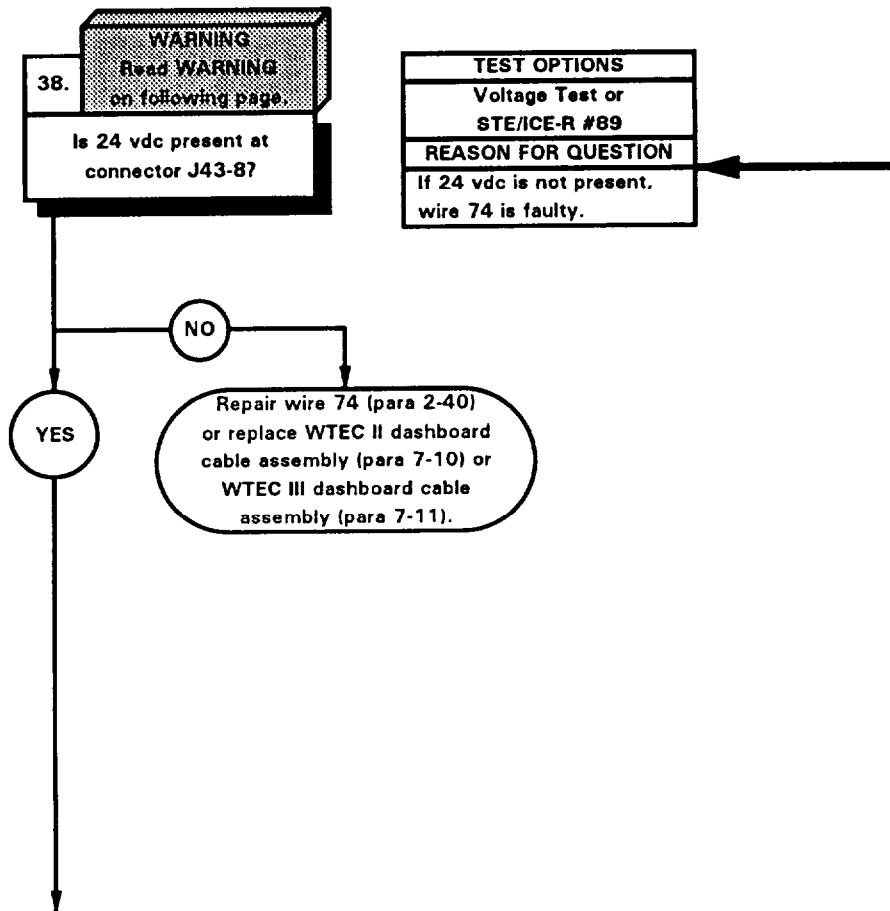
RELAY K1 CAVITY

K2E02361



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral. Starting motor OK. Starter to chassis ground cable OK. Starter to shunt 24 vdc cable OK. Shunt OK. Battery cable OK. 100 amp reverse polarity relay OK. 100 amp reverse polarity relay to PDP 24 vdc cable OK. Relay K2 OK. WTEC II VIM OK. Relay K24 OK. Starter pushbutton OK. Diode D3B OK. Relay K1 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty start and charging cable assembly. Faulty auxiliary starter solenoid.

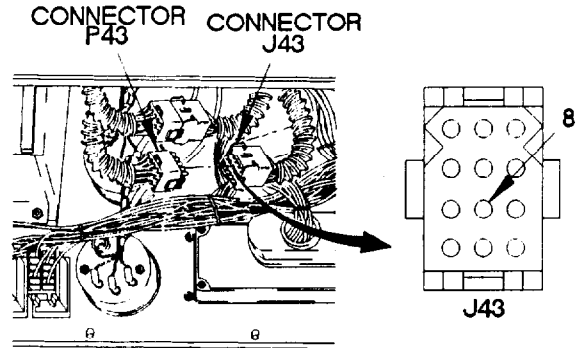


**WARNING**

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**

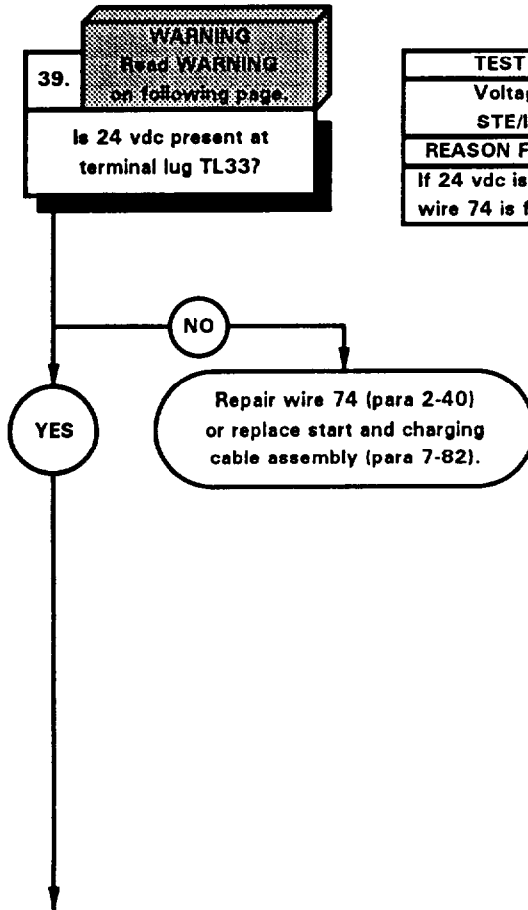
- (1) Disconnect connector J43 from connector P43.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J43-8.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Press starter pushbutton (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 74 (para 2-40) 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 9-2320-365-10).
- (9) Connect connector J43 to connector P43.
- (10) Install instrument panel assembly (para 7-15).



X2E0237A

62. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Battery cable OK.
100 amp reverse polarity relay OK.
100 amp reverse polarity relay to PDP 24 vdc cable OK.
Relay K2 OK.
WTEC II VIM OK.
Relay K24 OK.
Starter pushbutton OK.
Diode D3B OK.
Relay K1 OK.
Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty start and charging cable assembly.
Faulty auxiliary starter solenoid.



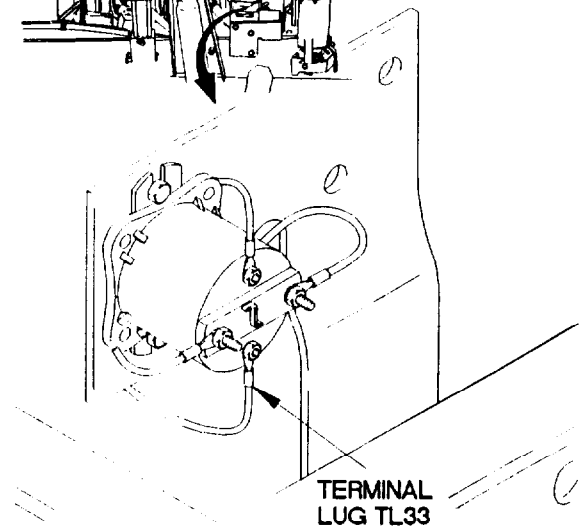
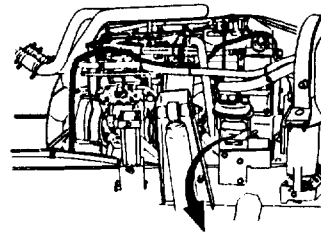
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 74 is faulty.

**WARNING**

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

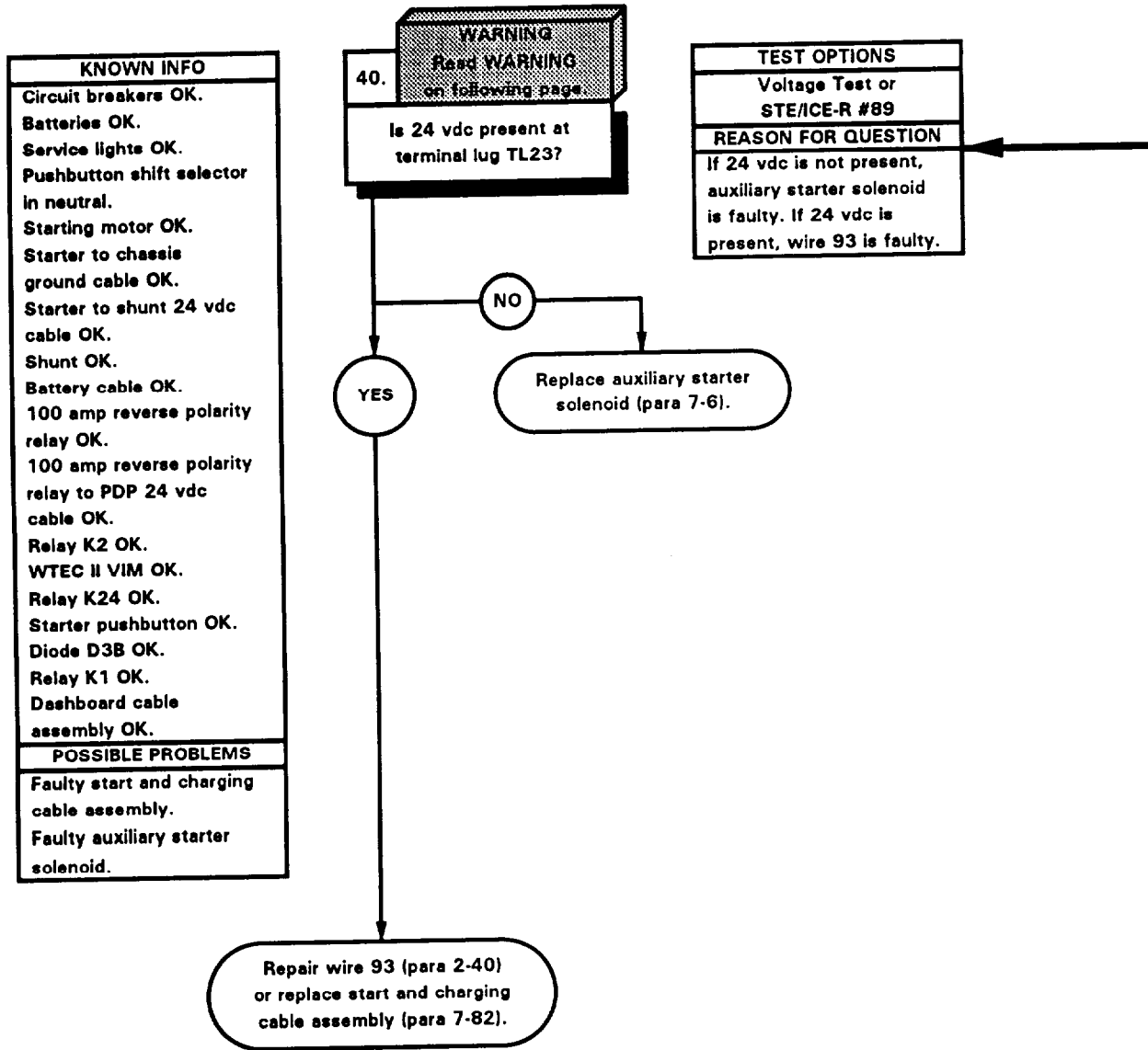
**VOLTAGE TEST**

- (1) Raise cab (TM 9-2320-365-10).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to terminal lug TL33.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Press starter pushbutton (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 74 (para 2-40) or replace start and charging cable assembly (para 7-82).
- (8) Position master power switch to off (TM 9-2320-365-10).



x2E0238A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

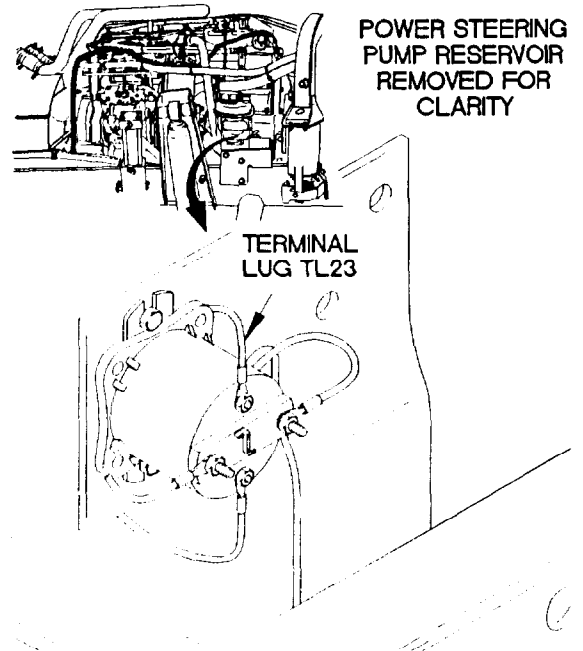


**WARNING**

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.

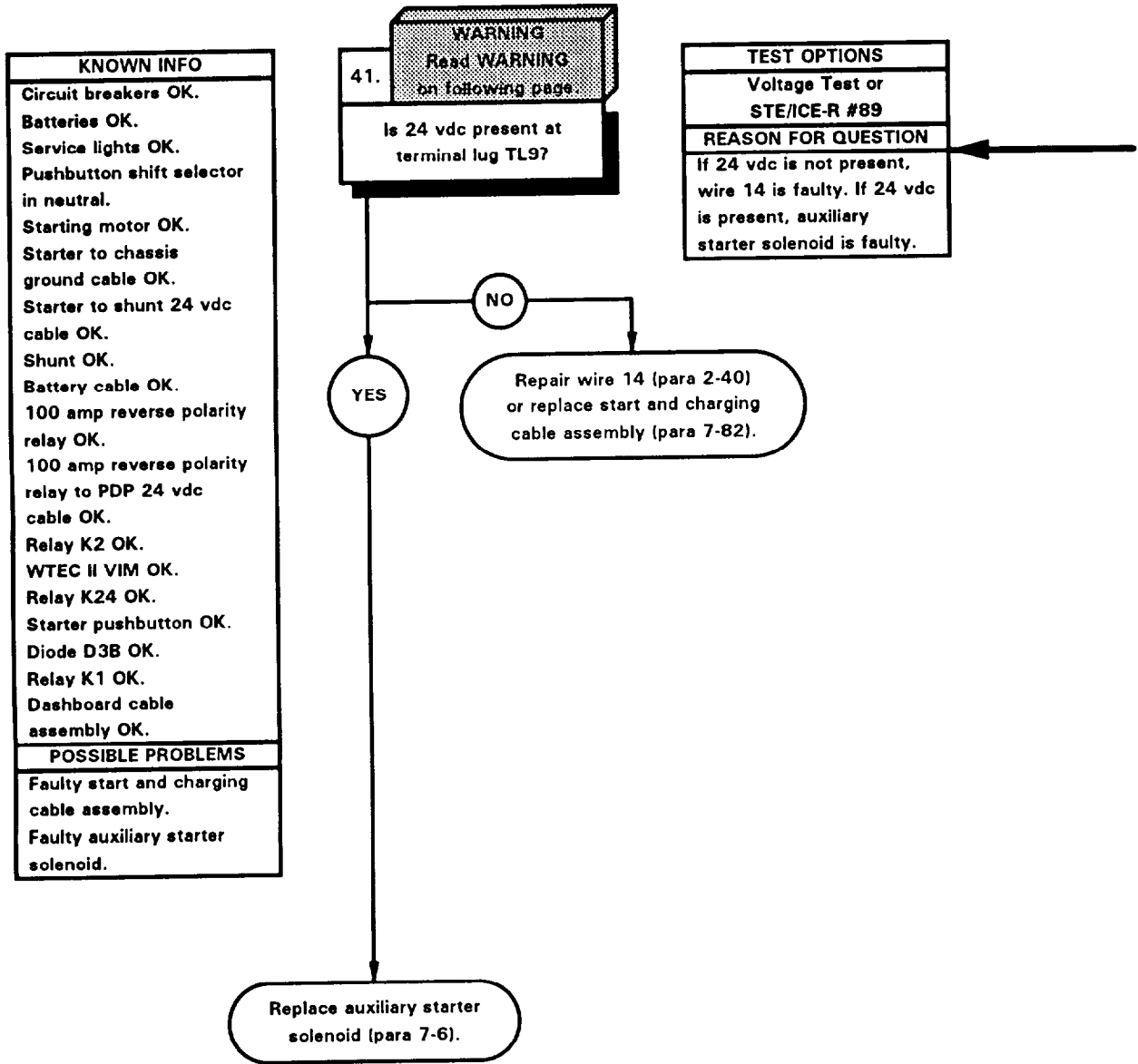
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal lug TL23.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Press starter pushbutton (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, replace auxiliary starter solenoid (para 7-6).
- (7) If 24 vdc is present, repair wire 93 (para 2-40) or replace start and charging cable assembly (para 7-82).
- (8) Position master power switch to off (TM 9-2320-365-10).
- (9) Lower cab (TM 9-2320-365-10).



K2E0239A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

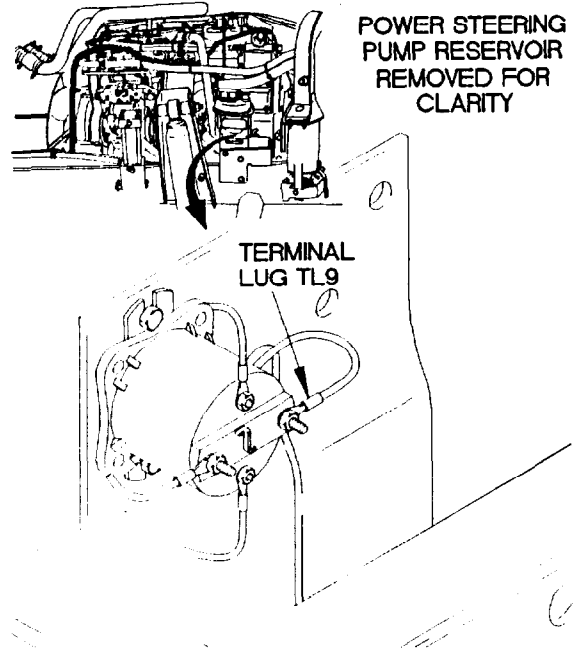


**WARNING**

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) Raise cab (TM 9-2320-365-10).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to terminal lug TL9.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Press starter pushbutton (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 14 (para 2-40) or replace start and charging cable assembly (para 7-82).
- (8) If 24 vdc is present, replace auxiliary starter solenoid (para 7-6).
- (9) Position master power switch to off (TM 9-2320-365-10).
- (10) Lower cab (TM 9-2320-365-10).

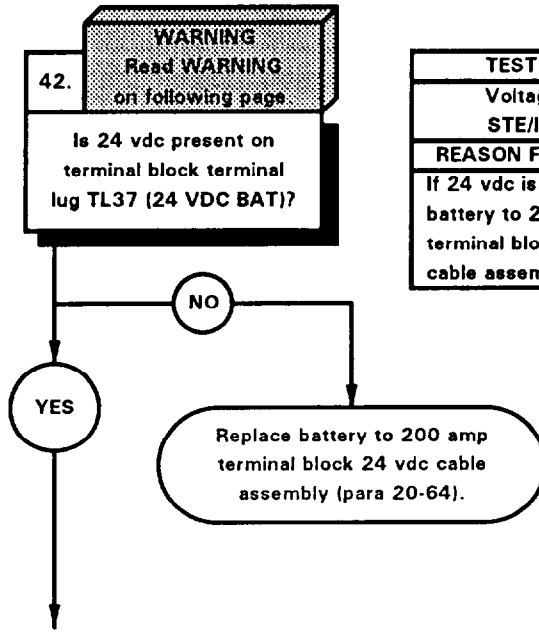


K2EG240A



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral. Starting motor OK. Starter to chassis ground cable OK. Starter to shunt 24 vdc cable OK. Shunt OK. Start and charging cable assembly OK. Relay K1 OK. Relay K24 OK. Diode D3B OK. Starter pushbutton OK. Auxiliary starter solenoid OK. Battery cable OK.
POSSIBLE PROBLEMS
Faulty battery to 200 amp terminal block 24 vdc cable assembly. Faulty 200 amp terminal block. Faulty 200 amp terminal block to reverse polarity relay 24 vdc battery cable. Faulty 200 amp reverse polarity relay. Faulty 200 amp terminal block to reverse polarity relay 24 vdc LOAD cable. Faulty 200 amp terminal block to PDP 24 vdc cable. Faulty dashboard cable assembly.



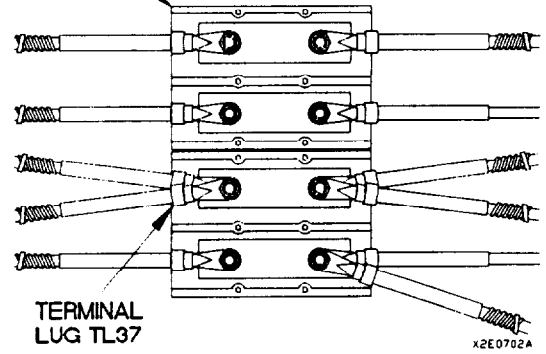
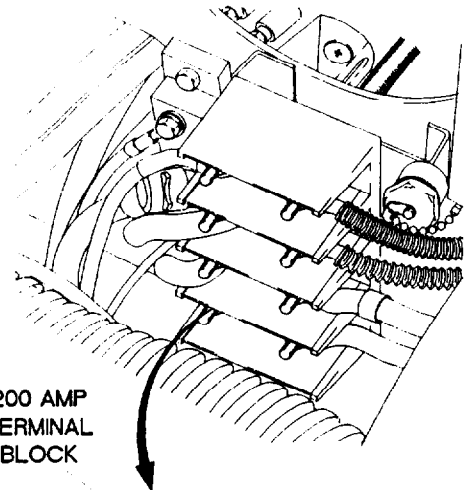
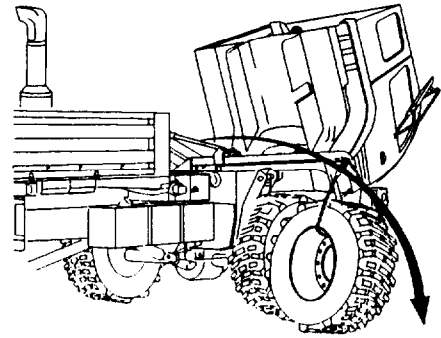
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, battery to 200 amp terminal block 24 vdc cable assembly is faulty.

**WARNING**

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

**VOLTAGE TEST**

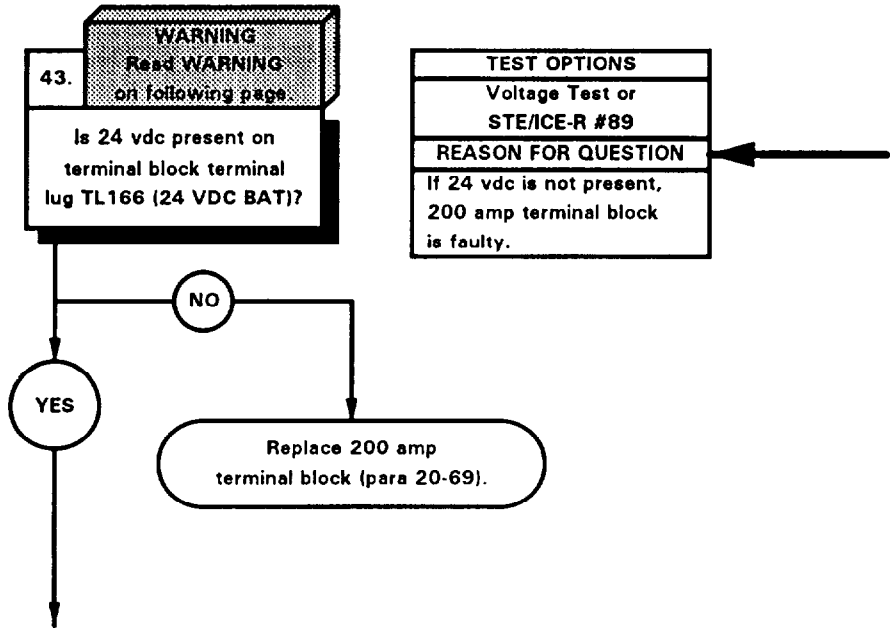
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal block terminal lug TL37 (24V BAT).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 24 vdc is not present, replace battery to 200 amp terminal block 24 vdc cable assembly (para 20-64).



x2E0702A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral. Starting motor OK. Starter to chassis ground cable OK. Starter to shunt 24 vdc cable OK. Shunt OK. Start and charging cable assembly OK. Relay K1 OK. Relay K24 OK. Diode D3B OK. Starter pushbutton OK. Auxiliary starter solenoid OK. Battery cable OK. Battery to 200 amp terminal block 24 vdc cable assembly OK.
POSSIBLE PROBLEMS
Faulty 200 amp terminal block. Faulty 200 amp terminal block to reverse polarity relay 24 vdc battery cable. Faulty 200 amp reverse polarity relay. Faulty 200 amp terminal block to reverse polarity relay 24 vdc LOAD cable. Faulty 200 amp terminal block to PDP 24 vdc cable. Faulty dashboard cable assembly.

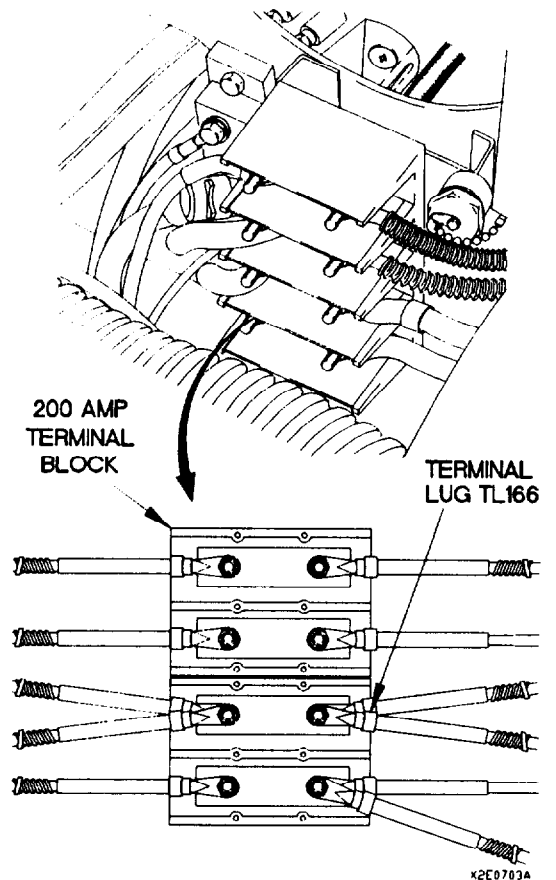
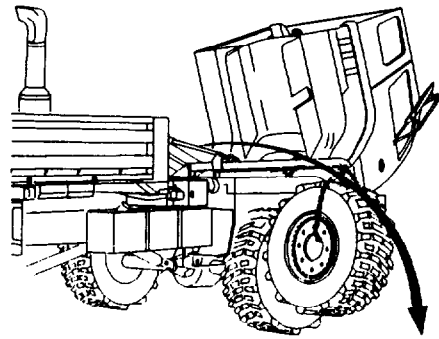


**WARNING**

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

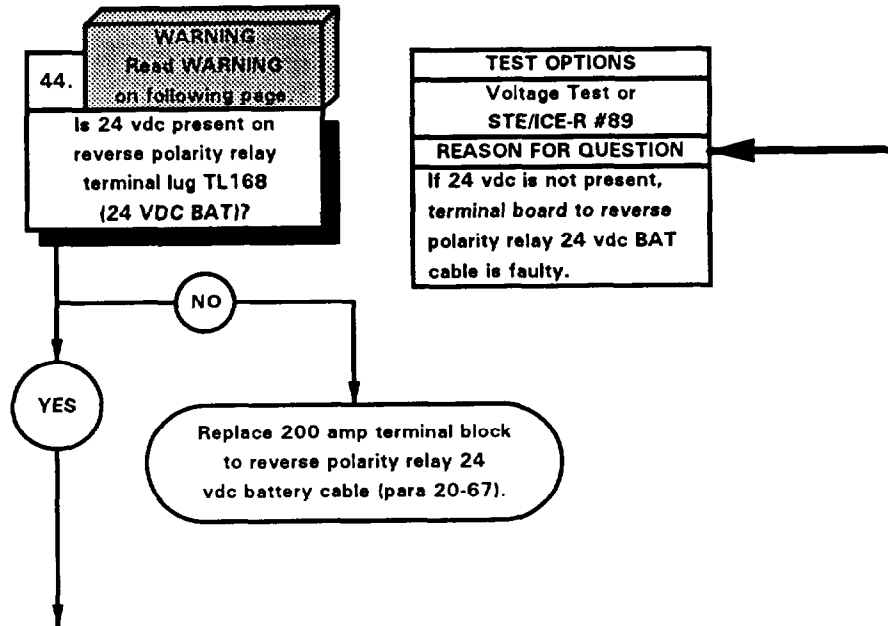
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to 200 amp terminal block terminal lug TL166 (24V BAT).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 24 vdc is not present, replace 200 amp terminal block (para 20-69).



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK.
Batteries OK.
Service lights OK.
Pushbutton shift selector in neutral.
Starting motor OK.
Starter to chassis ground cable OK.
Starter to shunt 24 vdc cable OK.
Shunt OK.
Start and charging cable assembly OK.
Relay K1 OK.
Relay K24 OK.
Diode D3B OK.
Starter pushbutton OK.
Auxiliary starter solenoid OK.
Battery cable OK.
Battery to 200 amp terminal block 24 vdc cable assembly OK.
POSSIBLE PROBLEMS
Faulty 200 amp terminal block to reverse polarity relay 24 vdc battery cable.
Faulty 200 amp reverse polarity relay.
Faulty 200 amp terminal block to reverse polarity relay 24 vdc LOAD cable.
Faulty 200 amp terminal block.
Faulty 200 amp terminal block to PDP 24 vdc cable.
Faulty dashboard cable assembly.

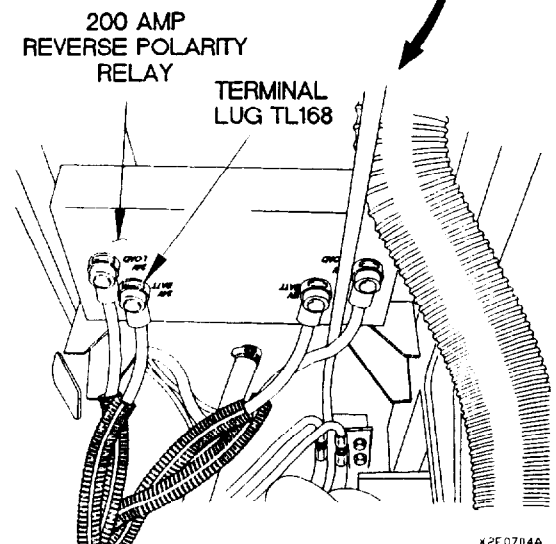
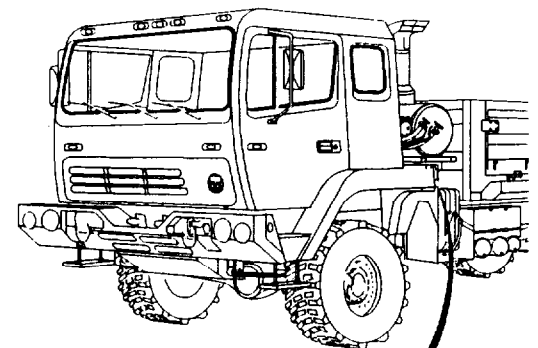


**WARNING**

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

**VOLTAGE TEST**

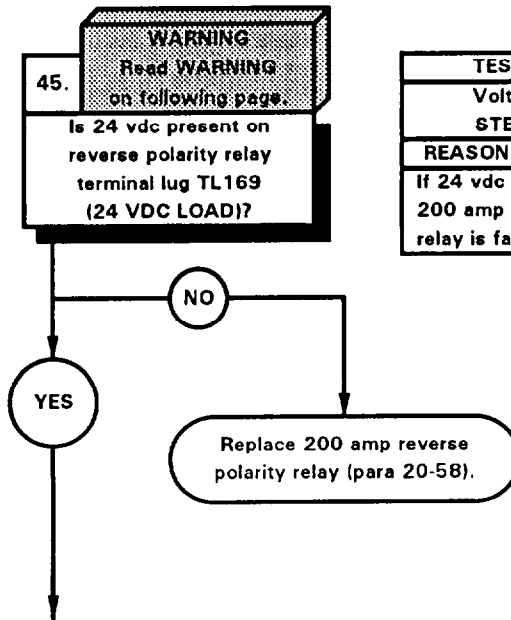
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to reverse polarity relay terminal lug TL168 (24V BAT).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 24 vdc is not present, replace 200 amp terminal block to reverse polarity relay 24 vdc battery cable (para 20-67).



K2E0704A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral. Starting motor OK. Starter to chassis ground cable OK. Starter to shunt 24 vdc cable assembly OK. Shunt OK. Start and charging cable assembly OK. Relay K1 OK. Relay K24 OK. Diode D3B OK. Starter pushbutton OK. Auxiliary starter solenoid OK. Battery cable OK. Battery to 200 amp terminal block 24 vdc cable assembly OK. 200 amp terminal block to reverse polarity relay 24 vdc battery cable OK.
POSSIBLE PROBLEMS
Faulty 200 amp reverse polarity relay. Faulty 200 amp terminal block to reverse polarity relay 24 vdc LOAD cable. Faulty 200 amp terminal block. Faulty 200 amp terminal block to PDP 24 vdc cable. Faulty dashboard cable assembly.



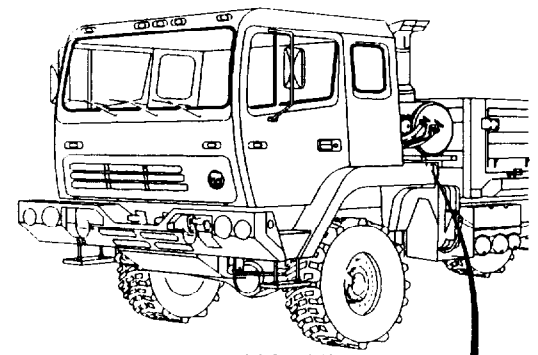
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, 200 amp reverse polarity relay is faulty.

**WARNING**

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

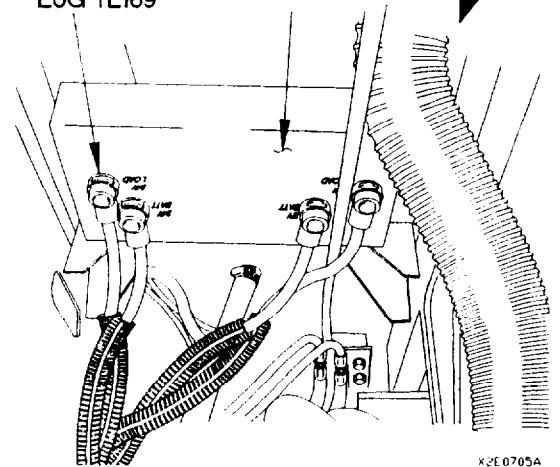
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to reverse polarity relay terminal lug TL169 (24V LOAD).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 24 vdc is not present, replace 200 amp reverse polarity relay (para 20-58).



200 AMP  
REVERSE POLARITY  
RELAY

TERMINAL  
LUG TL169

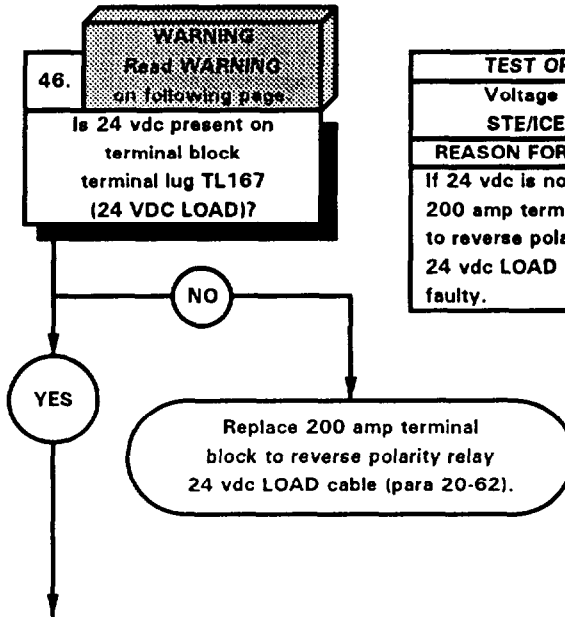


X3E 0705A



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breakers OK. Batteries OK. Service lights OK. Pushbutton shift selector in neutral. Starting motor OK. Starter to chassis ground cable OK. Starter to shunt 24 vdc cable OK. Shunt OK. Start and charging cable assembly OK. Relay K1 OK. Relay K24 OK. Diode D3B OK. Starter pushbutton OK. Auxiliary starter solenoid OK. Battery cable OK. Battery to 200 amp terminal block 24 vdc cable assembly OK. 200 amp terminal block to reverse polarity relay 24 vdc battery cable OK. 200 amp reverse polarity relay OK.
POSSIBLE PROBLEMS
Faulty 200 amp terminal block to reverse polarity relay 24 vdc LOAD cable. Faulty 200 amp terminal block. Faulty 200 amp terminal block to PDP 24 vdc cable. Faulty dashboard cable assembly.



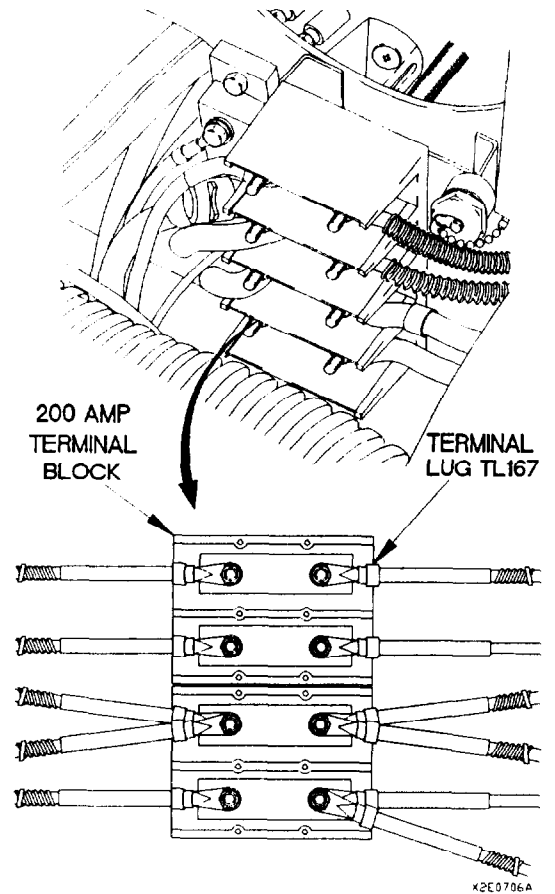
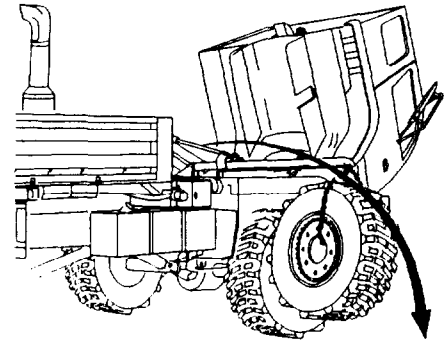
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, 200 amp terminal block to reverse polarity relay 24 vdc LOAD cable is faulty.

**WARNING**

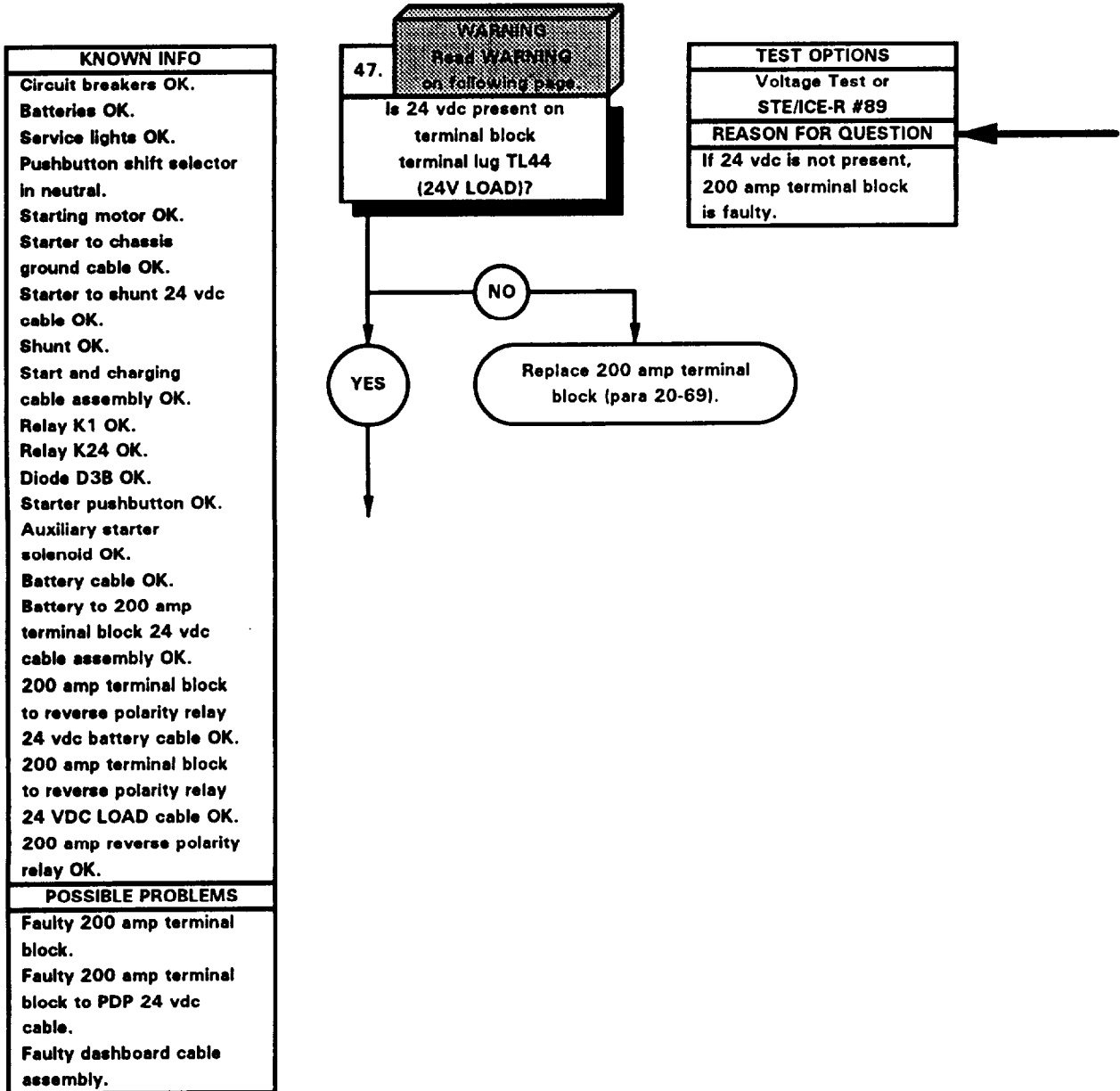
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock. Batteries can explode from a spark. Battery acid is harmful to skin and eyes.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

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal block terminal lug TL167 (24V LOAD).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 24 vdc is not present, replace 200 amp terminal block to reverse polarity relay 24 vdc LOAD cable (para 20-62).



2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

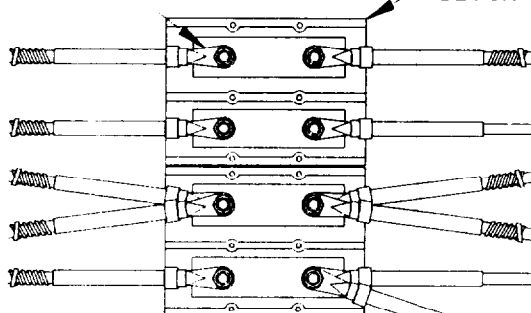
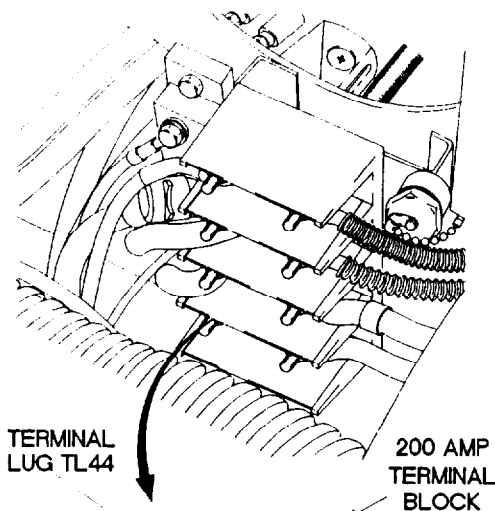
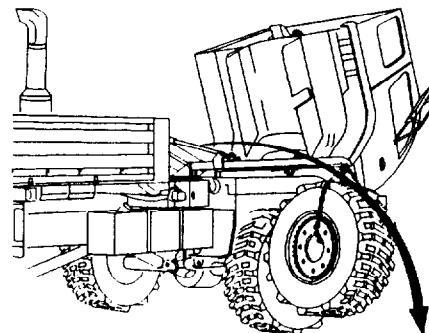


**WARNING**

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.

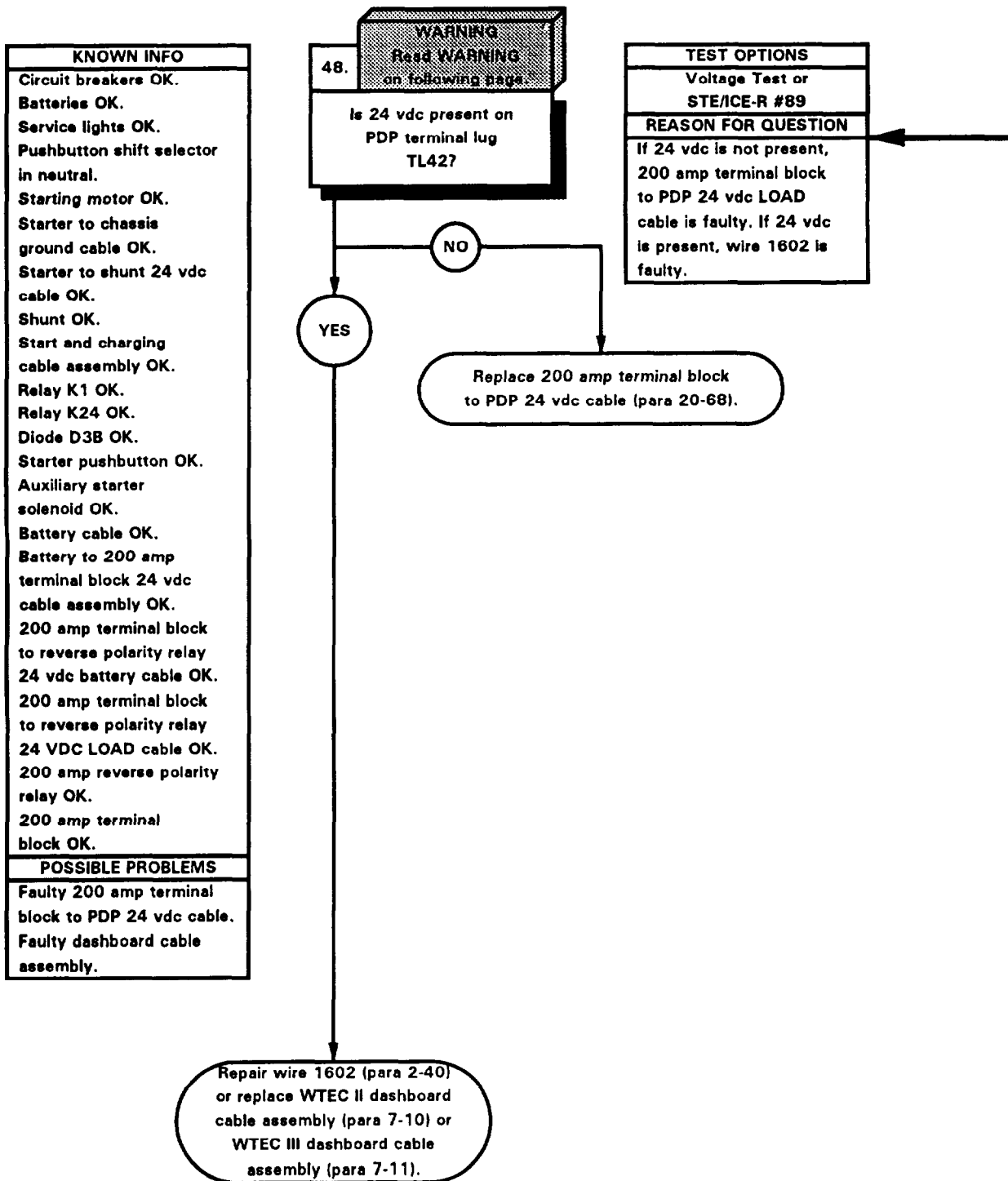
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal block terminal lug TL44 (24V LOAD).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 24 vdc is not present, replace 200 amp terminal block (para 20-69).



X2E0707A

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

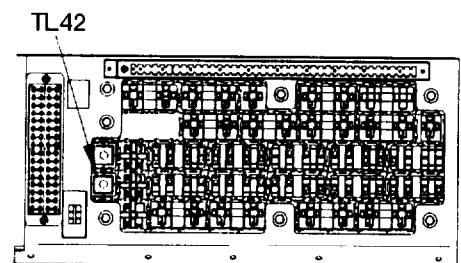
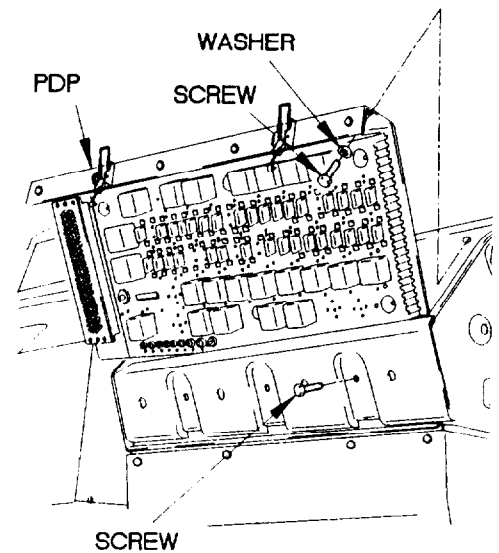


**WARNING**

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.

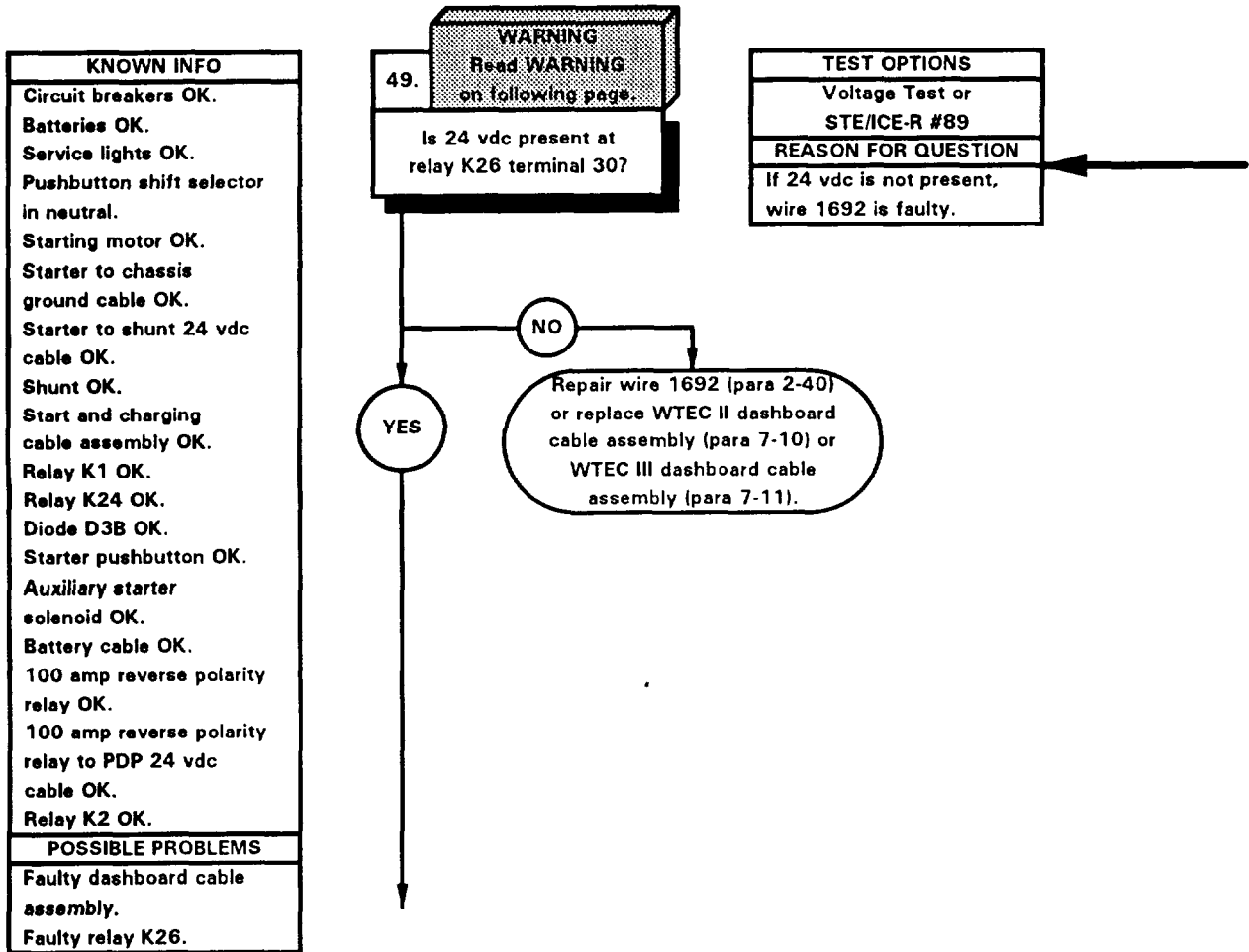
**VOLTAGE TEST**

- (1) Remove 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) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to PDP terminal lug TL42.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If 24 vdc is not present, replace terminal board to PDO 24 vdc cable (TL42) (para 20-68).
- (9) If 24 vdc is present, repair wire 1602 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) Install PDP on dashboard with three screws.
- (11) Install three washers and screws in PDP.
- (12) Install PDP cover (para 16-2).



X2E06041

e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

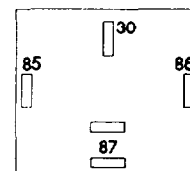
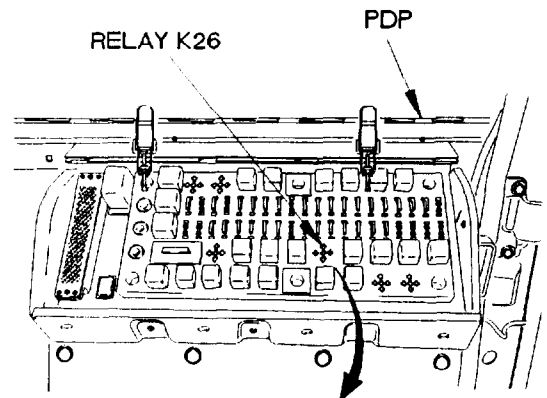


**WARNING**

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 relay K26 from PDP.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to PDP terminal 30, where relay K26 was removed.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 1692 (para 2-40) 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 9-2320-365-10).
- (8) Install relay K26 in PDP.

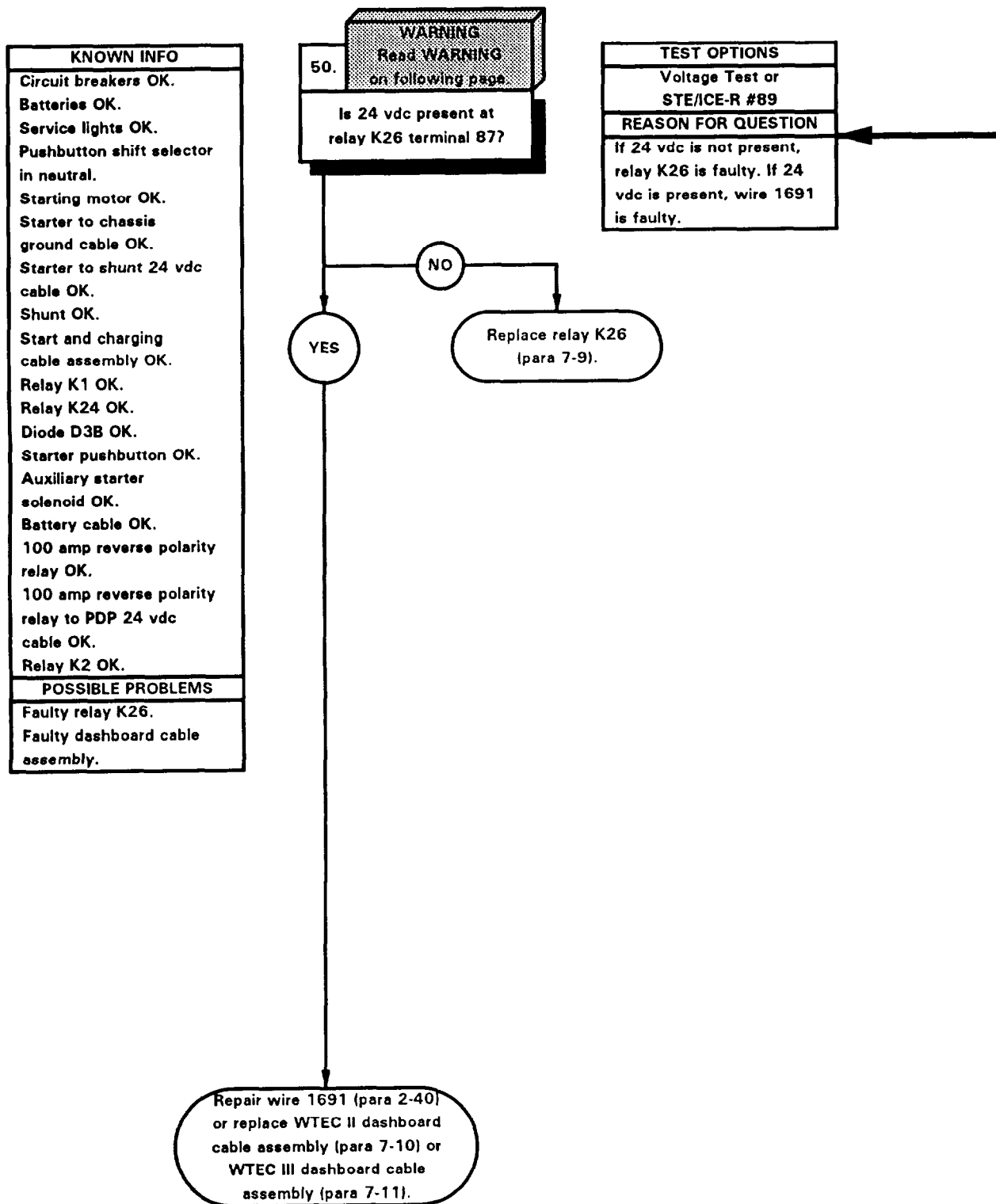


RELAY K26

x2E02481



e2. ENGINE DOES NOT CRANK/24 VDC CIRCUITS DO NOT OPERATE (CONT)

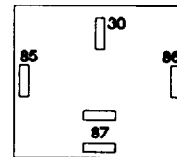
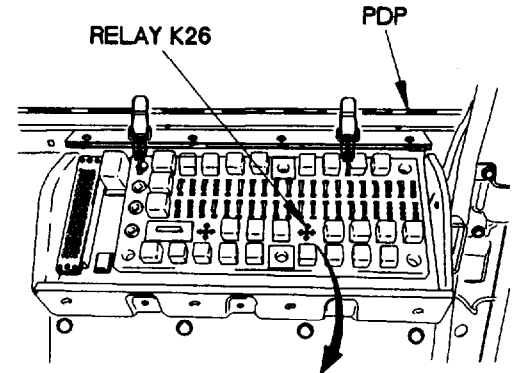


**WARNING**

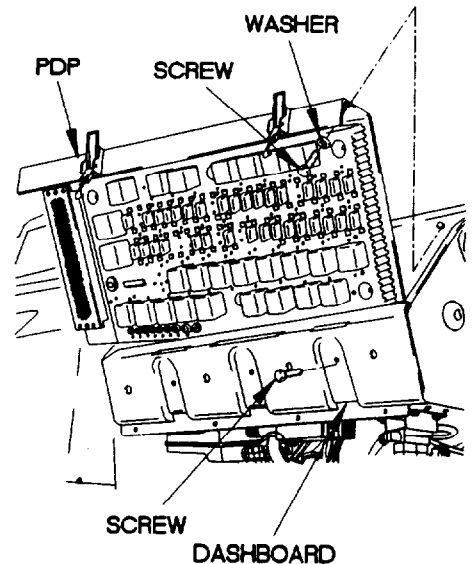
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to back of PDP terminal 87 of relay K26.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, replace relay K26 (para 7-9).
- (6) If 24 vdc is present, repair wire 1691 (para 2-40) 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 9-2320-365-10).
- (8) Install PDP in dashboard with three screws.
- (9) Install three washers and screws in PDP.
- (10) Install kick panel (para 16-3).

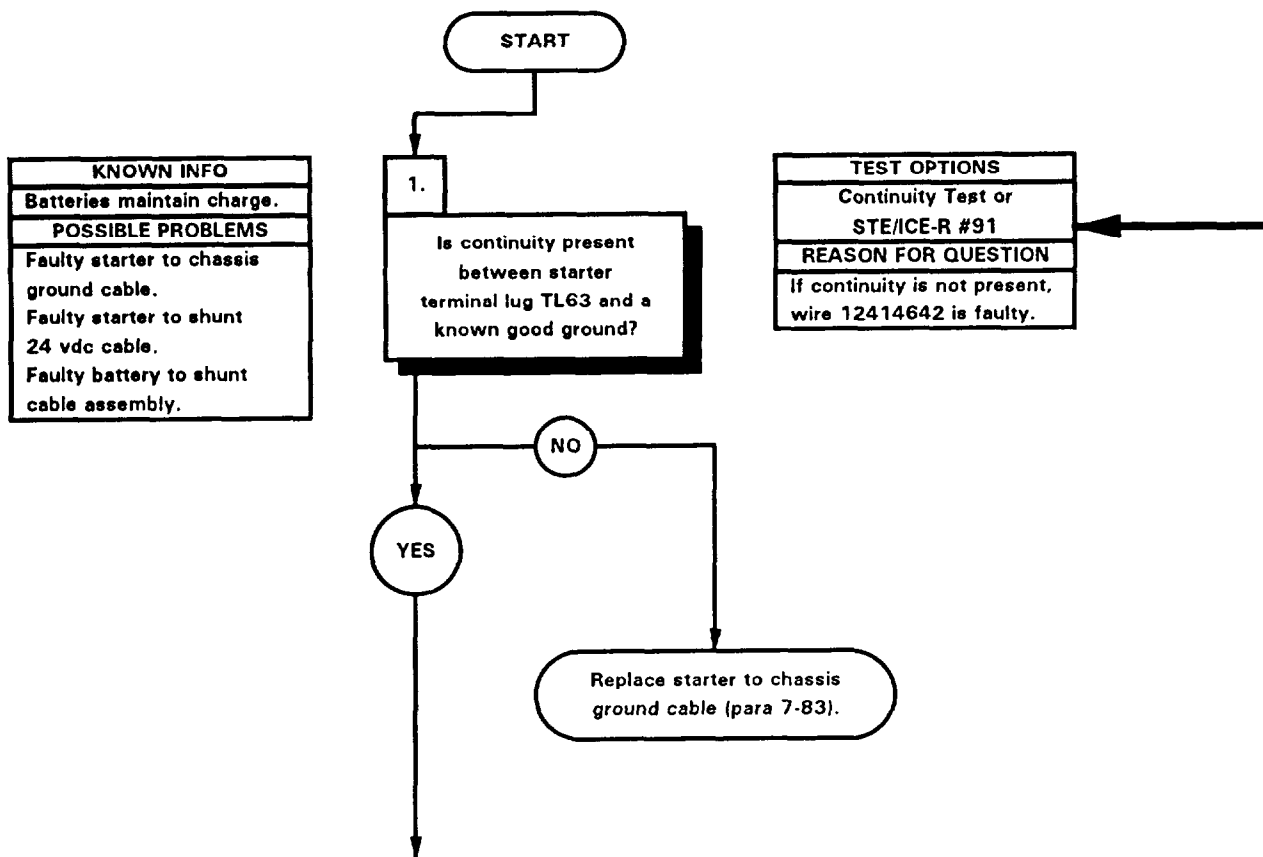


RELAY K26

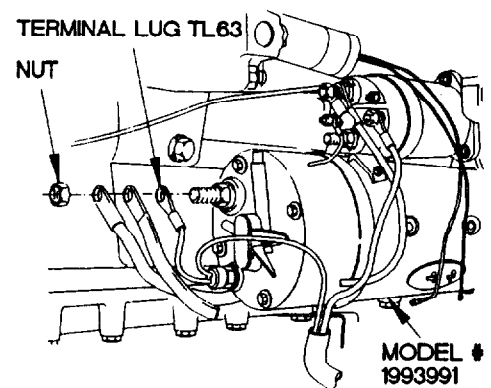
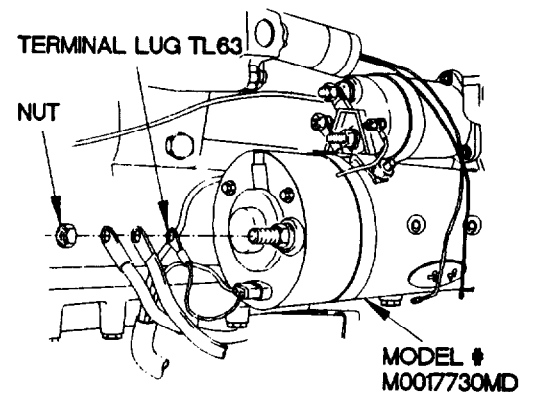
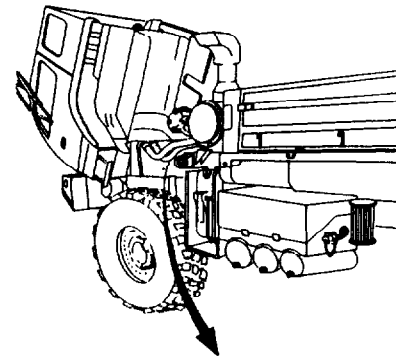


x2E02491

e3. 12 VDC AND 24 VDC CIRCUITS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

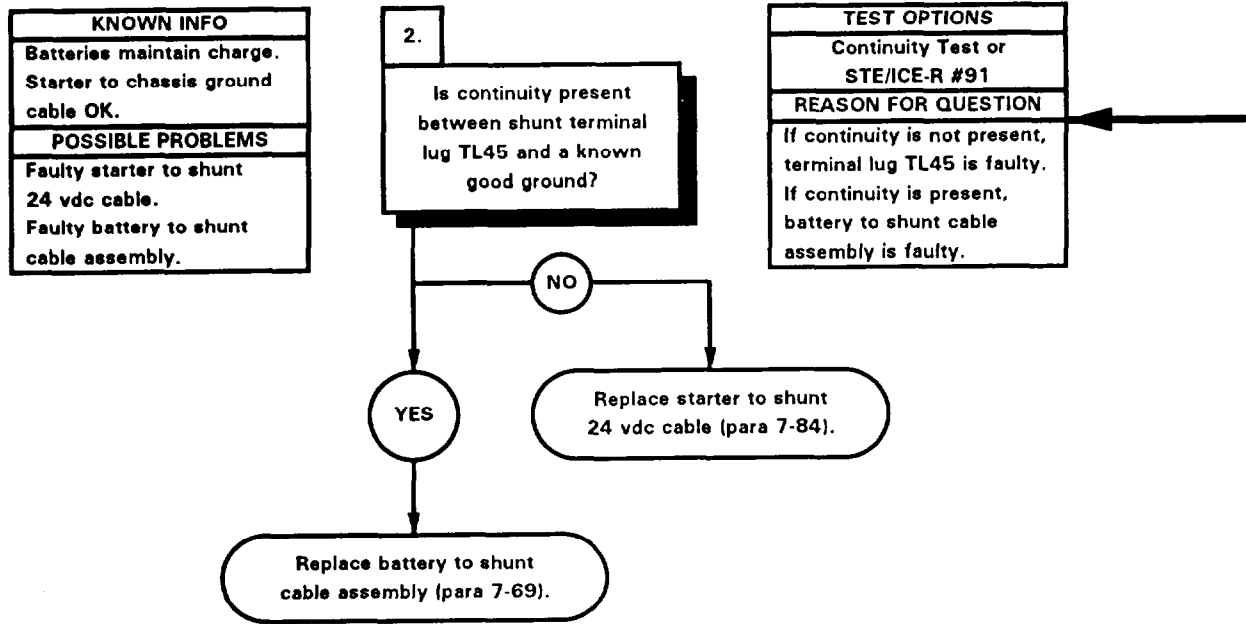


- | CONTINUITY TEST |  |
|-----------------|--|
|                 | (1) Raise cab (TM 9-2320-365-10).  |
|                 | (2) Disconnect terminal lug TL63 from starting motor.  |
|                 | (3) Set multimeter to ohms.  |
|                 | (4) Connect positive (+) probe of multimeter to terminal lug TL63.                             |
|                 | (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.         |
|                 | (6) If continuity is not present, replace replace starter to chassis ground cable (para 7-83). |
|                 | (7) Connect terminal lug TL63 to starting motor.   |



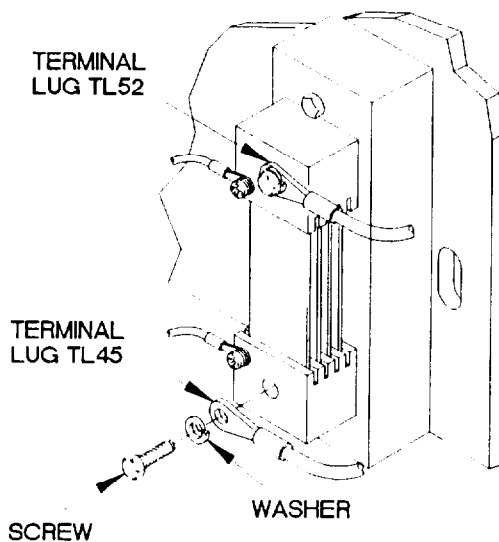
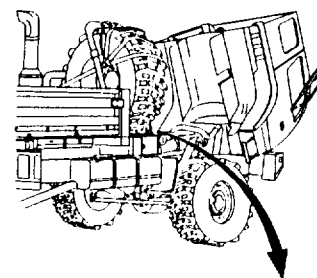
X2E0301A

e3. 12 VDC AND 24 VDC CIRCUITS DO NOT OPERATE (CONT)



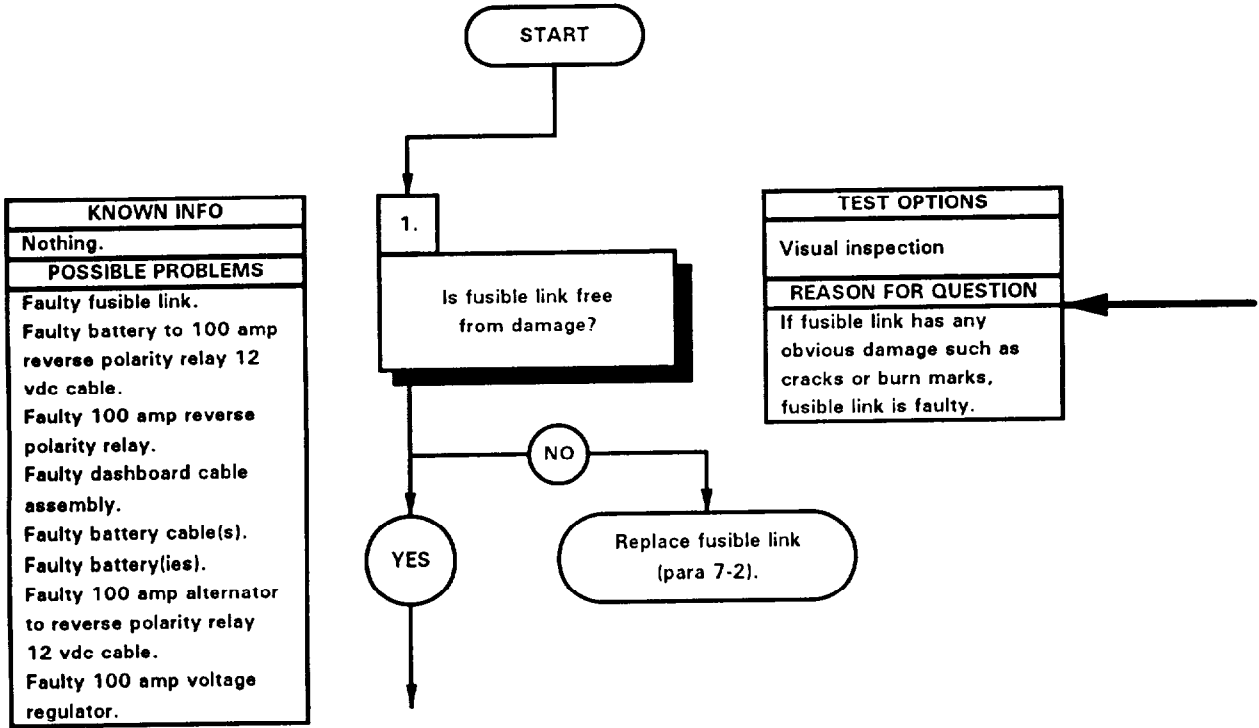
**CONTINUITY TEST**

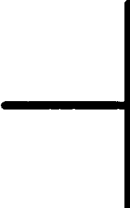
- (1) Disconnect terminal lug TL45 from shunt.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to terminal lug TL45.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, replace starter to shunt 24 vdc cable (para 7-84).
- (6) If continuity is present, replace battery to shunt cable assembly (para 7-69).
- (7) Connect terminal lug TL45 to shunt.
- (8) Lower cab (TM 9-2320-365-10).
- (9) Connect batteries (para 7-48).



x2E0302A

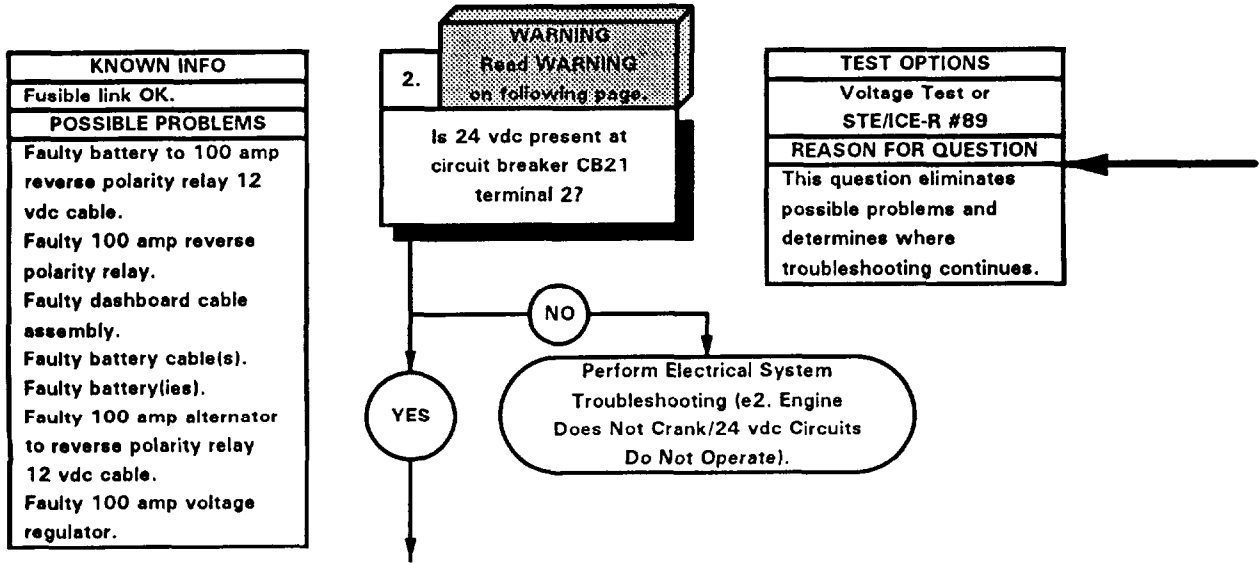
e4. 12 VDC CIRCUITS DO NOT OPERATE (100 AMP ALTERNATOR)	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Tester, Antifreeze and Battery (Item 41, Appendix C) Goggles, Industrial (Item 15, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	



- 
- (1) Remove fusible link (para 7-2).
  - (2) Check fusible link for obvious signs of cracks and burn marks.
  - (3) If cracks or burn marks are found, replace fusible link (para 7-2).
  - (4) Install fusible link (para 7-2).



e4. 12 VDC CIRCUITS DO NOT OPERATE (100 AMP ALTERNATOR) (CONT)

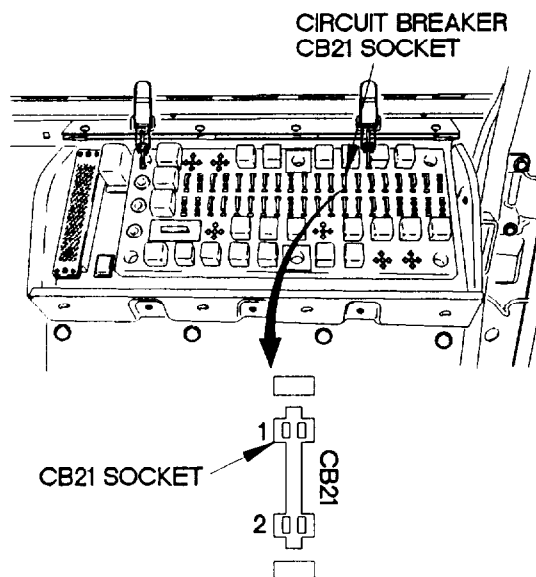


**WARNING**

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.

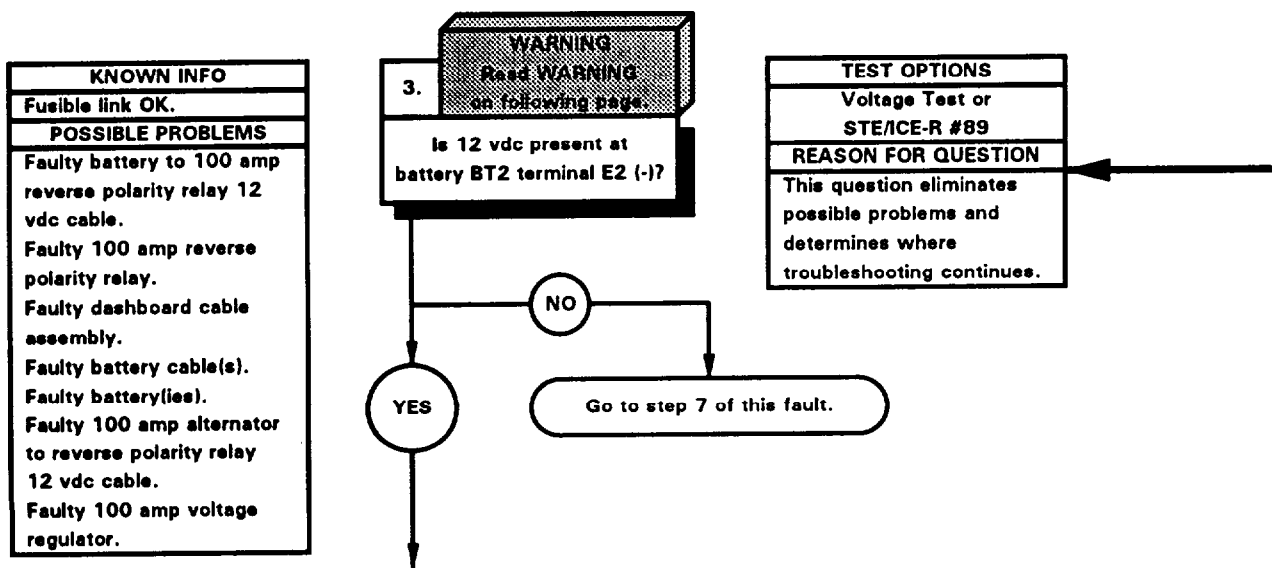
**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove circuit breaker CB21 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, socket 2, where circuit breaker CB21 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, perform Electrical System Troubleshooting (e2. Engine Does Not Crank/24 vdc Circuits Do Not Operate).
- (8) Position master power switch to off (TM 9-2320-365-10).
- (9) Install circuit breaker CB21 in PDP.



X2E040 1A

e4. 12 VDC CIRCUITS DO NOT OPERATE (100 AMP ALTERNATOR) (CONT)

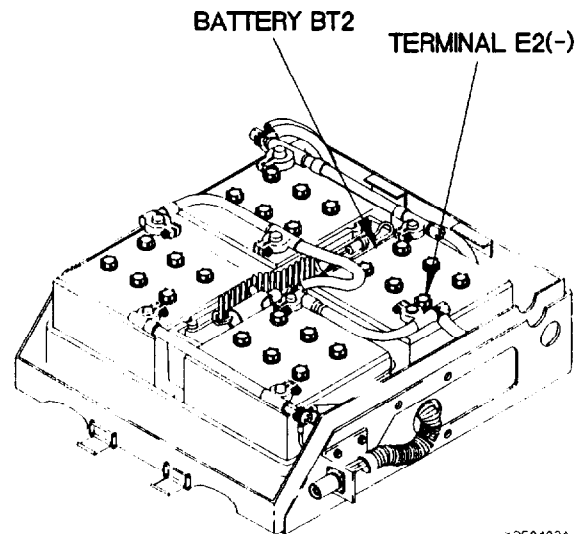


**WARNING**

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 when working with batteries.

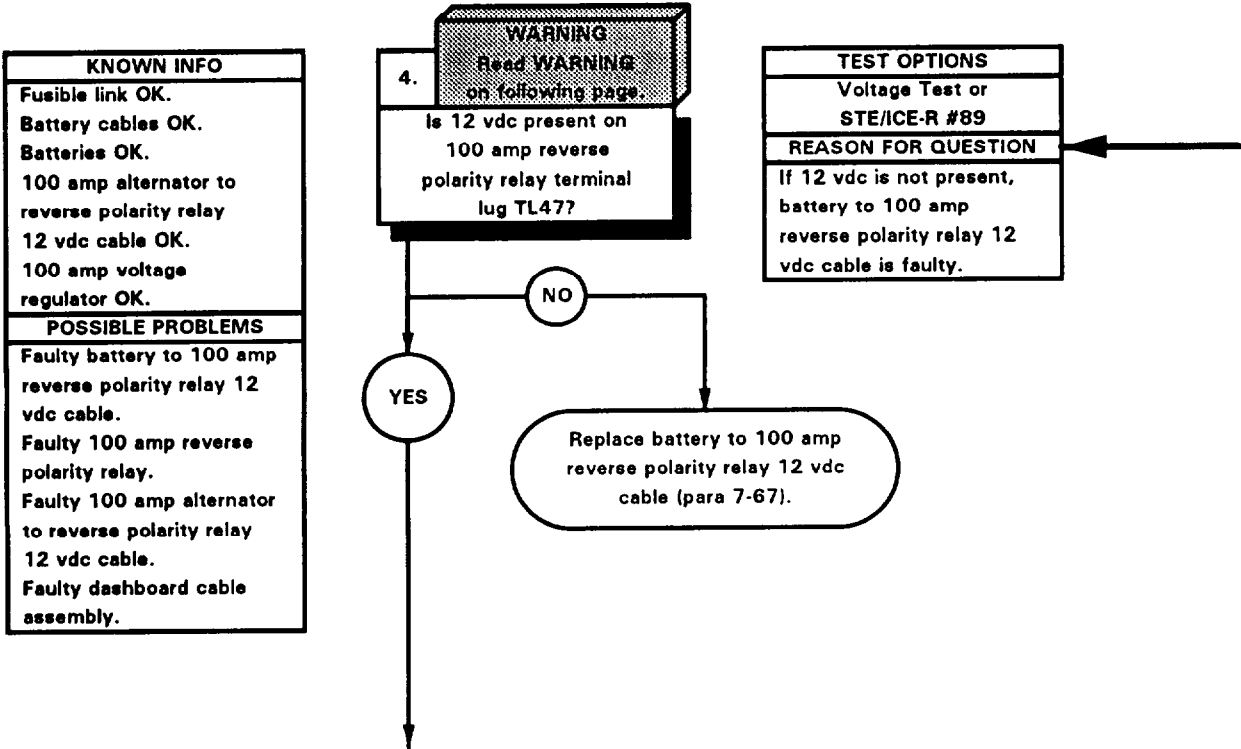
**VOLTAGE TEST**

- (1) Remove battery box cover from battery box (TM 9-2320-365-10).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to battery BT2 terminal E2 (-).
- (4) Connect negative (-) multimeter to ground and note reading on multimeter.
- (5) If 12 vdc is not present, go to step 7 of this fault.



A2E0402A

e4. 12 VDC CIRCUITS DO NOT OPERATE (100 AMP ALTERNATOR) (CONT)

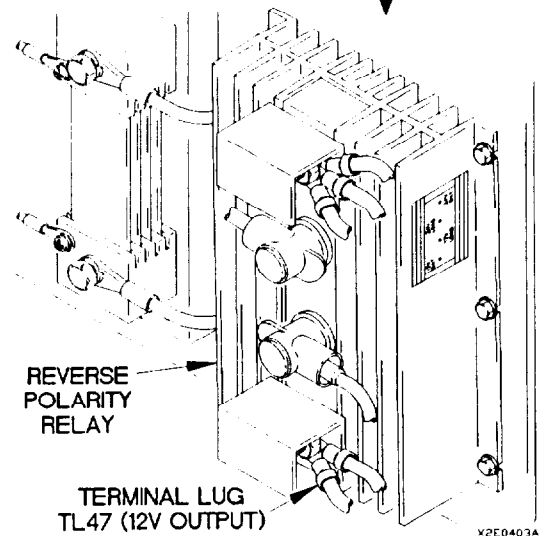
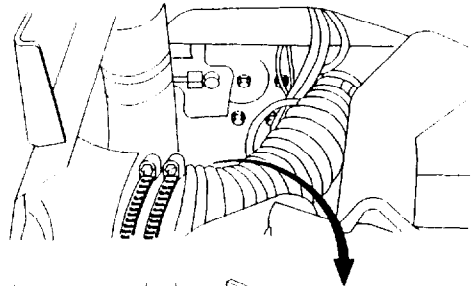
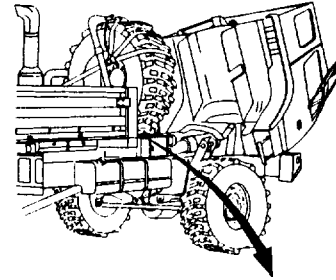


**WARNING**

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.

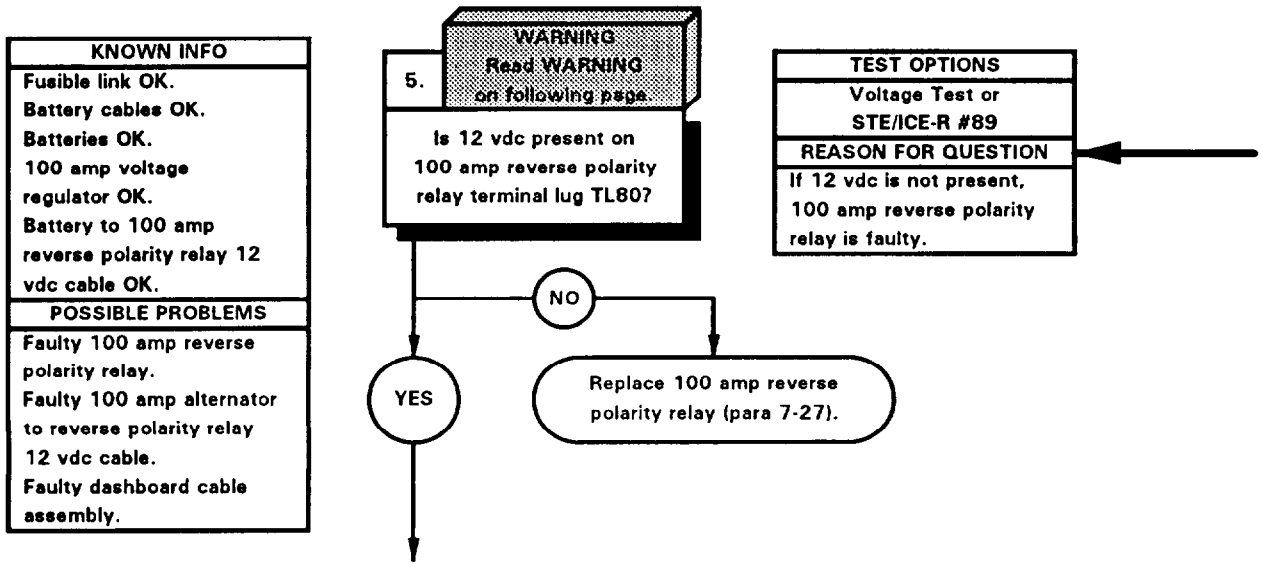
**VOLTAGE TEST**

- (1) Install battery box cover on battery box (TM 9-2320-365-10).
- (2) Raise cab (TM 9-2320-365-10).
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to 100 amp reverse polarity relay terminal lug TL47 (12V BAT).
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If 12 vdc is not present, replace battery to 100 amp reverse polarity relay 12 vdc cable (para 7-67).



V2E0403A

e4. 12 VDC CIRCUITS DO NOT OPERATE (100 AMP ALTERNATOR) (CONT)

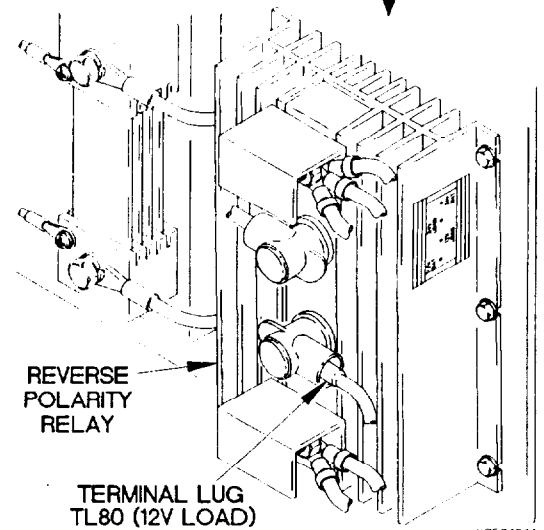
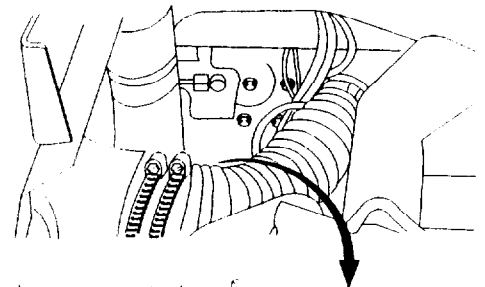
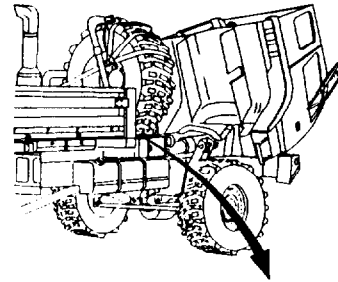


**WARNING**

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**

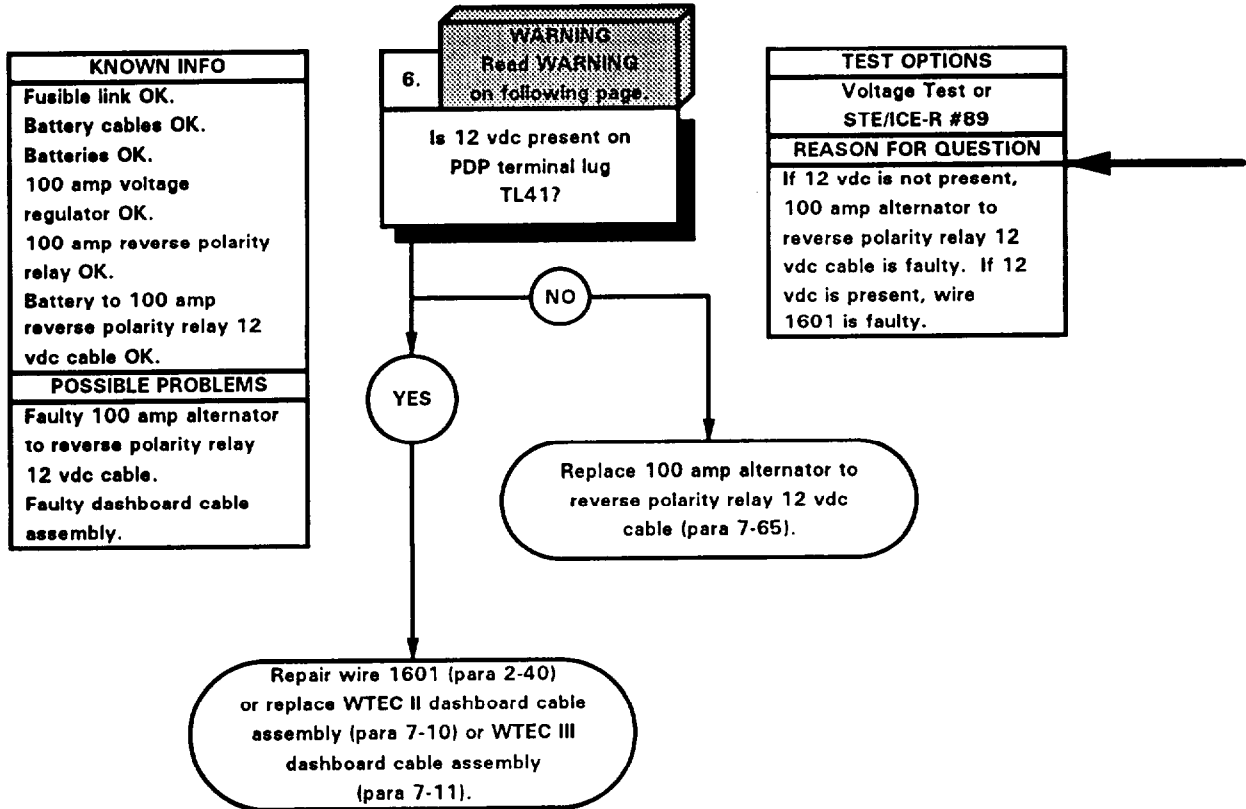
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to 100 amp reverse polarity relay terminal lug TL80 (12V load).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 12 vdc is not present, replace 100 amp reverse polarity relay (para 7-27).
- (5) Lower cab (TM 9-2320-365-10).



X2E0404A



e4. 12 VDC CIRCUITS DO NOT OPERATE (100 AMP ALTERNATOR) (CONT)

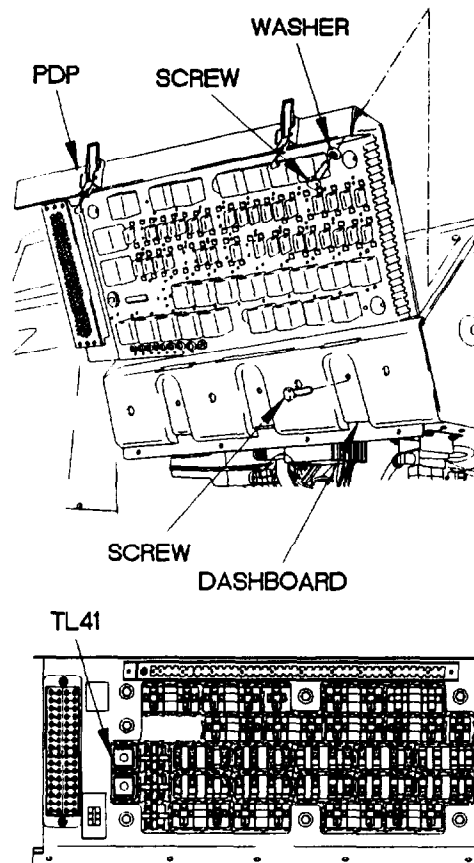


**WARNING**

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.

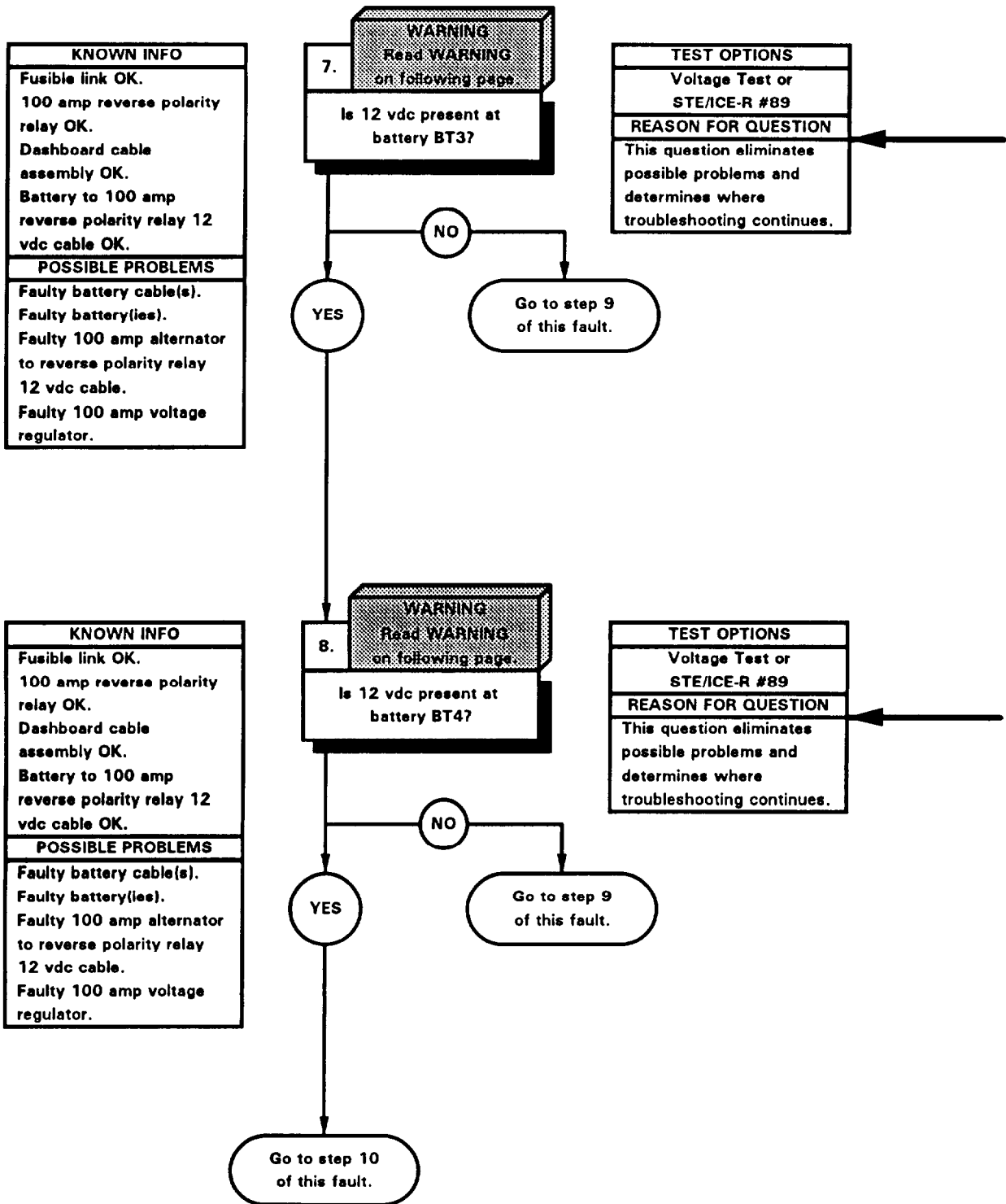
**VOLTAGE TEST**

- (1) Remove three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to PDP terminal lug TL41.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If 12 vdc is not present, replace 100 amp alternator to reverse polarity relay 12 vdc cable (para 7-65).
- (8) If 12 vdc is present, repair wire 1601 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Install PDP on dashboard with three screws.
- (10) Install three screws and washers in PDP.
- (11) Install PDP cover (para 16-2).



X2E04051

e4. 12 VDC CIRCUITS DO NOT OPERATE (100 AMP ALTERNATOR) (CONT)

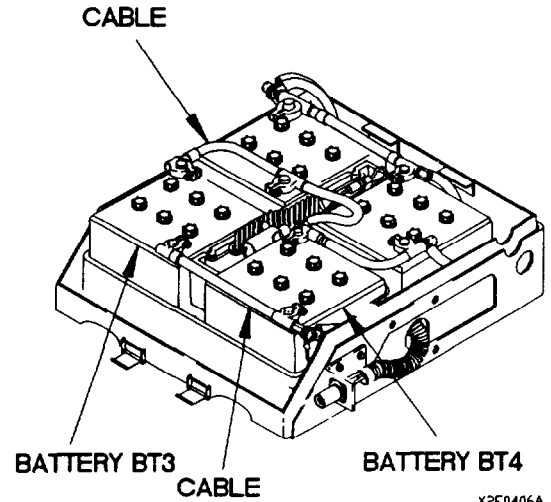


**WARNING**

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 when working with batteries.

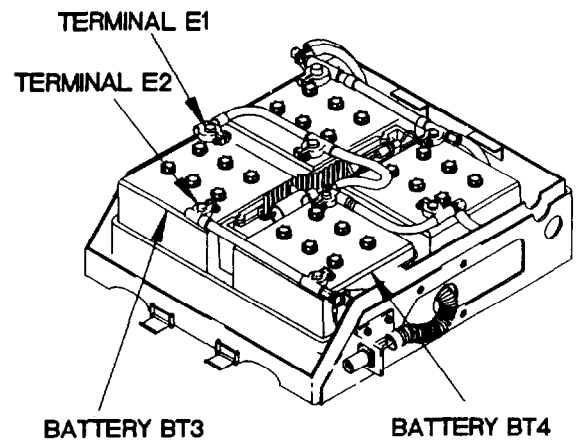
**VOLTAGE TEST**

- (1) Disconnect batteries (para 7-48).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to terminal E1 (+) of battery BT3.
- (4) Connect negative (-) probe of multimeter to terminal E2 (-) of battery BT3 and note reading on multimeter.
- (5) If 12 vdc is not present, go to step 9 of this fault.



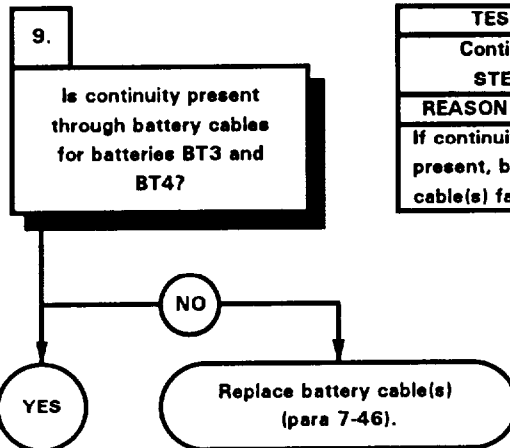
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal E1 (+) of battery BT4.
- (3) Connect negative (-) probe of multimeter to terminal E2 (-) of battery BT4 and note reading on multimeter.
- (4) If 12 vdc is not present, go to step 9 of this fault.
- (5) If 12 vdc is present, go to step 10 of this fault.



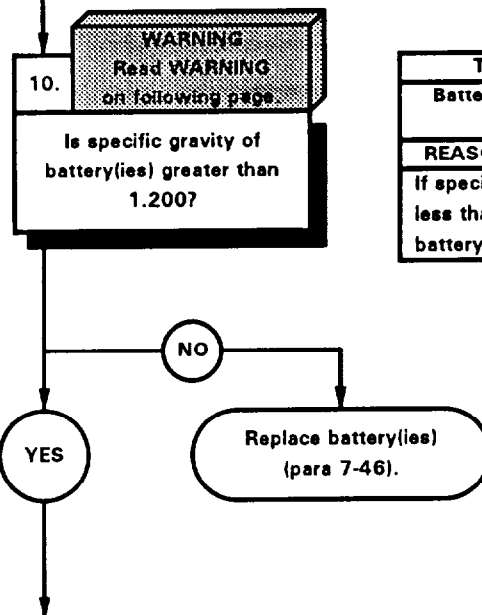
e4. 12 VDC CIRCUITS DO NOT OPERATE (100 AMP ALTERNATOR) (CONT)

KNOWN INFO
Fusible link OK. 100 amp reverse polarity relay OK. Dashboard cable assembly OK. Battery to 100 amp reverse polarity relay 12 vdc cable OK.
POSSIBLE PROBLEMS
Faulty battery cable(s). Faulty battery(ies). Faulty 100 amp alternator to reverse polarity relay 12 vdc cable. Faulty 100 amp voltage regulator.



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

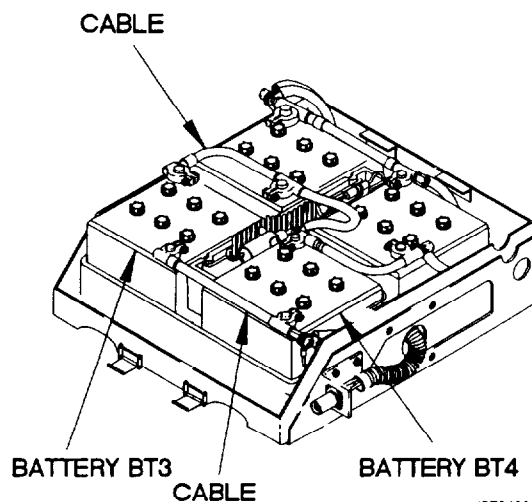
KNOWN INFO
Fusible link OK. 100 amp reverse polarity relay OK. Dashboard cable assembly OK. Battery to 100 amp reverse polarity relay 12 vdc cable OK. Battery cables OK.
POSSIBLE PROBLEMS
Faulty battery(ies). Faulty 100 amp alternator to reverse polarity relay 12 vdc cable. Faulty 100 amp voltage regulator.



TEST OPTIONS
Battery Specific Gravity Test
REASON FOR QUESTION
If specific gravity is less than 1.200, battery(ies) faulty.

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to end of battery cable, one cable at a time.
- (3) Connect negative (-) probe of multimeter to remaining end of same cable and note reading on multimeter.
- (4) If continuity is not present, replace battery cable (para 7-46).
- (5) Connect batteries (para 7-48).



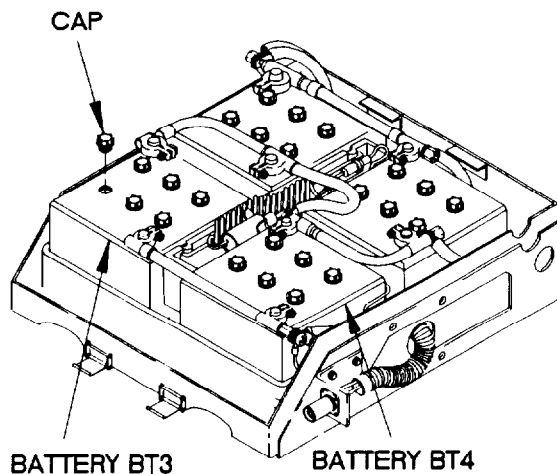
X2E0406A

**WARNING**

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

**BATTERY SPECIFIC GRAVITY TEST**

- (1) Remove one cap from battery BT3 and one cap from battery BT4, one battery at a time.
- (2) Remove a few sample drops of electrolyte from each battery.
- (3) Place a few drops of electrolyte on exposed portion of measuring window of electrolyte tester.
- (4) Point tester toward light source and note reading.
- (5) If specific gravity reading is less than 1.200, replace battery(ies) (para 7-46).
- (6) Install caps on batteries.
- (7) Charge battery(ies) (TM 9-6140-200-14).
- (8) Install battery box cover on battery box (TM 9-2320-365-10).

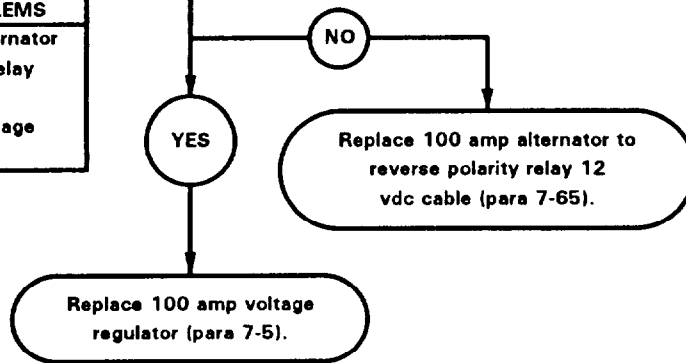


X2E0409A

KNOWN INFO
Fusible link OK. 100 amp reverse polarity relay OK. Dashboard cable assembly OK. Battery to 100 amp reverse polarity relay 12 vdc cable OK. Battery cables OK. Batteries OK.
POSSIBLE PROBLEMS
Faulty 100 amp alternator to reverse polarity relay 12 vdc cable. Faulty 100 amp voltage regulator.

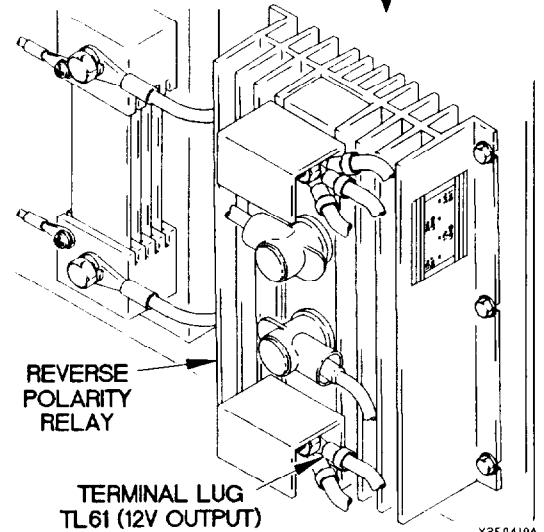
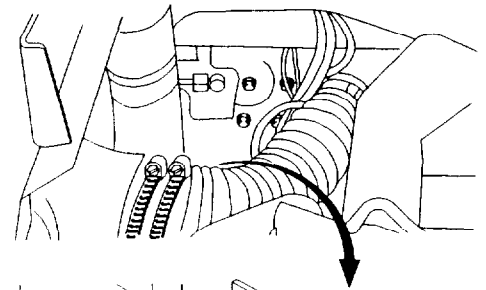
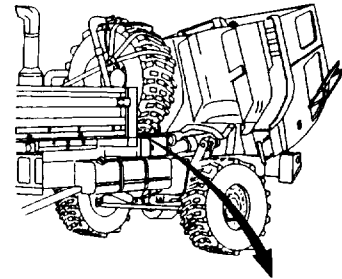
11.  
 Is continuity present between 100 amp voltage regulator terminal lug TL60 (12V output) and 100 amp reverse polarity relay terminal lug TL61 (12V output)?

TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, 100 amp alternator to reverse polarity relay 12 vdc cable is faulty. If continuity is present, 100 amp voltage regulator is faulty.



**CONTINUITY TEST**

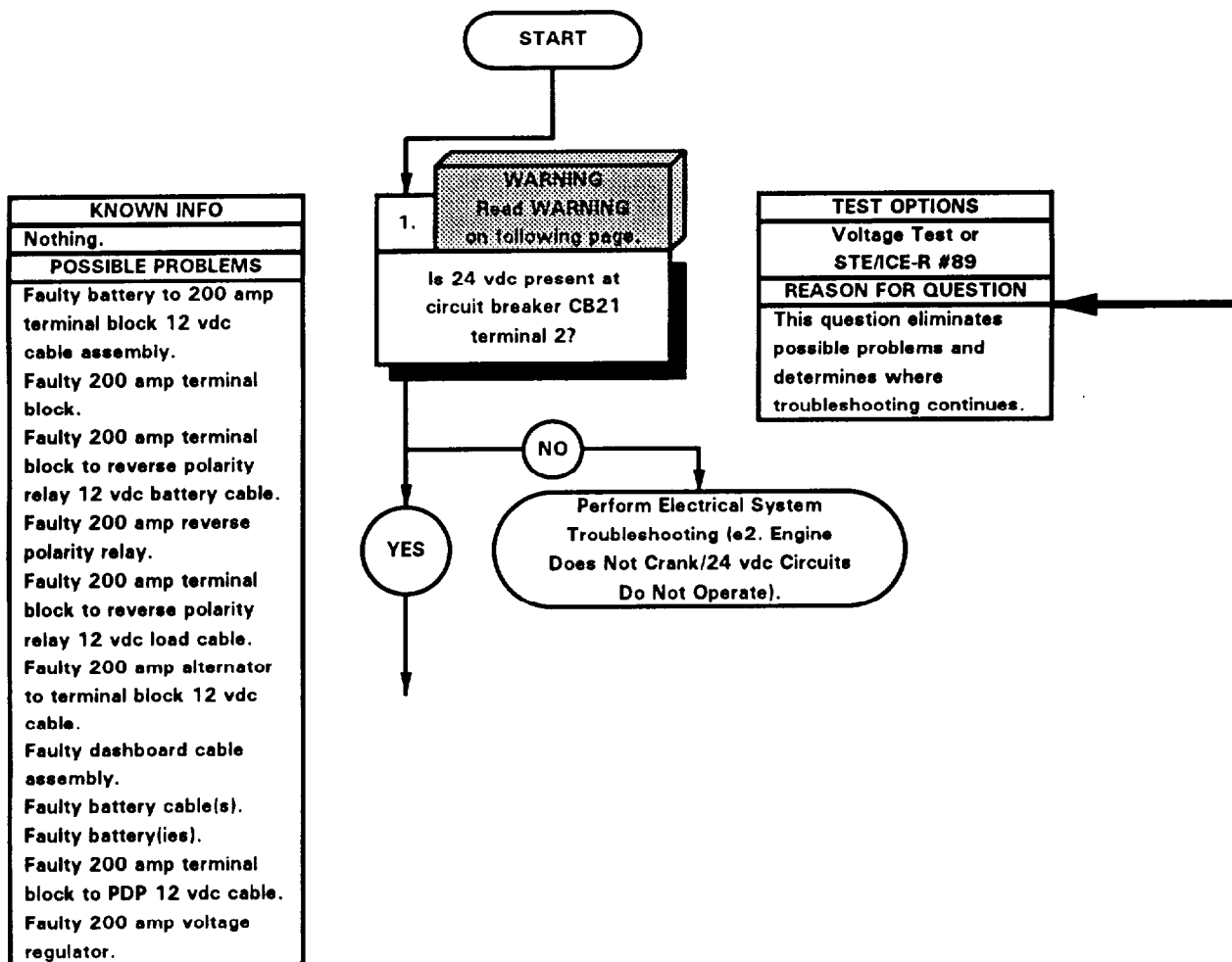
- (1) Raise cab (TM 9-2320-365-10).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to 100 amp reverse polarity relay terminal lug TL61 (12V output).
- (4) Connect negative (-) probe of multimeter to 100 amp voltage regulator terminal lug TL60 (12V output) and note reading on multimeter.
- (5) If continuity is not present, replace 100 amp alternator to reverse polarity relay 12 vdc cable (para 7-65).
- (6) If continuity is present, replace 100 amp voltage regulator (para 7-5).
- (7) Lower cab (TM 9-2320-365-10).



X2E0410A



e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR)	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Tester, Antifreeze and Battery (Item 41, Appendix C) Goggles, Industrial (Item 15, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	

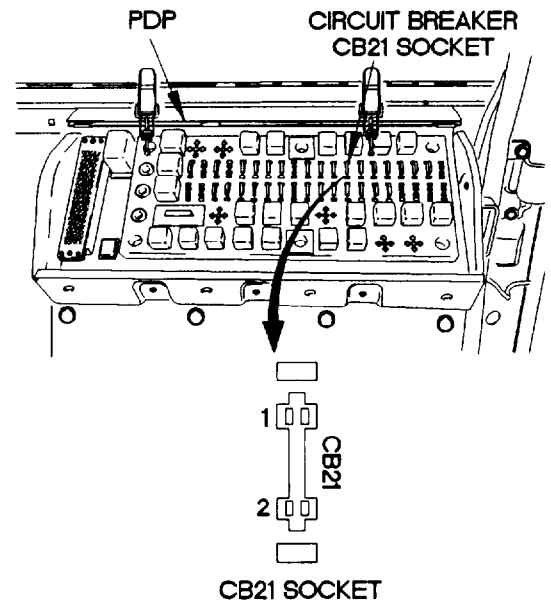


**WARNING**

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**

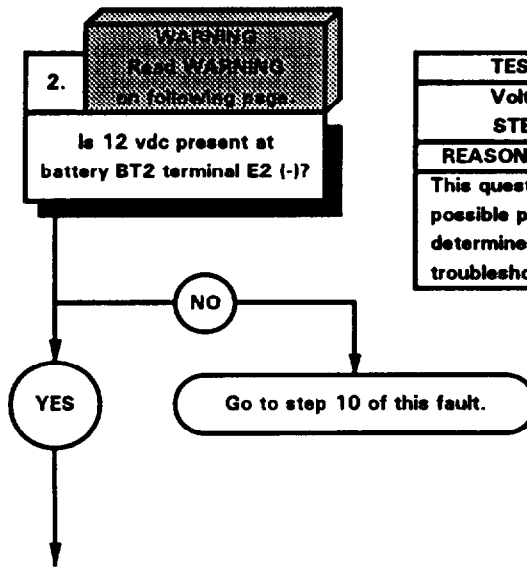
- (1) Remove PDP cover (para 16-2).
- (2) Remove circuit breaker CB21 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, socket 2, where circuit breaker CB21 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, perform Electrical System Troubleshooting (e2. Engine Does Not Crank/24 vdc Circuits Do Not Operate).
- (8) Position master power switch to off (TM 9-2320-365-10).
- (9) Install circuit breaker CB21 in PDP.



x2E05011

e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)

KNOWN INFO
Nothing.
POSSIBLE PROBLEMS
Faulty battery to 200 amp terminal block 12 vdc cable assembly.
Faulty 200 amp terminal block.
Faulty 200 amp terminal block to reverse polarity relay 12 vdc battery cable.
Faulty 200 amp reverse polarity relay.
Faulty 200 amp terminal block to reverse polarity relay 12 vdc load cable.
Faulty 200 amp alternator to terminal block 12 vdc cable.
Faulty dashboard cable assembly.
Faulty battery cable(s).
Faulty battery(ies).
Faulty 200 amp terminal block to PDP 12 vdc cable.
Faulty 200 amp voltage regulator.



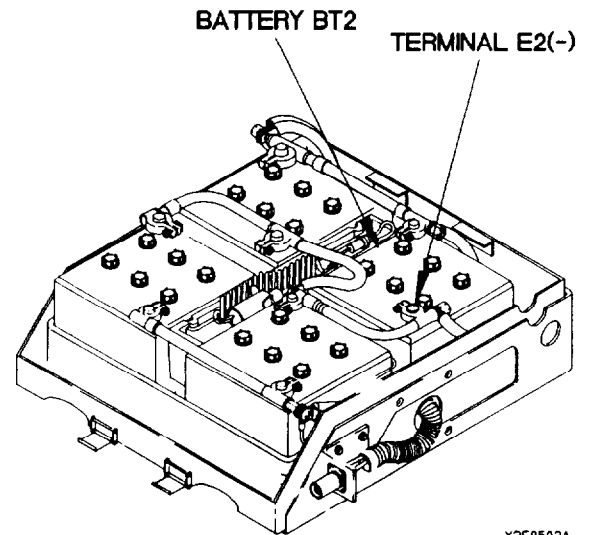
TEST OPTIONS
Voltage Test or STE/CE-R #89
REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.

**WARNING**

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

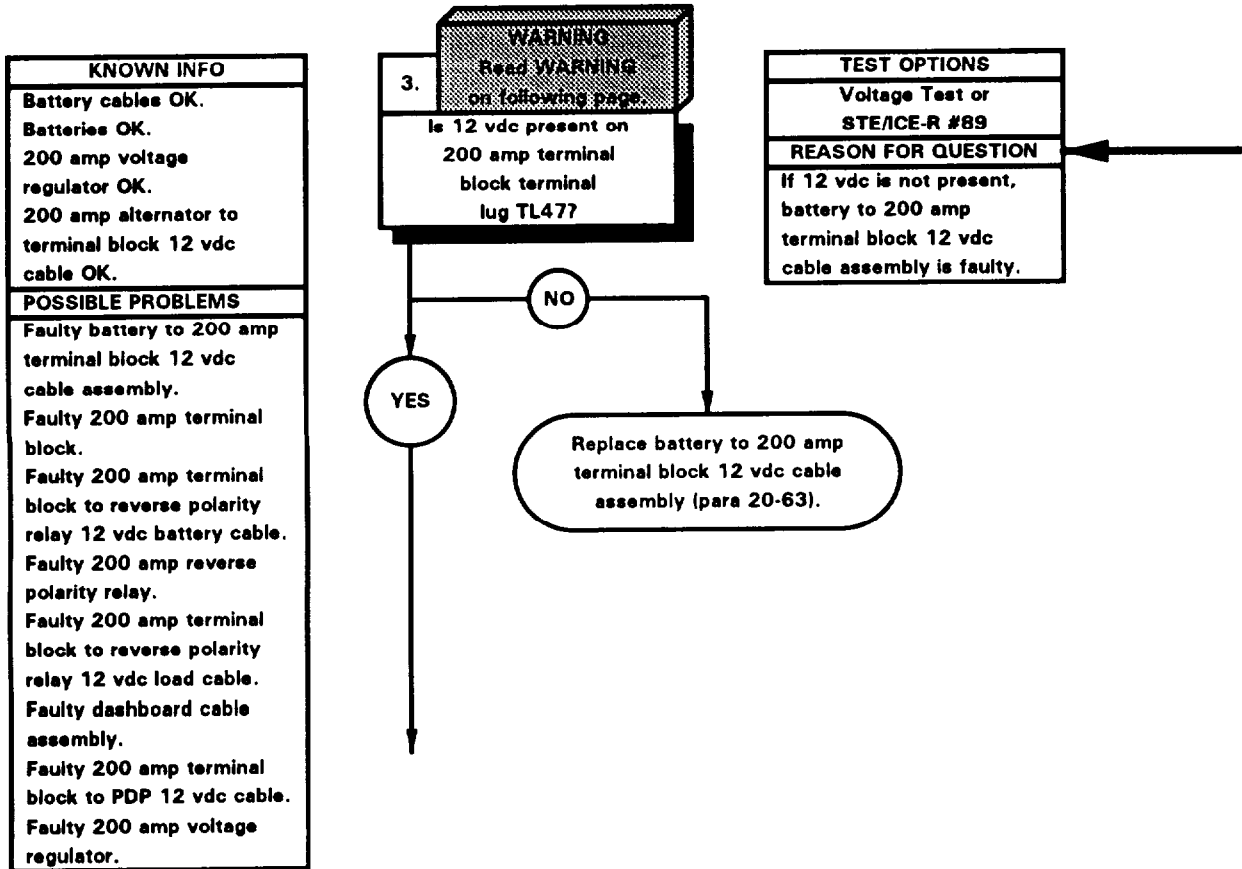
**VOLTAGE TEST**

- (1) Remove battery box cover from battery box (TM 9-2320-365-10).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to battery BT2 terminal E2 (-).
- (4) Connect negative (-) multimeter to ground and note reading on multimeter.
- (5) If 12 vdc is not present, go to step 10 of this fault.



X2E0502A

e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)

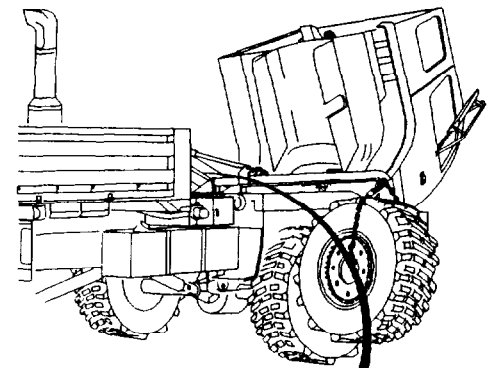
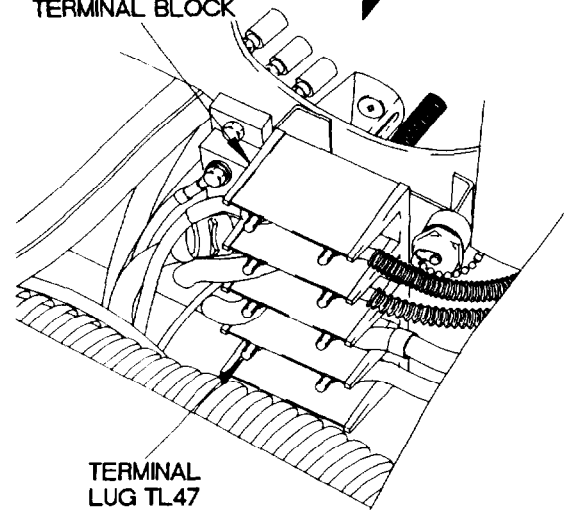


**WARNING**

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.

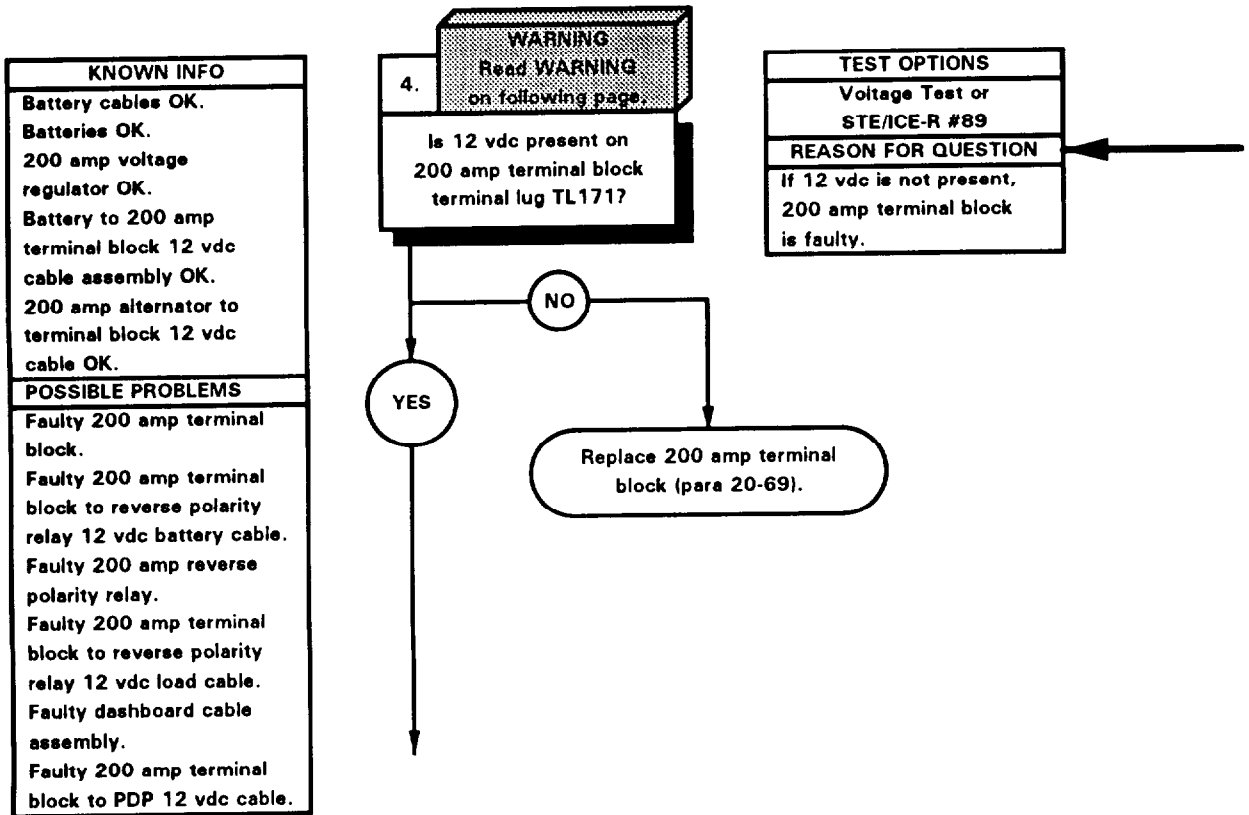
**VOLTAGE TEST**

- (1) Install battery box cover on battery box (TM 9-2320-365-10).
- (2) Raise cab (TM 9-2320-365-10).
- (3) Lower spare tire (TM 9-2320-365-10).
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to terminal block terminal lug TL47 (12V BAT).
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If 12 vdc is not present, replace battery to 200 amp terminal block 12 vdc cable assembly (para 20-63).

200 AMP  
TERMINAL BLOCKTERMINAL  
LUG TL47

X2C0503A

e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)

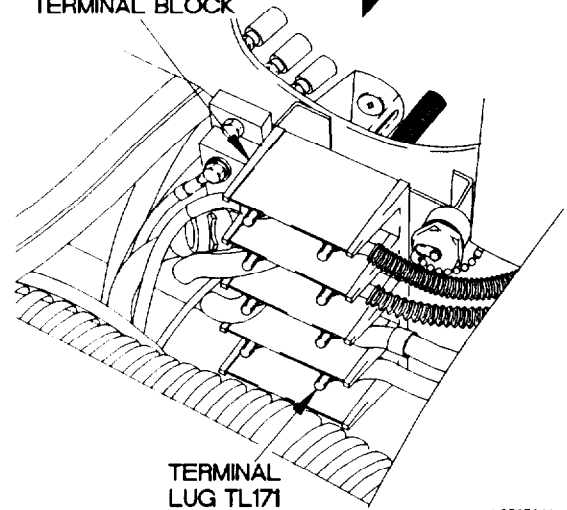
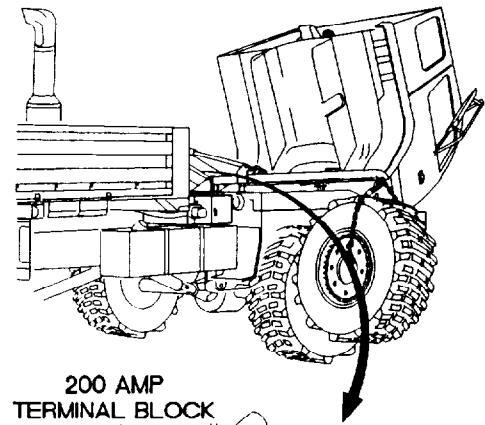


**WARNING**

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**

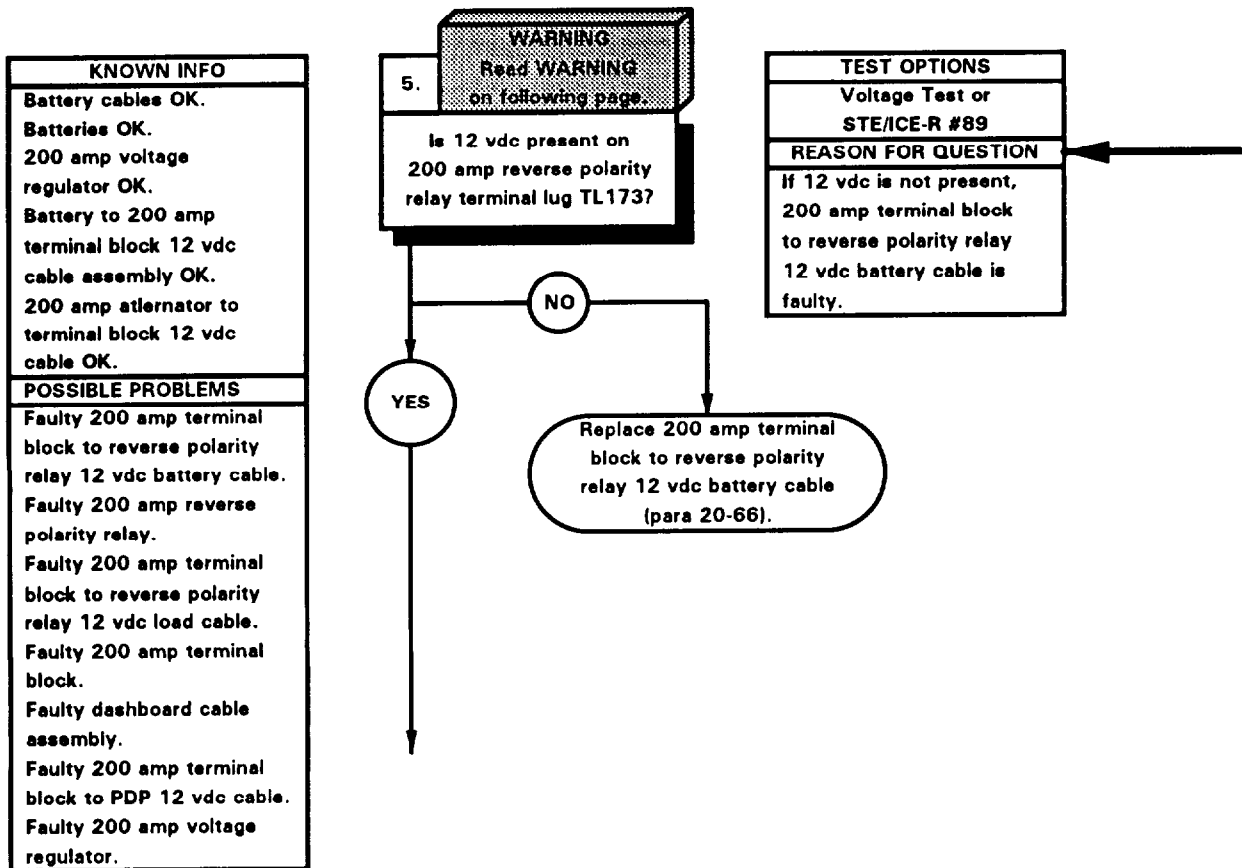
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal block terminal lug TL171 (12V BAT).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 12 vdc is not present, replace 200 amp terminal block (para 20-69).



X2E0504A



e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)

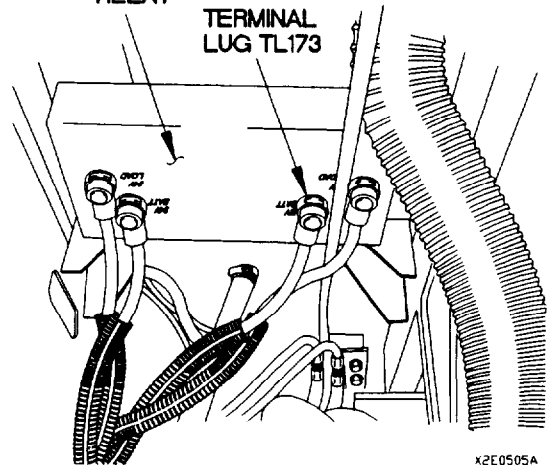
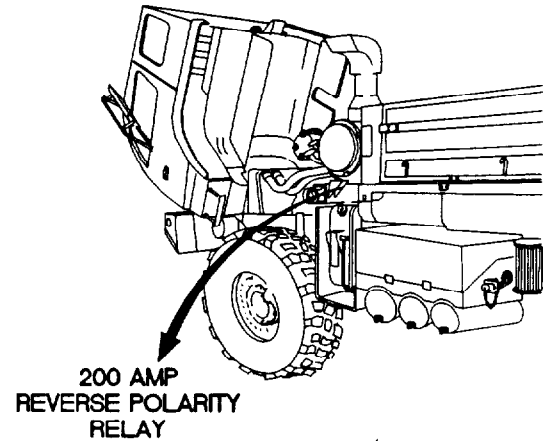


**WARNING**

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.

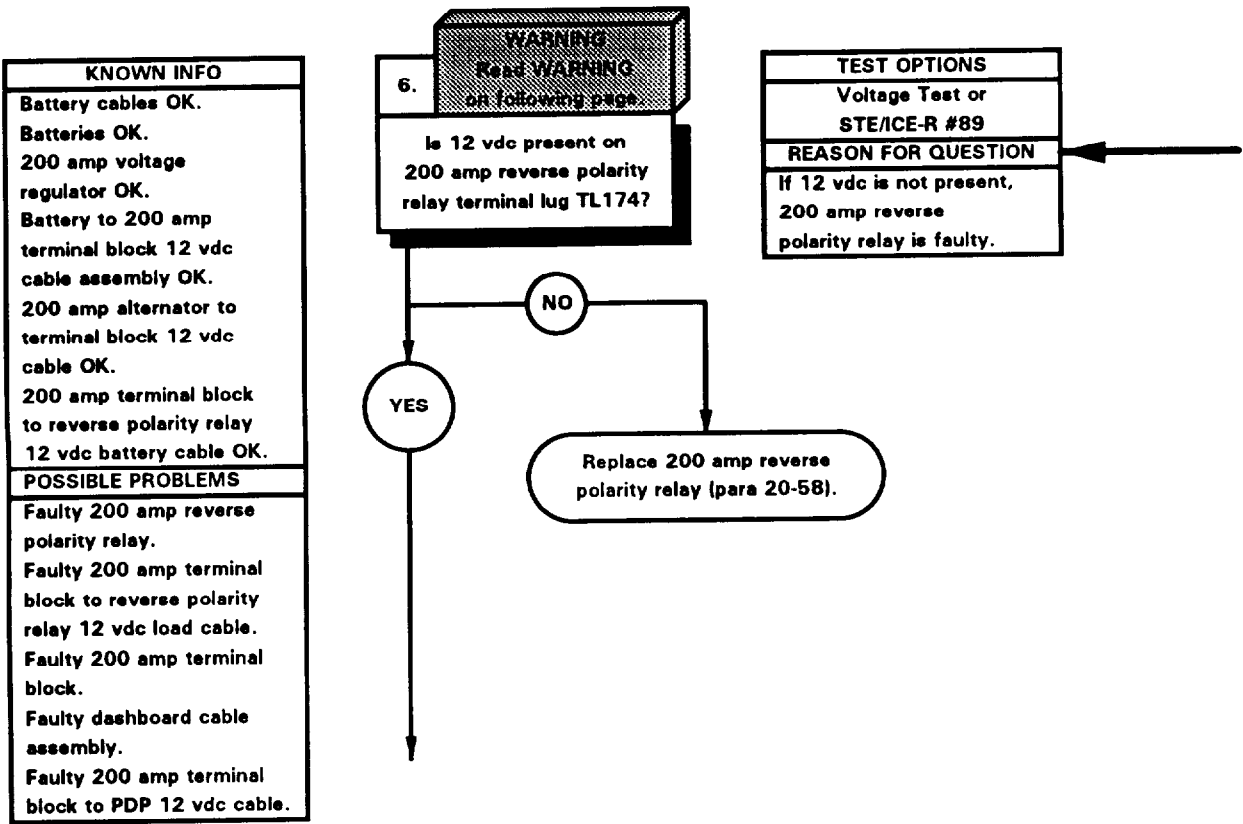
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to 200 amp reverse polarity relay terminal lug TL173 (12V BAT).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 12 vdc is not present, replace 200 amp terminal block to reverse polarity relay 12 vdc battery cable (para 20-66).



X2E0505A

e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)

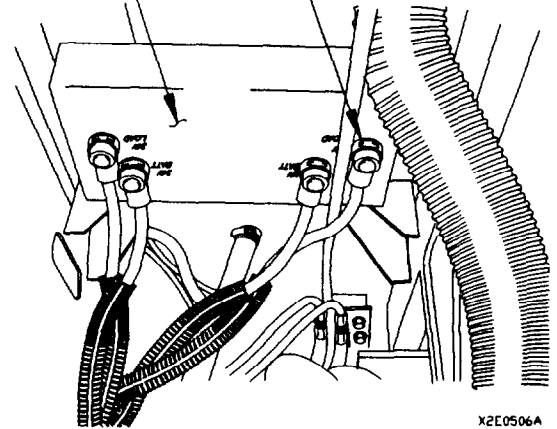
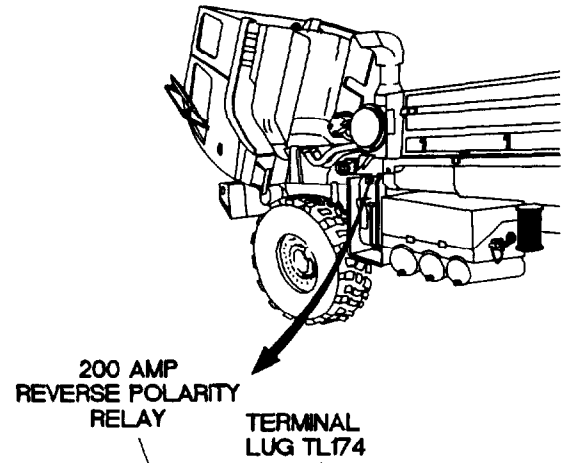


**WARNING**

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.

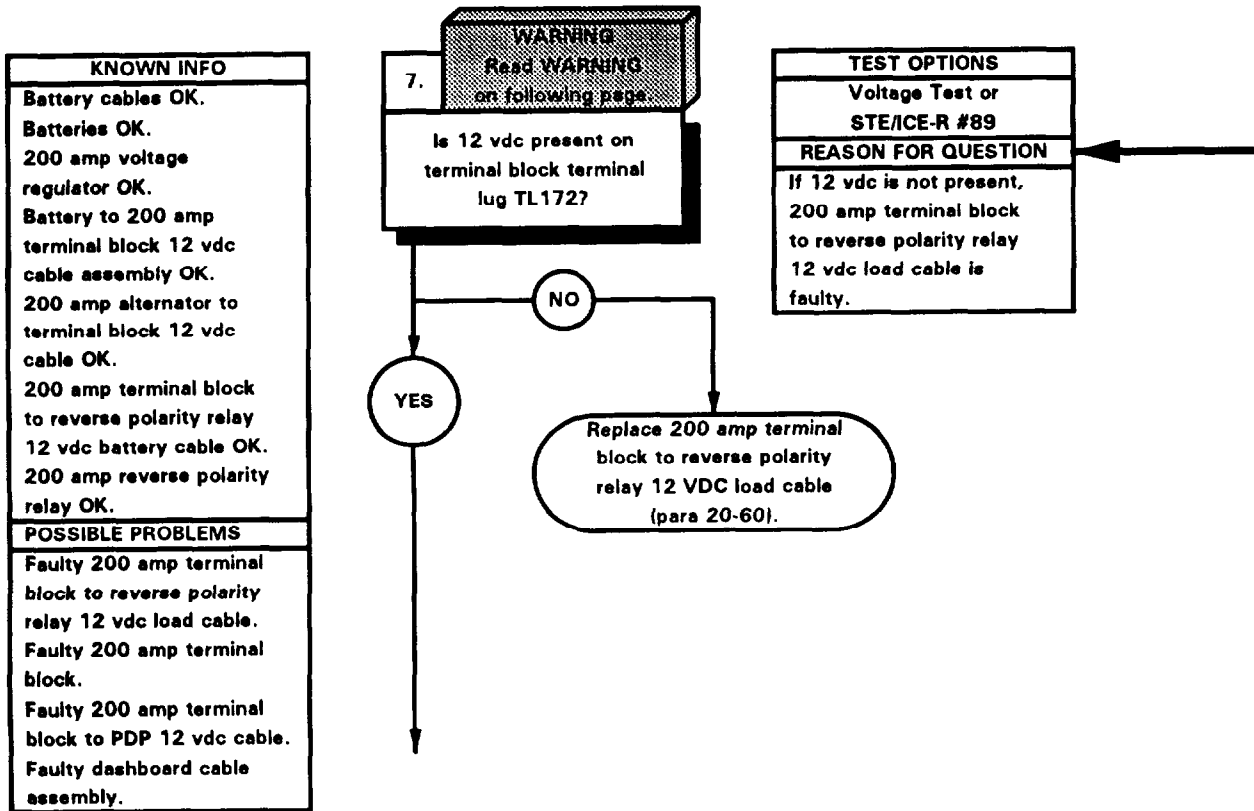
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to 200 amp reverse polarity relay terminal lug TL174 (12V LOAD).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 12 vdc is not present, replace 200 amp reverse polarity relay (para 20-58).



X2E0506A

e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)

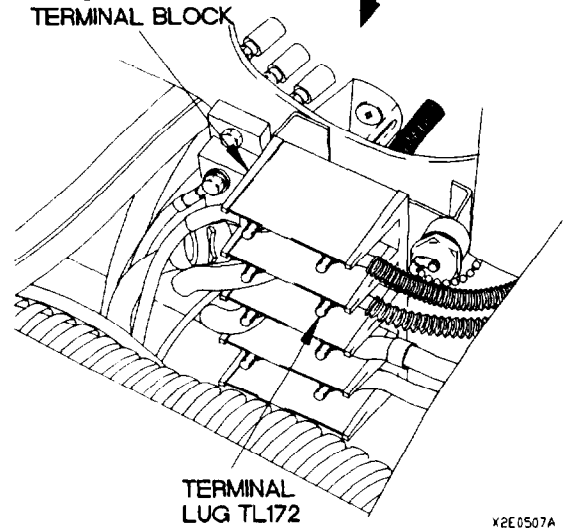
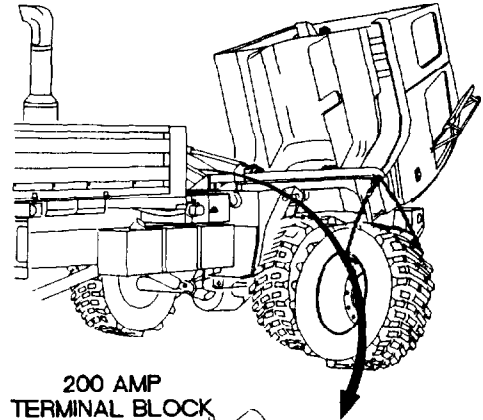


**WARNING**

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.

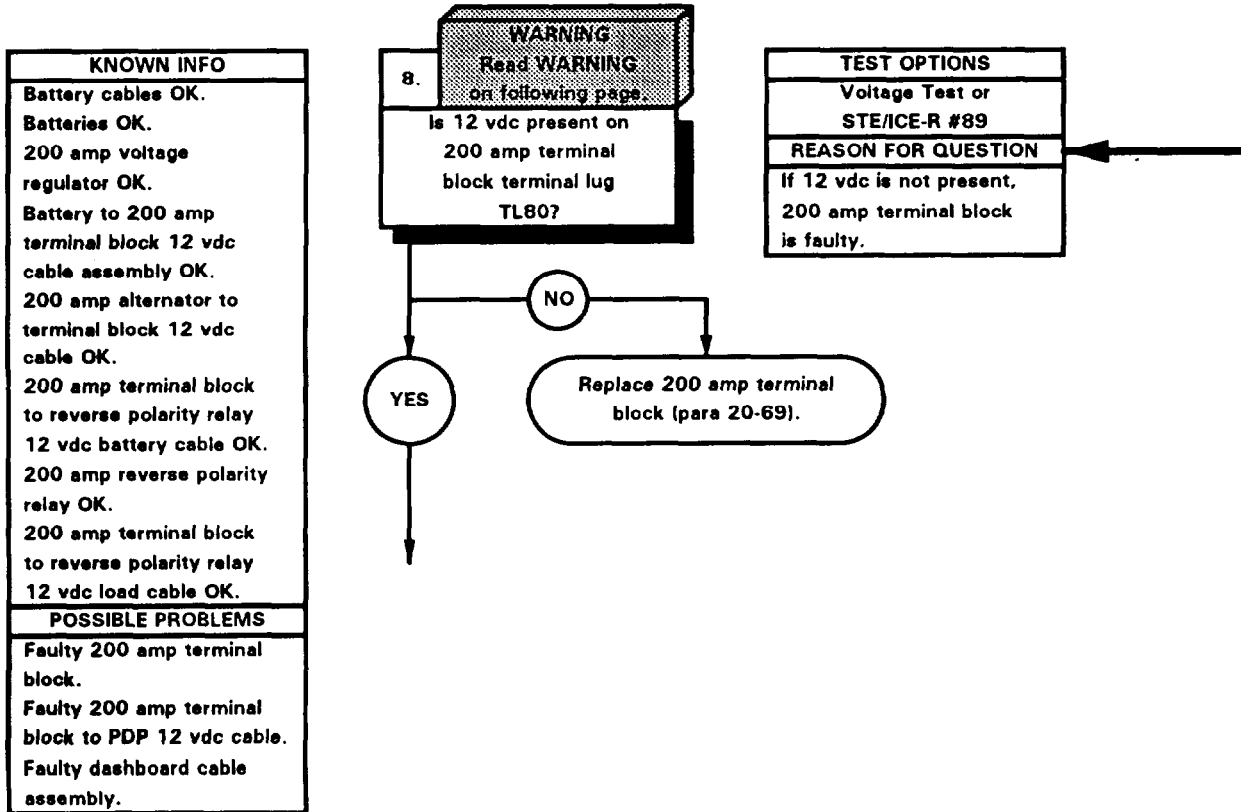
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to 200 amp terminal block terminal lug TL172 (12V LOAD).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 12 vdc is not present, replace 200 amp terminal block to reverse polarity relay 12 VDC load cable (para 20-60).



X2E0507A

e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)

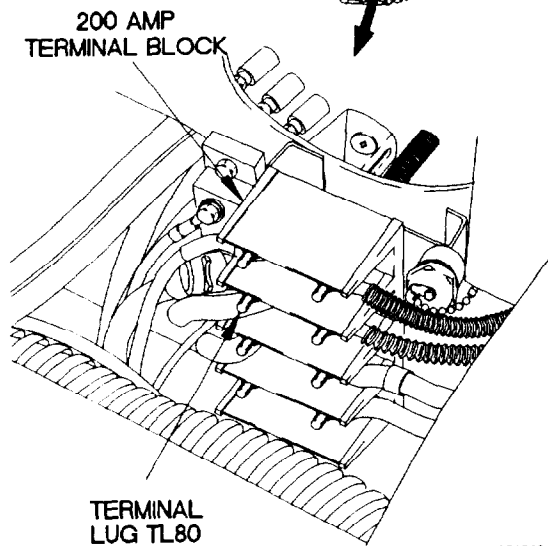
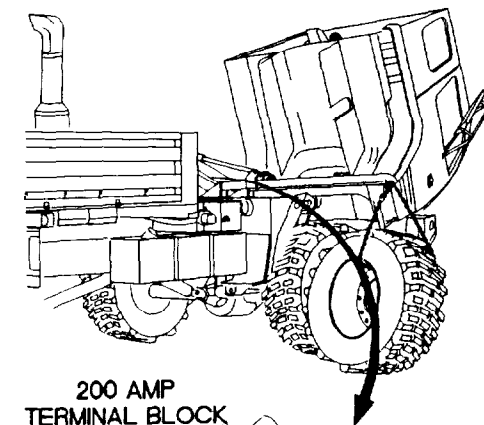


**WARNING**

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**

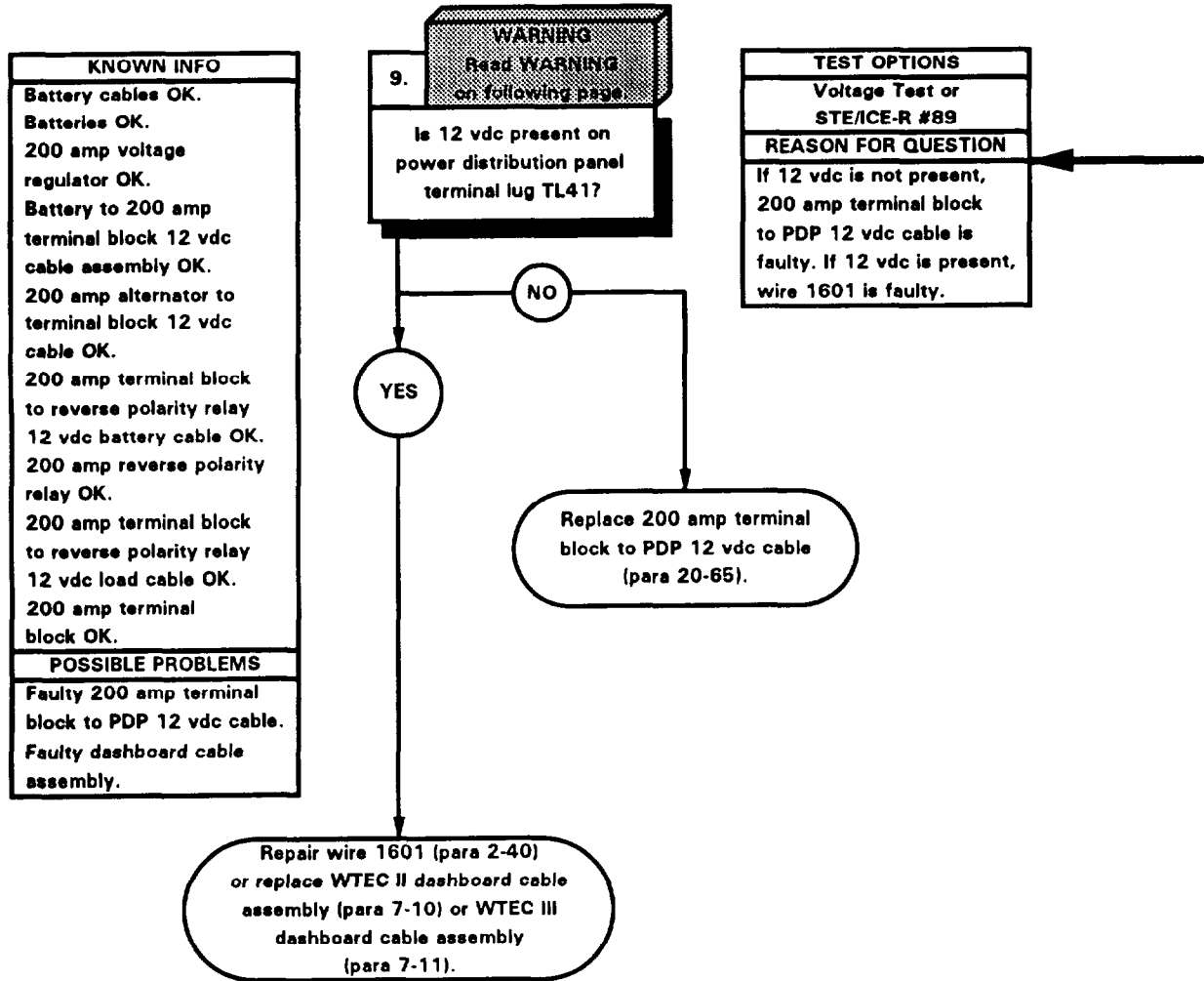
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to 200 amp terminal block terminal lug TL80 (12V LOAD).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 12 vdc is not present, replace 200 amp terminal block (para 20-69).
- (5) Raise spare tire (TM 9-2320-365-10).
- (6) Lower cab (TM 9-2320-365-10).



X2E0508A



e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)

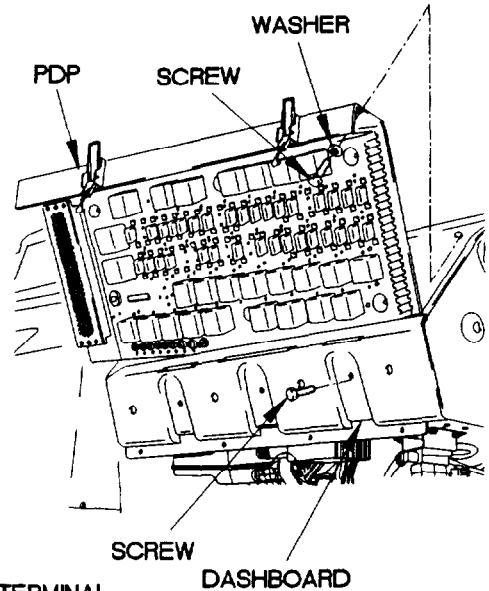


**WARNING**

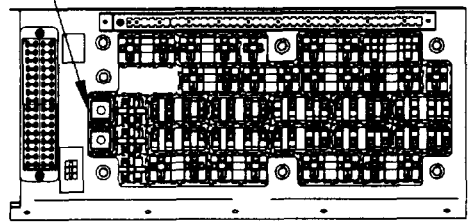
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Remove three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to PDP terminal lug TL41.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If 12 vdc is not present, replace 200 amp terminal block to PDP 12 vdc cable (para 20-65).
- (8) If 12 vdc is present, repair wire 1601 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Install PDP on dashboard with three screws.
- (10) Install three washers and screws in PDP.
- (11) Install PDP cover (para 16-2).

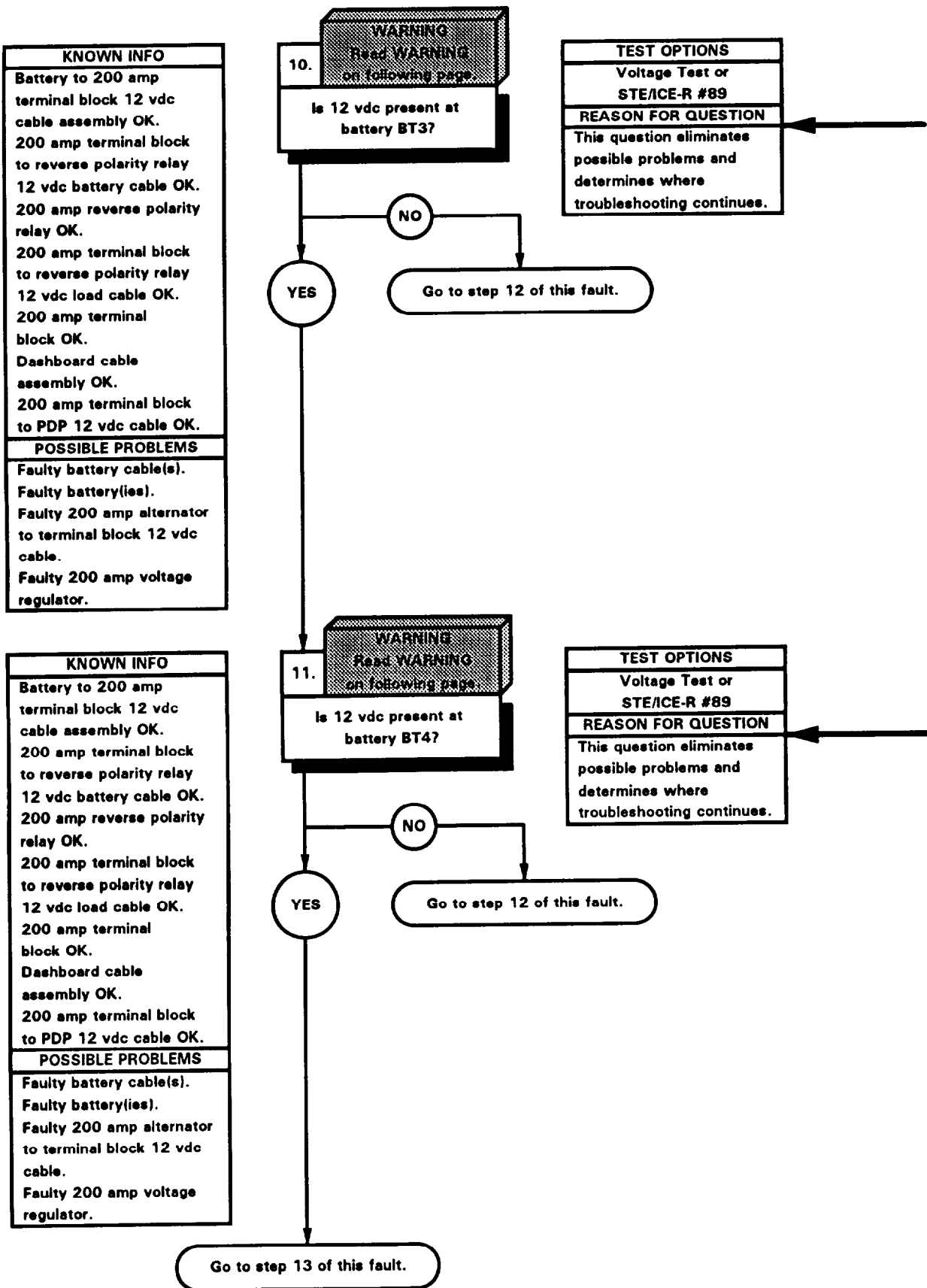


TERMINAL LUG TL41



X2E05091

e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)

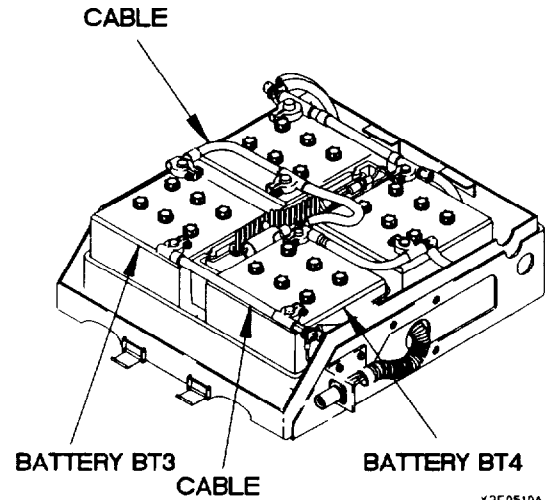


**WARNING**

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 when working with batteries.

**VOLTAGE TEST**

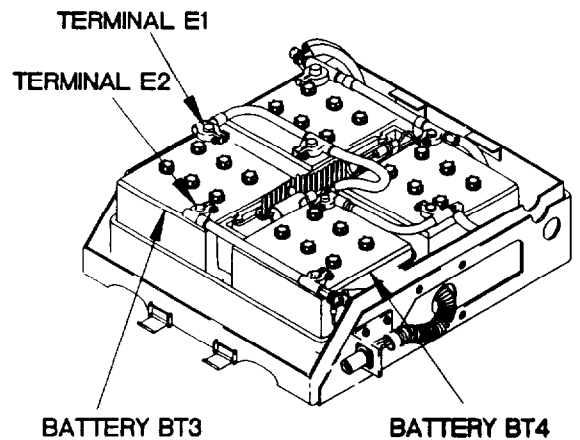
- (1) Install PDP cover (para 16-2).
- (2) Disconnect batteries (para 7-48).
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to terminal E1 (+) of battery BT3.
- (5) Connect negative (-) probe of multimeter to terminal E2 (-) of battery BT3 and note reading on multimeter.
- (6) If 12 vdc is not present, go to step 12 of this fault.



X2E0510A

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to terminal E1 (+) of battery BT4.
- (3) Connect negative (-) probe of multimeter to terminal E2 (-) of battery BT4 and note reading on multimeter.
- (4) If 12 vdc is not present, go to step 12 of this fault.
- (5) If 12 vdc is present, go to step 13 of this fault.



X2E0511A

e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)

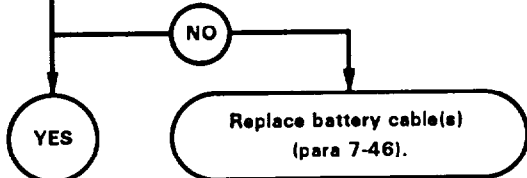
KNOWN INFO
Battery to 200 amp terminal block 12 vdc cable assembly OK. 200 amp terminal block to reverse polarity relay 12 vdc battery cable OK. 200 amp reverse polarity relay OK. 200 amp terminal block to reverse polarity relay 12 vdc load cable OK. 200 amp terminal block OK. Dashboard cable assembly OK. 200 amp terminal block to PDP 12 vdc cable OK.
POSSIBLE PROBLEMS
Faulty battery cable(s). Faulty battery(ies). Faulty 200 amp alternator to terminal block 12 vdc cable. Faulty 200 amp voltage regulator.

KNOWN INFO
Battery to 200 amp terminal block 12 vdc cable assembly OK. 200 amp terminal block to reverse polarity relay 12 vdc battery cable OK. 200 amp reverse polarity relay OK. 200 amp terminal block to reverse polarity relay 12 vdc load cable OK. 200 amp terminal block OK. Dashboard cable assembly OK. 200 amp terminal block to PDP 12 vdc cable OK. Battery cables OK.
POSSIBLE PROBLEMS
Faulty battery(ies). Faulty 200 amp alternator to terminal block 12 vdc cable. Faulty 200 amp voltage regulator.

12. **WARNING**  
Read **WARNING** on following page.

Is continuity present through battery cables for batteries BT3 and BT4?

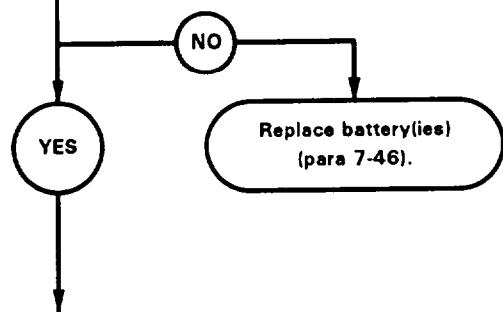
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, battery cable(s) faulty.



13. **WARNING**  
Read **WARNING** on following page.

Is specific gravity of battery(ies) greater than 1.200?

TEST OPTIONS
Battery Specific Gravity Test
REASON FOR QUESTION
If specific gravity is less than 1.200, battery(ies) faulty.



**WARNING**

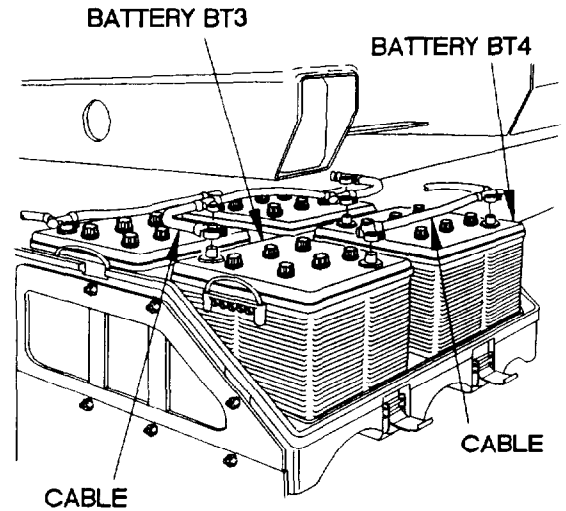
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock. Batteries can explode from a spark. Battery acid is harmful to skin and eyes.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

**CONTINUITY TEST**

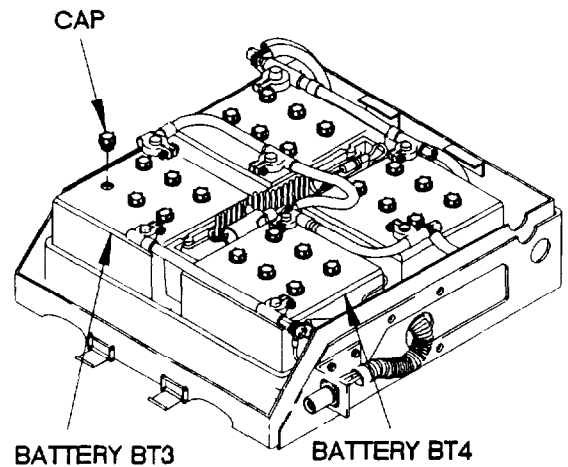
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to end of battery cable, one cable at a time.
- (3) Connect negative (-) probe of multimeter to remaining end of same cable and note reading on multimeter.
- (4) If continuity is not present, replace battery cable (para 7-46).
- (5) Connect batteries (para 7-48).

**BATTERY SPECIFIC GRAVITY TEST**

- (1) Remove one cap from battery BT3 and one cap from battery BT4, one battery at a time.
- (2) Remove a few sample drops of electrolyte from each battery.
- (3) Place a few drops of electrolyte on exposed portion of measuring window of electrolyte tester.
- (4) Point tester toward light source and note reading.
- (5) If specific gravity reading is less than 1.200, replace battery(ies) (para 7-46).
- (6) Install caps on batteries.
- (7) Charge battery(ies) (TM 9-6140-200-14).
- (8) Install battery box cover on battery box (TM 9-2320-365-10).

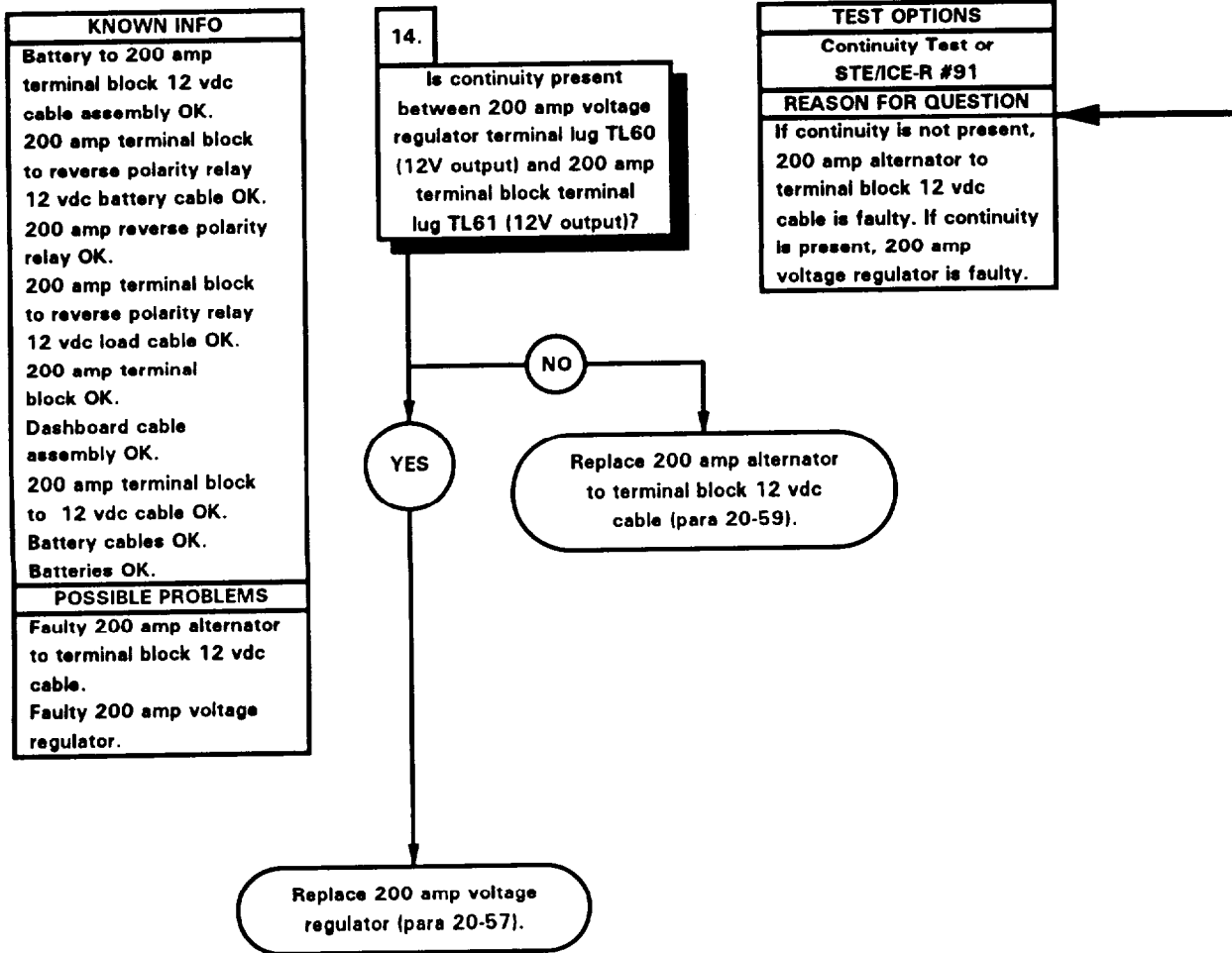


X2E0512A



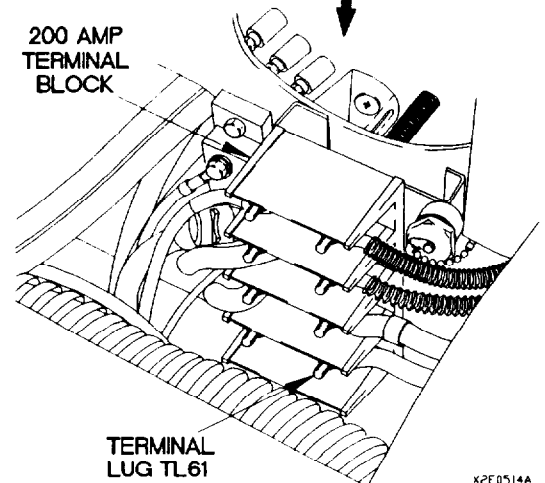
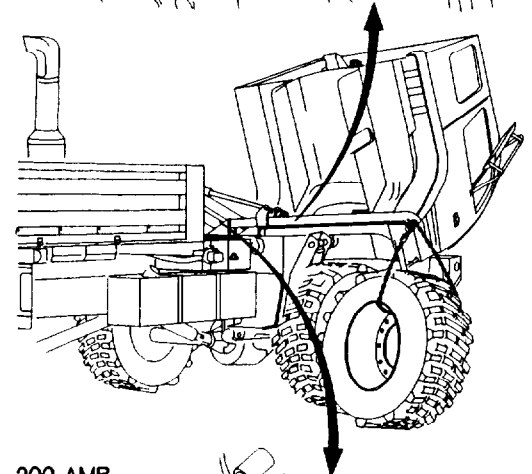
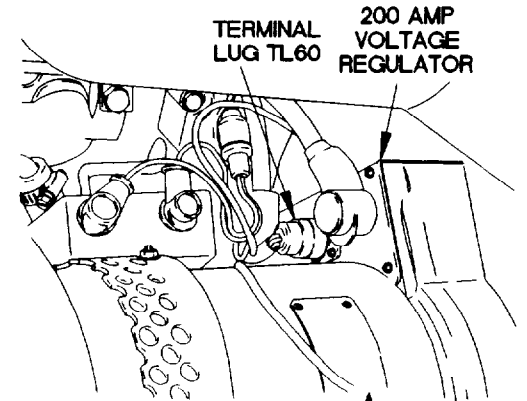
X2E0513A

e5. 12 VDC CIRCUITS DO NOT OPERATE (200 AMP ALTERNATOR) (CONT)



**CONTINUITY TEST**

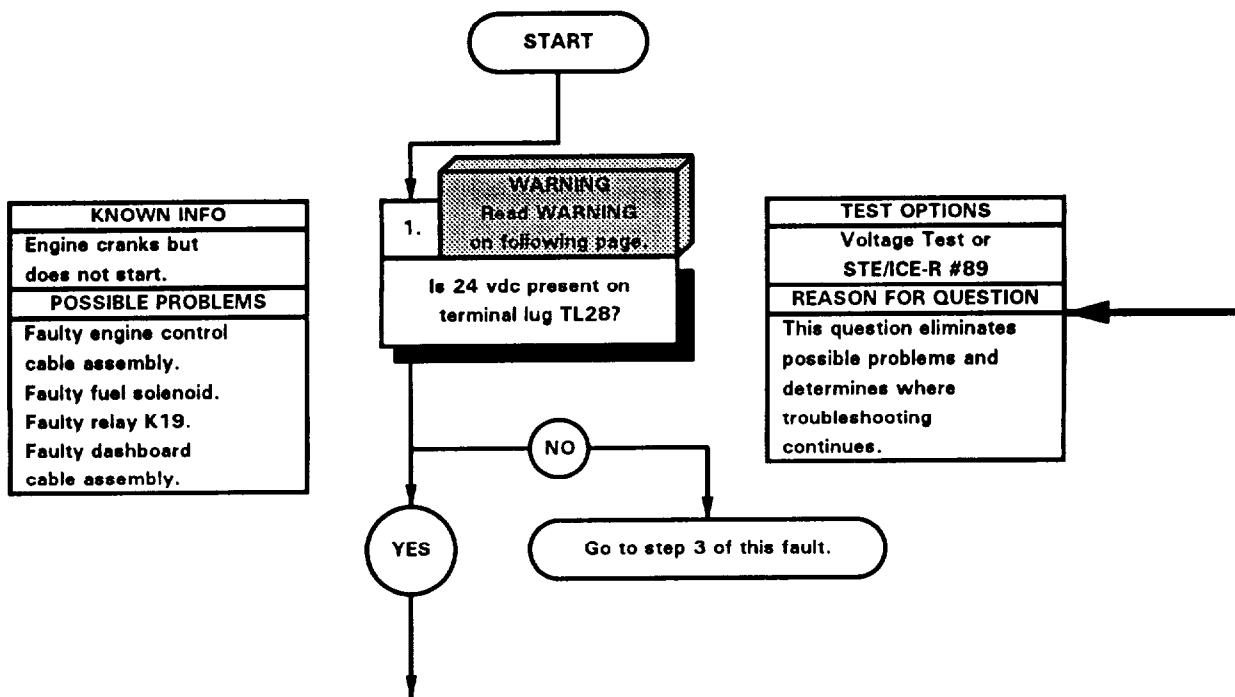
- (1) Raise cab (TM 9-2320-365-10).
- (2) Lower spare tire (TM 9-2320-365-10).
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to 200 amp terminal block terminal lug TL61 (12V output).
- (5) Connect negative (-) probe of multimeter to 200 amp voltage regulator terminal lug TL60 (12V output) and note reading on multimeter.
- (6) If continuity is not present, replace 200 amp alternator to terminal block 12 vdc cable (para 20-59).
- (7) If continuity is present, replace 200 amp voltage regulator (para 20-57).
- (8) Raise spare tire (TM 9-2320-365-10).
- (9) Lower cab (TM 9-2320-365-10).



x2E0514A



e6. ENGINE CRANKS BUT DOES NOT START	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Start inhibit switch off (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	

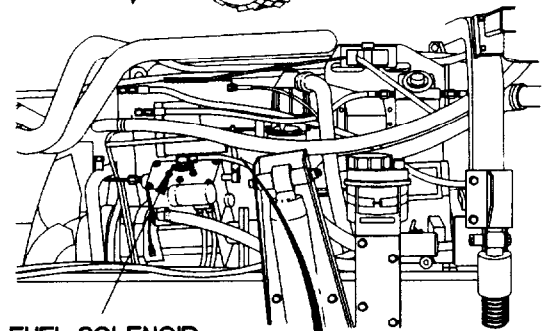
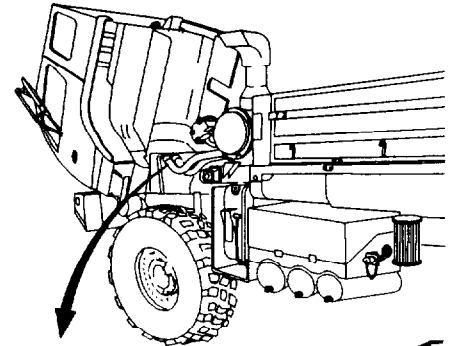


**WARNING**

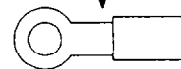
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Raise cab (TM 9-2320-365-10).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to terminal lug TL28.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 3 of this fault.
- (7) Position master power switch to off (TM 9-2320-365-10).



FUEL SOLENOID

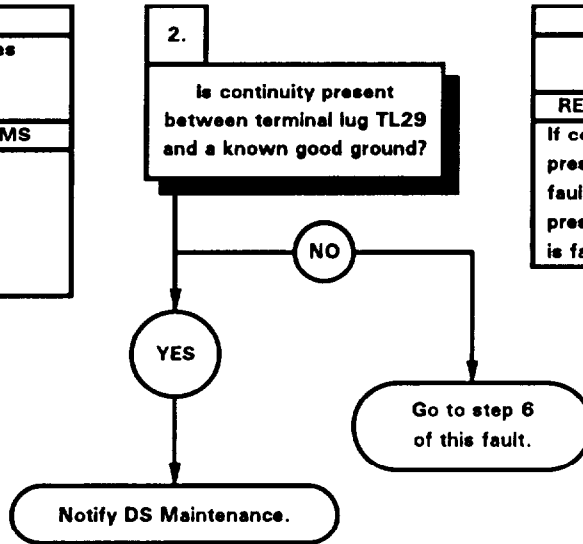


TERMINAL LUG TL28

X2E0801A

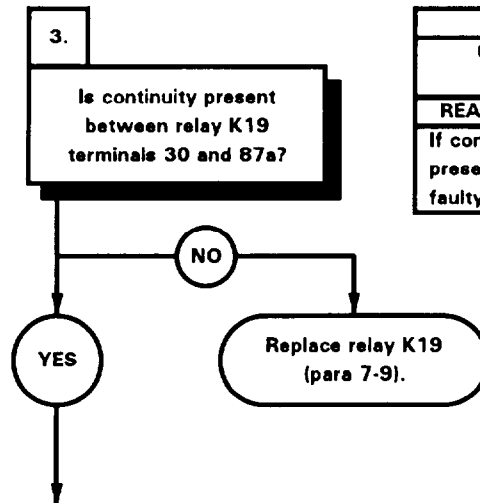
e6. ENGINE CRANKS BUT DOES NOT START (CONT)

KNOWN INFO
Engine cranks but does not start. Relay K19 OK.
POSSIBLE PROBLEMS
Faulty engine control cable assembly. Faulty fuel solenoid. Faulty dashboard cable assembly.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3015 is faulty. If continuity is present, fuel solenoid is faulty.

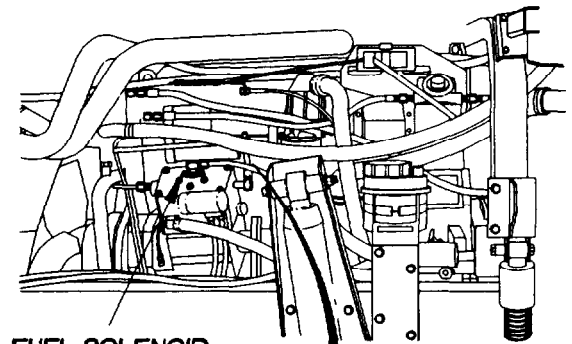
KNOWN INFO
Engine cranks but does not start. Fuel solenoid OK.
POSSIBLE PROBLEMS
Faulty relay K19. Faulty dashboard cable assembly. Faulty engine control cable assembly.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, relay K19 is faulty.

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal lug TL29.
- (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.
- (5) If continuity is present, fuel solenoid is faulty, notify DS Maintenance.
- (6) Lower cab (TM 9-2320-365-10).



FUEL SOLENOID



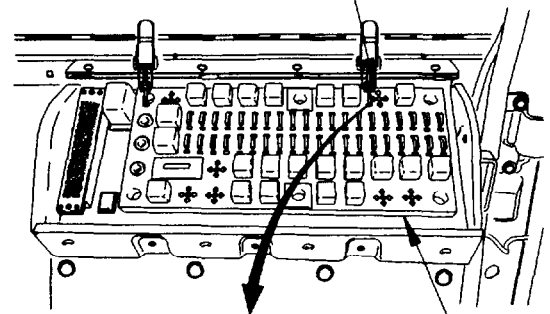
TERMINAL LUG TL29

X2E002A

**CONTINUITY TEST**

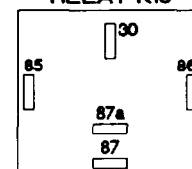
- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K19 from PDP.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to relay K19 terminal 87a.
- (5) Connect negative (-) probe of multimeter to relay K19 terminal 30 and note reading on multimeter.
- (6) If continuity is not present, replace relay K19 (para 7-9).

RELAY K19 CAVITY



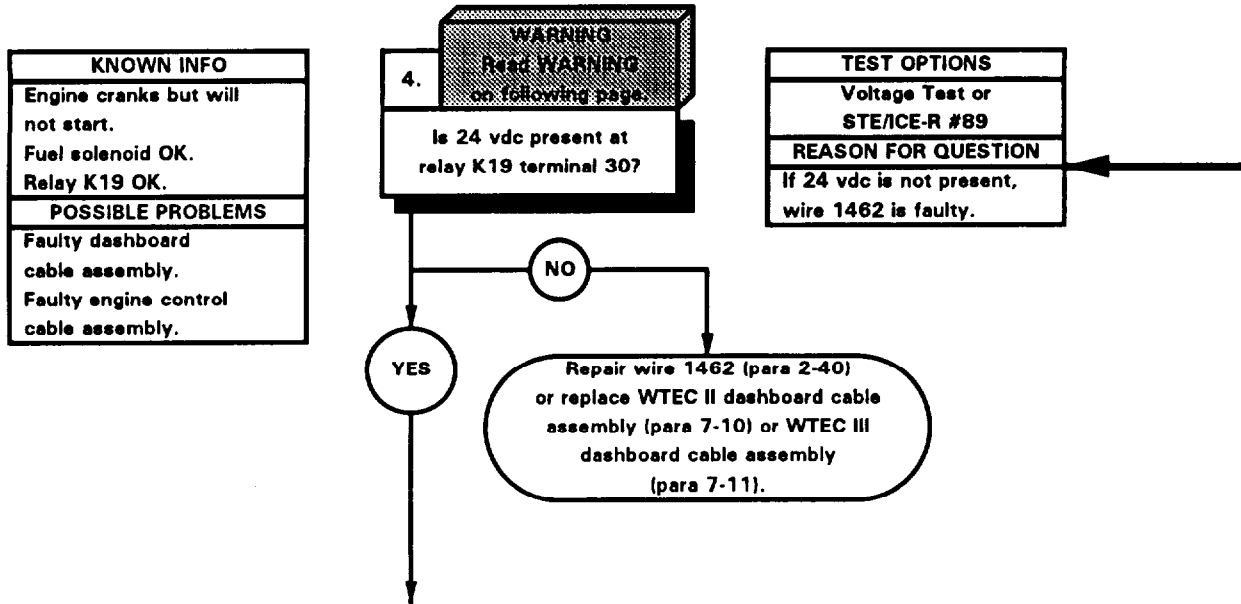
PDP

RELAY K19



X2E0803I

e6. ENGINE CRANKS BUT DOES NOT START (CONT)

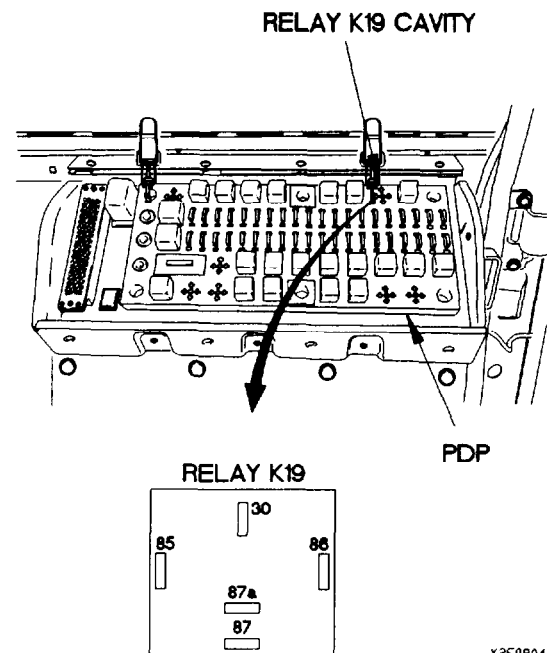


**WARNING**

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 terminal 30, where relay K19 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1462 (para 2-40) 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 9-2320-365-10).



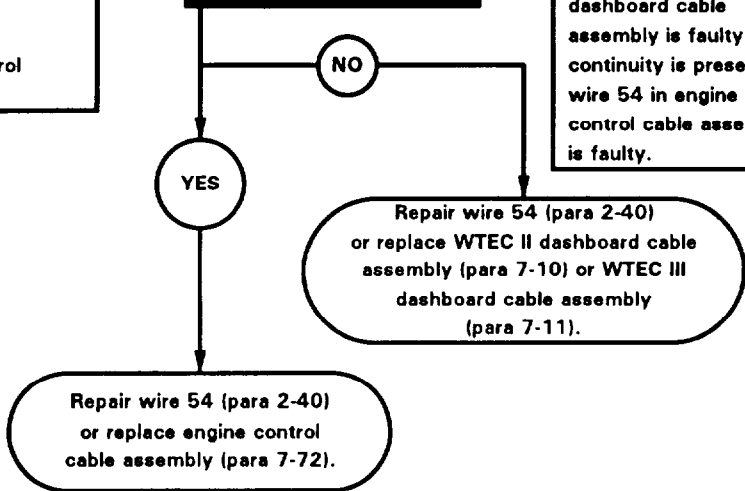
X2E08041

e6. ENGINE CRANKS BUT DOES NOT START (CONT)

KNOWN INFO
Engine cranks but does not start. Fuel solenoid OK. Relay K19 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty engine control cable assembly.

5.  
Is continuity present from relay K19 terminal 87A to connector J31-14?

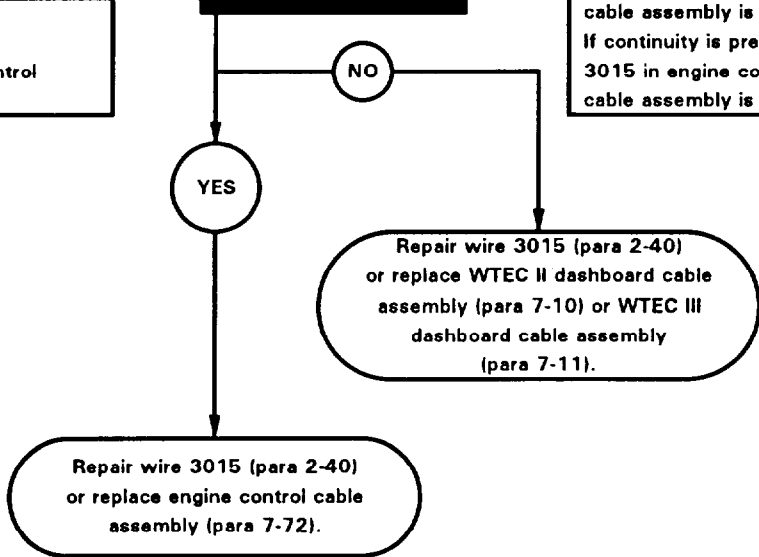
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 54 in dashboard cable assembly is faulty. If continuity is present, wire 54 in engine control cable assembly is faulty.



KNOWN INFO
Engine cranks but does not start. Fuel solenoid OK. Relay K19 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty engine control cable assembly.

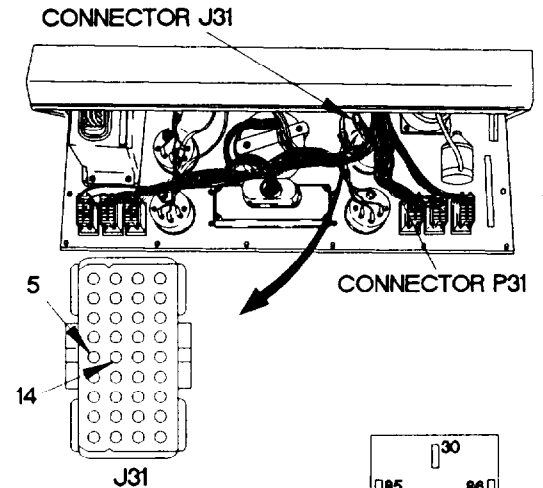
6.  
Is continuity present from connector J31-5 to ground?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3015 in dashboard cable assembly is faulty. If continuity is present, wire 3015 in engine control cable assembly is faulty.



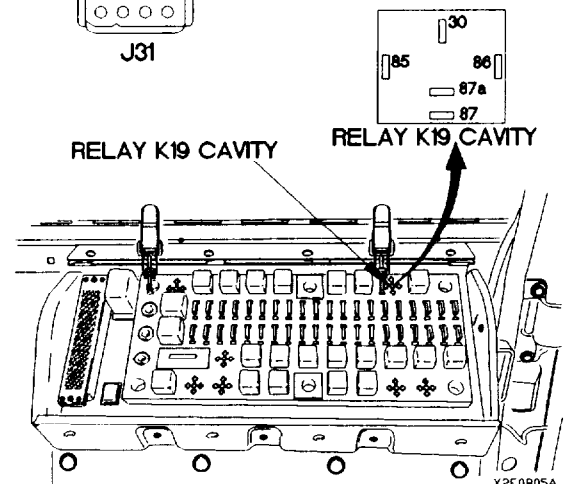
**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector J31 from connector P31.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector J31-14.
- (5) Connect negative (-) probe of multimeter to PDP terminal 87A, where relay K19 was removed and note reading on multimeter.
- (6) If continuity is not present, repair wire 54 (para 2-40) 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 54 (para 2-40) or replace engine control cable assembly (para 7-72).
- (8) Connect connector J31 to connector P31.
- (9) Install relay K19 in PDP.
- (10) Install PDP cover (para 16-2).
- (11) Install instrument panel assembly (para 7-15).



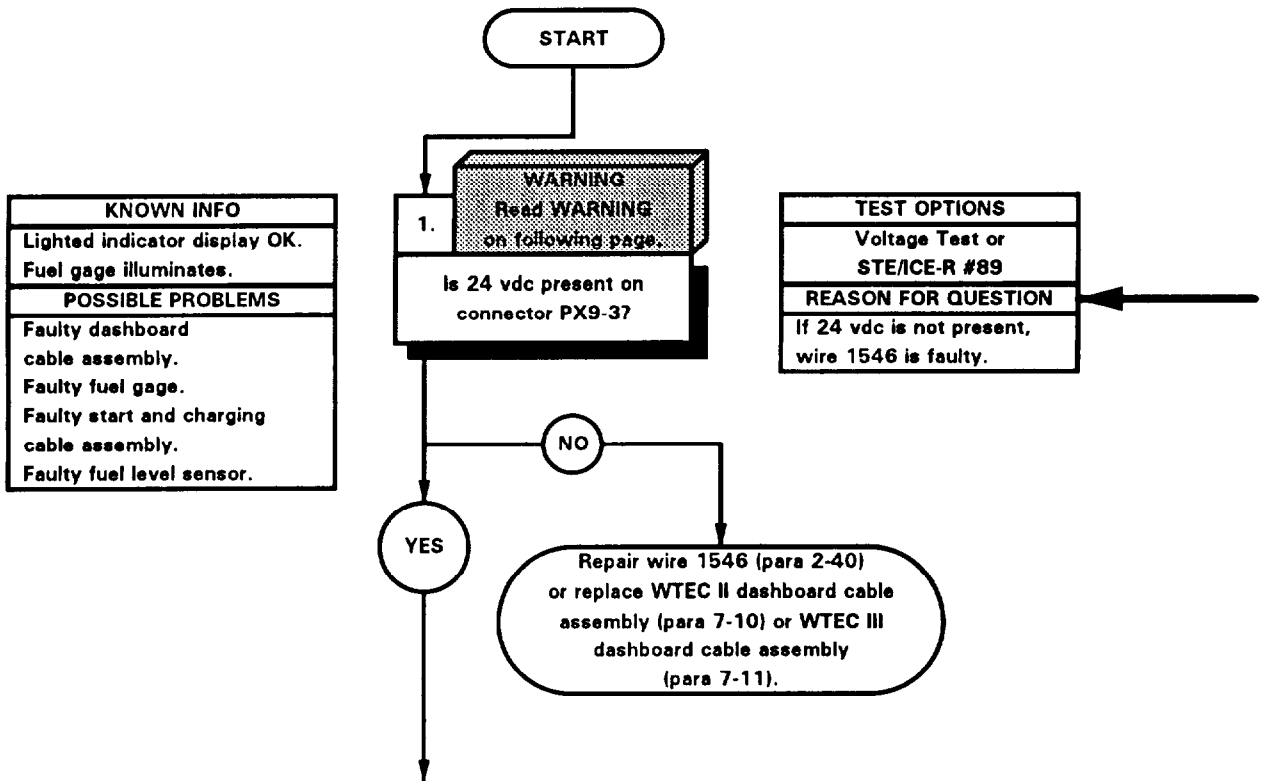
**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector J31 from connector P31.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector J31-5.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If continuity is not present, repair wire 3015 (para 2-40) 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 3015 (para 2-40) or replace engine control cable assembly (para 7-72).
- (8) Connect connector J31 to connector P31.
- (9) Install instrument panel assembly (para 7-15).





e7. FUEL GAGE DOES NOT OPERATE OR IS INACCURATE	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)
<b>References</b> TM 9-4910-571-12&P	

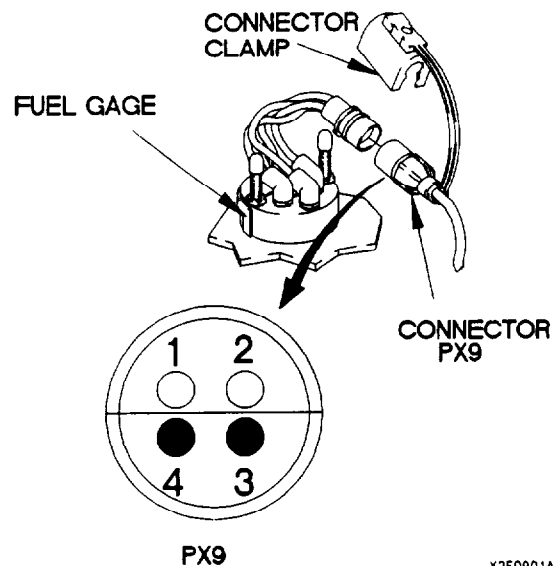


**WARNING**

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 instrument panel assembly for access (para 7-15).
- (2) Disconnect connector clamp from fuel gage connector.
- (3) Disconnect connector PX9 from fuel gage connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector PX9-3.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1546 (para 2-40) 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 9-2320-365-10).

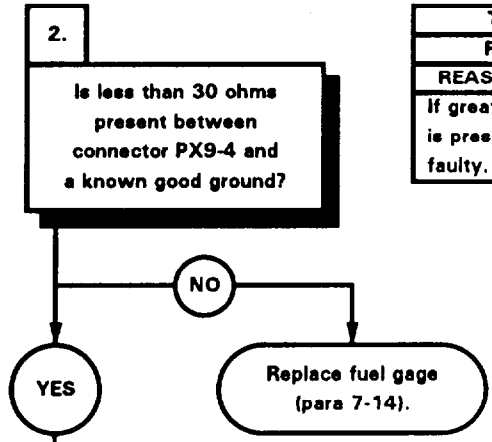


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ø7. FUEL GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

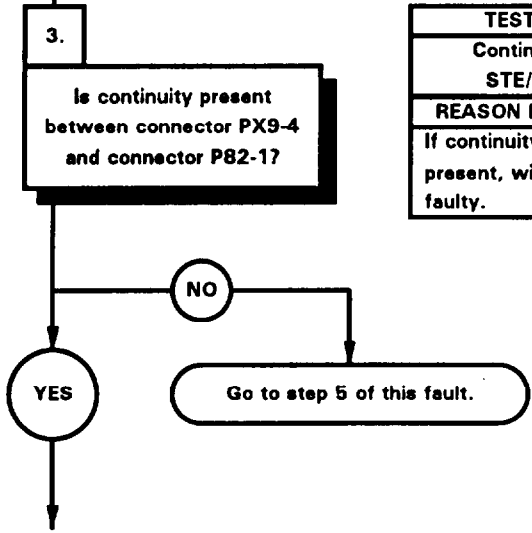
KNOWN INFO
Lighted indicator display OK. Fuel gage illuminates.
POSSIBLE PROBLEMS
Faulty fuel gage. Faulty dashboard cable assembly. Faulty start and charging cable assembly. Faulty fuel level sensor.

TEST OPTIONS
Resistance Test
REASON FOR QUESTION
If greater than 30 ohms is present, fuel gage is faulty.



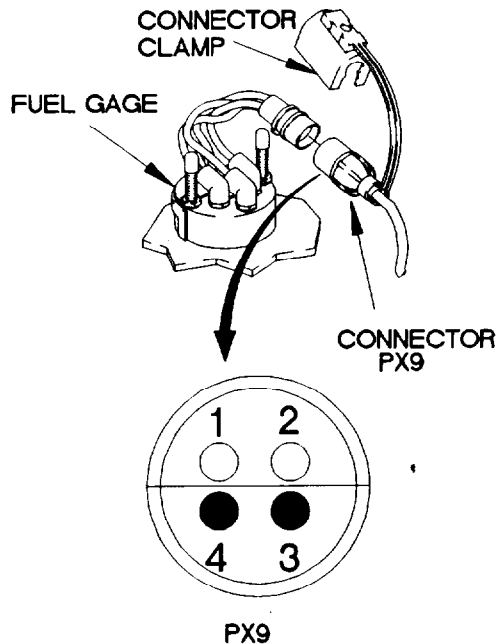
KNOWN INFO
Lighted indicator display OK. Fuel gage illuminates. Fuel gage OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty start and charging cable assembly. Faulty fuel level sensor.

TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 28 is faulty.



**RESISTANCE TEST**

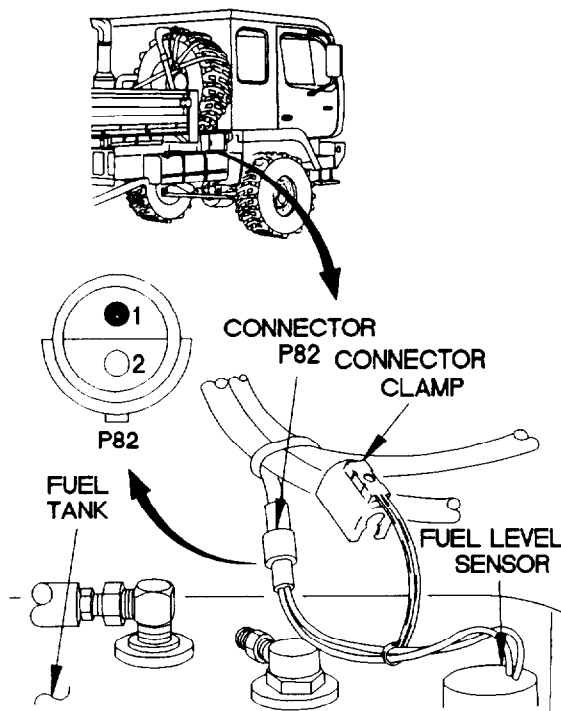
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX9-4.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If greater than 30 ohms is present, replace fuel gage (para 7-14).



X2E0902A

**CONTINUITY TEST**

- (1) Disconnect connector clamp from fuel level sensor.
- (2) Disconnect connector P82 from fuel level sensor.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector PX9-4.
- (5) Connect negative (-) probe of multimeter to connector P82-1 and note reading on multimeter.
- (6) If continuity is not present, go to step 5 of this fault.



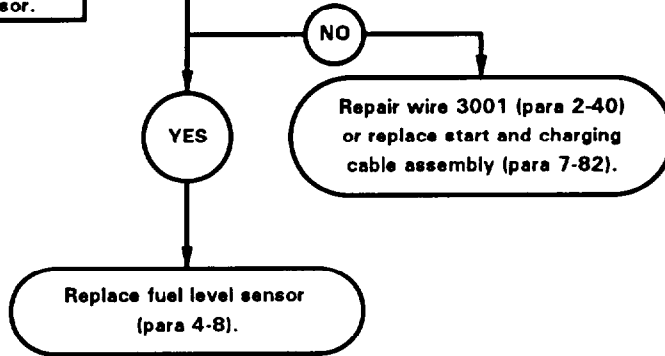
X2E0903A

e7. FUEL GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

KNOWN INFO
Lighted indicator display OK. Fuel gage illuminates. Fuel gage OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty start and charging cable assembly. Faulty fuel level sensor.

4.  
Is continuity present between connector P82-2 and a known good ground?

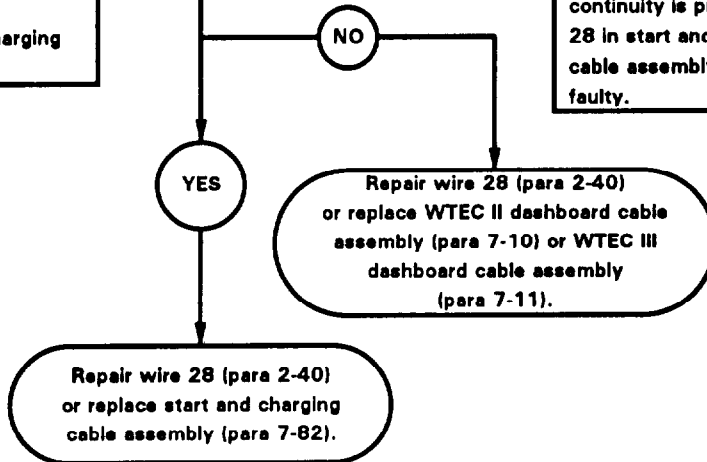
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3001 is faulty. If continuity is present, fuel level sensor is faulty.



KNOWN INFO
Lighted indicator display OK. Fuel gage illuminates. Fuel gage OK. Fuel level sensor OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty start and charging cable assembly.

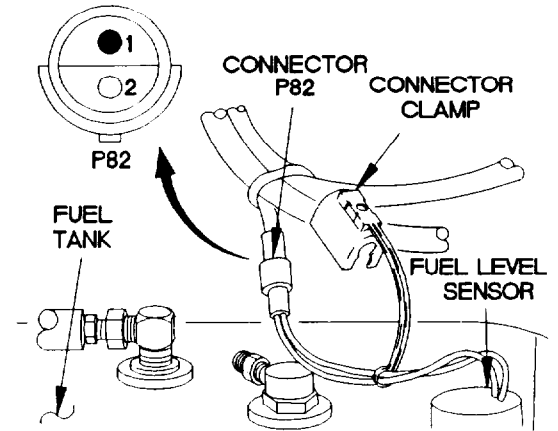
5.  
Is continuity present between connector J43-3 and PX9-4?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 28 in dashboard cable assembly is faulty. If continuity is present, wire 28 in start and charging cable assembly is faulty.



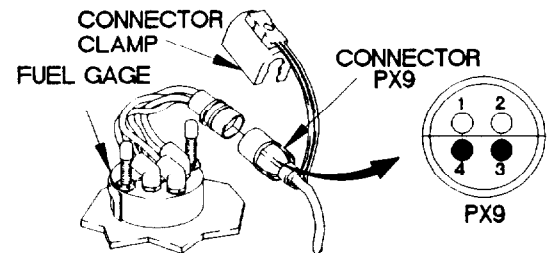
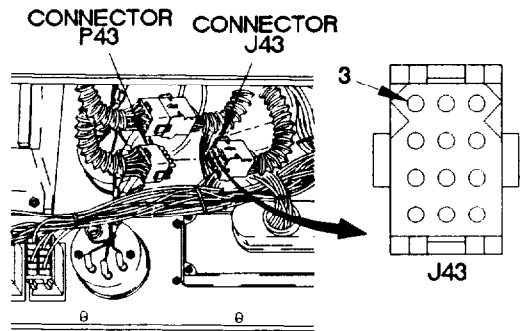
**CONTINUITY TEST**

- (1) Connect connector PX9 to fuel gage connector.
- (2) Connect connector clamp on fuel gage connector.
- (3) Install instrument panel assembly (para 7-15).
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector P82-2.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is not present, repair wire 3001 (para 2-40) or replace start and charging cable assembly (para 7-82).
- (8) If continuity is present, replace fuel level sensor (para 4-8).
- (9) Connect connector P82 to fuel level sensor.
- (10) Connect connector clamp on fuel level sensor.



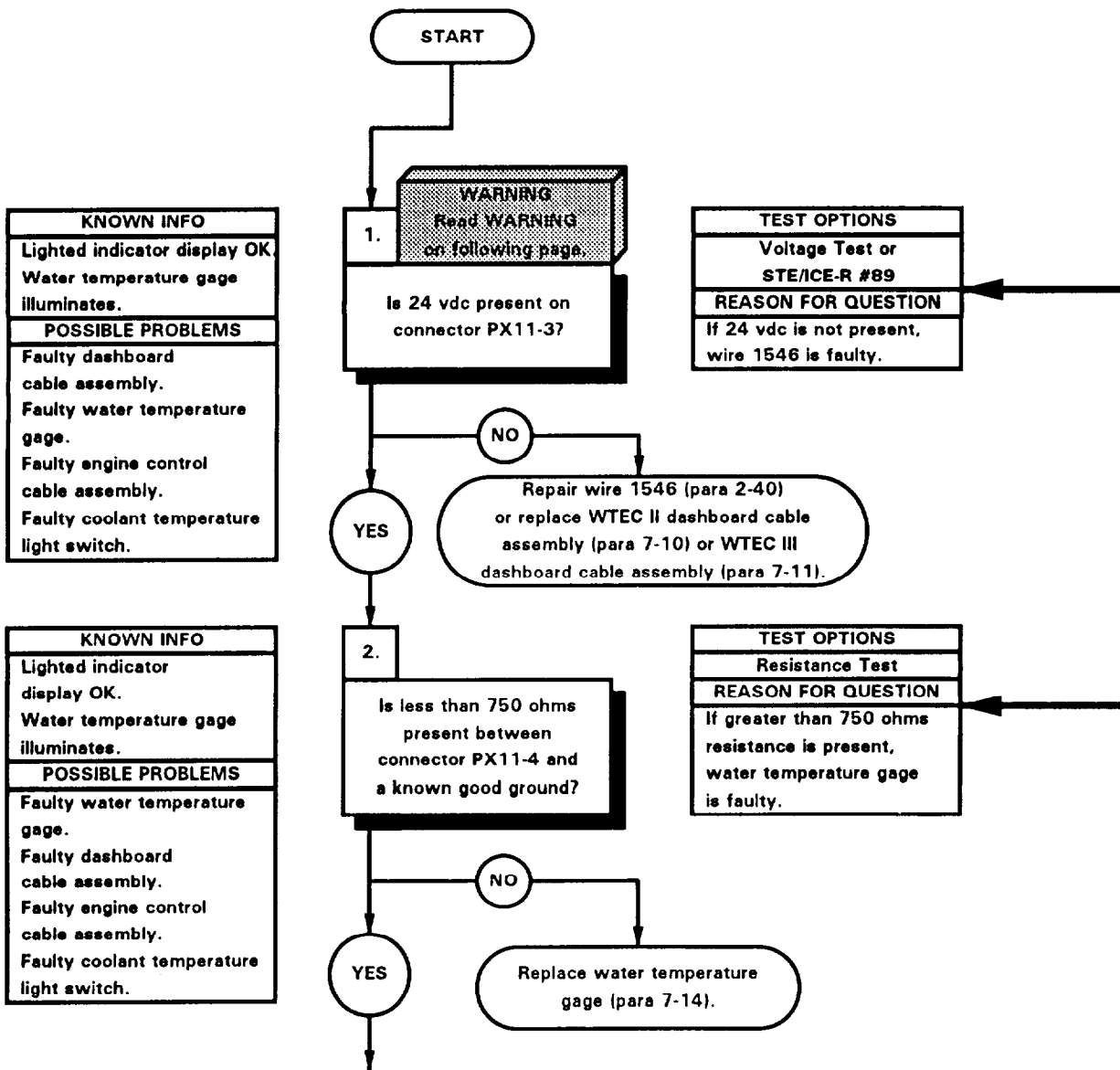
**CONTINUITY TEST**

- (1) Connect connector P82 to fuel level sensor.
- (2) Connect connector clamp on fuel level sensor.
- (3) Disconnect connector J43 from connector P43.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector J43-3.
- (6) Connect negative (-) probe of multimeter to PX9-4 and note reading on multimeter.
- (7) If continuity is not present, repair wire 28 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) If continuity is present, repair wire 28 (para 2-40) or replace start and charging cable assembly (para 7-82).
- (9) Connect connector J43 to connector P43.
- (10) Connect connector PX9 to fuel gage connector.
- (11) Connect connector clamp on fuel gage connector.
- (12) Install instrument panel assembly (para 7-15).



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8. WATER TEMPERATURE GAGE DOES NOT OPERATE OR IS INACCURATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)
<b>References</b> TM 9-4910-571-12&P	



**WARNING**

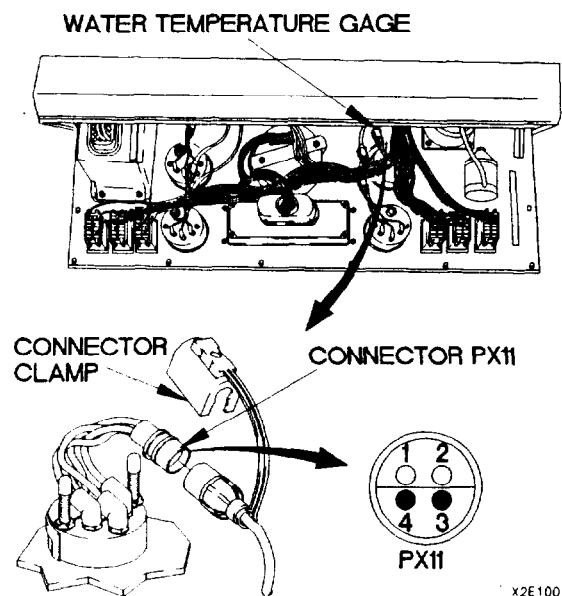
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector clamp from water temperature gage connector.
- (3) Disconnect connector PX11 from water temperature gage connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector PX11-3.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1546 (para 2-40) 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 9-2320-365-10).

**RESISTANCE TEST**

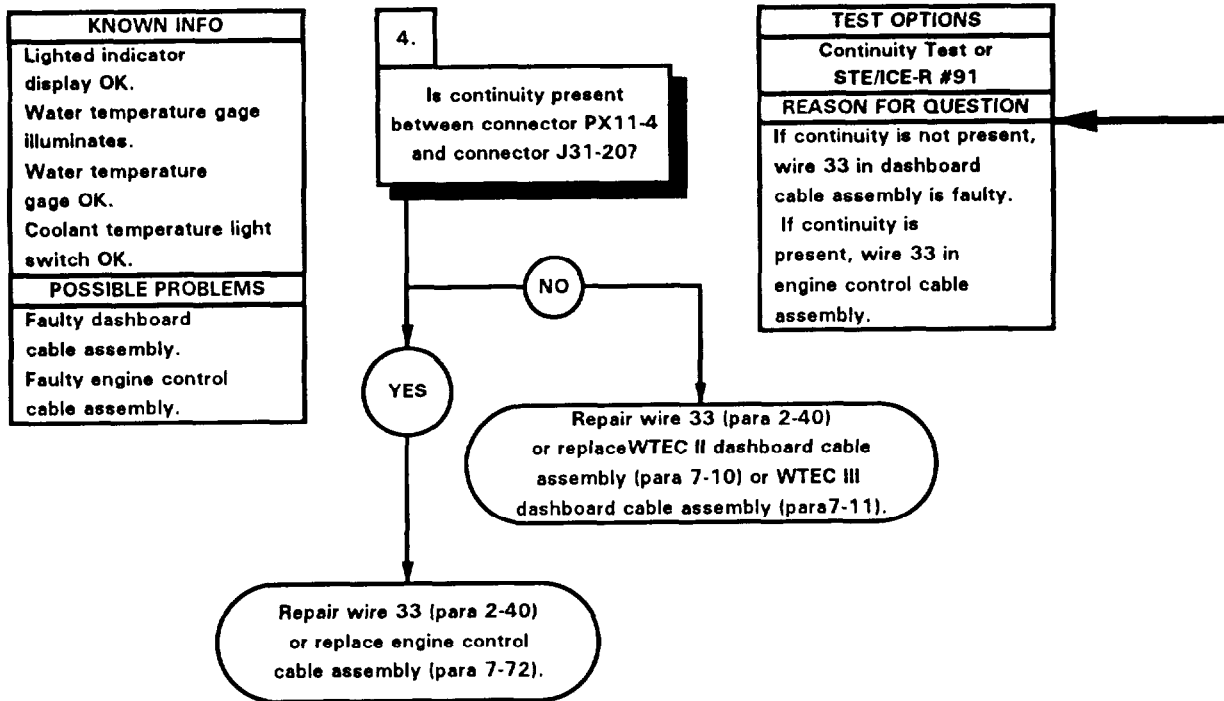
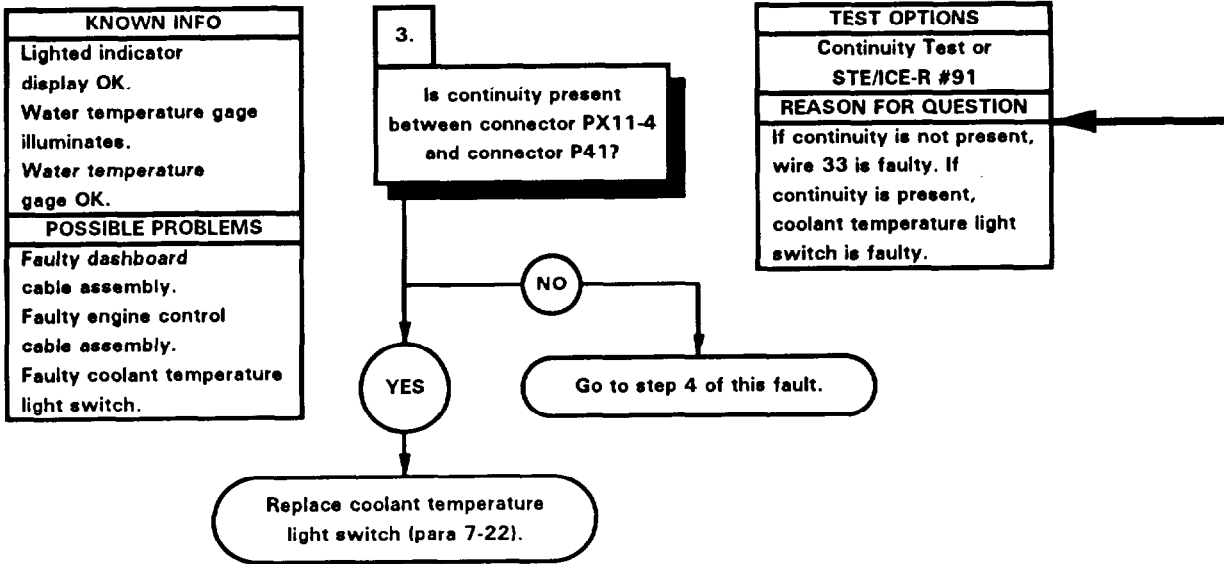
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX11-4.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If less than 750 ohms is present, go to step 3 of this fault.
- (5) If greater than 750 ohms is present, replace water temperature gage (para 7-14).



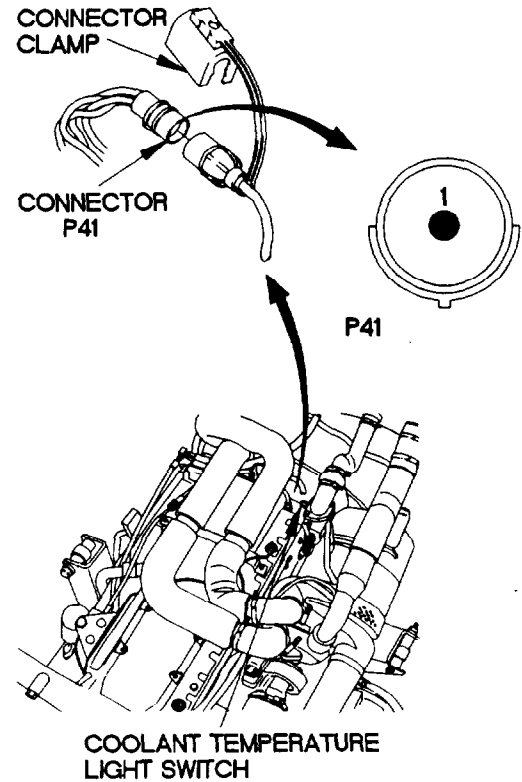
X2E1001A



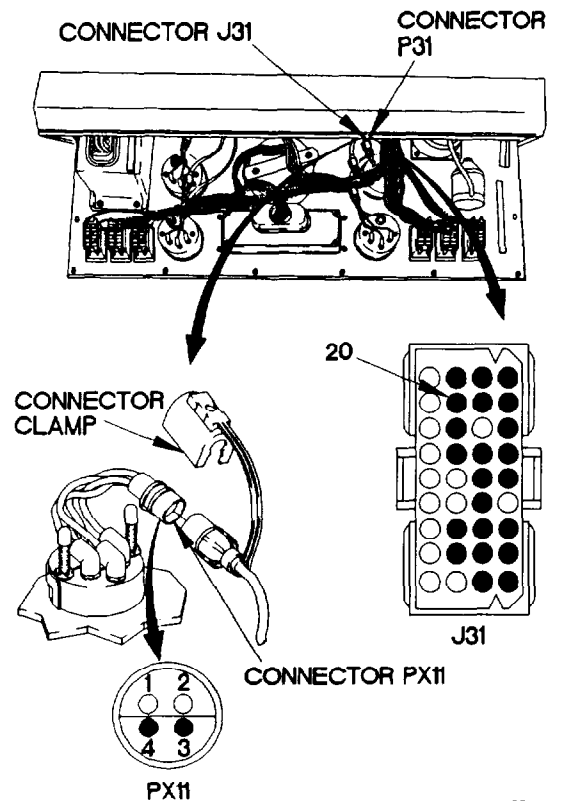
e8. WATER TEMPERATURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)



- CONTINUITY TEST**
- (1) Raise cab (TM 9-2320-365-10).
  - (2) Disconnect connector clamp from coolant temperature light switch connector.
  - (3) Disconnect connector P41 from coolant temperature light switch connector.
  - (4) Set multimeter to ohms.
  - (5) Connect positive (+) probe of multimeter to connector PX11-4.
  - (6) Connect negative (-) probe of multimeter to connector P41 and note reading on multimeter.
  - (7) If continuity is not present, go to step 4 of this fault.
  - (8) If continuity is present, replace coolant temperature light switch (para 7-22).
  - (9) Connect connector P41 to coolant temperature light switch connector.
  - (10) Connect connector clamp to coolant temperature light switch connector.
  - (11) Lower cab (TM 9-2320-365-10).

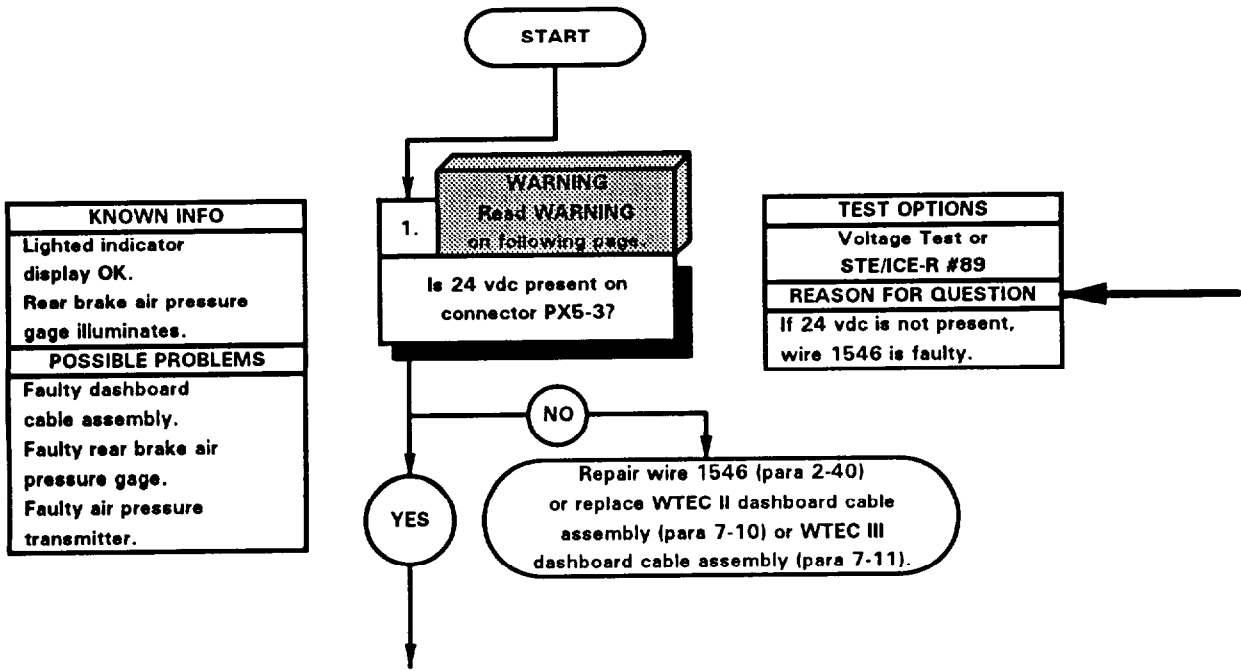


- CONTINUITY TEST**
- (1) Disconnect connector J31 from connector P31.
  - (2) Set multimeter to ohms.
  - (3) Connect positive (+) probe of multimeter to connector PX11-4.
  - (4) Connect negative (-) probe of multimeter to connector J31-20 and note reading on multimeter.
  - (5) If continuity is not present, repair wire 33 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (6) If continuity is present, repair wire 33 (para 2-40) or replace engine control cable assembly (para 7-72).
  - (7) Connect connector J31 to connector P31.
  - (8) Connect connector PX11 to water temperature gage connector.
  - (9) Connect connector clamp on water temperature gage connector.
  - (10) Install instrument panel assembly (para 7-15).



X2E1004A

e9. REAR BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



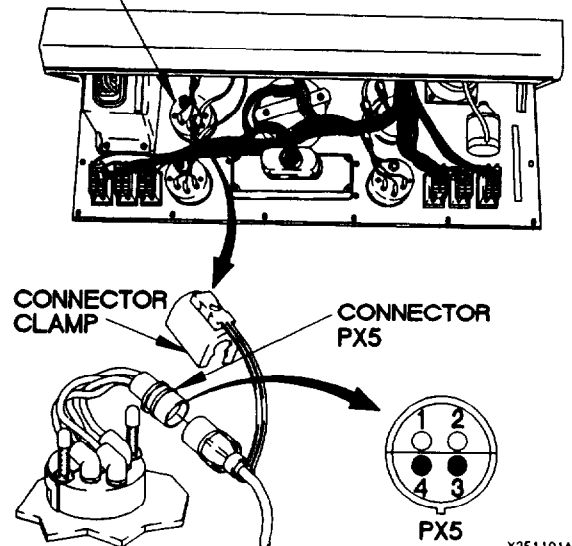
**WARNING**

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**

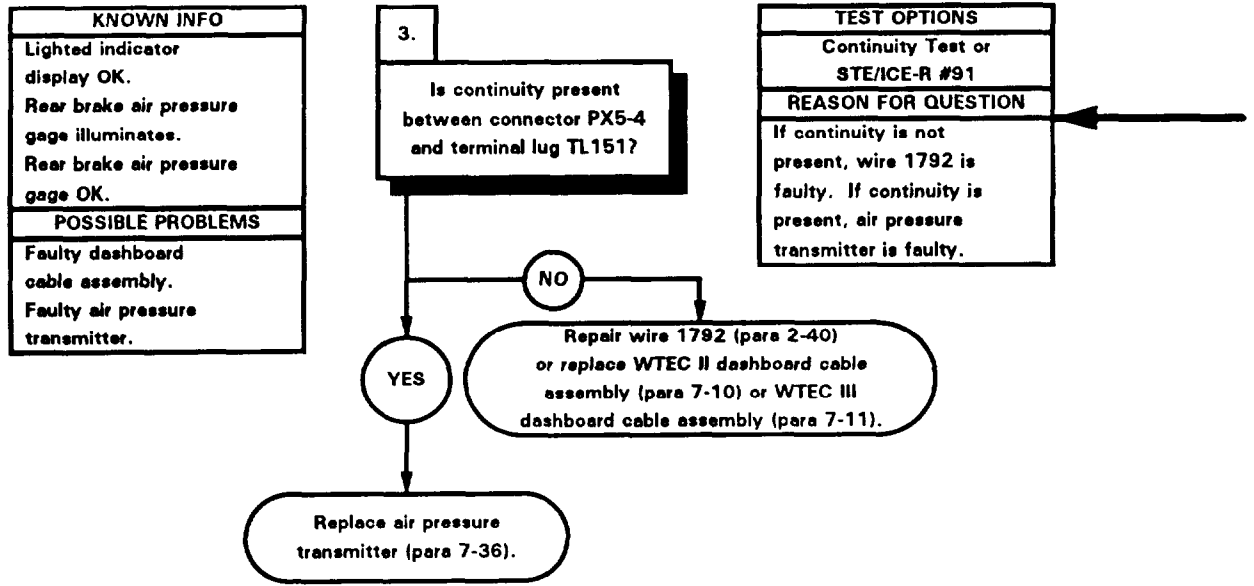
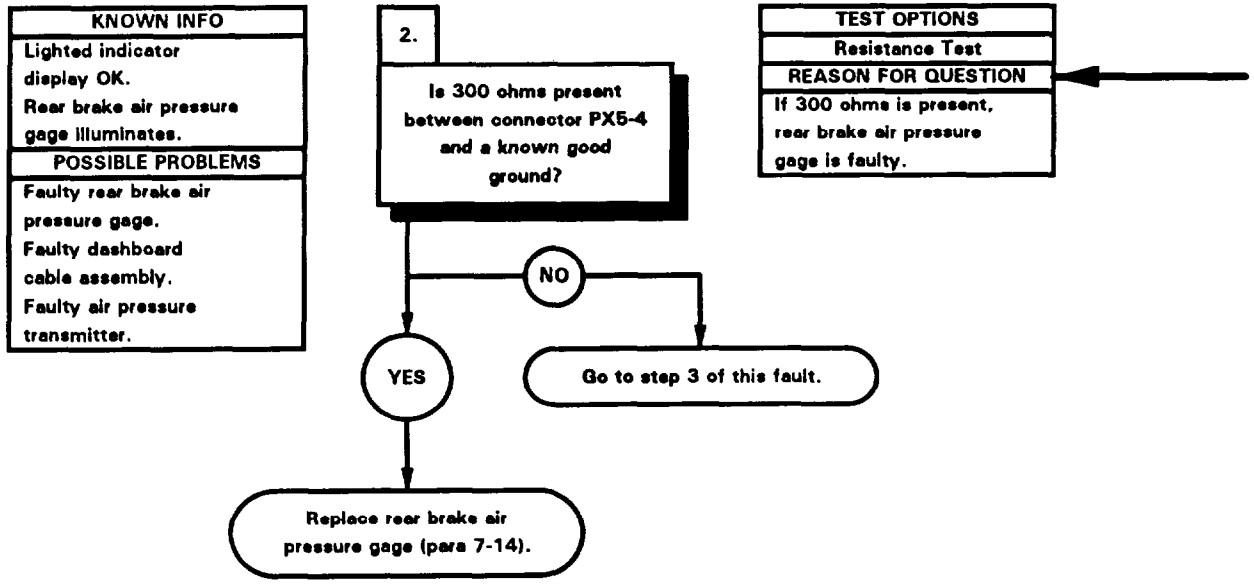
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector clamp from rear brake air pressure gage connector.
- (3) Disconnect connector PX5 from rear brake air pressure gage connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector PX5-3.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1546 (para 2-40) 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 9-2320-365-10).

REAR BRAKE  
AIR PRESSURE  
GAGE



X2E1101A

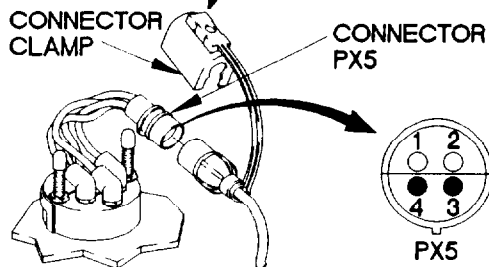
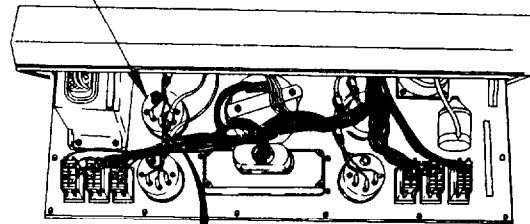
e9. REAR BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)



**RESISTANCE TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX5-4.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 300 ohms is not present, go to step 3 of this fault.
- (5) If 300 ohms is present, replace rear brake air pressure gage (para 7-14).

REAR BRAKE  
AIR PRESSURE  
GAGE

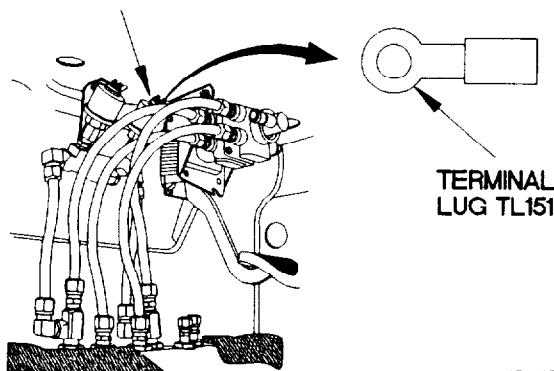


x2F1102A

**CONTINUITY TEST**

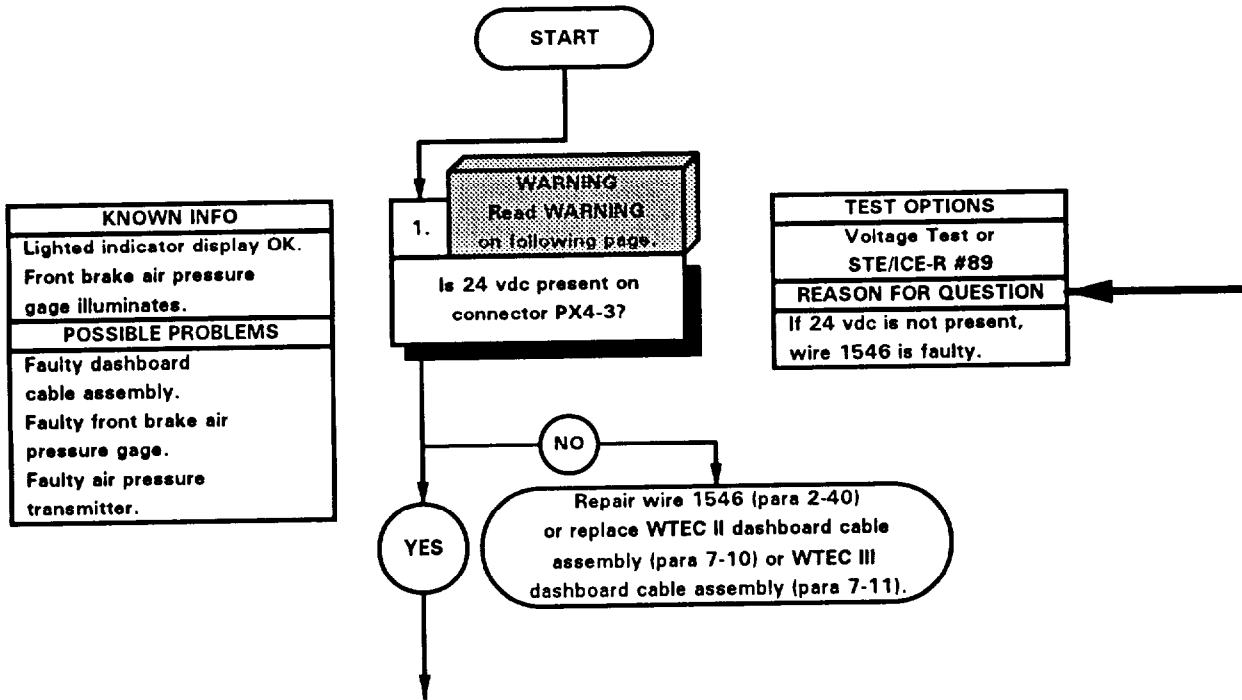
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX5-4.
- (3) Connect negative (-) probe of multimeter to terminal lug TL151 and note reading on multimeter.
- (4) If continuity is not present, repair wire 1792 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) If continuity is present, replace air pressure transmitter (para 7-36).
- (6) Connect connector PX5 to rear brake air pressure gage connector.
- (7) Connect connector clamp to rear brake air pressure gage connector.
- (8) Install instrument panel assembly (para 7-15).

TERMINAL  
LUG TL151



x2E1103A

●10. FRONT BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



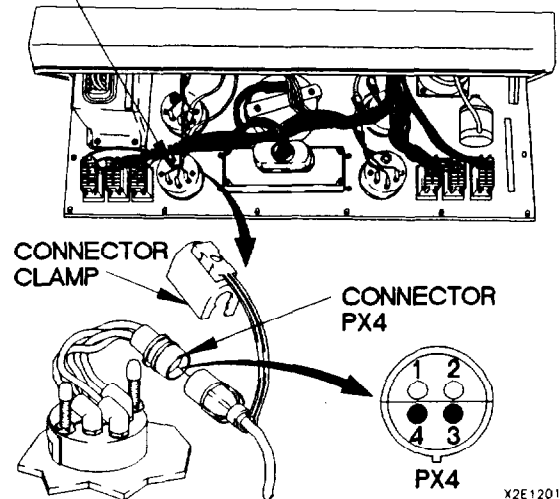
**WARNING**

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 instrument panel assembly for access (para 7-15).
- (2) Disconnect connector clamp from front brake air pressure gage connector.
- (3) Disconnect connector PX4 from front brake air pressure gage connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector PX4-3.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1546 (para 2-40) 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 9-2320-365-10).

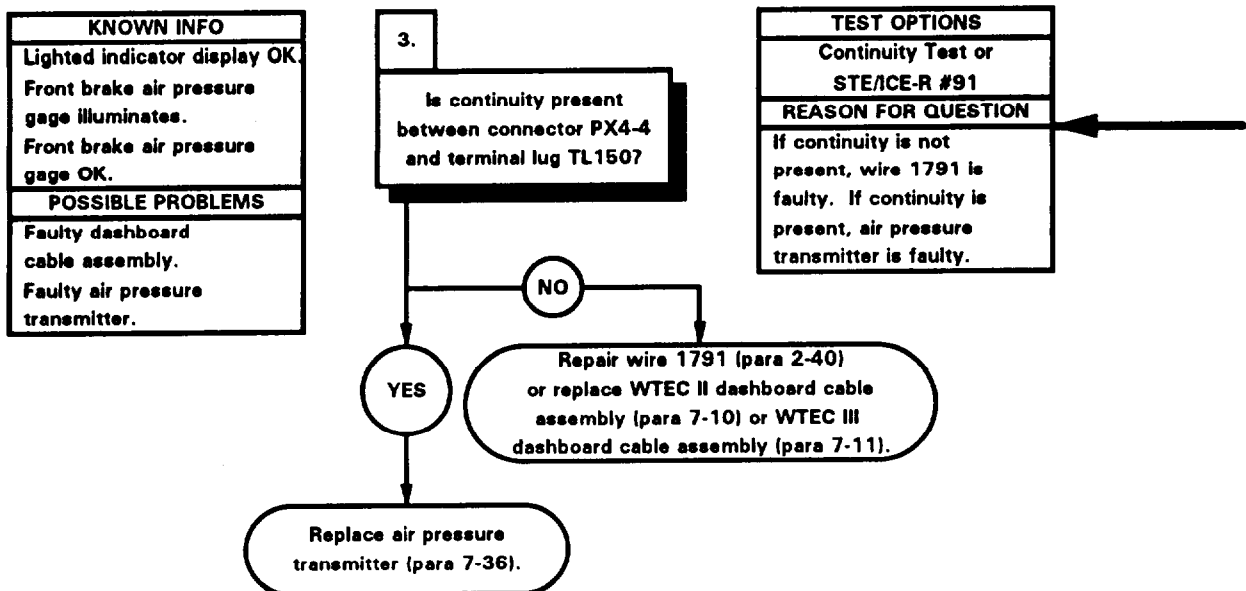
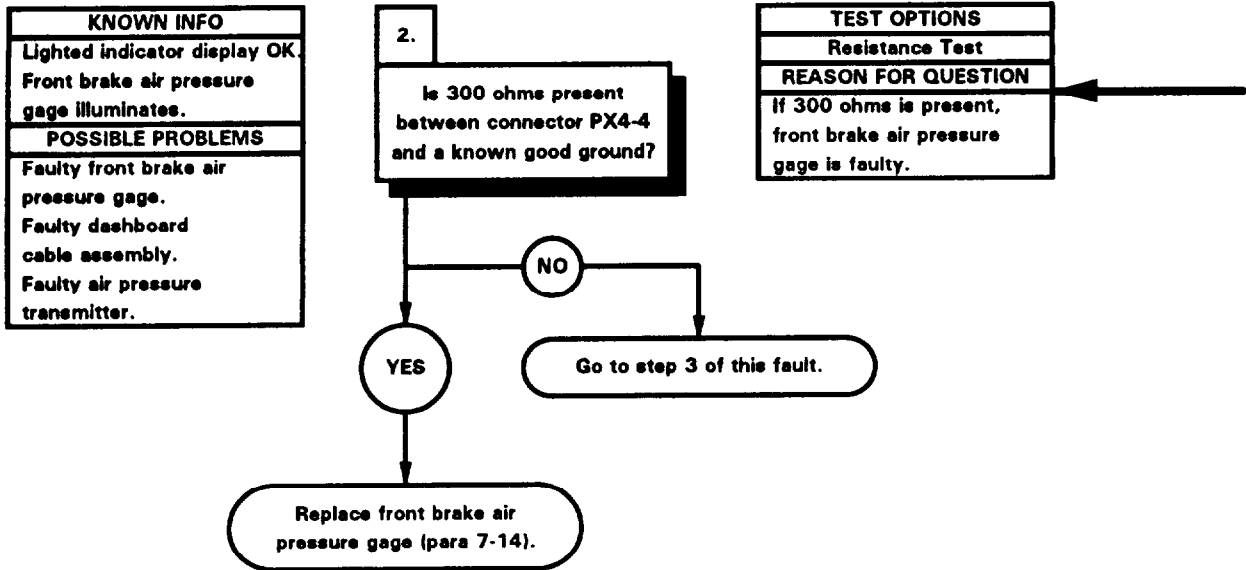
FRONT BRAKE  
AIR PRESSURE  
GAGE CONNECTOR



X2E1201A



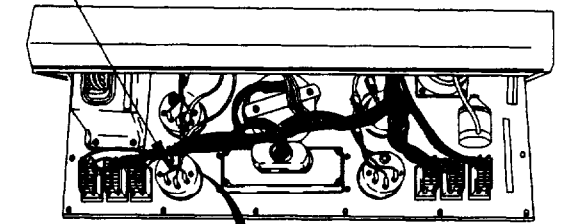
10. FRONT BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)



**RESISTANCE TEST**

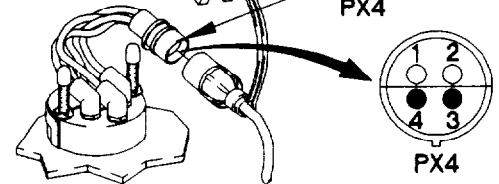
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX4-4.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 300 ohms is not present, go to step 3 of this fault.
- (5) If 300 ohms is present, replace front brake air pressure gage (para 7-14).

FRONT BRAKE  
AIR PRESSURE  
GAGE CONNECTOR



CONNECTOR  
CLAMP

CONNECTOR  
PX4

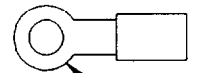
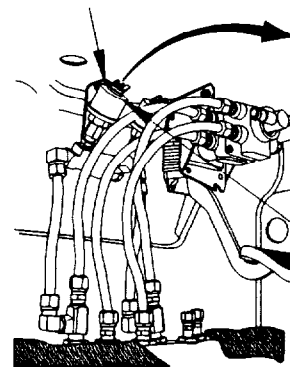


X2E1202A

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX4-4.
- (3) Connect negative (-) probe of multimeter to terminal lug TL150 and note reading on multimeter.
- (4) If continuity is not present, repair wire 1791 (para 2-40) 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 air pressure transmitter (para 7-36).
- (6) Connect connector PX4 to front brake air pressure gage connector.
- (7) Connect connector clamp on front brake air pressure gage connector.
- (8) Install instrument panel assembly (para 7-15).

TERMINAL  
LUG TL150

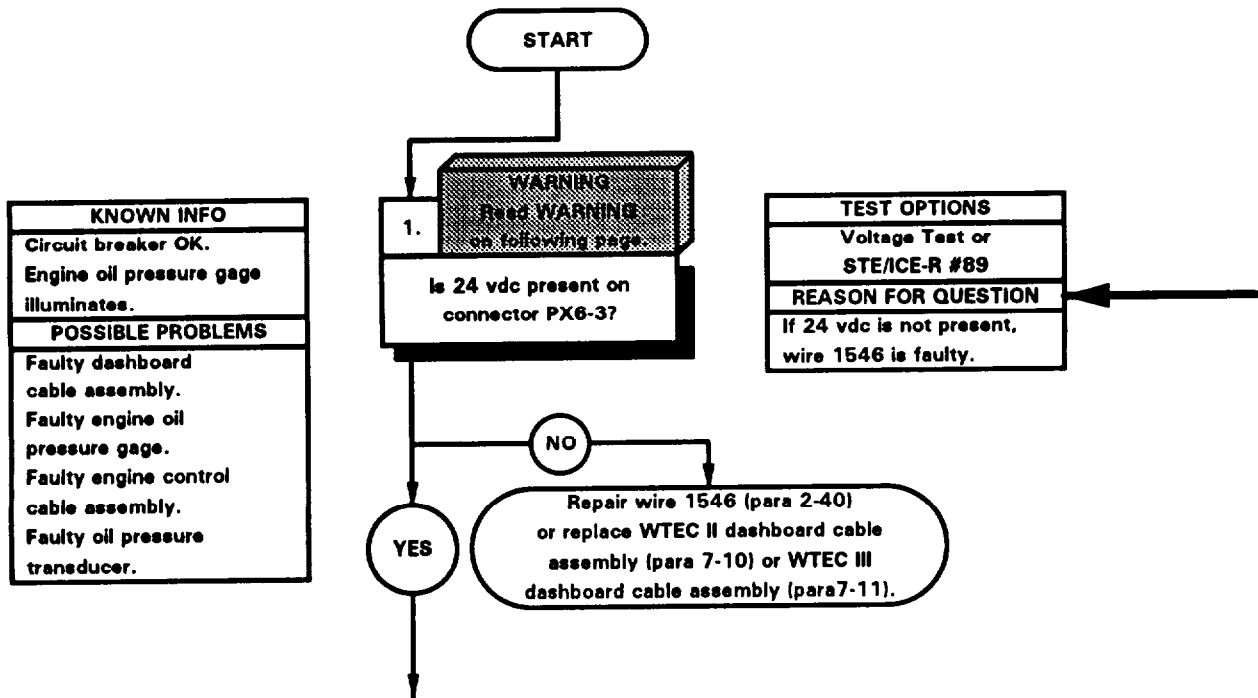


TERMINAL  
LUG TL150

AIR PRESSURE  
TRANSMITTER

X2E1203A

11. ENGINE OIL PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

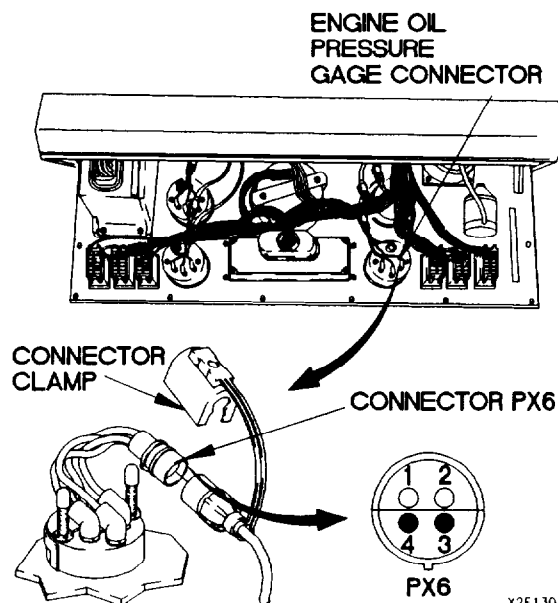


**WARNING**

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.

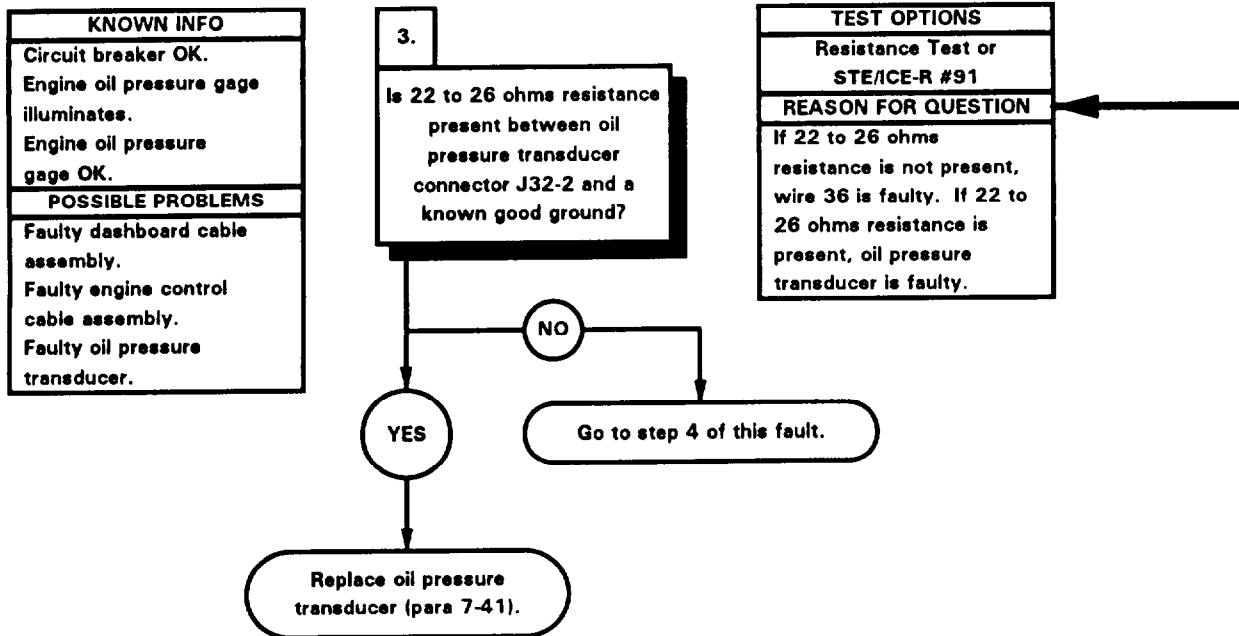
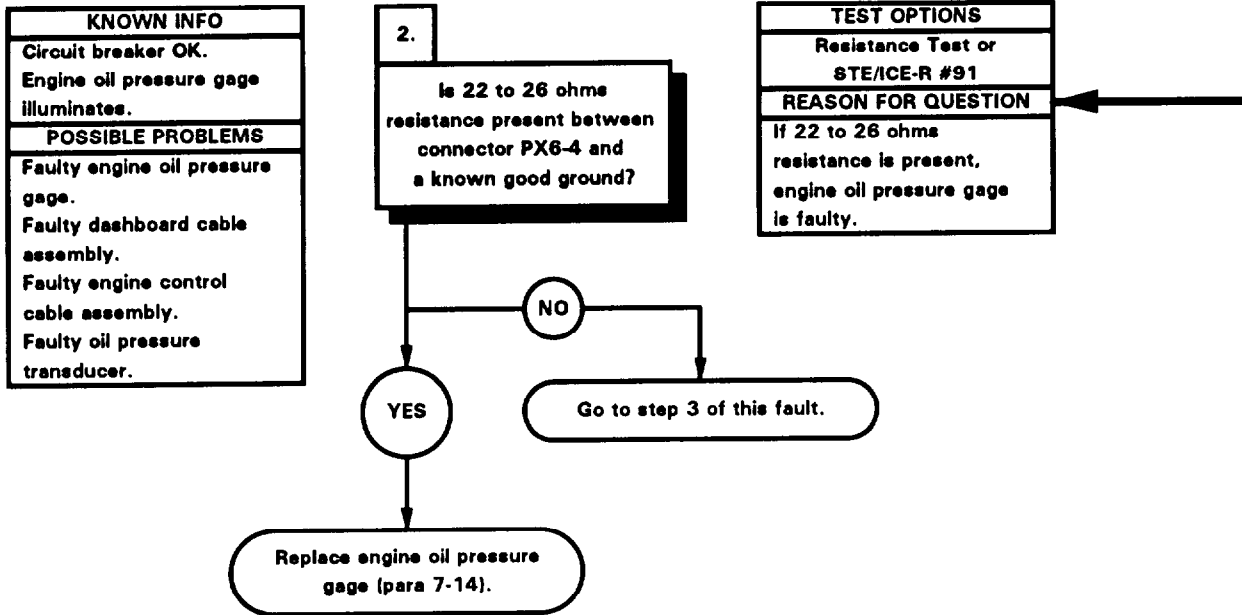
**VOLTAGE TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector clamp from engine oil pressure gage connector.
- (3) Disconnect connector PX6 from engine oil pressure gage connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector PX6-3.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1546 (para 2-40) 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 9-2320-365-10).



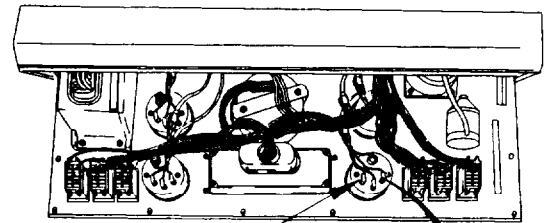
X2E1301A

11. ENGINE OIL PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

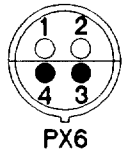


**RESISTANCE TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX6-4.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If 22 to 26 ohms resistance is not present, go to step 3 of this fault.
- (5) If 22 to 26 ohms resistance is present, replace engine oil pressure gage (para 7-14).

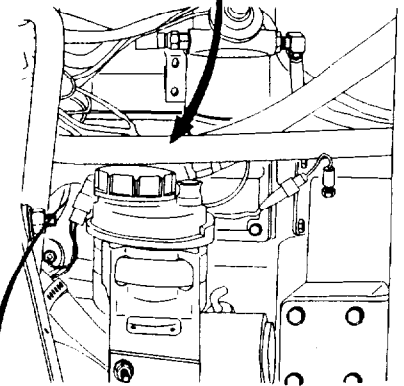
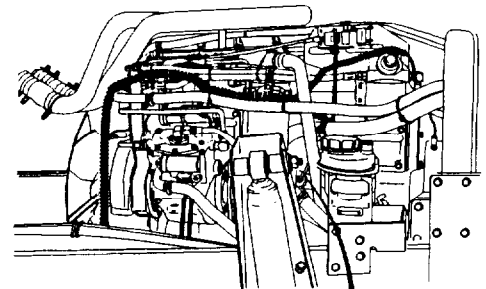


CONNECTOR PX6



PX6

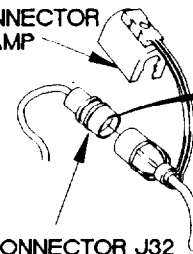
X2E1302A



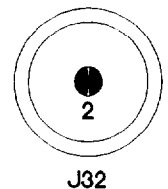
**RESISTANCE TEST**

- (1) Raise cab (TM 9-2320-365-10).
- (2) Disconnect connector clamp from connector J32.
- (3) Disconnect connector P32 from connector J32.
- (4) Connect positive (+) probe of multimeter to connector J32-2.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If 22 to 26 ohms resistance is not present, go to step 4 of this fault.
- (7) If 22 to 26 ohms resistance is present, replace oil pressure transducer (para 7-41).
- (8) Connect connector P32 to connector J32.
- (9) Connect connector clamp on connector J32.
- (10) Lower cab (TM 9-2320-365-10).

CONNECTOR CLAMP



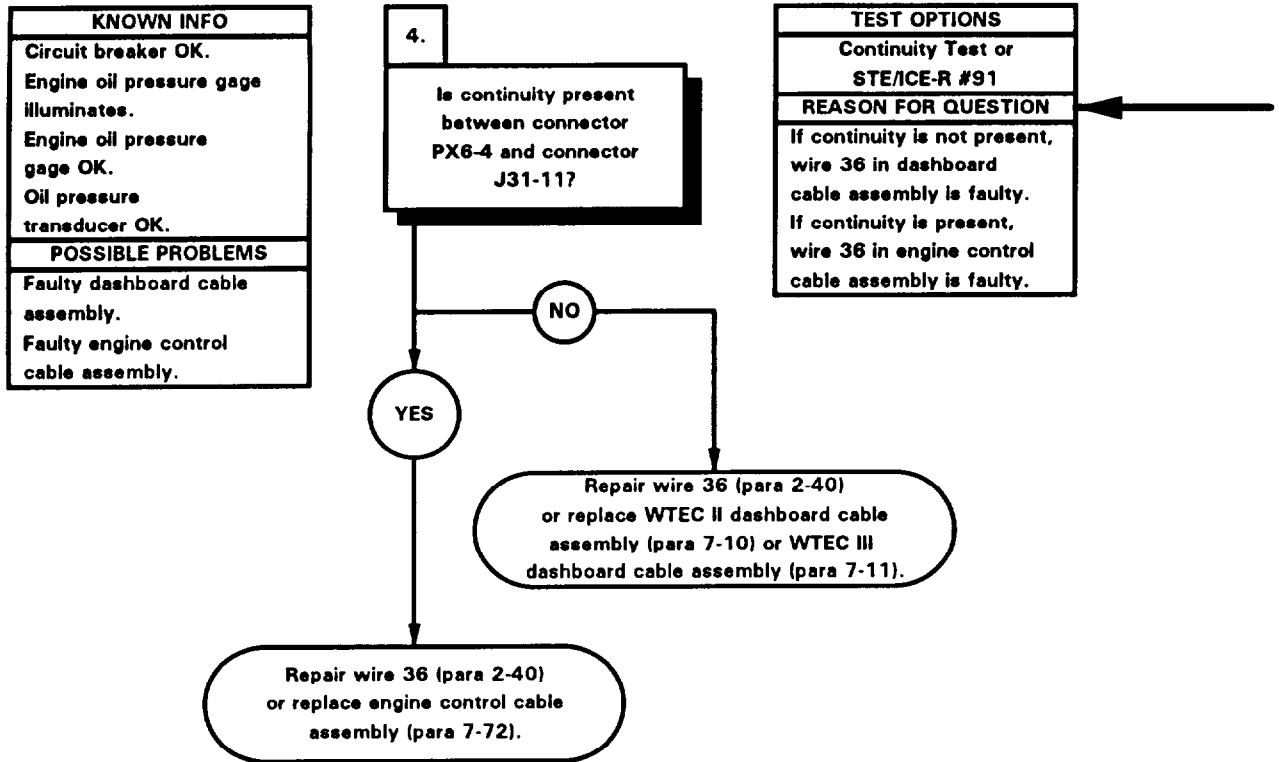
CONNECTOR J32



J32

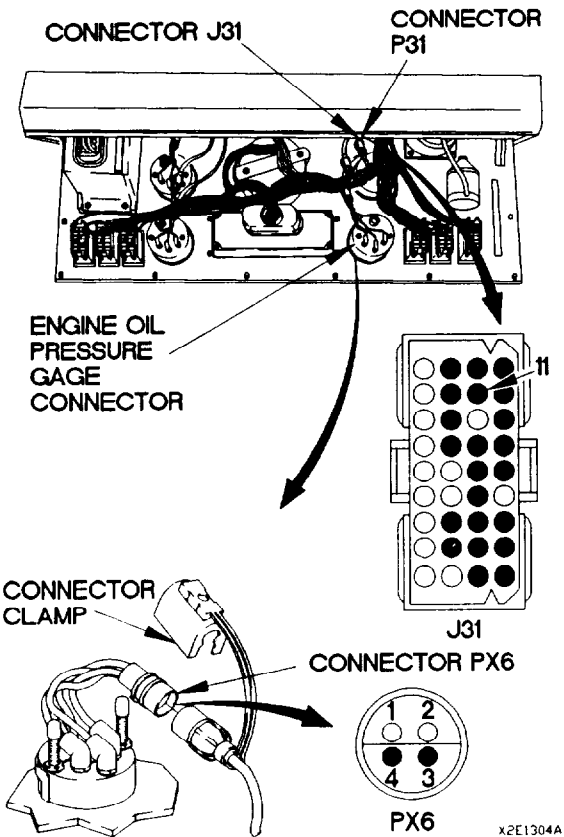
X2E1303A

e11. ENGINE OIL PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)



**CONTINUITY TEST**

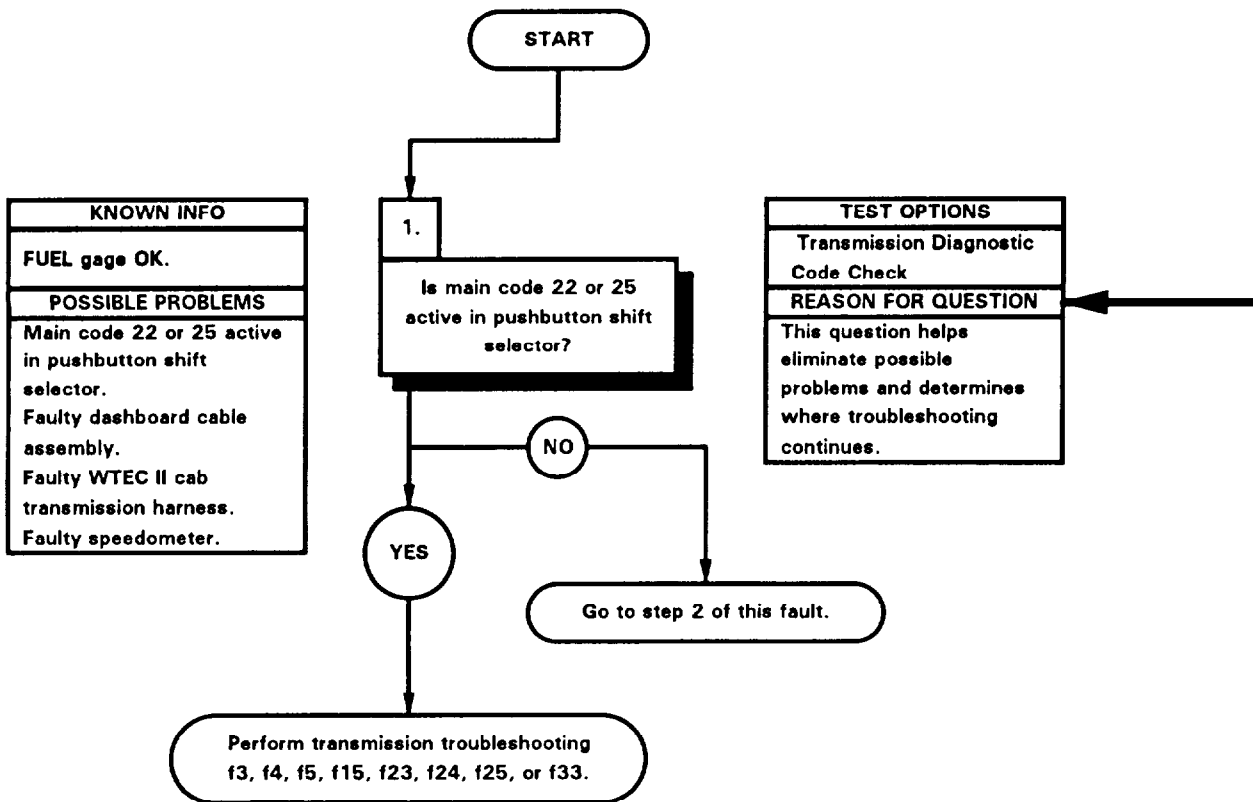
- (1) Disconnect connector J31 from connector P31.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector PX6-4.
- (4) Connect negative (-) probe of multimeter to connector J31-11 and note reading on multimeter.
- (5) If continuity is not present, repair wire 36 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-141).
- (6) If continuity is present, repair wire 36 (para 2-40) or replace engine control cable assembly (para 7-72).
- (7) Connect connector J31 to connector P31.
- (8) Connect connector PX6 to engine oil pressure gage connector.
- (9) Connect connector clamp on engine oil pressure gage connector.
- (10) Install instrument panel assembly (para 7-15).




x2E1304A

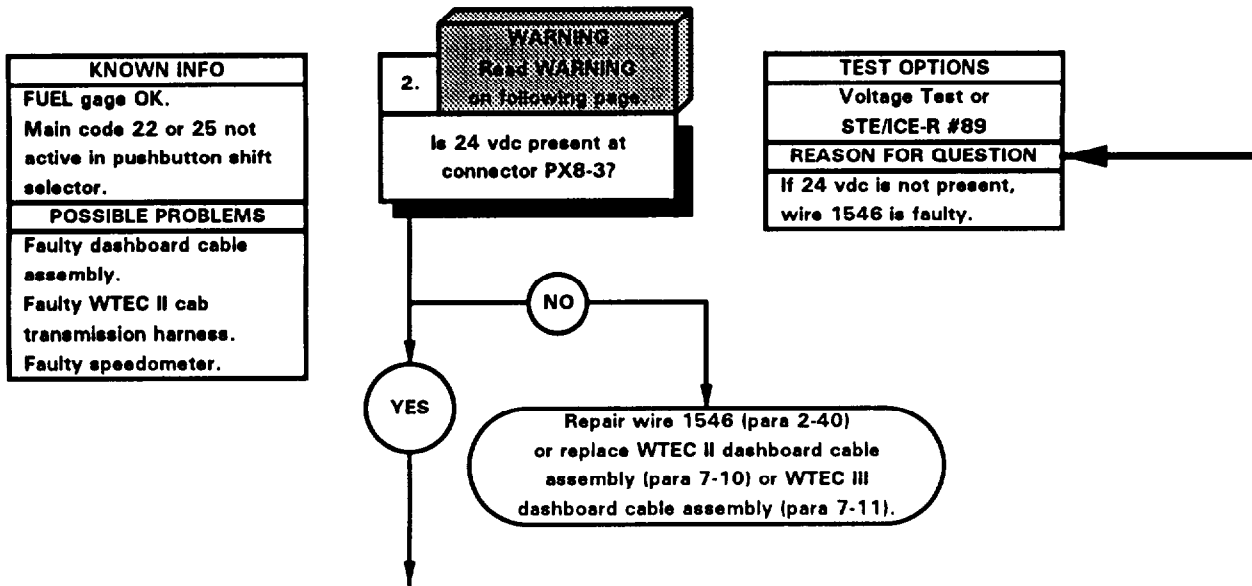


e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



- 
- (1) Check for active transmission diagnostic codes (para 8-4 or 8-5).
  - (2) If main code 22 or 25 is active in pushbutton shift selector, perform transmission troubleshooting f3, f4, f5, f15, f23, f24, f25, or f33.

e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

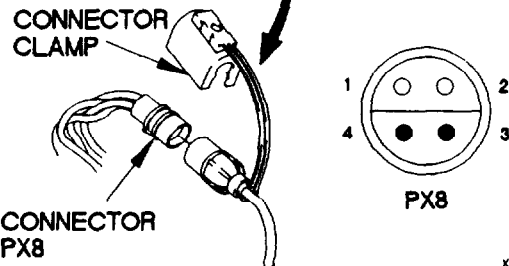
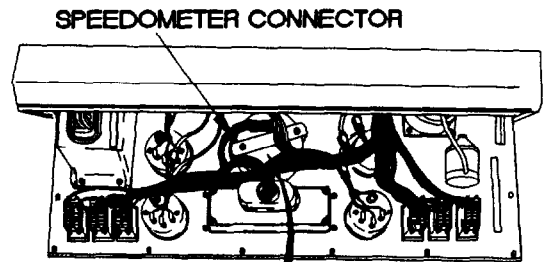


**WARNING**

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**

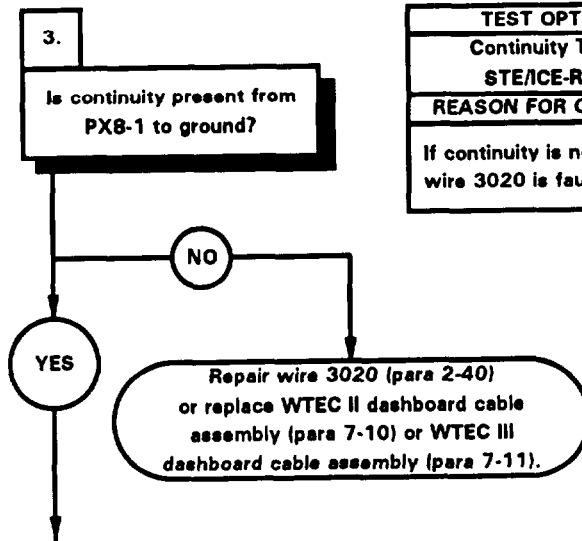
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector clamp from speedometer connector.
- (3) Disconnect connector PX8 from speedometer connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector PX8-3.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1546 (para 2-40) 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 9-2320-365-10).



x2E12011

e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

KNOWN INFO
FUEL gage OK. Main code 22 or 25 not active in pushbutton shift selector. Wire 1546 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty WTEC II cab transmission harness. Faulty speedometer.



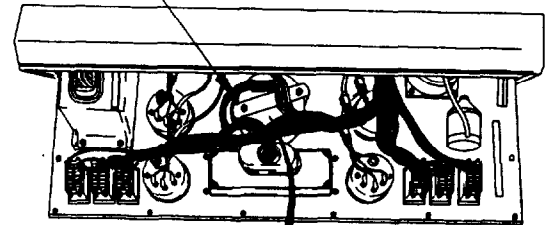
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3020 is faulty.



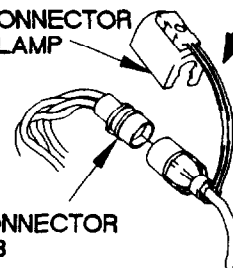
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX8-1.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3020 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

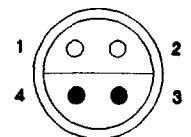
SPEEDOMETER CONNECTOR



CONNECTOR CLAMP



CONNECTOR PX8

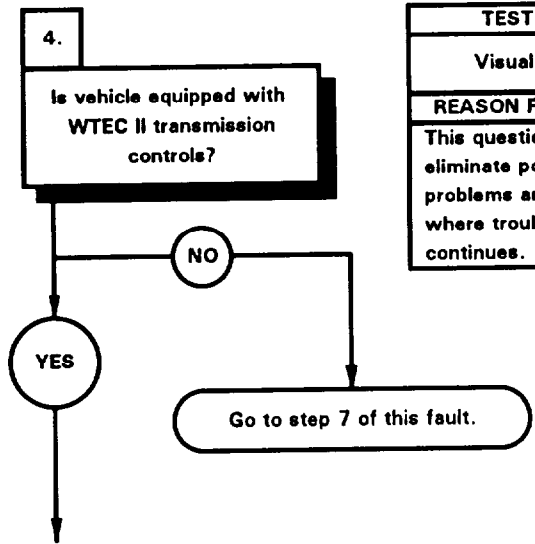


PX8

X2E12021

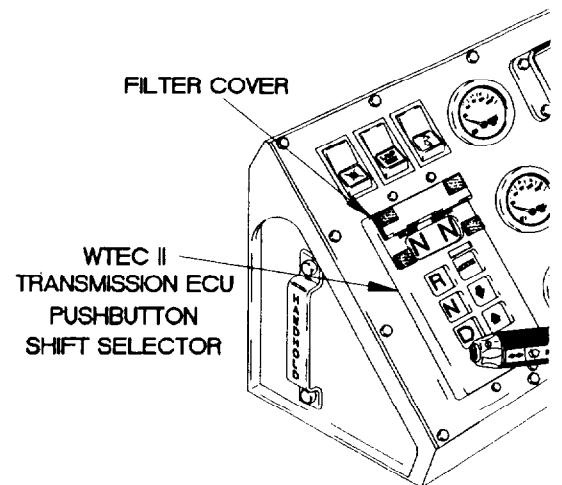
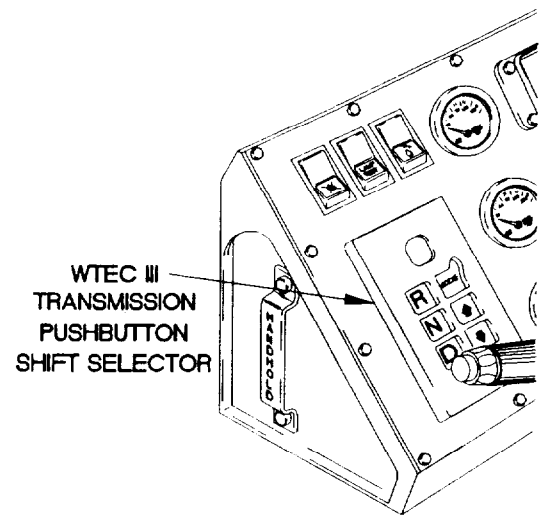
e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

KNOWN INFO
FUEL gage OK. Main code 22 or 25 not active in pushbutton shift selector. Wire 1546 OK. Wire 3020 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty WTEC II cab transmission harness. Faulty speedometer.



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

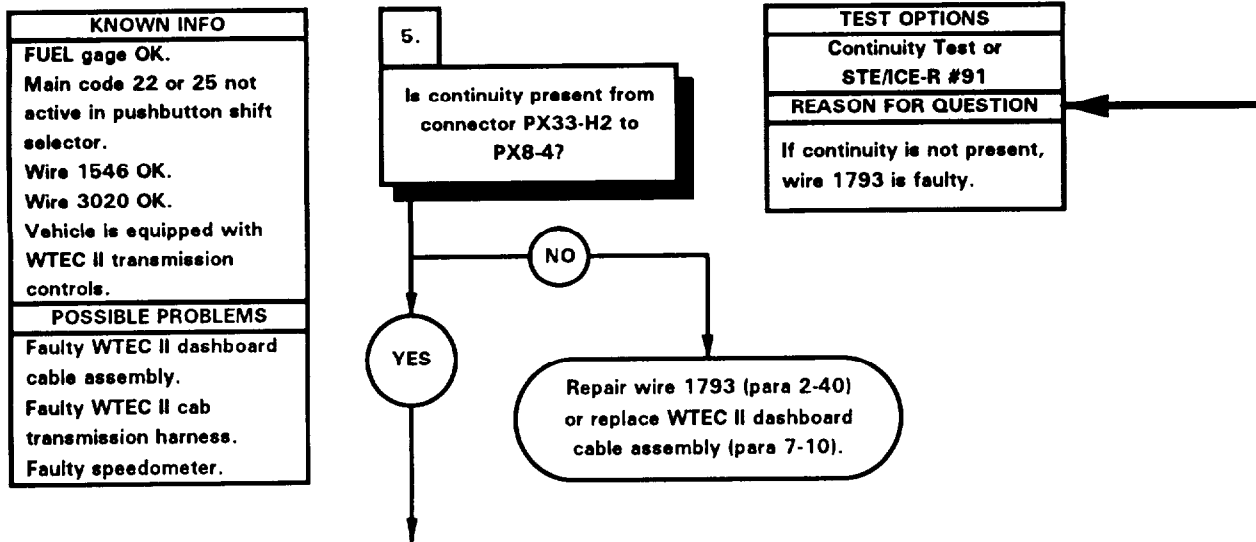
- (1) Check if vehicle is equipped with WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS).
- (2) If TEPSS is not mounted with four screws and does not have a filter cover, go to step 7 of this fault.



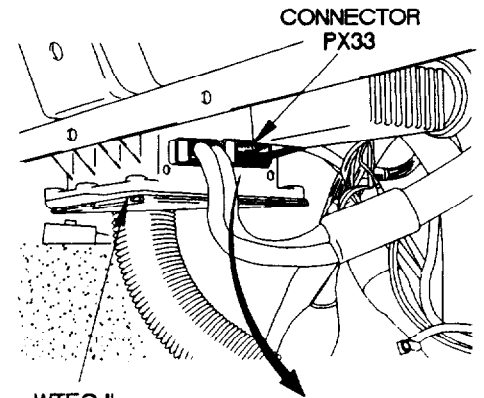
x2E12031



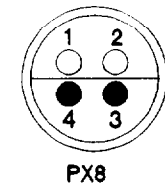
e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)



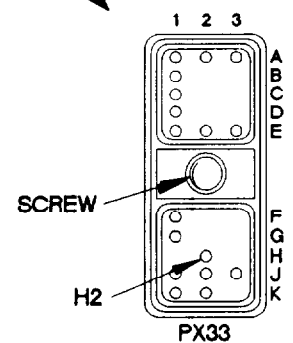
- | CONTINUITY TEST |   |
|-----------------|---|
| (1)             | Remove kick panel (para 16-3).  |
| (2)             | Loosen screw in connector PX33.   |
| (3)             | Disconnect connector PX33 from WTEC II VIM.   |
| (4)             | Set multimeter to ohms.   |
| (5)             | Connect positive (+) probe of multimeter to connector PX33-H2.  |
| (6)             | Connect negative (-) probe of multimeter to connector PX8-4 and note reading on multimeter.                         |
| (7)             | If continuity is not present, repair wire 1793 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10). |
| (8)             | Connect connector PX33 to WTEC II VIM.  |
| (9)             | Tighten screw in connector PX33.  |
| (10)            | Connect connector PX8 to speedometer connector.   |
| (11)            | Connect connector clamp on speedometer connector.   |



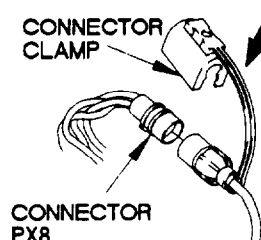
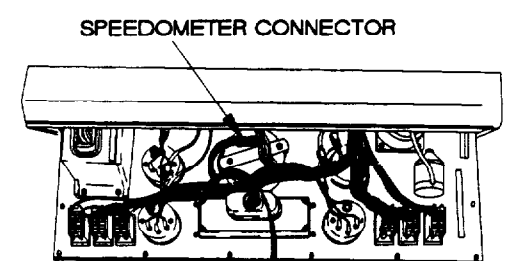
WTEC II  
VIM



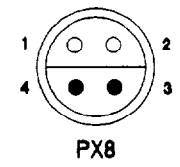
PX8



PX33



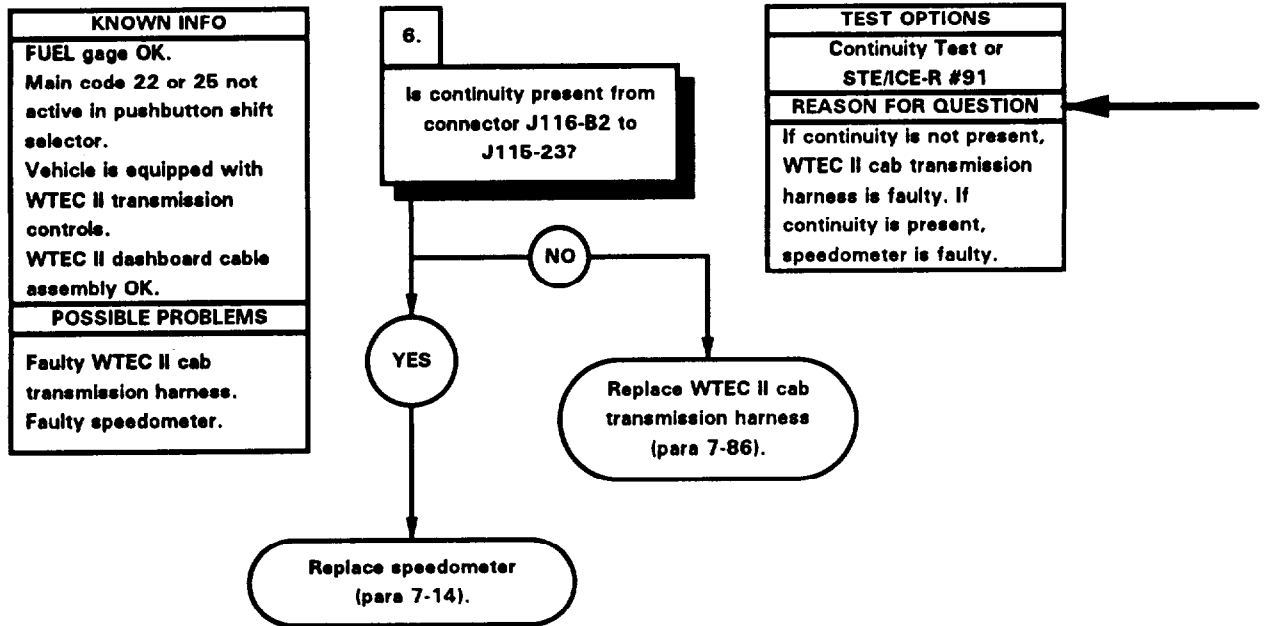
CONNECTOR  
PX8



PX8

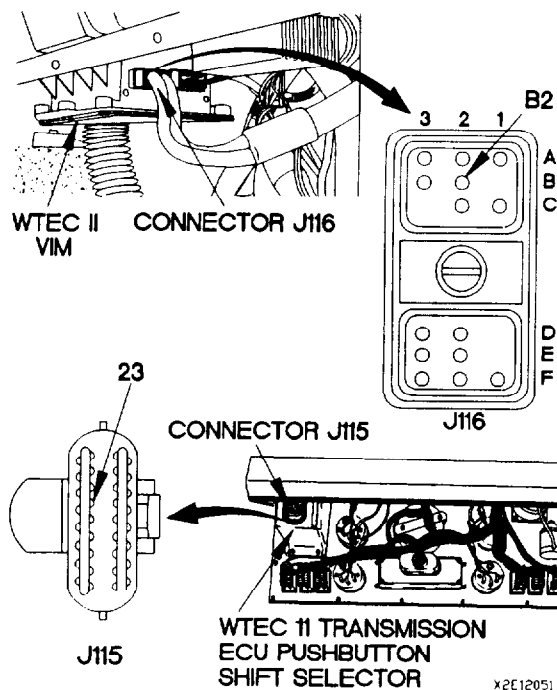
K2E12041

e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

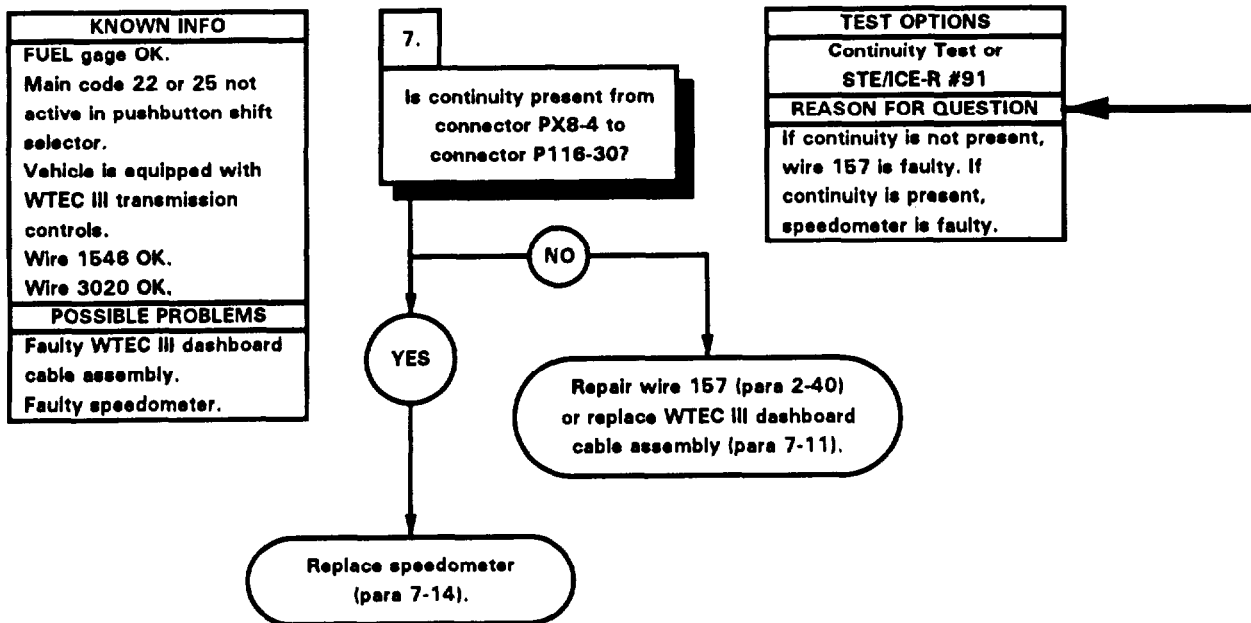


**CONTINUITY TEST**

- (1) Disconnect connector J115 from WTEC II TEPSS.
- (2) Loosen screw in connector J116.
- (3) Disconnect connector J116 from WTEC II VIM.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector J116-B2.
- (6) Connect negative (-) probe of multimeter to connector J115-23 and note reading on multimeter.
- (7) If continuity is not present, replace WTEC II cab transmission harness (para 7-86).
- (8) If continuity is present, replace speedometer (para 7-14).
- (9) Connect connector J116 to WTEC II VIM.
- (10) Tighten screw in connector J116.
- (11) Install kick panel (para 16-3).
- (12) Connect connector J115 to WTEC II TEPSS.
- (13) Install instrument panel assembly (para 7-15).

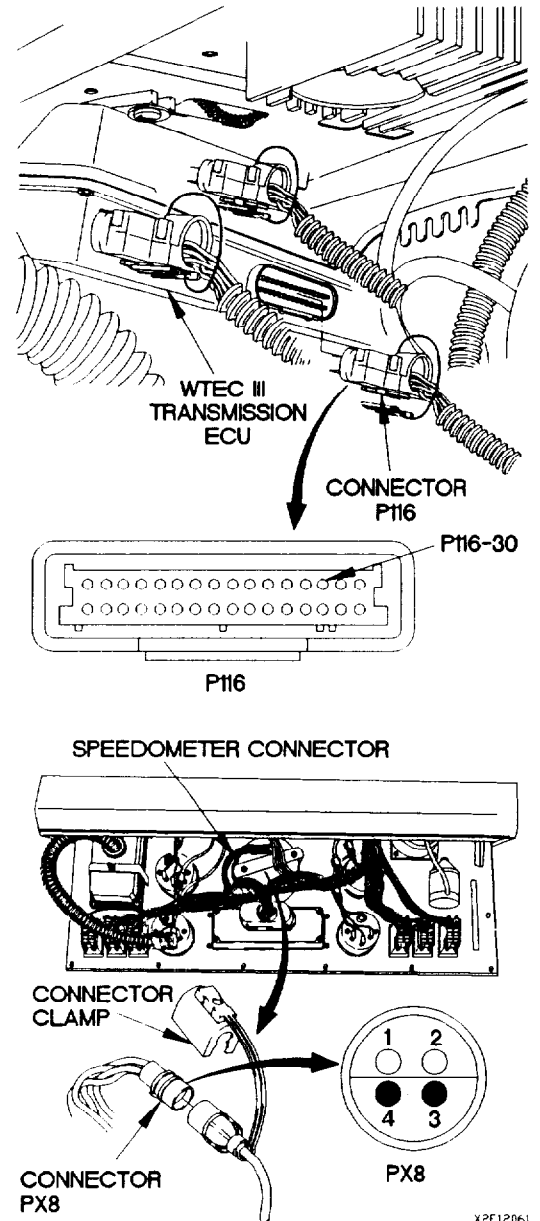


e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)



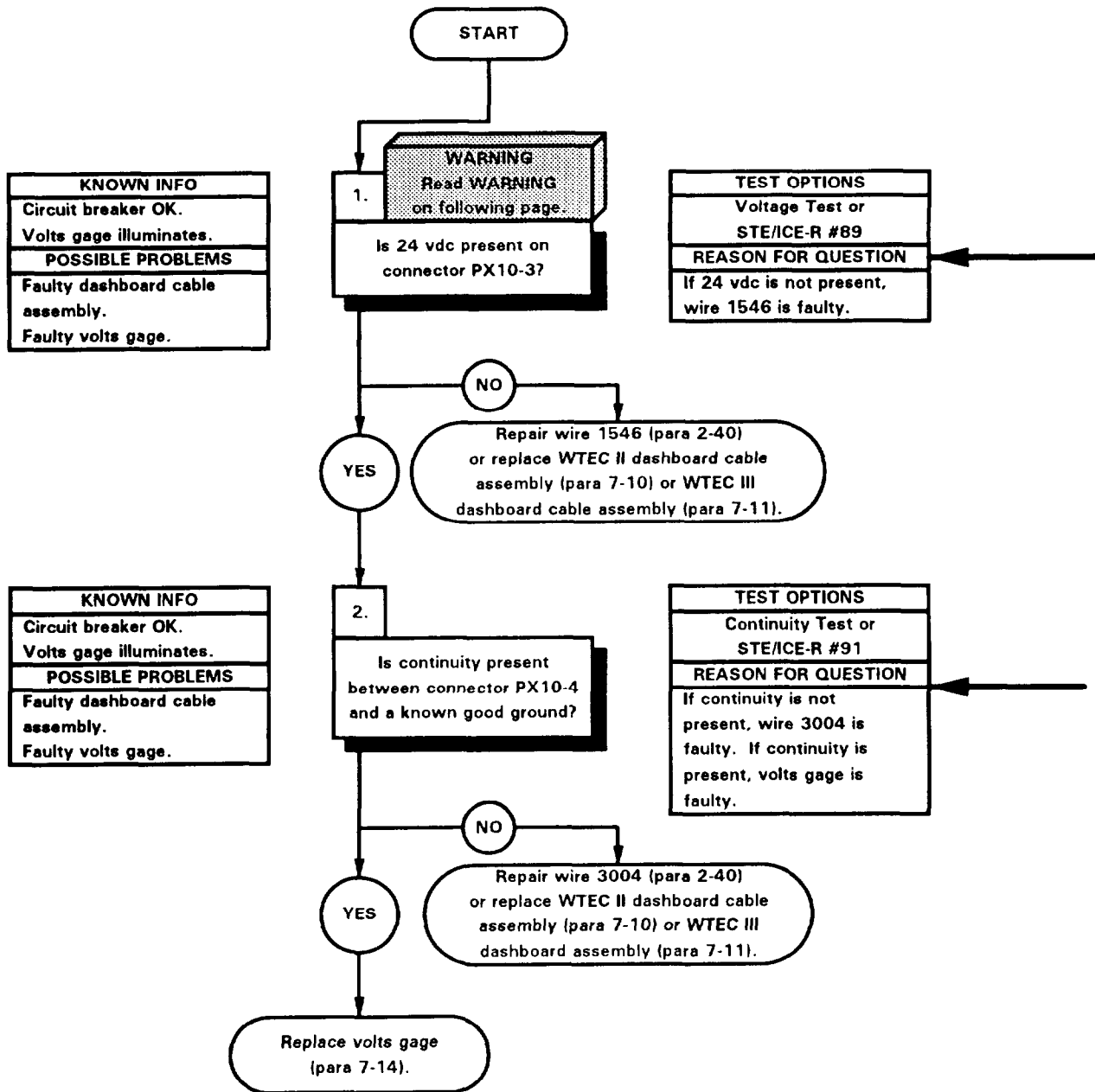
**CONTINUITY TEST**

- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector clamp from connector P116.
- (3) Disconnect connector P116 from WTEC III transmission ECU.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector P116-30.
- (6) Connect negative (-) probe of multimeter to connector PX8-4 and note reading on multimeter.
- (7) If continuity is not present, repair wire 157 (para 2-40) or replace WTEC III dashboard cable assembly (para 7-11).
- (8) If continuity is present, replace speedometer (para 7-14).
- (9) Connect connector P116 to WTEC III transmission ECU.
- (10) Connect connector clamp on connector P116.
- (11) Install kick panel (para 16-3).
- (12) Connect connector PX8 to speedometer connector.
- (13) Connect connector clamp on speedometer connector.
- (14) Install instrument panel assembly (para 7-15).



X2E12061

13. VOLTS GAGE DOES NOT OPERATE OR IS INACCURATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

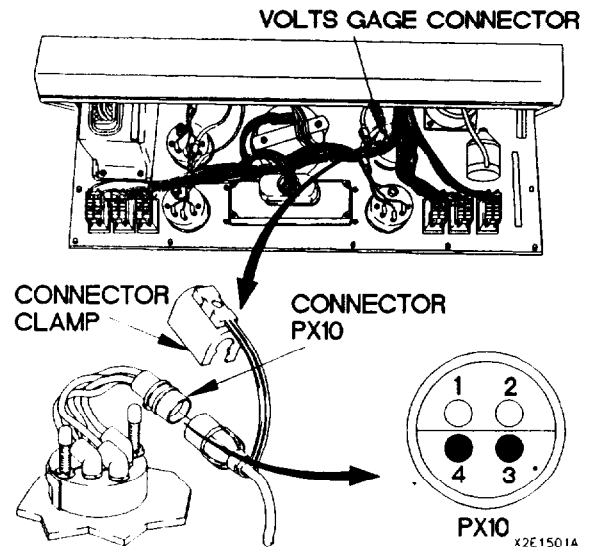


**WARNING**

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 instrument panel assembly for access (para 7-15).
- (2) Disconnect connector clamp from volts gage connector.
- (3) Disconnect connector PX10 from volts gage connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector PX10-3.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1546 (para 2-40) 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 9-2320-365-10).

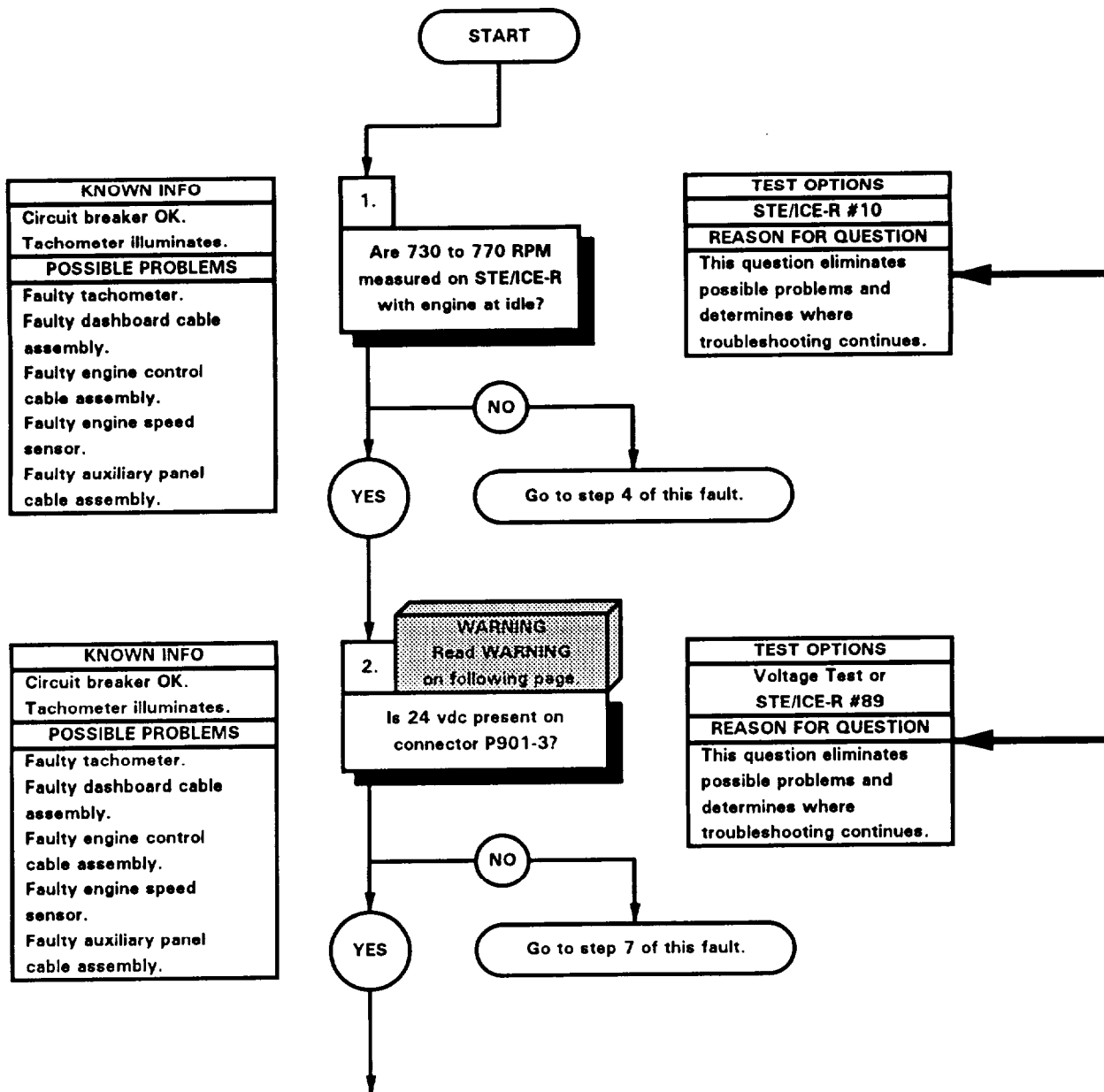


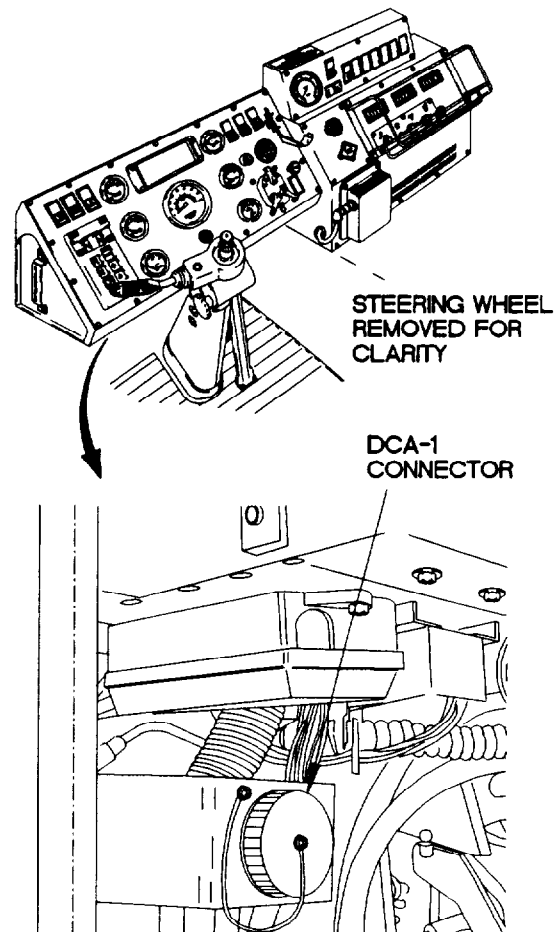
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX10-4.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3004 (para 2-40) 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 volts gage (para 7-14).
- (6) Connect connector PX10 to volts gage connector.
- (7) Connect connector clamp on volts gage connector.
- (8) Install instrument panel assembly (para 7-15).



14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)
<b>References</b> TM 9-4910-571-12&P	





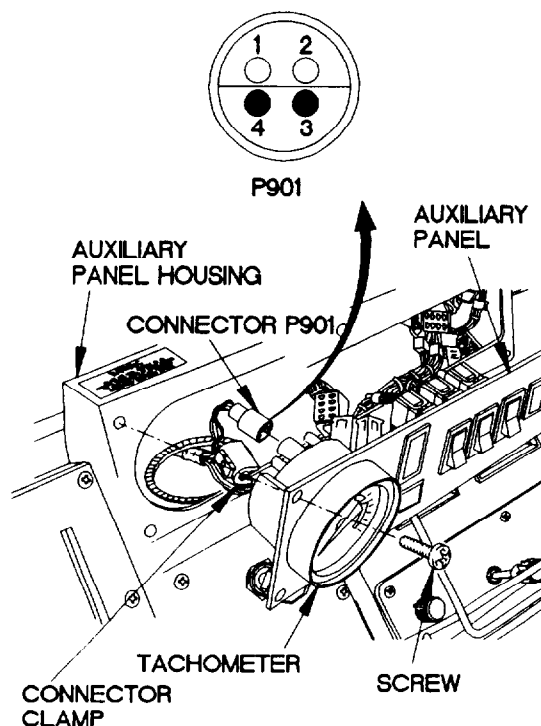
- (1) Perform STE/ICE-R test #10.
- (2) If engine rpm is not 730 to 770 at idle, go to step 4 of this fault.

**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 clamp from tachometer.
- (4) Disconnect connector P901 from tachometer.
- (5) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to connector P901-3.
- (7) Connect negative (-) probe of multimeter to ground.
- (8) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (9) If 24 vdc is not present, go to step 7 of this fault.
- (10) Position master power switch to off (TM 9-2320-365-10).

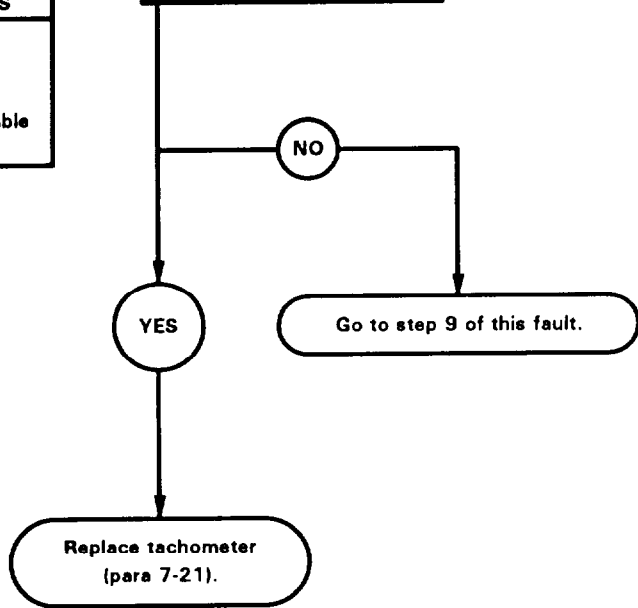


e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

KNOWN INFO
Circuit Breaker OK. Tachometer illuminates. Engine control cable assembly OK. Engine speed sensor OK.
POSSIBLE PROBLEMS
Faulty tachometer. Faulty dashboard cable assembly. Faulty auxiliary panel cable assembly.

3.  
Is continuity present between connector P901-4 and connector PX26-1?

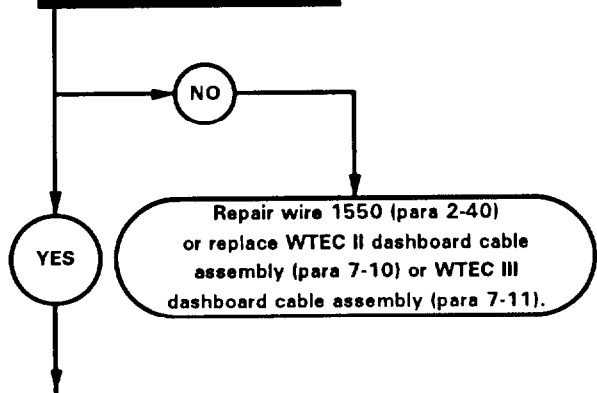
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is present, tachometer is faulty.



KNOWN INFO
Circuit breaker OK. Tachometer illuminates. Tachometer OK. Auxiliary panel cable assembly OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty engine control cable assembly. Faulty engine speed sensor.

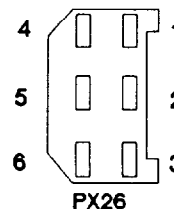
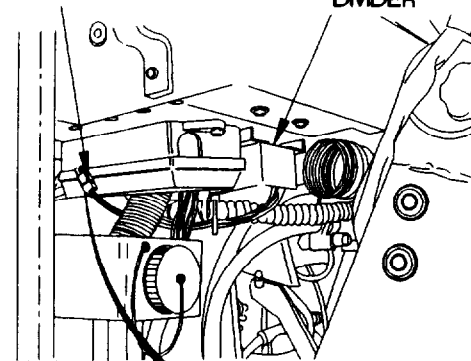
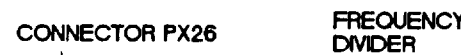
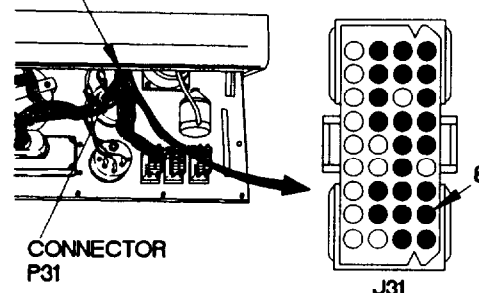
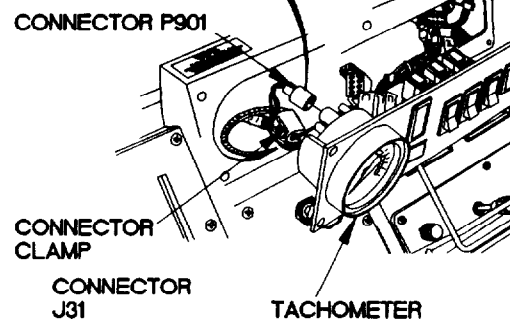
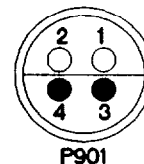
4.  
Is continuity present between connector PX26-1 and connector J31-87?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1550 is faulty.



**CONTINUITY TEST**

- (1) Disconnect connector PX26 from frequency divider.
- (2) Connect positive (+) probe of multimeter to connector P901-4.
- (3) Connect negative (-) probe of multimeter to connector PX26-1 and note reading on multimeter.
- (4) If continuity is not present, go to step 9 of this fault.
- (5) If continuity is present, replace tachometer (para 7-21).
- (6) Connect connector PX26 to frequency divider.
- (7) Connect connector P901 to tachometer.
- (8) Connect connector clamp on tachometer.



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**CONTINUITY TEST**

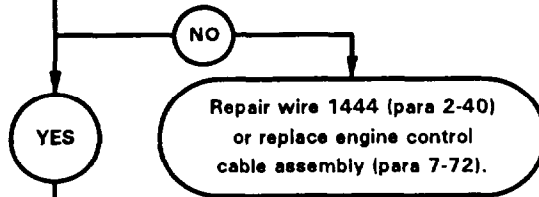
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX26 from frequency divider.
- (3) Connect connector PX26-1 to ground.
- (4) Disconnect connector P31 from connector J31.
- (5) Connect positive (+) probe of multimeter to connector J31-8.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is not present, repair wire 1550 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Connect connector PX26 to frequency divider.

e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

KNOWN INFO
Circuit breaker OK. Tachometer illuminates. Tachometer OK. Auxiliary panel cable assembly OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty engine control cable assembly. Faulty engine speed sensor.

5.  
Is continuity present between connector P31-8 and connector P38-1?

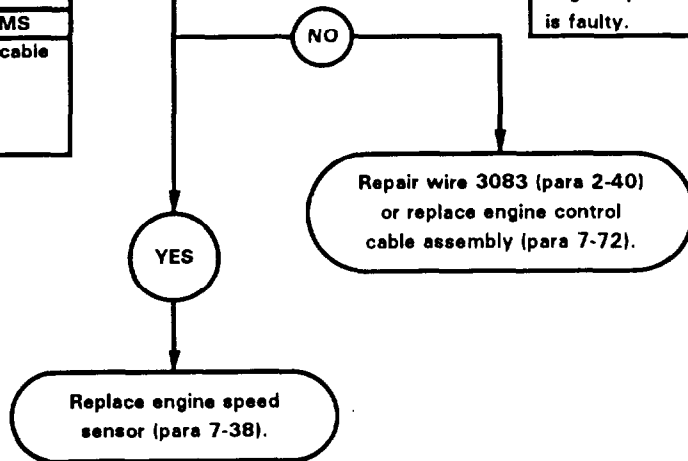
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1444 is faulty.



KNOWN INFO
Circuit breaker OK. Tachometer illuminates. Tachometer OK. Auxiliary panel cable assembly OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty engine control cable assembly. Faulty engine speed sensor.

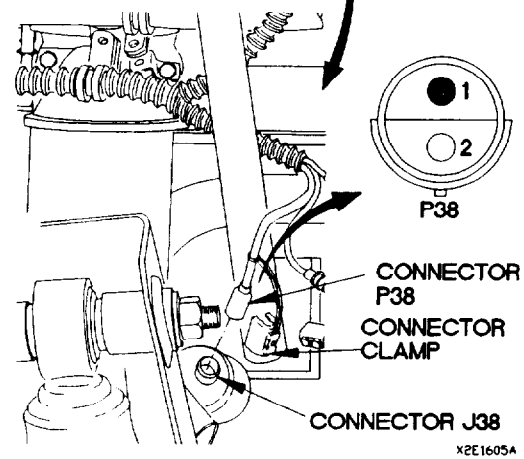
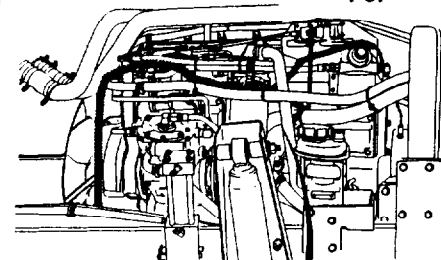
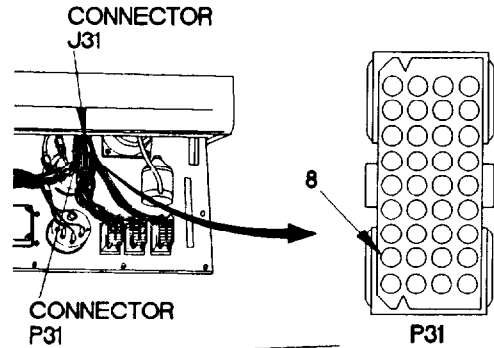
6.  
Is continuity present between connector P38-2 and a known good ground?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3083 is faulty. If continuity is present, engine speed sensor is faulty.



**CONTINUITY TEST**

- (1) Raise cab (TM 9-2320-365-10).
- (2) Disconnect connector clamp from connector J38.
- (3) Disconnect connector P38 from connector J38.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector P31-8.
- (6) Connect negative (-) probe of multimeter to connector P38-1 and note reading on multimeter.
- (7) If continuity is not present, repair wire 1444 (para 2-40) or replace engine control cable assembly (para 7-72).
- (8) Lower cab (TM 9-2320-365-10).
- (9) Connect connector P31 to connector J31.
- (10) Install instrument panel assembly (para 7-15).

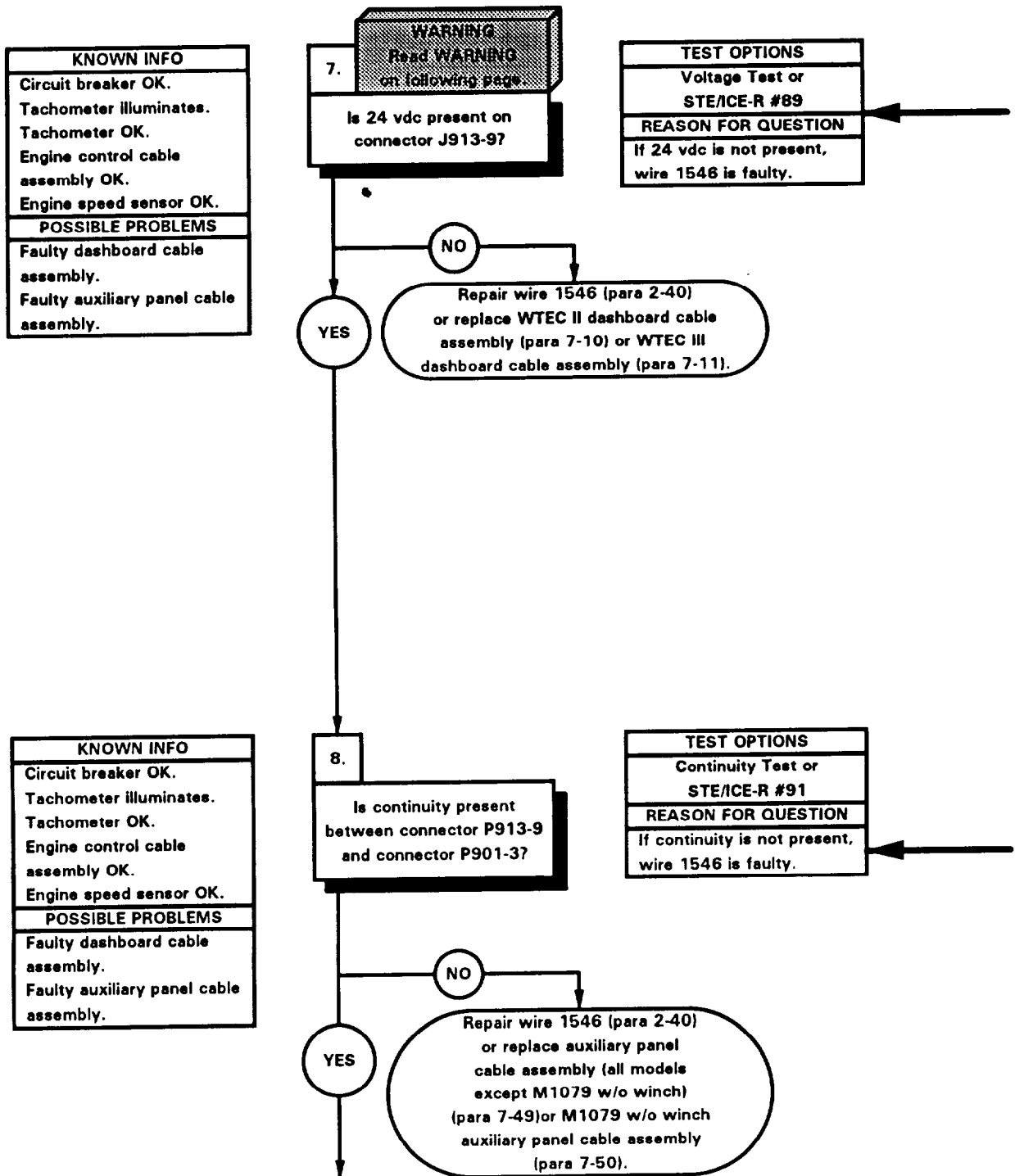


**CONTINUITY TEST**

- (1) Raise cab (TM 9-2320-365-10).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P38-2.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, repair wire 3083 (para 2-40) or replace engine control cable assembly (para 7-72).
- (6) If continuity is present, replace engine speed sensor (para 7-38).
- (7) Connect connector P38 to connector J38.
- (8) Connect connector clamp on connector J38.
- (9) Lower cab (TM 9-2320-365-10).

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e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)



**WARNING**

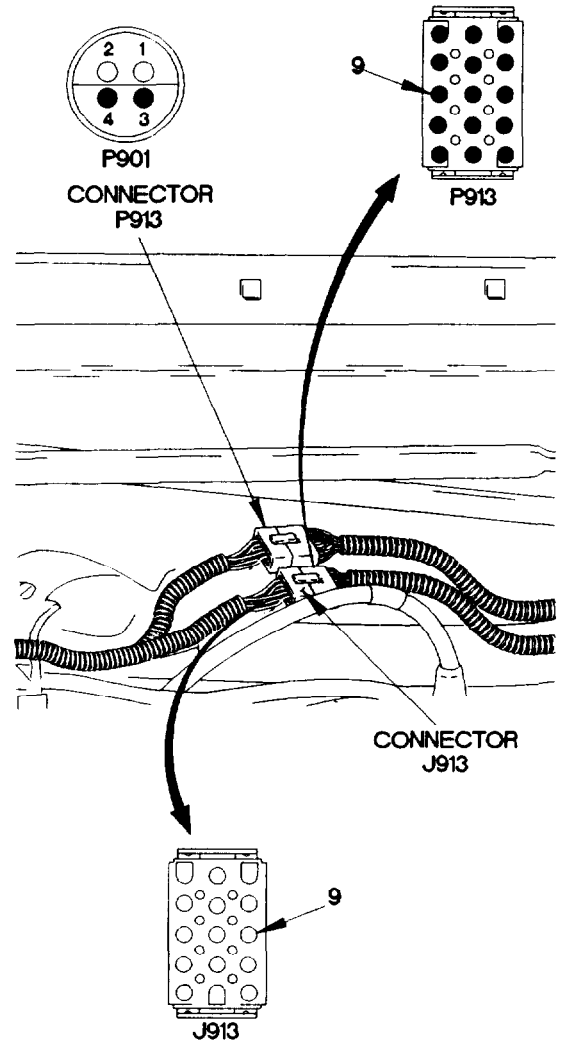
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Remove personnel heater for access (para 18-9).
- (2) Disconnect connector P913 from connector J913.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector J913-9.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1546 (para 2-40) 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 9-2320-365-10).

**CONTINUITY TEST**

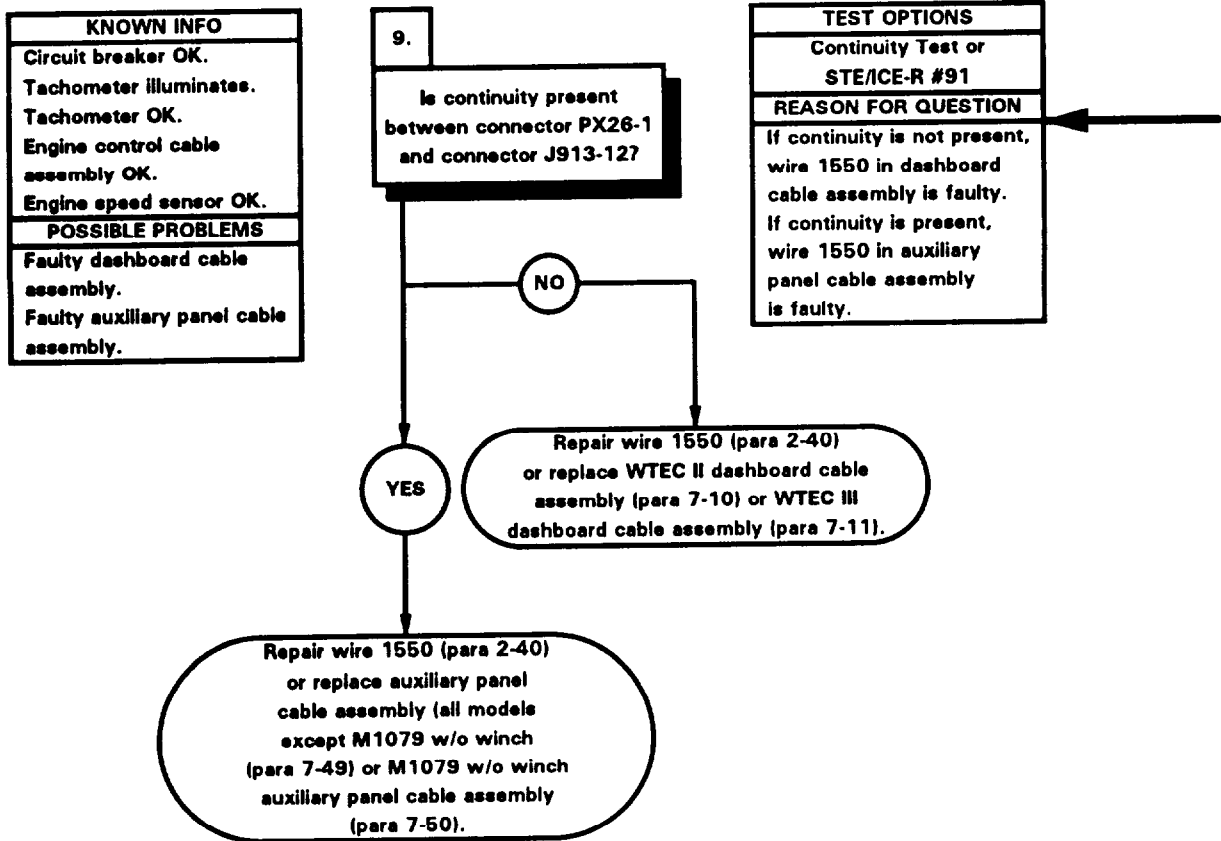
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P913-9.
- (3) Connect negative (-) probe of multimeter to connector P901-3 and note reading on multimeter.
- (4) If continuity is not present, repair wire 1546 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (para 7-50).



x2E1606A

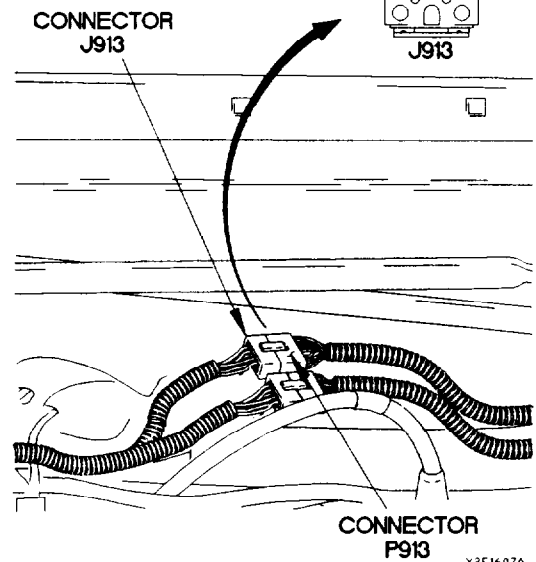
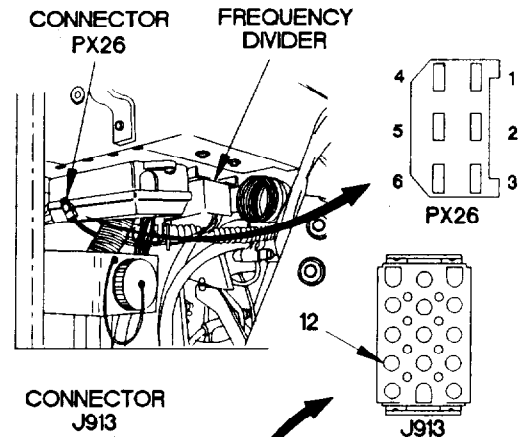
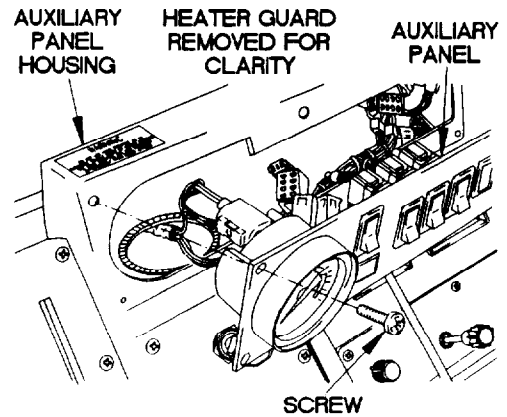


e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

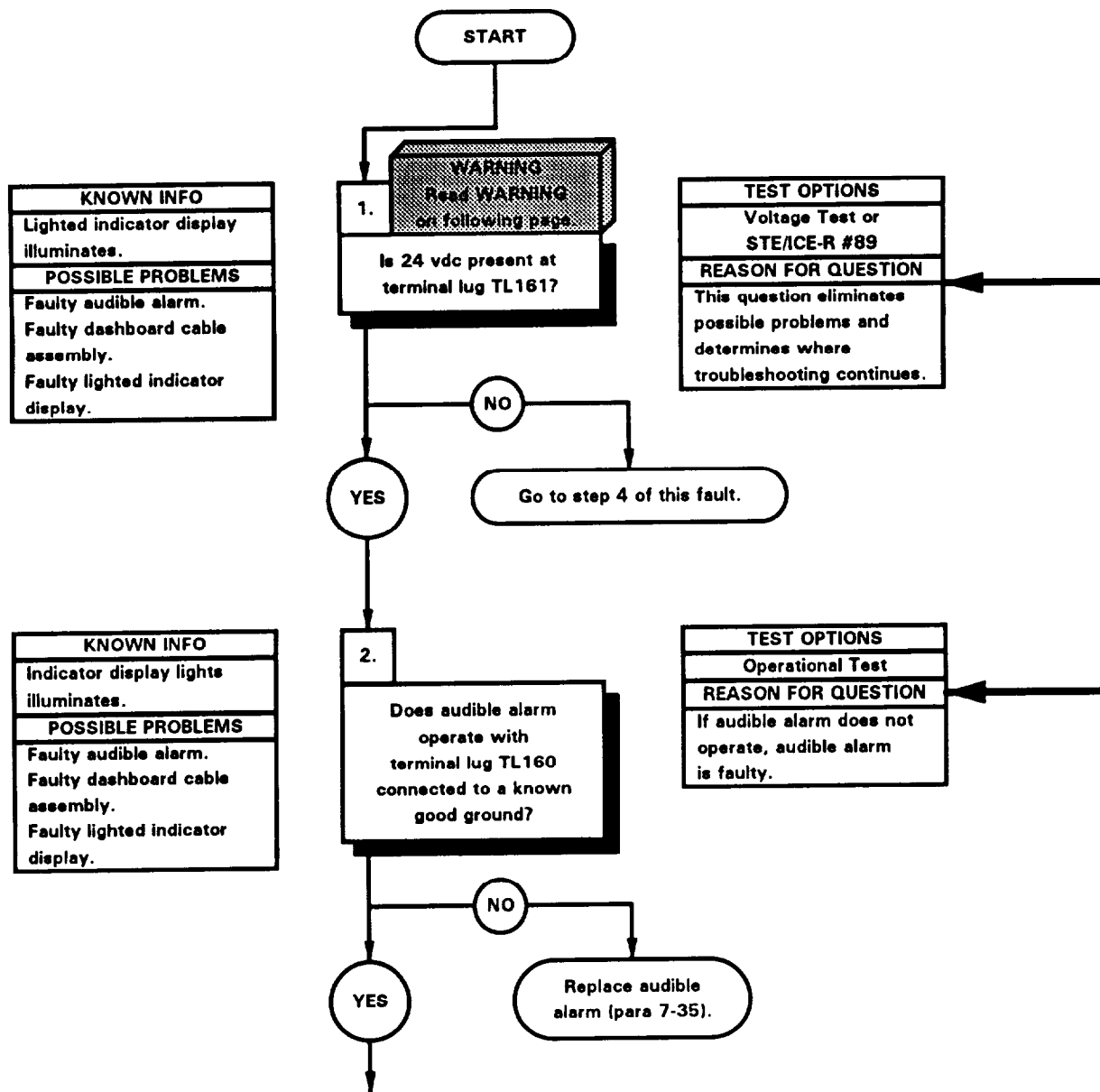


**CONTINUITY TEST**

- (1) Disconnect connector PX26 from frequency divider.
- (2) Connect positive (+) probe of multimeter to connector PX26-1.
- (3) Connect negative (-) probe of multimeter to connector J913-12 and note reading on multimeter.
- (4) If continuity is not present, repair wire 1550 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) If continuity is present, repair wire 1550 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (para 7-50).
- (6) Connect connector P901 to tachometer.
- (7) Connect connector clamp on tachometer.
- (8) Connect connector PX26 to frequency divider.
- (9) Connect connector P913 to connector J913.
- (10) Install personnel heater (para 18-9).
- (11) Position auxiliary panel on auxiliary panel housing with six screws.
- (12) Tighten six screws to 24 lb-in. (3 N·m).



15. AUDIBLE ALARM DOES NOT OPERATE (ALL MODELS EXCEPT M1078/M1081)	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 43, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Dispenser, Pressure Sensitive Adhesive Tape (Item 18, Appendix D) Wire, Elect, 50 ft (Item 64, Appendix D)
<b>References</b> 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.

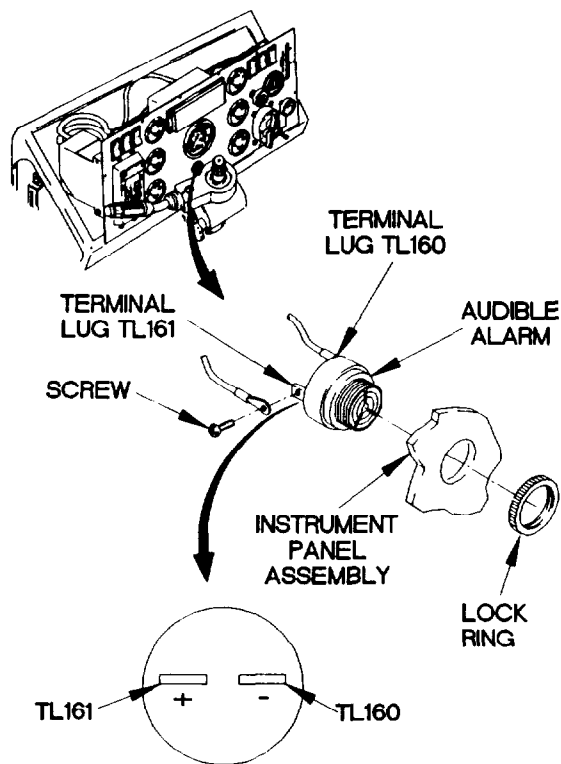
**VOLTAGE TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Remove lock ring from audible alarm.

**NOTE**

Tag wires and connection points prior to disconnecting.

- (3) Remove screw and terminal lug TL161 from audible alarm.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to terminal lug TL161.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, go to step 4 of this fault.
- (9) Position master power switch to off (TM 9-2320-365-10).
- (10) Install terminal lug TL161 on audible alarm with screw.

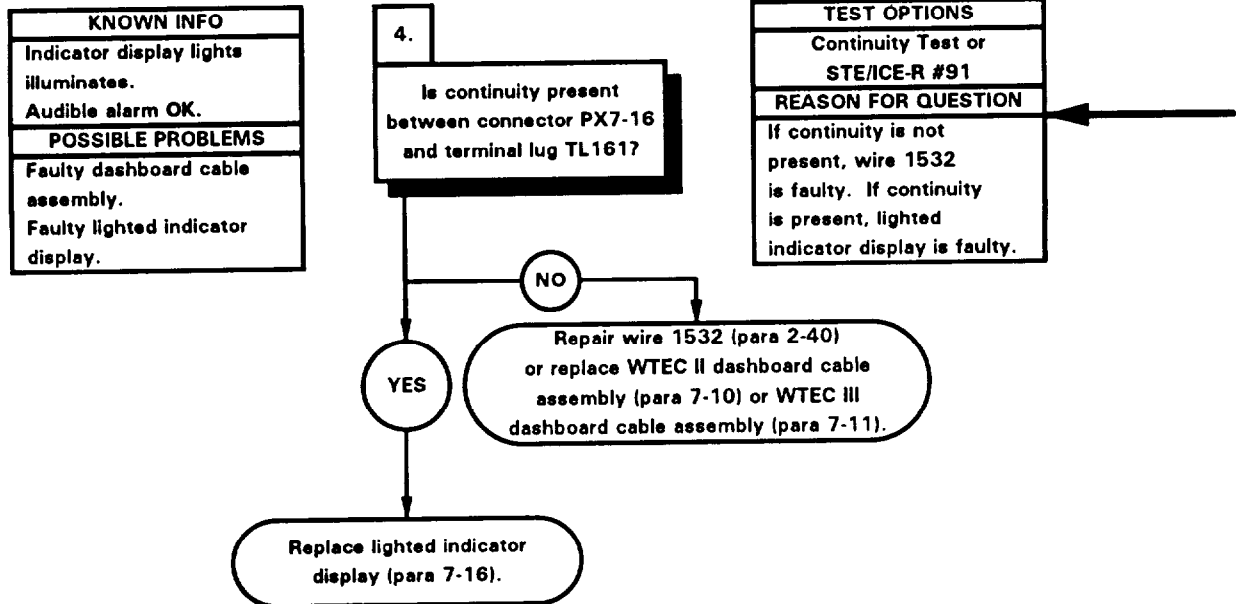
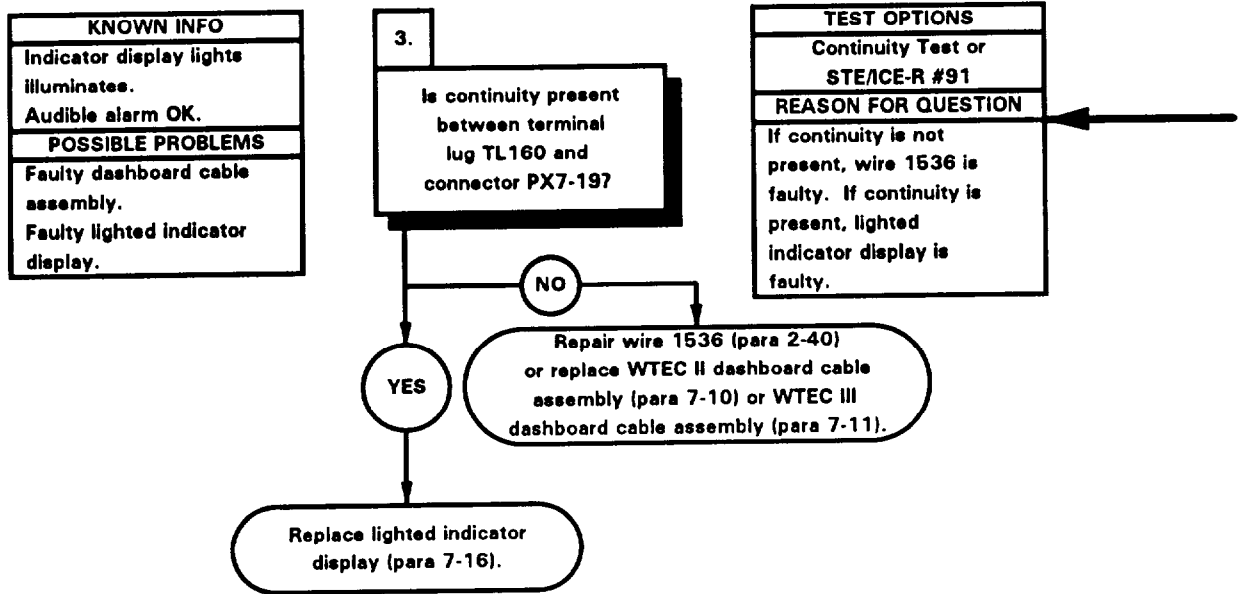


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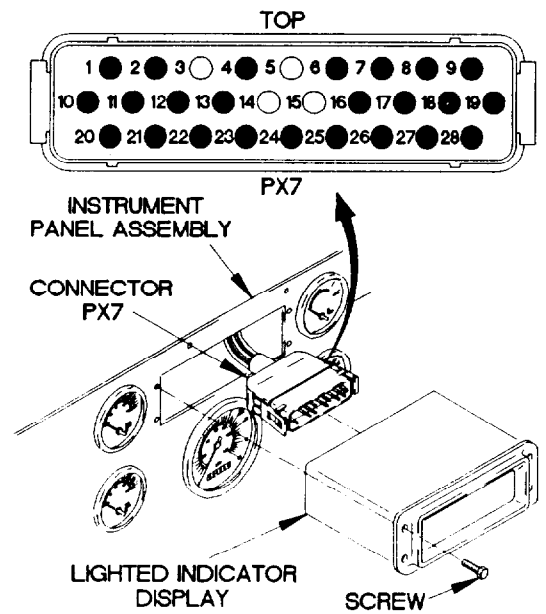
**OPERATIONAL TEST**

- (1) Connect terminal lug TL160 to ground.
- (2) Position master power switch to on (TM 9-2320-365-10).
- (3) If audible alarm does not operate, replace audible alarm (para 7-35).
- (4) Position master power switch to off (TM 9-2320-365-10).

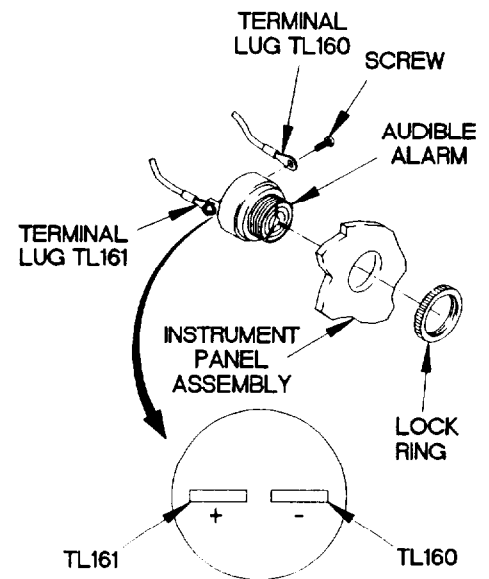
e15. AUDIBLE ALARM DOES NOT OPERATE (ALL MODELS EXCEPT M1078/M1081) (CONT)



- CONTINUITY TEST**
- (1) Disconnect connector PX7 from lighted indicator display.
  - (2) Set multimeter to ohms.
  - (3) Connect positive (+) probe of multimeter to terminal lug TL160.
  - (4) Connect negative (-) probe of multimeter to connector PX7-19 and note reading on multimeter.
  - (5) If continuity is not present, repair wire 1538 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (6) If continuity is present, replace lighted indicator display (para 7-16).
  - (7) Install audible alarm in instrument panel assembly with lock ring.
  - (8) Install instrument panel assembly (para 7-15).

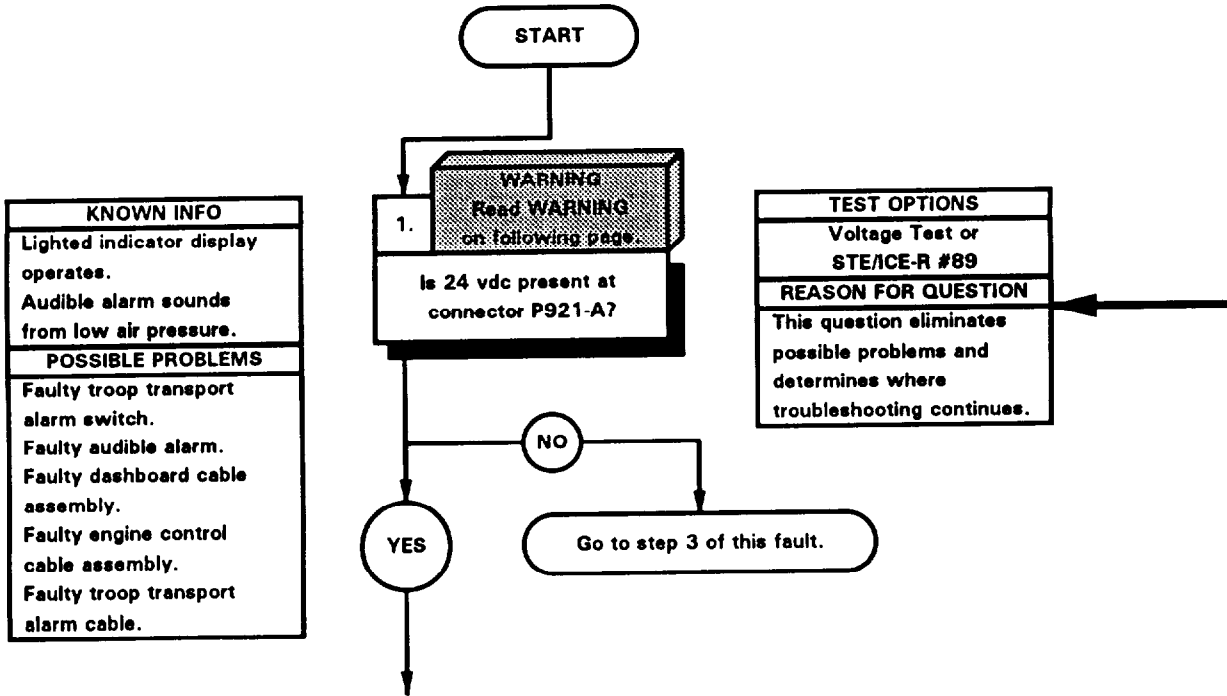


- CONTINUITY TEST**
- (1) Disconnect connector PX7 from lighted indicator display.
  - (2) Set multimeter to ohms.
  - (3) Connect positive (+) probe of multimeter to terminal lug TL161.
  - (4) Connect negative (-) probe of multimeter to connector PX7-16 and note reading on multimeter.
  - (5) If continuity is not present, repair wire 1532 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (6) If continuity is present, replace lighted indicator display (para 7-16).
  - (7) Install audible alarm in instrument panel assembly with lock ring.
  - (8) Install instrument panel assembly (para 7-15).



x2E17021

16. AUDIBLE ALARM DOES NOT OPERATE (MODELS M1078/M1081 ONLY)	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



**WARNING**

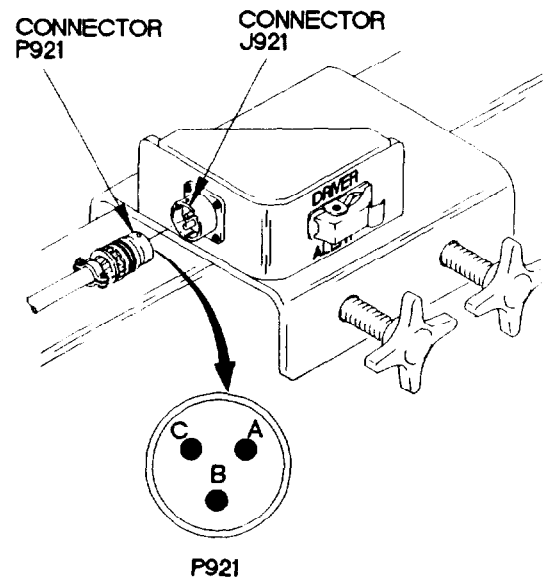
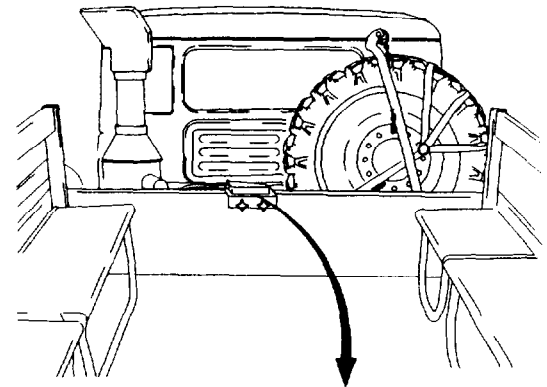
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**NOTE**

In order to perform this trouble shooting task air pressure 75-120 psi must be present on vehicle.

**VOLTAGE TEST**

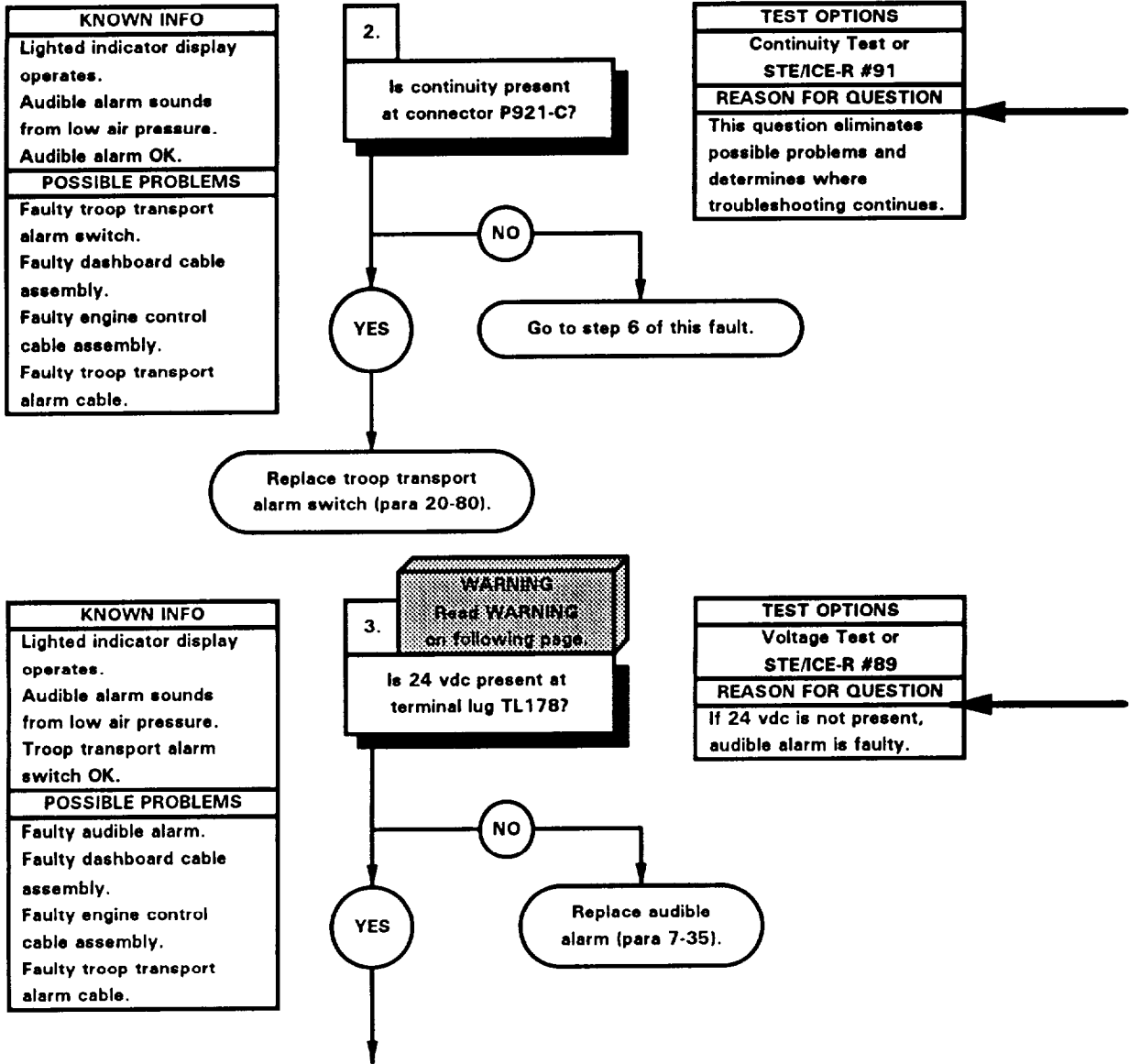
- (1) Disconnect connector P921 from J921.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P921-A.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 3 of this fault.
- (7) Position master power switch to off (TM 9-2320-365-10).



x2E15A01

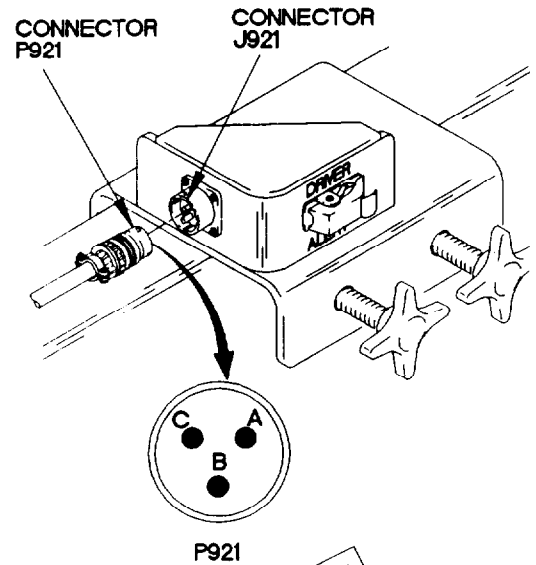


16. AUDIBLE ALARM DOES NOT OPERATE (MODELS M1078/M1081 ONLY) (CONT)



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P921-C.
- (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.
- (5) Connect connector P921 to connector J921.

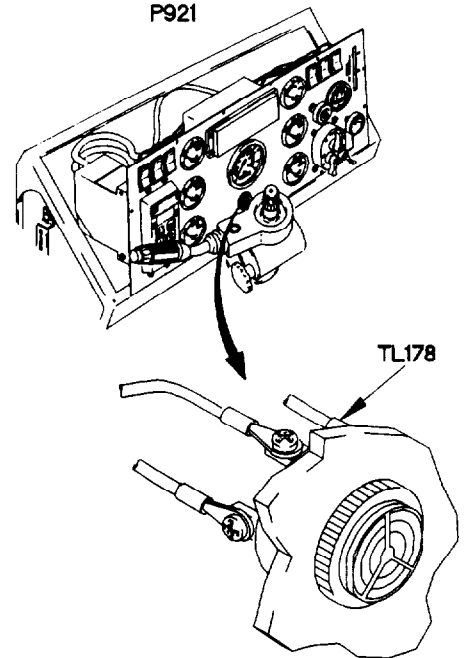


**WARNING**

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.

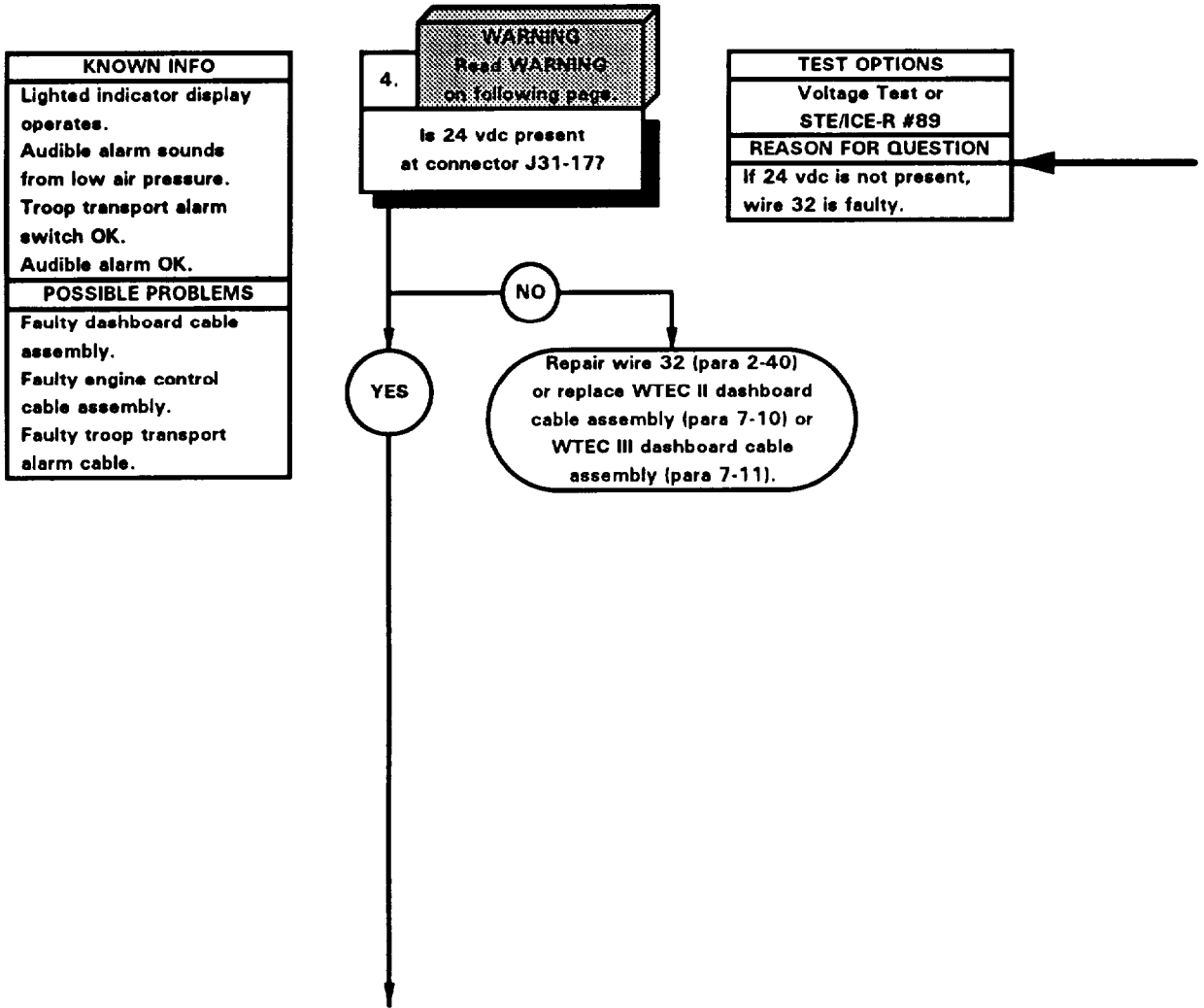
**VOLTAGE TEST**

- (1) Remove steering wheel (para 13-2).
- (2) Remove instrument panel assembly for access (para 7-15).
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to terminal lug TL178.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, replace audible alarm (para 7-35).
- (8) Position master power switch to off (TM 9-2320-365-10).



X2E15A03

e16. AUDIBLE ALARM DOES NOT OPERATE (MODELS M1078/M1081 ONLY) (CONT)

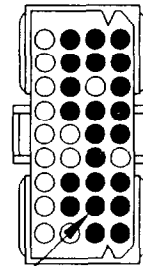
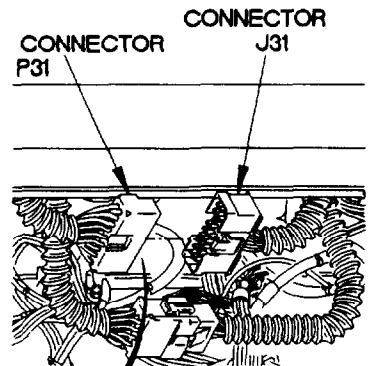
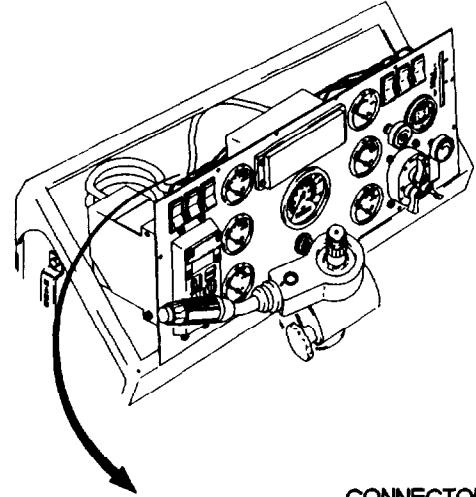


**WARNING**

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**

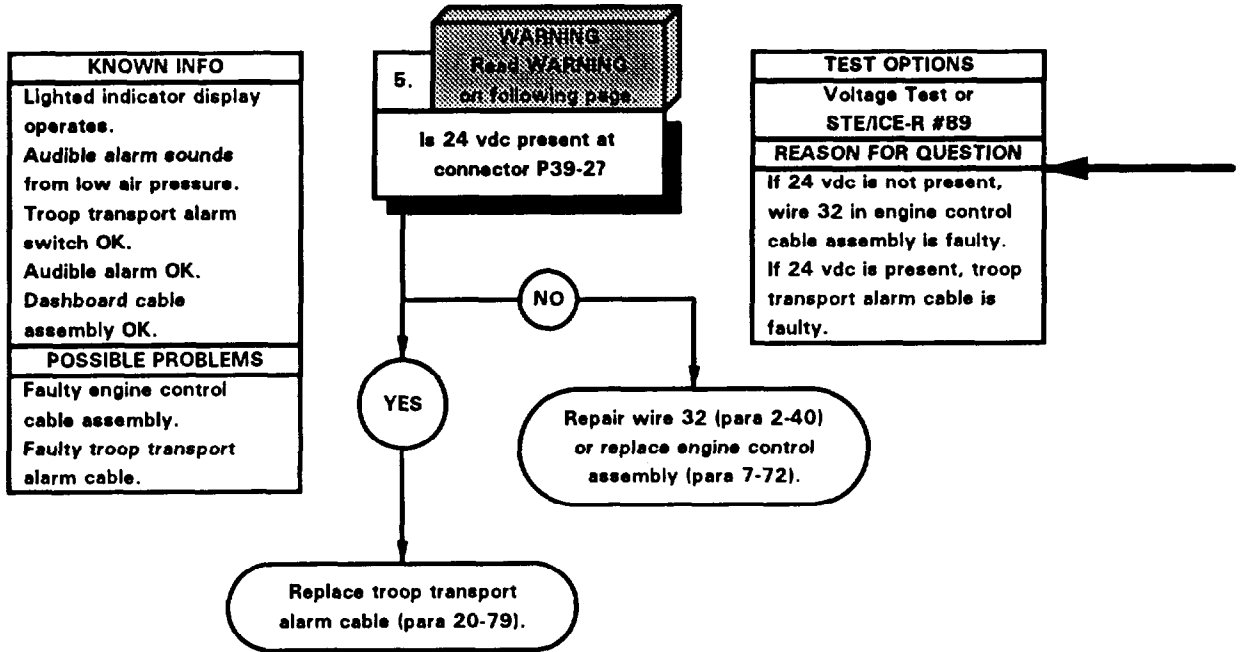
- (1) Disconnect connector J31 from connector P31.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J31-17.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 32 (para 2-40) 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 9-2320-365-10).
- (8) Connect connector J31 to connector P31.
- (9) Install instrument panel assembly (para 7-15).



J31-17 J31

X2E15A04

e16. AUDIBLE ALARM DOES NOT OPERATE (MODELS M1078/M1081 ONLY) (CONT)

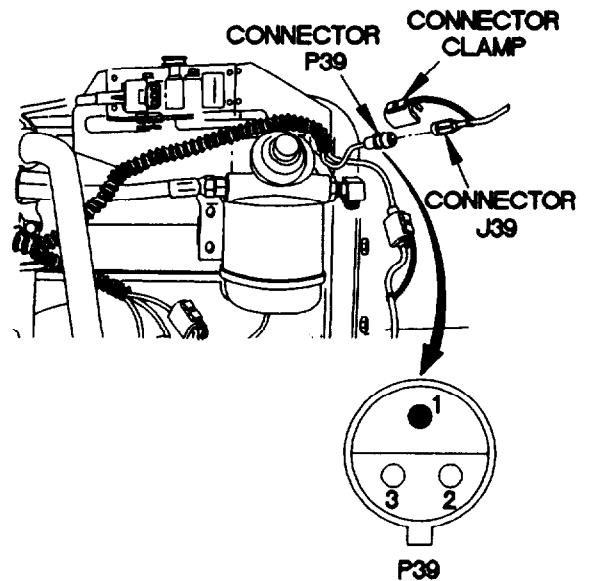


**WARNING**

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**

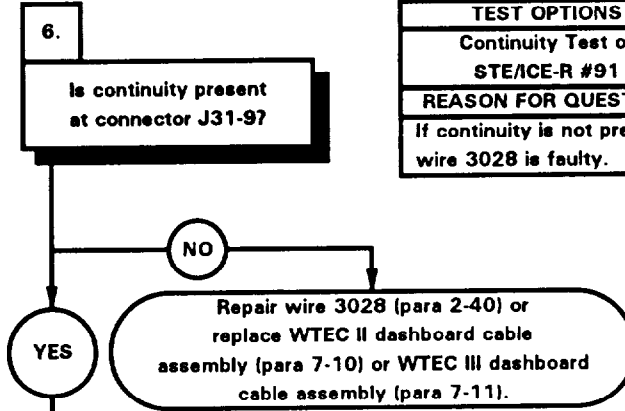
- (1) Raise cab (TM 9-2320-365-10).
- (2) Disconnect connector clamp from connector P39.
- (3) Disconnect connector P39 from connector J39.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector P39-2.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 32 (para 2-40) or replace engine control cable assembly (para 7-72).
- (9) If 24 vdc is present, replace troop transport alarm cable (para 20-79).
- (10) Position master power switch to off (TM 9-2320-365-10).
- (11) Connect connector P39 to connector J39.
- (12) Connect connector clamp on connector P39.
- (13) Lower cab (TM 9-2320-365-10).



K2E15A51

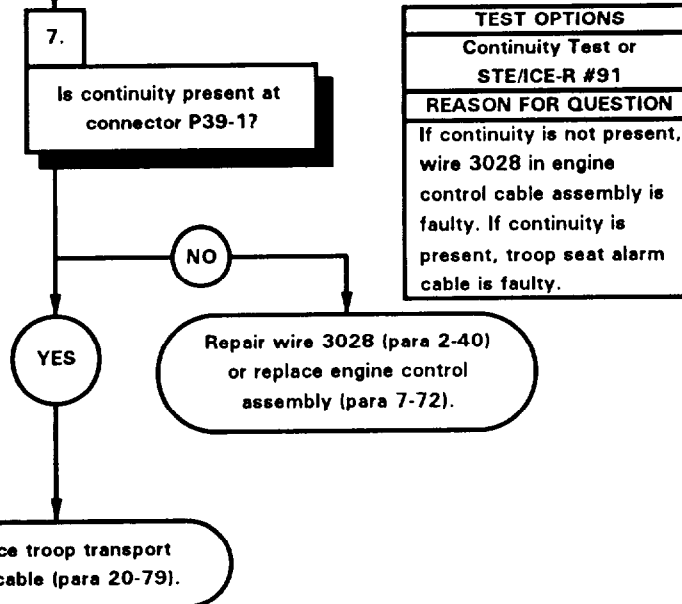
e16. AUDIBLE ALARM DOES NOT OPERATE (MODELS M1078/M1081 ONLY) (CONT)

KNOWN INFO
Lighted indicator display operates.
Audible alarm sounds from low air pressure.
Troop transport alarm switch OK.
Audible alarm OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty engine control cable assembly.
Faulty troop transport alarm cable.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3028 is faulty.

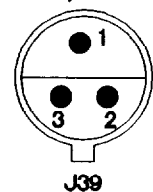
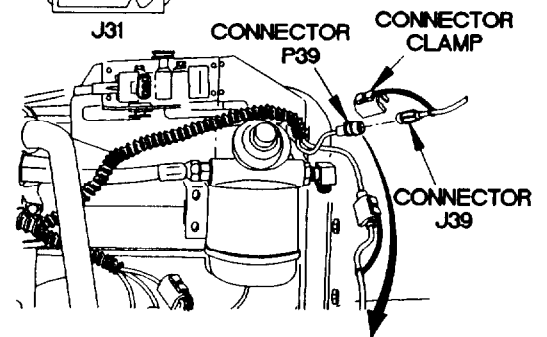
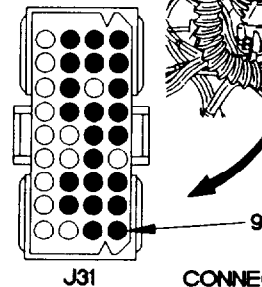
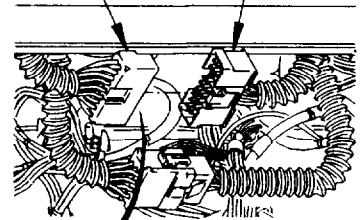
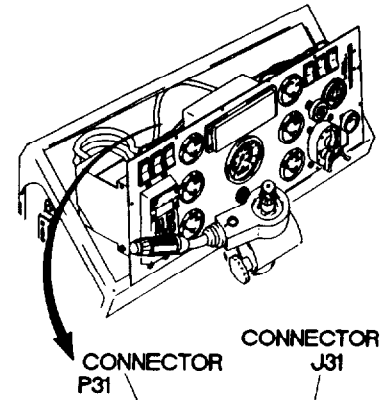
KNOWN INFO
Lighted indicator display operates.
Audible alarm sounds from low air pressure.
Troop seat alarm switch OK.
Audible alarm OK.
Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty engine control cable assembly.
Faulty troop seat alarm cable.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3028 in engine control cable assembly is faulty. If continuity is present, troop seat alarm cable is faulty.

**CONTINUITY TEST**

- (1) Remove steering wheel (para 13-2).
- (2) Remove instrument panel assembly access (para 7-15).
- (3) Disconnect connector J31 from connector P31.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector J31-9.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is not present, repair wire 3028 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Connect connector J31 to connector P31.
- (9) Install instrument panel assembly (para 7-15).
- (10) Install steering wheel (para 13-2).



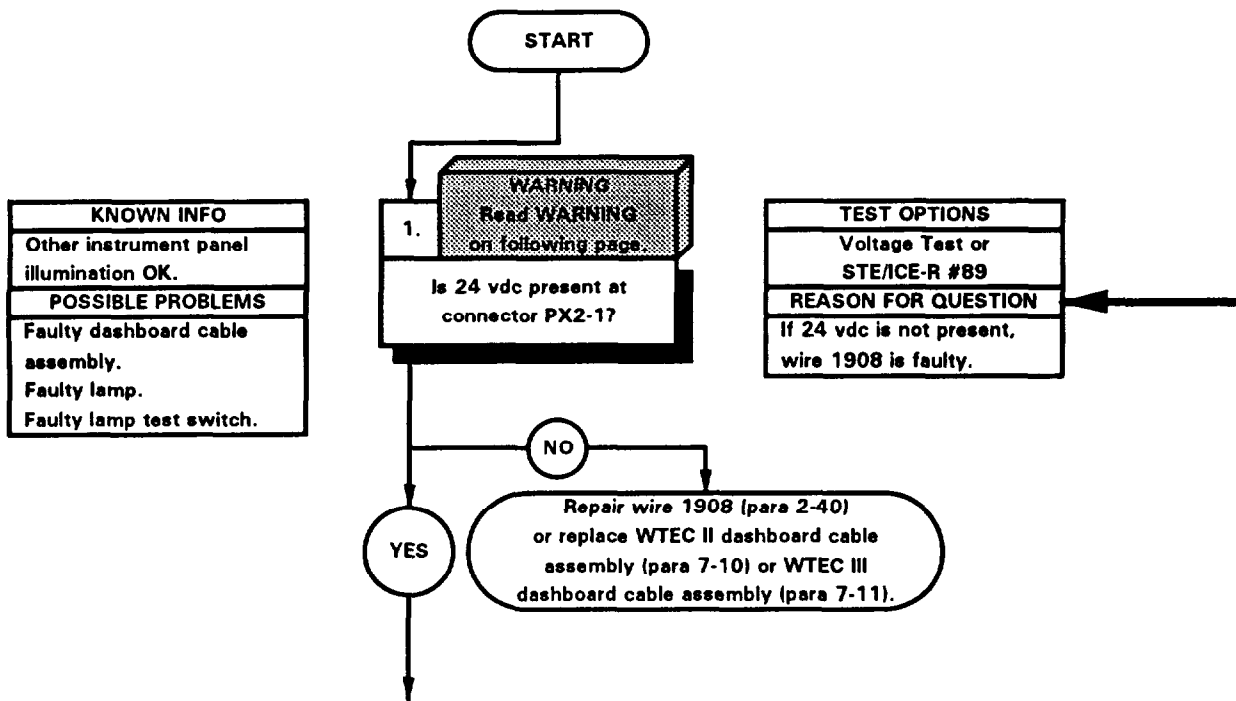
**VOLTAGE TEST**

- (1) Raise cab (TM 9-2320-365-10).
- (2) Disconnect connector clamp from connector P39.
- (3) Disconnect connector P39 from connector J39.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector J39-1.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is not present, repair wire 3028 (para 2-40) or replace engine control cable assembly (para 7-72).
- (8) If continuity is present, replace troopseat alarm cable (para 20-79).
- (9) Connect connector P39 to connector J39.
- (10) Connect connector clamp on connector P39.
- (11) Lower cab (TM 9-2320-365-10).

X2E15A61



●17. LAMP TEST SWITCH DOES NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	
<b>References</b> TM 9-4910-571-12&P	

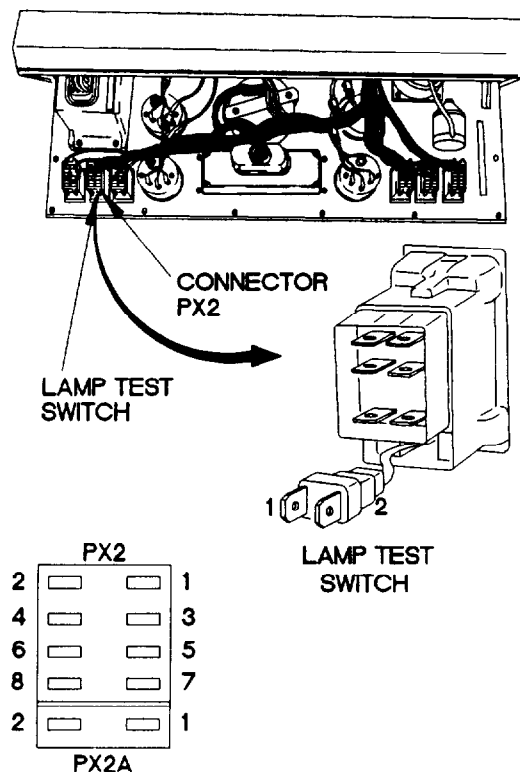


**WARNING**

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**

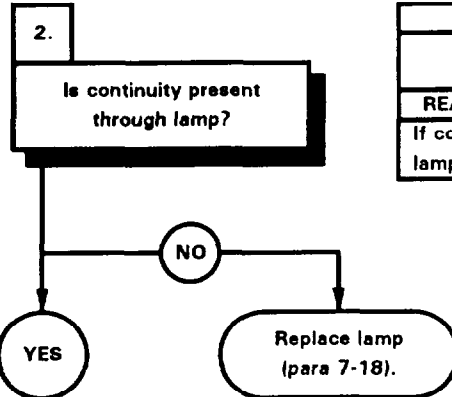
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX2 from lamp test switch.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector PX2-1.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10) note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1908 (para 2-40) 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 9-2320-365-10).



X2E1902A

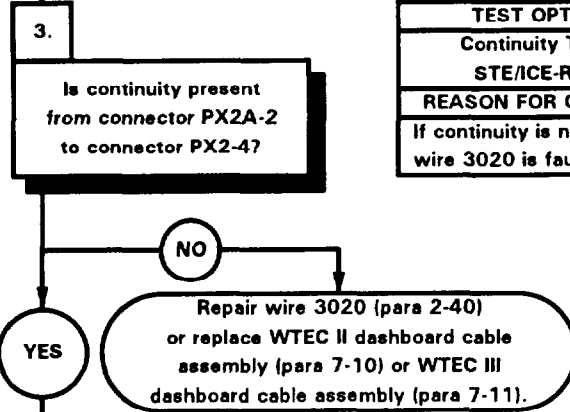
e17. LAMP TEST SWITCH DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Other instrument panel illumination OK.
POSSIBLE PROBLEMS
Faulty lamp.
Faulty dashboard cable assembly.
Faulty lamp test switch.



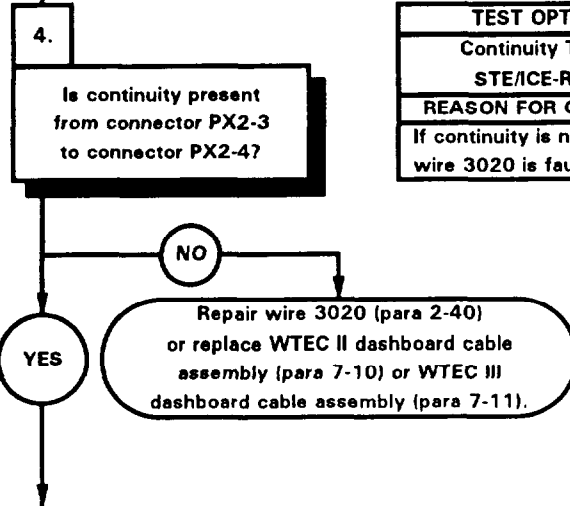
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, lamp is faulty.

KNOWN INFO
Other instrument panel illumination OK.
Lamp OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty lamp test switch.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3020 is faulty.

KNOWN INFO
Other instrument panel illumination OK.
Lamp OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty lamp test switch.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3020 is faulty.

**CONTINUITY TEST**

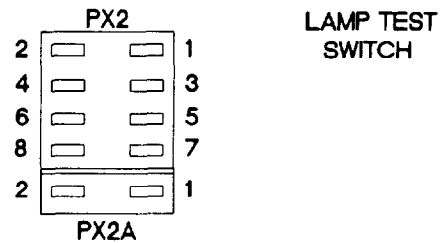
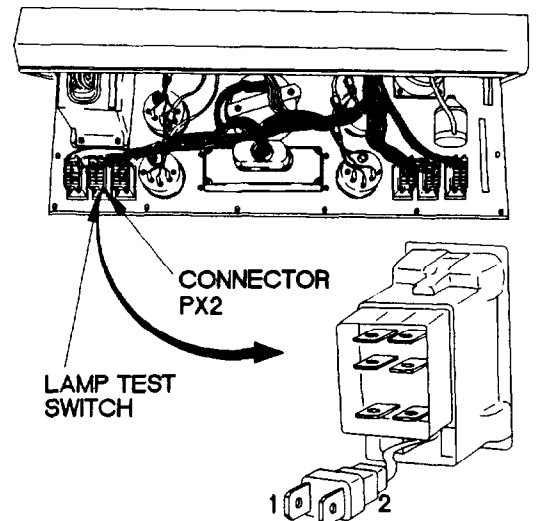
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to lamp test switch lamp terminal 1.
- (3) Connect negative (-) probe of multimeter to lamp test switch lamp terminal 2 and note reading on multimeter.
- (4) If continuity is not present, replace lamp (para 7-18).

**CONTINUITY TEST**

- (1) Disconnect connector PX2 from lamp test switch.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector PX2A-2.
- (4) Connect negative (-) probe of multimeter to connector PX2-4 and note reading on multimeter.
- (5) If continuity is not present, repair wire 3020 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX2-3.
- (3) Connect negative (-) probe of multimeter to connector PX2-4 and note reading on multimeter.
- (4) If continuity is not present, repair wire 3020 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



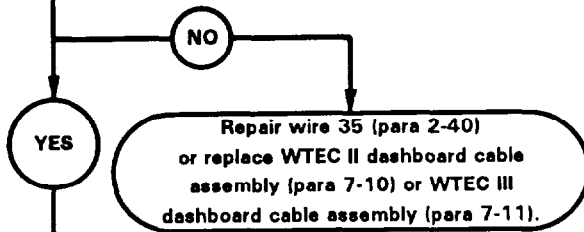
x2E1962A

ø17. LAMP TEST SWITCH DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Other instrument panel illumination OK.
POSSIBLE PROBLEMS
Faulty lamp. Faulty dashboard cable assembly. Faulty lamp test switch.

5.  
Is continuity present from connector PX2-1 to connector PX7-12?

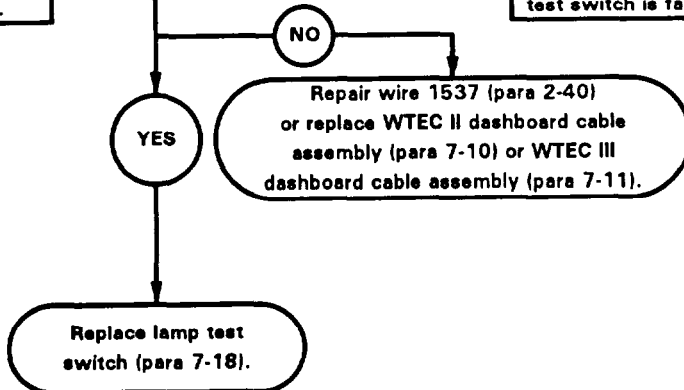
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 35 is faulty.



KNOWN INFO
Other instrument panel illumination OK. Lamp OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty lamp test switch.

6.  
Is continuity present from connector PX2-2 to connector PX7-20?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1537 is faulty. If continuity is present, lamp test switch is faulty.

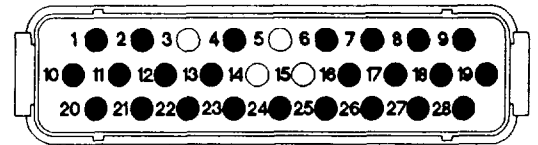


**CONTINUITY TEST**

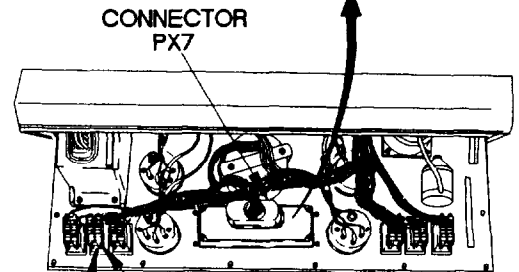
- (1) Disconnect connector PX7 from lighted indicator display.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector PX2-1.
- (4) Connect negative (-) probe of multimeter to connector PX7-12 and note reading on multimeter.
- (5) If continuity is not present, repair wire 35 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**CONTINUITY TEST**

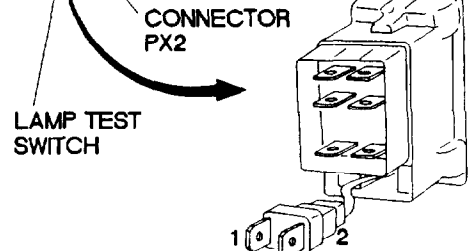
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX2-2.
- (3) Connect negative (-) probe of multimeter to connector PX7-20 and note reading on multimeter.
- (4) If continuity is not present, repair wire 1537 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) If continuity is present, replace lamp test switch (para 7-18).
- (6) Connect connector PX7 to lighted indicator display.
- (7) Connect connector PX2 to lamp test switch.
- (8) Install instrument panel assembly (para 7-15).



PX7



CONNECTOR PX7

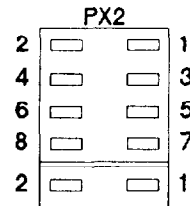


CONNECTOR PX2

LAMP TEST SWITCH

1 2

LAMP TEST SWITCH

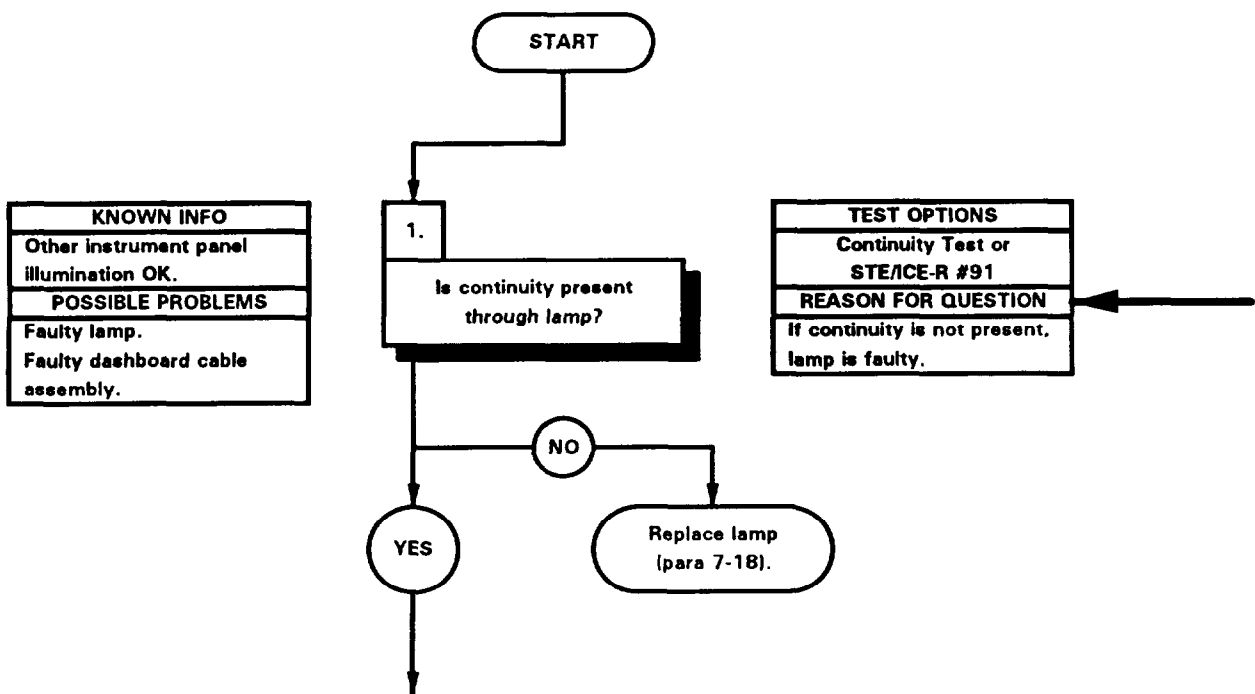


PX2

PX2A

X2E1903A

●18. INSTRUMENT PANEL SWITCH DOES NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

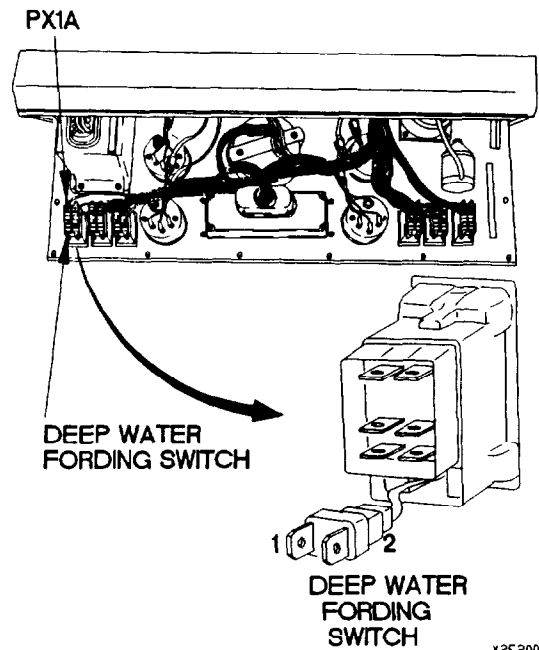


**NOTE**

All instrument panel switch illumination faults are traced the same way. Deep water fording switch shown.

**CONTINUITY TEST**

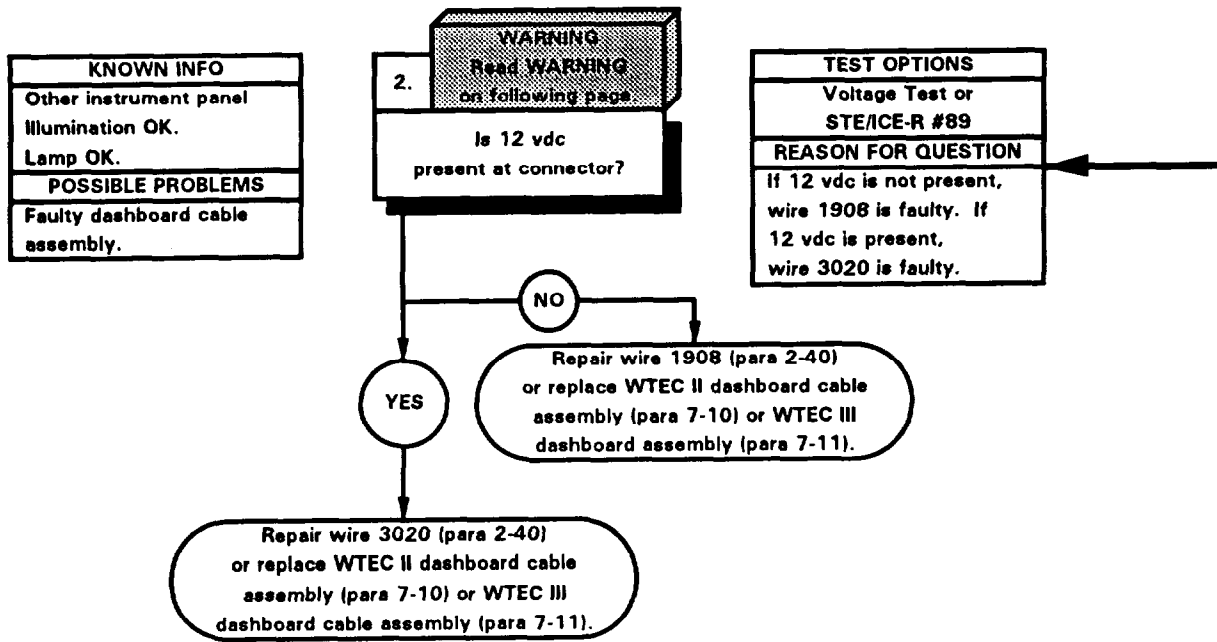
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX1A from deep water fording switch.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to deep water fording switch lamp terminal 1.
- (5) Connect negative (-) probe of multimeter to deep water fording switch lamp terminal 2 and note reading on multimeter.
- (6) If continuity is not present, replace lamp (para 7-18).



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e18. INSTRUMENT PANEL SWITCH DOES NOT ILLUMINATE (CONT)



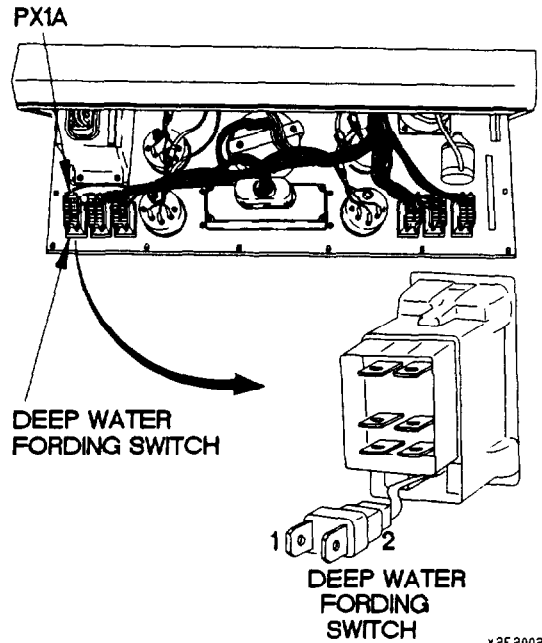
**WARNING**

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

- VOLTAGE TEST**
- (1) Set multimeter to volts dc.
  - (2) Connect positive (+) probe of multimeter to terminal 2 of connector PX1A or refer to Reference Table 2-9.
  - (3) Connect negative (-) probe of multimeter to ground.
  - (4) Position main light switch to PANEL BRT (TM 9-2320-365-10).
  - (5) Position dimmer switch to maximum brightness (TM 9-2320-365-10).
  - (6) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
  - (7) If 12 vdc is not present, repair wire 1908 (para 2-40) 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 3020 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (9) Position main light switch to OFF (TM 9-2320-365-10).
  - (10) Connect deep water fording switch connector to deep water fording switch.
  - (11) Install instrument panel assembly (para 7-15).

**REFERENCE TABLE 2-9**

SWITCH DESCRIPTION	LAMP
DEEP WATER FORDING	PX1A-2
WARNING LIGHT	PX12A-2
ETHER START	PX13A-2
HAZARD LIGHTS	PX14A-2
MASTER POWER	PX17A-2
LAMP TEST	PX2A-2



x2E2002A

19. INSTRUMENT PANEL GAGE DOES NOT ILLUMINATE

INITIAL SETUP

Equipment Conditions

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

Personnel Required

(2)

References

TM 9-4910-571-12&P

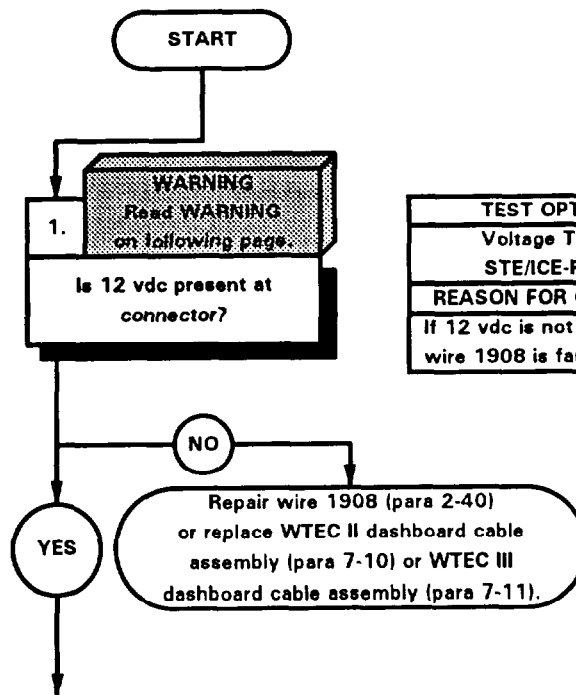
Tools and Special Tools

Tool Kit, Genl Mech (Item 44, Appendix C)

STE/ICE-R (Item 39, Appendix C)

Multimeter, Digital (Item 22, Appendix C)

<b>KNOWN INFO</b>
Other instrument panel illuminations OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly.
Faulty gage.



<b>TEST OPTIONS</b>
Voltage Test or STE/ICE-R #89
<b>REASON FOR QUESTION</b>
If 12 vdc is not present, wire 1908 is faulty.

**WARNING**

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

**NOTE**

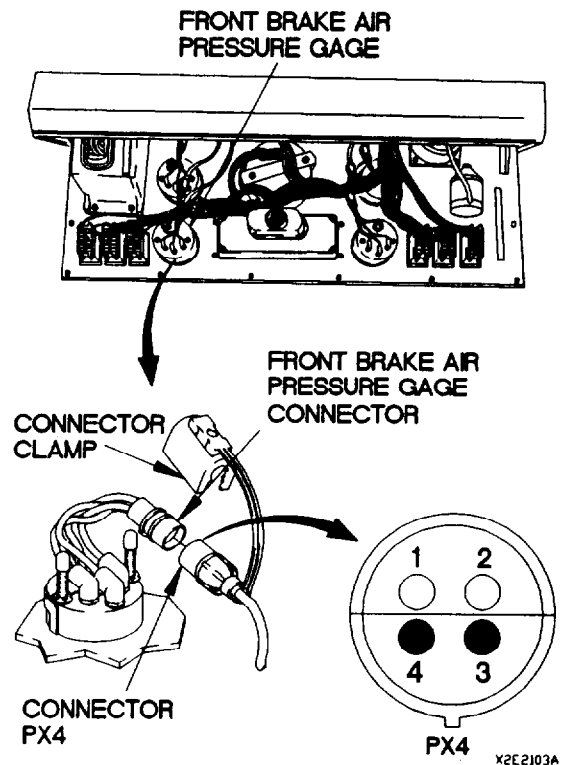
All gage illumination faults are traced the same way. Front brake air pressure gage shown.

**VOLTAGE TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector clamp from front brake air pressure gage connector.
- (3) Disconnect connector PX4 from front brake air pressure gage connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to terminal 2 of connector PX4 or refer to Reference Table 2-10.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position main light switch to PANEL BRT (TM 9-2320-365-10).
- (8) Position dimmer switch to maximum brightness (TM 9-2320-365-10).
- (9) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (10) If 12 vdc is not present, repair wire 1908 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (11) Position main light switch to OFF (TM 9-2320-365-10).

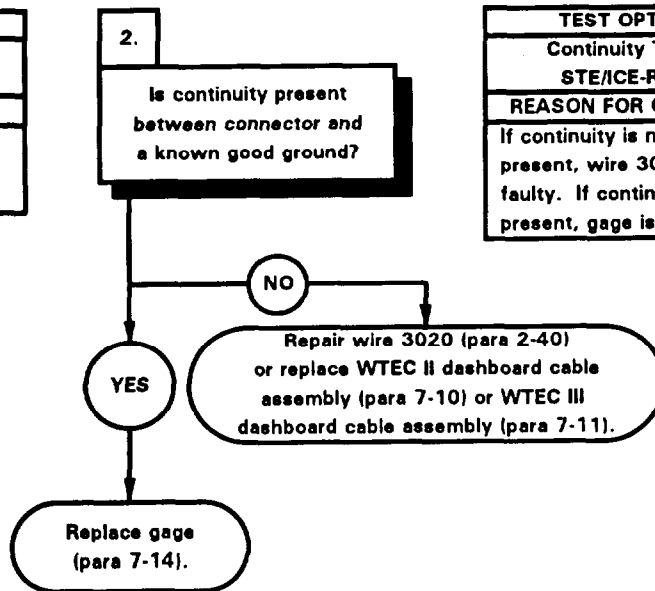
**REFERENCE TABLE 2-10**

GAGE DESCRIPTION	CONNECTOR
FUEL	PX9-2
WATER TEMP	PX11-2
FRONT BRAKE AIR PRESSURE	PX4-2
REAR BRAKE AIR PRESSURE	PX5-2
OIL PRESS	PX6-2
SPEEDOMETER	PX8-2
ODOMETER	PX8-2
VOLTS	PX10-2



19. INSTRUMENT PANEL GAGE DOES NOT ILLUMINATE (CONT)

<b>KNOWN INFO</b>
Other instrument panel illumination OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly.
Faulty gage.



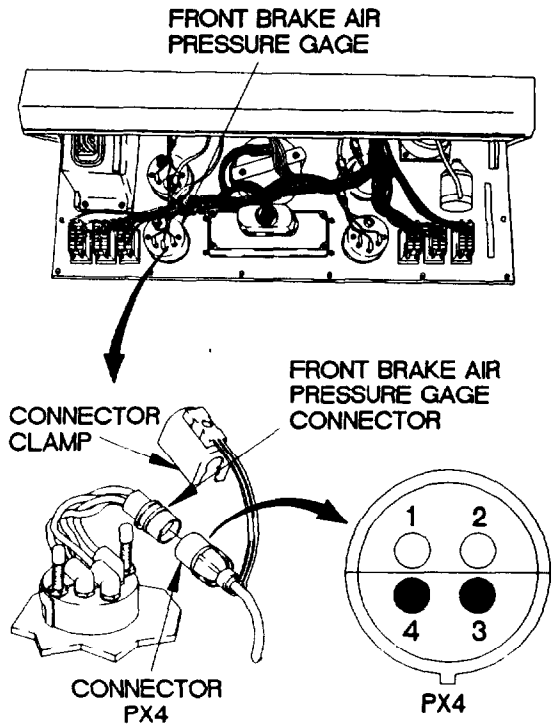
<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 3020 is faulty. If continuity is present, gage is faulty.



- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to terminal 1 of connector PX4 or refer to Reference Table 2-11.
  - (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
  - (4) If continuity is not present, repair wire 3020 (para 2-40) 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 gage (para 7-14).
  - (6) Connect connector PX4 to front brake air pressure gage connector.
  - (7) Connect connector clamp on front brake air pressure gage connector.
  - (8) Install instrument panel assembly (para 7-15).

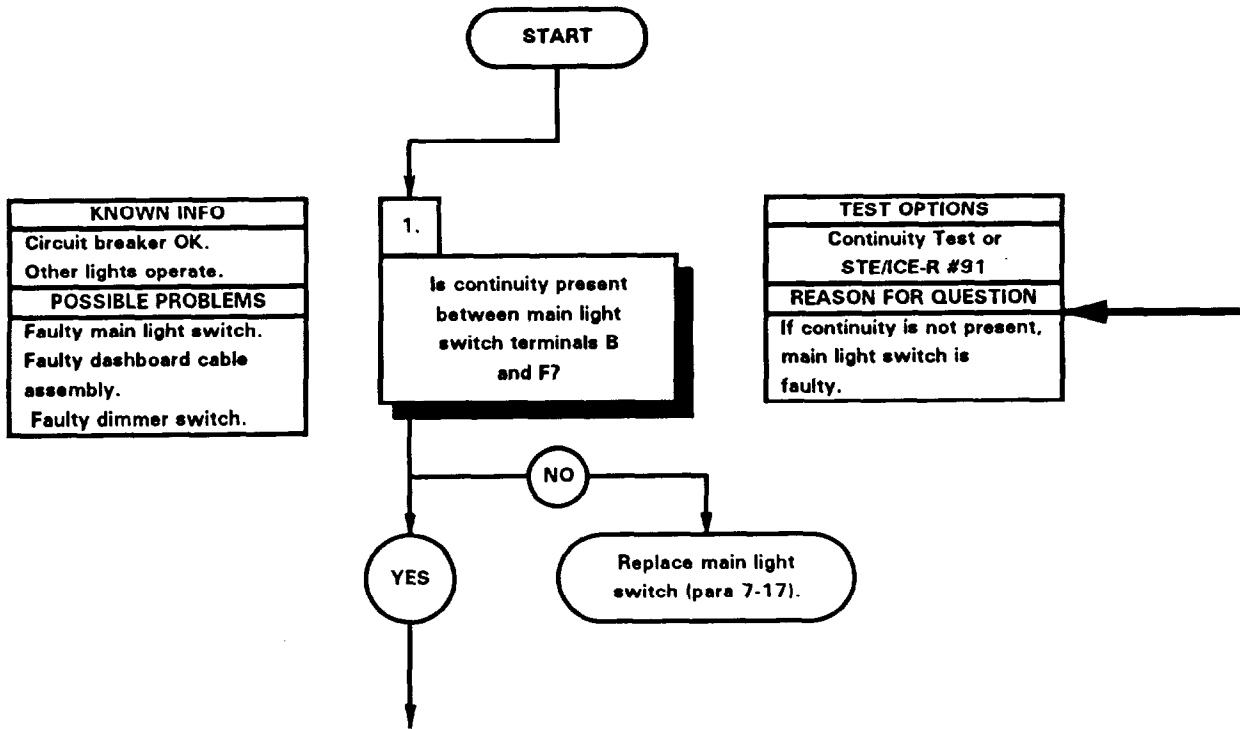
**REFERENCE TABLE 2-11**

GAGE DESCRIPTION	CONNECTOR
FUEL	PX9-1
WATER TEMP	PX11-1
FRONT BRAKE AIR PRESSURE	PX4-1
REAR BRAKE AIR PRESSURE	PX5-1
OIL PRESS	PX6-1
SPEEDOMETER	PX8-1
ODOMETER	PX8-1
VOLTS	PX10-1



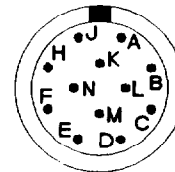
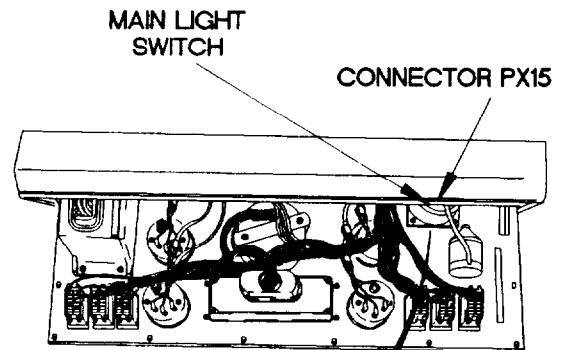
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e20. AUXILIARY PANEL, PERSONNEL HEATER, AND INSTRUMENT PANEL DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX15 from main light switch.
- (3) Set multimeter to ohms.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (5) Position main light switch auxiliary lever to PANEL BRT (TM 9-2320-365-10).
- (6) Connect positive (+) probe of multimeter to main light switch terminal F.
- (7) Connect negative (-) probe of multimeter to main light switch terminal B and note reading on multimeter.
- (8) If continuity is not present, replace main light switch (para 7-17).
- (9) Position main light switch to OFF (TM 9-2320-365-10).

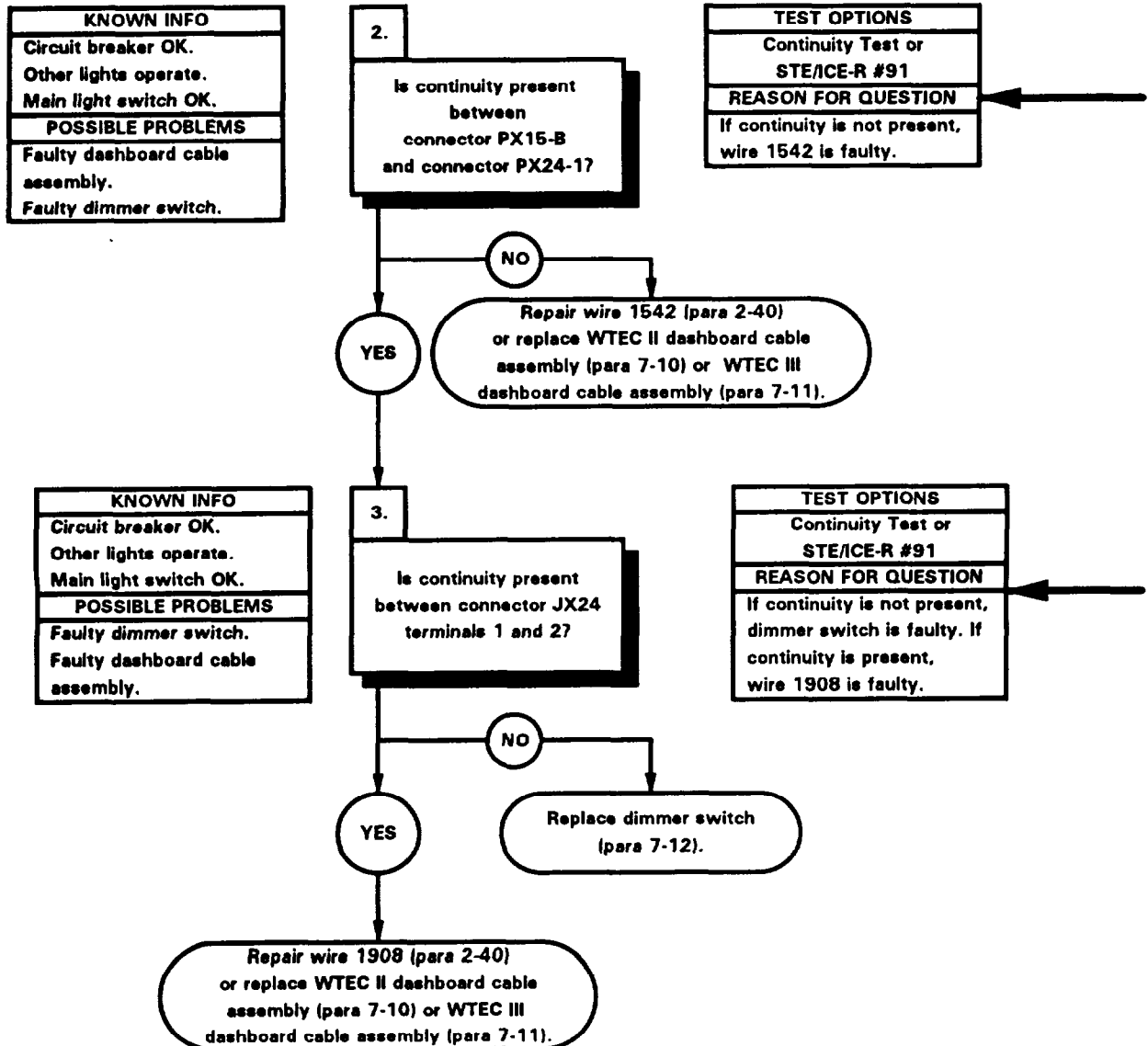


**MAIN LIGHT SWITCH**

X2E2201A

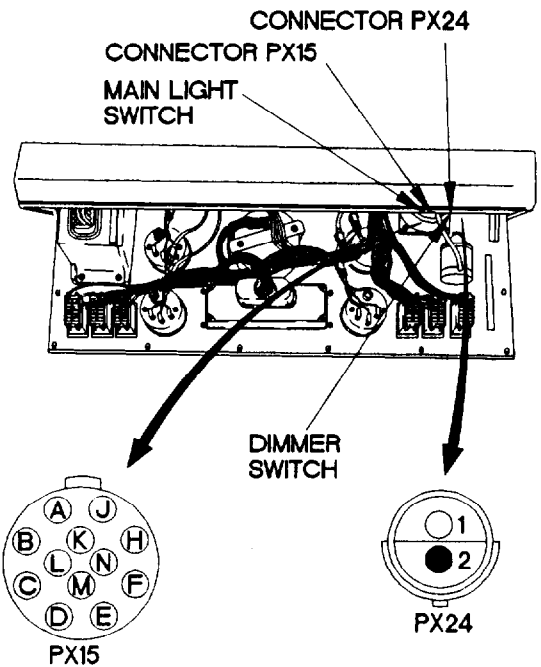


20. AUXILIARY PANEL, PERSONNEL HEATER, AND INSTRUMENT PANEL DO NOT ILLUMINATE (CONT)



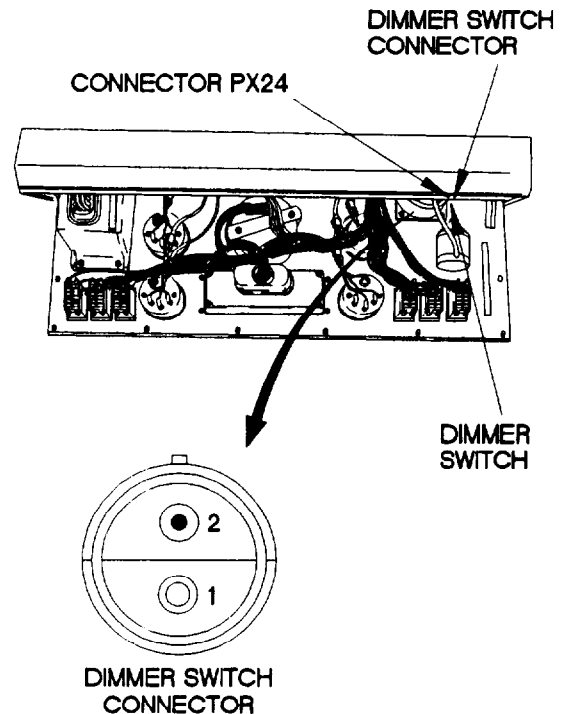
**CONTINUITY TEST**

- (1) Disconnect connector PX24 from dimmer switch.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector PX15-B.
- (4) Connect negative (-) probe of multimeter to connector PX24-1 and note reading on multimeter.
- (5) If continuity is not present, repair wire 1542 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) Connect connector PX15 to main light switch.



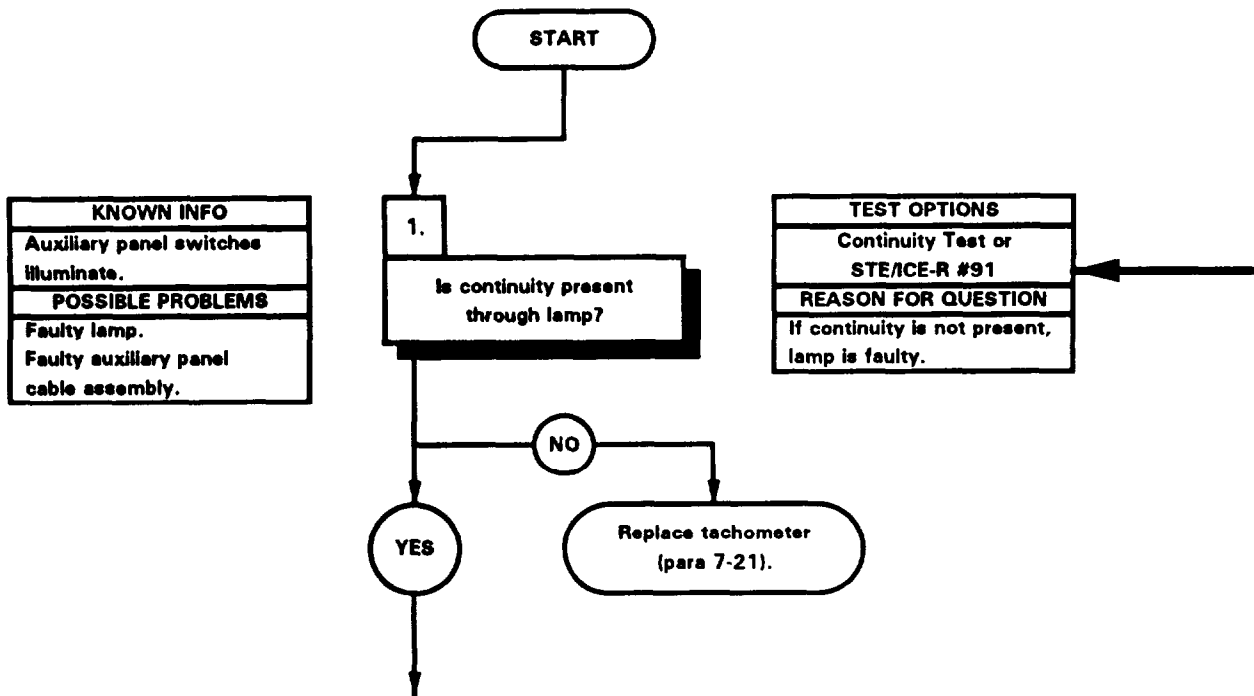
**CONTINUITY TEST**

- (1) Position dimmer switch to maximum illumination (TM 9-2320-365-10).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to dimmer switch connector terminal 1.
- (4) Connect negative (-) probe of multimeter to dimmer switch connector terminal 2 and note reading on multimeter.
- (5) If continuity is not present, replace dimmer switch (para 7-12).
- (6) If continuity is present, repair wire 1908 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) Connect connector PX24 to dimmer switch.
- (8) Install instrument panel assembly (para 7-15).



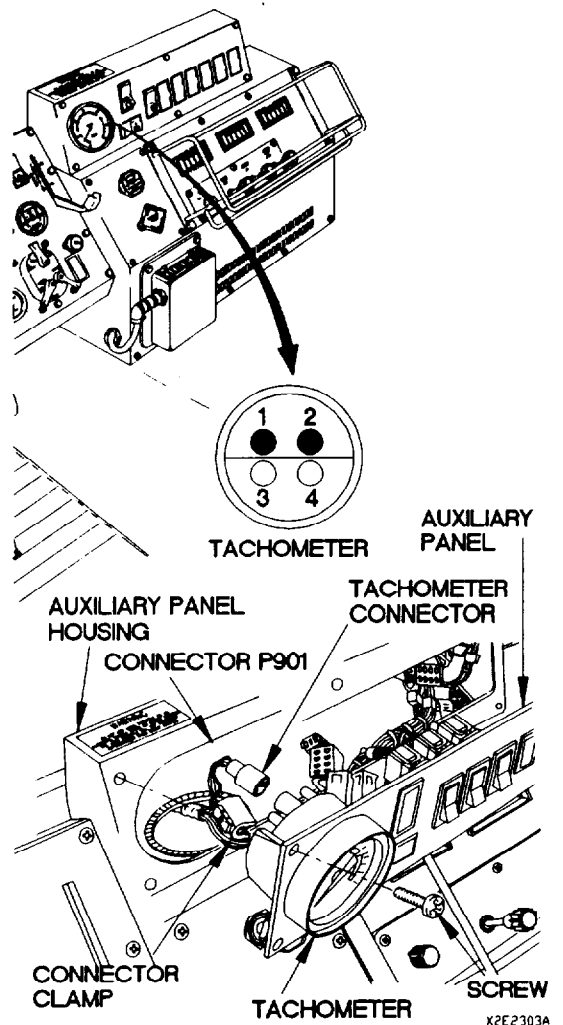
X2E2203A

e21. TACHOMETER DOES NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Conditions</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
<b>Personnel Required</b> (2)	
<b>References</b> TM 9-4910-571-12&P	

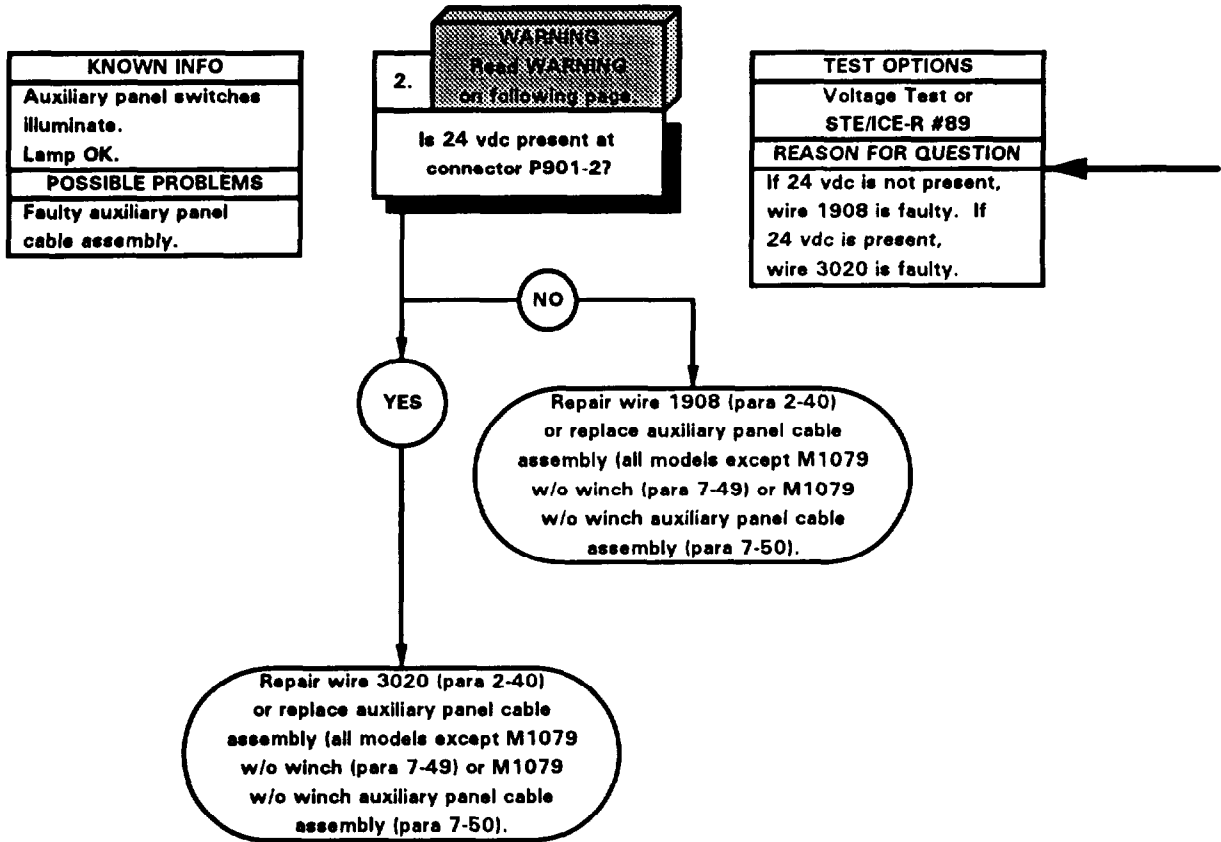


**CONTINUITY TEST**

- (1) Remove six screws from auxiliary panel.
- (2) Lift auxiliary panel from auxiliary panel housing to gain access.
- (3) Disconnect connector clamp from tachometer connector.
- (4) Disconnect connector P901 from tachometer connector.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to terminal 2 of tachometer connector.
- (7) Connect negative (-) probe of multimeter to terminal 1 of tachometer connector and note reading on multimeter.
- (8) Reverse multimeter leads and note reading on multimeter.
- (9) If multimeter shows the same in step (7) and (8), replace tachometer (para 7-21).



21. TACHOMETER DOES NOT ILLUMINATE (CONT)

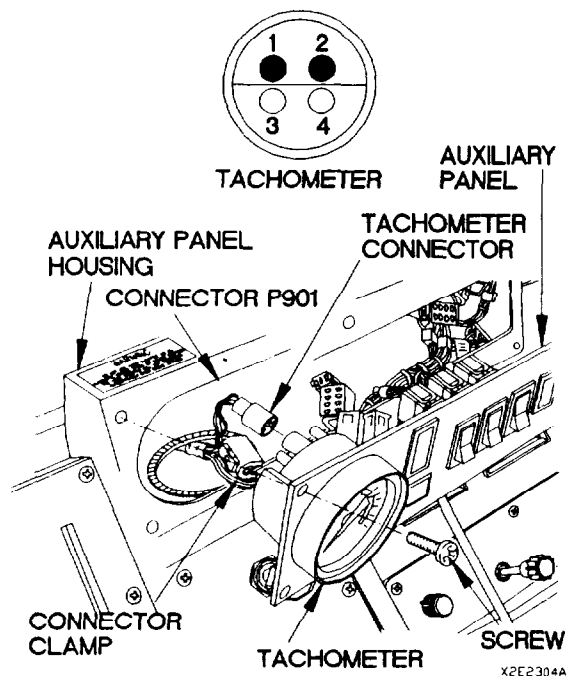


**WARNING**

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

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector P901-2.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1908 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (para 7-50).
- (6) If 24 vdc is present, repair wire 3020 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (para 7-50).
- (7) Position master power switch to off (TM 9-2320-365-10).
- (8) Connect connector P901 to tachometer connector.
- (9) Connect connector clamp on tachometer connector.
- (10) Position auxiliary panel on auxiliary panel housing with six screws.
- (11) Tighten six screws to 24 lb-in. (3 N·m).



**22. AUXILIARY PANEL SWITCH DOES NOT ILLUMINATE**

**INITIAL SETUP**

**Equipment Condition**

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

**Personnel Required**

(2)

**References**

TM 9-4910-571-12&P

**Tools and Special Tools**

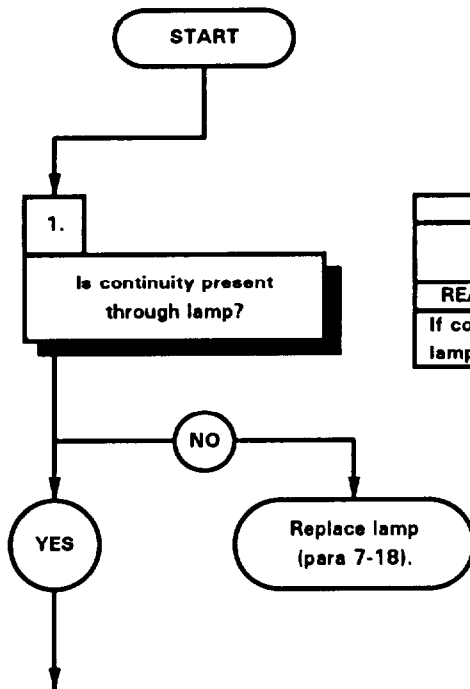
Tool Kit, Genl Mech (Item 44, Appendix C)

STE/ICE-R (Item 39, Appendix C)

Multimeter, Digital (Item 22, Appendix C)

Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

<b>KNOWN INFO</b>
Other auxiliary panel switches illuminate.
<b>POSSIBLE PROBLEMS</b>
Faulty lamp.
Faulty auxiliary panel cable assembly.



<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, lamp is faulty.

**NOTE**  
 All auxiliary panel switch illumination faults are traced the same way. Power Take-Off (PTO) switch shown.

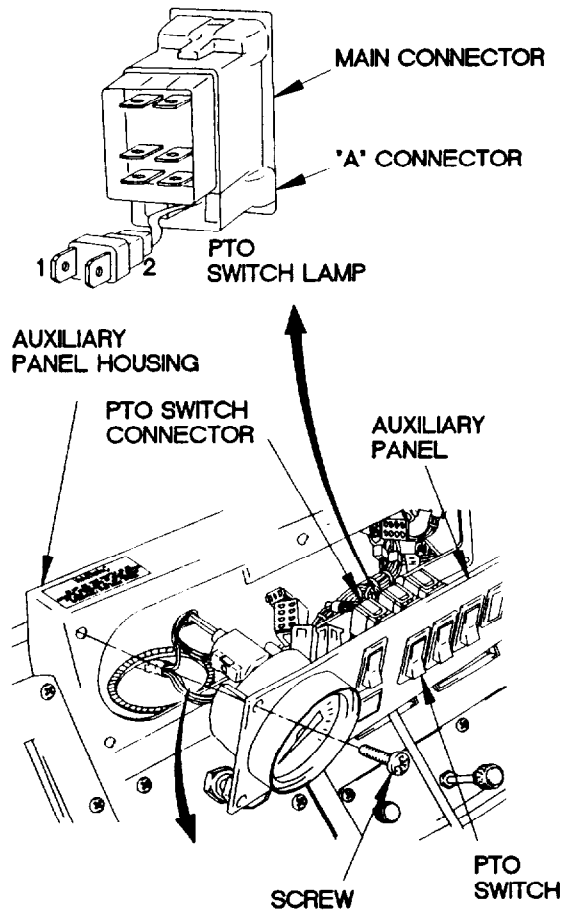
**CONTINUITY TEST**

- (1) Remove six screws from auxiliary panel.
- (2) Lift auxiliary panel from auxiliary panel housing to gain access.

**NOTE**

Main connector and "A" connector will come off as a unit.

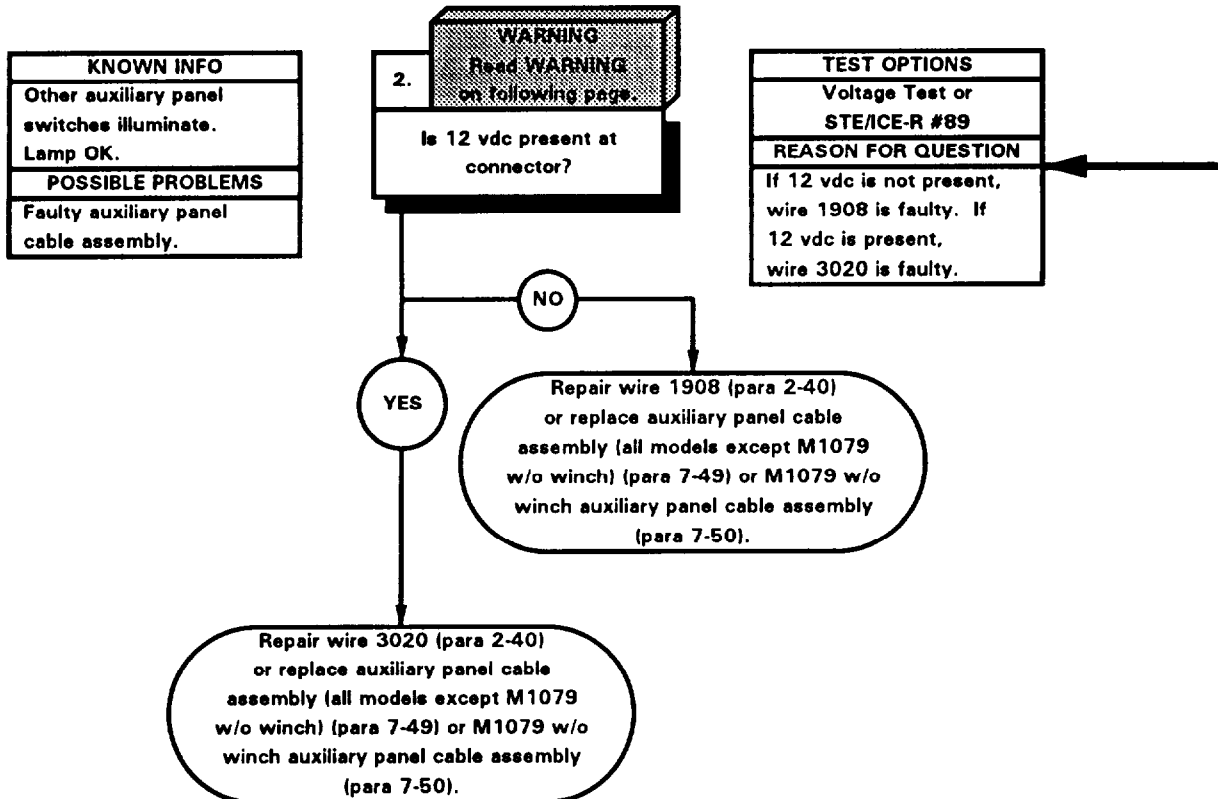
- (3) Disconnect PTO switch connector from PTO switch.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to PTO switch lamp terminal 1.
- (6) Connect negative (-) probe of multimeter to PTO switch lamp terminal 2 and note reading on multimeter.
- (7) If continuity is not present, replace lamp (para 7-18).



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e22. AUXILIARY PANEL SWITCH DOES NOT ILLUMINATE (CONT)

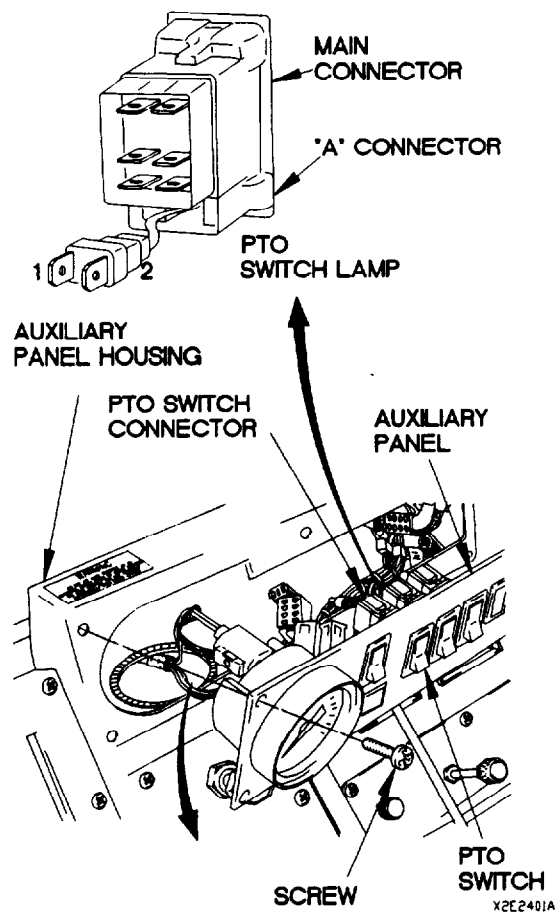


**WARNING**

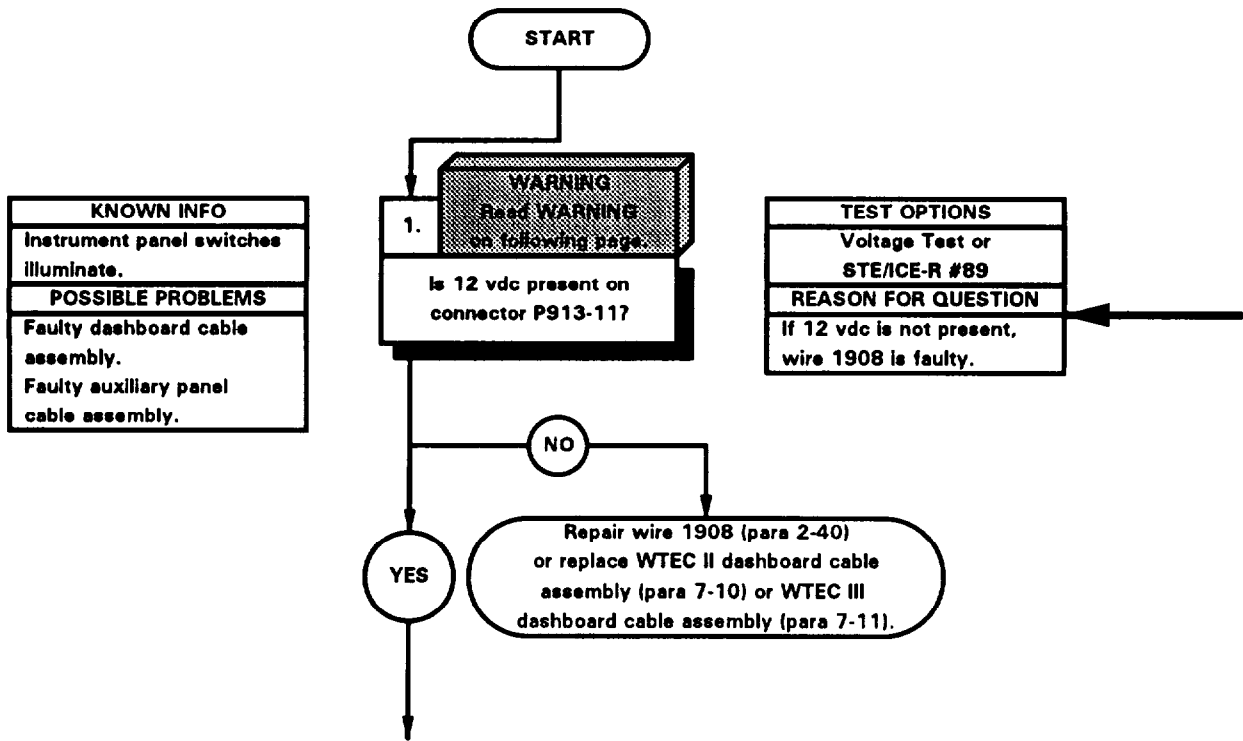
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to "A" switch connector terminal 1.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch auxiliary lever to PANEL BRT (TM 9-2320-365-10).
- (5) Position dimmer switch to maximum brightness (TM 9-2320-365-10).
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1908 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (para 7-50).
- (8) If 12 vdc is present, repair wire 3020 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (para 7-50).
- (9) Position main light switch to OFF (TM 9-2320-365-10).
- (10) Connect PTO switch connector to PTO switch.
- (11) Position auxiliary panel on auxiliary panel housing with six screws.
- (12) Tighten six screws to 24 lb-in. (3 N·m).



●23. AUXILIARY PANEL DOES NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/CE-R (Item 39, Appendix C)
<b>Personnel Required</b> (2)	Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
<b>References</b> TM 9-4910-571-12&P	

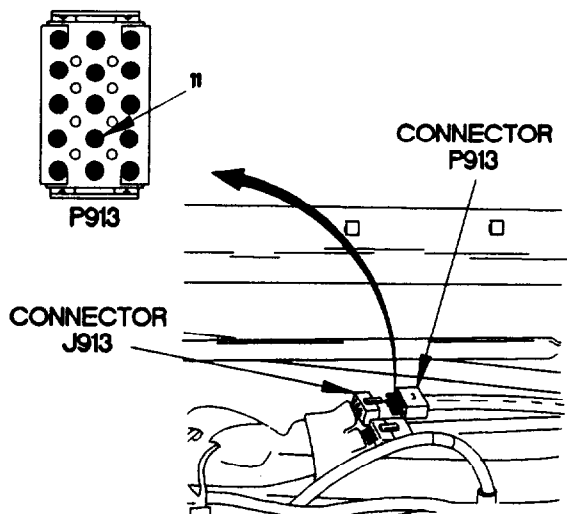


**WARNING**

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 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 P913-11.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to STOP LIGHT and PANEL BRIGHT (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1908 (para 2-40) 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 9-2320-365-10).



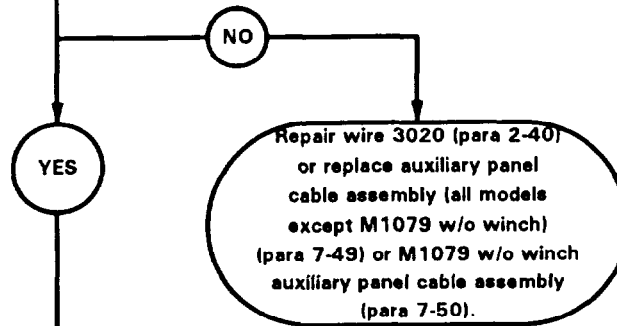
x2E2501A

e23. AUXILIARY PANEL DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Instrument panel switches illuminate. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty auxiliary panel cable assembly.

2.  
Is continuity present between connector J913-10 and connector P914A-2?

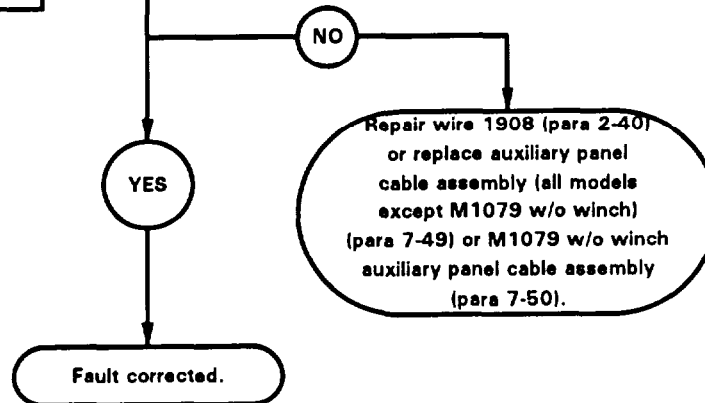
TEST OPTIONS
Continuity Test STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3020 is faulty.



KNOWN INFO
Instrument panel switches illuminate. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty auxiliary panel cable assembly.

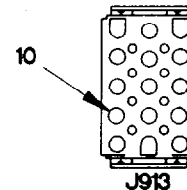
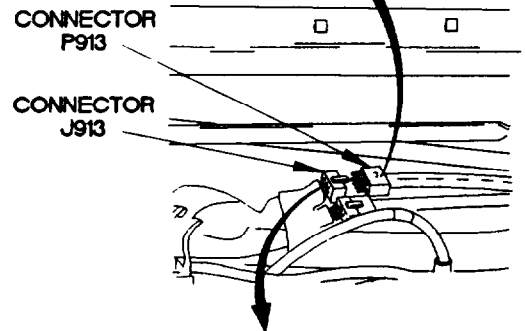
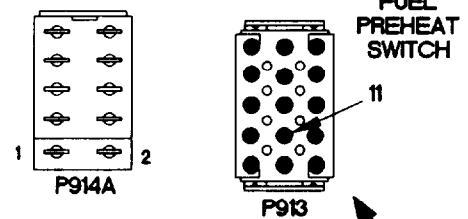
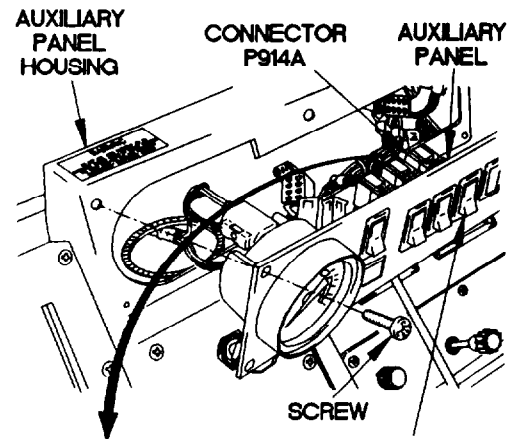
3.  
Is continuity present between connector P913-11 and connector P914A-1?

TEST OPTIONS
Continuity Test STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1908 is faulty.



**CONTINUITY TEST**

- (1) Remove six screws from auxiliary panel.
- (2) Lift auxiliary panel from auxiliary panel housing to gain access.
- (3) Disconnect connector P914A from fuel preheat switch, if equipped.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector J913-10.
- (6) Connect negative (-) probe of multimeter to connector P914A-2 and note reading on multimeter.
- (7) If continuity is not present, repair wire 3020 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (para 7-50).

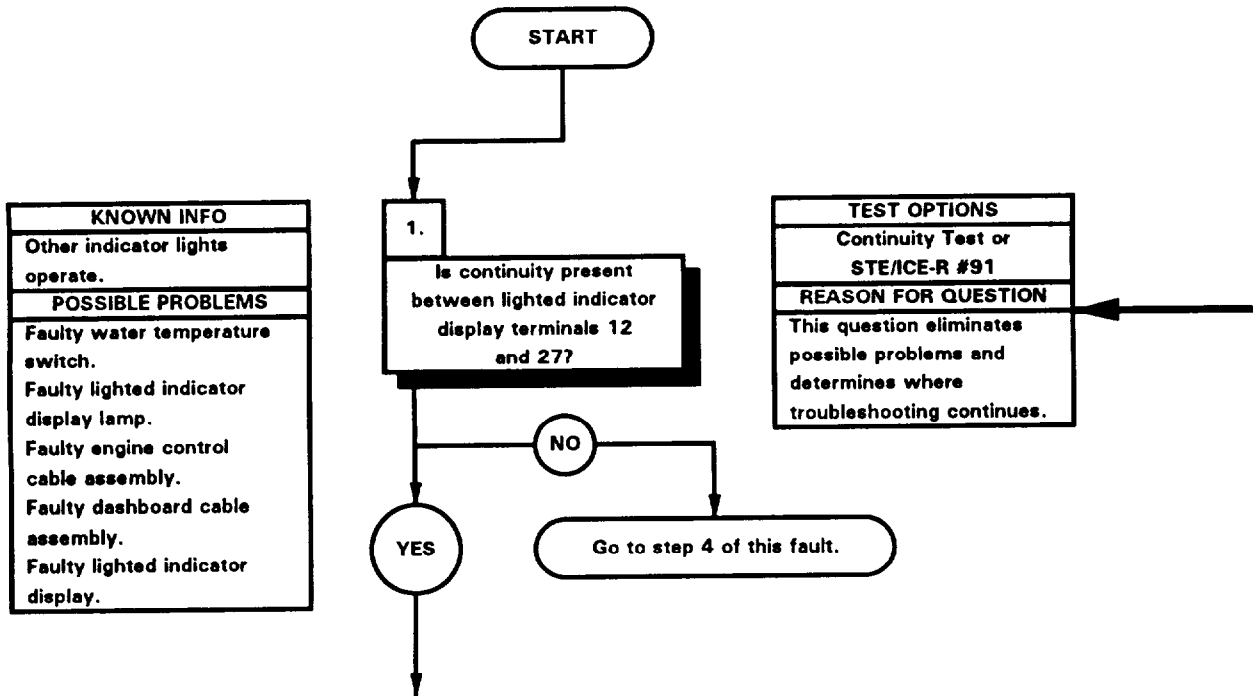


**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P913-11.
- (3) Connect negative (-) probe of multimeter to connector P914A-1 and note reading on multimeter.
- (4) If continuity is not present, repair wire 1908 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (para 7-50).
- (5) Connect connector P914A to fuel preheat switch, if equipped.
- (6) Position auxiliary panel housing on auxiliary panel with six screws.
- (7) Tighten six screws to 24 lb-in. (3 N·m).
- (8) Connect connector P913 to connector J913.
- (9) Install personnel heater (para 18-9).

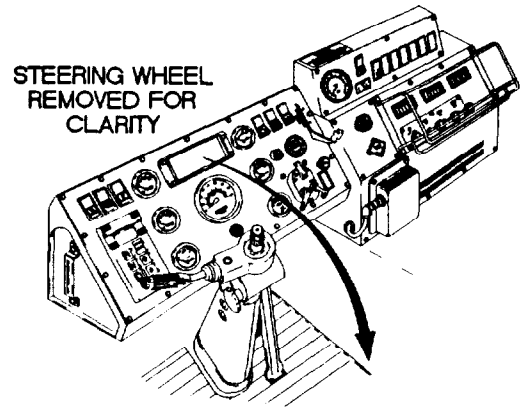
X2E2502A

e24. HIGH ENGINE TEMPERATURE INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

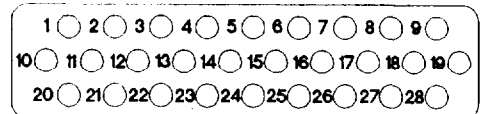


**CONTINUITY TEST**

- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to lighted indicator display terminal 27.
- (6) Connect negative (-) probe of multimeter to lighted indicator display terminal 12 and note reading on multimeter.
- (7) If continuity is not present, go to step 4 of this fault.



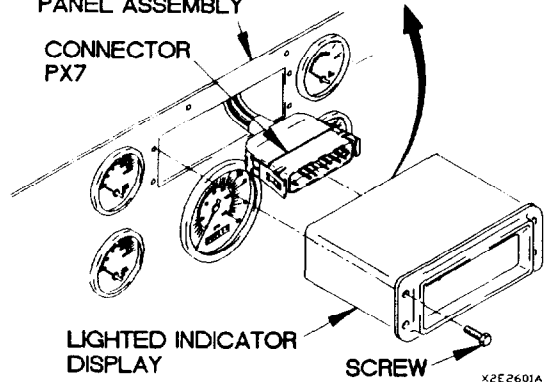
**BOTTOM**



**LIGHTED INDICATOR DISPLAY**

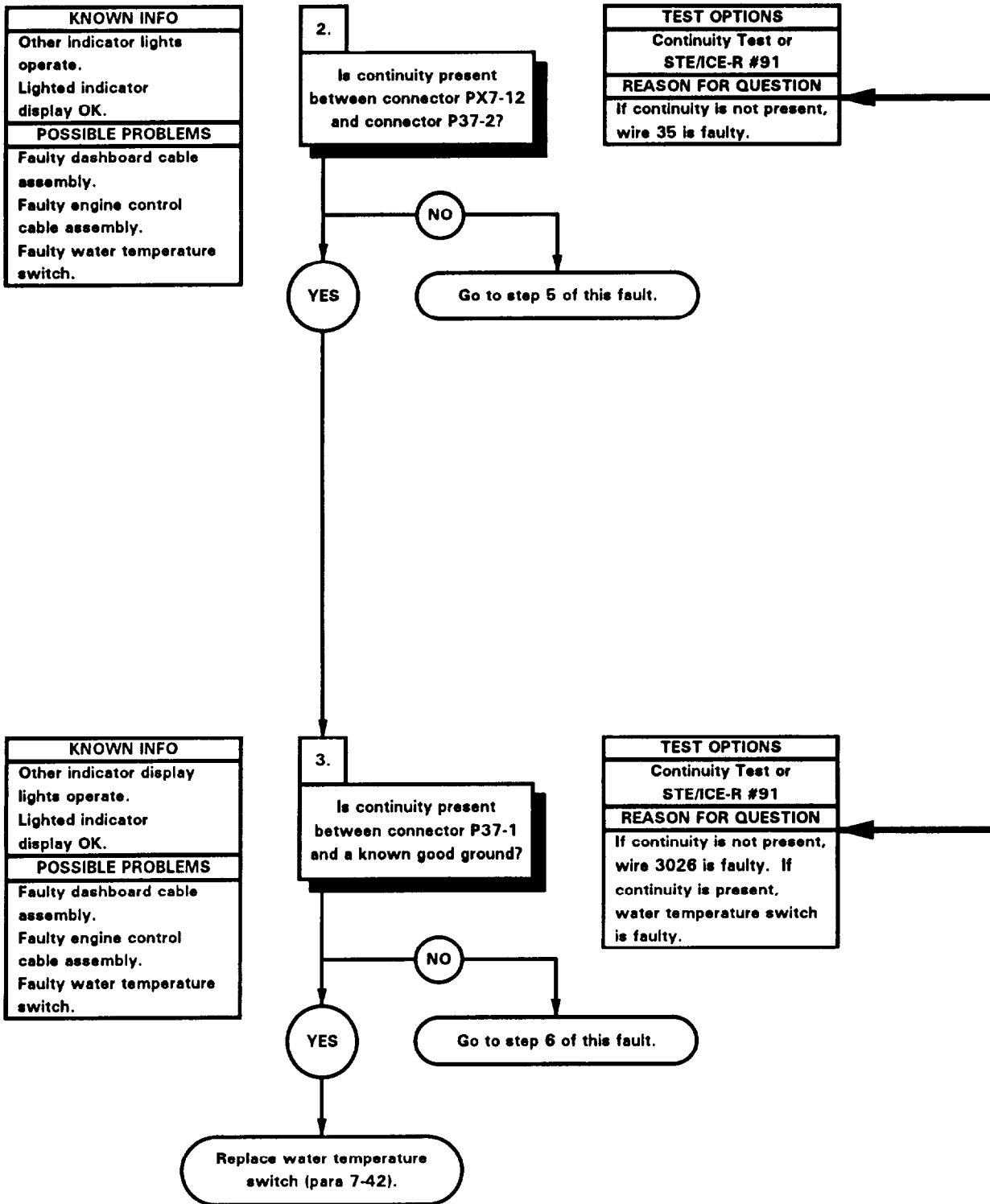
**INSTRUMENT  
PANEL ASSEMBLY**

**CONNECTOR  
PX7**

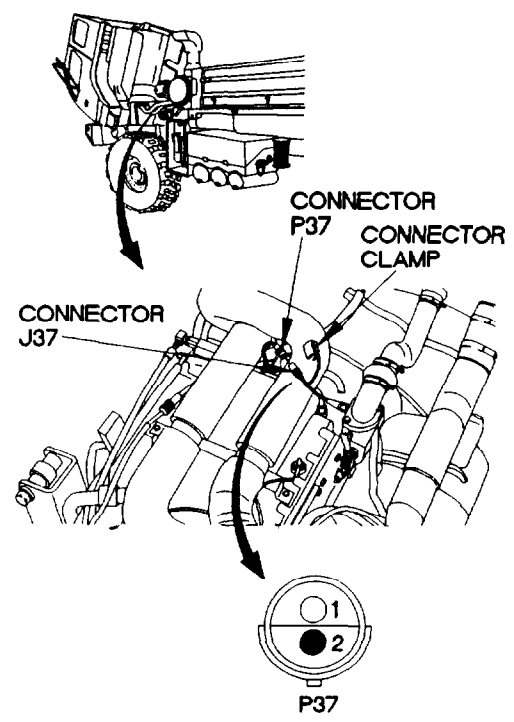




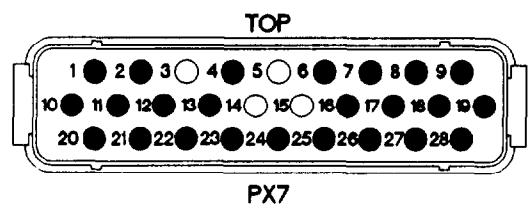
e24. HIGH ENGINE TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)



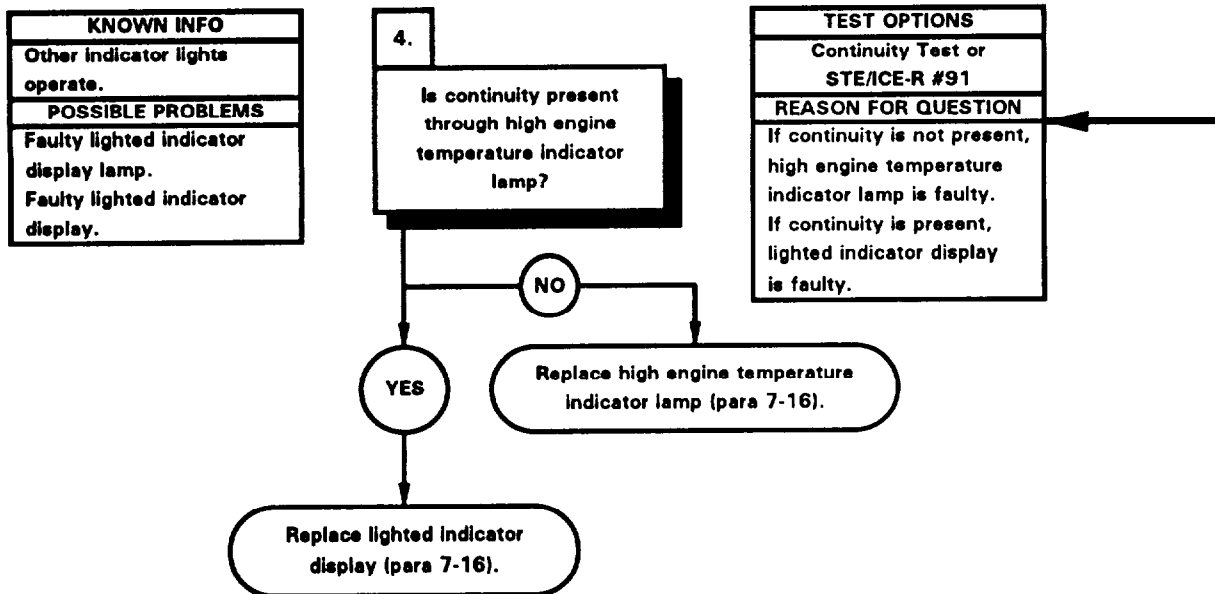
- CONTINUITY TEST**
- (1) Raise cab (TM 9-2320-365-10).
  - (2) Set multimeter to ohms.
  - (3) Disconnect connector clamp from connector J37.
  - (4) Disconnect connector P37 from connector J37.
  - (5) Connect positive (+) probe of multimeter to connector P37-2.
  - (6) Connect negative (-) probe of multimeter to connector PX7-12 and note reading on multimeter.
  - (7) If continuity is not present, go to step 5 of this fault.



- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to connector P37-1.
  - (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.
  - (5) If continuity is present, replace water temperature switch (para 7-42).
  - (6) Connect connector P37 to connector J37.
  - (7) Connect connector clamp on connector J37.
  - (8) Lower cab (TM 9-2320-365-10).

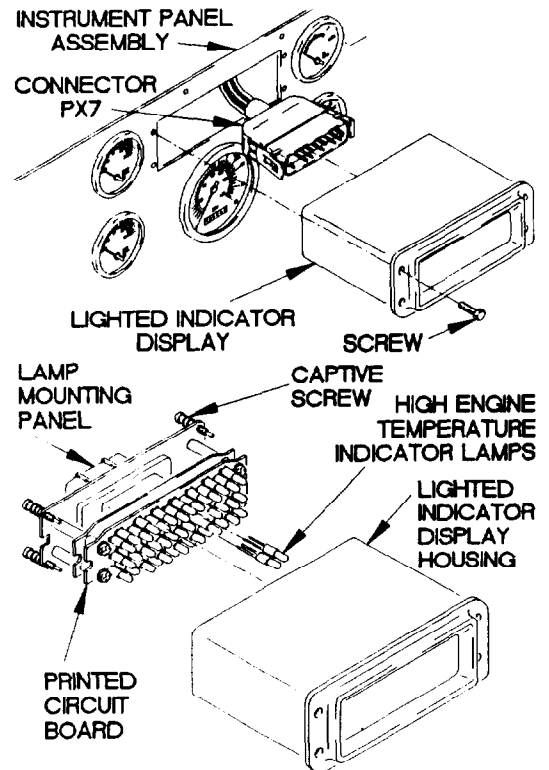
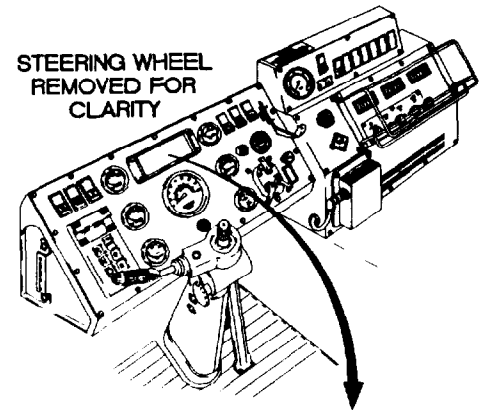


e24. HIGH ENGINE TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

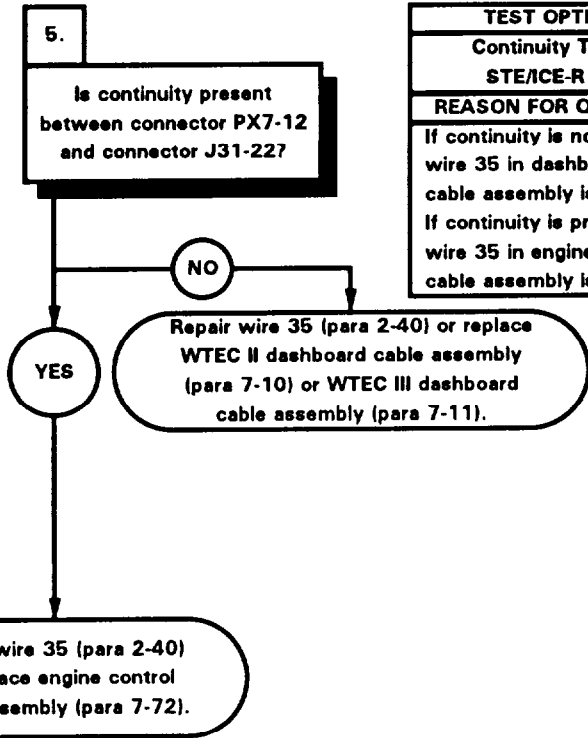
- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove high engine temperature lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each high engine temperature indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace lamp (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install high engine temperature lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 6-10 lb-in. (1 N·m).
- (14) Connect batteries (para 7-48).



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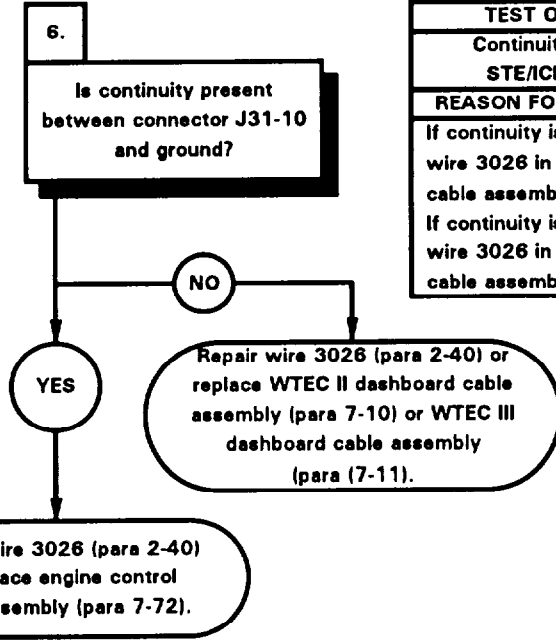
e24. HIGH ENGINE TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)

KNOWN INFO
Other indicator lights operate. Lighted indicator display OK. Water temperature switch OK.
POSSIBLE PROBLEMS
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, wire 35 in dashboard cable assembly is faulty. If continuity is present, wire 35 in engine control cable assembly is faulty.

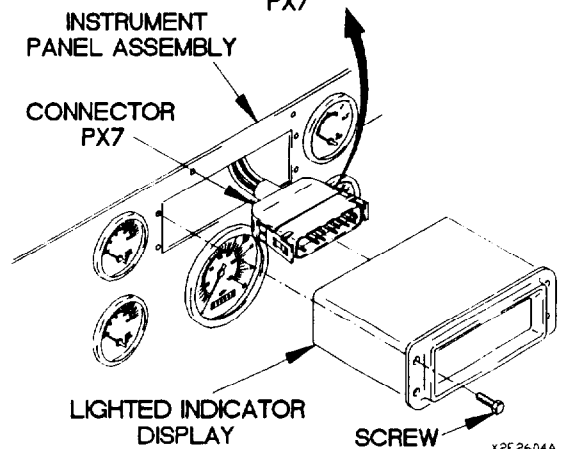
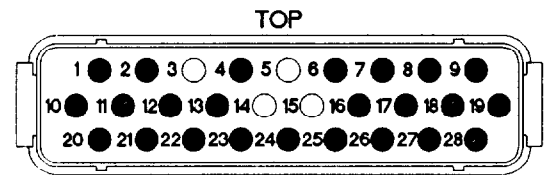
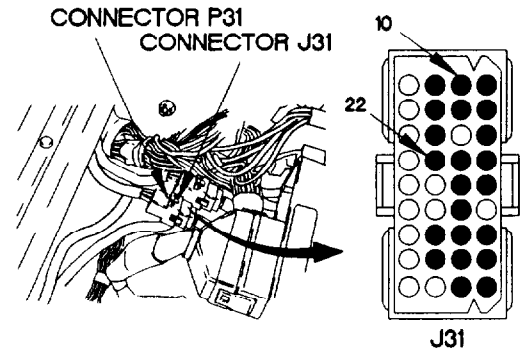
KNOWN INFO
Other indicator display lights operate. Lighted indicator display OK. Water temperature switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty engine control cable assembly.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3026 in dashboard cable assembly is faulty. If continuity is present, wire 3026 in engine control cable assembly is faulty.

**CONTINUITY TEST**

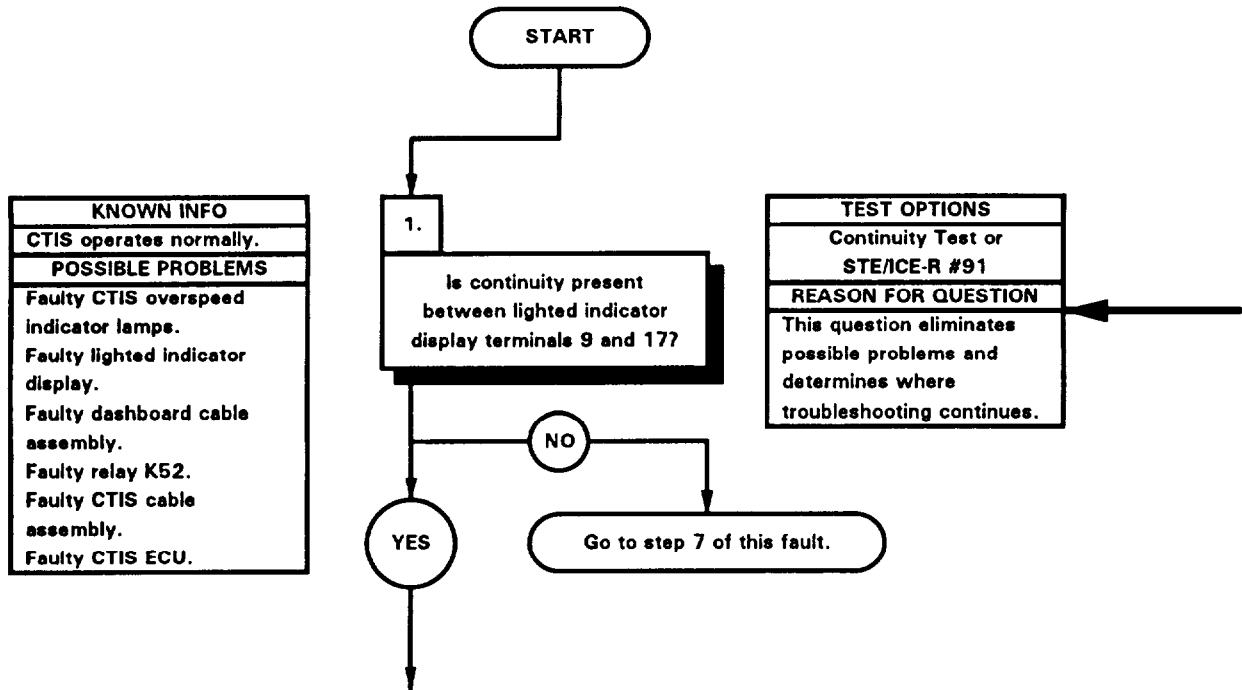
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Set multimeter to ohms.
- (3) Disconnect connector J31 from connector P31.
- (4) Connect positive (+) probe of multimeter to connector PX7-12.
- (5) Connect negative (-) probe of multimeter to connector J31-22 and note reading on multimeter.
- (6) If continuity is not present, repair wire 35 (para 2-40) 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 35 (para 2-40) or replace engine control cable assembly (para 7-72).
- (8) Connect connector J31 to connector P31.
- (9) Install instrument panel assembly (para 7-15).
- (10) Connect lighted indicator display to connector PX7.
- (11) Position lighted indicator display in instrument panel assembly with four screws.
- (12) Tighten four screws to 6-10 lb-in. (1 N·m).
- (13) Connect batteries (para 7-48).



**CONTINUITY TEST**

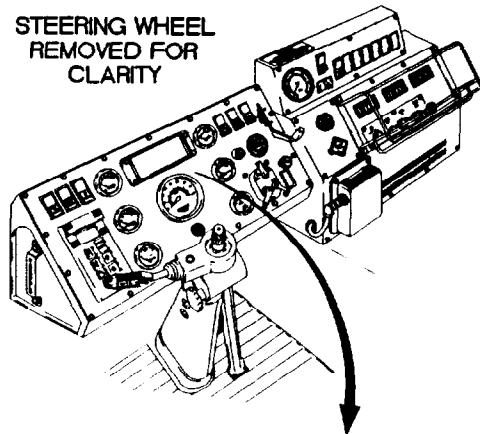
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Set multimeter to ohms.
- (3) Disconnect connector J31 from connector P31.
- (4) Connect positive (+) probe of multimeter to connector J31-10.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If continuity is not present, repair wire 3026 (para 2-40) 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 3026 (para 2-40) or replace engine control cable assembly (para 7-72).
- (8) Connect connector J31 to connector P31.
- (9) Install instrument panel assembly (para 7-15).
- (10) Connect lighted indicator display to connector PX7.
- (11) Position lighted indicator display in instrument panel assembly with four screws.
- (12) Tighten four screws to 6-10 lb-in. (1 N·m).
- (13) Connect batteries (para 7-48).

e25. CTIS OVERSPEED INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

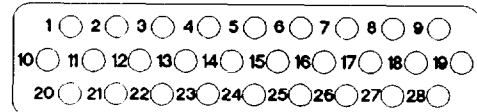


**CONTINUITY TEST**

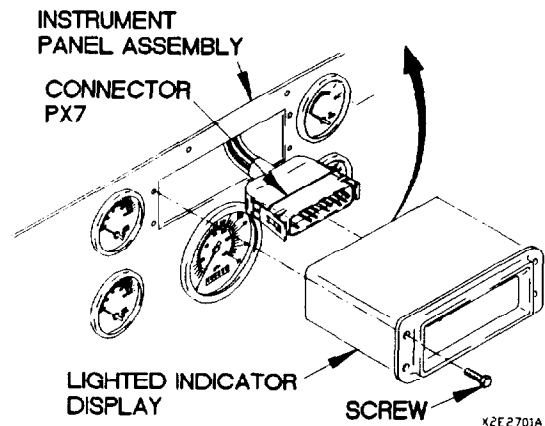
- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to lighted indicator display terminal 9.
- (6) Connect negative (-) probe of multimeter to lighted indicator display terminal 17 and note reading on multimeter.
- (7) If continuity is not present, go to step 7 of this fault.



**BOTTOM**



**LIGHTED INDICATOR DISPLAY**



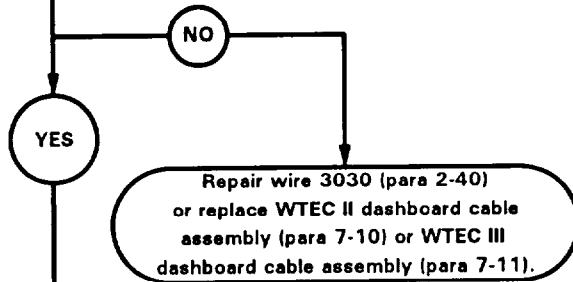


e25. CTIS OVERSPEED INDICATOR DOES NOT OPERATE (CONT)

KNOWN INFO
CTIS operates normally. Lighted indicator display OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K52. Faulty CTIS ECU. Faulty CTIS cable assembly.

2.  
Is continuity present between connector PX7-17 and a known good ground?

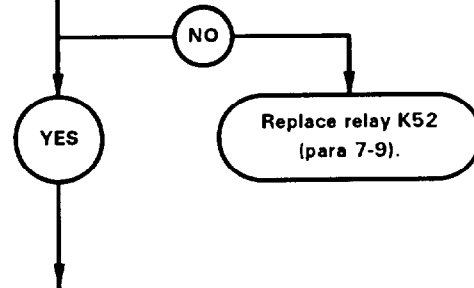
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3030 is faulty.



KNOWN INFO
CTIS operates normally. Lighted indicator display OK.
POSSIBLE PROBLEMS
Faulty relay K52. Faulty dashboard cable assembly. Faulty CTIS ECU. Faulty CTIS cable assembly.

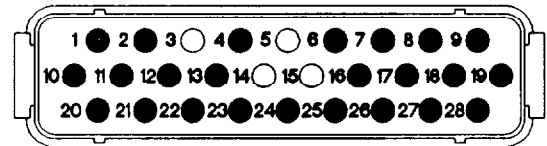
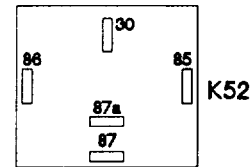
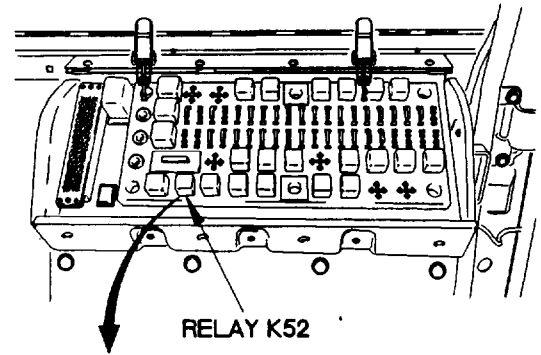
3.  
Is continuity present between relay K52 terminals 30 and 87A?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, relay K52 is faulty.



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX7-17.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3030 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



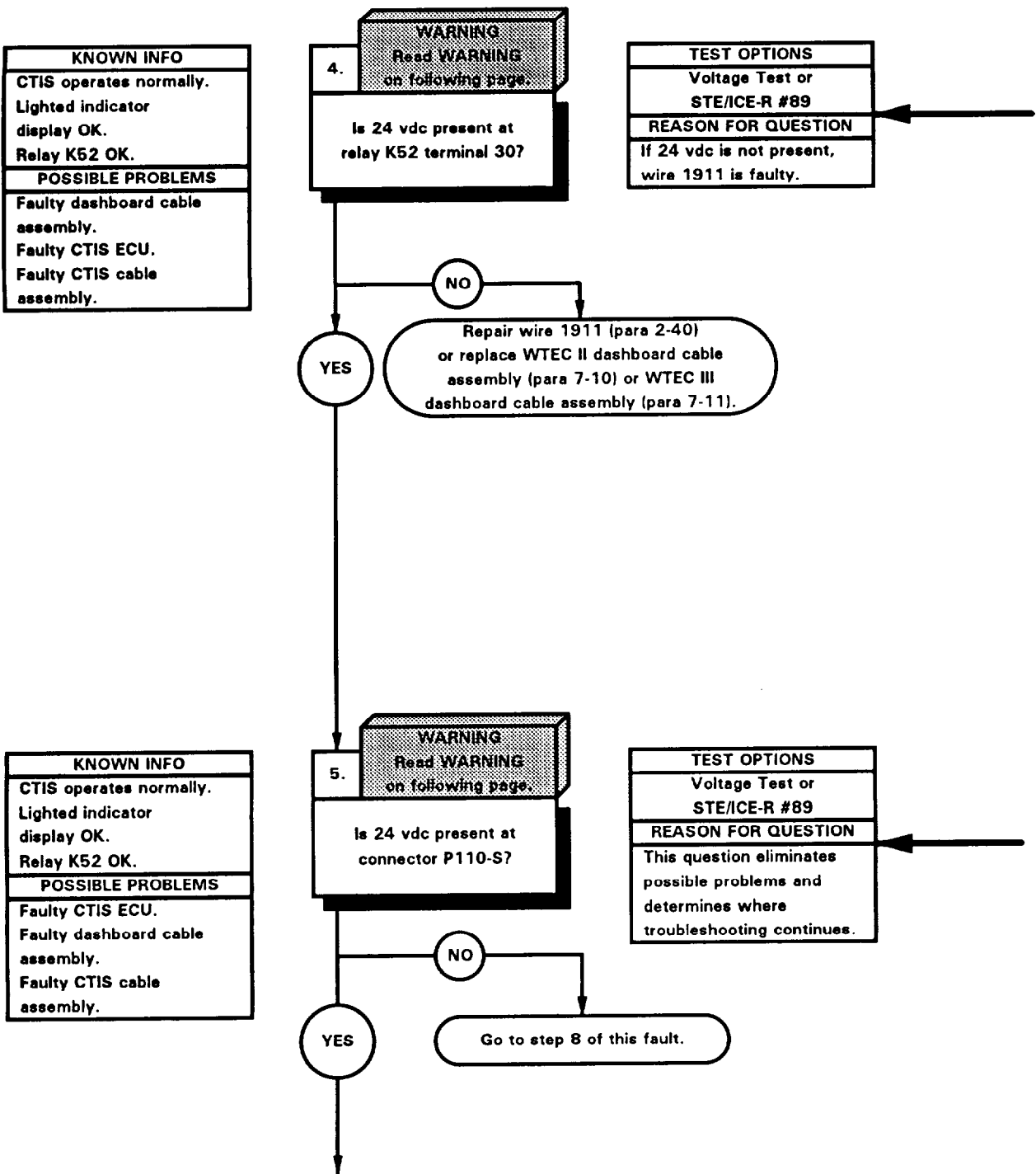
PX7

x2E2702A

**CONTINUITY TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K52 from PDP.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to relay K52 terminal 30.
- (5) Connect negative (-) probe of multimeter to relay K52 terminal 87A and note reading on multimeter.
- (6) If continuity is not present, replace relay K52 (para 7-9).

e25. CTIS OVERSPEED INDICATOR DOES NOT OPERATE (CONT)

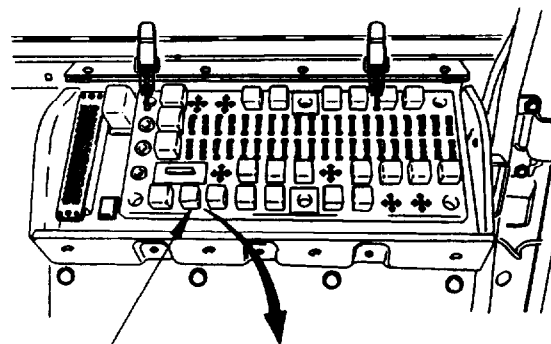


**WARNING**

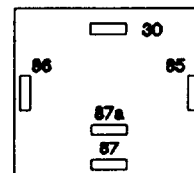
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Connect batteries (para 7-48).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to PDP, terminal 30, where relay K52 was removed.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 1911 (para 2-40) 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 9-2320-365-10).
- (8) Install relay K52 in PDP.
- (9) Install PDP cover (para 16-2).



RELAY K52 CAVITY



RELAY K52 CAVITY

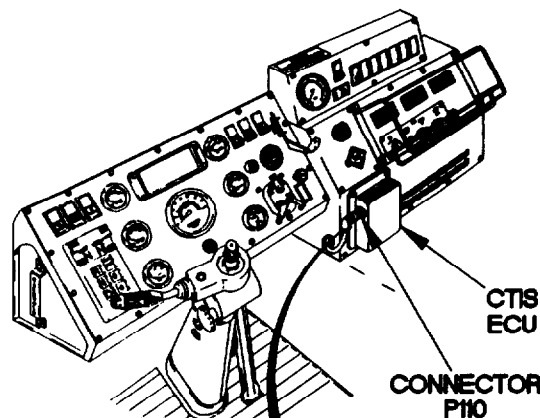
X2E2703A

**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**

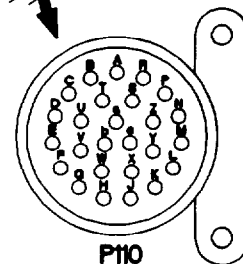
- (1) Disconnect connector P110 from CTIS ECU.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P110-S.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 8 of this fault.
- (7) Position master power switch to off (TM 9-2320-365-10).



CTIS ECU

CONNECTOR P110

STEERING WHEEL REMOVED FOR CLARITY



P110

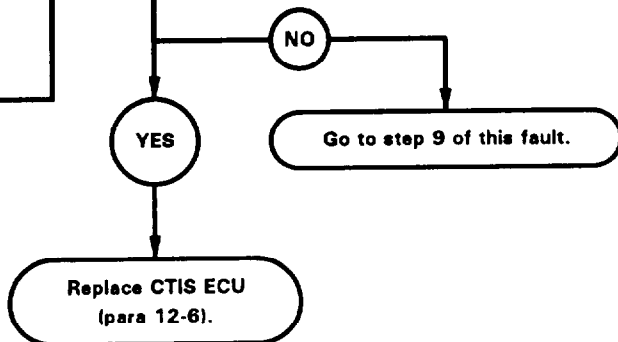
X2E2704A

e25. CTIS OVERSPEED INDICATOR DOES NOT OPERATE (CONT)

<b>KNOWN INFO</b>
CTIS operates normally. Lighted indicator display OK. Relay K52 OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS ECU. Faulty CTIS cable assembly. Faulty dashboard cable assembly.

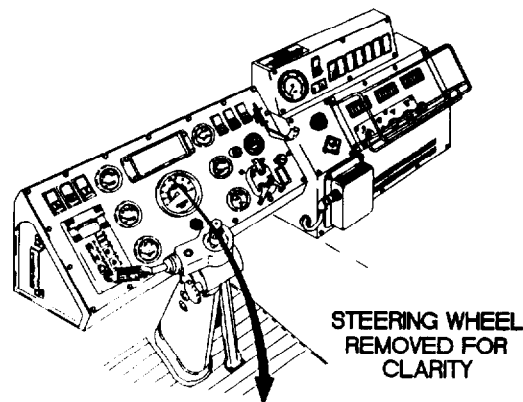
6.  
Is continuity present between connector P110-E and connector PX7-9?

<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is present, CTIS ECU is faulty.

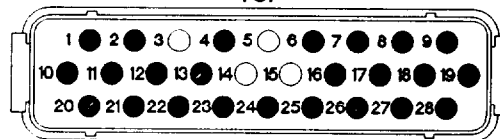


**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P110-E.
- (3) Connect negative (-) probe of multimeter to connector PX7-9 and note reading on multimeter.
- (4) If continuity is not present, go to step 9 of this fault.
- (5) If continuity is present, replace CTIS ECU (para 12-6).
- (6) Connect lighted indicator display to connector PX7.
- (7) Position lighted indicator display in instrument panel assembly with four screws.
- (8) Tighten four screws to 6-10 lb-in. (1 N·m).
- (9) Connect batteries (para 7-48).



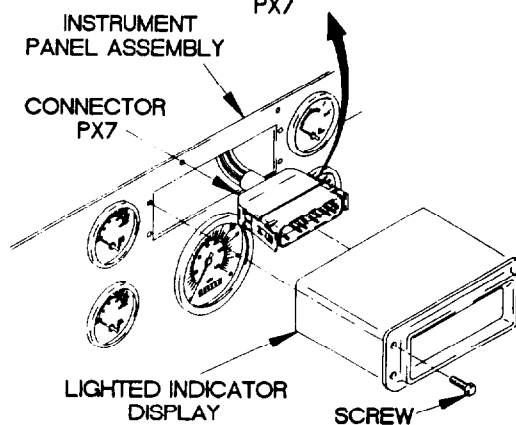
TOP



PX7

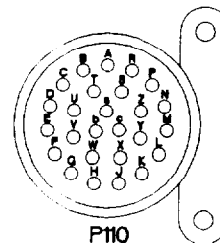
INSTRUMENT  
PANEL ASSEMBLY

CONNECTOR  
PX7



LIGHTED INDICATOR  
DISPLAY

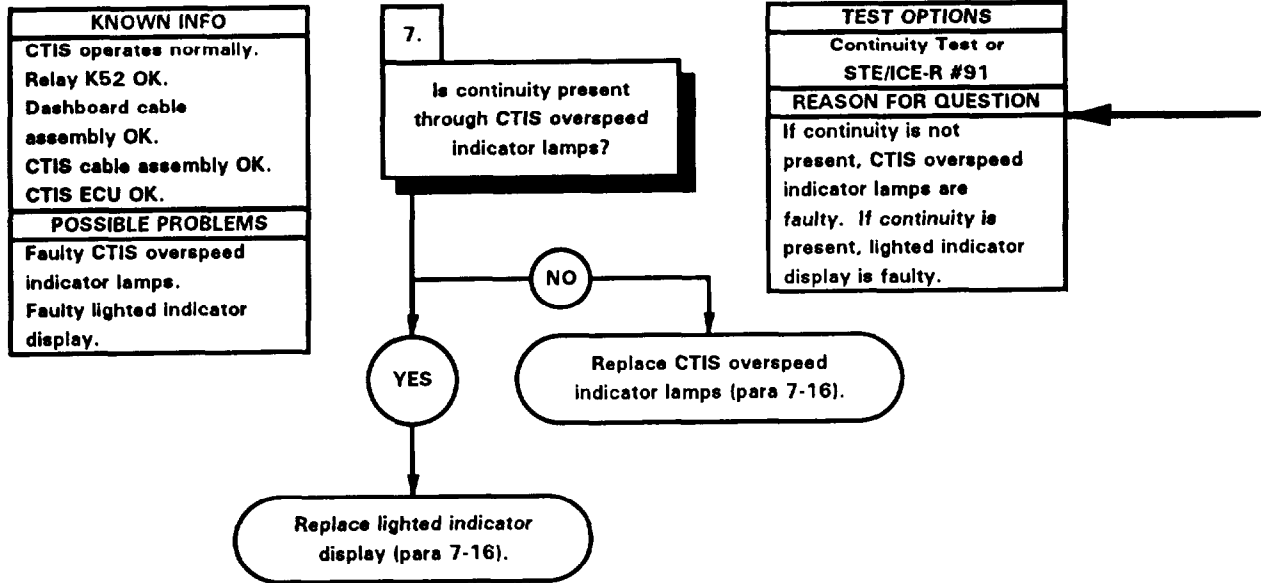
SCREW



P110

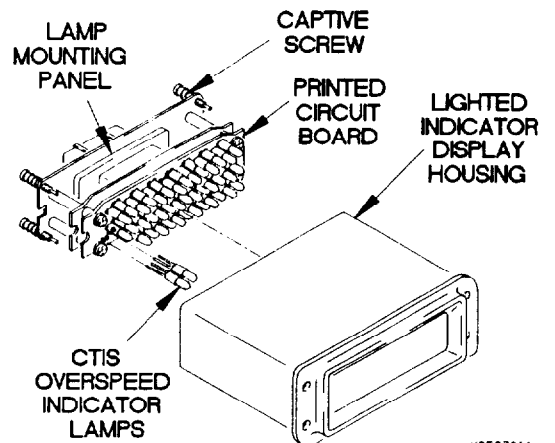
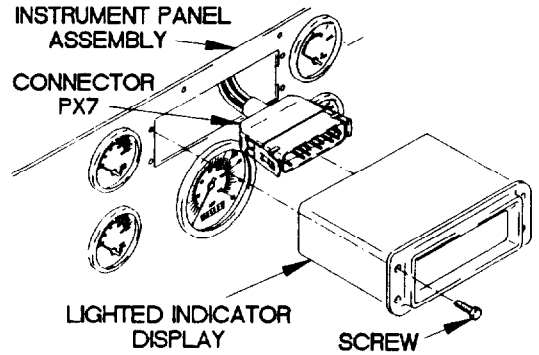
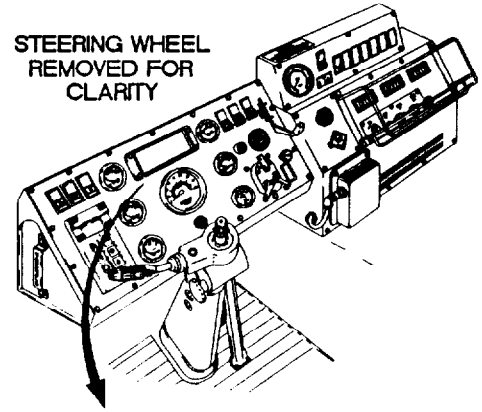
x2E2705A

e25. CTIS OVERSPEED INDICATOR DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove CTIS overspeed indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each CTIS overspeed indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install CTIS overspeed indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 6-10 lb-in. (1 N·m).
- (14) Connect batteries (para 7-48).



X2E2706A

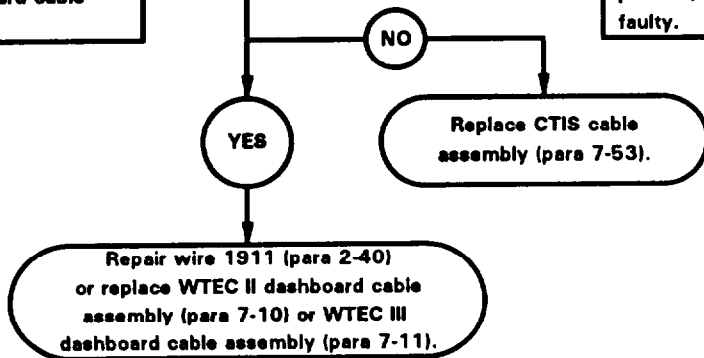


25. CTIS OVERSPEED INDICATOR DOES NOT OPERATE (CONT)

<b>KNOWN INFO</b>
CTIS operates normally. Relay K52 OK. Lighted indicator display OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty dashboard cable assembly.

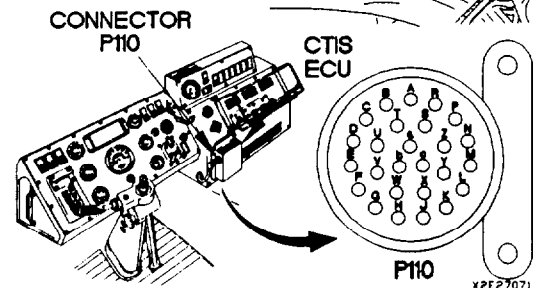
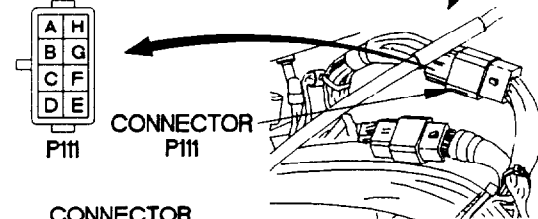
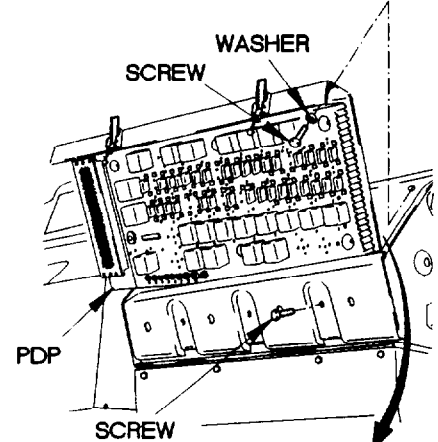
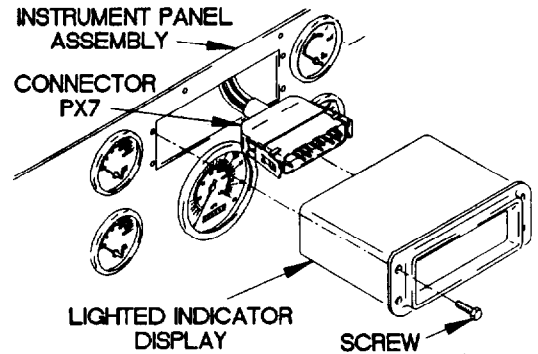
8.  
Is continuity present between connector P110-S and connector P111-G?

<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, CTIS cable assembly is faulty. If continuity is present, wire 1911 is faulty.



**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 connector P111 from connector J111.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P110-S.
- (8) Connect negative (-) probe of multimeter to connector P111-G and note reading on multimeter.
- (9) If continuity is not present, replace CTIS cable assembly (para 7-53).
- (10) If continuity is present, repair wire 1911 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (11) Connect connector P111 to connector J111.
- (12) Install PDP on dashboard with three screws.
- (13) Install three washers and screws in PDP.
- (14) Install PDP cover (para 16-2).
- (15) Connect lighted indicator display to connector PX7.
- (16) Position lighted indicator display in instrument panel assembly with four screws.
- (17) Tighten four screws to 6-10 lb-in. (1 N·m).

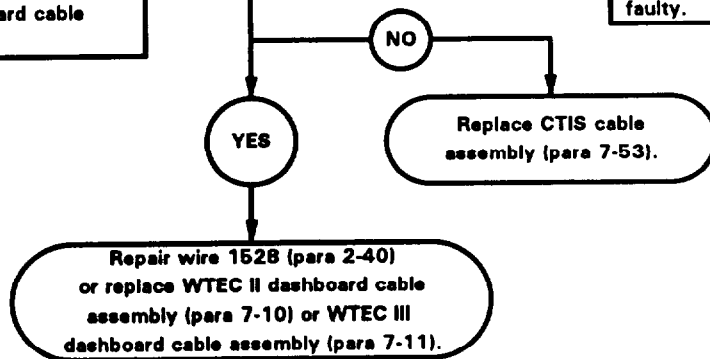


e25. CTIS OVERSPEED INDICATOR DOES NOT OPERATE (CONT)

<b>KNOWN INFO</b>
CTIS operates normally. Relay K52 OK. Lighted indicator display OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty dashboard cable assembly.

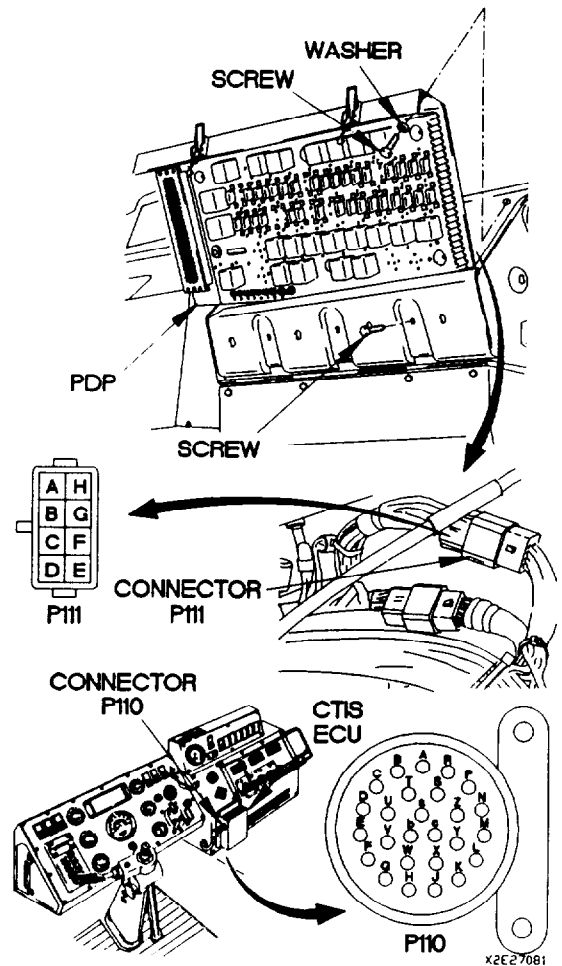
9.  
Is continuity present between connector P110-E and connector P111-D?

<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, CTIS cable assembly is faulty. If continuity is present, wire 1528 is faulty.

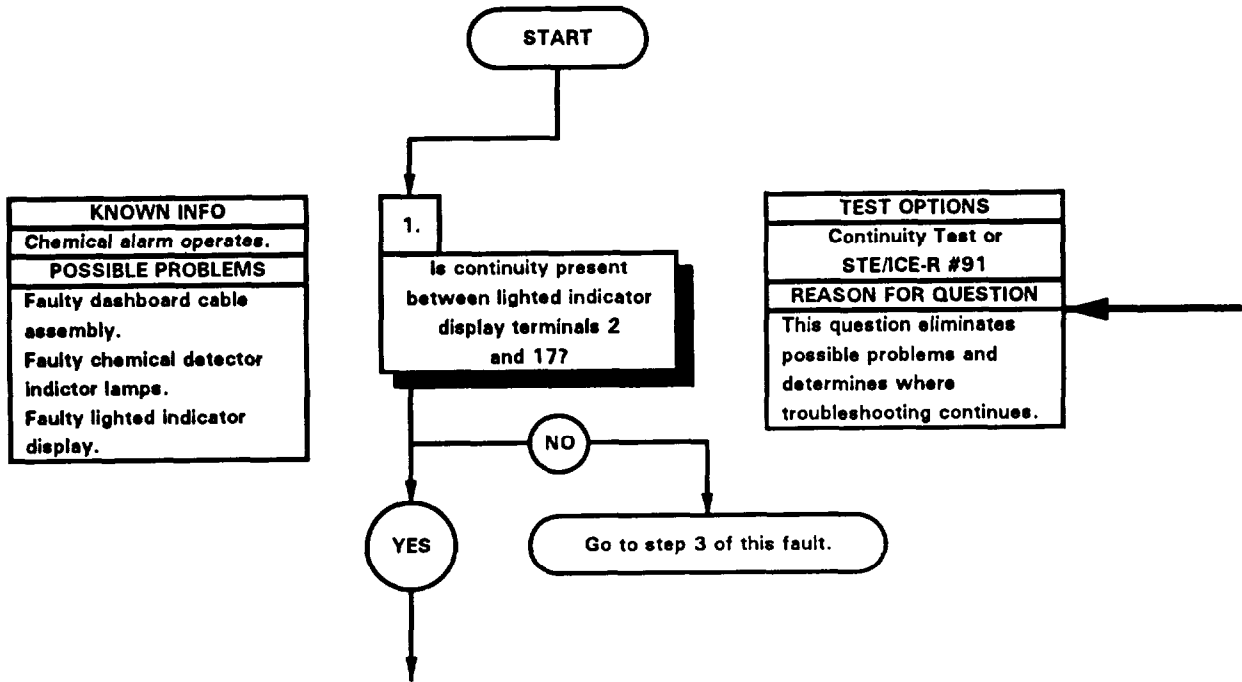


**CONTINUITY TEST**

- (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 connector P111 from connector J111.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P110-E.
- (8) Connect negative (-) probe of multimeter to connector P111-D and note reading on multimeter.
- (9) If continuity is not present, replace CTIS cable assembly (para 7-53).
- (10) If continuity is present, repair wire 1528 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (11) Connect connector P111 to connector J111.
- (12) Install PDP on dashboard with three screws.
- (13) Install three washers and screws in PDP.
- (14) Install PDP cover (para 16-2).
- (15) Connect connector P110 to CTIS ECU.

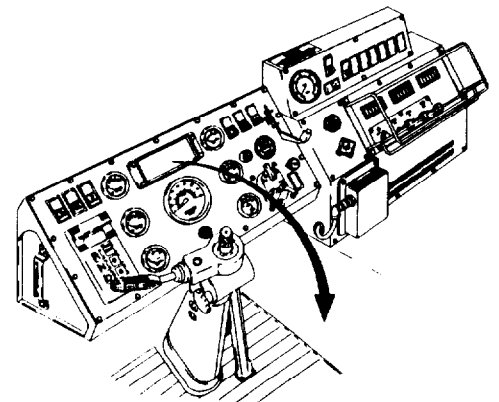


26. CHEMICAL DETECTOR INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

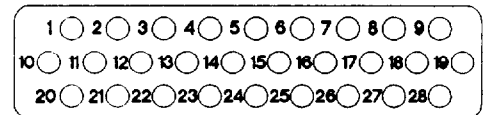


**CONTINUITY TEST**

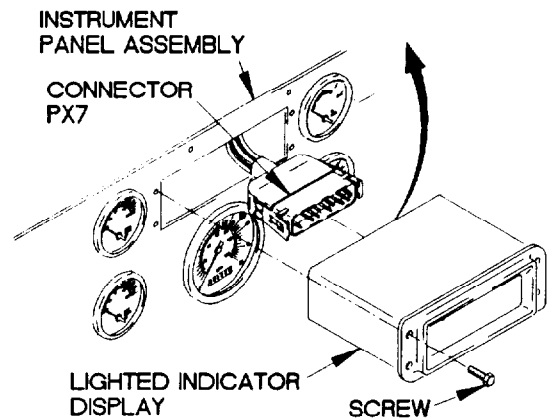
- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to lighted indicator display terminal 2.
- (6) Connect negative (-) probe of multimeter to lighted indicator display terminal 17 and note reading on multimeter.
- (7) If continuity is not present, go to step 3 of this fault.



**BOTTOM**



**LIGHTED INDICATOR DISPLAY**



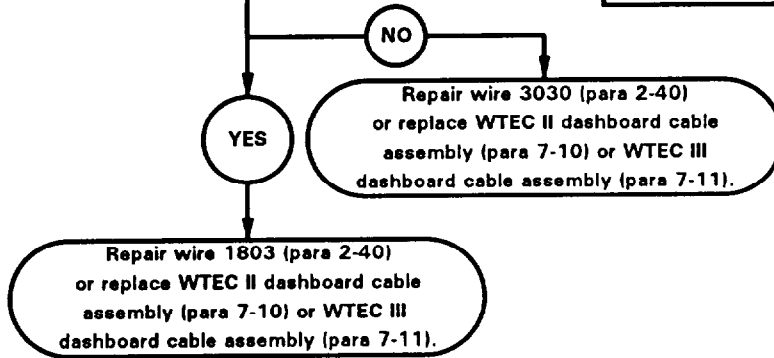
X2E2801A

e26. CHEMICAL DETECTOR INDICATOR DOES NOT OPERATE (CONT)

KNOWN INFO
Chemical alarm operates. Lighted indicator display OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.

2.  
Is continuity present between connector PX7-17 and a known good ground?

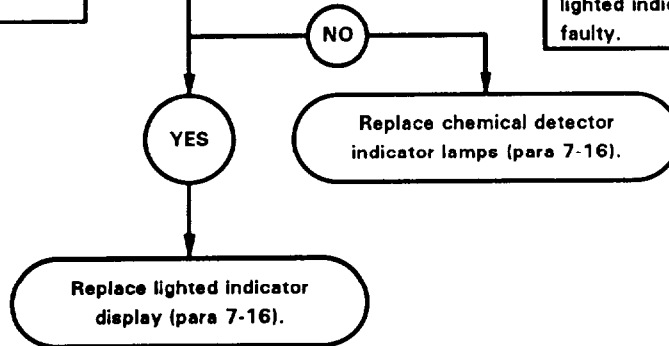
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3030 is faulty. If continuity is present, wire 1803 is faulty.



KNOWN INFO
Chemical alarm operates. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty chemical detector indicator lamps. Faulty lighted indicator display.

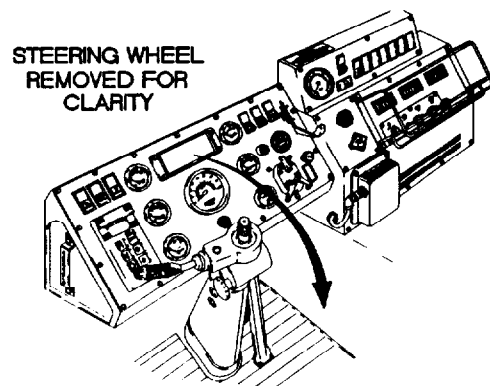
3.  
Is continuity present through chemical detector indicator lamps?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, chemical detector indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.

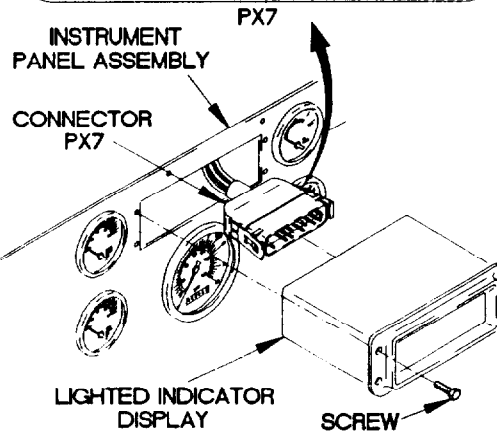
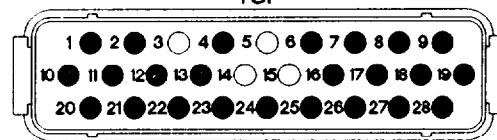


**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX7-17.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3030 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) If continuity is present, repair wire 1803 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) Connect lighted indicator display to connector PX7.
- (7) Position lighted indicator display in instrument panel assembly with four screws.
- (8) Tighten four screws to 6-10 lb-in. (1 N·m).
- (9) Connect batteries (para 7-48).

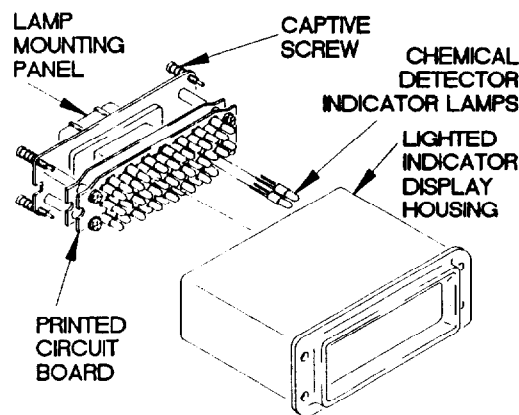


TOP



**CONTINUITY TEST**

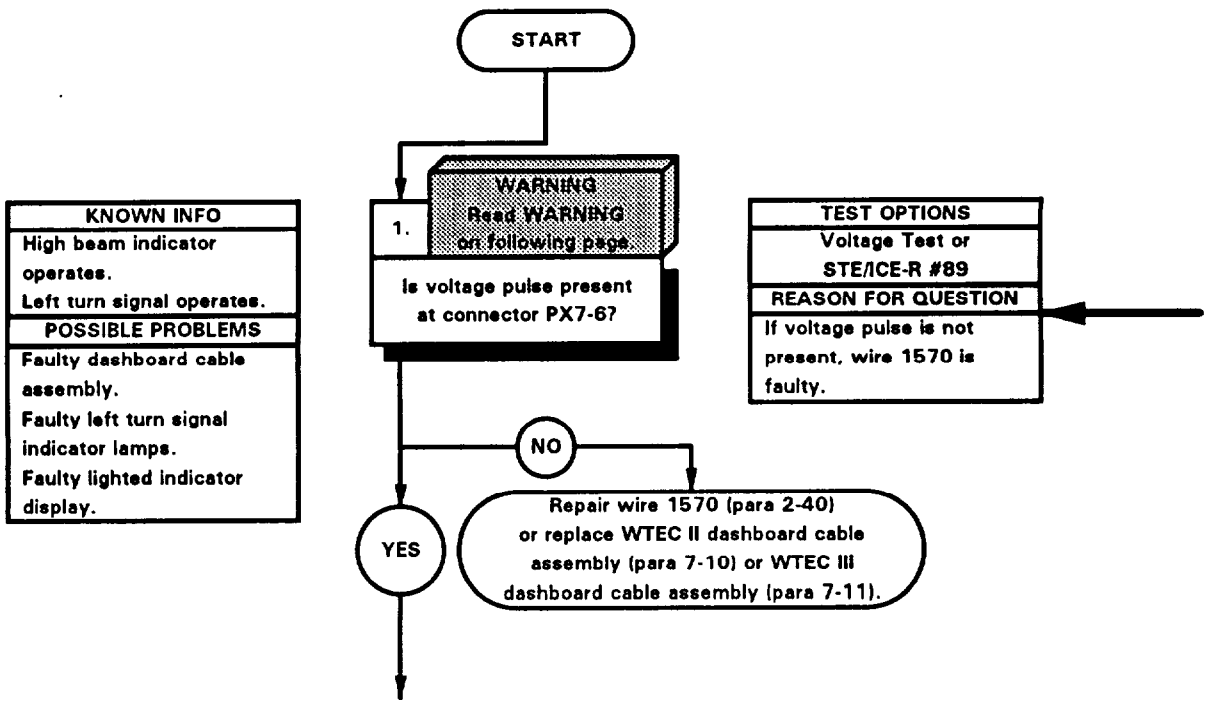
- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove chemical detector indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each chemical detector indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install chemical detector indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 6-10 lb-in. (1 N·m).
- (14) Connect batteries (para 7-48).



X2E2802A



●27. LEFT TURN SIGNAL INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

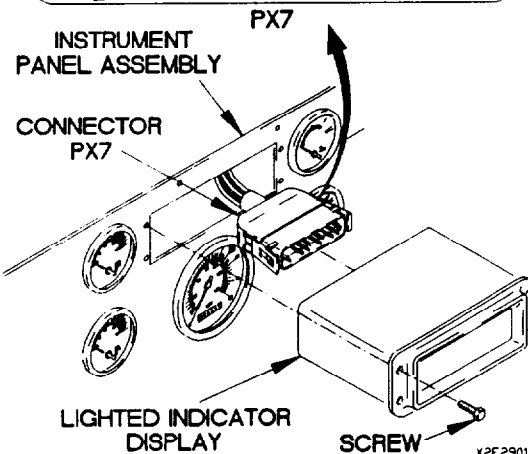
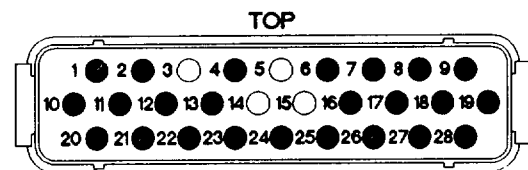
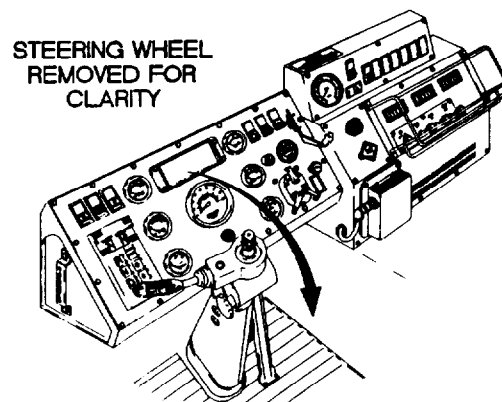


**WARNING**

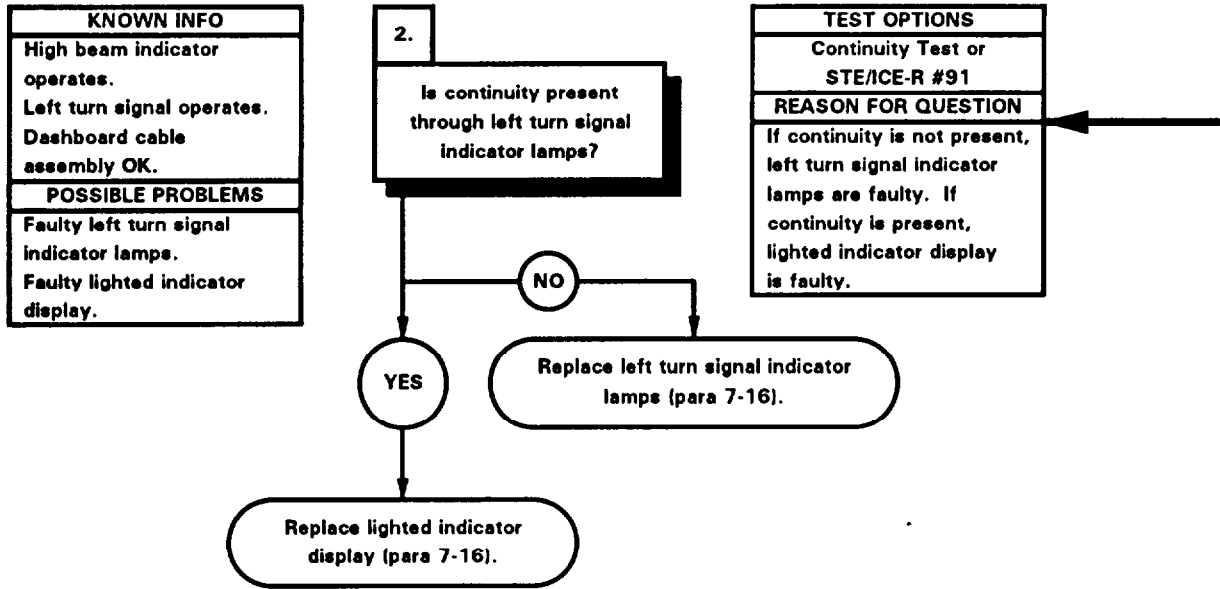
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Connect batteries (para 7-48).
- (5) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to connector PX7-6.
- (7) Connect negative (-) probe of multimeter to ground.
- (8) Position master power switch to on (TM 9-2320-365-10).
- (9) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (10) Position turn signal to left turn signal position (TM 9-2320-365-10) and note reading on multimeter.
- (11) If voltage pulse is not present, repair wire 1570 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (12) Position master power switch to off (TM 9-2320-365-10).
- (13) Position main light switch to OFF (TM 9-2320-365-10).
- (14) Position turn signal switch to middle position (TM 9-2320-365-10).



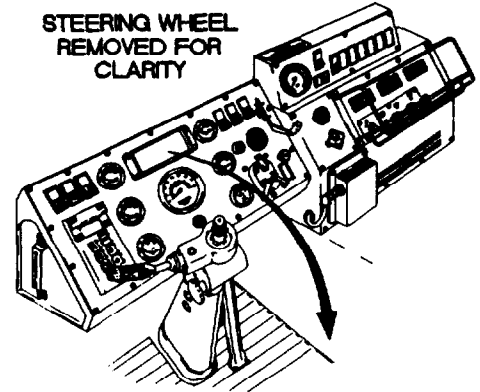
e27. LEFT TURN SIGNAL INDICATOR DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

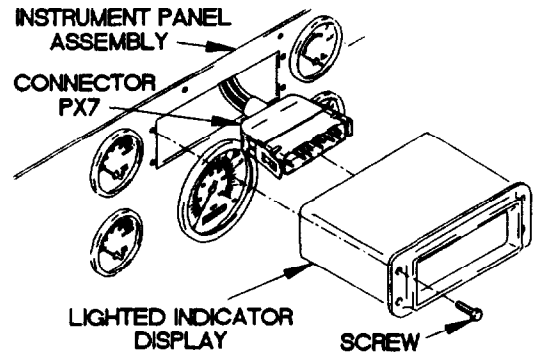
- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove left turn signal indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each left turn signal indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install left turn signal indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Disconnect batteries (para 7-48).
- (12) Connect lighted indicator display to connector PX7.
- (13) Position lighted indicator display in instrument panel assembly with four screws.
- (14) Tighten four screws to 6-10 lb-in. (1 N·m).

STEERING WHEEL  
REMOVED FOR  
CLARITY



INSTRUMENT PANEL  
ASSEMBLY

CONNECTOR  
PX7



LIGHTED INDICATOR  
DISPLAY

SCREW

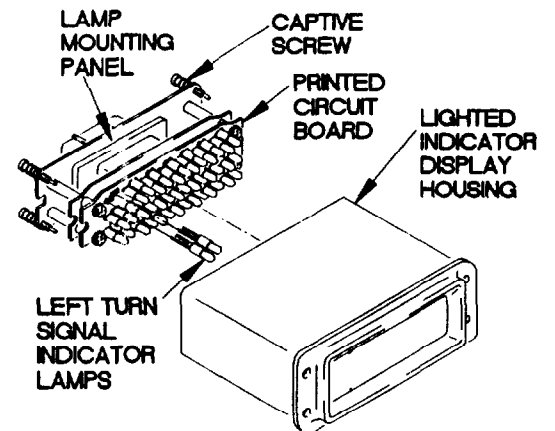
LAMP  
MOUNTING  
PANEL

CAPTIVE  
SCREW

PRINTED  
CIRCUIT  
BOARD

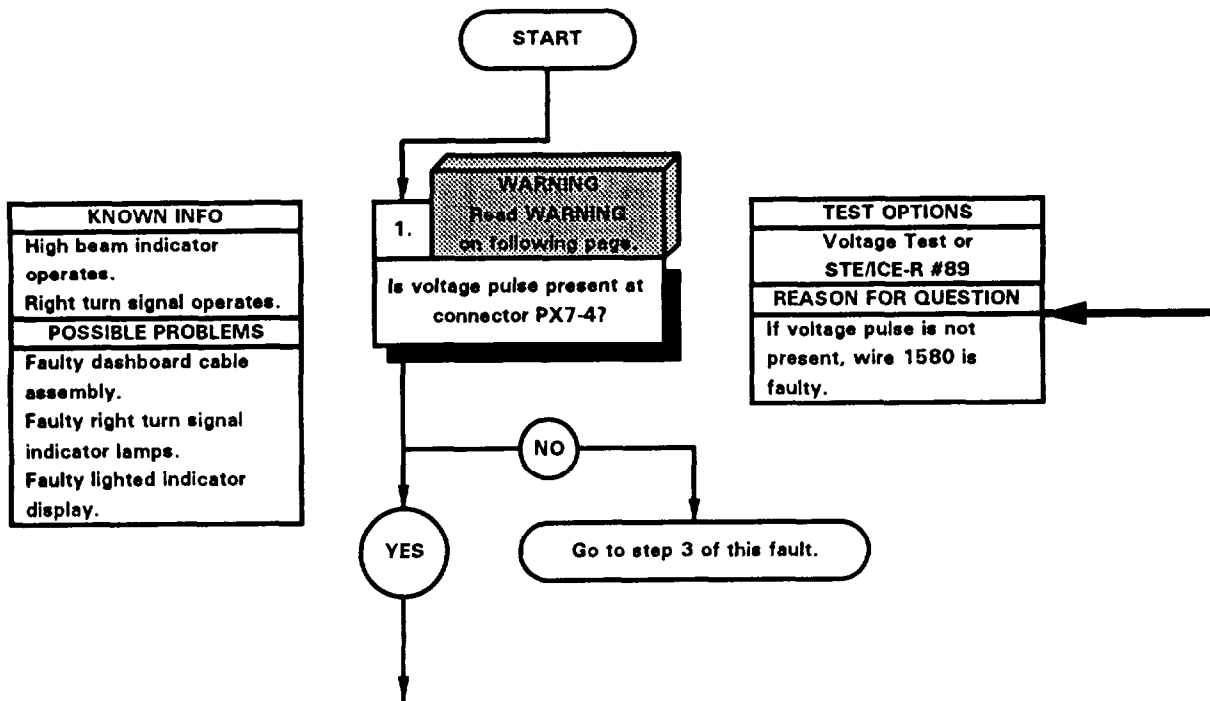
LIGHTED  
INDICATOR  
DISPLAY  
HOUSING

LEFT TURN  
SIGNAL  
INDICATOR  
LAMPS



x2E2962A

e28. RIGHT TURN SIGNAL INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

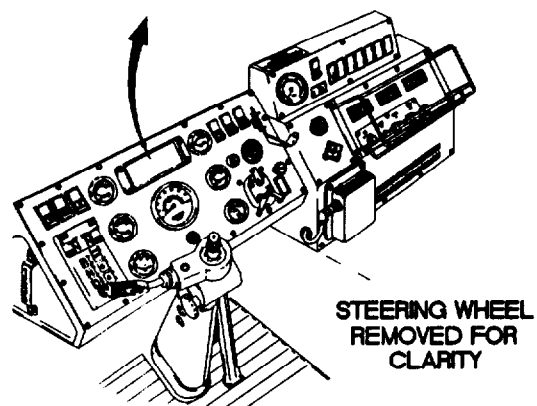
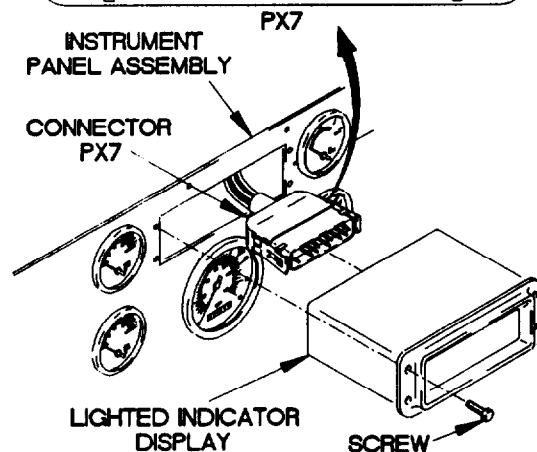
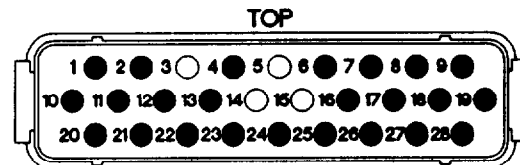


**WARNING**

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.

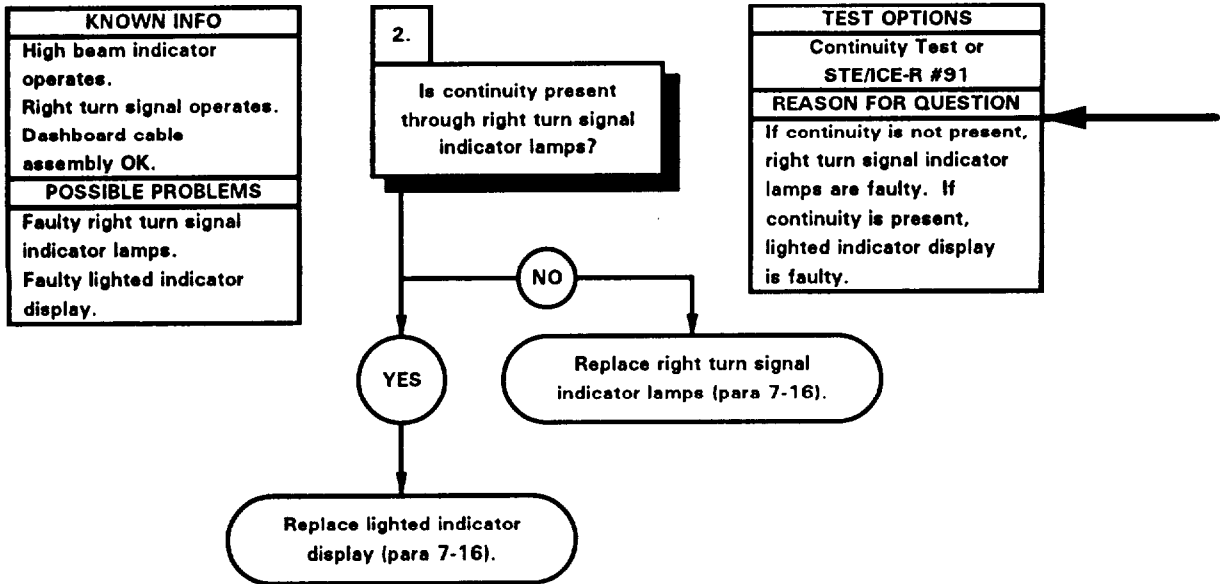
**VOLTAGE TEST**

- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Connect batteries (para 7-48).
- (5) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to connector PX7-4.
- (7) Connect negative (-) probe of multimeter to ground.
- (8) Position master power switch to on (TM 9-2320-365-10).
- (9) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (10) Position right signal to right turn signal position (TM 9-2320-365-10) and note reading on multimeter.
- (11) If voltage pulse is not present, go to step 3 of this fault.
- (12) Position master power switch to off (TM 9-2320-365-10).
- (13) Position main light switch to OFF (TM 9-2320-365-10).
- (14) Position turn signal control to middle position (TM 9-2320-365-10).



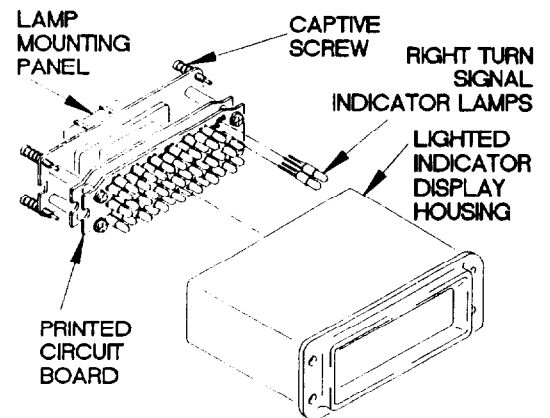
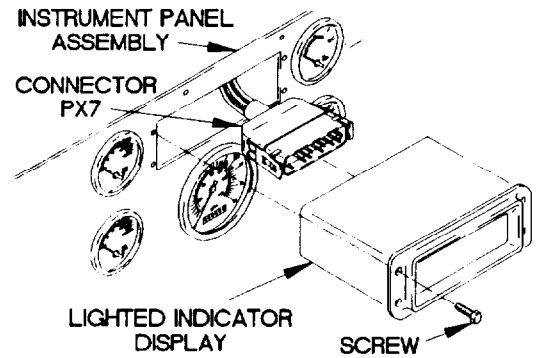
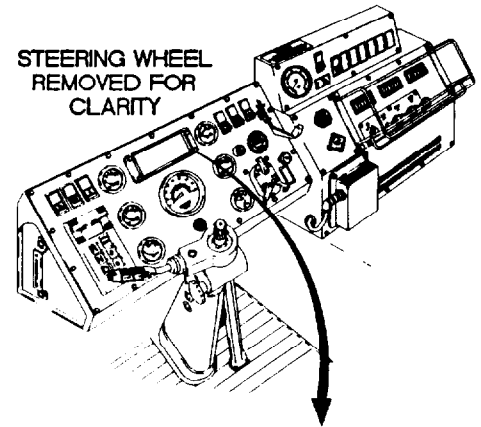
XPE 3001A

e28. RIGHT TURN SIGNAL INDICATOR DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

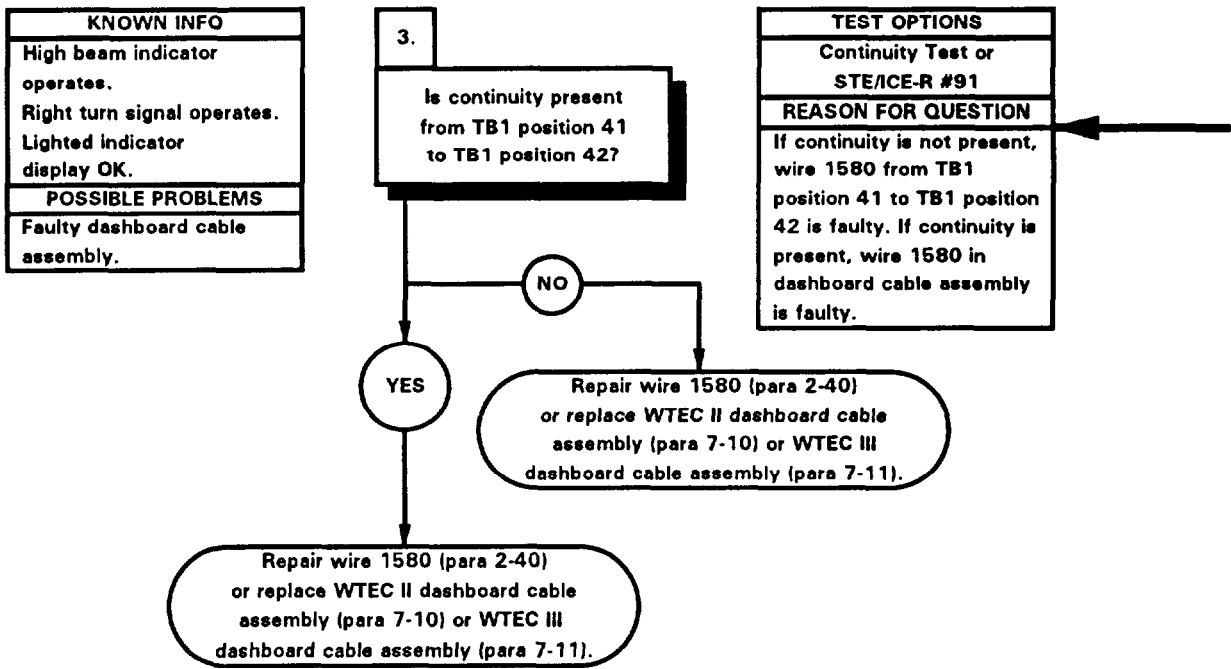
- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove right turn signal indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each right turn signal indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install right turn signal indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Disconnect batteries (para 7-48).
- (12) Connect lighted indicator display to connector PX7.
- (13) Position lighted indicator display in instrument panel assembly with four screws.
- (14) Tighten four screws to 6-10 lb-in. (1 N·m).
- (15) Connect batteries (para 7-48).



K2E 3002A

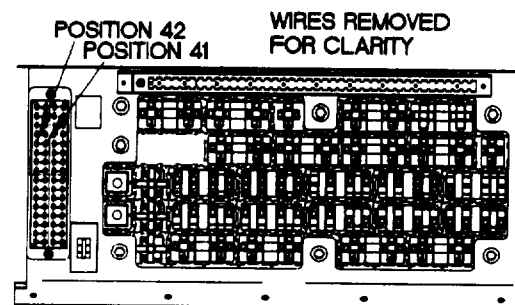
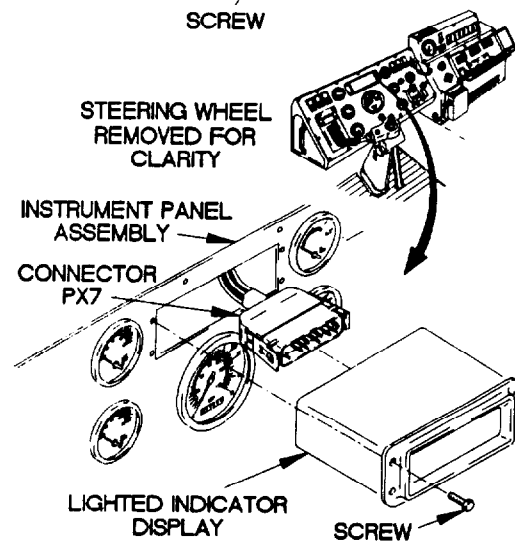
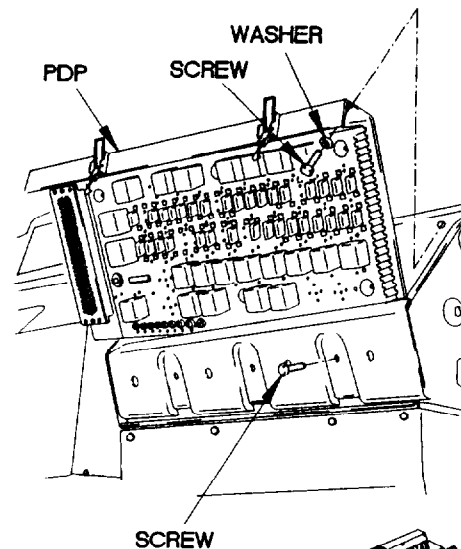


e28. RIGHT TURN SIGNAL INDICATOR DOES NOT OPERATE (CONT)



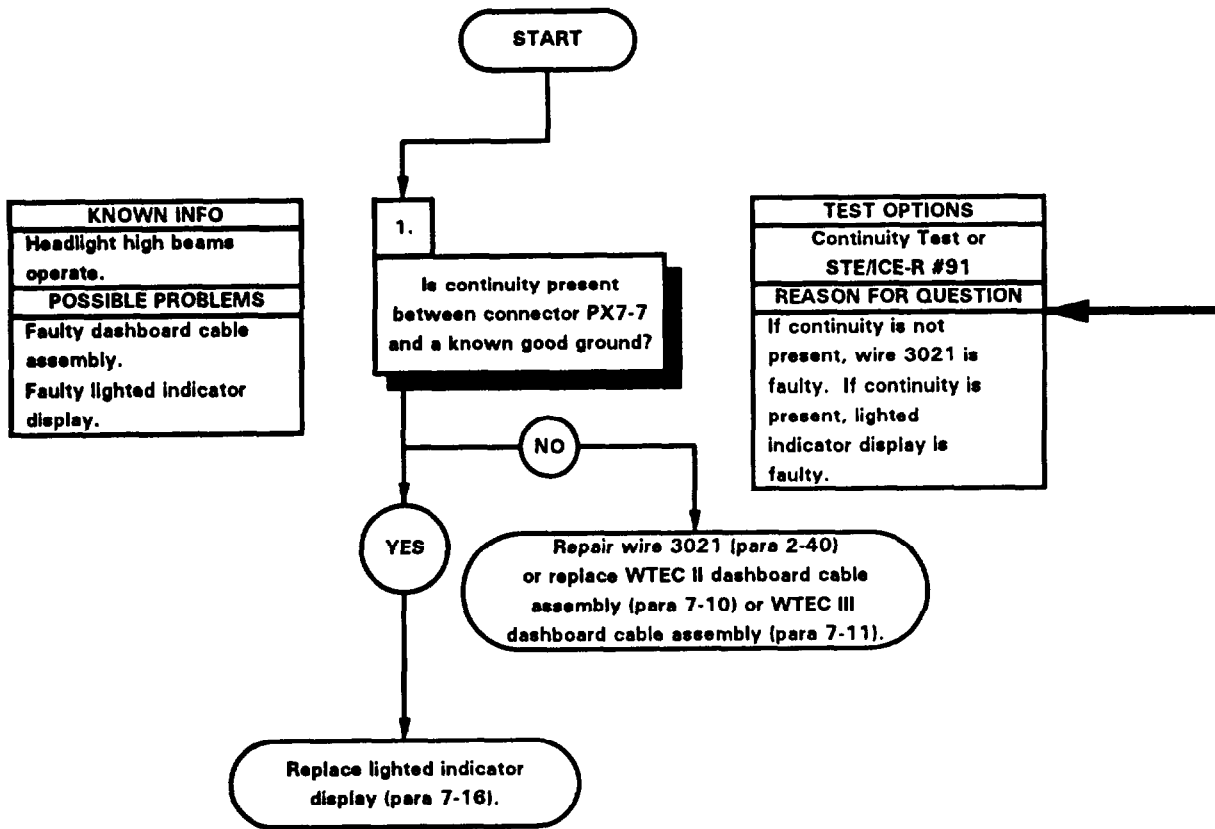
**CONTINUITY TEST**

- (1) Disconnect batteries (para 7-48).
- (2) Remove PDP cover (para 16-2).
- (3) Remove three screws and washers from PDP.
- (4) Remove three screws from PDP.
- (5) Lift PDP outward to gain access.
- (6) Connect positive (+) probe of multimeter to TB1 position 41.
- (7) Connect negative (-) probe of multimeter to TB1 position 42 and note reading on multimeter.
- (8) If continuity is not present, repair wire 1580 from TB1 position 41 to TB1 position 42 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) If continuity is present, repair wire 1580 in dashboard cable assembly (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) Install PDP on dashboard with three screws.
- (11) Install three washers and screws in PDP.
- (12) Install PDP cover (para 16-2).
- (13) Connect lighted indicator display to connector PX7.
- (14) Position lighted indicator display in instrument panel assembly with four screws.
- (15) Tighten four screws to 6-10 lb-in. (1 Nm).
- (16) Connect batteries (para 7-48).



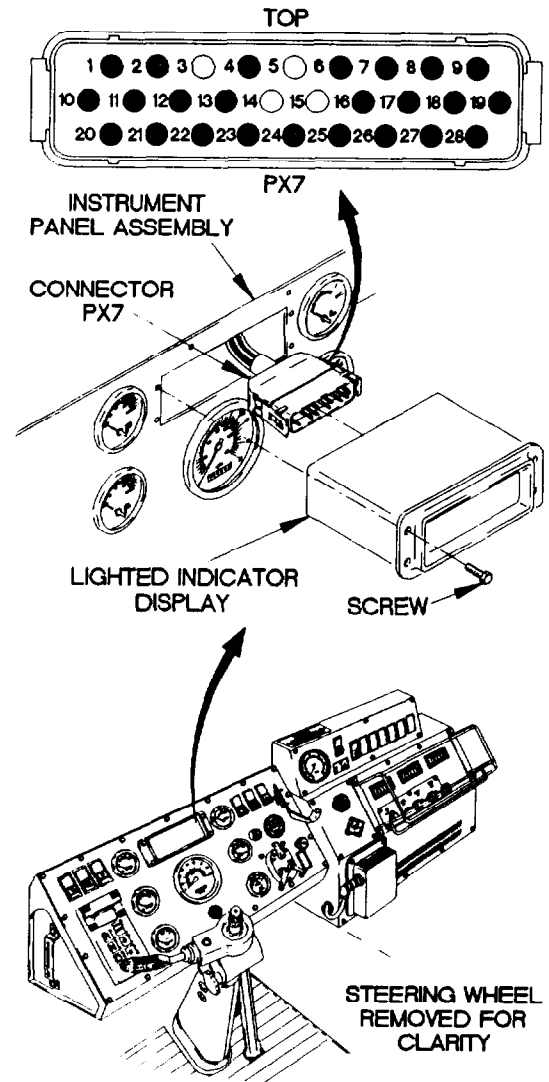
x2E 30031

●29. TURN SIGNAL INDICATORS AND HIGH BEAMS ON INDICATOR DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



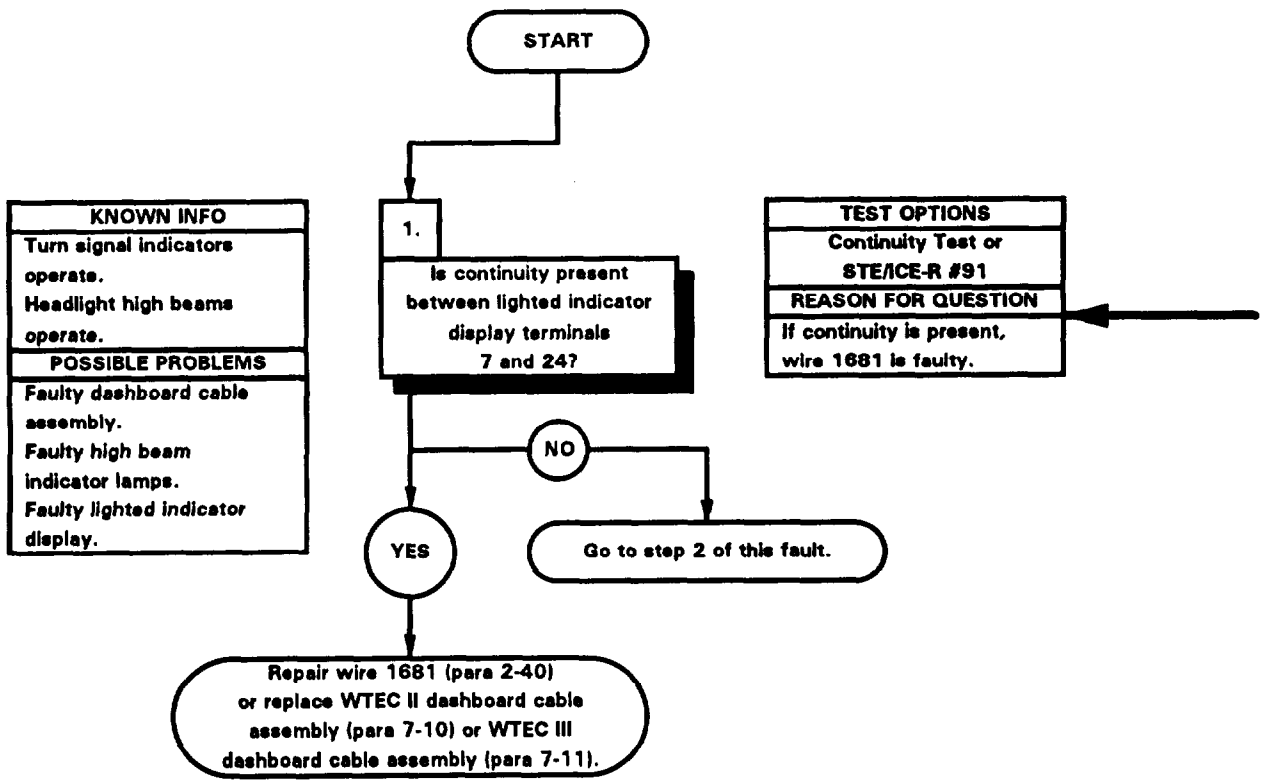
**CONTINUITY TEST**

- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector PX7-7.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is not present, repair wire 3021 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) If continuity is present, replace lighted indicator display (para 7-16).
- (9) Connect lighted indicator display to connector PX7.
- (10) Position lighted indicator display in instrument panel assembly with four screws.
- (11) Tighten four screws to 6-10 lb-in. (1 N·m).
- (12) Connect batteries (para 7-48).



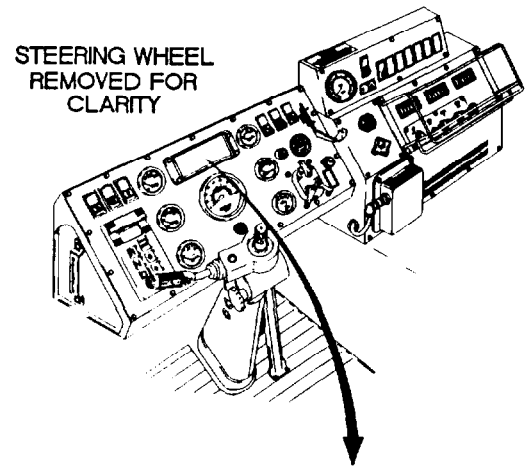
x2E 3101A

30. HIGH BEAMS ON INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

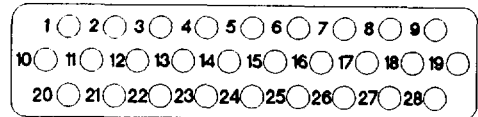


**CONTINUITY TEST**

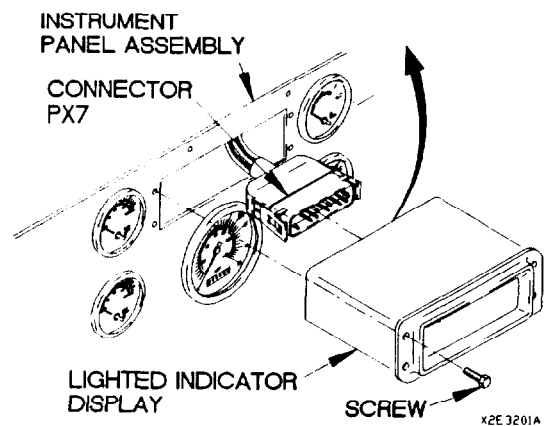
- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to lighted indicator display terminal 7.
- (6) Connect negative (-) probe of multimeter to lighted indicator display terminal 24 and note reading on multimeter.
- (7) If continuity is present, repair wire 1681 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



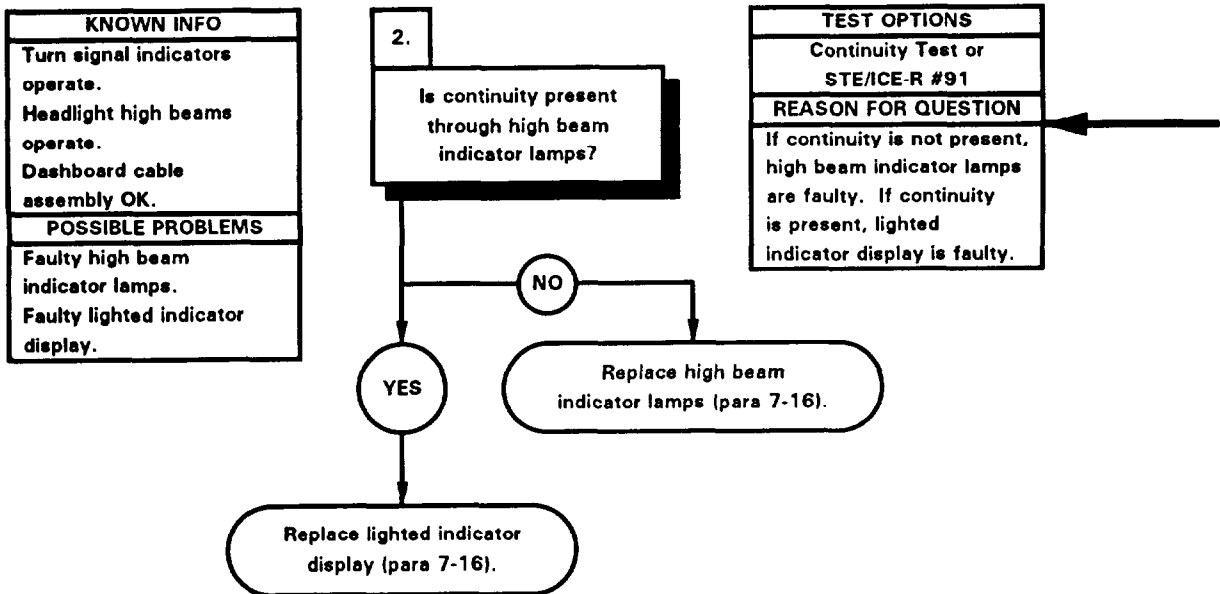
**BOTTOM**



**LIGHTED INDICATOR DISPLAY**

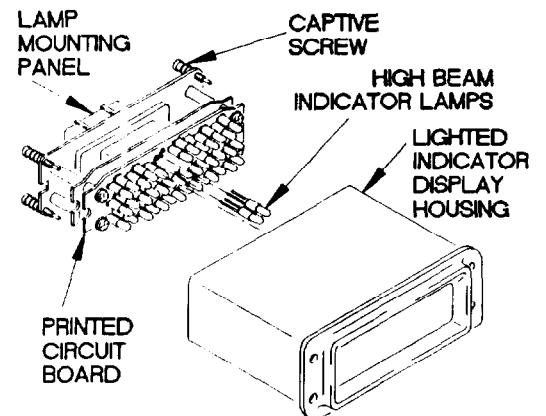
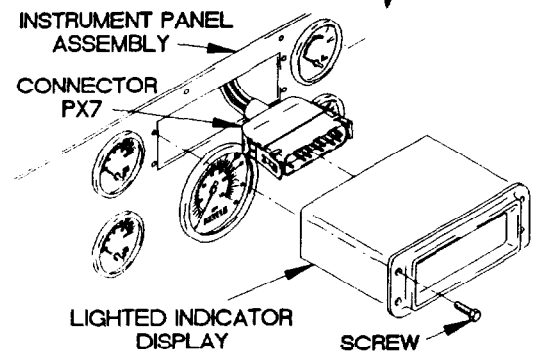
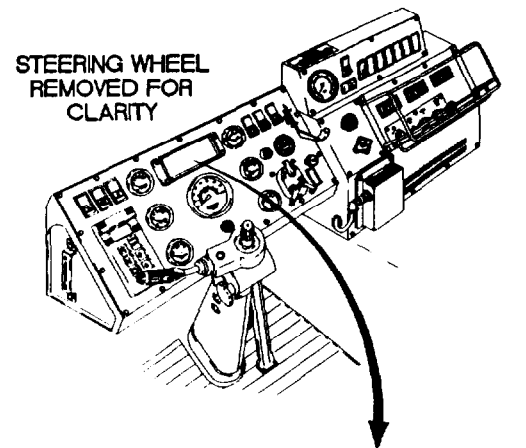


e30. HIGH BEAMS ON INDICATOR DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

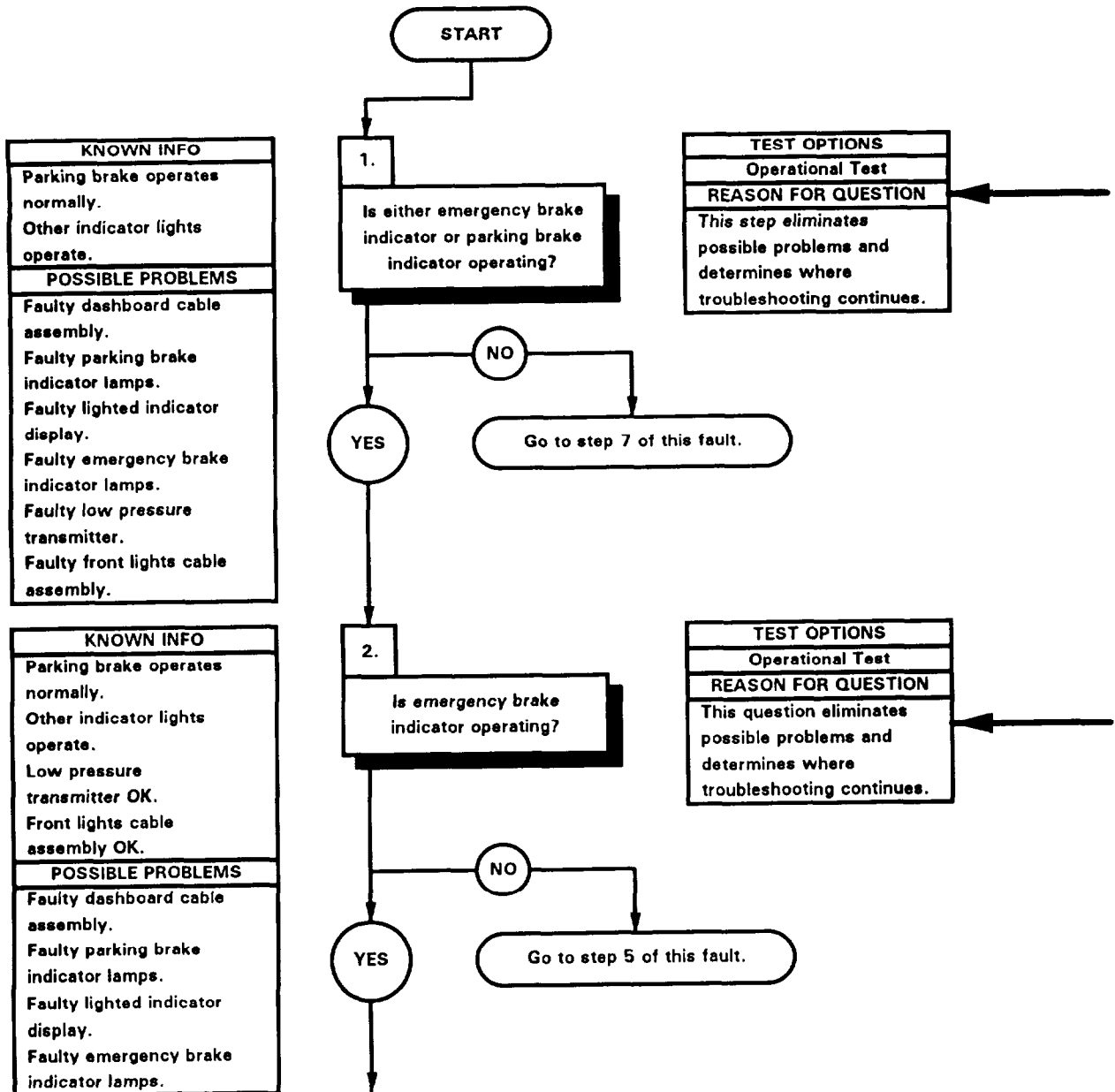
- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove high beam indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each high beam indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install high beam indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 6-10 lb-in. (1 N·m).
- (14) Connect batteries (para 7-48).



x2E 3202A

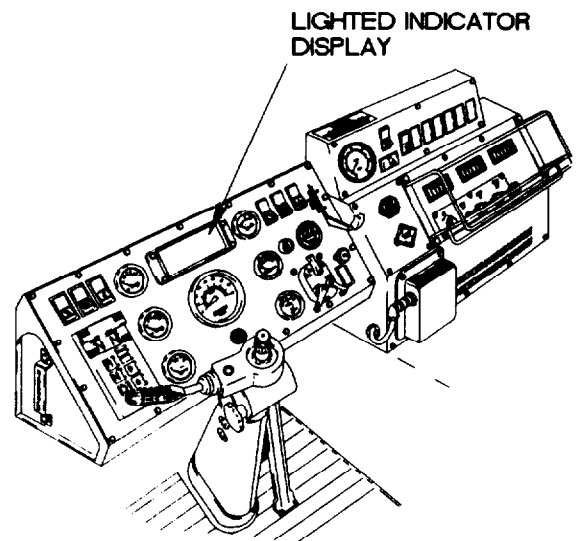


31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)
<b>References</b> TM 9-4910-571-12&P	



**OPERATIONAL TEST**

- (1) Start engine (TM 9-2320-365-10).
- (2) Visually check lighted indicator display.
- (3) If emergency brake and parking brake indicator lights do not operate, go to step 7 of this fault.



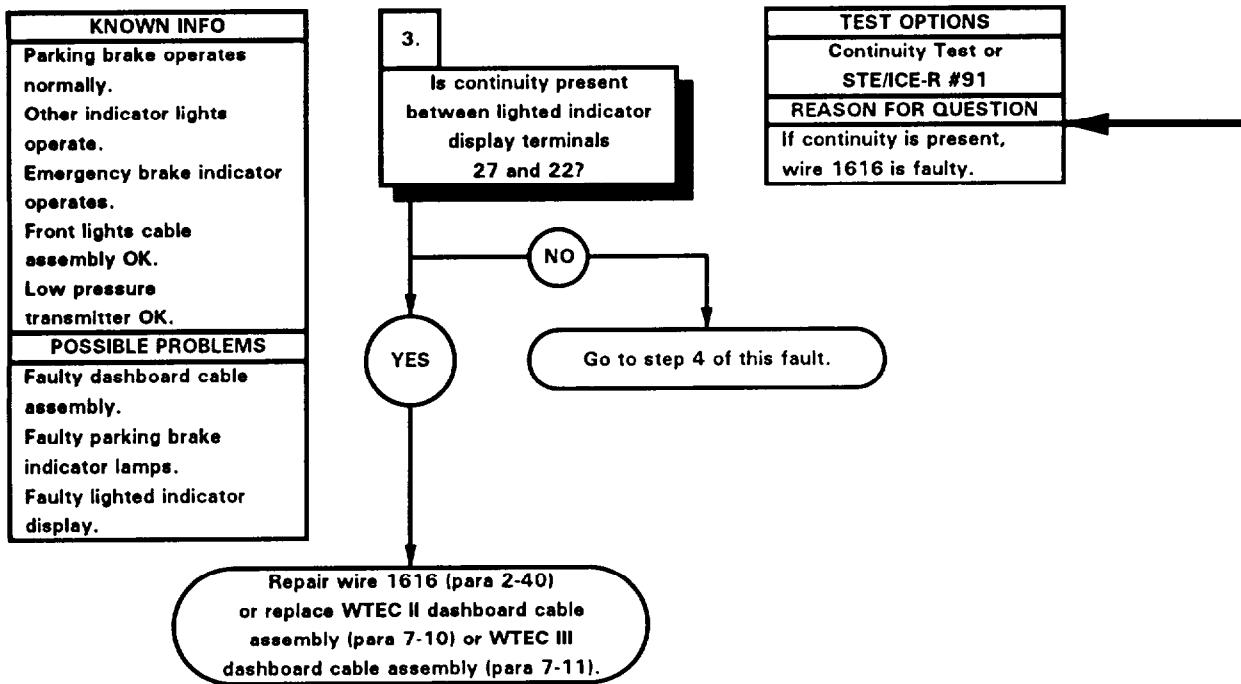
STEERING WHEEL  
REMOVED FOR  
CLARITY

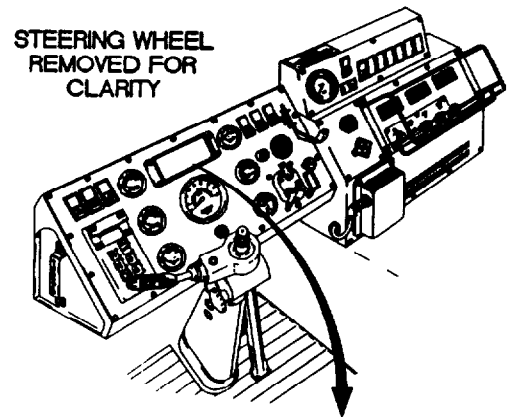
X2E3301A

**OPERATIONAL TEST**

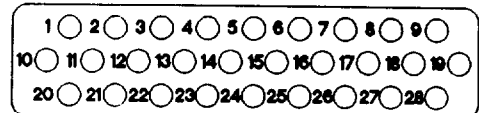
- (1) Visually check lighted indicator display.
- (2) If parking brake indicator operates and emergency brake indicator does not, go to step 5 of this fault.
- (3) Shut down engine (TM 9-2320-365-10).

631. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT OPERATE (CONT)





BOTTOM

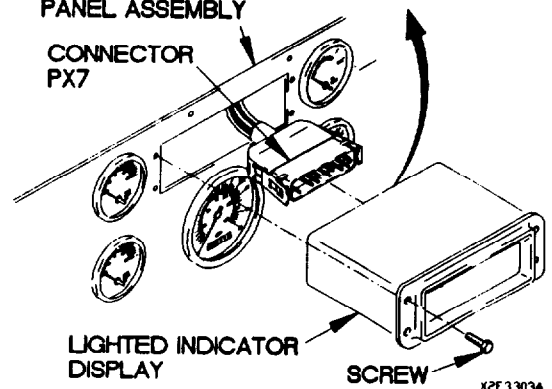


LIGHTED INDICATOR DISPLAY

- CONTINUITY TEST**
- (1) Disconnect batteries (para 7-48).
  - (2) Remove four screws from lighted indicator display.
  - (3) Remove lighted indicator display from instrument panel assembly.
  - (4) Disconnect connector PX7 from lighted indicator display.
  - (5) Set multimeter to ohms.
  - (6) Connect positive (+) probe of multimeter to lighted indicator display terminal 27.
  - (7) Connect negative (-) probe of multimeter to lighted indicator display terminal 22 and note reading on multimeter.
  - (8) If continuity is not present, go to step 4 of this fault.
  - (9) If continuity is present, repair wire 1616 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

INSTRUMENT  
PANEL ASSEMBLY

CONNECTOR  
PX7

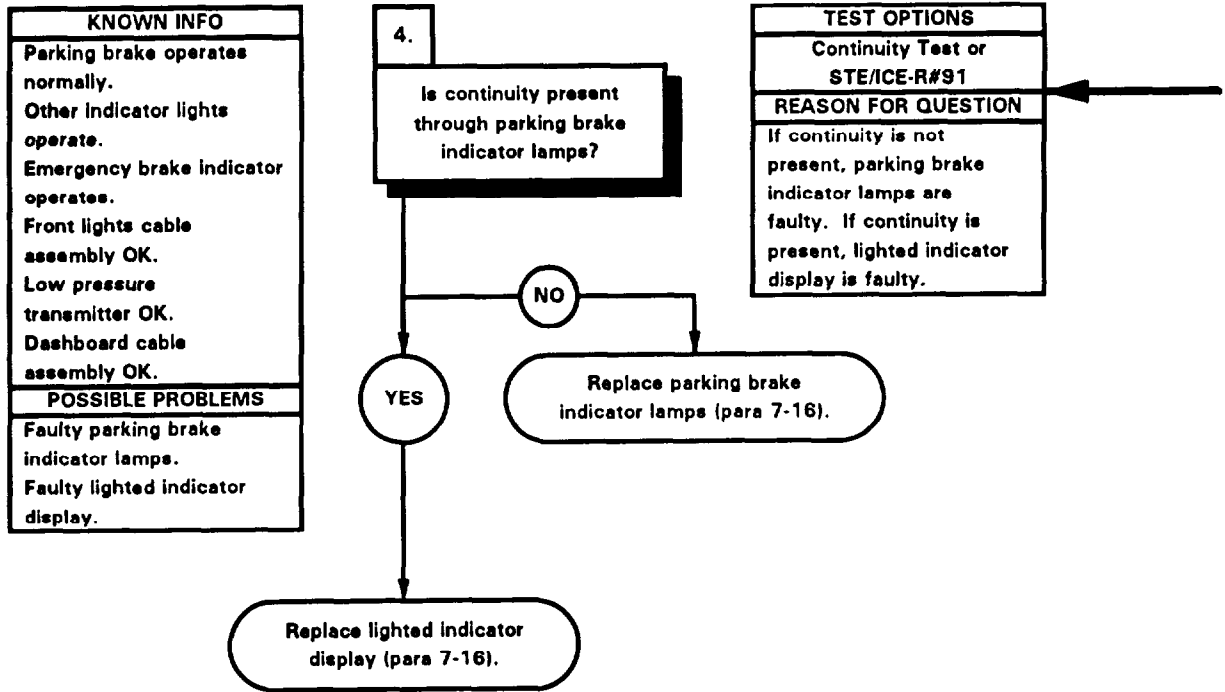


LIGHTED INDICATOR  
DISPLAY

SCREW

X2E3303A

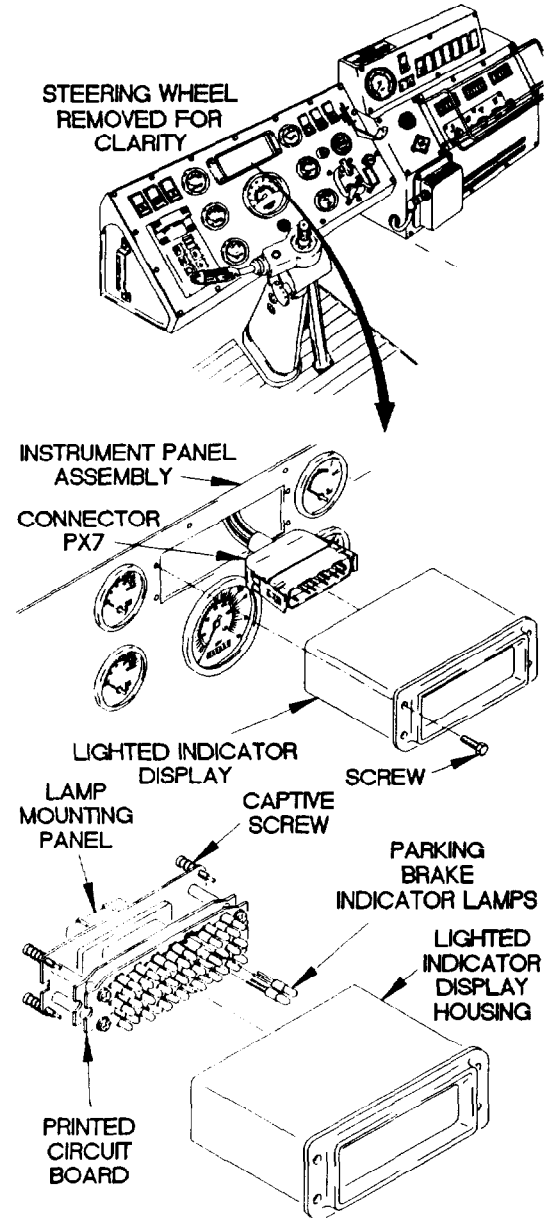
31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

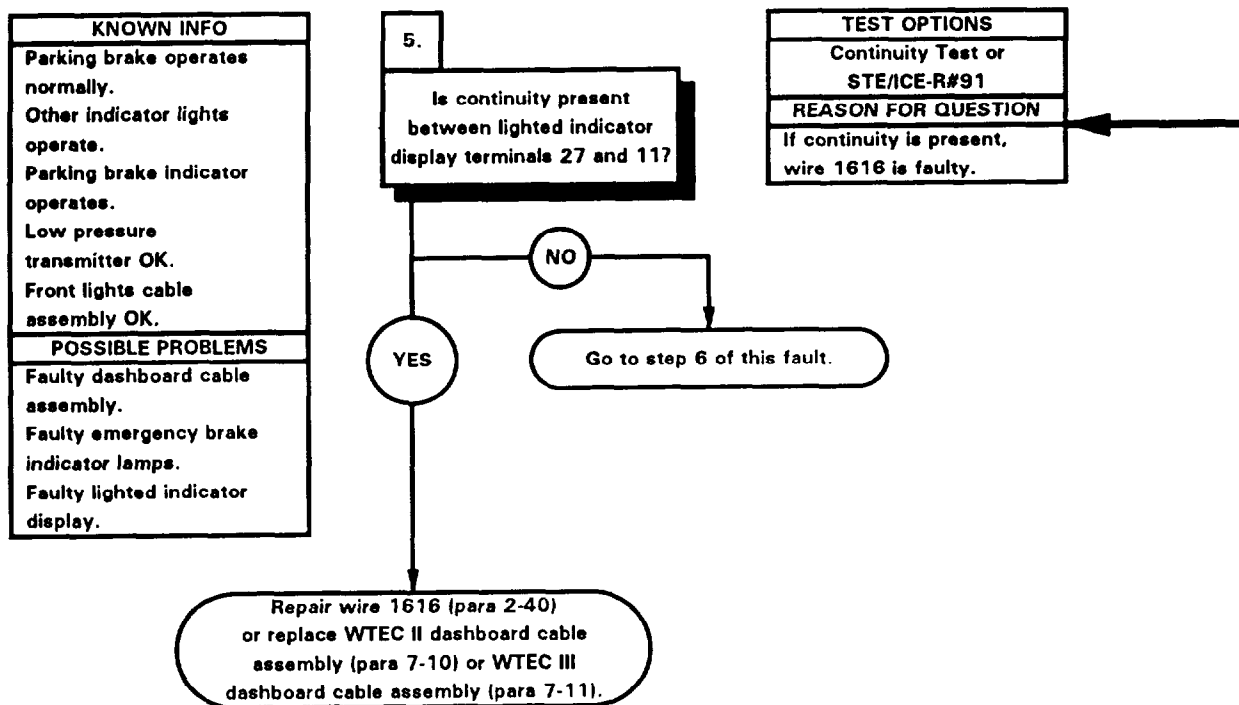
- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove parking brake indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each parking brake indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install parking brake indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 6-10 lb-in. (1 N-m).
- (14) Connect batteries (para 7-48).

STEERING WHEEL  
REMOVED FOR  
CLARITY



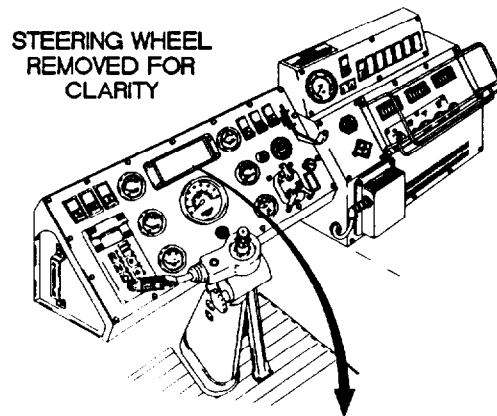
X2E3304A

31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT OPERATE (CONT)

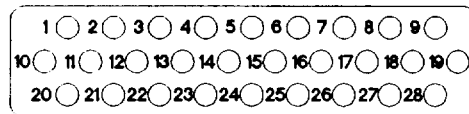


**CONTINUITY TEST**

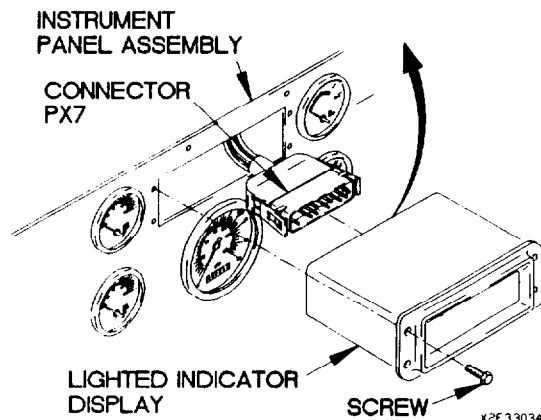
- (1) Disconnect batteries (para 7-48).
- (2) Remove four screws from lighted indicator display.
- (3) Remove lighted indicator display from instrument panel assembly.
- (4) Disconnect connector PX7 from lighted indicator display.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to lighted indicator display terminal 11.
- (7) Connect negative (-) probe of multimeter to lighted indicator display terminal 22 and note reading on multimeter.
- (8) If continuity is not present, go to step 6 of this fault.
- (9) If continuity is present, repair wire 1616 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



**BOTTOM**



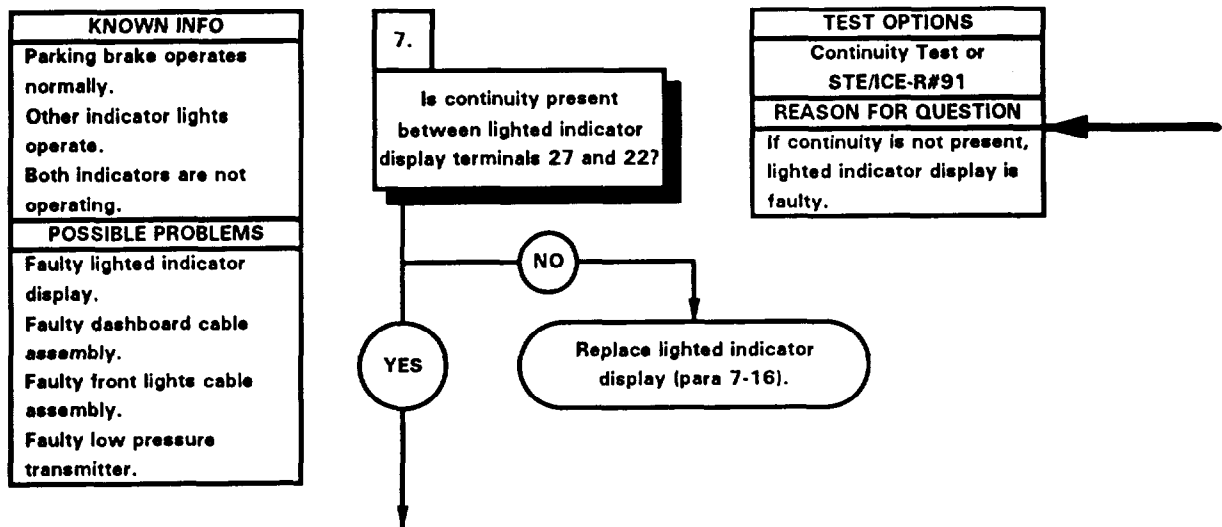
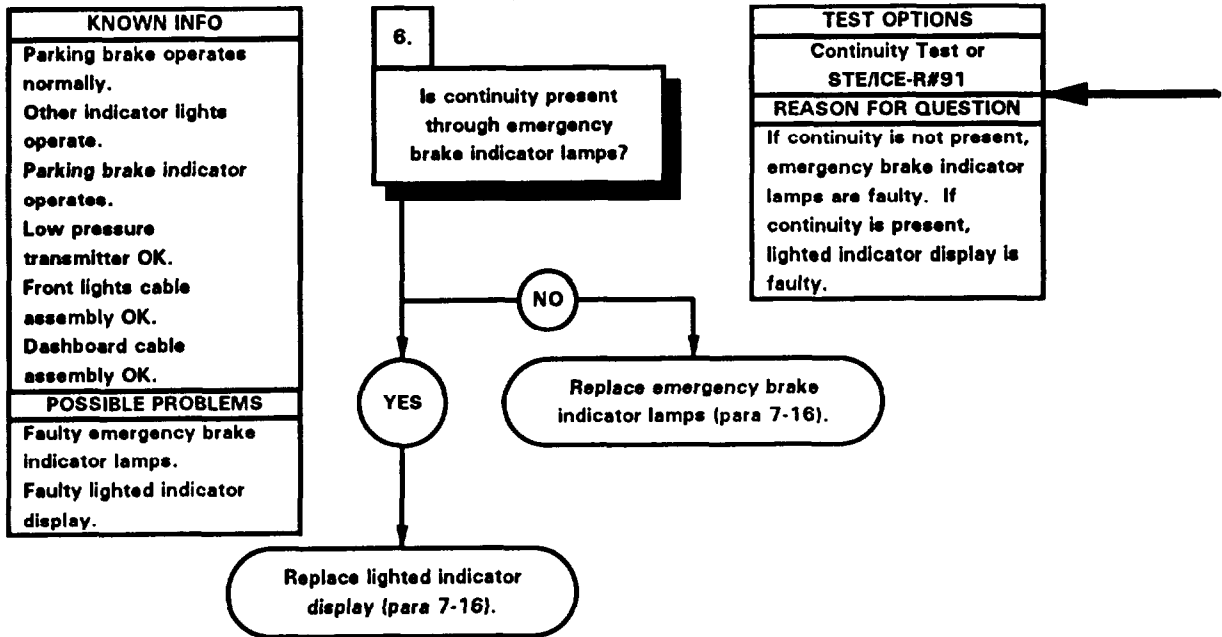
**LIGHTED INDICATOR DISPLAY**



K2E 3303A



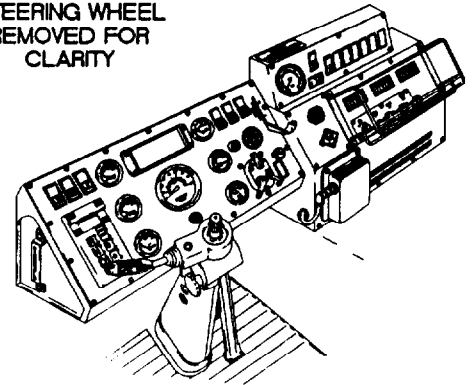
31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT OPERATE (CONT)



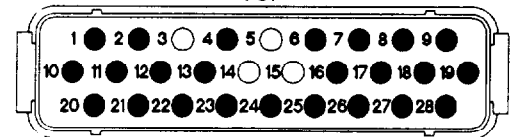
**CONTINUITY TEST**

- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove emergency brake indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each emergency brake indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install emergency brake indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 6-10 lb-in. (1 N·m).
- (14) Connect batteries (para 7-48).

STEERING WHEEL  
REMOVED FOR  
CLARITY



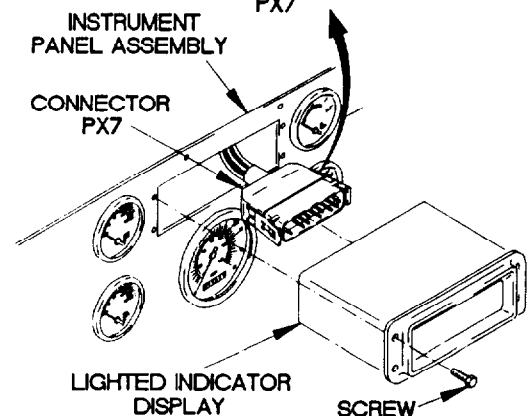
TOP



PX7

INSTRUMENT  
PANEL ASSEMBLY

CONNECTOR  
PX7



LIGHTED INDICATOR  
DISPLAY

SCREW

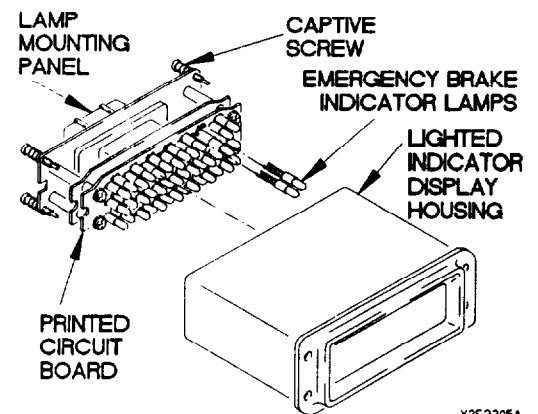
LAMP  
MOUNTING  
PANEL

CAPTIVE  
SCREW

EMERGENCY BRAKE  
INDICATOR LAMPS

LIGHTED  
INDICATOR  
DISPLAY  
HOUSING

PRINTED  
CIRCUIT  
BOARD



**CONTINUITY TEST**

- (1) Shut down engine (TM 9-2320-365-10).
- (2) Disconnect batteries (para 7-48).
- (3) Remove four screws from lighted indicator display.
- (4) Remove lighted indicator display from instrument panel assembly.
- (5) Disconnect connector PX7 from lighted indicator display.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to lighted indicator display terminal 27.
- (8) Connect negative (-) probe of multimeter to lighted indicator display terminal 22 and note reading on multimeter.
- (9) If continuity is not present, replace lighted indicator display (para 7-16).

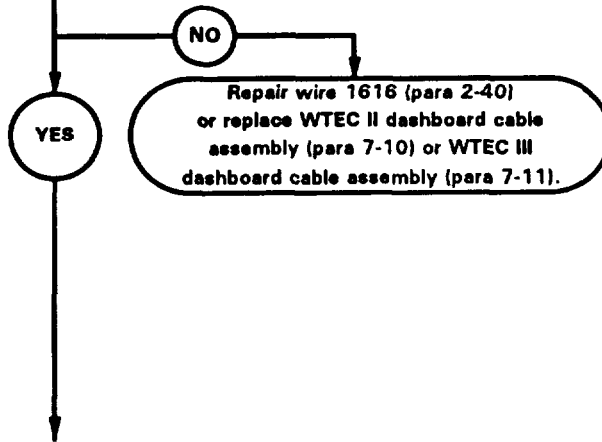
Y2E3305A

31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT OPERATE (CONT)

KNOWN INFO
Parking brake operates normally. Both indicator lights do not operate. Lighted indicator display OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty front lights cable assembly. Faulty low pressure transmitter.

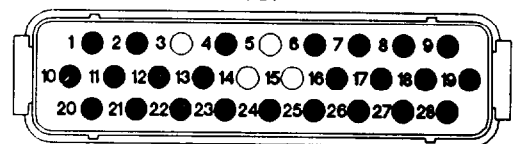
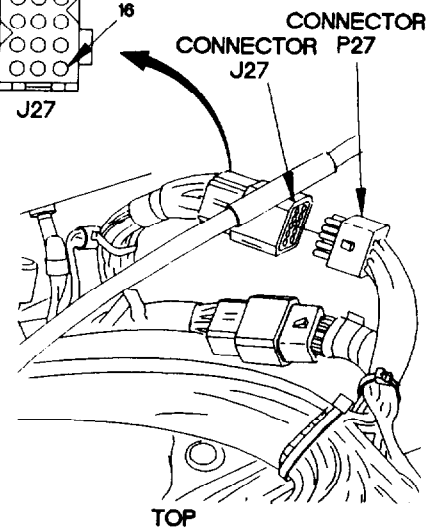
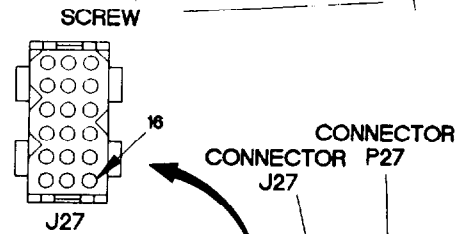
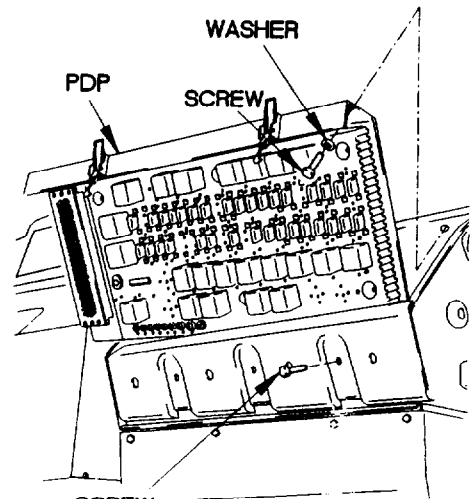
8.  
Is continuity present from connector PX7-22 to connector J27-167

TEST OPTIONS
Continuity Test or STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, wire 1616 is faulty.



**CONTINUITY TEST**

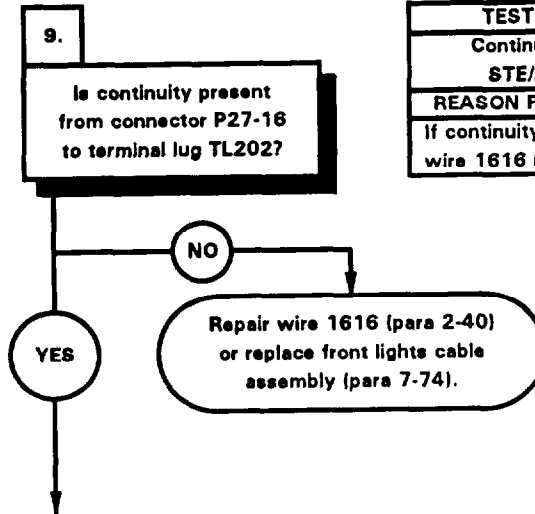
- (1) Remove PDP cover (para 16-2).
- (2) Remove three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Disconnect connector J27 from connector P27.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector PX7-22.
- (8) Connect negative (-) probe of multimeter to connector J27-16 and note reading on multimeter.
- (9) If continuity is not present, repair wire 1616 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



X2E33061

31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT OPERATE (CONT)

KNOWN INFO
Parking brake operates normally. Other indicator lights operate. Both indicators do not operate. Lighted indicator display OK.
POSSIBLE PROBLEMS
Faulty front lights cable assembly. Faulty dashboard cable assembly. Faulty low pressure transmitter.

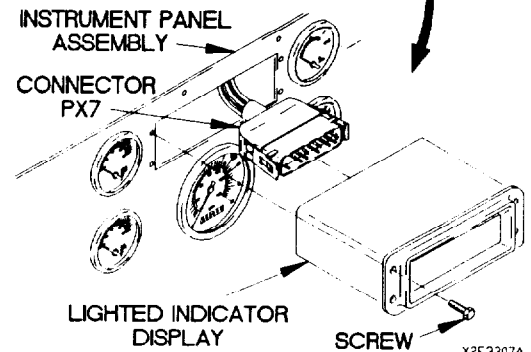
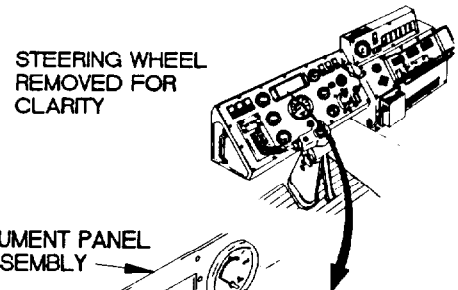
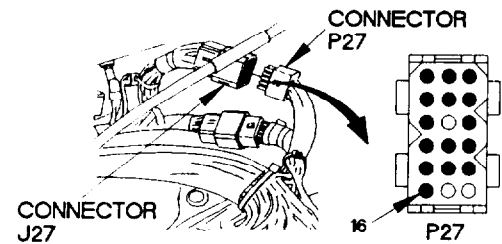
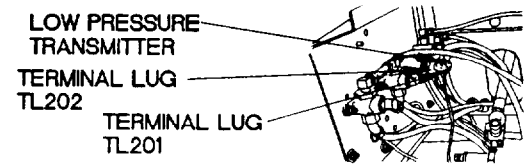
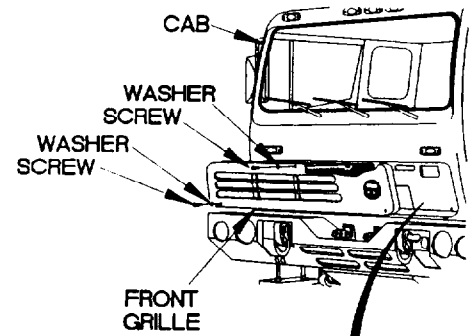


TEST OPTIONS
Continuity Test or STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, wire 1616 is faulty.

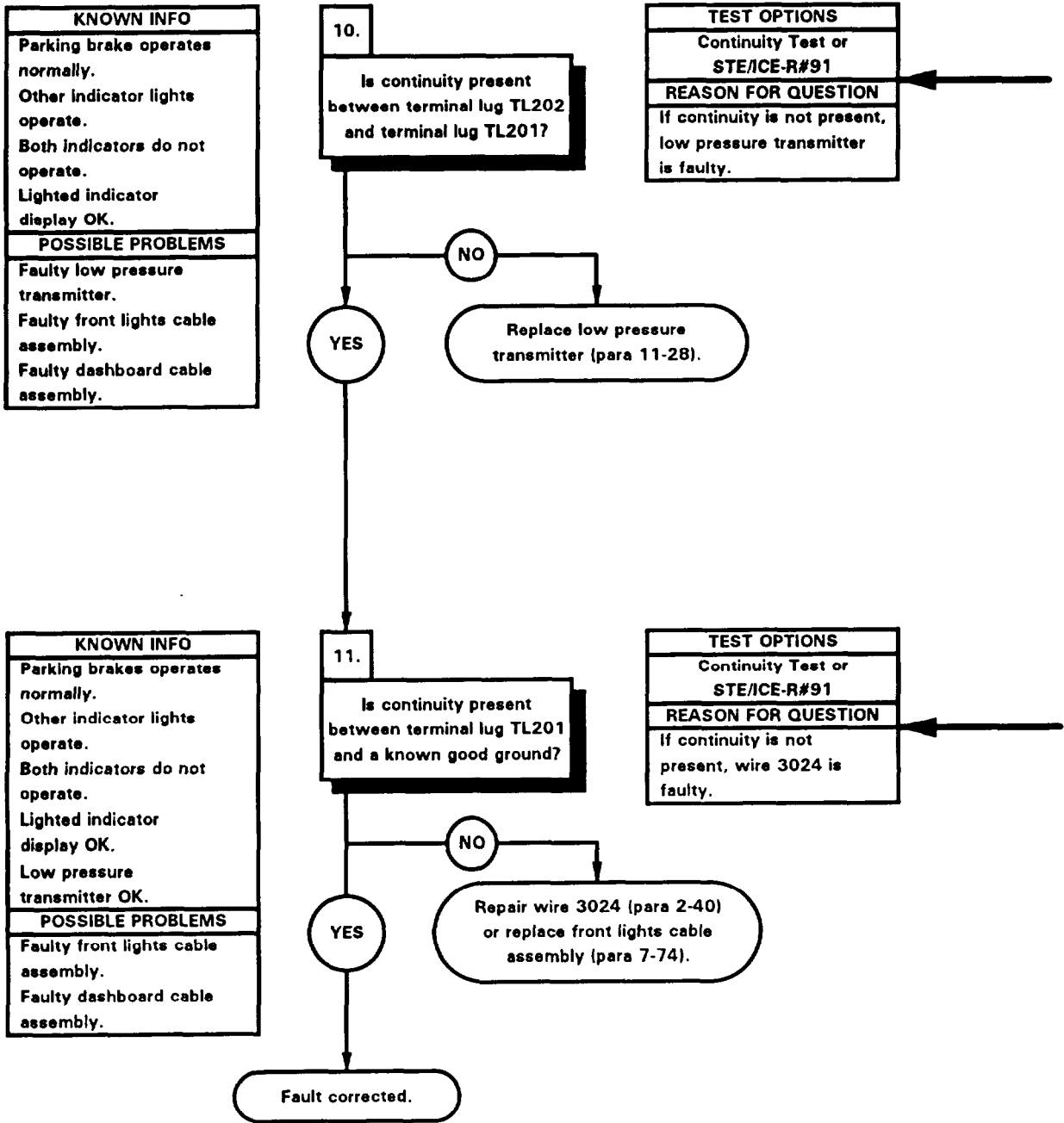


**CONTINUITY TEST**

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector P27-16.
- (6) Connect negative (-) probe of multimeter to terminal lug TL202 and note reading on multimeter.
- (7) If continuity is not present, repair wire 1616 (para 2-40) or replace front lights cable assembly (para 7-74).
- (8) Connect connector P27 to connector J27.
- (9) Connect lighted indicator display to connector PX7.
- (10) Position lighted indicator display in instrument panel assembly with four screws.
- (11) Tighten four screws to 6-10 lb-in. (1 N·m).
- (12) Connect batteries (para 7-48).

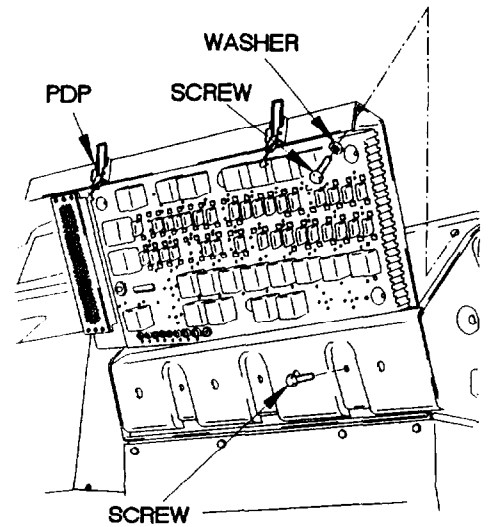


631. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT OPERATE (CONT)



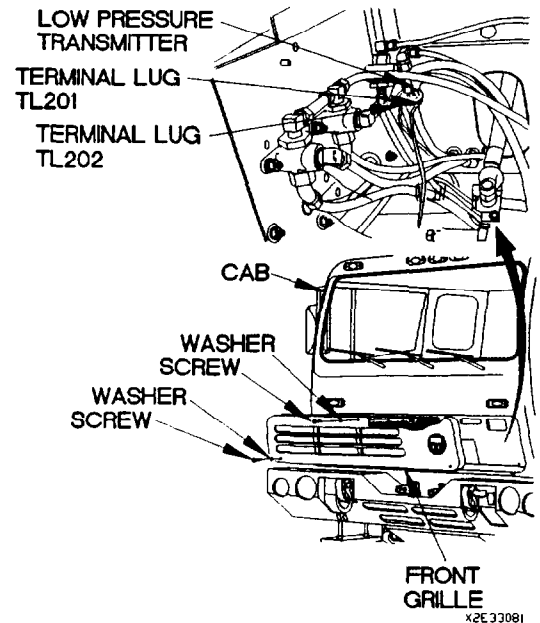
**CONTINUITY TEST**

- (1) Set multimeter to ohms position.
- (2) Connect positive (+) probe of multimeter to terminal lug TL202.
- (3) Connect negative (-) probe of multimeter to terminal lug TL201 and note reading on multimeter.
- (4) If continuity is not present, replace low pressure transmitter (para 11-28).



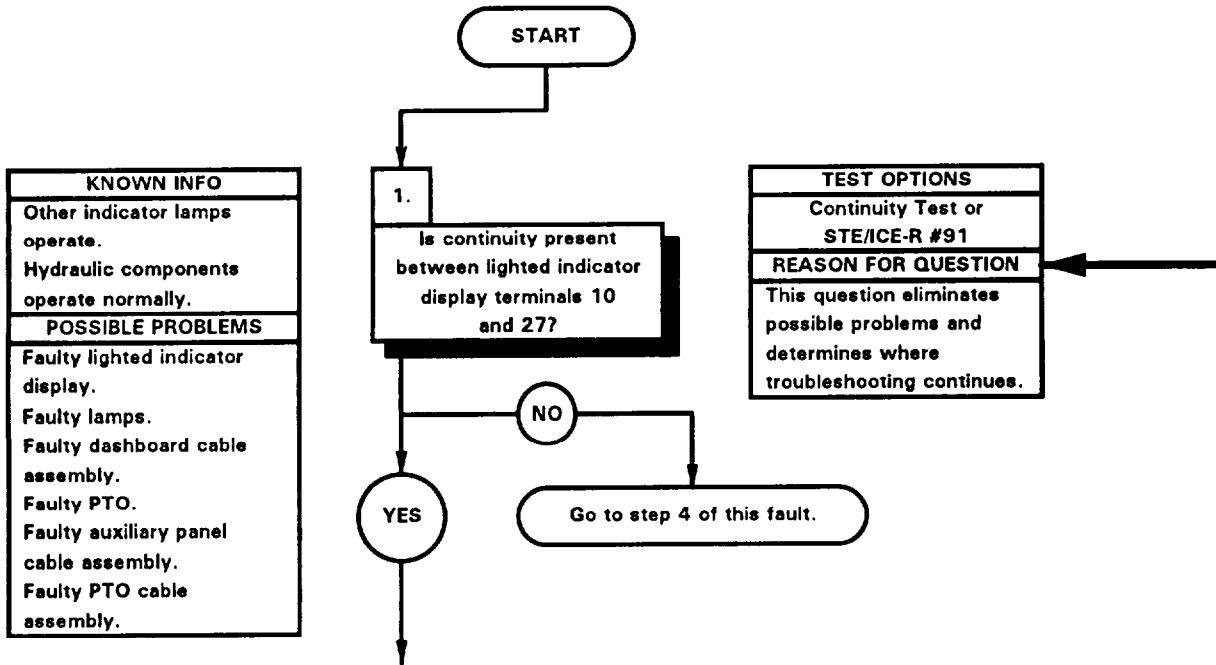
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal lug TL201.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3024 (para 2-40) or replace front lights cable assembly (para 7-74).
- (5) Install PDP in dashboard with three screws.
- (6) Install three washers and screws in PDP.
- (7) Install PDP cover (para 16-2).
- (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).



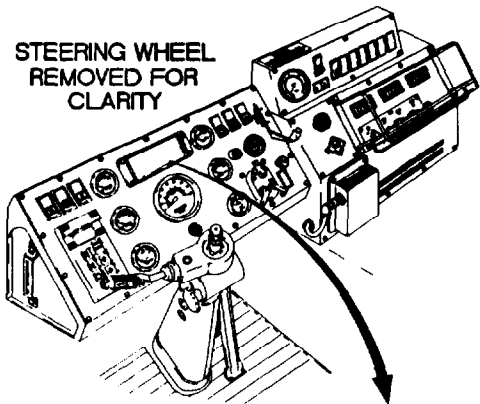


32. PTO INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	
<b>References</b> TM 9-4910-571-12&P	

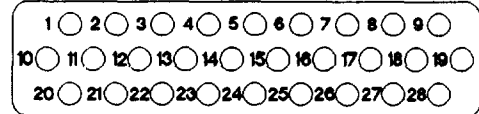


**CONTINUITY TEST**

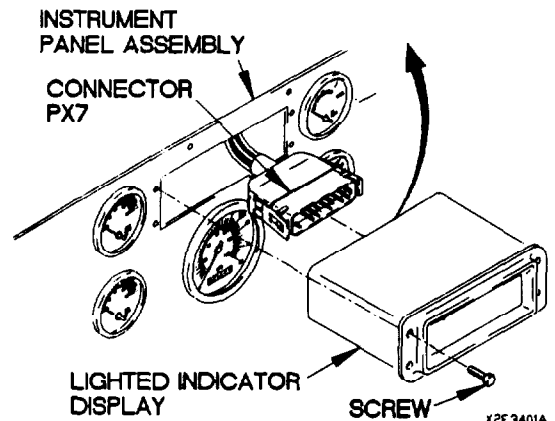
- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to lighted indicator display terminal 27.
- (6) Connect negative (-) probe of multimeter to lighted indicator display terminal 10 and note reading on multimeter.
- (7) If continuity is not present, go to step 4 of this fault.



**BOTTOM**

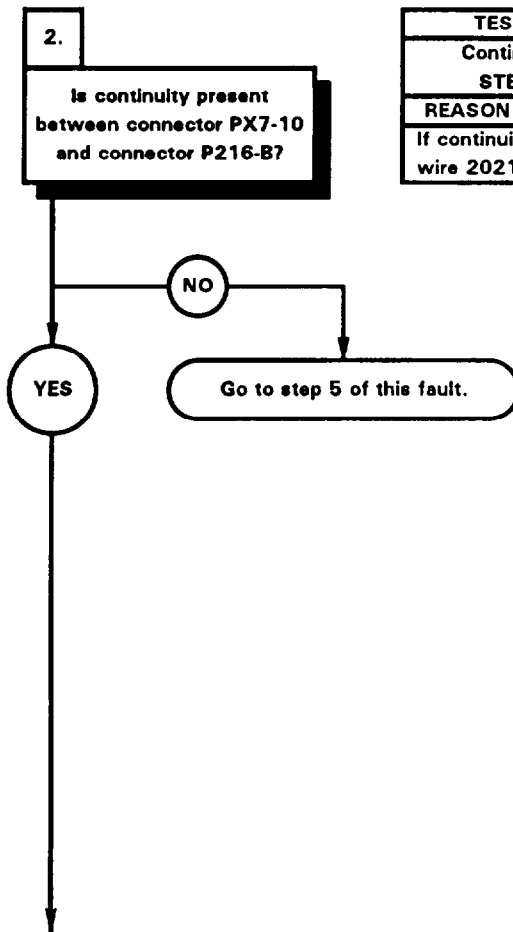


**LIGHTED INDICATOR DISPLAY**



e32. PTO INDICATOR DOES NOT OPERATE (CONT)

KNOWN INFO
Other indicator lights operate. Hydraulic components operate normally. Lighted indicator display OK. Lamps OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty PTO. Faulty auxiliary panel cable assembly. Faulty PTO cable assembly.

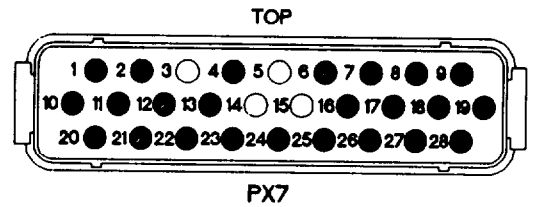
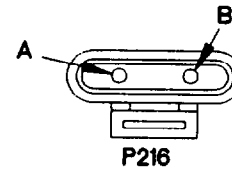
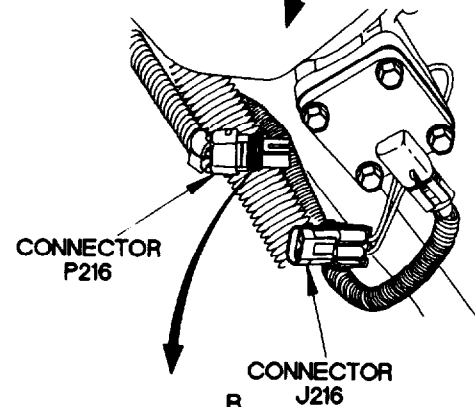
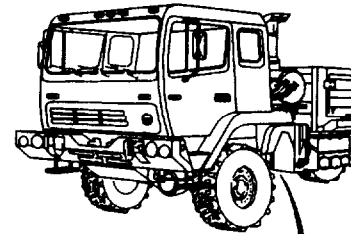


TEST OPTIONS
Continuity Test or STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, wire 2021 is faulty.

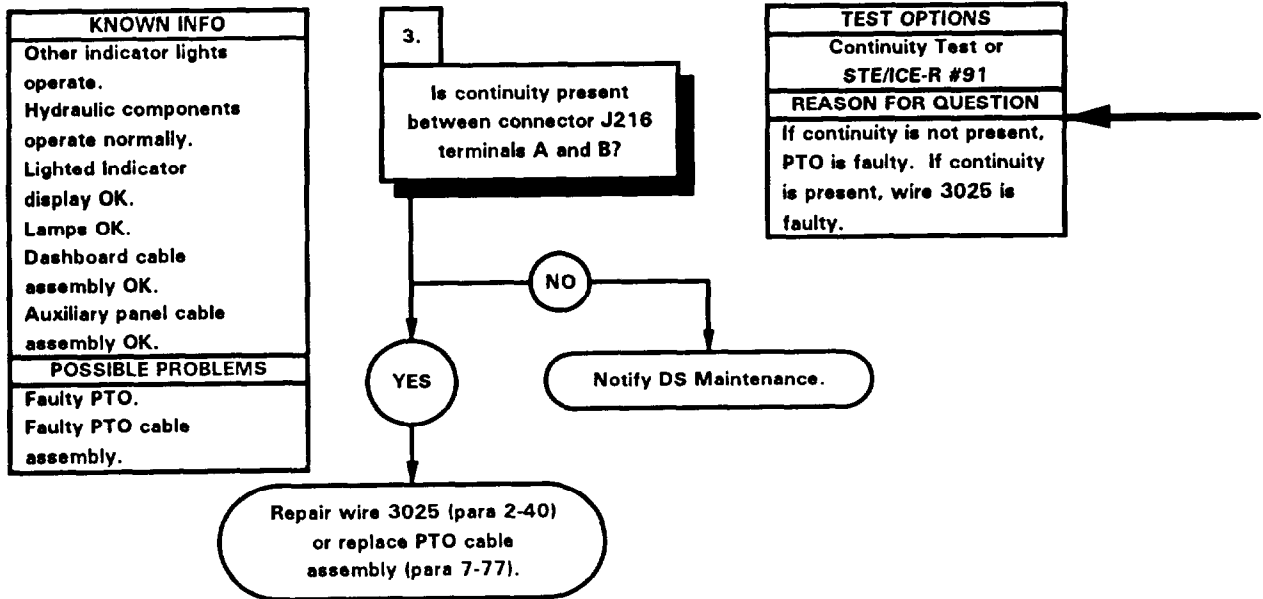


**CONTINUITY TEST**

- (1) Disconnect connector P216 from connector J216.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector PX7-10.
- (4) Connect negative (-) probe of multimeter to connector P216-B and note reading on multimeter.
- (5) If continuity is not present, go to step 5 of this fault.

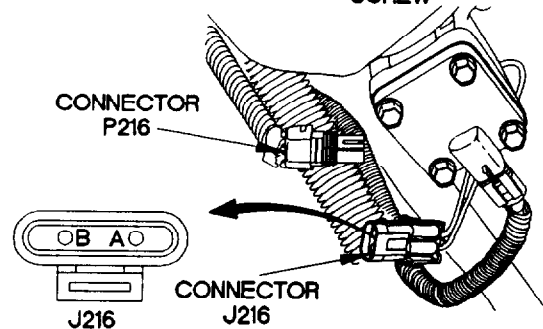
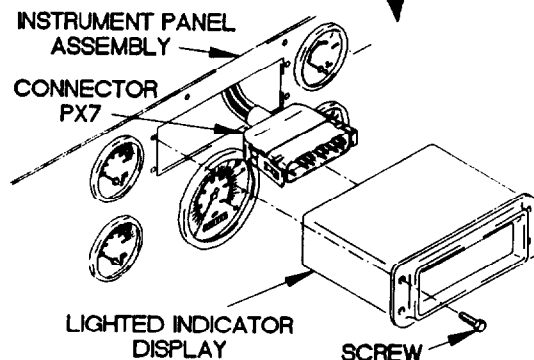
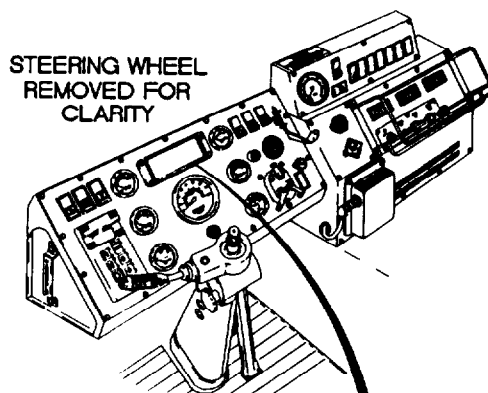


e32. PTO INDICATOR DOES NOT OPERATE (CONT)



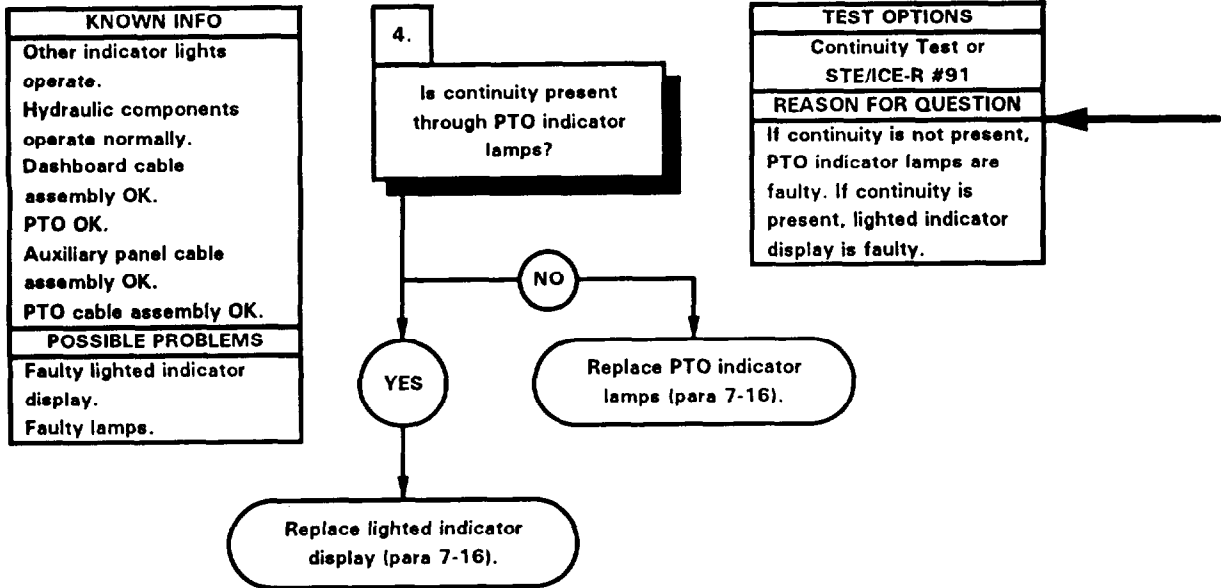
**CONTINUITY TEST**

- (1) Connect lighted indicator display to connector PX7.
- (2) Position lighted indicator display in instrument panel assembly with four screws.
- (3) Tighten four screws to 6-10 lb-in. (1 N-m).
- (4) Connect batteries (para 7-48).
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector J216-B.
- (7) Connect negative (-) probe of multimeter to connector J216-A.
- (8) Start engine (TM 9-2320-365-10).
- (9) Position PTO switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (10) If continuity is not present, notify DS Maintenance.
- (11) If continuity is present, repair wire 3025 (para 2-40) or replace PTO cable assembly (para 7-77).
- (12) Position PTO switch to off (TM 9-2320-365-10).
- (13) Shut down engine (TM 9-2320-365-10).
- (14) Connect connector P216 to connector J216.



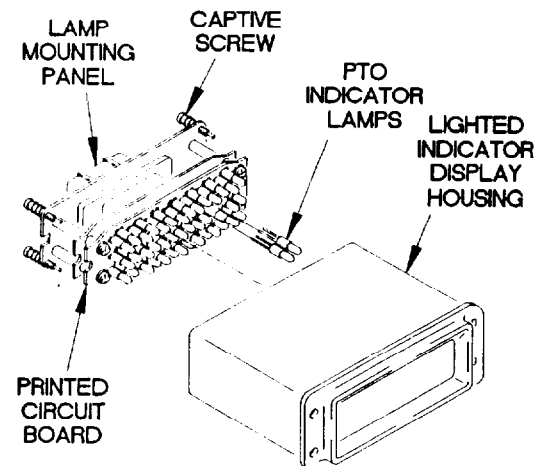
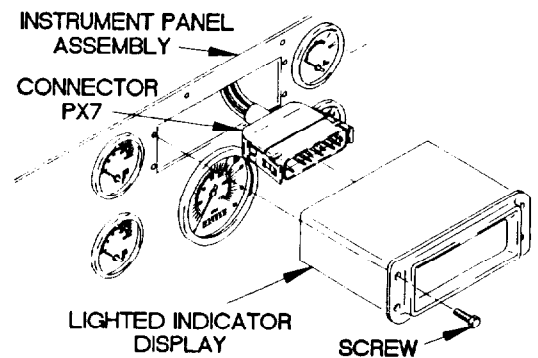
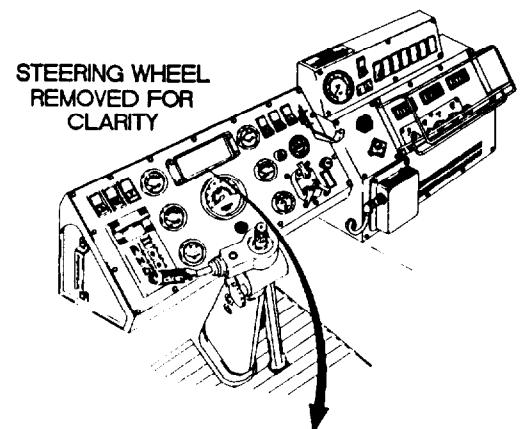
X2E 3403A

e32. PTO INDICATOR DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove PTO indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace PTO indicator lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install PTO indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 6-10 lb-in. (1 N·m).
- (14) Connect batteries (para 7-48).

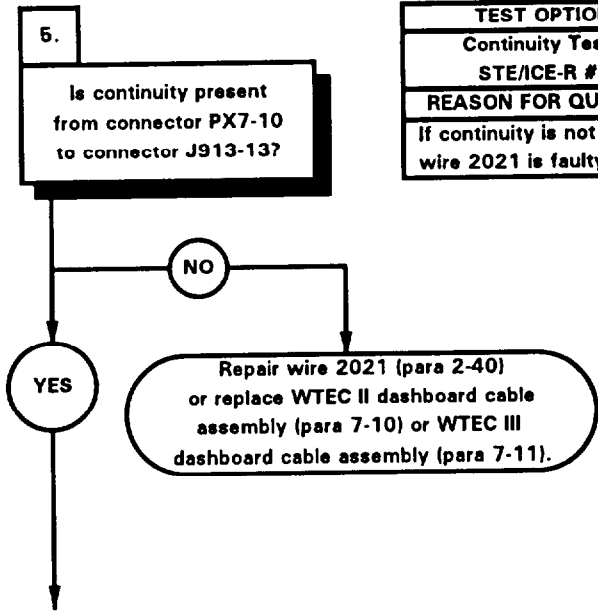


X2E3404A



e32. PTO INDICATOR DOES NOT OPERATE (CONT)

KNOWN INFO
Other indicator lights operate. Hydraulic components operate normally. PTO OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty auxiliary panel cable assembly. Faulty PTO cable assembly.

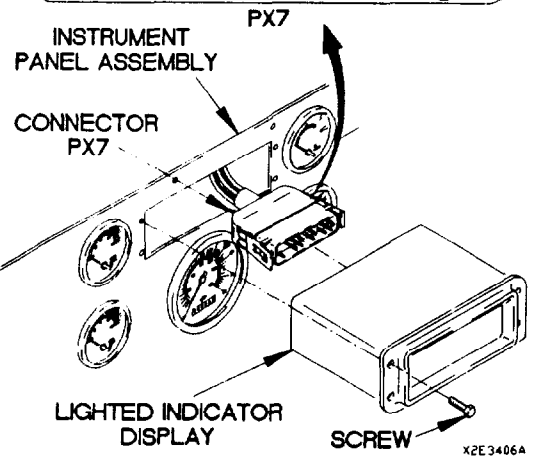
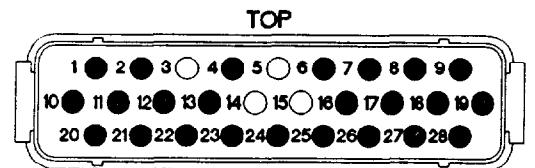
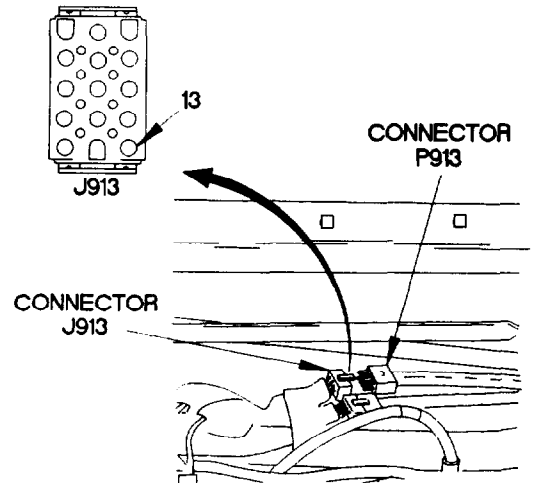


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 2021 is faulty.

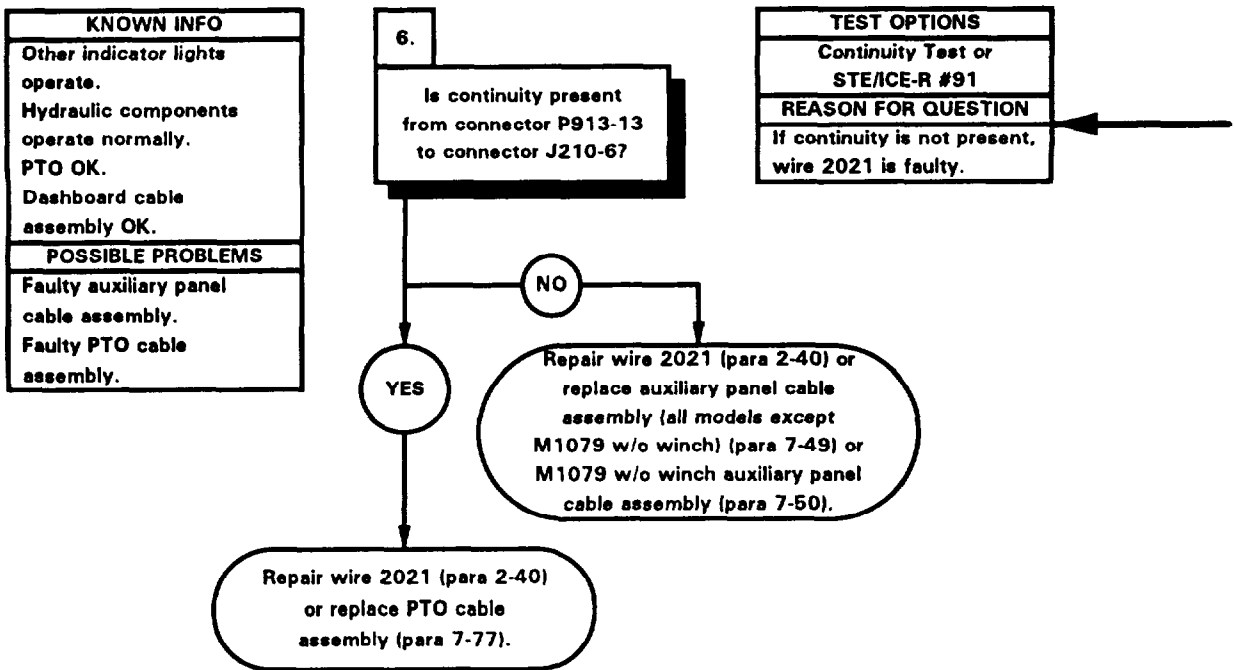


**CONTINUITY TEST**

- (1) Remove personnel heater for access (para 18-9).
- (2) Disconnect connector P913 from connector J913.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to PX7-10.
- (5) Connect negative (-) probe of multimeter to J913-13 and note reading on multimeter.
- (6) If continuity is not present, repair wire 2021 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) Connect lighted indicator display to connector PX7.
- (8) Position lighted indicator display in instrument panel assembly with four screws.
- (9) Tighten four screws to 6-10 lb-in. (1 N·m).
- (10) Connect batteries (para 7-48).

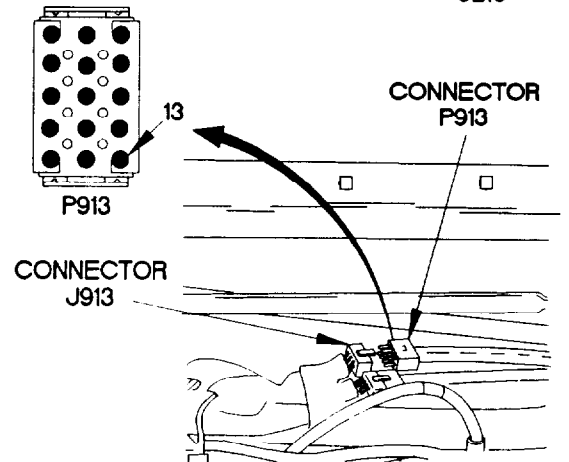
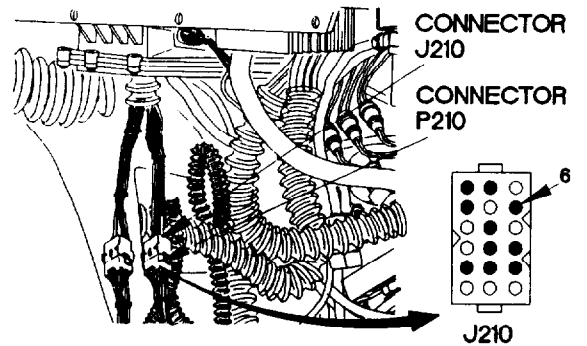


e32. PTO INDICATOR DOES NOT OPERATE (CONT)



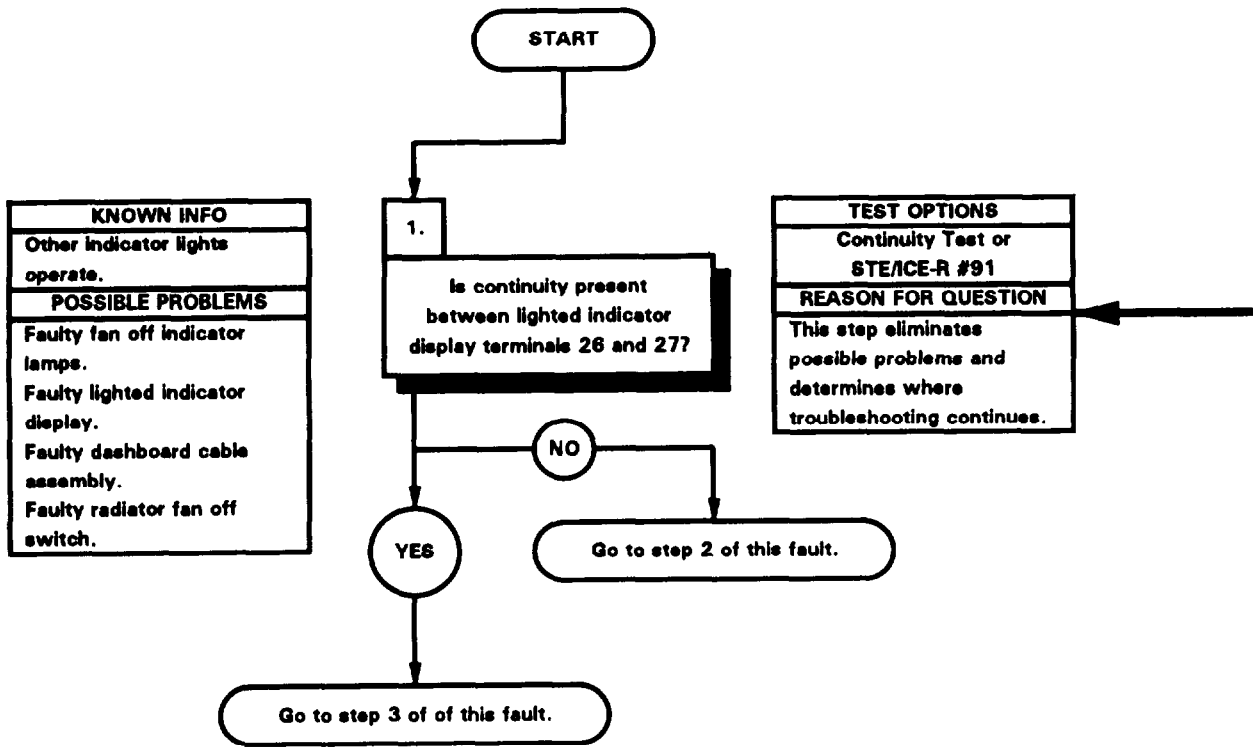
**CONTINUITY TEST**

- (1) Disconnect connector P210 from connector J210.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to J210-6.
- (4) Connect negative (-) probe of multimeter to P913-13 and note reading on multimeter.
- (5) If continuity is not present, repair wire 2021 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (para 7-50).
- (6) If continuity is present, repair wire 2021 (para 2-40) or replace PTO cable assembly (para 7-77).
- (7) Connect connector J210 to connector P210.
- (8) Connect connector P913 to connector J913.
- (9) Install personnel heater (para 18-9).



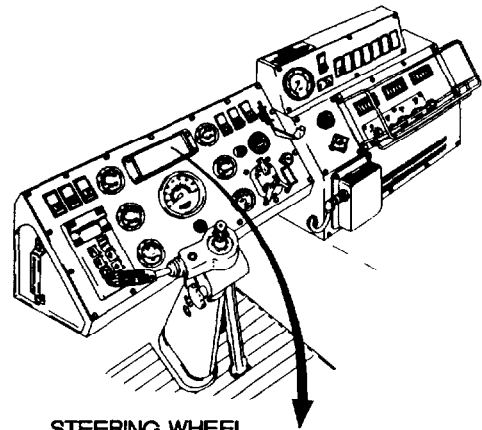
X2E3407A

e33. FAN OFF INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/CE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



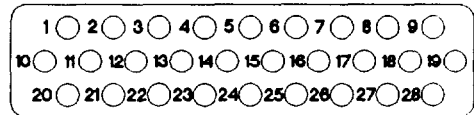
**CONTINUITY TEST**

- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to lighted indicator display terminal 27.
- (6) Connect negative (-) probe of multimeter to lighted indicator display terminal 26 and note reading on multimeter.
- (7) If continuity is not present, go to step 2 of this fault.
- (8) If continuity is present, go to step 3 of this fault.

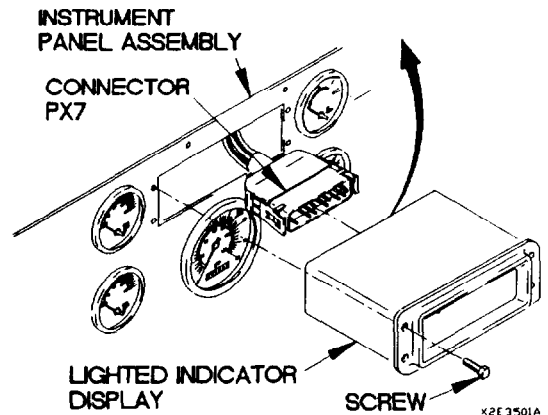


STEERING WHEEL  
REMOVED FOR  
CLARITY

BOTTOM



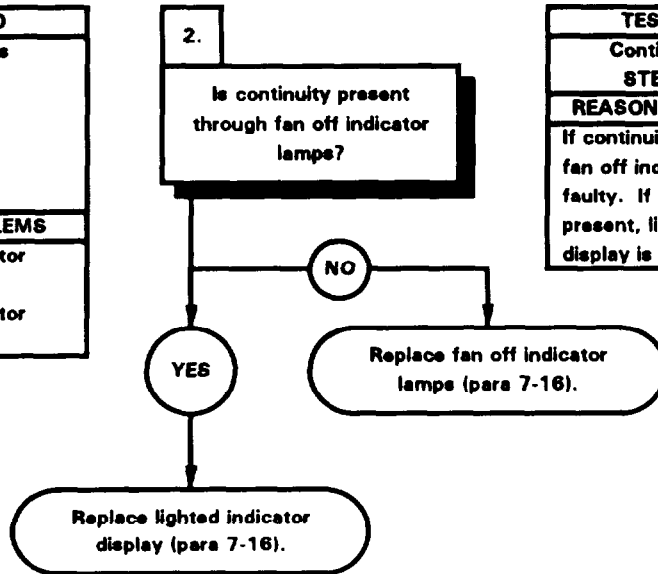
LIGHTED INDICATOR DISPLAY



K2E 3501A

633. FAN OFF INDICATOR DOES NOT OPERATE (CONT)

KNOWN INFO
Other indicator lights operate. Dashboard cable assembly OK. Radiator fan off switch OK.
POSSIBLE PROBLEMS
Faulty fan off indicator lamps. Faulty lighted indicator display.

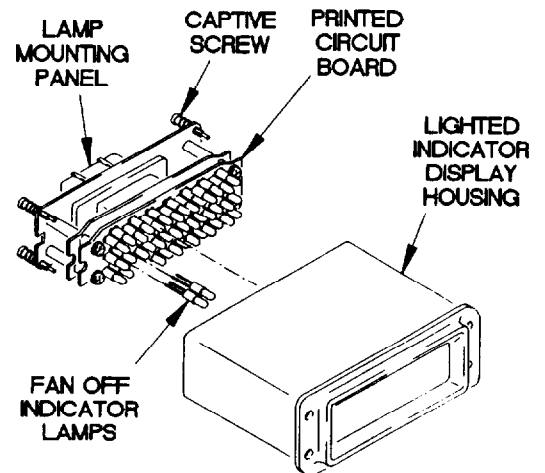
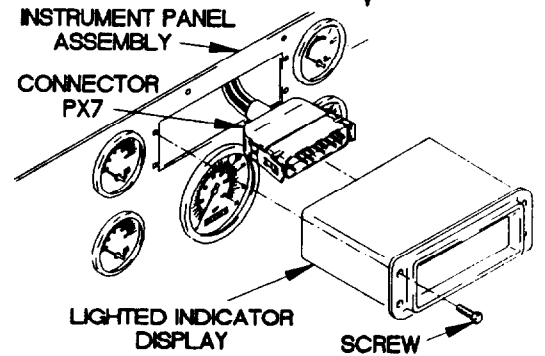
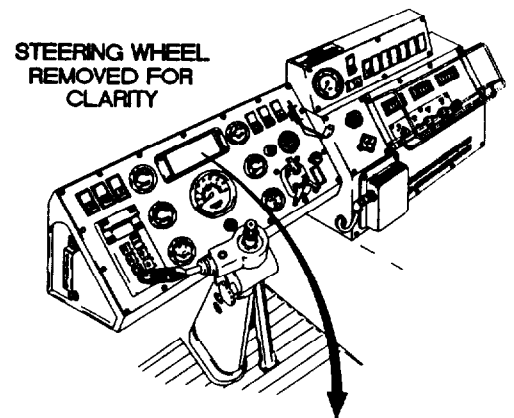


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, fan off indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.



**CONTINUITY TEST**

- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove fan off indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each fan off indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace fan off indicator lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install fan off indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 6-10 lb-in. (1 N·m).
- (14) Connect batteries (para 7-48).



x2E 3502A

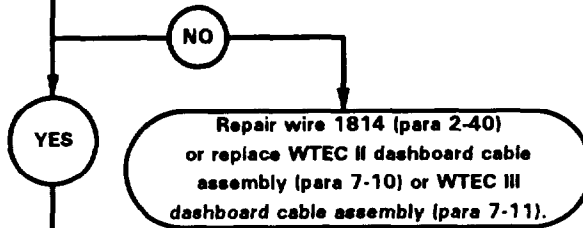


e33. FAN OFF INDICATOR DOES NOT OPERATE (CONT)

<b>KNOWN INFO</b>
Other indicator lights operate. Lighted indicator display OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly. Faulty radiator fan off switch.

3.  
Is continuity present between connector PX7-26 and connector PX1-6?

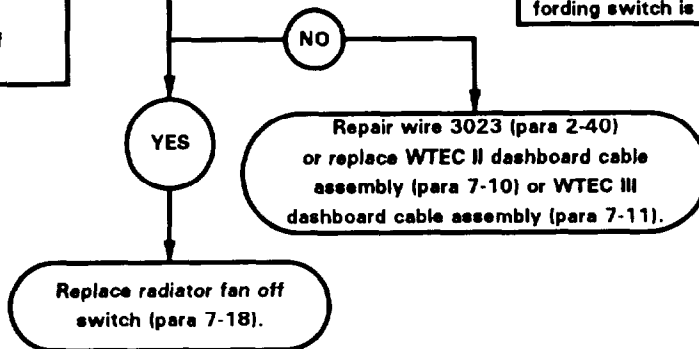
<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 1814 is faulty.



<b>KNOWN INFO</b>
Other indicator lights operate. Fan off indicator lamps OK. Lighted indicator display OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly. Faulty radiator fan off switch.

4.  
Is continuity present between connector PX1-2 and a known good ground?

<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 3023 is faulty. If continuity is present, radiator fan off fording switch is faulty.

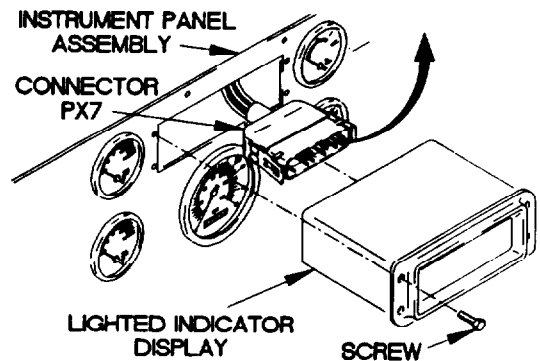
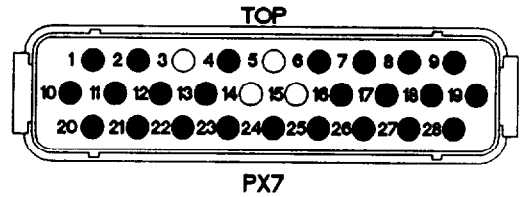
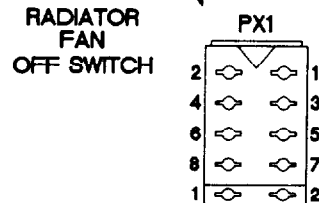
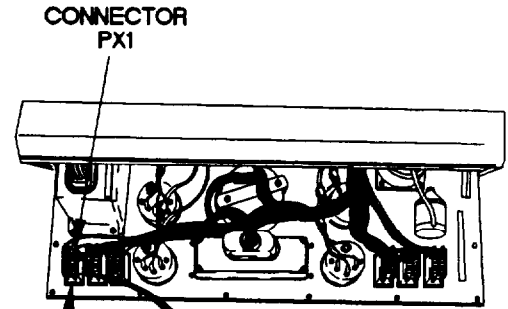


**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX1 from radiator fan off switch.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector PX7-26.
- (5) Connect negative (-) probe of multimeter to connector PX1-6 and note reading on multimeter.
- (6) If continuity is not present, repair wire 1814 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

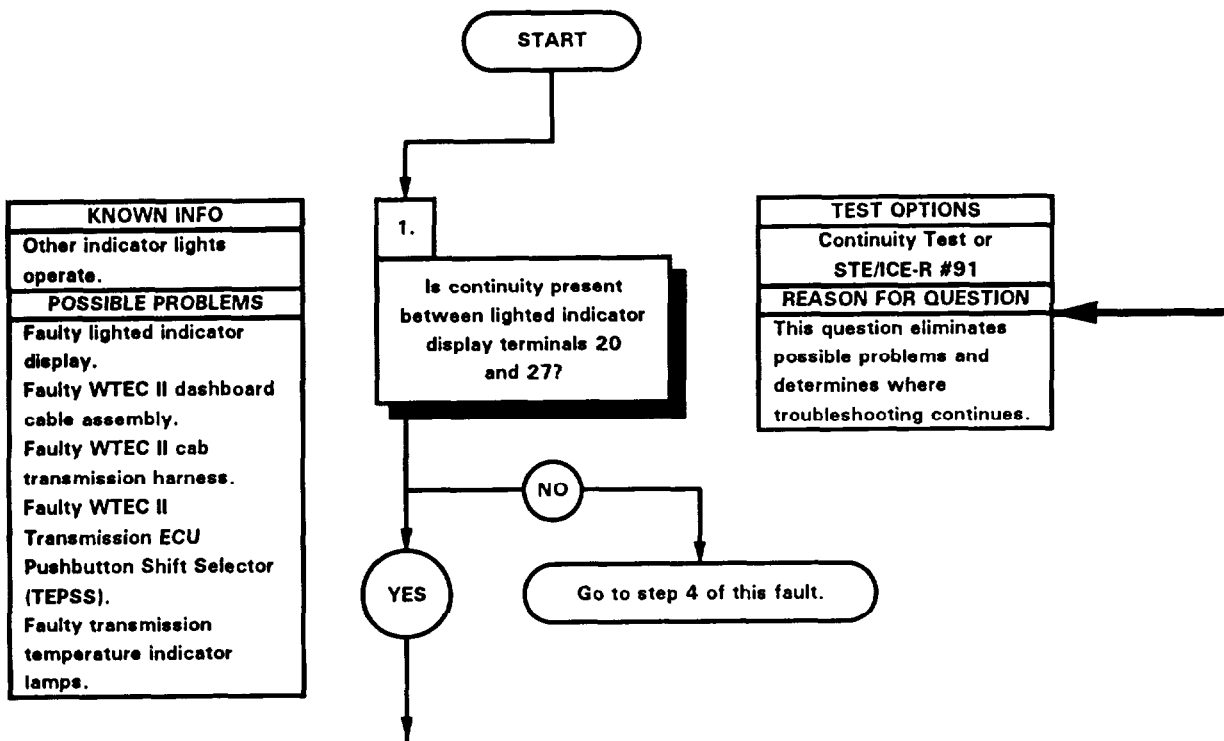
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX1-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3023 (para 2-40) 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 radiator fan off switch (para 7-18).
- (6) Connect connector PX1 to radiator fan off switch.
- (7) Install instrument panel assembly (para 7-15).
- (8) Connect lighted indicator display to connector PX7.
- (9) Position lighted indicator display in instrument panel assembly with four screws.
- (10) Tighten four screws to 6-10 lb-in. (1 N·m).
- (11) Connect batteries (para 7-48).



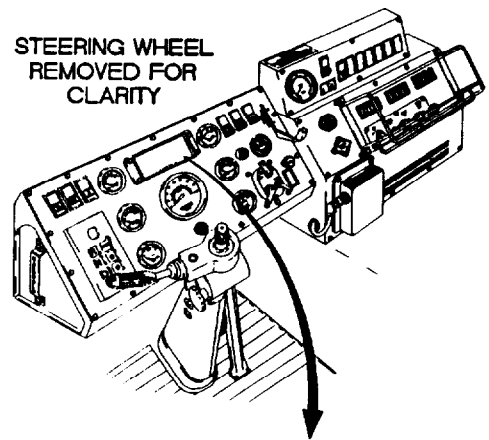
X2E35031

34. WTEC II TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	

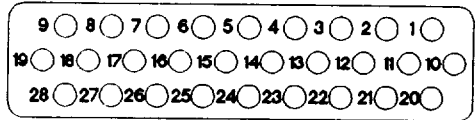


**CONTINUITY TEST**

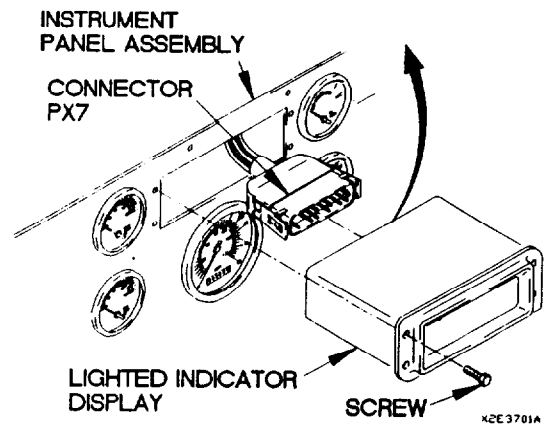
- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to lighted indicator display terminal 27.
- (6) Connect negative (-) probe of multimeter to lighted indicator display terminal 20 and note reading on multimeter.
- (7) If continuity is not present, go to step 4 of this fault.



**BOTTOM**

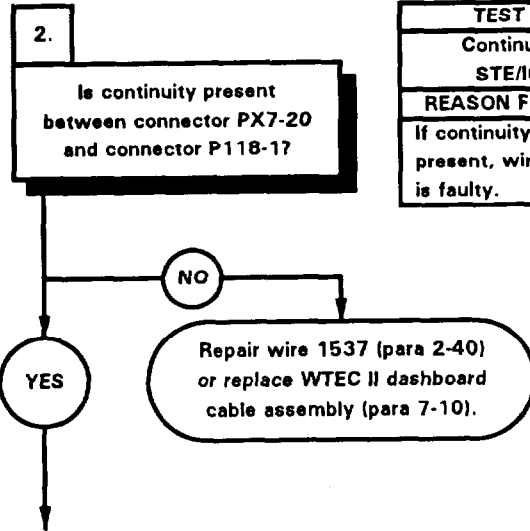


**LIGHTED INDICATOR DISPLAY**



634. WTEC II TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)

KNOWN INFO
Other indicator lights operate. Lighted indicator display OK.
POSSIBLE PROBLEMS
Faulty WTEC II dashboard cable assembly. Faulty WTEC II cab transmission harness. Faulty WTEC II TEPSS.

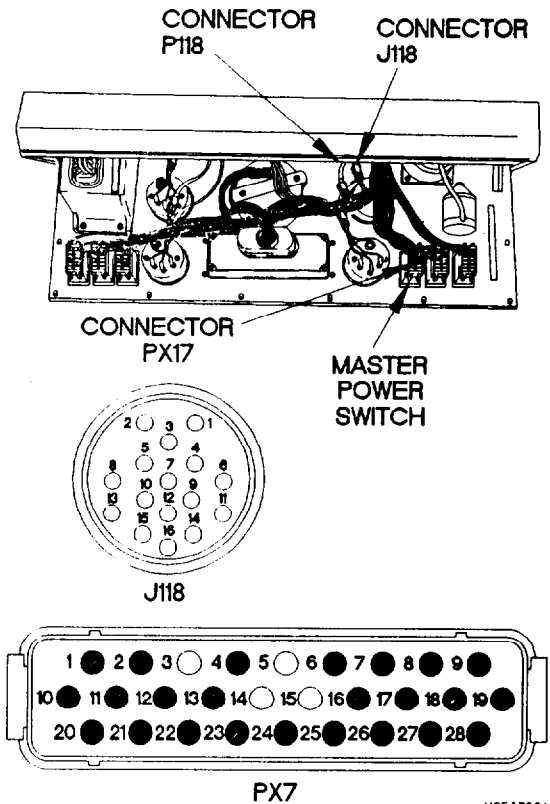


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1537 is faulty.



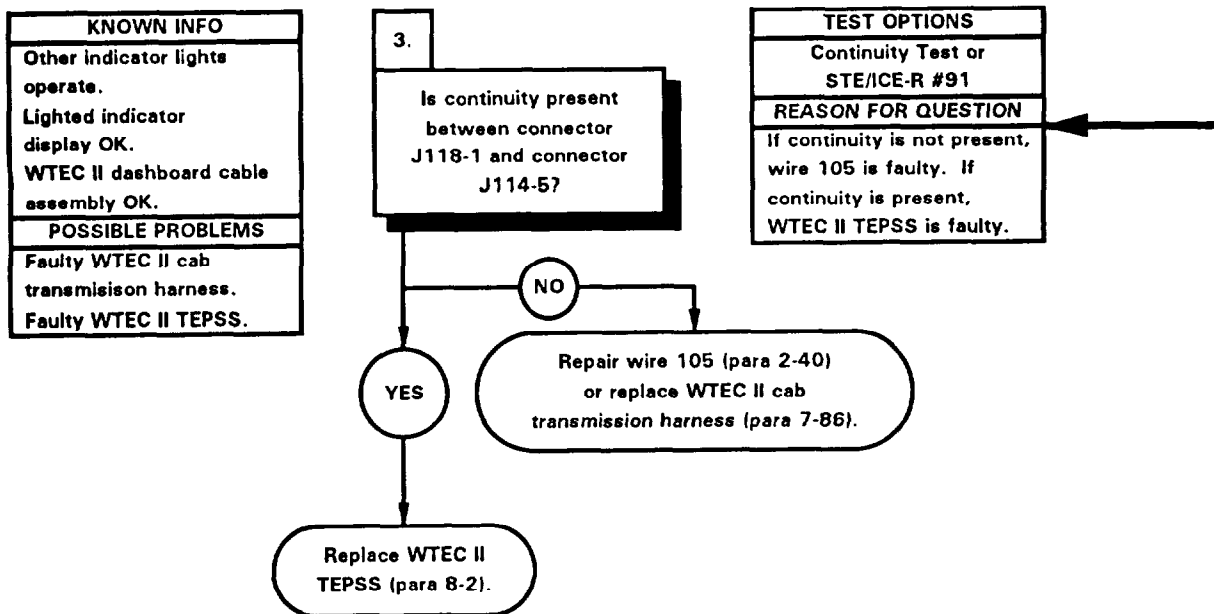
**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX17 from master power switch.
- (3) Disconnect connector J118 from connector P118.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector PX7-20.
- (6) Connect negative (-) probe of multimeter to connector P118-1 and note reading on multimeter.
- (7) If continuity is not present, repair wire 1537 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10).



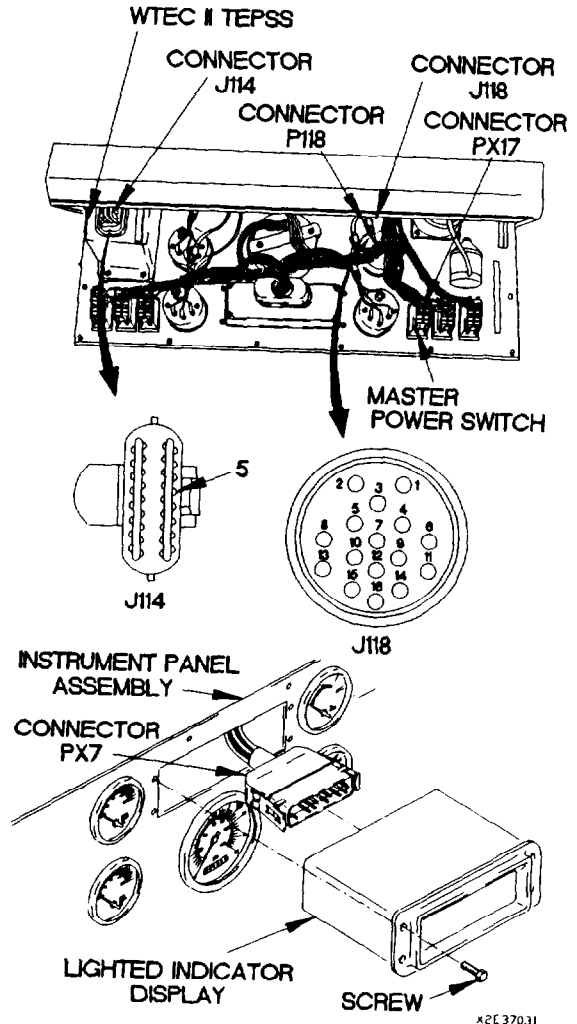
X2E3702A

e34. WTEC II TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)



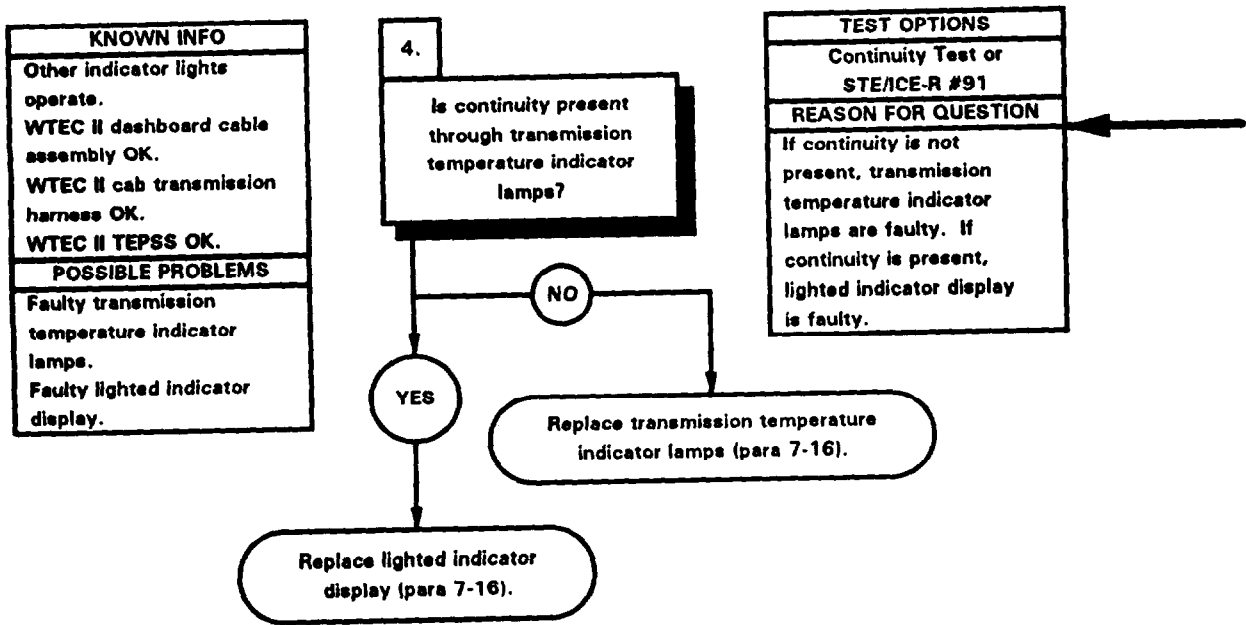
**CONTINUITY TEST**

- (1) Disconnect connector J114 (bottom connector) from WTEC II TEPSS.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector J114-5.
- (4) Connect negative (-) probe of multimeter to connector J118-1 and note reading on multimeter.
- (5) If continuity is not present, repair wire 105 (para 2-40) or replace WTEC II cab transmission harness (para 7-86).
- (6) If continuity is present, replace WTEC II TEPSS (para 8-2).
- (7) Connect connector J114 to WTEC II TEPSS.
- (8) Connect connector J118 to connector P118.
- (9) Install instrument panel assembly (para 7-15).
- (10) Connect lighted indicator display to connector PX7.
- (11) Position lighted indicator display in instrument panel assembly with four screws.
- (12) Tighten four screws to 6-10 lb-in. (1 N·m).
- (13) Connect batteries (para 7-48).



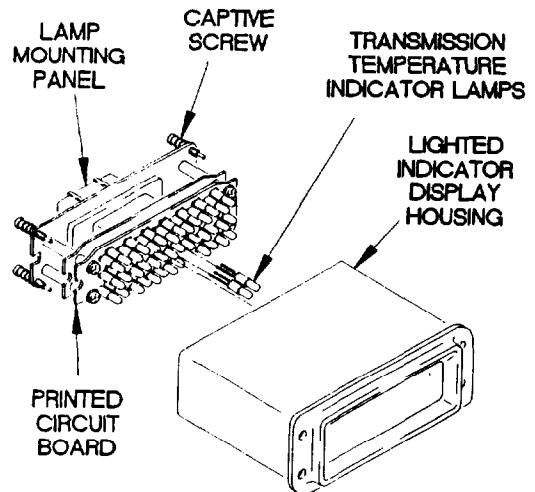
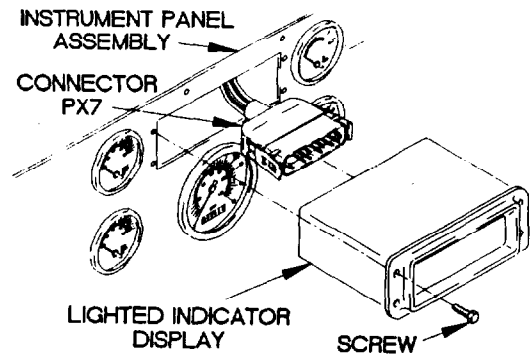
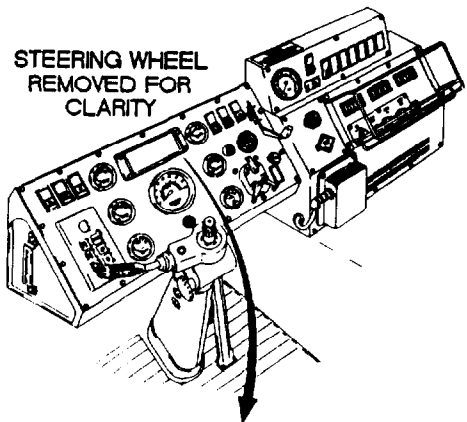


34. WTEC II TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)



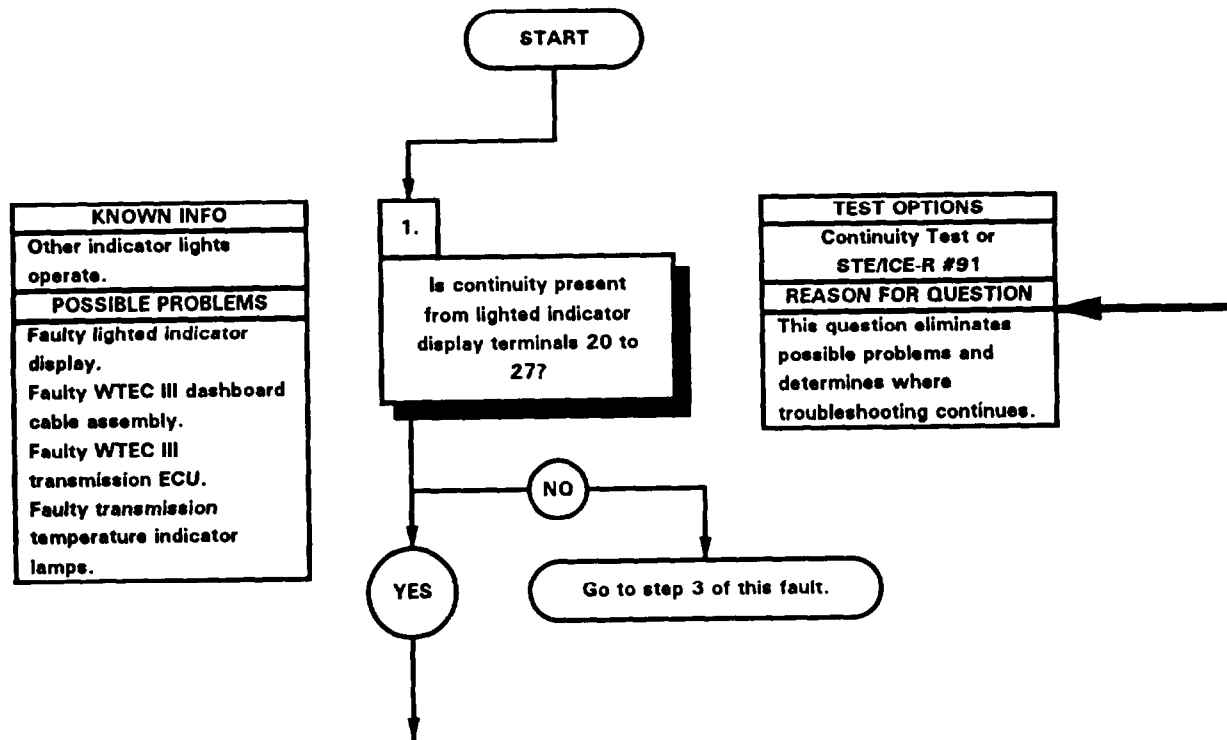
**CONTINUITY TEST**

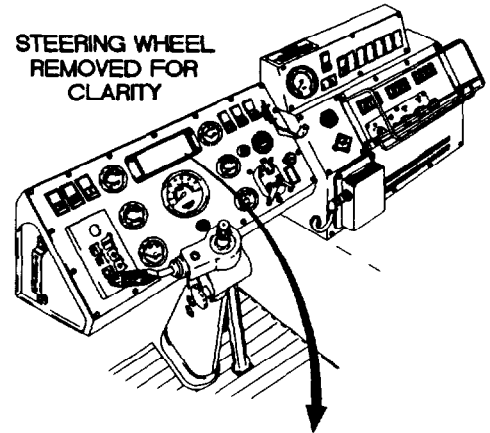
- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove transmission temperature indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each transmission temperature indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace transmission temperature indicator lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install transmission temperature indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 8-10 lb-in. (1 N·m).
- (14) Connect batteries (para 7-48).



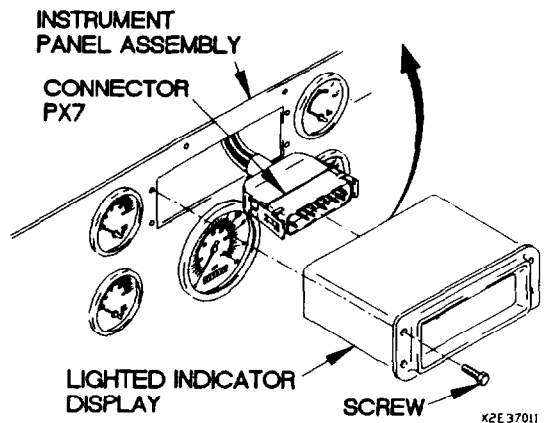
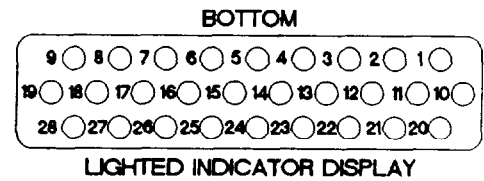
x2E3704A

35. WTEC III TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	

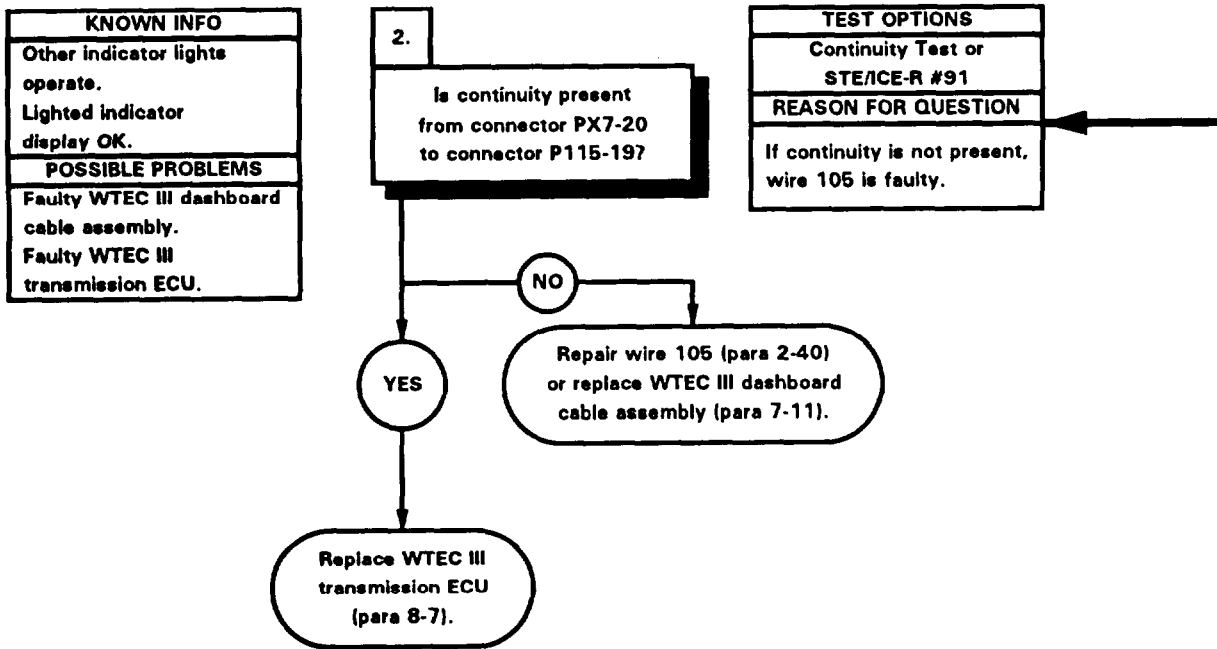


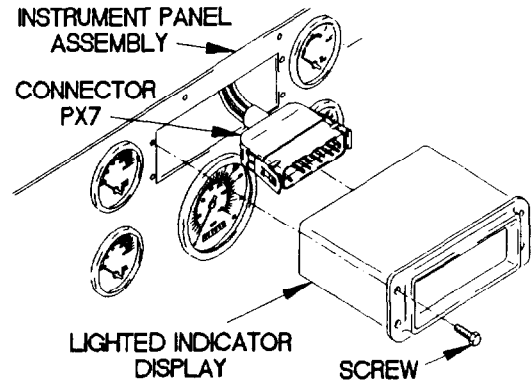


- | CONTINUITY TEST |   |
|-----------------|---|
| (1)             | Remove four screws from lighted indicator display.  |
| (2)             | Remove lighted indicator display from instrument panel assembly.  |
| (3)             | Disconnect connector PX7 from lighted indicator display.  |
| (4)             | Set multimeter to ohms.   |
| (5)             | Connect positive (+) probe of multimeter to lighted indicator display terminal 27.                                |
| (6)             | Connect negative (-) probe of multimeter to lighted indicator display terminal 20 and note reading on multimeter. |
| (7)             | If continuity is not present, go to step 3 of this fault.   |

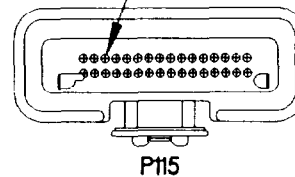
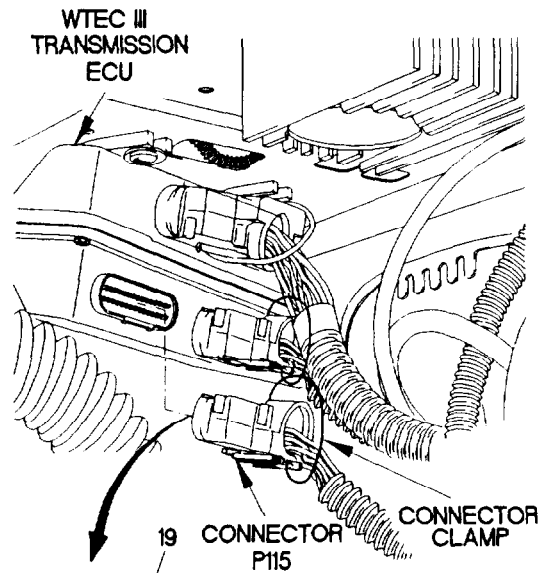
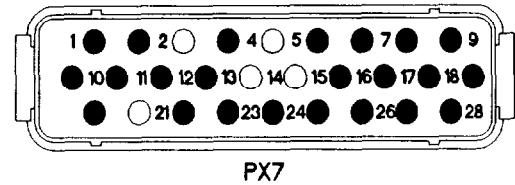


35. WTEC III TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)



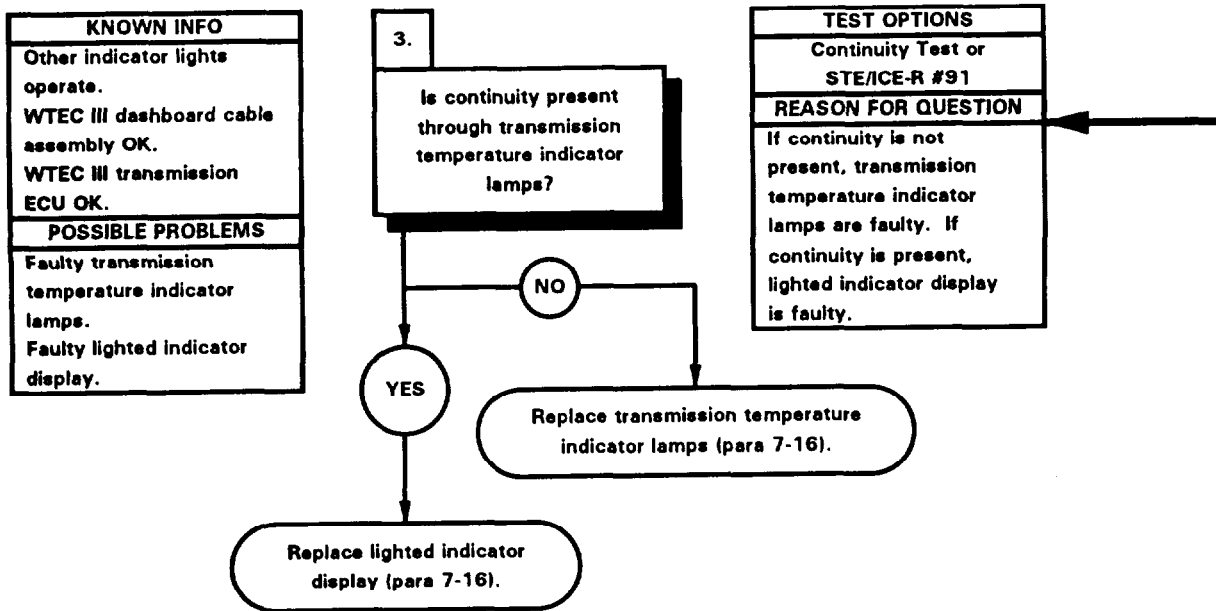


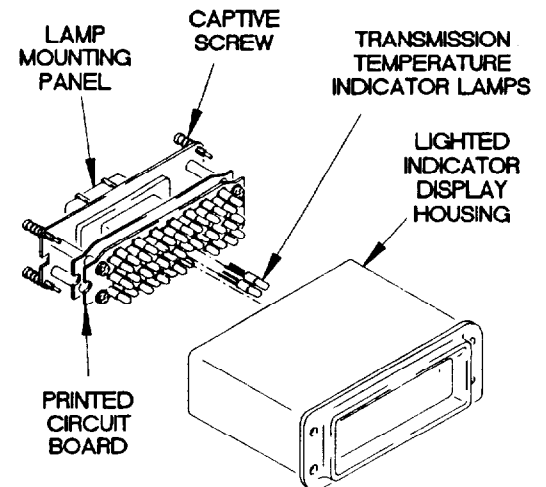
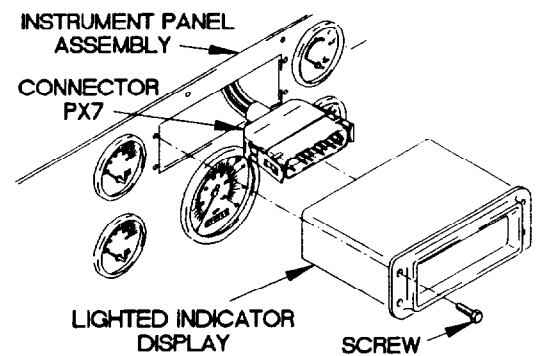
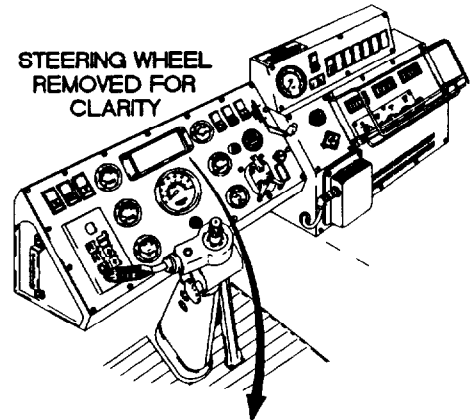
- | CONTINUITY TEST |   |
|-----------------|---|
| (1)             | Remove kick panel (para 16-3).  |
| (2)             | Disconnect connector clamp from connector P115.   |
| (3)             | Disconnect connector P115 from WTEC III transmission ECU.   |
| (4)             | Set multimeter to ohms.   |
| (5)             | Connect positive (+) probe of multimeter to connector PX7-20.   |
| (6)             | Connect negative (-) probe of multimeter to connector P115-19 and note reading on multimeter.                       |
| (7)             | If continuity is not present, repair wire 105 (para 2-40) or replace WTEC III dashboard cable assembly (para 7-11). |
| (8)             | If continuity is present, replace WTEC III transmission ECU (para 8-7).   |
| (9)             | Connect connector P115 to WTEC III transmission ECU.  |
| (10)            | Connect connector clamp to connector P115.  |
| (11)            | Install kick panel (para 16-3).   |
| (12)            | Connect lighted indicator display to connector PX7.   |
| (13)            | Position lighted indicator display in instrument panel assembly with four screws.                                   |
| (14)            | Tighten four screws to 6-10 lb-in. (1 N·m).   |
| (15)            | Connect batteries (para 7-48).  |



x2C 37021

35. WTEC III TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)





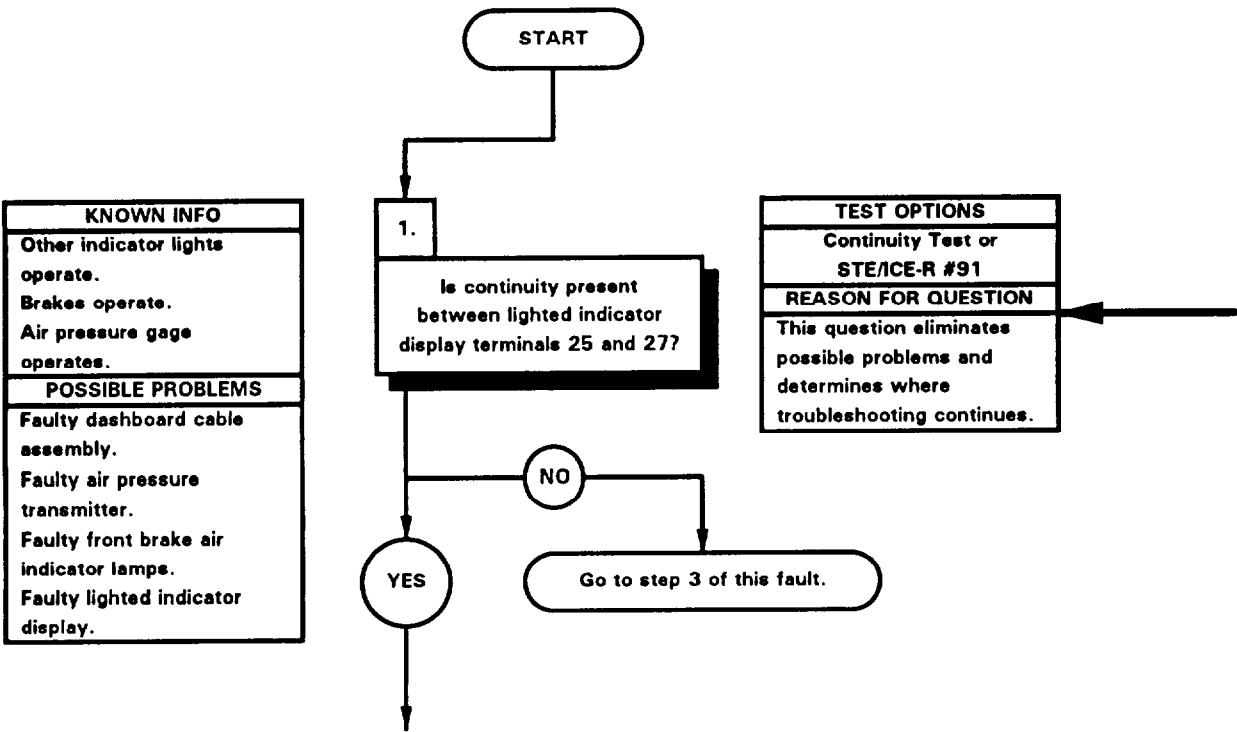
**CONTINUITY TEST**

- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Loosen four captive screws in lamp mounting panel.
- (5) Remove lamp mounting panel from lighted indicator display housing.
- (6) Remove transmission temperature indicator lamps from printed circuit board.
- (7) Set multimeter to ohms.
- (8) Check continuity through each transmission temperature indicator lamp and note reading on multimeter.
- (9) If continuity is not present, replace transmission temperature indicator lamps (para 7-16).
- (10) If continuity is present, replace lighted indicator display (para 7-16).
- (11) Install transmission temperature indicator lamps in printed circuit board.
- (12) Install lamp mounting panel in lighted indicator display housing.
- (13) Tighten four captive screws in lamp mounting panel.
- (14) Connect lighted indicator display to connector PX7.
- (15) Position lighted indicator display in instrument panel assembly with four screws.
- (16) Tighten four screws to 6-10 lb-in. (1 N·m).
- (17) Connect batteries (para 7-48).

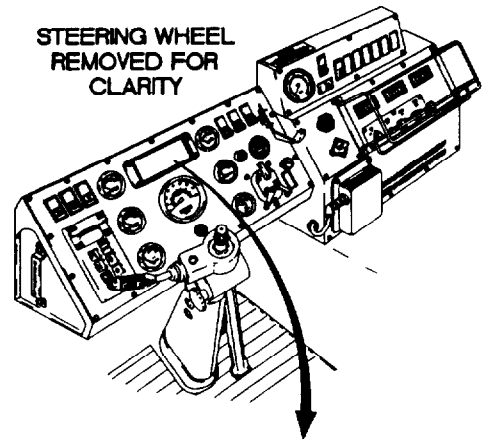
X2E3704A



e36. FRONT BRAKE AIR INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



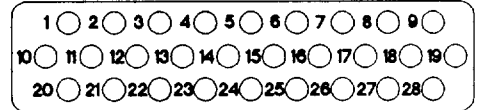
STEERING WHEEL  
REMOVED FOR  
CLARITY



**CONTINUITY TEST**

- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to lighted indicator display terminal 27.
- (6) Connect negative (-) probe of multimeter to lighted indicator display terminal 25 and note reading on multimeter.
- (7) If continuity is not present, go to step 3 of this fault.

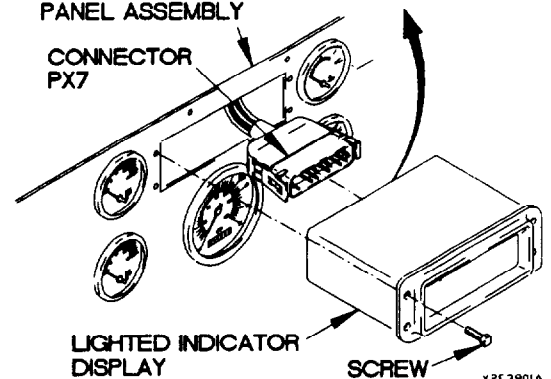
**BOTTOM**



**LIGHTED INDICATOR DISPLAY**

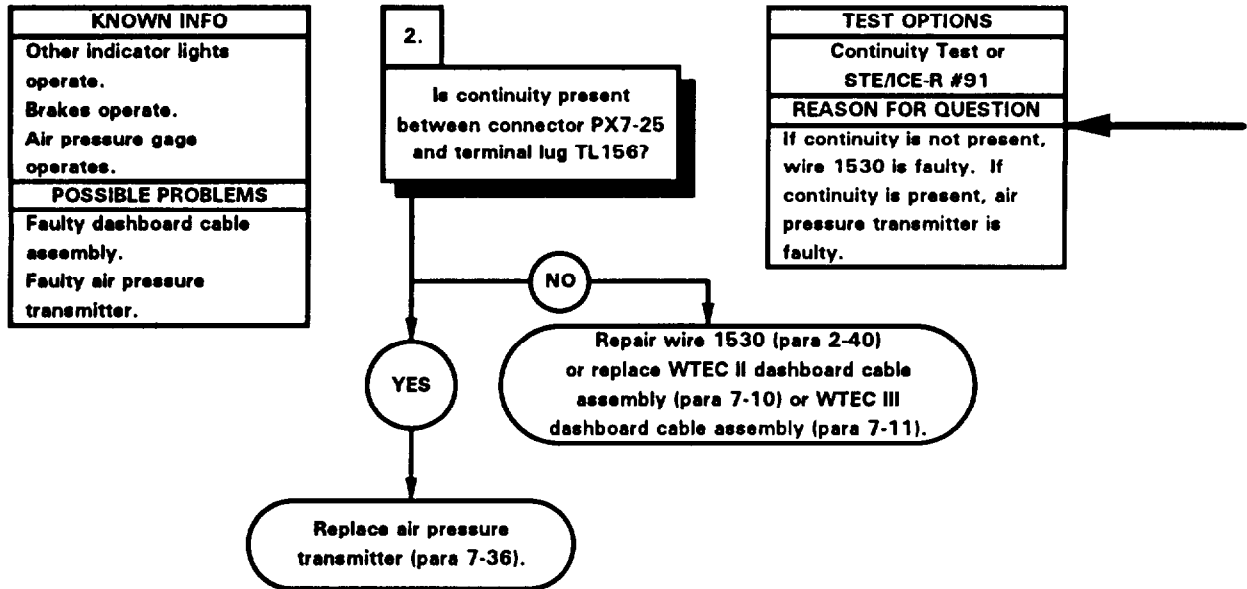
**INSTRUMENT  
PANEL ASSEMBLY**

**CONNECTOR  
PX7**

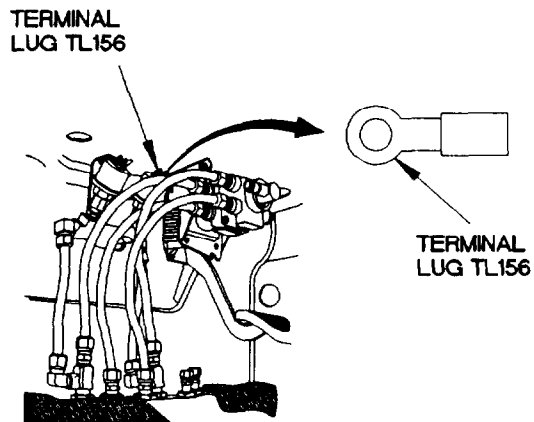
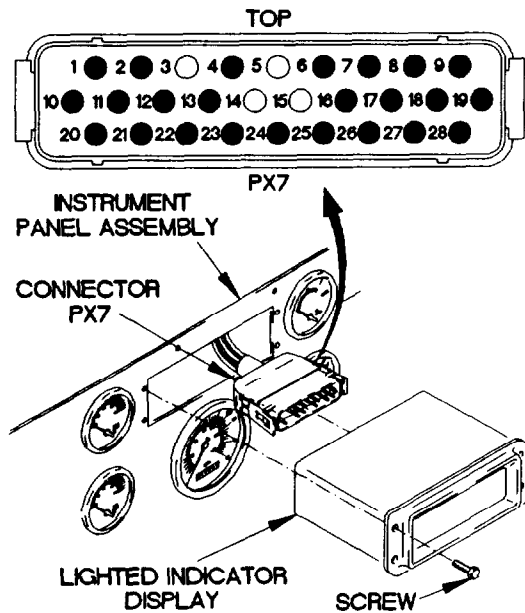


x2E3801A

e36. FRONT BRAKE AIR INDICATOR DOES NOT OPERATE (CONT)

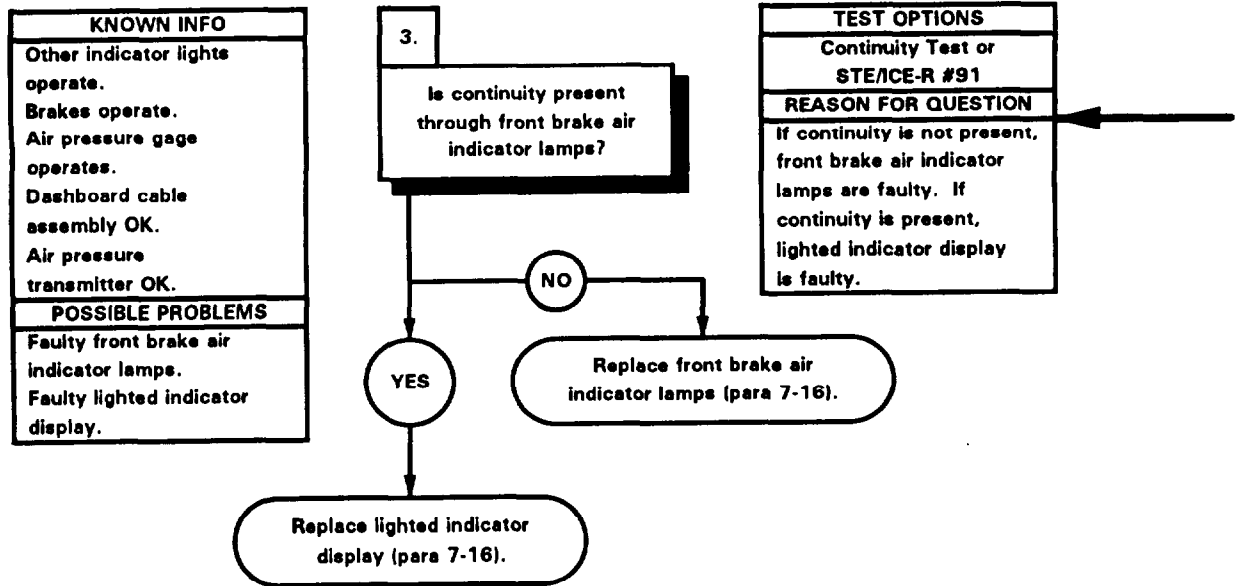


- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to connector PX7-25.
  - (3) Connect negative (-) probe of multimeter to terminal lug TL156 and note reading on multimeter.
  - (4) If continuity is not present, repair wire 1530 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (5) If continuity is present, replace air pressure transmitter (para 7-36).
  - (6) Connect lighted indicator display to connector PX7.
  - (7) Position lighted indicator display in instrument panel assembly with four screws.
  - (8) Tighten four screws to 6-10 lb-in. (1 Nm).
  - (9) Connect batteries (para 7-48).



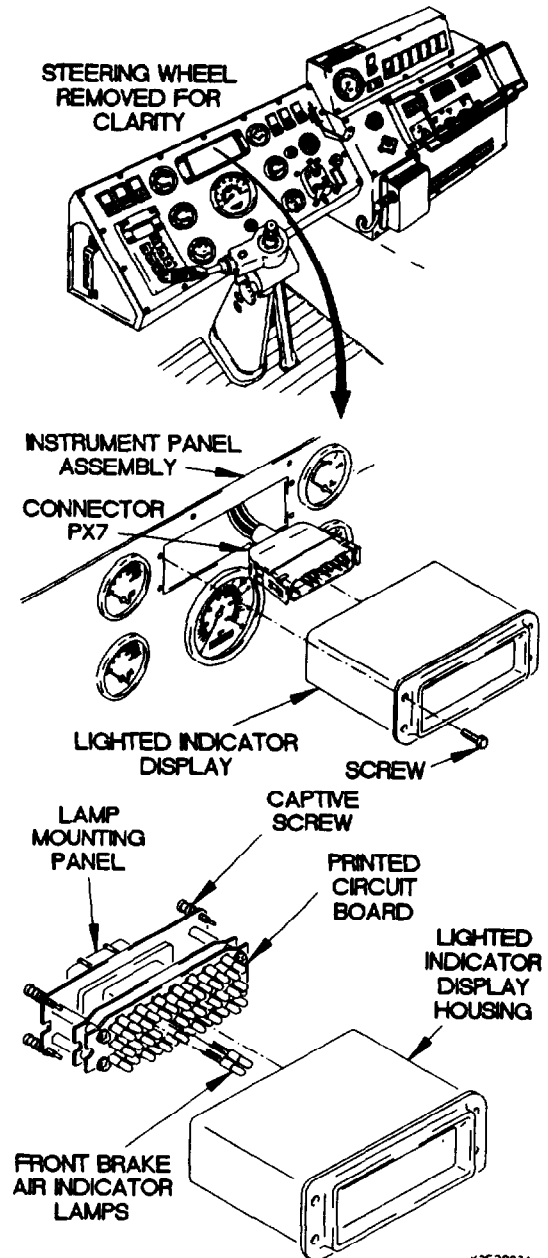
x2E3802A

ø36. FRONT BRAKE AIR INDICATOR DOES NOT OPERATE (CONT)



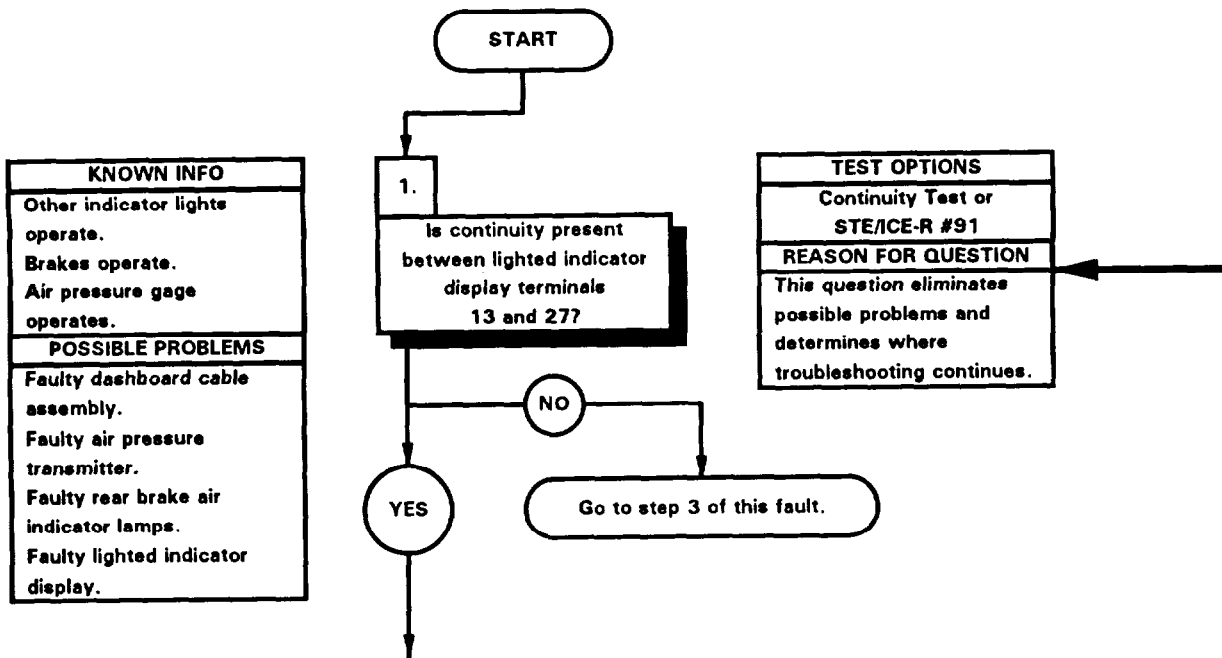
**CONTINUITY TEST**

- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove front brake air indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each front brake air indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace front brake air indicator lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install front brake air indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 6-10 lb-in. (1 N-m).
- (14) Connect batteries (para 7-48).



K2E3803A

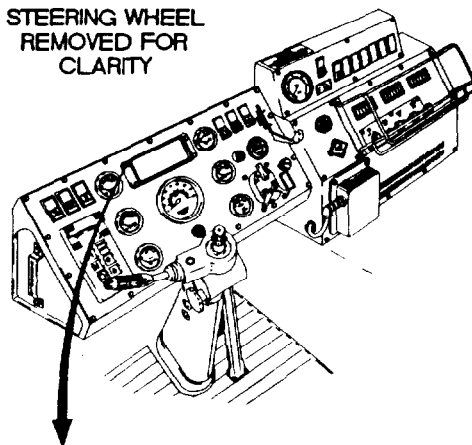
●37. REAR BRAKE AIR INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



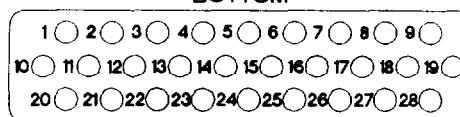
**CONTINUITY TEST**

- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to lighted indicator display terminal 27.
- (6) Connect negative (-) probe of multimeter to lighted indicator display terminal 13 and note reading on multimeter.
- (7) If continuity is not present, go to step 3 of this fault.

STEERING WHEEL  
REMOVED FOR  
CLARITY

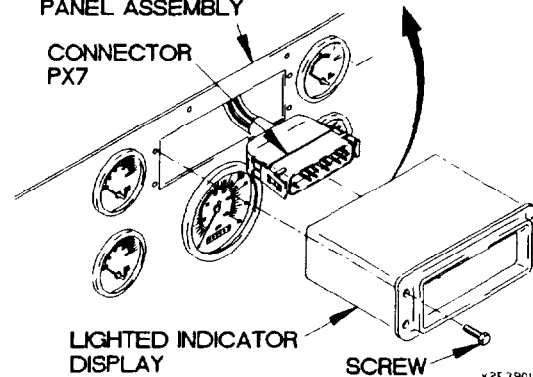


**BOTTOM**



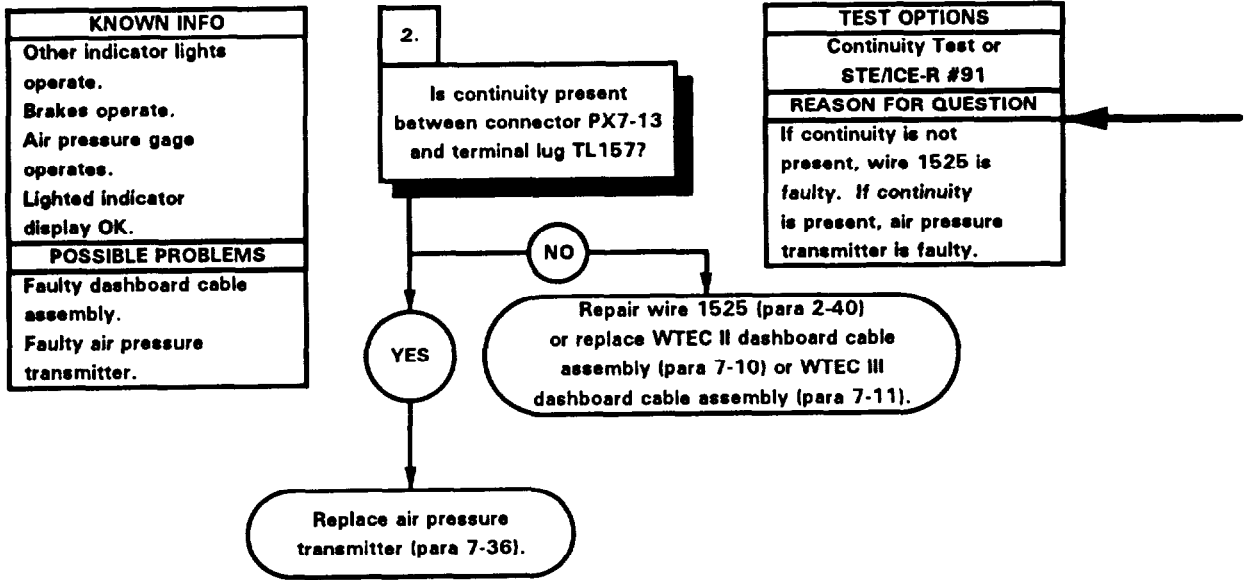
**LIGHTED INDICATOR DISPLAY**

**INSTRUMENT  
PANEL ASSEMBLY**

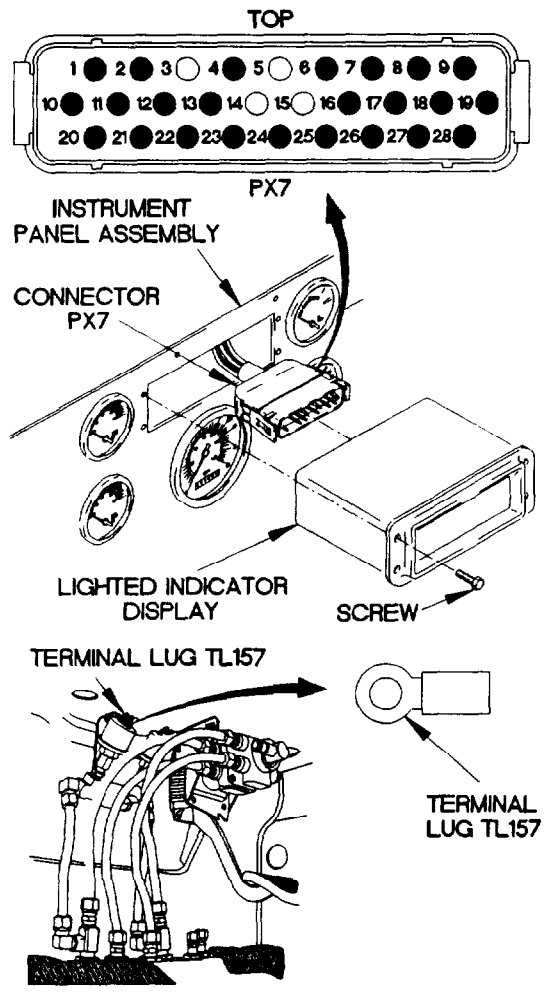




e37. REAR BRAKE AIR INDICATOR DOES NOT OPERATE (CONT)

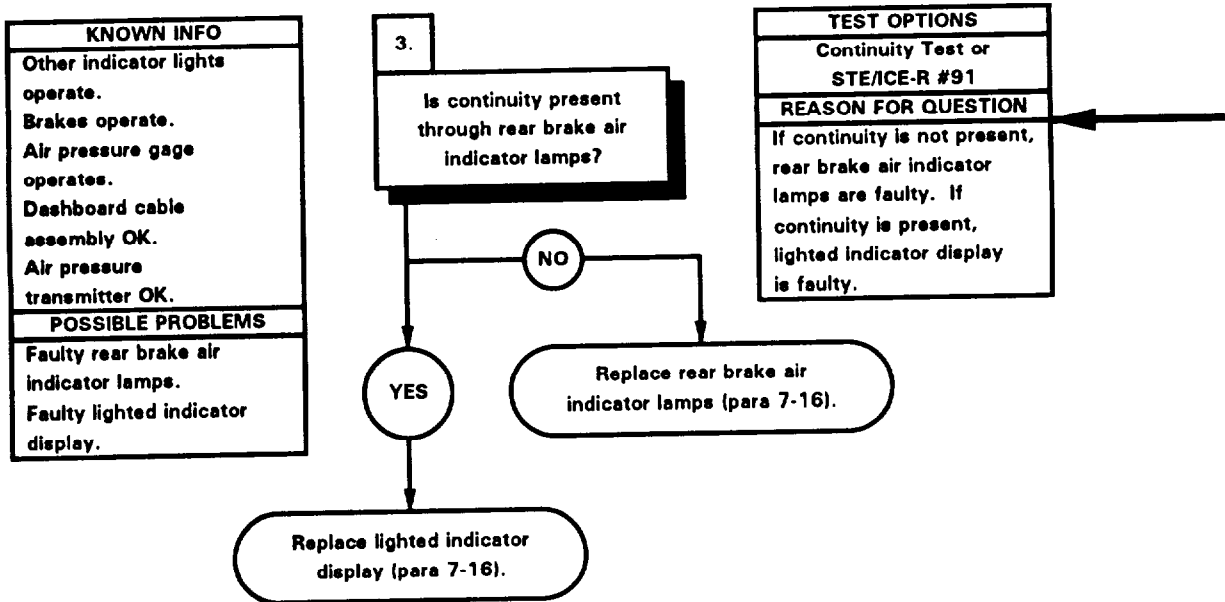


- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to connector PX7-13.
  - (3) Connect negative (-) probe of multimeter to terminal lug TL157 and note reading on multimeter.
  - (4) If continuity is not present, repair wire 1525 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (5) If continuity is present, replace air pressure transmitter (para 7-36).
  - (6) Connect lighted indicator display to connector PX7.
  - (7) Position lighted indicator display in instrument panel assembly with four screws.
  - (8) Tighten four screws to 6-10 lb-in. (1 N·m).
  - (9) Connect batteries (para 7-48).

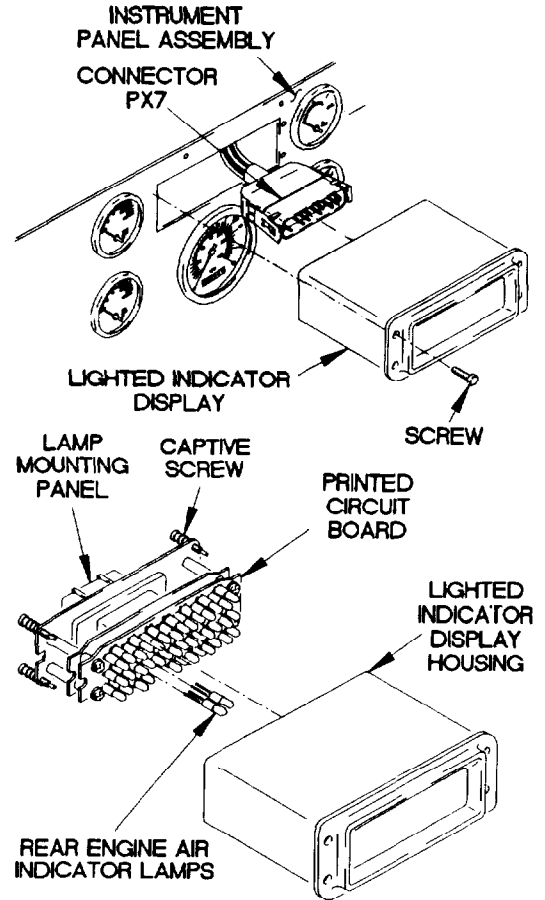
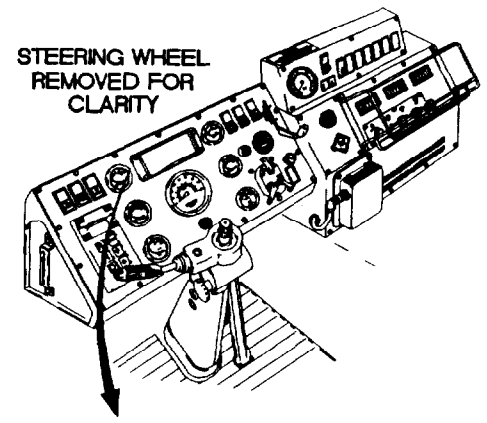


X2E3902A

e37. REAR BRAKE AIR INDICATOR DOES NOT OPERATE (CONT)

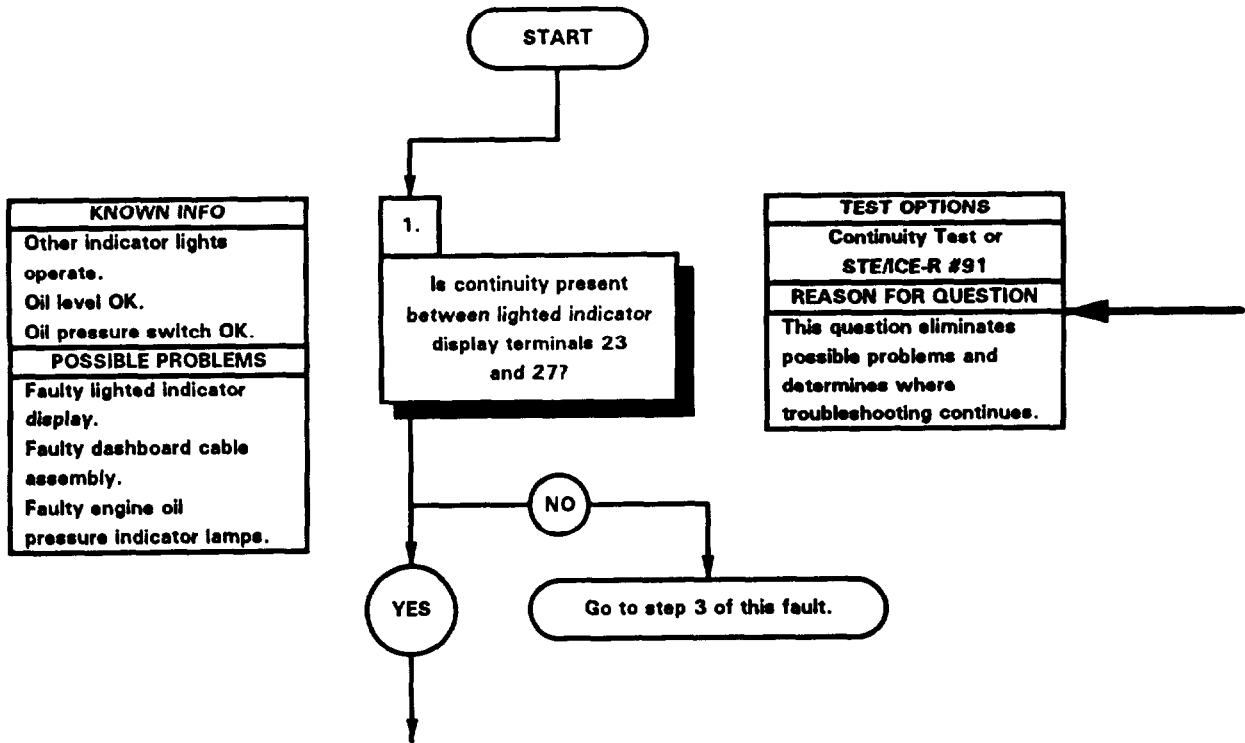


- CONTINUITY TEST.**
- (1) Loosen four captive screws in lamp mounting panel.
  - (2) Remove lamp mounting panel from lighted indicator display housing.
  - (3) Remove rear brake air indicator lamps from printed circuit board.
  - (4) Set multimeter to ohms.
  - (5) Check continuity through each rear brake air indicator lamp and note reading on multimeter.
  - (6) If continuity is not present, replace rear brake air indicator lamps (para 7-16).
  - (7) If continuity is present, replace lighted indicator display (para 7-16).
  - (8) Install rear brake air indicator lamps in printed circuit board.
  - (9) Install lamp mounting panel in lighted indicator display housing.
  - (10) Tighten four captive screws in lamp mounting panel.
  - (11) Connect lighted indicator display to connector PX7.
  - (12) Position lighted indicator display in instrument panel assembly with four screws.
  - (13) Tighten four screws to 6-10 lb-in. (1 Nm).
  - (14) Connect batteries (para 7-48).



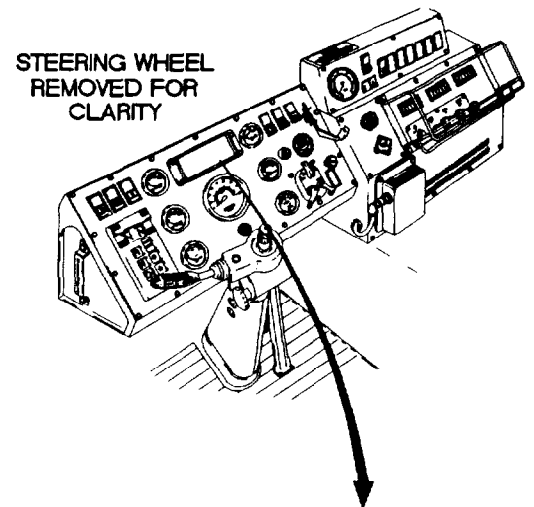
x2E 3903A

e38. ENGINE OIL PRESSURE INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<p><b>Equipment Condition</b>                      Engine shut down (TM 9-2320-365-10).                      Batteries disconnected (para 7-48).</p> <p><b>Personnel Required</b>                      (2)</p>	<p><b>Tools and Special Tools</b>                      Tool Kit, Genl Mech (Item 44, Appendix C)                      STE/ICE-R (Item 39, Appendix C)                      Multimeter, Digital (Item 22, Appendix C)                      Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)</p> <p><b>References</b>                      TM 9-4910-571-12&amp;P</p>

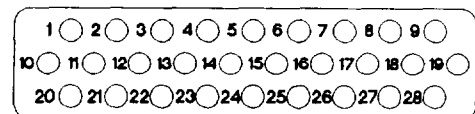


**CONTINUITY TEST**

- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to lighted indicator display terminal 27.
- (6) Connect negative (-) probe of multimeter to lighted indicator display terminal 23 and note reading on multimeter.
- (7) If continuity is not present, go to step 3 of this fault.



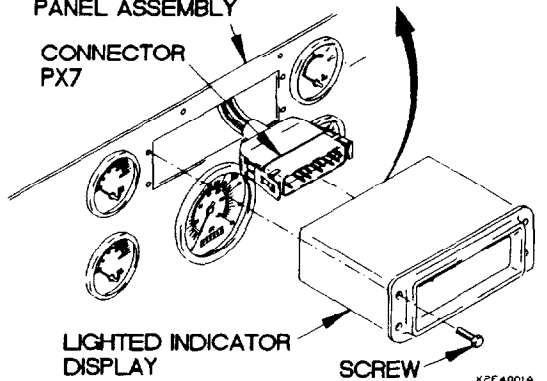
BOTTOM



LIGHTED INDICATOR DISPLAY

INSTRUMENT  
PANEL ASSEMBLY

CONNECTOR  
PX7

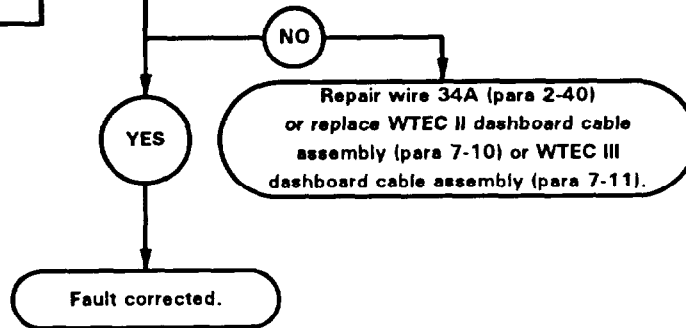


e38. ENGINE OIL PRESSURE INDICATOR DOES NOT OPERATE (CONT)

KNOWN INFO
Other indicator lights operate.
Oil level OK.
Oil pressure switch OK.
Lighted indicator display OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.

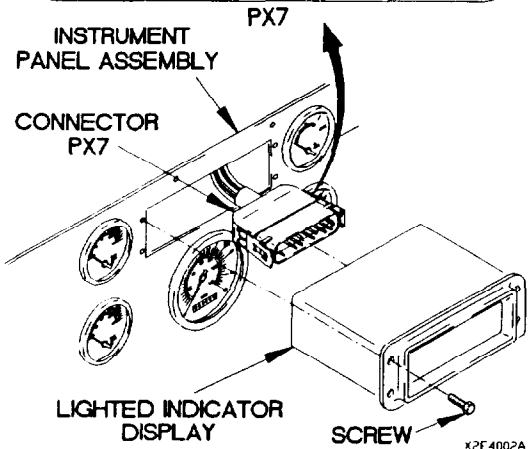
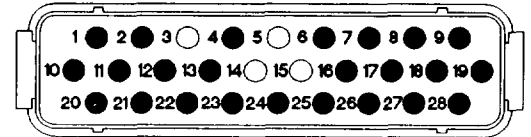
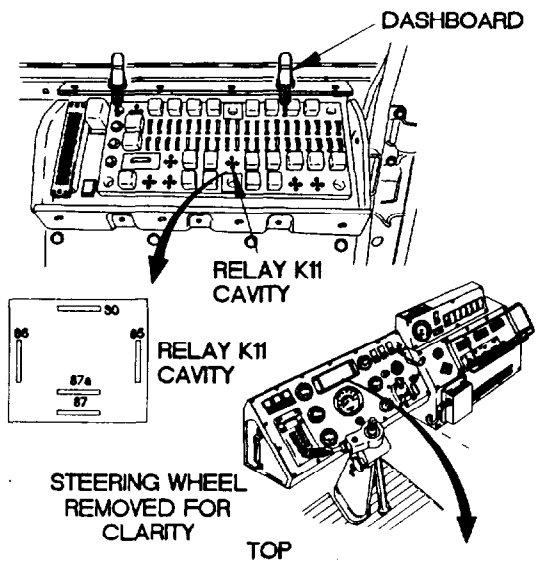
2.  
Is continuity present between relay K11 terminal 85 and PX7-237

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 34A is faulty.



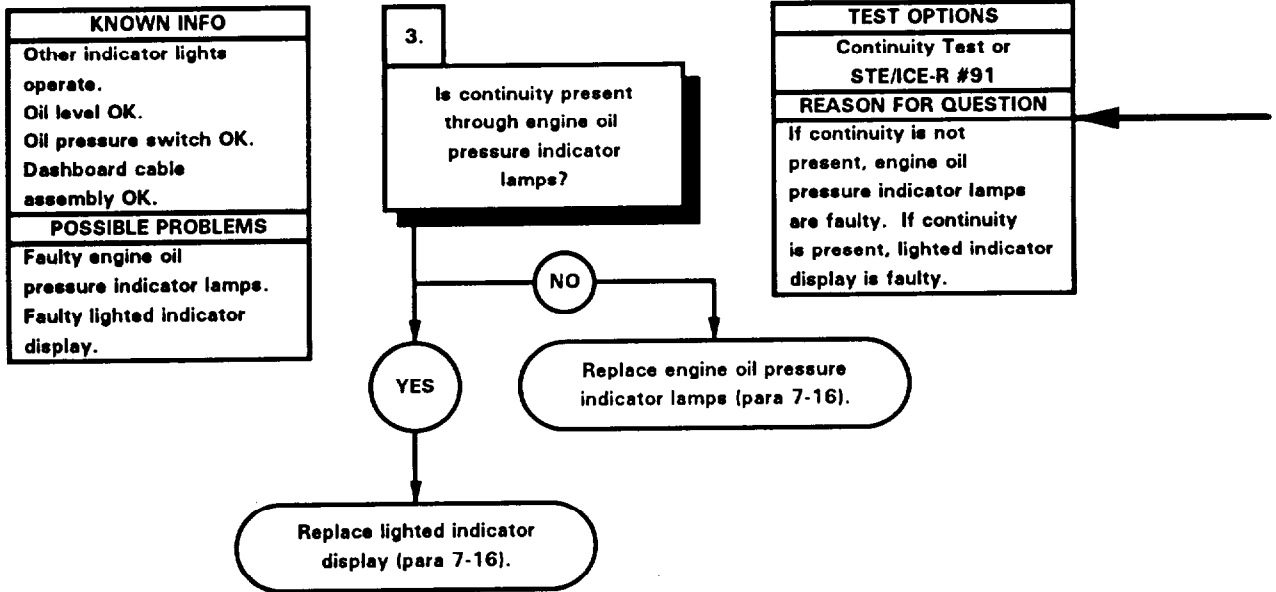
**CONTINUITY TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K11 from PDP.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K11 was removed.
- (5) Connect negative (-) probe of multimeter to PX7-23 and note reading on multimeter.
- (6) If continuity is not present, repair wire 34A (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) Install relay K11 in PDP.
- (8) Install PDP cover (para 16-2).
- (9) Connect lighted indicator display to connector PX7.
- (10) Position lighted indicator display in instrument panel assembly with four screws.
- (11) Tighten four screws to 6-10 lb-in. (1 N·m).
- (12) Connect batteries (para 7-48).



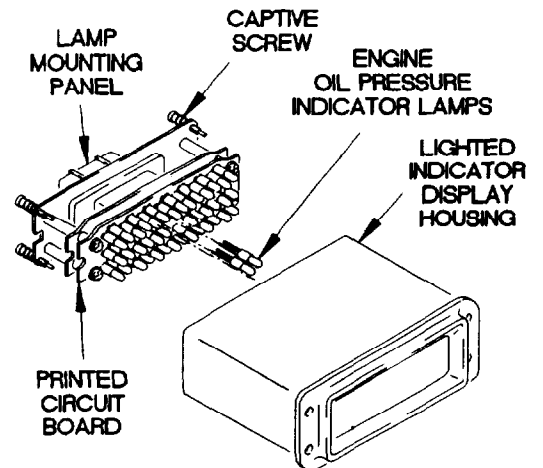
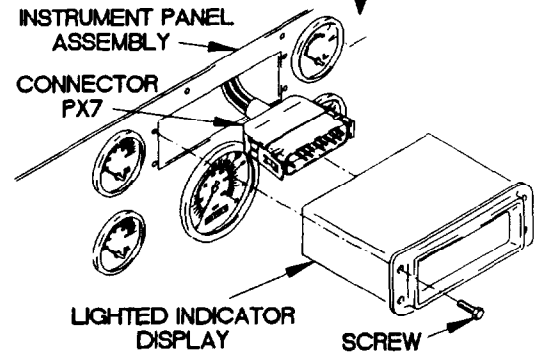
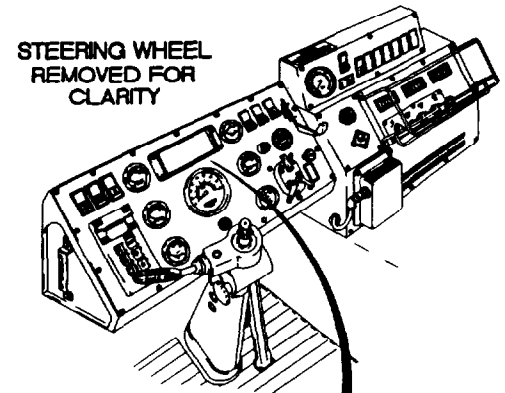


e38. ENGINE OIL PRESSURE INDICATOR DOES NOT OPERATE (CONT)



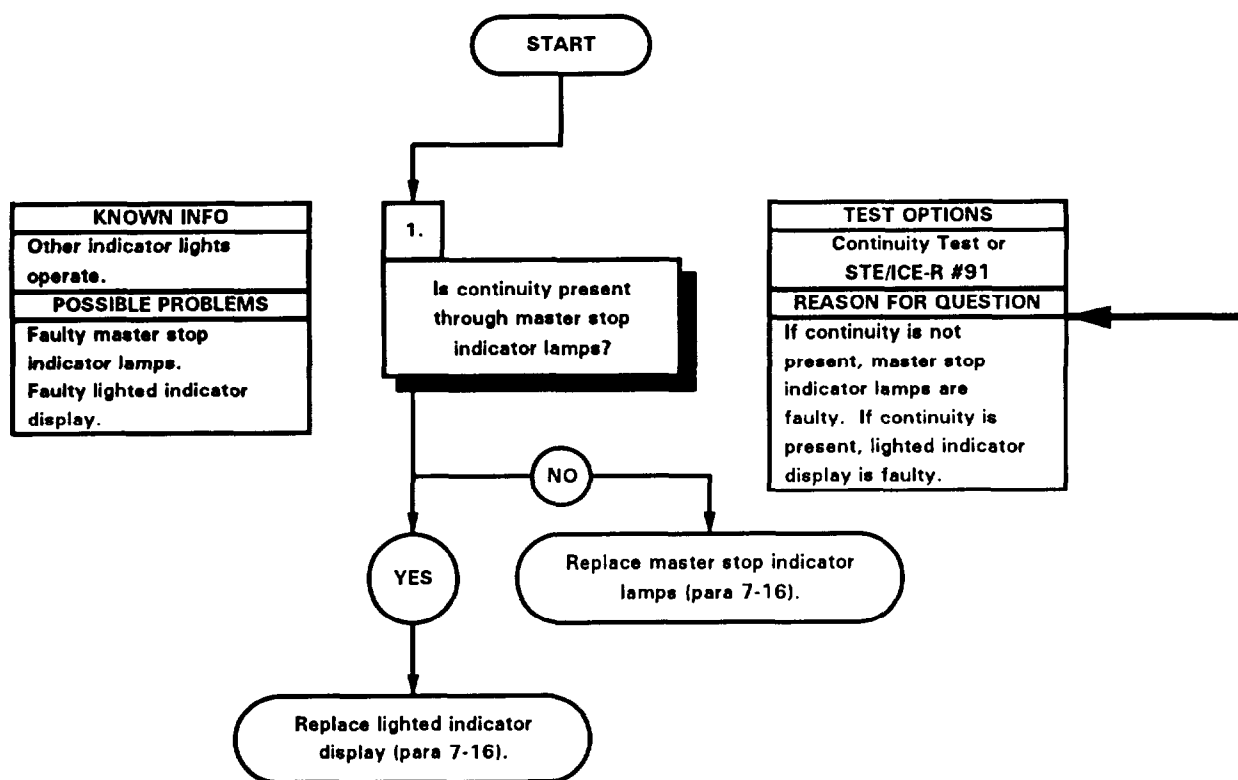
**CONTINUITY TEST**

- (1) Loosen four captive screws in lamp mounting panel.
- (2) Remove lamp mounting panel from lighted indicator display housing.
- (3) Remove engine oil pressure indicator lamps from printed circuit board.
- (4) Set multimeter to ohms.
- (5) Check continuity through each engine oil pressure indicator lamp and note reading on multimeter.
- (6) If continuity is not present, replace engine oil pressure indicator lamps (para 7-16).
- (7) If continuity is present, replace lighted indicator display (para 7-16).
- (8) Install engine oil pressure indicator lamps in printed circuit board.
- (9) Install lamp mounting panel in lighted indicator display housing.
- (10) Tighten four captive screws in lamp mounting panel.
- (11) Connect lighted indicator display to connector PX7.
- (12) Position lighted indicator display in instrument panel assembly with four screws.
- (13) Tighten four screws to 6-10 lb-in. (1 N·m).
- (14) Connect batteries (para 7-48).



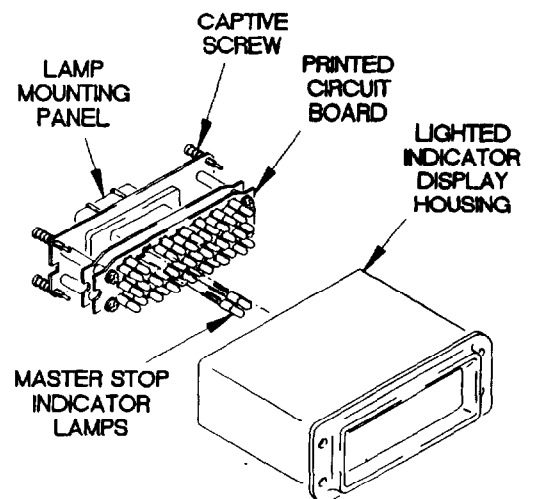
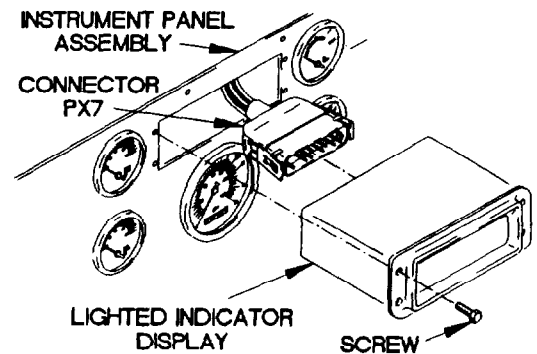
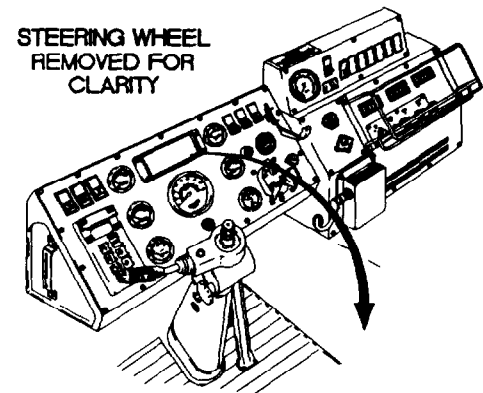
x2E4003A

●39. MASTER STOP INDICATOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



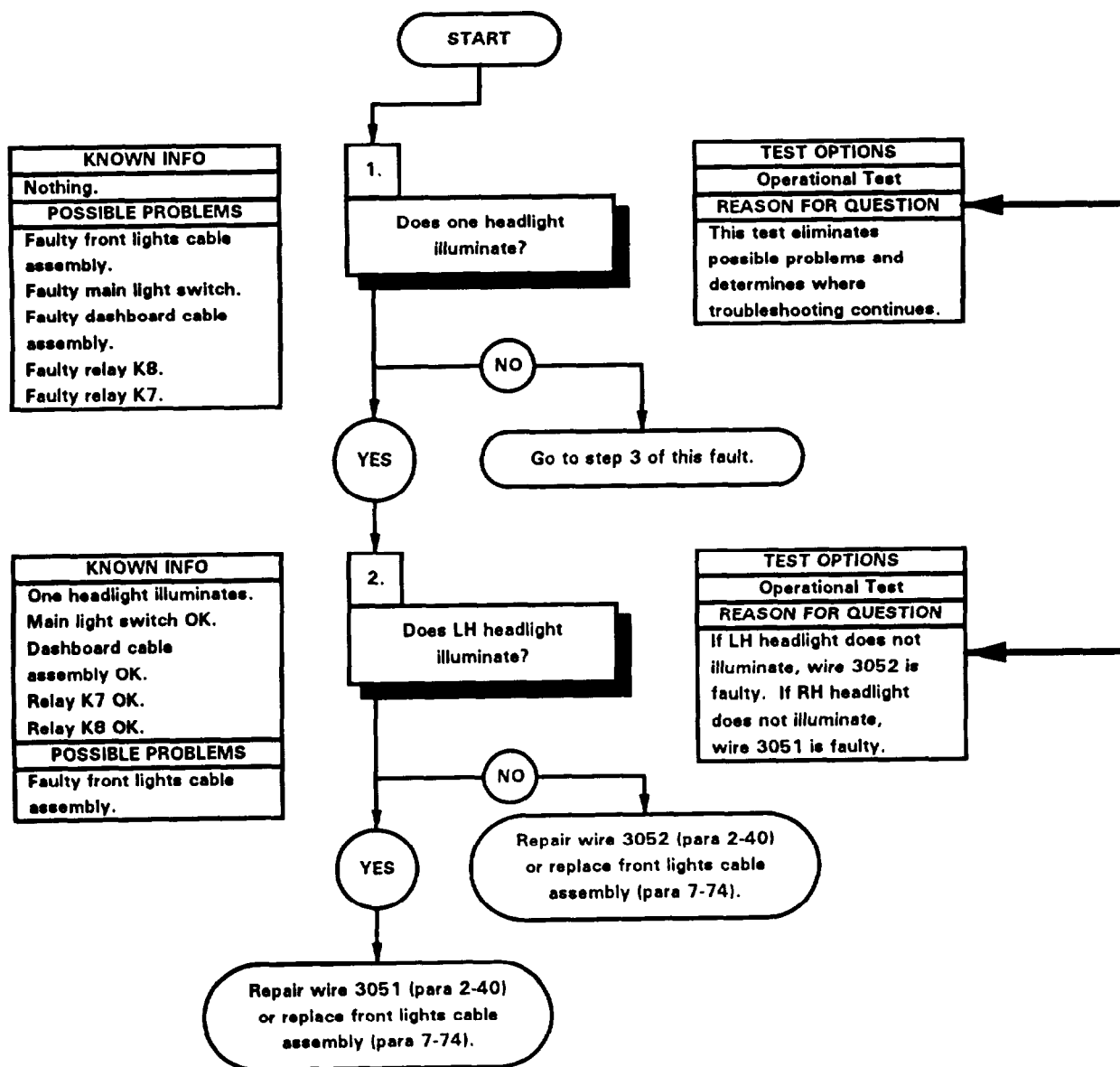
**CONTINUITY TEST**

- (1) Remove four screws from lighted indicator display.
- (2) Remove lighted indicator display from instrument panel assembly.
- (3) Disconnect connector PX7 from lighted indicator display.
- (4) Loosen four captive screws in lamp mounting panel.
- (5) Remove lamp mounting panel from lighted indicator display housing.
- (6) Remove master stop indicator lamps from printed circuit board.
- (7) Set multimeter to ohms.
- (8) Check continuity through each master stop indicator lamp and note reading on multimeter.
- (9) If continuity is not present, replace master stop indicator lamps (para 7-16).
- (10) If continuity is present, replace lighted indicator display (para 7-16).
- (11) Install master stop indicator lamps in printed circuit board.
- (12) Install lamp mounting panel in lighted indicator display housing.
- (13) Tighten four captive screws in lamp mounting panel.
- (14) Connect lighted indicator display to connector PX7.
- (15) Position lighted indicator display in instrument panel assembly with four screws.
- (16) Tighten four screws to 6-10 lb-in. (1 Nm).
- (17) Connect batteries (para 7-48).



XZE 4101A

e40. ONE OR BOTH HEADLIGHTS (HIGH AND LOW BEAM) DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



**OPERATIONAL TEST**

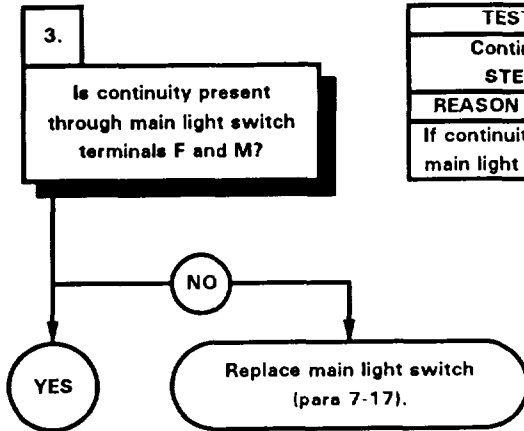
- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) If both headlights do not operate, go to step 3 of this fault.
- (3) Position main light switch to OFF (TM 9-2320-365-10).

**OPERATIONAL TEST**

- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) Observe which headlight illuminates.
- (3) If LH headlight illuminates, repair wire 3051 (para 2-40) or replace front lights cable assembly (para 7-74).
- (4) If RH headlight illuminates, repair wire 3052 (para 2-40) or replace front lights cable assembly (para 7-74).
- (5) Position main light switch to OFF (TM 9-2320-365-10).

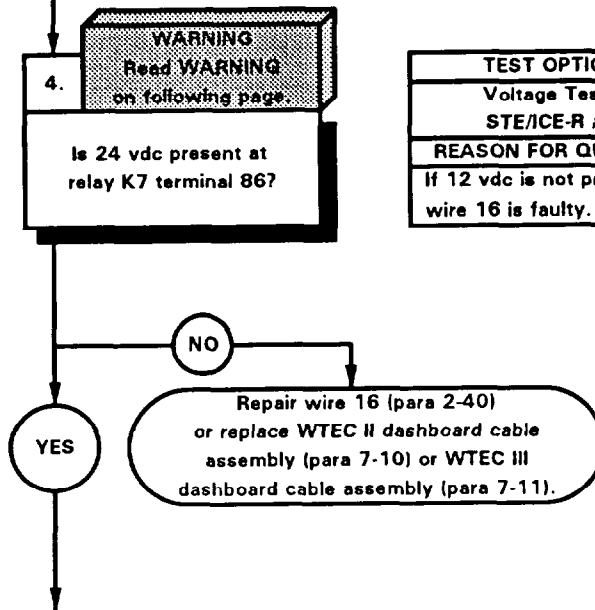
e40. ONE OR BOTH HEADLIGHTS (HIGH AND LOW BEAM) DO NOT ILLUMINATE (CONT)

KNOWN INFO
Front lights cable assembly OK.
POSSIBLE PROBLEMS
Faulty main light switch.
Faulty dashboard cable assembly.
Faulty relay K8.
Faulty relay K7.



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

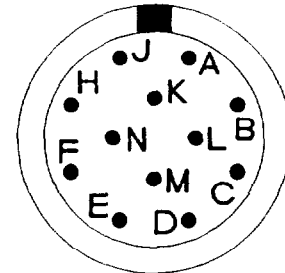
KNOWN INFO
Front lights cable assembly OK.
Main light switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K8.
Faulty relay K7.



TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 16 is faulty.

**CONTINUITY TEST**

- (1) Remove main light switch (para 7-17).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to light switch terminal M.
- (4) Connect negative (-) probe of multimeter to main light switch terminal F and note reading on multimeter.
- (5) If continuity is not present, replace main light switch (para 7-17).
- (6) Install main light switch (para 7-17).



MAIN LIGHT SWITCH

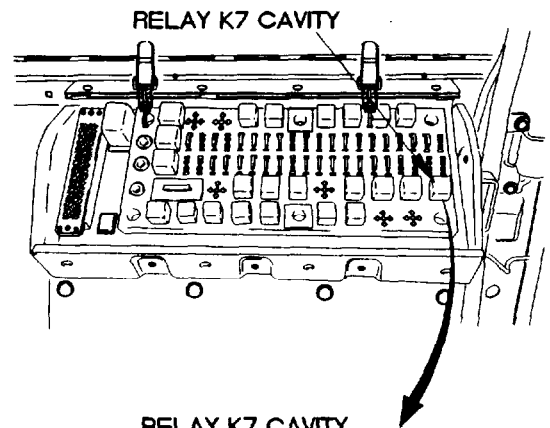
X2E4201A

**WARNING**

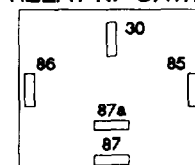
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K7 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K7 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 16 (para 2-40) 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 9-2320-365-10).



RELAY K7 CAVITY



X2E4202A

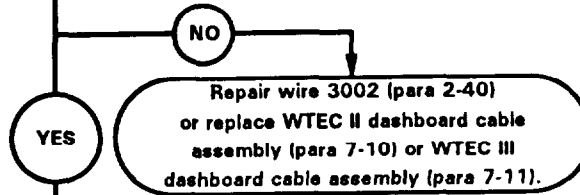


e40. ONE OR BOTH HEADLIGHTS (HIGH AND LOW BEAM) DO NOT ILLUMINATE (CONT)

KNOWN INFO
Front lights cable assembly OK. Main light switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K8. Faulty relay K7.

5.  
Is continuity present between relay K7 terminal 85 and a known good ground?

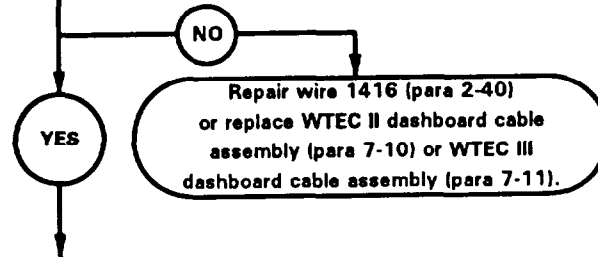
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3002 is faulty.



KNOWN INFO
Front lights cable assembly OK. Main light switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K8. Faulty relay K7.

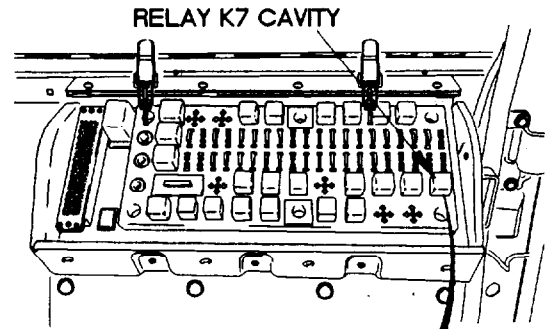
6. **WARNING**  
Read **WARNING** on following page.  
Is 24 vdc present at relay K7 terminal 307?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1416 is faulty.

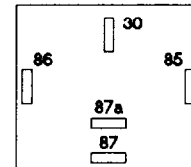


**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to power distribution panel terminal 85, where relay K7 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3002 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



RELAY K7 CAVITY



X2E4202A

**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**

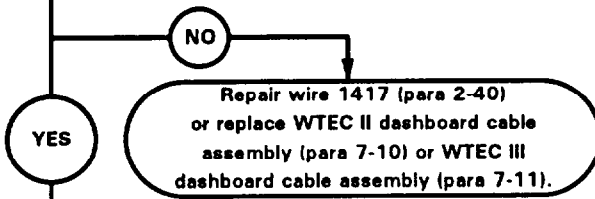
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 30, where relay K7 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1416 (para 2-40) 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 9-2320-365-10).

640. ONE OR BOTH HEADLIGHTS (HIGH AND LOW BEAM) DO NOT ILLUMINATE (CONT)

KNOWN INFO
Front lights cable assembly OK. Main light switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K8. Faulty relay K7.

7.  
Is continuity present between relay K7 terminal 87 and relay K8 terminal 30?

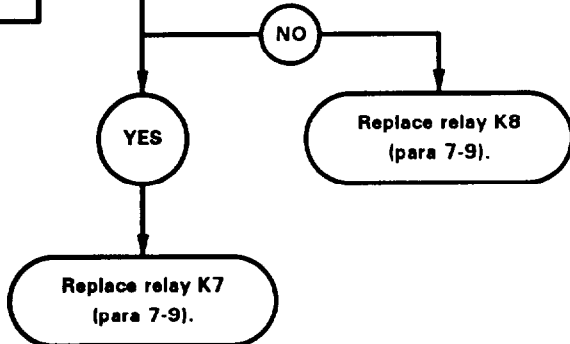
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1417 is faulty.



KNOWN INFO
Front lights cable assembly OK. Main light switch OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty relay K8. Faulty relay K7.

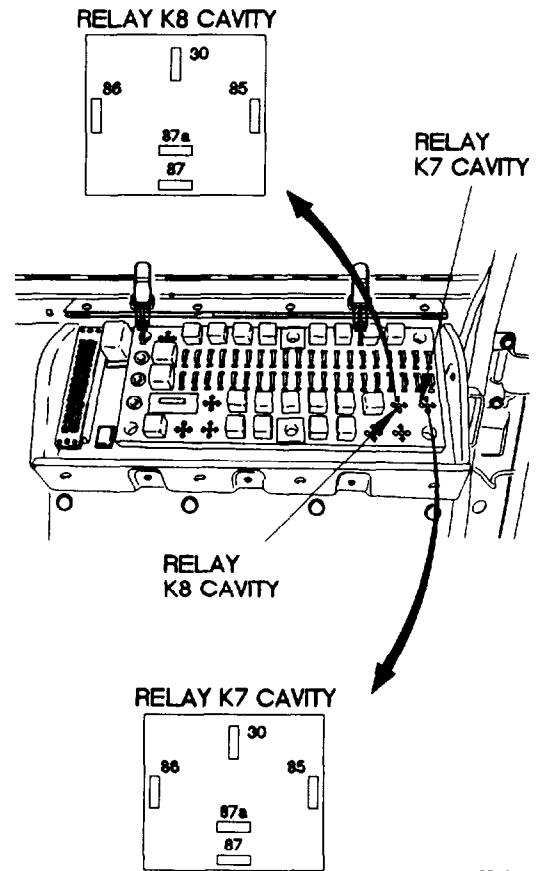
8.  
Is continuity present between relay K8 terminals 30 and B7A?

TEST OPTIONS
Continuity Test or STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, relay K8 is faulty. If continuity is present, relay K7 is faulty.



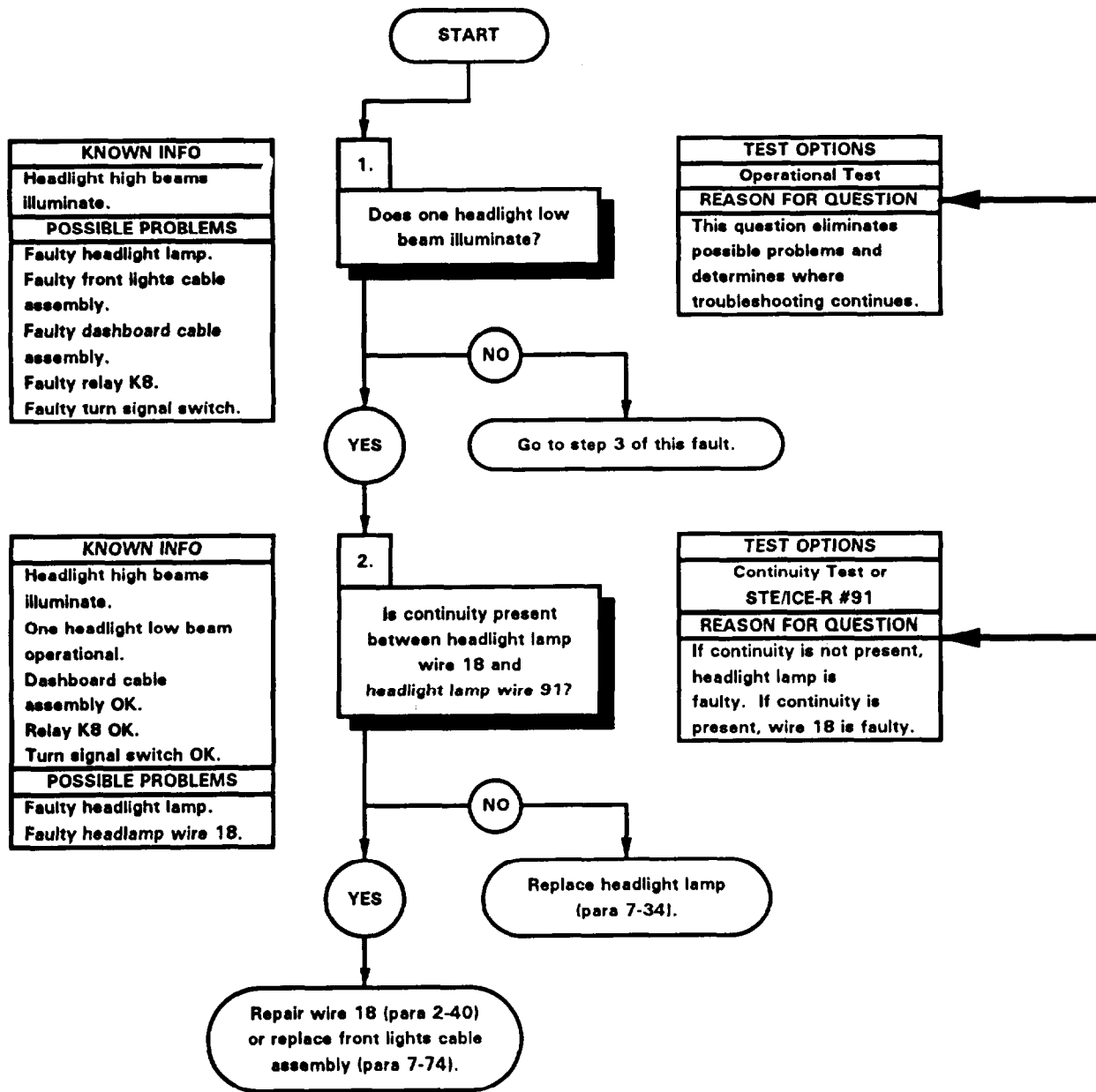
- CONTINUITY TEST**
- (1) Remove relay K8 from PDP.
  - (2) Set multimeter to ohms.
  - (3) Connect positive (+) probe of multimeter to PDP, terminal 87, where relay K7 was removed.
  - (4) Connect negative (-) probe of multimeter to PDP, terminal 30, where relay K8 was removed and note reading on multimeter.
  - (5) If continuity is not present, repair wire 1417 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (6) Install relay K7 in PDP.

- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to relay K8 terminal 87A.
  - (3) Connect negative (-) probe of multimeter to relay K8 terminal 30 and note reading on multimeter.
  - (4) If continuity is not present, replace relay K8 (para 7-9).
  - (5) If continuity is present, replace relay K7 (para 7-9).
  - (6) Install relay K8 in PDP.
  - (7) Install PDP cover (para 16-2).



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e41. ONE OR BOTH HEADLIGHT LOW BEAMS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

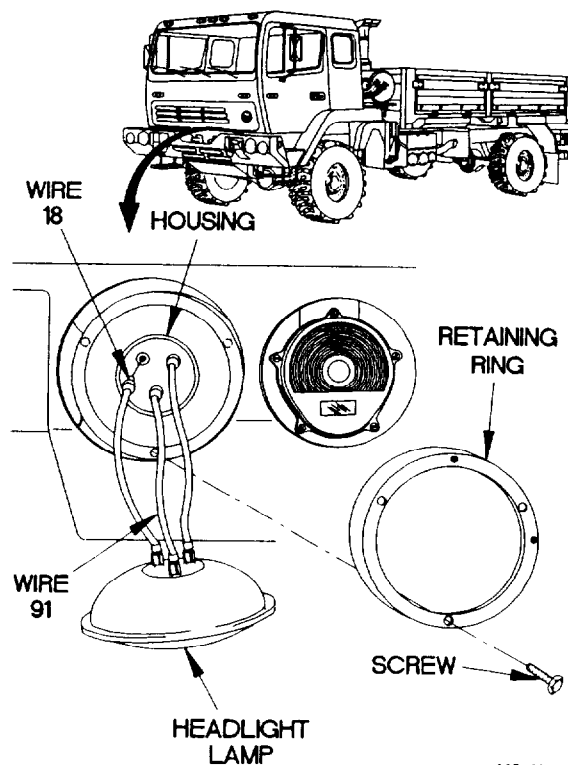


**OPERATIONAL TEST**

- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) Position headlight low beams to on (TM 9-2320-365-10).
- (3) If both headlight low beams do not illuminate, go to step 3 of this fault.
- (4) Position main light switch to OFF (TM 9-2320-365-10).

**CONTINUITY TEST**

- (1) Remove three screws and retaining ring from housing.
- (2) Remove lamp from housing.
- (3) Disconnect headlight lamp wire 18 from housing.
- (4) Disconnect headlight lamp wire 91 from housing.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to headlight lamp wire 18.
- (7) Connect negative (-) probe of multimeter to headlight lamp wire 91 and note reading on multimeter.
- (8) If continuity is not present, replace headlight lamp (para 7-34).
- (9) If continuity is present, repair wire 18 (para 2-40) or replace front lights cable assembly (para 7-74).
- (10) Connect headlight lamp wire 18 to housing.
- (11) Connect headlight lamp wire 91 to housing.
- (12) Install lamp in housing.
- (13) Install retaining ring on housing with three screws.

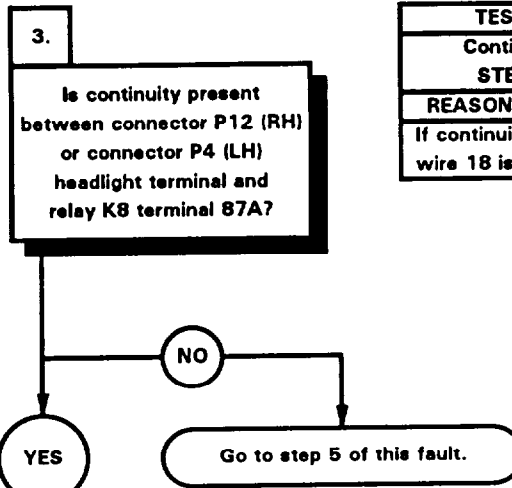


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e41. ONE OR BOTH HEADLIGHT LOW BEAMS DO NOT ILLUMINATE (CONT)

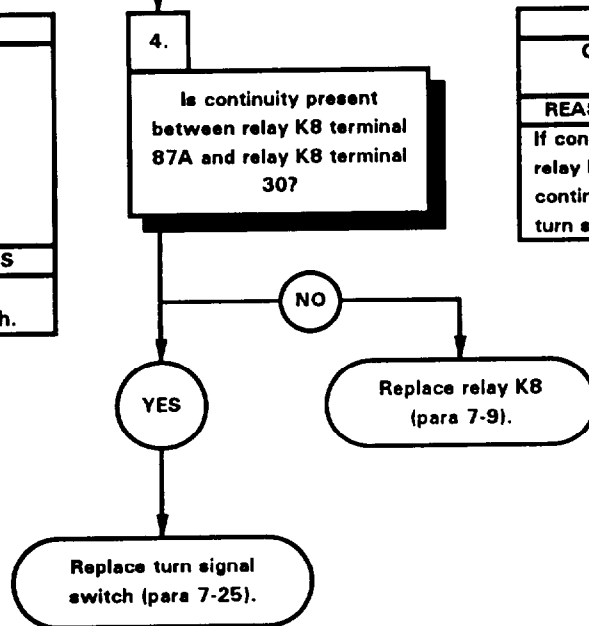
KNOWN INFO
Headlight high beams illuminate.
Headlight lamp OK.
POSSIBLE PROBLEMS
Faulty front lights cable assembly.
Faulty dashboard cable assembly.
Faulty relay K8.
Faulty turn signal switch.

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 18 is faulty.



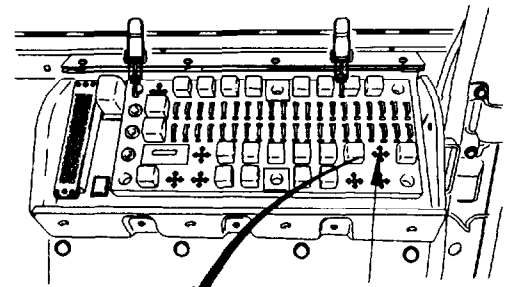
KNOWN INFO
Headlight high beams illuminate.
Headlight lamp OK.
Front lights cable assembly OK.
Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty relay K8.
Faulty turn signal switch.

TEST OPTIONS
Continuity Test or STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, relay K8 is faulty. If continuity is present, turn signal switch is faulty.

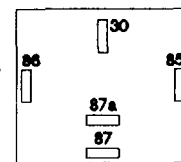


**CONTINUITY TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K8 from PDP.
- (3) Disconnect connector P12 (RH) or connector P4 (LH) from housing.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector P12 (RH) or connector P4 (LH).
- (6) Connect negative (-) probe of multimeter to PDP, terminal 87A, where relay K8 was removed and note reading on multimeter.
- (7) If continuity is not present, go to step 5 of this fault.
- (8) Connect connector P12 (RH) or connector P5 (LH) to housing.



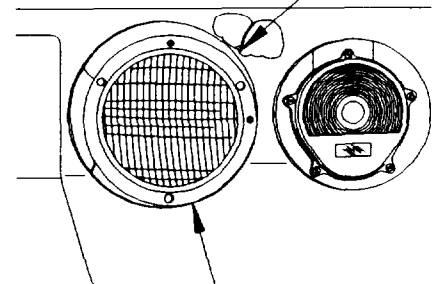
RELAY K8 CAVITY



RELAY K8 CAVITY

CONNECTOR P12 OR P4

FRONT



HOUSING

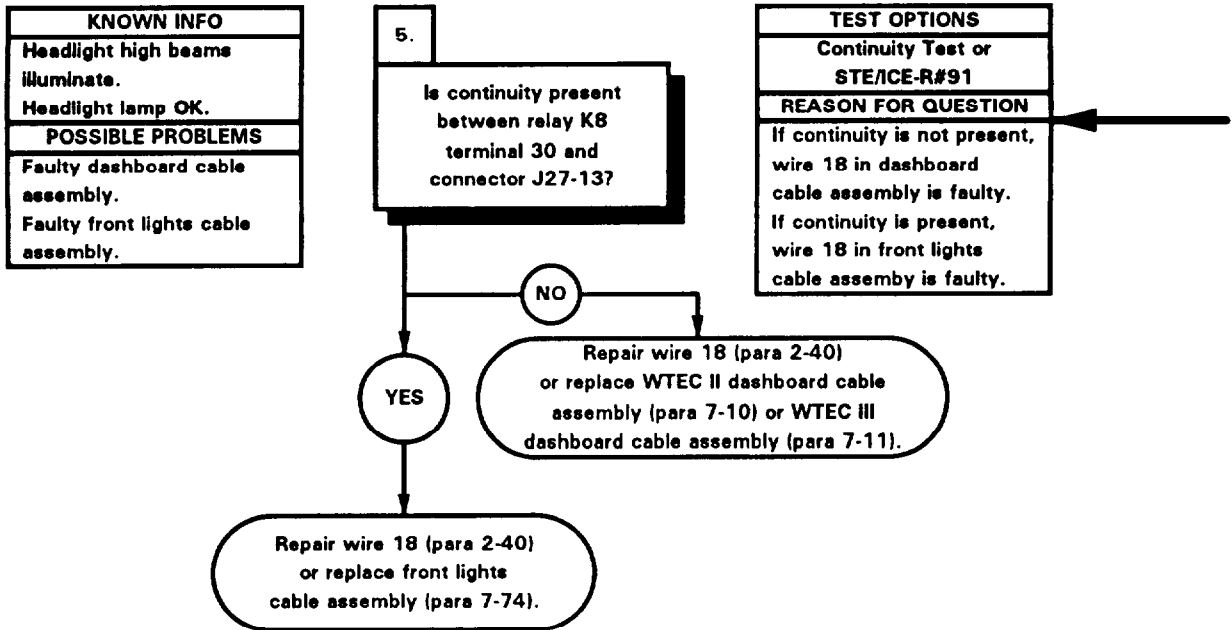
K2E4302A

**CONTINUITY TEST**

- (1) Set multimeter to ohms
- (2) Connect positive (+) probe of multimeter to relay K8 terminal 87A.
- (3) Connect negative (-) probe of multimeter to relay K8 terminal 30 and note reading on multimeter.
- (4) If continuity is not present, replace relay K8 (para 7-9).
- (5) If continuity is present, replace turn signal switch (para 7-25).
- (6) Install relay K8 in PDP.
- (7) Install PDP cover (para 16-2).

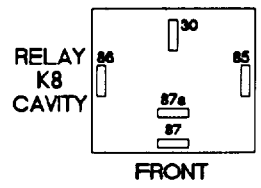
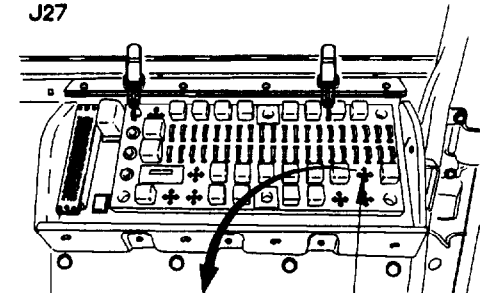
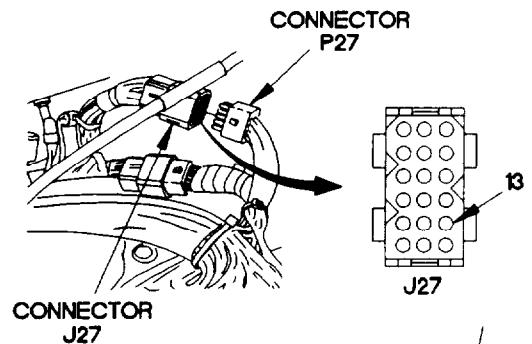
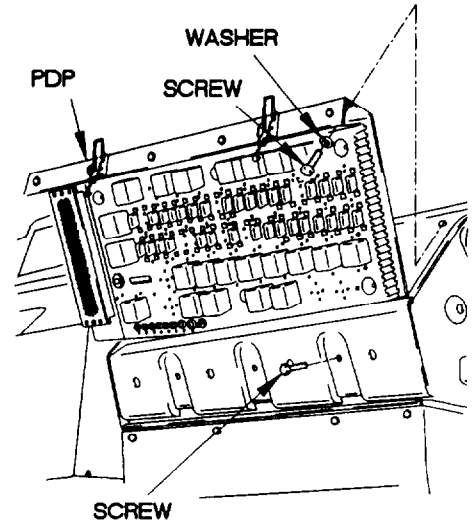


e41. ONE OR BOTH HEADLIGHT LOW BEAMS DO NOT ILLUMINATE (CONT)



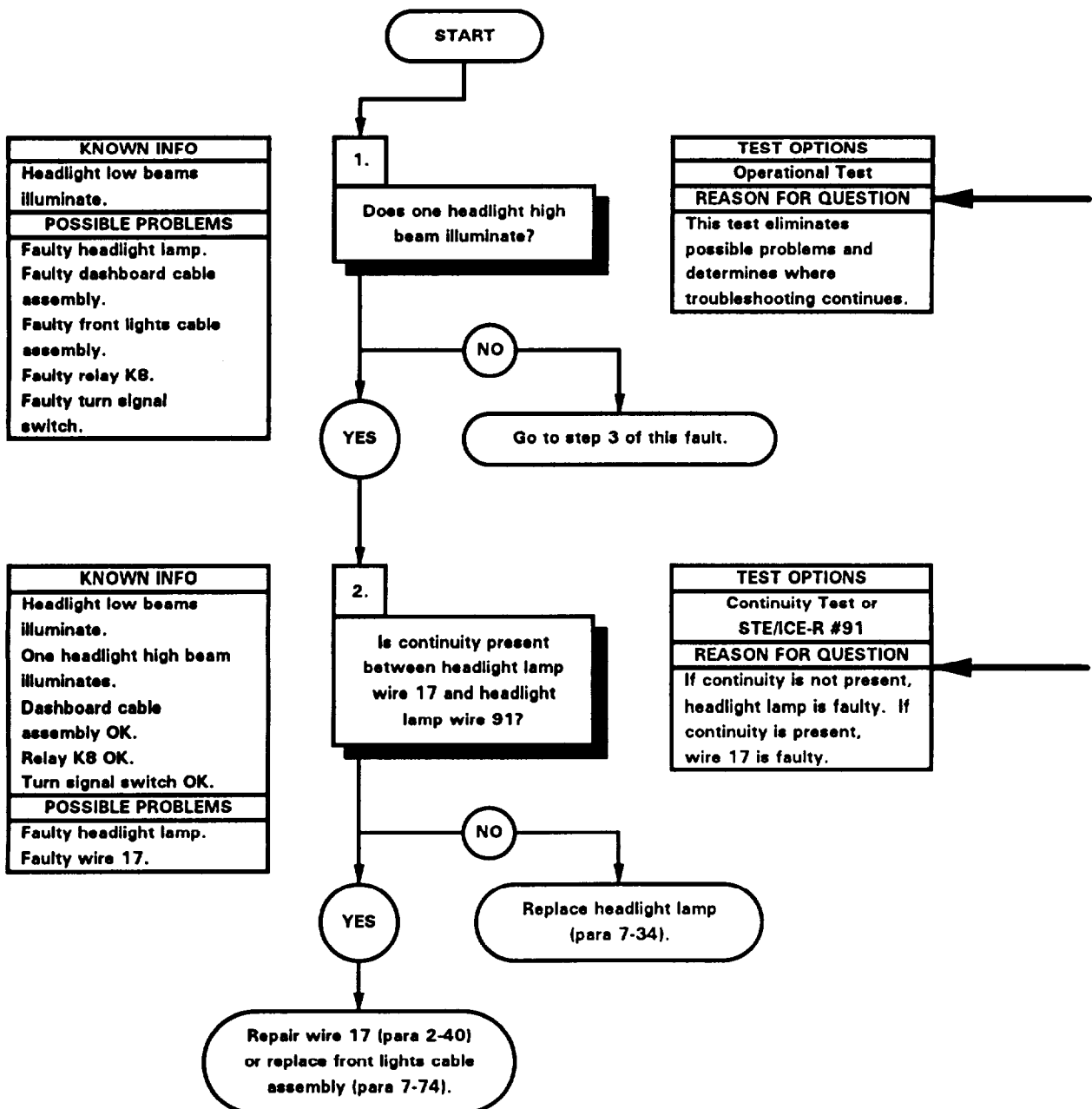
**CONTINUITY TEST**

- (1) Remove three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Disconnect connector J27 from connector P27.
- (5) Set multimeter to ohms
- (6) Connect positive (+) probe of multimeter to PDP, relay K8 terminal 87A, where relay K8 was removed.
- (7) Connect negative (-) probe of multimeter to connector J27-13 and note reading on multimeter.
- (8) If continuity is not present, repair wire 18 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) If continuity is present, repair wire 18 (para 2-40) or replace front lights cable assembly (para 7-74).
- (10) Connect connector P27 to connector J27.
- (11) Install PDP in dashboard with three screws.
- (12) Install three washers and screws in PDP.
- (13) Install relay K8 in PDP.
- (14) Install PDP cover (para 16-2).



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e42. ONE OR BOTH HEADLIGHT HIGH BEAMS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

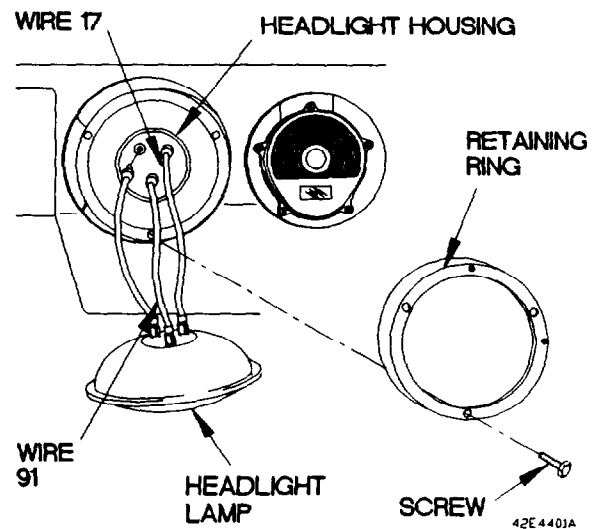


**OPERATIONAL TEST**

- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) Position headlight high beams on (TM 9-2320-365-10).
- (3) If both headlights high beams do not illuminate, and go to step 3 of this fault.
- (4) Position main light switch to OFF (TM 9-2320-365-10).

**CONTINUITY TEST**

- (1) Remove three screws and retaining ring from housing.
- (2) Remove headlight lamp from housing.
- (3) Disconnect headlight lamp wire 17 from housing.
- (4) Disconnect headlight lamp wire 91 from housing.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to headlight lamp wire 17.
- (7) Connect negative (-) probe of multimeter to headlight lamp wire 91 and note reading on multimeter.
- (8) If continuity is not present, replace headlight lamp (para 7-34).
- (9) If continuity is present, repair wire 17 (para 2-40) or replace front lights cable assembly (para 7-74).
- (10) Connect headlight lamp wire 17 to housing.
- (11) Connect headlight lamp wire 91 to housing.
- (12) Install headlight lamp in housing.
- (13) Install retaining ring on housing with three screws.

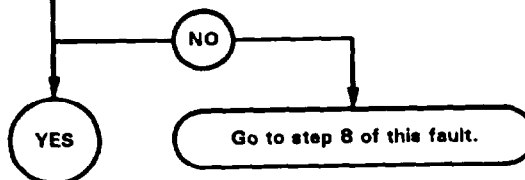


e42. ONE OR BOTH HEADLIGHT HIGH BEAMS DO NOT ILLUMINATE (CONT)

<b>KNOWN INFO</b>
Headlight low beams illuminate. Headlight lamp OK.
<b>POSSIBLE PROBLEMS</b>
Faulty front lights cable assembly. Faulty dashboard cable assembly. Faulty relay K8. Faulty turn signal switch.

3.  
Is continuity present between connector P14 (RH) or connector P20 (LH) and relay K8 terminal 87?

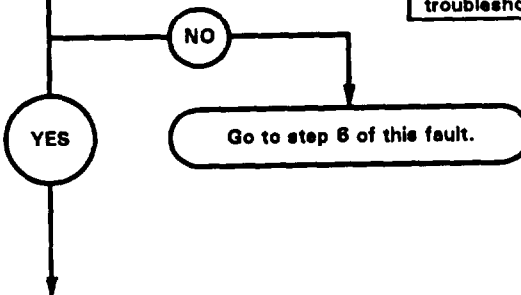
<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 17 is faulty.



<b>KNOWN INFO</b>
Headlight low beams illuminate. Headlight lamp OK. Front lights cable assembly OK.
<b>POSSIBLE PROBLEMS</b>
Faulty relay K8. Faulty dashboard cable assembly. Faulty turn signal switch.

4. **WARNING**  
Read WARNING on following page.  
Is 12 vdc present at relay K8 terminal 86?

<b>TEST OPTIONS</b>
Voltage Test or STE/ICE-R #89
<b>REASON FOR QUESTION</b>
This test eliminates possible problems and determines where troubleshooting continues.



**CONTINUITY TEST**

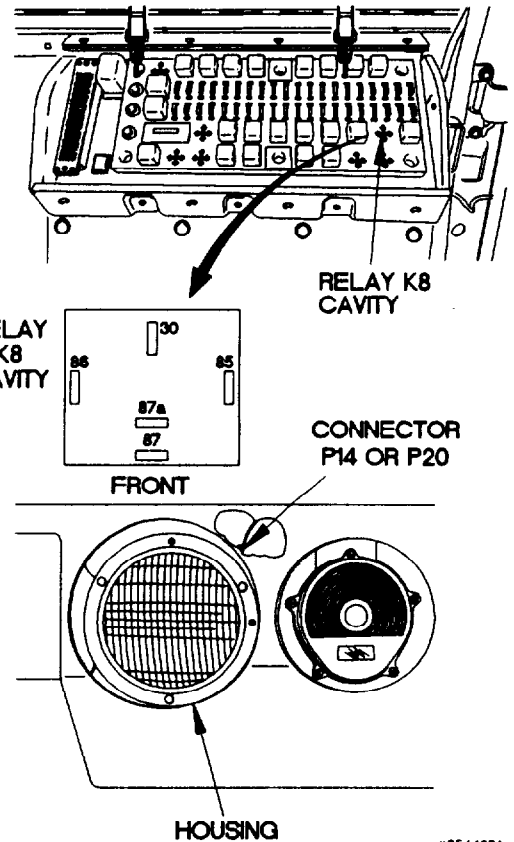
- (1) Remove PDP cover (para para 16-2).
- (2) Remove relay K8 from PDP.
- (3) Disconnect connector P14 (RH) or connector P20 (LH) from housing.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to PDP, terminal 87A, where relay K8 was removed.
- (6) Connect negative (-) probe of multimeter to connector P14 (RH) or connector P20 (LH) and note reading on multimeter.
- (7) If continuity is not present, go to step 8 of this fault.
- (8) Connect connector P14 (RH) or connector P20 (LH) to housing.

**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 86, where relay K8 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (5) Position headlight high beams to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, go to step 6 of this fault.
- (7) Position main light switch to OFF (TM 9-2320-365-10).



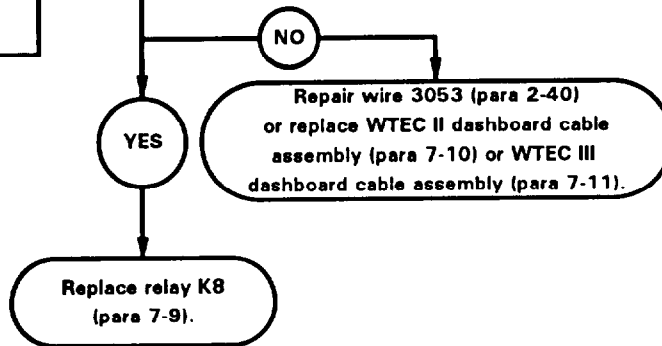
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642. ONE OR BOTH HEADLIGHT HIGH BEAMS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Headlight low beams illuminate.
Headlight lamp OK.
Front lights cable assembly OK.
Turn signal switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K8.

5.  
Is continuity present between relay K8 terminal 85 and a known good ground?

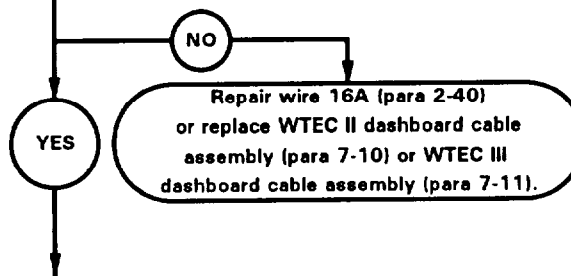
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3053 is faulty. If continuity is present, relay K8 is faulty.



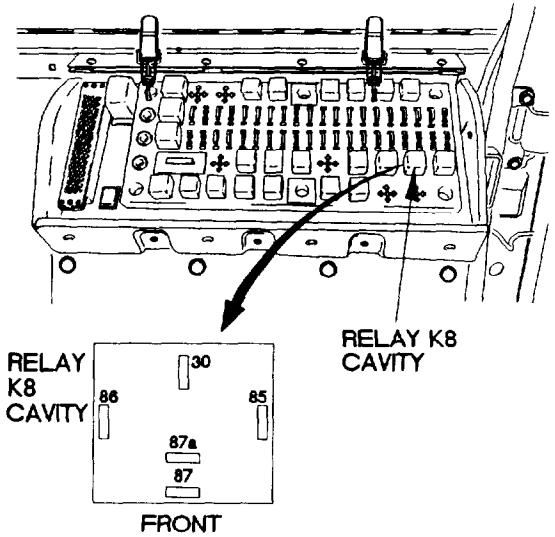
KNOWN INFO
Headlight low beams illuminate.
Headlight lamp OK.
Front lights cable assembly OK.
POSSIBLE PROBLEMS
Faulty turn signal switch.
Faulty dashboard cable assembly.

6.  
**WARNING**  
Read **WARNING** on following page.  
Is 12 vdc present at connector P18-37?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 16A is faulty.



- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K8 was removed.
  - (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
  - (4) If continuity is not present, repair wire 3053 (para 2-40) 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 K8 (para 7-9).
  - (6) Install relay K8 in PDP.
  - (7) Install PDP cover (para 16-2).

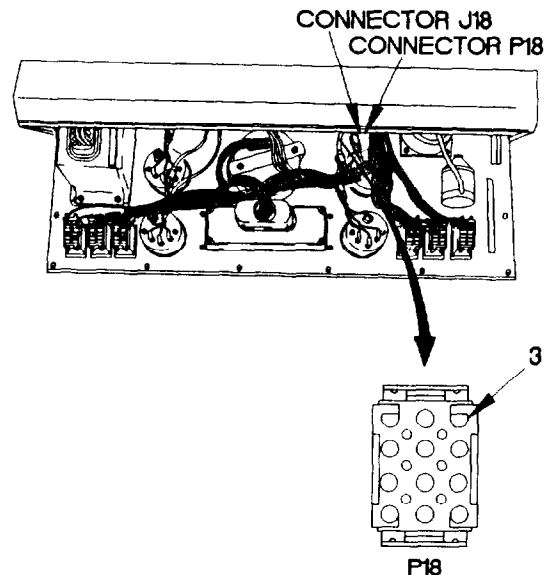


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**WARNING**

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.

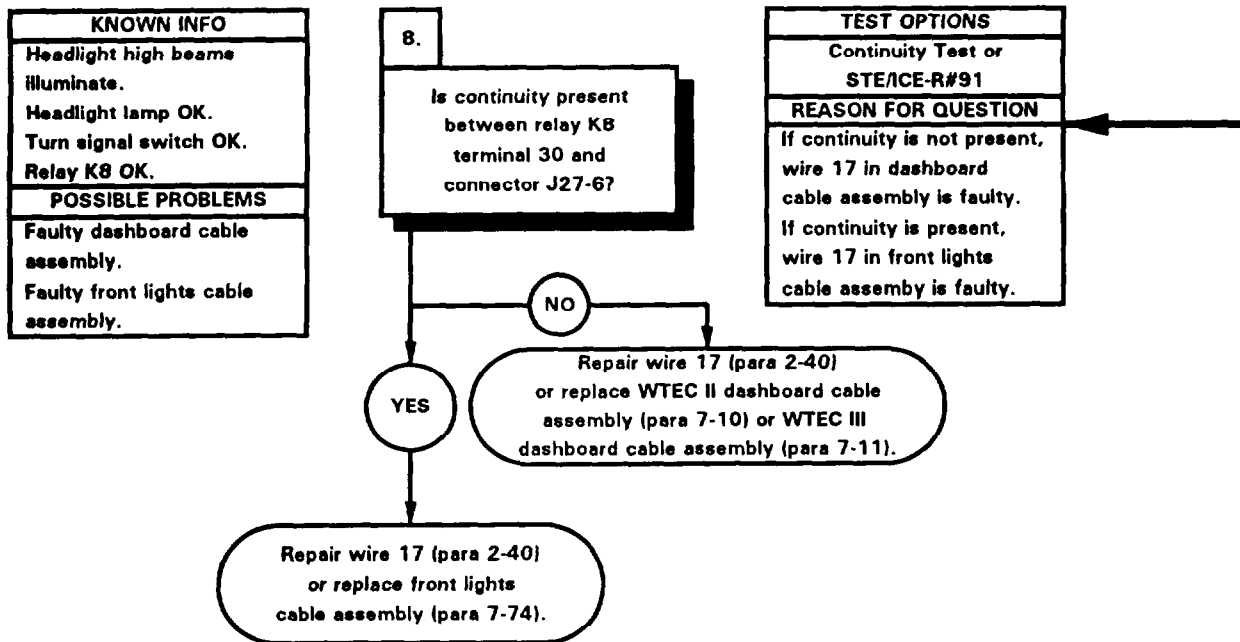
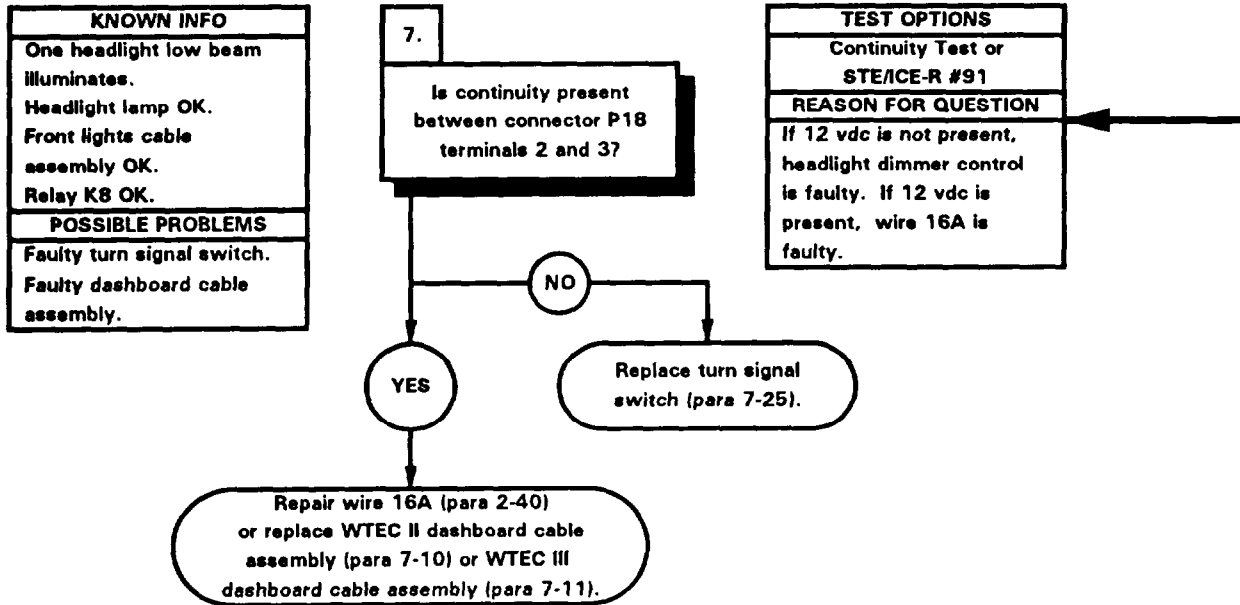
- VOLTAGE TEST**
- (1) Remove instrument panel assembly for access (para 7-15).
  - (2) Disconnect connector P18 from connector J18.
  - (3) Set multimeter to volts dc.
  - (4) Connect positive (+) probe of multimeter to connector P18-3.
  - (5) Connect negative (-) probe of multimeter to ground.
  - (6) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
  - (7) If 12 vdc is not present, repair wire 16A (para 2-40) 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 9-2320-365-10).



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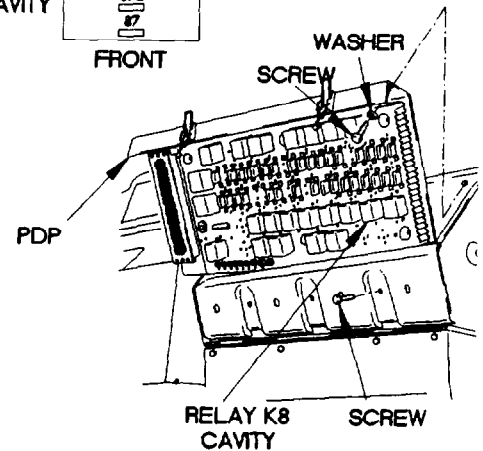
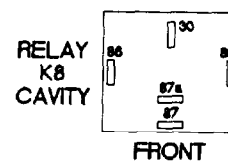
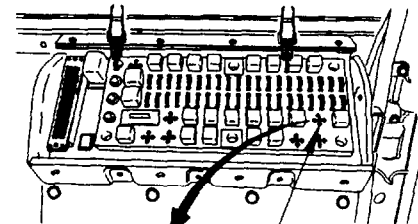


e42. ONE OR BOTH HEADLIGHT HIGH BEAMS DO NOT ILLUMINATE (CONT)



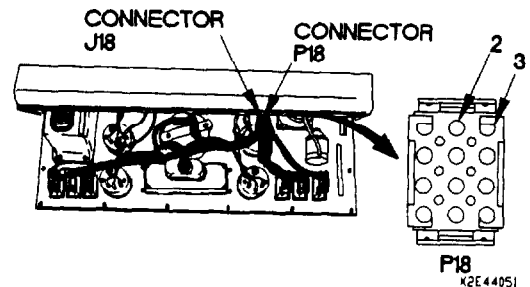
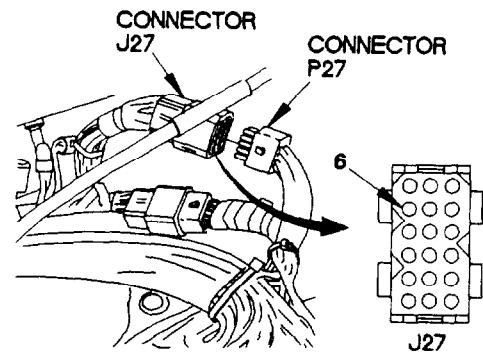
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P18-3.
- (3) Connect negative (-) probe of multimeter to connector P18-2.
- (4) If continuity is not present, replace turn signal switch (para 7-25).
- (5) If continuity is present, repair wire 16A (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) Connect connector P18 to connector J18.
- (7) Install instrument panel assembly (para 7-15).
- (8) Install relay K8 in PDP.
- (9) Install PDP cover (para 16-2).

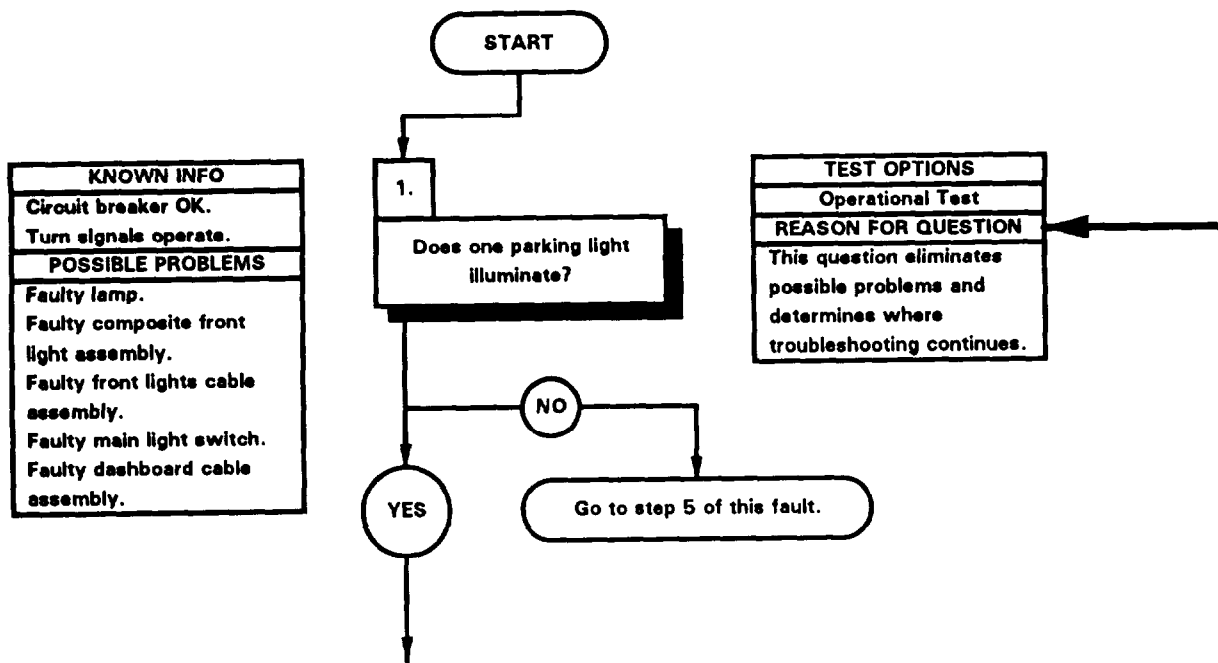


**CONTINUITY TEST**

- (1) Remove three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Disconnect connector J27 from connector P27.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to PDP, relay K8 terminal 30, where relay K8 was removed.
- (7) Connect negative (-) probe of multimeter to connector J27-6 and note reading on multimeter.
- (8) If continuity is not present, repair wire 17 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) If continuity is present, repair wire 17 (para 2-40) or replace front lights cable assembly (para 7-74).
- (10) Connect connector P27 to connector J27.
- (11) Install PDP in dashboard with three screws.
- (12) Install three washers and screws in PDP.
- (13) Install relay K8 in PDP.
- (14) Install PDP cover (para 16-2).



43. PARKING LIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materiale/Parts</b> Packing, Preformed (Item 170, Appendix G)	

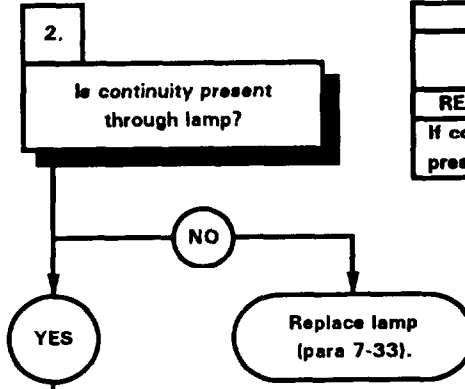


**OPERATIONAL TEST**

- (1) Position main light switch to **SER DRIVE** (TM 9-2320-365-10).
- (2) Position main light switch auxiliary lever to **PARK** (TM 9-2320-365-10).
- (3) If no parking lights illuminate, go to step 5 of this fault.
- (4) Position main light switch to **OFF** (TM 9-2320-365-10).

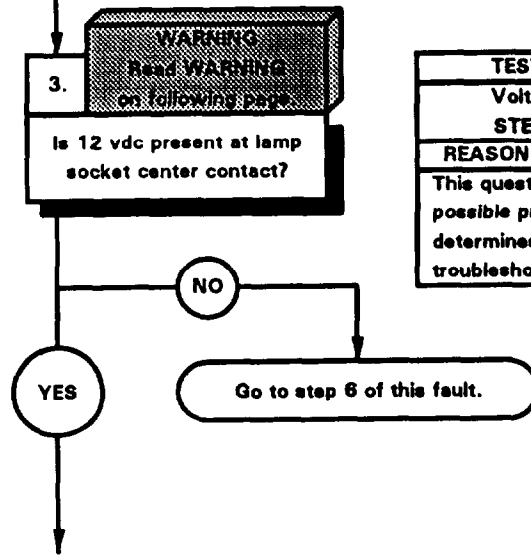
e43. PARKING LIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker OK. Turn signals operate. Other parking light illuminates. Main light switch OK.
POSSIBLE PROBLEMS
Faulty lamp. Faulty composite front light assembly. Faulty front lights cable assembly. Faulty dashboard cable assembly.



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

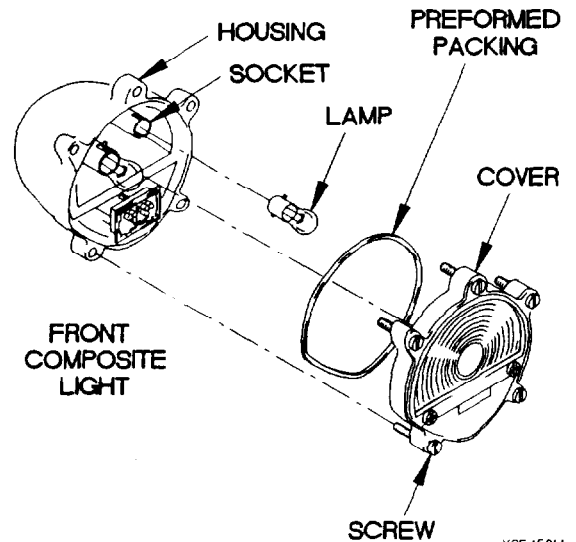
KNOWN INFO
Circuit breaker OK. Turn signals operate. Other parking light illuminates. Main light switch OK. Lamp OK.
POSSIBLE PROBLEMS
Faulty composite front light assembly. Faulty front lights cable assembly. Faulty dashboard cable assembly.



TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.

**CONTINUITY TEST**

- (1) Loosen five screws on cover.
- (2) Remove cover and preformed packing from housing. Discard preformed packing.
- (3) Remove lamp from socket.
- (4) Set multimeter to ohms.
- (5) Check continuity through lamp and note reading on multimeter.
- (6) If continuity is not present, replace lamp (para 7-33).



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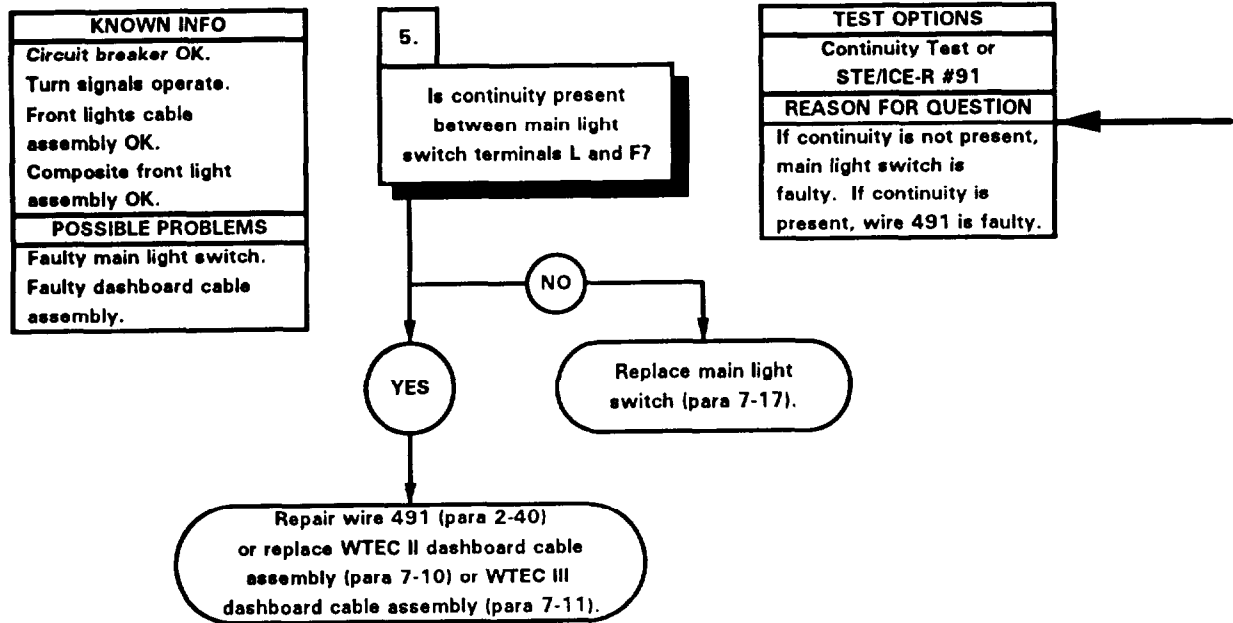
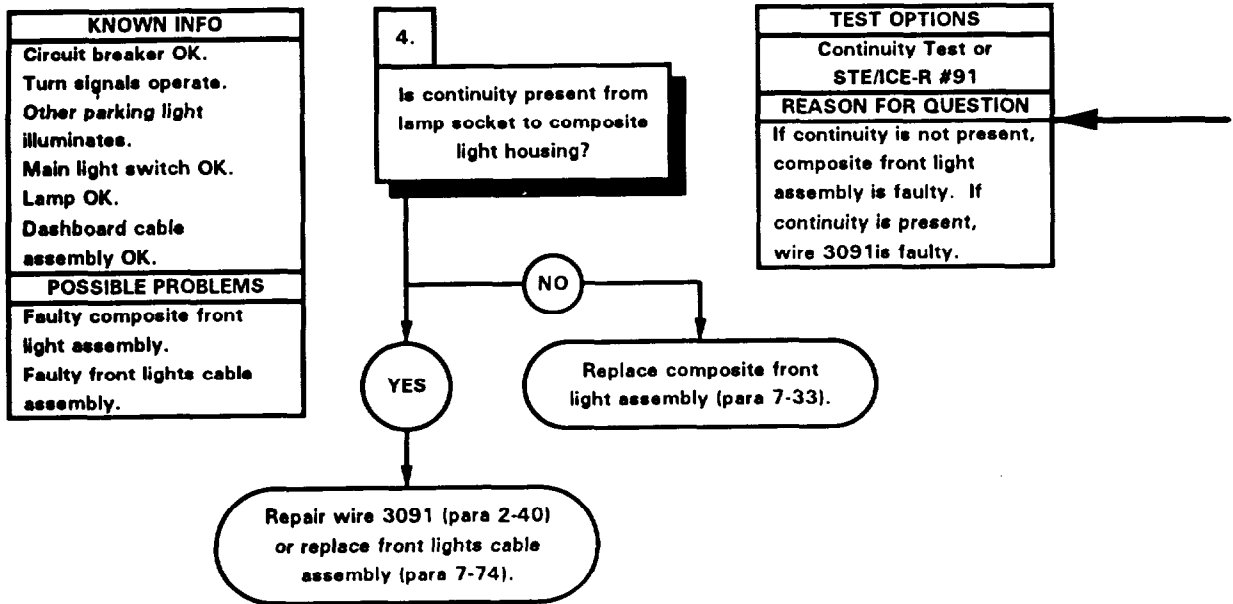
**WARNING**

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.

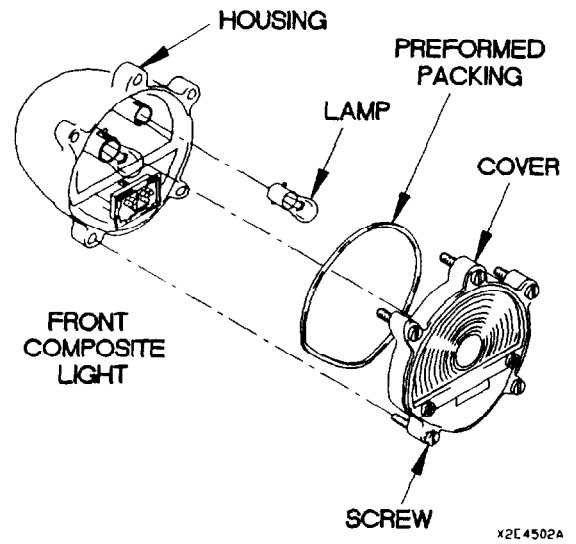
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to center contact of lamp socket.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (5) Position main light switch auxiliary lever to PARK (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, go to step 6 of this fault.
- (7) Position main light switch to OFF (TM 9-2320-365-10).

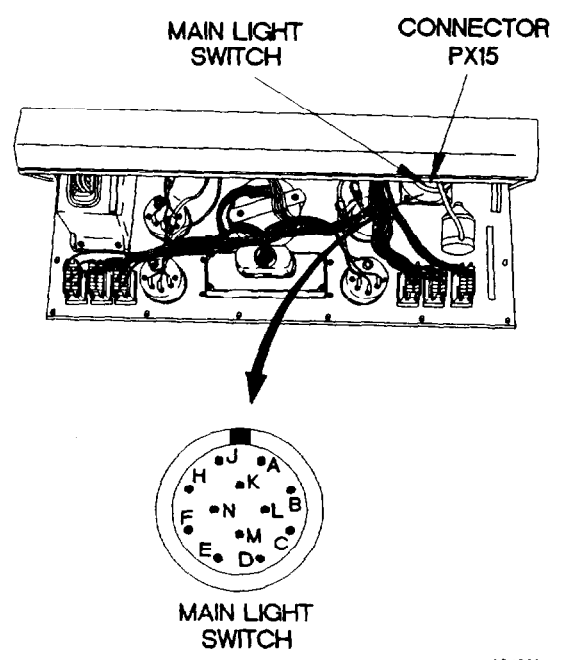
e43. PARKING LIGHTS DO NOT ILLUMINATE (CONT)



- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to lamp socket.
  - (3) Connect negative (-) probe of multimeter to composite front light housing and note reading on multimeter.
  - (4) If continuity is not present, replace composite front light assembly (para 7-33).
  - (5) If continuity is present, repair wire 3091 (para 2-40) or replace front lights cable assembly (para 7-74).
  - (6) Install lamp in socket.
  - (7) Install preformed packing and cover on housing with five screws.

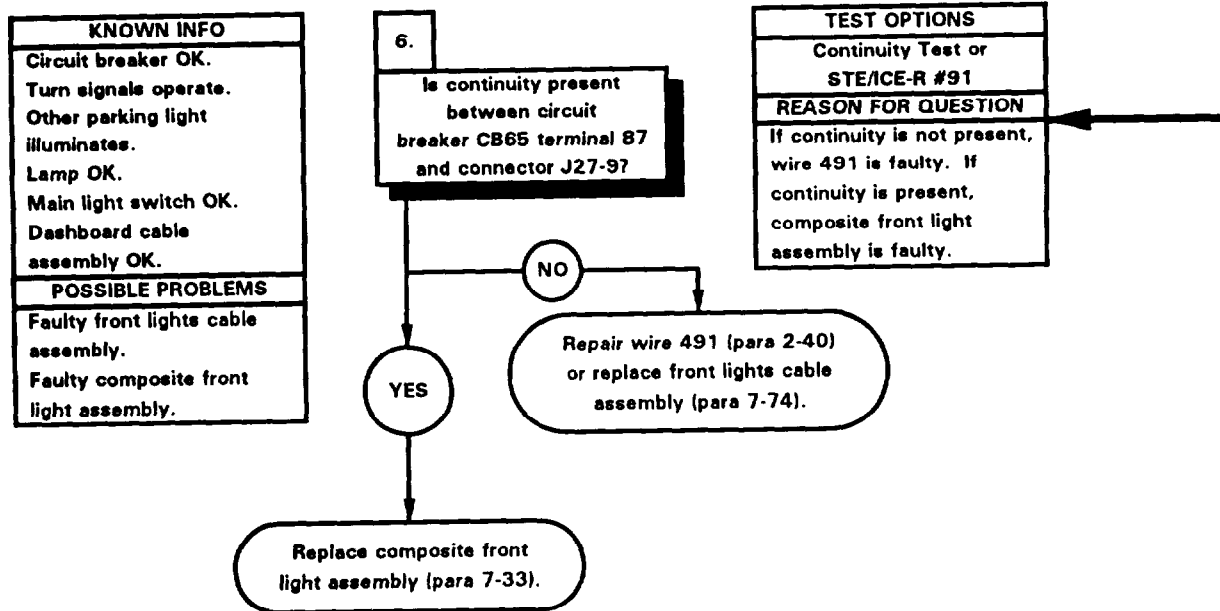


- CONTINUITY TEST**
- (1) Remove instrument panel assembly for access (para 7-15).
  - (2) Disconnect connector PX15 from main light switch.
  - (3) Set multimeter to ohms.
  - (4) Connect positive (+) probe of multimeter to main light switch terminal L.
  - (5) Connect negative (-) probe of multimeter to main light switch terminal F.
  - (6) Position main light switch auxiliary lever to PARK (TM 9-2320-365-10) and note reading on multimeter.
  - (7) If continuity is not present, replace main light switch (para 7-17).
  - (8) If continuity is present, repair wire 491 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (9) Connect connector PX15 to main light switch.
  - (10) Install instrument panel assembly (para 7-15).



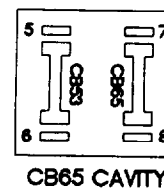
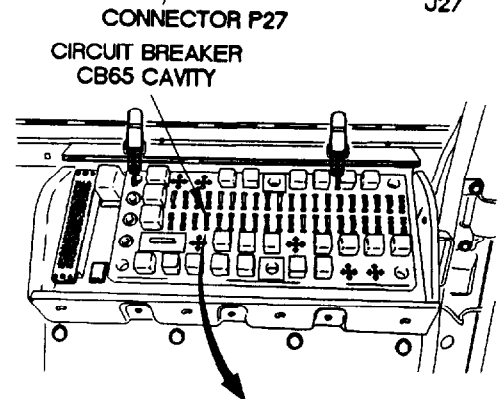
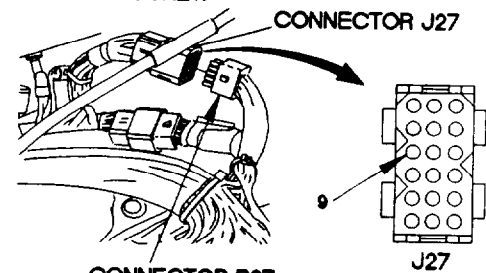
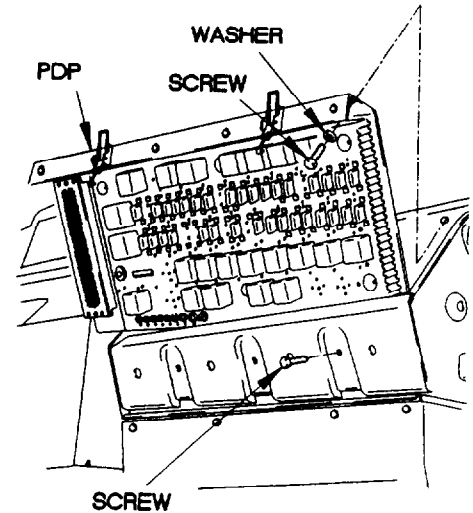


e43. PARKING LIGHTS DO NOT ILLUMINATE (CONT)



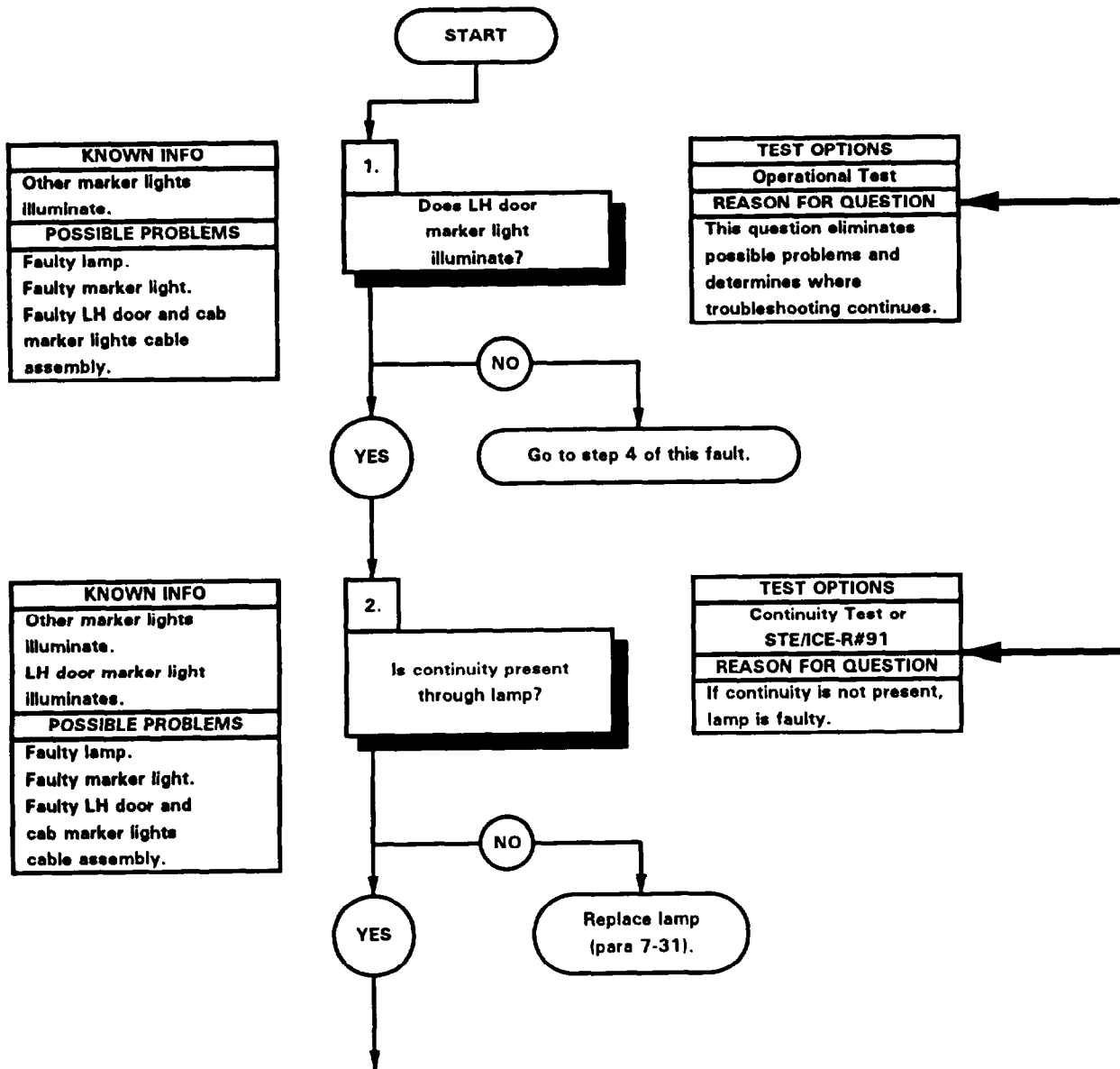
**CONTINUITY TEST**

- (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 connector J27 from connector P27.
- (6) Remove circuit breaker CB65 from PDP.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to PDP, terminal 8, where CB65 was removed.
- (9) Connect negative (-) probe of multimeter to connector J27-9 and note reading on multimeter.
- (10) If continuity is not present, repair wire 491 (para 2-40) or replace front lights cable assembly (para 7-74).
- (11) If continuity is present, replace composite front light assembly (para 7-33).
- (12) Install lamp in socket.
- (13) Install preformed packing and cover on housing with five screws.
- (14) Connect connector J27 to connector P27.
- (15) Install PDP on dashboard with three screws.
- (16) Install three washers and screws in PDP.
- (17) Install circuit breaker CB65 in PDP.
- (18) Install PDP cover (para 16-2).



X2C45041

e44. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Lockwasher (2) (Item 77, Appendix G)	

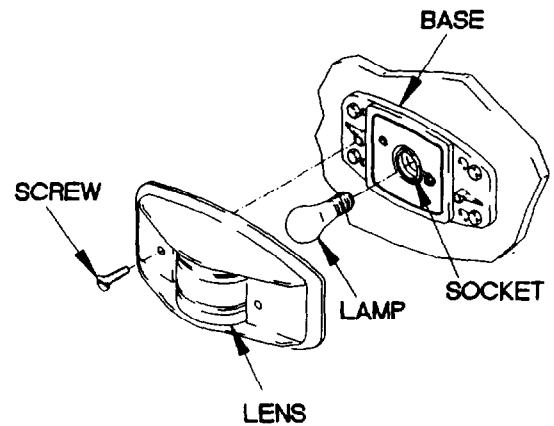


**OPERATIONAL TEST**

- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) If LH door marker light does not illuminate, go to step 4 of this fault.
- (3) Position main light switch to OFF (TM 9-2320-365-10).

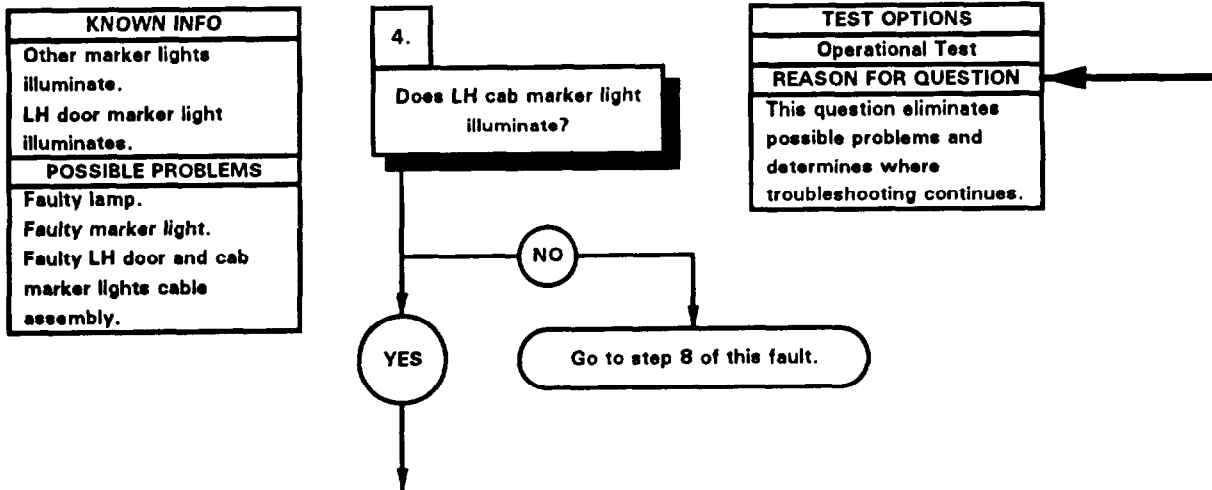
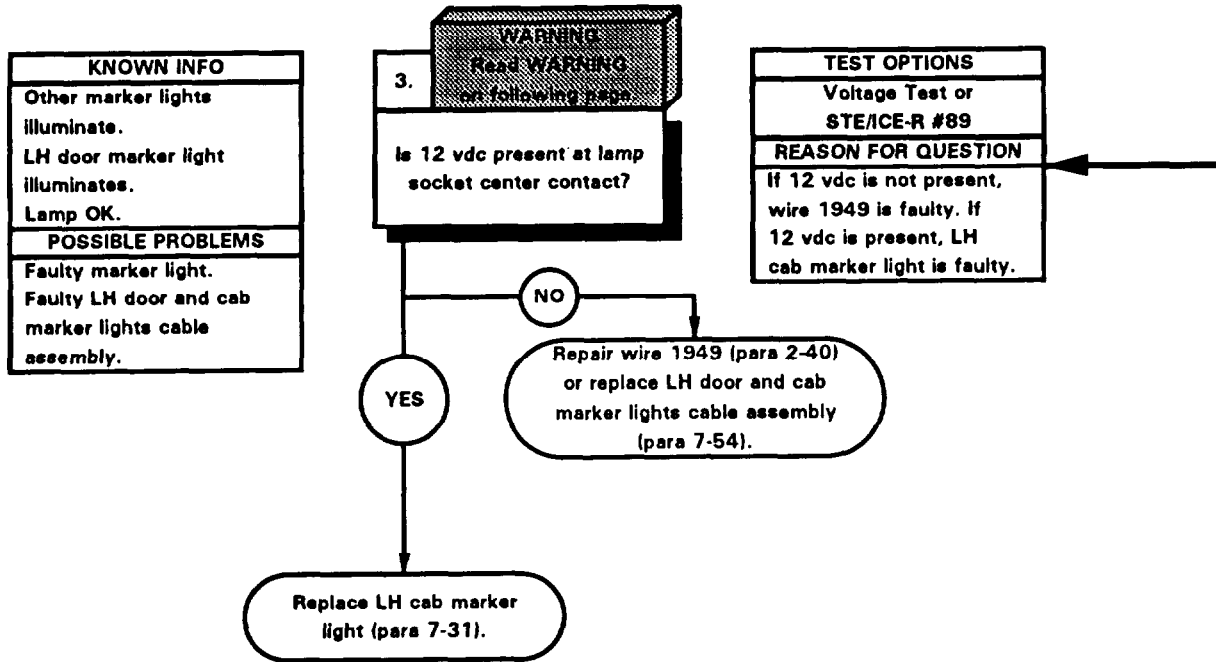
**CONTINUITY TEST**

- (1) Remove two screws and lens from base.
- (2) Remove lamp from socket.
- (3) Set multimeter to ohms.
- (4) Check continuity through lamp and note reading on multimeter.
- (5) If continuity is not present, replace lamp (para 7-31).



X2E 4306-

e44. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

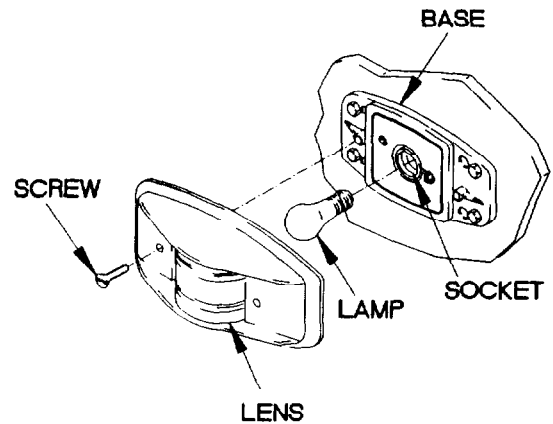


**WARNING**

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 marker light socket center contact.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1949 (para 2-40) or replace LH door and cab marker lights cable assembly (para 7-54).
- (6) If 12 vdc is present, replace LH cab marker light (para 7-31).
- (7) Position main light switch to OFF (TM 9-2320-365-10).
- (8) Install lamp in socket.
- (9) Install lens on base with two screws.



X2E 4306-

**OPERATIONAL TEST**

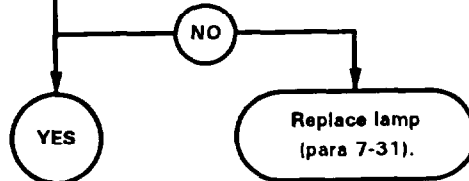
- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) If LH cab marker light does not illuminate, go to step 8 of this fault.
- (3) Position main light switch to OFF (TM 9-2320-365-10).

644. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Other marker lights illuminate. LH cab marker light illuminates.
POSSIBLE PROBLEMS
Faulty lamp. Faulty marker light. Faulty LH door and cab marker lights cable assembly.

5.  
Is continuity present through lamp?

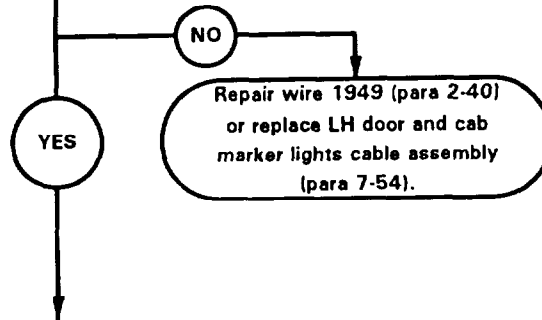
TEST OPTIONS
Continuity Test or STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, lamp is faulty.



KNOWN INFO
Other marker lights illuminate. LH cab marker light illuminates. Lamp OK.
POSSIBLE PROBLEMS
Faulty LH door and cab marker lights cable assembly.

6.  
**WARNING**  
Read WARNING on following page.  
Is 12 vdc present at lamp socket center contact?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 1949 is faulty.



**CONTINUITY TEST**

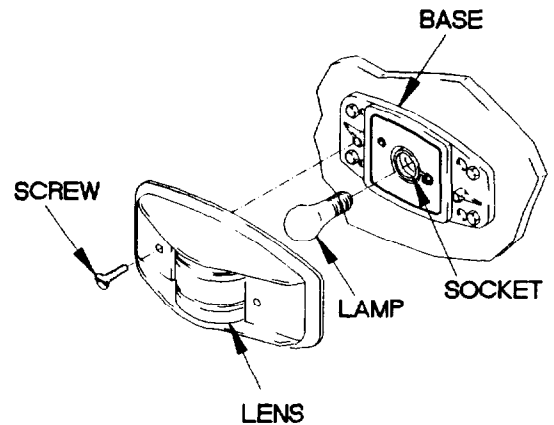
- (1) Remove two screws and lens from base.
- (2) Remove lamp from socket.
- (3) Set multimeter to ohms.
- (4) Check continuity through lamp and note reading on multimeter.
- (5) If continuity is not present, replace lamp (para 7-31).

**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**

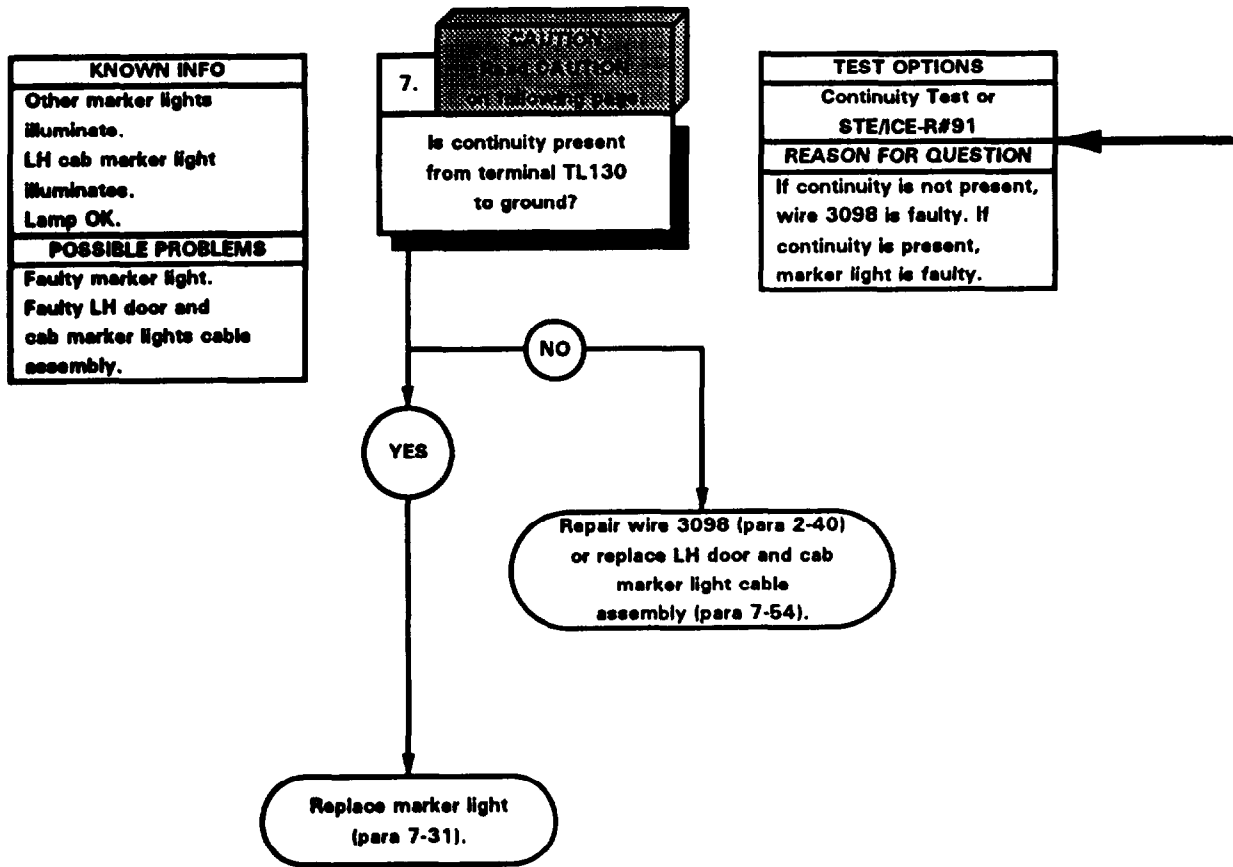
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to lamp socket center contact.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1949 (para 2-40) or replace LH door and cab marker lights cable assembly (para 7-54).
- (6) Position main light switch to OFF (TM 9-2320-365-10).



X2E4306-



44. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)



**CONTINUITY TEST**

- (1) Remove four screws and washers from base.

**NOTE**

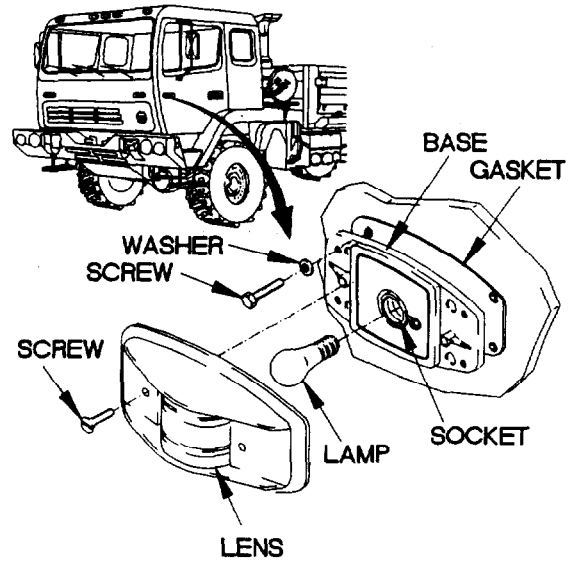
Do not let wires slip through hole and into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

- (2) Extend base and disconnect connector P130 from marker light connector.

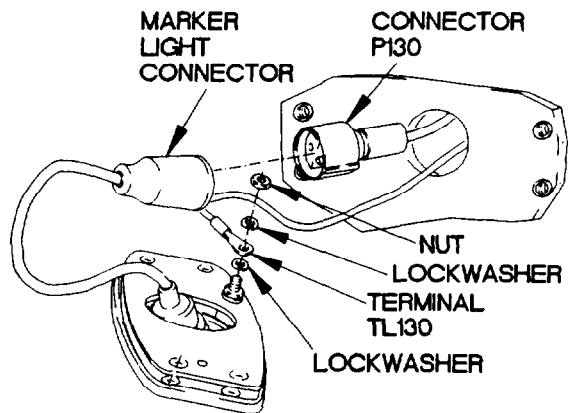
**CAUTION**

Two nuts are used to keep bottom nut in place. To prevent damage to equipment, use care when removing base.

- (3) Remove nut, lockwasher, terminal TL130, lockwasher, base, and gasket from vehicle. Discard lockwashers.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to terminal TL130.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is not present, repair wire 3098 (para 2-40) or replace LH cab and door marker lights cable assembly (para 7-54).
- (8) If continuity is present, replace marker light (para 7-31).
- (9) Connect marker light connector to connector P130.
- (10) Install lockwasher, terminal TL130, lockwasher, and nut on back of base.
- (11) Install base on vehicle with four washers and screws.
- (12) Install lamp in base.
- (13) Install lens on base with two screws.

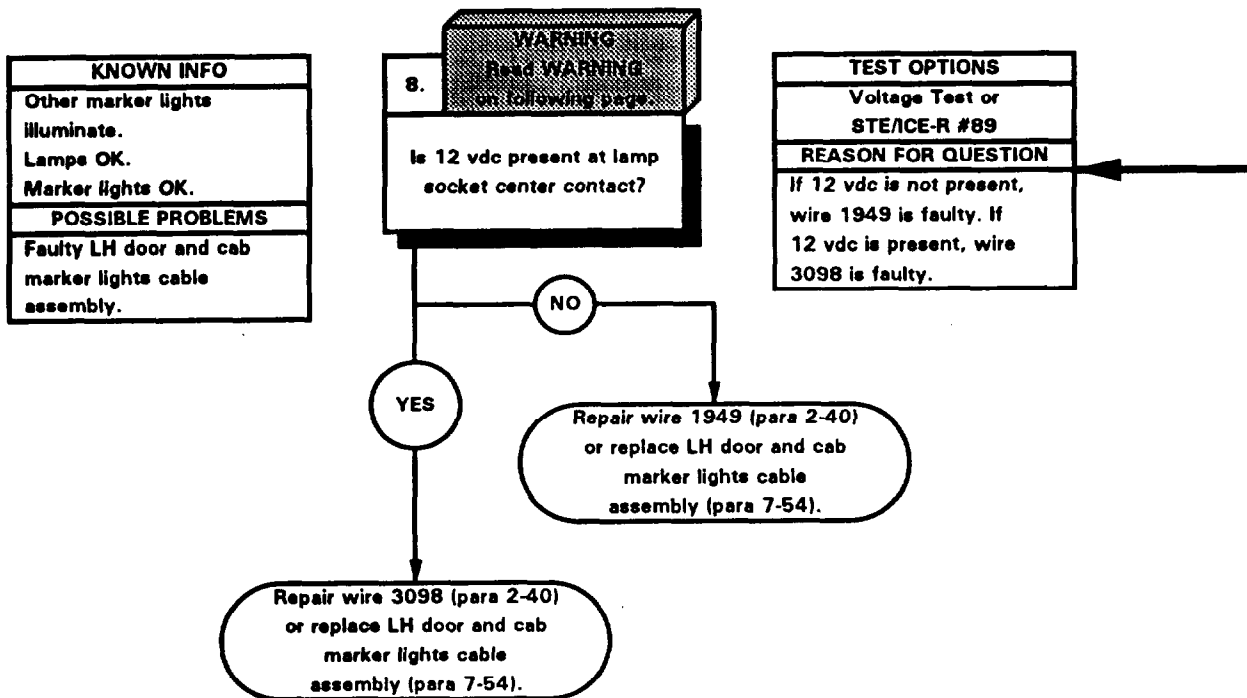


X2E4305-



X2E4304-

644. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

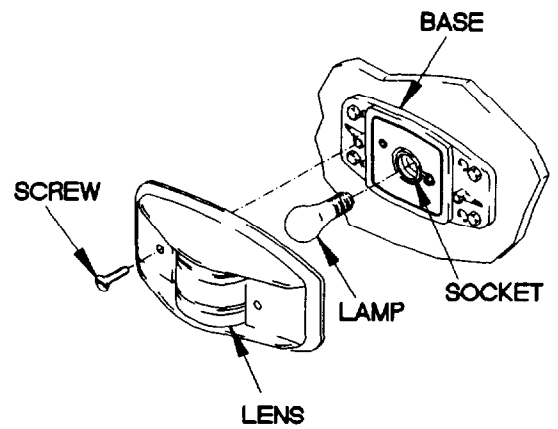


**WARNING**

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.

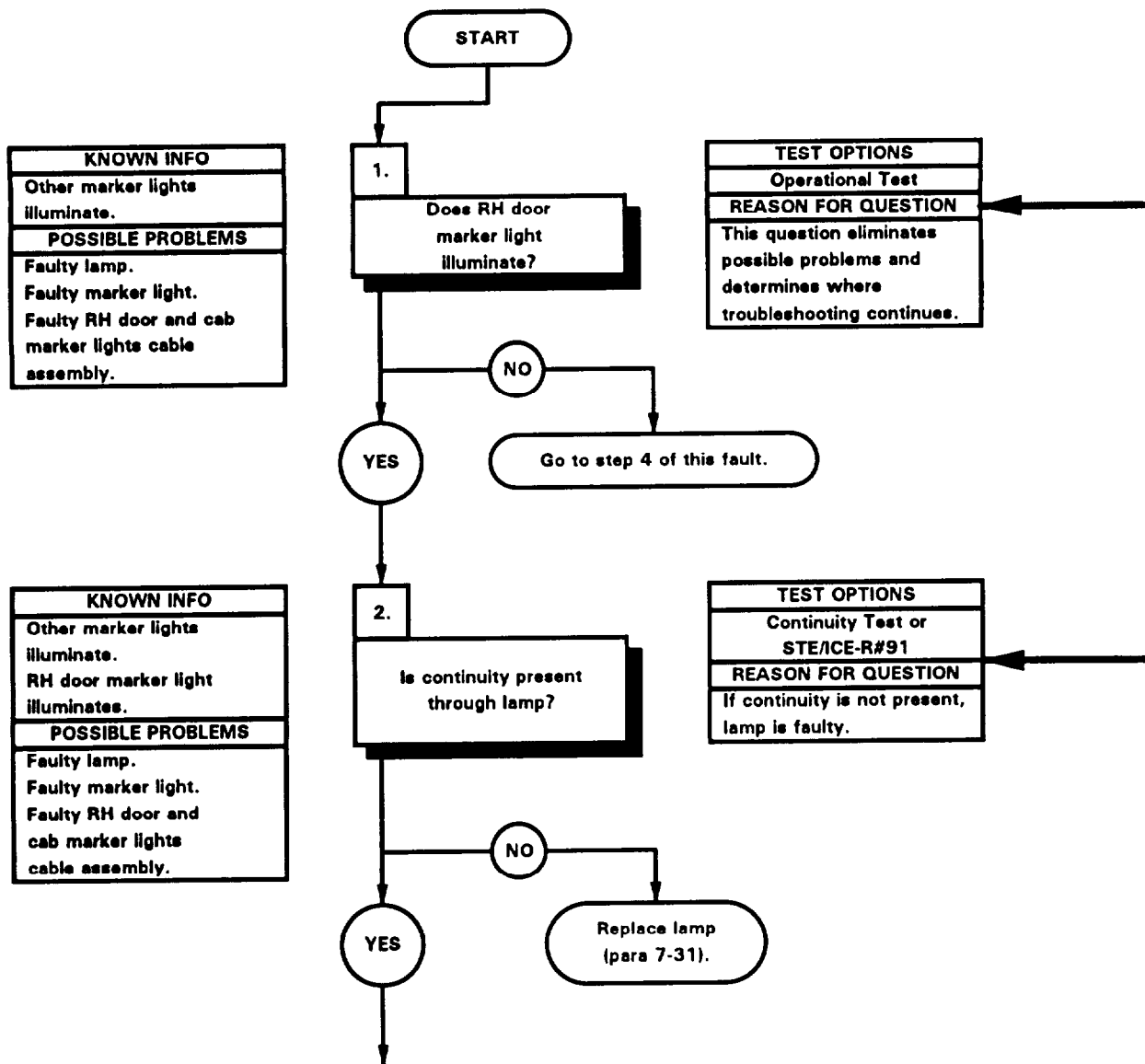
**VOLTAGE TEST**

- (1) Remove two screws and lens from base.
- (2) Remove lamp from socket.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to lamp socket center contact.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1949 (para 2-40) or replace LH door and cab marker lights cable assembly (para 7-54).
- (8) If 12 vdc is present, repair wire 3098 (para 2-40) or replace LH door and cab marker light cable assembly (para 7-54).
- (9) Position main light switch to OFF (TM 9-2320-365-10).
- (10) Install lamp in socket.
- (11) Install lens on base with two screws.



X2E4306-

45. RH DOOR AND/OR RH FRONT MARKER LIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Geni Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Lockwasher (2) (Item 70, Appendix G)	

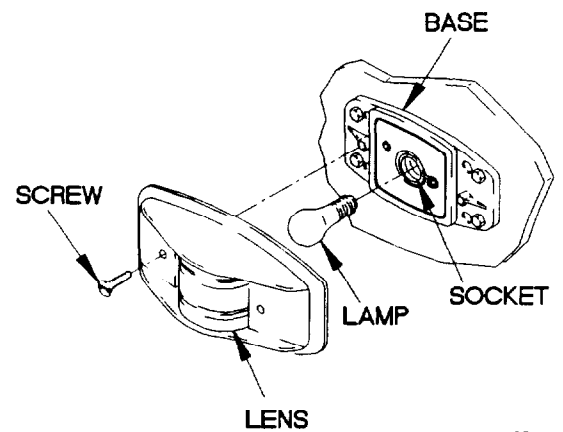


**OPERATIONAL TEST**

- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) If RH door marker light does not illuminate, go to step 4 of this fault.
- (3) Position main light switch to OFF (TM 9-2320-365-10).

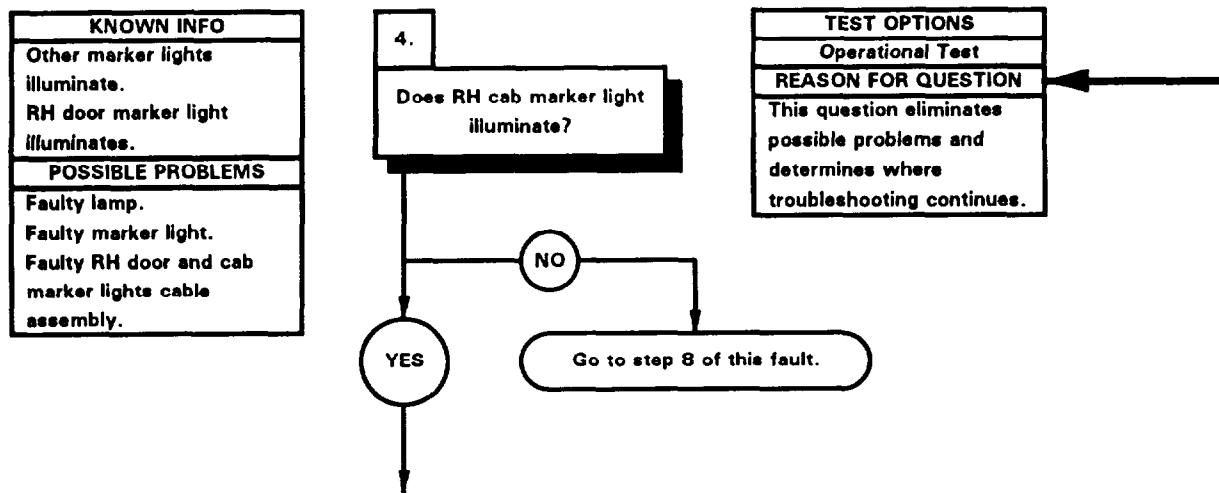
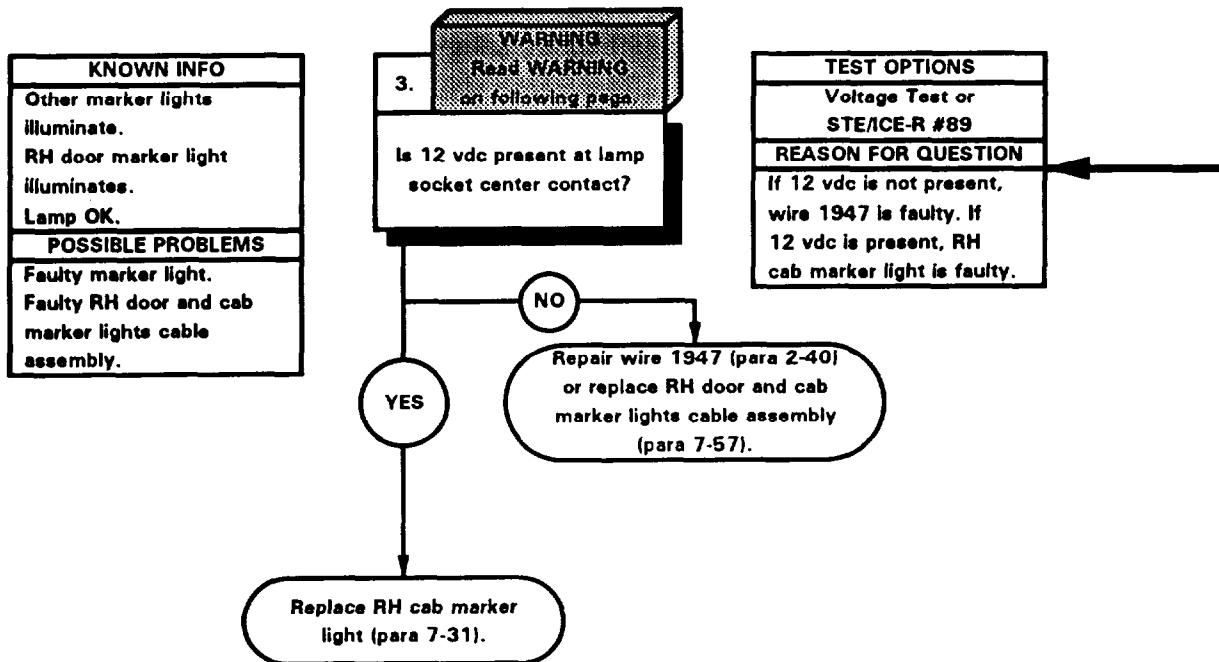
**CONTINUITY TEST**

- (1) Remove two screws and lens from base.
- (2) Remove lamp from socket.
- (3) Set multimeter to ohms.
- (4) Check continuity through lamp and note reading on multimeter.
- (5) If continuity is not present, replace lamp (para 7-31).



X2E 4402-

e45. RH DOOR AND/OR RH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

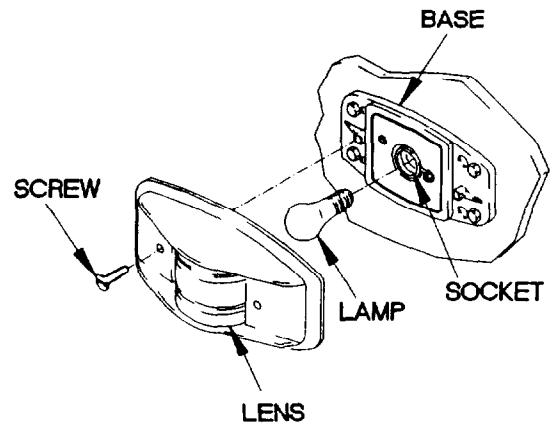


**WARNING**

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 marker light socket center contact.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1947 (para 2-40) or replace RH door and cab marker lights cable assembly (para 7-57).
- (6) If 12 vdc is present, replace RH cab marker light (para 7-31).
- (7) Position main light switch to OFF (TM 9-2320-365-10).
- (8) Install lamp in socket.
- (9) Install lens on base with two screws.



X2E4306

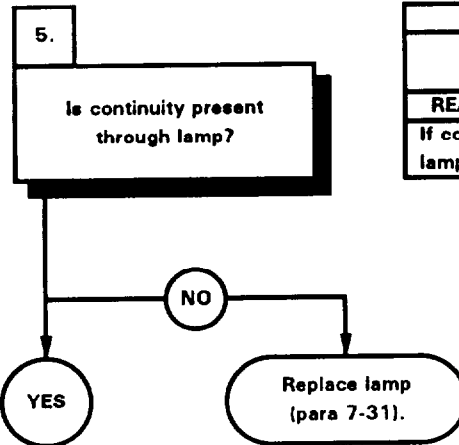
**OPERATIONAL TEST**

- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) If RH cab marker light does not illuminate, go to step 8 of this fault.
- (3) Position main light switch to OFF (TM 9-2320-365-10).



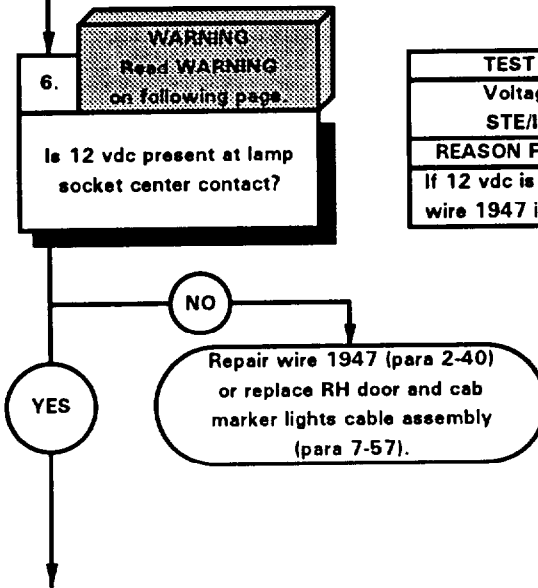
e45. RH DOOR AND/OR RH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Other marker lights illuminate. RH cab marker light illuminates.
POSSIBLE PROBLEMS
Faulty lamp. Faulty marker light. Faulty RH door and cab marker lights cable assembly.



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

KNOWN INFO
Other marker lights illuminate. RH cab marker light illuminates. Lamp OK.
POSSIBLE PROBLEMS
Faulty RH door and cab marker lights cable assembly.



TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 1947 is faulty.

**CONTINUITY TEST**

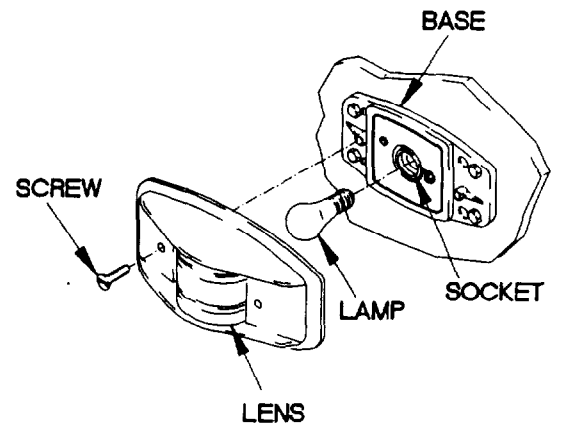
- (1) Remove two screws and lens from base.
- (2) Remove lamp from socket.
- (3) Set multimeter to ohms.
- (4) Check continuity through lamp and note reading on multimeter.
- (5) If continuity is not present, replace lamp (para 7-31).

**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.

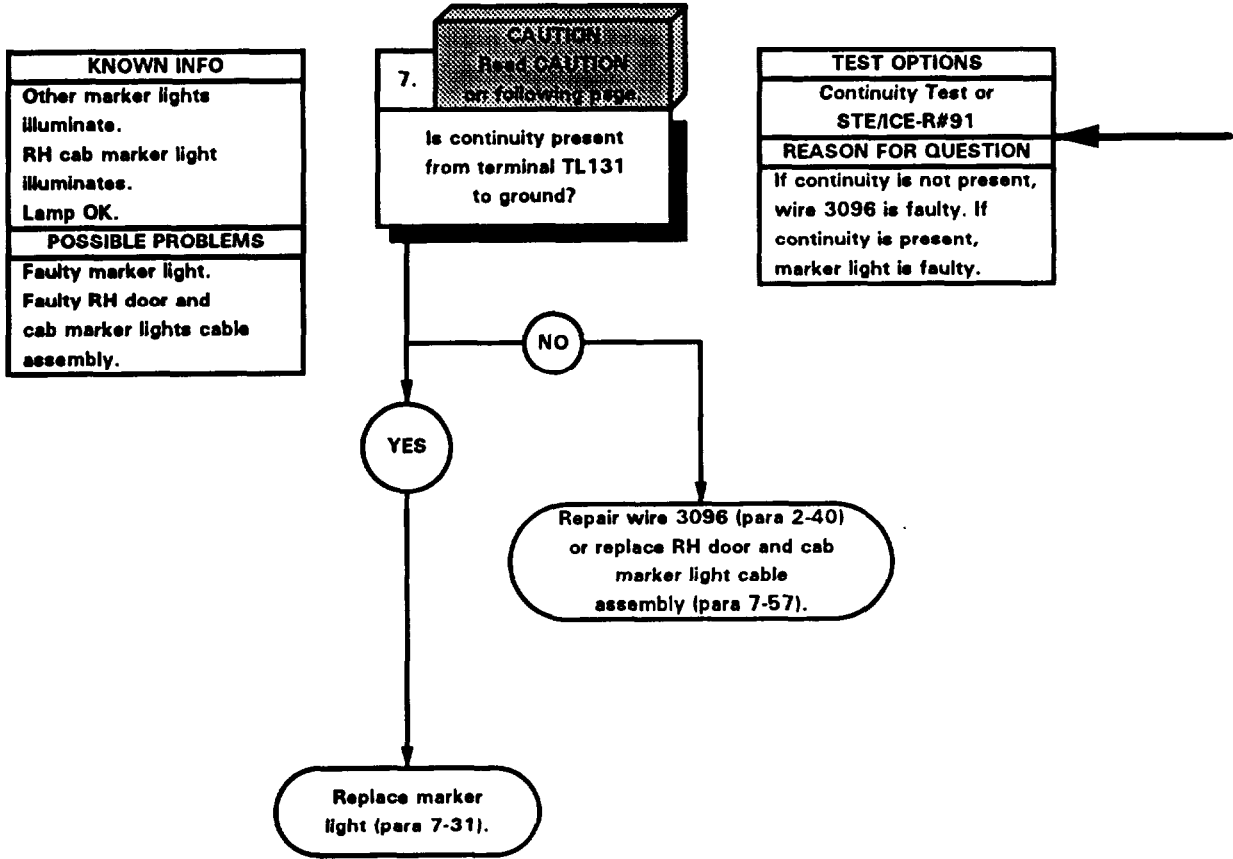
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to lamp socket center contact.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1947 (para 2-40) or replace RH door and cab marker lights cable assembly (para 7-57).
- (6) Position main light switch to OFF (TM 9-2320-365-10).



X2E4306-

645. RH DOOR AND/OR RH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)



**CONTINUITY TEST**

- (1) Remove four screws and washers from base.

**NOTE**

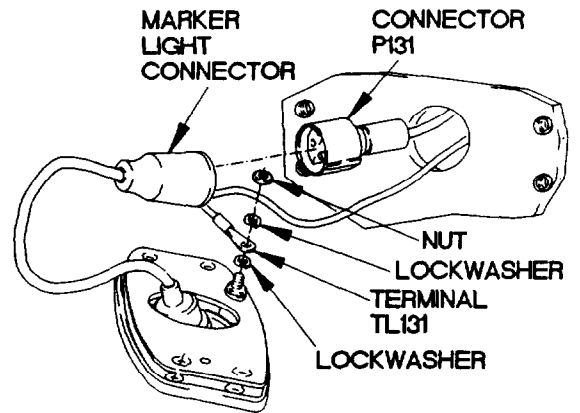
Do not let wires slip through hole and into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

- (2) Extend base and disconnect connector P131 from marker light connector.

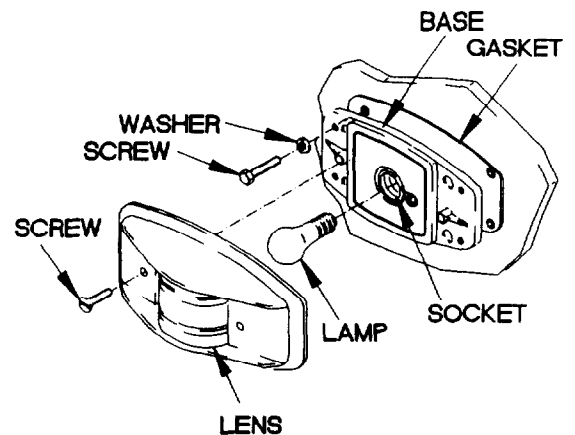
**CAUTION**

Two nuts are used to keep bottom nut in place. To prevent damage to equipment, use care when removing base.

- (3) Remove nut, lockwasher, terminal TL131, lockwasher, base, and gasket from vehicle. Discard lockwashers.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to terminal TL131.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is not present, repair wire 3096 (para 2-40) or replace RH cab and door marker lights cable assembly (para 7-57).
- (8) If continuity is present, replace marker light (para 7-31).
- (9) Connect marker light connector to connector P131.
- (10) Install lockwasher, terminal TL131, lockwasher, and nut on back of base.
- (11) Install base on vehicle with four washers and screws.
- (12) Install lamp in base.
- (13) Install lens on base with two screws.

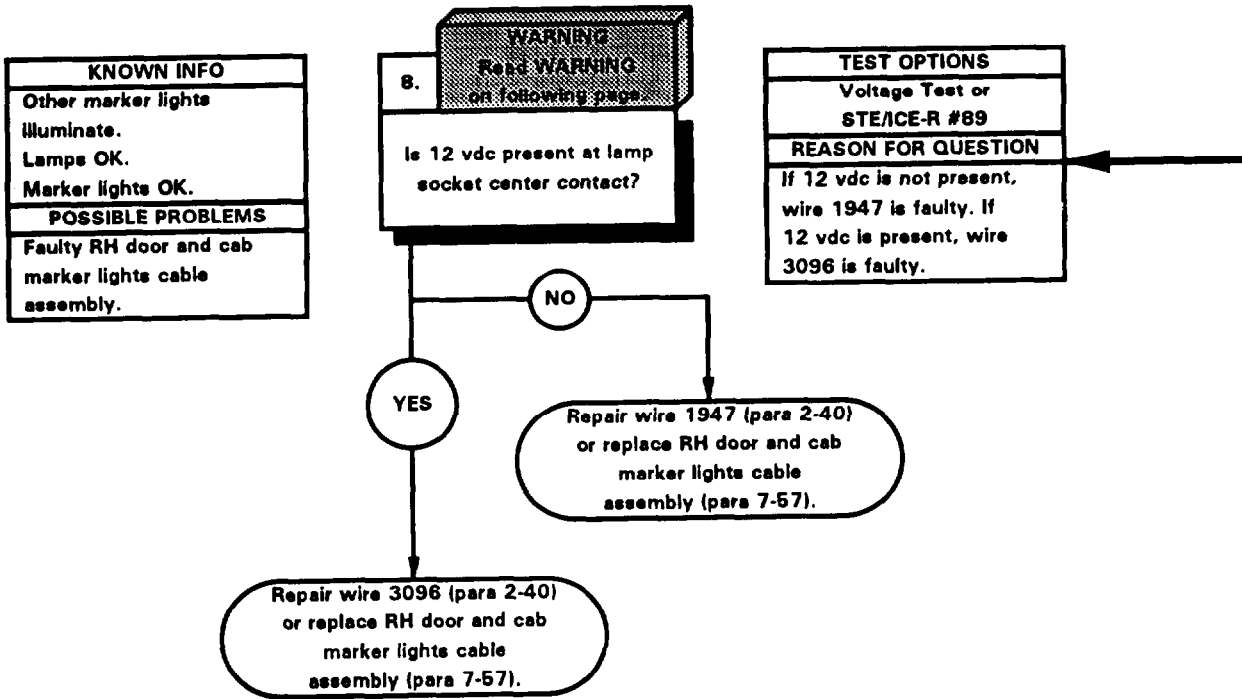


X2E 4405-



X2E 4404-

e45. RH DOOR AND/OR RH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

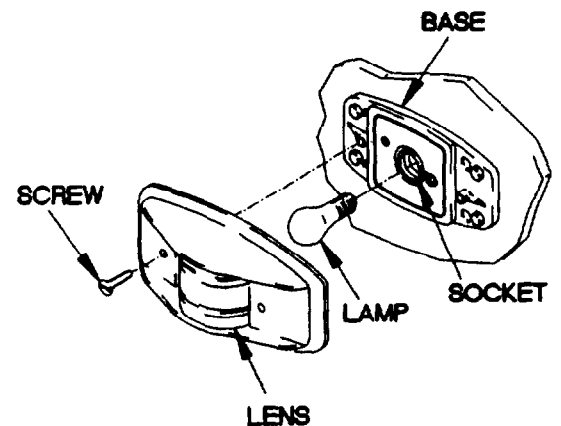


**WARNING**

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.

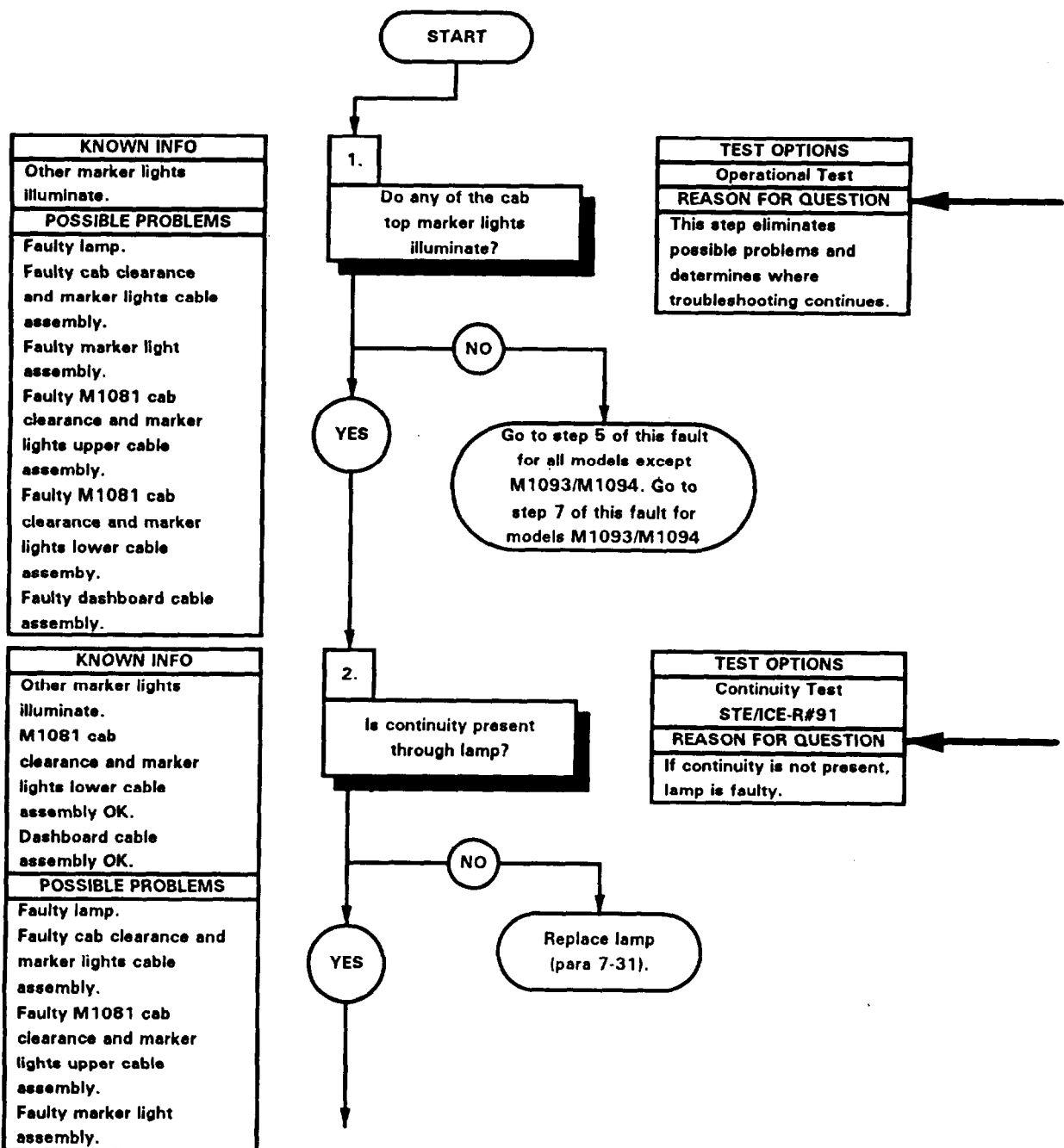
**VOLTAGE TEST**

- (1) Remove two screws and lens from base.
- (2) Remove lamp from socket.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to lamp socket center contact.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1947 (para 2-40) or replace RH door and cab marker lights cable assembly (para 7-57).
- (8) If 12 vdc is present, repair wire 3096 (para 2-40) or replace RH door and cab marker light cable assembly (para 7-57).
- (9) Position main light switch to OFF (TM 9-2320-365-10).
- (10) Install lamp in socket.
- (11) Install lens on base with two screws.



KZE 4306-

e46. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Lockwasher (2) (Item 70, Appendix G)	



KNOWN INFO
Other marker lights illuminate.
POSSIBLE PROBLEMS
Faulty lamp.
Faulty cab clearance and marker lights cable assembly.
Faulty marker light assembly.
Faulty M1081 cab clearance and marker lights upper cable assembly.
Faulty M1081 cab clearance and marker lights lower cable assembly.
Faulty dashboard cable assembly.

TEST OPTIONS
Operational Test
REASON FOR QUESTION
This step eliminates possible problems and determines where troubleshooting continues.

KNOWN INFO
Other marker lights illuminate.
M1081 cab clearance and marker lights lower cable assembly OK.
Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty lamp.
Faulty cab clearance and marker lights cable assembly.
Faulty M1081 cab clearance and marker lights upper cable assembly.
Faulty marker light assembly.

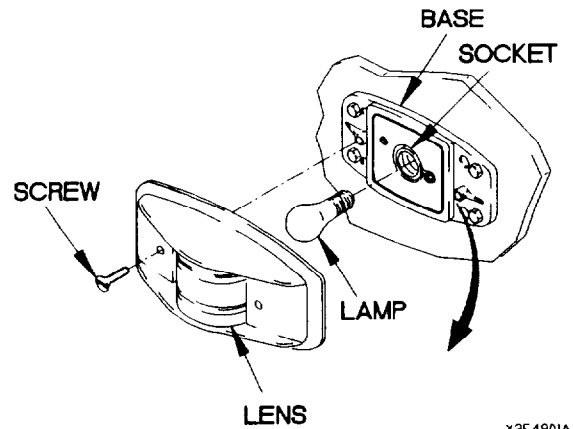
TEST OPTIONS
Continuity Test
STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, lamp is faulty.

**OPERATIONAL TEST**

- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) If no marker lights are illuminating, go to step 5 of this fault for all models except M1081 or step 7 of this fault for models M1081.
- (3) Position main light switch to OFF (TM 9-2320-365-10).

**CONTINUITY TEST**

- (1) Remove two screws and lens from base.
- (2) Remove lamp from socket.
- (3) Set multimeter to ohms.
- (4) Check continuity through lamp and note reading on multimeter.
- (5) If continuity is not present, replace lamp (para 7-31).

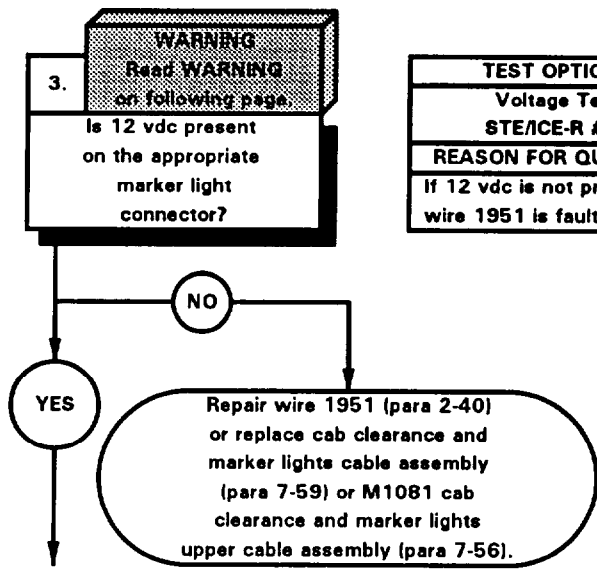


X2E 4801A



ø46. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Other marker lights illuminate.
M1081 cab clearance and marker lights lower cable assembly OK.
Dashboard cable assembly OK.
Lamp OK.
POSSIBLE PROBLEMS
Faulty cab clearance and marker lights cable assembly.
Faulty M1081 cab clearance and marker lights upper cable assembly.
Faulty marker light.



TEST OPTIONS
Voltage Test
STE/CE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 1951 is faulty.



**WARNING**

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

**VOLTAGE TEST**

- (1) Remove four screws and washers from base.

**NOTE**

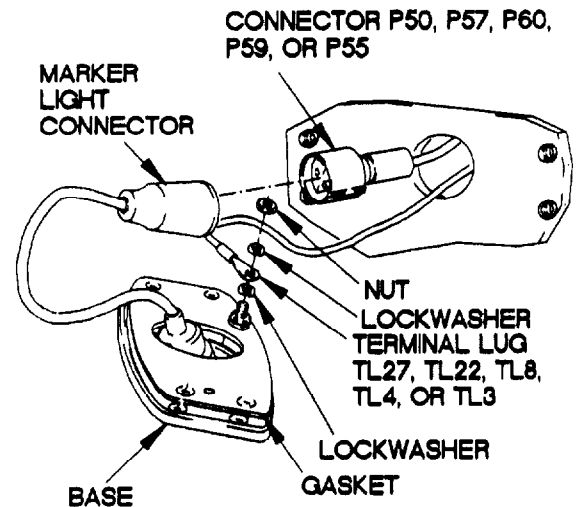
Do not let wires slip through hole and into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

- (2) Extend base and disconnect marker light connector from connector P50, P57, P60, P59, or P55.

**CAUTION**

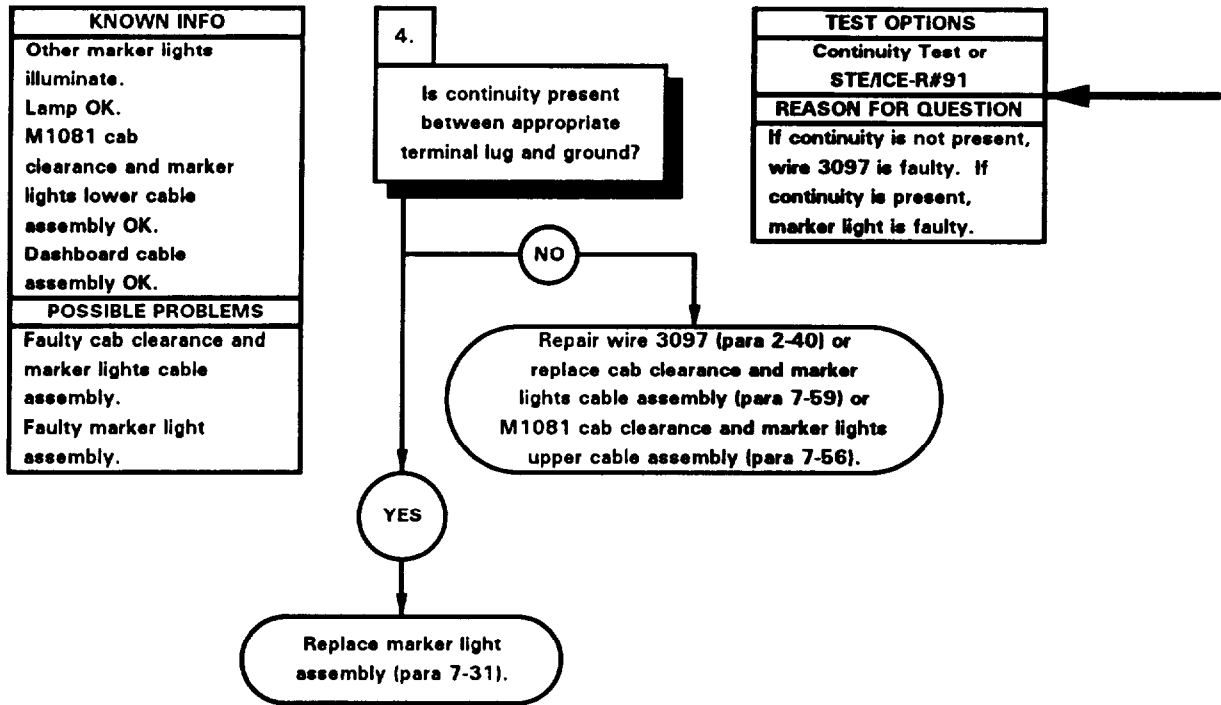
Two nuts are used to keep bottom nut in place. To prevent damage to equipment, use care when removing base.

- (3) Remove nut, lockwasher, terminal lug TL27, TL22, TL8, TL4, or TL3, lockwasher, base, and gasket from vehicle. Discard lockwashers.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector P50 (top LH marker light), P57 (top LH middle marker light), P60 (top middle marker light), P59 (top RH middle marker light), P55 (top RH marker light).
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 12 vdc is not present, repair wire 1951 (para 2-40) or replace cab clearance and marker lights cable assembly (para 7-59) or M1081 cab clearance and marker lights upper cable assembly (para 7-56).
- (9) Position main light switch to OFF (TM 9-2320-365-10).



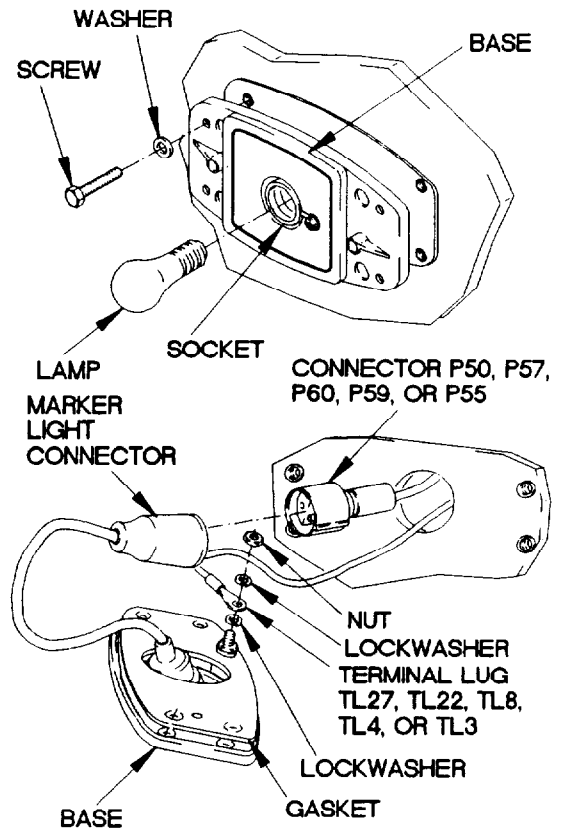
X2E4802A

e46. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE (CONT)



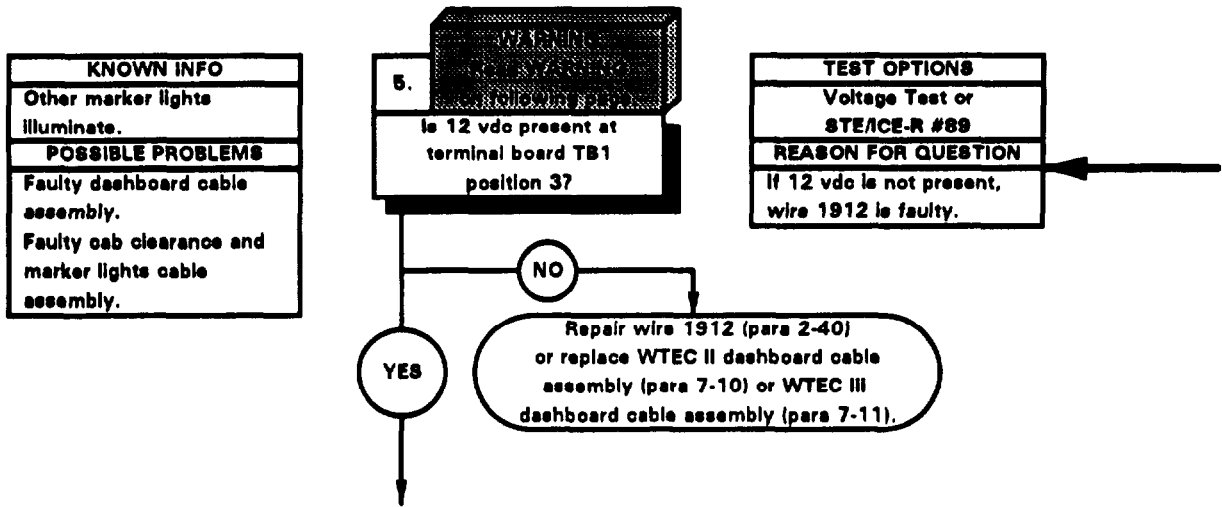
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to appropriate terminal lug, TL27 (top LH marker light), TL22 (top LH middle marker light), TL8 (top middle marker light), TL4 (top RH middle marker light), or TL3 (top RH marker light).
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3097 (para 2-40) or replace cab clearance and marker lights cable assembly (para 7-59) or M1081 cab clearance and marker lights upper cable assembly (para 7-56).
- (5) If continuity is present, replace marker light assembly (para 7-31).
- (6) Connect connector P50, P57, P60, P59, or P55 to marker light connector.
- (7) Install lockwasher, terminal lug TL27, TL22, TL8, TL4, or TL3, lockwasher, and nut on back of base.
- (8) Install base on vehicle with four washers and screws.
- (9) Install lamp in socket.
- (10) Install lens on base with two screws.



X2E4803A

46. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE (CONT)

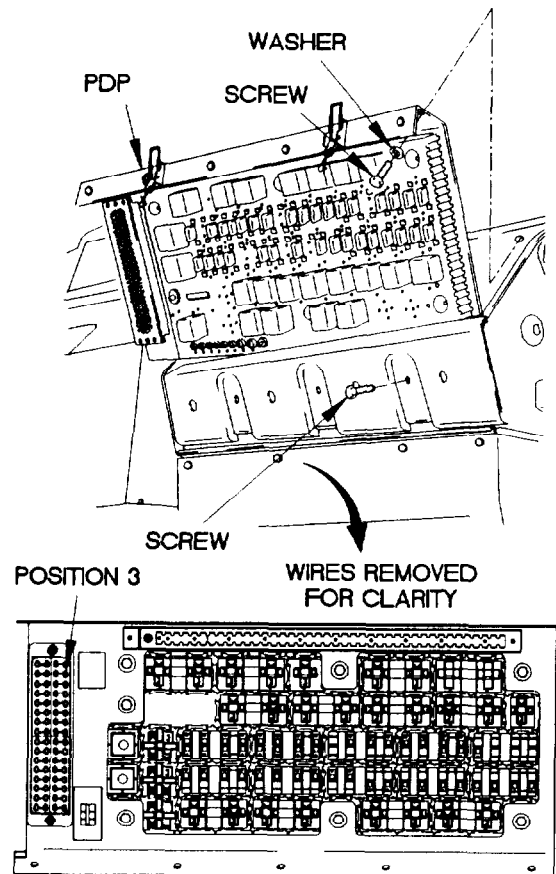


**WARNING**

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.

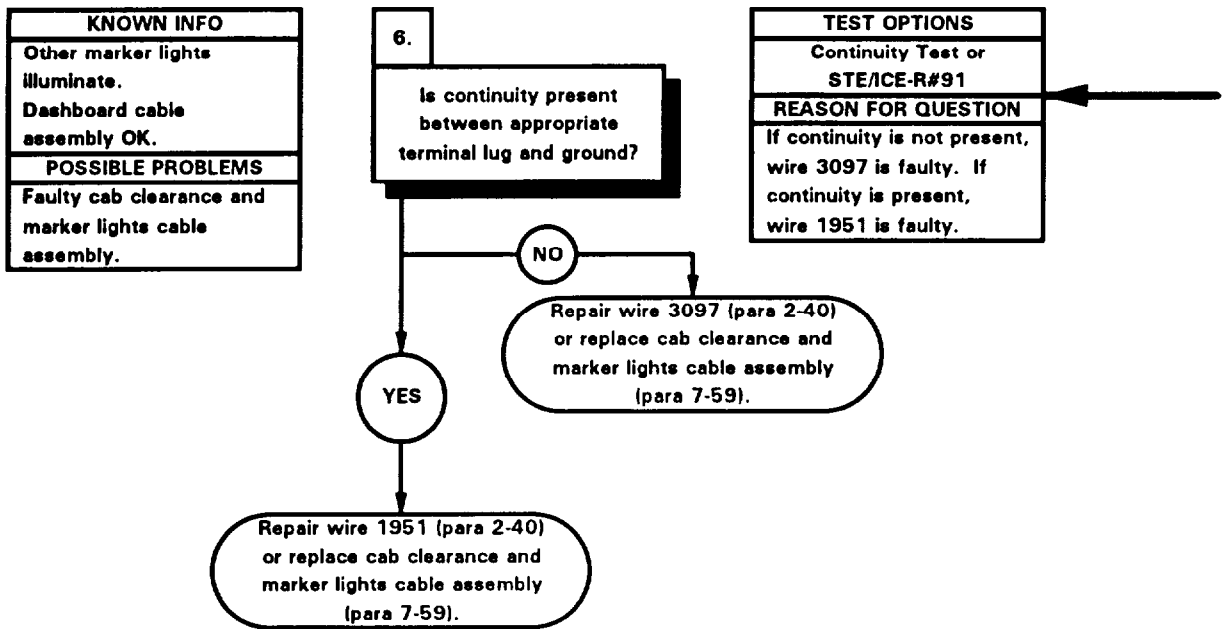
**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to terminal board TB1 position 3.
- (7) Connect negative (-) probe of multimeter to ground.
- (8) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (9) If 12 vdc is not present, repair wire 1912 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) Position main light switch to OFF (TM 9-2320-365-10).



x2E 48041

e46. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE (CONT)



**CONTINUITY TEST**

- (1) Remove two screws and lens from base.
- (2) Remove lamp from socket.
- (3) Remove four screws and washers from base.

**NOTE**

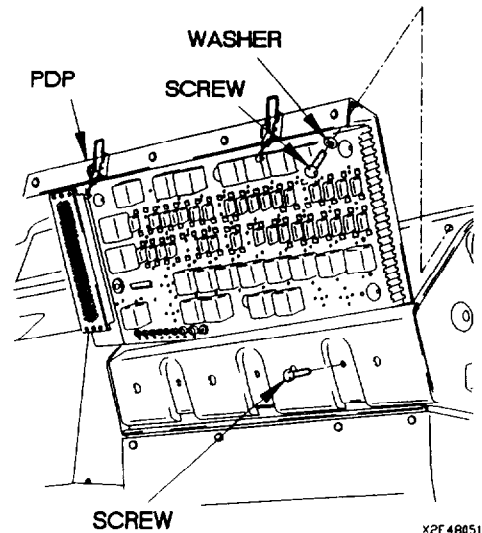
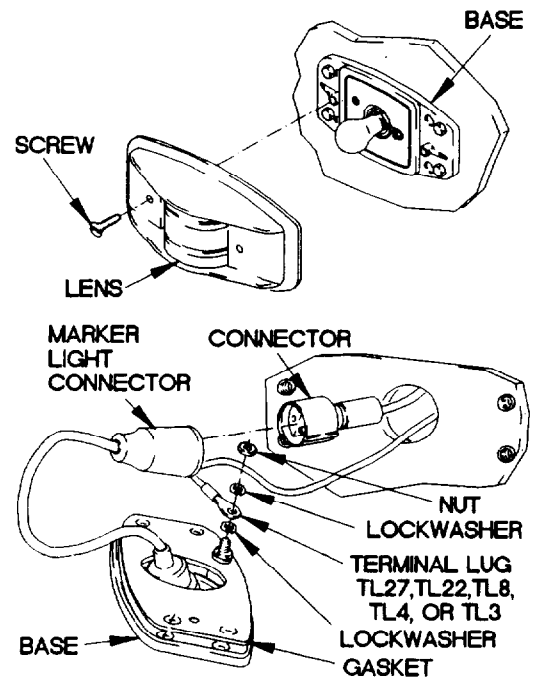
Do not let wires slip through hole and into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

- (4) Extend base and disconnect marker light connector from connector P50, P57, P60, P59, or P55.

**CAUTION**

Two nuts are used to keep bottom nut in place. To prevent damage to equipment, use care when removing base.

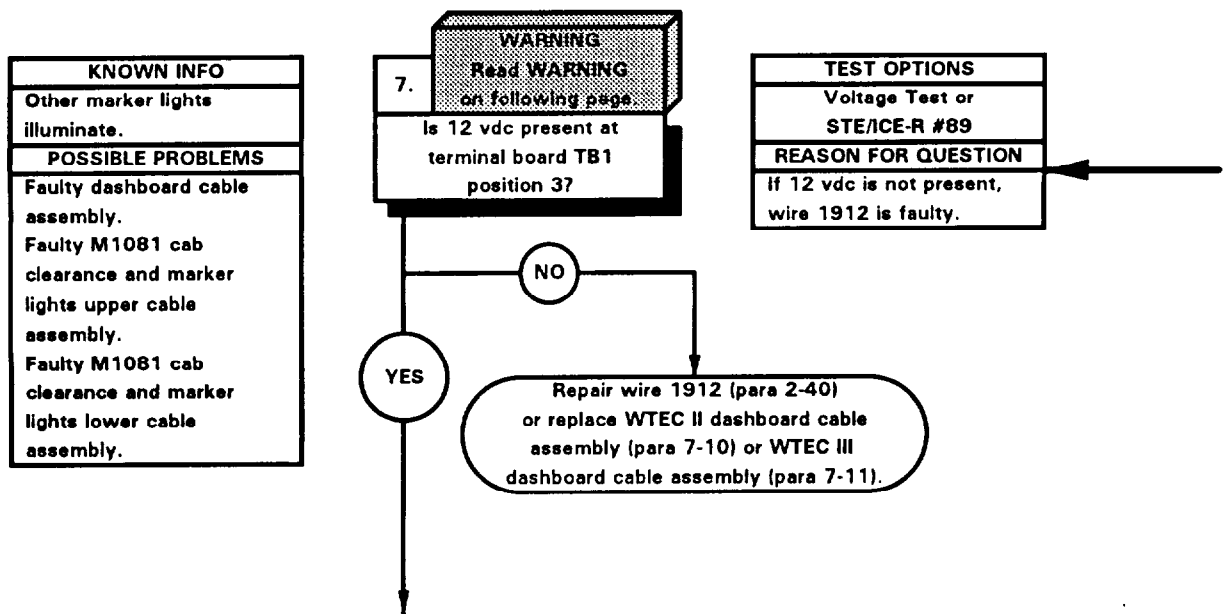
- (5) Remove nut, lockwasher, terminal lug TL27, TL22, TL8, TL4, or TL3, lockwasher, base, and gasket from vehicle. Discard lockwashers.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to appropriate terminal lug, TL27 (top LH marker light), TL22 (top LH middle marker light), TL8 (top middle marker light), TL4 (top RH middle marker light), or TL3 (top RH marker light).
- (8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (9) If continuity is not present, repair wire 3097 (para 2-40) or replace cab clearance and marker lights cable assembly (para 7-59).
- (10) If continuity is present, replace repair wire 1951 (para 2-40) or replace cab clearance and marker lights cable assembly (para 7-59).
- (11) Connect connector P50, P57, P60, P59, or P55 to marker light connector.
- (12) Install lockwasher, terminal lug TL27, TL22, TL8, TL4, or TL3, lockwasher, and nut on back of base.
- (13) Install base on vehicle with four washers and screws.
- (14) Install lamp in socket.
- (15) Install lens on base with two screws.
- (16) Install PDP on dashboard with three screws.
- (17) Install three washers and screws in PDP.
- (18) Install PDP cover (para 16-2).



X2E48051



e46. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE (CONT)

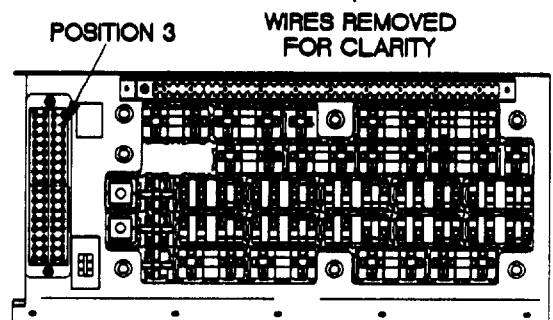
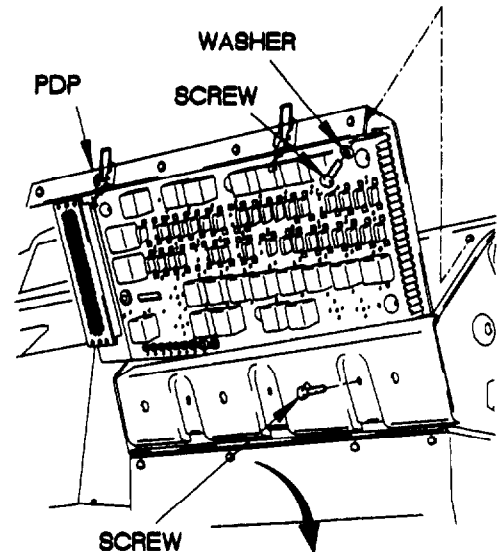


**WARNING**

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.

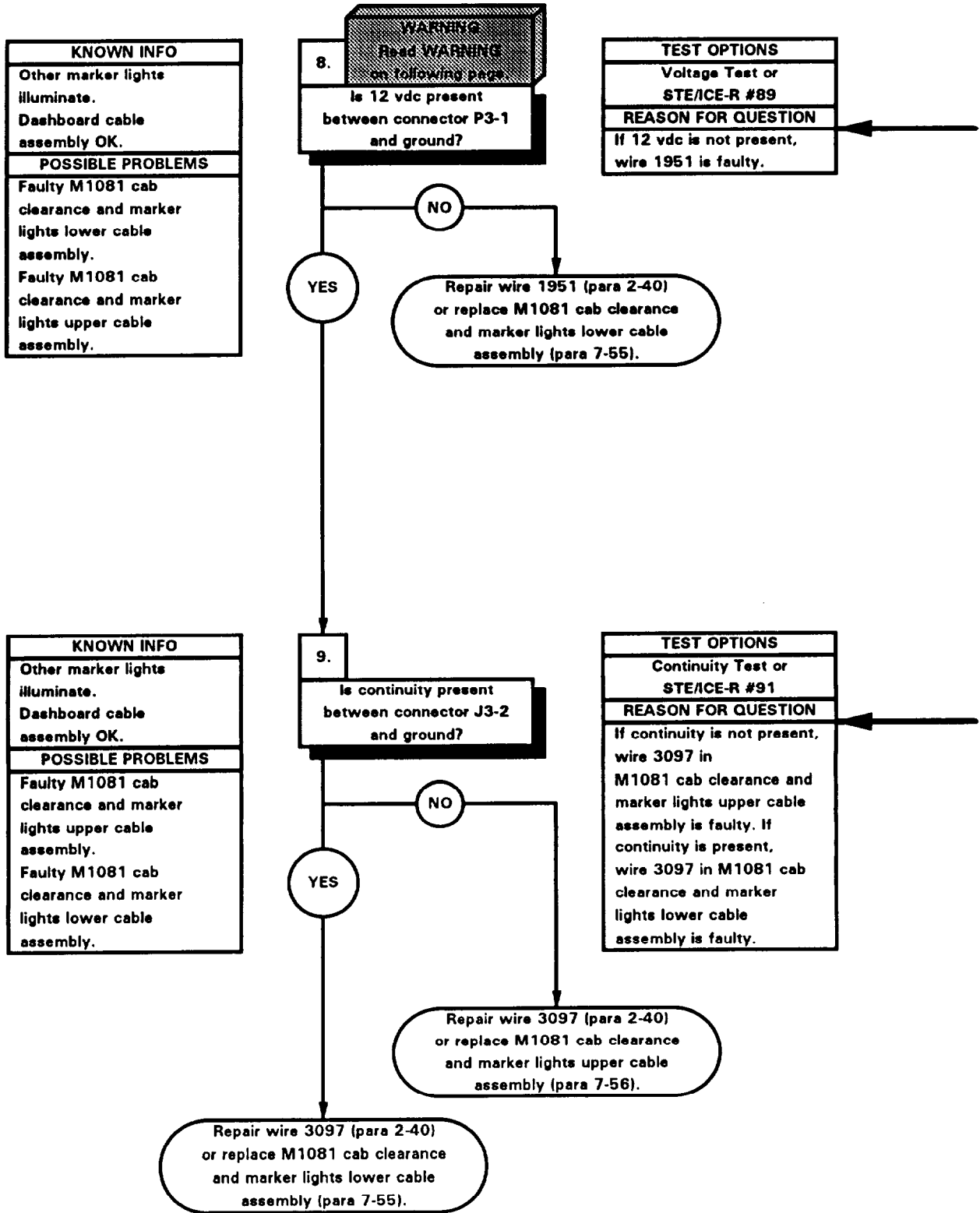
**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to terminal board TB1 position 3.
- (7) Connect negative (-) probe of multimeter to ground.
- (8) Position main light switch to **SER DRIVE** (TM 9-2320-365-10) and note reading on multimeter.
- (9) If 12 vdc is not present, repair wire 1912 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) Position main light switch to **OFF** (TM 9-2320-365-10).
- (11) Install PDP on dashboard with three screws.
- (12) Install three washers and screws in PDP.



X2E48061

e46. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE (CONT)



**WARNING**

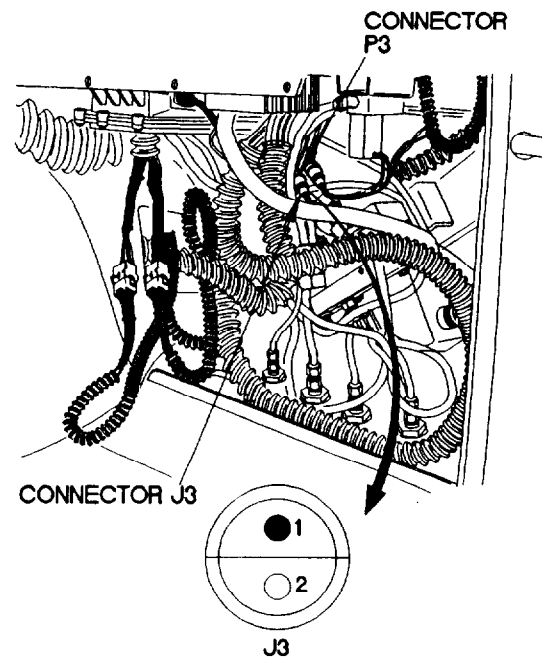
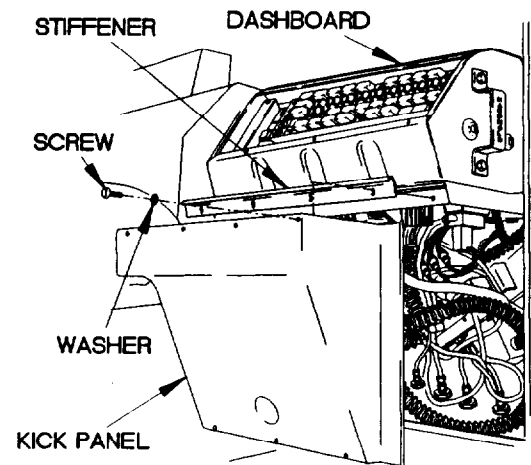
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Remove seven screws and washers from kick panel.
- (2) Remove kick panel and stiffener from dashboard.
- (3) Disconnect connector P3 from connector J3.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector P3-1.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 12 vdc is not present, repair wire 1951 (para 2-40) or replace M1081 cab clearance and marker lights lower cable assembly (para 7-55).
- (9) Position main light switch to OFF (TM 9-2320-365-10).

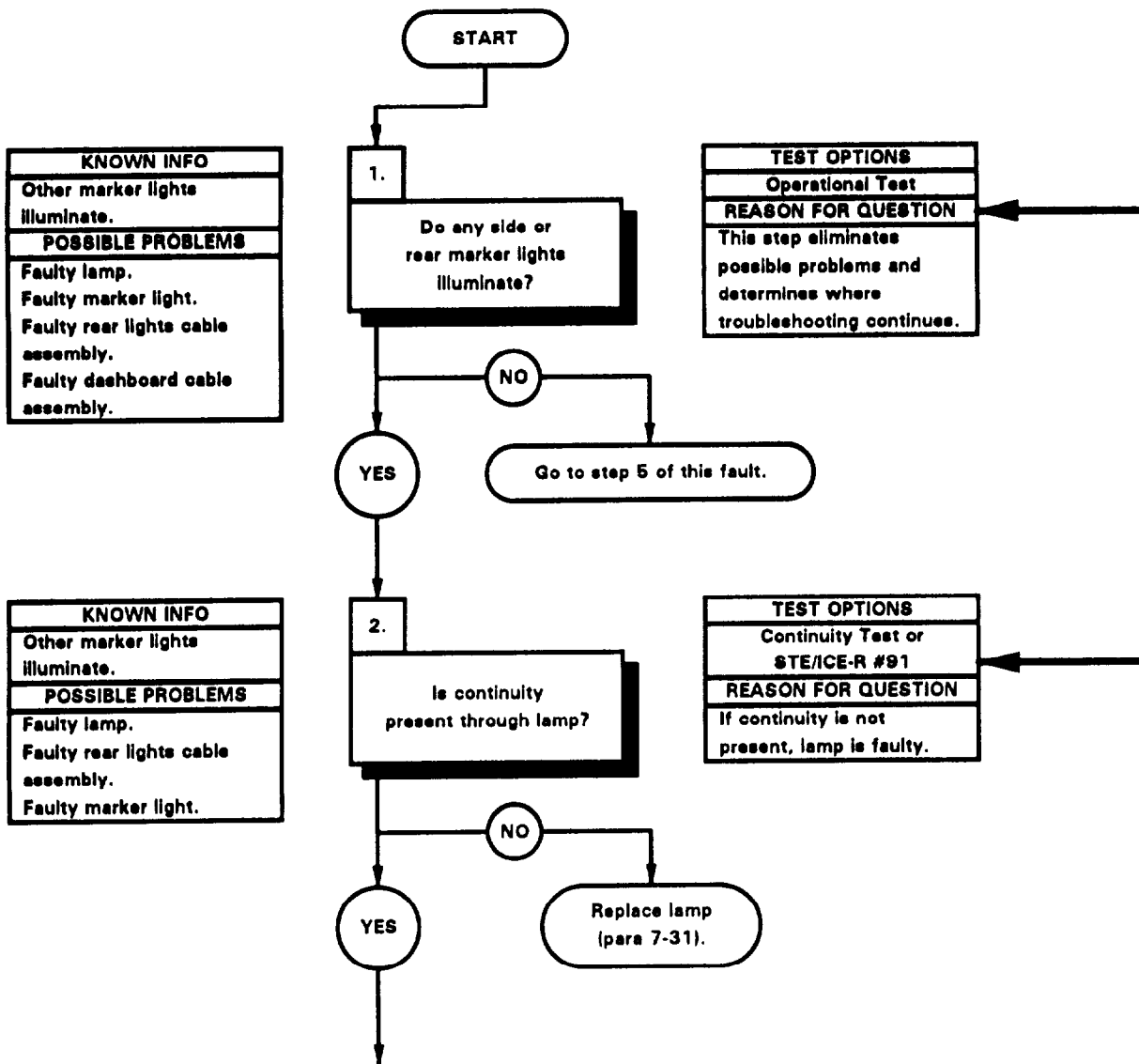
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J3-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3097 (para 2-40) or replace M1081 cab clearance and marker lights upper cable assembly (para 7-56).
- (5) If continuity is present, repair wire 3097 (para 2-40) or replace M1081 cab clearance and marker lights lower cable assembly (para 7-55).
- (6) Connect connector P3 to connector J3.
- (7) Install kick panel (para 16-3).



32E4807A

47. SIDE AND/OR REAR MARKER LIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Lockwasher (2) (Item 70, Appendix G)	

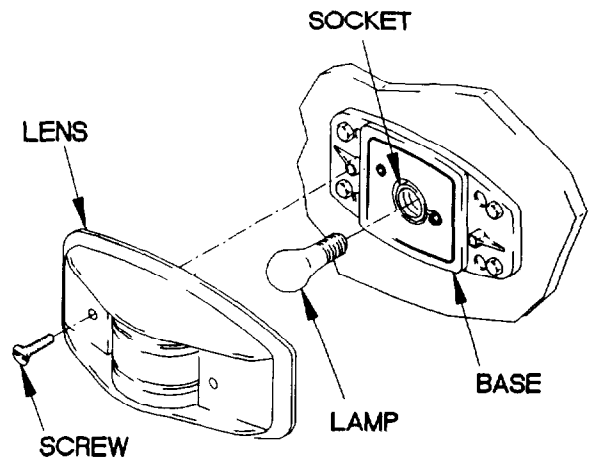


**OPERATIONAL TEST**

- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) Observe side and rear marker lights and determine how many lights do not illuminate.
- (3) If two or more marker lights do not illuminate, go to step 6 of this fault.
- (4) Position main light switch to OFF (TM 9-2320-365-10).

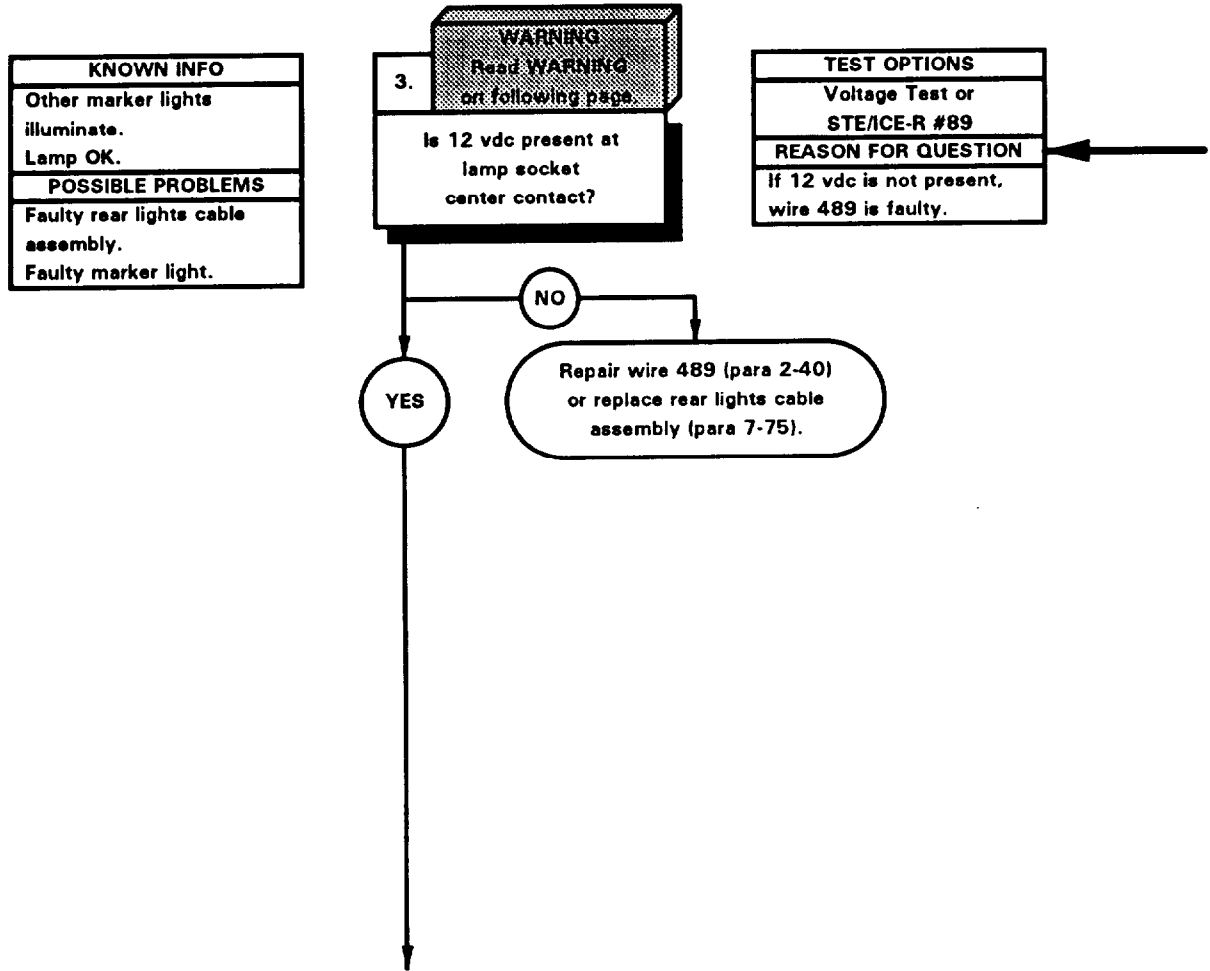
**CONTINUITY TEST**

- (1) Remove two screws and lens from base.
- (2) Remove lamp from socket.
- (3) Set multimeter to ohms.
- (4) Check continuity through lamp and note reading on multimeter.
- (5) If continuity is not present, replace lamp (para 7-31).



X2E4901A

e47. SIDE AND/OR REAR MARKER LIGHTS DO NOT ILLUMINATE (CONT)

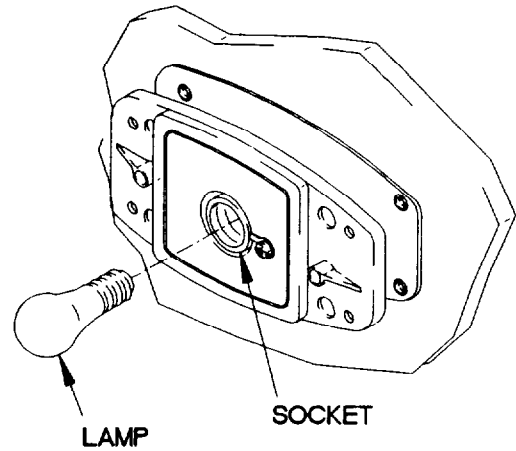


**WARNING**

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**

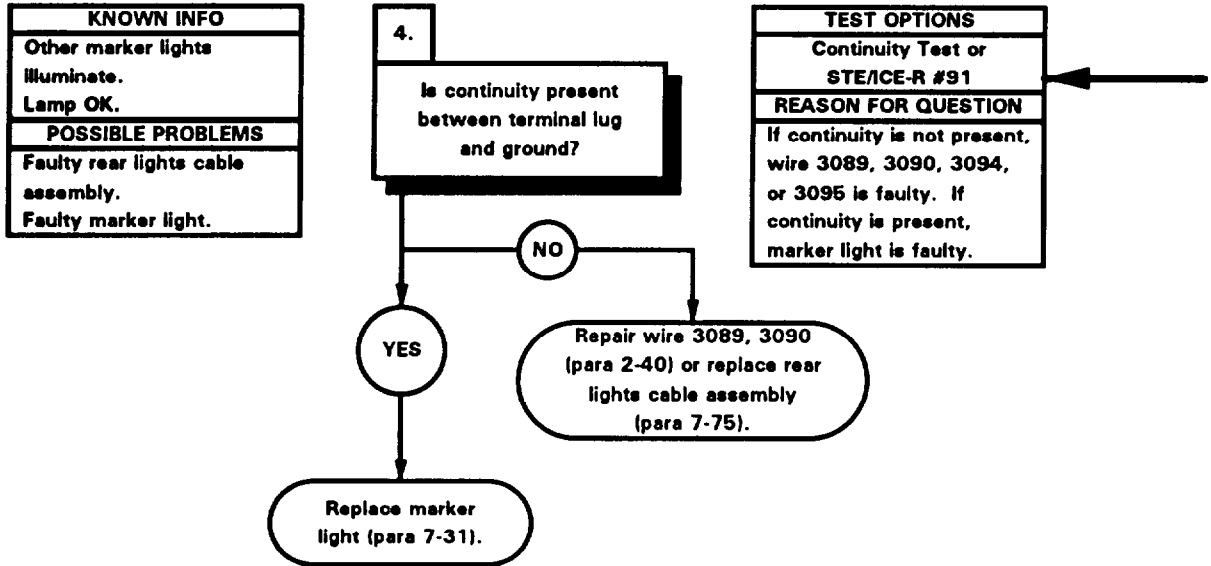
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to lamp socket center contact.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 489 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (6) Position main light switch to OFF (TM 9-2320-365-10).



X2E4902A



ø47. SIDE AND/OR REAR MARKER LIGHTS DO NOT ILLUMINATE (CONT)



**CONTINUITY TEST**

- (1) Remove four screws and washers from base.

**NOTE**

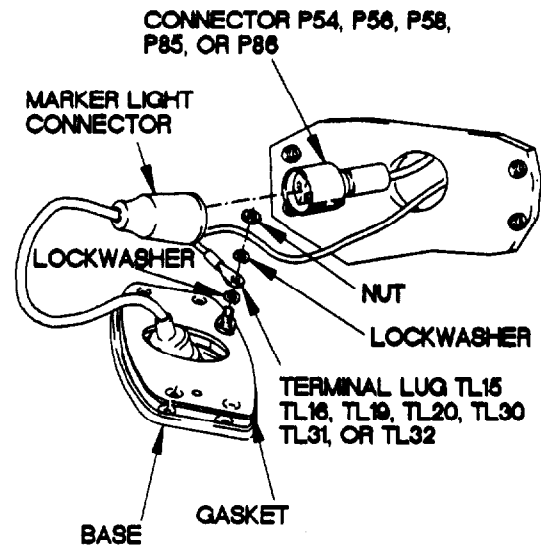
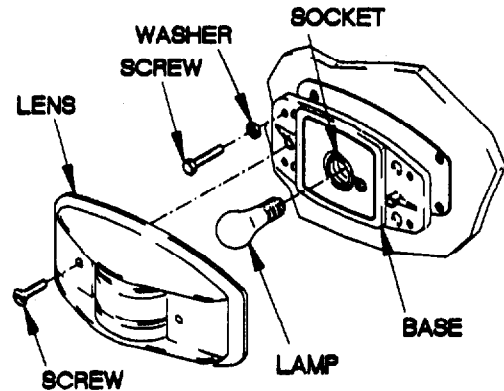
Do not let wires slip through hole and into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

- (2) Extend base and disconnect marker light connector from connector P85, P86, P88, P89, P84, P56, or P58.

**CAUTION**

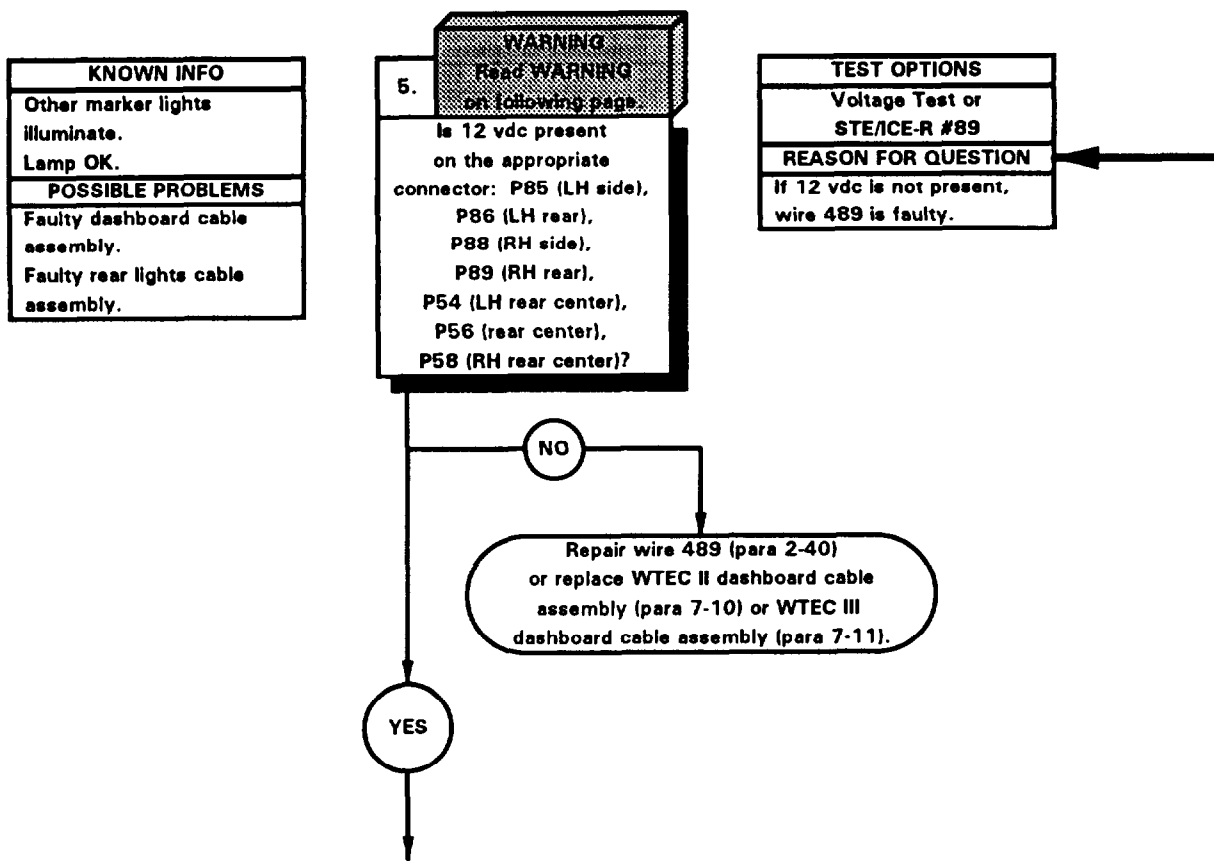
Two nuts are used to keep bottom nut in place. To prevent damage to equipment, use care when removing base.

- (3) Remove nut, lockwasher, terminal lug TL15, TL16, TL19, TL20, TL30, TL31, or TL32 lockwasher, base, and gasket from vehicle. Discard lockwashers.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to appropriate connector, P85 (left rear side), P86 (left rear rear), P88 (right rear side), P89 (right rear rear), P54 (LH rear center), P56 (rear middle), P58 (RH rear center).
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is not present, repair wire 3089 or 3090 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (8) If continuity is present, replace marker light (para 7-31).
- (9) Connect marker light connector to connector P85, P86, P88, P89, P54, P56, or P58.
- (10) Install lockwasher, terminal lug TL15, TL16, TL19, TL20, TL30, TL31, or TL32, lockwasher, and nut on back of base.
- (11) Install base on vehicle with four washers and screws.
- (12) Install lamp in socket.
- (13) Install lens on base with two screws.



3DE49031

e47. SIDE AND/OR REAR MARKER LIGHTS DO NOT ILLUMINATE (CONT)

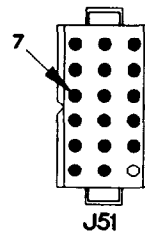
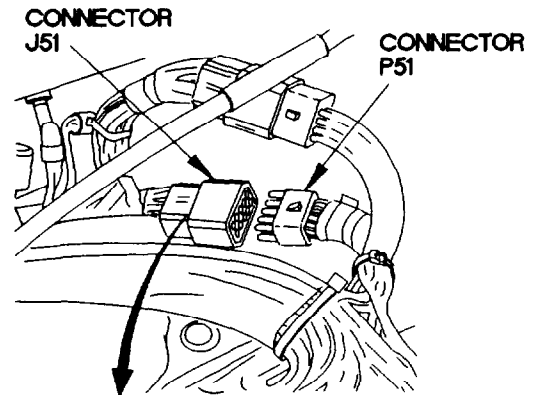
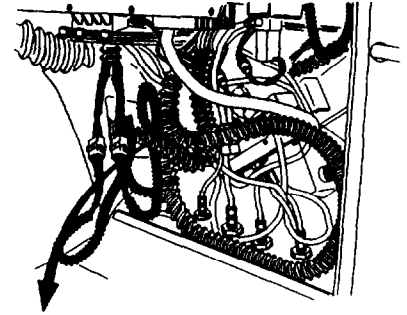


**WARNING**

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.

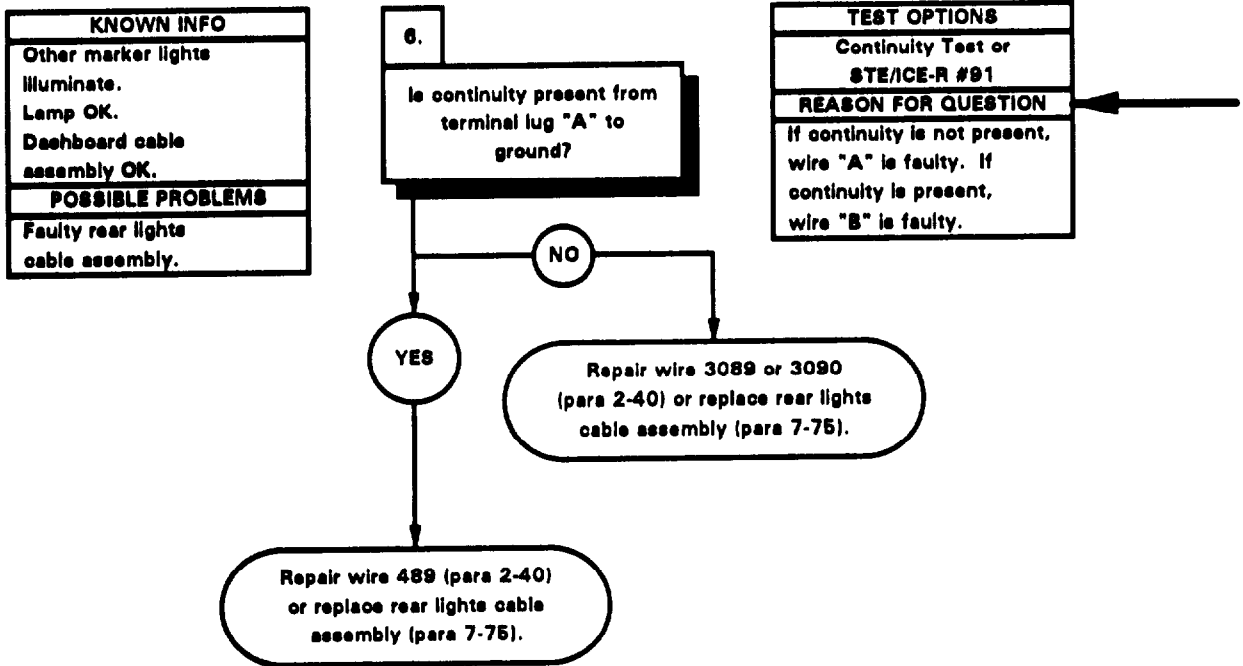
**VOLTAGE TEST**

- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P51 from connector J51.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector J51-7.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 489 (para 2-40) 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 9-2320-365-10).
- (9) Connect connector J51 to connector P51.
- (10) Install kick panel (para 16-3).



32E4904A

47. SIDE AND/OR REAR MARKER LIGHTS DO NOT ILLUMINATE (CONT)



**CONTINUITY TEST**

(1) Remove four screws and washers from base.

**NOTE**

Do not let wires slip through hole and into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

(2) Extend base and disconnect marker light connector from connector P85, P86, P88, P89, P54, P56, or P58.

**CAUTION**

Two nuts are used to keep bottom nut in place. To prevent damage to equipment, use care when removing base.

(3) Remove nut, lockwasher, terminal lug TL15, TL16, TL19, TL20, TL30, TL31, or TL32, lockwasher, base, and gasket from vehicle. Discard lockwashers.

(4) Set multimeter to ohms.

(5) Connect positive (+) probe of multimeter to terminal lug "A".

(6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.

(7) If continuity is not present, repair wire "A" (para 2-40) or replace rear lights cable assembly (para 7-75).

(8) If continuity is present, repair wire "B" (para 2-40) or replace rear lights cable assembly (para 7-75).

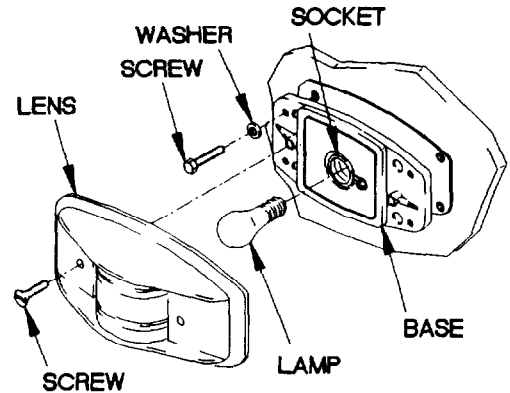
(9) Connect marker light connector to connector P85, P86, P88, P89, P54, P56, or P58.

(10) Install lockwasher, terminal lug TL15, TL16, TL19, TL20, TL30, TL31, or TL32, lockwasher, and nut on back of base.

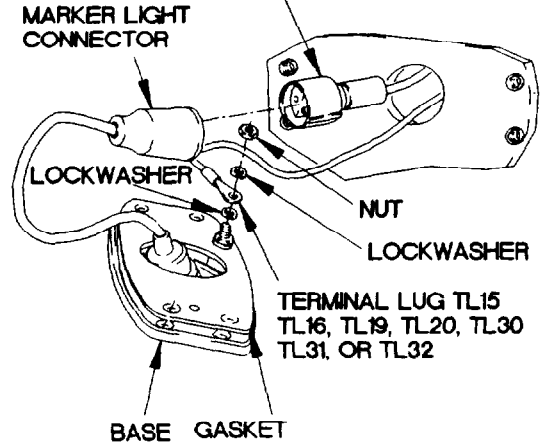
(11) Install base on vehicle with four washers and screws.

(12) Install lamp in socket.

(13) Install lens on base with two screws.



CONNECTOR P54, P56, P58, P85, OR P86

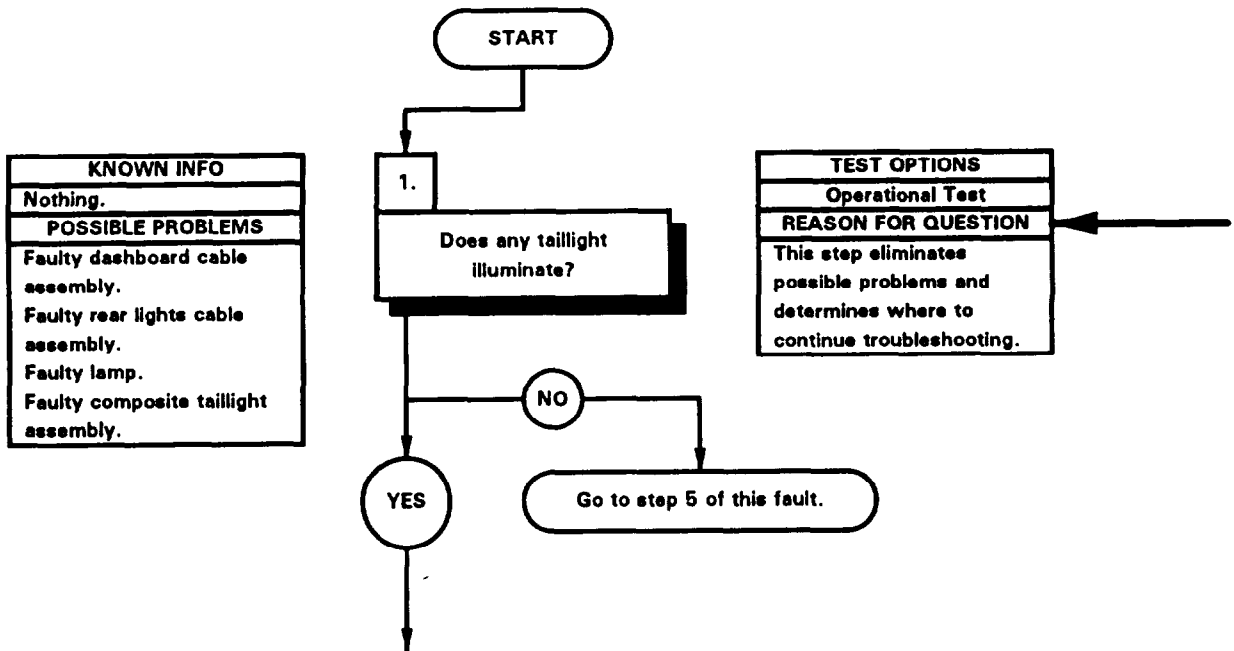


32E 49051

**TABLE 2-12 TERMINAL LUG IDENTIFICATION**

TERMINAL LUG "A"	WIRE "A"	WIRE "B"
TL15 (LH side marker light)	3094	489
TL16 (LH rear marker light)	3094	489
TL19 (RH side marker light)	3095	489
TL20 (RH rear marker light)	3095	489
TL30 (LH rear center marker light)	3095	489
TL31 (rear center marker light)	3095	489
TL32 (RH rear center marker light)	3095	489

e48. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-671-12&P
<b>Materials/Parts</b> Packing, Preformed (Item 172, Appendix G)	

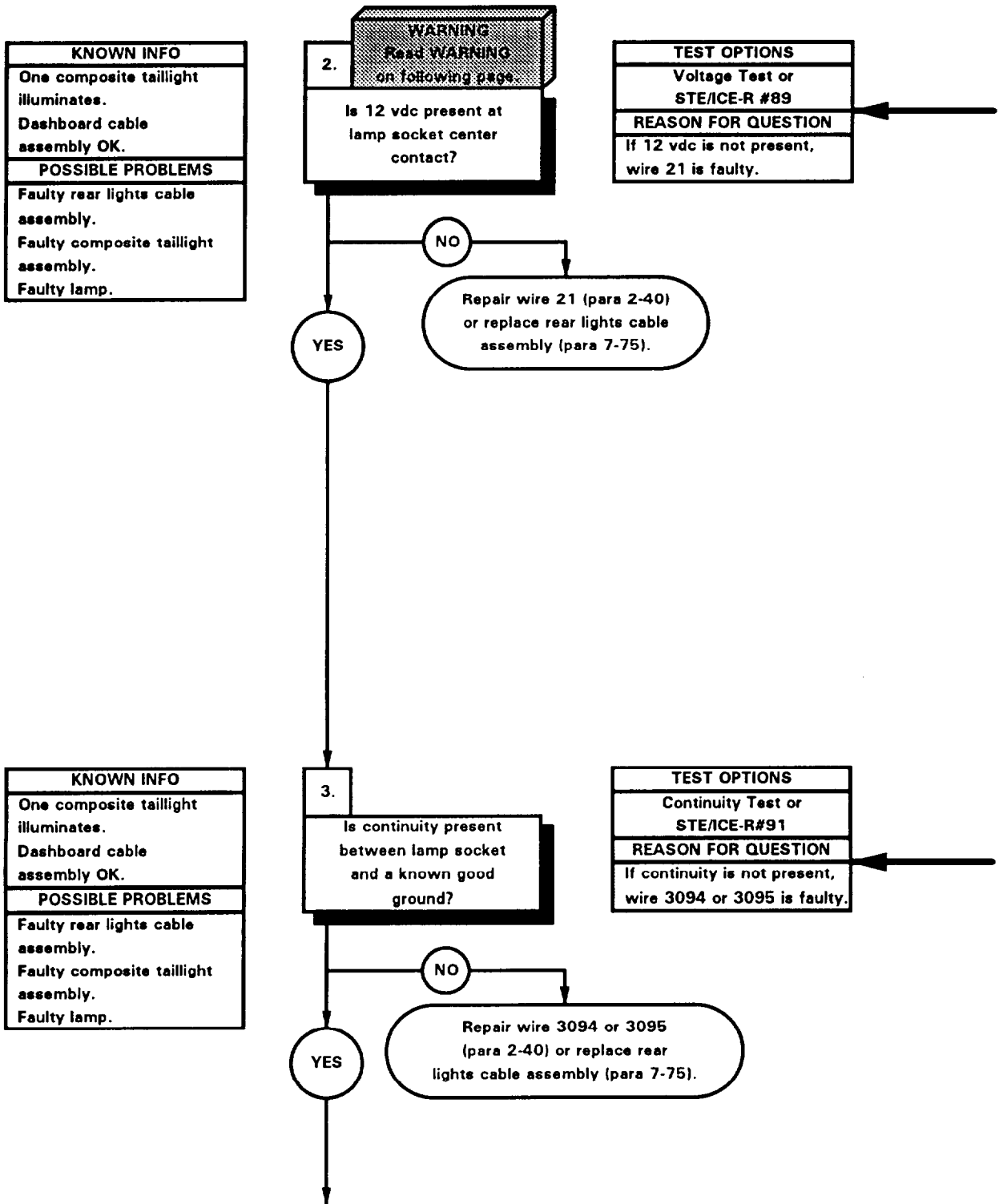


**OPERATIONAL TEST**

- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) Position main light switch auxiliary lever to PARK (TM 9-2320-365-10).
- (3) If neither composite taillight illuminates, go to step 5 of this fault.
- (4) Position main light switch to OFF (TM 9-2320-365-10).



e48. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

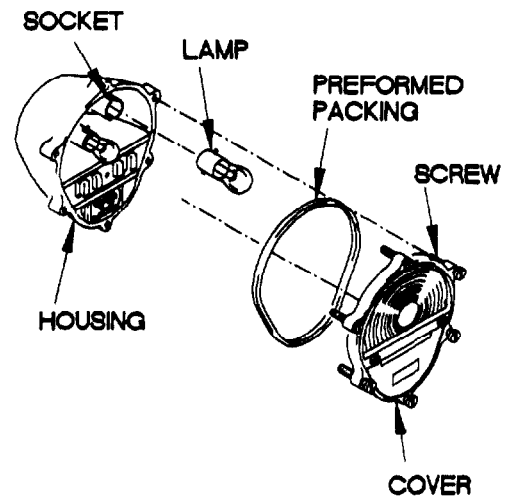


**WARNING**

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) Loosen six screws and remove cover and preformed packing from housing. Discard preformed packing.
- (2) Remove lamp from socket.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to lamp socket center contact.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to **SER DRIVE** (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 21 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (8) Position main light switch to **OFF** (TM 9-2320-365-10).



X2E5001A

**CONTINUITY TEST**

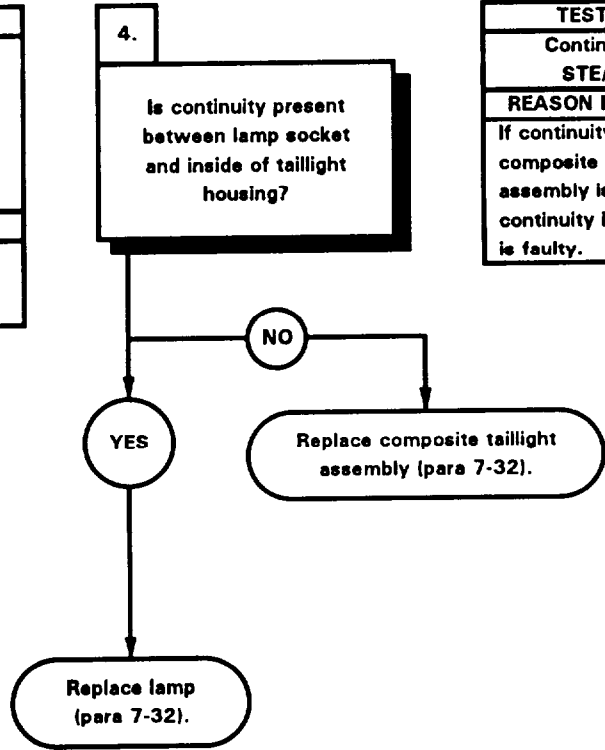
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to lamp socket.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3094 or 3095 (para 2-40) or replace rear lights cable assembly (para 7-75).

e48. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
One composite taillight illuminates.
Dashboard cable assembly OK.
Rear lights cable assembly OK.

POSSIBLE PROBLEMS
Faulty composite taillight assembly.
Faulty lamp.



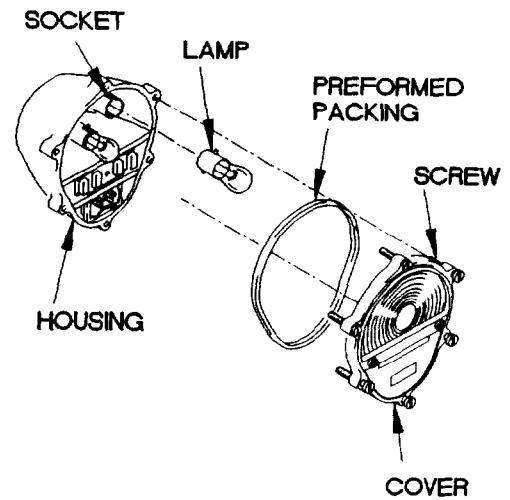
TEST OPTIONS
Continuity Test or STE/ICE-R#91

REASON FOR QUESTION
If continuity is not present, composite taillight assembly is faulty. If continuity is present, lamp is faulty.

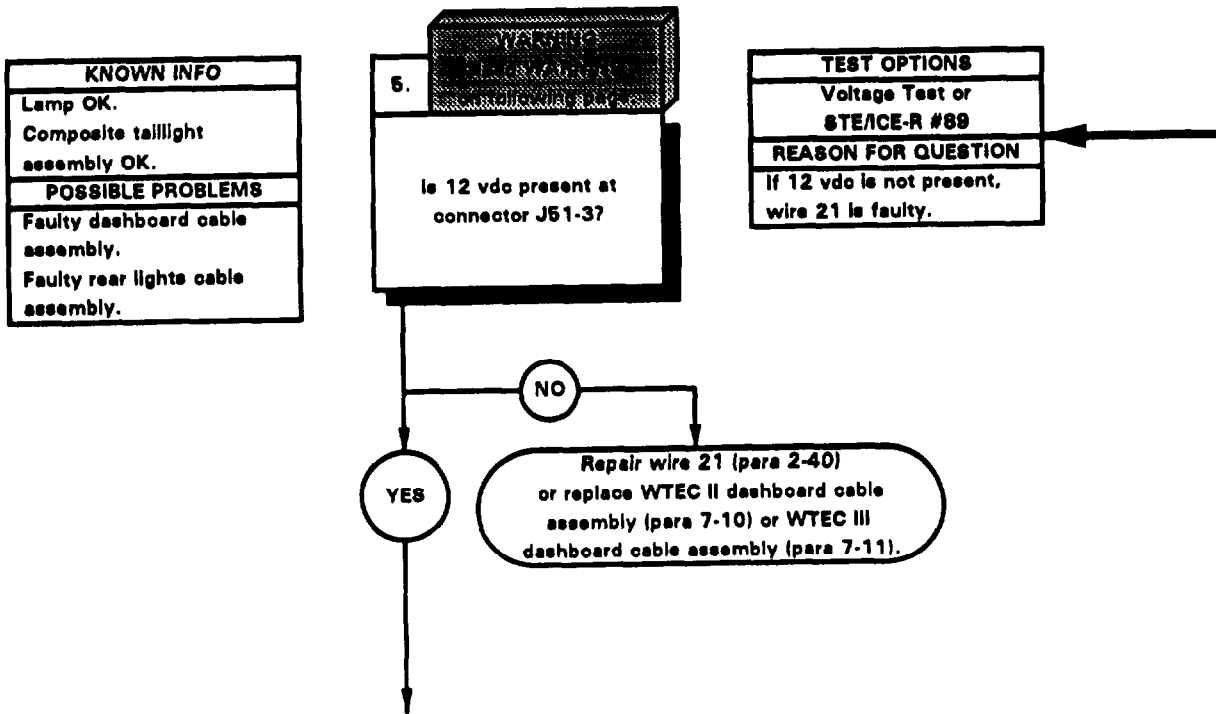
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to lamp socket.
- (4) Connect negative (-) probe of multimeter to inside of composite taillight housing and note reading on multimeter.
- (5) If continuity is not present, replace composite taillight assembly (para 7-32).
- (6) If continuity is present, replace lamp (para 7-32).
- (7) Install lamp in socket.
- (8) Install preformed packing and cover on housing with six screws.



X2E5002A

648. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

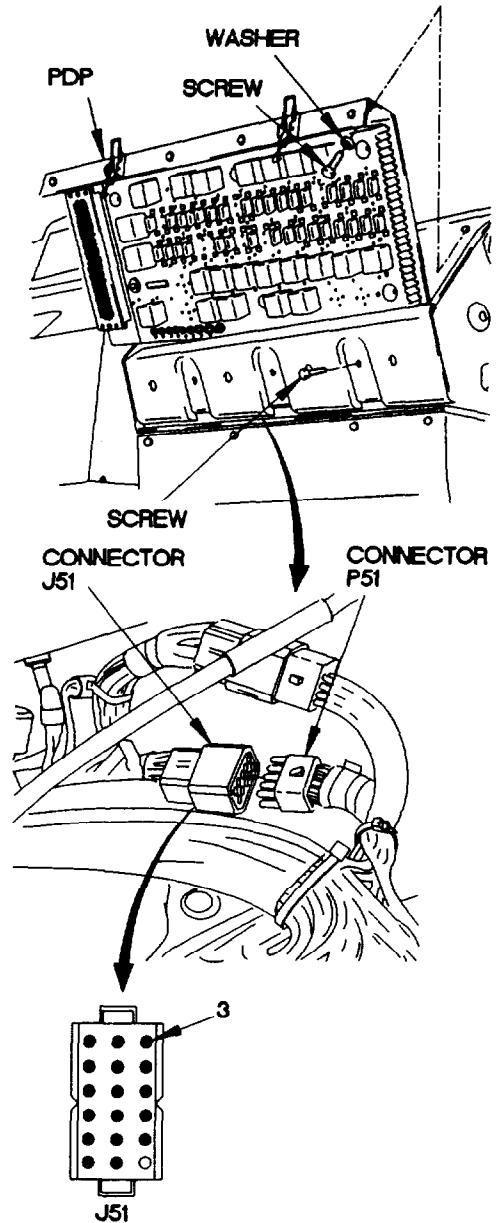


**WARNING**

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.

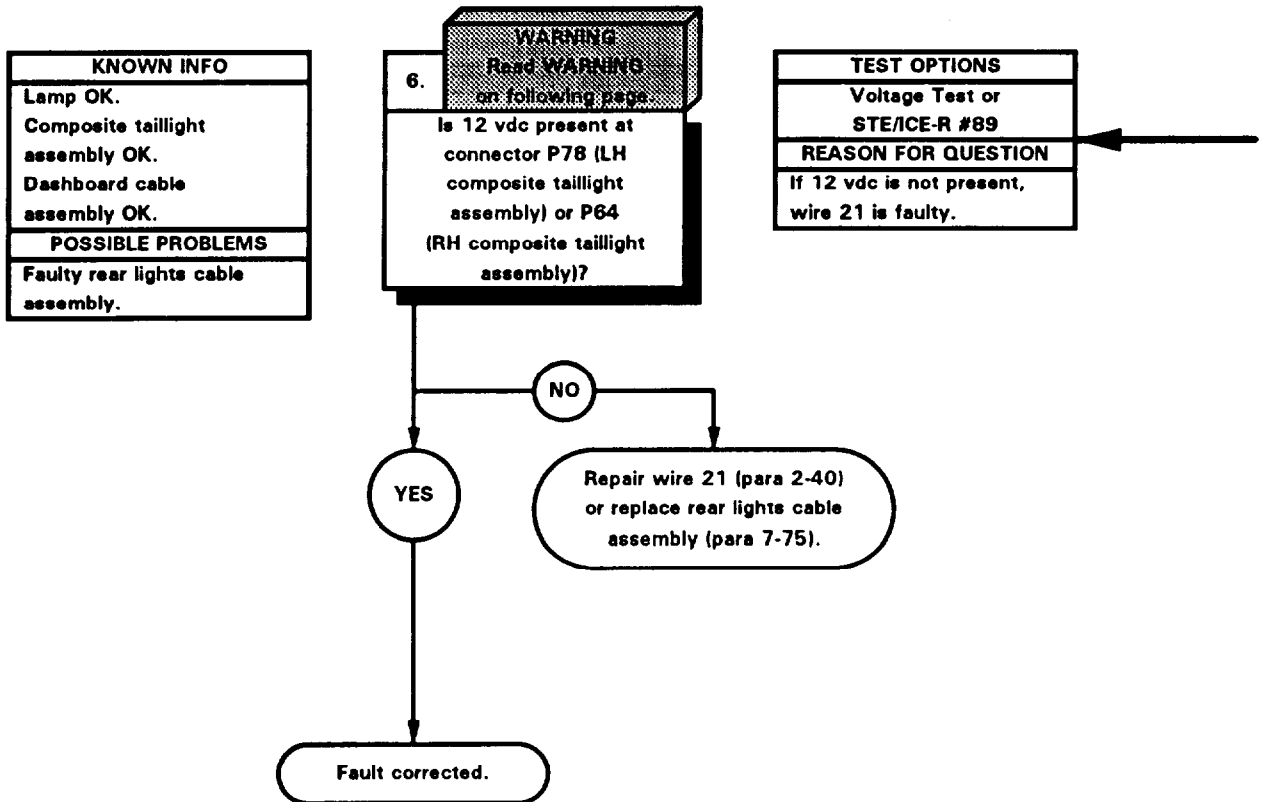
**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Disconnect connector J51 from connector P51.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to J51-3.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (10) If 12 vdc is not present, repair wire 21 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (11) Position main light switch to OFF (TM 9-2320-365-10).
- (12) Connect connector J51 to connector P51.
- (13) Install PDP on dashboard with three screws.
- (14) Install three washers and screws in PDP.
- (15) Install PDP cover (para 16-2).



x2E50031

e48. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

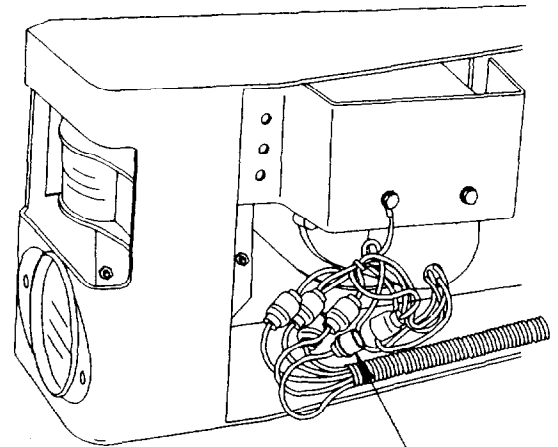


**WARNING**

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) Disconnect connector P78 (LH composite taillight assembly) or connector P64 (RH composite taillight assembly) from taillight connector.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P78 or connector P64.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (6) Position main light switch auxiliary lever to PARK (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 21 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (8) Position main light switch to OFF (TM 9-2320-365-10).
- (9) Connect connector P78 or connector P64 to taillight connector.

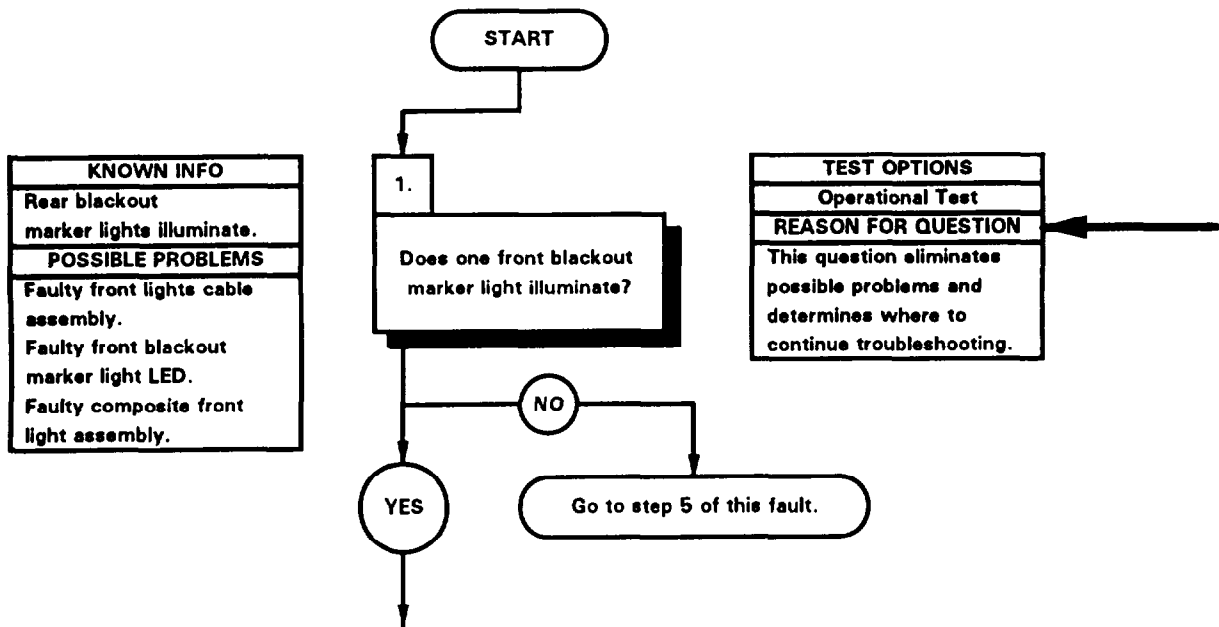


CONNECTOR P64 (RH) OR P78 (LH)

X2E5004A



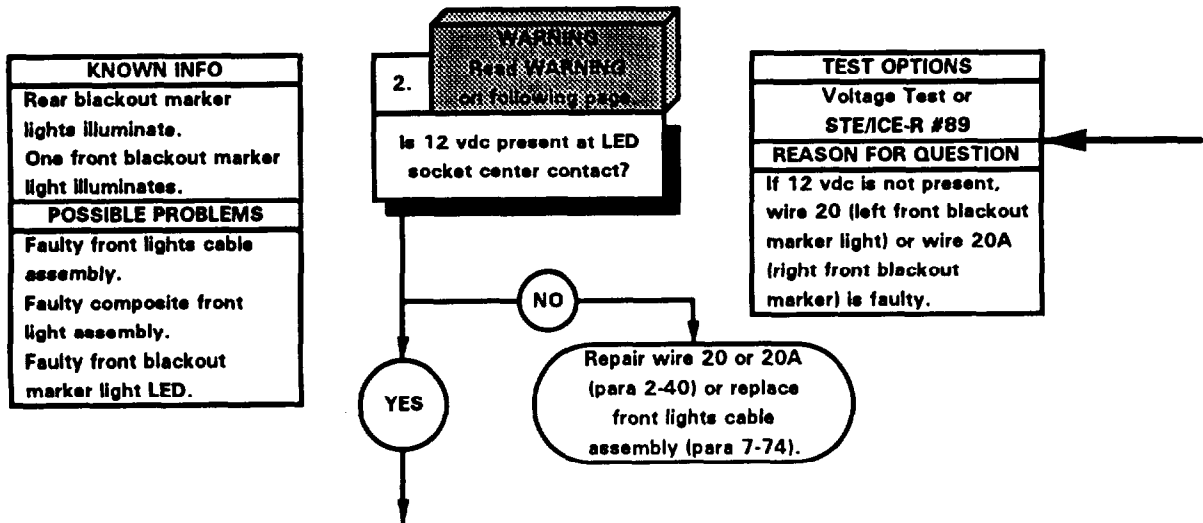
e49. ONE OR BOTH FRONT BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Packing, Preformed (Item 172, Appendix G)	



**OPERATIONAL TEST**

- (1) Position main light switch to **BO MARKER**  
(TM 9-2320-365-10).
- (2) Observe front blackout marker lights and determine how many lights do not illuminate.
- (3) If both marker lights do not illuminate, go to step 5 of this fault.
- (4) Position main light switch to **OFF**  
(TM 9-2320-365-10).

49. ONE OR BOTH FRONT BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

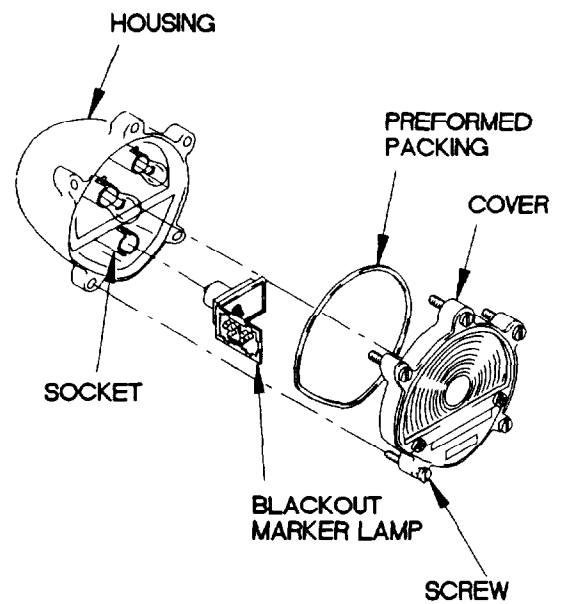


**WARNING**

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**

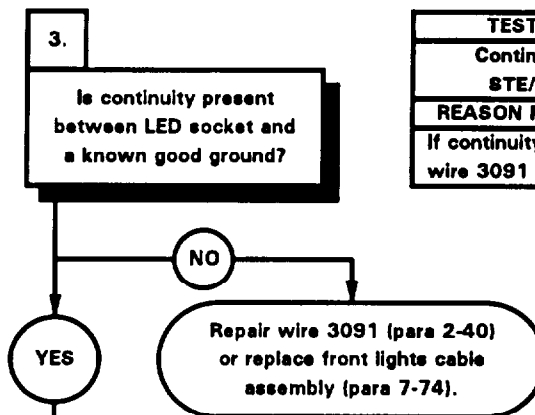
- (1) Loosen five screws on cover.
- (2) Remove cover and preformed packing from housing. Discard preformed packing.
- (3) Open blackout marker lamp.
- (4) Remove blackout marker lamp from socket.
- (5) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to LED socket center contact.
- (7) Connect negative (-) probe of multimeter to ground.
- (8) Position main light switch BO MARKER (TM 9-2320-365-10) and note reading on multimeter.
- (9) If 12 vdc is not present, repair wire 20 (left front blackout marker) or wire 20A (right front blackout marker) (para 2-40) or replace front lights cable assembly (para 7-74).
- (10) Position main light switch to OFF (TM 9-2320-365-10).



X2E 4802-

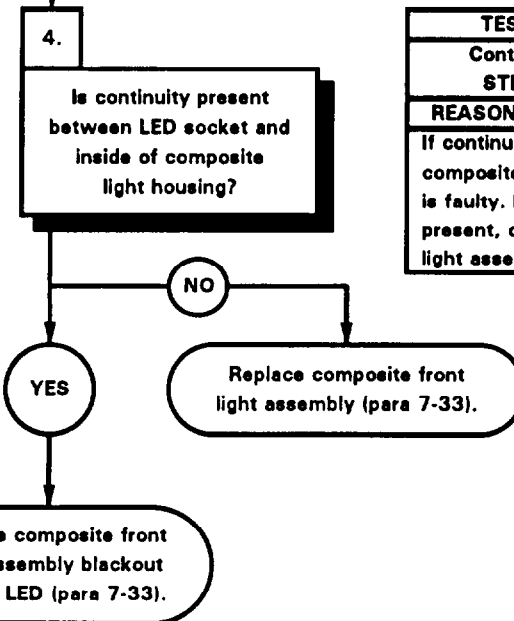
649. ONE OR BOTH FRONT BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Rear blackout marker lights illuminate. One blackout marker light illuminates. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty front blackout marker light LED. Faulty composite front light assembly. Faulty front lights cable assembly.



TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3091 is faulty.

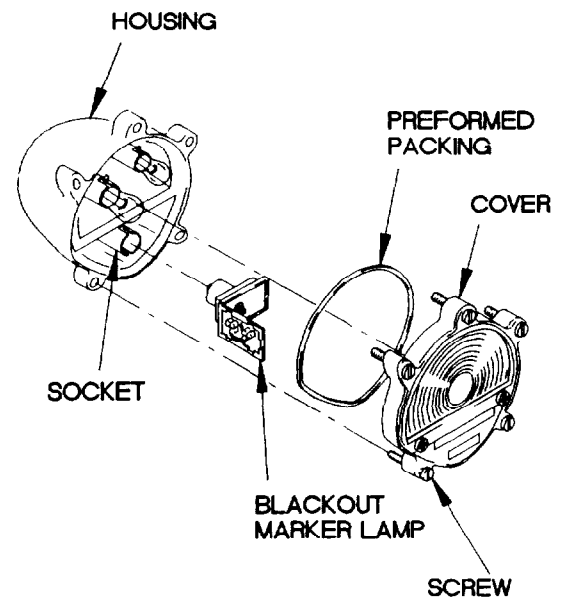
KNOWN INFO
Rear blackout marker lights illuminate. One blackout marker light illuminates. Dashboard cable assembly OK. Front blackout marker light LED OK. Front lights cable assembly OK.
POSSIBLE PROBLEMS
Faulty composite front light assembly.



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

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to LED socket.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3091 (para 2-40) or replace front lights cable assembly (para 7-74).

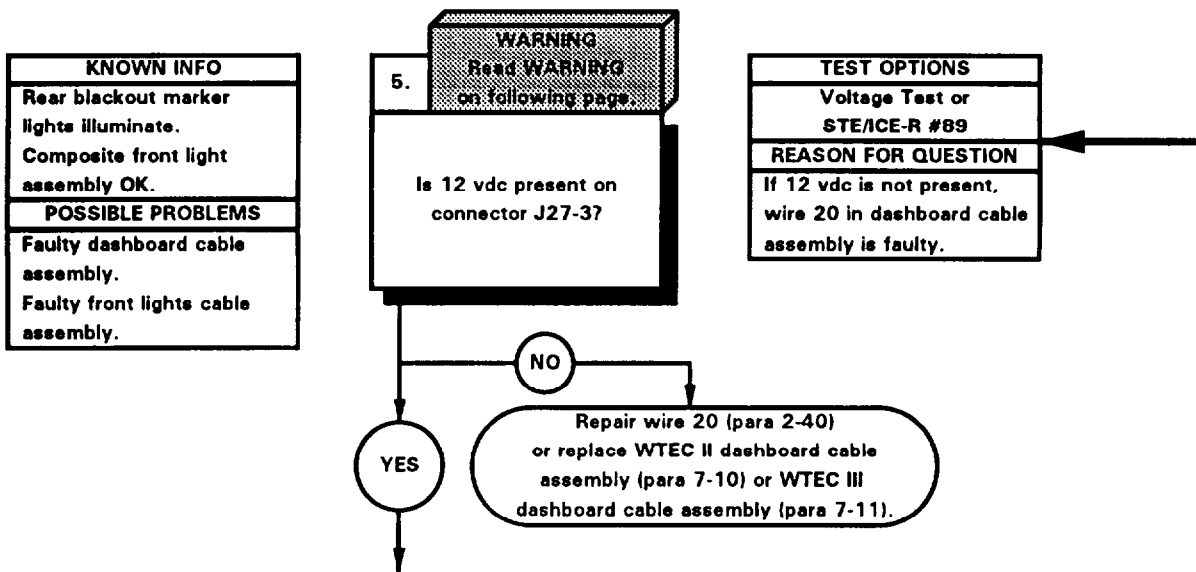


**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to inside of housing.
- (3) Connect negative (-) probe of multimeter to socket and note reading on multimeter.
- (4) If continuity is present, replace composite front light assembly blackout marker LED (para 7-33).
- (5) If continuity is not present, replace composite front light assembly (para 7-33).
- (6) Open blackout marker lamp.
- (7) Install blackout marker lamp in socket.
- (8) Install preformed packing and cover on housing with five screws.

X2E 4803-

49. ONE OR BOTH FRONT BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

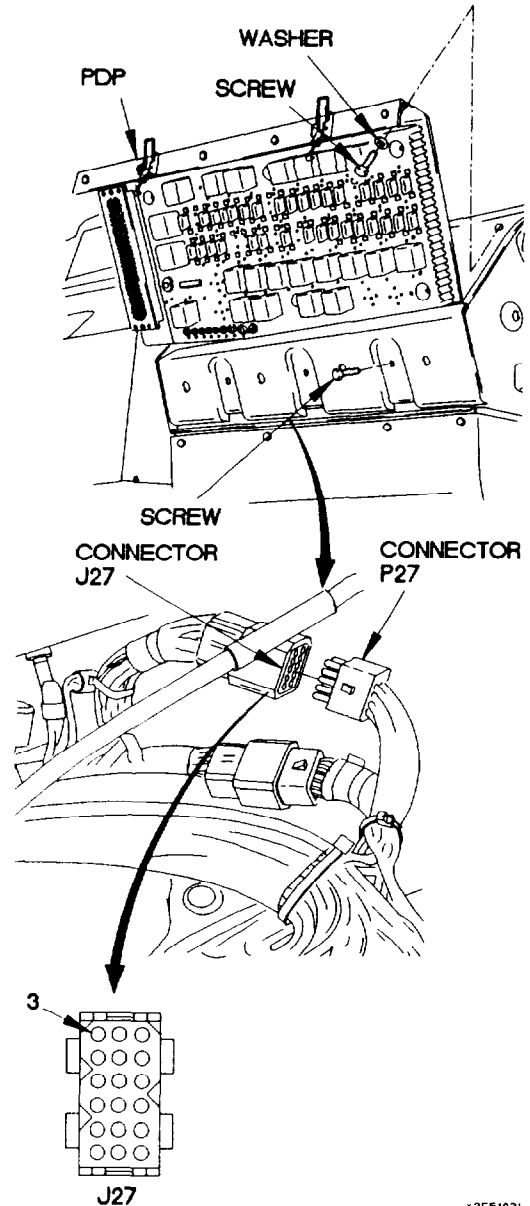


**WARNING**

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**

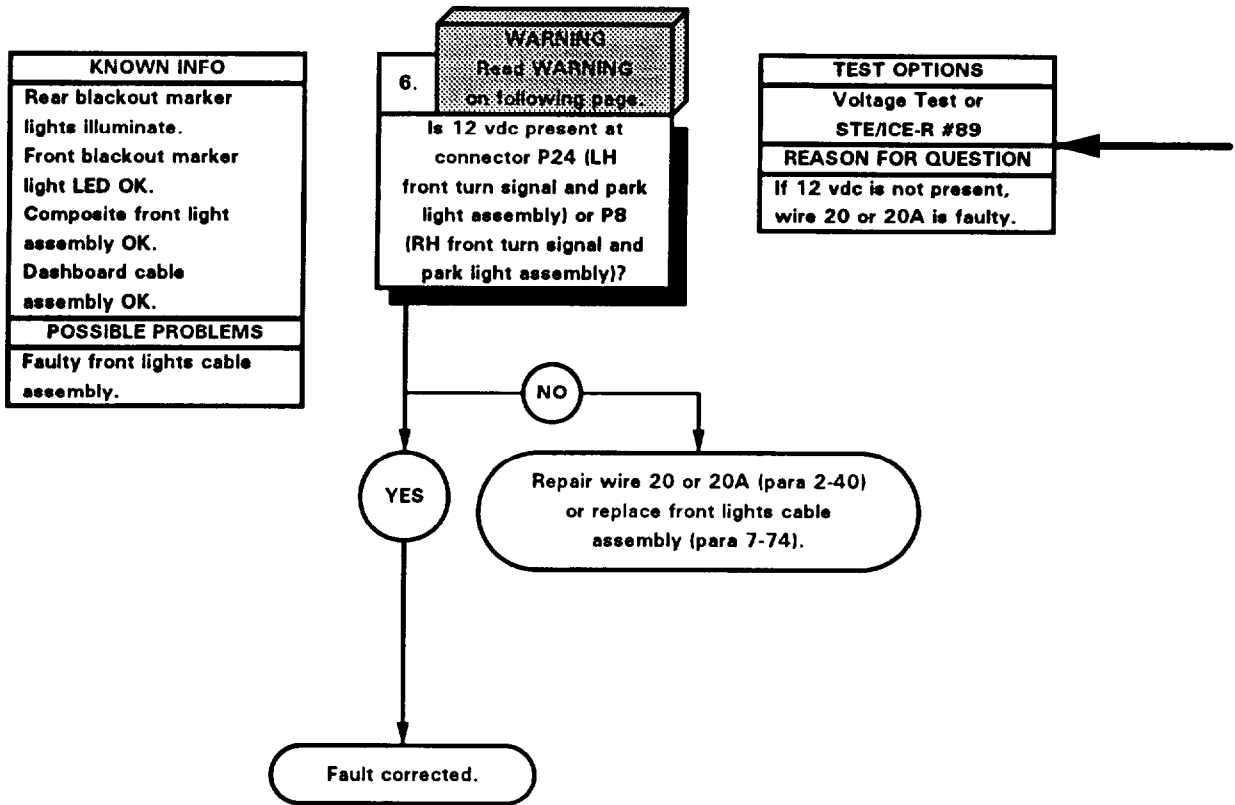
- (1) Remove PDP cover (para 16-2).
- (2) Remove three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Disconnect connector J27 from connector P27.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to J27-3.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (10) If 12 vdc is not present, repair wire 20 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (11) Position main light switch to OFF (TM 9-2320-365-10).
- (12) Connect connector J27 to connector P27.
- (13) Install PDP on dashboard with three screws.
- (14) Install three washers and screws in PDP.
- (15) Install PDP cover (para 16-2).



A2E51031



e49. ONE OR BOTH FRONT BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

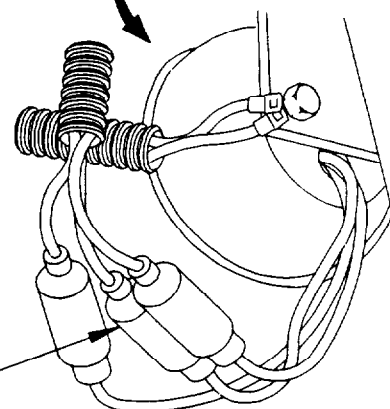
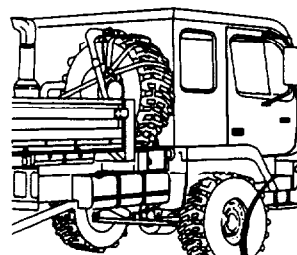


**WARNING**

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) Disconnect connector P24 (LH composite front light assembly) or connector P8 (RH composite front assembly) from composite front assembly connector.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P24 or connector P8.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to BO MARKER (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, repair wire 20 or 20A (para 2-40) or replace front lights cable assembly (para 7-74).
- (7) Position main light switch to OFF (TM 9-2320-365-10).
- (8) Connect connector P24 or connector P8 to composite front light assembly connector.



X2E5104A

**50. BLACKOUT DRIVE LIGHT DOES NOT ILLUMINATE**

**INITIAL SETUP**

**Equipment Condition**

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

**Personnel Required**

(2)

**Materials/Parts**

Packing, Preformed (Item 168, Appendix G)

**Tools and Special Tools**

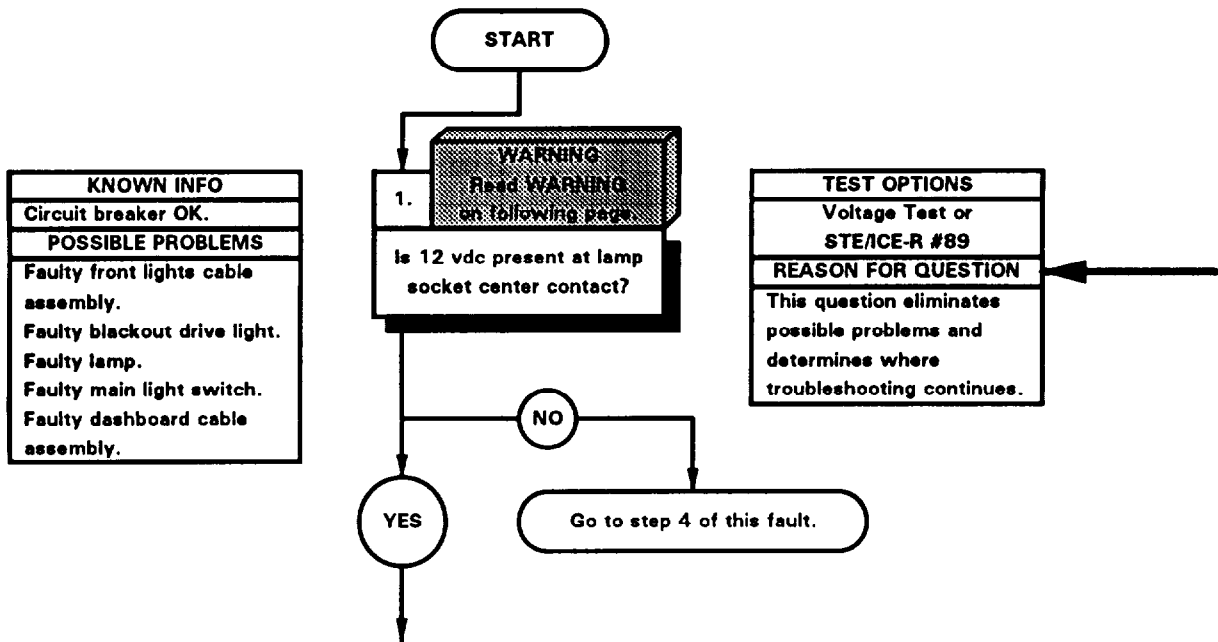
Tool Kit, Genl Mech (Item 44, Appendix C)

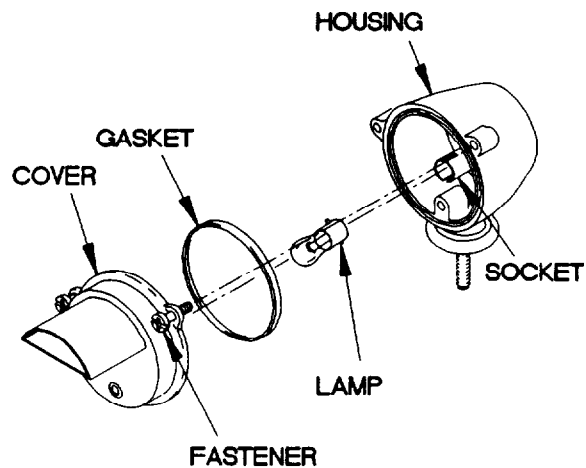
STE/ICE-R (Item 39, Appendix C)

Multimeter, Digital (Item 22, Appendix C)

**References**

TM 9-4910-571-12&P





**WARNING**

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

X2E4901-

**VOLTAGE TEST**

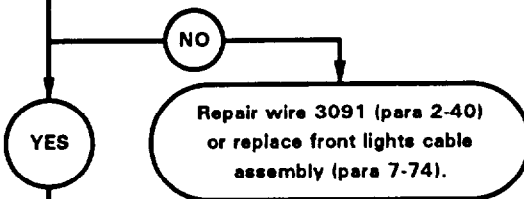
- (1) Loosen three screws on cover.
- (2) Remove cover and gasket from housing. Discard gasket.
- (3) Remove lamp from socket.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to lamp socket center contact.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position main light switch to BO DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 12 vdc is not present, go to step 4 of this fault.
- (9) Position main light switch to OFF (TM 9-2320-365-10).

•50. BLACKOUT DRIVE LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker OK. Main light switch OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty front lights cable assembly. Faulty blackout drive light. Faulty lamp.

2.  
Is continuity present between lamp socket and a known good ground?

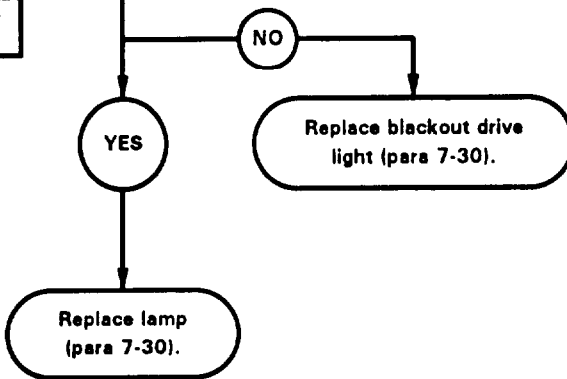
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3091 is faulty.



KNOWN INFO
Circuit breaker OK. Main light switch OK. Dashboard cable assembly OK. Front lights cable assembly OK.
POSSIBLE PROBLEMS
Faulty blackout drive light. Faulty lamp.

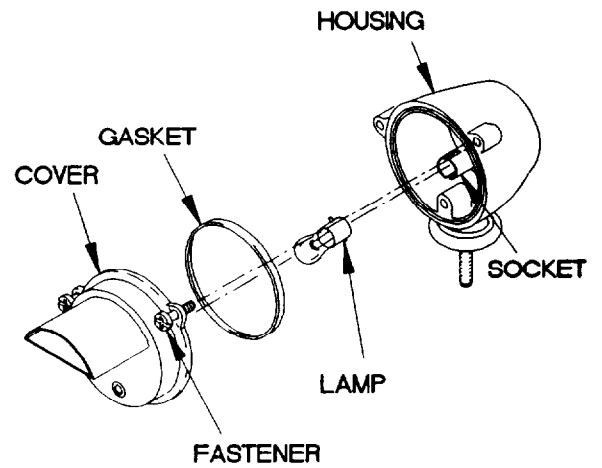
3.  
Is continuity present between lamp socket and inside of blackout drive light housing?

TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, blackout drive light is faulty. If continuity is present, lamp is faulty.



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to lamp socket.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3091 (para 2-40) or replace front lights cable assembly (para 7-74).



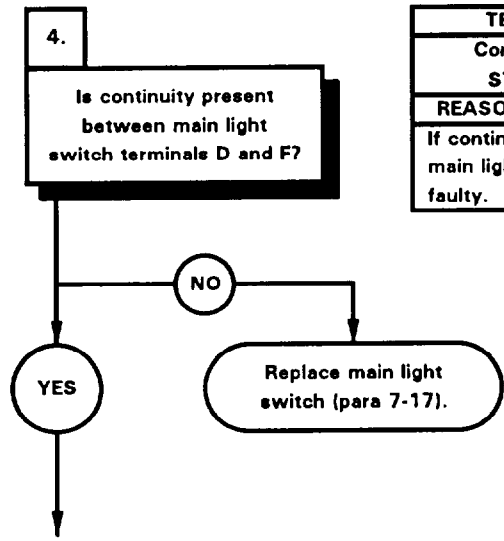
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to inside of blackout drive light housing.
- (3) Connect negative (-) probe of multimeter to lamp socket and note reading on multimeter.
- (4) If continuity is not present, replace blackout drive light (para 7-30).
- (5) If continuity is present, replace lamp (para 7-30).
- (6) Install lamp in socket.
- (7) Install gasket and cover on housing with three screws.

x2E4902-

e50. BLACKOUT DRIVE LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker OK. Lamp OK. Blackout drive light OK.
POSSIBLE PROBLEMS
Faulty main light switch. Faulty dashboard cable assembly. Faulty front lights cable assembly.

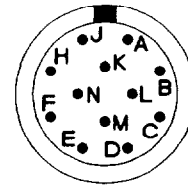


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, main light switch is faulty.



**CONTINUITY TEST**

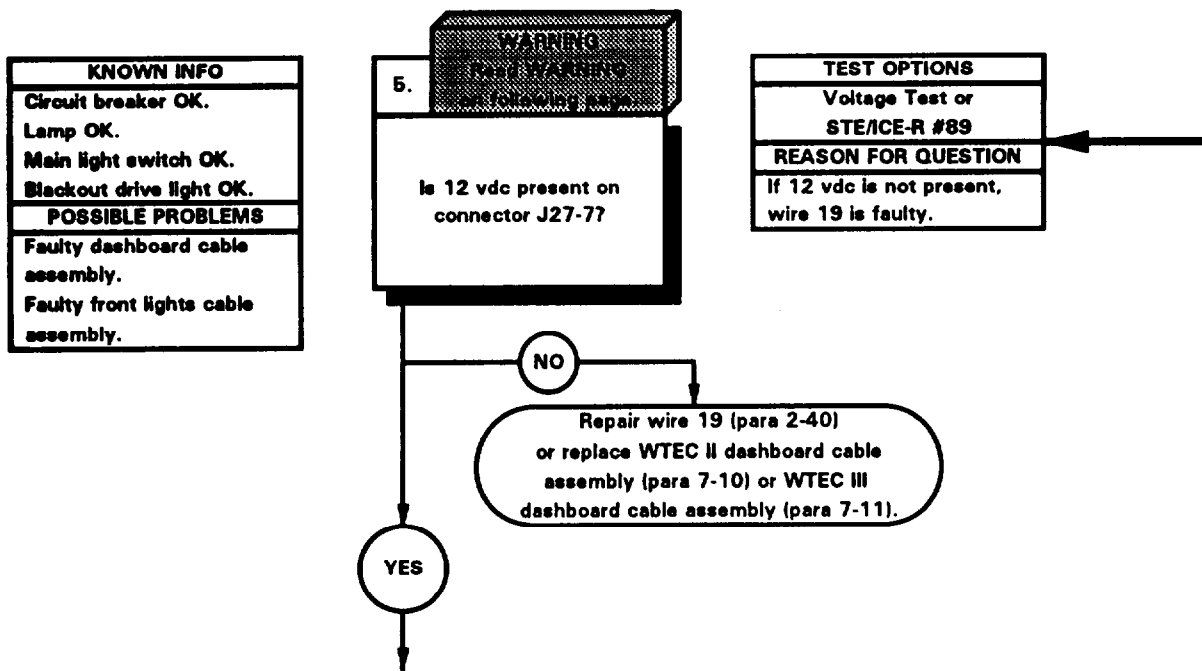
- (1) Remove main light switch (para 7-17).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to main light switch terminal F.
- (4) Connect negative (-) probe of multimeter to main light switch terminal D.
- (5) Position main light switch to BO DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (6) If continuity is not present, replace main light switch (para 7-17).
- (7) Position main light switch to OFF (TM 9-2320-365-10).
- (8) Install main light switch (para 7-17).

**MAIN  
LIGHT  
SWITCH**

X2E5203A



e50. BLACKOUT DRIVE LIGHT DOES NOT ILLUMINATE (CONT)

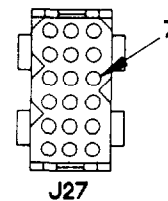
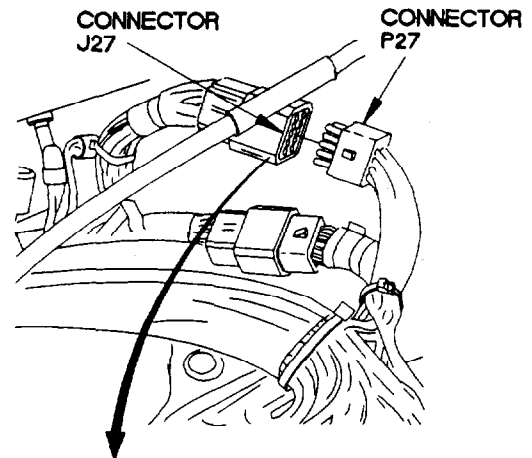
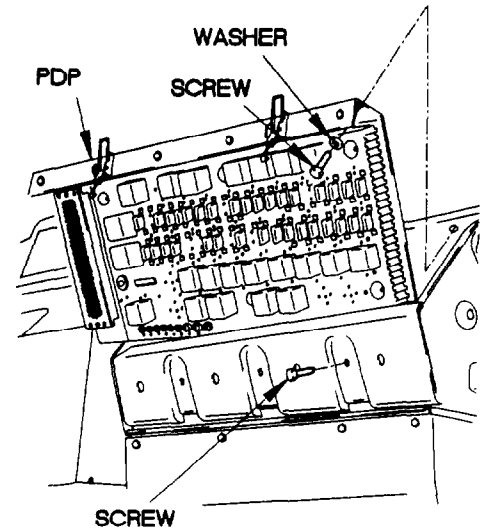


**WARNING**

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

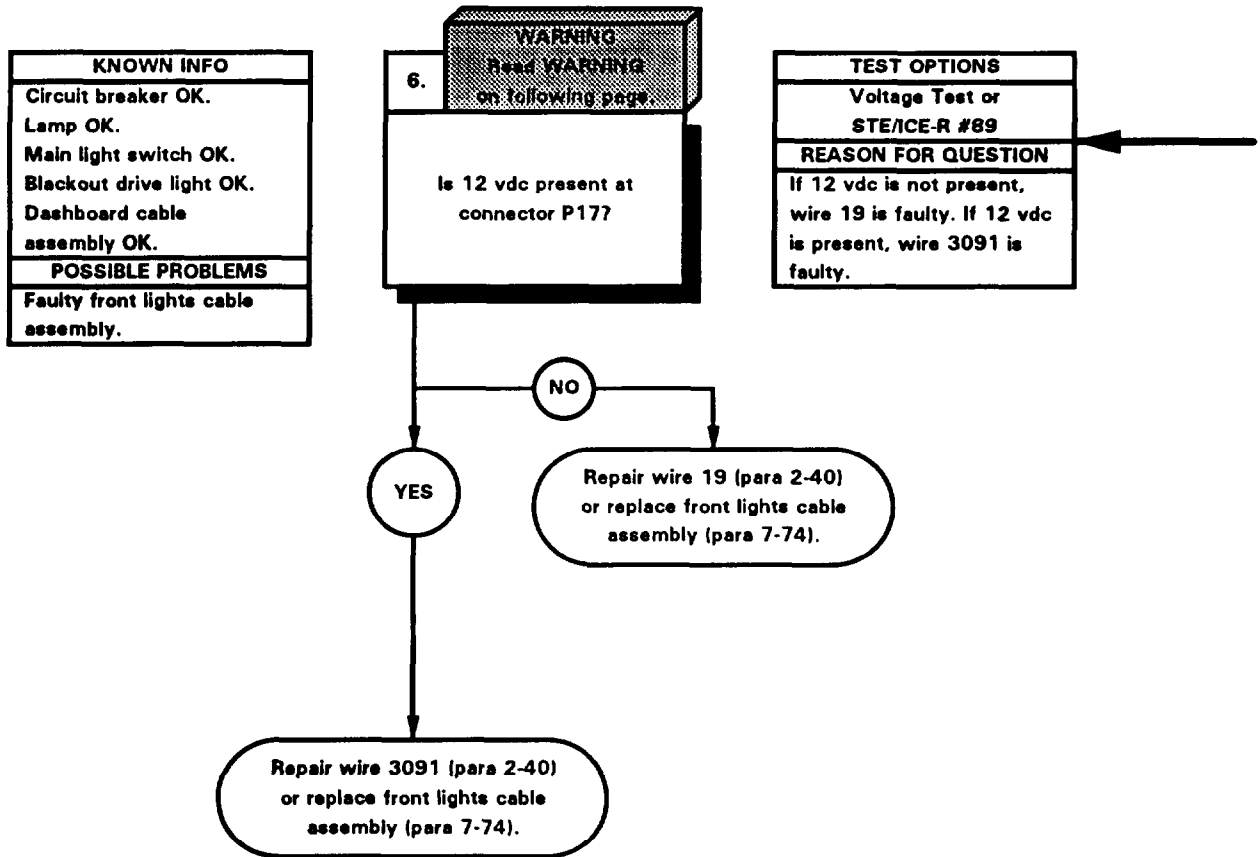
**VOLTAGE TEST**

- (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 connector J27 from connector P27.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter to J27-7.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position main light switch to BO DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (10) If 12 vdc is not present, repair wire 19 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (11) Position main light switch to OFF (TM 9-2320-365-10).
- (12) Connect connector J27 to connector P27.
- (13) Install PDP on dashboard with three screws.
- (14) Install three washers and screws in PDP.
- (15) Install PDP cover (para 16-2).



x2E52041

e50. BLACKOUT DRIVE LIGHT DOES NOT ILLUMINATE (CONT)

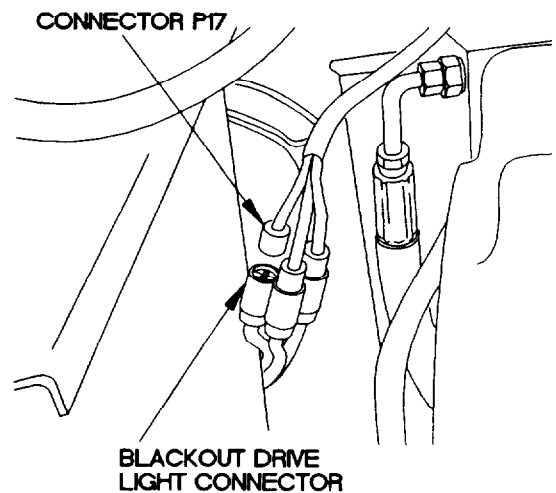
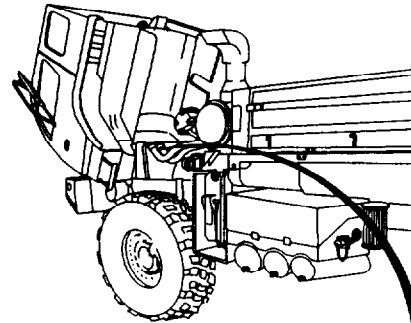


**WARNING**

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

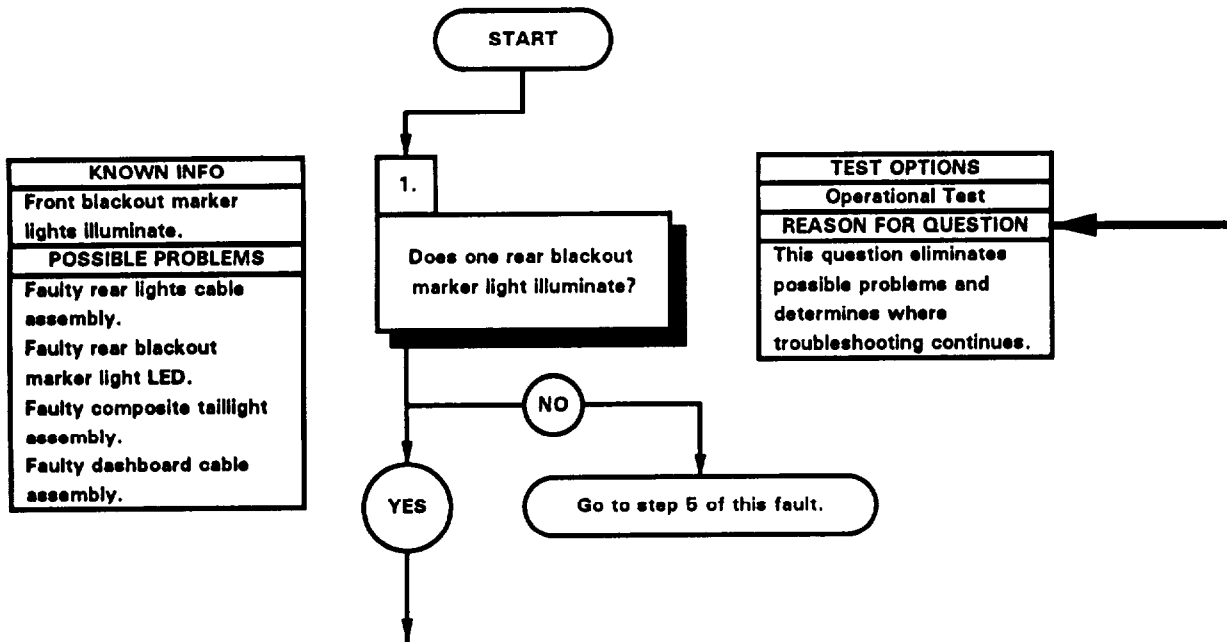
**VOLTAGE TEST**

- (1) Disconnect connector P17 from blackout drive light connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P17.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to **BO DRIVE** (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, repair wire 19 (para 2-40) or replace front lights cable assembly (para 7-74).
- (7) If 12 vdc is present, repair wire 3091 (para 2-40) or replace front lights cable assembly (para 7-74).
- (8) Position main light switch to **OFF** (TM 9-2320-365-10).
- (9) Connect connector P17 to blackout drive light connector.



X2LS205A

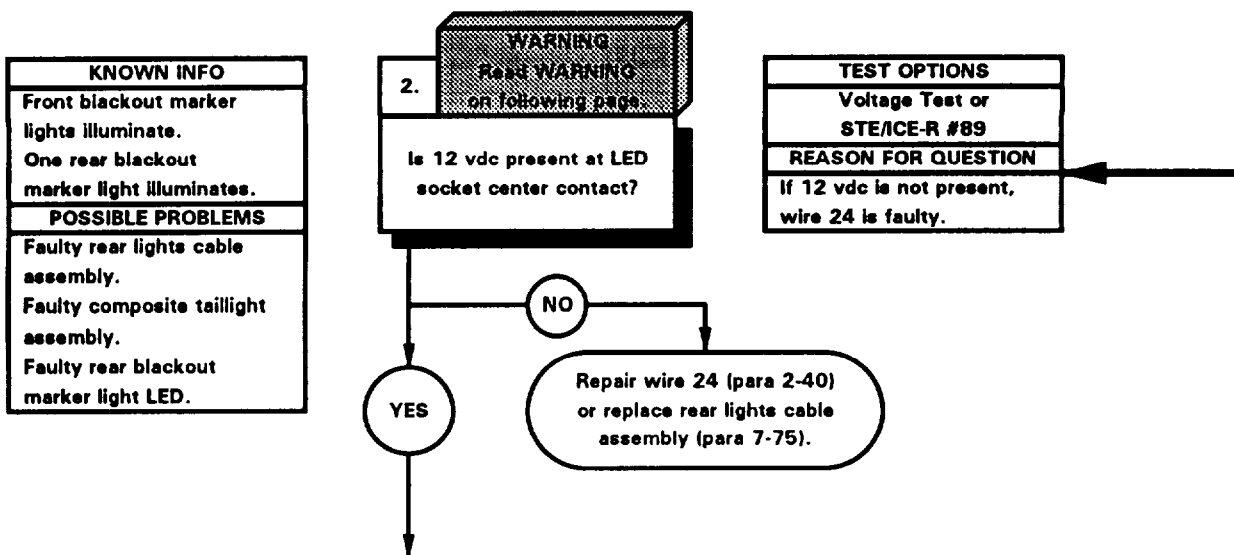
61. ONE OR BOTH REAR BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Packing, Preformed (Item 172, Appendix G) Nut, Self-Locking (Item 137, Appendix G)	



**OPERATIONAL TEST**

- (1) Position main light switch to BO MARKER (TM 9-2320-365-10).
- (2) Observe operation of blackout marker lights at rear of vehicle.
- (3) If neither rear blackout marker light illuminates, go to step 5 of this fault.
- (4) Position main light switch to OFF (TM 9-2320-365-10).

e51. ONE OR BOTH REAR BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

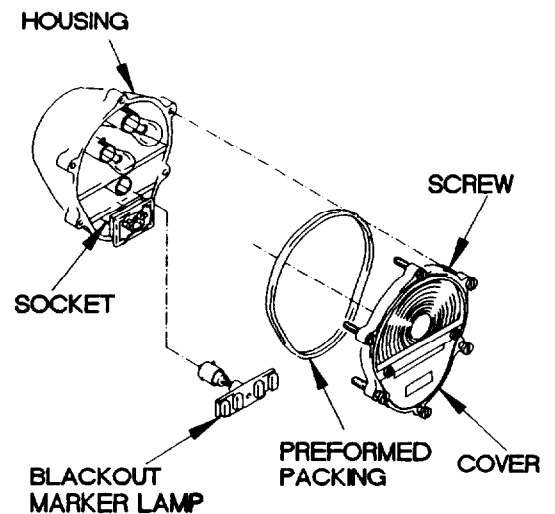


**WARNING**

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) Loosen six screws and remove cover and preformed packing from housing. Discard preformed packing.
- (2) Open blackout marker lamp.
- (3) Remove blackout marker lamp from socket.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to LED socket center contact.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position main light switch to BO MARKER (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 12 vdc is not present, repair wire 24 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (9) Position main light switch to OFF (TM 9-2320-365-10).



X2E5002A

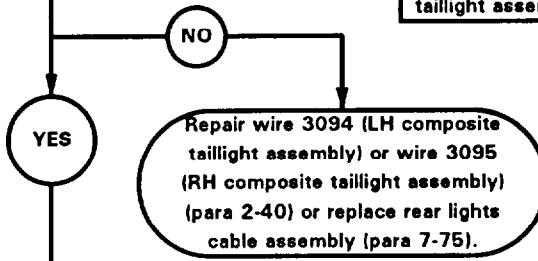


e51. ONE OR BOTH REAR BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Front blackout marker lights illuminate.
One rear blackout marker light illuminates.
Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty rear lights cable assembly.
Faulty rear blackout marker light LED.
Faulty composite taillight assembly.

3.  
Is continuity present between LED socket and ground?

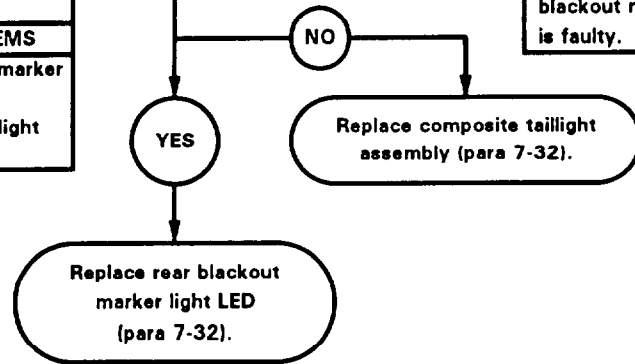
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3094 (LH composite taillight assembly) or wire 3095 (RH composite taillight assembly) is faulty.



KNOWN INFO
Front blackout marker lights illuminate.
One rear blackout marker light illuminates.
Dashboard cable assembly OK.
Rear lights cable assembly OK.
POSSIBLE PROBLEMS
Faulty rear blackout marker light LED.
Faulty composite taillight assembly.

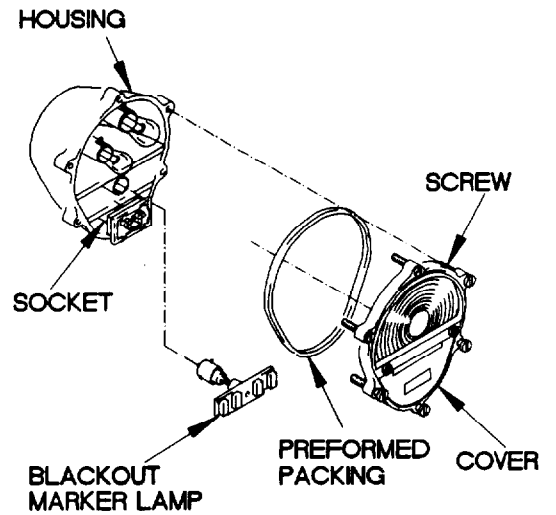
4.  
Is continuity present between LED socket and inside of rear taillight housing?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, composite taillight assembly is faulty. If continuity is present, rear blackout marker light LED is faulty.



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to LED socket.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3094 (LH composite taillight assembly) or wire 3095 (RH composite taillight assembly) (para 2-40) or replace rear lights cable assembly (para 7-75).

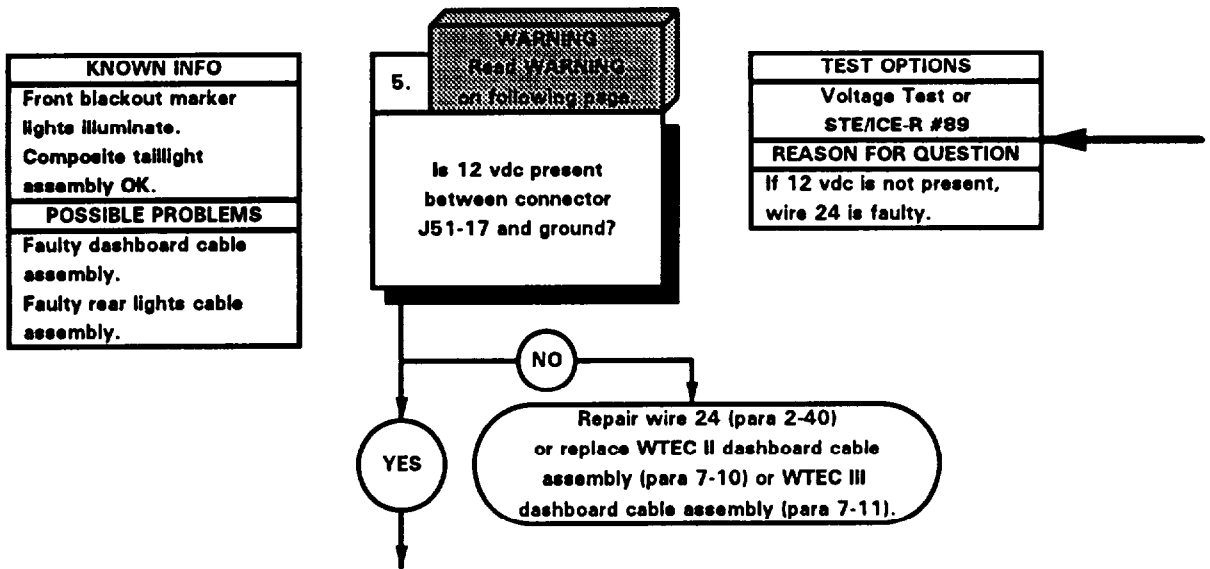


X2E5002A

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to inside of housing.
- (3) Connect negative (-) probe of multimeter to LED socket and note reading on multimeter.
- (4) If continuity is not present, replace composite taillight assembly (para 7-32).
- (5) If continuity is present, replace rear blackout marker light LED (para 7-32).
- (6) Open blackout marker lamp.
- (7) Install blackout marker lamp in socket.
- (8) Install preformed packing and cover on housing with six screws.

651. ONE OR BOTH REAR BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

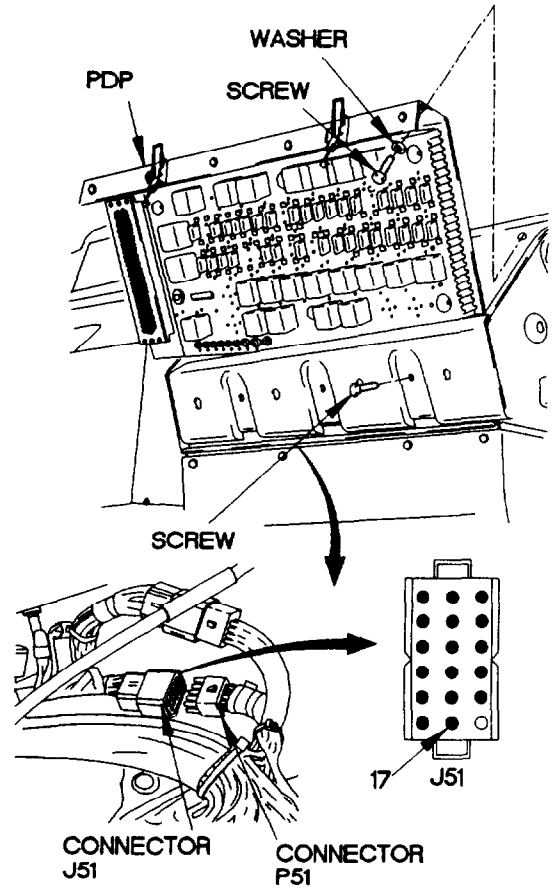


**WARNING**

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.

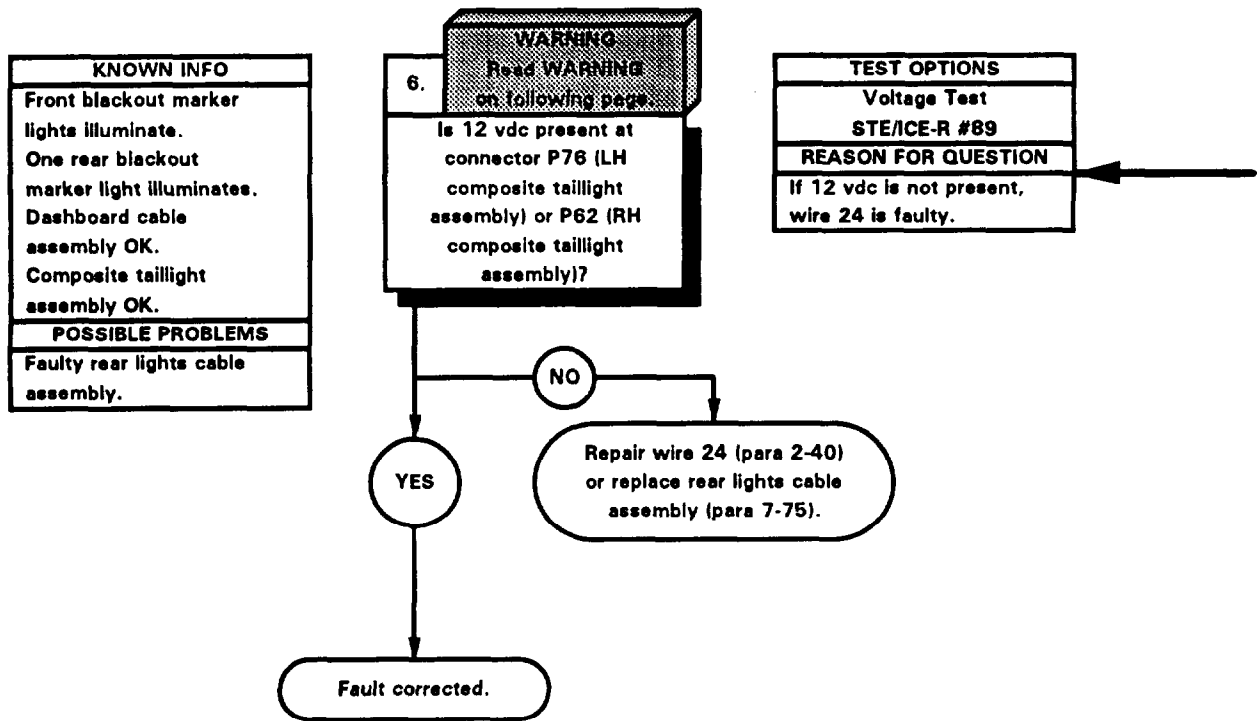
**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Disconnect connector J51 from connector P51.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter to J51-17.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position main light switch to BO MARKER (TM 9-2320-365-10) and note reading on multimeter.
- (10) If 12 vdc is not present, repair wire 24 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (11) Position main light switch to OFF (TM 9-2320-365-10).
- (12) Connect connector J51 to connector P51.
- (13) Install PDP on dashboard with three screws.
- (14) Install three washers and screws in PDP.
- (15) Install PDP cover (para 16-2).



X2E53031

e51. ONE OR BOTH REAR BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

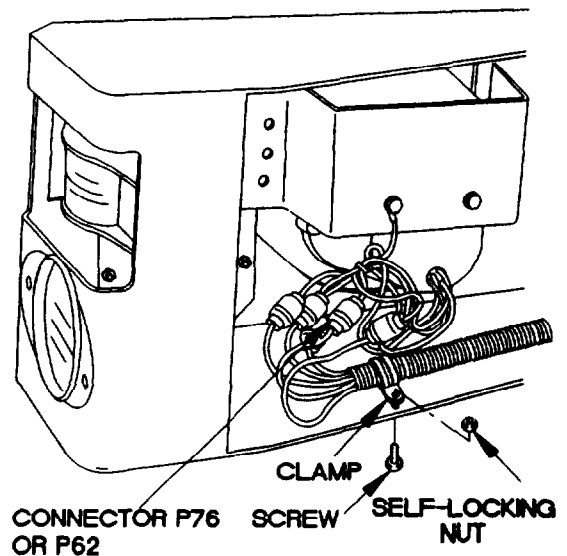


**WARNING**

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.

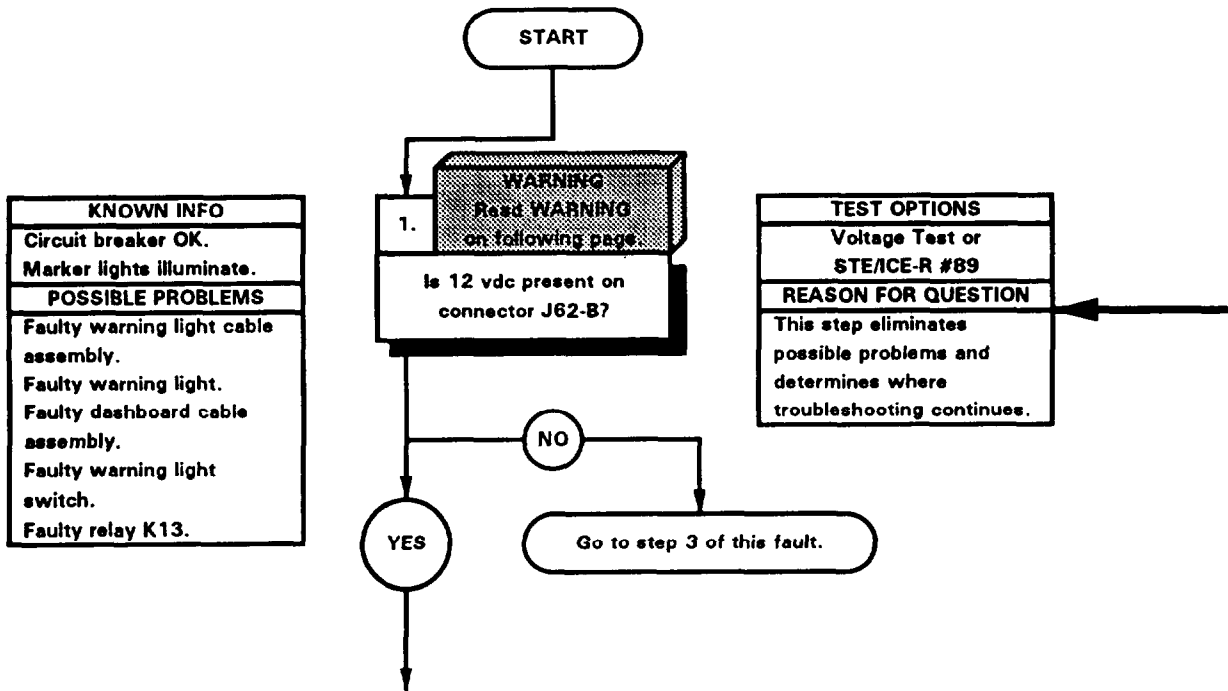
**VOLTAGE TEST**

- (1) Remove self-locking nut, screw, and clamp from vehicle. Discard self-locking nut.
- (2) Disconnect connector P76 (LH composite taillight assembly) or connector P62 (RH composite taillight assembly) from composite taillight assembly.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector P76 (LH composite taillight assembly) or connector P62 (RH composite taillight assembly).
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to BO MARKER (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 24 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (8) Position main light switch to OFF (TM 9-2320-365-10).
- (9) Connect connector P76 (LH composite taillight assembly) or connector P62 (RH composite taillight assembly) to composite taillight assembly.
- (10) Install clamp on vehicle with screw and self-locking nut.



K2C5005-

e52. WARNING LIGHT DOES NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

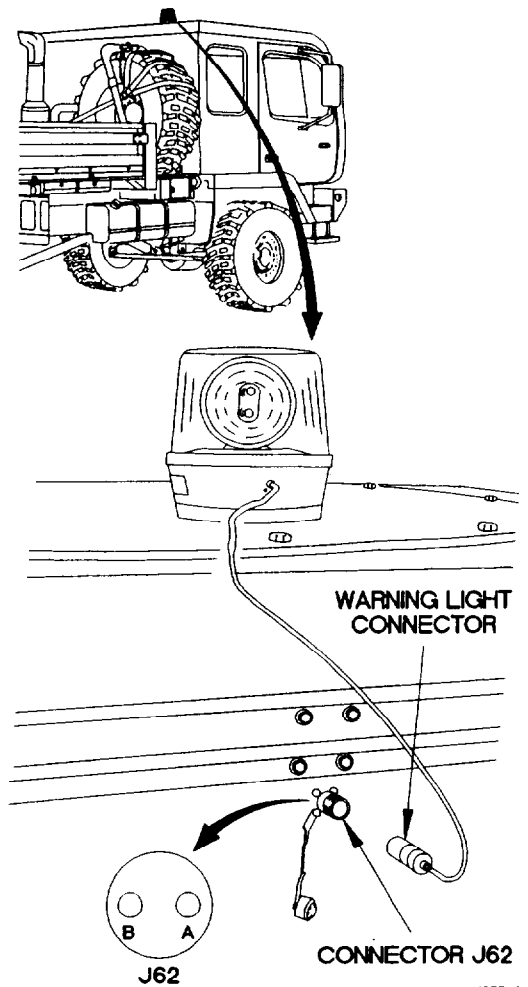


**WARNING**

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 warning light connector from connector J62.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J62-B.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (6) Position warning light switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, go to step 3 of this fault.
- (8) Position warning light switch to off (TM 9-2320-365-10).
- (9) Position main light switch to OFF (TM 9-2320-365-10).



X2E5401A

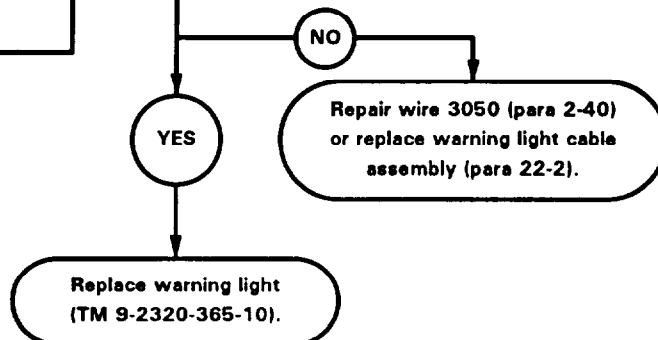


e52. WARNING LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker OK. Marker lights illuminate. Dashboard cable assembly OK. Relay K13 OK.
POSSIBLE PROBLEMS
Faulty warning light cable assembly. Faulty warning light.

2.  
Is continuity present between connector J62-A and a known good ground?

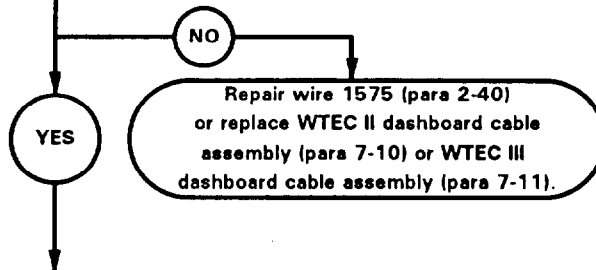
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3050 is faulty. If continuity is present, warning light is faulty.



KNOWN INFO
Circuit breaker OK. Marker lights illuminate. Warning light OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty warning light switch. Faulty relay K13. Faulty warning light cable assembly.

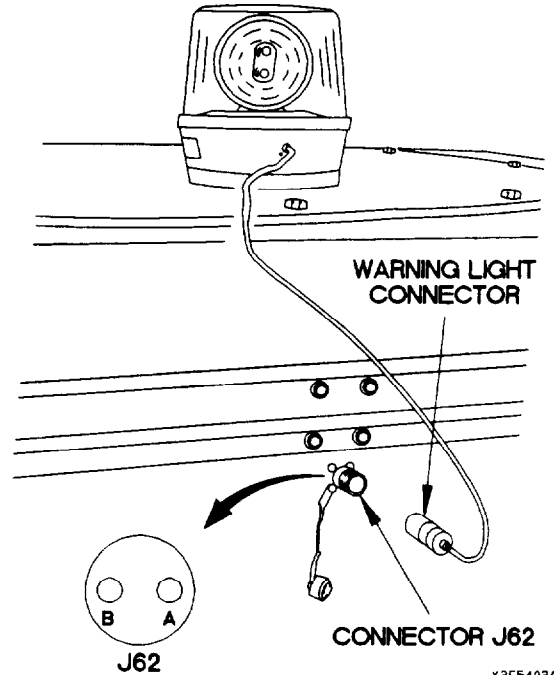
3. **WARNING**  
Read WARNING on following page.  
Is 12 vdc present at connector PX12-57?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 1575 is faulty.



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J62-A.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3050 (para 2-40) or replace warning light cable assembly (para 22-2).
- (5) If continuity is present, replace warning light (TM 9-2320-365-10).



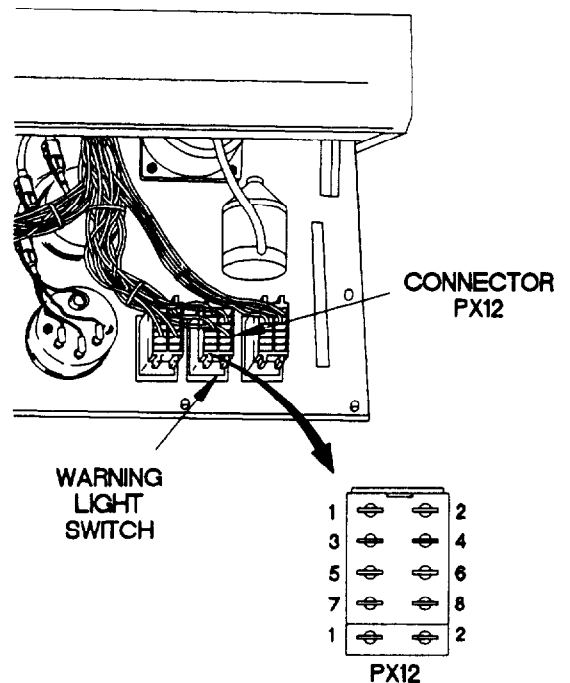
X2E5402A

**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**

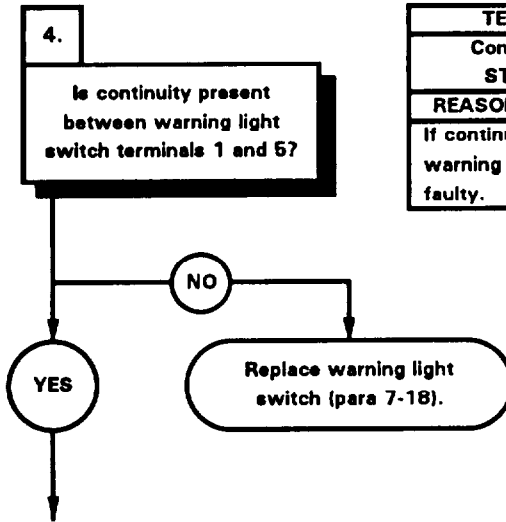
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Set multimeter to volts dc.
- (3) Disconnect connector PX12 from warning light switch.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (5) Connect positive (+) probe of multimeter to connector PX12-5.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) If 12 vdc is not present, repair wire 1575 (para 2-40) 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 9-2320-365-10).



X2E5403A

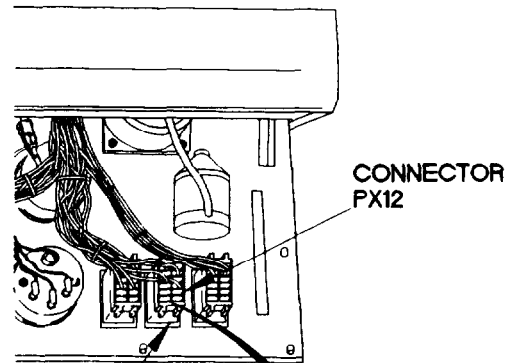
e52. WARNING LIGHT DOES NOT ILLUMINATE (CONT)

<b>KNOWN INFO</b>
Circuit breaker OK. Marker lights illuminate. Warning light OK.
<b>POSSIBLE PROBLEMS</b>
Faulty warning light switch. Faulty dashboard cable assembly. Faulty relay K13. Faulty warning light cable assembly.

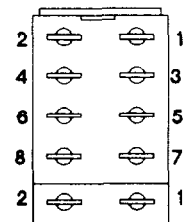


<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, warning light switch is faulty.

- | CONTINUITY TEST |  |
|-----------------|--|
| (1)             | Set multimeter to ohms.  |
| (2)             | Connect positive (+) probe of multimeter to warning light switch terminal 1.           |
| (3)             | Connect negative (-) probe of multimeter to warning light switch terminal 5.           |
| (4)             | Position warning light switch to on (TM 9-2320-365-10) and note reading on multimeter. |
| (5)             | If continuity is not present, replace warning light switch (para 7-18).                |



WARNING LIGHT SWITCH



WARNING LIGHT SWITCH

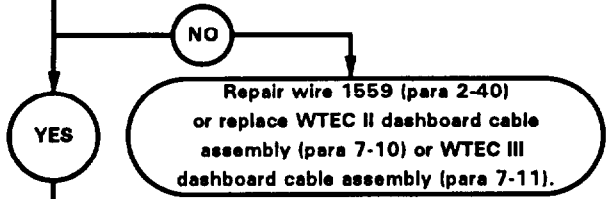
X2E5404A

ø52. WARNING LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker OK. Marker lights illuminate. Warning light switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K13. Faulty warning light cable assembly.

5.  
Is continuity present between connector PX12-1 and relay K13 terminal 86?

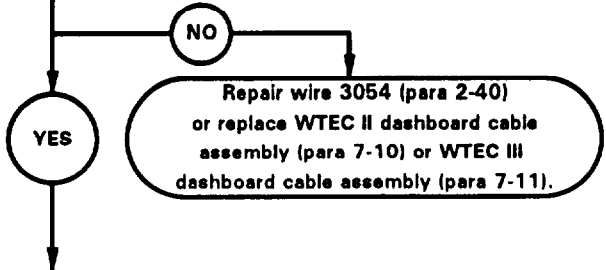
TEST OPTIONS
Continuity Test or STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, wire 1559 is faulty.



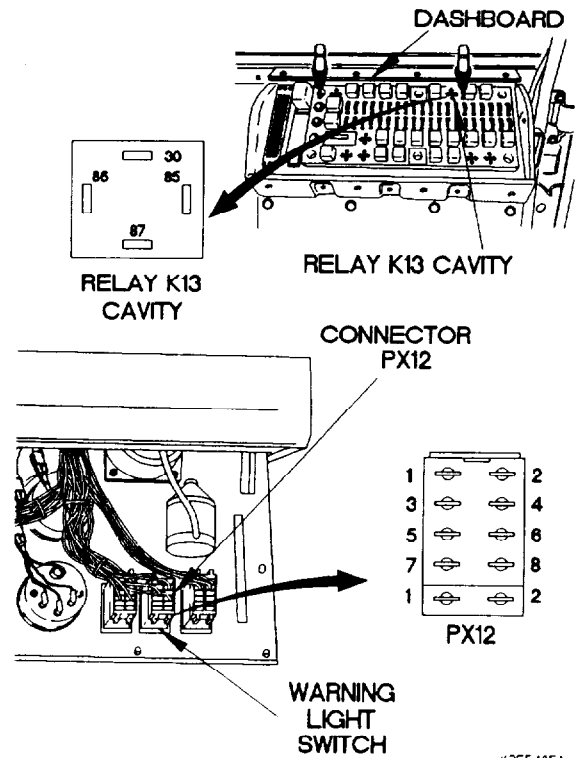
KNOWN INFO
Circuit breaker OK. Marker lights illuminate. Warning light switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K13. Faulty warning light cable assembly.

6.  
Is continuity present between relay K13 terminal 85 and a known good ground?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3054 is faulty.



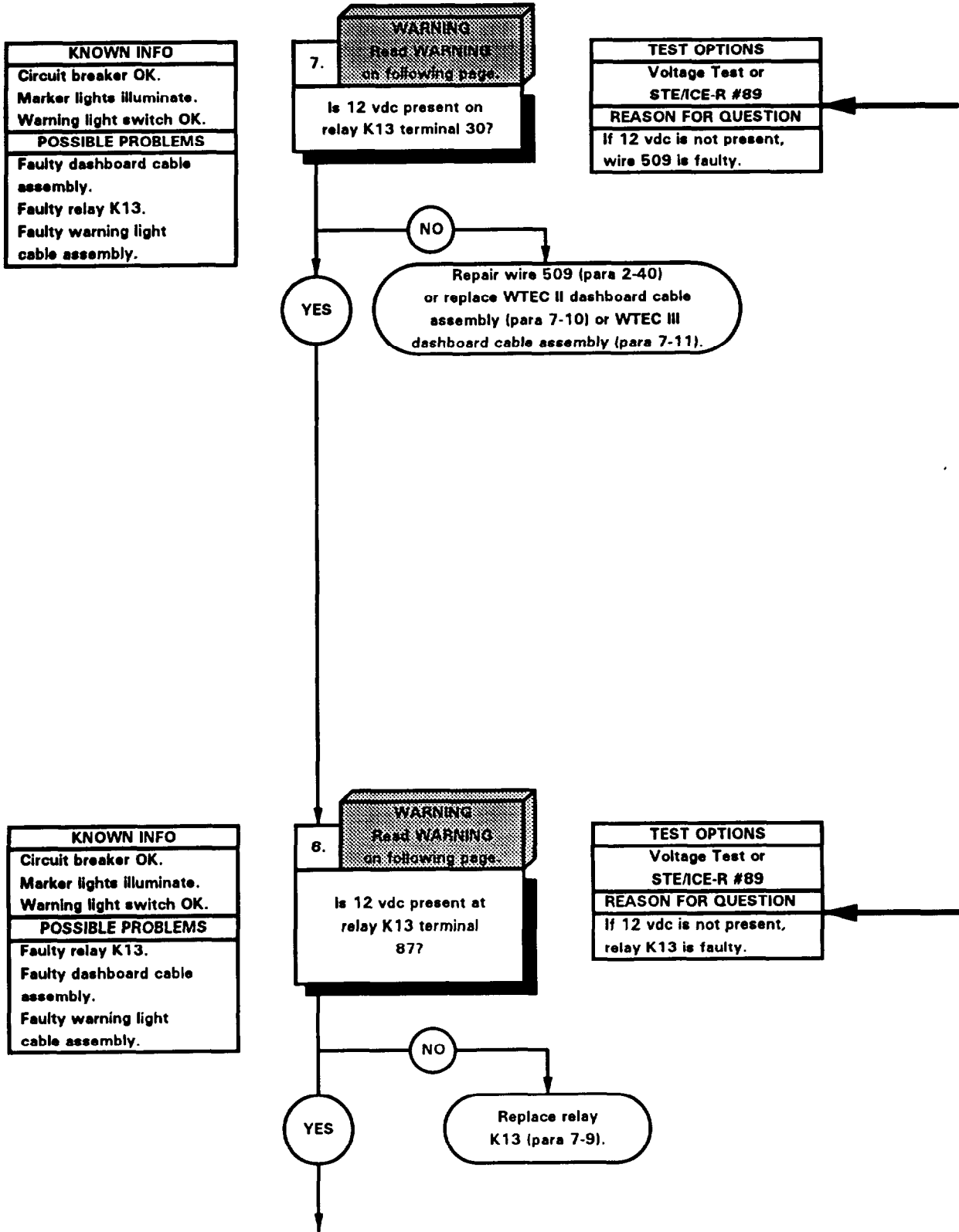
- CONTINUITY TEST**
- (1) Remove PDP cover (para 16-2).
  - (2) Remove relay K13 from PDP.
  - (3) Set multimeter to ohms.
  - (4) Connect positive (+) probe of multimeter to PDP, socket 86, where relay K13 was removed.
  - (5) Connect negative (-) probe of multimeter to connector PX12-1 and note reading on multimeter.
  - (6) If continuity is not present, repair wire 1559 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (7) Connect connector PX12 to warning light switch.
  - (8) Install instrument panel assembly (para 7-15).



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- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to PDP, socket 85, where relay K13 was removed.
  - (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
  - (4) If continuity is not present, repair wire 3054 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

e52. WARNING LIGHT DOES NOT ILLUMINATE (CONT)

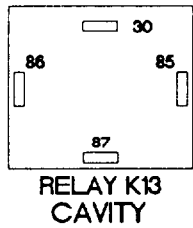
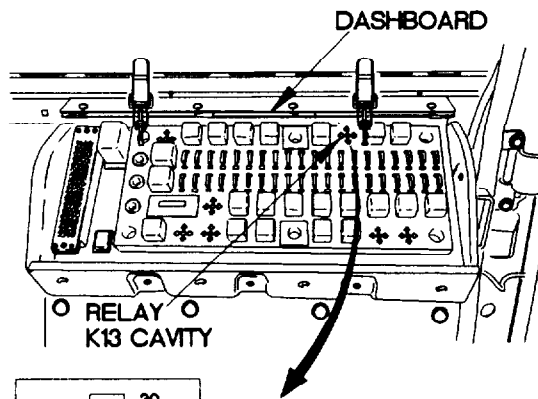


**WARNING**

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

- VOLTAGE TEST**
- (1) Set multimeter to volts dc.
  - (2) Connect positive (+) probe of multimeter to PDP, socket 30, where relay K13 was removed.
  - (3) Connect negative (-) probe of multimeter to ground.
  - (4) Position main light switch to SER DRIVE (TM 9-2320-365-10).
  - (5) Position warning light switch to on (TM 9-2320-365-10).
  - (6) If 12 vdc is not present, repair wire 509 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (7) Position warning light switch to off (TM 9-2320-365-10).
  - (8) Position main light switch to OFF (TM 9-2320-365-10).

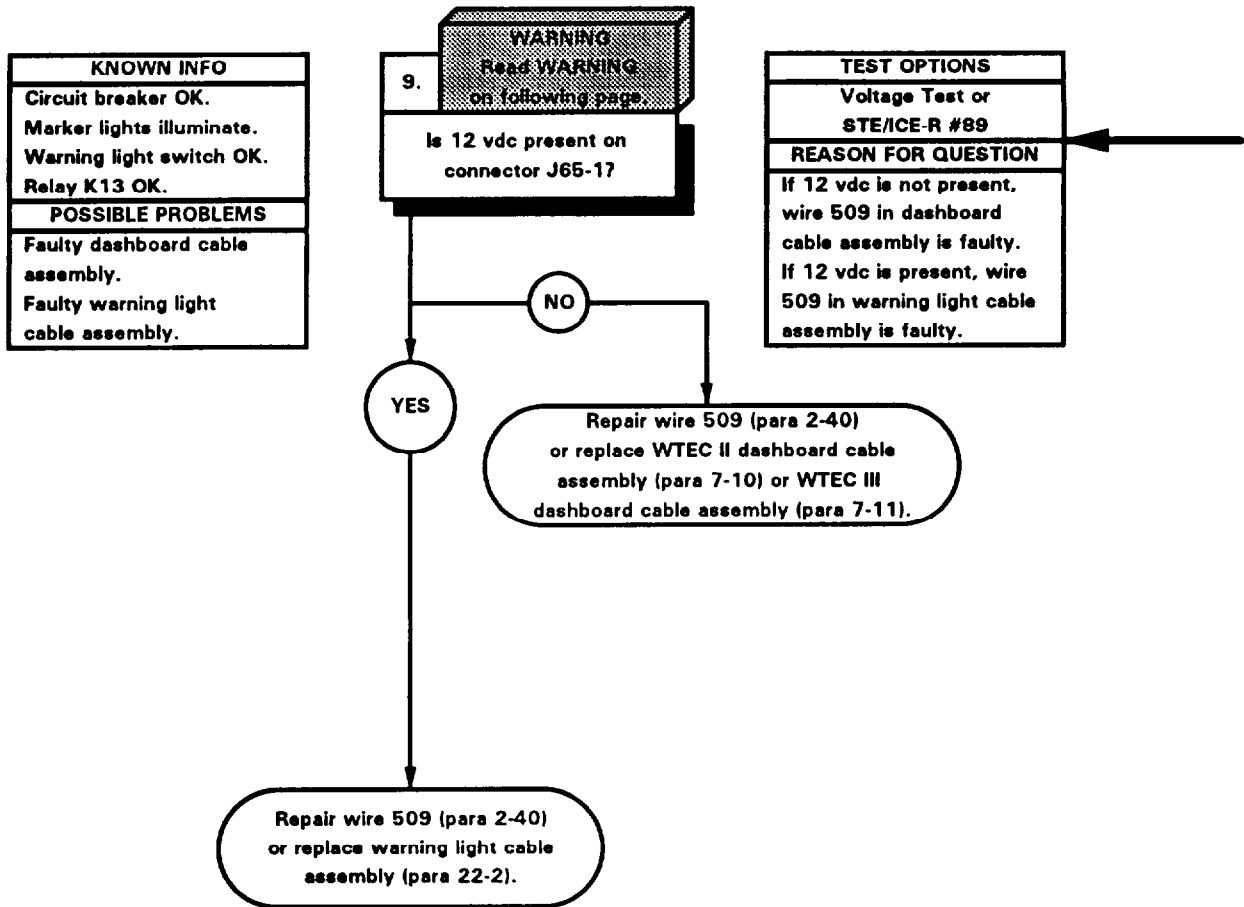
- VOLTAGE TEST**
- (1) Install relay K13 in PDP.
  - (2) Set multimeter to volts dc.
  - (3) Connect positive (+) probe of multimeter to relay K13 terminal 87.
  - (4) Connect negative (-) probe of multimeter to ground.
  - (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
  - (6) Position warning light switch to on (TM 9-2320-365-10) and note reading on multimeter.
  - (7) If 12 vdc is not present, replace relay K13 (para 7-9).
  - (8) Position warning light switch to off (TM 9-2320-365-10).
  - (9) Position main light switch to OFF (TM 9-2320-365-10).



X2E5406A



e52. WARNING LIGHT DOES NOT ILLUMINATE (CONT)

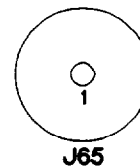
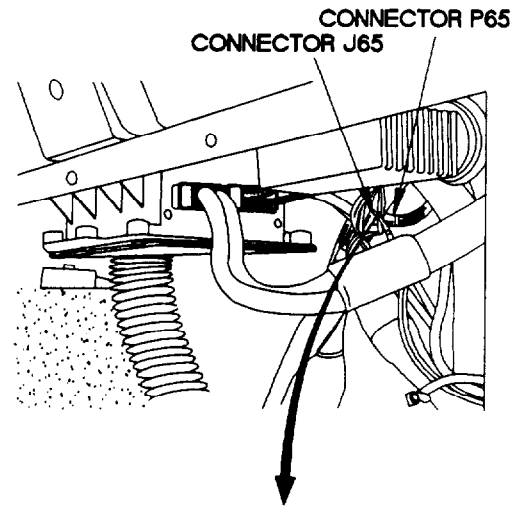
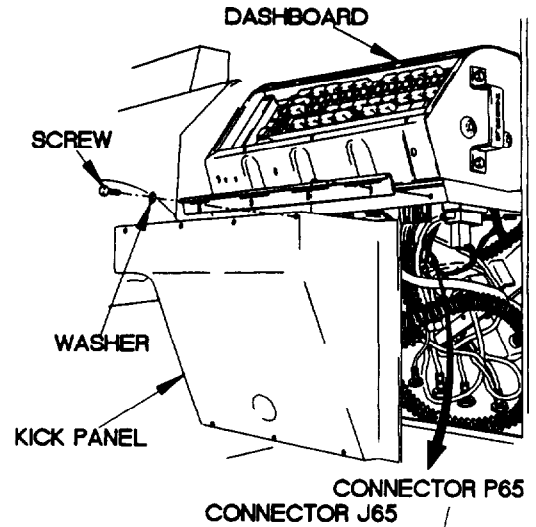


**WARNING**

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

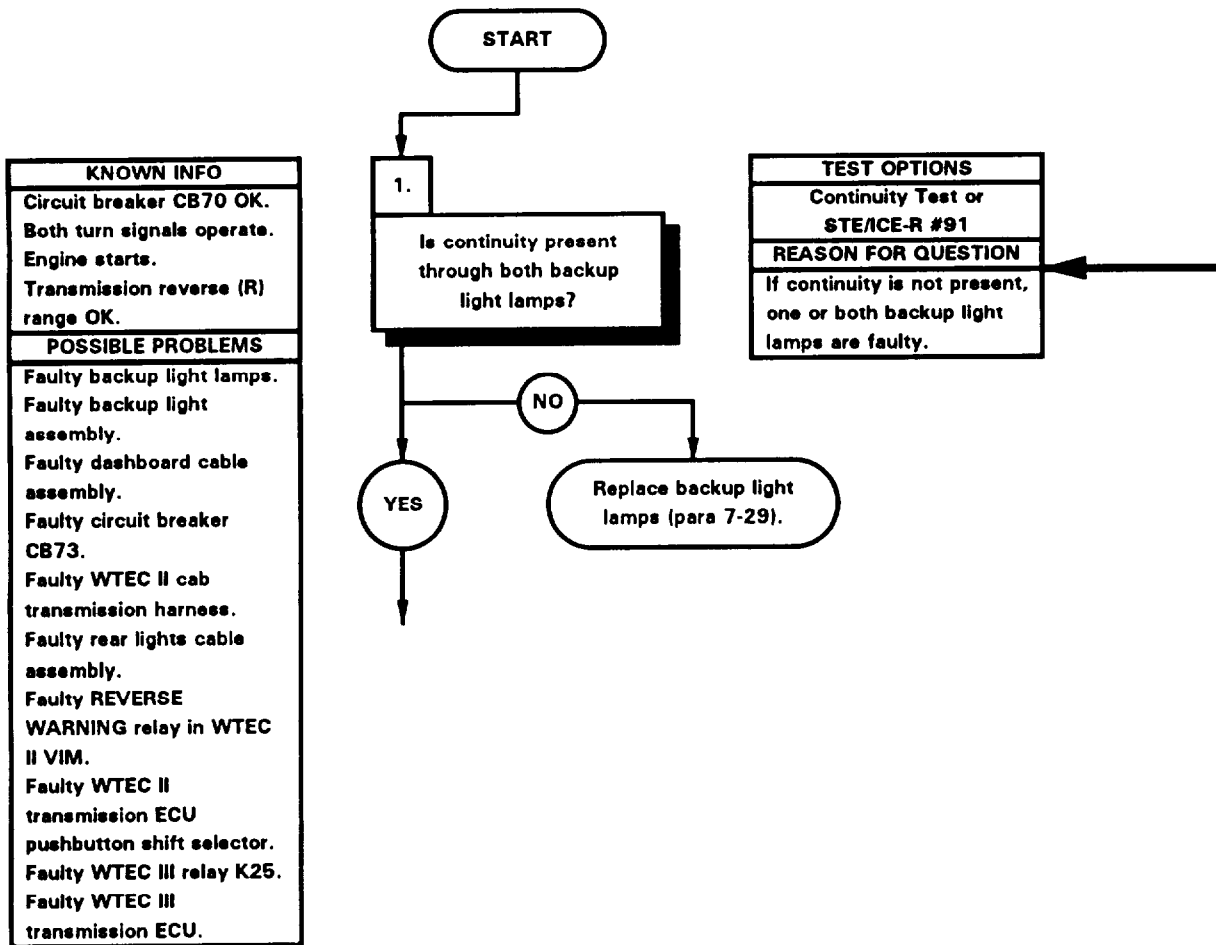
**VOLTAGE TEST**

- (1) Remove seven screws and washers from kick panel.
- (2) Remove kick panel and stiffener from dashboard.
- (3) Disconnect connector P65 from connector J65.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector J65-1.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (8) Position warning light switch to on (TM 9-2320-365-10).
- (9) If 12 vdc is not present, repair wire 509 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) If 12 vdc is present, repair wire 509 (para 2-40) or replace warning light cable assembly (para 22-2).
- (11) Position warning light switch to off (TM 9-2320-365-10).
- (12) Position main light switch to OFF (TM 9-2320-365-10).
- (13) Connect connector P65 to connector J65.
- (14) Install kick panel (para 16-3).



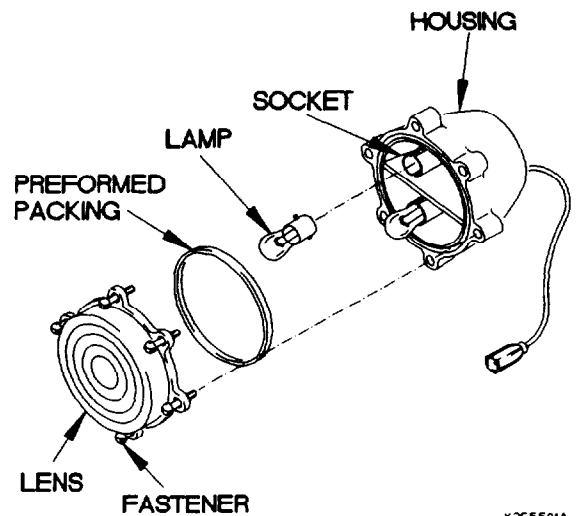
32E5407A

e53. BACKUP LIGHT DOES NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Batteries disconnected (para 7-48).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Packing, Preformed (Item 192, Appendix G) Wire, Electrical, 50 ft (Item 77, Appendix D)	



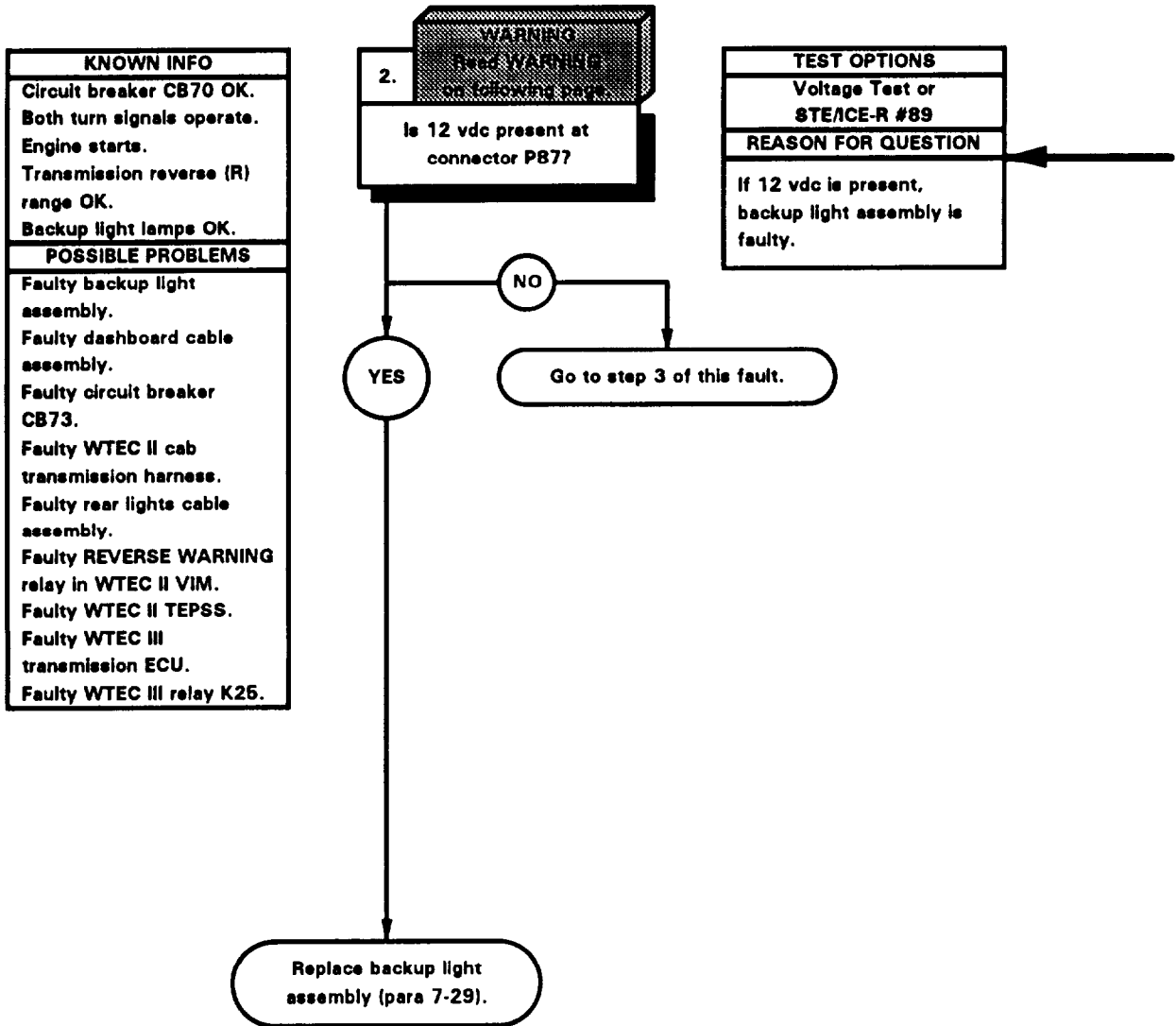
**CONTINUITY TEST**

- (1) Loosen six captive screws on lens.
- (2) Remove lens from housing.
- (3) Remove preformed packing from housing. Discard preformed packing.
- (4) Remove two lamps from sockets.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to center contact of lamp.
- (7) Connect negative (-) probe of multimeter to lamp base and note reading on multimeter.
- (8) If continuity is not present, replace one or both lamps (para 7-29).
- (9) Install two lamps in sockets.
- (10) Install preformed packing and lens on housing with six captive screws.
- (11) Connect batteries (para 7-48).



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e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

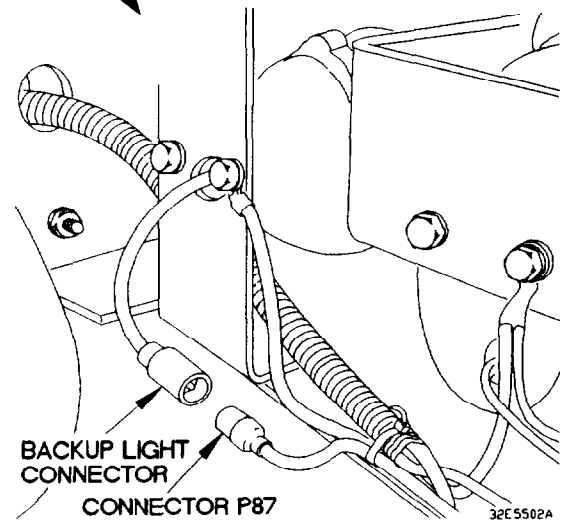
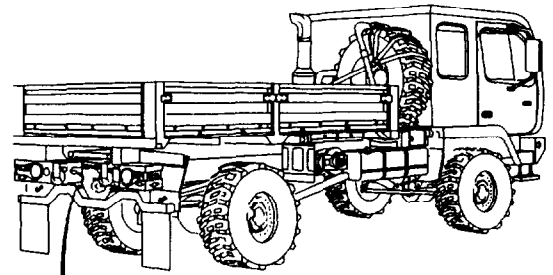


**WARNING**

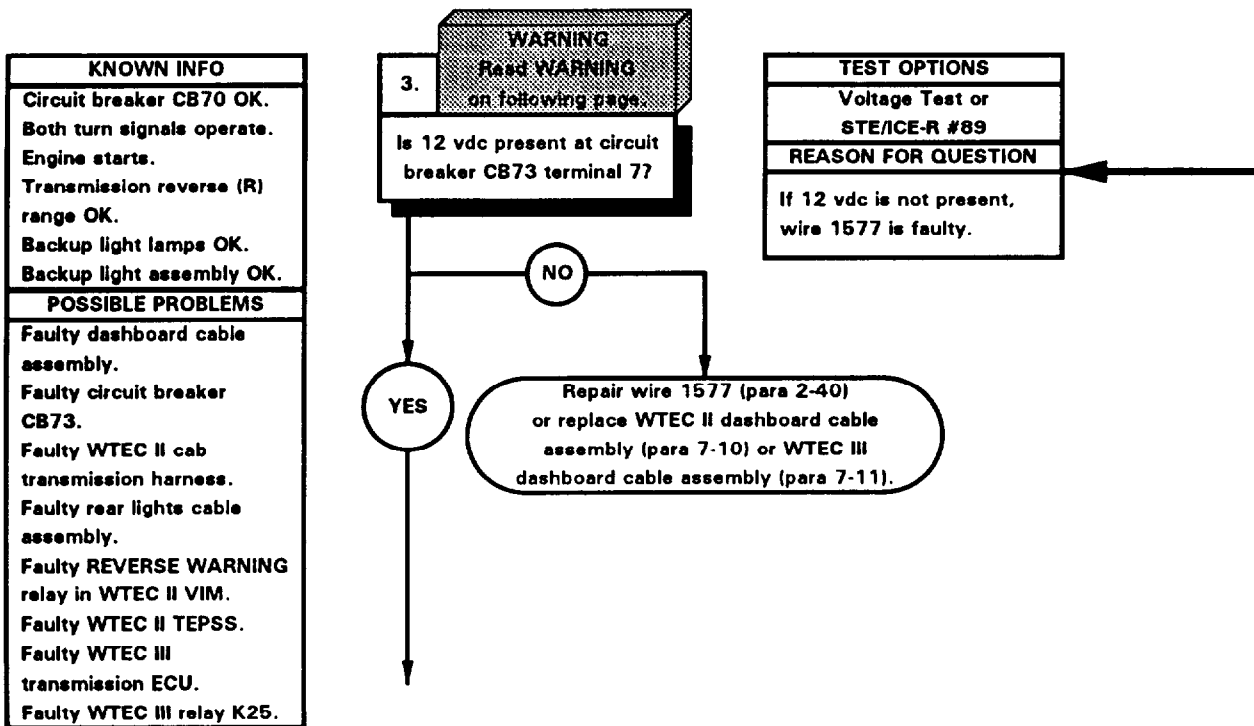
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Disconnect connector P87 from backup light connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P87.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Start engine (TM 9-2320-365-10).
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (7) Select R (reverse) on pushbutton shift selector (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 12 vdc is not present, go to step 3 of this fault. If 12 vdc is present, replace backup light assembly (para 7-29).
- (9) Select N (neutral) on pushbutton shift selector (TM 9-2320-365-10).
- (10) Position main light switch to OFF (TM 9-2320-365-10).
- (11) Shut down engine (TM 9-2320-365-10).
- (12) Connect connector P87 to backup light connector.



e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)



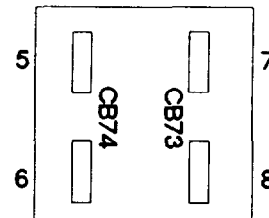
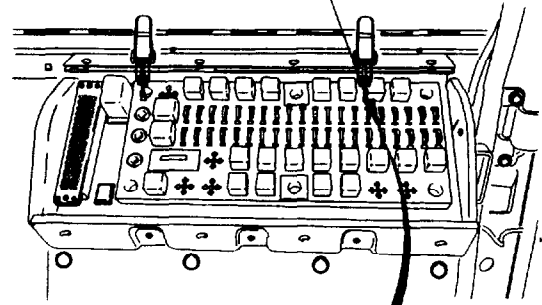
**WARNING**

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

**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove circuit breaker CB73 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 7, where circuit breaker CB73 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1577 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Position main light switch of OFF (TM 9-2320-365-10).

CIRCUIT BREAKER CB73

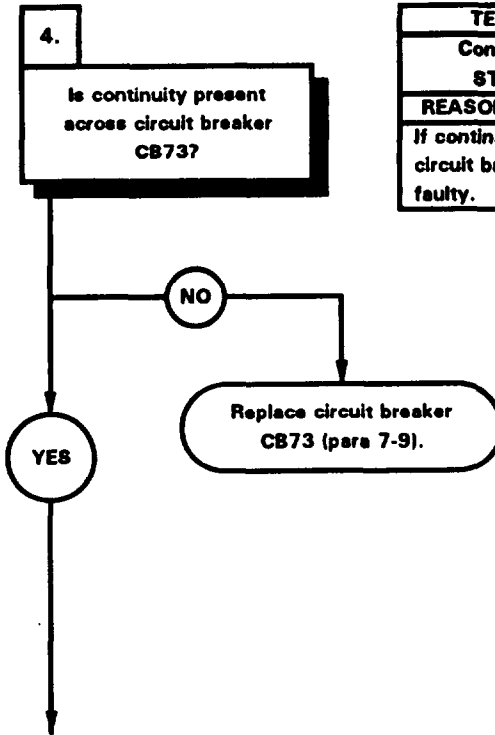


K2E55031



653. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Wire 1577 OK.
POSSIBLE PROBLEMS
Faulty circuit breaker CB73. Faulty dashboard cable assembly. Faulty WTEC II cab transmission harness. Faulty rear lights cable assembly. Faulty REVERSE WARNING relay in WTEC II VIM. Faulty WTEC II TEPSS. Faulty WTEC III transmission ECU. Faulty WTEC III relay K25.

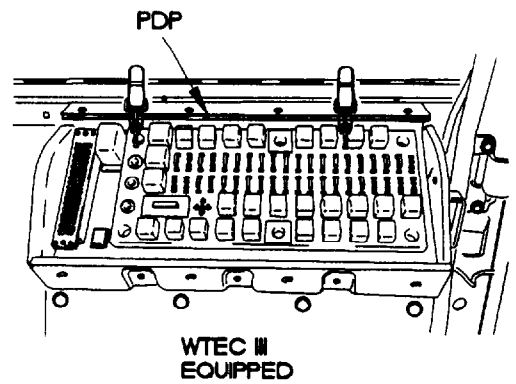
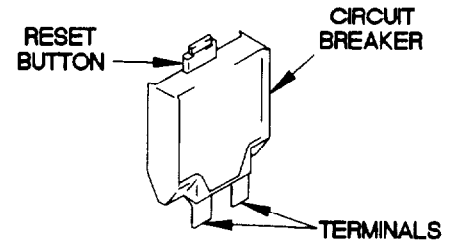
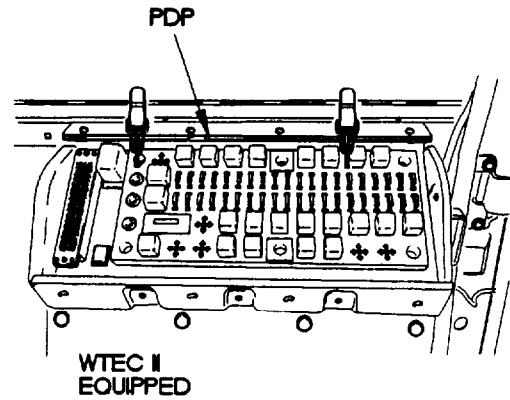


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, circuit breaker CB73 is faulty.



**CONTINUITY TEST**

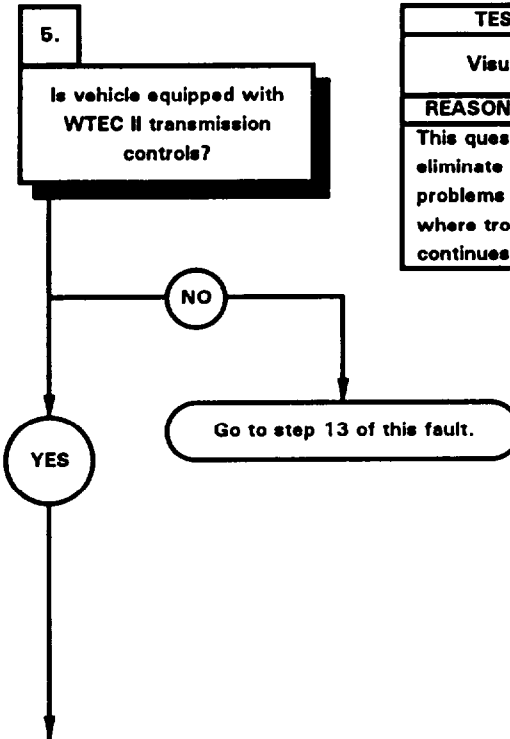
- (1) Reset circuit breaker CB73 (TM 9-2320-365-10).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to one terminal of circuit breaker CB73.
- (4) Connect negative (-) probe of multimeter to other terminal of circuit breaker CB73 and note reading on multimeter.
- (5) If continuity is not present, replace circuit breaker CB73 (para 7-9).
- (6) Install circuit breaker CB73 in PDP.



x2c55041

a53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Wire 1577 OK. Circuit breaker CB73 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty WTEC II cab transmission harness. Faulty rear lights cable assembly. Faulty REVERSE WARNING relay in WTEC II VIM. Faulty WTEC II TEPSS. Faulty WTEC III transmission ECU. Faulty WTEC III relay K25.



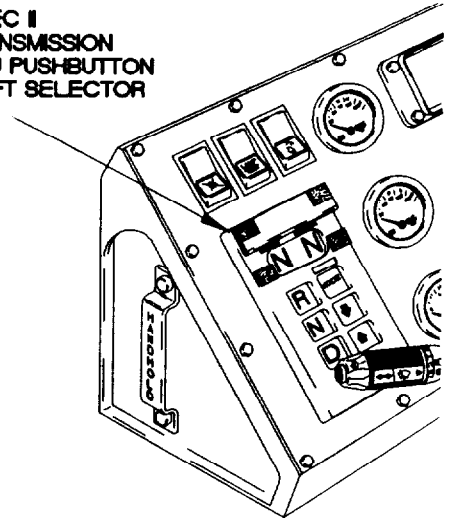
TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
This question helps eliminate possible problems and determines where troubleshooting continues.



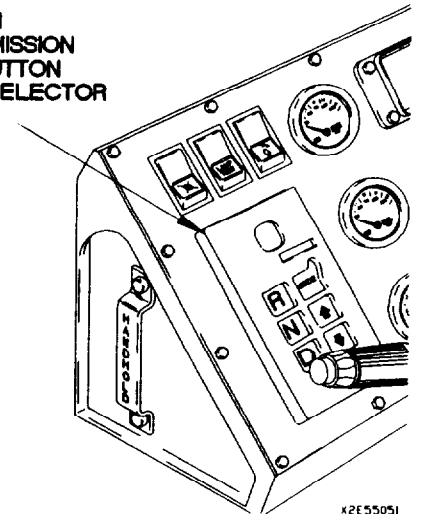


- (1) Check if vehicle is equipped with WTEC II TEPSS.
- (2) If transmission pushbutton shift selector is not mounted with four screws and does not have a filter cover, go to step 13 of this fault.

WTEC II  
TRANSMISSION  
ECU PUSHBUTTON  
SHIFT SELECTOR



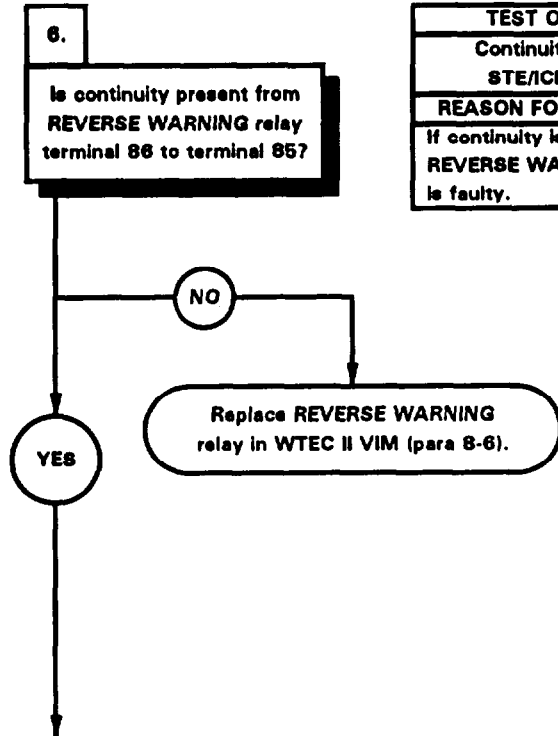
WTEC II  
TRANSMISSION  
PUSHBUTTON  
SHIFT SELECTOR



x2E55051

653. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Wire 1577 OK. Circuit breaker CB73 OK. Vehicle is equipped with WTEC II transmission controls.
POSSIBLE PROBLEMS
Faulty REVERSE WARNING relay in WTEC II VIM. Faulty WTEC II dashboard cable assembly. Faulty WTEC II cab transmission harness. Faulty rear lights cable assembly. Faulty WTEC II TEPSS.

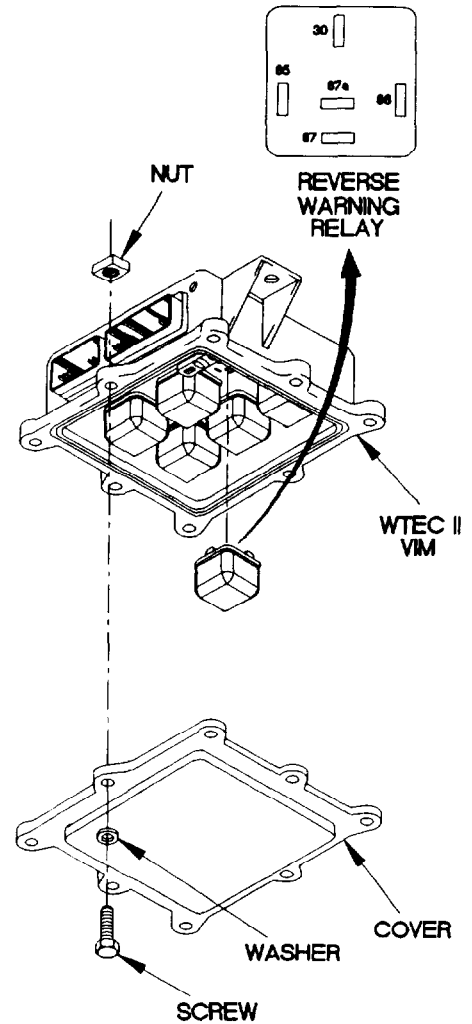


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, REVERSE WARNING relay is faulty.



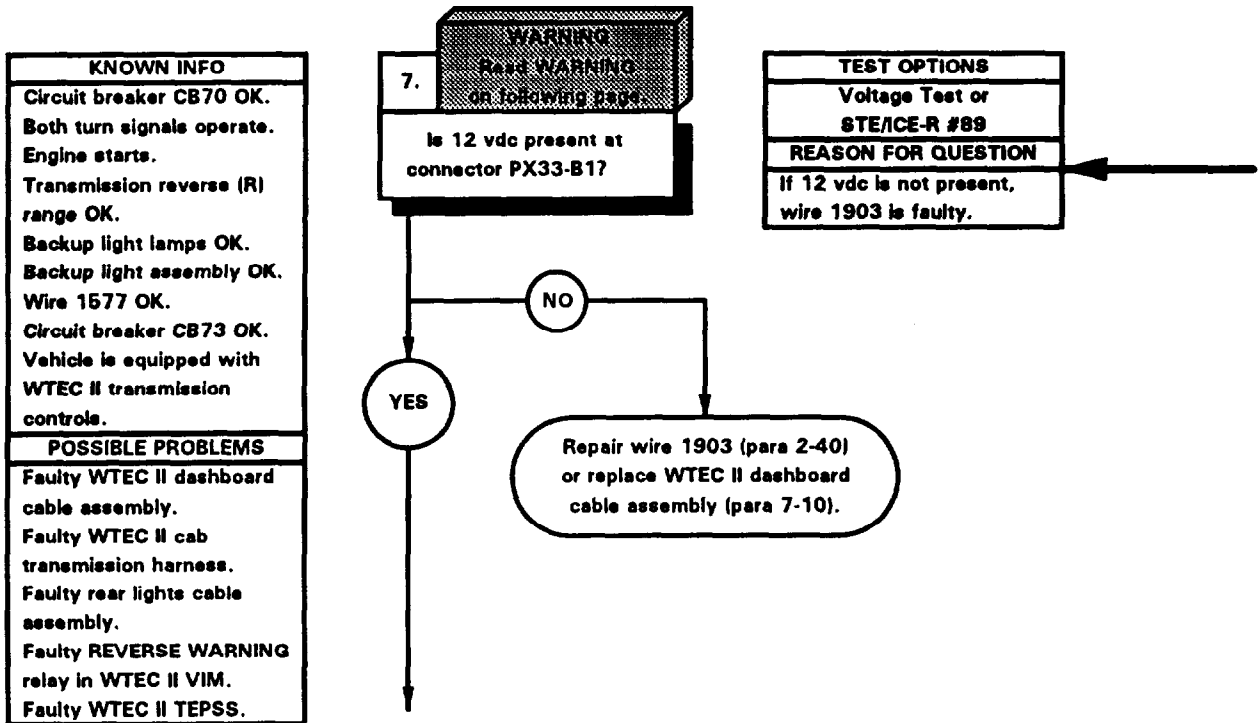
**CONTINUITY TEST**

- (1) Remove kick panel (para 16-3).
- (2) Remove seven screws and washers from cover.
- (3) Remove screw, washer, cover, and nut from WTEC II VIM.
- (4) Remove REVERSE WARNING relay from WTEC II VIM.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to REVERSE WARNING relay terminal 86.
- (7) Connect negative (-) probe of multimeter to REVERSE WARNING relay terminal 85 and note reading on multimeter.
- (8) If continuity is not present, replace REVERSE WARNING relay in WTEC II VIM (para 8-6).
- (9) Install REVERSE WARNING relay in WTEC II VIM.



x2E55061

e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

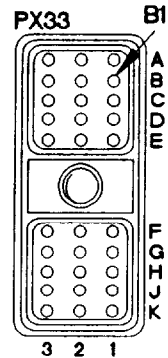
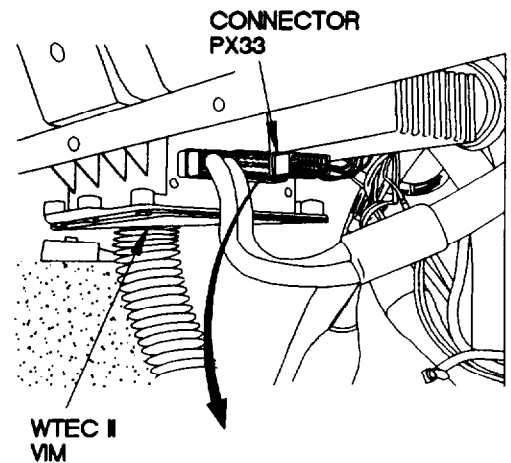


**WARNING**

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

**VOLTAGE TEST**

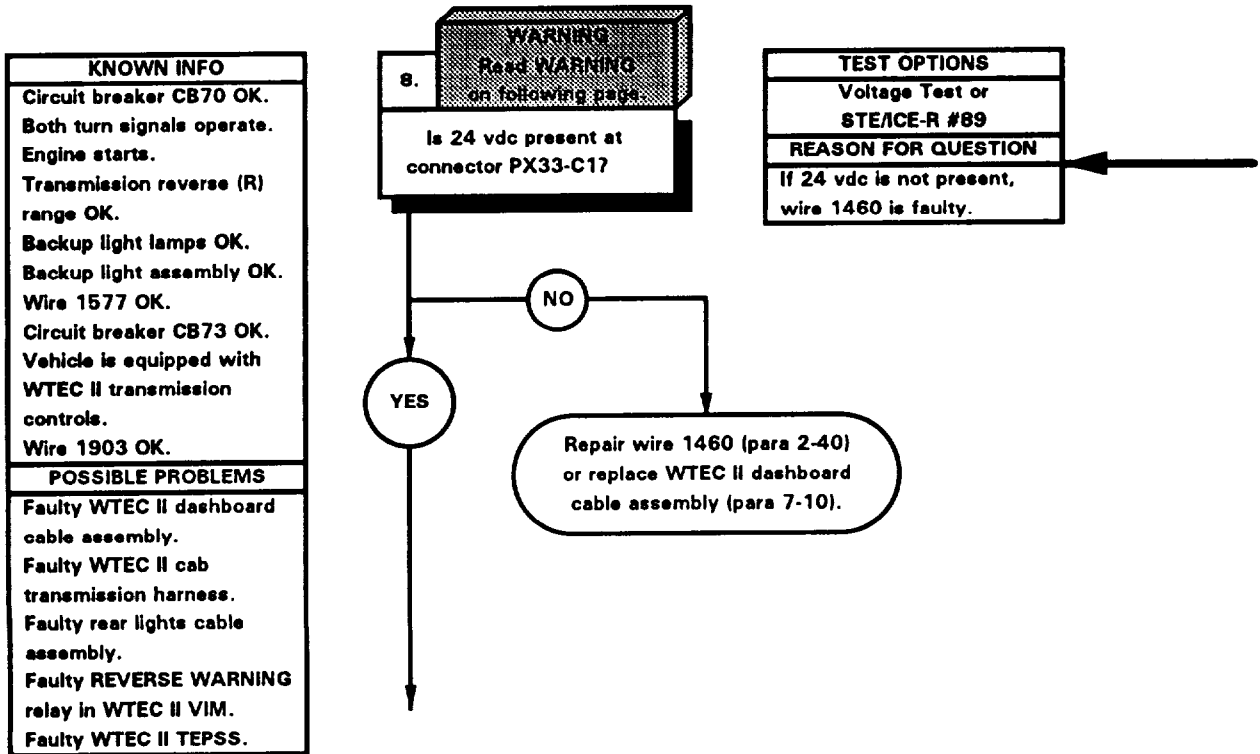
- (1) Loosen screw in connector PX33.
- (2) Disconnect connector PX33 from WTEC II VIM.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector PX33-B1.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1903 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10).
- (8) Position main light switch to OFF (TM 9-2320-365-10).



X2E55071



e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

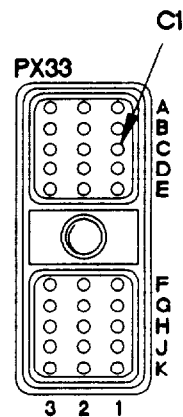


**WARNING**

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

**VOLTAGE TEST**

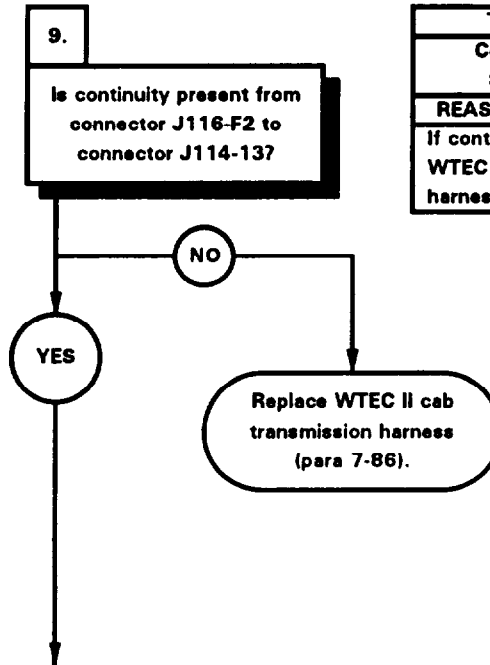
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector PX33-C1.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1460 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10).
- (6) Position main light switch to OFF (TM 9-2320-365-10).



x2E55081

e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Wire 1577 OK. Circuit breaker CB73 OK. Vehicle is equipped with WTEC II transmission controls. Wire 1903 OK. Wire 1460 OK.
POSSIBLE PROBLEMS
Faulty WTEC II cab transmission harness. Faulty WTEC II dashboard cable assembly. Faulty rear lights cable assembly. Faulty REVERSE WARNING relay in WTEC II VIM. Faulty WTEC II TEPSS.

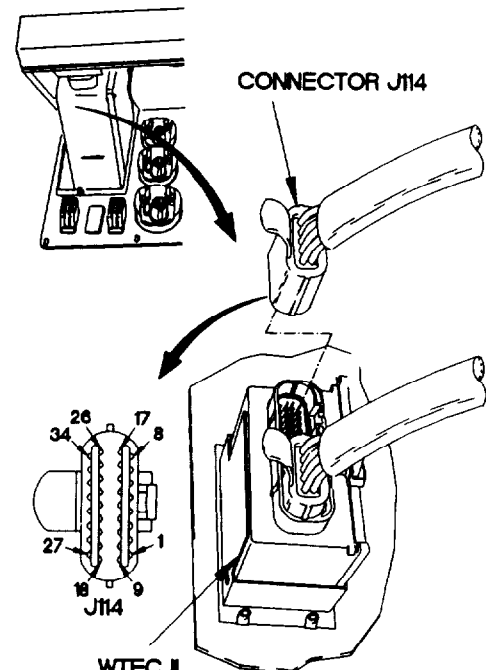


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, WTEC II cab transmission harness is faulty.

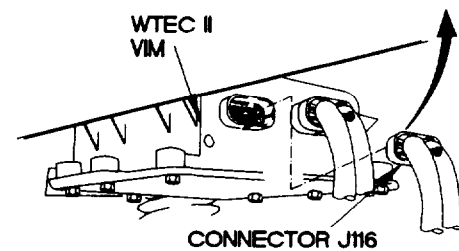
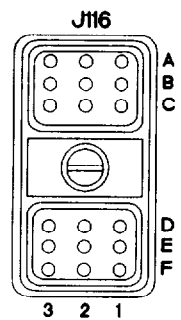


**CONTINUITY TEST**

- (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) Connect positive (+) probe of multimeter to connector J116-F2.
- (6) Connect negative (-) probe of multimeter to connector J114-13 and note reading on multimeter.
- (7) If continuity is not present, replace WTEC II cab transmission harness (para 7-86).
- (8) Connect connector J114 to WTEC II TEPSS.
- (9) Install instrument panel assembly (para 7-15).
- (10) Connect connector J116 to WTEC II VIM.
- (11) Tighten screw in connector J116.



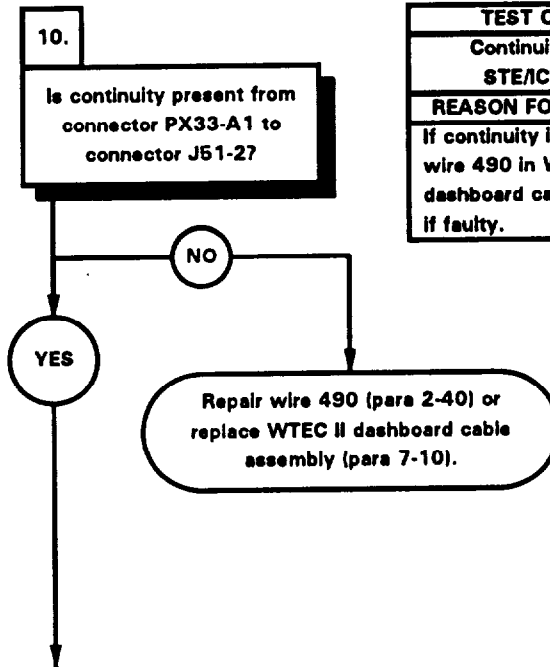
WTEC II  
TRANSMISSION  
ECU PUSHBUTTON  
SHIFT SELECTOR



K2E55091

e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

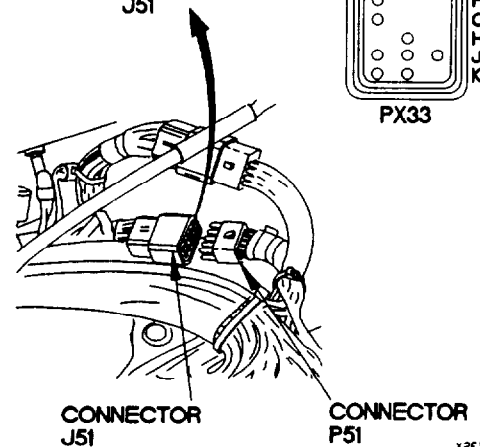
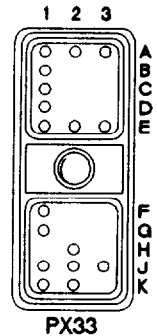
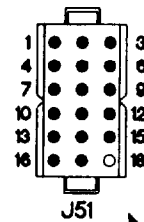
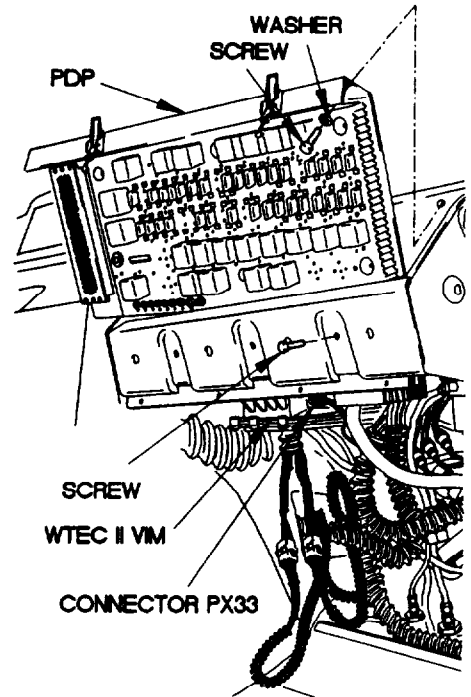
KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Wire 1577 OK. Circuit breaker CB73 OK. Vehicle is equipped with WTEC II transmission controls. Wire 1903 OK. Wire 1460 OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty WTEC II dashboard cable assembly. Faulty rear lights cable assembly. Faulty REVERSE WARNING relay in WTEC II VIM. Faulty WTEC II TEPSS.



TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 490 in WTEC II dashboard cable assembly if faulty.

**CONTINUITY TEST**

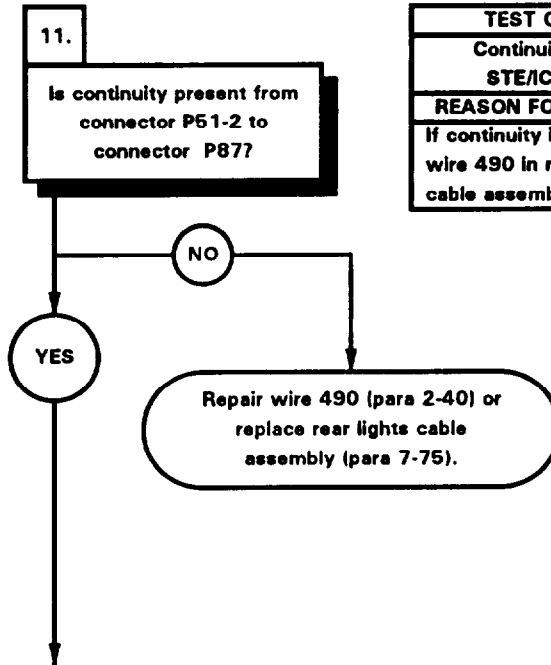
- (1) Remove three screws from PDP.
- (2) Remove three screws and washers from PDP.
- (3) Lift PDP outward to gain access.
- (4) Disconnect connector P51 from connector J51.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector PX33-A1.
- (7) Connect negative (-) probe of multimeter to connector J51-2 and note reading on multimeter.
- (8) If continuity is not present, repair wire 490 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10).
- (9) Connect connector PX33 to WTEC II VIM.
- (10) Tighten screw in connector PX33.



x2E 55101

e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Circuit breaker CB73 OK. Vehicle is equipped with WTEC II transmission controls. WTEC II cab transmission harness OK. WTEC II dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty rear lights cable assembly. Faulty REVERSE WARNING relay in WTEC II VIM. Faulty WTEC II TEPSS.

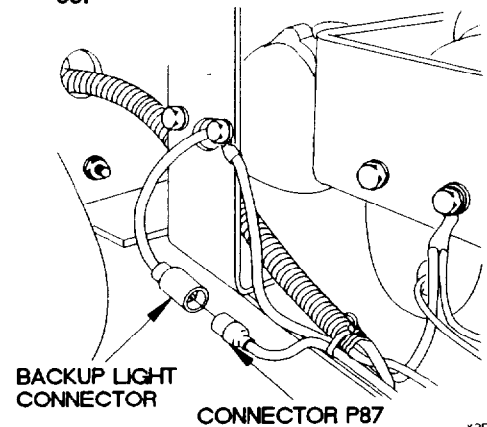
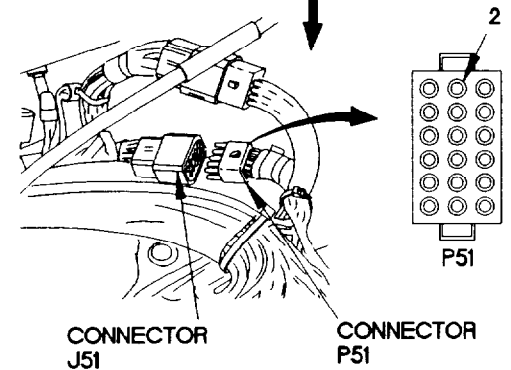
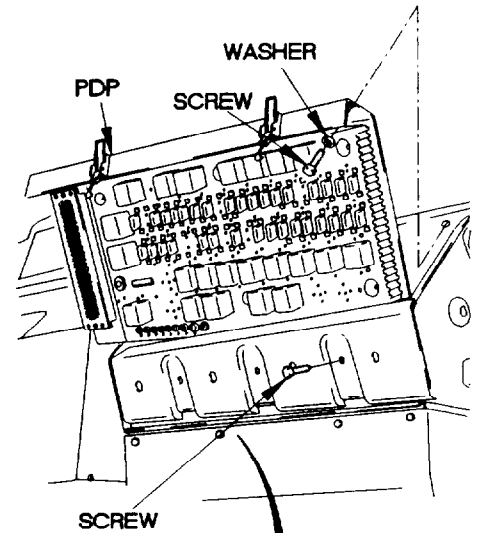


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 490 in rear lights cable assembly is faulty.



**CONTINUITY TEST**

- (1) Disconnect connector P87 from backup light connector.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P51-2.
- (4) Connect negative (-) probe of multimeter to connector P87 and note reading on multimeter.
- (5) If continuity is not present, repair wire 490 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (6) Connect connector P87 to backup light connector.
- (7) Connect connector P51 to connector J51.
- (8) Install PDP on dashboard with three screws.
- (9) Install three washers and screws in PDP.

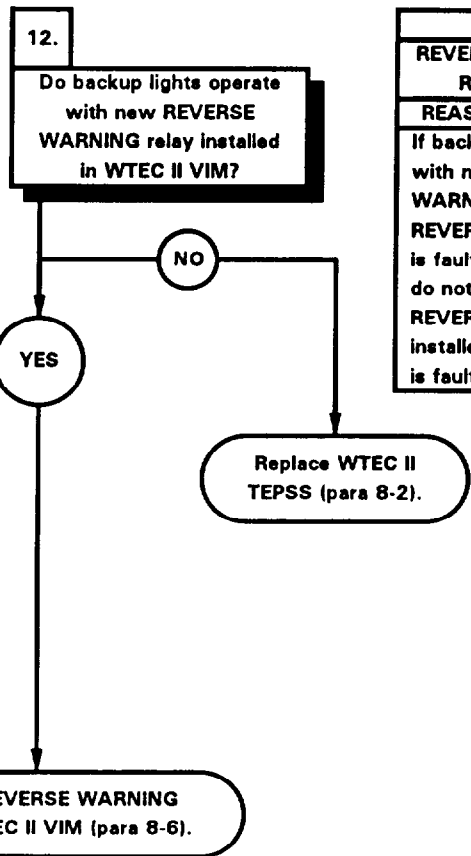


x2E55111



e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

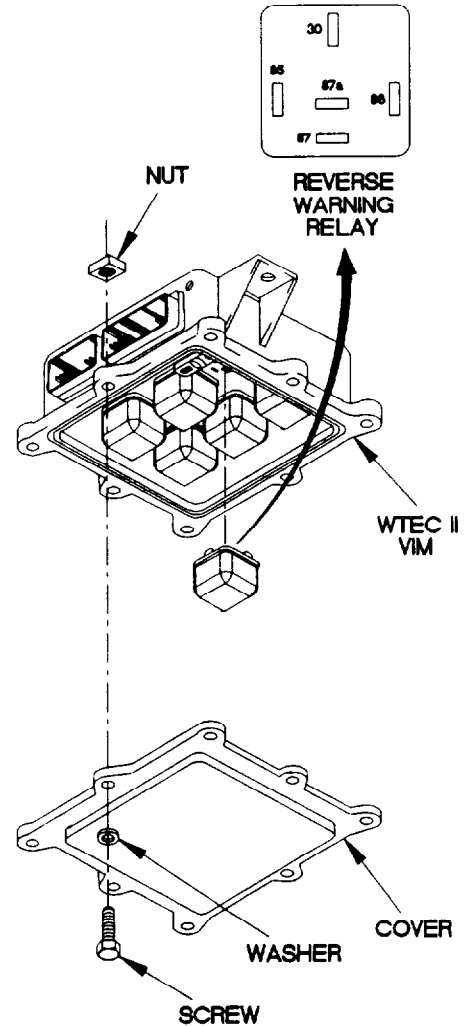
KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Circuit breaker CB73 OK. Vehicle is equipped with WTEC II transmission controls. WTEC II cab transmission harness OK. WTEC II dashboard cable assembly OK. Rear lights cable assembly OK.
POSSIBLE PROBLEMS
Faulty REVERSE WARNING relay in WTEC II VIM. Faulty WTEC II TEPSS.



TEST OPTIONS
REVERSE WARNING Relay Replacement Test
REASON FOR QUESTION
If backup lights operate with new REVERSE WARNING relay installed, REVERSE WARNING relay is faulty. If backup lights do not operate with new REVERSE WARNING relay installed, WTEC II TEPSS is faulty.



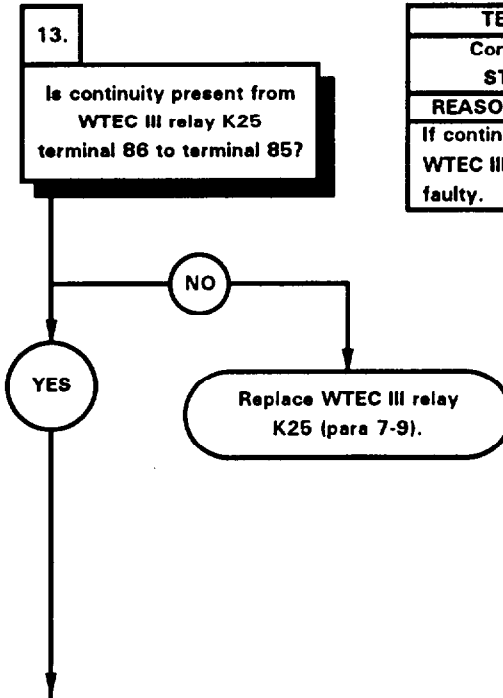
- (1) Remove REVERSE WARNING relay from WTEC II VIM.
- (2) Install new REVERSE WARNING relay in WTEC II VIM.
- (3) Start engine (TM 9-2320-365-10).
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (5) Select R (reverse) on WTEC II TEPSS (TM 9-2320-365-10).
- (6) Check to see if backup lights operate.
- (7) If backup lights operate, replace REVERSE WARNING relay in WTEC II VIM (para 8-6).
- (8) If backup lights do not operate, replace WTEC II TEPSS (para 8-2).
- (9) Select N (neutral) on WTEC II TEPSS (TM 9-2320-365-10).
- (10) Position main light switch to OFF (TM 9-2320-365-10).
- (11) Shut down engine (TM 9-2320-365-10).
- (12) Remove new REVERSE WARNING relay from WTEC II VIM.
- (13) Install old REVERSE WARNING relay in WTEC II VIM.
- (14) Install cover on WTEC II VIM with nut, washer, and screw.
- (15) Install seven washers and screws in cover.
- (16) Install kick panel (para 16-3).



X2C55121

ø53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

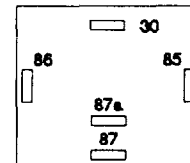
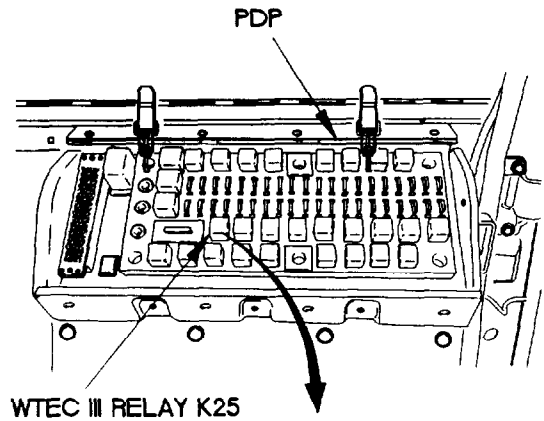
KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Circuit breaker CB73 OK. Vehicle is equipped with WTEC III transmission controls.
POSSIBLE PROBLEMS
Faulty WTEC III relay K25. Faulty WTEC III dashboard cable assembly. Faulty rear lights cable assembly. Faulty WTEC III transmission ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, WTEC III relay K25 is faulty.

**CONTINUITY TEST**

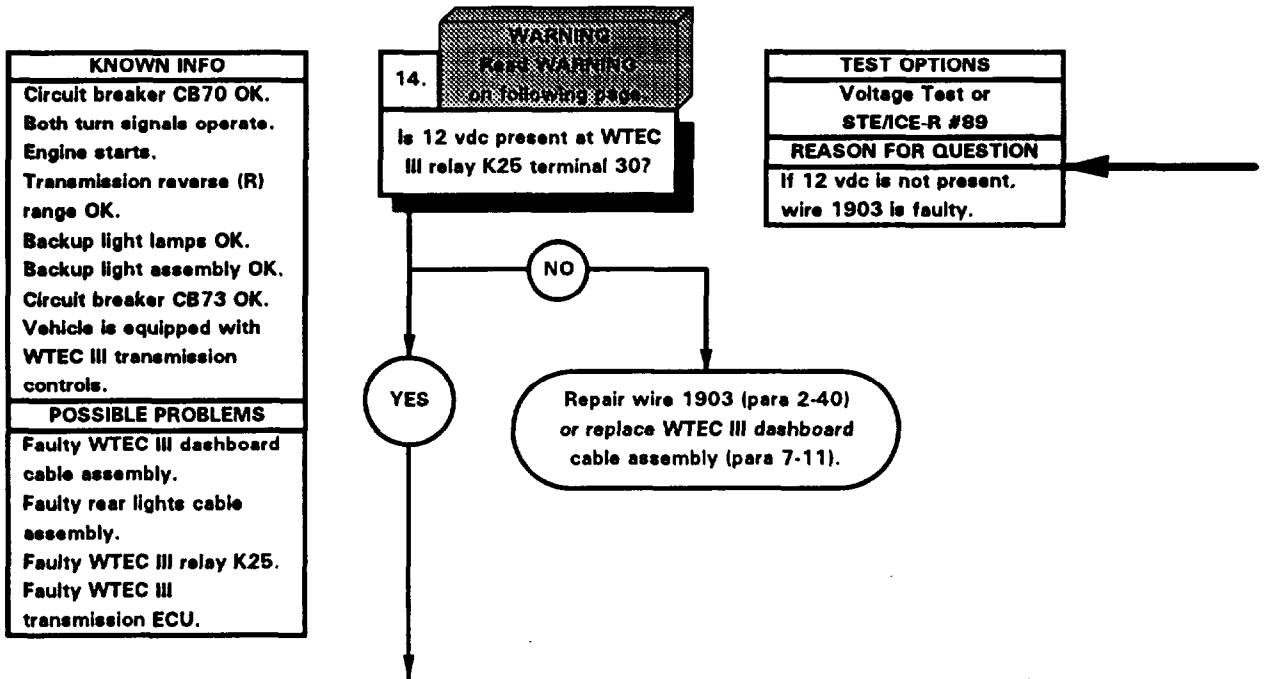
- (1) Remove WTEC III relay K25 from PDP.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to WTEC III relay K25 terminal 86.
- (4) Connect negative (-) probe of multimeter to WTEC III relay K25 terminal 85 and note reading on multimeter.
- (5) If continuity is not present, replace WTEC III relay K25 (para 7-9).



WTEC III RELAY K25

x2E55131

ø53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

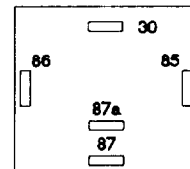
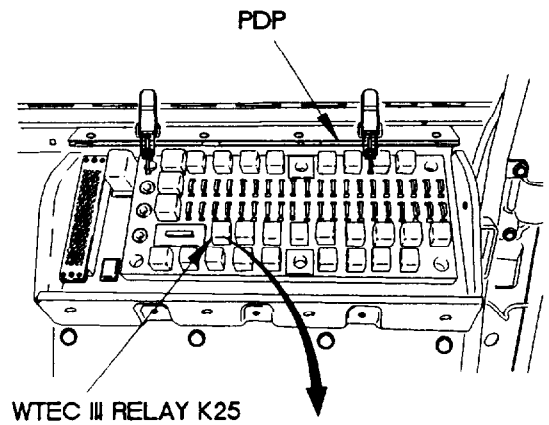


**WARNING**

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical 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 K25 terminal 30 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1903 (para 2-40) or replace WTEC III dashboard cable assembly (para 7-11).
- (6) Position main light switch to OFF (TM 9-2320-365-10).

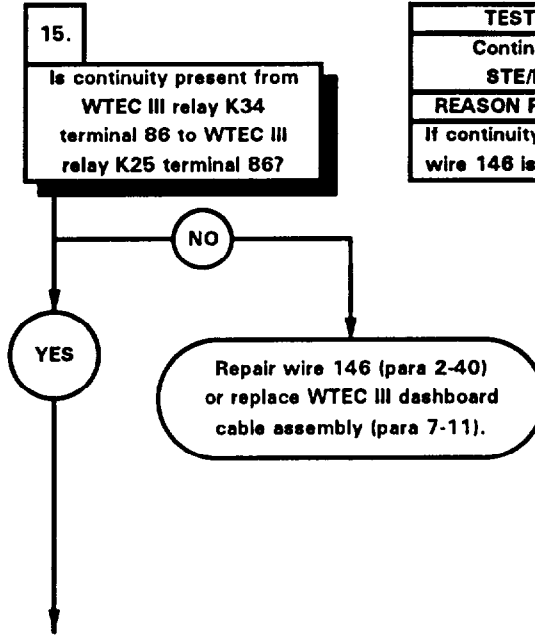


WTEC III RELAY K25

X2E55141

e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

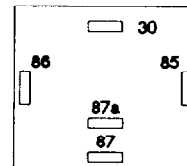
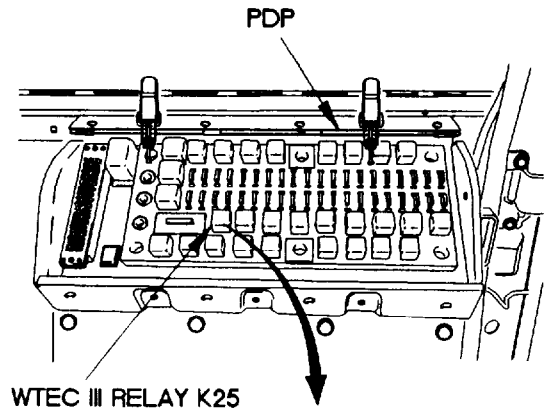
KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Circuit breaker CB73 OK. Vehicle is equipped with WTEC III transmission controls. Wire 1903 OK.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly. Faulty rear lights cable assembly. Faulty WTEC III relay K25. Faulty WTEC III transmission ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 146 is faulty.

**CONTINUITY TEST**

- (1) Remove WTEC III relay K34 from PDP.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to PDP, where WTEC III relay K34 terminal 86 was removed.
- (4) Connect negative (-) probe of multimeter to PDP, where WTEC III relay K25 terminal 86 was removed, and note reading on multimeter.
- (5) If continuity is not present, repair wire 146 (para 2-40) or replace WTEC III dashboard cable assembly (para 7-11).
- (6) Install WTEC III relay K34 on PDP.



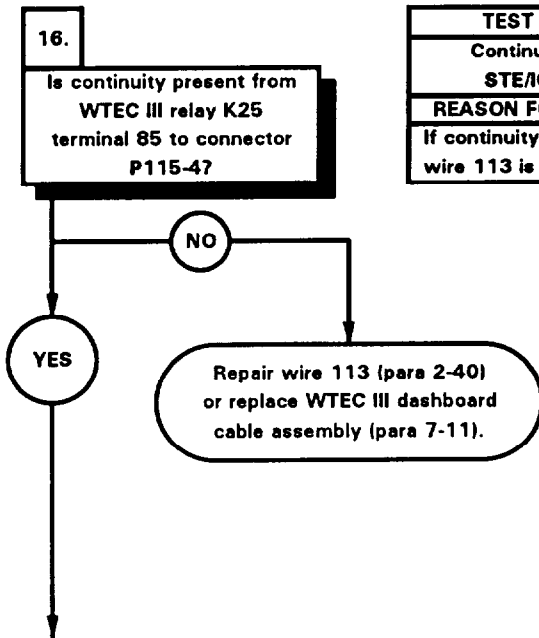
**WTEC III RELAY K25**

x2E55151



e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Circuit breaker CB73 OK. Vehicle is equipped with WTEC III transmission controls. Wire 1903 OK. Wire 146 OK.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly. Faulty rear lights cable assembly. Faulty WTEC III relay K25. Faulty WTEC III transmission ECU.

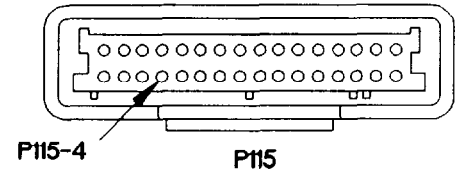
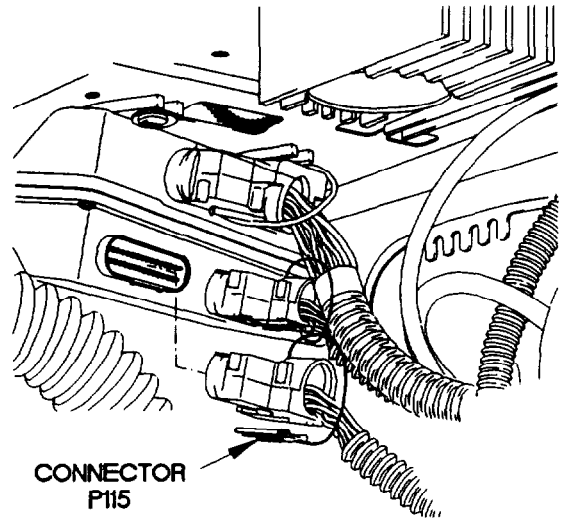


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 113 is faulty.



**CONTINUITY TEST**

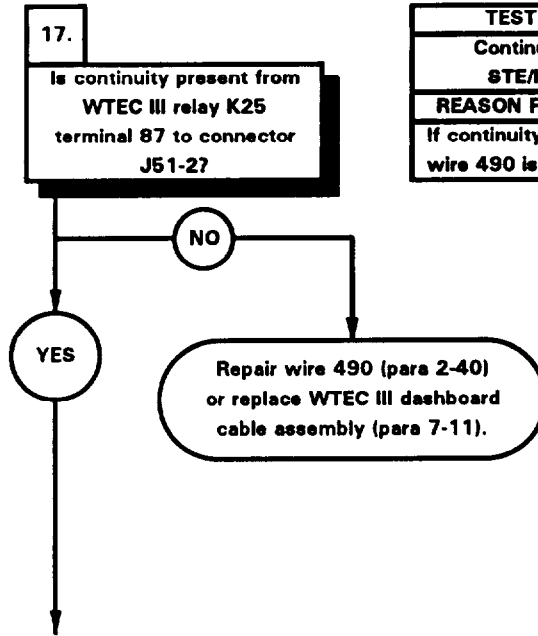
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector clamp from connector P115.
- (3) Disconnect connector P115 from WTEC III transmission ECU.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to PDP, where WTEC III relay K25 terminal 85 was removed.
- (6) Connect negative (-) probe of multimeter to connector P115-4 and note reading on multimeter.
- (7) If continuity is not present, repair wire 113 (para 2-40) or replace WTEC III dashboard cable assembly (para 7-11).
- (8) Connect connector P115 to WTEC III transmission ECU.
- (9) Connect connector clamp to connector P115.



x2E55161

e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Circuit breaker CB73 OK. Vehicle is equipped with WTEC III transmission controls. Wire 1903 OK. Wire 146 OK. Wire 113 OK.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly. Faulty rear lights cable assembly. Faulty WTEC III relay K25. Faulty WTEC III transmission ECU.

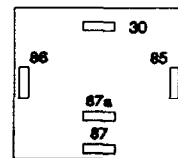
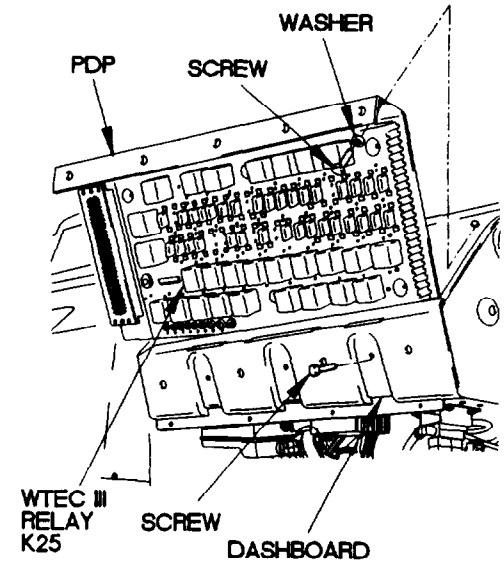


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 490 is faulty.

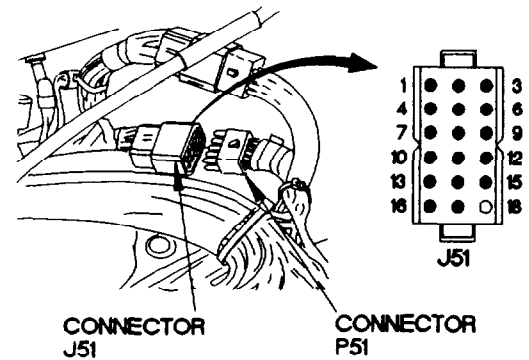


**CONTINUITY TEST**

- (1) Remove three screws from PDP.
- (2) Remove three screws and washers from PDP.
- (3) Lift PDP outward to gain access.
- (4) Disconnect connector P51 from connector J51.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to PDP, where WTEC III relay K25 terminal 87 was removed.
- (7) Connect negative (-) probe of multimeter to connector J51-2 and note reading on multimeter.
- (8) If continuity is not present, repair wire 490 (para 2-40) or replace WTEC III dashboard cable assembly (para 7-11).



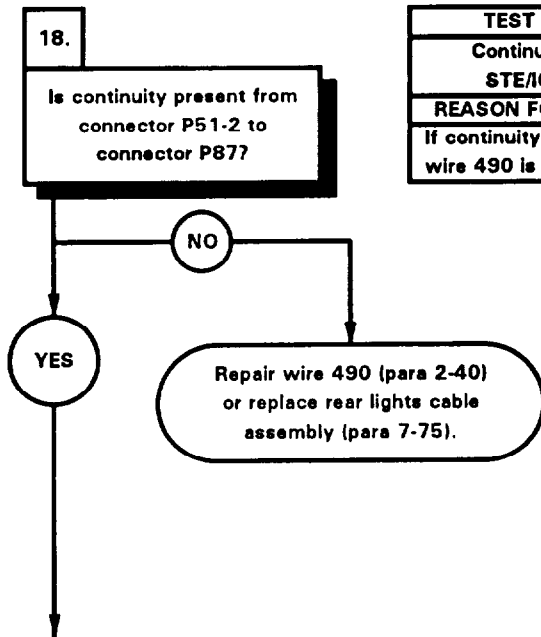
**WTEC III  
RELAY  
K25**



x2c55171

e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker CB70 OK. Both turn signals operate. Engine starts. Transmission reverse (R) range OK. Backup light lamps OK. Backup light assembly OK. Circuit breaker CB73 OK. Vehicle is equipped with WTEC III transmission controls. WTEC III dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty rear lights cable assembly. Faulty WTEC III relay K25. Faulty WTEC III transmission ECU.

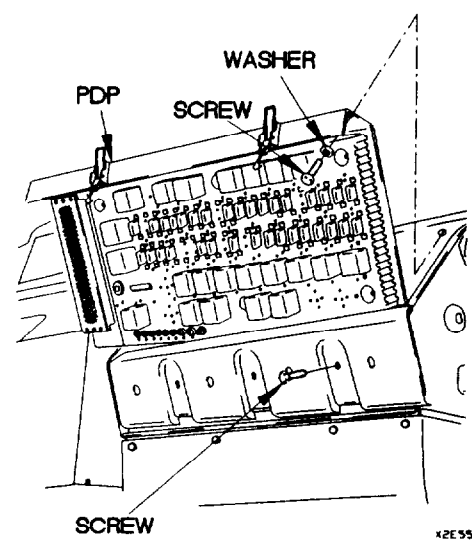
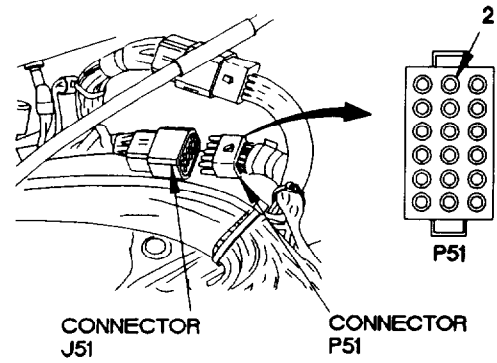
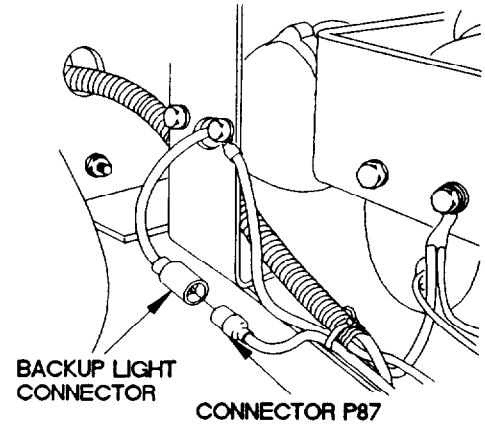


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 490 is faulty.



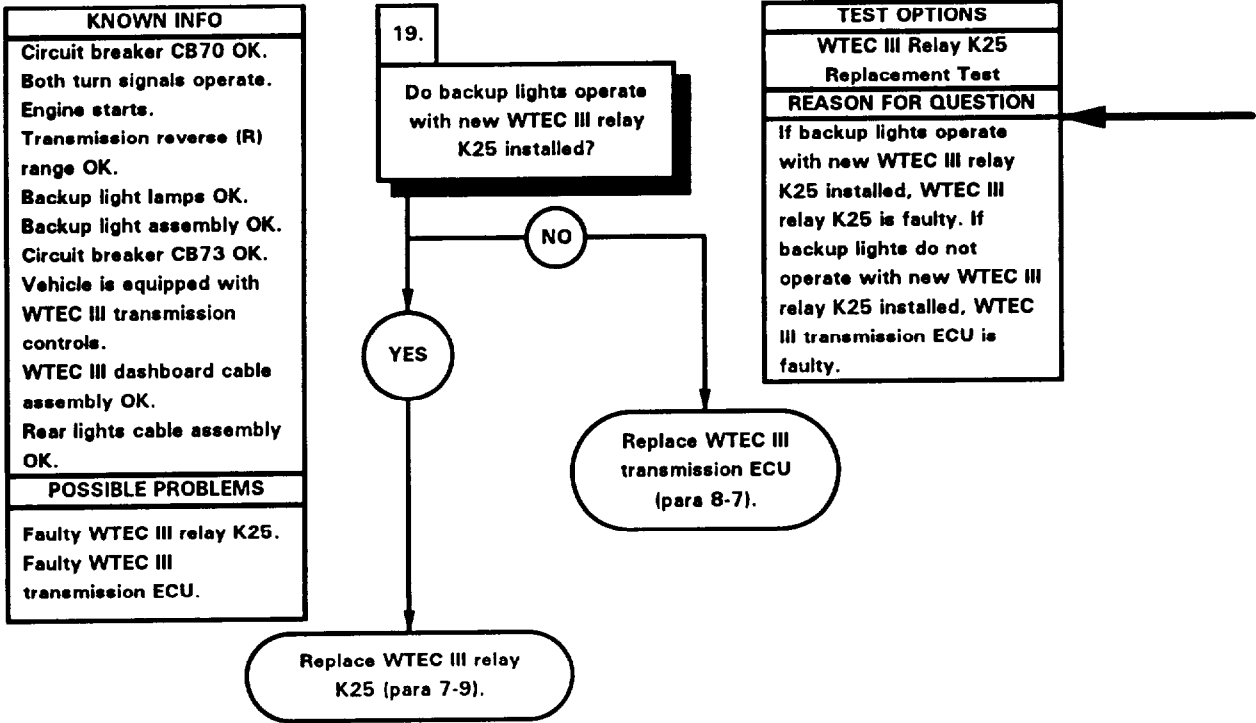
**CONTINUITY TEST**

- (1) Disconnect connector P87 from backup light connector.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P51-2.
- (4) Connect negative (-) probe of multimeter to connector P87 and note reading on multimeter.
- (5) If continuity is not present, repair wire 490 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (6) Connect connector P87 to backup light connector.
- (7) Connect connector P51 to connector J51.
- (8) Install PDP on dashboard with three screws.
- (9) Install three washers and screws in PDP.

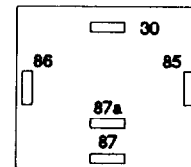
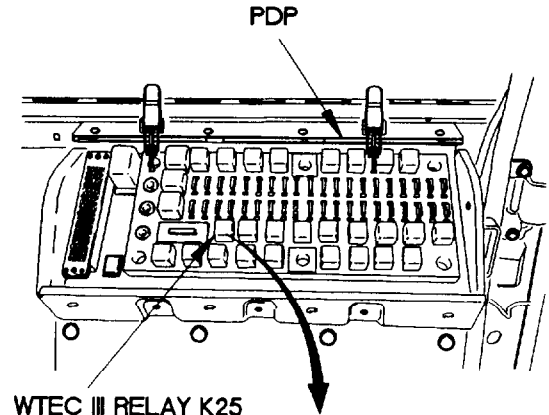


\*2E 55181

e53. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)



- (1) Install new WTEC III relay K25 on PDP.
- (2) Start engine (TM 9-2320-365-10).
- (3) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (4) Select R (reverse) on WTEC III TPSS (TM 9-2320-365-10).
- (5) Check to see if backup lights operate.
- (6) If backup lights operate, replace WTEC III relay K25 (para 7-9).
- (7) If backup lights do not operate, replace WTEC III transmission ECU (para 8-7).
- (8) Select N (neutral) on WTEC III TPSS (TM 9-2320-365-10).
- (9) Position main light switch to OFF (TM 9-2320-365-10).
- (10) Shut down engine (TM 9-2320-365-10).
- (11) Remove new WTEC III relay K25 from PDP.
- (12) Install old WTEC III relay K25 on PDP.
- (13) Install kick panel (para 16-3).

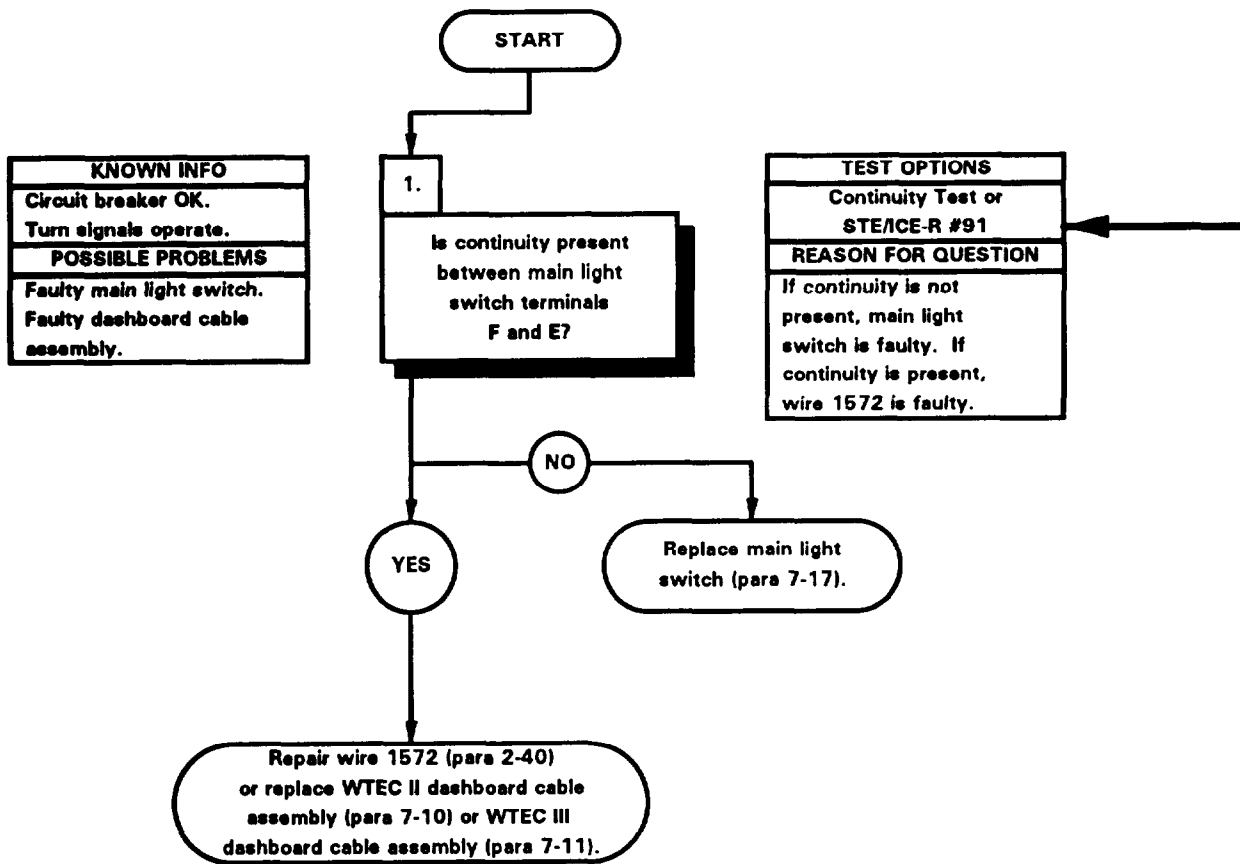


WTEC III RELAY K25

x2E55191

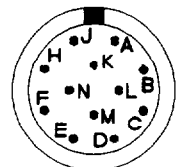
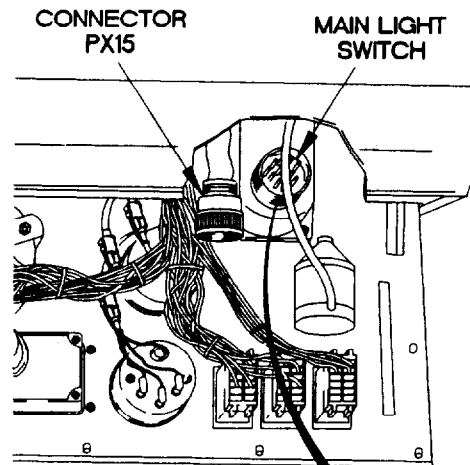


e64. BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



**CONTINUITY TEST**

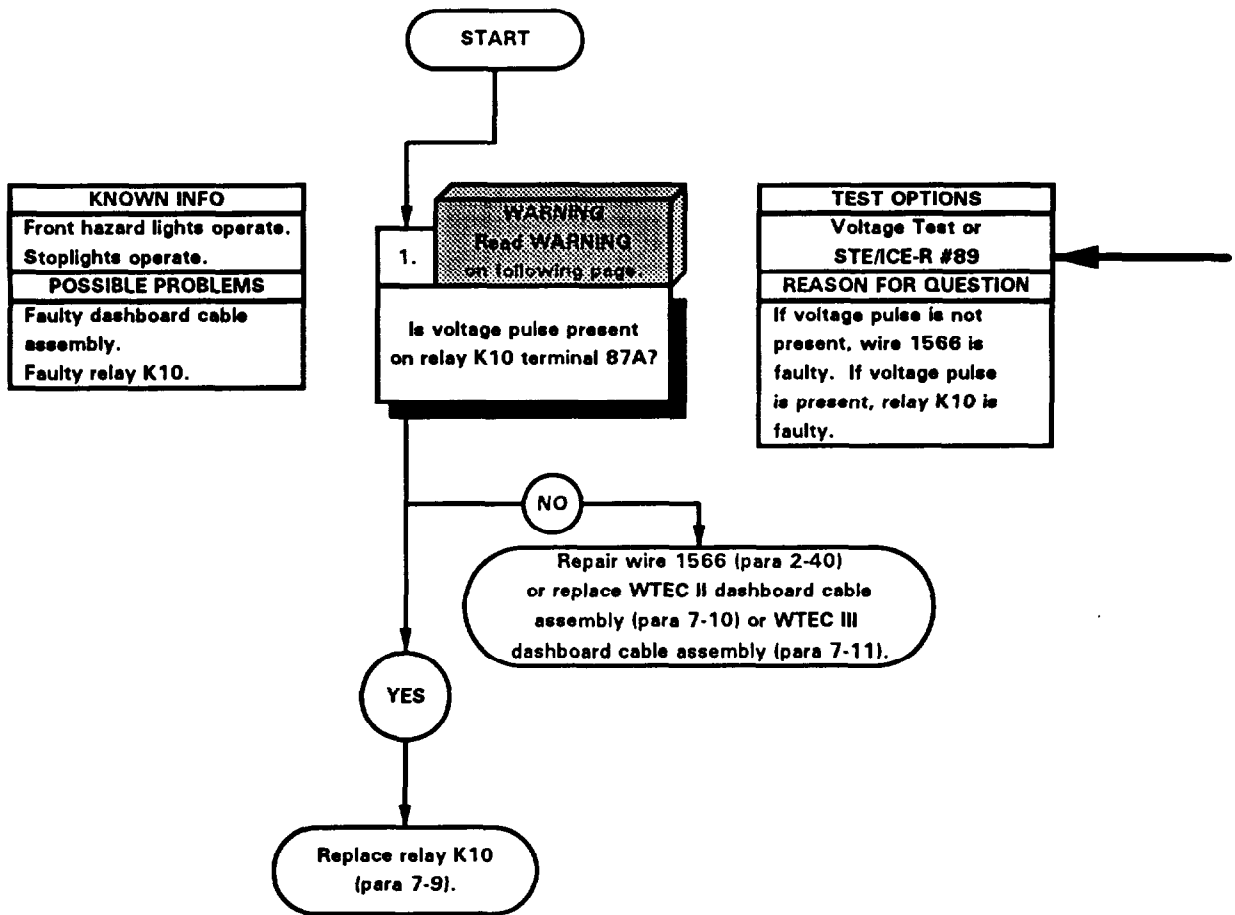
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX15 from main light switch.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to main light switch terminal F.
- (5) Connect negative (-) probe of multimeter to main light switch terminal E.
- (6) Position main light switch to BO MARKER (TM 9-2320-365-10) and note reading on multimeter.
- (7) If continuity is not present, replace main light switch (para 7-17).
- (8) If continuity is present, repair wire 1572 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Position main light switch to OFF (TM 9-2320-365-10).
- (10) Connect connector PX15 to main light switch.
- (11) Install instrument panel assembly (para 7-18).



**MAIN LIGHT SWITCH**

X2E5601A

●55. REAR HAZARD LIGHTS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



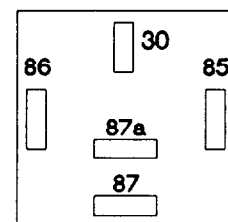
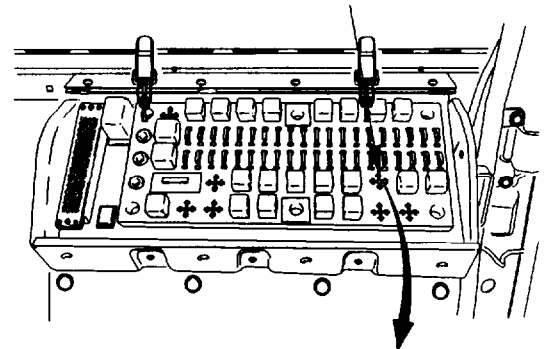
**WARNING**

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 K10 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 87A, where relay K10 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position hazard lights switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (7) If voltage pulse is not present, repair wire 1566 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) If voltage pulse is present, replace relay K10 (para 7-9).
- (9) Position hazard lights switch to off (TM 9-2320-365-10).
- (10) Install relay K10 in PDP.
- (11) Install PDP cover (para 16-2).

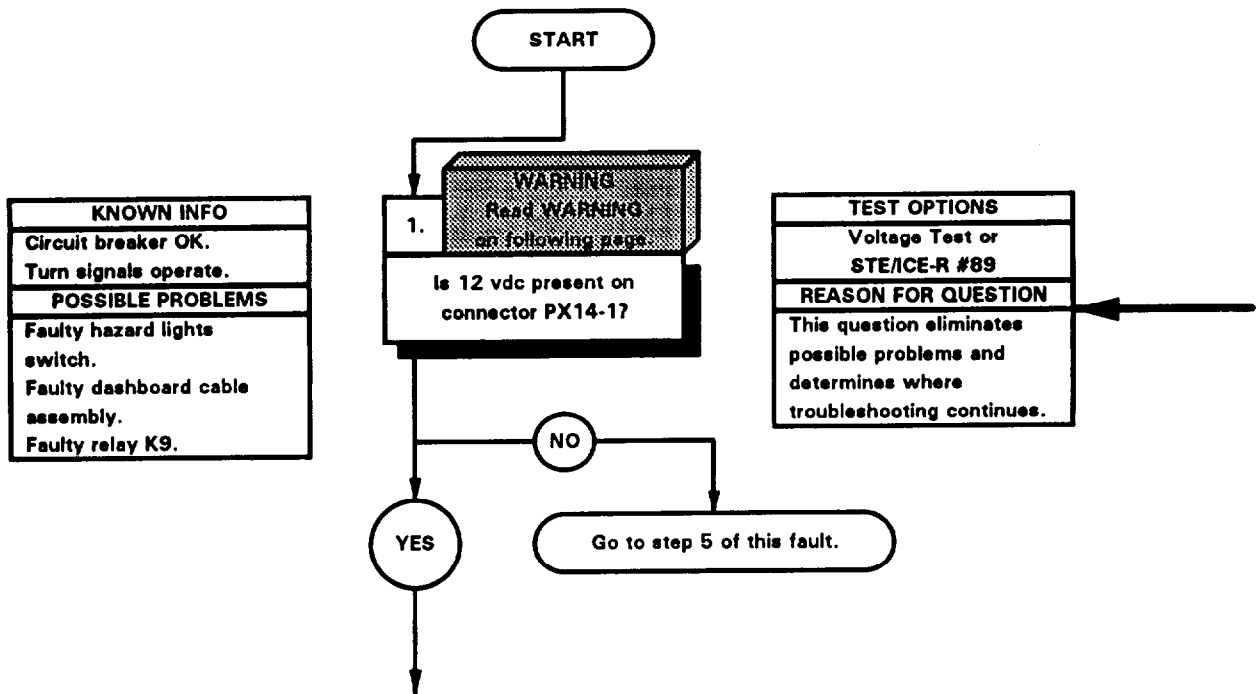
RELAY K10 CAVITY



RELAY K10 CAVITY

\*2ES701A

56. FRONT AND REAR HAZARD LIGHTS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

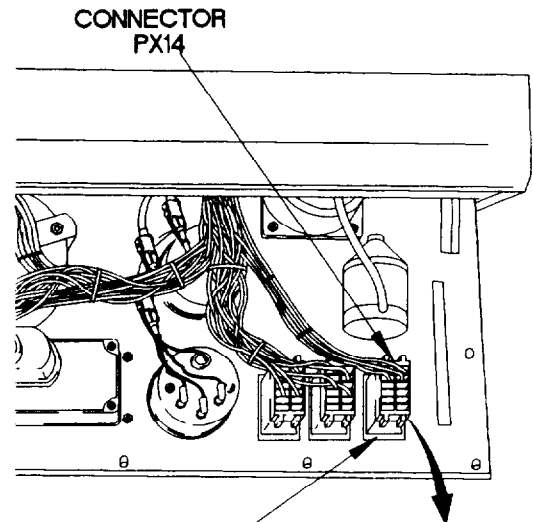


**WARNING**

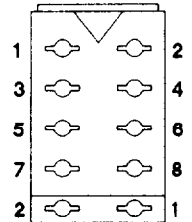
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX14 from hazard lights switch.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector PX14-1.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, go to step 5 of this fault.
- (8) Position main light switch to OFF (TM 9-2320-365-10).



HAZARD LIGHT SWITCH



PX14

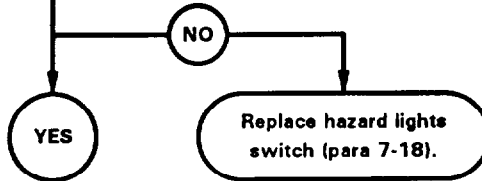
X2E5801A

e56. FRONT AND REAR HAZARD LIGHTS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Turn signals operate. Relay K9 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty hazard lights switch.

2.  
Is continuity present between hazard lights switch terminals 1 and 5?

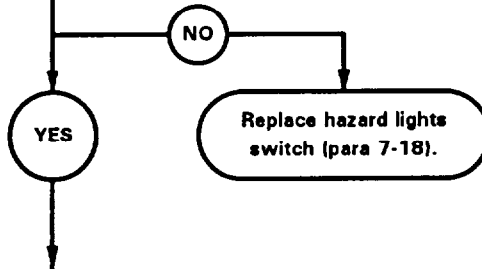
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, hazard lights switch is faulty.



KNOWN INFO
Circuit breaker OK. Turn signals operate. Relay K9 OK.
POSSIBLE PROBLEMS
Faulty hazard lights switch. Faulty dashboard cable assembly.

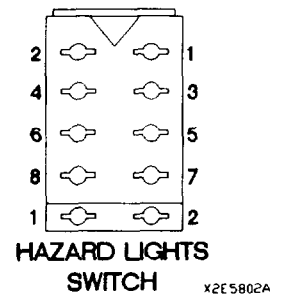
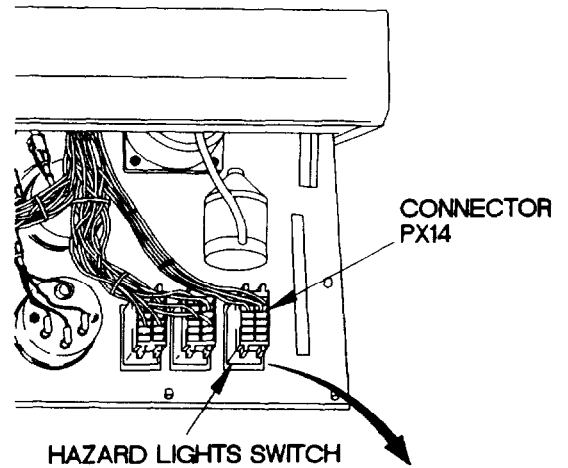
3.  
Is continuity present between hazard lights switch terminals 2 and 6?

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



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to hazard lights switch terminal 1.
- (3) Connect negative (-) probe of multimeter to hazard lights switch terminal 5.
- (4) Position hazard lights switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If continuity is not present, replace hazard lights switch (para 7-18).

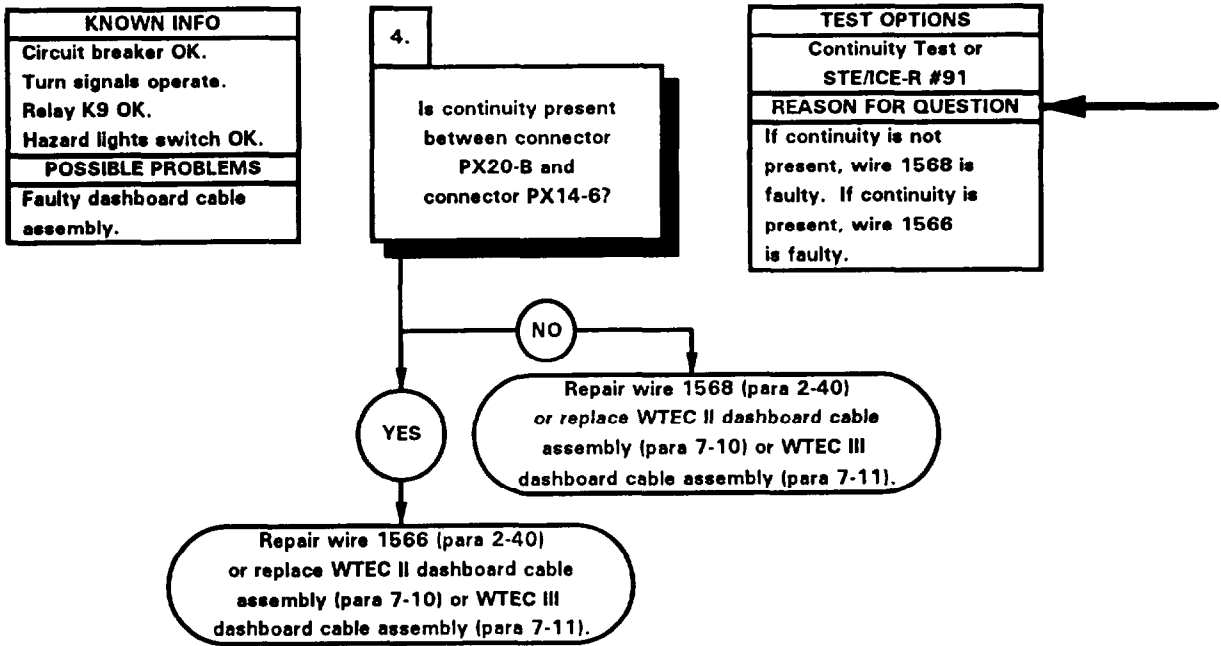


**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to hazard lights switch terminal 2.
- (3) Connect negative (-) probe of multimeter to hazard lights switch terminal 6.
- (4) Position hazard lights switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If continuity is not present, replace hazard lights switch (para 7-18).

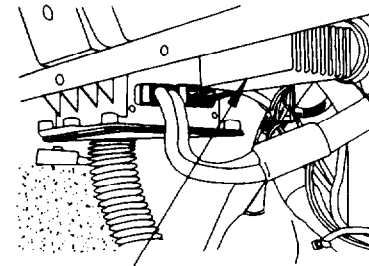
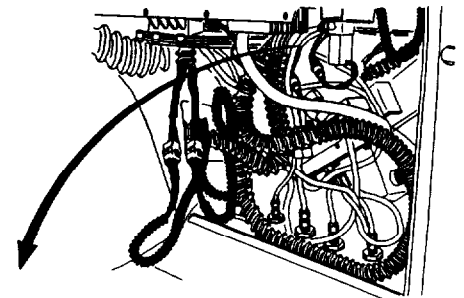


e56. FRONT AND REAR HAZARD LIGHTS DO NOT OPERATE (CONT)

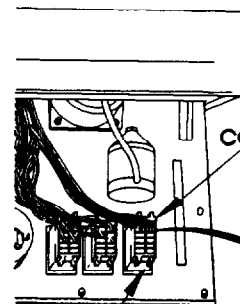
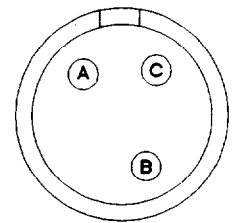


**CONTINUITY TEST**

- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector PX20 from flasher unit.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector PX14-6.
- (5) Connect negative (-) probe of multimeter to connector PX20-A and note reading on multimeter.
- (6) If continuity is not present, repair wire 1568 (para 2-40) 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 1566 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Connect connector PX20 to flasher unit.
- (9) Install kick panel (para 16-3).
- (10) Connect connector PX14 to hazard lights switch.
- (11) Install instrument panel assembly (para 7-15).

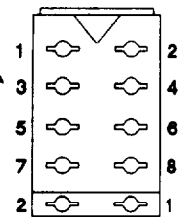


FLASHER UNIT



CONNECTOR PX14

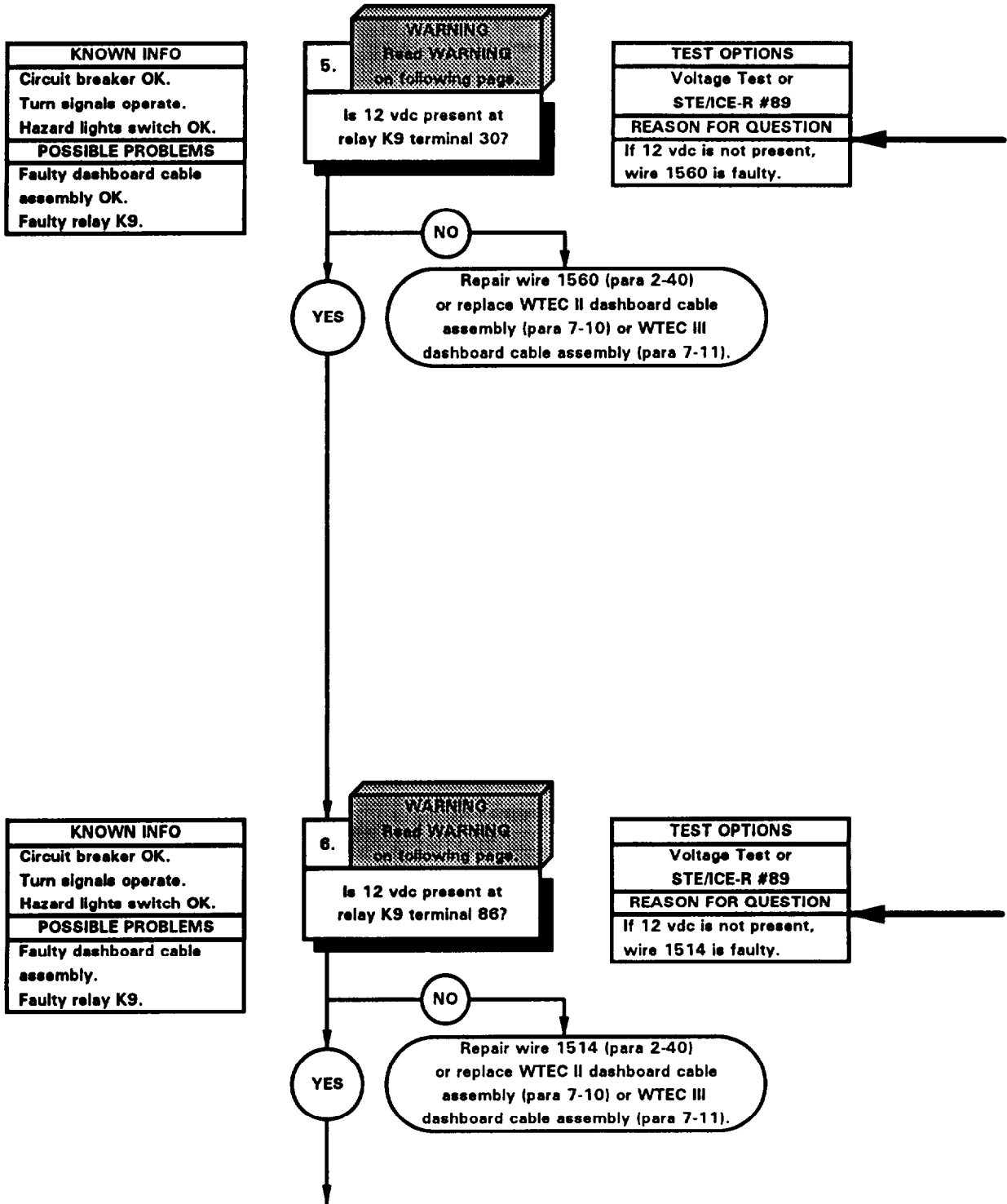
HAZARD LIGHTS SWITCH



PX14

32E5803A

e56. FRONT AND REAR HAZARD LIGHTS DO NOT OPERATE (CONT)

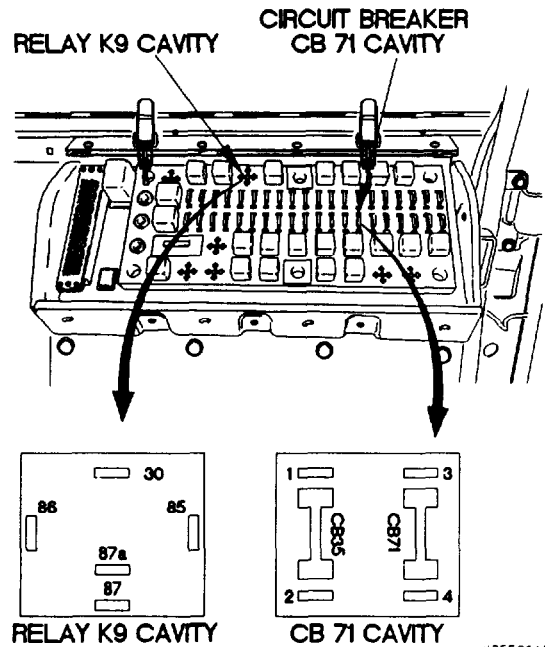


**WARNING**

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 PDP cover (para 16-2).
- (2) Remove circuit breaker CB71 from PDP.
- (3) Remove relay K9 from PDP.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to PDP, terminal 30, where relay K9 was removed.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Install circuit breaker CB71 in PDP and note reading on multimeter.
- (8) If 12 vdc is not present, repair wire 1566 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



X2E5804A

**VOLTAGE TEST**

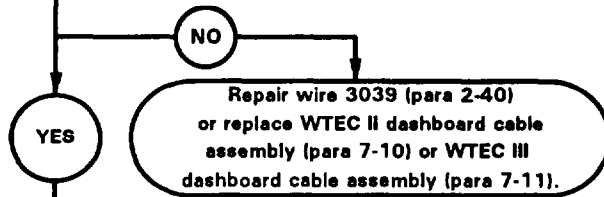
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K9 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1514 (para 2-40) 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 9-2320-365-10).

ø56. FRONT AND REAR HAZARD LIGHTS DO NOT OPERATE (CONT)

<b>KNOWN INFO</b>
Circuit breaker OK. Turn signals operate. Hazard lights switch OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly. Faulty relay K9.

7.  
Is continuity present between relay K9 terminal 85 and a known good ground?

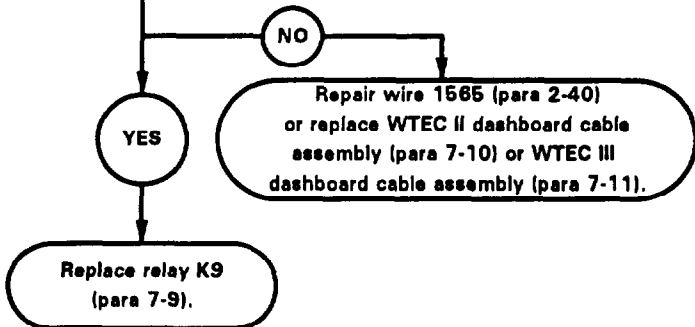
<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 3039 is faulty.



<b>KNOWN INFO</b>
Circuit breaker OK. Turn signals operate. Hazard lights switch OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly. Faulty relay K9.

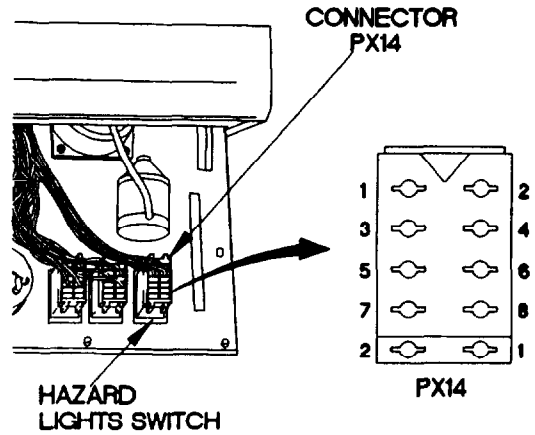
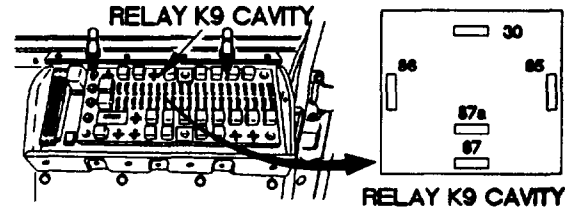
8.  
Is continuity present between relay K9 terminal 87 and connector PX14-27?

<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 1565 is faulty. If continuity is present, relay K9 is faulty.



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K9 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 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

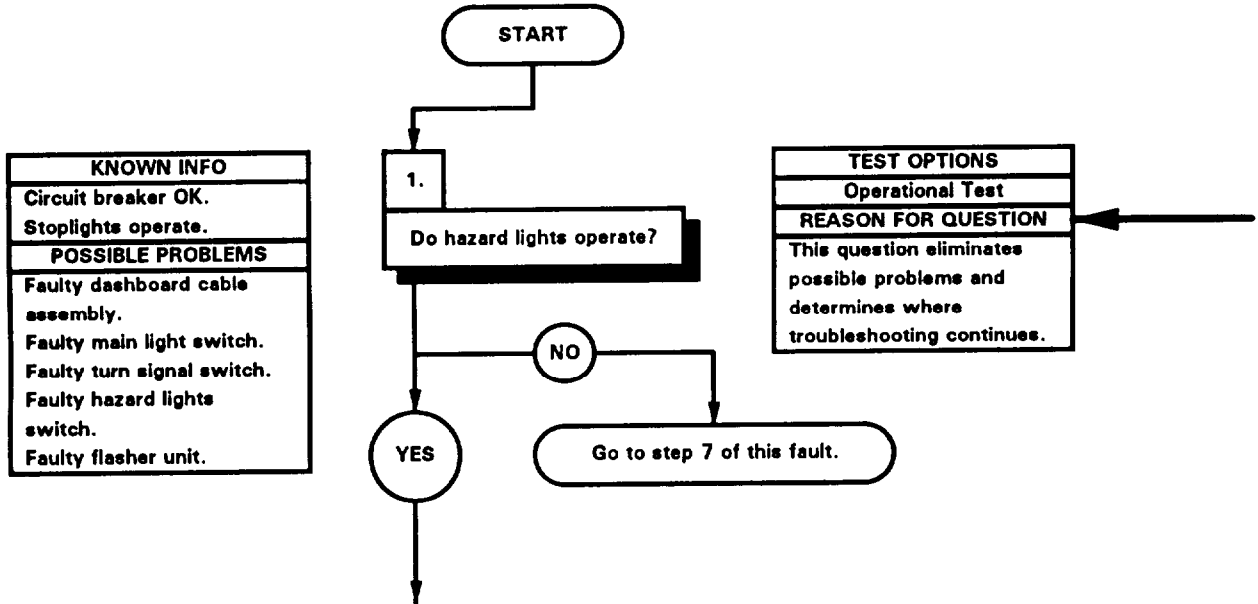


X2E5805A

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 87, where relay K9 was removed.
- (3) Connect negative (-) probe of multimeter to connector PX14-2 and note reading on multimeter.
- (4) If continuity is not present, repair wire 1565 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) If 12 vdc is present, replace relay K9 (para 7-9).
- (6) Connect connector PX14 to hazard lights switch.
- (7) Install relay K9 in PDP.
- (8) Install PDP cover (para 16-2).
- (9) Install instrument panel assembly (para 7-15).

●57. FRONT AND REAR TURN SIGNALS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

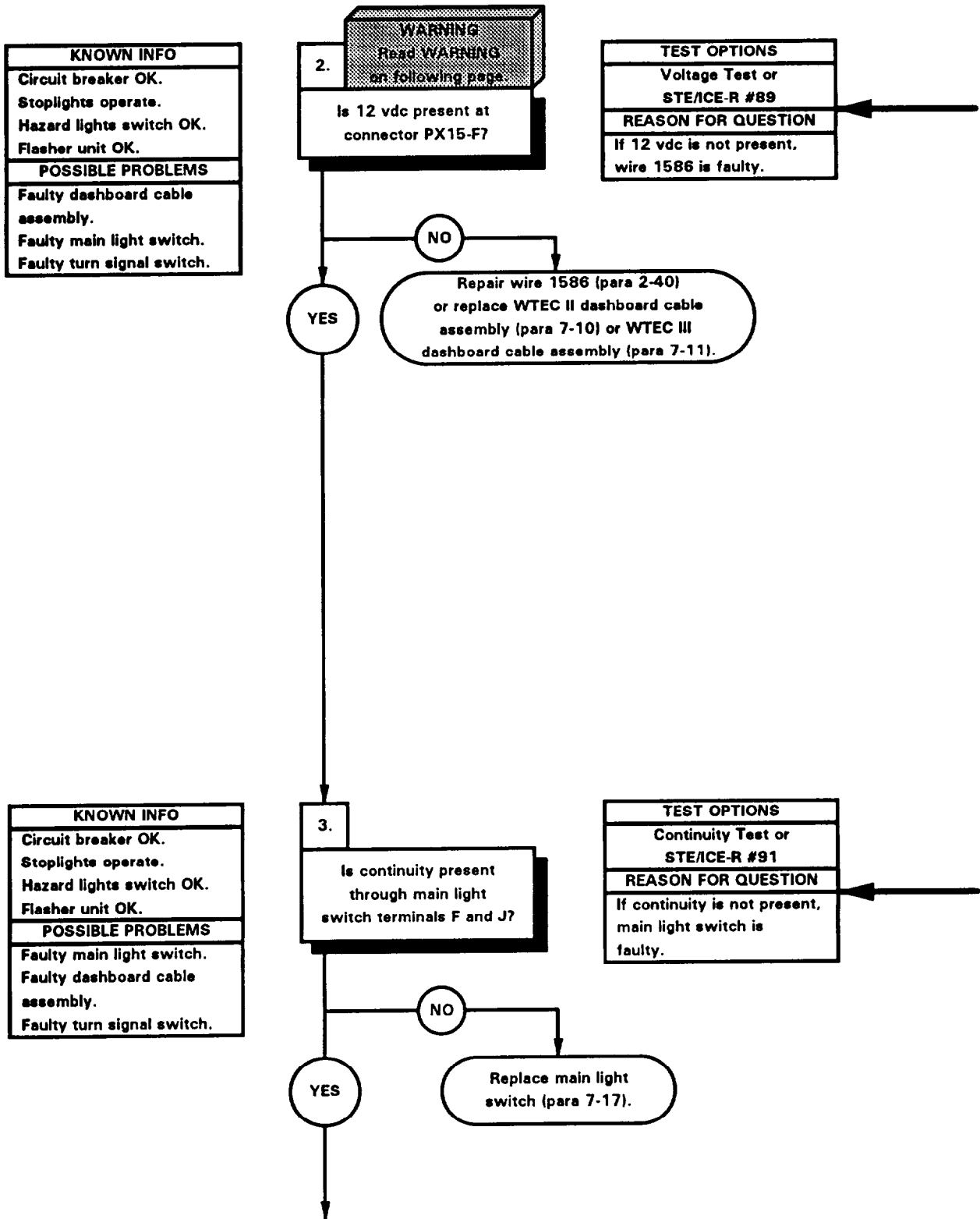


**OPERATIONAL TEST**

- (1) Position main light switch to STOPLIGHT  
(TM 9-2320-365-10).
- (2) Position hazard lights switch to on  
(TM 9-2320-365-10).
- (3) Observe hazard lights.
- (4) If hazard lights do not operate, go to step 7  
of this fault.
- (5) Position hazard lights switch to off  
(TM 9-2320-365-10).
- (6) Position main light switch to OFF  
(TM 9-2320-365-10).



e57. FRONT AND REAR TURN SIGNALS DO NOT OPERATE (CONT)



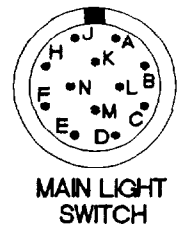
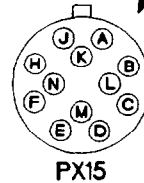
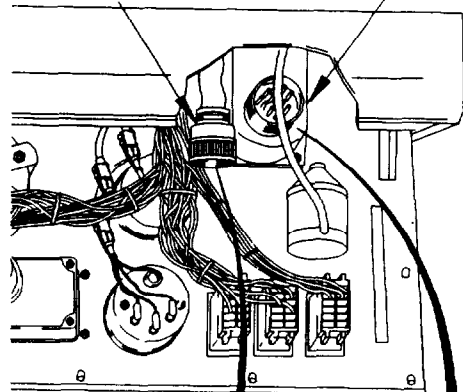
**WARNING**

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 PX15 from main light switch.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector PX15-F.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If 12 vdc is not present, repair wire 1586 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

CONNECTOR PX15      MAIN LIGHT SWITCH

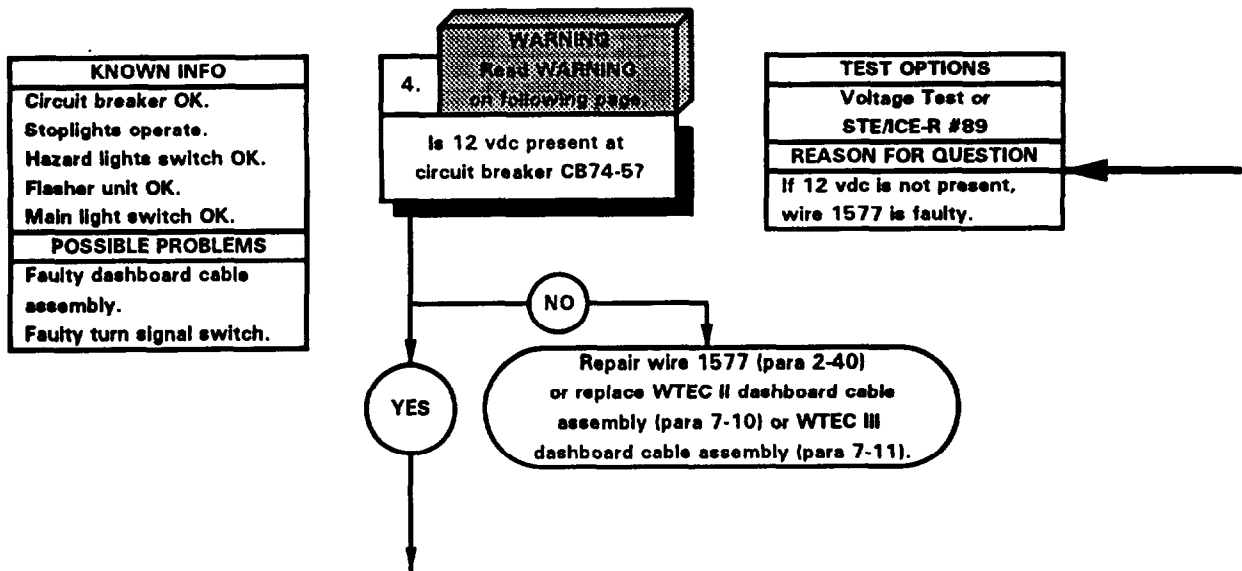


x2E5901A

**CONTINUITY TEST**

- (1) Remove main light switch (para 7-17).
- (2) Set multimeter to ohms.
- (3) Position main light switch to STOPLIGHT (TM 9-2320-365-10).
- (4) Connect positive (+) probe of multimeter to main light switch terminal F.
- (5) Connect negative (-) probe of multimeter to main light switch terminal J and note reading on multimeter.
- (6) If continuity is not present, replace main light switch (para 7-17).
- (7) Install main light switch (para 7-17).

e57. FRONT AND REAR TURN SIGNALS DO NOT OPERATE (CONT)



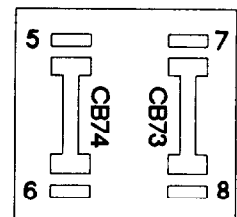
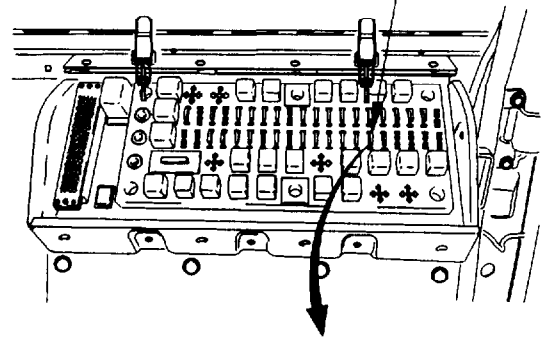
**WARNING**

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 PDP cover (para 16-2).
- (2) Remove circuit breaker CB74 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 5, where circuit breaker CB74 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to **STOPLIGHT** (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1577 (para 2-40) 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 9-2320-365-10).
- (9) Install circuit breaker CB74 in PDP.
- (10) Install PDP cover (para 16-2).

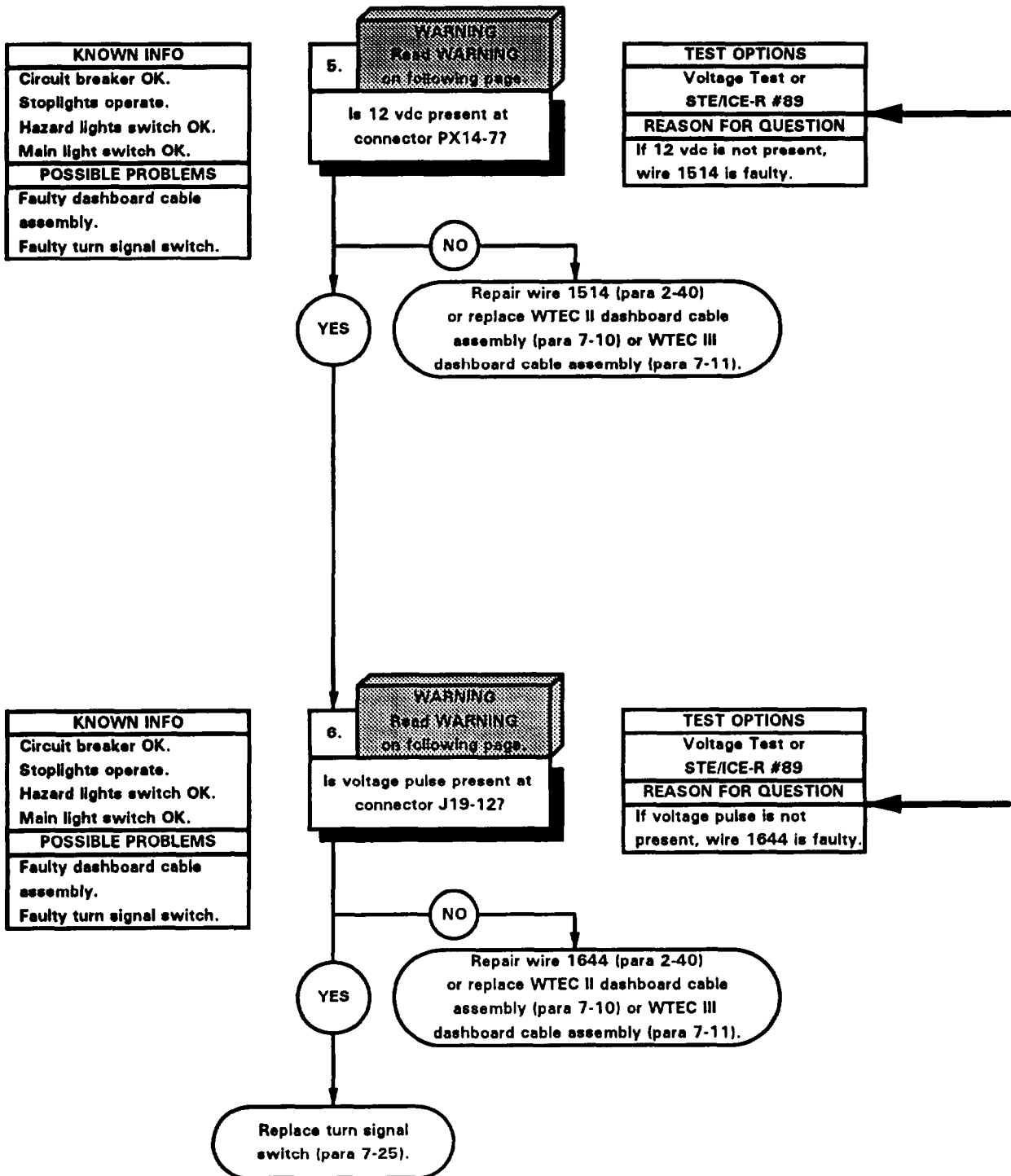
**CIRCUIT BREAKER  
CB74 CAVITY**



**CB74 CAVITY**

X2E5902A

e57. FRONT AND REAR TURN SIGNALS DO NOT OPERATE (CONT)

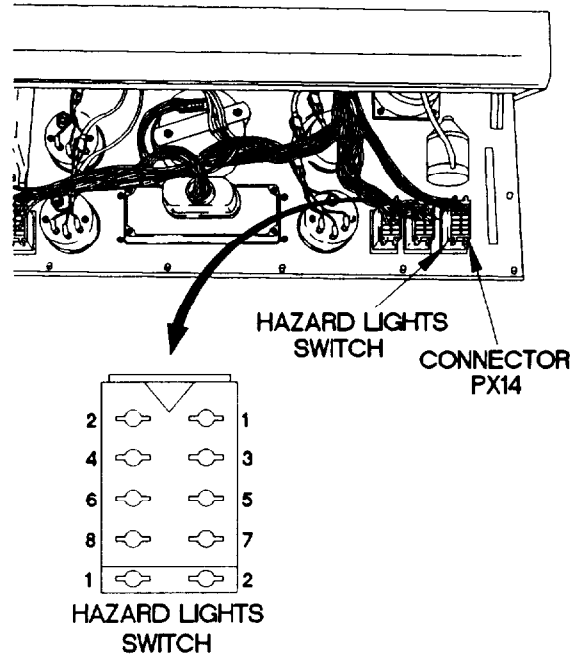


**WARNING**

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 PX14 from hazard lights switch.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector PX14-7.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to STOPLIGHT (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, repair wire 1514 (para 2-40) 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 9-2320-365-10).
- (8) Connect connector PX14 to hazard light switch.



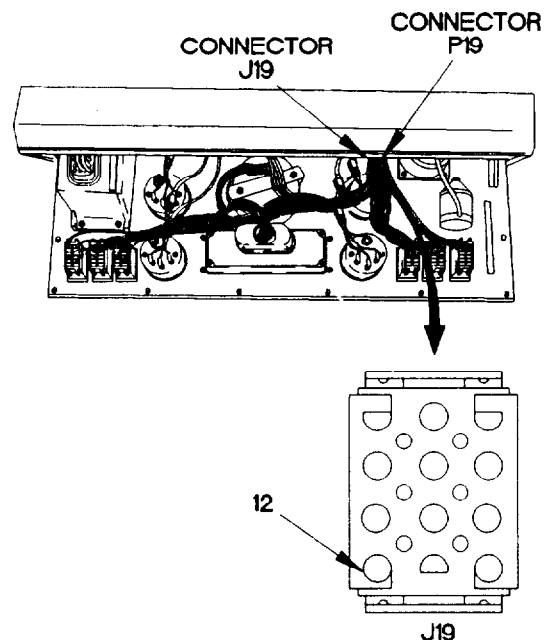
X2E5903A

**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 P19 from connector J19.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J19-12.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to STOPLIGHT (TM 9-2320-365-10) and note reading on multimeter.
- (6) If voltage pulse is not present, repair wire 1644 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) If voltage pulse is present, replace turn signal switch (para 7-25).
- (8) Position main light switch to OFF (TM 9-2320-365-10).
- (9) Connect connector P19 to connector J19.
- (10) Install instrument panel assembly (para 7-15).



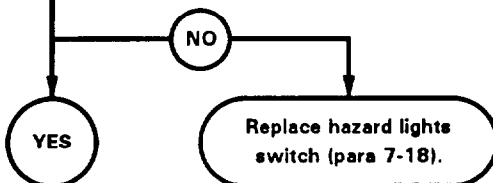
X2E5904A

e57. FRONT AND REAR TURN SIGNALS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Stoplights operate. Main light switch OK. Turn signal switch OK.
POSSIBLE PROBLEMS
Faulty hazard lights switch. Faulty dashboard cable assembly. Faulty flasher unit.

7.  
Is continuity present between hazard lights switch terminals 7 and 5?

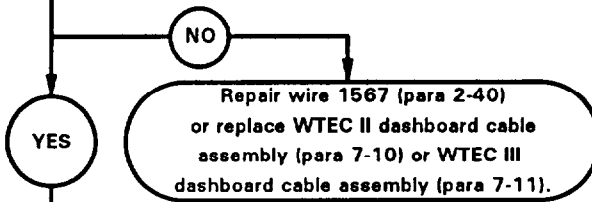
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, hazard lights switch is faulty.



KNOWN INFO
Circuit breaker OK. Stoplights operate. Main light switch OK. Turn signal switch OK. Hazard lights switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty flasher unit.

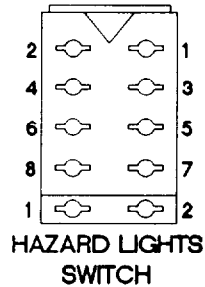
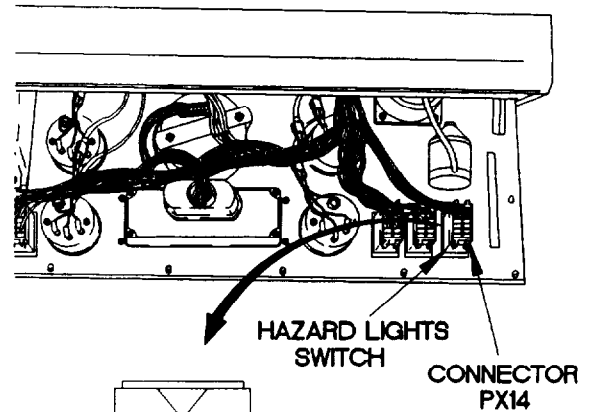
8. **WARNING**  
Read WARNING on following page.  
Is 12 vdc present at connector PX20-B?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 1567 is faulty.



**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX14 from hazard lights switch.
- (3) Set multimeter to volts dc.
- (4) Position hazard lights switch to on (TM 9-2320-365-10).
- (5) Connect positive (+) probe of multimeter to hazard lights switch terminal 7.
- (6) Connect negative (-) probe of multimeter to hazard lights switch terminal 5 and note reading on multimeter.
- (7) If continuity is not present, replace hazard lights switch (para 7-18).
- (8) Connect connector PX14 to hazard lights switch.



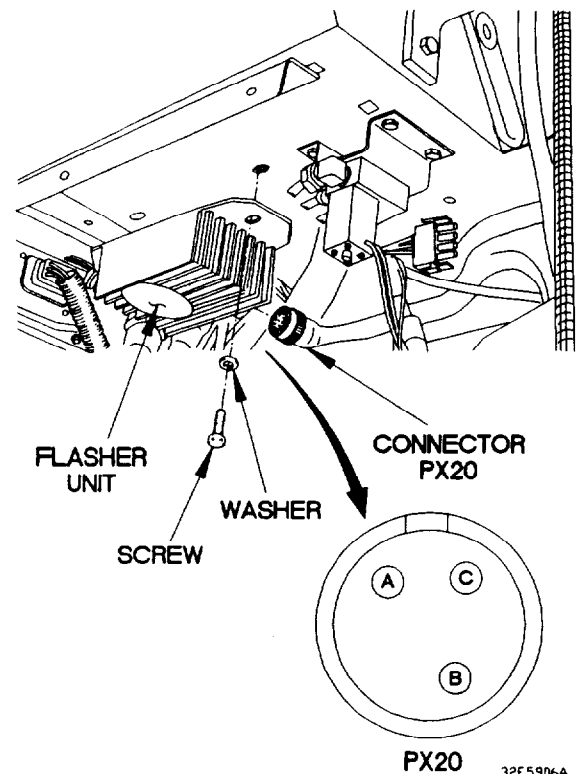
x2E5905A

**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 two screws, washers, and flasher unit from dashboard.
- (3) Disconnect connector PX20 from flasher unit.
- (4) Position hazard light switch to off (TM 9-2320-365-10).
- (5) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to connector PX20-B.
- (7) Connect negative (-) probe of multimeter to ground.
- (8) Position main light switch to STOPLIGHT (TM 9-2320-365-10) and note reading on multimeter.
- (9) If 12 vdc is not present, repair wire 1567 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) Position main light switch to OFF (TM 9-2320-365-10).



32E5906A

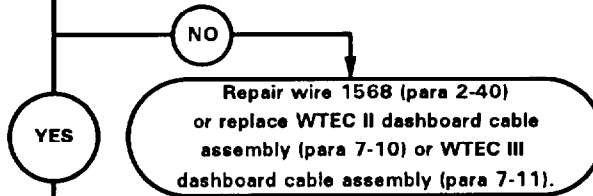


e57. FRONT AND REAR TURN SIGNALS DO NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Stoplights operate. Main light switch OK. Turn signal switch OK. Hazard lights switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty flasher unit.

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1568 is faulty.

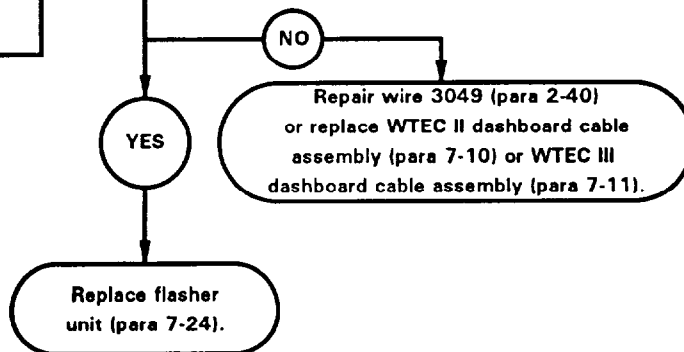
9.  
Is continuity present between connector PX20-A and connector PX14-67?



KNOWN INFO
Circuit breaker OK. Stoplights operate. Main light switch OK. Turn signal switch OK. Hazard lights switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty flasher unit.

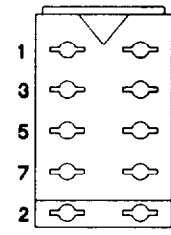
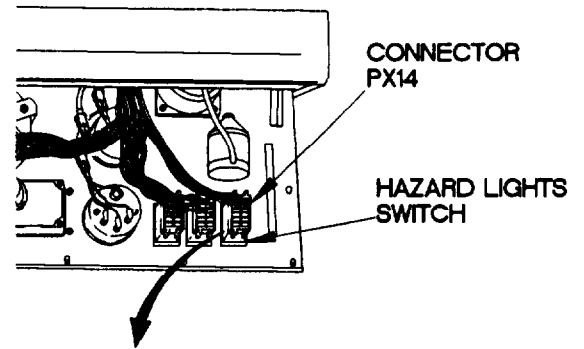
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3049 is faulty. If continuity is present, flasher unit is faulty.

10.  
Is continuity present between connector PX20-C and a known good ground?

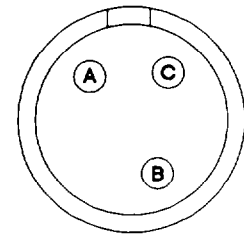


**CONTINUITY TEST**

- (1) Disconnect connector PX14 from hazard lights switch.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector PX20-A.
- (4) Connect negative (-) probe of multimeter to connector PX14-6 and note reading on multimeter.
- (5) If continuity is not present, repair wire 1568 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) Connect connector PX14 to hazard lights switch.
- (7) Install instrument panel assembly (para 7-15).



PX14

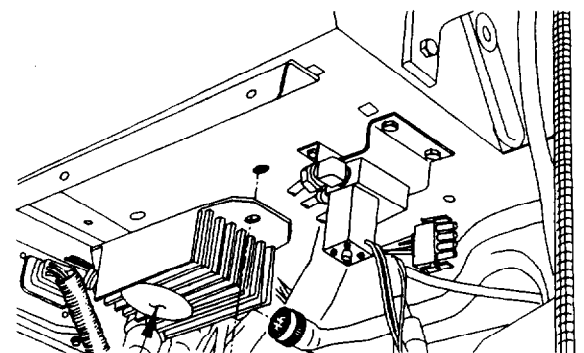


PX20

x2E5907A

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX20-C.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3049 (para 2-40) 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 flasher unit (para 7-24).
- (6) Connect connector PX20 to flasher unit.
- (7) Install flasher unit on dashboard with two washers and screws.
- (8) Install kick panel (para 16-3).

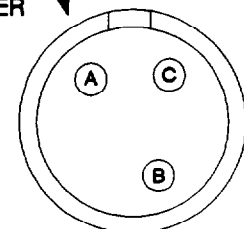


FLASHER UNIT

WASHER

SCREW

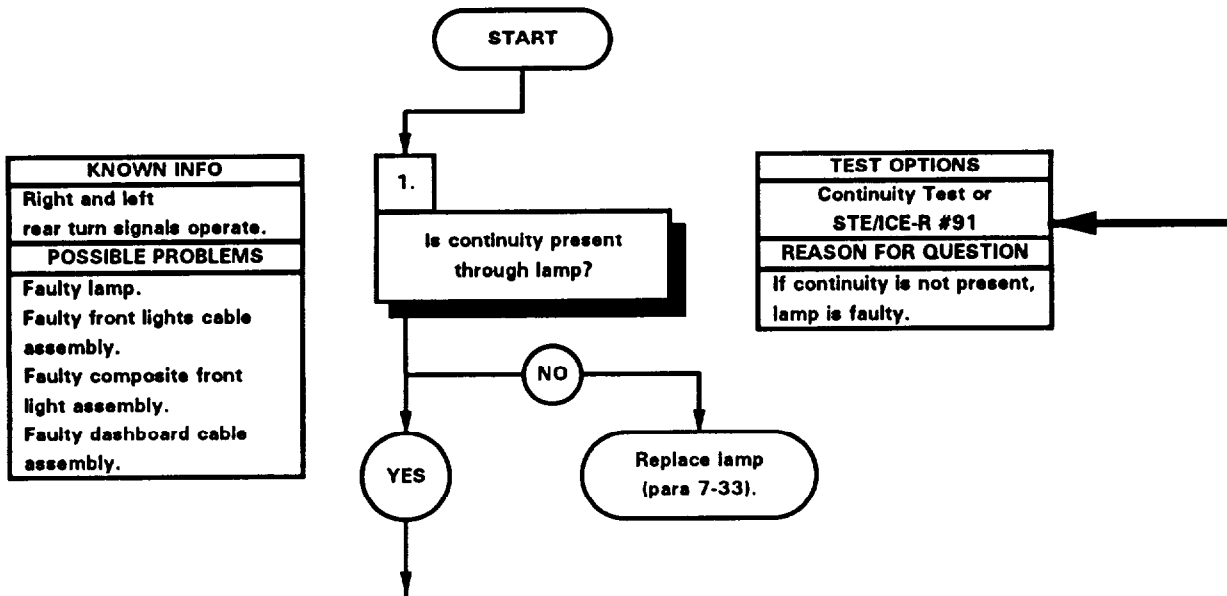
CONNECTOR PX20



PX20

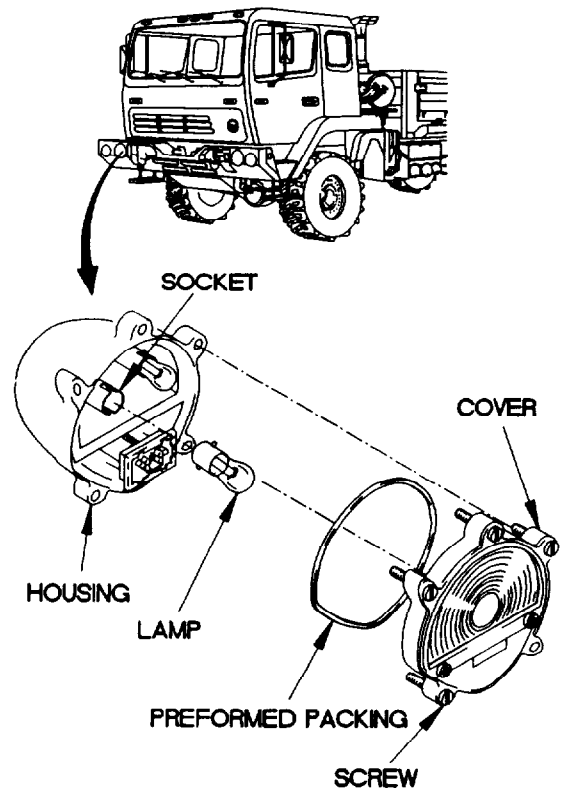
32E5906A

e58. LEFT OR RIGHT FRONT TURN SIGNAL DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Packing, Preformed (Item 170, Appendix G) Lockwasher (Item 92, Appendix G)	



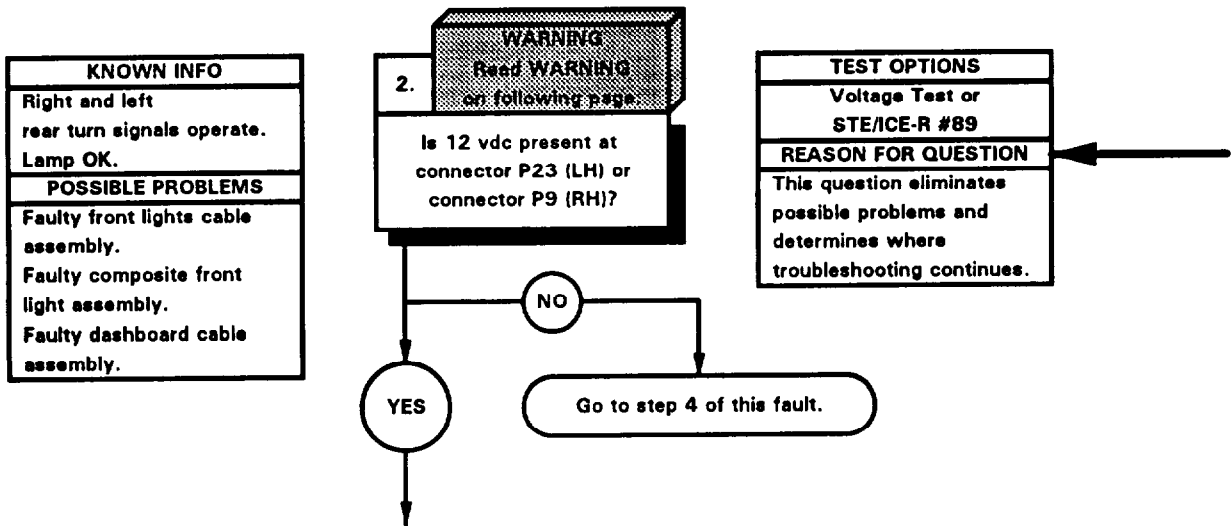
**CONTINUITY TEST**

- (1) Loosen five screws on cover.
- (2) Remove cover and preformed packing from housing. Discard preformed packing.
- (3) Remove lamp from socket.
- (4) Set multimeter to ohms.
- (5) Check continuity through lamp and note reading on multimeter.
- (6) If continuity is not present, replace lamp (para 7-33).
- (7) Install turn signal lamp in socket.
- (8) Install preformed packing and cover on housing with five screws.



X2E6001A

e58. LEFT OR RIGHT FRONT TURN SIGNAL DOES NOT OPERATE (CONT)

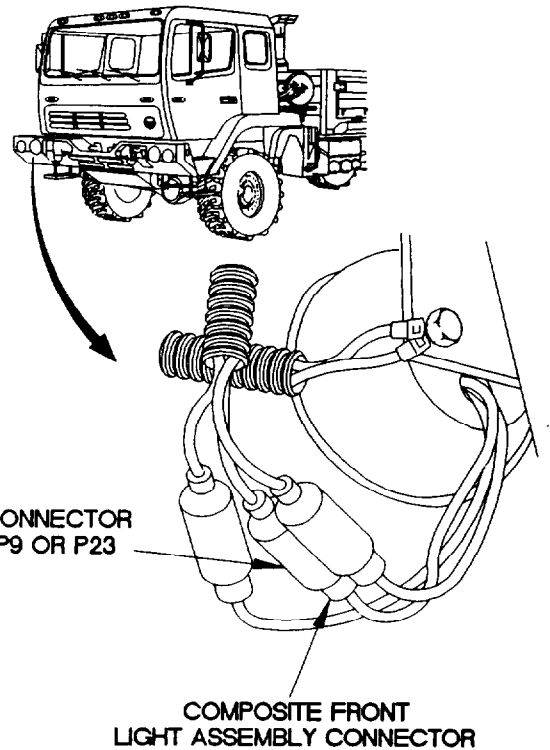


**WARNING**

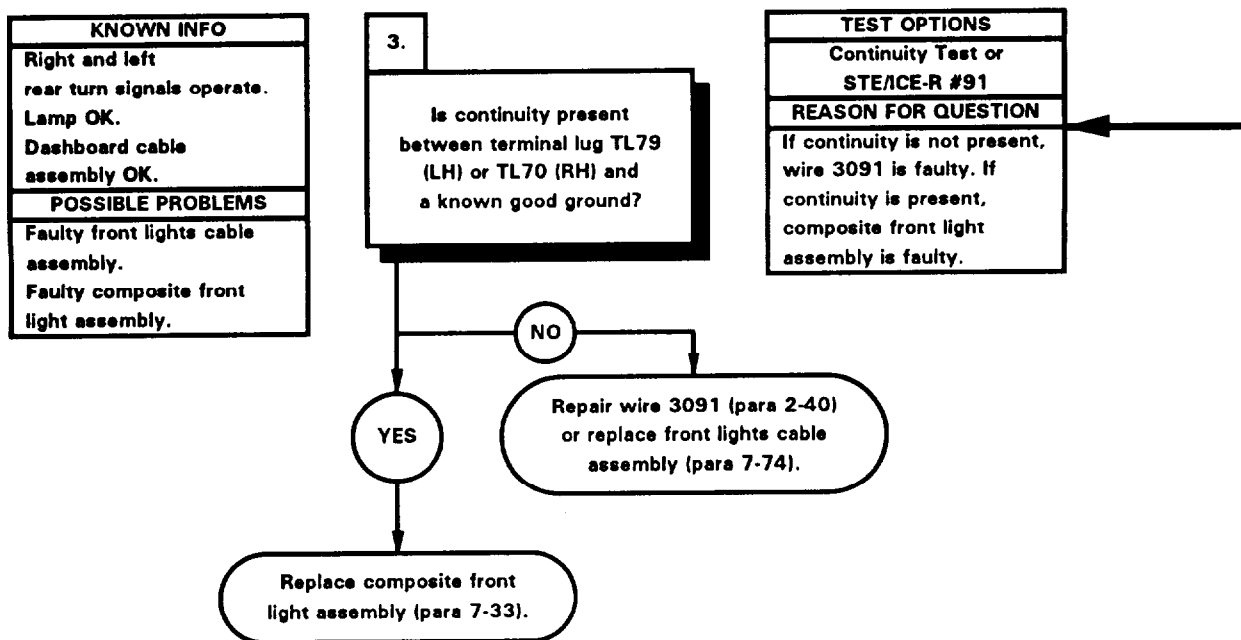
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Raise cab (TM 9-2320-365-10).
- (2) Disconnect connector P23 (LH composite front light assembly) or P9 (RH composite front light assembly) from composite front light assembly connector.
- (3) Lower cab (TM 9-2320-365-10).
- (4) Connect positive (+) probe of multimeter to connector P23 (LH composite front light assembly) or P9 (RH composite front light assembly).
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to STOPLIGHT (TM 9-2320-365-10).
- (7) Position turn signal switch to left turn or right turn position (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 12 vdc is not present, go to step 4 of this fault.
- (9) Position turn signal switch to off (TM 9-2320-365-10).
- (10) Position main light switch to OFF (TM 9-2320-365-10).
- (11) Raise cab (TM 9-2320-365-10).
- (12) Connect connector P23 (LH composite front light assembly) or P9 (RH composite front light assembly) to composite front light assembly connector.

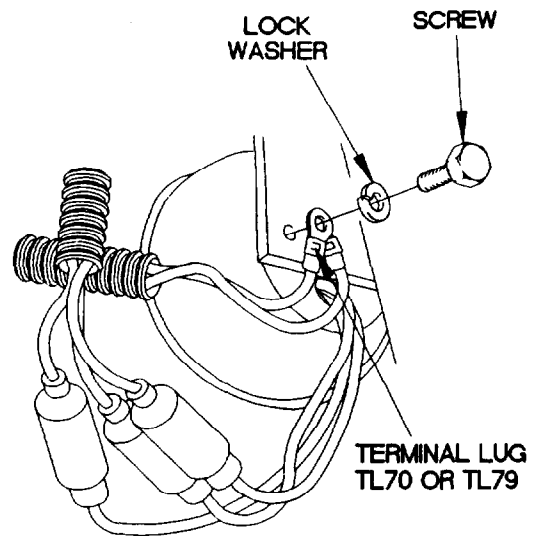


e58. LEFT OR RIGHT FRONT TURN SIGNAL DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

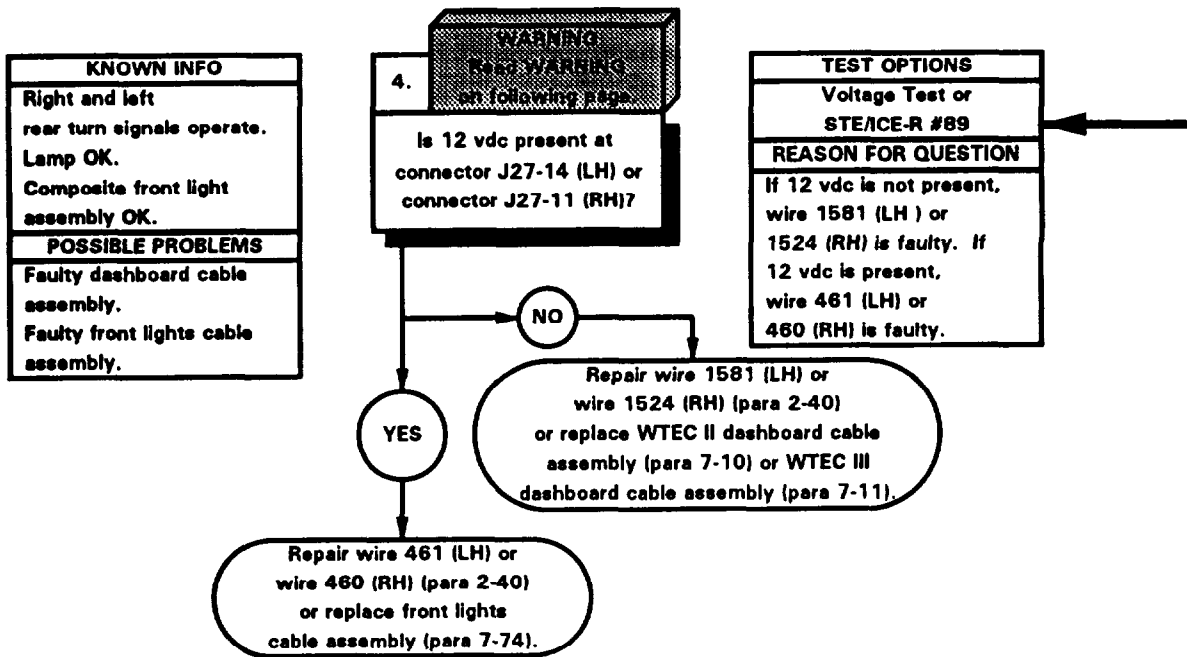
- (1) Remove screw, lockwasher, and terminal lug TL79 (LH) or TL70 (RH) from composite front light light assembly. Discard lockwasher.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to terminal lug TL79 (LH) or TL90 (RH).
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, repair wire 3091 (para 2-40) or replace front lights cable assembly (para 7-74).
- (6) If continuity is present, replace composite front light assembly (para 7-33).
- (7) Install terminal lug TL79 (LH) or TL90 (RH), lockwasher, and screw on composite front light assembly.



X2E6003A



658. LEFT OR RIGHT FRONT TURN SIGNAL DOES NOT OPERATE (CONT)

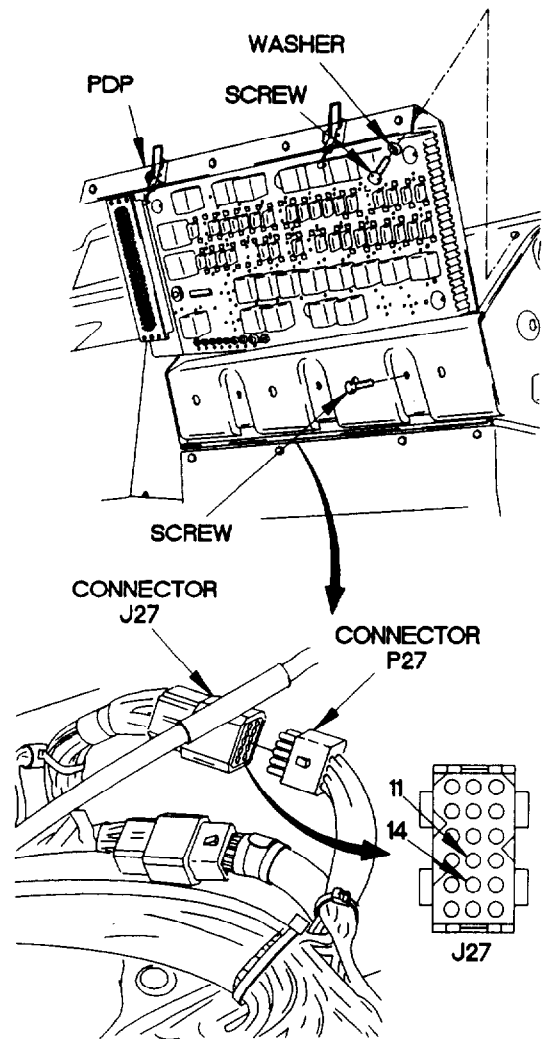


**WARNING**

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.

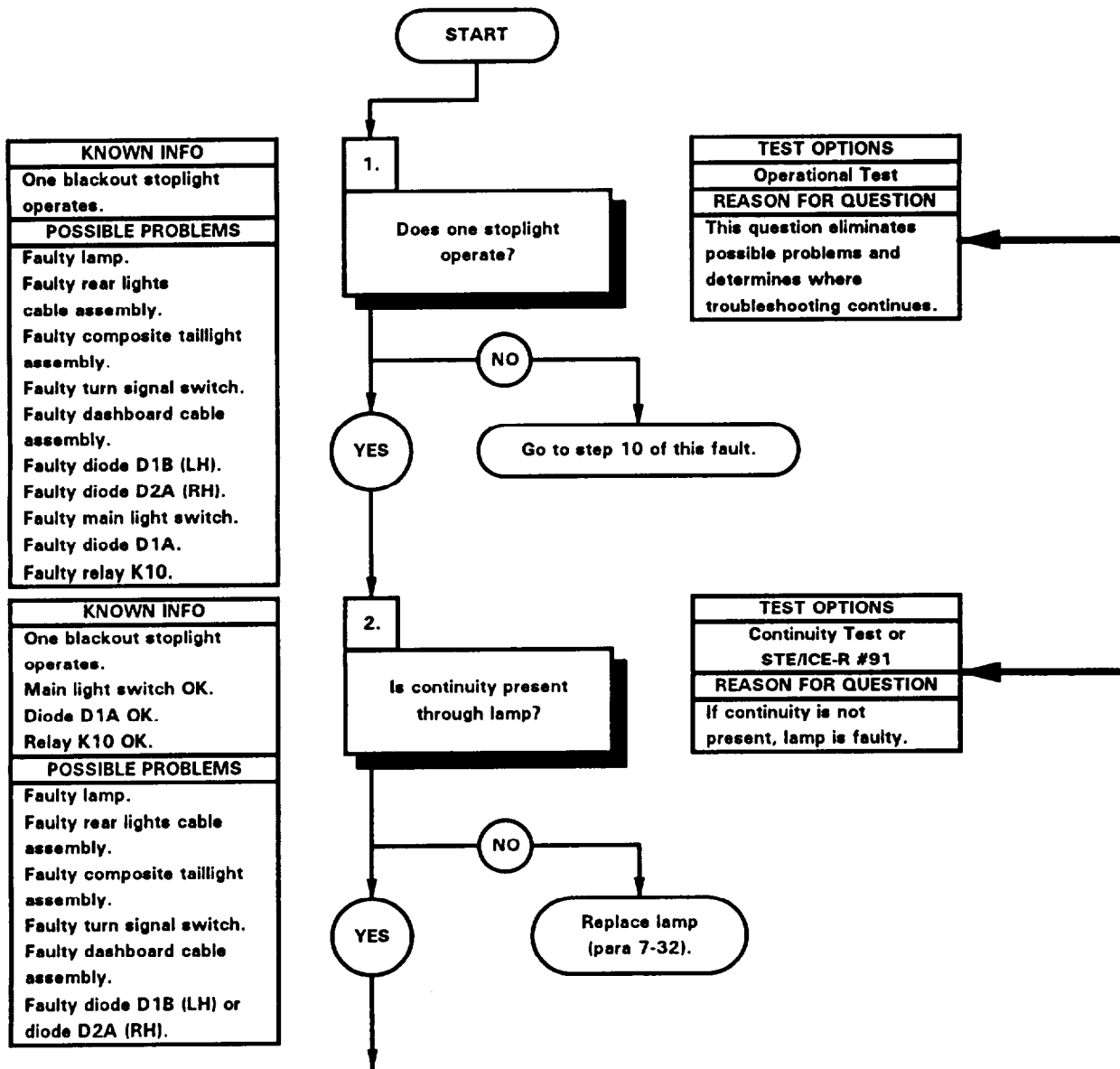
**VOLTAGE TEST**

- (1) Remove 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 connector J27 from connector P27.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter to connector J27-14 (LH) or J27-11 (RH).
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position main light switch to STOPLIGHT (TM 9-2320-365-10).
- (10) Position turn signal switch to up for right turn signal operation or down for left turn signal operation (TM 9-2320-365-10).
- (11) If 12 vdc is not present, repair wire 1581 (LH) or wire 1524 (RH) (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (12) If 12 vdc is present, repair wire 461 (LH) or wire 460 (RH) (para 2-40) or replace front lights cable assembly (para 7-74).
- (13) Position main light switch to OFF (TM 9-2320-365-10).
- (14) Position turn signal switch to middle (off) (TM 9-2320-365-10).
- (15) Connect connector P27 to connector J27.
- (16) Install PDP on dashboard with three screws.
- (17) Install three washers and screws in PDP.
- (18) Install PDP cover (para 16-2).



X2E60041

●59. ONE OR BOTH STOPLIGHTS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Packing, Preformed (Item 170, Appendix G)	

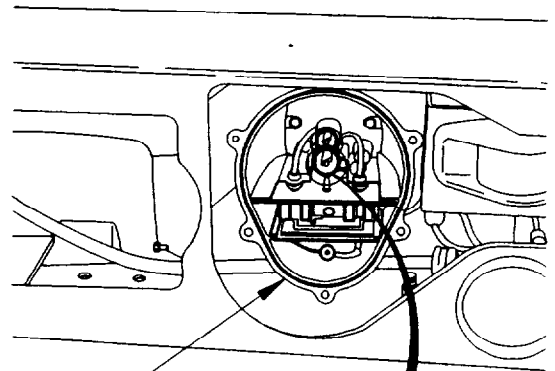


**OPERATIONAL TEST**

- (1) Position master power switch to on (TM 9-2320-365-10).
- (2) Position main light switch to STOPLIGHT (TM 9-2320-365-10).
- (3) Depress brake pedal.
- (4) If both stoplights do not illuminate, go to step 10 of this fault.
- (5) Position master power switch to off (TM 9-2320-365-10).
- (6) Position main light switch to OFF (TM 9-2320-365-10).

**CONTINUITY TEST**

- (1) Loosen six screws on cover.
- (2) Remove cover and preformed packing from housing. Discard preformed packing.
- (3) Remove lamp from socket.
- (4) Set multimeter to ohms.
- (5) Check continuity through lamp.
- (6) If continuity is not present, replace lamp (para 7-32).

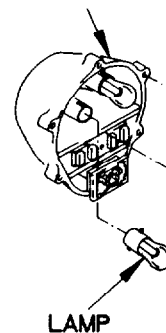


HOUSING

CENTER CONTACT

LAMP SOCKET

HOUSING



LAMP

PREFORMED PACKING

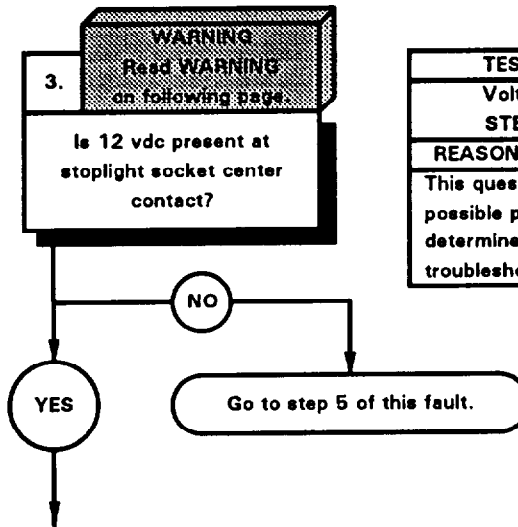
SCREW

COVER

X2E6102A

e59. ONE OR BOTH STOPLIGHTS DO NOT OPERATE (CONT)

KNOWN INFO
One blackout stoplight operates. Main light switch OK. Diode D1A OK. Relay K10 OK. Lamp OK.
POSSIBLE PROBLEMS
Faulty rear lights cable assembly. Faulty composite taillight assembly. Faulty turn signal switch. Faulty dashboard cable assembly. Faulty diode D1B (LH) or diode D2A (RH).



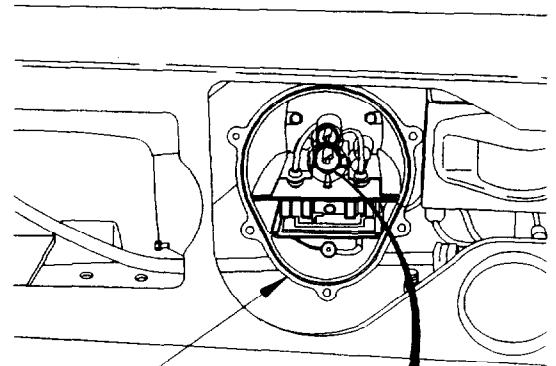
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.

**WARNING**

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

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to stoplight lamp socket center contact.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Position main light switch to STOPLIGHT (TM 9-2320-365-10).
- (6) Depress brake pedal.
- (7) If 12 vdc is not present, go to step 5 of this fault.
- (8) Position master power switch to off (TM 9-2320-365-10).
- (9) Position main light switch to OFF (TM 9-2320-365-10).
- (10) Install lamp in socket.
- (11) Install preformed packing and cover on housing with six screws.

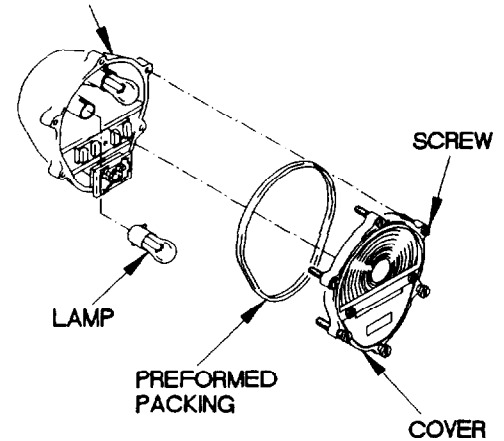


HOUSING

CENTER CONTACT

LAMP SOCKET

HOUSING



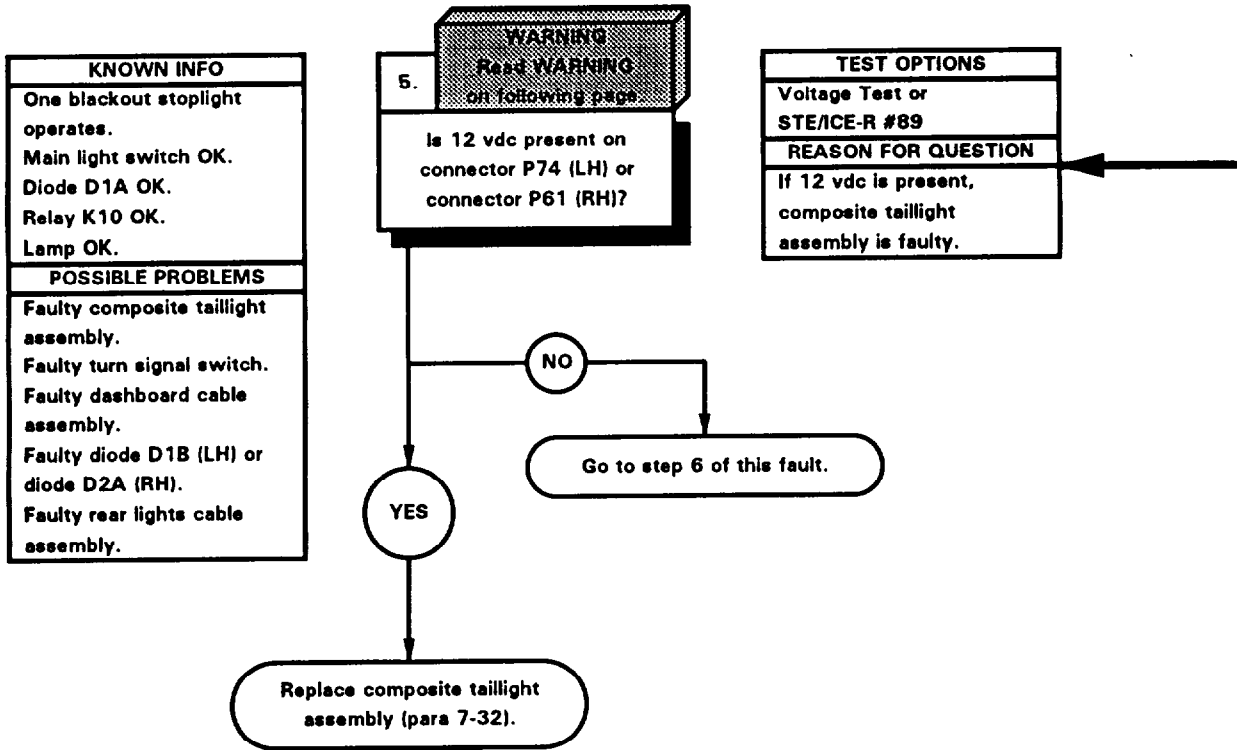
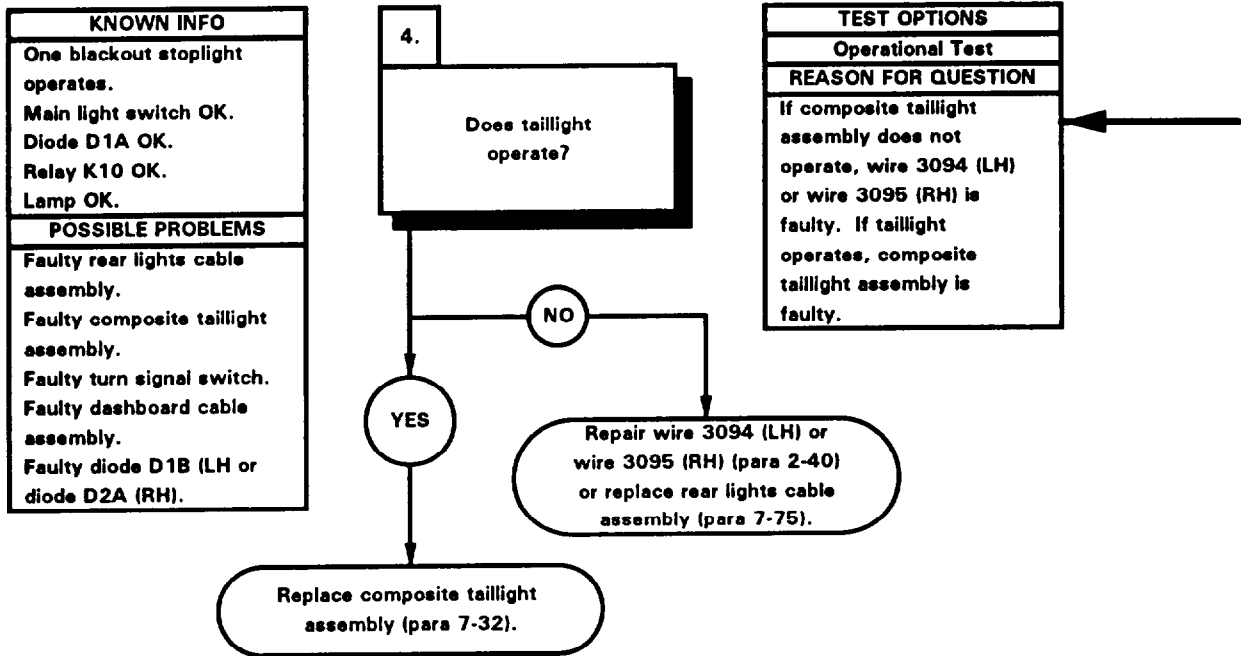
LAMP

PREFORMED PACKING

COVER

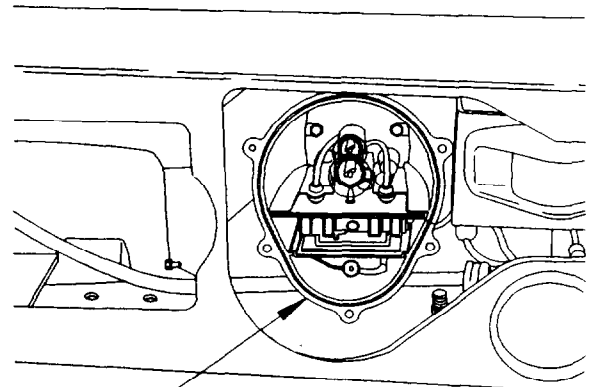
x2E6102A

e59. ONE OR BOTH STOPLIGHTS DO NOT OPERATE (CONT)



**OPERATIONAL TEST**

- (1) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (2) Observe taillight in housing with non-operating stoplight.
- (3) If taillight does not operate, repair wire 3094 (LH) or wire 3095 (RH) (para 2-40) or replace rear lights cable assembly (para 7-75).
- (4) If taillight operates, replace composite taillight assembly (para 7-32).
- (5) Position main light switch to OFF (TM 9-2320-365-10).



TAILLIGHT

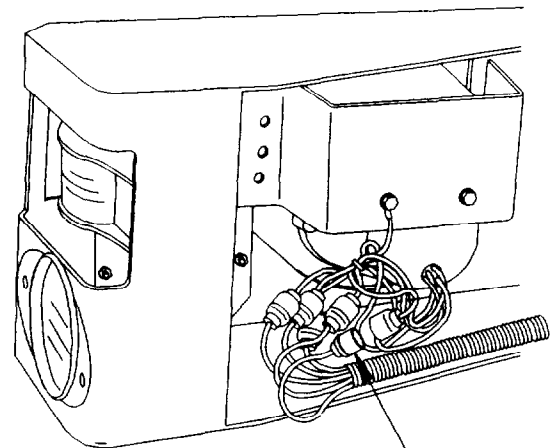
X2E6103A

**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 P74 (LH) or connector P61 (RH) from stoplight connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P74 (LH) or connector P61 (RH).
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Position main light switch to STOPLIGHT (TM 9-2320-365-10).
- (7) Depress brake pedal.
- (8) If 12 vdc is not present, go to step 6 of this fault.
- (9) If 12 vdc is present, replace composite taillight assembly (para 7-32).
- (10) Position master power switch to off (TM 9-2320-365-10).
- (11) Position main light switch to OFF (TM 9-2320-365-10).
- (12) Connect connector P74 (LH) or connector P61 (RH) to stoplight connector.



CONNECTOR P61 OR P74

X2E6104A

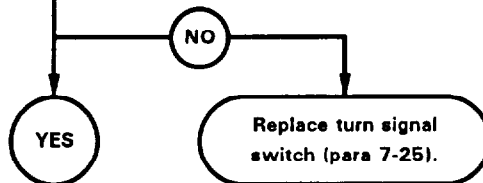


e59. ONE OR BOTH STOPLIGHTS DO NOT OPERATE (CONT)

KNOWN INFO
One blackout stoplight operates. Main light switch OK. Diode D1A OK. Relay K10 OK. Lamp OK. Composite taillight assembly OK.
POSSIBLE PROBLEMS
Faulty turn signal switch. Faulty dashboard cable assembly. Faulty diode D1B (LH) or diode D2A (RH). Faulty rear lights cable assembly.

6.  
Is continuity present between turn signal switch connector terminals 2 (LH) and 6 or terminals 3 (RH) and 6?

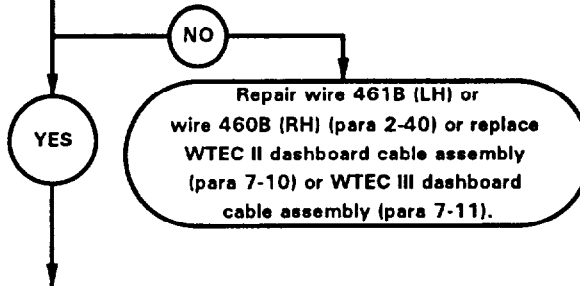
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, turn signal switch is faulty.



KNOWN INFO
One blackout stoplight operates. Main light switch OK. Diode D1A OK. Relay K10 OK. Lamp OK. Composite taillight assembly OK. Turn signal switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty diode D1B (LH) or diode D2A (RH). Faulty rear lights cable assembly.

7.  
**WARNING**  
Read **WARNING** on following page.  
Is 12 vdc present on diode D1B-4 (LH stoplight) or diode D2A-2 (RH stoplight)?

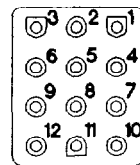
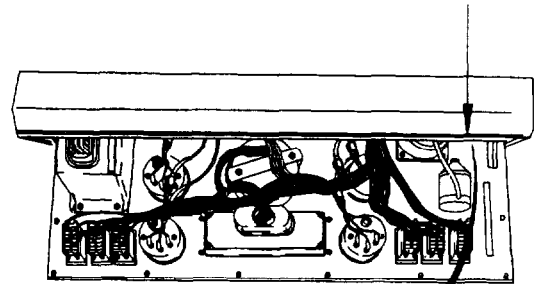
TEST OPTIONS
Voltage Test or STE/CE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 461B (LH) or wire 460B (RH) is faulty.



**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect turn signal switch connector from connector J19.
- (3) Position turn signal switch to center position (TM 9-2320-365-10).
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to turn signal switch connector terminal 6.
- (6) Connect negative (-) probe of multimeter to turn signal switch connector terminal 2 (LH) or turn signal switch connector terminal 3 (RH) and note reading on multimeter.
- (7) If continuity is not present, replace turn signal switch (para 7-25).
- (8) Connect connector J19 to turn signal switch connector.
- (9) Install instrument panel assembly (para 7-15).

TURN SIGNAL SWITCH CONNECTOR



TURN SIGNAL SWITCH CONNECTOR

X2E6105A

**WARNING**

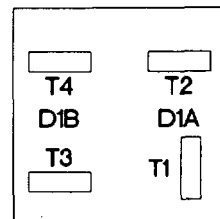
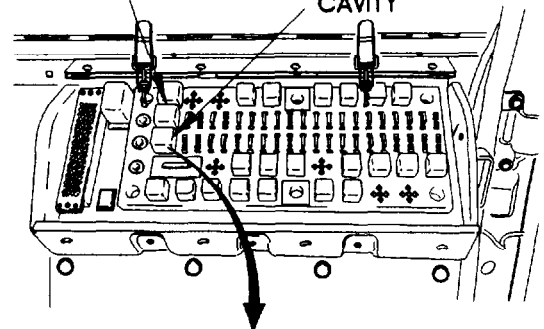
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

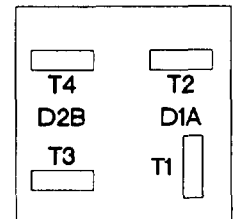
- (1) Remove PDP cover (para 16-2).
- (2) Remove diode D1B (LH) or diode D2A (RH) from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 4 (LH) or terminal 2 (RH), where diode D1B (LH) or D2A (RH) was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Position main light switch to STOPLIGHT (TM 9-2320-365-10).
- (8) Depress brake pedal and note reading on multimeter.
- (9) If 12 vdc is not present, repair wire 461B (LH) or wire 460B (RH) (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) Position master power switch to off (TM 9-2320-365-10).
- (11) Position main light switch to OFF (TM 9-2320-365-10).

DIODE D1 CAVITY

DIODE D2 CAVITY



DIODE D1 CAVITY



DIODE D2 CAVITY

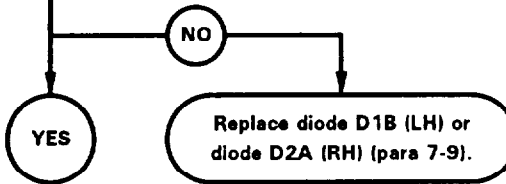
X2E6106A

e59. ONE OR BOTH STOPLIGHTS DO NOT OPERATE (CONT)

KNOWN INFO
One blackout stoplight operates. Main light switch OK. Diode D1A OK. Relay K10 OK. Lamp OK. Composite taillight assembly OK. Turn signal switch OK.
POSSIBLE PROBLEMS
Faulty diode D1B (LH) or diode D2A (RH). Faulty dashboard cable assembly. Faulty rear lights cable assembly.

8.  
 Is continuity present between diode D1B terminals 3 and 4 (LH stoplight) or diode D2A terminals 1 and 2 (RH stoplight)?

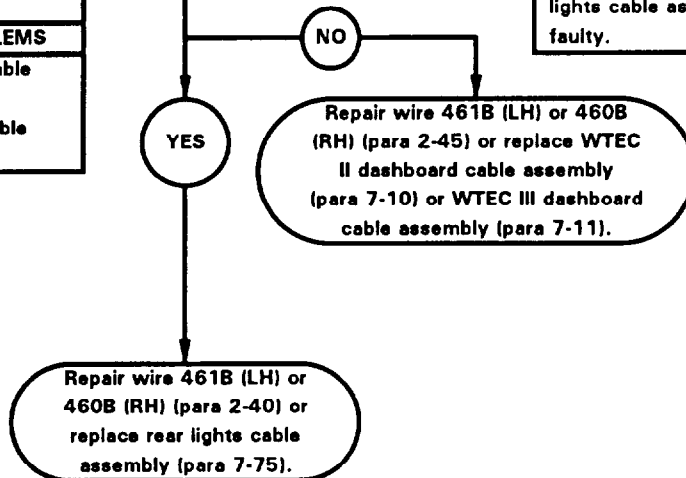
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, diode D1B (LH) or diode D2A (RH) is faulty.



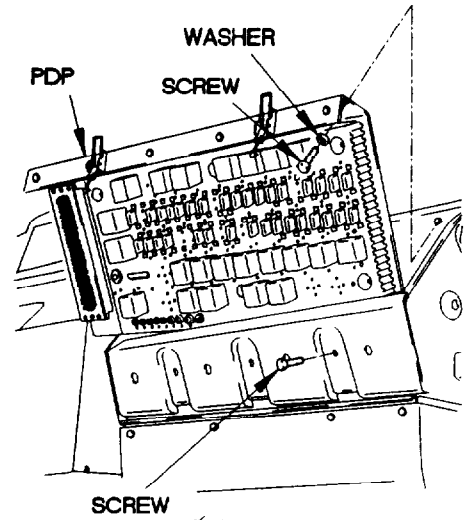
KNOWN INFO
One blackout stoplight operates. Main light switch OK. Diode D1A OK. Relay K10 OK. Lamp OK. Composite taillight assembly OK. Turn signal switch OK. Diode D1B (LH) or D2A (RH) OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty rear lights cable assembly.

9.  
 Is continuity present between diode D1B terminal 3 (LH) and connector P51-5 (LH) or diode D2A terminal 1 (RH) and connector P51-4 (RH)?

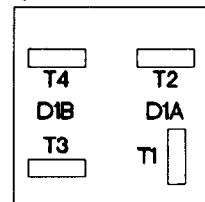
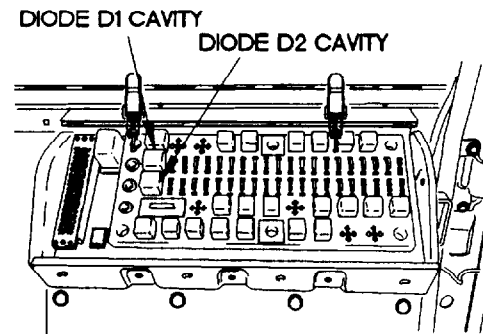
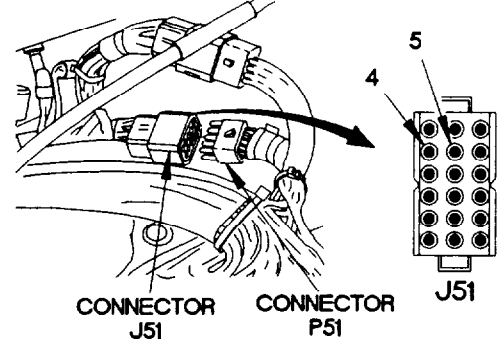
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 461B (LH) or wire 460B (RH) in dashboard cable assembly is faulty. If continuity is present, wire 461B (LH) or wire 460B (RH) in rear lights cable assembly is faulty.



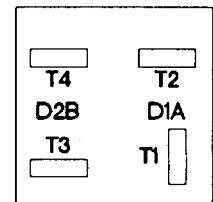
- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to diode D1B terminal 4 (LH) or diode D2A terminal 2 (RH).
  - (3) Connect negative (-) probe of multimeter to diode D1B terminal 3 (LH) or diode D2A terminal 1 (RH) and note reading on multimeter.
  - (4) If continuity is not present, replace diode D1B (LH) or diode D2A (RH) (para 7-9).
  - (5) Install instrument panel assembly (para 7-15).



- 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 P51 from connector J51.
  - (5) Set multimeter to ohms.
  - (6) Connect positive (+) probe of multimeter to PDP, terminal 3 (LH) or terminal 1 (RH), where diode D1B (LH) or D2A (RH) was removed.
  - (7) Connect negative (-) probe of multimeter to connector J51-5 (LH) or J51-4 (RH) and note reading on multimeter.
  - (8) If continuity is not present, repair wire 461B (LH) or 460B (RH) (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (9) If continuity is present, repair wire 461B (LH) or 460B (RH) (para 2-40) or replace rear lights cable assembly (para 7-75).
  - (10) Connect connector P51 to connector J51.
  - (11) Install PDP on dashboard with three screws.
  - (12) Install three washers and screws in PDP.
  - (13) Install PDP cover (para 16-2).



DIODE D1 CAVITY



DIODE D2 CAVITY

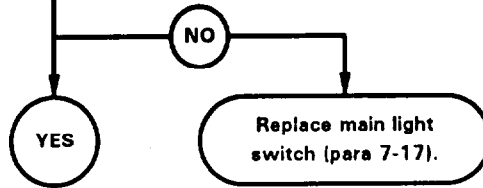
X2E61081

659. ONE OR BOTH STOPLIGHTS DO NOT OPERATE (CONT)

KNOWN INFO
One blackout stoplight operates. Lamp OK. Rear lights cable assembly OK. Composite taillight assembly OK. Turn signal switch OK. Diode D1B OK. Diode D2A OK.
POSSIBLE PROBLEMS
Faulty main light switch. Faulty dashboard cable assembly. Faulty diode D1A. Faulty relay K10.

10.  
Is continuity present between main light switch terminals K and C?

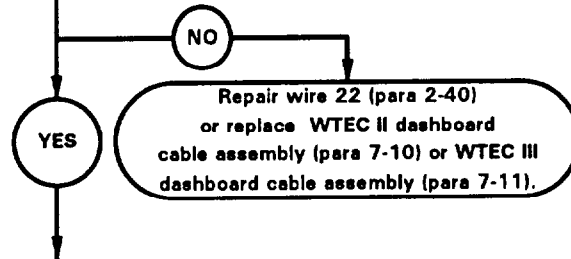
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, main light switch is faulty.



KNOWN INFO
One blackout stoplight operates. Lamp OK. Rear lights cable assembly OK. Composite taillight assembly OK. Turn signal switch OK. Diode D1B OK. Diode D2A OK. Main light switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty diode D1A. Faulty relay K10.

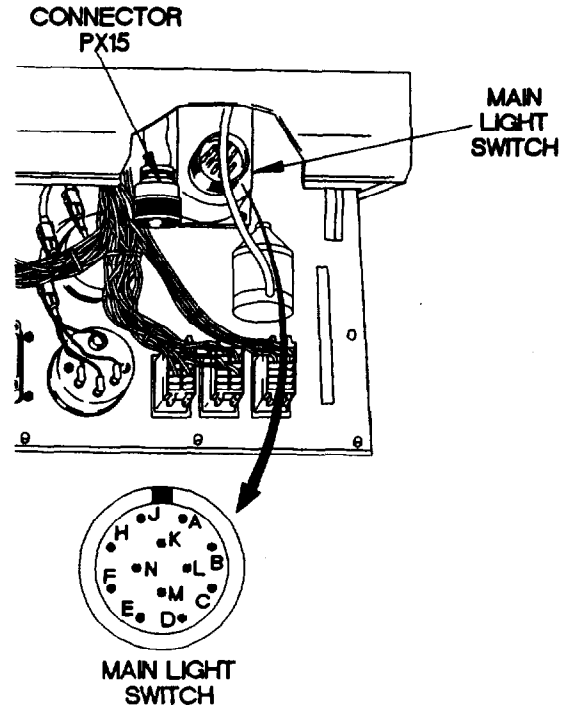
11.  
**WARNING**  
Read WARNING on following page.  
Is 12 vdc present on diode D1A-2?

TEST OPTIONS
Voltage Test STE/ICE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 22 is faulty.



**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX15 from main light switch.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to main light switch terminal K.
- (5) Connect negative (-) probe of multimeter to main light switch terminal C.
- (6) Position main light switch to STOPLIGHT (TM 9-2320-365-10) and note reading on multimeter.
- (7) If continuity is not present, replace main light switch (para 7-17).
- (8) Position main light switch to OFF (TM 9-2320-365-10).
- (9) Connect connector PX15 to main light switch.



X2E6109A

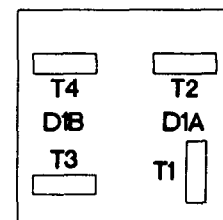
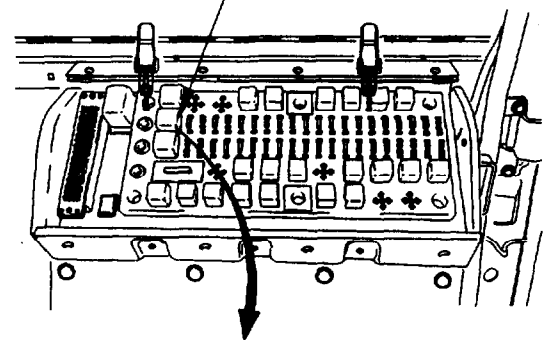
**WARNING**

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 D1A from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 2, where diode D1A was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Position main light switch to STOP LIGHT (TM 9-2320-365-10).
- (8) Depress brake pedal.
- (9) If 12 vdc is not present, repair wire 22 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) Position master power switch to off (TM 9-2320-365-10).
- (11) Position main light switch to OFF (TM 9-2320-365-10).

**DIODE D1 CAVITY**



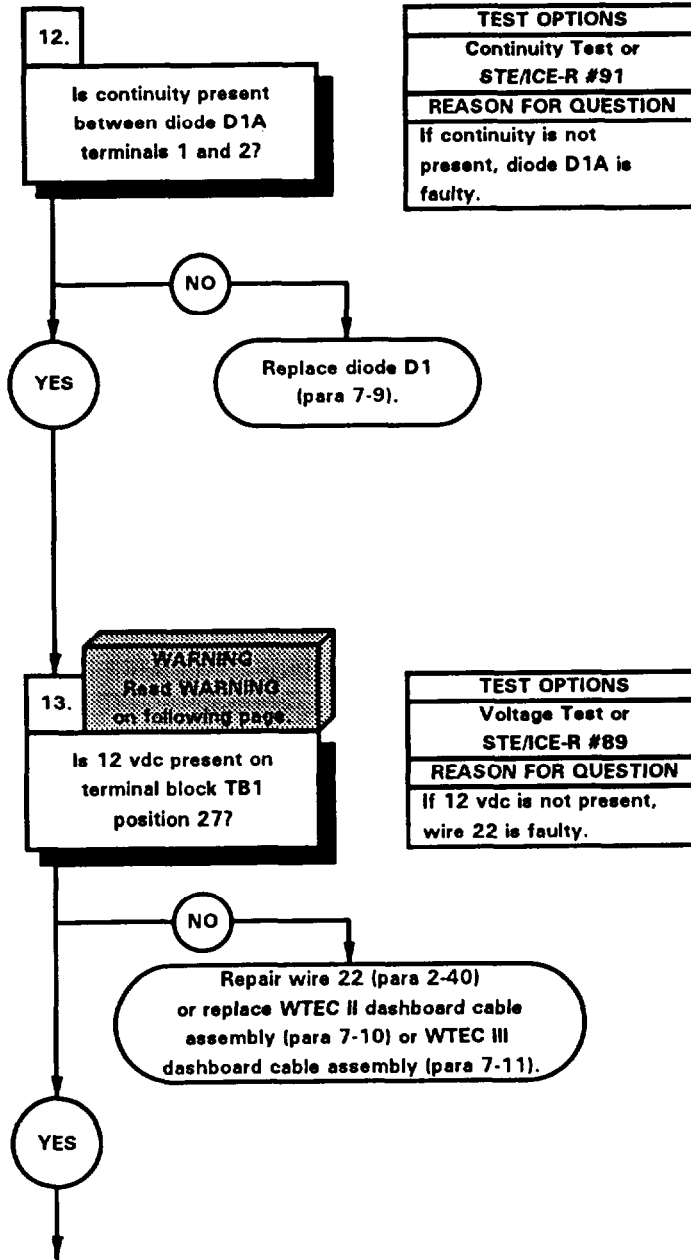
**DIODE D1 CAVITY**

X2E6110A

e59. ONE OR BOTH STOPLIGHTS DO NOT OPERATE (CONT)

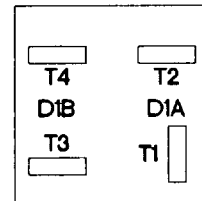
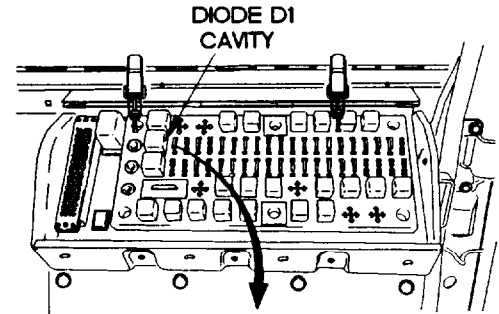
KNOWN INFO
One blackout stoplight operates. Lamp OK. Rear lights cable assembly OK. Composite taillight assembly OK. Turn signal switch OK. Diode D1B OK. Diode D2A OK. Main light switch OK.
POSSIBLE PROBLEMS
Faulty diode D1A. Faulty dashboard cable assembly. Faulty relay K10.

KNOWN INFO
One blackout stoplight operates. Lamp OK. Rear lights cable assembly OK. Composite taillight assembly OK. Turn signal switch OK. Diode D1B OK. Diode D2A OK. Main light switch OK. Diode D1A OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K10.



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to diode D1A-1.
- (3) Connect negative (-) probe of multimeter to diode D1A-2 and note reading on multimeter.
- (4) If continuity is not present, replace diode D1 (para 7-9).



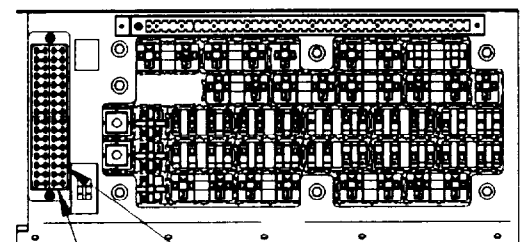
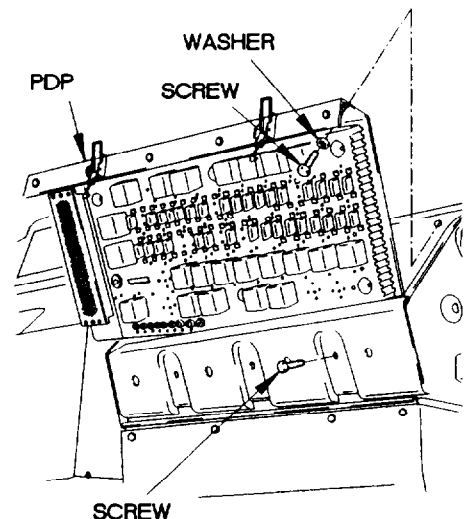
DIODE D1

**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 three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to terminal block TB1 position 27.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to ON (TM 9-2320-365-10).
- (8) Position main light switch to STOPLIGHT (TM 9-2320-365-10).
- (9) Depress brake pedal and note reading on multimeter.
- (10) If 12 vdc is not present, repair wire 22 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (11) Position master power switch to off (TM 9-2320-365-10).
- (12) Position main light switch to OFF (TM 9-2320-365-10).
- (13) Install PDP on dashboard with three screws.
- (14) Install three washers and screws in PDP.

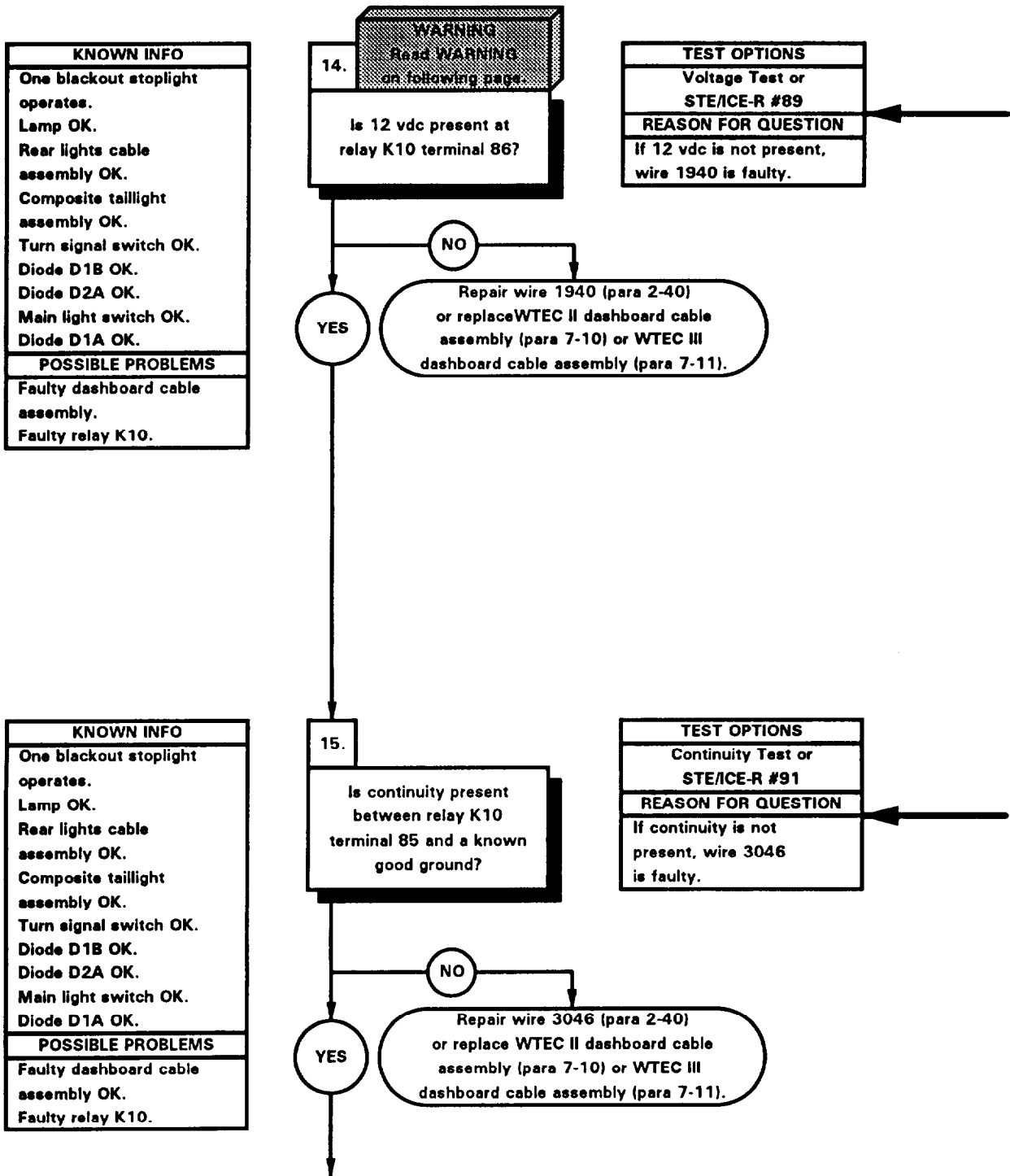


TERMINAL BOARD TB1  
POSITION 27

x2E 61121



e59. ONE OR BOTH STOPLIGHTS DO NOT OPERATE (CONT)

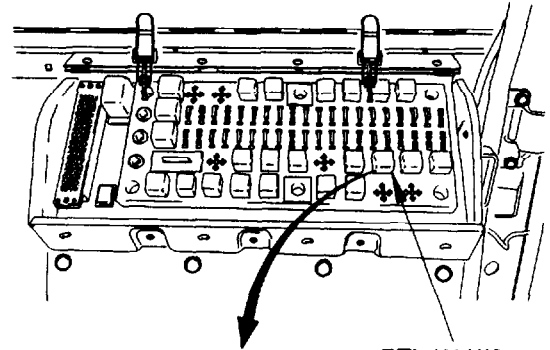


**WARNING**

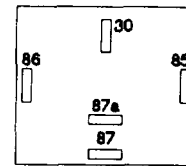
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Remove relay K10 from PDP.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K10 terminal 86 was removed.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Position main light switch to STOPLIGHT (TM 9-2320-365-10).
- (7) Depress brake pedal and note reading on multimeter.
- (8) If 12 vdc is not present, repair wire 1940 (para 2-40) 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 9-2320-365-10).
- (10) Position main light switch to OFF (TM 9-2320-365-10).



RELAY K10 CAVITY



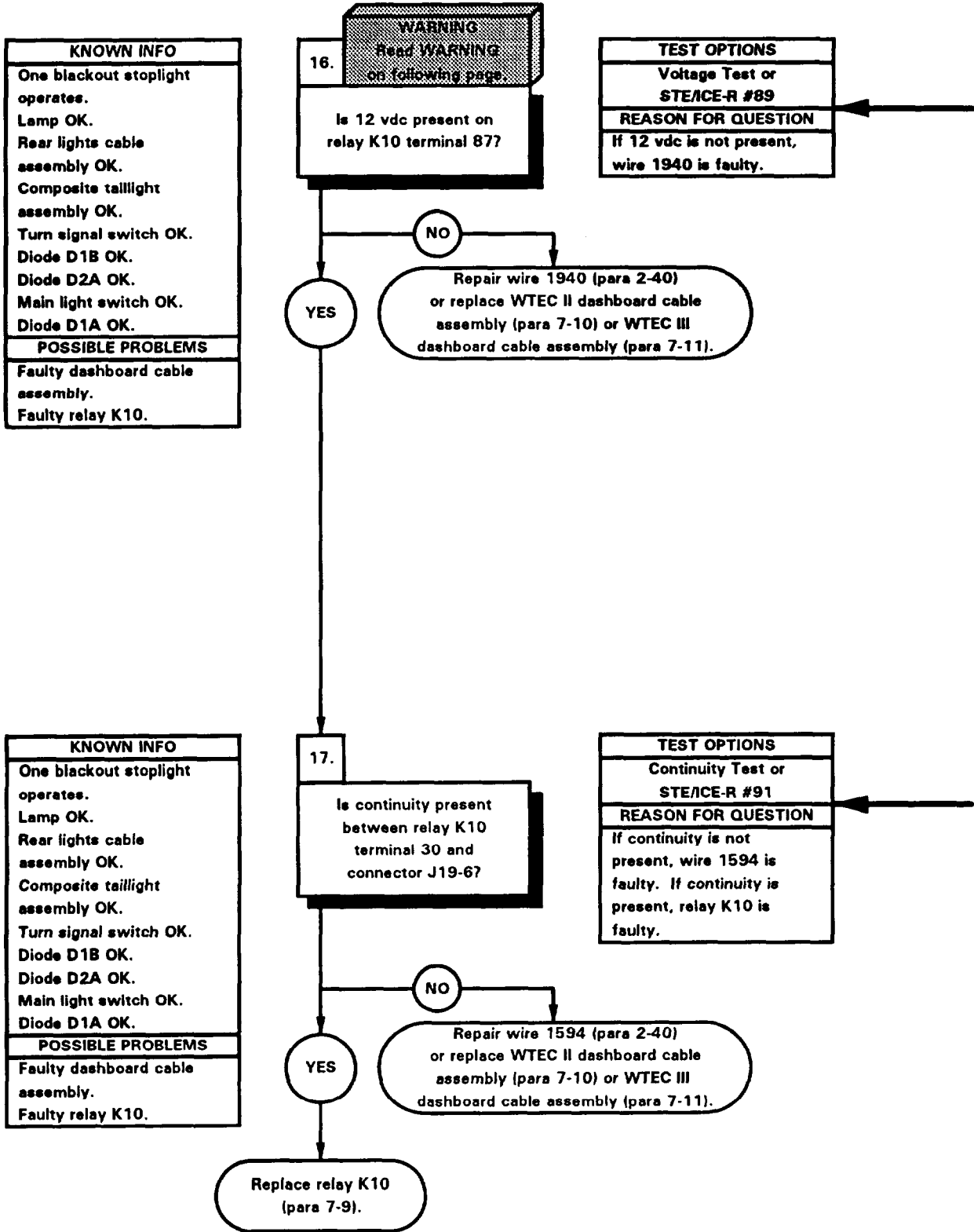
RELAY K10 CAVITY

X2E6113A

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K10 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3046 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

e59. ONE OR BOTH STOPLIGHTS DO NOT OPERATE (CONT)



**WARNING**

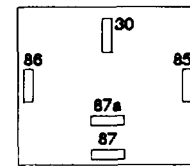
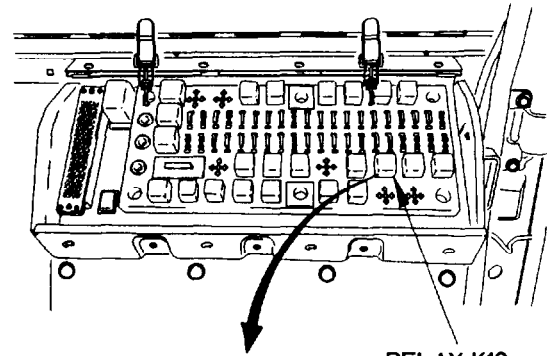
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 87, where relay K10 terminal 87 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Position main light switch to STOPLIGHT (TM 9-2320-365-10).
- (6) Depress brake pedal and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1940 (para 2-40) 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 9-2320-365-10).
- (9) Position main light switch to OFF (TM 9-2320-365-10).

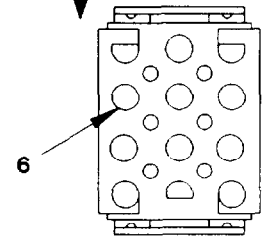
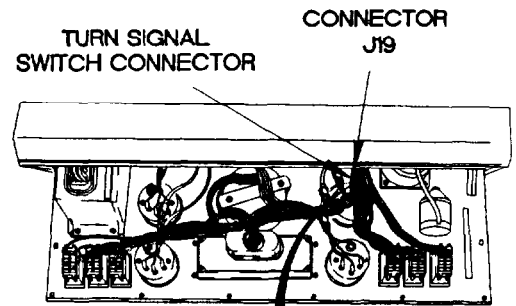
**CONTINUITY TEST**

- (1) Disconnect turn signal switch connector from connector J19.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to PDP, terminal 30, where relay K10 terminal 30 was removed.
- (4) Connect negative (-) probe of multimeter to connector J19-6.
- (5) If continuity is not present, repair wire 1594 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) If continuity is present, replace relay K10 (para 7-9).
- (7) Install relay K10 in PDP.
- (8) Connect connector J19 to turn signal switch connector.
- (9) Install instrument panel assembly (para 7-15).
- (10) Install PDP cover (para 16-2).

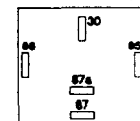
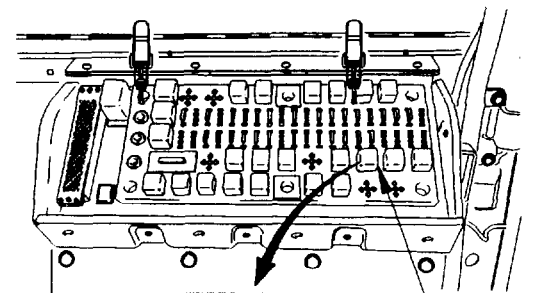


RELAY K10 CAVITY

x2E6113A



J19

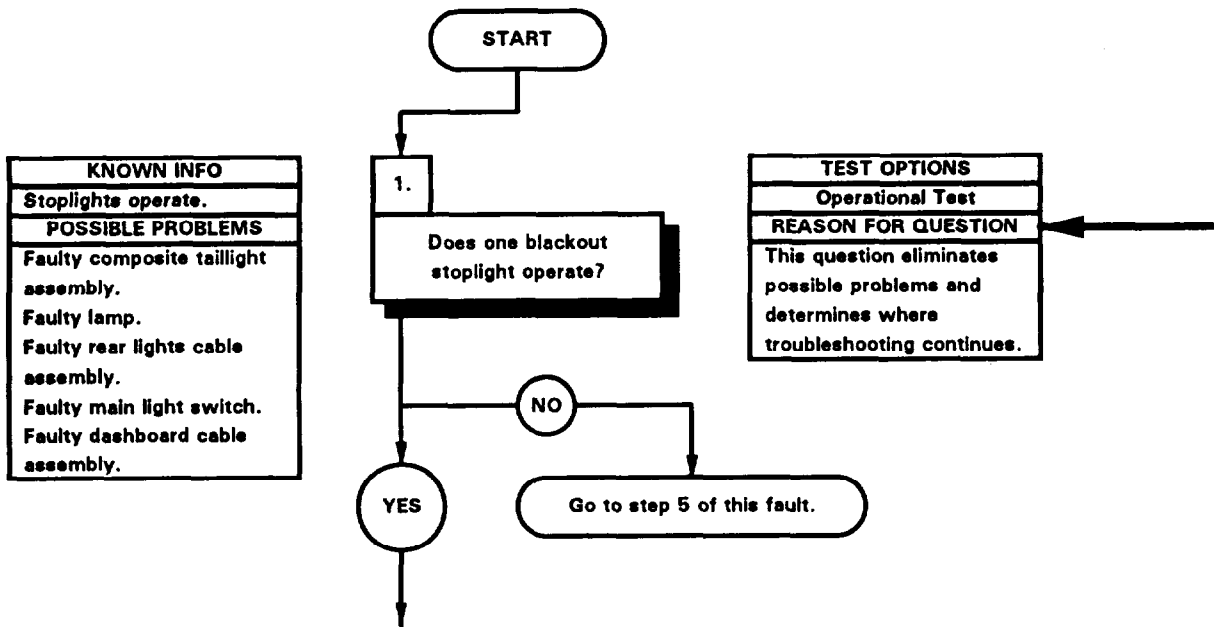


RELAY K10 CAVITY

RELAY K10 CAVITY

x2E6114A

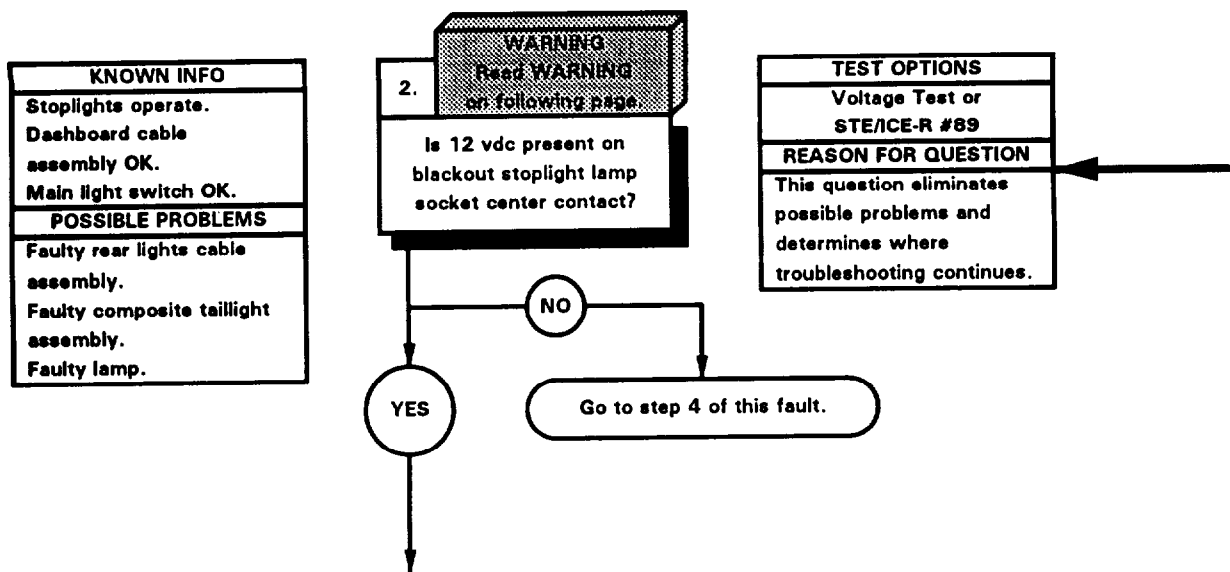
60. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Packing, Preformed (Item 170, Appendix G)	



**OPERATIONAL TEST**

- (1) Position master power switch to on  
(TM 9-2320-365-10).
- (2) Position main light switch to BO DRIVE  
(TM 9-2320-365-10).
- (3) Depress brake pedal and observe blackout  
stoplight operation.
- (4) If both blackout stoplights do not illuminate,  
go to step 5 of this fault.
- (5) Position master power switch to off  
(TM 9-2320-365-10).
- (6) Position main light switch to OFF  
(TM 9-2320-365-10).

e60. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)

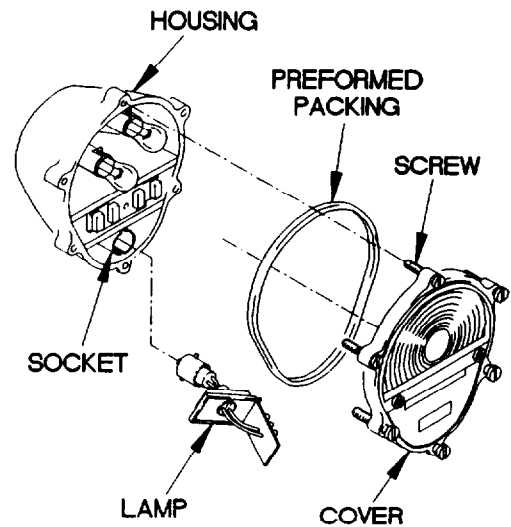


**WARNING**

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 six screws and remove cover and preformed packing from housing. Discard preformed packing.
- (2) Remove lamp from socket.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to blackout stoplight lamp socket center contact.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Position main light switch to BO DRIVE (TM 9-2320-365-10).
- (8) Depress brake pedal and note reading on multimeter.
- (9) If 12 vdc is not present, go to step 4 of this fault.
- (10) Position master power switch to off (TM 9-2320-365-10).
- (11) Position main light switch to OFF (TM 9-2320-365-10).

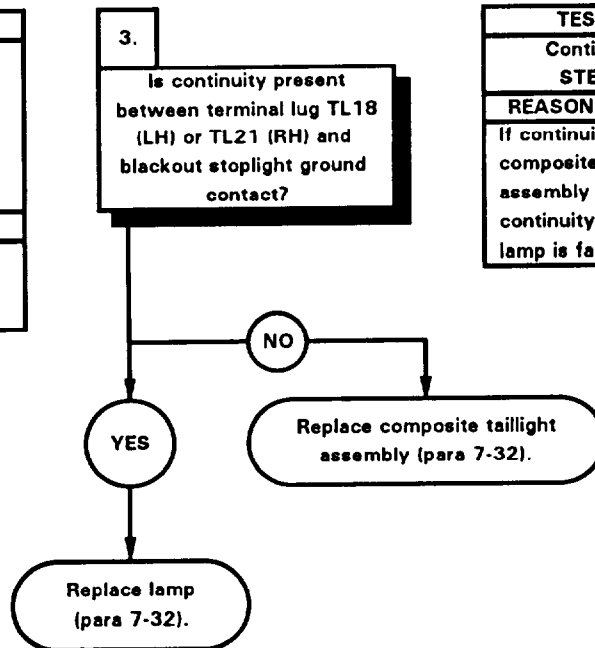


X2E6201A

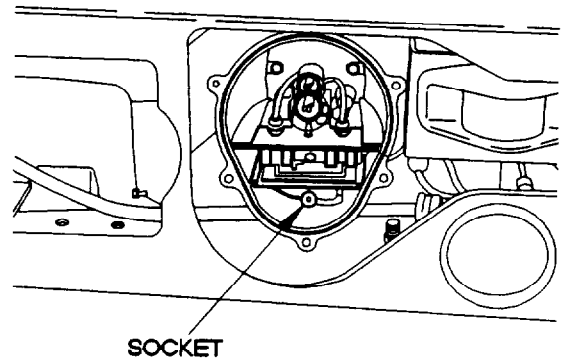


e60. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)

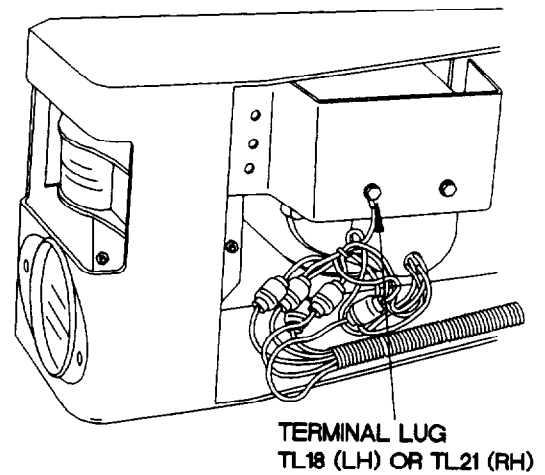
KNOWN INFO
Stoplights operate. Rear lights cable assembly OK. Main light switch OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty composite taillight assembly. Faulty lamp.



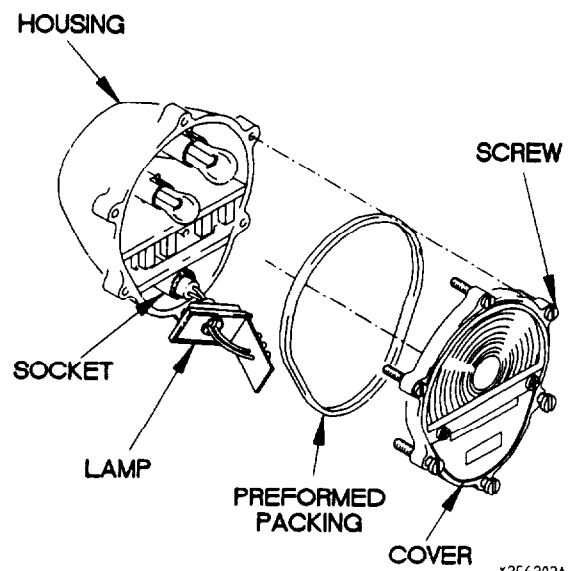
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, composite taillight assembly is faulty. If continuity is present, lamp is faulty.



- | CONTINUITY TEST |  |
|-----------------|--|
| (1)             | Set multimeter to ohms.  |
| (2)             | Connect positive (+) probe of multimeter to terminal lug TL18 (LH) or TL21 (RH).                           |
| (3)             | Connect negative (-) probe of multimeter to blackout stoplight lamp socket and note reading on multimeter. |
| (4)             | If continuity is not present, replace composite taillight assembly (para 7-32).                            |
| (5)             | If continuity is present, replace lamp (para 7-32).  |
| (6)             | Install lamp in socket.  |
| (7)             | Install preformed packing and cover on housing with six screws.  |

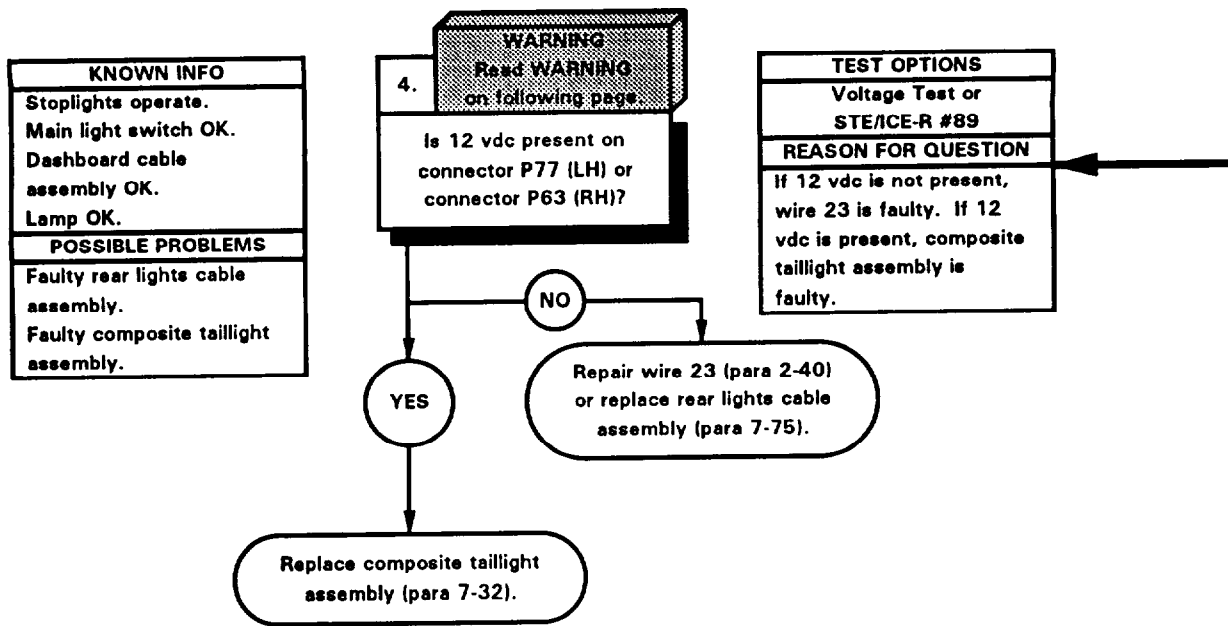


X2E6202A



X2E6203A

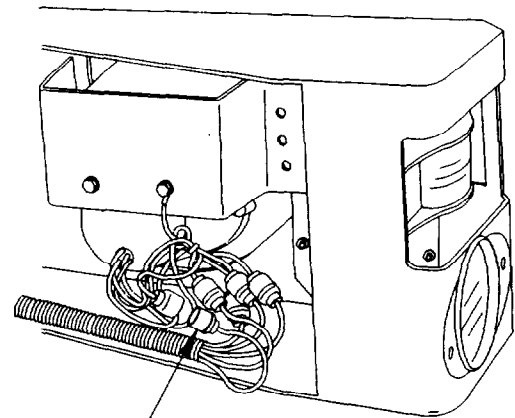
e60. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)



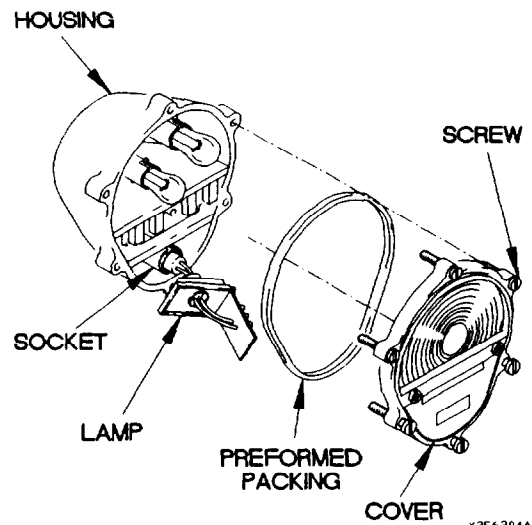
**WARNING**

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) Disconnect connector P77 (LH) or connector P63 (RH) from blackout stoplight connector.
  - (3) Connect positive (+) probe of multimeter to connector P77 (LH) or connector P63 (RH).
  - (4) Connect negative (-) probe of multimeter to ground.
  - (5) Position master power switch to on (TM 9-2320-365-10).
  - (6) Position main light switch to BO DRIVE (TM 9-2320-365-10).
  - (7) Depress brake pedal and note reading on multimeter.
  - (8) If 12 vdc is not present, repair wire 23 (para 2-40) or replace rear lights cable assembly (para 7-75).
  - (9) If 12 vdc is present, replace composite taillight assembly (para 7-32).
  - (10) Position master power switch to off (TM 9-2320-365-10).
  - (11) Position main light switch to OFF (TM 9-2320-365-10).
  - (12) Install lamp in socket.
  - (13) Install preformed packing and cover on housing with six screws.



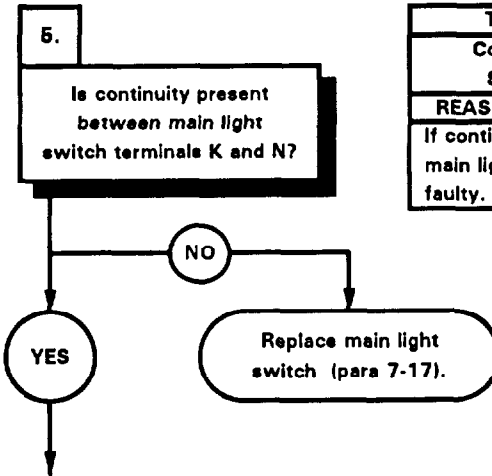
CONNECTOR P77 OR P63



x2E6204A

e60. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)

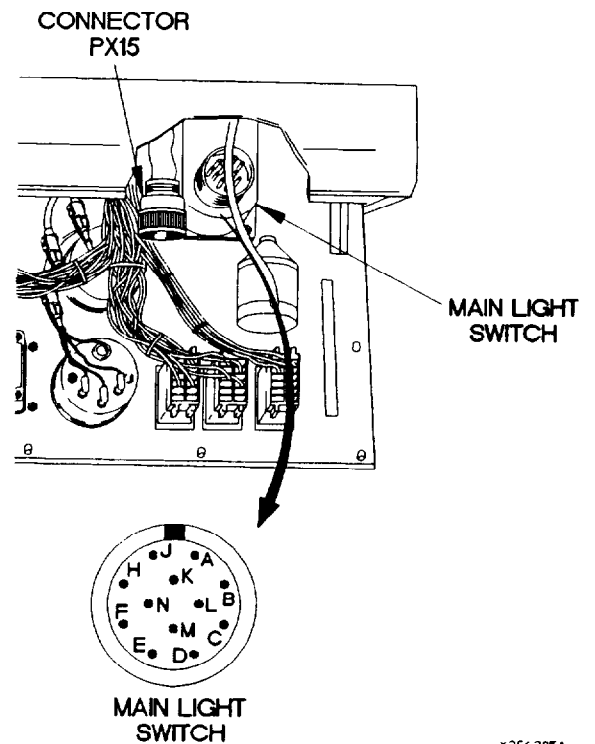
KNOWN INFO
Stoplights operate. Composite taillight assembly OK. Lamp OK.
POSSIBLE PROBLEMS
Faulty main light switch. Faulty dashboard cable assembly. Faulty rear lights cable assembly.



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

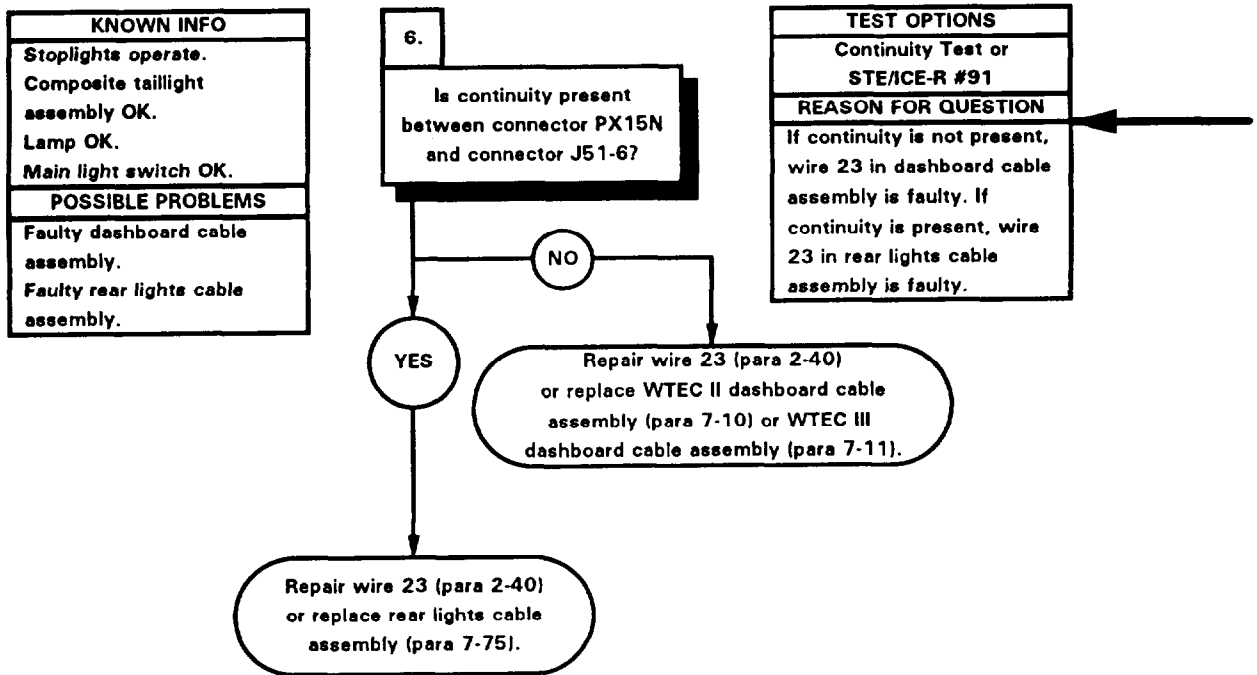
**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX15 from main light switch.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to main light switch terminal K.
- (5) Connect negative (-) probe of multimeter to main light switch terminal N.
- (6) Position main light switch to BO DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (7) If continuity is not present, replace main light switch (para 7-17).
- (8) Position main light switch to OFF (TM 9-2320-365-10).



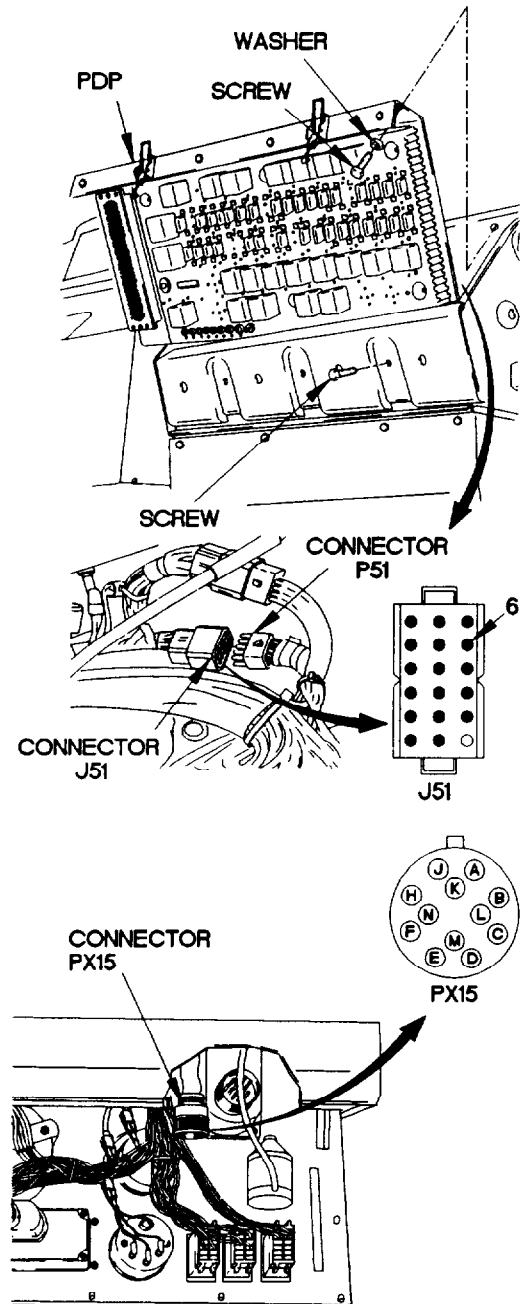
x2c6205A

e60. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)



**CONTINUITY TEST**

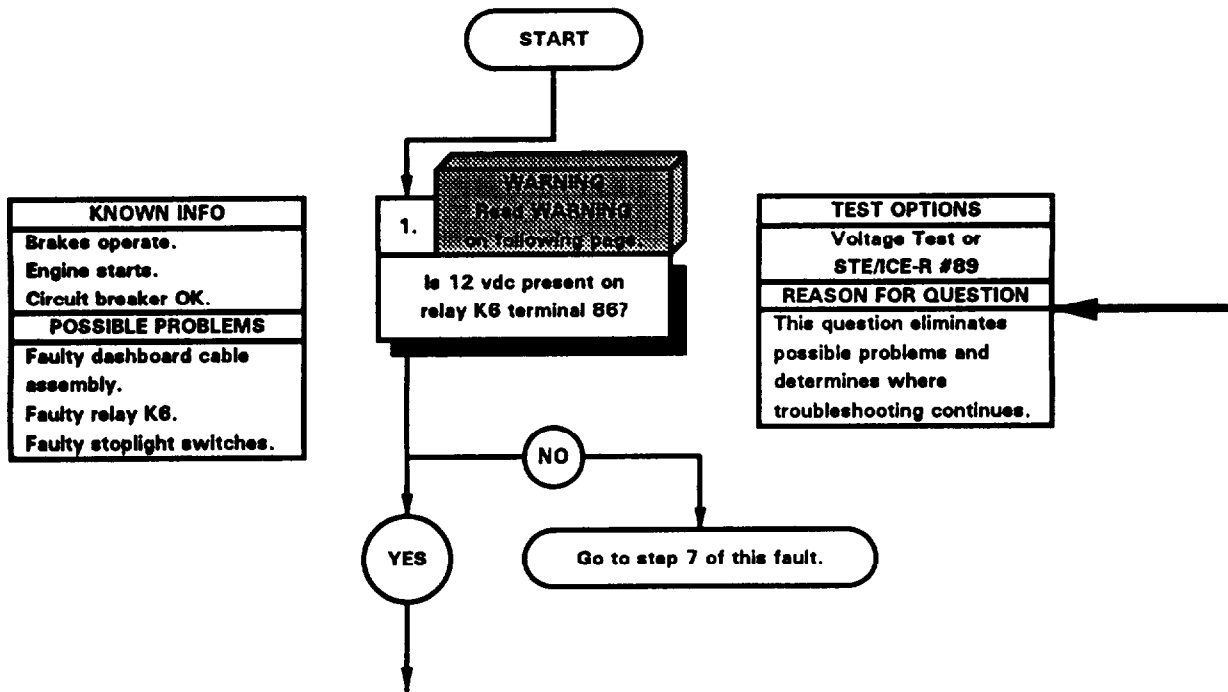
- (1) Remove PDP cover (para 16-2).
- (2) Remove three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Disconnect connector J51 from connector P51.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector PX15N.
- (8) Connect negative (-) probe of multimeter to connector J51-6 and note reading on multimeter.
- (9) If continuity is not present, repair wire 23 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) If continuity is present, repair wire 23 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (11) Connect connector PX15 to main light switch.
- (12) Install instrument panel assembly (para 7-15).
- (13) Connect connector J51 to connector P51.
- (14) Install PDP on dashboard with three screws.
- (15) Install three washers and screws in PDP.
- (16) Install PDP cover (para 16-2).



x2E6206i



e61. STOPLIGHTS AND BLACKOUT STOPLIGHTS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

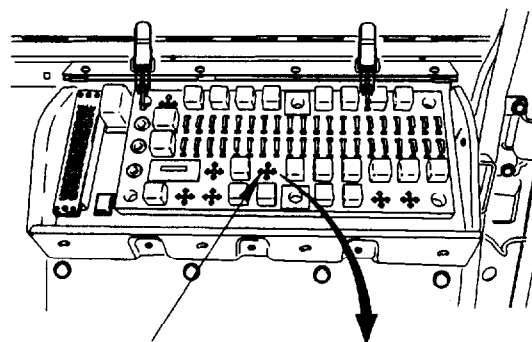


**WARNING**

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.

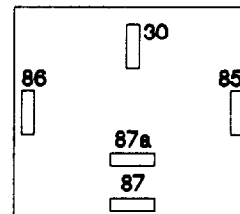
**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K6 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K6 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, go to step 7 of this fault.
- (8) Position master power switch to off (TM 9-2320-365-10).



RELAY K6 CAVITY

RELAY K6 CAVITY



FRONT

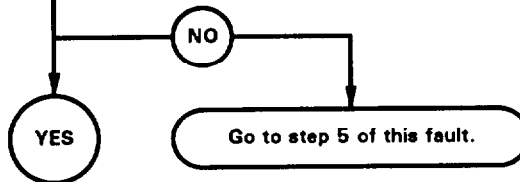
K2E6301A

e61. STOPLIGHTS AND BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)

KNOWN INFO
Brakes operate.
Engine starts.
Circuit breaker OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K6.
Faulty stoplight switches.

2.  
Is continuity present between relay K6 terminal 85 and a known good ground while depressing brake pedal?

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

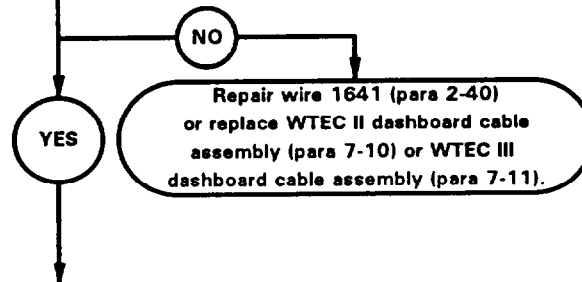


KNOWN INFO
Brakes operate.
Engine starts.
Circuit breaker OK.
Stoplight switches OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K6.

**WARNING**  
Read WARNING on following page.

3.  
Is 12 vdc present at relay K6 terminal 30?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 1641 is faulty.



**CONTINUITY TEST**

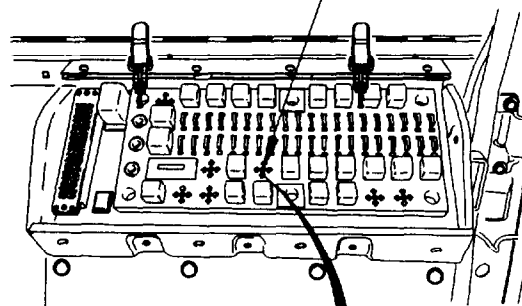
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K6 was removed.
- (3) Connect negative (-) probe of multimeter to ground.

**NOTE**

Full system air pressure is required to actuate stoplights.

- (4) Apply brakes (TM 9-2320-365-10) and note reading on multimeter.
- (5) If continuity is not present, go to step 5 of this fault.

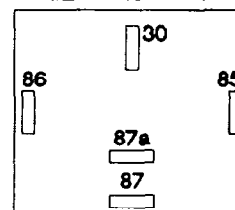
RELAY K6 CAVITY



**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.

RELAY K6 CAVITY



FRONT

**VOLTAGE TEST**

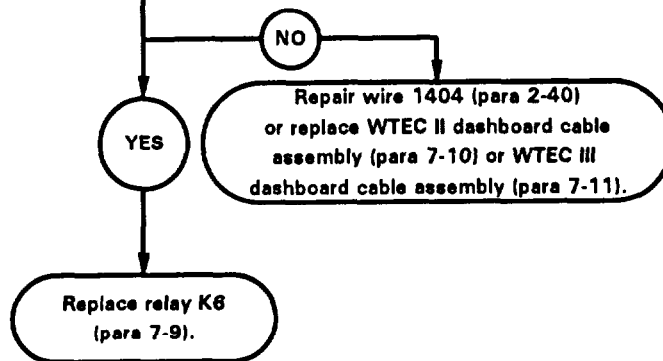
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 30, where relay K6 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1641 (para 2-40) 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 9-2320-365-10).

e61. STOPLIGHTS AND BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)

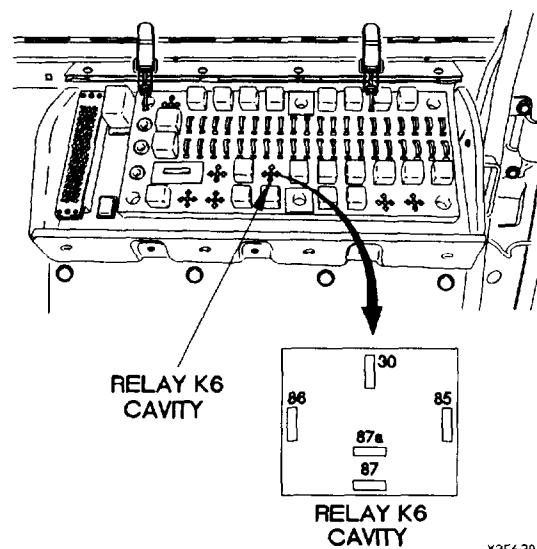
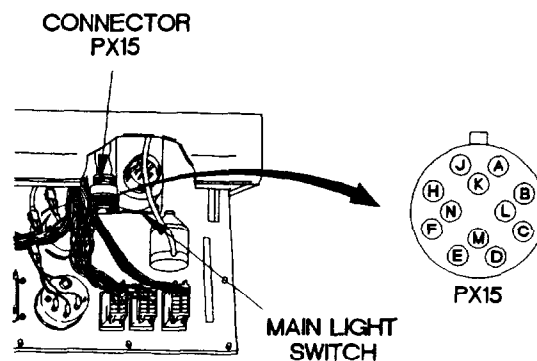
<b>KNOWN INFO</b>
Brakes operate.
Engine starts.
Circuit breaker OK.
Stoplight switches OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly.
Faulty relay K6.

4.  
Is continuity present between relay K6 terminal 87 and connector PX15-K7

<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 1404 is faulty. If continuity is present, relay K6 is faulty.



- CONTINUITY TEST**
- (1) Remove instrument panel assembly for access (para 7-15).
  - (2) Disconnect connector PX15 from main light switch.
  - (3) Connect positive (+) probe of multimeter to connector PX15-K.
  - (4) Connect negative (-) probe of multimeter to PDP, terminal 87, where relay K6 was removed, and note reading on multimeter.
  - (5) If continuity is not present, repair wire 1404 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - (6) If continuity is present, replace relay K6 (para 7-9).
  - (7) Install relay K6 in PDP.
  - (8) Install PDP cover (para 16-2).
  - (9) Connect connector PX15 to main light switch.
  - (10) Install instrument panel assembly (para 7-15).

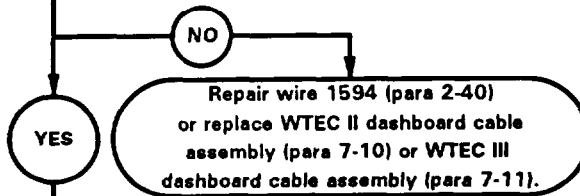


e61. STOPLIGHTS AND BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)

KNOWN INFO
Brakes operate. Engine starts. Circuit breaker OK. Relay K6 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty stoplight switches.

5.  
Is continuity present between relay K6 terminal 85 and terminal lug TL154?

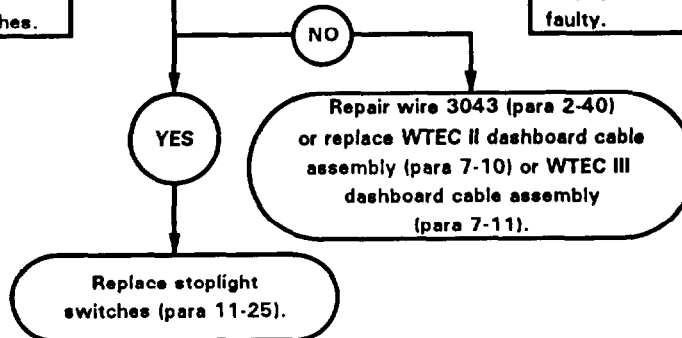
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1594 is faulty.



KNOWN INFO
Brakes operate. Engine starts. Circuit breaker OK. Relay K6 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty stoplight switches.

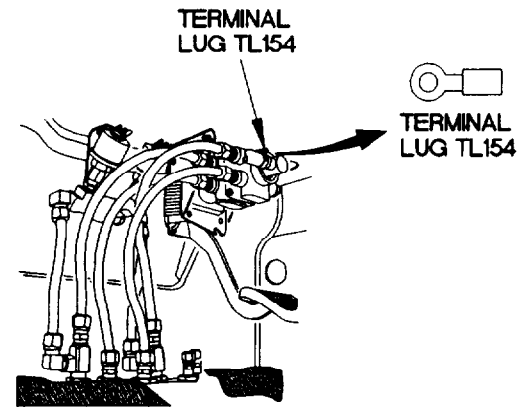
6.  
Is continuity present between terminal lug TL155 and a known good ground?

TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3043 is faulty. If continuity is present, stoplight switches are faulty.

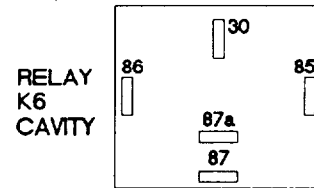
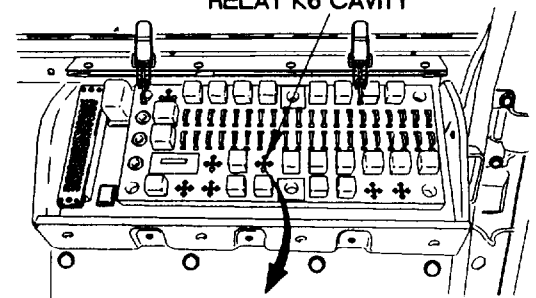


**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal lug TL154.
- (3) Connect negative (-) probe of multimeter to PDP, terminal 85, where relay K6 was removed, and note reading on multimeter.
- (4) If continuity is not present, repair wire 1594 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) Install relay K6 in PDP.
- (6) Install PDP cover (para 16-2).



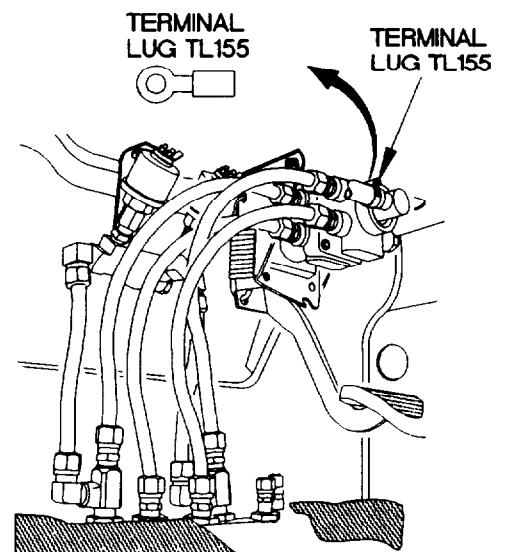
**RELAY K6 CAVITY**



x2E6304A

**CONTINUITY TEST**

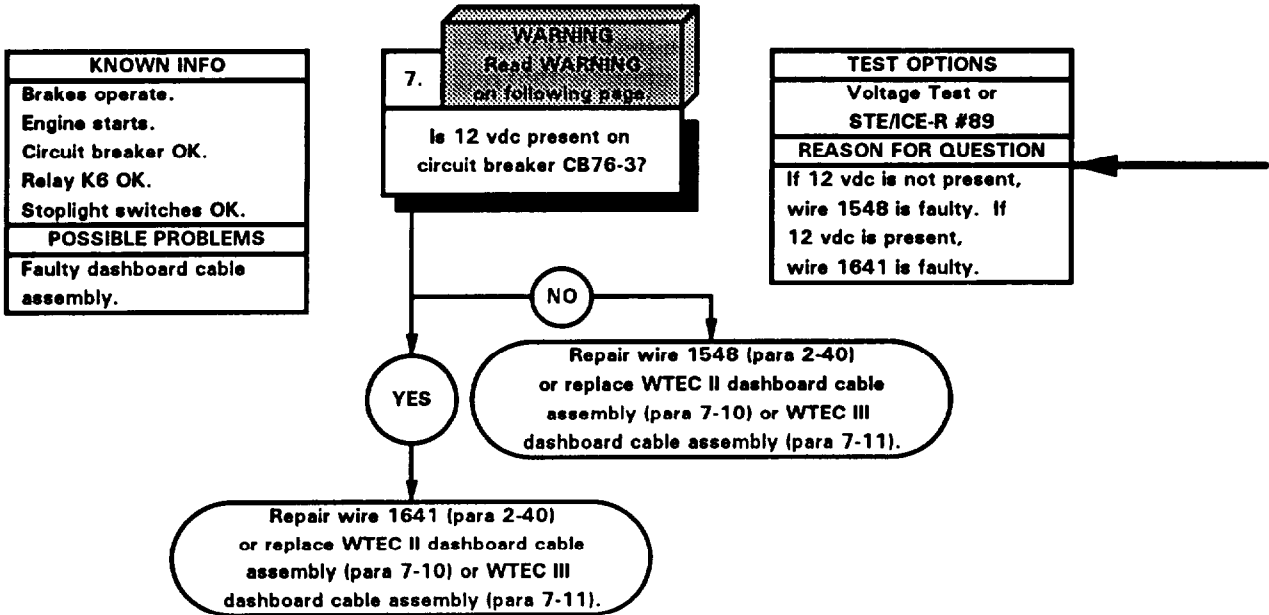
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal lug TL155.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3043 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) If continuity is present, replace both stoplight switches (para 11-25).



x2E6005-



61. STOPLIGHTS AND BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)

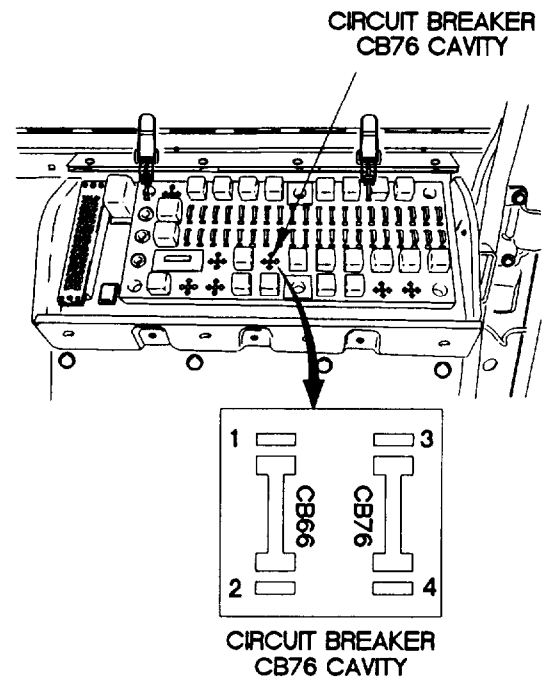


**WARNING**

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.

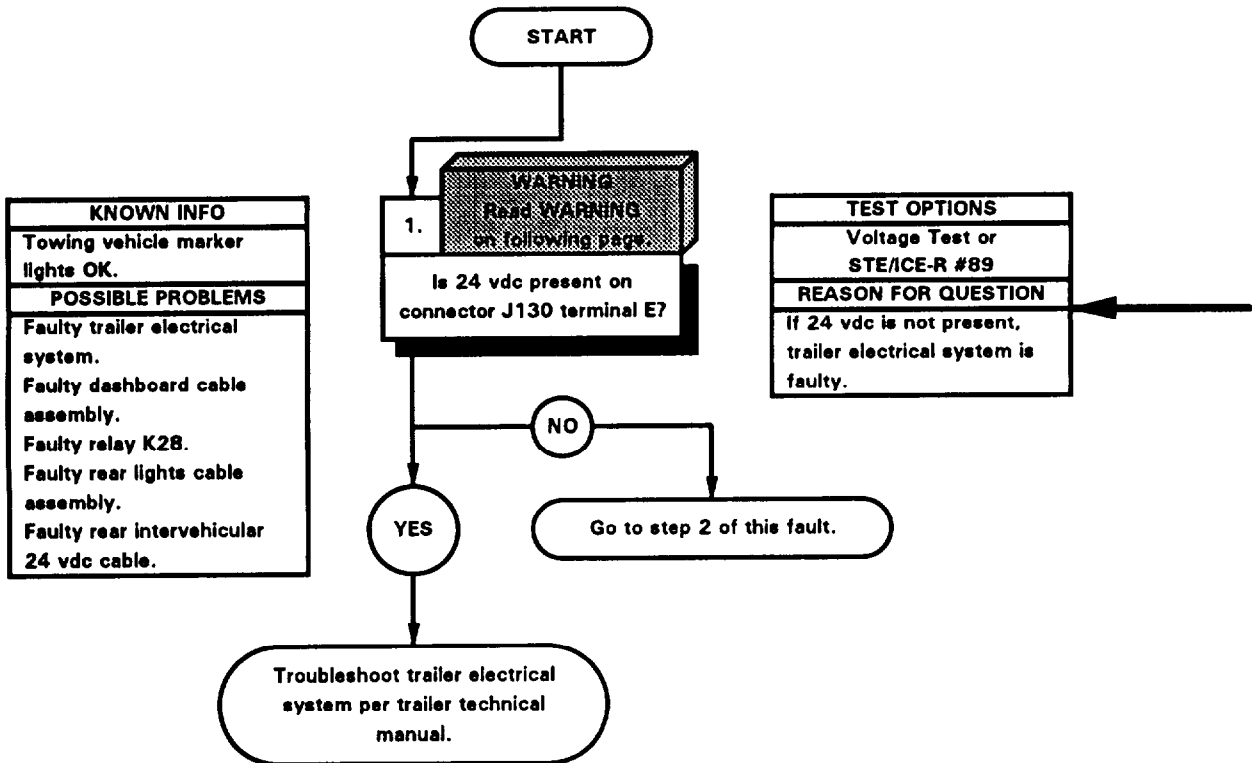
**VOLTAGE TEST**

- (1) Remove circuit breaker CB76 from PDP.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to PDP, terminal 3, where circuit breaker CB76 was removed.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, repair wire 1548 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) If 12 vdc is present, repair wire 1641 (para 2-40) 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 9-2320-365-10).
- (9) Install circuit breaker CB76 in PDP.
- (10) Install relay K6 in PDP.
- (11) Install PDP cover (para 16-2).



X2E6 306A

e62. TRAILER MARKER/TAILLIGHTS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect. 50 ft (Item 77, Appendix D)	

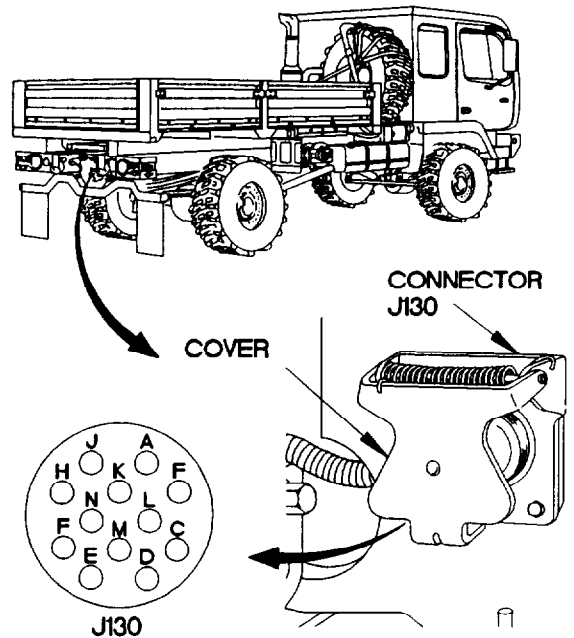


**WARNING**

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.

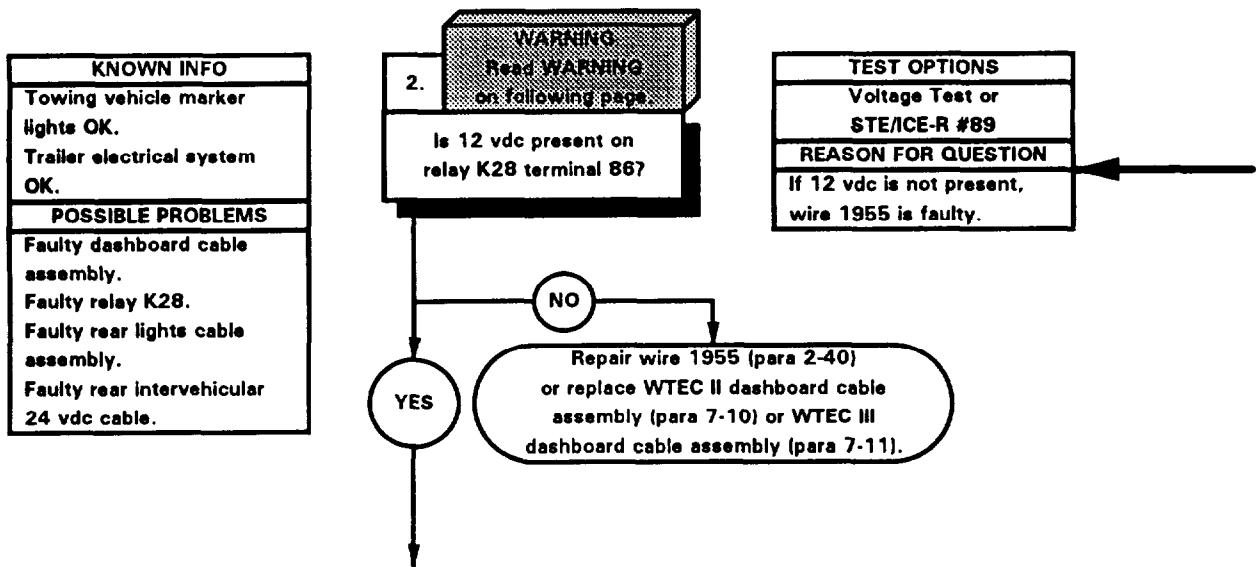
**VOLTAGE TEST**

- (1) Lift cover on connector J130 intervehicular 24 vdc connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J130 terminal E.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 2 of this fault.
- (7) If 24 vdc is present, troubleshoot trailer electrical system per trailer technical manual.
- (8) Position main light switch to OFF (TM 9-2320-365-10).
- (9) Lower cover on connector J130 intervehicular 24 vdc connector.



32E6501A

e62. TRAILER MARKER/TAILLIGHTS DO NOT ILLUMINATE (CONT)



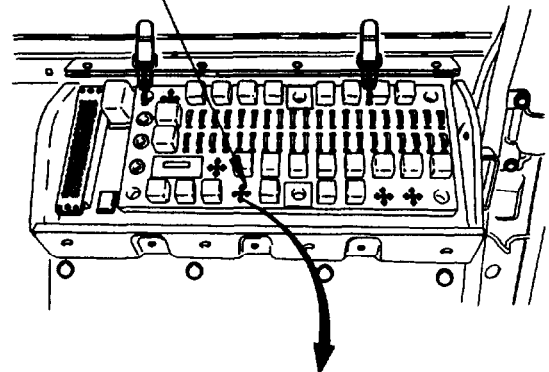
**WARNING**

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.

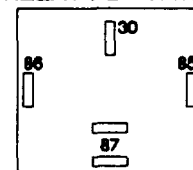
**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K28 from PDP.
- (3) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K28 was removed.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, repair wire 1955 (para 2-40) 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 9-2320-365-10).

RELAY K28 CAVITY



RELAY K28 CAVITY



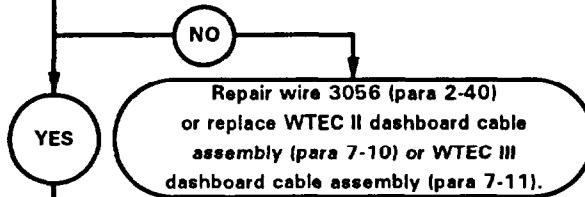
K2E6502A

e62. TRAILER MARKER/TAILLIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle marker lights OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K28. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.

3.  
Is continuity present between relay K28 terminal 85 and a known good ground?

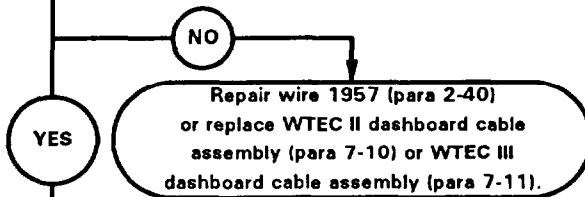
TEST OPTIONS
Continuity Test or STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, wire 3056 is faulty.



KNOWN INFO
Towing vehicle marker lights OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K28. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.

4. **WARNING**  
Read WARNING on following page.  
Is 24 vdc present on relay K28 terminal 30?

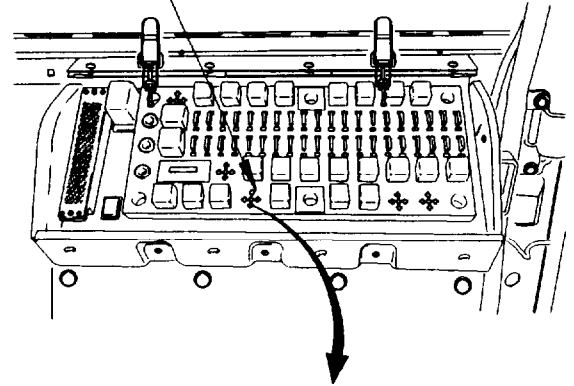
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1957 is faulty.



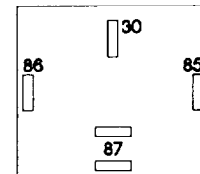
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K28 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3056 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

RELAY K28 CAVITY



RELAY K28 CAVITY



**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 30, where relay K28 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1957 (para 2-40) 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 9-2320-365-10).

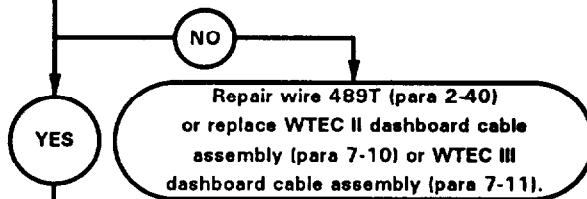


e62. TRAILER MARKER/TAILLIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle marker lights OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K28. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.

5.  
Is continuity present between relay K28 terminal 87 and connector J51-9?

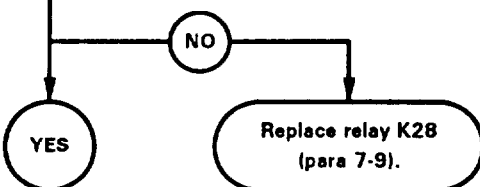
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 489T is faulty.



KNOWN INFO
Towing vehicle marker lights OK. Trailer electrical system OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty relay K28. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.

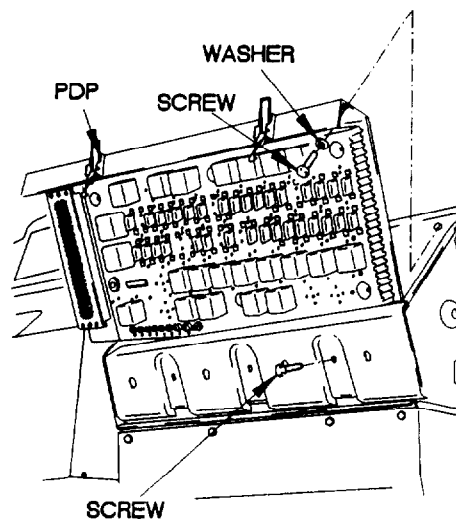
6. **WARNING**  
Read WARNING on following page.  
Is 24 vdc present on connector J51-9?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, relay K28 is faulty.

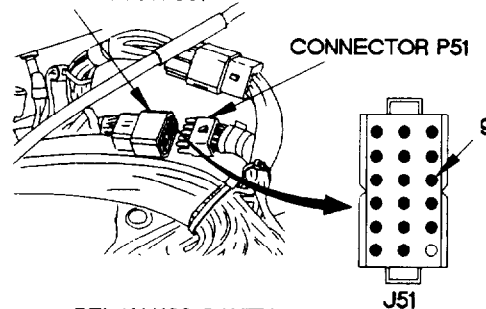


**CONTINUITY TEST**

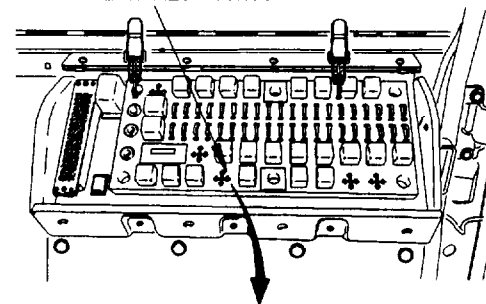
- (1) Remove three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Disconnect connector J51 from connector P51.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to PDP, terminal 87, where relay K28 was removed.
- (7) Connect negative (-) probe of multimeter to connector J51-9 and note reading on multimeter.
- (8) If continuity is not present, repair wire 489T (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Install relay K28 in PDP.



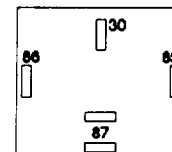
CONNECTOR J51



RELAY K28 CAVITY



RELAY K28 CAVITY



**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 J51-9.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (5) If 24 vdc is not present, replace relay K28 (para 7-9).
- (6) Position main light switch to OFF (TM 9-2320-365-10).

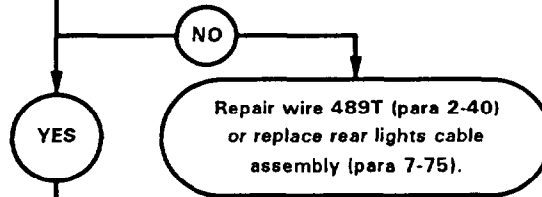
K2C65041

e62. TRAILER MARKER/TAILLIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle marker lights OK.
Trailer electrical system OK.
Dashboard cable assembly OK.
Relay K28 OK.
POSSIBLE PROBLEMS
Faulty rear lights cable assembly.
Faulty rear intervehicular 24 vdc cable.

7.  
Is continuity present between connector P51-9 and connector P53R2?

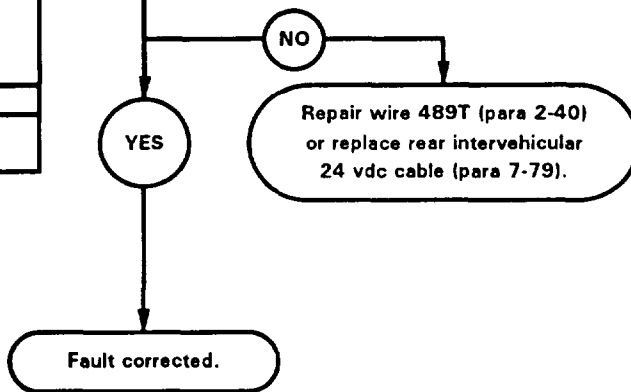
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 489T is faulty.



KNOWN INFO
Towing vehicle marker lights OK.
Trailer electrical system OK.
Dashboard cable assembly OK.
Relay K28 OK.
Rear lights cable assembly OK.
POSSIBLE PROBLEMS
Faulty rear intervehicular 24 vdc cable.

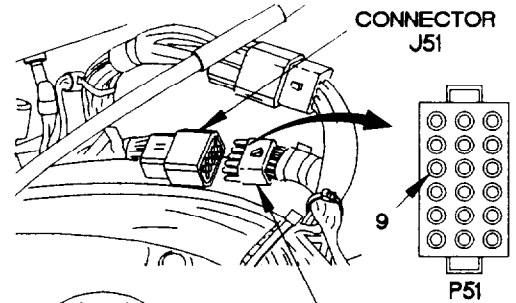
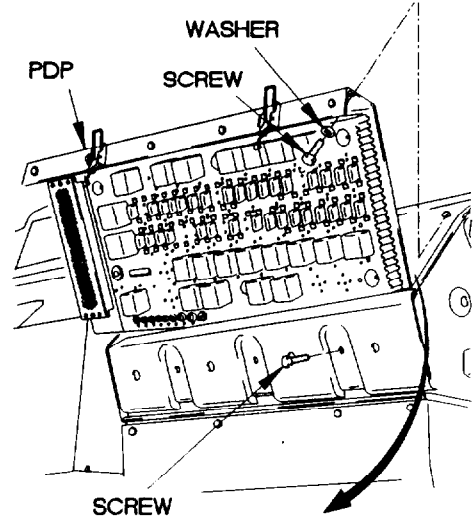
8.  
Is continuity present between connector J53R2 and connector J130-E7?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 489T is faulty.



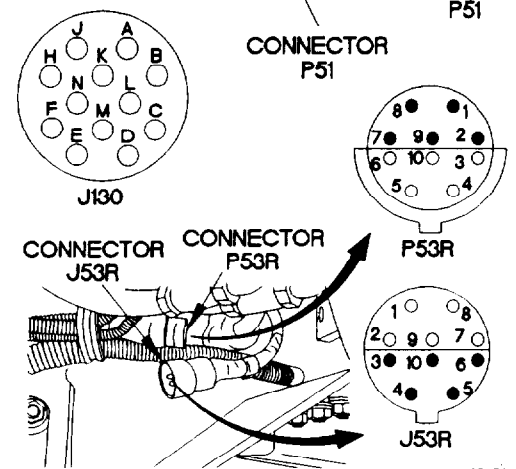
**CONTINUITY TEST**

- (1) Disconnect connector P53R from J53R.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P51-9.
- (4) Connect negative (-) probe of multimeter to connector P53R2 and note reading on multimeter.
- (5) If continuity is not present, repair wire 489T (para 2-40) or replace rear lights cable assembly (para 7-75).
- (6) Connect connector P51 to connector J51.
- (7) Install PDP on dashboard with three screws.
- (8) Install three washers and screws in PDP.
- (9) Install PDP cover (para 16-2).



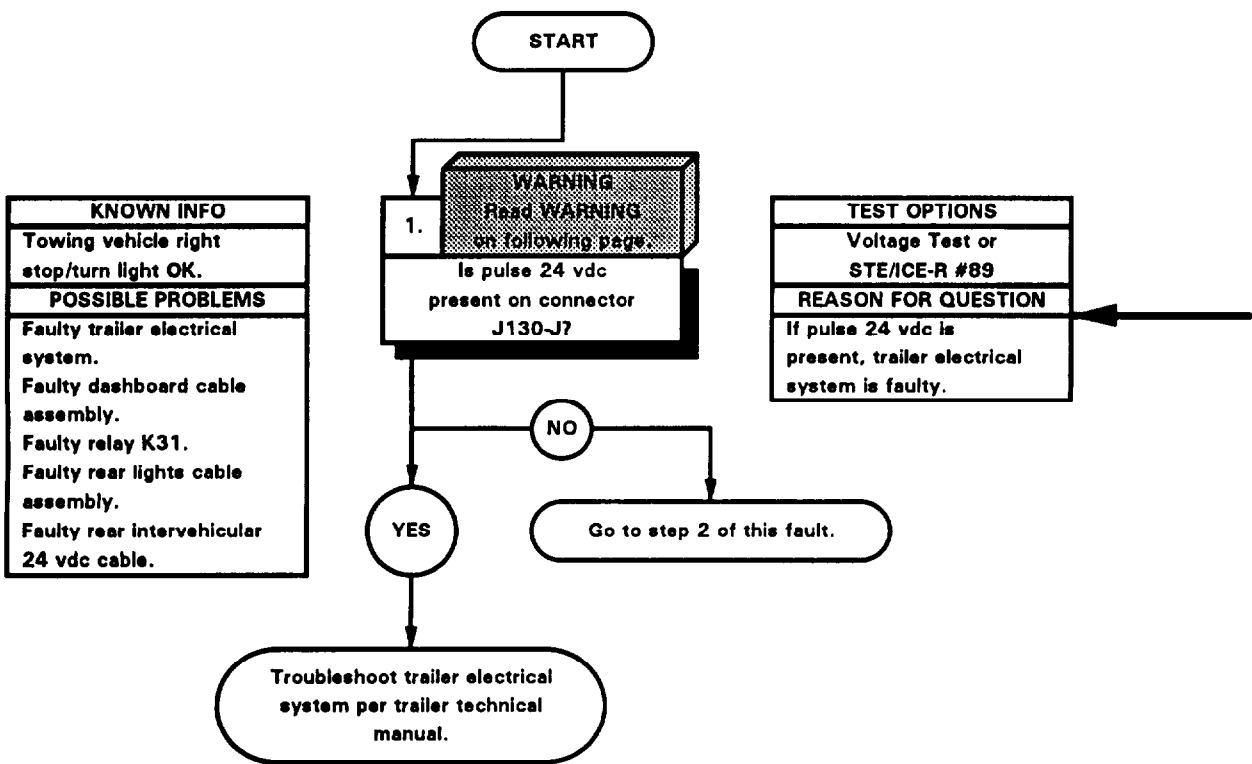
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J53R2.
- (3) Connect negative (-) probe of multimeter to connector J130-E and note reading on multimeter.
- (4) If continuity is not present, repair wire 489T (para 2-40) or replace rear intervehicular 24 vdc cable (para 7-79).
- (5) Connect connector P53 to connector J53.



x2c65061

63. TRAILER RIGHT STOP/TURN LIGHT DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	

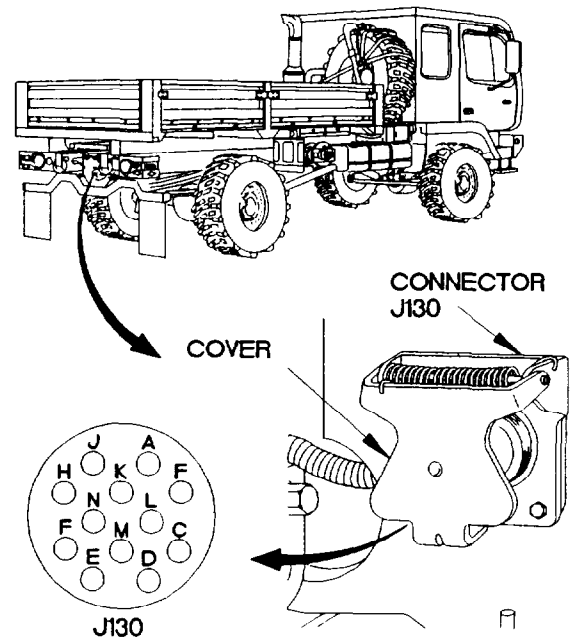


**WARNING**

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.

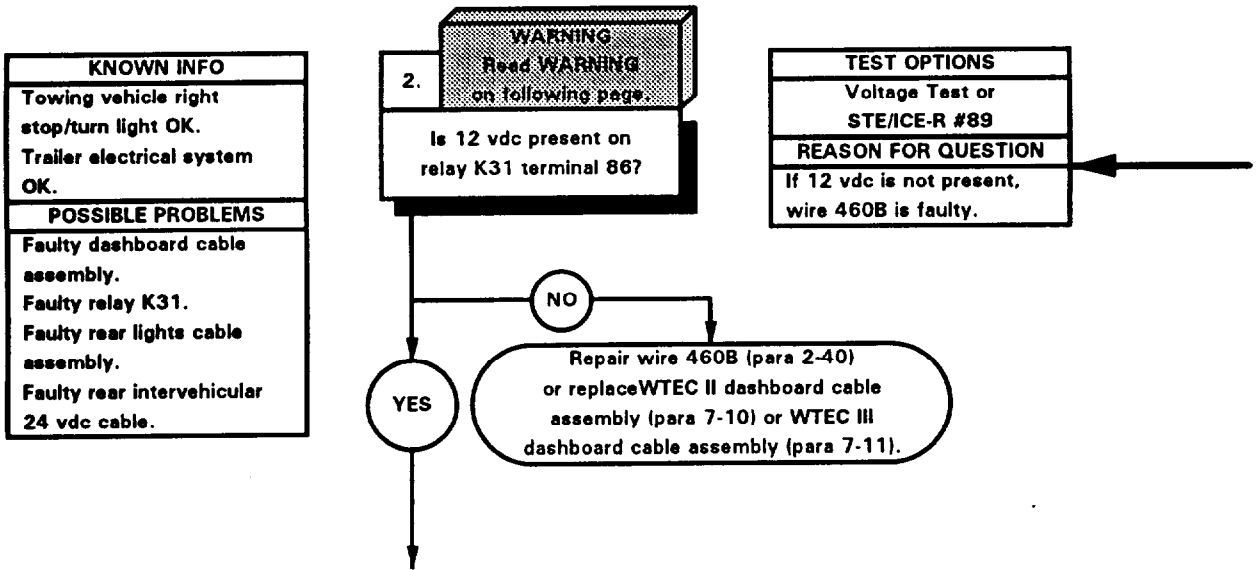
**VOLTAGE TEST**

- (1) Lift cover on connector J130 intervehicular 24 vdc connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J130-J.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (6) Position turn signal switch to right turn (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc pulse is not present, go to step 2 of this fault.
- (8) If 24 vdc pulse is present, troubleshoot trailer electrical system per trailer technical manual.
- (9) Position turn signal switch to off (TM 9-2320-365-10).
- (10) Position main light switch to OFF (TM 9-2320-365-10).
- (11) Lower cover on connector J130 intervehicular 24 vdc connector.



32E6601A

e63. TRAILER RIGHT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

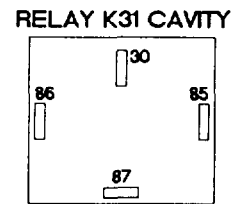
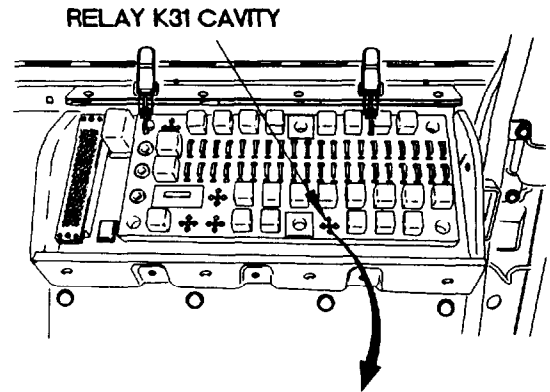


**WARNING**

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

**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K31 from PDP.
- (3) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K31 was removed.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (7) Apply brakes and note reading on multimeter.
- (8) If 12 vdc is not present, repair wire 460B (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Position main light switch to OFF (TM 9-2320-365-10).
- (10) Position master power switch to off (TM 9-2320-365-10).

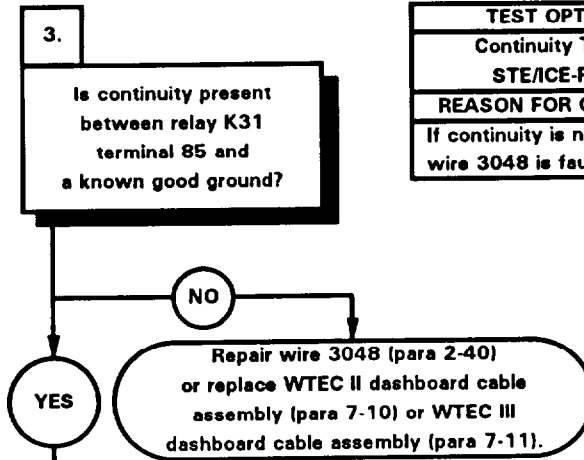


K2E6602A



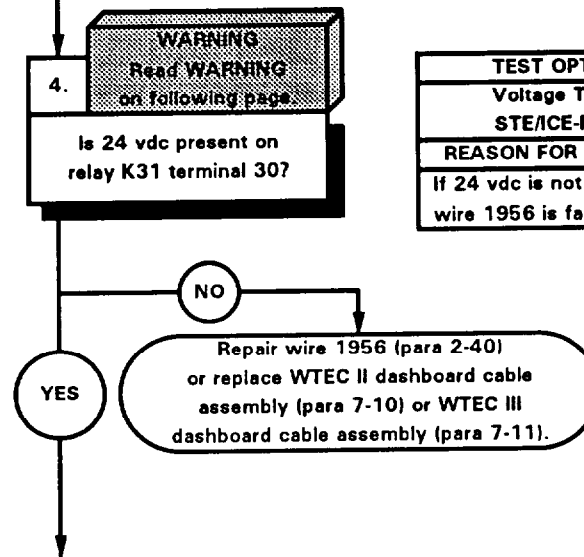
e63. TRAILER RIGHT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle right stop/turn light OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K31. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.



TEST OPTIONS
Continuity Test or STE/CE-R#91
REASON FOR QUESTION
If continuity is not present, wire 3048 is faulty.

KNOWN INFO
Towing vehicle right stop/turn light OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K31. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.



TEST OPTIONS
Voltage Test or STE/CE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1956 is faulty.

**CONTINUITY TEST**

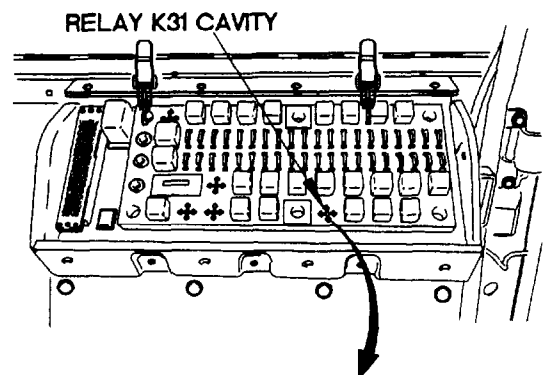
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K31 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3048 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**WARNING**

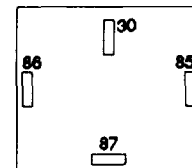
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 30, where K31 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1956 (para 2-40) 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 9-2320-365-10).

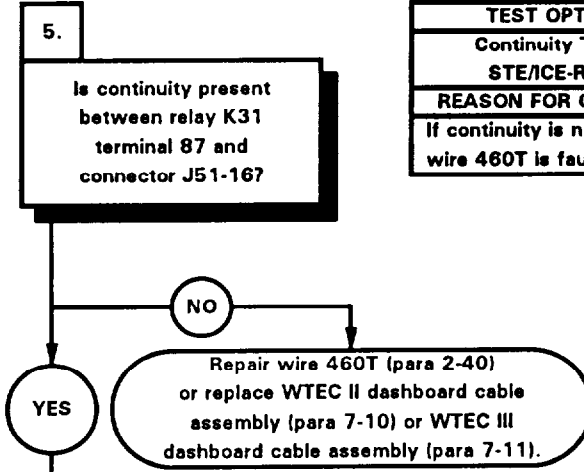


RELAY K31 CAVITY



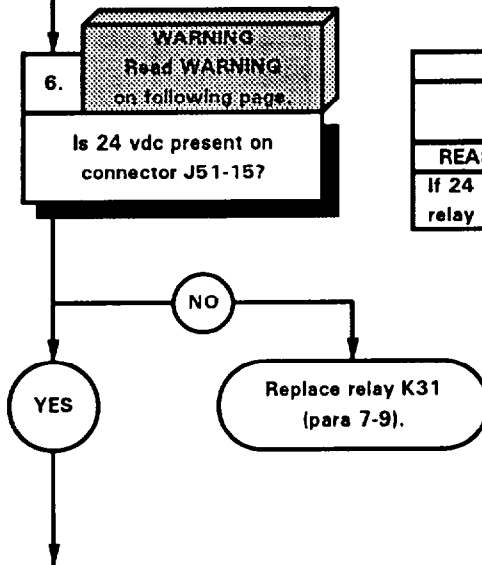
e63. TRAILER RIGHT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle right stop/turn light OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K31. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 460T is faulty.

KNOWN INFO
Towing vehicle right stop/turn light OK. Trailer electrical system OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty relay K31. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.



TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, relay K31 is faulty.

**CONTINUITY TEST**

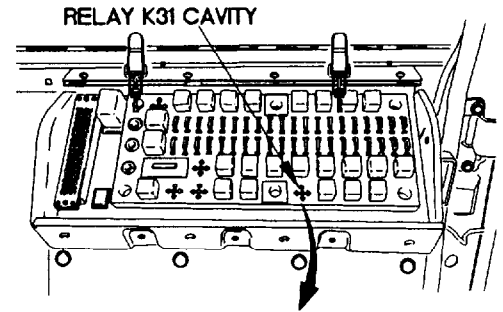
- (1) Remove three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Disconnect connector J51 from connector P51.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to PDP, terminal 87, where relay K31 was removed.
- (7) Connect negative (-) probe of multimeter to connector J51-16 and note reading on multimeter.
- (8) If continuity is not present, repair wire 460T (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Install relay K31 in PDP.

**WARNING**

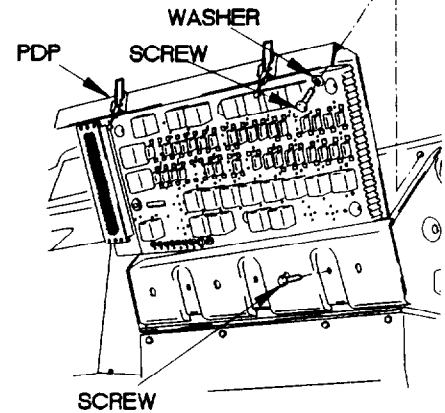
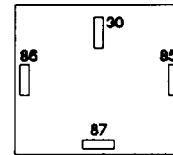
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

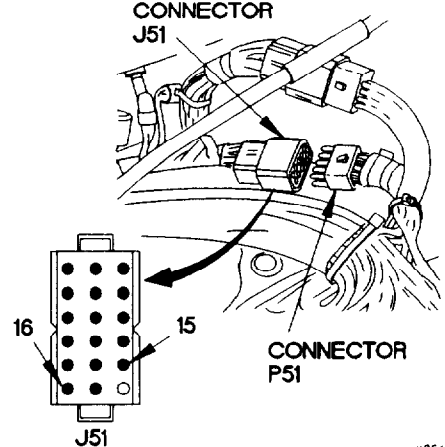
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector J51-15.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (6) Apply brakes and note reading on multimeter.
- (7) If 12 vdc is not present, replace relay K31 (para 7-9).
- (8) Position main light switch to OFF (TM 9-2320-365-10).
- (9) Position master power switch to off (TM 9-2320-365-10).



RELAY K31 CAVITY



CONNECTOR J51



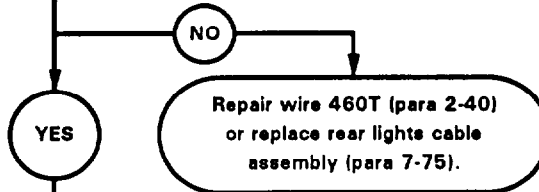
x2E66041

e63. TRAILER RIGHT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle right stop/turn light OK. Trailer electrical system OK. Dashboard cable assembly OK. Relay K31 OK.
POSSIBLE PROBLEMS
Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.

7.  
Is continuity present between connector P51-16 and connector P53R5?

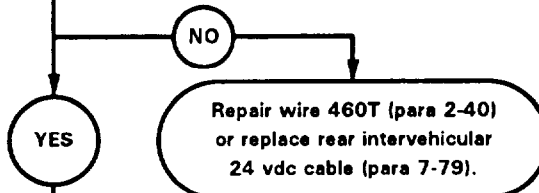
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 460T is faulty.



KNOWN INFO
Towing vehicle right stop/turn light OK. Trailer electrical system OK. Dashboard cable assembly OK. Relay K31 OK. Rear lights cable assembly OK.
POSSIBLE PROBLEMS
Faulty rear intervehicular 24 vdc cable.

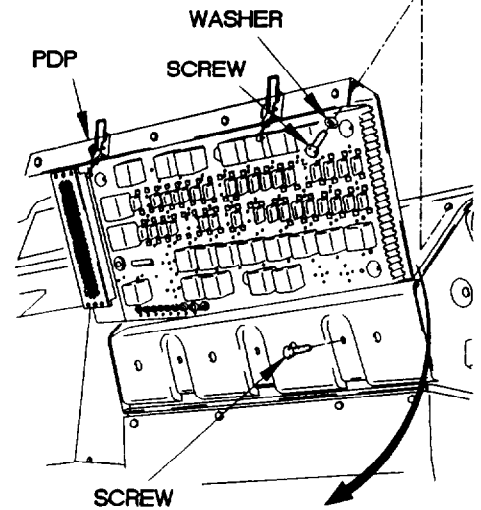
8.  
Is continuity present between connector J53R5 and connector J130-J7?

TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 460T is faulty.



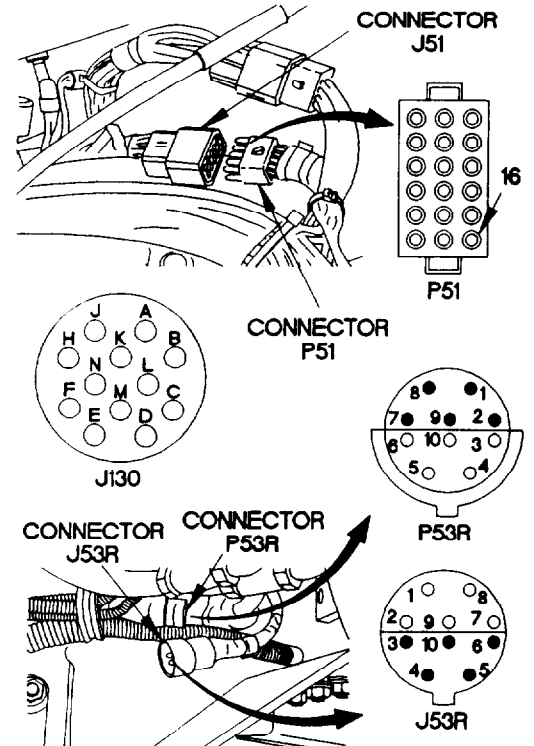
**CONTINUITY TEST**

- (1) Disconnect connector P53R from J53R.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P51-16.
- (4) Connect negative (-) probe of multimeter to connector P53R5 and note reading on multimeter.
- (5) If continuity is not present, repair wire 460T (para 2-40) or replace rear lights cable assembly (para 7-75).
- (6) Connect connector P51 to connector J51.
- (7) Install PDP on dashboard with three screws.
- (8) Install three washers and screws in PDP.
- (9) Install PDP cover (para 16-2).



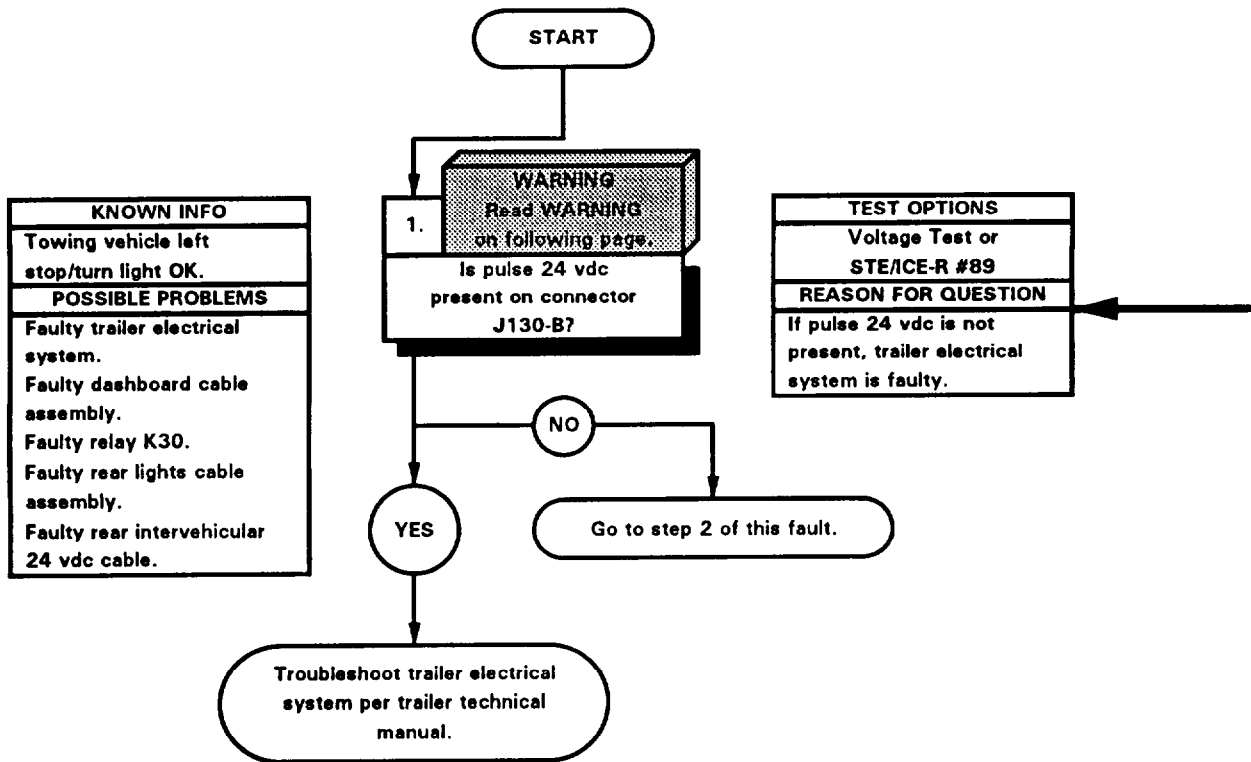
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J53R5.
- (3) Connect negative (-) probe of multimeter to connector J130-J and note reading on multimeter.
- (4) If continuity is not present, repair wire 460T (para 2-40) or replace rear intervehicular 24 vdc cable (para 7-79).
- (5) Connect connector P53R to connector J53R.



x2c66061

e64. TRAILER LEFT STOP/TURN LIGHT DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	

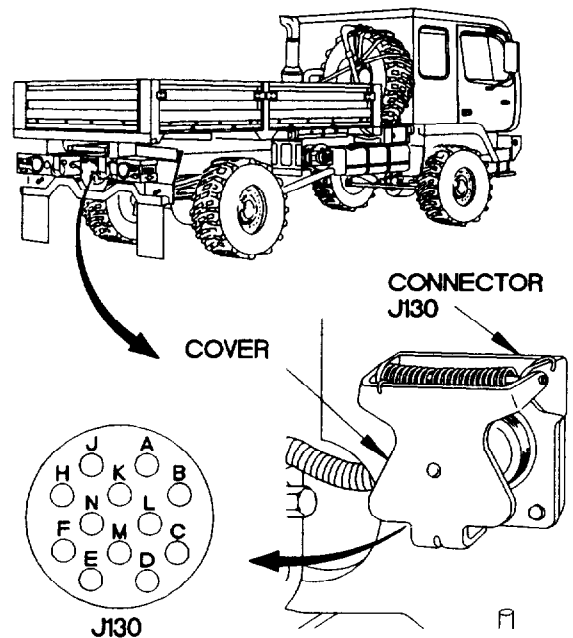


**WARNING**

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**

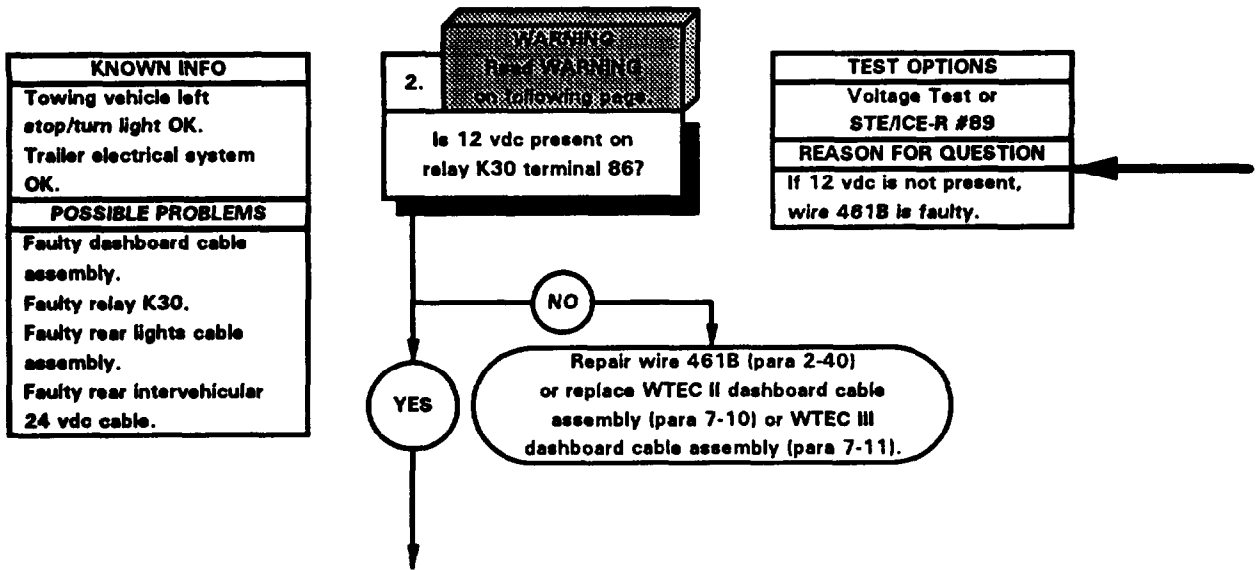
- (1) Lift cover on connector J130 intervehicular 24 vdc connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J130-B.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (6) Position turn signal switch to left turn (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc pulse is not present, go to step 2 of this fault.
- (8) If 24 vdc pulse is present, troubleshoot trailer electrical system per trailer technical manual.
- (9) Position turn signal switch to off (TM 9-2320-365-10).
- (10) Position main light switch to OFF (TM 9-2320-365-10).
- (11) Lower cover on connector J130 intervehicular 24 vdc connector.



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64. TRAILER LEFT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)



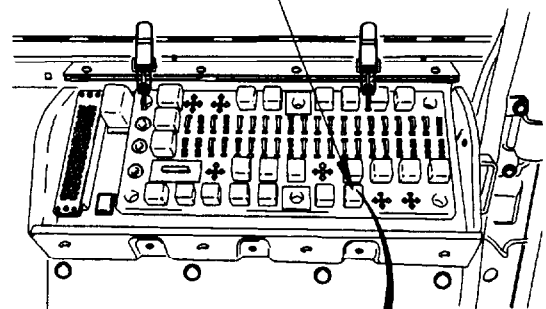
**WARNING**

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

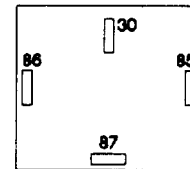
**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K30 from PDP.
- (3) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K30 was removed.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (7) Apply brakes and note reading on multimeter.
- (8) If 12 vdc is not present, repair wire 461B (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Position main light switch to OFF (TM 9-2320-365-10).
- (10) Position master power switch to off (TM 9-2320-365-10).

RELAY K30 CAVITY



RELAY K30 CAVITY



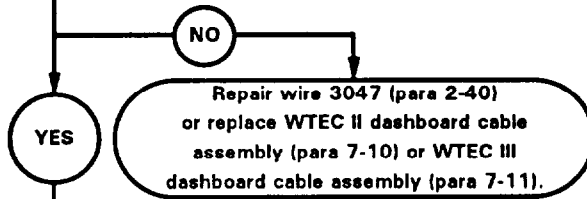
X2E6702A

e64. TRAILER LEFT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle left stop/turn light OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K30. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.

3.  
Is continuity present between relay K30 terminal 85 and a known good ground?

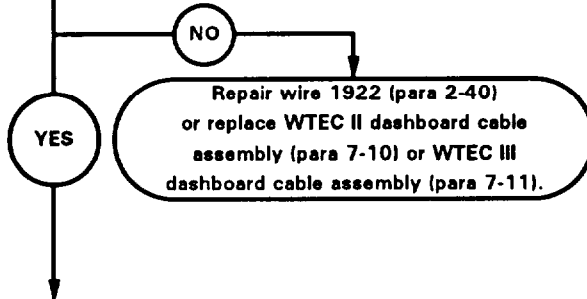
TEST OPTIONS
Continuity Test or STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, wire 3047 is faulty.



KNOWN INFO
Towing vehicle left stop/turn light OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K30. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.

4. **WARNING**  
Read WARNING on following page.  
Is 24 vdc present on relay K30 terminal 30?

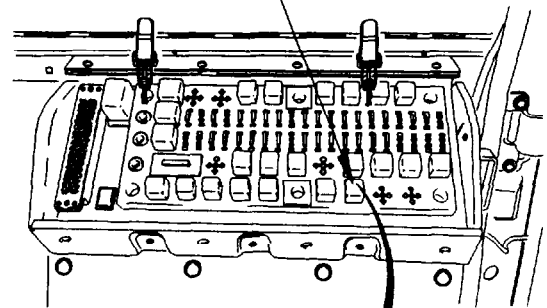
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1922 is faulty.



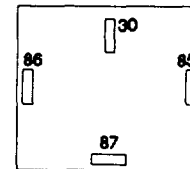
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K30 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3047 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

RELAY K30 CAVITY



RELAY K30 CAVITY



**WARNING**

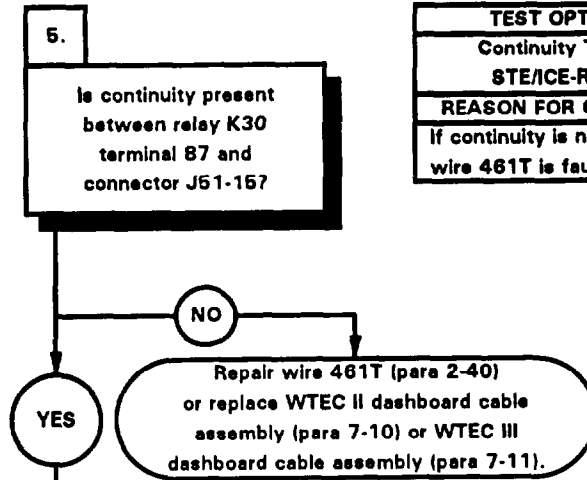
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 30, panel where relay K30 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1922 (para 2-40) 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 9-2320-365-10).

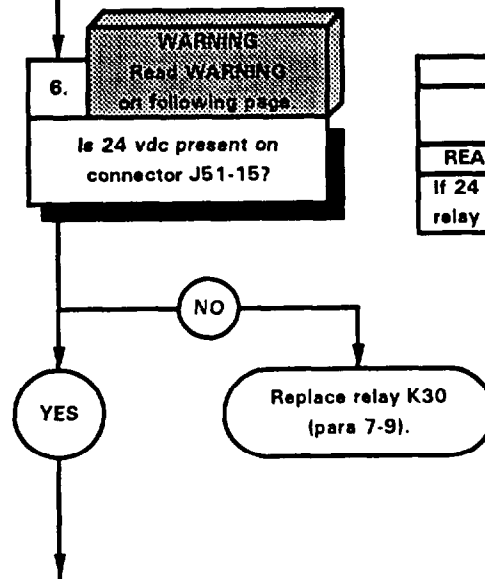
e64. TRAILER LEFT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle left stop/turn light OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K30. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 461T is faulty.

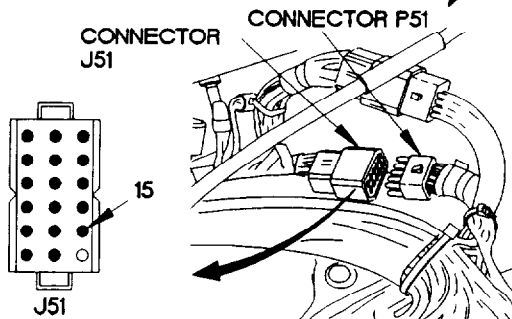
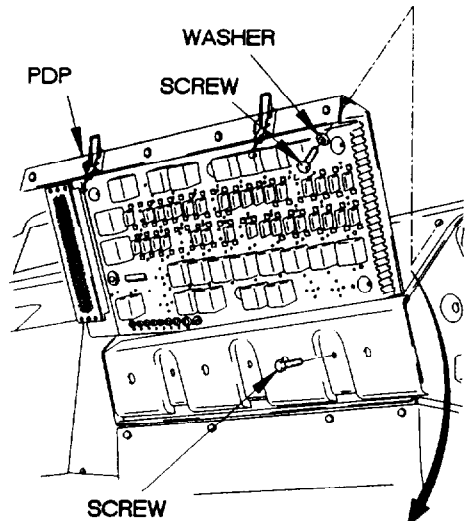
KNOWN INFO
Towing vehicle left stop/turn light OK. Trailer electrical system OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty relay K30. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.



TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, relay K30 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 J51 from connector P51.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to PDP, terminal 87, where relay K30 was removed.
- (7) Connect negative (-) probe of multimeter to connector J51-15 and note reading on multimeter.
- (8) If continuity is not present, repair wire 461T (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Install relay K30 in PDP.

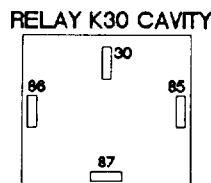
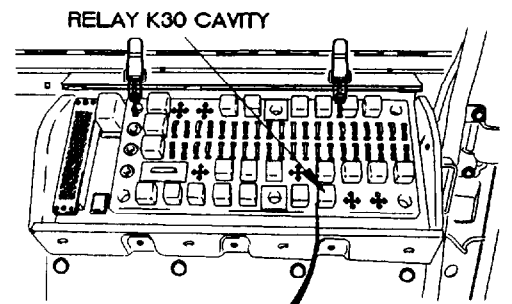


**WARNING**

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 J51-15.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (6) Apply brakes and note reading on multimeter.
- (7) If 24 vdc is not present, replace relay K30 (para 7-9).
- (8) Position main light switch to OFF (TM 9-2320-365-10).
- (9) Position master power switch to off (TM 9-2320-365-10).



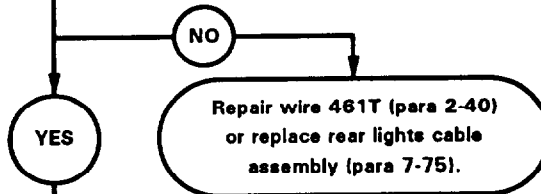
X2E67041

e64. TRAILER LEFT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle left stop/turn light OK. Trailer electrical system OK. Dashboard cable assembly OK. Relay K30 OK.
POSSIBLE PROBLEMS
Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable.

7.  
Is continuity present between connector P51-15 and connector P53R8?

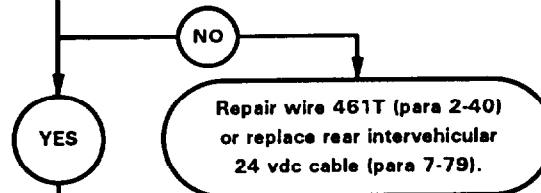
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 461T is faulty.



KNOWN INFO
Towing vehicle left stop/turn light OK. Trailer electrical system OK. Dashboard cable assembly OK. Relay K30 OK. Rear lights cable assembly OK.
POSSIBLE PROBLEMS
Faulty rear intervehicular 24 vdc cable.

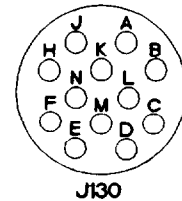
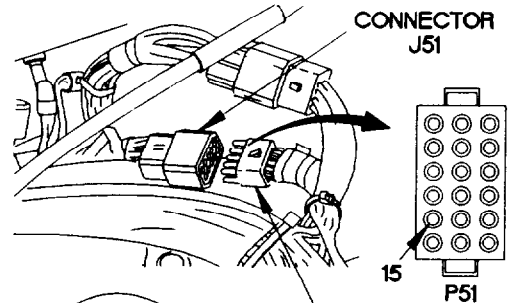
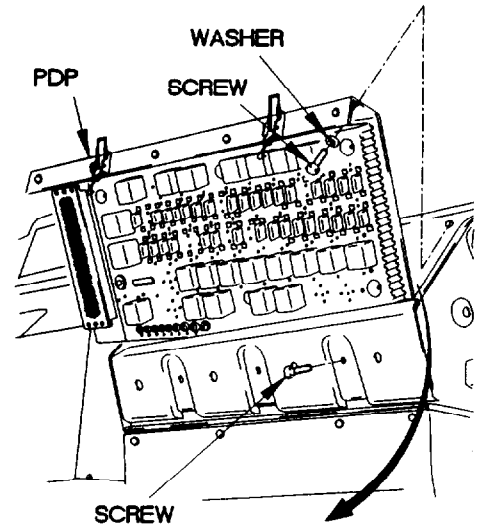
8.  
Is continuity present between connector J53R8 and connector J130-B?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 461T is faulty.

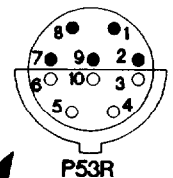


**CONTINUITY TEST**

- (1) Disconnect connector P53R from J53R.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P51-15.
- (4) Connect negative (-) probe of multimeter to connector P53R8 and note reading on multimeter.
- (5) If continuity is not present, repair wire 461T (para 2-40) or replace rear lights cable assembly (para 7-75).
- (6) Connect connector P51 to connector J51.
- (7) Install PDP on dashboard with three screws.
- (8) Install three washers and screws in PDP.
- (9) Install PDP cover (para 18-2).

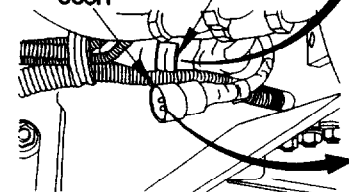


CONNECTOR P51



P53R

CONNECTOR J53R



J53R

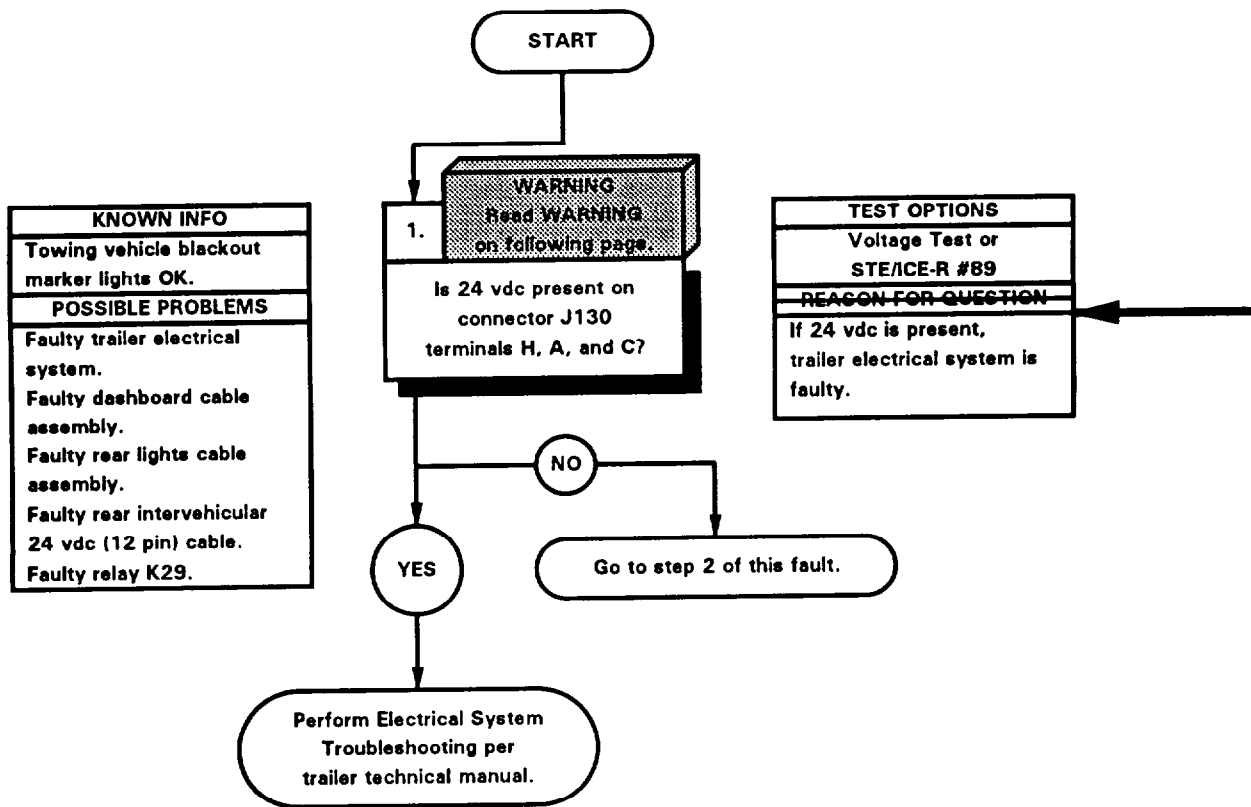
X2E67061

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J53R8.
- (3) Connect negative (-) probe of multimeter to connector J130-B and note reading on multimeter.
- (4) If continuity is not present, repair wire 461T (para 2-40) or replace rear intervehicular 24 vdc cable (para 7-79).
- (5) Connect connector P53R to connector J53R.



●65. TRAILER BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	

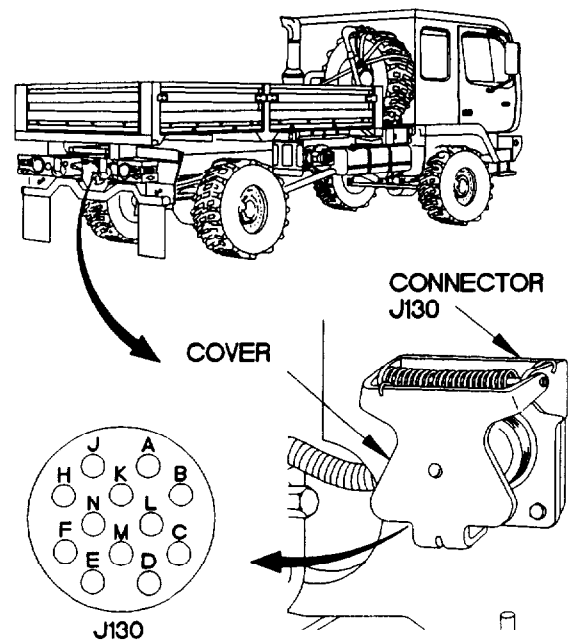


**WARNING**

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

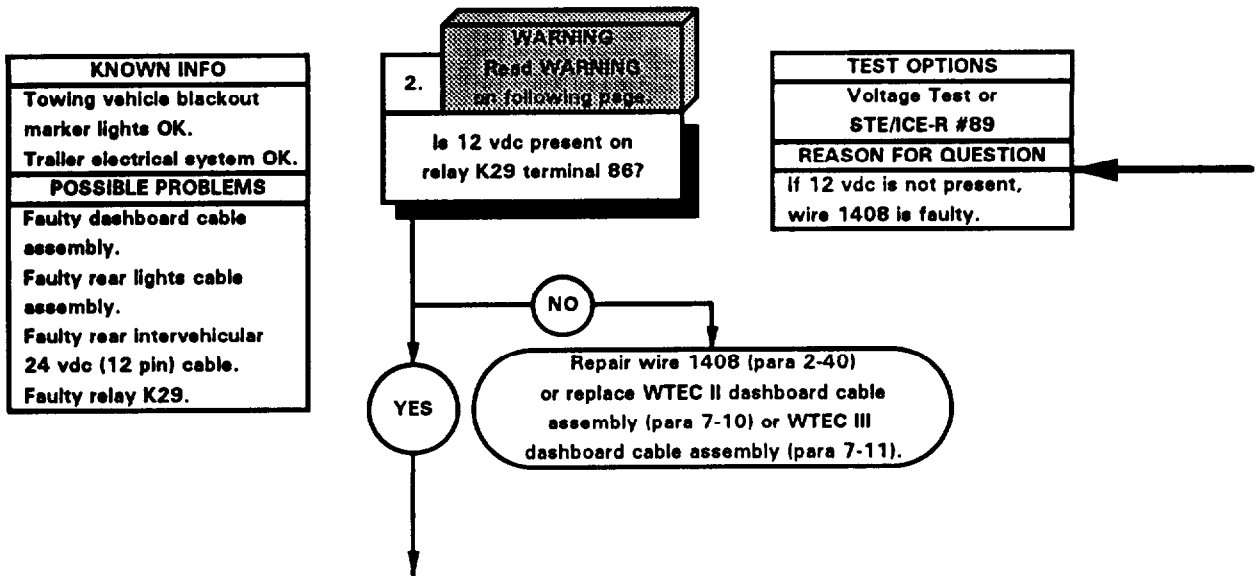
**VOLTAGE TEST**

- (1) Raise cover on connector J130 intervehicular 24 vdc connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J130 terminal H, terminal A and terminal C, one terminal at a time.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to BO MARKER (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 2 of this fault.
- (7) If 24 vdc is present, perform Electrical System Troubleshooting per trailer technical manual.
- (8) Position main light switch to OFF (TM 9-2320-365-10).



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e65. TRAILER BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)



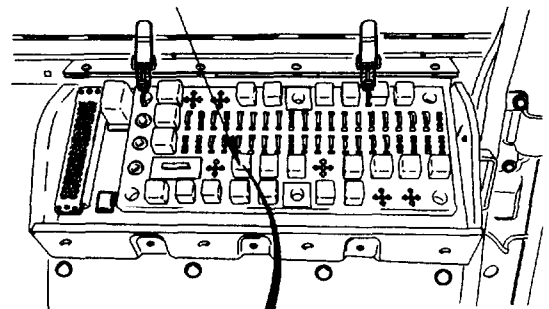
**WARNING**

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.

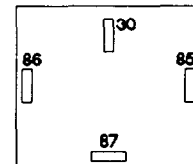
**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K29 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K29 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to BO MARKER (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1408 (para 2-40) 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 9-2320-365-10).

RELAY K29 CAVITY



RELAY K29 CAVITY



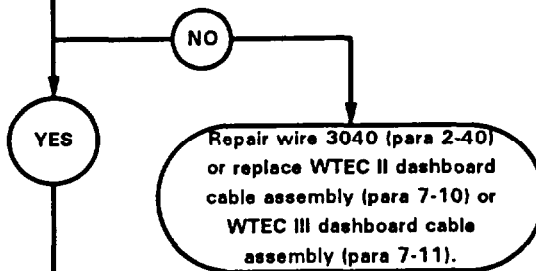
x2E6802A

e65. TRAILER BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle blackout marker lights OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc (12 pin) cable. Faulty relay K29.

3.  
Is continuity present between relay K29 terminal 85 and a known good ground?

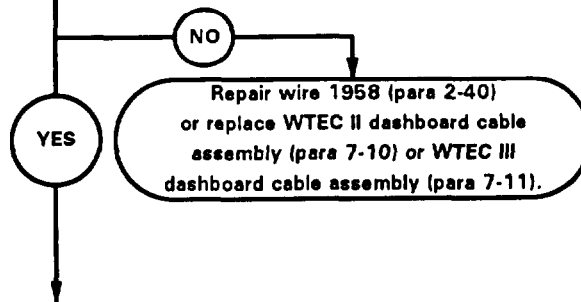
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3040 is faulty.



KNOWN INFO
Towing vehicle blackout marker lights OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc (12 pin) cable. Faulty relay K29.

4.  
Is 24 vdc present on relay K29 terminal 30?

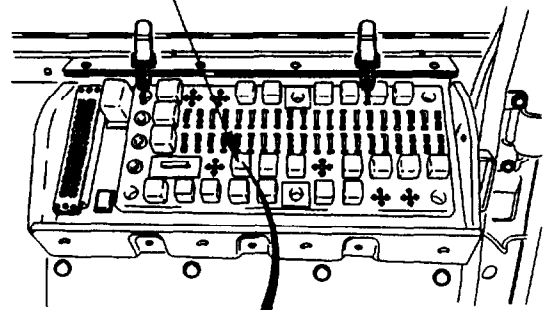
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1958 is faulty.



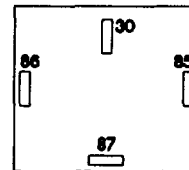
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K29 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3040 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

RELAY K29 CAVITY



RELAY K29 CAVITY



**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**

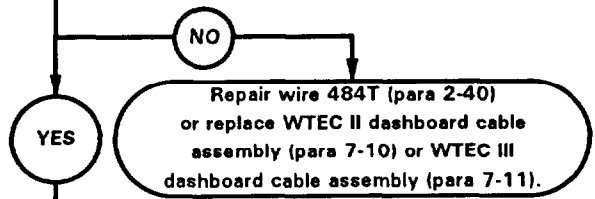
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 30, where relay K29 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to BO MARKER (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1958 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

e65. TRAILER BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle blackout marker lights OK. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc (12 pin) cable. Faulty relay K29.

5.  
Is continuity present between relay K29 terminal 87 and connector J51-10?

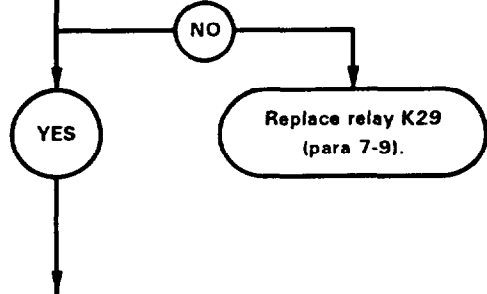
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 484T is faulty.



KNOWN INFO
Towing vehicle blackout marker lights OK. Trailer electrical system OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty relay K29. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc (12 pin) cable.

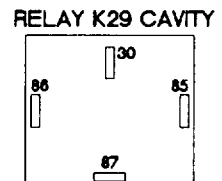
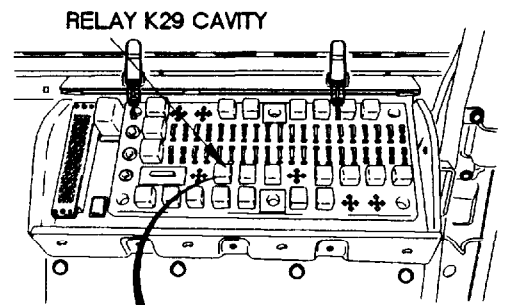
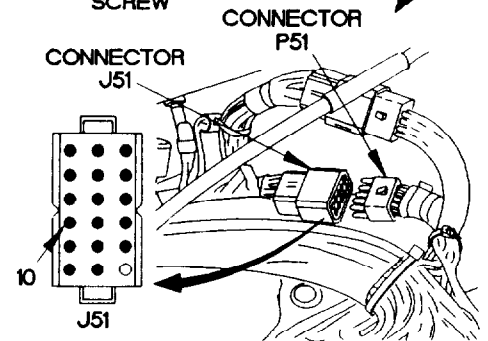
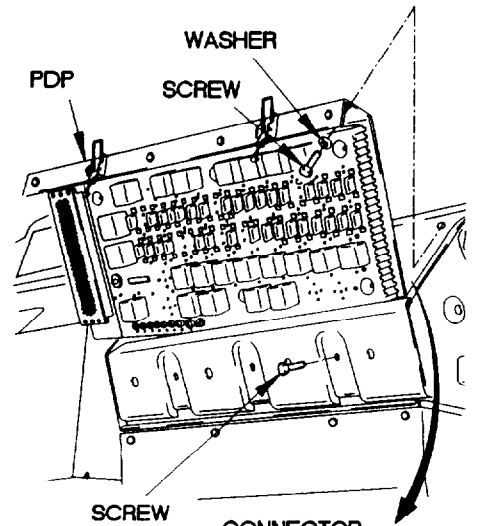
6. **WARNING**  
Read WARNING on following page.  
Is 24 vdc present on connector J51-10?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, relay K29 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 J51 from connector P51.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to PDP, terminal 87, where relay K29 was removed.
- (7) Connect negative (-) probe of multimeter to connector J51-10 and note reading on multimeter.
- (8) If continuity is not present, repair wire 484T (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Install relay K29 in PDP.



**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.

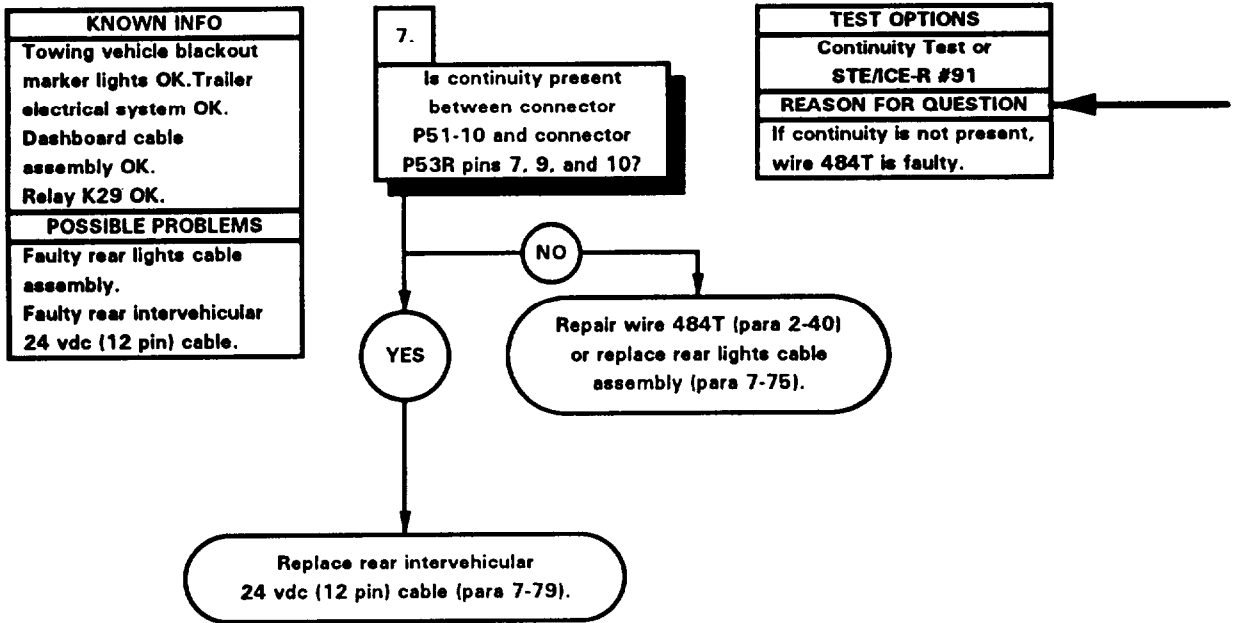
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector J51-10.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to BO MARKER (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, replace relay K29 (para 7-9).
- (6) Position main light switch to OFF (TM 9-2320-365-10).

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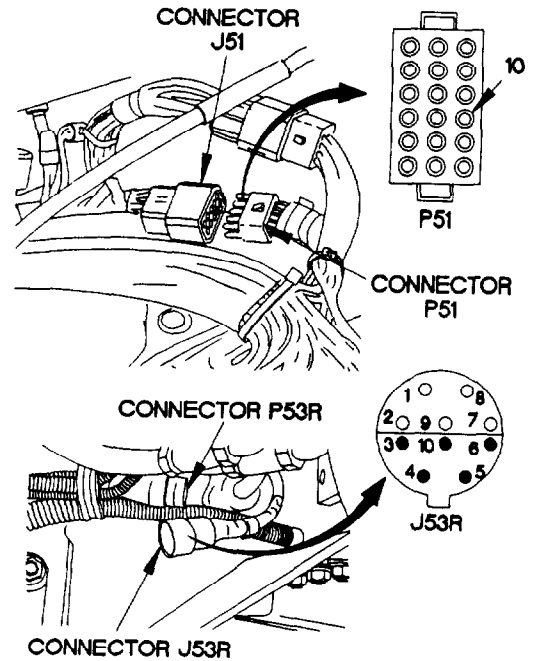
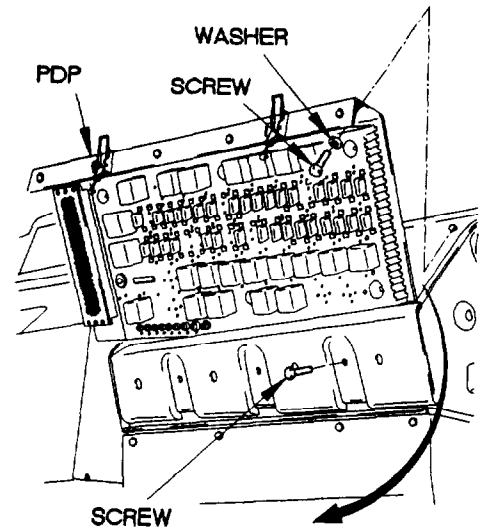


e65. TRAILER BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)



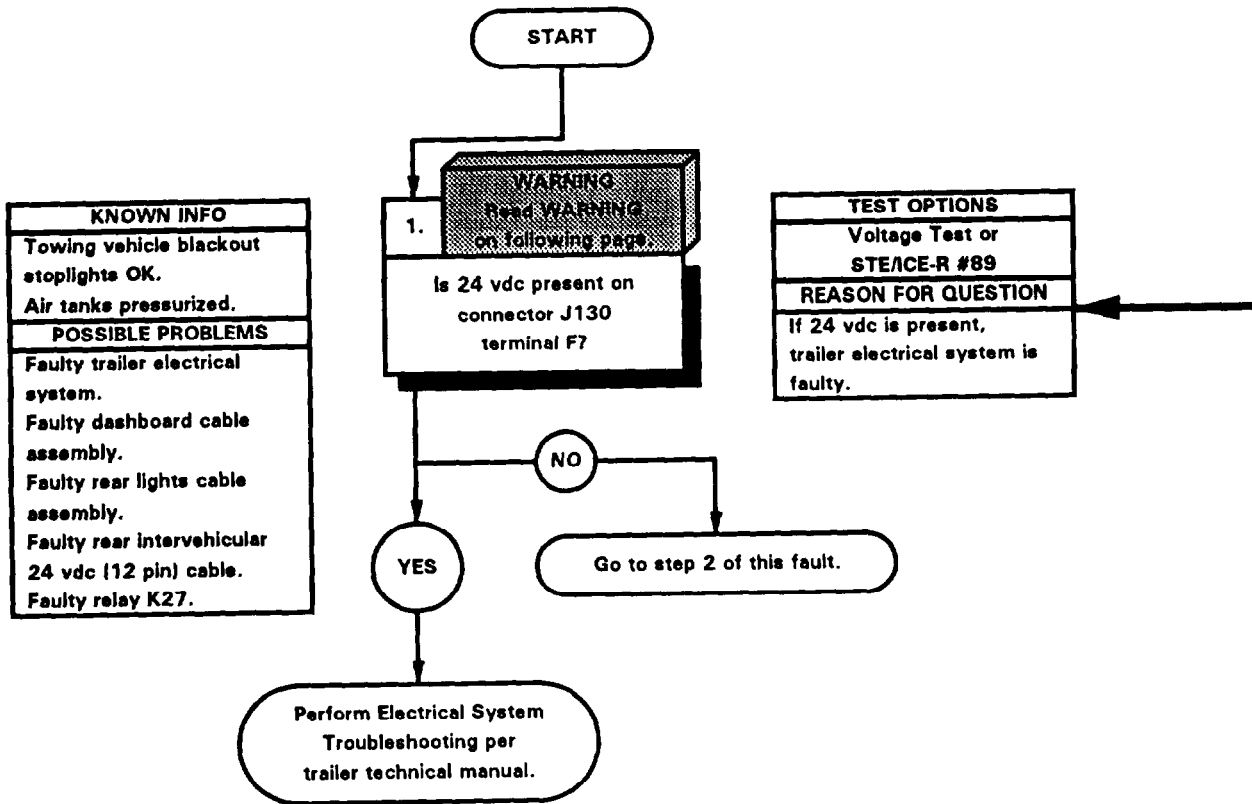
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Disconnect connector P53R from connector J53R.
- (3) Connect positive (+) probe of multimeter to connector P51-10.
- (4) Connect negative (-) probe of multimeter to connector P53R-7 and note reading on multimeter.
- (5) Connect positive (+) probe of multimeter to connector P51-10.
- (6) Connect negative (-) probe of multimeter to connector P53R-9 and note reading on multimeter.
- (7) Connect positive (+) probe of multimeter to connector P51-10.
- (8) Connect negative (-) probe of multimeter to connector P53R-10 and note reading on multimeter.
- (9) If continuity is not present, repair wire 484T (para 2-40) or replace rear lights cable assembly (para 7-75).
- (10) If continuity is present, replace rear intervehicular 24 vdc (12 pin) cable (para 7-79).
- (11) Connect connector P51 to connector J51.
- (12) Install PDP on dashboard with three screws.
- (13) Install three washers and screws in PDP.
- (14) Install PDP cover (para 16-2).



X2E6B061

e66. TRAILER BLACKOUT STOP LIGHTS DO NOT ILLUMINATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	

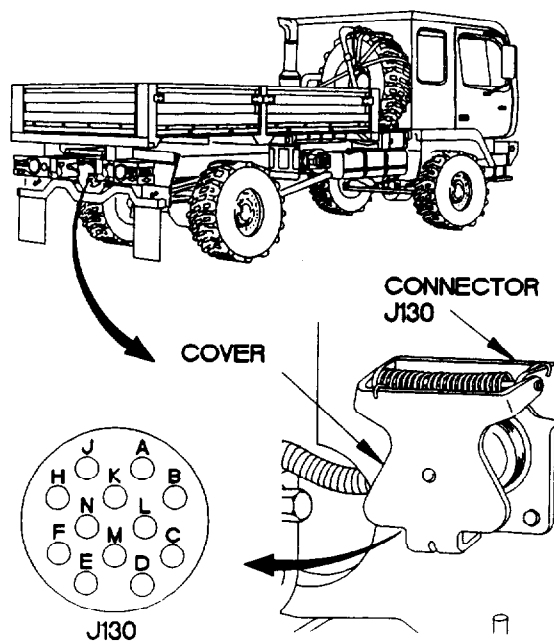


**WARNING**

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

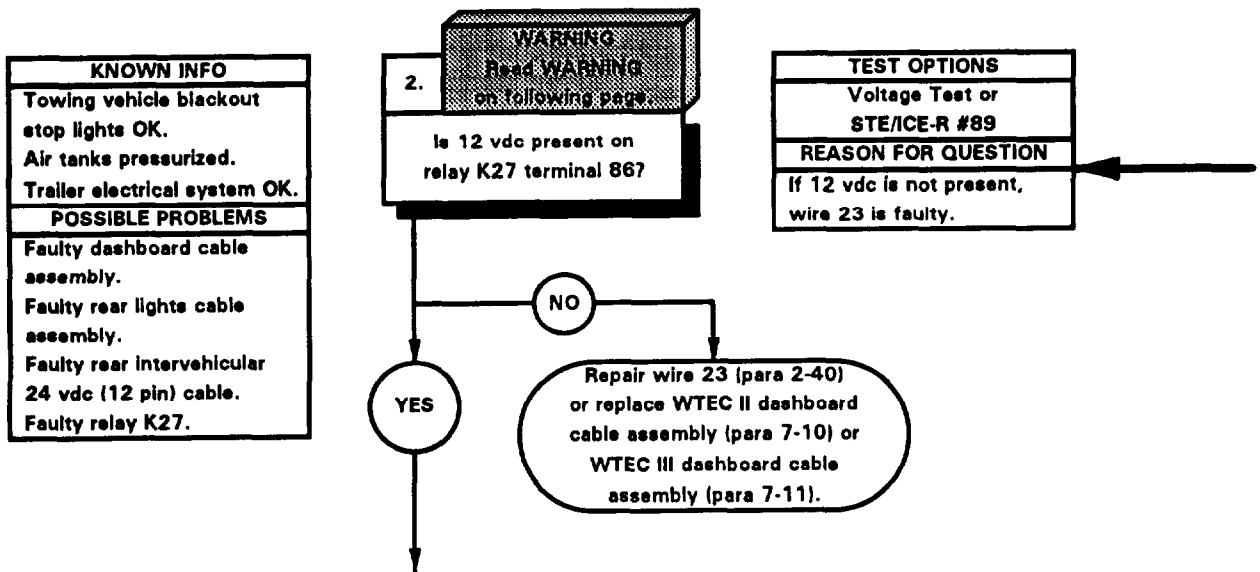
**VOLTAGE TEST**

- (1) Raise cover on connector J130 intervehicular 24 vdc connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J130 terminal F.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Position main light switch to BO DRIVE (TM 9-2320-365-10).
- (7) Apply brakes (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, go to step 2 of this fault.
- (9) If 24 vdc is present, perform Electrical System Troubleshooting per trailer technical manual.
- (10) Position main light switch to OFF (TM 9-2320-365-10).
- (11) Position master power switch to off (TM 9-2320-365-10).



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e66. TRAILER BLACKOUT STOP LIGHTS DO NOT ILLUMINATE (CONT)



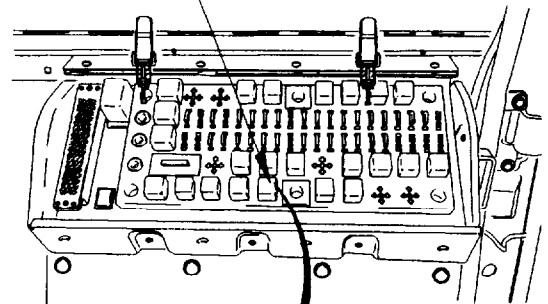
**WARNING**

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.

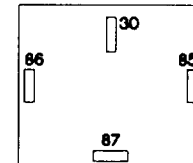
**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K27 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K27 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Position main light switch to BO DRIVE (TM 9-2320-365-10).
- (8) Apply brakes (TM 9-2320-365-10) and note reading on multimeter.
- (9) If 12 vdc is not present, repair wire 23 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) Position main light switch to OFF (TM 9-2320-365-10).
- (11) Position master power switch to off (TM 9-2320-365-10).

RELAY K27 CAVITY



RELAY K27 CAVITY



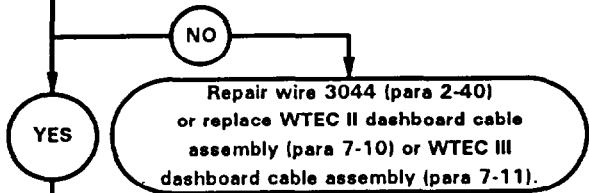
X2E6902A

e66. TRAILER BLACKOUT STOP LIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle blackout stop lights OK. Air tanks pressurized. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable. Faulty relay K27.

3.  
Is continuity present between relay K27 terminal 85 and a known good ground?

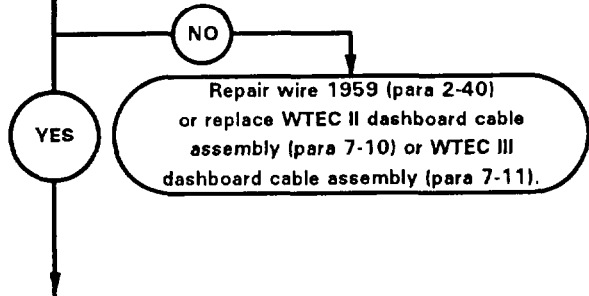
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3044 is faulty.



KNOWN INFO
Towing vehicle blackout stop lights OK. Air tanks pressurized. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc cable. Faulty relay K27.

4.  
**WARNING**  
Read WARNING on following page.  
Is 24 vdc present on relay K27 terminal 30?

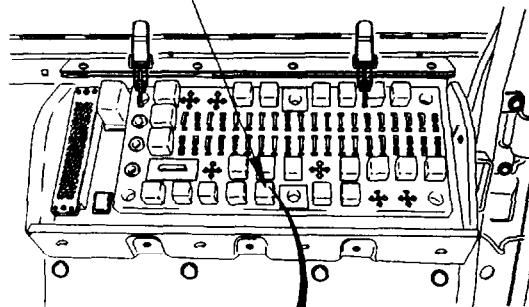
TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1959 is faulty.



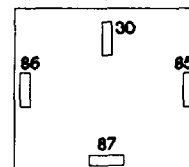
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K27 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3044 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

RELAY K27 CAVITY



RELAY K27 CAVITY



**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 30, where relay K27 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Position main light switch to BO DRIVE (TM 9-2320-365-10).
- (6) Apply brakes (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1959 (para 2-40) 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 9-2320-365-10).
- (9) Position master power switch to off (TM 9-2320-365-10).

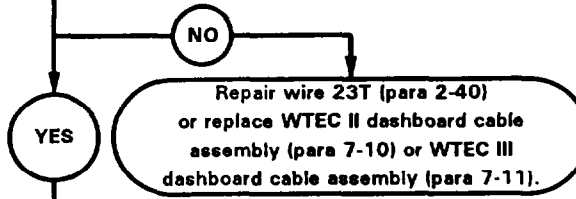


e66. TRAILER BLACKOUT STOP LIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle blackout stop lights OK. Air tanks pressurized. Trailer electrical system OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc (12 pin) cable. Faulty relay K27.

5.  
Is continuity present between relay K27 terminal 87 and connector J51-87

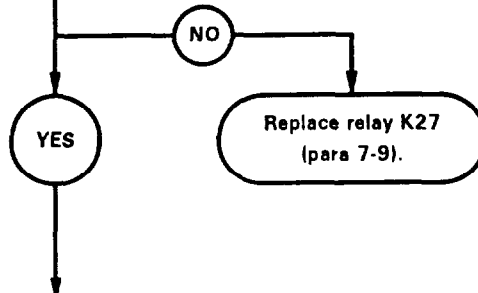
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 23T is faulty.



KNOWN INFO
Towing vehicle blackout stop lights OK. Air tanks pressurized. Trailer electrical system OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty relay K27. Faulty rear lights cable assembly. Faulty rear intervehicular 24 vdc (12 pin) cable.

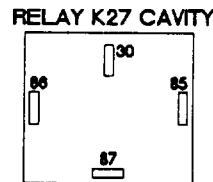
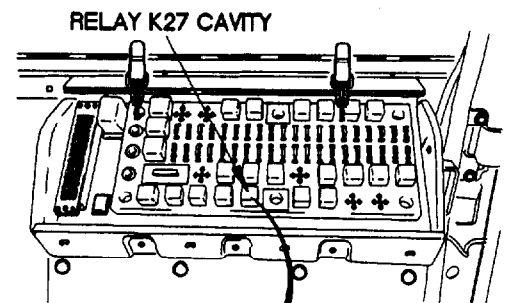
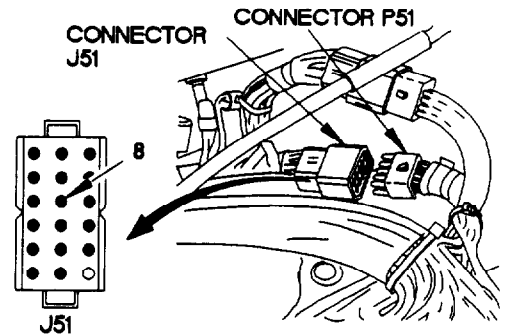
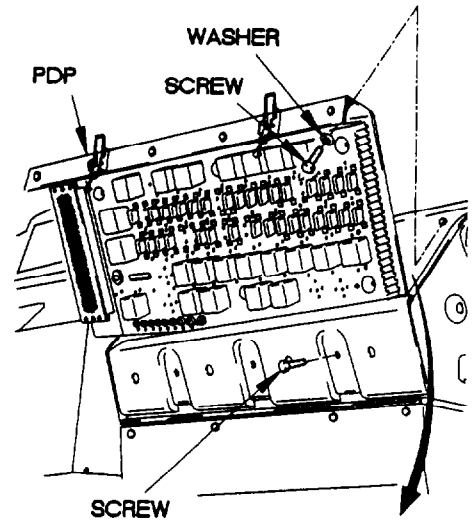
6. **WARNING**  
Read WARNING on following page.  
Is 24 vdc present on connector J51-87

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, relay K27 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 J51 from connector P51.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to PDP, terminal 87, where relay K27 was removed.
- (7) Connect negative (-) probe of multimeter to connector J51-8 and note reading on multimeter.
- (8) If continuity is not present, repair wire 23T (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Install relay K27 in PDP.



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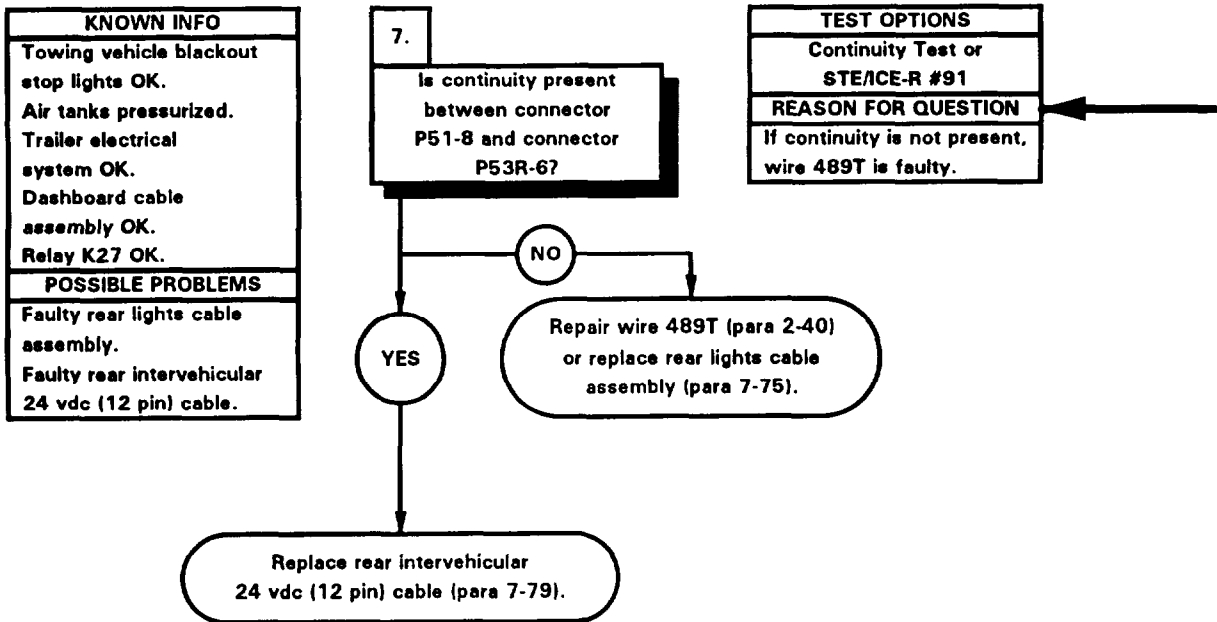
**WARNING**

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**

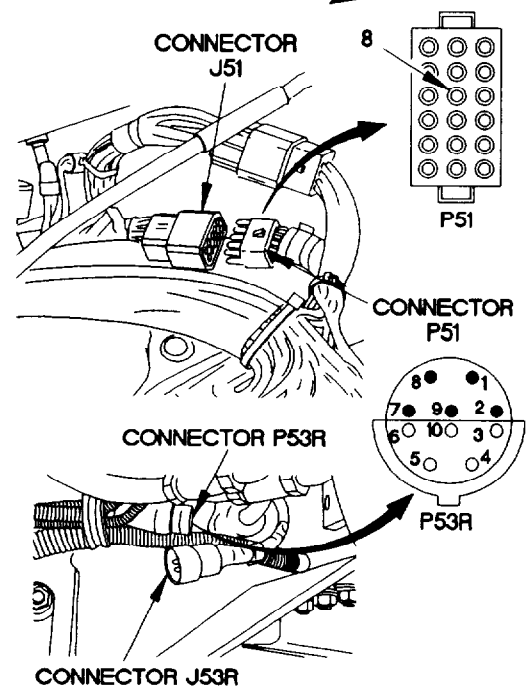
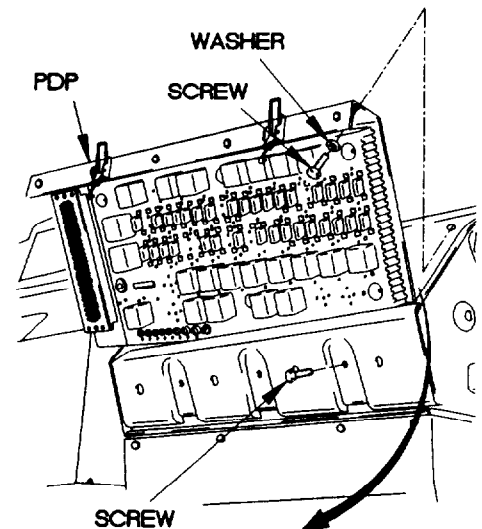
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector J51-8.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Position main light switch to BO DRIVE (TM 9-2320-365-10).
- (6) Apply brakes (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, replace relay K27 (para 7-9).
- (8) Position main light switch to OFF (TM 9-2320-365-10).
- (9) Position master power switch to off (TM 9-2320-365-10).

e66. TRAILER BLACKOUT STOP LIGHTS DO NOT ILLUMINATE (CONT)



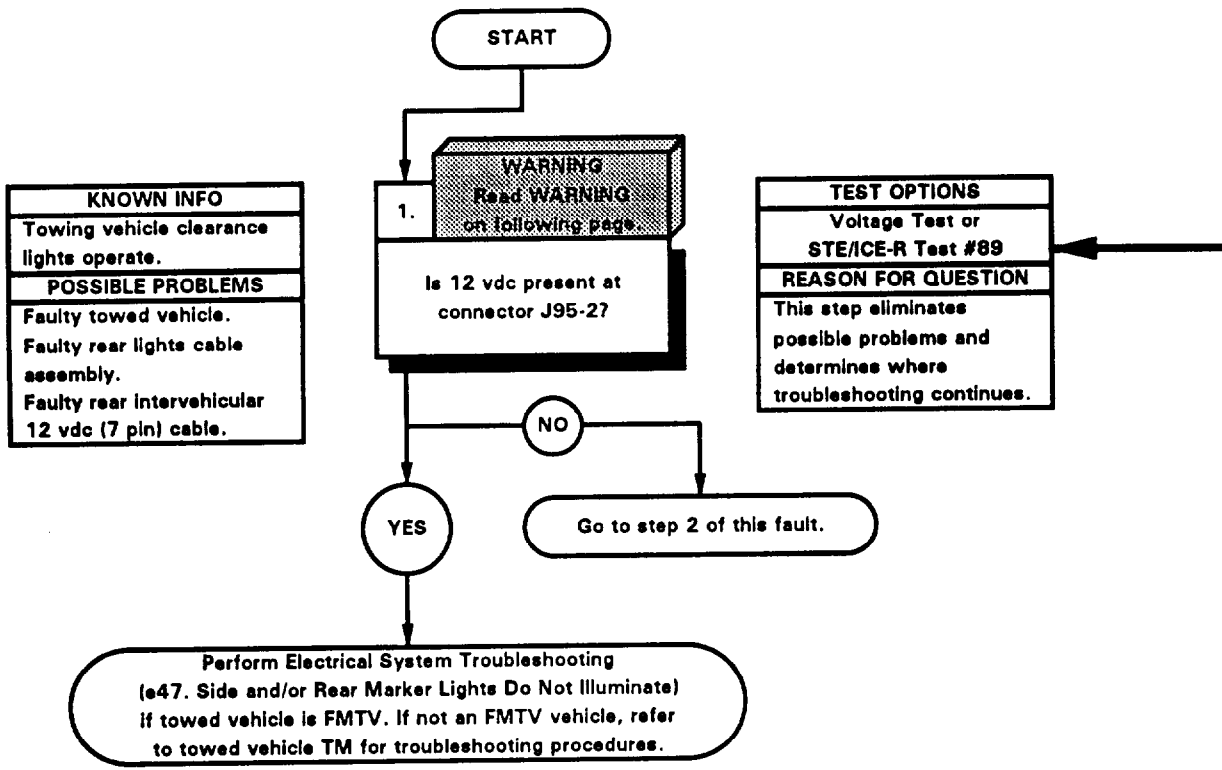
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Disconnect connector P53R from connector J53R.
- (3) Connect positive (+) probe of multimeter to connector P51-8.
- (4) Connect negative (-) probe of multimeter to connector P53R-6 and note reading on multimeter.
- (5) If continuity is not present, repair wire 489T (para 2-40) or replace rear lights cable assembly (para 7-75).
- (6) If continuity is present, replace rear intervehicular 24 vdc cable (para 7-79).
- (7) Connect connector P51 to connector J51.
- (8) Install PDP on dashboard with three screws.
- (9) Install three washers and screws in PDP.
- (10) Install PDP cover (para 16-2).



X2E69061

e67. INTERVEHICLE CLEARANCE LIGHTS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Ties, Cable, Plastic (Item 76, Appendix D)
<b>References</b> TM 9-4910-571-12&P	

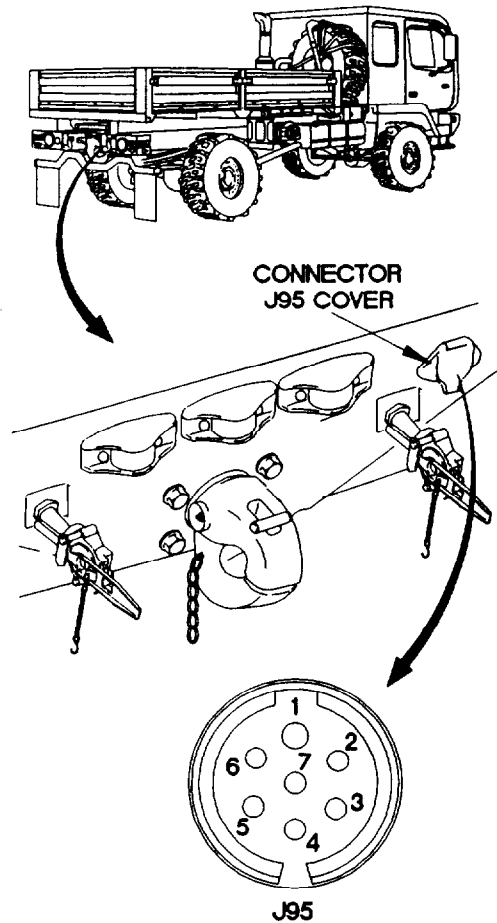


**WARNING**

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.

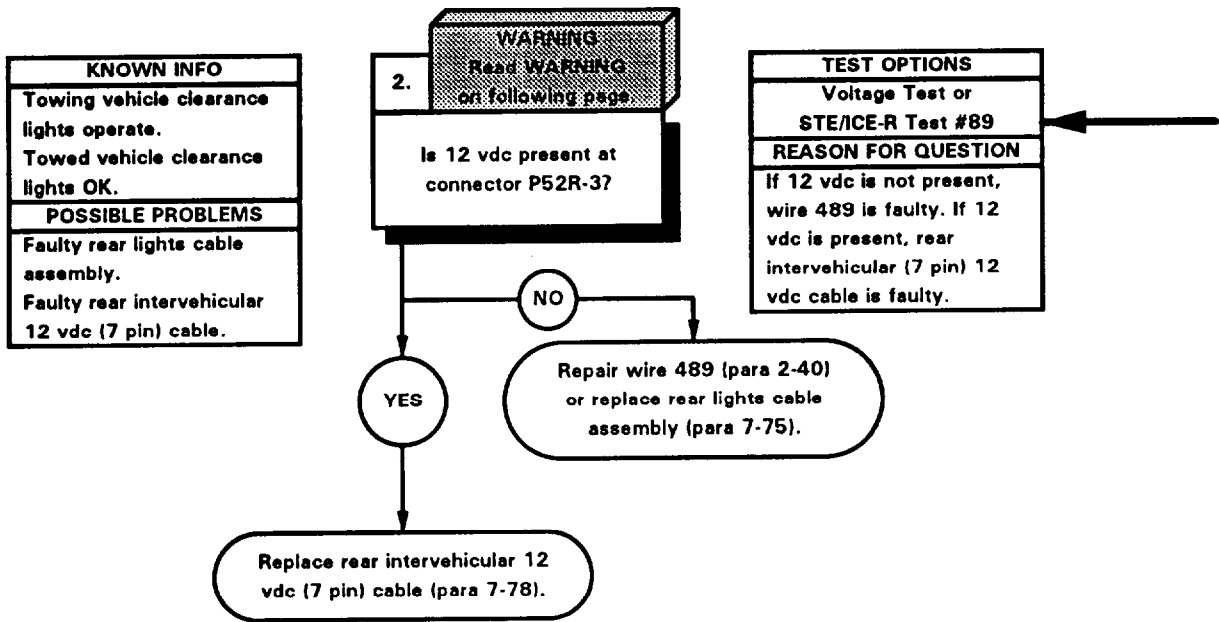
**VOLTAGE TEST**

- (1) Raise cover on connector J95 intervehicular 12 vdc connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J95-2.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, go to step 2 of this fault.
- (7) If 12 vdc is present, perform Electrical System Troubleshooting (e47. Side and/or Rear Marker Lights Do Not Illuminate) If towed vehicle is FMTV. If towed vehicle is not an FMTV, refer to towed vehicle TM for troubleshooting procedures.
- (8) Position main light switch to OFF (TM 9-2320-365-10).



32E7101A

e67. INTERVEHICLE CLEARANCE LIGHTS DO 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**

**NOTE**

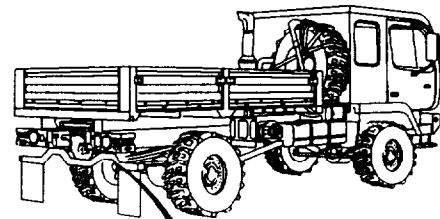
Remove plastic cable ties as required.

- (1) Disconnect connector P52R from connector J52.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P52R-3.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, repair wire 489 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (7) If 12 vdc is present, replace rear intervehicular 12 vdc (7 pin) cable (para 7-78).
- (8) Position main light switch to OFF (TM 9-2320-365-10).

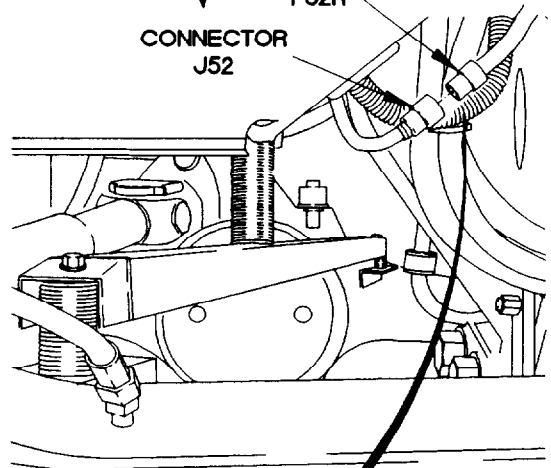
**NOTE**

Install plastic cable ties as required.

- (9) Connect connector P52R to connector J52.



CONNECTOR P52R  
CONNECTOR J52



32E7103A



**68. INTERVEHICLE LEFT TURN SIGNAL DOES NOT OPERATE**

**INITIAL SETUP**

**Equipment Condition**

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

**Personnel Required**

(2)

**References**

TM 9-4910-571-12&P

**Tools and Special Tools**

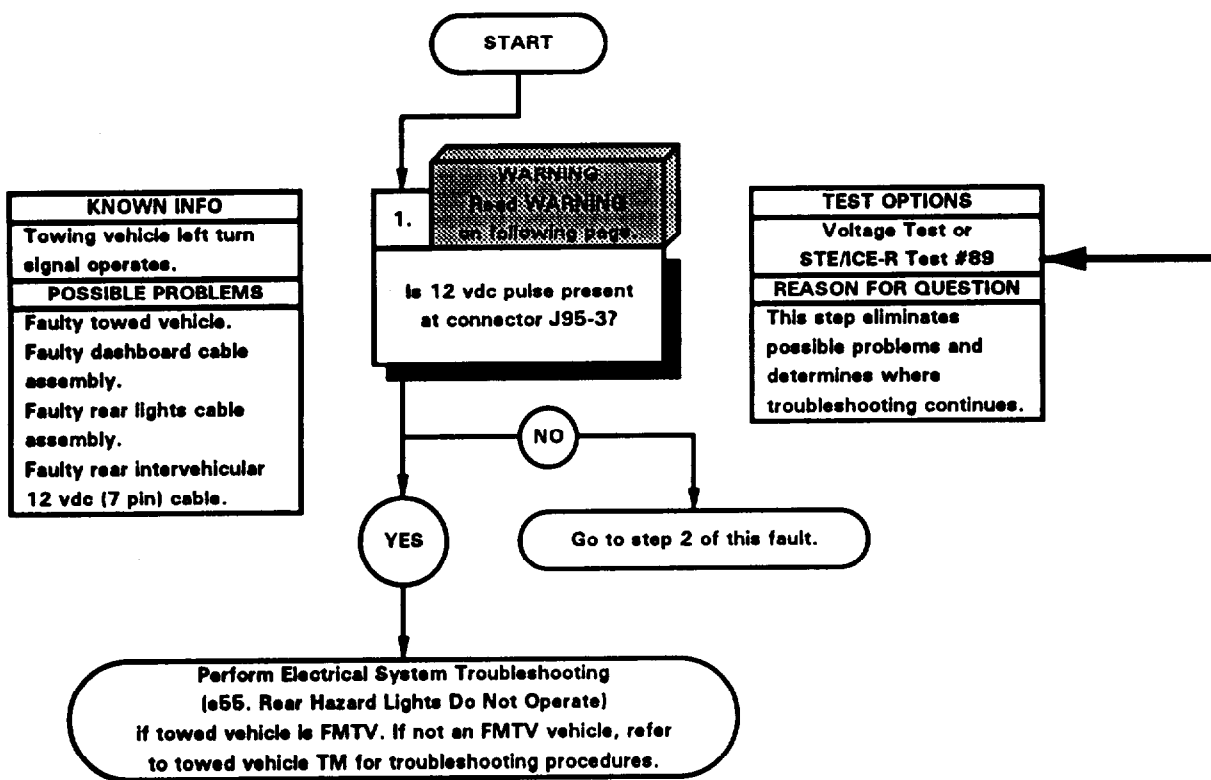
Tool Kit, Genl Mech (Item 44, Appendix C)

STE/CE-R (Item 39, Appendix C)

Multimeter, Digital (Item 22, Appendix C)

**Materials/Parts**

Ties, Cable, Plastic (Item 76, Appendix D)

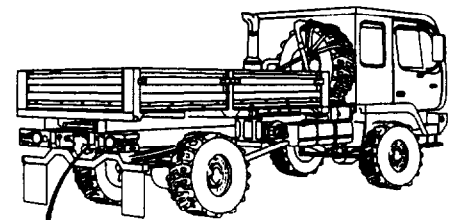


**WARNING**

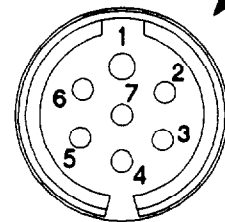
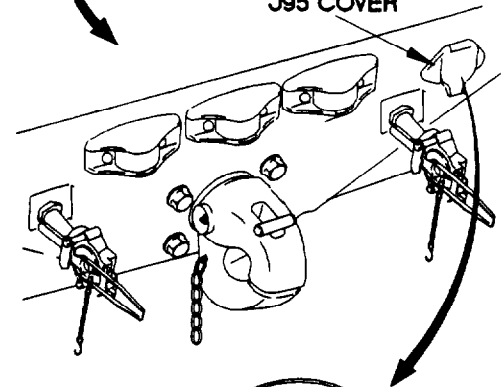
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Raise cover on connector J95 intervehicular 12 vdc connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J95-3.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (6) Position turn signal switch for left turn (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc pulse is not present, go to step 2 of this fault.
- (8) If 12 vdc pulse is present, perform Electrical System Troubleshooting (e55. Rear Hazard Lights Do Not Operate) if towed vehicle is FMTV. If towed vehicle is not an FMTV, refer to towed vehicle TM for troubleshooting procedures.
- (9) Position turn signal switch to off (TM 9-2320-365-10).
- (10) Position main light switch to OFF (TM 9-2320-365-10).



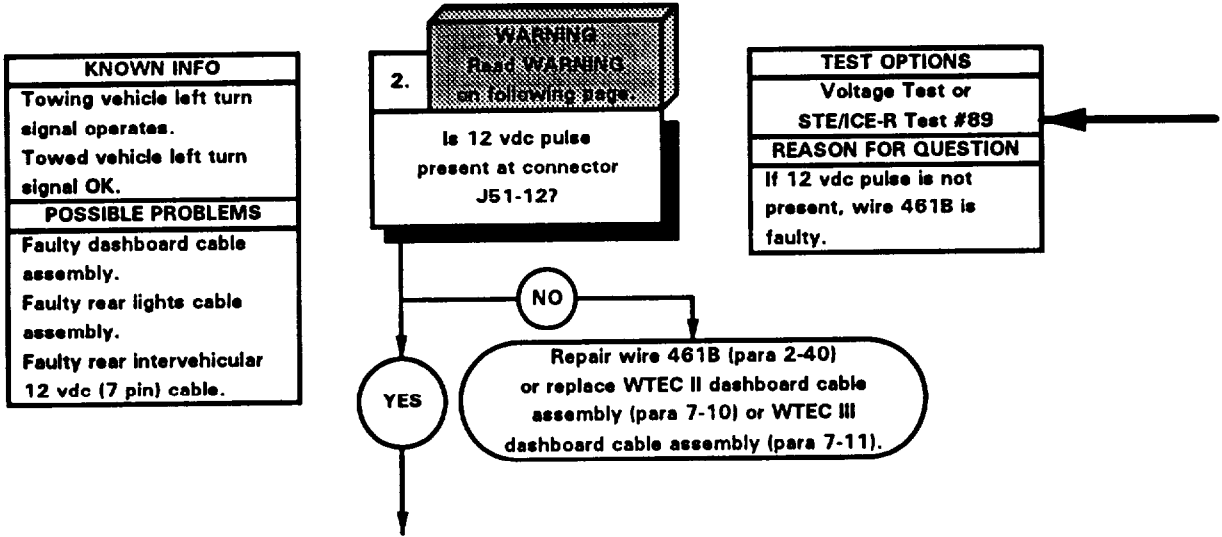
CONNECTOR J95 COVER



J95

32E7101A

e68. INTERVEHICLE LEFT TURN SIGNAL DOES NOT OPERATE (CONT)

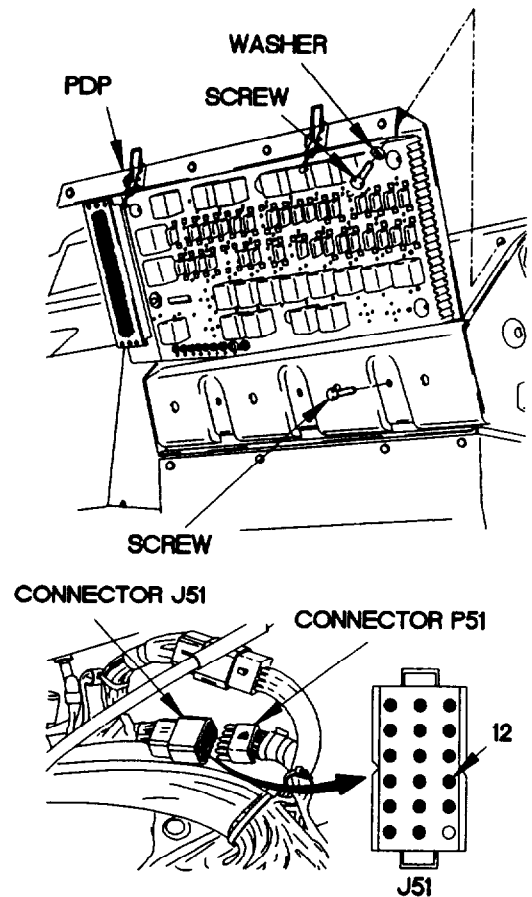


**WARNING**

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.

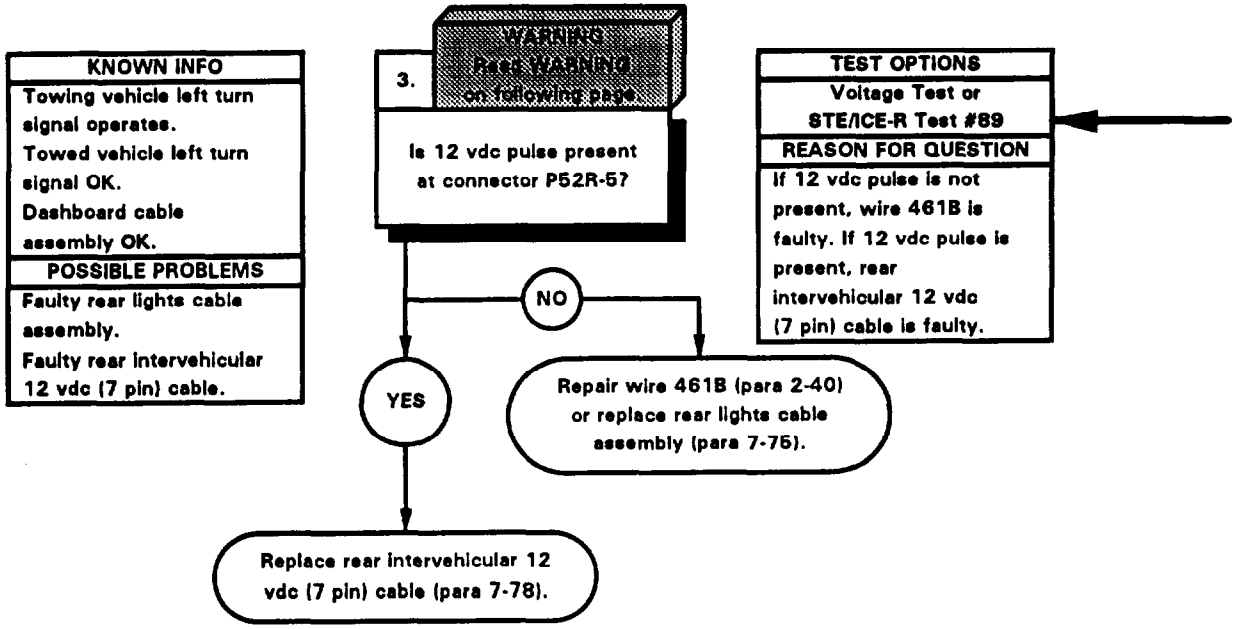
**VOLTAGE TEST**

- (1) Remove 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 connector J51 from connector P51.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter to connector J51-12.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (10) Position turn signal switch for left turn (TM 9-2320-365-10) and note reading on multimeter.
- (11) If 12 vdc pulse is not present, repair wire 461B (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (12) Position main light switch to OFF (TM 9-2320-365-10).
- (13) Position turn signal switch to off (TM 9-2320-365-10).
- (14) Connect connector J51 to connector P51.
- (15) Install PDP on dashboard with three screws.
- (16) Install three washers and screws in PDP.
- (17) Install PDP cover (para 16-2).



X2E71021

e68. INTERVEHICLE LEFT TURN SIGNAL 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**

**NOTE**

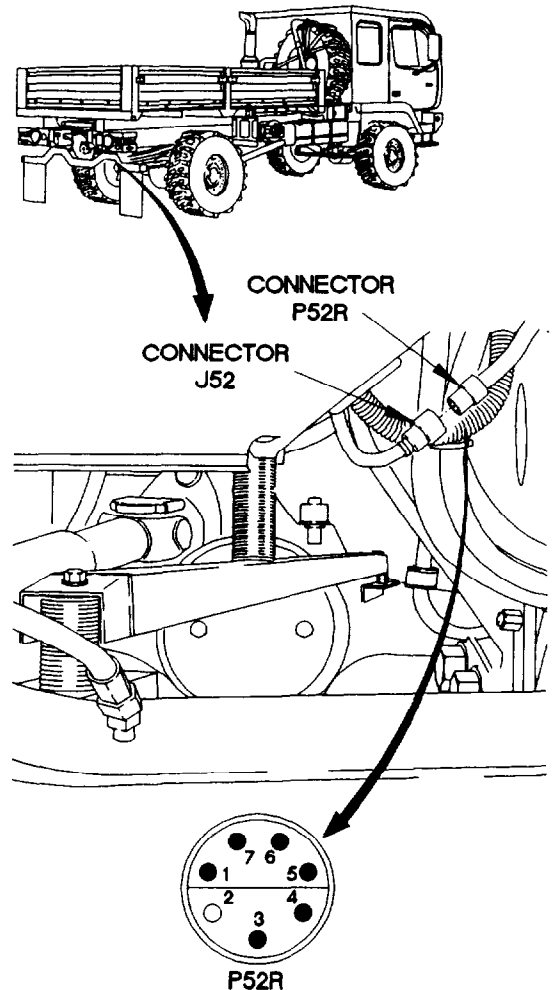
Remove plastic cable ties as required.

- (1) Disconnect connector P52R from connector J52.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P52R-5.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (6) Position turn signal switch for left turn (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc pulse is not present, repair wire 461B (para 2-40) or replace rear lights cable assembly (para 7-75).
- (8) If 12 vdc pulse is present, replace rear intervehicular 12 vdc (7 pin) cable (para 7-78).
- (9) Position turn signal switch to off (TM 9-2320-365-10).
- (10) Position main light switch to OFF (TM 9-2320-365-10).

**NOTE**

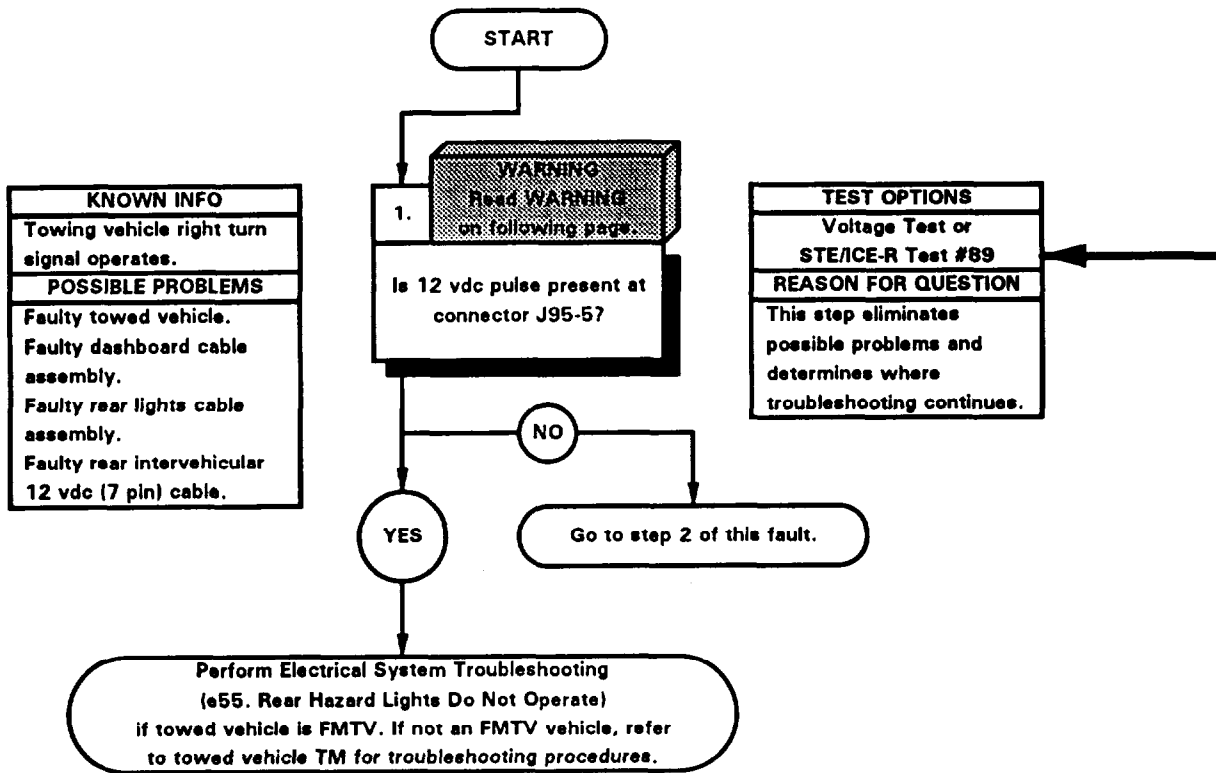
Install plastic cable ties as required.

- (11) Connect connector P52R to connector J52.



32E7103A

e69. INTERVEHICLE RIGHT TURN SIGNAL DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Ties, Cable, Plastic (Item 76, Appendix D)
<b>References</b> TM 9-4910-571-12&P	

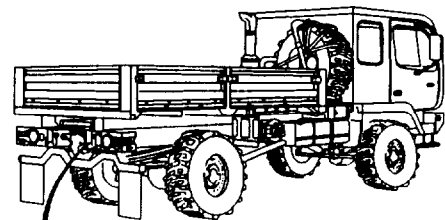


**WARNING**

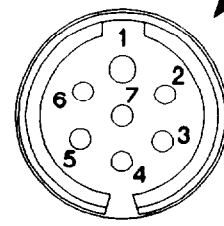
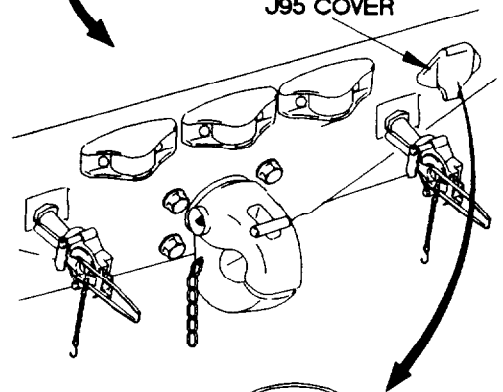
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Raise cover on connector J95 intervehicular 12 vdc connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J95-5.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (6) Position turn signal switch for right turn (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc pulse is not present, go to step 2 of this fault.
- (8) If 12 vdc pulse is present, perform Electrical System Troubleshooting (e55. Rear Hazard Do Not Operate) if towed vehicle is FMTV. If towed vehicle is not an FMTV, refer to towed vehicle TM for troubleshooting procedures.
- (9) Position turn signal switch to off (TM 9-2320-365-10).
- (10) Position main light switch to OFF (TM 9-2320-365-10).



CONNECTOR J95 COVER

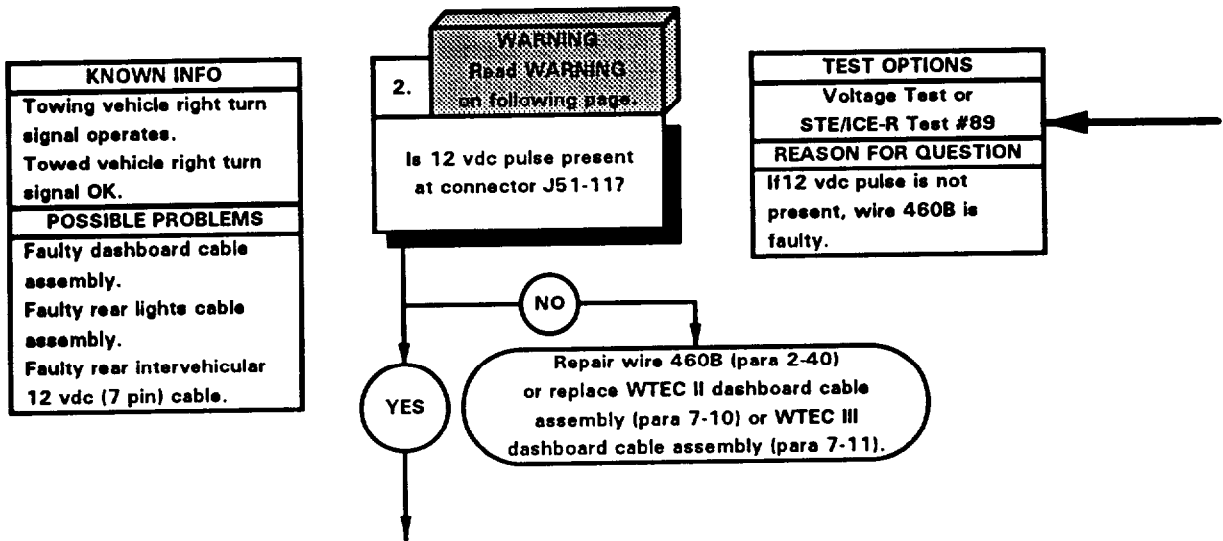


J95

32E7101A



e69. INTERVEHICLE RIGHT TURN SIGNAL DOES NOT OPERATE (CONT)

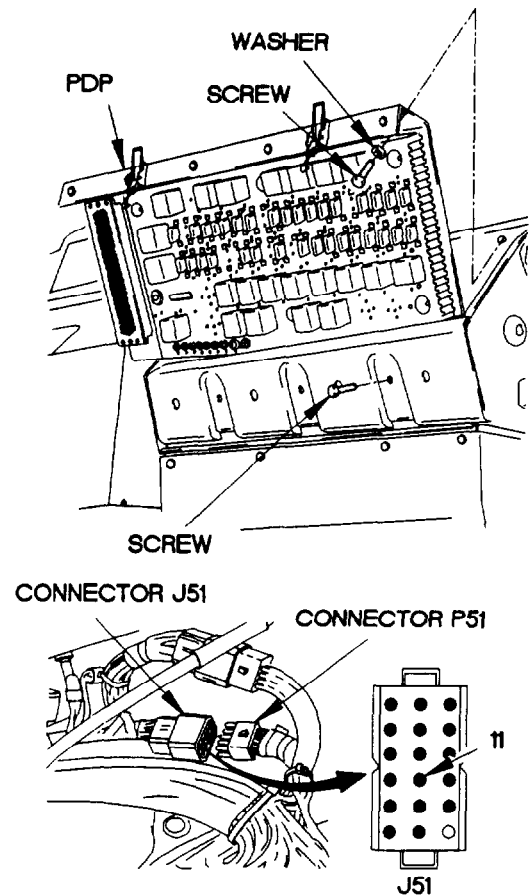


**WARNING**

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.

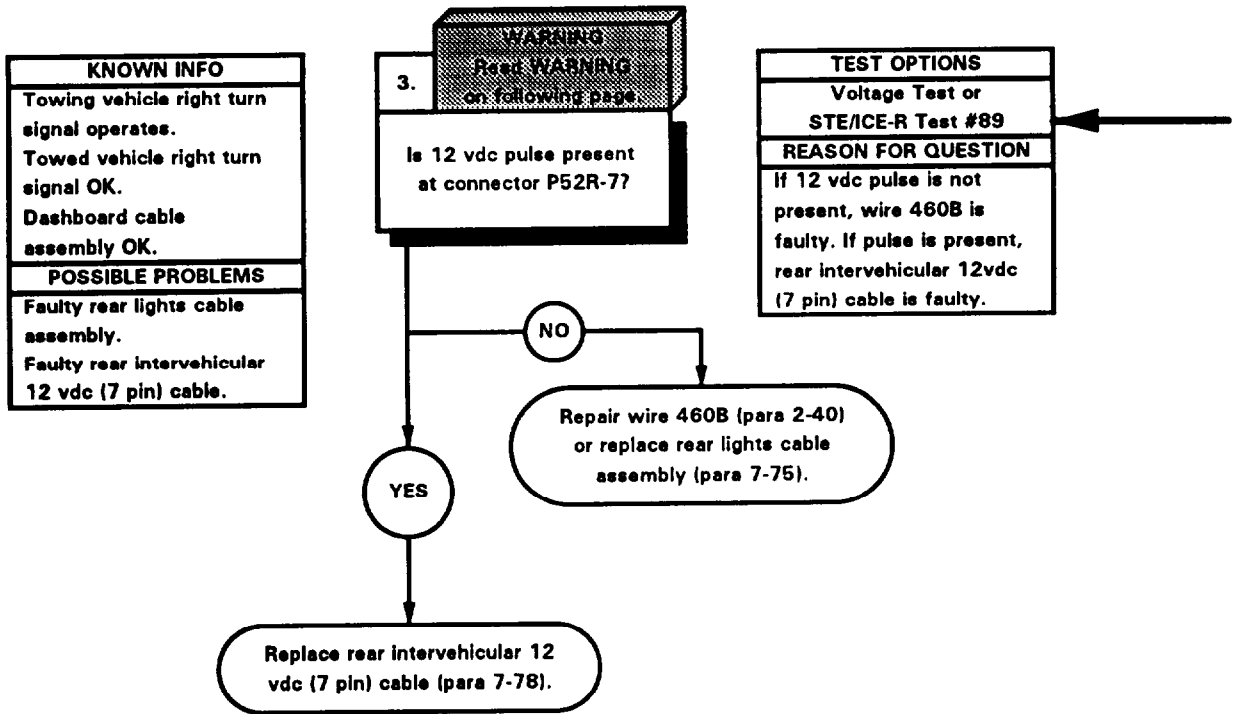
**VOLTAGE TEST**

- (1) Remove 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 connector J51 from connector P51.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter to connector J51-11.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (10) Position turn signal switch for right turn (TM 9-2320-365-10) and note reading on multimeter.
- (11) If 12 vdc pulse is not present, repair wire 460B (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (12) Position turn signal switch to off (TM 9-2320-365-10).
- (13) Position main light switch to OFF (TM 9-2320-365-10).
- (14) Connect connector J51 to connector P51.
- (15) Install PDP on dashboard with three screws.
- (16) Install three washers and screws in PDP.
- (17) Install PDP cover (para 16-2).



X2E 72021

e69. INTERVEHICLE RIGHT TURN SIGNAL 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**

**NOTE**

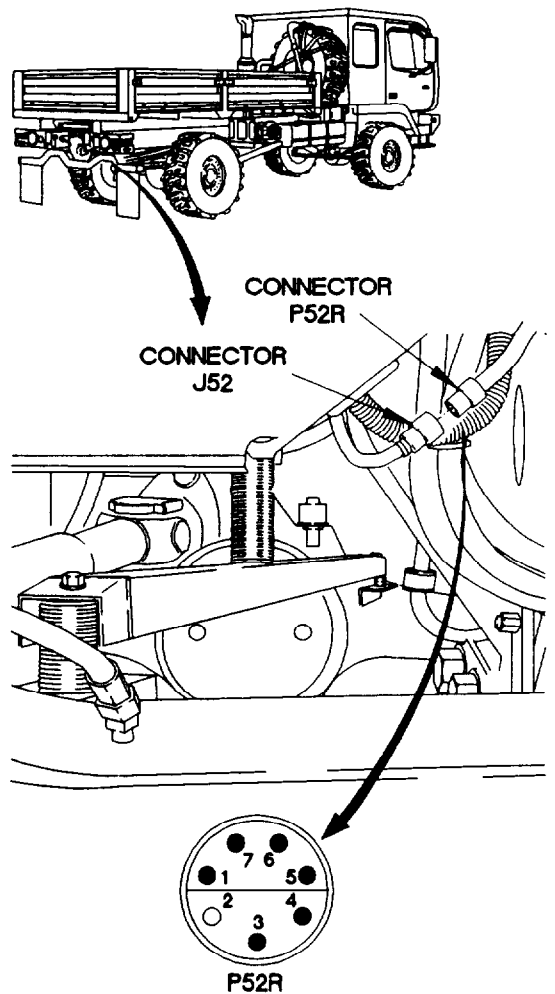
Remove plastic cable ties as required.

- (1) Disconnect connector P52R from connector J52.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P52R-7.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (6) Position turn signal switch for right turn (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc pulse is not present, repair wire 460B (para 2-40) or replace rear lights cable assembly (para 7-75).
- (8) If 12 vdc pulse is present, replace rear intervehicular 12 vdc (7 pin) cable (para 7-78).
- (9) Position turn signal switch to off (TM 9-2320-365-10).
- (10) Position main light switch to OFF (TM 9-2320-365-10).

**NOTE**

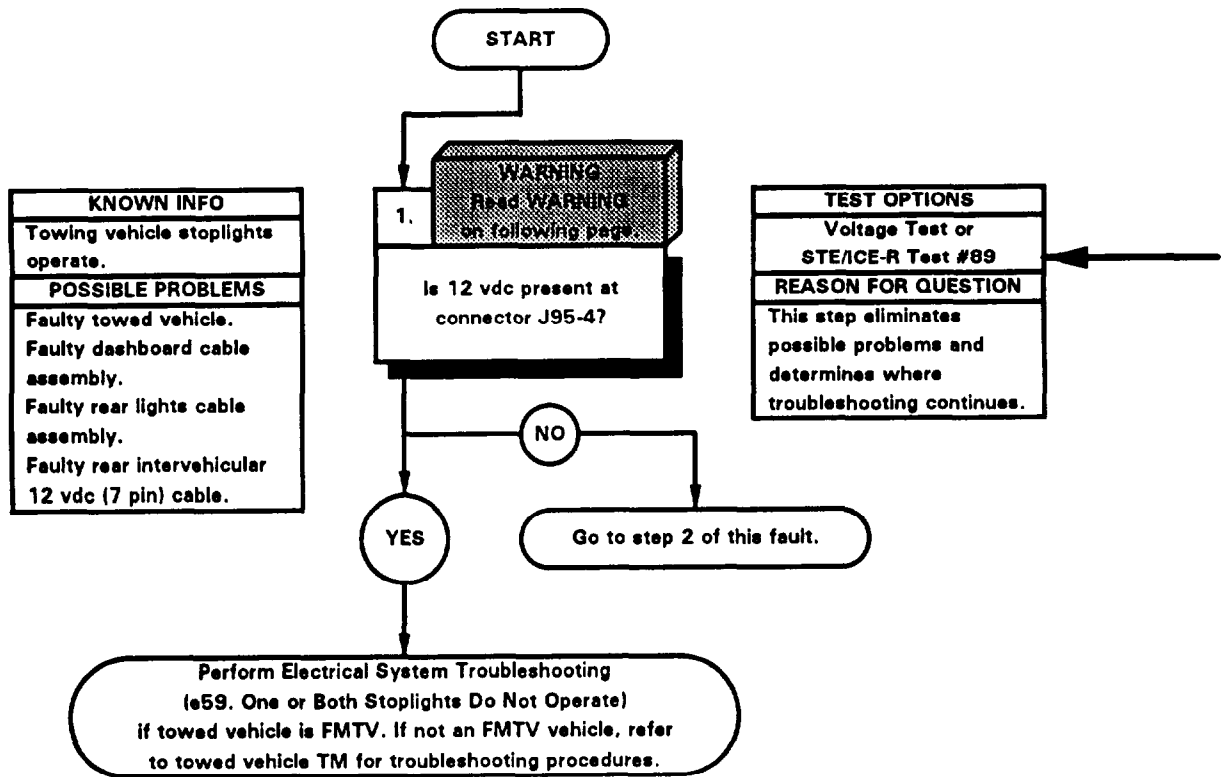
Install plastic cable ties as required.

- (11) Connect connector P52R to connector J52.



32E7103A

e70. INTERVEHICLE STOPLIGHTS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Ties, Cable, Plastic (Item 76, Appendix D)
<b>References</b> TM 9-4910-571-12&P	

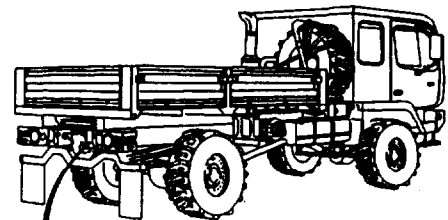


**WARNING**

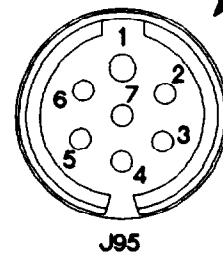
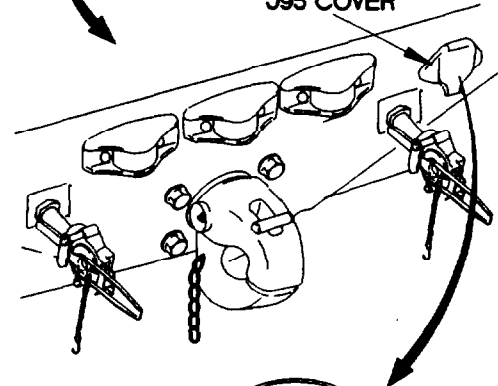
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Raise cover on connector J95 intervehicular 12 vdc connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J95-4.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (7) Apply brakes (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 12 vdc is not present, go to step 2 of this fault.
- (9) If 12 vdc is present, perform Electrical System Troubleshooting (e59. One or Both Stoplights Do Not Operate) if towed vehicle is FMTV. If towed vehicle is not an FMTV, refer to towed vehicle TM for troubleshooting procedures.
- (10) Position main light switch to OFF (TM 9-2320-365-10).
- (11) Position master power switch to off (TM 9-2320-365-10).

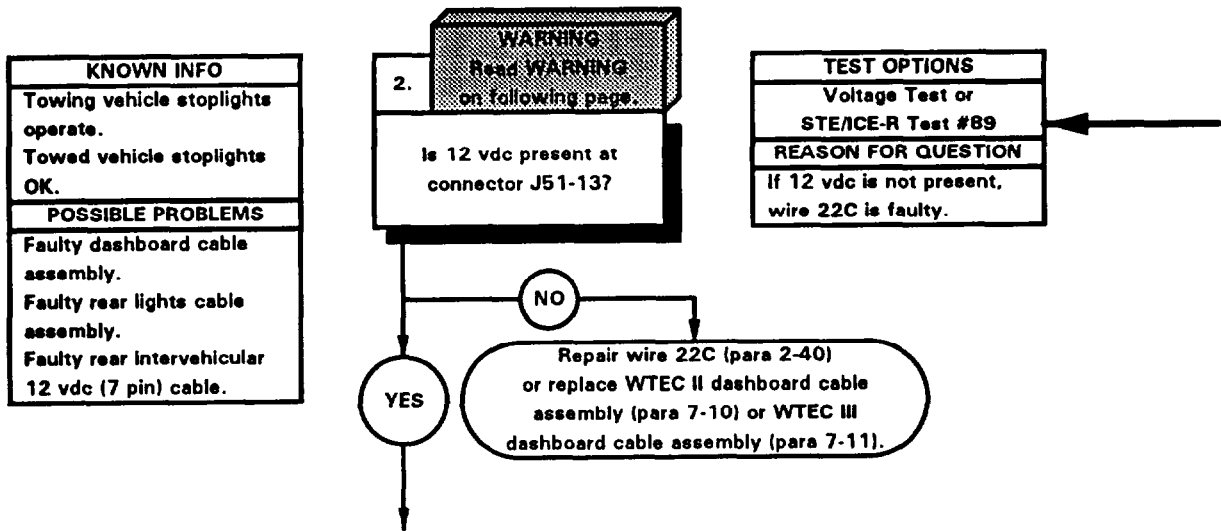


CONNECTOR J95 COVER



32E7101A

e70. INTERVEHICLE STOPLIGHTS DO NOT OPERATE (CONT)

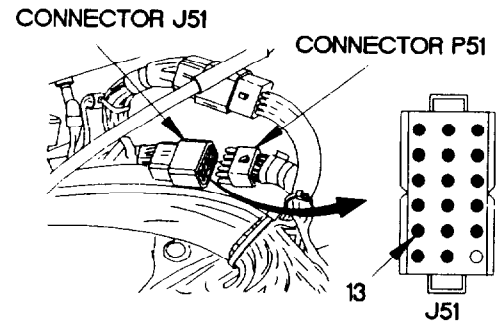
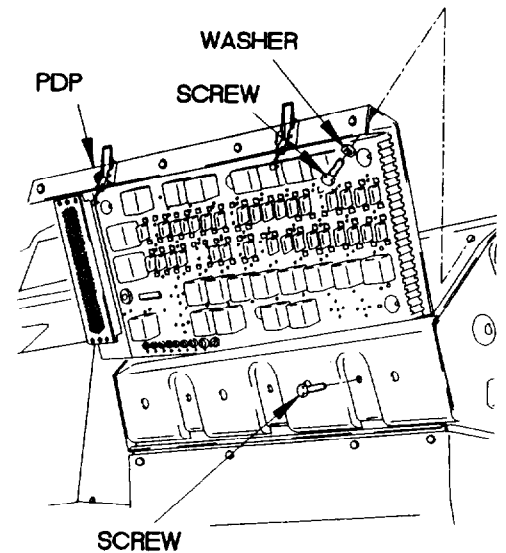


**WARNING**

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**

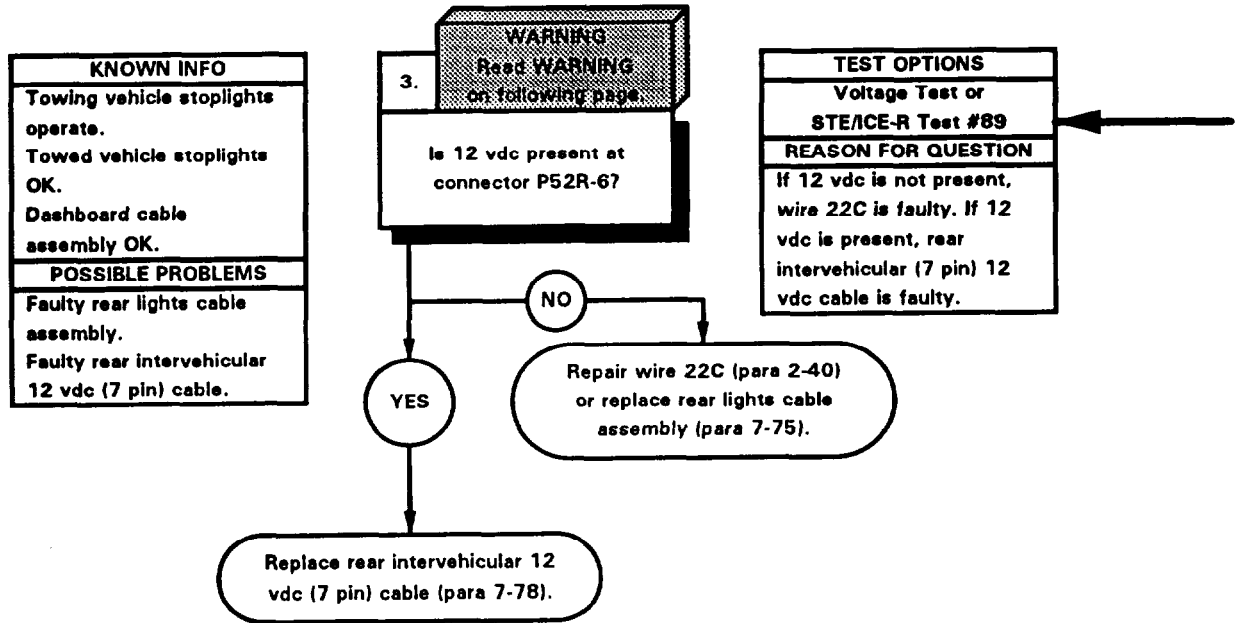
- (1) Remove PDP cover (para 16-2).
- (2) Remove three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Disconnect connector J51 from connector P51.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter to connector J51-13.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position master power switch to on (TM 9-2320-365-10).
- (10) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (11) Apply brakes (TM 9-2320-365-10) and note reading on multimeter.
- (12) If 12 vdc is not present, repair wire 22C (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (13) Position main light switch to OFF (TM 9-2320-365-10).
- (14) Position master power switch to off (TM 9-2320-365-10).
- (15) Connect connector J51 to connector P51.
- (16) Install PDP on dashboard with three screws.
- (17) Install three washers and screws in PDP.
- (18) Install PDP cover (para 16-2).



x2E 73021



e70. INTERVEHICLE STOPLIGHTS DO 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**

**NOTE**

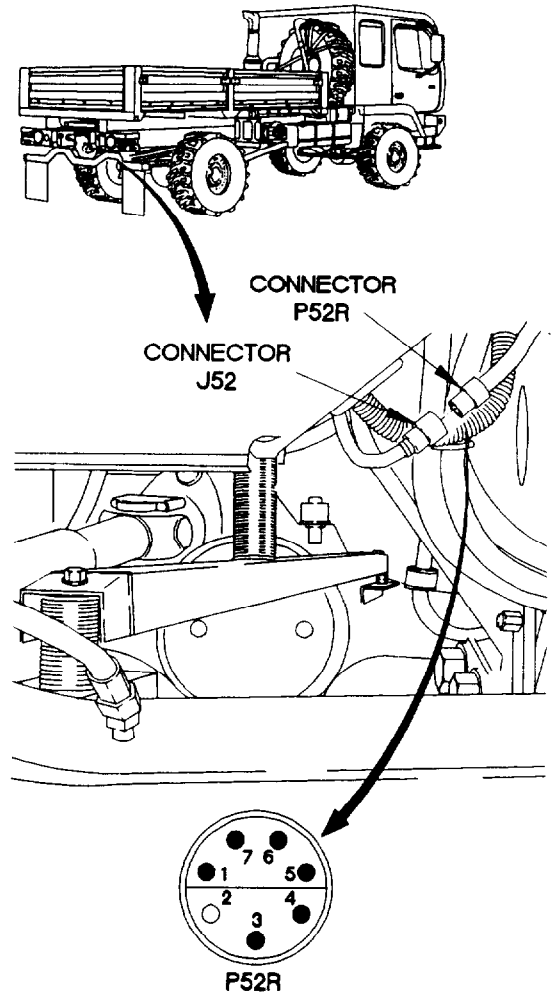
Remove plastic cable ties as required.

- (1) Disconnect connector P52R from connector J52.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P52R-6.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (7) Apply brakes (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 12 vdc is not present, repair wire 22C (para 2-40) or replace rear lights cable assembly (para 7-75).
- (9) If 12 vdc is present, replace rear intervehicular 12 vdc (7 pin) cable (para 7-78).
- (10) Position main light switch to OFF (TM 9-2320-365-10).
- (11) Position master power switch to off (TM 9-2320-365-10).

**NOTE**

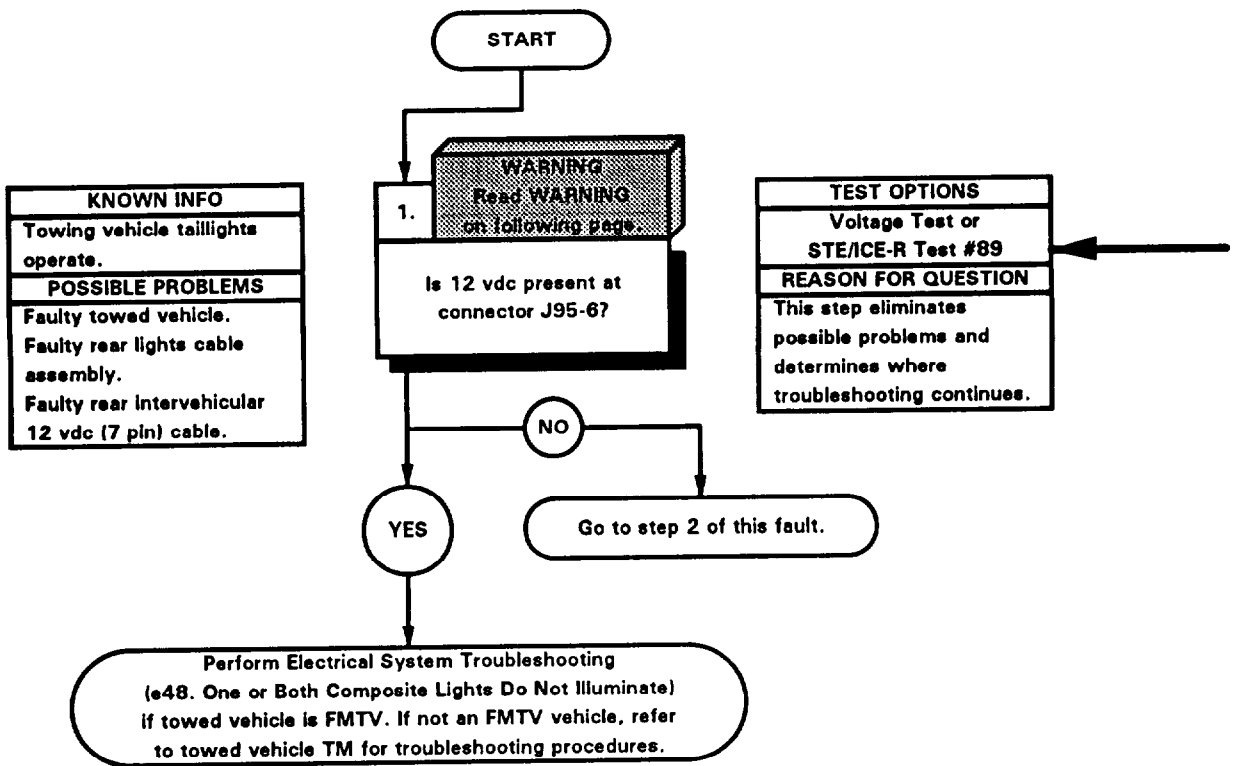
Install plastic cable ties as required.

- (12) Connect connector P52R to connector J52.



32E7103A

e71. INTERVEHICLE TAILLIGHTS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Ties, Cable, Plastic (Item 76, Appendix D)
<b>References</b> TM 9-4910-571-12&P	

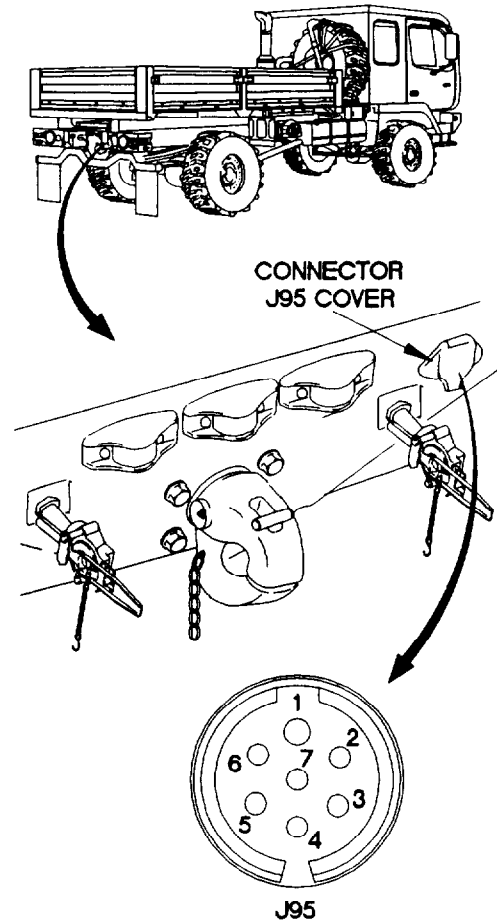


**WARNING**

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.

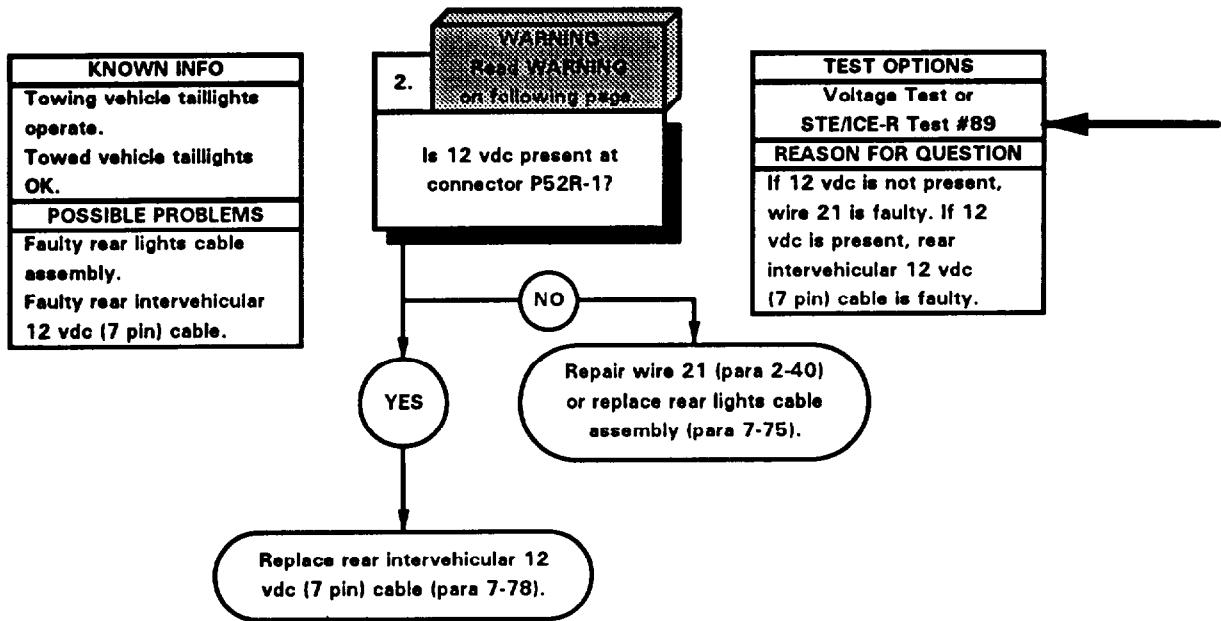
**VOLTAGE TEST**

- (1) Raise cover on connector J95 intervehicular 12 vdc connector.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J95-6.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, go to step 2 of this fault.
- (7) If 12 vdc is present, perform Electrical System Troubleshooting (e48. One or Both Composite Lights Do Not Illuminate) if towed vehicle is FMTV. If towed vehicle is not an FMTV, refer to towed vehicle TM for troubleshooting procedures.
- (8) Position main light switch to OFF (TM 9-2320-365-10).



32E 7101A

e71. INTERVEHICLE TAILLIGHTS DO 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**

**NOTE**

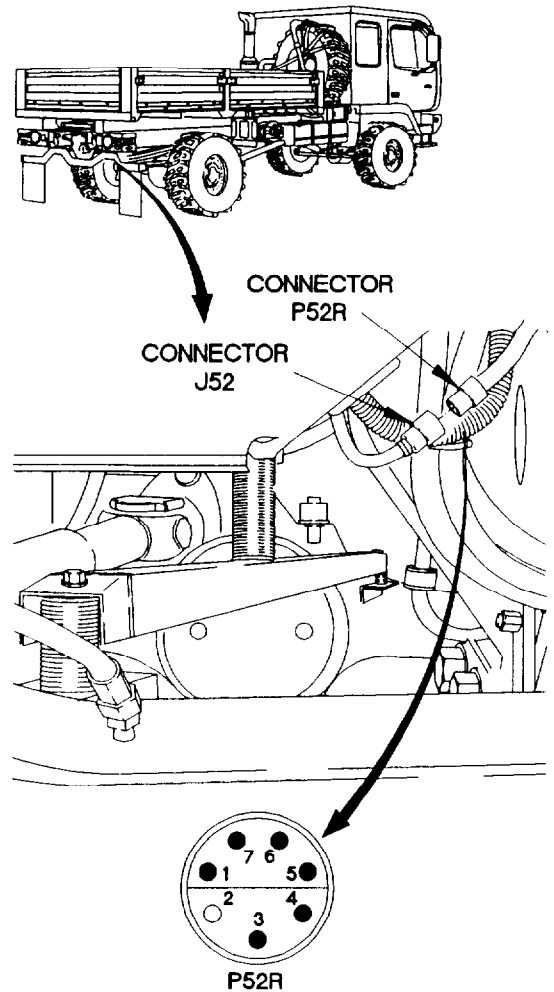
Remove plastic cable ties as required.

- (1) Disconnect connector P52R from connector J52.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P52R-1.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 12 vdc is not present, repair wire 21 (para 2-40) or replace rear lights cable assembly (para 7-75).
- (7) If 12 vdc is present, replace rear intervehicular 12 vdc (7 pin) cable (para 7-78).
- (8) Position main light switch to OFF (TM 9-2320-365-10).

**NOTE**

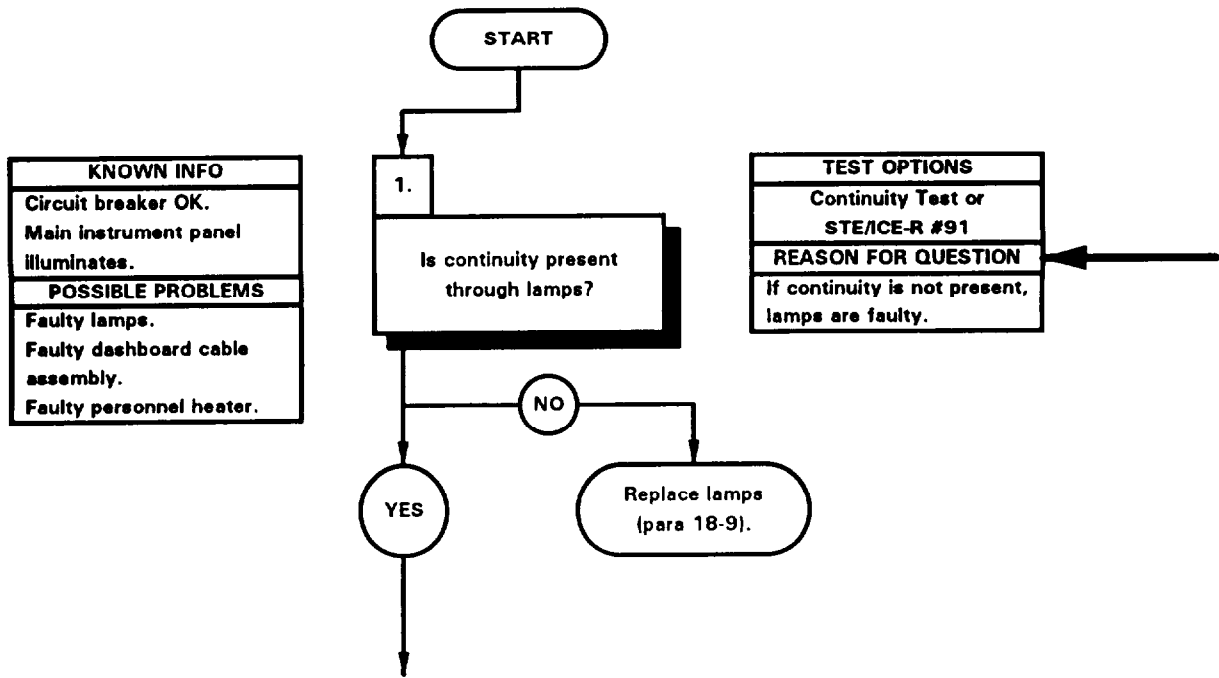
Install plastic cable ties as required.

- (9) Connect connector P52R to connector J52.

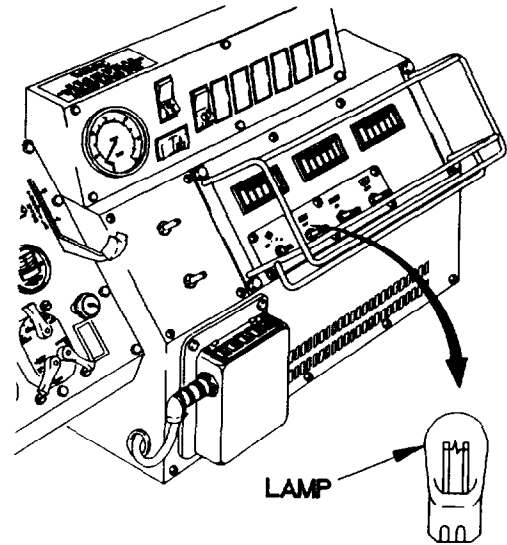


32E7103A

●72. PERSONNEL HEATER CONTROL ILLUMINATION DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	
<b>References</b> TM 9-4910-571-12&P	



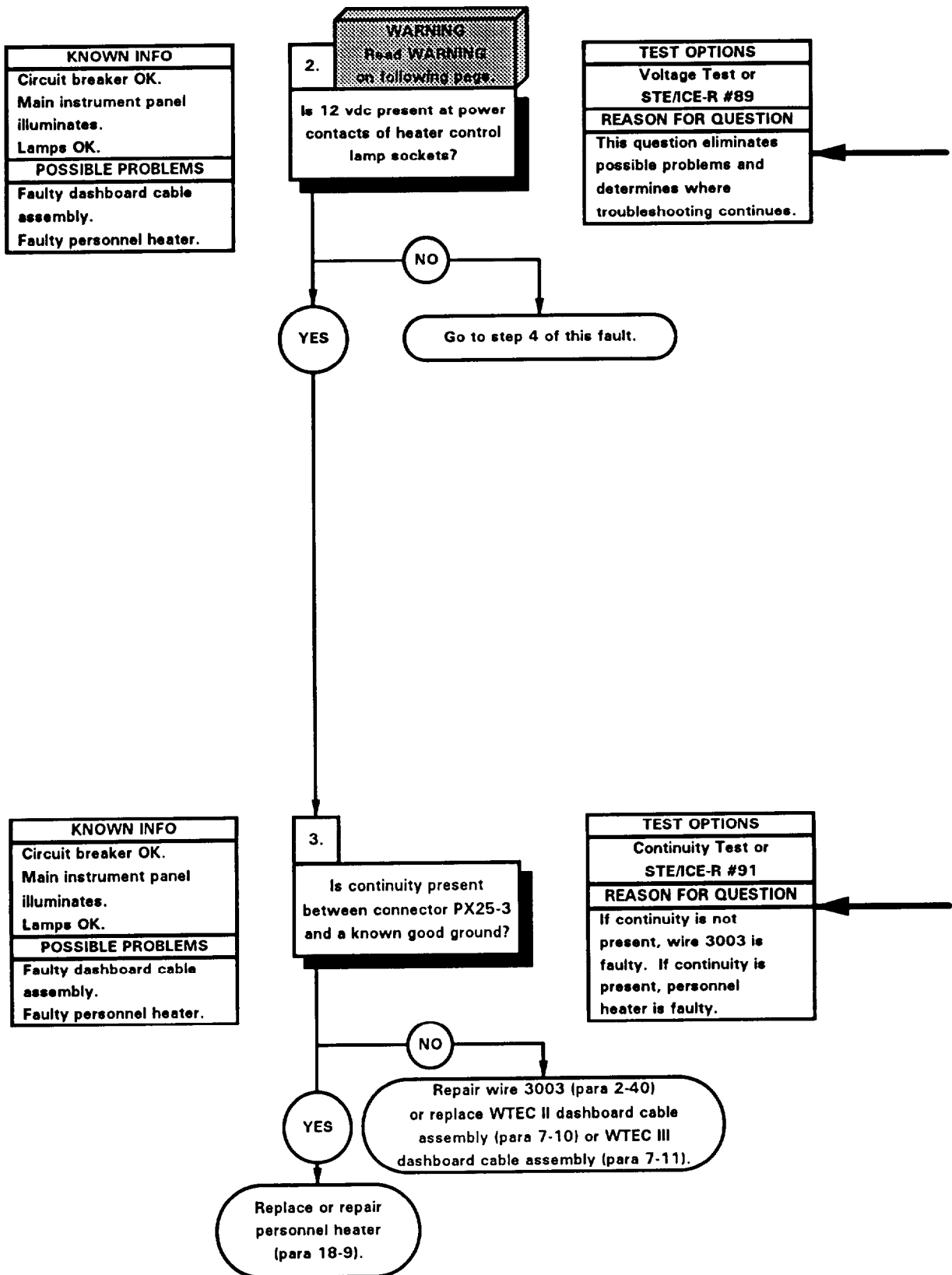
- CONTINUITY TEST**
- (1) Remove lamps from heater (para 18-9).
  - (2) Set multimeter to ohms.
  - (3) Check continuity through each lamp.
  - (4) If continuity is not present, replace lamp(s) (para 18-9).



X2E7501A



e72. PERSONNEL HEATER ILLUMINATION DOES NOT OPERATE (CONT)

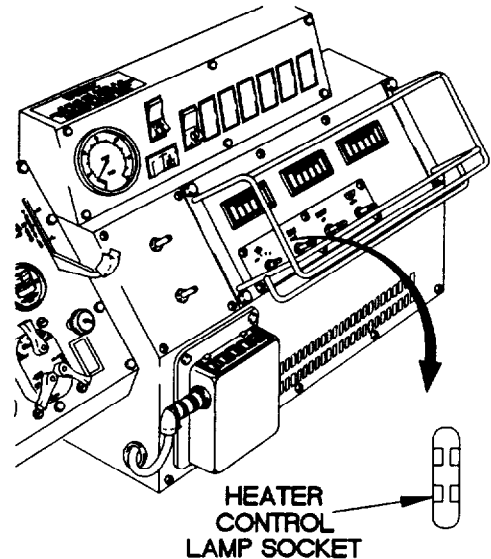


**WARNING**

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**

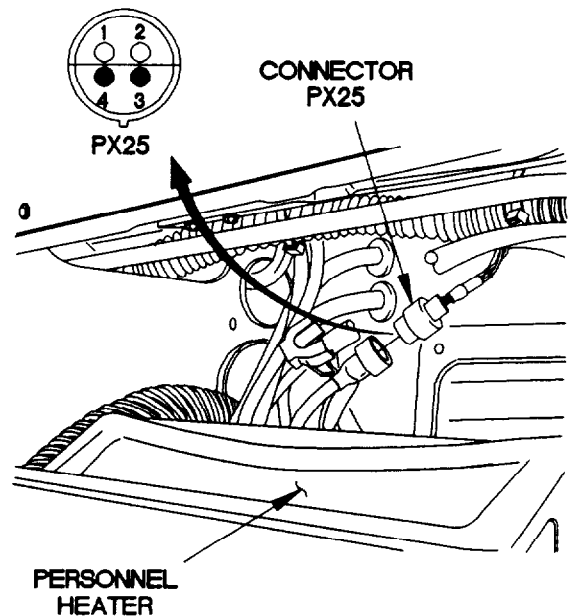
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to power contact of each heater control lamp socket.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to SER DRIVE (TM 9-2320-365-10).
- (5) Position main light switch auxiliary lever to PANEL BRT (TM 9-2320-365-10).
- (6) Position dimmer switch to maximum brightness (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 12 vdc is not present, go to step 4 of this fault.
- (8) Position main light switch to OFF (TM 9-2320-365-10).
- (9) Position main light switch auxiliary lever to OFF (TM 9-2320-365-10).
- (10) Install lamps in heater (para 18-9).



X2E7502A

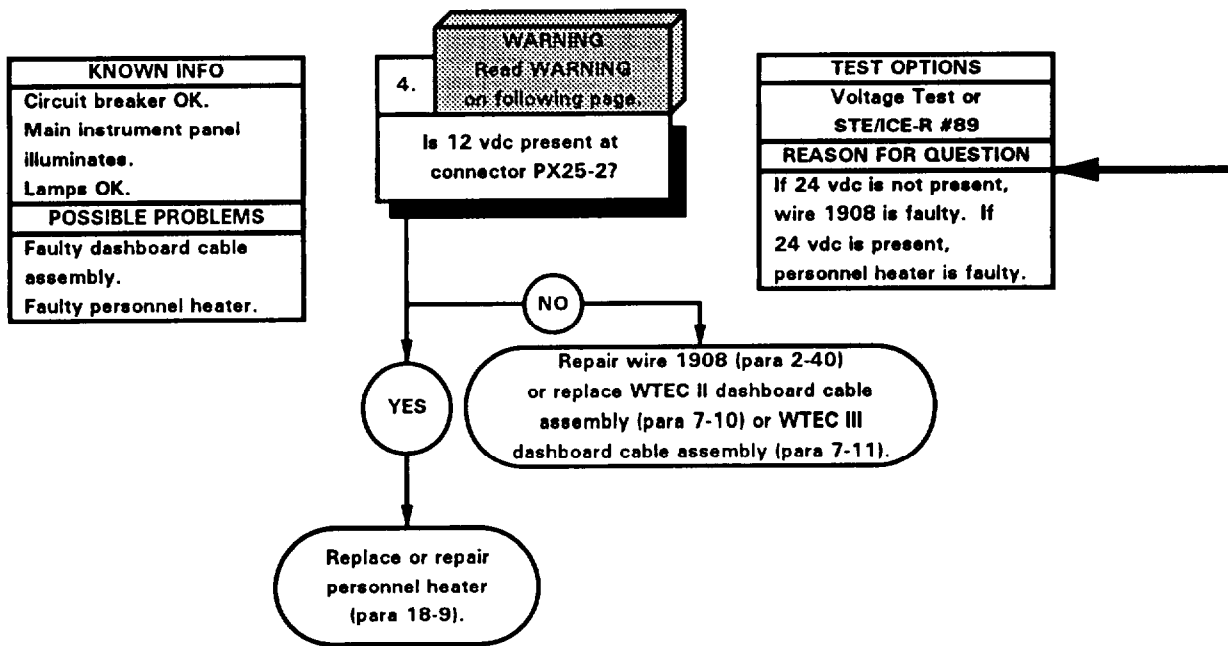
**CONTINUITY TEST**

- (1) Remove personnel heater for access (para 18-9).
- (2) Disconnect connector PX25 from personnel heater connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector PX25-3.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If continuity is not present, repair wire 3003 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) If continuity is present, replace or repair personnel heater (para 18-9).
- (8) Connect connector PX25 to personnel heater connector.
- (9) Install personnel heater (para 18-9).



X2E7504A

e72. PERSONNEL HEATER ILLUMINATION DOES NOT OPERATE (CONT)

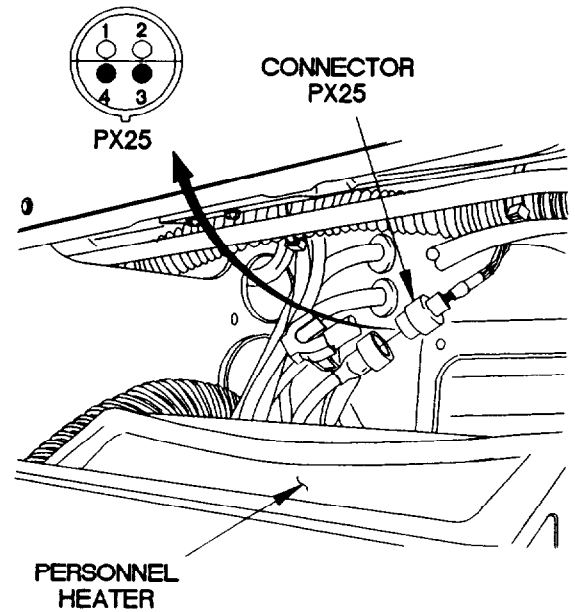


**WARNING**

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 PX25 from personnel heater connector.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector PX25-1.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Position main light switch auxiliary lever to PNL BRT (TM 9-2320-365-10).
- (8) Position dimmer switch to maximum brightness (TM 9-2320-365-10) and note reading on multimeter.
- (9) If 12 vdc is not present, repair wire 1908 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) If 12 vdc is present, replace or repair personnel heater (para 18-9).
- (11) Position master power switch to off (TM 9-2320-365-10).
- (12) Position main light switch auxiliary lever to OFF (TM 9-2320-365-10).
- (13) Connect connector PX25 to personnel heater connector.
- (14) Install personnel heater (para 18-9).



X2E7504A

**73. PERSONNEL HEATER FAN DOES NOT OPERATE**

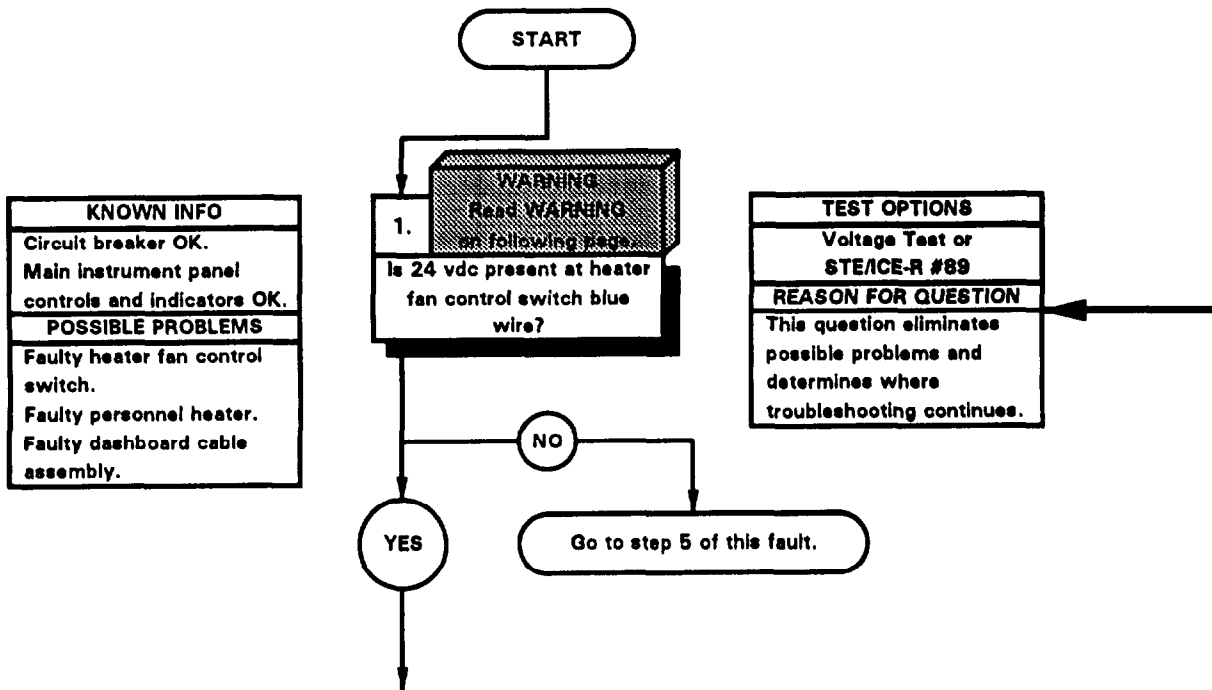
**INITIAL SETUP**

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

**Personnel Required**  
 (2)

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

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

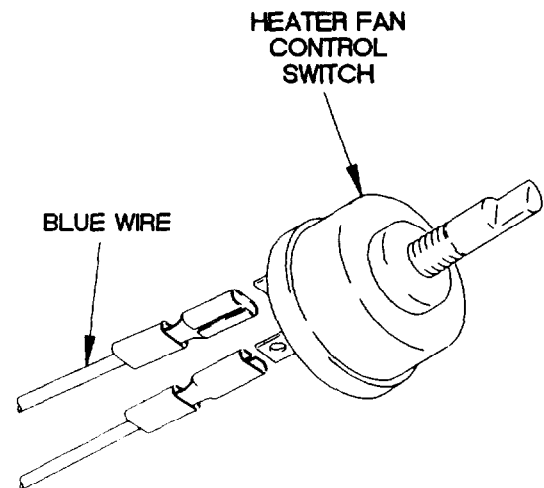


**WARNING**

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.

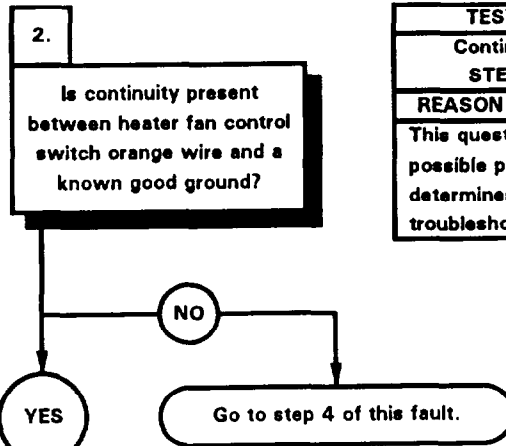
**VOLTAGE TEST**

- (1) Remove heater fan control switch (para 18-10).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to personnel heater fan control switch blue wire.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 5 of this fault.
- (7) Position master power switch to off (TM 9-2320-365-10).



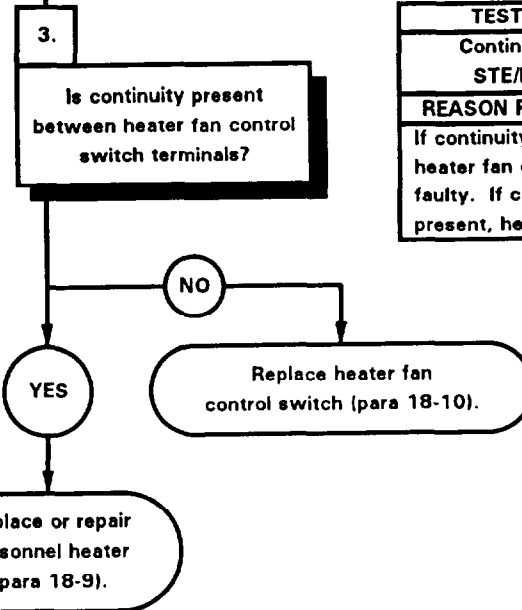
e73. PERSONNEL HEATER FAN DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Main instrument panel controls and indicators OK.
POSSIBLE PROBLEMS
Faulty heater fan control switch. Faulty personnel heater. Faulty dashboard cable assembly.



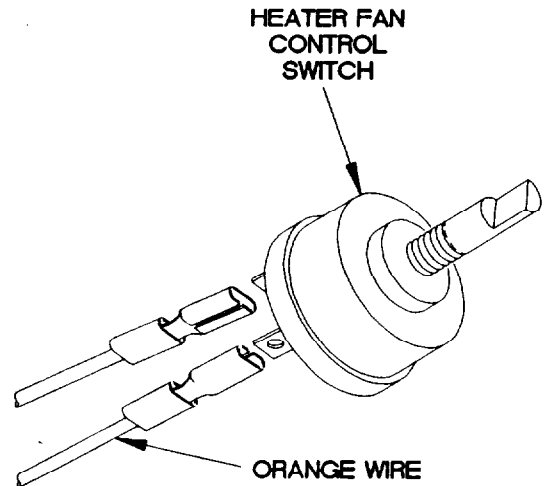
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.

KNOWN INFO
Circuit breaker OK. Main instrument panel controls and indicators OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty heater fan control switch. Faulty personnel heater.



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

CONTINUITY TEST	
	(1) Set multimeter to ohms.
	(2) Connect positive (+) probe of multimeter to heater fan control switch orange wire.
	(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
	(4) If continuity is not present, go to step 4 of this fault.



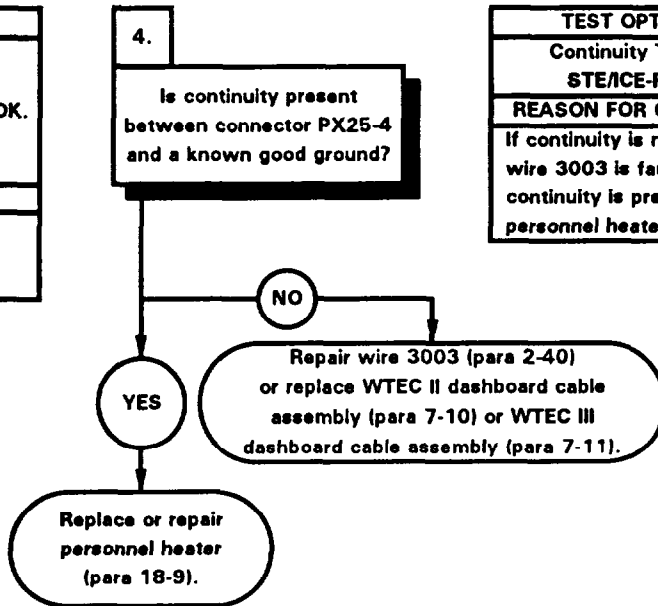
K2E6302-

CONTINUITY TEST	
	(1) Set multimeter to ohms.
	(2) Position heater fan control switch to high speed.
	(3) Connect positive (+) probe of multimeter to one heater fan control switch terminal.
	(4) Connect negative (-) probe of multimeter to other heater fan control switch terminal and note reading on multimeter.
	(5) If continuity is not present, replace heater fan control switch (para 18-10).
	(6) If continuity is present, replace or repair personnel heater (para 18-9).
	(7) Install heater fan control switch (para 18-10).



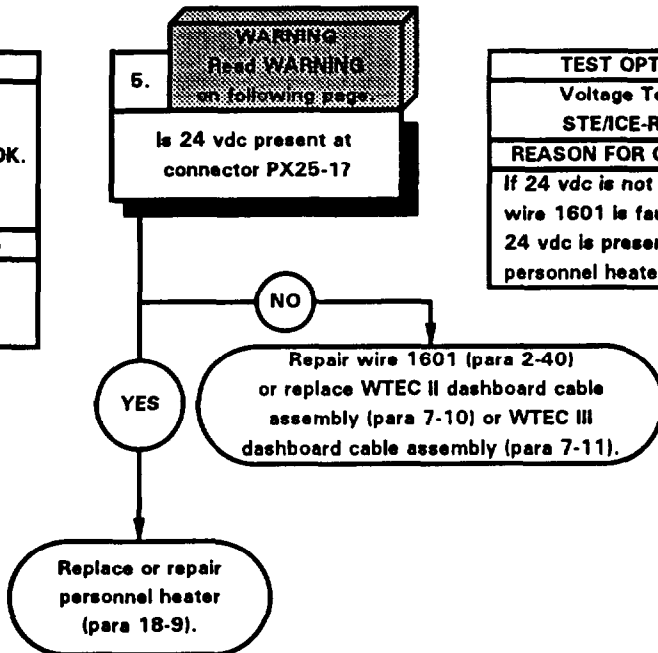
673. PERSONNEL HEATER FAN DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Main instrument panel controls and indicators OK. Heater fan control switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty personnel heater.



TEST OPTIONS
Continuity Test or STE/CE-R#91
REASON FOR QUESTION
If continuity is not present, wire 3003 is faulty. If continuity is present, personnel heater is faulty.

KNOWN INFO
Circuit breaker OK. Main instrument panel controls and indicators OK. Heater fan control switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty personnel heater.



TEST OPTIONS
Voltage Test or STE/CE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1601 is faulty. If 24 vdc is present, personnel heater is faulty.

**CONTINUITY TEST**

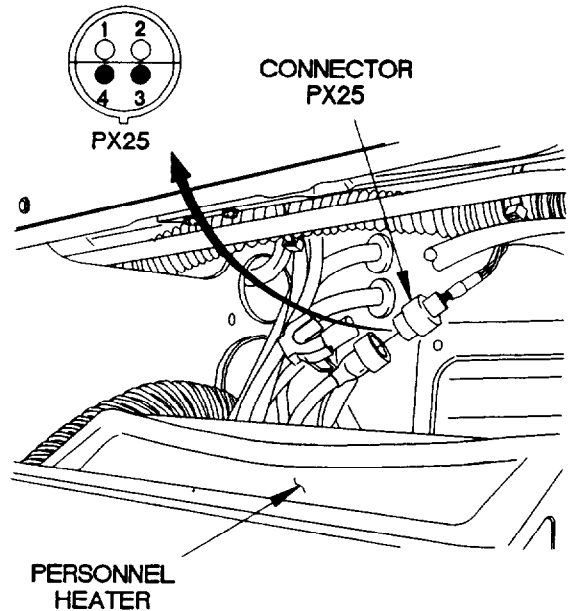
- (1) Remove personnel heater for access (para 18-9).
- (2) Disconnect connector PX25 from personnel heater connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector PX25-4.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If continuity is not present, repair wire 3003 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) If continuity is present, replace or repair personnel heater (para 18-9).
- (8) Install personnel heater (para 18-9).
- (9) Install heater fan control switch (para 18-10).

**WARNING**

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

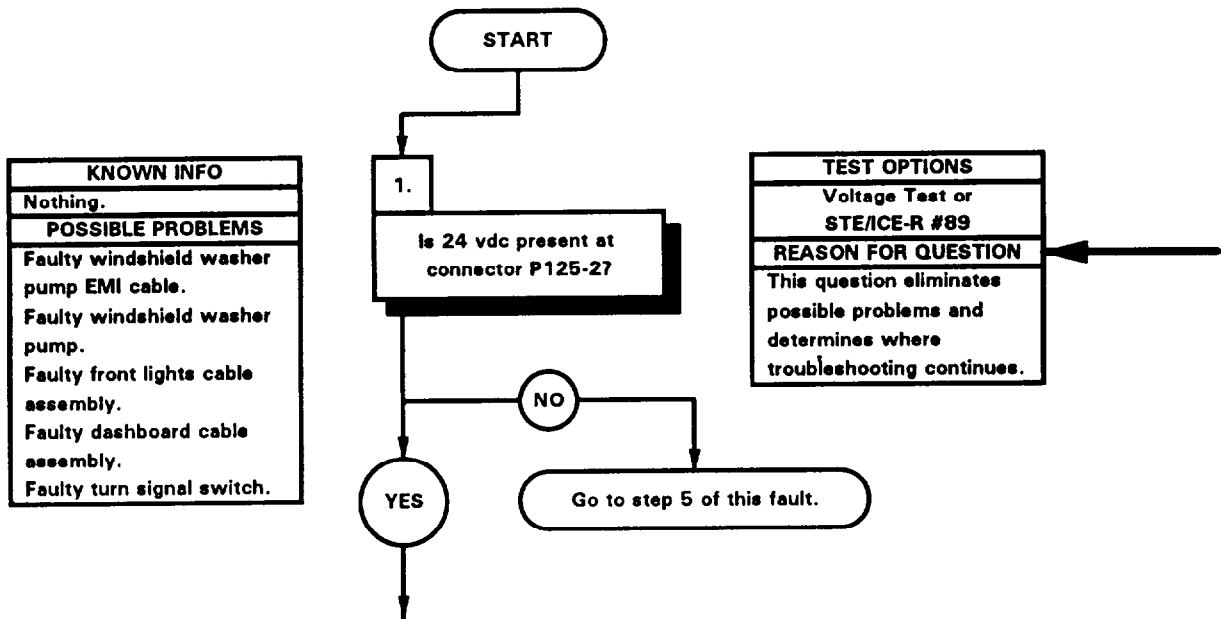
**VOLTAGE TEST**

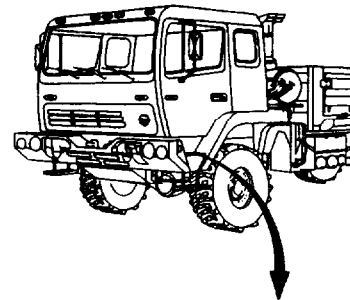
- (1) Remove personnel heater for access (para 18-9).
- (2) Disconnect connector PX25 from personnel heater connector.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector PX25-2.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1601 (para 2-40) 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, replace or repair personnel heater (para 18-9).
- (9) Position master power switch to off (TM 9-2320-365-10).
- (10) Install personnel heater (para 18-9).
- (11) Install heater fan control switch (para 18-10).



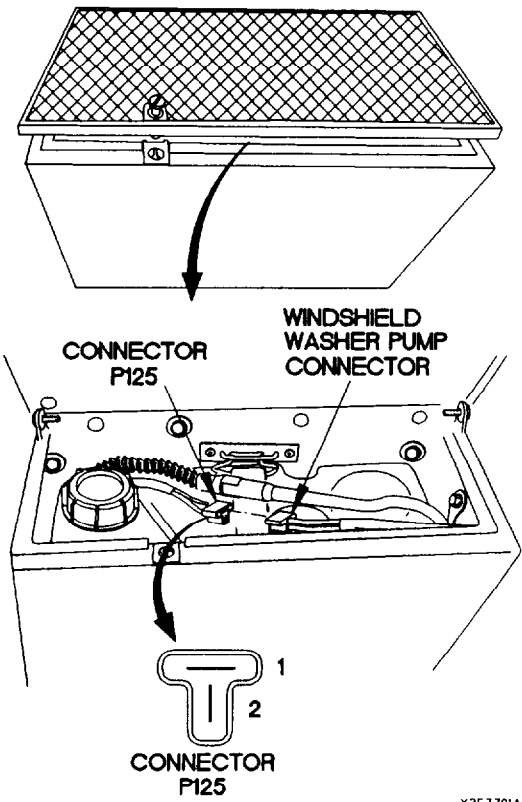
X2E7603A

74. WINDSHIELD WASHER DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P





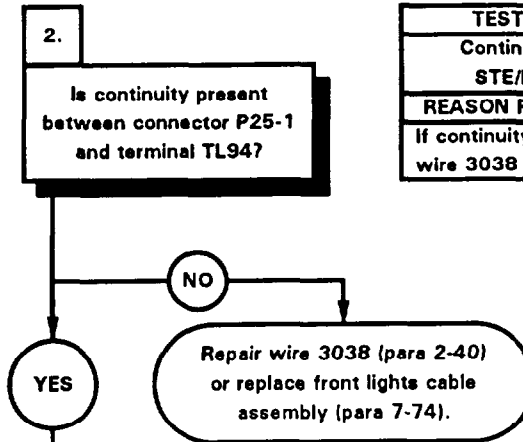
- | VOLTAGE TEST |  |
|--------------|--|
| (1)          | Open left cab step tread (TM 9-2320-365-10).                     |
| (2)          | Disconnect connector P125 from windshield washer pump connector. |
| (3)          | Set multimeter to volts dc.                                      |
| (4)          | Connect positive (+) probe of multimeter to connector P125-2.    |
| (5)          | Connect negative (-) probe of multimeter to ground.              |
| (6)          | Operate windshield washer (TM 9-2320-365-10).                    |
| (7)          | If 24 vdc is not present, go to step 5 of this fault.            |
| (8)          | Position master power switch to off (TM 9-2320-365-10).          |
| (9)          | Connect connector P125 to windshield washer pump connector.      |



X2E7701A

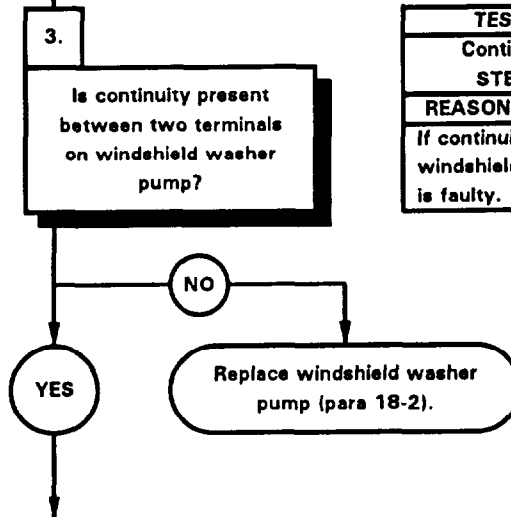
e74. WINDSHIELD WASHER DOES NOT OPERATE (CONT)

KNOWN INFO
Dashboard cable assembly OK. Turn signal switch OK.
POSSIBLE PROBLEMS
Faulty front lights cable assembly. Faulty windshield washer pump. Faulty windshield washer pump EMI cable.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3038 is faulty.

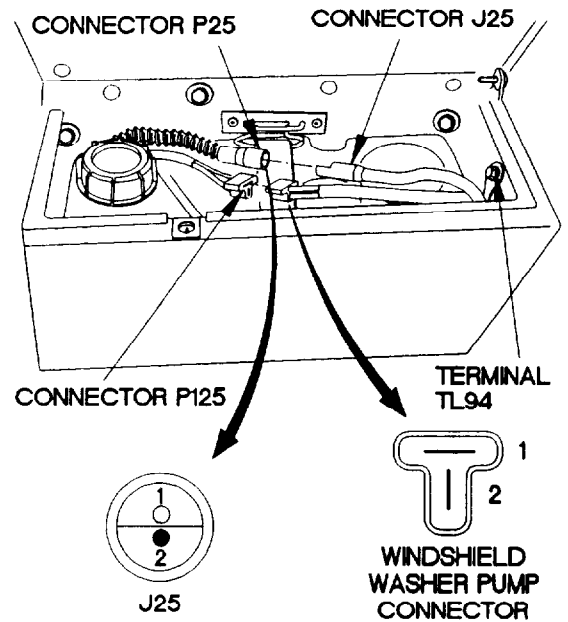
KNOWN INFO
Dashboard cable assembly OK. Turn signal switch OK. Front lights cable assembly OK.
POSSIBLE PROBLEMS
Faulty windshield washer pump. Faulty windshield washer pump EMI cable.



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

**CONTINUITY TEST**

- (1) Disconnect connector P25 from connector J25.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector J25-1.
- (4) Connect negative (-) probe of multimeter to terminal TL94.
- (5) If continuity is not present, repair wire 3038 (para 2-40) or replace front lights cable assembly (para 7-74).
- (6) Connect connector P25 to connector J25.

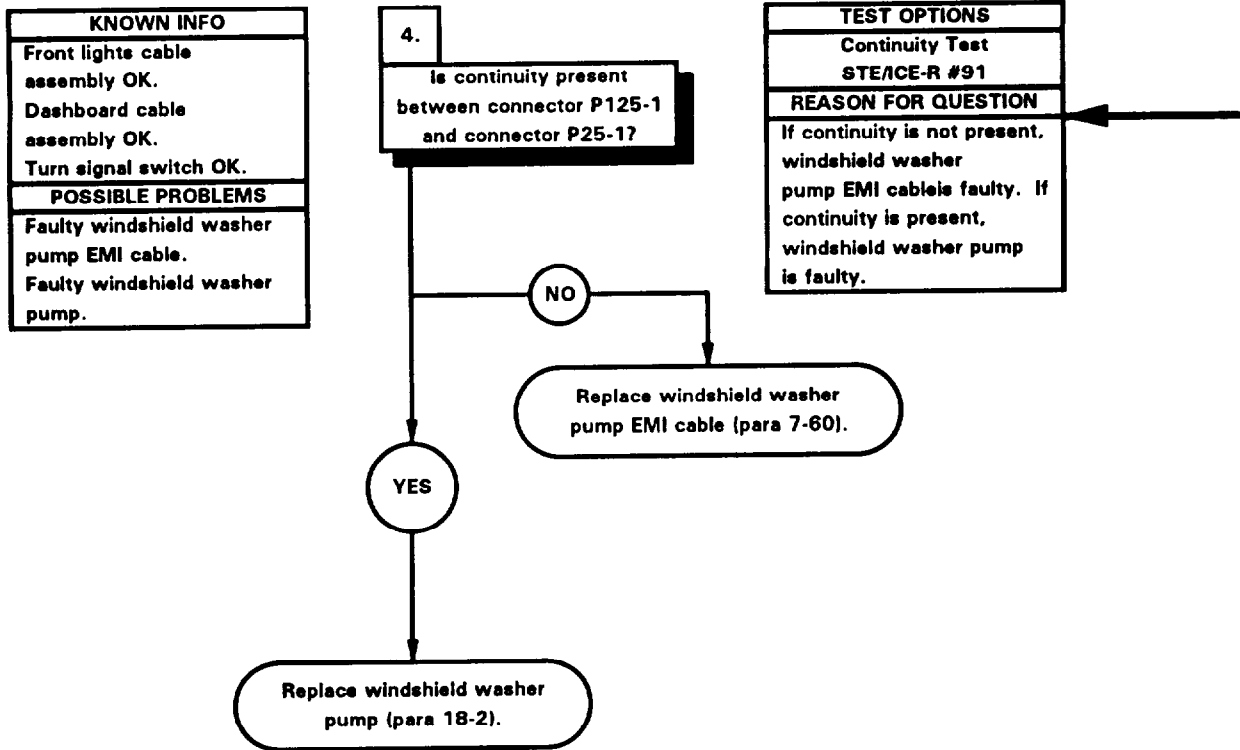


**CONTINUITY TEST**

- (1) Disconnect connector P125 from windshield washer pump connector.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to terminal 1 of windshield washer pump connector.
- (4) Connect negative (-) probe of multimeter to terminal 2 of windshield washer pump connector.
- (5) If continuity is not present, replace windshield washer motorpump (para 18-2).
- (6) Connect connector P125 to windshield washer pump connector.

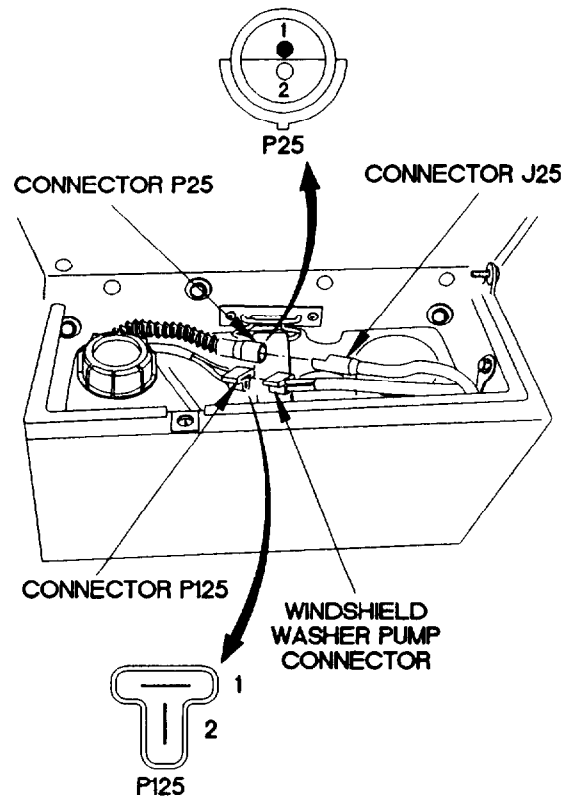
X2E7702A

e74. WINDSHIELD WASHER DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

- (1) Disconnect connector P25 from connector J25.
- (2) Disconnect connector P125 from windshield washer pump connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P25-1.
- (5) Connect negative (-) probe of multimeter to connector P125-1 and note reading on multimeter.
- (6) If continuity is not present, replace windshield washer pump EMI cable (para 7-60).
- (7) If continuity is present, replace windshield washer pump (para 18-2).
- (8) Connect connector P25 to connector J25.
- (9) Connect connector P125 to windshield washer pump.
- (10) Close left cab step tread (TM 9-2320-365-10).



x2E.7703A



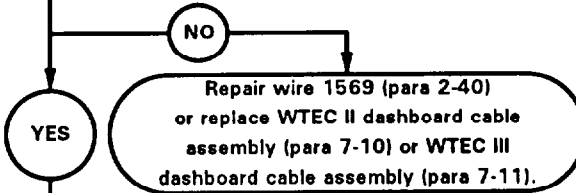
e74. WINDSHIELD WASHER DOES NOT OPERATE (CONT)

KNOWN INFO
Windshield washer pump OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty turn signal switch.
Faulty front lights cable assembly.
Faulty windshield washer pump EMI cable.

5. **WARNING**  
Read WARNING on following page.

Is 24 vdc present at connector P18-4?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1569 is faulty.

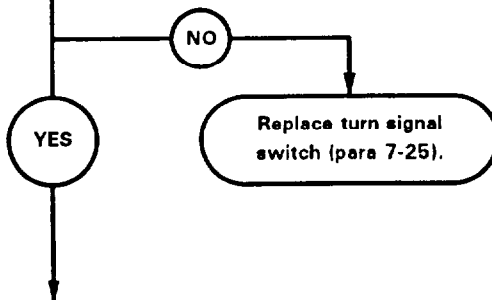


KNOWN INFO
Windshield washer pump OK.
POSSIBLE PROBLEMS
Faulty turn signal switch.
Faulty dashboard cable assembly.
Faulty windshield washer pump EMI cable.

6.

Is continuity present between turn signal switch connector terminal 4 and terminal 8?

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

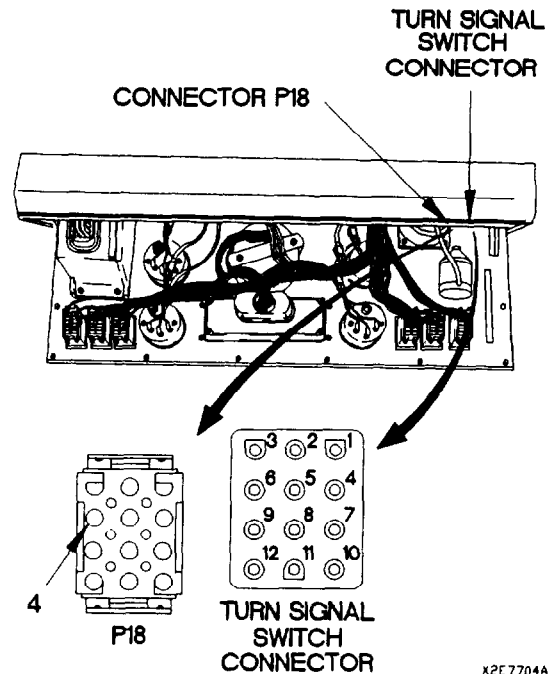


**WARNING**

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

**VOLTAGE TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector P18 from turn signal switch connector.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector P18-4.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Press windshield washer switch (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1569 (para 2-40) 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 9-2320-365-10).

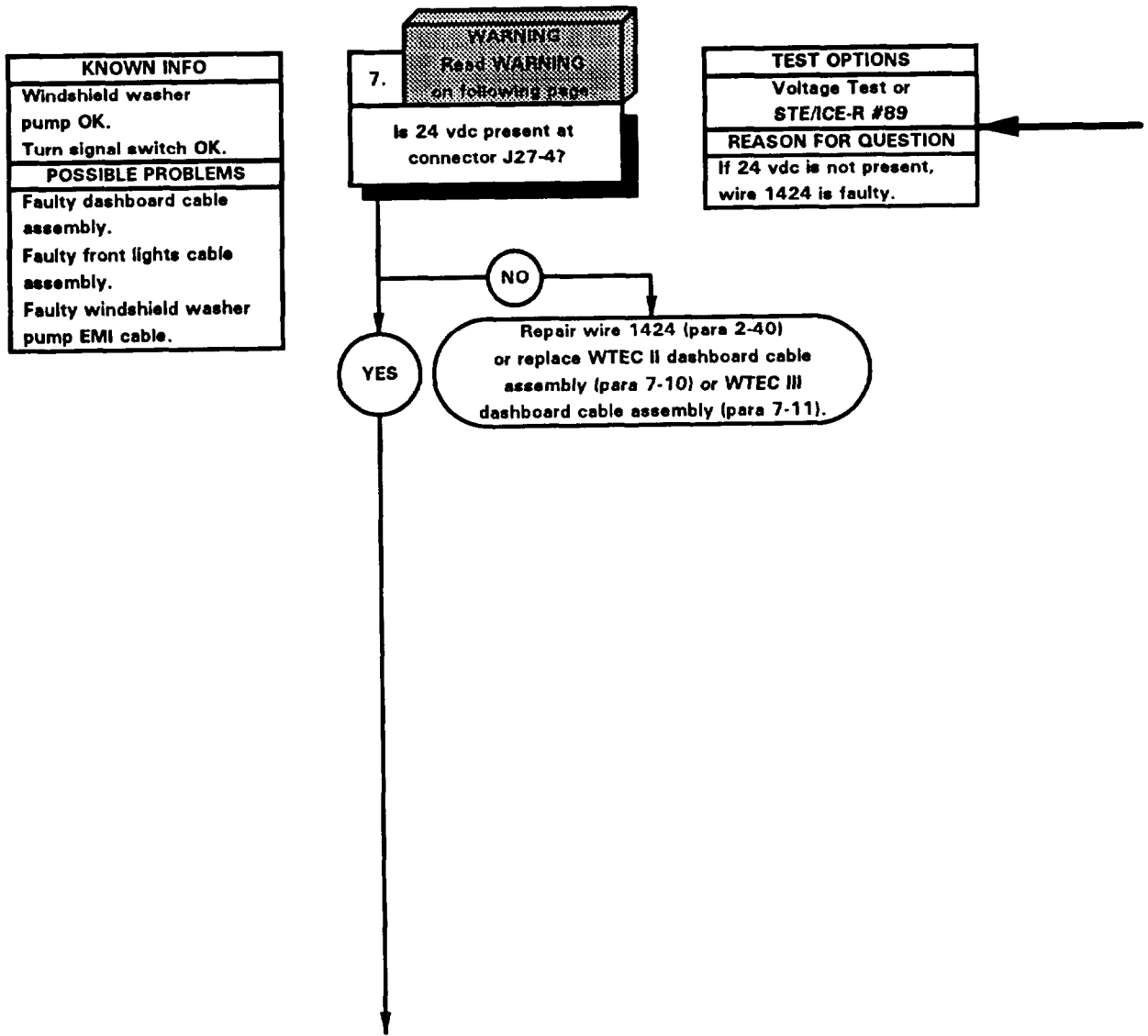


X2E7704A

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to turn signal switch connector terminal 4.
- (3) Connect negative (-) probe of multimeter to turn signal switch connector terminal 8.
- (4) Press windshield washer switch (TM 9-2320-365-10) and note reading on multimeter.
- (5) If continuity is not present, replace turn signal switch (para 7-25).
- (6) Connect connector P18 to turn signal switch connector.
- (7) Install instrument panel assembly (para 7-15).

e74. WINDSHIELD WASHER DOES NOT OPERATE (CONT)

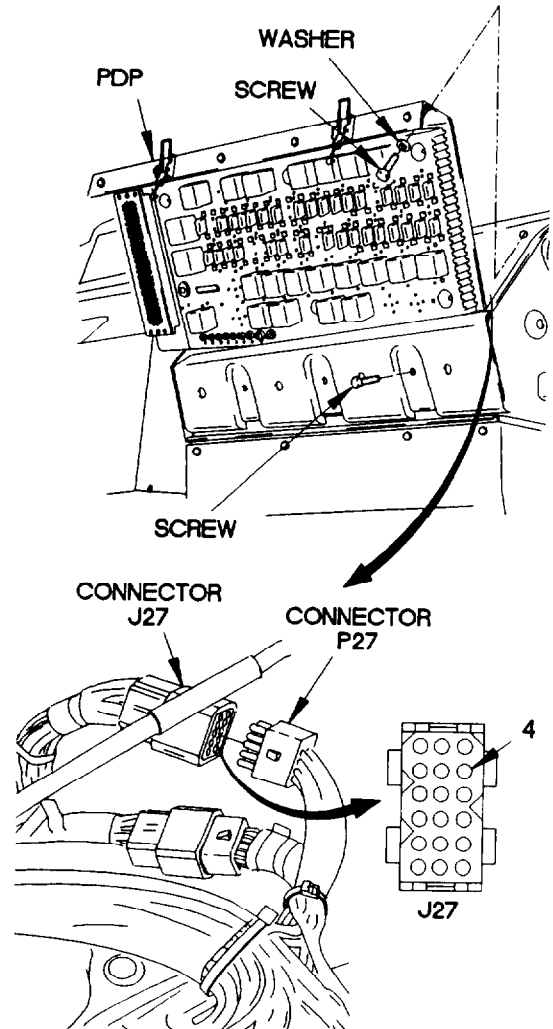


**WARNING**

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.

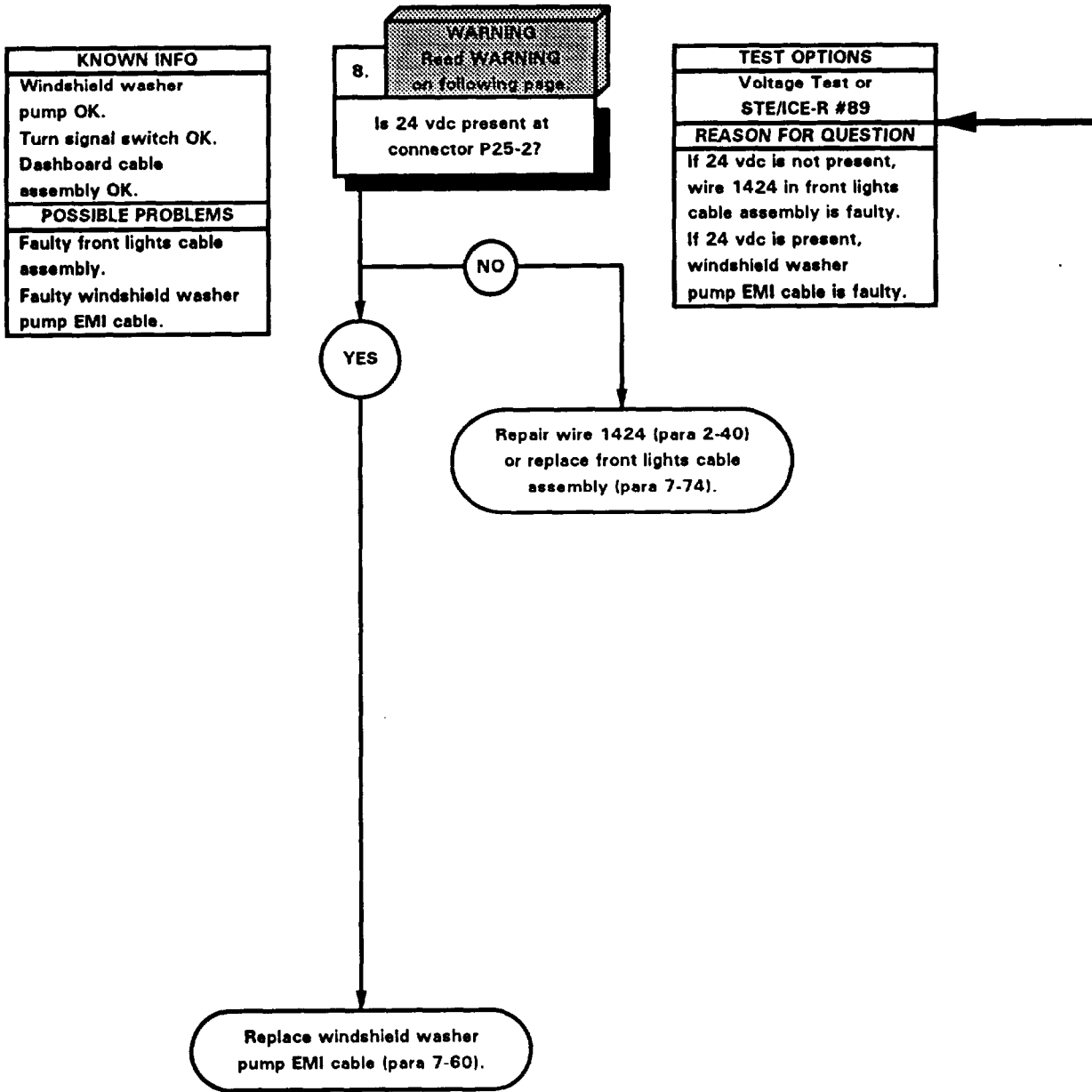
**VOLTAGE TEST**

- (1) Remove 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 connector J27 from connector P27.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter to connector J27-4.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position master power switch to on (TM 9-2320-365-10).
- (10) Press windshield washer switch (TM 9-2320-365-10) and note reading on multimeter.
- (11) If 24 vdc is not present, repair wire 1424 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (12) Position master power switch to off (TM 9-2320-365-10).
- (13) Connect connector J27 to connector P27.
- (14) Install PDP on dashboard with three screws.
- (15) Install three washers and screws in PDP.
- (16) Install PDP cover (para 16-2).



K2E77951

e74. WINDSHIELD WASHER DOES NOT OPERATE (CONT)

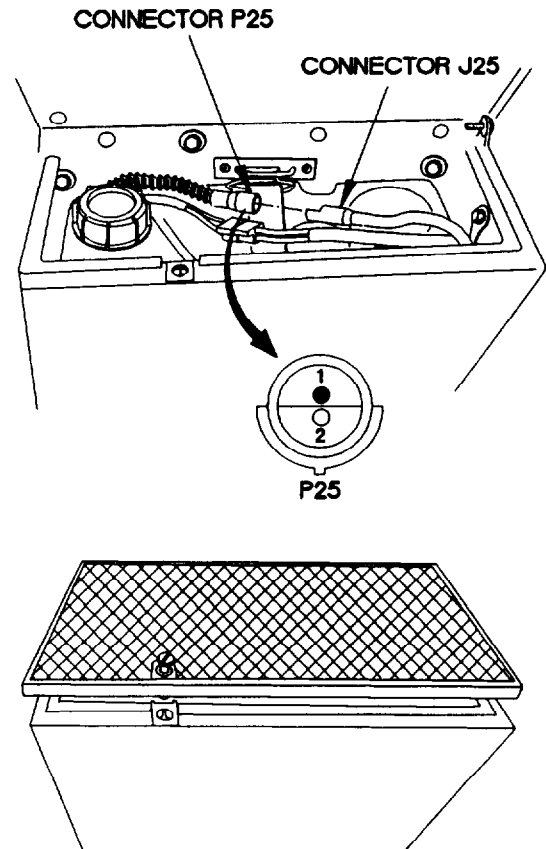


**WARNING**

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.

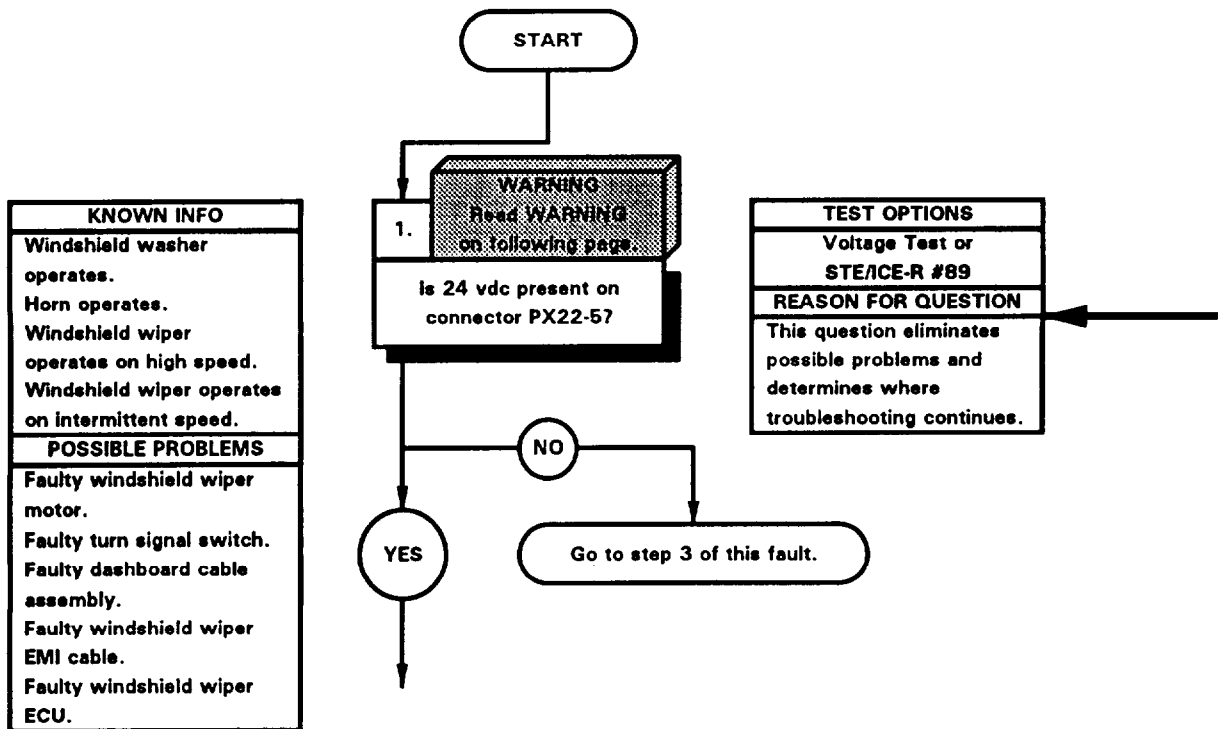
**VOLTAGE TEST**

- (1) Disconnect connector P25 from connector J25.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P25-2.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Press windshield washer switch (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1424 (para 2-40) or replace front lights cable assembly (para 7-74).
- (8) If 24 vdc is present, replace windshield washer pump EMI cable (para 7-60).
- (9) Position master power switch to off (TM 9-2320-365-10).
- (10) Connect connector P25 to connector J25.
- (11) Close left cab step tread (TM 9-2320-365-10).



K2E 7706A

75. WINDSHIELD WIPER DOES NOT OPERATE ON LOW SPEED	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

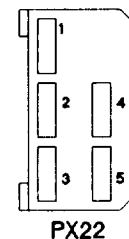
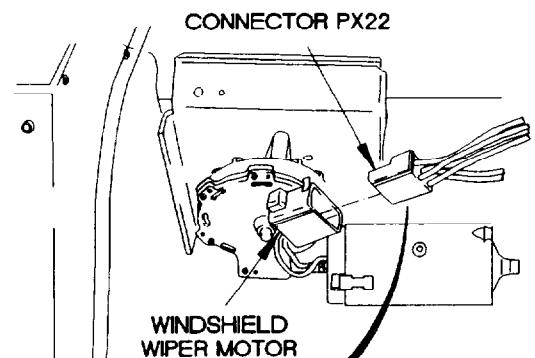
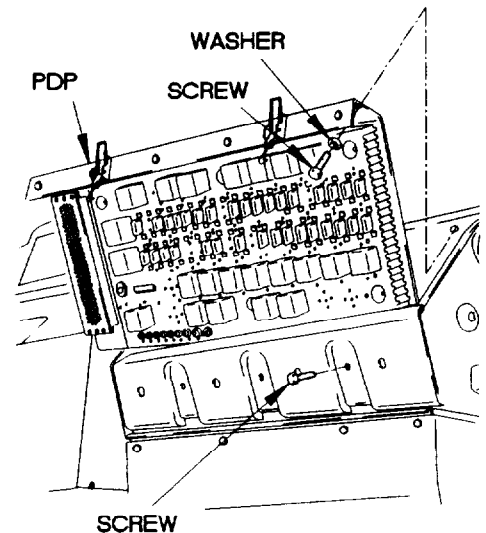


**WARNING**

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**

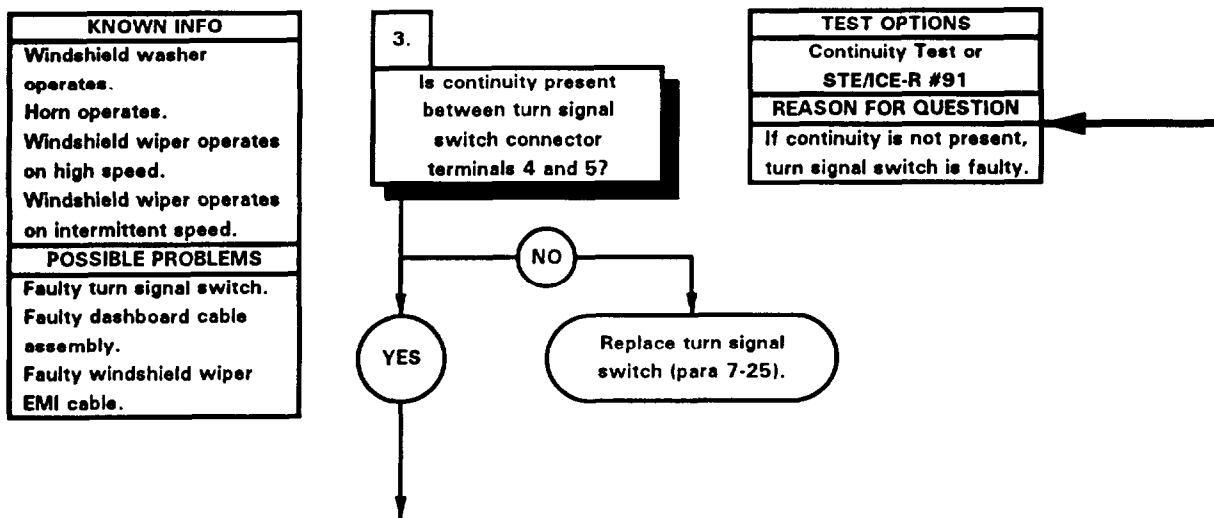
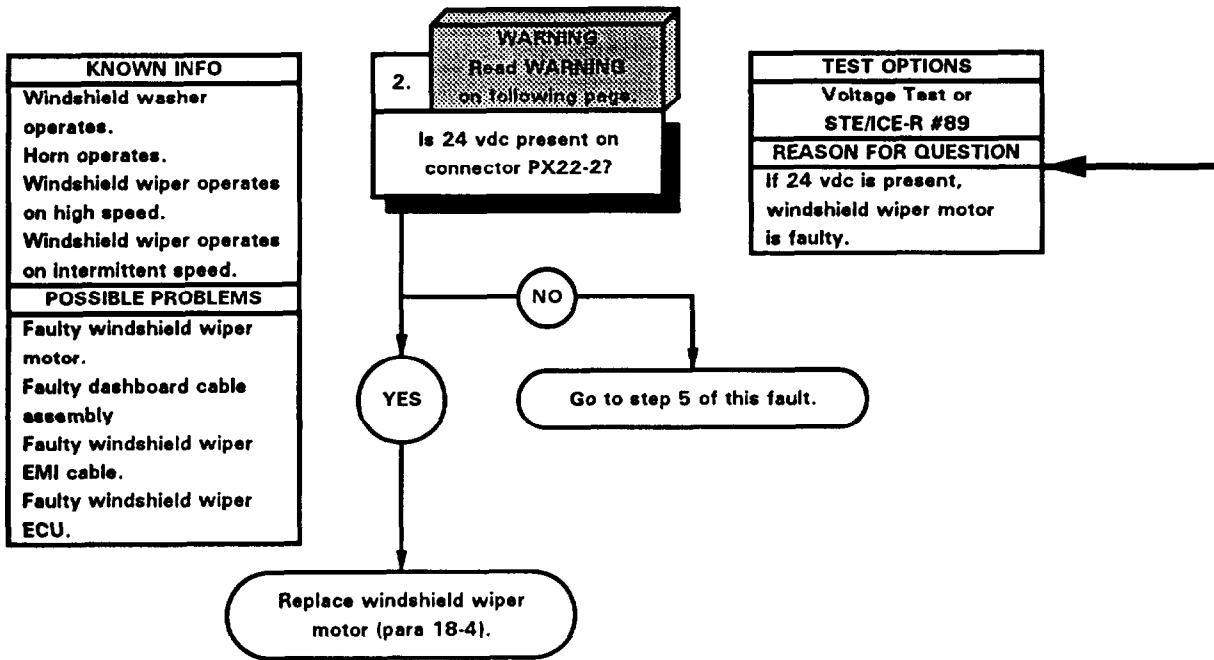
- (1) Remove PDP cover (para 16-2).
- (2) Remove three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Disconnect connector PX22 from windshield wiper motor.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter to connector PX22-5.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position master power switch to on (TM 9-2320-365-10).
- (10) Position windshield wiper switch to low (TM 9-2320-365-10) and note reading on multimeter.
- (11) If 24 vdc is not present, go to step 3 of this fault.
- (12) Position windshield wiper switch to off (TM 9-2320-365-10).
- (13) Position master power switch to off (TM 9-2320-365-10).



x2E 78011



e75. WINDSHIELD WIPER DOES NOT OPERATE ON LOW SPEED (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.

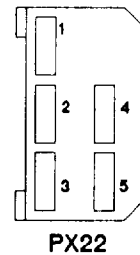
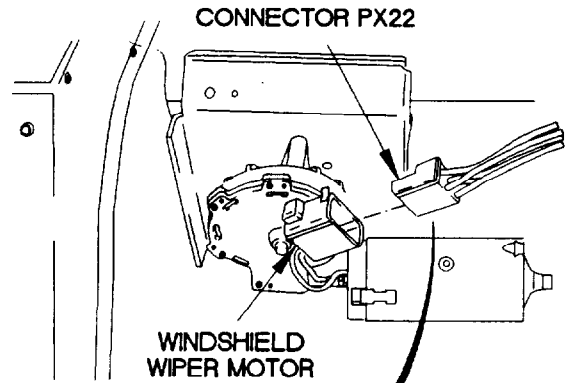
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector PX22-2.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).

**NOTE**

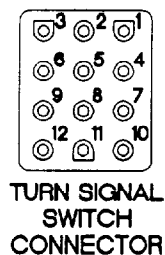
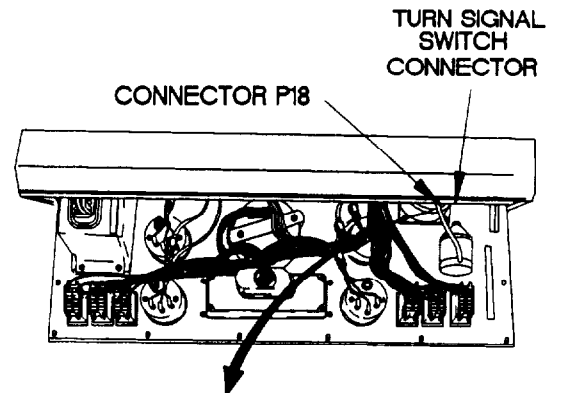
24 vdc is indicated for approximately 1 (one) second.

- (5) Position windshield wiper switch to low (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 5 of this fault.
- (7) Position windshield wiper switch to off (TM 9-2320-365-10).
- (8) Position master power switch to off (TM 9-2320-365-10).



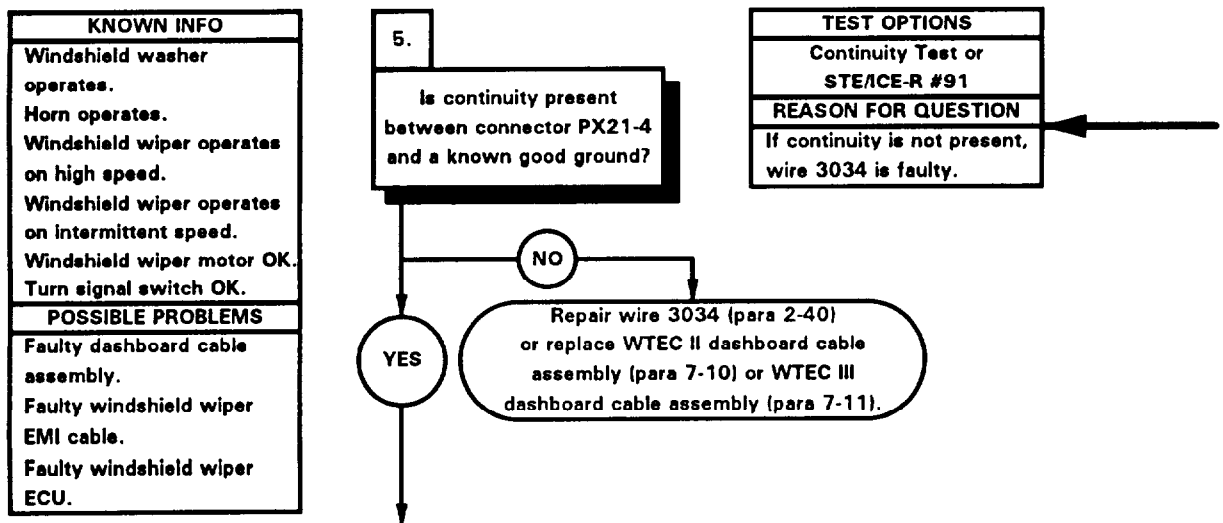
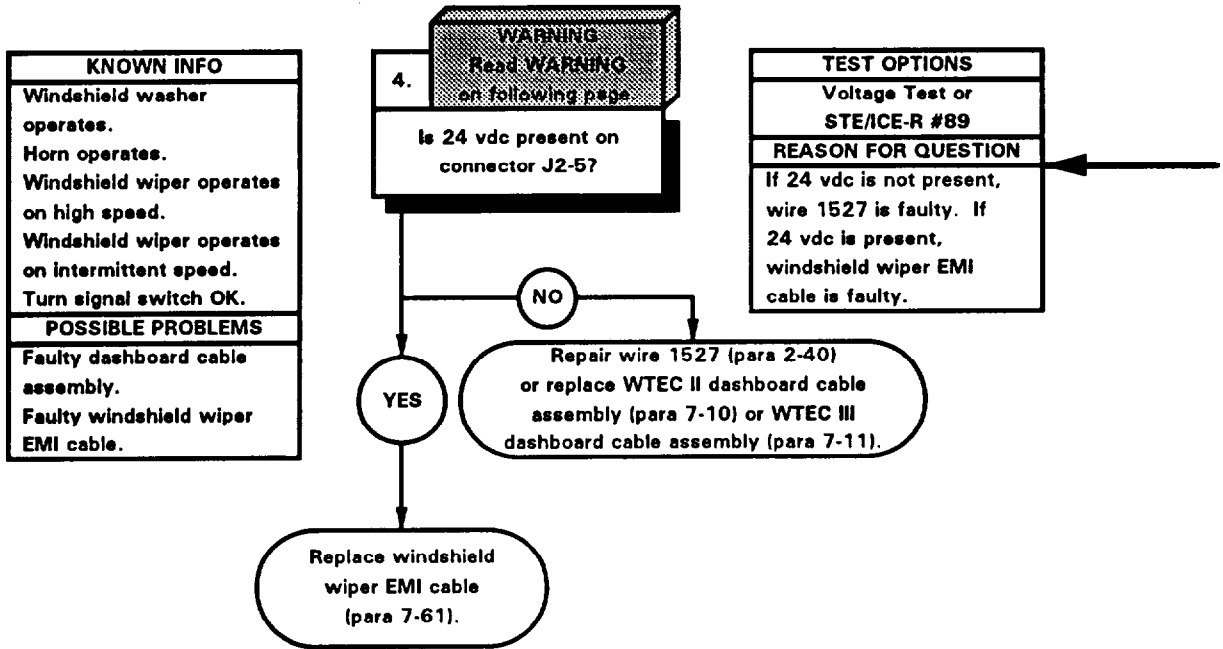
**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect turn signal switch connector from connector P18.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to turn signal switch connector terminal 4.
- (5) Connect negative (-) probe of multimeter to turn signal switch connector terminal 5.
- (6) Position windshield wiper switch to low position (TM 9-2320-365-10) and note reading on multimeter.
- (7) If continuity is not present, replace turn signal switch (para 7-25).
- (8) Position windshield wiper switch to off (TM 9-2320-365-10).
- (9) Connect turn signal switch connector to connector P18.
- (10) Install instrument panel assembly (para 7-15).



x2E 7803A

e75. WINDSHIELD WIPER DOES NOT OPERATE ON LOW SPEED (CONT)

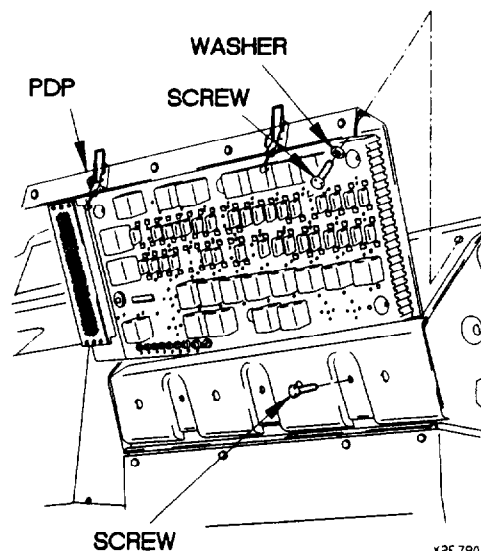
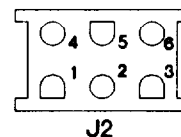
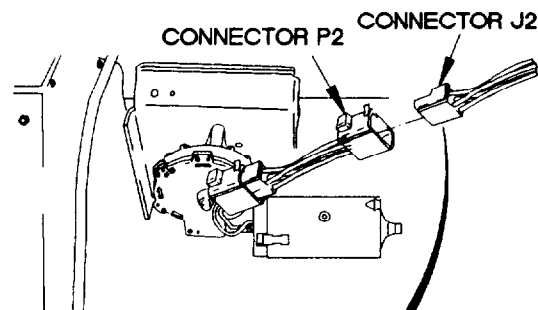


**WARNING**

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 J2 from connector P2.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J2-5.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Position windshield wiper switch to low (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1527 (para 2-40) 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, replace windshield wiper EMI cable (para 7-61).
- (9) Position windshield wiper switch to off (TM 9-2320-365-10).
- (10) Position master power switch to off (TM 9-2320-365-10).
- (11) Connect connector J2 to connector P2.
- (12) Install PDP on dashboard with three screws.
- (13) Install three washers and screws in PDP.
- (14) Install PDP cover (para 16-2).

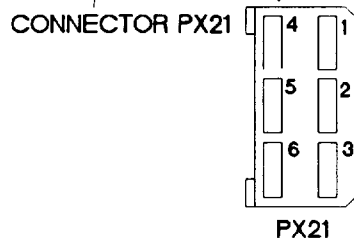
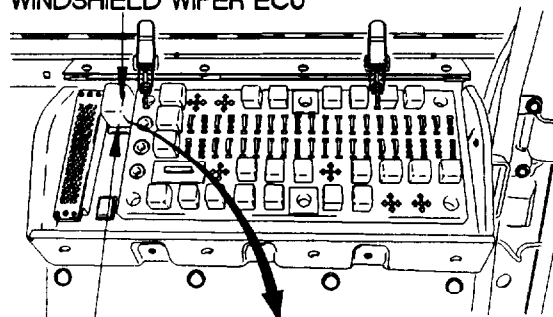


x2E 78041

**CONTINUITY TEST**

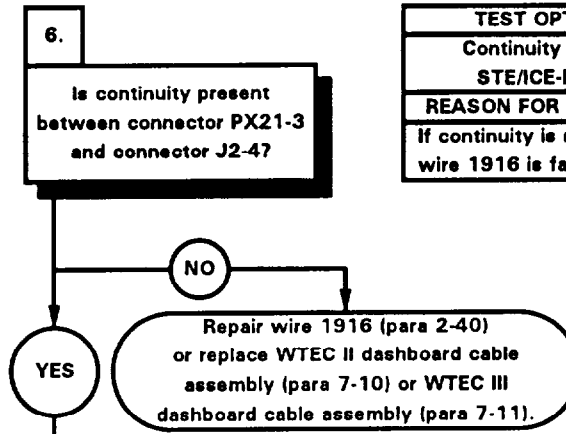
- (1) Disconnect windshield wiper ECU from connector PX21.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector PX21-4.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, repair wire 3034 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**WINDSHIELD WIPER ECU**



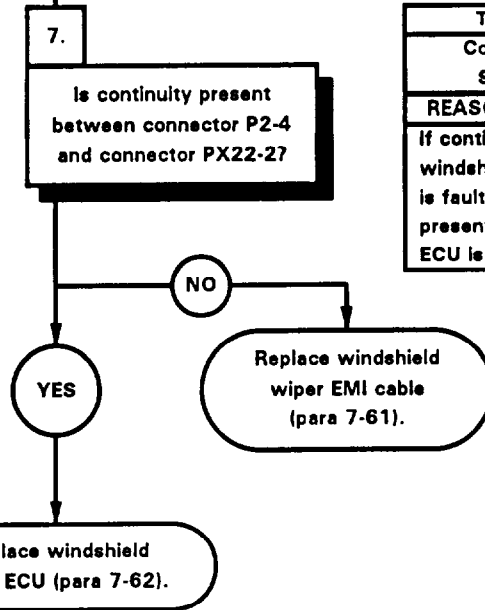
675. WINDSHIELD WIPER DOES NOT OPERATE ON LOW SPEED (CONT)

KNOWN INFO
Windshield washer operates.
Horn operates.
Windshield wiper operates on high speed.
Windshield wiper operates on intermittent speed.
Windshield wiper motor OK.
Turn signal switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty windshield wiper EMI cable.
Faulty windshield wiper ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1916 is faulty.

KNOWN INFO
Windshield washer operates.
Horn operates.
Windshield wiper operates on high speed.
Windshield wiper operates on intermittent speed.
Windshield wiper motor OK.
Turn signal switch OK.
Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty windshield wiper EMI cable.
Faulty windshield wiper ECU.

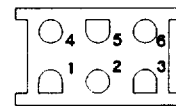
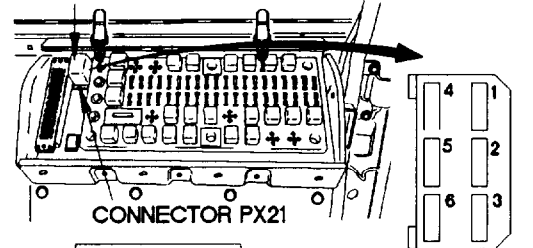


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, windshield wiper EMI cable is faulty. If continuity is present, windshield wiper ECU is faulty.

**CONTINUITY TEST**

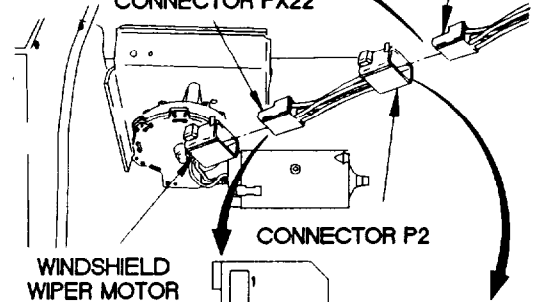
- (1) Disconnect connector J2 from connector P2.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector J2-4.
- (4) Connect negative (-) probe of multimeter to connector PX21-3 and note reading on multimeter.
- (5) If continuity is not present, repair wire 1916 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) Connect windshield wiper ECU to connector PX21.

WINDSHIELD WIPER ECU



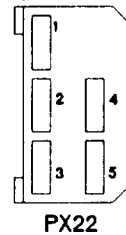
CONNECTOR J2

J2  
CONNECTOR PX22

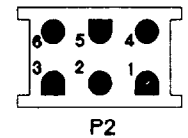


CONNECTOR P2

WINDSHIELD  
WIPER MOTOR



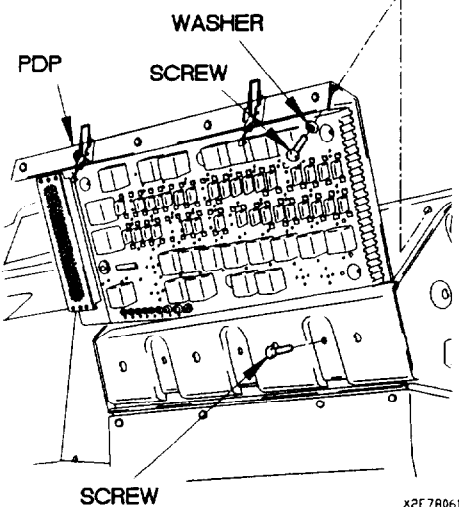
PX22



P2

**CONTINUITY TEST**

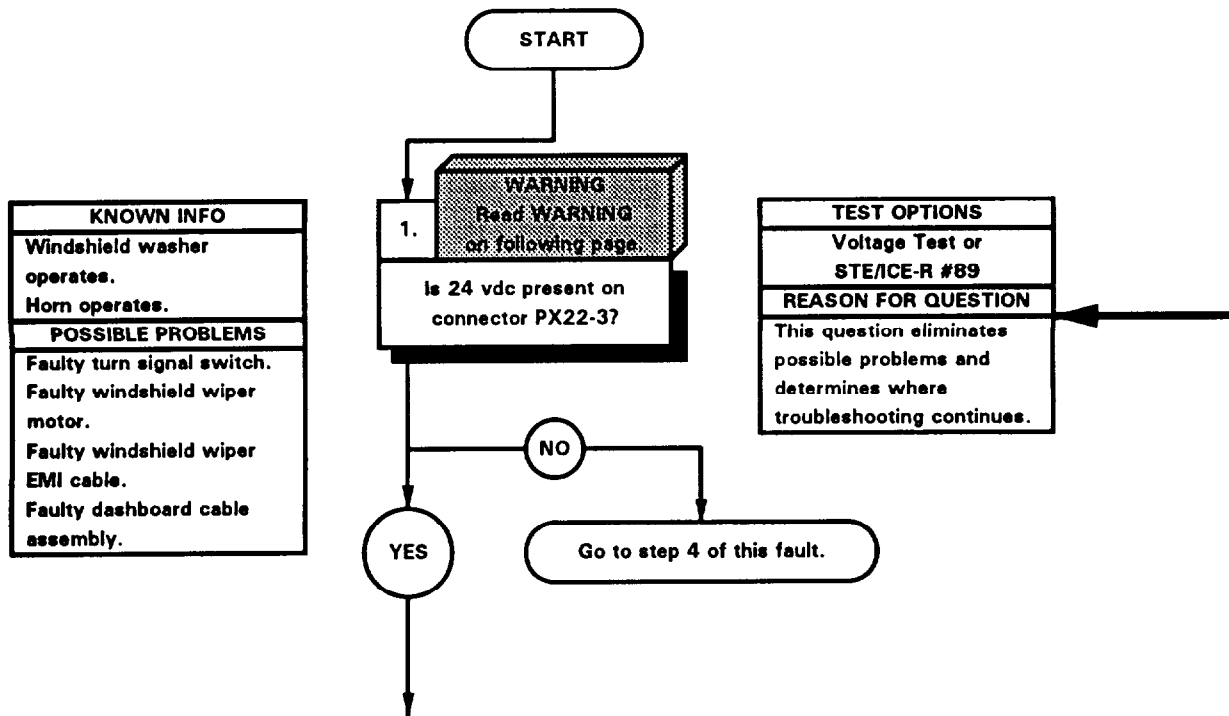
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P2-4.
- (3) Connect negative (-) probe of multimeter to connector PX22-2 and note reading on multimeter.
- (4) If continuity is not present, replace windshield wiper EMI cable (para 7-61).
- (5) If continuity is present, replace windshield wiper ECU (para 7-62).
- (6) Connect connector P2 to connector J2.
- (7) Connect connector PX22 to windshield wiper motor.
- (8) Install PDP on dashboard with three screws.
- (9) Install three washers and screws in PDP.
- (10) Install PDP cover (para 16-2).



SCREW

X2E 78061

e76. ALL WINDSHIELD WIPER SPEEDS DO NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

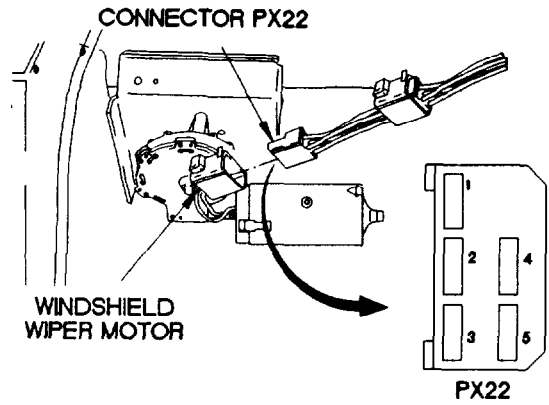
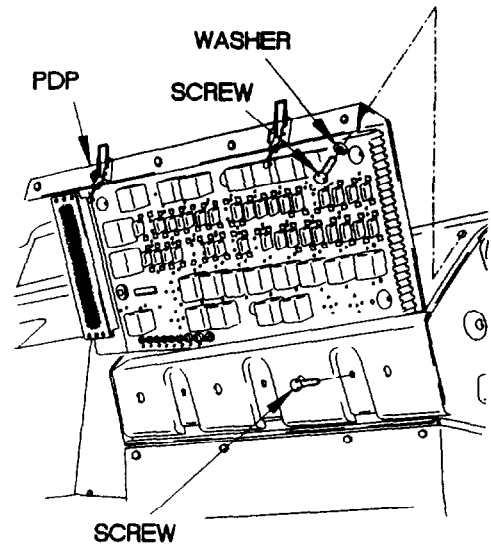


**WARNING**

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**

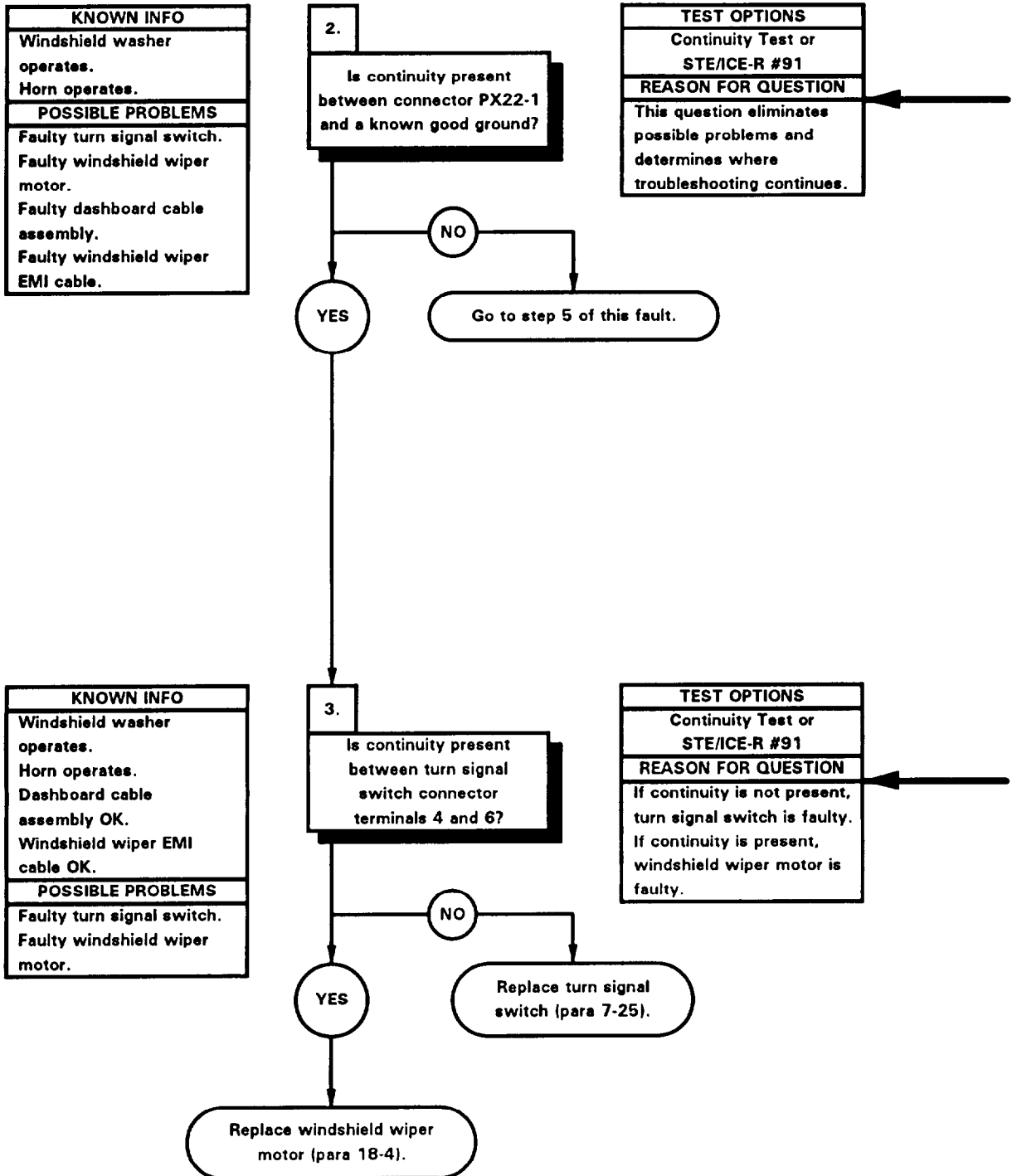
- (1) Remove PDP cover (para 16-2).
- (2) Remove three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Disconnect connector PX22 from windshield wiper motor.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter to connector PX22-3.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (10) If 24 vdc is not present, go to step 4 of this fault.
- (11) Position master power switch to off (TM 9-2320-365-10).



x2c79011

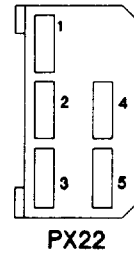
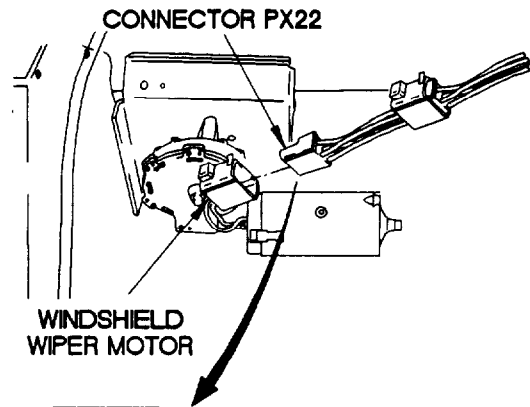


e76. ALL WINDSHIELD WIPER SPEEDS DO NOT OPERATE (CONT)



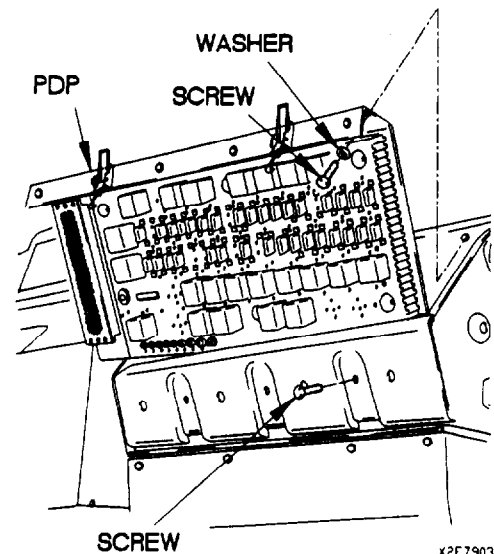
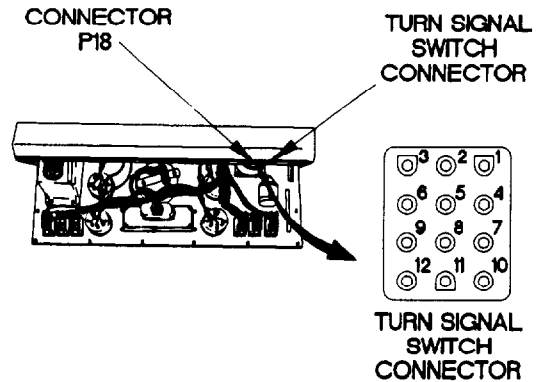
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX22-1.
- (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) Connect connector PX22 to windshield wiper motor.



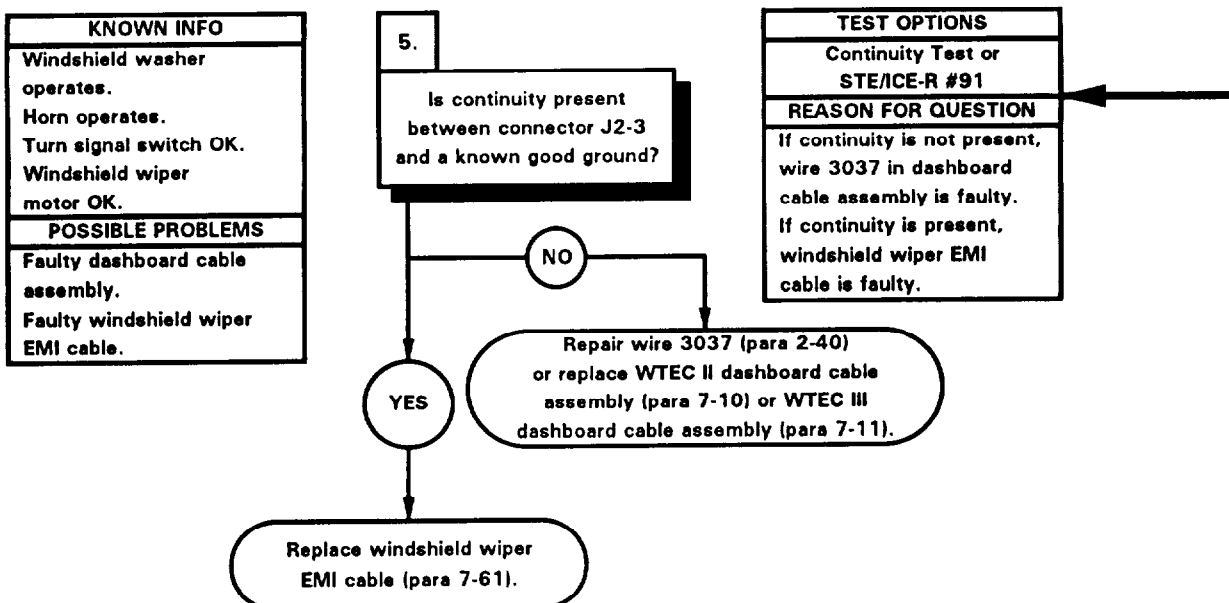
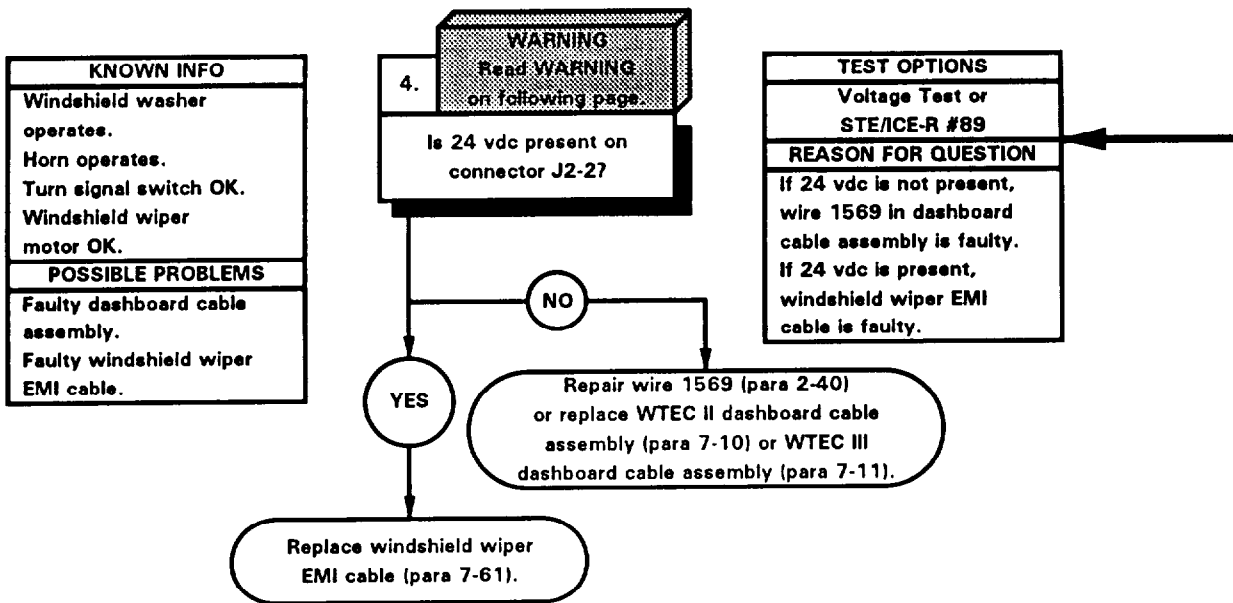
**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect turn signal switch connector from connector P18.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to turn signal switch connector terminal 6.
- (5) Connect negative (-) probe of multimeter to turn signal switch connector terminal 4.
- (6) Position windshield wiper switch to high (TM 9-2320-365-10) and note reading on multimeter.
- (7) If continuity is not present, replace turn signal switch (para 7-25).
- (8) If continuity is present, replace windshield wiper motor (para 18-4).
- (9) Position windshield wiper switch to off (TM 9-2320-365-10).
- (10) Connect turn signal switch connector to connector P18.
- (11) Install instrument panel assembly (para 7-15).
- (12) Install PDP on dashboard with three screws.
- (13) Install three washers and screws in PDP.
- (14) Install PDP cover (para 16-2).



x2E79031

e76. ALL WINDSHIELD WIPER SPEEDS DO NOT OPERATE (CONT)



**WARNING**

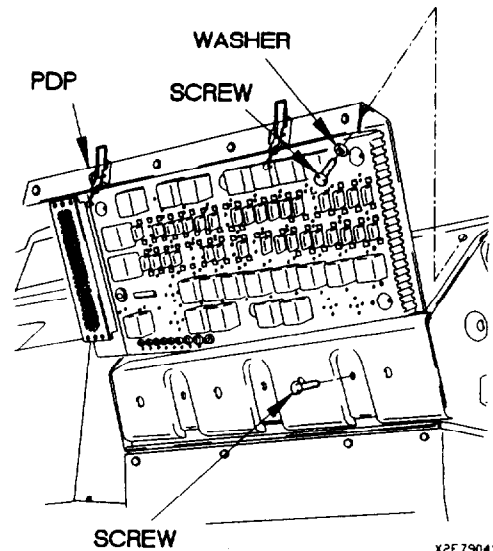
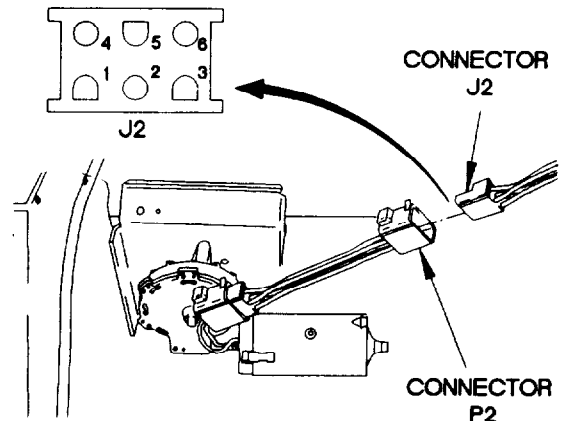
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Disconnect connector J2 from connector P2.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J2-2.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 1569 (para 2-40) 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, replace windshield wiper EMI cable (para 7-61).
- (8) Position master power switch to off (TM 9-2320-365-10).
- (9) Connect connector P2 to connector J2.
- (10) Install PDP on dashboard with three screws.
- (11) Install three washers and screws in PDP.
- (12) Install PDP cover (para 16-2).

**CONTINUITY TEST**

- (1) Disconnect connector J2 from connector P2.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector J2-3.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, repair wire 3037 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) If continuity is present, replace windshield wiper EMI cable (para 7-61).
- (7) Connect connector P2 to connector J2.
- (8) Install PDP on dashboard with three screws.
- (9) Install three washers and screws in PDP.
- (10) Install PDP cover (para 16-2).



x2E79041

●77. WINDSHIELD WIPER DOES NOT OPERATE ON INTERMITTENT SPEED

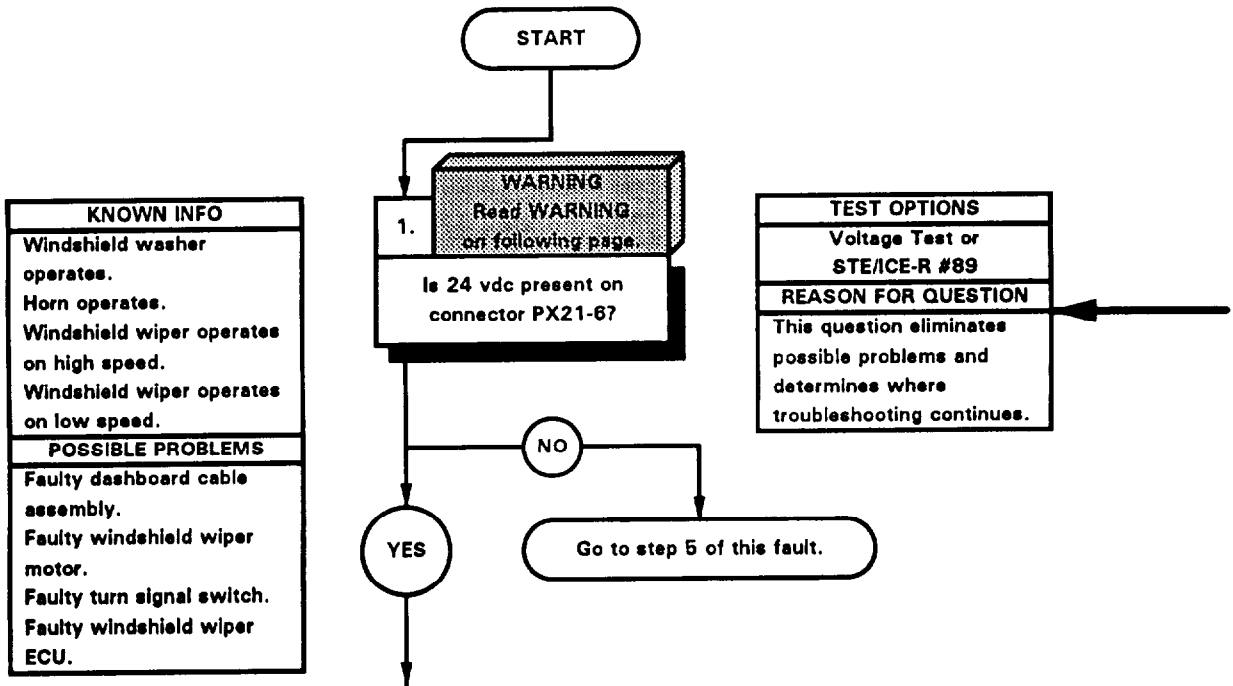
**INITIAL SETUP**

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

**Personnel Required**  
 (2)

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

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

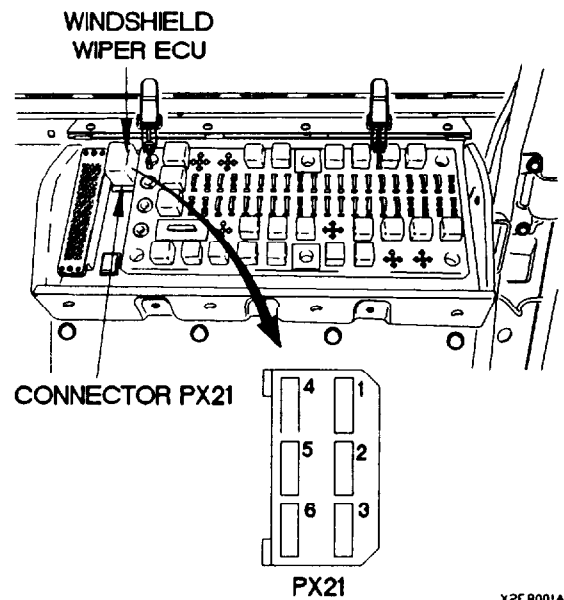


**WARNING**

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

**VOLTAGE TEST**

- (1) Remove PDP cover (para 16-2).
- (2) Disconnect windshield wiper ECU from connector PX21.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector PX21-6.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Position windshield wiper switch to intermittent (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, go to step 5 of this fault.
- (9) Position windshield wiper switch to off (TM 9-2320-365-10).
- (10) Position master power switch to off (TM 9-2320-365-10).



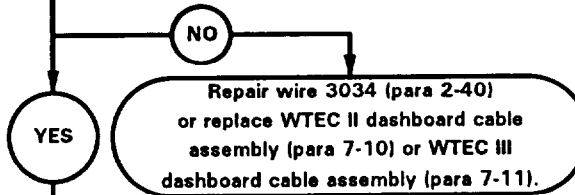
X2E8001A

e77. WINDSHIELD WIPER DOES NOT OPERATE ON INTERMITTENT SPEED (CONT)

KNOWN INFO
Windshield washer operates. Horn operates. Windshield wiper operates on high speed. Windshield wiper operates on low speed.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty windshield wiper motor. Faulty turn signal switch. Faulty windshield wiper ECU.

2.  
Is continuity present between connector PX21-4 and a known good ground?

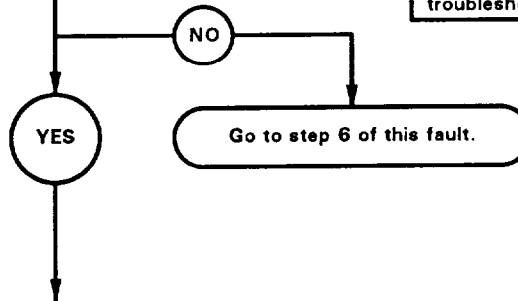
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3034 is faulty.



KNOWN INFO
Windshield washer operates. Horn operates. Windshield wiper operates on high speed. Windshield wiper operates on low speed.
POSSIBLE PROBLEMS
Faulty windshield wiper motor. Faulty dashboard cable assembly. Faulty turn signal switch. Faulty windshield wiper ECU.

3.  
Is 24 vdc present on connector PX22-57?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.



**CONTINUITY TEST**

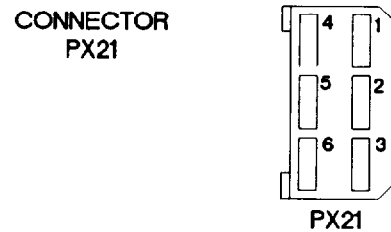
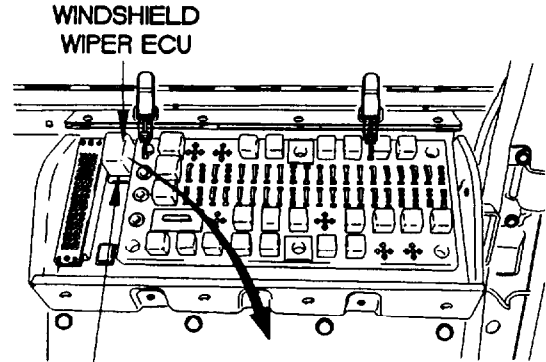
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX21-4.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3034 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) Connect windshield wiper ECU to connector PX21.

**WARNING**

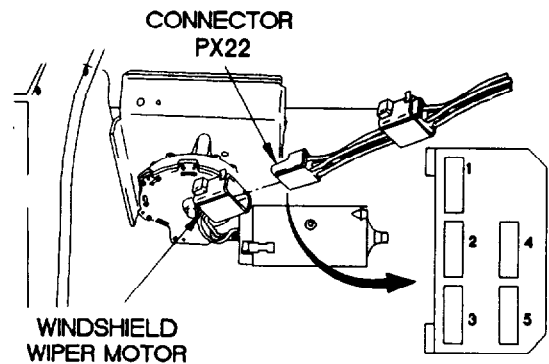
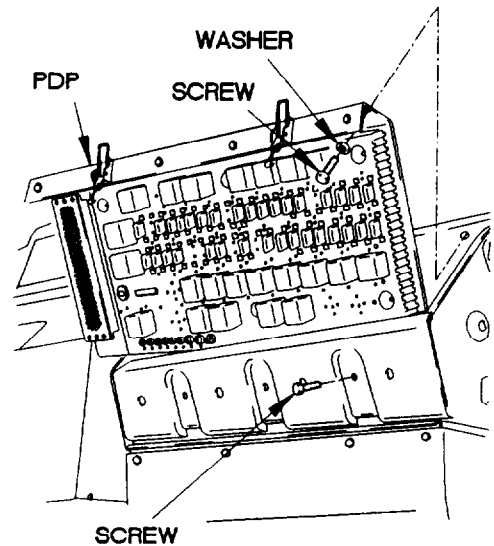
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Remove three screws from PDP.
- (2) Remove three screws and washers from PDP.
- (3) Lift PDP outward to gain access.
- (4) Disconnect connector PX22 from windshield wiper motor.
- (5) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to connector PX22-5.
- (7) Connect negative (-) probe of multimeter to ground.
- (8) Position master power switch to on (TM 9-2320-365-10).
- (9) Position windshield wiper switch to intermittent (TM 9-2320-365-10) and note reading on multimeter.
- (10) If 24 vdc is not present, go to step 6 of this fault.
- (11) Position windshield wiper switch to off (TM 9-2320-365-10).
- (12) Position master power switch to off (TM 9-2320-365-10).



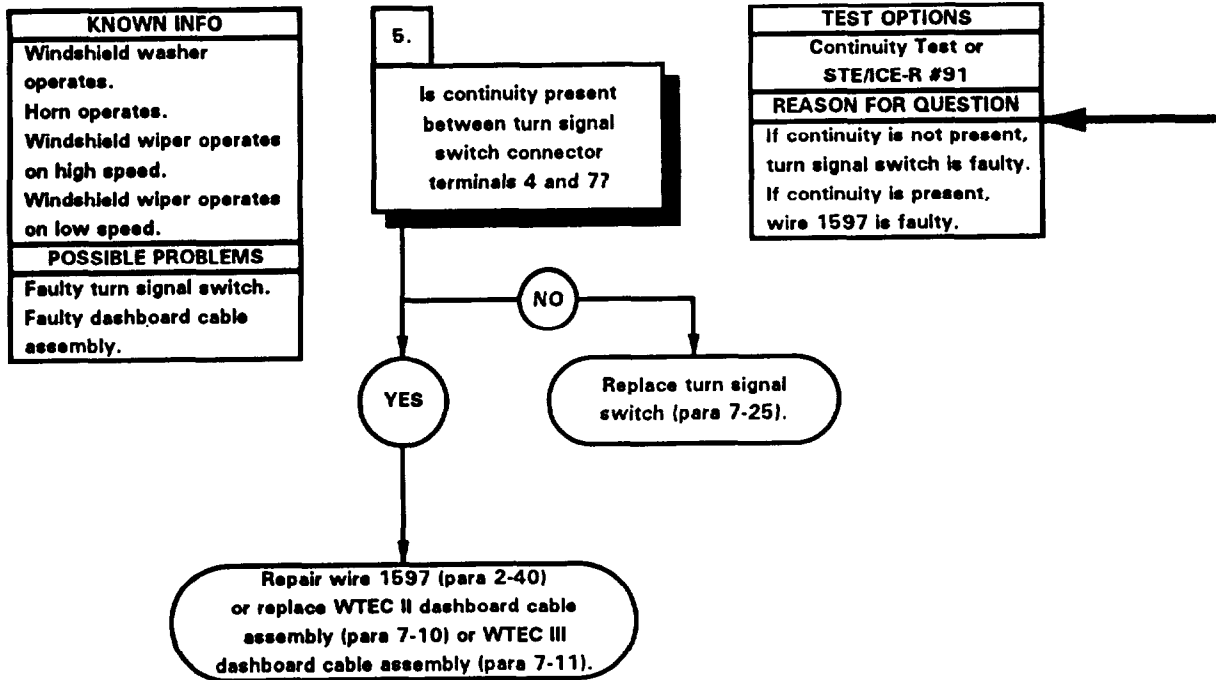
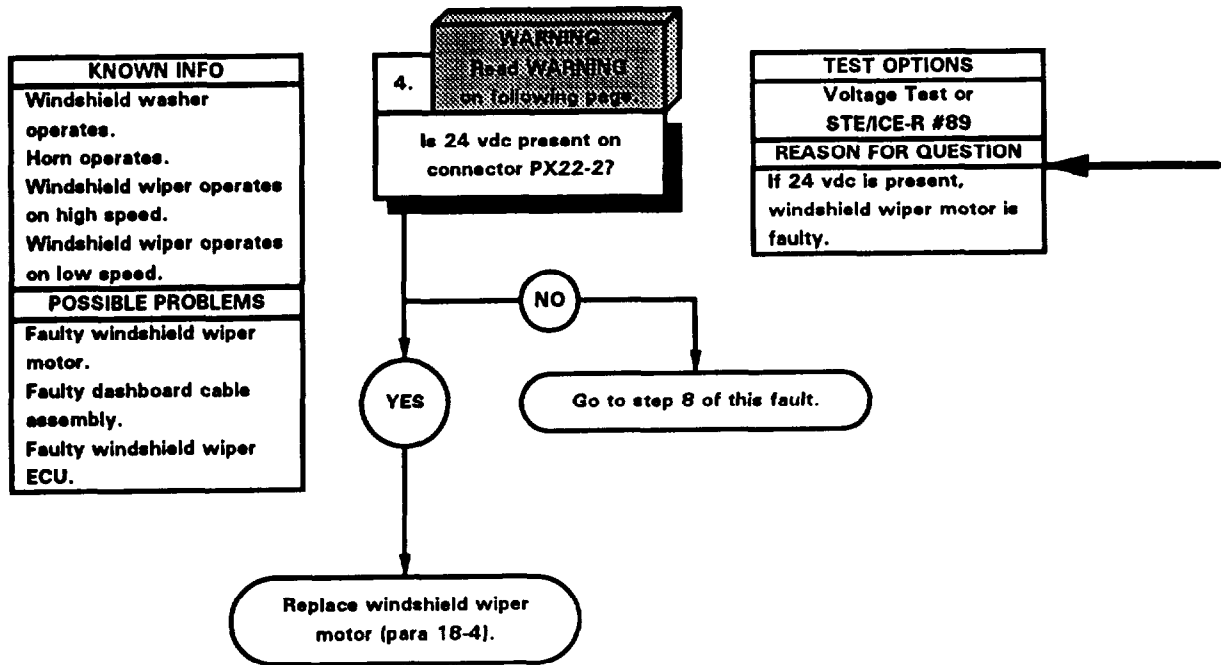
X2E 8002A



X2E 80031



e77. WINDSHIELD WIPER DOES NOT OPERATE ON INTERMITTENT SPEED (CONT)

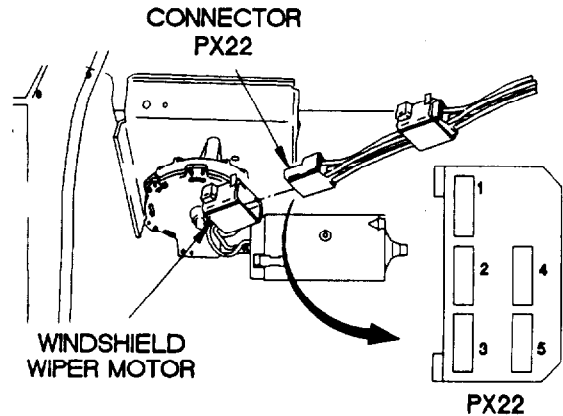


**WARNING**

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**

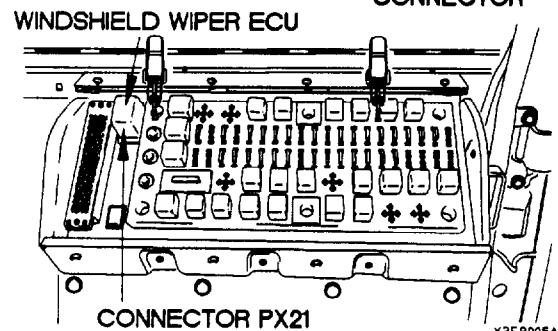
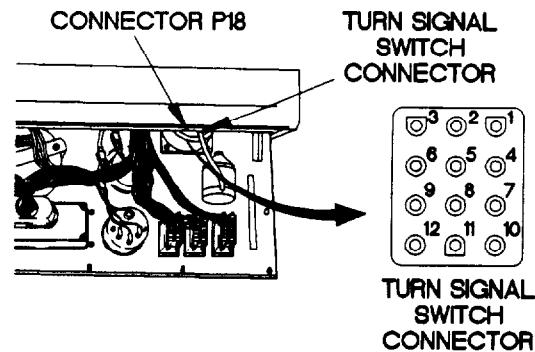
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector PX22-2.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10).
- (5) Position windshield wiper switch to intermittent (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 8 of this fault.
- (7) If 24 vdc is present, replace windshield wiper motor (para 18-4).
- (8) Position windshield wiper switch to off (TM 9-2320-365-10).
- (9) Position master power switch to off (TM 9-2320-365-10).
- (10) Connect connector PX22 to windshield wiper motor.



X2E8004A

**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect turn signal switch connector from connector P18.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to turn signal switch connector terminal 4.
- (5) Connect negative (-) probe of multimeter to turn signal switch connector terminal 7.
- (6) Position windshield wiper switch to intermittent (TM 9-2320-365-10) and note reading on multimeter.
- (7) If continuity is not present, replace turn signal switch (para 7-25).
- (8) If continuity is present, repair wire 1597 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Position windshield wiper switch to off (TM 9-2320-365-10).
- (10) Connect turn signal switch connector to connector P18.
- (11) Install instrument panel assembly (para 7-15).
- (12) Connect windshield wiper ECU to connector PX21.
- (13) Install PDP cover (para 16-2).



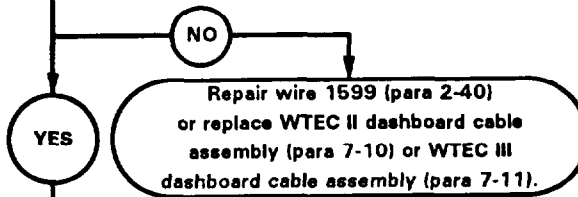
X2E8005A

e77. WINDSHIELD WIPER DOES NOT OPERATE ON INTERMITTENT SPEED (CONT)

KNOWN INFO
Windshield washer operates. Horn operates. Windshield wiper operates on high speed. Windshield wiper operates on low speed.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty turn signal switch. Faulty windshield wiper ECU.

6.  
Is continuity present between connector PX21-1 and connector P18-97

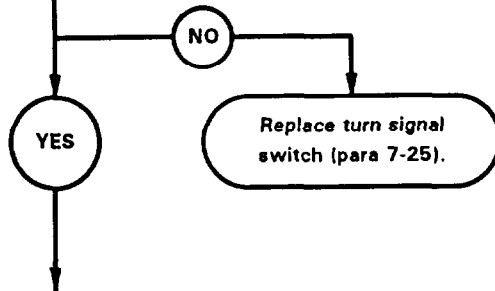
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1599 is faulty.



KNOWN INFO
Windshield washer operates. Horn operates. Windshield wiper operates on high speed. Windshield wiper operates on low speed.
POSSIBLE PROBLEMS
Faulty turn signal switch. Faulty dashboard cable assembly. Faulty windshield wiper ECU.

7.  
Is continuity present between turn signal switch connector terminals 5 and 9?

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



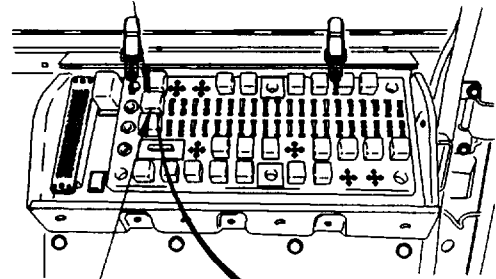
**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect windshield wiper ECU from connector PX21.
- (3) Disconnect connector P18 from turn signal switch connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector PX21-1.
- (6) Connect negative (-) probe of multimeter to connector P18-9 and note reading on multimeter.
- (7) If continuity is not present, repair wire 1599 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to turn signal switch connector terminal 9.
- (3) Connect negative (-) probe of multimeter to turn signal switch connector terminal 5.
- (4) Position windshield wiper switch to intermittent (TM 9-2320-365-10) and note reading on multimeter.
- (5) If continuity is not present, replace turn signal switch (para 7-25).
- (6) Position windshield wiper switch to off (TM 9-2320-365-10).
- (7) Connect windshield wiper ECU to connector PX21.
- (8) Connect connector P18 to turn signal switch connector.
- (9) Install instrument panel assembly (para 7-15).
- (10) Install PDP on dashboard with three screws.
- (11) Install three washers and screws in PDP.
- (12) Install PDP cover (para 16-2).

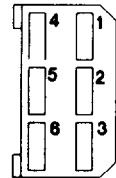
WINDSHIELD WIPER ECU



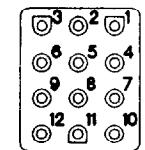
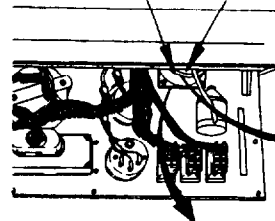
CONNECTOR PX21

CONNECTOR P18

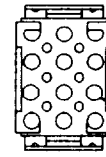
TURN SIGNAL SWITCH CONNECTOR



PX21



TURN SIGNAL SWITCH CONNECTOR

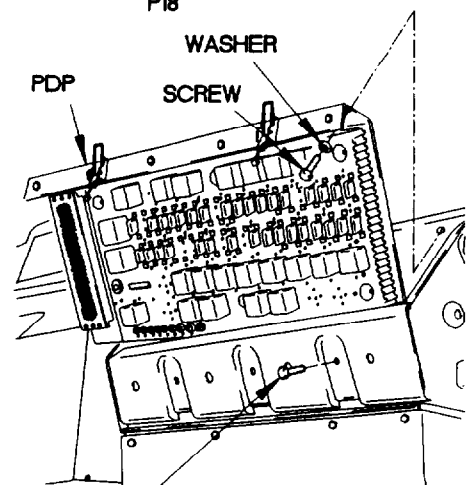


P18

PDP

WASHER

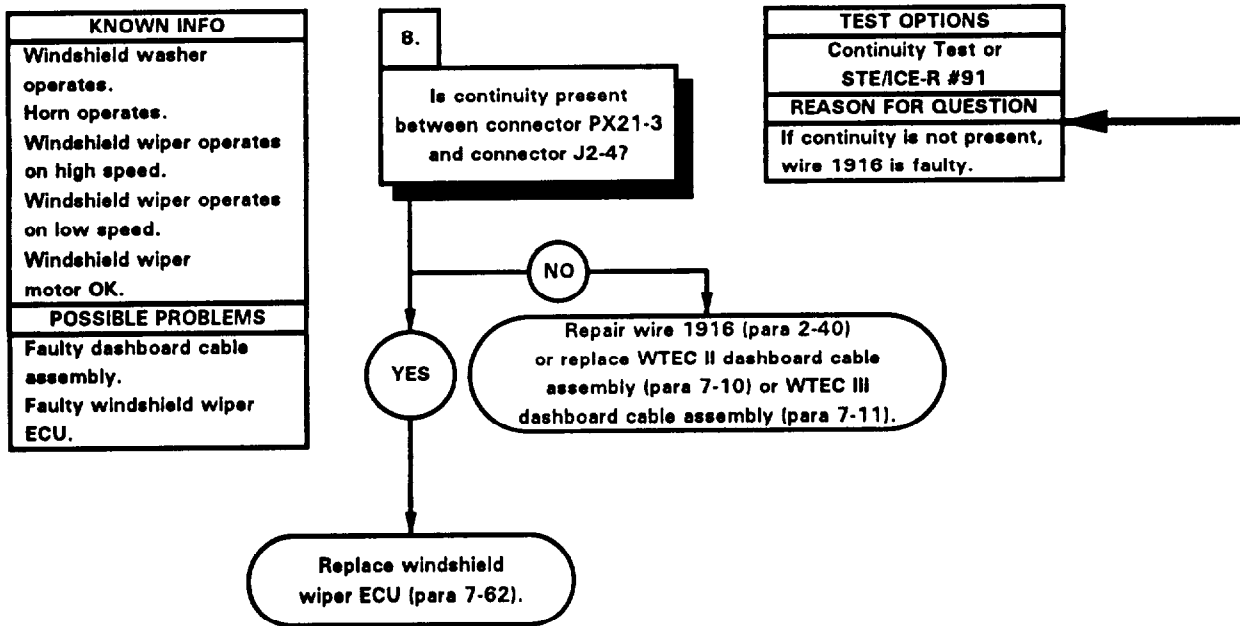
SCREW



SCREW

X2C 80061

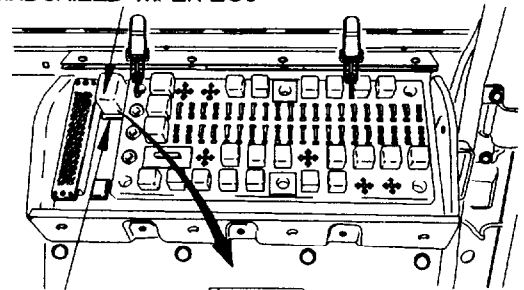
ø77. WINDSHIELD WIPER DOES NOT OPERATE ON INTERMITTENT SPEED (CONT)



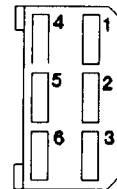
**CONTINUITY TEST**

- (1) Disconnect connector J2 from connector P2.
- (2) Disconnect windshield wiper ECU from connector PX21.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector PX21-3.
- (5) Connect negative (-) probe of multimeter to connector J2-4 and note reading on multimeter.
- (6) If continuity is not present, repair wire 1916 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) If continuity is present, replace windshield wiper ECU (para 7-62).
- (8) Connect windshield wiper ECU to connector PX21.
- (9) Connect connector P2 to connector J2.
- (10) Install PDP on dashboard with three screws.
- (11) Install three washers and screws in PDP.
- (12) Install PDP cover (para 16-2).

WINDSHIELD WIPER ECU



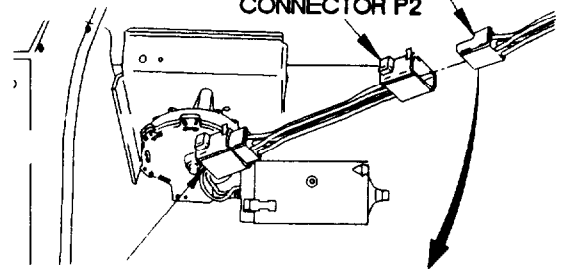
CONNECTOR PX21



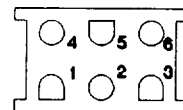
PX21

CONNECTOR J2

CONNECTOR P2



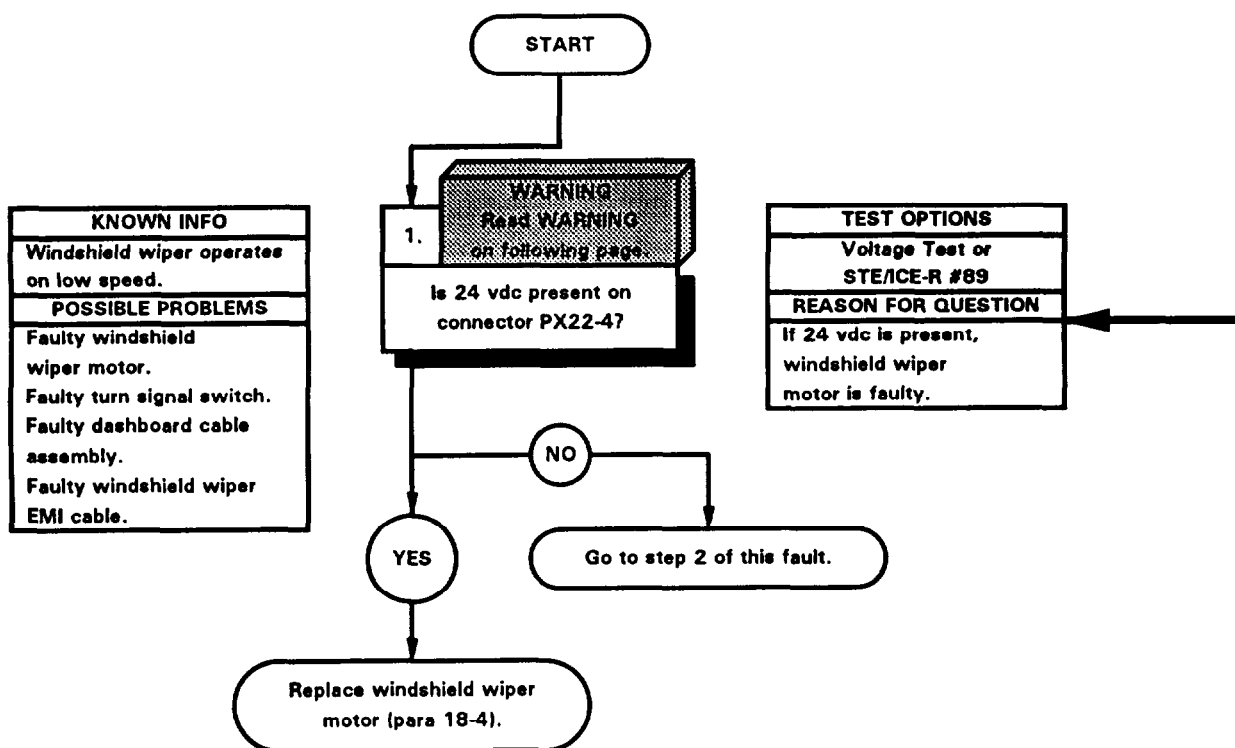
WINDSHIELD WIPER MOTOR



J2

x2E 8008A

●78. WINDSHIELD WIPER DOES NOT OPERATE ON HIGH SPEED	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

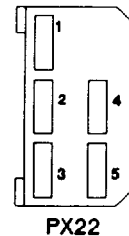
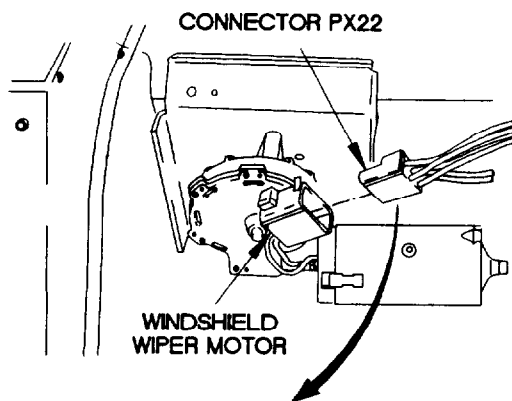
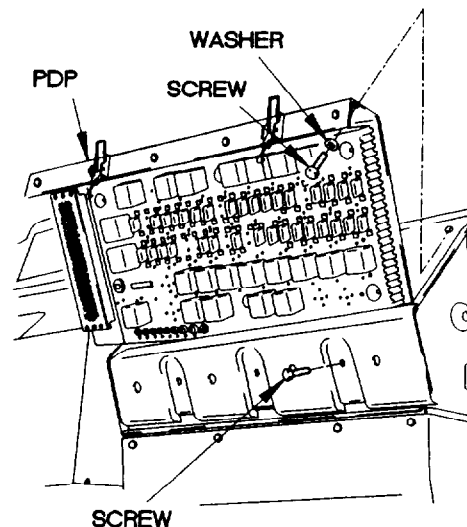


**WARNING**

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 three screws and washers from PDP.
- (3) Remove three screws from PDP.
- (4) Lift PDP outward to gain access.
- (5) Disconnect connector PX22 from windshield wiper motor.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter to connector PX22-4.
- (8) Connect negative (-) probe of multimeter to ground.
- (9) Position master power switch to on (TM 9-2320-365-10).
- (10) Position windshield wiper switch to high (TM 9-2320-365-10) and note reading on multimeter.
- (11) If 24 vdc is not present, go to step 2 of this fault.
- (12) If 24 vdc is present, replace windshield wiper motor (para 18-4).
- (13) Position windshield wiper switch to off (TM 9-2320-365-10).
- (14) Position master power switch to off (TM 9-2320-365-10).
- (15) Connect connector PX22 to windshield wiper motor.

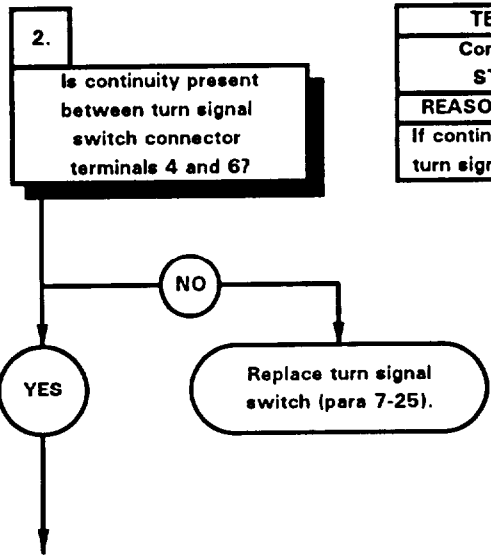


x2E91011



e78. WINDSHIELD WIPER DOES NOT OPERATE ON HIGH SPEED (CONT)

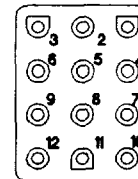
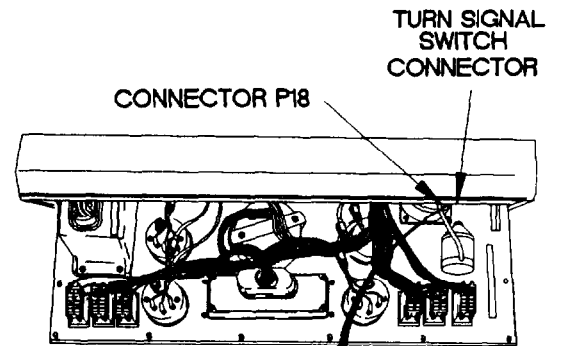
KNOWN INFO
Windshield wiper operates on low speed. Windshield wiper motor OK.
POSSIBLE PROBLEMS
Faulty turn signal switch. Faulty dashboard cable assembly. Faulty windshield wiper EMI cable.



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

**CONTINUITY TEST**

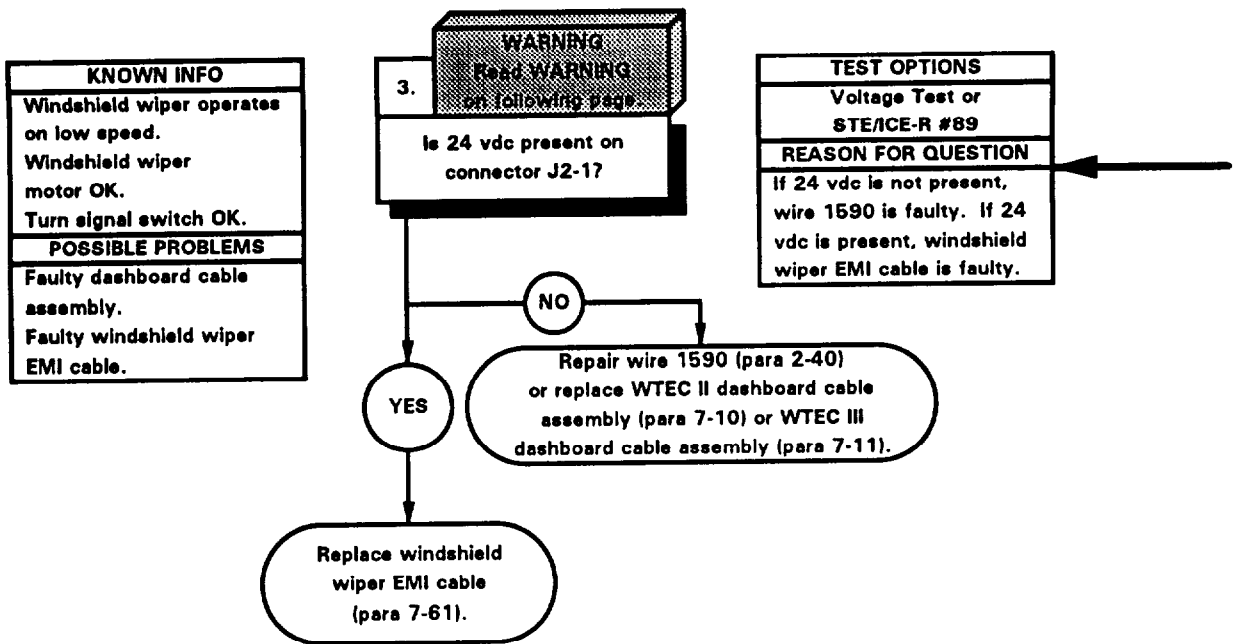
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect turn signal switch connector from connector P18.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to turn signal switch connector terminal 4.
- (5) Connect negative (-) probe of multimeter to turn signal switch connector terminal 6.
- (6) Position windshield wiper switch to high (TM 9-2320-365-10) and note reading on multimeter.
- (7) If continuity is not present, replace turn signal switch (para 7-25).
- (8) Position windshield wiper switch to off (TM 9-2320-365-10).
- (9) Connect turn signal switch connector to connector P18.
- (10) Install instrument panel assembly (para 7-15).



**TURN SIGNAL SWITCH CONNECTOR**

X2E8102A

e78. WINDSHIELD WIPER DOES NOT OPERATE ON HIGH SPEED (CONT)

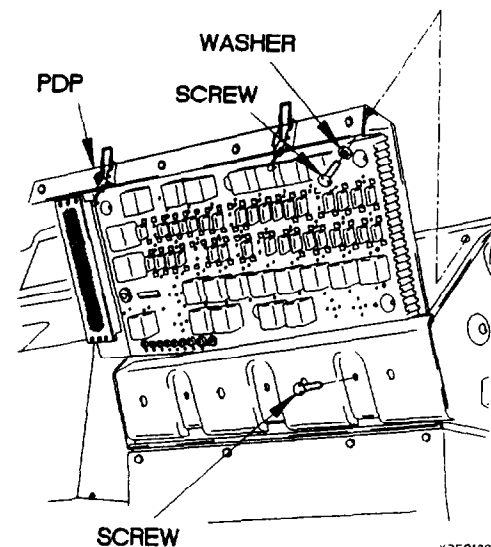
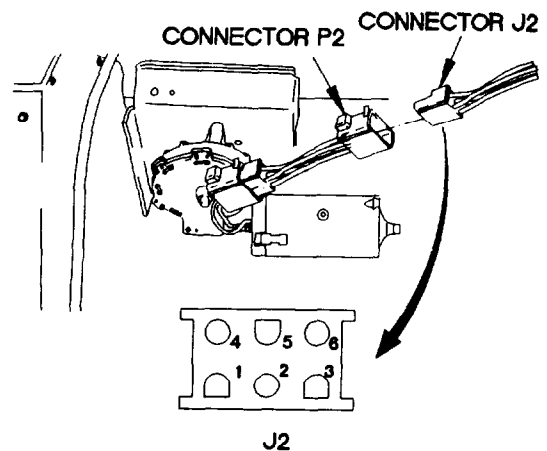


**WARNING**

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.

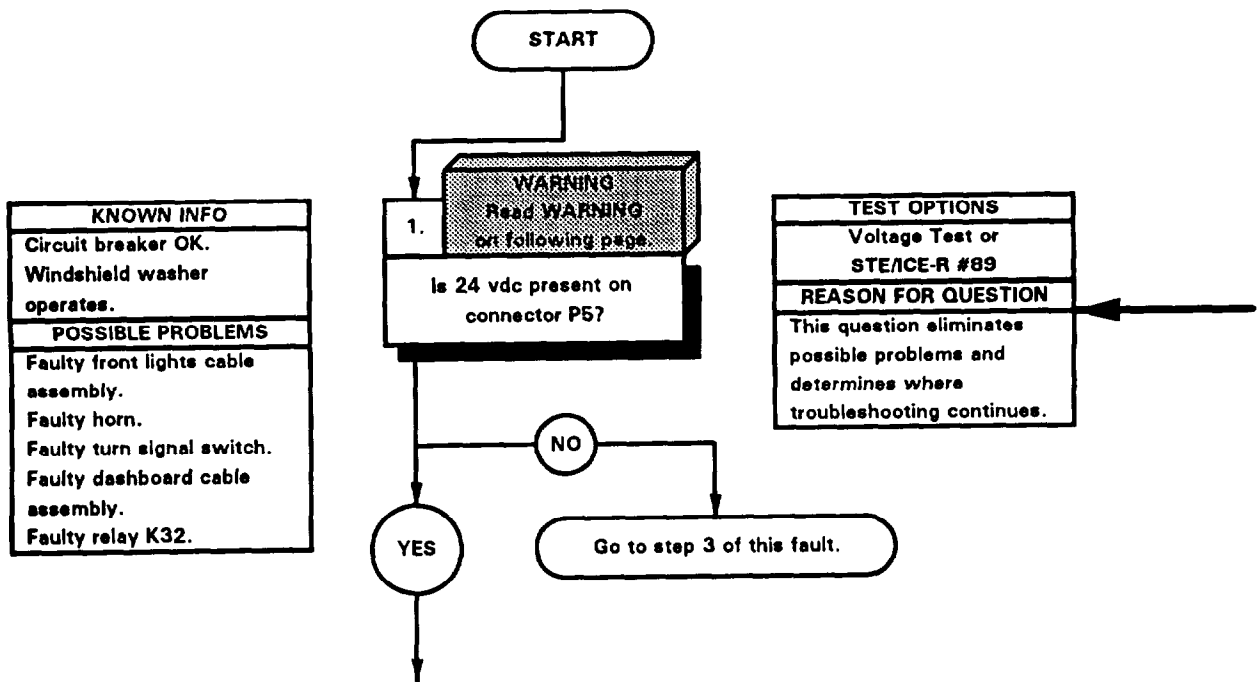
**VOLTAGE TEST**

- (1) Disconnect connector J2 from connector P2.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J2-1.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Position windshield wiper switch to high (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1590 (para 2-40) 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, replace windshield wiper EMI cable (para 7-61).
- (9) Position windshield wiper switch to off (TM 9-2320-365-10).
- (10) Position master power switch to off (TM 9-2320-365-10).
- (11) Connect connector J2 to connector P2.
- (12) Install PDP on dashboard with three screws.
- (13) Install three washers and screws in PDP.
- (14) Install PDP cover (para 16-2).



K2E81031

●79. HORN DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Geni Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

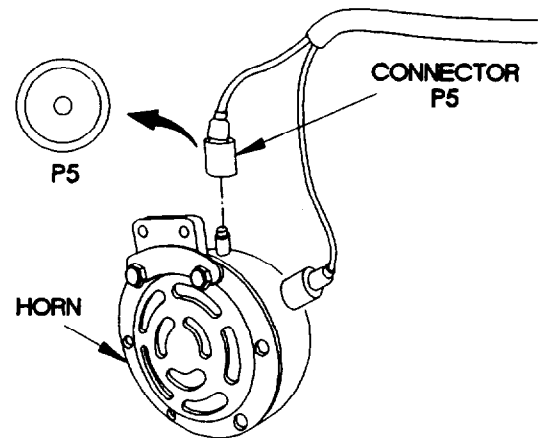
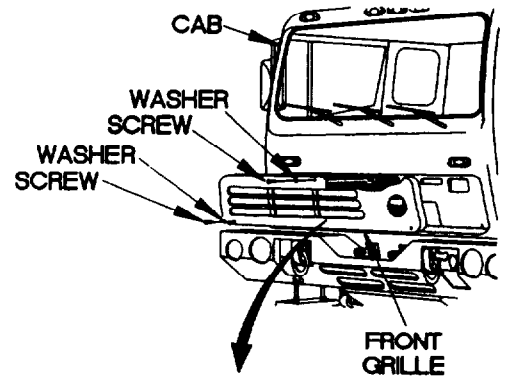


**WARNING**

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 two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P5 from horn.
- (5) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to connector P5.
- (7) Connect negative (-) probe of multimeter to ground.
- (8) Position master power switch to on (TM 9-2320-365-10).
- (9) Press horn button (TM 9-2320-365-10) and note reading of multimeter.
- (10) If 24 vdc is not present, go to step 3 of this fault.
- (11) Position master power switch to off (TM 9-2320-365-10).
- (12) Connect connector P5 to horn.



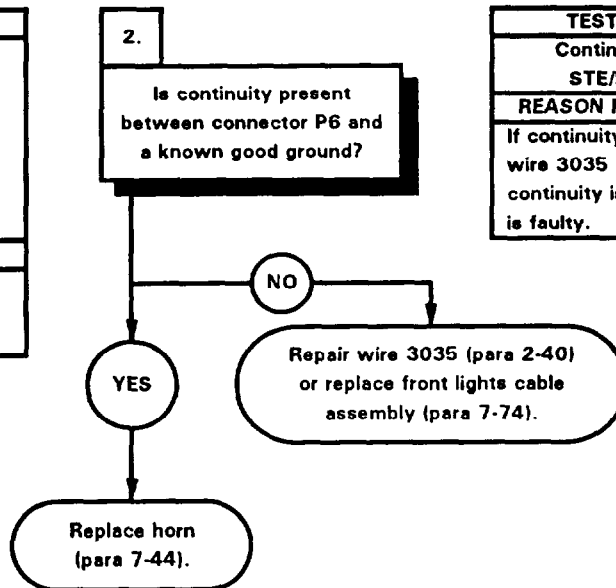
X2E8201A

e79. HORN DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK.
Windshield washer operates.
Turn signal switch OK.
Dashboard cable assembly OK.
Relay K32 OK.

POSSIBLE PROBLEMS
Faulty front lights cable assembly.
Faulty horn.



TEST OPTIONS
Continuity Test or STE/CE-R #91

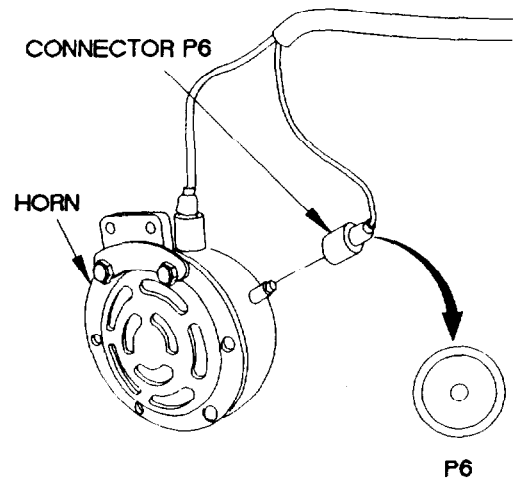
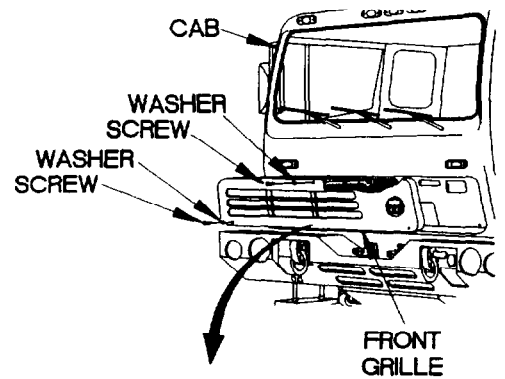
  

REASON FOR QUESTION
If continuity is not present, wire 3035 is faulty. If continuity is present, horn is faulty.



**CONTINUITY TEST**

- (1) Disconnect connector P6 from horn.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P6.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, repair wire 3035 (para 2-40) or replace front lights cable assembly (para 7-74).
- (6) If continuity is present, replace horn (para 7-44).
- (7) Connect connector P6 to horn.
- (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).



X2E 8202A

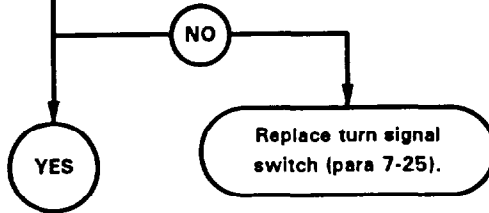


e79. HORN DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Windshield washer operates. Horn OK.
POSSIBLE PROBLEMS
Faulty turn signal switch. Faulty dashboard cable assembly. Faulty front lights cable assembly. Faulty relay K32.

3.  
Is continuity present between turn signal switch connector terminal 4 and terminal 12?

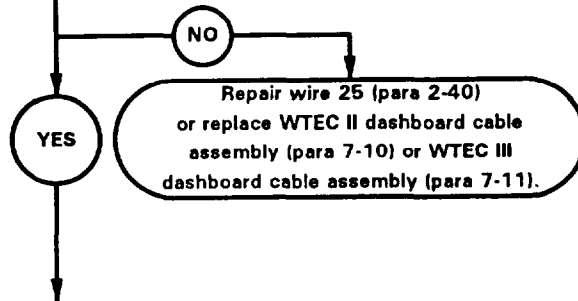
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, turn signal switch is faulty.



KNOWN INFO
Circuit breaker OK. Windshield washer operates. Horn OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty front lights cable assembly. Faulty relay K32.

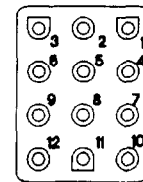
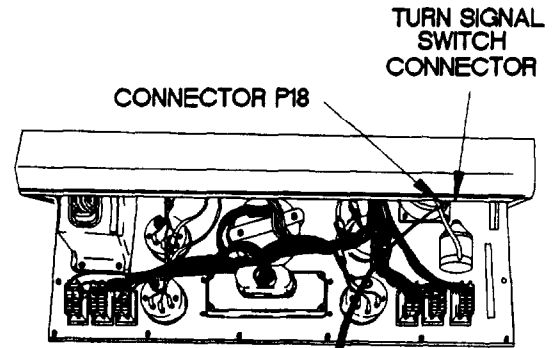
4.  
**WARNING**  
Read **WARNING** on following page.  
Is 24 vdc present on relay K32 terminal 86?

TEST OPTIONS
Voltage Test or STE/CE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 25 is faulty.



**CONTINUITY TEST**

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector P18 from turn signal switch connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to turn signal switch connector terminal 4.
- (5) Connect negative (-) probe of multimeter to turn signal switch connector terminal 12.
- (6) Press horn button (TM 9-2320-365-10) and note reading on multimeter.
- (7) If continuity is not present, replace turn signal switch (para 7-25).
- (8) Connect connector P18 to turn signal switch connector.
- (9) Install instrument panel assembly (para 7-15).



TURN SIGNAL SWITCH CONNECTOR

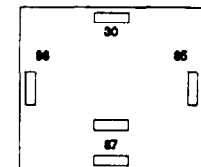
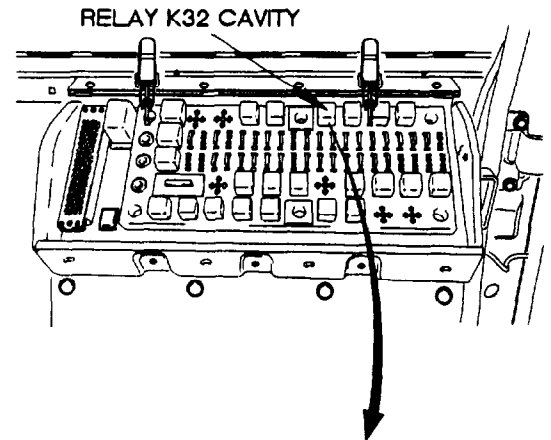
X2E8203A

**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 K32 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K32 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Press horn button (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 25 (para 2-40) or 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 9-2320-365-10).



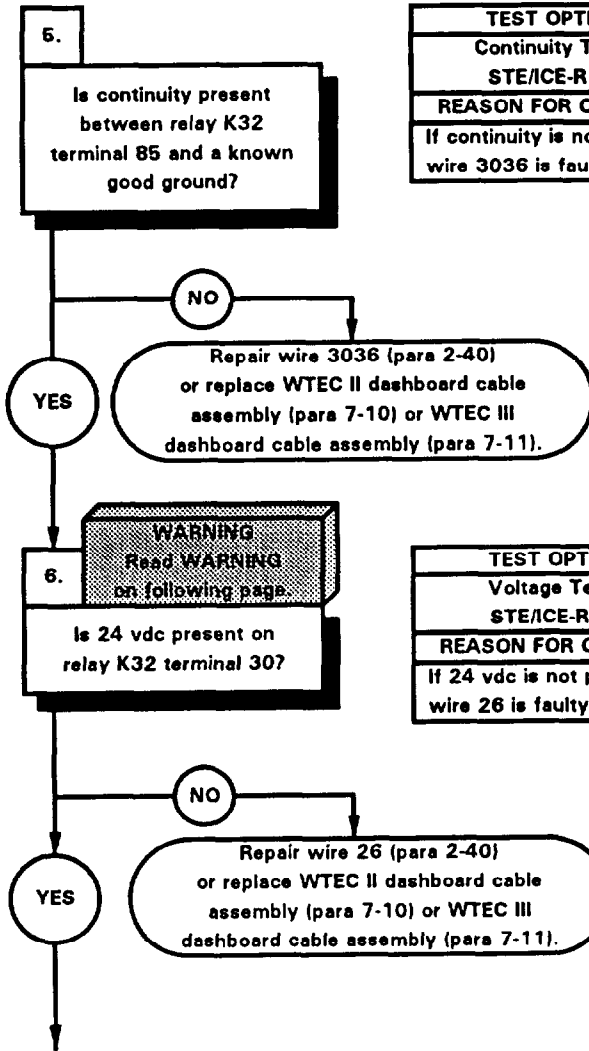
RELAY K32 CAVITY

X2E8204A

e79. HORN DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Windshield washer operates. Horn OK. Turn signal switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K32. Faulty front lights cable assembly.

KNOWN INFO
Circuit breaker OK. Windshield washer operates. Horn OK. Turn signal switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K32. Faulty front lights cable assembly.



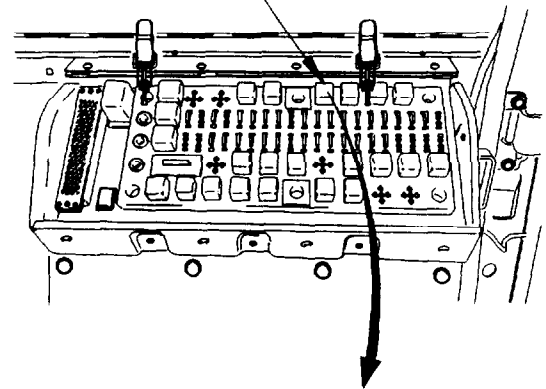
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3036 is faulty.

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 26 is faulty.

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K32 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3036 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

RELAY K32 CAVITY

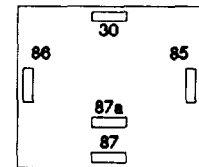


**WARNING**

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.

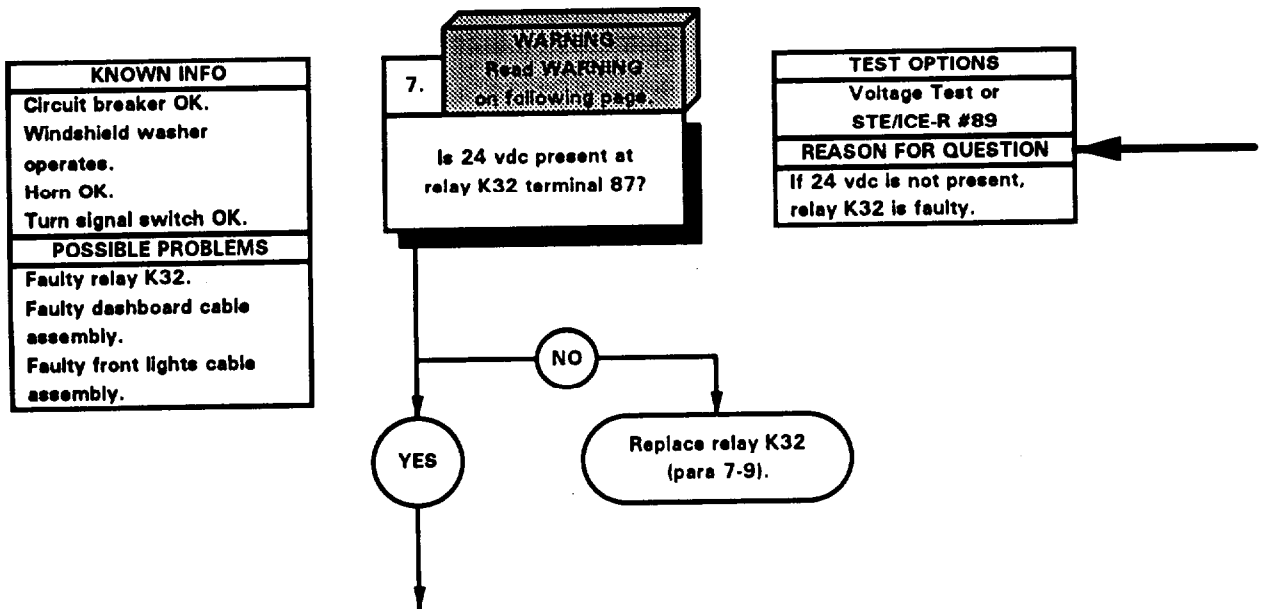
**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 30, where relay K32 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 26 (para 2-40) 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 9-2320-365-10).



RELAY K32 CAVITY

e79. HORN DOES NOT OPERATE (CONT)

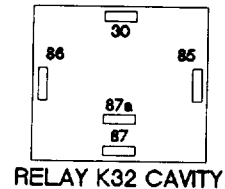
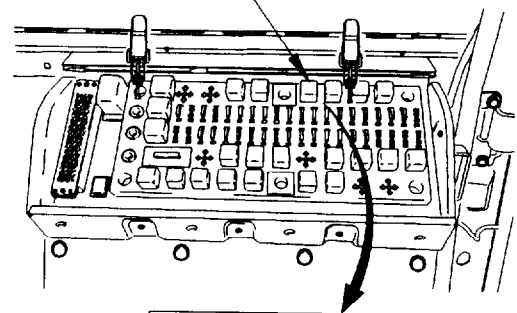
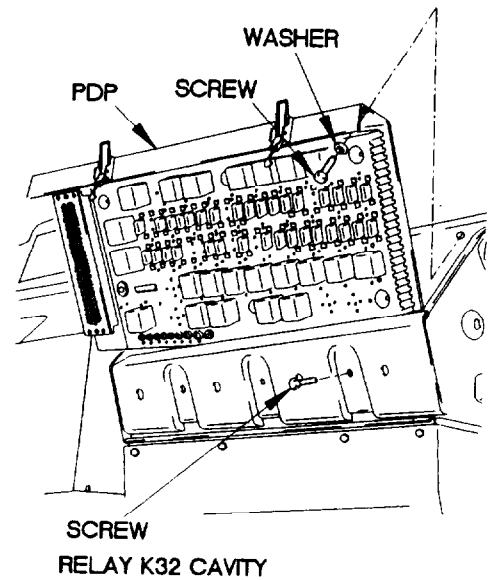


**WARNING**

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.

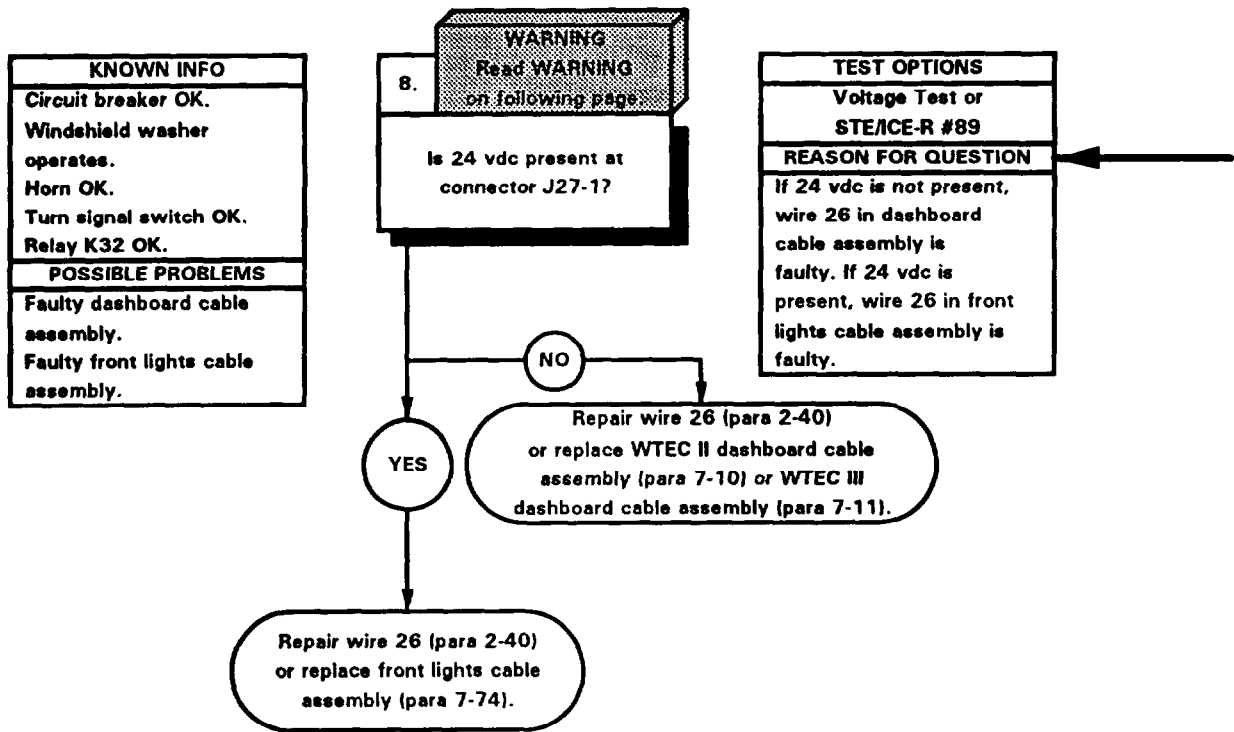
**VOLTAGE TEST**

- (1) Remove three screws and washers from PDP.
- (2) Remove three screws from PDP.
- (3) Lift PDP outward to gain access.
- (4) Install relay K32 in PDP.
- (5) Set multimeter to volts dc.
- (6) Connect positive (+) probe of multimeter to terminal 87 on relay K32.
- (7) Connect negative (-) probe of multimeter to ground.
- (8) Position master power switch to on (TM 9-2320-365-10).
- (9) Press horn button (TM 9-2320-365-10) and note reading on multimeter.
- (10) If 24 vdc is not present, replace relay K32 (para 7-9).
- (11) Position master power switch to off (TM 9-2320-365-10).



K2E02061

e79. HORN DOES NOT OPERATE (CONT)

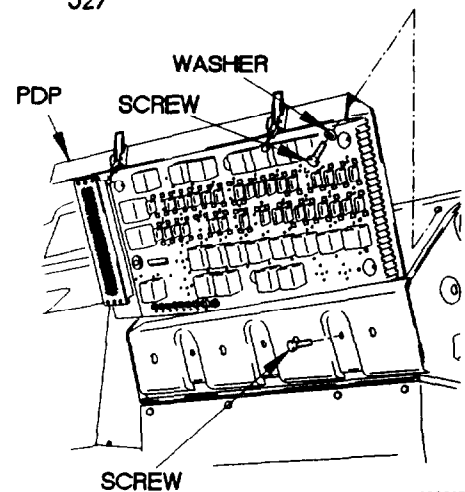
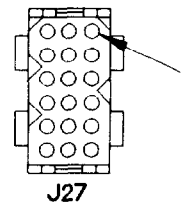
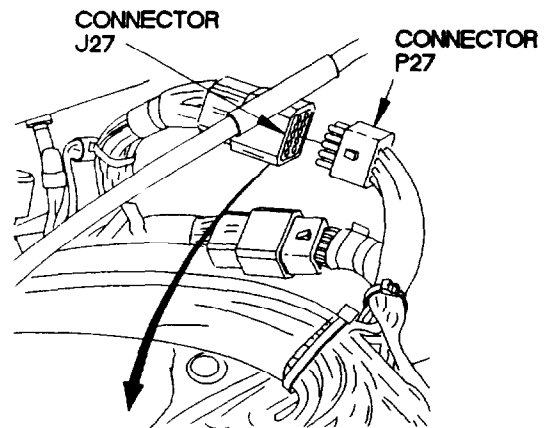


**WARNING**

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**

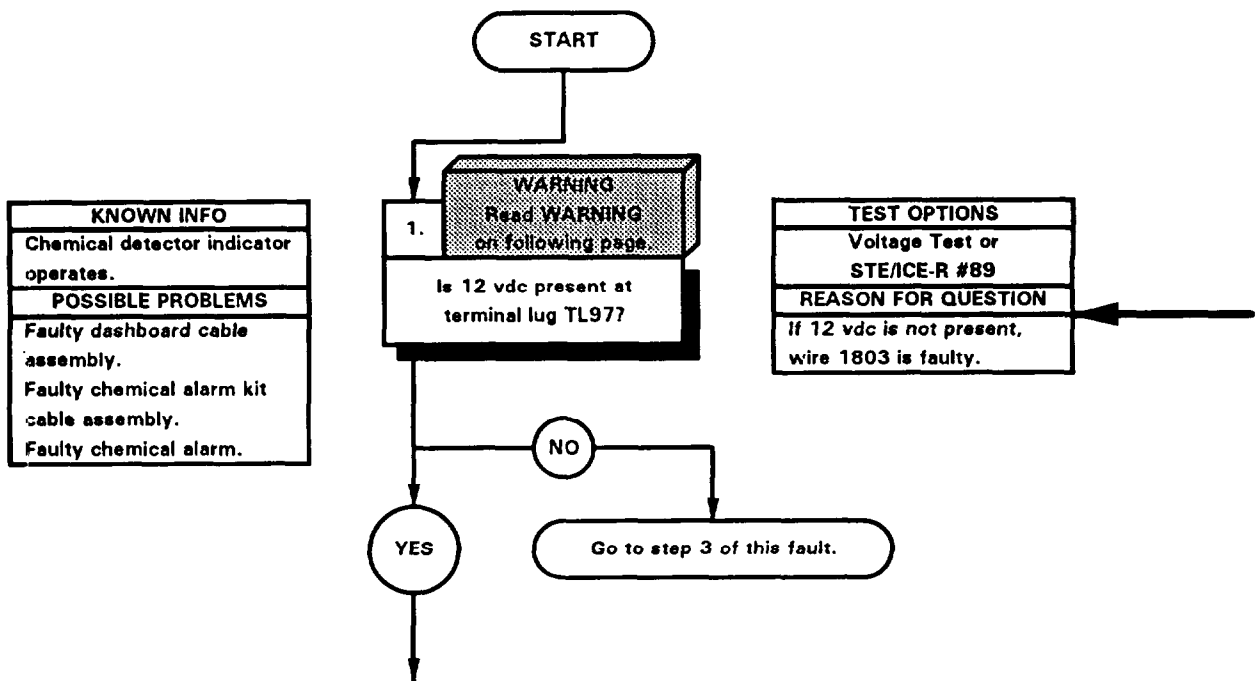
- (1) Disconnect connector J27 from connector P27.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector J27-1.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10).
- (6) Press horn button (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 26 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) If 24 vdc present, repair wire 26 (para 2-40) or replace front lights cable assembly (para 7-74).
- (9) Position master power switch to off (TM 9-2320-365-10).
- (10) Connect connector J27 to connector P27.
- (11) Install PDP on dashboard with three screws.
- (12) Install three washers and screws in PDP.
- (13) Install PDP cover (para 16-2).



x2E82071



e80. CHEMICAL ALARM DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

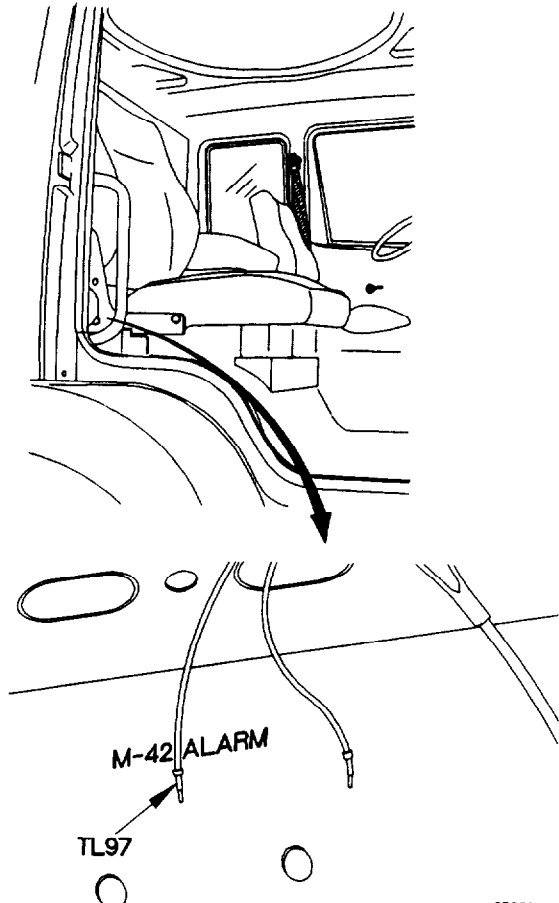


**WARNING**

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 terminal lug TL97.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, go to step 3 of this fault.
- (6) Position master power switch to off (TM 9-2320-365-10).



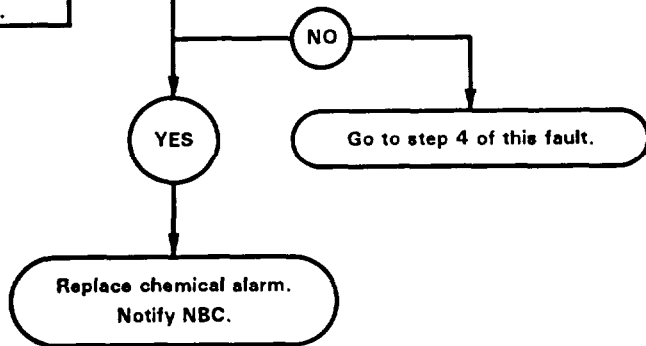
X2E8301A

80. CHEMICAL ALARM DOES NOT OPERATE (CONT)

<b>KNOWN INFO</b>
Chemical detector indicator operates.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly.
Faulty chemical alarm kit cable assembly.
Faulty chemical alarm.

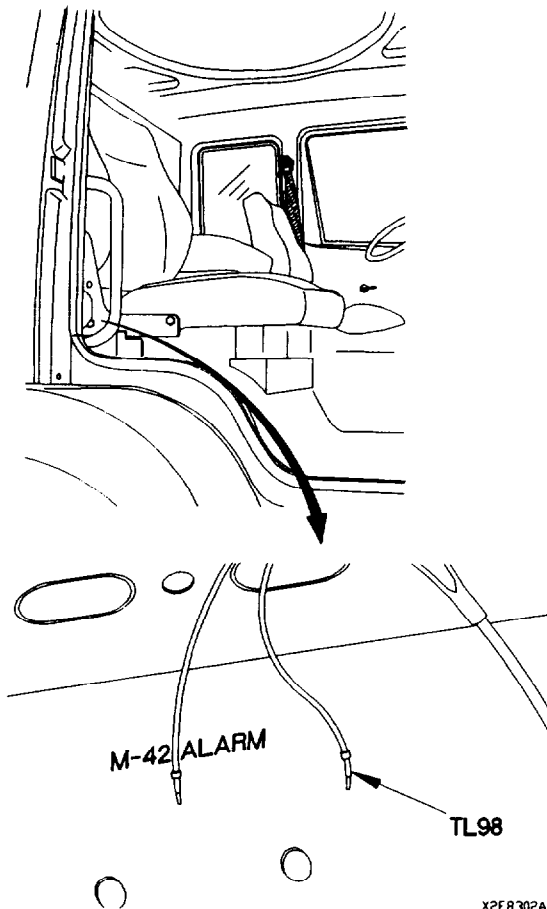
2.  
Is continuity present between terminal lug TL98 and a known good ground?

<b>TEST OPTIONS</b>
Continuity Test STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 1804 is faulty. If continuity is present, chemical alarm is faulty.



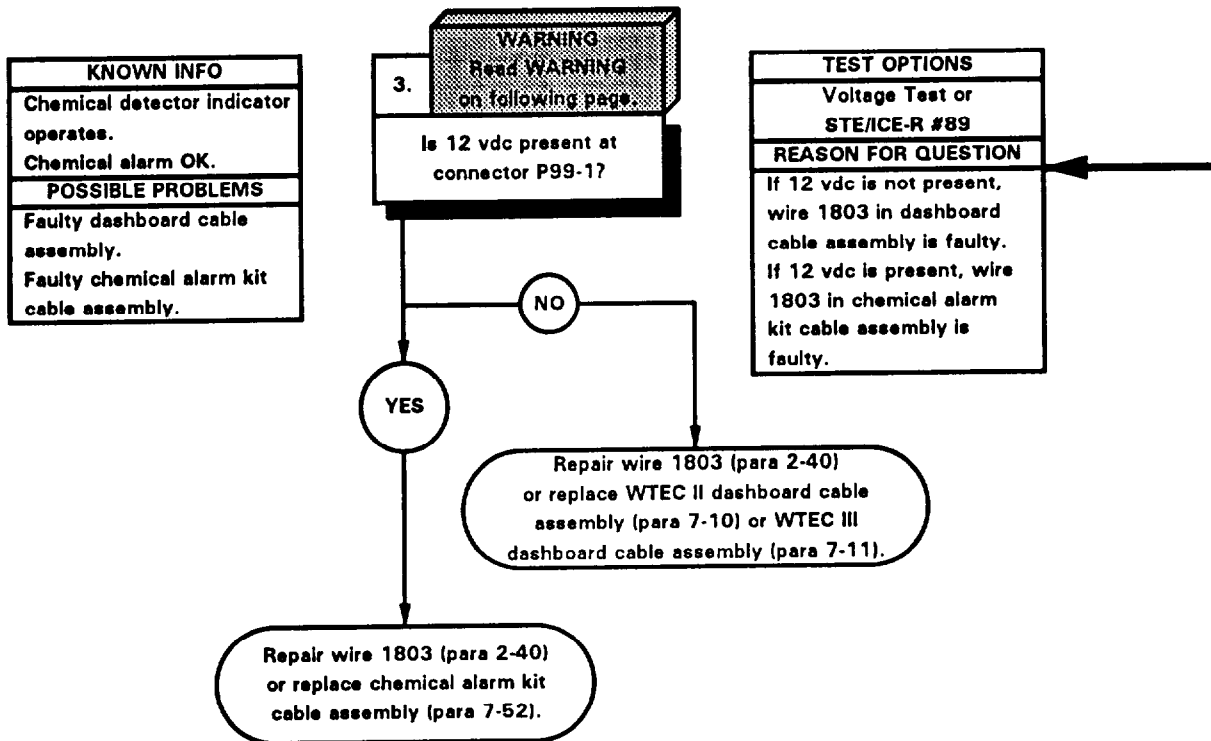
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal lug TL98.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, go to step 4 of this fault.
- (5) If continuity is present, replace chemical alarm (notify NBC).



X2E8302A

e80. CHEMICAL ALARM DOES NOT OPERATE (CONT)

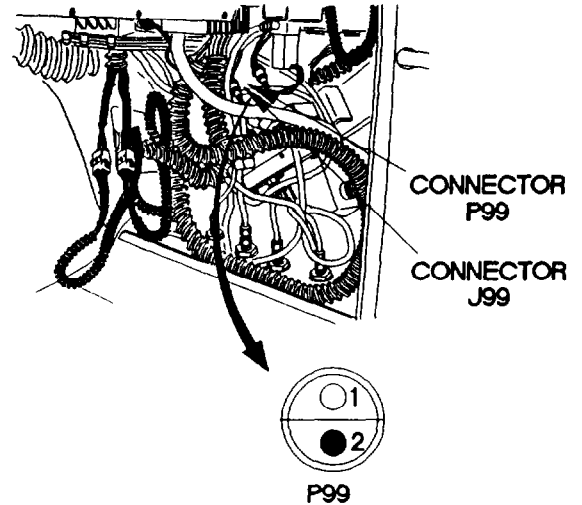


**WARNING**

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.

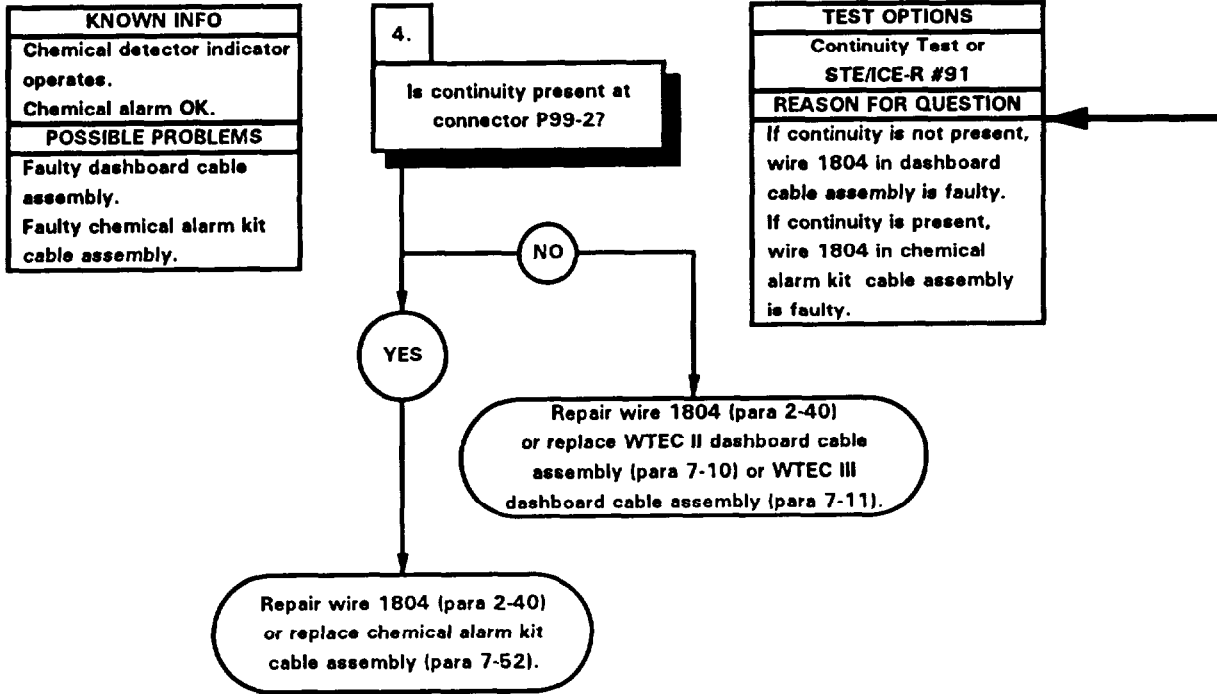
**VOLTAGE TEST**

- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P99 from connector J99.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector P99-1.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1803 (para 2-40) 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 1803 (para 2-40) or replace chemical alarm kit cable assembly (para 7-52).
- (9) Position master power switch to off (TM 9-2320-365-10).
- (10) Connect connector P99 to connector J99.
- (11) Install kick panel (para 16-3).



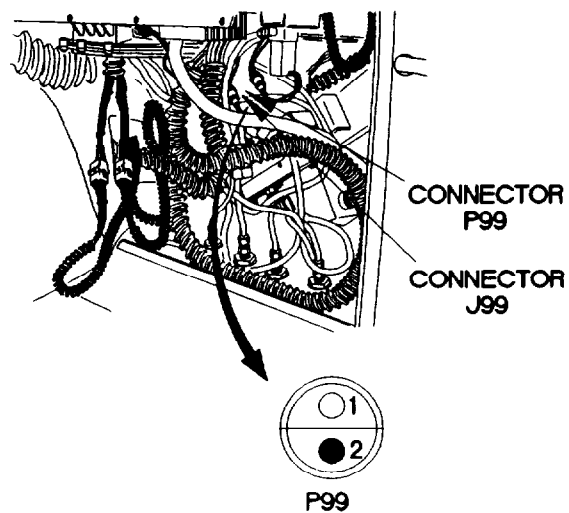
32E 8303A

e80. CHEMICAL ALARM DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

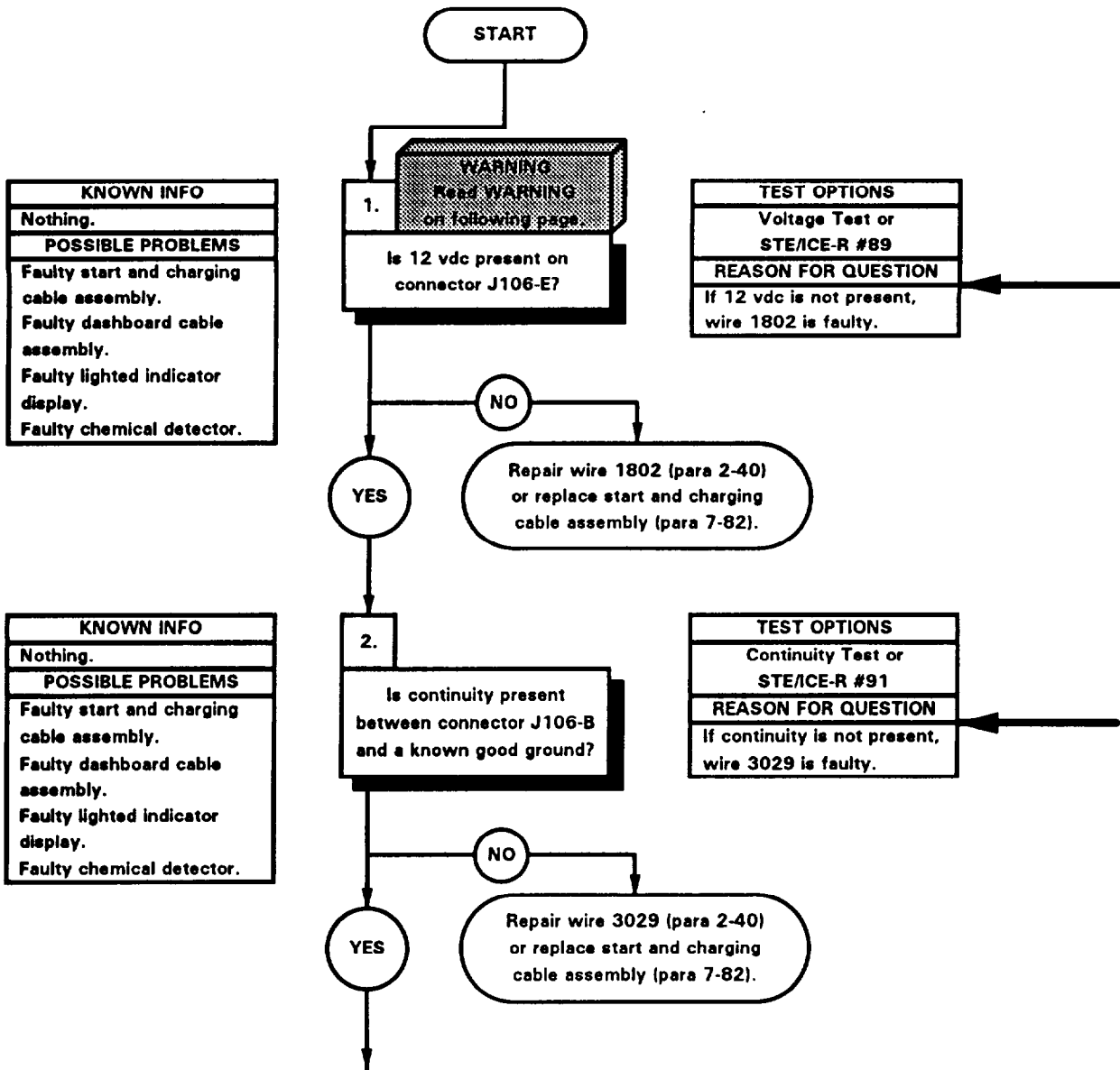
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P99 from connector J99.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P99-2.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If continuity is not present, repair wire 1804 (para 2-40) 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 1804 (para 2-40) or replace chemical alarm kit cable assembly (para 7-52).
- (8) Connect connector P99 to connector J99.
- (9) Install kick panel (para 16-3).



32E8304A



81. CHEMICAL DETECTOR DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



**WARNING**

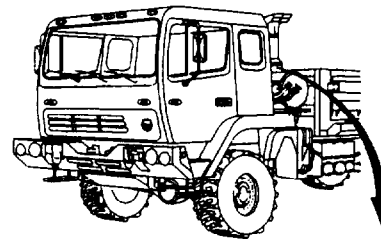
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

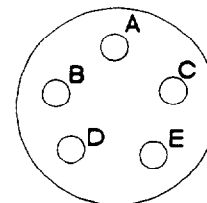
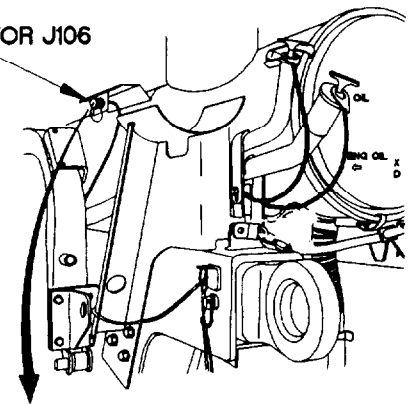
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector J106-E.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1802 (para 2-40) or replace start and charging cable assembly (para 7-82).
- (6) Position master power switch to off (TM 9-2320-365-10).

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J106-B.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3029 (para 2-40) or replace start and charging cable assembly (para 7-82).



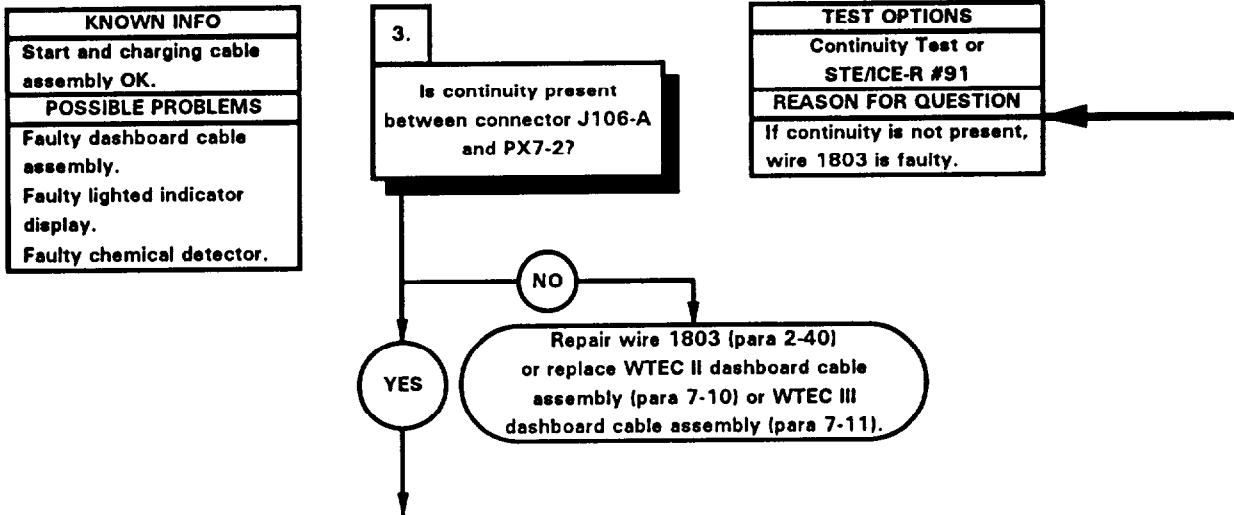
CONNECTOR J106



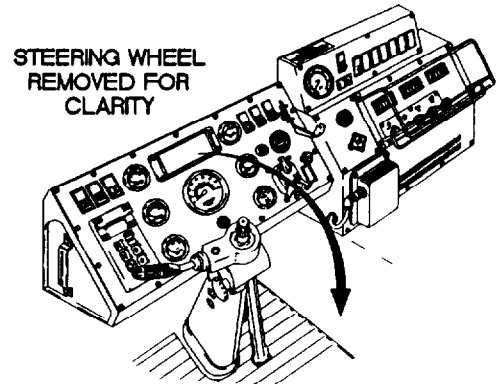
J106

X2E8401A

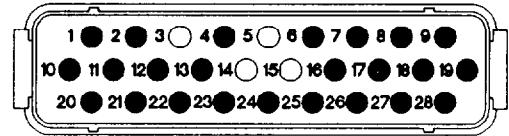
e81. CHEMICAL DETECTOR DOES NOT OPERATE (CONT)



- | CONTINUITY TEST |  |
|-----------------|--|
| (1)             | Disconnect batteries (para 7-48).  |
| (2)             | Remove four screws from lighted indicator display.   |
| (3)             | Remove lighted indicator display from instrument panel assembly.   |
| (4)             | Disconnect connector PX7 from lighted indicator display.   |
| (5)             | Set multimeter to ohms.  |
| (6)             | Connect positive (+) probe of multimeter to connector J106-A.  |
| (7)             | Connect negative (-) probe of multimeter to connector PX7-2 and note reading on multimeter.  |
| (8)             | If continuity is not present, repair wire 1803 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11). |
| (9)             | Connect connector J106 to connector P106.  |

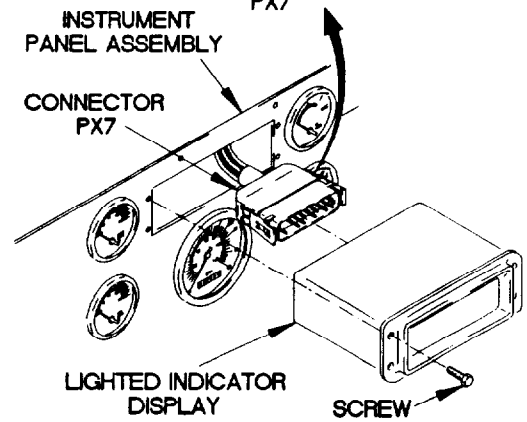


TOP

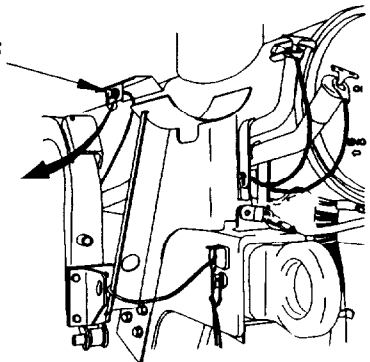
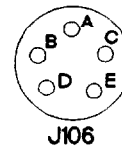


INSTRUMENT  
PANEL ASSEMBLY

CONNECTOR  
PX7



CONNECTOR  
J106



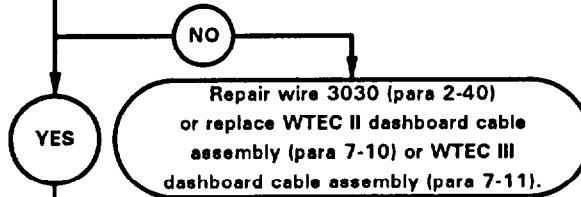
x2E 8403A

e81. CHEMICAL DETECTOR DOES NOT OPERATE (CONT)

<b>KNOWN INFO</b>
Start and charging cable assembly OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly.
Faulty lighted indicator display.
Faulty chemical detector.

4.  
Is continuity present between connector PX7-17 and a known good ground?

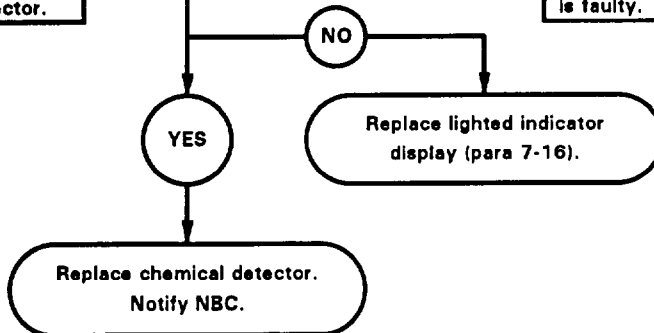
<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 3030 is faulty.



<b>KNOWN INFO</b>
Start and charging cable assembly OK.
Dashboard cable assembly OK.
<b>POSSIBLE PROBLEMS</b>
Faulty lighted indicator display.
Faulty chemical detector.

5.  
Is continuity present between connector PX7-2 and connector PX7-17?

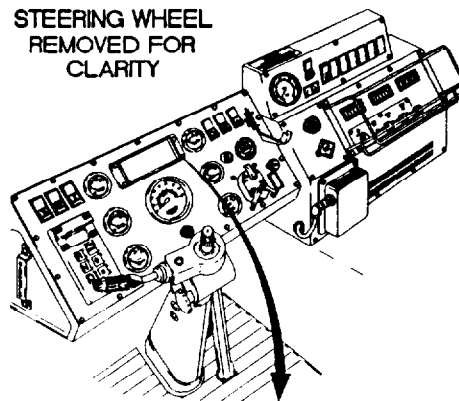
<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, lighted indicator display is faulty. If continuity is present, chemical detector is faulty.



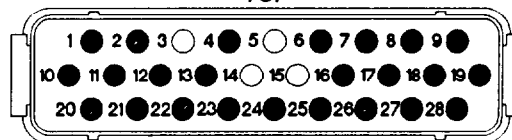
**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX7-17.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3030 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

STEERING WHEEL  
REMOVED FOR  
CLARITY



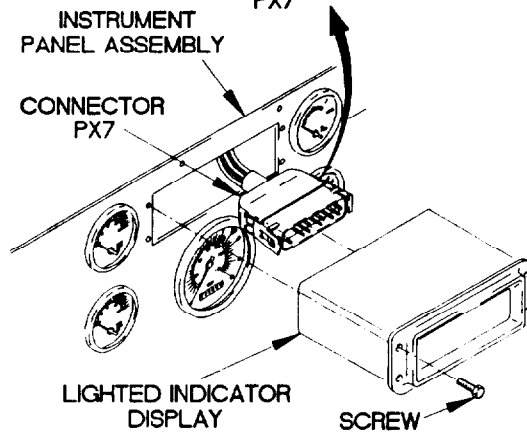
TOP



PX7

INSTRUMENT  
PANEL ASSEMBLY

CONNECTOR  
PX7



LIGHTED INDICATOR  
DISPLAY

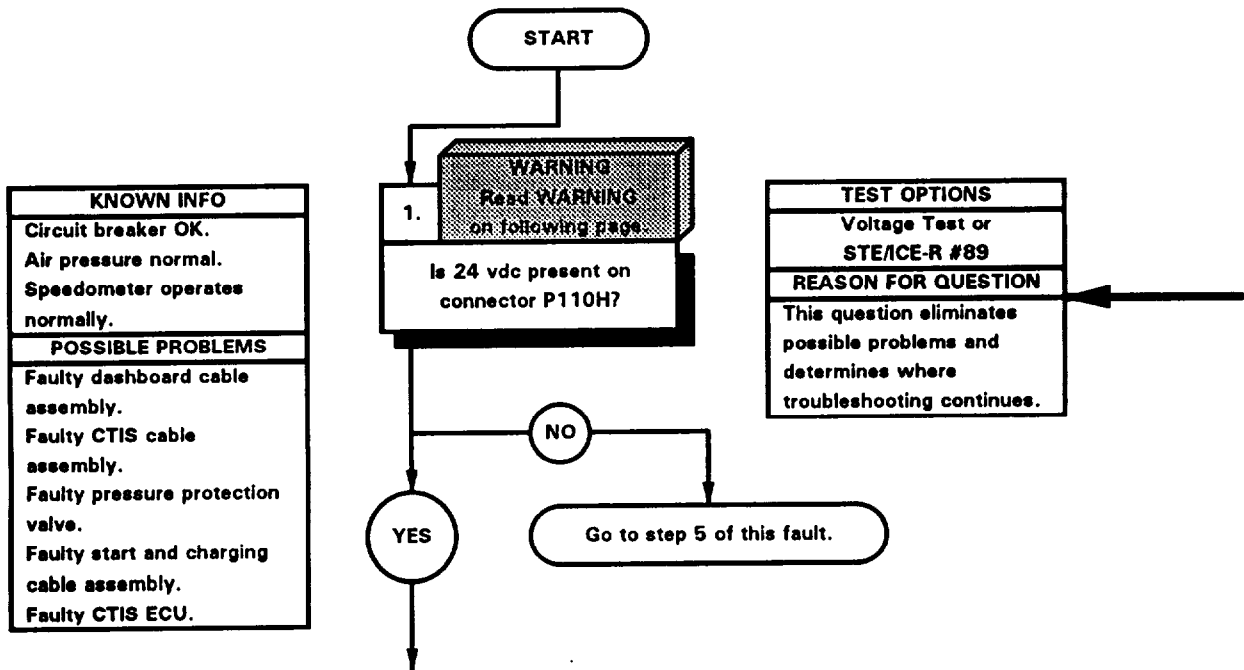
SCREW

X2E8404A

**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX7-2.
- (3) Connect negative (-) probe of multimeter to connector PX7-17 and note reading on multimeter.
- (4) If continuity is not present, replace lighted indicator display (para 7-16).
- (5) If continuity is present, replace chemical detector (notify NBC).
- (6) Connect lighted indicator display to connector PX7.
- (7) Position lighted indicator display in instrument panel assembly with four screws.
- (8) Tighten four screws to 6-10 lb-in. (1 Nm).
- (9) Connect batteries (para 7-48).

●82. CTIS DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)
<b>References</b> TM 9-4910-571-12&P	

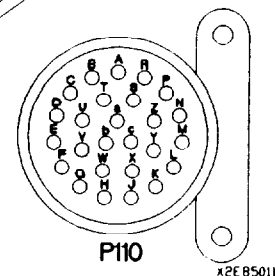
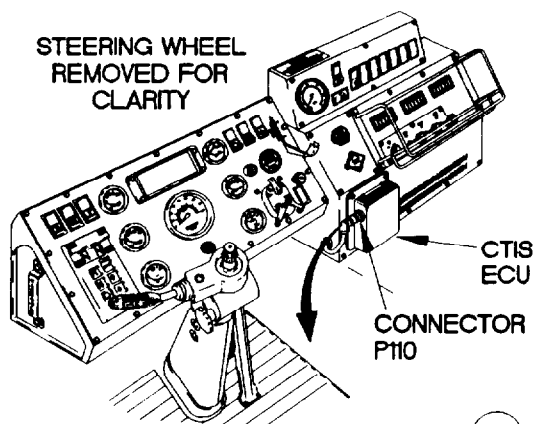


**WARNING**

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**

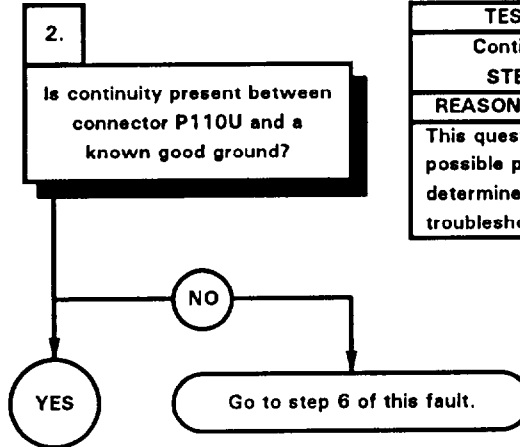
- (1) Disconnect connector P110 from CTIS ECU.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P110H.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 5 of this fault.
- (7) Position master power switch to off (TM 9-2320-365-10).





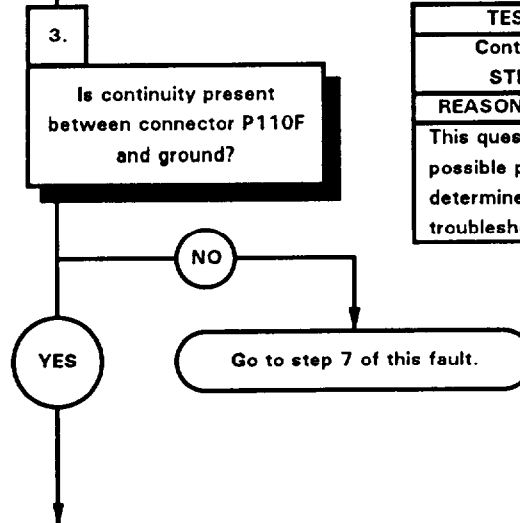
e82. CTIS DOES NOT OPERATE (CONT)

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



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

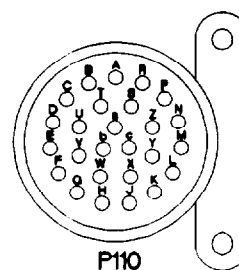
KNOWN INFO
Circuit breaker OK. Air pressure normal. Speedometer operates normally.
POSSIBLE PROBLEMS
Faulty CTIS cable assembly. Faulty dashboard cable assembly. Faulty start and charging cable assembly. Faulty pressure protection valve. Faulty CTIS ECU.



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

**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.

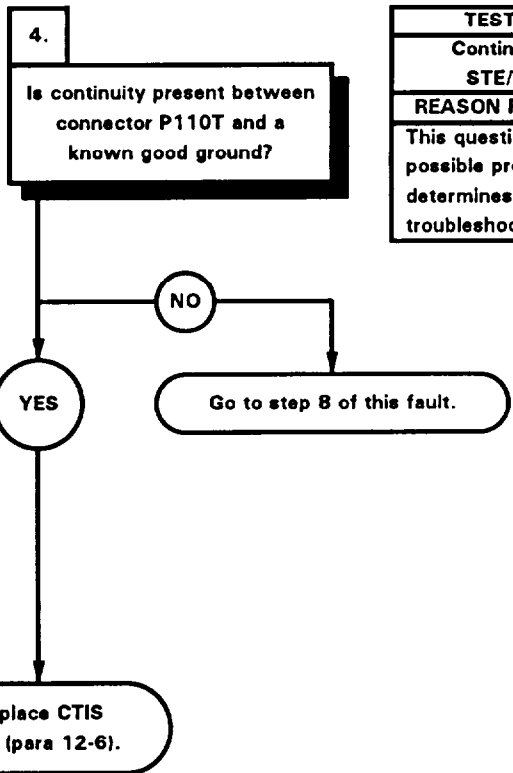


**CONTINUITY TEST**

- (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.

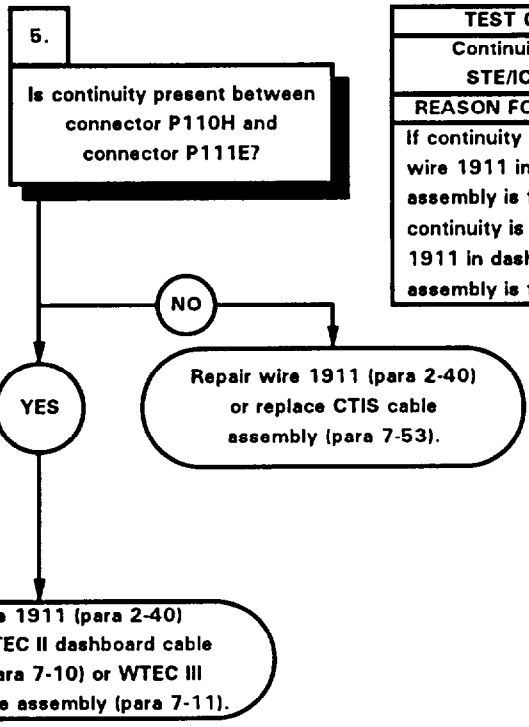
e82. CTIS DOES NOT OPERATE (CONT)

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



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

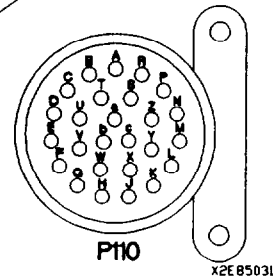
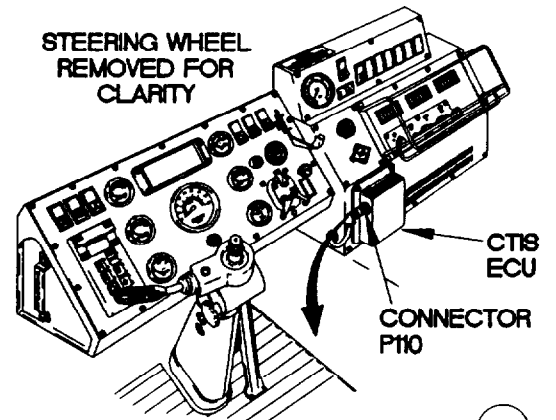
KNOWN INFO
Circuit breaker OK. Air pressure normal. Speedometer operates normally.
POSSIBLE PROBLEMS
Faulty CTIS cable assembly. Faulty dashboard cable assembly. Faulty pressure protection valve. Faulty start and charging cable assembly. Faulty CTIS ECU.



TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1911 in CTIS cable assembly is faulty. If continuity is present, wire 1911 in dashboard cable assembly is faulty.

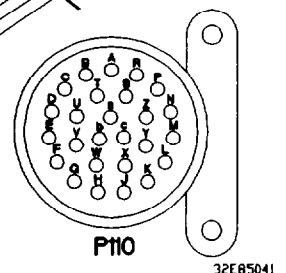
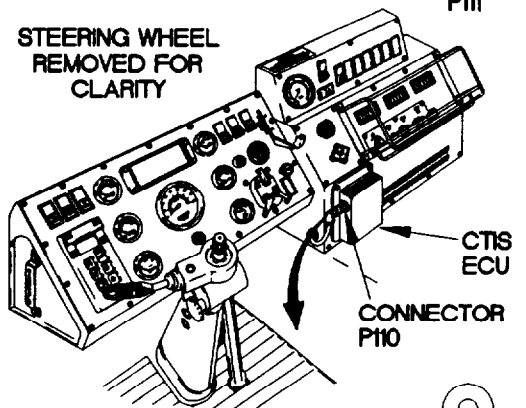
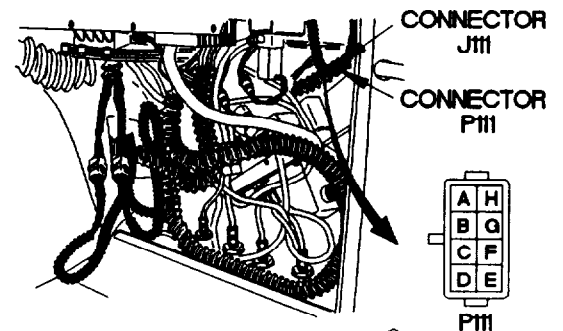
**CONTINUITY TEST**

- (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 12-6).
- (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 2-40) or replace CTIS cable assembly (para 7-53).
- (7) If continuity is present, repair wire 1911 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Connect connector P111 to connector J111.
- (9) Install kick panel (para 16-3).
- (10) Connect connector P110 to CTIS ECU.

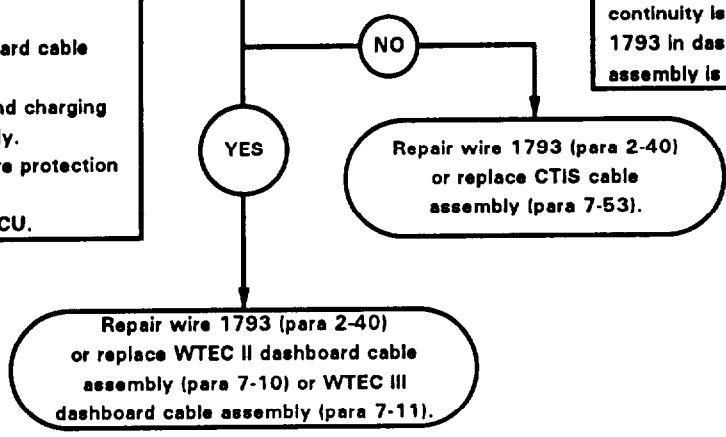


e82. CTIS DOES NOT OPERATE (CONT)

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

6.  
Is continuity present between connector P110U and connector P111B?

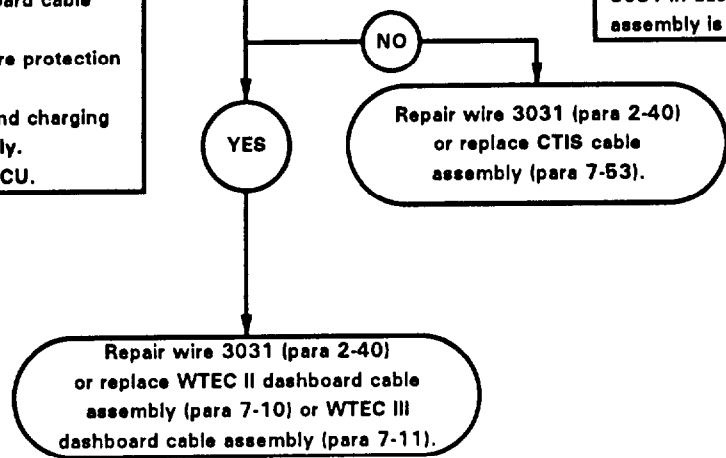
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1793 in CTIS cable assembly is faulty. If continuity is present, wire 1793 in dashboard cable assembly is faulty.



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

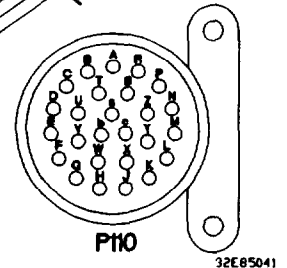
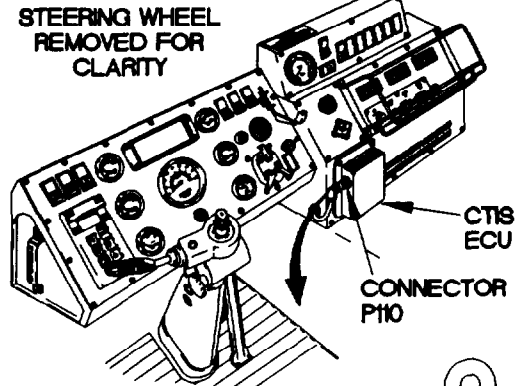
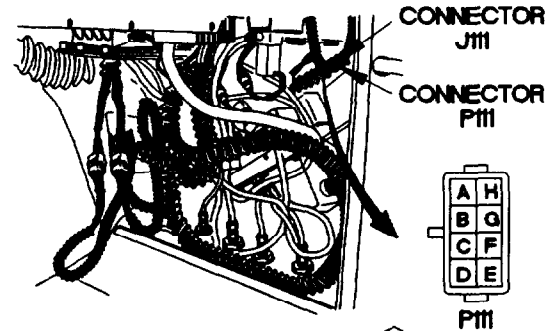
7.  
Is continuity present between connector P110F and connector P111A?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3031 in CTIS cable assembly is faulty. If continuity is present, wire 3031 in dashboard 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 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 2-40) or replace CTIS cable assembly (para 7-53).
- (7) If continuity is present, repair wire 1793 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Connect connector P111 to connector J111.
- (9) Install kick panel (para 16-3).
- (10) Connect connector P110 to CTIS ECU.



**CONTINUITY TEST**

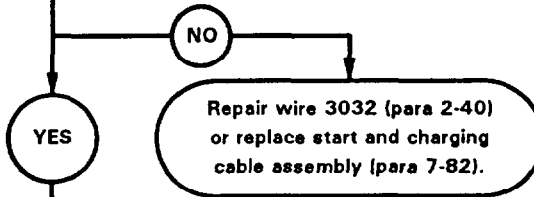
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P111 from connector J111.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P110F.
- (5) Connect negative (-) probe of multimeter to connector P111A and note reading on multimeter.
- (6) If continuity is not present, repair wire 3031 (para 2-40) or replace CTIS cable assembly (para 7-53).
- (7) If continuity is present, repair wire 3031 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Connect connector P111 to connector J111.
- (9) Install kick panel (para 16-3).
- (10) Connect connector P110 to CTIS ECU.

e82. CTIS DOES NOT OPERATE (CONT)

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

8.  
Is continuity present between connector P84A and a known good ground?

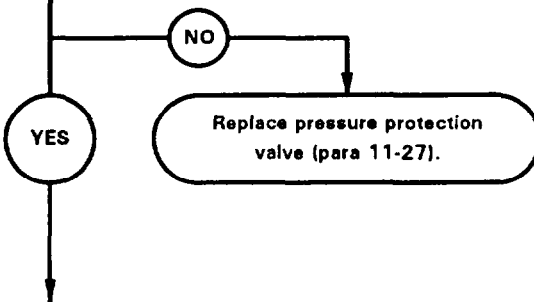
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3032 is faulty.



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

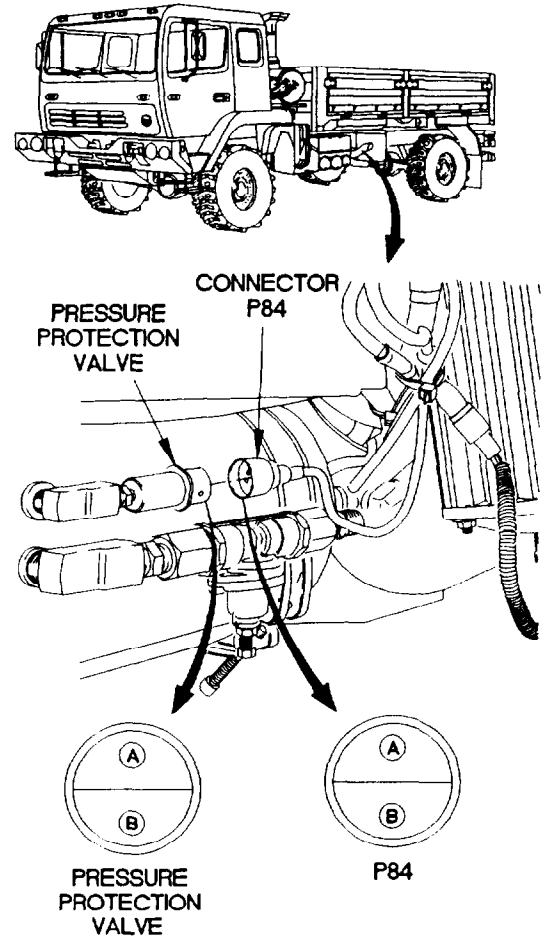
9.  
Is continuity present across pressure protection valve?

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



**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 2-40) or replace start and charging cable assembly (para 7-82).



32E 8506-A

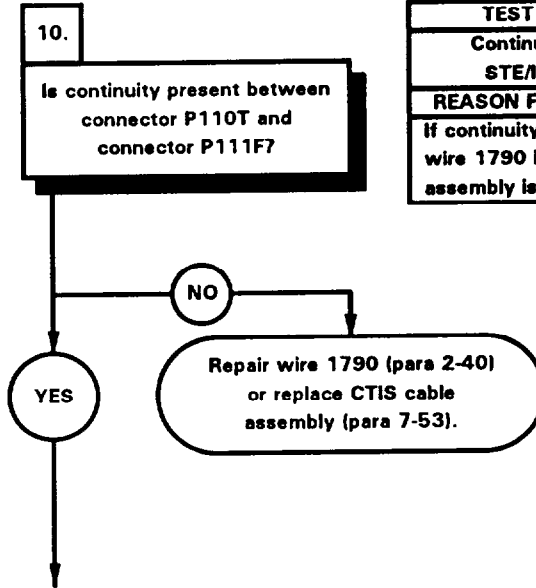
**CONTINUITY TEST**

- (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 11-27).
- (5) Connect connector P84 to pressure protection valve.



e82. CTIS DOES NOT OPERATE (CONT)

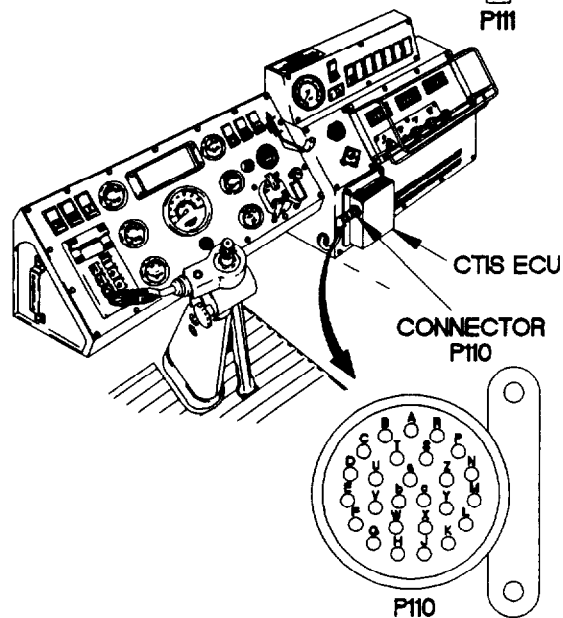
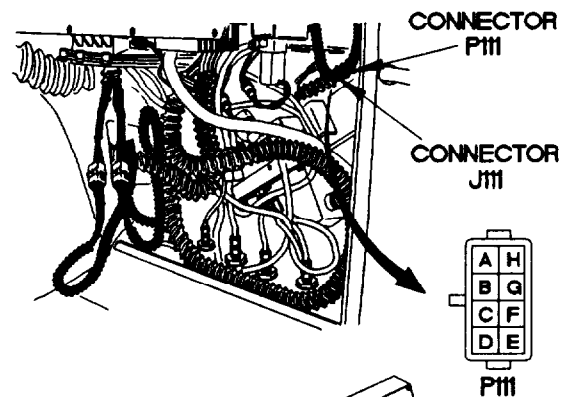
KNOWN INFO
Circuit breaker OK. Air pressure normal. Speedometer operates normally. CTIS ECU OK. Pressure protection valve OK.
POSSIBLE PROBLEMS
Faulty CTIS cable assembly. Faulty dashboard cable assembly. Faulty start and charging cable assembly.



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.

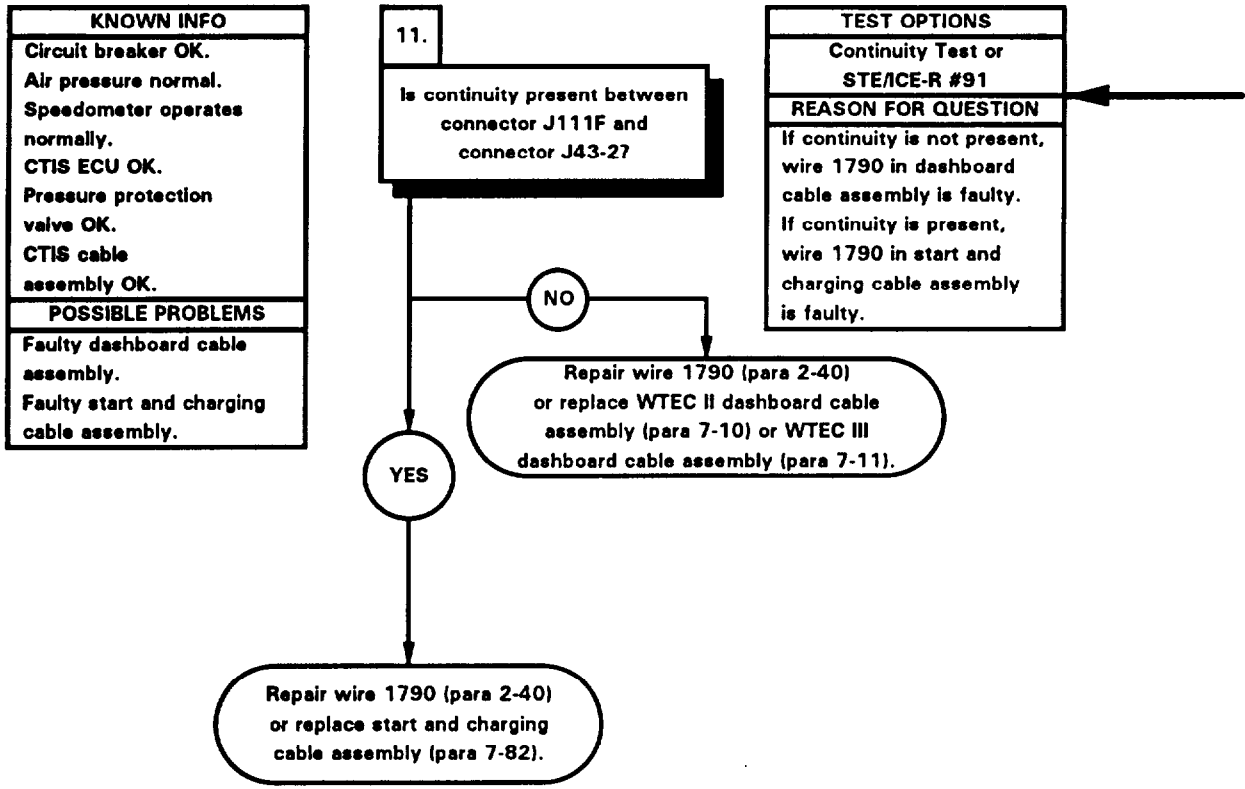
**CONTINUITY TEST**

- (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 2-40) or replace CTIS cable assembly (para 7-53).
- (7) Connect connector P110 to CTIS ECU.



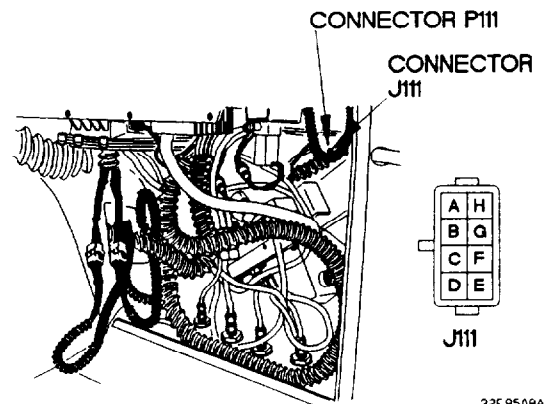
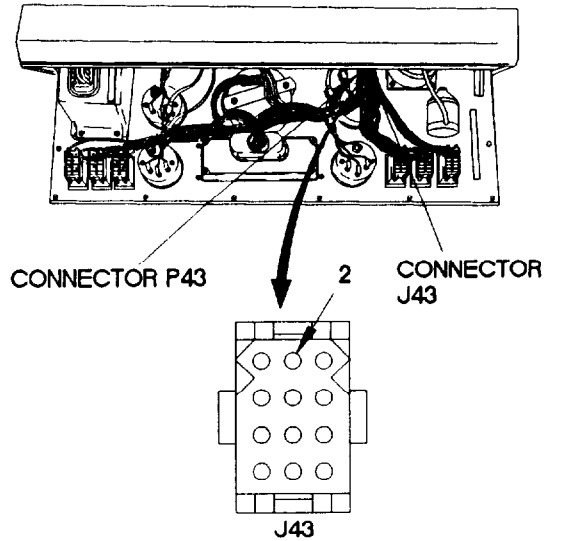
32E05071

82. CTIS DOES NOT OPERATE (CONT)



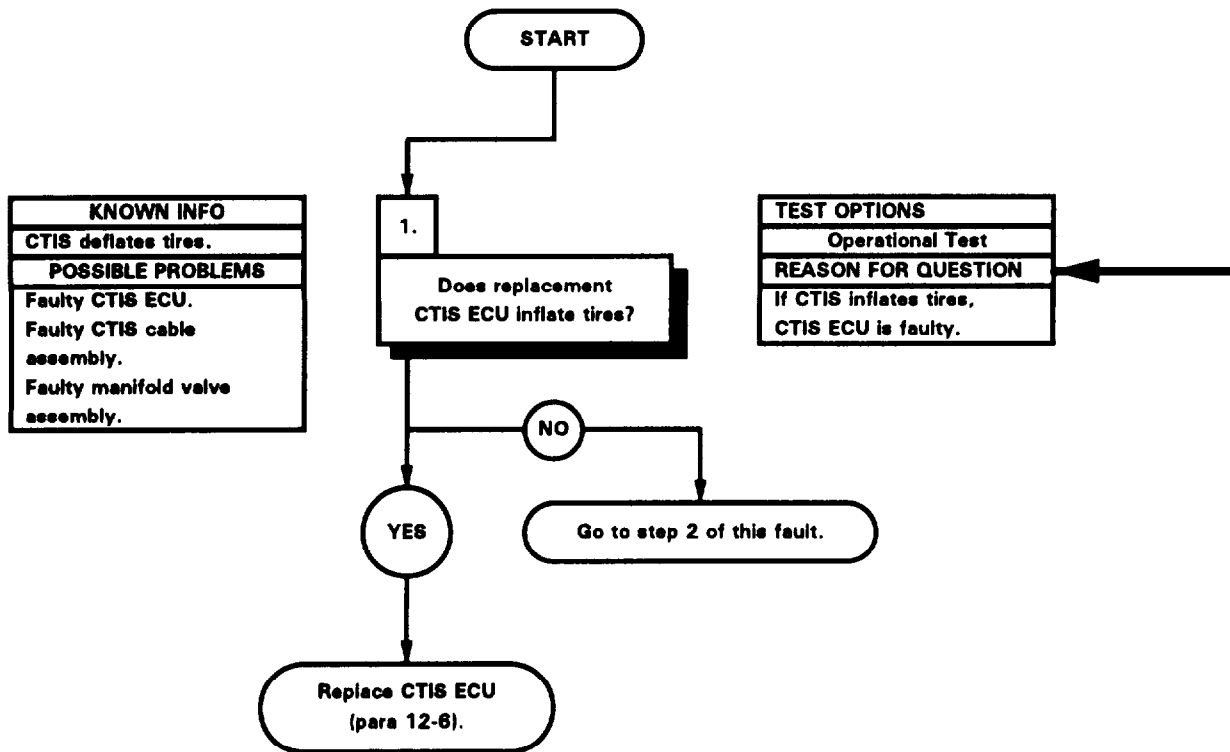
**CONTINUITY TEST**

- (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 2-40) 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 2-40) or replace start and charging cable assembly (para 7-82).
- (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).



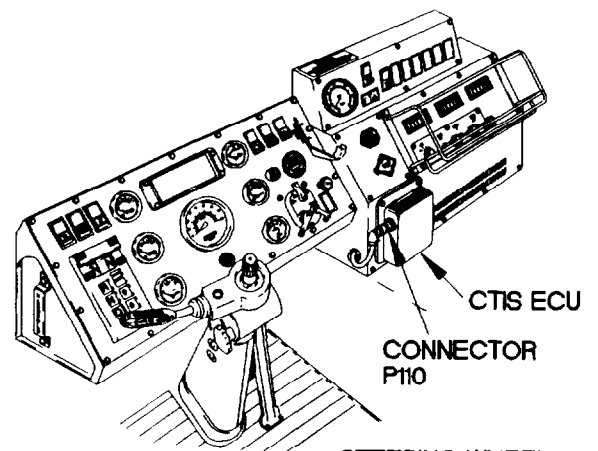
32E8508A

83. CTIS DOES NOT INFLATE TIRES	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)
<b>References</b> 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 9-2320-365-10).
- (4) Allow air pressure to reach 85 psi.
- (5) Deflate tires (TM 9-2320-365-10).
- (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 9-2320-365-10).
- (9) Disconnect connector P110 from known-good CTIS ECU.



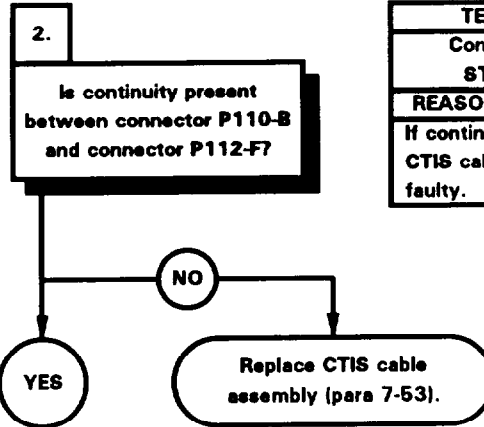
STEERING WHEEL  
REMOVED FOR  
CLARITY

x2E9601A

ø83. CTIS DOES NOT INFLATE TIRES (CONT)

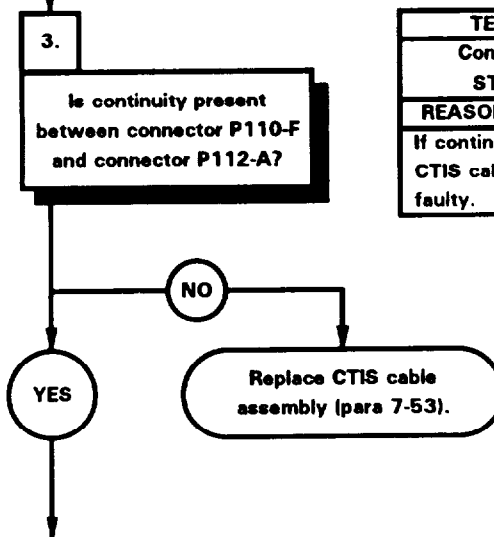
<b>KNOWN INFO</b>
CTIS deflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.

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



<b>KNOWN INFO</b>
CTIS deflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.

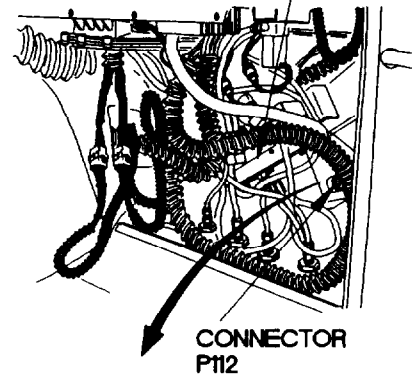
<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, CTIS cable assembly is faulty.



**CONTINUITY TEST**

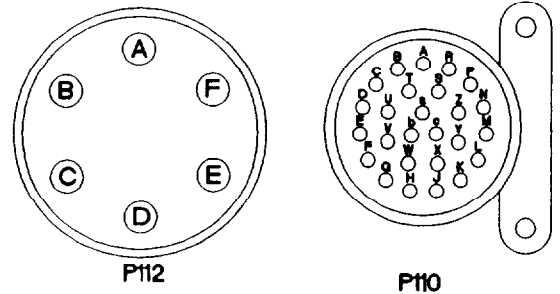
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P112 from manifold valve assembly.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P110-B.
- (5) Connect negative (-) probe of multimeter to connector P112-F and note reading on multimeter.
- (6) If continuity is not present, replace CTIS cable assembly (para 7-53).

MANIFOLD VALVE ASSEMBLY



**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 7-53).

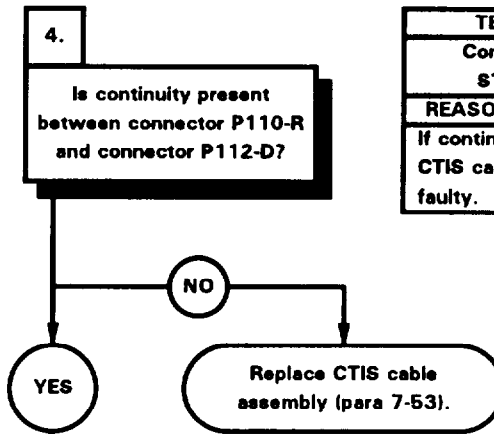


32E8602A



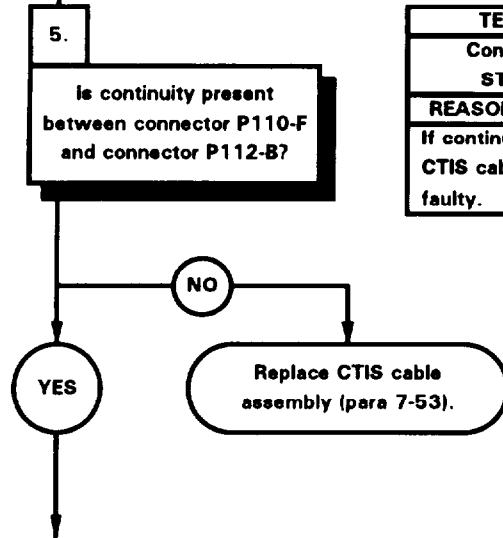
ø83. CTIS DOES NOT INFLATE TIRES (CONT)

<b>KNOWN INFO</b>
CTIS deflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.



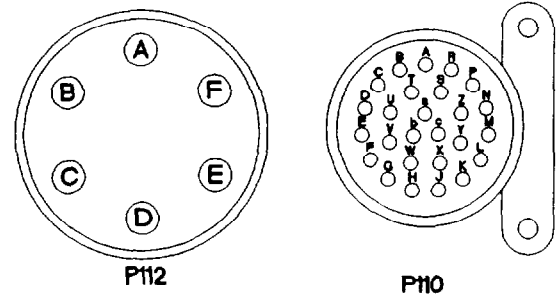
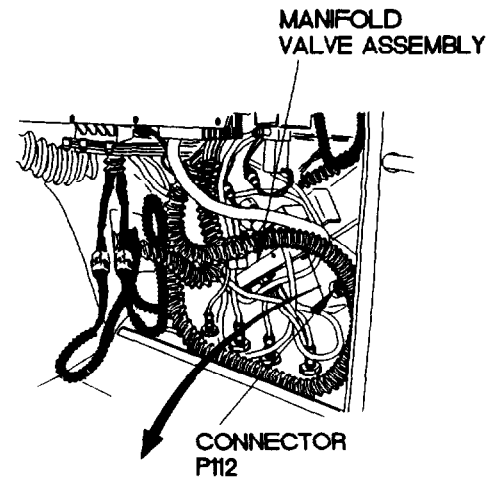
<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, CTIS cable assembly is faulty.

<b>KNOWN INFO</b>
CTIS deflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.



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

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 7-53).



32E8603A

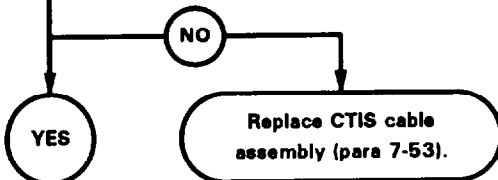
CONTINUITY TEST	
	(1) Set multimeter to ohms.
	(2) Connect positive (+) probe of multimeter to connector P110-F.
	(3) Connect negative (-) probe of multimeter to connector P112-B and note reading on multimeter.
	(4) If continuity is not present, replace CTIS cable assembly (para 7-53).
	(5) Connect connector P112 to manifold valve assembly.

e83. CTIS DOES NOT INFLATE TIRES (CONT)

<b>KNOWN INFO</b>
CTIS deflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.

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

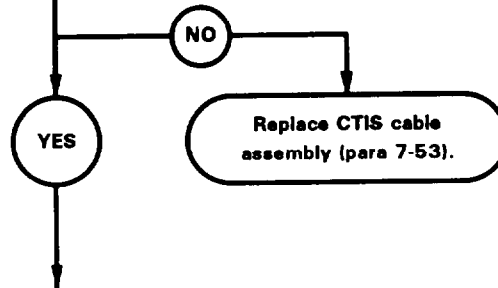
<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, CTIS cable assembly is faulty.



<b>KNOWN INFO</b>
CTIS deflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.

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

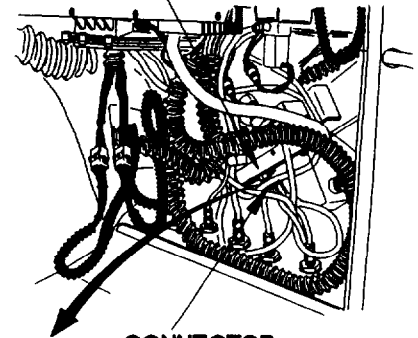
<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, CTIS cable assembly is faulty.



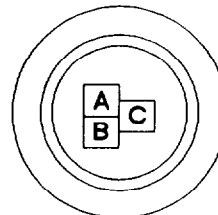
**CONTINUITY TEST**

- (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 7-53).

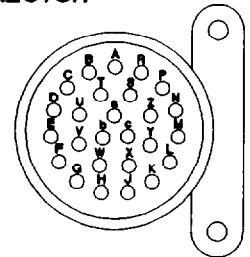
MANIFOLD VALVE ASSEMBLY



CONNECTOR P113



P113



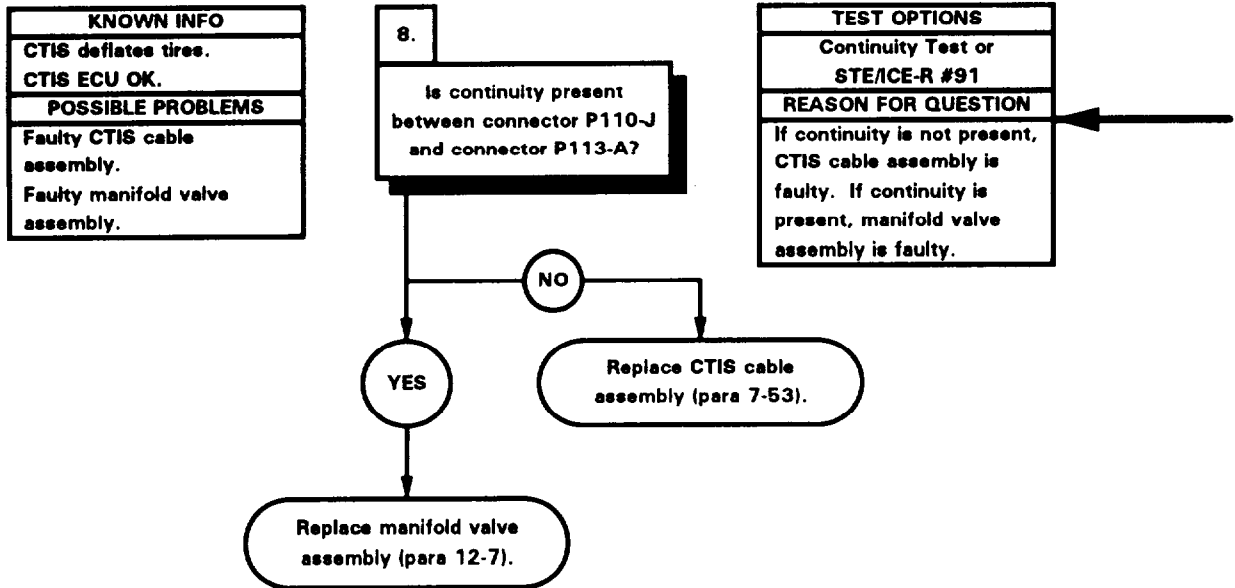
P110

32E8604A

**CONTINUITY TEST**

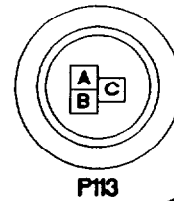
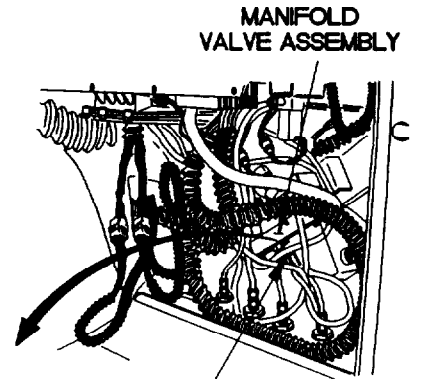
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P110-c.
- (3) Connect negative (-) probe of multimeter to connector P113-C and note reading on multimeter.
- (4) If continuity is not present, replace CTIS cable assembly (para 7-53).

83. CTIS DOES NOT INFLATE TIRES (CONT)



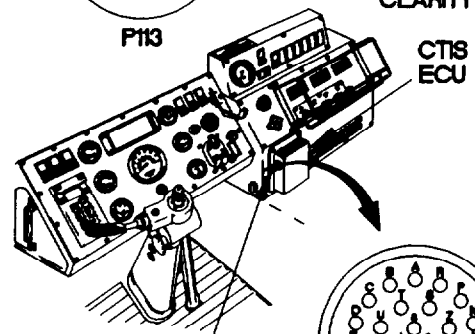
**CONTINUITY TEST**

- (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 7-53).
- (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.

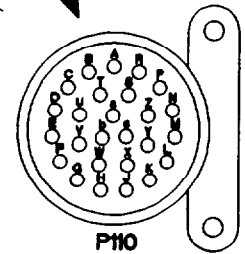


CONNECTOR P113

STEERING WHEEL REMOVED FOR CLARITY

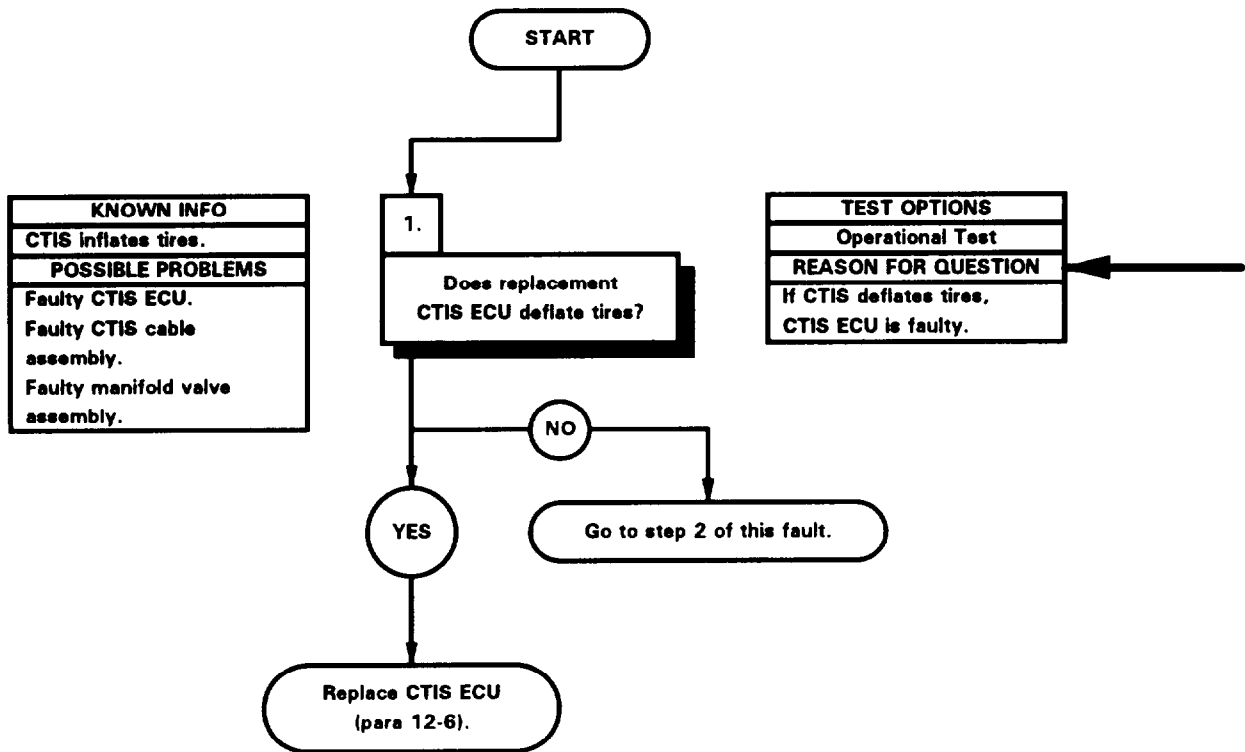


CONNECTOR P110



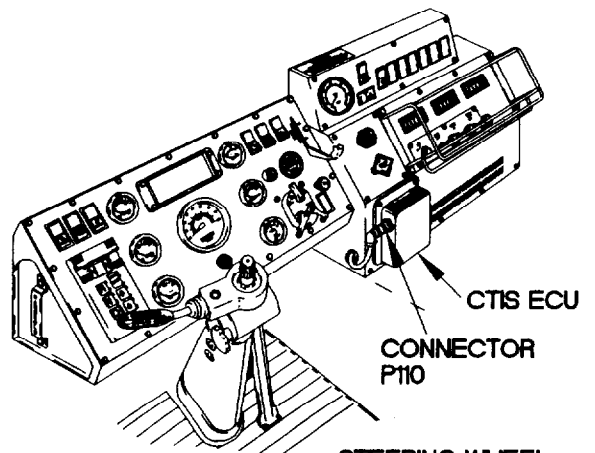
32E 06051

84. CTIS DOES NOT DEFLATE TIRES	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)
<b>References</b> TM 9-4910-671-12&P	



**OPERATIONAL TEST**

- (1) Disconnect connector P110 from CTIS ECU.
- (2) Connect connector P110 to a known-good CTIS ECU.
- (3) Start vehicle (TM 9-2320-365-10).
- (4) Allow air pressure to reach 85 psi.
- (5) Deflate tires (TM 9-2320-365-10).
- (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 9-2320-365-10).
- (9) Disconnect connector P110 from known-good CTIS ECU.



STEERING WHEEL  
REMOVED FOR  
CLARITY

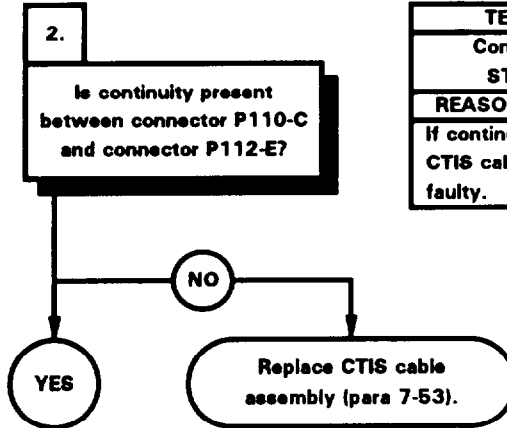
x2E8701A



e84. CTIS DOES NOT DEFLATE TIRES (CONT)

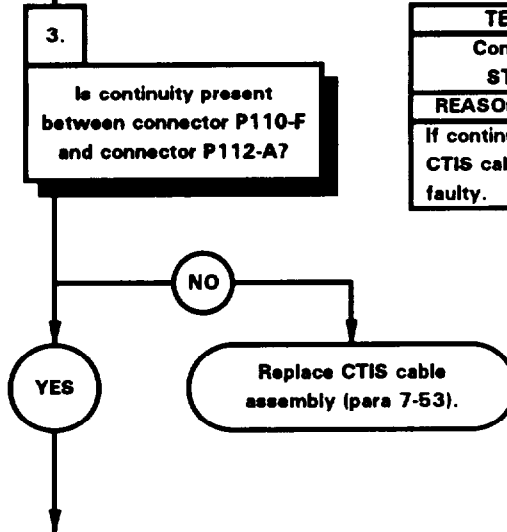
<b>KNOWN INFO</b>
CTIS inflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.

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

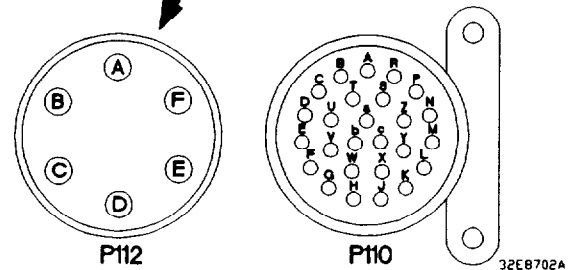
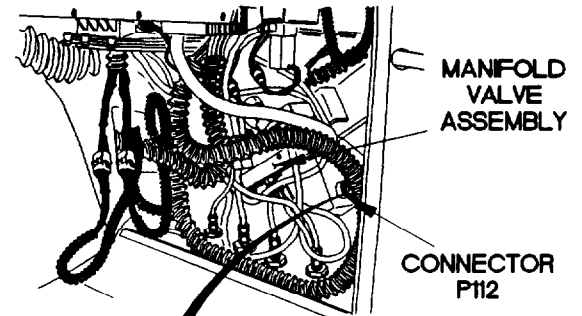


<b>KNOWN INFO</b>
CTIS inflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.

<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
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-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 7-53).



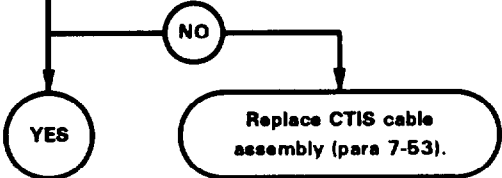
- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to connector P110-F.
  - (3) Connect negative (-) probe of multimeter to connector P112-A and note reading on multimeter.
  - (4) If continuity is not present, replace CTIS cable assembly (para 7-53).

ø84. CTIS DOES NOT DEFLATE TIRES (CONT)

<b>KNOWN INFO</b>
CTIS inflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.

4.  
Is continuity present between connector P110-R and connector P112-D?

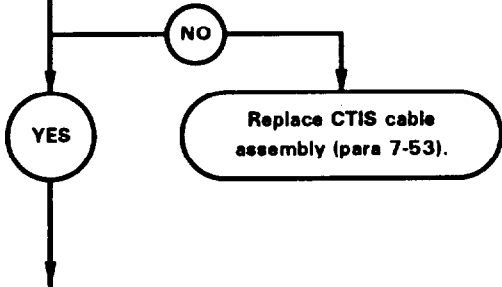
<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, CTIS cable assembly is faulty.



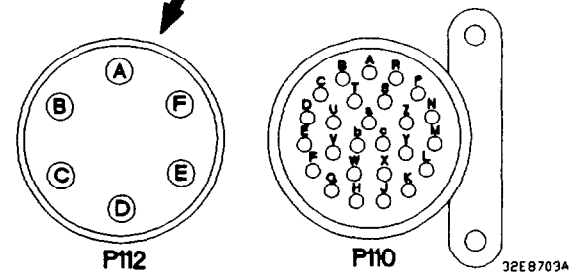
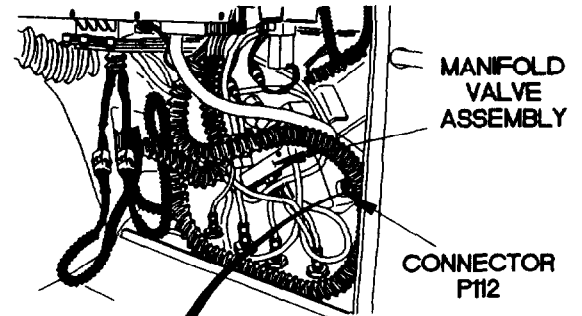
<b>KNOWN INFO</b>
CTIS inflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.

5.  
Is continuity present between connector P110-F and connector P112-B?

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



- 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 7-53).



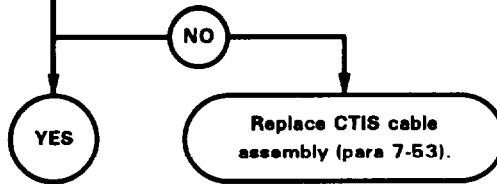
- CONTINUITY TEST**
- (1) Set multimeter to ohms.
  - (2) Connect positive (+) probe of multimeter to connector P110-F.
  - (3) Connect negative (-) probe of multimeter to connector P112-B and note reading on multimeter.
  - (4) If continuity is not present, replace CTIS cable assembly (para 7-53).
  - (5) Connect connector P112 to manifold valve assembly.

e84. CTIS DOES NOT DEFLATE TIRES (CONT)

KNOWN INFO
CTIS inflates 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-B7

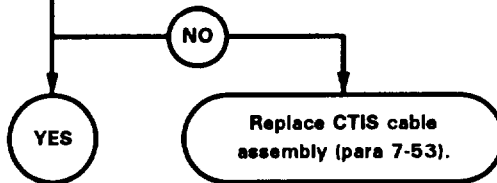
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, CTIS cable assembly is faulty.



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

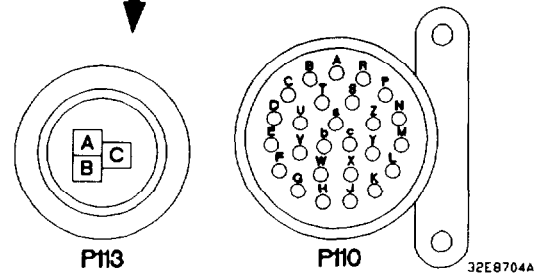
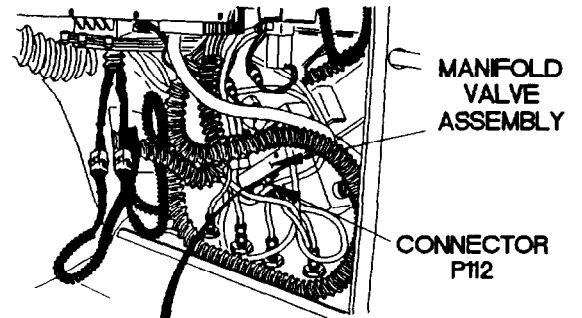
7.  
Is continuity present between connector P110-c and connector P113-C7

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) 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 7-53).

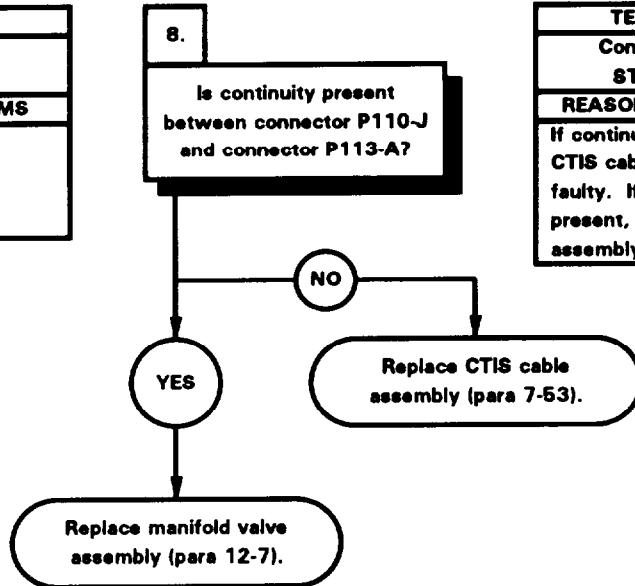


**CONTINUITY TEST**

- (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 7-53).

ø84. CTIS DOES NOT DEFLATE TIRES (CONT)

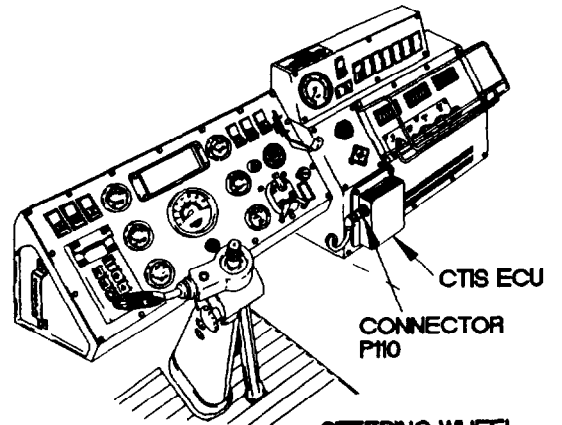
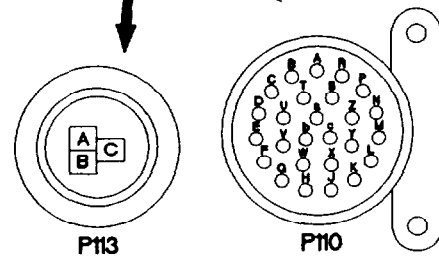
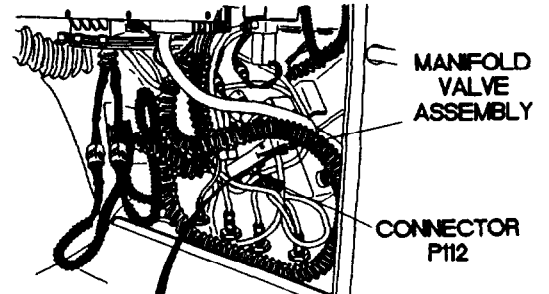
<b>KNOWN INFO</b>
CTIS inflates tires. CTIS ECU OK.
<b>POSSIBLE PROBLEMS</b>
Faulty CTIS cable assembly. Faulty manifold valve assembly.



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



- 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 7-53).
  - (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.

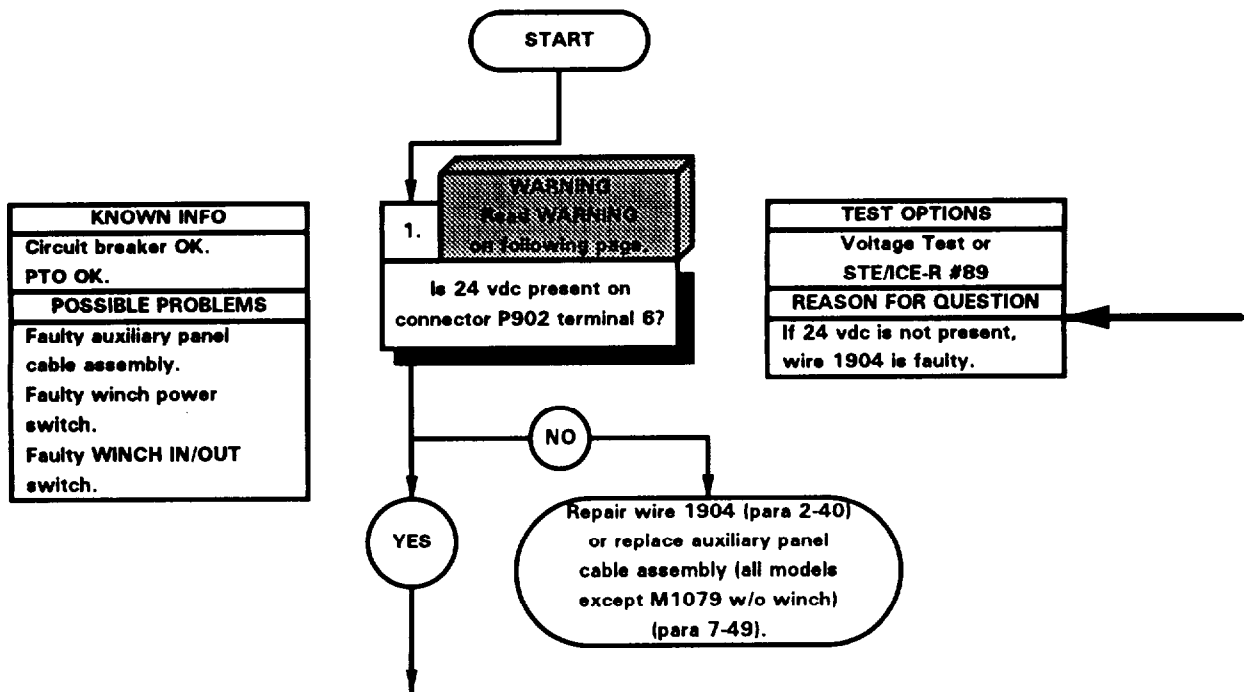


STEERING WHEEL  
REMOVED FOR  
CLARITY

32E87051



e85. 11K SELF-RECOVERY WINCH DOES NOT REEL IN OR PAY OUT	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	



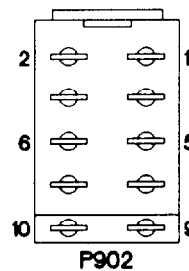
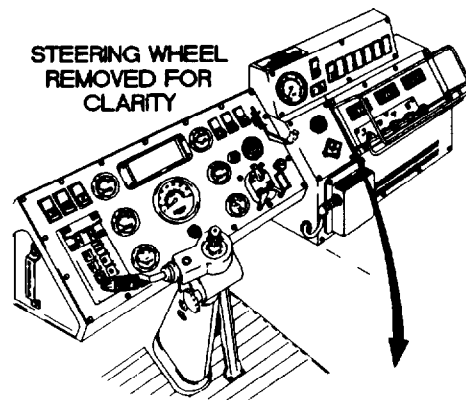
**WARNING**

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.

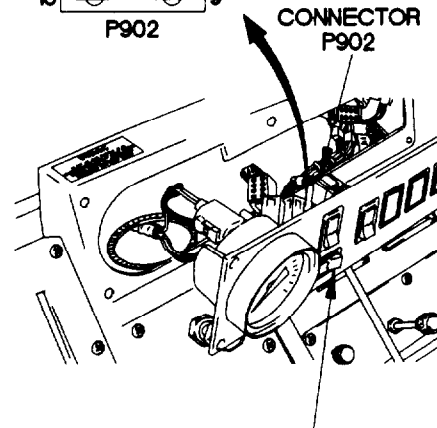
**VOLTAGE TEST**

- (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 9-2320-365-10).
- (7) Position PTO switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1904 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49).
- (9) Position PTO switch to off (TM 9-2320-365-10).
- (10) Position master power switch to off (TM 9-2320-365-10).

STEERING WHEEL  
REMOVED FOR  
CLARITY



CONNECTOR  
P902

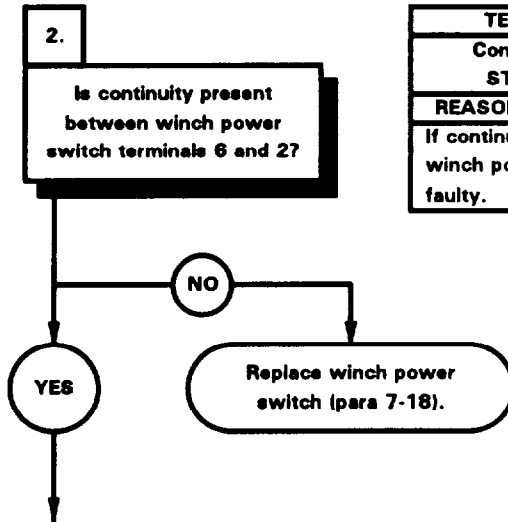


WINCH POWER  
SWITCH

X2E8801A

ø85. 11K SELF-RECOVERY WINCH DOES NOT REEL IN OR PAY OUT (CONT)

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

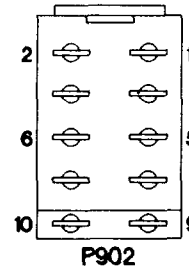
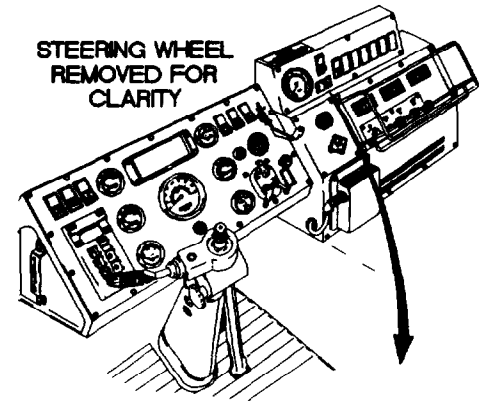


<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, winch power switch is faulty.

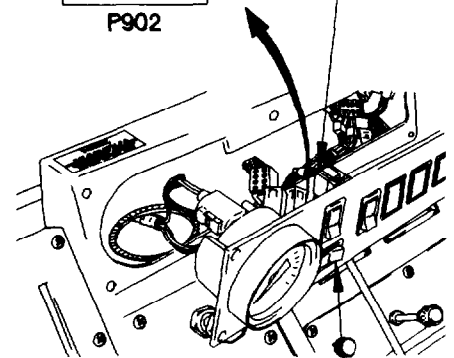


**CONTINUITY TEST**

- (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-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 7-53).



CONNECTOR  
P902



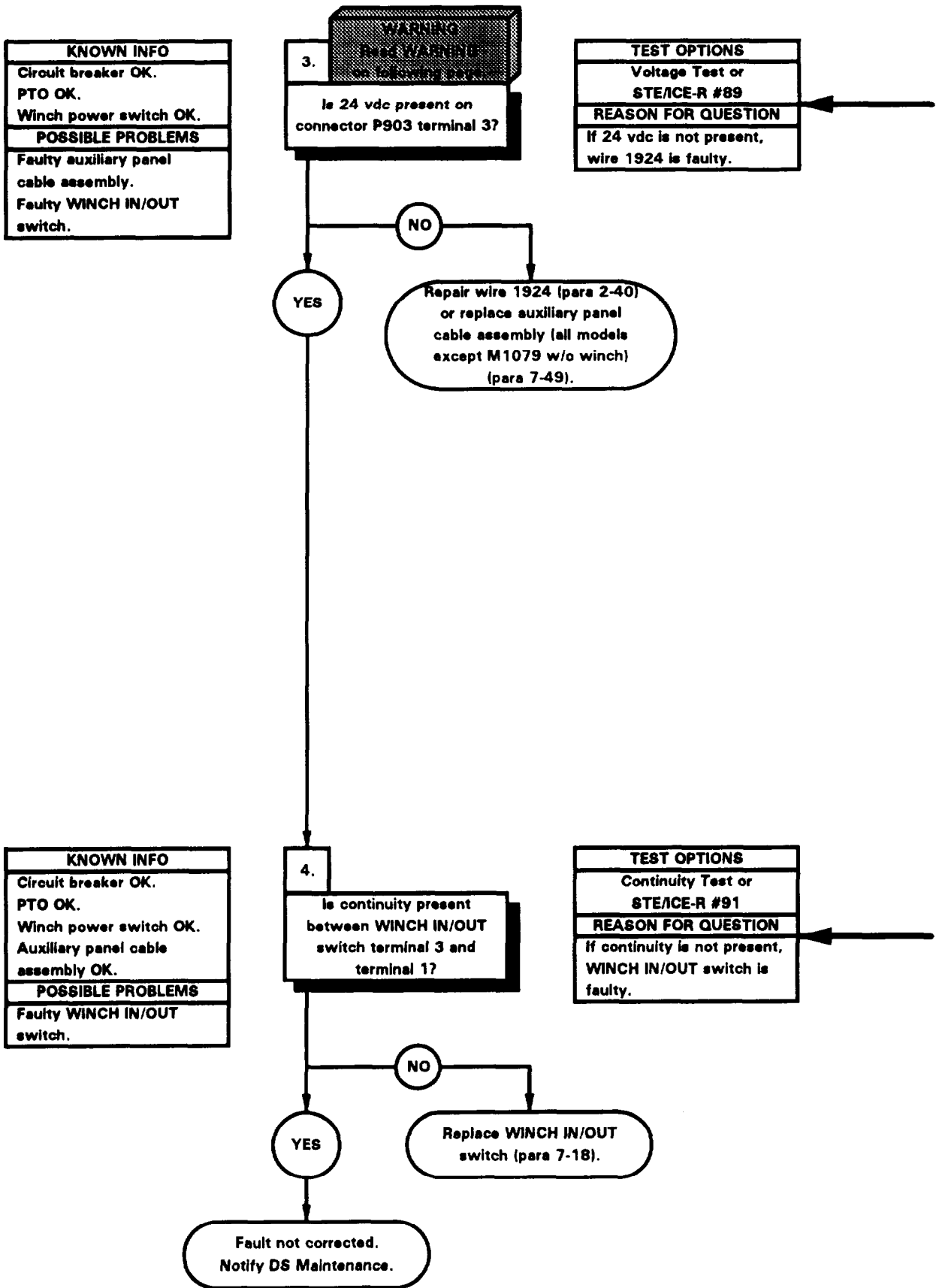
WINCH POWER  
SWITCH

**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 7-53).

XZE 8802A

85. 11K SELF-RECOVERY WINCH DOES NOT REEL IN OR PAY OUT (CONT)



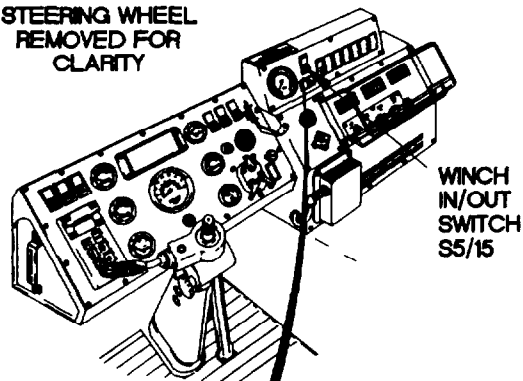
**WARNING**

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.

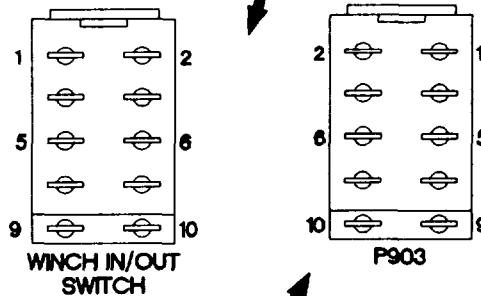
**VOLTAGE TEST**

- (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 9-2320-365-10).
- (6) Position PTO switch to on (TM 9-2320-365-10).
- (7) Position winch power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1924 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49).
- (9) Position winch power switch to off (TM 9-2320-365-10).
- (10) Position PTO switch to off (TM 9-2320-365-10).
- (11) Position master power switch to off (TM 9-2320-365-10).

STEERING WHEEL  
REMOVED FOR  
CLARITY

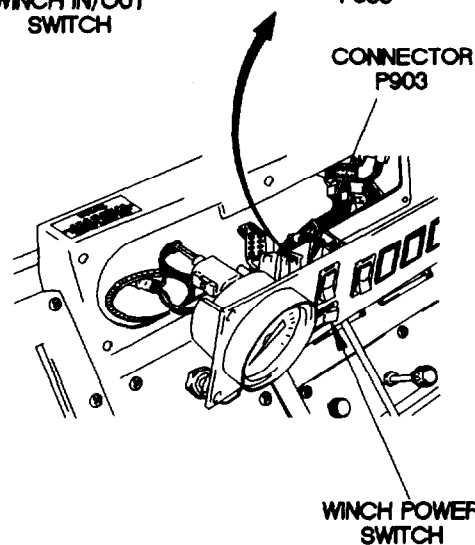


WINCH  
IN/OUT  
SWITCH  
S5/15



**CONTINUITY TEST**

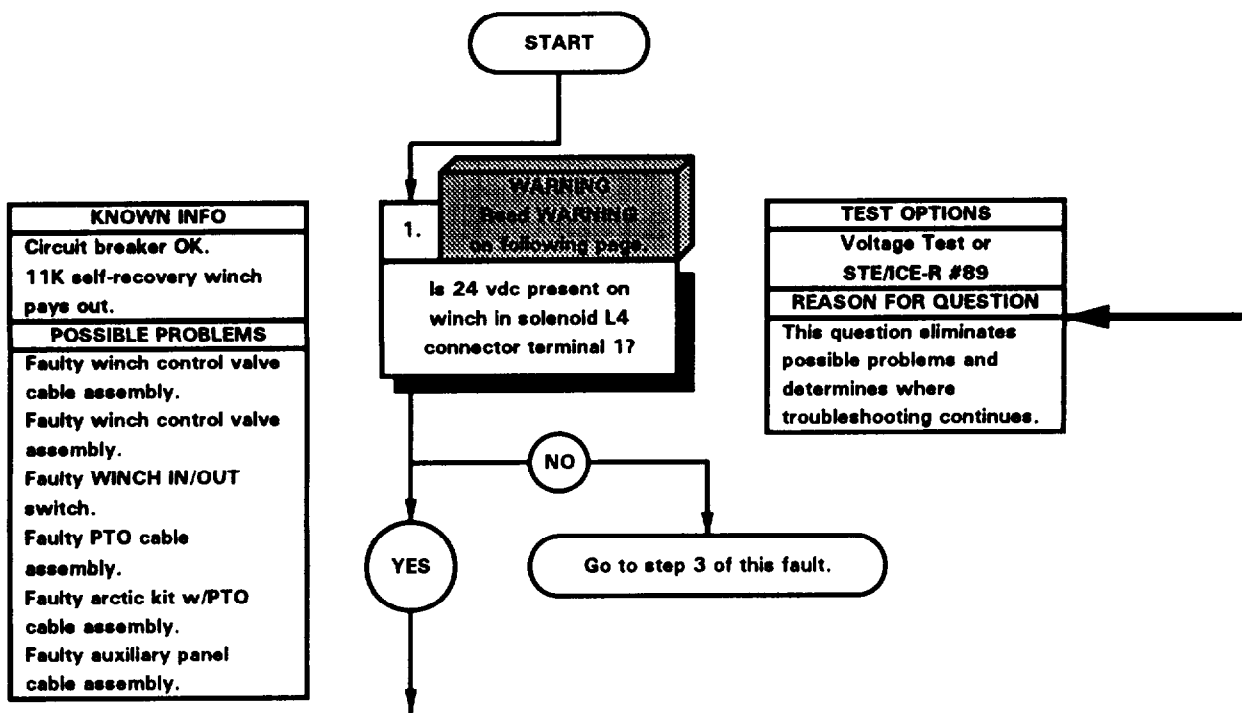
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to WINCH IN/OUT switch terminal 3.
- (3) Connect negative (-) probe of multimeter to WINCH IN/OUT switch terminal 1.
- (4) Position WINCH IN/OUT switch to in (TM 9-2320-365-10) and note reading on multimeter.
- (5) If continuity 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).



WINCH POWER  
SWITCH

X2C0003A

e86. 11K SELF-RECOVERY WINCH DOES NOT REEL IN	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)
<b>References</b> TM 9-4910-571-12&P	

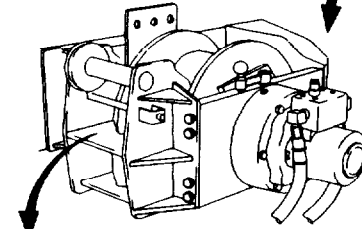
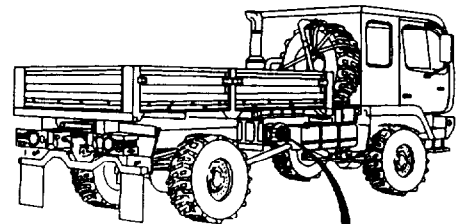


**WARNING**

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.

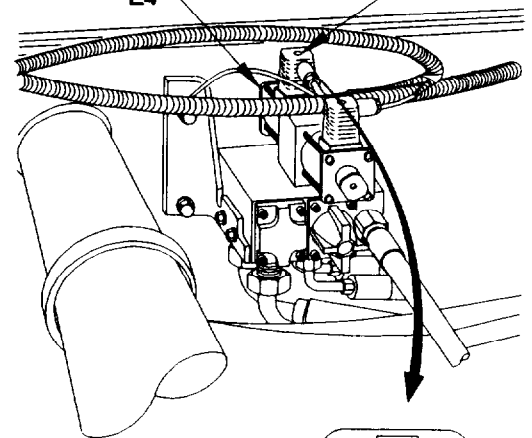
**VOLTAGE TEST**

- (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 9-2320-365-10).
- (7) Position PTO switch to on (TM 9-2320-365-10).
- (8) Position winch power switch to on (TM 9-2320-365-10).
- (9) Position WINCH IN/OUT switch to IN (TM 9-2320-365-10) 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 9-2320-365-10).
- (12) Position PTO switch to off (TM 9-2320-365-10).
- (13) Position master power switch to off (TM 9-2320-365-10).



WINCH IN SOLENOID L4

SCREW



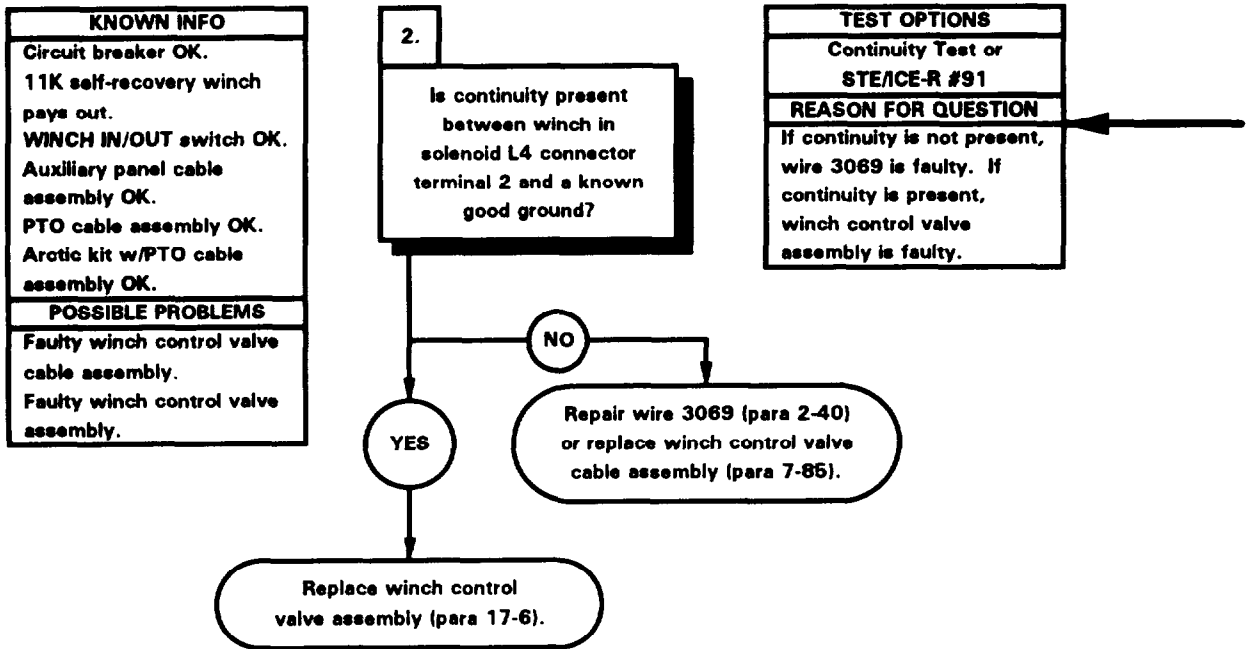
TERMINAL 1

WINCH IN SOLENOID L4 CONNECTOR

32E8901A

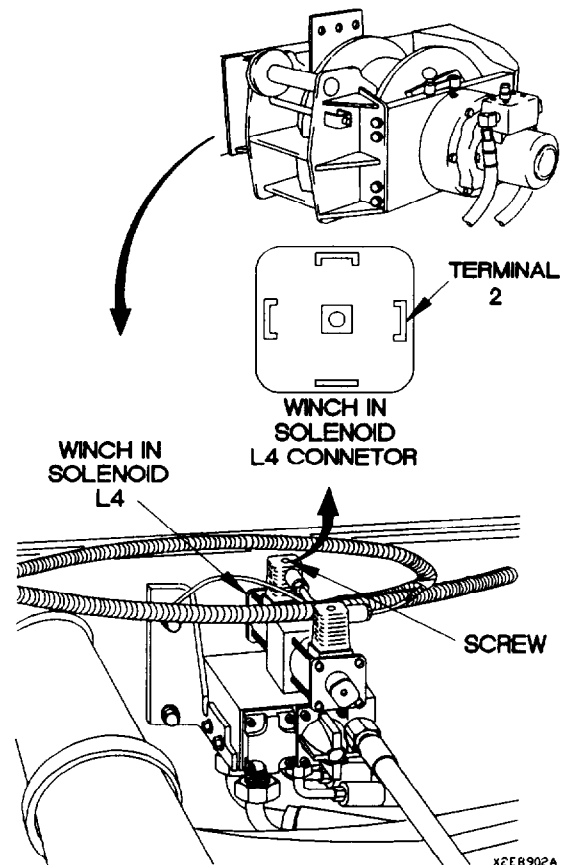


e86. 11K SELF-RECOVERY WINCH DOES NOT REEL IN (CONT)



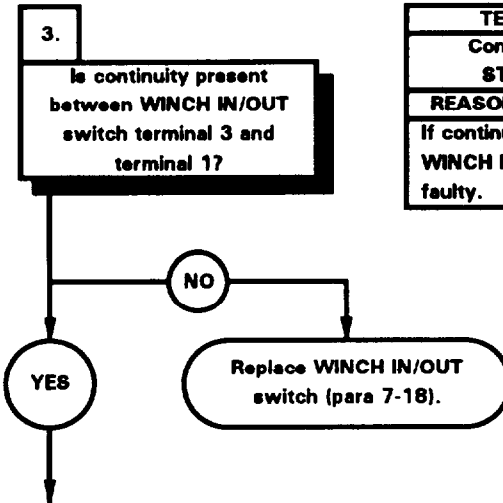
**CONTINUITY TEST**

- (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 2-40) or replace winch control valve cable assembly (para 7-85).
- (5) If continuity is present, replace winch control valve assembly (para 17-6).
- (6) Connect winch in solenoid L4 connector on solenoid L4 and tighten screw.



86. 11K SELF-RECOVERY WINCH DOES NOT REEL IN (CONT)

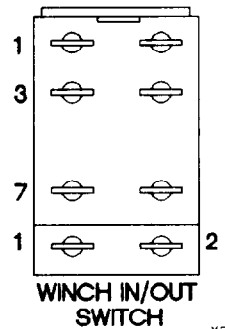
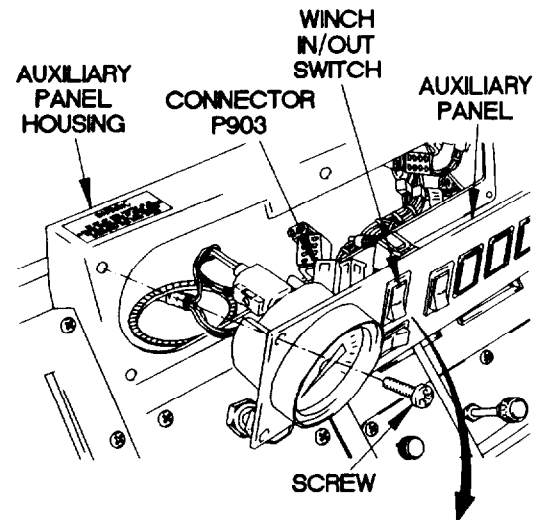
<b>KNOWN INFO</b>
Circuit breaker OK. 11K self-recovery winch pays out. Winch control valve assembly OK.
<b>POSSIBLE PROBLEMS</b>
Faulty winch in/out switch. Faulty winch control valve cable assembly. Faulty PTO cable assembly. Faulty arctic kit w/PTO cable assembly. Faulty auxiliary panel cable assembly.



<b>TEST OPTIONS</b>
Continuity Test or STE/ICE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, WINCH IN/OUT switch is faulty.

**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 9-2320-365-10) and note reading on multimeter.
- (8) If continuity is not present, replace WINCH IN/OUT switch (para 7-18).



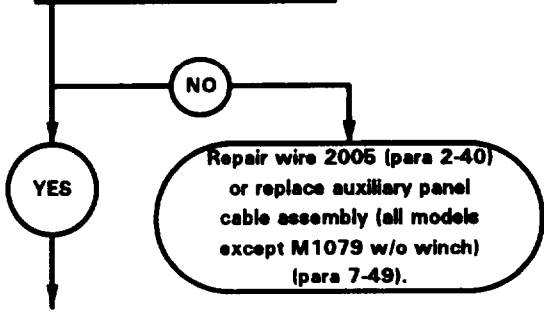
X2C8903A

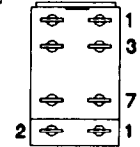
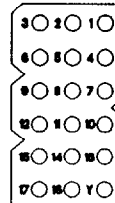
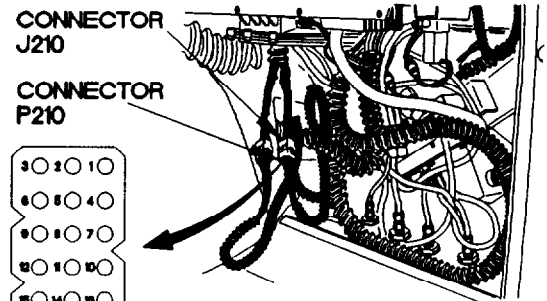
ø86. 11K SELF-RECOVERY WINCH DOES NOT REEL IN (CONT)

KNOWN INFO
Circuit breaker OK. 11K self-recovery winch 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 arctic kit w/PTO cable assembly. Faulty auxiliary panel cable assembly.

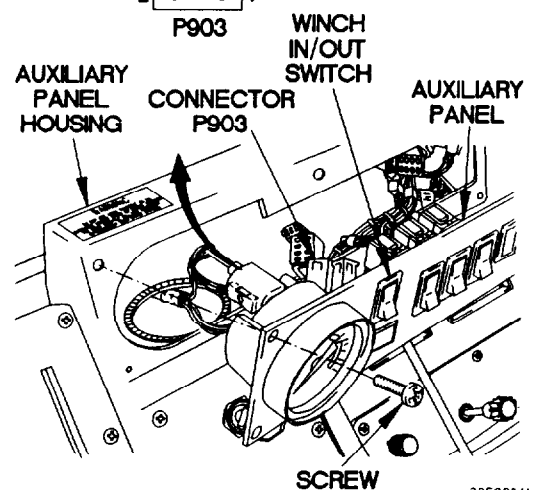
4.  
Is continuity present between connector P903-1 and connector P210-147

TEST OPTIONS
Continuity Test or STE/CE-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 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch (para 7-49).
  - (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).

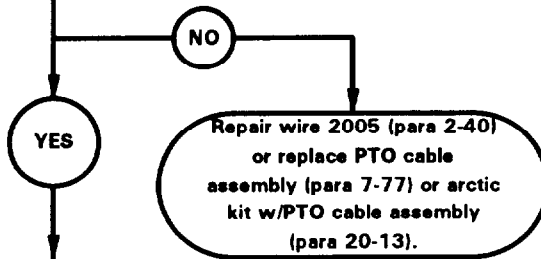


32E89041

86. 11K SELF-RECOVERY WINCH DOES NOT REEL IN (CONT)

KNOWN INFO
Circuit breaker OK. 11K self-recovery winch pay 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. Faulty arctic kit w/PTO cable assembly.

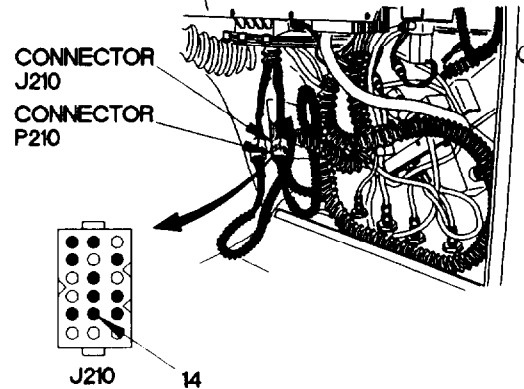
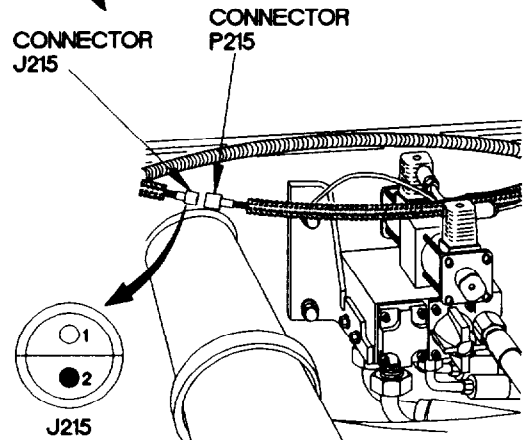
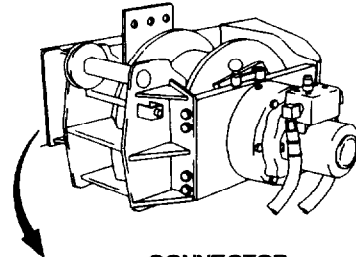
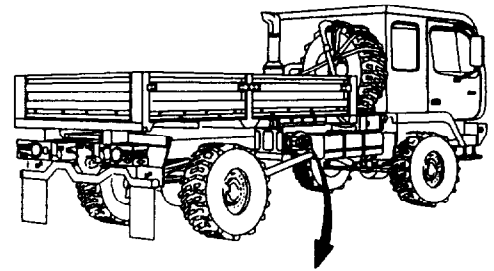
5.  
 Is continuity present between connector J210-14 and connector P215-2?



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



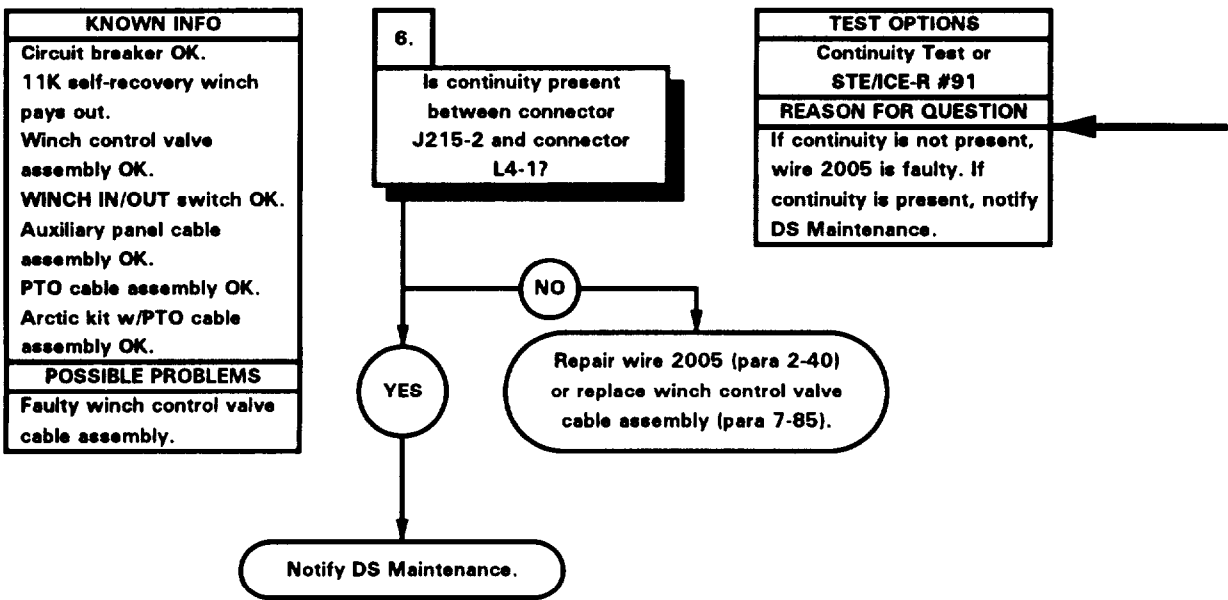
- CONTINUITY TEST**
- (1) Disconnect connector P215 from connector J215.
  - (2) Set multimeter to ohms.
  - (3) Connect positive (+) probe of multimeter to connector J210-14.
  - (4) Connect negative (-) probe of multimeter to connector P215-2 and note reading on multimeter.
  - (5) If continuity is not present, repair wire 2005 (para 2-40) or replace PTO cable assembly (para 7-77) or arctic kit w/PTO cable assembly (para 20-13).
  - (6) Connect connector P210 to connector J210.
  - (7) Install kick panel (para 16-3).



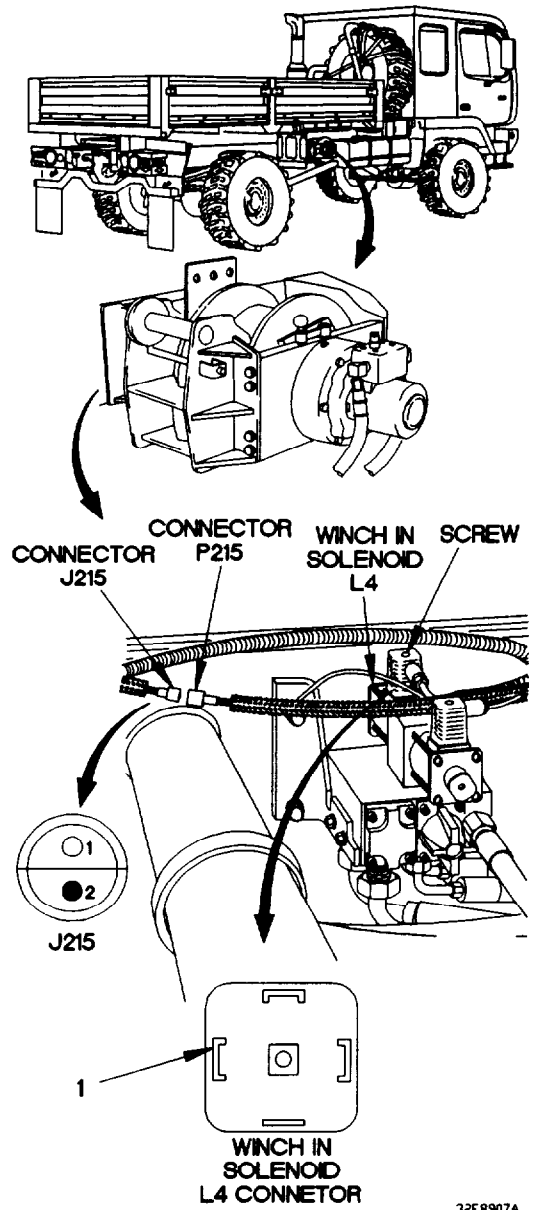
32E8906A



e86. 11K SELF-RECOVERY WINCH DOES NOT REEL IN (CONT)



- | <b>CONTINUITY TEST</b> |   |
|------------------------|---|
| (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 2-40) or replace winch control valve cable assembly (para 7-85). |
| (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.  |



32E8907A

**ø87. 11K SELF-RECOVERY WINCH DOES NOT PAY OUT**

**INITIAL SETUP**

**Equipment Condition**

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

**Personnel Required**

(2)

**References**

TM 9-4910-571-12&P

**Tools and Special Tools**

Tool Kit, Genl Mech (Item 44, Appendix C)

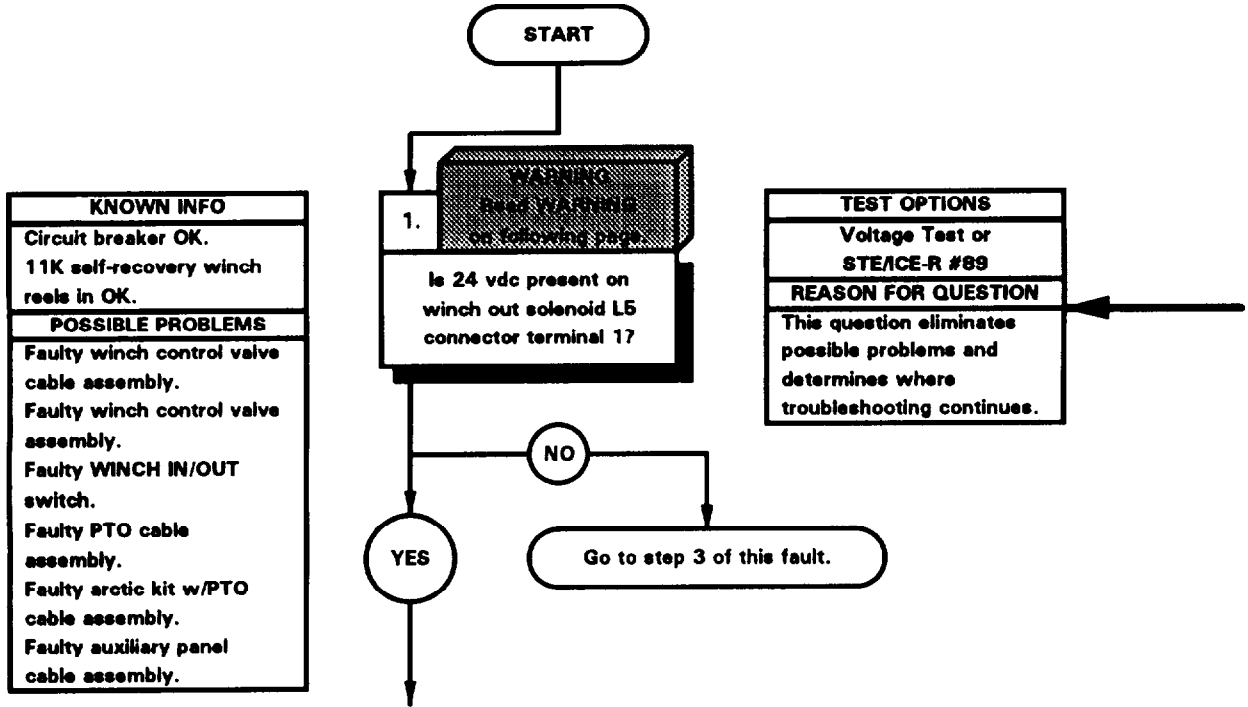
STE/ICE-R (Item 39, Appendix C)

Multimeter, Digital (Item 22, Appendix C)

Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

**Materials/Parts**

Wire, Elect, 50 ft (Item 77, Appendix D)

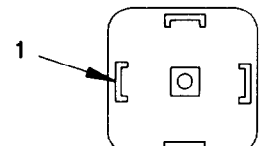
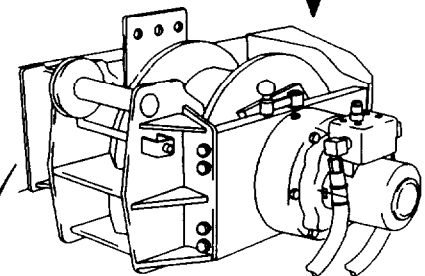
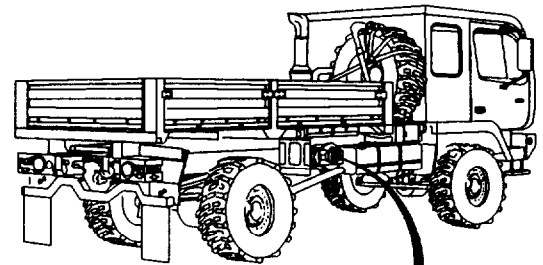


**WARNING**

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**

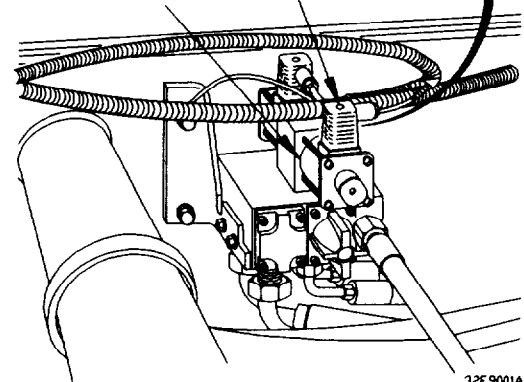
- (1) Remove four nuts, washers, solenoid bracket, washers, and screws.
- (2) Loosen screw and disconnect winch out solenoid L5 connector from solenoid L5.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to winch out solenoid L5 connector terminal 1.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Position PTO switch to on (TM 9-2320-365-10).
- (8) Position winch power switch to on (TM 9-2320-365-10).
- (9) Position WINCH IN/OUT switch to OUT (TM 9-2320-365-10) 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 9-2320-365-10).
- (12) Position PTO switch to off (TM 9-2320-365-10).
- (13) Position master power switch to off (TM 9-2320-365-10).



WINCH OUT SOLENOID L5 CONNECTOR

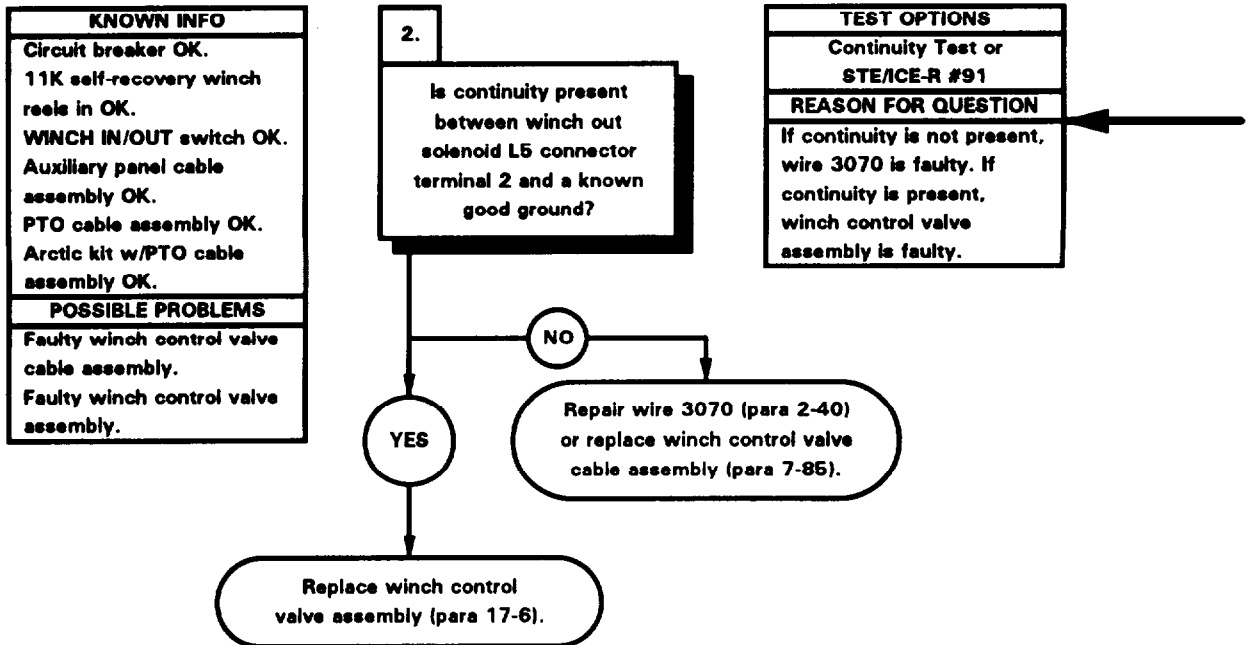
WINCH OUT SOLENOID L5

SCREW



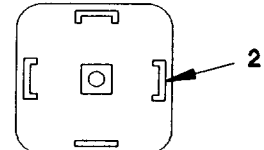
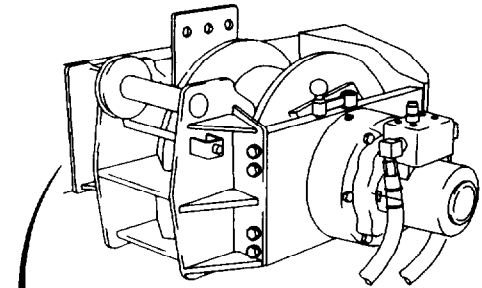
32E 9001A

87. 11K SELF-RECOVERY WINCH DOES NOT PAY OUT (CONT)

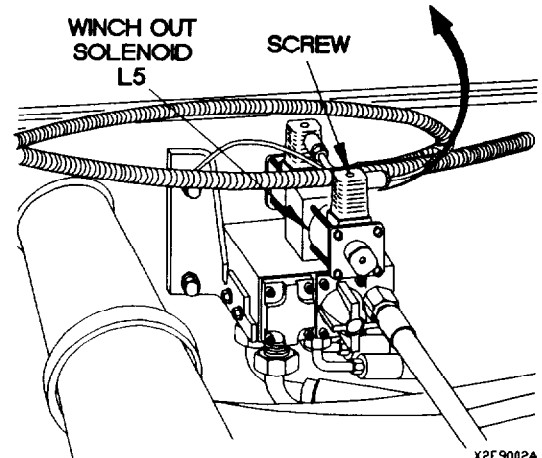


**CONTINUITY TEST**

- (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 2-40) or replace winch control valve cable assembly (para 7-85).
- (5) If continuity is present, replace winch control valve assembly (para 17-6).
- (6) Connect winch out solenoid L5 connector on solenoid L5 and tighten screw.



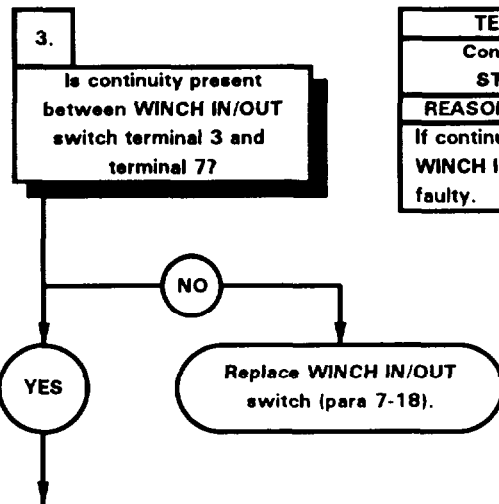
WINCH OUT SOLENOID L5 CONNECTOR



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e87. 11K SELF-RECOVERY WINCH DOES NOT PAY OUT (CONT)

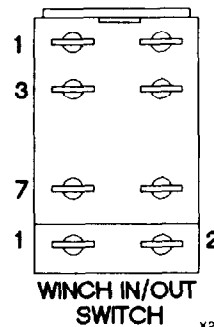
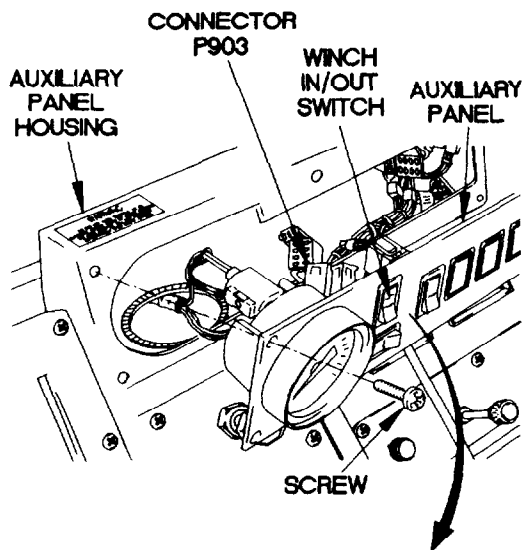
KNOWN INFO
Circuit breaker OK. 11K self-recovery winch reels in OK. Winch control valve assembly OK.
POSSIBLE PROBLEMS
Faulty WINCH IN/OUT switch. Faulty winch control valve cable assembly. Faulty PTO cable assembly. Faulty arctic kit w/PTO cable assembly. Faulty auxiliary panel cable assembly.



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

**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 9-2320-365-10) and note reading on multimeter.
- (8) If continuity is not present, replace WINCH IN/OUT switch (para 7-18).

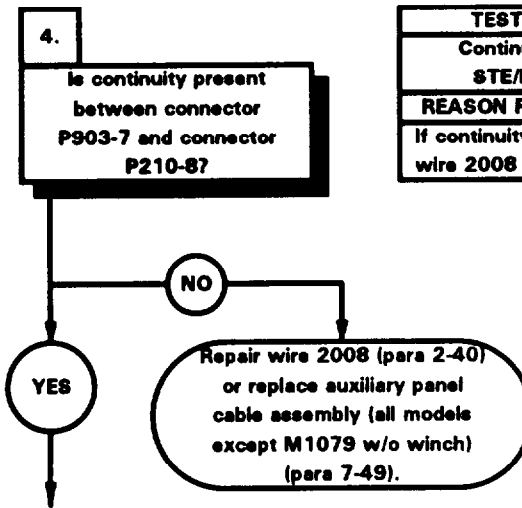


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87. 11K SELF-RECOVERY WINCH DOES NOT PAY OUT (CONT)

KNOWN INFO
Circuit breaker OK. 11K self-recovery winch reels in OK. Winch control valve assembly OK. WINCH IN/OUT switch OK.
POSSIBLE PROBLEMS
Faulty winch control valve cable assembly. Faulty PTO cable assembly. Faulty arctic kit w/PTO cable assembly. Faulty auxiliary panel cable assembly.

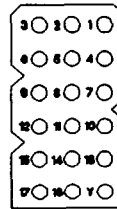
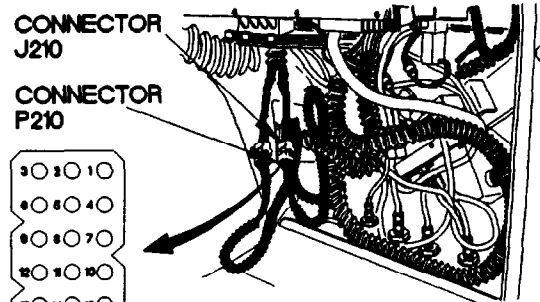


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 2008 is faulty.

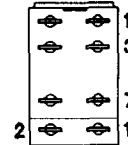


**CONTINUITY TEST**

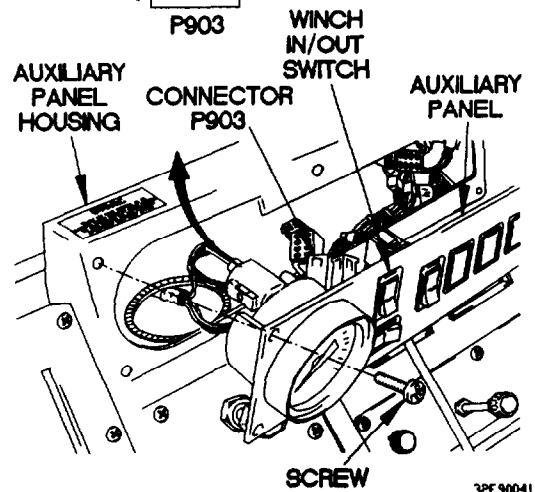
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P210 from connector J210.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P903-7.
- (5) Connect negative (-) probe of multimeter to connector P210-8 and note reading on multimeter.
- (6) If continuity is not present, repair wire 2008 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch (para 7-49).
- (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).



P210



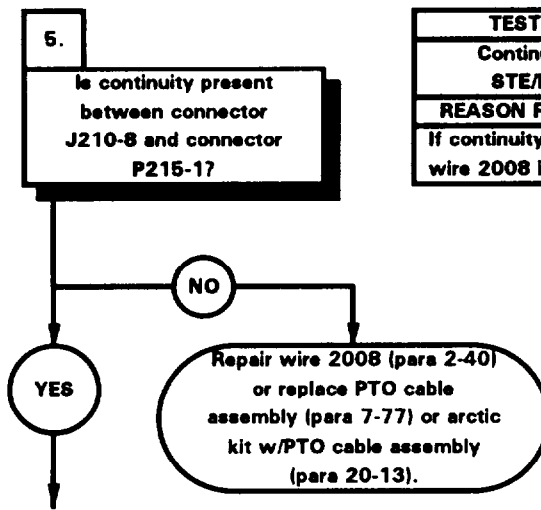
P903



32E 90041

ø87. 11K SELF-RECOVERY WINCH DOES NOT PAY OUT (CONT)

KNOWN INFO
Circuit breaker OK. 11K self-recovery winch 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. Faulty arctic kit w/PTO cable assembly.

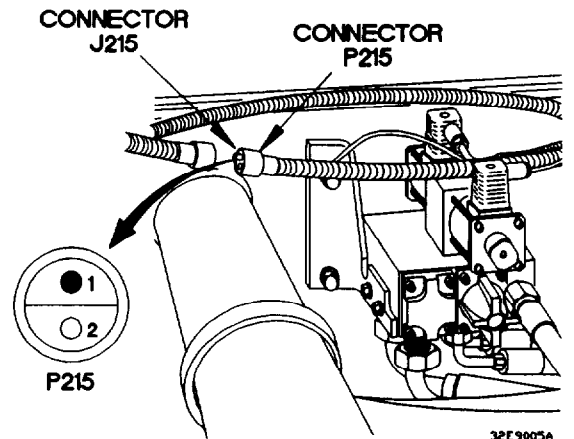
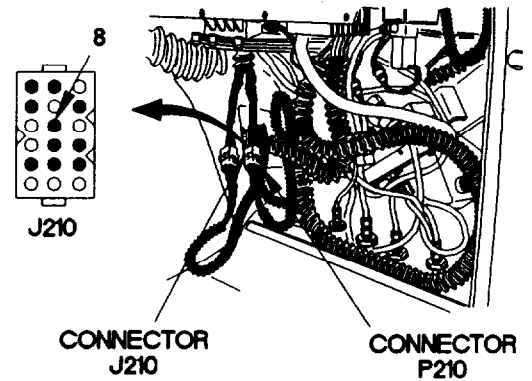


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 2008 is faulty.



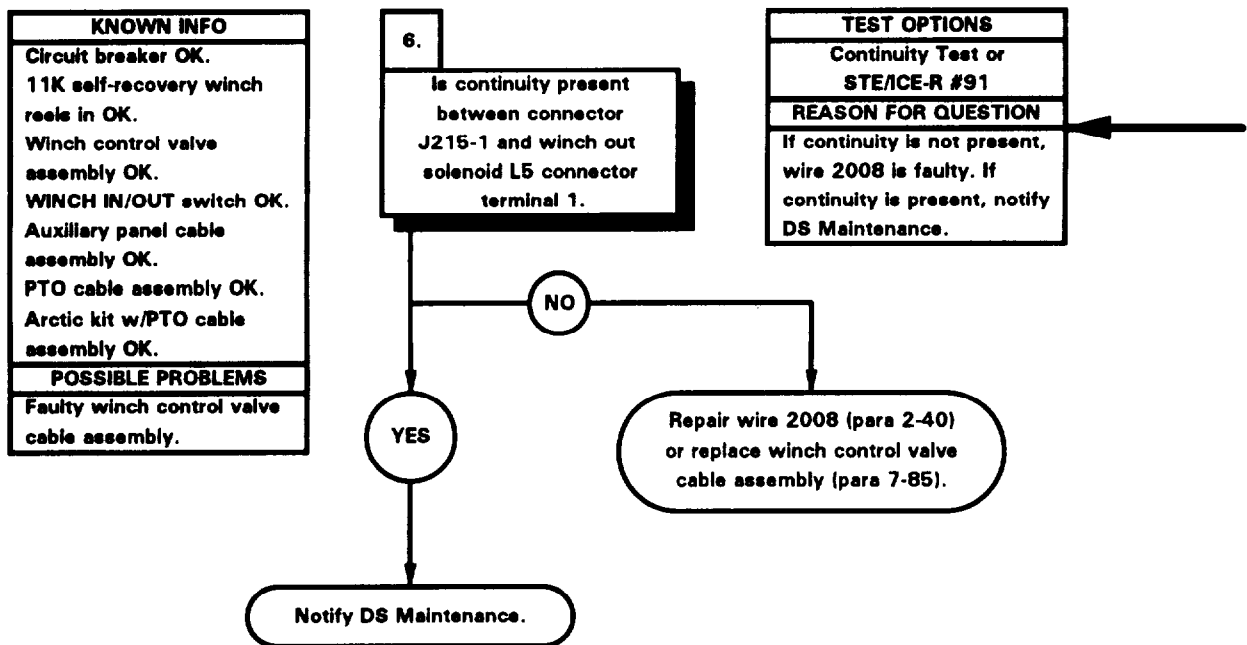
**CONTINUITY TEST**

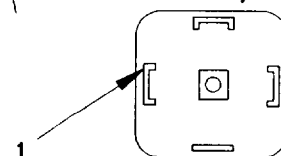
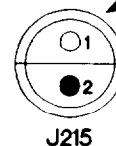
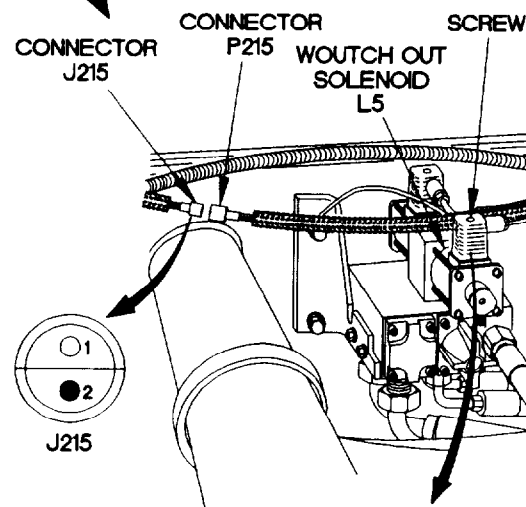
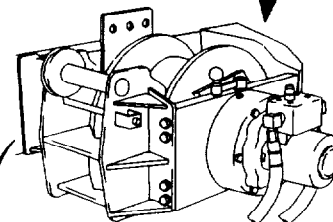
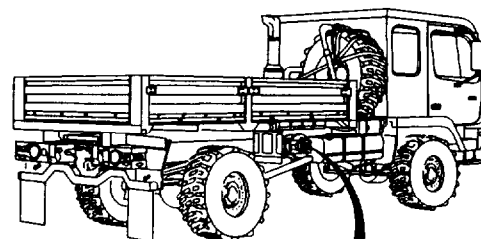
- (1) Disconnect connector P215 from connector J215.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector J210-8.
- (4) Connect negative (-) probe of multimeter to connector P215-1 and note reading on multimeter.
- (5) If continuity is not present, repair wire 2008 (para 2-40) or replace PTO cable assembly (para 7-77) or arctic kit w/PTO cable assembly (para 20-13).
- (6) Connect connector P210 to connector J210.
- (7) Install kick panel (para 16-3).



32E9005A

ø87. 11K SELF-RECOVERY WINCH DOES NOT PAY OUT (CONT)





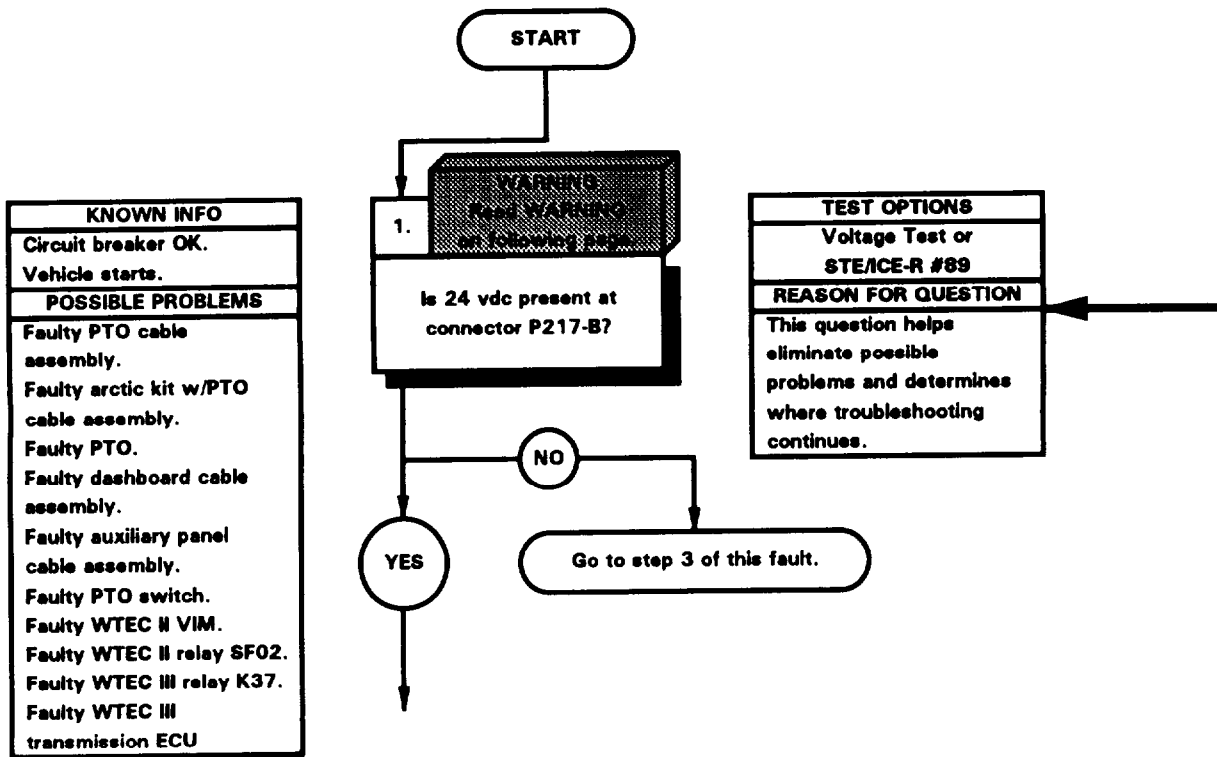
WINCH OUT SOLENOID L5 CONNECTOR

32E 9006A

**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 2-40) or replace winch control valve cable assembly (para 7-86).
- (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.

e88. PTO DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/CE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 78, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D) Wire, Relay Test (Item E-9, Appendix E)
<b>References</b> TM 9-4910-571-12&P	

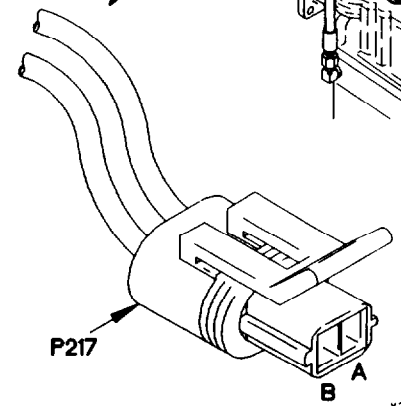
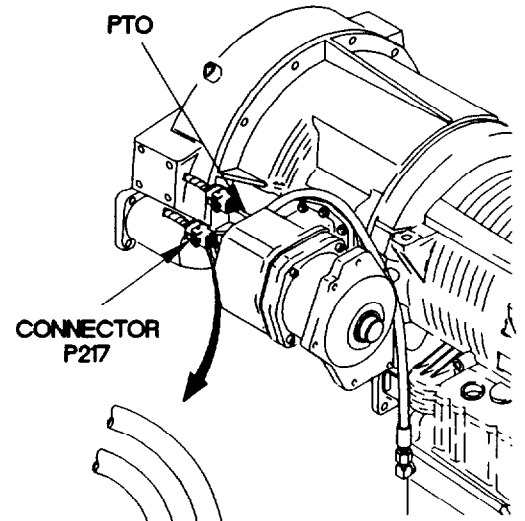
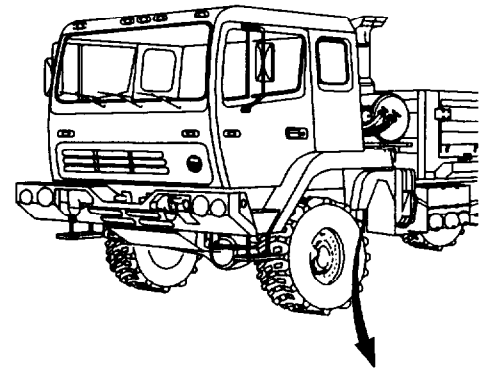


**WARNING**

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**

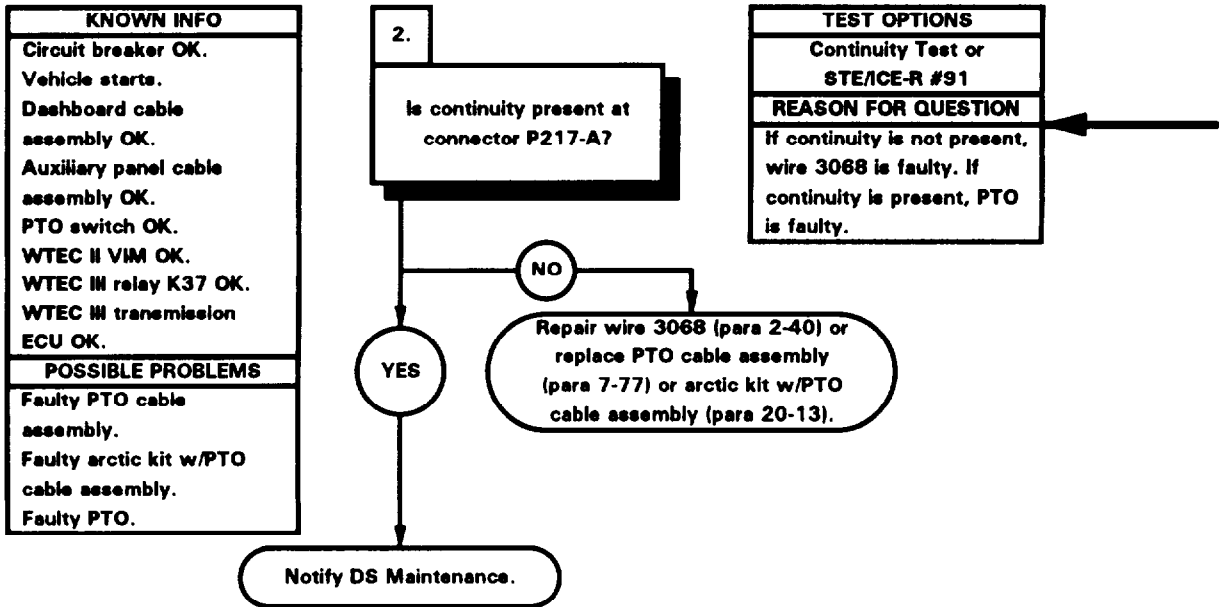
- (1) Disconnect connector P217 from PTO.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P217-B.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Start engine (TM 9-2320-365-10).
- (6) Position PTO switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, go to step 3 of this fault.
- (8) Position PTO switch to off (TM 9-2320-365-10).
- (9) Shut down engine (TM 9-2320-365-10).



X2E9101L

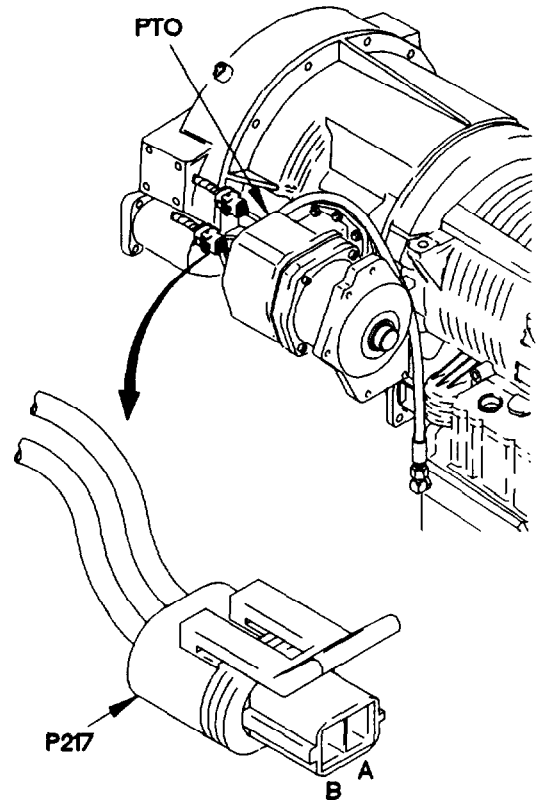


688. PTO DOES NOT OPERATE (CONT)



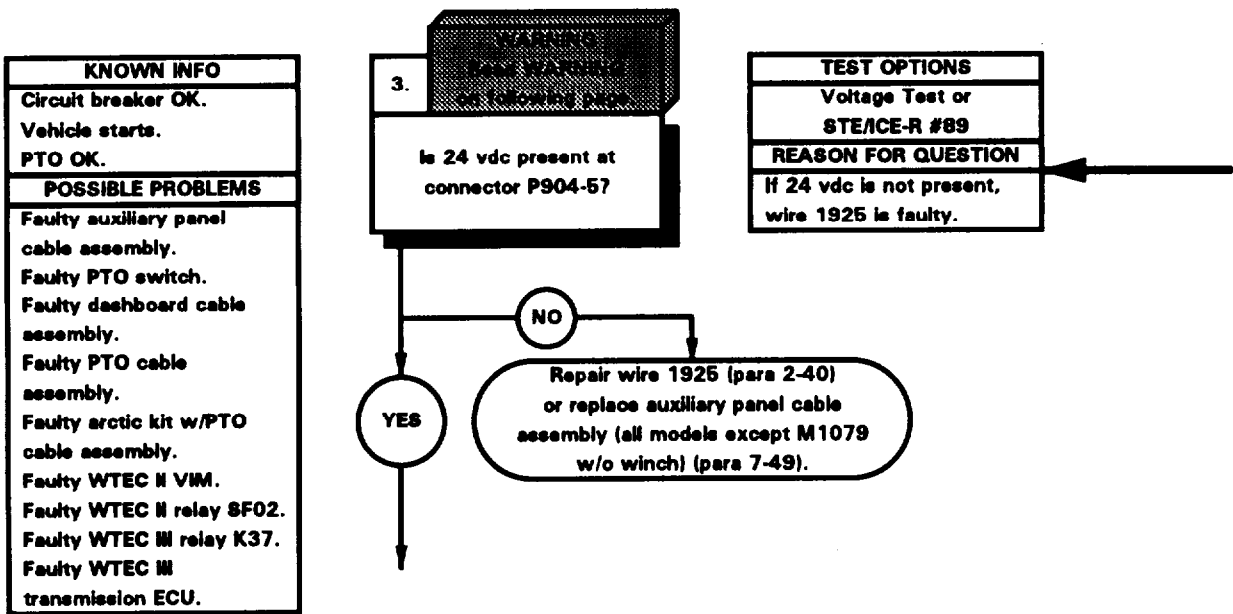
**CONTINUITY TEST**

- (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 2-40) or replace PTO cable assembly (para 7-77) or arctic kit w/PTO cable assembly (para 20-13).
- (5) If continuity is present, notify DS Maintenance.
- (6) Connect connector P217 to PTO.



X2E91021

e88. PTO DOES NOT OPERATE (CONT)

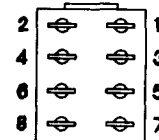


**WARNING**

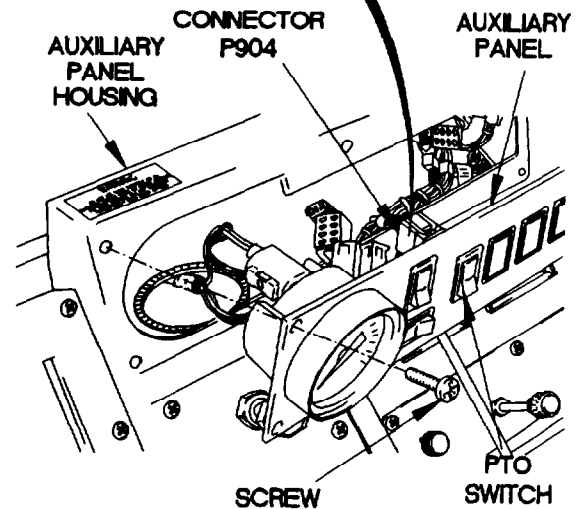
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**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 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1925 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49).
- (9) Position master power switch to off (TM 9-2320-365-10).



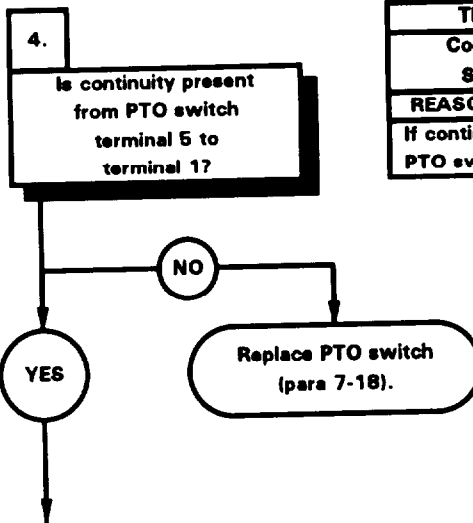
P904



X2E9104A

88. PTO DOES NOT OPERATE (CONT)

<b>KNOWN INFO</b>
Circuit breaker OK. Vehicle starts. PTO OK.
<b>POSSIBLE PROBLEMS</b>
Faulty PTO switch. Faulty auxiliary panel cable assembly. Faulty dashboard cable assembly. Faulty PTO cable assembly. Faulty arctic kit w/PTO cable assembly. Faulty WTEC II VIM. Faulty WTEC II relay SF02. Faulty WTEC III relay K37. Faulty WTEC III transmission ECU.

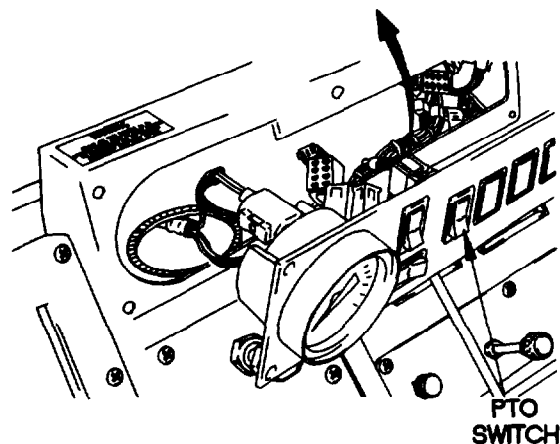
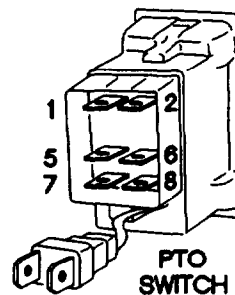


<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, PTO switch is faulty.



**CONTINUITY TEST**

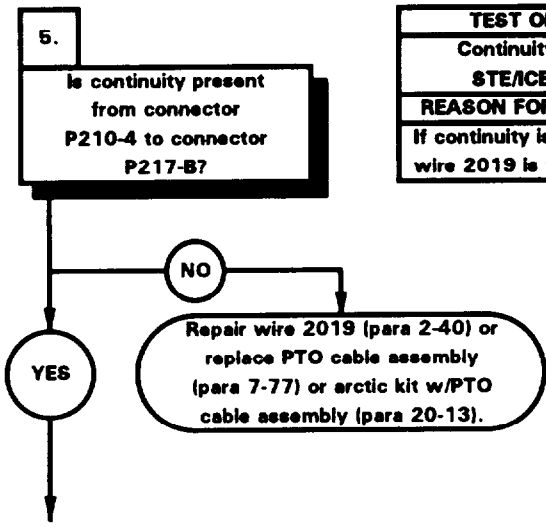
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PTO switch terminal 5.
- (3) Connect negative (-) probe of multimeter to PTO switch terminal 1.
- (4) Position PTO switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If continuity is not present, replace PTO switch (para 7-18).
- (6) Position PTO switch to off (TM 9-2320-365-10).



X2E91051

e88. PTO DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Vehicle starts. PTO OK. PTO switch OK.
POSSIBLE PROBLEMS
Faulty PTO cable assembly. Faulty arctic kit w/PTO cable assembly. 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 transmission ECU.

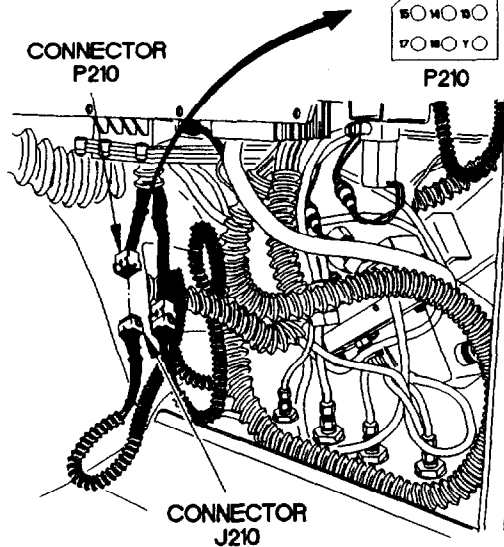
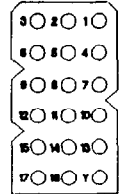
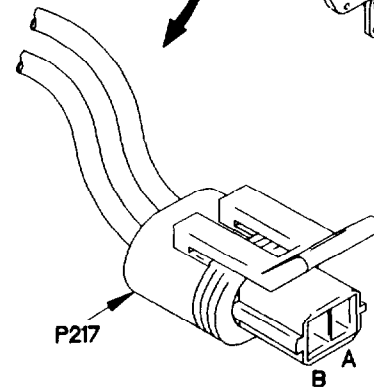
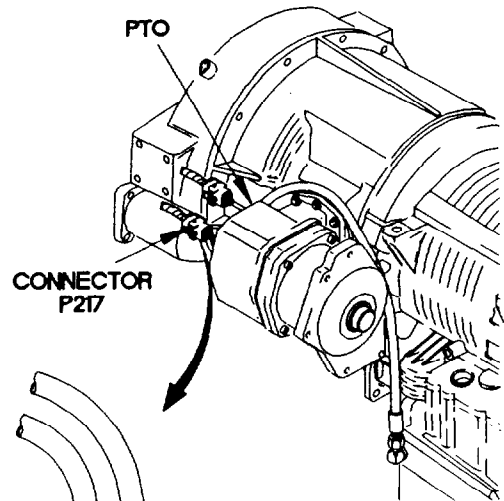


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 2019 is faulty.



**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 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 2-40) or replace PTO cable assembly (para 7-77) or arctic kit w/PTO cable assembly (para 20-13).
- (8) Connect connector P217 to PTO.
- (9) Connect connector P210 to connector J210.

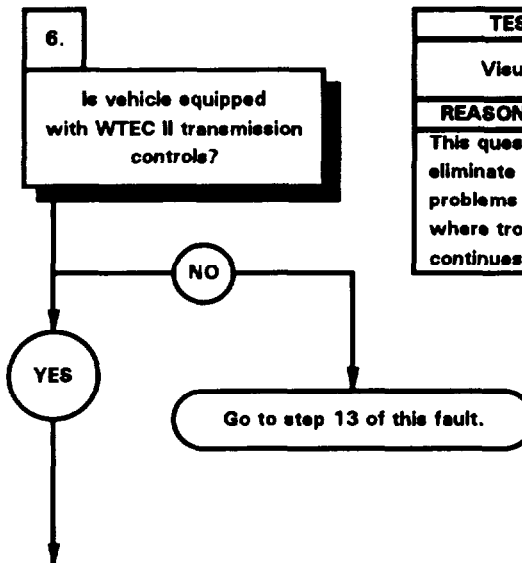


32E 91101



e88. PTO DOES NOT OPERATE (CONT)

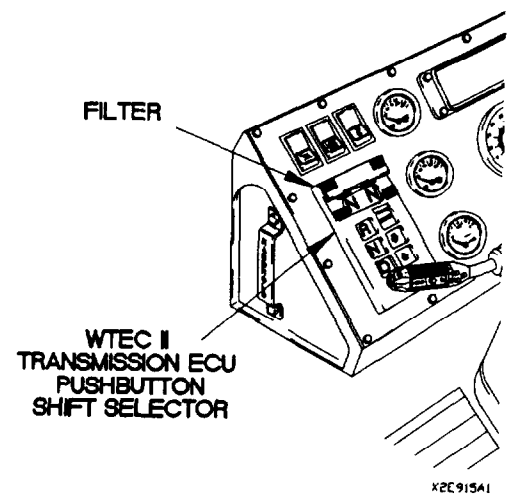
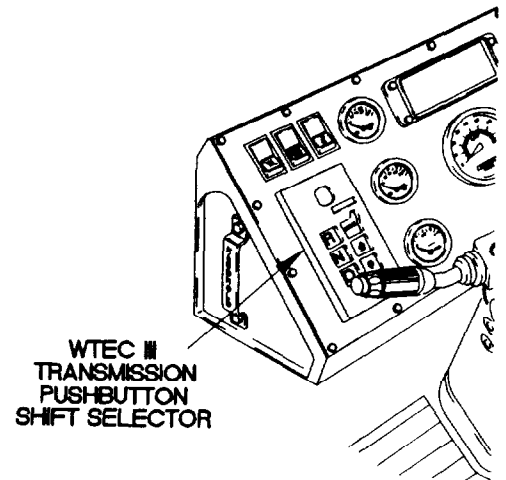
KNOWN INFO
Circuit breaker OK. Vehicle starts. PTO OK. PTO switch OK. PTO cable assembly OK. Arctic kit w/PTO cable assembly OK.
POSSIBLE PROBLEMS
Faulty WTEC II VIM. Faulty dashboard cable assembly. Faulty auxiliary panel cable assembly. Faulty WTEC II relay SF02. Faulty WTEC III relay K37. Faulty WTEC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

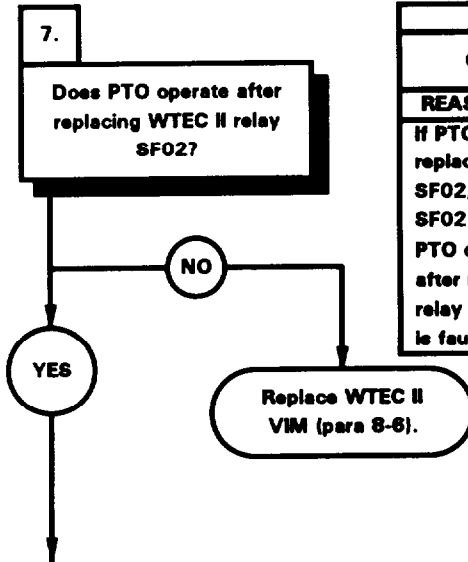


- (1) Check if vehicle is equipped with WTEC II transmission ECU pushbutton shift selector.
- (2) If transmission pushbutton shift selector is not mounted with four screws and does not have a filter cover, go to step 13.



e88. PTO DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Vehicle starts. PTO OK. PTO switch OK. PTO cable assembly OK. Arctic kit w/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.



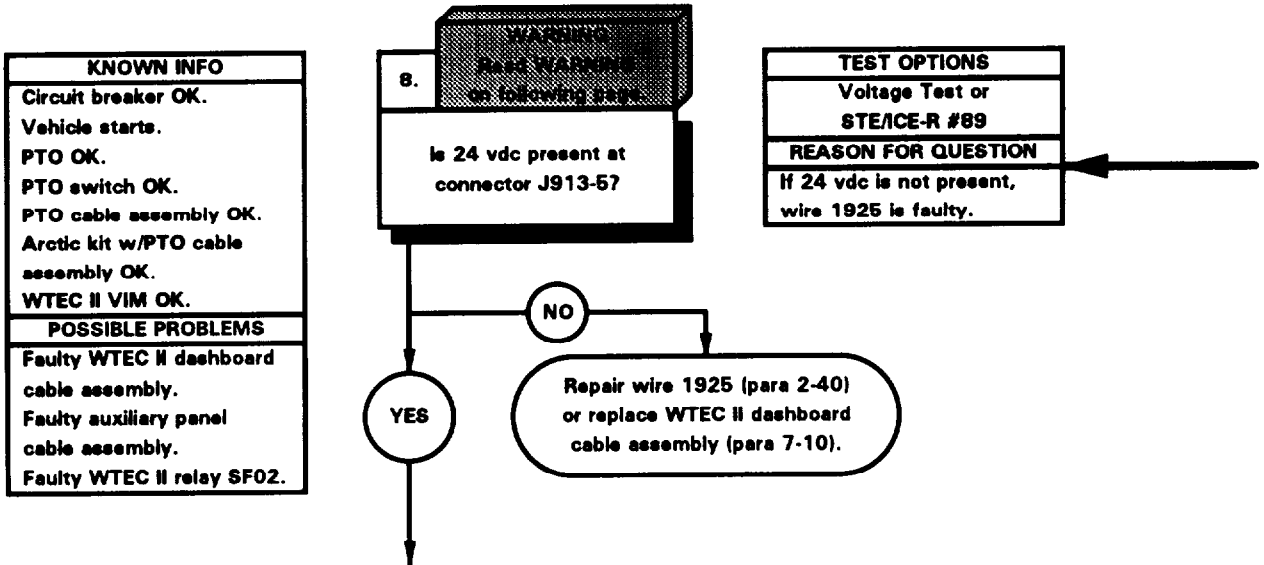
TEST OPTIONS
Operational Test
REASON FOR QUESTION
If PTO operates after replacing WTEC II relay SF02, WTEC II relay SF02 is faulty. If PTO does not operate after replacing WTEC II relay SF02, WTEC II VIM is faulty.



**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 9-2320-365-10).**
- (4) Position PTO switch to on  
(TM 9-2320-365-10-1).**
- (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).**

e88. PTO DOES NOT OPERATE (CONT)

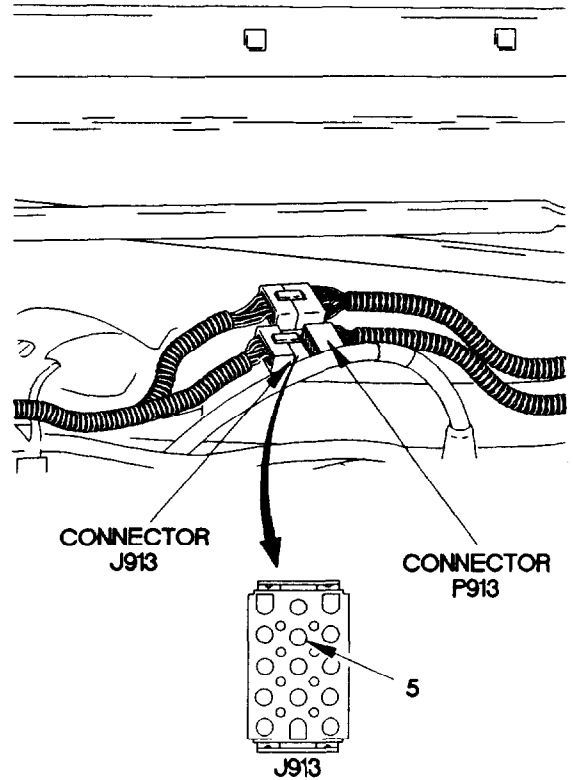


**WARNING**

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 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1925 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10).
- (8) Position master power switch to off (TM 9-2320-365-10).



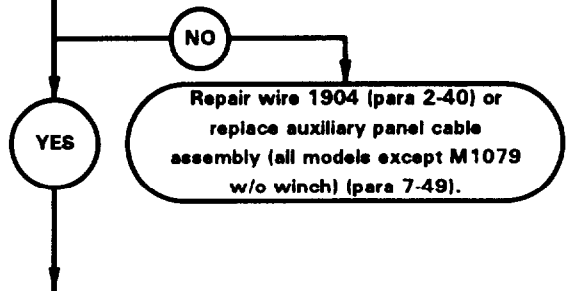
X2E 91031

e88. PTO DOES NOT OPERATE (CONT)

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

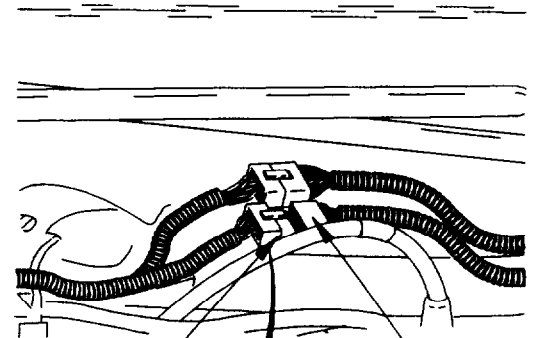
9.  
Is continuity present from connector P904-1 to connector P913-15?

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



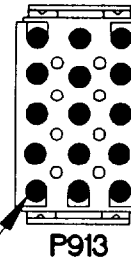
**CONTINUITY TEST**

- (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 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch (para 7-49).

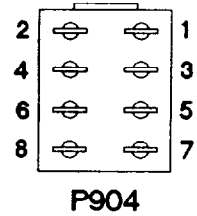


CONNECTOR J913

CONNECTOR P913

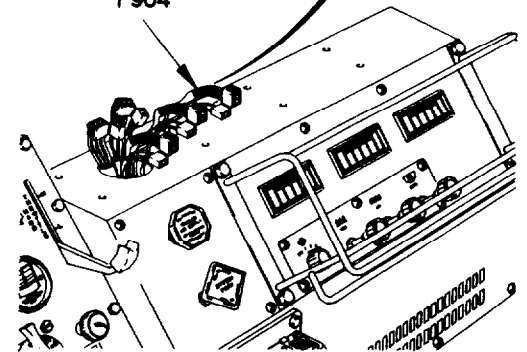


15



P904

CONNECTOR P904

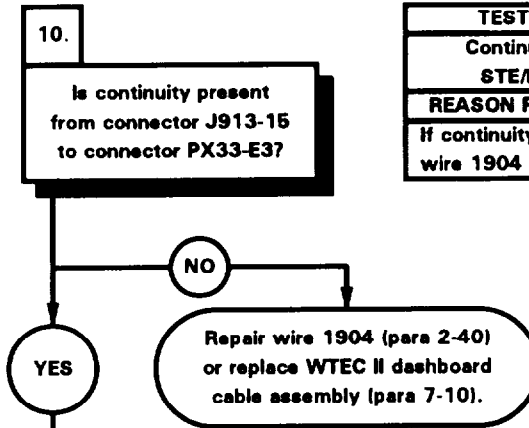


X2E91061



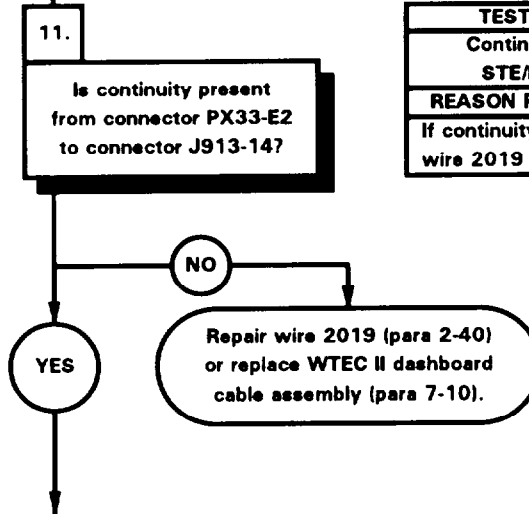
e88. PTO DOES NOT OPERATE (CONT)

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



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

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



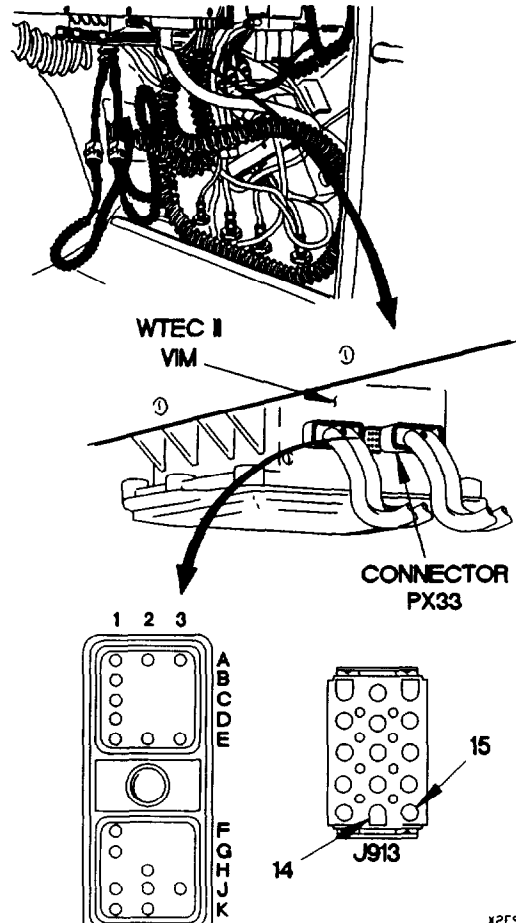
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 2019 is faulty.

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

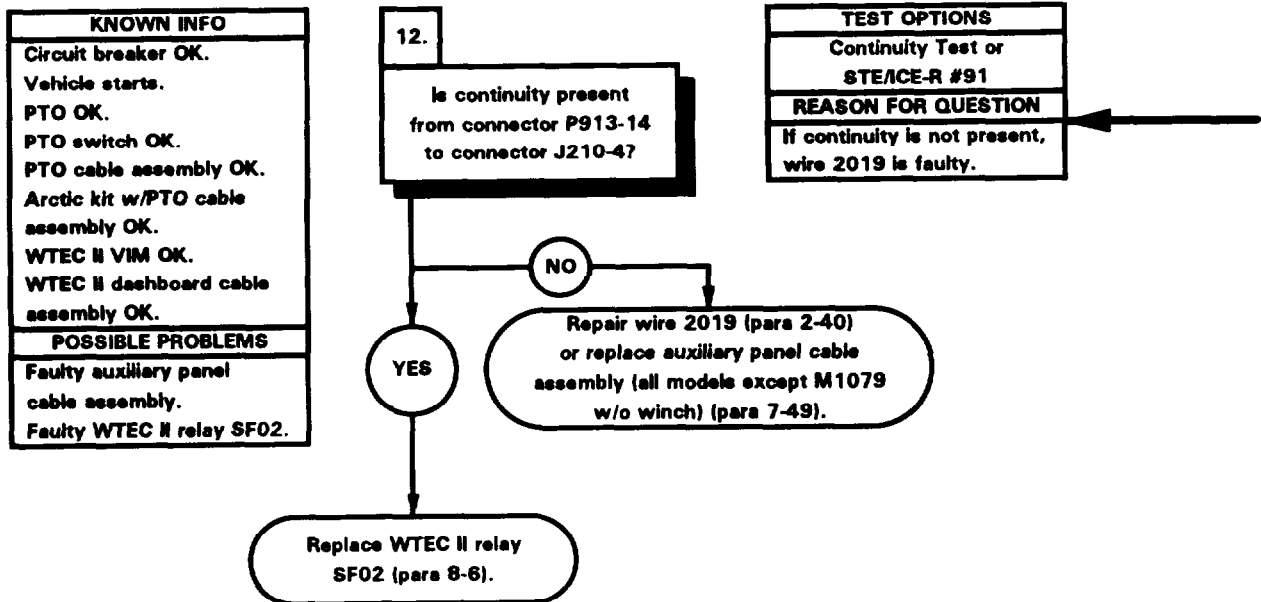
**CONTINUITY TEST**

- (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 2-40) or replace WTEC II dashboard cable assembly (para 7-10).
- (5) Connect connector PX33 to WTEC II VIM.
- (6) Tighten screw in connector PX33.



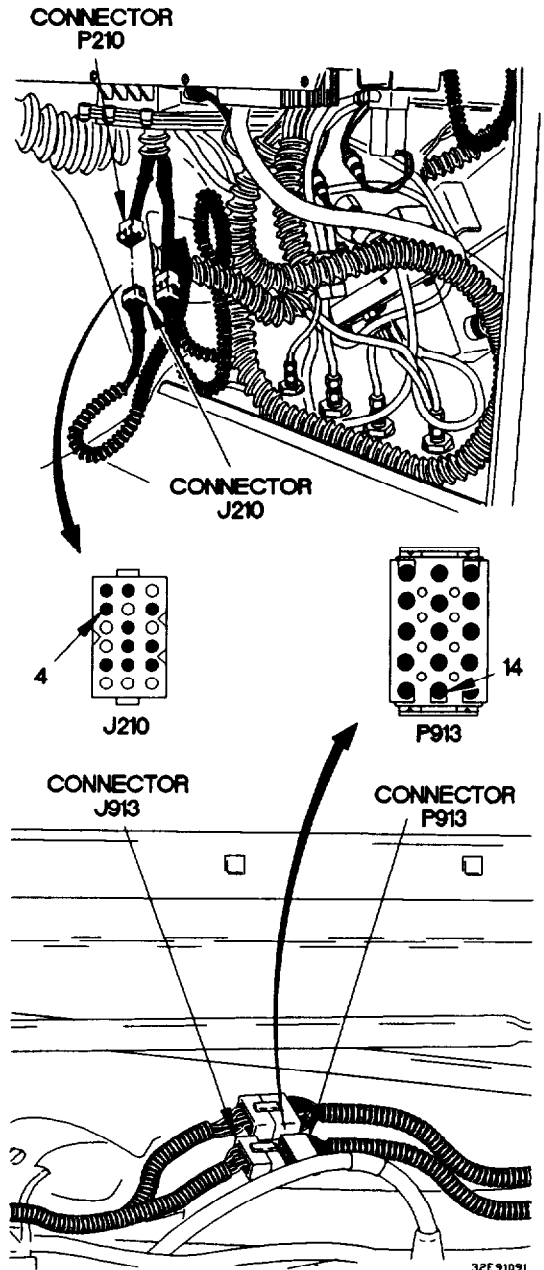
x2E91071

688. PTO DOES NOT OPERATE (CONT)



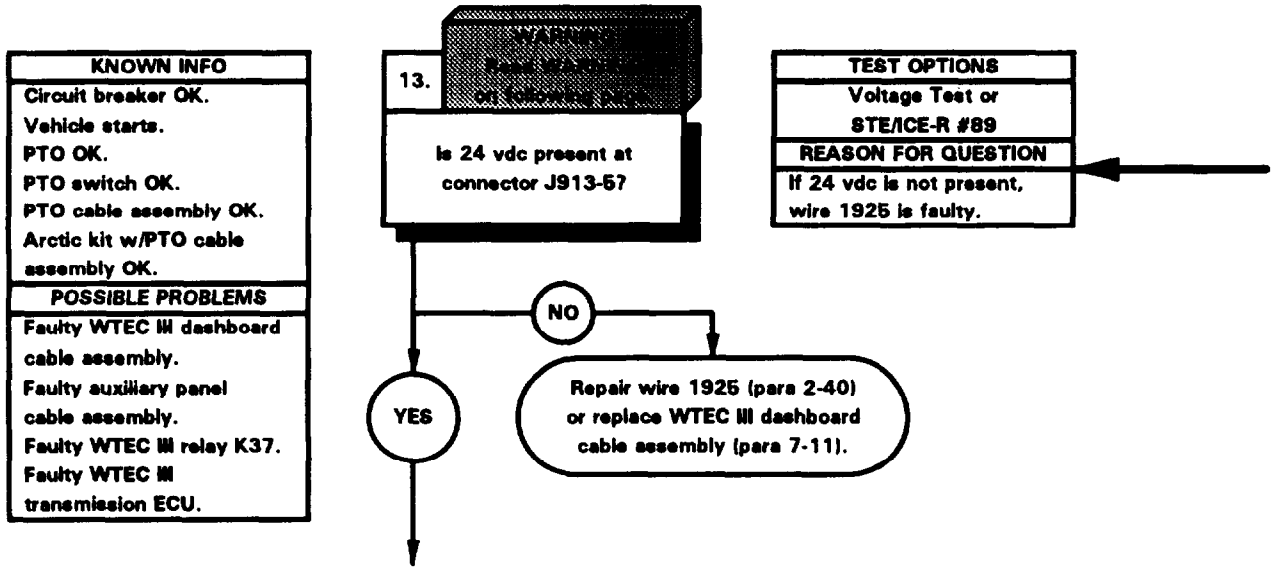
**CONTINUITY TEST**

- (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 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49).
- (6) If continuity is present, replace WTEC II relay SF02 (para 8-6).
- (7) Connect connector P913 to connector J913.
- (8) Connect connector J210 to connector P210.
- (9) Install personnel heater (para 18-9).



32E 91091

e88. PTO DOES NOT OPERATE (CONT)

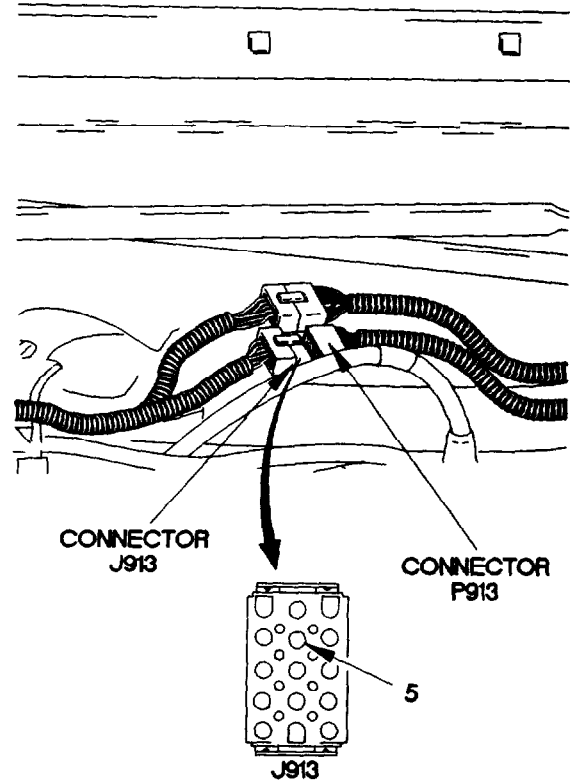


**WARNING**

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 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1925 (para 2-40) or replace WTEC III dashboard cable assembly (para 7-11).
- (8) Position master power switch to off (TM 9-2320-365-10).



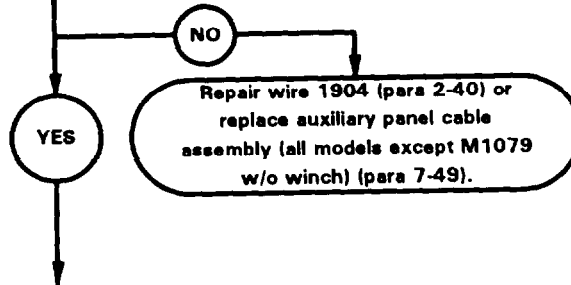
X2C91031

ø88. PTO DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Vehicle starts. PTO OK. PTO switch OK. PTO cable assembly OK. Arctic kit w/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.

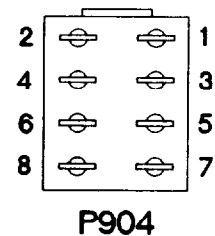
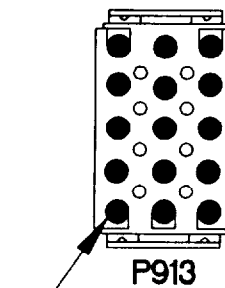
14.  
Is continuity present from connector P904-1 to connector P913-15?

TEST OPTIONS
Continuity Test or STE/ICE-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 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49).

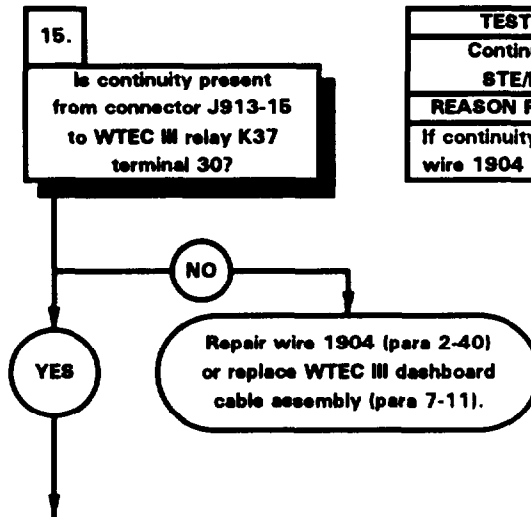


X2E91131



88. PTO DOES NOT OPERATE (CONT)

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

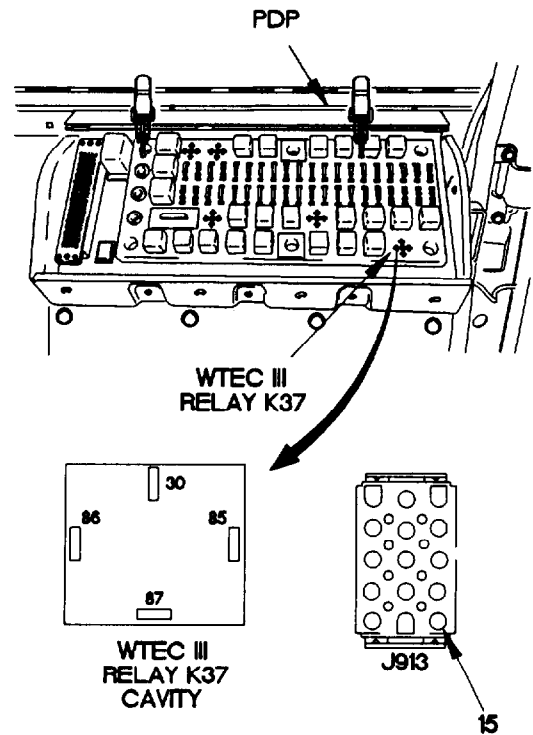


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1904 is faulty.



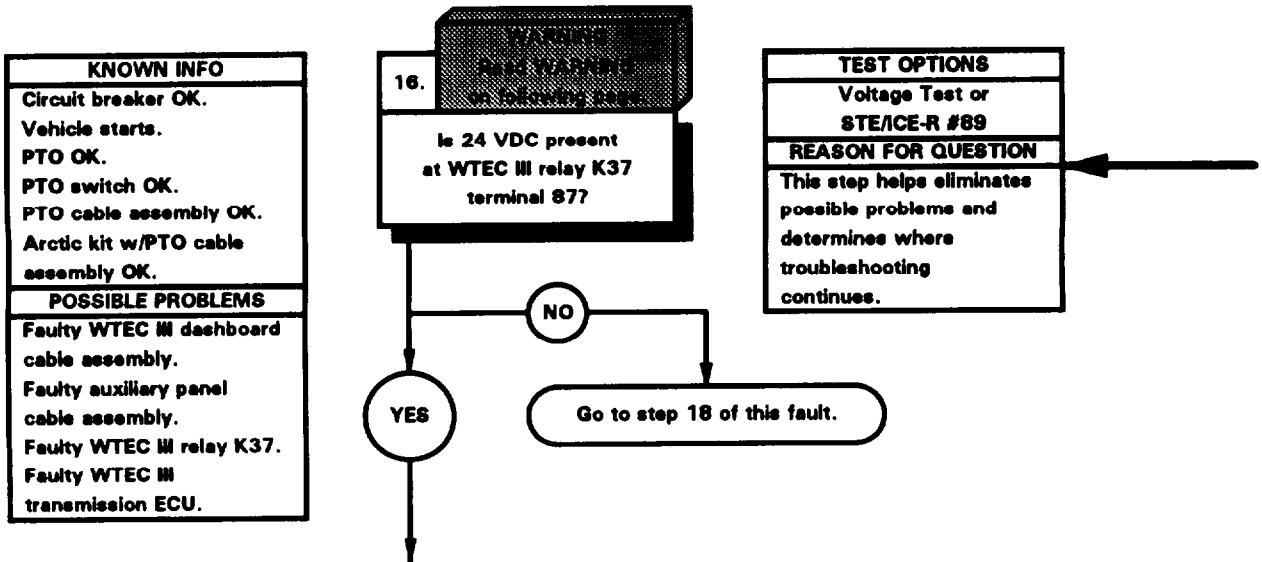
**CONTINUITY TEST**

- (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 2-40) or replace WTEC III dashboard cable assembly (para 7-11).
- (6) Install WTEC III relay K37 in PDP.



x2E91141

88. PTO DOES NOT OPERATE (CONT)

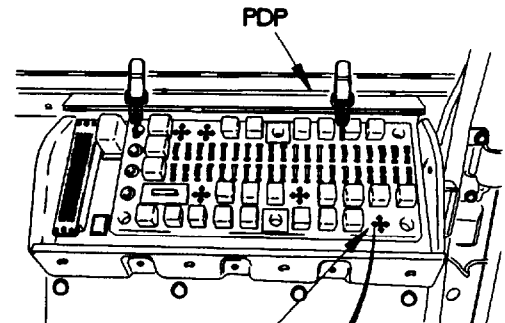


**WARNING**

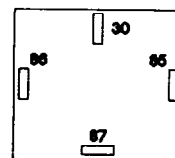
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

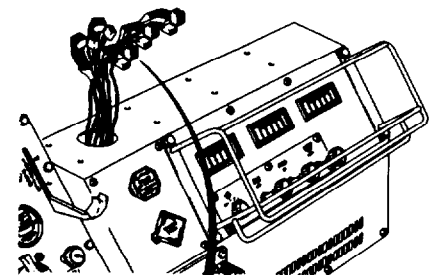
- (1) Install personnel heater hoses (para 18-9).
- (2) Remove PTO switch from auxiliary panel.
- (3) Install PTO switch on connector P904.
- (4) Remove WTEC III relay K37 from PDP.
- (5) Insert relay test wire in PDP, terminal 87, where WTEC III relay K37 was removed.
- (6) Install WTEC III relay K37 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 9-2320-365-10).
- (11) Position PTO switch to on (TM 9-2320-365-10) 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 9-2320-365-10).
- (14) Shut down engine (TM 9-2320-365-10).
- (15) Remove WTEC III relay 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

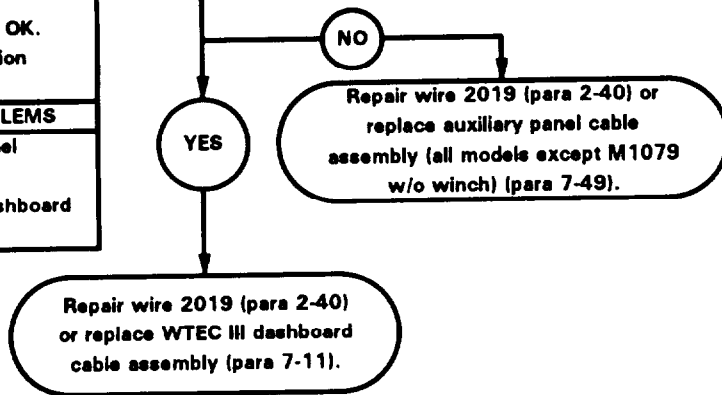
X2E91151

e88. PTO DOES NOT OPERATE (CONT)

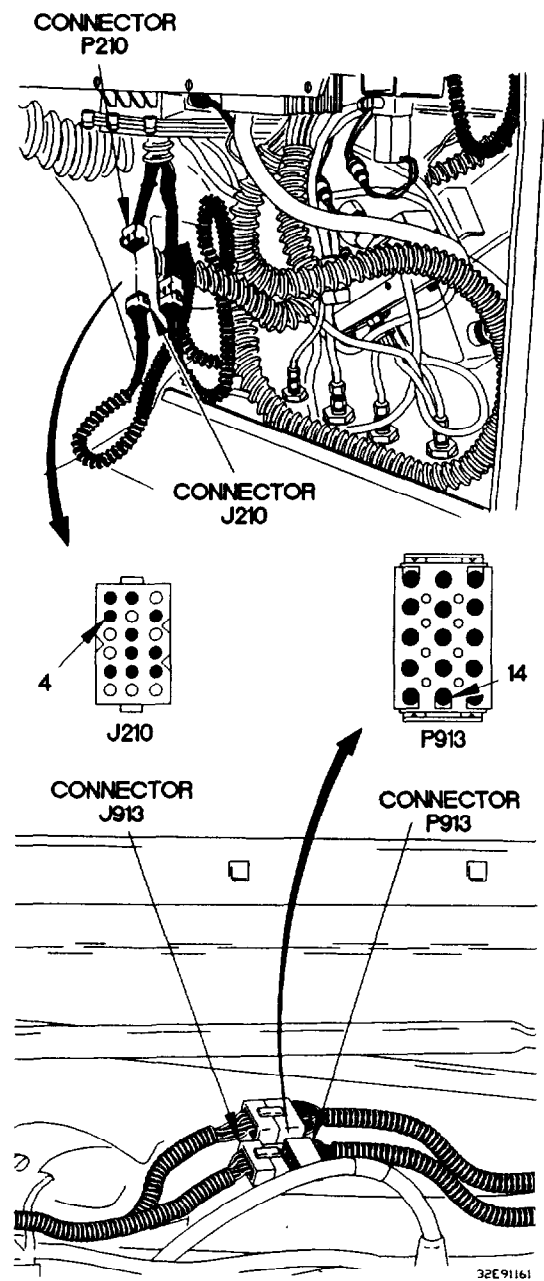
KNOWN INFO
Circuit breaker OK.
Vehicle starts.
PTO OK.
PTO switch OK.
PTO cable assembly OK.
Arctic kit w/PTO cable assembly OK.
WTEC III relay K37 OK.
WTEC III transmission ECU OK.
POSSIBLE PROBLEMS
Faulty auxiliary panel cable assembly.
Faulty WTEC III dashboard cable assembly.

17.  
Is continuity present from connector P913-14 to connector J210-4?

TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 2019 is faulty.

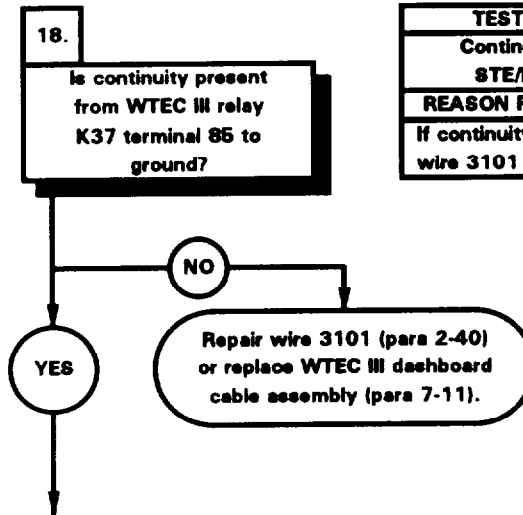


- CONTINUITY TEST**
- (1) Disconnect connector P210 from connector J210.
  - (2) Set multimeter to ohms.
  - (3) Connect positive (+) probe of multimeter to connector P913-14.
  - (4) Connect negative (-) probe of multimeter to connector J210-4 and note reading on multimeter.
  - (5) If continuity is not present, repair wire 2019 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49).
  - (6) If continuity is present, repair wire 2019 (para 2-40) 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).



688. PTO DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Vehicle starts. PTO OK. PTO switch OK. PTO cable assembly OK. Arctic kit w/PTO cable assembly OK.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly. Faulty WTEC III relay K37. Faulty WTEC III transmission ECU.

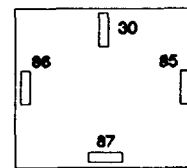
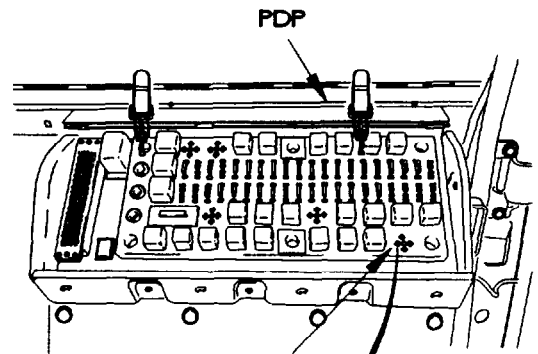


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3101 faulty.



**CONTINUITY TEST**

- (1) Remove WTEC III relay K37 from PDP.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to PDP, terminal 86, where WTEC III relay K37 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 2-40) or replace WTEC III dashboard cable assembly (para 7-11).

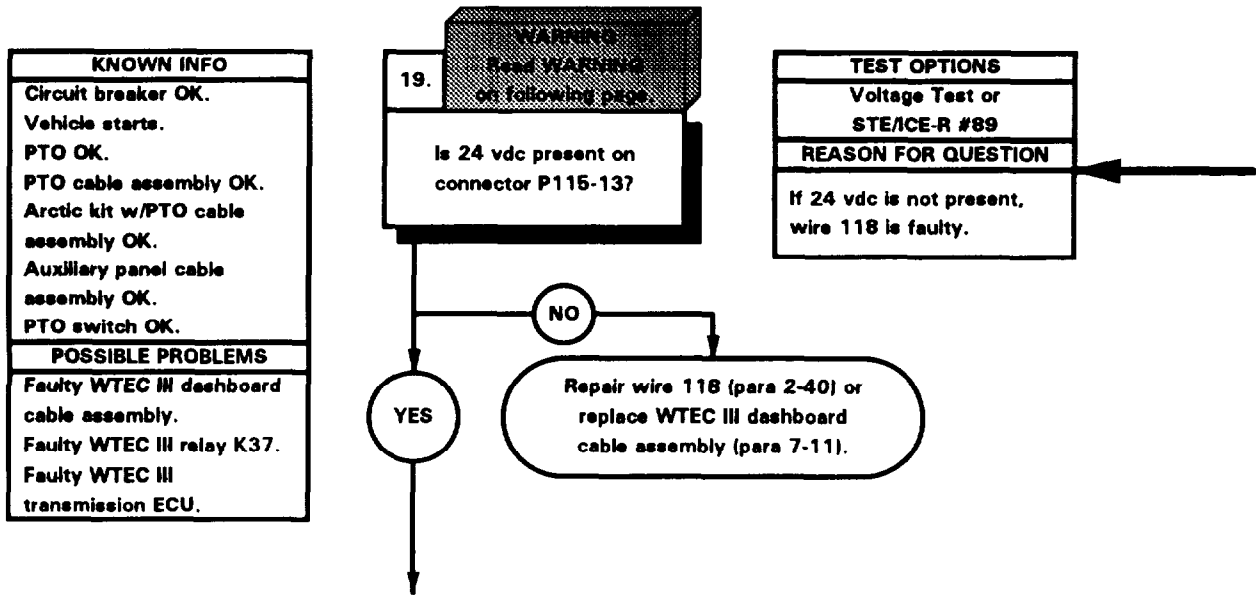


**WTEC III  
RELAY K37**

X2E91171



e88. PTO DOES NOT OPERATE (CONT)

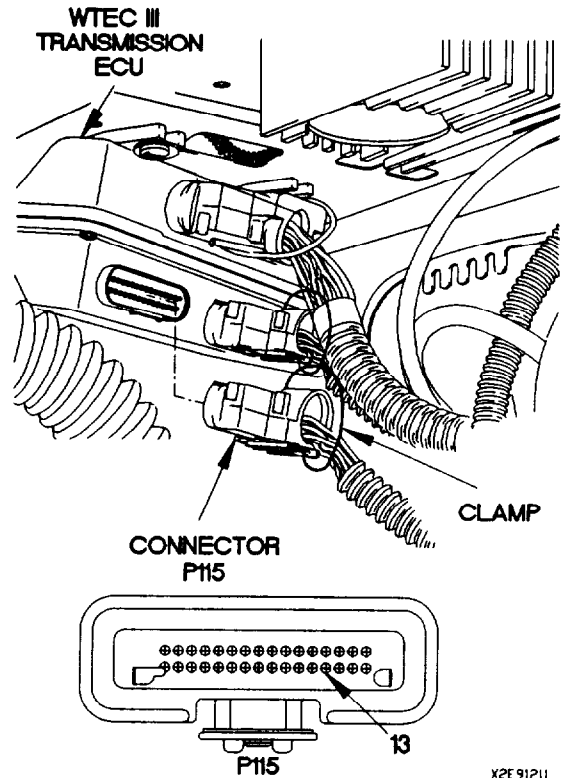


**WARNING**

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**

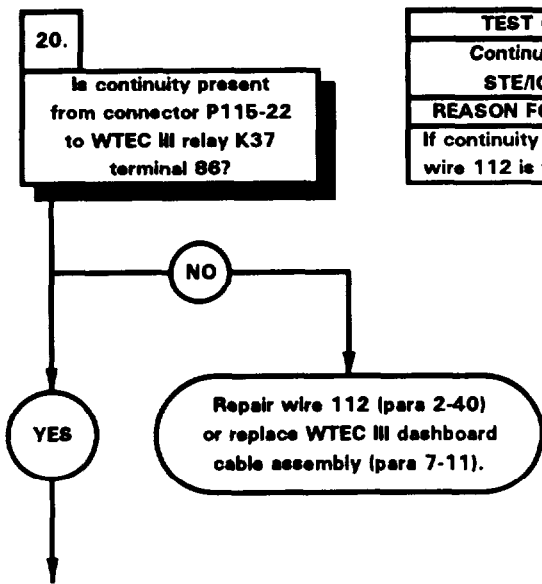
- (1) Disconnect connector clamp from connector P115.
- (2) Disconnect connector P115 from WTEC III transmission ECU.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector P115-13.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-365-10).
- (7) Position PTO switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 118 (para 2-40) or replace WTEC III dashboard cable assembly (para 7-11).
- (9) Position PTO switch to off (TM 9-2320-365-10).
- (10) Position master power switch to off (TM 9-2320-365-10).



X2E91211

e88. PTO DOES NOT OPERATE (CONT)

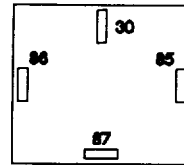
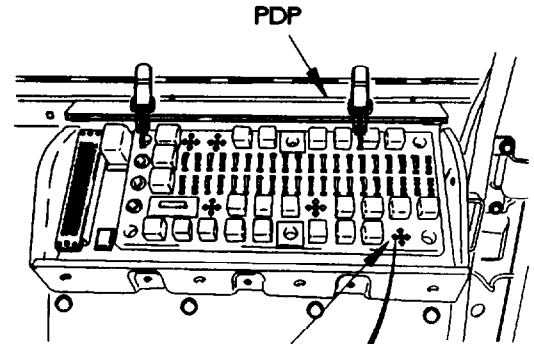
KNOWN INFO
Circuit breaker OK. Vehicle starts. PTO OK. PTO cable assembly OK. Arotic kit w/PTO cable assembly OK. Auxiliary panel cable assembly OK. PTO switch OK.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly. Faulty WTEC III relay K37. Faulty WTEC III transmission ECU.



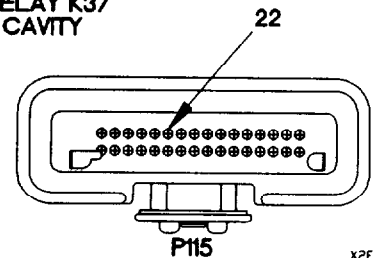
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 112 is faulty.



- 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, terminal 86, where WTEC III relay K37 was removed, and note reading on multimeter.
  - (4) If continuity is not present, repair wire 112 (para 2-40) 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.

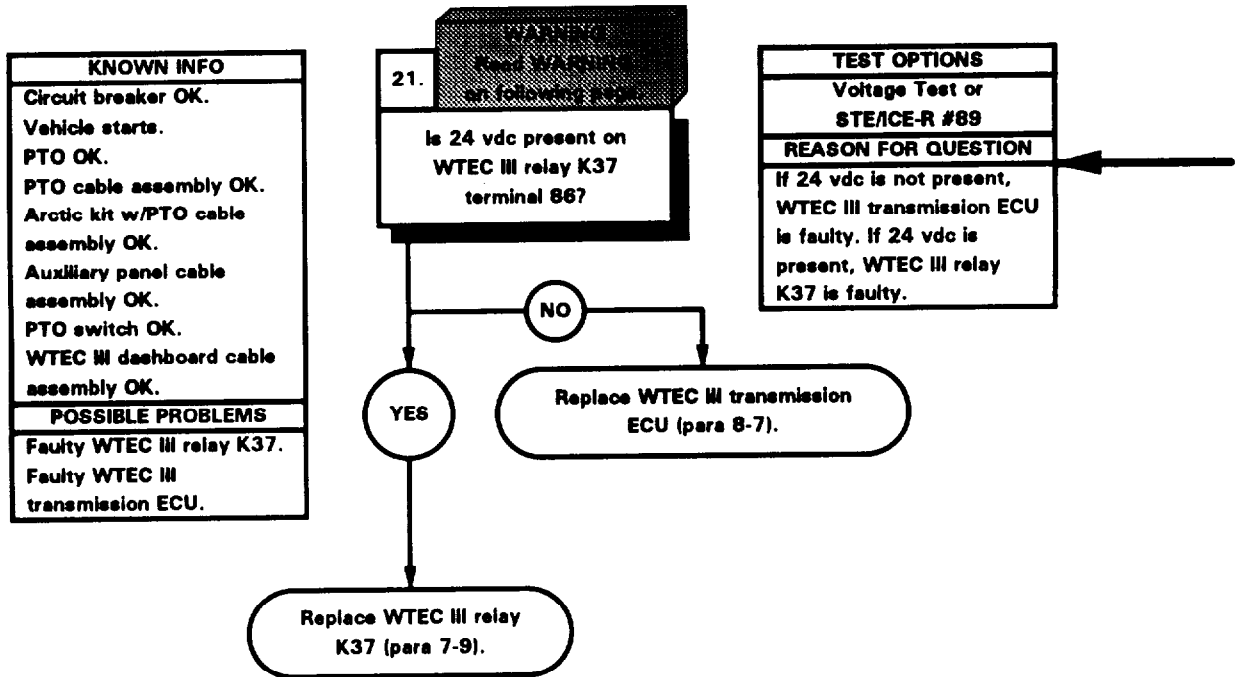


WTEC III  
RELAY K37  
CAVITY



X2C91221

e88. PTO DOES NOT OPERATE (CONT)

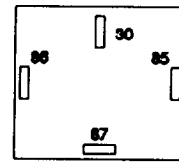
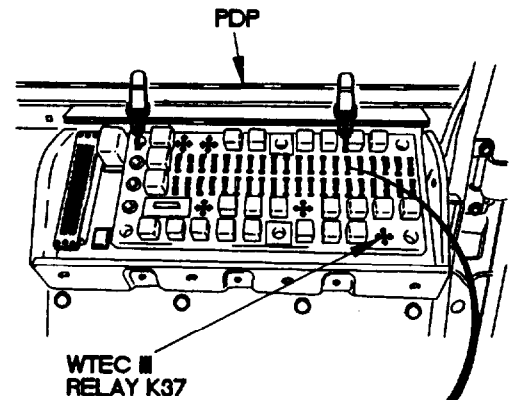


**WARNING**

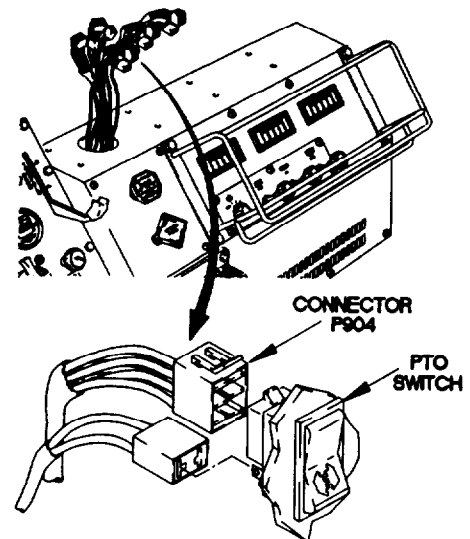
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 86, where WTEC III relay K37 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).

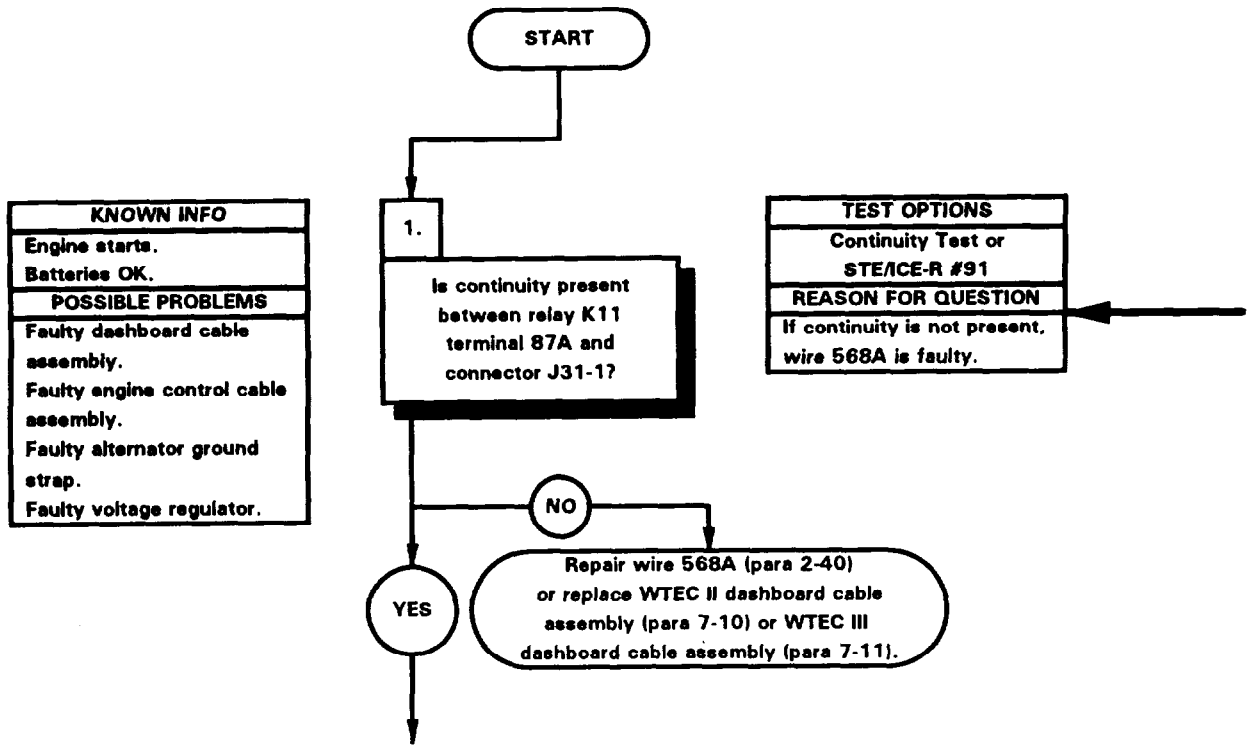


WTEC III  
RELAY K37  
CAVITY



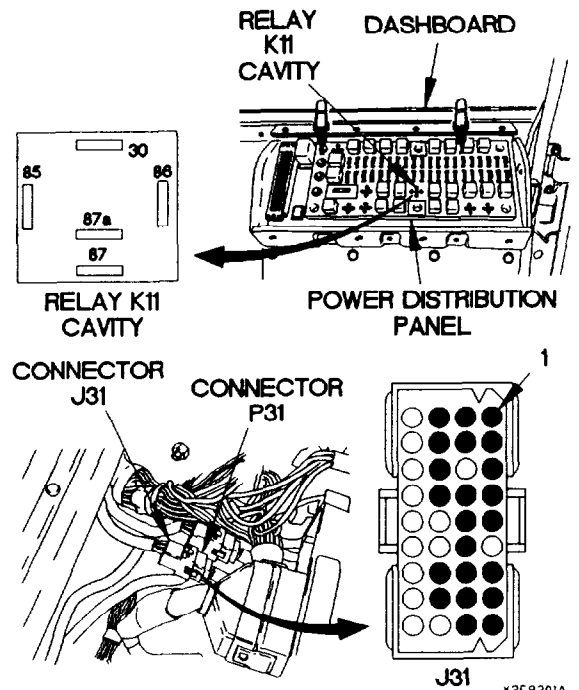
X2E 91201

e89. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/CE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Nut, Self-Locking (Item 130, Appendix G) Wire, Elect, 50 ft (Item 77, Appendix D)	



**CONTINUITY TEST**

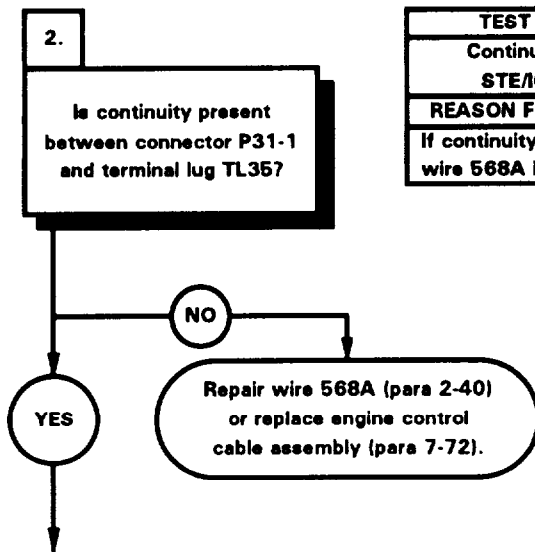
- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K11 from PDP.
- (3) Remove instrument panel assembly for access (para 7-15).
- (4) Disconnect connector P31 from connector J31.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector J31-1.
- (7) Connect negative (-) probe of multimeter to PDP, terminal 87A, where relay K11 was removed.
- (8) If continuity is not present, repair wire 568A (para 2-40) 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).





689. 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.

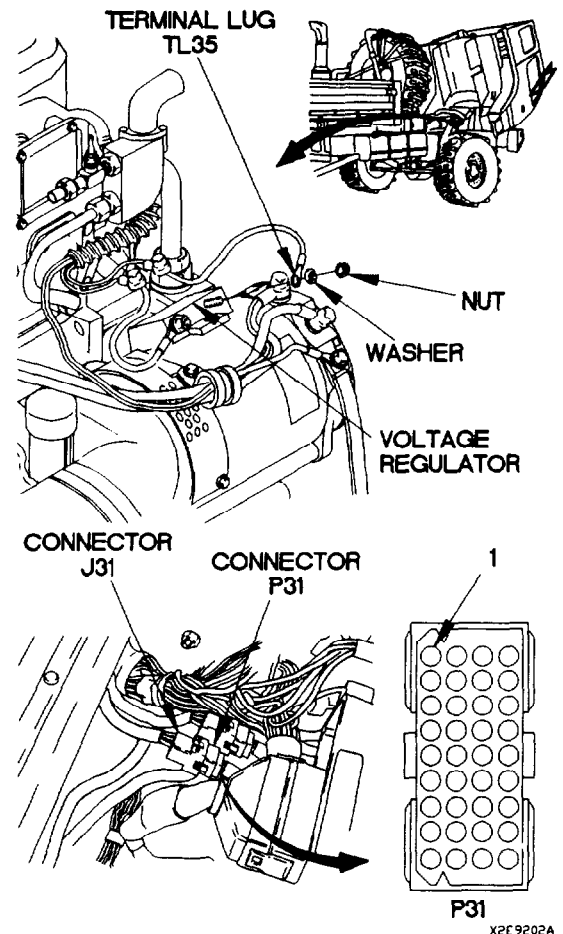


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 568A is faulty.



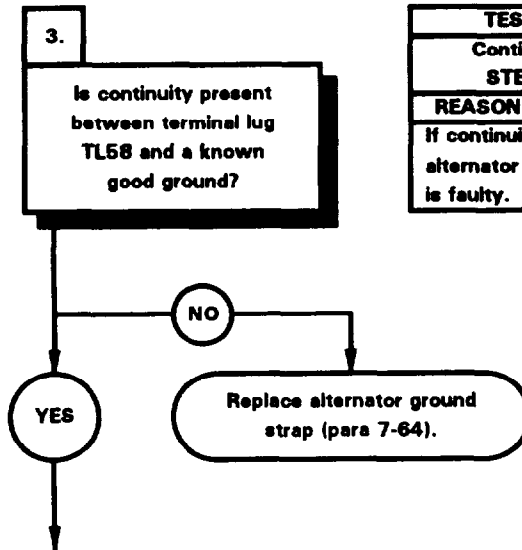
**CONTINUITY TEST**

- (1) Raise cab (TM 9-2320-365-10).
- (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 9-2320-365-10).
- (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 2-40) or replace engine control cable assembly (para 7-72).
- (9) Raise cab (TM 9-2320-365-10).
- (10) Install terminal lug TL35, washer, and self-locking nut on voltage regulator.
- (11) Lower cab (TM 9-2320-365-10).
- (12) Connect connector P31 to connector J31.
- (13) Install instrument panel assembly (para 7-15).



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

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

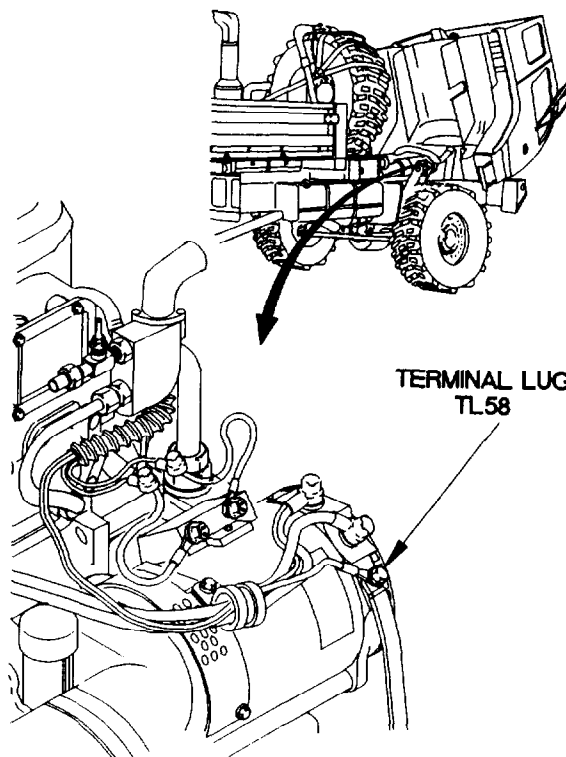


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, alternator ground strap is faulty.



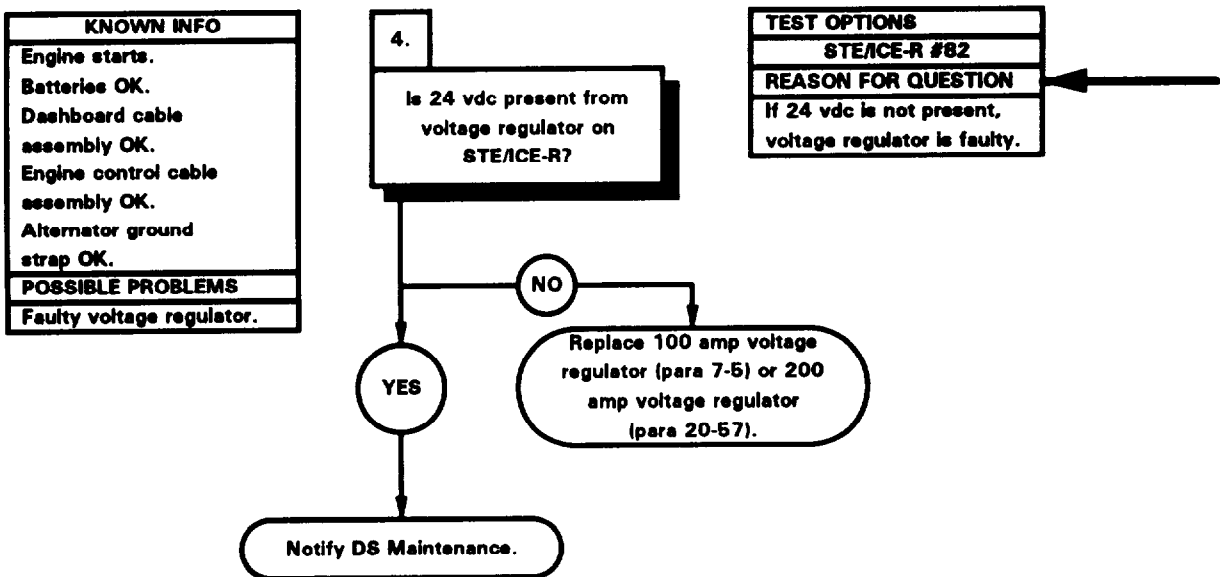
**CONTINUITY TEST**

- (1) Raise cab (TM 9-2320-365-10).
- (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 7-64).
- (6) Lower cab (TM 9-2320-365-10).



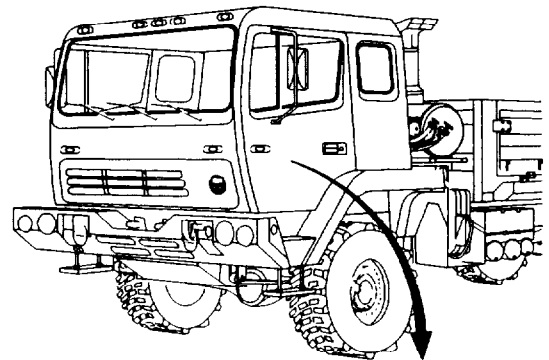
X2E9203A

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



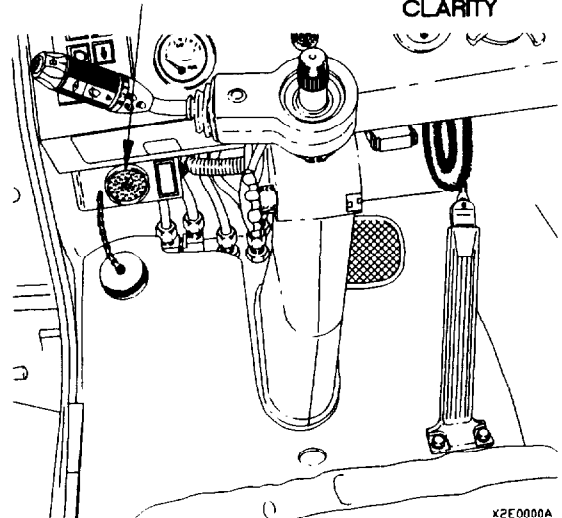
**STE/ICE-R #82**

- (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 9-2320-365-10).
- (6) Start engine (TM 9-2320-365-10).
- (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 20-57).
- (10) If voltage regulator output voltage is 6 to 28 vdc, notify DS Maintenance.
- (11) Position master power switch to off (TM 9-2320-365-10).
- (12) Disconnect DCA cable W1 from VTM and DCA-1 connector.
- (13) Install dust cover on DCA-1 connector.

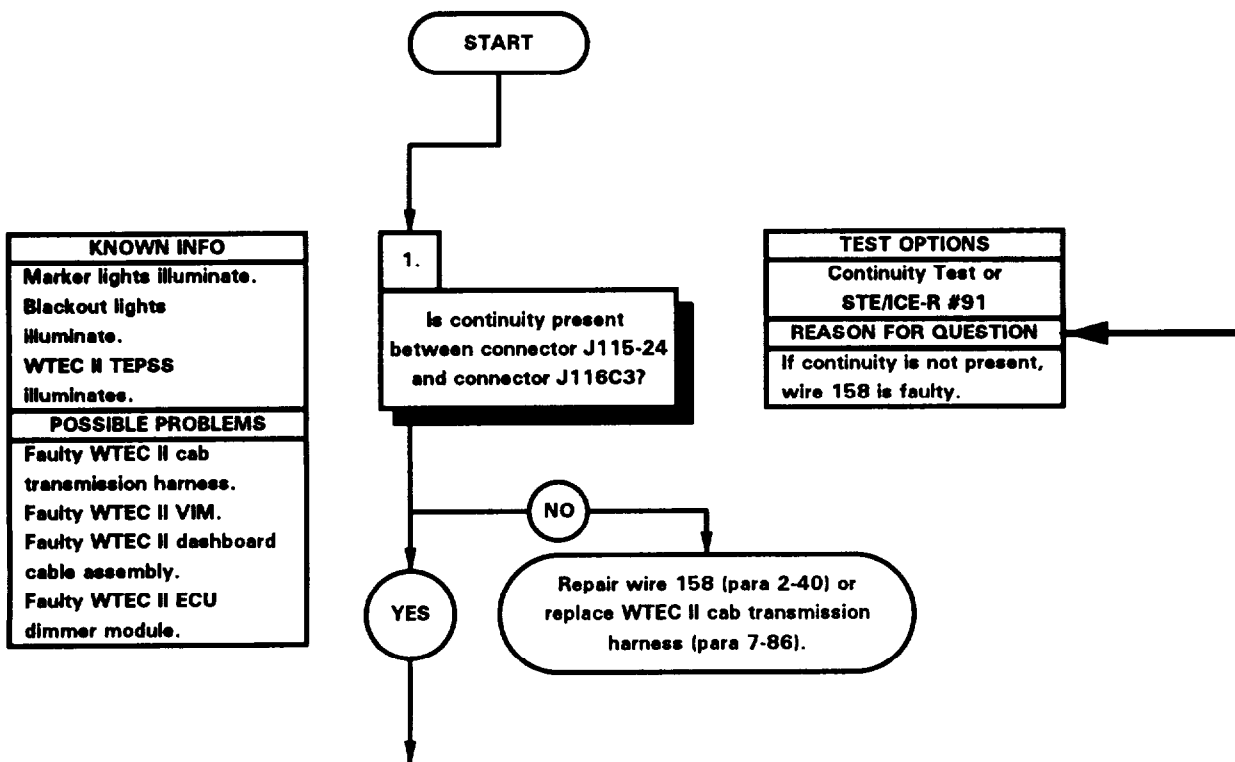


DCA CONNECTOR

STEERING WHEEL  
REMOVED FOR  
CLARITY

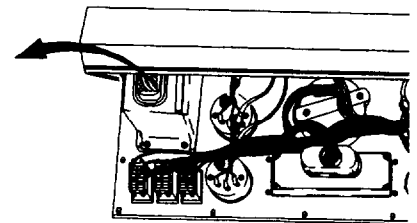
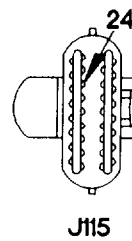
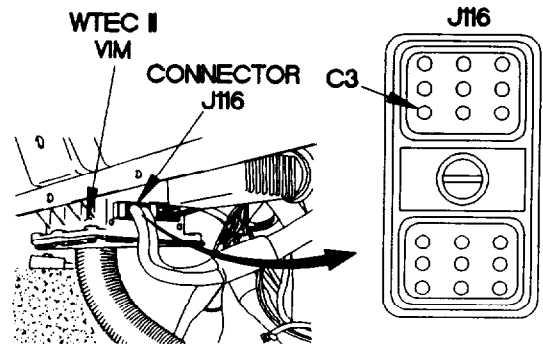


90. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) ILLUMINATION DOES NOT DIM	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)
<b>References</b> 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 15B (para 2-40) or replace WTEC II cab transmission harness (para 7-86).
- (9) Connect connector J115 to WTEC II TEPSS.
- (10) Install instrument panel assembly (para 7-15).

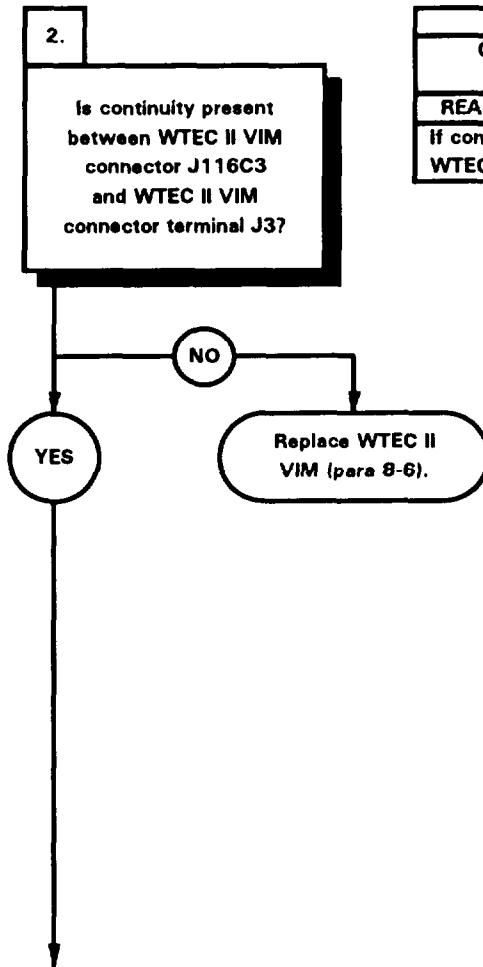


x2E93011



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

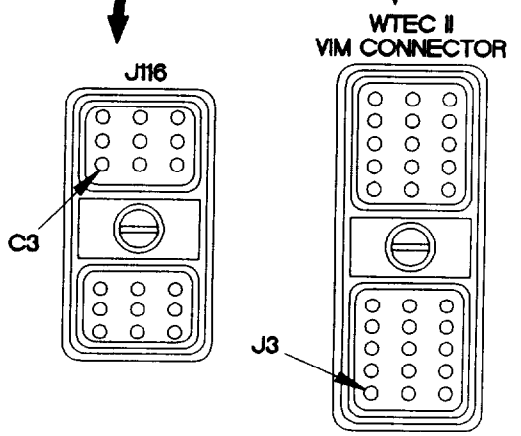
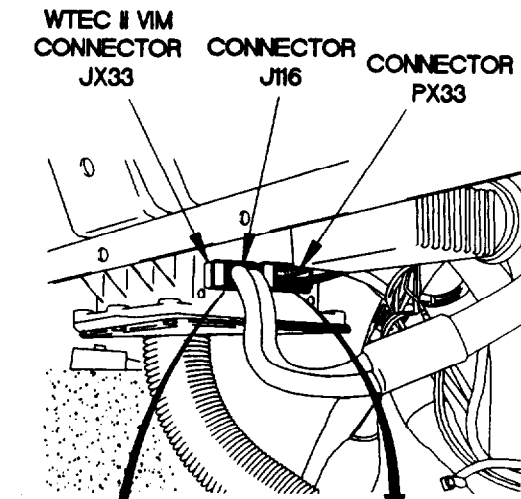
KNOWN INFO
Marker lights illuminate. Blackout lights illuminate. WTEC II TEPSS illuminates. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty WTEC II VIM. Faulty WTEC II dashboard cable assembly. Faulty WTEC II ECU dimmer module.



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

**CONTINUITY TEST**

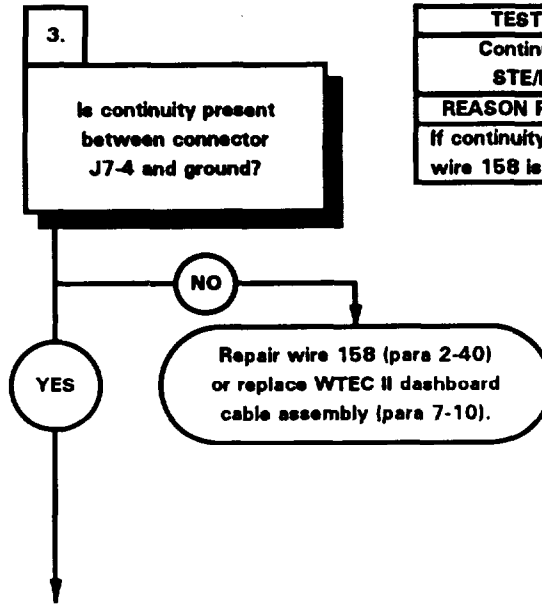
- (1) Loosen screw and disconnect connector PX33 from WTEC II VIM.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to WTEC II VIM connector J116C3.
- (4) Connect negative (-) probe of multimeter to WTEC II VIM connector terminal J3 and note reading on multimeter.
- (5) If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



X2E93021

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

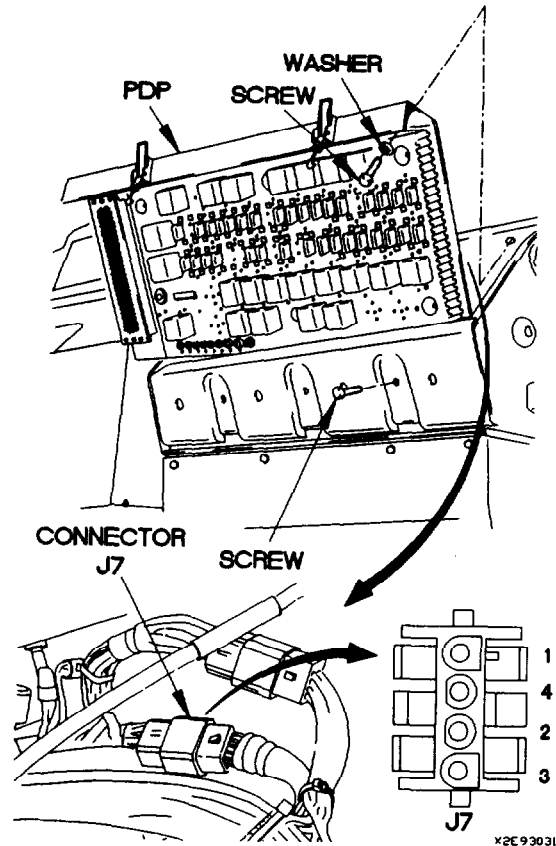
KNOWN INFO
Marker lights illuminate. Blackout lights illuminate. WTEC II TEPSS illuminates. WTEC II VIM OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty WTEC II dashboard cable assembly. Faulty WTEC II ECU dimmer module.



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

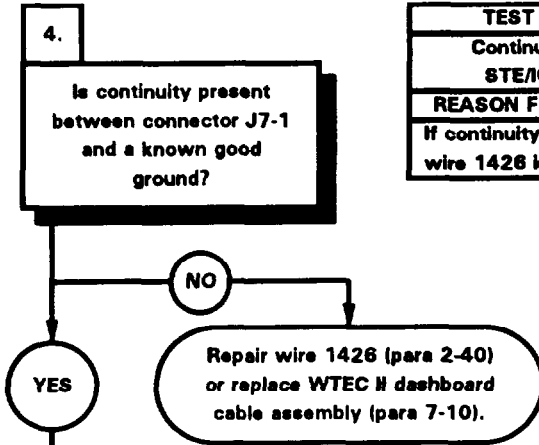
**CONTINUITY TEST**

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



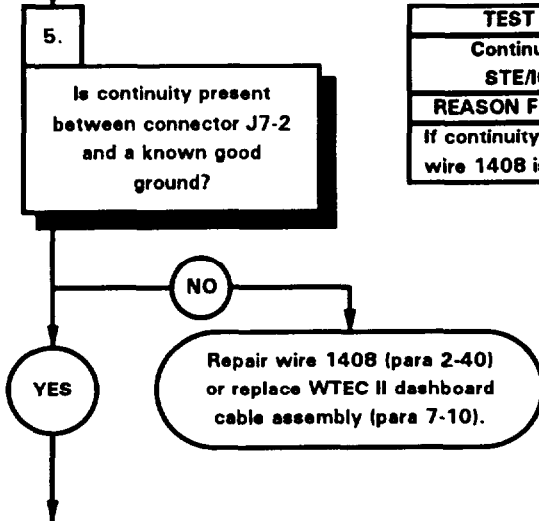
90. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) ILLUMINATION DOES NOT DIM (CONT)

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 ECU dimmer module.



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

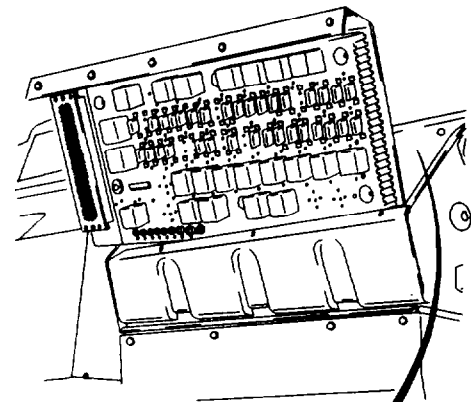
KNOWN INFO
Marker lights illuminate. Blackout lights illuminate. WTEC II TEPSS illuminates. WTEC II cab transmission harness OK. WTEC II VIM OK.
POSSIBLE PROBLEMS
Faulty WTEC II dashboard cable assembly. Faulty WTEC II ECU dimmer module.



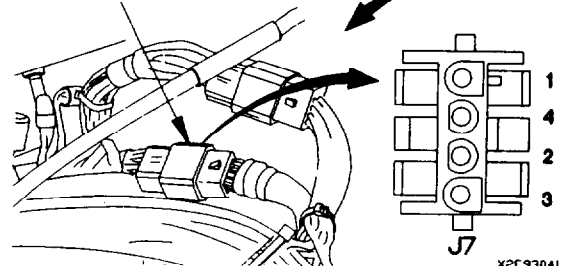
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1408 is faulty.

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



CONNECTOR  
J7

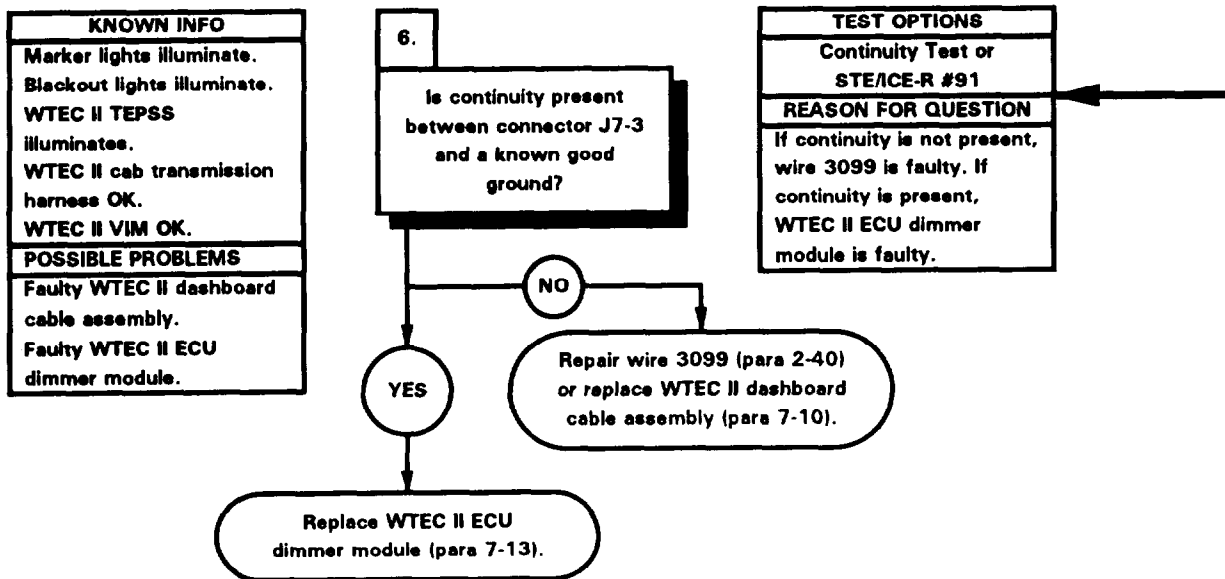


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**CONTINUITY TEST**

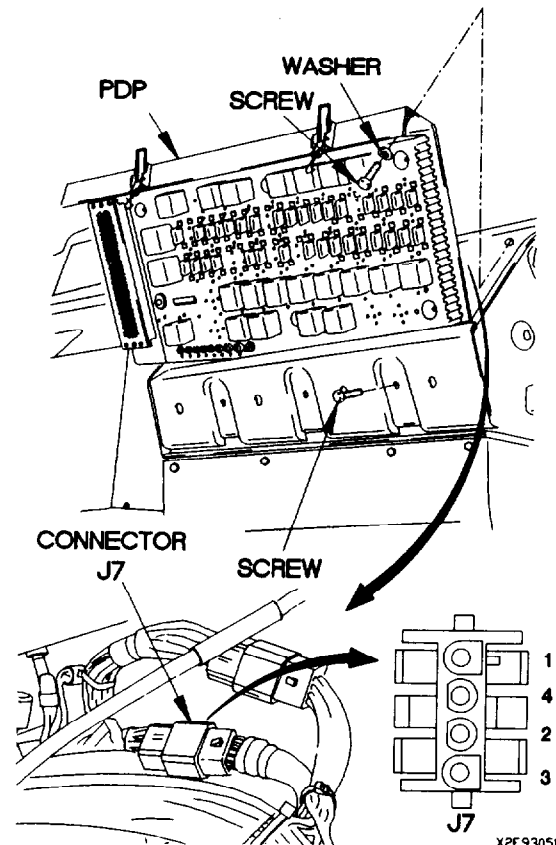
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J7-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 1408 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10).

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



**CONTINUITY TEST**

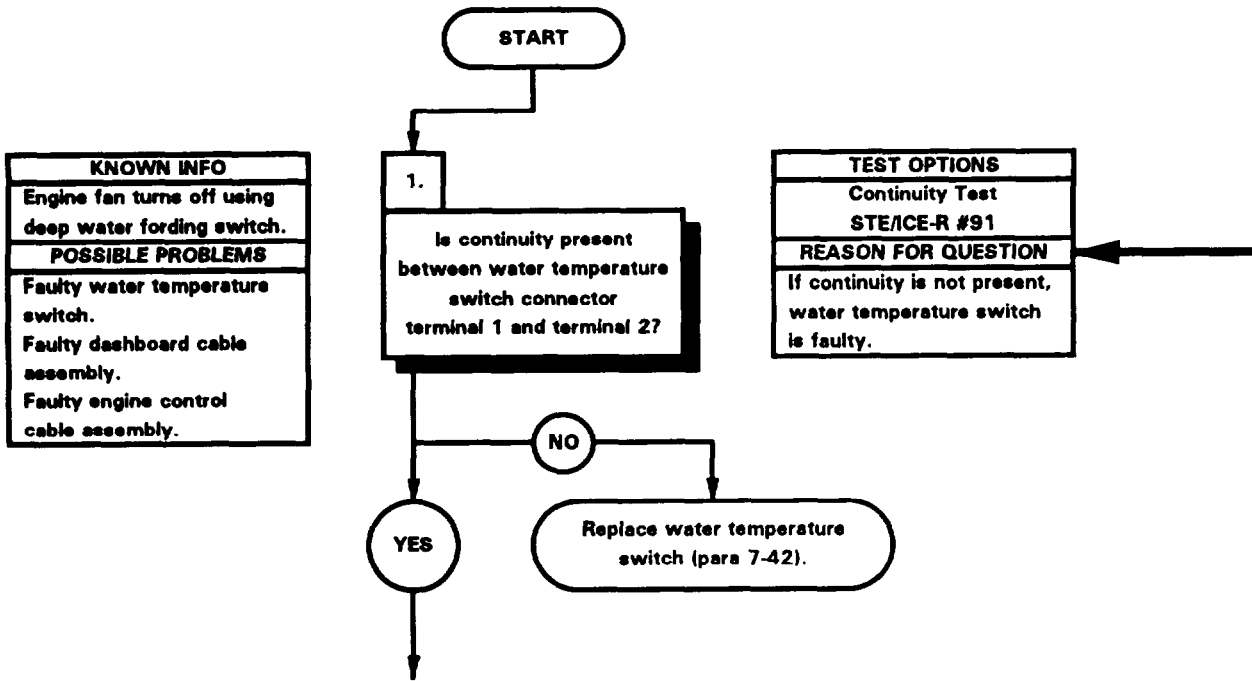
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J7-3.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3099 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10).
- (5) If continuity is present, replace WTEC II ECU dimmer module (para 7-13).
- (6) Connect connector J7 to WTEC II ECU 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).



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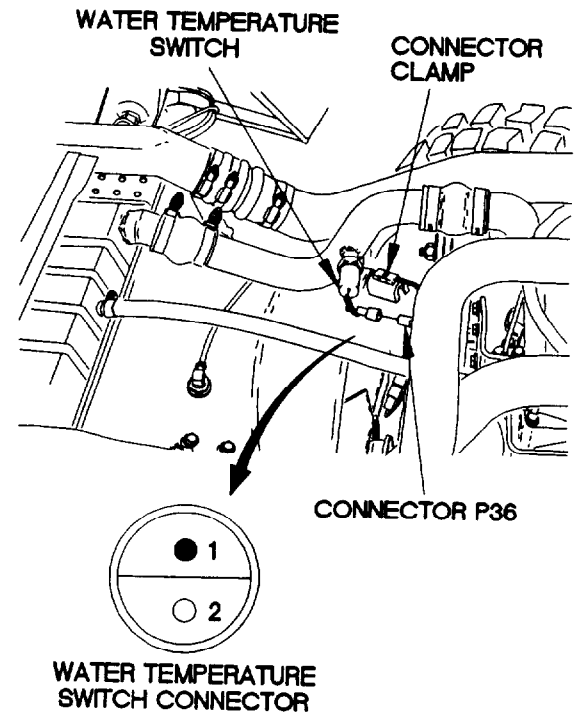
#91. ENGINE FAN RUNS CONSTANTLY	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P



**CONTINUITY TEST**

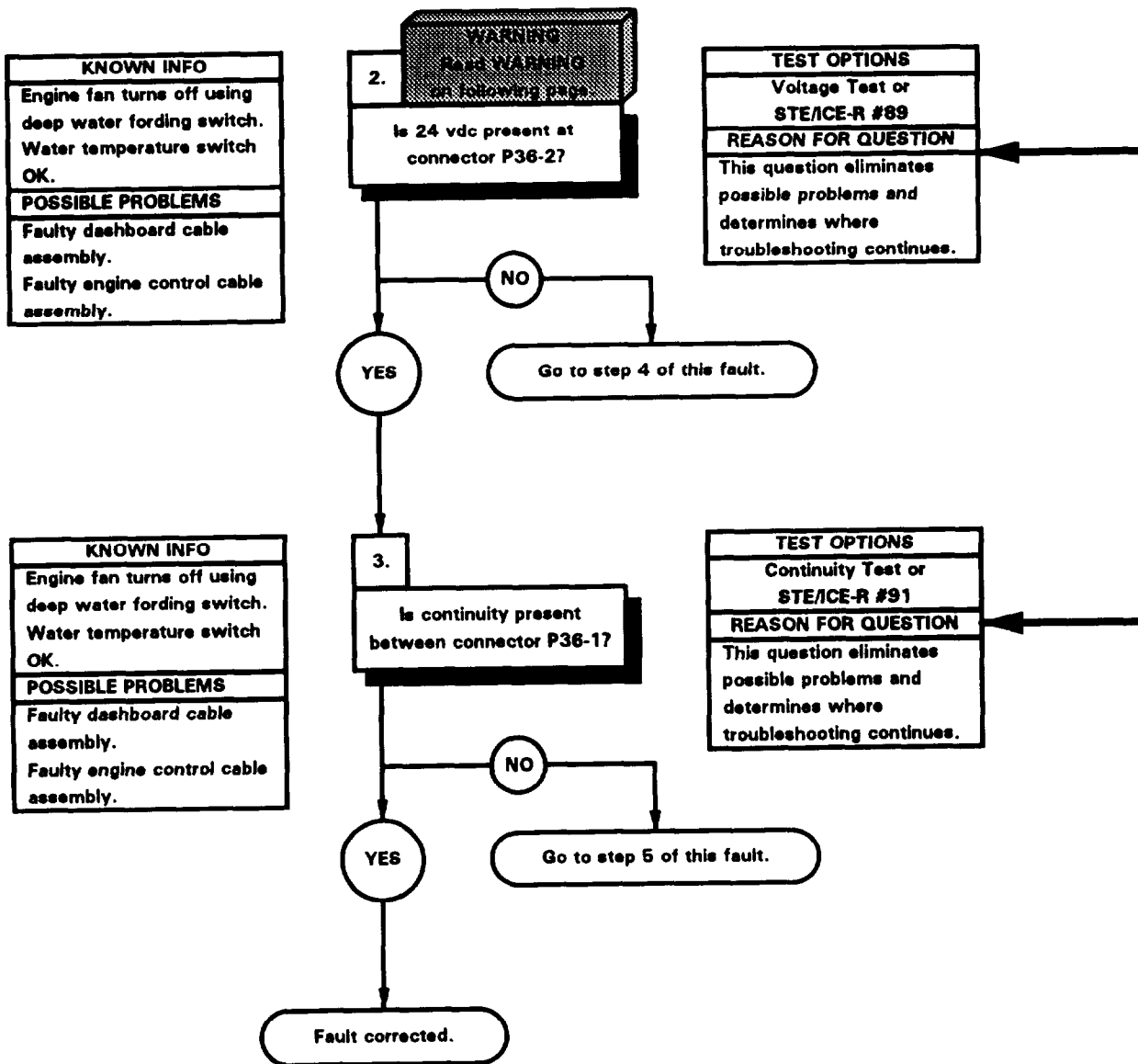
**NOTE**  
Engine must be cool during test.

- (1) Raise cab (TM 9-2320-365-10).
- (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 7-42).



X2E9501A

e91. ENGINE FAN RUNS CONSTANTLY (CONT)

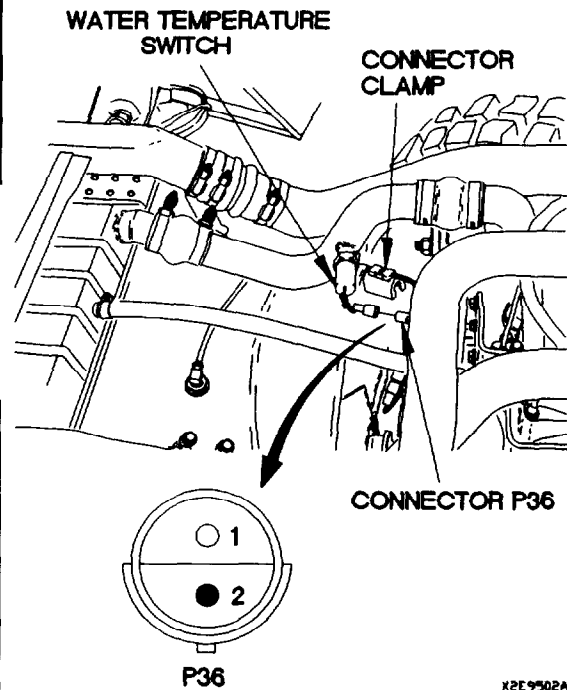


**WARNING**

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

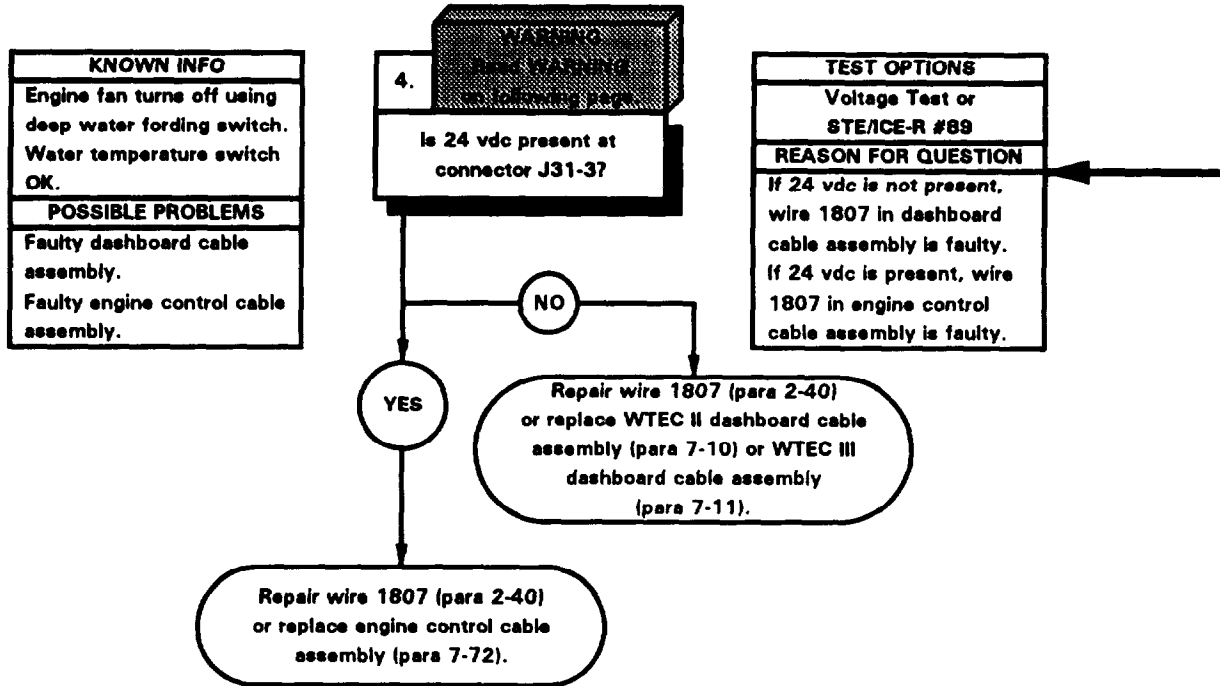


**CONTINUITY TEST**

- (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.

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691. ENGINE FAN RUNS CONSTANTLY (CONT)

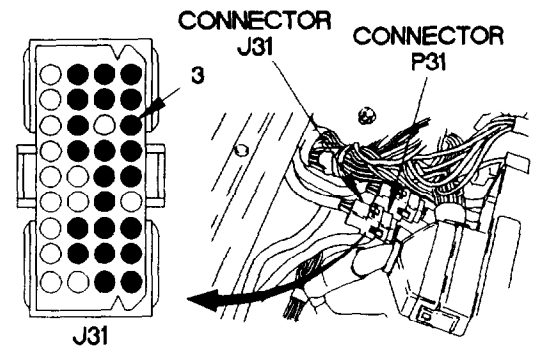
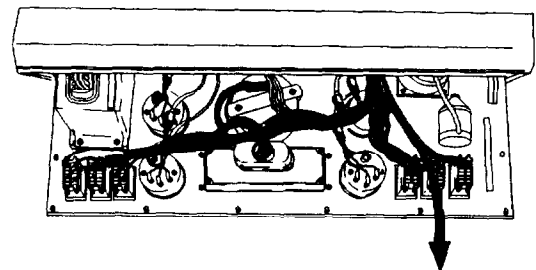


**WARNING**

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.

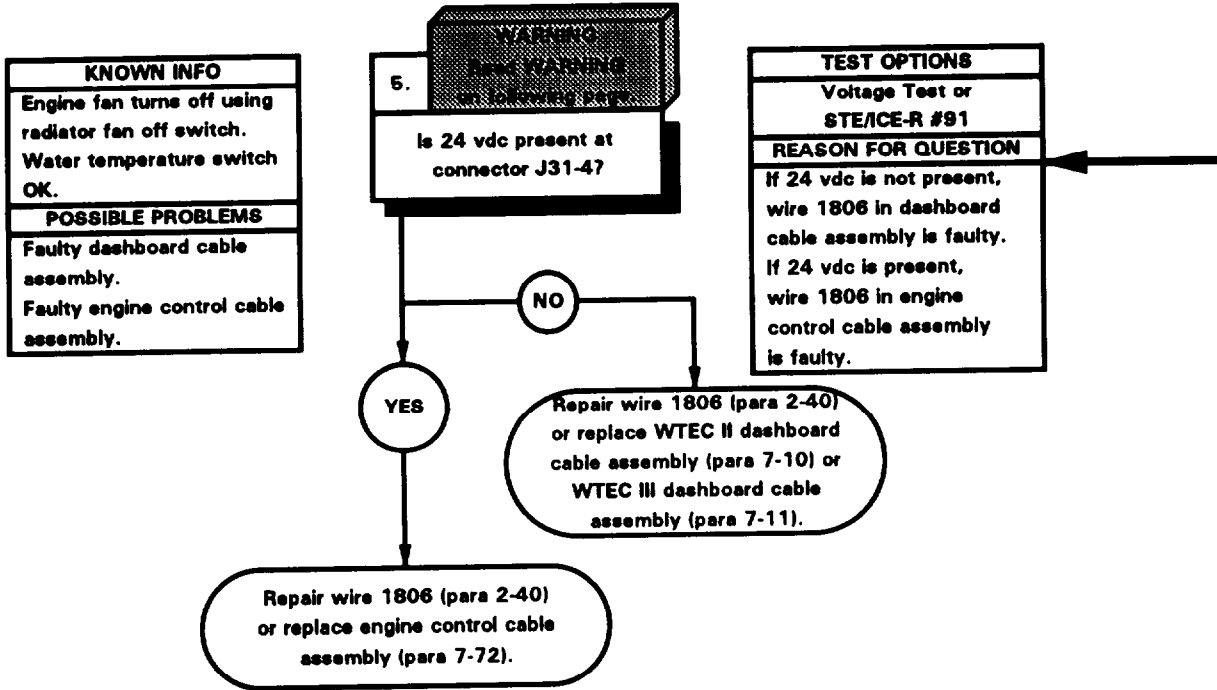
**VOLTAGE TEST**

- (1) Lower cab (TM 9-2320-365-10).
- (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 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1807 (para 2-40) 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 2-40) or replace engine control cable assembly (para 7-72).
- (10) Position master power switch to off (TM 9-2320-365-10).
- (11) Connect connector J31 to connector P31.
- (12) Install instrument panel assembly (para 7-15).



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e91. ENGINE FAN RUNS CONSTANTLY (CONT)

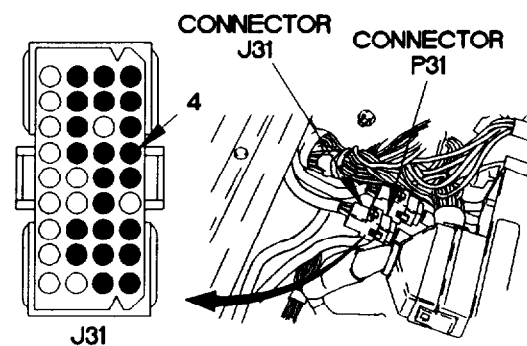
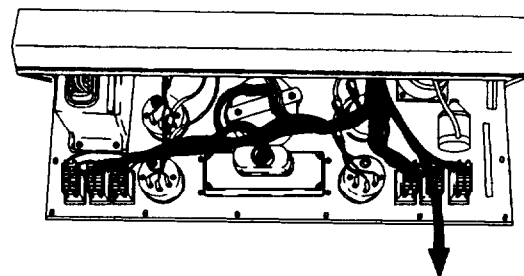


**WARNING**

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**

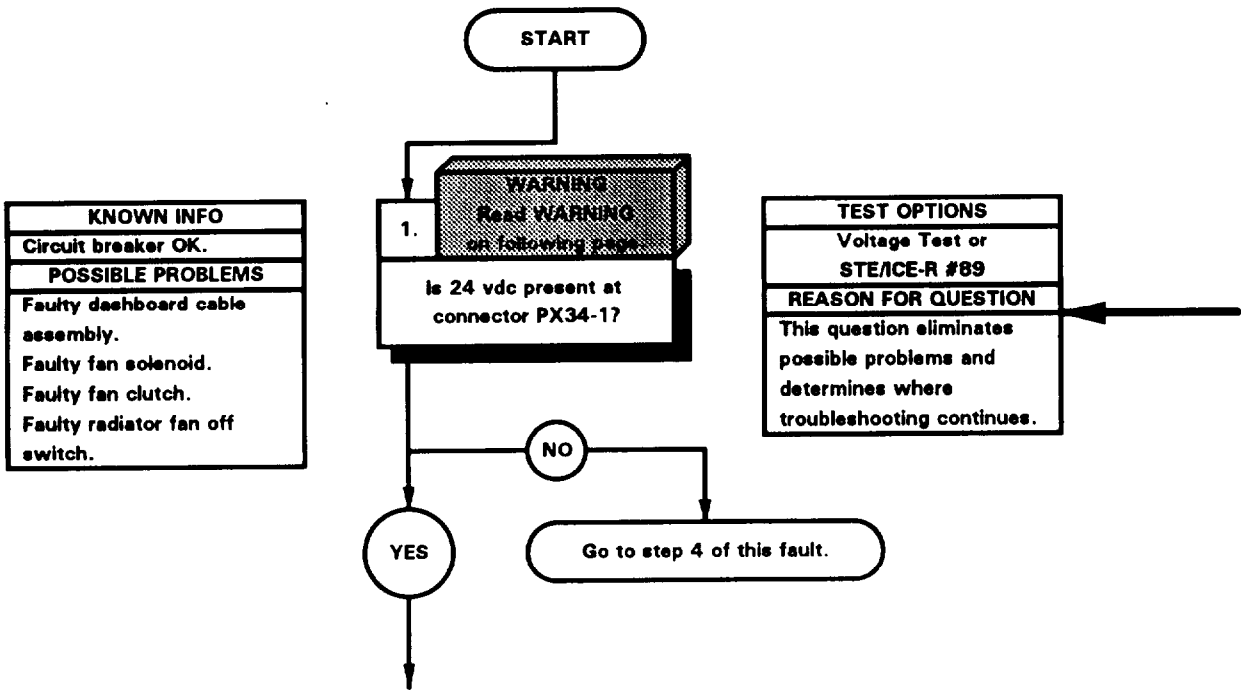
- (1) Lower cab (TM 9-2320-365-10).
- (2) Remove instrument panel assembly for access (para 7-15).
- (3) Disconnect connector J31 from connector P31.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector J31-4.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1806 (para 2-40) 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 2-40) or replace engine control cable assembly (para 7-72).
- (10) Position master power switch to off (TM 9-2320-365-10).
- (11) Connect connector J31 to connector P31.
- (12) Install instrument panel assembly (para 7-15).



X2E9505A



92. ENGINE FAN DOES NOT TURN OFF USING RADIATOR FAN OFF SWITCH	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

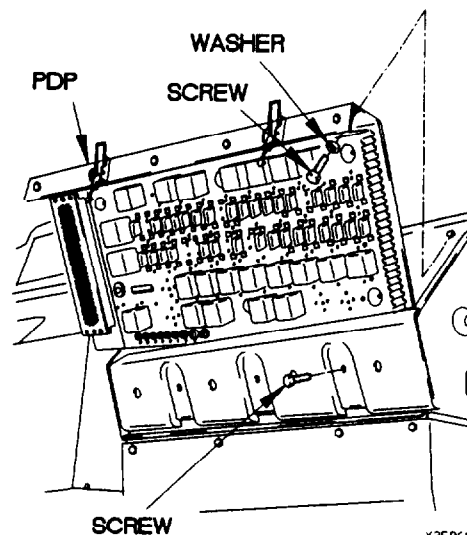
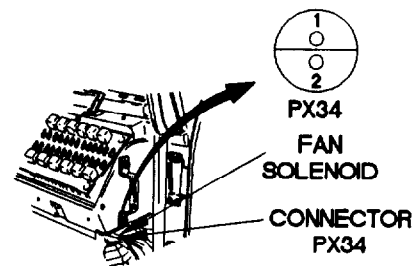
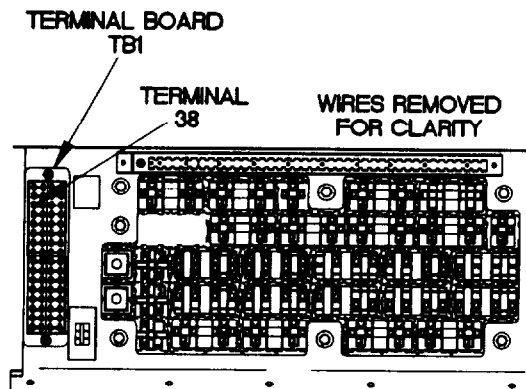


**WARNING**

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 9-2320-365-10).
- (11) Position radiator fan off switch to on (TM 9-2320-365-10) 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 9-2320-365-10).
- (14) Position master power switch to off (TM 9-2320-365-10).
- (15) Connect wire 1807 to terminal board TB1 terminal 38.



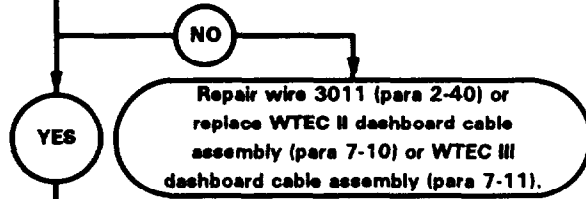
X2E96011

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

KNOWN INFO
Circuit breaker OK. Radiator fan off switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty fan solenoid. Faulty fan clutch.

2.  
Is continuity present between connector PX34-2 and a known good ground?

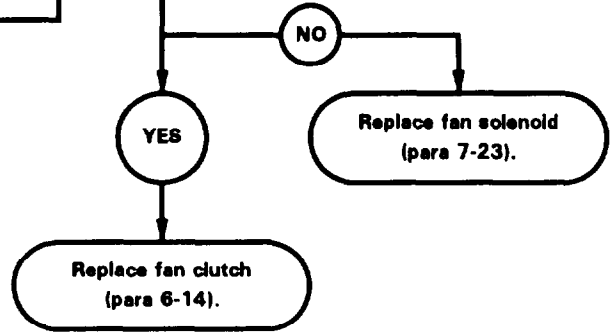
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3011 is faulty.



KNOWN INFO
Circuit breaker OK. Radiator fan off switch OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty fan solenoid. Faulty fan clutch.

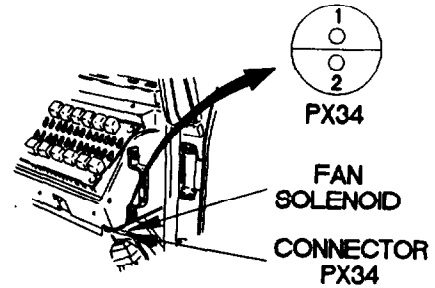
3.  
Does fan solenoid release air pressure to radiator fan?

TEST OPTIONS
Operational Test
REASON FOR QUESTION
If fan solenoid does not release air pressure to engine fan, fan solenoid is faulty.



**CONTINUITY TEST**

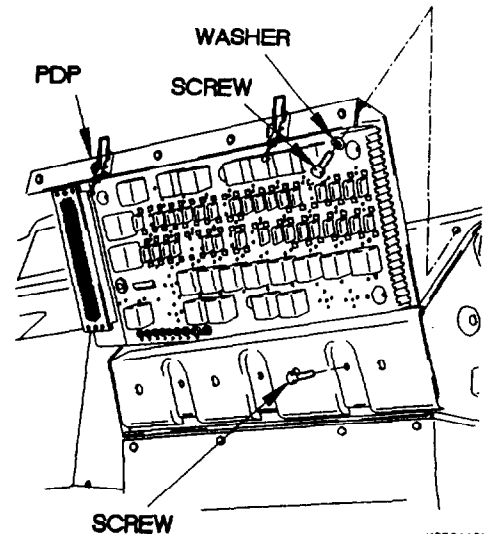
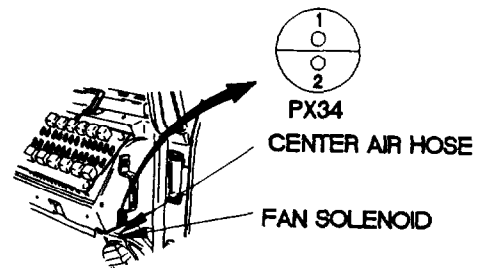
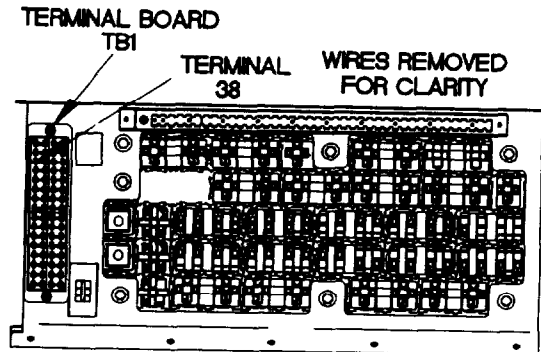
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX34-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3011 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) Connect connector PX34 to fan solenoid.



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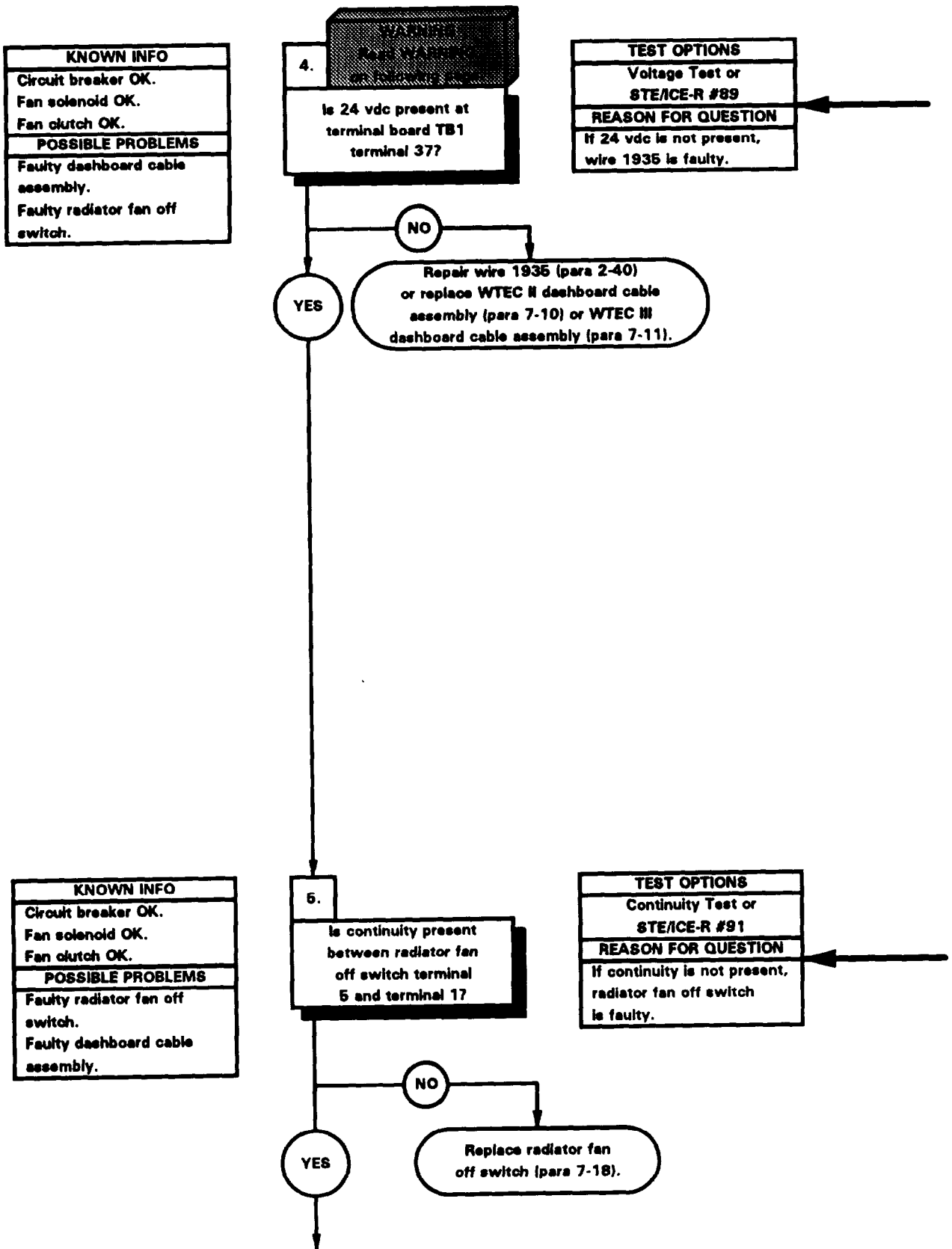
**OPERATIONAL TEST**

- (1) Remove air hose from fan solenoid.
- (2) Start engine (TM 9-2320-365-10) and allow air pressure to build up to normal level.
- (3) Position radiator fan off switch to on (TM 9-2320-365-10).
- (4) If air pressure is not present, replace fan solenoid (para 7-23).
- (5) If air pressure is present, replace fan clutch (para 6-14).
- (6) Position radiator fan off switch to off (TM 9-2320-365-10).
- (7) Position master power switch to off (TM 9-2320-365-10).
- (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).



X2E96031

e92. ENGINE FAN DOES NOT TURN OFF USING RADIATOR FAN OFF SWITCH (CONT)

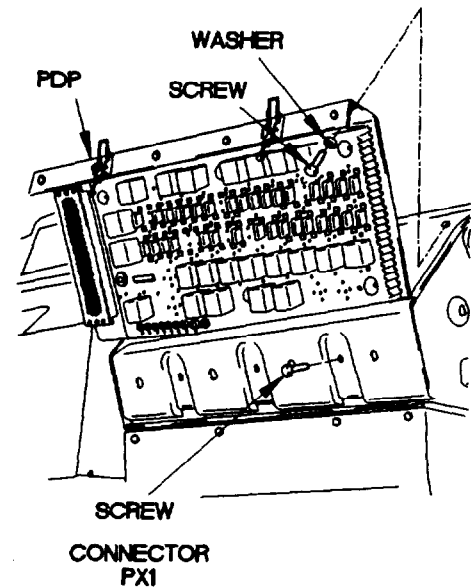
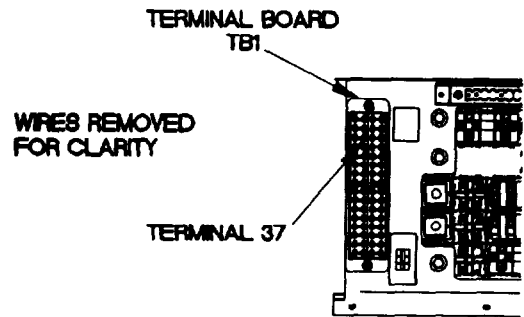


**WARNING**

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.

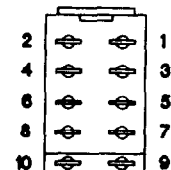
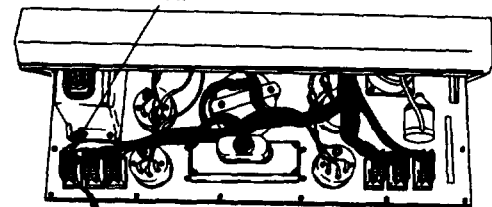
**VOLTAGE TEST**

- (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 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1935 (para 2-40) 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 9-2320-365-10).
- (7) Install PDP on dashboard with three screws.
- (8) Install three washers and screws in PDP.
- (9) Install kick panel (para 18-3).



**CONTINUITY TEST**

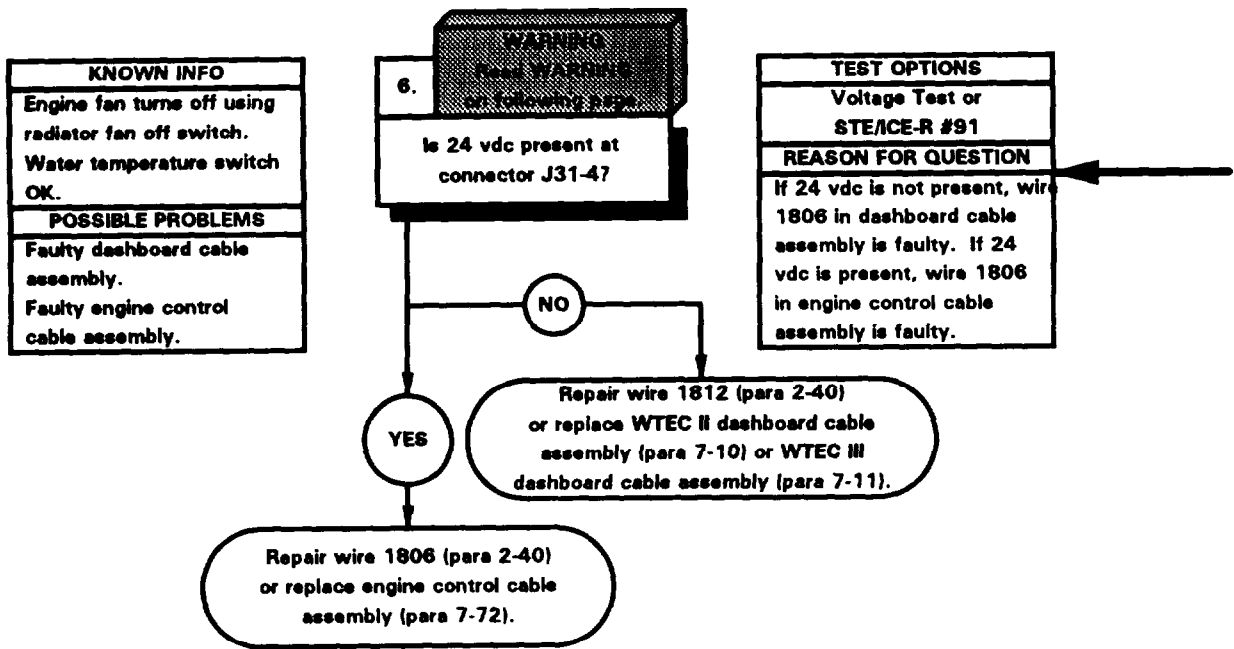
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector PX1 from radiator fan off switch.
- (3) Position radiator fan off switch to on (TM 9-2320-365-10).
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to radiator fan off switch terminal 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 9-2320-365-10).



RADIATOR FAN OFF SWITCH

X2C96041

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

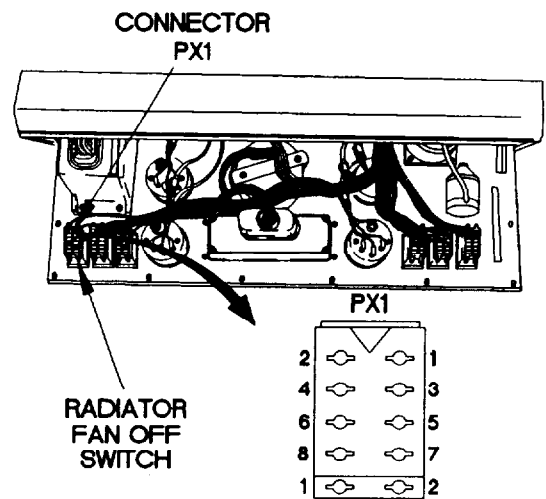


**WARNING**

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**

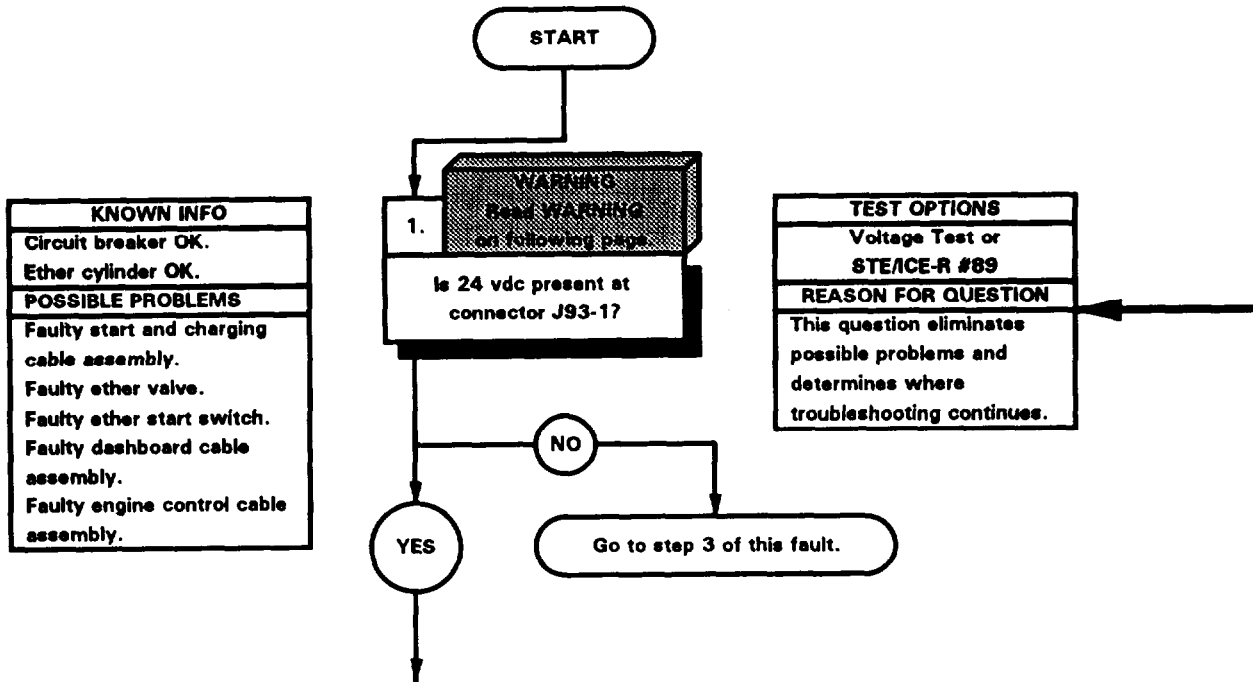
- (1) Lower cab (TM 9-2320-365-10).
- (2) Remove instrument panel assembly for access (para 7-15).
- (3) Disconnect connector J31 from connector P31.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector J31-4.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1806 (para 2-40) 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 2-40) or replace engine control cable assembly (para 7-72).
- (10) Position master power switch to off (TM 9-2320-365-10).
- (11) Connect connector J31 to connector P31.
- (12) Install instrument panel assembly (para 7-15).



XZE 96051



e93. ETHER START DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10). Spare tire lowered (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	

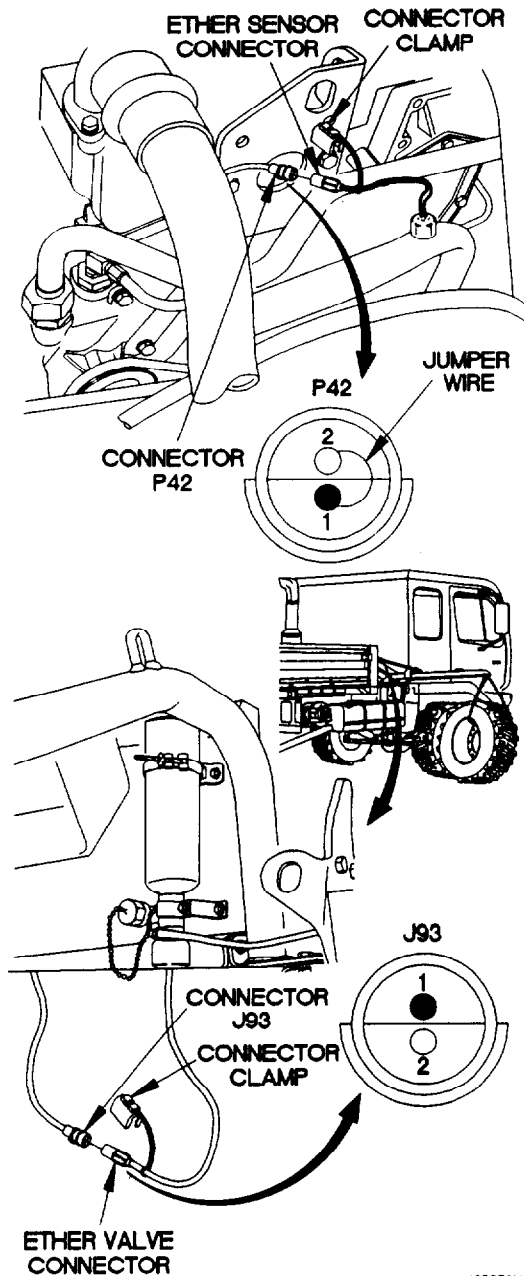


**WARNING**

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**

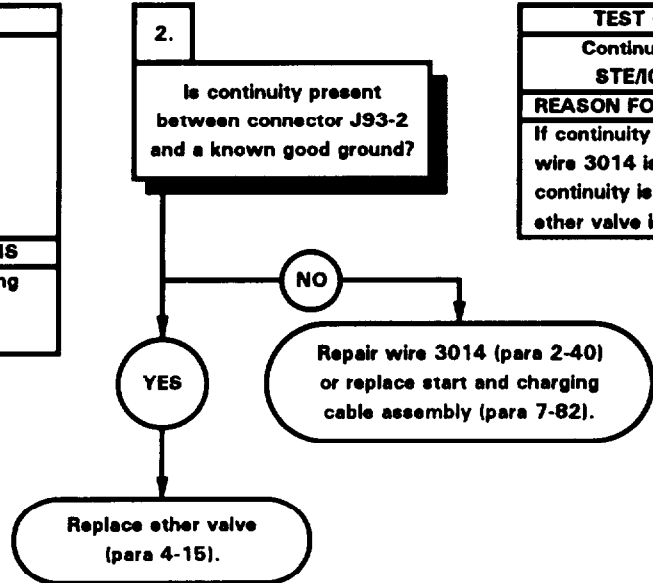
- (1) Disconnect connector clamp from ether valve connector.
- (2) Disconnect ether valve connector from connector J93.
- (3) Disconnect connector clamp from ether sensor connector.
- (4) Disconnect connector P42 from ether sensor connector.
- (5) Install jumper wire from connector P42-1 to connector 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 9-2320-365-10).
- (10) Press ether start switch (TM 9-2320-365-10) 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 9-2320-365-10).
- (13) Position master power switch to off (TM 9-2320-365-10).
- (14) Remove jumper wire from connector P42-1 and connector P42-2.
- (15) Connect connector P42 to ether sensor connector.
- (16) Lower cab (TM 9-2320-365-10).



X2E9701A

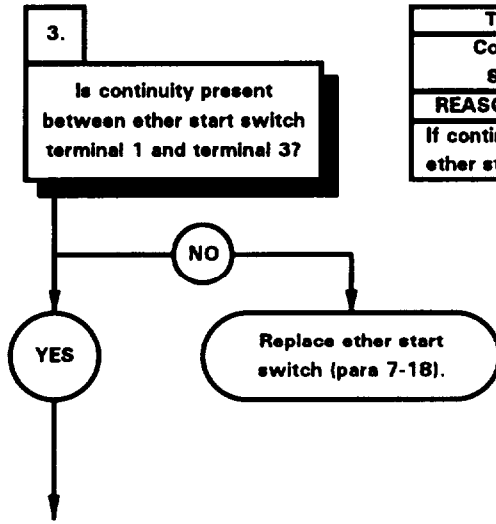
e93. ETHER START DOES NOT OPERATE (CONT)

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.

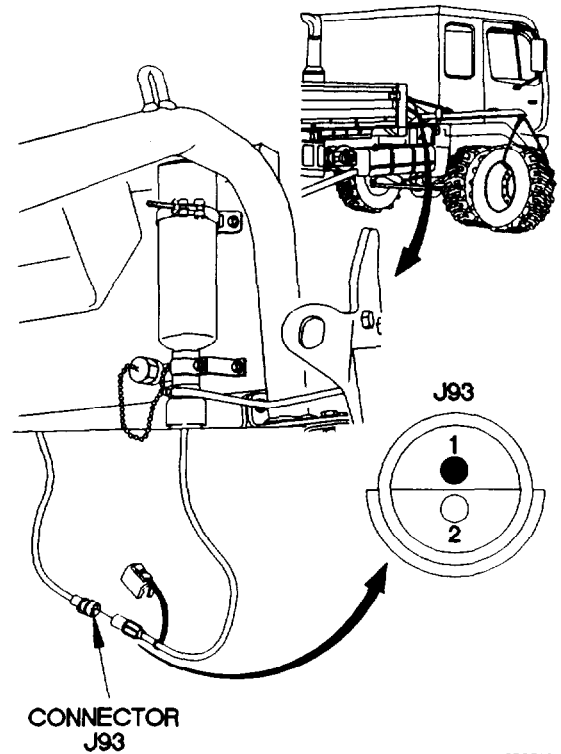
KNOWN INFO
Circuit breaker OK. Ether cylinder OK. Start and charging cable assembly OK. Ether valve OK.
POSSIBLE PROBLEMS
Faulty ether start switch. Faulty dashboard cable assembly. Faulty engine control cable assembly.



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

**CONTINUITY TEST**

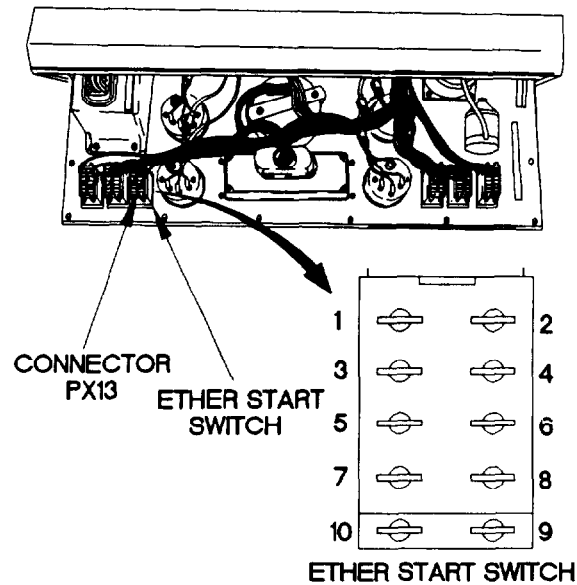
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J93-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3014 (para 2-40) or replace ether start and charging cable assembly (para 7-82).
- (5) If continuity is present, replace ether valve (para 4-15).
- (6) Raise spare tire (TM 9-2320-365-10).



X2E 9702A

**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 9-2320-365-10) and note reading on multimeter.
- (7) If continuity is not present, replace ether start switch (para 7-18).



**ETHER START SWITCH**

X2E 9703A

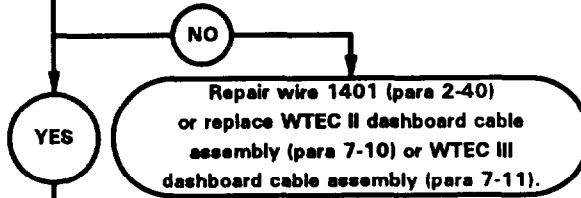
ø93. ETHER START DOES NOT OPERATE (CONT)

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

4. **WARNING**  
Do not work on energized parts.

Is 24 vdc present at connector PX13-17

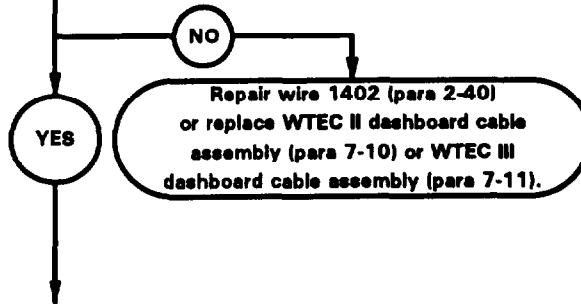
TEST OPTIONS
Voltage Test or STE/CE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1401 is faulty.



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

5. Is continuity present from connector J31-2 to connector PX13-3?

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



**WARNING**

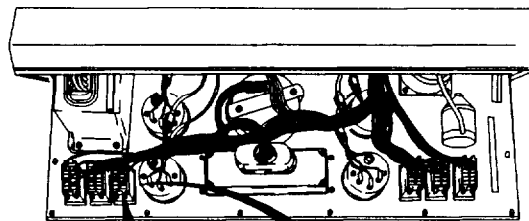
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**VOLTAGE TEST**

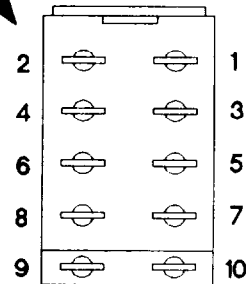
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector PX13-1.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1401 (para 2-40) 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 9-2320-365-10).

**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 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

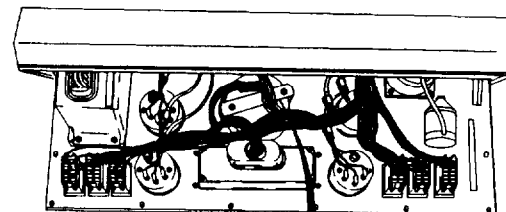


CONNECTOR PX13



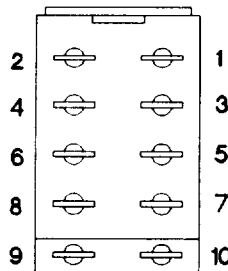
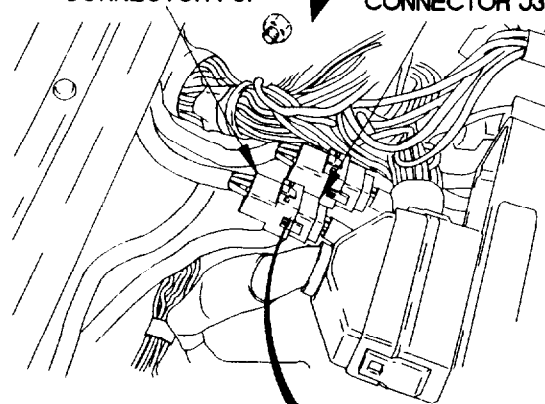
PX13

X2E9704A

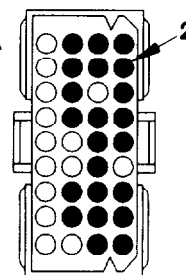


CONNECTOR P31

CONNECTOR J31



PX13



J31

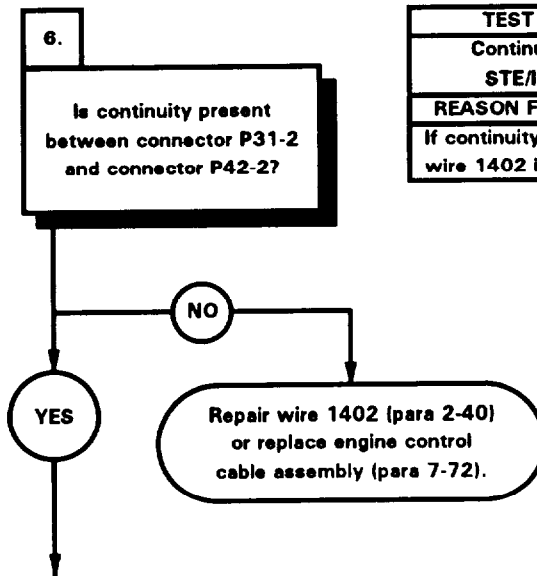
X2E9705A

e93. 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.



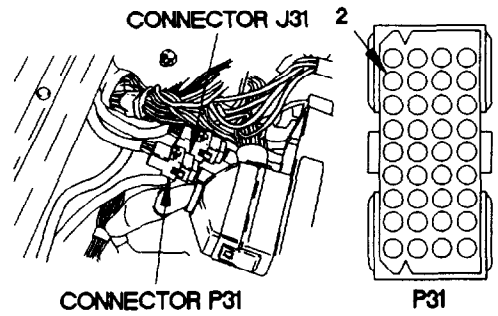
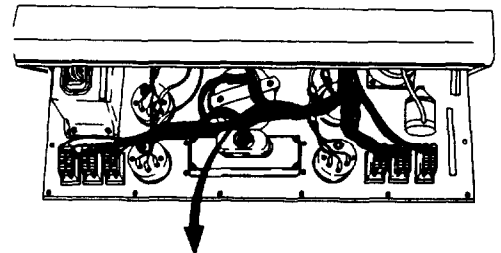
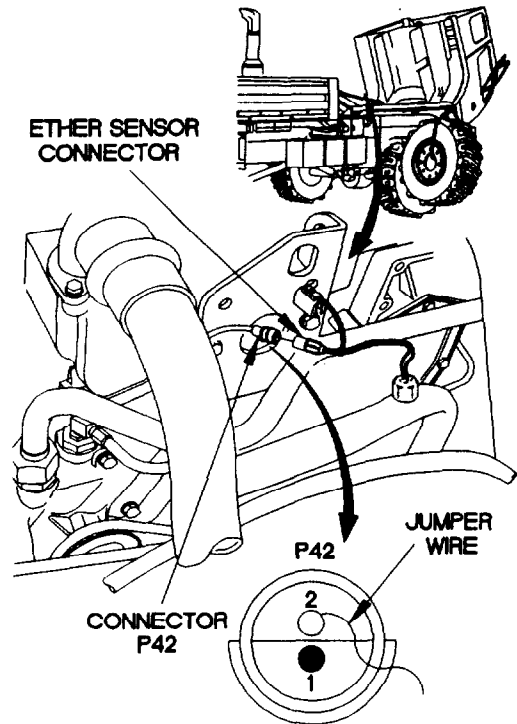
TEST OPTIONS
Continuity Test or STE/ICE-R #91

REASON FOR QUESTION
If continuity is not present, wire 1402 is faulty.

←

- CONTINUITY TEST**
- (1) Raise cab (TM 9-2320-365-10).
  - (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 2-40) or replace engine control cable assembly (para 7-72).



X2E9706A

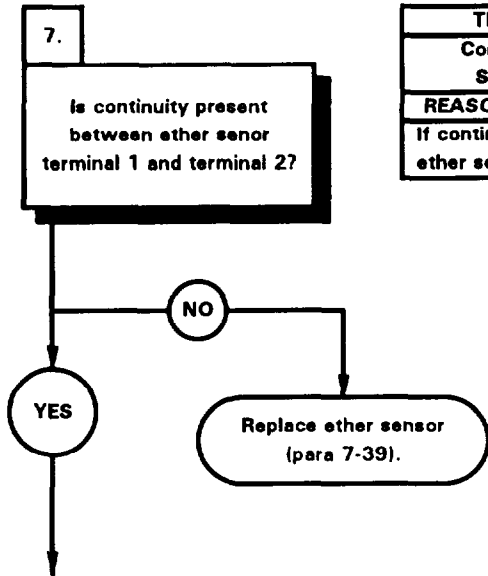


e93. ETHER START DOES NOT OPERATE (CONT)

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.



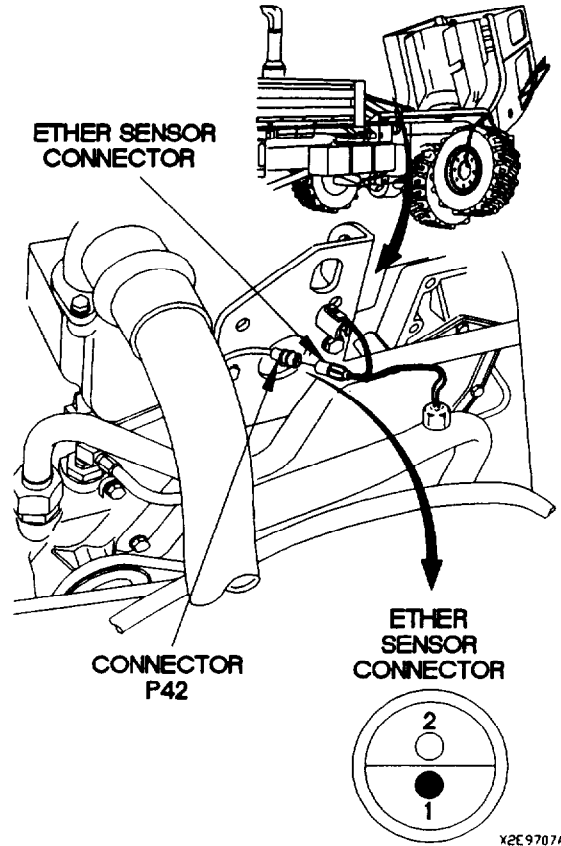
TEST OPTIONS
Continuity Test or STE/ICE-R #91

REASON FOR QUESTION
If continuity is not present, ether sensor is faulty.

←

- | <b>CONTINUITY TEST</b> |   |
|------------------------|---|
| (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 7-39).                                     |

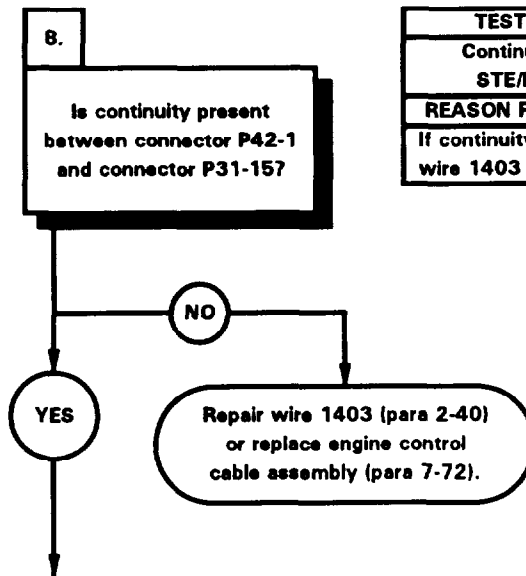


e93. ETHER START DOES NOT OPERATE (CONT)

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/CE-R #91

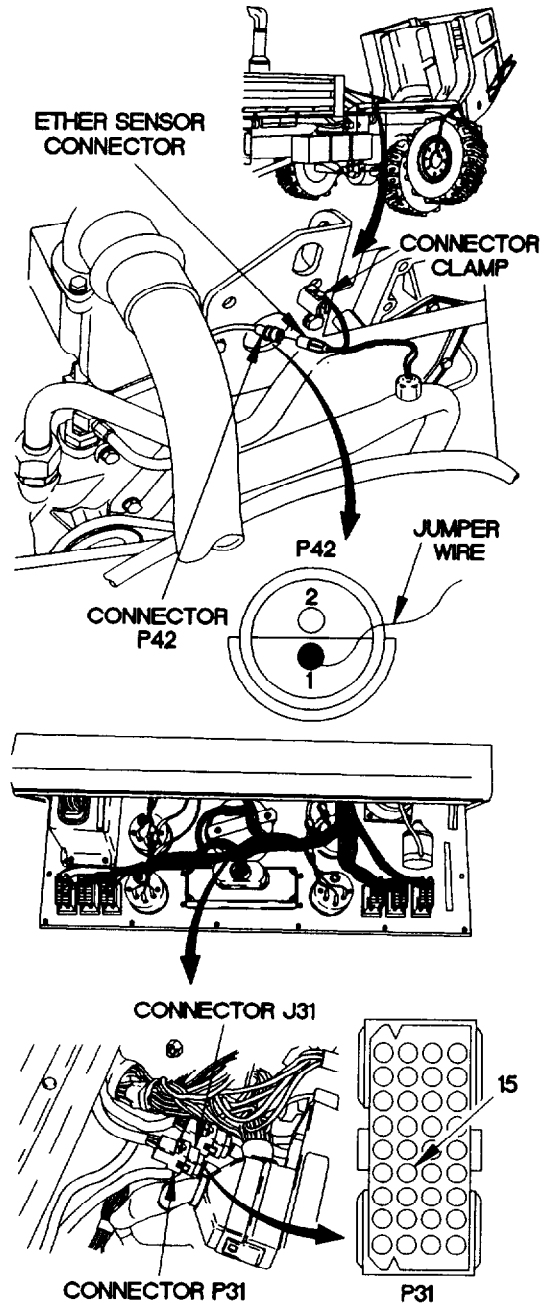
  

REASON FOR QUESTION
If continuity is not present, wire 1403 is faulty.

←

**CONTINUITY TEST**

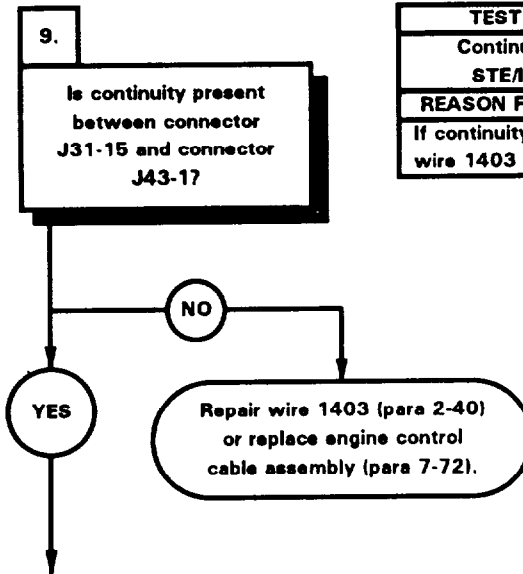
- (1) Set multimeter to ohms.
- (2) Connect jumper wire to connector P42-1.
- (3) Lower cab (TM 9-2320-365-10).
- (4) Connect positive (+) probe of multimeter to connector P31-15.
- (5) Connect negative (-) probe of multimeter to jumper wire and note reading on multimeter.
- (6) If continuity is not present, repair wire 1403 (para 2-40) or replace engine control cable assembly (para 7-72).
- (7) Raise cab (TM 9-2320-365-10).
- (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 9-2320-365-10).



K2E9708A

ø93. 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.

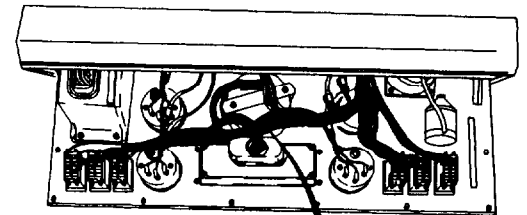


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1403 is faulty.



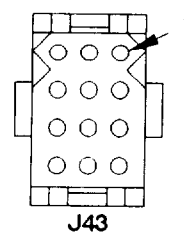
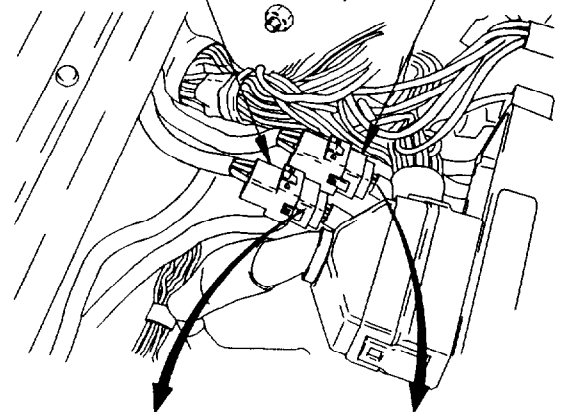
**CONTINUITY TEST**

- (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 2-40) or replace engine control cable assembly (para 7-72).

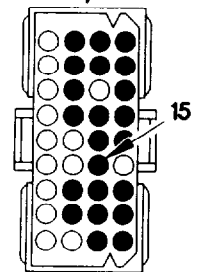


CONNECTOR  
J43

CONNECTOR  
J31



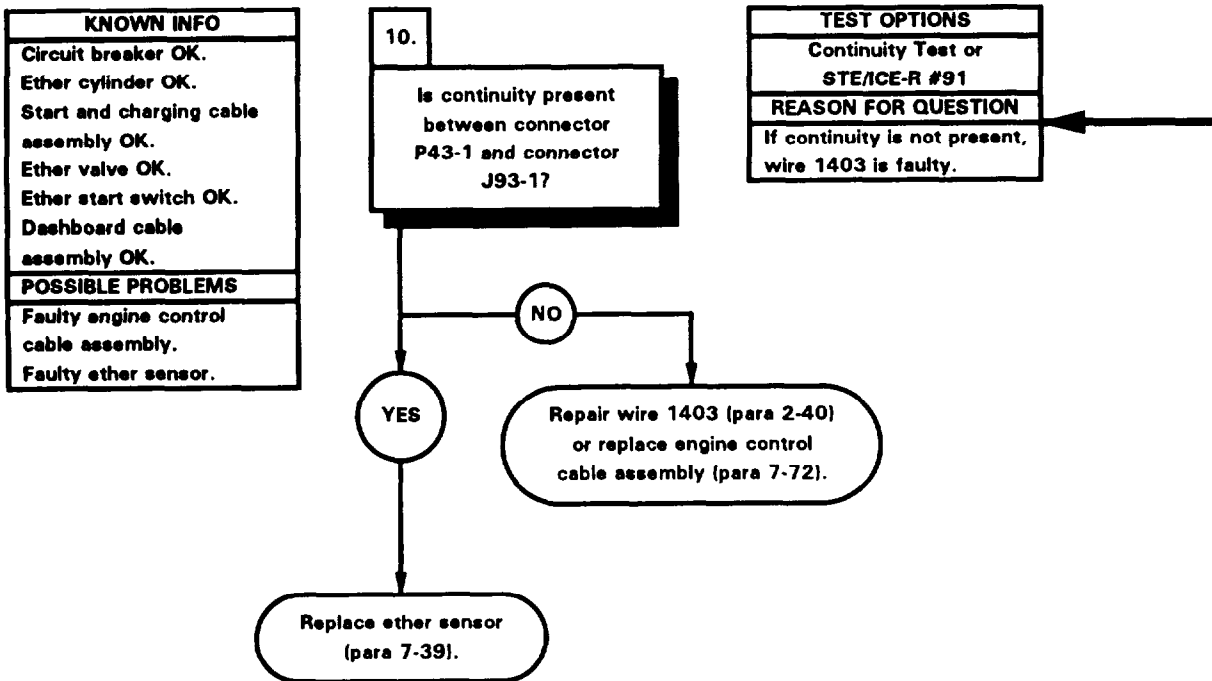
J43



J31

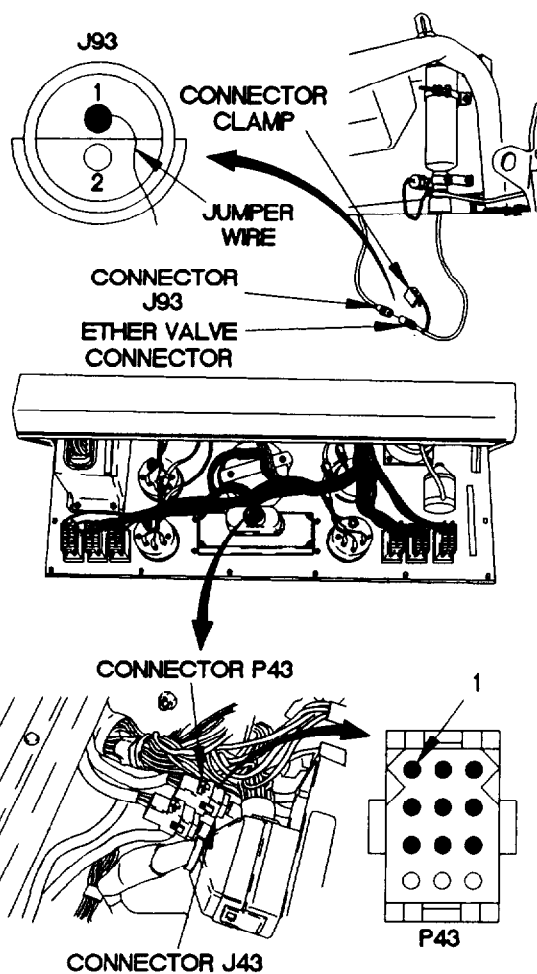
X2C9709A

e93. ETHER START DOES NOT OPERATE (CONT)



**CONTINUITY TEST**

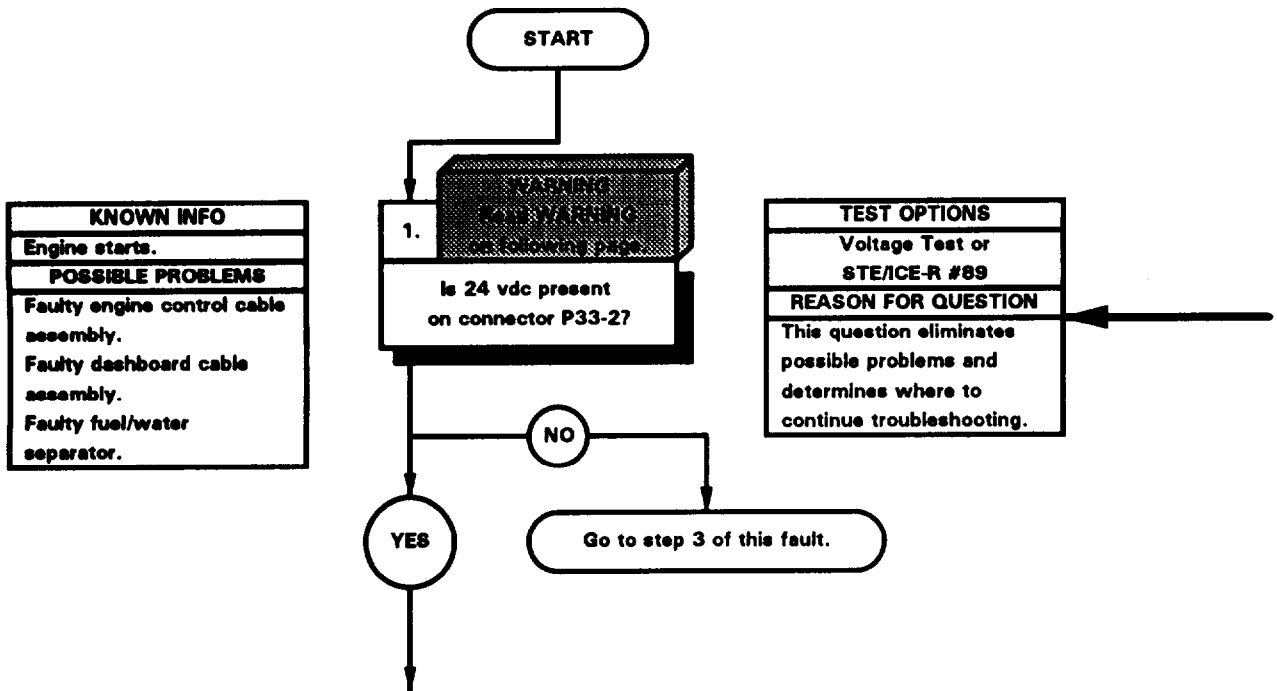
- (1) Set multimeter to ohms.
- (2) Connect jumper wire to connector J93-1.
- (3) Connect positive (+) probe of multimeter to connector P43-1.
- (4) Connect negative (-) probe of multimeter to jumper wire and note reading on multimeter.
- (5) If continuity is not present, repair wire 1403 (para 2-40) or replace engine control cable assembly (para 7-72).
- (6) If continuity is present, replace ether sensor (para 7-39).
- (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).



X2E97104



e94. EXCESSIVE CONDENSATION IN FUEL	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)
<b>References</b> TM 9-4910-571-12&P	

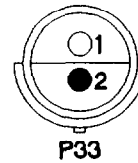
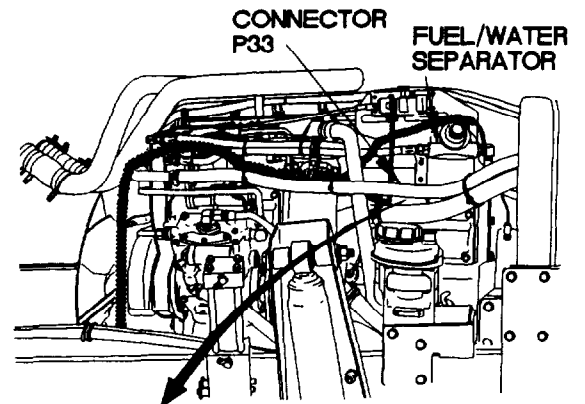


**WARNING**

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



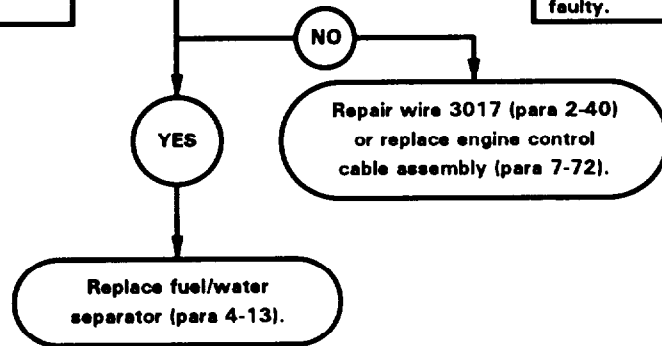
X2C9801A

e94. EXCESSIVE CONDENSATION IN FUEL (CONT)

KNOWN INFO
Engine starts. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty engine control cable assembly. Faulty fuel/water separator.

2.  
Is continuity present between connector P33-1 and a known good ground?

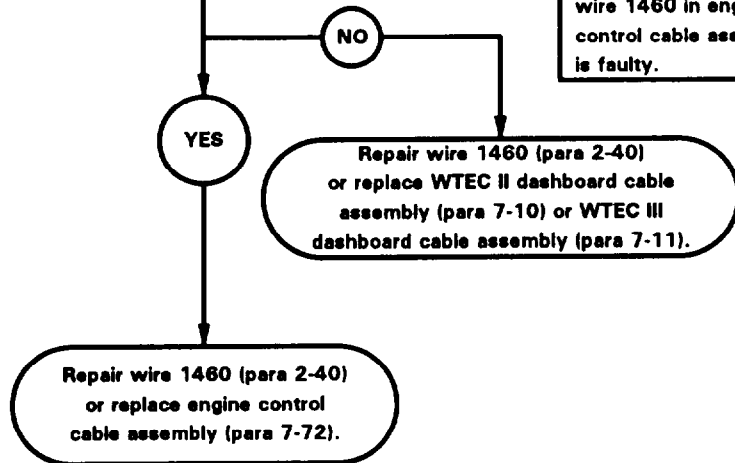
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3017 is faulty. If continuity is present, fuel/water separator is faulty.



KNOWN INFO
Engine starts. Fuel/water separator OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty engine control cable assembly.

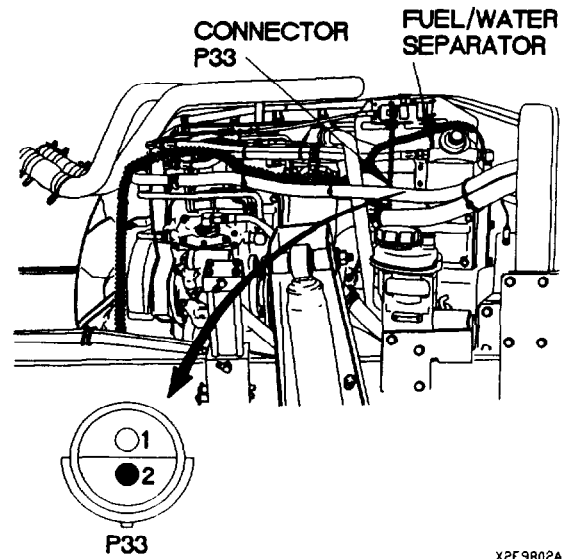
3. **WARNING**  
Read WARNING on following page.  
Is 24 vdc present on connector J31-13?

TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 24 vdc is not present, wire 1460 in dashboard cable assembly is faulty. If 24 vdc is present, wire 1460 in engine control cable assembly is faulty.



**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 2-40) or replace engine control cable assembly (para 7-72).
- (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 9-2320-365-10).



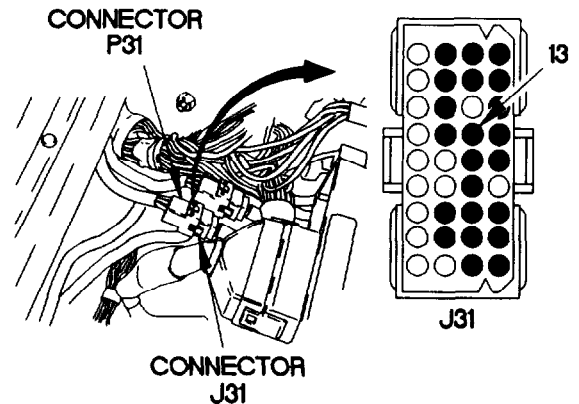
X2E9802A

**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.

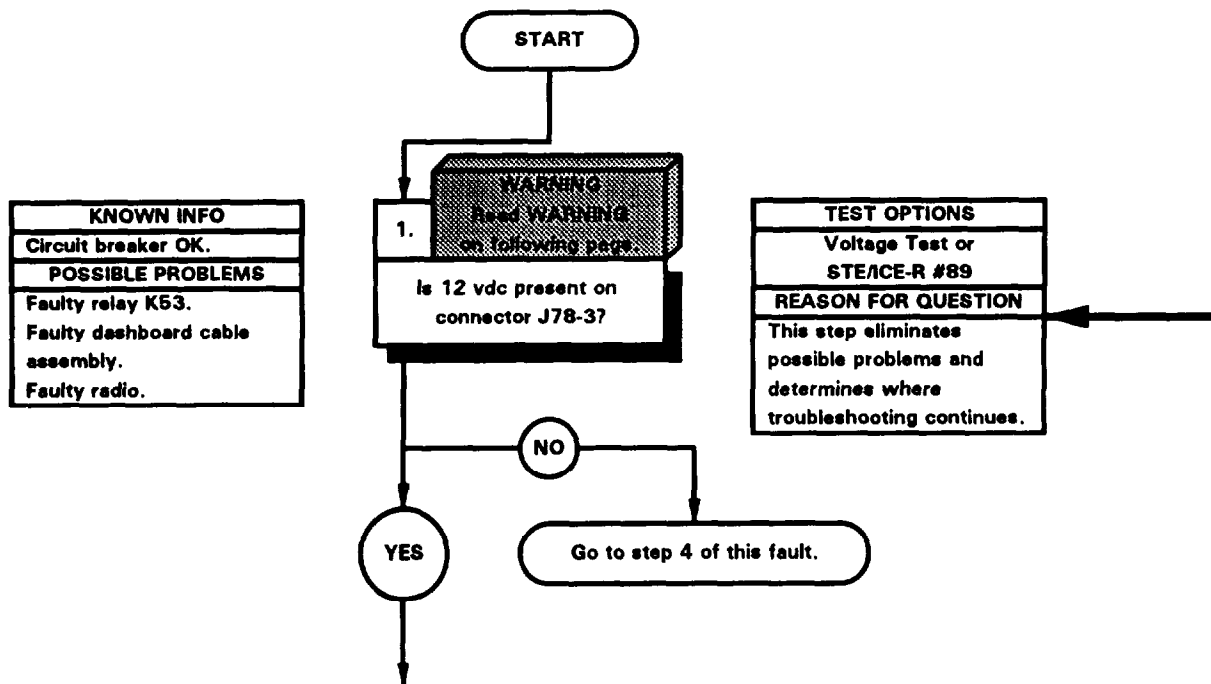
**VOLTAGE TEST**

- (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 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1460 (para 2-40) 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 2-40) or replace engine control cable assembly (para 7-72).
- (9) Position master power switch to off (TM 9-2320-365-10).
- (10) Connect connector P31 to connector J31.
- (11) Install instrument panel assembly on (para 7-15).



X2E9803A

95. RADIO DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/CE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-671-12&P

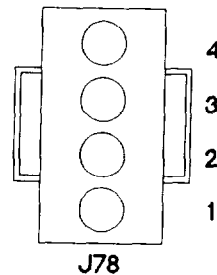
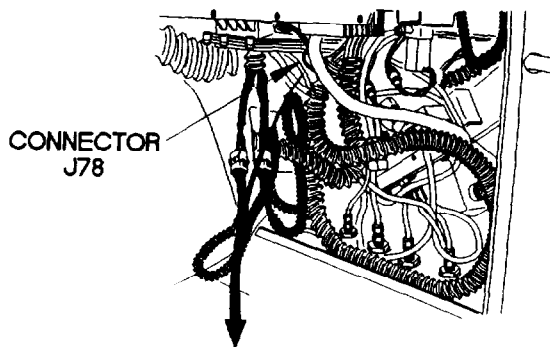


**WARNING**

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short 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 9-2320-365-10) 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 9-2320-365-10).



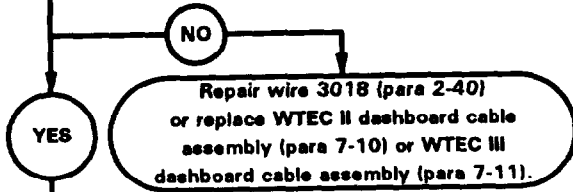
32E9901A

e95. RADIO DOES NOT OPERATE (CONT)

<b>KNOWN INFO</b>
Circuit breaker OK. Relay K53 OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly. Faulty radio.

2.  
Is continuity present between connector J78-2 and a known good ground?

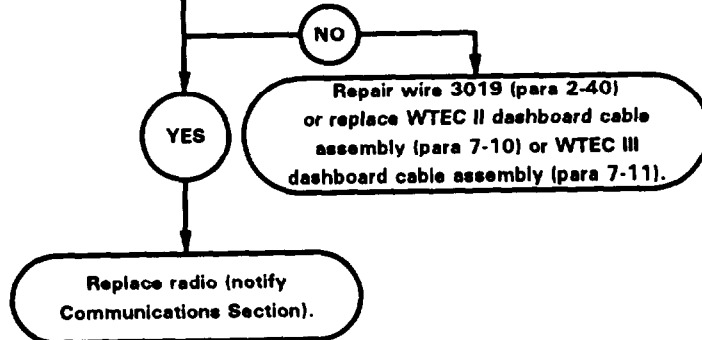
<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 3018 is faulty.



<b>KNOWN INFO</b>
Circuit breaker OK. Relay K53 OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly. Faulty radio.

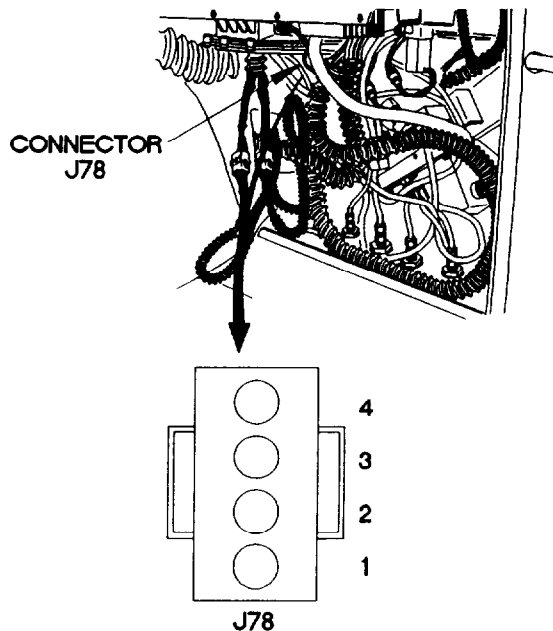
3.  
Is continuity present between connector J78-4 and a known good ground?

<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #91
<b>REASON FOR QUESTION</b>
If continuity is not present, wire 3019 is faulty. If continuity is present, radio is faulty.



**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 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



**CONTINUITY TEST**

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J78-4.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3019 (para 2-40) 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).

32E9901A

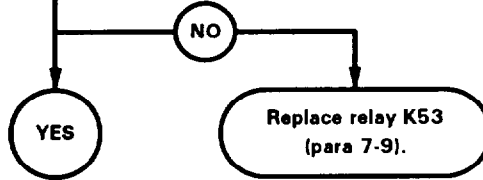


e95. RADIO DOES NOT OPERATE (CONT)

<b>KNOWN INFO</b>
Circuit breaker OK. Radio OK.
<b>POSSIBLE PROBLEMS</b>
Faulty relay K53. Faulty dashboard cable assembly.

4.  
Is continuity present between relay K53 terminals 30 and 87A?

<b>TEST OPTIONS</b>
Continuity Test or STE/CE-R #81
<b>REASON FOR QUESTION</b>
If continuity is not present, relay K53 is faulty.

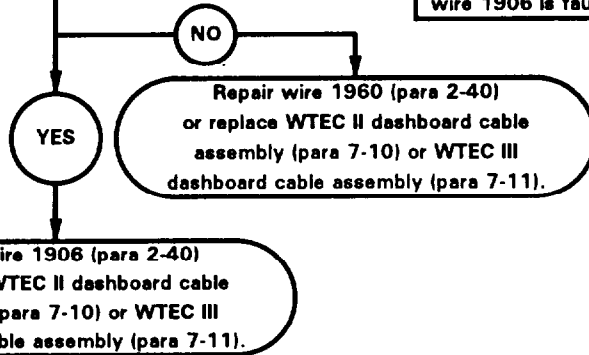


<b>KNOWN INFO</b>
Circuit breaker OK. Radio OK. Relay K53 OK.
<b>POSSIBLE PROBLEMS</b>
Faulty dashboard cable assembly.

5.  
Is 24 vdc present at relay K53 terminal 857?

**WARNING**  
Read WARNING on following page.

<b>TEST OPTIONS</b>
Voltage Test or STE/CE-R #89
<b>REASON FOR QUESTION</b>
If 24 vdc is not present, wire 1960 is faulty. If 24 vdc is present, wire 1906 is faulty.



**CONTINUITY TEST**

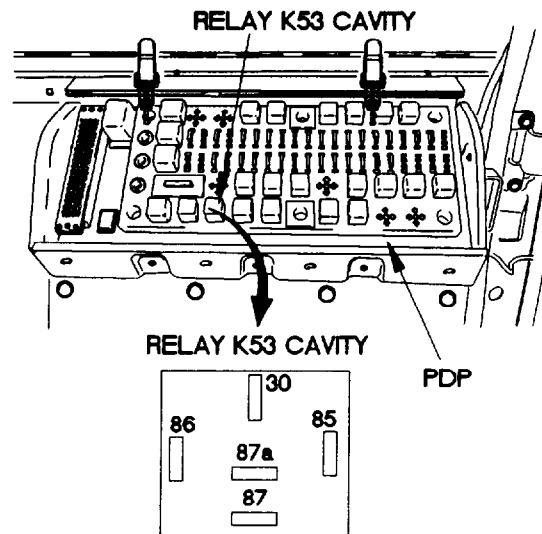
- (1) Remove relay K53 from PDP.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to relay K53 terminal 30.
- (4) Connect negative (-) probe of multimeter to relay K53 terminal 87A and note reading on multimeter.
- (5) If continuity is not present, replace relay K53 (para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

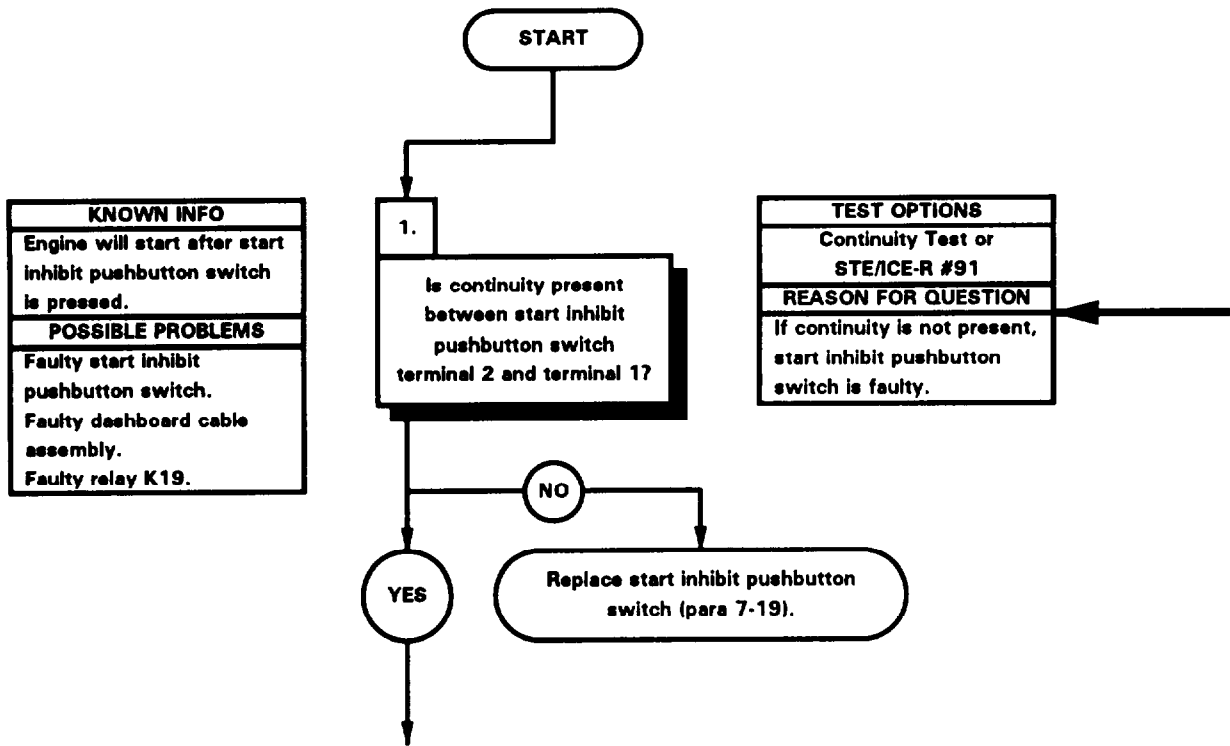
**VOLTAGE TEST**

- (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 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1960 (para 2-40) 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 2-40) 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 9-2320-365-10).
- (8) Install relay K53 in PDP.
- (9) Connect connector J78 to radio.
- (10) Install kick panel (para 16-3).



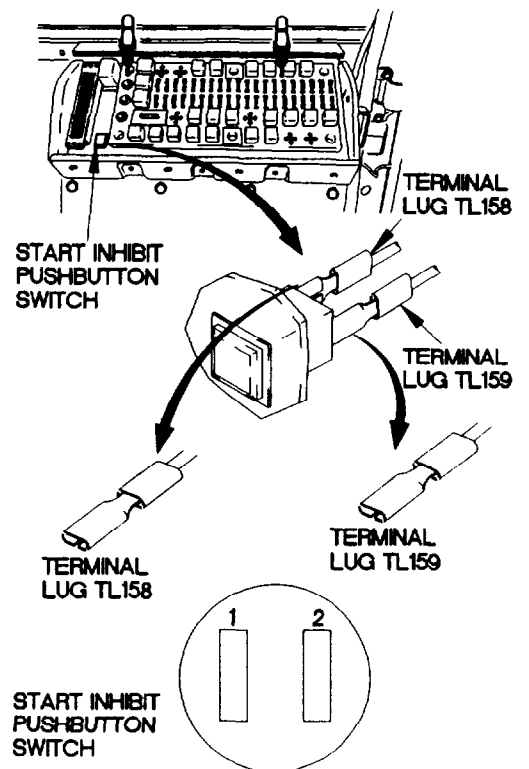
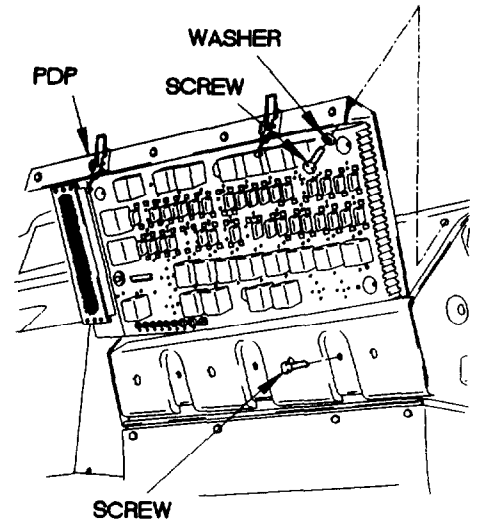
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e96. START INHIBIT PUSHBUTTON DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P
<b>Materials/Parts</b> Wire, Elect, 50 ft (Item 77, Appendix D)	



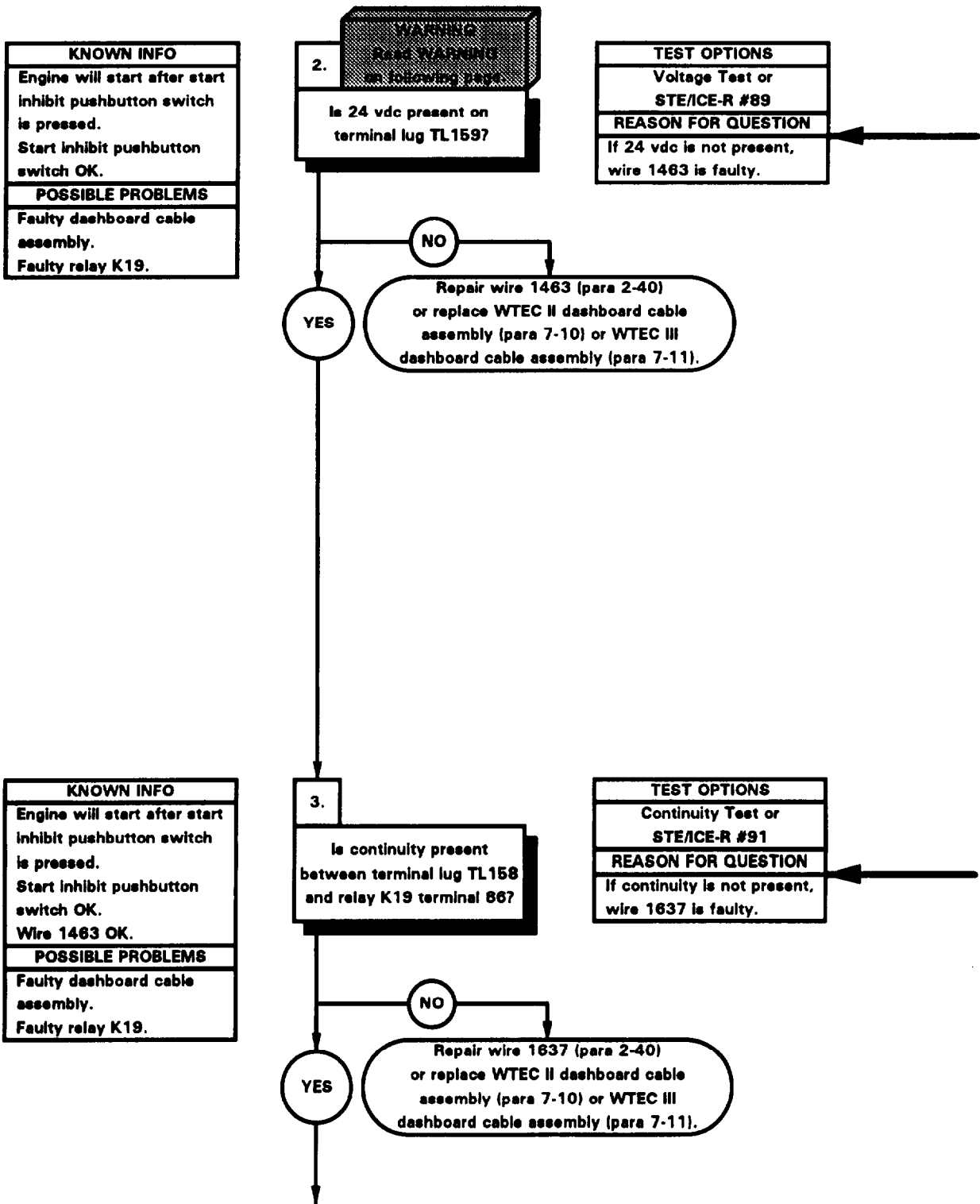
**CONTINUITY TEST**

- (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 9-2320-365-10) 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.



x2E J0011

e96. START INHIBIT PUSHBUTTON DOES NOT OPERATE (CONT)



**WARNING**

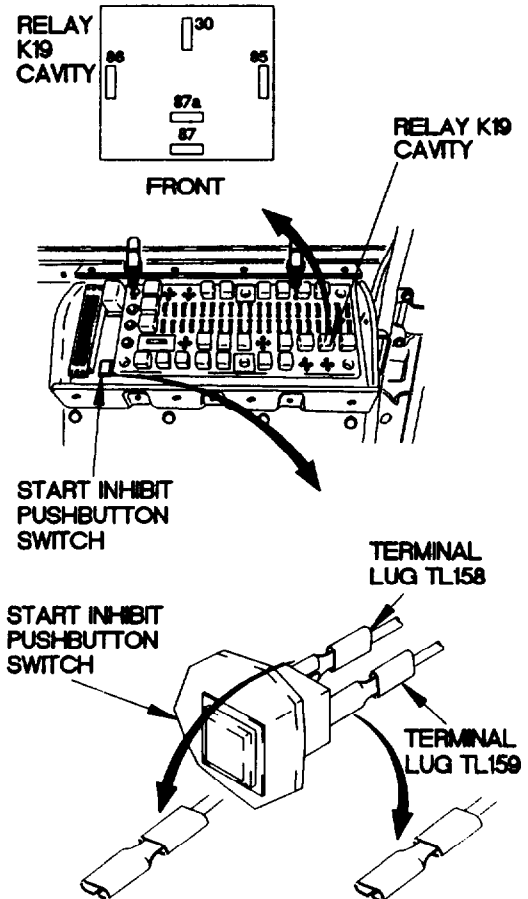
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**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 9-2320-365-10) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 1463 (para 2-40) 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 9-2320-365-10).

**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 2-40) 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.



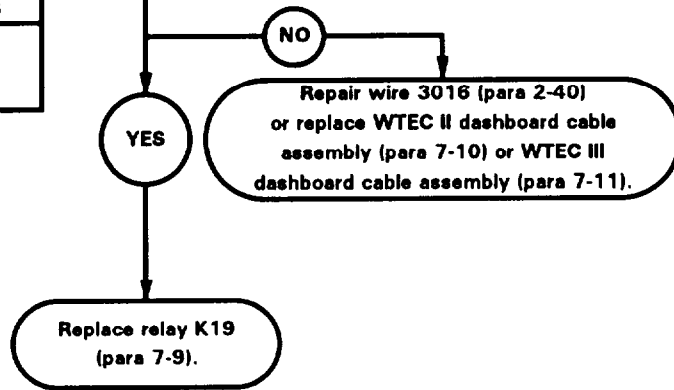
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e96. START INHIBIT PUSHBUTTON DOES NOT OPERATE (CONT)

KNOWN INFO
Engine will start after start inhibit pushbutton switch is pressed. Start inhibit pushbutton switch OK. Wire 1463 OK. Wire 1637 OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K19.

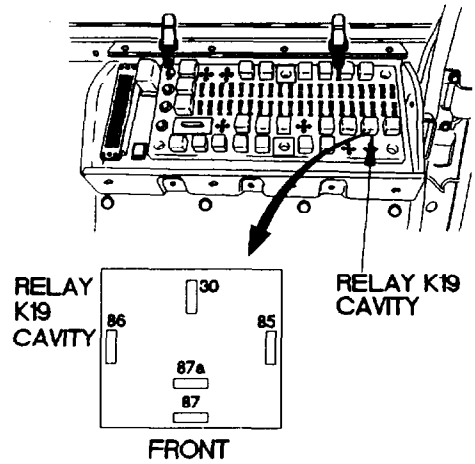
4.  
Is continuity present between relay K19 terminal 85 and a known good ground?

TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3016 is faulty. If continuity is present, relay K19 is faulty.



**CONTINUITY TEST**

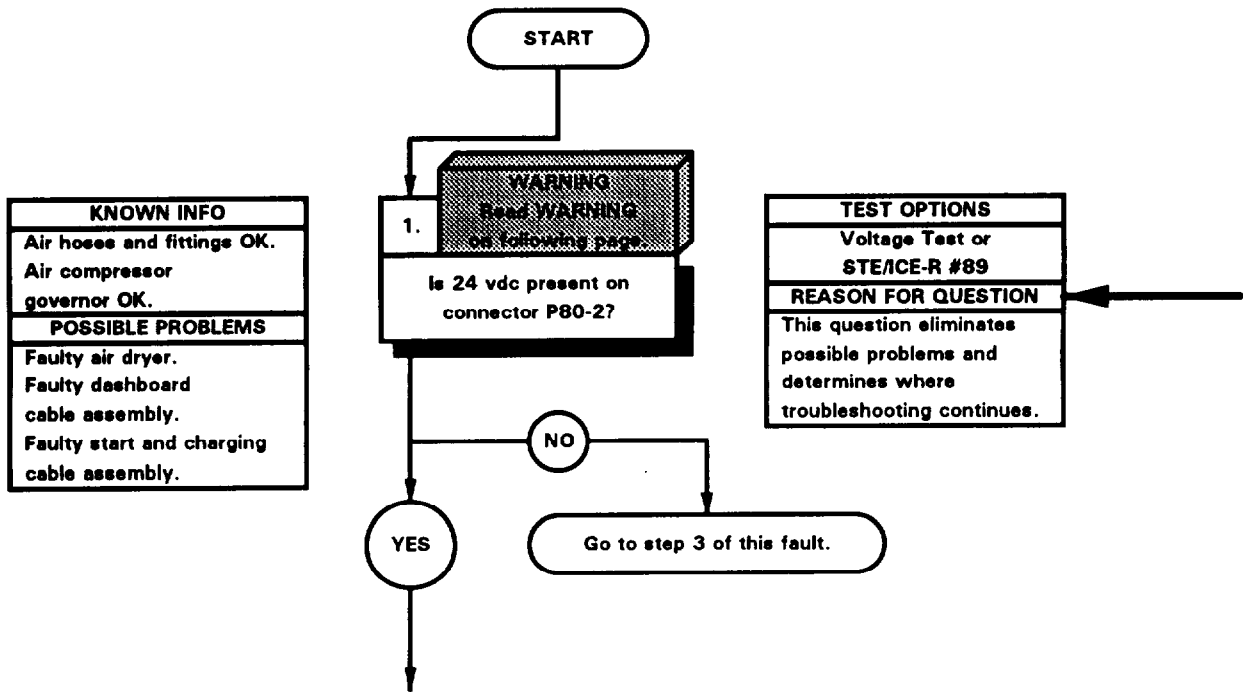
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K19 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3016 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) If continuity is present, replace relay K19 (para 7-9).
- (6) Install relay K19 in PDP.
- (7) Install PDP cover (para 16-2).



X2E J003A



e97. AIR DRYER DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C)
<b>Personnel Required</b> (2)	<b>References</b> TM 9-4910-571-12&P

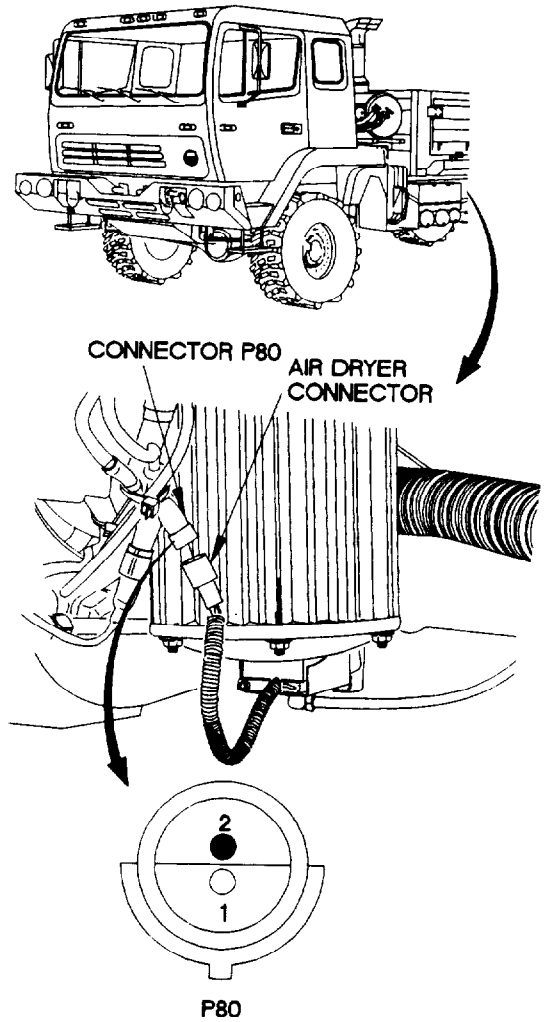


**WARNING**

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.

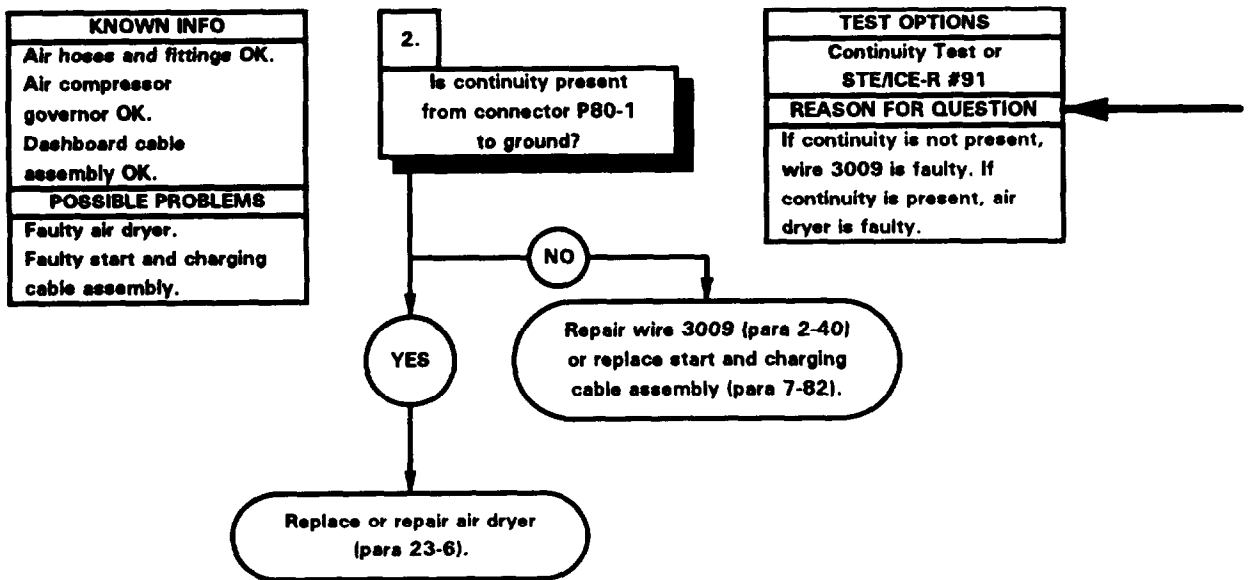
**VOLTAGE TEST**

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



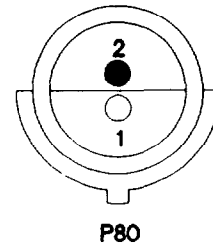
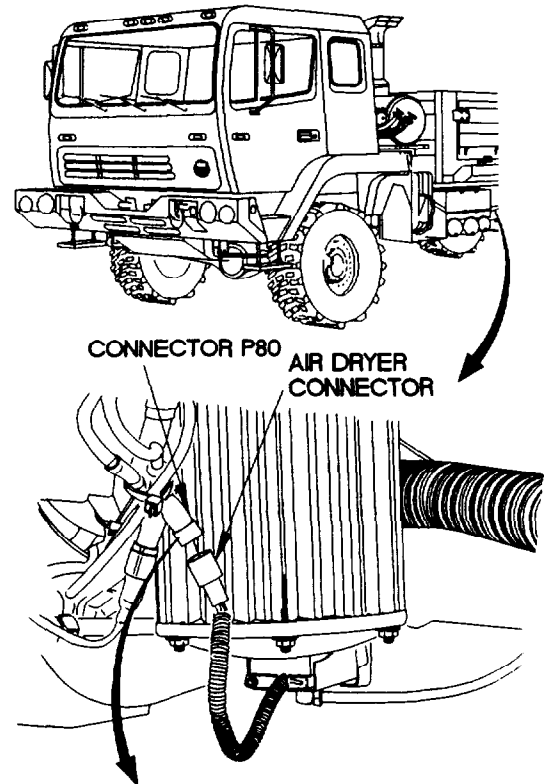
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e97. AIR DRYER DOES NOT OPERATE (CONT)



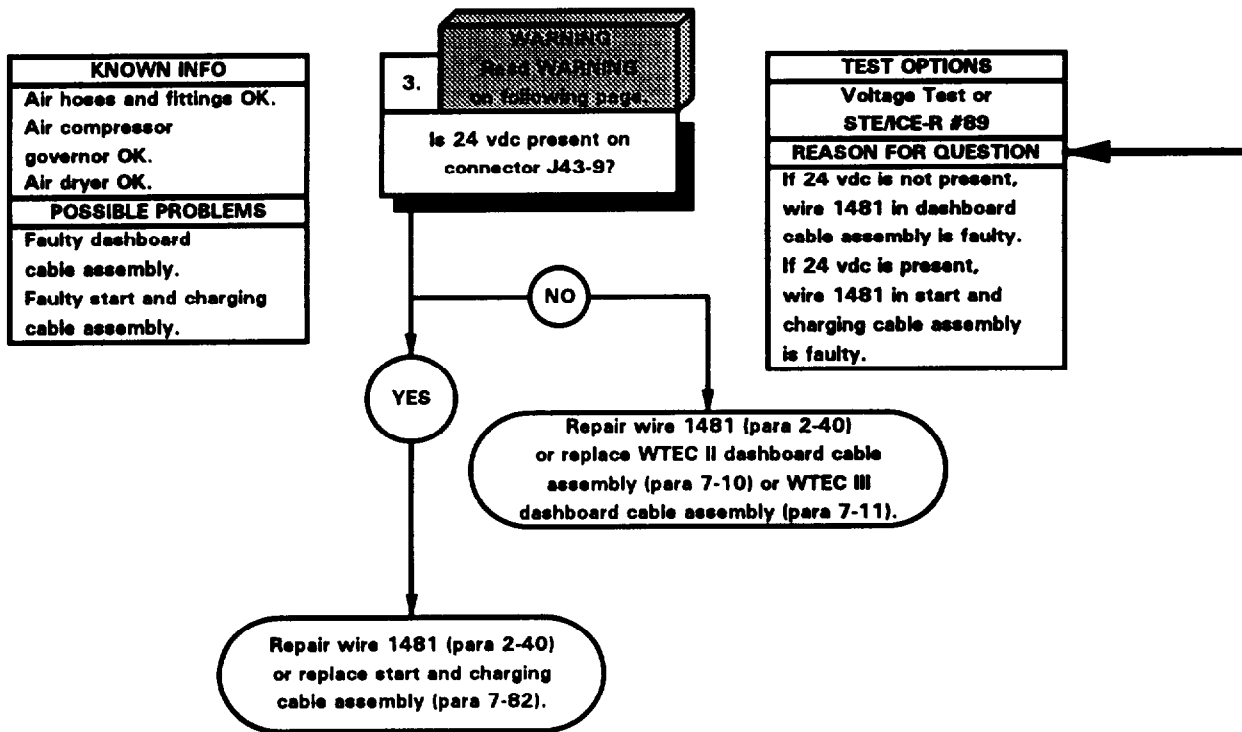
**CONTINUITY TEST**

- (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 2-40) or replace start and charging cable assembly (para 7-82).
- (5) If continuity is present, replace or repair air dryer (para 23-6).
- (6) Connect connector P80 to air dryer connector.



42E J102A

e97. AIR DRYER DOES NOT OPERATE (CONT)

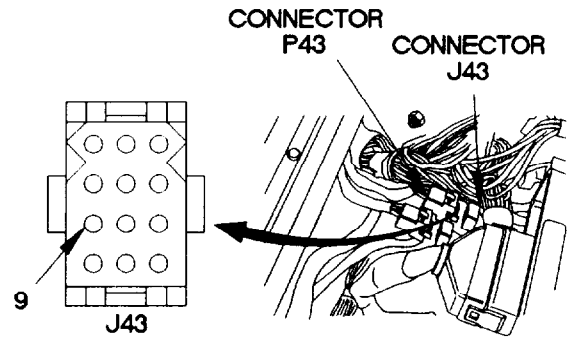


**WARNING**

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.

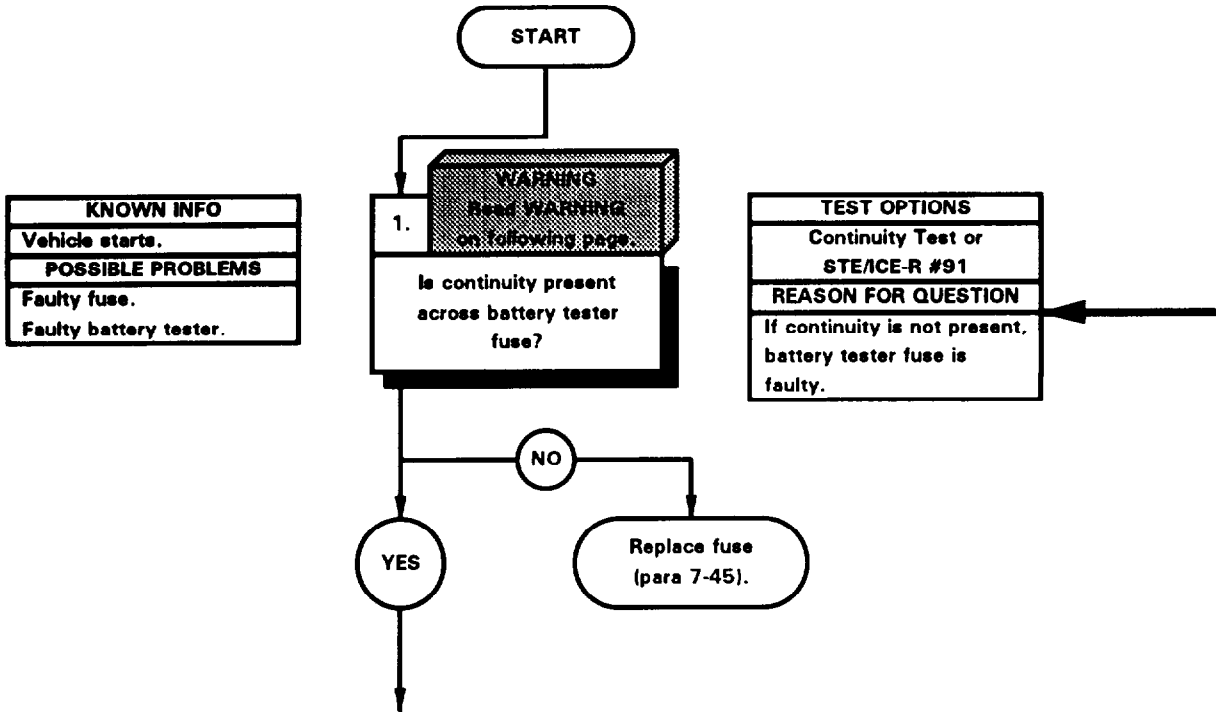
**VOLTAGE TEST**

- (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 9-2320-365-10) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1481 (para 2-40) 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 2-40) or replace start and charging cable assembly (para 7-82).
- (9) Position master power switch to off (TM 9-2320-365-10).
- (10) Connect connector J43 to connector P43.
- (11) Install instrument panel assembly (para 7-15).



42E J203A

●98. BATTERY TESTER DOES NOT OPERATE	
<b>INITIAL SETUP</b>	
<b>Equipment Condition</b> Engine shut down (TM 9-2320-365-10).	<b>Tools and Special Tools</b> STE/ICE-R (Item 39, 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)
<b>Personnel Required</b> (2)	
<b>References</b> TM 9-4910-671-12&P	

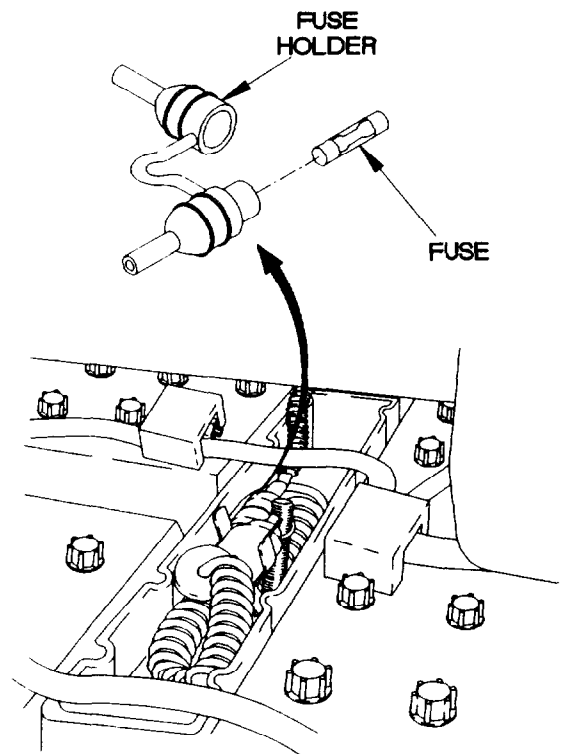


**WARNING**

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short 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**

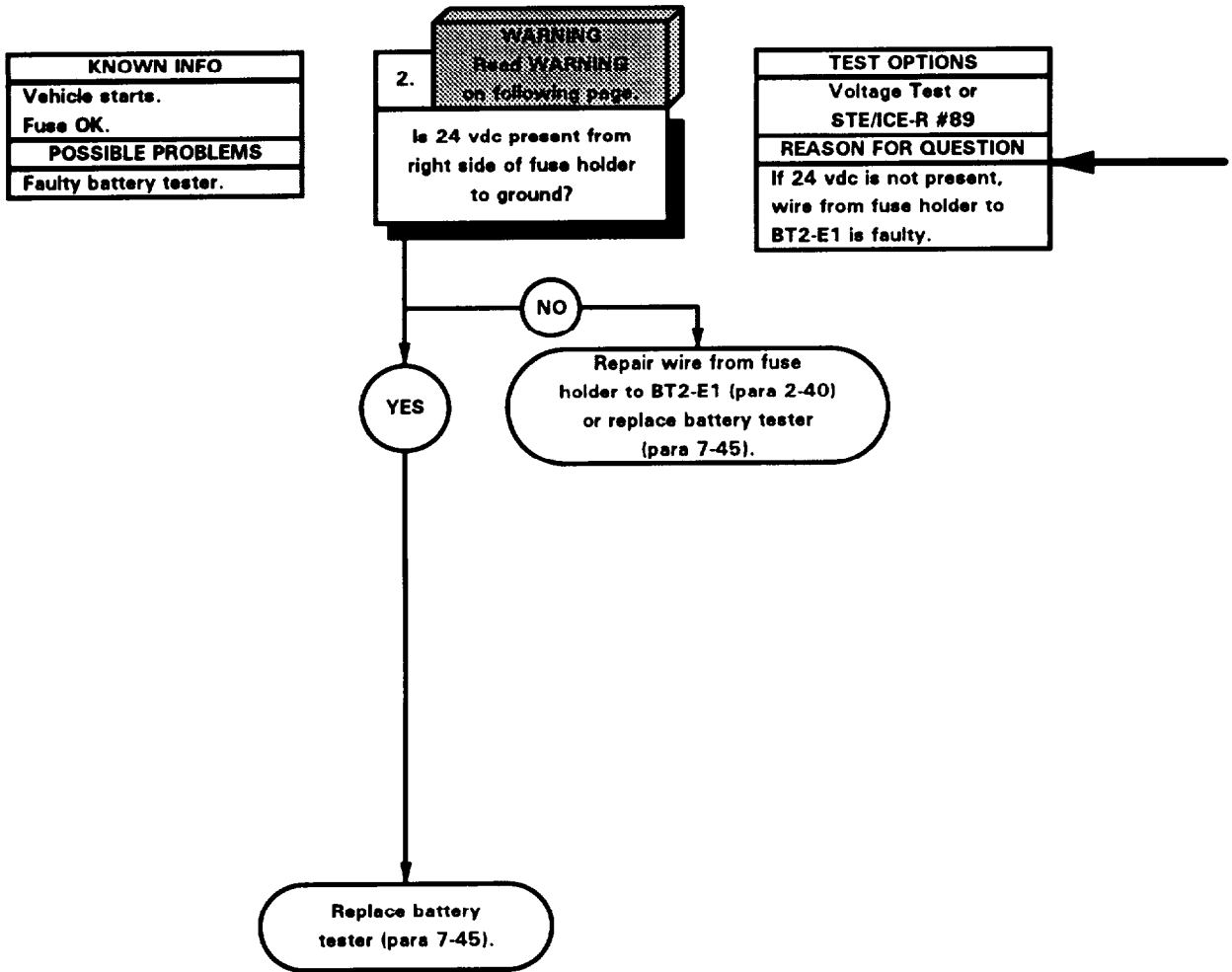
- (1) Remove battery box cover (TM 9-2320-365-10).
- (2) Open fuse holder on battery tester.
- (3) Remove fuse from fuse holder.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to one end of fuse.
- (6) Connect negative (-) probe of multimeter to other end of fuse and note reading on multimeter.
- (7) If continuity is not present, replace battery tester 3 milliamp fuse (para 7-45).



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e98. BATTERY TESTER DOES NOT OPERATE (CONT)

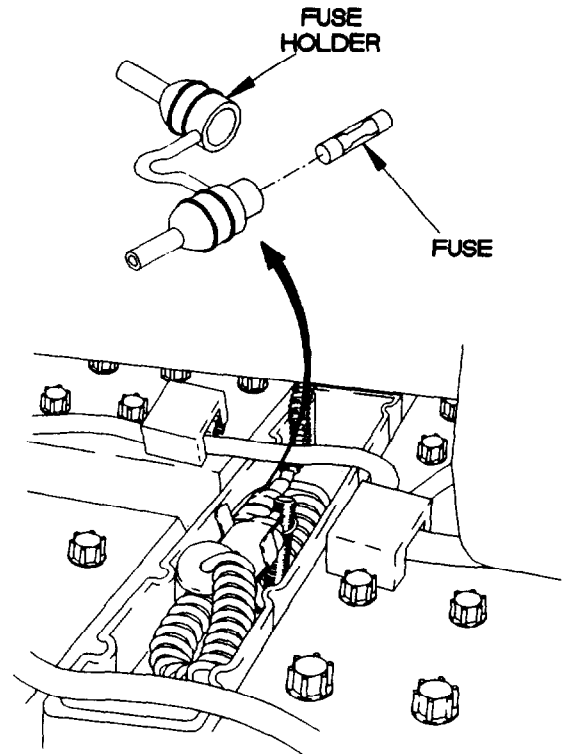


**WARNING**

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 burn 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 2-40) or replace battery tester (para 7-45).
- (5) If 24 vdc is present, replace battery tester (para 7-45).
- (6) Install fuse in battery tester fuse holder.
- (7) Close battery tester fuse holder.
- (8) Install battery box cover (TM 9-2320-365-10).



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## APPENDIX A REFERENCES

### A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals, and other publications referenced in this manual. Those publications that should be consulted for additional information about vehicle operations are also listed.

### A-2. PUBLICATIONS INDEX

The following index should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

Consolidated Index of Army Publications and Blank Forms . . . . . DA Pam 25-30

### A-3. FORMS

The following forms pertain to this manual. See DA Pam 25-30 for index of blank forms. See DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to this material.

Equipment Control Record . . . . .	DA Form 2408-9
Equipment Inspection and Maintenance Worksheet . . . . .	DA Form 2404
Maintenance Request . . . . .	DA Form 2407
Packaging Improvement Report . . . . .	DD Form 6
Processing and Deprocessing Record of Shipping, Storage, and Issue of Vehicles and Spare Engines . . . . .	DD Form 1397
Product Quality Deficiency Report . . . . .	SF 368
Recommended Changes to DA Publications and Blank Forms . . . . .	DA Form 2028-2
Report of Item Discrepancy (ROID) . . . . .	SF 364

### A-4. OTHER PUBLICATIONS

The following publications contain information pertinent to the LMTV and associated equipment.

a. Safety.

First Aid for Soldiers . . . . .	FM 21-11
Security of Tactical Wheeled Vehicles . . . . .	TB 9-2300-422-20
Safety Inspection and Testing of Lifting Devices . . . . .	TB 43-0142

**A-4. OTHER PUBLICATIONS (CONT)**

**b. LMTV.**

Direct Support and General Support Maintenance Manual for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-34

Hand Receipt Covering Contents of Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL), for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicles (LMTV) . . . . . TM 9-2320-365-10-HR

Operator's Manual for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-10

Unit, Direct Support, and General Support Repair Parts and Special Tools List for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-34P

Warranty Program for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TB 9-2300-365-15

**c. General Vehicle Operation.**

Army Motor Transport Units and Operations . . . . . FM 55-30

Deepwater Fording of Ordnance Material . . . . . TM 9-238

Manual for the Wheeled Vehicle Driver . . . . . FM 21-305

Safety Prevention of Motor Vehicle Accidents . . . . . AR 385-55

Vehicle Recovery Operations . . . . . FM 20-22

**d. General Maintenance and Repair.**

Army Oil Analysis Program . . . . . TB 43-0211

Camouflage Pattern Painting . . . . . FM 5-20

Charging System Troubleshooting . . . . . DA Pam 750-33

Color, Marking, and Camouflage Painting of Military Vehicles . . . . . TB 43-0209

Cooling Systems: Tactical Vehicles . . . . . TM 750-254

Corrosion Prevention and Control Including Rustproofing Procedures for Tactical Vehicles and Trailers . . . . . TB 43-0213

Description, Use, Bonding Techniques, and Properties of Adhesives . . . . . TB ORD 1032

Equipment Improvement Report and Maintenance Digest: TACOM Equipment . . . . . TB 43-0001-39-1

Equipment Improvement Report and Maintenance Summary . . . . . TM 43-0143

Installation Instructions for Installation Kit, Electronic Equipment, MK-2700/VRC (NSN 5895-01-421-0814) (EIC: N/A) to Permit Installation of Radio Set AN/VRC-87/88/90 Series into M1078, M1080, M1081, M1083-M1086, M1088-M1094 and M1096 Family of Medium Tactical Vehicles . . . . . TB 11-5820-890-20-101

Installation Instructions for Installation Kit, Electronic Equipment, MK-2715/VRC (NSN 5895-01-421-0812) (EIC: N/A) to Permit Installation of Radio Set AN/VRC-89/91/92 Series into M1078, M1080, M1081, M1083-M1086, M1088-M1094 and M1096 Family of Medium Tactical Vehicles . . . . . TB 11-5820-890-20-92

Metal Body Repair and Related Operations . . . . . FM 43-2

Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials Including Chemicals . . . . . TM 9-247

Operator's and Organizational Maintenance Manual for Radio Sets . . . . . TM 110-5820-498-12

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.. .....	FM5-125
Use and Care of Hand Tools and Measuring Tools .....	TM 9-243
Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems .....	TB 750-651
Welding Theory and Application .....	TM 9-237

**e. Cold Weather Operation.**

Basic Cold Weather Manual .....	FM 31-70
Northern Operations .....	FM 31-71
Operation and Maintenance of Ordnance Materiel in Cold Weather (0° to -65°F) .....	FM 9-207

**f. Decontamination.**

Decontamination Operations Facilities & Equipment .....	TB 700-4
NBC Protection .....	FM3-4
NBC Decontamination .....	FM 3-5

**g. Maintenance of Special Purpose Kits.**

Operator and Organizational Maintenance Manual for Chemical Alarm .....	TM 3-6665-225-12
Operator's and Unit Maintenance Manual Including Repair Parts and Special Tools List for Decontaminating Apparatus: M13 .....	TM 3-4230-214-12&P
Operator's, Organizational, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List for Various Machine Gun Mounts .....	TM 9-1005-245-14
Operator's, Organizational, Direct Support, and General Support Maintenance Manual, Air Conditioner, Horizontal Compact, 18,000 BTU/HR, 208 Volt, 3 Phase, 50/60 Hertz, Model F18H-3S .....	TM 5-4120-384-14
Unit and Direct Support Maintenance, Repair Parts and Special Tools List for Heater, Space, Multifuel with Blower, 60,000 BTU/HR, 120V, Model UH-68G, NSN 4520-01-203-4410, and Model UH-68G1, NSN 4520-01-297-6803 .....	TM 5-4520-253-23P

**h. General.**

Operator's Manual (M998 Series) .....	TM 9-2320-280-10
Operator's Manual (M1008 Series) .....	TM 9-2320-289-10
Operator's Manual (M35 Series) .....	TM 9-2320-361-10
Operator's Manual (M939 Series) .....	TM 9-2320-272-10
Principles of Automotive Vehicles .....	TM 9-8000
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (US Army Tank-automotive and Armaments Command) .....	TM 750-244-6
Route Reconnaissance and Classification .....	FM 5-36
Soldier's Manual MOS 88M Motor Transport Operator, Skill Levels 1/2 .....	STP 55-88-M12-SM

**A-4. OTHER PUBLICATIONS (CONT)**

**i. Land, Sea, and Air Shipment.**

Airdrop of Supplies and Equipment: Rigging 2 1/2-Ton Trucks ..... FM 10-520  
Containerization of Military Vehicles ..... MTMCTEA Ref 95-55-23  
Lifting and Tiedown of U.S. Military Helicopters ..... MTMCTEA Ref 95-55-21  
Marine Lifting and Lashing Handbook ..... MTMCTEA Ref 95-55-22  
Marine Terminal Lifting Guidance ..... MTMCTEA Pam 56-1  
Multiservice Helicopter External Air Transport: Basic Operations and Equipment ..... FM 55-450-3  
Multiservice Helicopter External Air Transport: Dual-Point Load Rigging Procedures ..... FM 55-450-5  
Multiservice Helicopter External Air Transport: Single-Point Load Rigging Procedures ..... FM 55-450-4  
Standard Characteristics (Dimensions, Weight, and Cube) for Transportability of Military  
Vehicles and Other Outsize/Overweight Equipment (in TOE Line Sequence) ..... TB 55-46-1  
Tiedown Handbook for Rail Movements ..... MTMCTEA Pam 55-19  
Tiedown Handbook for Truck Movements ..... MTMCTEA Ref 92-55-20

# APPENDIX B MAINTENANCE ALLOCATION CHART (MAC)

## SECTION I

### INTRODUCTION

#### B-1. The Army Maintenance System MAC.

a. This introduction (Section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

**Unit** - includes two subcolumns, C (Operator/Crew) and 0 (Unit) maintenance.

**Direct Support** - includes an F subcolumn.

**General Support** - includes an H subcolumn.

**Depot** - includes a D subcolumn.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

#### B-2. Maintenance Functions. Maintenance functions are limited to and defined as follows:

a. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g. by sight, sound, or feel).

b. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. **Service.** Operations required periodically to keep an item in proper operating condition; e.g. to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemicals fluids, or gases.

d. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

e. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.

f. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments or Test, Measurement, and Diagnostic Equipment (TMDE) used in precision measurement. Consists of comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.



**g. Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

**h. Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the 3d position code of the SMR code.

**i. Repair.** The application of maintenance services<sup>1</sup> including fault location/troubleshooting\*, removal/installation, and disassembly/assembly<sup>3</sup> procedures, and maintenance actions<sup>4</sup> 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.

### 8-3. 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.

<sup>1</sup>Services - Inspect, test, service, adjust, align calibrate, and/or replace.

\*Fault location/troubleshooting - The process of investigating and detecting the cause of equipment malfunction; the act of isolating a fault within a system or Unit Under Test (UUT).

<sup>3</sup>Disassembly/assembly - The step-by-step breakdown (taking apart) of a spare/functional group coded item, to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

<sup>4</sup>Actions - Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C .....	Operator or crew maintenance
O .....	Unit maintenance
F .....	irect Support maintenance
L .....	Specialized Repair Activity (SRA) <sup>5</sup>
H .....	eneral 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.

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<sup>5</sup>This maintenance level is not included in Section II, Column (4) of the Maintenance Allocation Chart. Functions to this level of maintenance are identified by a work-time figure in the "H" column of Section II, Column (4), and an associated reference code is used in the Remarks column (6). This code is keyed to Section IV, Remarks, and the SRA complete repair application is explained there.

**Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE**

(1) 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				78	
		Test		1.5	0.3			78,79	
		Adjust			3.0			56,60,78, 80	
		Service		0.8				57,59,78	
		Replace			7.0			16,56,59, 61,78,79	
		Repair		0.4	1.6	3.3		16,31,32, 44,56,59, 60,61,78, 79	
0101	CYLINDER HEAD ASSEMBLY	Inspect			0.1			78	
		Replace			2.0			44,56,59, 60,78	
		Repair				2.5		56,59,60, 61,62,78, 81	
0102	CRANKSHAFT	Replace				16.0		56,57,60, 71,78	
		Repair			3.8	16.0		16,31,32, 56,59,60, 61,78	
0103	FLEXPLATE, ENGINE	Replace			6.5			56,59,78	
		Repair			1.0			56,49,78	
0104	PISTON ASSEMBLY	Replace				9.0		56,57,59, 60,62,78, 79	
		Repair				0.6		78	
0105	CAMSHAFT ASSEMBLY	Replace				3.1		14,56,57, 49,60,78	
		Repair				1.2		56,78	
0105	ROCKER ARM AND PUSH RODS	Replace			2.0			44,59,60, 61,78	
		Repair			0.3			44,78	
0106	COOLER, ENGINE OIL	Replace			1.3			56,78	
		Repair			0.3			56,78	
0108	MANIFOLDS, INLET AND EXHAUST	Replace			1.5			56,60,61, 78,79	
0301	INJECTOR ASSEMBLY, FUEL	Replace			2.1			44,57,78, 80	
		Adjust			1.6			56,78,79, 80	
0304	AIR INTAKE SYSTEM	Service		0.3					
		Repair		0.3				46,57	

**Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)**

(1) 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				6,46,57,78	
		Repair		0.4				57,78	
0305	TURBOCHARGER	Replace			0.8			56,61,78,79	
0306	FUEL TANK	Inspect	0.1						
		Replace		1.5				57,59,78	
0308	GOVERNOR, ENGINE SPEED	Replace			1.0			57,60,76,78,79	
		Repair		0.5	0.7			57,78	
0309	FILTER, FUEL/WATER SEPARATOR	Inspect	0.2						
		Service	0.2	0.3				78	
		Replace		0.5				57,78	
0311	ETHER STARTING AID	Replace		0.6				57,59,78	
0312	ACCELERATOR/HAND THROTTLE	Replace		0.5				57,78	
		Adjust		0.2				57,78	
0401	EXHAUST MUFFLER/PIPES	Inspect	0.1	0.2					
		Replace		0.9				57,59,78	
0501	RADIATOR/CHARGE AIR COOLER	Inspect	0.1						
		Replace		2.5				2,27,53,59,78	
		Service Repair		1.5	2.0			59,79	
0501	RADIATOR OVERFLOW TANK	Replace		0.5				2,27,53,59,78	
		Repair		0.3				46,57,78	
0502	SHROUD, FAN	Replace		1.0				78	
0503	HOSES, WATER	Replace		0.5				57,59,78,86	
0504	PUMP, WATER	Replace		0.8				57,59,78,86	
0505	CLUTCH, ENGINE FAN	Inspect		1.0				57	
		Service		0.2				59	
		Replace		1.5				2,53,57,78	
		Repair			1.2			56,59,60,61,78,79	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) 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			59,63,78	
		Replace		1.0				59,78	
		Repair		0.2	0.5			38,56,57, 59,63,78, 79	
0603	STARTING MOTOR, ENGINE	Inspect		0.1					
		Test		0.5	0.5			57,63	
		Replace		1.5				2,9,57, 59,78	
		Repair			2.1			52,56,59, 60,76,78	
0606	SOLENOID, FUEL SHUTOFF	Replace			1.0			60,78,80	
0607	CABLE ASSEMBLY, DASHBOARD	Test		0.5				56	
		Replace		2.9				57,59,76, 78	
		Repair		1.0	0.6			56,57,61, 78	
0607	DISPLAY, LIGHTED INDICATOR	Test		0.3					
		Replace		0.5				78,86	
		Repair		0.3				78	
0609	LIGHT ASSEMBLY, BACKUP	Inspect	0.1						
		Replace		0.8				57,78	
		Repair		0.3				78	
0609	LIGHT, BLACKOUT DRIVE	Inspect	0.1						
		Replace		0.8				57,59,78	
		Repair		0.5				78	
0609	TAILLIGHT ASSEMBLY, COMPOSITE	Inspect	0.1						
		Replace		0.8				57,59,78	
		Repair		0.5				78	
0609	LIGHT ASSEMBLY, FRONT TURN SIGNAL AND PARK	Inspect	0.1						
		Replace		0.8				57,59,78	
		Repair		0.5				78	
0609	HEADLIGHT	Inspect	0.1						
		Adjust		0.4				78	
		Replace		1.0				57,59,78	
0610	AUDIBLE ALARM	Inspect	0.1						
		Replace		0.6				78	
0611	HORN, CAB	Inspect	0.1						

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) 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		
0612	BOX ASSEMBLY, BATTERY	Replace		0.4				57,78	A
		Inspect	0.1						
		Test		0.5				57,78	
		Service		0.3				57	
		Replace		1.0				57,59,78	
0613	CABLE ASSEMBLY, LH/RH CAB AND DOOR MARKER LIGHTS	Repair		0.2				63	
		Inspect	0.1						
0613	CABLE ASSEMBLY, LOWER, CAB MARKER LIGHTS, M1081	Replace		0.8				78	
		Repair		0.7				63	
0613	CABLE ASSEMBLY, LOWER, CAB MARKER LIGHTS, M1081	Inspect	0.1						
		Replace		0.6				78,86	
0613	CABLE ASSEMBLY, UPPER, CAB CLEARANCE AND MARKER LIGHTS, M1081	Repair		0.5				63	
		Inspect	0.1						
0613	CABLE ASSEMBLY, UPPER, CAB CLEARANCE AND MARKER LIGHTS, M1081	Replace		0.8				78,86	
		Repair		0.5				63	
0613	CABLE ASSEMBLY, STE/ICE-R	Replace		1.0				78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, CAB CLEARANCE AND MARKER LIGHTS	Inspect	0.1						
		Replace		1.2				57,78	
0613	CABLE ASSEMBLY, CAB CLEARANCE AND MARKER LIGHTS	Repair		0.5	0.8			63	
		Replace		0.5				48,78,86	
0613	CABLE ASSEMBLY, WARNING LIGHT	Repair		0.3	0.5			63	
		Replace		0.5				78	
0613	CABLE ASSEMBLY, WINDSHIELD WASHER PUMP/EMI	Repair		0.3				63	
		Inspect	0.1						
0613	CABLE ASSEMBLY, ENGINE CONTROL	Replace		2.3				57,78	
		Repair		0.5	0.5			63	
0613	CABLE ASSEMBLY, FRONT INTERVEHICULAR, 12 VDC	Replace		0.8				59,78	
		Repair		0.2	1.3			63	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) 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, FRONT LIGHTS	Replace		2.0				57,59,78, 86	
		Repair		0.5	0.5			63	
0613	CABLE ASSEMBLY, REAR LIGHTS	Replace		2.8				57,59,78	
		Repair		0.5	0.5			63	
0613	CABLE ASSEMBLY, PTO	Replace		1.6				57,59,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, REAR INTERVEHICULAR, 24 VDC	Replace		0.6				59,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, START AND CHARGING	Replace		2.0				57,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, WINCH CONTROL VALVE	Replace		1.8				57,59,78	
		Repair		0.5	0.8			63	
0705	WTEC II VEHICLE INTERFACE MODULE (VIM)	Replace		0.6				78	
		Repair		0.8				78	
0708	TORQUE CONVERTER	Adjust			0.9			18,59,60, 78	
		Remove/Install			0.8			56,59,60, 61,78	
		Repair			1.3			30,56,59, 60,62,78	
0710	TRANSMISSION	Inspect		0.4				78	
		Service		1.5				57,59,78	
		Replace			7.0			56,59,60, 61,78,79, 84	
		Repair		0.4	2.7	1.9		3,18,19, 24,25,27, 41,56,57, 59,60,61, 78,79,84	
0710	MODULE, FRONT SUPPORT	Remove/Install				2.0		56,57,59, 60,61,78	
		Repair				0.7		30,56,57, 59,60,61, 78	
0710	MODULE, PLANETARY GEAR (P1)	Remove/Install				2.0		59,60,71, 78	

**Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)**

(1) 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, PLANETARY (P2)	Repair					1.5	59,60,71, 78	
		Remove/ Install					2.0	3,56,59, 60,61,78	
		Repair					1.9	3,19,56, 59,60,61, 71,78	
0710	PLANETARY CARRIER (P3)	Remove/ Install					2.0	3,56,60, 78	
		Repair					1.9	3,27,56, 60,78	
		Remove/ Install					2.0	59,60,78	
0710	MODULE, MAIN SHAFT	Repair					0.4	59,60,78	
0710	MODULE, CONVERTER HOUSING	Remove/ Install					4.3	3,56,57, 59,60,78	
		Repair					2.0	3,19,25, 56,57,59, 60,78	
		Remove/ Install					2.0	56,57,59, 60,78	
0713	CLUTCH ASSEMBLY, C3/C4/C5, TRANSMISSION	Repair					2.0	56,57,59, 60,78	
		Remove/ Install					1.0	41,56,57, 59,60,78	
0713	MODULE, ROTATING CLUTCH	Remove/ Install					2.0	3,56,59, 60,78	
		Repair					2.4	3,19,24, 56,59,60, 78	
0714	VALVE ASSEMBLY, CONTROL MODULE	Remove/ Install					2.0	56,59,60, 61,78,79	
		Repair		1.0			2.5	59,61,78, 79	
0714	BODY ASSEMBLY, MAIN VALVE	Service		1.5				57,59,78	
		Remove/ Install					2.0	56,59,60, 61,78,79	
		Repair		1.5			2.5	56,59,60, 61,78,79	
0801	MODULE, TRANSFER CASE	Adjust					1.0		
		Remove/ Install					2.0	21,56,57, 59,60,61, 71,74,78, 79	
		Repair					1.1	23,27,33, 50,56,57, 60,78	



Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) 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		
0802	HOUSING ASSEMBLY, C6 AND C7 CLUTCH	Remove/Install				2.0		56,59,60,61,78	
		Repair				0.8		19,23,26,27,28,29,56,59,60,61,62,71,78	
0802	CONTROL VALVE ASSEMBLY	Remove/Install				2.0		56,59,61,78,79	
		Repair				1.0		56,59,61,78,79	
0804	PUMP ASSEMBLY, OIL	Replace				1.0		79	
		Repair				0.8		79	
0900	PROPELLER SHAFT	Inspect		0.1					
		Service		0.5					59
		Repair		0.6					57,59,78
		Replace		0.5					57,59,78
1000	AXLE ASSEMBLY, FRONT	Inspect	0.1	0.3	0.7				78
		Adjust			1.0				57,79
		Service		0.5					59,78
		Replace			4.5				56,57,59,60,61,70,78
		Repair		2.3	2.2	6.0			56,57,59,60,61,78
1002	CARRIER ASSEMBLY, DIFFERENTIAL	Inspect		0.1	0.1	0.1			78,79
		Service			0.3				78
		Replace				4.6			21,56,57,59,60,78,79
		Repair				2.7			56,57,59,60,78,79
1004	STEERING KNUCKLE, AXLE	Inspect			0.2				
		Adjust			2.5				79
		Service			0.3				79
		Replace			5.1				56,57,59,60,71,78
1100	AXLE ASSEMBLY, REAR	Inspect	0.1	0.4	0.7				
		Service		0.8					57,59,78
		Replace			4.5				34,56,57,59,60,78,84

**Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)**

(1) 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	Repair			0.9	6.0		21,56,57, 59,60,78 84,85, 78,79	
		Inspect		0.1	0.1	1.0		78	
		Service Replace			0.3		4.6	21,56,57 59,60,78, 79,85	
		Repair					2.7	21,37,56, 57,59,60, 71,73,78 59,78,79	
1202	BRAKE ASSEMBLY, FRONT AXLE	Inspect		0.1	1.0			57,59,78	
		Adjust Repair		0.4 1.5	0.5			57,59,78, 83	
1202	BRAKE ASSEMBLY, REAR AXLE	Inspect		0.1	1.0			59,78,79	
		Adjust Repair		0.4 1.5	0.5			57,59,78 57,59,78, 83	
1208	BRAKE AIR CHAMBER	Inspect		0.1				57,59,78	
1209	AIR COMPRESSOR	Replace		0.5				59,78	
		Adjust Replace		0.6	1.2			56,60,61, 78,79	
1311	WHEEL ASSEMBLY, PNEUMATIC TIRE	Inspect	0.1					57	
		Replace	1.0	1.2				57,59	
1313	TIRE, PNEUMATIC	Repair		2.0				57,59	
		Replace		2.0				57,59	
1401	STEERING SYSTEM	Inspect		0.2					
		Adjust Repair			1.0 1.5			56,60,78 54,56,57, 59,60,61, 78,79	
1407	STEERING GEAR ASSEMBLY PUMP, POWER STEERING	Replace			4.0			56,60,78	
		Replace			1.5			47,56,59, 60,78	
1411	HOSES, POWER STEERING	Replace		0.3				57,59,78, 88	
1413	HYDRAULIC RESERVIOR, POWER STEERING	Service	0.1	0.5				78	
		Replace		0.8				59,78,86	

**Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)**

(1) 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		
1501	FRAME ASSEMBLY	Inspect Repair	0.1	0.3 0.8	14.0			56,57,59, 60,61,78, 79	
1504	RETAINER, SPARE TIRE	Inspect Replace Repair	0.1	0.1 3.0 0.6				57,59,78 57,59,78	
1601	LEAF SPRING ASSEMBLIES	Inspect  Replace	0.1	0.2 0.3	2.7			57 56,57,59, 60,78,79	
1604	SHOCK ABSORBERS	Inspect Replace	0.1	0.3 0.5				57,59,78	
1605	STABILIZER BAR, REAR	Inspect Replace		0.2 2.0				57,59,68, 78	
1801	CAR BODY, STANDARD	Repair Inspect Replace	0.1	1.5	60.0			57,78 56,57,60, 61,78,79	
1801	CAR BODY, AIR DROP	Repair Inspect Replace	0.1	0.6	60.0			57,59,78 56,57,60, 61,78,79	
1801	CAR DOORS, STANDARD	Repair Inspect Replace	0.1	0.6	1.0			57,59,78 49,57,78	
1801	CAR DOORS, AIR DROP	Repair Inspect Replace	0.1	2.7	1.0			55,59,78 49,57,78	
1801	SUPPORT ASSEMBLY, CAB FRONT	Repair Inspect Replace	0.1	2.7 1.1	3.0			57,59,78 8,13,57, 59,60,78, 79	
1801	SUPPORT ASSEMBLY, CAB REAR	Inspect Replace Repair	0.1	1.0 0.8				57,59,78 57,78	
1802	WINDSHIELD	Replace			0.6			55,59,78	

**Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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		
1802	FENDER, VEHICULAR, FRONT	Inspect	0.1						
		Replace		2.0				57,59,78	
		Repair		0.5				57,78	
1803	ROOF, CAB, M1081	Replace		1.0				45,50,57, 59,78	
1805	FLOOR COVERING, CAB	Replace		1.0				57,78	
1806	SEATS	Replace							
1808	TOOL BOX ASSEMBLY	Inspect	0.1						
		Replace		0.5				47,57,59, 78	
		Repair		0.5				57,59,78	
1808	STOWAGE BOX, CAB	Replace		0.8				57,78	
		Repair		0.5				57,78	
1810	BODY, CARGO	Inspect	0.1						
		Replace			4.0			56,57,59, 60,78	
		Repair		0.5				57,59,78	
1812	BODY ASSEMBLY, VAN	Inspect	0.1	0.1					
		Repair		0.5				20,35,36, 42,43,47, 57,59,64, 72,76,78	
		Replace		1.9				36,64,78	
1812	DOOR, ACCESS, LEFT	Inspect	0.1					78	
		Replace		2.3					
		Repair		0.1				57,59-78	
1812	DOOR, ACCESS, RIGHT	Inspect	0.1						
		Replace		1.4				78	
		Repair		0.4				57,59,78	
1812	WINDOW SASH ASSEMBLY	Inspect	0.1						
		Replace		0.2				78	
		Repair		0.4				57,59,78	
1812	BOX ASSEMBLY, RELAY	Inspect	0.1	0.1					
		Replace		0.6				78	
		Repair		0.1				78	
		Test	0.1	0.5				59,78	
1812	FAN ASSEMBLY	Inspect	0.1						
		Replace		1.8				20,76,78	
		Repair		0.5				78	
2001	WINCH, 11K SELF- RECOVERY (SRW)	Inspect	0.1	4.0					

**Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)**

(1) 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		
2004	POWER TAKEOFF ASSEMBLY (PTO)	Service		0.2				59	
		Replace			1.0			59,60,78	
		Repair			0.9			59,60,78	
		Inspect	0.1						
		Replace			1.0			56,57,59, 60,78	
2202	MOTOR, WIPER, WINDSHIELD	Repair			0.8			56,57,59, 60,78	
		Test		0.5					
2207	HEATER ASSEMBLY, PERSONNEL	Replace		1.0				78	
2210	DECALS	Replace		2.0				57,59,78	
		Repair		1.0				57,59,78	
2401	POWER UNIT, AIR/HYDRAULIC	Inspect	0.1						
		Replace		1.0				78	
2402	MANIFOLD, HYDRAULIC	Inspect	0.1						
		Test		0.2					
		Service		1.0					
		Replace		3.0					57,59,78
		Repair			2.0				57,59,60, 69,78,79
2402	LATCH, HYDRAULIC, CAB	Inspect	0.1						
		Test		0.2					
		Replace		1.5					51,57,59, 78
2402	LATCH, HYDRAULIC, CAB	Repair		1.0					51,57,59, 78
		Inspect	0.1						
2404	SUSPENSION CYLINDER	Adjust		0.5					57,59,78
		Replace		0.5					57,59,78
2406	FILTER, HYDRAULIC	Inspect							
		Replace							59,78
2408	RESERVIOR, HYDRAULIC	Service		0.3					59,78
		Replace		0.2					59,78
3303	CAB ARCTIC KIT	Replace		1.0					57,59,78
		Repair		0.5					57,59,78
3303	CAB ARCTIC KIT	Inspect	0.2						
		Test		1.0					

**Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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	CABLE ASSEMBLY, ARCTIC KIT WITH PTO	Remove/Install			6.0			56,57,59,60,78,79,86	
		Replace		1.0				57,59,78,86	
		Repair		1.7				57,59,78,86	
		Replace		1.8				57,59,78	
3303	CARGO ARCTIC KIT	Repair		0.5	0.5			63	
		Inspect	0.2						
		Test		1.0					
		Remove/Install			12.0			56,57,59,60,78,79,86	
3303	FURNACE ASSEMBLY, CARGO	Replace		1.0				57,59,78,86	
		Repair		1.7				57,59,78,86	
		Replace		3.0				57,59,78,86	
3303	CABLE ASSEMBLY, FURNACE, CARGO	Repair		0.5				57,59,78,86	
		Inspect	0.1						
3303	CONTROL UNIT ASSEMBLY, FURNACE	Replace		0.5				57,59,78	
		Repair		0.7				57,59,78	
		Replace		1.5				57,59,78	
3303	HEATER ASSEMBLY, VEHICULAR	Repair		0.5				4,20,22,39,57,78	
		Inspect	0.1						
		Test		0.5					
		Service		0.5				59,78	
3303	SWINGFIRE ADAPTER KIT	Replace		1.5				57,78,86	
		Repair		1.5				57,78,86	
		Inspect	0.2						
		Test		1.0					
		Remove/Install		3.0	7.0			57,59,78,86	
		Replace		1.0				57,59,78,86	
		Repair		1.7				57,59,78,86	

**Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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	HEATER KIT, M1079	Inspect	0.1						
		Remove/ Install		2.5				78	
3305	FORDING KIT, DEEP WATER	Inspect	0.1						
		Remove/ Install		4.0				57,59,78	
3307	ALTERNATOR KIT, 200 AMP	Inspect	0.1	0.2					
		Test		0.5				59	
		Remove/ Install		2.0				57,59,78	
		Replace		1.0				57,59,78	
		Repair				0.5		56,57,60,	
3307	ALTERNATOR, 200 AMP	Inspect		0.2				62,78	
		Test		0.5	1.5			59,63,78	
		Replace		1.0				57,59,78	
		Repair		0.2	0.5			56,57,60,	
								61,63,78	
3307	CRANE (LMHC), MATERIAL HANDLING, LIGHT	Inspect	0.1	0.1					
		Repair		0.5				59,76,78	
		Replace		0.5					
		Test		0.5					
3307	WEIGHT BLOCK AND WIRE ROPE, LMHC	Inspect	1.0						
		Replace		0.1				59,78	
		Repair		0.5				59,78	
		Test			0.5				
3307	WINCH, LMHC	Inspect	0.1						
		Replace			0.5			59,78	
		Repair			1.0			59,78	
		Test		0.5					
3307	MAST/SWING ASSEMBLY, LMHC	Inspect	0.1						
		Repair		1.0				59,78	
		Test		0.5					
3307	CONTROL BOX, LMHC	Inspect	0.1						
		Replace		0.1					
		Repair		0.5					
		Test	1.0	0.5				76,78	
3307	TROOPSEAT KIT	Remove/ Install	1.0						

**Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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		
3307	COVER KIT, CARGO SOFT TOP	Inspect	0.1						
		Replace		1.0					
		Repair		0.5				78	
3307	AIR CONDITIONER KIT, M1079	Remove/ Install	1.5						
		Inspect	0.1						
		Replace		2.0					
3307	WARNING LIGHT ASSEMBLY, AMBER	Repair		0.5					
		Inspect	0.1						
		Remove/ Install		1.5				59,78	
3401	MACHINE GUN RING KIT	Inspect	0.1						
		Repair		0.4				78	
		Test		0.2					
3402	MOUNT, SMALL ARMS	Inspect	0.1						
		Remove/ Install		1.1				56,57,60, 78,79,84 10,57,78	
		Repair		0.3					
3909	CABLE ASSEMBLY, WARNING LIGHT	Inspect	0.1						
		Replace		0.5				78	
		Inspect	0.1						
4316	AIR HOSE, CTIS	Replace		0.5				78	
		Inspect	0.1						
		Replace		0.4				59,78	
4317	VALVE, INVERSION	Replace		0.5				59,78	
		Inspect	0.1	0.1					
		Replace		1.0				57,59,78	
4321	AIR DRYER	Repair		0.6				57,59,78	
		Replace		0.5				78	
		Inspect	0.1						
4702	GAUGE, AIR FILTER RESTRICTION	Replace		0.5					
		Inspect	0.1						
		Replace		0.5					



**Section III. TOOLS AND TEST EQUIPMENT FOR LMTV VEHICLES**

<b>Tool or Test Equipment REF Code</b>	<b>Maintenance Level</b>	<b>Nomenclature</b>	<b>National Stock Number</b>	<b>Tool Number</b>
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	5120-00-181-6754	GGG-C-1507
8	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-074-7557	FCOM19
9	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-236-9996	FCOM15
10	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1091	FC032
11	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1119	SCO34
12	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1122	SCO40
13	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-348-9473	AN8508--19A
14	H	DRIVER KIT, BEARING	4910-01-032-3128	8S0602
15	O	GAGE, BELT TENSION	6635-01-092-7462	0755-0101
16	O,F	GAGE, BELT TENSION	6635-01-143-2237	GA-424
17	O,F	GAGE, PRESSURE, 0-150 psi	6685-00-474-5721	111T1D05A01
18	F,H	GAGE, PROFILE	5220-01-388-1460	J-38548-1
19	H	HANDLE DRIVE	5120-00-377-2259	J8092
20	O	HEATER, GUN TYPE, ELECTRIC	4940-00-561-1002	500A
21	F,H	HOLDING BAR, PINION	5120-01-166-0573	J3453
22	O	INSERTER AND REMOVER, ELECTRICAL CONTACT	5120-00-915-4588	MS3447-16
23	H	INSERTER AND REMOVER, SPRING	5120-01-388-3660	J38573
24	H	INSERTER AND REMOVER SPRING	5120-01-388-4436	J35923
25	H	INSERTER, BEARING AND BUSHING	5120-01-388-7841	J-38565
26	H	INSERTER, BEARING AND BUSHING	5120-01-389-0658	J35921-1
27	H	INSERTER, BEARING AND BUSHING	5120-01-390-1104	J 38569
28	H	INSERTER, BEARING AND BUSHING	5120-01-390-1105	J 38568-3
29	H	INSERTER, BEARING AND BUSHING	5120-01-391-5133	J38579
30	F,H	INSERTER, BEARING AND BUSHING	5120-01-414-7398	J38566
31	F	INSERTER, SEAL	5120-01-362-2026	1U7430
32	F	INSERTER, SEAL	5120-01-362-2027	1U7598
33	F	INSTALLER, SEAL	N/A	J38574

## Section III. TOOLS AND TEST EQUIPMENT FOR LMTV VEHICLES

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
34	F	JACK, LEVELING SUPPORT VEHICLE	2590-00-231-7418	10876244
35	O	KEY, SOCKET HEAD SCREW	5120-00-984-0247	58010
36	O	LINK, CHAIN, END	4010-00-932-5013	NAS1049-16
37	H	PULLER KIT, UNIVERSAL	5180-00-089-3660	A57QB
38	F	PULLER KIT, UNIVERSAL	5180-01-124-1903	1P3075
39	O	REMOVER, ELECTRICAL CONTACT	5120-00-148-9844	MS3448-001B
40	F	RIVETER, BLIND, HAND	5120-01-289-4310	HP-2
41	H	RIVETER, YOKE, HAND	5120-01-415-3558	J-39354
42	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-00-180-0881	5120-00-180-0881
43	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-053-4158	FAM5A
44	O,F,H	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-055-1308	ANSIB18.3.2M
45	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-079-8032	SAM8A
46	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-160-8862	S 6 HBS
47	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3462	SA10A
48	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3497	TMP12A
49	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3519	F23D
50	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3526	FP24
51	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3527	FP32A
52	F,H	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3536	FTX40A
53	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3574	GFA8A
54	O	SEPARATOR, BALL JOINT	5120-01-255-8238	2287
55	F	SETTING TOOL, WINDSHIELD	5120-01-316-4995	CRL216
56	O,F	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-348-7696	SC4910-95CLA02
57	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0650	SC4910-95CLA72
58	O	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0653	SC4910-95CLA73
59	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0654	SC4910-95CLA74
60	F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0705	SC4910-95CLA31
61	F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0706	SC4910-95CLA62

**Section III. TOOLS AND TEST EQUIPMENT FOR LMTV VEHICLES**

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
62	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0707	SC 4910-95CLA63
63	O,F	SHOP EQUIPMENT, FUEL AND ELECTRICAL	4910-00-754-0714	SC 4910-95CLA01
64	O	SLING, EYE	3940-01-334-0749	EE1-202
65	F	SLING, MULTIPLE LEG	3940-00-777-5744	A170
66	H	SOCKET SET, SOCKET WRENCH	5120-01-195-0640	208FA
67	F,H	SOCKET, SOCKET WRENCH	5120-01-068-5643	5555M
68	O	SOCKET, SOCKET WRENCH	5120-01-161-5907	GLDH382
69	F	SOCKET, SOCKET WRENCH	5120-01-335-0784	TW321
70	O	SOCKET, SOCKET WRENCH	5120-01-359-9521	TV940009
71	F	SOLDERING AND BRAZING OUTFIT, RESISTANCE HEATING	3439-00-460-7198	SC4940-95-CLB20
72	O	SOLDERING IRON, ELECTRIC	3439-01-036-3308	3112-S3-40W
73	H	STAND, DIFFERENTIAL CARRIER REPAIR	4910-01-085-7729	J3409-D
74	H	STAND, MAINTENANCE AUTOMOTIVE ENGINE	4910-00-808-3372	J29109
75	O	TESTING APPARATUS	4910-01-426-3974	440.28
76	O,F	TOOL KIT, AUTO FUEL AND ELECTRICAL SYSTEM REPAIR	5180-00-754-0655	SC4910-95CLA50
77	F	TOOL KIT, BODY AND FENDER	5180-00-754-0643	SC5180-90-N34
78	O,F,H	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033	SC5180-90-CLN26
79	F,H	TOOL KIT, GENERAL MECHANIC'S	5180-00-699-5273	SC5180-90-CL-N05
80	F	TOOL KIT, INTERNAL COMBUSTION ENGINE	5180-01-356-8155	1U6680
81	H	TOOL KIT, SLEEVE REPAIR	5180-01-415-5896	4C4462
82	F	TOOL OUTFIT, HYDRAULIC	4940-01-036-5784	SC4940-95-CL-B07
83	O	TOOL, SPRING REMOVAL	5120-01-360-1918	TV940010
84	F	WRENCH SET, CROWFOOT, RATCHETING	5120-00-293-0013	GGG-W-646
85	F	WRENCH SET, SOCKET	5120-00-148-3706	ANSI-B107.5
86	O	WRENCH, TORQUE, 0-75 LB-IN.	5120-01-112-9532	TQSC6A

**Section IV. REMARKS FOR THE LMTV VEHICLE**

Remarks Code	Remarks
A	Battery service will be in accordance with TM 9-6140-200-14.
B	Repair of tires will be in accordance with TM 9-2610-200-14.

## APPENDIX C TOOLS IDENTIFICATION LIST

### Section I. INTRODUCTION

#### C-1. INTRODUCTION

This appendix lists common tools, supplements, and special tools/fixtures that are suggested for maintenance tasks performed at the Unit Maintenance level.

#### C-2. EXPLANATION OF COLUMNS

- a. Column (1) - Item Number.** This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item, e.g., "Bar, Pry (Item 1, Appendix C)."
- b. Column (2) - Item Name.** This column contains the nomenclature for the item.
- c. Column (3) - National Stock Number.** This is the national stock number assigned to the item which you can use to requisition it.
- d. Column (4) - Part Number.** This provides the Government, manufacturer, or vendor part number for the item.
- e. Column (5) - Reference.** This column contains the shop catalog (SC), technical manual, or other publication which provides an illustration and description of the item, or lists whether the item is fabricated.

## APPENDIX C Section II. TOOLS IDENTIFICATION LIST

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
1	ADAPTER, SOCKET WRENCH	5120-00-227-8088	A-A-2172	SC 4910-95-CL-A74
2	ADJUSTING TOOL, BRAKE SHOE	5120-00-154-3029	J34061	SC 4910-95-CL-A74
3	APRON, RUBBER	8145-00-082-6108	MIL-A-41829	SC 4910-95-CL-A74
4	CAPS, VISE JAW	5120-00-221-1506	GGG-C-137	SC 4910-95-CL-A74
5	DISPENSING PUMP, HAND DRIVEN	4930-00-263-9886	43D15069	SC 4910-95-CL-A74
6	DRILL SET, TWIST	5130-00-293-0983	58	SC 4910-95-CL-A74
7	DRILL, PORTABLE, ELECTRIC	5130-00-293-1849	W-D-661	SC 4910-95-CL-A74
8	DRILL, TWIST	5133-01-120-3519		SC 4910-95-CL-A74

**Section II. TOOLS IDENTIFICATION LIST (CONT)**

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
9	FISHING TOOL,PNEUMATIC TIRE VALVE	5120-00-516-4220	991	SC 4910-95-CL-A74
10	GAGE,DEPTH, MICROMETER	5210-00-619-4045	445BZ-6RL	CTA 50-909
11	GAGE, TIRE PRESSURE	4910-01-117-2994	955	SC 4910-95-CL-A72
12	GAGE,WHEEL ALIGNMENT	5210-00-529-1205	WA361	SC 4910-95-CL-A72
13	GLOVES,RUBBER	8415-00-641-4601	ZZ-G-381	SC 4910-95-CL-A74
14	GLOVES,WELDER'S	8415-00-268-7859	A-A-50022	SC 4910-95-CL-A72
15	GOGGLES,INDUSTRIAL	4240-00-052-3776	A-A-1110	SC 4910-95-CL-A74
16	GUN,LUBRICATING	4930-00-253-2478	1142	SC 4910-95-CL-A74
17	HAMMER,HAND	5120-00-224-4130	A-A-1292	SC 4910-95-CL-A74
18	HAMMER,HAND	5120-01-065-9037	57-533	SC 4910-95-CL-A72
19	HOSE ASSEMBLY, NONMETALLIC	4720-00-356-8557	ZZ-H-461	
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	4240-00-255-2524	GGG-M-125/6	SC 4910-95-CL-A72
30	SCALE,WEIGHING	6670-00-254-4634	AAA-5-133	SC 4910-95-CL-A72
31	SLING,CARGO	1670-00-823-5043	63J4261-13	CTA 50-970
32	SLING,ENDLESS	3940-00-675-5003	PD101-96	CTA 50-970
33	SOCKET SET, IMPACT	5120-01-117-0466	4151MMY	SC 4910-95-CL-A74
34	SOCKET SET,SOCKET WRENCH	5120-01-073-2821	217FMY	SC 4910-95-CL-A72

## Section II. TOOLS IDENTIFICATION LIST (CONT)

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
35	SOCKET SET, SOCKET WRENCH	5120-01-117-3876	221FSMY	SC 4910-95-CL-A02
36	SOCKET, SOCKET WRENCH	5120-00-181-6813	5530	SC 4910-95-CL-A74
37	SOCKET, SOCKET WRENCH	5120-00-232-5681	1242	SC 4910-95-CL-A74
38	SOCKET, SOCKET WRENCH	5120-01-112-0581	SIMM190	SC 4910-95-CL-A74
39	STE/ICE-R	4910-01-222-6589	12259266	SC 4910-95-CL-A74
40	TAPE, MEASURING	5210-00-081-4719	GA508A	CTA 50-970
41	TESTER, ANTIFREEZE AND BATTERY	6630-00-105-1418	10425	SC 4910-95-CL-A74
42	TOOL KIT, AUTO FUEL	5780-00-754-0655		SC 45180-95-CL-A50
43	TOOL KIT, BLIND RIVET	5180-01201-4978	D-100-MIL-1	SC 4910-95-CL-A72
44	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033		SC 5180-90-N26
45	TRESTLE, MOTOR VEHICLE MAINTENANCE	4910-0-251-8013	306	SC 4910-95-CL-A72
46	WISE, MACHINIST	5120-00-293-1439	504M2	SC 4910-95-CL-A74
47	WRENCH SET, SOCKET	5120-00-081-2305	GGG-W-641	SC 4910-95-CL-A74
48	WRENCH SET, SOCKET	5120-00-204-1999	GGG-W-641	SC 4910-95-CL-A74
49	WRENCH SET, SOCKET	5120-00-322-6231	51200017510	SC 4910-95-CL-A74
50	WRENCH, ADJUSTABLE	5120-00-264-3793	2117080	SC 4910-95-CL-A72
51	WRENCH, ADJUSTABLE, AUTOMOTIVE	5120-00-449-8083	1B7536	SC 4910-95-CL-A74
52	WRENCH, BOX AND OPEN END	5120-00-277-8833	1244	SC 4910-95-CL-A74
53	WRENCH, BOX AND OPEN END	5120-00-277-8834	GGG-W-636	SC 4910-95-CL-A74
54	WRENCH, PIPE	5120-00-277-1461		SC 4910-95-CL-A74
55	WRENCH, PIPE	5120-00-277-1485		SC 4910-95-CL-A74
56	WRENCH, STRAP, ADJUSTABLE	5120-00-020-2947	A91C	SC 4910-95-CL-A74
57	WRENCH, TORQUE, 0-175 lb-ft	5120-00-640-6364	1753LDF	SC 4910-95-CL-A72
58	WRENCH, TORQUE, 0-200 lb-in.	5120-00-853-4538	F2001	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
59	WRENCH, TORQUE, 0-600 lb-ft	5120-00-221-7983	SW130-301	SC 4910-95-CL-A72

## APPENDIX D EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

### Section I. INTRODUCTION

#### D-1. SCOPE

This appendix lists expendable and durable items that you will need to operate and maintain the LMTV vehicle. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except medical, class V repair parts, and heraldic items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

#### D-2. EXPLANATION OF COLUMNS

- a. **Column (1) - Item Number.** This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item, e.g., "Oil, Lubricating (Item 25, Appendix D).
- b. **Column (2) - Level.** This column identifies the lowest level of maintenance that requires the item.
- c. **Column (3) - National Stock Number.** This is the national stock number assigned to the item which you can use to requisition it.
- d. **Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number.** This provides the other information you need to identify the item.
- e. **Column (5) - Unit of Measure.** This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

### Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	O	4730-00-248-9340	Adapter, Pipe to Tube (81343) 4-4 010103B	ea
2	O	8040-00-273-8717	Adhesive (81348) MMM-A-121	pt
3	O	8040-00-152-0063	Adhesive (81348) MMM-A-1617 TY 3	bt
4	O	8040-01-250-3969	Adhesive (05972) 242	ea
5	O	8040-01-117-7872	Adhesive (04963) 08031	tu
6	O	8040-00-117-8510	Adhesive (71984) 3145 RTV Clear	tu
7	O	8040-00-776-9602	Adhesive (73168) 80055-31	kt
8	O	8040-00-118-2695	Adhesive (72799) RTV162	kt
9	O	8040-01-239-6828	Adhesive (01139) RTV123	tu
10	O	8040-01-331-7473	Adhesive (81349) (MIL-A-46106 GP3TY1)	tu
11	O	8040-01-331-7470	Adhesive (81349) (MIL-A-46106 GP1TY)	tu



**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	6850-00-174-1806	Antifreeze,Arctic Type (81349) (MIL-A-11755) 55 gl drum	dr
13	C	6850-00-181-7940	Antifreeze,Ethylene Glycol,Permanent (81349) (MIL-A-46153) 55 gl drum	dr
14	O	8030-00-597-5367	Antiseize Compound (81349) (MIL-A-907)	lb
15	O	5340-00-450-5718	Cap and Plug Set 10935405	ea
16	O	6850-00-926-2275	Cleaning Compound, Windshield (81349) O-C 1901 16 Oz bottle	bt
17	O	7920-00-044-9281	Cloth,Cleaning (81349) (MIL-C-85043)	bx
18	O		Corrosion Preventive Compound (81349) (MIL-C-16173)	
		8030-00-062-6950	Grade 1-1 qt can	qt
		9030-01-149-1731	Grade 2-1 qt can	qt
		8030-00-837-6557	Grade 3-1 qt can	pt
		8030-00-903-0931	Grade 4-1 qt can	pt
19	O	8030-00-033-4291	Corrosion Preventive Compound (MIL-C-82594) 8 oz can	bt
20	C	9150-00-664-0047	Damping Fluid (81348) VV-D-1078 1 lb can	lb
21	O	7520-01-209-1152	Dispenser,Pressure Sensitive Adhesive Tape (75037) STD-0-9	ea
22	O	5330-01-325-6993	Gasket Forming Compound (05972) 515	ea
23	C		Grease,Automotive and Artillery (GAA) (81349) (MIL-G-10924)	
		9150-01-197-7688	2-1/4 oz tube	tu
		9150-01-197-7690	1.75 lb can	cn
		9150-01-197-7689	6.5 lb can	cn
		9150-01-197-7692	35 lb can	cn
24		9150-00-530-6814	Grease,Wire Rope-Exposed Gear 981349) (MIL-G-18458) 35 lb can	cn
25		9150-00-935-4018	Grease,Molybenum Disulfide (81349) (MIL-G-21164) 14 oz cartridge	ca
26	C		Hydraulic Fluid A (MIL-H-5606)	
		9150-00-252-6383	1 qt can	cn
		9150-00-223-4134	1 gl can	cn
27	O	7510-00-145-0559	Ink,Marking Stencil (MIL-I-43553)	oz
28	O	7510-01-386-0787	Inking Pad,Rubber Stamp	ea

## Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
29	O	9150-01-360-1905	Insulating Compound,Electrical	tu
30	O	5970-00-838-5951	Insulation Sleeving,Electrical (06090) CRN3-16BLACK	ft
31	O	5970-01-422-3579	Insulation Sleeving,Electrical (06090) AT"UM 1/2 4ft length	lg
32	O	1650-00-166-4834	Lockwire (90166) 68A32	ea
33	O	9150-01-360-1905	Lubricant,Solid Film (MIL-_46147) 16 oz can	cn
34	O	4730-00-019-0608	Nipple,Pipe	ea
35	O	4730-00-825-7304	Nipple, Tube Ms51501B4	ea
36	O	5310-00-059-4265	Nut,Plain,Hex	ea
37	C		Oil,Fuel Diesel, DF-A, Arctic (VV-F-800) (81348)	
		9140-00-286-5283	Bulk	gl
		9140-00-286-5284	55 gl drum, 16 gauge	dr
		9140-00-286-5285	55 gl drum, 18 gauge	dr
38	C		Oil,Fuel Diesel, DF-1, Winter (VV-F-800) (81348)	
		9140-00-286-5286	Bulk	gl
		9140-00-286-5288	55 gl drum, 16 gauge	dr
		9140-00-286-5289	55 gl drum, 18 gauge	dr
39	C		Oil,Fuel Diesel,DF-2,Regular (VV-F-800) (81348)	
		9140-00-2868294	Bulk	gl
		9140-00-286-5296	55 gl drum, 16 gauge	dr
		9140-00-286-5297	55 gl drum, 18 gauge	dr
40	C		Oil,Lubricating,Arctic (MIL-L-46167)	
		9150-00-402-2372	5 gl can	cn
		9150-00-491-7197	55 gl drum	dr
41	C		Oil,Lubricating,Gear, GO 75W (MIL-L-2105C)	
		9150-00-035-5390	1 qt can	cn
		9150-00-035-5391	5 gl can	cn
42	C		Oil,Lubricating,Gewar, 80W-90 (MIL-L2105C)	
		9150-00-035-5392	1 qt can	qt
		9150-00-035-5393	5 gl can	cn
		9150-00-035-5394	55 gl drum, 16 gauge	dr
43	C		Oil,Lubricating,OE/HDO 10 (MIL-L-2104)	
		9150-00-183-7807	Bulk	gl
		9150-00-186-6668	5 gl can	cn
		9150-00-191-2772	55 gl drum	dr
44	C		Oil,Lubricating,OE/HDO 10W (MIL-L2104)	
		9150-00-189-6727	1 qt can	cn

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
45	C	9150-01-152-4117 9150-01-152-4118 9150-01-152-4119	Oil,Lubricating,OE/HDO 15W-40 (MIL-L-2104) 1 qt can 5 gl can 55 gl drum	cn cn dr
46	C	9150-00-183-7808 9150-00-186-6681 9150-00-188-9858 9150-00-189-6729	Oil,Lubricating,OE/HDO 30 (SAE 30) (MIL-L-2104) Bulk 1 qt can 5 gl can 55 gl drum, 18 gauge	gl cn cn dr
47	C	9150-00-405-2987 9150-00-189-6730 9150-00-188-9862	Oil,Lubricating,OE/HDO 40 (MIL-L-2104) Bulk 1 qt can 55 gl can	gl cn cn
48	O	5350-00-067-7639	Paper,Abrasive (28124) 02347 pg contains 100 sheets	pg
49	O	8010-01-146-2650	Polyurethane Coating (MIL-C-46168)	kt
50	O	8030-00-181-8372	Primer,Sealing Compound (05972) 747-56	cn
51	C	7920-00-205-1711	Rag,Wiping A-A-531	be
52	O	4730-00-021-1788	Reducer,Boxx 4-6F50G5	ea
53	O	4020-00-855-2767	Rope,Fibrous (MIL-R-17343) 75 ft	cl
54	O	7520-00-634-2442	Rubber Stamp Set,Fixed Type	ea
55	O	5330-01-337-1108	Rubber Strip (12624) V4062	ft
56	O	5330-01-181-6482	Rubber Strip (19207) 12328583-3	ft
57	O	5305-01-286-0019	Screw,Cap,Socket Head (06888) SHCM75275 50 ct box	bx
58	O	1015-01-255-4144	Sealant,Pipe,Teflon (19207) 12297953 50 ml tube	tu
59	O	8030-00-081-2327	Sealing Compound (05972) 079-21	bx
60	O	8030-00-0111-2762	Sealing Compound (05972) 290-31	bt
61	O	8030-00-133-3164	Sealing Compound (05972) 571-31	bt
62	O	8030-00-148-9833	Sealing Compound (05972) 271-21	bx
63	O	8030-00-204-9149	Sealing Compound (05972) 592-41	tu
64	O	8030-00-656-1426	Sealing Compound (81349) (MIL-S-45180)	pt
65	O	8030-01-025-1692	Sealing Compound (05972) 242-41	bt
66	O	8030-01-088-8140	Sealing Compound (52571) 9001512-0011	bt

## Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
67	O	8030-00-753-5006	Sealing Compound (81349) (MIL-S-8802TY2CLB-2) 2 oz cartridge	ca
		8030-00-753-4599	6 oz can	kt
		8030-00-723-2746	12 oz can	kt
		8030-00-685-0915	24 oz can	kt
68	O	8030-01-155-3238	Sealing Compound (11083) 6V6640	ml
69	C	7930-00-634-3935	Soap,Laundry (81348) P-S-1792	lb
70	O	3439-00-006-7764	Solder, Tin Alloy (81348) SN63WRAP3	sl
71	C		Solvent,Dry Cleaning SD (P-D-680)	
		6850-00-281-1985	1 gl can	cn
		6850-00-664-5685	1 qt can	cn
72	O		Tape,Adhesive (0SHR6) 70P00002	ea
73	O	8030-00-889-3534	Tape, Antiseizing (81349) MIL-T-27730)	ea
74	O	5640-00-103-2254	Tape,Duct (39428) 1791K70	ea
75	O	5970-00-644-3167	Tape, Insulation,Electrical (80063) TL83	ro
76	O	5975-01-379-4997	Ties,Cable,Plastic (06383) PLT 35-C-O	hd
77	O	6145-01-148-2263	Wire,Electrical (80009) 175-0825-00 50 ft	ft

## APPENDIX E ILLUSTRATED LIST OF MANUFACTURED ITEMS

### Section I. INTRODUCTION

#### E-1. INTRODUCTION

This appendix includes complete instructions for manufacturing or fabricating authorized items locally. All bulk materials needed to manufacture an item are listed by part number or specification number. Figures are provided as needed. See standards and specifications DoD-Std-00100D(AR) and ANSI Y14.5M1982 for required details.

### Section II. MANUFACTURED ITEMS INDEX

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
Brake Adjusting Tool Support		E-2
Brake Plunger Seal Driver		E-3
Cab Support Tool		E-4
Headlight Adjustment Screen		E-5
M1079 Blackout Shield Seals		E-6
M1079 Door Gaskets		E-7
M1079 Window Sash Glazing Seals		E-8
Relay Test Wire		E-9
Wheel Bearing Shim Tool Rest		E-10
12414690-001	Pneumatic Tube	E-11
12414690-002	Pneumatic Tube	E-11
12414690-004	Pneumatic Tube	E-11
12414690-005	Pneumatic Tube	E-11
12414690-010	Pneumatic Tube	E-11
12414690-101	Pneumatic Tube	E-11
12414690-102	Pneumatic Tube	E-11
12414690-103	Pneumatic Tube	E-11
12414690-104	Pneumatic Tube	E-11
12414690-105	Pneumatic Tube	E-11
12414690-106	Pneumatic Tube	E-11
12414690-107	Pneumatic Tube	E-11
12414690-108	Pneumatic Tube	E-11
12414690-109	Pneumatic Tube	E-11
12414690-112	Pneumatic Tube	E-11
12414690-113	Pneumatic Tube	E-11
12414690-115	Pneumatic Tube	E-11
12414690-117	Pneumatic Tube	E-11
12414690-118	Pneumatic Tube	E-11
12414690-119	Pneumatic Tube	E-11
12414690-120	Pneumatic Tube	E-11
12414690-121	Pneumatic Tube	E-11
12414690-122	Pneumatic Tube	E-11
12414690-123	Pneumatic Tube	E-11
12414690-124	Pneumatic Tube	E-11
12414690-125	Pneumatic Tube	E-11
12414690-126	Pneumatic Tube	E-11
12414690-127	Pneumatic Tube	E-11
12414690-201	Pneumatic Tube	E-11
12414690-202	Pneumatic Tube	E-11

Section II. MANUFACTURED ITEMS INDEX (CONT)

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12414690-203	Pneumatic Tube	E-11
12414690-205	Pneumatic Tube	E-11
12414690-206	Pneumatic Tube	E-11
12414690-207	Pneumatic Tube	E-11
12414690-208	Pneumatic Tube	E-11
12414690-209	Pneumatic Tube	E-11
12414690-210	Pneumatic Tube	E-11
12414690-211	Pneumatic Tube	E-11
12414690-212	Pneumatic Tube	E-11
12414690-213	Pneumatic Tube	E-11
12414690-214	Pneumatic Tube	E-11
12414690-215	Pneumatic Tube	E-11
12414690-216	Pneumatic Tube	E-11
12414690-217	Pneumatic Tube	E-11
12414690-218	Pneumatic Tube	E-11
12414690-219	Pneumatic Tube	E-11
12414690-220	Pneumatic Tube	E-11
12414690-221	Pneumatic Tube	E-11
12414690-222	Pneumatic Tube	E-11
12414690-223	Pneumatic Tube	E-11
12414690-224	Pneumatic Tube	E-11
12414690-225	Pneumatic Tube	E-11
12414690-226	Pneumatic Tube	E-11
12414690-227	Pneumatic Tube	E-11
12414690-228	Pneumatic Tube	E-11
12414690-229	Pneumatic Tube	E-11
12414690-230	Pneumatic Tube	E-11
12414690-231	Pneumatic Tube	E-11
12414690-301	Pneumatic Tube	E-11
12414690-302	Pneumatic Tube	E-11
12414690-303	Pneumatic Tube	E-11
12416381-P1	Non-Metallic Electrical Cable Conduit	E-12
12416381P10	Non-Metallic Electrical Cable Conduit	E-12
12416381P11	Non-Metallic Electrical Cable Conduit	E-12
12416381P12	Non-Metallic Electrical Cable Conduit	E-12
12416381P13	Non-Metallic Electrical Cable Conduit	E-12
12416381P14	Non-Metallic Electrical Cable Conduit	E-12
12416381P15	Non-Metallic Electrical Cable Conduit	E-12
12416381P16	Non-Metallic Electrical Cable Conduit	E-12
12416381P17	Non-Metallic Electrical Cable Conduit	E-12
12416381P2	Non-Metallic Electrical Cable Conduit	E-12
12416381P20	Non-Metallic Electrical Cable Conduit	E-12
12416381P21	Non-Metallic Electrical Cable Conduit	E-12
12416381P22	Non-Metallic Electrical Cable Conduit	E-12
12416381P23	Non-Metallic Electrical Cable Conduit	E-12
12416381P26	Non-Metallic Electrical Cable Conduit	E-12
12416381P3	Non-Metallic Electrical Cable Conduit	E-12
12416381P30	Non-Metallic Electrical Cable Conduit	E-12
12416381P32	Non-Metallic Electrical Cable Conduit	E-12
12416381P34	Non-Metallic Electrical Cable Conduit	E-12
12416381P35	Non-Metallic Electrical Cable Conduit	E-12

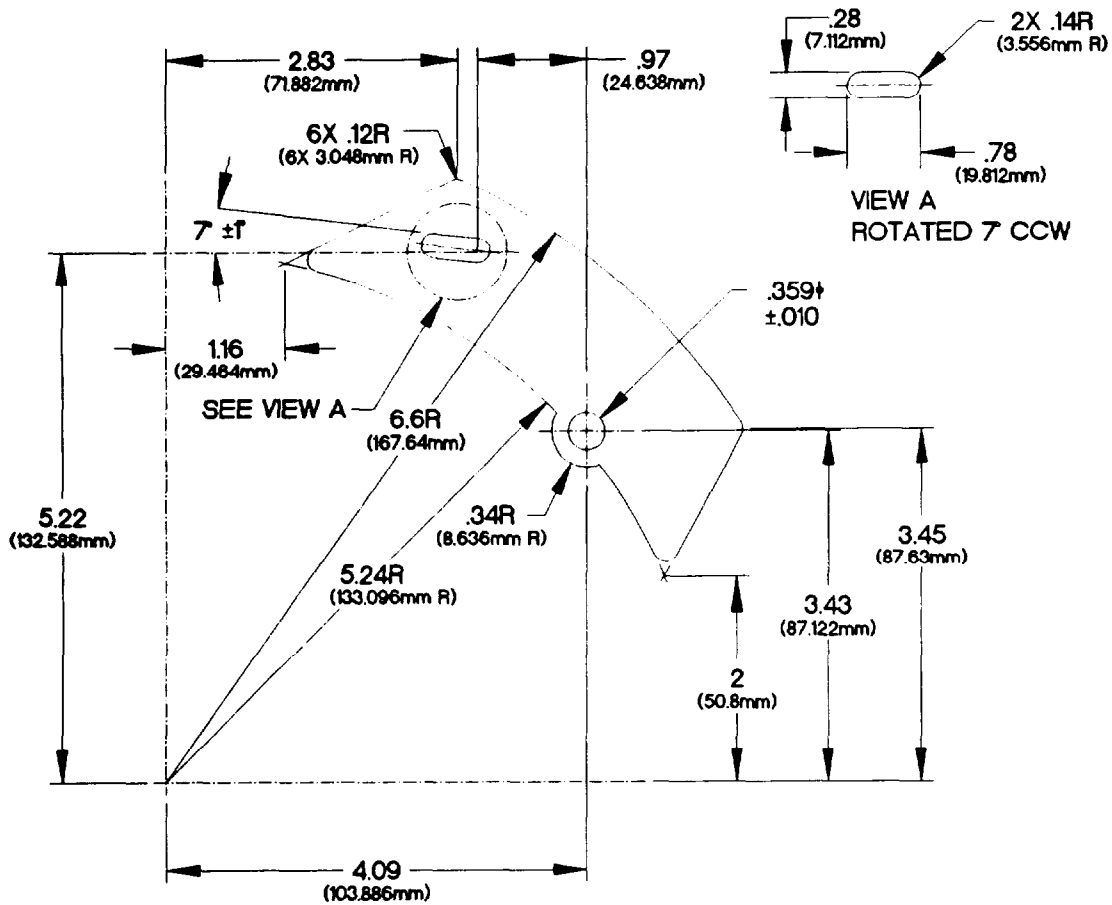
ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12416381P36	Non-Metallic Electrical Cable Conduit	E-12
12416381P37	Non-Metallic Electrical Cable Conduit	E-12
12416381P38	Non-Metallic Electrical Cable Conduit	E-12
12416381P4	Non-Metallic Electrical Cable Conduit	E-12
12416381P5	Non-Metallic Electrical Cable Conduit	E-12
12416381P6	Non-Metallic Electrical Cable Conduit	E-12
12416381P7	Non-Metallic Electrical Cable Conduit	E-12
12416381P8	Non-Metallic Electrical Cable Conduit	E-12
12416381P9	Non-Metallic Electrical Cable Conduit	E-12
12418037	Steering Gear Return Hose	E-13
12418460-001	Transmission Oil Cooler Hose	E-13
12418460-002	Transmission Oil Cooler Hose	E-13
12418763	Lanyard Assembly	E-14
12420196	Lanyard Assembly	E-14
12420197-001	Non-Metallic Vent Air Hose	E-15
12420197-002	Non-Metallic Vent Air Hose	E-15
12420197-003	Non-Metallic Vent Air Hose	E-15
12420197-004	Non-Metallic Vent Air Hose	E-15
12420197-005	Non-Metallic Vent Air Hose	E-15
12420197-006	Non-Metallic Vent Air Hose	E-15
12420198-001	Non-Metallic Vent Air Hose	E-15
12420198-002	Non-Metallic Vent Air Hose	E-15
12420308-457	Personnel Heater Air Duct Hose	E-16
12420308-760	Personnel Heater Air Duct Hose	E-16
12420489	Block Seal	E-17
3556-H-1048	CTIS Seal Driver	E-18
3256-K-1051	Wheel Hub Grease Seal Driver	E-19

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



XAPPE13A

Figure E-1. Brake Adjusting Tool Support

- a. All dimensions are in inches (millimeters).
- b. Cut steel sheet as shown by dimensions on Figure E-1. Brake Adjusting Tool Support.
- c. De-burr and remove sharp edges.



**E-3. BRAKE PLUNGER SEAL DRIVER**

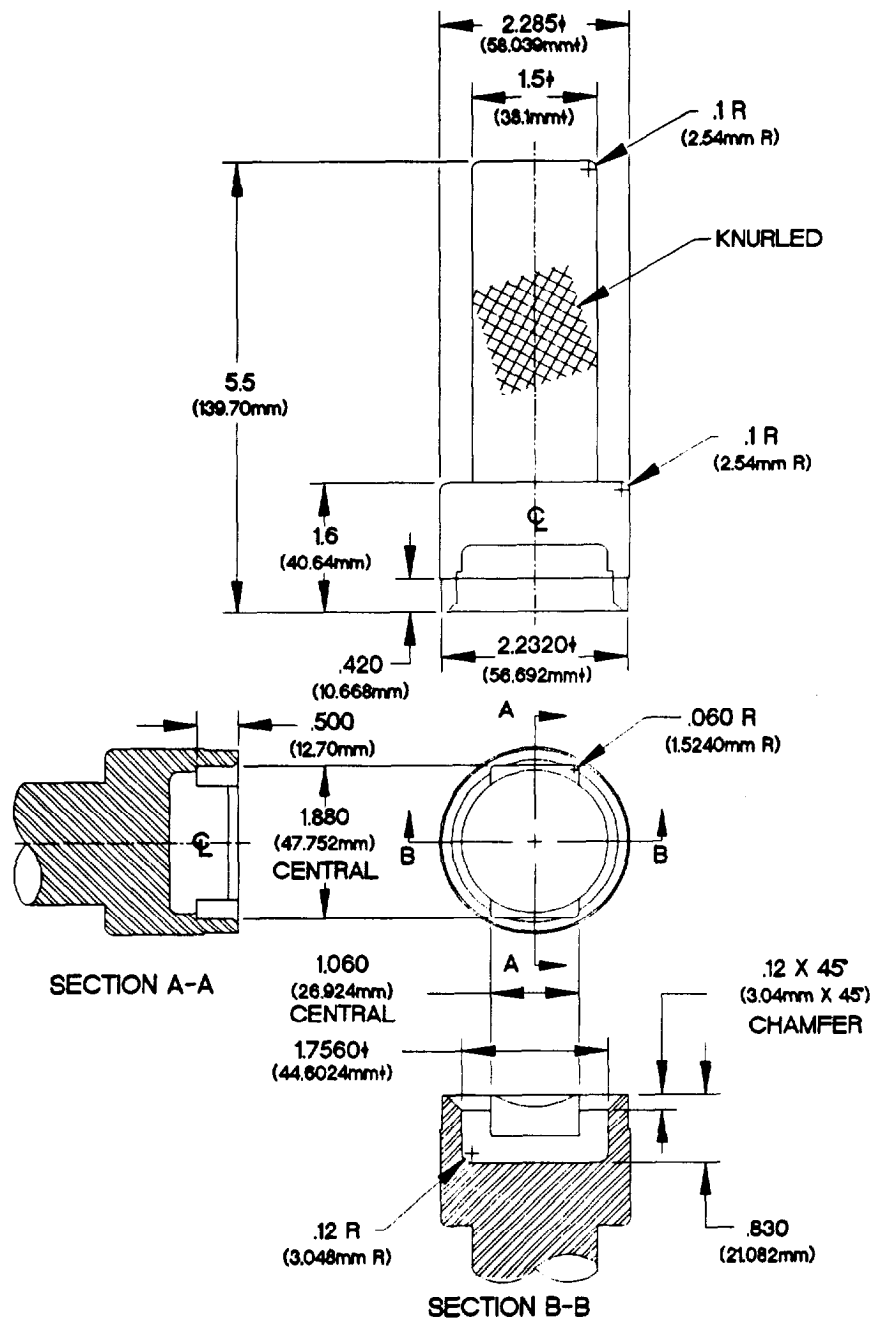


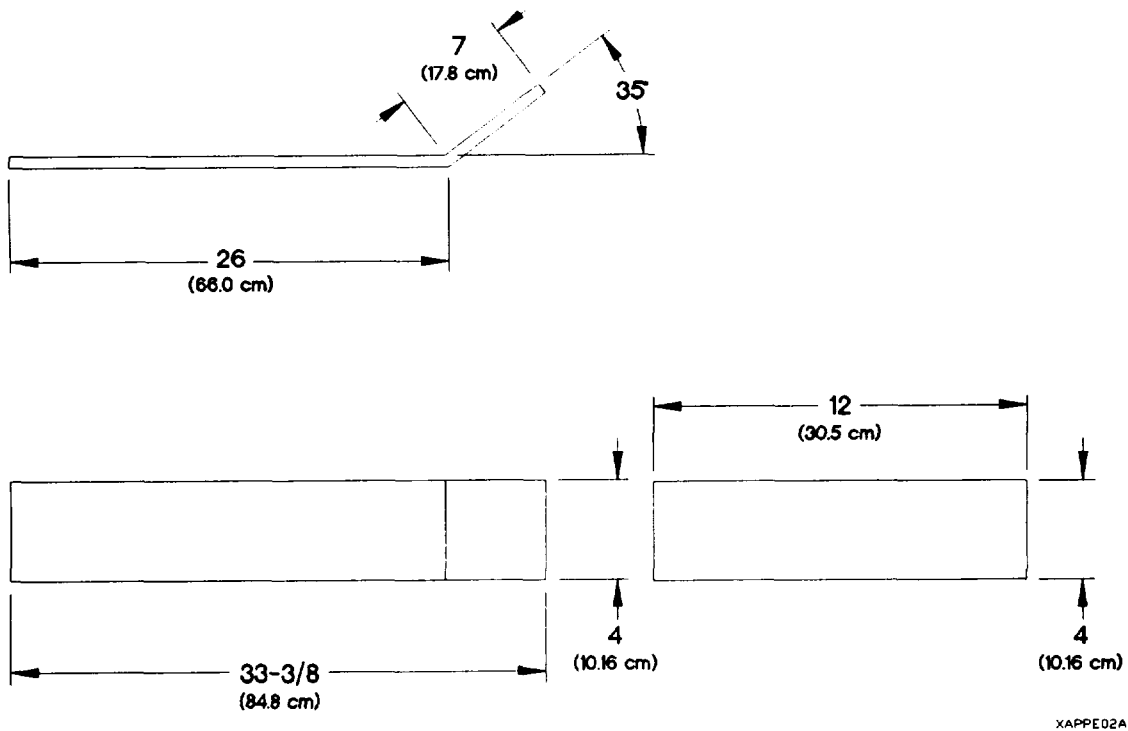
Figure E-2. Brake Plunger Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from round steel stock.
- c. De-burr and remove sharp edges.

**E-4. CAB SUPPORT TOOL**

Make the cab support tool from .38 inch (.96 cm) flat steel stock and angle iron stock according to the following instructions. Refer to the parts list and Figure E-3. Cab Support Tool Strut and Cab Rest for details.

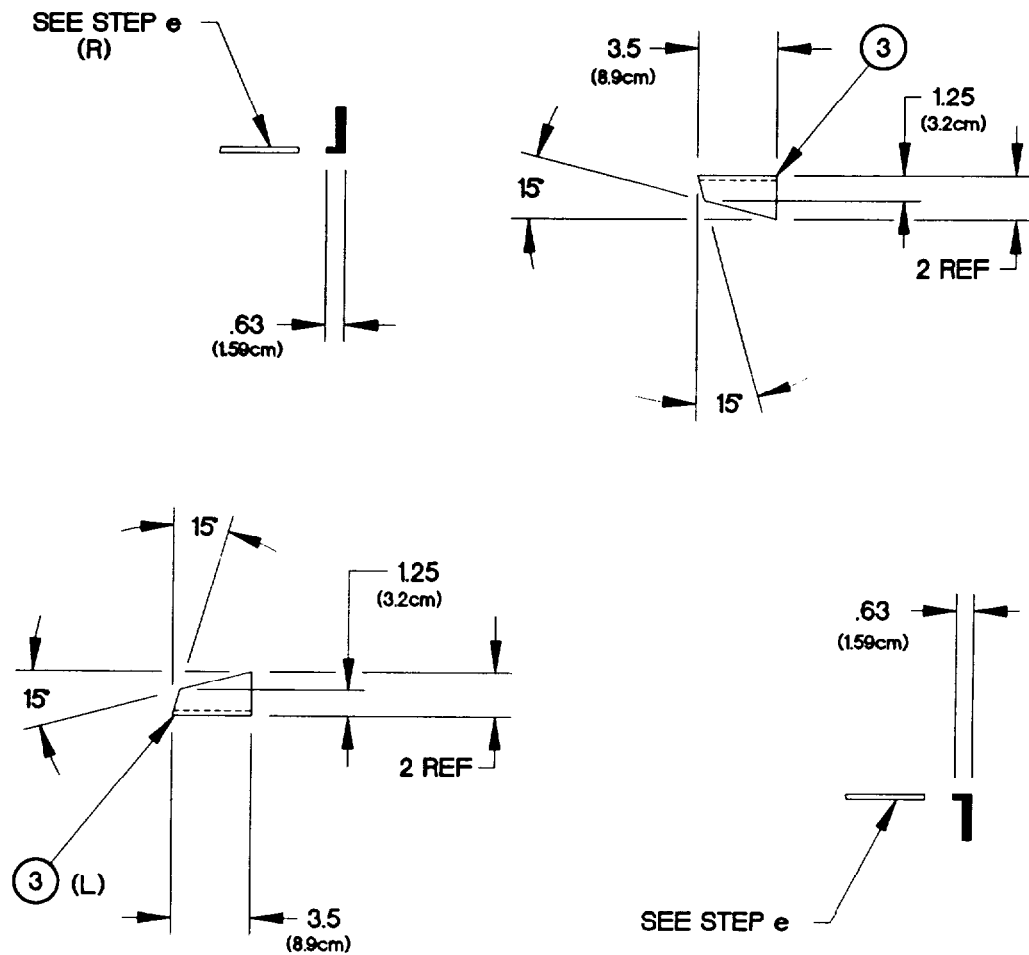
Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, Flat Bar	4.0 in. (10.2 cm) X 33.38 in. X (84.8 cm) X 0.38 in. (0.96 cm)	1
2	N/A	Steel, Flat Bar	4.0 in. (10.2 cm) X 12.0 in. (30.5 cm) X 0.38 in. (0.96 cm)	1
3	N/A	Angle Iron	2.0 in. (5.1 cm) X 2.0 in. (5.1 cm) X 3.5 in. (8.9 cm)	2
4	H.S.105VW-1	Insulgrip, CSA 105 C		



XAPPE02A

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.

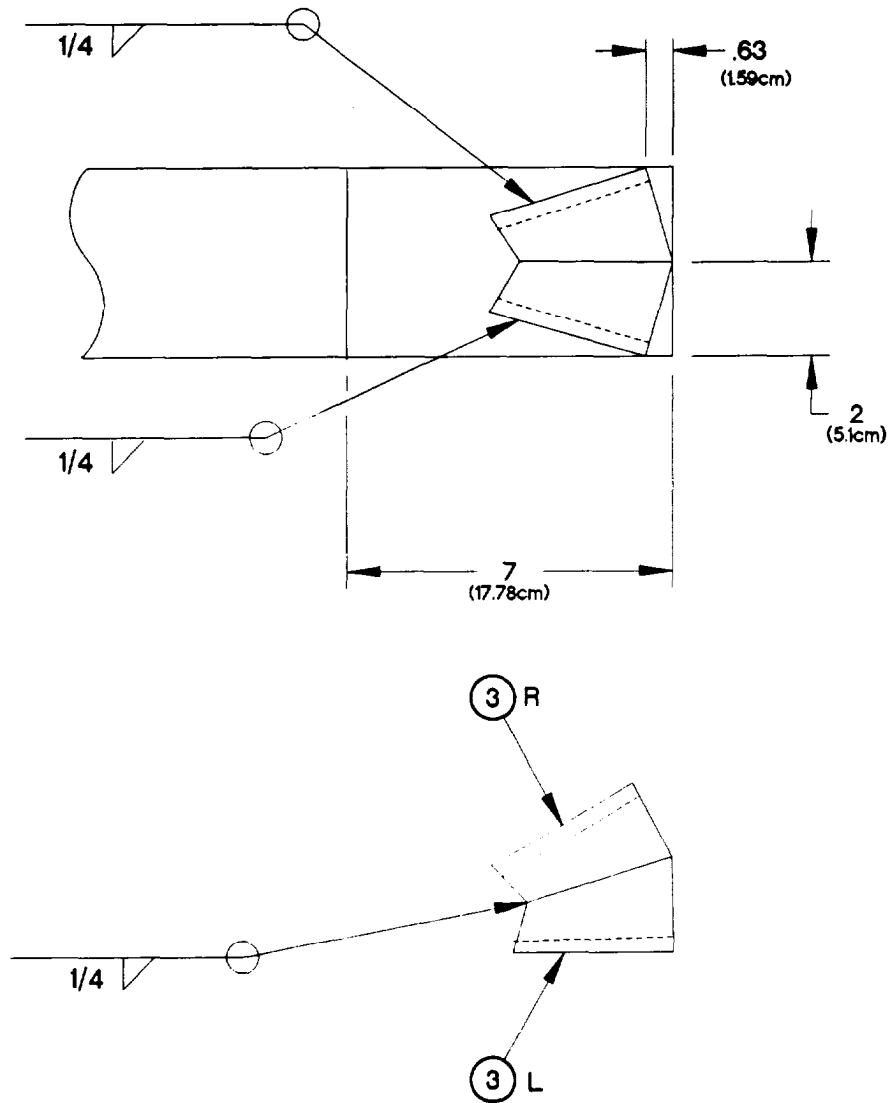


XAPPE03A

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.

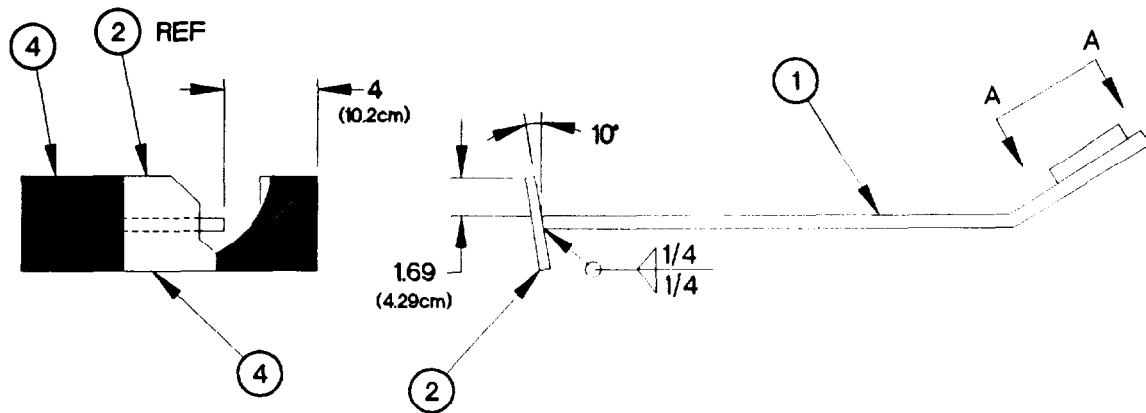
**E-4. CAB SUPPORT TOOL (CONT)**



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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.



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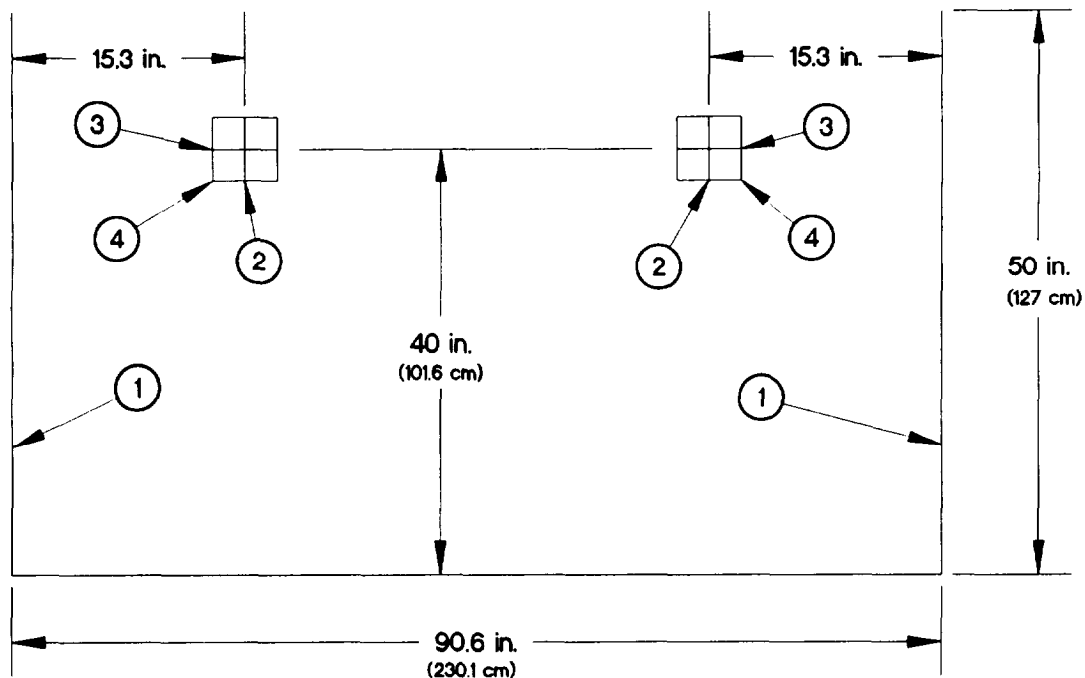
Figure E-6. Cab Support Tool Assembly

- m. Position and clamp cab support tool strut (1) to cab support tool cab rest (2) as shown by dimensions on Figure E-6. Cab Support Tool Assembly, before insulgrip (4) is applied.
- n. Weld cab support tool strut (1) to cab support tool cab rest (2).
- o. Apply Insulgrip (4) to cab support tool cab rest (2) as described on material container.

**E-5. HEADLIGHT ADJUSTMENT SCREEN**

The headlight adjustment screen may be drawn on any vertical surface at least 50 in. (127 cm) high and 100 in. (254 cm) wide.

- a. Draw two vertical lines (1) 50 in. (127 cm) high and 90.6 in. (230 cm) apart (centered on headlight adjustment screen).
- b. Locate two points 40 in. (101.6 cm) from floor and 13 in. (33 cm) toward the center from each vertical line (1).
- c. Draw vertical line (2) about 3-5 in. (8-13 cm) centered on each of the two points.
- d. Draw horizontal line (3) about 3-5 in. (8-13 cm) centered on each of the two points.
- e. Measure out 4 in. (10 cm) along each vertical line (2) and horizontal line (3) from each of the two points to make 8 in. (20 cm) squares (4).



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Figure E-7. Headlight Adjustment Screen

### E-6. M1079 BLACKOUT SHIELD SEALS

Fabricate the M1079 blackout shield seals according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
Blackout Shield Header Seal	942P00001	OSHR6	28-3/4 in. (730 mm)
Blackout Shield Jamb Seal (van body serial numbers 001 through 190)	942P00001	OSHR6	63-3/8 in. (1610 mm)
Blackout Shield Jamb Seal (van body serial number 191 and higher)	942P00001	OSHR6	33 in. (838 mm)

- a. Dimensions are in inches (millimeters).
- b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.

### E-7. M1079 DOOR GASKETS

Fabricate the M1079 door gaskets according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
LH Door Gasket	12416417	19207	214 in. (5435 mm)
RH Door Gasket	12416417	19207	197 in. (5004 mm)

- a. Dimensions are in inches (millimeters).
- b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.
- c. Glue ends of gasket to each other using adhesive MIL-A-46106 GP1TY1 (Item 11, Appendix D).

**E-8. M1079 WINDOW SASH GLAZING SEALS**

Fabricate the M1079 window sash glazing seals according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
Window Sash Top/Bottom Seal	941P00001	0SHR6	26-13/16 in. (681 mm)
Window Sash Side Seal (van body serial numbers 001 through 190)	941P00001	0SHR6	28-1/2 in. (724 mm)
Window Sash Side Seal (van body serial number 191 and higher)	941P00001	0SHR6	12-11/16 in. (2322 mm)

- a. Dimensions are in inches (millimeters).
- b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.

**NOTE**

Cut miters so that short side of seal faces toward glass.

- c. Cut 45-degree miters on ends of window sash seals.

**E-9. RELAY TEST WIRE**

Fabricate the relay test wire according to the following steps. Refer to the following parts list for materials.

Material Description	National Stock Number	Cut Length
Wire, Electrical (MIL-W-16878)	6145-00-330-3318	6 in. (152 mm)

- a. Dimensions are in inches (millimeters).
- b. Cut a length of wire six inches (152 mm) long.
- c. Remove approximately 3/4 in. (19 mm) of electrical insulation from each end of wire.

**E-10. WHEEL BEARING SHIM TOOL REST**

Fabricate the wheel bearing shim tool rest according to the following steps. Refer to the following parts list for materials.

Part Number	National Stock Number	Description
QQ-T-570	9510-00-866-1037	Bar, Metal

- a. Dimensions are in inches (millimeters).
- b. Cut metal bar to 9.0 inches (228.6 mm) long.
- c. De-burr and remove sharp edges from ends of metal bar.



<b>E-11. PNEUMATIC TUBES FABRICATION</b>
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Cut pneumatic tubes from bulk tubing stock listed Table E-1. Pneumatic Tube Lengths. Use a fine-toothed hacksaw or suitable cutting device and cut tubing to required length.

Table E-1. Pneumatic Tube Lengths

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-001	NT-100-4 (79470)	18.1	46.0
12414690-002	NT-100-4 (79470)	16.0	40.6
12414690-004	NT-100-4 (79470)	74.8	190.0
12414690-005	NT-100-4 (79470)	69.7	177.0
12414690-010	NT-100-4 (79470)	180.0	457.2
12414690-101	J844TYBSIZE 3/8 (81343)	18.0	45.7
12414690-102	J844TYBSIZE 3/8 (81343)	35.4	90.0
12414690-103	J844TYBSIZE 3/8 (81343)	20.9	53.0
12414690-104	J844TYBSIZE 3/8 (81343)	13.8	35.0
12414690-105	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-106	J844TYBSIZE 3/8 (81343)	20.5	52.0
12414690-107	J844TYBSIZE 3/8 (81343)	39.0	99.0
12414690-108	J844TYBSIZE 3/8 (81343)	15.4	39.0
12414690-109	J844TYBSIZE 3/8 (81343)	23.0	58.4
12414690-112	J844TYBSIZE 3/8 (81343)	80.0	198.0
12414690-113	J844TYBSIZE 3/8 (81343)	11.4	29.0
12414690-115	J844TYBSIZE 3/8 (81343)	82.8	210.2
12414690-117	J844TYBSIZE 3/8 (81343)	156.5	397.5
12414690-118	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-119	J844TYBSIZE 3/8 (81343)	269.5	684.5
12414690-120	J844TYBSIZE 3/8 (81343)	11.9	30.2
12414690-121	J844TYBSIZE 3/8 (81343)	43.0	109.2
12414690-122	J844TYBSIZE 3/8 (81343)	44.1	112.0
12414690-123	J844TYBSIZE 3/8 (81343)	259.4	659.0
12414690-124	J844TYBSIZE 3/8 (81343)	288.2	732.0
12414690-125	J844TYBSIZE 3/8 (81343)	10.8	27.3
12414690-126	J844TYBSIZE 3/8 (81343)	17.0	43.2
12414690-127	J844TYBSIZE 3/8 (81343)	17.0	43.2

**E-11. PNEUMATIC TUBES FABRICATION (CONT)**

Table E-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	c m
12414690-201	C608-100BLK (13174)	14.8	37.5
12414690-202	C608-100BLK (13174)	14.0	35.7
12414690-203	C608-100BLK (13174)	6.5	16.5
12414690-205	C608-100BLK (13174)	14.5	36.8
12414690-206	C608-100BLK (13174)	14.9	37.7
12414690-207	C608-100BLK (13174)	15.5	39.5
12414690-208	C608-100BLK (13174)	6.7	17.0
12414690-209	C608-100BLK (13174)	19.5	49.5
12414690-210	C608-100BLK (13174)	15.5	39.3
12414690-211	C608-100BLK (13174)	8.0	20.3
12414690-212	C608-100BLK (13174)	16.9	43.0
12414690-213	C608-100BLK (13174)	118.5	301.0
12414690-214	C608-100BLK (13174)	124.0	315.0
12414690-215	C608-100BLK (13174)	163.0	414.0
12414690-216	C608-100BLK (13174)	160.0	406.4
12414690-217	C608-100BLK (13174)	62.6	159.0
12414690-218	C608-100BLK (13174)	119.8	304.2
12414690-219	C608-100BLK (13174)	69.0	175.3
12414690-220	C608-100BLK (13174)	45.5	115.6
12414690-221	C608-100BLK (13174)	12.6	32.0
12414690-222	C608-100BLK (13174)	5.5	14.0
12414690-223	C608-100BLK (13174)	14.6	37.1
12414690-224	C608-100BLK (13174)	170.0	431.8
12414690-225	C608-100BLK (13174)	174.0	442.0
12414690-226	C608-100BLK (13174)	103.5	263.0
12414690-227	C608-100BLK (13174)	32.8	83.2
12414690-228	C608-100BLK (13174)	3.5	8.9
12414690-229	C608-100BLK (13174)	62.2	158.1
12414690-230	C608-100BLK (13174)	14.6	37.0
12414690-231	C608-100BLK (13174)	60.5	153.7
12414690-301	PFT-10B-BLK-100 (61424)	19.0	48.3
12414690-302	PFT-10B-BLK-100 (61424)	56.0	142.2
12414690-303	PFT-10B-BLK-100 (61424)	118.1	300.0

<b>E-12. NON-METALLIC ELECTRICAL CABLE CONDUIT FABRICATION</b>
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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
12418381P3	27413	7.3	18.5
12416381P30	49007	17.0	43.2
12416381P32	49005	1.7	4.3
12416381P34	49005	20.7	52.6
12416381P35	49005	21.8	55.4
12416381P36	49005	5.5	14.0
12416381P37	49005	8.0	20.3
12416381P38	49008	3.7	9.4
12416381P4	49008	12.0	30.5
12416381P5	49008	26.0	66.0
12416381P6	49008	7.7	19.6
12416381P7	49008	26.7	67.8
12416381P8	49008	5.2	13.2
12416381P9	49008	16.8	42.7

**E-13. STEERING GEAR RETURN HOSE AND TRANSMISSION OIL COOLER HOSES FABRICATION**

Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12418037	A110 (30327)	75.5	191.7
12418460-001	MS5213028110380 (96906)	17.5	44.4
12418460-002	MS521301A206R (96906)	16.0	40.6

**E-14. LANYARD ASSEMBLIES P/N 12418763 AND 12420196 FABRICATION**

Make the following lanyard assemblies from bulk cable material, sleeves, and tab material and assemble according to Figure E-8. Lanyard Assembly. The following parts list identifies part numbers and lengths of cut pieces.

Item	Part Number	Material Description	Size	Qty
1	MIL-W-83420 Type 1, Comp B	1/16 in. stranded wire cable	4 in. (102 mm)	1
2	MS51844-22	Sleeve		2
3	N/A	Tab, Stainless Steel ASTM A617	.06 in. (16 mm) X .37 in. (9.5 mm) X 1.25 in. (32 mm)	1

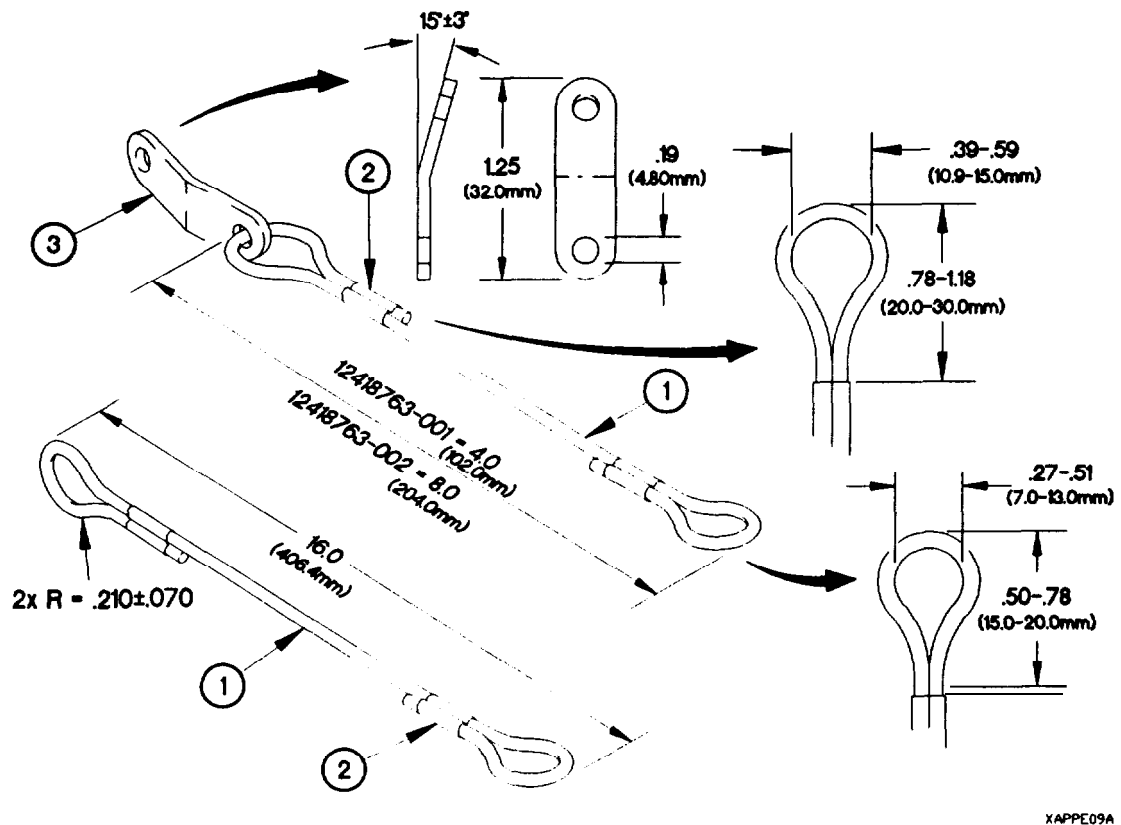


Figure E-8. Lanyard Assembly

- 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-15. NON-METALLIC VENT AIR HOSES FABRICATION**

Cut the following vent air hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12420197-001	483666 (02280)	180.0	457.2
12420197-002	483666 (02280)	120.0	304.8
12420197-003	483666 (02280)	96.0	243.8
12420197-004	483666 (02280)	36.0	91.4
12420197-005	483666 (02280)	156.0	396.2
12420197-006	483666 (02280)	72.0	182.9
12420198-001	881-16 (98441)	120.0	304.8
12420198-002	11657469	36.0	91.4

**E-16. PERSONNEL HEATER AIR DUCT HOSE FABRICATION**

Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12420308-457	8711054 (19207)	18.3	46.4
12420308-760	8711054 (19207)	30.4	77.2

**E-17. BLOCK SEAL 12420489 FABRICATION**

Make block seal from P/N (0VXY8) STN2.38X.5. Use a suitable cutting tool to cut seal to 0.52 inch (1.3 cm) long.

<b>E-18. CTIS SEAL DRIVER 3256-H-1048</b>
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Used on Front 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

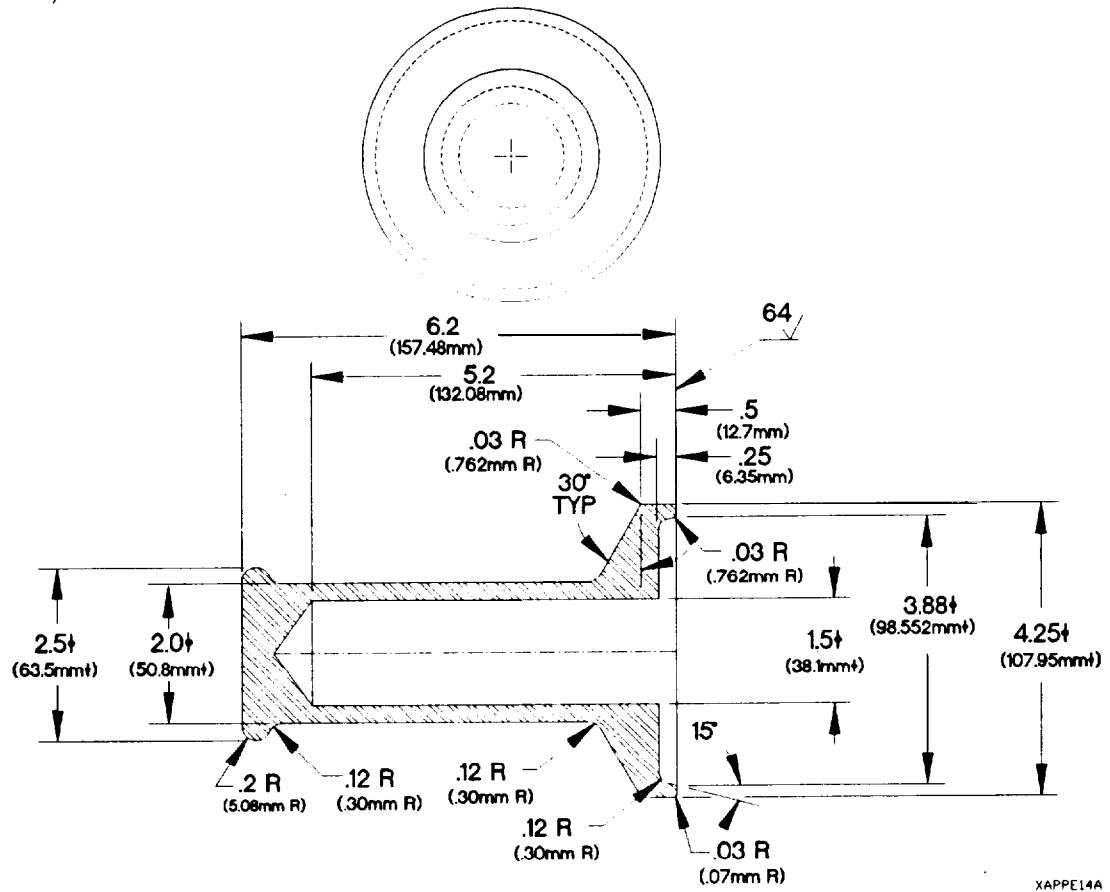


Figure E-9. CTIS Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from round steel stock.
- c. De-burr and remove sharp edges.

**E-19. WHEEL HUB GREASE SEAL DRIVER 3256-K-1051**

NOTES ON USE OF DRIVER

- 1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS. DIRT, NICKS AND BURRS
- 2) DO NOT USE A METAL HAMMER ON DRIVER  
A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE Mallet IS TO BE USED
- 3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL

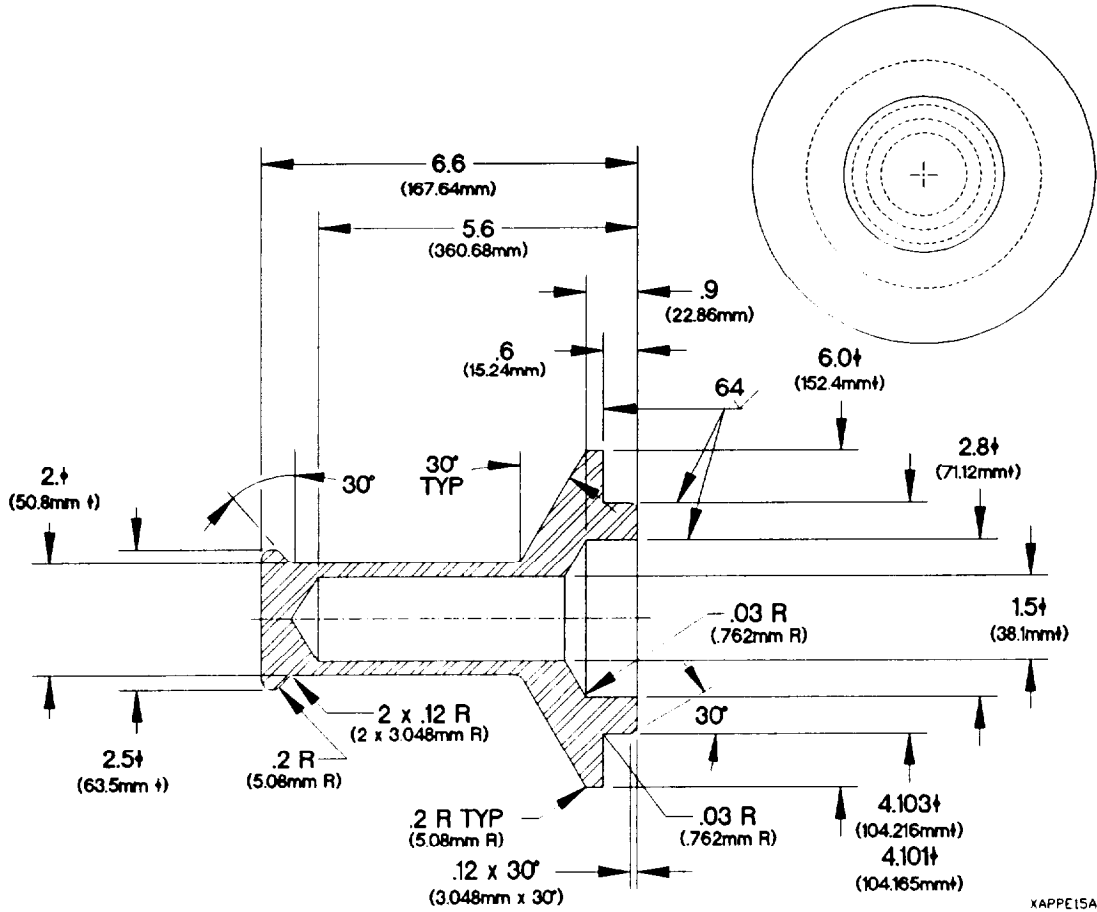


Figure E-10. Wheel Hub Grease Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from round steel stock.
- c. De-burr and remove sharp edges.



## APPENDIX F TORQUE LIMITS

### F-1. GENERAL

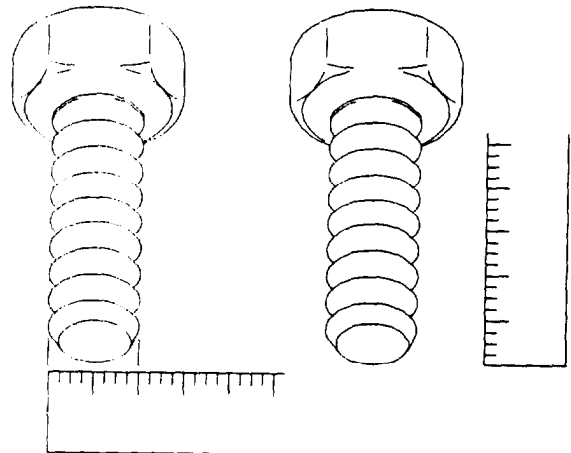
This appendix provides general torque limits for screws and nuts used on the vehicle. Special torque limits are shown in the maintenance procedures for applicable components. Use the general torque limit given in this appendix when specific torque limits are not given in the maintenance procedure. These general torque limits can not be applied to screws that retain rubber components. The rubber components will be damaged before the torque limit is reached. If a special torque limit is not given in the maintenance instructions for a fastener which retains a rubber component, tighten the screw or nut until it touches metal, then tighten one more turn. Whenever possible, the tightening force (torque) should be applied to the nut side of the fastener group.

### F-2. TORQUE LIMITS

Refer to Table F-1. Torque Limits for SAE and ANSI Fasteners for torque limits on standard (SAE and ANSI) screws and free spinning nuts. Refer to Table F-2. Torque Limits for SAE and ANSI Prevailing Torque Nuts for torque limits on standard (SAE and ANSI) self-locking nuts. Refer to Table F-3. Torque Limits for Metric Screws and Free Spinning Nuts for torque limits on metric screws and free spinning nuts, Refer to Table F-4. Torque Limits for Metric Prevailing Torque Nuts for torque limits on metric self-locking nuts.

### F-3. USE OF TORQUE TABLES

- (1) Measure the diameter of the screw to be installed.
- (2) Count the number of threads per inch.
- (3) Under the heading DIAMETER look down the column until the diameter of the screw is found, (There are usually two lines beginning with the same diameter.)
- (4) Under the heading THREADS PER INCH (SAE and ANSI) or THREAD PITCH (metric), find the number of threads per inch that matches the number counted in step (2).
- (5) To find the grade of the screw, match the markings on the head to the correct picture under CAPSCREW HEAD MARKINGS on the torque table.
- (6) Look down the column under the picture found in step (5) until the torque limit (lb-ft or N•m) for the diameter and threads per inch (or thread pitch, in the case of metric fasteners) of the screw are located.



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## APPENDIX F TORQUE LIMITS

Table F-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

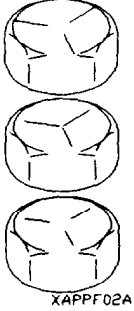
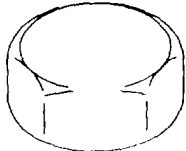
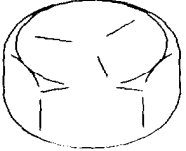
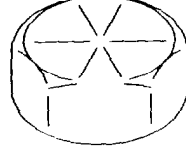
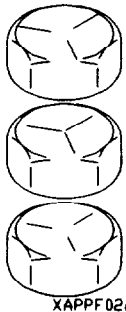
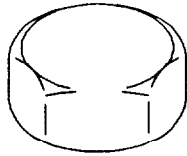
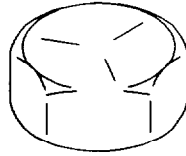
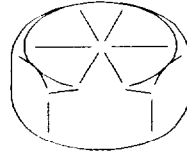
 <b>NOTE</b> Manufacturer's marks may vary. These are all SAE Grade 5.		<b>Material Grade Markings</b>					
		 XAPPF03A <b>SAE Grade 2</b>	 XAPPF04A <b>SAE Grade 5</b>	 XAPPF06A <b>SAE Grade 8</b>			
		<b>Torque</b>					
Diameter	Threads per inch						
inch		lb-ft	N•m	lb-ft	N•m	lb-ft	N•m
1/4	20	3-5	5-7	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. Drv Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

 Manufacturer's marks may vary. These are all SAE Grade 5		Material Grade Markings					
		 SAE Grade 2	 SAE Grade 5	 SAE Grade 8	Torque		
Diameter	Threads per inch	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m
inch							
11/16	24	99-133	135-181	153-207	209-279	217-291	296-394
3/4	10	110-148	150-200	171-229	232-310	240-324	328-438
3/4	16	123-165	168-224	190-256	259-345	269-361	366-488
3/4	20	127-171	174-232	197-265	268-358	278-374	379-505
13/16	20			252-340	345-459	357-481	487-649
7/8	9			275-369	374-498	387-521	528-704
7/8	14			303-407	413-551	427-575	583-777
7/8	20			319-429	435-579	450-606	614-818
15/16	20			395-531	538-718	558-750	760-1014
1	8			411-553	560-748	581-781	792-1056
1	12			450-606	614-818	636-856	867-1155
1	20			483-649	658-878	681-917	929-1239
1-1/16	18			576-776	782-1044	813-1095	1109-1479
1-1/8	7			507-683	693-923	824-1108	1123-1497
1-1/8	12			570-766	776-1034	923-1241	1258-1678
1-1/8	18			600-806	817-1089	971-1307	1324-1766
1-3/16	18			709-953	966-1288	1149-1545	1566-2088
1-1/4	7			716-964	976-1302	1161-1563	1584-2112
1-1/4	12			793-1067	1081-1441	1286-1730	1754-2338
1-1/4	18			831-1117	1132-1510	1346-1812	1835-2447
1-5/16	18			965-1299	1316-1754	1565-2105	2134-2846
1-3/8	6			939-1263	1281-1707	1523-2049	2076-2768

## APPENDIX F TORQUE LIMITS

Table F-2. Dry Torque Limits for SAE and ANSI Prevailing Torque Nuts

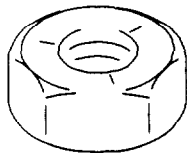
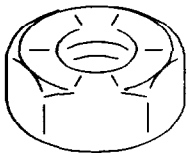
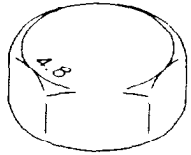
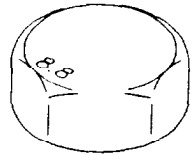
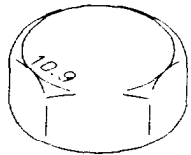
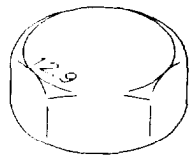
		Material Grade Markings				
		 XAPPF07A <b>SAE Grade 5</b>				 XAPPF08A <b>SAE Grade 8</b>
Hole Diameter	Threads per inch	Torque				
		lb-ft	N•m	lb-ft	N•m	
Inch						
1/4	20	10-12	14-16	15-17	20-24	
1/4	28	12-14	16-18	14-18	21-25	
5/16	18	20-24	27-33	26-32	36-44	
5/16	24	22-26	30-36	29-35	40-48	
3/8	16	35-41	47-55	48-58	65-77	
3/8	24	38-46	53-63	53-63	72-86	
7/16	14	55-65	74-88	75-91	103-123	
7/16	20	60-70	81-97	80-98	110-132	
1/2	13	86-102	116-138	113-137	154-184	
1/2	20	92-110	125-149	127-153	177-207	
9/16	12	120-144	162-194	168-202	229-273	
9/16	18	135-161	183-219	179-217	244-294	
5/8	11	165-199	226-270	226-272	306-368	
5/8	18	181-219	246-296	244-296	331-401	
3/4	10	296-354	402-480	395-479	538-648	
3/4	16	310-376	422-508	424-516	576-698	
7/8	9	460-554	625-749	612-746	833-1009	
7/8	14	503-607	684-822	652-800	888-1082	
1	8	686-828	933-1121	941-1141	1280-1544	

Table F-3. Dry Torque Limits for Metric Screws and Free Spinning Nuts

		Material Grade Markings							
									
		Metric Grade 4.8	Metric Grade 8.8	Metric Grade 10.9	Metric Grade 12.9				
Diameter	Thread Pitch	Torque							
		lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m
mm									
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

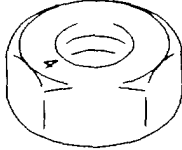
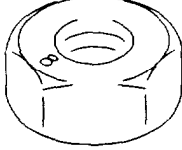


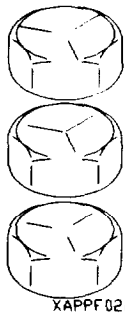
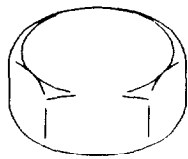
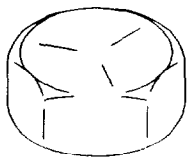
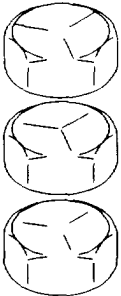
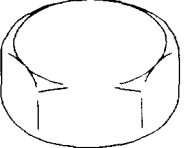
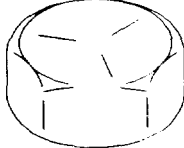
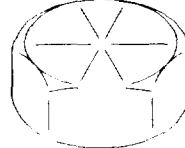
		Material Grade Markings							
									
		<b>Metric Grade 4.8</b>	<b>Metric Grade 8.8</b>	<b>Metric Grade 10.9</b>	<b>Metric Grade 12.9</b>				
Diameter	Thread Pitch	Torque							
		lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m
6	1	5-6	7-8	7-9	10-12	10-12	14-17	11-14	15-19
8	1.25	12-14	16-18	18-22	24-30	24-30	32-40	27-33	36-46
8	1	12-14	16-20	19-23	25-31	25-31	34-42	28-36	38-48
10	1.5	21-25	28-34	33-41	44-56	44-56	60-76	50-64	68-86
10	1.25	21-25	29-35	34-42	46-58	46-58	63-79	53-67	71-91
10	0.75	23-27	31-37	37-47	49-63	50-64	68-86	57-73	77-99
12	1.75	33-41	46-56	55-69	74-94	75-95	102-128	85-109	115-147
12	1.5	35-43	47-57	56-72	77-97	78-98	106-134	89-113	120-152
12	1.25	36-44	48-60	58-74	79-101	81-103	109-139	91-117	125-159
12	1	37-45	50-62	61-77	82-104	84-106	114-144	95-121	129-165
14	2	53-65	72-88	87-109	117-149	118-150	160-204	134-172	182-232
14	1.5	57-69	76-94	92-116	125-159	126-160	171-217	143-183	194-248
16	2	79-97	107-131	130-166	177-225	178-228	243-309	204-262	277-355
16	1.5	82-102	112-138	138-176	187-239	189-241	256-328	215-277	292-376
18	1.5			197-253	267-343	271-347	367-471	309-399	420-542
20	2.5			248-318	337-431	342-438	464-594	391-503	530-682
20	1.5			271-349	369-473	374-480	507-651	428-552	580-750
20	1			283-365	384-494	390-502	529-681	447-577	606-784
22	2.5			335-429	455-583	460-592	624-802	526-680	714-922
22	1.5			363-467	492-634	499-643	676-872	730-950	990-1290
24	3			420-540	569-733	577-743	783-1009	662-856	897-1161
24	2			453-583	614-792	622-804	844-1090	803-1043	1088-1416

Table F-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

		Material Grade Markings					
		 XAPPF02A <b>NOTE</b> Manufacturer's marks may vary. These are all SAE Grade 5.		 XAPPF03A <b>SAE Grade 2</b>		 XAPPF04A <b>SAE Grade 5</b>	
Diameter	Threads per inch	Torque					
inch		lb-ft	N•m	lb-ft	N•m	lb-ft	N•m
1/4	20	4	6	6	8	9	12
1/4	28	5	7	7	9	10	14
5/16	18	8	11	13	18	18	24
5/16	24	9	12	14	19	20	27
3/8	16	15	20	23	31	35	47
3/8	24	17	23	25	34	35	47
7/16	14	24	33	35	47	55	75
7/16	20	25	34	40	54	60	81
1/2	13	35	47	55	75	80	108
1/2	20	40	54	65	88	90	122
9/16	12	50	68	80	108	110	149
9/16	18	55	75	90	122	130	176
5/8	11	70	95	110	149	170	231
5/8	18	80	108	130	176	180	244
3/4	10	120	163	200	271	280	380
3/4	16	140	190	220	298	320	434
7/8	9	110	149	300	407	460	624
7/8	14	120	163	320	434	500	678
1	8	160	217	440	597	680	922
1	12	170	231	480	651	740	1003
1-1/8	7	220	298	600	814	960	1302
1-1/8	12	260	353	660	895	1080	1464

## APPENDIX F TORQUE LIMITS

Table F-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

 <p style="text-align: center; font-size: small;">XAPPF02A</p> <p style="text-align: center;"><b>Manufacturer's marks may vary. These are all SAE Grade 5</b></p>		<b>Material Grade Markings</b>					
		 <p style="text-align: center; font-size: small;">XAPPF03A</p> <p style="text-align: center;"><b>SAE Grade 2</b></p>	 <p style="text-align: center; font-size: small;">XAPPF04A</p> <p style="text-align: center;"><b>SAE Grade 5</b></p>	 <p style="text-align: center; font-size: small;">XAPPF06A</p> <p style="text-align: center;"><b>SAE Grade 8</b></p>			
Diameter	Threads per inch	Torque					
inch		lb-ft	N•m	lb-ft	N•m	lb-ft	N•m
1-1/4	7	320	434	840	1139	1360	1844
1-1/4	12	360	488	920	1248	1500	2034
1-3/8	6	420	570	1100	1492	1780	2414
1-3/8	12	460	624	1260	1709	2040	2766



## APPENDIX G MANDATORY REPLACEMENT PARTS

### Section I. INTRODUCTION

#### G-1. SCOPE

This appendix lists mandatory replacement parts you will need to maintain the LMTV vehicle.

#### G-2. EXPLANATION OF COLUMNS

- |  |   |
|--|---|
| a. Column (1) - Item Number.           | This number is assigned to each entry in the listing and is referenced in the Initial Setup of the applicable task under Materials/Parts. |
| b. Column (2) - Nomenclature.          | Name or identification of the part.   |
| c. Column (3) - Part Number.           | The manufacturer's part number.   |
| d. Column (4) - National Stock Number. | The National stock number of the part.  |

### Section II. MANDATORY REPLACEMENT PARTS LIST

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
1	BLADE, WINDSHIELD WIPER	105.384	2540-01-364-621
2	BOLT, MACHINE	12414307-065	5306-01-382-5054
3	BOOT KIT, EXHAUST	DQ6025	4730-01-417-3197
4	BUMPER, RUBBER	12419182	5340-01-410-8397
5	BUSHING, SLEEVE	7-199-002668	3120-01-367-6894
6	CHANNEL, RUBBER	ZZR765/2-001A7	9390-01-420-4560
7	CLAMP	024S9	
8	CLAMP	032S9	
9	DECAL	12340917	7690-01-256-4909
10	FASTENER TAPE	MIL-F-21840	8315-00-006-9855
11	FASTENER TAPE	50-534718-19	8315-00-935-6762
12	FILTER ASSEMBLY	75223-11	2940-01-417-9333
13	FILTER ELEMENT	1048011	2940-01-385-8931
14	FILTER ELEMENT, FLUID	R22146	2910-01-360-6366
15	FILTER ELEMENT, FLUID	29507750	2940-01-361-2406
16	FILTER ELEMENT, FLUID	59979 1	4460-01-284-2344
17	FILTER ELEMENT, FLUID	931558	2940-01-363-4377

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
18	FILTER ELEMENT,INTAKE AIR CLEANER	P52-7750	2940-01-361-2407
19	FILTER, AIR	12416539	
20	FILTER, AIR	12416563	
21	FILTER, FUEL	7E9763	2940-01-363-3089
22	FILTER, OIL	1R0739	2940-00-029-0388
23	GASKET	F337576M6	
24	GASKET	M28840/24HA	5935-01-421-9754
25	GASKET	QS-1181	5330-01-058-3788
26	GASKET	10-36675-18	5330-00-298-0190
27	GASKET	119-2940	5330-01-424-7905
28	GASKET	12421469	
29	GASKET	12422254	
30	GASKET	13848	5330-01-211-0717
31	GASKET	350700	5330-01-295-3053
32	GASKET	350903	5330-00-576-4626
33	GASKET	352200	5330-01-421-6105
34	GASKET	352302	5330-01-421-6107
35	GASKET	353400	5330-01-421-6102
36	GASKET	353806	5330-01-421-6103
37	GASKET	353810	
38	GASKET	355148	5330-01-423-0596
39	GASKET	355175	5330-01-423-0623
40	GASKET	3K3257	5330-01-305-6550
41	GASKET	4P1624	5330-01-360-5934
42	GASKET	9Y8103	5330-01-360-5931
43	GASKET, FUEL FILTER	7C1159	5330-01-360-5941
44	GASKET, RING	331.406	5330-01-395-4645
45	GASKET, THERMOSTAT	2W7212	5330-01-347-3206
46	GROMMET, NONMETALLIC	MS35489-6	5325-00-263-6632
47	GROMMET, NONMETALLIC	12417598	5325-01-375-1299
48	GROMMET, NONMETALLIC	12421402	5325-01-440-2178

## Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
49	GROMMET, NONMETALLIC	4082-36734-01	5325-01-194-3076
50	GROMMET, NONMETALLIC	50S12-1-1AA	5325-01-145-0105
51	GROMMET, NONMETALLIC	8741442	5325-00-088-6147
52	INSULATOR, TANK	A1394J	5970-01-385-7317
53	INSULATOR, TANK	A1394K	5970-01-385-7262
54	KIT, FILTER	29503829	
55	KIT, FILTER	29526899	
56	KIT, PROPELLER SHAFT	KT-16SB	2520-01-370-1360
57	LAMP, INCANDESCENT	CM7-7373	6240-00-270-6824
58	LAMP, INCANDESCENT	CM7376	6270-00-499-6278
59	LATCH, BAIL HEAD	68-20-101-10	2540-01-232-2470
60	LOCKNUT	0770-023-003	5310-01-423-3725
61	LOCKWASHER	ABCH207-LW-1/2	
62	LOCKWASHER	ABCH207-LW-3/8	
63	LOCKWASHER	B7949000161	
64	LOCKWASHER	D70336/1-20	5310-01-110-7933
65	LOCKWASHER	D70336/3-50	5310-01-439-2542
66	LOCKWASHER	D70336/3-52	5310-01-438-2543
67	LOCKWASHER	MS35335-30	5310-00-209-0788
68	LOCKWASHER	MS35335-31	5310-00-596-7693
69	LOCKWASHER	MS35335-33	5310-00-209-0786
70	LOCKWASHER	MS35335-36	5310-00-550-3503
71	LOCKWASHER	MS35335-38	5310-00-616-6354
72	LOCKWASHER	MS35335-58	5310-00-209-1366
73	LOCKWASHER	MS35335-61	5310-00-527-3634
74	LOCKWASHER	MS35335-62	5310-00-184-9562
75	LOCKWASHER	MS35337-25	5310-00-013-8502
76	LOCKWASHER	MS35338-100	5310-00-261-8278
77	LOCKWASHER	MS35338-102	5310-00-167-0671
78	LOCKWASHER	MS35338-103	5310-00-184-8971
79	LOCKWASHER	MS35338-135	5310-00-933-8118

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
80	LOCKWASHER	MS35338-136	5310-00-929-6395
81	LOCKWASHER	MS35338-137	5310-00-933-8119
82	LOCKWASHER	MS35338-138	5310-00-933-8120
83	LOCKWASHER	MS35338-139	5310-00-933-8121
84	LOCKWASHER	MS35338-140	5310-00-974-6623
85	LOCKWASHER	MS35338-141	5310-00-984-7042
86	LOCKWASHER	MS35338-143	5310-00-933-8778
87	LOCKWASHER	MS35338-158	5310-00-883-9417
88	LOCKWASHER	MS35338-171	5310-01-130-9066
89	LOCKWASHER	MS35338-42	5310-00-045-3299
90	LOCKWASHER	MS35338-43	5310-00-045-3296
91	LOCKWASHER	MS35338-45	5610-00-407-9566
92	LOCKWASHER	MS35338-46	5310-01-334-4710
93	LOCKWASHER	MS35338-51	5310-00-584-7888
94	LOCKWASHER	MS35340-44	5310-00-682-5930
95	LOCKWASHER	MS51414-1	5310-01-235-2057
96	LOCKWASHER	MS51414-2	5310-01-310-1098
97	LOCKWASHER	MS51848-50	5310-01-033-8615
98	LOCKWASHER	N9015	5310-01-369-6073
99	LOCKWASHER	N9018	5310-01-032-4827
100	LOCKWASHER	N9459	5310-01-348-8393
101	LOCKWASHER	N9461	5310-01-348-8392
102	LOCKWASHER	1229-S-513C	5310-01-062-3384
103	LOCKWASHER	12414570-015	5310-01-388-2043
104	LOCKWASHER	12414570-021	5310-01-374-4516
105	LOCKWASHER	152.269	5310-01-407-4764
106	LOCKWASHER	152.522	
107	LOCKWASHER	152.544	5340-01-395-0823
108	LOCKWASHER	1729B262	5310-00-964-7811
109	LOCKWASHER	488.671	
110	NUT, BLIND RIVET	MS27130-S136	5310-01-409-4435

## MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
111	NUT, BLIND RIVET	MS27130-S148	5310-01-370-5548
112	NUT, BLIND RIVET	12421403-060	
113	NUT, BLIND RIVET	12421403-065	
114	NUT, BLIND RIVET	12421634-017	
115	NUT, BLIND RIVET	12442158-5	
116	NUT, SELF-LOCKING	DIN-934STM6	5310-01-342-2739
117	NUT, SELF-LOCKING	MS16228-10C	5310-00-245-8826
118	NUT, SELF-LOCKING	MS16228-5C	5310-00-584-7992
119	NUT, SELF-LOCKING	MS20500-524	5310-00-208-4023
120	NUT, SELF-LOCKING	MS21042-04	5310-00-811-6419
121	NUT, SELF-LOCKING	MS21042-5	5310-00-807-1469
122	NUT, SELF-LOCKING	MS21044C08	5310-00-982-6814
123	NUT, SELF-LOCKING	MS21083N08	5310-00-941-6019
124	NUT, SELF-LOCKING	MS21083N6	5310-00-926-1852
125	NUT, SELF-LOCKING	MS51922-1	5310-00-088-1251
126	NUT, SELF-LOCKING	MS51922-2	5310-00-929-1807
127	NUT, SELF-LOCKING	MS51922-33	5310-00-225-6993
128	NUT, SELF-LOCKING	MS51922-5	5310-00-959-7600
129	NUT, SELF-LOCKING	N9406	5310-01-362-6171
130	NUT, SELF-LOCKING	N9410	5310-01-348-8398
131	NUT, SELF-LOCKING	N9467	5310-01-350-4257
132	NUT, SELF-LOCKING	12301125	5310-01-210-0199
133	NUT, SELF-LOCKING	12412476-04	
134	NUT, SELF-LOCKING	12414308-002	5310-01-381-2819
135	NUT, SELF-LOCKING	12414308-003	5310-01-377-1549
136	NUT, SELF-LOCKING	12414308-004	5310-01-369-5703
137	NUT, SELF-LOCKING	12414308-007	5310-01-046-0186
138	NUT, SELF-LOCKING	12414308-017	5310-01-381-9830
139	NUT, SELF-LOCKING	12414308-018	5310-01-369-3337
140	NUT, SELF-LOCKING	12414308-019	5310-01-369-9522
141	NUT, SELF-LOCKING	12414308-020	5310-01-381-9849

## Section II. MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
142	NUT, SELF-LOCKING	12414308-021	5310-01-369-3338
143	NUT, SELF-LOCKING	12414308-022	5310-01-417-1262
144	NUT, SELF-LOCKING	12414308-025	5310-01-367-6706
145	NUT, SELF-LOCKING	12414308-027	5310-01-369-3339
146	NUT, SELF-LOCKING	12414315-003	5310-01-374-1382
147	NUT, SELF-LOCKING	12414315-005	5310-01-372-3023
148	NUT, SELF-LOCKING	12414315-006	5310-01-369-3332
149	NUT, SELF-LOCKING	12414315-009	5310-01-365-7236
150	NUT, SELF-LOCKING	12414315-012	5310-01-369-3331
151	NUT, SELF-LOCKING	12414315-017	5310-01-368-8065
152	NUT, SELF-LOCKING	12414420-004	5310-01-370-0010
153	NUT, SELF-LOCKING	12419003	5310-01-376-0773
154	NUT, SELF-LOCKING	270W10000	
155	NUT, SELF-LOCKING	29514660	
156	NUT, SELF-LOCKING	7951286	5310-00-789-0398
157	PACKING, PREFORMED	A82777	5330-00-579-6495
158	PACKING, PREFORMED	F4001-16	
159	PACKING, PREFORMED	J515-8-1	5330-00-292-8171
160	PACKING, PREFORMED	MK0012510	
161	PACKING, PREFORMED	MS28775-011	5330-00-582-2133
162	PACKING, PREFORMED	MS28775-227	5330-00-576-9731
163	PACKING, PREFORMED	MS28778-10	5330-00-285-9842
164	PACKING, PREFORMED	MS28778-12	5330-00-251-8839
165	PACKING, PREFORMED	MS28778-16	5330-00-816-3546
166	PACKING, PREFORMED	MS28778-4	5330-00-805-2966
167	PACKING, PREFORMED	MS9955-113	5330-01-374-2325
168	PACKING, PREFORMED	M25998/1-246	5330-01-189-6351
169	PACKING, PREFORMED	OR420A	5330-01-389-6028
170	PACKING, PREFORMED	11639519-1	5330-00-463-0200
171	PACKING, PREFORMED	1509	5330-00-172-1919
172	PACKING, PREFORMED	2M4453	5330-00-074-3768

## Section II. MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
173	PACKING, PREFORMED	22617-16	5330-01-168-0885
174	PACKING, PREFORMED	23043446	5330-01-424-6629
175	PACKING, PREFORMED	29500969	5330-01-360-7852
176	PACKING, PREFORMED	29503383	5330-01-360-6017
177	PACKING, PREFORMED	3-906N522-90	5330-01-104-1093
178	PACKING, PREFORMED	3-908N522-90	5330-00-929-8171
179	PACKING, PREFORMED	3D2824	5330-00-944-8281
180	PACKING, PREFORMED	3J1907	5330-01-333-6444
181	PACKING, PREFORMED	3J7354	5330-00-954-8008
182	PACKING, PREFORMED	3K0360	5330-00-948-6482
183	PACKING, PREFORMED	4J5477	5330-00-855-8059
184	PACKING, PREFORMED	4L9564	5330-00-828-8639
185	PACKING, PREFORMED	5-X-1155	5330-01-392-1637
186	PACKING, PREFORMED	5F7054	5330-00-339-6224
187	PACKING, PREFORMED	5P7813	5330-01-335-0042
188	PACKING, PREFORMED	6V8397	5330-00-579-6495
189	PACKING, PREFORMED	673268	
190	PACKING, PREFORMED	673269	5330-01-395-1252
191	PACKING, PREFORMED	7F8267	5330-01-291-7353
192	PACKING, PREFORMED	7320658	5330-00-297-7106
193	PACKING, PREFORMED	9604792-001	5330-01-429-3089
194	PAD, CUSHIONING	12416479-001	2590-01-397-7844
195	PAD, CUSHIONING	12416479-002	2590-01-412-2663
196	PARTS, KIT, DEHYDRATOR	RN-60-A	4440-01-337-7324
197	PARTS KIT, SEAL REPLACEMENT	SK10-2	5330-01-350-4474
198	PARTS KIT, SEAL REPLACEMENT	SK10-3	5330-01-350-4472
199	PARTS KIT, SEAL REPLACEMENT	SK10-4	5330-01-343-2745
200	PIN, COTTER	K-2412-Z	5315-01-179-9882
201	PIN, COTTER	MS171659	5315-00-846-8337
202	PIN, COTTER	MS24665-151	5315-00-815-1405
203	PIN, COTTER	MS24665-298	5315-00-234-1861

Section II. MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
204	PIN, COTTER	MS24665-385	5315-00-187-9382
205	PIN, COTTER	MS24665-423	5315-00-013-7228
206	PIN, COTTER	MS24665-457	5315-00-187-9393
207	PIN, COTTER	MS24665-459	5315-00-187-9394
208	PIN, COTTER	MS24665-69	5315-00-828-8190
209	PIN, COTTER	352.497	5315-01-394-3546
210	PIN, SPRING	MS16562-142	5315-00-058-6115
211	PIN, SPRING	MS16552-146	5315-00-853-3814
212	PLASTIC STRIP	352700	5330-01-296-2109
213	RECEPTACLE	50R4-1-1AA	5325-01-049-2049
214	RING, BUSHING	152.157	
215	RIVET, BLIND	AK42H	5320-00-874-4477
216	RIVET, BLIND	AK43H	5320-00-143-6149
217	RIVET, BLIND	MS20600AD5W12	5320-01-047-0467
218	RIVET, BLIND	MS20604B3W2	5320-00-721-9075
219	RIVET, BLIND	M24243/1-A806	5320-00-850-3256
220	RIVET, BLIND	M24243/1-B302	5320-00-999-0397
221	RIVET, BLIND	M24243/1-D502	5320-00-850-3248
222	RIVET, BLIND	M24243/1-D608	5320-00-850-3246
223	RIVET, BLIND	M24243/1-F402	5320-00-129-9706
224	RIVET, BLIND	M24243/6-A403H	5320-00-882-8388
225	RIVET, BLIND	M24243/6-A405H	5320-01-291-9121
226	RIVET, BLIND	M24243/6-A406H	5320-01-421-0484
227	RIVET, BLIND	M24243/6-A602H	5320-00-956-7362
228	RIVET, BLIND	M24243/6-A604H	5320-00-956-7355
229	RIVET, BLIND	M24243/6-A606H	5320-00-882-8385
230	RIVET, BLIND	M24243/6-A608H	5320-01-032-6534
231	RIVET, BLIND	M24243/7-A402H	5320-00-874-4477
232	RIVET, BLIND	M24243/7-A403H	5320-00-143-6149
233	RIVET, BLIND	M24243/7-A604H	5320-00-420-2165
234	RIVET, BLIND	M24243/7-A606H	5320-00-490-5523



## Section II. MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
235	RIVET, BLIND	SD64BSLF	5320-01-397-3347
236	RIVET, BLIND	206057	5320-01-411-0081
237	RIVET, COMPRESSION	12418469	5320-01-376-0699
238	SCREW, CAP	12414475-131	5303-01-363-0703
239	SCREW, CAP	6V-2315	5306-01-433-4753
240	SCREW, MACHINE	MS24693-144	
241	SCREW, MACHINE	MS51958-83	5305-00-071-2095
242	SCREW, SELF-LOCKING	MS16998-61L	5305-01-211-3097
243	SEAL	VC08G1R0B	5330-01-389-6109
244	SEAL	12421431	
245	SEAL	125128-5	
246	SEAL	125128-6	
247	SEAL	355150	5330-01-423-0689
248	SEAL ASSEMBLY, CTIS	A1205-Q-2435	5330-01-360-7753
249	SEAL ASSEMBLY, HUB	A1205-R-2254	5330-01-360-5252
250	SEAL, DOOR	12416467	5330-01-385-3769
251	SEAL RING, METAL	29505809	5330-01-360-5329
252	SEAL, NONMETALLIC	CC3550	
253	SEAL, NONMETALLIC	12417725	5330-01-375-2908
254	SEAL, NONMETALLIC	2418974-1	5330-01-257-1709
255	SEAL, NONMETALLIC	673267	5330-01-395-1251
256	SEAL, URETHANE FOAM	12420420-001	
257	SEAL, URETHANE FOAM	12420420-002	
258	SEAL, URETHANE FOAM	12420420-003	
259	SEAL, WEATHER	147P00039	
260	SPACER, RING	4P2987	5365-01-433-8407
261	SPLICE, CONDUCTOR	12420927-001	
262	SPLICE, CONDUCTOR	12420927-002	5940-01-421-6955
263	STRAIN RELIEF	10280870-3	5975-00-376-1585
264	TERMINAL, LUG	MS20659-163	5940-00-113-3145
265	TERMINAL, LUG	MS20659-164	5940-00-113-3148

**Section II. MANDATORY REPLACEMENT PARTS (CONT)**

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
266	TERMINAL, LUG	MS25036-108	5940-00-143-4780
267	TERMINAL, LUG	MS25036-122	5940-00-113-8190
268	TERMINAL, LUG	12414275-001	
269	TERMINAL, LUG	12416409-006	
270	WASHER, FLAT	MS27183-10	5310-00-809-4058
271	WASHER, FLAT	12417948-004	5365-01-436-8308
272	WASHER, FLAT RUBBER	900.032	5330-01-378-7541
273	WASHER, NYLON	MS51859-16	5310-00-964-7811
274	WASHER, SPRING	D63474/1-30	5310-01-413-8475
275	WASHER, SPRING	WW579S18	
276	WASHER, SPRING	110 7289	5310-01-246-1387
277	WASHER, SPRING	12414559-021	5310-01-374-4517
278	WASHER, SPRING	12414560-017	5310-01-395-0820
279	WASHER, SPRING	12414560-018	5310-01-381-3281
280	WASHER, SPRING	12414560-019	5310-01-369-6074
281	WASHER, SPRING	12417503	5310-01-406-6326
282	WASHER, SPRING	12418220	5310-01-372-3495

## APPENDIX H LUBRICATION ORDER

### SECTION I. INTRODUCTION

#### H-1. GENERAL

The information contained in this appendix provides the lubrication requirements for the LMTV vehicle.

- a. Adherence.** Intervals (on-condition or hardtime) and the related man-hour times are based on normal operation. The man-hour time specified is the time needed to do all the services prescribed for a particular interval. On-condition (OC) oil sample intervals will be applied unless changed by the Army Oil Analysis Program (AOAP) laboratory. Change the hardtime interval if the lubricants are contaminated or if operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The calendar interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Hardtime intervals will be applied in the event AOAP laboratory support is not available. Hardtime intervals must be applied during the warranty period.

Intervals shown in this lubrication order are based on mileage/calendar, and in some cases mileage alone. An example of a mileage/calendar interval is: **Q**, which means every 3,000 miles (4,827 km) or quarterly (every three months). The lubrication is to be performed at whichever interval occurs first for the vehicle. An example of a mileage alone interval is: **6K**, which stands for every 6,000 miles (9,654 km). The lubrication is to be performed at the mileage indicated regardless of the calendar interval.

#### WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breath vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 138°F (50°C). Failure to comply may result in serious injury or death to personnel.**
  - **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get medical attention. Failure to comply may result in injury to personnel.**
- b. Cleaning fittings before lubricating.** Clean parts with dry cleaning solvent (SD P-D-680) (Item 71, Appendix D) or equivalent. Dry before lubricating. Dashed arrows indicate lubrication on both sides of the equipment.
- c. Lubricating after fording.** If fording occurs, lubricate all fittings below fording depth and check submerged gearboxes for presence of water.
- d. Lubricating after high-pressure washing.** After a thorough washing, lubricate all grease fittings and oil can points outside and underneath vehicle.
- e. Level of Maintenance.** The lowest level of maintenance authorized to lubricate a point is Operator/Unit Maintenance (O). Operator/crew (C) may lubricate points authorized for Unit Maintenance (O) when authorized by Unit Maintenance (O).
- f. Localized views.** A reference to the appropriate localized view is given after most lubrication entries. Localized views begin on page H-9.

## H-1. GENERAL (CONT)

**g. Interval Symbols.** The lubrications interval symbols will be used as applicable:

- Q-quarterly/3,000 mi (4,827 km) (whichever occurs first)
- S-semiannually/6,000 mi (9,654 km) (whichever occurs first)
- A-annually/12,000 mi (19,308 km) (whichever occurs first)
- B-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 Bass. 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)	43.3 qt (41 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (at oil change)	31.8 qt (30.0 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (after overhaul)	39.0 qt (37.0 L)	OE/HDO-15/40	OE/HDO-10	OEA
Steering system	5 qt (4.8 L)	OE/HDO-10	OE/HDO-10	OEA
Hydraulic Reservoir	27 gal (102.2 L)	OE/HDO-10	OE/HDO-10	OEA
Front axle differential (maximum capacity)	9.5 qt (9.0 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Rear axle differential (maximum capacity)	18.05 qt (17.1 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Front axle planetary hubs	11-13 oz (0.33-0.38 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
11K Self-Recovery Winch (SRW)	As Required	GO-85/140	GO-80/90	GO-75
Propeller shaft universal and slip j o i n t s	As Required	GAA	GAA	GAA
Tie rod ends	As Required	GAA	GAA	GAA
Towing pintle assembly	As Required	GAA	GAA	GAA
Spring bolts and spring shackles	As Required	GAA	GAA	GAA
Front axle shaft U-joints and steering knuckles	As Required	GAA	GAA	GAA

**H-5. LUBRICATION KEY (CONT)**

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +40° (Above +4°C)	+40° to -15°F (+4°C to -26°C)	-15°F to -50°F (-26°C to -46°C)
Front axle inner wheel bearing	As Required	G A A	G A A	G A A
Rear axle inner wheel bearing	As Required	G A A	G A A	G A A
Front lifting beam	As Required	G A A	G A A	G A A
11K Self-Recovery Winch (SRW) cable	As Required	GW	GW	GW
Air/hydraulic power unit	3 pt (1.4 L)	O H A	O H A	O H A
Backup hydraulic pump	19 oz (562 ml)	O H A	O H A	O H A

COOLANT	
Specification	Type
MIL-A-46153	Antifreeze, Ethylene Glycol, Inhibited, Heavy Duty, Single Package
MIL-A-11755	Antifreeze, Arctic-Type

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +40°F (Above +4°C)	+40°F to -15°F (+4°C to -26°C)	-15°F to -50°F (-26°C to -46°C)
Cooling system (engine only)	14 qt (13 L)	MIL-A-46153	MIL-A-46153	N/A
Cooling system (total system)	43.8 qt (41.5 L)	MIL-A-46153	MIL-A-46153	N/A
Cooling system, Arctic (total system)	58.3 qt (55.2 L)	N/A	N/A	MIL-A-11755

CLEANING AGENT	
Specification	Type
P-D-680	Dry Cleaning Solvent, SD-II
O-C-1901	Cleaning Compound, Windshield

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +15°F (Above -9°C)	+15°F to -15°F (-9°C to -26°C)	-15°F to -50°F (-26°C to -46°C)
All metal ports as required	N/A	SD-II (all temperatures)		
Windshield washer reservoir	7.5 qt (7.1 L)	2/3 water to 1/3 O-C-1901	1/2 water to 1/2 O-C-1901	1/3 water to 2/3 O-C-1901

For arctic operation refer to FM 9-207.

**H-6. LUBRICATION INTERVALS**

Intervals		Total Man-Hours
Quarterly (Q)	Lubrication performed once every three months or 3,000 mi (4,827 km).*	2.0
Semi-annually (S)	Lubrication performed once every six months or 6,000 mi (9,654 km).*	2.5
Annually (A)	Lubrication performed once every year or every 12,000 mi (19,308 km).*	1.5
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).**	4.0
24K	Lubrication performed once every 24,000 mi (38,616 km).**	0.5
* Whichever occurs first.		
** No calendar interval.		

**H-7. LUBRICATION LOCATOR VIEWS**

LUBRICANT INTERVAL

INTERVAL LUBRICANT

**Engine Crankcase Breather (O)**  
(See note 17 and view A)

**Fuel Filter (O)**  
(See note 6 and view A)

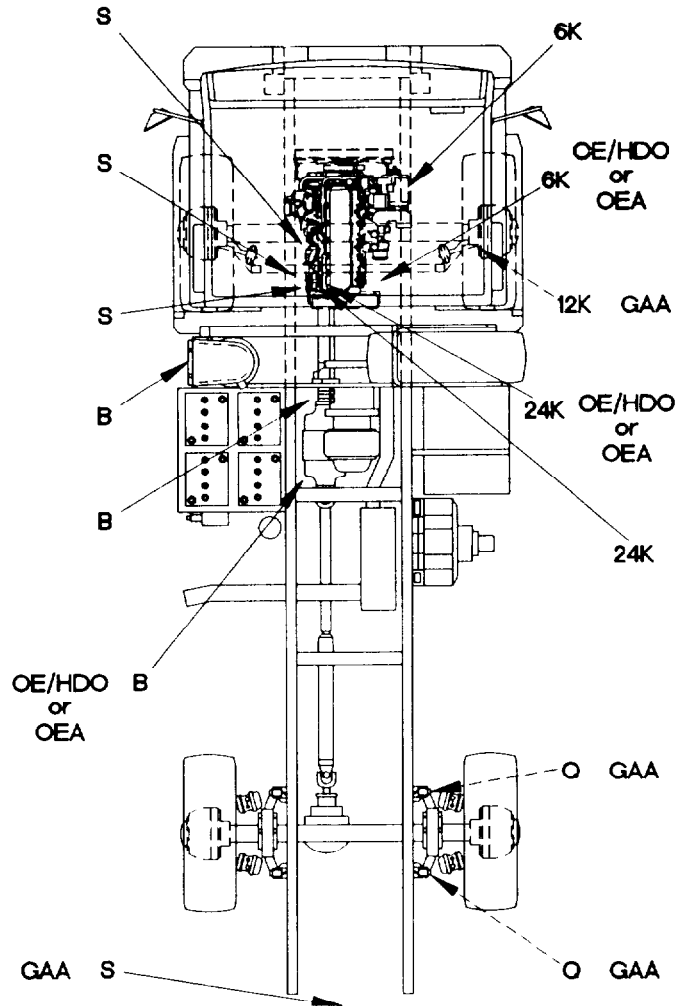
**Fuel/Water Separator (O)**  
(See note 5 and view B)

**Cooling System (O)**  
(See note 7)

**Transmission Filter (O)**  
(See note 3 and view F)

**Transmission Drain and Fill (O)**  
(See note 3 and views D, E, and F)

**Towing Pintle Fill (O)**  
(See note 16 and views J and K)



**Engine Oil Filter (O)**  
(See note 2 and view C)

**Crankcase Drain and Fill (O)**  
(See note 1 and views C and D)

**Front Axle Inner Wheel Bearing Repack (O)**  
(See note 22)

**Power Steering Reservoir Drain and Fill (O)**  
(See note 4 and view G)

**Power Steering Filter (O)**  
(See note 4 and view G)

**Spring Bolt Fill (O)**  
(See note 18 and view H)

**Spring Shackle Fill (O)**  
(See note 18 and view AE)

**CHASSIS**

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

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LUBRICANT INTERVAL

INTERVAL LUBRICANT

**Spring Bolt  
Fill (O)**  
(See note 18 and view H)

**Spring Shackle  
Fill (O)**  
(See note 18 and view I)

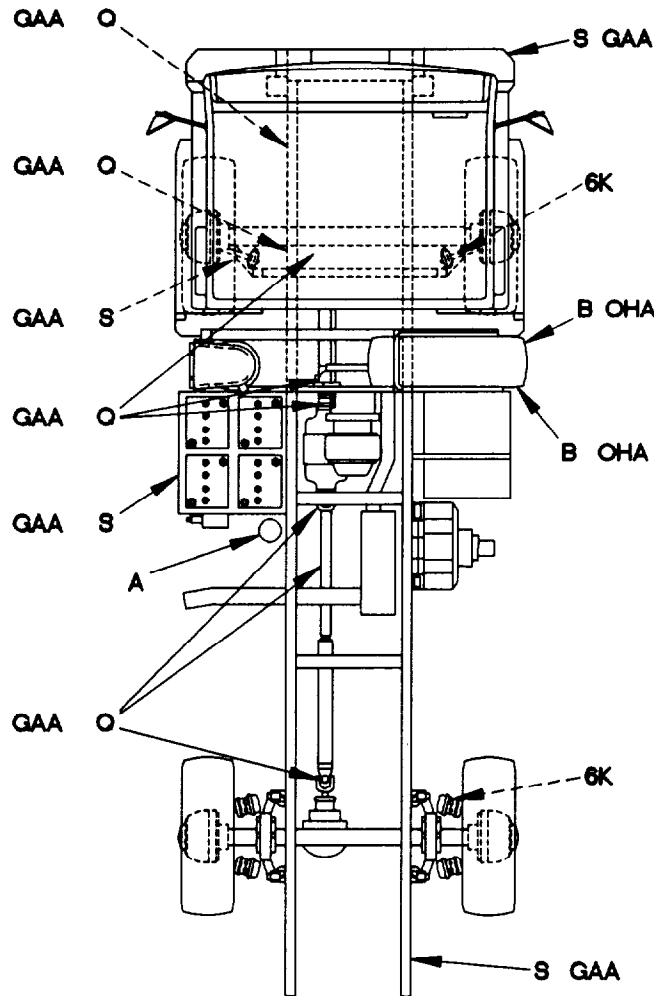
**Tie Rod Ends  
Fill (O)**  
(See note 13 and view N)

**Universal and Slip Joints  
Fill (O)**  
(See note 9 and view P)

**Battery Posts (O)**  
(See note 19 and view Q)

**Air Dryer (O)**  
(See note 25 and view AF)

**Universal and Slip Joints  
Fill (O)**  
(See note 9 and view P)



**11K Self-Recovery Winch  
(SRW) Cable Front Roller  
Fairlead  
Fill (O)**  
(See note 23 and views Z  
and AA)

**Brake Wedge and Air  
Chamber (O)**  
(See note 21 and view L)

**Backup Hydraulic Pump  
Drain and Fill (O)**  
(See note 10 and view R)

**Air/Hydraulic Power Unit  
Drain and Fill (O)**  
(See note 10 and view S)

**Brake Wedge and Air  
Chamber (O)**  
(See note 21 and view M)

**11K Self-Recovery Winch  
(SRW) Cable Rear Roller  
Fairlead  
Fill (O)**  
(See note 23 and views AB  
and AC)

3APPH021

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)

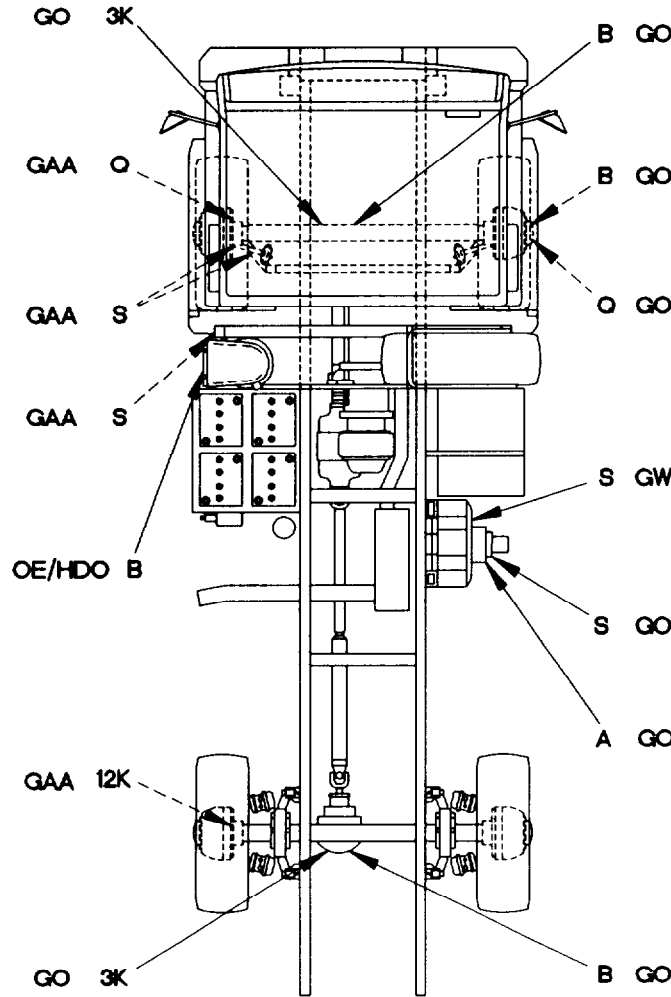
**Steering Knuckles  
Fill (O)**  
(See note 20 and view U)

**Front Lifting Beam  
Clean and Fill (O)**  
(See note 24 and view AD)

**Hydraulic Reservoir and  
Filter  
Drain and Fill (O)**  
(See note 8 and view X)

**Rear Axle Inner Wheel  
Bearing Repack (O)**  
(See note 22)

**Rear Axle  
Check and Fill (O)**  
(See note 11 and view T)



**Front Axle  
Drain and Fill (O)**  
(See note 11 and view T)

**Wheel End Planetary Hubs  
Drain and Fill (O)**  
(See note 12 and view V)

**Wheel End Planetary Hubs  
Check and Fill (O)**  
(See note 12 and view V)

**11K Self-Recovery Winch  
(SRW) Cable  
Fill (O)**  
(See note 14 and view W)

**11K Self-Recovery Winch  
(SRW)  
Check and Fill (O)**  
(See note 15 and view Y)

**11K Self-Recovery Winch  
(SRW)  
Drain and Fill (O)**  
(See note 15 and view Y)

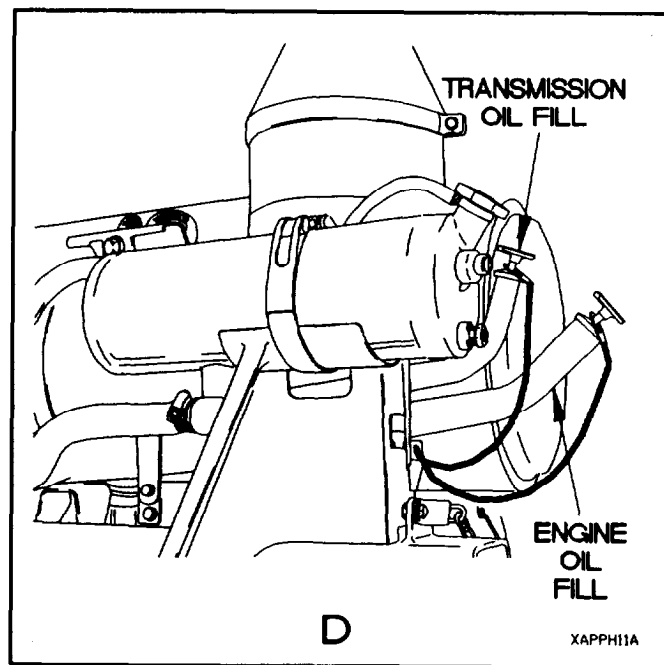
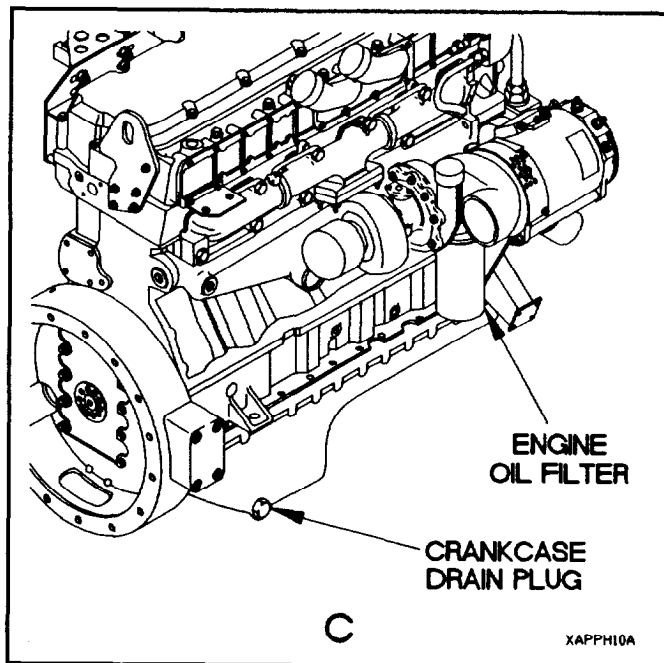
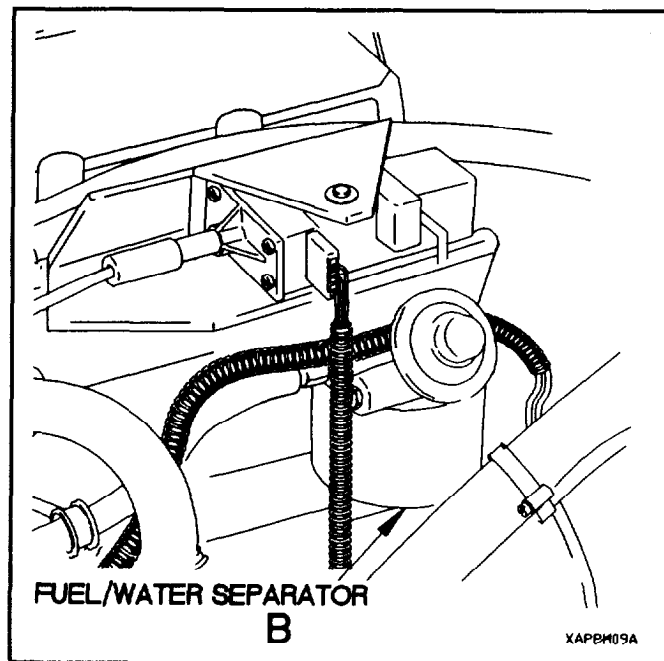
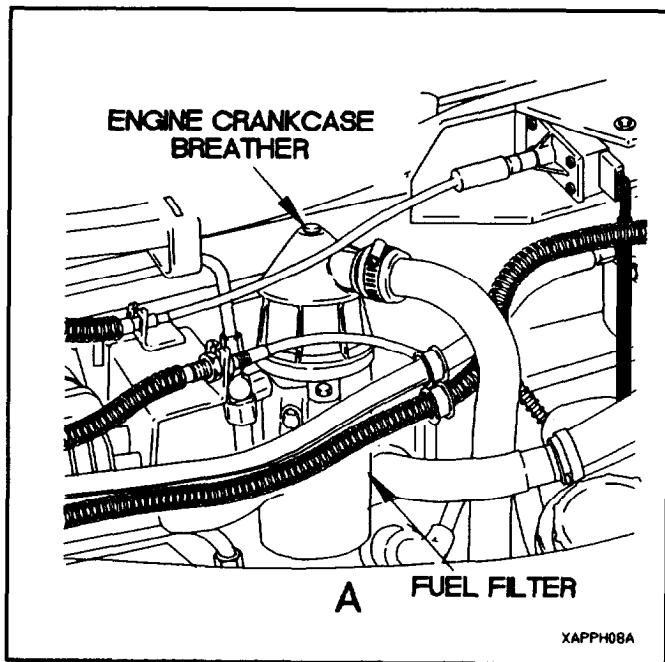
**Rear Axle  
Drain and Fill (O)**  
(See note 11 and view T)

**CHASSIS**

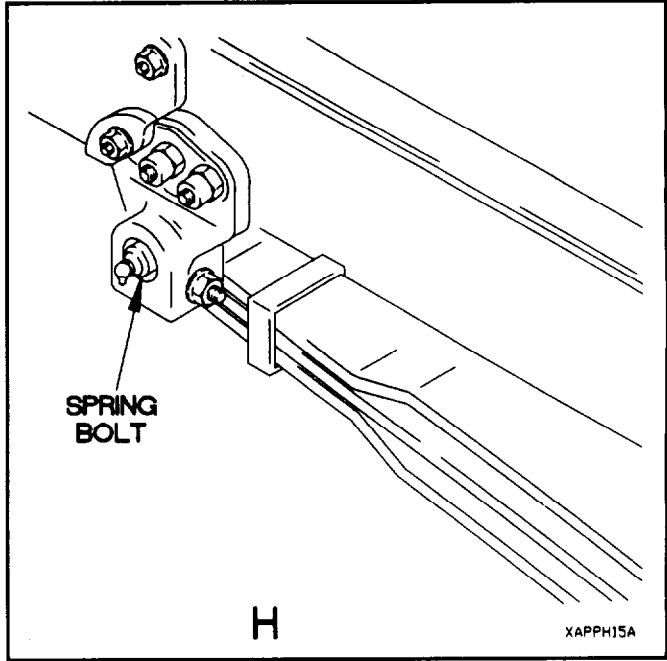
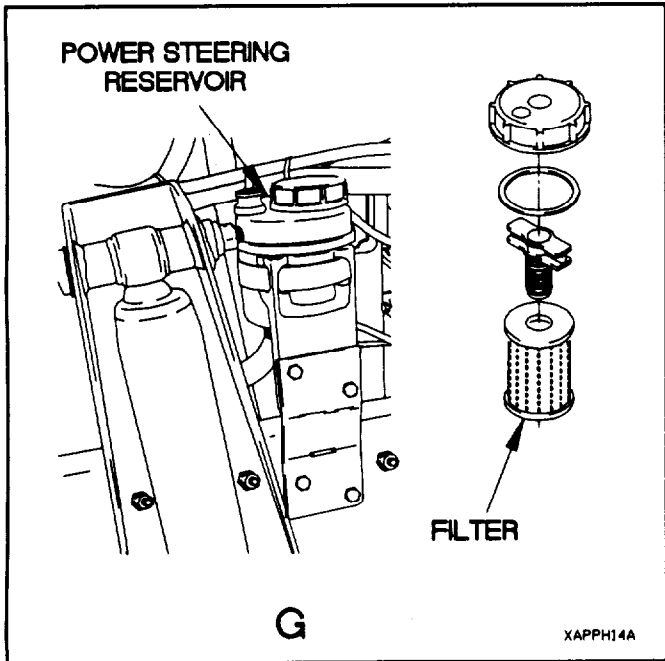
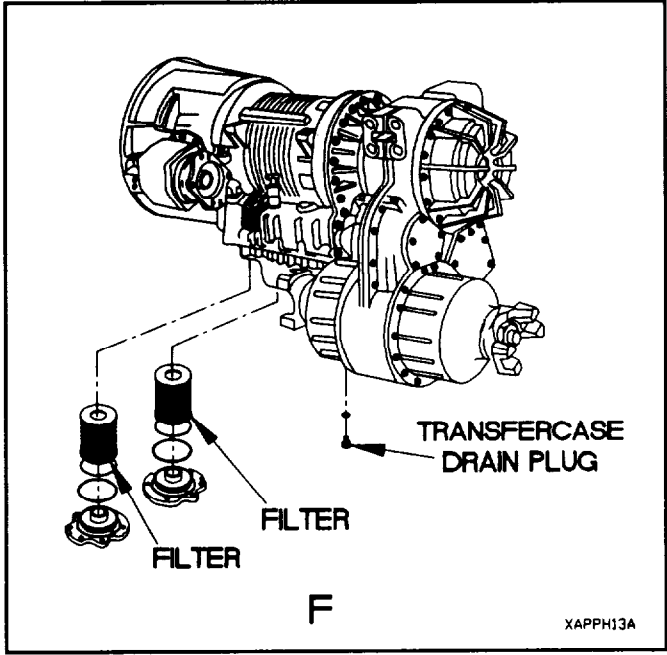
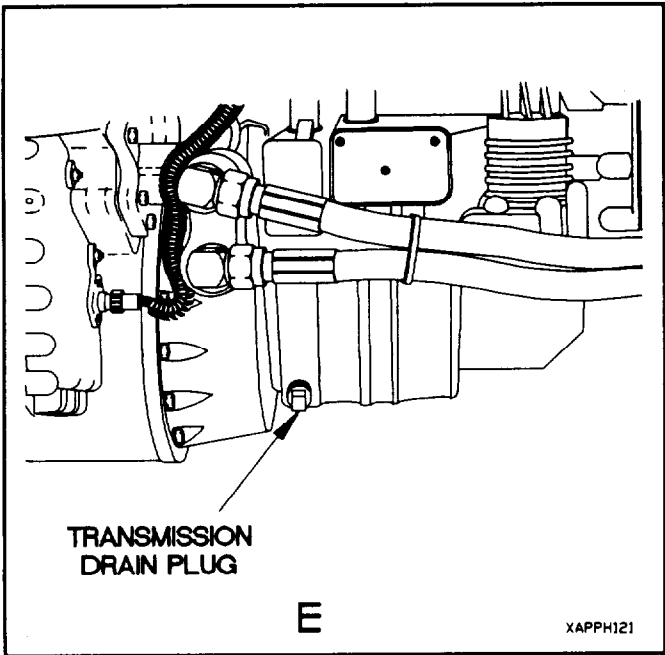
NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

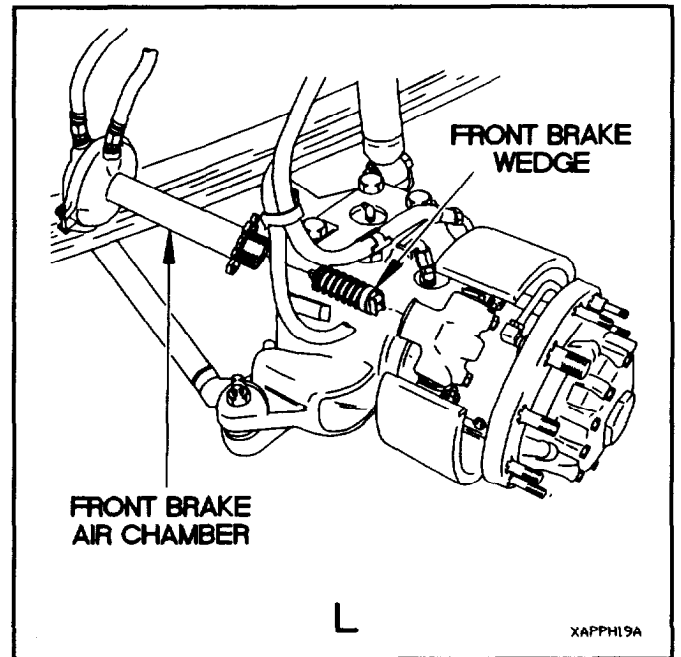
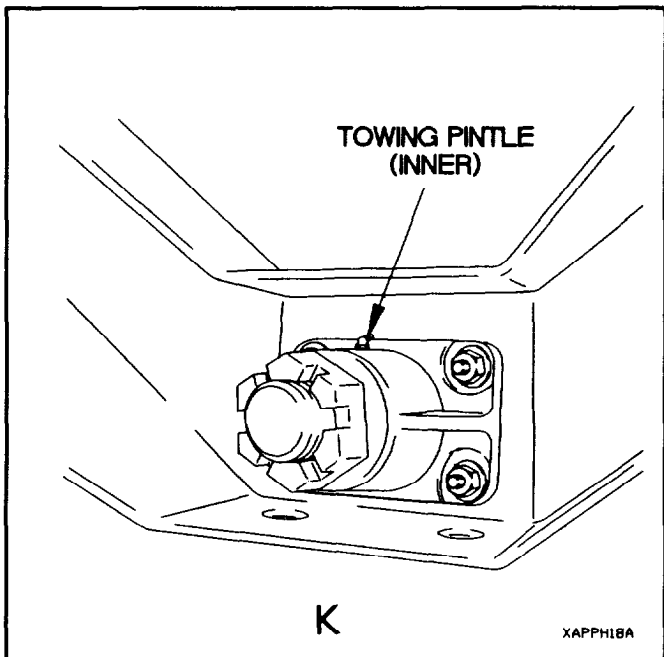
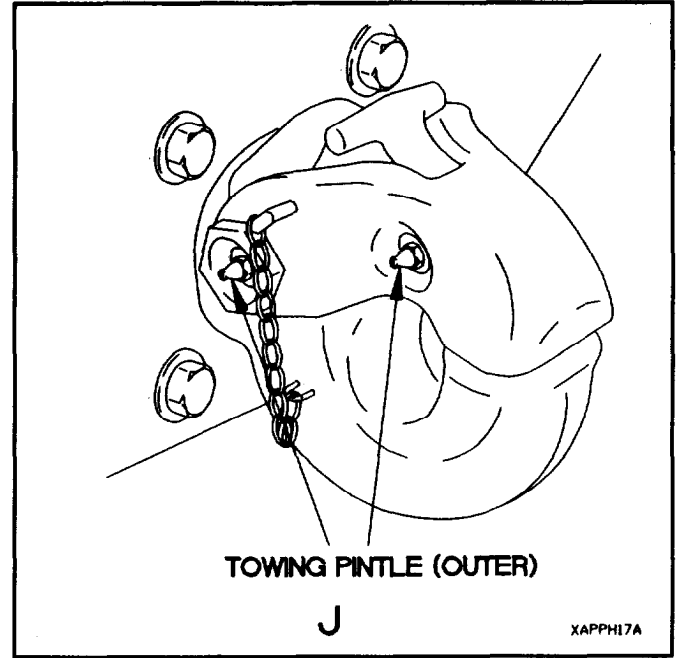
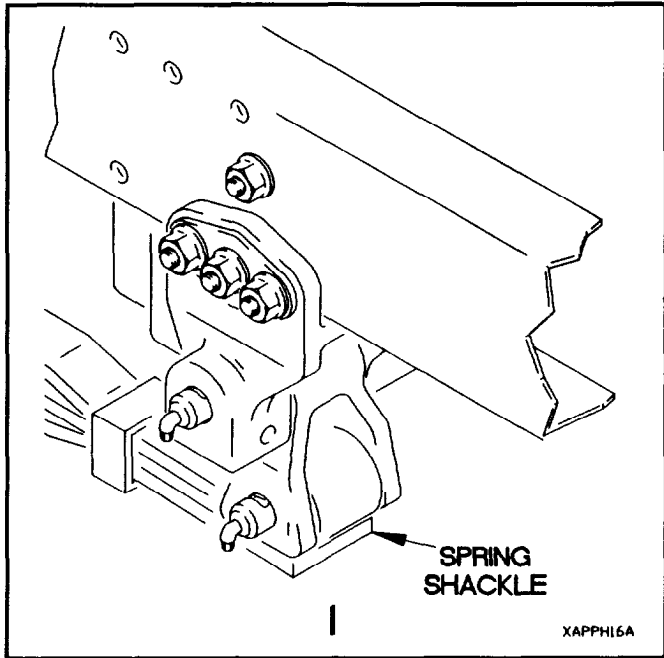
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H-8. LUBRICATION LOCAL VIEWS

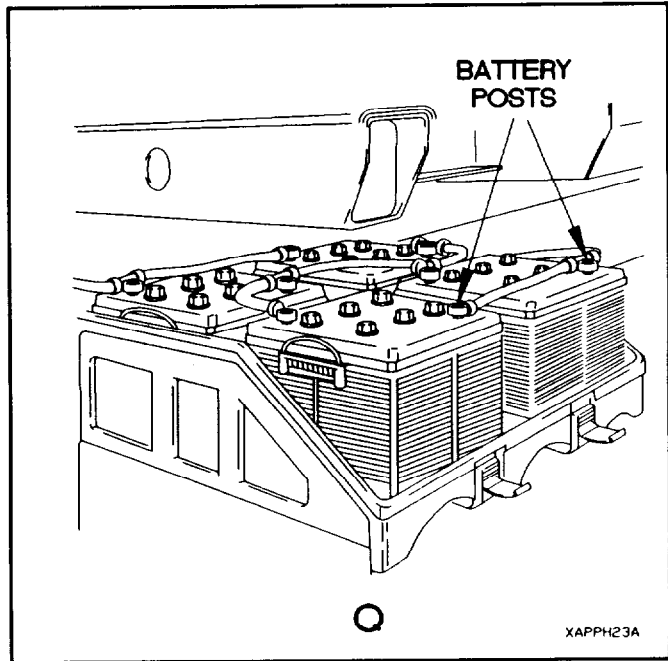
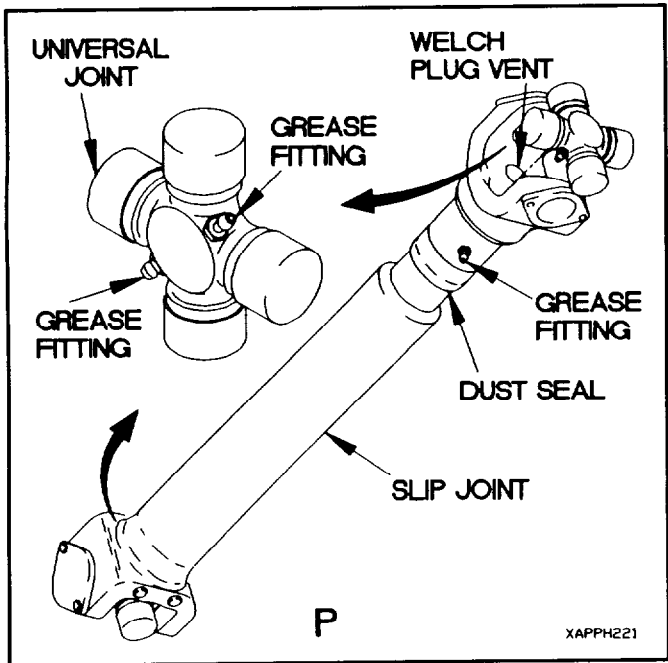
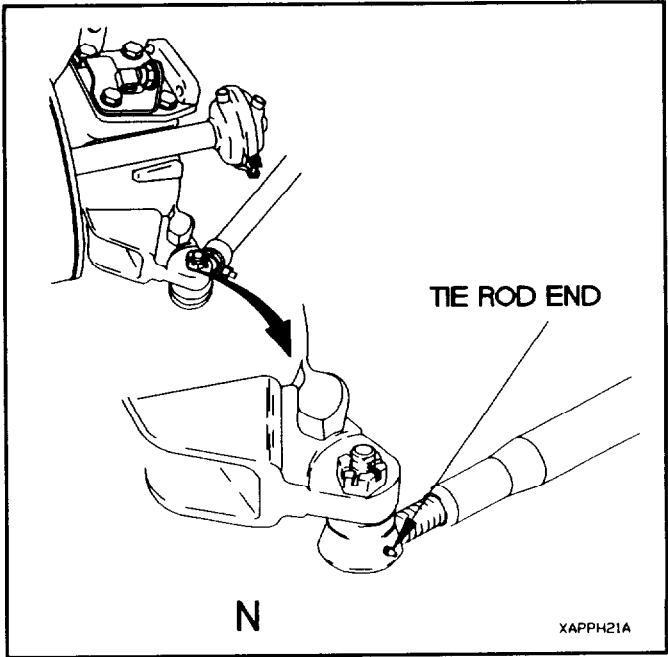
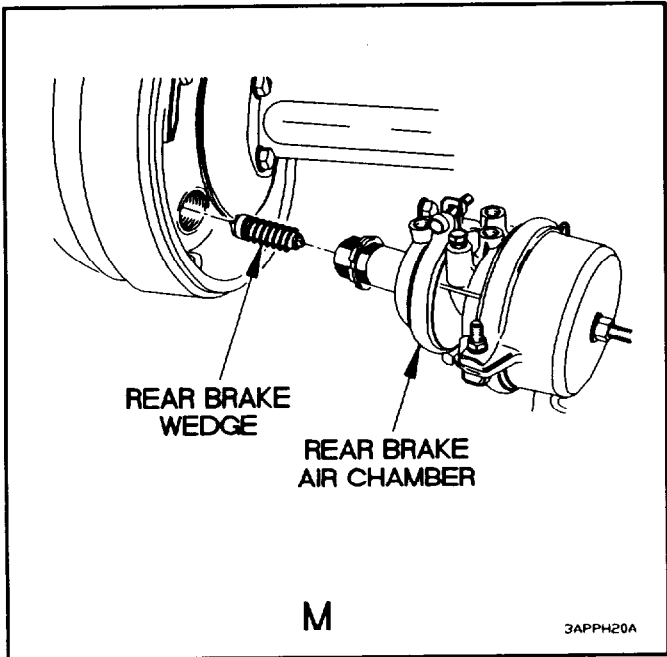


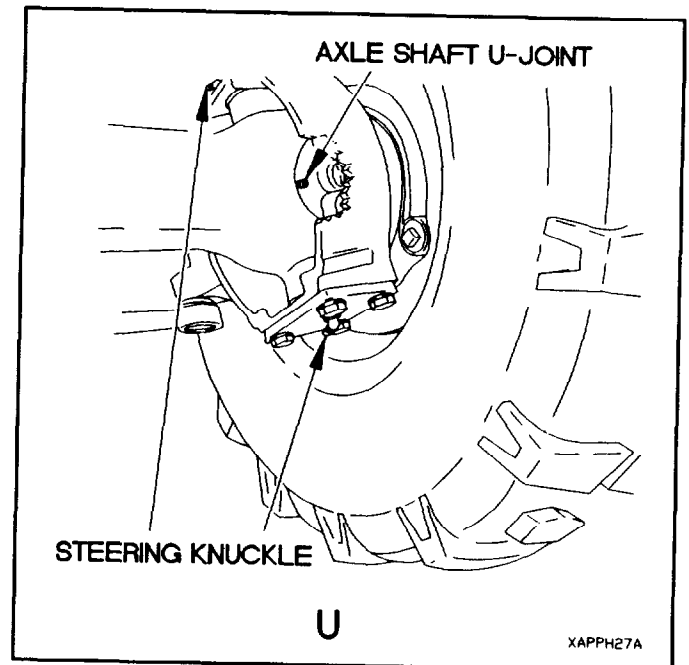
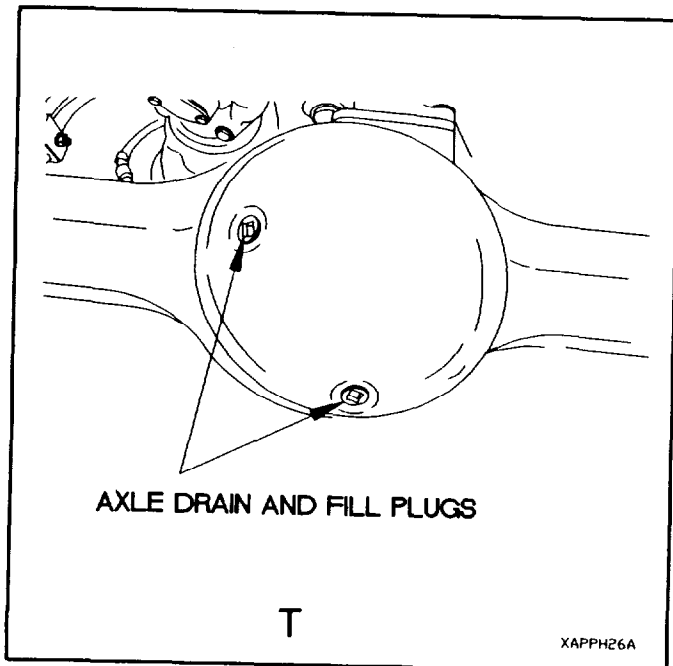
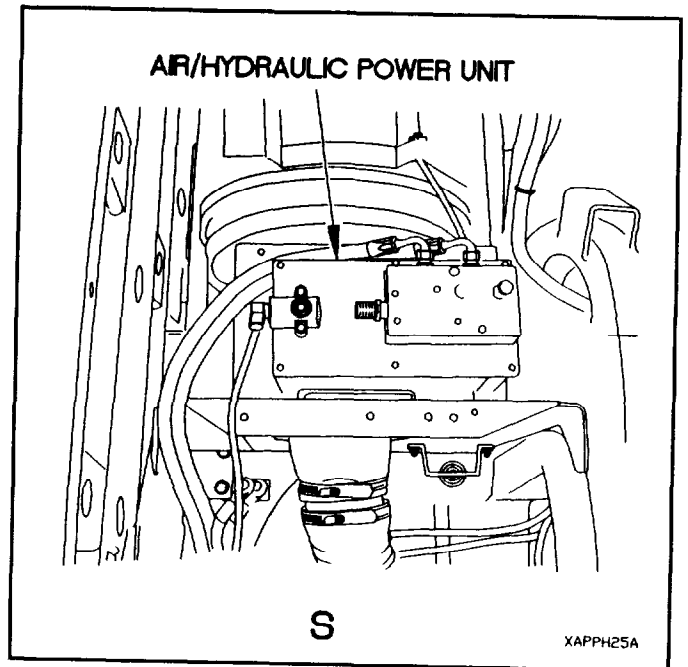
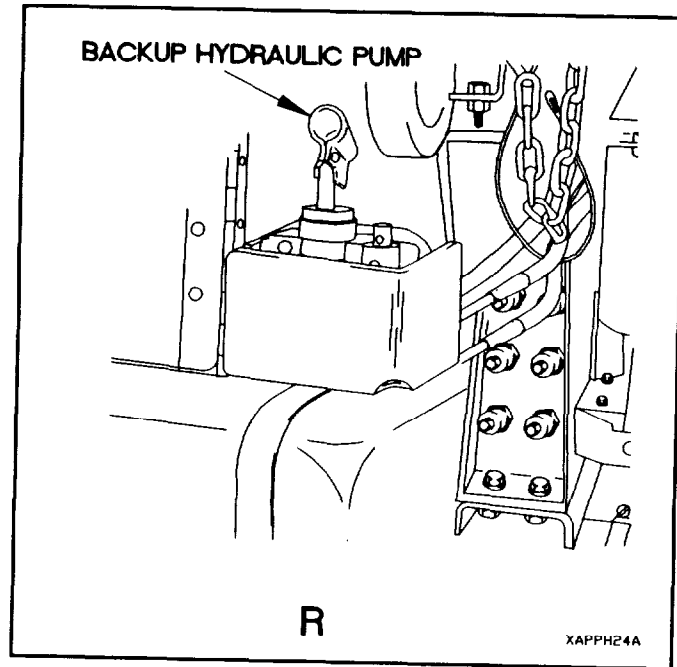
**H-8. LUBRICATION LOCAL VIEWS (CONT)**



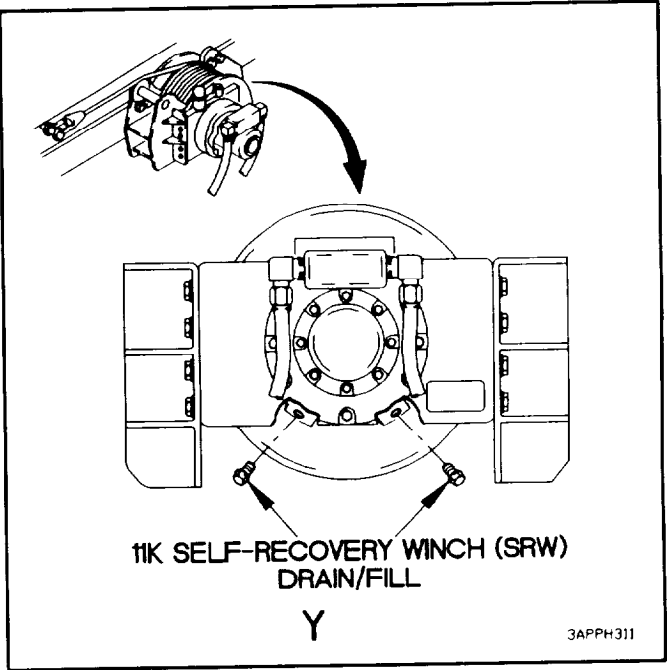
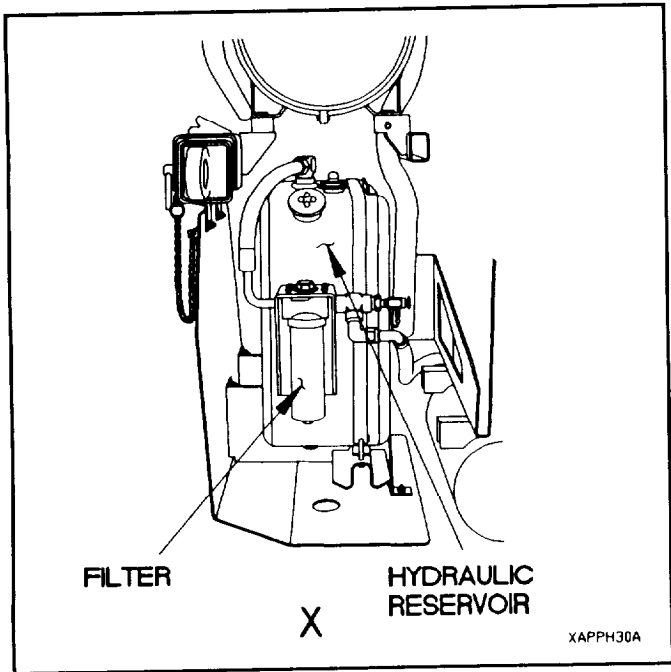
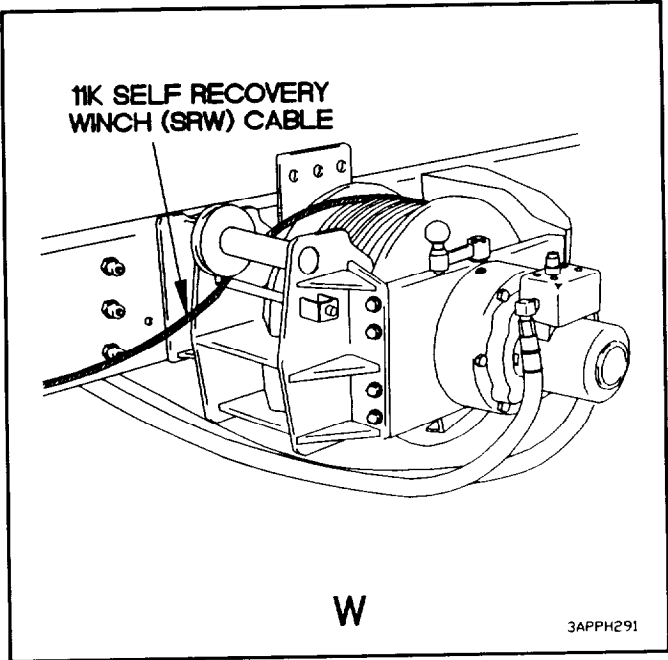
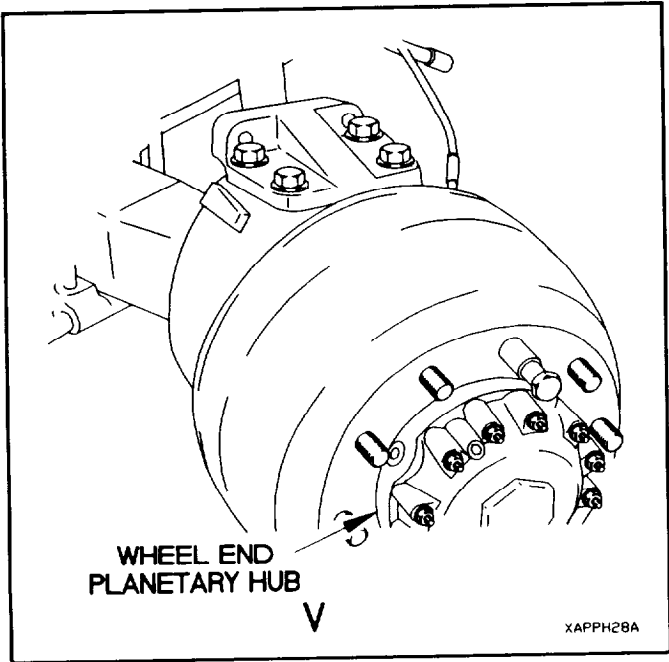


**H-8. LUBRICATION LOCAL VIEWS (CONT)**

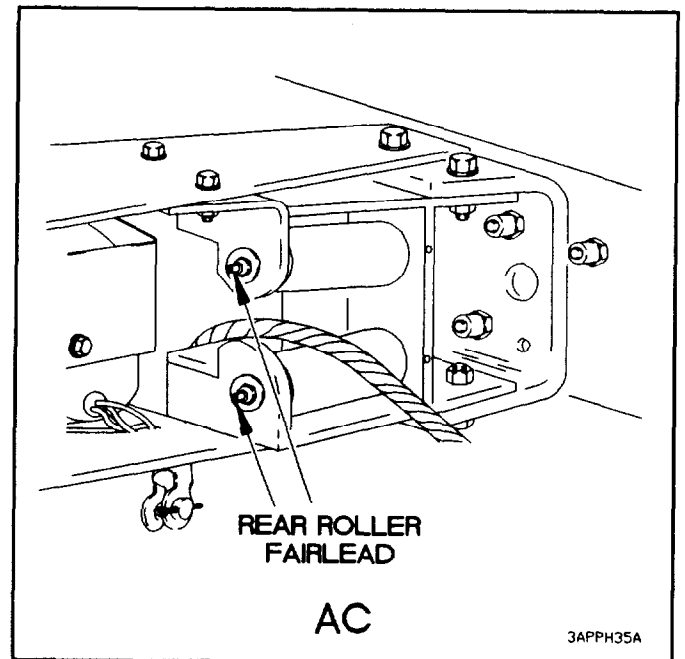
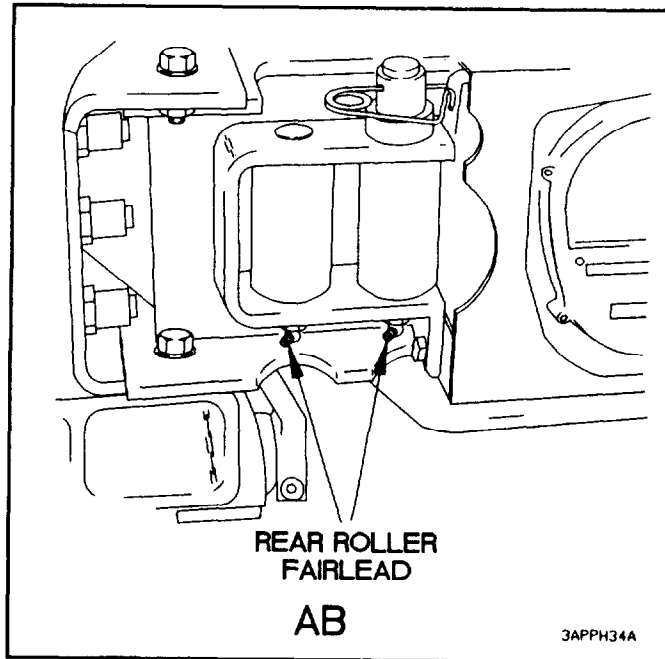
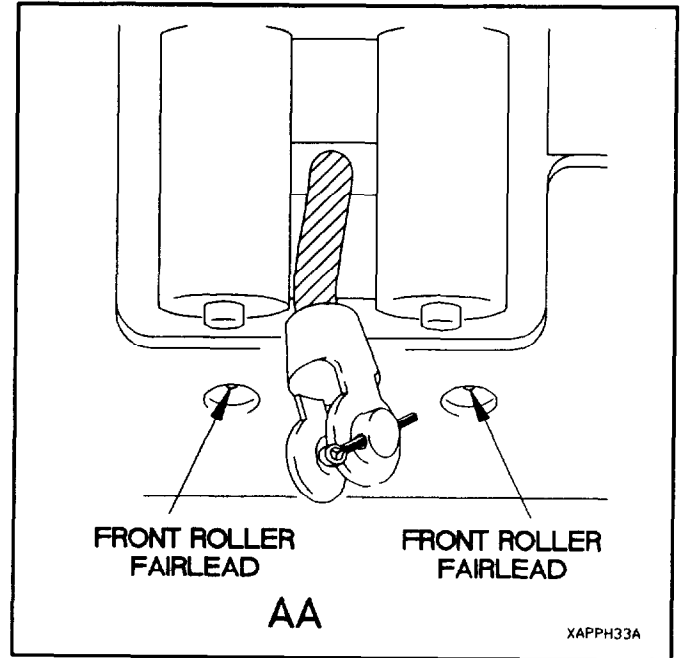
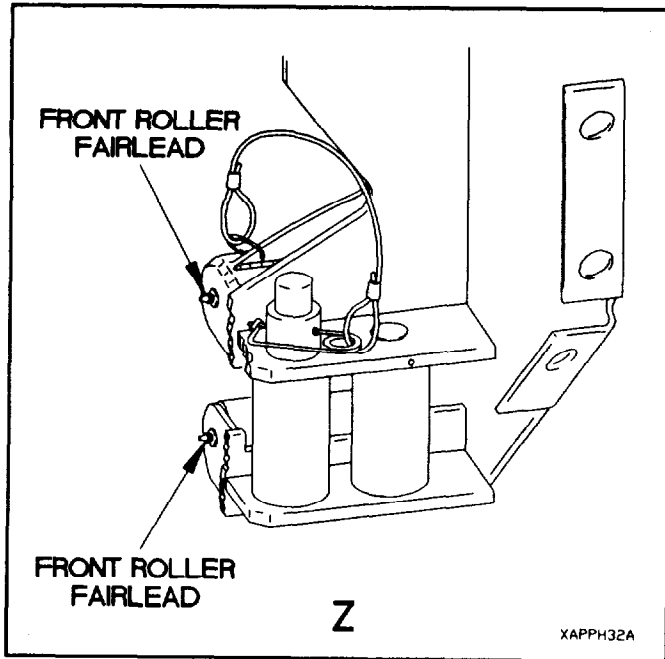




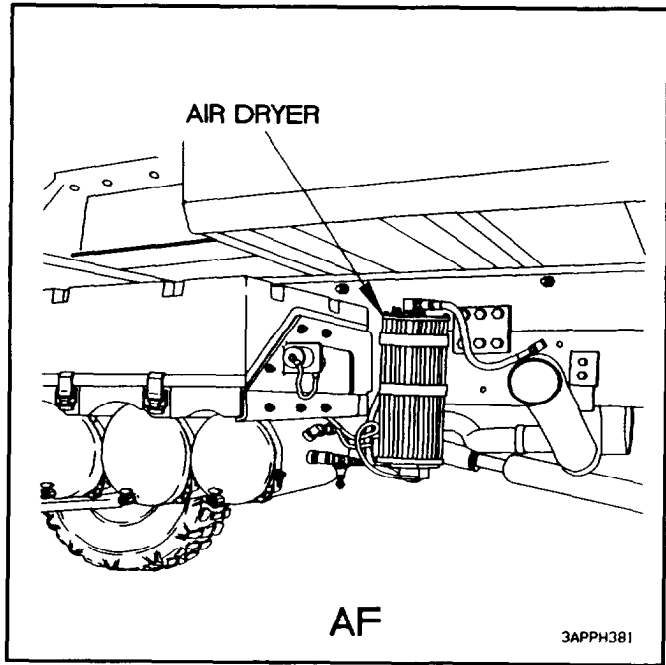
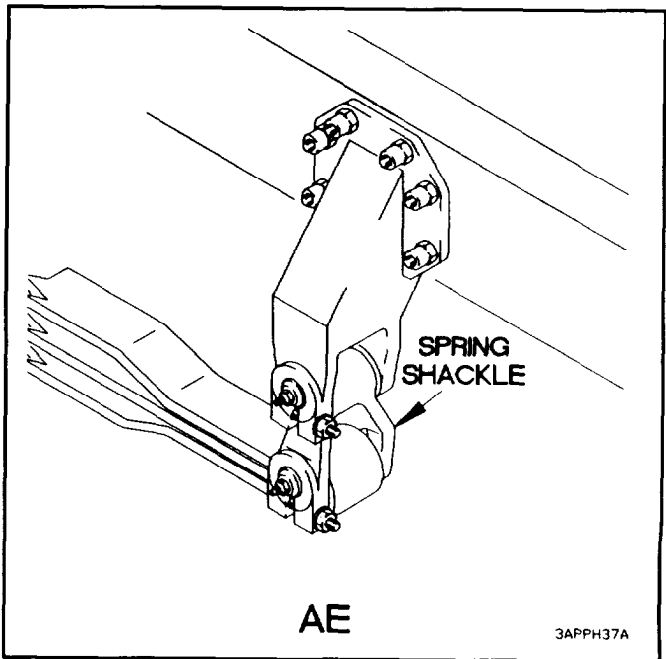
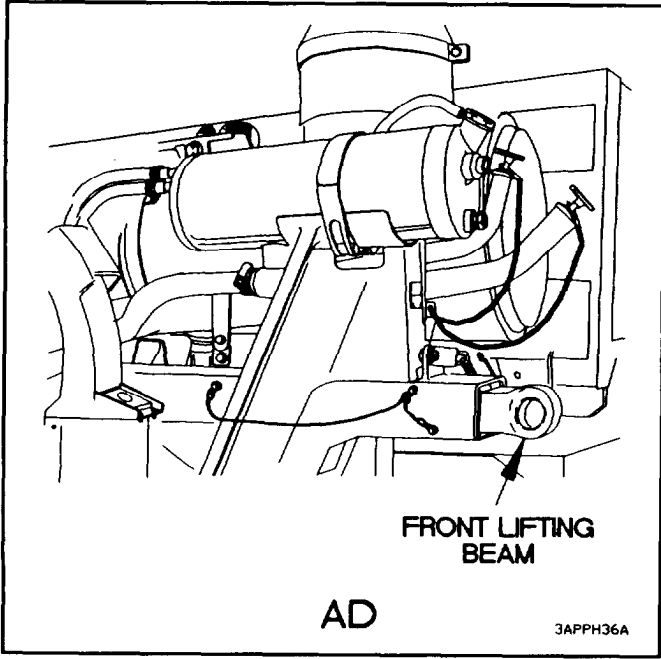
**H-8. LUBRICATION LOCAL VIEWS (CONT)**







**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 9-2320-365-10). Do not overfill. Replace oil filters each time transmission oil is changed.
  
4. **POWER STEERING.** Check power steering oil level weekly. Change the oil every 24,000 miles (38,616 km). Disconnect upper and lower hoses from steering gear and drain oil. Refill power steering pump reservoir with OE/HDO specified for the ambient temperature. Reservoir is full when oil is between the two marks on the dipstick. Do not overfill. Remove dipstick, wipe clean and install dipstick fully into reservoir. Remove dipstick and read oil level. Replace oil filter each time power steering oil is changed.
  
5. **FUEL/WATER SEPARATOR.** Replace filter element every 6,000 miles (9,654 km) or once every six months, whichever occurs first.
  
6. **FUEL FILTER.** The fuel particle filter is replaced when a new fuel/water separator filter element is installed. The normal replacement interval is every 6,000 miles (9,654 km) or once every six months, whichever occurs first.
  
7. **ENGINE COOLANT.** Check engine coolant level daily. Change the coolant and flush the cooling system every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Fill radiator overflow tank with an Ethylene Glycol/water mixture as specified in 0-A-548D. Service the cooling system before the specified interval if:
  - Coolant is heavily contaminated.
  - Engine overheats.
  - Oil cooler has failed allowing oil and coolant to mix.
  
8. **HYDRAULIC RESERVOIR and FILTER.** Check oil level weekly and make sure oil level gage reads F (full). Units participating in AOAP will sample oil annually and change oil and filter as directed by AOAP. Units not participating in AOAP will change oil and filter every two years. Drain oil and refill hydraulic reservoir with OE/HDO specified for ambient operating temperature. Fill hydraulic reservoir until oil level gage reads F (full). Do not overfill. Replace oil filter each time oil is changed.

## H-9. LUBRICATION NOTES (CONT)

### 9. 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 grease 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 grease until grease appears at the vent in the welch plug.
- B. Place your finger over the welch plug vent and add grease until grease purges from the dust seal.
- C. If grease does not purge from the dust seal, 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 19-7. Air Transportability Hydraulic System Service.

**11. ALL AXLE DIFFERENTIALS.** Check oil level in differentials every 3,000 miles (4,827 km). Check oil level with vehicle parked on level surface and axle differential at ambient temperature, allowing at least one hour to cool down after vehicle operation. If oil is checked when axle differential is hot, it is normal for oil to spill out of the port due to expansion from the heat. Oil level is considered full if it is within one inch of the bottom of the fill port. If oil spills from the fill port when the axle differential is cool, it is overfull. Allow oil to drain until no more drains out. If the oil level is more than one inch below the bottom of the fill port, refill axle differential with GO specified for the ambient temperature until level with bottom of fill port. Change the oil every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Drain oil when hot after operation.

**12. FRONT AXLE WHEEL END PLANETARY HUBS.** There are two lube intervals for the front axle wheel end planetary hubs.

- a. Check and fill front axle wheel end planetary hubs every 3,000 miles (4,827 km) or once every three months, whichever occurs first, as follows:

- (1) Position vehicle on a level surface. Allow 15 minutes for vehicle to cool before checking oil levels.
- (2) Position fill port at 4 o'clock position. If oil flows from fill port when plug is loosened, let oil drain to correct level. If oil level is below fill port, fill hub with GO specified for the ambient temperature until oil is level with fill port.

- b. Drain and fill front axle wheel end planetary hubs every 24,000 miles (38,616 km) or once every two years, whichever occurs first, following the repacking of the inner wheel bearings or whenever wheel end assemblies are taken apart for other maintenance as follows:

- (1) Position vehicle on a level surface.
- (2) Position fill port at the 6 o'clock (down) position.
- (3) Drain hub oil (allow a minimum of 15 minutes for oil to drain down from vent tubes).
- (4) Refill hubs with 11-13 ounces of GO specified for the ambient temperature.

**13. TIE ROD ENDS.** Lubricate tie rod ends with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun, until new grease is seen purging from the boot area. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

**14. 11K SELF-RECOVERY WINCH (SRW) CABLE:****CAUTION**

Do not use dry cleaning solvent to clean 11K Self-Recovery Winch (SRW) cables. Use of dry cleaning solvent will remove lubricant from inner strands of 11K SRW cables. Failure to comply may result in damage to equipment.

## a. After each operation:

Clean and lubricate length of 11K SRW cable reeled out with new OE/HDO 30.

## b. Infrequent use or in very damp conditions:

Lubricate 11K SRW cable with GW.

## c. Dry or dusty conditions:

Do not lubricate 11K SRW cable.

## d. Every six months:

- (1) Unwind entire length of 11K SRW cable (TM 9-2320-365-10).
- (2) Soak and clean 11K SRW cable with new OE/HDO 30.
- (3) Wipe off excess OE/HDO 30.
- (4) Coat 11K SRW cable with GW.
- (5) Rewind 11K SRW cable (TM 9-2320-365-10).

**15. 11K SRW.** Check 11K SRW gear oil level every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Refill 11K SRW with GO specified for ambient temperature. Change oil every 12,000 miles (19,308 km) or once every year, whichever occurs first. Use procedure (a) to check and fill oil level; use procedure (b) to change oil.

## a. Check and fill oil level as follows:

- (1) Shift the freespool mechanism to the disengage position so the drum can be freely rotated.
- (2) Rotate the drum to where either plug is near the top of the 11K SRW. Remove the plug.
- (3) Rotate the drum 90 degrees in the direction that allows the other plug to be near the top of the 11K SRW. Remove the plug.

**NOTE**

Oil level is full if a small amount of oil runs out of lower plug.

- (4) Add oil until a small amount of oil runs out of lower plug hole.
- (5) Apply adhesive (Item 2, Appendix D) to plug and position plug in top hole.
- (6) Rotate drum until open hole is at top.
- (7) Apply adhesive (Item 2, Appendix D) to plug and position plug in top hole.
- (8) Tighten plugs to 13-15 lb-ft (18-20 N•m).

## H-9. LUBRICATION NOTES (CONT)

b. Change oil as follows:

- (1) Shift the freespool mechanism to the disengage position so the drum can be freely rotated.
- (2) Rotate the drum to where either plug is near the top of the 11K SRW. Remove the plug.
- (3) Rotate the drum 90 degrees in the direction that allows the other plug to be near the top of the 11K SRW. Remove the plug.
- (4) Position drain pan (Item 17, Appendix C) under 11K SRW.
- (5) Rotate the drum until either hole is straight down to the bottom of the 11K SRW. Allow the oil to drain completely.
- (6) Rotate the drum until either hole is at top.

### NOTE

Oil level is full if a small amount of oil runs out of lower plug.

- (7) Add oil until a small amount of oil runs out of lower plug hole.
- (8) Apply adhesive (Item 2, Appendix D) to plug and position plug in top hole.
- (9) Rotate drum until open hole is at top.
- (10) Apply adhesive (Item 2, Appendix D) to plug and position plug in top hole.
- (11) Tighten plugs to 13-15 lb-ft (18-20 N•m).

**16. TOWING PINTLE.** Lubricate towing pintle with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun until new grease is seen purging.

### WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breath vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 138°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get medical attention. Failure to comply may result in injury to personnel.**

**17. ENGINE CRANKCASE BREATHER.** Remove crankcase breather and clean with Dry Cleaning Solvent (SD P-D-680) (Item 71, Appendix D) or equivalent, and replace o-ring seal every 6,000 miles (9,654 km) or once every six months, whichever occurs first.

**18. FRONT and REAR AXLE SPRING BOLT and SPRING SHACKLE.** Lubricate front and rear axle spring bolts and spring shackles with GAA every 3,000 miles (4,827 km) or once every three months, whichever occurs first, using a low pressure lubrication gun until grease appears between pins and bushings at both ends of spring bolt and spring shackle. If pins do not accept grease, remove pins. Clean and inspect pins and bushings, replace if necessary. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

**19. BATTERY POSTS.** Service batteries in accordance with TM 9-6140-200-14, every 6,000 miles (9,654 km) or once every six months, whichever occurs first.

**20. FRONT AXLE SHAFT UNIVERSAL JOINTS and STEERING KNUCKLES.** Lubricate universal joints every 3,000 miles (4,827 km) or once every three months, whichever occurs first. Lubricate steering knuckles with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

**21. BRAKE WEDGE and AIR CHAMBER: BRAKE SPIDER, SELF-ADJUSTER MECHANISM, AND WEDGE ASSEMBLY.** Clean and lubricate (with GAA) areas of spider and hardware that contact the brake shoes. Disassemble, clean and lubricate the self-adjuster mechanism. Clean and lubricate the wedge head, rollers and ramps in the plungers. Clean and lubricate every 6,000 miles (9,654 km). If operating conditions are severe or abnormal, service at 3,000 miles (4,827 km) or once every three months, whichever occurs first, or when any of the following occur:

- Seals are replaced
- Plungers are removed
- Brakes are relined
- Grease becomes contaminated or hardened

**22. FRONT and REAR AXLE INNER WHEEL BEARINGS.** Repack inner wheel bearings with GAA every 12,000 miles (19,308 km), when semiannual PMCS inspection of service brakes reveals oil leak from inner hub, or whenever wheel end assemblies are taken apart for other maintenance.

**23. 11K SRW CABLE ROLLER FAIRLEADS.** Lubricate with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

**WARNING**

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breath vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 138°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get medical attention. Failure to comply may result in injury to personnel.**

**24. FRONT LIFTING BEAM.** Remove left and right lifting beams and clean with Dry Cleaning Solvent (SD P-D-680) (Item 71, Appendix D) or equivalent, every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Apply a light coat of GAA to lifting beams. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

**25. AIR DRYER.** Service air dryer (para 23-6) every 12,000 miles (19,308 km) or annually, whichever occurs first.

**APPENDIX J  
ADDITIONAL AUTHORIZATION LIST (AAL)**

**Section I. INTRODUCTION**

**J-1 SCOPE**

This appendix lists additional items you are authorized for the support of the LMTV.

**J-2 GENERAL**

This list identifies items that do not have to accompany the LMTV and that do not have to be turned in with it. These items are all authorized to you by Common Tables of Allowance (CTA), Modification Table of Organization and Equipment (MTOE), Tables of Distribution and Allowances (TDA), or Joint Table of Allowance (JTA).

**J-3. EXPLANATION OF LISTING**

National Stock Numbers, description, and quantities are provided to help you identify and request the additional items you require to support this equipment.

**Section II. ADDITIONAL AUTHORIZATION LIST**

(1) National Stock Number	(2) Description (CAGE) Part Number	(3) U/M	(4) Qty Auth
6685-01-193-1733	10,000 PSI Transducer: (19207) 12258956	EA	1



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## GLOSSARY ABBREVIATIONS

A/C	.....	Air Conditioner
ANSI	.....	American National Standards Institute
CCW	.....	Counterclockwise
CTIS	.....	Central Tire Inflation System
CW	.....	Clockwise
ECU	.....	Electronic Control Unit
EMI	.....	Electromagnetic Interference
LED	.....	Light Emitting Diode
LH	.....	.LeftHand
LMHC	.....	Light Material Handling Crane
MAC	.....	Maintenance Allocation Chart
NATO	.....	North Atlantic Treaty Organization
NBC	.....	Nuclear, Biological, or Chemical
NO/NC	.....	Normally Open/Normally Closed
PDP	.....	Power Distribution Panel
PMCS	.....	Preventive Maintenance Checks and Services
PTO	.....	Power Takeoff
RH	.....	Right Hand
SAE	.....	Society of Automotive Engineers
SRW	.....	Self-Recovery Winch
STE/ICE-R	.....	Simplified Test Equipment/Internal Combustion Engine-Reprogrammable
TEPSS	.....	Transmission ECU Pushbutton Shift Selector
TPS	.....	Throttle Position Sensor
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)

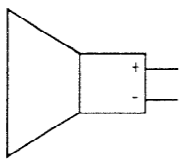

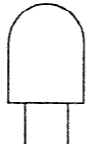
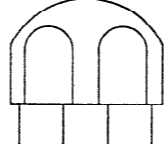
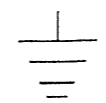
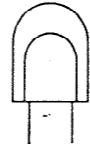
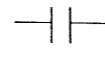
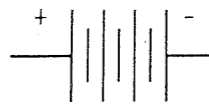
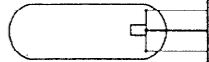
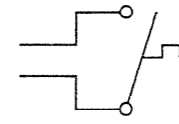
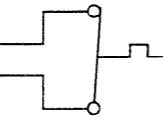
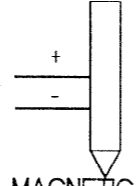
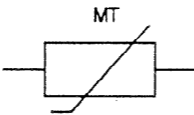
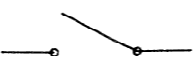
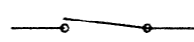
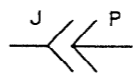
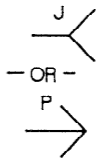
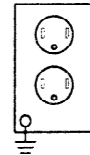

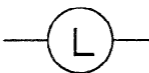
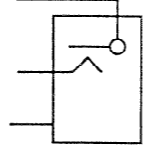
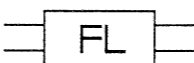

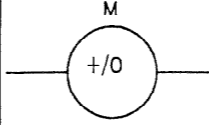
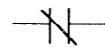
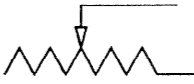
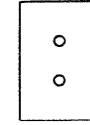
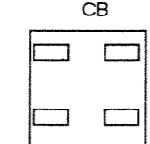
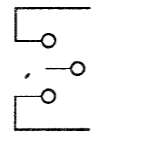
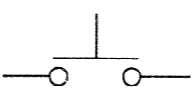
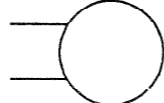
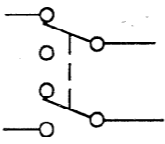
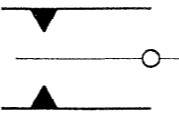


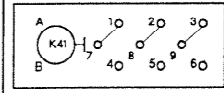
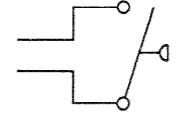
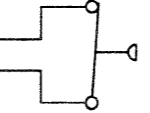
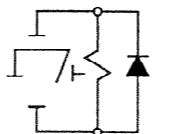
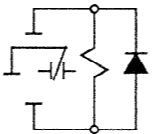

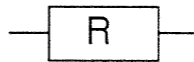
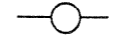
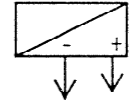


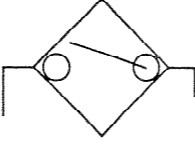
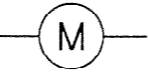
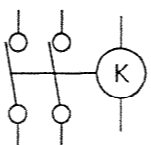
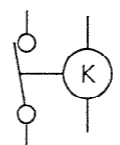

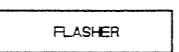
	1	2	3	4	5	6	7	8	9
A									
B									
C	HORN	BLACKOUT MARKER	LAMP	DUALBEAM LAMP	GROUND	POWER LAMP	OPEN CONTACT	BATTERY	FLOURESCENT LIGHT
D									
E	TEMPERATURE SWITCH OPEN	TEMPERATURE SWITCH CLOSED	MAGNETIC PICKUP	SENSOR	NORMALLY OPEN	NORMALLY CLOSED	CONNECTOR	RECEPTACLE	ELECTRICAL OUTLET
F									
G	MOTOR	SOLENOID	LEVEL SENSOR	FILTER	LED	METER OR GAUGE	CLOSED CONTACT	DIMMER MODULE	TELEPHONE RECEPTACLE
H									
I	CIRCUIT BREAKER	TWO WAY SWITCH	PUSHBUTTON	CIRCULATING PUMP	DPDT SWITCH	DPST SWITCH	PHOTOCELL	FUSE	RELAY
J									
K	PRESSURE SWITCH OPEN	PRESSURE SWITCH CLOSED	NORMALLY OPEN	NORMALLY CLOSED	ALTERNATOR	RESISTOR	TERMINAL LUG	ELECTRONIC IGNITION UNIT	
L									
M	DIODE	SPLICE	SENSING SWITCH	MOTOR	GROUND RELAY	RELAY	CIRCUIT BREAKER	FLASHER	
N									
O									
P									
Q									
R									
S									
T									
U									
V									
W									
X									
Y									
Z									
AA									
AB									
AC									
AD									
AE									
AF									
AG									
AH									
	1	2	3	4	5	6	7	8	9

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC  
 FOLDOUT 1 OF 34  
 SIZE B ILL. NO. 5WD01L11 JFP-1/FP-2 BLANK

CONNECTORS				CONNECTORS (CONTINUED)				CONNECTORS (CONTINUED)				CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION
A	C258	29	ELECTRONIC CONTROL UNIT	J152	B271	31	VAN FRONT MARKER LIGHT	P19	E38	5	LEFT HEADLIGHT	P118	D161	16	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
A	D265	30	ELECTRONIC CONTROL UNIT	J153	A271	31	VAN FRONT MARKER LIGHT	P20	D38	5	LEFT HEADLIGHT	P116	E291	33	WTEC II CAB DASH RIGHT KICK PANEL
A13	A66	8	WTEC II TRANSMISSION CONNECTOR A	J154	A271	31	VAN FRONT MARKER LIGHT	P22	G38	5	PARKING LIGHT FRONT LEFT	P119	A64	8	WTEC II TRANSMISSION (A)
A13	A70	8	WTEC II TRANSMISSION CONNECTOR B	J155	B287	32	VAN CURBSIDE MARKER LIGHT	P23	F38	5	FRONT LEFT TURN SIGNAL	P119	A69	8	WTEC I TRANSMISSION (SERIAL # 29517497)
A13	A74	9	WTEC II TRANSMISSION CONNECTOR C	J156	B287	32	VAN CURBSIDE MARKER LIGHT	P24	H38	5	BLACKOUT MARKER LEFT FRONT	P119	A73	9	WTEC I TRANSMISSION (SERIAL # 29513233)
B	E258	29	ELECTRONIC CONTROL UNIT	J157	C287	32	VAN ROADSIDE MARKER LIGHT	P25	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)	P119	B169	19	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
B	F265	30	ELECTRONIC CONTROL UNIT	J158	C287	32	VAN ROADSIDE MARKER LIGHT	P27	A43	5	CHASSIS - FRONT	P125	G84	10	WINDSHIELD WASHER ROTARY PUMP (B3)
C	E260	29	ELECTRONIC CONTROL UNIT	J159	D287	32	VAN REAR CENTER MARKER LIGHT	P31	E56	7	ENGINE	P129	F85	10	CAB MARKER LIGHT FRONT LOWER LEFT
C	F266	29	ELECTRONIC CONTROL UNIT	J160	E287	32	VAN REAR CENTER MARKER LIGHT	P31X	D56	7	ENGINE	P129	F85	10	CAB MARKER LIGHT LEFT DOOR
J1	D285	32	VAN 110 VAC POWER ENTRY	J161	E287	32	VAN REAR CENTER MARKER LIGHT	P32	F59	7	ENGINE OIL PRESSURE SENSOR	P131	A85	10	CAB MARKER LIGHT RIGHT DOOR
J2	A185	21	EMI FILTER	J162	B273	31	VAN CURBSIDE BLACKOUT LIGHT	P33	H59	7	FUEL/WATER SEPARATOR	P132	B85	10	CAB MARKER LIGHT FRONT LOWER RIGHT
J2	E285	32	VAN 110 VAC POWER ENTRY	J163	B274	31	VAN CURBSIDE EMERGENCY LIGHT	P34	E59	7	OIL PRESSURE WARNING LIGHT SWITCH	P150	B272	31	VAN FRONT MARKER LIGHT
J3	D205	23	AIRDROP ONLY	J164	H274	31	VAN ROADSIDE BLACKOUT LIGHT	P36	A57	7	WATER COOLER TEMPERATURE	P151	B272	31	VAN FRONT MARKER LIGHT
J5	A38	5	VEHICLE HORN	J165	H275	31	VAN ROADSIDE EMERGENCY LIGHT	P37	C57	7	WATER TEMPERATURE SWITCH	P152	B272	31	VAN FRONT MARKER LIGHT
J6	A38	5	VEHICLE HORN	J166	C271	31	VAN FRONT EMERGENCY LIGHT	P38	F61	7	ENGINE SPEED MAGNETIC PICKUP	P153	A272	31	VAN FRONT MARKER LIGHT
J7	A188	21	WTEC II TRANSMISSION DIMMER MODULE	J167	D287	32	VAN REAR EMERGENCY LIGHT	P39	G61	7	ENGINE	P154	A272	31	VAN FRONT MARKER LIGHT
J8	B38	5	BLACKOUT MARKER RIGHT FRONT	J173	G272	31	VAN 12/24 VDC POWER RECEPTACLE	P41	B57	7	WATER TEMPERATURE SENSOR	P155	B287	32	VAN CURBSIDE MARKER LIGHT
J9	C38	5	FRONT RIGHT TURN SIGNAL	J204	D254	29	HEATER SWITCH	P410	E240	27	ARCTIC KIT W/PTO EQUIPPED	P156	B287	32	VAN CURBSIDE MARKER LIGHT
J10	B38	5	PARKING LIGHT FRONT RIGHT	J204	B254	29	TROOP HEATER	P42	F57	7	ETHER SENSOR SWITCH	P157	C287	32	VAN ROADSIDE MARKER LIGHT
J12	D38	5	RIGHT HEADLIGHT	J205	D254	29	HEATER SWITCH	P43	G42	5	CHASSIS FRONT	P158	C287	32	VAN ROADSIDE MARKER LIGHT
J13	C38	5	RIGHT HEADLIGHT	J205	B254	29	TROOP HEATER	P43X	F42	5	CHASSIS FRONT	P159	D287	32	VAN REAR CENTER MARKER LIGHT
J14	C38	5	RIGHT HEADLIGHT	J206	D253	29	HEATER SWITCH	P50	E85	10	CAB MARKER LIGHT FRONT UPPER LEFT	P160	E287	32	VAN REAR CENTER MARKER LIGHT
J17	H38	5	BLACKOUT DRIVE LIGHT	J206	B253	29	TROOP HEATER	P50	F206	23	LH FRONT TOP CAB MARKER LIGHT	P161	D287	32	VAN REAR CENTER MARKER LIGHT
J18	D38	5	LEFT HEADLIGHT	J207	F255	29	FURNACE ASSEMBLY	P51	D190	22	CAB DASH RIGHT POWER DISTRIBUTION PANEL	P162	B273	31	VAN CURBSIDE BLACKOUT LIGHT
J19	E38	5	LEFT HEADLIGHT	J209	C256	29	WEBASTO CONTROL UNIT	P52F	E38	5	CHASSIS FRONT	P163	B274	31	VAN CURBSIDE EMERGENCY LIGHT
J19	C177	20	CAB - DASH - LEFT - UNDERDASH	J209A	C230	26	PTO EQUIPPED	P52R	E196	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	P164	G274	31	VAN ROADSIDE BLACKOUT LIGHT
J20	D38	5	LEFT HEADLIGHT	J209A	A239	27	ARCTIC KIT W/PTO EQUIPPED	P53R	D196	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	P165	G275	31	VAN ROADSIDE EMERGENCY LIGHT
J22	G38	5	PARKING LIGHT FRONT LEFT	J209B	D230	26	PTO EQUIPPED	P54	D198	22	LEFT REAR MARKER	P166	C272	32	VAN FRONT EMERGENCY LIGHT
J23	F38	5	FRONT LEFT TURN SIGNAL	J209B	B239	27	ARCTIC KIT W/PTO EQUIPPED	P55	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT	P167	D287	31	VAN REAR EMERGENCY LIGHT
J24	H38	5	BLACKOUT MARKER LEFT FRONT	J210	F222	25	CAB DASH CENTER OPTIONS PANEL	P55	D206	23	RH FRONT TOP CAB MARKER LIGHT	P172	E264	30	DUMP BODY CONNECTOR
J25	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)	J210	C255	29	FURNACE ASSEMBLY	P56	E198	22	MIDDLE REAR MARKER	P173	G271	31	VAN 12/24 VDC POWER
J27	A43	5	CHASSIS - FRONT	J211	B255	29	FURNACE ASSEMBLY	P57	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT	P200	B255	29	TROOP HEATER
J31	E56	7	ENGINE	J214	F246	28	SWINGFIRE HEATER	P57	F206	23	LH FRONT TOP CAB CLEARANCE LIGHT	P200	C255	29	TROOP HEATER
J31X	F175	20	CAB - DASH - LEFT - UNDERDASH	J215	E230	26	PTO EQUIPPED	P58	E198	22	RIGHT REAR MARKER	P201	G61	7	ENGINE
J39	G61	7	ENGINE	J215	C239	27	ARCTIC KIT W/PTO EQUIPPED	P59	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT	P202	A240	27	ARCTIC KIT W/PTO EQUIPPED
J43	G42	5	CHASSIS - FRONT	J225	B258	29	FURNACE ASSEMBLY	P59	D206	23	RH FRONT TOP CAB CLEARANCE LIGHT	P208	F256	29	TROOP HEATER
J43X	F42	5	CHASSIS - FRONT	J226	E258	29	WEBASTO CONTROL UNIT	P60	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE	P209	C256	29	FURNACE ASSEMBLY
J43X	G175	20	CAB - DASH - LEFT - UNDERDASH	J230	A282	32	VAN CURBSIDE 110 VAC OUTLET	P60	E206	23	MIDDLE FRONT TOP CLEARANCE LIGHT	P210	F222	25	CAB DASH CENTER OPTIONS PANEL
J50	E85	10	CAB MARKER LIGHT FRONT UPPER LEFT	J231	A283	32	VAN CURBSIDE 110 VAC OUTLET	P61	F198	22	RH COMPOSITE LIGHT	P210	C227	26	PTO EQUIPPED
J51	D42	5	CHASSIS - FRONT	J232	A284	32	VAN CURBSIDE 110 VAC OUTLET	P62	F198	22	RH COMPOSITE LIGHT	P210	A235	27	ARCTIC KIT W/PTO EQUIPPED
J52	E38	5	CHASSIS - FRONT BUMPER	J233	H282	32	VAN ROADSIDE 110 VAC OUTLET	P63	G198	22	RH COMPOSITE LIGHT	P211	D238	27	ARCTIC KIT W/PTO EQUIPPED
J52	B203	23	CHASSIS - FRONT	J234	H283	32	VAN ROADSIDE 110 VAC OUTLET	P64	F198	22	RH COMPOSITE LIGHT	P211A	D239	27	ARCTIC KIT W/PTO EQUIPPED
J53	F200	23	AIRDROP ONLY	J235	H284	32	VAN ROADSIDE 110 VAC OUTLET	P65	E186	21	ROTARY WARNING LIGHT CONNECTOR	P212	E238	27	ARCTIC KIT W/PTO EQUIPPED
J55	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT	J236	H275	31	VAN ROADSIDE 24 VDC OUTLET	P67	D301	34	WTEC II TRANSMISSION	P214	G241	27	ARCTIC KIT W/PTO EQUIPPED
J57	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT	J237	275	31	VAN CURBSIDE 24 VDC OUTLET	P69	D59	7	ENGINE	P215	E230	26	PTO EQUIPPED
J59	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT	J242	D271	31	VAN A/C	P71	H301	34	WTEC II TRANSFER CASE	P215	C239	27	ARCTIC KIT W/PTO EQUIPPED
J60	D65	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE	J244	F271	31	VAN THERMOSTAT	P72	G301	34	WTEC II ENGINE SPEED SENSOR	P216	E229	26	PTO EQUIPPED
J62	E88	10	ROTARY WARNING LIGHT CONNECTOR	J245	E271	31	VAN HEATER	P73	G300	34	WTEC II THROTTLE POSITION SENSOR	P216	B238	27	ARCTIC KIT W/PTO EQUIPPED
J65	E186	21	ROTARY WARNING LIGHT CONNECTOR	J912	R124	14	CAB DASH CENTER HEATER / CTIS ECU	P74	B198	22	LH COMPOSITE LIGHT	P217	C229	26	PTO EQUIPPED
J78	F185	21	CAB RADIO CONNECTOR	J912	D209	24	CAB DASH CENTER OPTIONS PANEL	P76	C198	22	LH COMPOSITE LIGHT	P217	B268	30	PTO EQUIPPED
J93	B50	6	CHASSIS - SPARE TIRE	J913	B122	14	CAB DASH CENTER HEATER / CTIS ECU	P77	C198	22	LH COMPOSITE LIGHT	P217	B238	27	ARCTIC KIT W/PTO EQUIPPED
J95	E38	5	12V INTERVEHICULAR	J921	G62	7	TROOP TRANSPORT ALARM	P78	B198	22	LH COMPOSITE LIGHT	P901	A209	24	CAB DASH CENTER OPTIONS PANEL
J95	B206	23	ENGINE	J410	E262	30	CAB ARCTIC HEATER	P80	G51	6	CHASSIS - REAR	P902	C214	24	CAB DASH CENTER OPTIONS PANEL
J99	E187	21	CHEMICAL ALARM CONNECTOR	MT9	F66	8	WTEC II TRANSMISSION (A)	P80	D78	9	AIR DRYER (EXCEPT DUMP)	P902A	D214	24	CAB DASH CENTER OPTIONS PANEL
J106	F50	6	CHEMICAL DETECTOR RECEPTACLE	MT9	F70	8	WTEC II TRANSMISSION (B)	P81	C47	6	CHASSIS - FRONT	P903	C212	24	CAB DASH CENTER OPTIONS PANEL
J108	B222	25	CAB DASH CENTER OPTIONS PANEL	MT9	E74	9	WTEC II TRANSMISSION (C)	P81	D62	7	STARTER THERMO SWITCH	P903A	D212	24	CAB DASH CENTER OPTIONS PANEL
J111	E122	14	CTIS ELECTRONIC CONTROL UNIT	MT11	F66	8	WTEC II TRANSMISSION (A)	P82	B51	6	FUEL TANK LEVEL SENSOR	P904	C211	24	CAB DASH CENTER OPTIONS PANEL
J113	G186	21	CTIS PRESSURE TRANSDUCER	MT11	F70	8	WTEC II TRANSMISSION (B)	P83	B172	20	CAB - DASH - LEFT - UNDERDASH	P904A	D211	24	CAB DASH CENTER OPTIONS PANEL
J114	B185	21	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS	MT11	F74	9	WTEC II TRANSMISSION (C)	P84	F51	6	CHASSIS - REAR	P905	A211	24	CAB DASH CENTER OPTIONS PANEL
J115	C154	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS	P2	A185	21	EMI FILTER	P85	A198	22	LH SIDE MARKER LIGHT	P905A	B211	24	CAB DASH CENTER OPTIONS PANEL
J116	C159	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS	P2	G246	28	SWINGFIRE HEATER	P86	A198	22	LH REAR MARKER LIGHT	P906	A212	24	CAB DASH CENTER OPTIONS PANEL
J117	F161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS	P3	D204	23	AIRDROP ONLY	P87	C198	22	BACKUP LIGHT	P906A	B212	24	CAB DASH CENTER OPTIONS PANEL
J117	B289	33	WTEC III DIAGNOSTIC CONNECTOR	P5	A38	5	VEHICLE HORN	P88	H198	22	RH SIDE MARKER LIGHT	P908	A215	24	CAB DASH CENTER OPTIONS PANEL
J118	D161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS	P6	A38	5	VEHICLE HORN	P89	G198	22	RH REAR MARKER LIGHT	P908A	B215	24	CAB DASH CENTER OPTIONS PANEL
J119	B169	19	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS	P8	B38	5	BLACKOUT MARKER RIGHT FRONT	P99	F186	21	CHEMICAL ALARM CONNECTOR	P909	A220	25	CAB DASH CENTER OPTIONS PANEL
J119	C298	34	WTEC II TRANSMISSION HARNESS	P9	C38	5	FRONT RIGHT TURN SIGNAL	P10	B38	5	PARKING LIGHT FRONT RIGHT	P909A	B220	25	CAB DASH CENTER OPTIONS PANEL
J129	F85	10	CAB MARKER LIGHT FRONT LOWER LEFT	P10	B38	5	PARKING LIGHT FRONT RIGHT	P110	E119	14	CTIS ELECTRONIC CONTROL UNIT	P910	C215	24	CAB DASH CENTER OPTIONS PANEL
J129	F85	10	CAB MARKER LIGHT LEFT DOOR	P12	D38	5	RIGHT HEADLIGHT	P111	E122	14	CTIS ELECTRONIC CONTROL UNIT	P910A	D215	24	CAB DASH CENTER OPTIONS PANEL
J130	F202	23	12 PIN CONNECTOR	P13	C38	5	RIGHT HEADLIGHT	P112	G123	14	CAB DASH CENTER HEATER / CTIS ECU	P911	C220	25	CAB DASH CENTER OPTIONS PANEL
J131	B85	10	CAB MARKER LIGHT RIGHT DOOR	P14	C38	5	RIGHT HEADLIGHT	P113	F123	14	CTIS ELECTRONIC CONTROL UNIT				
J132	B85	10	CAB MARKER LIGHT FRONT LOWER RIGHT	P17	H38	5	BLACKOUT DRIVE LIGHT	P114	C296	33	WTEC III CAB DASH RIGHT KICK PANEL				
J150	B271	31	VAN FRONT MARKER LIGHT	P18	D38	5	LEFT HEADLIGHT	P115	C290	33	WTEC III CAB DASH RIGHT KICK PANEL				
J151	B271	31	VAN FRONT MARKER LIGHT	P18	A177	20	CAB - DASH - LEFT - UNDERDASH	P116	C185	21	CAB - DASH - RIGHT - UNDERDASH				

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC  
FOLDOUT 2 OF 34  
SIZE B ILL. NO. 5WD01L21 FP-3/FP-4 BLANK



28				29				30				31				32				33				34				35				36																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
<table border="1"> <thead> <tr> <th colspan="4">TERMINAL LUGS (CONTINUED)</th> </tr> <tr> <th>NUMBER</th> <th>ZONE</th> <th>SH</th> <th>DESCRIPTION</th> </tr> </thead> <tr><td>TL126</td><td>G86</td><td>10</td><td>WINDSHIELD WASHER ROTARY PUMP (B3)</td></tr> <tr><td>TL126</td><td>E126</td><td>14</td><td>PARKING BRAKE SWITCH</td></tr> <tr><td>TL130</td><td>F85</td><td>10</td><td>CAB MARKER LIGHTS</td></tr> <tr><td>TL131</td><td>A85</td><td>10</td><td>CAB MARKER LIGHTS</td></tr> <tr><td>TL133</td><td>F85</td><td>10</td><td>CAB MARKER LIGHTS</td></tr> <tr><td>TL134</td><td>B85</td><td>10</td><td>CAB MARKER LIGHTS</td></tr> <tr><td>TL150</td><td>F177</td><td>20</td><td>SENSOR/FRONT AIR PRESSURE TRANSMITTER</td></tr> <tr><td>TL151</td><td>G177</td><td>20</td><td>SENSOR/REAR AIR PRESSURE TRANSMITTER</td></tr> <tr><td>TL152</td><td>C179</td><td>20</td><td>STOPLIGHT SWITCH</td></tr> <tr><td>TL153</td><td>C179</td><td>20</td><td>STOPLIGHT SWITCH</td></tr> <tr><td>TL154</td><td>D179</td><td>20</td><td>STOPLIGHT SWITCH</td></tr> <tr><td>TL154</td><td>D179</td><td>20</td><td>STOPLIGHT SWITCH</td></tr> <tr><td>TL155</td><td>D179</td><td>20</td><td>STOPLIGHT SWITCH</td></tr> <tr><td>TL156</td><td>F177</td><td>20</td><td>SWITCH/FRONT AIR PRESSURE TRANSMITTER</td></tr> <tr><td>TL157</td><td>G177</td><td>20</td><td>SWITCH/REAR AIR PRESSURE TRANSMITTER</td></tr> <tr><td>TL158</td><td>E337</td><td>16</td><td>START INHIBIT PUSHBUTTON</td></tr> <tr><td>TL159</td><td>E136</td><td>16</td><td>START INHIBIT PUSHBUTTON</td></tr> <tr><td>TL160</td><td>H102</td><td>12</td><td>AUDIBLE ALARM</td></tr> <tr><td>TL161</td><td>H102</td><td>12</td><td>AUDIBLE ALARM</td></tr> <tr><td>TL162</td><td>B114</td><td>13</td><td>STARTER PUSHBUTTON</td></tr> <tr><td>TL163</td><td>B114</td><td>13</td><td>STARTER PUSHBUTTON</td></tr> <tr><td>TL164</td><td>G62</td><td>7</td><td>ENGINE (REF J921)</td></tr> <tr><td>TL165</td><td>G62</td><td>7</td><td>ENGINE (REF J921)</td></tr> <tr><td>TL166</td><td>F54</td><td>6</td><td>TERMINAL BLOCK</td></tr> <tr><td>TL167</td><td>E54</td><td>6</td><td>TERMINAL BLOCK</td></tr> <tr><td>TL169</td><td>D53</td><td>6</td><td>POLARITY PROTECTION (P/P)</td></tr> <tr><td>TL170</td><td>F248</td><td>28</td><td>SWINGFIRE HEATER</td></tr> <tr><td>TL171</td><td>F54</td><td>6</td><td>TERMINAL BLOCK</td></tr> <tr><td>TL172</td><td>F54</td><td>6</td><td>TERMINAL BLOCK</td></tr> <tr><td>TL173</td><td>E54</td><td>6</td><td>POLARITY PROTECTION (P/P)</td></tr> <tr><td>TL174</td><td>D54</td><td>6</td><td>POLARITY PROTECTION (P/P)</td></tr> <tr><td>TL190</td><td>D290</td><td>33</td><td>WTEC II PRESSURE SWITCH GROUND</td></tr> <tr><td>TL201</td><td>E125</td><td>14</td><td>PARKING BRAKE SWITCH</td></tr> <tr><td>TL202</td><td>E125</td><td>14</td><td>PARKING BRAKE SWITCH</td></tr> <tr><td>TL320</td><td>E232</td><td>26</td><td>PTO EQUIPPED</td></tr> <tr><td>TL320</td><td>C241</td><td>27</td><td>ARCTIC KIT W/PTO EQUIPPED</td></tr> </table>				TERMINAL LUGS (CONTINUED)				NUMBER	ZONE	SH	DESCRIPTION	TL126	G86	10	WINDSHIELD WASHER ROTARY PUMP (B3)	TL126	E126	14	PARKING BRAKE SWITCH	TL130	F85	10	CAB MARKER LIGHTS	TL131	A85	10	CAB MARKER LIGHTS	TL133	F85	10	CAB MARKER LIGHTS	TL134	B85	10	CAB MARKER LIGHTS	TL150	F177	20	SENSOR/FRONT AIR PRESSURE TRANSMITTER	TL151	G177	20	SENSOR/REAR AIR PRESSURE TRANSMITTER	TL152	C179	20	STOPLIGHT SWITCH	TL153	C179	20	STOPLIGHT SWITCH	TL154	D179	20	STOPLIGHT SWITCH	TL154	D179	20	STOPLIGHT SWITCH	TL155	D179	20	STOPLIGHT SWITCH	TL156	F177	20	SWITCH/FRONT AIR PRESSURE TRANSMITTER	TL157	G177	20	SWITCH/REAR AIR PRESSURE TRANSMITTER	TL158	E337	16	START INHIBIT PUSHBUTTON	TL159	E136	16	START INHIBIT PUSHBUTTON	TL160	H102	12	AUDIBLE ALARM	TL161	H102	12	AUDIBLE ALARM	TL162	B114	13	STARTER PUSHBUTTON	TL163	B114	13	STARTER PUSHBUTTON	TL164	G62	7	ENGINE (REF J921)	TL165	G62	7	ENGINE (REF J921)	TL166	F54	6	TERMINAL BLOCK	TL167	E54	6	TERMINAL BLOCK	TL169	D53	6	POLARITY PROTECTION (P/P)	TL170	F248	28	SWINGFIRE HEATER	TL171	F54	6	TERMINAL BLOCK	TL172	F54	6	TERMINAL BLOCK	TL173	E54	6	POLARITY PROTECTION (P/P)	TL174	D54	6	POLARITY PROTECTION (P/P)	TL190	D290	33	WTEC II PRESSURE SWITCH GROUND	TL201	E125	14	PARKING BRAKE SWITCH	TL202	E125	14	PARKING BRAKE SWITCH	TL320	E232	26	PTO EQUIPPED	TL320	C241	27	ARCTIC KIT W/PTO EQUIPPED	<table border="1"> <thead> <tr> <th colspan="4">SWITCHES (CONTINUED)</th> </tr> <tr> <th>NUMBER</th> <th>ZONE</th> <th>SH</th> <th>DESCRIPTION</th> </tr> </thead> <tr><td>S27</td><td>E59</td><td>7</td><td>OIL PRESSURE WARNING LIGHT SWITCH</td></tr> <tr><td>S29</td><td>G177</td><td>20</td><td>SWITCH/REAR AIR PRESSURE TRANSMITTER</td></tr> <tr><td>S31</td><td>A216</td><td>24</td><td>ARCTIC TROOP HEATER SWITCH</td></tr> <tr><td>S32</td><td>F288</td><td>32</td><td>VAN LIGHTS ON/OFF SWITCH</td></tr> <tr><td>S33</td><td>E277</td><td>31</td><td>VAN BLACKOUT SWITCH</td></tr> <tr><td>S34</td><td>D278</td><td>31</td><td>VAN BLACKOUT SWITCH</td></tr> <tr><td>S35</td><td>H273</td><td>31</td><td>VAN BLACKOUT OVERRIDE SWITCH</td></tr> <tr><td>S40</td><td>F58</td><td>7</td><td>ETHER SENSOR SWITCH</td></tr> <tr><td>S45</td><td>E62</td><td>7</td><td>TROOP ALARM SWITCH</td></tr> <tr><td>S45</td><td>G62</td><td>31</td><td>VAN FAN ON/OFF SWITCH</td></tr> <tr><td>S56</td><td>A57</td><td>7</td><td>WATER TEMPERATURE SWITCH</td></tr> <tr><td>S57</td><td>G77</td><td>9</td><td>LMHC IN/OUT SWITCH</td></tr> </table>				SWITCHES (CONTINUED)				NUMBER	ZONE	SH	DESCRIPTION	S27	E59	7	OIL PRESSURE WARNING LIGHT SWITCH	S29	G177	20	SWITCH/REAR AIR PRESSURE TRANSMITTER	S31	A216	24	ARCTIC TROOP HEATER SWITCH	S32	F288	32	VAN LIGHTS ON/OFF SWITCH	S33	E277	31	VAN BLACKOUT SWITCH	S34	D278	31	VAN BLACKOUT SWITCH	S35	H273	31	VAN BLACKOUT OVERRIDE SWITCH	S40	F58	7	ETHER SENSOR SWITCH	S45	E62	7	TROOP ALARM SWITCH	S45	G62	31	VAN FAN ON/OFF SWITCH	S56	A57	7	WATER TEMPERATURE SWITCH	S57	G77	9	LMHC IN/OUT SWITCH	<table border="1"> <thead> <tr> <th 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TIRE</td></tr> <tr><td>L16</td><td>E239</td><td>27</td><td>WATER SOLENOID</td></tr> <tr><td>L17</td><td>D240</td><td>27</td><td>WATER PUMP</td></tr> <tr><td>E80</td><td>9</td><td></td><td>LMHC IN SOLENOID</td></tr> <tr><td>F80</td><td>9</td><td></td><td>LMHC OUT SOLENOID</td></tr> <tr><td>A304</td><td>34</td><td></td><td>WTEC II A SOLENOID</td></tr> <tr><td>B304</td><td>34</td><td></td><td>WTEC II H SOLENOID</td></tr> <tr><td>C304</td><td>34</td><td></td><td>WTEC II N SOLENOID</td></tr> <tr><td>D304</td><td>34</td><td></td><td>WTEC II J SOLENOID</td></tr> <tr><td>E304</td><td>34</td><td></td><td>WTEC II G SOLENOID</td></tr> <tr><td>F304</td><td>34</td><td></td><td>WTEC II E SOLENOID</td></tr> <tr><td>F304</td><td>34</td><td></td><td>WTEC II D SOLENOID</td></tr> <tr><td>G304</td><td>34</td><td></td><td>WTEC II C SOLENOID</td></tr> <tr><td>G304</td><td>34</td><td></td><td>WTEC II B SOLENOID</td></tr> <tr><td>H304</td><td>34</td><td></td><td>WTEC II A SOLENOID</td></tr> 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DASH - RIGHT - POWER DISTRIBUTION PNL</td></tr> <tr><td>D3A</td><td>B138</td><td>16</td><td>CAB - DASH - RIGHT - POWER DISTRIBUTION PNL</td></tr> <tr><td>D3B</td><td>B138</td><td>16</td><td>CAB - DASH - RIGHT - POWER DISTRIBUTION PNL</td></tr> <tr><td>E1</td><td>C52</td><td>6</td><td>BATTERY</td></tr> <tr><td>E1</td><td>D52</td><td>6</td><td>BATTERY</td></tr> <tr><td>E1</td><td>D52</td><td>6</td><td>BATTERY</td></tr> <tr><td>E1</td><td>E52</td><td>6</td><td>BATTERY</td></tr> <tr><td>E2</td><td>C43</td><td>5</td><td>CHASSIS FRONT BUMPER (REF J27)</td></tr> <tr><td>E2</td><td>C52</td><td>6</td><td>BATTERY</td></tr> <tr><td>E2</td><td>D52</td><td>6</td><td>BATTERY</td></tr> <tr><td>E2</td><td>E52</td><td>6</td><td>BATTERY</td></tr> <tr><td>E2</td><td>E52</td><td>6</td><td>BATTERY</td></tr> <tr><td>E3</td><td>H148</td><td>17</td><td>CAB - DASH - RIGHT - POWER DISTRIBUTION PNL</td></tr> <tr><td>E4</td><td>H150</td><td>17</td><td>CAB - DASH - RIGHT - POWER DISTRIBUTION PNL</td></tr> <tr><td>E5</td><td>B151</td><td>17</td><td>CAB - DASH - RIGHT - POWER DISTRIBUTION PNL</td></tr> <tr><td>E14</td><td>E94</td><td>22</td><td>ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE</td></tr> <tr><td>E15</td><td>E197</td><td>22</td><td>ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE</td></tr> <tr><td>E16</td><td>A197</td><td>22</td><td>ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE</td></tr> <tr><td>E17</td><td>G195</td><td>22</td><td>ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE</td></tr> <tr><td>E18</td><td>G194</td><td>22</td><td>ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE</td></tr> <tr><td>E19</td><td>F194</td><td>22</td><td>ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE</td></tr> <tr><td>E20</td><td>E194</td><td>22</td><td>ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE</td></tr> <tr><td>E21</td><td>D195</td><td>22</td><td>ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE</td></tr> <tr><td>E22</td><td>B86</td><td>10</td><td>CAB MARKER LIGHTS</td></tr> <tr><td>E23</td><td>D86</td><td>10</td><td>CAB MARKER LIGHTS</td></tr> <tr><td>E23</td><td>D205</td><td>23</td><td>AIRDROP ONLY</td></tr> <tr><td>E24</td><td>C85</td><td>10</td><td>CAB MARKER LIGHTS</td></tr> <tr><td>E24</td><td>D205</td><td>23</td><td>AIRDROP ONLY</td></tr> <tr><td>E25</td><td>F86</td><td>10</td><td>CAB MARKER LIGHTS</td></tr> <tr><td>E60</td><td>B41</td><td>31</td><td>24 VDC VAN POWER</td></tr> <tr><td>E65</td><td>B41</td><td>5</td><td>CHASSIS - FRONT</td></tr> <tr><td>E66</td><td>C41</td><td>5</td><td>CHASSIS - FRONT</td></tr> <tr><td>E66</td><td>E298</td><td>34</td><td>WTEC III TRANSMISSION HARNESS</td></tr> <tr><td>E67</td><td>D38</td><td>5</td><td>CHASSIS - FRONT</td></tr> <tr><td>E68</td><td>D40</td><td>5</td><td>CHASSIS - FRONT</td></tr> <tr><td>E70</td><td>G229</td><td>26</td><td>PTO EQUIPPED</td></tr> <tr><td>E70</td><td>A238</td><td>27</td><td>ARCTIC KIT W/PTO EQUIPPED</td></tr> <tr><td>E71</td><td>F173</td><td>20</td><td>CAB - DASH - LEFT - UNDERDASH</td></tr> <tr><td>E73</td><td>G238</td><td>27</td><td>ARCTIC KIT W/PTO EQUIPPED</td></tr> <tr><td>E74</td><td>B238</td><td>27</td><td>ARCTIC KIT W/PTO EQUIPPED</td></tr> <tr><td>F76</td><td>E239</td><td>27</td><td>ARCTIC KIT W/PTO EQUIPPED</td></tr> <tr><td>E88</td><td>B106</td><td>12</td><td>CAB DASH LEFT INSTRUMENT PANEL</td></tr> <tr><td>E89</td><td>C106</td><td>12</td><td>CAB DASH LEFT INSTRUMENT PANEL</td></tr> <tr><td>E90</td><td>F298</td><td>34</td><td>WTEC III TRANSMISSION HARNESS</td></tr> <tr><td>E91</td><td>D298</td><td>34</td><td>WTEC III TRANSMISSION HARNESS</td></tr> <tr><td>E501</td><td>B275</td><td>31</td><td>VAN EMERGENCY/BLACKOUT LIGHT/24 VDC OUTLET</td></tr> <tr><td>E502</td><td>G274</td><td>31</td><td>VAN EMERGENCY/BLACKOUT LIGHT</td></tr> <tr><td>E503</td><td>B273</td><td>31</td><td>VAN MARKER LIGHT</td></tr> <tr><td>E504</td><td>B272</td><td>31</td><td>VAN MARKER LIGHT</td></tr> <tr><td>E505</td><td>B287</td><td>32</td><td>VAN REAR MARKER LIGHTS</td></tr> <tr><td>E506</td><td>C287</td><td>32</td><td>VAN REAR MARKER LIGHTS</td></tr> <tr><td>E514</td><td>C274</td><td>31</td><td>VAN EMERGENCY LIGHT</td></tr> <tr><td>E516</td><td>H272</td><td>31</td><td>VAN 24 VDC</td></tr> <tr><td>F1</td><td>F256</td><td>29</td><td>FURNACE CONTROL UNIT</td></tr> <tr><td>F2</td><td>H271</td><td>31</td><td>VAN 24 VDC POWER</td></tr> <tr><td>FL</td><td>E183</td><td>21</td><td>WTEC II VEHICLE INTERFACE MODULE</td></tr> <tr><td>FL1</td><td>G85</td><td>10</td><td>EMI FILTER</td></tr> <tr><td>FL2</td><td>A184</td><td>21</td><td>EMI FILTER</td></tr> <tr><td>FL3</td><td>C118</td><td>14</td><td>FAN MOTOR</td></tr> </table>				MISCELLANEOUS (CONTINUED)				NUMBER	ZONE	SH	DESCRIPTION	D2B	D138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	D3A	B138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	D3B	B138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	E1	C52	6	BATTERY	E1	D52	6	BATTERY	E1	D52	6	BATTERY	E1	E52	6	BATTERY	E2	C43	5	CHASSIS FRONT BUMPER (REF J27)	E2	C52	6	BATTERY	E2	D52	6	BATTERY	E2	E52	6	BATTERY	E2	E52	6	BATTERY	E3	H148	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	E4	H150	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	E5	B151	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	E14	E94	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	E15	E197	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	E16	A197	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	E17	G195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	E18	G194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	E19	F194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	E20	E194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	E21	D195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	E22	B86	10	CAB MARKER LIGHTS	E23	D86	10	CAB MARKER LIGHTS	E23	D205	23	AIRDROP ONLY	E24	C85	10	CAB MARKER LIGHTS	E24	D205	23	AIRDROP ONLY	E25	F86	10	CAB MARKER LIGHTS	E60	B41	31	24 VDC VAN POWER	E65	B41	5	CHASSIS - FRONT	E66	C41	5	CHASSIS - FRONT	E66	E298	34	WTEC III TRANSMISSION HARNESS	E67	D38	5	CHASSIS - FRONT	E68	D40	5	CHASSIS - FRONT	E70	G229	26	PTO EQUIPPED	E70	A238	27	ARCTIC KIT W/PTO EQUIPPED	E71	F173	20	CAB - DASH - LEFT - UNDERDASH	E73	G238	27	ARCTIC KIT W/PTO EQUIPPED	E74	B238	27	ARCTIC KIT W/PTO EQUIPPED	F76	E239	27	ARCTIC KIT W/PTO EQUIPPED	E88	B106	12	CAB DASH LEFT INSTRUMENT PANEL	E89	C106	12	CAB DASH LEFT INSTRUMENT PANEL	E90	F298	34	WTEC III TRANSMISSION HARNESS	E91	D298	34	WTEC III TRANSMISSION HARNESS	E501	B275	31	VAN EMERGENCY/BLACKOUT LIGHT/24 VDC OUTLET	E502	G274	31	VAN EMERGENCY/BLACKOUT LIGHT	E503	B273	31	VAN MARKER LIGHT	E504	B272	31	VAN MARKER LIGHT	E505	B287	32	VAN REAR MARKER LIGHTS	E506	C287	32	VAN REAR MARKER LIGHTS	E514	C274	31	VAN EMERGENCY LIGHT	E516	H272	31	VAN 24 VDC	F1	F256	29	FURNACE CONTROL UNIT	F2	H271	31	VAN 24 VDC POWER	FL	E183	21	WTEC II VEHICLE INTERFACE MODULE	FL1	G85	10	EMI FILTER	FL2	A184	21	EMI FILTER	FL3	C118	14	FAN MOTOR	<table border="1"> <thead> <tr> <th colspan="4">MISCELLANEOUS (CONTINUED)</th> </tr> <tr> <th>NUMBER</th> <th>ZONE</th> <th>SH</th> <th>DESCRIPTION</th> </tr> </thead> <tr><td>F310A</td><td>E262</td><td>30</td><td>ARTIC CAB HEATER</td></tr> <tr><td>F210A</td><td>E263</td><td>30</td><td>ARTIC CAB HEATER</td></tr> <tr><td>F10A</td><td>E263</td><td>30</td><td>ARTIC CAB HEATER</td></tr> <tr><td>G1</td><td>D60</td><td>7</td><td>ALTERNATOR</td></tr> <tr><td>MPU1</td><td>F61</td><td>7</td><td>ENGINE SPEED MAGNETIC PICKUP</td></tr> <tr><td>MT3</td><td>F60</td><td>7</td><td>ENGINE OIL PRESSURE SENSOR</td></tr> <tr><td>MT4</td><td>E177</td><td>20</td><td>SENSOR/FRONT AIR PRESSURE TRANSMITTER</td></tr> <tr><td>MT5</td><td>G177</td><td>20</td><td>SENSOR/REAR AIR PRESSURE TRANSMITTER</td></tr> <tr><td>MT6</td><td>B57</td><td>7</td><td>WATER COOLER TEMPERATURE</td></tr> <tr><td>MT7</td><td>B52</td><td>6</td><td>FUEL TANK LEVEL SENSOR</td></tr> <tr><td>MT11</td><td>A63</td><td>7</td><td>THROTTLE POSITION SENSOR</td></tr> <tr><td>NS</td><td>E183</td><td>21</td><td>WTEC II VEHICLE INTERFACE MODULE</td></tr> <tr><td>NS</td><td>F183</td><td>21</td><td>WTEC II VEHICLE INTERFACE MODULE</td></tr> <tr><td>P/P</td><td>B54</td><td>6</td><td>POLARITY PROTECTION</td></tr> <tr><td>P/P</td><td>D54</td><td>6</td><td>POLARITY PROTECTION</td></tr> <tr><td>R11</td><td>D50</td><td>6</td><td>SHUNT</td></tr> <tr><td>R1</td><td>D79</td><td>9</td><td>AIR DRYER</td></tr> <tr><td>TB1</td><td>B257</td><td>29</td><td>WEBASTO CONTROL UNIT</td></tr> <tr><td>TB1</td><td>C128</td><td>15</td><td>CAB DASH RIGHT POWER</td></tr> <tr><td>TB2</td><td>F130</td><td>15</td><td>CAB - DASH - RIGHT - POWER DISTRIBUTION PNL</td></tr> <tr><td>TB2</td><td>D257</td><td>29</td><td>WEBASTO CONTROL UNIT</td></tr> <tr><td>X1</td><td>C137</td><td>16</td><td>24 VDC</td></tr> <tr><td>X11</td><td>F52</td><td>6</td><td>NATO SLAVE RECEPTACLE</td></tr> <tr><td>X2</td><td>D137</td><td>16</td><td>24 VDC</td></tr> <tr><td>X3</td><td>F37</td><td>16</td><td>GROUND</td></tr> <tr><td>X5</td><td>D137</td><td>16</td><td>24 VDC</td></tr> <tr><td>X7</td><td>D137</td><td>16</td><td>24 VDC</td></tr> <tr><td>PHONE 1</td><td>A285</td><td>32</td><td>VAN PHONE 1</td></tr> <tr><td>PHONE 2</td><td>H287</td><td>32</td><td>VAN PHONE 2</td></tr> <tr><td>E77</td><td>9</td><td></td><td>LIGHT MATERIAL HANDLING CRANE (LMHC)</td></tr> <tr><td>E77</td><td>9</td><td></td><td>LMHC REMOTE CONTROL BOX</td></tr> <tr><td>E77</td><td>9</td><td></td><td>LMHC POWER CABLE</td></tr> <tr><td>G78</td><td>9</td><td></td><td>LMHC REMOTE CONTROL IN/OUT</td></tr> <tr><td>G302</td><td>34</td><td></td><td>WTEC III TRANSMISSION PRESSURE SWITCH</td></tr> <tr><td>B304</td><td>34</td><td></td><td>WTEC III OUTPUT SPEED SENSOR</td></tr> <tr><td>C304</td><td>34</td><td></td><td>WTEC III ENGINE SPEED SENSOR</td></tr> <tr><td>E304</td><td>34</td><td></td><td>WTEC III SUMP TEMP SENSOR</td></tr> </table>				MISCELLANEOUS (CONTINUED)				NUMBER	ZONE	SH	DESCRIPTION	F310A	E262	30	ARTIC CAB HEATER	F210A	E263	30	ARTIC CAB HEATER	F10A	E263	30	ARTIC CAB HEATER	G1	D60	7	ALTERNATOR	MPU1	F61	7	ENGINE SPEED MAGNETIC PICKUP	MT3	F60	7	ENGINE OIL PRESSURE SENSOR	MT4	E177	20	SENSOR/FRONT AIR PRESSURE TRANSMITTER	MT5	G177	20	SENSOR/REAR AIR PRESSURE TRANSMITTER	MT6	B57	7	WATER COOLER TEMPERATURE	MT7	B52	6	FUEL TANK LEVEL SENSOR	MT11	A63	7	THROTTLE POSITION SENSOR	NS	E183	21	WTEC II VEHICLE INTERFACE MODULE	NS	F183	21	WTEC II VEHICLE INTERFACE MODULE	P/P	B54	6	POLARITY PROTECTION	P/P	D54	6	POLARITY PROTECTION	R11	D50	6	SHUNT	R1	D79	9	AIR DRYER	TB1	B257	29	WEBASTO CONTROL UNIT	TB1	C128	15	CAB DASH RIGHT POWER	TB2	F130	15	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	TB2	D257	29	WEBASTO CONTROL UNIT	X1	C137	16	24 VDC	X11	F52	6	NATO SLAVE RECEPTACLE	X2	D137	16	24 VDC	X3	F37	16	GROUND	X5	D137	16	24 VDC	X7	D137	16	24 VDC	PHONE 1	A285	32	VAN PHONE 1	PHONE 2	H287	32	VAN PHONE 2	E77	9		LIGHT MATERIAL HANDLING CRANE (LMHC)	E77	9		LMHC REMOTE CONTROL BOX	E77	9		LMHC POWER CABLE	G78	9		LMHC REMOTE CONTROL IN/OUT	G302	34		WTEC III TRANSMISSION PRESSURE SWITCH	B304	34		WTEC III OUTPUT SPEED SENSOR	C304	34		WTEC III ENGINE SPEED SENSOR	E304	34		WTEC III SUMP TEMP SENSOR
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<tr><td>K5</td><td>D261</td><td>29</td><td>FLAME CONTROL RELAY</td></tr> <tr><td>K5</td><td>E267</td><td>30</td><td>FLAME CONTROL RELAY</td></tr> <tr><td>K6</td><td>F144</td><td>16</td><td>STOPLIGHT RELAY</td></tr> <tr><td>K7</td><td>G153</td><td>17</td><td>HEADLIGHT RELAY</td></tr> <tr><td>K8</td><td>G151</td><td>17</td><td>HEADLIGHT LO/HI-BEAM RELAY</td></tr> <tr><td>K9</td><td>A142</td><td>16</td><td>HAZARD FLASHER BO OVERRIDE</td></tr> <tr><td>K10</td><td>F150</td><td>17</td><td>STOP HAZARD FLASHER RELAY</td></tr> <tr><td>K11</td><td>F146</td><td>17</td><td>ALTERNATOR EXCITATION RELAY</td></tr> <tr><td>K12</td><td>B139</td><td>16</td><td>WORKLIGHT RELAY</td></tr> <tr><td>K13</td><td>B149</td><td>17</td><td>ROTATING BEACON BO OVRD RELAY</td></tr> <tr><td>K15</td><td>B140</td><td>16</td><td>AUXILIARY COOLER RELAY</td></tr> <tr><td>K19</td><td>B150</td><td>17</td><td>START INHIBIT RELAY</td></tr> <tr><td>K20</td><td>H138</td><td>16</td><td>MARKER LIGHTS RELAY</td></tr> <tr><td>K24</td><td>B151</td><td>17</td><td>CRANKING LOCKOUT RELAY</td></tr> <tr><td>K25</td><td>B292</td><td>33</td><td>WTEC III REVERSE WARNING RELAY</td></tr> <tr><td>K26</td><td>B290</td><td>33</td><td>WTEC III NEUTRAL START RELAY</td></tr> <tr><td>K27</td><td>H143</td><td>16</td><td>BO STOP RELAY</td></tr> <tr><td>K28</td><td>H142</td><td>16</td><td>TRAILER REAR LIGHTS RELAY</td></tr> <tr><td>K29</td><td>F142</td><td>16</td><td>BO MARKER RELAY</td></tr> <tr><td>K29</td><td>B295</td><td>33</td><td>WTEC III BLACKOUT DRIVE RELAY</td></tr> <tr><td>K30</td><td>H147</td><td>17</td><td>REAR LEFT COMPOSITE LAMP RELAY</td></tr> <tr><td>K31</td><td>H149</td><td>17</td><td>REAR RIGHT COMPOSITE LAMP RELAY</td></tr> <tr><td>K32</td><td>B147</td><td>17</td><td>HORN RELAY</td></tr> <tr><td>K35</td><td>E277</td><td>31</td><td>VAN 110 VAC OUTLETS</td></tr> <tr><td>K36</td><td>F277</td><td>31</td><td>VAN FLOURESCENT LIGHTS</td></tr> <tr><td>K37</td><td>B294</td><td>33</td><td>WTEC III PTO ENABLE OUTPUT RELAY</td></tr> <tr><td>K52</td><td>H139</td><td>16</td><td>CTIS OVERSPEED INDICATION RELAY</td></tr> <tr><td>K53</td><td>H140</td><td>16</td><td>RADIO POWER RELAY</td></tr> </table>				RELAYS				NUMBER	ZONE	SH	DESCRIPTION	K1	F256	30	GROUND RELAY	K1	F149	17	STARTER RELAY	K1	E259	29	GROUND RELAY	K1	B291	33	WTEC III STARTER RELAY	K2	D259	29	HEATER MOTOR RELAY	K2	E266	30	HEATER MOTOR RELAY	K2	B143	16	CONTROL PANEL RELAY	K3	D260	29	CONTROL THERMOSTAT RELAY	K3	E266	30	CONTROL THERMOSTAT RELAY	K4	D260	29	IGNITION RELAY	K4	E266	30	IGNITION RELAY	K5	D261	29	FLAME CONTROL RELAY	K5	E267	30	FLAME CONTROL RELAY	K6	F144	16	STOPLIGHT RELAY	K7	G153	17	HEADLIGHT RELAY	K8	G151	17	HEADLIGHT LO/HI-BEAM RELAY	K9	A142	16	HAZARD FLASHER BO OVERRIDE	K10	F150	17	STOP HAZARD FLASHER RELAY	K11	F146	17	ALTERNATOR EXCITATION RELAY	K12	B139	16	WORKLIGHT RELAY	K13	B149	17	ROTATING BEACON BO OVRD RELAY	K15	B140	16	AUXILIARY COOLER RELAY	K19	B150	17	START INHIBIT RELAY	K20	H138	16	MARKER LIGHTS RELAY	K24	B151	17	CRANKING LOCKOUT RELAY	K25	B292	33	WTEC III REVERSE WARNING RELAY	K26	B290	33	WTEC III NEUTRAL START RELAY	K27	H143	16	BO STOP RELAY	K28	H142	16	TRAILER REAR LIGHTS RELAY	K29	F142	16	BO MARKER RELAY	K29	B295	33	WTEC III BLACKOUT DRIVE RELAY	K30	H147	17	REAR LEFT COMPOSITE LAMP RELAY	K31	H149	17	REAR RIGHT COMPOSITE LAMP RELAY	K32	B147	17	HORN RELAY	K35	E277	31	VAN 110 VAC OUTLETS	K36	F277	31	VAN FLOURESCENT LIGHTS	K37	B294	33	WTEC III PTO ENABLE OUTPUT RELAY	K52	H139	16	CTIS OVERSPEED INDICATION RELAY	K53	H140	16	RADIO POWER RELAY	<table border="1"> <thead> <tr> <th colspan="4">HORNS AND ALARMS</th> </tr> <tr> <th>NUMBER</th> <th>ZONE</th> <th>SH</th> <th>DESCRIPTION</th> </tr> </thead> <tr><td>LS1</td><td>A37</td><td>5</td><td>VEHICLE HORN</td></tr> <tr><td>LS2</td><td>H101</td><td>12</td><td>AUDIBLE ALARM</td></tr> </table>				HORNS AND ALARMS				NUMBER	ZONE	SH	DESCRIPTION	LS1	A37	5	VEHICLE HORN	LS2	H101	12	AUDIBLE ALARM	<table border="1"> <thead> <tr> <th 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29513233)</td></tr> <tr><td>B10</td><td>E70</td><td>8</td><td>WTEC II TRANSFER CASE (SERIAL # 29513233)</td></tr> <tr><td>B10</td><td>E66</td><td>8</td><td>WTEC II TRANSMISSION (SERIAL # 29513233)</td></tr> <tr><td>B10</td><td>E71</td><td>8</td><td>WTEC II TRANSFER CASE (SERIAL # 29517497)</td></tr> <tr><td>B10</td><td>E70</td><td>8</td><td>WTEC II TRANSMISSION (SERIAL # 29517497)</td></tr> <tr><td>B10</td><td>E76</td><td>9</td><td>WTEC II TRANSFER CASE (SERIAL # 29513233)</td></tr> <tr><td>B10</td><td>E74</td><td>9</td><td>WTEC II TRANSMISSION (SERIAL # 29513233)</td></tr> <tr><td>B1</td><td>A175</td><td>20</td><td>JUNCTION BOX</td></tr> <tr><td>BL1</td><td>F257</td><td>29</td><td>FURNACE CONTROL UNIT</td></tr> <tr><td>BL2</td><td>F256</td><td>29</td><td>FURNACE CONTROL UNIT</td></tr> <tr><td>BL3</td><td>F256</td><td>29</td><td>FURNACE CONTROL UNIT</td></tr> <tr><td>D1A</td><td>C138</td><td>16</td><td>CAB - DASH - RIGHT - POWER DISTRIBUTION PNL</td></tr> <tr><td>D1B</td><td>C138</td><td>16</td><td>CAB - DASH - RIGHT - POWER DISTRIBUTION PNL</td></tr> <tr><td>D2A</td><td>D138</td><td>16</td><td>CAB - DASH - RIGHT - POWER DISTRIBUTION PNL</td></tr> </table>				MISCELLANEOUS				NUMBER	ZONE	SH	DESCRIPTION	10A	C183	21	WTEC II VEHICLE INTERFACE MODULE	10A	E183	21	WTEC II VEHICLE INTERFACE MODULE	A2	F118	14	CTIS ELECTRONIC CONTROL UNIT	A3	G114	13	INSTRUMENT PANEL LIGHTS DIMMER MODULE	A5	A135	15	WIPER DELAY MODULE	A7	B179	20	FREQUENCY DIVIDER	A18	A103	12	LIGHTED INDICATOR DISPLAY	A20	H59	7	FUEL/WATER SEPARATOR	B1	C63	7	STARTER/STARTER SOLENOID	B3	G83	10	WINDSHIELD WASHER ROTARY PUMP	B10	E67	8	WTEC II TRANSFER CASE (SERIAL # 29513233)	B10	E70	8	WTEC II TRANSFER CASE (SERIAL # 29513233)	B10	E66	8	WTEC II TRANSMISSION (SERIAL # 29513233)	B10	E71	8	WTEC II TRANSFER CASE (SERIAL # 29517497)	B10	E70	8	WTEC II TRANSMISSION (SERIAL # 29517497)	B10	E76	9	WTEC II TRANSFER CASE (SERIAL # 29513233)	B10	E74	9	WTEC II TRANSMISSION (SERIAL # 29513233)	B1	A175	20	JUNCTION BOX	BL1	F257	29	FURNACE CONTROL UNIT	BL2	F256	29	FURNACE CONTROL UNIT	BL3	F256	29	FURNACE CONTROL UNIT	D1A	C138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	D1B	C138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	D2A	D138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	<table border="1"> <thead> <tr> <th colspan="4">TRANSMISSION</th> </tr> <tr> <th>NUMBER</th> <th>ZONE</th> <th>SH</th> <th>DESCRIPTION</th> </tr> </thead> <tr><td>A10</td><td>B183</td><td>21</td><td>WTEC II VEHICLE INTERFACE MODULE</td></tr> <tr><td>A13</td><td>B67</td><td>8</td><td>WTEC II TRANSMISSION A13 (SERIAL # 29513233)</td></tr> <tr><td>A13</td><td>A72</td><td>8</td><td>WTEC II TRANSMISSION A13 (SERIAL # 29517497)</td></tr> <tr><td>A13</td><td>A76</td><td>9</td><td>WTEC II TRANSMISSION A13 (SERIAL # 29513233)</td></tr> <tr><td>MT9</td><td>F67</td><td>8</td><td>WTEC II ENGINE SPEED SENSOR (SERIAL # 29513233)</td></tr> <tr><td>MT9</td><td>F72</td><td>8</td><td>WTEC II ENGINE SPEED 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A13	A76	9	WTEC II TRANSMISSION A13 (SERIAL # 29513233)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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MT11	A62	7	THROTTLE POSITION SENSOR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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S5/11	A91	11	ENGINE FAN OFF SWITCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S5/14	C23	24	WINCH ON OFF																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S5/15	B212	24	WINCH IN-OUT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S5/16	F91	11	ETHER STARTER SWITCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S5/2	D91	11	LAMP TEST SWITCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S5/2	D111	13	ROTATING WARNING LIGHT SWITCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S5/22	G11	13	FULL HAZARD WARNING SWITCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S5/25	A219	25	SWINGFIRE PUMP SWITCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S5/6	B210	24	PTO ON/OFF SWITCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S5/8	A213	24	BLACKOUT OVERRIDE SWITCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S5/9	A214	24	FUEL PRE-HEAT SWITCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S6	A114	13	STARTER PUSHBUTTON																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
S7	F137	16	START INHIBIT PUSHBUTTON																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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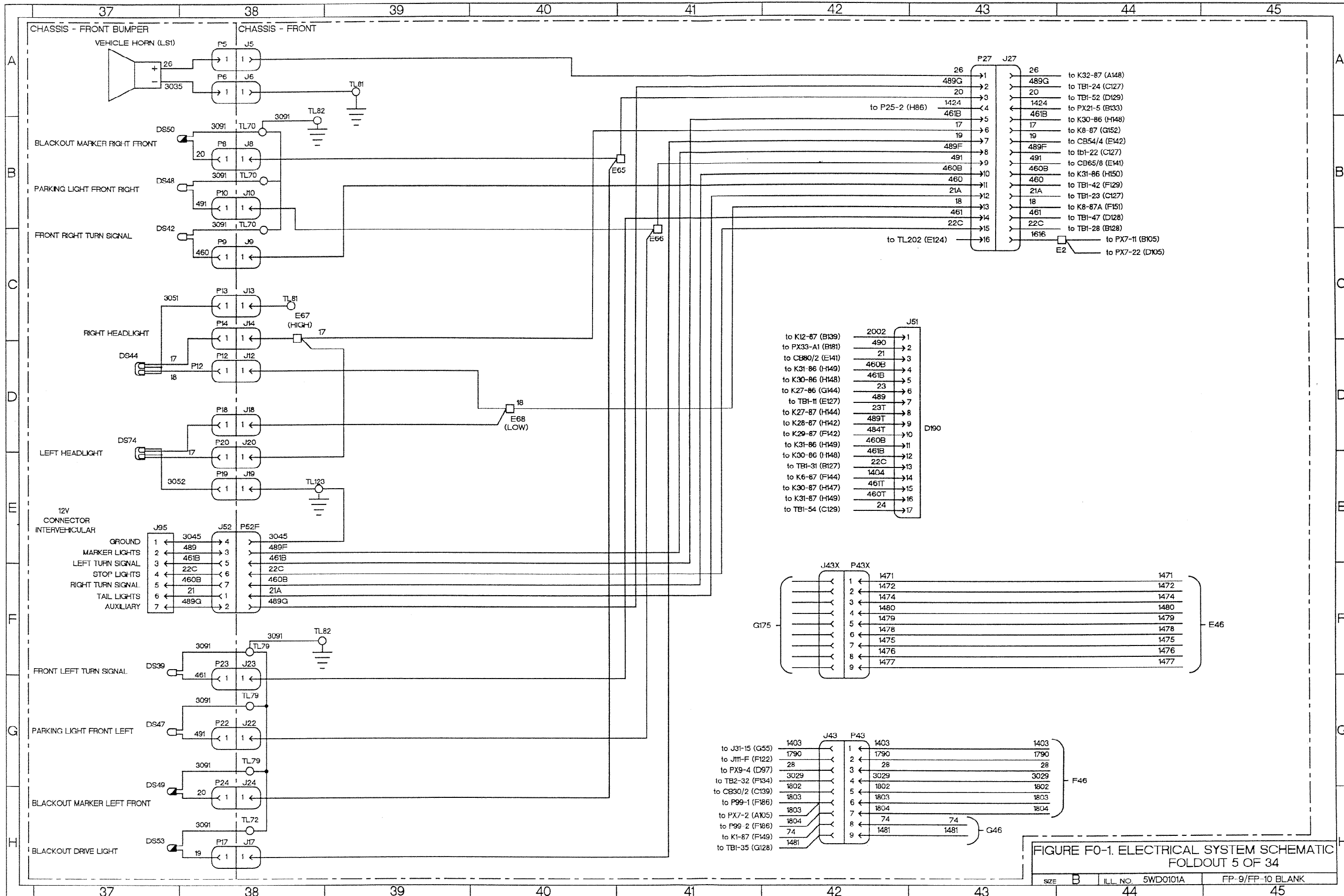


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 5 OF 34

SIZE	B	ILL. NO.	5WD0101A	FP-9/FP-10	BLANK
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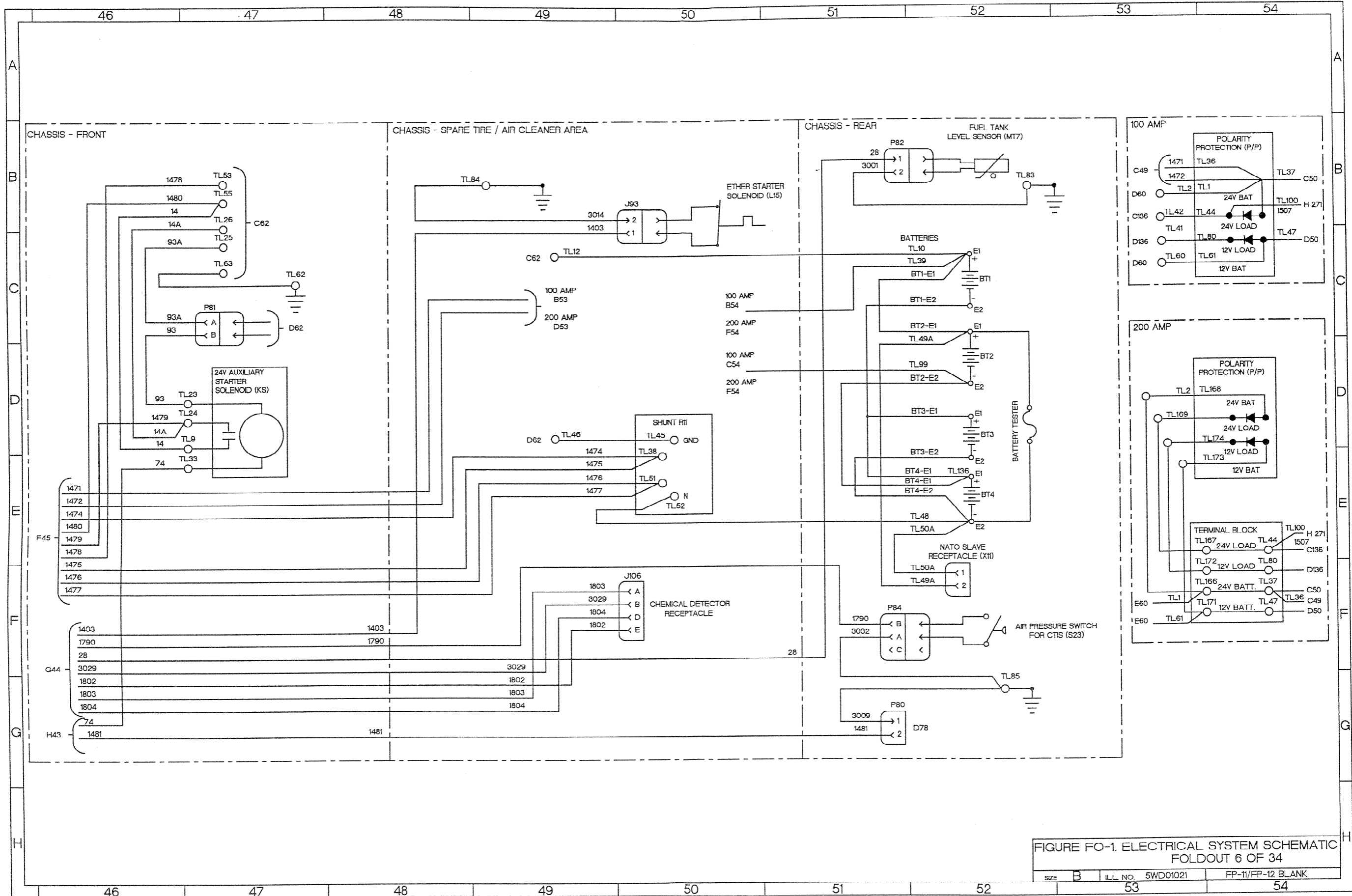


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 6 OF 34  
 SIZE B ILL NO. 5WD01021 FP-11/FP-12 BLANK

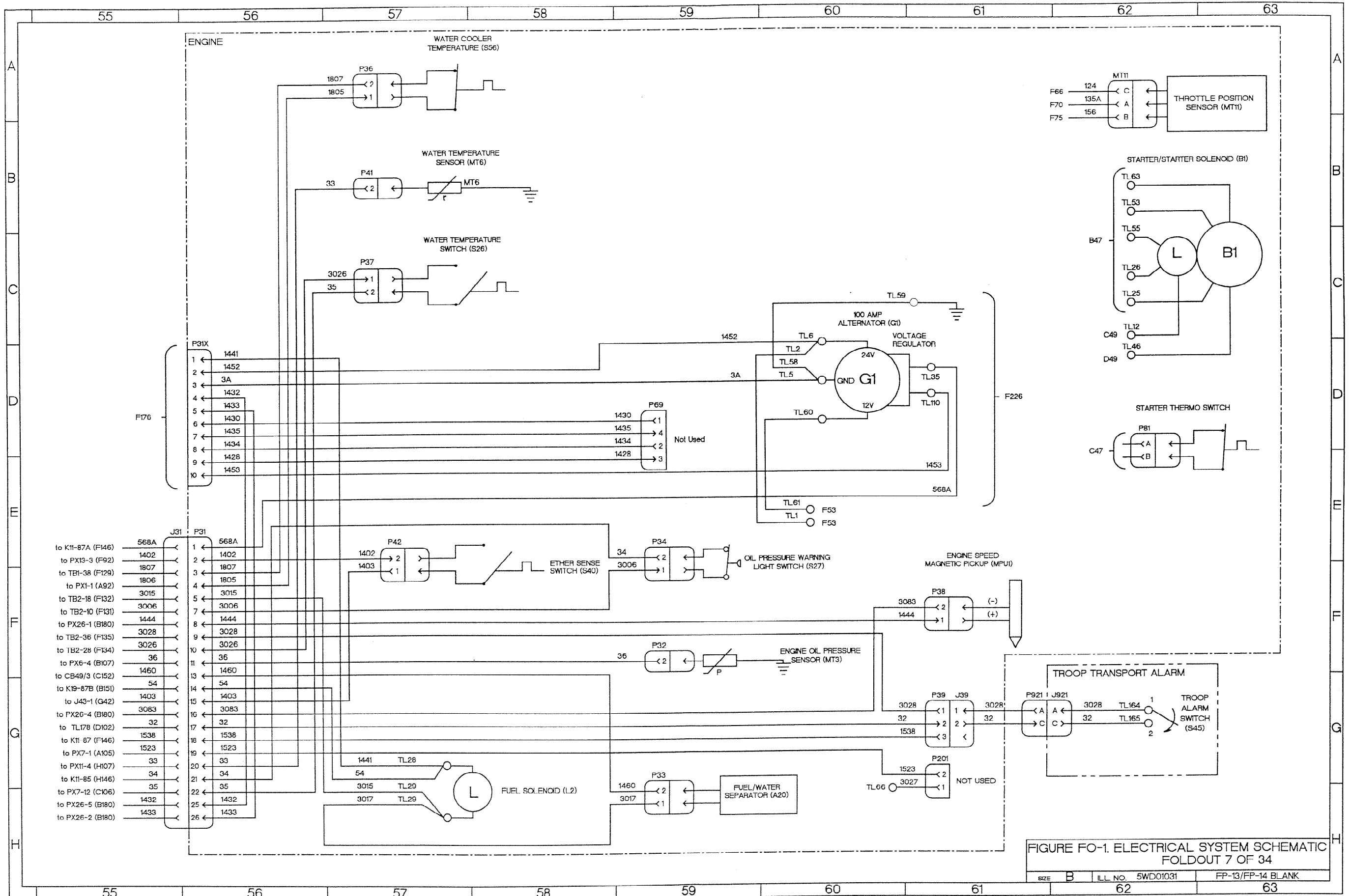


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 7 OF 34

SIZE	B	ILL. NO.	5WD01031	FP-13/FP-14	BLANK
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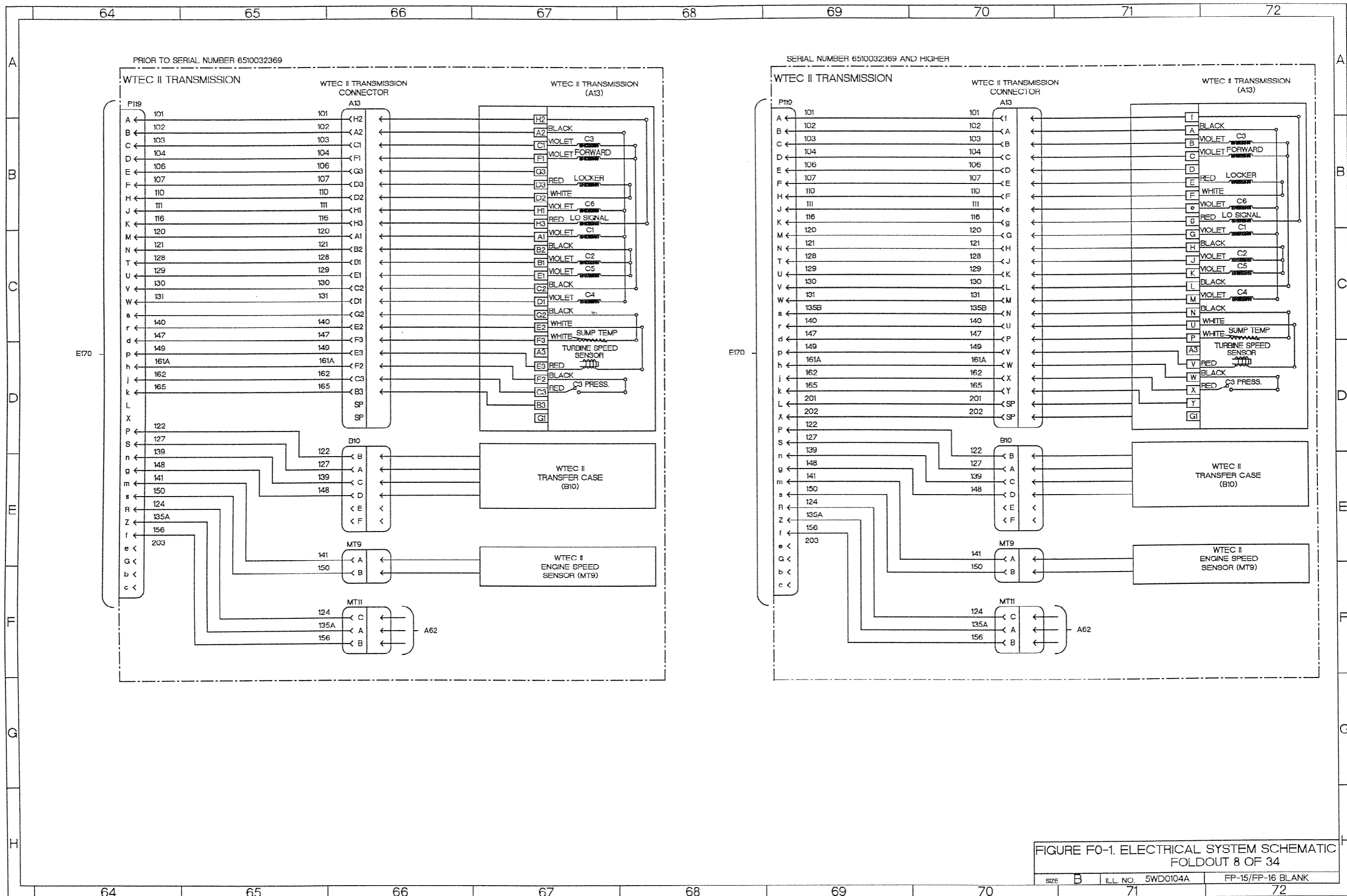


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 8 OF 34  
 SIZE B ILL. NO. 5WD0104A FP-15/FP-16 BLANK

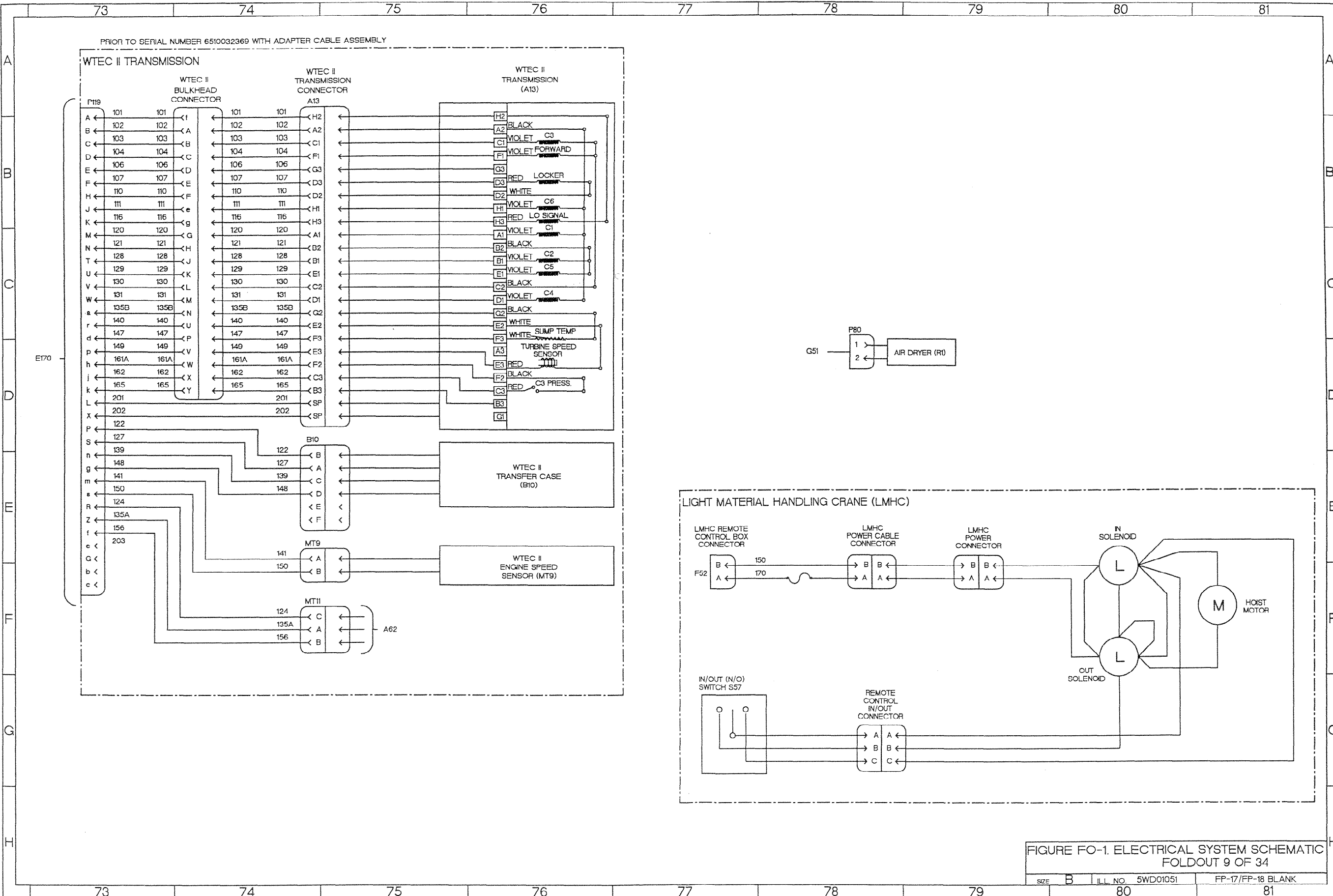


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 9 OF 34

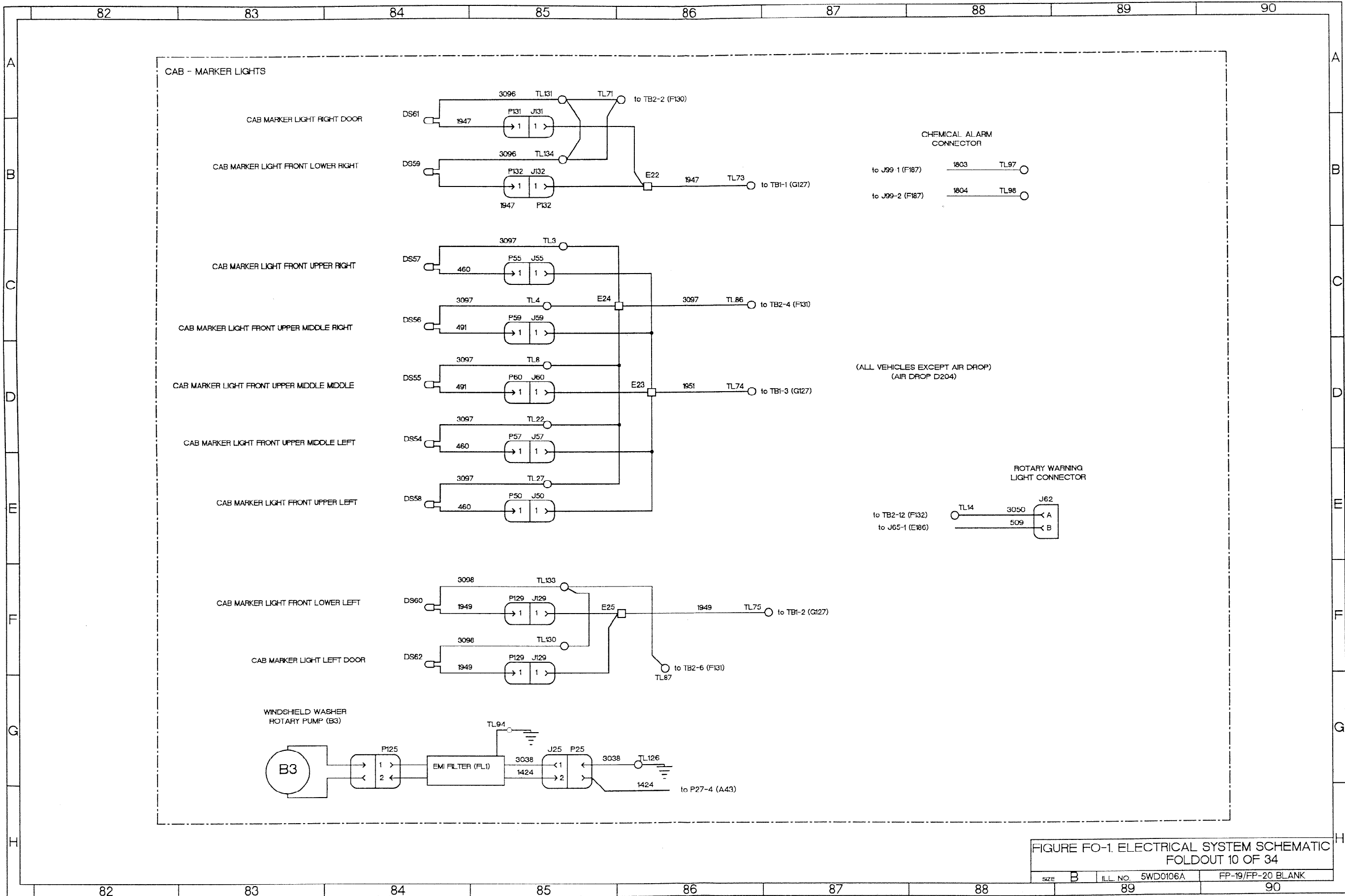


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 10 OF 34

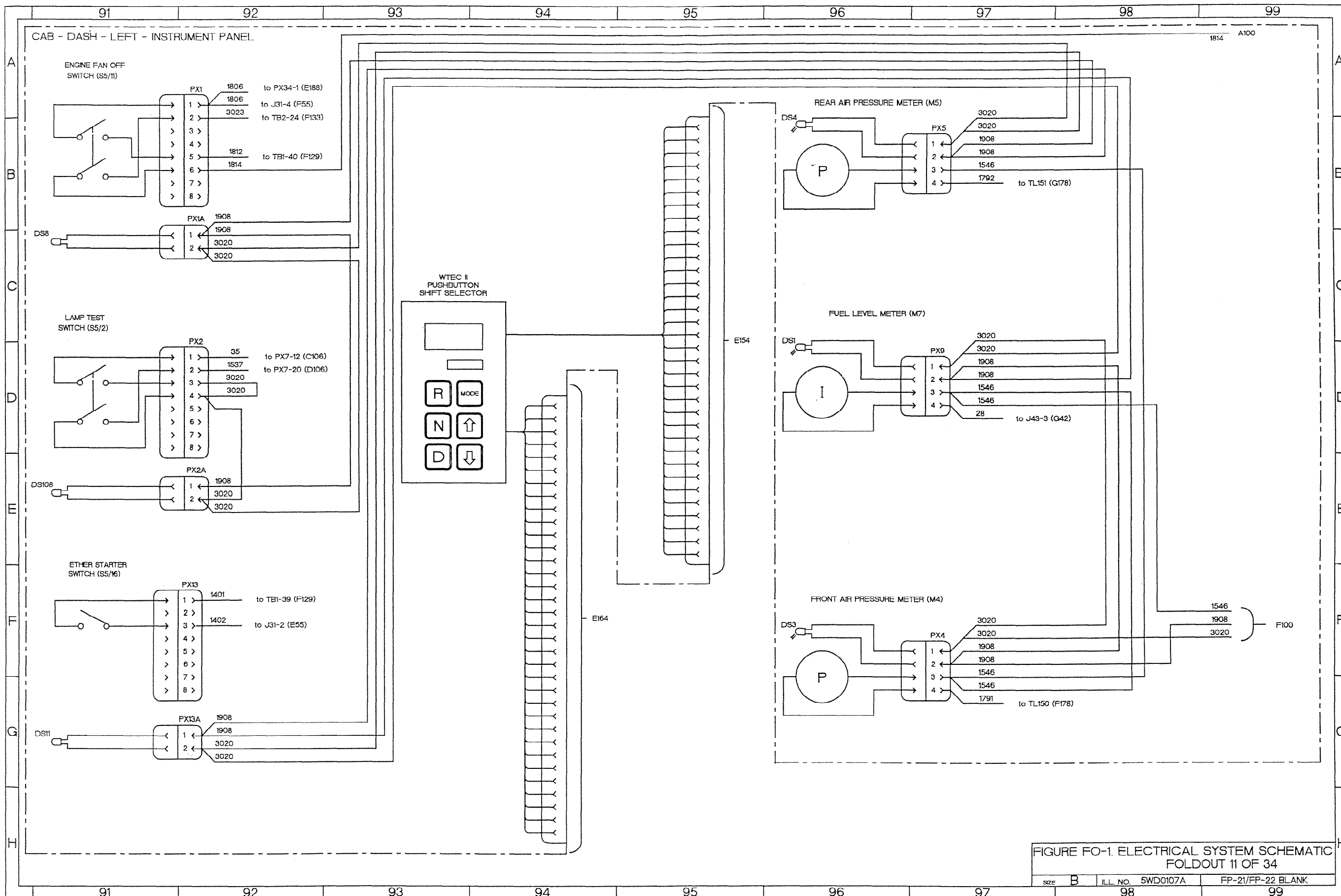


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 11 OF 34

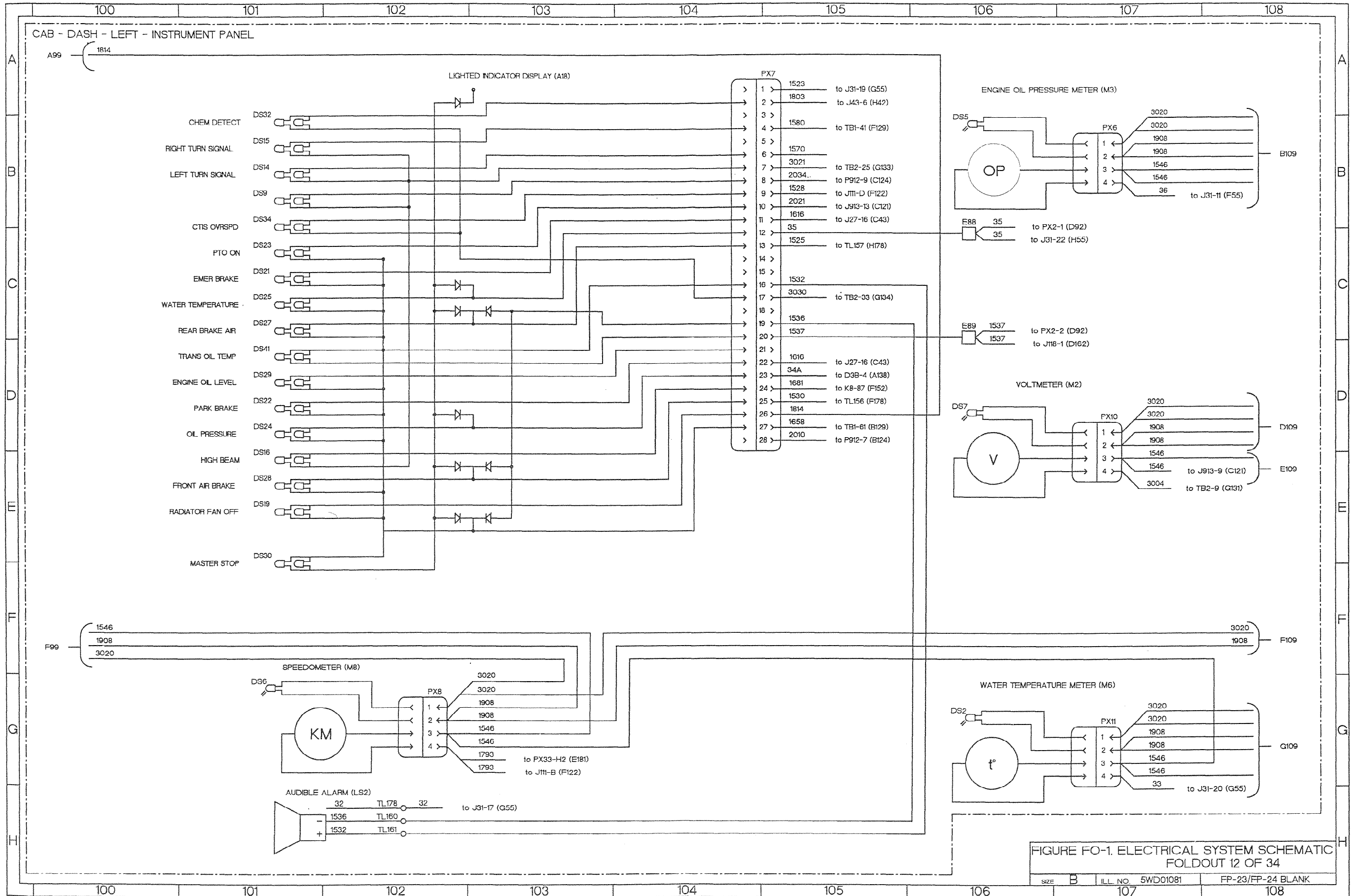


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 12 OF 34

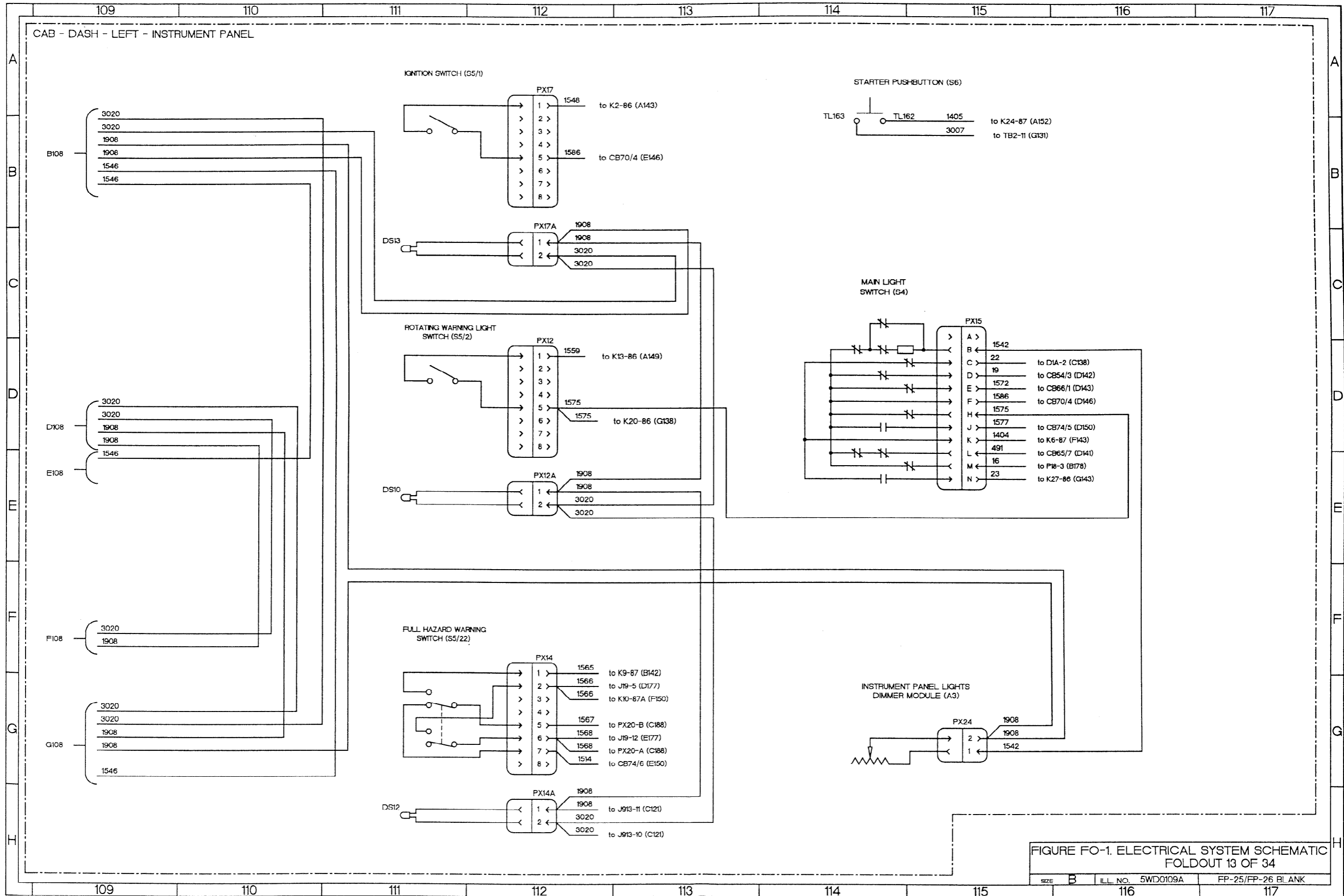


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 13 OF 34

SIZE B ILL. NO. 5WD0109A FP-25/FP-26 BLANK

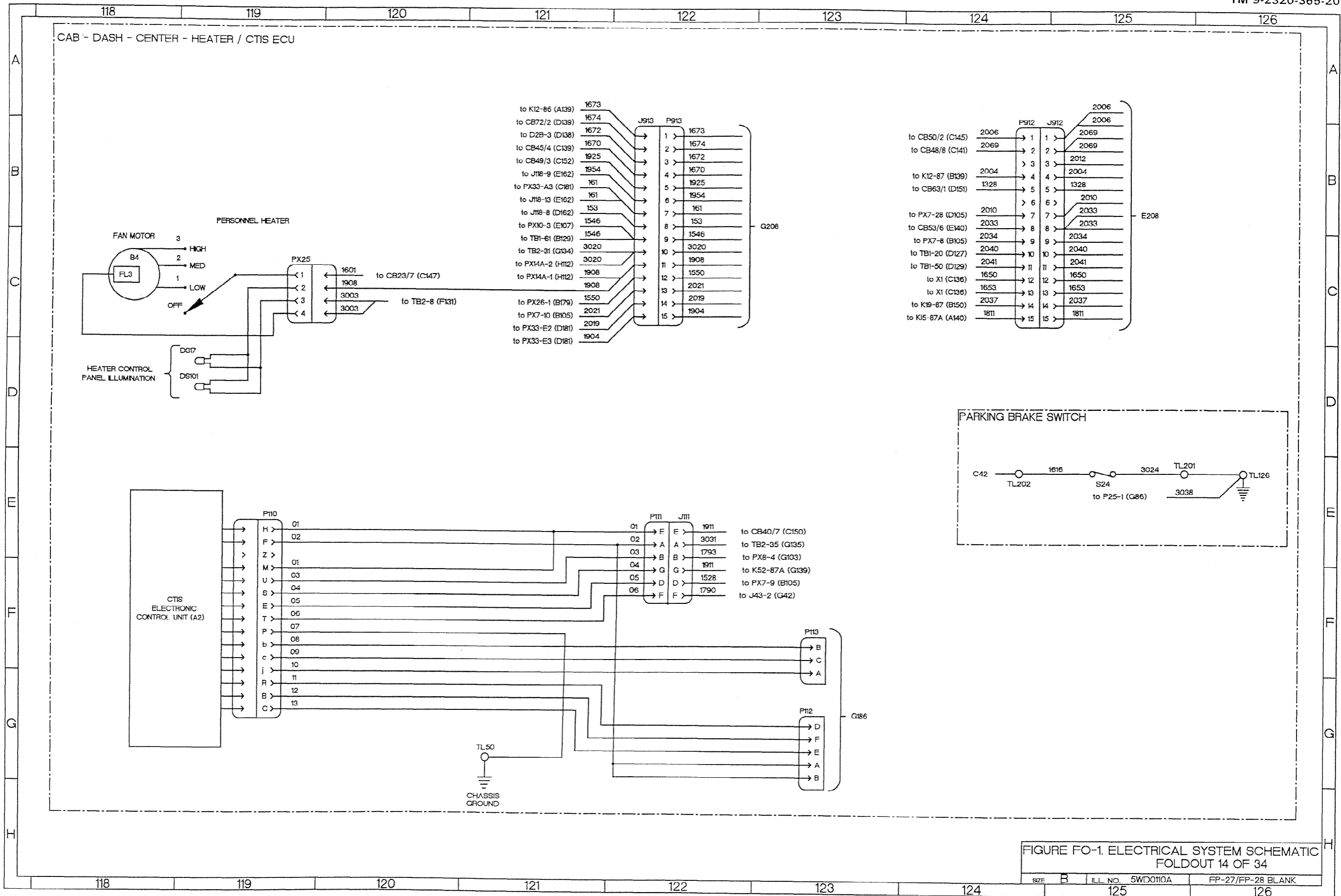


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 14 OF 34

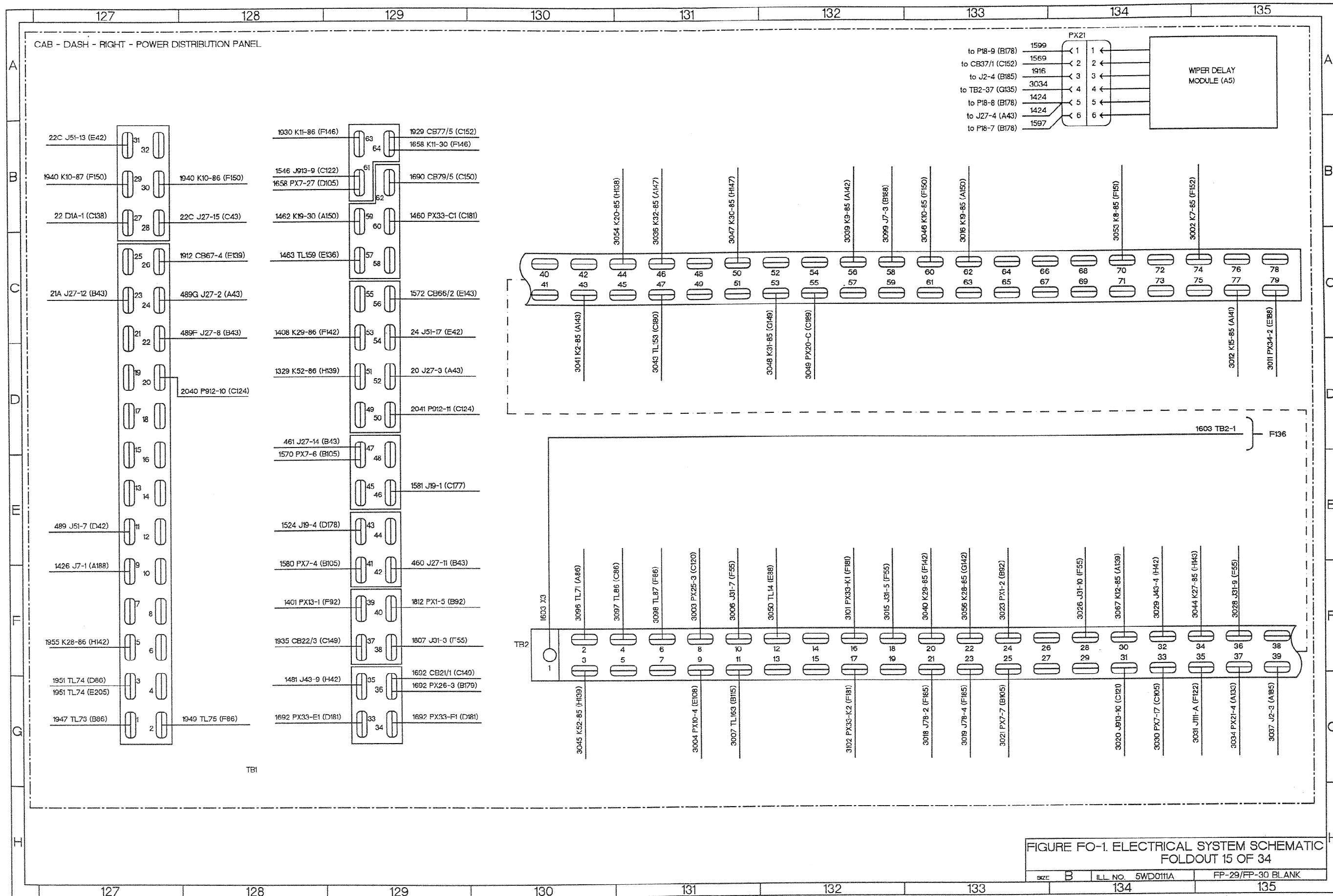


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 15 OF 34

SIZE	B	ILL. NO.	5WD0111A	FP-29/FP-30 BLANK
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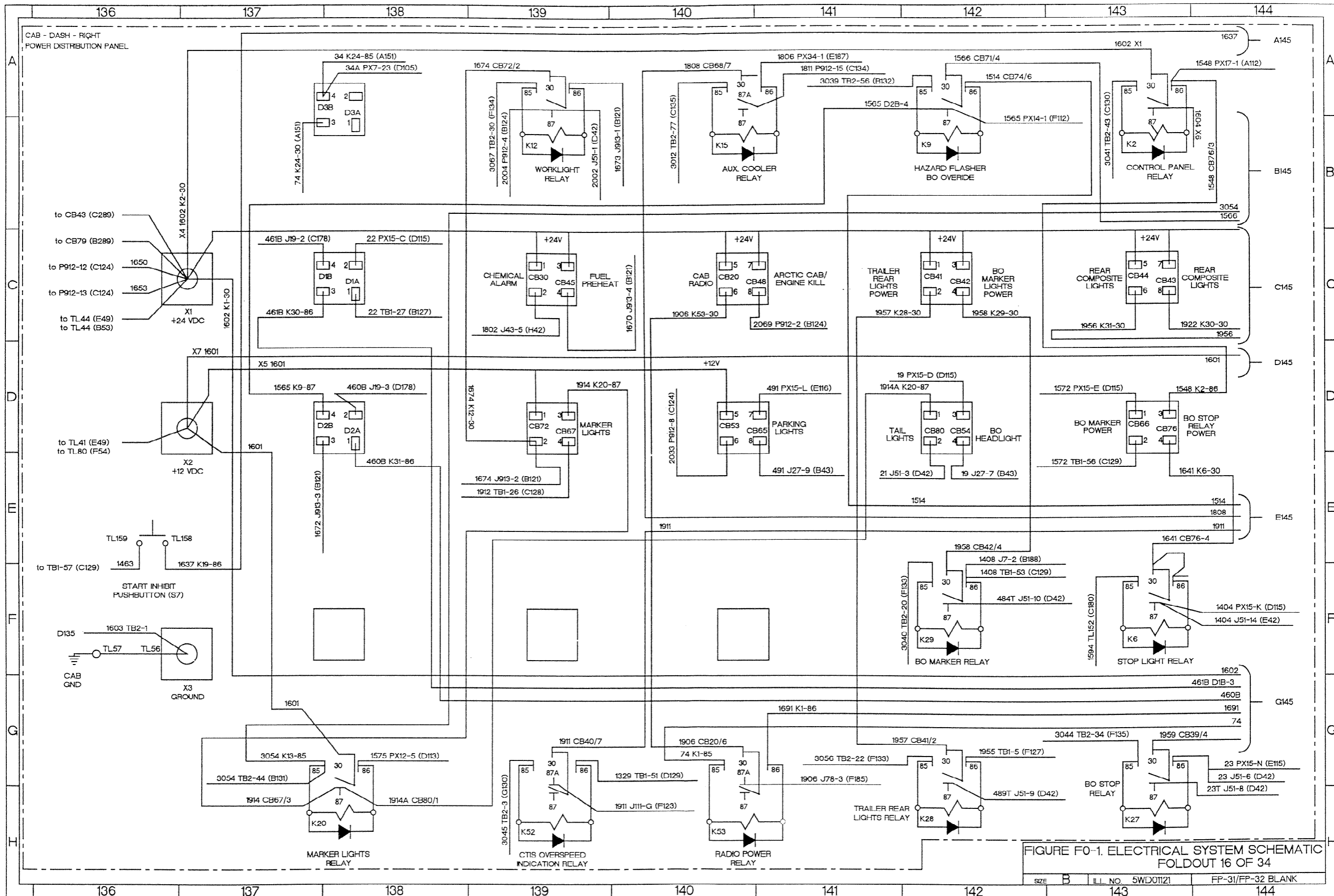
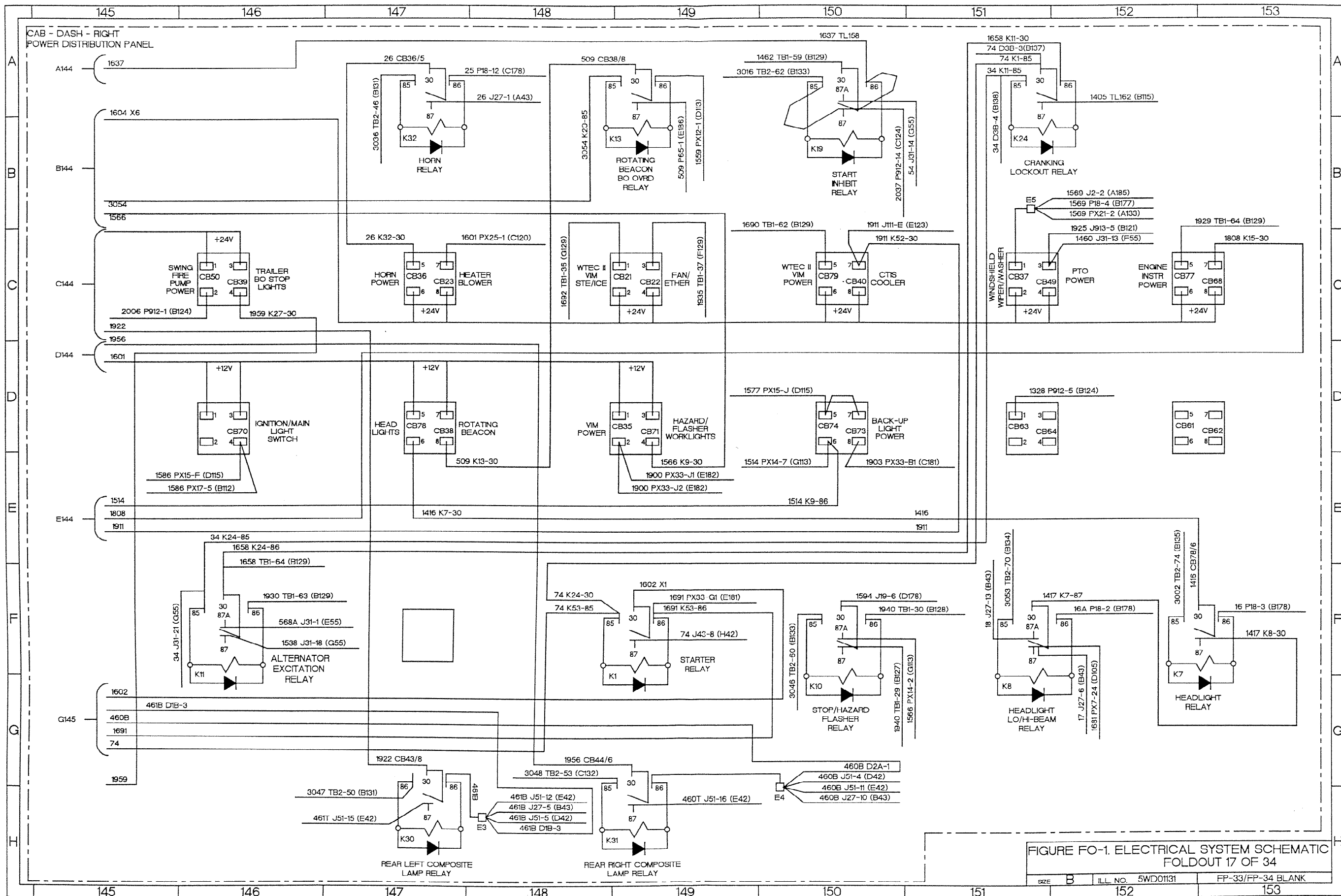


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 16 OF 34



**FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC  
FOLDOUT 17 OF 34**

SIZE	B	ILL. NO.	5WD01131	FP-33/FP-34 BLANK
			152	153

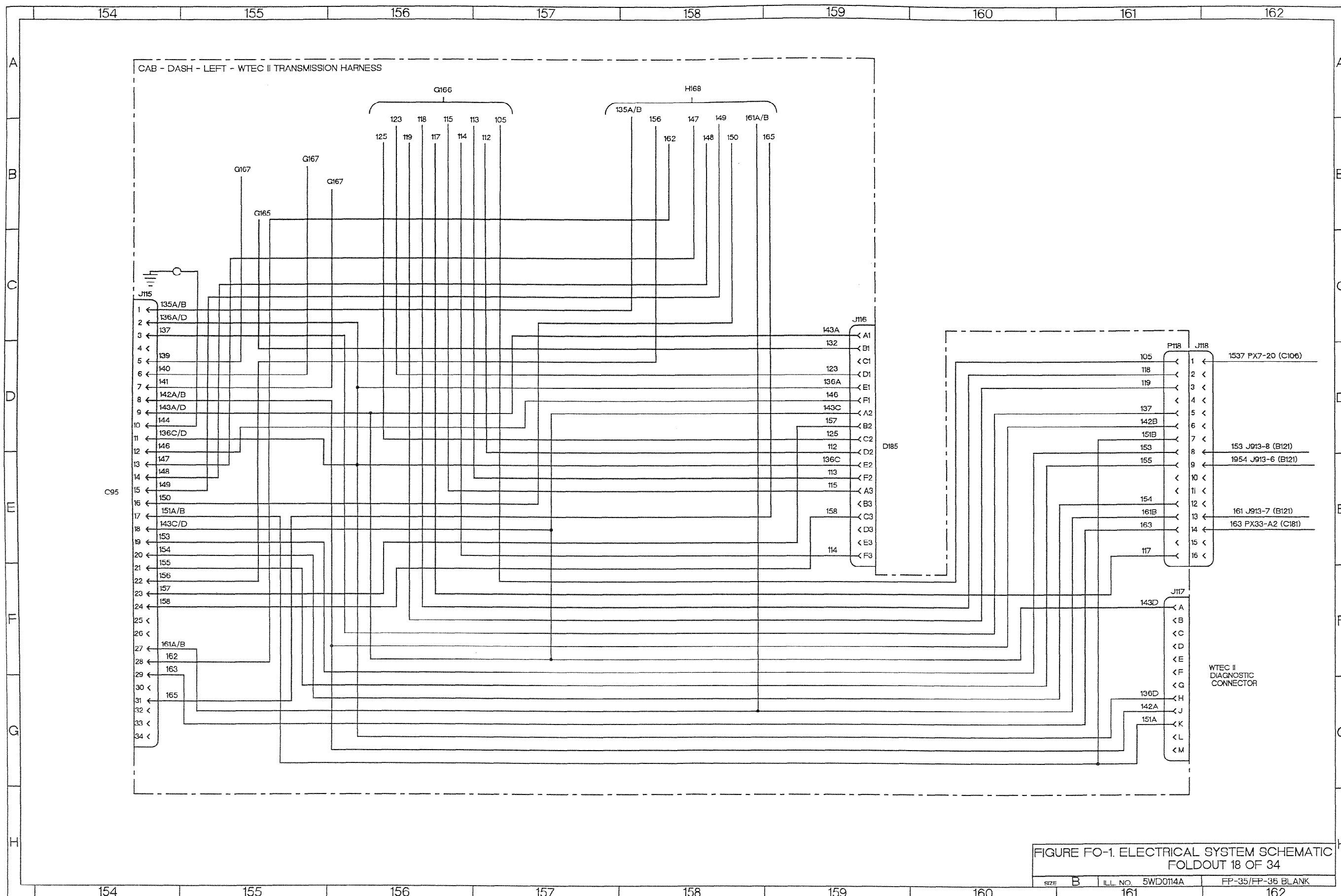


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC  
FOLDOUT 18 OF 34

SIZE	B	ILL. NO.	5WDO114A	FP-35/FP-36	BLANK
			161		162

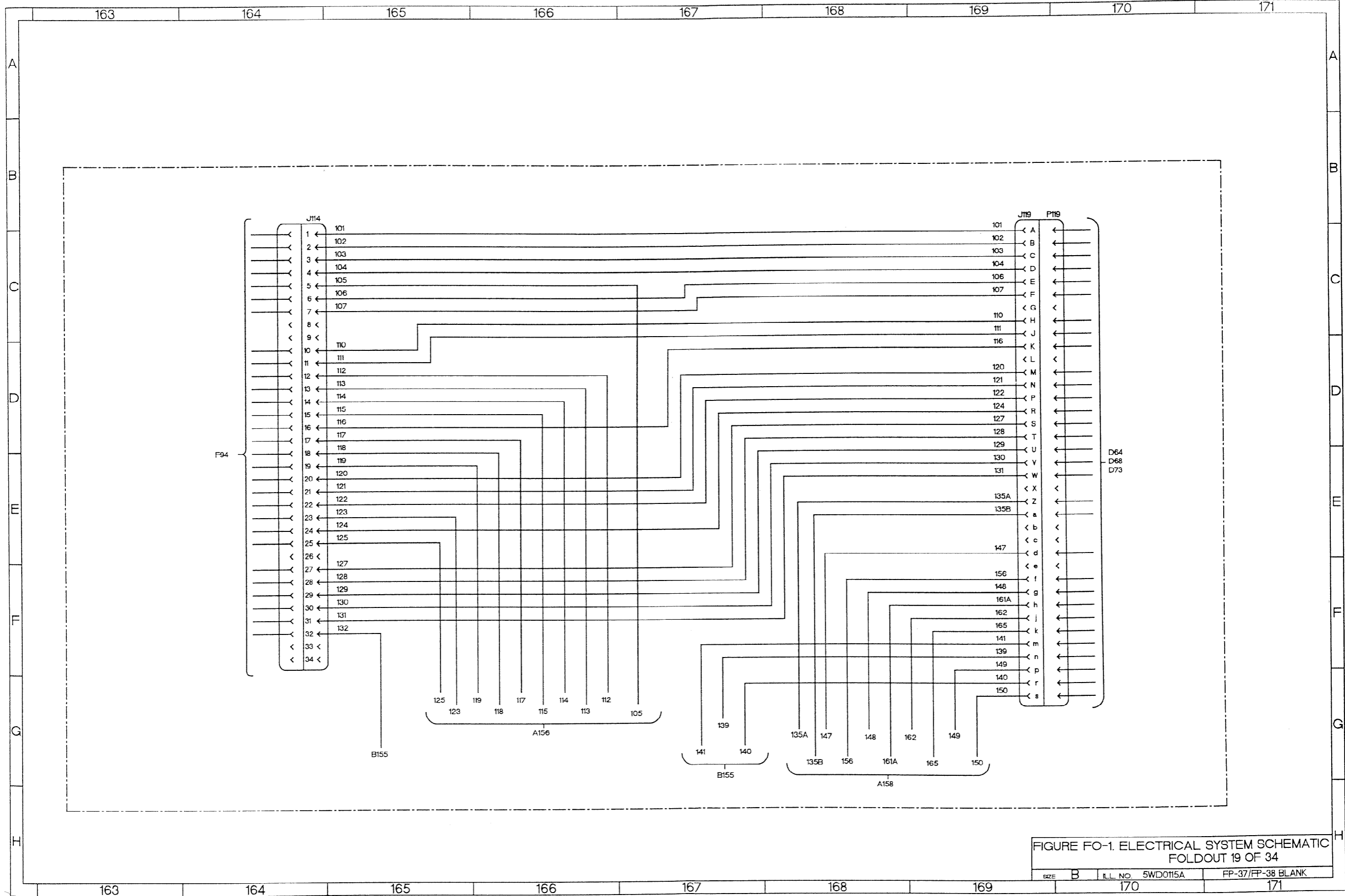


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC  
 FOLDOUT 19 OF 34

SIZE	B	ILL. NO.	5WD0115A	FP-37/FP-38	BLANK
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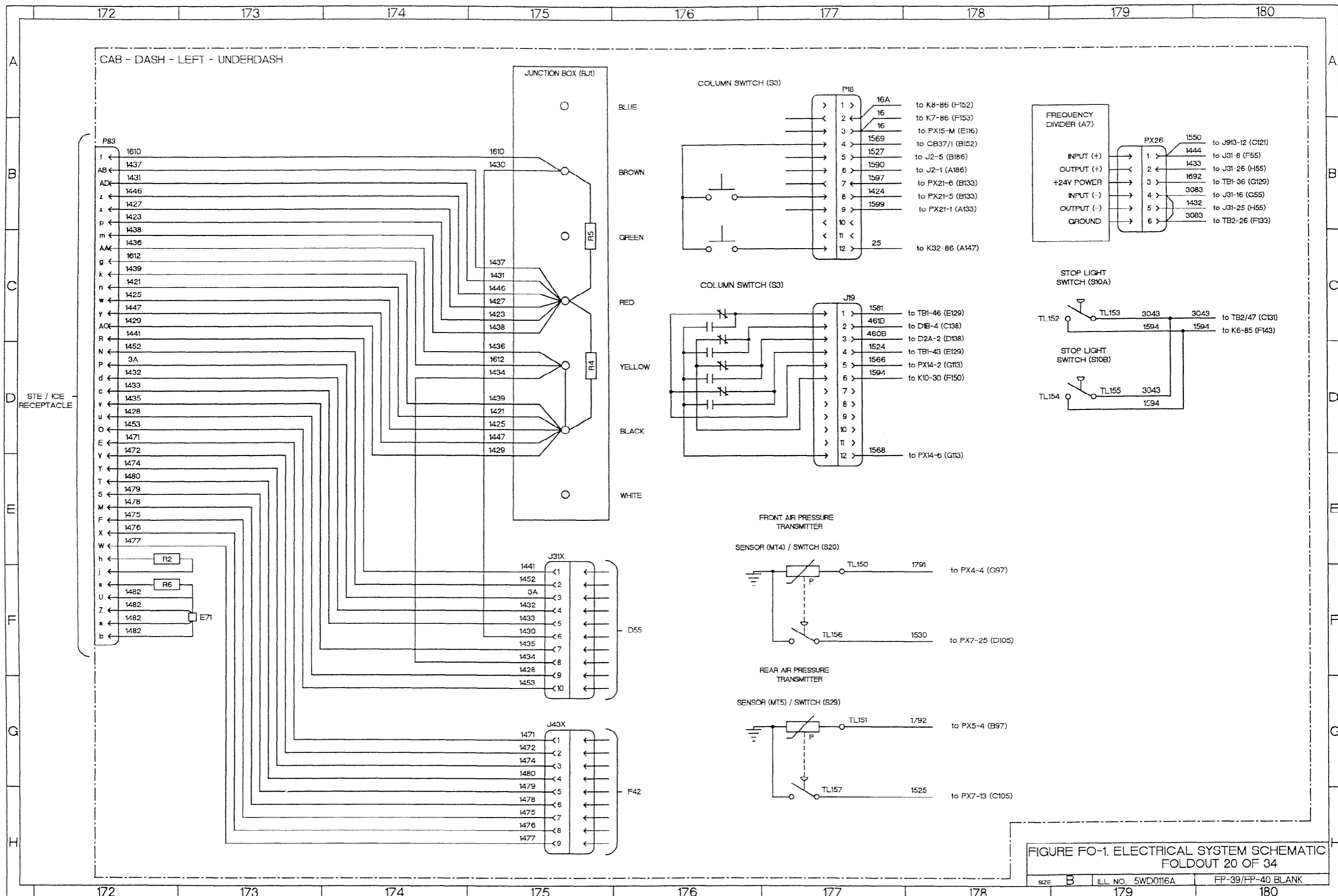


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 20 OF 34

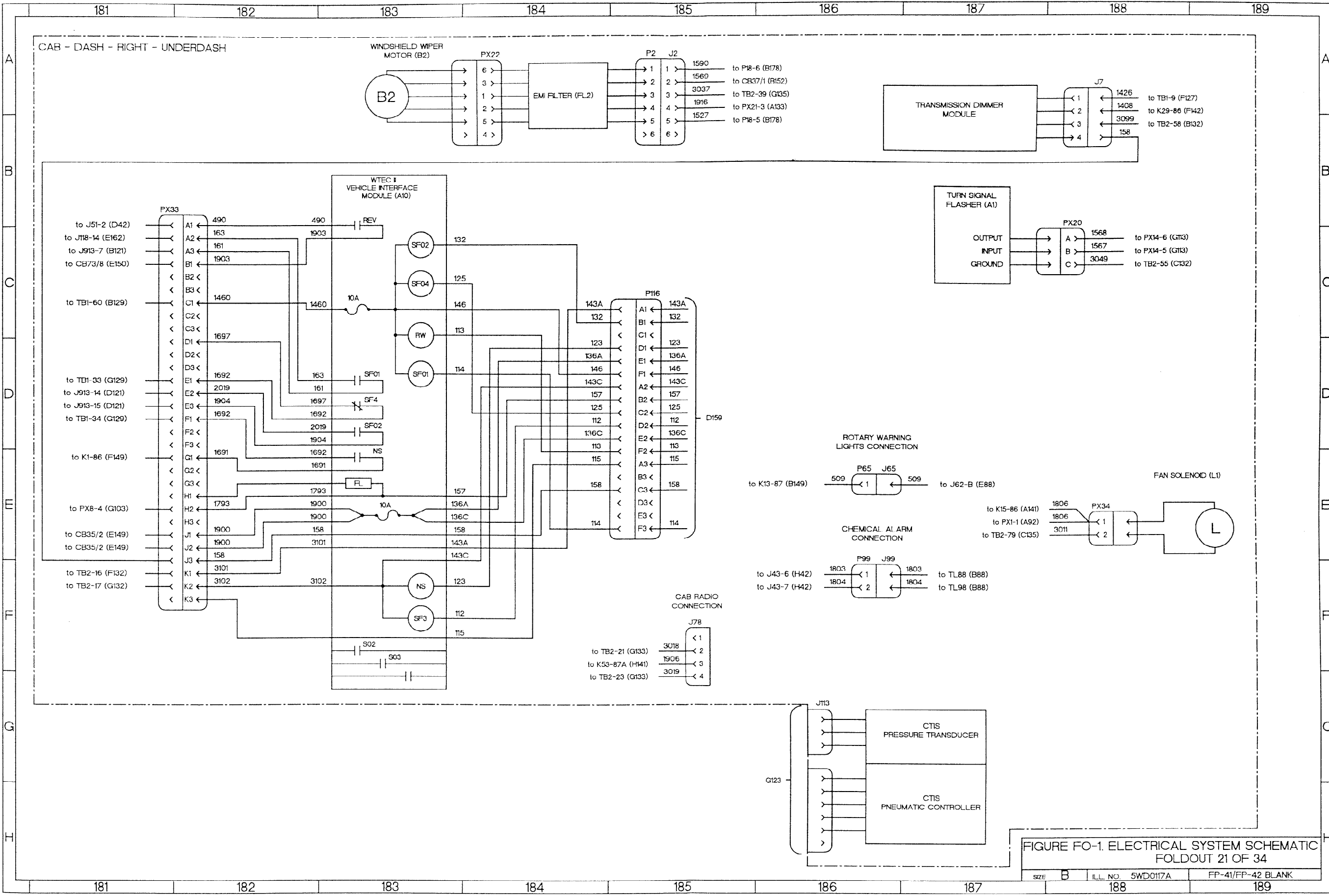


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 21 OF 34

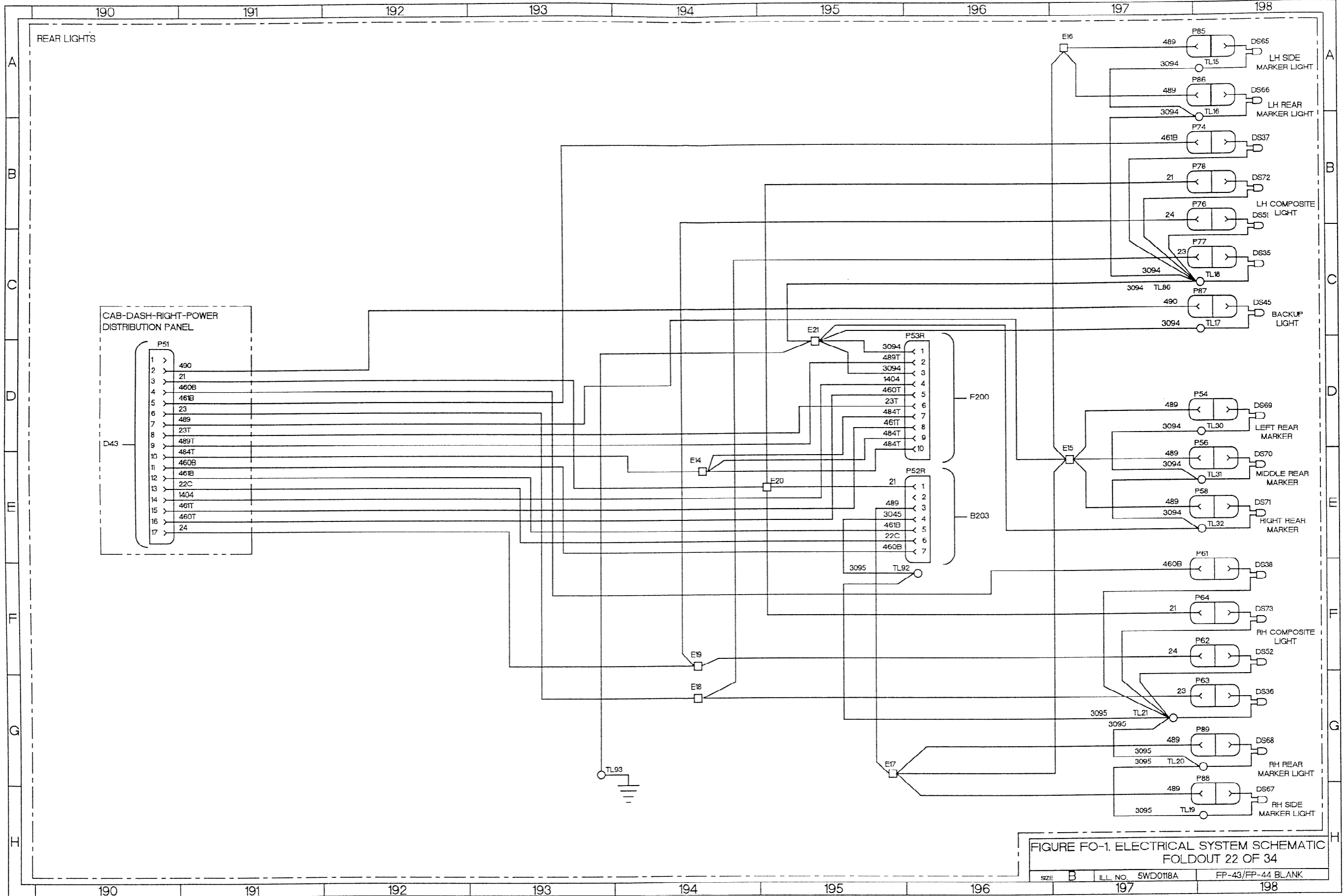


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 22 OF 34

SIZE	B	ILL. NO.	5WD0118A	FP-43/FP-44	BLANK
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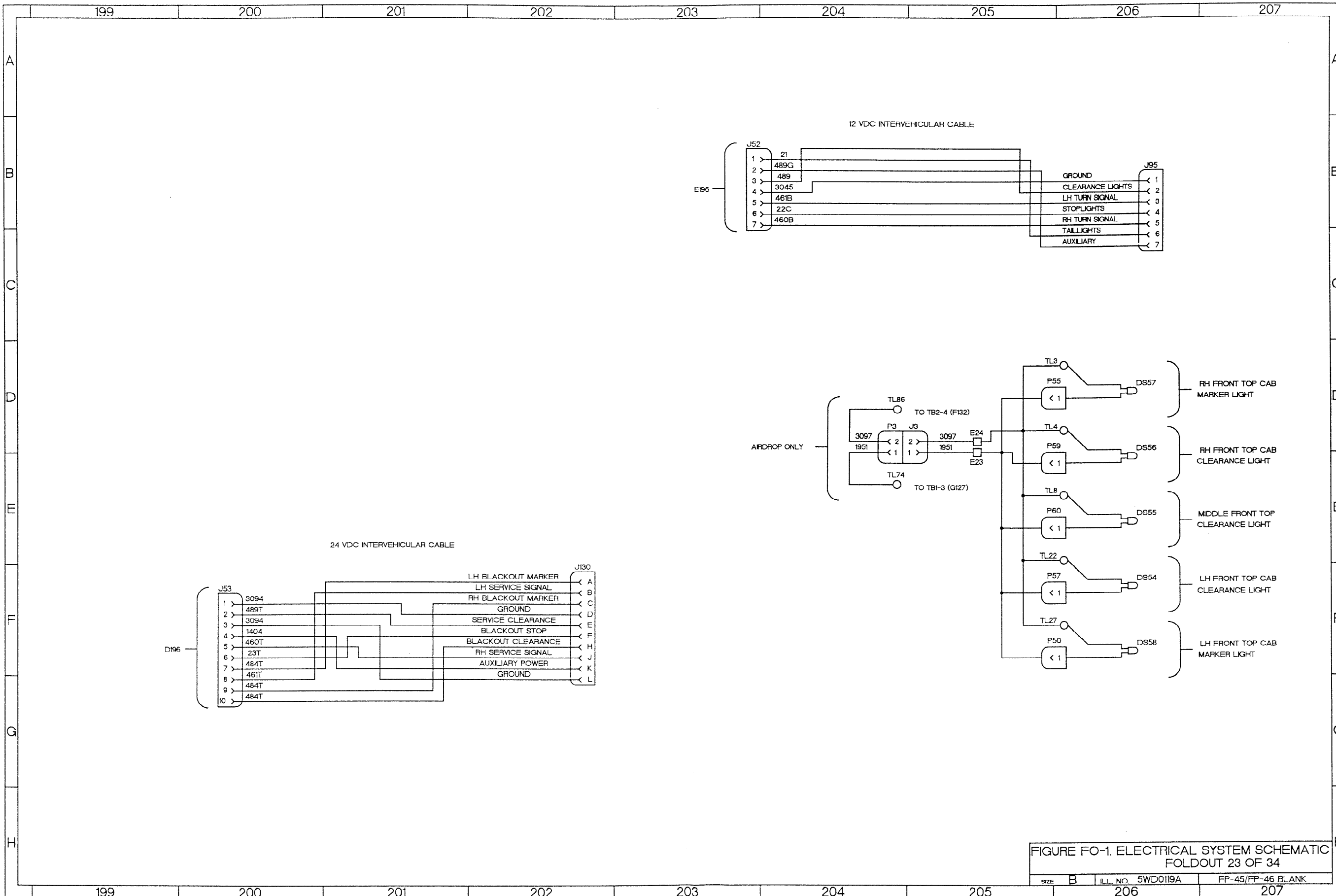


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 23 OF 34

SIZE	B	ILL. NO.	5WD0119A	FP-45/FP-46	BLANK
			206		207



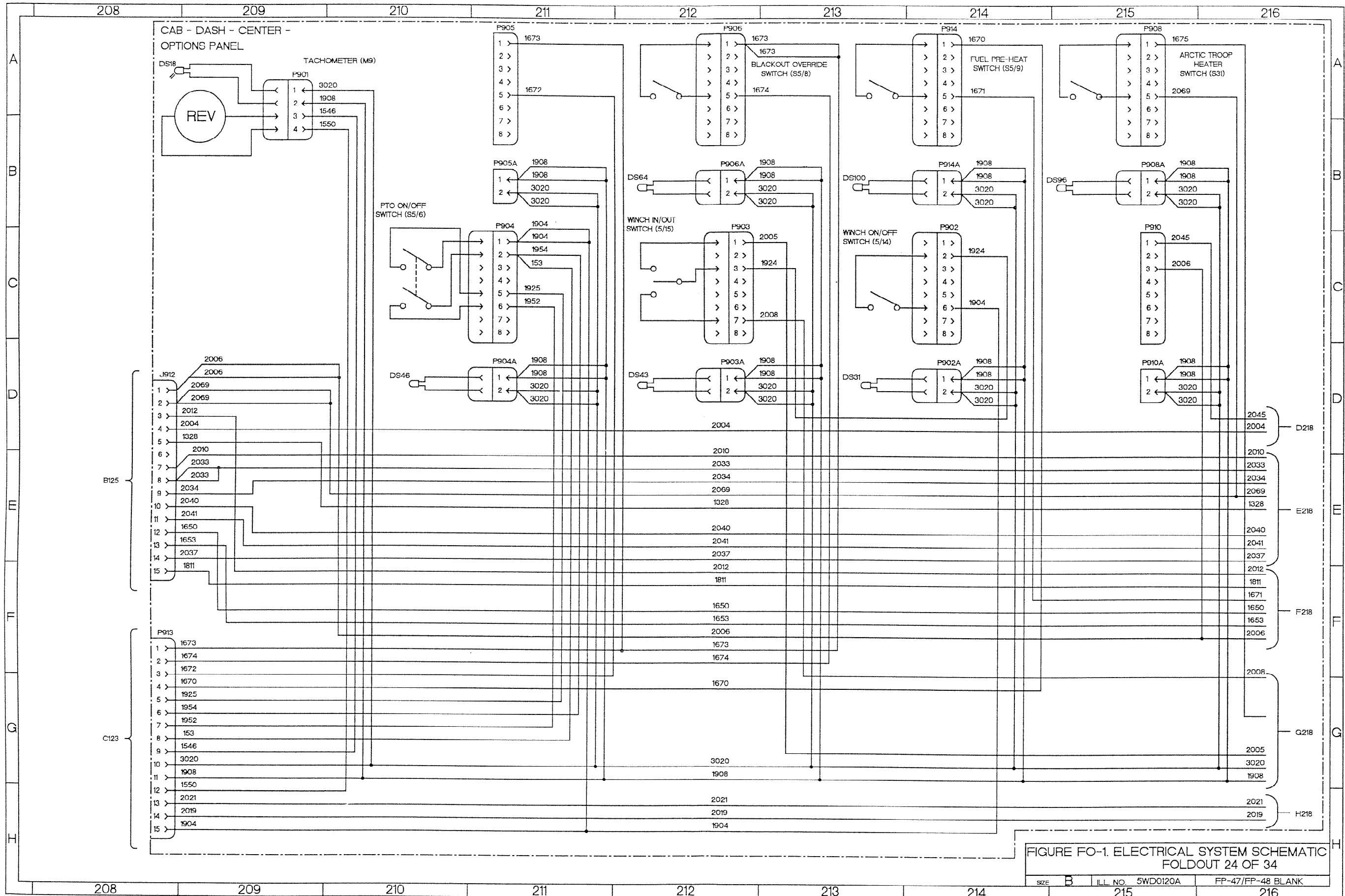
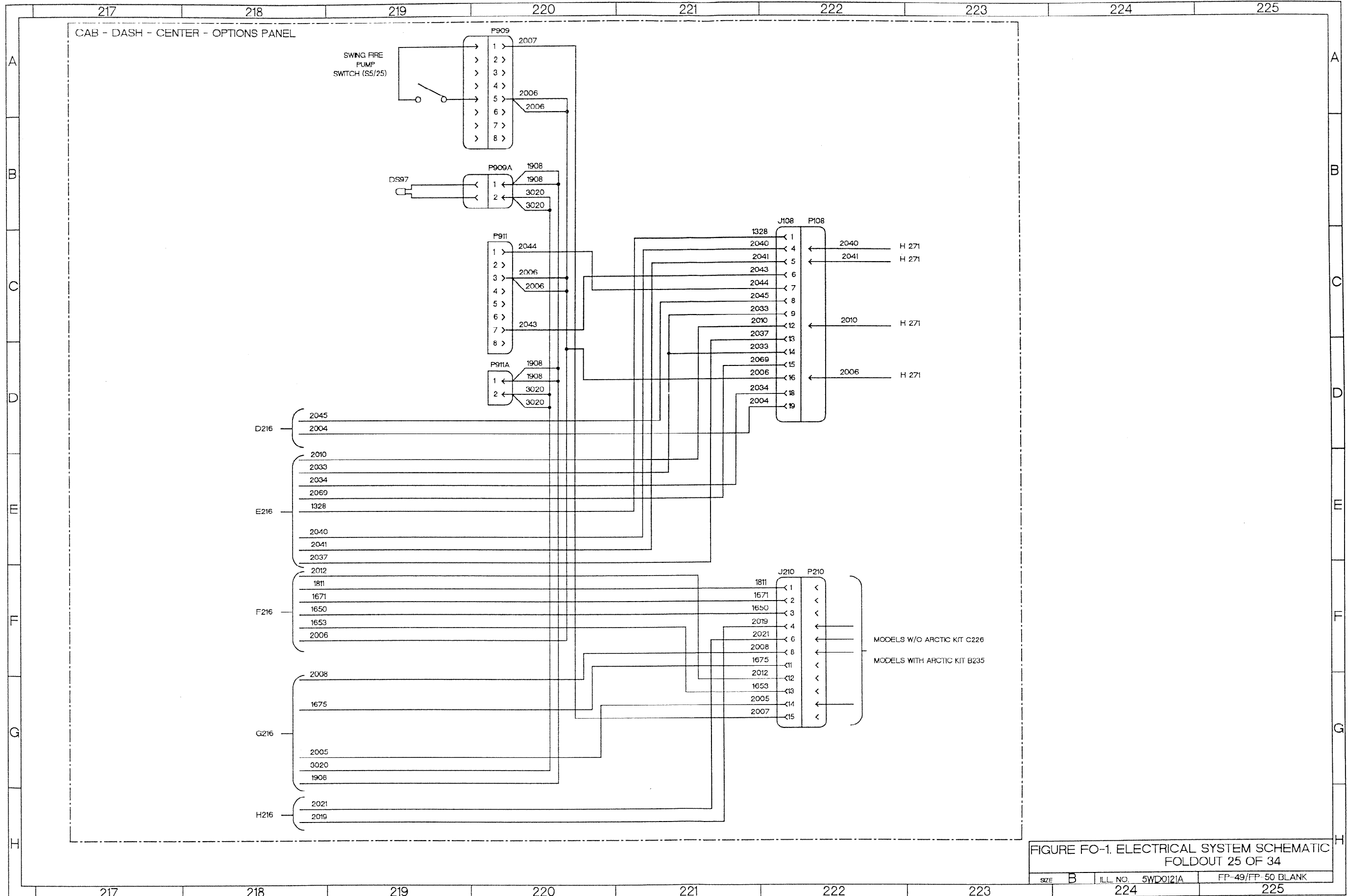


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 24 OF 34



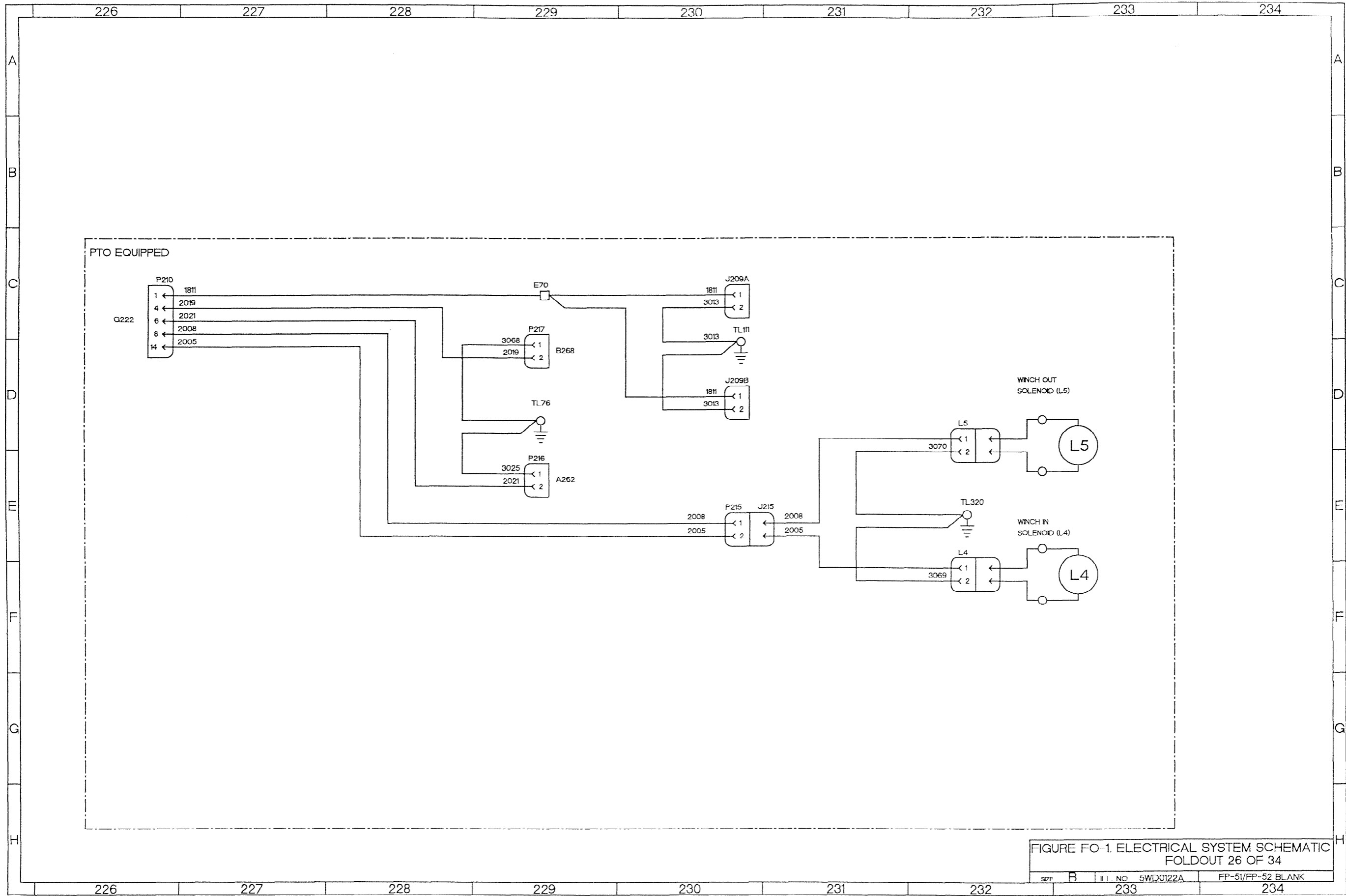


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 26 OF 34

SIZE	B	ILL. NO.	5WD0122A	FP-51/FP-52	BLANK
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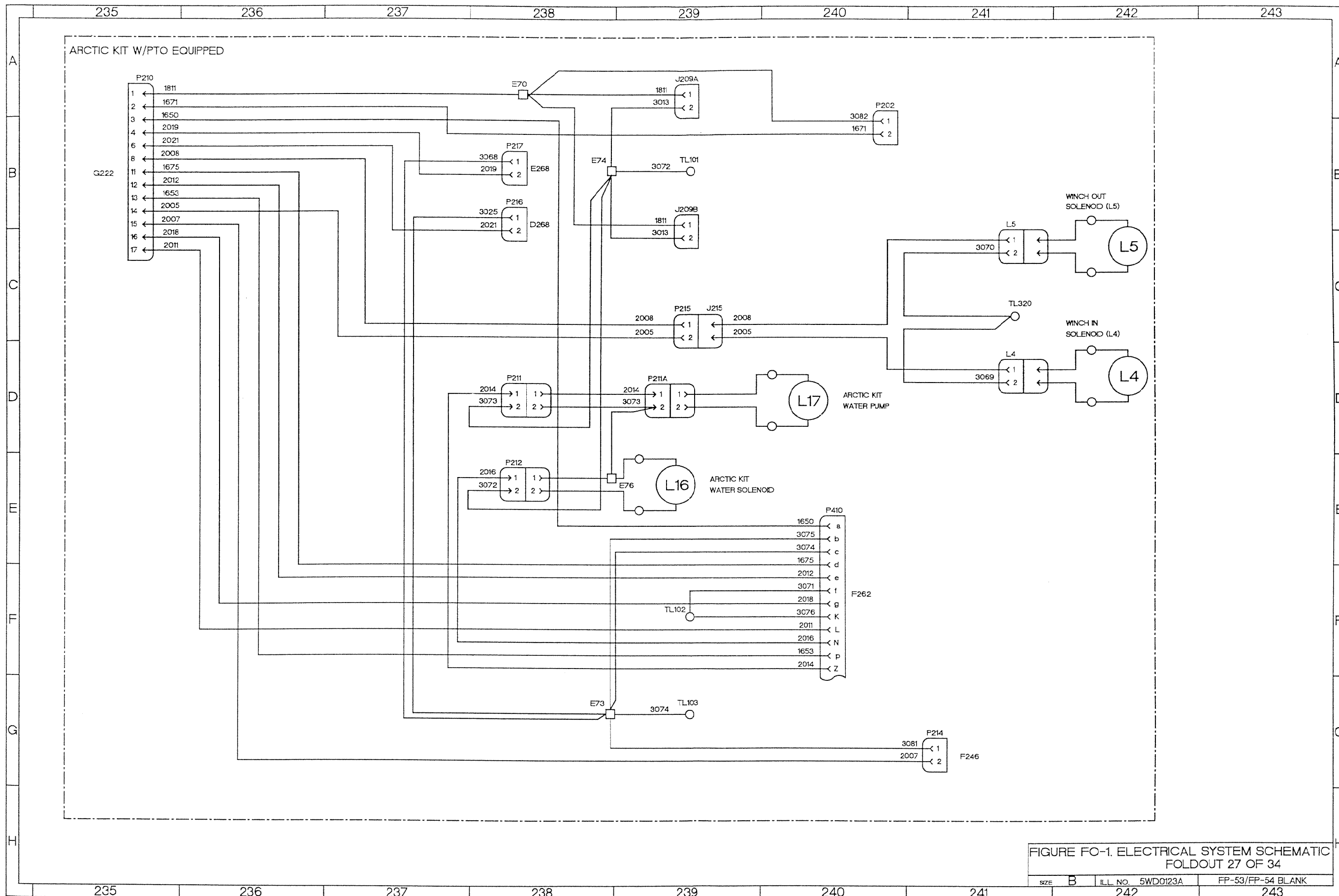


FIGURE FC-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 27 OF 34

SIZE	B	ILL. NO.	5WD0123A	FP-53/FP-54	BLANK
			242		243

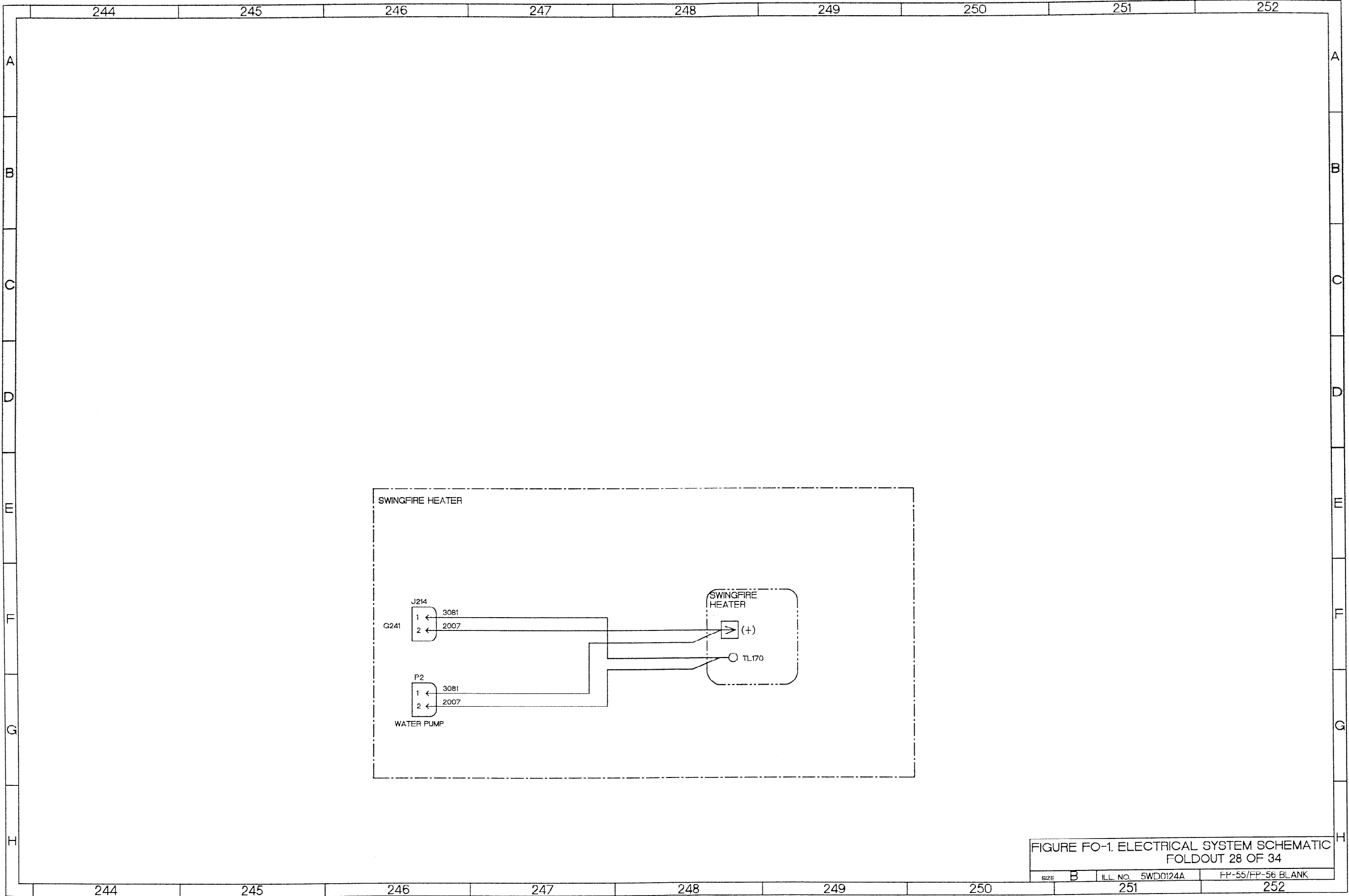


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 28 OF 34

SIZE	B	ILL. NO.	5WD0124A	FP-55/FP-56	BLANK
			251		252

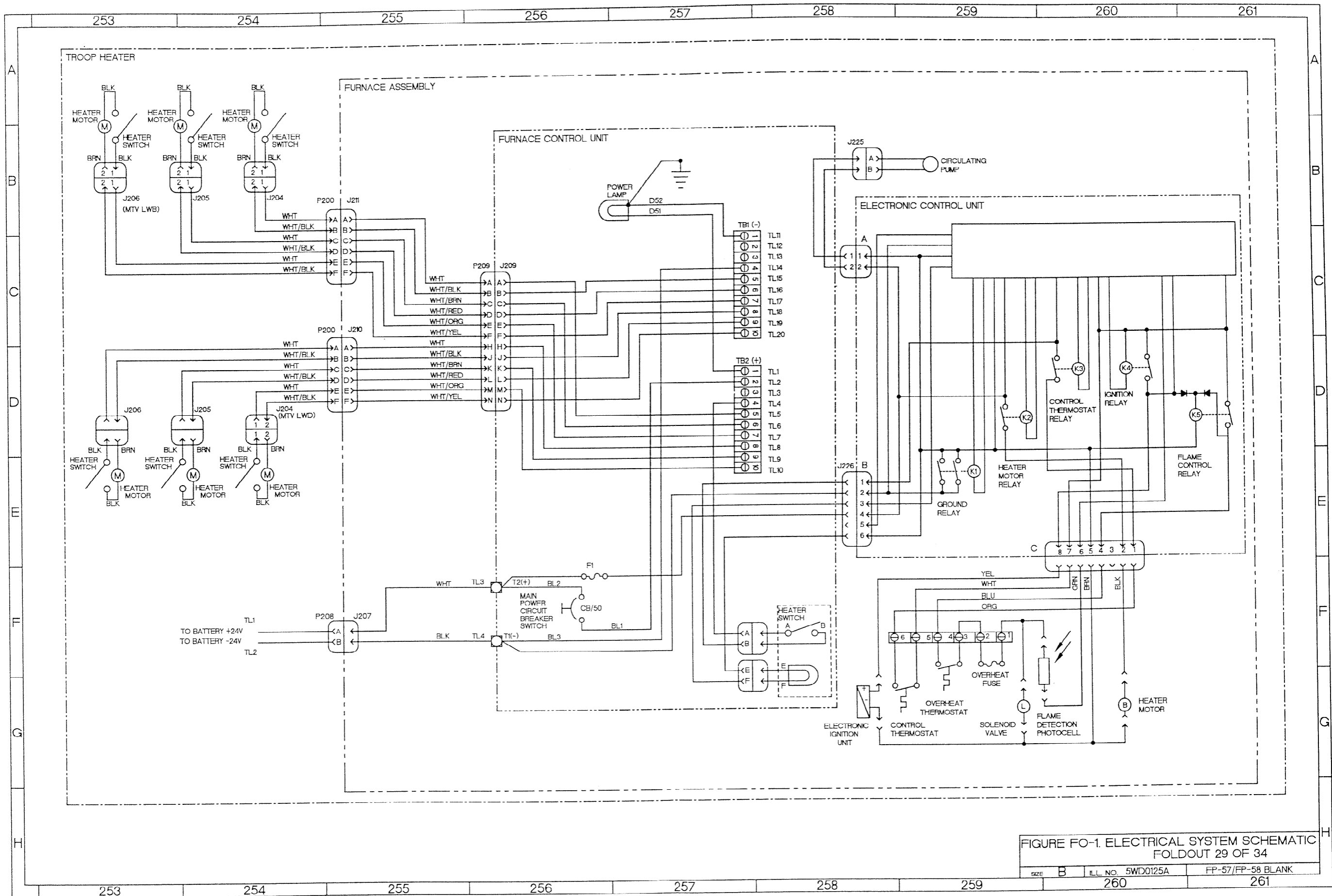


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 29 OF 34

SIZE	B	ILL. NO.	5WD0125A	FP-57/FP-58	BLANK
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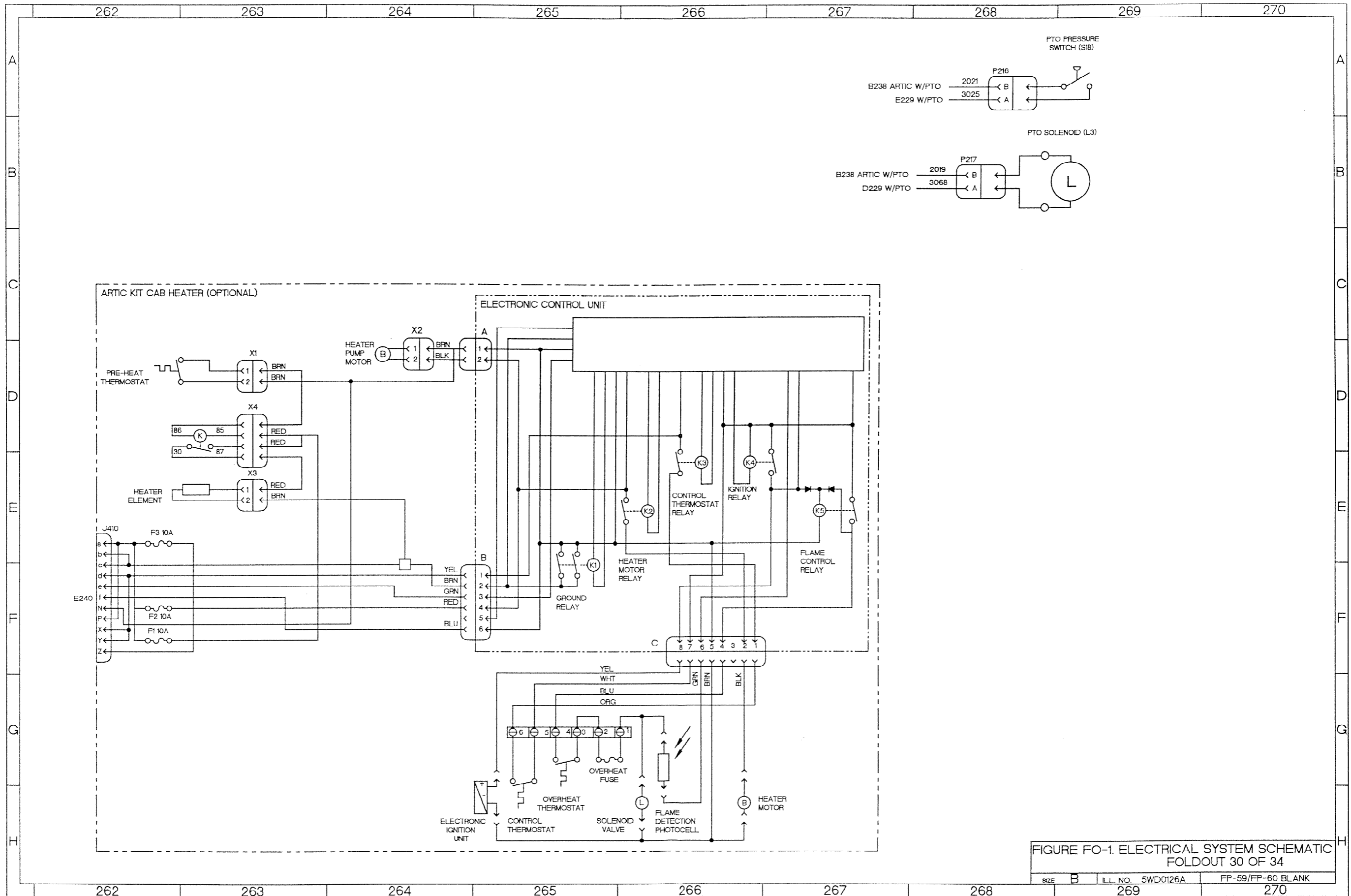


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 30 OF 34

SIZE	B	ILL. NO.	5WD0126A	FP-59/FP-60	BLANK
			269		270

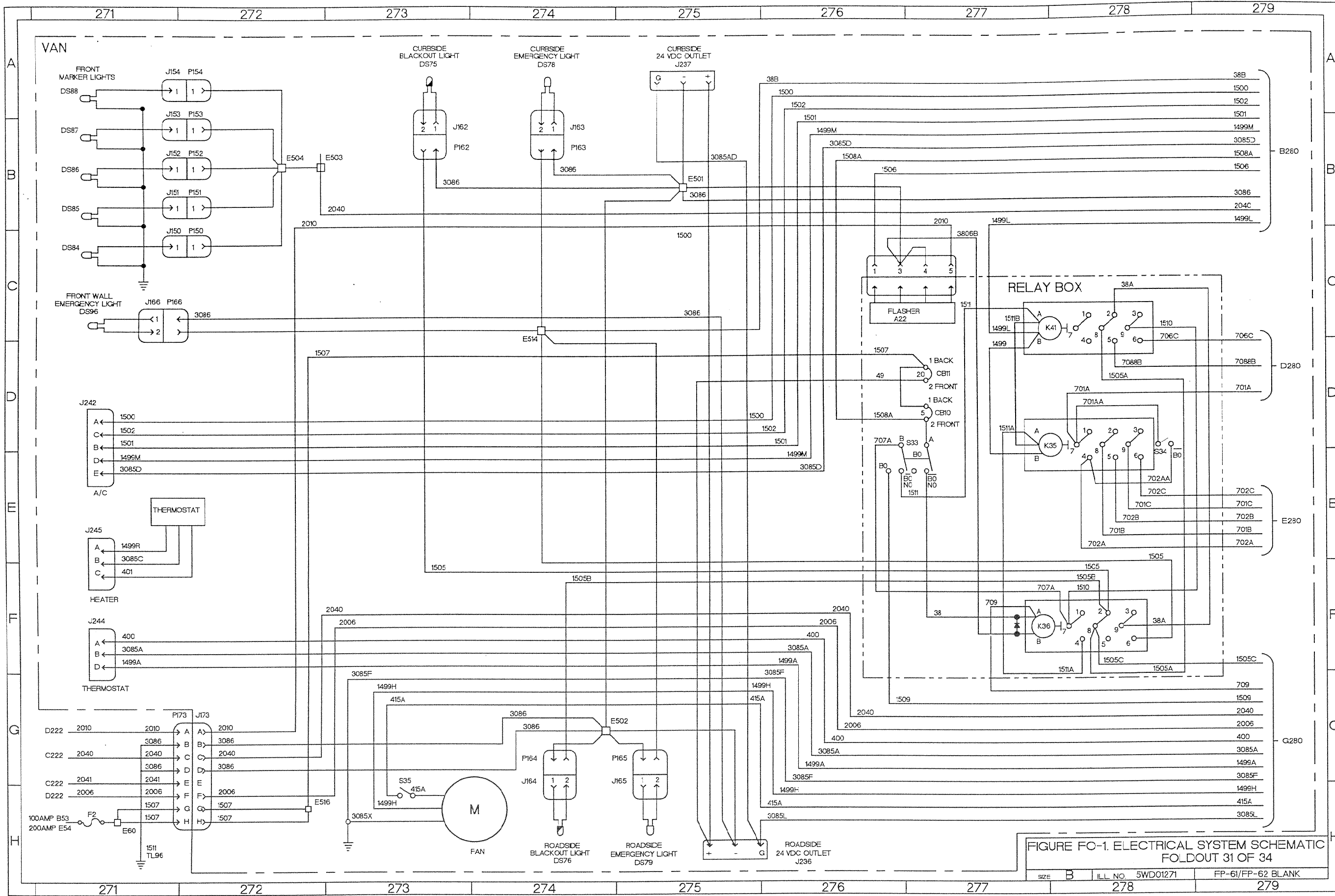


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 31 OF 34

SIZE	B	ILL. NO.	5WD01271	FP-61/FP-62	BLANK
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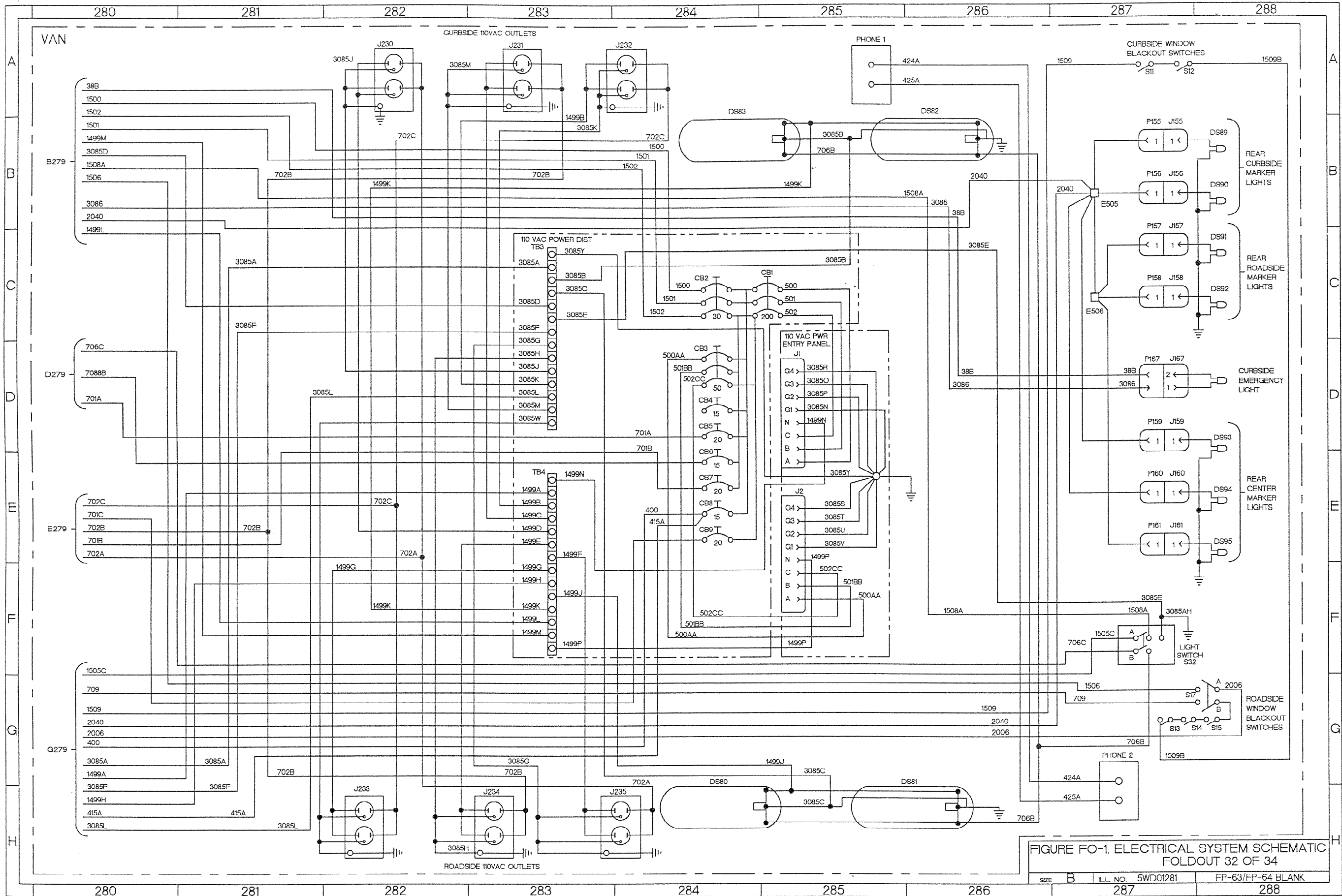


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 32 OF 34

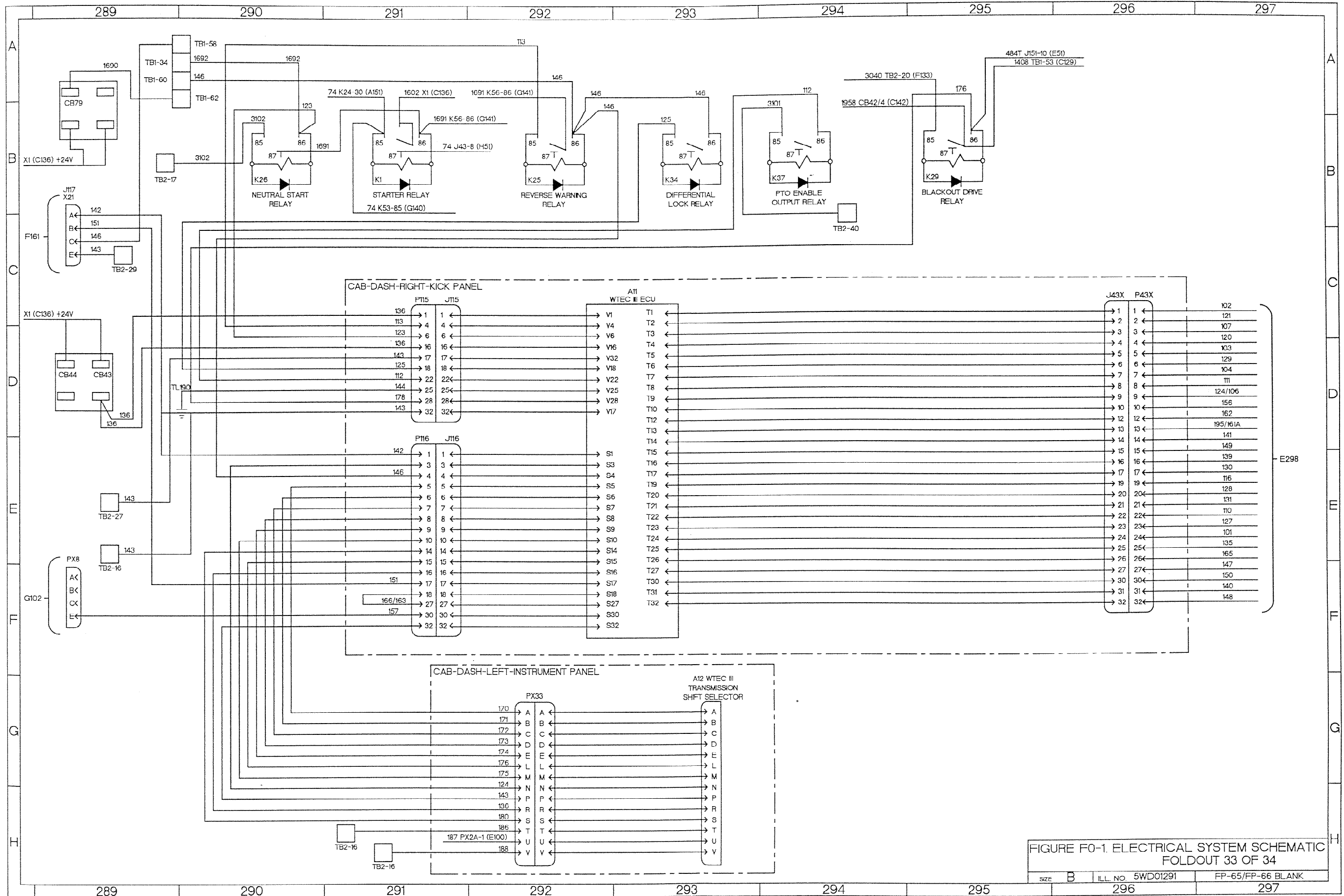


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 33 OF 34

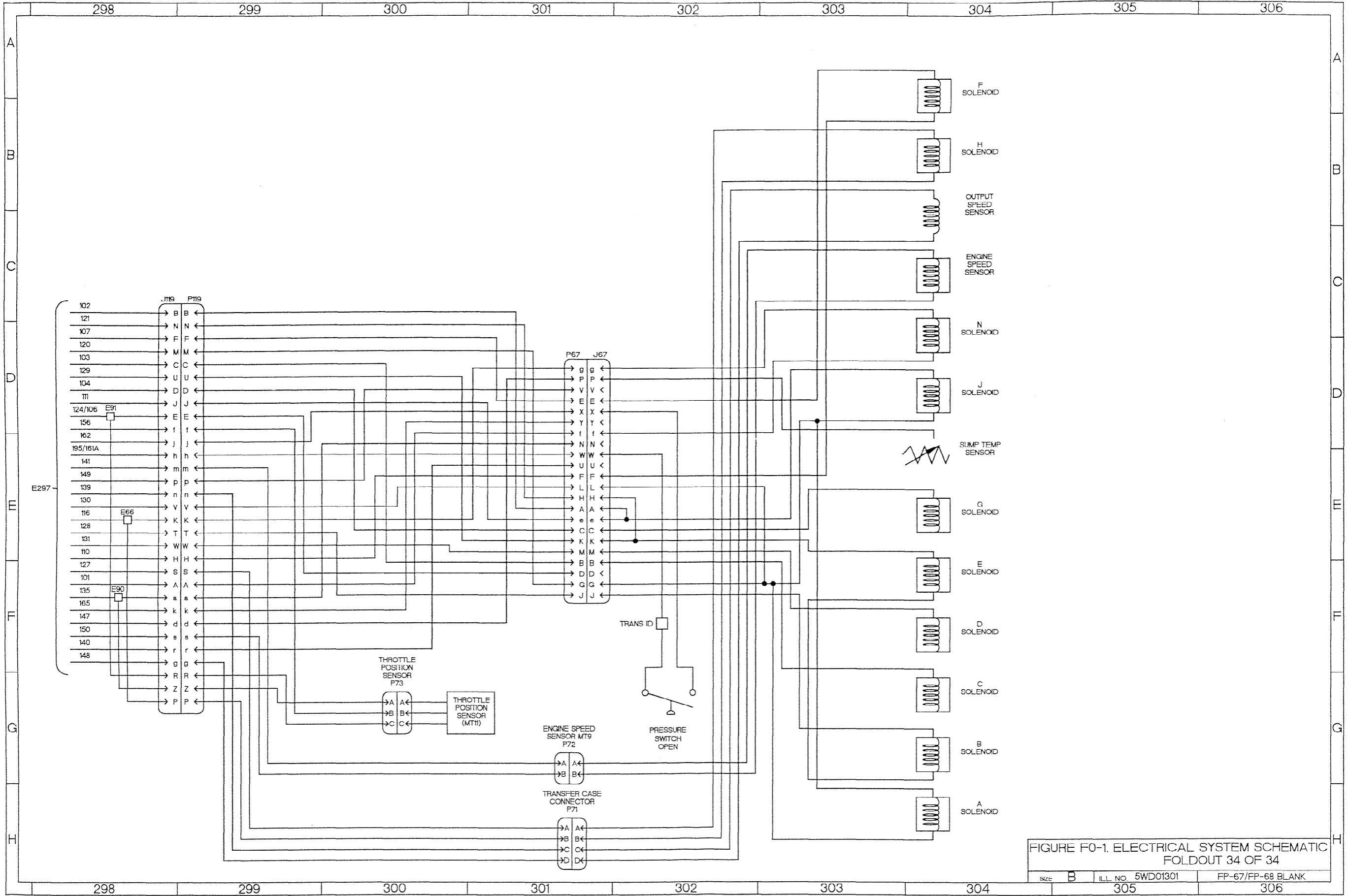


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 34 OF 34

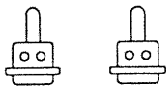

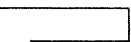
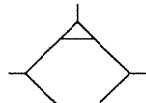
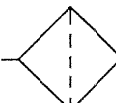
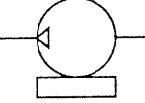
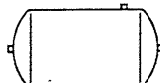



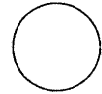
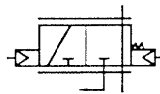
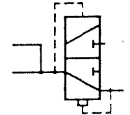
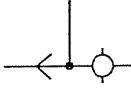
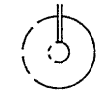
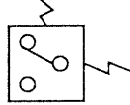
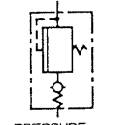
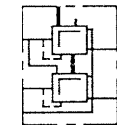
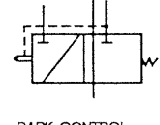
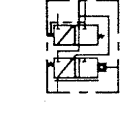
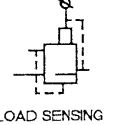
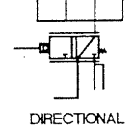
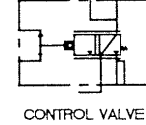
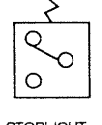

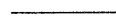

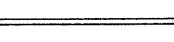
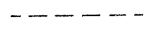
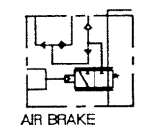
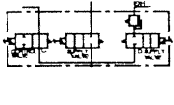

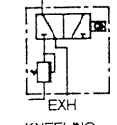
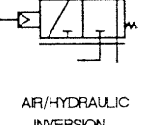
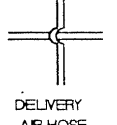
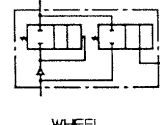
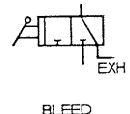
 REAR AXLE BRAKE CHAMBER	 FRONT AXLE BRAKE CHAMBER	 COUPLER AIR BRAKE	 AIR DRYER	 AIR CLEANER INTAKE	 AIR COMPRESSOR WITH GOVERNOR	 AIR TANKS	 DASH GAUGE
 MANUAL VALVE	 ONE WAY CHECK VALVE	 FAN CLUTCH	 MODULATED CONTROL VALVE	 QUICK RELEASE VALVE	 TWO WAY CHECK VALVE	 TIRE	 PRESSURE SWITCH
 PRESSURE RELIEF VALVE	 FOOT CONTROL VALVE	 PARK CONTROL VALVE (HAND OPERATED)	 TRAILER AIR SUPPLY VALVE (HAND OPERATED)	 LOAD SENSING VALVE (MECHANICALLY CONTROLLED)	 DIRECTIONAL RELAY VALVE	 CONTROL VALVE WITH TWO WAY CHECK VALVE	 STOPLIGHT SWITCH
 CONNECTION	 SUPPLY AIR HOSE	 NO CONNECTION	 DELIVERY AIR HOSE	 PARK/EMERGENCY AIR HOSE	 AIR BRAKE PROTECTING VALVE	 CTIS MANFOLD VALVE	 AIR BR AKE PRESSURE TRANSMITTER
 EXH KNEELING VALVE	 AIR/HYDRAULIC INVERSION VALVE	 DELIVERY AIR HOSE NO CONNECTION	 WHEEL VALVE	 BLEED VALVE			

FIGURE FO-2 PNEUMATIC SYSTEM SCHEMATIC  
FOLDOUT 1 OF 4

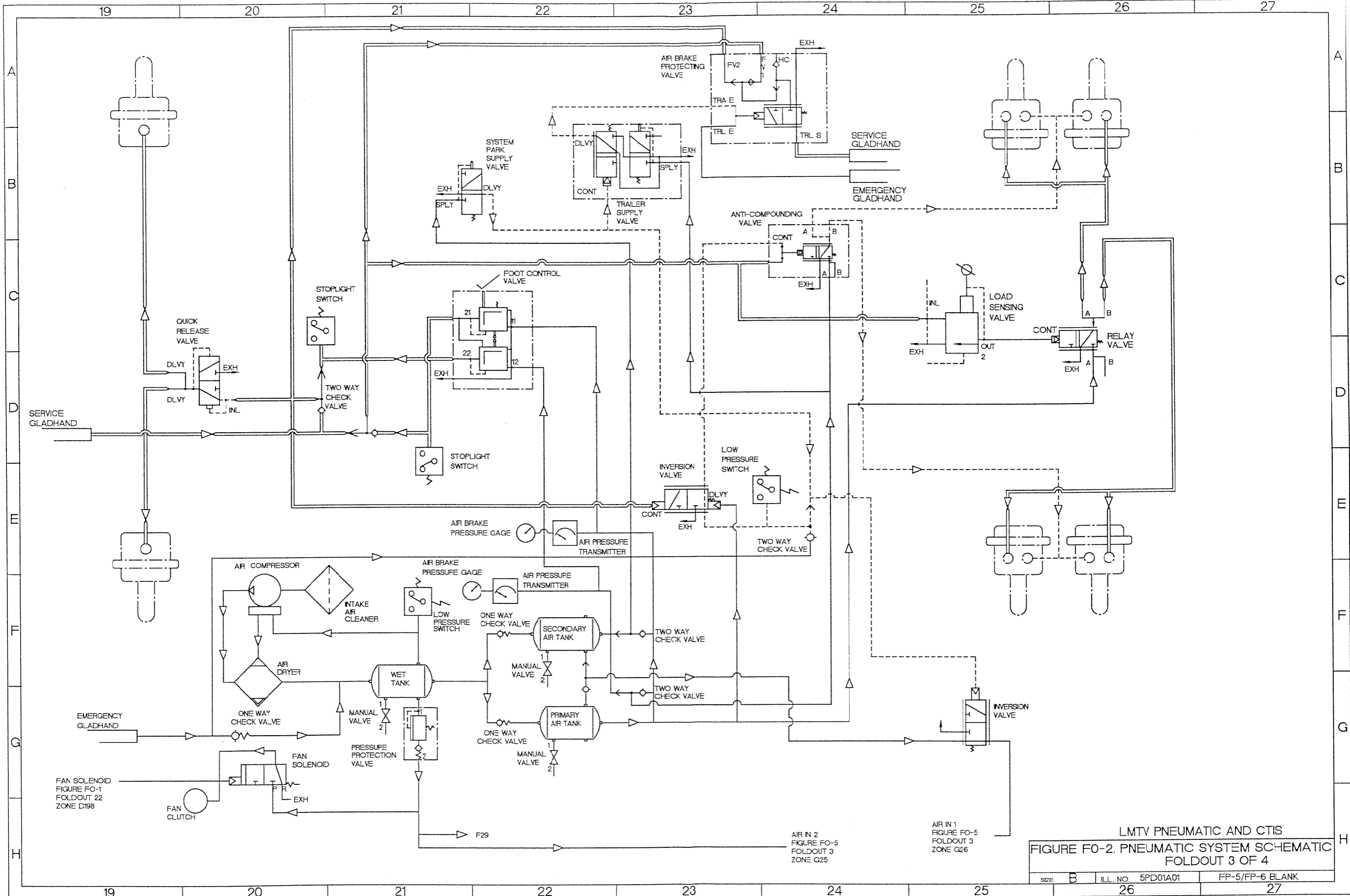
SIZE	B	ILL. NO.	5PD01A1	FP-1/FP-2	BLANK
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SH	ZONE	DESCRIPTION
3	E22	AIR BRAKE PRESSURE GAGE
3	F22	AIR BRAKE PRESSURE GAGE
3	A23	AIR BRAKE PROTECTING VALVE
3	F20	AIR COMPRESSOR
3	F20	AIR DRYER
3	E22	AIR PRESSURE TRANSMITTER
3	E22	AIR PRESSURE TRANSMITTER
3	C24	ANTI-COMPOUNDING VALVE
4	E31	CONTROL VALVE
4	E31	CTIS MANIFOLD VALVE
4	E32	DEFLATE VALVE
3	G19	EMERGENCY GLADHAND
3	B24	EMERGENCY GLADHAND
3	H20	FAN CLUTCH
3	G20	FAN SOLENOID
3	C22	FOOT CONTROL VALVE
3	F20	INTAKE AIR CLEANER
3	G25	INVERSION VALVE
3	E23	INVERSION VALVE
4	C28	KNEELING VALVE
4	E28	KNEELING VALVE
3	C25	LOAD SENSING VALVE
3	E23	LOW PRESSURE SWITCH
3	F21	LOW PRESSURE SWITCH
3	F22	MANUAL VALVE
3	G22	MANUAL VALVE
3	G21	MANUAL VALVE
3	F22	ONE WAY CHECK VALVE
3	G22	ONE WAY CHECK VALVE
3	G20	ONE WAY CHECK VALVE
3	G21	PRESSURE PROTECTION VALVE
3	G22	PRIMARY AIR TANK
3	C20	QUICK RELEASE VALVE
4	C34	QUICK RELEASE VALVE
4	D30	QUICK RELEASE VALVE
3	D26	RELAY VALVE
3	F22	SECONDARY AIR TANK

SH	ZONE	DESCRIPTION
3	D19	SERVICE GLADHAND
3	B24	SERVICE GLADHAND
3	C20	STOPLIGHT SWITCH
3	E21	STOPLIGHT SWITCH
4	F32	SUPPLY VALVE
3	B21	SYSTEM PARK SUPPLY VALVE
3	B22	TRAILER SUPPLY VALVE
3	D21	TWO WAY CHECK VALVE
3	E24	TWO WAY CHECK VALVE
3	F23	TWO WAY CHECK VALVE
3	G23	TWO WAY CHECK VALVE
3	F21	WET TANK
4	C29	WHEEL VALVE
4	C33	WHEEL VALVE
4	E29	WHEEL VALVE
4	E33	WHEEL VALVE

LMTV PNEUMATIC AND CTIS  
 FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC  
 FOLDOUT 2 OF 4

SIZE B ILL. NO. 5PD01AL2 FP-3/FP-4 BLANK



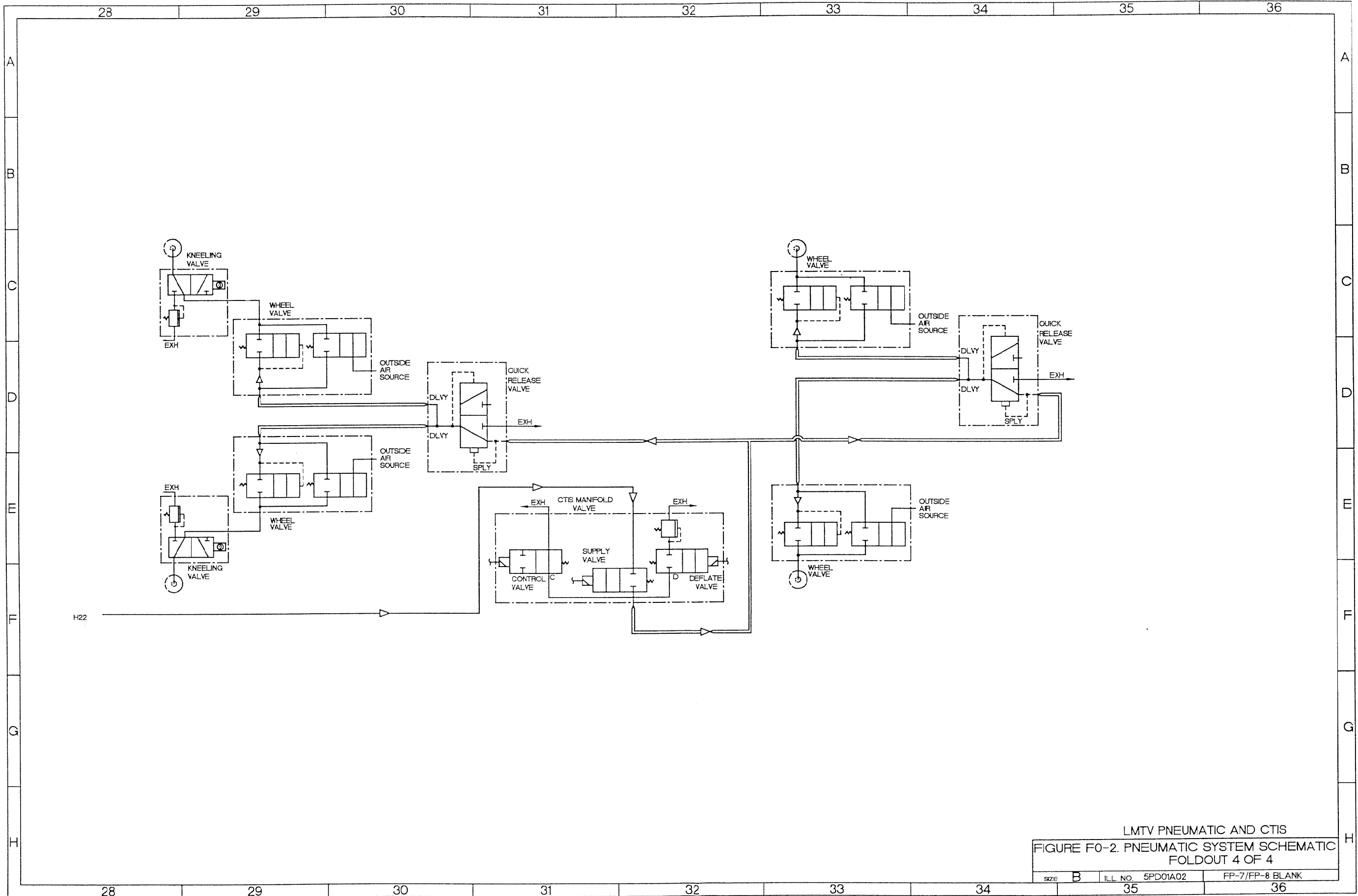
LMTV PNEUMATIC AND CTIS  
 FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC  
 FOLDOUT 3 OF 4

SIZE	B	ILL. NO.	5PD01A01	FP-5/FP-6 BLANK
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FAN SOLENOID  
 FIGURE FO-1  
 FOLDOUT 22  
 ZONE D198

AIR IN 2  
 FIGURE FO-5  
 FOLDOUT 3  
 ZONE G25

AIR IN 1  
 FIGURE FO-5  
 FOLDOUT 3  
 ZONE G26



LMTV PNEUMATIC AND CTIS  
FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC  
FOLDOUT 4 OF 4

SIZE	B	ILL. NO.	5PD01A02	FP-7/FP-8	BLANK
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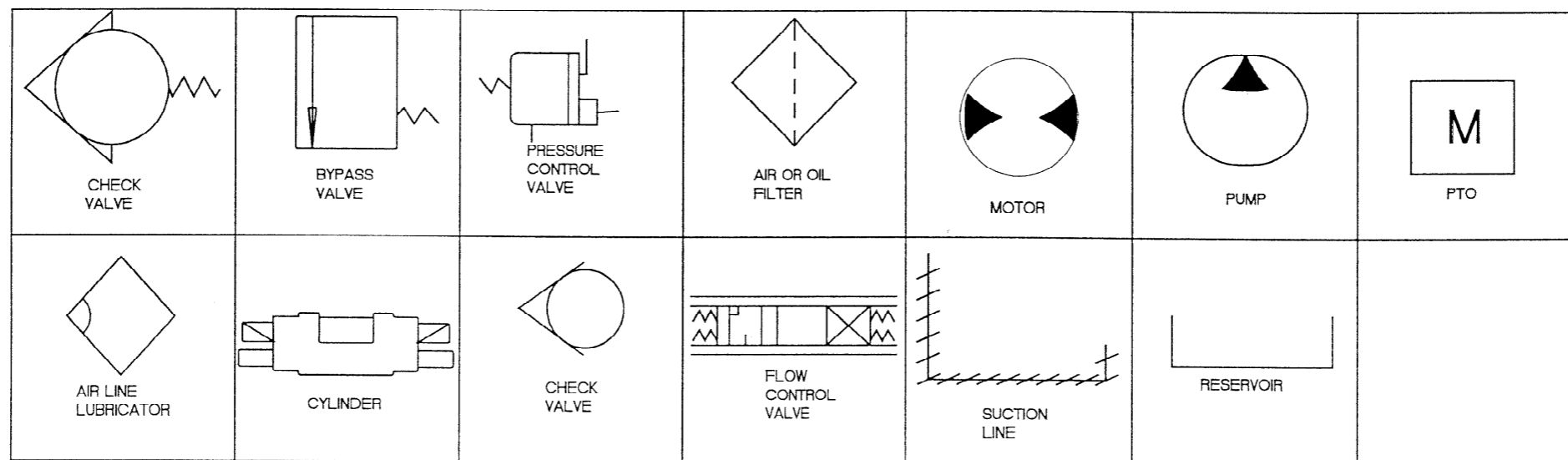


FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC  
 FOLDOUT 1 OF 3

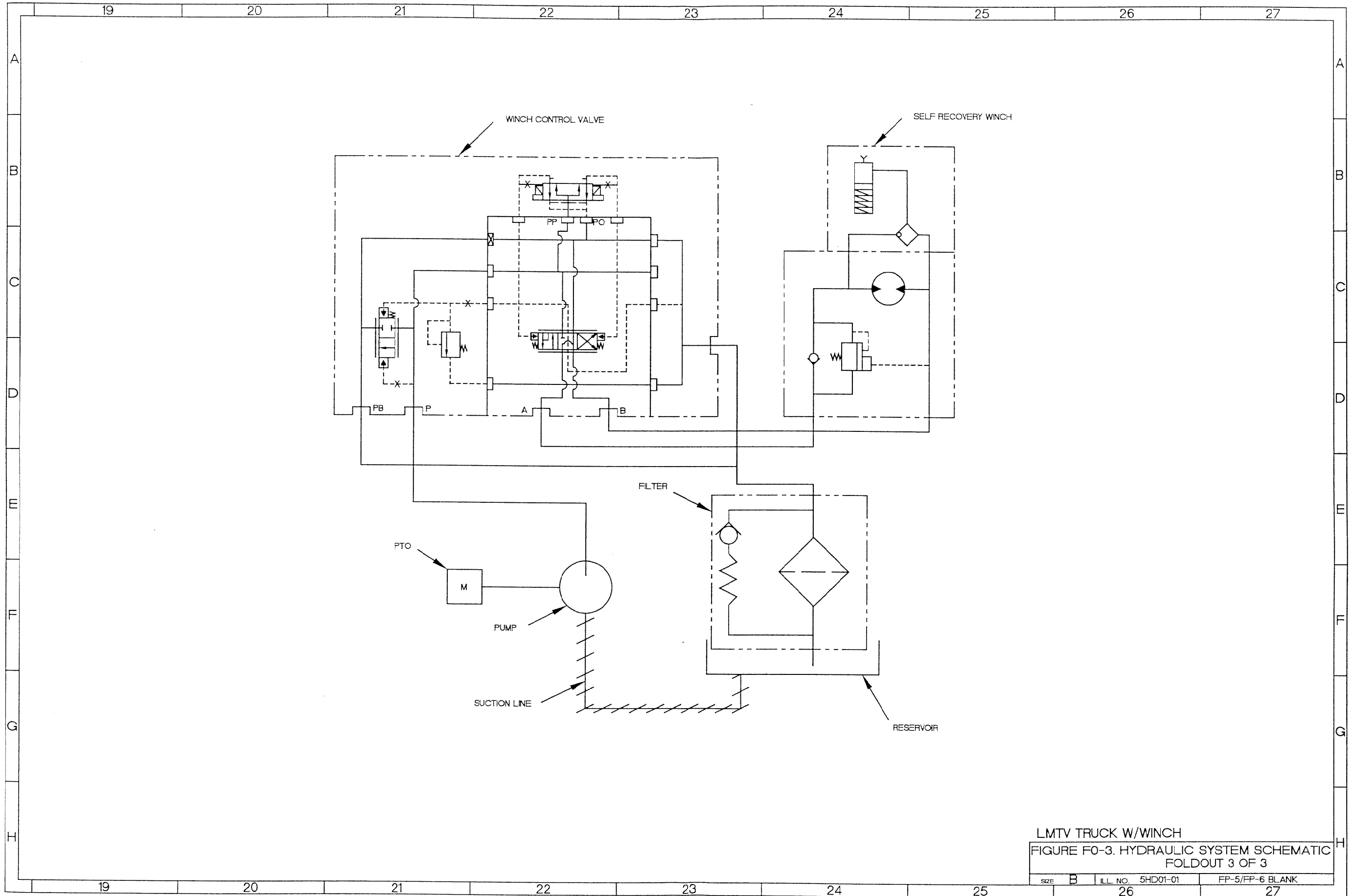
SIZE B ILL. NO. 5HD01A11 FP-1/FP-2 BLANK



SHEET	ZONE	DESCRIPTION
3	B21	WINCH CONTROL VALVE
3	B24	SELF RECOVERY WINCH
3	F21	PTO
3	F22	PUMP
3	E23	FILTER
3	G23	RESERVOIR
3	G22	SUCTION LINE

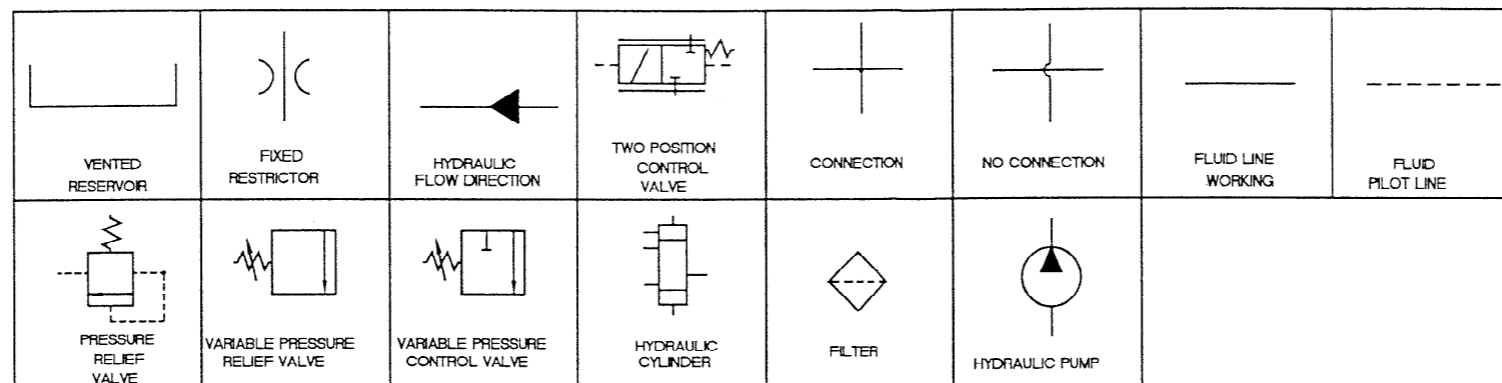
FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC  
FOLDOUT 2 OF 3

SIZE	B	ILL. NO.	5HD01-L2	FP-3/FP-4	BLANK
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LMTV TRUCK W/WINCH  
FIGURE F0-3. HYDRAULIC SYSTEM SCHEMATIC  
FOLDOUT 3 OF 3

SIZE	B	ILL. NO.	5HD01-01	FP-5/FP-6	BLANK
			26		27



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

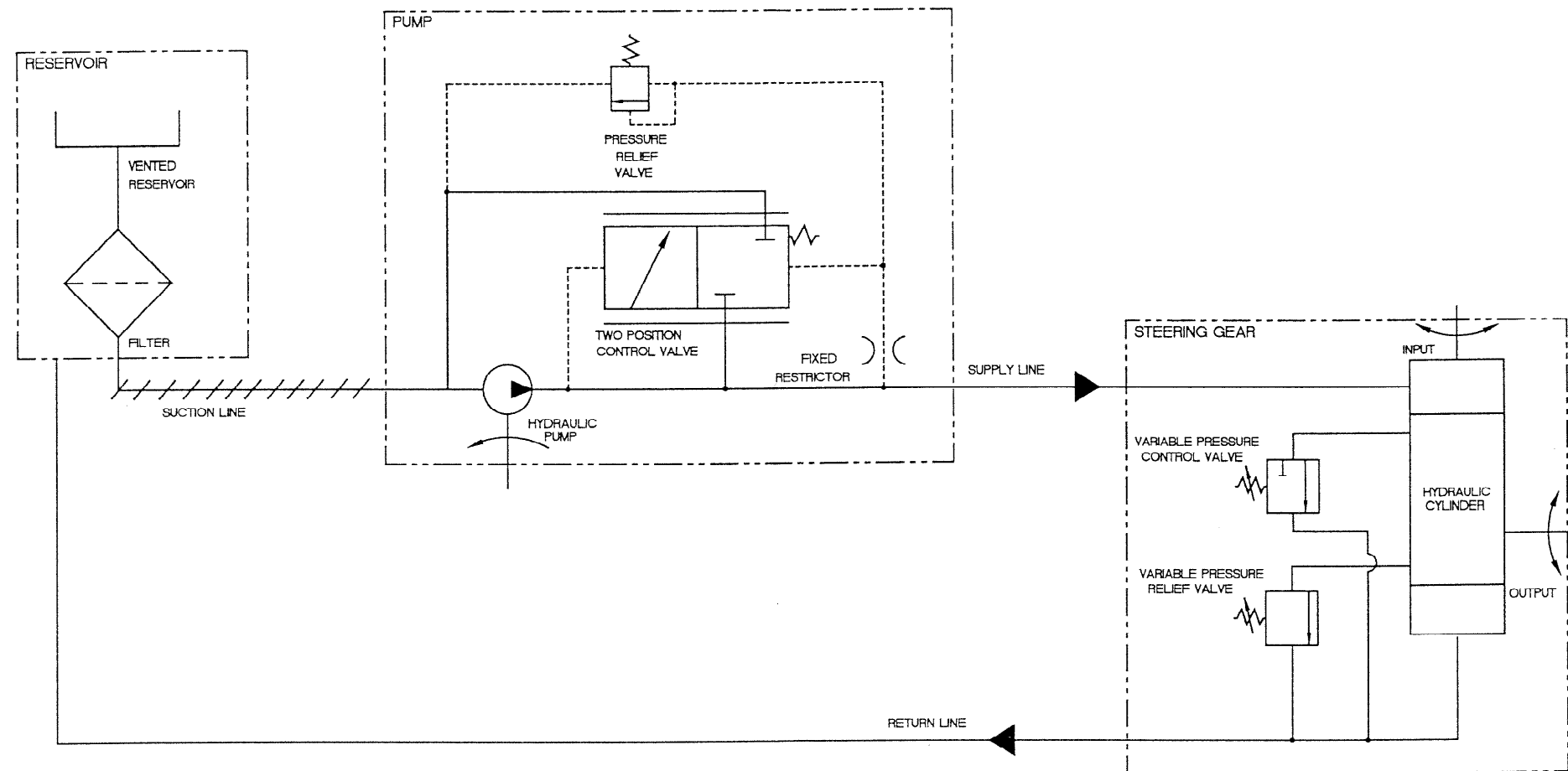


FIGURE FO-4 HYDRAULIC STEERING SYSTEM  
FOLDOUT 2 OF 2

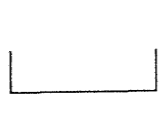
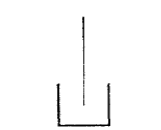
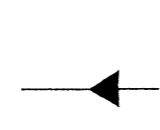
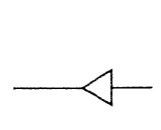



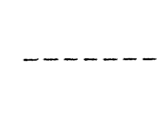
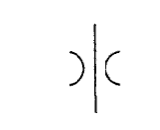
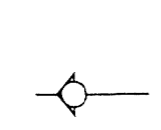
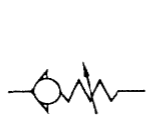
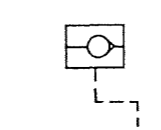
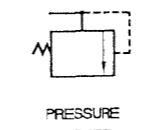
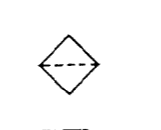
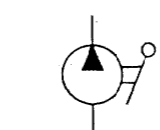

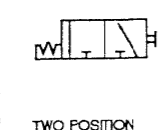
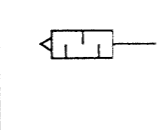
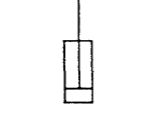
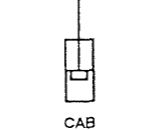
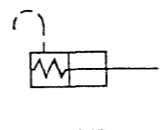
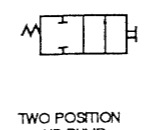
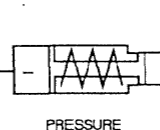
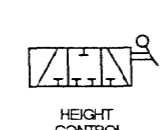
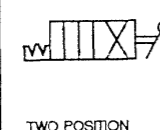
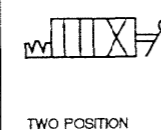
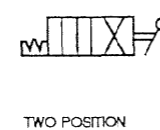

 VENTED RESERVOIR	 ABOVE FLUID LEVEL RESERVOIR	 HYDRAULIC FLOW DIRECTION	 PNEUMATIC FLOW DIRECTION	 CONNECTION	 NO CONNECTION	 FLUID LINE WORKING	 FLUID PILOT LINE
 FIXED RESTRICTOR	 CHECK VALVE	 VARIABLE CONTROL CHECK VALVE	 CHECK PILOT	 PRESSURE RELIEF VALVE	 FILTER	 HAND PUMP	 DETENT
 TWO POSITION 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. YAD01A1 FP-1/FP-2 BLANK

SH	ZONE	DESCRIPTION
3	A25	CAB AIR SUSPENSION W/DAMPER
3	F21	CHECK PILOT
3	A22	CHECK VALVE
3	A23	CHECK VALVE
3	B22	CHECK VALVE
3	B23	CHECK VALVE
3	B25	CHECK VALVE
3	C20	CHECK VALVE
3	C21	CHECK VALVE
3	E19	CHECK VALVE
3	E24	CHECK VALVE
3	E25	CHECK VALVE
3	F19	CHECK VALVE
3	F21	CHECK VALVE
3	G21	CHECK VALVE
3	A22	FILTER
3	B22	FILTER
3	A24	FILTER
3	B24	FILTER
3	D19	FILTER
3	D20	FILTER
3	D21	FILTER
3	E19	FILTER
3	G19	FILTER
3	G21	FILTER
3	A22	FIXED RESTRICTOR
3	B22	FIXED RESTRICTOR
3	A23	FIXED RESTRICTOR
3	B23	FIXED RESTRICTOR
3	F19	HAND PUMP
3	B25	HEIGHT CONTROL VALVE
3	B22	HYDRAULIC CYLINDER
3	B23	HYDRAULIC CYLINDER
3	C21	HYDRAULIC CYLINDER
3	F20	MUFFLER
3	F21	PRESSURE INTENSIFIER
3	F19	PRESSURE RELIEF VALVE
3	A24	REAR CAB LATCH
3	E21	THREE POSITION SELECTION VALVE
3	D26	TWO POSITION AIR PUMP VALVE
3	D25	TWO POSITION CAB SUSPENSION VALVE
3	C24	TWO POSITION CAB TILT VALVE
3	C23	TWO POSITION SPARE TIRE VALVE
3	D21	TWO POSITION SUSPENSION VALVE
3	G22	VARIABLE CONTROL CHECK VALVE
3	G22	VENTED RESERVOIR

FIGURE F0-5 AIR TRANSPORTABILITY  
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC  
FOLDOUT 2 OF 3

SIZE B ILL. NO. YAD01AL2 FP-3/FP-4 BLANK

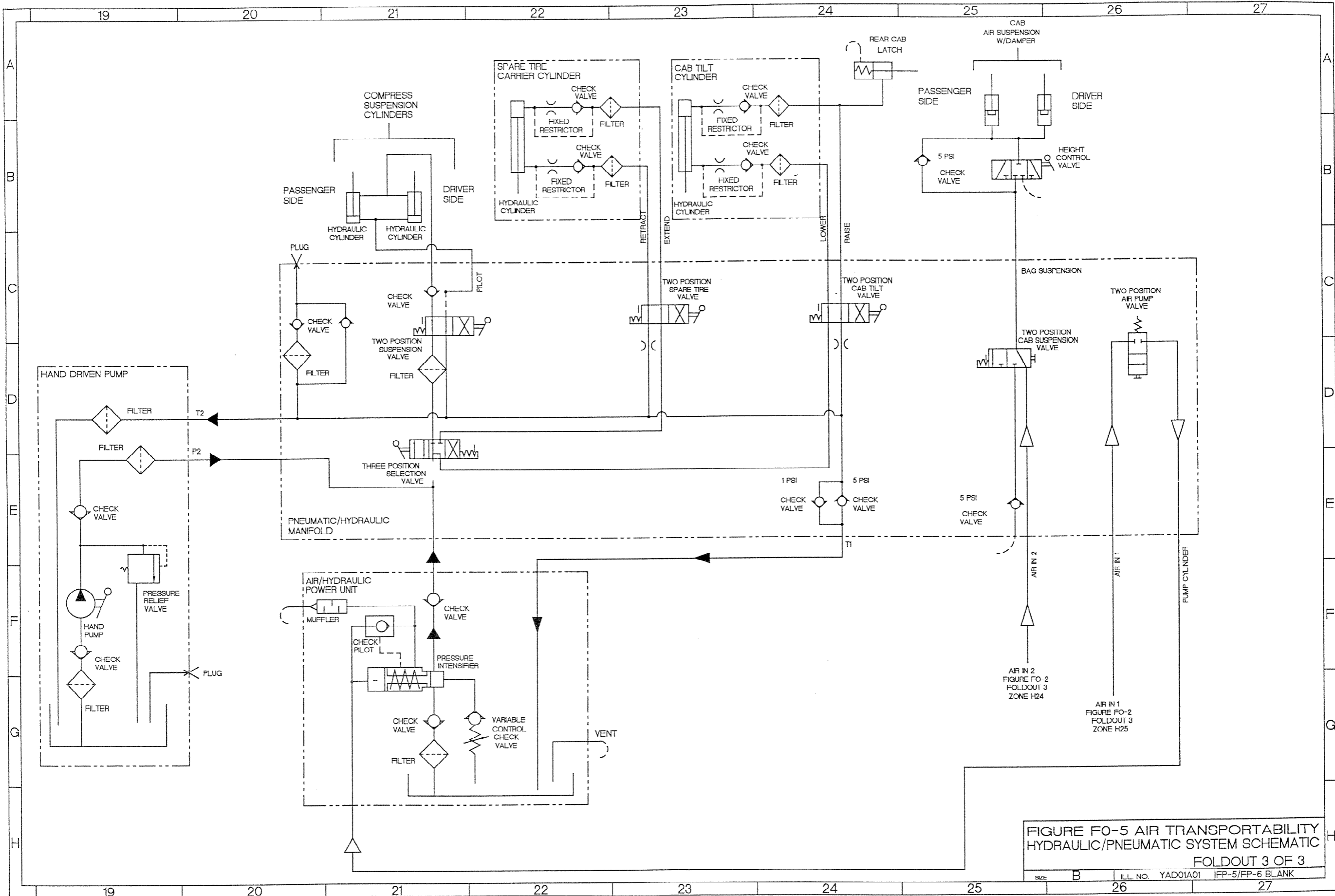
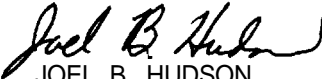


FIGURE FO-5 AIR TRANSPORTABILITY HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 3 OF 3

**By Order of the Secretary of the Army:**

DENNIS J. REIMER  
*General, United States Army*  
*Chief of Staff*

Official:

  
JOEL B. HUDSON  
*Administrative Assistant to the*  
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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.

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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

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches  
 1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet  
 1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 Lb  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches  
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

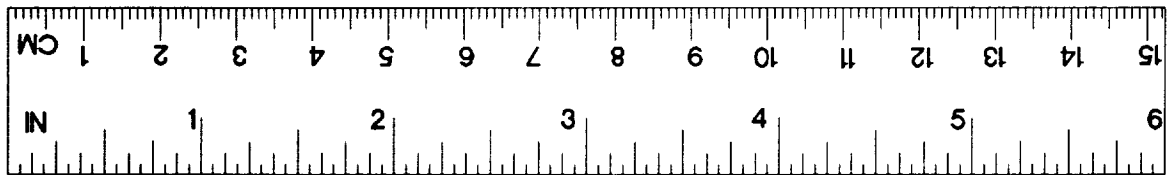
1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 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	0.254	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 Hour	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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