TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
UNIT MAINTENANCE
M1083 SERIES, 5-TON, 6 X 6,
MEDIUM TACTICAL VEHICLES (MTV)
VOLUME NO. 1 OF 5

MODEL NSN EIC

TRK, CAR., MTV, M1083
W/WN 2320-01-360-1895 BT3
W/O WN 2320-01-354-3386 BR2

TRK, CAR., MTV, W/MATL
HDLG EQPT (MHE), M1084 2320-01-354-3387 BR3

TRK, CAR., MTV, LWB, M1085
W/WN 2320-01-360-1897 BT5
W/O WN 2320-01-354-4530 BR7

TRK, CAR., MTV, LWB, W/MATL
HDLG EQPT (MHE), M1086 2320-01-354-4531 BR8

TRK, TRACTOR, MTV, M1088
W/WN 2320-01-360-1892 BTY
W/O WN 2320-01-355-4332 BTJ

TRK, WKR, MTV, M1089 2320-01-354-4528 BR4

TRK, DUMP, MTV, M1090
W/WN 2320-01-360-1893 BTZ
W/O WN 2320-01-354-4529 BR5

TRK, CHAS, MTV, M1092 2320-01-354-3382 BRZ

TRK, CAR., MTV, AIR DROP, M1093
W/WN 2320-01-360-1896 BT4
W/O WN 2320-01-355-3063 BR9

TRK, DUMP, MTV, AIR DROP, M1094
W/WN 2320-01-360-1984 BT2
W/O WN 2320-01-355-3062 BTK

TRK, CHAS, MTV, LWB, M1096 2320-01-354-4527 BR6

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

HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE

SEPTEMBER 1998
WARNING SUMMARY

WARNING

EXHAUST GASES CAN KILL

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

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

WARNING

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

WARNING

Do not work on fuel system when engine is hot; fuel can be ignited by a hot engine.
WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

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

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

WARNING

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

WARNING

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

WARNING

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

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

Ensure that tire is totally deflated before removing self-locking nuts. Failure to comply may result in serious injury or death to personnel.
Spring brakes must be caged before attempting replacement of a rear axle wheel stud. Failure to comply may result in severe injury to personnel.

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

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.

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.

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

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

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

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

Wear appropriate eye protection when installing spring rings. Spring rings are under tension and can act as projectiles when being installed. Failure to comply may result in injury to personnel.
TM 9-2320-366-20-1, 15 September 1998, is changed as follows:
1. Remove old pages and insert new pages as indicated below.
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1 of 1
By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

SANDRA R. RILEY
Administrative Assistant to the Secretary of the Army
0601913

By Order of the Secretary of the Air Force:

JOHN P. JUMPER
General, United States Air Force
Chief of Staff

Official:

GREGORY S. MARTIN
General, United States Air Force
Commander, Air Force Materiel Command

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CHANGE
NO. 2

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

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

VOLUME NO. 1 OF 5

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Metric Conversion Chart Metric Conversion Chart
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HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
Washington, D.C., 1 July 2003

TECHNICAL MANUAL
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UNIT MAINTENANCE
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Place this change sheet in the front of the publication for reference purposes.

2 of 2
By Order of the Secretary of the Army:

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

Official:  
JOEL B. HUDSON  
Administrative Assistant to the  
Secretary of the Army  
0110109

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### Unit Maintenance Manual

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

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### HOW TO USE THIS MANUAL

**OVERVIEW**

This Technical Manual (TM) is provided to help you maintain the MTV at the Unit Maintenance level. Because of its size, it is divided into five volumes. Volumes 3, 4, and 5 contain information which will assist you in the performance of Unit Maintenance on the MTV. 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 MTV 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.
OVERVIEW (CONT)

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

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

- **APPENDIX C, TOOLS IDENTIFICATION LIST.** Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.

- **APPENDIX D, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.

- **APPENDIX E, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the MTV.

- **APPENDIX F, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.

- **APPENDIX G, MANDATORY REPLACEMENT PARTS.**

- **APPENDIX H, LUBRICATION ORDER.**

- **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**

- **APPENDIX K, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART.** Lists actions required to mate different transmission configurations with WTEC II or WTEC III controls.

- **SUBJECT INDEX.** Lists important subjects contained in 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)**

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

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

- **APPENDIX C, TOOLS IDENTIFICATION LIST.** Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.

- **APPENDIX D, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.

- **APPENDIX E, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the MTV.

- **APPENDIX F, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.
• APPENDIX G, MANDATORY REPLACEMENT PARTS.

• APPENDIX H, LUBRICATION ORDER.

• APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).

• APPENDIX K, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART. Lists actions required to mate different transmission configurations with WTEC II or WTEC III controls.

• SUBJECT INDEX. Lists important subjects contained in volume 2 in alphabetical order and gives the associated paragraph number.

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 2, TROUBLESHOOTING (CONT)

• CHAPTER 3, ENGINE MAINTENANCE

• CHAPTER 4, FUEL SYSTEM MAINTENANCE

• CHAPTER 5, EXHAUST SYSTEM MAINTENANCE

• CHAPTER 6, COOLING SYSTEM MAINTENANCE

• CHAPTER 7, ELECTRICAL SYSTEM MAINTENANCE

• APPENDIX A, REFERENCES. Lists publications used with the MTV.

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

• APPENDIX C, TOOLS IDENTIFICATION LIST. Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.

• APPENDIX D, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST. Lists expendable and durable items used in the performance of maintenance.

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• APPENDIX G, MANDATORY REPLACEMENT PARTS.

• APPENDIX H, LUBRICATION ORDER.

• APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).

• APPENDIX K, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART. Lists actions required to mate different transmission configurations with WTEC II or WTEC III controls.
OVERVIEW (CONT)

- **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 7, ELECTRICAL SYSTEM MAINTENANCE (CONT)**
- **CHAPTER 8, TRANSMISSION MAINTENANCE**
- **CHAPTER 9, PROPELLER SHAFT MAINTENANCE**
- **CHAPTER 10, FRONT, INTERMEDIATE, 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**
- **CHAPTER 16, BODY AND CAB MAINTENANCE**
- **APPENDIX A, REFERENCES.** Lists publications used with the MTV.
- **APPENDIX B, MAINTENANCE ALLOCATION CHART.** The maintenance allocation chart denotes the level of maintenance which performs specific maintenance tasks and the time required. It also lists tools and special tools required for each task.
- **APPENDIX C, TOOLS IDENTIFICATION LIST.** Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.
- **APPENDIX D, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.
- **APPENDIX E, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the MTV.
- **APPENDIX F, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.
- **APPENDIX G, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX H, LUBRICATION ORDER.**
- **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**
- **APPENDIX K, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART.** Lists actions required to mate different transmission configurations with WTEC II or WTEC III controls.
• **SUBJECT INDEX.** Lists important subjects contained in volume 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 17, MATERIAL HANDLING CRANES, 30K WINCHES, AND 15K SELF-RECOVERY WINCH (SRW) MAINTENANCE**

• **CHAPTER 18, BODY, CHASSIS, AND ACCESSORY ITEMS MAINTENANCE**

• **CHAPTER 19, HYDRAULIC SYSTEM MAINTENANCE**

• **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 MTV.

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

• **APPENDIX C, TOOLS IDENTIFICATION LIST.** Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.

• **APPENDIX D, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.

• **APPENDIX E, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the MTV.

• **APPENDIX F, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.

• **APPENDIX G, MANDATORY REPLACEMENT PARTS.**

• **APPENDIX H, LUBRICATION ORDER.**

• **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**

• **APPENDIX K, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART.** Lists actions required to mate different transmission configurations with WTEC II or WTEC III controls.

• **SUBJECT INDEX.** Lists important subjects contained in volume 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 through 24. The PMCS and troubleshooting tables often reference you to these procedures. When you perform maintenance, look over the entire procedure before starting. Make sure you have the necessary tools and materials at hand. Always follow the WARNINGS and CAUTIONS.

FOLLOW THESE GUIDELINES WHEN USING THIS MANUAL:

- Become familiar with the entire maintenance procedure before beginning a maintenance task.

- Read all WARNINGS and CAUTIONS before performing any procedures.
CHAPTER 1
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Section I. GENERAL INFORMATION

1-1. SCOPE

This chapter provides general information, equipment description, and principles of operation for the M1083 series Medium Tactical Vehicle (MTV). The MTV will herein be referred to as the vehicle.


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

M1083 Truck, Cargo: 5-Ton, 6x6, Dropside (Figure 1-1).
M1084 Truck, Cargo: 5-Ton, 6x6, Dropside, W/MHC (Figure 1-2).
M1085 Truck, Cargo: 5-Ton, 6x6, Dropside, LWB (Figure 1-3).
M1086 Truck, Cargo: 5-Ton, 6x6, Dropside, LWB, W/MHC (Figure 1-4).
M1088 Truck, Tractor: 5-Ton, 6x6 (Figure 1-5).
M1089 Truck, Wrecker: 5-Ton, 6x6 (Figure 1-6).
M1090 Truck, Dump: 5-Ton, 6x6 (Figure 1-7).
M1092 Truck, Chassis: 5-Ton, 6x6 (Figure 1-8).
M1093 Truck, Cargo: 5-Ton, 6x6, Dropside, AIR DROP (Figure 1-9).
M1094 Truck, Dump: 5-Ton, 6x6, AIR DROP (Figure 1-10).
M1096 Truck, Chassis: 5-Ton, 6x6, LWB (Figure 1-11).
c. **Purpose of Equipment.** The MTV series is a family of 6x6 wheeled vehicles. The purpose of these vehicles is as follows:

(1) M1083 - Cargo hauling vehicle; can be outfitted for troop transport when equipped with a troopseat kit.

(2) M1084 - Cargo hauling vehicle; equipped with a Material Handling Crane (MHC).

(3) M1085 - Long Wheelbase (LWB) cargo hauling vehicle; can be outfitted for troop transport when equipped with a troopseat kit.

(4) M1086 - Long Wheelbase (LWB) cargo hauling vehicle; equipped with a Material Handling Crane (MHC).

(5) M1088 - Tractor with fifth wheel; used to pull various types of fifth wheel trailers.

(6) M1089 - Wrecker with two winches, an underlift assembly, and a Material Handling Crane (MHC); used for recovering disabled vehicles.

(7) M1090 - Dump truck; can be outfitted for troop transport when equipped with a troopseat kit.

(8) M1092 - Standard wheelbase vehicle chassis; this chassis will accept a standard cargo bed or may be modified for special missions.

(9) M1093 - Cargo hauling vehicle; can be airdropped and outfitted for troop transport when equipped with a troopseat kit.

(10) M1094 - Dump truck; can be airdropped and outfitted for troop transport when equipped with a troopseat kit.

(11) M1096 - Long Wheelbase (LWB) vehicle chassis; this chassis will accept a long cargo bed or may be modified for special missions.
Figure 1-1. M1083 Truck, Cargo: 5-Ton, 6x6, Dropside
1-1. SCOPE (CONT)

Figure 1-2. M1084 Truck, Cargo: 5-Ton, 6x6, Dropside, W/MHC
Figure 1-3. M1085 Truck, Cargo: 5-Ton, 6x6, Dropside, LWB
Figure 1-4. M1086 Truck, Cargo: 5-Ton, 6x6, Dropside, LWB, W/MHC
Figure 1-5. M1088 Truck, Tractor: 5-Ton, 6x6
1-1. SCOPE (CONT)

Figure 1-6. M1089 Truck, Wrecker: 5-Ton, 6x6

LEFT FRONT VIEW

RIGHT REAR VIEW
LEFT FRONT VIEW

RIGHT REAR VIEW

Figure 1-7. M1090 Truck, Dump: 5-Ton, 6x6
Figure 1-8. M1092 Truck, Chassis: 5-Ton, 6x6
LEFT FRONT VIEW

RIGHT REAR VIEW

Figure 1-9. M1093 Truck, Cargo: 5-Ton, 6x6, Dropside, AIR DROP
Figure 1-10. M1094 Truck, Dump: 5-Ton, 6x6, AIR DROP
Figure 1-11. M1096 Truck, Chassis: 5-Ton, 6x6, LWB
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 M1083 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>
<thead>
<tr>
<th>Common Name</th>
<th>Official Nomenclature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold Start System</td>
<td>Ether Quick-Start System</td>
</tr>
<tr>
<td>Engine Coolant</td>
<td>Antifreeze, Ethylene, Glycol, Inhibited</td>
</tr>
<tr>
<td>Gladhand</td>
<td>Quick-Disconnect Coupling</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Medium Tactical Vehicle (MTV)</td>
</tr>
</tbody>
</table>

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

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

1-6. WARRANTY INFORMATION

Refer to M1083 Series Warranty Program Technical Bulletin, TB 9-2300-366-15, 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 9-2320-366-10-1 for equipment characteristics, capabilities, and features.
1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Refer to TM 9-2320-366-10-1 for location and description of major components.

1-9. DIFFERENCES BETWEEN MODELS

Refer to TM 9-2320-366-10-1 for differences between models.

Section III. PRINCIPLES OF OPERATION

1-10. POWERTRAIN

Power for the vehicle is provided by a diesel engine (1, Figure 1-12) 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, 5, and 6) 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 either a WTEC II Transmission Electronic Control Unit (ECU) Pushbutton Shift Selector (WTEC II TEPSS) or a WTEC III Transmission Pushbutton Shift Selector (WTEC III TPSS) coupled with a WTEC III transmission ECU; a control module located directly beneath the transmission main housing; a Throttle Position Sensor (TPS) which detects the percentage of throttle being used; engine, turbine, and output speed sensors which, in combination with each other, send information to the ECU to provide the smoothest possible shifting and allow the ECU to monitor overall transmission performance.
a. **Engine.** The vehicle is equipped with a Caterpillar diesel engine, model 3116 ATAAC (Air-to-Air After Cooler) (1, Figure 1-12), rated at 290 HP.

b. **Transmission.** The vehicle is equipped with an Allison automatic transmission, model MD3070PT (2, Figure 1-12). It is a fully automatic electronically controlled seven-speed close-ratio transmission.

(1) The WTEC II TEPSS contains microprocessor based electronics, and is located in the instrument panel to the driver’s left. The WTEC III TPSS is located in the instrument panel to the driver’s left, while the WTEC III 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 WTEC II TEPSS and WTEC III 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 WTEC II TEPSS and a fault is detected in the transmission controls, the WTEC II TEPSS will emit an eight second series of beeps. When electrical power is applied to the WTEC III TPSS and a fault is detected in the transmission controls, "--" will appear in the WTEC III 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 9-2320-366-10-1 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 hydraulically operated components.
c. **Transfer Case.** The transfer case (3, Figure 1-12) 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, Intermediate and Rear axles (4, 5, and 6, Figure 1-12) 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.

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**1-11. ENGINE AIR INTAKE SYSTEM**

The engine air intake system consists of a dry-type air cleaner (1, Figure 1-13), 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.
The primary components of the fuel system are the fuel tank (1, Figure 1-14), 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.
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.
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 1-15), 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 1-15. 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.
Cooling capacity for the transmission is increased through the use of a transmission auxiliary oil cooler (9). All MTV vehicles, except M1088 and M1089, are supplied with a transmission auxiliary oil cooler equipped with a single electric fan (10) to draw air over the oil cooler core. The M1088 and M1089 vehicles are supplied with a larger transmission auxiliary oil cooler (11) equipped with dual electric fans (12) to provide even more air flow across the oil cooler core.

Figure 1-15. Cooling System (Cont)
1-14. ELECTRICAL SYSTEM

In the Electrical System, a heavy duty starting motor (1, Figure 1-16) 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
- Material Handling Crane (MHC)
- Troubleshooting Aid
- M1089 Underlift

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.
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 1-17) 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.
c. Service Lighting. The Service Lighting System includes the headlights (1, Figure 1-18), 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 9-2320-366-10-1).
**d. Blackout Lighting.** The Blackout Lighting System includes the front blackout marker lights (1, Figure 1-19), 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 9-2320-366-10-1).

**e. Accessory Lighting.** The accessory lights are the warning light and worklights. These circuits are energized by positioning the appropriate switch (TM 9-2320-366-10-1) to on. The worklights are then controlled by a separate switch on the worklight.
f. **Instruments.** The Instrument Panel includes all gages that provide the operator with information about vehicle condition and operating status. The speedometer (1, Figure 1-20) 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.
h. Material Handling Crane (MHC). The primary electrical components of the MHC System are the remote control box (1, Figure 1-21), junction box (2), overload shutdown box (3), tension load cell (4), left and right side jack cylinder proximity sensors (5) and several function and lockout solenoids. When the operator selects an MHC function using the remote control box, electrical current is sent through the junction box and to the appropriate solenoid. When energized from the remote control box, the function solenoid controls hydraulic pressure to the function selected by the operator. When the function solenoid is de-energized, hydraulic pressure is removed and the function stops. The overload shutdown system controls the lockout solenoids. The lockout solenoids prevent operation of certain MHC functions when an overload condition is sensed. Overload conditions are sensed, in combination, by the tension load cell and a microprocessor inside the overload shutdown box which monitors boom angle and extension. When an overload condition is sensed, the boom up/boom down, hoist up, telescope out functions are locked out. The hoist down and telescope in functions will still operate and allow the operator to safely lower the load to the ground. When the power switch on the remote control box is used as an emergency shutdown, all crane functions are locked out. The left and right side jack cylinder proximity sensors prevent operation of the MHC until both jack cylinder outrigger pads are lowered fully to the ground.
i. **Troubleshooting Aid.** A start inhibit switch (1, Figure 1-22), 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.
j. **M1089 Underlift.** The electrical portion of the M1089 Underlift consists of a remote control box (1, Figure 1-23) and solenoids attached to the function valves in the WRECKER CONTROL PANEL (2). When the operator selects an underlift function from the remote control box, electrical current is sent to the solenoid which controls the selected function. The solenoid is energized and hydraulic pressure is supplied to the selected component(s). When the solenoid is de-energized, hydraulic pressure is removed and the selected function stops.
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 1-24) 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).
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. A booster valve (6) is incorporated into the primary brake circuit to provide a more rapid braking response. Air from the booster valve is supplied to the load sensing valve (7) which, in turn, controls air delivery to the relay valve (8). The load sensing valve is mounted on a crossmember and connected, by a spring and cable, to the load averaging channel. This arrangement of the load sensing valve and load averaging channel 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 (9) 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.
The vehicle is equipped with hydraulically-assisted power steering. The power steering pump (1, Figure 1-25) 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.
When specified, any vehicle except models M1084 and M1086 may be equipped with a 15K Self-Recovery Winch (SRW) (1, Figure 1-26) mounted on the right hand frame rail. The SRW is rated for 15,500 lbs (68,944 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 9,090 lbs (40,432 N). For recovery operations, the SRW cable may be routed to the front on all vehicles so equipped. The SRW cable may be routed to the rear of the vehicle on models M1083, M1085, M1090, M1093, and M1094. 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.
Vehicle models M1084 and M1086 are equipped with a Material Handling Crane (MHC) (1, Figure 1-27) mounted on the frame at the rear of the vehicle. The M1084/M1086 MHC has a lifting capacity of 5,000 lbs (2,270 kgs). The MHC contains an overload shutdown system which monitors boom angle, boom extension, and load weight. If the overload shutdown system senses an overload condition, certain crane functions become locked out. The vehicle is stabilized during crane operation by jack cylinders (2). Proximity sensors are attached to the jack cylinders to prevent operation of the crane unless the jack cylinders are extended to the ground. Outrigger pads (3) are provided and are attached to the bottom of the jack cylinders by quick release pins. All crane functions are hydraulically controlled by levers at the control station (4). All exposed hydraulic cylinder rods are hard chrome plated to resist corrosion and wear.

**a. MHC Hydraulic System.** The hydraulic reservoir (5) provides for 21 gal (79 L) of fluid. A fluid filter (6) is mounted on the hydraulic reservoir. The filter removes contaminants from the oil and is easily replaced. Hydraulic pressure for the MHC is supplied by a hydraulic pump (7) attached to the rear of the Power Take-Off (PTO) (8). The hydraulic cylinders contain cartridge-type holding valves which lock the cylinder in case of sudden hydraulic pressure loss. A hand operated back-up hydraulic pump (9) allows the operator to lower any load to the ground and stow the crane if the hydraulic pump fails.
b. **MHC Control Station.** All crane functions can be controlled by the operator from the control station (1, Figure 1-28). A lever controlled valve (2) is provided for each control function. All control valves are spring-loaded and will return to the center, or neutral, position when they are released. The control valves are proportionately variable. A small movement from the neutral position results in a small change in the function which that valve controls. A larger movement from the neutral position results in a faster change. The function of each control lever is identified on the end of the control knob (3).

c. **MHC Remote Control.** The MHC remote control (4) permits operation of the crane from either side of the vehicle. This feature allows the operator to keep the load in sight at all times. A remote control switch (5) activates power to the remote control connector (6). The remote control is attached to the crane by an electrical cable. When the remote control is active, solenoids on the control valves respond to input from the remote control. The levers on the remote control are proportionately variable. A small change in lever position results in a small change in the function controlled by that lever. A larger change in lever position results in a faster change in function. The levers on the remote control are also spring-loaded and will return to the neutral position when released. The remote control can be used to operate hoist up/down, boom up/down, telescope in/out, and swing clockwise/counterclockwise.

*Figure 1-28. MHC Control Station and Remote Control*
Vehicle model M1089 is equipped with a Material Handling Crane (MHC) (1, Figure 1-29) mounted on the frame near the middle of the vehicle; left and right 30K winches (2), located ahead of the MHC; and an underlift (3), attached to the rear of the vehicle.
a. Material Handling Crane (MHC). The M1089 MHC has a lifting capacity of 11,000 lbs (4,994 kgs). The MHC contains an overload shutdown system which monitors boom angle, boom extension, and load weight. If the overload shutdown system senses an overload condition, certain crane functions become locked out. The vehicle is stabilized during crane operation by jack cylinders (4) attached to outrigger beams. Outrigger pads (5) are provided and are attached to the bottom of the jack cylinders by quick release pins. All crane functions are hydraulically controlled by levers at the control station (6). All exposed hydraulic cylinder rods are hard chrome plated to resist corrosion and wear.
b. Hydraulic System. All of the hydraulics on the M1089 are driven by a common power source and supply system. The M1089 is provided with a hydraulic tank (7) which has a capacity of 74 gal (280 L) of fluid. The hydraulic tank contains an internal fluid filter. The filter removes contaminants from the oil and is easily replaced. Hydraulic pressure for the MHC is supplied by a three stage hydraulic pump (8) attached to the rear of the Power Take-Off (PTO) (9). The hydraulic cylinders contain cartridge-type holding valves which lock the cylinder in case of sudden hydraulic pressure loss. A hand operated back-up hydraulic pump (10) allows the operator to lower any load to the ground and stow the crane if the hydraulic pump fails.
c. **M1089 30K Winches.** The left and right 30K winches (1, Figure 1-30) are designed to be used for recovering stranded vehicles from the rear of the M1089. The 30K winches are rated for a 30,000 lbs (13,620 kgs) pull with only one full layer of cable on the winch drum. Pulling capacity is reduced with each layer of cable that is added to the winch drum. Pulling capacity with a full drum of cable is 15,830 lbs (7,187 kgs). One full layer of cable is the minimum amount of cable that may be left on the drum when using the winch. The winch 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. The 30K winches are equipped with pay-in/reel out spoolers (2) to keep tension on the cable when cable is payed-in/reeled out. The 30K winches can be controlled from either the M1089 control panel (3) or from the remote control (4).
d. **M1089 Underlift.** Vehicle model M1089 is equipped with a hydraulic underlift (1, Figure 1-31) component. The underlift is used for towing a disabled vehicle. Stifflegs (2) are used to keep the M1089 vehicle stable during recovery operations. The stinger (3) can be extended to position the crossbar (4) beneath the vehicle being recovered. The crossbar is equipped with adapters which make it suitable for towing a wide range of vehicles. Two underlift cylinders (5) control the height of the crossbar to allow the operator to tow a disabled vehicle with the front wheels off the ground. All underlift functions are hydraulically controlled from the wrecker control panel (6).
The entire series of M1083 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 secondary and primary air tanks (1 and 2, Figure 1-32) 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).
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.
1-21. 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 1-33) 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.
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.

Figure 1-33. Air System (Cont)
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Section I. REPAIR PARTS, TOOLS, SPECIAL TOOLS, TEST, MEASUREMENT,
AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT

2-1. COMMON TOOLS AND EQUIPMENT

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

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

For a listing of special tools, TMDE, and support equipment, refer to the Maintenance Allocation Chart (MAC), Appendix B, of this manual and to the Repair Parts and Special Tools List (RPSTL), TM 9-2320-366-24P.

2-3. REPAIR PARTS

Mandatory replacement parts are listed in Appendix G. Repair parts are listed and illustrated in the RPSTL, TM 9-2320-366-24P, covering Unit Maintenance repair parts and special tools for vehicle.

Section II. SERVICE UPON RECEIPT

2-4. UNPACKING AND DEPROCESSING

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 9-2320-366-10-1). 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 9-2320-366-10-HR) in good condition, clean and properly mounted or stowed (TM 9-2320-366-10-1).
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 hand throttle 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 9-2320-366-10-HR.
2-6. SERVICE BEFORE OPERATION

a. General.

(1) Refer to TM 9-2320-366-10-1 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 9-2320-366-10-1). Inspect all assemblies, subassemblies, and accessories to be sure they are in proper working order. Secure, clean, correctly adjust, and/or lubricate (TM 9-2320-366-10-1 and Appendix H) as needed. Check all tools and equipment to be sure every item is there (TM 9-2320-366-10-HR), in good condition, clean and properly mounted or stowed (TM 9-2320-366-10-1).

(3) Follow general procedures for all services and inspections given in TM 9-2320-366-10-1.

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 (BII) against checklist to make sure all items are accounted for and are in good condition (TM 9-2320-366-10-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 65, Appendix D).

(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, Intermediate, and Rear Axle oil change.
   (2) Perform Front Axle Wheel end Planetary Hub oil change.
2-6. SERVICE BEFORE OPERATION (CONT)

b. Initial 1000 miles (1609 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 5000 miles (8045 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 skin. Failure to comply may result in injury to 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 9-2320-366-10-1).
      (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 9-2320-366-10-1).
      (a) Inspect cab for evidence of damage during shipment.
      (b) Inspect windshield 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 seat adjustments to ensure they are functioning properly.
      (f) Unpin cab air springs, stow retaining pins, and inflate cab air spring (TM 9-2320-366-10-2, Preparation for Internal Air Transport).

   (3) Engine Inspection (TM 9-2320-366-10-1).
      (a) Examine intake air cleaner element for dirty or restricted condition.
      (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) Inspect engine and coolant hose connections for evidence of leakage.
(e) Check for obstructions of cooling air flow to radiator.

(4) Transmission Inspection (TM 9-2320-366-10-1).
   (a) Check fluid level with dipstick.
   (b) Check external tubes and hoses for evidence of leakage.

(5) Transfer Case Inspection (TM 9-2320-366-10-1).
   (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 9-2320-366-10-1).
   (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) Check that alternator is charging batteries properly.
   (d) Check that all electrical equipment functions properly.

(7) Air System Inspection (TM 9-2320-366-10-1).
   (a) Drain any water from air tanks.
   (b) Inspect all accessible air hose and tubing connections for leakage.

(8) Steering System Inspection (TM 9-2320-366-10-1).
   (a) Check steering hydraulic reservoir for proper fluid level.
   (b) Examine steering linkage and steering gear for damage incurred during shipment.
   (c) Examine steering hoses and connections for evidence of leakage.
   (d) Check steering system for proper operation during road test.

(9) Chassis and Front, Intermediate, and Rear Axle Inspection (TM 9-2320-366-10-1).
   (a) Check all lubricant levels.
   (b) Check axle housing pressure vents to ensure freedom from foreign matter.
2-6. SERVICE BEFORE OPERATION (CONT)

(10) Tire Inspection.

(a) Check tire pressure (TM 9-2320-366-20-1).

(b) Inspect tires for serious cuts, bubbles, cracks, bruises, dry-rot, foreign objects, or exposure of internal cords. Remove any foreign objects lodged between treads (TM 9-2320-366-20-1).

(c) Check all wheel mounting nuts for proper torque (para 12-4).


(a) Check fuel level and replenish if necessary.

(b) Inspect fuel tubes, hoses, 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 7-4).

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

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

This section contains Unit Maintenance Preventive Maintenance Checks and Services (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 PMCS in TM 9-2320-366-10-1 before doing the Unit Maintenance PMCS.

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 65, 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, replace or repair using the 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 using the 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, replace or repair it.

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

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### 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 perform 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.

f. When doing preventive maintenance, take along the tools and supplies needed to make all the checks, including a clean cloth or two.
2-9. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) TABLE (CONT)

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 as a source of reference 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 integrated 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.
Table 2-1. Preventive Maintenance Checks and Services

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ROAD TEST</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maintenance personnel will be with vehicle operator during the road test.</td>
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<tr>
<td></td>
<td></td>
<td>NOTE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Perform the following during road test.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>• For road test, vehicle will be driven at least five miles over different ground to give enough time to detect any malfunctions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. Notice if starter engages smoothly and turns engine at normal cranking speed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. Test for accelerator response. Observe for sticking pedal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Semiannual</td>
<td>Preservice Checks</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. Starter inoperative or makes excessive grinding sound.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Engine knocks, rattles or smokes excessively.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Transmission shifts improperly, does not shift or makes excessive noises.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. Pedal sticking or binding.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>e. Steering binds, grabs, wanders or freeplay is more than 1-1/2 in. (3.8 cm) in either direction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item No.</td>
<td>Interval</td>
<td>Location Item to be Checked or Serviced</td>
<td>Procedure</td>
<td>Not Fully Mission Capable If:</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>----------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Semiannual</td>
<td>Preservice Checks (CONT)</td>
<td>NOTE</td>
<td>f. Steering wheel exceeds 2-1/2 in. (6.4 cm) free play.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>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).</td>
<td>g. Brakes chatter, pull to one side, will not release, or do not work.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>g. Apply brake pedal with steady force. Vehicle should slow down and stop without pulling to one side or jerking. Release brake pedal. The brakes should release immediately and without difficulty.</td>
<td>h. Handling is unstable.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>h. Observe vehicle response to road shocks, side sway or continuous bouncing indicates a malfunction.</td>
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<td></td>
<td>CAUTION</td>
<td>i. Hard steering is evident.</td>
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<td></td>
<td>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.</td>
<td>j. Engine exceeds or fails to reach governed speed.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>i. With vehicle stopped, turn steering wheel to extreme left, then to extreme right to check for binding or jerking.</td>
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<td></td>
<td>j. Check engine operation at all speeds. Ensure that engine does not go over engine governed speed - (55 mph or 2600 rpm).</td>
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</tr>
</tbody>
</table>
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location</th>
<th>Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Semiannual</td>
<td>WHEELS, HUBS, AND CTIS</td>
<td></td>
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</tr>
</tbody>
</table>

**WARNING**

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.

- a. Check wheels for obvious cracks around lug holes. If cracks are found, repair wheel (para 12-2).
- b. Replace any loose or damaged wheel studs (para 12-3). Tighten lugnuts (para 12-4).
- c. Check for oil leaks.
- d. Check and fill wheel end hub (Appendix H).
- e. Check wheels for CTIS air leaks.
- f. Remove manifold valve (para 12-5) and inspect manifold filter for damage. Clean any debris from manifold filter.

- a. Cracks are found around lug holes.
- b. More than one lugnut or wheel stud is damaged or missing.
- c. Class III leak is evident.
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 3        | Semiannual    | SERVICE BRAKES                          | **WARNING**  

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

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

a. Shut down engine (TM 9-2320-366-10-1) and drain primary air tank. Rear service brakes should not apply. If rear service brakes apply, inversion valve is inoperative. Replace inversion valve (para 11-13). 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.  

a. Rear portion of brake system fails.
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Semiannual</td>
<td>SERVICE BRAKES (CONT)</td>
<td>b. Inspect load sensing valve for signs of corrosion.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Check security of mounting hardware.</td>
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<td></td>
<td></td>
<td></td>
<td>d. Check for air leaks around brake hose fittings.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>e. Inspect control cable for corrosion and abrasions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>f. Check security of control cable upper and lower attaching hardware and adjust (para 11-10).</td>
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<tr>
<td></td>
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<td></td>
<td>g. Inspect brake air chambers for obvious cracks and corrosion.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not Fully Mission Capable If:</th>
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<tbody>
<tr>
<td>d. Air leaks are found.</td>
</tr>
<tr>
<td>e. Control cable is damaged or missing.</td>
</tr>
<tr>
<td>g. Brake air chamber leaks.</td>
</tr>
<tr>
<td>Item No.</td>
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<tr>
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<td>3</td>
</tr>
</tbody>
</table>

**WARNING**

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.

**CAUTION**

Brake drum clearance must be checked along centerline of brake shoe. Failure to comply may result in damage to equipment.

**NOTE**

Over time a ridge will form on the outer edge of the brake shoes. This is normal and does not affect brake shoe serviceability.

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.

h. Brake drums are excessively hot, cool, or rusted.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Semiannual</td>
<td>SERVICE BRAKES (CONT)</td>
<td>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 in. (0.051-0.102 cm) maximum.</td>
<td>i. Brake shoe adjustment is out of tolerance.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>j. Examine brake shoes for excessive brake lining wear and cracking (para 11-2 and 11-3).</td>
<td>j. Brake linings are cracked or excessively worn.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>k. Inspect brake shoe return springs and hold-down clips for cracks.</td>
<td>k. Springs or clips are cracked or broken.</td>
</tr>
<tr>
<td>Item No.</td>
<td>Interval</td>
<td>Location Item to be Checked or Serviced</td>
<td>Procedure</td>
<td>Not Fully Mission Capable If:</td>
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<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>Semiannual</td>
<td>SERVICE BRAKES (CONT)</td>
<td>I. Inspect actuator plunger seals for cuts, tears, and leaks (para 11-4 and 11-5).</td>
<td>I. Plunger seals, adjusting pawl assembly, adjusting plunger or actuator are damaged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SHOCK ABSORBERS AND SPRINGS</td>
<td>a. Inspect shock absorbers for oil leaks and damage.</td>
<td>a. Shock absorber is bent or leak greater than Class I is evident.</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>b. Check shock absorber mounting hardware for security.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>c. Check rubber bushings for looseness which may result in inner sleeve contacting eye ring of shock absorber.</td>
<td>c. Rubber bushings are loose or inner sleeve is contacting eye ring of shock absorber.</td>
</tr>
</tbody>
</table>
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Semiannual</td>
<td>SHOCK ABSORBERS AND SPRINGS (CONT)</td>
<td>d. Inspect spring leaves, spring clips, saddles, saddle caps, and U-bolts for cracks or breaks.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>e. Check torque rods for cracks or bends. Inspect rubber bushings for damage or dry rot.</td>
<td>d. Cracks or breaks are found.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Semiannual</td>
<td>AXLE BREATHER VALVES</td>
<td>a. Inspect axle breather valves to ensure up and down movement.</td>
</tr>
</tbody>
</table>

**WARNING**

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

- If personnel become dizzy while using 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 65, 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 compounds get 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 13, Appendix D) and install axle breather valve in fitting.
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
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<th>Procedure</th>
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</thead>
<tbody>
<tr>
<td>7</td>
<td>Semiannual</td>
<td>DRIVE SHAFTS</td>
<td></td>
<td>WARNING</td>
<td>a. Lubrication fittings, screws or lock tabs are broken or missing, or play is evident.</td>
</tr>
</tbody>
</table>

**WARNING**

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

a. Inspect U-joints for play, broken and missing lubrication fittings (Appendix H).

b. Perform propeller shaft hinging inspection (para 9-3).

c. Inspect all drive shafts for damage or obvious spline movement.

a. Hinging reading is greater than .02 in. (.5 mm).

c. Damage or obvious movement evident.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 7a      | Semiannual | V-ROD CONTROL ARM               | **WARNING**<br>Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.<br>a. Inspect U-bolts for play, cracks, or breaks.  
b. Check V-rod control arms for cracks or bends.  
c. Check V-rod control arm mounting hardware for secure installation. | a. Cracks or breaks are found or there is excessive play.  
b. Any V-rod control arm is cracked or bent.  
c. Bolts or nuts loose or missing. |
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location</th>
<th>Item to be Checked or Serviced</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Semiannual</td>
<td>TRANSMISSION</td>
<td></td>
<td><strong>WARNING</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a. Check transmission for cracks, loose bolts, leaks, and damage.</td>
<td>a. Cracks, loose or missing bolts, or Class III leaks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Check that transmission oil pan bolts and drain plug are tight.</td>
<td>b. Oil pan bolts or drain plug are loose or missing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Inspect transmission output shaft seal for damage or leaks.</td>
<td>c. Damage or Class III leaks are evident.</td>
</tr>
</tbody>
</table>

![Diagram of transmission and drain plug]
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 8       | Semiannual | TRANSMISSION (Cont) | d. Inspect transmission oil cooler tubes/hoses for leaks.  
          |           |                                        | e. Inspect scavenge pump hose for leaks. | d. Class III leak is evident.  
          |           |                                        |            | e. Class III leak is evident. |
| 9       | Semiannual | ENGINE MOUNTS | WARNING  
          |           |                                        | Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.  
          |           |                                        | Check engine mounts for loose hardware or cracks. | Engine mounts are loose or damaged. |
| 10      | Semiannual | ENGINE CRANK-CASE | CAUTION  
          |           |                                        | Initial valve clearance adjustment on new engines, rebuilt engines, or remanufactured engines is required at initial 6,000 miles of engine operation.  
          |           |                                        | The adjustment is necessary due to the initial wear of the valve train components and seating of the valve train components. Notify DS Maintenance if initial valve clearance adjustment is required. Failure to comply may result in damage to equipment. | |
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Semiannual</td>
<td>ENGINE CRANK-CASE (Cont)</td>
<td>COLD TEMPERATURE OPERATION</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>For operation of equipment in continuous temperatures below 0°F (-18°C), remove lubricants</td>
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<tr>
<td></td>
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<td></td>
<td>prescribed in the key for temperature above 0°F (-18°C). Relubricate with lubricant specified in</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>the key for temperatures 0°F to -50°F (-18°C to -46°C).</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>a. Start engine (TM 9-2320-366-10-1) and run for five minutes.</td>
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<td>b. Check for oil leaks around top of engine oil filter.</td>
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<td></td>
<td>c. Shut down engine (TM 9-2320-366-10-1).</td>
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<td></td>
<td></td>
<td></td>
<td>d. Check oil level on engine oil dipstick.</td>
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<td></td>
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<td></td>
<td>e. Add engine oil, if required, to bring oil level to full mark on engine oil dipstick.</td>
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</tr>
<tr>
<td>Item No.</td>
<td>Interval</td>
<td>Location Item to be Checked or Serviced</td>
<td>Procedure</td>
<td>Not Fully Mission Capable If:</td>
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</tr>
<tr>
<td>10</td>
<td>Semiannual</td>
<td>ENGINE CRANK-CASE (Cont)</td>
<td>f. Check oil pan bolts and oil pan drain plug for tightness.</td>
<td>f. Drain plug or oil pan bolts are loose or missing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>g. Check valve cover for evidence of oil leaks.</td>
<td>g. Class III leak is evident.</td>
</tr>
</tbody>
</table>

- **f.** Check oil pan bolts and oil pan drain plug for tightness.
- **g.** Check valve cover for evidence of oil leaks.

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

11  | Semiannual | ENGINE WIRING | Check all engine compartment wiring for frays, splits, missing insulation or poor connections. | Insulation missing. Frays, splits, poor connections evident. |
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Semiannual</td>
<td>AIR SYSTEM</td>
<td>a. Observe air dryer purge valve operation and ensure proper functioning.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>b. Inspect purge valve seal for cracks and leaks.</td>
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<td></td>
<td></td>
<td></td>
<td>c. Check wiring to heater portion of air dryer. Ensure there are no loose connections or frayed wires.</td>
<td>c. Loose connection cannot be tightened or frayed wires are evident.</td>
</tr>
<tr>
<td>Item No.</td>
<td>Interval</td>
<td>Location Item to be Checked or Serviced</td>
<td>Procedure</td>
<td></td>
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</tr>
<tr>
<td>13</td>
<td>Semiannual</td>
<td>EXHAUST SYSTEM</td>
<td><strong>WARNING</strong> 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.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>a. Inspect exhaust manifold, exhaust pipes, muffler, and tailpipe for corrosion, carbon deposits, loose clamps, or leaking gaskets.</td>
<td></td>
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</tbody>
</table>

The EXHAUST SYSTEM parts include the exhaust manifold, exhaust pipes, muffler, and tailpipe.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Semiannual</td>
<td>STABILIZER BAR (EXCEPT M1089)</td>
<td>a. Check rear stabilizer bar for secure mounting.</td>
</tr>
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<td></td>
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<td></td>
<td>b. Inspect stabilizer rubber bushings for cracks and dry rot.</td>
</tr>
</tbody>
</table>
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Semiannual</td>
<td>PINTLE TOWING HOOK</td>
<td>a. Check for free rotation and operation of pintle towing hook.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PINTLE TOWING HOOK</td>
<td>b. Inspect pintle towing hook and mounting plate for cracks or loose hardware.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Inspect pintle cotter pin for presence.</td>
</tr>
</tbody>
</table>

![Diagram of pintle towing hook and cotter pin]
### Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location</th>
<th>Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Semiannual</td>
<td>VEHICLE EXTERIOR</td>
<td></td>
<td>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.</td>
<td>a. Cover gasket is not intact or capable of making a good seal.</td>
</tr>
<tr>
<td>17</td>
<td>Semiannual</td>
<td>AIR CLEANER</td>
<td></td>
<td>a. Remove air cleaner cover and examine air cleaner cover gasket for dry rot and/or missing sections.</td>
<td></td>
</tr>
<tr>
<td>Item No.</td>
<td>Interval</td>
<td>Location Item to be Checked or Serviced</td>
<td>Procedure</td>
<td>Not Fully Mission Capable If:</td>
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</tr>
</tbody>
</table>
| 17      | Semiannual  | AIR CLEANER (CONT)                      | b. Inspect air shutter by loosening one hose clamp, removing cover, and ensuring air shutter moves freely without binding or resistance.  
c. Inspect air shutter gasket for cracking and dry rot.  
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. | b. Air shutter binds or is stuck.  
c. Gasket is broken or dry rotted.  
d. Particle extraction pathway between air cleaner and tailpipe is not intact. |
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
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<th>Procedure</th>
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<tbody>
<tr>
<td>18</td>
<td>Semiannual</td>
<td>BATTERIES AND BATTERY BOX</td>
<td><img src="image" alt="Warning" /></td>
<td></td>
</tr>
</tbody>
</table>

- 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.

- 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.

- 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.

a. Inspect battery box for obvious signs of corrosion and for loose mounting hardware.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 18      | Semiannual | BATTERIES 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. |

**Procedure:**

- **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.
- **d.** Inspect battery cables for corrosion, frays, splits, chafing and secure attachment.
- **d.** Battery cables are worn, frayed or corroded.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Semiannual</td>
<td>BOGIE AXLE</td>
<td>Inspect axle bogie for damage.</td>
<td>Damage to or excessive movement in axle bogie.</td>
</tr>
</tbody>
</table>
| 20      | 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)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 21       | 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. |
| 22       | Semiannual| CAB HYDRAULIC LATCH                     | Check security of attaching hardware for hydraulic cab latch. | a. If cab will not securely latch.  
<pre><code>      |           |                                         |           | b. missing or loose hardware. |
</code></pre>
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>Semiannual</td>
<td>AIR/HYDRAULIC</td>
<td>Check air/hydraulic power unit reservoir and refill in accordance with Appendix H.</td>
<td>Class III leak is evident.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>POWER UNIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Semiannual</td>
<td>SUSPENSION</td>
<td>Check suspension cylinder for oil leaks and damage.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CYLINDER</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Diagram of AIR/HYDRAULIC POWER UNIT and SUSPENSION CYLINDER]
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Semiannual</td>
<td>STEERING SYSTEM</td>
<td>a. Inspect steering column universal joint attachment hardware for security.</td>
<td>a. Universal joint is loose, broken, cracked, or hardware is missing.</td>
</tr>
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<td></td>
<td><strong>NOTE</strong></td>
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<td></td>
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<td></td>
<td>Wheels must be centered before performing step b.</td>
</tr>
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<td></td>
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<td></td>
<td><strong>b.</strong> Inspect staking of pitman arm attachment nut.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>c.</strong> Inspect power steering hoses for leaks, cracks, and chafing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>d.</strong> Check steering gear mounting bolts for tightness.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>e.</strong> Check steering column U-joint, steering knuckles, tie rod, drag link, pitman arm, and steering gear for tightness, breaks, cracks, rust, and serviceability.</td>
</tr>
</tbody>
</table>

![Diagram of steering system components]
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>Semiannual</td>
<td>PULLEY DAMPER</td>
<td>Inspect pulley damper for dents.</td>
<td>Pulley damper is damaged.</td>
</tr>
<tr>
<td>27</td>
<td>Semiannual</td>
<td>ALTERNATOR PULLEY</td>
<td>Inspect alternator pulley for dents, nicks, and cuts in flanges.</td>
<td>Pulley is damaged to the point that it affects belt wear.</td>
</tr>
</tbody>
</table>
| 28      | Semiannual| ALTERNATOR BRACKETS                    | a. Check for loose or cracked mounting hardware on alternator bracket and alternator pulley.  
<pre><code>       |           |                                        | b. Check idler pulley for dents, nicks, and cuts in flanges. | Pulley is damaged to the point that it affects belt wear. |
</code></pre>
<p>| 29      | Semiannual| ALTERNATOR 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. |</p>
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Semiannual</td>
<td>THROTTLE POSITION SENSOR (TPS)</td>
<td>Check TPS for secure mounting.</td>
<td>TPS is not firmly mounted or securely attached to throttle lever.</td>
</tr>
</tbody>
</table>
| 31      | Semiannual | ENGINE                                  | a. Inspect engine speed governor for loose mounting hardware.  
b. Check for fuel leaks around fittings and for abrasion of fuel hoses. | a. Mounting hardware is loose or missing.  
b. Fuel leaks are evident. |
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location</th>
<th>Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 31      | 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. |
| 32      | Semiannual | TURBO-CHARGER |                               | Check turbocharger oil tubes for leaks or crimping which would restrict oil flow.  
a. Inspect charge air cooler tube assembly for obvious signs of corrosion or cracking. | Class III leak is evident.  
a. Charge air cooler tubing is cracked. |
| 33      | Semiannual | CHARGE AIR COOLER TUBES |                       | Check turbocharger oil tubes for leaks or crimping which would restrict oil flow.  
a. Inspect charge air cooler tube assembly for obvious signs of corrosion or cracking. | Class III leak is evident.  
a. Charge air cooler tubing is cracked. |
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>Semiannual</td>
<td>CHARGE AIR COOLER TUBES (Cont)</td>
<td>b. Check all hose clamps between turbocharger and intake manifold and verify that they are tight (90-100 lb-in. (10-11 N·m)).</td>
<td>c. Rubber hose(s) is damaged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Check turbocharger rubber charge air hoses for cracking and chafing.</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Semiannual</td>
<td>CHARGE AIR COOLER</td>
<td>a. Inspect charge air cooler for bent or clogged cooling fins.</td>
<td>a. Charge air cooler is damaged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Check charge air cooler mounting for security and tighten any loose hardware.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Inspect mounting brackets for cracks and damage.</td>
<td></td>
</tr>
</tbody>
</table>
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
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<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Semiannual</td>
<td>EXHAUST AND INTAKE MANIFOLDS</td>
<td>a. Check exhaust manifold for damage, loose mounting bolts and for exhaust leaks.</td>
<td>a. Exhaust manifold is damaged, exhaust leaks, or mounting hardware is loose.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Check intake manifold for loose mounting bolts and damage.</td>
<td>b. Intake manifold is damaged. Mounting hardware is loose.</td>
</tr>
<tr>
<td>36</td>
<td>Semiannual</td>
<td>ENGINE CRANKCASE BREATHER</td>
<td>Inspect crankcase breather for oil leaks around breather base. Check security of mounting hardware.</td>
<td>Class III leak or loose or missing hardware are evident.</td>
</tr>
</tbody>
</table>
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
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<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>Semiannual</td>
<td>ENGINE WIRING</td>
<td>Check all engine wiring for signs of fraying, chafing, cracking, and burnt insulation.</td>
<td>Wiring is burned, cracked, frayed, or broken.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a. Inspect air compressor and air compressor governor for leaks and loose hardware.</td>
<td>a. Class III leak is evident or hardware is missing or loose.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Inspect air compressor oil tube for leaks and kinks/bends which would cause a restriction.</td>
<td>b. Class III leak, kinks or bends are evident.</td>
</tr>
<tr>
<td>38</td>
<td>Semiannual</td>
<td>AIR COMPRESSOR AND GOVERNOR</td>
<td>c. Check air compressor coolant tubes for leaks and kinks/bends.</td>
<td>c. Class III leak, kinks or bends are evident.</td>
</tr>
</tbody>
</table>

![Diagram of engine components]
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>Semiannual</td>
<td>COOLING SYSTEM</td>
<td>WARNING</td>
<td></td>
</tr>
</tbody>
</table>

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.

- a. Check coolant condition. Test coolant to see if draining is necessary (TB 750-651).
- b. Replace coolant if required (Appendix H).
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 40      | Semiannual   | THERMO-STAT HOUSING                     | a. Check thermostat housing for loose mounting bolts and leaks around base. Tighten loose mounting bolts.  
  b. Inspect upper coolant tube for cracks and splits. Refer to para 6-9 if clamps are found to be loose.  
  c. Check for leaks around water temperature transducer and coolant temperature switch. | a. Class III leak is evident.  
  c. Class III leak is evident. |
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>Semiannual</td>
<td>WATER PUMP</td>
<td>a. Check security of water pump attachment bolts and hose clamps. Refer to para 6-12 if clamps are found to be loose.</td>
<td>a. Bolts are stripped.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Inspect water pump for leaks around impeller shaft.</td>
<td>b. Class III leak is evident.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Inspect water pump pulley and idler pulley for damage.</td>
<td>c. Water pump pulley or idler pulley is damaged to the point that it affects belt wear.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>d. Check drive belt for cracks, frays, and shiny spots.</td>
<td>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.</td>
</tr>
<tr>
<td>Item No.</td>
<td>Interval</td>
<td>Location</td>
<td>Item to be Checked or Serviced</td>
<td>Procedure</td>
</tr>
<tr>
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</tr>
<tr>
<td>42</td>
<td>Semiannual</td>
<td>FAN BLADE AND CLUTCH</td>
<td></td>
<td><strong>a.</strong> Inspect fan for chipping, cracking, and missing fan blades.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>b.</strong> Inspect fan clutch for loose bolts (para 6-14).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>c.</strong> Check fan clutch air hose and fitting for leaks.</td>
</tr>
<tr>
<td>43</td>
<td>Semiannual</td>
<td>RADIATOR</td>
<td></td>
<td><strong>a.</strong> Check radiator for leaks and bent or clogged cooling fins.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>b.</strong> Check fan shroud for cracks and missing pieces.</td>
</tr>
<tr>
<td>Item No.</td>
<td>Interval</td>
<td>Location Item to be Checked or Serviced</td>
<td>Procedure</td>
<td></td>
</tr>
<tr>
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<td>---------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Semiannual</td>
<td>FUEL/WATER SEPARATOR</td>
<td>a. Inspect fuel/water separator assembly for dents and cracks that could cause leaks.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Replace filter element every 6,000 miles (9,656 km) or every six months, whichever occurs first (para 4-13).</td>
<td></td>
</tr>
</tbody>
</table>

**Not Fully Mission Capable If:**

a. Any leak is evident.
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location</th>
<th>Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>Semiannual</td>
<td>FRONT WHEEL ALIGNMENT</td>
<td>Check front wheel alignment (para 13-5).</td>
<td></td>
<td>Front wheels cannot be aligned.</td>
</tr>
</tbody>
</table>

**NOTE**

Do not turn tires when turning wheel to check for steering wheel free play.

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).

Steering wheel exceeds 2-1/2 in. (6.4 cm) free play.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 46      | Semiannual  | TRANSMISSION                           | Check to see if any diagnostic codes are logged in WTEC II TEPSS (para 8-4) or WTEC III TPSS (para 8-5).  
  
  a. Perform Transmission System Troubleshooting (para 2-17) for any diagnostic code(s) logged in WTEC II TEPSS or WTEC III TPSS.  
  
  b. Clear diagnostic code(s) from WTEC II TEPSS (para 8-4) or WTEC III TPSS (para 8-5). | |
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location</th>
<th>Item to be Checked or Serviced</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>Semiannual</td>
<td>HYDRAULIC TANK (M1089)</td>
<td></td>
<td>a. Inspect hydraulic tank for leaks, cracks, or dents.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a. Class III leak is evident.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>b. Check valve and manifold beneath tank for leaks and cracks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>c. Check operation of valve.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>b. Class III leak is evident.</td>
</tr>
<tr>
<td>Item No.</td>
<td>Interval</td>
<td>Location Item to be Checked or Serviced</td>
<td>Procedure</td>
<td>Not Fully Mission Capable If:</td>
</tr>
<tr>
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</tr>
<tr>
<td>48</td>
<td>Semiannual</td>
<td>HYDRAULIC RESERVOIR (If Equipped)</td>
<td>Inspect hydraulic reservoir for leaks, cracks, or dents.</td>
<td>Class III is evident.</td>
</tr>
<tr>
<td>Item No.</td>
<td>Interval</td>
<td>Location</td>
<td>Procedure</td>
<td>Not Fully Mission Capable If:</td>
</tr>
<tr>
<td>---------</td>
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<td>---------------------------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>49</td>
<td>Semiannual</td>
<td>M1084/ M1086/ M1089 MHC</td>
<td>a. Check crane for cracks and security of mounting hardware.</td>
<td>a. Crane is damaged or not securely mounted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Check security of electrical connectors on overload shutdown box.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Inspect electrical cables for cracking, fraying, and chafing.</td>
<td></td>
</tr>
</tbody>
</table>
Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 50       | Semiannual     | M1084/ M1086/ M1089 MHC CABLE            | **WARNING**

  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.

  a. Spool out hoist cable completely (TM 9-2320-366-20-1); and inspect for kinks, sharp bends, abrasions, and broken wires.

  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.

  c. Kinking, crushing, or any other damage resulting in distortion of the cable structure.

  a. Hoist cable is damaged or excessively worn.

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

<table>
<thead>
<tr>
<th>Item No.</th>
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<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 51       | Semiannual| 30K WINCH CABLES (M1089)                | **WARNING**  
A 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.  

a. Spool out main winch cables completely (TM 9-2320-366-20-1); and inspect for kinks, sharp bends, abrasions, and broken wires.  

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. Result  

a. Winch cable is damaged or excessively worn.  

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. |

<p>|       |           |                                       | c. Kinking, crushing, or any other damage resulting in distortion of the cable structure. |                               |</p>
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
</table>
| 52      | Semiannual   | 15K SRW CABLE                           | **WARNING**

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.

a. Spool out 15K SRW cable completely (TM 9-2320-366-20-2); and inspect for kinks, sharp bends, abrasions, and broken wires.

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. 

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.

c. Kinking, crushing, or any other damage resulting in distortion of the cable structure.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location</th>
<th>Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>Semiannual</td>
<td>15K SRW</td>
<td></td>
<td>Check security of 15K SRW mounting hardware.</td>
<td>Mounting hardware broken or missing.</td>
</tr>
</tbody>
</table>

![Self-Recovery Winch Diagram](image1.png)

| 54      | Semiannual   | CARGO BODY   |                                 | a. Check cargo body for corrosion and damage.   |                                |
|         |              |              |                                 | b. Inspect ladder for damage and cracks.        |                                |

![Ladder Diagram](image2.png)
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>Semiannual</td>
<td>TRAILER AIR HOSES (M1088)</td>
<td>a. Check trailer air supply hoses for cracks and leaks.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Inspect gaskets in gladhands for cracking and dry rot.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a. Trailer air supply hoses damaged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>b. Gladhands are damaged.</td>
</tr>
<tr>
<td>56</td>
<td>Semiannual</td>
<td>TRAILER ELECTRICAL POWER</td>
<td>a. Check trailer electrical power cables for cracking, chafing, and bare wires.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Check electrical connectors for secure attachment to cables.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a. Tractor electrical power supply cables are damaged.</td>
</tr>
<tr>
<td>Item No.</td>
<td>Interval</td>
<td>Location Item to be Checked or Serviced</td>
<td>Procedure</td>
<td>Not Fully Mission Capable If:</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>----------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>57</td>
<td>Semiannual</td>
<td>FIFTH WHEEL (M1088)</td>
<td>Check fifth wheel for gouges and loose or missing mounting hardware.</td>
<td>Fifth wheel mounting hardware is loose or missing.</td>
</tr>
<tr>
<td>58</td>
<td>Semiannual</td>
<td>WORK PLATFORM (M1088)</td>
<td>Inspect work platform for corrosion, damage, and cracks. Check security of platform mounting hardware.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2-1. Preventive Maintenance Checks and Services (Cont)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Interval</th>
<th>Location Item to be Checked or Serviced</th>
<th>Procedure</th>
<th>Not Fully Mission Capable If:</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>Semiannual</td>
<td>WORK PLATFORM (M1089)</td>
<td>Inspect work platform for corrosion, damage, and cracks. Check security of platform mounting hardware.</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Semiannual</td>
<td>CROSSBAR (M1089)</td>
<td>a. Inspect crossbar thrust bearing for cracks and grooves.</td>
<td>a. Cracks or grooves are evident.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Inspect crossbar thrust bearing clearance between crossbar and thrust bearing maximum clearance 0.040 in. (0.101 cm).</td>
<td>b. More than 0.040 in. (0.101 cm) clearance is evident.</td>
</tr>
</tbody>
</table>
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 be operational, it is entered at the bottom of the KNOWN INFO box as OK.

(d) QUESTION - Each question, located in the middle column, refers to the first possible problem listed in POSSIBLE PROBLEMS. If the answer to the question is YES, proceed to the next step. If the answer is NO, follow the NO arrow to obtain directions for correcting the problem. If the step contains a WARNING or CAUTION message, a small shadow box is printed above the question. Text for WARNINGS or CAUTIONs is on the following right-hand page.

(e) TEST OPTIONS - This box is located in the top right-hand column. TEST OPTIONS lists tests available for testing parts suspected of failing. When the TEST OPTION is a VOLTAGE TEST, the voltage values listed are nominal values for a 12/24 VDC system. Some variation from these values should be expected. When the TEST OPTION is a CONTINUITY TEST, the expected reading is one of low resistance. If high resistance is noted, further testing should be performed to determine the cause.

(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 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 r1. 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

a. ENGINE SYSTEM TROUBLESHOOTING

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>a1. Engine Does Not Crank</td>
<td>2-72</td>
</tr>
<tr>
<td>a2. Engine Cranks But Does Not Start</td>
<td>2-76</td>
</tr>
<tr>
<td>a3. Low Engine Oil Pressure</td>
<td>2-80</td>
</tr>
<tr>
<td>a4. Engine Stalls at Low RPM</td>
<td>2-82</td>
</tr>
<tr>
<td>a5. Engine Overspeeds on Start</td>
<td>2-88</td>
</tr>
<tr>
<td>a6. Too Much Engine Vibration</td>
<td>2-90</td>
</tr>
<tr>
<td>a7. Coolant in Engine Lubrication Oil</td>
<td>2-92</td>
</tr>
<tr>
<td>a8. Excessive Engine Oil Consumption</td>
<td>2-94</td>
</tr>
<tr>
<td>a9. Engine Overheats</td>
<td>2-98</td>
</tr>
<tr>
<td>a10. Excessive Black or Gray Exhaust Smoke</td>
<td>2-100</td>
</tr>
<tr>
<td>a11. White Exhaust Smoke</td>
<td>2-104</td>
</tr>
<tr>
<td>a12. Low Engine Power</td>
<td>2-108</td>
</tr>
</tbody>
</table>

b. FUEL SYSTEM TROUBLESHOOTING

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>b1. Engine Cranks But Does Not Start or Engine Stalls After Starting</td>
<td>2-110</td>
</tr>
<tr>
<td>b2. Ether Starting Aid Does Not Operate</td>
<td>2-116</td>
</tr>
<tr>
<td>b3. Fuel Consumption Too High</td>
<td>2-120</td>
</tr>
<tr>
<td>b4. Accelerator Pedal Sticks</td>
<td>2-122</td>
</tr>
</tbody>
</table>

c. EXHAUST SYSTEM TROUBLESHOOTING

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>c1. Exhaust System Unusually Noisy or Vibrates Excessively During Engine Operation</td>
<td>2-128</td>
</tr>
<tr>
<td>c2. Exhaust Fumes in Cab</td>
<td>2-132</td>
</tr>
</tbody>
</table>

d. COOLING SYSTEM TROUBLESHOOTING

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>d1. Engine Overheats</td>
<td>2-138</td>
</tr>
<tr>
<td>d2. Oil in Cooling System</td>
<td>2-150</td>
</tr>
<tr>
<td>d3. Loss of Coolant</td>
<td>2-152</td>
</tr>
</tbody>
</table>

e. ELECTRICAL SYSTEM TROUBLESHOOTING

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>e1. Circuit Breaker Does Not Operate</td>
<td>2-158</td>
</tr>
<tr>
<td>e2. Engine Does Not Crank</td>
<td>2-164</td>
</tr>
<tr>
<td>e3. 12 VDC and 24 VDC Circuits Do Not Operate</td>
<td>2-264</td>
</tr>
<tr>
<td>e4. 24 VDC Circuits Do Not Operate</td>
<td>2-268</td>
</tr>
<tr>
<td>e5. Deleted</td>
<td>2-286</td>
</tr>
<tr>
<td>e6. Engine Cranks But Does Not Start</td>
<td>2-310</td>
</tr>
<tr>
<td>e7. FUEL Gage Does Not Operate or Is Inaccurate</td>
<td>2-318</td>
</tr>
<tr>
<td>e8. WATER TEMP Gage Does Not Operate or Is Inaccurate</td>
<td>2-324</td>
</tr>
<tr>
<td>e9. REAR BRAKE AIR Pressure Gage Does Not Operate or Is Inaccurate</td>
<td>2-328</td>
</tr>
<tr>
<td>e10. FRONT BRAKE AIR Pressure Gage Does Not Operate or Is Inaccurate</td>
<td>2-332</td>
</tr>
<tr>
<td>e11. Engine Oil Pressure Gage Does Not Operate or Is Inaccurate</td>
<td>2-336</td>
</tr>
<tr>
<td>e12. Speedometer Does Not Operate or Is Inaccurate</td>
<td>2-342</td>
</tr>
</tbody>
</table>
### Table 2-2. Vehicle Troubleshooting (Cont)

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Troubleshooting Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>e13. VOLTS Gage Does Not Operate or Is Inaccurate</td>
<td>2-356</td>
</tr>
<tr>
<td>e14. Tachometer Does Not Operate or Is Inaccurate</td>
<td>2-358</td>
</tr>
<tr>
<td>e15. Audible Alarm Does Not Operate</td>
<td>2-368</td>
</tr>
<tr>
<td>e16. Troop Transport Audible Alarm Does Not Operate</td>
<td>2-372</td>
</tr>
<tr>
<td>e16A. Master Power Switch Does Not Operate</td>
<td>2-380.4</td>
</tr>
<tr>
<td>e16B. Lamp Test Switch Does Not Illuminate</td>
<td>2-380.10</td>
</tr>
<tr>
<td>e17. Radiator Fan Off Switch Does Not Operate</td>
<td>2-382</td>
</tr>
<tr>
<td>e17A. Ether Start Switch Does Not Operate</td>
<td>2-386</td>
</tr>
<tr>
<td>e17B. Hazard Lights Switch Does Not Operate</td>
<td>2-386.4</td>
</tr>
<tr>
<td>e17C. Amber Warning Light Switch Does Not Operate</td>
<td>2-386.8</td>
</tr>
<tr>
<td>e17D. Master Power Switch Does Not Operate</td>
<td>2-386.12</td>
</tr>
<tr>
<td>e18. REAR BRAKE AIR Gage Does Not Illuminate</td>
<td>2-388</td>
</tr>
<tr>
<td>e18A. FUEL Gage Does Not Illuminate</td>
<td>2-390.2</td>
</tr>
<tr>
<td>e18B. FRONT BRAKE AIR Gage Does Not illuminate</td>
<td>2-390.6</td>
</tr>
<tr>
<td>e18C. Speedometer Does Not Illuminate</td>
<td>2-390.10</td>
</tr>
<tr>
<td>e18D. VOLTS Gage Does Not Illuminate</td>
<td>2-390.14</td>
</tr>
<tr>
<td>e18E. WATER TEMP Gage Does Not illuminate</td>
<td>2-390.18</td>
</tr>
<tr>
<td>e19. OIL PRESS Gage Does Not Illuminate</td>
<td>2-392</td>
</tr>
<tr>
<td>e20. Auxiliary Panel, Personnel Heater, and Instrument Panel Do Not Illuminate</td>
<td>2-396</td>
</tr>
<tr>
<td>e21. Tachometer Does Not Illuminate</td>
<td>2-400</td>
</tr>
<tr>
<td>e22. Auxiliary Panel Switch Does Not Illuminate</td>
<td>2-404</td>
</tr>
<tr>
<td>e23. Auxiliary Panel Does Not Illuminate</td>
<td>2-408</td>
</tr>
<tr>
<td>e24. High Engine Temperature Indicator Does Not Operate</td>
<td>2-412</td>
</tr>
<tr>
<td>e25. Central Tire Inflation System (CTIS) Overspeed Indicator Does Not Operate</td>
<td>2-420</td>
</tr>
<tr>
<td>e26. Chemical Detector Indicator Does Not Operate</td>
<td>2-434</td>
</tr>
<tr>
<td>e27. Left Turn Signal Indicator Does Not Operate</td>
<td>2-438</td>
</tr>
<tr>
<td>e28. Right Turn Signal Indicator Does Not Operate</td>
<td>2-442</td>
</tr>
<tr>
<td>e29. Turn Signal Indicators and High Beams On Indicator Do Not Operate</td>
<td>2-448</td>
</tr>
<tr>
<td>e30. High Beams On Indicator Does Not Operate</td>
<td>2-450</td>
</tr>
<tr>
<td>e31. Parking Brake Indicator and/or Emergency Brake Indicator Does Not Illuminate</td>
<td>2-454</td>
</tr>
<tr>
<td>e32. Power Take-Off (PTO) Indicator Does Not Operate</td>
<td>2-470</td>
</tr>
<tr>
<td>e33. Fan Off Indicator Does Not Operate</td>
<td>2-482</td>
</tr>
<tr>
<td>e34. Dump Up Indicator Does Not Operate</td>
<td>2-488</td>
</tr>
<tr>
<td>e35. WTEC II Transmission Temperature Indicator Does Not Operate</td>
<td>2-498</td>
</tr>
<tr>
<td>e36. WTEC III Transmission Temperature Indicator Does Not Operate</td>
<td>2-506</td>
</tr>
<tr>
<td>e37. Front Brake Air Indicator Does Not Illuminate When Air Pressure Is Below 65 PSI</td>
<td>2-512</td>
</tr>
<tr>
<td>e38. Rear Brake Air Indicator Does Not illuminate When Air Pressure Is Below 65 PSI</td>
<td>2-518</td>
</tr>
<tr>
<td>e39. Engine Oil Pressure Indicator Does Not Operate</td>
<td>2-524</td>
</tr>
<tr>
<td>e40. Master Stop Indicator Does Not Operate</td>
<td>2-530</td>
</tr>
<tr>
<td>e41. One or Both Headlights (High and Low Beam) Do Not Illuminate</td>
<td>2-532</td>
</tr>
<tr>
<td>e42. One or Both Headlight Low Beams Do Not illuminate</td>
<td>2-540</td>
</tr>
<tr>
<td>e43. One or Both Headlight High Beams Do Not illuminate</td>
<td>2-546</td>
</tr>
<tr>
<td>e44. Parking Lights Do Not Illuminate</td>
<td>2-554</td>
</tr>
<tr>
<td>e45. LH Door and/or LH Front Marker Lights Do Not Illuminate</td>
<td>2-562</td>
</tr>
</tbody>
</table>
e46. RH Door and/or RH Front Marker Lights Do Not Illuminate ............................ 2-572

e47. One or More Cab Top Marker Lights Do Not Illuminate .................................. 2-582

e48. M1083/M1084/M1090/M1092/M1093/M1094 Side and/or Rear Marker Lights
Do Not Illuminate ..................................................................................... 2-596

e48A. All Marker Lights Do Not Illuminate In Normal Mode ............................. 2-604.56

e48B. M1085/M1086/M1089/M1096 Intermediate, Side and/or Rear
Marker Light(s) Do Not Illuminate .......................................................... 2-604.70

e48C. M1088 Rear Marker Light(s) Do Not Illuminate ...................................... 2-604.164

e49. One or Both Composite Taillights Do Not Illuminate ................................. 2-606

e50. One or Both Front Blackout Marker Lights Do Not Illuminate ...................... 2-616

e51. Blackout Drive Light Does Not Illuminate ............................................ 2-626

e52. One or Both Rear Blackout Marker Lights Do Not Illuminate ..................... 2-636

e53. Amber Warning Light Does Not Illuminate (All Models Except M1089) ............ 2-646

e54. M1089 Amber Warning Light Does Not Illuminate ................................... 2-658

e55. Backup Light Does Not Illuminate ..................................................... 2-670

e56. Blackout Marker Lights Do Not Illuminate ........................................... 2-708

e56A. Front Hazard Lights Do Not Illuminate ............................................. 2-710

e57. Rear Hazard Lights Do Not Illuminate ............................................... 2-712

e58. Front and Rear Hazard Lights Do Not Illuminate .................................... 2-714

e59. Front and Rear Turn Signals Do Not Operate ........................................ 2-722

e60. Left or Right Front Turn Signal Does Not Operate .................................. 2-734

e61. One or Both Stoplights Do Not Illuminate ........................................... 2-742

e62. One or Both Blackout Stoplights Do Not Illuminate ................................. 2-760

e63. Stoplights and Blackout Stoplights Do Not Operate ............................... 2-772

e64. Stoplights Do Not Operate When M1088 Trailer Brakes Are Applied .............. 2-782

e65. Trailer Marker/Taillights Do Not Illuminate ........................................ 2-786

e66. Trailer Right Stop/Turn Light Does Not Illuminate .................................. 2-796

e67. Trailer Left Stop/Turn Light Does Not Illuminate ..................................... 2-806

e68. Trailer Blackout Marker Lights Do Not Illuminate .................................. 2-816

e69. Trailer Blackout Stoplights Do Not Illuminate ....................................... 2-826

e70. Intervehicle Clearance Lights Do Not Operate ..................................... 2-836

e71. Intervehicle Left Turn Signal Does Not Illuminate .................................. 2-840

e72. Intervehicle Right Turn Signal Does Not Illuminate ................................ 2-846

e73. Intervehicle Stoplights Do Not Operate ............................................. 2-852

e74. Intervehicle Taillights Do Not Operate ............................................. 2-858

e75. Personnel Heater Control Illumination Does Not Operate .......................... 2-862

e76. Personnel Heater Fan Does Not Operate ............................................ 2-868

e77. Windshield Washer Does Not Operate .............................................. 2-874

e78. Windshield Wiper Does Not Operate On Low Speed .................................. 2-886

e79. All Windshield Wiper Speeds Do Not Operate ....................................... 2-894

e80. Windshield Wiper Does Not Operate On Intermittent Speed .......................... 2-900

e81. Windshield Wiper Does Not Operate On High Speed ................................ 2-910

e82. Horn Does Not Operate ........................................................................ 2-916

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v1. Deleted

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Change 1 2-69
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<td>x20. Light Material Handling Crane (LMHC) Hoist In Does Not Operate</td>
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</tr>
<tr>
<td>y1. M1084/M1086 Material Handling Crane (MHC) Hand Pump Does Not Work</td>
<td>2-2410</td>
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<tr>
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<td>z2. Cab Does Not Lower</td>
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<td>z4. Spare Tire Retainer Does Not Lower</td>
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<td></td>
</tr>
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<td>aa3. Main Winch RH FreeSpool Does Not Operate</td>
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<td>aa5. M1089 LH or RH 30K Winch Cable Drum Tensioner Does Not Operate</td>
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<td>aa6. One Wrecker Function Does Not Operate From Wrecker Remote Control</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>ab1. Tires Continue to Wear After Front End Alignment and/or Vehicle Drives Sideways Down Road</td>
<td>2-2436</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Fault No.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
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<td>a1</td>
<td>Engine Does Not Crank</td>
<td>2-72</td>
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<tr>
<td>a2</td>
<td>Engine Cranks But Does Not Start</td>
<td>2-76</td>
</tr>
<tr>
<td>a3</td>
<td>Low Engine Oil Pressure</td>
<td>2-80</td>
</tr>
<tr>
<td>a4</td>
<td>Engine Stalls at Low RPM</td>
<td>2-82</td>
</tr>
<tr>
<td>a5</td>
<td>Engine Overspeeds on Start</td>
<td>2-88</td>
</tr>
<tr>
<td>a6</td>
<td>Too Much Engine Vibration</td>
<td>2-90</td>
</tr>
<tr>
<td>a7</td>
<td>Coolant in Engine Lubrication Oil</td>
<td>2-92</td>
</tr>
<tr>
<td>a8</td>
<td>Excessive Engine Oil Consumption</td>
<td>2-94</td>
</tr>
<tr>
<td>a9</td>
<td>Engine Overheats</td>
<td>2-98</td>
</tr>
<tr>
<td>a10</td>
<td>Excessive Black or Gray Exhaust Smoke</td>
<td>2-100</td>
</tr>
<tr>
<td>a11</td>
<td>White Exhaust Smoke</td>
<td>2-104</td>
</tr>
<tr>
<td>a12</td>
<td>Low Engine Power</td>
<td>2-108</td>
</tr>
</tbody>
</table>
a1. ENGINE DOES NOT CRANK.

INITIAL SETUP

<table>
<thead>
<tr>
<th>Equipment Conditions</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shutdown (TM 9-2320-366-10-1.)</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Apron, Rubber (Item 3, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Gloves, Rubber (Item 13, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Goggles, Industrial (Item 15, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Tester, Antifreeze and Battery (Item 42, Appendix C)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Personnel Required</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2)</td>
<td>TM 9-6140-200-14</td>
</tr>
<tr>
<td></td>
<td>TM 9-4910-571-12&amp;P</td>
</tr>
</tbody>
</table>

KNOWLEDGE

- Batteries electrolyte level OK.

POSSIBLE PROBLEMS

- Faulty battery(ies).
- Faulty electrical system.
- Faulty air compressor.
- Faulty engine assembly.

TEST OPTIONS

- Battery Specific Gravity Test

REASON FOR QUESTION

- Engine will not crank if batteries are discharged.

START

1. WARNING
   Read WARNING on following page.

   Are batteries fully charged?

   NO

   Charge battery(ies)
   (TM 9-6140-200-14) or
   replace battery(ies)
   (para 7-55).

   YES
Battery Specific Gravity Test

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

WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock. 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.
a1. ENGINE DOES NOT CRANK (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batteries electrolyte level OK.</td>
</tr>
<tr>
<td>Battery(ies) OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty electrical system.</td>
</tr>
<tr>
<td>Faulty air compressor.</td>
</tr>
<tr>
<td>Faulty engine assembly.</td>
</tr>
</tbody>
</table>

**TEST OPTIONS**

**REASON FOR QUESTION**

- **Operational Test**

  This question eliminates possible problems and determines where troubleshooting continues.

---

2. Can engine be turned manually?

- **NO**

- **YES**
  - Perform Electrical System Troubleshooting, e2. Engine Does Not Crank.
**OPERATIONAL TEST**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(3)</strong> If engine can not be turned manually, notify DS Maintenance to perform Engine System Troubleshooting task a14. Engine Does Not Crank.</td>
<td></td>
</tr>
<tr>
<td><strong>(4)</strong> If engine can be turned manually, perform Electrical System Troubleshooting, e2. Engine Does Not Crank.</td>
<td></td>
</tr>
<tr>
<td><strong>(5)</strong> Lower cab (TM 9-2320-366-10-1).</td>
<td></td>
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</tbody>
</table>

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

**ALTERNATOR**
**a2. ENGINE CRANKS BUT DOES NOT START**

**INITIAL SETUP**

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

**Personnel Required**
(2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Pan, Drain (Item 24, Appendix C)

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

---

**KNOWN INFO**
- Fuel quantity OK.
- Fuel/water separator is primed.

**POSSIBLE PROBLEMS**
- Air cleaner hose or tube restricted or damaged.
- Faulty fuel system.
- Faulty electrical system.

---

**START**

1. Are air cleaner tube and hose free from restrictions and/or damage?

   **YES**
   - Remove restrictions and damaged air cleaner hose or tube (para 4-2).

   **NO**

2. Does fuel flow from fuel return hose?

   **YES**
   - Perform Fuel System Troubleshooting task b1. Engine Cranks But Does Not Start or Engine Stalls After Starting.

   **NO**

---

**WARNING**
- Read WARNING on following page.

**TEST OPTIONS**
- Fuel Return Hose Test

**REASON FOR QUESTION**
- Restricted or damaged air cleaner hose or tube may cause engine not to intake enough air to ignite fuel.

---

**KNOWN INFO**
- Fuel quantity OK.
- Fuel/water separator is primed.
- Air cleaner hose or tube OK.

**POSSIBLE PROBLEMS**
- Faulty fuel system.
- Faulty electrical system.
(1) Raise cab (TM 9-2320-366-10-1).
(2) Remove air cleaner hose and tube and inspect for restrictions and damage which would cause a loss of intake air (para 4-2).
(3) Lower cab (TM 9-2320-366-10-1).

**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.

<table>
<thead>
<tr>
<th>FUEL RETURN HOSE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Position drain pan under fuel tank.</td>
</tr>
<tr>
<td>(2) Remove fuel return hose from fuel tank.</td>
</tr>
<tr>
<td>(3) Place fuel hose in drain pan.</td>
</tr>
</tbody>
</table>

**NOTE**

Fuel should flow freely from fuel hose with no restriction.

(4) Attempt to start engine (TM 9-2320-366-10-1) and observe fuel flow from fuel return hose.

(5) If fuel does not flow from fuel return hose, perform Fuel System Troubleshooting task b1. Engine Cranks But Does Not Start or Engine Stalls After Starting.


(7) Install fuel return hose on fuel tank.
a3. LOW ENGINE OIL PRESSURE

INITIAL SETUP

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

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

References
TM 9-4910-571-12&P

START

1. Is engine oil filter free from leaks or damage?

   KNOWN INFO
   Engine oil level and condition OK.

   POSSIBLE PROBLEMS
   Damaged engine oil filter.
   Faulty reading from oil pressure gage.

   TEST OPTIONS
   Visual Inspection

   REASON FOR QUESTION
   Leaking engine oil filter or oil tubes will cause low oil level and result in low engine oil pressure.

   NO

   YES

   Replace damaged oil tubes and fittings. Replace damaged engine oil filter (para 3-4).

2. Is oil pressure gage reading correctly?

   KNOWN INFO
   Engine oil level and condition OK.
   Engine oil filter and oil tubes OK.

   POSSIBLE PROBLEMS
   Faulty reading from oil pressure gage.

   TEST OPTIONS
   Pressure Gage Check or STE/ICE-R Test #50

   REASON FOR QUESTION
   Defective wiring, sending unit, or gage will indicate low oil pressure even though engine oil pressure is good. If gage shows HIGH pressure, sending unit is faulty. If gage shows no pressure, gage is faulty.

   NO

   YES

   Perform Electrical System Troubleshooting task e11. Engine Oil Pressure Gage Does Not Operate Or Is Inaccurate.

   Notify DS Maintenance.
(1) Raise cab (TM 9-2320-366-10-1).
(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).

<table>
<thead>
<tr>
<th>PRESSURE GAGE CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Lower cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(2) Start engine (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(3) Perform STE/ICE-R test #50.</td>
</tr>
<tr>
<td>(4) Oil pressure gage should read 15 PSI (100 kPa) at 750 RPM and maximum at full load condition of 88 PSI (600 kPa).</td>
</tr>
<tr>
<td>(5) If oil pressure gage does not read correctly, perform Electrical System Troubleshooting task e11. Engine Oil Pressure Gage Does Not Operate Or Is Inaccurate.</td>
</tr>
<tr>
<td>(6) If oil pressure gage reads correctly, notify DS Maintenance.</td>
</tr>
<tr>
<td>(7) Shut down engine (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
a4. ENGINE STALLS AT LOW RPM

**INITIAL SETUP**

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

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

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

---

**KNOWLEDGE INFO**
Air cleaner OK.
Engine oil level and condition OK.
Air system OK.

**POSSIBLE PROBLEMS**
Faulty fuel hoses between fuel tank and fuel transfer pump.
Air in fuel system.
Dirty fuel filters.
Faulty transfer pump.
Faulty fuel pressure regulating valve.

---

**TEST OPTIONS**
Visual Inspection

**REASON FOR QUESTION**
Leaks or bad bends in fuel hoses will cause engine to stall at low rpm.

---

1. **Are fuel hoses between fuel tank and fuel transfer pump free of kinks, breaks, and leakage?**

---

**KNOWLEDGE INFO**
Air cleaner OK.
Engine oil level and condition OK.
Air system OK.
Fuel hoses OK.

**POSSIBLE PROBLEMS**
Air in fuel system.
Dirty fuel filters.
Faulty transfer pump.
Faulty fuel pressure regulating valve.

---

2. **Is the fuel system free from air at fuel/water separator?**

---

**KNOWLEDGE INFO**
Air cleaner OK.
Engine oil level and condition OK.
Air system OK.
Fuel hoses OK.

**POSSIBLE PROBLEMS**
Air in fuel system.
Dirty fuel filters.
Faulty transfer pump.
Faulty fuel pressure regulating valve.

---

**TEST OPTIONS**
Visual Inspection

**REASON FOR QUESTION**
Air in the fuel system will cause engine to stall at low rpm.

---

**YES**

Replace fuel/water separator (para 4-13).

---

**NO**

---

Replace fuel hose(s) (para 4-9).

---

**YES**

---

**NO**

---

START
(1) Raise cab (TM 9-2320-366-10-1).
(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).

(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).
a4. ENGINE STALLS AT LOW RPM (CONT)

**KNOWLEDGE INFO**
- Air cleaner OK.
- Engine oil level and condition OK.
- Air system OK.
- Fuel hoses OK.
- No air in fuel system.

**POSSIBLE PROBLEMS**
- Dirty fuel filters.
- Faulty transfer pump.
- Faulty fuel pressure regulating valve.

3. Are primary and secondary fuel filters clean and clear of debris?

**TEST OPTIONS**
- Remove and inspect
- REASON FOR QUESTION
- Dirty or clogged fuel filters will cause engine to stall at low rpm.

**YES**
- Replace fuel filter (para 4-14).

**NO**

4. Is outlet pressure of fuel transfer pump 10 - 65 psi.

**TEST OPTIONS**
- Fuel Pump Test or STE/ICE-R Test #50
- REASON FOR QUESTION
- Low fuel pressure from fuel transfer pump will cause engine to stall at low rpm.

**YES**
- Notify DS Maintenance.

**NO**
(1) Remove inlet fuel tube from secondary fuel filter base.
(2) Position drain pan under inlet fuel tube.
(3) Attempt to start engine (TM 9-2320-366-10-1).
(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.

(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 filter is clogged, replace filter (para 4-14).

---

**FUEL PUMP TEST**

<table>
<thead>
<tr>
<th>Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove inlet fuel tube from secondary fuel filter base.</td>
</tr>
<tr>
<td>(2) Position drain pan under inlet fuel tube.</td>
</tr>
<tr>
<td>(3) Attempt to start engine (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(4) Check for fuel flow from inlet fuel tube while attempting to start engine.</td>
</tr>
<tr>
<td>(5) If fuel does not flow from inlet fuel tube, notify DS Maintenance.</td>
</tr>
<tr>
<td>(6) Install inlet fuel tube on secondary fuel filter base.</td>
</tr>
</tbody>
</table>
5. Faulty fuel pressure regulating valve.

Is fuel pressure regulating valve free from leaks or damage?

A defective or leaking fuel pressure regulating valve will cause engine to stall at low rpm.

TEST OPTIONS
Visual inspection

REASON FOR QUESTION
A defective or leaking fuel pressure regulating valve will cause engine to stall at low rpm.

Known Info:
- Air cleaner OK.
- Engine oil level and condition OK.
- Air system OK.
- Fuel hoses OK.
- No air in fuel system.
- Fuel filters OK.
- Fuel transfer pump OK.

Possible Problems:
- Faulty fuel pressure regulating valve.

Notify DS Maintenance.

YES

Replace fuel pressure regulating valve (para 4-3).

NO
(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 9-2320-366-10-1).
a5. ENGINE OVERSPEEDS ON START

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)

START

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nothing</td>
</tr>
<tr>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty fuel control linkage.</td>
</tr>
</tbody>
</table>

1. Is fuel control linkage secure and free from damage?

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual inspection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing hardware or damage to fuel control linkage will cause engine to overspeed.</td>
</tr>
</tbody>
</table>

NO

YES

Replace missing hardware or damaged linkage (para 4-12, 4-18, 4-19 and/or 4-20).

Notify DS Maintenance.
(1) Remove instrument panel assembly (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 9-2320-366-10-1).
(5) Check fuel control linkage for improper assembly, missing hardware, and damaged parts.
(6) Lower cab (TM 9-2320-366-10-1).
a6. TOO MUCH ENGINE VIBRATION

<table>
<thead>
<tr>
<th>INITIAL SETUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment Conditions</td>
</tr>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1)</td>
</tr>
</tbody>
</table>

**Known Info**
- Vibration damper OK.
- Air cleaner OK.
- Engine oil level and condition OK.
- Air system OK.
- **Possible Problems**
  - Faulty engine mounts.
  - Toe-in out of adjustment.

**Test Options**
- Visual inspection
- **Reason for Question**
  - Loose mounting bolts or damaged engine mounts will cause vibration.

**Test Options**
- Visual inspection
- **Reason for Question**
  - Improper toe-in will cause vibration.

**Flowchart**

1. Are engine mounts secure and free from damage?
   - **Yes**
     - Notify DS Maintenance.
   - **No**
     - **Possible Problems**
       - Faulty engine mounts.
       - Toe-in out of adjustment.

2. Are front wheels aligned properly?
   - **Yes**
     - Align front wheels (para 13-5).
     - Notify DS Maintenance.
   - **No**
     - **Possible Problems**
       - Faulty engine mounts.
       - Toe-in out of adjustment.
(1) Check engine mounts for loose mounting hardware and damage.
(2) If engine mounts are damaged or mounting hardware is loose, notify DS Maintenance.

(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.
1. Is cylinder head free from leaks and radiator overflow tank free from bubbles?

   **START**

   **KNOWN INFO**
   - Nothing
   - **POSSIBLE PROBLEMS**
     - Faulty head gasket or cylinder head.

   **TEST OPTIONS**
   - Visual inspection
   - Head Gasket Test

   **REASON FOR QUESTION**
   - Air bubbles in radiator overflow tank or water seepage from cylinder head will cause leakage of coolant into lubrication oil.

   **YES**
   - Notify DS Maintenance.

   **NO**
   - Notify DS Maintenance.
(1) Raise cab (TM 9-2320-366-10-1).
(2) Check sides of engine block at cylinder head for obvious signs of water leakage.
(3) Lower cab (TM 9-2320-366-10-1).

HEAD GASKET TEST
(1) Remove radiator cap.
(2) Start engine (TM 9-2320-366-10-1).
   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 9-2320-366-10-1).
## a8. EXCESSIVE ENGINE OIL CONSUMPTION

### INITIAL SETUP

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

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)

### Flowchart

**START**

1. **KNOWN INFO**
   - Engine oil level OK.

   **POSSIBLE PROBLEMS**
   - Damaged engine oil filter or oil tubes.
   - Damaged valve cover or gasket.
   - Damaged oil pan, air compressor, cylinder head, or sending unit.

   **TEST OPTIONS**
   - Visual inspection
   - **REASON FOR QUESTION**
   - Leaking engine oil filter or oil tubes will cause excessive oil consumption.

   **YES**
   - Replace damaged oil tubes and fittings.
   - Replace damaged engine oil filter (para 3-4).

   **NO**
   - Replace damaged engine oil filter and gasket free from leaks or damage?

2. **KNOWN INFO**
   - Engine oil level OK.
   - Engine oil filter and oil tubes OK.

   **POSSIBLE PROBLEMS**
   - Damaged valve cover or gasket.
   - Damaged oil pan, air compressor, cylinder head, or sending unit.

   **TEST OPTIONS**
   - Visual inspection
   - **REASON FOR QUESTION**
   - Leaking engine valve cover and/or gasket will cause excessive oil consumption.

   **YES**
   - Replace damaged valve cover and gasket (para 3-3).

   **NO**
   - Tighten loose valve cover bolts (para 3-3).
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 9-2320-366-10-1).
(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).

(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).
3. Are oil pan, air compressor, cylinder head, or sending unit free from leaks or damage?

- **NO**
  - Notify DS Maintenance.

- **YES**
  - Leaking oil pan, air compressor, cylinder head, or sending unit will cause excessive oil consumption.
  - Visual inspection
  - Reason for question

**Known Info**
- Engine oil level OK.
- Engine oil filter and oil tubes OK.
- Engine valve cover and gasket OK.

**Possible Problems**
- Damaged oil pan, air compressor, cylinder head, or sending unit.

**Test Options**
- Visual inspection

**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 9-2320-366-10-1).
**a9. ENGINE OVERHEATS**

**INITIAL SETUP**

<table>
<thead>
<tr>
<th>Equipment Conditions</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>Personnel Required</td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td>(2)</td>
<td></td>
</tr>
</tbody>
</table>

**REFERENCES**

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

TM 9-4910-571-12&P

---

**KNOWN INFO**

| Radiator/engine coolant level OK. |
| Engine oil level OK. |
| Engine oil filter and oil tubes OK. |

**POSSIBLE PROBLEMS**

| Faulty coolant temperature gage sensor or WATER TEMP gage. |

---

**TEST OPTIONS**

| STE/ICE-R Test #38 |

**REASON FOR QUESTION**

If STE/ICE-R confirms WATER TEMP gage reading, cooling system is faulty. If STE/ICE-R indicates normal operating temperature, coolant temperature gage sensor or WATER TEMP gage is faulty.

---

**RESULT SUMMARY**

**YES**

Perform Cooling System Troubleshooting (d1. Engine Overheats).

Perform Electrical System Troubleshooting (e8. Temperature Gage Does Not Operate or is Inaccurate).

---

**START**
NOTE

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

<table>
<thead>
<tr>
<th>STE/ICE-R TEST #38</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Hook up STE/ICE-R to DCA.</td>
</tr>
<tr>
<td>(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.</td>
</tr>
<tr>
<td>(3) Start engine (TM 9-2320-366-10-1) and raise engine idle until engine is at normal operating temperature, 180-205°F (82-96°C).</td>
</tr>
<tr>
<td>(4) Coolant temperature should read between 160-210°F (71-99°C).</td>
</tr>
<tr>
<td>(5) Record test results.</td>
</tr>
<tr>
<td>(6) If coolant temperature is not 160-210°F (71-99°C), perform Cooling System Troubleshooting (d1. Engine Overheats).</td>
</tr>
<tr>
<td>(7) If coolant temperature is 160-210°F (71-99°C), perform Electrical System Troubleshooting (e8. Temperature Gage Does Not Operate or is Inaccurate).</td>
</tr>
<tr>
<td>(8) Shut down engine (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Remove STE/ICE-R from DCA.</td>
</tr>
</tbody>
</table>
a10. EXCESSIVE BLACK OR GRAY EXHAUST SMOKE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)

---

**START**

1. **TEST OPTIONS**
   - AIR FILTER RESTRICTION GAUGE Check
   - REASON FOR QUESTION
   - Exhaust smoke may be black or gray if air flow to engine is restricted.

   **KNOWEN INFO**
   - Air cleaner element serviced by emergency cleaning.
   - Air inlet system OK.
   - POSSIBLE PROBLEMS
     - Faulty air cleaner.
     - Clogged air filter.
     - Damaged manifold hose and/or flex hose.
     - Damaged particle extraction hose.

   **REASON FOR QUESTION**
   - AIR FILTER RESTRICTION GAUGE read below yellow area?

   **YES**
   - Service air cleaner or replace restricted air hoses (para 4-2).

   **NO**
   - Air filter check

2. **TEST OPTIONS**
   - Air filter check
   - REASON FOR QUESTION
   - Exhaust smoke may be black or gray if air filter is clogged.

   **KNOWN INFO**
   - Air cleaner element serviced by emergency cleaning.
   - Air inlet system OK.
   - AIR FILTER RESTRICTION GAUGE OK.
   - POSSIBLE PROBLEMS
     - Clogged air filter.
     - Damaged manifold hose or flex hose.
     - Damaged particle extraction flex hoses.

   **REASON FOR QUESTION**
   - Is air filter clean?

   **YES**
   - Replace air filter (para 4-2). Go to step 4 of this fault.

   **NO**
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 9-2320-366-10-1) and check AIR FILTER RESTRICTION GAUGE again.

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 on intake air cleaner cover.
a10. EXCESSIVE BLACK OR GRAY EXHAUST SMOKE (CONT)

3.

Is turbocharger tube or air cleaner flex hose serviceable?

NO

YES

Replace turbocharger tube or flex hose (para 4-2).

Notify DS Maintenance.

3.

TEST OPTIONS

Visual inspection

REASON FOR QUESTION

Exhaust smoke may be black or gray if turbocharger tube or turbocharger intake hose is kinked or damaged.

KNOWLEDGE

Air cleaner element serviced by emergency cleaning.
Air inlet system OK.
AIR FILTER RESTRICTION GAUGE OK.
Air filter OK.

POSSIBLE PROBLEMS

Damaged manifold hose and flex hose.
Damaged particle extraction flex hoses.

4.

Is particle extraction hose serviceable?

NO

YES

Replace particle extraction hose (para 4-2).

Notify DS Maintenance.

KNOWLEDGE

Air cleaner element serviced by emergency cleaning.
Air inlet system OK.
Air indicator OK.
AIR FILTER RESTRICTION GAUGE OK.
Turbocharger tube and turbocharger intake hose OK.

POSSIBLE PROBLEMS

Damaged particle extraction hose.

TEST OPTIONS

Visual inspection

REASON FOR QUESTION

Exhaust smoke may be black or gray if particle extraction hose is kinked or damaged.
(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.
(4) Raise cab (TM 9-2320-366-10-1).
(5) Check turbocharger tube and turbocharger hose for kinks and damage.
(6) If turbocharger tube or turbocharger hose is damaged, replace turbocharger tube or turbocharger hose (para 4-2).
(7) If turbocharger tube and turbocharger hose are free from kinks and damage, notify DS Maintenance.
(8) Lower cab (TM 9-2320-366-10-1).
a11. WHITE EXHAUST SMOKE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Container (Capacity 40 qt (38L))
Goggles, Industrial (Item 15, Appendix C)

---

1. Is engine oil clean (contains no presence of coolant)?
   - NO
     - Contaminated engine oil.
     - Contaminated coolant.
     - Head gasket leaking.
     - Notify DS Maintenance.
   - YES
     - Contaminated engine oil.
     - Contaminated coolant.
     - Head gasket leaking.
     - Notify DS Maintenance.

2. Is coolant clean (contains no oil and does not appear milky)?
   - NO
     - Contaminated coolant.
     - Head gasket leaking.
     - Notify DS Maintenance.
   - YES
     - Contaminated coolant.
     - Head gasket leaking.
     - Notify DS Maintenance.

---

WARNING
Read WARNING on following page.

---

TEST OPTIONS
Engine Oil Check
REASON FOR QUESTION
Engine oil contaminated with coolant indicates faulty head gasket and/or oil cooler.

TEST OPTIONS
Coolant Check
REASON FOR QUESTION
Contaminated coolant indicates faulty head gasket and/or oil cooler.

---

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, 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).

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.
3. Is head gasket free from leaks?

- **NO**
  - Notify DS Maintenance.

- **YES**
  - Notify DS Maintenance.

**KNOWN INFO**
- Air cleaner OK.
- Engine oil OK.
- Coolant OK.

**POSSIBLE PROBLEMS**
- Head gasket leaking.

**TEST OPTIONS**
- Head Gasket Check

**REASON FOR QUESTION**
- A faulty head gasket will cause white exhaust smoke.
<table>
<thead>
<tr>
<th>HEAD GASKET CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Start engine (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(2) Raise cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(3) Check head gasket for leaks.</td>
</tr>
<tr>
<td>(4) If head gasket is leaking, notify DS Maintenance.</td>
</tr>
<tr>
<td>(5) If head gasket is not leaking and white exhaust smoke still exists, notify DS Maintenance.</td>
</tr>
<tr>
<td>(6) Lower cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(7) Shut down engine (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
a12. LOW ENGINE POWER

INITIAL SETUP

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

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

Materials/Parts
Packing, Preformed (2) (Item 203, Appendix G)

References
TM 9-4910-571-12&P

START

1. Are fuel hoses between fuel tank and fuel transfer pump free of kinks, breaks and leakage?

- **NO**
  - LEAKS OR BAD BENDS IN FUEL HOSES WILL CAUSE LOW ENGINE POWER.

- **YES**
  - Replace fuel hose(s) (para 4-9).

2. Is fuel system free from air leaks at fuel/water separator?

- **NO**
  - AIR IN THE FUEL SYSTEM WILL CAUSE LOW ENGINE POWER.

- **YES**
  - Replace fuel/water separator (para 4-13).

KNOWLED INFO

| Fuel OK. |
| Oil level OK. |
| Air cleaner OK. |
| Air system OK. |

POSSIBLE PROBLEMS

Faulty fuel hoses between fuel tank and fuel transfer pump.
Air in fuel system.
Dirty fuel filters.
Faulty fuel pressure regulating valve.
Restricted or damaged fuel filter.
Faulty fuel governor.

KNOWLED INFO

| Fuel OK. |
| Oil level OK. |
| Air cleaner OK. |
| Air system OK. |
| Fuel hoses OK. |

POSSIBLE PROBLEMS

Air in fuel system.
Dirty fuel filters.
Faulty fuel pressure regulating valve.
Restricted or damaged fuel filter.
Faulty fuel governor.
(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).

(1) Raise cab (TM 9-2320-366-10-1).
(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).
**a12. LOW ENGINE POWER (CONT)**

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel OK.</td>
</tr>
<tr>
<td>Oil level OK.</td>
</tr>
<tr>
<td>Air cleaner OK.</td>
</tr>
<tr>
<td>Air system OK.</td>
</tr>
<tr>
<td>Fuel hoses OK.</td>
</tr>
<tr>
<td>No air in fuel system.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dirty fuel filters.</td>
</tr>
<tr>
<td>Faulty fuel pressure regulating valve.</td>
</tr>
<tr>
<td>Restricted or damaged fuel filter.</td>
</tr>
<tr>
<td>Faulty fuel governor.</td>
</tr>
</tbody>
</table>

**TEST OPTIONS**

3. **Are fuel/water separator filter and fuel filter clean and clear of debris?**

**REASON FOR QUESTION**

Remove and inspect

Dirty or clogged fuel/water separator filter and/or fuel filter will cause low engine power.

**TEST OPTIONS**

4. **Is fuel pressure regulating valve free from leaks or damage?**

**REASON FOR QUESTION**

Visual inspection

A defective or leaking fuel pressure regulating valve will cause low engine power.

**TEST OPTIONS**

- **NO**
  - Replace fuel/water separator filter (para 4-13) and/or fuel filter (para 4-14).

- **YES**
  - Replace fuel/pressure regulating valve (para 4-3).

**KNOWN INFO**

- Fuel OK.
- Oil level OK.
- Air cleaner OK.
- Air system OK.
- Fuel hoses OK.
- No air in fuel system.
- Fuel filters clean.

**POSSIBLE PROBLEMS**

- Faulty fuel pressure regulating valve.
- Restricted or damaged fuel filter.
- Faulty fuel governor.
(1) Check fuel/water separator filter and fuel filter 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 water separator filter and/or fuel filter is clogged, replace fuel/water separator filter (para 4-13) and/or fuel filter (para 4-14).

(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).
5. Is outlet pressure of fuel transfer pump 39-58 psi?

- **YES**
  - Notify DS Maintenance.

- **NO**
  - Read WARNING on following page.

**WARNING**

Low fuel pressure from fuel transfer pump will cause low engine power.

**TEST OPTIONS**

STE/ICE-R Test #50

**REASON FOR QUESTION**

Low fuel pressure from fuel transfer pump will cause low engine power.

---

**KNOWN INFO**

Fuel OK.
Oil level OK.
Air cleaner OK.
Air system OK.
Fuel hoses OK.
No air in fuel system.
Fuel filters clean.
Fuel pressure regulating valve OK.

**POSSIBLE PROBLEMS**

Faulty fuel governor.
Restricted or damaged fuel filter.
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.

STE/ICE-R TEST #50

(1) Remove plug from adapter fitting on inlet side of fuel filter base.
(2) Prepare STE/ICE-R Test #50 (TM 9-4910-571-12&P) to adapter fitting.
(3) Start engine (TM 9-2320-366-10-1).
(4) Perform STE/ICE-R Test #50 (TM 9-4910-571-12&P).
(5) Raise idle speed to 2000 rpm for 10 seconds.
(6) Pressure should read between 39 psi and 58 psi.
(7) Record test results.
(8) Shut down engine (TM 9-2320-366-10-1).
(9) If pressure is below 39 psi, notify DS Maintenance.
a12. LOW ENGINE POWER (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel OK.</td>
</tr>
<tr>
<td>Oil level OK.</td>
</tr>
<tr>
<td>Air cleaner OK.</td>
</tr>
<tr>
<td>Air system OK.</td>
</tr>
<tr>
<td>Fuel hoses OK.</td>
</tr>
<tr>
<td>No air in fuel system.</td>
</tr>
<tr>
<td>Fuel filters OK.</td>
</tr>
<tr>
<td>Fuel pressure regulating valve OK.</td>
</tr>
<tr>
<td>Fuel governor OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restricted or damaged fuel filter.</td>
</tr>
</tbody>
</table>

6. Is fuel filter free from damage or restrictions?

**WARNING**
Read WARNING on following page.

6. Is fuel filter free from damage or restrictions?

- **YES**: Replace fuel filter (para 4-14).
- **NO**: Notify DS Maintenance.

**TM 9-2320-366-20-1**

**2-108.6** Change 1
Diesel fuel is flammable. If fuel is spilled, clean it up immediately. Failure to comply may result in serious injury or death to personnel.

### STE/ICE-R TEST #50

1. Remove plug from tee fitting on outlet side of fuel filter base.
2. Remove adapter fitting from tee fitting on inlet side of fuel filter base.
3. Install plug in tee fitting on inlet side of fuel filter base.
4. Install adapter fitting in tee fitting on outlet side of fuel filter base.
5. Prepare STE/ICE-R Test #50 (TM 9-4910-571-12&P) to adapter fitting.
7. Perform STE/ICE-R Test #50 (TM 9-4910-571-12&P).
8. Raise idle speed to 2000 rpm for 10 seconds.
9. Pressure should read between 39 psi and 58 psi.
10. Record test results.
12. If test results indicate more than 10 psi pressure difference from results of step 5 of this fault, replace fuel filter (para 4-14).
13. Disconnect STE/ICE-R from adapter fitting.
15. Remove plug and preformed packing from tee fitting on inlet side of fuel filter base. Discard preformed packing.
16. Install preformed packing, adapter fitting, and plug in tee fitting on inlet side of fuel filter base.
17. Install preformed packing and plug in tee fitting on outlet side of fuel filter base.
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

<table>
<thead>
<tr>
<th>Fault No.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>b1</td>
<td>Engine Cranks But Does Not Start or Engine Stalls After Starting</td>
<td>2-110</td>
</tr>
<tr>
<td>b2</td>
<td>Ether Starting Aid Does Not Operate</td>
<td>2-116</td>
</tr>
<tr>
<td>b3</td>
<td>Fuel Consumption Too High</td>
<td>2-120</td>
</tr>
<tr>
<td>b4</td>
<td>Accelerator Pedal Sticks</td>
<td>2-122</td>
</tr>
</tbody>
</table>
b1. ENGINE CRANKS BUT DOES NOT START OR ENGINE STALLS AFTER STARTING

INITIAL SETUP

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

Materials/Parts
- Ties, Cable, Plastic (Item 69, Appendix D)
- Packing, Preformed (Item 203, Appendix G)
- Packing, Preformed (2) (Item 203, Appendix G)

Tool Kit, Genl Mech (Item 46, Appendix C)
- Pan, Drain (Item 24, Appendix C)

NOTE
If engine cranks but does not start perform Engine Troubleshooting (a2. Engine Cranks But Does Not Start) prior to beginning this task.

START

1. **WARNING**
   Read WARNING on following page.

   Does fuel flow from fuel pressure regulating valve?

   **NO**
   - Faulty fuel return hose.
   - Faulty fuel transfer hose.
   - Faulty fuel transfer pump.
   - Faulty fuel tubes.
   - Faulty fuel filter.
   - Faulty fuel pressure regulating valve.
   - Faulty orifice tube assembly.
   - Faulty fuel supply hose.
   - Faulty fuel tank.
   - Faulty fuel/water separator.
   - Faulty cylinder head.

   **YES**
   Go to step 4 of this fault.

   **TEST OPTIONS**
   - Visual inspection

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

   **KNOWN INFO**
   - Malfunction in fuel system.
   - Engine cranking speed OK.

   **POSSIBLE PROBLEMS**
   - Fuel contaminated.
   - Faulty fuel return hose.
   - Faulty fuel transfer hose.
   - Faulty fuel transfer pump.
   - Faulty fuel tubes.
   - Faulty fuel filter.
   - Faulty fuel pressure regulating valve.
   - Faulty orifice tube assembly.
   - Faulty fuel supply hose.
   - Faulty fuel tank.
   - Faulty fuel/water separator.
   - Faulty cylinder head.
Perform Fuel System Bleeding (para 4-11).

If fuel flow is not present from fuel pressure regulating valve, go to step 4 of this fault.

If fuel flow is present, collect fuel sample.

Remove plastic cable ties as required.

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

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

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

NOTE
Remove plastic cable ties as required.

(1) Perform Fuel System Bleeding (para 4-11).
(2) If fuel flow is not present from fuel pressure regulating valve, go to step 4 of this fault.
(3) If fuel flow is present, collect fuel sample.
b1. ENGINE CRANKS BUT DOES NOT START OR ENGINE STALLS AFTER STARTING (CONT)

**KNOWN INFO**
Malfunction in fuel system.
Engine cranking speed OK.
Fuel transfer hose OK.
Fuel tubes OK.
Fuel filter OK.
Fuel pressure regulating valve OK.
Orifice tube assembly OK.
Fuel supply hose OK.
Fuel tank OK.
Fuel/water separator OK.
Cylinder head OK.

**POSSIBLE PROBLEMS**
Faulty return hose.
Faulty fuel transfer pump.

**TEST OPTIONS**
Visual inspection

**REASON FOR QUESTION**
Contaminated fuel may cause engine to stall after starting.

2. Is fuel free from water, debris, and contamination?
   - NO
   - YES
     - flush fuel system.

**WARNING**
Read WARNING on following page.

3. Is fuel return hose free from kinks, blockage, or damage?
   - NO
   - YES
     - Replace fuel return hose (para 4-9).
     - Notify DS Maintenance.

**TEST OPTIONS**
Visual inspection

**REASON FOR QUESTION**
If fuel return hose is OK, fuel transfer pump is faulty.

**KNOWN INFO**
Malfunction in fuel system.
Engine cranking speed OK.
Fuel transfer hose OK.
Fuel tubes OK.
Fuel filter OK.
Fuel pressure regulating valve OK.
Orifice tube assembly OK.
Fuel supply hose OK.
Fuel tank OK.
Fuel/water separator OK.
Cylinder head OK.
Fuel contaminant free.

**POSSIBLE PROBLEMS**
Faulty return hose.
Faulty fuel transfer pump.
(1) Check fuel sample from step 1 for water, debris, and contamination.

(2) If fuel is not free from contamination, flush fuel tank, fuel hoses, and replace fuel filters.

**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.

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) Disconnect fuel return hose from fuel pressure regulating valve.

(2) Disconnect fuel return hose from fuel tank.

(3) Apply compressed air to one end of fuel return hose.

(4) If compressed air does not flow freely through fuel return hose, replace fuel return hose (para 4-9).

(5) If compressed air flows freely through fuel return hose, notify DS Maintenance.

(6) Connect fuel return hose to fuel pressure regulating valve.

(7) Connect fuel return hose to fuel tank.
b1. ENGINE CRANKS BUT DOES NOT START OR ENGINE STALLS AFTER STARTING (CONT)

**KNOWN INFO**
Malfunction in fuel system.
Engine cranking speed OK.
Fuel return hose OK.

**POSSIBLE PROBLEMS**
Faulty fuel transfer hose.
Faulty fuel transfer pump.
Faulty fuel tubes.
Faulty fuel filter.
Faulty fuel pressure regulating valve.
Faulty orifice tube assembly.
Faulty fuel supply hose.
Faulty fuel tank.
Faulty fuel/water separator.
Faulty cylinder head.

**TEST OPTIONS**
Visual inspection

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

---

4. Does fuel flow from fuel/water separator?

- **NO**
  - Go to step 12 of this fault.

- **YES**
  - Test Options: Visual inspection
  - Reason for Question: This question eliminates possible problems and determines where troubleshooting continues.

---

5. Does fuel flow from fuel transfer hose?

- **NO**
  - Replace fuel transfer hose (para 4-9).

- **YES**
  - Replace fuel transfer hose (para 4-9).
(1) Disconnect fuel transfer hose from fuel/water separator.
(2) Depress button on fuel/water separator as many times as necessary to get a steady stream of clear fuel.
(3) If fuel does not flow from fuel/water separator, go to step 12 of this fault.
(4) Connect fuel transfer hose to fuel/water separator.

(1) Disconnect fuel transfer hose from fuel transfer pump.
(2) Depress button on fuel/water separator as many times as necessary to get a steady stream of clear fuel.
(3) If fuel does not flow from fuel transfer hose, replace fuel transfer hose (para 4-9).
(4) Connect fuel transfer hose to fuel transfer pump.
b1. ENGINE CRANKS BUT DOES NOT START OR ENGINE STALLS AFTER STARTING (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction in fuel system.</td>
<td>Visual inspection</td>
<td>If fuel does not flow from fuel transfer pump, fuel transfer pump is faulty.</td>
</tr>
<tr>
<td>Engine cranking speed OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel return hose OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel supply hose OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel tank OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel/water separator OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel transfer hose OK.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| POSSIBLE PROBLEMS | | |
|-------------------| | |
| Faulty fuel transfer pump. | | |
| Faulty fuel tubes. | | |
| Faulty fuel filter. | | |
| Faulty fuel pressure regulating valve. | | |
| Faulty orifice tube assembly. | | |
| Faulty cylinder head. | | |

---

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction in fuel system.</td>
<td>Visual inspection</td>
<td>If fuel does not flow from fuel tube, fuel tube is faulty.</td>
</tr>
<tr>
<td>Engine cranking speed OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel return hose OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel supply hose OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel tank OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel/water separator OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel transfer hose OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel transfer pump OK.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| POSSIBLE PROBLEMS | | |
|-------------------| | |
| Faulty fuel tubes. | | |
| Faulty fuel filter. | | |
| Faulty fuel pressure regulating valve. | | |
| Faulty orifice tube assembly. | | |
| Faulty cylinder head. | | |

---

6. Does fuel flow from fuel transfer pump?

- **NO**
  - Notify DS Maintenance.

- **YES**
  - Does fuel flow from fuel tube?

- **NO**
  - Replace fuel tube from fuel filter base to fuel transfer pump (para 4-10).

- **YES**
  - Replace fuel tube from fuel filter base to fuel transfer pump (para 4-10).
(1) Remove plug from adapter fitting on inlet side of fuel filter base.

(2) Depress button on fuel/water separator as many times as necessary to get a steady stream of clear fuel.

(3) If fuel does not flow from fuel tube, replace fuel tube from fuel filter base to fuel transfer pump (para 4-10).

(4) Install plug in adapter fitting on inlet side of fuel filter base.
**b1. ENGINE CRANKS BUT DOES NOT START OR ENGINE STALLS AFTER STARTING (CONT)**

**KNOWN INFO**
Malfunction in fuel system.
Engine cranking speed OK.
Fuel return hose OK.
Fuel supply hose OK.
Fuel tank OK.
Fuel/water separator OK.
Fuel transfer pump OK.
Fuel transfer hose OK.

**POSSIBLE PROBLEMS**
Faulty fuel filter.
Faulty fuel tube.
Faulty fuel pressure regulating valve.
Faulty orifice tube assembly.
Faulty cylinder head.

---

**TEST OPTIONS**
Visual inspection

**REASON FOR QUESTION**
If fuel does not flow from fuel filter, fuel filter is faulty.

---

**KNOWEN INFO**
Malfunction in fuel system.
Engine cranking speed OK.
Fuel return hose OK.
Fuel supply hose OK.
Fuel tank OK.
Fuel/water separator OK.
Fuel transfer pump OK.
Fuel transfer hose OK.
Fuel filter OK.

**POSSIBLE PROBLEMS**
Faulty fuel tube.
Faulty fuel pressure regulating valve.
Faulty orifice tube assembly.
Faulty cylinder head.

---

**TEST OPTIONS**
Visual inspection

**REASON FOR QUESTION**
If fuel does not flow from fuel tube, fuel tube is faulty.

---

**KNOWEN INFO**
Malfunction in fuel system.
Engine cranking speed OK.
Fuel return hose OK.
Fuel supply hose OK.
Fuel tank OK.
Fuel/water separator OK.
Fuel transfer pump OK.
Fuel transfer hose OK.
Fuel filter OK.

**POSSIBLE PROBLEMS**
Faulty fuel tube.
Faulty fuel pressure regulating valve.
Faulty orifice tube assembly.
Faulty cylinder head.

---

**TEST OPTIONS**
Visual inspection

**REASON FOR QUESTION**
If fuel does not flow from fuel tube, fuel tube is faulty.
(1) Remove plug and preformed packing from tee fitting on outlet side of fuel filter base. Discard preformed packing.
(2) Depress button on fuel/water separator as many times as necessary to get a steady stream of clear fuel.
(3) If fuel does not flow from fuel filter, replace fuel filter (para 4-14).
(4) Install preformed packing and plug in tee fitting on outlet side of fuel filter base.

(1) Disconnect fuel tube from cylinder head. Discard preformed packing.
(2) Depress button on fuel/water separator as many times as necessary to get a steady stream of clear fuel.
(3) If fuel does not flow from fuel tube, replace fuel tube from fuel filter base to cylinder head (para 4-10).
(4) Install preformed packing and fuel tube on cylinder head.
b1. ENGINE CRANKS BUT DOES NOT START OR ENGINE STALLS AFTER STARTING (CONT)

**Known Info**
- Malfunction in fuel system.
- Engine cranking speed OK.
- Fuel return hose OK.
- Fuel supply hose OK.
- Fuel tank OK.
- Fuel/water separator OK.
- Fuel transfer pump OK.
- Fuel transfer hose OK.
- Fuel filter OK.
- Fuel tube OK.

**Possible Problems**
- Faulty fuel pressure regulating valve.
- Faulty orifice tube assembly.
- Faulty cylinder head.

10. **Does fuel flow from orifice tube?**

   **Test Options**
   - Visual inspection

   **Reason for Question**
   - If fuel flows from orifice tube, fuel pressure regulating valve is faulty.

   **Yes**
   - Go to step 11 of this fault.
   - Replace fuel pressure regulating valve (para 4-3).

   **No**

11. **Does fuel flow from cylinder head?**

   **Test Options**
   - Visual inspection

   **Reason for Question**
   - If fuel flow is not present, cylinder head is faulty.
   - If fuel flow is present, orifice tube assembly is faulty.

   **Yes**
   - Notify DS Maintenance.

   **No**

   **Possible Problems**
   - Faulty orifice tube assembly.
   - Faulty cylinder head.

   **Replace orifice tube assembly (para 4-7).**
(1) Remove fuel pressure regulating valve (para 4-3).
(2) Depress button on fuel/water separator as many times as necessary to get a steady stream of clear fuel.
(3) If fuel does not flow from orifice tube, go to step 11 of this fault.
(4) If fuel flow is present, replace fuel pressure regulating valve (para 4-3).

(1) Remove orifice tube assembly (para 4-7).
(2) Depress button on fuel/water separator as many times as necessary to get a steady stream of clear fuel.
(3) If fuel does not flow from cylinder head, notify DS Maintenance.
(4) If fuel flow is present, replace orifice tube assembly (para 4-7).
(5) Install orifice tube assembly (para 4-7).
(6) Install fuel pressure regulating valve (para 4-3).
b1. ENGINE CRANKS BUT DOES NOT START OR ENGINE STALLS AFTER STARTING (CONT)

**KNOWN INFO**
Malfunction in fuel system.
Engine cranking speed OK.
Fuel return hose OK.
Fuel transfer pump OK.
Fuel transfer hose OK.
Fuel filter OK.
Fuel tube OK.
Fuel pressure regulating valve OK.
Orifice tube assembly OK.
Cylinder head OK.

**POSSIBLE PROBLEMS**
Faulty fuel supply hose.
Faulty fuel tank.
Faulty fuel/water separator.

**TEST OPTIONS**
Visual inspection

**REASON FOR QUESTION**
If compressed air does not flow freely through fuel supply hose, fuel supply hose is faulty.

**WARNING**
Read WARNING on following page.

12. Is fuel supply hose free from kinks, blockage, or damage?

- **NO**
  - Replace fuel supply hose (para 4-9).

- **YES**
  - Replace fuel supply hose (para 4-9).

13. Is fuel pick-up tube free from blockage or damage?

- **NO**
  - Replace fuel/water separator (para 4-13).

- **YES**
  - Replace fuel/water separator (para 4-13).

**WARNING**
Read WARNING on following page.

**REASON FOR QUESTION**
If compressed air does not flow freely through fuel pick-up tube, fuel tank is faulty. If compressed air flows freely through fuel pick-up tube, fuel/water separator is faulty.
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.

1. Disconnect fuel supply hose from fuel/water separator.
2. Disconnect fuel supply hose from fuel tank.
3. Apply compressed air to one end of fuel supply hose.
4. If compressed air does not flow freely through fuel supply hose, replace fuel supply hose (para 4-9).
5. Connect fuel supply hose to fuel/water separator.

1. Remove fuel cap from fuel tank.
2. Apply compressed air to 90° degree fitting on fuel tank and listen for air bubbles in fuel tank.
3. If air flow is not present, replace fuel tank (para 4-8).
4. If air flow is present, replace fuel/water separator (para 4-13).
5. Connect fuel supply hose to fuel tank.
6. Install fuel cap on fuel tank.
b2. ETHER STARTING AID DOES NOT OPERATE

INITIAL SETUP

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

START

1. Is there an adequate supply of ether and is ether cylinder secure and free from damage?

- KNOWN INFO: Nothing
- POSSIBLE PROBLEMS: Empty, leaking, or damaged ether cylinder. Faulty ether valve. Ether hose loose.

- TEST OPTIONS: Ether Cylinder Inspection
- REASON FOR QUESTION: No ether will be available to start engine if ether cylinder is empty.

NO

YES

Replace ether cylinder (para 4-15).

2. Does ether valve operate properly?

- KNOWN INFO: Ether cylinder OK.
- POSSIBLE PROBLEMS: Faulty ether valve. Ether hose loose.

- TEST OPTIONS: Ether Injector Valve Test
- REASON FOR QUESTION: Ether valve and/or electrical system is faulty if click is not heard when ether start switch is pressed.

NO

YES

Perform Electrical System Troubleshooting (e97. Ether Start Does Not Operate).
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 injury 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 4-13).
(2) Shake ether cylinder to determine if ether is present.
(3) Check ether cylinder for damage.
(4) Install ether cylinder (para 4-13).

ETHER VALVE TEST
(1) Position master power switch to on (TM 9-2320-366-10-1).
(2) Press ether start switch (TM 9-2320-366-10-1) and listen for ether valve to click.
(3) Position master power switch to off (TM 9-2320-366-10-1).
b2. ETHER STARTING AID DOES NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ether cylinder OK.</td>
<td>Visual inspection</td>
</tr>
<tr>
<td>Ether valve OK.</td>
<td>REASON FOR QUESTION</td>
</tr>
<tr>
<td>Ether hose loose.</td>
<td>Ether will not go into engine if it is leaking from ether hose. Replace ether hose if kinked, cracked, leaking, or damaged.</td>
</tr>
</tbody>
</table>

3. Is ether hose between ether cylinder and engine in good condition, free from kinks, cracks, leakage, or damage?

- **NO**
  - Replace ether hose.

- **YES**
  - Notify DS Maintenance.
(1) Raise cab (TM 9-2320-366-10-1).
(2) Check ether hose between ether cylinder and engine for leaks and damage.
(3) Lower cab (TM 9-2320-366-10-1).
b3. FUEL CONSUMPTION TOO HIGH

**INITIAL SETUP**

Equipment Conditions

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

---

**START**

**WARNING**

Read WARNING on following page.

1. Is fuel tank free from leaks?

**NO**

Replace fuel tank (para 4-8).

**YES**

Notify DS Maintenance.

---

**KNOWN INFO**

Secondary fuel filter, fuel hoses, fittings, and draincocks OK.

**POSSIBLE PROBLEMS**

- Damaged fuel tank.

**TEST OPTIONS**

- Visual inspection
- REASON FOR QUESTION

A leaking fuel tank will cause high fuel consumption.
(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).

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.
**b4. ACCELERATOR PEDAL STICKS**

### INITIAL SETUP

- **Equipment Conditions:** Engine shut down (TM 9-2320-366-10-1).
- **Tools and Special Tools:** Tool Kit, Genl Mech (Item 46, Appendix C)

---

**START**

1. **Does fuel control linkage return to normal position after snap test?**

   - **Yes:** Go to step 2 of this fault.
   - **No:**
     - **Reason for Question:** If fuel control linkage returns to normal position after snap test, accelerator pedal is faulty.

2. **Test Options:**
   - Fuel Control Linkage Return Test

3. **Known Info**
   - Nothing
   - Possible Problems:
     - Faulty accelerator pedal.
     - Faulty fuel control linkage.

---

**Replace accelerator pedal (para 4-21).**
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)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerator pedal OK.</td>
<td>Faulty fuel control linkage.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual inspection</td>
<td>Missing hardware or damage to the fuel control linkage will cause the engine to overspeed.</td>
</tr>
</tbody>
</table>

2. Is fuel control linkage secure and free from damage?

- **NO**
  - Replace missing hardware or damaged linkage (para 4-12, 4-17, 4-18, 4-19, and/or 4-20).

- **YES**
  - Fault corrected.
(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 9-2320-366-10-1).
(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 9-2320-366-10-1).
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

<table>
<thead>
<tr>
<th>Fault No.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>c1.</td>
<td>Exhaust System Unusually Noisy or Vibrates Excessively During Engine Operation</td>
<td>2-128</td>
</tr>
<tr>
<td>c2.</td>
<td>Exhaust Fumes in Cab</td>
<td>2-132</td>
</tr>
</tbody>
</table>
c1. EXHAUST SYSTEM UNUSUALLY NOISY OR VIBRATES EXCESSIVELY DURING ENGINE OPERATION

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

START

WARNING
Read WARNING on following page.

1. Are the tailpipe, muffler, exhaust junction to muffler pipe, exhaust pipe bracket assembly(s), engine to junction exhaust pipe, and loop clamp halves secure and free from damage?

TEST OPTIONS
Visual Inspection

REASON FOR QUESTION
Engine may operate with excessive noise or vibration if tailpipe, muffler, exhaust junction to muffler pipe, exhaust pipe bracket assembly(s), engine to junction exhaust pipe, or loop clamp halves are loose or damaged.

WARNING on following page.

NO

YES

Tighten connection(s) or replace leaking or damaged component(s) (para 5-2 thru 5-4).
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.
c1. EXHAUST SYSTEM UNUSUALLY NOISY OR VIBRATES EXCESSIVELY DURING ENGINE OPERATION (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tailpipe, muffler, junction to muffler exhaust pipe, exhaust pipe bracket assembly(s), engine to junction exhaust pipe, and clamp halves OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loose or leaking exhaust manifold.</td>
</tr>
</tbody>
</table>

2. Is exhaust manifold free from leaks or damage?

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual inspection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine may operate with excessive noise or vibration when exhaust manifold is loose or leaking.</td>
</tr>
</tbody>
</table>

- **YES**: Notify DS Maintenance.
- **NO**: Notify DS Maintenance.
(1) Start engine (TM 9-2320-366-10-1).
(2) Check exhaust manifold for looseness or evidence of exhaust leakage.
(3) Shut down engine (TM 9-2320-366-10-1).
(4) Lower cab (TM 9-2320-366-10-1).
c2. EXHAUST FUMES IN CAB

INITIAL SETUP

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

START

1. Are engine to junction exhaust pipe, muffler, and tailpipe secure and free from damage?

   TEST OPTIONS
   Visual inspection

   REASON FOR QUESTION
   Exhaust fumes may enter cab if engine to junction exhaust pipe, muffler, or tailpipe are loose or damaged.

   YES
   tighten connection(s) or replace leaking component(s) (para 5-2 thru 5-4).

   NO

   KNOWLEDGE INFO
   Engine to junction exhaust pipe, muffler, and tailpipe OK.

   POSSIBLE PROBLEMS
   Loose or leaking junction to muffler exhaust pipe. Loose or leaking exhaust manifold.

2. Is junction to exhaust pipe free from damage or leaks?

   TEST OPTIONS
   Visual inspection

   REASON FOR QUESTION
   Exhaust fumes may enter cab if junction to muffler exhaust pipe is loose or leaking.

   YES
   Replace junction to muffler exhaust pipe (para 5-3).

   NO

   KNOWLEDGE INFO
   Loose or leaking junction to muffler exhaust pipe. Loose or leaking exhaust manifold.
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.

Check engine to junction exhaust pipe for loose connections or leaks.
c2. EXHAUST FUMES IN CAB (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine to junction</td>
</tr>
<tr>
<td>exhaust pipe, muffler,</td>
</tr>
<tr>
<td>and tailpipe OK.</td>
</tr>
<tr>
<td>Junction to muffler</td>
</tr>
<tr>
<td>exhaust pipe OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loose or leaking exhaust</td>
</tr>
<tr>
<td>manifold.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual inspection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust fumes may enter</td>
</tr>
<tr>
<td>cab if exhaust manifold</td>
</tr>
<tr>
<td>is loose or leaking.</td>
</tr>
</tbody>
</table>

3. Is the exhaust manifold free from damage or leaks?

- NO
  - Notify DS Maintenance.

- YES
  - Notify DS Maintenance.
(1) Raise cab (TM 9-2320-366-10-1).
(2) Start engine (TM 9-2320-366-10-1).
(3) Check exhaust manifold for looseness or leaks.
(4) Shut down engine (TM 9-2320-366-10-1).
(5) Lower cab (TM 9-2320-366-10-1).
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

<table>
<thead>
<tr>
<th>Fault No.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>d1.</td>
<td>Engine Overheats</td>
<td>2-138</td>
</tr>
<tr>
<td>d2.</td>
<td>Oil in Cooling System</td>
<td>2-150</td>
</tr>
<tr>
<td>d3.</td>
<td>Loss of Coolant</td>
<td>2-152</td>
</tr>
</tbody>
</table>
d1. ENGINE OVERHEATS

INITIAL SETUP

<table>
<thead>
<tr>
<th>Equipment Conditions</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>Personnel Required (2)</td>
<td>Test Kit, Radiator (Item 41.1, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Pressure Tester, Radiator (Item 26, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Pan, Drain (Item 24, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)</td>
</tr>
</tbody>
</table>

NOTE
Perform engine troubleshooting a9. ENGINE OVERHEATS prior to beginning this task.

WARNING

CAUTION

Read WARNING and CAUTION on following page.

Is radiator secure and free from damage?

1. [START]

KNOWEN INFO
Coolant level OK.
Radiator core free of debris.
WATER TEMP gage OK.

POSSIBLE PROBLEMS
Faulty radiator.
Faulty upper and lower coolant hoses.
Faulty radiator cap.
Faulty radiator overflow tank and hoses.
Loss of pressure in cooling system.
Faulty radiator fan shroud.
Faulty water pump.
Faulty thermostat.
Faulty fan clutch.

TEST OPTIONS
Visual Inspection

REASON FOR QUESTION
If leaks or damage are present, radiator is faulty.

YES
Replace radiator (para 6-2).

NO
WARNING

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

(1) Raise cab (TM 9-2320-366-10-1).
(2) Check radiator for leaks and damage.
(3) Remove radiator cap from radiator overflow tank.
(4) Install test kit on radiator overflow tank.
(5) Install radiator tester on test kit.

CAUTION

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

(6) Pressurize radiator overflow tank, using tester, to 15 psi (103 kPa).
(7) Observe radiator for coolant leaks.

NOTE

Pressure loss without external leaks indicates engine internal coolant leaks.

(8) Observe radiator tester for loss of pressure.
(9) If leaks or damage are present, replace radiator (para 6-2).
d1. ENGINE OVERHEATS (CONT)

**KNOWN INFO**
Coolant level OK.
Radiator core free of debris.
WATER TEMP gage OK.
Radiator OK.

**POSSIBLE PROBLEMS**
Faulty upper and lower coolant hoses.
Faulty radiator cap.
Faulty radiator overflow tank and hoses.
Loss of pressure in cooling system.
Faulty radiator fan shroud.
Faulty water pump.
Faulty thermostat.
Faulty fan clutch.

**TEST OPTIONS**
Visual Inspection

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

2. Does cooling system maintain pressure?

- **NO**
  - Go to step 7 of this fault.

- **YES**
CAUTION

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

WARNING

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

(1) Pressurize radiator overflow tank, using tester, to 15 psi (103 kPa).
(2) Observe radiator overflow tank for coolant leaks.

NOTE

Pressure loss without external leaks indicates engine internal coolant leaks.

(3) Observe radiator tester for loss of pressure.
(4) If cooling system does not maintain pressure, go to step 7 of this fault.
(5) Remove tester and test kit from radiator overflow tank.
(6) Install radiator cap on radiator overflow tank.
Is radiator fan shroud secure and free from damage?

3.

NO

Tighten radiator fan shroud hardware or replace radiator fan shroud (para 6-4).

YES

KNOWLEDGE

Coolant level OK.
Radiator core free of debris.
WATER TEMP gage OK.
Radiator OK.
Upper and lower coolant hoses OK.
Radiator cap OK.
Radiator overflow tank and hoses OK.
Cooling system pressure OK.

POSSIBLE PROBLEMS

Faulty radiator fan shroud.
Faulty water pump.
Faulty thermostat.
Faulty fan clutch.

TEST OPTIONS

Visual Inspection

REASON FOR QUESTION

If damage is present, radiator fan shroud is faulty.
(1) Check radiator fan shroud for loose hardware and damage.
(2) If radiator fan shroud hardware is loose, tighten hardware.
(3) If radiator fan shroud is damaged, replace radiator fan shroud (para 6-4).
4. Is water pump secure and free from damage?

**POSSIBLE PROBLEMS**
- Faulty water pump.
- Faulty thermostat.
- Faulty fan clutch.

**TEST OPTIONS**

- Visual Inspection

**REASON FOR QUESTION**

- If damage is present, water pump is faulty.

5. Does thermostat operate properly?

**WARNING**

Read WARNING on following page.

**POSSIBLE PROBLEMS**
- Faulty thermostat.
- Faulty fan clutch.

**TEST OPTIONS**

- Visual Inspection

**REASON FOR QUESTION**

- If thermostat does not operate properly, thermostat is faulty.

**POSSIBLE PROBLEMS**
- Faulty thermostat.
- Faulty fan clutch.
(1) Check water pump for loose hardware and damage.
(2) If water pump hardware is loose, tighten hardware.
(3) If water pump is damaged, replace water pump (para 6-12).

**WARNING**

Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing troubleshooting. 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.
(3) Start engine (TM 9-2320-366-10-1).

**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 flow of coolant from coolant hose.
(5) If thermostat does not operate properly, replace thermostat (para 6-5).
(6) Shut down engine (TM 9-2320-366-10-1).
(7) Install coolant hose on overflow tank and radiator (para 6-3).
(8) Refill overflow tank to proper level (TM 9-2320-366-10-1).
(9) Lower cab (TM 9-2320-366-10-1).
**d1. ENGINE OVERHEATS (CONT)**

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolant level OK.</td>
</tr>
<tr>
<td>Radiator core free of debris.</td>
</tr>
<tr>
<td>WATER TEMP gage OK.</td>
</tr>
<tr>
<td>Radiator OK.</td>
</tr>
<tr>
<td>Upper and lower coolant hoses OK.</td>
</tr>
<tr>
<td>Radiator cap OK.</td>
</tr>
<tr>
<td>Radiator overflow tank and hoses OK.</td>
</tr>
<tr>
<td>Cooling system pressure OK.</td>
</tr>
<tr>
<td>Radiator fan shroud OK.</td>
</tr>
<tr>
<td>Water pump OK.</td>
</tr>
<tr>
<td>Thermostat OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty fan clutch.</td>
</tr>
</tbody>
</table>

**6. Does fan clutch spin freely without air applied?**

**TEST OPTIONS**
- Visual Inspection

**REASON FOR QUESTION**
- If fan clutch spins freely without air pressure applied, fan clutch is faulty.

**FLOWCHART**
- **YES**
  - Notify DS Maintenance.
- **NO**
  - Replace fan clutch (para 6-14).
(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 from fan clutch.
(5) Check to see if fan clutch turns freely.
(6) If fan clutch turns freely without air applied, replace fan clutch (para 6-14).
(7) Connect air hose to fan clutch.
(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).
d1. ENGINE OVERHEATS (CONT)

**KNOWN INFO**
Coolant level OK.
Radiator core free of debris.
WATER TEMP gage OK.
Radiator OK.
Loss of pressure in cooling system.
Radiator fan shroud OK.
Water pump OK.
Thermostat OK.
Fan clutch OK.

**POSSIBLE PROBLEMS**
Faulty upper and lower coolant hoses.
Faulty radiator cap.
Faulty radiator overflow tank and hoses.

**TEST OPTIONS**
Visual Inspection

**REASON FOR QUESTION**
If external leaks are present, upper coolant hose, lower coolant hose, radiator overflow tank hose(s), or radiator overflow tank is faulty.

---

7. Does cooling system leak externally?

**NO**

**YES**

Replace upper coolant hose (para 6-9), lower coolant hose (para 6-10), radiator overflow tank hose(s), or radiator overflow tank (para 6-3).

Perform Cooling System Troubleshooting (d2. Oil in Cooling System).
**WARNING**

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

**CAUTION**

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

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

**NOTE**

Pressure loss without external leaks indicates engine internal coolant leaks.

3. Observe radiator tester for loss of pressure.
4. If no external leaks are present, perform Cooling System Troubleshooting (d2. Oil in Cooling System).
5. If external leaks are present, replace upper coolant hose (para 6-10), radiator overflow tank hose(s), or radiator overflow tank (para 6-3).
6. Remove tester and test kit from radiator overflow tank.
7. Install radiator cap on radiator overflow tank.

---

**Radiator Overflow Tank**

**Radiator Cap**
## d2. OIL IN COOLING SYSTEM

**INITIAL SETUP**

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

**Tools and Special Tools**
Tool Kit, Genl Mech (Item 46, Appendix C)

### 1. KNOWN INFO

Nothing.

### POSSIBLE PROBLEMS

- Faulty transmission oil cooler.
- Faulty engine head gasket.

### TEST OPTIONS

**Visual Inspection**

**REASON FOR QUESTION**

Leaking or damaged transmission oil cooler will allow oil to enter cooling system.

---

**Is transmission oil dipstick free of any signs of being milky and over HOT FULL line?**

- **YES**
  - Replace transmission oil cooler (para 8-10).

- **NO**

---

**WARNING**

Read WARNING on following page.

**Is engine oil dipstick free of any signs of being milky and over FULL line?**

- **YES**
  - Notify DS Maintenance.

- **NO**

---

**Notify DS Maintenance.**
Perform transmission oil check when engine is at normal operating temperature (160°F-230°F (71°C-110°C)).

NOTE

Engine oil dipstick is located close to starter solenoid connections which are 24 VDC and high amperage. Use caution removing/installing engine oil dipstick to prevent shorting across starter solenoid connections. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

(1) Start engine (TM 9-2320-366-10-1).
(2) Check transmission oil dipstick for signs of oil being milky and over HOT FULL line.
(3) If transmission oil dipstick shows oil level over HOT FULL line and milky, replace transmission oil cooler (para 8-10).
(4) Shut down engine (TM 9-2320-366-10-1).

(1) Raise cab (TM 9-2320-366-10-1).
(2) Check engine oil dipstick for signs of being milky and over FULL line.
(3) If engine oil dipstick shows engine oil to be milky and over FULL line, notify DS Maintenance.
(4) If engine oil dipstick shows engine oil appears normal and not over FULL line, notify DS Maintenance.
(5) Lower cab (TM 9-2320-366-10-1).
**d3. LOSS OF COOLANT**

**INITIAL SETUP**

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

**Personnel Required**
(2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- Test Kit, Radiator (P/N 4910-00-728-8227)
- Pressure Tester, Radiator (Item 26, Appendix C)
- Goggles, Industrial (Item 15, Appendix C)

**KNOWN INFO**
- Nothing.

**POSSIBLE PROBLEMS**
- Faulty radiator.
- Faulty radiator overflow tank.
- Faulty coolant hose or tube.
- External leaks or damage to engine oil cooler.
- External leaks or damage to transmission oil cooler.
- Faulty water pump.
- Faulty transmission oil cooler.

**WARNING**
- CAUTION

**READ WARNING and CAUTION on following page.**

1. **Are radiator, radiator overflow tank, and coolant hoses and tubes free from leaks or external damage?**

**REASON FOR QUESTION**
Leaking or damaged radiator, radiator overflow tank, or coolant hoses and tubes will cause a loss of coolant.

**TEST OPTIONS**
- Visual Inspection and Cooling System Pressure Test

**YES**
Replace radiator (para 6-2), radiator overflow tank (para 6-3), upper coolant tube(s) or hose(s) (para 6-9), or lower coolant hose (para 6-10).

**NO**
**COOLING SYSTEM PRESSURE TEST**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove radiator cap from radiator overflow tank.</td>
</tr>
<tr>
<td>2</td>
<td>Install test kit on radiator overflow tank.</td>
</tr>
<tr>
<td>3</td>
<td>Install pressure tester on test kit.</td>
</tr>
<tr>
<td>4</td>
<td>Pressurize radiator overflow tank, using tester, to 15 psi (103 kPa).</td>
</tr>
<tr>
<td>5</td>
<td>Observe radiator and radiator overflow tank for coolant leaks.</td>
</tr>
</tbody>
</table>

**CAUTION**

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

**NOTE**

Pressure loss without external leaks indicates internal coolant leaks.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Observe radiator tester for loss of pressure.</td>
</tr>
<tr>
<td>7</td>
<td>Remove pressure tester and test kit from radiator overflow tank.</td>
</tr>
<tr>
<td>8</td>
<td>Install radiator cap on radiator overflow tank.</td>
</tr>
</tbody>
</table>

**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 9-2320-366-10-1).
(2) Check radiator, radiator overflow tank, and coolant hoses and tubes for leaks and damage.

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

**NOTE**

Pressure loss without external leaks indicates internal coolant leaks.
d3. LOSS OF COOLANT (CONT)

**KNOWN INFO**
- Radiator OK.
- Radiator overflow tank OK.
- Air coolant hoses and tubes OK.

**POSSIBLE PROBLEMS**
- External leaks or damage to engine oil cooler.
- External leaks or damage to transmission oil cooler.
- Faulty water pump.
- Faulty transmission oil cooler.

**TEST OPTIONS**
- Visual Inspection

**REASON FOR QUESTION**
- Leaking or damaged engine oil cooler will cause a loss of coolant.

**WARNING**
Read WARNING on following page.

2.
Is engine oil cooler free from external leaks or damage?

- **NO**
- **YES** Notify DS Maintenance.

3.
Is transmission oil cooler free from external leaks or damage?

- **NO**
- **YES** Replace transmission oil cooler (para 8-10).

**WARNING**
- Leaking or damaged transmission oil cooler will cause a loss of coolant.
(1) Check engine oil cooler for leaks and obvious signs of damage.
(2) If leaks or damage are noted, notify DS Maintenance.

WARNING

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

(1) Check transmission oil cooler for obvious signs of damage and leakage.
(2) If leaks or damage are noted, replace transmission oil cooler (para 8-10).
(3) Lower cab (TM 9-2320-366-10-1).
d3. LOSS OF COOLANT (CONT)

**KNOWN INFO**
- Radiator OK.
- Radiator overflow tank OK.
- All coolant hoses and tubes OK.
- Engine oil cooler free from external leaks or damage.
- Transmission oil cooler free from external leaks or damage.

**POSSIBLE PROBLEMS**
- Faulty water pump.
- Faulty transmission oil cooler.

4. **Is water pump free from leaks or damage?**
   - **NO**
   - **YES**
     - Replace water pump (para 6-12).

**TEST OPTIONS**
- Visual Inspection

**REASON FOR QUESTION**
- Leaking or damaged water pump will cause a loss of coolant.

**KNOWN INFO**
- Radiator OK.
- Radiator overflow tank OK.
- All coolant hoses and tubes OK.
- Engine oil cooler free from external leaks or damage.
- Transmission oil cooler free from external leaks or damage.
- Water pump OK.

**POSSIBLE PROBLEMS**
- Faulty transmission oil cooler.

5. **Is transmission oil dipstick free of any signs of being over HOT FULL line, discolored, or milky?**
   - **NO**
   - **YES**
     - Replace transmission oil cooler (para 8-10).

**TEST OPTIONS**
- Visual Inspection

**REASON FOR QUESTION**
- Leaking or damaged transmission oil cooler will cause a loss of coolant.

Notify DS Maintenance.
(1) Start engine (TM 9-2320-366-10-1).
(2) Check water pump for obvious signs of damage and leakage.
(3) If leaks or damage are found, replace water pump (para 6-12).
(4) Shut down engine (TM 9-2320-366-10-1).

**NOTE**

Perform transmission oil check when engine is at normal operating temperature (160°F - 230°F (71°C - 110°C)).

(1) Start engine (TM 9-2320-366-10-1).
(2) Check transmission oil dipstick for signs of being over HOT FULL line, discolored, or milky.
(3) If signs of being over HOT FULL line, discolored, or milky are found, replace transmission oil cooler (para 8-10).
(4) If no signs of being over HOT FULL line, discolored, or milky are found, notify DS Maintenance.
(5) Shut down engine (TM 9-2320-366-10-1).
# 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**

<table>
<thead>
<tr>
<th>Fault No.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>e1</td>
<td>Circuit Breaker Does Not Operate</td>
<td>2-158</td>
</tr>
<tr>
<td>e2</td>
<td>Engine Does Not Crank</td>
<td>2-164</td>
</tr>
<tr>
<td>e3</td>
<td>12 VDC and 24 VDC Circuits Do Not Operate</td>
<td>2-264</td>
</tr>
<tr>
<td>e4</td>
<td>24 VDC Circuits Do Not Operate</td>
<td>2-268</td>
</tr>
<tr>
<td>e5</td>
<td>Deleted</td>
<td>2-286</td>
</tr>
<tr>
<td>e6</td>
<td>Engine Cranks But Does Not Start</td>
<td>2-310</td>
</tr>
<tr>
<td>e7</td>
<td>FUEL Gage Does Not Operate or Is Inaccurate</td>
<td>2-318</td>
</tr>
<tr>
<td>e8</td>
<td>WATER TEMP Gage Does Not Operate or Is Inaccurate</td>
<td>2-324</td>
</tr>
<tr>
<td>e9</td>
<td>REAR BRAKE AIR Pressure Gage Does Not Operate or Is Inaccurate</td>
<td>2-328</td>
</tr>
<tr>
<td>e10</td>
<td>FRONT BRAKE AIR Pressure Gage Does Not Operate or Is Inaccurate</td>
<td>2-332</td>
</tr>
<tr>
<td>e11</td>
<td>Engine Oil Pressure Gage Does Not Operate or Is Inaccurate</td>
<td>2-336</td>
</tr>
<tr>
<td>e12</td>
<td>Speedometer Does Not Operate or Is Inaccurate</td>
<td>2-342</td>
</tr>
<tr>
<td>e13</td>
<td>VOLTS Gage Does Not Operate or Is Inaccurate</td>
<td>2-356</td>
</tr>
<tr>
<td>e14</td>
<td>Tachometer Does Not Operate or Is Inaccurate</td>
<td>2-358</td>
</tr>
<tr>
<td>e15</td>
<td>Audible Alarm Does Not Operate</td>
<td>2-368</td>
</tr>
<tr>
<td>e16</td>
<td>Troop Transport Audible Alarm Does Not Operate</td>
<td>2-372</td>
</tr>
<tr>
<td>e16A</td>
<td>Master Power Switch Does Not Shut Down Engine</td>
<td>2-380.4</td>
</tr>
<tr>
<td>e16B</td>
<td>Lamp Test Switch Does Not Illuminate</td>
<td>2-380.10</td>
</tr>
<tr>
<td>e17</td>
<td>Radiator Fan Off Switch Does Not Illuminate</td>
<td>2-382</td>
</tr>
<tr>
<td>e17A</td>
<td>Ether Start Switch Does Not Illuminate</td>
<td>2-386</td>
</tr>
<tr>
<td>e17B</td>
<td>Hazard Lights Switch Does Not Illuminate</td>
<td>2-386.4</td>
</tr>
<tr>
<td>e17C</td>
<td>Amber Warning Light Switch Does Not Illuminate</td>
<td>2-386.8</td>
</tr>
<tr>
<td>e17D</td>
<td>Master Power Switch Does Not Illuminate</td>
<td>2-386.12</td>
</tr>
<tr>
<td>e18</td>
<td>REAR BRAKE AIR Gage Does Not Illuminate</td>
<td>2-388</td>
</tr>
<tr>
<td>e18A</td>
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<td>FRONT BRAKE AIR Gage Does Not Illuminate</td>
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<td>e18C</td>
<td>Speedometer Does Not Illuminate</td>
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<td>e18D</td>
<td>VOLTS Gage Does Not Illuminate</td>
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<td>OIL PRESS Gage Does Not Illuminate</td>
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<td>Auxiliary Instrument Panel, Personnel Heater, and Instrument Panel Do Not Illuminate</td>
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<td>Auxiliary Panel Switch Does Not Illuminate</td>
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<td>Central Tire Inflation System (CTIS) Overspeed Indicator Does Not Operate</td>
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<td>e34</td>
<td>Dump Up Indicator Does Not Operate</td>
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<td>WTEC II Transmission Temperature Indicator Does Not Operate</td>
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<td>e37</td>
<td>Front Brake Air Indicator Does Not Illuminate When Air Pressure is Below 65 PSI</td>
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<td>e38</td>
<td>Rear Brake Air Indicator Does Not Illuminate When Air Pressure is Below 65 PSI</td>
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<td>e39</td>
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<td>e61</td>
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<td>e62</td>
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<td>e64</td>
<td>Stoplights Do Not Operate When M1088 Trailer Brakes Are Applied</td>
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<td>Trailer Marker/Taillights Do Not Illuminate</td>
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<td>Trailer Left Stop/Turn Light Does Not Illuminate</td>
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<td>e68</td>
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<td>Trailer Blackout Stoplights Do Not Illuminate</td>
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<td>e70</td>
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<td>e71</td>
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e73.       | Intervehicle Stoplights Do Not Illuminate | 2-852 |
e74.       | Intervehicle Taillights Do Not Operate | 2-858 |
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e76.       | Personnel Heater Fan Does Not Operate | 2-868 |
e77.       | Windshield Washer Does Not Operate | 2-874 |
e78.       | Windshield Wiper Does Not Operate On Low Speed | 2-886 |
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e82.       | Horn Does Not Operate | 2-916 |
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e85.       | Central Tire Inflation System (CTIS) Does Not Operate | 2-946 |
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<td>M1089 Material Handling Crane (MHC) Does Not Operate</td>
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<td>M1089 Material Handling Crane (MHC) Does Not Operate From Remote Control</td>
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<td>M1089 Material Handling Crane (MHC) Telescope In Does Not Operate From Remote Station</td>
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<td>M1089 Material Handling Crane (MHC) Telescope Out Does Not Operate From Remote Station</td>
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<td>M1089 Material Handling Crane (MHC) Swing CCW Does Not Operate From Remote Station</td>
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<td>M1089 Material Handling Crane (MHC) Hoist Up Lockout Does Not Activate</td>
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<td>M1089 Material Handling Crane (MHC) Boom Down Lockout Does Not Activate</td>
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<td>M1089 Material Handling Crane (MHC) Boom Up Lockout Does Not Activate</td>
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<td>M1089 Material Handling Crane (MHC) Telescope Out Lockout Does Not Activate</td>
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<td>M1089 Material Handling Crane (MHC) Overload Shutdown System Does Not Activate</td>
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<td>All Wrecker Functions Do Not Operate From Wrecker Remote Control</td>
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<td>All Wrecker Functions Do Not Operate From Wrecker Control Panel</td>
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<td>e138A</td>
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<tr>
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<td>Main Winch LH or RH Speed Switch Does Not Operate From Wrecker Control Panel</td>
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<td>e140</td>
<td>Main Winch LH or RH Freespool Switch Does Not Operate From Wrecker Control Panel</td>
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<td>e141</td>
<td>One Wrecker Function Does Not Operate From Wrecker Remote Control</td>
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<td>e142</td>
<td>M1090/M1094 Tailgate Release Does Not Operate</td>
<td>2-1468</td>
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<td>e143</td>
<td>M1090/M1094 Dump Body Does Not Raise</td>
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<td>e144</td>
<td>M1090/M1094 Dump Body Does Not Lower</td>
<td>2-1492</td>
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<tr>
<td>e145</td>
<td>Transmission Auxiliary Oil Cooler Fan(s) Runs Constantly</td>
<td>2-1504</td>
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<td>e146</td>
<td>Transmission Auxiliary Oil Cooler Fan Does Not Operate (All Models Except M1088/M1089)</td>
<td>2-1508</td>
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<tr>
<td>e147</td>
<td>M1088/M1089 Transmission Auxiliary Oil Cooler Fan Does Not Operate</td>
<td>2-1526</td>
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<td>e148</td>
<td>M1088/M1089 Worklights Do Not Illuminate</td>
<td>2-1540</td>
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<td>e149</td>
<td>M1088/M1089 (LH) Worklights Do Not Illuminate</td>
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<td>e150</td>
<td>M1088/M1089 (RH) Worklights Do Not Illuminate</td>
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<td>e151</td>
<td>M1088/M1089 Worklights Do Not Illuminate In Blackout Mode With Blackout Override Switch On</td>
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<td>e152</td>
<td>M1084/M1086 Worklights Do Not Illuminate</td>
<td>2-1576</td>
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</tbody>
</table>
### INITIAL SETUP

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

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

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

## e1. CIRCUIT BREAKER DOES NOT OPERATE

### KNOWLEDGE INFO
- Nothing.

### POSSIBLE PROBLEMS
- Faulty circuit breaker.

### WARNING
Read WARNING on following page.

### TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

### REASON FOR QUESTION
If continuity is not present, circuit breaker is faulty.

### Diagram

- **START**
- **WARNING**
  - Is continuity present through circuit breaker (refer to Table 2-8. Function To Circuit Breaker Cross Reference or Table 2-8.1. Circuit Breaker to Function Cross Reference)?
- **NO**
- **YES**
  - Replace circuit breaker (para 7-9).
  - Circuit breaker is OK. Return to troubleshooting for affected circuit.

---

2-158 Change 1
WARNING

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

CONTINUITY TEST

(1) Remove Power Distribution Panel (PDP) cover (para 16-2).
(2) Locate circuit breaker to be tested on PDP (refer to Figure 2-1. Circuit Breaker Locations and Table 2-8. Function to Circuit Breaker Cross Reference or Table 2-8.1. Circuit Breaker to Function 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, circuit breaker is OK. Return to troubleshooting affected circuit.
(10) Install tested circuit breaker in PDP.
(11) Install PDP cover (para 16-2).

---

Figure 2-1. Circuit Breaker Locations

---
e1. CIRCUIT BREAKER DOES NOT OPERATE (CONT)

Table 2-8. Function to Circuit Breaker Cross Reference

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<tr>
<th>Function</th>
<th>Circuit Breaker / AMP</th>
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<td>10 AMP Fuse WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS)</td>
<td>CB79 / 15</td>
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<tr>
<td>12 VDC Intervehicular Left Turn Signal</td>
<td>CB76 / 15</td>
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<tr>
<td>12 VDC Intervehicular Marker Lights</td>
<td>CB67 / 25</td>
</tr>
<tr>
<td>12 VDC Intervehicular Right Turn Signal</td>
<td>CB76 / 15</td>
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<td>12 VDC Intervehicular Stoplight</td>
<td>CB76 / 15</td>
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<tr>
<td>12 VDC Intervehicular Taillights</td>
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<td>24 VDC Intervehicular Auxiliary</td>
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<td>24 VDC Intervehicular Blackout Clearance</td>
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<td>24 VDC Intervehicular Blackout Stoplight</td>
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<td>24 VDC Intervehicular Clearance and Rear Light</td>
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<td>24 VDC Intervehicular Left Blackout Marker</td>
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<tr>
<td>24 VDC Intervehicular Left and Right Turn Signals and Stoplights (WTEC III)</td>
<td>CB44 / 15</td>
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<td>24 VDC Intervehicular Left Turn Signal and Stoplight (WTEC II)</td>
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<tr>
<td>24 VDC Intervehicular Right Blackout Marker</td>
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<tr>
<td>24 VDC Intervehicular Right Turn Signal and Stoplight (WTEC II)</td>
<td>CB44 / 15</td>
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<tr>
<td>Air Dryer</td>
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Table 2-8. Function to Circuit Breaker Cross Reference (Cont)

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<td>Audible Alarm</td>
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<td>Auxiliary Oil Coolers Fan Motors (M1088 and M1089)</td>
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<tr>
<td>Blackout Drive Light</td>
<td>CB54 / 8</td>
</tr>
<tr>
<td>Blackout Override Switch</td>
<td>CB72 / 15</td>
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<td>Blackout Override Switch Light</td>
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<td>Cab Radio</td>
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<td>Central Tire Inflation System (CTIS) Overspeed Indicator Light</td>
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<td>Circuit Breaker CB54</td>
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<td>Circuit Breaker CB74</td>
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### Table 2-8. Function to Circuit Breaker Cross Reference (Cont)

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<td>Main Light Switch</td>
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<td>Material Handling Crane</td>
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<td>Personnel Heater Lights</td>
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<td>Power Take-Off (PTO) Indicator Light</td>
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<td>Rotating Warning Light(s)</td>
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<td>Starter Pushbutton Switch</td>
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<td>Stoplight Switches</td>
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### Table 2-8. Function to Circuit Breaker Cross Reference (Cont)

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<td>Water Temperature Switch (Fan)</td>
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### Table 2-8. Function to Circuit Breaker Cross Reference (Cont)

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<td>Wrecker Remote Control</td>
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<tr>
<td>Wrecker Remote Engine Kill Switch</td>
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<tr>
<td>WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS)</td>
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<tr>
<td>WTEC II Vehicle Interface Module (VIM)</td>
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<td>WTEC II / WTEC III Transmission Pushbutton Shift Selector (TPSS) Dimmer Module</td>
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### Table 2-8.1. Circuit Breaker to Function Cross Reference (Cont)

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<td>Personnel Heater</td>
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<td>CB30 / 10</td>
<td>Chemical Alarm</td>
<td>CB49 / 15</td>
<td>Power Take-Off (PTO) Solenoid</td>
</tr>
<tr>
<td>CB30 / 10</td>
<td>Chemical Detector</td>
<td>CB49 / 15</td>
<td>Power Take-Off (PTO) Switch</td>
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<tr>
<td>CB30 / 10</td>
<td>Chemical Detector Indicator Light</td>
<td>CB49 / 15</td>
<td>Winch In Solenoid</td>
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<tr>
<td>CB35 / 15</td>
<td>WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS)</td>
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<tr>
<td>CB35 / 15</td>
<td>WTEC II Vehicle Interface Module (VIM)</td>
<td></td>
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<tr>
<td>CB36 / 20</td>
<td>Horn</td>
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<tr>
<td>CB37 / 20</td>
<td>Windshield Wiper ECU</td>
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<tr>
<td>CB37 / 20</td>
<td>Wiper Motor</td>
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### Table 2-8.1. Circuit Breaker to Function Cross Reference (Cont)

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<tr>
<th>Circuit Breaker / AMP</th>
<th>Function</th>
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<tbody>
<tr>
<td>CB49 / 15</td>
<td>Winch In/Out Switch</td>
</tr>
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<td>CB49 / 15</td>
<td>Winch Out Solenoid</td>
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<td>CB49 / 15</td>
<td>Winch Switch</td>
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<tr>
<td>CB50 / 15</td>
<td>Dump Down Solenoid</td>
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<tr>
<td>CB50 / 15</td>
<td>Dump Up Solenoid</td>
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<tr>
<td>CB50 / 15</td>
<td>Dump Up/Down Switch</td>
</tr>
<tr>
<td>CB50 / 15</td>
<td>Tailgate Release Solenoid</td>
</tr>
<tr>
<td>CB50 / 15</td>
<td>Tailgate Release Switch</td>
</tr>
<tr>
<td>CB65 / 8</td>
<td>Wrecker Control Panel</td>
</tr>
<tr>
<td>CB65 / 8</td>
<td>Wrecker Remote Control</td>
</tr>
<tr>
<td>CB54 / 15</td>
<td>Material Handling Crane</td>
</tr>
<tr>
<td>CB54 / 8</td>
<td>Blackout Drive Light</td>
</tr>
<tr>
<td>CB65 / 8</td>
<td>Front Left Parking Light</td>
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<tr>
<td>CB65 / 8</td>
<td>Front Right Parking Light</td>
</tr>
<tr>
<td>CB66 / 8</td>
<td>Front Left Blackout Marker</td>
</tr>
<tr>
<td>CB66 / 8</td>
<td>Front Right Blackout Marker</td>
</tr>
<tr>
<td>CB66 / 8</td>
<td>Rear LH Blackout Marker</td>
</tr>
<tr>
<td>CB66 / 8</td>
<td>Rear RH Blackout Marker</td>
</tr>
<tr>
<td>CB66 / 8</td>
<td>WTEC II / WTEC III Transmission Pushbutton Shift Selector (TPSS) Dimmer Module</td>
</tr>
<tr>
<td>CB67 / 25</td>
<td>12 VDC Intervehicular Marker Lights</td>
</tr>
<tr>
<td>CB67 / 25</td>
<td>All Marker Lights</td>
</tr>
<tr>
<td>CB68 / 20</td>
<td>Auxiliary Oil Coolers Fan Motors (except M1088 and M1089)</td>
</tr>
</tbody>
</table>

### Table 2-8.1. Circuit Breaker to Function Cross Reference (Cont)

<table>
<thead>
<tr>
<th>Circuit Breaker / AMP</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB68 / 25</td>
<td>Auxiliary Oil Coolers Fan Motors (M1088 and M1089)</td>
</tr>
<tr>
<td>CB70 / 20</td>
<td>Blackout Override Switch Light</td>
</tr>
<tr>
<td>CB70 / 20</td>
<td>Circuit Breaker CB54</td>
</tr>
<tr>
<td>CB70 / 20</td>
<td>Circuit Breaker CB65</td>
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<tr>
<td>CB70 / 20</td>
<td>Ether Start Switch Light</td>
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<tr>
<td>CB70 / 20</td>
<td>Front Brake Air Pressure Gage Light</td>
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<td>CB70 / 20</td>
<td>Circuit Breaker CB66</td>
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<td>CB70 / 20</td>
<td>Circuit Breaker CB74</td>
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<td>CB70 / 20</td>
<td>Circuit Breaker CB76</td>
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<td>Dimmer Module</td>
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<td>Dump Up/Down Switch Light</td>
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<td>CB70 / 20</td>
<td>Engine Fan Off Switch Light</td>
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<tr>
<td>CB70 / 20</td>
<td>Engine Oil Pressure Gage Light</td>
</tr>
<tr>
<td>CB70 / 20</td>
<td>Fuel Gage Light</td>
</tr>
<tr>
<td>CB70 / 20</td>
<td>Hazard Warning Switch Light</td>
</tr>
<tr>
<td>CB70 / 20</td>
<td>Headlight Dimmer Switch</td>
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<tr>
<td>CB70 / 20</td>
<td>Lamp Test Switch Light</td>
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<td>CB70 / 20</td>
<td>Main Light Switch</td>
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<td>CB70 / 20</td>
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<td>CB70 / 20</td>
<td>Master Power Switch Light</td>
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<tr>
<td>CB70 / 20</td>
<td>Personnel Heater Lights</td>
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<td>CB70 / 20</td>
<td>Power Take-Off (PTO) Switch Light</td>
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<tr>
<td>CB70 / 20</td>
<td>Rear Brake Air Pressure Gage Light</td>
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### Table 2-8.1. Circuit Breaker to Function Cross Reference (Cont)

<table>
<thead>
<tr>
<th>Circuit Breaker / AMP</th>
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<tr>
<td>CB70 / 20</td>
<td>Rotating Warning Light Switch</td>
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<tr>
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<td>Rotating Warning Light Switch Light</td>
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<td>CB70 / 20</td>
<td>Speedometer Light</td>
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<td>CB70 / 20</td>
<td>Tachometer Light</td>
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<tr>
<td>CB70 / 20</td>
<td>Tailgate Release Switch Light</td>
</tr>
<tr>
<td>CB70 / 20</td>
<td>Voltmeter Light</td>
</tr>
<tr>
<td>CB70 / 20</td>
<td>Water Temperature Gage Light</td>
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<tr>
<td>CB70 / 20</td>
<td>Winch In/Out Switch Light</td>
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<td>CB70 / 20</td>
<td>Winch Switch Light</td>
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<td>CB70 / 20</td>
<td>Work Light Switch Light</td>
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<tr>
<td>CB71 / 15</td>
<td>Hazard Warning Switch</td>
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<tr>
<td>CB71 / 15</td>
<td>Turn Signal Flasher ECU</td>
</tr>
<tr>
<td>CB71 / 15</td>
<td>Work Light Switch</td>
</tr>
<tr>
<td>CB72 / 15</td>
<td>Blackout Override Switch</td>
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<td>Work Lights</td>
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<td>CB73 / 8</td>
<td>Backup Light</td>
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<td>Turn Signal Flasher ECU</td>
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<td>12 VDC Intervehicular Left Turn Signal</td>
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<td>12 VDC Intervehicular Right Turn Signal</td>
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<td>12 VDC Intervehicular Stoplight</td>
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<td>CB76 / 15</td>
<td>24 VDC Intervehicular Auxiliary</td>
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<td>Left Blackout Stoplight</td>
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<td>CB76 / 15</td>
<td>Left Turn Signal Indicator Light</td>
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<td>CB76 / 15</td>
<td>Rear Left Composite Lamp Turn Signal</td>
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<tr>
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<td>Rear Right Composite Lamp Turn Signal</td>
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<td>Right Blackout Stoplight</td>
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<td>Right Turn Signal Indicator Light</td>
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<td>CB76 / 15</td>
<td>Stoplight Switches</td>
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<td>Tractor Stoplight Switch</td>
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<td>Audible Alarm</td>
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<td>Emergency Brake Indicator Light</td>
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<td>Engine Fan Off Indicator Light</td>
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<td>CB77 / 10</td>
<td>Engine Fan Off Switch (Indicator Light)</td>
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<td>Engine Oil Pressure Gage</td>
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<td>Engine Oil Pressure Switch</td>
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<td>CB77 / 10</td>
<td>Front Brake Air Indicator Light</td>
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Table 2-8.1. Circuit Breaker to Function Cross Reference (Cont)

<table>
<thead>
<tr>
<th>Circuit Breaker / AMP</th>
<th>Function</th>
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<tbody>
<tr>
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<td>Front Brake Air Pressure Gage</td>
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<td>Fuel Gage</td>
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<td>CB77 / 10</td>
<td>Fuel Level Sensor</td>
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<td>CB77 / 10</td>
<td>Magnetic Pickup</td>
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<td>CB77 / 10</td>
<td>Master Stop Indicator Light</td>
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<tr>
<td>CB77 / 10</td>
<td>Parking Brake Indicator Light</td>
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<td>CB77 / 10</td>
<td>Parking Brake Switch</td>
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<td>Power Take-Off (PTO) Indicator Light</td>
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<td>Power Take-Off (PTO) Pressure Switch</td>
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<td>Rear Brake Air Indicator Light</td>
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<td>Rear Brake Air Indicator Light Switch</td>
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<td>Tachometer</td>
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<td>CB77 / 10</td>
<td>Transmission Temperature Indicator Light</td>
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<td>Troop Transport Alarm Switch</td>
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<td>Voltmeter</td>
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<td>CB77 / 10</td>
<td>Water Temperature Gage</td>
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<td>CB77 / 10</td>
<td>Water Temperature Indicator Light</td>
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<tr>
<td>CB79 / 15</td>
<td>10 AMP Fuse WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS)</td>
</tr>
<tr>
<td>CB79 / 15</td>
<td>Fuel Solenoid</td>
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<tr>
<td>CB79 / 15</td>
<td>Start Inhibit Pushbutton Switch</td>
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<tr>
<td>CB79 / 15</td>
<td>Wrecker Remote Engine Kill Switch</td>
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<tr>
<td>CB79 / 15</td>
<td>WTEC III Transmission ECU</td>
</tr>
<tr>
<td>CB80 / 25</td>
<td>12 VDC Intervehicular Taillights</td>
</tr>
<tr>
<td>CB80 / 25</td>
<td>Left Rear Composite Lamp Taillight</td>
</tr>
<tr>
<td>CB80 / 25</td>
<td>Right Rear Composite Lamp Taillight</td>
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Table 2-8.1. Circuit Breaker to Function Cross Reference (Cont)

<table>
<thead>
<tr>
<th>Circuit Breaker / AMP</th>
<th>Function</th>
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<tbody>
<tr>
<td>CB77 / 10</td>
<td>Water Temperature Sensor</td>
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<td>CB77 / 10</td>
<td>Water Temperature Switch</td>
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<td>CB78 / 15</td>
<td>Headlight HI Beam Indicator Light</td>
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<td>Left Headlight</td>
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<td>CB78 / 15</td>
<td>Right Headlight</td>
</tr>
<tr>
<td>CB79 / 15</td>
<td>10 AMP Fuse WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS)</td>
</tr>
<tr>
<td>CB79 / 15</td>
<td>Fuel Solenoid</td>
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<tr>
<td>CB79 / 15</td>
<td>Start Inhibit Pushbutton Switch</td>
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<td>CB79 / 15</td>
<td>Wrecker Remote Engine Kill Switch</td>
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<td>WTEC III Transmission ECU</td>
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<td>12 VDC Intervehicular Taillights</td>
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<tr>
<td>CB80 / 25</td>
<td>Left Rear Composite Lamp Taillight</td>
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<tr>
<td>CB80 / 25</td>
<td>Right Rear Composite Lamp Taillight</td>
</tr>
</tbody>
</table>
**e2. ENGINE DOES NOT CRANK**

### INITIAL SETUP

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

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wire, Elect, 50 ft (Item 71, Appendix D)
- Wire, Relay Test (Item 9, Appendix E)

**Materials/Parts**
- Ties, Cable, Plastic (Item 69, Appendix D)
- Adhesive (Item 8, Appendix D)
- Dispenser, Pressure Sensitive Adhesive Tape (Item 20, Appendix D)
- Seal Ring, Metal (Item 268, Appendix G)

**Personnel Required**
- (2)

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

### KNOWN INFO

- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.

### POSSIBLE PROBLEMS

- Faulty starting motor.
- Faulty auxiliary starter solenoid.
- Faulty battery to starter cable assembly.
- Faulty oil pressure switch.
- Faulty relay K24.
- Faulty start and charging cable assembly.
- Faulty relay K1.
- Faulty engine control cable assembly.
- Faulty starter pushbutton switch.
- Faulty neutral start relay.
- Faulty WTEC II Vehicle Interface Module (VIM).
- Faulty WTEC II cab transmission wiring harness.
- Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
- Faulty relay K26.
- Faulty dashboard cable assembly.
- Faulty WTEC III transmission ECU.
- Faulty WTEC III transmission pushbutton shift selector (TPSS).

### NOTE

Perform Engine System Troubleshooting a1. Engine Does Not Crank and Electrical System Troubleshooting e1. Circuit Breaker Does Not Operate on circuit breakers CB21 and CB77 prior to beginning this task.

Remove and install plastic cable ties as required.

### TEST OPTIONS

- **Visual Inspection**

**REASON FOR QUESTION**

If vehicle is equipped with connector P81, perform Thermal Switch Bypass procedure. If vehicle is not equipped with connector P81, continue with step 2 of this fault.

![Decision Tree Diagram]

**START**

1. **WARNING**

   Is vehicle equipped with connector P81?

   - **NO**
     - Go to step 2 of this fault.
   - **YES**
     - Perform Thermal Switch Bypass Procedure.

---

**TM 9-2320-366-20-1**

2-164 Change 1
WARNING

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

(1) If vehicle is not equipped with connector P81 continue with step 2 of this fault.
(2) If vehicle is equipped with connector P81 perform Thermal Switch Bypass Procedure, see below.
(3) After performing Thermal Switch Bypass Procedure, attempt to start engine (TM 9-2320-366-10-1).
(4) If engine still does not crank, continue with step 2 of this fault.

THERMAL SWITCH BYPASS PROCEDURE

The tools and materials are required to perform the thermal switch bypass:
- Heater, Gun type, Electrical (Appendix B, Item 24)
- Tape, Insulation, Electrical (Appendix D, Item 68)
- Splice, Conductor (Item 261, Appendix G)
- Insulation Sleeving, Electrical (1.5 in. or 3.8 cm) (Item 28.1, Appendix D)

(1) Disconnect batteries (para 7-57).
(2) Disconnect connector P81 from thermal switch connector.
(3) Cut connector P81 from branch of start and charging cable assembly.
(4) Remove band marker from branch of start and charging cable assembly.

NOTE
Remove electrical tape as required.

(5) Remove insulation sleeving from convoluted tubing to body of start and charging cable assembly.
(6) Remove insulation sleeving from two wires to body of start and charging cable assembly.

NOTE
Measure wires from body of start and charging cable assembly.

(7) Cut one wire 3 in. (7.6 cm).
(8) Cut other wire 4 in. (10.2 cm).
(9) Remove 0.38 in. (1 cm) of insulation from two wires.
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.

**POSSIBLE PROBLEMS**
Faulty starting motor.
Faulty auxiliary starter solenoid.
Faulty battery to starter cable assembly.
Faulty oil pressure switch.
Faulty relay K24.
Faulty start and charging cable assembly.
Faulty relay K1.
Faulty engine control cable assembly.
Faulty starter pushbutton switch.
Faulty neutral start relay.
Faulty WTEC II vehicle interface module (VIM).
Faulty WTEC II cab transmission wiring harness.
Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
Faulty relay K26.
Faulty dashboard cable assembly.
Faulty WTEC III transmission ECU.
Faulty WTEC III transmission pushbutton shift selector (TPSS).

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, ground wire is faulty.

2. **Is continuity present from solenoid left terminal stud to starting motor ground terminal stud?**

   - **NO**
     - Repair or replace ground wire from solenoid left terminal stud to starting motor ground terminal stud (para 2-45).

   - **YES**
<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>(2) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to solenoid left terminal stud.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to starting motor ground terminal stud and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If continuity is not present repair or replace ground wire from solenoid left terminal stud to starting motor ground terminal stud (para 2-45).</td>
</tr>
</tbody>
</table>

![Diagram of starting motor and ground terminal stud]
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.

**POSSIBLE PROBLEMS**
- Faulty starting motor.
- Faulty auxiliary starter solenoid.
- Faulty battery to starter cable assembly.
- Faulty oil pressure switch.
- Faulty relay K24.
- Faulty start and charging cable assembly.
- Faulty relay K1.
- Faulty engine control cable assembly.
- Faulty starter pushbutton switch.
- Faulty neutral start relay.
- Faulty WTEC II vehicle interface module (VIM).
- Faulty WTEC II cab transmission wiring harness.
- Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
- Faulty relay K26.
- Faulty dashboard cable assembly.
- Faulty WTEC III transmission pushbutton shift selector (TPSS).

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 24 VDC is not present, go to step 4 of this fault. If 24 VDC is present, starting motor is faulty.

**WARNING**
Read WARNING on following page.

3. Is 24 VDC present at terminal lug TL26?

**YES**
Go to step 4 of this fault.

**NO**
Replace starting motor (para 7-7).
WARNING

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

VOLTAGE TEST

(1) Remove adhesive from solenoid right terminal stud.
(2) Connect batteries (para 7-57).
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to terminal lug TL26.
(5) Connect negative (-) probe of multimeter to ground.
(6) Lower cab (TM 9-2320-366-10-1).
(7) Position master power switch to on (TM 9-2320-366-10-1).
(8) Press starter pushbutton (TM 9-2320-366-10-1) and note reading on multimeter.
(9) If 24 VDC is not present, go to 4 of this fault.
(10) If 24 VDC is present, replace starting motor (para 7-7).
(11) Position master power switch to off (TM 9-2320-366-10-1).
Is 24 VDC present at terminal lug TL9?

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.

**POSSIBLE PROBLEMS**
- Faulty auxiliary starter solenoid.
- Faulty battery to starter cable assembly.
- Faulty oil pressure switch.
- Faulty relay K24.
- Faulty start and charging cable assembly.
- Faulty relay K1.
- Faulty engine control cable assembly.
- Faulty starter pushbutton switch.
- Faulty neutral start relay.
- Faulty WTEC II vehicle interface module (VIM).
- Faulty WTEC II cab transmission wiring harness.
- Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
- Faulty relay K26.
- Faulty dashboard cable assembly.
- Faulty WTEC III transmission pushbutton shift selector (TPSS).

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

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

Go to step 8 of this fault.

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

### VOLTAGE TEST

1. Raise cab (TM 9-2320-366-10-1).
2. Disconnect batteries (para 7-57).
3. Remove adhesive from auxiliary starter solenoid.
4. Connect batteries (para 7-57).
5. Set multimeter to volts DC.
6. Connect positive (+) probe of multimeter to terminal lug TL9.
7. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
8. If 24 VDC is not present, go to step 8 of this fault.
e2. ENGINE DOES NOT CRANK (CONT)

KNOWN INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.

POSSIBLE PROBLEMS
Faulty auxiliary starter solenoid.
Faulty oil pressure switch.
Faulty relay K24.
Faulty start and charging cable assembly.
Faulty relay K1.
Faulty engine control cable assembly.
Faulty starter pushbutton switch.
Faulty neutral start relay.
Faulty WTEC II vehicle interface module (VIM).
Faulty WTEC II cab transmission wiring harness.
Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
Faulty relay K26.
Faulty dashboard cable assembly.
Faulty WTEC III transmission pushbutton shift selector (TPSS).

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

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

WARNING
Read WARNING on following page.

5. Is 24 VDC present at terminal lug TL33?

NO

YES

Go to step 9 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 circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to terminal lug TL33.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Lower cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(5) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Press starter pushbutton (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 24 VDC is not present, go to step 9 of this fault.</td>
</tr>
<tr>
<td>(8) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Raise cab (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
6. **Is continuity present from terminal lug TL23 to ground?**

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- Relay K24 OK.
- Relay K1 OK.
- Engine control cable assembly OK.
- Starter pushbutton switch OK.
- Neutral start relay OK.
- WTEC II vehicle interface module (VIM) OK.
- WTEC II cab transmission wiring harness OK.
- WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
- Relay K26 OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty auxiliary starter solenoid.
- Faulty start and charging cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 93 is faulty.

**YES**
- Repair wire 93 from terminal lug TL23 to terminal lug TL25 (para 2-45) or replace start and charging cable assembly (para 7-132).

**NO**
CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Remove nut, lockwasher, and terminal lug TL23 from auxiliary starter solenoid. Discard lockwasher.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal lug TL23.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If continuity is not present, repair wire 93 from terminal lug TL23 to terminal lug TL25 (para 2-45) or replace start and charging cable assembly (para 7-132).
(7) Install terminal lug TL23 on auxiliary starter solenoid with lockwasher and nut.
**KNOWLEDGE INFO**

- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- Relay K24 OK.
- Relay K1 OK.
- Engine control cable assembly OK.
- Starter pushbutton switch OK.
- Neutral start relay OK.
- WTEC II vehicle interface module (VIM) OK.
- WTEC II cab transmission wiring harness OK.
- WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
- Relay K26 OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**

- Faulty auxiliary starter solenoid.
- Faulty start and charging cable assembly.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, wire 14A is faulty. If continuity is present, auxiliary starter solenoid is faulty.

**7.**

- Is continuity present from terminal lug TL24 to terminal lug TL26?

**YES**

- Replace auxiliary starter solenoid (para 7-6).

**NO**

- Repair wire 14A from terminal lug TL24 to terminal lug TL26 (para 2-45) or replace start and charging cable assembly (para 7-132).
CONTINUITY TEST

1) Remove nut, lockwasher, and terminal lug TL24 from auxiliary starter solenoid. Discard lockwasher.
2) Set multimeter to ohms.
3) Connect positive (+) probe of multimeter to terminal lug TL24.
4) Connect negative (-) probe of multimeter to terminal lug TL26 and note reading on multimeter.
5) If continuity is not present, repair wire 14A from terminal lug TL24 to terminal lug TL26 (para 2-45) or replace start and charging cable assembly (para 7-132).
6) If continuity is present, replace auxiliary starter solenoid (para 7-6).
7) Install terminal lug TL24 on auxiliary starter solenoid with lockwasher and nut.
8) Apply adhesive to auxiliary starter solenoid.
9) Apply adhesive to solenoid right terminal stud.
10) Lower cab (TM 9-2320-366-10-1).
11) Connect batteries (para 7-57).
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Starting motor OK.

**POSSIBLE PROBLEMS**
- Faulty battery to starter cable assembly.
- Faulty start and charging cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 24 VDC is not present, wire 1602 is faulty. If 24 VDC is present, wire 14 faulty.

**WARNING**
Read WARNING on following page.

8. Is 24 VDC present at terminal lug TL12?

- **NO**
  - Replace battery to starter cable assembly (para 7-77).

- **YES**
  - Repair wire 14 from terminal lug TL55 to terminal lug TL9 (para 2-45) or replace start and charging cable assembly (para 7-132).
**WARNING**

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

### VOLTAGE TEST

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to terminal lug TL12.
3. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
4. If 24 VDC is not present, replace battery to starter cable assembly (para 7-77).
5. If 24 VDC is present, repair wire 14 from terminal lug TL55 to terminal lug TL9 (para 2-45) or replace start and charging cable assembly (para 7-132).
6. Disconnect batteries (para 7-57).
7. Apply adhesive to auxiliary starter solenoid.
8. Apply adhesive to solenoid right terminal stud.
9. Connect batteries (para 7-57).
e2. ENGINE DOES NOT CRANK (CONT)

KNOWN INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.

POSSIBLE PROBLEMS
Faulty oil pressure switch.
Faulty relay K24.
Faulty start and charging cable assembly.
Faulty relay K1.
Faulty engine control cable assembly.
Faulty starter pushbutton switch.
Faulty neutral start relay.
Faulty WTEC II vehicle interface module (VIM).
Faulty WTEC II cab transmission wiring harness.
Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
Faulty relay K26.
Faulty dashboard cable assembly.
Faulty WTEC III transmission pushbutton shift selector (TPSS).

CAUTION
Read CAUTION on following page.

9.
Is continuity present from oil pressure switch connector socket 1 to pin 2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, oil pressure switch is faulty.

NO

YES
Replace oil pressure switch (para 7-48).
**CAUTION**

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

**NOTE**

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>(2) Apply adhesive to auxiliary starter solenoid.</td>
</tr>
<tr>
<td>(3) Apply adhesive to solenoid right terminal stud.</td>
</tr>
<tr>
<td>(4) Disconnect connector clamp from oil pressure switch connector.</td>
</tr>
<tr>
<td>(5) Disconnect connector P34 from oil pressure switch connector.</td>
</tr>
<tr>
<td>(6) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(7) Connect positive (+) probe of multimeter to oil pressure switch connector socket 1.</td>
</tr>
<tr>
<td>(8) Connect negative (-) probe of multimeter to oil pressure switch connector pin 2 and note reading on multimeter.</td>
</tr>
<tr>
<td>(9) If continuity is not present, replace oil pressure switch (para 7-48).</td>
</tr>
</tbody>
</table>
10. Is continuity present from connector P34 pin 1 to ground?

**KNOWN INFO**
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.

**POSSIBLE PROBLEMS**
Faulty relay K24.
Faulty start and charging cable assembly.
Faulty relay K1.
Faulty engine control cable assembly.
Faulty starter pushbutton switch.
Faulty neutral start relay.
Faulty WTEC II vehicle interface module (VIM).
Faulty WTEC II cab transmission wiring harness.
Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
Faulty relay K26.
Faulty dashboard cable assembly.
Faulty WTEC III transmission pushbutton shift selector (TPSS).

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
This question eliminates possible problems and determines where to continue troubleshooting.
CONTINUITY TEST

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

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector P34 pin 1.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If continuity is not present, go to step 20 of this fault.</td>
</tr>
</tbody>
</table>
e2. ENGINE DOES NOT CRANK (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission pushbutton shift selector in neutral (N).</td>
</tr>
<tr>
<td>Batteries OK.</td>
</tr>
<tr>
<td>Service drive lights OK.</td>
</tr>
<tr>
<td>Circuit breakers OK.</td>
</tr>
<tr>
<td>Starting motor OK.</td>
</tr>
<tr>
<td>Battery to starter cable assembly OK.</td>
</tr>
<tr>
<td>Oil pressure switch OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty relay K24.</td>
</tr>
<tr>
<td>Faulty start and charging cable assembly.</td>
</tr>
<tr>
<td>Faulty relay K1.</td>
</tr>
<tr>
<td>Faulty engine control cable assembly.</td>
</tr>
<tr>
<td>Faulty starter pushbutton switch.</td>
</tr>
<tr>
<td>Faulty neutral start relay.</td>
</tr>
<tr>
<td>Faulty WTEC II vehicle interface module (VIM).</td>
</tr>
<tr>
<td>Faulty WTEC II cab transmission wiring harness.</td>
</tr>
<tr>
<td>Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).</td>
</tr>
<tr>
<td>Faulty relay K26.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty WTEC III transmission pushbutton shift selector (TPSS).</td>
</tr>
</tbody>
</table>

**WARNING**
Read WARNING on following page.

11. Is 24 VDC present at relay K24 socket 30 on PDP?

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
This question eliminates possible problems and determines where to continue troubleshooting.

**NO**

**YES**

Got step 21 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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Connect connector P34 to oil pressure switch connector.
(2) Connect connector clamp to oil pressure switch connector.
(3) Lower cab (TM 9-2320-366-10-1).
(4) Connect batteries (para 7-57).
(5) Remove power distribution panel (PDP) cover (para 16-2).

NOTE
Tag relays and connection points prior to removal.

(6) Remove relay K24 from PDP.
(7) Set multimeter to volts DC.
(8) Connect positive (+) probe of multimeter to relay K24 socket 30 on PDP.
(9) Connect negative (-) probe of multimeter to ground.
(10) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(11) If 24 VDC is not present, go to step 21 of this fault.
(12) Position master power switch to off (TM 9-2320-366-10-1).
### KNOWN INFO
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- Neutral start relay OK.
- WTEC II vehicle interface module (VIM) OK.
- WTEC II cab transmission wiring harness OK.
- WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
- Relay K26 OK.
- WTEC III transmission pushbutton shift selector (TPSS) OK.

### POSSIBLE PROBLEMS
- Faulty relay K24.
- Faulty start and charging cable assembly.
- Faulty relay K1.
- Faulty engine control cable assembly.
- Faulty starter pushbutton switch.
- Faulty dashboard cable assembly.

### TEST OPTIONS
- **Voltage Test or STE/ICE-R Test #89**

### REASON FOR QUESTION
This question eliminates possible problems and determines where to continue troubleshooting.

#### WARNING
Read WARNING on following page.

12. **Is 24 VDC present at relay K24 socket 86 on PDP?**

- **NO**
- **YES**

Go to step 23 of this fault.

---

**TM 9-2320-366-20-1**

2-186 Change 1
WARNING

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

VOLTAGE TEST

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to relay K24 socket 86 on PDP.
3. Connect negative (-) probe of multimeter to ground.
4. Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
5. If 24 VDC is not present, go to step 23 of this fault.
### e2. ENGINE DOES NOT CRANK (CONT)

#### KNOWN INFO
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- Neutral start relay OK.
- WTEC II vehicle interface module (VIM) OK.
- WTEC II cab transmission wiring harness OK.
- WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
- Relay K26 OK.
- WTEC III transmission pushbutton shift selector (TPSS) OK.

#### POSSIBLE PROBLEMS
- Faulty relay K24.
- Faulty start and charging cable assembly.
- Faulty relay K1.
- Faulty engine control cable assembly.
- Faulty starter pushbutton switch.
- Faulty dashboard cable assembly.

#### TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

#### POSSIBLE PROBLEMS
This question eliminates possible problems and determines where to continue troubleshooting.

---

13. Is continuity present from relay K24 socket 85 on PDP to ground?

- **NO**
- **YES**

   Go to step 25 of this fault.
(1) Disconnect batteries (para 7-57).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to relay K24 socket 85 on PDP.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, go to step 25 of this fault.
KNOWLEDGE INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
Neutral start relay OK.
WTEC II vehicle interface module (VIM) OK.
WTEC II cab transmission wiring harness OK.
WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
Relay K26 OK.
WTEC III transmission pushbutton shift selector (TPSS) OK.
Engine control cable assembly OK.

POSSIBLE PROBLEMS
Faulty relay K24.
Faulty start and charging cable assembly.
Faulty relay K1.
Faulty starter pushbutton switch.
Faulty dashboard cable assembly.

14.
Is 306-399 ohms resistance present from relay K24 terminal 86 to terminal 85?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91

REASON FOR QUESTION
If 306-399 ohms resistance is not present, relay K24 is faulty.

Replace relay K24 (para 7-9).
RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay K24 terminal 86.
(3) Connect negative (-) probe of multimeter to relay K24 terminal 85 and note reading on multimeter.
(4) If 306-399 ohms resistance is not present, replace relay K24 (para 7-9).
(5) Connect batteries (para 7-57).
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**

<table>
<thead>
<tr>
<th>Transmission pushbutton shift selector in neutral (N).</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batteries OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service drive lights OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circuit breakers OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starting motor OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery to starter cable assembly OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil pressure switch OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral start relay OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WTBD II vehicle interface module (VIM) OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WTBD II cab transmission wiring harness OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WTBD II transmission ECU pushbutton shift selector (TEPSS) OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relay K26 OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WTBD III transmission pushbutton shift selector (TPSS) OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine control cable assembly OK.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty relay K24.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulty start and charging cable assembly.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulty relay K1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulty starter pushbutton switch.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TEST OPTIONS**

Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 24 VDC is not present, relay K24 is faulty.

**WARNING**

Read WARNING on following page.

15. Is 24 VDC present at PDP relay K24 socket 87?

**YES**

Replace relay K24 (para 7-9).

**NO**
## WARNING

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

### VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Install relay test wire in relay K24 socket 87 on PDP.</td>
</tr>
<tr>
<td>2</td>
<td>Install relay K24 in PDP.</td>
</tr>
<tr>
<td>3</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>4</td>
<td>Connect positive (+) probe of multimeter to relay test wire.</td>
</tr>
<tr>
<td>5</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>6</td>
<td>Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If 24 VDC is not present, replace relay K24 (para 7-9).</td>
</tr>
<tr>
<td>8</td>
<td>Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>9</td>
<td>Remove relay K24 from PDP.</td>
</tr>
<tr>
<td>10</td>
<td>Remove relay test wire from relay K24 socket 87 on PDP.</td>
</tr>
<tr>
<td>11</td>
<td>Install relay K24 in PDP.</td>
</tr>
</tbody>
</table>
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
Neutral start relay OK.
WTEC II vehicle interface module (VIM) OK.
WTEC II cab transmission wiring harness OK.
WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
Relay K26 OK.
WTEC III transmission pushbutton shift selector (TPSS) OK.
Engine control cable assembly OK.
Relay K24 OK.

**POSSIBLE PROBLEMS**
Faulty start and charging cable assembly.
Faulty relay K1.
Faulty starter pushbutton switch.
Faulty dashboard cable assembly.

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 24 VDC is not present, wire 1602 is faulty.

**WARNING**
Read WARNING on following page.

16. Is 24 VDC present at relay K1 socket 30 on PDP?

- **NO**
  - Repair wire 1602 from relay K1 socket 30 on PDP to unmarked terminal lug (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
WARNING

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

VOLTAGE TEST

1. Disconnect batteries (para 7-57).
2. Remove relay K1 from PDP.
3. Connect batteries (para 7-57).
4. Set multimeter to volts DC.
5. Connect positive (+) probe of multimeter to PDP relay K1 socket 30.
6. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
7. If 24 VDC is not present, repair wire 1602 from relay K1 socket 30 on PDP to unmarked terminal lug (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**

- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- Neutral start relay OK.
- WTEC II vehicle interface module (VIM) OK.
- WTEC II cab transmission wiring harness OK.
- WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
- Engine control cable assembly OK.
- Relay K24 OK.

**POSSIBLE PROBLEMS**

- Faulty start and charging cable assembly.
- Faulty relay K1.
- Faulty starter pushbutton switch.
- Faulty dashboard cable assembly.

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 24 VDC is not present, relay K1 is faulty.

17. Is 24 VDC present at relay K1 socket 87 on PDP?

- **NO**

- **YES** Replace relay K1 (para 7-9).

**WARNING**

Read WARNING on following page.
WARNING

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

VOLTAGE TEST

(1) Disconnect batteries (para 7-57).
(2) Install relay test wire in relay K1 socket 87 on PDP.
(3) Install relay K1 in PDP.
(4) Connect batteries (para 7-57).
(5) Set multimeter to volts DC.
(6) Connect positive (+) probe of multimeter to relay test wire.
(7) Connect negative (-) probe of multimeter to ground.
(8) Position master power switch to on (TM 9-2320-366-10-1).
(9) Press starter pushbutton (TM 9-2320-366-10-1) and note reading on multimeter.
(10) If 24 VDC is not present, replace relay K1 (para 7-9).
(11) Position master power switch to off (TM 9-2320-366-10-1).
(12) Disconnect batteries (para 7-57).
(13) Remove relay K1 from PDP.
(14) Remove relay test wire from relay K1 socket 87 on PDP.
(15) Install relay K1 in PDP.
KNOWN INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
Neutral start relay OK.
WTEC II vehicle interface module (VIM) OK.
WTEC II cab transmission wiring harness OK.
WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
Relay K26 OK.
WTEC III transmission pushbutton shift selector (TPSS) OK.
Engine control cable assembly OK.
Relay K24 OK.
Relay K1 OK.

POSSIBLE PROBLEMS
Faulty start and charging cable assembly.
Faulty starter pushbutton switch.
Faulty dashboard cable assembly.

18. Is continuity present from PDP relay K24 socket 87 to ground?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

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

NO

YES

Go to step 27 of this fault.
CONTINUITY TEST

(1) Remove relay K24 from PDP.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to relay K24 socket 87 on PDP.
(4) Connect negative (-) probe of multimeter to ground.
(5) Press starter pushbutton (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If continuity is not present, go to step 27 of this fault.
e2. ENGINE DOES NOT CRANK (CONT)

KNOWN INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
Neutral start relay OK.
WTEC II vehicle interface module (VIM) OK.
WTEC II cab transmission wiring harness OK.
WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
Relay K26 OK.
WTEC II transmission pushbutton shift selector (TPSS) OK.
Engine control cable assembly OK.
Relay K24 OK.
Relay K1 OK.
Starter pushbutton switch OK.

POSSIBLE PROBLEMS
Faulty start and charging cable assembly.
Faulty dashboard cable assembly.

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, wire 74 is faulty. If continuity is present, wire 74 is faulty.

CAUTION
Read CAUTION on following page.

19.
Is continuity present from relay K1 socket 87 on PDP to connector J43 socket 8?

NO

YES

Repair wire 74 from relay K1 socket 87 on PDP to connector J43 socket 8 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Repair wire 74 from connector P43 pin 8 to terminal TL33 (para 2-45) or replace start and charging cable assembly (para 7-132).
CONTINUITY TEST

(1) Install relay K24 in PDP.
(2) Remove relay K1 from PDP.
(3) Remove instrument panel for access (para 7-15).
(4) Disconnect connector J43 from connector P43.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector J43 socket 8.
(7) Connect negative (-) probe of multimeter to relay K1 socket 87 on PDP and note reading on multimeter.
(8) If continuity is not present, repair wire 74 from relay K1 socket 87 on PDP and connector J43 socket 8 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) If continuity is present, repair wire 74 from connector P43 pin 8 to terminal TL33 (para 2-45) or replace start and charging cable assembly (para 7-132).
(10) Connect connector J43 to connector P43.
(11) Install instrument panel (para 7-15).
(12) Install relay K1 in PDP.
(13) Install power distribution panel (PDP) cover (para 16-2).
(14) Connect batteries (para 7-57).
2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.

**POSSIBLE PROBLEMS**
- Faulty engine control cable assembly.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3006 is faulty. If continuity is present, wire 3006 is faulty.

**CAUTION**
Read CAUTION on following page.

20. Is continuity present from connector P34 pin 1 to connector P31 socket 7?

- **NO**
  - Repair wire 3006 from connector P34 pin 1 to connector P31 socket 7 (para 2-45) or replace engine control cable assembly (para 7-80).

- **YES**
  - Repair wire 3006 from connector J31 pin 7 to terminal lug at terminal board TB2 position 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector P34 pin 1.</td>
</tr>
<tr>
<td>(3) Lower cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(4) Remove instrument panel for access (para 7-15).</td>
</tr>
<tr>
<td>(5) Disconnect connector J31 from connector P31.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to connector P31 socket 7 and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If continuity is not present, repair wire 3006 from connector P34 pin 1 to connector P31 socket 7 (para 2-45) or replace engine control cable assembly (para 7-80).</td>
</tr>
<tr>
<td>(8) If continuity is present, repair wire 3006 from connector J31 pin 7 to terminal lug at terminal board TB2 position 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(9) Connect connector P31 to connector J31.</td>
</tr>
<tr>
<td>(10) Install instrument panel (para 7-15).</td>
</tr>
<tr>
<td>(11) Raise cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(12) Connect connector P34 to oil pressure switch connector.</td>
</tr>
<tr>
<td>(13) Connect connector clamp on oil pressure switch connector.</td>
</tr>
<tr>
<td>(14) Connect batteries (para 7-57).</td>
</tr>
<tr>
<td>(15) Lower cab (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e2. ENGINE DOES NOT CRANK (CONT)

KNOWN INFO
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.

POSSIBLE PROBLEMS
- Faulty relay K1.
- Faulty neutral start relay.
- Faulty WTEC II vehicle interface module (VIM).
- Faulty WTEC II cab transmission wiring harness.
- Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
- Faulty relay K26.
- Faulty dashboard cable assembly.
- Faulty WTEC III transmission pushbutton shift selector (TPSS).

WARNING
Read WARNING on following page.

21. Is 24 VDC present at relay K1 socket 86 on PDP?

TEST OPTIONS
- Voltage Test or STE/ICE-R Test #89

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

GOAL
Go to step 29 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 circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Install relay K24 in PDP.</td>
</tr>
<tr>
<td>(2) Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>(3) Remove relay K1 from PDP.</td>
</tr>
<tr>
<td>(4) Connect batteries (para 7-57).</td>
</tr>
<tr>
<td>(5) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(6) Connect positive (+) probe of multimeter to relay K1 socket 86 on PDP.</td>
</tr>
<tr>
<td>(7) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(8) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(9) If 24 VDC is not present, go to step 29 of this fault.</td>
</tr>
<tr>
<td>(10) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
KNOWLEDGE INFO
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- Neutral start relay OK.
- WTEC II vehicle interface module (VIM) OK.
- WTEC II cab transmission wiring harness OK.
- WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
- Relay K26 OK.
- WTEC III transmission pushbutton shift selector (TPS) OK.

POSSIBLE PROBLEMS
- Faulty relay K1.
- Faulty dashboard cable assembly.

22. Is 306-399 ohms resistance present from relay K1 terminal 86 to terminal 85?

- If 306-399 ohms resistance is not present, relay K1 is faulty.
- If 306-399 ohms resistance is present, wire 74 is faulty.

TEST OPTIONS
- Resistance Test or STE/ICE-R Test #91

REASON FOR QUESTION
- Repair wire 74 from relay K1 socket 30 on PDP to relay K24 socket 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Replace relay K1 (para 7-9).
<table>
<thead>
<tr>
<th>RESISTANCE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to relay K1 terminal 86.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to relay K1 terminal 85 and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If 306-399 ohms resistance is not present, replace relay K1 (para 7-9).</td>
</tr>
<tr>
<td>(5) If 306-399 ohms resistance is present, repair wire 74 from relay K1 socket 30 on PDP to relay K24 socket 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(6) Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>(7) Install relay K1 in PDP.</td>
</tr>
<tr>
<td>(8) Install PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(9) Connect batteries (para 7-57).</td>
</tr>
</tbody>
</table>
e2. ENGINE DOES NOT CRANK (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission pushbutton shift selector in neutral (N).</td>
</tr>
<tr>
<td>Batteries OK.</td>
</tr>
<tr>
<td>Service drive lights OK.</td>
</tr>
<tr>
<td>Circuit breakers OK.</td>
</tr>
<tr>
<td>Starting motor OK.</td>
</tr>
<tr>
<td>Battery to starter cable assembly OK.</td>
</tr>
<tr>
<td>Oil pressure switch OK.</td>
</tr>
<tr>
<td>Neutral start relay OK.</td>
</tr>
<tr>
<td>WTEC II vehicle interface module (VIM) OK.</td>
</tr>
<tr>
<td>WTEC II cab transmission wiring harness OK.</td>
</tr>
<tr>
<td>WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.</td>
</tr>
<tr>
<td>Relay K26 OK.</td>
</tr>
<tr>
<td>WTEC III transmission pushbutton shift selector (TPSS) OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, wire 1658 is faulty.</td>
</tr>
</tbody>
</table>

23. If continuity is not present, wire 1658 from relay K24 socket 86 on PDP to relay K11 socket 30 on PDP?

- YES: Repair wire 1658 from relay K24 socket 86 on PDP to relay K11 socket 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- NO: Repair wire 1658 from relay K24 socket 86 on PDP to relay K11 socket 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
### CONTINUITY TEST

1. Disconnect batteries (para 7-57).
2. Remove relay K11 from PDP.
3. Set multimeter to ohms.
4. Connect positive (+) probe of multimeter to relay K24 socket 86 on PDP.
5. Connect negative (-) probe of multimeter to relay K11 socket 30 and note reading on multimeter.
6. If continuity is not present, repair wire 1658 from relay K24 socket 86 on PDP to relay K30 socket 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
7. Install relay K24 in PDP.
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- Neutral start relay OK.
- WTEC II vehicle interface module (VIM) OK.
- WTEC II cab transmission wiring harness OK.
- WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
- Relay K26 OK.
- WTEC III transmission pushbutton shift selector (TPSS) OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.

<table>
<thead>
<tr>
<th>24.</th>
<th>Is continuity present from relay K11 socket 30 on PDP to terminal board TB1 position 64 on PDP?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NO</strong></td>
<td>Repair wire 1658 from relay K11 socket 30 on PDP to terminal board TB1 position 64 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td><strong>YES</strong></td>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 1658 is faulty. If continuity is present, wire 1929 is faulty.

**Repair wire 1929 from terminal board TB1 position 64 to circuit breaker CB77 socket 5 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).**
CONTINUITY TEST

(1) Remove three screws and washers from PDP.
(2) Remove three screws from PDP.
(3) Lift PDP outward to gain access.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to relay K11 socket 30 on PDP.
(6) Connect negative (-) probe of multimeter to terminal board TB1 position 64 on PDP and note reading on multimeter.
(7) If continuity is not present, repair wire 1658 from relay K11 socket 30 on PDP to terminal board TB1 position 64 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If continuity is present, repair wire 1929 from circuit breaker CB77 socket 5 on PDP to terminal board TB1 position 64 (para 2-45) 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 relay K11 in PDP.
(12) Install PDP cover (para 16-2).
(13) Connect batteries (para 7-57).
e2. ENGINE DOES NOT CRANK (CONT)

KNOWLEDGE INFO

Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
Neutral start relay OK.
WTEC II vehicle interface module (VIM) OK.
WTEC II cab transmission wiring harness OK.
WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
Relay K26 OK.
WTEC III transmission pushbutton shift selector (TPSS) OK.

POSSIBLE PROBLEMS

Faulty engine control cable assembly.
Faulty dashboard cable assembly.

TEST OPTIONS

Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION

If continuity is not present, wire 34 is faulty.

25. Is continuity present from relay K24 socket 85 on PDP to relay K11 socket 85 on PDP?

NO

Repair wire 34 from relay K24 socket 85 on PDP to relay K11 socket 85 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

YES
CONTINUITY TEST

(1) Remove relay K11 from PDP.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to relay K24 socket 85 on PDP.
(4) Connect negative (-) probe of multimeter to relay K11 socket 85 on PDP and note reading on multimeter.
(5) If continuity is not present, repair wire 34 from relay K24 socket 85 on PDP to relay K11 socket 85 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Install relay K24 in PDP.
e2. ENGINE DOES NOT CRANK (CONT)

KNOWN INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
Neutral start relay OK.
WTEC II vehicle interface module (VIM) OK.
WTEC II cab transmission wiring harness OK.
WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
Relay K26 OK.
WTEC III transmission pushbutton shift selector (TPSS) OK.

POSSIBLE PROBLEMS
Faulty engine control cable assembly.
Faulty dashboard cable assembly.

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, wire 34 is faulty. If continuity is present wire 34 is faulty.

26. Is continuity present from relay K11 socket 85 on PDP to connector J 31 pin 21?

If NO, repair wire 34 from relay K11 socket 85 on PDP to connector J 31 pin 21 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

If YES, repair wire 34 from connector P31 socket 21 to connector P34 socket 2 (para 2-45) or replace engine control cable assembly (para 7-80).
**CAUTION**

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

**NOTE**

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

### CONTINUITY TEST

1. Remove instrument panel 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 pin 21.
5. Connect negative (-) probe of multimeter to relay K11 socket 85 on PDP and note reading on multimeter.
6. If continuity is not present, repair wire 34 from relay K11 socket 85 on PDP to connector J31 pin 21 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
7. If continuity is present, repair wire 34 from connector P31 socket 21 to connector P34 socket 2 (para 2-45) or replace engine control cable assembly (para 7-80).
9. Install instrument panel (para 7-15).
10. Install relay K11 in PDP.
11. Install power distribution panel (PDP) cover (para 16-2).
12. Connect batteries (para 7-57).
### KNOWN INFO
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- Neutral start relay OK.
- WTEC II vehicle interface module (VIM) OK.
- WTEC II cab transmission wiring harness OK.
- WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
- Relay K26 OK.
- WTEC III transmission pushbutton shift selector (TPSS) OK.
- Engine control cable assembly OK.
- Relay K24 OK.
- Relay K1 OK.

### POSSIBLE PROBLEMS
- Faulty starter pushbutton switch.
- Faulty dashboard cable assembly.

### TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

### REASON FOR QUESTION
- If continuity is not present, wire 1405 is faulty.

### 27.
Is continuity present from relay K24 socket 87 on PDP to terminal lug TL162?

- **NO**
  - Repair wire 1405 from relay K24 socket 87 on PDP to terminal lug TL162 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
CONTINUITY TEST

(1) Remove instrument panel for access (para 7-15).
(2) Disconnect terminal lug TL162 from starter pushbutton switch.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal lug TL162.
(5) Connect negative (-) probe of multimeter to relay K24 socket 87 on PDP and note reading on multimeter.
(6) If continuity is not present, repair wire 1405 from relay K24 socket 87 on PDP to terminal lug TL162 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) Install relay K24 in PDP.
(8) Connect terminal lug TL162 to starter pushbutton switch.
Is continuity present from terminal lug TL163 to ground?

If continuity is present, starter pushbutton switch is faulty. If continuity is not present, wire 3007 is faulty.

Replace starter pushbutton switch (para 7-20).

Repair wire 3007 from terminal lug TL163 to terminal board TB2 position 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

1. Disconnect terminal lug TL163 from starter pushbutton switch.
2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to terminal lug TL163.
4. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
5. If continuity is not present, repair wire 3007 from terminal TL163 to terminal board TB2 position 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
6. If continuity is present, replace starter pushbutton switch (para 7-20).
7. Connect terminal lug TL163 to starter pushbutton.
8. Install instrument panel (para 7-15).
9. Install power distribution panel (PDP) cover (para 16-2).
10. Connect batteries (para 7-57).
KNOW LED INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.

POSSIBLE PROBLEMS
Faulty neutral start relay.
Faulty WTEC II vehicle interface module (VIM).
Faulty WTEC II cab transmission wiring harness.
Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
Faulty relay K26.
Faulty dashboard cable assembly.
Faulty WTEC III transmission ECU.
Faulty WTEC III transmission pushbutton shift selector (TPSS).

29. Is the vehicle equipped with WTEC II transmission ECU pushbutton shift selector (TEPSS)?

NO

YES

Go to step 36 of this fault.

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 not equipped with a filter cover, go to step 36 of this fault.
KNOWLEDGE
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.

POSSIBLE PROBLEMS
Faulty neutral start relay.
Faulty WTEC II vehicle interface module (VIM).
Faulty WTEC II cab transmission wiring harness.
Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
Faulty dashboard cable assembly.

WARNING
Read WARNING on following page.

30.
Is 24 VDC present at neutral start relay socket 87 on VIM?

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

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

NO

YES

Go to step 41 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 circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Install relay K1 in PDP.</td>
</tr>
<tr>
<td>(2) Remove kick panel (para 16-3).</td>
</tr>
<tr>
<td>(3) Remove circuit breaker CB35 from PDP.</td>
</tr>
<tr>
<td>(4) Remove eight screws, washers, cover, and metal seal ring from VIM. Discard metal seal ring.</td>
</tr>
<tr>
<td>(5) Remove neutral start relay from VIM.</td>
</tr>
<tr>
<td>(6) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(7) Connect positive (+) probe of multimeter to neutral start relay socket 87 on VIM.</td>
</tr>
<tr>
<td>(8) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(9) Install circuit breaker CB35 in PDP and note reading on multimeter.</td>
</tr>
<tr>
<td>(10) If 24 VDC is not present, go to step 41 of this fault.</td>
</tr>
<tr>
<td>(11) Remove circuit breaker CB35 from PDP.</td>
</tr>
</tbody>
</table>
known info
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.

possible problems
Faulty neutral start relay.
Faulty WTEC II vehicle interface module (VIM).
Faulty WTEC II cab transmission wiring harness.
Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
Faulty dashboard cable assembly.

31. Is 12 VDC present at neutral start relay socket 85 on VIM?

Warning:
Read WARNING on following page.

Test Options:
Voltage Test or STE/ICE-R Test #89

Reason for Question:
This question eliminates possible problems and determines where to continue troubleshooting.

YES
Go to step 43 of this fault.

NO
**WARNING**

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

**VOLTAGE TEST**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(2)</td>
<td>Connect positive (+) probe of multimeter to neutral start relay socket 85 on VIM.</td>
</tr>
<tr>
<td>(3)</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4)</td>
<td>Install circuit breaker CB35 in PDP and note reading on multimeter.</td>
</tr>
<tr>
<td>(5)</td>
<td>If 12 VDC is not present, go to step 43 of this fault.</td>
</tr>
<tr>
<td>(6)</td>
<td>Remove circuit breaker CB35 from PDP.</td>
</tr>
</tbody>
</table>
e2. ENGINE DOES NOT CRANK (CONT)

KNOWLEDGE INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
WTEC II cab transmission wiring harness OK.
WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.

POSSIBLE PROBLEMS
Faulty neutral start relay.
Faulty WTEC II vehicle interface module (VIM).
Faulty dashboard cable assembly.

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

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

32. Is continuity present from neutral start relay socket 86 on VIM to ground?

YES
Go to step 45 of this fault.

NO

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to neutral start relay socket 86 on VIM.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, go to step 45 of this fault.
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
WTEC II cab transmission wiring harness OK.
WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.

FAULTY NEUTRAL START RELAY
Faulty WTEC II vehicle interface module (VIM).
Faulty dashboard cable assembly.

33. Is 76-99 ohms resistance present from neutral start relay terminal 86 to terminal 85?

NO

Replace neutral start relay (para 8-6).

YES

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91

REASON FOR QUESTION
If 76-99 ohms resistance is not present, neutral start relay is faulty.
RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to neutral start relay terminal 85.
(3) Connect negative (-) probe of multimeter to neutral start relay terminal 86 and note reading on multimeter.
(4) If 76-99 ohms resistance is not present, replace neutral start relay (para 8-6).
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
WTEC II cab transmission wiring harness OK.
WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.

**POSSIBLE PROBLEMS**
Faulty neutral start relay.
Faulty WTEC II vehicle interface module (VIM).
Faulty dashboard cable assembly.

---

**WARNING**
Read WARNING on following page.

34. **TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 24 VDC is not present, neutral start relay is faulty.

---

Is 24 VDC present at VIM neutral start relay socket 30?

**NO**

**YES**
Replace neutral start relay (para 8-6).


**WARNING**

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Install relay test wire in neutral start relay socket 30 on VIM.</td>
</tr>
<tr>
<td>(2) Install neutral start relay in VIM.</td>
</tr>
<tr>
<td>(3) Install circuit breaker CB35 in PDP.</td>
</tr>
<tr>
<td>(4) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to relay test wire.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(8) If 24 VDC is not present, replace neutral start relay (para 8-6).</td>
</tr>
<tr>
<td>(9) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Remove circuit breaker CB35 from PDP.</td>
</tr>
<tr>
<td>(11) Remove neutral start relay from VIM.</td>
</tr>
<tr>
<td>(12) Remove relay test wire from neutral start relay socket 30 on VIM.</td>
</tr>
</tbody>
</table>
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- WTEC II cab transmission wiring harness OK.
- WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.
- Neutral start relay OK.

**POSSIBLE PROBLEMS**
- Faulty WTEC II vehicle interface module (VIM).
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, WTEC II vehicle interface module (VIM) is faulty. If continuity is present, wire 1691 is faulty.

**35.**
Is continuity present from VIM neutral start relay socket 30 to VIM connector pin G1?

**YES**
Replace WTEC II vehicle interface module (VIM) (para 8-6).

**NO**

**CAUTION**
Read CAUTION on following page.

Repair wire 1691 from connector PX33 socket G1 to relay K1 socket 86 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
CONTINUITY TEST

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

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>(2) Loosen screw in connector PX33.</td>
</tr>
<tr>
<td>(3) Disconnect connector PX33 from VIM connector.</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to neutral start relay socket 30 on VIM.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to VIM connector pin G1 and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If continuity is not present, replace WTEC II vehicle interface module (VIM) (para 8-6).</td>
</tr>
<tr>
<td>(8) If continuity is present, repair wire 1691 from connector PX33 socket G1 to relay K1 socket 86 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).</td>
</tr>
<tr>
<td>(9) Connect connector PX33 to VIM connector.</td>
</tr>
<tr>
<td>(10) Tighten screw in connector PX33.</td>
</tr>
<tr>
<td>(11) Install neutral start relay in VIM.</td>
</tr>
<tr>
<td>(12) Install cover on VIM with metal seal ring, eight washers, and screws.</td>
</tr>
<tr>
<td>(13) Install circuit breaker CB35 in PDP.</td>
</tr>
<tr>
<td>(14) Install kick panel (para 16-3).</td>
</tr>
<tr>
<td>(15) Connect batteries (para 7-57).</td>
</tr>
</tbody>
</table>
**e2. ENGINE DOES NOT CRANK (CONT)**

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.

**POSSIBLE PROBLEMS**
- Faulty relay K26.
- Faulty dashboard cable assembly.
- Faulty WTEC III transmission ECU.
- Faulty WTEC III transmission pushbutton shift selector (TPSS).

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
This question eliminates possible problems and determines where to continue troubleshooting.

**36.** Is 24 VDC present at relay K26 socket 30 on PDP?

**NO**

**YES**
Go to step 46 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 circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Install relay K1 in PDP.</td>
</tr>
<tr>
<td>(2) Remove relay K26 from PDP.</td>
</tr>
<tr>
<td>(3) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to relay K26 socket 30 on PDP.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 24 VDC is not present, go to step 46 of this fault.</td>
</tr>
<tr>
<td>(8) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
### KNOWN INFO

<table>
<thead>
<tr>
<th>Transmission pushbutton shift selector in neutral (N).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batteries OK.</td>
</tr>
<tr>
<td>Service drive lights OK.</td>
</tr>
<tr>
<td>Circuit breakers OK.</td>
</tr>
<tr>
<td>Starting motor OK.</td>
</tr>
<tr>
<td>Battery to starter cable assembly OK.</td>
</tr>
<tr>
<td>Oil pressure switch OK.</td>
</tr>
</tbody>
</table>

### POSSIBLE PROBLEMS

- Faulty relay K26.
- Faulty dashboard cable assembly.
- Faulty WTEC III transmission ECU.
- Faulty WTEC III transmission pushbutton shift selector (TPSS).

### TEST OPTIONS

- Voltage Test or STE/ICE-R Test #89

### REASON FOR QUESTION

This question eliminates possible problems and determines where to continue troubleshooting.

---

**WARNING**

Read **WARNING** on following page.

**37.** Is 24 VDC present at relay K26 socket 86 on PDP?

**NO**

**YES**

Go to step 47 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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to relay K26 socket 86 on PDP.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 VDC is not present, go to step 47 of this fault.
(6) Position master power switch to off (TM 9-2320-366-10-1).
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- WTEC III transmission pushbutton shift selector (TPSS) OK.

**POSSIBLE PROBLEMS**
- Faulty relay K26.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3102 is faulty.

**38.**
- Is continuity present from relay K26 socket 85 on PDP to ground?

**YES**
- Repair wire 3102 from relay K26 socket 85 on PDP to terminal board TB2 position 17 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

**NO**
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay K26 socket 85 on PDP.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3102 from relay K26 socket 85 on PDP to terminal board TB2 position 17 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- WTEC III transmission pushbutton shift selector (TPSS) OK.

**POSSIBLE PROBLEMS**
- Faulty relay K26.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Resistance Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
Is 306-399 ohms resistance present from relay K26 terminal 85 to terminal 86?

- NO
- Replace relay K26 (para 7-9).

- YES
RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay K26 terminal 85.
(3) Connect negative (-) probe of multimeter to relay K26 terminal 86 and note reading on multimeter.
(4) If 306-399 ohms resistance is not present, replace relay K26 (para 7-9).
e2. ENGINE DOES NOT CRANK (CONT)

KNOWN INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
WTEC III transmission pushbutton shift selector (TPSS) OK.

POSSIBLE PROBLEMS
Faulty relay K26.
Faulty dashboard cable assembly.

WARNING
Read WARNING on following page.

40. Is 24 VDC present at relay K26 socket 87 on PDP?

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION
If 24 VDC is not present, relay K26 is faulty.

YES
Replace relay K26 (para 7-9).

NO

Repair wire 1691 from relay K26 socket 87 on PDP to relay K1 socket 86 on PDP (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
**WARNING**

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

---

**VOLTAGE TEST**

1. Install relay test wire in relay K26 socket 87 on PDP.
2. Install relay K26 in PDP.
3. Set multimeter to volts DC.
4. Connect positive (+) probe of multimeter to relay test wire.
5. Connect negative (-) probe of multimeter to ground.
6. Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 24 VDC is not present, replace relay K26 (para 7-9).
8. If 24 VDC is present, repair wire 1691 from relay 26 socket 87 on PDP to relay K1 socket 86 on PDP (para 2-40) or replace WTEC III dashboard cable assembly (para 7-11).
10. Remove relay K26 from PDP.
11. Remove relay test wire from relay K26 socket 87 on PDP.
12. Install relay K26 in PDP.
13. Install power distribution panel (PDP) cover (para 16-2).
2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**

Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.

**POSSIBLE PROBLEMS**

Faulty WTEC II vehicle interface module (VIM).
Faulty dashboard cable assembly.

---

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, WTEC II vehicle interface module is faulty.

---

**CAUTION**

Read CAUTION on following page.

41. Is continuity present from VIM connector pin F1 to neutral start relay socket 87 on VIM?

---

**YES**

Replace WTEC II vehicle interface module (VIM) (para 8-6).

---

**NO**
CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>2</td>
<td>Loosen screw in connector PX33.</td>
</tr>
<tr>
<td>3</td>
<td>Disconnect connector PX33 from VIM connector.</td>
</tr>
<tr>
<td>4</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>5</td>
<td>Connect positive (+) probe of multimeter to neutral start relay socket 87 on VIM.</td>
</tr>
<tr>
<td>6</td>
<td>Connect negative (-) probe of multimeter to VIM connector PX33 pin F1 and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If continuity is not present, replace WTEC II vehicle interface module (VIM) (para 8-6).</td>
</tr>
<tr>
<td>8</td>
<td>Install neutral start relay in VIM.</td>
</tr>
<tr>
<td>9</td>
<td>Install cover on VIM with metal seal ring, eight washers, and screws.</td>
</tr>
<tr>
<td>10</td>
<td>Install circuit breaker CB35 in PDP.</td>
</tr>
</tbody>
</table>

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

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

NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back or not capable of making good contact.
e2. ENGINE DOES NOT CRANK (CONT)

KNOWN INFO
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- WTEC II vehicle interface module (VIM) OK.

POSSIBLE PROBLEMS
- Faulty dashboard cable assembly.

CAUTION
Read CAUTION on following page.

42. TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, WTEC II vehicle interface module is faulty. If continuity is present, wire 1692 is faulty.

Is continuity present from connector PX33 socket F1 to terminal board TB1 position 34?

- YES
  - Repair wire 1692 from connector PX33 socket F1 to terminal board TB1 position 34 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).

- NO
  - Repair wire 1692 from terminal board TB1 position 36 to circuit breaker CB21 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
CAUTION

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

NOTE

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

CONTINUITY TEST

1. Remove three screws and washers from PDP.
2. Remove three screws from PDP.
3. Lift PDP outward to gain access.
4. Set multimeter to ohms.
5. Connect positive (+) probe of multimeter to terminal board TB1 position 34.
6. Connect negative (-) probe of multimeter connector PX33 socket F1 and note reading on multimeter.
7. If continuity is not present, repair wire 1692 from connector PX33 socket F1 to terminal board TB1 position 34 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
8. If continuity is present, repair wires 1692 from terminal board TB1 position 36 and circuit breaker CB21 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
9. Install PDP on dashboard with three screws.
10. Install three washers and screws in PDP.
11. Connect connector PX33 to VIM connector.
12. Tighten screw in connector PX33.
13. Install kick panel (para 16-3).
e2. ENGINE DOES NOT CRANK (CONT)

KNOWN INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.

POSSIBLE PROBLEMS
Faulty WTEC II vehicle interface module (VIM).
Faulty WTEC II cab transmission wiring harness.
Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).

CAUTION
Read CAUTION on following page.

43. Is continuity present from neutral start relay socket 85 on VIM to VIM connector pin P1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, WTEC II vehicle interface module (VIM) is faulty.

NO

YES

Replace WTEC II vehicle interface module (VIM) (para 8-6).
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

### Continuity Test

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>2</td>
<td>Loosen screw on connector J 116.</td>
</tr>
<tr>
<td>3</td>
<td>Disconnect connector J 116 from VIM connector.</td>
</tr>
<tr>
<td>4</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>5</td>
<td>Connect positive (+) probe of multimeter to neutral start relay socket 85 on VIM.</td>
</tr>
<tr>
<td>6</td>
<td>Connect negative (-) probe of multimeter to VIM connector pin P1 and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If continuity is not present, replace WTEC II vehicle interface module (VIM) (para 8-6).</td>
</tr>
<tr>
<td>8</td>
<td>Install neutral start relay in VIM.</td>
</tr>
<tr>
<td>9</td>
<td>Install cover on VIM with metal seal ring, eight washers, and screws.</td>
</tr>
<tr>
<td>10</td>
<td>Install circuit breaker CB35 in PDP.</td>
</tr>
</tbody>
</table>
e2. ENGINE DOES NOT CRANK (CONT)

KNOWN INFO
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
WTEC II vehicle interface module (VIM) OK.

POSSIBLE PROBLEMS
Faulty WTEC II cab transmission wiring harness.
Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, WTEC II cab transmission wiring harness is faulty. If continuity is present, WTEC II transmission ECU pushbutton shift selector (TEPSS) is faulty.

CAUTION
Read CAUTION on following page.

44. Is continuity present from connector J116 socket D1 to connector J114 socket 23?

NO

YES

Replace WTEC II cab transmission wiring harness (para 7-137).

Replace WTEC II transmission ECU pushbutton shift selector (TEPSS) (para 8-2).
**CONTINUITY TEST**

(1) Remove instrument panel for access (para 7-15).
(2) Disconnect connector J114 from WTEC II transmission ECU pushbutton shift selector (TEPSS).
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector J114 socket 23.
(5) Connect negative (-) probe of multimeter to connector J116 socket D1 and note reading on multimeter.
(6) If continuity is not present, replace WTEC II cab transmission wiring harness (para 7-137).
(7) If continuity is present, replace WTEC II transmission ECU pushbutton shift selector (TEPSS) (para 8-2).
(8) Connect connector J114 to WTEC II transmission ECU pushbutton shift selector (TEPSS).
(9) Install instrument panel (para 7-15).
(10) Connect connector J116 to VIM connector.
(11) Tighten screw on connector J116.
(12) Install kick panel (para 16-3).
(13) Connect batteries (para 7-57).

---

**CAUTION**

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

**NOTE**

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back or not capable of making good contact.
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.
WTEC II cab transmission wiring harness OK.
WTEC II transmission ECU pushbutton shift selector (TEPSS) OK.

**POSSIBLE PROBLEMS**
Faulty WTEC II vehicle interface module (VIM).
Faulty dashboard cable assembly.

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, WTEC II VIM is faulty. If continuity is present, wire 3101 is faulty.

45. Is continuity present from neutral start relay socket 86 on VIM to VIM connector pin K1?

**CAUTION**
Read CAUTION on following page.

**NO**

**YES**
Replace WTEC II vehicle interface module (VIM) (para 8-6).

Repair wire 3101 from connector PX33 socket K1 to terminal board TB2 position 16 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to neutral start relay socket 86 on VIM.
(3) Connect negative (-) probe of multimeter to VIM connector pin K1 and note reading on multimeter.
(4) If continuity is not present, replace WTEC II vehicle interface module (VIM) (para 8-6).
(5) If continuity is present, repair wire 3101 from connector PX33 socket K1 to terminal board TB2 position 16 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(6) Install neutral start relay in VIM.
(7) Install cover on VIM with metal seal ring, eight washers, and screws.
(8) Connect connector PX33 to VIM connector.
(9) Tighten screw in connector PX33.
(10) Install circuit breaker CB35 in PDP.
(11) Install kick panel (para 16-3).
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWLEDGE INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.

**WARNING**
- Read WARNING on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- Is 24 VDC is not present, wire 1692 is faulty.

---

46. **Is 24 VDC present at terminal board TB1 position 36?**

**YES**
- Repair wire 1692 from terminal board TB1 position 36 and circuit breaker CB21 socket 1 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

**NO**
- Repair wire 1692 from terminal board TB1 position 34 and relay K26 socket 30 on PDP (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
## WARNING

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

## VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Install relay K26 in PDP.</td>
</tr>
<tr>
<td>2</td>
<td>Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>3</td>
<td>Remove three screws from PDP.</td>
</tr>
<tr>
<td>4</td>
<td>Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>5</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>6</td>
<td>Connect positive (+) probe of multimeter to terminal board TB1 position 36.</td>
</tr>
<tr>
<td>7</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>8</td>
<td>Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>9</td>
<td>If 24 VDC is not present, repair wire 1692 from terminal board TB1 position 36 to circuit breaker CB21 socket 1 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>10</td>
<td>If 24 VDC is present, repair wire 1692 from terminal board TB1 position 34 to relay K26 socket 30 on PDP (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>11</td>
<td>Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>12</td>
<td>Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>13</td>
<td>Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>14</td>
<td>Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
If continuity is not present, wire 123 is faulty.

**Transmission pushbutton shift selector in neutral (N).**
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.

**Faulty dashboard cable assembly.**
Faulty WTEC III transmission ECU.
Faulty WTEC III transmission pushbutton shift selector (TPSS).

If continuity is not present, wire 123 is faulty.

**Repair wire 123 from relay K26 socket 86 on PDP to connector P115 socket 8 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).**
CAUTION

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

NOTE

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

CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Remove kick panel (para 16-3).
(3) Disconnect connector clamp from connector P115.
(4) Disconnect connector P115 from WTEC III transmission ECU connector.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to relay K26 socket 86.
(7) Connect negative (-) probe of multimeter to connector P115 socket 8 and note reading on multimeter.
(8) If continuity is not present, repair wire 123 from relay K26 socket 86 to connector P115 socket 8 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(9) Connect connector P115 to WTEC III transmission ECU connector.
(10) Connect connector clamp to connector P115.
(11) Install relay K26 in PDP.
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty WTEC III transmission ECU.
- Faulty WTEC III transmission pushbutton shift selector (TPSS).

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, wire (refer to Table 2-8.2. Connector PX33 Ground Continuity Test) is faulty.</td>
</tr>
</tbody>
</table>

**CAUTION**
Read CAUTION on following page.

48. Is continuity present from connector PX33 socket (refer to Table 2-8.2. Connector PX33 Ground Continuity Test) to terminal board TB2 position (refer to Table 2-8.2. Connector PX33 Ground Continuity Test)?

YES

Repair wire (refer to Table 2-8.2. Connector PX33 Ground Continuity Test (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

NO
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

<table>
<thead>
<tr>
<th>Terminal Board TB2 Position</th>
<th>Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>186</td>
</tr>
<tr>
<td>13</td>
<td>188</td>
</tr>
</tbody>
</table>
e2. ENGINE DOES NOT CRANK (CONT)

**KNOWN INFO**
Transmission pushbutton shift selector in neutral (N).
Batteries OK.
Service drive lights OK.
Circuit breakers OK.
Starting motor OK.
Battery to starter cable assembly OK.
Oil pressure switch OK.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.
Faulty WTEC III transmission ECU.
Faulty WTEC III transmission pushbutton shift selector (TPSS).

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire (refer to Table 2-8.3. Connector PX33 Continuity Test) is faulty.

---

49. Is continuity present from connector PX33 socket (refer to Table 2-8.3. Connector PX33 Continuity Test) to connector P116 socket (refer to Table 2-8.3. Connector PX33 Continuity Test)?

---

**YES**
Repair wire (refer to Table 2-8.3. Connector PX33 Continuity Test (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

**NO**
CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

CONTINUITY TEST

(1) Disconnect connector clamp from connector P116.
(2) Disconnect connector P116 from WTEC III transmission ECU connector.
(3) Set multimeter to ohms.
(4) For each line of Table 2-8.3. Connector PX33 Ground Continuity Test perform the following:
   (a) Connect positive (+) probe of multimeter to connector PX33 socket.
   (b) Connect negative (-) probe of multimeter to connector P116 position and not reading on multimeter.
(5) If continuity is not present on either wire in Table 2-8.3. Connector PX33 Continuity Test repair wire (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(6) Install PDP on dashboard with three screws.
(7) Connect connector P116 to WTEC III transmission ECU connector.
(8) Connect connector clamp to connector P116.

Table 2-8.3. Connector PX33 Continuity Test

<table>
<thead>
<tr>
<th>Connector PX33 Socket</th>
<th>Connector P116 Socket</th>
<th>Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>32</td>
<td>143</td>
</tr>
<tr>
<td>L</td>
<td>15</td>
<td>176</td>
</tr>
<tr>
<td>A</td>
<td>5</td>
<td>170</td>
</tr>
<tr>
<td>B</td>
<td>6</td>
<td>171</td>
</tr>
<tr>
<td>C</td>
<td>7</td>
<td>172</td>
</tr>
<tr>
<td>D</td>
<td>8</td>
<td>173</td>
</tr>
<tr>
<td>E</td>
<td>9</td>
<td>174</td>
</tr>
<tr>
<td>S</td>
<td>14</td>
<td>180</td>
</tr>
<tr>
<td>M</td>
<td>10</td>
<td>175</td>
</tr>
<tr>
<td>N</td>
<td>3</td>
<td>124</td>
</tr>
<tr>
<td>R</td>
<td>16</td>
<td>136</td>
</tr>
</tbody>
</table>
**e2. ENGINE DOES NOT CRANK (CONT)**

**KNOWN INFO**
- Transmission pushbutton shift selector in neutral (N).
- Batteries OK.
- Service drive lights OK.
- Circuit breakers OK.
- Starting motor OK.
- Battery to starter cable assembly OK.
- Oil pressure switch OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty WTEC III transmission ECU.
- Faulty WTEC III transmission pushbutton shift selector (TPSS).

---

**50.**

**TEST OPTIONS**
- WTEC III Transmission Pushbutton Shift Selector Test

**REASON FOR QUESTION**
- If engine cranks, WTEC III transmission pushbutton shift selector is faulty. If engine does not crank, WTEC III transmission ECU is faulty.

---

**YES**

Replace WTEC III transmission ECU (para 8-7).

---

**NO**

Does engine crank with a known good WTEC III transmission pushbutton shift selector (TPSS)?

---

**Replace WTEC III transmission pushbutton shift selector (TPSS) (para 8-3).**
WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR TEST (TPSS)

(1) Replace WTEC III TPSS (para 8-3).
(2) Connect batteries (para 7-57).
(3) Attempt to start engine (TM 9-2320-366-10-1).
(4) If engine does not crank, replace WTEC III transmission ECU (para 8-7).
(5) If engine does crank, replace WTEC III TPSS (para 8-3).
(6) Install instrument panel (para 7-15).
(7) Install kick panel (para 16-3).
**POSSIBLE PROBLEMS**

1. Are batteries serviceable?

**KNOWN INFO**

- Circuit breaker CB70 OK.

**INITIAL SETUP**

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

- **Materials/Parts**
  
  - Dispenser, Pressure Sensitive Adhesive Tape (Item 20, Appendix D)
  - Lockwasher (Item 75, Appendix G)
  - Lockwasher (Item 83, Appendix G)
  - Lockwasher (Item 86, Appendix G)
  - Lockwasher (Item 87, Appendix G)
  - Lockwasher (4) (Item 96, Appendix G)
  - Lockwasher (2) (Item 72, Appendix G)
  - Self-locking Nut (Item 167, Appendix G)
  - Ties, Cable, Plastic (Item 69 Appendix D)
  - Wire, Elect, 50 ft (Item 71, Appendix D)

**Test Options**

- **Battery Specific Gravity Test**

**Reason For Question**

If battery(ies) is unserviceable, 12 VDC circuits will not operate.

**NOTE**

Perform electrical troubleshooting e1. Circuit Breaker Does Not Operate on circuit breaker CB70 prior to beginning this task.

**TEST OPTIONS**

- Battery Specific Gravity Test

**Personnel Required**

2

**Tools and Special Tools**

- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Apron, Rubber (Item 3, Appendix C)
- Goggles, Industrial (Item 15, Appendix C)
- Gloves, Rubber (Item 13, Appendix C)
- Socket Set, Socket Wrench (Item 36, Appendix C)
- Tester, Antifreeze and Battery (Item 42, Appendix C)
- Wire, Relay Test (Item 9, Appendix E)
- Wrench, Torque, 0-175 lb-ft. (Item 58, Appendix C)
- Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)

**References**

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

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

**Battery Specific Gravity Test**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove four batteries from battery box (para 7-55).</td>
</tr>
<tr>
<td>2</td>
<td>Test batteries for serviceability (TM 9-6140-200-14).</td>
</tr>
<tr>
<td>3</td>
<td>Replace battery(ies) if unserviceable (TM 9-6140-200-14).</td>
</tr>
<tr>
<td>4</td>
<td>Install four batteries in battery box (para 7-55).</td>
</tr>
</tbody>
</table>
**KNOW INFO**
- Circuit breakers CB70 OK.
- Battery(ies) OK.

**POSSIBLE PROBLEMS**
- Faulty cab to chassis ground strap.
- Faulty PDP to cab ground cable.
- Faulty dashboard cable assembly.
- Faulty shunt.
- Faulty starter to shunt 24 VDC cable.
- Faulty battery to shunt cable assembly.
- Faulty starter to chassis ground cable.
- Faulty 100 AMP reverse polarity relay.
- Faulty battery to 100 AMP reverse polarity relay 12 VDC cable.
- Faulty 100 AMP reverse polarity relay to PDP 12 VDC cable.
- Faulty 200 AMP reverse polarity relay.
- Faulty 200 AMP terminal block.
- Faulty 200 AMP terminal block to PDP 12 VDC cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC load cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC battery cable.
- Faulty battery to 200 AMP terminal block 12 VDC cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

Is continuity present from terminal X3 on power distribution panel (PDP) to terminal lug TL64?

**Diagram:**
- **NO**
- **YES**

Go to step 6 of this fault.
CONTINUITY TEST

(1) Disconnect batteries (para 7-57).

NOTE
Remove plastic cable ties as required.

(2) Remove two screws and washers from front grille.
(3) Remove screw, washer, and front grille from cab.
(4) Remove power distribution panel (PDP) cover (para 16-2).
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to terminal X3 on power distribution panel (PDP).
(7) Connect negative (-) probe of multimeter to terminal lug TL64 and note reading on multimeter.
(8) If continuity is not present, go to step 6 of this fault.
e3. 12 VDC AND 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty shunt.
- Faulty starter to shunt 24 VDC cable.
- Faulty battery to shunt cable assembly.
- Faulty starter to chassis ground cable.
- Faulty 100 AMP reverse polarity relay.
- Faulty battery to 100 AMP reverse polarity relay 12 VDC cable.
- Faulty 100 AMP reverse polarity relay to PDP 12 VDC cable.
- Faulty 200 AMP reverse polarity relay.
- Faulty 200 AMP terminal block.
- Faulty 200 AMP terminal block to PDP 12 VDC cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC load cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC battery cable.
- Faulty battery to 200 AMP terminal block 12 VDC cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

3. Is continuity present from terminal lug TL48 to terminal lug TL62?

- **NO**
  - Go to step 8 of this fault.
- **YES**
Install plastic cable ties as required.

(1) Position front grille on cab with washer and screw.
(2) Position two washers and screws in front grille.
(3) Tighten screw to 48-60 lb-in. (5-7 N.m).
(4) Tighten two screws to 24 lb-in. (3 N.m).
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to terminal lug TL48.
(7) Connect negative (-) probe of multimeter to terminal lug TL62 and note reading on multimeter.
(8) If continuity is not present, go to step 8 of this fault.

**CONTINUITY TEST**

**NOTE**

Install plastic cable ties as required.
KNOWN INFO
- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.
- Battery to shunt cable assembly OK.
- Starter to chassis ground cable OK.

POSSIBLE PROBLEMS
- Faulty dashboard cable assembly.
- Faulty 100 AMP reverse polarity relay.
- Faulty battery to 100 AMP reverse polarity relay 12 VDC cable.
- Faulty 100 AMP reverse polarity relay to PDP 12 VDC cable.
- Faulty 200 AMP reverse polarity relay.
- Faulty 200 AMP terminal block.
- Faulty 200 AMP terminal block to PDP 12 VDC cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC load cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC battery cable.
- Faulty battery to 200 AMP terminal block 12 VDC cable assembly.

TEST OPTIONS
- Voltage Test or STE/ICE-R Test #89

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

4. Is 12 VDC present at terminal X2 on PDP?

NO

YES

Go to step 11 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 circuits and cause severe burns or electrical shock.

### VOLTAGE TEST
1. Connect batteries (para 7-57).
2. Set multimeter to volts DC.

### CAUTION
When testing to terminal X2 on PDP, ensure that multimeter probes come in contact with the outside metal ring. Failure to comply may result in false troubleshooting test results.
3. Connect positive (+) probe of multimeter to terminal X2 on PDP
4. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
5. If 12 VDC is not present, go to step 11 of this fault.
e3. 12 VDC AND 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**
Faulty dashboard cable assembly.

**POSSIBLE PROBLEMS**
- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.
- Battery to shunt cable assembly OK.
- Starter to chassis ground cable OK.
- 100 AMP reverse polarity relay OK.
- Battery to 100 AMP reverse polarity relay 12 VDC cable OK.
- 100 AMP reverse polarity relay to PDP 12 VDC cable OK.
- 200 AMP reverse polarity relay OK.
- 200 AMP terminal block OK.
- 200 AMP terminal block to PDP 12 VDC cable OK.
- 200 AMP terminal block to reverse polarity relay 12 VDC load cable OK.
- 200 AMP terminal block to reverse polarity relay 12 VDC battery cable OK.
- Battery to 200 AMP terminal block 12 VDC cable assembly OK.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 1601 is faulty. If 12 VDC is present, bus bar X7 is faulty.

**WARNING**
Read WARNING on following page.

5. Is 12 VDC present at circuit breaker socket 1, left of circuit breaker CB70 on PDP?

- **NO**
  - Replace bus bar X7 on PDP or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11)

- **YES**
  - Repair wire 1601 from bus bar X7 on PDP to terminal X2 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11)
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(2) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to circuit breaker socket 1, left of circuit breaker CB70 on PDP.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If 12 VDC is not present, repair wire 1601 from bus bar X7 on PDP to terminal X2 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(6) If 12 VDC is present, replace bus bar X7 on PDP or WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(7) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(8) Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
### Known Info
| Circuit breakers CB70 OK. Battery(ies) OK. |

### Possible Problems
- Faulty cab to chassis ground strap.
- Faulty PDP to cab ground cable.
- Faulty dashboard cable assembly.

### Test Options
- Continuity Test or STE/ICE-R Test #91

### Reason for Question
If continuity is not present, cab to chassis ground strap is faulty.

---

#### 6.
Is continuity present from terminal lug TL65 to terminal lug TL64?

- **No**
  - Replace cab to chassis ground strap (para 7-78).
- **Yes**
CONTINUITY TEST

(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL65.
(4) Connect negative (-) probe of multimeter to terminal lug TL64 and note reading on multimeter.
(5) If continuity is not present, replace cab to chassis ground strap (para 7-78).
(6) Install lockwasher and terminal lug TL65 on stud with washer and self-locking nut.

NOTE
Install plastic cable ties as required.

(7) Position front grille on cab with washer and screw.
(8) Position two washers and screws in front grille.
(9) Tighten screw to 48-60 lb-in. (5-7 N.m).
(10) Tighten two screws to 24 lb-in. (3 N.m).
7. Is continuity present from terminal lug TL56 to terminal lug TL57?

**KNOWLEDGE INFO**
- Circuit breakers CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.

**POSSIBLE PROBLEMS**
- Faulty PDP to cab ground cable.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, PDP to cab ground cable is faulty. If continuity is present, wire 1603 is faulty.

If continuity is not present, replace PDP to cab ground cable (para 7-126).

If continuity is present, repair wire 1603 from terminal X3 on PDP to terminal board TB2 position 1 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) Remove three screws and washers from PDP.
(2) Remove three screws from PDP.
(3) Lift outward to gain access.
(4) Remove nut, lockwasher, terminal lug TL190, and terminal lug TL57 from grounding stud. Discard lockwasher.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to terminal lug TL57.
(7) Connect negative (-) probe of multimeter to terminal lug TL56 and note reading on multimeter.
(8) If continuity is not present, replace PDP to cab ground cable (para 7-126).
(9) If continuity is present, repair wire 1603 from terminal X3 on PDP to terminal board TB2 position 1 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(10) Install terminal lug TL190 and terminal lug TL57 on grounding stud with lockwasher and nut.
(11) Install PDP on dashboard with three screws.
(12) Install three washers and screws in PDP.
(13) Install PDP cover (para 16-2).
(14) Connect batteries (para 7-57).
e3. 12 VDC AND 24 VDC CIRCUITS DO NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit breaker CB70 OK.</td>
</tr>
<tr>
<td>Battery(ies) OK.</td>
</tr>
<tr>
<td>Cab to chassis ground strap OK.</td>
</tr>
<tr>
<td>PDP to cab ground cable OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty shunt.</td>
</tr>
<tr>
<td>Faulty starter to shunt 24 VDC cable.</td>
</tr>
<tr>
<td>Faulty battery to shunt cable assembly.</td>
</tr>
<tr>
<td>Faulty starter to chassis ground cable.</td>
</tr>
</tbody>
</table>

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, shunt is faulty.

8. Is continuity present from one end of shunt to other end of shunt?

- **NO**
- **YES**

- Replace shunt (para 7-29).
CONTINUITY TEST

(1) Raise cab (TM 9-2320-366-10-1).
(2) Lower spare tire (TM 9-2320-366-10-2).
(3) Install PDP cover (para 16-2).
(4) Loosen clamp on air hose.
(5) Remove air hose from intake air cleaner boot.

NOTE
Tag wires and connection points prior to disconnecting.

(6) Remove screw, lockwasher, and terminal lug TL52 from shunt. Discard lockwasher.
(7) Remove screw, lockwasher, and terminal lug TL45 from shunt. Discard lockwasher.
(8) Set multimeter to ohms.
(9) Connect positive (+) probe of multimeter to one end of shunt.
(10) Connect negative (-) probe of multimeter to other end of shunt and note reading of multimeter.
(11) If continuity is not present, replace shunt (para 7-29).
e3. 12 VDC AND 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**
Circuit breaker CB70 OK.
Battery(ies) OK.
Cab to chassis ground strap OK.
PDP to cab ground cable OK.
Shunt OK.

**POSSIBLE PROBLEMS**
Faulty starter to shunt 24 VDC cable.
Faulty battery to shunt cable assembly.
Faulty starter to chassis ground cable.

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, starter to shunt 24 VDC cable is faulty.

---

9. Is continuity present from starting motor ground terminal stud to terminal lug TL45?

- **NO**
  - Replace starter to shunt 24 VDC cable (para 7-134).

- **YES**
### CONTINUITY TEST

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2)</td>
<td>Connect positive (+) probe of multimeter to starting motor ground terminal stud.</td>
</tr>
<tr>
<td>(3)</td>
<td>Connect negative (-) probe of multimeter to terminal lug TL45 and note reading on multimeter.</td>
</tr>
<tr>
<td>(4)</td>
<td>If continuity is not present, replace starter to shunt 24 VDC cable (para 7-134).</td>
</tr>
<tr>
<td>(5)</td>
<td>Lower cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6)</td>
<td>Install terminal lug TL45 on shunt with lockwasher and screw.</td>
</tr>
</tbody>
</table>

**Diagram:**
- Starting Motor Ground Terminal Stud
- Shunt
- Terminal Lug TL45
- Screw
- Lockwasher
e3. 12 VDC AND 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.

**POSSIBLE PROBLEMS**
- Faulty battery to shunt cable assembly.
- Faulty starter to chassis ground cable.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, battery to shunt cable assembly is faulty. If continuity is present starter to chassis ground cable is faulty.

**10.**
Is continuity present from terminal lug TL52 to terminal lug TL48?

**NO**
- Replace battery to shunt cable assembly (para 7-76).

**YES**
- Replace starter to chassis ground cable (para 7-133).
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 to shunt cable assembly (para 7-76).
5. If continuity is present, replace starter to chassis ground cable (para 7-133).
6. Install terminal lug TL52 on shunt with lockwasher and screw.
7. Position air hose on intake air cleaner boot with clamp.
8. Tighten clamp to 36-48 lb-in. (4-5 N.m).
10. Connect batteries (para 7-57).
e3. 12 VDC AND 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.
- Battery to shunt cable assembly OK.
- Starter to chassis ground cable OK.

**POSSIBLE PROBLEMS**
- Faulty 100 AMP reverse polarity relay.
- Faulty battery to 100 AMP reverse polarity relay 12 VDC cable.
- Faulty 100 AMP reverse polarity relay to PDP 12 VDC cable.
- Faulty 200 AMP reverse polarity relay.
- Faulty 200 AMP terminal block.
- Faulty 200 AMP terminal block to PDP 12 VDC cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC load cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC battery cable.
- Faulty battery to 200 AMP terminal block 12 VDC cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

11. Is vehicle equipped with a 100 AMP reverse polarity relay?

- **NO**
  - Go to step 14 of this fault.

- **YES**
  - Go to step 14 of this fault.
(1) Lower spare tire (TM 9-2320-366-10-2).
(2) Check if vehicle is equipped with 100 AMP reverse polarity relay.
(3) If vehicle is not equipped with 100 AMP reverse polarity relay, go to step 14 of this fault.
12. Reason for Question

Is continuity present from terminal lug TL80 to terminal X2 on PDP?

Caution
Read Caution on following page.

If continuity is not present, 100 AMP reverse polarity relay to PDP 12VDC cable is faulty.

Replace 100 AMP reverse polarity relay to PDP 12VDC cable (para 7-130).

Test Options
Continuity Test or STE/ICE-R Test #91

Possible Problems
Faulty 100 AMP reverse polarity relay.
Faulty battery to 100 AMP reverse polarity relay 12 VDC cable.
Faulty 100 AMP reverse polarity relay to PDP 12 VDC cable.

Known Info
Circuit breaker CB70 OK.
Battery(ies) OK.
Cab to chassis ground strap OK.
PDP to cab ground cable OK.
Shunt OK.
Starter to shunt 24 VDC cable OK.
Battery to shunt cable assembly OK.
Starter to chassis ground cable OK.
### CONTINUITY TEST

1. Disconnect batteries (para 7-57).
2. Loosen clamp on air hose.
3. Remove air hose from intake air cleaner boot.
4. Lift dust boot on 12V LOAD terminal stud on 100 AMP reverse polarity relay.

#### CAUTION

Tag all terminal lugs and connection points prior to disconnecting.

5. Remove nut, lockwasher, and terminal lug TL80 from 12V LOAD terminal stud on 100 AMP reverse polarity relay.
6. Set multimeter to ohms.

#### CAUTION

When testing to terminal X2 on PDP, ensure that multimeter probes come in contact with the outside metal ring. Failure to comply may result in false troubleshooting test results.

7. Connect positive probe (+) of multimeter to terminal X2 on PDP.
8. Connect negative probe (-) of multimeter to terminal lug TL80 and note reading on multimeter.
9. If continuity is not present, replace 100 AMP reverse polarity relay to PDP 12 VDC cable (para 7-130).
10. Position terminal lug TL80 on 12V LOAD terminal stud on 100 AMP reverse polarity relay with lockwasher and nut.
11. Tighten nut to 120-144 lb-in. (14-16 N.m).
12. Position dust boot on 12V LOAD terminal stud on 100 AMP reverse polarity relay.
13. Install PDP cover (para 16-2).
13. Is continuity present from terminal lug TL99 to terminal lug TL47?

**Reason for Question**
Replace battery to 100 AMP reverse polarity relay 12 VDC cable (para 7-74).

**Known Info**
- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.
- Battery to shunt cable assembly OK.
- Starter to chassis ground cable OK.
- 100 AMP reverse polarity relay to PDP 12 VDC cable OK.

**Possible Problems**
- Faulty 100 AMP reverse polarity relay.
- Faulty battery to 100 AMP reverse polarity relay 12 VDC cable.

**Test Options**
- Continuity Test or STE/ICE-R Test #91

**If Continuity is Not Present**
If continuity is not present, battery to 100 AMP reverse polarity relay 12 VDC cable is faulty. If continuity is present, 100 AMP reverse polarity relay is faulty.

**If Continuity is Present**
Replace battery to 100 AMP reverse polarity relay 12 VDC cable (para 7-74).

Replace 100 AMP reverse polarity relay (para 7-30).
CONTINUITY TEST

1. Lift terminal cover on 12V BAT terminal stud on 100 AMP reverse polarity relay.
2. Remove nut, lockwasher, terminal lug TL61, and terminal lug TL47 from 12V BAT terminal stud on 100 AMP reverse polarity relay. Discard lockwasher.
3. Set multimeter to ohms.
4. Connect positive probe (+) of multimeter to terminal lug TL99.
5. Connect negative probe (-) of multimeter to terminal lug TL47 and note reading on multimeter.
6. If continuity is not present, replace battery to 100 AMP reverse polarity relay 12 VDC cable (para 7-74).
7. If continuity is present, replace 100 AMP reverse polarity relay (para 7-30).
8. Lift terminal cover on 12V BAT terminal stud on 100 AMP reverse polarity relay.
9. Position terminal lugs TL47 and TL61 on 12V BAT terminal stud on 100 AMP reverse polarity relay with lockwasher and nut.
10. Tighten nut to 120-144 lb-in. (14-16 N.m).
11. Position air hose on intake air cleaner boot with clamp.
12. Tighten clamp to 36-48 lb-in. (4-5 N.m).
13. Connect batteries (para 7-57).
14. Is continuity present from 200 AMP terminal block 12V BAT left terminal stud to right terminal stud?

- **NO**
  - Replace 200 AMP terminal block (para 20-58).

- **YES**

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, 200 AMP terminal block is faulty.

**KNOWN INFO**

- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.
- Battery to shunt cable assembly OK.
- Starter to chassis ground cable OK.

**POSSIBLE PROBLEMS**

- Faulty 200 AMP reverse polarity relay.
- Faulty 200 AMP terminal block.
- Faulty 200 AMP terminal block to PDP 12 VDC cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC load cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC battery cable.
- Faulty battery to 200 AMP terminal block 12 VDC cable assembly.
CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Remove nut, lockwasher, washer, and terminal lug TL47 from left 12V BAT terminal stud on 200 AMP terminal block. Discard lockwasher.
(3) Remove nut, lockwasher, washer, and terminal lugs TL171 and TL61 from right 12V BAT terminal stud on 200 AMP terminal block. Discard lockwasher.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to left 12V BAT terminal stud on 200 AMP terminal block.
(6) Connect negative (-) probe of multimeter to right 12V BAT terminal stud on 200 AMP terminal block and note reading on multimeter.
(7) If continuity is not present, replace 200 AMP terminal block (para 20-58).
(8) Position terminal lug TL47 on left 12V BAT terminal stud on 200 AMP terminal block with washer, lockwasher, and nut.
(9) Tighten nut to 15-19 lb-ft (21-25 N.m).
If continuity is not present, 200 AMP terminal block is faulty.

**15.** Is continuity present from 200 AMP terminal block 12V LOAD left terminal stud to right terminal stud?

- **NO**
- **YES**

**If continuity is not present,**

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**POSSIBLE PROBLEMS**

- Faulty 200 AMP reverse polarity relay.
- Faulty 200 AMP terminal block.
- Faulty 200 AMP terminal block to PDP 12 VDC cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC load cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC battery cable.
- Faulty battery to 200 AMP terminal block 12 VDC cable assembly.

**REASON FOR QUESTION**

- If continuity is not present, 200 AMP terminal block is faulty.

**KNOWING INFO**

- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.
- Battery to shunt cable assembly OK.
- Starter to chassis ground cable OK.
CONTINUITY TEST

1. Lift dust boot on left 12V LOAD terminal stud on 200 AMP terminal block.
2. Remove nut, lockwasher, washer, and terminal lug TL80 from left 12V LOAD terminal stud on 200 AMP terminal block. Discard lockwasher.
3. Remove nut, lockwasher, washer, and terminal lug TL172 from right 12V LOAD terminal stud on 200 AMP terminal block. Discard lockwasher.
4. Set multimeter to ohms.
5. Connect positive (+) probe of multimeter to left 12V LOAD terminal stud on 200 AMP terminal block.
6. Connect negative (-) probe of multimeter to right 12V LOAD terminal stud on 200 AMP terminal block and note reading on multimeter.
7. If continuity is not present, replace 200 AMP terminal block (para 20-58).
Is continuity present from terminal lug TL80 to terminal X2 on PDP?

**Possible Problems**
- Faulty 200 AMP reverse polarity relay.
- Faulty 200 AMP terminal block to PDP 12 VDC cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC load cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC battery cable.
- Faulty battery to 200 AMP terminal block 12 VDC cable assembly.

**Known Info**
- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.
- Battery to shunt cable assembly OK.
- Starter to chassis ground cable OK.
- 200 AMP terminal block OK.

**Test Options**
- Continuity Test or STE/ICE-R Test #91

**Reason for Question**
- If continuity is not present, 200 AMP terminal block to PDP is 12 VDC cable is faulty.

**Caution**
Read CAUTION on following page.
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal lug TL80.

CAUTION

When testing to terminal X2 on PDP, ensure that multimeter probes come in contact with the outside metal ring. Failure to comply may result in false troubleshooting test results.

(3) Connect negative (-) probe of multimeter to terminal block X2 on PDP and note reading on multimeter.
(4) If continuity is not present, replace 200 AMP terminal block to PDP 12 VDC cable (para 20-54).
(5) Position terminal lug TL80 on left 12V LOAD terminal stud on 200 AMP terminal block with washer, lockwasher, and nut.
(6) Tighten nut to 15-19 lb-ft (21-25 N.m).
(7) Position dust boot on left 12V LOAD terminal stud on 200 AMP terminal block.
17. Is continuity present from terminal lug TL172 to terminal lug TL174?

**Known Info**
- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.
- Battery to shunt cable assembly OK.
- Starter to chassis ground cable OK.
- 200 AMP terminal block OK.
- 200 AMP terminal block to PDP 12 VDC cable OK.

**Possible Problems**
- Faulty 200 AMP reverse polarity relay.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC load cable.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC battery cable.
- Faulty battery to 200 AMP terminal block 12 VDC cable assembly.

**Test Options**
- Continuity Test or STE/ICE-R Test #91

**Reason for Question**
If continuity is not present, 200 AMP terminal block to reverse polarity relay 12 VDC load cable is faulty.

**YES**
Replace 200 AMP terminal block to reverse polarity relay 12 VDC load cable (para 20-49).

**NO**
CONTINUITY TEST

(1) Lift dust boot on 12V LOAD terminal stud on 200 AMP reverse polarity relay.
(2) Remove nut, lockwasher, and terminal lug TL174 from 12V LOAD terminal stud on 200 AMP reverse polarity relay. Discard lockwasher.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal lug TL172.
(5) Connect negative (-) probe of multimeter to terminal lug TL174 and note reading on multimeter.
(6) If continuity is not present, replace 200 AMP terminal block to reverse polarity relay 12 VDC load cable (para 20-49).
(7) Position terminal lug TL172 on right 12V LOAD terminal stud on 200 AMP terminal block with washer, lockwasher, and nut.
(8) Tighten nut to 15-19 lb-ft (21-25 N.m).
(9) Position terminal lug TL174 on 12V LOAD terminal stud on 200 AMP reverse polarity relay with lockwasher and nut.
(10) Tighten nut to 108-132 lb-in. (12-15 N.m).
(11) Position dust boot on 12V LOAD terminal stud on 200 AMP reverse polarity relay.
Is continuity present from terminal lug TL173 to terminal lug TL171?

**Test Options**
- Continuity Test or STE/ICE-R Test #91

**Reason for Question**
If continuity is not present, 200 AMP terminal block to reverse polarity relay 12 VDC battery cable is faulty.

**Known Info**
- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.
- Battery to shunt cable assembly OK.
- Starter to chassis ground cable OK.
- 200 AMP terminal block OK.
- 200 AMP terminal block to PDP 12 VDC cable OK.
- 200 AMP terminal block to reverse polarity relay 12 VDC load cable OK.

**Possible Problems**
- Faulty 200 AMP reverse polarity relay.
- Faulty 200 AMP terminal block to reverse polarity relay 12 VDC battery cable.
- Faulty battery to 200 AMP terminal block 12 VDC cable assembly.

**Yes**
Replace 200 AMP terminal block to reverse polarity relay 12 VDC battery cable (para 20-55).
CONTINUITY TEST

(1) Lift dust boot on 12V BAT terminal stud on 200 AMP reverse polarity relay.
(2) Remove nut, lockwasher, and terminal lug TL173 from 12V BAT terminal stud on 200 AMP reverse polarity relay. Discard lockwasher.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal lug TL173.
(5) Connect negative (-) probe of multimeter to terminal lug TL171 and note reading on multimeter.
(6) If continuity is not present, replace 200 AMP terminal block to reverse polarity relay 12 VDC battery cable (para 20-55).
(7) Position terminal lugs TL171 and TL61 on right 12V BAT terminal stud on 200 AMP terminal block with washer, lockwasher, and nut.
(8) Tighten nuts to 15-19 lb-ft (21-25 N.m).
(9) Position terminal lug TL173 on 12V BAT terminal stud on 200 AMP reverse polarity relay with lockwasher and nut.
(10) Tighten nut to 108-132 lb-in. (12-15 N.m).
(11) Position dust boot on 12V BAT terminal stud on 200 AMP reverse polarity relay.
19. Is continuity present from terminal lug TL47 to terminal lug TL99?

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Battery(ies) OK.
- Cab to chassis ground strap OK.
- PDP to cab ground cable OK.
- Shunt OK.
- Starter to shunt 24 VDC cable OK.
- Battery to shunt cable assembly OK.
- Starter to chassis ground cable OK.
- 200 AMP terminal block OK.
- 200 AMP terminal block to PDP 12 VDC cable OK.
- 200 AMP terminal block to reverse polarity relay 12 VDC load cable OK.
- 200 AMP terminal block to reverse polarity relay 12 VDC battery cable OK.

**POSSIBLE PROBLEMS**
- Faulty 200 AMP reverse polarity relay.
- Faulty battery to 200 AMP terminal block 12 VDC cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, battery to 200 AMP terminal block 12 VDC cable assembly, is faulty. If continuity is present, 200 AMP reverse polarity relay is faulty.

**IF NO**
- Replace battery to 200 AMP terminal block 12 VDC cable assembly (para 20-52).

**IF YES**
- Replace 200 AMP reverse polarity relay (para 20-47).
CONTINUITY TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to terminal lug TL47.
3. Connect negative (-) probe of multimeter to terminal lug TL99 and note reading on multimeter.
4. If continuity is not present, replace battery to 200 AMP terminal block 12 VDC cable assembly (para 20-52).
5. If continuity is present, replace 200 AMP reverse polarity relay (para 20-47).
6. Install PDP cover (para 16-2).
7. Connect batteries (para 7-57).
e4. 24 VDC CIRCUITS DO NOT OPERATE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (item 46, Appendix C)
STE/ICE-R (item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Tester, Antifreeze and Battery (item 42, Appendix C)
Goggles, Industrial (item 15, Appendix C)
Gloves, Rubber (item 13, Appendix C)
Apron, Rubber (item 3, Appendix C)
Socket Set, Socket Wrench (item 34, Appendix C)
Wrench, Torque, 0-200 lb-in. (item 59, Appendix C)
Wrench, Torque, 0-175 lb-ft (item 58, Appendix C)
Wire, Relay Test (item 9, Appendix E)

Materials/Parts
Ties, Cable, Plastic (item 69, Appendix D)
Dispenser, Pressure Sensitive Tape
(item 20, Appendix D)
Wire, Elect, 50 ft (item 77, Appendix D)
Lockwasher (2) (item 95, Appendix G) (100 AMP)
Lockwasher (2) (item 73, Appendix G) (200 AMP)
Lockwasher (4) (item 96, Appendix G) (200 AMP)

Personnel Required
(2)

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

NOTE
Perform electrical troubleshooting e1. Circuit Breaker Does Not Operate on circuit breaker CB70 prior to beginning this task.

Remove and install plastic cable ties as required.

START

WARNING
Read WARNING on following page.

Are batteries serviceable?

1. Read WARNING on following page.

Charge battery(ies) (TM 9-6140-200-14) or replace battery(ies) (para 7-55).

NO

YES
WARNING

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

### BATTERY SPECIFIC GRAVITY TEST

1. Remove four batteries from battery box (para 7-55).
2. Test batteries for serviceability (TM 9-6140-200-14).
3. Charge battery(ies) if discharged but serviceable (TM 9-6140-200-14).
4. Replace battery(ies) if unserviceable (para 7-55).
5. Install four batteries in battery box (para 7-55).
KNOW INFO

Service drive lights OK.
Circuit breaker CB70 OK.
Batteries OK.

POSSIBLE PROBLEMS

Faulty relay K2.
Faulty master power switch.
Faulty dashboard cable assembly.
Faulty 100 AMP reverse polarity relay.
Faulty 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable.
Faulty battery to 100 AMP reverse polarity relay 24 VDC cable.
Faulty 200 AMP reverse polarity relay.
Faulty 200 AMP terminal block.
Faulty battery to 200 AMP terminal block 24 VDC cable assembly.
Faulty 200 AMP terminal block to reverse polarity relay 24 VDC battery cable.
Faulty 200 AMP terminal block to reverse polarity relay 24 VDC load cable.
Faulty 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable.

2. Is 24 VDC present at terminal X1 on power distribution panel (PDP)?

- NO
  - Go to step 10 of this fault.

- YES
  - Voltage Test or STE/ICE-R Test #89

WARNING

Read WARNING and CAUTION on following page.

CAUTION

This question eliminates possible problems and determines where troubleshooting continues.

TEST OPTIONS

Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.
**WARNING**

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

**VOLTAGE TEST**

(1) Remove power distribution panel (PDP) cover (para 16-2).
(2) Set multimeter to volts DC.

**CAUTION**

When testing to terminal X1 on PDP, ensure that multimeter probes come in contact with the outside metal ring. Failure to comply may result in false troubleshooting test results.

(3) Connect positive (+) probe of multimeter to terminal X1 on power distribution panel (PDP).
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If 24 VDC is not present, go to step 10 of this fault.
### e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

#### KNOWN INFO

<table>
<thead>
<tr>
<th>Component</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service drive lights</td>
<td>OK</td>
</tr>
<tr>
<td>Circuit breaker CB70</td>
<td>OK</td>
</tr>
<tr>
<td>Batteries</td>
<td>OK</td>
</tr>
<tr>
<td>100 AMP reverse polarity relay</td>
<td>OK</td>
</tr>
<tr>
<td>100 AMP reverse polarity relay to power distribution panel (PDP)</td>
<td>24 VDC cable OK</td>
</tr>
<tr>
<td>Battery to 100 AMP reverse polarity relay 24 VDC cable</td>
<td>OK</td>
</tr>
<tr>
<td>200 AMP reverse polarity relay</td>
<td>OK</td>
</tr>
<tr>
<td>200 AMP terminal block</td>
<td>OK</td>
</tr>
<tr>
<td>Battery to 200 AMP terminal block 24 VDC cable assembly</td>
<td>OK</td>
</tr>
<tr>
<td>200 AMP terminal block to reverse polarity relay 24 VDC battery cable</td>
<td>OK</td>
</tr>
<tr>
<td>200 AMP terminal block to reverse polarity relay 24 VDC load cable</td>
<td>OK</td>
</tr>
<tr>
<td>200 AMP terminal block to power distribution panel (PDP) 24 VDC cable</td>
<td>OK</td>
</tr>
</tbody>
</table>

#### POSSIBLE PROBLEMS

- Faulty relay K2.
- Faulty master power switch.
- Faulty dashboard cable assembly.

#### TEST OPTIONS

- Voltage Test or STE/ICE-R Test #89

#### REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

### 3. **WARNING**

Read WARNING on following page.

Is 24 VDC present at circuit breaker CB39 socket 3 on PDP?

- **NO**
  - Go to step 13 of this fault.
- **YES**
  - Go to step 13 of this fault.
VOLTAGE TEST

(1) Remove circuit breaker CB39 from PDP.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to circuit breaker CB39 socket 3 on PDP.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If 24 VDC is not present, go to step 13 of this fault.
(6) Install circuit breaker CB39 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 circuits and cause severe burns or electrical shock.
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**

- Service drive lights OK.
- Circuit breaker CB70 OK.
- Batteries OK.
- 100 AMP reverse polarity relay OK.
- 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable OK.
- Battery to 100 AMP reverse polarity relay 24 VDC cable OK.
- 200 AMP reverse polarity relay OK.
- 200 AMP terminal block 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 terminal block to reverse polarity relay 24 VDC load cable OK.
- 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable OK.

**POSSIBLE PROBLEMS**

- Faulty relay K2.
- Faulty master power switch.
- Faulty dashboard cable assembly.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, wire 1602 is faulty.

---

**CAUTION**

Read CAUTION on following page.

---

Is continuity present from relay K2 socket 30 on PDP to terminal X1 on PDP?

---

If continuity is not present, wire 1602 is faulty.

---

Is continuity present from relay K2 socket 30 on PDP to terminal X1 on PDP?

---

Repair wire 1602 from terminal X1 on PDP to relay K2 socket 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) Disconnect batteries (para 7-57)
(2) Remove relay K2 from PDP.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to relay K2 socket 30 on PDP.

**CAUTION**

When testing to terminal X1 on PDP, ensure that multimeter probes come in contact with the outside metal ring. Failure to comply may result in false troubleshooting test results.

(5) Connect negative (-) probe of multimeter to terminal X1 on PDP and note reading on multimeter.
(6) If continuity is not present, repair wire 1602 from terminal X1 on PDP to relay K2 socket 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**

Service drive lights OK.
Circuit breaker CB70 OK.
Batteries OK.
100 AMP reverse polarity relay OK.
100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable OK.
Battery to 100 AMP reverse polarity relay 24 VDC cable OK.
200 AMP reverse polarity relay OK.
200 AMP terminal block 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 terminal block to reverse polarity relay 24 VDC load cable OK.
200 AMP terminal block to power distribution panel (PDP) 24 VDC cable OK.

**POSSIBLE PROBLEMS**

Faulty relay K2.
Faulty master power switch.
Faulty dashboard cable assembly.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

This question eliminates possible problems and determines where troubleshooting continues.

---

**5.**

Is continuity present from relay K2 socket 86 on PDP to circuit breaker CB70 socket 3 on PDP?

**NO**

**YES**

Go to step 14 of this fault.
## CONTINUITY TEST

1. Remove circuit breaker CB70 from PDP.
2. Position master power switch to on (TM 9-2320-366-10-1).
3. Set multimeter to ohms.
4. Connect positive (+) probe of multimeter to relay K2 socket 86 on PDP.
5. Connect negative (-) probe of multimeter to circuit breaker CB70 socket 4 on PDP and note reading on multimeter.
6. If continuity is not present, go to step 14 of this fault.
7. Position master power switch to off (TM 9-2320-366-10-1).
8. Install circuit breaker CB70 in PDP.
### KNOWN INFO

- Service drive lights OK.
- Circuit breaker CB70 OK.
- Batteries OK.
- 100 AMP reverse polarity relay OK.
- 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable OK.
- Battery to 100 AMP reverse polarity relay 24 VDC cable OK.
- 200 AMP reverse polarity relay OK.
- 200 AMP terminal block 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 terminal block to reverse polarity relay 24 VDC load cable OK.
- 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable OK.
- Master power switch OK.

### POSSIBLE PROBLEMS

- Faulty relay K2.
- Faulty dashboard cable assembly.

### TEST OPTIONS

- Continuity Test or STE/ICE-R Test #91

### REASON FOR QUESTION

If continuity is not present, wire 3041 is faulty.

**6.**

Is continuity present from relay K2 socket 85 on PDP to ground?

- **NO**
  - Repair wire 3041 from terminal board TB2 position 43 on PDP to relay K2 socket 85 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay K2 socket 85 on PDP.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3041 from terminal board TB2 position 43 on PDP to relay K2 socket 85 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
If continuity is not present, relay K2 is faulty.

Replace relay K2 (para 7-9).

**KNOWLEDGE INFO**

| Service drive lights OK. |
| Circuit breaker CB70 OK. |
| Batteries OK. |
| 100 AMP reverse polarity relay OK. |
| 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable OK. |
| Battery to 100 AMP reverse polarity relay 24 VDC cable OK. |
| 200 AMP reverse polarity relay OK. |
| 200 AMP terminal block 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 terminal block to reverse polarity relay 24 VDC load cable OK. |
| 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable OK. |
| Master power switch OK. |

**POSSIBLE PROBLEMS**

| Faulty relay K2. |
| Faulty dashboard cable assembly. |

**TEST OPTIONS**

- Resistance Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, relay K2 is faulty.
RESISTANCE TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to relay K2 terminal 85.
3. Connect negative (-) probe of multimeter to relay K2 terminal 86 and note reading on multimeter.
4. If 76-99 ohms resistance is not present, replace relay K2 (para 7-9).
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**

- Service drive lights OK.
- Circuit breaker CB70 OK.
- Batteries OK.
- 100 AMP reverse polarity relay OK.
- 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable OK.
- Battery to 100 AMP reverse polarity relay 24 VDC cable OK.
- 200 AMP reverse polarity relay OK.
- 200 AMP terminal block 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 terminal block to reverse polarity relay 24 VDC load cable OK.
- 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable OK.
- Master power switch OK.

**POSSIBLE PROBLEMS**

- Faulty relay K2.
- Faulty dashboard cable assembly.

**TEST OPTIONS**

- Voltage Test or
- STE/ICE-R Test #89

**REASON FOR QUESTION**

If 24 VDC is not present, relay K2 is faulty.

Is 24 VDC present at relay K2 socket 87 on PDP?

- **YES**
  - Replace relay K2 (para 7-9).

- **NO**
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Install relay test wire in relay K2 socket 87 on PDP.
(2) Install relay K2 in PDP.
(3) Connect batteries (para 7-57).
(4) Position master power switch to on (TM 9-2320-366-10-1).
(5) Set multimeter to volts DC.
(6) Connect positive (+) probe of multimeter to relay test wire.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If 24 VDC is not present, replace relay K2 (para 7-9).
(9) Position master power switch to off (TM 9-2320-366-10-1).
(10) Disconnect batteries (para 7-57).
(11) Remove relay K2 from PDP.
(12) Remove relay test wire from PDP relay K2 socket 87.
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**

- Service drive lights OK.
- Circuit breaker CB70 OK.
- Batteries OK.
- 100 AMP reverse polarity relay OK.
- 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable OK.
- Battery to 100 AMP reverse polarity relay 24 VDC cable OK.
- 200 AMP reverse polarity relay OK.
- 200 AMP terminal block 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 terminal block to reverse polarity relay 24 VDC load cable OK.
- 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable OK.
- Master power switch OK.
- Relay K2 OK.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.

---

9.

Is continuity present from relay K2 socket 87 on PDP to circuit breaker CB36 socket 6 on PDP?

- **NO**
  
  **REASON FOR QUESTION**
  
  If continuity is not present, wire 1604 is faulty. If continuity is present, bus bar X6 is faulty.

  **TEST OPTIONS**
  
  Continuity Test or STE/ICE-R Test #91

- **YES**
  
  Repair wire 1604 from relay K2 socket 87 on PDP to bus bar X6 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Replace bus bar X6 on PDP or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

1. Remove circuit breaker CB36 from PDP.
2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to relay K2 socket 87 on PDP.
4. Connect negative (-) probe of multimeter to circuit breaker CB36 socket 6 on PDP and note reading on multimeter.
5. If continuity is not present, repair wire 1604 from relay K2 socket 87 on PDP to bus bar X6 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
6. If continuity is present, replace bus bar X6 on PDP or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
7. Install circuit breaker CB36 in PDP.
8. Install relay K2 in PDP.
9. Install power distribution panel (PDP) cover (para 16-2).
10. Connect batteries (para 7-57).
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service drive lights OK.</td>
</tr>
<tr>
<td>Circuit breaker CB70 OK.</td>
</tr>
<tr>
<td>Batteries OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty 100 AMP reverse polarity relay.</td>
</tr>
<tr>
<td>Faulty 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable.</td>
</tr>
<tr>
<td>Faulty battery to 100 AMP reverse polarity relay 24 VDC cable.</td>
</tr>
<tr>
<td>Faulty 200 AMP reverse polarity relay.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block.</td>
</tr>
<tr>
<td>Faulty battery to 200 AMP terminal block 24 VDC cable assembly.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block to reverse polarity relay 24 VDC battery cable.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block to reverse polarity relay 24 VDC load cable.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Inspection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>This question eliminates possible problems and determines where to continue troubleshooting.</td>
</tr>
</tbody>
</table>

10. Is vehicle equipped with a 100 AMP reverse polarity relay?

- **NO**
  - Go to step 16 of this fault.

- **YES**
(1) Lower spare tire (TM 9-2320-366-10-2).
(2) Check if vehicle is equipped with 100 AMP reverse polarity relay.
(3) If vehicle is not equipped with 100 AMP reverse polarity relay, go to step 16 of this fault.
 Known Info

- Service drive lights OK.
- Circuit breaker CB70 OK.
- Batteries OK.

Possible Problems

- Faulty 100 AMP reverse polarity relay.
- Faulty 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable.
- Faulty battery to 100 AMP reverse polarity relay 24 VDC cable.

Test Options

- Continuity Test or STE/ICE-R Test #91

Reason for Question

If continuity is not present, battery to 100 AMP reverse polarity relay 24 VDC cable is faulty.

11.

Is continuity present from terminal lug TL39 to terminal lug TL37?

- NO

If continuity is not present, battery to 100 AMP reverse polarity relay 24 VDC cable is faulty.

- YES

Replace battery to 100 AMP reverse polarity relay 24 VDC cable (para 7-75).
CONTINUITY TEST

(1) Disconnect batteries (para 7-57)
(2) Remove nut, terminal lug TL10, and terminal lug TL39 from battery 24 VDC cable.
(3) Loosen clamp on air hose.
(4) Remove air hose from intake air cleaner boot.

NOTE
Tag all terminal lug and connection points prior to disconnecting.

(5) Lift terminal cover on 24V BAT terminal stud on 100 AMP reverse polarity relay.
(6) Remove nut, lockwasher, and terminal lugs TL1, TL37, and TL36 from 24V BAT terminal stud on 100 AMP reverse polarity relay. Discard lockwasher.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to terminal lug TL37.
(9) Connect negative (-) probe of multimeter to terminal lug TL39 and note reading on multimeter.
(10) If continuity is not present, replace battery to 100 AMP reverse polarity relay 24 VDC cable (para 7-75).
(11) Lift terminal cover on 24V BAT terminal stud on 100 AMP reverse polarity relay.
(12) Position terminal lugs TL36, TL37, and TL1 on 24V BAT terminal stud on 100 AMP reverse polarity relay with lockwasher and nut.
(13) Tighten nut to 120-144 lb-in. (14-16 N.m).
(14) Install terminal lug TL39 and terminal lug TL10 on battery 24 VDC cable with nut.
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**
- Service drive lights OK.
- Circuit breaker CB70 OK.
- Batteries OK.
- Battery to 100 AMP reverse polarity relay 24 VDC cable OK.

**POSSIBLE PROBLEMS**
- Faulty 100 AMP reverse polarity relay.
- Faulty 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, 100 AMP reverse polarity relay to PDP 24 VDC cable is faulty. If continuity is present, 100 AMP reverse polarity relay is faulty.

---

**12.** Is continuity present from terminal lug TL44 to terminal X1 on PDP?  

- **NO**  
  - If continuity is not present, 100 AMP reverse polarity relay to PDP 24 VDC cable is faulty. If continuity is present, 100 AMP reverse polarity relay is faulty.

- **YES**  
  - Replace 100 AMP reverse polarity relay to PDP 24 VDC cable (para 7-131).

- Replace 100 AMP reverse polarity relay (para 7-30).
CONTINUITY TEST

(1) Lift dust boot on 24V LOAD terminal stud on 100 AMP reverse polarity relay.
(2) Remove nut, lockwasher, and terminal lug TL44 from 24V LOAD terminal stud on 100 AMP reverse polarity relay. Discard lockwasher.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal lug TL44.

**CAUTION**

When testing to terminal X1 on PDP, ensure that multimeter probes come in contact with the outside metal ring. Failure to comply may result in false troubleshooting test results.

(5) Connect negative (-) probe of multimeter to terminal X1 on PDP and note reading on multimeter.
(6) If continuity is not present, replace 100 AMP reverse polarity relay to PDP 24 VDC cable (para 7-131).
(7) If continuity is present, replace 100 AMP reverse polarity relay (para 7-30).
(8) Install PDP cover (para 16-2).
(9) Position terminal lug TL44 on 24V LOAD terminal stud on 100 AMP reverse polarity relay with lockwasher and nut.
(10) Tighten nut to 120-144 lb-in. (14-16 N.m).
(11) Position dust boot on 24V LOAD terminal stud on 100 AMP reverse polarity relay.
(12) Position air hose on intake air cleaner boot with clamp.
(13) Tighten clamp to 36-48 lb-in. (4-5 N.m).
(14) Connect batteries (para 7-57)
(15) Raise spare tire (TM 9-2320-365-10).
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**

- Service drive lights OK.
- Circuit breaker CB70 OK.
- Batteries OK.
- 100 AMP reverse polarity relay OK.
- 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable OK.
- Battery to 100 AMP reverse polarity relay 24 VDC cable OK.
- 200 AMP reverse polarity relay OK.
- 200 AMP terminal block 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 terminal block to reverse polarity relay 24 VDC load cable OK.
- 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable OK.

**POSSIBLE PROBLEMS**

Faulty dashboard cable assembly.

---

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 24 VDC is not present, wire 1602 is faulty. If 24 VDC is present bus bar X4 is faulty.

---

**WARNING**

Read WARNING on following page.

13. Is 24 VDC present at circuit breaker CB30 socket 1 on PDP?

- **NO**
  - Repair wire 1602 from terminal X1 on PDP to bus bar X4 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace bus bar X4 on PDP or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**WARNING**

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

### VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove circuit breaker CB30 from PDP.</td>
</tr>
<tr>
<td>2</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>3</td>
<td>Connect positive (+) probe of multimeter to circuit breaker CB30 socket 1 on PDP.</td>
</tr>
<tr>
<td>4</td>
<td>Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>5</td>
<td>If 24 VDC is not present, Repair wire 1602 from terminal X1 on PDP to bus bar X4 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>6</td>
<td>If 24 VDC is present, replace bus bar X4 on PDP or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>7</td>
<td>Install circuit breaker CB30 in PDP.</td>
</tr>
<tr>
<td>8</td>
<td>Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>

---

**CIRCUIT BREAKER CB30**

**PDP**

---

**CB30 CAVITY**

---

Change 1 2-284.9
Known Info

Service drive lights OK.
Circuit breaker CB70 OK.
Batteries OK.
100 AMP reverse polarity relay OK.
100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable OK.
Battery to 100 AMP reverse polarity relay 24 VDC cable OK.
200 AMP reverse polarity relay OK.
200 AMP terminal block 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 terminal block to reverse polarity relay 24 VDC load cable OK.
200 AMP terminal block to power distribution panel (PDP) 24 VDC cable.

Possible Problems

Faulty master power switch.
Faulty dashboard cable assembly.

Test Options

Continuity Test or STE/ICE-R Test #91

Reason for Question

If continuity is not present, master power switch is faulty.

Is continuity present from master power switch connector pin 1 to pin 5?

Yes

Replace master power switch (para 7-18).

No

CAUTION
Read CAUTION on following page.
**CAUTION**

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

**NOTE**

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

### CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove instrument panel for access (para 7-15).</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector PX17 from master power switch connector.</td>
</tr>
<tr>
<td>3</td>
<td>Position master power switch to on.</td>
</tr>
<tr>
<td>4</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>5</td>
<td>Connect positive (+) probe of multimeter to master power switch connector pin 1.</td>
</tr>
<tr>
<td>6</td>
<td>Connect negative (-) probe of multimeter to master power switch connector pin 5 and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If continuity is not present, replace master power switch (para 7-18).</td>
</tr>
<tr>
<td>8</td>
<td>Position master power switch to off.</td>
</tr>
</tbody>
</table>
**KNOWLEDGE INFO**

- Service drive lights OK.
- Circuit breaker CB70 OK.
- Batteries OK.
- 100 AMP reverse polarity relay OK.
- 100 AMP reverse polarity relay to power distribution panel (PDP) 24 VDC cable OK.
- Battery to 100 AMP reverse polarity relay 24 VDC cable OK.
- 200 AMP reverse polarity relay OK.
- 200 AMP terminal block 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 terminal block to reverse polarity relay 24 VDC load cable OK.
- 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable OK.
- Master power switch OK.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.

---

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, wire 1548 is faulty. If continuity is present wire 1586 is faulty.

---

**15.**

Is continuity present from relay K2 socket 86 on PDP to connector PX17 socket 1?

---

**YES**

- Repair wire 1548 from connector PX17 socket 1 to relay K2 socket 86 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

---

**NO**

- Repair wire 1586 from connector PX17 socket 5 to circuit breaker CB70 socket 4 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**CAUTION**

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

**NOTE**

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

### CONTINUITY TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to connector PX17 socket 1.
3. Connect negative (-) probe of multimeter to relay K2 socket 86 on PDP and note reading on multimeter.
4. If continuity is not present, repair wire 1548 from connector PX17 socket 1 to relay K2 socket 86 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
5. If continuity is present, repair wire 1586 from connector PX17 socket 5 to circuit breaker CB70 socket 4 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
6. Connect connector PX17 to master power switch connector.
7. Install instrument panel (para 7-15).
8. Install relay K2 in PDP.
9. Install PDP cover (para 16-2).
10. Connect batteries (para 7-57).
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service drive lights OK.</td>
</tr>
<tr>
<td>Circuit breaker CB70 OK.</td>
</tr>
<tr>
<td>Batteries OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty 200 AMP reverse polarity relay.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block.</td>
</tr>
<tr>
<td>Faulty battery to 200 AMP terminal block 24 VDC cable assembly.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block to reverse polarity relay 24 VDC battery cable.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block to reverse polarity relay 24 VDC load cable.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable.</td>
</tr>
</tbody>
</table>

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, 200 AMP terminal block is faulty.

16. Is continuity present from 200 AMP terminal block 24V BATT left terminal stud to right terminal stud?

- NO
  - Replace 200 AMP terminal block (para 20-58).
- YES
CONTINUITY TEST

NOTE
Tag terminal lugs and connection points prior to disconnecting.

(1) Disconnect batteries (para 7-57).
(2) Remove nut, lockwasher, washer, and terminal lugs TL37 and TL36 from left 24V BAT terminal stud on 200 AMP terminal block. Discard lockwasher.
(3) Remove nut, lockwasher, washer, and terminal lugs TL1 and TL166 from right 24V BAT terminal stud on 200 AMP terminal block. Discard lockwasher.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to left 24V BAT terminal stud on 200 AMP terminal block.
(6) Connect negative (-) probe of multimeter to right 24V BAT terminal stud on 200 AMP terminal block and note reading on multimeter.
(7) If continuity is not present, replace 200 AMP terminal block (para 20-58).
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service drive lights OK.</td>
</tr>
<tr>
<td>Circuit breaker CB70 OK.</td>
</tr>
<tr>
<td>Batteries OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty 200 AMP reverse polarity relay.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block.</td>
</tr>
<tr>
<td>Faulty battery to 200 AMP terminal block 24 VDC cable assembly.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block to reverse polarity relay 24 VDC battery cable.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block to reverse polarity relay 24 VDC load cable.</td>
</tr>
<tr>
<td>Faulty 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, 200 AMP terminal block is faulty.</td>
</tr>
</tbody>
</table>

17. Is continuity present from 200 AMP terminal block 24V LOAD left terminal stud to right terminal stud?

- **NO**: Replace 200 AMP terminal block (para 20-58).
- **YES**: Replace 200 AMP terminal block (para 20-58).
(1) Lift dust boot from left 24V LOAD terminal stud on 200 AMP terminal block.
(2) Remove nut, lockwasher, washer, and terminal lug TL44 from left 24V LOAD terminal stud on 200 AMP terminal block. Discard lockwasher.
(3) Remove nut, lockwasher, washer, and terminal lug TL167 from right 24V LOAD terminal stud on 200 AMP terminal block. Discard lockwasher.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to left 24V LOAD terminal stud on 200 AMP terminal block.
(6) Connect negative (-) probe of multimeter to right 24V LOAD terminal stud on 200 AMP terminal block and note reading on multimeter.
(7) If continuity is not present, replace 200 AMP terminal block (para 20-58).

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Lift dust boot from left 24V LOAD terminal stud on 200 AMP terminal block.</td>
</tr>
<tr>
<td>(2) Remove nut, lockwasher, washer, and terminal lug TL44 from left 24V LOAD terminal stud on 200 AMP terminal block. Discard lockwasher.</td>
</tr>
<tr>
<td>(3) Remove nut, lockwasher, washer, and terminal lug TL167 from right 24V LOAD terminal stud on 200 AMP terminal block. Discard lockwasher.</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to left 24V LOAD terminal stud on 200 AMP terminal block.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to right 24V LOAD terminal stud on 200 AMP terminal block and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If continuity is not present, replace 200 AMP terminal block (para 20-58).</td>
</tr>
</tbody>
</table>
Service drive lights OK.
Circuit breaker CB70 OK.
Batteries OK.
200 AMP terminal block OK.

Faulty 200 AMP reverse polarity relay OK.
Faulty battery to 200 AMP terminal block 24 VDC cable assembly.
Faulty 200 AMP terminal block to reverse polarity relay 24 VDC battery cable.
Faulty 200 AMP terminal block to reverse polarity relay 24 VDC load cable.
Faulty 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable.

If continuity is not present, battery to 200 AMP terminal block 24 VDC cable assembly is faulty.
CONTINUITY TEST

(1) Remove nut and terminal lugs TL39 and TL10 from battery 24 VDC cable.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL39.
(4) Connect negative (-) probe of multimeter to terminal lug TL37 and note reading on multimeter.
(5) If continuity is not present, replace battery to 200 AMP terminal block 24 VDC cable assembly (para 20-53).
(6) Position terminal lugs TL36 and TL37 on left 24V BAT terminal stud on 200 AMP terminal block with washer, lockwasher, and nut.
(7) Tighten nut to 15-19 lb-ft (21-25 N.m).
(8) Install terminal lugs TL10 and TL39 on battery 24 VDC cable with nut.

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

TM 9-2320-366-20-1
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**
Service drive lights OK.  
Circuit breaker CB70 OK.  
Batteries OK.  
200 AMP terminal block OK.  
Battery to 200 AMP terminal block 24 VDC cable assembly OK.

**POSSIBLE PROBLEMS**
Faulty 200 AMP reverse polarity relay.  
Faulty 200 AMP terminal block to reverse polarity relay 24 VDC battery cable.  
Faulty 200 AMP terminal block to reverse polarity relay 24 VDC load cable.  
Faulty 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable.

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
<td>If continuity is not present, 200 AMP terminal block to reverse polarity relay 24 VDC battery cable is faulty.</td>
</tr>
</tbody>
</table>

19. Is continuity present from terminal lug TL166 to terminal lug TL168?

**YES**  
Replace 200 AMP terminal block to reverse polarity relay 24 VDC battery cable (para 20-56).  

**NO**
CONTINUITY TEST

(1) Lift dust boot on 24V BAT terminal stud on 200 AMP reverse polarity relay.
(2) Remove nut, lockwasher, terminal lug TL168 from 24V BAT terminal stud on 200 AMP reverse polarity relay. Discard lockwasher.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal lug TL166.
(5) Connect negative (-) probe of multimeter to terminal lug TL168 and note reading on multimeter.
(6) If continuity is not present, replace 200 AMP terminal block to reverse polarity relay 24 VDC battery cable (para 20-56).
(7) Position terminal lug TL168 on 24V BAT terminal stud on 200 AMP reverse polarity relay with lockwasher and nut.
(8) Tighten nut to 27-33 lb-ft (37-45 N.m).
(9) Position dust boot on 24 V BAT terminal stud on 200 AMP reverse polarity relay.
(10) Position terminal lugs TL166 and TL1 on right 24 VDC BAT terminal stud on 200 AMP terminal block with washer, lockwasher, and nut.
(11) Tighten nut to 15-19 lb-ft (21-25 N.m).
Is continuity present from terminal lug TL169 to terminal lug TL167?

### TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

### REASON FOR QUESTION
If continuity is not present, 200 AMP terminal block to reverse polarity relay 24 VDC load cable is faulty. If continuity is present, 200 AMP terminal block to PDP 24 VDC cable is faulty.

### KNOWN INFO
- Service drive lights OK.
- Circuit breaker CB70 OK.
- Batteries OK.
- 200 AMP terminal block 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 to power distribution panel (PDP) 24 VDC cable.

### Replacement
Replace 200 AMP terminal block to reverse polarity relay 24 VDC load cable (para 20-51).
<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Lift dust boot on 24V LOAD terminal stud on 200 AMP reverse polarity relay.</td>
</tr>
<tr>
<td>(2) Remove nut, lockwasher, and terminal lug TL169 from 24V LOAD terminal stud on 200 AMP reverse polarity relay. Discard lockwasher.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to terminal lug TL169.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to terminal lug TL167 and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If continuity is not present, replace 200 AMP terminal block to reverse polarity relay 24 VDC load cable (para 20-62).</td>
</tr>
<tr>
<td>(7) If continuity is present, replace 200 AMP terminal block to PDP 24 VDC cable (para 20-51).</td>
</tr>
<tr>
<td>(8) Position terminal lug TL167 on right 24V LOAD terminal stud on 200 AMP terminal block with washer, lockwasher, and nut.</td>
</tr>
<tr>
<td>(9) Tighten nut to 15-19 lb-ft (21-25 N.m).</td>
</tr>
<tr>
<td>(10) Position terminal lug TL169 on 24V LOAD terminal stud on 200 AMP reverse polarity relay with lockwasher and nut.</td>
</tr>
<tr>
<td>(11) Tighten nut to 27-33 lb-ft (37-45 N.m).</td>
</tr>
<tr>
<td>(12) Position dust boot on 24V LOAD terminal stud on 200 AMP reverse polarity relay.</td>
</tr>
</tbody>
</table>
e4. 24 VDC CIRCUITS DO NOT OPERATE (CONT)

**KNOWN INFO**

- Service drive lights OK.
- Circuit breaker CB70 OK.
- Batteries OK.
- 200 AMP terminal block 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.
- Faulty 200 AMP terminal block to reverse polarity relay 24 VDC load cable.

**POSSIBLE PROBLEMS**

- Faulty 200 AMP reverse polarity relay.
- Faulty 200 AMP terminal block to power distribution panel (PDP) 24 VDC cable.

---

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

- If continuity is not present, 200 MAP terminal block to PDP 24 VDC cable is faulty. If continuity is present, 200 AMP reverse polarity relay is faulty.

---

**21.**

Is continuity present from terminal X1 on PDP to terminal lug TL44?

- **NO**
  - Replace 200 AMP terminal block to PDP 24 VDC cable (para 20-57).

- **YES**
  - Replace 200 AMP reverse polarity relay (para 20-47).
CONTINUITY TEST

(1) Set multimeter to ohms.

CAUTION

When testing to terminal X1 on PDP, ensure that multimeter probes come in contact with the outside metal ring. Failure to comply may result in false troubleshooting test results.

(2) Connect positive (+) probe of multimeter to terminal X1 on PDP.
(3) Connect negative (-) probe of multimeter to terminal lug TL44 and note reading on multimeter.
(4) If continuity is not present, replace 200 AMP terminal block to PDP 24 VDC cable (para 20-57).
(5) If continuity is present, replace 200 AMP reverse polarity relay (para 20-47).
(6) Position terminal lug TL44 on left 24V LOAD terminal stud on 200 AMP terminal block with washer, lockwasher, and nut.
(7) Tighten nut to 15-19 lb-ft (21-25 N.m)
(8) Position dust boot on left 24V LOAD terminal stud on 200 AMP terminal block.
(9) Install PDP cover (para 16-2).
(10) Connect batteries (para 7-57).
e6. ENGINE CRANKS BUT DOES NOT START

INITIAL SETUP

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

Personnel Required
(2)

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

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

References
TM 9-4910-571-12&P

NOTE
Perform Engine System Troubleshooting a2.
Engine Cranks But Does Not Start prior to beginning this task.

START

WARNING
Read WARNING on following page.

1. Is 24 vdc present on terminal lug TL28?

NO

YES

Go to step 3 of this fault.

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

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

KNOWN INFO
Fuel quantity OK.
Fuel/water separator primed.
Air cleaner hose or tube OK.

POSSIBLE PROBLEMS
Faulty start inhibit pushbutton switch.
Faulty relay K19.
Faulty dashboard cable assembly.
Faulty engine control cable assembly.
Faulty fuel shutoff 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 circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to terminal lug TL28 on fuel solenoid.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If 24 vdc is not present, go to step 3 of this fault.</td>
</tr>
<tr>
<td>(6) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e6. ENGINE CRANKS BUT DOES NOT START (CONT)

2. **TEST OPTIONS**
   Continuity Test or STE/ICE-R Test #91
   **REASON FOR QUESTION**
   This question eliminates possible problems and determines where troubleshooting continues.
   **KNOWN INFO**
   Is continuity present from terminal lug TL29 to ground?
   **POSSIBLE PROBLEMS**
   Faulty dashboard cable assembly.
   Faulty engine control cable assembly.
   Faulty fuel shutoff solenoid.

   **YES**
   Go to step 4 of this fault.
   **NO**
   Notify DS Maintenance to perform Fuel System Troubleshooting task a.1.1 Engine Cranks But Does Not Start.

3. **TEST OPTIONS**
   Voltage Test or STE/ICE-R Test #89
   **REASON FOR QUESTION**
   If 24 VDC is not present, go to step 5 of this fault. If 24 VDC is present, start inhibit pushbutton switch is faulty.
   **KNOWN INFO**
   Is 24 VDC present at relay K19 socket 86 on power distribution panel (PDP)?
   **POSSIBLE PROBLEMS**
   Faulty start inhibit pushbutton switch.
   Faulty relay K19.
   Faulty dashboard cable assembly.
   Faulty engine control cable assembly.

   **NO**
   Replace start inhibit pushbutton switch (para 7-19).
   **YES**
   Go to step 5 of this fault.

**WARNING**
Read WARNING on following page.
**CONTINUITY TEST**

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to terminal lug TL29 on fuel solenoid.
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, fuel solenoid is faulty, notify DS Maintenance.

---

**WARNING**

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

---

**VOLTAGE TEST**

1. Lower cab (TM 9-2320-366-10-1).
2. Remove power distribution panel (PDP) cover (para 16-2).
3. Remove relay K19 from power distribution panel (PDP).
4. Set multimeter to volts DC.
5. Connect positive (+) probe of multimeter to relay K19 socket 86 on power distribution panel (PDP).
6. Connect negative (-) probe of multimeter to ground.
7. Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
8. If 24 VDC is not present, go to step 5 of this fault.
9. If 24 VDC is present, replace start inhibit pushbutton switch (para 7-19).
e6. ENGINE CRANKS BUT DOES NOT START (CONT)

**KNOWN INFO**
- Fuel quantity OK.
- Fuel/water separator primed.
- Air cleaner hose or tube OK.
- Start inhibit pushbutton switch OK.
- Relay K19 OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty engine control cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3015 from connector J31 pin 5 to terminal board TB2 position 18 on power distribution panel (PDP) is faulty. If continuity is present, wire 3015 from connector P31 socket 5 to terminal lug TL29 is faulty.

**CAUTION**
Read CAUTION on following page.

**4.** Is continuity present from connector J31 pin 5 to ground?

- **NO**
  - Repair wire 3015 from connector J31 pin 5 to terminal board TB2 position 18 on power distribution panel (PDP) (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Repair wire 3015 from connector P31 socket 5 to terminal lug TL29 (para 2-45) or replace engine control cable assembly (para 7-80).
CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Remove instrument panel assembly for access (para 7-15).
(3) Disconnect connector J 31 from connector P31.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector J 31 pin 5.
(6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(7) If continuity is not present, repair wire 3015 from connector J 31 pin 5 to terminal board TB2 position 18 on power distribution panel (PDP) (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If continuity is present, repair wire 3015 from connector P31 socket 5 to terminal lug TL29 (para 2-45) or replace engine control cable assembly (para 7-80).
(9) Connect connector J 31 to connector P31.
(10) Install instrument panel assembly (para 7-15).
(11) Connect batteries (para 7-57).
e6. ENGINE CRANKS BUT DOES NOT START (CONT)

**KNOWN INFO**
- Fuel quantity OK.
- Fuel/water separator primed.
- Air cleaner hose or tube OK.
- Start inhibit pushbutton switch OK.
- Relay K19 OK.

**POSSIBLE PROBLEMS**
- Faulty relay K19.
- Faulty dashboard cable assembly.
- Faulty engine control cable assembly.

---

**5.**

Is continuity present from relay K19 terminals 30 to 87A?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, relay K19 is faulty.

---

**6.**

Is 24 VDC present from relay K19 socket 30 on PDP?

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

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

---

**KNOWN INFO**
- Fuel quantity OK.
- Fuel/water separator primed.
- Air cleaner hose or tube OK.
- Start inhibit pushbutton switch OK.
- Relay K19 OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty engine control cable assembly.

---

**YES**

- Replace relay K19 (para 7-9).

**NO**

- Go to step 8 of this fault.
**CONTINUITY TEST**

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to relay K19 terminal 87a.
3. Connect negative (-) probe of multimeter to relay K19 terminal 30 and note reading on multimeter.
4. If continuity is not present, replace relay K19 (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 circuits and cause severe burns or electrical shock.

**VOLTAGE TEST**

1. Set multimeter to volts DC.
2. Connect positive (+) of multimeter to relay K19 socket 30 on PDP.
3. Connect negative (-) probe of multimeter to ground.
4. Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
5. If 24 VDC is not present, go to step 8 of this fault.
### KNOWN INFO
- Fuel quantity OK.
- Fuel/water separator primed.
- Air cleaner hose or tube OK.
- Start inhibit pushbutton switch OK.
- Relay K19 OK.

### POSSIBLE PROBLEMS
- Faulty dashboard cable assembly.
- Faulty engine control cable assembly.

---

#### TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

#### REASON FOR QUESTION
- If continuity is not present, wire 54 from relay K19 socket 87A on PDP to connector J31 pin 14 is faulty. If continuity is present, wire 54 from connector P31 socket 14 to terminal lug TL28 is faulty.

---

#### CAUTION
Read CAUTION on following page.

#### 7.
Is continuity present from relay K19 socket 87A to connector J31 pin 14?

---

**NO**
- Repair wire 54 from relay K19 socket 87A on PDP to connector J31 pin 14 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

---

**YES**
- Repair wire 54 from connector P31 socket 14 to terminal lug TL28 (para 2-45) or replace engine control cable assembly (para 7-80).
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

**CONTINUITY TEST**

(1) Disconnect batteries (para 7-57).
(2) Remove instrument panel for access (para 7-15).
(3) Disconnect connector J31 from connector P31.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to relay K19 socket 87A on PDP.
(6) Connect negative (-) probe of multimeter to connector J31 pin 14 and note reading on multimeter.
(7) If continuity is not present, repair wire 54 from connector J31 pin 14 to relay K19 socket 87A on PDP (para 2-45) or replace WTEC II dashboard cable assembly (7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If continuity is present, repair wire 54 from connector P31 socket 14 to terminal lug TL 28 (para 2-45) or replace engine control cable assembly (para 7-80).
(9) Connect connector J31 to connector P31.
(10) Install instrument panel (para 7-15).
(11) Install relay K19 in PDP.
(12) Install PDP cover (para 16-2).
(13) Connect batteries (para 7-57).
e6. ENGINE CRANKS BUT DOES NOT START (CONT)

**KNOWN INFO**
- Fuel quantity OK.
- Fuel/water separator primed.
- Air cleaner hose or tube OK.
- Start inhibit pushbutton switch OK.
- Relay K19 OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty engine control cable assembly.

**WARNING**
Read WARNING on following page.

8. Is 24 VDC present at terminal board TB1 position 59?

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 24 VDC is not present, wire 1690 is faulty. If 24 VDC is present, wire 1462 is faulty.

**YES**
- Repair wire 1690 from terminal board TB1 position 61 on PDP to circuit breaker CB79 socket 5 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
- Repair wire 1462 from terminal board TB1 position 59 on PDP to relay K19 socket 87A on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
WARNING

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

VOLTAGE TEST

(1) Install relay K19 in PDP.
(2) Remove three screws and washers from PDP.
(3) Remove three screws from PDP.
(4) Set multimeter to volts DC.
(5) Connect positive (+) probe of multimeter to terminal board TB1 position 59 on PDP.
(6) Connect negative (-) probe of multimeter to ground.
(7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 VDC is not present, repair wire 1690 from terminal board TB1 position 61 on PDP to circuit breaker CB79 socket 5 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) If 24 VDC is present, repair wire 1462 from terminal board TB1 position 59 on PDP to relay K19 socket 87A on PDP (para 2-45) 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 washers and screws.
(11) Install three screws in PDP.
(12) Install PDP cover (para 16-2).
**Initial Setup**

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<th><strong>Tools and Special Tools</strong></th>
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<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
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<td><strong>Personnel Required</strong></td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
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<td>(2)</td>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
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<tr>
<td>TM 9-4910-571-12&amp;P</td>
<td>Wire, Elect, 50 ft (Item 71, Appendix D)</td>
</tr>
</tbody>
</table>

### Known Info
- Lighted indicator display OK. FUEL gage illuminates.

### Possible Problems
- Faulty dashboard cable assembly.
- Faulty FUEL gage.
- Faulty start and charging cable assembly.
- Faulty fuel level sensor.

#### Warning

**1. Is 24 VDC present on connector PX9 pin 3?**

**Test Options**
- Voltage Test or STE/ICE-R Test #89

**Reason for Question**
- If 24 VDC is not present, wire 1546 is faulty.

**START**

- **YES**
  - Repair wire 1546 from connector PX9 to terminal block TB1 position 61 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**
**WARNING**
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

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

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

### VOLTAGE TEST

1. Remove 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 a known good ground.
7. Position master power switch to on (TM 9-2320-366-10-1) and note reading on digital multimeter.
8. If 24 vdc is not present, repair wire 1546 from connector PX9 pin 3 to terminal board TB1 position 61 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**e7. FUEL GAGE DOES NOT OPERATE OR IS INACCURATE**

**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 or STE/ICE-R Test #91

**REASON FOR QUESTION**
If greater than 30 ohms is present, FUEL gage is faulty.

---

2. **CAUTION**
Read CAUTION on following page.

Is less than 30 ohms present from connector PX9 pin 4 to a known good ground?

**NO**

**YES**

Replace FUEL gage (para 7-14).

---

3. **CAUTION**
Read CAUTION on following page.

Is continuity present from connector PX9 pin 4 to connector P82 pin 1?

**NO**

**YES**

If continuity is not present, wire 28 is faulty.

Go to step 5 of this fault.

---

**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.
**CAUTION**

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

**NOTE**

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

---

### RESISTANCE TEST

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>(1)</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2)</td>
<td>Connect positive (+) probe of multimeter to connector PX9 pin 4.</td>
</tr>
<tr>
<td>(3)</td>
<td>Connect negative (-) probe of multimeter to a known good ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(4)</td>
<td>If greater than 30 ohms is present, replace FUEL gage (para 7-14).</td>
</tr>
</tbody>
</table>

---

### CONTINUITY TEST

<p>| | |</p>
<table>
<thead>
<tr>
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<th></th>
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<tbody>
<tr>
<td>(1)</td>
<td>Disconnect connector clamp from fuel level sensor.</td>
</tr>
<tr>
<td>(2)</td>
<td>Disconnect connector P82 from fuel level sensor.</td>
</tr>
<tr>
<td>(3)</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4)</td>
<td>Connect positive (+) probe of multimeter to connector PX9 pin 4.</td>
</tr>
<tr>
<td>(5)</td>
<td>Connect negative (-) probe of multimeter to connector P82 pin 1 and note reading on multimeter.</td>
</tr>
<tr>
<td>(6)</td>
<td>If continuity is not present, go to step 5 of this fault.</td>
</tr>
</tbody>
</table>
e7. FUEL GAGE DOES NOT OPERATE OR IS INACCURATE

- **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.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3001 is faulty. If continuity is present, fuel level sensor is faulty.

**4.**
Is continuity present from connector P82 pin 2 to a known good ground?

**CAUTION**
Read CAUTION on following page.

- **YES**
  - Repair wire 3001 from connector P82 pin 2 to terminal lug TL83 (para 2-45) or replace start and charging cable assembly (para 7-132).
  - Replace fuel level sensor (para 4-8).

- **NO**
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Connect connector PX9 to fuel gage connector.</td>
</tr>
<tr>
<td>(2) Connect connector clamp on fuel gage connector.</td>
</tr>
<tr>
<td>(3) Install instrument panel assembly (para 7-15).</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to connector P82 socket 2.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to a known good ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If continuity is not present, repair wire 3001 from connector P82 socket 2 to terminal lug TL83 (para 2-45) or replace start and charging cable assembly (para 7-132).</td>
</tr>
<tr>
<td>(8) If continuity is present, replace fuel level sensor (para 4-8).</td>
</tr>
<tr>
<td>(9) Connect connector P82 to fuel level sensor.</td>
</tr>
<tr>
<td>(10) Connect connector clamp on fuel level sensor.</td>
</tr>
</tbody>
</table>
e7. FUEL GAGE DOES NOT OPERATE OR IS INACCURATE

**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.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #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.

---

**FLOWCHART:**

**S.**

Is continuity present from connector J 43 socket 3 to connector PX9 pin 4?

- **NO**
  - Repair wire 28 from connector J 43 socket 3 to connector PX9 pin 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Repair wire 28 from connector P43 pin 3 to connector P82 pin 1 (para 2-45) or replace start and charging cable assembly (para 7-132).
<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Connect connector P82 to fuel level sensor.</td>
</tr>
<tr>
<td>(2) Connect connector clamp on fuel level sensor.</td>
</tr>
<tr>
<td>(3) Disconnect connector J43 from connector P43.</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to connector J43 socket 3.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to PX9 pin 4 and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If continuity is not present, repair wire 28 from connector PX9 pin 4 to connector J43 socket 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(8) If continuity is present, repair wire 28 from connector P43 pin 3 to connector P82 pin 1 (para 2-45) or replace start and charging cable assembly (para 7-132).</td>
</tr>
<tr>
<td>(9) Connect connector J43 to connector P43.</td>
</tr>
<tr>
<td>(10) Connect connector PX9 to fuel gage connector.</td>
</tr>
<tr>
<td>(11) Connect connector clamp on fuel gage connector.</td>
</tr>
<tr>
<td>(12) Install instrument panel assembly (para 7-15).</td>
</tr>
</tbody>
</table>

**CAUTION**

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

**NOTE**

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

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
**e8. WATER TEMP GAGE DOES NOT OPERATE OR IS INACCURATE**

**INITIAL SETUP**

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

**Personnel Required**
(2)

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

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

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

---

**KNOWN INFO**

Lighted indicator display OK. WATER TEMP gage illuminates.

**POSSIBLE PROBLEMS**

Faulty dashboard cable assembly.
Faulty WATER TEMP gage.
Faulty engine control cable assembly.
Faulty WATER TEMP gage sensor.

---

**TEST OPTIONS**

Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 24 vdc is not present, wire 1546 is faulty.

**START**

1. Is 24 vdc present on connector PX11 pin 3?

**CAUTION**

Read WARNING and CAUTION on following page.

**NO**

Repair wire 1546 from connector PX11 pin 3 to terminal board TB1 position 61 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**YES**
WARNING

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

CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(2) Disconnect connector clamp from WATER TEMP gage connector.</td>
</tr>
<tr>
<td>(3) Disconnect connector PX11 from WATER TEMP gage connector.</td>
</tr>
<tr>
<td>(4) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to connector PX11 pin 3.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(8) If 24 vdc is not present, repair wire 1546 from connector PX11 pin 3 to terminal board TB1 position 61 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(9) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
2. Is less than 750 ohms present from connector PX11 pin 4 to a known good ground?

- **YES** Replace WATER TEMP gage (para 7-14)
- **NO** CAUTION: Read CAUTION on following page.

**TEST OPTIONS**
- Resistance Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If less than 750 ohms resistance is present, WATER TEMP gage is faulty.

**KNOWN INFO**
- Lighted indicator display OK, WATER TEMP gage illuminates.

**POSSIBLE PROBLEMS**
- Faulty WATER TEMP gage.
- Faulty dashboard cable assembly.
- Faulty engine control cable assembly.
- Faulty WATER TEMP gage sensor.
RESISTANCE TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to connector PX11 pin 4.
3. Connect negative (-) probe of multimeter to a known good 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 TEMP gage (para 7-14).

CAUTION

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

NOTE

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

NOTE

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

CAUTION

TM 9-2320-366-20-1
Change 1          2-326.1
3. **CAUTION**
Read CAUTION on following page.

Is continuity present from connector PX11 pin 4 to connector P41?

- **YES**
  - Go to step 4 of this fault.
  - Replace WATER TEMP gage sensor (para 7-45).

- **NO**
  - If continuity is present, WATER TEMP gage sensor is faulty.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is present, WATER TEMP gage sensor is faulty.
NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back or not capable of making good contact.

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

CONTINUITY TEST
(1) Raise cab (TM 9-2320-366-10-1).
(2) Disconnect connector clamp from WATER TEMP gage sensor connector, if equipped.
(3) Disconnect connector P41 from WATER TEMP gage sensor connector.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector PX11 pin 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 WATER TEMP gage sensor (para 7-45).
(9) Connect connector P41 to WATER TEMP gage sensor connector.
(10) Connect connector clamp to WATER TEMP gage sensor connector, if equipped.
(11) Lower cab (TM 9-2320-366-10-1).
e8. WATER TEMP GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

KNOWN INFO
Lighted indicator display OK.
WATER TEMP gage illuminates.
WATER TEMP gage OK.
WATER TEMP gage sensor OK.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty engine control cable assembly.

TEST OPTIONS
4. Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, wire 33 in dashboard cable assembly is faulty. If continuity is present, wire 33 in engine control cable assembly is faulty.

CAUTION
Read CAUTION on following page.

Is continuity present from connector PX11 pin 4 to connector J31 pin 20?

NO

YES

Repair wire 33 from connector PX11 pin 4 to connector J31 pin 20 (para 2-45). or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Repair wire 33 from connector P31 socket 20 to connector P41 (para 2-45) or replace engine control cable assembly (para 7-80).
CONTINUITY TEST

(1) Disconnect connector J31 from connector P31.

(2) Set multimeter to ohms.

(3) Connect positive (+) probe of multimeter to connector PX11 pin 4.

(4) Connect negative (-) probe of multimeter to connector J31 pin 20 and note reading on multimeter.

(5) If continuity is not present, repair wire 33 from connector PX11 pin 4 to connector J31 pin 20 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

(6) If continuity is present, repair wire 33 from connector P31 socket 20 to connector P41 (para 2-45) or replace engine control cable assembly (para 7-80).

(7) Connect connector J31 to connector P31.

(8) Connect connector PX11 to WATER TEMP gage connector.

(9) Connect connector clamp on WATER TEMP gage connector.

(10) Install instrument panel assembly (para 7-15).
**e9. REAR BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE**

### INITIAL SETUP

**Equipment Condition**
- Engine shut down (TM 9-2320-366-10-1).
- Air tanks drained (TM 9-2320-366-10-1)

**Personnel Required**
- (2)

**Materials/Parts**
- Nut, Self-Locking (Item 167, Appendix G)
- Antiseize Compound (Item 13, Appendix D)
- Ties, Cable, Plastic (Item 69, Appendix D)

### Tools and Special Tools
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-300 lb-in. (Item 59.1, Appendix C)

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

---

**KNOWLEDGE INFO**

FRONT BRAKE AIR pressure gage OK.

**POSSIBLE PROBLEMS**
- Faulty rear brake air pressure transmitter.
- Faulty REAR BRAKE AIR pressure gage.
- Faulty dashboard cable assembly.

---

**START**

1. Does REAR BRAKE AIR pressure gage operate?

   **NO**

   **YES**

   Go to step 4 of this fault.

---

**TEST OPTIONS**

- Operational Test

**REASON FOR QUESTION**

This question eliminates possible problems and determines where troubleshooting continues.
OPERATIONAL TEST

(1) Start engine (TM 9-2320-366-10-1).
(2) Allow vehicle to build air pressure.
(3) Note reading on REAR BRAKE AIR pressure gage.
(4) If REAR BRAKE AIR pressure gage reads 0 PSI, go to step 4 of this fault.
(5) Shut down engine (TM 9-2320-366-10-1).
e9. REAR BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

<table>
<thead>
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</thead>
<tbody>
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<td>FRONT BRAKE AIR pressure gage OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
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<tbody>
<tr>
<td>Faulty rear brake air pressure transmitter.</td>
</tr>
<tr>
<td>Faulty REAR BRAKE AIR pressure gage.</td>
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</tbody>
</table>

<table>
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<tr>
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</table>

<table>
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<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If mounting surfaces are not free of corrosion or fittings and hardware are not tight the pressure transmitter will give a faulty reading.</td>
</tr>
</tbody>
</table>

2. Is mounting surface between air pressure transmitters mounting bracket and dashboard free from corrosion and are all fittings and hardware tight?

- **NO**
  - Clean mounting surfaces of dashboard and air pressure transmitters mounting bracket, if needed. Tighten rear air brake pressure transmitter, all fittings, and hardware to ensure a good ground.

- **YES**
OPERATIONAL TEST

(1) Remove instrument panel assembly for access (para 7-15).

NOTE
Note orientation of brackets on dashboard prior to removing.

(2) Remove self-locking nut, air pressure transmitters mounting bracket, screw and bracket from dashboard. Discard self-locking nut.

(3) Inspect dashboard and air pressure transmitters mounting bracket mounting surfaces for corrosion.

(4) If mounting surfaces between air pressure transmitters mounting bracket and dashboard are not free of corrosion or all fittings and hardware are not tight, clean mounting surfaces if needed. Tighten rear brake air pressure transmitter, all fittings, and hardware to ensure a good ground.

(5) Position bracket, screw, air pressure transmitters mounting bracket, and self-locking nut on dashboard.

(6) Tighten self-locking nut to 168-192 lb-in. (19-21 N.m).

(7) Install instrument panel assembly (para 7-15).
e9. REAR BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

**KNOWN INFO**
- FRONT BRAKE AIR pressure gage OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty REAR BRAKE AIR pressure gage.
- Faulty rear brake air pressure transmitter.

**3.**
Does REAR BRAKE AIR pressure gage operate normally with a known good rear brake air pressure transmitter?

**TEST OPTIONS**
- Operational Test

**REASON FOR QUESTION**
- If REAR BRAKE AIR pressure gage does not operate, REAR BRAKE AIR pressure gage is faulty. If REAR BRAKE AIR pressure gage does operate, rear brake air pressure transmitter is faulty.

**YES**
- Replace REAR BRAKE AIR pressure gage (para 7-14).

**NO**
- Replace rear brake air pressure transmitter (para 7-44).
CONTINUITY TEST

1. Replace rear brake air pressure transmitter (para 7-44).
3. Observe REAR BRAKE AIR pressure gage and allow vehicle to build air pressure.
4. If REAR BRAKE AIR pressure gage does not operate normally, replace REAR BRAKE AIR pressure gage (para 7-14).
5. If REAR BRAKE AIR pressure gage does operate normally, replace rear brake air pressure transmitter (para 7-44).
e9. REAR BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

4. Is 24 VDC present at connector PX5 pin 3?

<table>
<thead>
<tr>
<th>WARNING</th>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read WARNING and CAUTION on following page.</td>
<td></td>
</tr>
</tbody>
</table>

| TEST OPTIONS |
| Voltage Test or STE/ICE-R Test #89 |

| REASON FOR QUESTION |
| If 24 VDC is not present, wire 1546 is faulty. |

- **Known Info**
  - FRONT BRAKE AIR pressure gage OK.

- **Possible Problems**
  - Faulty rear brake air pressure transmitter.
  - Faulty REAR BRAKE AIR pressure gage.
  - Faulty dashboard cable assembly.

- **Test Options**
  - Voltage Test or STE/ICE-R Test #89

- **Reason for Question**
  - If 24 VDC is not present, wire 1546 is faulty.

- **Flowchart**
  - If NO:
    - Repair wire 1546 from connector PX5 pin 3 to connector PX4 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - If YES:
    - Continue with further steps.
### WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

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

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

### VOLTAGE TEST
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove instrument panel for access (para 7-15).</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector clamp from REAR BRAKE AIR pressure gage connector.</td>
</tr>
<tr>
<td>3</td>
<td>Disconnect connector PX5 from REAR BRAKE AIR pressure gage connector.</td>
</tr>
<tr>
<td>4</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>5</td>
<td>Connect positive (+) probe of multimeter to connector PX5 pin 3.</td>
</tr>
<tr>
<td>6</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>7</td>
<td>Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>8</td>
<td>If 24 VDC is not present, repair wire 1546 from connector PX5 pin 3 to connector PX4 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>9</td>
<td>Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e9. REAR BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

5. If continuity is not present, wire 1792 is faulty.

6. Is continuity present from rear brake air pressure transmitter housing to ground?

   Known Info
   Front brake air pressure gage OK.
   Dashboard cable assembly OK.

   Possible Problems
   Faulty REAR BRAKE AIR pressure gage.
   Faulty rear brake air pressure transmitter.

   Test Options
   Continuity Test or STE/ICE-R Test #91

   Reason for Question
   If continuity is not present, ground is faulty.

   Yes

   Tighten rear brake air pressure transmitter and fittings to ensure a good ground.

   No

   Replace wire 1792 from connector PX5 pin 4 to terminal lug TL151 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   Known Info
   Front brake air pressure gage OK.
   Dashboard cable assembly OK.

   Possible Problems
   Faulty REAR BRAKE AIR pressure gage.
   Faulty rear brake air pressure transmitter.
**CAUTION**

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

**NOTE**

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

## CONTINUITY TEST

Remove plastic cable ties as required.

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to connector PX5 pin 4.
3. Connect negative (-) probe of multimeter to terminal lug TL151 and note reading on multimeter.
4. If continuity is not present, replace wire 1792 from connector PX5 pin 4 to terminal lug TL151 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

## CONTINUITY TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to rear air brake pressure transmitter housing.
3. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
4. If continuity is not present, tighten rear brake air pressure transmitter and fittings to ensure a good ground.
5. Connect connector PX5 to REAR BRAKE AIR pressure gage connector.
6. Connect connector clamp to REAR BRAKE AIR pressure gage connector.

**NOTE**

Install plastic cable ties as required.

7. Install instrument panel assembly (para 7-15).
e9. REAR BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRONT BRAKE AIR pressure gage OK. Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty REAR BRAKE AIR pressure gage. Faulty rear brake air pressure transmitter.</td>
</tr>
</tbody>
</table>

7. Does REAR BRAKE AIR pressure gage operate with a known good rear air brake pressure transmitter?

**TEST OPTIONS**
Operational Test

**REASON FOR QUESTION**
If REAR BRAKE AIR pressure gage does not operate, REAR BRAKE AIR pressure gage is faulty. If REAR BRAKE AIR pressure gage does operate, rear brake air pressure transmitter is faulty.

**YES**
Replace REAR BRAKE AIR pressure gage (para 7-14).

**NO**
Replace rear brake air pressure transmitter (para 7-44).
CONTINUITY TEST

(1) Replace rear brake air pressure transmitter (para 7-44).
(2) Start engine (TM 9-2320-366-10-1).
(3) Allow vehicle to build air pressure.
(4) Note reading on REAR BRAKE AIR pressure gage.
(5) If REAR BRAKE AIR pressure gage does not operate, replace REAR BRAKE AIR pressure gage (para 7-14).
(6) If REAR BRAKE AIR pressure gage does operate, replace rear brake air pressure transmitter (para 7-44).
(7) Shut down engine (TM 9-2320-366-10-1).
e10. FRONT BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE

INITIAL SETUP

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

Personnel Required
(2)

Materials/Parts
Nut, Self-Locking (Item 167, Appendix G)
Antiseize Compound (Item 13, Appendix D)
Ties, Cable, Plastic (Item 69, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-300 lb-in. (Item 59.1, Appendix C)

References
TM 9-4910-571-12&P

KNOWN INFO

FUEL gage OK.

POSSIBLE PROBLEMS

Faulty front brake air pressure transmitter.
Faulty FRONT BRAKE AIR pressure gage.
Faulty dashboard cable assembly.

TEST OPTIONS

Operational Test

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

START

1. Does FRONT BRAKE AIR pressure gage operate?

NO

YES

Go to step 4 of this fault.
OPERATIONAL TEST

(1) Start engine (TM 9-2320-366-10-1).
(2) Allow vehicle to build air pressure.
(3) Note reading on FRONT BRAKE AIR pressure gage.
(4) If FRONT BRAKE AIR pressure gage reads 0 PSI, go to step 4 of this fault.
(5) Shut down engine (TM 9-2320-366-10-1).
**Known Info**

- **Fuel Gage OK.**

**Possible Problems**

- Faulty front brake air pressure transmitter.
- Faulty FRONT BRAKE AIR pressure gage.

**Test Options**

- **Visual Inspection**

**Reason for Question**

If mounting surfaces are not free of corrosion or fittings and hardware are not tight, the pressure transmitter will give a faulty reading.

**Diagram**

1. **Known Info**
   - Fuel gage OK.

2. **Possible Problems**
   - Faulty front brake air pressure transmitter.
   - Faulty FRONT BRAKE AIR pressure gage.

   - **Test Options**
     - Visual Inspection

   - **Reason for Question**
     - If mounting surfaces are not free of corrosion or fittings and hardware are not tight, the pressure transmitter will give a faulty reading.

   - **Diagram**
     - If mounting surfaces are not free of corrosion or fittings and hardware are not tight, the pressure transmitter will give a faulty reading.

   - **Diagram**
     - Clean mounting surfaces of dashboard and air pressure transmitters mounting bracket, if needed. Tighten front brake air pressure transmitter, all fittings, and hardware to ensure a good ground.
OPERATIONAL TEST

(1) Remove instrument panel assembly for access (para 7-15).

**NOTE**

Note orientation of brackets on dashboard prior to removing.

(2) Remove self-locking nut, air pressure transmitters mounting bracket, screw and bracket from dashboard. Discard self-locking nut.

(3) Inspect dashboard and air pressure transmitters mounting bracket mounting surfaces for corrosion.

(4) If mounting surfaces between air pressure transmitters mounting bracket and dashboard are not free of corrosion or all fittings and hardware are not tight, clean mounting surfaces if needed. Tighten front brake air pressure transmitter, all fittings, and hardware to ensure a good ground.

(5) Position bracket, screw, air pressure transmitters mounting bracket, and self-locking nut on dashboard.

(6) Tighten self-locking nut to 168-192 lb-in. (19-21 N.m).

(7) Install instrument panel assembly (para 7-15).
**e10. FRONT BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)**

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUEL gage OK. Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty FRONT BRAKE AIR pressure gage. Faulty front brake air pressure transmitter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational Test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If FRONT BRAKE AIR pressure gage does not operates, FRONT BRAKE AIR pressure gage is faulty. If FRONT BRAKE AIR pressure gage does operate, front brake air pressure transmitter is faulty.</td>
</tr>
</tbody>
</table>

---

3. Does FRONT BRAKE AIR pressure gage operate normally with a known good rear air pressure transmitter?

- **NO**
  - Replace front brake air pressure transmitter (para 7-44).

- **YES**
  - Replace FRONT BRAKE AIR pressure gage (para 7-14).
CONTINUITY TEST

(1) Replace front brake air pressure transmitter (para 7-44).
(2) Start engine (TM 9-2320-366-10-1).
(3) Observe FRONT BRAKE AIR pressure gage and allow vehicle to build air pressure.
(4) If FRONT BRAKE AIR pressure gage does not operate normally, replace FRONT BRAKE AIR pressure gage (para 7-14).
(5) If FRONT BRAKE AIR pressure gage does operate normally, replace front brake air pressure transmitter (para 7-44).
(6) Shut down engine (TM 9-2320-366-10-1).
e10. FRONT BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUEL gage OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty front brake air pressure transmitter.</td>
</tr>
<tr>
<td>Faulty FRONT BRAKE AIR pressure gage.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

4. Is 24 VDC present at connector PX4 pin 3?

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAUTION</td>
</tr>
<tr>
<td>Read WARNING and CAUTION on following page.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Test or STE/ICE-R Test #89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 24 VDC is not present, wire 1546 is faulty.</td>
</tr>
</tbody>
</table>

- **NO**
  - Repair wire 1546 from connector PX4 pin 3 to connector PX9 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).  
- **YES**
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

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

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

VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(1) Remove instrument panel for access (para 7-15).</td>
</tr>
<tr>
<td>2</td>
<td>(2) Disconnect connector clamp from FRONT BRAKE AIR pressure gage connector.</td>
</tr>
<tr>
<td>3</td>
<td>(3) Disconnect connector PX4 from FRONT BRAKE AIR pressure gage connector.</td>
</tr>
<tr>
<td>4</td>
<td>(4) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>5</td>
<td>(5) Connect positive (+) probe of multimeter to connector PX4 pin 3.</td>
</tr>
<tr>
<td>6</td>
<td>(6) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>7</td>
<td>(7) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>8</td>
<td>(8) If 24 VDC is not present, repair wire 1546 from connector PX4 pin 3 to connector PX9 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>9</td>
<td>(9) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
- Known Info
  - Fuel gauge OK.

- Possible Problems
  - Faulty front brake air pressure transmitter.
  - Faulty FRONT BRAKE AIR pressure gage.
  - Faulty dashboard cable assembly.

### Test Options
- Continuity Test or STE/ICE-R Test #91

### Reason for Question
- If continuity is not present, wire 1792 is faulty.

#### 5.
- Is continuity present from connector PX4 pin 4 to terminal lug TL150?
  - Yes
    - Replace wire 1792 from connector PX4 pin 4 to terminal lug TL150 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - No

#### 6.
- Is continuity present from front brake air pressure transmitter housing to ground?
  - Yes
    - Clean mounting surfaces of dashboard and air pressure transmitters mounting bracket, if needed. Tighten front brake air pressure transmitter, all fittings, and hardware to ensure a good ground.
  - No
CONTINUITY TEST

NOTE
Remove plastic cable ties as required.

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX4 pin 4.
(3) Connect negative (-) probe of multimeter to terminal lug TL150 and note reading on multimeter.
(4) If continuity is not present, replace wire 1792 from connector PX4 pin 4 to terminal lug TL150 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

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

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

NOTE
(10) Connect connector PX4 to FRONT BRAKE AIR pressure gage connector.
(11) Connect connector clamp to FRONT BRAKE AIR pressure gage.

NOTE
Install plastic cable ties as required.

(12) Install instrument panel assembly (para 7-15).

CONTINUITY TEST (Cont)

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to front brake air pressure transmitter housing.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, perform steps (5) through (12).
(6) Inspect dashboard and air pressure transmitters mounting bracket for corrosion.
(7) If mounting surface is corroded or fittings and hardware are not tight, clean mounting surface if needed. Tighten front brake air pressure transmitter, all fittings, and hardware to ensure a good ground.
(8) Position bracket, screw, air pressure transmitters mounting bracket, and self-locking nut on dashboard.
(9) Tighten self-locking nut to 168-192 lb-in. (19-21 N.m).
e10. FRONT BRAKE AIR PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUEL gage OK.</td>
<td>Operational Test</td>
<td>If FRONT BRAKE AIR pressure gage does not operate, FRONT</td>
</tr>
<tr>
<td>Dashboard cable</td>
<td></td>
<td>BRAKE AIR pressure gage is faulty. If REAR BRAKE AIR</td>
</tr>
<tr>
<td>assembly OK.</td>
<td></td>
<td>pressure gage does operate, front brake air pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>transmitter is faulty.</td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulty FRONT BRAKE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIR pressure gage.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulty rear brake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>air pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>transmitter.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Does FRONT BRAKE AIR pressure gage operate with a known good front brake air pressure transmitter?

- NO
  - Replace FRONT BRAKE AIR pressure gage (para 7-14).

- YES
  - Replace front brake air pressure transmitter (para 7-44).
CONTINUITY TEST

(1) Connect connector PX4 to FRONT BRAKE AIR pressure gage connector.
(2) Connect connector clamp to FRONT BRAKE AIR pressure gage.
(3) Install instrument panel assembly (para 7-15).
(4) Replace front brake air pressure transmitter (para 7-44).
(5) Start engine (TM 9-2320-366-10-1).
(6) Allow vehicle to build air pressure.
(7) Note reading on FRONT BRAKE AIR pressure gage.
(8) If FRONT BRAKE AIR pressure gage does not operate, replace FRONT BRAKE AIR pressure gage (para 7-14).
(9) If FRONT BRAKE AIR pressure gage does operate, replace front brake air pressure transmitter (para 7-44).
(10) Shut down engine (TM 9-2320-366-10-1).
### e11. ENGINE OIL PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE

#### INITIAL SETUP

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>(2)</td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
</tr>
</tbody>
</table>

#### Known Info

<table>
<thead>
<tr>
<th>VOLTS gage OK.</th>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine oil level OK.</td>
<td>Voltage Test or</td>
</tr>
<tr>
<td>ENGINE OIL PRESSURE</td>
<td>STE/ICE-R Test #89</td>
</tr>
<tr>
<td>indicator goes out after engine starts.</td>
<td>REASON FOR QUESTION</td>
</tr>
</tbody>
</table>

#### Possible Problems

| Faulty engine oil pressure transmitter. | If 24 VDC is not present, wire 1546 from connector PX6 pin 3 to connector PX10 pin 3 is faulty. |
| Faulty engine OIL PRESS gage. | |
| Faulty engine control cable assembly. | |
| Faulty WTEC II dashboard cable assembly. | |
| Faulty WTEC III dashboard cable assembly. | |

#### Test Options

1. Is 24 VDC present at connector PX6 pin 3?

   **YES**  
   Repair wire 1546 from connector PX6 pin 3 to connector PX10 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   **NO**

   Read WARNING and CAUTION on following page.

   Start
**WARNING**

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

**CAUTION**

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

**NOTE**

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

---

**VOLTAGE TEST**

1. Remove instrument panel assembly for access (para 7-15).
2. Disconnect connector clamp from engine OIL PRESS gage connector.
3. Disconnect connector PX6 from engine OIL PRESS gage connector.
4. Set multimeter to volts DC.
5. Connect positive (+) probe of multimeter to connector PX6 pin 3.
6. Connect negative (-) probe of multimeter to known good ground.
7. Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
8. If 24 VDC is not present, repair wire 1546 from connector PX6 pin 3 to connector PX10 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e11. ENGINE OIL PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

2. Is 202-243 ohms resistance present from connector PX6 pin 4 to a known good ground?

   NO
   
   YES
   
   Go to step 4 of this fault.

3. Is 90-130 ohms resistance present from connector PX6 pin 4 to a known good ground?

   NO
   
   YES
   
   Replace oil pressure transmitter (para 7-49).

   YES
   
   Replace OIL PRESS gage (para 7-14).

TEST OPTIONS

- Resistance Test or STE/ICE-R #91

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

KNOWLEDGE INFO

- VOLTS gage OK.
- Engine oil level OK.
- Engine oil pressure indicator goes out after engine starts.

POSSIBLE PROBLEMS

- Faulty engine oil pressure transmitter.
- Faulty engine OIL PRESS gage.
- Faulty engine control cable assembly.
- Faulty WTEC II dashboard cable assembly.
- Faulty WTEC III dashboard cable assembly.

KNOWLEDGE INFO

- VOLTS gage OK.
- Engine oil level OK.
- Engine oil pressure indicator goes out after engine starts.
- Engine control cable assembly OK.
- WTEC II dashboard cable assembly OK.
- WTEC III dashboard cable assembly OK.

POSSIBLE PROBLEMS

- Faulty engine oil pressure transmitter.
- Faulty engine OIL PRESS gage.
RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX6 pin 4.
(3) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(4) If 202-243 ohms resistance is not present, go to step 4 of this fault.

RESISTANCE TEST

(1) Start engine (TM 9-2320-366-10-1).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector PX6 pin 4.
(4) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(5) If 90-130 ohms resistance is not present, replace engine oil pressure transmitter (para 7-49).
(6) If 90-130 ohms resistance is present, replace engine OIL PRESS gage (para 7-14).
(7) Shut down engine (TM 9-2320-366-10-1).
(8) Connect connector PX6 to engine OIL PRESS gage connector.
(9) Connect connector clamp to engine OIL PRESS gage connector.
(10) Install instrument panel assembly (para 7-15).
e11. ENGINE OIL PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

4. Is 202-243 ohms resistance present from engine oil pressure transmitter connector pin 2 to a known good ground?

   TEST OPTIONS
   Resistance Test or STE/ICE-R #91
   
   REASON FOR QUESTION
   If 202-243 ohms resistance is not present, engine oil pressure transmitter is faulty.

   KNOWN INFO
   VOLTS gage OK.
   Engine oil level OK.
   Engine oil pressure indicator goes out after engine starts.

   POSSIBLE PROBLEMS
   Faulty engine oil pressure transmitter.
   Faulty engine control cable assembly.
   Faulty WTEC II dashboard cable assembly.
   Faulty WTEC III dashboard cable assembly.

   TEST OPTIONS
   Continuity Test or STE/ICE-R Test #91
   
   REASON FOR QUESTION
   If continuity is not present, wire 36 from connector J31 pin 11 to connector PX6 pin 4 is faulty.

   KNOWN INFO
   VOLTS gage OK.
   Engine oil level OK.
   Engine oil pressure indicator goes out after engine starts.
   Engine oil pressure transmitter OK.

   POSSIBLE PROBLEMS
   Faulty engine control cable assembly.
   Faulty WTEC II dashboard cable assembly.
   Faulty WTEC III dashboard cable assembly.

   KNOWN INFO
   VOLTS gage OK.
   Engine oil level OK.
   Engine oil pressure indicator goes out after engine starts.
   Engine oil pressure transmitter OK.

   POSSIBLE PROBLEMS
   Faulty engine control cable assembly.
   Faulty WTEC II dashboard cable assembly.
   Faulty WTEC III dashboard cable assembly.

   KNOWN INFO
   VOLTS gage OK.
   Engine oil level OK.
   Engine oil pressure indicator goes out after engine starts.
   Engine oil pressure transmitter OK.

   POSSIBLE PROBLEMS
   Faulty engine control cable assembly.
   Faulty WTEC II dashboard cable assembly.
   Faulty WTEC III dashboard cable assembly.

   KNOWN INFO
   VOLTS gage OK.
   Engine oil level OK.
   Engine oil pressure indicator goes out after engine starts.
   Engine oil pressure transmitter OK.

   POSSIBLE PROBLEMS
   Faulty engine control cable assembly.
   Faulty WTEC II dashboard cable assembly.
   Faulty WTEC III dashboard cable assembly.

   KNOWN INFO
   VOLTS gage OK.
   Engine oil level OK.
   Engine oil pressure indicator goes out after engine starts.
   Engine oil pressure transmitter OK.

   POSSIBLE PROBLEMS
   Faulty engine control cable assembly.
   Faulty WTEC II dashboard cable assembly.
   Faulty WTEC III dashboard cable assembly.

   KNOWN INFO
   VOLTS gage OK.
   Engine oil level OK.
   Engine oil pressure indicator goes out after engine starts.
   Engine oil pressure transmitter OK.

   POSSIBLE PROBLEMS
   Faulty engine control cable assembly.
   Faulty WTEC II dashboard cable assembly.
   Faulty WTEC III dashboard cable assembly.
CONTINUITY TEST

(1) Raise cab (TM 9-2320-366-10-1).
(2) Set multimeter to ohms.
(3) Disconnect connector P32 from engine oil pressure transmitter connector.
(4) Connect positive (+) probe of multimeter to engine oil pressure transmitter pin 2.
(5) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(6) If 202-243 ohms resistance is not present, replace engine oil pressure transmitter (para 7-49).

NOTE
Perform steps (7) through (9) if 202-243 ohms resistance is not present.

(7) Connect connector PX6 to engine OIL PRESS gage connector.
(8) Connect connector clamp to engine OIL PRESS gage connector.
(9) Install instrument panel assembly (para 7-15).

RESISTANCE TEST

(1) Connect connector P32 to engine oil pressure transmitter connector.
(2) Lower cab (TM 9-2320-366-10-1).
(3) Disconnect connector J31 from connector P31.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector PX6 pin 4.
(6) Connect negative (-) probe of multimeter to connector J31 pin 11 and note reading on multimeter.
(7) If continuity is not present, repair wire 36 from connector PX6 pin 4 to connector J31 pin 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e11. ENGINE OIL PRESSURE GAGE DOES NOT OPERATE OR IS INACCURATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLTS gage OK.</td>
</tr>
<tr>
<td>Engine oil level OK.</td>
</tr>
<tr>
<td>Engine oil pressure indicator goes out after engine starts.</td>
</tr>
<tr>
<td>Engine oil pressure transmitter OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty engine control cable assembly.</td>
</tr>
<tr>
<td>Faulty WTEC II dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty WTEC III dashboard cable assembly.</td>
</tr>
</tbody>
</table>

6. Is continuity present from connector PX6 pin 4 to a known good ground?

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, wire 36 from connector P31 socket 11 to connector P32 socket 2 is faulty. If continuity is present, wire 36 from connector J31 pin 11 to connector PX6 pin 4 is faulty.</td>
</tr>
</tbody>
</table>

**NO**

**YES**

Repair wire 36 from connector P31 socket 11 to connector P32 socket 2 (para 2-45) or engine control cable assembly (para 7-80).

Repair wire 36 from connector J31 pin 11 to connector PX6 pin 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX6 pin 4.
(3) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(4) If continuity is not present, repair wire 36 from connector P31 socket 11 to connector P32 socket 2 (para 2-45) or engine control cable assembly (para 7-80).
(5) If continuity is present, repair wire 36 from connector J31 pin 11 to connector PX6 pin 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Connect connector J31 to connector P31.
(7) Connect connector PX6 to engine OIL PRESS gage connector.
(8) Connect connector clamp to engine OIL PRESS gage connector.
(9) Install instrument panel assembly (para 7-15).
e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE

INITIAL SETUP

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

Materials/Parts
Nut, Self-Locking (2) (Item 133, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

Personnel Required
(2)

References
TM 9-4910-571-12&P

START

1. Is main code 13, 22 or 25 active in pushbutton shift selector?

NO

Perform transmission troubleshooting f19 or f37 for main code 13, transmission troubleshooting f2, f3, f4, f22, f23, or f24 for main code 22, or transmission troubleshooting f14 or f32 for main code 25.

YES

Go to step 2 of this fault.

KNOWLEDGE INFORMATION

Water temperature gage operates correctly.

POSSIBLE PROBLEMS

Main code 13, 22, or 25 active in pushbutton shift selector.
Faulty dashboard cable assembly.
Faulty WTEC II VIM.
Faulty WTEC II cab transmission harness.
Faulty Central Tire Inflation System (CTIS) cable assembly.
Faulty CTIS ECU.
Faulty speedometer.

TEST OPTIONS

Transmission Diagnostic Code Check

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.
(1) Check for active transmission diagnostic codes (para 8-4 or 8-5).
(2) If main code 13 is active in pushbutton shift selector, perform transmission troubleshooting f19 or f37.
(3) If main code 22 is active in pushbutton shift selector, perform transmission troubleshooting f2, f3, f4, f22, f23, or f24.
(4) If main code 25 is active in pushbutton shift selector, perform transmission troubleshooting f14 or f32.
e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Temperature gage operates correctly. Main code 13, 22, or 25 not active in pushbutton shift selector.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty WTEC II VIM.</td>
</tr>
<tr>
<td>Faulty WTEC II cab transmission harness.</td>
</tr>
<tr>
<td>Faulty CTIS cable assembly.</td>
</tr>
<tr>
<td>Faulty CTIS ECU.</td>
</tr>
<tr>
<td>Faulty speedometer.</td>
</tr>
</tbody>
</table>

2. **TEST OPTIONS**

<table>
<thead>
<tr>
<th>Voltage Test or STE/ICE-R Test #89</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is 24 VDC present at connector PX8 pin 3?</td>
</tr>
</tbody>
</table>

If 24 VDC is not present, wire 1546 is faulty.

- **YES**
  - Repair wire 1546 from connector PX11 pin 3 to connector PX8 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

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

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

## 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 pin 3. |
| (6) Connect negative (-) probe of multimeter to ground. |
| (7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter. |
| (8) If 24 VDC is not present, repair wire 1546 from connector PX11 pin 3 to connector PX8 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11). |
| (9) Position master power switch to off (TM 9-2320-366-10-1). |
e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

**KNOWN INFO**
Water temperature gage operates correctly.
Main code 13, 22, or 25 not active in pushbutton shift selector.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.
Faulty WTEC II VIM.
Faulty WTEC II cab transmission harness.
Faulty CTIS cable assembly.
Faulty CTIS ECU.
Faulty speedometer.

**TEST OPTIONS**
Visual Check

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

3. **Does VOLTS gage operate correctly?**

   **NO**
   Repair wire 3020 from connector PX8 pin 1 to connector PX10 pin 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   **YES**

4. **Is vehicle equipped with WTEC II transmission controls?**

   **NO**

   **YES**
   Go to step 12 of this fault.
(1) Position master power switch to on (TM 9-2320-366-10-1).
(2) Observe if VOLTS gage indicator needle moves (TM 9-2320-366-10-1).
(3) If VOLTS gage indicator needle does not move, repair wire 3020 from connector PX8 pin 1 to connector PX10 pin 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(4) Position master power switch to off (TM 9-2320-366-10-1).

(1) Check if vehicle is equipped with WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS).
(2) If pushbutton shift selector is not mounted with four screws and is not equipped with a filter cover, go to step 12 of this fault.
e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

**KNOWN INFO**

| Water temperature gage operates correctly. |
| Main code 13, 22, or 25 not active in pushbutton shift selector. |
| VOLTS gage operates correctly. |
| Vehicle is equipped with WTEC II transmission controls. |

**POSSIBLE PROBLEMS**

Faulty WTEC II dashboard cable assembly.  
Faulty WTEC II VIM.  
Faulty WTEC II cab transmission harness.  
Faulty CTIS cable assembly.  
Faulty CTIS ECU.  
Faulty speedometer.

---

**TEST OPTIONS**

**REASON FOR QUESTION**

Continuity Test or STE/ICE-R Test #91

- **CAUTION**
  - Read CAUTION on following page.

**TEST OPTIONS**

- **CAUTION**
  - Read CAUTION on following page.

**TEST OPTIONS**

Continuity Test or STE/ICE-R Test #91

- **REASON FOR QUESTION**
  - If continuity is not present from connector PX33 socket H2 to connector PX8 pin 4, wire 1793 is faulty.

---

**5.** Is continuity present from connector PX33 socket H2 to connector PX8 pin 4?

**YES**

- Repair wire 1793 from connector PX33 socket H2 to connector PX8 pin 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).

**NO**

**6.** Is continuity absent from connector PX33 socket H2 to ground?

**YES**

- Repair wire 1793 from connector PX33 socket H2 to connector PX8 pin 4 or wire 1793 from connector J111 socket B to connector PX8 pin 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).

**NO**
**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 socket H2.
(6) Connect negative (-) probe of multimeter to connector PX8 pin 4 and note reading on multimeter.
(7) If continuity is not present, repair wire 1793 from connector PX33 socket H2 to connector PX8 pin 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).

---

**CONTINUITY TEST**

(1) Remove PDP cover (TM 9-2320-366-10-2).
(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 PX33 socket H2.
(8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(9) If continuity is present, remove plastic cable ties as required and perform visual inspection of wire 1793 from connector PX33 socket H2 to connector PX8 pin 4 and wire 1793 from connector PX8 pin 4 to connector J111 socket B to determine which wire is faulty. Repair wire 1793 para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(10) Connect connector PX33 to WTEC II VIM.
(11) Tighten screw in connector PX33.
(12) Install kick panel (para 16-3).
**e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)**

**KNOWN INFO**
- Water temperature gage operates correctly.
- Main code 13, 22, or 25 not active in pushbutton shift selector.
- VOLTS gage operates correctly.
- Vehicle is equipped with WTEC II transmission controls.
- WTEC II dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty WTEC II VIM.
- Faulty WTEC II cab transmission harness.
- Faulty CTIS cable assembly.
- Faulty CTIS ECU.
- Faulty speedometer.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

7. Is continuity present from WTEC II VIM connector pin H2 to WTEC II VIM connector pin M2?

- **YES**
  - Replace WTEC II VIM (para 8-6).

- **NO**
  - If continuity is not present, WTEC II VIM is faulty.

8. Is continuity present from connector J116 socket B2 to connector J115 socket 23 and continuity absent from connector J116 socket B2 to ground?

- **YES**
  - Replace WTEC II cab transmission harness (para 7-137).

- **NO**
  - CAUTION: Read CAUTION on following page.

**KNOWN INFO**
- Water temperature gage operates correctly.
- Main code 13, 22, or 25 not active in pushbutton shift selector.
- VOLTS gage operates correctly.
- Vehicle is equipped with WTEC II transmission controls.
- WTEC II dashboard cable assembly OK.
- WTEC II VIM OK.

**POSSIBLE PROBLEMS**
- Faulty WTEC II cab transmission harness.
- Faulty CTIS cable assembly.
- Faulty CTIS ECU.
- Faulty speedometer.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

- CAUTION: Read CAUTION on following page.

If continuity is not present from connector J116 socket B2 to connector J115 socket 23 or continuity is present from connector J116 socket B2 to ground, WTEC II cab transmission harness is faulty.
CAUTION

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

NOTE

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

CONTINUITY TEST

(1) Loosen screw in connector J 116.
(2) Disconnect connector J 116 from WTEC II VIM.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to WTEC II VIM connector pin H2.
(5) Connect negative (-) probe of multimeter to WTEC II VIM connector pin M2 and note reading on multimeter.
(6) If continuity is not present, replace WTEC II VIM (para 8-6).
(7) Connect connector PX33 to WTEC II VIM.
(8) Tighten screw in connector PX33.

CONTINUITY TEST

(1) Disconnect connector J 115 from WTEC II TEPSS.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector J 116 socket B2.
(4) Connect negative (-) probe of multimeter to connector J 115 socket 23 and note reading on multimeter.
(5) If continuity is not present, replace WTEC II cab transmission harness (par 7-137).
(6) Connect positive (+) probe of multimeter to connector J 116 socket B2.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If continuity is present, replace WTEC II cab transmission harness (para 7-137).
(9) Connect connector J 115 to WTEC II TEPSS.
(10) Connect connector J 116 to WTEC II VIM.
(11) Tighten screw in connector J 116.
e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

**KNOWN INFO**

| Water temperature gage operates correctly. Main code 13, 22, or 25 not active in pushbutton shift selector. VOLTS gage operates correctly. Vehicle is equipped with WTEC II transmission controls. WTEC II dashboard cable assembly OK. WTEC II VIM OK. WTEC II cab transmission harness OK. |

**POSSIBLE PROBLEMS**

| Faulty CTIS cable assembly. Faulty CTIS ECU. Faulty speedometer. |

**TEST OPTIONS**

Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is present from CTIS ECU connector pin U to ground, CTIS ECU is faulty.

**CAUTION**

Read CAUTION on following page.

9. Is continuity absent from connector P110 socket U to ground?

**YES**

Replace CTIS ECU (para 12-6).

**NO**

Repair wire 1793 from connector P110 socket U to connector P111 socket B (para 2-45) or replace CTIS cable assembly (para 7-60).

10. Is continuity absent from CTIS ECU connector pin U to ground?

**YES**

Replace CTIS ECU (para 12-6).

**NO**

If continuity is present from CTIS ECU connector pin U to ground, CTIS ECU is faulty.

---

CAUTION

Read CAUTION on following page.
CONTINUITY TEST
(1) Disconnect connector P110 from CTIS ECU.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to
   connector P110 socket U.
(4) Connect negative (-) probe of multimeter to
ground and note reading on multimeter.
(5) If continuity is present, repair wire 1793
   from connector P110 socket U to connector
   P111 socket B (para 2-45) or replace CTIS
cable assembly (para 7-60).

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

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

CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to
   CTIS ECU connector pin U.
(3) Connect negative (-) probe of multimeter to
ground and note reading on multimeter.
(4) If continuity is present, replace CTIS ECU
   (para 12-6).
(5) Connect connector P110 to CTIS ECU.
12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

**KNOWN INFO**
- Water temperature gage operates correctly.
- Main code 13, 22, or 25 not active in pushbutton shift selector.
- VOLTS gage operates correctly.
- Vehicle is equipped with WTEC II transmission controls.
- WTEC II dashboard cable assembly OK.
- WTEC II VIM OK.
- WTEC II cab transmission harness OK.
- CTIS cable assembly OK.
- CTIS ECU OK.

**POSSIBLE PROBLEMS**
- Faulty speedometer.

**TEST OPTIONS**
- Visual Inspection

**REASON FOR QUESTION**
If speedometer dip switch settings are correct and speedometer does not operate or is inaccurate, speedometer is faulty.

11. Are speedometer dip switch settings correct?

**YES**
- Correct speedometer dip switch settings (para 7-14).

**NO**
- Replace speedometer (para 7-14).
(1) Remove two protective caps, self-locking nuts, retaining ring, and speedometer from instrument panel assembly. Discard self-locking nuts.

(2) Note position of speedometer dip switches. Refer to Table 2-8.4. Speedometer Dip Switch Settings.

(3) If speedometer dip switch setting(s) are incorrect, correct speedometer dip switch setting(s) (para 7-14).

(4) If speedometer dip switch settings are correct, replace speedometer (para 7-14).

(5) Position speedometer in instrument panel assembly with retaining ring and two self-locking nuts.

(6) Tighten two self-locking nuts to 9 lb-in. (1 N·m).

(7) Install two protective caps on speedometer.

(8) Connect connector PX8 to speedometer connector.

(9) Connect connector clamp on speedometer connector.

(10) Install instrument panel assembly (para 7-10).

(11) Connect connector P111 to connector J111.

(12) Install PDP on dashboard with three washers and screws.

(13) Install three screws in PDP.

(14) Install PDP cover (TM 9-2320-366-10-2).

Table 2-8.4. Speedometer Dip Switch Settings

<table>
<thead>
<tr>
<th>Switch Number</th>
<th>Switch Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Up</td>
</tr>
<tr>
<td>2</td>
<td>Up</td>
</tr>
<tr>
<td>3</td>
<td>Down</td>
</tr>
<tr>
<td>4</td>
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</tr>
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<td>7</td>
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</tr>
<tr>
<td>8</td>
<td>Up</td>
</tr>
<tr>
<td>9</td>
<td>Down</td>
</tr>
<tr>
<td>10</td>
<td>Up</td>
</tr>
</tbody>
</table>
**e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)**

<table>
<thead>
<tr>
<th>Known Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water temperature gage operates correctly. Main code 13, 22, or 25 not active in pushbutton shift selector. VOLTS gage operates correctly. Vehicle is equipped with WTEC III transmission controls.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Possible Problems</th>
</tr>
</thead>
</table>

**Known Info**


**Possible Problems**


**Test Options**

Continuity Test or STE/ICE-R Test #91

**Reason For Question**

If continuity is not present from connector P116 socket 30 to connector PX8 pin 4, wire 157 is faulty.

**Test Options**

Continuity Test or STE/ICE-R Test #91

**Reason For Question**

If continuity is present, wire 157 from connector P116 socket 30 to connector PX8 pin 4 or wire 1793 from connector PX8 pin 4 to connector J111 socket B is faulty.

If continuity is absent from connector P116 socket 30 to connector PX8 pin 4, wire 157 is faulty.

**Test Options**

Continuity Test or STE/ICE-R Test #91

**Reason For Question**

If continuity is present, wire 157 from connector P116 socket 30 to connector PX8 pin 4 or wire 1793 from connector PX8 pin 4 to connector J111 socket B (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

### CONTINUITY TEST

1. Remove 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 socket 30.
6. Connect negative (-) probe of multimeter to connector PX8 pin 4 and note reading on multimeter.
7. If continuity is not present, repair wire 157 from connector P116 socket 30 to connector PX8 pin 4 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

### CONTINUITY TEST

1. Remove PDP cover (TM 9-2320-366-10-2).
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 P116 socket 30.
8. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
9. If continuity is present, remove plastic cable ties as required and perform visual inspection of wire 157 from connector P116 socket 30 to connector PX8 pin 4 and wire 1793 from connector PX8 pin 4 to connector J111 socket B to determine which wire is faulty. Repair wire 157 or 1793 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
10. Connect connector P116 to WTEC III transmission ECU.
12. Install kick panel (para 16-3).
**Known Info**

Water temperature gage operates correctly.
Main code 13, 22, or 25 not active in pushbutton shift selector.
VOLTS gage operates correctly.
Vehicle is equipped with WTEC III transmission controls.
WTEC III dashboard cable assembly OK.

**Possible Problems**

Faulty CTIS cable assembly.
Faulty CTIS ECU.
Faulty speedometer.

---

**Reason for Question**

If continuity is present from CTIS ECU connector pin U to ground, CTIS ECU is faulty.

**Test Options**

Continuity Test or STE/ICE-R Test #91

---

**Known Info**

Water temperature gage operates correctly.
Main code 13, 22, or 25 not active in pushbutton shift selector.
VOLTS gage operates correctly.
Vehicle is equipped with WTEC III transmission controls.
WTEC III dashboard cable assembly OK.
CTIS cable assembly OK.

**Possible Problems**

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

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

CONTINUITY TEST
(1) Disconnect connector P110 from CTIS ECU.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P110 socket U.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is present, repair wire 1793 from connector P110 socket U to connector P111 socket B (para 2-45) or replace CTIS cable assembly (para 7-60).

CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to CTIS ECU connector pin U.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is present, replace CTIS ECU (para 12-6).
(5) Connect connector P110 to CTIS ECU.
e12. SPEEDOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

**KNOWN INFO**

| Water temperature gage operates correctly. |
| Main code 13, 22, or 25 not active in pushbutton shift selector. |
| VOLTS gage operates correctly. |
| Vehicle is equipped with WTEC III transmission controls. |
| WTEC III dashboard cable assembly OK. |
| CTIS cable assembly OK. |
| CTIS ECU OK. |

**POSSIBLE PROBLEMS**

Faulty speedometer.

**TEST OPTIONS**

| Visual Inspection |

**REASON FOR QUESTION**

If speedometer dip switch settings are correct and speedometer does not operate or is inaccurate, speedometer is faulty.

**FLOWCHART**

16. Are speedometer dip switch settings correct?

- **NO**
  - Replace speedometer (para 7-14).

- **YES**
  - Correct speedometer dip switch settings (para 7-14).
(1) Remove two protective caps, self-locking nuts, retaining ring, and speedometer from instrument panel assembly. Discard self-locking nuts.
(2) Note position of speedometer dip switches. Refer to Table 2-8.5. Speedometer Dip Switch Settings.
(3) If speedometer dip switch setting(s) are incorrect, correct speedometer dip switch setting(s) (para 7-14).
(4) If speedometer dip switch settings are correct, replace speedometer (para 7-14).
(5) Position speedometer in instrument panel assembly with retaining ring and two self-locking nuts.
(6) Tighten two self-locking nuts to 9 lb-in. (1 N·m).
(7) Install two protective caps on speedometer.
(8) Connect connector PX8 to speedometer connector.
(9) Connect connector clamp on speedometer connector.
(10) Install instrument panel assembly (para 7-10).
(11) Connect connector P111 to connector J111.
(12) Install PDP on dashboard with three washers and screws.
(13) Install three screws in PDP.
(14) Install PDP cover (TM 9-2320-366-10-2).

<table>
<thead>
<tr>
<th>Switch Number</th>
<th>Switch Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Up</td>
</tr>
<tr>
<td>2</td>
<td>Up</td>
</tr>
<tr>
<td>3</td>
<td>Down</td>
</tr>
<tr>
<td>4</td>
<td>Up</td>
</tr>
<tr>
<td>5</td>
<td>Up</td>
</tr>
<tr>
<td>6</td>
<td>Down</td>
</tr>
<tr>
<td>7</td>
<td>Down</td>
</tr>
<tr>
<td>8</td>
<td>Up</td>
</tr>
<tr>
<td>9</td>
<td>Down</td>
</tr>
<tr>
<td>10</td>
<td>Up</td>
</tr>
</tbody>
</table>
e13. VOLTS GAGE DOES NOT OPERATE OR IS INACCURATE

INITIAL SETUP

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

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE
Perform electrical troubleshooting e1.
CIRCUIT BREAKER DOES NOT OPERATE on circuit breaker CB77 prior to beginning this task.

START

Is 24 VDC present on connector PX10 pin 3?

WARNING
CAUTION
Read WARNING and CAUTION on following page.

KNOWN INFO
Circuit breaker CB77 OK.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty VOLTS gage.

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

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

YES

GO TO STEP 3 OF THIS FAULT.

NO
WARNING

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

CAUTION

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

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

### VOLTAGE TEST

<table>
<thead>
<tr>
<th>(1)</th>
<th>Remove instrument panel assembly for access (para 7-15).</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2)</td>
<td>Disconnect connector clamp from VOLTS gage connector.</td>
</tr>
<tr>
<td>(3)</td>
<td>Disconnect connector PX10 from VOLTS gage connector.</td>
</tr>
<tr>
<td>(4)</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(5)</td>
<td>Connect positive (+) probe of multimeter to connector PX10 pin 3.</td>
</tr>
<tr>
<td>(6)</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(7)</td>
<td>Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(8)</td>
<td>If 24 VDC is not present, go to step 3 of this task.</td>
</tr>
<tr>
<td>(9)</td>
<td>Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
2. Is continuity present from connector PX10 socket 1 to a known good ground?

**KNOWN INFO**
- Circuit breaker CB77 OK.
- Faulty dashboard cable assembly.
- Faulty VOLTS gage.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty VOLTS gage.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3004 from connector PX10 socket 1 to terminal board TB2 position 9 is faulty.

**CAUTION**
Read CAUTION on following page.

**NO**

**YES**
Repair wire 3004 from connector PX10 socket 1 to terminal board TB2 position 9 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Replace VOLTS gage (para 7-14).
CAUTION

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

NOTE

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

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX10 socket 1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3004 from connector PX10 socket 1 to terminal board TB2 position 9 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace 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).
3. Test options

Voltage Test or STE/ICE-R Test #89

Reason for question
This question eliminates possible problems and determines where troubleshooting continues.

Known info
Circuit breaker CB77 OK.
VOLTS gage OK.

Possible problems
Faulty dashboard cable assembly.

WARNING
CAUTION
Read WARNING and CAUTION on following page.

Is 24 VDC present at connector J913 socket 9?

YES
Repair wire 1546 from connector J913 socket 9 to connector PX10 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

NO
Go to step 4 of this fault.
CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove personnel heater for access (para 18-9).</td>
</tr>
<tr>
<td>(2) Disconnect connector P913 from connector J913, if required.</td>
</tr>
<tr>
<td>(3) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to connector J913 socket 9.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(6) Position master power switch to on (TM 9-2320-366-10-1) and not reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 24 VDC is not present, go to step 4 of this fault.</td>
</tr>
<tr>
<td>(8) If 24 VDC is present, repair wire 1546 from connector J913 socket 9 to connector PX10 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(9) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Connect connector PX10 to VOLTS gage connector.</td>
</tr>
<tr>
<td>(11) Connect connector clamp on VOLTS gage connector.</td>
</tr>
<tr>
<td>(12) Connect connector P913 to connector J913, if required.</td>
</tr>
<tr>
<td>(13) Install personnel heater assembly (para 18-9).</td>
</tr>
<tr>
<td>(14) Install instrument panel assembly (para 7-15).</td>
</tr>
</tbody>
</table>
**Test Options**

**Voltage Test or STE/ICE-R Test #89**

**Reason for Question**

If 24 VDC is not present, wire 1929 is faulty. If 24 VDC is present, wire 1546 is faulty.

**Known Info**

- Circuit breaker CB77 OK.
- VOLTS gage OK.

**Possible Problems**

- Faulty dashboard cable assembly.

---

4. Is 24 VDC present at terminal board TB1 position 64?

- **YES**
  - Repair wire 1929 from circuit breaker CB77 socket 5 to terminal board TB1 position 64 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**
  - Repair wire 1546 from terminal board TB1 position 61 to connector J913 pin 9 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

---
WARNING

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

VOLTAGE TEST

1. Remove PDP cover (TM 9-2320-366-10-1).
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 64.
7. Connect negative (-) probe of multimeter to ground.
8. Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
9. If 24 VDC is not present, repair wire 1929 from circuit breaker CB77 socket 5 to terminal board TB1 position 64 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
10. If 24 VDC is present, repair wire 1546 from terminal board TB1 position 61 to connector J 913 socket 9 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
12. Install PDP on dashboard with three screws.
13. Install three washers and screws in PDP.
**e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE**

**INITIAL SETUP**

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

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

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

**Personnel Required**
(2)

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

**NOTE**
If tachometer does not illuminate, perform Electrical System Troubleshooting e21. Tachometer Does Not Illuminate prior to beginning this task.

---

**KNOWLEDGE INFO**
- Tachometer illuminates. VOLTS gage OK.

**POSSIBLE PROBLEMS**
- Faulty engine speed sensor.
- Faulty dashboard cable assembly.
- Faulty auxiliary panel cable assembly.
- Faulty engine control cable assembly.
- Faulty tachometer.

**TEST OPTIONS**
- Resistance Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If resistance is greater than 1440 ohms, engine speed sensor is faulty.

---

1. **CAUTION**
   Read CAUTION on following page.

   Is less than 1440 ohms resistance present from engine speed sensor connector socket 1 to pin 2?

   **YES**
   Replace engine speed sensor (para 7-46).

   **NO**

---

2. **TEST OPTIONS**
   Resistance Test or STE/ICE-R Test #91

---

3. **REASON FOR QUESTION**
   If resistance is greater than 1440 ohms, engine speed sensor is faulty.
CONTINUITY TEST

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

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Raise cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(2) Disconnect connector clamp from engine speed sensor connector.</td>
</tr>
<tr>
<td>(3) Disconnect connector P38 from engine speed sensor connector.</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to socket 1 of engine speed sensor connector.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to pin 2 of engine speed sensor connector and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If greater than 1440 ohms resistance is present, replace engine speed sensor (para 7-46).</td>
</tr>
</tbody>
</table>
e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

2.

Is engine speed sensor free from damage?

Yes

Replace engine speed sensor (para 7-46).

No


3.

Does tachometer operate correctly after performing step 2?

Yes

Go to step 4 of this fault.

No


Fault corrected.
(1) Perform STE/ICE-R test #10.
(2) Position PTO switch to on (TM 9-2320-366-10-1).
(3) Observe if STE/ICE-R test #10 results and tachometer reading are in agreement.
(4) Position PTO switch to off (TM 9-2320-366-10-1).
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If STE/ICE-R test #10 and tachometer reading are not in agreement, go to step 4 of this fault.

(1) Remove engine speed sensor (para 7-46).
(2) Observe lower end of engine speed sensor for damage caused by contact with engine ring gear.
(3) If engine speed sensor is damaged, replace engine speed sensor (para 7-46).
(4) Install engine speed sensor (para 7-46).
(5) Adjust engine speed sensor (para 7-46).
e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

4. Is 24 VDC present on connector P901 pin 3?

**KNOWLEDGE INFO**

- Tachometer illuminates.
- VOLTS gage OK.
- Engine speed sensor OK.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.
- Faulty auxiliary panel cable assembly.
- Faulty engine control cable assembly.
- Faulty tachometer.

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

- If 24 VDC is not present, wire 1546 is faulty.

**WARNING**

**CAUTION**

Read WARNING and CAUTION on following page.

- NO

**YES**

Repair wire 1546 from connector P913 pin 9 to connector P901 pin 3 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
**CAUTION**

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

---

**WARNING**

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

---

**CAUTION**

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

---

**NOTE**

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

---

**VOLTAGE TEST**

1. Remove six screws from auxiliary panel.
2. Lift auxiliary panel from auxiliary panel housing to gain access.
3. Disconnect connector clamp from tachometer connector.
4. Disconnect connector P901 from tachometer connector.
5. Set multimeter to VDC.
6. Connect positive (+) probe of multimeter to connector P901 pin 3.
7. Connect negative (-) probe of multimeter to ground.
8. Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
9. If 24 VDC is not present, repair wire 1546 from connector P913 pin 9 to connector P901 pin 3 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

5. Is continuity present from connector P901 pin 4 to connector P38 pin 1?

**KNOWLEDGE INFO**
- Tachometer illuminates.
- VOLTS gage OK.
- Engine speed sensor OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty auxiliary panel cable assembly.
- Faulty engine control cable assembly.
- Faulty tachometer.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

**KNOWN INFO**
Replace tachometer (para 7-21).

6. Is continuity present from connector P38 socket 2 to a known good ground?

**KNOWLEDGE INFO**
- Tachometer illuminates.
- VOLTS gage OK.
- Engine speed sensor OK.
- Auxiliary panel cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty engine control cable assembly.
- Faulty tachometer.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is present, tachometer is faulty.

- **YES**
  - Go to step 7 of this task.

- **NO**
  - Go to step 10 of this task.

- **YES**
  - Replace tachometer (para 7-21).
CAUTION

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

NOTE

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

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P901 pin 4.
(3) Raise cab (TM 9-2320-366-10-1).
(4) Disconnect connector clamp from engine speed sensor connector.
(5) Disconnect connector P38 from engine speed sensor connector.
(6) Connect negative (-) probe of multimeter to connector P38 pin 1 and note reading on multimeter.
(7) If continuity is not present, go to step 7 of this task.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P38 socket 2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, go to step 10 of this task.
(5) If continuity is present, replace tachometer (para 7-21).
(6) Connect connector P38 to engine speed sensor connector.
(7) Connect connector clamp on engine speed sensor connector.
(8) Lower cab (TM 9-2320-366-10-1).
(9) Connect connector P901 to tachometer connector.
(10) Connect connector clamp on tachometer connector.
(11) Position auxiliary panel on auxiliary panel housing with six screws.
(12) Tighten six screws to 18 lb-in. (2 N·m).
e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

**KNOWN INFO**
Tachometer illuminates.
VOLTS gage OK.
Engine speed sensor OK.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.
Faulty auxiliary panel cable assembly.
Faulty engine control cable assembly.

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

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

---

**CAUTION**
Read CAUTION on following page.

7. Is continuity present from connector P901 pin 4 to connector J31 pin 8?

---

If **NO**

**YES**
Repair wire 1444 from connector P31 socket 8 to connector P38 pin 1 (para 2-45) or replace engine control cable assembly (para 7-80).

Go to step 8 of this task.
CAUTION

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

NOTE

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

CONTINUITY TEST

(1) Connect connector P38 to engine speed sensor connector.
(2) Connect connector clamp on engine speed sensor connector.
(3) Lower cab (TM 9-2320-366-10-1).
(4) Remove instrument panel assembly for access (para 7-15).
(5) Disconnect connector P31 from connector J31.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P901 pin 4.
(8) Connect negative (-) probe of multimeter to connector J31 pin 8 and note reading on multimeter.
(9) If continuity is not present, go to step 8 of this task.
(10) If continuity is present, repair wire 1444 from connector P31 socket 8 to connector P38 pin 1 (para 2-45) or replace engine control cable assembly (para 7-80).
(11) Connect connector P31 to connector J31.
(12) Install instrument panel assembly (para 7-15).

NOTE

Perform steps (13) through (16) if continuity is present.

(13) Connect connector P901 to tachometer connector.
(14) Connect connector clamp on tachometer connector.
(15) Position auxiliary panel on auxiliary panel housing with six screws.
(16) Tighten six screws to 18 lb-in. (2 N·m).
**e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)**

**KNOWN INFO**
- Tachometer illuminates.
- VOLTS gage OK.
- Engine speed sensor OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty auxiliary panel cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

---

8. **CAUTION**
Read CAUTION on following page.

Is continuity present from connector P901 pin 4 to connector PX26 socket 1?

---

8. **NO**

- Go to step 9 of this task.

---

8. **YES**

Repair wire 1444 from connector PX26 socket 1 to connector J31 pin 8 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**CAUTION**

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

**NOTE**

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

---

**CONTINUITY TEST**

1. Disconnect connector PX26 from frequency ECU connector.
2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to connector P901 pin 4.
4. Connect negative (-) probe of multimeter to connector PX26 socket 1 and note reading on multimeter.
5. If continuity is not present, go to step 9 of this task.
6. If continuity is present, repair wire 1444 from connector PX26 socket 1 to connector J31 pin 8 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
7. Connect connector PX26 to frequency ECU connector.

**NOTE**

Perform steps (8) through (11) if continuity is present.

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 18 lb-in. (2 N·m).
e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tachometer illuminates. VOLTS gage OK. Engine speed sensor OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty dashboard cable assembly. Faulty auxiliary panel cable assembly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, wire 1550 in auxiliary panel cable assembly is faulty. If continuity is present, wire 1550 in dashboard cable assembly is faulty.</td>
</tr>
</tbody>
</table>

9. Is continuity present from connector P901 pin 4 to connector P913 pin 12?

- **YES**
  - Repair wire 1550 from connector P901 pin 4 to connector P913 pin 12 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).

- **NO**
  - Repair wire 1550 from connector J913 socket 12 to connector PX26 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CAUTION

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

NOTE

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

CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove personnel heater assembly for access (para 18-9).</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector P913 from connector J913.</td>
</tr>
<tr>
<td>3</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>4</td>
<td>Connect positive (+) probe of multimeter to connector P901 pin 4.</td>
</tr>
<tr>
<td>5</td>
<td>Connect negative (-) probe of multimeter to connector P913 pin 12 and note reading on multimeter.</td>
</tr>
<tr>
<td>6</td>
<td>If continuity is not present, repair wire 1550 from connector P901 pin 4 to connector P913 pin 12 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).</td>
</tr>
<tr>
<td>7</td>
<td>If continuity is present, repair wire 1550 from connector J913 socket 12 to connector PX26 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>8</td>
<td>Connect connector P913 to connector J913.</td>
</tr>
<tr>
<td>9</td>
<td>Install personnel heater assembly (para 18-9).</td>
</tr>
</tbody>
</table>
**e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)**

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tachometer illuminates. VOLTS gage OK. Engine speed sensor OK.</td>
<td>Continuity Test or STE/ICE-R Test #91</td>
<td>This question eliminates possible problems and determines where troubleshooting continues.</td>
</tr>
</tbody>
</table>

### POSSIBLE PROBLEMS
- Faulty dashboard cable assembly.
- Faulty auxiliary panel cable assembly.
- Faulty engine control cable assembly.

### TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

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

---

**KNOW EN INFO**
- Is continuity present from connector J 31 pin 16 to a known good ground?

**NO**

**YES**

- Go to step 11 of this task.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

---

**KNOW EN INFO**
- Is continuity present from connector PX26 socket 6 to a known good ground?

**NO**

**YES**

- Repair wire 3083 from connector P38 socket 2 to connector P31 socket 16 (para 2-45) or replace engine control cable assembly (para 7-80).

**FAILING CIRCUIT**
- Repair wire 3083 from connector PX26 socket 6 to terminal board TB2 position 26 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

---

**KNOW EN INFO**
- Is continuity present from connector PX26 socket 6 to a known good ground?

**NO**

**YES**

- Repair wire 3083 from connector PX26 socket 6 to terminal board TB2 position 26 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**CAUTION**

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

**NOTE**

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

### CONTINUITY TEST

1. Remove instrument panel assembly for access (para 7-15).
2. Disconnect connector P31 from connector J31.
3. Set multimeter to ohms.
4. Connect positive (+) probe of multimeter to connector J31 pin 16.
5. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
6. If continuity is not present, go to step 11 of this task.
7. If continuity is present, repair wire 3083 from connector P38 socket 2 to connector P31 socket 16 (para 2-45) or replace engine control cable assembly (para 7-80).
9. Install instrument panel assembly (para 7-15).

### CONTINUITY TEST

1. Disconnect connector PX26 from frequency ECU connector.
2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to connector PX26 socket 6.
4. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
5. If continuity is not present, repair wire 3083 from connector PX26 socket 6 to terminal board TB2 position 26 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
### e14. TACHOMETER DOES NOT OPERATE OR IS INACCURATE (CONT)

#### KNOWN INFO
- Tachometer illuminates.
- VOLTS gage OK.
- Engine speed sensor OK.

#### POSSIBLE PROBLEMS
- Faulty dashboard cable assembly.

#### TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

#### CAUTION
Read CAUTION on following page.

#### REASON FOR QUESTION
If continuity is not present, wire 3083 from connector PX26 socket 6 to socket 4 is faulty. If continuity is present, wire 3083 from connector PX26 socket 4 to connector J31 pin 16 is faulty.

#### 12. Is continuity present from connector PX26 socket 6 to socket 4?

- **YES**
  - Repair wire 3083 from connector PX26 socket 4 to connector J31 pin 16 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**
  - Repair wire 3083 from connector PX26 socket 6 to socket 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector PX26 socket 6.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to connector PX26 socket 4 and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If continuity is not present, repair wire 3083 from connector PX26 socket 6 to socket 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(5) If continuity is present, repair wire 3083 connector PX26 socket 4 to connector J 31 pin 16 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(6) Connect connector PX26 to frequency ECU connector.</td>
</tr>
</tbody>
</table>
e15. AUDIBLE ALARM DOES NOT OPERATE

INITIAL SETUP

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

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

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

---

START

1. WARNING
Read WARNING on following page.

Is 24 VDC present at terminal lug TL161?

---

KNOWLEDGE
Some lights on lighted indicator display illuminate.

POSSIBLE PROBLEMS
Faulty audible alarm.
Faulty dashboard cable assembly.
Faulty lighted indicator display.

---

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

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

---

NO

YES

Go to step 4 of this fault.

---

2. WARNING
Read WARNING on following page.

Does audible alarm operate with terminal lug TL160 connected to a known good ground?

---

KNOWLEDGE
Some lights on lighted indicator display illuminate.

POSSIBLE PROBLEMS
Faulty audible alarm.
Faulty dashboard cable assembly.
Faulty lighted indicator display.

---

TEST OPTIONS
Operational Test

REASON FOR QUESTION
If audible alarm does not operate when terminal lug TL160 grounded, audible alarm is faulty.

---

NO

YES

Replace audible alarm (para 7-43).
WARNING

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(2) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to terminal lug TL161.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If 24 VDC is not present, go to step 4 of this fault.</td>
</tr>
<tr>
<td>(7) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPERATIONAL TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Connect one end of electrical wire to terminal lug TL160.</td>
</tr>
<tr>
<td>(2) Connect opposite end of electrical wire to ground.</td>
</tr>
<tr>
<td>(3) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(4) If audible alarm does not operate, replace audible alarm (para 7-43).</td>
</tr>
<tr>
<td>(5) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e15. AUDIBLE ALARM DOES NOT OPERATE (CONT)

3. Is continuity present from terminal lug TL160 to connector PX7 pin 19?

**KNOWN INFO**
- Some lights on lighted indicator display illuminate.
- Audible alarm OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty lighted indicator display.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 1536 from terminal lug TL160 to connector PX7 pin 19 is faulty. If continuity is present, lighted indicator display is faulty.

- **YES**
  - Repair wire 1536 from terminal lug TL160 to connector PX7 pin 19 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - Replace lighted indicator display (para 7-16).

- **NO**
  - Replace lighted indicator display (para 7-16).

4. Is continuity present from terminal lug TL161 to connector PX7 pin 16?

**KNOWN INFO**
- Some lights on lighted indicator display illuminate.
- Audible alarm OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty lighted indicator display.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 1532 from terminal lug TL161 to connector PX7 pin 16 is faulty. If continuity is present, lighted indicator display is faulty.

- **YES**
  - Repair wire 1532 from terminal lug TL161 to connector PX7 pin 16 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - Replace lighted indicator display (para 7-16).

- **NO**
  - Replace lighted indicator display (para 7-16).
CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

CONTINUITY TEST
(1) Disconnect connector 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 pin 19 and note reading on multimeter.
(5) If continuity is not present, repair wire 1536 from terminal lug TL160 to connector PX7 pin 19 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) If continuity is present, replace lighted indicator display (para 7-16).
(7) Connect connector PX7 to lighted indicator display.
(8) Install instrument panel assembly (para 7-15).
e16. TROOP TRANSPORT AUDIBLE ALARM DOES NOT OPERATE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

Materials/Parts
Lockwasher (2) (Item 82, Appendix G)
Wire, Elect, 50 ft (Item 71, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

1. Is continuity present across troop transport alarm switch?

- **NO**
  - If continuity is not present, troop transport alarm switch is faulty.

- **YES**
  - Replace troop transport alarm switch (para 20-70).

**KNOWN INFO**

- Steady tone audible alarm operates.

**POSSIBLE PROBLEMS**

- Faulty troop transport alarm switch.
- Faulty audible alarm.
- Faulty engine control cable assembly.
- Faulty troop transport alarm cable assembly.
- Faulty troop transport alarm switch cable assembly.
- Faulty dashboard cable assembly.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

- If continuity is not present, troop transport alarm switch is faulty.
CONTINUITY TEST

(1) Remove two screws, lockwashers, and terminal lugs TL164 and TL165 from troop transport alarm switch. Discard lockwashers.
(2) Lift switch cover on troop transport alarm switch.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to one terminal of troop transport alarm switch.
(5) Connect negative (-) probe of multimeter to second terminal of troop transport alarm switch.
(6) Position troop transport alarm switch to on and note reading on multimeter.
(7) If continuity is not present, replace troop transport alarm switch (para 20-70).
(8) Install terminal lugs TL165 and TL164 on troop transport alarm switch with two lockwashers and screws.
(9) Close switch cover on troop transport alarm switch.
e16. TROOP TRANSPORT AUDIBLE ALARM DOES NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady tone audible alarm operates.</td>
</tr>
<tr>
<td>Troop transport alarm switch OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty audible alarm.</td>
</tr>
<tr>
<td>Faulty engine control cable assembly.</td>
</tr>
<tr>
<td>Faulty troop transport alarm cable assembly.</td>
</tr>
<tr>
<td>Faulty troop transport alarm switch cable assembly.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

2. Does troop transport audible alarm operate when connected to a known good ground?

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read WARNING on following page.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Test or STE/ICE-R Test #89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If troop transport audible alarm does not operate when connected to a known good ground, audible alarm is faulty.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace audible alarm (para 7-43).</td>
<td></td>
</tr>
</tbody>
</table>

2-374 Change 1
### WARNING

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Start engine (TM 9-2320-366-10-1) and allow enough pressure to build in air tanks to cause steady tone audible alarm to cease.</td>
</tr>
<tr>
<td>(2) Shut down engine (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(3) Remove PDP cover (TM 9-2320-366-10-2).</td>
</tr>
<tr>
<td>(4) Remove circuit breaker CB77 from PDP (para 7-9).</td>
</tr>
<tr>
<td>(5) Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(6) Install circuit breaker CB77 on PDP (para 7-9).</td>
</tr>
<tr>
<td>(7) Connect one end of electrical wire to terminal lug TL178.</td>
</tr>
<tr>
<td>(8) Connect opposite end of electrical wire to ground.</td>
</tr>
<tr>
<td>(9) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) If troop transport audible alarm does not operate, replace audible alarm (para 7-43).</td>
</tr>
<tr>
<td>(11) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(12) Install PDP cover (TM 9-2320-366-10-2).</td>
</tr>
</tbody>
</table>
e16. TROOP TRANSPORT AUDIBLE ALARM DOES NOT OPERATE (CONT)

### CAUTION
Read CAUTION on following page.

#### Known Info
- Steady tone audible alarm operates.
- Troop transport alarm switch OK.
- Audible alarm OK.

#### Possible Problems
- Faulty engine control cable assembly.
- Faulty troop transport alarm cable assembly.
- Faulty troop transport alarm switch cable assembly.
- Faulty dashboard cable assembly.

#### Test Options
- Continuity Test or STE/ICE-R Test #91

#### Reason for Question
- If continuity is not present, wire 32 in engine control cable is faulty.

---

### 3.
Is continuity present from connector P31 socket 17 to connector P39 socket 2?

**NO**
- Repair wire 32 in engine control cable assembly (para 2-45) or replace engine control cable assembly (para 7-80).

**YES**

### 4.
Is continuity present from connector P31 socket 9 to connector P39 pin 1?

**NO**

**YES**
- Repair wire 32 in engine control cable assembly (para 2-45) or replace engine control cable assembly (para 7-80).
CONTINUITY TEST

(1) Remove instrument panel for access (para 7-15).
(2) Disconnect connector P31 from connector J31.
(3) Raise cab (TM 9-2320-366-10-1).
(4) Disconnect connector clamp from connector P39.
(5) Disconnect connector P39 from connector J39.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P39 socket 2.
(8) Connect negative (-) probe of multimeter to connector P31 socket 17 and note reading on multimeter.
(9) If continuity is not present, repair wire 32 in engine control cable (para 2-45) or replace engine control cable assembly (para 7-80).

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

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

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P39 pin 1.
(3) Connect negative (-) probe of multimeter to connector P31 socket 9 and note reading on multimeter.
(4) If continuity is not present, repair wire 3028 in engine control cable (para 2-45) or replace engine control cable assembly (para 7-80).
16. TROOP TRANSPORT AUDIBLE ALARM DOES NOT OPERATE (CONT)

**KNOWN INFO**
- Steady tone audible alarm operates.
- Troop transport alarm switch OK.
- Audible alarm OK.
- Engine control cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty troop transport alarm cable assembly.
- Faulty troop transport alarm switch cable assembly.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 32 in troop transport alarm cable assembly is faulty.

---

**KNOWN INFO**
- Steady tone audible alarm operates.
- Troop transport alarm switch OK.
- Audible alarm OK.
- Engine control cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty troop transport alarm cable assembly.
- Faulty troop transport alarm switch cable assembly.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3028 in troop transport alarm cable assembly is faulty.

---

5. Is continuity present from connector J 39 pin 2 to connector P921 pin A?

- **NO**
  - Repair wire 32 in troop transport alarm cable assembly (para 2-45) or replace troop transport alarm cable assembly (para 20-69).

- **YES**
  - CAUTION Read CAUTION on following page.

6. Is continuity present from connector J 39 socket 1 to connector P921 pin C?

- **NO**
  - CAUTION Read CAUTION on following page.

- **YES**
  - Repair wire 32 in troop transport alarm cable assembly (para 2-45) or replace troop transport alarm cable assembly (para 20-69).
CAUTION

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

NOTE

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

CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disconnect connector P921 from connector J921.</td>
</tr>
<tr>
<td>2</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>3</td>
<td>Connect positive (+) probe of multimeter to connector P921 pin A.</td>
</tr>
<tr>
<td>4</td>
<td>Connect negative (-) probe of multimeter to connector J39 pin 2 and note reading on multimeter.</td>
</tr>
<tr>
<td>5</td>
<td>If continuity is not present, repair wire 3028 in troop transport alarm cable assembly (para 2-45) or replace troop transport alarm cable assembly (para 20-69).</td>
</tr>
</tbody>
</table>

CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>2</td>
<td>Connect positive (+) probe of multimeter to connector J39 socket 1.</td>
</tr>
<tr>
<td>3</td>
<td>Connect negative (-) probe of multimeter to connector P921 pin C and note reading on multimeter.</td>
</tr>
<tr>
<td>4</td>
<td>If continuity is not present, repair wire 3028 in troop transport alarm cable assembly (para 2-45) or replace troop transport alarm cable assembly (para 20-69).</td>
</tr>
<tr>
<td>5</td>
<td>Connect connector P39 to connector J39.</td>
</tr>
<tr>
<td>6</td>
<td>Connect connector clamp on connector P39.</td>
</tr>
<tr>
<td>7</td>
<td>Lower cab (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e16. TROOP TRANSPORT AUDIBLE ALARM DOES NOT OPERATE (CONT)

**KNOWN INFO**
- Steady tone audible alarm operates.
- Troop transport alarm switch OK.
- Audible alarm OK.
- Engine control cable assembly OK.
- Troop transport alarm cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty troop transport alarm switch cable assembly.
- Faulty dashboard cable assembly.

**CAUTION**
Read CAUTION on following page.

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 32 in troop transport alarm switch cable assembly is faulty.

7. Is continuity present from connector J921 socket A to terminal lug TL164?

- **NO**
  - Repair wire 32 in troop transport alarm switch cable assembly (para 2-45) or replace troop transport alarm switch cable assembly (para 20-70).

- **YES**
  - Repair wire 32 in troop transport alarm switch cable assembly (para 2-45) or replace troop transport alarm switch cable assembly (para 20-70).

**KNOWN INFO**
- Steady tone audible alarm operates.
- Troop transport alarm switch OK.
- Audible alarm OK.
- Engine control cable assembly OK.
- Troop transport alarm cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty troop transport alarm switch cable assembly.
- Faulty dashboard cable assembly.

**CAUTION**
Read CAUTION on following page.

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3028 in troop transport alarm switch cable assembly is faulty.

8. Is continuity present from connector J921 socket C to terminal lug TL165?

- **NO**
  - Repair wire 3028 in troop transport alarm switch cable assembly (para 2-45) or replace troop transport alarm switch cable assembly (para 20-70).

- **YES**
  - Repair wire 3028 in troop transport alarm switch cable assembly (para 2-45) or replace troop transport alarm switch cable assembly (para 20-70).
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J921 socket C.
(3) Connect negative (-) probe of multimeter to terminal lug TL165 and note reading on multimeter.
(4) If continuity is not present, repair wire 3028 in troop transport alarm switch cable assembly (para 2-45) or replace troop transport alarm switch cable assembly (para 20-70).

**CAUTION**

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

**NOTE**

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector J921 socket A.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to terminal lug TL164 and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If continuity is not present, repair wire 32 in troop transport alarm switch cable assembly (para 2-45) or replace troop transport alarm switch cable assembly (para 20-70).</td>
</tr>
</tbody>
</table>

**CONTINUITY TEST**

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J921 socket C.
(3) Connect negative (-) probe of multimeter to terminal lug TL165 and note reading on multimeter.
(4) If continuity is not present, repair wire 3028 in troop transport alarm switch cable assembly (para 2-45) or replace troop transport alarm switch cable assembly (para 20-70).
(5) Connect connector P921 to connector J921.

**NOTE**

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
e16. TROOP TRANSPORT AUDIBLE ALARM DOES NOT OPERATE (CONT)

KNOWN INFO

| Steady tone audible alarm operates. |
| Troop transport alarm switch OK. |
| Audible alarm OK. |
| Engine control cable assembly OK. |
| Troop transport alarm cable assembly OK. |
| Troop transport alarm switch cable assembly OK. |

POSSIBLE PROBLEMS

Faulty dashboard cable assembly.

TEST OPTIONS

- Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION

If continuity is not present, wire 3028 in dashboard cable assembly is faulty. If continuity is present, wire 32 in dashboard cable assembly is faulty.

CAUTION

Read CAUTION on following page.

9. Is continuity present from connector J 31 pin 9 to ground?

NO

YES

Repair wire 3028 in dashboard cable assembly (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Repair wire 32 in dashboard cable assembly (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CAUTION

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

NOTE

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

### CONTINUITY TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to connector J31 pin 9.
3. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
4. If continuity is not present, repair wire 3028 in dashboard cable assembly (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
5. If continuity is present, repair wire 32 in dashboard cable assembly (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
7. Install instrument panel (para 7-15).
e16A. MASTER POWER SWITCH DOES NOT SHUT DOWN ENGINE

**INITIAL SETUP**

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

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

**Personnel Required**
(2)

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

---

**START**

1. **WARNING**
   Read WARNING on following page.

   Does engine shut down when circuit breaker CB70 is removed from Power Distribution Panel (PDP)?

   **YES**
   Replace master power switch (para 7-18).

   **NO**
   Replace relay K2 (para 7-09).

---

**TEST OPTIONS**
- Visual Inspection

**REASON FOR QUESTION**
- If engine shuts down when circuit breaker CB70 is removed, master power switch is faulty. If engine does not shut down when circuit breaker CB70, relay K2 is faulty.

**KNOWN INFO**
- Master power switch off.

**POSSIBLE PROBLEMS**
- Faulty master power switch.
- Faulty relay K2.
**WARNING**
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

### VISUAL INSPECTION

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove Power Distribution Panel (PDP) cover (para 16-2).</td>
</tr>
<tr>
<td>2</td>
<td>Remove circuit breaker CB79 from Power Distribution Panel (PDP).</td>
</tr>
<tr>
<td>3</td>
<td>Install circuit breaker CB79 in Power Distribution Panel (PDP).</td>
</tr>
<tr>
<td>4</td>
<td>Start engine (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>5</td>
<td>Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>6</td>
<td>Remove circuit breaker CB70 from Power Distribution Panel (PDP).</td>
</tr>
<tr>
<td>7</td>
<td>If engine does not shut down when circuit breaker CB70 is removed, replace relay K2 (para 7-9).</td>
</tr>
<tr>
<td>8</td>
<td>If engine shuts down when circuit breaker CB70, replace master power switch (para 7-18).</td>
</tr>
</tbody>
</table>

**NOTE**
Perform step (9) if engine does not shut down.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Press start inhibit switch.</td>
</tr>
<tr>
<td>10</td>
<td>Install circuit breaker CB70 in Power Distribution Panel (PDP).</td>
</tr>
<tr>
<td>11</td>
<td>Install Power Distribution Panel (PDP) cover (para 16-2).</td>
</tr>
</tbody>
</table>
**INITIAL SETUP**

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

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 44, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

**Personnel Required**
(2)

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

---

**e16B. LAMP TEST SWITCH DOES NOT ILLUMINATE**

**KNOWN INFO**
- Radiator fan off switch illuminates.

**POSSIBLE PROBLEMS**
- Faulty rocker switch lamp.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, rocker switch lamp is faulty.

**Diagram Flow**

1. Is continuity present through rocker switch lamp?
   - **YES**
     - Replace rocker switch lamp (para 7-18).
   - **NO**

---

2-380.10  Change 1
CONTINUITY TEST

(1) Remove instrument panel for access (para 7-15).
(2) Disconnect connector PX2A from lamp test switch lamp base connector.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to one terminal of lamp base connector.
(5) Connect negative (-) probe of multimeter to second terminal of lamp base connector and note reading on multimeter.
(6) If continuity is not present, replace rocker switch lamp (para 7-18).

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

- Radiator fan off switch illuminates.
- Rocker switch lamp OK.

Possible Problems

Faulty dashboard cable assembly.

Reason for Question

Radiator fan off switch illuminates.
Rocker switch lamp OK.

Possible Problems

Faulty dashboard cable assembly.

Test Options

Continuity Test or STE/ICE-R Test #91

2.

Is continuity present from connector PX2A socket 2 to a known good ground?

Caution

Read Caution on following page.

If continuity is not present, wire 3020 is faulty. If continuity is present, wire 1908 is faulty.

No

Repair wire 3020 from connector PX2A socket 2 to connector PX1A socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Yes

Repair wire 1908 from connector PX2A socket 1 to connector PX1A socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**CAUTION**

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

### CONTINUITY TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to connector PX2A socket 2.
3. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
4. If continuity is not present, repair wire 3020 from connector PX2A socket 2 to connector PX1A socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
5. If continuity is present, repair wire 1908 from connector PX2A socket 1 to connector PX1A socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
6. Connect connector PX2A to lamp test switch lamp base connector.
7. Install instrument panel assembly (para 7-15).
e17. RADIATOR FAN OFF SWITCH DOES NOT ILLUMINATE

INITIAL SETUP

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

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

**Personnel Required**
(2)

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

START

<table>
<thead>
<tr>
<th>KNOWLEDGED INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REAR BRAKE AIR</strong> gage illuminates.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rocker switch lamp.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

**TEST OPTIONS**

**Continuity Test or STE/ICE-R Test #91**

**REASON FOR QUESTION**

If continuity is not present, rocker switch lamp is faulty.

1. Is continuity present through rocker switch lamp?

**NO**

**YES**

Replace rocker switch lamp (para 7-18).
NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove instrument panel for access (para 7-15).</td>
</tr>
<tr>
<td>(2) Disconnect connector PX1A from radiator fan off switch lamp base connector.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to one terminal of lamp base connector.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to second terminal of lamp base connector and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If continuity is not present, replace rocker switch lamp (para 7-18).</td>
</tr>
</tbody>
</table>
2. Is continuity present from connector PX1A socket 2 to a known good ground?

- **NO**
  - Repair wire 3020 from connector PX1A socket 2 to connector PX5 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Repair wire 1908 from connector PX1A socket 1 to connector PX5 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3020 is faulty. If continuity is present, wire 1908 is faulty.

**CAUTION**
- Read CAUTION on following page.
**CAUTION**

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

**CONTINUITY TEST**

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to connector PX1A socket 2.
3. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
4. If continuity is not present, repair wire 3020 from connector PX1A socket 2 to connector PX5 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
5. If continuity is present, repair wire 1908 from connector PX1A socket 1 to connector PX5 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
6. Connect connector PX1A to radiator fan off switch lamp base connector.
7. Install instrument panel assembly (para 7-15).
e17A. ETHER START SWITCH DOES NOT ILLUMINATE

INITIAL SETUP

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

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

1. Is continuity present through rocker switch lamp?

YES

Replace rocker switch lamp (para 7-18).

NO

If continuity is not present, rocker switch lamp is faulty.

Test Options
Continuity Test or STE/ICE-R Test #91

Reason for Question
If continuity is not present, rocker switch lamp is faulty.

Known Info
FUEL gage illuminates.

Possible Problems
Faulty rocker switch lamp.
Faulty dashboard cable assembly.
CONTINUITY TEST

(1) Remove instrument panel for access (para 7-15).
(2) Disconnect connector PX13A from ether start switch lamp base connector.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to one terminal of lamp base connector.
(5) Connect negative (-) probe of multimeter to second terminal of lamp base connector and note reading on multimeter.
(6) If continuity is not present, replace rocker switch lamp (para 7-18).

NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
2. If continuity is not present, wire 3020 is faulty. If continuity is present, wire 1908 is faulty.

CAUTION
Read CAUTION on following page.

Is continuity present from connector PX13A socket 2 to a known good ground?

YES

Repair wire 1908 from connector PX13A socket 1 to connector PX9 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

NO

Repair wire 3020 from connector PX13A socket 2 to connector PX9 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

KNOWING INFO
- FUEL gage illuminates.
- Rocker switch lamp OK.

POSSIBLE PROBLEMS
- Faulty dashboard cable assembly.

TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, wire 3020 is faulty. If continuity is present, wire 1908 is faulty.
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

**CONTINUITY TEST**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2)</td>
<td>Connect positive (+) probe of multimeter to connector PX13A socket 2.</td>
</tr>
<tr>
<td>(3)</td>
<td>Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(4)</td>
<td>If continuity is not present, repair wire 3020 from connector PX13A socket 2 to connector PX9 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(5)</td>
<td>If continuity is present, repair wire 1908 from connector PX13A socket 1 to connector PX9 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(6)</td>
<td>Connect connector PX13A to ether start switch lamp base connector.</td>
</tr>
<tr>
<td>(7)</td>
<td>Install instrument panel assembly (para 7-15).</td>
</tr>
</tbody>
</table>
e17B. HAZARD LIGHTS SWITCH DOES NOT ILLUMINATE

INITIAL SETUP

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

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

KNOWLEDGE INFO

Amber warning light switch illuminates.

POSSIBLE PROBLEMS
Faulty rocker switch lamp.
Faulty dashboard cable assembly.

TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, rocker switch lamp is faulty.

START

1. Is continuity present through rocker switch lamp?

NO

YES

Replace rocker switch lamp (para 7-18).
CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove instrument panel for access (para 7-15).</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector PX14A from hazard lights switch lamp base connector.</td>
</tr>
<tr>
<td>3</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>4</td>
<td>Connect positive (+) probe of multimeter to one terminal of lamp base connector.</td>
</tr>
<tr>
<td>5</td>
<td>Connect negative (-) probe of multimeter to second terminal of lamp base connector and note reading on multimeter.</td>
</tr>
<tr>
<td>6</td>
<td>If continuity is not present, replace rocker switch lamp (para 7-18).</td>
</tr>
</tbody>
</table>

NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
2. If continuity is not present, wire 3020 is faulty. If continuity is present, wire 1908 is faulty.

**Known Info**
- Amber warning light switch illuminates.
- Rocker switch lamp OK.

**Possible Problems**
- Faulty dashboard cable assembly.

**Test Options**
- Continuity Test or STE/ICE-R Test #91

**Reason for Question**
- If continuity is not present, wire 3020 is faulty. If continuity is present, wire 1908 is faulty.

**Diagram**
- **NO**
  - Repair wire 3020 from connector PX14A socket 2 to connector J913 pin 10 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- **YES**
  - Repair wire 1908 from connector PX14A socket 1 to connector PX12A socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>2.</td>
<td>Connect positive (+) probe of multimeter to connector PX14A socket 2.</td>
</tr>
<tr>
<td>3.</td>
<td>Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>4.</td>
<td>If continuity is not present, repair wire 3020 from connector PX14A socket 2 to connector J913 pin 10 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>5.</td>
<td>If continuity is present, repair wire 1908 from connector PX14A socket 1 to connector PX12A socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>6.</td>
<td>Connect connector PX14A to hazard lights switch lamp base connector.</td>
</tr>
<tr>
<td>7.</td>
<td>Install instrument panel assembly (para 7-15).</td>
</tr>
</tbody>
</table>
**INITIAL SETUP**

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

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

**Personnel Required**
(2)

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

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**e17C. AMBER WARNING LIGHT SWITCH DOES NOT ILLUMINATE**

1. **KNOWN INFO**
   - Master power switch illuminates.

2. **POSSIBLE PROBLEMS**
   - Faulty rocker switch lamp.
   - Faulty dashboard cable assembly.

3. **TEST OPTIONS**
   - Continuity Test or STE/ICE-R Test #91

4. **REASON FOR QUESTION**
   - If continuity is not present, rocker switch lamp is faulty.

5. **Is continuity present through rocker switch lamp?**
   - **YES**
     - Replace rocker switch lamp (para 7-18).
   - **NO**
     - Continue with the test.
NOTES
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove instrument panel for access (para 7-15).</td>
</tr>
<tr>
<td>(2) Disconnect connector PX12A from amber warning light switch lamp base connector.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to one terminal of lamp base connector.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to second terminal of lamp base connector and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If continuity is not present, replace rocker switch lamp (para 7-18).</td>
</tr>
</tbody>
</table>
2. If continuity is not present, wire 3020 is faulty. If continuity is present, wire 1908 is faulty.

Repair wire 3020 from connector PX12A socket 2 to connector PX14A socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Repair wire 1908 from connector PX12A socket 1 to connector PX17A socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**CAUTION**

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector PX12A socket 2.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If continuity is not present, repair wire 3020 from connector PX12A socket 2 to connector PX14A socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(5) If continuity is present, repair wire 1908 from connector PX12A socket 1 to connector PX17A socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(6) Connect connector PX12A to amber warning light switch lamp base connector.</td>
</tr>
<tr>
<td>(7) Install instrument panel assembly (para 7-15).</td>
</tr>
</tbody>
</table>
e17D. MASTER POWER SWITCH DOES NOT ILLUMINATE

INITIAL SETUP

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

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

START

1. Is continuity present through rocker switch lamp?

KNOWEN INFO
OIL PRESS gage illuminates.

POSSIBLE PROBLEMS
Faulty rocker switch lamp.
Faulty dashboard cable assembly.

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, rocker switch lamp is faulty.

NO

YES

Replace rocker switch lamp (para 7-18).
## CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Remove instrument panel for access (para 7-15).</td>
</tr>
<tr>
<td>2.</td>
<td>Disconnect connector PX17A from master power switch lamp base connector.</td>
</tr>
<tr>
<td>3.</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>4.</td>
<td>Connect positive (+) probe of multimeter to one terminal of lamp base connector.</td>
</tr>
<tr>
<td>5.</td>
<td>Connect negative (-) probe of multimeter to second terminal of lamp base connector and note reading on multimeter.</td>
</tr>
<tr>
<td>6.</td>
<td>If continuity is not present, replace rocker switch lamp (para 7-18).</td>
</tr>
</tbody>
</table>

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

---

**CONNECTOR PX17A**

**MASTER POWER SWITCH**

**LAMP BASE CONNECTOR**

---

**Change 1**

2-386.13
2. If continuity is not present, wire 3020 is faulty. If continuity is present, wire 1908 is faulty.

- **YES**: Repair wire 1908 from connector PX17A socket 1 to connector PX6 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**: Repair wire 3020 from connector PX17A socket 2 to connector PX12A socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**Known Info**
- Oil press gauge illuminates.
- Rocker switch lamp OK.

**Possible Problems**
- Faulty dashboard cable assembly.
**CAUTION**

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

### CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>2</td>
<td>Connect positive (+) probe of multimeter to connector PX17A socket 2.</td>
</tr>
<tr>
<td>3</td>
<td>Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>4</td>
<td>If continuity is not present, repair wire 3020 from connector PX17A socket 2 to connector PX12A socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>5</td>
<td>If continuity is present, repair wire 1908 from connector PX17A socket 1 to connector PX6 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>6</td>
<td>Connect connector PX17A to master power switch lamp base connector.</td>
</tr>
<tr>
<td>7</td>
<td>Install instrument panel assembly (para 7-15).</td>
</tr>
</tbody>
</table>
### e18. REAR BRAKE AIR GAGE DOES NOT ILLUMINATE

**INITIAL SETUP**

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

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

**Personnel Required**
(2)

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

---

**KNOWN INFO**
Ether start switch illuminates.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.
Faulty REAR BRAKE AIR gage.

---

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3020 is faulty.

---

**START**

1. **CAUTION**
Read CAUTION on following page.

**Is continuity present from connector PX5 socket 1 to a known good ground?**

**YES**

Repair wire 3020 from connector PX5 socket 1 to connector PX13A socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
CONTINUITY TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector clamp from REAR BRAKE AIRgage connector.
(3) Disconnect connector PX5 from REAR BRAKE AIRgage connector.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector PX5 socket 1.
(6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(7) If continuity is not present, repair wire 3020 from connector PX5 socket 1 to connector PX13A socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

CAUTION

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

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

CAUTION

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
REAR BRAKE AIR GAGE DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Ether start switch illuminates.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty REAR BRAKE AIR gage.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 1908 is faulty. If 12 VDC is present, REAR BRAKE AIR gage is faulty.

**WARNING**

**CAUTION**
Read WARNING and CAUTION on following page.

2. Is 12 VDC present at connector PX5 socket 2?

**YES**
- Repair wire 1908 from connector PX5 socket 2 to connector PX13A socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
- Replace REAR BRAKE AIR gage (para 7-14).
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

**CAUTION**

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

**WARNING**

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

---

### VOLTAGE TEST

1. **Set multimeter to volts DC.**
2. **Connect positive (+) probe of multimeter to connector PX5 socket 2.**
3. **Connect negative (-) probe of multimeter to ground.**
4. **Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).**
5. **Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1).**
6. **Position dimmer switch for maximum brightness (TM 9-2320-366-10-1) and note reading on multimeter.**
7. **If 12 VDC is not present, repair wire 1908 from connector PX5 socket 2 to connector PX13A socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).**
8. **If 12 VDC is present, replace REAR BRAKE AIR gage (para 7-14).**
9. **Position main light switch to auxiliary lever to OFF (TM 9-2320-366-10-1).**
10. **Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).**
11. **Connect connector PX5 to REAR BRAKE AIR gage connector.**
12. **Connect connector clamp on REAR BRAKE AIR gage connector.**
13. **Install instrument panel (para 7-15).**
e18A. FUEL GAGE DOES NOT ILLUMINATE

INITIAL SETUP

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

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

**Personnel Required**
(2)

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

---

**KNOWN INFO**
FRONT BRAKE AIR gage illuminates.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.
Faulty FUEL gage.

---

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

---

**REASON FOR QUESTION**
If continuity is not present, wire 3020 is faulty.

---

START

1. **CAUTION Read CAUTION on following page.**
   Is continuity present from connector PX9 socket 1 to a known good ground?

   - **Yes**
     Repair wire 3020 from connector PX9 socket 1 to connector PX4 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   - **No**
     If continuity is not present, wire 3020 is faulty.
**CONTINUITY TEST**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(2)</td>
<td>Disconnect connector clamp from FUEL gage connector.</td>
</tr>
<tr>
<td>(3)</td>
<td>Disconnect connector PX9 from FUEL gage connector.</td>
</tr>
<tr>
<td>(4)</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5)</td>
<td>Connect positive (+) probe of multimeter to connector PX9 socket 1.</td>
</tr>
<tr>
<td>(6)</td>
<td>Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(7)</td>
<td>If continuity is not present, repair wire 3020 from connector PX9 socket 1 to connector PX4 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
</tbody>
</table>

**CAUTION**

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

**NOTE**

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
**e18A. FUEL GAGE DOES NOT ILLUMINATE (CONT)**

**KNOWN INFO**
- FRONT BRAKE AIR gage illuminates.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty FUEL gage.

**TEST OPTIONS**

| Voltage Test or STE/ICE-R Test #89 |

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 1908 is faulty. If 12 VDC is present, FUEL gage is faulty.

**2.** Is 12 VDC present at connector PX9 socket 2?

- **NO**
  - Repair wire 1908 from connector PX9 socket 2 to connector PX4 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace FUEL gage (para 7-14).
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

**CAUTION**

WARNING

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector PX9 socket 2.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(5) Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position dimmer switch for maximum brightness (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 VDC is not present, repair wire 1908 from connector PX9 socket 2 to connector PX4 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(8) If 12 VDC is present, replace FUEL gage (para 7-14).</td>
</tr>
<tr>
<td>(9) Position main light switch to auxiliary lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(11) Connect connector PX9 to FUEL gage connector.</td>
</tr>
<tr>
<td>(12) Connect connector clamp on FUEL gage connector.</td>
</tr>
<tr>
<td>(13) Install instrument panel (para 7-15).</td>
</tr>
</tbody>
</table>
**e18B. FRONT BRAKE AIR GAGE DOES NOT ILLUMINATE**

**INITIAL SETUP**

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

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

**Personnel Required**
(2)

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

---

**KNOWLEDGMENT INFO**
Speedometer illuminates.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.  
Faulty FRONT BRAKE AIR gage.

---

**TEST OPTIONS**
Continuity Test or  
STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3020 is faulty.

---

**START**

1. **CAUTION**  
Read CAUTION on following page.

- Is continuity present from connector PX4 socket 1 to a known good ground?

---

**YES**

- Repair wire 3020 from connector PX4 socket 1 to connector PX8 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

---

**NO**
NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

CONTINUITY TEST
1. Remove instrument panel assembly for access (para 7-15).
2. Disconnect connector clamp from FRONT BRAKE AIR gage connector.
3. Disconnect connector PX4 from FRONT BRAKE AIR gage connector.
4. Set multimeter to ohms.
5. Connect positive (+) probe of multimeter to connector PX4 socket 1.
6. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
7. If continuity is not present, repair wire 3020 from connector PX4 socket 1 to connector PX8 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e18B. FRONT BRAKE AIR GAGE DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
Speedometer illuminates.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.
Faulty FRONT BRAKE AIR gage.

2. Is 12 VDC present at connector PX4 socket 2?

**WARNING**
CAUTION
Read WARNING and CAUTION on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 1908 is faulty. If 12 VDC is present, FRONT BRAKE AIR gage is faulty.

- **YES**
  - Repair wire 1908 from connector PX4 socket 2 to connector PX8 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - Replace FRONT BRAKE AIR gage (para 7-14).

- **NO**
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

WARNING

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

CAUTION

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

VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>2</td>
<td>Connect positive (+) probe of multimeter to connector PX4 socket 2.</td>
</tr>
<tr>
<td>3</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>4</td>
<td>Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>5</td>
<td>Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>6</td>
<td>Position dimmer switch for maximum brightness (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If 12 VDC is not present, repair wire 1908 from connector PX4 socket 2 to connector PX8 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>8</td>
<td>If 12 VDC is present, replace FRONT BRAKE AIR gage (para 7-14).</td>
</tr>
<tr>
<td>9</td>
<td>Position main light switch to auxiliary lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>10</td>
<td>Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>11</td>
<td>Connect connector PX4 to FRONT BRAKE AIR gage connector.</td>
</tr>
<tr>
<td>12</td>
<td>Connect connector clamp on FRONT BRAKE AIR gage connector.</td>
</tr>
<tr>
<td>13</td>
<td>Install instrument panel (para 7-15).</td>
</tr>
</tbody>
</table>
e18C. SPEEDOMETER DOES NOT ILLUMINATE

INITIAL SETUP

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

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

KNOWLEDGE

VOLTS gage illuminates.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty speedometer.

START

CAUTION
Read CAUTION
on following page.

1. Is continuity present from
connector PX8 socket 1 to a
known good ground?

YES

NO

TEST OPTIONS
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present,
wire 3020 is faulty.

Repair wire 3020 from connector PX8
socket 1 to connector PX10 socket 1
(para 2-45) or replace WTEC II dashboard
cable assembly (para 7-10) or WTEC III
dashboard cable assembly (para 7-11).
NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

CONTINUITY TEST

1. 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 ohms.
5. Connect positive (+) probe of multimeter to connector PX8 socket 1.
6. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
7. If continuity is not present, repair wire 3020 from connector PX8 socket 1 to connector PX10 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**e18C. SPEEDOMETER DOES NOT ILLUMINATE (CONT)**

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLTS gage illuminates.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty speedometer.</td>
</tr>
</tbody>
</table>

**WARNING**

Read WARNING and CAUTION on following page.

**TEST OPTIONS**

Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 12 VDC is not present, wire 1908 is faulty. If 12 VDC is present, speedometer is faulty.

2. **Is 12 VDC present at connector PX8 socket 2?**

   **YES**

   Repair wire 1908 from connector PX8 socket 2 to connector PX10 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   Replace speedometer (para 7-14).

   **NO**
WARNING

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

CAUTION

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

VOLTAGE TEST

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to connector PX8 socket 2.
3. Connect negative (-) probe of multimeter to ground.
5. Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1).
6. Position dimmer switch for maximum brightness (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 12 VDC is not present, repair wire 1908 from connector PX8 socket 2 to connector PX10 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
8. If 12 VDC is present, replace speedometer (para 7-14).
11. Connect connector PX8 to speedometer connector.
12. Connect connector clamp on speedometer connector.
13. Install instrument panel (para 7-15).
e18D. VOLTS GAGE DOES NOT ILLUMINATE

INITIAL SETUP

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

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, wire 3020 is faulty.

KNOWLEDGE INFO
WATER TEMP gage illuminates.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty VOLTS gage.

CAUTION
Read CAUTION on following page.

1. Is continuity present from connector PX10 socket 1 to a known good ground?

NO

YES

Repair wire 3020 from connector PX10 socket 1 to connector PX11 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**NOTE**
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

**CONTINUITY TEST**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector clamp from VOLTS gage connector.</td>
</tr>
<tr>
<td>3</td>
<td>Disconnect connector PX10 from VOLTS gage connector.</td>
</tr>
<tr>
<td>4</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>5</td>
<td>Connect positive (+) probe of multimeter to connector PX10 socket 1.</td>
</tr>
<tr>
<td>6</td>
<td>Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If continuity is not present, repair wire 3020 from connector PX10 socket 1 to connector PX11 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
</tbody>
</table>

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

![Diagram](image-url)
e18D. VOLTS GAGE DOES NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER TEMP gage illuminates.</td>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td></td>
<td>Faulty VOLTS gage.</td>
</tr>
</tbody>
</table>

2. Is 12 VDC present at connector PX10 socket 2?

- **WARNING CAUTION**
  Read WARNING and CAUTION on following page.

- **TEST OPTIONS**
  Voltage Test or STE/ICE-R Test #89

- **REASON FOR QUESTION**
  If 12 VDC is not present, wire 1908 is faulty. If 12 VDC is present, VOLTS gage is faulty.

**YES**

- Repair wire 1908 from connector PX10 socket 2 to connector PX11 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**

Replace VOLTS gage (para 7-14).
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

## WARNING

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

## CAUTION

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

### VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>2</td>
<td>Connect positive (+) probe of multimeter to connector PX10 socket 2.</td>
</tr>
<tr>
<td>3</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>4</td>
<td>Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>5</td>
<td>Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>6</td>
<td>Position dimmer switch for maximum brightness (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If 12 VDC is not present, repair wire 1908 from connector PX10 socket 2 to connector PX11 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>8</td>
<td>If 12 VDC is present, replace VOLTS gage (para 7-14).</td>
</tr>
<tr>
<td>9</td>
<td>Position main light switch auxiliary lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>10</td>
<td>Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>11</td>
<td>Connect connector PX10 to VOLTS gage connector.</td>
</tr>
<tr>
<td>12</td>
<td>Connect connector clamp on VOLTS gage connector.</td>
</tr>
<tr>
<td>13</td>
<td>Install instrument panel (para 7-15).</td>
</tr>
</tbody>
</table>
e18E. WATER TEMP GAGE DOES NOT ILLUMINATE

INITIAL SETUP

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

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

Materials/Parts
Dimmer Switch Test Wire (Item 20, Appendix E)

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE
Perform Electrical System Troubleshooting e1. Circuit Breaker Does Not Operate on circuit breaker CB70 prior to beginning this task.

START

 CAUTION
Read CAUTION on following page.

1. Is continuity present from main light switch pin F to pin B?

KNOW INFO
Circuit breaker CB70 OK.

POSSIBLE PROBLEMS
Faulty main light switch.
Faulty dimmer switch.
Faulty dashboard cable assembly.
Faulty WATER TEMP gage.

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, main light switch is faulty.

NO

YES

Replace main light switch (para 7-17).
CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove PDP cover (TM 9-2320-366-10-2).</td>
</tr>
<tr>
<td>(2) Remove circuit breaker CB70 from PDP.</td>
</tr>
<tr>
<td>(3) Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(4) Disconnect connector PX15 from main light switch connector.</td>
</tr>
<tr>
<td>(5) Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position main light switch auxiliary selector lever to PNL BRT (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(7) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(8) Connect positive (+) probe of multimeter to main light switch connector pin F.</td>
</tr>
<tr>
<td>(9) Connect negative (-) probe of multimeter to main light switch connector pin B and note reading on multimeter.</td>
</tr>
<tr>
<td>(10) If continuity is not present, replace main light switch (para 7-17).</td>
</tr>
<tr>
<td>(11) Position main light switch auxiliary lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(12) Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e18E. WATER TEMP GAGE DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Main light switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty dimmer switch.
- Faulty WATER TEMP gage.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 1586 is faulty.

1. Is 12 VDC present at connector PX15 socket F?

2. **NO**
   - Repair wire 1586 from connector PX15 socket F to circuit breaker CB70 socket 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

2. **YES**
   - Read WARNING and CAUTION on following page.
**WARNING**

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

**CAUTION**

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

### VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Install circuit breaker CB70 on PDP.</td>
</tr>
<tr>
<td>2</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>3</td>
<td>Connect positive (+) probe of multimeter to connector PX15 socket F.</td>
</tr>
<tr>
<td>4</td>
<td>Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>5</td>
<td>If 12 VDC is not present, repair wire 1586 from connector PX15 socket F to circuit breaker CB70 socket 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
</tbody>
</table>
e18E. WATER TEMP GAGE DOES NOT ILLUMINATE (CONT)

**WARNING**

**CAUTION**

Read WARNING and CAUTION on following page.

**TEST OPTIONS**

Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 12 VDC is not present, wire 1542 is faulty.

**KNOWN INFO**

- Circuit breaker CB70 OK.
- Main light switch OK.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.
- Faulty dimmer switch.
- Faulty WATER TEMP gage.

3. Is 12 VDC present at connector PX24 socket 1?

**YES**

Repair wire 1542 from connector PX24 socket 1 to connector PX15 socket B (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
If 12 VDC is not present, repair wire 1542 from connector PX24 pin 1 to connector PX15 socket B (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Position main light switch auxiliary lever to OFF (TM 9-2320-366-10-1).

Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).

Install PDP cover (TM 9-2320-366-10-1).

WARNING

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

CAUTION

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove circuit breaker CB70 from PDP.</td>
</tr>
<tr>
<td>(2) Connect connector PX15 to main light switch connector.</td>
</tr>
<tr>
<td>(3) Install circuit breaker CB70 on PDP.</td>
</tr>
<tr>
<td>(4) Disconnect connector clamp from dimmer switch connector.</td>
</tr>
<tr>
<td>(5) Disconnect connector PX24 from dimmer switch connector.</td>
</tr>
<tr>
<td>(6) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(7) Connect positive (+) probe of multimeter to connector PX24 socket 1.</td>
</tr>
<tr>
<td>(8) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(9) Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(11) If 12 VDC is not present, repair wire 1542 from connector PX24 pin 1 to connector PX15 socket B (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(12) Position main light switch auxiliary lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(13) Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(14) Install PDP cover (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
WARNING
CAUTION
Read WARNING and CAUTION on following page.

Is 12 VDC present at dimmer switch connector socket 2?

If 12 VDC is not present, dimmer switch is faulty.

Yes

Replace dimmer switch (para 7-12).

No
CONTINUITY TEST

2. Install dimmer switch test wire pin in connector PX24 socket 1.
3. Install dimmer switch test wire socket on dimmer switch connector pin 1.
4. Set multimeter to volts DC.
5. Connect positive (+) probe of multimeter to dimmer switch connector socket 2.
6. Connect negative (-) probe of multimeter to ground.
7. Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).
8. Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1) and note reading on multimeter.
9. If 12 VDC is not present, replace dimmer switch (para 7-12).
12. Disconnect dimmer switch test wire from dimmer switch connector.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
e18E. WATER TEMP GAGE DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Main light switch OK.
- Dimmer switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty WATER TEMP gage.

5.
**Is continuity present from connector PX11 socket 2 to connector PX24 pin 2?**

- **YES**
  - CAUTION: Read CAUTION on following page.
  - **TEST OPTIONS**
    - Continuity Test or STE/ICE-R Test #91
  - **REASON FOR QUESTION**
    - If continuity is not present, wire 1908 is faulty.
  - Repair wire 1908 from connector PX11 socket 2 to connector PX24 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**

6.
**Is continuity present from connector PX11 socket 1 to a known good ground?**

- **YES**
  - CAUTION: Read CAUTION on following page.
  - **TEST OPTIONS**
    - Continuity Test or STE/ICE-R Test #91
  - **REASON FOR QUESTION**
    - If continuity is not present, wire 3020 is faulty. If continuity is present, WATER TEMP gage is faulty.
  - Repair wire 3020 from connector PX11 socket 1 to connector PX6 socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**

Replace WATER TEMP gage (para 7-14).
CONTINUITY TEST

(1) Disconnect connector clamp from WATER TEMP gage connector.
(2) Disconnect connector PX11 from WATER TEMP gage connector.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector PX11 socket 2.
(5) Connect negative (-) probe of multimeter to connector PX24 pin 2 and note reading on multimeter.
(6) If continuity is not present, repair wire 1908 from connector PX11 socket 2 to connector PX24 socket 2 (para 2-45) 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 connector.
(8) Connect connector clamp on dimmer switch connector.
(9) Connect connector PX11 to WATER TEMP gage connector.
(10) Install instrument panel assembly (para 7-15).

CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
e19. OIL PRESS GAGE DOES NOT ILLUMINATE

**INITIAL SETUP**

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

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

**Materials/Parts**
Dimmer Switch Test Wire (Item 20, Appendix E)

**Personnel Required**
(2)

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

**NOTE**
Perform Electrical System Troubleshooting

1. Circuit Breaker Does Not Operate on
circuit breaker CB70 prior to beginning this task.

**Known Info**
- Circuit breaker CB70 OK.

**Possible Problems**
- Faulty main light switch.
- Faulty dimmer switch.
- Faulty dashboard cable assembly.
- Faulty OIL PRESS gage.

**Test Options**
- Continuity Test or
STE/ICE-R Test #91

**Reason for Question**
If continuity is not present,
main light switch is faulty.

**Start**

CAUTION
Read CAUTION on following page.

1. Is continuity present from
main light switch pin F to
pin B?

**No**

**Yes**
Replace main light switch
(para 7-17).
CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
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<tbody>
<tr>
<td>(1) Remove PDP cover (TM 9-2320-366-10-2).</td>
</tr>
<tr>
<td>(2) Remove circuit breaker CB70 from PDP.</td>
</tr>
<tr>
<td>(3) Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(4) Disconnect connector PX15 from main light switch connector.</td>
</tr>
<tr>
<td>(5) Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position main light switch auxiliary selector lever to PNL BRT (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(7) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(8) Connect positive (+) probe of multimeter to main light switch connector pin F.</td>
</tr>
<tr>
<td>(9) Connect negative (-) probe of multimeter to main light switch connector pin B and note reading on multimeter.</td>
</tr>
<tr>
<td>(10) If continuity is not present, replace main light switch (para 7-17).</td>
</tr>
<tr>
<td>(11) Position main light switch auxiliary lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(12) Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
Is 12 VDC present at connector PX15 socket F?

If 12 VDC is not present, wire 1586 is faulty.

2. POSSIBLE PROBLEMS
- Faulty dashboard cable assembly.
- Faulty dimmer switch.
- Faulty OIL PRESS gage.

TEST OPTIONS
- Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION
- If 12 VDC is not present, wire 1586 is faulty.

YES
- Repair wire 1586 from connector PX15 socket F to circuit breaker CB70 socket 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**WARNING**

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

**CAUTION**

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

---

**VOLTAGE TEST**

1. Install circuit breaker CB70 on PDP.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector PX15 socket F.
4. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
5. If 12 VDC is not present, repair wire 1586 from connector PX15 socket F to circuit breaker CB70 socket 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e19. OIL PRESS GAGE DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Main light switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty dimmer switch.
- Faulty OIL PRESS gage.

---

**WARNING**
- CAUTION
- Read WARNING and CAUTION on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 1542 is faulty.

3. **Is 12 VDC present at connector PX24 socket 1?**

   **NO**

   **YES**

   Repair wire 1542 from connector PX24 socket 1 to connector PX15 socket B (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**WARNING**

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

**CAUTION**

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

### VOLTAGE TEST

1. Remove circuit breaker CB70 from PDP.
2. Connect connector PX15 to main light switch connector.
3. Install circuit breaker CB70 on PDP.
4. Disconnect connector clamp from dimmer switch connector.
5. Disconnect connector PX24 from dimmer switch connector.
6. Set multimeter to volts DC.
7. Connect positive (+) probe of multimeter to connector PX24 socket 1.
8. Connect negative (-) probe of multimeter to ground.
10. Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1) and note reading on multimeter.
11. If 12 VDC is not present, repair wire 1542 from connector PX24 pin 1 to connector PX15 socket B (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e19. OIL PRESS GAGE DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Main light switch OK.

**POSSIBLE PROBLEMS**
- Faulty dimmer switch.
- Faulty dashboard cable assembly.
- Faulty OIL PRESS gage.

**WARNING**

**CAUTION**
Read WARNING and CAUTION on following page.

4. Is 12 VDC present at dimmer switch connector socket 2?

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, dimmer switch is faulty.

**YES**
Replace dimmer switch (para 7-12).

**NO**
CONTINUITY TEST

WARNING

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

CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Position dimmer switch for maximum brightness (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(2) Install dimmer switch test wire pin in connector PX24 socket 1.</td>
</tr>
<tr>
<td>(3) Install dimmer switch test wire socket on dimmer switch connector pin 1.</td>
</tr>
<tr>
<td>(4) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to dimmer switch connector socket 2.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(7) Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(8) Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(9) If 12 VDC is not present, replace dimmer switch (para 7-12).</td>
</tr>
<tr>
<td>(10) Position main light switch auxiliary lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(11) Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(12) Disconnect dimmer switch test wire from dimmer switch connector.</td>
</tr>
<tr>
<td>(13) Disconnect dimmer switch test wire from connector PX24.</td>
</tr>
</tbody>
</table>

XBC/0643
e19. OIL PRESS GAGE DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Main light switch OK.
- Dimmer switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty OIL PRESS gage.

5. **TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 1908 is faulty.

**CAUTION**
Read CAUTION on following page.

- Is continuity present from connector PX6 socket 2 to connector PX24 pin 2?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 1908 is faulty.

**YES**
Repair wire 1908 from connector PX6 socket 2 to connector PX24 pin 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
Replace OIL PRESS gage (para 7-14).

6. **CAUTION**
Read CAUTION on following page.

- Is continuity present from connector PX6 socket 1 to a known good ground?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3020 is faulty. If continuity is present, OIL PRESS gage is faulty.

**NO**
Repair wire 3020 from connector PX6 socket 1 to connector PX17A socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**YES**
Replace OIL PRESS gage (para 7-14).
CONTINUITY TEST

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

(1) Disconnect connector clamp from OIL PRESS gage connector.
(2) Disconnect connector PX6 from OIL PRESS gage connector.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector PX6 socket 2.
(5) Connect negative (-) probe of multimeter to connector PX24 pin 2 and note reading on multimeter.
(6) If continuity is not present, repair wire 1908 from connector PX6 socket 2 to connector PX24 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX6 socket 1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3020 from connector PX6 socket 1 to connector PX17A socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace OIL PRESS gage (para 7-14).
(6) Connect connector PX24 to dimmer switch connector.
(7) Connect connector clamp on dimmer switch connector.
(8) Connect connector PX6 to OIL PRESS gage connector.
(9) Connect connector clamp on OIL PRESS gage connector.
(10) Install instrument panel assembly (para 7-15).
e20. AUXILIARY PANEL, PERSONNEL HEATER, AND INSTRUMENT PANEL DO NOT ILLUMINATE

INITIAL SETUP

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>(2)</td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
<td></td>
</tr>
</tbody>
</table>

References

TM 9-4910-571-12&P

START

1. Is continuity present between main light switch terminals B and F?

KNOWN INFO

Circuit breaker OK. Other lights operate.

POSSIBLE PROBLEMS

Faulty main light switch. Faulty dashboard cable assembly. Faulty dimmer switch.

TEST OPTIONS

Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION

If continuity is not present, main light switch is faulty.

YES

Replace main light switch (para 7-17).

NO
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 9-2320-366-10-1).
(5) Position main light switch auxiliary lever to PANEL BRT (TM 9-2320-366-10-1).
(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 9-2320-366-10-1).
If continuity is not present, wire 1542 is faulty.

Is continuity present between connector PX15-B and connector PX24-1?

YES

REPAIR/REPLACE:
- Repair wire 1542 (para 2-45)
- Repair WTEC II dashboard cable assembly (para 7-10)
- Repair WTEC III dashboard cable assembly (para 7-11)

NO

REPAIR/REPLACE:
- Repair dimmer switch (para 7-12)

If continuity is not present, dimmer switch is faulty. If continuity is present, wire 1908 is faulty.

Is continuity present between connector JX24 terminals 1 and 2?

YES

REPAIR/REPLACE:
- Repair wire 1908 (para 2-45)
- Repair WTEC II dashboard cable assembly (para 7-10)
- Repair WTEC III dashboard cable assembly (para 7-11)

NO

CIRCUIT BREAKER OK.
Other lights operate.
Main light switch OK.
Faulty dimmer switch.
Faulty dashboard cable assembly.

KNOWLEDGMENT:
- Circuit breaker OK.
- Other lights operate.
- Main light switch OK.
- Faulty dimmer switch.
- Faulty dashboard cable assembly.

POSSIBLE PROBLEMS:
- Faulty dimmer switch.
- Faulty dashboard cable assembly.

TEST OPTIONS:
- Continuity Test or STE/ICE-R #91

REASON FOR QUESTION:
- If continuity is not present, wire 1542 is faulty.
- If continuity is not present, dimmer switch is faulty. If continuity is present, wire 1908 is faulty.
**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 2-45) 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 9-2320-366-10-1).
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 2-45) 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).
e21. TACHOMETER DOES NOT ILLUMINATE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)

Personnel Required
(2)

References
TM 9-4910-571-12&P

1. KNOWN INFO
Hazard lights switch illuminates.

POSSIBLE PROBLEMS
Faulty auxiliary panel cable assembly.
Faulty dashboard cable assembly.
Faulty tachometer.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P901 socket 1 to a known good ground?

YES
Go to step 4 of this fault.

NO

START

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

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

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

**NOTE**

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

### CONTINUITY TEST

1. 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 connector P901 socket 1.
7. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
8. If continuity is not present, go to step 4 of this fault.
e21. TACHOMETER DOES NOT ILLUMINATE (CONT)

### KNOWN INFO
- Hazard lights switch illuminates.

### POSSIBLE PROBLEMS
- Faulty auxiliary panel cable assembly.
- Faulty dashboard cable assembly.
- Faulty tachometer.

### TEST OPTIONS
- Voltage Test or STE/ICE-R Test #89

### WARNING
Read WARNING and CAUTION on following page.

### CAUTION

### REASON FOR QUESTION
If 12 VDC is present, tachometer is faulty.

2. Is 12 VDC present at connector P901 socket 2?

#### YES
Replace tachometer (para 7-21).

#### NO
Go to step 3 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 circuits and cause severe burns or electrical shock.

CAUTION

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector P901 socket 2.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(5) Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If 12 VDC is not present, go to step 3 of this fault.</td>
</tr>
<tr>
<td>(7) If 12 VDC is present, replace tachometer (para 7-21).</td>
</tr>
<tr>
<td>(8) Position main light switch auxiliary lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e21. TACHOMETER DOES NOT ILLUMINATE (CONT)

3. TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION
If 12 VDC is not present, wire 1908 in dashboard cable assembly is faulty. If 12 VDC is present, wire 1908 in auxiliary panel cable is faulty.

KNOWLEDGEMENT
Hazard lights switch illuminates.
Tachometer OK.

POSSIBLE PROBLEMS
Faulty auxiliary panel cable assembly.
Faulty dashboard cable assembly.

WARNING
Read WARNING and CAUTION on following page.

YES

Is 12 VDC present at connector J913 socket 11?

NO

Repair wire 1908 from connector J913 socket 11 to connector PX14A socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

YES

Repair wire 1908 from connector P913 pin 11 to connector P901 socket 2 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
VOLTAGE TEST

(1) Remove personnel heater for access (para 18-9).
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector J913 socket 11.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch main selector lever to SER DRIVE (TM 9-2320-366-10-1).
(6) Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 12 VDC is not present, repair wire 1908 from connector J913 socket 11 to connector PX14A socket 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If 12 VDC is present, repair wire 1908 from connector P913 pin 11 to connector P901 socket 2 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(9) Position main light switch auxiliary lever to OFF (TM 9-2320-366-10-1).
(10) Position main light switch main selector lever to OFF (TM 9-2320-366-10-1).
(11) Install personnel heater assembly (para 18-9).
e21. TACHOMETER DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
Hazard lights switch illuminates.
Tachometer OK.

**POSSIBLE PROBLEMS**
Faulty auxiliary panel cable assembly.
Faulty dashboard cable assembly.

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, auxiliary panel cable assembly is faulty.

---

4. Is continuity present from connector P901 socket 1 to connector P913 pin 10?

**CAUTION**
Read CAUTION on following page.

---

NO

YES

Repair wire 3020 from connector P901 socket 1 to connector P913 pin 10 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).

---

Repair wire 3020 from connector J 913 socket 10 to terminal board TB2 position 31 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**CAUTION**

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

**NOTE**

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

---

### CONTINUITY TEST

1. Remove personnel heater assembly for access (para 18-9).
2. Disconnect connector P913 from connector J913.
3. Set multimeter to ohms.
4. Connect positive (+) probe of multimeter to connector P901 socket 1.
5. Connect negative (-) probe of multimeter to connector P913 pin 10 and note reading on multimeter.
6. If continuity is not present, repair wire 3020 from connector P901 socket 1 to connector P913 pin 10 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
7. If continuity is present, repair wire 3020 from connector J913 socket 10 to terminal board TB2 position 31 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
8. Install personnel heater assembly (para 18-9).
### e22. AUXILIARY PANEL SWITCH DOES NOT ILLUMINATE

**INITIAL SETUP**

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td>Personnel Required</td>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
</tr>
<tr>
<td>(2)</td>
<td>Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)</td>
</tr>
</tbody>
</table>

**References**

TM 9-4910-571-12&P

---

**START**

1. Is continuity present through lamp?

**KNOWN INFO**

Other auxiliary panel switches illuminate.

**POSSIBLE PROBLEMS**

Faulty lamp. Faulty auxiliary panel cable assembly.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, lamp is faulty.

**YES**

Replace lamp (para 7-18).

**NO**

Continue with troubleshooting.
CONTINUITY TEST

All auxiliary panel switch illumination faults are traced the same way.
Power Take-Off (PTO) switch shown.

| NOTE |
| All auxiliary panel switch illumination faults are traced the same way. |
| Power Take-Off (PTO) switch shown. |

| NOTE |
| Main connector and "A" connector will come off as a unit. |

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).
2. If 12 vdc is not present, wire 1908 is faulty. If 12 vdc is present, wire 3020 is faulty.

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
If 12 vdc is not present, wire 1908 is faulty. If 12 vdc is present, wire 3020 is faulty.

**KNOWN INFO**
Other auxiliary panel switches illuminate. Lamp OK.

**POSSIBLE PROBLEMS**
Faulty auxiliary panel cable assembly.

**FLOW CHART**
- Is 12 vdc present at connector?
  - **NO**
    - Repair wire 1908 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
  - **YES**
    - Repair wire 3020 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
WARNING

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to &quot;A&quot; switch connector terminal 1.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Position main light switch auxiliary lever to PANEL BRT (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(5) Position dimmer switch to maximum brightness (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 vdc is not present, repair wire 1908 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).</td>
</tr>
<tr>
<td>(8) If 12 vdc is present, repair wire 3020 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).</td>
</tr>
<tr>
<td>(9) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Connect PTO switch connector to PTO switch.</td>
</tr>
<tr>
<td>(11) Position auxiliary panel on auxiliary panel housing with six screws.</td>
</tr>
<tr>
<td>(12) Tighten six screws to 24 lb-in. (3 N·m).</td>
</tr>
</tbody>
</table>
1. START

WARNING
Read WARNING on following page.

1. Is 12 vdc present on connector P913-11?

NO

YES

Repair wire 1908 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

SUCCESS

KNOWLEDGE

Instrument panel switches illuminate.

POSSIBLE PROBLEMS

Faulty dashboard cable assembly.
Faulty auxiliary panel cable assembly.

TEST OPTIONS

Voltage Test or STE/ICE-R #89

REASON FOR QUESTION

If 12 vdc is not present, wire 1908 is faulty.

REFERENCES

TM 9-4910-571-12&P

IMPLEMENTATION

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

Personnel Required
(2)

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

Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)

INITIAL SETUP

Tools and Special Tools

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

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

VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Remove personnel heater for access (para 18-9).</td>
</tr>
<tr>
<td>(2)</td>
<td>Disconnect connector J913 from connector P913.</td>
</tr>
<tr>
<td>(3)</td>
<td>Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(4)</td>
<td>Connect positive (+) probe of multimeter to connector P913-11.</td>
</tr>
<tr>
<td>(5)</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(6)</td>
<td>Position main light switch to STOP LIGHT and PANEL BRIGHT (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7)</td>
<td>If 12 vdc is not present, repair wire 1908 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(8)</td>
<td>Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
2. Continuity Test

**TEST OPTIONS**
Continuity Test
STE/ICE-R #91

**REASON FOR QUESTION**
If continuity is not present, wire 3020 is faulty.

If continuity is present between connector J913-10 and connector P914A-2?

**KNOWN INFO**
Instrument panel switches illuminate.
Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
Faulty auxiliary panel cable assembly.

**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. Continuity Test

**TEST OPTIONS**
Continuity Test
STE/ICE-R #91

**REASON FOR QUESTION**
If continuity is not present, wire 1908 is faulty.

If continuity is present between connector P913-11 and connector P914A-1?

**KNOWN INFO**
Instrument panel switches illuminate.
Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
Faulty auxiliary panel cable assembly.

**TEST OPTIONS**
Continuity Test
STE/ICE-R #91

**REASON FOR QUESTION**
If continuity is not present, wire 1908 is faulty.

**KNOWN INFO**
Instrument panel switches illuminate.
Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
Faulty auxiliary panel cable assembly.

**TEST OPTIONS**
Continuity Test
STE/ICE-R #91

**REASON FOR QUESTION**
If continuity is not present, wire 1908 is faulty.

If continuity is present between connector J913-10 and connector P914A-2?

If continuity is present between connector P913-11 and connector P914A-1?

**REPAIRS**
Repair wire 3020 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
Repair wire 1908 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).

Fault corrected.
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 P914A-1 and note reading on multimeter.
(6) Connect negative (-) probe of multimeter to connector P914A-2 and note reading on multimeter.
(7) If continuity is not present, repair wire 1908 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).

---

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P914A-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 2-45) or replace auxiliary panel cable assembly (para 7-58).
(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).
24. HIGH ENGINE TEMPERATURE INDICATOR DOES NOT OPERATE

INITIAL SETUP

Equipment Condition
- Engine shut down (TM 9-2320-366-10-1).
- Batteries disconnected (para 7-57).

Personnel Required
- (2)

Tools and Special Tools
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 60, Appendix B)

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

**KNOWN INFO**
- Other indicator lights operate.

**POSSIBLE PROBLEMS**
- Faulty water temperature switch.
- Faulty lighted indicator display lamp.
- Faulty engine control cable assembly.
- Faulty dashboard cable assembly.
- Faulty lighted indicator display.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

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

**FLOW CHART**

START

1. Is continuity present between lighted indicator display terminals 12 and 27?

   NO

   YES

   Go to step 4 of this fault.

YES

NO
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.
24. HIGH ENGINE TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other indicator lights operate. Lighted indicator display OK.</td>
<td>Continuity Test or STE/ICE-R #91</td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
<td>REASON FOR QUESTION</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly. Faulty engine control cable assembly. Faulty water temperature switch.</td>
<td>If continuity is not present, wire 35 is faulty.</td>
</tr>
</tbody>
</table>

2. Is continuity present between connector PX7-12 and connector P37-2?

- **NO**
  - Go to step 5 of this fault.

- **YES**
  - Go to step 6 of this fault.

3. Is continuity present between connector P37-1 and a known good ground?

- **NO**
  - If continuity is not present, wire 3026 is faulty. If continuity is present, water temperature switch is faulty. Go to step 6 of this fault.

- **YES**
  - Replace water temperature switch (para 7-50).
CONTINUITY TEST

(1) Raise cab (TM 9-2320-366-10-1).
(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 7-50).
(6) Connect connector P37 to connector J37.
(7) Connect connector clamp on connector J37.
(8) Lower cab (TM 9-2320-366-10-1).
24. HIGH ENGINE TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)

- **Known info**: Other indicator lights operate.
- **Possible problems**: Faulty lighted indicator display lamp. Faulty lighted indicator display.

4. Is continuity present through high engine temperature indicator lamp?

   - **Test options**: Continuity Test or STE/ICE-R #91
   - **Reason for question**: If continuity is not present, high engine temperature indicator lamp is faulty. If continuity is present, lighted indicator display is faulty.

   - **Yes**
     - Replace high engine temperature indicator lamp (para 7-16).

   - **No**
     - Replace lighted indicator display (para 7-16).
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 7-57).
24. 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.

**Test Options (cont)**
- Repair wire 35 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**Reason for Question (cont)**
- Repair wire 3026 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**Test Options (final)**
- Repair wire 3026 (para 2-45) or replace engine control cable assembly (para 7-80).
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) If continuity is present, repair wire 35 (para 2-45) or replace engine control cable assembly (para 7-80).
(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 7-57).
**e24A. HIGH ENGINE TEMPERATURE INDICATOR ILLUMINATES**

**INITIAL SETUP**

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

**Personnel Required**
- (2)

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

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

---

**KNOW INFO**

- Engine temperature is below 216° F (102° C) when high engine temperature indicator illuminates.

**POSSIBLE PROBLEMS**

- Faulty coolant temperature light switch.
- Faulty LAMP TEST switch (if equipped).
- Faulty engine control cable assembly.
- Faulty WTEC II dashboard cable assembly.
- Faulty WTEC III dashboard cable assembly.

---

**CAUTION**

Read CAUTION on following page.

**START**

1. Does high engine temperature indicator illuminate when master power switch is positioned to on?

**TEST OPTIONS**

- Operational Test

**REASON FOR QUESTION**

If high engine temperature indicator does not illuminate when master power switch is positioned to on, coolant temperature light switch is faulty.

---

**YES**

Replace coolant temperature light switch (para 7-22).

**NO**

---

2-418.2 Change 2

---
Ensure engine has cooled before performing this troubleshooting task. Failure to comply may result in incorrect test results.

### OPERATIONAL TEST

1. Position master power switch to on (TM 9-2320-366-10-1).
2. Check to see if high engine temperature indicator illuminates (TM 9-2320-366-10-1).
3. If high engine temperature indicator illuminates, replace coolant temperature light switch (para 7-22).
e24A. HIGH ENGINE TEMPERATURE INDICATOR ILLUMINATES (CONT)

**KNOWN INFO**

| Engine temperature is below 216° F (102° C) when high engine temperature indicator illuminates. |
| High engine temperature indicator illuminates when master power switch is positioned to on. |

**POSSIBLE PROBLEMS**

- Faulty coolant temperature light switch.
- Faulty LAMP TEST switch (if equipped).
- Faulty engine control cable assembly.
- Faulty WTEC II dashboard cable assembly.
- Faulty WTEC III dashboard cable assembly.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is present, coolant temperature light switch is faulty.

---

2. Is continuity present from coolant temperature light switch connector socket 2 to known good ground?

- **NO**
  - Go to step 3 of this fault.

- **YES**
  - Replace coolant temperature light switch (para 7-22).
CAUTION

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

NOTE

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

## CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Raise cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector clamp from coolant temperature light switch connector.</td>
</tr>
<tr>
<td>3</td>
<td>Disconnect connector P37 from coolant temperature light switch.</td>
</tr>
<tr>
<td>4</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>5</td>
<td>Connect positive (+) probe of multimeter to coolant temperature light switch connector socket 2.</td>
</tr>
<tr>
<td>6</td>
<td>Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If continuity is not present, go to step 3 of this fault.</td>
</tr>
<tr>
<td>8</td>
<td>If continuity is present, replace coolant temperature light switch (para 7-22).</td>
</tr>
<tr>
<td>9</td>
<td>Connect connector P37 to coolant temperature light switch.</td>
</tr>
<tr>
<td>10</td>
<td>Connect connector clamp to coolant temperature light switch connector.</td>
</tr>
<tr>
<td>11</td>
<td>Lower cab (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

CTE 2 2-418.5
3. Is vehicle equipped with LAMP TEST switch?

**Known Info**
- Engine temperature is below 216°F (102°C) when high engine temperature indicator illuminates.
- High engine temperature indicator illuminates when master power switch is positioned to on.
- Coolant temperature light switch OK.

**Possible Problems**
- Faulty LAMP TEST switch (if equipped).
- Faulty engine control cable assembly.
- Faulty WTEC II dashboard cable assembly.
- Faulty WTEC III dashboard cable assembly.

**Test Options**
- Visual Inspection

**Reason for Question**
This question eliminates possible problems and determines where troubleshooting continues.

**Diagram Flow**
- **Yes**
  - Go to step 6 of this fault.
- **No**
  - Is vehicle equipped with LAMP TEST switch?

4. Is TRANS OIL TEMP indicator illuminated?

**Known Info**
- Engine temperature is below 216°F (102°C) when high engine temperature indicator illuminates.
- High engine temperature indicator illuminates when master power switch is positioned to on.
- Coolant temperature light switch OK.

**Possible Problems**
- Faulty LAMP TEST switch.
- Faulty engine control cable assembly.
- Faulty WTEC II dashboard cable assembly.
- Faulty WTEC III dashboard cable assembly.

**Test Options**
- Operational Test

**Reason for Question**
If TRANS OIL TEMP indicator illuminates with high engine temperature indicator, LAMP TEST switch is faulty.

**Diagram Flow**
- **Yes**
  - Go to step 5 of this fault.
- **No**
  - Is TRANS OIL TEMP indicator illuminated?

Replace LAMP TEST switch (par 7-18).
OPERATIONAL TEST

(1) Position master power switch to on (TM 9-2320-366-10-1).
(2) Check to see if TRANS OIL TEMP indicator illuminates (TM 9-2320-366-10-1).
(3) If TRANS OIL TEMP indicator does not illuminate, go to step 5 of this fault.
(4) If TRANS OIL TEMP indicator illuminates, replace LAMP TEST switch (para 7-18).
(5) Position master power switch to off (TM 9-2320-366-10-1).
e24A. HIGH ENGINE TEMPERATURE INDICATOR ILLUMINATES (CONT)

**KNOWN INFO**

- Engine temperature is below 216°F (102°C) when high engine temperature indicator illuminates.
- High engine temperature indicator illuminates when master power switch is positioned to on.
- Coolant temperature light switch OK.

**POSSIBLE PROBLEMS**

- Faulty LAMP TEST switch.
- Faulty engine control cable assembly.
- Faulty WTEC II dashboard cable assembly.
- Faulty WTEC III dashboard cable assembly.

**TEST OPTIONS**

- Operational Test

**REASON FOR QUESTION**

If high engine temperature indicator does not illuminate when connector PX2 is disconnected, LAMP TEST switch is faulty. If high engine temperature indicator illuminates when connector PX2 is disconnected, go to step 7 of this fault.

---

5. Does high engine temperature indicator illuminate when connector PX2 is disconnected?

**YES**

Replace LAMP TEST switch (para 7-18).

**NO**

Go to step 7 of this fault.
(1) Remove instrument panel for access (para 7-15).
(2) Disconnect connector PX2 from LAMP TEST switch connector.
(3) Position master power switch to on (TM 9-2320-366-10-1).
(4) Check to see if high engine temperature indicator illuminates (TM 9-2320-366-10-1).
(5) If high engine temperature indicator does not illuminate, replace LAMP TEST switch (para 7-18).
(6) If high engine temperature indicator illuminates, go to step 7 of this fault.
e24A. HIGH ENGINE TEMPERATURE INDICATOR ILLUMINATES (CONT)

**KNOWN INFO**

Is vehicle equipped with connector PX2?

- **YES**
  - Go to step 9 of this fault.

- **NO**
  - Visual Inspection
  - Reason for Question: This question eliminates possible problems and determines where troubleshooting continues.

**POSSIBLE PROBLEMS**

- Faulty engine control cable assembly.
- Faulty WTEC II dashboard cable assembly.
- Faulty WTEC III dashboard cable assembly.

**KNOWN INFO**

Is 24 VDC present at connector J31 pin 22?

- **YES**
  - Go to step 10 of this fault.

- **NO**
  - Voltage Test or STE/ICE-R Test #89
  - Reason for Question: This question eliminates possible problems and determines where troubleshooting continues.

**POSSIBLE PROBLEMS**

- Faulty engine control cable assembly.
- Faulty WTEC II dashboard cable assembly.
- Faulty WTEC III dashboard cable assembly.
(1) Remove instrument panel assembly for access (para 7-15).
(2) Check to see if connector PX2 is in dashboard.
(3) If vehicle is not equipped with connector PX2, go step 9 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 circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>(2) Disconnect connector J31 form connector P31.</td>
</tr>
<tr>
<td>(3) Connect batteries (para 7-57)</td>
</tr>
<tr>
<td>(4) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(5) Connect positive (+ ) probe of multimeter to connector J31 pin 22.</td>
</tr>
<tr>
<td>(6) Connect negative probe of multimeter to known good ground.</td>
</tr>
<tr>
<td>(7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(8) If 24 VDC is not present, go to step 10 of this fault.</td>
</tr>
<tr>
<td>(9) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
**e24A. HIGH ENGINE TEMPERATURE INDICATOR ILLUMINATES (CONT)**

**KNOWN INFO**

Engine temperature is below 216°F (102°C) when high engine temperature indicator illuminates.
High engine temperature indicator illuminates when master power switch is positioned to on.
Coolant temperature light switch OK.
LAMP TEST switch OK (if equipped).

**POSSIBLE PROBLEMS**

Faulty engine control cable assembly.
Faulty WTEC II dashboard cable assembly.
Faulty WTEC III dashboard cable assembly.

**TEST OPTIONS**

Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 24 VDC is not present, wire 35 from splice E88 to connector PX2 socket 1 is faulty. If 24 VDC is present, wire 35 from connector P31 socket 22 to connector P37 pin 2 is faulty.

---

8. **WARNING**

Read WARNING on following page.

Is 24 VDC present at connector PX2 socket 1?

**NO**

Repair wire 35 from splice E88 to connector J31 pin 22 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**YES**

Repair wire 35 from connector P31 socket 22 to connector P37 pin 2 (para 2-45) or replace engine control cable assembly (para 7-80).
WARNING

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

VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to connector PX2 socket 1.
(3) Connect negative (-) probe of multimeter to known good ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 VDC is not present, repair wire 35 from splice E88 to connector J31 pin 22 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) If 24 VDC is present, repair wire 35 from connector P31 socket 22 to connector P37 pin 2 (para 2-45) or replace engine control cable assembly (para 7-80).
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Disconnect batteries (para 7-57)
(9) Connect connector P31 to connector J31.

NOTE

Perform step (10) if vehicle is equipped with LAMP TEST switch.

(10) Connect connector PX2 to LAMP TEST switch connector.
(11) Install instrument panel assembly (para 7-15).
(12) Connect batteries (para 7-57).
e24A. HIGH ENGINE TEMPERATURE INDICATOR ILLUMINATES (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine temperature is below 216°F (102°C) when high engine temperature indicator illuminates.</td>
</tr>
<tr>
<td>High engine temperature indicator illuminates when master power switch is positioned to on.</td>
</tr>
<tr>
<td>Coolant temperature light switch OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty engine control cable assembly.</td>
</tr>
<tr>
<td>Faulty WTEC II dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty WTEC III dashboard cable assembly.</td>
</tr>
</tbody>
</table>

**WARNING**
Read WARNING on following page.

9. Is 24 VDC present at connector J31 pin 22?

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 24 VDC is not present, wire 35 from connector PX7 pin 12 to connector J31 pin 22 is faulty. If 24 VDC is present, wire 35 from connector P31 socket 22 to connector P37 pin 2 is faulty.

**YES**
Repair wire 35 from connector PX7 pin 12 to connector J31 pin 22 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or replace WTEC III dashboard cable assembly (para 7-11).

**NO**
Repair wire 35 from connector P31 socket 22 to connector P37 pin 2 (para 2-45) or replace engine control cable assembly (para 7-80).
WARNING

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

VOLTAGE TEST

(1) Disconnect batteries (para 7-57).
(2) Disconnect connector J31 from connector P31.
(3) Connect batteries (para 7-57).
(4) Set multimeter to volts DC.
(5) Connect positive (+) probe of multimeter to connector J31 pin 22.
(6) Connect negative (-) probe of multimeter to known good ground.
(7) Position master power switch to on and note reading on multimeter.
(8) Is 24 VDC is not present, repair wire 35 from connector PX7 pin 12 to connector J31 pin 22 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or replace WTEC III dashboard cable assembly (para 7-11).
(9) If 24 VDC is present, repair wire 35 from connector P31 socket 22 to connector P37 pin 2 (para 2-45) or replace engine control cable assembly (para 7-80).
(10) Position master power switch to off (TM 9-2320-366-10-1).
(11) Disconnect batteries (para 7-57).
(12) Connect connect P31 to connector J31.
(13) Install instrument panel assembly (para 7-15).
(14) Connect batteries (para 7-57).
e24A. HIGH ENGINE TEMPERATURE INDICATOR ILLUMINATES (CONT)

**KNOWN INFO**

Engine temperature is below 216°F (102°C) when high engine temperature indicator illuminates. High engine temperature indicator illuminates when master power switch is positioned to on. Coolant temperature light switch OK. LAMP TEST switch OK (if equipped). Engine control cable assembly OK.

**POSSIBLE PROBLEMS**

Faulty WTEC II dashboard cable assembly.
Faulty WTEC III dashboard cable assembly.

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 24 VDC is not present, wire 35 from connector PX7 pin 12 to splice E88 is faulty. If 24 VDC is present, wire 35 from connector J31 pin 22 to splice E88 is faulty.

**10.** Is 24 VDC present at connector PX2 socket 1?

- **NO**
  - Repair wire 35 from connector PX7 pin 12 to splice E88 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Repair wire 35 from connector J31 pin 22 to splice E88 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
WARNING

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

VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to connector PX2 socket 1.
(3) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 VDC is not present, repair wire 35 from connector PX7 pin 12 to splice E88 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) If 24 VDC is present, repair wire 35 from connector J31 pin 22 to splice E88 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Disconnect batteries (para 7-57)
(9) Connect connector P31 to connector J31.

NOTE

Perform step (10) if vehicle is equipped with LAMP TEST switch.

(10) Connect connector PX2 to LAMP TEST switch connector.
(11) Install instrument panel assembly (para 7-15).
(12) Connect batteries (para 7-57).
### INITIAL SETUP

**Equipment Condition**
- Engine shut down (TM 9-2320-366-10-1).
- Batteries disconnected (para 7-57).

**Personnel Required**
(2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

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

### KNOWN INFO

- CTIS operates normally.
- Faulty CTIS overspeed indicator lamps.
- Faulty lighted indicator display.
- Faulty dashboard cable assembly.
- Fault relay K52.
- Faulty CTIS cable assembly.
- Faulty CTIS ECU.

### POSSIBLE PROBLEMS

### TEST OPTIONS

- Continuity Test or STE/ICE-R #91

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

---

**START**

1. Is continuity present between lighted indicator display terminals 9 and 17?

**NO**

**YES**

Go to step 7 of this fault.
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.
25. CENTRAL TIRE INFLATION SYSTEM (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.

**Test Options**
- Continuity Test or STE/ICE-R #91

**Reason for Question**
- If continuity is not present, wire 3030 is faulty.

2. Is continuity present between connector PX7-17 and a known good ground?

   - **Yes**
     - Repair wire 3030 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
   - **No**

3. Is continuity present between relay K52 terminals 30 and 87A?

   - **Yes**
     - Replace relay K52 (para 7-9).
   - **No**
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).
4. Is 24 VDC present at relay K52 terminal 30?

- **YES**
  - WARNING: Read WARNING on following page.
  - TEST OPTIONS: Voltage Test or STE/ICE-R #89
  - REASON FOR QUESTION: If 24 VDC is not present, wire 1911 is faulty.

- **NO**
  - POSSIBLE PROBLEMS:
    - Faulty dashboard cable assembly.
    - Faulty CTIS ECU.
    - Faulty CTIS cable assembly.
  - WARNING: Read WARNING on following page.
  - TEST OPTIONS: Voltage Test or STE/ICE-R #89
  - REASON FOR QUESTION: This question eliminates possible problems and determines where troubleshooting continues.
  - YES: Repair wire 1911 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - NO: Go to step 8 of this fault.

5. Is 24 VDC present at connector P110-5?

- **YES**
  - WARNING: Read WARNING on following page.
  - TEST OPTIONS: Voltage Test or STE/ICE-R #89
  - REASON FOR QUESTION: This question eliminates possible problems and determines where troubleshooting continues.

- **NO**
  - POSSIBLE PROBLEMS:
    - Faulty CTIS ECU.
    - Faulty dashboard cable assembly.
    - Faulty CTIS cable assembly.
  - WARNING: Read WARNING on following page.
  - TEST OPTIONS: Voltage Test or STE/ICE-R #89
  - REASON FOR QUESTION: This question eliminates possible problems and determines where troubleshooting continues.
  - YES: Go to step 8 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

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disconnect connector P110 from CTIS ECU.</td>
</tr>
<tr>
<td>2</td>
<td>Set multimeter to volts dc.</td>
</tr>
<tr>
<td>3</td>
<td>Connect positive (+) probe of multimeter to connector P110-S.</td>
</tr>
<tr>
<td>4</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>5</td>
<td>Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>6</td>
<td>If 24 vdc is not present, go to step 8 of this fault.</td>
</tr>
<tr>
<td>7</td>
<td>Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>8</td>
<td>Install relay K52 in PDP.</td>
</tr>
<tr>
<td>9</td>
<td>Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
25. CENTRAL TIRE INFLATION SYSTEM (CTIS) OVERSPEED INDICATOR DOES NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTIS operates normally. Lighted indicator display OK. Relay K52 OK.</td>
<td>Continuity Test or STE/ICE-R #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty CTIS ECU. Faulty CTIS cable assembly. Faulty dashboard cable assembly.</td>
<td>If continuity is present, CTIS ECU is faulty.</td>
</tr>
</tbody>
</table>

6. Is continuity present between connector P110-E and connector PX7-9?

**NO**

Go to step 9 of this fault.

**YES**

Replace CTIS ECU (para 12-6).
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 7-57).
25. CENTRAL TIRE INFLATION SYSTEM (CTIS) OVERSPEED INDICATOR DOES NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTIS operates normally.</td>
</tr>
<tr>
<td>Relay K52 OK.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
<tr>
<td>CTIS cable assembly OK.</td>
</tr>
<tr>
<td>CTIS ECU OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty CTIS overspeed indicator lamps.</td>
</tr>
<tr>
<td>Faulty lighted indicator display.</td>
</tr>
</tbody>
</table>

**TEST OPTIONS**

- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**

If continuity is not present, CTIS overspeed indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.

**7.** Is continuity present through CTIS overspeed indicator lamps?

- **YES**
  - Replace CTIS overspeed indicator lamps (para 7-16).
- **NO**
  - Replace lighted indicator display (para 7-16).
**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).
e25. CENTRAL TIRE INFLATION SYSTEM (CTIS) OVERSPEED INDICATOR DOES NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTIS operates normally.</td>
</tr>
<tr>
<td>Relay K52 OK.</td>
</tr>
<tr>
<td>Lighted indicator display OK</td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
</tr>
<tr>
<td>Faulty CTIS cable assembly.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

8. Is continuity present between connector P110-S and connector P111-G?

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, CTIS cable assembly is faulty. If continuity is present, wire 1911 is faulty.</td>
</tr>
</tbody>
</table>

YES

- Replace CTIS cable assembly (para 7-60).

NO

- Repair wire 1911 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
## 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 7-60).
10. If continuity is present, repair wire 1911 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
11. Connect connector P111 to connector J111.
12. Install PDP on dashboard with three screws.
13. Install three washers and screws in PDP.
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).
9. Is continuity present between connector P110-E and connector P111-D?

If continuity is not present, CTIS cable assembly is faulty. If continuity is present, wire 1528 is faulty.

**KNOWN INFO**
- CTIS operates normally.
- Relay K52 OK.
- Lighted indicator display OK.

**POSSIBLE PROBLEMS**
- Faulty CTIS cable assembly.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- CTIS operates normally.
- Relay K52 OK.
- Lighted indicator display OK.

**POSSIBLE PROBLEMS**
- Faulty CTIS cable assembly.
- Faulty dashboard cable assembly.

- Replace CTIS cable assembly (para 7-60).
- Repair wire 1528 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) 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 7-60).
(10) If continuity is present, repair wire 1528 (para 2-45) 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.
e26. CHEMICAL DETECTOR INDICATOR DOES NOT OPERATE

INITIAL SETUP

Equipment Condition
- Engine shut down (TM 9-2320-366-10-1).
- Batteries disconnected (para 7-57).

Personnel Required
- (2)

Tools and Special Tools
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

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

1. Is continuity present between lighted indicator display terminals 2 and 17?
   - YES
     - Go to step 3 of this fault.
   - NO
     - REASON FOR QUESTION
       - This question eliminates possible problems and determines where troubleshooting continues.

KNOWN INFO
- Chemical alarm operates.

POSSIBLE PROBLEMS
- Faulty dashboard cable assembly.
- Faulty chemical detector indicator lamps.
- Faulty lighted indicator display.

TEST OPTIONS
- Continuity Test or STE/ICE-R #91
**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.
26. CHEMICAL DETECTOR INDICATOR DOES NOT OPERATE (CONT)

**KNOWN INFO**
- Chemical alarm operates.
- Lighted indicator display OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.

**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.

2. Is continuity present between connector PX7-17 and a known good ground?

- **NO**
  - Repair wire 3030 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Repair wire 1803 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**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?

- **NO**
  - Replace chemical detector indicator lamps (para 7-16).

- **YES**
  - Replace lighted indicator display (para 7-16).
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

(5) If continuity is present, repair wire 1803 (para 2-45) 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 7-57).

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 7-57).
### e27. LEFT TURN SIGNAL INDICATOR DOES NOT OPERATE

**INITIAL SETUP**

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>Batteries disconnected (para 7-57).</td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td>Personnel Required</td>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
</tr>
<tr>
<td>(2)</td>
<td>Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)</td>
</tr>
</tbody>
</table>

**KNOWN INFO**

- High beam indicator operates.
- Left turn signal operates.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.
- Faulty left turn signal indicator lamps.
- Faulty lighted indicator display.

**TEST OPTIONS**

- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**

- If voltage pulse is not present, wire 1570 is faulty.

**Flowchart**

1. **START**
2. **WARNING**
   - Read WARNING on following page.
   - Is voltage pulse present at connector PX7-6?
3. **NO**
   - Repair wire 1570 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
4. **YES**

**References**

- TM 9-4910-571-12&P
**WARNING**

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

---

### VOLTAGE TEST

1. Remove four 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 7-57).
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 9-2320-366-10-1).
10. Position turn signal to left turn signal position (TM 9-2320-366-10-1) and note reading on multimeter.
11. If voltage pulse is not present, repair wire 1570 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
2. Is continuity present through left turn signal indicator lamps?

NO

YES

Replace lighted indicator display (para 7-16).

Replace left turn signal indicator lamps (para 7-16).

KNOWN INFO
High beam indicator operates. 
Left turn signal operates. 
Dashboard cable assembly OK.

POSSIBLE PROBLEMS
Faulty left turn signal indicator lamps. 
Faulty lighted indicator display.

TEST OPTIONS
Continuity Test or STE/ICE-R #91

REASON FOR QUESTION
If continuity is not present, left turn signal indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.

Replace left turn signal indicator lamps (para 7-16).
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 7-57).

(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).
28. RIGHT TURN SIGNAL INDICATOR DOES NOT OPERATE

INITIAL SETUP

**Equipment Condition**
- Engine shut down (TM 9-2320-366-10-1).
- Batteries disconnected (para 7-57).

**Personnel Required**
(2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

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

**Known Info**
- High beam indicator operates.
- Right turn signal operates.

**Possible Problems**
- Faulty dashboard cable assembly.
- Faulty right turn signal indicator lamps.
- Faulty lighted indicator display.

**Test Options**
- Voltage Test or STE/ICE-R #89

**Reason for Question**
- If voltage pulse is not present, wire 1580 is faulty.

**Flowchart**

1. **Warning**
   - Read WARNING on following page.
   - Is voltage pulse present at connector PX7-4?

   - **Yes**
     - Go to step 3 of this fault.

   - **No**
     - Faulty dashboard cable assembly.
     - Faulty right turn signal indicator lamps.
     - Faulty lighted indicator display.
WARNING

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove four screws from lighted indicator display.</td>
</tr>
<tr>
<td>(2) Remove lighted indicator display from instrument panel assembly.</td>
</tr>
<tr>
<td>(3) Disconnect connector PX7 from lighted indicator display.</td>
</tr>
<tr>
<td>(4) Connect batteries (para 7-57).</td>
</tr>
<tr>
<td>(5) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(6) Connect positive (+) probe of multimeter to connector PX7-4.</td>
</tr>
<tr>
<td>(7) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(8) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Position right signal to right turn signal position (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(11) If voltage pulse is not present, go to step 3 of this fault.</td>
</tr>
<tr>
<td>(12) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(13) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(14) Position turn signal control to middle position (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
2. Is continuity present through right turn signal indicator lamps?

**KNOWN INFO**
- High beam indicator operates.
- Right turn signal operates.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty right turn signal indicator lamps.
- Faulty lighted indicator display.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
If continuity is not present, right turn signal indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.

- YES
  - Replace lighted indicator display (para 7-16).

- NO
  - Replace right turn signal indicator lamps (para 7-16).
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 7-57).
(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 7-57).
28. RIGHT TURN SIGNAL INDICATOR DOES NOT OPERATE (CONT)

**KNOWN INFO**
- High beam indicator operates.
- Right turn signal operates.
- Lighted indicator display OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.

3. **Is continuity present from TB1 position 41 to TB1 position 42?**

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
If continuity is not present, wire 1580 from TB1 position 41 to TB1 position 42 is faulty. If continuity is present, wire 1580 in dashboard cable assembly is faulty.

**YES**
- Repair wire 1580 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
- Repair wire 1580 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>(2)</td>
<td>Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(3)</td>
<td>Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>(4)</td>
<td>Remove three screws from PDP.</td>
</tr>
<tr>
<td>(5)</td>
<td>Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>(6)</td>
<td>Connect positive (+) probe of multimeter to terminal board TB1, position 41.</td>
</tr>
<tr>
<td>(7)</td>
<td>Connect negative (-) probe of multimeter to terminal board TB1, position 42 and note reading on multimeter.</td>
</tr>
<tr>
<td>(8)</td>
<td>If continuity is not present, repair wire 1580 from terminal board TB1, position 41 to terminal TB1, position 42 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(9)</td>
<td>If continuity is present, repair wire 1580 in dashboard cable assembly (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(10)</td>
<td>Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>(11)</td>
<td>Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>(12)</td>
<td>Install PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(13)</td>
<td>Connect lighted indicator display to connector PX7.</td>
</tr>
<tr>
<td>(14)</td>
<td>Position lighted indicator display in instrument panel assembly with four screws.</td>
</tr>
<tr>
<td>(15)</td>
<td>Tighten four screws to 6-10 lb-in. (1 N·m).</td>
</tr>
<tr>
<td>(16)</td>
<td>Connect batteries (para 7-57).</td>
</tr>
</tbody>
</table>
1. Is continuity present between connector PX7-7 and a known good ground?

   **YES**
   - Repair wire 3021 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
   - Replace lighted indicator display (para 7-16).

   **NO**
   - Faulty dashboard cable assembly.
   - Faulty lighted indicator display.

**Known Info**
- Headlight high beams operate.
- Faulty dashboard cable assembly.
- Faulty lighted indicator display.

**Possible Problems**
- Headlight high beams operate.
- Faulty dashboard cable assembly.
- Faulty lighted indicator display.

**Test Options**
- Continuity Test or STE/ICE-R #91

**Reason for Question**
- If continuity is not present, wire 3021 is faulty. If continuity is present, lighted indicator display is faulty.

**Initial Setup**
- Equipment Condition:
  - Engine shut down (TM 9-2320-366-10-1).
  - Batteries disconnected (para 7-57).
- Personnel Required:
  - (2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

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

**Equipment Condition**
- Equipment Condition
  - Engine shut down (TM 9-2320-366-10-1).
  - Batteries disconnected (para 7-57).
- Personnel Required
  - (2)
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If continuity is present, 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 7-57).
### e30. HIGH BEAMS ON INDICATOR DOES NOT OPERATE

<table>
<thead>
<tr>
<th>INITIAL SETUP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment Condition</strong></td>
</tr>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>Batteries disconnected (para 7-57).</td>
</tr>
<tr>
<td><strong>Personnel Required</strong></td>
</tr>
<tr>
<td>(2)</td>
</tr>
<tr>
<td><strong>Tools and Special Tools</strong></td>
</tr>
<tr>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
</tr>
<tr>
<td>Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn signal indicators operate.</td>
</tr>
<tr>
<td>Headlight high beams operate.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty high beam indicator lamps.</td>
</tr>
<tr>
<td>Faulty lighted indicator display.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is present, wire 1681 is faulty.</td>
</tr>
</tbody>
</table>

#### START

1. Is continuity present between lighted indicator display terminals 7 and 24?

   - **YES**
     - Go to step 2 of this fault.
   - **NO**
     - Faulty dashboard cable assembly. |
     - Faulty high beam indicator lamps. |
     - Faulty lighted indicator display.

#### Repair Wire 1681 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) 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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
2. Is continuity present through high beam indicator lamps?

- **YES**
  - Replace high beam indicator lamps (para 7-16).
  - Replace lighted indicator display (para 7-16).

- **NO**
  - If continuity is not present, high beam indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.

**KNOWN INFO**
- Turn signal indicators operate.
- Headlight high beams operate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty high beam indicator lamps.
- Faulty lighted indicator display.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- Replace high beam indicator lamps (para 7-16).
- Replace lighted indicator display (para 7-16).
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 7-57).
e31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT ILLUMINATE

INITIAL SETUP

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

Personnel Required
(2)

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICR-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

References
TM 9-4910-571-12&P

NOTE
Perform Electrical System Troubleshooting

e1. Circuit Breaker Does Not Operate on circuit breaker CB77 prior to beginning this task.

START

1. Does either emergency brake indicator or parking brake indicator illuminate?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking brake operates.</td>
</tr>
<tr>
<td>Circuit breaker CB77 OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty front light cable assembly.</td>
</tr>
<tr>
<td>Faulty low pressure transmitter.</td>
</tr>
<tr>
<td>Faulty emergency brake indicator lamps.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty parking brake indicator lamps.</td>
</tr>
<tr>
<td>Faulty lighted indicator display.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Inspection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>This question eliminates possible problems and determines where troubleshooting continues.</td>
</tr>
</tbody>
</table>

YES

Go to step 7 of this fault.

NO
(1) Start engine (TM 9-2320-366-10-1).
(2) Visually check lighted indicator display.
(3) If emergency brake and parking brake indicator lights both do not illuminate, go to step 7 of this fault.
### e31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking brake operates.</td>
</tr>
<tr>
<td>Circuit breaker CB77 OK.</td>
</tr>
<tr>
<td>Front lights cable assembly OK.</td>
</tr>
<tr>
<td>Low pressure transmitter OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty emergency brake indicator lamps.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty parking brake indicator lamps.</td>
</tr>
<tr>
<td>Faulty lighted indicator display.</td>
</tr>
</tbody>
</table>

**Does emergency brake indicator illuminate?**

- **NO**
  - Go to step 5 of this fault.
- **YES**
  - Go to step 5 of this fault.

**CAUTION**

Read **CAUTION** on following page.

**Test Options**

- Visual Inspection
- Continuity Test or STE/ICE-R Test #91

**Reason for Question**

This question eliminates possible problems and determines where troubleshooting continues.

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking brake operates.</td>
</tr>
<tr>
<td>Circuit breaker CB77 OK.</td>
</tr>
<tr>
<td>Front lights cable assembly OK.</td>
</tr>
<tr>
<td>Low pressure transmitter OK.</td>
</tr>
<tr>
<td>Emergency brake indicator lamps OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty parking brake indicator lamps.</td>
</tr>
<tr>
<td>Faulty lighted indicator display.</td>
</tr>
</tbody>
</table>

**Is continuity present from lighted indicator display socket 27 to socket 22?**

- **NO**
  - Go to step 4 of this fault.
- **YES**
  - Go to step 4 of this fault.

**Test Options**

- Continuity Test or STE/ICE-R Test #91

**Reason for Question**

If continuity is present, wire 1616 is faulty.

**Known Info**

Repair wire 1616 from connector PX7 pin 22 to splice E2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(1) Visually check lighted indicator display.
(2) If emergency brake indicator does not illuminate, go to step 5 of this fault.
(3) Shut down engine (TM 9-2320-366-10-1).

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

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

---

### Continuity Test

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>2</td>
<td>Remove four screws from lighted indicator display.</td>
</tr>
<tr>
<td>3</td>
<td>Remove lighted indicator display from instrument panel assembly.</td>
</tr>
<tr>
<td>4</td>
<td>Disconnect connector PX7 from lighted indicator display.</td>
</tr>
<tr>
<td>5</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>6</td>
<td>Connect positive (+) probe of multimeter to lighted indicator display socket 27.</td>
</tr>
<tr>
<td>7</td>
<td>Connect negative (-) probe of multimeter to lighted indicator display socket 22 and note reading on multimeter.</td>
</tr>
<tr>
<td>8</td>
<td>If continuity is not present, go to step 4 of this fault.</td>
</tr>
<tr>
<td>9</td>
<td>If continuity is present, repair wire 1616 from connector PX7 pin 22 to splice E2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
</tbody>
</table>

---
e31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking brake operates.</td>
</tr>
<tr>
<td>Circuit breaker CB77 OK.</td>
</tr>
<tr>
<td>Front lights cable assembly OK.</td>
</tr>
<tr>
<td>Low pressure transmitter OK.</td>
</tr>
<tr>
<td>Emergency brake indicator lamps OK.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty parking brake indicator lamps.</td>
</tr>
<tr>
<td>Faulty lighted indicator display.</td>
</tr>
</tbody>
</table>

4. Is continuity present through both parking brake indicator lamps?

- **NO**
  - Replace parking brake indicator lamps (para 7-16).
  - Replace lighted indicator display (para 7-16).

- **YES**
  - Replace lighted indicator display (para 7-16).

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, parking brake 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 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 in both lamps, replace lamps (para 7-16).
7. If continuity is present in either lamp, 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).
e31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Parking brake operates.
- Circuit breaker CB77 OK.
- Front lights cable assembly OK.
- Low pressure transmitter OK.
- Parking brake indicator lamps OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty emergency brake indicator lamps.
- Faulty lighted indicator display.

5. **CAUTION**
   Read CAUTION on following page.

Is continuity present from lighted indicator display socket 27 to socket 11?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is present, wire 1616 is faulty.

**YES**
- Go to step 6 of this fault.

**NO**
- Repair wire 1616 from connector PX7 pin 11 to splice E2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(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 socket 27.
(7) Connect negative (-) probe of multimeter to lighted indicator display socket 11 and note reading on multimeter.
(8) If continuity is not present, go to step 6 of this faulty.
(9) If continuity is present, repair wire 1616 from connector PX7 pin 11 to splice E2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

CAUTION

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

NOTE

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

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

STRAIGHT WHEEL
REMOVED FOR CLARITY

INSTRUMENT PANEL ASSEMBLY

LIGHTED INDICATOR DISPLAY

CONNECTOR PX7

SCREW

LIGHTED INDICATOR DISPLAY

XBE3104B
e31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Parking brake operates.
- Circuit breaker CB77 OK.
- Front lights cable assembly OK.
- Low pressure transmitter OK.
- Parking brake indicator lamps OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty emergency brake indicator lamps.
- Faulty lighted indicator display.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, emergency brake indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.

6. Is continuity present through both emergency brake indicator lamps?

- **NO**
  - Replace emergency brake indicator lamps (para 7-16).

- **YES**
  - Replace lighted indicator display (para 7-16).
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 in both lamps, replace lamps (para 7-16).
(7) If continuity is present in either lamp, 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 7-57).
e31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Parking brake operates.
- Circuit breaker CB77 OK.
- Parking brake indicator lamps OK.
- Emergency brake indicator lamps OK.

**POSSIBLE PROBLEMS**
- Faulty lighted indicator display.
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.
- Faulty low pressure transmitter.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, lighted indicator display is faulty.

**CAUTION** Read CAUTION on following page.

7. Is continuity present from lighted indicator display socket 27 to socket 22?

**REASON FOR QUESTION**
- If continuity is not present, lighted indicator display is faulty.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.
- Faulty low pressure transmitter.

8. Is continuity present from connector PX7 pin 22 to connector J27 socket 16?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 1616 is faulty.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.
- Faulty low pressure transmitter.

**KNOWN INFO**
- Parking brake operates.
- Circuit breaker CB77 OK.
- Parking brake indicator lamps OK.
- Emergency brake indicator lamps OK.
- Lighted indicator display OK.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 1616 is faulty.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.
- Faulty low pressure transmitter.

**KNOWN INFO**
- Parking brake operates.
- Circuit breaker CB77 OK.
- Parking brake indicator lamps OK.
- Emergency brake indicator lamps OK.
- Lighted indicator display OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.
- Faulty low pressure transmitter.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, lighted indicator display is faulty.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.
- Faulty low pressure transmitter.

**KNOWN INFO**
- Parking brake operates.
- Circuit breaker CB77 OK.
- Parking brake indicator lamps OK.
- Emergency brake indicator lamps OK.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 1616 is faulty.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.
- Faulty low pressure transmitter.

**KNOWN INFO**
- Parking brake operates.
- Circuit breaker CB77 OK.
- Parking brake indicator lamps OK.
- Emergency brake indicator lamps OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.
- Faulty low pressure transmitter.

**REPAIR**
- Repair wire 1616 from splice E2 to connector J27 socket 16 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) 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 pin 22.
(8) Connect negative (-) probe of multimeter to connector J27 socket 16 and note reading on multimeter.
(9) If continuity is not present, repair wire 1616 from splice E2 to connector J27 socket 16 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

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

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

CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(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 socket 27.
(7) Connect negative (-) probe of multimeter to lighted indicator display socket 22 and note reading on multimeter.
(8) If continuity is not present, go to step 4 of this faulty.
(9) If continuity is not present, replace lighted indicator display (para 7-16).

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

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
**e31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT ILLUMINATE (CONT)**

### KNOWN INFO
- Parking brake operates.
- Circuit breaker CB77 OK.
- Parking brake indicator lamps OK.
- Emergency brake indicator lamps OK.
- Lighted indicator display OK.
- Dashboard cable assembly OK.

### POSSIBLE PROBLEMS
- Faulty front lights cable assembly.
- Faulty low pressure transmitter.

<table>
<thead>
<tr>
<th>9.</th>
<th>CAUTION Read CAUTION on following page.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Is continuity present from connector P27 pin 16 to terminal lug TL202?</td>
</tr>
</tbody>
</table>

### TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

### REASON FOR QUESTION
- If continuity is not present, wire 1616 is faulty.

### YES
- Repair wire 1616 from connector P27 pin 16 to terminal lug TL202 (para 2-45) or replace front lights cable assembly (para 7-82).
CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

CONTINUITY TEST

1. Remove two screws and washers from front grille.
2. Remove screw and washer from front grille.
3. Remove front grille from cab.
4. Set multimeter to ohms.
5. Connect positive (+) probe of multimeter to connector P27 pin 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 from connector P27 pin 16 to terminal lug TL202 (para 2-45) or replace front lights cable assembly (para 7-82).
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 7-57).
e31. PARKING BRAKE INDICATOR AND/OR EMERGENCY BRAKE INDICATOR DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Parking brake operates.
- Circuit breaker CB77 OK.
- Parking brake indicator lamps OK.
- Emergency brake indicator lamps OK.
- Lighted indicator display OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty front lights cable assembly.
- Faulty low pressure transmitter.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3024 is faulty. If continuity is present, low pressure transmitter is faulty.

10. Is continuity present from terminal lug TL201 to a known good ground?

**YES**
- Repair wire 1616 from terminal lug TL201 to terminal lug TL126 (para 2-45) or replace front lights cable assembly (para 7-82).

**NO**
- Replace low pressure transmitter (para 11-30).
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 from terminal lug TL201 to terminal lug TL126 (para 2-45) or replace front lights cable assembly (para 7-82).
(5) If continuity is present, replace low pressure transmitter (para 11-30).
(6) Position front grille on cab with washer and screw.
(7) Position two washers and screws in front grille.
(8) Tighten screw to 48-60 lb-in. (5-7 N·m).
(9) Tighten two screws to 24 lb-in. (3 N·m).
(10) Install PDP in dashboard with three screws.
(11) Install three washers and screws in PDP.
(12) Install PDP cover (para 16-2).
### e32. POWER TAKE-OFF (PTO) INDICATOR DOES NOT OPERATE

#### INITIAL SETUP

**Equipment Condition**
- Engine shut down (TM 9-2320-366-10-1).
- Batteries disconnected (para 7-57).

**Personnel Required**
- (2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

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

#### KNOWN INFO

- Other indicator lamps operate.
- Hydraulic components operate normally.

#### POSSIBLE PROBLEMS

- Faulty lighted indicator display.
- Faulty lamps.
- Faulty dashboard cable assembly.
- Faulty PTO.
- Faulty auxiliary panel cable assembly.
- Faulty PTO cable assembly.

#### TEST OPTIONS

**Continuity Test or STE/ICE-R Test #91**

#### REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

---

**START**

1. Is continuity present between lighted indicator display terminals 10 and 27?

**YES**

- Go to step 4 of this fault.

**NO**
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.
Is continuity present between connector PX7-10 and connector P216-B?

- **YES**: Go to step 5 of this fault.
- **NO**: Wire 2021 is faulty.

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

KNOW INFO
- Other indicator lights operate.
- Hydraulic components operate normally.
- Lighted Indicator display OK.
- Lamps OK.
- Dashboard cable assembly OK.
- Auxiliary panel cable assembly OK.

POSSIBLE PROBLEMS
- Faulty PTO.
- Faulty PTO cable assembly.

3. Is continuity present between connector J216 terminals A and B?

TEST OPTIONS
- Continuity Test or STE/ICE-R #91

REASON FOR QUESTION
- If continuity is not present, PTO is faulty. If continuity is present, wire 3025 is faulty.

YES  NO

Notify DS Maintenance.

Repair wire 3025 (para 2-45) or replace PTO cable assembly (para 7-127).
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 7-57).
(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 9-2320-366-10-1).
(9) Position PTO switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(10) If continuity is not present, notify DS Maintenance.
(11) If continuity is present, repair wire 3025 (para 2-45) or replace PTO cable assembly (para 7-127).
(12) Position PTO switch to off (TM 9-2320-366-10-1).
(13) Shut down engine (TM 9-2320-366-10-1).
(14) Connect connector P216 to connector J216.
4. Is continuity present through PTO indicator lamps?

- **YES**
  - Replace lighted indicator display (para 7-16).

- **NO**
  - Replace PTO indicator lamps (para 7-16).

**KNOWN INFO**
- Other indicator lights operate.
- Hydraulic components operate normally.
- Dashboard cable assembly OK.
- PTO OK.
- Auxiliary panel cable assembly OK.
- PTO cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lighted indicator display.
- Faulty lamps.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- If continuity is not present, PTO 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 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).
32. POWER TAKE-OFF (PTO) INDICATOR DOES NOT OPERATE (CONT)

**KNOW** 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.

5. Is continuity present from connector PX7-10 to connector J913-13?

**TEST OPTIONS**
Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
If continuity is not present, wire 2021 is faulty.

**YES**
Repair wire 2021 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
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 2-45) 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 7-57).
6. Is continuity present from connector P913-13 to connector J210-6?

- **YES**
  - Repair wire 2021 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).

- **NO**
  - If continuity is not present, wire 2021 is faulty.
  - Repair wire 2021 (para 2-45) or replace PTO cable assembly (para 7-127).

**KNOWN INFO**
- Other indicator lights operate.
- Hydraulic components operate normally.
- PTO OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty auxiliary panel cable assembly.
- Faulty PTO cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- Repair wire 2021 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
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 2-45) or replace auxiliary panel cable assembly (para 7-58).
(6) If continuity is present, repair wire 2021 (para 2-45) or replace PTO cable assembly (para 7-127).
(7) Connect connector J210 to connector P210.
(8) Connect connector P913 to connector J913.
(9) Install personnel heater (para 18-9).
**INITIAL SETUP**

**Equipment Condition**
- Engine shut down (TM 9-2320-366-10-1).
- Batteries disconnected (para 7-57).

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

**Personnel Required**
(2)

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

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**e33. FAN OFF INDICATOR DOES NOT OPERATE**

**KNOWN INFO**
- Other indicator lights operate.

**POSSIBLE PROBLEMS**
- Faulty fan off indicator lamps.
- Faulty lighted indicator display.
- Faulty dashboard cable assembly.
- Faulty radiator fan off switch.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

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

---

**START**

1. **Is continuity present between lighted indicator display terminals 26 and 27?**

**NO**

**YES**

- Go to step 2 of this fault.
- Go to step 3 of this fault.
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.
2. Is continuity present through fan off indicator lamps?

- **YES**
  - Replace lighted indicator display (para 7-16).

- **NO**
  - Replace fan off indicator lamps (para 7-16).

**TEST OPTIONS**
- Continuity Test or STE/ICE-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.

**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.
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 7-57).
3. Is continuity present between connector PX7-26 and connector PX1-6?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
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<tbody>
<tr>
<td>Other indicator lights operate.</td>
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<tr>
<td>Lighted indicator display OK.</td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty radiator fan off switch.</td>
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</tbody>
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<tr>
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<tr>
<td>REASON FOR QUESTION</td>
</tr>
<tr>
<td>If continuity is not present, wire 1814 is faulty.</td>
</tr>
</tbody>
</table>

If continuity is present, radiator fan off switch is faulty.

YES

Repair wire 1814 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

NO

Repair wire 3023 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

4. Is continuity present between connector PX1-2 and a known good ground?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
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<tbody>
<tr>
<td>Other indicator lights operate.</td>
</tr>
<tr>
<td>Fan off indicator lamps OK.</td>
</tr>
<tr>
<td>Lighted indicator display OK.</td>
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<tr>
<td>POSSIBLE PROBLEMS</td>
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<td>Faulty dashboard cable assembly.</td>
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<tr>
<td>Continuity Test or STE/ICE-R #91</td>
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<tr>
<td>REASON FOR QUESTION</td>
</tr>
<tr>
<td>If continuity is not present, wire 3023 is faulty. If continuity is present, radiator fan off switch is faulty.</td>
</tr>
</tbody>
</table>

If continuity is present, radiator fan off switch is faulty.

YES

Replace radiator fan off switch (para 7-18).
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector 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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace 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 7-57).
1. Is continuity present between lighted indicator display terminals 8 and 7?

**Known Info:**
- Other indicator lights operate.
- Faulty lighted indicator display.
- Faulty dump up indicator lamps.
- Faulty dashboard cable assembly.
- Faulty M1090/M1094 dump power cable assembly.
- Faulty dump body switch.
- Faulty auxiliary panel cable assembly.

**Possible Problems:**
- Faulty lighted indicator display.
- Faulty dump up indicator lamps.
- Faulty dashboard cable assembly.
- Faulty M1090/M1094 dump power cable assembly.
- Faulty dump body switch.
- Faulty auxiliary panel cable assembly.

**Test Options:**
- Continuity Test or STE/ICE-R #91

**Reason for Question:**
This question eliminates possible problems and determines where troubleshooting continues.

**Start**

**Yes**
- Go to step 4 of this fault.

**No**
- Is continuity present between lighted indicator display terminals 8 and 7?

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

**References**
- 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 8.
6. Connect negative (-) probe of multimeter to lighted indicator display terminal 7 and note reading on multimeter.
7. If continuity is not present, go to step 4 of this fault.
e34. DUMP UP INDICATOR DOES NOT OPERATE (CONT)

2. Is 24 vdc present at connector P172-A?

- **NO**
  - WARNING
    - Read WARNING on following page.

- **YES**
  - Go to step 5 of this fault.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty M1090/M1094 dump power cable assembly.
- Faulty dump body switch.
- Faulty auxiliary panel cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 24 vdc is not present, wire 2034 is faulty.

3. Is continuity present between connector P172-B and a known good ground?

- **NO**
  - Repair wire 3022 (para 2-45) or replace M1090/M1094 dump power cable assembly (para 7-125).

- **YES**
  - Replace dump body switch (para 7-23).

**POSSIBLE PROBLEMS**
- Faulty M1090/M1094 dump power cable assembly.
- Faulty dump body switch.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3022 is faulty. If continuity is present, dump body switch is faulty.

**KNOWN INFO**
- Other indicator lights operate.
- Lighted indicator display OK.
- Dashboard cable assembly OK.
- Auxiliary panel cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty M1090/M1094 dump power cable assembly.
- Faulty dump body switch.
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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 7-57).
(2) Raise dump bed (TM 9-2320-366-10-1).
(3) Disconnect connector P172 from connector J172.
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to connector P172-B.
(6) Connect negative (-) probe of multimeter to ground.
(7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, go to step 5 of this fault.
(9) Position master power switch to off (TM 9-2320-366-10-1).

CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P172-B.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3022 (para 2-45) or replace M1090/M1094 dump power cable assembly (para 7-125).
(6) If continuity is present, replace M1090/M1094 dump body switch (para 7-23).
(7) Connect connector P172 to connector J172.
(8) Lower dump bed (TM 9-2320-366-10-1).
(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 7-57).
4. **Is continuity present through dump up indicator lamps?**

**Yes**
- Replace lighted indicator display (para 7-16).

**No**
- If continuity is not present, dump up indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.
- Replace dump up indicator lamps (para 7-16).

**KNOWN INFO**
- Other indicator lights operate.
- Dashboard cable assembly OK.
- Auxiliary panel cable assembly OK.
- M1090/M1094 dump power cable assembly OK.
- Dump body switch OK.

**POSSIBLE PROBLEMS**
- Faulty dump up indicator lamps.
- Faulty lighted indicator display.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- If continuity is not present, dump up indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.

**POSSIBLE PROBLEMS**
- Other indicator lights operate.
- Dashboard cable assembly OK.
- Auxiliary panel cable assembly OK.
- M1090/M1094 dump power cable assembly OK.
- Dump body switch OK.

- Faulty dump up indicator lamps.
- Faulty lighted indicator display.
CONTINUITY TEST

(1) Loosen four captive screws in lamp mounting panel.
(2) Remove lamp mounting panel from lighted indicator display housing.
(3) Remove dump up indicator lamps from printed circuit board.
(4) Set multimeter to ohms.
(5) Check continuity through each dump up indicator lamp and note reading on multimeter.
(6) If continuity is not present, replace dump up indicator lamps (para 7-16).
(7) If continuity is present, replace lighted indicator display (para 7-16).
(8) Install dump up 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 7-57).
If 24 VDC is not present, wire 2034 is faulty.

5. Is 24 VDC present at connector J912-9?

- **YES**
  - Repair wire 2034 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**
  - If 24 VDC is not present, wire 2034 is faulty.

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
Other indicator lights operate.
Lighted indicator display OK.
Dump body switch OK.
Faulty dashboard cable assembly.
Faulty M1090/M1094 dump power cable assembly.
Faulty auxiliary panel cable assembly.

**KNOWN INFO**
Faulty M1090/M1094 dump power cable assembly.
Faulty auxiliary panel 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.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
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<tbody>
<tr>
<td>(1) Connect lighted indicator display to connector PX7.</td>
</tr>
<tr>
<td>(2) Position lighted indicator display in instrument panel assembly with four screws.</td>
</tr>
<tr>
<td>(3) Tighten four screws to 6-10 lb-in. (1 N-m).</td>
</tr>
<tr>
<td>(4) Connect batteries (para 7-57).</td>
</tr>
<tr>
<td>(5) Remove personnel heater for access (para 18-9).</td>
</tr>
<tr>
<td>(6) Disconnect connector J912 from connector P912.</td>
</tr>
<tr>
<td>(7) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(8) Connect positive (+) probe of multimeter to connector J912-9.</td>
</tr>
<tr>
<td>(9) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(10) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(11) If 24 vdc is not present, repair wire 2034 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(12) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(13) Connect connector P912 to connector J912.</td>
</tr>
</tbody>
</table>
6. Is 24 vdc present at connector J108-18?

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
If 24 vdc is not present, wire 2034 in auxiliary panel cable assembly is faulty. If 24 vdc is present, wire 2034 in M1090/M1094 dump power cable assembly is faulty.

**KNOWN INFO**
Other indicator lights operate.
Lighted indicator display OK.
Dump body switch OK.
Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
Faulty M1090/M1094 dump power cable assembly.
Faulty auxiliary panel cable assembly.

YES
Repair wire 2034 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).

NO

Repair wire 2034 (para 2-45) or replace M1090/M1094 dump power cable assembly (para 7-125).
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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 J108 from connector P108.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector J108-18.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 vdc is not present, repair wire 2034 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(7) If 24 vdc is present, repair wire 2034 (para 2-45) or replace M1090/M1094 dump power cable assembly (para 7-125).
(8) Position master power switch to off (TM 9-2320-366-10-1).
(9) Connect connector P108 to connector J108.
(10) Connect connector P172 to connector J172.
(11) Lower dump bed (TM 9-2320-366-10-1).
(12) Install personnel heater (para 18-9).
1. IS CONTINUITY PRESENT BETWEEN LIGHTED INDICATOR DISPLAY Terminals 20 and 27?

YES

NO

START

TEST OPTIONS

CONTINUITY TEST OR STE/ICE-R #91

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

YES

Go to step 4 of this fault.

NO

KNOWLEDGE INFO

Other indicator lights operate.

POSSIBLE PROBLEMS

Faulty lighted indicator display.
Faulty WTEC II dashboard cable assembly.
Faulty WTEC II cab transmission harness.
Faulty WTEC II transmission ECU pushbutton shift selector (TEPSS).
Faulty transmission temperature indicator lamps.

INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (para 7-57).

Personnel Required
(2)

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

References
TM 9-4910-571-12&P

TM 9-2320-366-20-1

2-498
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.
e35. WTEC II TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)

2. Is continuity present between connector PX7-20 and connector P118-1?

- **YES**
  - Repair wire 1537 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).

- **NO**
  - Other indicator lights operate.
  - Lighted indicator display OK.

**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.

**REPAIR**
- Repair wire 1537 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
3. Is continuity present between connector J118-1 and connector J114-5?

**KNOWLEDGE INFO**
- Other indicator lights operate.
- Lighted indicator display OK.
- WTEC II dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty WTEC II cab transmission harness.
- Faulty WTEC II TEPSS.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- Other indicator lights operate.
- Lighted indicator display OK.
- WTEC II dashboard cable assembly OK.

If continuity is not present, wire 105 is faulty. If continuity is present, WTEC II transmission ECU pushbutton shift selector is faulty.

**YES**
- Repair wire 105 (para 2-45) or replace WTEC II cab transmission harness (para 7-137).

**NO**
- Replace WTEC II TEPSS (para 8-2).
CONTINUITY TEST

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Disconnect connector J114 (bottom connector) from WTEC II TEPSS.</td>
</tr>
<tr>
<td>2.</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>3.</td>
<td>Connect positive (+) probe of multimeter to connector J114-5.</td>
</tr>
<tr>
<td>4.</td>
<td>Connect negative (-) probe of multimeter to connector J118-1 and note reading on multimeter.</td>
</tr>
<tr>
<td>5.</td>
<td>If continuity is not present, repair wire 105 (para 2-45) or replace WTEC II cab transmission harness (para 7-137).</td>
</tr>
<tr>
<td>6.</td>
<td>If continuity is present, replace WTEC II TEPSS (para 8-2).</td>
</tr>
<tr>
<td>7.</td>
<td>Connect connector J114 to WTEC II TEPSS.</td>
</tr>
<tr>
<td>8.</td>
<td>Connect connector J118 to connector P118.</td>
</tr>
<tr>
<td>9.</td>
<td>Install instrument panel assembly (para 7-15).</td>
</tr>
<tr>
<td>10.</td>
<td>Connect lighted indicator display to connector PX7.</td>
</tr>
<tr>
<td>11.</td>
<td>Position lighted indicator display in instrument panel assembly with four screws.</td>
</tr>
<tr>
<td>12.</td>
<td>Tighten four screws to 6-10 lb-in. (1 N·m).</td>
</tr>
<tr>
<td>13.</td>
<td>Connect batteries (para 7-57).</td>
</tr>
</tbody>
</table>
4. Is continuity present through transmission temperature indicator lamps?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other indicator lights operate.</td>
</tr>
<tr>
<td>WTEC II dashboard cable assembly OK.</td>
</tr>
<tr>
<td>WTEC II cab transmission harness OK.</td>
</tr>
<tr>
<td>WTEC II TEPSS OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
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<tbody>
<tr>
<td>Faulty transmission temperature indicator lamps.</td>
</tr>
<tr>
<td>Faulty lighted indicator display.</td>
</tr>
</tbody>
</table>

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<tr>
<th>TEST OPTIONS</th>
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<tr>
<td>Continuity Test or STE/ICE-R #91</td>
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<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, transmission temperature indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.</td>
</tr>
</tbody>
</table>

4. NO

Replace transmission temperature indicator lamps (para 7-16).

4. YES

Replace lighted indicator display (para 7-16).
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 6-10 lb-in. (1 N·m).
(14) Connect batteries (para 7-57).
e36. WTEC III TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE

**INITIAL SETUP**

<table>
<thead>
<tr>
<th><strong>Equipment Condition</strong></th>
<th><strong>Tools and Special Tools</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>Batteries disconnected (para 7-57).</td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th><strong>Personnel Required</strong></th>
<th><strong>Multimeter, Digital (Item 22, Appendix C)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(2)</td>
<td>Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Materials/Parts</strong></th>
<th><strong>References</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire, Elect, 50 ft (Item 71, Appendix D)</td>
<td>TM 9-4910-571-12&amp;P</td>
</tr>
</tbody>
</table>

**KNOWLEDGE**

- Other indicator lights operate.

**POSSIBLE PROBLEMS**

- Faulty lighted indicator display.
- Faulty WTEC III dashboard cable assembly.
- Faulty WTEC III transmission ECU.
- Faulty transmission temperature indicator lamps.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**

- This question eliminates possible problems and determines where troubleshooting continues.

**START**

1. Is continuity present from lighted indicator display terminals 20 to 27?  
   - **NO**
   - **YES**

**GO TO**

- Go to step 3 of this fault.
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.
e36. WTEC III TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)

**KNOWN INFO**
- Other indicator lights operate.
- Lighted indicator display OK.

**POSSIBLE PROBLEMS**
- Faulty WTEC III dashboard cable assembly.
- Faulty WTEC III transmission ECU.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- If continuity is not present, wire 105 is faulty.

1. **Is continuity present from connector PX7-20 to connector P115-19?**
   - **NO**
     - Replace WTEC III transmission ECU (para 8-7).
   - **YES**
     - Repair wire 105 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
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 2-45) 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 7-57).
36. WTEC III TRANSMISSION TEMPERATURE INDICATOR DOES NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other indicator lights operate.</td>
</tr>
<tr>
<td>WTEC III dashboard cable assembly OK.</td>
</tr>
<tr>
<td>WTEC III transmission ECU OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty transmission temperature indicator lamps.</td>
</tr>
<tr>
<td>Faulty lighted indicator display.</td>
</tr>
</tbody>
</table>

3. Is continuity present through transmission temperature indicator lamps?

- **NO**
  - If continuity is not present, transmission temperature indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.

- **YES**
  - Replace transmission temperature indicator lamps (para 7-16).
  - Replace lighted indicator display (para 7-16).

**TEST OPTIONS**

- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**

- Other indicator lights operate. WTEC III dashboard cable assembly OK. WTEC III transmission ECU OK. Possible problems:
  - Faulty transmission temperature indicator lamps.
  - Faulty lighted indicator display.

- If continuity is not present, transmission temperature indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.
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 7-57).

(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 7-57).

(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.
e37. FRONT BRAKE AIR INDICATOR DOES NOT ILLUMINATE WHEN AIR PRESSURE IS BELOW 65 PSI

INITIAL SETUP

Equipment Condition
- Engine shut down (TM 9-2320-366-10-1).
- Batteries disconnected (para 7-57).
- Air tanks drained (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

References
TM 9-4910-571-12&P

KNOWLEDGE

Other indicator lights illuminate.
- FRONT BRAKE AIR pressure gage operates.

POSSIBLE PROBLEMS
- Faulty front brake air indicator lamps.
- Front brake air pressure transmitter.
- Faulty lighted indicator display.
- Faulty dashboard cable assembly.

TEST OPTIONS

Resistance Test

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

START

CAUTION
Read CAUTION on following page.

1. Is 15-25 ohms resistance present from lighted indicator display connector socket 27 to socket 25?

NO

YES

Go to step 4 of this fault.
CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>RESISTANCE TEST</th>
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<tbody>
<tr>
<td>(1) Remove four screws from lighted indicator display.</td>
</tr>
<tr>
<td>(2) Remove lighted indicator display from instrument panel assembly.</td>
</tr>
<tr>
<td>(3) Disconnect connector PX7 from lighted indicator display connector.</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to lighted indicator display connector socket 27.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to lighted indicator display connector socket 25 and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 15-25 ohms resistance is not present, go to step 4 of this fault.</td>
</tr>
</tbody>
</table>
2. Is continuity present from connector PX7 pin 25 to terminal lug TL156?

- **NO**: If continuity is not present, wire 1530 is faulty.
- **YES**: Repair wire 1530 from connector PX7 pin 25 to terminal lug TL156 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

---

**KNOWN INFO**
- Other indicator lights illuminate.
- FRONT BRAKE AIR pressure gage operates.
- Front brake air indicator lamps OK.
- Lighted indicator display OK.

**POSSIBLE PROBLEMS**
- Faulty front air pressure transmitter.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 1530 is faulty.
NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back or not capable of making good contact.

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

CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX7 pin 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 from connector PX7 pin 25 to terminal lug TL156 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e37. FRONT BRAKE AIR INDICATOR DOES NOT ILLUMINATE WHEN AIR PRESSURE IS BELOW 65 PSI (CONT)

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 24VDC is not present, wire 1658 is faulty. If continuity is present, front air pressure transmitter is faulty.

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other indicator lights illuminate. FRONT BRAKE AIR pressure gage operates. Front brake air indicator lamps OK. Lighted indicator display OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty front air pressure transmitter. Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

3. Is 24 VDC present at connector PX7 pin 27?

- **NO**
  - Repair wire 1658 from connector PX7 pin 27 to terminal board TB1 position 61 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace front air pressure transmitter (para 7-44).
**WARNING**

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

**CAUTION**

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

**NOTE**

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

### VOLTAGE TEST

(1) Set multimeter to volts DC.

(2) Connect positive (+) probe of multimeter to connector PX7 pin 27.

(3) Connect negative (-) probe of multimeter to ground.

(4) Connect batteries (para 7-57).

(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.

(6) Position master power switch to off (TM 9-2320-366-10-1).

(7) Disconnect batteries (para 7-57).

(8) If 24 VDC is not present, repair wire 1658 from connector PX7 pin 27 to terminal board TB1 position 61 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

(9) If continuity is present, replace front air pressure transmitter (para 7-44).

(10) Connect lighted indicator display connector 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 7-57).
4. Is continuity present through front brake air indicator lamps?

**KNOWN INFO**
- Other indicator lights illuminate.
- FRONT BRAKE AIR pressure gage operates.

**POSSIBLE PROBLEMS**
- Faulty front brake air indicator lamps.
- Faulty lighted indicator display.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, front brake air indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.

**YES**
- Replace front brake air indicator lamps (para 7-16).

**NO**
- Replace lighted indicator display (para 7-16).
CONTINUITY TEST

(1) Loosen four captive screws in lamp mounting panel.
(2) Remove lamp mounting panel from lighted indicator display.
(3) Remove two 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 two front brake air indicator lamps in printed circuit board.
(9) Install lamp mounting panel in lighted indicator display.
(10) Tighten four captive screws in lamp mounting panel.
(11) Connect lighted indicator display connector 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 7-57).
e38. REAR BRAKE AIR INDICATOR DOES NOT ILLUMINATE WHEN AIR PRESSURE IS BELOW 65 PSI

INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (para 7-57).
Air tanks drained (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

References
TM 9-4910-571-12&P

KNOWLEDGMENT

Other indicator lights illuminate.
REAR BRAKE AIR pressure gage operates.

POSSIBLE PROBLEMS
Faulty rear brake air indicator lamps.
Faulty rear air pressure transmitter.
Faulty lighted indicator display.
Faulty dashboard cable assembly.

START

CAUTION
Read CAUTION on following page.

1. Is 15-25 ohms resistance present from lighted indicator display connector socket 27 to socket 13?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91

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

YES
Go to step 4 of this fault.

NO
CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

<table>
<thead>
<tr>
<th>RESISTANCE TEST</th>
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<tbody>
<tr>
<td>(1) Remove four screws from lighted indicator display.</td>
</tr>
<tr>
<td>(2) Remove lighted indicator display from instrument panel assembly.</td>
</tr>
<tr>
<td>(3) Disconnect connector PX7 from lighted indicator display connector.</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to lighted indicator display connector socket 27.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to lighted indicator display connector socket 13 and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 15-25 ohms resistance is not present, go to step 4 of this fault.</td>
</tr>
</tbody>
</table>
E38. REAR BRAKE AIR INDICATOR DOES NOT ILLUMINATE WHEN AIR PRESSURE IS BELOW 65 PSI (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other indicator lights illuminate.</td>
</tr>
<tr>
<td>REAR BRAKE AIR pressure gage operates.</td>
</tr>
<tr>
<td>Rear brake air indicator lamps OK.</td>
</tr>
<tr>
<td>Lighted indicator display OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rear air pressure transmitter.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

2. Is continuity present from connector PX7 pin 13 to terminal lug TL157?

- **YES**
  - Repair wire 1525 from terminal lug TL157 to connector PX7 pin 13 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**
  - If continuity is not present, wire 1525 is faulty.

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

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

CONTINUITY TEST

| (1) Set multimeter to ohms. |
| (2) Connect positive (+) probe of multimeter to connector PX7 pin 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 from terminal lug TL157 to connector PX7 pin 13 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11). |
3. Is 24 VDC present at connector PX7 pin 27?

**WARNING**
Read **WARNING** and **CAUTION** on following page.

**POSSIBLE PROBLEMS**
- Faulty rear air pressure transmitter.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 24VDC is not present, wire 1658 is faulty. If continuity is present, rear air pressure transmitter is faulty.

**YES**
Replace rear air pressure transmitter (para 7-44).

**NO**
Repair wire 1658 from connector PX7 pin 27 to terminal board TB1 position 61 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back or not capable of making good contact.

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

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

VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>2</td>
<td>Connect positive (+) probe of multimeter to connector PX7 pin 27.</td>
</tr>
<tr>
<td>3</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>4</td>
<td>Connect batteries (para 7-57).</td>
</tr>
<tr>
<td>5</td>
<td>Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>6</td>
<td>Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>7</td>
<td>Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>8</td>
<td>If 24 VDC is not present, repair wire 1658 from connector PX7 pin 27 to terminal board TB1 position 61 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>9</td>
<td>If continuity is present, replace rear air pressure transmitter (para 7-44).</td>
</tr>
<tr>
<td>10</td>
<td>Connect lighted indicator display connector to connector PX7.</td>
</tr>
<tr>
<td>11</td>
<td>Position lighted indicator display in instrument panel assembly with four screws.</td>
</tr>
<tr>
<td>12</td>
<td>Tighten four screws to 6-10 lb-in. (1 N·m).</td>
</tr>
<tr>
<td>13</td>
<td>Connect batteries (para 7-57).</td>
</tr>
</tbody>
</table>
e38. REAR BRAKE AIR INDICATOR DOES NOT ILLUMINATE WHEN AIR PRESSURE IS BELOW 65 PSI (CONT)

**KNOWN INFO**

| Other indicator lights illuminate. |
| REAR BRAKE AIR pressure gage operates. |

**POSSIBLE PROBLEMS**

| Faulty rear brake air indicator lamps. |
| Faulty lighted indicator display. |

**TEST OPTIONS**

| Continuity Test or STE/ICE-R Test #91 |

**REASON FOR QUESTION**

If continuity is not present, rear brake air indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.

4. Is continuity present through rear brake air indicator lamps?

- **NO**
  - Replace rear brake air indicator lamps (para 7-16).

- **YES**
  - Replace lighted indicator display (para 7-16).
CONTINUITY TEST

(1) Loosen four captive screws in lamp mounting panel.
(2) Remove lamp mounting panel from lighted indicator display housing.
(3) Remove two 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 two 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 connector 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 7-57).

Change 1 2-523
e39. ENGINE OIL PRESSURE INDICATOR DOES NOT OPERATE

INITIAL SETUP

**Equipment Condition**
- Engine shut down (TM 9-2320-366-10-1).
- Batteries disconnected (para 7-57).

**Personnel Required**
- (2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

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

---

**KNOWN INFO**
- Other indicator lights operate.
- Oil level OK.
- Oil pressure switch OK.

**POSSIBLE PROBLEMS**
- Faulty lighted indicator display.
- Faulty dashboard cable assembly.
- Faulty engine oil pressure indicator lamps.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

---

**START**

1. Is continuity present between lighted indicator display terminals 23 and 27?

**NO**

**YES**

Go to step 3 of this fault.
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.
2. Is continuity present between relay K11 terminal 85 and PX7-23?

- **YES**
  - Repair wire 34A (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - Fault corrected.

- **NO**
  - If continuity is not present, wire 34A is faulty.
  - Continuity Test or STE/ICE-R #91
  - Reason for question: If continuity is not present, wire 34A is faulty.

**KNOWN INFO**
- Other indicator lights operate.
- Oil level OK.
- Oil pressure switch OK.
- Lighted indicator display OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.

**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 2-45) 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 7-57).
39. ENGINE OIL PRESSURE INDICATOR DOES NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other indicator lights operate.</td>
</tr>
<tr>
<td>Oil level OK.</td>
</tr>
<tr>
<td>Oil pressure switch OK.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty engine oil pressure indicator lamps.</td>
</tr>
<tr>
<td>Faulty lighted indicator display.</td>
</tr>
</tbody>
</table>

3. Is continuity present through engine oil pressure indicator lamps?

- **NO**
  - Replace engine oil pressure indicator lamps (para 7-16).
  - Replace lighted indicator display (para 7-16).

- **YES**
  - Replace engine oil pressure indicator lamps (para 7-16).

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, engine oil pressure indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.</td>
</tr>
<tr>
<td>CONTINUITY TEST</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>(1) Loosen four captive screws in lamp mounting panel.</td>
</tr>
<tr>
<td>(2) Remove lamp mounting panel from lighted indicator display housing.</td>
</tr>
<tr>
<td>(3) Remove engine oil pressure indicator lamps from printed circuit board.</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Check continuity through each engine oil pressure indicator lamp and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If continuity is not present, replace engine oil pressure indicator lamps (para 7-16).</td>
</tr>
<tr>
<td>(7) If continuity is present, replace lighted indicator display (para 7-16).</td>
</tr>
<tr>
<td>(8) Install engine oil pressure indicator lamps in printed circuit board.</td>
</tr>
<tr>
<td>(9) Install lamp mounting panel in lighted indicator display housing.</td>
</tr>
<tr>
<td>(10) Tighten four captive screws in lamp mounting panel.</td>
</tr>
<tr>
<td>(11) Connect lighted indicator display to connector PX7.</td>
</tr>
<tr>
<td>(12) Position lighted indicator display in instrument panel assembly with four screws.</td>
</tr>
<tr>
<td>(13) Tighten four screws to 6-10 lb-in. (1 N·m).</td>
</tr>
<tr>
<td>(14) Connect batteries (para 7-57).</td>
</tr>
</tbody>
</table>
1. Is continuity present through master stop indicator lamps?

- **YES**
  - Replace master stop indicator lamps (para 7-16).
  - Replace lighted indicator display (para 7-16).

- **NO**
  - If continuity is not present, master stop indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.
  - **REASON FOR QUESTION**
    - If continuity is not present, master stop indicator lamps are faulty. If continuity is present, lighted indicator display is faulty.
  - **TEST OPTIONS**
    - Continuity Test or STE/ICE-R #91
  - **KNOWN INFO**
    - Other indicator lights operate.
  - **POSSIBLE PROBLEMS**
    - Faulty master stop indicator lamps.
    - Faulty lighted indicator display.

**INITIAL SETUP**
- **Equipment Condition**
  - Engine shut down (TM 9-2320-366-10-1).
  - Batteries disconnected (para 7-57).
- **Personnel Required**
  - (2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

**References**
- TM 9-4910-571-12&P
(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 N·m).
(17) Connect batteries (para 7-57).
e41. ONE OR BOTH HEADLIGHTS (HIGH AND LOW BEAM) DO NOT ILLUMINATE

INITIAL SETUP

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

**Personnel Required**
(2)

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

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

---

**KNOWN INFO**
Nothing.

**POSSIBLE PROBLEMS**
Faulty front lights cable assembly.
Faulty main light switch.
Faulty dashboard cable assembly.
Faulty relay K8.
Faulty relay K7.

---

**TEST OPTIONS**
Operational Test

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

---

**KNOWN INFO**
One headlight illuminates.
Main light switch OK.
Dashboard cable assembly OK.
Relay K8 OK.
Relay K7 OK.

**POSSIBLE PROBLEMS**
Faulty front lights cable assembly.

---

**TEST OPTIONS**
Operational Test

**REASON FOR QUESTION**
If LH headlight does not illuminate, wire 3052 is faulty. If RH headlight does not illuminate, wire 3051 is faulty.

---

**1.**
Does one headlight illuminate?

**NO**
Go to step 3 of this fault.

**YES**

---

**2.**
Does left headlight illuminate?

**NO**
Repair wire 3052 from connector P19 to terminal lug TL123 (para 2-45) or replace front lights cable assembly (para 7-82).

**YES**
Repair wire 3051 from connector P13 to terminal lug TL81 (para 2-45) or replace front lights cable assembly (para 7-82).
OPERATIONAL TEST

(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) If both headlights do not operate, go to step 3 of this fault.
(3) Position main light switch to OFF (TM 9-2320-366-10-1).

OPERATIONAL TEST

(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) Observe which headlight illuminates.
(3) If LH headlight illuminates, repair wire 3051 from connector P13 to terminal lug TL81 (para 2-45) or replace front lights cable assembly (para 7-82).
(4) If RH headlight illuminates, repair wire 3052 from connector P19 to terminal lug TL123 (para 2-45) or replace front lights cable assembly (para 7-82).
(5) Position main light switch to OFF (TM 9-2320-366-10-1).
e41. 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 Test #91

**REASON FOR QUESTION**
- If continuity is not present, main light switch is faulty.

3. **Is continuity present through main light switch terminals F and M?**
   - **NO**
   - **YES**
     - Replace main light switch (para 7-17).

**WARNING**
- Read WARNING on following page.

4. **Is 12 VDC present at relay K7 terminal 86?**
   - **NO**
   - **YES**
     - Go to step 9 of this fault.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 24 VDC is not present, wire 16 is faulty.
CONTINUITY 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 9-2320-366-10-1) and note reading on multimeter.
7. If 12 VDC is not present, go to step 9 of this fault.
8. Install main light switch (para 7-17).
9. If continuity is not present, go to step 9 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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

1. Remove PDP cover (para 16-2).
2. Remove relay K7 form 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 9-2320-366-10-1) and note reading on multimeter.
7. If 12 VDC is not present, go to step 9 of this fault.
5. Is continuity present from relay K7 terminal 85 to a known good ground?

- **NO**
  - Repair wire 3002 from PDP relay K7 terminal 85 to terminal board TB2 position 74 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Front lights cable assembly OK.
  - Main light switch OK.
  - Faulty dashboard cable assembly.
  - Faulty relay K8.
  - Faulty relay K7.

6. Is 12 VDC present at relay K7 terminal 30?

- **NO**
  - Repair wire 1416 from PDP relay K7 terminal 30 to circuit breaker CB78 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Warning: Read WARNING on following page.
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PDP 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 from PDP relay K7 terminal 85 to terminal board TB2 position 74 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

WARNING

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

VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to PDP terminal 30, where relay K7 was removed.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 12 VDC is not present, Repair wire 1416 from PDP relay K7 terminal 30 to circuit breaker CB78 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
e41. 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.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 1417 is faulty.

---

7. Is continuity present from relay K7 terminal 87 to relay K8 terminal 30?

- **NO**
  - Repair wire 1417 from PDP relay K7 terminal 87 to PDP relay K8 terminal 30 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace relay K8 (para 7-9).

---

8. Is continuity present between relay K8 terminals 30 and 87A?

- **NO**
  - Replace relay K8 (para 7-9).

- **YES**
  - Replace relay K7 (para 7-9).
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 from PDP relay K7 terminal 87 to PDP relay K8 terminal 30 (para 2-45) 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).
e41. ONE OR BOTH HEADLIGHTS (HIGH AND LOW BEAM) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Front lights cable assembly OK.
- Main light switch OK.
- Relay K8 OK.
- Relay K7 OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- This test determines which section of wire 16 is faulty.

**9.**
Is continuity present from relay K7 terminal 86 to connector P18 pin 3?

**YES**
- Repair wire 16 from connector P16 pin 3 to connector PX15 socket M (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
- Repair wire 16 from PDP relay K7 terminal 86 to connector P16 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

CAUTION

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

NOTE

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

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector P18 from connector J18.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to PDP terminal 86, where relay K7 was removed.
(5) Connect negative (-) probe of multimeter to connector P18 pin 3 and note reading on multimeter.
(6) If continuity is not present, repair wire 16 from PDP relay K7 terminal 86 to connector P18 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) If continuity is present, repair wire 16 from connector P16 pin 3 to connector PX15 socket M (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Install relay K7 in PDP.
(9) Install PDP cover (para 16-2).
(10) Connect connector P18 to connector J18.
(11) Install instrument panel assembly (para 7-15).
**e42. ONE OR BOTH HEADLIGHT LOW BEAMS DO NOT ILLUMINATE**

**INITIAL SETUP**

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

**Personnel Required**
(2)

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

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

---

**START**

1. **Does one headlight low beam illuminate?**
   - **YES**
     - Go to step 3 of this fault.
   - **NO**
     - **TEST OPTIONS**
       - **Operational Test**
         - **REASON FOR QUESTION**
           - This question eliminates possible problems and determines where troubleshooting continues.

2. **Is continuity present between headlight lamp wire 18 and headlight lamp wire 91?**
   - **YES**
     - Replace headlight lamp (para 7-41).
   - **NO**
     - **TEST OPTIONS**
       - **Continuity Test or STE/ICE-R Test #91**
         - **REASON FOR QUESTION**
           - If continuity is not present, headlight lamp is faulty. If continuity is present, wire 18 is faulty.

---

**KNOWN INFO**

Headlight high beams illuminate.

**POSSIBLE PROBLEMS**

Faulty headlight lamp.
Faulty front lights cable assembly.
Faulty dashboard cable assembly.
Faulty relay K8.
Faulty turn signal switch.

**KNOWN INFO**

Headlight high beams illuminate.
One headlight low beam operational.
Dashboard cable assembly OK.
Relay K8 OK.
Turn signal switch OK.

**POSSIBLE PROBLEMS**

Faulty headlight lamp.
Faulty headlamp wire 18.

---

**REFERENCE**

TM 9-2320-366-20-1
OPERATIONAL TEST
(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) Position headlight low beams to on (TM 9-2320-366-10-1).
(3) If both headlight low beams do not illuminate, go to step 3 of this fault.
(4) Position main light switch to OFF (TM 9-2320-366-10-1).

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 7-41).
(9) If continuity is present, repair wire 18 (para 2-45) or replace front lights cable assembly (para 7-82).
(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.
3. **Is continuity present between connector P12 (RH) or connector P4 (LH) headlight terminal and relay K8 terminal 87A?**

   **KNOWN INFO**
   - Headlight high beams illuminate.
   - Headlight lamp OK.
   - Front lights cable assembly OK.
   - Dashboard cable assembly 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.

   NO

   YES

   Go to step 5 of this fault.

4. **Is continuity present between relay K8 terminal 87A and relay K8 terminal 30?**

   **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.

   NO

   YES

   Replace relay K8 (para 7-9).

   Replace turn signal switch (para 7-26).
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.

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 7-26).
(6) Install relay K8 in PDP.
(7) Install PDP cover (para 16-2).
5. Is continuity present between relay K8 terminal 30 and connector J27-13?

- **YES**: Repair wire 18 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- **NO**: Faulty dashboard cable assembly. Faulty front lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R#91

**REASON FOR QUESTION**
- Headlight high beams illuminate.
- Headlight lamp OK.
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
9. If continuity is present, repair wire 18 (para 2-45) or replace front lights cable assembly (para 7-82).
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.
2-546

**INITIAL SETUP**

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

**Personnel Required**
(2)

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

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

---

**START**

1. **Does one headlight high beam illuminate?**
   - **YES**
     - Go to step 3 of this fault.
   - **NO**
     - **REASON FOR QUESTION**
       - This test eliminates possible problems and determines where troubleshooting continues.

2. **Is continuity present between headlight lamp wire 17 and headlight lamp wire 91?**
   - **NO**
     - **POSSIBLE PROBLEMS**
       - Faulty headlight lamp.
       - Faulty wire 17.
   - **YES**
     - **TEST OPTIONS**
       - Continuity Test or STE/ICE-R #91
     - **REASON FOR QUESTION**
       - If continuity is not present, headlight lamp is faulty. If continuity is present, wire 17 is faulty.
     - Replace headlight lamp (para 7-41).

---

**KNOWN INFO**
Headlight low beams illuminate.

**POSSIBLE PROBLEMS**
- Faulty headlight lamp.
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.
- Faulty relay K8.
- Faulty turn signal switch.

**KNOWN INFO**
Headlight low beams illuminate.
One headlight high beam illuminates.
Dashboard cable assembly OK.
Relay K8 OK.
Turn signal switch OK.

**POSSIBLE PROBLEMS**
- Faulty headlight lamp.
- Faulty wire 17.

---

**REFERENCES**
- TM 9-2320-366-20-1
- TM 9-2320-366-10-1
- Appendix C
- Items 46, 41, 22
- TM 9-4910-571-12&P
OPERATIONAL TEST
(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) Position headlight high beams on (TM 9-2320-366-10-1).
(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 9-2320-366-10-1).

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 7-41).
(9) If continuity is present, repair wire 17 (para 2-45) or replace front lights cable assembly (para 7-82).
(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.
e43. ONE OR BOTH HEADLIGHT HIGH BEAMS DO NOT ILLUMINATE (CONT)

3. Is continuity present between connector P14 (RH) or connector P20 (LH) and relay K8 terminal 87?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
</table>

**TEST OPTIONS**
Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
If continuity is not present, wire 17 is faulty.

**YES**
Go to step 8 of this fault.

**NO**

---

4. Is 12 vdc present at relay K8 terminal 86?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
</table>

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R #89

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

**YES**
Go to step 6 of this fault.

**NO**

---

Faulty front lights cable assembly.
Faulty dashboard cable assembly.
Faulty relay K8.
Faulty turn signal switch.
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.

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.
5. Position headlight high beams to on (TM 9-2320-366-10-1) and note reading on multimeter.
6. If 12 vdc is not present, go to step 6 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.
5. Is continuity present between relay K8 terminal 85 and a known good ground?

- **YES**
  - Repair wire 3053 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - Replace relay K8 (para 7-9).

- **NO**
  - Faulty dashboard cable assembly.
  - Faulty relay K8.

---

6. Is 12 vdc present at connector P18-3?

- **YES**
  - Headlight low beams illuminate.
  - Headlight lamp OK.
  - Front lights cable assembly OK.
  - Turn signal switch OK.
  - Faulty turn signal switch.
  - Faulty dashboard cable assembly.

- **NO**
  - Faulty turn signal switch.
  - Faulty dashboard cable assembly.

---

# 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.
### 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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
5. If continuity is present, replace relay K8 (para 7-9).
6. Install relay K8 in PDP.
7. Install PDP cover (para 16-2).

### WARNING

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

### 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 9-2320-366-10-1) and note reading on multimeter.
7. If 12 vdc is not present, repair wire 16A (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e43. ONE OR BOTH HEADLIGHT HIGH BEAMS DO NOT ILLUMINATE (CONT)

**7.** Is continuity present between connector P18 terminals 2 and 3?

- **NO**
  - Replace turn signal switch (para 7-26).

- **YES**
  - Repair wire 16A (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**TEST OPTIONS**
Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
If 12 vdc is not present, headlight dimmer control is faulty. If 12 vdc is present, wire 16A is faulty.

**KNOWN INFO**
One headlight low beam illuminates.
Headlight lamp OK.
Front lights cable assembly OK.
Relay K8 OK.

**POSSIBLE PROBLEMS**
Faulty turn signal switch.
Faulty dashboard cable assembly.

**8.** Is continuity present between relay K8 terminal 30 and connector J27-6?

- **NO**
  - Repair wire 17 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Repair wire 17 (para 2-45) or replace front lights cable assembly (para 7-82).

**TEST OPTIONS**
Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
If continuity is not present, wire 17 in dashboard cable assembly is faulty. If continuity is present, wire 17 in front lights cable assembly is faulty.

**KNOWN INFO**
Headlight high beams illuminate.
Headlight lamp OK.
Turn signal switch OK.
Relay K8 OK.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.
Faulty front lights cable assembly.
### CONTINUITY TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to connector P18-3.
4. If continuity is not present, replace turn signal switch (para 7-26).
5. If continuity is present, repair wire 16A (para 2-45) 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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
9. If continuity is present, repair wire 17 (para 2-45) or replace front lights cable assembly (para 7-82).
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.
**INITIAL SETUP**

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

**Personnel Required**
(2)

**Materials/Parts**
Packing, Preformed (Item 191, Appendix G)

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

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

---

**KNOWLEDGE INFO**
- Circuit breaker OK.
- Turn signals operate.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty composite front light assembly.
- Faulty front light assembly.
- Faulty main light switch.
- Faulty dashboard cable assembly.

---

**TEST OPTIONS**
**Operational Test**

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

---

**START**

1. Does one parking light illuminate?

**NO**

---

**YES**

Go to step 5 of this fault.
OPERATIONAL TEST

(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) Position main light switch auxiliary lever to PARK (TM 9-2320-366-10-1).
(3) If no parking lights illuminate, go to step 5 of this fault.
(4) Position main light switch to OFF (TM 9-2320-366-10-1).
e44. PARKING LIGHTS DO NOT ILLUMINATE (CONT)

2. Is continuity present through lamp?

NO

YES

Replace lamp (para 7-40).

3. Is 12 vdc present at lamp socket center contact?

NO

YES

Go to step 6 of this fault.

Circuit breaker OK. Turn signals operate. Other parking light illuminates. Main light switch OK.

KNOW INFO


POSSIBLE PROBLEMS

Circuit breaker OK. Turn signals operate. Other parking light illuminates. Main light switch OK. Lamp OK.

WARNING

Read WARNING on following page.

Circuit breaker OK. Turn signals operate. Other parking light illuminates. Main light switch OK. Lamp OK.

Circuit breaker OK. Turn signals operate. Other parking light illuminates. Main light switch OK. Lamp OK.

Circuit breaker OK. Turn signals operate. Other parking light illuminates. Main light switch OK. Lamp OK.

TEST OPTIONS

Continuity Test or STE/ICE-R#91

REASON FOR QUESTION

If continuity is not present, lamp is faulty.

TEST OPTIONS

Voltage Test or STE/ICE-R #89

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

KNOW INFO


POSSIBLE PROBLEMS

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 7-40).

WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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 9-2320-366-10-1).
(5) Position main light switch auxiliary lever to PARK (TM 9-2320-366-10-1) 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 9-2320-366-10-1).
4. Is continuity present from lamp socket to composite light housing?

- **YES**: Replace composite front light assembly (para 7-40).
- **NO**: Repair wire 3091 (para 2-45) or replace front lights cable assembly (para 7-82).

**POSSIBLE PROBLEMS**
- Faulty composite front light assembly.
- Faulty front lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- If continuity is not present, composite front light assembly is faulty. If continuity is present, wire 3091 is faulty.

5. Is continuity present between main light switch terminals L and F?

- **YES**: Repair wire 491 (para 2-45) or replace front lights cable assembly (para 7-82).
- **NO**: Replace main light switch (para 7-17).

**POSSIBLE PROBLEMS**
- Faulty main light switch.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- If continuity is not present, main light switch is faulty. If continuity is present, wire 491 is faulty.
### CONTINUITY TEST (Lighting System)

<table>
<thead>
<tr>
<th>Step</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>2</td>
<td>Connect positive (+) probe of multimeter to lamp socket.</td>
</tr>
<tr>
<td>3</td>
<td>Connect negative (-) probe of multimeter to composite front light housing and note reading on multimeter.</td>
</tr>
<tr>
<td>4</td>
<td>If continuity is not present, replace composite front light assembly (para 7-40).</td>
</tr>
<tr>
<td>5</td>
<td>If continuity is present, repair wire 3091 (para 2-45) or replace front lights cable assembly (para 7-82).</td>
</tr>
<tr>
<td>6</td>
<td>Install lamp in socket.</td>
</tr>
<tr>
<td>7</td>
<td>Install preformed packing and cover on housing with five screws.</td>
</tr>
</tbody>
</table>

### CONTINUITY TEST (Instrument Panel)

<table>
<thead>
<tr>
<th>Step</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector PX15 from main light switch.</td>
</tr>
<tr>
<td>3</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>4</td>
<td>Connect positive (+) probe of multimeter to main light switch terminal L.</td>
</tr>
<tr>
<td>5</td>
<td>Connect negative (-) probe of multimeter to main light switch terminal F.</td>
</tr>
<tr>
<td>6</td>
<td>Position main light switch auxiliary lever to PARK (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If continuity is not present, replace main light switch (para 7-17).</td>
</tr>
<tr>
<td>8</td>
<td>If continuity is present, repair wire 491 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>9</td>
<td>Connect connector PX15 to main light switch.</td>
</tr>
<tr>
<td>10</td>
<td>Install instrument panel assembly (para 7-15).</td>
</tr>
</tbody>
</table>
e44. PARKING LIGHTS DO NOT ILLUMINATE (CONT)

6. Is continuity present between circuit breaker CB65 terminal 87 and connector J27-9?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit breaker OK.</td>
</tr>
<tr>
<td>Turn signals operate.</td>
</tr>
<tr>
<td>Other parking light illuminates.</td>
</tr>
<tr>
<td>Lamp OK.</td>
</tr>
<tr>
<td>Main light switch OK.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty front lights cable assembly.</td>
</tr>
<tr>
<td>Faulty composite front light assembly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, wire 491 is faulty. If continuity is present, composite front light assembly is faulty.</td>
</tr>
</tbody>
</table>

NO

YES

Replace composite front light assembly (para 7-40).

Repair wire 491 (para 2-45) or replace front lights cable assembly (para 7-82).
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 2-45) or replace front lights cable assembly (para 7-82).
(11) If continuity is present, replace composite front light assembly (para 7-40).
(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).
e45. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE

INITIAL SETUP

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

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

Materials/Parts
Lockwasher (4) (Item 82, Appendix G)
Gasket (2) (P/N 12421469)

Personnel Required
(2)

References
TM 9-4910-571-12&P

---

START

1.
Does LH door marker light illuminate?

NO

YES

Go to step 4 of this fault.

---

2.
Is continuity present through LH cab marker light lamp?

NO

YES

Replace LH cab marker light lamp (para 7-38).

---

KNOWN INFO
Other marker lights illuminate.
LH door marker light illuminates.

POSSIBLE PROBLEMS
Faulty lamp.
Faulty marker light.
Faulty LH door and cab marker lights cable assembly.

TEST OPTIONS
Operational Test

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

---

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, LH cab marker light lamp is faulty.
(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) If LH door marker light lamp does not illuminate, go to step 4 of this fault.
(3) Position main light switch to OFF (TM 9-2320-366-10-1).

CONTINUITY TEST

(1) Remove two screws and lens cover from LH cab marker light base.
(2) Remove LH marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH marker light lamp (para 7-38).
e45. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- LH door marker light illuminates.
- LH cab marker light lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty LH door and cab marker lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 1949 is faulty. If 12 VDC is present, LH cab marker light is faulty.

**WARNING**
- Read WARNING and CAUTION on following page.

3. Is 12 VDC present at connector P129 socket?

**YES**
- Repair wire 1949 from connector P129 socket to splice E25 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).

**NO**
- Replace LH cab marker light (para 7-38).
WARNING

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

CAUTION

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

NOTE

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

VOLTAGE TEST

(1) Remove four screws from LH cab marker light base.

   NOTE

   Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

(2) Remove nut, lockwasher, terminal lug TL133, and lockwasher from LH cab marker light base. Discard lockwashers.

(3) Extend base and disconnect connector P129 from marker light connector.

(4) Remove gasket from LH door marker light base. Discard gasket.

(5) Set multimeter to volts DC.

(6) Connect positive (+) probe of multimeter to connector P129 socket.

(7) Connect negative (-) probe of multimeter to ground.

(8) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.

(9) If 12 VDC is not present, repair wire 1949 from connector P129 socket to splice E25 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).

(10) If 12 VDC is present, replace LH cab marker light (para 7-38).

(11) Position main light switch to OFF (TM 9-2320-366-10-1).

(12) Install gasket on LH cab marker light base.

(13) Connect marker light connector to connector P129.

(14) Install lockwasher, terminal lug TL133, lockwasher, and nut on back of LH cab marker light base.

(15) Install LH cab marker light base on vehicle with four screws.

(16) Install LH cab marker light lamp in socket.

(17) Install lens cover on base with two screws.
e45. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty lamp.</td>
</tr>
<tr>
<td>Faulty marker light.</td>
</tr>
<tr>
<td>Faulty LH door and cab marker lights cable assembly.</td>
</tr>
</tbody>
</table>

4. Is continuity present through LH door marker light lamp?

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, LH door marker light lamp is faulty.</td>
</tr>
</tbody>
</table>

NO

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate. LH door marker light lamp OK.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty lamp.</td>
</tr>
<tr>
<td>Faulty marker light.</td>
</tr>
<tr>
<td>Faulty LH door and cab marker lights cable assembly.</td>
</tr>
</tbody>
</table>

5. Does LH cab marker light illuminate?

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational Test</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>This question eliminates possible problems and determines where troubleshooting continues.</td>
</tr>
</tbody>
</table>

NO

YES

Go to step 8 of this fault.

YES

Replace LH door marker light lamp (para 7-38).
CONTINUITY TEST

(1) Remove two screws and lens cover from LH door marker light base.
(2) Remove LH door marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH door marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH door marker light lamp (para 7-38).

(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) If LH cab marker light lamp does not illuminate, go to step 8 of this fault.
(3) Position main light switch to OFF (TM 9-2320-366-10-1).
e45. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

WARNING
Read WARNING and CAUTION on following page.

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION
If 12 VDC is not present, wire 1949 is faulty.

Is 12 VDC present at connector P130 socket?

NO

YES

Repair wire 1949 from connector P130 socket to splice E25 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).

KNOWN INFO
Other marker lights illuminate. LH door marker light lamp OK. LH cab marker light illuminates.

POSSIBLE PROBLEMS
Faulty marker light. Faulty LH door and cab marker lights cable assembly.
VOLTAGE TEST

(1) Remove four screws from LH door marker light base.

NOTE

Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

(2) Remove nut, lockwasher, terminal lug TL130, and lockwasher from LH door marker light base. Discard lockwashers.

(3) Extend base and disconnect connector P130 from marker light connector.

(4) Remove gasket from LH door marker light base. Discard gasket.

(5) Set multimeter to volts DC.

(6) Connect positive (+) probe of multimeter to connector P130 socket.

(7) Connect negative (-) probe of multimeter to ground.

(8) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.

(9) If 12 VDC is not present, repair wire 1949 from connector P130 socket to splice E25 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).

(10) Position main light switch to OFF (TM 9-2320-366-10-1).
**KNOWN INFO**

| Other marker lights illuminate. | LH door marker light lamp OK. | LH cab marker light illuminates. |

**POSSIBLE PROBLEMS**

| Faulty marker light. |
| Faulty LH door and cab marker lights cable assembly. |

**TEST OPTIONS**

| Continuity Test or STE/ICE-R Test #91 |

**REASON FOR QUESTION**

If continuity is not present, wire 3098 is faulty. If continuity is present, LH door marker light is faulty.

7. Is continuity present from terminal lug TL130 to terminal lug TL133?

- **YES**
  - Repair wire 3098 from terminal lug TL130 to terminal lug TL133 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).

- **NO**
  - Replace LH door marker light (para 7-38).
# CONTINUITY TEST

1. Remove two screws and lens cover from LH cab marker light base.
2. Remove LH cab marker light lamp from socket.
3. Remove four screws from LH cab marker light base.

**NOTE**

Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

5. Extend base and disconnect connector P129 from marker light connector.
7. Set multimeter to ohms.
8. Connect positive (+) probe of multimeter to terminal lug TL130.
9. Connect negative (-) probe of multimeter to terminal lug TL133 and note reading on multimeter.
10. If continuity is not present, repair wire 3098 from terminal lug TL130 to terminal lug TL133 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).
11. If continuity is present, replace LH door marker light (para 7-38).
12. Install gasket on LH cab marker light base.
13. Connect marker light connector to connector P129.
15. Install LH cab marker light base on vehicle with four screws.
17. Install lens cover on base with two screws.
18. Install gasket on LH door marker light base.
19. Connect marker light connector to connector P130.
20. Install lockwasher, terminal lug TL130, lockwasher, and nut on back of base.
21. Install LH door marker light base on vehicle with four screws.
22. Install LH door marker light lamp in socket.
23. Install lens cover on base with two screws.
e45. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- LH door marker light lamp OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty LH door and cab marker lights cable assembly.

**8.**
Is continuity present through LH cab marker light lamp?

**NO**

**YES**
Replace LH cab marker light lamp (para 7-38).

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, LH cab marker light lamp is faulty.

**9.**
Is continuity present from terminal lug TL130 to ground?

**NO**

**YES**
Go to step 12 of this fault.

**KNOWING INFO**
- Other marker lights illuminate.
- LH door marker light lamp OK.
- LH cab marker light lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty LH door and cab marker lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

(1) Remove two screws and lens cover from LH cab marker light base.
(2) Remove LH cab marker light lamp from socket.
(3) Remove four screws from LH door marker light.
(4) Set multimeter to ohms.
(5) Check continuity through LH cab marker light lamp and note reading on multimeter.
(6) If continuity is not present, replace LH cab marker light lamp (para 7-38).

NOTE
Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

(1) Remove two screws and lens cover from LH door marker light base.
(2) Remove LH door marker light lamp from socket.
(3) Remove four screws from LH door marker light.
(4) Remove nut, lockwasher, terminal lug TL130, and lockwasher from LH door marker light base. Discard lockwashers.
(5) Extend base and disconnect connector P130 from marker light connector.
(6) Remove gasket from LH door marker light base. Discard gasket.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to terminal lug TL130.
(9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(10) If continuity is not present from terminal lug TL130 to ground, go to step 12 of this fault.
e45. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**.reason for question**
This question eliminates possible problems and determines where troubleshooting continues.

**Known Info**
- Other marker lights illuminate.
- LH door marker light illuminates.
- LH cab marker light lamp OK.

**Possible Problems**
- Faulty marker light.
- Faulty LH door and cab marker lights cable assembly.

**10.**
Is 12 VDC present at connector P129 socket?

- **NO**
  - **Go to step 13 of this fault.**

- **YES**
  - **Go to step 13 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 circuits and cause severe burns or electrical shock.

**CAUTION**

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

**NOTE**

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

### VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1    | Remove four screws from LH cab marker light base.  
**NOTE**  
Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires. |
| 2    | Remove nut, lockwasher, terminal lug TL133, and lockwasher from LH cab marker light base. Discard lockwashers. |
| 3    | Extend base and disconnect connector P129 from marker light connector. |
| 4    | Remove gasket from LH cab marker light base. Discard gasket. |
| 5    | Set multimeter to volts DC. |
| 6    | Connect positive (+) probe of multimeter to connector P129 socket. |
| 7    | Connect negative (-) probe of multimeter to ground. |
| 8    | Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter. |
| 9    | If 12 VDC is not present, go to step 13 of this fault. |
| 10   | Position main light switch to OFF (TM 9-2320-366-10-1). |
| 11   | Install gasket on LH cab marker light base. |
| 12   | Connect marker light connector to connector P129. |
| 13   | Install lockwasher, terminal lug TL133, lockwasher, and nut on back of LH cab marker light base. |
| 14   | Install LH cab marker light base on vehicle with four screws. |
| 15   | Install LH cab marker light lamp on vehicle. |
| 16   | Install lens cover on base with two screws. |
e45. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
Other marker lights illuminate. LH door marker light lamp OK. LH cab marker light illuminates.

**POSSIBLE PROBLEMS**
Faulty marker light. Faulty LH door and cab marker lights cable assembly.

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 1949 is faulty.

11. Is 12 VDC present at connector P130 socket?

- **NO**
  - Repair wire 1949 from connector P130 socket to splice E25 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).

- **YES**
  - Replace LH cab marker light and LH door marker light (para 7-38).
**WARNING**

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

**CAUTION**

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

**NOTE**

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

---

**VOLTAGE TEST**

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to connector P130 socket.
3. Connect negative (-) probe of multimeter to ground.
4. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
5. If 12 VDC is not present, repair wire 1949 from connector P130 socket to splice E25 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).
6. If 12 VDC is present, replace LH cab marker light and LH door marker light (para 7-38).
8. Install gasket on LH door marker light base.
9. Connect marker light connector to connector P130.
10. Install lockwasher, terminal lug TL130, lockwasher, and nut on back of LH door marker light base.
11. Install LH door marker light base on vehicle with four screws.
12. Install LH door marker light lamp in socket.
13. Install lens cover on base with two screws.
12. Is continuity present from terminal lug TL130 to terminal lug TL133?

**KNOWN INFO**
- Other marker lights illuminate.
- LH door marker light lamp OK.
- LH cab marker light illuminates.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty LH door and cab marker lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3098 is faulty. If continuity is present, LH door marker light is faulty.

**YES**
- Repair wire 3098 from terminal lug TL130 to terminal lug TL133 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).

**NO**
- Repair wire 3098 from terminal lug TL133 to terminal lug TL87 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).
CONTINUITY TEST

1. Remove four screws from LH cab marker light base.

**NOTE**
Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

2. Remove nut, lockwasher, terminal lug TL133, and lockwasher from LH cab marker light base. Discard lockwashers.

3. Extend base and disconnect connector P129 from marker light connector.


5. Set multimeter to ohms.

6. Connect positive (+) probe of multimeter to terminal lug TL130.

7. Connect negative (-) probe of multimeter to terminal lug TL133 and note reading on multimeter.

8. If continuity is not present, repair wire 3098 from terminal lug TL130 to terminal lug TL133 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61).

9. If continuity is present, replace LH door marker light (para 7-38).

10. Install gasket on LH cab marker light base.

11. Connect marker light connector to connector P129.

12. Install lockwasher, terminal lug TL133, lockwasher, and nut on back of LH cab marker light base.

13. Install LH cab marker light base on vehicle with four screws.


15. Install lens cover on base with two screws.

16. Install gasket on LH door marker light base.

17. Connect marker light connector to connector P130.

18. Install lockwasher, terminal lug TL130, lockwasher, and nut on back of LH door marker light base.

19. Install LH door marker light base on vehicle with four screws.

20. Install LH door marker light lamp in socket.

21. Install lens cover on base with two screws.
e45. LH DOOR AND/OR LH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- LH door marker light lamp OK.
- LH cab marker light illuminates.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty LH door and cab marker lights cable assembly.

13. Is 12 VDC present at connector P130 socket?

**WARNING**
- Read WARNING and CAUTION on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 1949 is faulty. If 12 VDC is present, LH door and cab marker light cable assembly is faulty.

**YES**
- Repair wire 1949 from connector P130 socket to splice E25 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61) and replace LH door marker light (para 7-38).

**NO**
- Replace LH door and cab marker lights cable assembly (para 7-61).
WARNING

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

CAUTION

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

NOTE

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

---

**VOLTAGE TEST**

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to connector P130 socket.
3. Connect negative (-) probe of multimeter to ground.
4. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
5. If 12 VDC is not present, repair wire 1949 from connector P130 socket to splice E25 (para 2-45) or replace LH door and cab marker lights cable assembly (para 7-61) and replace LH door marker light (para 7-38).
6. If 12 VDC is present, replace LH door and cab marker light cable assembly (para 7-61).
8. Install gasket on LH door marker light base.
9. Connect marker light connector to connector P130.
10. Install lockwasher, terminal lug TL130, lockwasher, and nut on back of LH door marker light base.
11. Install LH door marker light base on vehicle with four screws.
12. Install LH door marker light lamp in socket.
13. Install lens cover on base with two screws.
e46. RH DOOR AND/OR RH FRONT MARKER LIGHTS DO NOT ILLUMINATE

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-23230-366-10-1).

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

Materials/Parts
Lockwasher (4) (Item 82, Appendix G)
Gasket (2) (Item 24, Appendix G)

Personnel Required
(2)

References
TM 9-4910-571-12&P

START

1. Does RH door marker light illuminate?

TEST OPTIONS
Operational Test

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

NO

YES

Go to step 4 of this fault.

2. Is continuity present through RH cab marker light lamp?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, RH cab marker light lamp is faulty.

NO

YES

Replace RH cab marker light lamp (para 7-38).

KNOWLEDGE
Other marker lights illuminate.

POSSIBLE PROBLEMS
Faulty lamp.
Faulty marker light.
Faulty RH door and cab marker lights cable assembly.

KNOWLEDGE
Other marker lights illuminate.
RH door marker light illuminates.

POSSIBLE PROBLEMS
Faulty lamp.
Faulty marker light.
Faulty RH door and cab marker lights cable assembly.
(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) If RH door marker light lamp does not illuminate, go to step 4 of this fault.
(3) Position main light switch to OFF (TM 9-2320-366-10-1).

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove two screws and lens cover from RH cab marker light base.</td>
</tr>
<tr>
<td>(2) Remove RH marker light lamp from socket.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Check continuity through RH marker light lamp and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If continuity is not present, replace RH marker light lamp (para 7-38).</td>
</tr>
</tbody>
</table>
e46. RH DOOR AND/OR RH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 1947 is faulty. If 12 VDC is present, RH cab marker light is faulty.

**WARNING**
- CAUTION
Read WARNING and CAUTION on following page.

**KNOWN INFO**

| Other marker lights illuminate. |
|---------------------------------
| RH door marker light illuminates. |
| RH cab marker light lamp OK. |

**POSSIBLE PROBLEMS**

- Faulty marker light. |
- Faulty RH door and cab marker lights cable assembly.

3. Is 12 VDC present at connector P132 socket?

**NO**

- Repair wire 1947 from connector P132 socket to splice E22 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).

**YES**

- Replace RH cab marker light (para 7-38).
(1) Remove four screws from RH cab marker light base.

(2) Remove nut, lockwasher, terminal lug TL134, and lockwasher from RH cab marker light base. Discard lockwashers.

(3) Extend base and disconnect connector P132 from marker light connector.

(4) Remove gasket from RH cab marker light base. Discard gasket.

(5) Set multimeter to volts DC.

(6) Connect positive (+) probe of multimeter to connector P132 socket.

(7) Connect negative (-) probe of multimeter to ground.

(8) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.

(9) If 12 VDC is not present, repair wire 1947 from connector P132 socket to splice E22 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).

(10) If 12 VDC is present, replace RH cab marker light (para 7-38).

(11) Position main light switch to OFF (TM 9-2320-366-10-1).

(12) Install gasket on RH cab marker light base.

(13) Connect marker light connector to connector P132.

(14) Install lockwasher, terminal lug TL134, lockwasher, and nut on back of RH cab marker light base.

(15) Install RH cab marker light base on vehicle with four screws.

(16) Install RH cab marker light lamp in socket.

(17) Install lens cover on base with two screws.

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

NOTE
Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

VOLTAGE TEST (CONT)

(14) Install lockwasher, terminal lug TL134, lockwasher, and nut on back of RH cab marker light base.

(15) Install RH cab marker light base on vehicle with four screws.

(16) Install RH cab marker light lamp in socket.

(17) Install lens cover on base with two screws.

VOLTAGE TEST

(1) Remove four screws from RH cab marker light base.

NOTE
Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

(2) Remove nut, lockwasher, terminal lug TL134, and lockwasher from RH cab marker light base. Discard lockwashers.

(3) Extend base and disconnect connector P132 from marker light connector.

(4) Remove gasket from RH cab marker light base. Discard gasket.

(5) Set multimeter to volts DC.

(6) Connect positive (+) probe of multimeter to connector P132 socket.

(7) Connect negative (-) probe of multimeter to ground.

(8) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.

(9) If 12 VDC is not present, repair wire 1947 from connector P132 socket to splice E22 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).

(10) If 12 VDC is present, replace RH cab marker light (para 7-38).

(11) Position main light switch to OFF (TM 9-2320-366-10-1).

(12) Install gasket on RH cab marker light base.

(13) Connect marker light connector to connector P132.

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

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

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

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

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NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
4. Is continuity present through RH door marker light lamp?

**KNOWN INFO**
Other marker lights illuminate.

**POSSIBLE PROBLEMS**

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, RH door marker light lamp is faulty.

**TEST OPTIONS**
Replace RH door marker light lamp (para 7-38).

5. Does RH cab marker light illuminate?

**KNOWN INFO**
Other marker lights illuminate. RH door marker light lamp OK.

**POSSIBLE PROBLEMS**

**TEST OPTIONS**
Operational Test

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

**TEST OPTIONS**
Go to step 8 of this fault.
CONTINUITY TEST

(1) Remove two screws and lens cover from RH door marker light base.
(2) Remove RH door marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through RH door marker light lamp and note reading on multimeter.
(5) If continuity is present, replace RH door marker light lamp (para 7-38).

(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) If RH cab marker light lamp does not illuminate, go to step 8 of fault.
(3) Position main light switch to OFF (TM 9-2320-366-10-1).
e46. RH DOOR AND/OR RH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- RH door marker light illuminates.
- RH cab marker light lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty RH door and cab marker lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 1947 is faulty.

**WARNING**
CAUTION
Read WARNING and CAUTION on following page.

6.
Is 12 VDC present at connector P131 socket?

**NO**

**YES**
- Repair wire 1947 from connector P131 socket to splice E22 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).
WARNING

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

CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove four screws from RH door marker light base.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.</td>
</tr>
<tr>
<td>(2) Remove nut, lockwasher, terminal lug TL131, and lockwasher from RH door marker light base. Discard lockwashers.</td>
</tr>
<tr>
<td>(3) Extend base and disconnect connector P131 from marker light connector.</td>
</tr>
<tr>
<td>(4) Remove gasket from RH door marker light base. Discard gasket.</td>
</tr>
<tr>
<td>(5) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(6) Connect positive (+) probe of multimeter to connector P131 socket.</td>
</tr>
<tr>
<td>(7) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(8) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(9) If 12 VDC is not present, repair wire 1947 from connector P131 socket to splice E22 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).</td>
</tr>
<tr>
<td>(10) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
7. Is continuity present from terminal lug TL134 to terminal lug TL131?

**KNOWN INFO**
- Other marker lights illuminate.
- RH door marker light lamp OK.
- RH cab marker light illuminates.

**POSSIBLE PROBLEMS**
- Faulty marker light. Faulty RH door and cab marker lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3096 is faulty. If continuity is present, RH door marker light is faulty.

**YES**
- Repair wire 3096 from terminal lug TL134 to terminal lug TL131 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).

**NO**
- Replace RH door marker light (para 7-38).
CONTINUITY TEST

(1) Remove two screws and lens cover from RH cab marker light base.
(2) Remove RH cab marker light lamp from socket.
(3) Remove four screws from RH cab marker light base.

NOTE
Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

(4) Remove nut, lockwasher, terminal lug TL134, and lockwasher from RH cab marker light base. Discard lockwashers.
(5) Extend base and disconnect connector P132 from marker light connector.
(6) Remove gasket from RH cab marker light base. Discard gasket.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to terminal lug TL131.
(9) Connect negative (-) probe of multimeter to terminal lug TL134 and note reading on multimeter.
(10) If continuity is not present, repair wire 3096 from terminal lug TL131 to terminal lug TL134 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).
(11) If continuity is present, replace RH door marker light (para 7-38).
(12) Install gasket on RH cab marker light base.
(13) Connect marker light connector to connector P132.
(14) Install lockwasher, terminal lug TL134, lockwasher, and nut on back of RH cab marker light base.
(15) Install RH cab marker light base on vehicle with four screws.
(16) Install RH cab marker light lamp in socket.
(17) Install lens cover on base with two screws.
(18) Install gasket on RH cab marker light base.
(19) Connect marker light connector to connector P131.
(20) Install lockwasher, terminal lug TL131, lockwasher, and nut on back of base.
(21) Install RH door marker light base on vehicle with four screws.
(22) Install RH door marker light lamp in socket.
(23) Install lens cover on base with two screws.
If continuity is not present, RH cab marker light lamp is faulty.

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, RH cab marker light lamp is faulty.

### Known Info

<table>
<thead>
<tr>
<th>Known Info</th>
<th>Possible Problems</th>
</tr>
</thead>
</table>

### Test Options

8. Is continuity present through RH cab marker light lamp?

8. **NO**

9. Is continuity present from terminal lug TL131 to ground?

9. **NO**

9. **YES**

Replace RH cab marker light lamp (para 7-38).

9. **YES**

Replace RH cab marker light lamp (para 7-38).

9. **NO**

9. **YES**

Go to step 12 of this fault.

**Known Info**

<table>
<thead>
<tr>
<th>Known Info</th>
<th>Possible Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate. RH door marker light lamp OK. RH cab marker light lamp OK.</td>
<td>Faulty marker light. Faulty RH door and cab marker lights cable assembly.</td>
</tr>
</tbody>
</table>

**Test Options**

Continuity Test or STE/ICE-R Test #91

**Reason for Question**
This question eliminates possible problems and determines where troubleshooting continues.
CONTINUITY TEST

1. Remove two screws and lens cover from RH cab marker light base.
2. Remove RH cab marker light lamp from socket.
3. Set multimeter to ohms.
4. Check continuity through RH cab marker light lamp and note reading on multimeter.
5. If continuity is not present, replace RH cab marker light lamp (para 7-38).

CONTINUITY TEST

1. Remove two screws and lens cover from RH door marker light base.
2. Remove RH door marker light lamp from socket.
3. Remove four screws from RH door marker light.
   **NOTE**
   Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.
5. Extend base and disconnect connector P131 from marker light connector.
7. Set multimeter to ohms.
8. Connect positive (+) probe of multimeter to terminal lug TL131.
9. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
10. If continuity is not present from terminal lug TL131 to ground, go to step 12 of this fault.
10.

WARNING
CAUTION
Read WARNING and CAUTION on following page.

Is 12 VDC present at connector P132 socket?

NO

YES

Go to step 13 of this fault.

KNOW THE INFO

Other marker lights illuminate.
RH door marker light illuminates.
RH cab marker light lamp OK.

POSSIBLE PROBLEMS

Faulty marker light.
Faulty RH door and cab marker lights cable assembly.

TEST OPTIONS

Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

e46. 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 circuits and cause severe burns or electrical shock.

CAUTION

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

NOTE

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

VOLTAGE TEST

(1) Remove four screws from RH cab marker light base.

NOTE

Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

(2) Remove nut, lockwasher, terminal lug TL134, and lockwasher from RH cab marker light base. Discard lockwashers.

(3) Extend base and disconnect connector P132 from marker light connector.

(4) Remove gasket from RH cab marker light base. Discard gasket.

(5) Set multimeter to volts DC.

(6) Connect positive (+) probe of multimeter to connector P132 socket.

(7) Connect negative (-) probe of multimeter to ground.

(8) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.

(9) If 12 VDC is not present, go to step 13 of this fault.

(10) Position main light switch to OFF (TM 9-2320-366-10-1).

(11) Install gasket on RH cab marker light base.

(12) Connect marker light connector to connector P132.

(13) Install lockwasher, terminal lug TL134, lockwasher, and nut on back of RH cab marker light base.

(14) Install RH cab marker light base on vehicle with four screws.

(15) Install RH cab marker light lamp in socket.

(16) Install lens cover on base with two screws.
11. Is 12 VDC present at connector P131 socket?

- **NO**
  - Repair wire 1947 from connector P131 socket to splice E22 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).

- **YES**
  - Replace RH cab marker light and RH door marker light (para 7-38).

**KNOWLEDGE INFO**

- Other marker lights illuminate. RH door marker light illuminates. RH cab marker light lamp OK.

**POSSIBLE PROBLEMS**

- Faulty marker light.
- Faulty RH door and cab marker lights cable assembly.

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

- If 12 VDC is not present, wire 1947 is faulty.

**WARNING**

- Read WARNING and CAUTION on following page.

**CAUTION**

- If 12 VDC is not present, wire 1947 is faulty.

---

If 12 VDC is not present, wire 1947 is faulty.
**WARNING**

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

**CAUTION**

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

**NOTE**

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

---

### VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>2</td>
<td>Connect positive (+) probe of multimeter to connector P132 socket.</td>
</tr>
<tr>
<td>3</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>4</td>
<td>Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>5</td>
<td>If 12 VDC is not present, repair wire 1947 from connector P132 socket to splice E22 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).</td>
</tr>
<tr>
<td>6</td>
<td>If 12 VDC is present, replace RH cab marker light and RH door marker light (para 7-38).</td>
</tr>
<tr>
<td>7</td>
<td>Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>8</td>
<td>Install gasket on RH door marker light base.</td>
</tr>
<tr>
<td>9</td>
<td>Connect marker light connector to connector P132.</td>
</tr>
<tr>
<td>10</td>
<td>Install lockwasher, terminal lug TL134, lockwasher, and nut on back of RH door marker light base.</td>
</tr>
<tr>
<td>11</td>
<td>Install RH door marker light base on vehicle with four screws.</td>
</tr>
<tr>
<td>12</td>
<td>Install RH door marker light lamp in socket.</td>
</tr>
<tr>
<td>13</td>
<td>Install lens cover on base with two screws.</td>
</tr>
</tbody>
</table>
12. Is continuity present from terminal lug TL134 to terminal lug TL131?

**KNOWN INFO**

Other marker lights illuminate.
RH door marker light lamp OK.
RH cab marker light illuminates.

**POSSIBLE PROBLEMS**

Faulty marker light.
Faulty RH door and cab marker lights cable assembly.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, wire 3096 is faulty. If continuity is present, RH door marker light is faulty.

**YES**

Repair wire 3096 from terminal lug TL134 to terminal lug TL131 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).

**NO**

Repair wire 3096 from terminal lug TL134 to terminal lug TL71 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).
CONTINUITY TEST

(1) Remove four screws from RH cab marker light base.

NOTE
Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

(2) Remove nut, lockwasher, terminal lug TL134, and lockwasher from RH cab marker light base. Discard lockwashers.

(3) Extend base and disconnect connector P132 from marker light connector.

(4) Remove gasket from RH cab marker light base. Discard gasket.

(5) Set multimeter to ohms.

(6) Connect positive (+) probe of multimeter to terminal lug TL131.

(7) Connect negative (-) probe of multimeter to terminal lug TL134 and note reading on multimeter.

(8) If continuity is not present, repair wire 3096 from terminal lug TL134 to terminal lug TL131 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).

(9) If continuity is present, replace RH door marker light (para 7-38).

(10) Install gasket on RH cab marker light base.

(11) Connect marker light connector to connector P132.

(12) Install lockwasher, terminal lug TL134, lockwasher, and nut on back of RH cab marker light base.

(13) Install RH cab marker light base on vehicle with four screws.

(14) Install RH cab marker light lamp in socket.

(15) Install lens cover on base with two screws.

(16) Install gasket on RH door marker light base.

(17) Connect marker light connector to connector P131.

(18) Install lockwasher, terminal lug TL131, lockwasher, and nut on back of RH door marker light base.

(19) Install RH door marker light base on vehicle with four screws.

(20) Install RH door marker light lamp in socket.

(21) Install lens cover on base with two screws.
e46. RH DOOR AND/OR RH FRONT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 1947 is faulty. If 12 VDC is present, RH door and cab marker light cable assembly is faulty.

**KNOWN INFO**
Other marker lights illuminate. RH door marker light lamp OK. RH cab marker light illuminates.

**POSSIBLE PROBLEMS**
Faulty marker light. Faulty RH door and cab marker lights cable assembly.

13. Is 12 VDC present at connector P131 socket?

- **NO**
  - Repair wire 1947 from connector P132 socket to splice E22 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64) and replace RH door marker light (para 7-38).

- **YES**
  - Replace RH door and cab marker lights cable assembly (para 7-64).
VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to connector P131 socket.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 12 VDC is not present, repair wire 1947 from connector P131 socket to splice E22 (para 2-45) or replace RH door and cab marker lights cable assembly (para 7-64).
(6) If 12 VDC is present, replace RH door and cab marker light cable assembly (para 7-64).
(7) Position main light switch to OFF (TM 9-2320-366-10-1).
(8) Install gasket on RH door marker light base.
(9) Connect marker light connector to connector P131.
(10) Install lockwasher, terminal lug TL131, lockwasher, and nut on back of RH door marker light base.
(11) Install RH door marker light base on vehicle with four screws.
(12) Install RH door marker light lamp in socket.
(13) Install lens cover on base with two screws.
e47. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-23230-366-10-1).

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

Materials/Parts
Lockwasher (4) (Item 82, Appendix G)
Gasket (2) (Item 29.2, Appendix G)
Wire, Elec, 50 ft (Item 71, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

BEGIN

START

1. Do any of the cab top marker lights illuminate?

   NO

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

   YES

   Go to step 5 of this fault.

2. Is continuity present through lamp?

   NO

   TEST OPTIONS
   Continuity Test or STE/ICE-R Test #91

   REASON FOR QUESTION
   If continuity is not present, lamp is faulty.

   YES

   Replace lamp (para 7-38).

END
(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) If no cab top marker lights illuminate, go to step 5 of this fault.
(3) Position main light switch to OFF (TM 9-2320-366-10-1).

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove two screws and lens cover from marker light base.</td>
</tr>
<tr>
<td>(2) Remove marker light lamp from socket.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Check continuity through marker light lamp and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If continuity is not present, replace marker light lamp (para 7-38).</td>
</tr>
</tbody>
</table>
e47. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**KNOWLEDGE INFO**

Other marker lights illuminate. Lamp OK.

**POSSIBLE PROBLEMS**


---

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 12 VDC is not present, wire 1951 is faulty.

---

**WARNING**

CAUTION

Read WARNING and CAUTION on following page.

---

**3.**

Is 12 VDC present at connector (Refer to Table 2-11.1. Cab Clearance and Marker Light Connectors) Socket 1?

---

**YES**

Repair wire 1951 from connector (Refer to Table 2-11.1. Cab Clearance and Marker Light Connectors) (para 2-45) or replace cab clearance and marker lights cable assembly (para 7-66) or M1093/M1094 cab clearance and marker lights upper cable assembly (para 7-63).

---

**NO**
CAUTION

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

NOTE

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

VOLTAGE TEST

(1) Remove four screws from marker light base.

NOTE

Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

(2) Remove nut, lockwasher, terminal lug, and lockwasher from marker light base. Discard lockwashers.

(3) Extend base and disconnect connector (Refer to Table 2-11.1. Cab Clearance and Marker Light Connectors) from marker light connector.

(4) Remove gasket from marker light base. Discard gasket.

(5) Set multimeter to volts DC.

(6) Connect positive (+) probe of multimeter to connector (Refer to Table 2-11.1. Cab Clearance and Marker Light Connectors).

(7) Connect negative (-) probe of multimeter to ground.

(8) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.

VOLTAGE TEST (CONT)

(9) If 12 VDC is not present, repair wire 1951 from connector (Refer to Table 2-11.1. Cab Clearance and Marker Light Connectors) (para 2-45) or replace cab clearance and marker lights cable assembly (para 7-66) or M1081 cab clearance and marker lights upper cable assembly (para 7-63).

(10) Position main light switch to OFF (TM 9-2320-366-10-1).

<table>
<thead>
<tr>
<th>Marker/ID Light</th>
<th>Connector</th>
<th>Wire Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH Cab Top Marker Light</td>
<td>P55</td>
<td>P55 to splice E23</td>
</tr>
<tr>
<td>RH Cab Top ID Light</td>
<td>P59</td>
<td>P59 to splice E23</td>
</tr>
<tr>
<td>Middle Cab Top ID Light</td>
<td>P60</td>
<td>P60 to splice E23</td>
</tr>
<tr>
<td>LH Cab Top ID Light</td>
<td>P57</td>
<td>P57 to splice E23</td>
</tr>
<tr>
<td>LH Cab Top Marker Light</td>
<td>P50</td>
<td>P50 to splice E23</td>
</tr>
</tbody>
</table>
**e47. ONE OR MORE TOP CAB MARKER LIGHTS DO NOT ILLUMINATE (CONT)**

**KNOWN INFO**

| Other marker lights illuminate. Lamp OK. |

**POSSIBLE PROBLEMS**


**4.**

Is continuity present from terminal lug (Refer to Table 2-11.2. Cab Clearance and Marker Light Terminal Lugs) to ground?

**TEST OPTIONS**

| Continuity Test or STE/ICE-R Test #91 |

**REASON FOR QUESTION**

If continuity is not present, wire 3097 is faulty. If continuity is present, marker light is faulty.

**NO**

Repair wire 3097 from terminal lug (Refer to Table 2-11.2. Cab Clearance and Marker Light Terminal Lugs) (para 2-45) or replace cab clearance and marker lights cable assembly (para 7-66) or M1093/M1094 cab clearance and marker lights upper cable assembly (para 7-63).

**YES**

Replace marker light assembly (para 7-38).
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal lug (Refer to Table 2-11.2. Cab Clearance and Marker Light Terminal Lugs).
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3097 (para 2-45) or replace cab clearance and marker lights cable assembly (para 7-66) or M1093/M1094 cab clearance and marker lights upper cable assembly (para 7-63).
(5) If continuity is present, replace marker light assembly (para 7-38).
(6) Install gasket on marker light base.
(7) Connect connector (Refer to Table 2-11.2. Cab Clearance and Marker Light Connectors) to marker light connector.
(8) Install lockwasher, terminal lug (Refer to Table 2-11.2. Cab Clearance and Marker Light Terminal Lugs), lockwasher, and nut on back of base.
(9) Install marker light lamp in socket.
(10) Install marker light base on vehicle with four screws.
(11) Install lens cover on base with two screws.

Table 2-11.2. Cab Clearance and Marker Light Terminal Lugs

<table>
<thead>
<tr>
<th>Light</th>
<th>Terminal Lug</th>
<th>Wire Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH Cab Top Marker Light</td>
<td>TL3</td>
<td>TL3 to splice E24</td>
</tr>
<tr>
<td>RH Cab Top ID Light</td>
<td>TL4</td>
<td>TL4 to splice E24</td>
</tr>
<tr>
<td>Middle Cab Top ID Light</td>
<td>TL8</td>
<td>TL8 to splice E24</td>
</tr>
<tr>
<td>LH Cab Top ID Light</td>
<td>TL22</td>
<td>TL22 to splice E24</td>
</tr>
<tr>
<td>LH Cab Top Marker Light</td>
<td>TL27</td>
<td>TL27 to splice E24</td>
</tr>
</tbody>
</table>
Is vehicle model M1093/M1094?

**Known Info**
No cab top marker lights illuminate.

**Possible Problems**
Faulty cab clearance and marker lights cable assembly.
Faulty M1093/M1094 cab clearance and marker lights lower cable assembly.
Faulty M1093/M1094 cab clearance and marker lights upper cable assembly.

**Test Options**
Visual Inspection

**Reason For Question**
This question eliminates possible problems and determines where troubleshooting continues.

**Flowchart:**
- **Yes:** Go to step 9 of this fault.
- **No:** Continue troubleshooting.
(1) Is vehicle model M1093/M1094? If vehicle is not model M1093/M1094, go to step 9 of this fault.
e47. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>No cab top marker lights illuminate.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty M1093/M1094 cab clearance and marker lights lower cable assembly.</td>
</tr>
<tr>
<td>Faulty M1093/M1094 cab clearance and marker lights upper cable assembly.</td>
</tr>
</tbody>
</table>

6. Is 12 VDC present at connector P3 socket 1?

- **WARNING**
- **CAUTION**
  Read WARNING and CAUTION on following page.

- **TEST OPTIONS**
  Voltage Test or STE/ICE-R Test #89

- **REASON FOR QUESTION**
  If 12 VDC is not present, wire 1951 is faulty.

- **NO**
  Repair wire 1951 from connector P3 socket 1 to terminal lug TL74 (para 2-45) or replace M1093/M1094 cab clearance and marker lights lower cable assembly (para 7-62).
WARNING

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

CAUTION

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

NOTE

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

### VOLTAGE TEST

1. Disconnect connector P3 from connector J3.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P3 socket 1.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
6. If 12 VDC is not present, repair wire 1951 (para 2-45) from connector P3 socket 1 to terminal lug TL74 or replace M1093/M1094 cab clearance and marker lights lower cable assembly (para 7-62).
e47. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3097 is faulty.

**KNOWN INFO**
No cab top marker lights illuminate.

**POSSIBLE PROBLEMS**
Faulty M1093/M1094 cab clearance and marker lights lower cable assembly.
Faulty M1093/M1094 cab clearance and marker lights upper cable assembly.

**7.**
Is continuity present from connector P3 pin 2 to ground?

**CAUTION**
Read CAUTION on following page.

**NO**
Repair wire 3097 from connector P3 pin 2 to terminal lug TL86 (para 2-45) or replace M1093/M1094 cab clearance and marker lights lower cable assembly (para 7-62).

**YES**
CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector P3 pin 2.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If continuity is not present, repair wire 3097 (para 2-45) from connector P3 pin 2 to terminal lug TL86 or replace M1093/M1094 cab clearance and marker lights lower cable assembly (para 7-62).</td>
</tr>
</tbody>
</table>
e47. ONE OR MORE CAB TOP MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**

No cab top marker lights illuminate. M1093/M1094 cab clearance and marker lights lower cable assembly OK.

**POSSIBLE PROBLEMS**

Faulty M1093/M1094 cab clearance and marker lights upper cable assembly.

**TEST OPTIONS**

Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, wire 3097 is faulty. If continuity is present, wire 1951 is faulty.

---

8. Is continuity present from connector J 3 socket 2 to terminal lug TL27?

**CAUTION**

Read CAUTION on following page.

---

**YES**

Repair wire 3097 from connector J 3 socket 2 to splice E24 (para 2-45) or replace M1093/M1094 cab clearance and marker lights upper cable assembly (para 7-63).

---

**NO**

Repair wire 1951 from connector J 3 pin 1 to splice E23 (para 2-45) or replace M1093/M1094 cab clearance and marker lights upper cable assembly (para 7-63).
**CONTINUITY TEST**

1. Remove two screws and lens cover from LH cab top marker light base.
2. Remove LH cab top marker light lamp from socket.
3. Remove four screws from LH cab top marker light base.

**NOTE**

Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

5. Extend base and disconnect marker light connector from connector P50.
7. Set multimeter to ohms.
8. Connect positive (+) probe of multimeter to connector J3 socket 2.
9. Connect negative (-) probe of multimeter to terminal lug TL27 and note reading on multimeter.
10. If continuity is not present, repair wire 3097 from connector J3 socket 2 to splice E24 (para 2-45) or replace M1093/M1094 cab clearance and marker lights upper cable assembly (para 7-63).
11. If continuity is present, repair wire 1951 from connector J3 pin 1 to splice E23 (para 2-45) or replace M1093/M1094 cab clearance and marker lights upper cable assembly (para 7-63).
12. Install gasket on LH cab top marker light base.
13. Connect marker light connector to connector P50.
15. Install LH cab top marker light base on vehicle with four screws.

**CAUTION**

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

**NOTE**

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

**CONTINUITY TEST (CONT)**

16. Install LH cab top marker light lamp in socket.
17. Install lens cover on base with two screws.
18. Connect connector P3 to connector J3.
**KNOWN INFO**

No cab top marker lights illuminate.

**POSSIBLE PROBLEMS**

Faulty cab clearance and marker lights cable assembly.

---

**TEST OPTIONS**

Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, wire 3097 is faulty. If continuity is present, wire 1951 is faulty.

---

9. Is continuity present from terminal lug TL3 to ground?

---

**CAUTION**

Read CAUTION on following page.

---

**YES**

Repair wire 3097 from terminal lug TL86 to splice E24 (para 2-45) or replace cab clearance and marker lights cable assembly (para 7-63).

---

**NO**

Repair wire 1951 from terminal lug TL74 to splice E23 (para 2-45) or replace cab clearance and marker lights cable assembly (para 7-66).
CONTINUITY TEST

1. Remove two screws and lens cover from RH cab top marker light base.
2. Remove RH cab top marker lamp from socket.
3. Remove four screws from RH cab top marker light base.

**NOTE**

Do not let wires slip through hole into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

5. Extend base and disconnect marker light connector from connector P55.
7. Set multimeter to ohms.
8. Connect positive (+) probe of multimeter to terminal lug TL3.
9. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
10. If continuity is not present, repair wire 3097 from terminal lug TL86 to splice E24 (para 2-45) or replace cab clearance and marker lights cable assembly (para 7-66).
11. If continuity is present, repair wire 1951 from terminal lug TL74 to splice E23 (para 2-45) or replace cab clearance and marker lights cable assembly (para 7-66).
12. Install gasket on RH cab top marker light base.
13. Connect connector P55 to marker light connector.
15. Install RH cab top marker light base on vehicle with four screws.
16. Install RH cab top marker light lamp in socket.
17. Install lens cover on RH cab top marker light base with two screws.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE

INITIAL SETUP

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

Tools and Special Tools
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICR-R (Item 42, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

Materials/Parts
- Lockwasher (6) (Item 82, Appendix G)
- Ties, Cable, Plastic (Item 69, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

START

1. Does any side or rear marker lights illuminate?
   - NO
     - Go to step 12 of this fault.
   - YES
     - Go to step 13 of this fault.

2. Does more than one side or rear marker light not illuminate?
   - NO
     - Go to step 12 of this fault.
   - YES
     - Go to step 13 of this fault.

KNOWLEDGE

Other marker lights illuminate.
Rear composite lights illuminate.

POSSIBLE PROBLEMS
Faulty lamp.
Faulty marker light.
Faulty rear lights cable assembly.
Faulty dashboard cable assembly.

TEST OPTIONS
Visual Inspection

REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.
(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).

(2) Note side and/or rear marker light(s) that do not illuminate.

(3) If all side and/or rear marker lights do not illuminate, go to step 12 of this fault.

(4) Position main light switch to OFF (TM 9-2320-366-10-1).

If only one side and/or rear marker light does not illuminate, go to step 13 of this fault.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**TEST OPTIONS**
Visual Inspection

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

### 3. Is vehicle M1084?
- **NO**
- **YES**
  - Go to step 16 of this fault.

### 4. Do both LH side and rear marker lights illuminate?
- **NO**
- **YES**
  - Go to step 17 of this fault.
If both LH side and rear marker lights do not illuminate, go to step 17 of this fault.

Is vehicle M1084? If vehicle is not M1084, go to step 16 of this fault.
**e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)**

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

---

**TEST OPTIONS**
- Visual Inspection

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

5. **Do both RH side and rear marker lights illuminate?**

- **NO**
- **YES**
  - Go to step 21 of this fault.

---

6. **Do any of the three rear marker lights illuminate?**

- **NO**
  - Repair wire 3094 from splice E21 to terminal lug TL32 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
- **YES**
If both RH side and rear marker lights do not illuminate, go to step 21 of this fault.

If all three marker lights do not illuminate, repair wire 3094 from splice E21 to terminal lug TL32 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
7. Does the RH rear marker light illuminate?

8. Does the middle rear marker light illuminate?

POSSIBLE PROBLEMS
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.
If the RH rear marker light does not illuminate, go to step 25 of this fault.

If the middle rear marker light does not illuminate, go to step 27 of this fault.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**Known Info**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**Possible Problems**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**Test Options**
- Continuity Test or STE/ICE-R Test #91

**Reason for Question**
- If continuity is not present, LH rear marker light lamp is faulty.

**Diagram**
- **9.** Is continuity present through LH rear marker light lamp?
  - **NO**
  - **YES** Replace LH rear marker light lamp (para 7-38).
CONTINUITY TEST

(1) Remove two screws and lens cover from LH rear marker light base.
(2) Remove LH rear marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH rear marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH rear marker light lamp (para 7-38).
(6) Install LH rear marker light lamp in socket.
(7) Install lens cover on LH rear marker light base with two screws.
**WARNING**

Read **WARNING** and **CAUTION** on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 489 is faulty.

---

### 10.
Is 12 VDC present at connector P54?

---

**YES**

Repair wire 489 from connector P54 to splice E15 (para 2-45) or replace rear lights cable assembly (para 784).

**NO**

---

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.
VOLTAGE TEST

(1) Disconnect connector P54 from LH rear marker light connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P54.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 489 from connector P54 to splice E15 (para 2-45) or replace rear lights cable assembly (para 7-84).
(7) Position main light switch to OFF (TM 9-2320-366-10-1).
(8) Connect LH rear marker light connector to connector P54.

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

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

NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
E48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate.</td>
<td>Continuity Test or STE/ICE-R Test #91</td>
<td>If continuity is not present, wire 3094 is faulty. If continuity is present, LH rear marker light is faulty.</td>
</tr>
<tr>
<td>Rear composite lights illuminate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty lamp.</td>
<td></td>
</tr>
<tr>
<td>Faulty marker light.</td>
<td></td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
<td></td>
</tr>
</tbody>
</table>

11. Is continuity present from terminal lug TL30 to terminal lug TL31?

- **NO**
  - If continuity is not present, wire 3094 is faulty. If continuity is present, LH rear marker light is faulty.

- **YES**
  - Repair wire 3094 from terminal lug TL30 to terminal lug TL31 (para 2-45) or replace rear lights cable assembly (para 7-84).

  Replace LH rear marker light (para 7-38).
CONTINUITY TEST

2. Remove nut, lockwasher, terminal lug TL31, and lockwasher from middle rear marker light screw. Discard lockwashers.
3. Set multimeter to ohms.
4. Connect positive (+) probe of multimeter to terminal lug TL30.
5. Connect negative (-) probe of multimeter to terminal lug TL31 and note reading on multimeter.
6. If continuity is not present, repair wire 3094 from terminal lug TL30 to terminal lug TL31 (para 2-45) or replace rear lights cable assembly (para 7-84).
7. If continuity is present, replace LH rear marker light (para 7-38).
8. Install lockwasher, terminal lug TL31, lockwasher, and nut on middle rear marker light screw.
10. Install LH rear marker light lamp in socket.
11. Install lens cover on LH rear marker light base with two screws.

Change 1 2-600.9
12. Is continuity present from connector J51 pin 7 to terminal board TB1 position 11?

- **YES**
  - Repair wire 489 from connector J51 pin 7 to terminal board TB1 position 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**
  - Repair wire 489 from connector J51 pin 7 to terminal board TB1 position 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 489 is faulty.

**CAUTION**
Read CAUTION on following page.

**Reason**
M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**Possible problems**
- Faulty rear lights cable assembly.
- Faulty dashboard cable assembly.

**Other marker lights illuminate.**
- Rear composite lights illuminate.

**Rear composite lights illuminate.**
- Faulty rear lights cable assembly.
- Faulty dashboard cable assembly.

**Repair wire 489 from connector J51 pin 7 to terminal board TB1 position 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).**
### CAUTION

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

### NOTE

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>(2) Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(3) Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>(4) Remove three screws from PDP.</td>
</tr>
<tr>
<td>(5) Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>(6) Disconnect connector P51 from connector J51.</td>
</tr>
<tr>
<td>(7) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(8) Connect positive (+) probe of multimeter to connector J51 pin 7.</td>
</tr>
<tr>
<td>(9) Connect negative (-) probe of multimeter to terminal board TB1 position 11 and note reading on multimeter.</td>
</tr>
<tr>
<td>(10) If continuity is not present, repair wire 489 from connector J51 pin 7 to terminal board TB1 position 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(11) If continuity is present, repair wire 489 from connector P51 socket 7 to splice E15 (para 2-45) or replace rear lights cable assembly (para 7-84).</td>
</tr>
<tr>
<td>(12) Connect connector J51 to connector P51.</td>
</tr>
<tr>
<td>(13) Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>(14) Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>(15) Install PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(16) Connect batteries (para 7-57).</td>
</tr>
</tbody>
</table>
13. **Is continuity present through marker light lamp?**

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, marker light lamp is faulty.

**YES**
- Replace marker light lamp (para 7-38).

**NO**
CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Remove two screws and lens cover from marker light base.</td>
</tr>
<tr>
<td>2.</td>
<td>Remove marker light lamp from socket.</td>
</tr>
<tr>
<td>3.</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>4.</td>
<td>Check continuity through marker light lamp and note reading on multimeter.</td>
</tr>
<tr>
<td>5.</td>
<td>If continuity is not present, replace marker light lamp (para 7-38).</td>
</tr>
<tr>
<td>6.</td>
<td>Install marker light lamp in socket.</td>
</tr>
<tr>
<td>7.</td>
<td>Install lens cover on marker light base with two screws.</td>
</tr>
</tbody>
</table>
**e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)**

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
14. Is 12 VDC present at connector?

**WARNING**
**CAUTION**
Read WARNING and CAUTION on following page.

**YES**
Repair wire 489 (refer to Table 2-12. M1083/M1084/M1090/M1092/M1093/M1094 Side and Rear Marker Light Connectors) (para 2-40) or replace rear lights cable assembly (para 7-75).

**NO**
If 12 VDC is not present, wire 489 is faulty.
VOLTAGE TEST

(1) Disconnect marker light connector from connector (refer to Table 2-12. M1083/M1084/M1090/M1092/M1093/M1094 Side and Rear Marker Light Connectors).
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector (refer to Table 2-12. M1083/M1084/M1090/M1092/M1093/M1094 Side and Rear Marker Light Connectors).
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
(7) If 12 VDC is not present, repair wire 489 (refer to Table 2-12. M1083/M1084/M1090/M1092/M1093/M1094 Side and Rear Marker Light Connectors) (para 2-45) or replace rear lights cable assembly (para 7-84).

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

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

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

Table 2-12. M1083/M1084/M1090/M1092/M1093/M1094 Side and Rear Marker Light Connectors

<table>
<thead>
<tr>
<th>Marker Light</th>
<th>Connector</th>
<th>Wire 489 Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH Side</td>
<td>P85</td>
<td>Connector P85 to Splice</td>
</tr>
<tr>
<td>LH Rear</td>
<td>P86</td>
<td>Connector P86 to Splice</td>
</tr>
<tr>
<td>Left Rear</td>
<td>P54</td>
<td>Connector P54 to Splice</td>
</tr>
<tr>
<td>Middle Rear</td>
<td>P56</td>
<td>Connector P56 to Splice</td>
</tr>
<tr>
<td>Right Rear</td>
<td>P58</td>
<td>Connector P58 to Splice</td>
</tr>
<tr>
<td>RH Rear</td>
<td>P89</td>
<td>Connector P89 to Splice</td>
</tr>
<tr>
<td>RH Side</td>
<td>P88</td>
<td>Connector P88 to Splice</td>
</tr>
</tbody>
</table>

XRE4014B
15. Is continuity present from terminal lug to ground?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire (refer to Table 2-12.1. M1083/M1084/M1090/M1092/M1093/M1094 Side and Rear Marker Light Terminal Lugs) is faulty.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**KNOWLEDGE INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

Replace marker light (para 7-38).
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug, and lockwasher from marker light screw. Discard lockwashers.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug (refer to Table 2-12.1. M1093/M1084/M1090/M1092/M1093 Side and Rear Marker Light Terminal Lugs).
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire (refer to Table 2-12.1. M1093/M1084/M1090/M1092/M1093 Side and Rear Marker Light Terminal Lugs) (para 2-45) or replace rear lights cable assembly (para 7-84).
(6) If continuity is present, replace marker light (para 7-38).
(7) Install lockwasher and terminal lug on marker light screw with lockwasher and nut.

Table 2-12.1. M1083/M1084/M1090/M1092/M1093/M1094 Side and Rear Marker Light Terminal Lugs

<table>
<thead>
<tr>
<th>Marker Light</th>
<th>Connector</th>
<th>Wire Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH Side</td>
<td>TL15</td>
<td>Wire 3094 from Terminal Lug TL15 to Terminal Lug TL16</td>
</tr>
<tr>
<td>LH Rear</td>
<td>TL16</td>
<td>Replace Marker Light (para 7-38)</td>
</tr>
<tr>
<td>Left Rear</td>
<td>TL30</td>
<td>Wire 3094 from Terminal Lug TL31 to Terminal Lug TL30</td>
</tr>
<tr>
<td>Middle Rear</td>
<td>TL31</td>
<td>Replace Marker Light (para 7-38)</td>
</tr>
<tr>
<td>Right Rear</td>
<td>TL32</td>
<td>Replace Marker Light (para 7-38)</td>
</tr>
<tr>
<td>RH Rear</td>
<td>TL20</td>
<td>Replace Marker Light (para 7-38)</td>
</tr>
<tr>
<td>RH Side</td>
<td>TL19</td>
<td>Wire 3095 from Terminal Lug TL19 to Terminal Lug TL20</td>
</tr>
</tbody>
</table>
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

16. Is rear carrier equipped with two marker lights?

- **YES**
  - Go to step 30 of this fault.

- **NO**
  - Go to step 7 of this fault.

Go to step 7 of this fault.
(1) If rear carrier is equipped with one marker light, go to step 30 of this fault.

(2) If rear carrier is equipped with two marker lights, go to step 7 of this fault.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

17. Does LH side or rear marker light illuminate?

   NO
   
   YES
   
   Go to step 32 of this fault.

18. Does LH side marker light illuminate?

   NO
   
   YES
   
   Go to step 33 of this fault.

KNOWLEDGE

Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK.

POSSIBLE PROBLEMS


TEST OPTIONS

Visual Inspection

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

KNOWLEDGE

Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK.

POSSIBLE PROBLEMS

If LH side and rear marker lights do not illuminate, go to step 32 of this fault.

If LH side marker light does not illuminate, go to step 33 of this fault.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

19. Is continuity present through LH rear marker light lamp?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate.</td>
</tr>
<tr>
<td>Rear composite lights illuminate.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty lamp.</td>
</tr>
<tr>
<td>Faulty marker light.</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, LH rear marker light lamp is faulty.</td>
</tr>
</tbody>
</table>

**NO**

**YES**

Replace LH rear marker light lamp (para 7-38) and go to step 5 of this fault if required.
CONTINUITY TEST

1. Remove two screws and lens cover from LH rear marker light base.
2. Remove LH rear marker light lamp from socket.
3. Set multimeter to ohms.
4. Check continuity through LH rear marker light lamp and note reading on multimeter.
5. If continuity is not present, replace LH rear marker light lamp (para 7-38) and go to step 5 of this fault if required.
6. Install LH rear marker light lamp in socket.
7. Install lens cover on LH rear marker light base with two screws.
20. Is 12 VDC present at connector P86?

- **NO**
  - Repair wire 489 from connector P86 to splice E16 (para 2-45) and go to step 5 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

- **YES**
  - Replace LH rear marker light (para 7-38) and go to step 5 of this fault if required.
VOLTAGE TEST

(1) Disconnect connector P86 from LH rear marker light connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P86.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 489 from connector P86 to splice E16 (para 2-45) and go to step 5 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(7) If 12 VDC is present, replace LH rear marker light (para 7-38) and go to step 5 of this fault if required.
(8) Position main light switch to OFF (TM 9-2320-366-10-1).
(9) Connect LH rear marker light connector to connector P86.
21. Does RH side or rear marker light illuminate?

**KNOWN INFO**
Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**

**TEST OPTIONS**
Visual Inspection

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

22. Does RH side marker light illuminate?

**KNOWN INFO**
Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**

**TEST OPTIONS**
Visual Inspection

**REASON FOR QUESTION**
This question eliminates possible problems and determines where troubleshooting continues.
If RH side or rear marker light does not illuminate, go to step 36 of this fault.

If RH side marker light does not illuminate, go to step 37 of this fault.
23. Is continuity present through RH rear marker light lamp?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate.</td>
</tr>
<tr>
<td>Rear composite lights illuminate.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty lamp.</td>
</tr>
<tr>
<td>Faulty marker light.</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, RH rear marker light lamp is faulty.</td>
</tr>
</tbody>
</table>

- **NO**
  - Replace RH rear marker light lamp (para 7-38) and go to step 6 of this fault if required.

- **YES**
### CONTINUITY TEST

1. Remove two screws and lens cover from RH rear marker light base.
2. Remove RH rear marker light lamp from socket.
3. Set multimeter to ohms.
4. Check continuity through RH rear marker light lamp and note reading on multimeter.
5. If continuity is not present, replace RH rear marker light lamp (para 7-38) and go to step 6 of this fault if required.
6. Install RH rear marker light lamp in socket.
7. Install lens cover on RH rear marker light base with two screws.
24. Is 12 VDC present at connector P89?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 489 is faulty. If 12 VDC is present RH rear marker light is faulty.

**WARNING**

**CAUTION**
Read WARNING and CAUTION on following page.

**YES**
- Repair wire 489 from connector P89 to splice E17 (para 2-45) and go to step 6 of this fault if required, or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**NO**
- Replace RH rear marker light (para 7-38) and go to step 6 of this fault if required.
VOLTAGE TEST

(1) Disconnect connector P89 from RH rear marker light connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P89.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 489 from connector P89 to splice E17 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(7) If 12 VDC is present, replace RH rear marker light (para 7-38) and go to step 6 of this fault.
(8) Position main light switch to OFF (TM 9-2320-366-10-1).
(9) Connect RH rear marker light connector to connector P89.

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

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

NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, RH rear marker light lamp is faulty.

25. Is continuity present through RH rear marker light lamp?

- **NO**
  - Replace RH rear marker light lamp (para 7-38) and go to step 9 of this fault if required.

- **YES**
CONTINUITY TEST

(1) Remove two screws and lens cover from RH rear marker light base.
(2) Remove RH rear marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through RH rear marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace RH rear marker light lamp (para 7-38) and go to step 9 of this fault if required.
(6) Install RH rear marker light lamp in socket.
(7) Install lens cover on RH rear marker light base with two screws.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

26. Is 12 VDC present at connector P58?

**KNOWN INFO**
Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 489 is faulty. If 12 VDC is present, RH rear marker light is faulty.

**WARNING**

**CAUTION**
Read WARNING and CAUTION on following page.

**NO**
Replace RH rear marker light (para 7-38) and go to step 8 of this fault if required.

**YES**
Repair wire 489 from connector P58 to splice E15 (para 2-45) and go to step 8 of this fault or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
VOLTAGE TEST

Change 1 2-604.19

TM 9-2320-366-20-1

(1) Disconnect connector P58 from RH rear marker light connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P58.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 489 from connector P58 to splice E15 (para 2-45) and go to step 8 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(7) If 12 VDC is present, replace RH rear marker light (para 7-38) and go to step 8 of this fault if required.
(8) Position main light switch to OFF (TM 9-2320-366-10-1).
(9) Connect RH rear marker light connector to connector P58.

WARNING

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

CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect connector P58 from RH rear marker light connector.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector P58.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If 12 VDC is not present, repair wire 489 from connector P58 to splice E15 (para 2-45) and go to step 8 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.</td>
</tr>
<tr>
<td>(7) If 12 VDC is present, replace RH rear marker light (para 7-38) and go to step 8 of this fault if required.</td>
</tr>
<tr>
<td>(8) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Connect RH rear marker light connector to connector P58.</td>
</tr>
</tbody>
</table>
27. Is continuity present through middle rear marker light lamp?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, middle rear marker light lamp is faulty.

- **NO**
  - Replace middle rear marker light lamp (para 7-38) and go to step 9 of this fault if required.

- **YES**
<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove two screws and lens cover from middle rear marker light base.</td>
</tr>
<tr>
<td>(2) Remove middle rear marker light lamp from socket.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Check continuity through middle rear marker light lamp and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If continuity is not present, replace middle rear marker light lamp (para 7-38) and go to step 9 of this fault if required.</td>
</tr>
<tr>
<td>(6) Install middle rear marker light lamp in socket.</td>
</tr>
<tr>
<td>(7) Install lens cover on middle rear marker light base with two screws.</td>
</tr>
</tbody>
</table>

![Diagram of middle rear marker light system]
28. Is 12 VDC present at connector P56?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 489 is faulty.

**WARNING**
Read WARNING and CAUTION on following page.

**YES**
Repair wire 489 from connector P56 to splice E15 (para 2-45) and go to step 9 of this fault or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**NO**
VOLTAGE TEST

(1) Disconnect connector P56 from middle rear marker light connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P56.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 489 from connector P56 to splice E15 (para 2-45) and go to step 9 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(7) Position main light switch to OFF (TM 9-2320-366-10-1).
(8) Connect middle rear marker light connector to connector P56.

WARNING

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

CAUTION

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

NOTE

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

CAUTION

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

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
Is continuity present from terminal lug TL31 to terminal lug TL32?

**NO**

- Repair wire 3094 from terminal lug TL31 to terminal lug TL32 (para 2-45) and go to step 9 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**YES**

- Replace middle rear marker light (para 7-38) and go to step 9 of this fault if required.

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3094 is faulty. If continuity is present, middle rear marker light is faulty.
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug TL31 and lockwasher from middle rear marker light screw. Discard lockwashers.

(2) Remove nut, lockwasher, terminal lug TL32 and lockwasher from RH rear marker light screw. Discard lockwashers.

(3) Set multimeter to ohms.

(4) Connect positive (+) probe of multimeter to terminal lug TL31.

(5) Connect negative (-) probe of multimeter to terminal lug TL32 and note reading on multimeter.

(6) If continuity is not present, repair wire 3094 from terminal lug TL31 to terminal lug TL32 (para 2-45) and go to step 9 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

(7) If continuity is present, replace middle rear marker light (para 7-38) and go to step 9 of this fault if required.

(8) Install lockwasher, terminal lug TL32, lockwasher, and nut on RH rear marker light screw.

(9) Install lockwasher, terminal lug TL31, lockwasher, and nut on middle rear marker light screw.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

---

30. Does LH marker light illuminate?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

---

31. Does RH marker light illuminate?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

---

**Flowchart**

**Steps**
- 30. Does LH marker light illuminate?
  - **If NO**
    - Go to step 40 of this fault.
  - **If YES**
    - Go to step 4 of this fault.

- 31. Does RH marker light illuminate?
  - **If NO**
    - Go to step 43 of this fault.
  - **If YES**
    - Go to step 6 of this fault.
If LH marker light does not illuminate, go to step 40 of this fault.

If RH marker light does not illuminate, go to step 43 of this fault.
Is continuity present from terminal lug TL16 to ground?

**KNOWLEDGE INFO**

- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**

- Faulty rear lights cable assembly.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

- If continuity is not present, wire 3094 is faulty. If continuity is present, wire 489 is faulty.

---

**YES**

Repair wire 3094 from terminal lug TL16 to terminal lug TL18 (para 2-45) and go to step 5 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**NO**

Repair wire 489 from splice E15 to splice E16 (para 2-45) and go to step 5 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
### CONTINUITY TEST

1. Remove nut, lockwasher, terminal lug TL16 and lockwasher from LH rear marker light screw. Discard lockwashers.
2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to terminal lug TL16.
4. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
5. If continuity is not present, repair wire 3094 from terminal lug TL16 to ground (para 2-45) and go to step 5 of this fault or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
6. If continuity is present, repair wire 489 from splice E15 to splice E16 (para 2-45) and go to step 5 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
Is continuity present through LH side marker light lamp?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, LH side marker light lamp is faulty.

If yes, replace LH side marker light lamp (para 7-38) and go to step 5 of this fault if required.
CONTINUITY TEST

(1) Remove two screws and lens cover from LH side marker light base.
(2) Remove LH side marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH side marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH side marker light lamp (para 7-38) and go to step 5 of this fault if required.
(6) Install LH side marker lamp in socket.
(7) Install lens cover on LH side marker light base with two screws.
34. Is 12 VDC present at connector P85?

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 489 is faulty.

**YES**
Repair wire 489 from connector P54 to splice E15 (para 2-45) or replace rear lights cable assembly (para 7-84).

**NO**

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**WARNING**
Read WARNING and CAUTION on following page.

TM 9-2320-366-20-1
2-604.32 Change 1
VOLTAGE TEST

(1) Disconnect connector P85 from LH side marker light connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P85.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 489 from connector P85 to splice E16 (para 2-45) or replace rear lights cable assembly (para 7-84).
(7) Position main light switch to OFF (TM 9-2320-366-10-1).

WARNING

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

CAUTION

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

NOTE

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

NOTE

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

CAUTION

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

NOTE

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

Change 1 2-604.33
Is continuity present from terminal lug TL15 to ground?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3094 is faulty. If continuity is present, LH side marker light is faulty.

- **YES**
  - Repair wire 3094 from terminal lug TL15 to terminal lug TL16 (para 2-45) and go to step 5 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

- **NO**
  - Replace LH side marker light (para 7-38) and go to step 5 of this fault if required.
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug TL15, and lockwasher from LH side marker light screw. Discard lockwashers.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL15.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3094 from terminal lug TL15 to terminal lug TL16 (para 2-45) and go to step 5 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(6) If continuity is present, replace LH side marker light (para 7-38) and go to step 5 of this fault if required.
(7) Install lockwasher, terminal lug TL15, lockwasher, and nut on LH side marker light screw.
(8) Connect LH side marker light connector to connector P85.
**KNOWLEDGE INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.

### 36.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3095 is faulty. If continuity is present, wire 489 is faulty.

**Is continuity present from terminal lug TL20 to ground?**

- **NO**
  - Repair wire 3095 from terminal lug TL20 to terminal lug TL21 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

- **YES**
  - Repair wire 489 from splice E15 to splice E17 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Remove nut, lockwasher, terminal lug TL20 and lockwasher from RH rear marker light screw. Discard lockwashers.</td>
</tr>
<tr>
<td>2) Set multimeter to ohms.</td>
</tr>
<tr>
<td>3) Connect positive (+) probe of multimeter to terminal lug TL20.</td>
</tr>
<tr>
<td>4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>5) If continuity is not present, repair wire 3095 from terminal lug TL20 to terminal lug TL21 (para 2-45) and go step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.</td>
</tr>
<tr>
<td>6) If continuity is present, repair wire 489 from splice E15 to splice E17 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.</td>
</tr>
<tr>
<td>7) Install lockwasher, terminal lug TL20, lockwasher, and nut on RH rear marker light screw.</td>
</tr>
</tbody>
</table>
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate.</td>
</tr>
<tr>
<td>Rear composite lights illuminate.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty lamp.</td>
</tr>
<tr>
<td>Faulty marker light.</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
</tbody>
</table>

37. Is continuity present through RH side marker light lamp?

- **NO**
  - **REASON FOR QUESTION**
    - If continuity is not present, RH side marker light lamp is faulty.

- **YES**
  - Replace RH side marker light lamp (para 7-38) and go to step 7 of this fault if required.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**Change 1**
CONTINUITY TEST

(1) Remove two screws and lens cover from RH side marker light base.
(2) Remove RH side marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through RH side marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace RH side marker light lamp (para 7-38) and go to step 7 of this fault if required.
(6) Install RH side marker light lamp in socket.
(7) Install lens cover on RH side marker light base with two screws.
38. Is 12 VDC present at connector P88?

**WARNING**

**CAUTION**

Read WARNING and CAUTION on following page.

**TEST OPTIONS**

Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 12 VDC is not present, wire 489 is faulty.

**KNOWLEDGE INFO**

Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.
Lamp OK.

**POSSIBLE PROBLEMS**

Faulty marker light.
Faulty rear lights cable assembly.

**YES**

Repair wire 489 from connector P88 to splice E17 (para 2-45) or replace rear lights cable assembly (para 7-84).

**NO**
VOLTAGE TEST

1. Disconnect connector P88 from RH side marker light connector.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P88.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
6. If 12 VDC is not present, repair wire 489 from connector P88 to splice E17 (para 2-45) or replace rear lights cable assembly (para 7-84).

WARNING

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

CAUTION

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

NOTE

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

WARNING

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

CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Disconnect connector P88 from RH side marker light connector.</td>
</tr>
<tr>
<td>2. Set multimeter to volts DC.</td>
</tr>
<tr>
<td>3. Connect positive (+) probe of multimeter to connector P88.</td>
</tr>
<tr>
<td>4. Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>6. If 12 VDC is not present, repair wire 489 from connector P88 to splice E17 (para 2-45) or replace rear lights cable assembly (para 7-84).</td>
</tr>
</tbody>
</table>
Is continuity present from terminal lug TL19 to ground?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3095 is faulty. If continuity is present, RH side marker light is faulty.

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**YES**
- Repair wire 3095 from terminal lug TL19 to terminal lug TL20 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**NO**
- Replace RH side marker light (para 7-38) and go to step 5 of this fault if required.
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug TL19, and lockwasher from RH side marker light screw. Discard lockwashers.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL19.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3095 from terminal lug TL19 to terminal lug TL20 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(6) If continuity is present, replace RH side marker light (para 7-38) and go to step 5 of this fault if required.
(7) Install lockwasher, terminal lug TL19, lockwasher, and nut on RH side marker light screw.
(8) Connect RH side marker light connector to connector P88.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, LH marker light lamp is faulty.

40. Is continuity present through LH marker light lamp?

**YES**
Replace LH marker light lamp (para 7-38) and go to step 31 of this fault if required.

**NO**

**WARNING**
Read WARNING and CAUTION on following page.

41. Is 12 VDC present at connector P86?

**YES**
Go to step 46 of this fault.

**NO**

**WARNING**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, LH marker light lamp is faulty.

Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK. Lamp OK.

**POSSIBLE PROBLEMS**
Faulty marker light. Faulty rear lights cable assembly.
CONTINUITY TEST

(1) Remove two screws and lens cover from LH marker light base.
(2) Remove LH marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH marker light lamp (para 7-38) and go to step 31 of this fault if required.
(6) Install LH marker light lamp in socket.
(7) Install lens cover on LH marker light base with two screws.

VOLTAGE TEST

(1) Disconnect LH marker light connector from connector P86.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P86.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
(7) If 12 VDC is not present, go to step 46 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 circuits and cause severe burns or electrical shock.

CAUTION

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

NOTE

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

CAUTION

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

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
Is continuity present from terminal lug TL16 to ground?

- **NO**
  - Repair wire 3094 from terminal lug TL16 to terminal lug TL18 (para 2-45) and go to step 30 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

- **YES**
  - Replace LH marker light (para 7-38) and go to step 31 of this fault if required.

---

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker lights.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3094 is faulty. If continuity is present, LH marker light is faulty.
**CONTINUITY TEST**

1. Remove nut, lockwasher, terminal lug TL16 and lockwasher from LH marker light screw. Discard lockwashers.
2. Connect positive (+) probe of multimeter to terminal lug TL16.
3. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
4. If continuity is not present, repair wire 3094 from terminal lug TL16 to terminal lug TL18 (para 2-45) and go to step 30 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
5. If continuity is present, replace LH marker light (para 7-38) and go to step 31 of this fault if required.
7. Connect LH marker light connector to connector P86.

---

**Diagram:**

- LH MARKER LIGHT CONNECTOR
- CONNECTOR P86
- LH MARKER LIGHT SCREW
- NUT
- TERMINAL LUG TL16
- LOCKWASHER
Is continuity present through RH marker light lamp?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, RH marker light lamp is faulty.

---

Replace RH marker light lamp (para 7-38) and go to step 6 of this fault if required.

---

Is 12 VDC present at connector P89?

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

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

---

Go to step 47 of this fault.
CONTINUITY TEST

1. Remove two screws and lens cover from RH marker light base.
2. Remove RH marker light lamp from socket.
3. Set multimeter to ohms.
4. Check continuity through RH marker light lamp and note reading on multimeter.
5. If continuity is not present, replace RH marker light lamp (para 7-38) and go to step 6 of this fault if required.
6. Install RH marker light lamp in socket.
7. Install lens cover on RH marker light base with two screws.

WARNING

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

CAUTION

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

NOTE

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

VOLTAGE TEST

1. Disconnect RH marker lamp connector from connector P89.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P89.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 12 VDC is not present, go to step 47 of this fault.
Is continuity present from terminal lug TL20 to ground?

**NO**
- Repair wire 3095 from terminal lug TL20 to terminal lug TL21 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**YES**
- Replace RH marker light (para 7-38) and go to step 6 of this fault if required.

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker lights.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3095 is faulty. If continuity is present, RH marker light is faulty.
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug TL20, and lockwasher from RH marker light screw. Discard lockwashers.
(2) Connect positive (+) probe of multimeter to terminal lug TL20.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3095 from terminal lug TL20 to terminal lug TL21 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(5) If continuity is present, replace RH marker light and go to step 6 of this fault if required.
(6) Install lockwasher, terminal lug TL20, lockwasher, and nut on RH marker light screw.
(7) Connect RH marker light connector to connector P89.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

46. Is 12 VDC present at connector P85?

- **YES**
  - Repair wire 489 from connector P85 to splice E16 (para 2-45) and go to step 31 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

- **NO**
  - If 12 VDC is not present, wire 489 is faulty. If 12 VDC is present, wire 489 is faulty.

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.
- Marker light OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- Voltage Test or STE/ICE-R Test #89

**WARNING**
**CAUTION**
Read WARNING and CAUTION on following page.
WARNING

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

CAUTION

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

NOTE

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

VOLTAGE TEST

NOTE

Remove plastic cable ties as required.

(1) Disconnect connector P85 from LH rear side marker light connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P85.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 489 from connector P85 to splice E16 (para 2-45) and go to step 31 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(7) If 12 VDC is present, repair wire 489 from connector P85 to splice E16 (para 2-45) and go to step 31 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(8) Position main light switch to OFF (TM 9-2320-366-10-1).

NOTE

Install plastic cable ties as required.

(9) Connect connector P85 to LH rear side marker light connector.
e48. M1083/M1084/M1090/M1092/M1093/M1094 SIDE AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**Known Info**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.
- Marker light OK.

**Possible Problems**
- Faulty rear lights cable assembly.

**Test Options**
- Voltage Test or STE/ICE-R Test #89

**Reason for Question**
- Voltage Test or STE/ICE-R Test #89

**WARNING**
- Read WARNING and CAUTION on following page.

**Question 47.** Is 12 VDC present at connector P88?

- **NO**
  - Repair wire 489 from splice E15 to splice E17 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

- **YES**
  - Repair wire 489 from connector P88 to splice E17 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 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 circuits and cause severe burns or electrical shock.

**CAUTION**

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

**NOTE**

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

---

**VOLTAGE TEST**

**NOTE**

Remove plastic cable ties as required.

1. Disconnect connector P88 from RH rear side marker light connector.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P88.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
6. If 12 VDC is not present, repair wire 489 from connector P88 to splice E17 (para 2-44) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.
7. If 12 VDC is present, repair wire 489 from connector P88 to splice E17 (para 2-45) and go to step 6 of this fault if required or replace rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**NOTE**

Install plastic cable ties as required.

**e48A. ALL MARKER LIGHTS DO NOT ILLUMINATE IN NORMAL MODE**

**INITIAL SETUP**

<table>
<thead>
<tr>
<th>Equipment Conditions</th>
<th>Personnel Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>(2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tools and Special Tools</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
<td>TM 9-4910-571-12&amp;P</td>
</tr>
<tr>
<td>STE/ICE-R (Item 41, Appendix C)</td>
<td></td>
</tr>
<tr>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE**

Perform electrical troubleshooting e1.  
CIRCUIT BREAKER DOES NOT OPERATE on circuit breaker CB67 prior to beginning this task.

---

**KNOWN INFO**

| Circuit breaker CB67 OK.  
| No marker lights illuminate. |

**POSSIBLE PROBLEMS**

| Faulty dashboard cable assembly.  
| Faulty main light switch.  
| Faulty relay K20. |

---

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 12 VDC is present, wire 1912 is faulty.

---

**WARNIMG**

Read WARNING on following page.

---

**START**

---

1. Is 12 VDC present at relay circuit breaker CB67 socket 3?

---

**NO**

---

**YES**

Go to step 2 of this fault.

---

**WARNING**

Read WARNING on following page.

---

Repair wire 1912 from circuit breaker CB67 socket 3 to terminal board TB1 position 26 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(2) Remove circuit breaker CB67 from PDP.</td>
</tr>
<tr>
<td>(3) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to circuit breaker CB67 socket 3 on PDP.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(6) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 VDC is not present, go to step 2 of this fault.</td>
</tr>
<tr>
<td>(8) If 12 VDC is present, repair wire 1912 from circuit breaker CB67 socket 3 to terminal board TB1 position 26 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(9) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.
If continuity is not present, wire 1914 is faulty.

Is continuity present from circuit breaker CB67 socket 3 to relay K20 terminal 87 on PDP?

YES

Repair wire 1914 from circuit breaker CB67 socket 3 to relay K20 terminal 87 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

NO

Faulty dashboard cable assembly.
Faulty main light switch.
Faulty relay K20.

Known Info
Circuit breaker CB67 OK.
No marker lights illuminate.

Possible Problems
Faulty dashboard cable assembly.
Faulty main light switch.
Faulty relay K20.

Test Options
Continuity Test or STE/ICE-R Test #91

Reason for Question
If continuity is not present, wire 1914 is faulty.
CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Remove relay K20 from PDP.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to circuit breaker CB67 socket 3 on PDP.
(5) Connect negative (-) probe of multimeter to relay K20 terminal 87 on PDP and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 1914 from circuit breaker CB67 socket 3 to relay K20 terminal 87 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) Install circuit breaker CB67 in PDP.
(8) Connect batteries (para 7-57).
e48A. ALL MARKER LIGHTS DO NOT ILLUMINATE IN NORMAL MODE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit breaker CB67 OK. No marker lights illuminate.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty main light switch.</td>
</tr>
<tr>
<td>Faulty relay K20.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Test or STE/ICE-R Test #89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 12 VDC is not present, wire 1501 is faulty.</td>
</tr>
</tbody>
</table>

3. Is 12 VDC present at relay K20 terminal 30 on PDP?

- **NO**
  - If 12 VDC is not present, wire 1501 is faulty.

- **YES**
  - Repair wire 1501 from terminal X2 on PDP to relay K20 terminal 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to relay K20 terminal 30 on PDP.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If 12 VDC is not present, repair wire 1501 from terminal X2 on PDP to relay K20 terminal 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
</tbody>
</table>
4. Is 12 VDC present at relay K20 terminal 86 on PDP?

- **NO**
  - Go to step 6 of this fault.

- **YES**
  - Go to step 6 of this fault.

**KNOWN INFO**
- Circuit breaker CB67 OK. No marker lights illuminate.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty main light switch.
- Faulty relay K20.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- This question eliminates possible problems and determines where troubleshooting continues.
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to relay K20 terminal 86 on PDP.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If 12 VDC is not present, go to step 6 of this fault.</td>
</tr>
<tr>
<td>(6) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e48A. ALL MARKER LIGHTS DO NOT ILLUMINATE IN NORMAL MODE (CONT)

**KNOWN INFO**
Circuit breaker CB67 OK.
No marker lights illuminate.
Main light switch OK.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.
Faulty relay K20.

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3054 is faulty.

---

**5.**
Is continuity present from relay K20 terminal 85 on PDP to ground?

- **NO**
  - Repair wire 3054 from relay K20 terminal 85 on PDP to terminal board TB2 position 44 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace relay K20 (para 7-9).
CONTINUITY TEST

1. Disconnect batteries (para 7-57).
2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to relay K20 terminal 85 on PDP.
4. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
5. If continuity is not present, repair wire 3054 from relay K20 terminal 85 on PDP to terminal board TB2 position 44 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
6. If continuity is present, replace relay K20 (para 7-9).
7. Install relay K20 in PDP.
8. Install PDP cover (para 16-2).
Is continuity present from relay K20 terminal 86 to connector PX12 pin 5?

If continuity is not present, wire 1575 is faulty.

Repair wire 1575 from relay K20 terminal 86 to connector PX12 pin 5 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect batteries (para 7-57).</td>
</tr>
<tr>
<td>(2) Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(3) Disconnect connector PX12 from warning light switch.</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to connector PX12 pin 5.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to relay K20 terminal 86 on PDP and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If continuity is not present, repair wire 1575 from relay K20 terminal 86 to connector PX12 pin 5 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(8) Install relay K20 in PDP.</td>
</tr>
<tr>
<td>(9) Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
7. Is continuity present from connector PX12 pin 5 to connector PX15 socket H? 

If continuity is not present, wire 1575 is faulty. If continuity is present, main light switch is faulty.

Yes: Repair wire 1575 from connector PX12 pin 5 to connector PX15 socket H (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

No: Replace main light switch (para 7-17).

Known Info:
- Circuit breaker CB67 OK.
- No marker lights illuminate.
- Relay K20 OK.

Possible Problems:
- Faulty dashboard cable assembly.
- Faulty main light switch.

Test Options:
- Continuity Test or STE/ICE-R Test #91

Reason for Question:
- If continuity is not present, wire 1575 is faulty. If continuity is present, main light switch is faulty.

Caution: Read Caution on following page.
CONTINUITY TEST

(1) Disconnect connector PX15 from main light switch.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector PX12 pin 5.
(4) Connect negative (-) probe of multimeter to connector PX15 socket H and note reading on multimeter.
(5) If continuity is not present, repair wire 1575 from connector PX12 pin 5 to connector PX15 socket H (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) If continuity is present, replace main light switch (para 7-17).
(7) Connect connector PX15 to main light switch.
(8) Connect connector PX12 to warning light switch.
(9) Install instrument panel assembly (para 7-15).
(10) Connect batteries (para 7-57).

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

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

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

NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE

INITIAL SETUP

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

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

Materials/Parts
Lockwasher (4) (Item 82, Appendix G)
Ties, Cable, Plastic (Item 69, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

KNOWN INFO
Other marker lights illuminate.
Rear composite lights illuminate.

POSSIBLE PROBLEMS
Faulty lamp.
Faulty marker light.
Faulty rear lights cable assembly.
Faulty dashboard cable assembly.

TEST OPTIONS
Visual Inspection

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

1. Does any intermediate (if equipped), side, or rear marker light illuminate?

   NO
   
   YES
   Go to step 15 of this fault.

   YES
   
   NO
   
   YES
   Go to step 17 of this fault.

2. Does more than one intermediate (if equipped), side, or rear marker light not illuminate?

   NO
   
   YES
   Go to step 15 of this fault.

   YES
   
   NO
   
   YES
   Go to step 17 of this fault.

   RELATED ILLUSTRATIONS
   
   INITIAL SETUP
   
   1. Does any intermediate (if equipped), side, or rear marker light illuminate?
   
   NO
   
   YES
   Go to step 15 of this fault.

   YES
   
   NO
   
   YES
   Go to step 17 of this fault.

   KNOWN INFO
   Other marker lights illuminate.
   Rear composite lights illuminate.
   Dashboard cable assembly OK.

   POSSIBLE PROBLEMS
   Faulty lamp.
   Faulty marker light.
   Faulty rear lights cable assembly.

   TEST OPTIONS
   Visual Inspection

   REASON FOR QUESTION
   This question eliminates possible problems and determines where troubleshooting continues.
(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) Note intermediate, side and/or rear marker light(s) that do not illuminate.
(3) If all intermediate, side, and rear marker lights do not illuminate, go to step 15 of this fault.
(4) Position main light switch to OFF (TM 9-2320-366-10-1).

If more than one intermediate, side, and/or rear marker lights do not illuminate, go to step 17 of this fault.
**KNOWLEDGE INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

3.

**Is vehicle M1086 or M1089?**

**TEST OPTIONS**
- Visual Inspection

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

**FLOW CHART**

- **NO**
  - **YES**
  - Go to step 6 of this fault.

**Diagram Elements**
- Known Info Section
- Possible Problems Section
- Test Options Section
- Reason for Question Section
- Flowchart Diagram: Decision node and flow paths.
If vehicle is not M1088 or M1089, go to step 6 of this fault.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

4. Does LH intermediate marker light illuminate?

   NO

   YES

   Go to step 20 of this fault.

5. Does RH intermediate marker light illuminate?

   NO

   YES

   Go to step 23 of this fault.

**KNOWN INFO**

| Other marker lights illuminate. | Rear composite lights illuminate. | Dashboard cable assembly OK. |

**POSSIBLE PROBLEMS**

| Faulty lamp. |
| Faulty marker light. |
| Faulty rear lights cable assembly. |

**TEST OPTIONS**

| Visual Inspection |

**REASON FOR QUESTION**

This question eliminates possible problems and determines where troubleshooting continues.
If LH intermediate marker light does not illuminate, go to step 20 of this fault.

If RH intermediate marker light does not illuminate, go to step 23 of this fault.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate.</td>
</tr>
<tr>
<td>Rear composite lights illuminate.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty lamp.</td>
</tr>
<tr>
<td>Faulty marker light.</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
</tbody>
</table>

**6.**

Is vehicle M1089?

**TEST OPTIONS**

Visual Inspection

**REASON FOR QUESTION**

This question eliminates possible problems and determines where troubleshooting continues.

**NO**

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate.</td>
</tr>
<tr>
<td>Rear composite lights illuminate.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty lamp.</td>
</tr>
<tr>
<td>Faulty marker light.</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
</tbody>
</table>

**YES**

Go to step 26 of this fault.

**7.**

Do both LH side and rear marker lights illuminate?

**TEST OPTIONS**

Visual Inspection

**REASON FOR QUESTION**

This question eliminates possible problems and determines where troubleshooting continues.

**NO**

**YES**

Go to step 28 of this fault.

**8.**

Do both RH side and rear marker lights illuminate?

**TEST OPTIONS**

Visual Inspection

**REASON FOR QUESTION**

This question eliminates possible problems and determines where troubleshooting continues.

**NO**

**YES**

Go to step 32 of this fault.
If vehicle is not M1089, go to step 26 of this fault.

If both LH side and rear marker lights do not illuminate, go to step 28 of this fault.

If both RH side and rear marker lights do not illuminate, go to step 32 of this fault.
9. Do any of the three rear marker lights illuminate?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

**YES**
Go to step 36 of this fault.

**NO**

10. Does the LH rear marker light illuminate?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

**YES**
Go to step 38 of this fault.

**NO**

11. Does the middle rear marker light illuminate?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

**YES**
Go to step 41 of this fault.

**NO**

- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.
If none of the three rear marker lights illuminate, go to step 36 of this fault.

If LH rear marker light does not illuminate, go to step 38 of this fault.

If middle rear marker light does not illuminate, go to step 41 of this fault.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

12. Is continuity present through RH rear marker light lamp?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, RH rear marker light lamp is faulty.

**FLOWCHART**

- **YES**: Replace RH rear marker light lamp (para 7-38).
- **NO**: Replace RH rear marker light lamp (para 7-38).
**CONTINUITY TEST**

1. Remove two screws and lens cover from RH rear marker light base.
2. Remove RH rear marker light lamp from socket.
3. Set multimeter to ohms.
4. Check continuity through RH rear marker light lamp and note reading on multimeter.
5. If continuity is not present, replace RH rear marker light lamp (para 7-38).
6. Install RH rear marker light lamp in socket.
7. Install lens cover on RH rear marker light base with two screws.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

KNOWLEDGE INFO
Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.
Lamp OK.

POSSIBLE PROBLEMS
Faulty marker light.
Faulty rear lights cable assembly.

WARNING
CAUTION
Read WARNING and CAUTION on following page.

13. Is 12 VDC present at connector P58?

YES

NO

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION
If 12 VDC is not present, wire 489 is faulty.

13. Is 12 VDC present at connector P58?

YES

NO

REASON FOR QUESTION
If 12 VDC is not present, wire 489 is faulty.

WARNING
CAUTION
Read WARNING and CAUTION on following page.

13. Is 12 VDC present at connector P58?

YES

NO

REASON FOR QUESTION
If 12 VDC is not present, wire 489 is faulty.

WARNING
CAUTION
Read WARNING and CAUTION on following page.

13. Is 12 VDC present at connector P58?

YES

NO

REASON FOR QUESTION
If 12 VDC is not present, wire 489 is faulty.

WARNING
CAUTION
Read WARNING and CAUTION on following page.

13. Is 12 VDC present at connector P58?

YES

NO

REASON FOR QUESTION
If 12 VDC is not present, wire 489 is faulty.

WARNING
CAUTION
Read WARNING and CAUTION on following page.

13. Is 12 VDC present at connector P58?

YES

NO

REASON FOR QUESTION
If 12 VDC is not present, wire 489 is faulty.

WARNING
CAUTION
Read WARNING and CAUTION on following page.

13. Is 12 VDC present at connector P58?

YES

NO

REASON FOR QUESTION
If 12 VDC is not present, wire 489 is faulty.

WARNING
CAUTION
Read WARNING and CAUTION on following page.

13. Is 12 VDC present at connector P58?

YES

NO

REASON FOR QUESTION
If 12 VDC is not present, wire 489 is faulty.

WARNING
CAUTION
Read WARNING and CAUTION on following page.

13. Is 12 VDC present at connector P58?

YES

NO

REASON FOR QUESTION
If 12 VDC is not present, wire 489 is faulty.
(1) Disconnect RH rear marker light connector from connector P58.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P58.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
(7) If 12 VDC is not present, repair wire 489 from connector P58 to splice (refer to Table 2-12.2. M1085/M1086/M1089/M1096 Rear Marker Light Splices) (para 2-45) or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84).
14. Is vehicle M1089?

**KNOWN INFO**
Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.
Lamp OK.

**POSSIBLE PROBLEMS**
Faulty marker light.
Faulty rear lights cable assembly.

**TEST OPTIONS**
Visual Inspection

**REASON FOR QUESTION**
If vehicle is not M1089, RH rear marker light is faulty.

YES

Replace RH rear marker light (para 7-38).

NO

15. Is continuity present from terminal lug TL32 to terminal lug TL31?

**KNOWN INFO**
Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.
Lamp OK.

**POSSIBLE PROBLEMS**
Faulty marker light.
Faulty rear lights cable assembly.

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3094 is faulty. If continuity is present RH rear marker light is faulty.

YES

Repair wire 3094 from terminal lug TL32 to terminal lug TL31 (para 2-45) or replace M1089 rear lights cable assembly (para 7-104)

NO

Replace RH rear marker light (para 7-38).
(1) Remove nut, lockwasher, terminal lug TL32, and lockwasher from RH rear marker light screw. Discard lockwashers.
(2) Remove nut, lockwasher, terminal lug TL31, and lockwasher from middle rear marker light screw. Discard lockwashers.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal lug TL32.
(5) Connect negative (-) probe of multimeter to terminal lug TL31 and note reading on multimeter.
(6) If continuity is not present, repair wire 3094 from terminal lug TL32 to terminal lug TL31 (para 2-45) or replace M1089 rear lights cable assembly (para 7-104).
(7) If continuity is present, replace RH rear marker light (para 7-38).
(8) Install lockwasher, terminal lug TL31, lockwasher, and nut on middle rear marker light screw.
(9) Install lockwasher, terminal lug TL32, lockwasher, and nut on RH rear marker light screw.
(10) Connect RH rear marker light connector to connector P58.

If vehicle is not M1089, replace RH rear marker light (para 7-38).
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate. Rear composite lights illuminate.</td>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rear lights cable assembly. Faulty dashboard cable assembly.</td>
<td>If continuity is not present, wire 489 is faulty. If continuity is present, wire 489 is faulty.</td>
</tr>
</tbody>
</table>

16. Is continuity present from connector J51 pin 7 to terminal board TB1 position 11?

- **NO**
  - Repair wire 489 from connector J51 pin 7 to terminal board TB1 position 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Repair wire 489 from connector P51 socket 7 to splice (refer to Table 2-12.3. M1085/1086/M1089/M1096 Rear Marker Light Wire 489 Splices) (para 2-45) or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84).
CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(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) Disconnect connector P51 from connector J51.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to connector J51 pin 7.
(9) Connect negative (-) probe of multimeter to terminal board TB1 position 11 and note reading on multimeter.
(10) If continuity is not present, repair wire 489 from connector J51 pin 7 to terminal board TB1 position 11 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(11) If continuity is present, repair wire 489 from connector P51 socket 7 to splice (refer to Table 2-12.3. M1085/M1086/M1089/M1096 Rear Marker Light Wire 489 Splices) (para 2-45) or replace M1086/ M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84).
(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).

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

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

Table 2-12.3. M1085/M1086/M1089/M1096 Rear Marker Light Wire 489 Splices

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1089</td>
<td>Splice E49</td>
</tr>
<tr>
<td>M1085/M1086/M1096</td>
<td>Splice E64</td>
</tr>
</tbody>
</table>
Is continuity present through marker light lamp?

17.

NO

Replace marker light lamp (para 7-38)

YES

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, marker light lamp is faulty.

KNOWN INFO
Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.

POSSIBLE PROBLEMS
Faulty lamp.
Faulty marker light.
Faulty rear lights cable assembly.
CONTINUITY TEST

(1) Remove two screws and lens cover from marker light base.
(2) Remove marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace marker light lamp (para 7-38).
(6) Install marker light lamp in socket.
(7) Install lens cover on marker light base with two screws.
e48B. M1085/M1086/M1089/M1096 Intermediate, Side, and/or Rear Marker Light(s) Do Not Illuminate (Cont)

<table>
<thead>
<tr>
<th>Known Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate.</td>
</tr>
<tr>
<td>Rear composite lights illuminate.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
<tr>
<td>Lamp OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Possible Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty marker light.</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Test or STE/ICE-R Test #89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reason for Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 12 VDC is not present, wire 489 is faulty.</td>
</tr>
</tbody>
</table>

18. Is 12 VDC present at connector?

- **No**
  - Repair wire 489 (refer to Table 2-12.4, M1085/M1086/M1089/M1096 Intermediate, Side, and Rear Marker Light Connectors and Splices) (para 2-45) or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84).

- **Yes**
  - Read WARNING and CAUTION on following page.

**WARNING**

**CAUTION**

- Voltage Test or STE/ICE-R Test #89

- If 12 VDC is not present, wire 489 is faulty.
WARNING

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

CAUTION

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

NOTE

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

VOLTAGE TEST

1. Disconnect marker light connector from connector (refer to Table 2-12.4. M1085/M1086/M1089/M1096 Intermediate, Side, and Rear Marker Light Connectors and Splices).
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector (refer to Table 2-12.4. M1085/M1086/M1089/M1096 Intermediate, Side, and Rear Marker Light Connectors and Splices).
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 12 VDC is not present, repair wire 489 (refer to Table 2-12.4. M1085/M1086/M1089/M1096 Intermediate, Side, and Rear Marker Light Connectors and Splices) (para 2-45) or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84).

Table 2-12.4. M1085/M1086/M1089/M1096 Intermediate, Side, and Rear Marker Light Connectors and Splices

<table>
<thead>
<tr>
<th>Marker Light</th>
<th>Connector</th>
<th>M1085/M1086/M1089/M1096 Splice</th>
<th>M1089 Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH Intermediate</td>
<td>P94</td>
<td>Splice E64</td>
<td>Splice E49</td>
</tr>
<tr>
<td>LH Side</td>
<td>P85</td>
<td>Splice E16</td>
<td>Splice E51</td>
</tr>
<tr>
<td>LH Rear</td>
<td>P86</td>
<td>Splice E16</td>
<td>Splice E51</td>
</tr>
<tr>
<td>Left Rear</td>
<td>P54</td>
<td>Splice E15</td>
<td>Splice E50</td>
</tr>
<tr>
<td>Middle Rear</td>
<td>P56</td>
<td>Splice E15</td>
<td>Splice E50</td>
</tr>
<tr>
<td>Right Rear</td>
<td>P58</td>
<td>Splice E15</td>
<td>Splice E50</td>
</tr>
<tr>
<td>RH Rear</td>
<td>P89</td>
<td>Splice E17</td>
<td>Splice E52</td>
</tr>
<tr>
<td>RH Side</td>
<td>P88</td>
<td>Splice E17</td>
<td>Splice E52</td>
</tr>
<tr>
<td>RH Intermediate</td>
<td>P95</td>
<td>Splice E64</td>
<td>Splice E49</td>
</tr>
</tbody>
</table>
**e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)**

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK. Lamp OK.</td>
<td>Continuity Test or STE/ICE-R Test #91</td>
<td>If continuity is not present, wire (refer to Table 2-12.5. M1085/ M1086/M1089/ M1096 Intermediate, Side, and Rear Marker Light Terminal Lugs) is faulty.</td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulty marker light. Faulty rear lights cable assembly.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

19. **Is continuity present from terminal lug to ground?**

- **NO**
  - Repair wire (refer to Table 2-12.5. M1085/ M1086/ M1089/M1096 Intermediate, Side, and Rear Marker Light Terminal Lugs) (para 2-45) or replace M1086/ M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84).

- **YES**
  - Replace marker light (para 7-38).

---

2-604.92 Change 1
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug, and lockwasher from marker light screw. Discard lockwashers.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug (refer to Table 2-12.5. M1085/M1086/ M1089/M1096 Intermediate, Side, and Rear Marker Light Terminal Lugs).
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire (Refer to Table 2-12.5. M1085/M1086/ M1089/ M1096 Intermediate, Side, and Rear Marker Light Terminal Lugs) (para 2-45) or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84).
(6) If continuity is present, replace marker light (para 7-38).
(7) Install lockwasher, terminal lug, lockwasher, and nut on marker light screw.
(8) Connect marker light connector to connector (refer to Table 2-12.5. M1085/ M1086/ M1089/M1096 Intermediate, Side, and Rear Marker Light Terminal Lugs).

<table>
<thead>
<tr>
<th>Marker Light</th>
<th>Terminal Lug</th>
<th>M1089</th>
<th>M1085/M1086/M1096</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH Intermediate</td>
<td>TL88</td>
<td>Wire 3089 from Terminal Lug TL88 to Terminal Lug TL90</td>
<td>Wire 3089 from Terminal Lug TL88 to Terminal Lug TL90</td>
</tr>
<tr>
<td>LH Side</td>
<td>TL15</td>
<td>Wire 3094 from Terminal Lug TL15 to Terminal Lug TL16</td>
<td>Wire 3094 from Terminal Lug TL15 to Terminal Lug TL16</td>
</tr>
<tr>
<td>LH Rear</td>
<td>TL16</td>
<td>Replace Marker Light (para 7-38)</td>
<td>Wire 3094 from Terminal Lug TL30 to Terminal Lug TL31</td>
</tr>
<tr>
<td>Left Rear</td>
<td>TL30</td>
<td>Replace Marker Light (para 7-38)</td>
<td>Replace Marker Light (para 7-38)</td>
</tr>
<tr>
<td>Middle Rear</td>
<td>TL31</td>
<td>Replace Marker Light (para 7-38)</td>
<td>Replace Marker Light (para 7-38)</td>
</tr>
<tr>
<td>Right Rear</td>
<td>TL32</td>
<td>Wire 3094 from Terminal Lug TL32 to Terminal Lug TL31</td>
<td>Replace Marker Light (para 7-38)</td>
</tr>
<tr>
<td>RH Rear</td>
<td>TL20</td>
<td>Replace Marker Light (para 7-38)</td>
<td>Replace Marker Light (para 7-38)</td>
</tr>
<tr>
<td>RH Side</td>
<td>TL19</td>
<td>Wire 3095 from Terminal Lug TL19 to Terminal Lug TL20</td>
<td>Wire 3095 from Terminal Lug TL19 to Terminal Lug TL20</td>
</tr>
<tr>
<td>RH Intermediate</td>
<td>TL89</td>
<td>Wire 3090 from Terminal Lug TL89 to Terminal Lug TL90</td>
<td>Wire 3090 from Terminal Lug TL89 to Terminal Lug TL90</td>
</tr>
</tbody>
</table>
20. Is continuity present through LH intermediate marker light lamp?

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, LH intermediate marker light lamp is faulty.

**YES**
Replace LH intermediate marker light lamp (para 7-38) and go to step 5 of this fault if required.

**NO**
CONTINUITY TEST

(1) Remove two screws and lens cover from LH intermediate marker light base.
(2) Remove LH intermediate marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH intermediate marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH intermediate marker light lamp (para 7-38) and go to step 5 of this fault if required.
(6) Install LH intermediate marker light lamp in socket.
(7) Install lens cover on LH intermediate marker light base with two screws.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

KNOWLED INFO
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

POSSIBLE PROBLEMS
- Faulty marker light.
- Faulty rear lights cable assembly.

21. Is 12 VDC present at connector P94?

YES

Repair wire 489 from connector P94 to splice (refer to Table 2-12.6. M1085/M1086/M1089/M1096 Intermediate Marker Light Splices) (para 2-45) and continue with step 5 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

NO

WARNING
Read WARNING and CAUTION on following page.

CAUTION

TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If 12 VDC is not present, wire 489 is faulty.
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits, or cause severe burns or electrical shock.

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

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

VOLTAGE TEST

(1) Disconnect LH intermediate marker light connector from connector P94.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P94.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
(7) If 12 VDC is not present, repair wire 489 from connector P94 to splice (refer to Table 2-12.6. M1085/M1086/M1089/M1096 Intermediate Marker Light Splices) (para 2-45) and go to step 5 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1086 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

Table 2-12.6. M1085/M1086/M1089/M1096 Intermediate Marker Light Splices

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1085/M1086/M1096</td>
<td>E64</td>
</tr>
<tr>
<td>M1089</td>
<td>E49</td>
</tr>
</tbody>
</table>
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug TL88, and lockwasher from LH intermediate marker light screw. Discard lockwashers.

(2) Set multimeter to ohms.

(3) Connect positive (+) probe of multimeter to terminal lug TL88.

(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.

(5) If continuity is not present, repair wire 3089 from terminal lug TL88 to terminal lug TL90 (para 2-45) and go to step 5 of this fault if required or replace M1086/ M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

(6) If continuity is present, remove LH intermediate marker light (para 7-38) and go to step 5 of this fault if required.

(7) Install lockwasher, terminal lug TL88, lockwasher, and nut on LH intermediate marker light screw.

(8) Connect LH intermediate marker light connector to connector P94.

CONTINUITY TEST

(1) Remove two screws and lens cover from RH intermediate marker light base.

(2) Remove RH intermediate marker light lamp from socket.

(3) Set multimeter to ohms.

(4) Check continuity through RH intermediate marker light lamp and note reading on multimeter.

(5) If continuity is not present, replace RH intermediate marker light lamp (para 7-38) and go to step 6 of this fault if required.

(6) Install RH intermediate marker light lamp in socket.

(7) Install lens cover on RH intermediate marker light base with two screws.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 489 is faulty.

24. Is 12 VDC present at connector P95?

**WARNING**
Read WARNING and CAUTION on following page.

**CAUTION**

**YES**
Repair wire 489 from connector P95 to splice (refer to Table 2-12.7. M1085/M1086/M1089/M1096 Intermediate Marker Light Splices) (para 2-45) and go to step 6 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**NO**

If 12 VDC is not present, wire 489 is faulty.
WARNING

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

CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect RH intermediate marker light connector from connector P95.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector P95.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(7) If 12 VDC is not present, repair wire 489 from connector P95 to splice (refer to Table 2-12.7. M1085/M1086/M1089/M1096 Intermediate Marker Light Splices) (para 2-45) and go to step 6 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.</td>
</tr>
</tbody>
</table>

Table 2-12.7. M1085/M1086/M1089/M1096 Intermediate Marker Light Splices

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1085/M1086/M1096</td>
<td>E64</td>
</tr>
<tr>
<td>M1089</td>
<td>E49</td>
</tr>
</tbody>
</table>
25. Is continuity present from terminal lug TL89 to ground?

**NO**

If continuity is not present, wire 3090 is faulty. If continuity is present, RH intermediate marker light is faulty.

**YES**

Repair wire 3090 from terminal lug TL89 to terminal lug TL90 (para 2-45) and go to step 6 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

Replace RH intermediate marker light (para 7-38) and go to step 6 of this fault if required.
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug TL89, and lockwasher from RH intermediate marker light screw. Discard lockwashers.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL89.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3090 from terminal lug TL89 to terminal lug TL90 (para 2-45) and go to step 6 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(6) If continuity is present, replace RH intermediate marker light (para 7-38) and go to step 6 of this fault if required.
(7) Install lockwasher, terminal lug TL89, lockwasher, and nut on RH intermediate marker light screw.
(8) Connect RH intermediate marker light connector to connector P95.
26. Does any side or rear marker light illuminate?

**NO**

Repair wire 489 from splice E64 to splice E15 (para 2-45) and go to step 7 of this fault if required or replace M1086 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**YES**

27. Is rear carrier equipped with two marker lights?

**NO**

Go to step 7 of this fault.

**YES**

Go to step 45 of this fault.
If all side and rear marker lights do not illuminate, repair wire 489 from splice E64 to splice E15 (para 2-45) and go to step 7 of this fault if required or replace M1086 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

(1) If rear carrier is equipped with one marker light, go to step 45 of this fault.
(2) If rear carrier is equipped with two marker lights, go to step 7 of this fault.
**e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)**

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

28.
Does LH side or rear marker light illuminate?

**TEST OPTIONS**
- Visual Inspection

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

YES
Go to step 47 of this fault.

NO

29.
Does LH side marker light illuminate?

YES
Go to step 48 of this fault.

NO

NO

YES
Go to step 48 of this fault.
If LH side and rear marker lights do not illuminate, go to step 47 of this fault.

If LH side marker light does not illuminate, go to step 48 of this fault.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

<table>
<thead>
<tr>
<th>30.</th>
<th>Is continuity present through LH rear marker light lamp?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>Replace LH rear marker light lamp (para 7-38) and go to step 8 of this fault if required.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, LH rear marker light lamp is faulty.</td>
</tr>
</tbody>
</table>
CONTINUITY TEST

(1) Remove two screws and lens cover from LH rear marker light base.
(2) Set multimeter to ohms.
(3) Remove LH rear marker light lamp from socket.
(4) Check continuity through LH rear marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH rear marker light lamp (para 7-38) and go to step 8 of this fault if required.
(6) Install LH rear marker light lamp in socket.
(7) Install lens cover on LH rear marker light base with two screws.
31. Is 12 VDC present at connector P86?

- **NO**
  - Repair wire 489 from connector P86 to splice (refer to Table 2-12. M1085/M1086/ M1089/ M1096 LH Side And Rear Marker Lights Splices) (para 2-45) and go to step 8 of this fault if required or replace M1086/ M1089 rear lights cable assembly (para 7-104) or M1085/ M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

- **YES**
  - Replace LH rear marker light (para 7-38) and go to step 8 of this fault if required.
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits, or cause severe burns or electrical shock.

**CAUTION**

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

**NOTE**

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

**VOLTAGE TEST**

1. Disconnect LH rear marker light connector from connector P86.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P86.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
7. Is 12 VDC is not present, repair wire 489 from connector P86 to splice (refer to Table 2-12.8. M1085/M1086/M1089/M1096 LH Side And Rear Marker Lights Splices) (para 2-45) and go to step 8 of this fault if or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
8. If 12 VDC is present, replace LH rear marker light (para 7-38) and go to step 8 of this fault if required.
9. Connect LH rear marker light connector to connector P86.

**Table 2-12.8. M1085/M1086/M1089/M1096 LH Side and Rear Marker Light Splices**

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1085/M1086/M1096</td>
<td>E16</td>
</tr>
<tr>
<td>M1089</td>
<td>E51</td>
</tr>
</tbody>
</table>
KNOWLEDGE
Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.

POSSIBLE PROBLEMS
Faulty lamp.
Faulty marker light.
Faulty rear lights cable assembly.

TEST OPTIONS
Visual Inspection

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

32. Does RH side or rear marker light illuminate?

NO

YES

Go to step 51 of this fault.

33. Does RH side marker light illuminate?

NO

YES

Go to step 52 of this fault.

KNOWLEDGE
Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.

POSSIBLE PROBLEMS
Faulty lamp.
Faulty marker light.
Faulty rear lights cable assembly.
If RH side and rear marker lights do not illuminate, go to step 51 of this fault.

If RH side marker light does not illuminate, go to step 52 of this fault.
Known Info:
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

Possible Problems:
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

Test Options:
- Continuity Test or STE/ICE-R Test #91

Reason for Question:
If continuity is not present, RH rear marker light lamp is faulty.

34. Is continuity present through RH rear marker light lamp?

- NO
  - Replace RH rear marker light lamp (para 7-38) and go to step 9 of this fault if required.
- YES
CONTINUITY TEST

1. Remove two screws and lens cover from RH rear marker light base.
2. Set multimeter to ohms.
3. Remove RH rear marker light lamp from socket.
4. Check continuity through RH rear marker light lamp and note reading on multimeter.
5. If continuity is not present, replace RH rear marker light lamp (para 7-38) and go to step 9 of this fault if required.
6. Install RH rear marker light lamp in socket.
7. Install lens cover on RH rear marker light base with two screws.
**TEST OPTIONS**

**Voltage Test or STE/ICE-R Test #89**

**REASON FOR QUESTION**

If 12 VDC is not present, wire 489 is faulty. Is 12 VDC is present, RH rear marker light is faulty.

**KNOWN INFO**

Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK. Lamp OK.

**POSSIBLE PROBLEMS**

Faulty marker light. Faulty rear lights cable assembly.

**WARNING**

If 12 VDC is not present, wire 489 is faulty. Is 12 VDC is present, RH rear marker light is faulty.

**CAUTION**

Read WARNING and CAUTION on following page.

**Is 12 VDC present at connector P89?**

**NO**

Repair wire 489 from connector P89 to splice (refer to Table 2-12.9. M1085/M1086/M1089/M1096 RH Side And Rear Marker Lights Splices) (para 2-45) and go to step 9 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**YES**

Replace RH rear marker light (para 7-38) and go to step 9 of this fault if required.
VOLTAGE TEST

(1) Disconnect RH rear marker light connector from connector P89.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P89.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10) and note reading on multimeter.
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
(7) Is 12 VDC is not present, repair wire 489 from connector P89 to splice (refer to Table 2-12.9. M1085/M1086/M1089/M1096 RH Side And Rear Marker Lights Splices) (para 2-45) and go to step 9 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(8) If 12 VDC is present, replace RH rear marker light (para 7-38) and go to step 9 of this fault if required.
(9) Connect RH rear marker light connector to connector P89.

Table 2-12.9. M1085/M1086/M1089/M1096 RH Side and Rear Marker Light Splices

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1085/M1086/M1096</td>
<td>E17</td>
</tr>
<tr>
<td>M1089</td>
<td>E52</td>
</tr>
</tbody>
</table>
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

**REASON FOR QUESTION**
- If vehicle is not vehicle M1089, wire 3094 is faulty.

---

36. Is vehicle M1089?

**NO**

Repair wire 3094 from terminal lug TL32 to splice E21 (para 2-45) and go to step 10 of this fault if required or replace M1086 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**YES**

**REASON FOR QUESTION**
- If continuity is not present, wire 3094 is faulty. If continuity is present, wire 489 is faulty.

---

37. Is continuity present from terminal lug TL30 to ground?

**NO**

Repair wire 3094 from terminal lug TL30 to terminal lug TL92 (para 2-45) and go to step 10 of this fault if required or replace M1089 rear lights cable assembly (para 7-104) and go to step 1 of this fault.

**YES**

Repair wire 489 from splice E49 to splice E50 (para 2-45) and go to step 10 of this fault if required or replace M1089 rear lights cable assembly (para 7-104) and go to step 1 of this fault.
If vehicle is not M1089, repair wire 3094 from terminal lug TL32 to splice E21 (para 2-45) and go to step 10 of this fault if required or replace M1086 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

(1) Remove nut, lockwasher, terminal lug TL30, and lockwasher from LH rear marker light screw. Discard lockwashers.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL30.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3094 from terminal lug TL30 to terminal lug TL92 (para 2-45) and go to step 10 of this fault if required or replace M1089 rear lights cable assembly (para 7-104) and go to step 1 of this fault.
(6) If continuity is present, repair wire 489 from splice E49 to splice E50 (para 2-45) and go to step 10 of this fault if required or replace M1089 rear lights cable assembly (para 7-104) and go to step 1 of this fault.
(7) Install lockwasher, terminal lug TL30, lockwasher, and nut on LH rear marker light screw.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**

38. Is continuity present through LH rear marker light lamp?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, LH rear marker light lamp is faulty.

If continuity is not present, LH rear marker light lamp is faulty.

Replace LH rear marker light lamp (para 7-38) and go to step 11 of this fault if required.
CONTINUITY TEST

(1) Remove two screws and lens cover from LH rear marker light base.
(2) Remove LH rear marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH rear marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH rear marker light lamp (para 7-38) and go to step 11 of this fault if required.
(6) Install LH rear marker light lamp in socket.
(7) Install lens cover on LH rear marker light base.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**WARNING**

39. Is 12 VDC present at connector P54?

**CAUTION**

Read WARNING and CAUTION on following page.

**TEST OPTIONS**

Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 12 VDC is not present, wire 489 is faulty.

**KNOWN INFO**

- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**

- Faulty marker light.
- Faulty rear lights cable assembly.

YES

Repair wire 489 from connector P54 to splice (refer to Table 2-12.10. M1085/1086/M1089/ M1096 Rear Marker Light Splices) (para 2-45) and go to step 11 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

NO

Faulty marker light. Faulty rear lights cable assembly.
VOLTAGE TEST

(1) Disconnect LH rear marker light connector from connector P54.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P54.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
(7) If 12 VDC is not present, repair wire 489 from connector P54 to splice (refer to Table 2-12.10. M1085/M1086/M1089/M1096 Rear Marker Light Splices) (para 2-45) and go to step 11 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(8) Connect LH rear marker light connector to connector P54.

Table 2-12.10. M1085/M1086/M1089/M1096 Rear Marker Light Splices

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1085/M1086/M1096</td>
<td>E15</td>
</tr>
<tr>
<td>M1089</td>
<td>E50</td>
</tr>
</tbody>
</table>

WARNING

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

CAUTION

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

NOTE

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

NOTE

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

CAUTION

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

WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits, or cause severe burns or electrical shock.
40. Is vehicle M1089?

**YES**

Replace LH rear marker light (para 7-38) and go to step 11 of this fault.

**NO**

Go to step 55 of this fault.
(1) If vehicle is not M1089, go to step 55 of this fault.
(2) If vehicle is M1089, replace LH rear marker light (para 7-38) and go to step 11 of this fault if required.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, middle rear marker light lamp is faulty.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

---

**Is continuity present through middle rear marker light lamp?**

- **NO**
  - Replace middle rear marker light lamp (para 7-38) and go to step 12 of this fault if required.

- **YES**
## CONTINUITY TEST

1. Remove two screws and lens cover from middle rear marker light base.
2. Remove middle rear marker light lamp from socket.
3. Set multimeter to ohms.
4. Check continuity through middle rear marker light lamp and note reading on multimeter.
5. If continuity is not present, replace middle rear marker light lamp (para 7-38) and go to step 12 of this fault if required.
6. Install middle rear marker light lamp in socket.
7. Install lens cover on middle rear marker light base with two screws.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- Is 12 VDC present at connector P56?
- If 12 VDC is not present, wire 489 is faulty.

**WARNING**
- Read WARNING and CAUTION on following page.

**CAUTION**
- **42.** If 12 VDC is not present, wire 489 is faulty.

**Flowchart:**
- **NO**
  - Repair wire 489 from connector P56 to splice (refer to Table 2-12.11, M1085/M1086/M1089/M1096 Rear Marker Lights Splices) (para 2-45) and go to step 12 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
- **YES**
WARNING

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

CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect middle rear marker light connector from connector P56.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector P56.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(7) If 12 VDC is not present, repair wire 489 from connector P56 to splice (refer to Table 2-12.11. M1085/M1086/M1089/M1096 Rear Marker Lights Splices) (para 2-45) and go to step 12 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.</td>
</tr>
<tr>
<td>(8) Connect middle rear marker light connector to connector P56.</td>
</tr>
</tbody>
</table>

Table 2-12.11. M1085/M1086/M1089/M1096 Rear Marker Light Splices

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1085/M1086/M1096</td>
<td>E15</td>
</tr>
<tr>
<td>M1089</td>
<td>E50</td>
</tr>
</tbody>
</table>
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.
Lamp OK.

**POSSIBLE PROBLEMS**
Faulty marker light.
Faulty rear lights cable assembly.

**TEST OPTIONS**
Visual Inspection

**REASON FOR QUESTION**
If vehicle is not M1089, middle rear marker light is faulty.

---

43. **Is vehicle M1089?**

**YES**
Replace middle rear marker light (para 7-38) and go to step 12 of this fault if required.

**NO**

---

44. **Is continuity present from terminal lug TL31 to ground?**

**YES**

**NO**
Repair wire 3094 from terminal lug TL31 to terminal lug TL30 (para 2-45) and go to step 12 of this fault if required or replace M1089 rear lights cable assembly (para 7-104) and go to step 1 of this fault.

---

Replace middle rear marker light (para 7-38) and go to step 12 of this fault if required.
If vehicle is not M1089, replace middle rear marker light (para 7-38) and go to step 12 of this fault if required.

**CONTINUITY TEST**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove nut, lockwasher terminal lug TL31, and lockwasher from middle rear marker light screw. Discard lockwashers.</td>
</tr>
<tr>
<td>2</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>3</td>
<td>Connect positive (+) probe of multimeter to terminal lug TL31.</td>
</tr>
<tr>
<td>4</td>
<td>Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>5</td>
<td>If continuity is not present, repair wire 3094 from terminal lug TL31 to terminal lug TL30 (para 2-45) and go to step 12 of this fault if required or replace M1089 rear lights cable assembly (para 7-104) and go to step 1 of this fault.</td>
</tr>
<tr>
<td>6</td>
<td>If continuity is present, replace middle rear marker light (para 7-38) and go to step 12 of this fault if required.</td>
</tr>
<tr>
<td>7</td>
<td>Install lockwasher, terminal lug TL31, lockwasher, and nut on middle rear marker light screw.</td>
</tr>
</tbody>
</table>
45. Does LH marker light illuminate?

**KNOWLEDGE**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

---

46. Does RH marker light illuminate?

**KNOWLEDGE**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

---

NO

YES

Go to step 57 of this fault.

NO

YES

Go to step 60 of this fault.

Go to step 9 of this fault.
If LH marker light does not illuminate, go to step 57 of this fault.

(1) If RH marker light does not illuminate, go to step 60 of this fault.
(2) If RH marker light does illuminate, go to step 9 of this fault.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, wire 3094 is faulty. If continuity is present, wire 489 is faulty.</td>
</tr>
</tbody>
</table>

47. Is continuity present from terminal TL16 to ground?

- **NO**
  - Repair 3094 from terminal lug TL16 to terminal lug TL18 (para 2-45) and go to step 8 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

- **YES**
  - Repair 489 from splice "A" to splice "B" (refer to Table 2-12.12. M1085/M1086/M1089/M1096 LH Rear Marker Light Splices) (para 2-45) and go to step 8 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug TL16, and lockwasher from LH rear marker light screw. Discard lockwashers.
(2) Step multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL16.
(4) Connect negative probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair 3094 from terminal lug TL16 to terminal lug TL18 (para 2-45) and go to step 8 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(6) If continuity is present, repair 489 from splice "A" to splice "B" (refer to Table 2-12.12. M1085/M1086/M1089/M1096 LH Rear Marker Light Splices) (para 2-45) and go to step 8 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(7) Install lockwasher, terminal lug TL16, lockwasher, and nut on LH rear marker light screw.

Table 2-12.12. M1085/M1086/M1089/M1096 LH Rear Marker Light Splices

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice &quot;A&quot;</th>
<th>Splice &quot;B&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1085/M1086/M1096</td>
<td>E15</td>
<td>E16</td>
</tr>
<tr>
<td>M1089</td>
<td>E49</td>
<td>E51</td>
</tr>
</tbody>
</table>
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, LH side marker light lamp is faulty.</td>
</tr>
</tbody>
</table>

**48.** Is continuity present through LH side marker light lamp?

- **NO**
  - Replace LH side marker light lamp (para 7-38) and go to step 8 of this fault if required.

- **YES**
## CONTINUITY TEST

1. Remove two screws and lens cover from LH side marker light base.
2. Set multimeter to ohms.
3. Remove LH side marker light lamp from socket.
4. Check continuity through LH side marker light lamp and note reading on multimeter.
5. If continuity is not present, replace LH side marker light lamp (para 7-38) and go to step 8 of this fault if required.
6. Install LH side marker light lamp in socket.
7. Install lens cover on LH side marker light base with two screws.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**

**REASON FOR QUESTION**

- Voltage Test or STE/ICE-R Test #89

**WARNING**

**CAUTION**

Read WARNING and CAUTION on following page.

49. Is 12 VDC present at connector P85?

**Yes**

Repair wire 489 from connector P85 to splice (refer to Table 2-12.13. M1085/M1086/M1089/M1096 LH Side And Rear Marker Light Splices) (para 2-45) and go to step 8 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**No**

If 12 VDC is not present, wire 489 is faulty. If 12 VDC is present, LH side marker light is faulty.
WARNING

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

CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect LH side marker light connector from connector P85.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector P85.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(7) If 12 VDC is not present, repair wire 489 from connector P85 to splice (refer to Table 2-12.13. M1085/M1086/M1089/M1096 LH Side And Rear Marker Light Splices) (para 2-45) and go to step 8 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.</td>
</tr>
</tbody>
</table>

Table 2-12.13. M1085/M1086/M1089/M1096 Rear Marker Light Splices

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1085/M1086/M1096</td>
<td>E15</td>
</tr>
<tr>
<td>M1089</td>
<td>E50</td>
</tr>
</tbody>
</table>
Known Info
Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.
Lamp OK.

Possible Problems
Faulty marker light.
Faulty rear lights cable assembly.

50. Is continuity present from terminal lug TL15 to ground?

Test Options
Continuity Test or STE/ICE-R Test #91

Reason for Question
If continuity is not present, wire 3094 is faulty. If continuity is present, LH side marker light is faulty.

Yes
Replace LH side marker light (para 7-38) and go to step 8 of this fault if required.

No
Repair wire 3094 from terminal lug TL15 to terminal lug TL16 (para 2-45) and go to step 8 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1086/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
CONINUITY TEST

(1) Remove nut, lockwasher, terminal lug TL15, and lockwasher from LH side marker light screw. Discard lockwashers.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL15.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3094 from terminal lug TL15 to terminal lug TL16 (para 2-45) and go to step 8 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1086/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(6) If continuity is present, replace LH side marker light (para 7-38) and go to step 8 of this fault if required.
(7) Install lockwasher, terminal lug TL15, lockwasher, and nut on LH side marker light.
(8) Connect LH side marker light connector to connector 85.
51. Is continuity present from terminal lug TL20 to ground?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate.</td>
</tr>
<tr>
<td>Rear composite lights illuminate.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, wire 3095 is faulty. If continuity is present, wire 489 is faulty.</td>
</tr>
</tbody>
</table>

**NO**

Repair wire 3095 from terminal lug TL20 to terminal lug TL21 (para 2-45). and go to step 9 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**YES**

Repair wire 489 from splice "A" to splice "B" (refer to Table 2-12.14. M1085/M1086/M1089/M1096 RH Rear Marker Light Splices) (para 2-45) and go to step 9 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
CONTINUITY TEST

2. Step multimeter to ohms.
3. Connect positive (+) probe of multimeter to terminal lug TL20.
4. Connect negative probe of multimeter to ground and note reading on multimeter.
5. If continuity is not present, repair wire 3095 from terminal lug TL20 to terminal lug TL21 (para 2-45) and go to step 9 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
6. If continuity is present, repair wire 489 from splice "A" to splice "B" (refer to Table 2-12.14, M1085/M1086/M1089/M1096 RH Rear Marker Light Splices) (para 2-45) and go to step 9 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

Table 2-12.14. M1085/M1086/M1089/M1096 RH Rear Marker Light Splices

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice &quot;A&quot;</th>
<th>Splice &quot;B&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1085/M1086/M1096</td>
<td>E15</td>
<td>E17</td>
</tr>
<tr>
<td>M1089</td>
<td>E49</td>
<td>E52</td>
</tr>
</tbody>
</table>
Known Info
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

Possible Problems
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

Test Options
- Continuity Test or STE/ICE-R Test #91

Reason for Question
- If continuity is not present, RH side marker light lamp is faulty.

52.

Is continuity present through RH side marker light lamp?

No

Replace RH side marker light lamp (para 7-38) and go to step 9 of this fault if required.

Yes

Replace RH side marker light lamp (para 7-38) and go to step 9 of this fault if required.
CONTINUITY TEST

(1) Remove two screws and lens cover from RH side marker light base.
(2) Set multimeter to ohms.
(3) Remove RH side marker light lamp from socket.
(4) Check continuity through RH side marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace RH side marker light lamp (para 7-38) and go to step 9 of this fault if required.
(6) Install RH side marker light lamp in socket.
(7) Install lens cover on RH side marker light base with two screws.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 489 is faulty. If 12 VDC is present, RH side marker light is faulty.

53. Is 12 VDC present at connector P88?

**WARNING**
- CAUTION
- Read **WARNING** and **CAUTION** on following page.

**YES**

Repair wire 489 from connector P88 to splice (refer to Table 2-12.15. M1085/M1086/M1089/M1096 RH Side And Rear Marker Light Splices) (para 2-45) and go to step 9 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**NO**
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits, or cause severe burns or electrical shock.

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

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

### VOLTAGE TEST

1. Disconnect RH side marker light connector from connector P88.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P88.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 12 VDC is not present, repair wire 489 from connector P88 to splice (refer to Table 2-12.15. M1085/M1086/M1089/M1096 RH Side and Rear Marker Light Splices) (para 2-45) and go to step 9 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1085/M1086/M1096</td>
<td>E17</td>
</tr>
<tr>
<td>M1089</td>
<td>E52</td>
</tr>
</tbody>
</table>
**KNOWN INFO**
Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.
Lamp OK.

**POSSIBLE PROBLEMS**
Faulty marker light.
Faulty rear lights cable assembly.

---

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3095 is faulty. If continuity is present, RH side marker light is faulty.

---

54.
Is continuity present from terminal lug TL19 to ground?

---

**YES**
Replace RH side marker light (para 7-38) and go to step 9 of this fault if required.

---

**NO**
Repair wire 3095 from terminal lug TL19 to terminal lug TL20 (para 2-45) and go to step 9 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1086/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
CONTINUITY TEST

2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to terminal lug TL19.
4. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
5. If continuity is not present, repair wire 3095 from terminal lug TL19 to terminal lug TL20 (para 2-45) and go to step 9 of this fault if required or replace M1086/M1089 rear lights cable assembly (para 7-104) or M1086/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
6. If continuity is present, replace RH side marker light (para 7-38) and go to step 9 of this fault if required.
**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

---

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3094 is faulty.

---

## 55.

Is continuity present from terminal lug TL30 to terminal lug TL31?

- **NO**
  - Repair wire 3094 from terminal lug TL30 to terminal lug TL31 (para 2-45) and go to step 11 of this fault if required or replace M1086 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

- **YES**
  - Is continuity present from terminal lug TL31 to terminal lug TL32?
    - **NO**
      - Repair wire 3094 from terminal lug TL31 to terminal lug TL32 (para 2-45) and go to step 11 of this fault if required or replace M1086 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
    - **YES**
      - Replace LH rear marker light (para 7-38) and go to step 11 of this fault if required.
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug TL30, and lockwasher from LH rear marker light screw. Discard lockwashers.
(2) Remove nut, lockwasher, terminal lug TL31, and lockwasher from middle rear marker light screw. Discard lockwashers.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal lug TL30.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If continuity is not present, repair wire 3094 from terminal lug TL30 to terminal lug TL31 (para 2-45) and go to step 11 of this fault if required or replace M1086 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(7) Install lockwasher, terminal lug TL30, lockwasher, and nut on LH rear marker light screw.

(1) Remove nut, lockwasher, terminal lug TL32, and lockwasher from RH rear marker light screw. Discard lockwashers.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL31.
(4) Connect negative (-) probe of multimeter to terminal lug TL32 and note reading on multimeter.
(5) If continuity is not present, repair wire 3094 from terminal lug TL31 to terminal lug TL32 (para 2-45) and go to step 11 of this fault if required or replace M1086 rear lights cable assembly (para 7-104) or M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(6) If continuity is present, replace LH rear marker light (para 7-38) and go to step 11 of this fault if required.
(7) Install lockwasher, terminal lug TL32, lockwasher, and nut on RH rear marker light screw.
(8) Install lockwasher, terminal lug TL31, lockwasher, and nut on middle rear marker light screw.
57. Is continuity present through LH rear marker light lamp?

- NO
  - Replace LH rear marker light lamp (para 7-38) and go to step 46 of this fault if required.

- YES
  - Go to step 63 of this fault.

58. Is 12 VDC present at connector P86?

- NO
  - If continuity is not present, LH rear marker light lamp is faulty.

- YES
  - Read WARNING and CAUTION on following page.

**Known Info**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.

**Possible Problems**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**Test Options**
- Continuity Test or STE/ICE-R Test #91

**Reason for Question**
- This question eliminates possible problems and determines where troubleshooting continues.

**Test Options**
- Voltage Test or STE/ICE-R Test #89
**CONTINUITY TEST**

(1) Remove two screws and lens cover from LH rear marker light base.
(2) Remove LH rear marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH rear marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH rear marker light lamp (para 7-38) and go to step 46 of this fault if required.
(6) Install LH rear marker light lamp in socket.
(7) Install lens cover on LH rear marker light base with two screws.

**WARNING**

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

**CAUTION**

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

**NOTE**

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

**VOLTAGE TEST**

(1) Disconnect LH rear marker light connector from connector P86.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P86.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
(7) If 12 VDC is not present, go to step 63 of this fault.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3094 is faulty. If continuity is present, LH rear marker light is faulty.

59. Is continuity present from terminal lug TL16 to ground?

- **NO**
  - Repair wire 3094 from terminal lug TL16 to terminal lug TL18 (para 2-45) and go to step 46 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

- **YES**
  - Replace LH rear marker light (para 7-38) and go to step 46 of this fault if required.
### CONTINUITY TEST

2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to terminal lug TL16.
4. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
5. If continuity is not present, repair wire 3094 from terminal lug TL16 to terminal lug TL18 (para 2-45) and go to step 46 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
6. If continuity is present, replace LH rear marker light (para 7-38) and go to step 46 of this fault if required.
8. Connect LH rear marker light connector to connector P86.
Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, RH rear marker light lamp is faulty.

60. Is continuity present through RH rear marker light lamp?

**YES**
- Replace RH rear marker light lamp (para 7-38) and go to step 9 of this fault if required.

**NO**
- Go to step 64 of this fault.

---

**KNOWN INFO**
- Other marker lights illuminate. Rear composite lights illuminate. Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

61. Is 12 VDC present at connector P89?

**NO**
- Go to step 64 of this fault.

**YES**
- WARNING
  - CAUTION
  - Read WARNING and CAUTION on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- This question eliminates possible problems and determines where troubleshooting continues.
CONTINUITY TEST

(1) Remove two screws and lens cover from RH rear marker light base.
(2) Remove RH rear marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through RH rear marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace RH rear marker light lamp (para 7-38) and go to step 9 of this fault if required.
(6) Install RH rear marker light lamp in socket.
(7) Install lens cover on RH rear marker light base with two screws.

WARNING

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

CAUTION

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

NOTE

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

VOLTAGE TEST

(1) Disconnect RH rear marker light connector from connector P89.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P89.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
(7) If 12 VDC is not present, go to step 64 of this fault.
e48B. M1085/M1086/M1089/M1096 INTERMEDIATE, SIDE, AND/OR REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3095 is faulty. If continuity is present, RH rear marker light is faulty.

**62.** Is continuity present from terminal lug TL20 to ground?

- **NO**
  - Repair wire 3095 from terminal lug TL20 to terminal lug TL21 (para 2-45) and go to step 9 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault if required.

- **YES**
  - Replace RH rear marker light (para 7-38) and go to step 9 of this fault if required.
CONTINUITY TEST

2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to terminal lug TL20.
4. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
5. If continuity is not present, repair wire 3095 from terminal lug TL20 to terminal lug TL21 (para 2-45) and go to step 9 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
6. If continuity is present, replace RH rear marker light (para 7-38) and go to step 9 of this fault if required.
8. Connect RH rear marker light connector to connector P89.
Known Info

Other marker lights illuminate.
Rear composite lights illuminate.
Dashboard cable assembly OK.
Lamp OK.

Possible Problems

Faulty marker light.
Faulty rear lights cable assembly.

Test Options

Voltage Test or STE/ICE-R Test #89

Reason for Question

This question eliminates possible problems and determines where troubleshooting continues.

63. Is 12 VDC present at connector P85?

No

Repair wire 489 from splice E15 to splice E16 (para 2-45) and go to step 46 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

Yes

Repair wire 489 from connector P85 to splice E16 (para 2-45) and go to step 46 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 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 circuits, or cause severe burns or electrical shock.

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

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

VOLTAGE TEST

NOTE
Remove plastic cable ties as required.

(1) Disconnect connector P85 from LH rear side marker light connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P85.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
(7) If 12 VDC is not present, repair wire 489 from splice E15 to splice E16 (para 2-45) and go to step 46 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
(8) If 12 VDC is present, repair wire 489 from connector P85 to splice E16 (para 2-45) and go to step 46 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

NOTE
Install plastic cable ties as required.

(9) Connect LH rear side marker light connector to connector P85.
(10) Connect LH marker light connector to connector P86.
Known Info
- Other marker lights illuminate.
- Rear composite lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

Possible Problems
- Faulty marker light.
- Faulty rear lights cable assembly.

Is 12 VDC present at connector P88? If yes, go to step 9 of this fault. If no, go to step 46 of this fault.

Test Options
- Voltage Test or STE/ICE-R Test #89

Reason for Question
This question eliminates possible problems and determines where troubleshooting continues.

Yes
- Repair wire 489 from splice E15 to splice E17 (para 2-45) and go to step 9 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

No
- Repair wire 489 from connector P89 to splice E17 (para 2-45) and go to step 46 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 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 circuits, or cause severe burns or electrical shock.

**CAUTION**

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

**NOTE**

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

---

**VOLTAGE TEST**

Remove plastic cable ties as required.

1. Disconnect connector P88 from RH rear side marker light connector.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P88.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 12 VDC is not present, repair wire 489 from splice E15 to splice E17 (para 2-45) and go to step 9 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.
8. If 12 VDC is present, repair wire 489 from connector P89 to splice E17 (para 2-45) and go to step 46 of this fault if required or replace M1085/M1096 rear lights cable assembly (para 7-84) and go to step 1 of this fault.

**NOTE**

Install plastic cable ties as required.

10. Connect RH rear marker light connector to connector P89.
**INITIAL SETUP**

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

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

**Materials/Parts**
Lockwasher (4) (Item 82, Appendix G)

**Personnel Required**
(2)

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

---

**KNOWN INFO**

Other marker lights illuminate.

**POSSIBLE PROBLEMS**

Faulty lamp.
Faulty marker light.
Faulty rear lights cable assembly.
Faulty dashboard cable assembly.

---

**TEST OPTIONS**

**Visual Inspection**

**REASON FOR QUESTION**

This question eliminates possible problems and determines where troubleshooting continues.

---

1. **Does any rear marker light illuminate?**

   **NO**

   **YES**

   Go to step 6 of this fault.

---

2. **Does LH rear marker light illuminate?**

   **NO**

   **YES**

   Go to step 9 of this fault.
(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) Note rear marker light(s) that do not illuminate.
(3) If all rear marker lights do not illuminate, go to step 6 of this fault.
(4) Position main light switch to OFF (TM 9-2320-366-10-1).

If LH rear marker light does not illuminate, go to step 9 of this fault.
known info
other marker lights illuminate.
dashboard cable assembly ok.
possible problems
faulty lamp.
faulty marker light.
faulty rear lights cable assembly.

3.

does the middle rear marker light illuminate?

no

yes

go to step 13 of this fault.

test options
visual inspection
reason for question
this question eliminates possible problems and determines where troubleshooting continues.

known info
other marker lights illuminate.
dashboard cable assembly ok.
possible problems
faulty lamp.
faulty marker light.
faulty rear lights cable assembly.

4.

is continuity present through rh rear marker light lamp?

no

yes

replace rh rear marker light lamp (para 7-38).

reason for question
if continuity is not present, rh rear marker light lamp is faulty.
If middle rear marker light does not illuminate, go to step 13 of this fault.

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove two screws and lens cover from RH rear marker light base.</td>
</tr>
<tr>
<td>(2) Remove RH rear marker light lamp from socket.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Check continuity through RH rear marker light lamp and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If continuity is not present, replace RH rear marker light lamp (para 7-38).</td>
</tr>
<tr>
<td>(6) Install RH rear marker light lamp in socket.</td>
</tr>
<tr>
<td>(7) Install lens cover on RH rear marker light base with two screws.</td>
</tr>
</tbody>
</table>
e48C. M1088 REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

5.

**Known Info**
- Other marker lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**Possible Problems**
- Faulty marker light.
- Faulty rear lights cable assembly.

**Test Options**
- Voltage Test or STE/ICE-R Test #89

**Reason for Question**
- If 12 VDC is not present, wire 489 is faulty. If 12 VDC is present, RH rear marker light is faulty.

**Warning and Caution**
Read WARNING and CAUTION on following page.

Is 12 VDC present at connector P58?

- **No**
  - Repair wire 489 from connector P58 to splice E27 (para 2-45) or replace M1088 rear lights cable assembly (para 7-104).

- **Yes**
  - Replace RH rear marker light (para 7-38).
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits, or cause severe burns or electrical shock.

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

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect RH rear marker light connector from connector P58.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector P58.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(7) If 12 VDC is not present, repair wire 489 from connector P58 to splice E27 (para 2-45) or replace M1088 rear lights cable assembly (para 7-104).</td>
</tr>
<tr>
<td>(8) If 12 VDC is present, replace RH rear marker light (para 7-38).</td>
</tr>
<tr>
<td>(9) Connect RH rear marker light connector to connector P58.</td>
</tr>
</tbody>
</table>
### Known Info

<table>
<thead>
<tr>
<th>Known Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate.</td>
</tr>
<tr>
<td>Possible Problems</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

### Test Options

- Continuity Test or STE/ICE-R Test #91

### Reason for Question

If continuity is not present, wire 489 is faulty.

### Reasoning

6. **Is continuity present from connector J51 pin 7 to terminal board TB1 position 11?**

- **NO**
  - Repair wire 489 from terminal board TB1 position 11 to connector J51 pin 7 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**

---

**CAUTION**

Read CAUTION on following page.

---

**e48C. M1088 Rear Marker Light(s) Do Not Illuminate (Cont)**
CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(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) Disconnect connector P51 from connector
J51.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter
to connector J51 pin 7.
(9) Connect negative (-) probe of multimeter to
terminal board TB1 position 11 and note
reading on multimeter.
(10) If continuity is not present, repair wire 489
from terminal board TB1 position 11 to
connector J51 pin 7 (para 2-45) or replace
WTEC II dashboard cable assembly
(para 7-10) or WTEC III dashboard cable
assembly (para 7-11).

CAUTION
Use care when testing electrical connectors not
to bend connector pins or damage connector
sockets with multimeter probes. Failure to
compel may result in damage to equipment.
Inspect connector pins/sockets for damage,
corrosion, and serviceability. Check that
connector pins are not pushed back and
are capable of making good contact.

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

Use care when testing electrical connectors not
to bend connector pins or damage connector
sockets with multimeter probes. Failure to
compel may result in damage to equipment.
7. Is continuity present from connector P51 socket 7 to connector P52M socket 3?

- **KNOWN INFO**
  - Other marker lights illuminate.
  - Dashboard cable assembly OK.

- **POSSIBLE PROBLEMS**
  - Faulty rear lights cable assembly.

- **CAUTION**
  Read CAUTION on following page.

- **TEST OPTIONS**
  - Continuity Test or STE/ICE-R Test #91

- **REASON FOR QUESTION**
  - If continuity is not present, wire 489 is faulty.

- **YES**
  Repair wire 489 from connector P51 socket 7 to connector P52M socket 3 (para 2-45) or replace M1088 rear lights cable assembly (para 7-104).

- **NO**
CONTINUITY TEST

(1) Disconnect connector P52M from connector J52M.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P51 socket 7.
(4) Connect negative (-) probe of multimeter to connector P52M socket 3 and note reading on multimeter.
(5) If continuity is not present, repair wire 489 from connector P51 socket 7 to P52M socket 3 or replace M1088 rear lights cable assembly (7-104).
(6) Connect connector J52M to connector P52M.
(7) Connect connector J51 to connector P51.
(8) Install PDP on dashboard with three screws.
(9) Install three washers and screws in PDP.
(10) Install PDP cover (para 16-2).
(11) Connect batteries (para 7-57).

CAUTION

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

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
8. Is continuity present from terminal lug TL32 to ground?

**NO**

- Repair wire 3094 from terminal lug TL32 to splice E28 (para 2-45) or replace M1088 rear lights cable assembly (para 7-104).

**YES**

- Repair wire 489 from splice E41 to splice E27 (para 2-45) or replace M1088 rear lights cable assembly (para 7-104).
<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove nut, lockwasher, terminal lug TL32, and lockwasher from RH rear marker light screw. Discard lockwashers.</td>
</tr>
<tr>
<td>(2) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to terminal lug TL32.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If continuity is not present, repair wire 3094 from terminal lug TL32 to splice E28 (para 2-45) or replace M1088 rear lights cable assembly (7-104).</td>
</tr>
<tr>
<td>(6) If continuity is present, repair wire 489 from splice E41 to splice E27 (para 2-45) or replace M1088 rear lights cable assembly (para 7-104).</td>
</tr>
<tr>
<td>(7) Install lockwasher, terminal lug TL32, lockwasher, and nut on RH rear marker light screw.</td>
</tr>
</tbody>
</table>
e48C. **M1088 REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)**

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other marker lights illuminate. Dashboard cable assembly OK.</td>
<td>Continuity Test or STE/ICE-R Test #91</td>
<td>If continuity is not present, LH rear marker light lamp is faulty.</td>
</tr>
<tr>
<td><strong>POSSIBLE PROBLEMS</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. Is continuity present through LH rear marker light lamp?

- **NO**
  - Replace LH rear marker light lamp (para 7-38) and go to step 3 of this fault if required.

- **YES**
**CONTINUITY TEST**

(1) Remove two screws and lens cover from LH rear marker light base.
(2) Remove LH rear marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH rear marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH rear marker light lamp (para 7-38) and go to step 3 of this fault if required.
(6) Install LH rear marker light lamp in socket.
(7) Install lens cover on LH rear marker light base with two screws.
If 12 VDC is not present, wire 489 is faulty.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 489 is faulty.

**KNOWLEDGE INFO**
- Other marker lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

10. Is 12 VDC present at connector P54?

- **YES**
  - Repair wire 489 from connector P54 to splice E27 (para 2-45) and go to step 3 of this fault if required or replace M1088 rear lights cable assembly (para 7-104) and go to step 1 of this fault.

- **NO**
  - Read WARNING and CAUTION on following page.
**WARNING**

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

**CAUTION**

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

**NOTE**

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

**VOLTAGE TEST**

1. Disconnect LH rear marker light connector from connector P54.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P54.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 12 VDC is not present, repair wire 489 from connector P54 to splice E27 (para 2-45) and go to step 3 of this fault if required or replace M1088 rear lights cable assembly (para 7-104) and go to step 1 of this fault.
8. Connect LH rear marker light connector to connector P54.
If continuity is not present, wire 3094 is faulty.

**Known Info**
- Other marker lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**Possible Problems**
- Faulty marker light.
- Faulty rear lights cable assembly.

**Test Options**
- Continuity Test or STE/ICE-R Test #91

**Reason for Question**
- If continuity is not present, wire 3094 is faulty.

**Step 11.** Is continuity present from terminal lug TL30 to terminal lug TL31?

- **NO**
  - Repair wire 3094 from terminal TL30 to terminal lug TL31 (para 2-45) and go to step 3 of this fault if required or replace M1088 rear lights cable assembly (para 7-104) go to step 1 of this fault.

- **YES**
<table>
<thead>
<tr>
<th><strong>CONTINUITY TEST</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove nut, lockwasher, terminal lug TL30, and lockwasher from LH rear marker light screw. Discard lockwashers.</td>
</tr>
<tr>
<td>(2) Remove nut, lockwasher, terminal lug TL31, and lockwasher from middle rear marker light screw. Discard lockwashers.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to terminal lug TL30.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to terminal lug TL31 and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If continuity is not present, repair wire 3094 from terminal TL30 to terminal lug TL31 (para 2-45) and go to step 3 of this fault if required or replace M1088 rear lights cable assembly (para 7-104) and go to step 1 of this fault.</td>
</tr>
<tr>
<td>(7) Install lockwasher, terminal lug TL30, lockwasher, and nut on LH rear maker light screw.</td>
</tr>
<tr>
<td>(8) Install LH rear marker light lamp in socket.</td>
</tr>
<tr>
<td>(9) Install lens cover on LH rear marker light base with two screws.</td>
</tr>
</tbody>
</table>
e48C. M1088 REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other marker lights illuminate.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3094 is faulty. If continuity is present, LH rear marker light is faulty.

---

**12.**

Is continuity present from terminal lug TL31 to terminal lug TL32?

---

**NO**

- Repair wire 3094 from terminal TL31 to terminal lug TL32 (para 2-45) and go to step 3 of this fault if required or replace M1088 rear lights cable assembly (para 7-104) and go to step 1 of this fault.

**YES**

- Replace LH rear marker light (para 7-38) and go to step 3 of this fault if required.
CONTINUITY TEST

(1) Remove nut, lockwasher, terminal lug TL32, and lockwasher from RH rear marker light screw. Discard lockwashers.

(2) Set multimeter to ohms.

(3) Connect positive (+) probe of multimeter to terminal lug TL31.

(4) Connect negative (-) probe of multimeter to terminal lug TL32 and note reading on multimeter.

(5) If continuity is not present, repair wire 3094 from terminal TL31 to terminal lug TL32 (para 2-45) and go to step 3 of this fault if required or replace M1088 rear lights cable assembly (para 7-104) and go to step 1 of this fault.

(6) If continuity is present, replace LH rear marker light (para 7-38) and go to step 3 of this fault if required.

(7) Install lockwasher, terminal lug TL31, lockwasher, and nut on middle rear marker light screw.

(8) Install lockwasher, terminal lug TL32, lockwasher, and nut on RH rear marker light screw.
e48C. M1088 REAR MARKER LIGHT(S) DO NOT ILLUMINATE (CONT)

**KNOW INFO**
Other marker lights illuminate. Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty marker light.
- Faulty rear lights cable assembly.

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, middle rear marker light lamp is faulty.

13. Is continuity present through middle rear marker light lamp?

- **NO**
  - Replace middle rear marker light lamp (para 7-38) and go to step 4 of this fault if required.

- **YES**
(1) Remove two screws and lens cover from middle rear marker light base.
(2) Remove middle rear marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH rear marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace LH rear marker light lamp (para 7-38) and go to step 4 of this fault if required.
(6) Install middle rear marker light lamp in socket.
(7) Install lens cover on middle rear marker light base with two screws.
Is 12 VDC present at connector P56?

**WARNING**
Read WARNING and CAUTION on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 489 is faulty. If 12 VDC is present, middle rear marker light is faulty.

**KNOWN INFO**
Other marker lights illuminate. Dashboard cable assembly OK. Lamp OK.

**POSSIBLE PROBLEMS**
Faulty marker light. Faulty rear lights cable assembly.

**YES**
Repair wire 489 from connector P56 to splice E27 (para 2-45) and go to step 4 of this fault if required or replace M1088 rear lights cable assembly (para 7-104) and go to step 1 of this fault.

**NO**
Replace middle rear marker light (para 7-38) and go to step 4 of this fault if required.
WARNING

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

CAUTION

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

NOTE

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

**VOLTAGE TEST**

(1) Disconnect middle rear marker light connector from connector P56.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P56.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
(7) If 12 VDC is not present, repair wire 489 from connector P56 to splice E27 (para 2-45) and go to step 4 of this fault if required or replace M1088 rear lights cable assembly (para 7-104) and go to step 1 of this fault.
(8) If 12 VDC is present, replace middle rear marker light (para 7-38) and go to step 4 of this fault if required.
(9) Connect middle rear marker light connector to connector P58.
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE

**INITIAL SETUP**

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

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

**Material/Parts**
- Packing, Preformed (Item 191, Appendix G)
- Lockwasher (2) (Item 96, Appendix G)

**Personnel Required**
(2)

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

**NOTE**
Perform Electrical System Troubleshooting

**e1. Circuit Breaker Does Not Operate on circuit breaker CB80 prior to beginning this task.**

**KNOWLED INFO**
Other service light illuminates. Circuit breaker CB80 OK.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty rear lights cable assembly.
- Faulty composite taillight assembly.
- Faulty dashboard cable assembly.
- Faulty relay K20.
- Faulty main light switch.

**REASON FOR QUESTION**
This question eliminates possible problems and determines where troubleshooting continues.
(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).

(2) If neither composite taillight illuminates, go to step 6 of this fault.

(3) Position main light switch to OFF (TM 9-2320-366-10-1).
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other service light illuminates.</td>
<td>Visual Inspection</td>
</tr>
<tr>
<td>Circuit breaker CB80 OK.</td>
<td></td>
</tr>
<tr>
<td>One composite taillight illuminate.</td>
<td></td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
<td></td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
<td>REASON FOR QUESTION</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
<td>This question eliminates possible problems and determines where troubleshooting continues.</td>
</tr>
<tr>
<td>Faulty composite taillight assembly.</td>
<td></td>
</tr>
<tr>
<td>Faulty lamp.</td>
<td></td>
</tr>
</tbody>
</table>

2. Does LH composite taillight illuminate?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other service light illuminates.</td>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
<tr>
<td>Circuit breaker CB80 OK.</td>
<td></td>
</tr>
<tr>
<td>One composite taillight illuminate.</td>
<td></td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
<td></td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
<td>REASON FOR QUESTION</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
<td>If continuity is not present, RH composite taillight lamp is faulty.</td>
</tr>
<tr>
<td>Faulty composite taillight assembly.</td>
<td></td>
</tr>
<tr>
<td>Faulty lamp.</td>
<td></td>
</tr>
</tbody>
</table>

3. Is continuity present through RH composite taillight lamp?

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other service light illuminates.</td>
<td></td>
</tr>
<tr>
<td>Circuit breaker CB80 OK.</td>
<td></td>
</tr>
<tr>
<td>One composite taillight illuminate.</td>
<td></td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
<td></td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
<td></td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
<td></td>
</tr>
<tr>
<td>Faulty composite taillight assembly.</td>
<td></td>
</tr>
<tr>
<td>Faulty lamp.</td>
<td></td>
</tr>
</tbody>
</table>

REASON FOR QUESTION

Visual Inspection

- <image as a diagram>

- Go to step 9 of this fault.

- If continuity is not present, RH composite taillight lamp is faulty.

- Replace RH composite taillight lamp (para 7-39).
If LH taillight does not illuminate, go to step 9 of this fault.

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Loosen six screws and remove cover and preformed packing from RH composite taillight. Discard preformed packing.</td>
</tr>
<tr>
<td>(2) Remove RH composite taillight lamp from socket.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Check continuity through RH composite taillight lamp and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If continuity is not present, replace RH composite taillight lamp (para 7-39).</td>
</tr>
</tbody>
</table>
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other service light illuminates.</td>
</tr>
<tr>
<td>Circuit breaker CB80 OK.</td>
</tr>
<tr>
<td>One composite taillight illuminates.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
<tr>
<td>Lamp OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
<tr>
<td>Faulty composite taillight assembly.</td>
</tr>
</tbody>
</table>

4. WARNING
CAUTION
Read WARNING and CAUTION on following page.

Is 12 VDC present at connector P64?

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Test or</td>
</tr>
<tr>
<td>STE/ICE-R Test #89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 12 VDC is not present, wire 21 is faulty.</td>
</tr>
</tbody>
</table>

YES

Repair wire 21 from connector to splice (refer to Table 2-12.16. Composite Taillight Connectors) (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094/M1096 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).

NO
**WARNING**

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

**CAUTION**

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

**NOTE**

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

---

**VOLTAGE TEST**

1. Disconnect connector P64 from RH composite taillight assembly.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P64.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
6. If 12 VDC is not present, repair wire 21 (refer to Table 2-12.16. Composite Taillight Connectors) (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094/M1096 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).

---

**Table 2-12.16. Composite Taillight Connectors**

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1083/M1084/M1085/M1086/M1090/M1092/M1093/M1094/M1096</td>
<td>Connector P64 to Splice E20</td>
</tr>
<tr>
<td>M1088</td>
<td>Connector P64 to Splice E32</td>
</tr>
<tr>
<td>M1089</td>
<td>Connector P64 to Splice E48</td>
</tr>
</tbody>
</table>
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**Known Info**

- Other service light illuminates.
- Circuit breaker CB80 OK.
- One composite taillight illuminates.
- Dashboard cable assembly OK.
- Lamp OK.
- Rear lights cable assembly OK.

**Possible Problems**

- Faulty composite taillight assembly.

**Test Options**

- Continuity Test or STE/ICE-R Test #91

**Reason for Question**

This question eliminates possible problems and determines where troubleshooting continues.

---

5. Is continuity present from terminal lug TL21 to ground?

- **No**
  - Go to step 12 of this fault.

- **Yes**
  - Replace RH composite taillight assembly (para 7-39).
CONTINUITY TEST

1. Remove two screws, lockwashers, RH composite taillight assembly, and terminal lug TL21 from right taillight carrier. Discard lockwashers.
2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to terminal lug TL21.
4. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
5. If continuity is not present, go to step 12 of this fault.
6. If continuity is present, replace RH composite taillight assembly (para 7-39).
7. Install terminal lug TL21, and RH composite taillight assembly on right taillight carrier with two lockwashers and screws.
8. Connect connector P64 to RH composite taillight assembly.
9. Install RH composite taillight lamp in socket.
10. Install preformed packing and cover on RH composite taillight assembly with six screws.
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

### KNOWN INFO
- Other service light illuminates.
- Circuit breaker CB80 OK.

### POSSIBLE PROBLEMS
- Faulty rear lights cable assembly.
- Faulty dashboard cable assembly.
- Faulty relay K20.
- Faulty main light switch.

### TEST OPTIONS
- Voltage Test or STE/ICE-R Test #89

### WARNING

### CAUTION

Read WARNING and CAUTION on following page.

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

6. Is 12 VDC present at connector J51 pin 3?

- **NO**
  - Go to step 14 of this fault.
- **YES**
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

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

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

## VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>2</td>
<td>Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>3</td>
<td>Remove three screws from PDP.</td>
</tr>
<tr>
<td>4</td>
<td>Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>5</td>
<td>Disconnect connector P51 from connector J51.</td>
</tr>
<tr>
<td>6</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>7</td>
<td>Connect positive (+) probe of multimeter to connector J51 pin 3.</td>
</tr>
<tr>
<td>8</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>9</td>
<td>Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>10</td>
<td>If 12 VDC is not present, go to step 14 of this fault.</td>
</tr>
<tr>
<td>11</td>
<td>Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>12</td>
<td>Connect connector J51 to connector P51.</td>
</tr>
<tr>
<td>13</td>
<td>Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>14</td>
<td>Install three washers and screws in PDP.</td>
</tr>
</tbody>
</table>
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- Lamp OK.
- Composite taillight assembly OK.
- Relay K20 OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty dashboard cable assembly.

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Inspection</td>
</tr>
</tbody>
</table>

**REASON FOR QUESTION**
This question eliminates possible problems and determines where to continue troubleshooting.

7. Is vehicle M1085 or M1086?

- **YES**
  - Go to step 19 of fault.

- **NO**
  - Go to step 19 of fault.
If vehicle is not M1085 or M1086, go to step 19 of this fault.
**e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)**

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other service light illuminates.</td>
</tr>
<tr>
<td>Circuit breaker CB80 OK.</td>
</tr>
<tr>
<td>Lamp OK.</td>
</tr>
<tr>
<td>Composite taillight assembly OK.</td>
</tr>
<tr>
<td>Relay K20 OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
</tbody>
</table>

**WARNING**

Read **WARNING** and **CAUTION** on following page.

**8.**

Is 12 VDC present at connector P52R pin 1?

**TEST OPTIONS**

Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 12 VDC is present, wire 21 from connector P51 socket 3 to splice E20 (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094/M1096 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).

If 12 VDC is not present, wire 21 from connector P51 socket 3 to splice E42 is faulty. If 12 VDC is present, wire 3094 from terminal lug TL92 to splice E72 is faulty.

**YES**

Repair wire 21 from connector P51 socket 3 to splice E20 (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1096 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).

If 12 VDC is present, repair wire 3094 from terminal lug TL92 to splice E72 (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094/M1096 (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).

**NO**
VOLTAGE TEST

(1) Disconnect connector P52R from connector J52R.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P52R pin 1.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 21 from connector P51 socket 3 to splice E20 (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094/M1096 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).
(7) If 12 VDC is present, repair wire 3094 from terminal lug TL92 to splice E72 (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094/M1096 (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).
(8) Position main light switch to OFF (TM 9-2320-366-10-1).
(9) Connect connector J52 to connector P52R.
9. Is continuity present through LH composite taillight lamp?

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, LH composite taillight lamp is faulty.

**KNOWN INFO**

- Other service light illuminates.
- Circuit breaker CB80 OK.
- One composite taillight illuminates.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**

- Faulty rear lights cable assembly.
- Faulty composite taillight assembly.
- Faulty lamp.

**YES**

Replace LH composite taillight lamp (para 7-39).

**NO**
(1) Loosen six screws and remove cover and preformed packing from LH composite taillight lamp. Discard preformed packing.
(2) Remove LH composite taillight lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through LH composite taillight lamp and note reading on multimeter.
(5) If continuity is not present, replace LH composite taillight lamp (para 7-39).
**e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)**

- **KNOWN INFO**
  - Other service light illuminates.
  - Circuit breaker CB80 OK.
  - One composite taillight illuminates.
  - Dashboard cable assembly OK.
  - Lamp OK.

- **POSSIBLE PROBLEMS**
  - Faulty rear lights cable assembly.
  - Faulty composite taillight assembly.

**WARNING**
- Read **WARNING** and **CAUTION** on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 21 is faulty.

10. **Is 12 VDC present at connector P78?**

**YES**
- Repair wire 21 from connector P78 to splice (refer to Table 2-12.17. Composite Taillight Connectors) (para 2-45) or replace M1083/M1084/M1090/M1092/M1093/M1094/M1096 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).

**NO**
WARNING

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

CAUTION

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

NOTE

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

VOLTAGE TEST

(1) Disconnect connector P78 from LH composite taillight assembly.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P78.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 21 (refer to Table 2-12.17. Composite Taillight Connectors) (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094/M1096 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).
(7) Position main light switch to OFF (TM 9-2320-366-10-1).

Table 2-12.17. Composite Taillight Connector

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1083/M1084/M1085/M1086/ M1090/M1093/M1094/M1096</td>
<td>Connector P78 to Splice E20</td>
</tr>
<tr>
<td>M1088</td>
<td>Connector P78 to Splice E32</td>
</tr>
<tr>
<td>M1089</td>
<td>Connector P78 to Splice E48</td>
</tr>
</tbody>
</table>
11. Is continuity present from terminal lug TL18 to ground?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

**KNOWN INFO**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- One composite taillight illuminates.
- Dashboard cable assembly OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty composite taillight assembly.
- Faulty rear lights cable assembly.

**YES**
Replace LH composite taillight assembly (para 7-39).

**NO**
Go to step 21 of this fault.
(1) Remove two screws, lockwashers, LH composite taillight assembly, and terminal lug TL18 from right taillight carrier. Discard lockwashers.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL18.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, go to step 21 of this fault.
(6) If continuity is present, replace LH composite taillight assembly (para 7-39).
(7) Install terminal lug TL18, and LH composite taillight assembly on left taillight carrier with two lockwashers and screws.
(8) Connect connector P78 to LH composite taillight assembly.
(9) Install LH composite taillight lamp in socket.
(10) Install preformed packing and cover on LH composite taillight assembly with six screws.
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- Lamp OK.
- Composite taillight assembly OK.
- Relay K20 OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.

12. Is vehicle M1089?

**TEST OPTIONS**
- Visual Inspection

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

- **YES**
  - Go to step 22 of this fault.

- **NO**
If vehicle is not M1089, go to step 22 of this fault.
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- One composite taillight illuminates.
- Dashboard cable assembly OK.
- Lamp OK.
- Rear lights cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty composite taillight assembly.

---

**CAUTION**
Read CAUTION on following page.

13. Is continuity present from P52R socket 4 to ground?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, 3094 from terminal lug TL92 to splice E59 is faulty. If continuity is present, wire 3094 from splice E59 to terminal lug TL21 is faulty.

---

**NO**

**YES**

- Repair wire 3094 from terminal lug TL92 to splice E59 (para 2-45) or replace M1089 rear lights cable assembly (para 7-104).

- Repair wire 3094 from splice E59 to terminal lug TL21 (para 2-45) or replace rear lights cable assembly (para 7-104).
CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

CONTINUITY TEST

(1) Disconnect connector P52R from connector J52.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P52R socket 4.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3094 from terminal lug TL92 to splice E59 (para 2-45) or replace M1089 rear lights cable assembly (para 7-104).
(6) If continuity is present, repair wire 3094 from splice E59 to terminal lug TL21 (para 2-45) or replace rear lights cable assembly (para 7-104).
(7) Connect connector J52 to connector P52R.
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- Rear lights cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty main light switch.
- Faulty dashboard cable assembly.
- Faulty relay K20.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is present, wire 21 is faulty.

14. Is 12 VDC present at circuit breaker CB80 socket 1?

- **YES**
  - Go to step 15 of this fault.

- **NO**
  - Repair wire 21 from circuit breaker CB80 socket 2 on PDP to connector J51 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

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

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

---

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(2) Remove circuit breaker CB80 from PDP.</td>
</tr>
<tr>
<td>(3) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to circuit breaker CB80 socket 1.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(6) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 VDC is not present, go to 15 of this fault.</td>
</tr>
<tr>
<td>(8) If 12 VDC is present, repair wire 21 from circuit breaker CB80 socket 2 on PDP to connector J 51 pin 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(9) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
### e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other service light illuminates.</td>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
<tr>
<td>Circuit breaker CB80 OK.</td>
<td></td>
</tr>
<tr>
<td>Rear lights cable assembly OK.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty main light switch.</td>
<td>If continuity is not present, wire 1914 from relay K20 terminal 87 on PDP to circuit breaker CB80 socket 1 on PDP is faulty.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
<td></td>
</tr>
<tr>
<td>Faulty relay K20.</td>
<td></td>
</tr>
</tbody>
</table>

**15.** Is continuity present from circuit breaker to CB80 socket 1 to relay K20 terminal 87 on PDP?

- **NO**
  - Repair wire 1914 from circuit breaker CB80 socket 1 on PDP to relay K20 terminal 87 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Repair wire 1914 from circuit breaker CB80 socket 1 on PDP to relay K20 terminal 87 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
## CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

### CONTINUITY TEST
1. Disconnect batteries (para 7-57).
2. Remove relay K20 from PDP.
3. Set multimeter to ohms.
4. Connect positive (+) probe of multimeter to circuit breaker CB80 socket 1 on PDP.
5. Connect negative (-) probe of multimeter to relay K20 terminal 87 on PDP and note reading on multimeter.
6. If 12 VDC is not present, repair wire 1914 from circuit breaker CB80 socket 1 on PDP to relay K20 terminal 87 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
7. Install circuit breaker CB80 in PDP.
8. Connect batteries (para 7-57).
Is 12 VDC present at relay K20 terminal 30 on PDP?

If 12 VDC is not present, wire 1501 from terminal X2 to relay K20 terminal 30 on PDP is faulty.

Repair wire 1501 from terminal X2 on PDP to relay K20 terminal 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
WARNING

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

VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to relay K20 terminal 30 on PDP.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 12 VDC is not present, repair wire 1501 from terminal X2 on PDP to relay K20 terminal 30 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
17. Is 12 VDC present at relay K20 terminal 86 on PDP?

**KNOWN INFO**
Other service light illuminates.
Circuit breaker CB80 OK.
Rear lights cable assembly OK.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.
Faulty relay K20.
Faulty main light switch.

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

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

**COMMENTS**

*Go to step 24 of this fault.*
VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to relay K20 terminal 86 on PDP.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If 12 VDC is not present, go to step 24 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 circuits and cause severe burns or electrical shock.
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- Rear lights cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty relay K20.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3054 is faulty. If continuity is present, relay K20 is faulty.

18. Is continuity present from relay K20 terminal 85 on PDP to ground?

**NO**
- Repair wire 3054 from relay K20 terminal 85 on PDP to terminal board TB2 position 44 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**YES**
- Replace relay K20 (para 7-9).
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay K20 terminal 85 on PDP.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3054 from relay K20 terminal 85 on PDP to terminal board TB2 position 44 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace relay K20 (para 7-9).
(6) Install relay K20 in PDP.
(7) Install PDP cover (para 16-2).
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

19. Is vehicle M1088?

**KNOWLEDGE INFO**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- Lamp OK.
- Composite taillight assembly OK.
- Relay K20 OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty dashboard cable assembly.

**TEST OPTIONS**
- Visual Inspection

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

**YES**

Repair wire 21 from connector P51 socket 3 to splice (refer to Table 2-12.18. Composite Taillight Splices) (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1096 rear lights cable assembly (para 7-104) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).

**NO**
If vehicle is not M1088, repair wire 21 from connector P51 socket 3 to splice (refer to Table 2-12.18. Composite Taillight Splices) (para 2-45) or replace M1088 rear lights cable assembly (para 7-104).

<table>
<thead>
<tr>
<th>Model</th>
<th>Splice</th>
</tr>
</thead>
</table>
| M1083/M1084/M1085/M1086  
M1090/M1092/M1093/M1094  
M1096          | Connector P51 Socket 3 to Splice E20                                  |
| M1089            | Connector P51 Socket 3 to Splice E48                                   |
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
Other service light illuminates.
Circuit breaker CB80 OK.
Lamp OK.
Composite taillight assembly OK.
Relay K20 OK.
Rear lights cable assembly OK.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 21 from connector P51 socket 3 to splice E42 is faulty. If 12 VDC is present, wire 21 from splice E32 to splice E42 is faulty.

---

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.</td>
<td>Is 12 VDC present at connector P52M socket 1?</td>
</tr>
<tr>
<td></td>
<td><strong>NO</strong></td>
</tr>
<tr>
<td></td>
<td>Repair wire 21 from connector P51 socket 3 to splice E42 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td></td>
<td><strong>YES</strong></td>
</tr>
<tr>
<td></td>
<td>If 12 VDC is present, repair wire 21 from splice E32 to splice E42 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
</tbody>
</table>
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

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

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

VOLTAGE TEST

(1) Disconnect connector P52M from connector J 52M.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P52M pin 1.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 VDC is not present, repair wire 21 from connector P51 socket 3 to splice E42 (para 2-45) 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 21 from splice E32 to splice E42 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or replace WTEC III dashboard cable assembly (para 7-11).
(8) Position main light switch to OFF (TM 9-2320-366-10-1).
(9) Connect connector J 52 to connector P52M.
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- One composite taillight illuminate.
- Dashboard cable assembly OK.
- Lamp OK.
- Composite taillight assembly OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.

---

**21.** Does backup light illuminate?

**TEST OPTIONS**
- Operational Test

**REASON FOR QUESTION**
- If backup light illuminates, wire 3094 is faulty.

---

**YES**
- Go to step 23 of this fault.

**NO**
- Repair wire 3094 (refer to Table 2-12.19. Backup Light Terminal Lugs)( para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094/M1096 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).
OPERATIONAL TEST

(1) Start engine (TM 9-2320-366-10-1).
(2) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(3) Select R (reverse) on pushbutton shift selector (TM 9-2320-366-10-1).
(4) If backup light does not illuminate, go to step 23 of this fault.
(5) If backup light does illuminate, repair wire 3094 (refer to Table 2-12.19. Backup Light Terminal Lugs) (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/ M1093/M1094/M1096 rear lights cable assembly (para 7-84) or M1086/M1088/ M1089 rear lights cable assembly (para 7-104).
(6) Select N (neutral) on pushbutton shift selector (TM 9-2320-366-10-1).
(7) Position main light switch to OFF (TM 9-2320-366-10-1).
(8) Shut down engine (TM 9-2320-366-10-1).

Table 2-12.19. Backup Light Terminal Lugs

<table>
<thead>
<tr>
<th>Model</th>
<th>Wire Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1083/M1084/M1085/M1086/ M1090/M1092/M1093/M1094/ M1096</td>
<td>Wire 3094 from Terminal Lug TL18 to Splice E21</td>
</tr>
<tr>
<td>M1088</td>
<td>Wire 3094 from Terminal Lug TL18 to Splice E28</td>
</tr>
<tr>
<td>M1089</td>
<td>Wire 3094 from Terminal Lug TL18 to Terminal Lug TL17</td>
</tr>
</tbody>
</table>
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWLEDGE**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- Lamp OK.
- Composite taillight assembly OK.
- Relay K20 OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.

**TEST OPTIONS**

**Is vehicle M1085 or M1086?**

- **NO**
  - **Reason for Question**
    - This question eliminates possible problems and determines where troubleshooting continues.

- **YES**
  - Repair wire 3095 from terminal lug TL92 to terminal lug TL21 (para 2-45) or replace M1083/M1084/M1090/M1092/M1093/M1094/M1096 rear lights cable assembly (para 7-84).
  - Repair wire 3095 from splice E72 to terminal lug TL21 (para 2-45) or replace M1085 rear lights cable assembly (para 7-84) or M1086 rear lights cable assembly (para 7-104).
If vehicle is not M1085 or M1086, repair wire 3095 from terminal lug TL92 to terminal lug TL21 (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094/M1096 rear lights cable assembly (para 7-84). If vehicle is M1085/M1086 repair wire 3095 from splice E72 to terminal lug TL21 (para 2-45) or replace M1085 rear lights cable assembly (para 7-84) or M1086 rear lights cable assembly (para 7-104).
2-612.36  Change 1

e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

### KNOWN INFO
- Other service light illuminates.
- Circuit breaker CB80 OK.
- Lamp OK.
- Composite taillight assembly OK.
- Relay K20 OK.
- Dashboard cable assembly OK.

### POSSIBLE PROBLEMS
- Faulty rear lights cable assembly.

### TEST OPTIONS
- Visual Inspection

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

<table>
<thead>
<tr>
<th>23.</th>
<th>Is vehicle M1089?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NO</strong></td>
<td><strong>YES</strong></td>
</tr>
</tbody>
</table>

**NO**
- Go to step 26 of this fault.

**YES**
- Repair wire 3094 from terminal lug TL18 to terminal lug TL17 (para 2-45) or replace M1086/M1088/M1089 rear lights cable assembly (para 7-104).
If vehicle is not M1089, go to step 26 of this fault. If vehicle is M1089 repair wire 3094 from terminal lug TL18 to terminal lug TL17 (para 2-45) or replace M1086/M1088/M1089 rear lights cable assembly (para 7-104).
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- Lamp OK.
- Relay K20 OK.
- Rear lights cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty main light switch.

---

24. **CAUTION**
Read CAUTION on following page.

Is continuity present from connector PX15 socket H to relay K20 terminal 86 on PDP?

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is present, main light switch is faulty.

---

**YES**
Replace main light switch (para 7-17).

**NO**
Go to step 25 of this fault.
### CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove circuit breaker CB70 from PDP.</td>
</tr>
<tr>
<td>2</td>
<td>Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>3</td>
<td>Disconnect connector PX15 from main light switch.</td>
</tr>
<tr>
<td>4</td>
<td>Install circuit breaker CB70 in PDP.</td>
</tr>
<tr>
<td>5</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>6</td>
<td>Connect positive (+) probe of multimeter to connector PX15 socket H.</td>
</tr>
<tr>
<td>7</td>
<td>Connect negative (-) probe of multimeter to relay K20 terminal 86 on PDP and note reading on multimeter.</td>
</tr>
<tr>
<td>8</td>
<td>If continuity is not present, go to step 25 of this fault.</td>
</tr>
<tr>
<td>9</td>
<td>If continuity is present, replace main light switch (para 7-17).</td>
</tr>
</tbody>
</table>

### CAUTION

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

**NOTE**

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

**CAUTION**

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
Is continuity present from connector PX15 socket H to connector PX12 pin 5?

- **YES**
  - Repair wire 1575 from connector PX15 socket H to connector PX12 pin 5 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**
  - If continuity is not present, wire 1575 from connector PX15 socket H to connector PX12 pin 5 is faulty. If continuity is present, wire 1575 from connector PX12 pin 5 to relay K20 terminal 86 on PDP is faulty.
  - Repair wire 1575 from connector PX12 pin 5 to relay K20 terminal 86 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) Remove circuit breaker CB70 from PDP.
(2) Disconnect connector PX12 from warning light switch.
(3) Install circuit breaker CB70 in PDP.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector PX15 socket H.
(6) Connect negative (-) probe of multimeter to connector PX12 pin 5 and note reading on multimeter.
(7) If continuity is not present, repair wire 1575 from connector PX15 socket H (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If continuity is present, repair wire 1575 from connector PX12 pin 5 to relay K20 terminal 86 on PDP (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) Remove circuit breaker CB70 from PDP.
(10) Connect connector PX12 to warning light switch.
(11) Connect connector PX15 to main light switch.
(12) Install circuit breaker CB70 in PDP.
(13) Install relay K20 in PDP.
(14) Install PDP cover (16-2).
(15) Install instrument panel assembly (para 7-15).
e49. ONE OR BOTH COMPOSITE TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Other service light illuminates.
- Circuit breaker CB80 OK.
- Lamp OK.
- Composite taillight assembly OK.
- Relay K20 OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.

---

**TEST OPTIONS**

**REASON FOR QUESTION**

Operational Test

If LH or RH worklights does not illuminate, wire 3094 from terminal lug TL93 to splice E58 is faulty. If LH or RH worklights does illuminate, wire 3094 from terminal lug TL17 to splice E58 is faulty.

---

26. Does LH or RH worklights illuminate?

**NO**

Repair wire 3094 from terminal lug TL93 to splice E58 (para 2-45) or replace M1086/M1088/M1089 rear lights cable assembly (para 7-104).

**YES**

Repair wire 3094 from terminal lug TL17 to splice E58 (para 2-45) or replace M1086/M1088/M1089 rear lights cable assembly (para 7-104).
(1) Position main light switch to STOP/PARK (TM 9-2320-366-10-1).
(2) Position work light switch to on (TM 9-2320-366-10-1).
(3) If LH or RH worklights does not illuminate, repair wire 3094 from terminal lug TL93 to splice E58 (para 2-45) or replace M1086/M1088/M1089 rear lights cable assembly (para 7-104).
(4) If LH or RH worklights does illuminate, repair wire 3094 from terminal lug TL17 to splice E58 (para 2-45) or replace M1086/M1088/M1089 rear lights cable assembly (para 7-104).
(6) Position main light switch to OFF (TM 9-2320-366-10-1).

**OPERATIONAL TEST**
e50. ONE OR BOTH FRONT BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE

INITIAL SETUP

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

Personnel Required
(2)

Materials/Parts
Packing, Preformed (Item 191, Appendix G)

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

References
TM 9-4910-571-12&P

START

1. Does one front blackout marker light illuminate?

NO

YES

Test Options
Operational Test

Reason for Question
This question eliminates possible problems and determines where troubleshooting continues.

Go to step 5 of this fault.

KNOW INFO
Rear blackout marker lights illuminate.

POSSIBLE PROBLEMS
Faulty front lights cable assembly.
Faulty front blackout marker light LED.
Faulty composite front light assembly.
OPERATIONAL TEST

(1) Position main light switch to BO MARKER (TM 9-2320-366-10-1).

(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 9-2320-366-10-1).
50. ONE OR BOTH FRONT BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

- Rear blackout marker lights illuminate.
- One front blackout marker light illuminates.

**Known Info**

- Faulty front lights cable assembly.
- Faulty composite front light assembly.
- Faulty front blackout marker light LED.

**Possible Problems**

- Faulty front lights cable assembly.
- Faulty composite front light assembly.
- Faulty front blackout marker light LED.

**Test Options**

- Voltage Test or STE/ICE-R #89

**Reason for Question**

- If 12 VDC is not present, wire 20 (left front blackout marker light) or wire 20A (right front blackout marker) is faulty.

**Flowchart Diagram**

- **2.** Read WARNING on following page.
- Is 12 VDC present at LED socket center contact?
  - **NO**
    - Repair wire 20 or 20A (para 2-45) or replace front lights cable assembly (para 7-82).
  - **YES**
WARNING

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Loosen five screws on cover.</td>
</tr>
<tr>
<td>(2) Remove cover and preformed packing from housing. Discard preformed packing.</td>
</tr>
<tr>
<td>(3) Open blackout marker lamp.</td>
</tr>
<tr>
<td>(4) Remove blackout marker lamp from socket.</td>
</tr>
<tr>
<td>(5) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(6) Connect positive (+) probe of multimeter to LED socket center contact.</td>
</tr>
<tr>
<td>(7) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(8) Position main light switch BO MARKER (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(9) If 12 vdc is not present, repair wire 20 (left front blackout marker) or wire 20A (right front blackout marker) (para 2-45) or replace front lights cable assembly (para 7-82).</td>
</tr>
<tr>
<td>(10) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e50. 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.

## 3.
Is continuity present between LED socket and a known good ground?

- **NO**
  - Repair wire 3091 (para 2-45) or replace front lights cable assembly (para 7-82).

- **YES**
  - Test Options:
    - Continuity Test or STE/ICE-R #91
  - Reason for Question:
    - If continuity is not present, wire 3091 is faulty.

## 4.
Is continuity present between LED socket and inside of composite light housing?

- **NO**
  - Test Options:
    - Continuity Test or STE/ICE-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.

- **YES**
  - Replace composite front light assembly (para 7-40).

Replace composite front light assembly blackout marker LED (para 7-40).
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 2-45) or replace front lights cable assembly (para 7-82).

(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 not present, replace composite front light assembly blackout marker LED (para 7-40).
(5) If continuity is present, replace composite front light assembly (para 7-40).
(6) Open blackout marker lamp.
(7) Install blackout marker lamp in socket.
(8) Install preformed packing and cover on housing with five screws.
5. Is 12 vdc present on connector J27-3?

NO

YES

Repair wire 20 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

WARNING
Read WARNING on following page.

TEST OPTIONS
Voltage Test or STE/ICE-R #89

REASON FOR QUESTION
If 12 vdc is not present, wire 20 in dashboard cable assembly is faulty.

KNOWN INFO
Rear blackout marker lights illuminate.
Composite front light assembly OK.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty front lights cable assembly.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty front lights cable assembly.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty front lights cable assembly.

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Faulty dashboard cable assembly.
Faulty front lights cable assembly.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty front lights cable assembly.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty front lights 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.

VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>2</td>
<td>Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>3</td>
<td>Remove three screws from PDP.</td>
</tr>
<tr>
<td>4</td>
<td>Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>5</td>
<td>Disconnect connector J27 from connector P27.</td>
</tr>
<tr>
<td>6</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>7</td>
<td>Connect positive (+) probe of multimeter to J27-3.</td>
</tr>
<tr>
<td>8</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>9</td>
<td>Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>10</td>
<td>If 12 vdc is not present, repair wire 20 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>11</td>
<td>Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>12</td>
<td>Connect connector J27 to connector P27.</td>
</tr>
<tr>
<td>13</td>
<td>Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>14</td>
<td>Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>15</td>
<td>Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
50. ONE OR BOTH FRONT BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Rear blackout marker lights illuminate.
- Front blackout marker light LED OK.
- Composite front light assembly OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty front lights cable assembly.

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 12 vdc is not present, wire 20 or 20A is faulty.

**6.** Is 12 vdc present at connector P24 (LH front turn signal and park light assembly) or P8 (RH front turn signal and park light assembly)?

- **NO**
- **YES**

- Repair wire 20 or 20A (para 2-45) or replace front lights cable assembly (para 7-82).

Fault corrected.
WARNING

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect connector P24 (LH composite front light assembly) or connector P8 (RH composite front assembly) from composite front assembly connector.</td>
</tr>
<tr>
<td>(2) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector P24 or connector P8.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to BO MARKER (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If 12 vdc is not present, repair wire 20 or 20A (para 2-45) or replace front lights cable assembly (para 7-82).</td>
</tr>
<tr>
<td>(7) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(8) Connect connector P24 or connector P8 to composite front light assembly connector.</td>
</tr>
</tbody>
</table>
### e51. BLACKOUT DRIVE LIGHT DOES NOT ILLUMINATE

**INITIAL SETUP**

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>Personnell Required</td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td>(2)</td>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
</tr>
<tr>
<td>Materials/Parts</td>
<td>References</td>
</tr>
<tr>
<td>Packing, Preformed (Item 189, Appendix G)</td>
<td>TM 9-4910-571-12&amp;P</td>
</tr>
</tbody>
</table>

---

#### KNOWN INFO

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit breaker OK.</td>
</tr>
<tr>
<td>Faulty front lights cable assembly.</td>
</tr>
<tr>
<td>Faulty blackout drive light.</td>
</tr>
<tr>
<td>Faulty lamp.</td>
</tr>
<tr>
<td>Faulty main light switch.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

#### WARNING

1. 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

This question eliminates possible problems and determines where troubleshooting continues.

---

START

No

Go to step 4 of this fault.

Yes
**WARNING**

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Loosen three screws on cover.</td>
</tr>
<tr>
<td>(2) Remove cover and gasket from housing.</td>
</tr>
<tr>
<td>Discard gasket.</td>
</tr>
<tr>
<td>(3) Remove lamp from socket.</td>
</tr>
<tr>
<td>(4) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to</td>
</tr>
<tr>
<td>lamp socket center contact.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(7) Position main light switch to BO DRIVE</td>
</tr>
<tr>
<td>(TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(8) If 12 vdc is not present, go to step 4 of this fault.</td>
</tr>
<tr>
<td>(9) Position main light switch to OFF</td>
</tr>
<tr>
<td>(TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e51. BLACKOUT DRIVE LIGHT DOES NOT ILLUMINATE (CONT)

2. Is continuity present between lamp socket and a known good ground?
   - **YES**
     - Repair wire 3091 (para 2-45) or replace front lights cable assembly (para 7-82).
   - **NO**
     - Repair wire 3091 (para 2-45) or replace front lights cable assembly (para 7-82).

3. Is continuity present between lamp socket and inside of blackout drive light housing?
   - **YES**
     - Replace blackout drive light (para 7-37).
   - **NO**
     - If continuity is not present, blackout drive light is faulty. If continuity is present, lamp is faulty.

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.
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 2-45) or replace front lights cable assembly (para 7-82).

---

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 7-37).

(5) If continuity is present, replace lamp (para 7-37).

(6) Install lamp in socket.

(7) Install gasket and cover on housing with three screws.
4. Is continuity present between main light switch terminals D and F?

**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.

**YES**
Replace main light switch (para 7-17).

**NO**
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 9-2320-366-10-1) 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 9-2320-366-10-1).
(8) Install main light switch (para 7-17).
5. **WARNING**

Read **WARNING** on following page.

**KNOW INFO**
- Circuit breaker OK.
- Lamp OK.
- Main light switch OK.
- Blackout drive light OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 12 vdc is not present, wire 19 is faulty.

**5.** Is 12 vdc present on connector J27-7?

**YES**
- Repair wire 19 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
### WARNING

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(2) Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>(3) Remove three screws from PDP.</td>
</tr>
<tr>
<td>(4) Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>(5) Disconnect connector J27 from connector P27.</td>
</tr>
<tr>
<td>(6) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(7) Connect positive (+) probe of multimeter to J27-7.</td>
</tr>
<tr>
<td>(8) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(9) Position main light switch to BO DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(10) If 12 vdc is not present, repair wire 19 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(11) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(12) Connect connector J27 to connector P27.</td>
</tr>
<tr>
<td>(13) Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>(14) Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>(15) Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>

[Diagram of PDP, SCREW, WASHER, CONNECTOR J27, CONNECTOR P27, PDP, J27, 7]
e51. BLACKOUT DRIVE LIGHT DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Circuit breaker OK.
- Lamp OK.
- Main light switch OK.
- Blackout drive light OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty front lights cable assembly.

---

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 12 vdc is not present, wire 19 is faulty. If 12 vdc is present, wire 3091 is faulty.

1. **Is 12 vdc present at connector P17?**
   - **NO**
     - Repair wire 19 (para 2-45) or replace front lights cable assembly (para 7-82).
   - **YES**
     - Repair wire 3091 (para 2-45) or replace front lights cable assembly (para 7-82).
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 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 vdc is not present, repair wire 19 (para 2-45) or replace front lights cable assembly (para 7-82).
(7) If 12 vdc is present, repair wire 3091 (para 2-45) or replace front lights cable assembly (para 7-82).
(8) Position main light switch to OFF (TM 9-2320-366-10-1).
(9) Connect connector P17 to blackout drive light connector.

WARNING

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

CONNECTOR P17

BLACKOUT DRIVE LIGHT CONNECTOR
e52. ONE OR BOTH REAR BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE

INITIAL SETUP

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

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

Material/Parts
Packing, Preformed (Item 191, Appendix G)
Nut, Self-Locking (Item 128, Appendix G)

Personnel Required
(2)

References
TM 9-4910-571-12&P

START

1. Does one rear blackout marker light illuminate?

NO

YES

Go to step 5 of this fault.

POSSIBLE PROBLEMS
Faulty rear lights cable assembly.
Faulty rear blackout marker light LED.
Faulty composite taillight assembly.
Faulty dashboard cable assembly.

KNOWLEDGE
Front blackout marker lights illuminate.

TEST OPTIONS
Operational Test

REASON FOR QUESTION
This question eliminates possible faults and determines where troubleshooting continues.
(1) Position main light switch to BO MARKER (TM 9-2320-366-10-1).
(2) Observe operation of rear blackout marker lights.
(3) If neither rear blackout marker light illuminates, go to step 5 of this fault.
(4) Position main light switch to OFF (TM 9-2320-366-10-1).
e52. ONE OR BOTH REAR BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front blackout marker lights illuminate.</td>
</tr>
<tr>
<td>One rear blackout marker light illuminates.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
<tr>
<td>Faulty composite taillight assembly.</td>
</tr>
<tr>
<td>Faulty rear blackout marker light LED.</td>
</tr>
</tbody>
</table>

2. Is 12 VDC present at LED socket center contact?

- **NO**
  - Repair wire 24 from LED socket center contact to splice E19 (para 2-45) or replace rear lights cable assembly (para 7-84 or para 7-104).

- **YES**
  - Voltage Test or STE/ICE-R Test #89
  - Reason for Question
    - If 12 VDC is not present, wire 24 is faulty.
### WARNING

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Loosen six screws and remove cover and preformed packing from housing. Discard preformed packing.</td>
</tr>
<tr>
<td>(2) Open blackout marker lamp.</td>
</tr>
<tr>
<td>(3) Remove blackout marker lamp from socket.</td>
</tr>
<tr>
<td>(4) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to LED socket center contact.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(7) Position main light switch to BO MARKER (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(8) If 12 VDC is not present, repair wire 24 from LED socket center contact to splice E19 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).</td>
</tr>
<tr>
<td>(9) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e52. ONE OR BOTH REAR BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

KNOWLEDGE
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.

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, wire 3094 (LH rear blackout marker light) or wire 3095 (RH rear blackout marker light) is faulty.

3.
Is continuity present from LED socket to ground?

NO

YES
Repair wire 3094 from terminal lug TL18 to terminal lug TL93 or wire 3095 from terminal lug TL21 to terminal lug TL92 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).

KNOWLEDGE
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.

TEST OPTIONS
Continuity Test or STE/ICE-R Test #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.

4.
Is continuity present from LED socket and inside of rear taillight housing?

NO

YES
Replace composite taillight assembly (para 7-39).

Replace rear blackout marker light LED (para 7-39).
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 from terminal lug TL18 to terminal lug TL93 (LH rear blackout marker light) or wire 3095 from terminal lug TL21 to terminal lug TL92 (RH rear blackout marker light) (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).

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 7-39).
5. If continuity is present, replace rear blackout marker light LED (para 7-39).
6. Open blackout marker lamp.
7. Install blackout marker lamp in socket.
8. Install preformed packing and cover on housing with six screws.
e52. ONE OR BOTH REAR BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**TEST OPTIONS**

| Voltage Test or STE/ICE-R Test #89 |

**REASON FOR QUESTION**

If 12 VDC is not present, wire 24 is faulty.

**KNOWN INFO**

| Front blackout marker lights illuminate. |
| Rear blackout marker light LED OK. |
| Composite taillight assembly OK. |

**POSSIBLE PROBLEMS**

| Faulty rear lights cable assembly. |
| Faulty dashboard cable assembly. |

5.

Is 12 VDC present at connector J51 pin 17?

- **NO**
  - Repair wire 24 from connector J51 pin 17 to terminal board TB1 position 54 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Repair wire 24 from connector P76 (LH rear blackout marker light) or P62 (RH rear blackout marker light) to connector P51 socket 17 (para 2-45) or replace rear lights cable assembly (para 7-84 or para 7-104).
WARNING

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

CAUTION

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

NOTE

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

### VOLTAGE TEST

1. Remove 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 pin 17.
8. Connect negative (-) probe of multimeter to ground.
9. Position main light switch to BO MARKER (TM 9-2320-366-10-1) and note reading on multimeter.
10. If 12 VDC is not present, repair wire 24 from connector J51 pin 17 to terminal board TB1 position 54 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
11. If 12 VDC is present, repair wire 24 from connector P76 (LH rear blackout marker light) or P62 (RH rear blackout marker light) to connector P51 socket 17 (para 2-45) or replace rear lights cable assembly (para 7-84 or para 7-104).
13. Connect connector J51 to connector P51.
15. Install three washers and screws in PDP.
16. Install PDP cover (para 16-2).
**e53. AMBER WARNING LIGHT DOES NOT ILLUMINATE (ALL MODELS EXCEPT M1089)**

**INITIAL SETUP**

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

**Personnel Required**
(2)

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

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

---

**Known Info**
- Circuit breaker OK.
- Marker lights illuminate.

**Possible Problems**
- Faulty warning light cable assembly.
- Faulty warning light.
- Faulty dashboard cable assembly.
- Faulty warning light switch.
- Faulty relay K13.

---

**Test Options**
- Voltage Test or STE/ICE-R Test #89

**Reason For Question**
This question eliminates possible problems and determines where troubleshooting continues.

---

**Flowchart**

1. **Warning**
   - Is 12 vdc present on connector J 62-B?

   - **Yes**
     - Go to step 3 of this fault.

   - **No**
     - "WARNING: Read WARNING on following page."
### WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect warning light connector from connector J62.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector J62-B.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position warning light switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 vdc is not present, go to step 3 of this fault.</td>
</tr>
<tr>
<td>(8) Position warning light switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
2. Is continuity present between connector J62-A and a known good ground?

**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.

**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.

**IF NO**
- Replace warning light (TM 9-2320-366-10-2).

**IF YES**
- Repair wire 3050 (para 2-45) or replace warning light cable assembly (para 22-5).

---

3. Is 12 vdc present at connector PX12-5?

**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.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 12 vdc is not present, wire 1575 is faulty.

**IF NO**
- Repair wire 1575 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**IF YES**
- Read WARNING on following page.
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 2-45) or replace warning light cable assembly (para 22-5).
5. If continuity is present, replace warning light (TM 9-2320-366-10-2).

WARNING

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

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.
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
4. Is continuity present between warning light switch terminals 1 and 5?

Known Info
- Circuit breaker OK.
- Marker lights illuminate.
- Warning light OK.

Possible Problems
- Faulty warning light switch.
- Faulty dashboard cable assembly.
- Faulty relay K13.
- Faulty warning light cable assembly.

Test Options
- Continuity Test or STE/ICE-R #91

Reason for Question
- If continuity is not present, warning light switch is faulty.

If yes, replace warning light switch (para 7-18).
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 9-2320-366-10-1) and note reading on multimeter.
(5) If continuity is not present, replace warning light switch (para 7-18).
5. If continuity is not present, wire 1559 is faulty.

6. Is continuity present between connector PX12-1 and relay K13 terminal 86?

   YES
   
   Repair wire 1559 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   NO

   Repair wire 1559 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   YES

   Is continuity present between relay K13 terminal 85 and a known good ground?

   NO

   Repair wire 3054 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST
(1) 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 2-45) 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).

---

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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
7. Is 12 vdc present on relay K13 terminal 30?

- **NO**
  - Faulty dashboard cable assembly.
  - Faulty relay K13.
  - Faulty warning light cable assembly.

- **YES**
  - Repair wire 509 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

8. Is 12 vdc present at relay K13 terminal 87?

- **NO**
  - Replace relay K13 (para 7-9).

- **YES**
  - Replace relay K13 (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.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to PDP, socket 30, where relay K13 was removed.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(5) Position warning light switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) If 12 vdc is not present, repair wire 509 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(7) Position warning light switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(8) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Install relay K13 in PDP.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to relay K13 terminal 87.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position warning light switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 vdc is not present, replace relay K13 (para 7-9).</td>
</tr>
<tr>
<td>(8) Position warning light switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e53. AMBER WARNING LIGHT DOES NOT ILLUMINATE (ALL MODELS EXCEPT M1089) (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>WARNING</th>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit breaker OK.</td>
<td>Read WARNING on following page.</td>
<td>Voltage Test or</td>
</tr>
<tr>
<td>Marker lights illuminate.</td>
<td></td>
<td>STE/ICE-R #89</td>
</tr>
<tr>
<td>Warning light switch OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relay K13 OK.</td>
<td>Is 12 vdc present on connector J65-1?</td>
<td></td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
<td>NO</td>
<td>REASON FOR QUESTION</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
<td></td>
<td>If 12 vdc is not present,</td>
</tr>
<tr>
<td>Faulty warning light cable assembly.</td>
<td></td>
<td>wire 509 in dashboard</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td>cable assembly is faulty.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If 12 vdc is present,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wire 509 in warning light</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cable assembly is faulty.</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>Repair wire 509 (para 2-45) or replace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WTEC II dashboard cable assembly (para</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-10) or WTEC III dashboard cable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>assembly (para 7-11).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair wire 509 (para 2-45) or replace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>warning light cable assembly (para 22-5).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**WARNING**

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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.
9. If 12 vdc is not present, repair wire 509 (para 2-45) 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 2-45) or replace warning light cable assembly (para 22-5).
13. Connect connector P65 to connector J65.
M1089 AMBER WARNING LIGHT DOES NOT ILLUMINATE

INITIAL SETUP

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

Personnel Required
(2)

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

References
TM 9-4910-571-12&P

START

1. Is 12 vdc present on connector J44-B (left warning light) or J45-B (right warning light)?

   YES
   Go to step 4 of this fault.

   NO

2. Is continuity present between connector J44-A (left warning light) or J45-A (right warning light) and a known good ground?

   YES
   Go to step 5 of this fault.

   NO

Replace M1089 amber warning light assembly (para 22-2).

KNOWLEDGE

Circuit breaker OK.
Marker lights illuminate.

POSSIBLE PROBLEMS

Faulty warning light cable assembly.
Faulty M1089 amber warning light assembly.
Faulty M1089 warning lights cable assembly.
Faulty dashboard cable assembly.
Faulty warning light switch.
Faulty relay K13.

TEST OPTIONS

Voltage Test or STE/ICE-R #89

REASON FOR QUESTION

This step eliminates possible problems and determines where troubleshooting continues.

KNOWLEDGE

Circuit breaker OK.
Marker lights illuminate.

POSSIBLE PROBLEMS

Faulty M1089 amber warning light assembly.
Faulty warning light cable assembly.
Faulty M1089 warning lights cable assembly.
Faulty dashboard cable assembly.
Faulty warning light switch.
Faulty relay K13.

TEST OPTIONS

Continuity Test or STE/ICE-R #91

REASON FOR QUESTION

If continuity is not present, go to step 5 of this fault.
If continuity is present, M1089 amber warning light 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.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect warning light connector from connector J44 (left) or J45 (right).</td>
</tr>
<tr>
<td>(2) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector J44-B (left) or J45-B (right).</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position warning light switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 vdc is not present, go to step 4 of this fault.</td>
</tr>
<tr>
<td>(8) Position warning light switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector J44-A (left) or J45-A (right).</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If continuity is not present, go to step 5 of this fault.</td>
</tr>
<tr>
<td>(5) If continuity is present, replace M1089 amber warning light assembly (para 22-2).</td>
</tr>
<tr>
<td>(6) Connect connector J44 (left) or J45 (right) to warning light connector.</td>
</tr>
</tbody>
</table>
**54. M1089 AMBER WARNING LIGHT DOES NOT ILLUMINATE (CONT)**

**KNOWN INFO**
- Circuit breaker OK.
- Marker lights illuminate.
- M1089 amber warning light assembly OK.

**POSSIBLE PROBLEMS**
- Faulty M1089 warning lights cable assembly.
- Faulty warning light cable assembly.
- Faulty dashboard cable assembly.
- Faulty warning light switch.
- Faulty relay K13.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 12 vdc is present, wire 509 (L/R) is faulty. If 12 vdc is not present, go to step 5 of this fault.

**WARNING**
Read WARNING on following page.

Is 12 vdc present on connector J62-B?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3050 in warning light cable assembly is faulty. If continuity is present, wire 3050 (L/R) in electrical warning light cable assembly is faulty.

**KNOWN INFO**
- Circuit breaker OK.
- Marker lights illuminate.
- M1089 amber warning light assembly OK.
- Dashboard cable assembly OK.
- Relay K13 OK.

**POSSIBLE PROBLEMS**
- Faulty warning light cable assembly.
- Faulty M1089 warning lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 12 vdc is present, wire 509 (L/R) is faulty. If 12 vdc is not present, go to step 5 of this fault.

**WARNING**
Read WARNING on following page.

Is 12 vdc present on connector J62-B?

**YES**
- Go to step 5 of this fault.

**NO**
- Repair wire 509 (L/R) (para 2-45) or replace M1089 warning lights cable assembly (para 22-4).

**YES**
- Repair wire 3050 (para 2-45) or replace warning light cable assembly (para 22-5).

**NO**
- Repair wire 3050 (L/R) (para 2-45) or replace M1089 warning lights cable assembly (para 22-4).
**WARNING**

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect connector P62A from connector J62.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector J62-B.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position warning light switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 vdc is not present, go to step 5 of this fault.</td>
</tr>
<tr>
<td>(8) If 12 vdc is present, repair wire 509 (L/R) (para 2-45) or replace M1089 warning lights cable assembly (para 22-4).</td>
</tr>
<tr>
<td>(9) Position warning light switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector J62-A.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If continuity is not present, repair wire 3050 (para 2-45) or replace warning light cable assembly (para 22-5).</td>
</tr>
<tr>
<td>(5) If continuity is present, repair wire 3050 (L/R) (para 2-45) or replace M1089 warning lights cable assembly (para 22-4).</td>
</tr>
<tr>
<td>(6) Connect connector P62A to connector J62.</td>
</tr>
</tbody>
</table>
If 12 vdc is not present, wire 1575 is faulty.

Is 12 vdc present at connector PX12-5?

WARNING
Read WARNING on following page.

If 12 vdc is not present, wire 1575 is faulty.

NO

Repair wire 1575 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

YES

Is continuity present between warning light switch terminals 1 and 5?

REASON FOR QUESTION
Voltage Test or STE/ICE-R #89

If continuity is not present, warning light switch is faulty.

NO

YES

Replace warning light switch (para 7-18).

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty warning light switch.
Faulty relay K13.
Faulty warning light cable assembly.

POSSIBLE PROBLEMS
Faulty warning light switch.
Faulty dashboard cable assembly.
Faulty relay K13.
Faulty warning light cable assembly.

KNOWN INFO
Circuit breaker OK.
Marker lights illuminate.
M1089 amber warning light assembly OK.
M1089 warning lights cable assembly OK.

KNOWN INFO
Circuit breaker OK.
Marker lights illuminate.
Warning light OK.
M1089 warning lights cable assembly OK.

TEST OPTIONS
Continuity Test or STE/ICE-R #91

REASON FOR QUESTION
If continuity is not present, warning light 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. Set multimeter to volts dc.
3. Disconnect connector PX12 from warning light switch.
4. Connect positive (+) probe of multimeter to connector PX12-5.
5. Connect negative (-) probe of multimeter to ground.
6. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 12 vdc is not present, repair wire 1575 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**CONTINUITY TEST**

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to 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 9-2320-366-10-1) and note reading on multimeter.
5. If continuity is not present, replace warning light switch (para 7-18).
7. Is continuity present between connector PX12-1 and relay K13 terminal 86?

   NO

   YES

   Repair wire 1559 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

8. Is continuity present between relay K13 terminal 85 and a known good ground?

   NO

   YES

   Repair wire 3054 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) 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 2-45) 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).
e54. M1089 AMBER WARNING LIGHT DOES NOT ILLUMINATE (CONT)

9. WARNING
   Is 12 vdc present on relay K13 terminal 30?

   TEST OPTIONS
   Voltage Test or STE/ICE-R #89

   REASON FOR QUESTION
   If 12 vdc is not present, wire 509 is faulty.

   KNOWN INFO
   Circuit breaker OK.
   Marker lights illuminate.
   M1089 amber warning light assembly OK.
   M1089 warning lights cable assembly OK.
   Warning light switch OK.

   POSSIBLE PROBLEMS
   Faulty dashboard cable assembly.
   Faulty relay K13.
   Faulty warning light cable assembly.

   YES
   Repair wire 509 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   NO

10. WARNING
    Is 12 vdc present at relay K13 terminal 87?

    TEST OPTIONS
    Voltage Test or STE/ICE-R #89

    REASON FOR QUESTION
    If 12 vdc is not present, relay K13 is faulty.

    KNOWN INFO
    Circuit breaker OK.
    Marker lights illuminate.
    M1089 amber warning light assembly OK.
    M1089 warning lights cable assembly OK.
    Warning light switch OK.

    POSSIBLE PROBLEMS
    Faulty relay K13.
    Faulty dashboard cable assembly.
    Faulty warning light cable assembly.

    YES
    Replace relay K13 (para 7-9),

    NO
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**WARNING**

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to PDP, socket 30, where relay K13 was removed.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) If 12 vdc is not present, repair wire 509 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Install relay K13 in PDP.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to relay K13 terminal 87.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position warning light switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 vdc is not present, replace relay K13 (para 7-9).</td>
</tr>
<tr>
<td>(8) Position warning light switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
11. Is 12 vdc present on connector P65-1?

- **NO**
  - Circuit breaker OK. Marker lights illuminate. M1089 amber warning light assembly OK. M1089 warning lights cable assembly OK. Warning light switch OK. Relay K13 OK.
- **YES**
  - Repair wire 509 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 12 vdc is not present, wire 509 in dashboard cable assembly is faulty. If 12 vdc is present, wire 509 in warning light cable assembly is faulty.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty warning light cable assembly.
(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 P65-1.
(6) Connect negative (-) probe of multimeter to ground.
(7) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(8) Position warning light switch to on (TM 9-2320-366-10-1).
(9) If 12 vdc is not present, repair wire 509 (para 2-45) 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 2-45) or replace warning light cable assembly (para 22-5).
(11) Position warning light switch to off (TM 9-2320-366-10-1).
(12) Position main light switch to OFF (TM 9-2320-366-10-1).
(13) Connect connector P65 to connector J65.
(14) Install kick panel (para 16-3).
**e55. BACKUP LIGHT DOES NOT ILLUMINATE**

**INITIAL SETUP**

<table>
<thead>
<tr>
<th>Equipment Conditions</th>
<th>Materials/Parts</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Tools and Special Tools</th>
<th>Personnel Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)</td>
<td>(2)</td>
</tr>
</tbody>
</table>

**NOTE**

Perform Electrical System Troubleshooting e1. Circuit Breaker Does Not Operate on circuit breakers CB70 and CB73 prior to beginning this task.

**START**

1. Is continuity present through both backup light lamps?

**KNOWN INFO**

- Circuit breaker CB70 OK.
- Circuit breaker CB73 OK.
- Both turn signals illuminate.
- Engine starts.
- Transmission reverse (R) range OK.

**POSSIBLE PROBLEMS**

- Faulty backup light lamps.
- Faulty backup light assembly.
- 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 transmission ECU pushbutton shift selector.
- Faulty WTEC III relay K25.
- Faulty WTEC III transmission ECU.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, one or both backup light lamps are faulty.

**NO**

Replace backup light lamp(s) (para 7-36).

**YES**
CONTINUITY TEST

1. Remove lens from housing.
2. Remove preformed packing from housing.
   - Discard preformed packing.
3. Remove two lamps from sockets.
4. Set multimeter to ohms.
5. Connect positive (+) probe of multimeter to center contact of lamp.
6. Connect negative (-) probe of multimeter to lamp base and note reading on multimeter.
7. If continuity is not present, replace one or both lamps (para 7-36).
8. Install two lamps in sockets.
9. Install preformed packing and lens on housing with six captive screws.
10. Connect batteries (para 7-57).
Is 12 VDC present at connector P87?

Replace backup light assembly (para 7-36).

- **KNOW INFO**
  - Circuit breaker CB70 OK.
  - Circuit breaker CB73 OK.
  - Both turn signals illuminate.
  - Engine starts.
  - Transmission reverse (R) range OK.
  - Backup light lamps OK.

- **POSSIBLE PROBLEMS**
  - Faulty backup light assembly.
  - 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 transmission ECU pushbutton shift selector.
  - Faulty WTEC III relay K25.
  - Faulty WTEC III transmission ECU.

- **WARNING**
- **CAUTION**
  - Read WARNING and CAUTION on following page.

- **TEST OPTIONS**
  - Voltage Test or STE/ICE-R Test #89

- **REASON FOR QUESTION**
  - If 12 VDC is present, backup light assembly is faulty.

- **2.**
  - Go to step 3 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 circuits and cause severe burns or electrical shock.

CAUTION

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

NOTE

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

VOLTAGE TEST

1. Disconnect connector 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 9-2320-366-10-1).
7. Select R (reverse) on pushbutton shift selector (TM 9-2320-366-10-1) and note reading on multimeter.
8. If 12 VDC is not present, go to step 3 of this faulty. If 12 VDC is present, replace backup light assembly (para 7-36).
12. Connect connector P87 to backup light connector.

NOTE

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

TM 9-2320-366-20-1

Change 1 2-673
**e55. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)**

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Circuit breaker CB73 OK.
- Both turn signals illuminate.
- Engine starts.
- Transmission reverse (R) range OK.
- Backup light lamps OK.
- Backup light assembly 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 transmission ECU pushbutton shift selector.
- Faulty WTEC III relay K25.
- Faulty WTEC III transmission ECU.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 1577 is faulty.

**WARNING**
- Read WARNING on following page.

**3.**
- Is 12 VDC present at circuit breaker CB73 terminal 7?

**NO**
- Repair wire 1577 from circuit breaker CB73 terminal 7 to connector PX15 socket J (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**YES**
### WARNING

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

---

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(2) Remove circuit breaker CB73 from PDP.</td>
</tr>
<tr>
<td>(3) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to PDP, terminal 7, where circuit breaker CB73 was removed.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(6) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 VDC is not present, repair wire 1577 from circuit breaker CB73 terminal 7 to connector PX15 socket J. (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(8) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

---

![Diagram of CB73 Cavity and PDP](image)
### Known Info
- Circuit breaker CB70 OK.
- Circuit breaker CB73 OK.
- Both turn signals illuminate.
- Engine starts.
- Transmission reverse (R) range OK.
- Backup light lamps OK.
- Backup light assembly 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 transmission ECU pushbutton shift selector.
- Faulty WTEC III relay K25.
- Faulty WTEC III transmission ECU.

### Test Options
**Visual Inspection**

**Reason for Question**
This question helps eliminate possible problems and determines where troubleshooting continues.

---

4. Is vehicle equipped with WTEC II transmission controls?

   - **NO**
     - Go to step 12 of this fault.
   - **YES**

---
(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.
e55. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
Circuit breaker CB70 OK.
Circuit breaker CB73 OK.
Both turn signals illuminate.
Engine starts.
Transmission reverse (R) range OK.
Backup light lamps OK.
Backup light assembly OK.
WTEC II transmission controls.

**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 transmission ECU pushbutton shift selector.

---

5. Is continuity present from REVERSE WARNING relay terminal 86 to terminal 85?

- **NO**
- **YES**

---

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, REVERSE WARNING relay is faulty.

---

Replace REVERSE WARNING relay in WTEC II VIM (para 8-6).
### 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.
10. Install cover on WTEC II VIM with nut, washer, and screw.
11. Install seven washers and screws in cover.
e55. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Circuit breaker CB73 OK.
- Both turn signals illuminate.
- Engine starts.
- Transmission reverse (R) range OK.
- Backup light lamps OK.
- Backup light assembly OK.
- WTEC II transmission controls.

**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 transmission ECU pushbutton shift selector.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 1903 is faulty.

**WARNING**
**CAUTION**
Read WARNING and CAUTION on following page.

6. Is 12 VDC present at connector PX33 socket B1?

**NO**

**YES**
Repair wire 1903 from connector PX33 socket B1 to circuit breaker CB73 terminal 8 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
VOLTAGE TEST

(1) Loosen screw in connector PX33.
(2) Disconnect connector PX33 from WTEC II VIM.
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to connector PX33 socket B1.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 12 VDC is not present, repair wire 1903 from connector PX33 socket B1 to circuit breaker CB73 terminal 8 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(8) Position main light switch to OFF (TM 9-2320-366-10-1).

WARNING

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

CAUTION

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

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
e55. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

KNOWLEDGE
Circuit breaker CB70 OK.
Circuit breaker CB73 OK.
Both turn signals illuminate.
Engine starts.
Transmission reverse (R) range OK.
Backup light lamps OK.
Backup light assembly OK.
WTEC II transmission controls.

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 transmission ECU pushbutton shift selector.

Does 12 VDC present at connector PX33 socket C1?

WARNING
Read WARNING and CAUTION on following page.

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION
If 12 VDC is not present, wire 1460 is faulty.

If 12 VDC present

Repair wire 1460 from connector PX33 socket C1 to terminal board TB1 position 60 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
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 circuits and cause severe burns or electrical shock.

CAUTION

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

NOTE

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

VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to connector PX33 socket C1.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 12 VDC is not present, repair wire 1460 from connector PX33 socket C1 to terminal board TB1 position 60 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
### KNOWN INFO
Circuit breaker CB70 OK.
Circuit breaker CB73 OK.
Both turn signals illuminate.
Engine starts.
Transmission reverse (R) range OK.
Backup light lamps OK.
Backup light assembly OK.
WTEC II transmission controls.

### POSSIBLE PROBLEMS
Faulty WTEC II cab transmission harness.
Faulty dashboard cable assembly.
Faulty rear lights cable assembly.
Faulty REVERSE WARNING relay in WTEC II VIM.
Faulty WTEC II transmission ECU pushbutton shift selector.

---

**8.** Continuity Test or STE/ICE-R Test #91
If continuity is not present, WTEC II cab transmission harness is faulty.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, WTEC II cab transmission harness is faulty.

---

**CAUTION**
Read CAUTION on following page.

- **Is continuity present from connector J116 socket F2 to connector J114 socket 13?**
  - **NO**
    - Replace WTEC II cab transmission harness (para 7-137).
  - **YES**
CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector J114 from WTEC II TEPSS.</td>
</tr>
<tr>
<td>3</td>
<td>Loosen screw in connector J116.</td>
</tr>
<tr>
<td>4</td>
<td>Disconnect connector J116 from WTEC II VIM.</td>
</tr>
<tr>
<td>5</td>
<td>Connect positive (+) probe of multimeter to connector J116 socket F2.</td>
</tr>
<tr>
<td>6</td>
<td>Connect negative (-) probe of multimeter to connector J114 socket 13 and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If continuity is not present, replace WTEC II cab transmission harness (para 7-137).</td>
</tr>
<tr>
<td>8</td>
<td>Connect connector J114 to WTEC II TEPSS.</td>
</tr>
<tr>
<td>9</td>
<td>Install instrument panel assembly (para 7-15).</td>
</tr>
<tr>
<td>10</td>
<td>Connect connector J116 to WTEC II VIM.</td>
</tr>
<tr>
<td>11</td>
<td>Tighten screw in connector J116.</td>
</tr>
</tbody>
</table>

CAUTION

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

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
**e55. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)**

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Circuit breaker CB73 OK.
- Both turn signals illuminate.
- Engine starts.
- Transmission reverse (R) range OK.
- Backup light lamps OK.
- Backup light assembly OK.
- WTEC II transmission controls.
- WTEC II cab transmission harness OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty rear lights cable assembly.
- Faulty REVERSE WARNING relay in WTEC II VIM.
- Faulty WTEC II transmission ECU pushbutton shift selector.

**CAUTION**
Read CAUTION on following page.

9.
Is continuity present from connector PX33 socket A1 to connector J 51 pin 2?

**TEST OPTIONS**
- Continuity Test or
  STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 490 in WTEC II dashboard cable assembly is faulty.

**NO**

**YES**

Repair wire 490 from connector PX33 socket A1 to connector J 51 pin 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
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 socket A1.
7. Connect negative (-) probe of multimeter to connector J51 pin 2 and note reading on multimeter.
8. If continuity is not present, repair wire 490 from connector PX33 socket A1 to connector J51 pin 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
9. Connect connector PX33 to WTEC II VIM.
10. Tighten screw in connector PX33.
11. Install kick panel (para 16-3).

CAUTION

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

NOTE

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

NOTE

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
e55. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**

- Circuit breaker CB70 OK.
- Circuit breaker CB73 OK.
- Both turn signals illuminate.
- Engine starts.
- Transmission reverse (R) range OK.
- Backup light lamps OK.
- Backup light assembly OK.
- 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 transmission ECU pushbutton shift selector.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, wire 490 in rear lights cable assembly is faulty.

---

**CAUTION**

Read CAUTION on following page.

10. Is continuity present from connector P51 socket 2 to connector P87?

---

**YES**

Repair wire 490 from connector P51 socket 2 to connector P87 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).

**NO**

---

NO
CAUTION

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

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

CONTINUITY TEST

1. Disconnect connector P87 from backup light connector.
2. Set multimeter to ohms.
3. Connect positive (+) probe of multimeter to connector P51 socket 2.
4. Connect negative (-) probe of multimeter to connector P87 and note reading on multimeter.
5. If continuity is not present, repair wire 490 from connector P51 socket 2 to connector P87 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
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.
Known Info

Circuit breaker CB70 OK.
Circuit breaker CB73 OK.
Both turn signals illuminate.
Engine starts.
Transmission reverse (R) range OK.
Backup light lamps OK.
Backup light assembly OK.
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 transmission ECU pushbutton shift selector.

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.

11. Do backup lights operate with new REVERSE WARNING relay installed in WTEC II VIM?

Yes

Replace REVERSE WARNING relay in WTEC II VIM (para 8-6).

No

Replace WTEC II TEPSS (para 8-2).
(1) Replace REVERSE WARNING relay in WTEC II VIM (para 8-6).
(2) Start engine (TM 9-2320-366-10-1).
(3) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(4) Select R (reverse) on WTEC II TEPSS (TM 9-2320-366-10-1).
(5) Check to see if backup lights operate.
(6) Select N (neutral) on WTEC II TEPSS (TM 9-2320-366-10-1).
(7) Position main light switch to OFF (TM 9-2320-365-10).
(8) Shut down engine (TM 9-2320-366-10-1).
(9) If backup lights do not operate, install old REVERSE WARNING relay in WTEC II VIM (para 8-6) and replace WTEC II TEPSS (para 8-2).
e55. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

KNOWLEDGE INFO
- Circuit breaker CB70 OK.
- Circuit breaker CB73 OK.
- Both turn signals illuminate.
- Engine starts.
- Transmission reverse (R) range OK.
- Backup light lamps OK.
- Backup light assembly OK.
- 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 Test #91

REASON FOR QUESTION
If continuity is not present, WTEC III relay K25 if faulty.

12. Is continuity present from WTEC III relay K25 terminal 86 to terminal 85?

YES
- Replace WTEC III relay K25 (para 7-9).

NO

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).
e55. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit breaker CB70 OK.</td>
</tr>
<tr>
<td>Circuit breaker CB73 OK.</td>
</tr>
<tr>
<td>Both turn signals illuminate.</td>
</tr>
<tr>
<td>Engine starts.</td>
</tr>
<tr>
<td>Transmission reverse (R) range OK.</td>
</tr>
<tr>
<td>Backup light lamps OK.</td>
</tr>
<tr>
<td>Backup light assembly OK.</td>
</tr>
<tr>
<td>WTEC III transmission controls.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty WTEC III relay K25.</td>
</tr>
<tr>
<td>Faulty WTEC III dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
<tr>
<td>Faulty WTEC III transmission ECU.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Test or STE/ICE-R Test #89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 12 VDC is not present, wire 1903 is faulty.</td>
</tr>
</tbody>
</table>

13. Is 12 VDC present at WTEC III relay K25 terminal 30?

- **NO**
  - Repair wire 1903 from WTEC III relay K25 terminal 30 to circuit breaker CB73 terminal 8 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Read WARNING on following page.

**WARNING**

- Repair wire 1903 from WTEC III relay K25 terminal 30 to circuit breaker CB73 terminal 8 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
WARNING

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

VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>2</td>
<td>Connect positive (+) probe of multimeter to PDP, where WTEC III relay K25 terminal 30 was removed.</td>
</tr>
<tr>
<td>5</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>6</td>
<td>Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If 12 VDC is not present, repair wire 1903 from WTEC III relay K25 terminal 30 to circuit breaker CB73 terminal 8 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>8</td>
<td>Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

Change 1 2-695
KNOWLEDGE DATA
- Circuit breaker CB70 OK.
- Circuit breaker CB73 OK.
- Both turn signals illuminate.
- Engine starts.
- Transmission reverse (R) range OK.
- Backup light lamps OK.
- Backup light assembly OK.
- 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 Test #91

REASON FOR QUESTION
If continuity is not present, wire 146 is faulty.

14. Is continuity present from WTEC III relay K34 terminal 86 to WTEC III relay K25 terminal 86?

NO

Repair wire 146 from WTEC III relay K34 terminal 86 to WTEC III relay K25 terminal 86 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

YES
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 from WTEC III relay K34 terminal 86 to WTEC III relay K25 terminal 86 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(6) Install WTEC III relay K34 on PDP.
Is continuity present from WTEC III relay K25 terminal 85 to connector P115 socket 4?

- **YES**: Repair wire 113 from WTEC III relay K25 terminal 85 to connector P115 socket 4 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

- **NO**: If continuity is not present, wire 113 is faulty.

**CAUTION**
Read CAUTION on following page.

**TEST OPTIONS**
Continuity Test or
STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 113 is faulty.

**KNOWN INFO**
Circuit breaker CB70 OK.
Circuit breaker CB73 OK.
Both turn signals illuminate.
Engine starts.
Transmission reverse (R) range OK.
Backup light lamps OK.
Backup light assembly OK.
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.
CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove kick panel (para 16-3).</td>
</tr>
<tr>
<td>(2) Disconnect connector clamp from connector P115.</td>
</tr>
<tr>
<td>(3) Disconnect connector P115 from WTEC III transmission ECU.</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to PDP, where WTEC III relay K25 terminal 85 was removed.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to connector P115 socket 4 and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If continuity is not present, repair wire 113 from WTEC III relay K25 terminal 85 to connector P115 socket 4 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(8) Connect connector P115 to WTEC III transmission ECU.</td>
</tr>
<tr>
<td>(9) Connect connector clamp to connector P115.</td>
</tr>
</tbody>
</table>
e55. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Circuit breaker CB70 OK.
- Circuit breaker CB73 OK.
- Both turn signals illuminate.
- Engine starts.
- Transmission reverse (R) range OK.
- Backup light lamps OK.
- Backup light assembly OK.
- 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 Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 490 is faulty.

---

CAUTION
Read CAUTION on following page.

**16.**
Is continuity present from WTEC III relay K25 terminal 87 to connector J51 pin 2?

- **NO**
  - Repair wire 490 from WTEC III relay K25 terminal 87 to connector J51 pin 2 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

- **YES**
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 pin 2 and note reading on multimeter.
(8) If continuity is not present, repair wire 490 from WTEC III relay K25 terminal 87 to connector J51 pin 2 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

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

CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
KNOWLEDGE INFO
Circuit breaker CB70 OK.
Circuit breaker CB73 OK.
Both turn signals illuminate.
Engine starts.
Transmission reverse (R) range OK.
Backup light lamps OK.
Backup light assembly OK.
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.

Is continuity present from connector P51 socket 2 to connector P87?

CAUTION
Read CAUTION on following page.

NO

YES

Repair wire 490 from connector P51 socket 2 to connector P87 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).

TEST OPTIONS
Continuity Test or STE/ICE-R Test #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 socket 2.
(4) Connect negative (-) probe of multimeter to connector P87 and note reading on multimeter.
(5) If continuity is not present, repair wire 490 from connector P51 socket 2 to connector P87 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
(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.

CAUTION

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

NOTE

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

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

NOTE

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
e55. BACKUP LIGHT DOES NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit breaker CB70 OK.</td>
</tr>
<tr>
<td>Circuit breaker CB73 OK.</td>
</tr>
<tr>
<td>Both turn signals illuminate.</td>
</tr>
<tr>
<td>Engine starts.</td>
</tr>
<tr>
<td>Transmission reverse (R) range OK.</td>
</tr>
<tr>
<td>Backup light lamps OK.</td>
</tr>
<tr>
<td>Backup light assembly OK.</td>
</tr>
<tr>
<td>WTEC III transmission controls.</td>
</tr>
<tr>
<td>WTEC III dashboard cable assembly OK.</td>
</tr>
<tr>
<td>Rear lights cable assembly OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty WTEC III relay K25.</td>
</tr>
<tr>
<td>Faulty WTEC III transmission ECU.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WTEC III Relay K25 Replacement Test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If backup lights operate with new WTEC III relay K25 installed, WTEC III relay K25 is faulty. If backup lights do not operate with new WTEC III relay K25 installed, WTEC III transmission ECU is faulty.</td>
</tr>
</tbody>
</table>

**18.**

Do backup lights operate with new WTEC III relay K25 installed?

**YES**

Replace WTEC III transmission ECU (para 8-7).

**NO**

Replace WTEC III relay K25 (para 7-9).
(1) Install new WTEC III relay K25 on PDP.
(2) Start engine (TM 9-2320-366-10-1).
(3) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(4) Select R (reverse) on WTEC III TPSS (TM 9-2320-366-10-1).
(5) Check to see if backup lights operate.
(6) Select N (neutral) on WTEC III TPSS (TM 9-2320-366-10-1).
(7) Position main light switch to OFF (TM 9-2320-366-10-1).
(8) Shut down engine (TM 9-2320-366-10-1).
(9) Remove new WTEC III relay K25 from PDP.
(10) Install old WTEC III relay K25 on PDP.
(11) If backup lights operate, replace WTEC III relay K25 (para 7-9).
(12) If backup lights do not operate, replace WTEC III transmission ECU (para 8-7).
(13) Install kick panel (para 16-3).
**e56. BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE**

### INITIAL SETUP

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

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

**Personnel Required**  
(2)

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

---

**NOTE**  
Perform Electrical System Troubleshooting  
e1. Circuit Breaker Does Not Operate on  
circuit breaker CB66 prior to beginning this  
task.

### KNOWN INFO

<table>
<thead>
<tr>
<th>Known Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit breaker CB66 OK. Turn signals illuminate.</td>
</tr>
</tbody>
</table>

### POSSIBLE PROBLEMS

<table>
<thead>
<tr>
<th>Possible Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty main light switch. Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

### TEST OPTIONS

<table>
<thead>
<tr>
<th>Test Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

### REASON FOR QUESTION

If continuity is not present, main light switch is faulty.  
If continuity is present, wire 1572 is faulty.

### START

1. Is continuity present between main light switch pins F and E?

   - **NO**
   - **YES**

   - **NO**
     - Replace main light switch (para 7-17).
   - **YES**
     - Repair wire 1572 from connector PX15 socket E to terminal board TB1 position 56 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or replace WTEC III dashboard cable assembly (para 7-11).
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 pin F.
(5) Connect negative (-) probe of multimeter to main light switch pin E.
(6) Position main light switch to BO MARKER (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If continuity is not present, replace main light switch connector (para 7-17).
(8) If continuity is present, repair wire 1572 from connector PX15 socket E to terminal board TB1 position 56 (para 2-45) 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 9-2320-366-10-1).
(10) Connect connector PX15 to main light switch.
(11) Install instrument panel assembly (para 7-15).

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(2) Disconnect connector PX15 from main light switch.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to main light switch pin F.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to main light switch pin E.</td>
</tr>
<tr>
<td>(6) Position main light switch to BO MARKER (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If continuity is not present, replace main light switch connector (para 7-17).</td>
</tr>
<tr>
<td>(8) If continuity is present, repair wire 1572 from connector PX15 socket E to terminal board TB1 position 56 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(9) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Connect connector PX15 to main light switch.</td>
</tr>
<tr>
<td>(11) Install instrument panel assembly (para 7-15).</td>
</tr>
</tbody>
</table>
TM 9-2320-366-20-1

**INITIAL SETUP**

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

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

**Personnel Required**  
(2)

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

---

**e56A. FRONT HAZARD LIGHTS DO NOT ILLUMINATE**

**START**

**WARNING**

**CAUTION**

Read WARNING and CAUTION on following page.

1. Is volts DC pulse present at connector J19 socket 5?

**NO**

**YES**

**TEST OPTIONS**  
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**  
If volts DC pulse is not present, wire 1566 is faulty.  
If volts DC pulse is present, turn signal switch is faulty.

**KNOWN INFO**  
Turn signals illuminate.  
Rear hazard lights illuminate.

**POSSIBLE PROBLEMS**  
Faulty dashboard cable assembly.  
Faulty turn signal switch.

**Repair**  
Repair wire 1566 from connector PX14 socket 2 to connector J19 socket 5 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Replace turn signal switch (para 7-26).
CAUTION

VOLTAGE TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector J19 from turn signal switch connector.
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to connector J19 socket 5.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(7) Position hazard lights switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If volts DC pulse is not present, Repair wire 1566 from connector PX14 socket 2 to connector J19 socket 5 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) If volts DC is present, replace turn signal switch (para 7-26).
(10) Position hazard lights switch to off (TM 9-2320-366-10-1).
(11) Position main light switch to OFF (TM 9-2320-366-10-1).
e57. REAR HAZARD LIGHTS DO NOT ILLUMINATE

INITIAL SETUP

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

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

START

WARNING
Read WARNING and CAUTION on following page.

CAUTION

1. Is volts DC pulse present at relay K10 socket 87A?

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION
If volts DC pulse is not present, wire 1566 is faulty.
If volts DC pulse is present, relay K10 is faulty.

NO

YES

Repair wire 1566 from relay K10 socket 87A to connector PX14 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

NO

YES

Replace relay K10 (para 7-9).

KNOWN INFO
Front hazard lights illuminate. Stoplights illuminate.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K10.
WARNING

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

CAUTION

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

NOTE

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

### VOLTAGE TEST

1. Remove 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, socket 87A, where relay K10 was removed.
5. Connect negative (-) probe of multimeter to ground.
6. Position main light switch to SER DRIVE (TM 9-2320-366-10-1). (TM 9-2320-366-10-1) and note reading on multimeter.
7. If volts DC pulse is not present, Repair wire 1566 from relay K10 socket 87A to connector PX14 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
8. If volts DC is present, replace relay K10 (para 7-9).
11. Position hazard lights switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
13. Install relay K10 in PDP.
### e58. FRONT AND REAR HAZARD LIGHTS DO NOT ILLUMINATE

#### INITIAL SETUP

<table>
<thead>
<tr>
<th>Equipment Conditions</th>
<th>Personnel Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>(2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tools and Special Tools</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
<td>TM 9-4910-571-12&amp;P</td>
</tr>
<tr>
<td>STE/ICE-R (Item 41, Appendix C)</td>
<td></td>
</tr>
<tr>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
<td></td>
</tr>
</tbody>
</table>

#### NOTE

Perform Electrical System Troubleshooting

**e1. Circuit Breaker Does Not Operate on circuit breaker CB71 prior to beginning this task.**

---

**START**

1. **WARNING**
   - CAUTION
   - Read **WARNING and CAUTION on following page.**

   **Is 12 VDC present at connector PX14 socket 1?**

   **TEST OPTIONS**
   - Voltage Test or STE/ICE-R Test #89
   - **REASON FOR QUESTION**
     - If 12 VDC is present, hazard lights switch is faulty.

   **KNOWN INFO**
   - Circuit breaker CB71 OK.
   - Turn signals illuminate.

   **POSSIBLE PROBLEMS**
   - Faulty hazard lights switch.
   - Faulty dashboard cable assembly.
   - Faulty relay K9.

   **YES**
   - Go to step 2 of this fault.

   **NO**
   - Replace hazard lights switch (para 7-18).
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

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

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

VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector PX14 from hazard lights switch.</td>
</tr>
<tr>
<td>3</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>4</td>
<td>Connect positive (+) probe of multimeter to connector PX14 socket 1.</td>
</tr>
<tr>
<td>5</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>6</td>
<td>Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>7</td>
<td>If 12 VDC is not present, go to step 2 of this fault.</td>
</tr>
<tr>
<td>8</td>
<td>If 12 VDC is present, replace hazard lights switch (para 7-18).</td>
</tr>
<tr>
<td>9</td>
<td>Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
### e58. FRONT AND REAR HAZARD LIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
</table>

#### 2.

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 1514 is faulty.

**WARNING**
Read WARNING on following page.

**Question:** Is 12 VDC present at relay K9 terminal 30?

- **NO**
  - Repair wire 1566 from relay K9 terminal 30 to circuit breaker CB 71 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - **WARNING**
    - Read WARNING on following page.
  
  **Question:** Is 12 VDC present at relay K9 terminal 86?

- **NO**
  - Repair wire 1514 from relay K9 terminal 86 to circuit breaker CB 74 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - **WARNING**
    - Read WARNING on following page.

### TM 9-2320-366-20-1

2-716  Change 1
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) 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 from relay K9 terminal 30 to circuit breaker CB71 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

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 9-2320-366-10-1) and not reading on multimeter.
(5) If 12 VDC is not present, repair wire 1514 from relay K9 terminal 86 to circuit breaker CB74 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
4. Is continuity present between relay K9 terminal 85 and a known good ground?

- **NO**
  - Repair wire 3039 from relay K9 terminal 85 to terminal board TB2 position 56 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Read CAUTION on following page.

5. Is continuity present between relay K9 terminal 87 and connector PX14 socket 2?

- **NO**
  - Repair wire 1565 from relay K9 terminal 87 to connector PX14 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace relay K9 (para 7-9).

**KNOWN INFO**
- Circuit breaker CB71 OK.
- Turn signals illuminate.
- Hazard lights switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty relay K9.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3039 is faulty.
- If continuity is not present, wire 1565 is faulty. If continuity is present, relay K9 is faulty.

**CAUTION**
- Read CAUTION on following page.
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 1565 from relay K9 terminal 85 to terminal board TB2 position 56 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

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

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PDP, terminal 87, where relay K9 was removed.
(3) Connect negative (-) probe of multimeter to connector PX14 socket 2.
(4) If continuity is not present, repair wire 1565 from relay K9 terminal 87 to connector PX14 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace relay 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).
**INITIAL SETUP**

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

**Personnel Required**
(2)

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

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

---

**KNOWN INFO**

- Circuit breaker OK.
- Stoplights operate.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.
- Faulty main light switch.
- Faulty turn signal switch.
- Faulty hazard lights switch.
- Faulty flasher unit.

---

**START**

1. Do hazard lights operate?

**YES**

- Go to step 7 of this fault.

**NO**

**TEST OPTIONS**

Operational Test

**REASON FOR QUESTION**

This question eliminates possible problems and determines where troubleshooting continues.
<table>
<thead>
<tr>
<th>OPERATIONAL TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Position main light switch to STOPLIGHT (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(2) Position hazard lights switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(3) Observe hazard lights.</td>
</tr>
<tr>
<td>(4) If hazard lights do not operate, go to step 7 of this fault.</td>
</tr>
<tr>
<td>(5) Position hazard lights switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
2. Is 12 vdc present at connector PX15-F? If 12 vdc is not present, wire 1586 is faulty.

   WARNING
   Read WARNING on following page.

   TEST OPTIONS
   Voltage Test or STE/ICE-R #89
   REASON FOR QUESTION
   If 12 vdc is not present, wire 1586 is faulty.

   YES

   NO

   POSSIBLE PROBLEMS
   Faulty dashboard cable assembly.
   Faulty main light switch.
   Faulty turn signal switch.

   YES

   LESSER OPTIONS
   Repair wire 1586 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   NO

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

   YES

   Replace main light switch (para 7-17).
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(2) Disconnect connector PX15 from main light switch.</td>
</tr>
<tr>
<td>(3) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to connector PX15-F.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If 12 vdc is not present, repair wire 1586 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove main light switch (para 7-17).</td>
</tr>
<tr>
<td>(2) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(3) Position main light switch to STOPLIGHT (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to main light switch terminal F.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to main light switch terminal J and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If continuity is not present, replace main light switch (para 7-17).</td>
</tr>
<tr>
<td>(7) Install main light switch (para 7-17).</td>
</tr>
</tbody>
</table>
4. Is 12 vdc present at circuit breaker CB74-5?

**WARNING**
Read WARNING on following page.

- If 12 vdc is not present, wire 1577 is faulty.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 12 vdc is not present, wire 1577 is faulty.

**KNOWLEDGE**
- Circuit breaker OK.
- Stoplights operate.
- Hazard lights switch OK.
- Flasher unit OK.
- Main light switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty turn signal switch.

**YES**
- Repair wire 1577 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
WARNING

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(2) Remove circuit breaker CB74 from PDP.</td>
</tr>
<tr>
<td>(3) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to PDP, terminal 5, where circuit breaker CB74 was removed.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(6) Position main light switch to STOPLIGHT (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 vdc is not present, repair wire 1577 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(8) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Install circuit breaker CB74 in PDP.</td>
</tr>
<tr>
<td>(10) Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
5. Is 12 vdc present at connector PX14-7?
   - If 12 vdc is not present, wire 1514 is faulty.

   **WARNING**
   Read WARNING on following page.

   **TEST OPTIONS**
   Voltage Test or STE/ICE-R #89

   **REASON FOR QUESTION**
   If 12 vdc is not present, wire 1514 is faulty.

   **POSSIBLE PROBLEMS**
   Faulty dashboard cable assembly.
   Faulty turn signal switch.

   **YES**
   Repair wire 1514 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   **NO**
   Replace turn signal switch (para 7-26).

6. Is voltage pulse present at connector J19-12?
   - If voltage pulse is not present, wire 1644 is faulty.

   **WARNING**
   Read WARNING on following page.

   **TEST OPTIONS**
   Voltage Test or STE/ICE-R #89

   **REASON FOR QUESTION**
   If voltage pulse is not present, wire 1644 is faulty.

   **POSSIBLE PROBLEMS**
   Faulty dashboard cable assembly.
   Faulty turn signal switch.

   **YES**
   Repair wire 1644 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   **NO**
   Replace turn signal switch (para 7-26).
**WARNING**

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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 9-2320-366-10-1) and note reading on multimeter.
6. If 12 vdc is not present, repair wire 1514 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
8. Connect connector PX14 to hazard light switch.

### 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 9-2320-366-10-1) and note reading on multimeter.
6. If voltage pulse is not present, repair wire 1644 (para 2-45) 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 7-26).
10. Install instrument panel assembly (para 7-15).
7. Is continuity present between hazard lights switch terminals 7 and 5?

- **YES**
  - Replace hazard lights switch (para 7-18).
- **NO**
  - If continuity is not present, hazard lights switch is faulty.

8. Is 12 vdc present at connector PX20-B?

- **YES**
  - Repair wire 1567 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- **NO**
  - 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 9-2320-366-10-1).
(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.

WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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 9-2320-366-10-1).
(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 9-2320-366-10-1) and note reading on multimeter.
(9) If 12 vdc is not present, repair wire 1567 (para 2-45) 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 9-2320-366-10-1).
9. Is continuity present between connector PX20-A and connector PX14-6?

**TEST OPTIONS**
Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
If continuity is not present, wire 1568 is faulty.

YES

NO

Repair wire 1568 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

10. Is continuity present between connector PX20-C and a known good ground?

**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.

YES

NO

Repair wire 3049 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Replace flasher unit (para 7-25).
CONTINUITY TEST
(1) Disconnect connector PX14 from hazard lights switch.
(2) Connect positive (+) probe of multimeter to connector PX20-A.
(3) Connect negative (-) probe of multimeter to connector PX14-6 and note reading on multimeter.
(4) If continuity is not present, repair wire 1568 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) Connect connector PX14 to hazard lights switch.
(6) Install instrument panel assembly (para 7-15).

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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace flasher unit (para 7-25).
(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).
e60. LEFT OR RIGHT FRONT TURN SIGNAL DOES NOT OPERATE

INITIAL SETUP

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>Personnel Required</td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td>(2)</td>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Materials/Parts</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing, Preformed (Item 191, Appendix G)</td>
<td>TM 9-4910-571-12&amp;P</td>
</tr>
<tr>
<td>Lockwasher (Item 96, Appendix G)</td>
<td></td>
</tr>
</tbody>
</table>

**KNOWLEDGE INFO**
- Right and left rear turn signals operate.

**POSSIBLE PROBLEMS**
- Faulty lamp.
- Faulty front lights cable assembly.
- Faulty composite front light 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.

**START**

1. Is continuity present through lamp?

**YES**
- Replace lamp (para 7-40).

**NO**
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 7-40).
7. Install turn signal lamp in socket.
8. Install preformed packing and cover on housing with five screws.
Is 12 vdc present at connector P23 (LH) or connector P9 (RH)?

**WARNING**
Read WARNING on following page.

2.

**Is 12 vdc present at connector P23 (LH) or connector P9 (RH)?**

**YES**

Go to step 4 of this fault.

**NO**

**KNOWN INFO**
Right and left rear turn signals operate.
Lamp OK.

**POSSIBLE PROBLEMS**
Faulty front lights cable assembly.
Faulty composite front light assembly.
Faulty dashboard cable assembly.

**TEST OPTIONS**
Voltage Test or STE/ICE-R #80

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Raise cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(2)</td>
<td>Disconnect connector P23 (LH composite front light assembly) or P9 (RH composite front light assembly) from composite front light assembly connector.</td>
</tr>
<tr>
<td>(3)</td>
<td>Lower cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(4)</td>
<td>Connect positive (+) probe of multimeter to connector P23 (LH composite front light assembly) or P9 (RH composite front light assembly).</td>
</tr>
<tr>
<td>(5)</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(6)</td>
<td>Position main light switch to STOPLIGHT (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(7)</td>
<td>Position turn signal switch to left turn or right turn position (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(8)</td>
<td>If 12 vdc is not present, go to step 4 of this fault.</td>
</tr>
<tr>
<td>(9)</td>
<td>Position turn signal switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10)</td>
<td>Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(11)</td>
<td>Raise cab (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(12)</td>
<td>Connect connector P23 (LH composite front light assembly) or P9 (RH composite front light assembly) to composite front light assembly connector.</td>
</tr>
</tbody>
</table>

WARNING

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

connector P9 or P23

COMPOSITE FRONT LIGHT ASSEMBLY CONNECTOR
e60. LEFT OR RIGHT FRONT TURN SIGNAL DOES NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Right and left rear turn signals operate.</td>
<td></td>
</tr>
<tr>
<td>Lamp OK.</td>
<td></td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
<td></td>
</tr>
</tbody>
</table>

| POSSIBLE PROBLEMS | |
|--------------------| |
| Faulty front lights cable assembly. | |
| Faulty composite front light assembly. | |

3. Is continuity present between terminal lug TL79 (LH) or TL70 (RH) and a known good ground?

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R #91</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, wire 3091 is faulty. If continuity is present, composite front light assembly is faulty.</td>
<td></td>
</tr>
</tbody>
</table>

- YES
  - Repair wire 3091 (para 2-45) or replace front lights cable assembly (para 7-82).

- NO
  - Replace composite front light assembly (para 7-40).
**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 2-45) or replace front lights cable assembly (para 7-82).

(6) If continuity is present, replace composite front light assembly (para 7-40).

(7) Install terminal lug TL79 (LH) or TL90 (RH), lockwasher, and screw on composite front light assembly.
e60. LEFT OR RIGHT FRONT TURN SIGNAL DOES NOT OPERATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right and left rear turn signals operate.</td>
</tr>
<tr>
<td>Lamp OK.</td>
</tr>
<tr>
<td>Composite front light assembly OK.</td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty front lights cable assembly.</td>
</tr>
</tbody>
</table>

4. Is 12 vdc present at connector J27-14 (LH) or connector J27-11 (RH)?

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Test or STE/ICE-R #89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 12 vdc is not present, wire 1581 (LH) or 1524 (RH) is faulty. If 12 vdc is present, wire 461 (LH) or 460 (RH) is faulty.</td>
</tr>
</tbody>
</table>

- YES: Repair wire 1581 (LH) or wire 1524 (RH) (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- NO: Repair wire 461 (LH) or wire 460 (RH) (para 2-45) or replace front lights cable assembly (para 7-82).
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 9-2320-366-10-1).
(10) Position turn signal switch to up for right turn signal operation or down for left turn signal operation (TM 9-2320-366-10-1).
(11) If 12 vdc is not present, repair wire 1581 (LH) or wire 1524 (RH) (para 2-45) 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 2-45) or replace front lights cable assembly (para 7-82).
(13) Position main light switch to OFF (TM 9-2320-366-10-1).
(14) Position turn signal switch to middle (off) (TM 9-2320-366-10-1).
(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).
### e61. ONE OR BOTH STOPLIGHTS DO NOT ILLUMINATE

#### INITIAL SETUP

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

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

**Material/Parts**
- Packing, Preformed (Item 191, Appendix G)

**Personnel Required**
- (2)

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

---

#### KNOWN INFO

Blackout stoplights illuminate.

#### POSSIBLE PROBLEMS

- Faulty lamp.
- Faulty rear lights cable assembly.
- Faulty composite taillight assembly.
- Faulty turn signal switch.
- Faulty dashboard cable assembly.
- Faulty diode D1B.
- Faulty diode D2A.
- Faulty main light switch.
- Faulty diode D1A.
- Faulty relay K10.

---

#### KNOWN INFO

Blackout stoplights illuminate.
- Main light switch OK.
- Diode D1A OK.
- Relay K10 OK.

#### POSSIBLE PROBLEMS

- Faulty lamp.
- Faulty rear lights cable assembly.
- Faulty composite taillight assembly.
- Faulty turn signal switch.
- Faulty dashboard cable assembly.
- Faulty diode D1B.
- Faulty diode D2A.

---

1. **Does one stoplight illuminate?**

   - **YES**
     - Go to step 10 of this fault.
   - **NO**
     - **TEST OPTIONS**
       - Operational Test
     - **REASON FOR QUESTION**
       - This question eliminates possible problems and determines where troubleshooting continues.

2. **Is continuity present through lamp?**

   - **NO**
     - **TEST OPTIONS**
       - Continuity Test or STE/ICE-R Test #91
     - **REASON FOR QUESTION**
       - If continuity is not present, lamp is faulty.
   - **YES**
     - Replace lamp (para 7-39).
(1) Position master power switch to on (TM 9-2320-366-10-1).
(2) Position main light switch to STOPLIGHT (TM 9-2320-366-10-1).
(3) Apply brakes and observe stoplights.
(4) If both stoplights do not illuminate, go to step 5 of this fault.
(5) Position main light switch to OFF (TM 9-2320-366-10-1).
(6) Position master power switch to off (TM 9-2320-366-10-1).

**CONTINUITY TEST**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loosen six screws on composite taillight assembly cover.</td>
</tr>
<tr>
<td>2</td>
<td>Remove cover and preformed packing from housing. Discard preformed packing.</td>
</tr>
<tr>
<td>3</td>
<td>Remove lamp from socket.</td>
</tr>
<tr>
<td>4</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>5</td>
<td>Check continuity through lamp.</td>
</tr>
<tr>
<td>6</td>
<td>If continuity is not present, replace lamp (para 7-39).</td>
</tr>
</tbody>
</table>
Known Info
- Blackout stoplights illuminate.
- 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.
- Faulty diode D2A.

3. WARNING
Read WARNING on following page.

Is 12 VDC present at stoplight lamp socket center contact?

If NO, go to step 5 of this fault.

If YES, go to step 5 of this fault.

Test Options
- Voltage Test or STE/ICE-R Test #89

Reason for Question
This question eliminates possible faults and determines where troubleshooting continues.
WARNING

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

### 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 9-2320-366-10-1).
5. Position main light switch to STOPLIGHT (TM 9-2320-366-10-1).
6. Apply brakes and note reading on multimeter.
7. If 12 VDC is not present, go to step 5 of this fault.
10. Install lamp in socket.
11. Install preformed packing and cover on housing with six screws.
e61. ONE OR BOTH STOPLIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackout stoplights illuminate.</td>
</tr>
<tr>
<td>Main light switch OK.</td>
</tr>
<tr>
<td>Diode D1A OK.</td>
</tr>
<tr>
<td>Relay K10 OK.</td>
</tr>
<tr>
<td>Lamp OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
<tr>
<td>Faulty composite taillight assembly.</td>
</tr>
<tr>
<td>Faulty turn signal switch.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty diode D1B.</td>
</tr>
<tr>
<td>Faulty diode D2A.</td>
</tr>
</tbody>
</table>

4. Does taillight illuminate?

**TEST OPTIONS**
Operational Test

**REASON FOR QUESTION**
If taillight does not illuminate, wire 3094 (LH) or wire 3095 (RH) is faulty. If taillight illuminates, composite taillight assembly is faulty.

**NO**
Repair wire 3094 from TL18 to TL93 (LH) or wire 3095 from TL21 to TL92 (RH) or wire 3095 from TL21 to splice E72 (M1084/M1085/M1086/M1096 RH).

**YES**
Replace composite taillight assembly (para 7-39).
(1) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(2) Observe taillight in housing with non-illuminating stoplight.
(3) If taillight does not illuminate, repair wire 3094 from TL18 to TL93 (LH) or wire 3095 from TL21 to TL92 (RH) or wire 3095 from TL21 to splice E72 (M1084/M1085/M1086/M1096 RH).
(4) If taillight illuminates, replace composite taillight assembly (para 7-39).
(5) Position main light switch to OFF (TM 9-2320-366-10-1).
Is 12 VDC present at connect P74 (LH) or connector P61 (RH)?

**KNOWN INFO**
- Blackout stoplights illuminate.
- 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.
- Faulty diode D2A.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**WARNING**
- Read WARNING and CAUTION on following page.

**REASON FOR QUESTION**
- If 12 VDC is present, composite taillight assembly is faulty.

**ACTION**
- **YES**: Replace composite taillight assembly (para 7-39).
- **NO**: Go to step 6 of this fault.
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 or connector P61.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1).
(6) Position main light switch to STOPLIGHT (TM 9-2320-366-10-1).
(7) Apply brakes and note reading on multimeter.
(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 7-39).
(10) Position master power switch to off (TM 9-2320-366-10-1).
(11) Position main light switch to OFF (TM 9-2320-366-10-1).
(12) Connect connector P74 or connector P61 to stoplight connector.
e61. ONE OR BOTH STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Blackout stoplights illuminate.
- Main light switch OK.
- Diode D1A OK.
- Relay K10 OK.
- Lamp OK.
- Composite taillight assembly OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty turn signal switch.
- Faulty dashboard cable assembly.
- Faulty diode D1B.
- Faulty diode D2A.

**CAUTION**
Read CAUTION on following page.

6. Is continuity present from turn signal switch connector socket 2 (LH) or socket 3 (RH) to socket 6?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, turn signal switch is faulty.

**Flowchart Diagram**

- **YES**
  - Replace turn signal switch (para 7-26).

- **NO**
  - Faulty rear lights cable assembly.
  - Faulty turn signal switch.
  - Faulty dashboard cable assembly.
  - Faulty diode D1B.
  - Faulty diode D2A.
CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(2) Disconnect turn signal switch connector from connector J19.</td>
</tr>
<tr>
<td>(3) Position turn signal switch to center position (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(4) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(5) Connect positive (+) probe of multimeter to turn signal switch connector socket 6.</td>
</tr>
<tr>
<td>(6) Connect negative (-) probe of multimeter to turn signal switch connector socket 2 (LH) or socket 3 (RH) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If continuity is not present, replace turn signal switch (para 7-26).</td>
</tr>
<tr>
<td>(8) Connect connector J19 to turn signal switch connector.</td>
</tr>
<tr>
<td>(9) Install instrument panel assembly (para 7-15).</td>
</tr>
</tbody>
</table>
e61. ONE OR BOTH STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Blackout stoplights illuminate.
- Main light switch OK.
- Diode D1A OK.
- Relay K10 OK.
- Lamp OK.
- Composite taillight assembly OK.
- Turn signal switch OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty dashboard cable assembly.
- Faulty diode D1B.
- Faulty diode D2A.

---

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present wire 461B (LH) or wire 460B (RH) is faulty.

---

**7.**
Is 12 VDC present at diode D1B-4 (LH) or diode D2A-2 (RH)?

---

**NO**
- Faulty rear lights cable assembly.
- Faulty dashboard cable assembly.
- Faulty diode D1B.
- Faulty diode D2A.

**YES**
- Repair wire 461B from diode D1B terminal 4 to connector J19 pin 2 (LH) or wire 460B from diode D2A terminal 2 to connector J19 pin 3 (RH) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
### WARNING

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

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.</td>
</tr>
</tbody>
</table>

### 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 diode D2A (RH) was removed.
5. Connect negative (-) probe of multimeter to ground.
6. Position master power switch to on (TM 9-2320-366-10-1).
8. Apply brakes and note reading on multimeter.
9. If 12 VDC is not present, repair wire 461B from diode D1B terminal 4 to connector J19 pin 2 (LH) or wire 460B from diode D2A terminal 2 to connector J19 pin 3 (RH) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e61. ONE OR BOTH STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Blackout stoplights illuminate.
- Main light switch OK.
- Diode D1A OK.
- Relay K10 OK.
- Lamp OK.
- Composite taillight assembly OK.
- Turn signal switch OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty dashboard cable assembly.
- Faulty diode D1B.
- Faulty diode D2A.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is present wire 461B (LH) or wire 460B (RH) is faulty.

**WARNING**
Read WARNING and CAUTION on following page.

**CAUTION**

8. Is 12 VDC present at connector J 51 pin 5 (LH) or connector J 51 pin 4 (RH)?

- **NO**
  - Repair wire 461B from connector P51 socket 5 to connector P74 (LH) or wire 460B from connector P51 socket 4 to connector P61 (RH) or replace rear lights cable assembly (para 7-84 or 7-104).

- **YES**
  - Go to step 9 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 circuits and cause severe burns or electrical shock.

**CAUTION**

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

**NOTE**

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

---

**VOLTAGE TEST**

1. Remove 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 volts DC.
6. Connect positive (+) probe of multimeter to connector J51 pin 5 (LH) or pin 4 (RH).
7. Connect negative (-) probe of multimeter to ground.
8. Position master power switch to on (TM 9-2320-366-10-1).
10. Apply brakes and note reading on multimeter.
11. If 12 VDC is not present, got to step 9 of this faulty.
12. If 12 VDC is present, repair wire 461B from connector P51 socket 5 to connector P74 (LH) or wire 460B from connector P51 socket 4 to connector P61 (RH) or replace rear lights cable assembly (para 7-84 or 7-104).
Blackout stoplights illuminate.
Main light switch OK.
Diode D1A OK.
Relay K10 OK.
Lamp OK.
Composite taillight assembly OK.
Turn signal switch OK.
Rear lights cable assembly OK.

Faulty dashboard cable assembly.
Faulty diode D1B.
Faulty diode D2A.

**WARNING**

**CAUTION**
Read WARNING and CAUTION on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 continuity is not present wire 461B (LH) or wire 460B (RH) is faulty. If continuity is present, diode D1B (LH) or diode D2A (RH) is faulty.

**POSSIBLE PROBLEMS**

9.
Is continuity present from diode D1B terminal 3 to connector J51 pin 5 (LH) or diode D2A terminal 1 to connector J51 pin 4 (RH)?

If 12 continuity is not present wire 461B (LH) or wire 460B (RH) is faulty. If continuity is present, diode D1B (LH) or diode D2A (RH) is faulty.

**YES**
Repair wire 461B from diode D1B terminal 3 to connector J51 pin 5 (LH) or wire 460B from diode D2A terminal 1 to connector J51 pin 4 (RH) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
YES

Replace diode D1B (LH) or diode D2A (RH) (para 7-9).
CAUTION

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

NOTE

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

CONTINUITY TEST

(1) Set multimeter to volts ohms.
(2) Connect positive (+) probe of multimeter to diode D1B terminal 3 (LH) or diode D2A terminal 1 (RH).
(3) Connect negative (-) probe of multimeter to connector J51 pin 5 (LH) or pin 4 (RH) and note reading on multimeter.
(4) If continuity is not present, repair wire 461B from connector J51 pin 5 to diode D1B terminal 3 (LH) or wire 460B from connector J51 pin 4 to diode D2A terminal 1 (RH) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) Connect connector J51 to connector P51.
(6) Install PDP on dashboard with three screws.
(7) Install three washers and screws in PDP.
(8) Install diode D1B (LH) or diode D2A (RH) in PDP.
(9) Install PDP cover (para 16-2).
e61. ONE OR BOTH STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Blackout stoplights illuminate.
- Lamp OK.
- Rear lights cable assembly OK.
- Composite taillight assembly OK.
- Turn signal switch OK.
- Diode D1B OK.
- Diode D2A OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty main light switch.
- Faulty diode D1A.
- Faulty relay K10.

---

**10.**
Is continuity present from main light switch pin K to pin C?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, main light switch is faulty.

[Diagram]

---

**11.**
Is 12 VDC present at diode D1A terminal 2?

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 22 is faulty.

[Diagram]
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 pin K.
(5) Connect negative (-) probe of multimeter to main light switch pin C.
(6) Position main light switch to STOPLIGHT (TM 9-2320-366-10-1) 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 9-2320-366-10-1).
(9) Connect connector PX15 to main light switch.

WARNING

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

VOLTAGE TEST

(1) Remove PDP cover (para 16-2).
(2) Remove 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 9-2320-366-10-1).
(7) Position main light switch to STOPLIGHT (TM 9-2320-366-10-1).
(8) Apply brakes and note reading on multimeter.
(9) If 12 VDC is not present, repair wire 22 from diode D1A terminal 2 to connector PX15 socket C (para 2-45) 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 9-2320-366-10-1).
(11) Position master power switch to off (TM 9-2320-366-10-1).
e61. ONE OR BOTH STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Blackout stoplights illuminate.
- 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.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

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

**WARNING**
Read WARNING on following page.

12. Is 12 VDC present at terminal block TB1 position 27?

NO

YES

Go to step 17 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 circuits 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 9-2320-366-10-1).
(8) Position main light switch to STOPLIGHT (TM 9-2320-366-10-1).
(9) Apply brakes and note reading on multimeter.
(10) If 12 VDC is not present, go to step 17 of this fault.
(11) Position main light switch to OFF (TM 9-2320-366-10-1).
(12) Position master power switch to off (TM 9-2320-366-10-1).
(13) Install PDP on dashboard with three screws.
(14) Install three washers and screws in PDP.
(15) Install diode D1A in PDP.
e61. ONE OR BOTH STOPLIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackout stoplights illuminate.</td>
</tr>
<tr>
<td>Lamp OK.</td>
</tr>
<tr>
<td>Rear lights cable assembly OK.</td>
</tr>
<tr>
<td>Composite taillight assembly OK.</td>
</tr>
<tr>
<td>Turn signal switch OK.</td>
</tr>
<tr>
<td>Diode D1B OK.</td>
</tr>
<tr>
<td>Diode D2A OK.</td>
</tr>
<tr>
<td>Main light switch OK.</td>
</tr>
<tr>
<td>Diode D1A OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty relay K10.</td>
</tr>
</tbody>
</table>

13. **Is 12 VDC present at relay K10 terminal 86?**

**NO**

- **WARNING**
  - Read WARNING on following page.

**YES**

- **TEST OPTIONS**
  - Voltage Test or STE/ICE-R Test #89

- **REASON FOR QUESTION**
  - If 12 VDC is not present, wire 1940 is faulty.

- **POSSIBLE PROBLEMS**
  - Repair wire 1940 from relay K10 terminal 86 to terminal board TB1 position 29 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
WARNING

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

VOLTAGE TEST

(1) Remove relay K10 from PDP.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to PDP, terminal 86, where relay K10 was removed.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1).
(6) Position main light switch to STOPLIGHT (TM 9-2320-366-10-1).
(7) Apply brakes and note reading on multimeter.
(8) If 12 VDC is not present, repair wire 1940 from relay K10 terminal 86 to terminal board TB1 position 29 (para 2-45) 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 9-2320-366-10-1).
(10) Position master power switch to off (TM 9-2320-366-10-1).
14. Is continuity present from relay K10 terminal 85 to ground?

**KNOWN INFO**
- Blackout stoplights illuminate.
- 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.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, wire 3046 is faulty.

If YES:
Repair wire 3046 from relay K10 terminal 85 to terminal board TB2 position 60 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

If NO:

15. Is 12 VDC present at relay K10 terminal 87?

**KNOWN INFO**
- Blackout stoplights illuminate.
- 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.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC is not present, wire 1940 is faulty.

If YES:
Repair wire 1940 from relay K10 terminal 87 to terminal board TB1 position 29 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

If NO:

**WARNING**
Read WARNING on following page.
### 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 from relay K10 terminal 85 to terminal board TB2 position 60 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

### WARNING

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

### VOLTAGE TEST

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to PDP, terminal 87, where relay K10 was removed.
3. Connect negative (-) probe of multimeter to ground.
4. Position master power switch to on (TM 9-2320-366-10-1).
5. Position main light switch to STOPLIGHT (TM 9-2320-366-10-1).
6. Apply brakes and note reading on multimeter.
7. If 12 VDC is not present, repair wire 1940 from relay K10 terminal 87 to terminal board TB1 position 29 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e61. ONE OR BOTH STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Blackout stoplights illuminate.
- 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.

---

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, wire 1594 is faulty. If continuity is present, relay K10 is faulty.</td>
</tr>
</tbody>
</table>

---

**CAUTION**
Read CAUTION on following page.

16. Is continuity present from relay K10 terminal 30 to connector J19 socket 6?

---

**NO**

---

**YES**

- Repair wire 1594 from relay K10 terminal 30 to connector J19 socket 6 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

---

Replace relay K10 (para 7-9).
NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

**CONTINUITY TEST**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disconnect turn signal switch connector from connector J19.</td>
</tr>
<tr>
<td>2</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>3</td>
<td>Connect positive (+) probe of multimeter to PDP, terminal 30, where relay K10 was removed.</td>
</tr>
<tr>
<td>4</td>
<td>Connect negative (-) probe of multimeter to connector J19 socket 6.</td>
</tr>
<tr>
<td>5</td>
<td>If continuity is not present, repair wire 1594 from relay K10 terminal 30 to connector J19 socket 6 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>6</td>
<td>If continuity is present, replace relay K10 (para 7-9).</td>
</tr>
<tr>
<td>7</td>
<td>Connect connector J19 to turn signal switch connector.</td>
</tr>
<tr>
<td>8</td>
<td>Install instrument panel assembly (para 7-15).</td>
</tr>
<tr>
<td>9</td>
<td>Install relay K10 in PDP.</td>
</tr>
<tr>
<td>10</td>
<td>Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>

**CAUTION**
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
e61. ONE OR BOTH STOPLIGHTS DO NOT ILLUMINATE (CONT)

17. Is continuity present from terminal board TB1 position 27 to diode D1A terminal 1?

NO

If continuity is not present, wire 22 is faulty.

YES

Repair wire 22 from terminal board TB1 position 27 to diode D1A terminal 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Replace diode D1A (para 7-9).
CONTINUITY 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 ohms.
(5) Connect positive (+) probe of multimeter to terminal board TB1 position 27.
(6) Connect negative (-) probe of multimeter to diode D1A terminal 1 and note reading on multimeter.
(7) If continuity is not present, repair wire 22 from terminal board TB1 position 27 to diode D1A terminal 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If continuity is present, replace diode D1A (para 7-9).
(9) Install PDP on dashboard with three screws.
(10) Install three washers and screws in PDP.
(11) Install diode D1A in PDP.
(12) Install PDP cover (para 16-2).
e62. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT ILLUMINATE

INITIAL SETUP

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

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

Material/Parts
Packing, Preformed (Item 191, Appendix G)

Personnel Required
(2)

References
TM 9-4910-571-12&P

START

Known Info

Stoplights operate in normal mode.

Possible Problems
Faulty composite taillight assembly.
Faulty lamp.
Faulty rear lights cable assembly.
Faulty main light switch.
Faulty dashboard cable assembly.

Test Options

Operational Test

Reason For Question
This question eliminates possible problems and determines where troubleshooting continues.

Yes

Does one blackout stoplight illuminate?

No

Go to step 5 of this fault.

Yes

Go to step 5 of this fault.
(1) Position master power switch to on (TM 9-2320-366-10-1).
(2) Position main light switch to BO DRIVE (TM 9-2320-366-10-1).
(3) Apply brakes and observe blackout stoplights.
(4) If both blackout stoplights do not illuminate, go to step 5 of this fault.
(5) Position main light switch to OFF (TM 9-2320-366-10-1).
(6) Position master power switch to off (TM 9-2320-366-10-1).
e62. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Stoplights illuminate in normal mode.
- Dashboard cable assembly OK.
- Main light switch OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty composite taillight assembly.
- Faulty lamp.

2. **WARNING**

   Read WARNING on following page.

   Is 12 VDC present at blackout stoplight lamp socket center contact?

   **YES**
   - Go to step 4 of this fault.

   **NO**
   - This question eliminates possible problems and determines where troubleshooting continues.

   **TEST OPTIONS**
   - Voltage Test or STE/ICE-R Test #89

   **REASON FOR QUESTION**
   - This question eliminates possible problems and determines where troubleshooting continues.
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

1. Loosen six screws and remove cover and preformed packing from composite taillight assembly 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 9-2320-366-10-1).
8. Apply brakes and note reading on multimeter.
9. If 12 VDC is not present, go to step 4 of this fault.
e62. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Stoplights illuminate in normal mode.
- Dashboard cable assembly OK.
- Main light switch OK.
- Rear lights cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty composite taillight assembly.
- Faulty lamp.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
If continuity is not present, composite taillight assembly is faulty. If continuity is present, lamp is faulty.

3. Is continuity present from terminal lug TL18 (LH) or TL21 (RH) to blackout stoplight lamp socket?

- **NO**
  - Replace composite taillight assembly (para 7-39).

- **YES**
  - Replace lamp (para 7-39).
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 7-39).
(5) If continuity is present, replace lamp (para 7-39).
(6) Install lamp in socket.
(7) Install preformed packing and cover on housing with six screws.
e62. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Stoplights illuminate in normal mode.
- Dashboard cable assembly OK.
- Main light switch OK.
- Lamp OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty composite taillight assembly.

### Step 4

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 23 is faulty. If 12 VDC is present, composite taillight assembly is faulty.

**WARNING**

**CAUTION**

Read WARNING and CAUTION on following page.

**Is 12 VDC present at connector P77 (LH) or connector P63 (RH)?**

- **NO**
  - Repair wire 23 from connector P77 (LH) or connector P63 (RH) to splice E18 or splice E46 (M1089) or splice E30 (M1088) (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).

- **YES**
  - Replace composite taillight assembly (para 7-39).

Replace composite taillight assembly (para 7-39).
CAUTION

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

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

VOLTAGE TEST

1. Set multimeter to volts DC.
2. Disconnect connector P77 (LH) or connector P63 (RH) from blackout stoplight connector.
3. Connect positive (+) probe of multimeter to connector P77 or connector P63.
4. Connect negative (-) probe of multimeter to ground.
5. Position master power switch to on (TM 9-2320-366-10-1).
7. Apply brakes and note reading on multimeter.
8. If 12 VDC is not present, repair wire 23 from connector P77 (LH) or connector P63 (RH) to splice E18 or splice E46 (M1089) or splice E30 (M1088) (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
9. If 12 VDC is present, replace composite taillight assembly (para 7-39).
12. Install lamp in socket.
13. Install preformed packing and cover on housing with six screws.

WARNING

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

NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
e62. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stoplights illuminate in normal mode.</td>
</tr>
<tr>
<td>Composite taillight assembly OK.</td>
</tr>
<tr>
<td>Lamp OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty main light switch.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, main light switch is faulty.</td>
</tr>
</tbody>
</table>

5. Is continuity present from main light switch pin K to pin N?

- NO: Replace main light switch (para 7-17).
- YES: Continue with test options.
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 pin K.
(5) Connect negative (-) probe of multimeter to main light switch pin N.
(6) Position main light switch to BO DRIVE (TM 9-2320-366-10-1) 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 9-2320-366-10-1).
e62. ONE OR BOTH BLACKOUT STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**

- Stoplights illuminate in normal mode.
- Composite taillight assembly OK.
- Lamp OK.
- Main light switch OK.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.
- Faulty rear lights cable assembly.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, wire 23 in dashboard cable assembly is faulty. If continuity is present, wire 23 in rear lights cable assembly is faulty.

---

**6.**

Is continuity present from connector PX15 socket N to connector J51 pin 6?

**CAUTION**

Read CAUTION on following page.

**NO**

- Repair wire 23 from connector PX15 socket N to connector J51 pin 6 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**YES**

- Repair wire 23 from connector P51 socket 6 to splice E18 or splice E46 (M1089) or splice E30 (M1088) (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
CONTINUITY TEST

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

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

CAUTION
Remove PDP cover (para 16-2).
Remove three screws and washers from PDP.
Remove three screws from PDP.
Lift PDP outward to gain access.
Disconnect connector J51 from connector P51.
Set multimeter to ohms.
Connect positive (+) probe of multimeter to connector PX15 socket N.
Connect negative (-) probe of multimeter to connector J51 pin 6 and note reading on multimeter.
If continuity is not present, repair wire 23 from connector PX15 socket N to connector J51 pin 6 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
If continuity is present, repair wire 23 from connector P51 socket 6 to splice E18 or splice E46 (M1089) or splice E30 (M1088) (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
Connect connector PX15 to main light switch.
Install instrument panel assembly (para 7-15).
Connect connector J51 to connector P51.
Install PDP on dashboard with three screws.
Install three washers and screws in PDP.
Install PDP cover (para 16-2).
**e63. STOPLIGHTS AND BLACKOUT STOPLIGHTS DO NOT OPERATE**

**INITIAL SETUP**

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Tools and Special Tools</th>
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<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>(2)</td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
</tr>
</tbody>
</table>

**References**

TM 9-4910-571-12&P

---

**KNOWN INFO**

- Brakes operate.
- Engine starts.
- Circuit breaker OK.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.
- Faulty relay K6.
- Faulty stoplight switches.

**START**

1. **WARNING Read WARNING on following page.**

   Is 12 vdc present on relay K6 terminal 86?

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

This question eliminates possible problems and determines where troubleshooting continues.

**YES**

Go to step 7 of this fault.

**NO**
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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 9-2320-366-10-1) 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 9-2320-366-10-1).
2. Is continuity present between relay K6 terminal 85 and a known good ground while depressing brake pedal?

YES

Go to step 5 of this fault.

NO

3. Is 12 vdc present at relay K6 terminal 30?

YES

Repair wire 1641 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

NO

WARNING
Read WARNING on following page.

TEST OPTIONS
Continuity Test or STE/ICE-R #91

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

KNOWLEDGE
Brakes operate.
Engine starts.
Circuit breaker OK.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K6.
Faulty stoplight switches.

TEST OPTIONS
Voltage Test or STE/ICE-R #89

REASON FOR QUESTION
If 12 vdc is not present, wire 1641 is faulty.

KNOWLEDGE
Brakes operate.
Engine starts.
Circuit breaker OK.
Stoplight switches OK.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K6.

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 9-2320-366-10-1) and note reading on multimeter.
(5) If continuity is not present, go to step 5 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) 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 9-2320-366-10-1) and note reading on multimeter.
(5) If 12 vdc is not present, repair wire 1641 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position master power switch to off (TM 9-2320-366-10-1).
4. Is continuity present between relay K6 terminal 87 and connector PX15-K?

- **NO**
  - Repair wire 1404 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace relay K6 (para 7-9).

**KNOWN INFO**
- Brakes operate.
- Engine starts.
- Circuit breaker OK.
- Stoplight switches OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty relay K6.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- 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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) If continuity is present, replace relay 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).
e63. STOPLIGHTS AND BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)

5. Is continuity present between relay K6 terminal 85 and terminal lug TL154?

- YES
- NO

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.

TEST OPTIONS
Continuity Test or STE/ICE-R #91

REASON FOR QUESTION
If continuity is not present, wire 1594 is faulty.

6. Is continuity present between terminal lug TL155 and a known good ground?

- YES
- NO

If continuity is not present, wire 3043 is faulty. If continuity is present, stoplight switches are faulty.

KNOWN INFO
Brakes operate.
Engine starts.
Circuit breaker OK.
Relay K6 OK.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty stoplight switches.

TEST OPTIONS
Continuity Test or STE/ICE-R #91

REASON FOR QUESTION
If continuity is not present, wire 3043 is faulty. If continuity is present, stoplight switches are faulty.

YES
Replace stoplight switches (para 11-27).

NO
Repair wire 1594 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

NO
Repair wire 3043 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 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 2-45) 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).

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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace both stoplight switches (para 11-27).
83. STOPLIGHTS AND BLACKOUT STOPLIGHTS DO NOT OPERATE (CONT)

**KNOWN INFO**
- Brakes operate.
- Engine starts.
- Circuit breaker OK.
- Relay K6 OK.
- Stoplight switches OK.
- Faulty dashboard cable assembly.

**POSSIBLE PROBLEMS**

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
If 12 vdc is not present, wire 1548 is faulty. If 12 vdc is present, wire 1641 is faulty.

7. Is 12 vdc present on circuit breaker CB76-3?

**YES**
- Repair wire 1641 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
- Repair wire 1548 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**WARNING**
Read WARNING on following page.

Repair wire 1641 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical 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 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 vdc is not present, repair wire 1548 (para 2-45) 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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Position master power switch to off (TM 9-2320-366-10-1).
(9) Install circuit breaker CB76 in PDP.
(10) Install relay K6 in PDP.
(11) Install PDP cover (para 16-2).
### INITIAL SETUP

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

**Personnel Required**
- (2)

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

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

---

**WARNING**

Read WARNING on following page.

**TEST OPTIONS**

- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**

If 12 vdc is not present, wire 1594 is faulty.

---

**KNOW INFO**

- Vehicle stoplights OK.
- **POSSIBLE PROBLEMS**
  - Faulty dashboard cable assembly.
  - Faulty M1088 stoplight switch.

---

**START**

1. Is 12 vdc present at terminal lug TL501?

**NO**

**YES**

- Repair wire 1594 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
## WARNING

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

### VOLTAGE TEST

1. Remove kick panel (para 16-3).
2. Set multimeter to volts dc.
3. Connect positive (+) probe of multimeter to terminal lug TL501.
4. Connect negative (-) probe of multimeter to ground.
5. Position master power switch to on (TM 9-2320-366-10-1).
6. Apply trailer brakes (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 12 vdc is not present, repair wire 1594 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e64. STOPLIGHTS DO NOT OPERATE WHEN M1088 TRAILER BRAKES ARE APPLIED (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle stoplights OK.</td>
<td>Continuity Test or STE/ICE-R #91</td>
<td>If continuity is not</td>
</tr>
<tr>
<td>POSSIBLE PROBLEMS</td>
<td></td>
<td>present, wire 3042 is</td>
</tr>
<tr>
<td>Faulty dashboard cable</td>
<td></td>
<td>faulty. If continuity is</td>
</tr>
<tr>
<td>assembly.</td>
<td></td>
<td>present, M1088 trailer</td>
</tr>
<tr>
<td>Faulty M1088 stoplight switch.</td>
<td></td>
<td>stoplight switch is faulty.</td>
</tr>
</tbody>
</table>

2. Is continuity present from terminal lug TL502 to ground?

- **NO**
  - Repair wire 3042 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace M1088 trailer stoplight switch (para 11-34).
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal lug TL502.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3042 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace M1088 trailer stoplight switch (para 11-34).
(6) Install kick panel (para 16-3).
e65. TRAILER MARKER/TAILLIGHTS DO NOT ILLUMINATE

INITIAL SETUP

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

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

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE
Perform Electrical System Troubleshooting

e1. Circuit Breaker Does Not Operate on
circuits breaker CB41 prior to beginning this
task.

START

WARNING

CAUTION

Read WARNING and
CAUTION on
following page.

Is 24 VDC present at
connector J130 socket E?

YES

NO

Troubleshoot trailer electrical
system per trailer technical
manual.

If 24 VDC is present, trailer
electrical system is faulty.

TEST OPTIONS
Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION
If 24 VDC is present, trailer
electrical system is faulty.

POSSIBLE PROBLEMS
Faulty trailer electrical system.
Faulty dashboard cable
assembly.
Faulty relay K28.
Faulty rear lights cable
assembly.
Faulty rear intervehicular
24 VDC (12 pin) cable.

KNOWN INFO
Towing vehicle marker/taillights
OK.
Circuit breaker CB41 OK.

TM 9-2320-366-20-1
2-786  Change 1
WARNING

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

CAUTION

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

NOTE

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

**VOLTAGE TEST**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lift cover on connector J130 intervehicular 24 VDC connector.</td>
</tr>
<tr>
<td>2</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>3</td>
<td>Connect positive (+) probe of multimeter to connector J130 socket E.</td>
</tr>
<tr>
<td>4</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>5</td>
<td>Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>6</td>
<td>If 24 VDC is not present, go to step 2 of this fault.</td>
</tr>
<tr>
<td>7</td>
<td>If 24 VDC is present, troubleshoot trailer electrical system per trailer technical manual.</td>
</tr>
<tr>
<td>8</td>
<td>Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e65. TRAILER MARKER/TAillIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Towing vehicle marker/taillights OK.
- Circuit breaker CB41 OK.
- Trailer electrical system OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty relay K28.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

---

2. **CAUTION**
- Read CAUTION on following page.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

**KNOWN INFO**
- Is continuity present from connector J130 socket E to relay K28 terminal 87?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

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

---

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

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 24 VDC is not present, wire 1957 is faulty.

**KNOWN INFO**
- Is 24 VDC present at relay K28 terminal 30 on PDP?

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 24 VDC is not present, wire 1957 is faulty.

**KNOWN INFO**
- Repair wire 1957 from K28 terminal 30 on PDP to circuit breaker CB41 terminal 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

---

**KNOWN INFO**
- Towing vehicle marker/taillights OK.
- Circuit breaker CB41 OK.
- Trailer electrical system OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty relay K28.

---

2-788 Change 1
**WARNING**

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

**CAUTION**

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

**NOTE**

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

---

### CONTINUITY TEST

1. Remove PDP cover (para 16-2).
2. Remove relay K28 from PDP.
3. Set multimeter to ohms.
4. Connect positive (+) probe of multimeter to connector J130 socket E.
5. Connect negative (-) probe of multimeter to relay K28 terminal 87 on PDP and note reading on multimeter.
6. If continuity is not present, go to step 6 of this fault.

---

### VOLTAGE TEST

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to relay K28 terminal 30 on PDP.
3. Connect negative (-) probe of multimeter to ground.
4. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
5. If 24 VDC is not present, repair wire 1957 from K28 terminal 30 on PDP to circuit breaker CB41 terminal 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e65. TRAILER MARKER/TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Towing vehicle marker/taillights OK.
- Circuit breaker CB41 OK.
- Trailer electrical system OK.
- Rear lights cable assembly OK.
- Rear intervehicular 24 VDC (12 pin) cable.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty relay K28.

4. **TEST OPTIONS**
   - Voltage Test or STE/ICE-R Test #89
   - **REASON FOR QUESTION**
     - If 12 VDC is not present, wire 1955 is faulty.

   **WARNING**
   Read WARNING on following page.

   **POSSIBLE PROBLEMS**
   - Is 12 VDC present at relay K28 terminal 86 on PDP?

   **TEST OPTIONS**
   - Continuity Test or STE/ICE-R Test #91
   - **REASON FOR QUESTION**
     - If continuity is not present, wire 3056 is faulty.

5. **POSSIBLE PROBLEMS**
   - Is continuity present from relay K28 terminal 85 on PDP to ground?

   **TEST OPTIONS**
   - Voltage Test or STE/ICE-R Test #89
   - **REASON FOR QUESTION**
     - If 12 VDC is not present, wire 1955 is faulty.

   **POSSIBLE PROBLEMS**
   - Repair wire 1955 from relay K28 terminal 86 on PDP to terminal board TB1 position 5 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   **POSSIBLE PROBLEMS**
   - Repair wire 3056 from K28 terminal 85 on PDP to terminal board TB2 position 22 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   Replace relay K28 (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 circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to relay K28 terminal 86 on PDP.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If 12 VDC is not present, repair wire 1955 from relay K28 terminal 86 on PDP to terminal board TB1 position 5 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(6) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to relay K28 terminal 85 on PDP.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If continuity is not present, repair wire 3056 from K28 terminal 85 on PDP to terminal board TB2 position 22 (para 2-45) or replace WTEC II dashboard assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(5) If continuity is present, replace relay K28 (para 7-9).</td>
</tr>
<tr>
<td>(6) Install relay K28 in PDP.</td>
</tr>
<tr>
<td>(7) Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
e65. TRAILER MARKER/TAILLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Towing vehicle marker/taillights OK.
- Circuit breaker CB41 OK.
- Trailer electrical system OK.
- Relay K28 OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 489T is faulty.

**6.**
- Is continuity present from relay K28 terminal 87 on PDP to connector J51 pin 9?

**CAUTION**
Read CAUTION on following page.

- **YES**
  - Repair wire 489T from relay K28 terminal 87 on PDP to connector J51 pin 9 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**
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 relay K28 terminal 87 on PDP.
(7) Connect negative (-) probe of multimeter to connector J51 pin 9 and note reading on multimeter.
(8) If continuity is not present, repair wire 489T from relay K28 terminal 87 on PDP to connector J51 pin 9 (para 2-45) or replace WTEC II dashboard assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) Install relay K28 in PDP.

CAUTION

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

NOTE

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

NOTE

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.
e65. TRAILER MARKER/TAILLIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Towing vehicle marker/tailights OK.
Circuit breaker CB41 OK.
Trailer electrical system OK.
Dashboard cable assembly OK.
Relay K28 OK.

POSSIBLE PROBLEMS
Faulty rear lights cable assembly.
Faulty rear intervehicular 24 VDC (12 pin) cable.

TEST OPTIONS
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION
If continuity is not present, wire 489T is faulty. If
continuity is present, intervehicular 24 VDC (12 pin)
cable is faulty.

CAUTION
Read CAUTION on following page.

7. Is continuity present from
connector P51 socket 9
to connector P53R pin 2?

NO

YES

Replace intervehicular 24 VDC cable (para 7-129).

Repair wire 489T from connector P51 socket 9
to connector P53R pin 2 (para 2-45) or replace
M1083/M1084/M1085/M1090/M1092/
M1093/M1094 rear lights cable assembly
(para 7-84) or M1086/M1088/M1089 rear lights
cable assembly (para 7-104).
CONTINUITY TEST

(1) Disconnect connector P53R from connector J53R.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P51 socket 9.
(4) Connect negative (-) probe of multimeter to connector P53R pin 2 and note reading on multimeter.
(5) If continuity is not present, repair wire 489T from connector P51 socket 9 to connector P53R pin 2 (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).
(6) If continuity is present, replace intervehicular 24 VDC (12 pin) cable (para 7-129).
(7) Connect connector P53R to connector J53R.
(8) Connect connector P51 to connector J51.
(9) Install PDP on dashboard with three screws.
(10) Install three washers and screws in PDP.
(11) Install PDP cover (para 16-2).
**e66. TRAILER RIGHT STOP/TURN LIGHT DOES NOT ILLUMINATE**

**INITIAL SETUP**

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Material/Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Wire, Elect, 50 ft (Item 71, Appendix D)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tools and Special Tools</th>
<th>Personnel Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
<td>(2)</td>
</tr>
<tr>
<td>STE/ICE-R (Item 41, Appendix C)</td>
<td></td>
</tr>
<tr>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
<td></td>
</tr>
</tbody>
</table>

**Note**

Perform Electrical System Troubleshooting e1. Circuit Breaker Does Not Operate on circuit breaker CB44 prior to beginning this task.

**KNOWN INFO**

- Towing vehicle right stop/turn light OK.
- Circuit breaker CB44 OK.

**POSSIBLE PROBLEMS**

- Faulty trailer electrical system.
- Faulty dashboard cable assembly.
- Faulty relay K31.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

- If 24 VDC is present, trailer electrical system is faulty.

**START**

1. **WARNING CAUTION**
   Read WARNING and CAUTION on following page.

   Is 24 VDC present at connector J130 socket J?

   **NO**

   **YES**

   Troubleshoot trailer electrical system per trailer technical manual.

   Go to step 2 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 circuits and cause severe burns or electrical shock.

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

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

**VOLTAGE TEST**

(1) Lift cover on connector J130 intervehicular 24 VDC connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector J130 socket J.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1).
(6) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(7) Apply brakes 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, troubleshoot trailer electrical system per trailer technical manual.
(10) Position main light switch to OFF (TM 9-2320-366-10-1).
(11) Position master power switch to off (TM 9-2320-366-10-1).
e66. TRAILER RIGHT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

2. **CAUTION**

Read CAUTION on following page.

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towing vehicle right stop/turn light OK.</td>
</tr>
<tr>
<td>Circuit breaker CB44 OK.</td>
</tr>
<tr>
<td>Trailer electrical system OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty relay K31.</td>
</tr>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
<tr>
<td>Faulty rear intervehicular 24 VDC (12 pin) cable.</td>
</tr>
</tbody>
</table>

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

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

2. Is continuity present from connector J 130 socket J to relay K31 terminal 87?

- **NO**

- **YES**

   Go to step 6 of this fault.

---

3. **WARNING**

Read WARNING on following page.

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towing vehicle right stop/turn light OK.</td>
</tr>
<tr>
<td>Circuit breaker CB44 OK.</td>
</tr>
<tr>
<td>Trailer electrical system OK.</td>
</tr>
<tr>
<td>Rear lights cable assembly OK.</td>
</tr>
<tr>
<td>Rear intervehicular 24 VDC (12 pin) cable OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty relay K31.</td>
</tr>
</tbody>
</table>

**REASON FOR QUESTION**
If 24 VDC is not present, wire 1956 is faulty.

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

3. Is 24 VDC present at relay K31 terminal 30 on PDP?

- **NO**

- **YES**

   Repair wire 1956 from K31 terminal 30 on PDP to circuit breaker CB44 terminal 6 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**WARNING**

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

**CONTINUITY TEST**

1. Remove PDP cover (para 16-2).
2. Remove relay K31 from PDP.
3. Set multimeter to ohms.
4. Connect positive (+) probe of multimeter to connector J 130 socket J.
5. Connect negative (-) probe of multimeter to relay K31 terminal 87 on PDP and note reading on multimeter.
6. If continuity is not present, go to step 6 of this fault.

**NOTE**

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

**VOLTAGE TEST**

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to relay K31 terminal 30 on PDP.
3. Connect negative (-) probe of multimeter to ground.
4. Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
5. If 24 VDC is not present, repair wire 1956 from K31 terminal 30 on PDP to circuit breaker CB44 terminal 6 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**CAUTION**

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

**NOTE**

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
e66. TRAILER RIGHT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Towing vehicle right stop/turn light OK.
- Circuit breaker CB44 OK.
- Trailer electrical system OK.
- Rear lights cable assembly OK.
- Rear intervehicular 24 VDC (12 pin) cable.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty relay K31.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 460B is faulty.

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3048 is faulty.

4. Is 12 VDC present at relay K31 terminal 86 on PDP?

**YES**
- Repair wire 460B from relay K31 terminal 86 on PDP to connector J19 socket 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
- Repair wire 3048 from K31 terminal 85 on PDP to terminal board TB2 position 53 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

5. Is continuity present from relay K31 terminal 85 on PDP to ground?

**YES**
- Replace relay K31 (para 7-9).

**NO**
- Repair wire 3048 from K31 terminal 85 on PDP to terminal board TB2 position 53 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
VOLTAGE TEST

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to relay K31 terminal 86 on PDP.
3. Connect negative (-) probe of multimeter to ground.
4. Position master power switch to on (TM 9-2320-366-10-1).
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
6. Apply brakes and note reading on multimeter.
7. If 12 VDC is not present, repair wire 460B from relay K31 terminal 86 on PDP to connector J19 socket 3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

CONTINUITY TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to relay K31 terminal 85 on PDP.
3. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
4. If continuity is not present, repair wire 3048 from K31 terminal 85 on PDP to terminal board TB2 position 53 (para 2-45) or replace WTEC II dashboard assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
5. If continuity is present, replace relay K31 (para 7-9).
6. Install relay K31 in PDP.
7. Install PDP cover (para 16-2).

WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.
e66. TRAILER RIGHT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Towing vehicle right stop/turn light OK.
- Circuit breaker CB44 OK.
- Trailer electrical system OK.
- Relay K31 OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 460T is faulty.

**6.**
- Is continuity present from relay K31 terminal 87 on PDP to connector J51 pin 16?

- **NO**
  - Repair wire 460T from relay K31 terminal 87 on PDP to connector J51 pin 16 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Read CAUTION on following page.

**CAUTION**
- Change 1
CAUTION

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

NOTE

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

CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>2</td>
<td>Remove three screws from PDP.</td>
</tr>
<tr>
<td>3</td>
<td>Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>4</td>
<td>Disconnect connector J51 from connector P51.</td>
</tr>
<tr>
<td>5</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>6</td>
<td>Connect positive (+) probe of multimeter to relay K31 terminal 87 on PDP.</td>
</tr>
<tr>
<td>7</td>
<td>Connect negative (-) probe of multimeter to connector J51 pin 16 and note reading on multimeter.</td>
</tr>
<tr>
<td>8</td>
<td>If continuity is not present, repair wire 460T from relay K31 terminal 87 on PDP to connector J51 pin 16 (para 2-45) or replace WTEC II dashboard assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>9</td>
<td>Install relay K31 in PDP.</td>
</tr>
</tbody>
</table>
Is continuity present from connector P51 socket 16 to connector P53R socket 5?

**Known Info**
- Towing vehicle right stop/turn light OK.
- Circuit breaker CB44 OK.
- Trailer electrical system OK.
- Dashboard cable assembly OK.
- Relay K31 OK.

**Possible Problems**
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

---

**Test Options**
- Continuity Test or STE/ICE-R Test #91

**Reason for Question**
- If continuity is not present, wire 460T is faulty. If continuity is present, intervehicular 24 VDC (12 pin) cable is faulty.

---

**NO**
- Repair wire 460T from connector P51 socket 16 to connector P53R socket 5 (para 2-45) or replace M1083/M1084/M1085/M1090/M1090/M1092/M1093/M1094 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).

---

**YES**
- Replace intervehicular 24 VDC cable (para 7-129).
CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect connector P53R from connector J53R.</td>
</tr>
<tr>
<td>(2) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector P51 socket 16.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to connector P53R socket 5 and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If continuity is not present, repair wire 460T from connector P51 socket 16 to connector P53R socket 5 (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).</td>
</tr>
<tr>
<td>(6) If continuity is present, replace intervehicular 24 VDC (12 pin) cable (para 7-129).</td>
</tr>
<tr>
<td>(7) Connect connector P53R to connector J53R.</td>
</tr>
<tr>
<td>(8) Connect connector P51 to connector J51.</td>
</tr>
<tr>
<td>(9) Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>(10) Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>(11) Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
e67. TRAILER LEFT STOP/TURN LIGHT DOES NOT ILLUMINATE

INITIAL SETUP

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

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

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE
Perform Electrical System Troubleshooting
e1. Circuit Breaker Does Not Operate on
circuit breaker CB43 prior to beginning this
task.

START

WARNING
CAUTION
Read WARNING and
CAUTION on
following page.

1. Is 24 VDC present at
connector J 130 socket B?

NO

YES

Go to step 2 of this fault.

Troubleshoot trailer electrical
system per trailer technical manual.

TEST OPTIONS
Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION
If 24 VDC is present, trailer electrical system is faulty.

KNOW INFO
Towing vehicle left stop/turn light OK.
Circuit breaker CB43 OK.

POSSIBLE PROBLEMS
Faulty trailer electrical system.
Faulty dashboard cable assembly.
Faulty relay K30.
Faulty rear lights cable assembly.
Faulty rear intervehicular 24 VDC (12 pin) cable.
WARNING

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

CAUTION

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

NOTE

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

---

VOLTAGE TEST

(1) Lift cover on connector J130 intervehicular 24 VDC connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector J130 socket B.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1).
(6) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(7) Apply brakes 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, troubleshoot trailer electrical system per trailer technical manual.
(10) Position main light switch to OFF (TM 9-2320-366-10-1).
(11) Position master power switch to off (TM 9-2320-366-10-1).
e67. TRAILER LEFT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

### KNOWN INFO
- Towing vehicle left stop/turn light OK.
- Circuit breaker CB43 OK.
- Trailer electrical system OK.

### POSSIBLE PROBLEMS
- Faulty dashboard cable assembly.
- Faulty relay K30.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

----------

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
<th>Continuity Test or STE/ICE-R Test #91</th>
</tr>
</thead>
</table>

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

----------

| CAUTION | Read CAUTION on following page. |

#### 2.
- Is continuity present from connector J130 socket B to relay K30 terminal 87?

- NO

----------

| WARNING | Read WARNING on following page. |

#### 3.
- Is 24 VDC present at relay K30 terminal 30 on PDP?

- NO

- YES
  - Go to step 6 of this fault.

----------

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
<th>Voltage Test or STE/ICE-R Test #89</th>
</tr>
</thead>
</table>

### REASON FOR QUESTION
If 24 VDC is not present, wire 1922 is faulty.

----------

| CAUTION | Read CAUTION on following page. |

#### 2.
- Repair wire 1922 from K30 terminal 30 on PDP to circuit breaker CB43 terminal 8 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
WARNING

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

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

CONTINUITY TEST

(1) Remove PDP cover (para 16-2).
(2) Remove relay K30 from PDP.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector J 130 socket B.
(5) Connect negative (-) probe of multimeter to relay K30 terminal 87 on PDP and note reading on multimeter.
(6) If continuity is not present, go to step 6 of this fault.

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

VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to relay K30 terminal 30 on PDP.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position main light switch to SER DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 VDC is not present, repair wire 1922 from K30 terminal 30 on PDP to circuit breaker CB43 terminal 8 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position main light switch to OFF (TM 9-2320-366-10-1).


**e67. TRAILER LEFT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)**

- **KNOWN INFO**
  - Towing vehicle left stop/turn light OK.
  - Circuit breaker CB43 OK.
  - Trailer electrical system OK.
  - Rear lights cable assembly OK.
  - Rear intervehicular 24 VDC (12 pin) cable.

- **POSSIBLE PROBLEMS**
  - Faulty dashboard cable assembly.
  - Faulty relay K30.

---

**TEST OPTIONS**

- **TEST OPTIONS**
  - Voltage Test or STE/ICE-R Test #89

- **REASON FOR QUESTION**
  - If 12 VDC is not present, wire 461B is faulty.

---

**4.**

Is 12 VDC present at relay K30 terminal 86 on PDP?

- **WARNING**
  - Read WARNING on following page.

- **NO**
  - Repair wire 461B from relay K30 terminal 86 on PDP to connector J19 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Faulty dashboard cable assembly.
  - Faulty relay K30.

---

**5.**

Is continuity present from relay K30 terminal 85 on PDP to ground?

- **NO**
  - Repair wire 3047 from K30 terminal 85 on PDP to terminal board TB2 position 50 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace relay K30 (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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to relay K30 terminal 86 on PDP.
3. Connect negative (-) probe of multimeter to ground.
4. Position master power switch to on (TM 9-2320-366-10-1).
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
6. Apply brakes and note reading on multimeter.
7. If 12 VDC is not present, repair wire 461B from relay K30 terminal 86 on PDP to connector J19 socket 2 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

CONTINUITY TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to relay K30 terminal 85 on PDP.
3. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
4. If continuity is not present, repair wire 3047 from K30 terminal 85 on PDP to terminal board TB2 position 50 (para 2-45) or replace WTEC II dashboard assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
5. If continuity is present, replace relay K30 (para 7-9).
6. Install relay K30 in PDP.
7. Install PDP cover (para 16-2).
e67. TRAILER LEFT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Towing vehicle left stop/turn light OK.
- Circuit breaker CB43 OK.
- Trailer electrical system OK.
- Relay K30 OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

6. **CAUTION**

Read **CAUTION** on following page.

Is continuity present from relay K30 terminal 87 on PDP to connector J51 pin 15?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**

If continuity is not present, wire 461T is faulty.

**NO**

**YES**

Repair wire 461T from relay K30 terminal 87 on PDP to connector J51 pin 15 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
**CONTINUITY TEST**

1. 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 relay K30 terminal 87 on PDP.
7. Connect negative (-) probe of multimeter to connector J51 pin 15 and note reading on multimeter.
8. If continuity is not present, repair wire 461T from relay K30 terminal 87 on PDP to connector J51 pin 15 (para 2-45) or replace WTEC II dashboard assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
9. Install relay K30 in PDP.

**CAUTION**

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

**NOTE**

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

---

Xbr6704b

**Change 1**  2-813
e67. TRAILER LEFT STOP/TURN LIGHT DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Towing vehicle left stop/turn light OK.
- Circuit breaker CB43 OK.
- Trailer electrical system OK.
- Dashboard cable assembly OK.
- Relay K30 OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- If continuity is not present, wire 461T is faulty. If continuity is present, intervehicular 24 VDC (12 pin) cable is faulty.

**CAUTION**
Read CAUTION on following page.

7. Is continuity present from connector P51 socket 15 to connector P53R pin 8?

- **NO**
  - Repair wire 461T from connector P51 socket 15 to connector P53R pin 8 (para 2-45) or replace M1083/M1084/M1085/M1090/M1090/M1092/M1093/M1094 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).

- **YES**
  - Replace intervehicular 24 VDC cable (para 7-129).
**CAUTION**

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

**NOTE**

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

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect connector P53R from connector J53R.</td>
</tr>
<tr>
<td>(2) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector P51 socket 15.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to connector P53R pin 8 and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If continuity is not present, repair wire 461T from connector P51 socket 15 to connector P53R pin 8 (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).</td>
</tr>
<tr>
<td>(6) If continuity is present, replace intervehicular 24 VDC (12 pin) cable (para 7-129).</td>
</tr>
<tr>
<td>(7) Connect connector P53R to connector J53R.</td>
</tr>
<tr>
<td>(8) Connect connector P51 to connector J51.</td>
</tr>
<tr>
<td>(9) Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>(10) Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>(11) Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
### e68. TRAILER BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE

#### INITIAL SETUP

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

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

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

**Personnel Required**
- (2)

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

#### NOTE
- Perform Electrical System Troubleshooting

**e1. Circuit Breaker Does Not Operate on circuit breaker CB42 prior to beginning this task.**

---

**WARNING**

**CAUTION**

**KNOWN INFO**
- Towing vehicle blackout marker lights OK.
- Circuit breaker CB42 OK.

**POSSIBLE PROBLEMS**
- Faulty trailer electrical system.
- Faulty dashboard cable assembly.
- Faulty relay K29.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
- If 24 VDC is present, trailer electrical system is faulty.

---

**START**

1. **WARNING CAUTION**
   - Read WARNING and CAUTION on following page.
   - Is 24 VDC present at connector J130 sockets A, C, and H?

**NO**

**YES**

- Troubleshoot trailer electrical system per trailer technical manual.

- Go to step 2 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 circuits and cause severe burns or electrical shock.

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

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

### VOLTAGE TEST

1. Lift cover on connector J130 intervehicular 24 VDC connector.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector J130 socket A.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to BO DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
6. Connect positive (+) probe of multimeter to connector J130 socket C.
7. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
8. Connect positive (+) probe of multimeter to connector J130 socket H.
9. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
10. If 24 VDC is not present, go to step 2 of this fault.
11. If 24 VDC is present, troubleshoot trailer electrical system per trailer technical manual.
e68. TRAILER BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

KNOWLEDGMENT
- Faulty dashboard cable assembly
- Faulty relay K29
- Faulty rear lights cable assembly
- Faulty rear intervehicular 24 VDC (12 pin) cable

POSSIBLE PROBLEMS
- Faulty dashboard cable assembly
- Faulty rear lights cable assembly
- Faulty rear intervehicular 24 VDC (12 pin) cable

TEST OPTIONS
- Continuity Test or
- STE/ICE-R Test #91

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

CAUTION
Read CAUTION on following page.

2. Is continuity present from connector J130 sockets A, C, and H to relay K29 terminal 87?

NO

YES

Go to step 6 of this fault.

WARNING
Read WARNING on following page.

3. Is 24 VDC present at relay K29 terminal 30 on PDP?

NO

YES

Repair wire 1958 from K29 terminal 30 on PDP to circuit breaker CB42 terminal 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

KNOWLEDGMENT
- Towing vehicle blackout marker lights OK
- Circuit breaker CB42 OK
- Trailer electrical system OK

POSSIBLE PROBLEMS
- Faulty dashboard cable assembly
- Faulty relay K29
**CAUTION**
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

### CONTINUITY TEST

(1) Remove PDP cover (para 16-2).
(2) Remove relay K29 from PDP.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector J 130 sockets A, C, and H, one at a time.
(5) Connect negative (-) probe of multimeter to relay K29 terminal 87 on PDP and note reading on multimeter.
(6) If continuity is not present, go to step 6 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 circuits and cause severe burns or electrical shock.

### VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to relay K29 terminal 30 on PDP.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position main light switch to BO DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 VDC is not present, repair wire 1958 from K29 terminal 30 on PDP to circuit breaker CB42 terminal 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position main light switch to OFF (TM 9-2320-366-10-1).
e68. TRAILER BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
<th>TEST OPTIONS</th>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towing vehicle blackout marker lights OK.</td>
<td>Voltage Test or STE/ICE-R Test #89</td>
<td>If 12 VDC is not present, wire 1408 is faulty.</td>
</tr>
<tr>
<td>Circuit breaker CB42 OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trailer electrical system OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear lights cable assembly OK.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear intervehicular 24 VDC (12 pin) cable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulty relay K29.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty relay K29.

4. Is 12 VDC present at relay K29 terminal 86 on PDP?

NO

Repair wire 1408 from relay K29 terminal 86 on PDP to terminal board TB1 position 53 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

YES

Replace relay K29 (para 7-9).

5. Is continuity present from relay K29 terminal 85 on PDP to ground?

NO

Repair wire 3040 from K29 terminal 85 on PDP to terminal board TB2 position 20 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

YES

Replace relay K29 (para 7-9).

WARNING
Read WARNING on following page.

WARNING
Read WARNING on following page.

NO

Repair wire 1408 from relay K29 terminal 86 on PDP to terminal board TB1 position 53 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

YES

Replace relay K29 (para 7-9).

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91 | If continuity is not present, wire 3040 is faulty. |

KNOWN INFO
Towing vehicle blackout marker lights OK. | | |
Circuit breaker CB42 OK. | | |
Trailer electrical system OK. | | |
Rear lights cable assembly OK. | | |
Rear intervehicular 24 VDC (12 pin) cable. | | |
Faulty dashboard cable assembly. | | |
Faulty relay K29. | | |
**WARNING**

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

**VOLTAGE TEST**

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to relay K29 terminal 86 on PDP.
3. Connect negative (-) probe of multimeter to ground.
4. Position main light switch to BO DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.
5. If 12 VDC is not present, repair wire 1408 from relay K29 terminal 86 on PDP to terminal board TB1 position 53 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**CONTINUITY TEST**

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to relay K29 terminal 85 on PDP.
3. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
4. If continuity is not present, repair wire 3040 from K29 terminal 85 on PDP to terminal board TB2 position 20 (para 2-45) or replace WTEC II dashboard assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
5. If continuity is present, replace relay K29 (para 7-9).
6. Install relay K29 in PDP.
7. Install PDP cover (para 16-2).
68. TRAILER BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

### KNOWN INFO
- Towing vehicle blackout marker lights OK.
- Circuit breaker CB42 OK.
- Trailer electrical system OK.
- Relay K29 OK.

### POSSIBLE PROBLEMS
- Faulty dashboard cable assembly.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

---

**CAUTION**
Read CAUTION on following page.

### TEST OPTIONS
- Continuity Test or STE/ICE-R Test #91

### REASON FOR QUESTION
If continuity is not present, wire 484T is faulty.

---

6. **Is continuity present from relay K29 terminal 87 on PDP to connector J51 pin 10?**

- **NO**
  - Repair wire 484T from relay K29 terminal 87 on PDP to connector J51 pin 10 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
CAUTION

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

NOTE

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

CONTINUITY TEST

(1) 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 relay K29 terminal 87 on PDP.
(7) Connect negative (-) probe of multimeter to connector J51 pin 10 and note reading on multimeter.
(8) If continuity is not present, repair wire 484T from relay K29 terminal 87 on PDP to connector J51 pin 10 (para 2-45) or replace WTEC II dashboard assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) Install relay K29 in PDP.
e68. TRAILER BLACKOUT MARKER LIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Towing vehicle blackout marker lights OK.
- Circuit breaker CB42 OK.
- Trailer electrical system OK.
- Dashboard cable assembly OK.
- Relay K29 OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R Test #91

**REASON FOR QUESTION**
- Continuity Test or STE/ICE-R Test #91

**CAUTION**
Read CAUTION on following page.

7. Is continuity present from connector P51 socket 10 to connector P53R sockets 7 and 9 and pin 10?

**YES**
- Repair wire 484T from connector P51 socket 10 to connector P53R socket 7 or 9 or pin 10 (para 2-45) or replace M1083/M1084/M1085/M1090/M1090/M1092/M1093/M1094 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).
- Replace intervehicular 24 VDC cable (para 7-129).

**NO**
- If continuity is not present, wire 484T is faulty. If continuity is present, intervehicular 24 VDC (12 pin) cable is faulty.
CONTINUITY TEST

(1) Disconnect connector P53R from connector J53R.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P51 socket 10.
(4) Connect negative (-) probe of multimeter to connector P53R sockets 7 and 9 and pin 10, one at a time, and note reading on multimeter.
(5) If continuity is not present, repair wire 484T from connector P51 socket 10 to connector P53R socket 7 or 9 or pin 10 (para 2-45) or replace M1083/M1084/ M1085/M1090/M1092/M1093/M1094 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).
(6) If continuity is present, replace intervehicular 24 VDC (12 pin) cable (para 7-129).
(7) Connect connector P53R to connector J53R.
(8) Connect connector P51 to connector J51.
(9) Install PDP on dashboard with three screws.
(10) Install three washers and screws in PDP.
(11) Install PDP cover (para 16-2).

CAUTION

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

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.
e69. TRAILER BLACKOUT STOPLIGHTS DO NOT ILLUMINATE

INITIAL SETUP

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

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

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

**Personnel Required**
- (2)

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

NOTE

Perform Electrical System Troubleshooting
e1. Circuit Breaker Does Not Operate on circuit breaker CB39 prior to beginning this task.

START

1. 

**WARNING**

**CAUTION**

Read **WARNING** and **CAUTION** on following page.

**KNOWN INFO**

- Towing vehicle blackout stoplights OK.
- Circuit breaker CB39 OK.

**POSSIBLE PROBLEMS**

- Faulty trailer electrical system.
- Faulty dashboard cable assembly.
- Faulty relay K27.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 24 VDC (12 pin) cable.

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 24 VDC is present, trailer electrical system is faulty.

**Is 24 VDC present at connector J130 socket F?**

**YES**

Troubleshoot trailer electrical system per trailer technical manual.

**NO**

Go to step 2 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 circuits and cause severe burns or electrical shock.

CAUTION

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

NOTE

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

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Lift cover on connector J130 intervehicular 24 VDC connector.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector J130 socket F.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position main light switch to BO DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(7) Apply brakes and note reading on multimeter.</td>
</tr>
<tr>
<td>(8) If 24 VDC is not present, go to step 2 of this fault.</td>
</tr>
<tr>
<td>(9) If 24 VDC is present, troubleshoot trailer electrical system per trailer technical manual.</td>
</tr>
<tr>
<td>(10) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(11) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
e69. TRAILER BLACKOUT STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
Towing vehicle blackout stoplights OK.
Circuit breaker CB39 OK.
Trailer electrical system OK.

**POSSIBLE PROBLEMS**
Faulty dashboard cable assembly.
Faulty relay K27.
Faulty rear lights cable assembly.
Faulty rear intervehicular 24 VDC (12 pin) cable.

---

**CAUTION**
Read CAUTION on following page.

2.

Is continuity present from connector J 130 socket F to relay K27 terminal 87?

**TEST OPTIONS**
Continuity Test or STE/ICE-R Test #91

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

---

**YES**

Go to step 6 of this fault.

---

**WARNING**
Read WARNING on following page.

3.

Is 24 VDC present at relay K27 terminal 30 on PDP?

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 24 VDC is not present, wire 1959 is faulty.

---

**NO**

---

**NO**

Repair wire 1959 from K27 terminal 30 on PDP to circuit breaker CB39 terminal 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

---

**YES**

---

Known Info:
Towing vehicle blackout stoplights OK.
Circuit breaker CB39 OK.
Trailer electrical system OK.

Possible Problems:
Faulty dashboard cable assembly.
Faulty relay K27.
Faulty rear lights cable assembly.
Faulty rear intervehicular 24 VDC (12 pin) cable.
**CAUTION**

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

**NOTE**

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

**CONTINUITY TEST**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>2</td>
<td>Remove relay K27 from PDP.</td>
</tr>
<tr>
<td>3</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>4</td>
<td>Connect positive (+) probe of multimeter to connector J130 socket F.</td>
</tr>
<tr>
<td>5</td>
<td>Connect negative (-) probe of multimeter to relay K27 terminal 87 on PDP and note reading on multimeter.</td>
</tr>
<tr>
<td>6</td>
<td>If continuity is not present, go to step 6 of this fault.</td>
</tr>
</tbody>
</table>

**WARNING**

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

**VOLTAGE TEST**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set multimeter to volts DC.</td>
</tr>
<tr>
<td>2</td>
<td>Connect positive (+) probe of multimeter to relay K27 terminal 30 on PDP.</td>
</tr>
<tr>
<td>3</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>4</td>
<td>Position main light switch to BO DRIVE (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>5</td>
<td>If 24 VDC is not present, repair wire 1959 from K27 terminal 30 on PDP to circuit breaker CB39 terminal 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>6</td>
<td>Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
**KNOWLEDGE INFO**
- Towing vehicle blackout stoplights OK.
- Circuit breaker CB39 OK.
- Trailer electrical system OK.
- Rear lights cable assembly OK.
- Rear intervehicular 24 VDC (12 pin) cable.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty relay K27.

**4. Is 12 VDC present at relay K27 terminal 86 on PDP?**

- **NO**
  - Repair wire 23 from relay K27 terminal 86 on PDP to connector PX15 socket N (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace relay K27 (para 7-9).

**5. Is continuity present from relay K27 terminal 85 on PDP to ground?**

- **NO**
  - Repair wire 3044 from K27 terminal 85 on PDP to terminal board TB2 position 34 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace relay K27 (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 circuits and cause severe burns or electrical shock.

## VOLTAGE TEST

1. Set multimeter to volts DC.
2. Connect positive (+) probe of multimeter to relay K27 terminal 86 on PDP.
3. Connect negative (-) probe of multimeter to ground.
4. Position master power switch to on (TM 9-2320-366-10-1).
5. Position main light switch to BO DRIVE (TM 9-2320-366-10-1).
6. Apply brakes and note reading on multimeter.
7. If 12 VDC is not present, repair wire 23 from relay K27 terminal 86 on PDP to connector PX15 socket N (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

## CONTINUITY TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to relay K27 terminal 85 on PDP.
3. Connect negative (-) probe of multimeter to ground and note reading on multimeter.
4. If continuity is not present, repair wire 3044 from K27 terminal 85 on PDP to terminal board TB2 position 34 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
5. If continuity is present, replace relay K27 (para 7-9).
6. Install relay K27 in PDP.
7. Install PDP cover (para 16-2).
6. Is continuity present from relay K27 terminal 87 on PDP to connector J51 pin 8?

**CAUTION**
Read **CAUTION** on following page.

- **KNOWN INFO**
  - Towing vehicle blackout stoplights OK.
  - Circuit breaker CB39 OK.
  - Trailer electrical system OK.
  - Relay K27 OK.

- **POSSIBLE PROBLEMS**
  - Faulty dashboard cable assembly.
  - Faulty rear lights cable assembly.
  - Faulty rear intervehicular 24 VDC (12 pin) cable.

- **TEST OPTIONS**
  - Continuity Test or STE/ICE-R Test #91

- **REASON FOR QUESTION**
  - If continuity is not present, wire 23T is faulty.

**NO**

**YES**

- Repair wire 23T from relay K27 terminal 87 on PDP to connector J51 pin 8 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CAUTION

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

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

1. Remove 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 relay K27 terminal 87 on PDP.
7. Connect negative (-) probe of multimeter to connector J51 pin 8 and note reading on multimeter.
8. If continuity is not present, repair wire 23T from relay K27 terminal 87 on PDP to connector J51 pin 8 (para 2-45) or replace WTMC II dashboard assembly (para 7-10) or WTMC III dashboard cable assembly (para 7-11).
9. Install relay K27 in PDP.
e69. TRAILER BLACKOUT STOPLIGHTS DO NOT ILLUMINATE (CONT)

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towing vehicle blackout stoplights OK.</td>
</tr>
<tr>
<td>Circuit breaker CB39 OK.</td>
</tr>
<tr>
<td>Trailer electrical system OK.</td>
</tr>
<tr>
<td>Dashboard cable assembly OK.</td>
</tr>
<tr>
<td>Relay K27 OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
<tr>
<td>Faulty rear intervehicular 24 VDC (12 pin) cable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R Test #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, wire 23T is faulty. If continuity is present, intervehicular 24 VDC (12 pin) cable is faulty.</td>
</tr>
</tbody>
</table>

7. Is continuity present from connector P51 socket 8 to connector P53R socket 6?

**CAUTION** Read CAUTION on following page.

- **NO**
  - Repair wire 23T from connector P51 socket 8 to connector P53R socket 6 (para 2-45) or replace M1083/M1084/M1085/M1090/M1090/M1092/M1093/M1094 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).

- **YES**
  - Replace intervehicular 24 VDC cable (para 7-129).
CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect connector P53R from connector J53R.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P51 socket 8.
(4) Connect negative (-) probe of multimeter to connector P53R socket 6 and note reading on multimeter.
(5) If continuity is not present, repair wire 23T from connector P51 socket 8 to connector P53R socket 6 (para 2-45) or replace M1083/M1084/M1085/M1090/M1092/M1093/M1094 rear lights cable assembly (para 7-84) or M1086/M1088/M1089 rear lights cable assembly (para 7-104).
(6) If continuity is present, replace intervehicular 24 VDC (12 pin) cable (para 7-129).
(7) Connect connector P53R to connector J53R.
(8) Connect connector P51 to connector J51.
(9) Install PDP on dashboard with three screws.
(10) Install three washers and screws in PDP.
(11) Install PDP cover (para 16-2).
e70. INTERVEHICLE CLEARANCE LIGHTS DO NOT OPERATE

INITIAL SETUP

**Equipment Condition**
- Engine shut down (TM 9-2320-366-10-1).

**Personnel Required**
- (2)

**References**
- TM 9-4910-571-12&P

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

**Materials/Parts**
- Ties, Cable, Plastic (Item 69, Appendix D)

---

**START**

1. **WARNING**
   - Read WARNING on following page.

   Is 12 vdc present at connector J 95-2?

**YES**
- Go to step 2 of this fault.

**NO**
- Perform Electrical System Troubleshooting
  (e48. Side and/or Rear Marker Lights Do Not Illuminate)
  if towed vehicle is FMTV. If not an FMTV vehicle, refer to towed vehicle TM for troubleshooting procedures.

---

**KNOWN INFO**
- Towing vehicle clearance lights operate.

**POSSIBLE PROBLEMS**
- Faulty towed vehicle.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 12 VDC (7 pin) cable.
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

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 9-2320-366-10-1) 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. 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 9-2320-366-10-1).
2-838

**70. INTERVEHICLE CLEARANCE LIGHTS DO NOT OPERATE (CONT)**

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towing vehicle clearance lights operate.</td>
</tr>
<tr>
<td>Towed vehicle clearance lights OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty rear lights cable assembly.</td>
</tr>
<tr>
<td>Faulty rear intervehicular 12 vdc (7 pin) cable.</td>
</tr>
</tbody>
</table>

**WARNING**
Read WARNING on following page.

2. Is 12 vdc present at connector P52R-3?

**TEST OPTIONS**
Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 vdc is not present, wire 489 is faulty. If 12 vdc is present, rear intervehicular (7 pin) 12 vdc cable is faulty.

**YES**
Repair wire 489 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).

**NO**
Replace rear intervehicular 12 vdc (7 pin) cable (para 7-128).
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOTE</strong></td>
</tr>
<tr>
<td>Remove plastic cable ties as required.</td>
</tr>
</tbody>
</table>

(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 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 vdc is not present, repair wire 489 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
(7) If 12 vdc is present, replace rear intervehicular 12 vdc (7 pin) cable (para 7-128).
(8) Position main light switch to OFF (TM 9-2320-366-10-1).

**NOTE**
Install plastic cable ties as required.

(9) Connect connector P52R to connector J52.
e71. INTERVEHICULAR LEFT TURN SIGNAL DOES NOT ILLUMINATE

INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Material/Parts
Ties, Cable, Plastic (Item 69, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

START

WARNING
CAUTION
Read WARNING and CAUTION on following page.

1. Is 12 VDC pulse present at connector J95 pin 3?

REASON FOR QUESTION

NO

If 12 VDC pulse is present, towed vehicle is faulty.

YES

Go to step 2 of this fault.

Perform Electrical System Troubleshooting (e57. Rear Hazard Lights Do Not Illuminate) if towed vehicle is FMTV. If not an FMTV vehicle, refer to towed vehicle TM for troubleshooting procedures.

KNOWLEDGE INFO

Towing vehicle left turn signal illuminates.

POSSIBLE PROBLEMS

Faulty towed vehicle.
Faulty dashboard cable assembly.
Faulty rear lights cable assembly.
Faulty rear intervehicular 12 VDC (7 pin) cable.

TEST OPTIONS

Voltage Test or STE/ICE-R Test #89

12 VDC (7 pin) cable.
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

**NOTE**

(1) Lift cover on connector J95 intervehicular 12 VDC connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector J95 pin 3.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(6) Position turn signal switch to left turn (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 12 VDC pulse is not present, go to step 2 of this fault.
(8) If 24 VDC pulse is present, perform Electrical System Troubleshooting (e57. Rear Hazard Lights Do Not Illuminate) 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 9-2320-366-10-1).
(10) Position main light switch to OFF (TM 9-2320-366-10-1).

---

**WARNING**

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

**CAUTION**

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

---

**NOTE**

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

---

**VOLTAGE TEST**

1. Lift cover on connector J95 intervehicular 12 VDC connector.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector J95 pin 3.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
6. Position turn signal switch to left turn (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 12 VDC pulse is not present, go to step 2 of this fault.
8. If 24 VDC pulse is present, perform Electrical System Troubleshooting (e57. Rear Hazard Lights Do Not Illuminate) if towed vehicle is FMTV. If towed vehicle is not an FMTV, refer to towed vehicle TM for troubleshooting procedures.
TOWING VEHICLE LEFT TURN SIGNAL ILLUMINATES.
TOWED VEHICLE LEFT TURN SIGNAL OK.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty rear lights cable assembly.
Faulty rear intervehicular 12 VDC (7 pin) cable.

Is 12 VDC pulse present at connector J51 pin 12?

If 12 VDC pulse is not present, wire 461B is faulty.

If 12 VDC pulse is not present, wire 461B is faulty.

Repair wire 461B from connector J51 pin 12 to splice E3 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

Read WARNING and CAUTION on following page.

WARNING
CAUTION

If 12 VDC pulse is not present, wire 461B is faulty.

2.

Is 12 VDC pulse present at connector J51 pin 12?

NO

YES

TEST OPTIONS
Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION
If 12 VDC pulse is not present, wire 461B is faulty.
**WARNING**

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

**CAUTION**

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

**NOTE**

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

### VOLTAGE TEST

1. 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 pin 12.
8. Connect negative (-) probe of multimeter to ground.
10. Position turn signal switch to left turn (TM 9-2320-366-10-1) and note reading on multimeter.
11. If 12 VDC pulse is not present, repair wire 461B from connector J51 pin 12 to splice E3.
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).
WARNING
CAUTION
Read WARNING and CAUTION on following page.

3. Is 12 VDC pulse present at connector P52R pin 5?

If 12 VDC pulse is not present, wire 461B is faulty. If 12 VDC pulse is present, rear intervehicular 12 VDC (7 pin) cable is faulty.

If 12 VDC pulse is not present, wire 461B is faulty. If 12 VDC pulse is present, rear intervehicular 12 VDC (7 pin) cable is faulty.

Replace rear intervehicular 12 VDC (7 pin) cable (para 7-128).

Repair wire 461B from connector P51 socket 12 to connector P52R pin 5 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
**WARNING**

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

**CAUTION**

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

**NOTE**

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

---

### VOLTAGE TEST

<table>
<thead>
<tr>
<th>NOTE</th>
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<tbody>
<tr>
<td>Remove plastic cable ties as required.</td>
</tr>
</tbody>
</table>

1. Disconnect connector P52R from connector J52.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P52R pin 5.
4. Connect negative (-) probe of multimeter to ground.
5. Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
6. Position turn signal switch to left turn (TM 9-2320-366-10-1).
7. If 12 VDC pulse is not present, repair wire 461B from connector P51 socket 12 to connector P52R pin 5 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
8. If 12 VDC pulse is present, replace rear intervehicular 12 VDC (7 pin) cable (para 7-128).

**NOTE**

Install plastic cable ties as required.

11. Connect connector P52R to connector J52.
**e72. INTERVEHICULAR RIGHT TURN SIGNAL DOES NOT ILLUMINATE**

**INITIAL SETUP**

**Equipment Condition**
Engine shut down (TM 9-2320-366-10-1).

**Tools and Special Tools**
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

**Material/Parts**
Ties, Cable, Plastic (Item 69, Appendix D)

**Personnel Required**
(2)

**References**
TM 9-4910-571-12&P

---

**KNOWN INFO**
Towing vehicle right turn signal illuminates.

**POSSIBLE PROBLEMS**
Faulty towed vehicle.
Faulty dashboard cable assembly.
Faulty rear lights cable assembly.
Faulty rear intervehicular 12 VDC (7 pin) cable.

---

**TEST OPTIONS**
Voltage Test or
STE/ICE-R Test #89

---

**REASON FOR QUESTION**
If 12 VDC pulse is present, towed vehicle is faulty.

---

**START**

1. **WARNING**
Read WARNING and CAUTION on following page.

Is 12 VDC pulse present at connector J95 pin 5?

---

**NO**

---

**YES**

Go to step 2 of this fault.

---

Perform Electrical System Troubleshooting (e57. Rear Hazard Lights Do Not Illuminate) if towed vehicle is FMTV. If not an FMTV vehicle, refer to towed vehicle TM for troubleshooting procedures.
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

CAUTION

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

VOLTAGE TEST

(1) Lift cover on connector J95 intervehicular 12 VDC connector.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector J95 pin 5.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(6) Position turn signal switch to right turn (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 12 VDC pulse is not present, go to step 2 of this fault.
(8) If 24 VDC pulse is present, perform Electrical System Troubleshooting (e57. Rear Hazard Lights Do Not Illuminate) 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 9-2320-366-10-1).
(10) Position main light switch to OFF (TM 9-2320-366-10-1).
e72. INTERVEHICULAR RIGHT TURN SIGNAL DOES NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Towing vehicle right turn signal illuminates.
- Towed vehicle right turn signal OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 12 VDC (7 pin) cable.

**WARNING**
**CAUTION**
Read **WARNING** and **CAUTION** on following page.

2. Is 12 VDC pulse present at connector J51 pin 11?

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 VDC pulse is not present, wire 460B is faulty.

**YES**
Repair wire 460B from connector J51 pin 11 to splice E4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

### VOLTAGE TEST

1. Remove 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 pin 11.
8. Connect negative (-) probe of multimeter to ground.
10. Position turn signal switch to right turn (TM 9-2320-366-10-1) and note reading on multimeter.
11. If 12 VDC pulse is not present, repair wire 460B from connector J51 pin 11 to splice E4.
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).
3. **POSSIBLE PROBLEMS**

- Faulty rear lights cable assembly.
- Faulty rear intervehicular 12 VDC (7 pin) cable.

**TEST OPTIONS**

- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

If 12 VDC pulse is not present, wire 460B is faulty. If 12 VDC pulse is present, rear intervehicular 12 VDC (7 pin) cable is faulty.

**Known Info**

- Towing vehicle right turn signal illuminates.
- Towed vehicle right turn signal OK.
- Dashboard cable assembly OK.

**Warning and Caution**

Read WARNING and CAUTION on following page.

Is 12 VDC pulse present at connector P52R pin 7?

**YES**

Replace rear intervehicular 12 VDC (7 pin) cable (para 7-128).

**NO**

Repair wire 460B from connector P51 socket 11 to connector P52R pin 7 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
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 pin 7.
(4) Connect negative (−) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).
(6) Position turn signal switch to right turn (TM 9-2320-366-10-1).
(7) If 12 VDC pulse is not present, repair wire 4608 from connector P51 socket 11 to connector P52R pin 7 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
(8) If 12 VDC pulse is present, replace rear intervehicular 12 VDC (7 pin) cable (para 7-128).
(9) Position turn signal switch to off (TM 9-2320-366-10-1).
(10) Position main light switch to OFF (TM 9-2320-366-10-1).

NOTE
Install plastic cable ties as required.

(11) Connect connector P52R to connector J52.
e73. INTERVEHICULAR STOPLIGHTS DO NOT ILLUMINATE

INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Material/Parts
Ties, Cable, Plastic (Item 69, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

START

WARNING
CAUTION
Read WARNING and CAUTION on following page.

1. Is 12 VDC present at connector J95 pin 4?

NO

POSSIBLE PROBLEMS
Faulty towed vehicle.
Faulty dashboard cable assembly.
Faulty rear lights cable assembly.
Faulty rear intervehicular 12 VDC (7 pin) cable.

YES

Perform Electrical System Troubleshooting
(e61. One or Both Stoplights Do Not Illuminate)
if towed vehicle is FMTV. If not an FMTV vehicle, refer
to towed vehicle TM for troubleshooting procedures.

TEST OPTIONS
Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION
If 12 VDC is present, towed vehicle is faulty.

YES

Go to step 2 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 circuits and cause severe burns or electrical shock.

## CAUTION

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

## NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

### VOLTAGE TEST

1. Lift cover on connector J95 intervehicular 12 VDC connector.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector J95 pin 4.
4. Connect negative (-) probe of multimeter to ground.
5. Position master power switch to on (TM 9-2320-366-10-1).
7. Apply brakes and note reading on multimeter.
8. If 12 VDC is not present, go to step 2 of this fault.
9. If 24 VDC is present, perform Electrical System Troubleshooting (61. One or Both Stoplights Do Not Illuminate) if towed vehicle is FMTV. If towed vehicle is not FMTV, refer to towed vehicle TM for troubleshooting procedures.
**Known Info**
- Towing vehicle stoplights illuminate.
- Towed vehicle stoplights OK.

**Possible Problems**
- Faulty dashboard cable assembly.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 12 VDC (7 pin) cable.

**Test Options**
- Voltage Test or STE/ICE-R Test #89

**Reason for Question**
- If 12 VDC is not present, wire 22C is faulty.

**Diagram**

**Question:** Is 12 VDC present at connector J51 pin 13?

- **No**
  - Repair wire 22C from connector J51 pin 13 to terminal board TB1 position 31 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **Yes**
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

CAUTION
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(2) Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>(3) Remove three screws from PDP.</td>
</tr>
<tr>
<td>(4) Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>(5) Disconnect connector J51 from connector P51.</td>
</tr>
<tr>
<td>(6) Set multimeter to volts DC.</td>
</tr>
<tr>
<td>(7) Connect positive (+) probe of multimeter to connector J51 pin 13.</td>
</tr>
<tr>
<td>(8) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(9) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(11) Apply brakes and note reading on multimeter.</td>
</tr>
<tr>
<td>(12) If 12 VDC is not present, repair wire 22C from connector J51 pin 13 to terminal board TB1 position 31.</td>
</tr>
<tr>
<td>(13) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(14) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(15) Connect connector J51 to connector P51.</td>
</tr>
<tr>
<td>(16) Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>(17) Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>(18) Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
e73. INTERVEHICULAR STOPLIGHTS DO NOT ILLUMINATE (CONT)

**KNOWN INFO**
- Towing vehicle stoplights illuminate.
- Towed vehicle stoplights OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 12 VDC (7 pin) cable.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

---

**3. Is 12 VDC present at connector P52R pin 6?**

- **YES**
  - Repair wire 22C from connector P51 socket 13 to connector P52R pin 6 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).

- **NO**
  - Replace rear intervehicular 12 VDC (7 pin) cable (para 7-128).

---

**WARNING**
- Read WARNING and CAUTION on following page.

**CAUTION**
- Towing vehicle stoplights illuminate.
- Towed vehicle stoplights OK.
- Dashboard cable assembly OK.

**REASON FOR QUESTION**
- If 12 VDC is not present, wire 22C is faulty. If 12 VDC is present, rear intervehicular 12 VDC (7 pin) 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 circuits and cause severe burns or electrical shock.

**CAUTION**

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

**NOTE**

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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### VOLTAGE TEST

<table>
<thead>
<tr>
<th>NOTE</th>
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<tbody>
<tr>
<td>Remove plastic cable ties as required.</td>
</tr>
</tbody>
</table>

1. Disconnect connector P52R from connector J52.
2. Set multimeter to volts DC.
3. Connect positive (+) probe of multimeter to connector P52R pin 6.
4. Connect negative (-) probe of multimeter to ground.
5. Position master power switch to on (TM 9-2320-366-10-1).
7. Apply brakes and note reading on multimeter.
8. If 12 VDC is not present, repair wire 22C from connector P51 socket 13 to connector P52R pin 6 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
9. If 12 VDC is present, replace rear intervehicular 12 VDC (7 pin) cable (para 7-128).

**NOTE**

Install plastic cable ties as required.

12. Connect connector P52R to connector J52.
e74. **INTERVERHICLE TAILLIGHTS DO NOT OPERATE**

### INITIAL SETUP

**Equipment Condition**
Engine shut down (TM 9-2320-366-10-1).

**Personnel Required**
(2)

**References**
TM 9-4910-571-12&P

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

**Materials/Parts**
- Ties, Cable, Plastic (Item 69, Appendix D)

---

**KNOW TO INFO**

Towing vehicle taillights operate.

**POSSIBLE PROBLEMS**
- Faulty towed vehicle.
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 12 VDC (7 pin) cable.

---

**TEST OPTIONS**

Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**

This question eliminates possible problems and determines where troubleshooting continues.

---

**START**

1. **WARNING**
   
   Read WARNING on following page.

   Is 12 vdc present at connector J 95-6?

   **NO**

   **YES**

   Go to step 2 of this fault.

   Perform Electrical System Troubleshooting (e49. One or Both Composite Lights Do Not Illuminate) if towed vehicle is FMTV. If not an FMTV vehicle, refer to towed vehicle TM for troubleshooting procedures.
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**WARNING**

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 9-2320-366-10-1) 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 (e49. One or Both Composite Lights Do Not Iilluminate) if towed vehicle is FMTV. If towed vehicle is not an FMTV, refer to towed vehicle TM for troubleshooting procedures.
74. INTERVEHICLE TAILLIGHTS DO NOT OPERATE (CONT)

**KNOWN INFO**
- Towing vehicle taillights operate.
- Towed vehicle taillights OK.

**POSSIBLE PROBLEMS**
- Faulty rear lights cable assembly.
- Faulty rear intervehicular 12 vdc (7 pin) cable.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R Test #89

**REASON FOR QUESTION**
If 12 vdc is not present, wire 21 is faulty. If 12 vdc is present, rear intervehicular 12vdc (7 pin)cable is faulty.

**WARNING**
Read WARNING on following page.

2. Is 12 vdc present at connector P52R-1?

**YES**
- Repair wire 21 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).

**NO**
- Replace rear intervehicular 12 vdc (7 pin) cable (para 7-128).
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

**WARNING**

**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 9-2320-366-10-1) and note reading on multimeter.
6. If 12 vdc is not present, repair wire 21 (para 2-45) or replace rear lights cable assembly (para 7-84 or 7-104).
7. If 12 vdc is present, replace rear intervehicular 12 vdc (7 pin) cable (para 7-128).

**NOTE**

Install plastic cable ties as required.

9. Connect connector P52R to connector J52.
1. Is continuity present through lamps?

- **YES**
  - Replace lamps (para 18-9).

- **NO**
  - Faulty lamps.
  - Faulty dashboard cable assembly.
  - Faulty personnel heater.
  - Continuity Test or STE/ICE-R #91
  - If continuity is not present, lamps are faulty.

**KNOWN INFO**
- Circuit breaker OK.
- Main instrument panel illuminates.

**POSSIBLE PROBLEMS**
- Faulty lamps.
- Faulty dashboard cable assembly.
- Faulty personnel heater.

**INITIAL SETUP**

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1)</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
</tbody>
</table>

**Personnel Required**
- (2)

**References**
- TM 9-4910-571-12&P
**CONTINUITY TEST**

<table>
<thead>
<tr>
<th>Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove lamps from heater (para 18-9).</td>
</tr>
<tr>
<td>(2) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(3) Check continuity through each lamp.</td>
</tr>
<tr>
<td>(4) If continuity is not present, replace lamp(s) (para 18-9).</td>
</tr>
</tbody>
</table>
e75. PERSONNEL HEATER ILLUMINATION DOES NOT OPERATE (CONT)

2. Is 12 vdc present at power contacts of heater control lamp sockets?
   - NO
   - YES
     Go to step 4 of this fault.

   KNOWN INFO
   - Circuit breaker OK.
   - Main instrument panel illuminates.
   - Lamps OK.
   - POSSIBLE PROBLEMS
     - Faulty dashboard cable assembly.
     - Faulty personnel heater.

   WARNING
   Read WARNING on following page.

   TEST OPTIONS
   - Voltage Test or STE/ICE-R #89

   REASON FOR QUESTION
   This question eliminates possible problems and determines where troubleshooting continues.

3. Is continuity present between connector PX25-3 and a known good ground?
   - NO
   - YES
     Repair wire 3003 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

   KNOWN INFO
   - Circuit breaker OK.
   - Main instrument panel illuminates.
   - Lamps OK.
   - POSSIBLE PROBLEMS
     - Faulty dashboard cable assembly.
     - Faulty personnel heater.

   TEST OPTIONS
   - Continuity Test or STE/ICE-R #91

   REASON FOR QUESTION
   If continuity is not present, wire 3003 is faulty. If continuity is present, personnel heater is faulty.

   Replace or repair personnel heater (para 18-9).
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.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to power contact of each heater control lamp socket.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Position main light switch to SER DRIVE (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(5) Position main light switch auxiliary lever to PANEL BRT (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position dimmer switch to maximum brightness (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 12 vdc is not present, go to step 4 of this fault.</td>
</tr>
<tr>
<td>(8) Position main light switch to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Position main light switch auxiliary lever to OFF (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Install lamps in heater (para 18-9).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove personnel heater for access (para 18-9).</td>
</tr>
<tr>
<td>(2) Disconnect connector PX25 from personnel heater connector.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to connector PX25-3.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(6) If continuity is not present, repair wire 3003 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(7) If continuity is present, replace or repair personnel heater (para 18-9).</td>
</tr>
<tr>
<td>(8) Connect connector PX25 to personnel heater connector.</td>
</tr>
<tr>
<td>(9) Install personnel heater (para 18-9).</td>
</tr>
</tbody>
</table>
4. Is 12 vdc present at connector PX25-2?

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
If 24 vdc is not present, wire 1908 is faulty. If 24 vdc is present, personnel heater is faulty.

**YES**
Repair wire 1908 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
Replace or repair personnel heater (para 18-9).

**KNOWLEDGE INFO**
- Circuit breaker OK.
- Main instrument panel illuminates.
- Lamps OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty personnel heater.
**WARNING**

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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 9-2320-366-10-1).
7. Position main light switch auxiliary lever to PNL BRT (TM 9-2320-366-10-1).
8. Position dimmer switch to maximum brightness (TM 9-2320-366-10-1) and note reading on multimeter.
9. If 12 vdc is not present, repair wire 1908 (para 2-45) 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).
13. Connect connector PX25 to personnel heater connector.
### INITIAL SETUP

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1).</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>Personnel Required</td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td>(2)</td>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
</tr>
</tbody>
</table>

**References**

TM 9-4910-571-12&P

---

#### 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

- Voltage Test or
- STE/ICE-R #89

**Reason for Question**

This question eliminates possible problems and determines where troubleshooting continues.

---

#### Flowchart

1. **WARNING**
   
   Is 24 vdc present at heater fan control switch blue wire?

   - **NO**
     - Go to step 5 of this fault.
   - **YES**
     - Go to step 5 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 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 9-2320-366-10-1) and note reading on multimeter.

(6) If 24 vdc is not present, go to step 5 of this fault.

(7) Position master power switch to off (TM 9-2320-366-10-1).
76. PERSONNEL HEATER FAN DOES NOT OPERATE (CONT)

2. Is continuity present between heater fan control switch orange wire and a known good ground?

   YES
   Go to step 4 of this fault.

   NO

   KNOWLEDGE
   Circuit breaker OK.
   Main instrument panel controls and indicators OK.
   Dashboard cable assembly OK.

   POSSIBLE PROBLEMS
   Faulty heater fan control switch.
   Faulty personnel heater.

3. Is continuity present between heater fan control switch terminals?

   YES
   Replace heater fan control switch (para 18-10).

   NO
   Replace or repair personnel heater (para 18-9).

   KNOWLEDGE
   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
   This question eliminates possible problems and determines where troubleshooting continues.

   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.

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).
e76. 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. |

4. Is continuity present between connector PX25-4 and a known good ground?

| TEST OPTIONS |
| Continuity Test or STE/ICE-R #91 |

| REASON FOR QUESTION |
| If continuity is not present, wire 3003 is faulty. If continuity is present, personnel heater is faulty. |

| YES |
| Repair wire 3003 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11). |
| NO |

| Replace or repair personnel heater (para 18-9). |

---

| 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. |

5. Is 24 vdc present at connector PX25-1?

| TEST OPTIONS |
| Voltage Test or STE/ICE-R #89 |

| REASON FOR QUESTION |
| If 24 vdc is not present, wire 1601 is faulty. If 24 vdc is present, personnel heater is faulty. |

| YES |
| Repair wire 1601 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11). |
| NO |

| Replace or repair personnel heater (para 18-9). |
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) If continuity is present, 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 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 1601 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If 24 vdc is present, replace or repair personnel heater (para 18-9).
(9) Position master power switch to off (TM 9-2320-366-20-1).
(10) Install personnel heater (para 18-9).
(11) Install heater fan control switch (para 18-10).
**e77. WINDSHIELD WASHER DOES NOT OPERATE**

**INITIAL SETUP**

- **Equipment Condition**: Engine shut down (TM 9-2320-366-10-1).
- **Personnel Required**: (2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

**References**
- TM 9-4910-571-12&P

---

**KNOWN INFO**
- Nothing.

**POSSIBLE PROBLEMS**
- Faulty windshield washer pump EMI cable.
- Faulty windshield washer pump.
- Faulty front lights cable assembly.
- Faulty dashboard cable assembly.
- Faulty turn signal switch.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- This question eliminates possible problems and determines where troubleshooting continues.

**START**

1. Is 24 vdc present at connector P125-2?

**NO**

**YES**

Go to step 5 of this fault.
### VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Open left cab step tread (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector P125 from windshield washer pump connector.</td>
</tr>
<tr>
<td>3</td>
<td>Set multimeter to volts dc.</td>
</tr>
<tr>
<td>4</td>
<td>Connect positive (+) probe of multimeter to connector P125-2.</td>
</tr>
<tr>
<td>5</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>6</td>
<td>Operate windshield washer (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>7</td>
<td>If 24 vdc is not present, go to step 5 of this fault.</td>
</tr>
<tr>
<td>8</td>
<td>Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>9</td>
<td>Connect connector P125 to windshield washer pump connector.</td>
</tr>
</tbody>
</table>
e77. 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.

2.

- Is continuity present between connector P25-1 and terminal TL94?

  **YES**
  - Repair wire 3038 (para 2-45) or replace front lights cable assembly (para 7-82).

  **NO**
  - Faulty front lights cable assembly.
  - Faulty windshield washer pump.
  - Faulty windshield washer pump EMI cable.

3.

- Is continuity present between two terminals on windshield washer pump?

  **YES**
  - Replace windshield washer pump (para 18-2).

  **NO**
  - Faulty windshield washer pump.
  - Faulty windshield washer pump EMI cable.

**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.
### 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 2-45) or replace front lights cable assembly (para 7-82).

---

### 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 or windshield washer pump connector.
5. If continuity is not present, replace windshield washer motor pump (para 18-2).
6. Connect connector P125 to windshield washer pump connector.
4. Is continuity present between connector P125-1 and connector P25-1?

**TEST OPTIONS**
- **Continuity Test STE/ICE-R #91**

**REASON FOR QUESTION**
- If continuity is not present, windshield washer pump EMI cable faulty. If continuity is present, windshield washer pump is faulty.

**KNOWN INFO**
- Front lights cable assembly OK.
- Dashboard cable assembly OK.
- Turn signal switch OK.

**POSSIBLE PROBLEMS**
- Faulty windshield washer pump EMI cable.
- Faulty windshield washer pump.

**YES**
- Replace windshield washer pump EMI cable (para 7-67).
- Replace windshield washer pump (para 18-2).
### CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disconnect connector P25 from connector J25.</td>
</tr>
<tr>
<td>2</td>
<td>Disconnect connector P125 from windshield washer pump connector.</td>
</tr>
<tr>
<td>3</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>4</td>
<td>Connect positive (+) probe of multimeter to connector P25-1.</td>
</tr>
<tr>
<td>5</td>
<td>Connect negative (-) probe of multimeter to connector P125-1 and note reading on multimeter.</td>
</tr>
<tr>
<td>6</td>
<td>If continuity is not present, replace windshield washer pump EMI cable (para 7-67).</td>
</tr>
<tr>
<td>7</td>
<td>If continuity is present, replace windshield washer pump (para 18-2).</td>
</tr>
<tr>
<td>8</td>
<td>Connect connector P25 to connector J25.</td>
</tr>
<tr>
<td>9</td>
<td>Connect connector P125 to windshield washer pump.</td>
</tr>
<tr>
<td>10</td>
<td>Close left cab step tread (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
If 24 vdc is not present, wire 1569 is faulty.

Is 24 vdc present at connector P18-4?

YES

NO

Is continuity present between turn signal switch connector terminal 4 and terminal 8?

YES

Replace turn signal switch (para 7-26).

NO

Repair wire 1569 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical 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 9-2320-366-10-1).
7. Press windshield washer switch (TM 9-2320-366-10-1) and note reading on multimeter.
8. If 24 vdc is not present, repair wire 1569 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

CONTINUITY TEST

1. Set multimeter to ohms.
2. Connect positive (+) probe of multimeter to 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 9-2320-366-10-1) and note reading on multimeter.
5. If continuity is not present, replace turn signal switch (para 7-26).
6. Connect connector P18 to turn signal switch connector.
7. Install instrument panel assembly (para 7-15).
7. **WARNING**
Read WARNING on following page.

**Is 24 vdc present at connector J27-4?**

- **YES**
  - Repair wire 1424 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **NO**
  - If 24 vdc is not present, wire 1424 is faulty.

**KNOWN INFO**
- Windshield washer pump OK.
- Turn signal switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.
- Faulty windshield washer pump EMI cable.
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>2</td>
<td>Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>3</td>
<td>Remove three screws from PDP.</td>
</tr>
<tr>
<td>4</td>
<td>Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>5</td>
<td>Disconnect connector J27 from connector P27.</td>
</tr>
<tr>
<td>6</td>
<td>Set multimeter to volts dc.</td>
</tr>
<tr>
<td>7</td>
<td>Connect positive (+) probe of multimeter to connector J27-4.</td>
</tr>
<tr>
<td>8</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>9</td>
<td>Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>10</td>
<td>Press windshield washer switch (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>11</td>
<td>If 24 vdc is not present, repair wire 1424 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>12</td>
<td>Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>13</td>
<td>Connect connector J27 to connector P27.</td>
</tr>
<tr>
<td>14</td>
<td>Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>15</td>
<td>Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>16</td>
<td>Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
e77. WINDSHIELD WASHER DOES NOT OPERATE (CONT)

**KNOWN INFO**
- Windshield washer pump OK.
- Turn signal switch OK.
- Dashboard cable assembly OK.

**POSSIBLE PROBLEMS**
- Faulty front lights cable assembly.
- Faulty windshield washer pump EMI cable.

---

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
If 24 vdc is not present, wire 1424 in front lights cable assembly is faulty.
If 24 vdc is present, windshield washer pump EMI cable is faulty.

---

8. Is 24 vdc present at connector P25-2?

- **NO**
  - Replace windshield washer pump EMI cable (para 7-67).

- **YES**
  - Repair wire 1424 (para 2-45) or replace front lights cable assembly (para 7-82).
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect connector P25 from connector J25.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector P25-2.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Press windshield washer switch (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 24 vdc is not present, repair wire 1424 (para 2-45) or replace front lights cable assembly (para 7-82).</td>
</tr>
<tr>
<td>(8) If 24 vdc is present, replace windshield washer pump EMI cable (para 7-67).</td>
</tr>
<tr>
<td>(9) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Connect connector P25 to connector J25.</td>
</tr>
<tr>
<td>(11) Close left cab step tread (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
1. Is 24 vdc present on connector PX22-5?

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
This question eliminates possible problems and determines where troubleshooting continues.

**KNOWN INFO**
- Windshield washer operates.
- Horn operates.
- Windshield wiper operates on high speed.
- Windshield wiper operates on intermittent speed.

**POSSIBLE PROBLEMS**
- Faulty windshield wiper motor.
- Faulty turn signal switch.
- Faulty dashboard cable assembly.
- Faulty windshield wiper EMI cable.
- Faulty windshield wiper ECU.

**INITIAL SETUP**

Equipment Condition
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

**START**

Go to step 3 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.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>2. Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>3. Remove three screws from PDP.</td>
</tr>
<tr>
<td>4. Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>5. Disconnect connector PX22 from windshield wiper motor.</td>
</tr>
<tr>
<td>6. Set multimeter to volts dc.</td>
</tr>
<tr>
<td>7. Connect positive (+) probe of multimeter to connector PX22-5.</td>
</tr>
<tr>
<td>8. Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>10. Position windshield wiper switch to low (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>11. If 24 vdc is not present, go to step 3 of this fault.</td>
</tr>
</tbody>
</table>
2. Windshield washer operates.
Horn operates.
Windshield wiper operates on high speed.
Windshield wiper operates on intermittent speed.

Is 24 vdc present on connector PX22-2?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go to step 5 of this fault.</td>
<td>Replace windshield wiper motor (para 18-4).</td>
</tr>
</tbody>
</table>

**WARNING**
Read WARNING on following page.

**POSSIBLE PROBLEMS**
Faulty windshield wiper motor.
Faulty dashboard cable assembly
Faulty windshield wiper EMI cable.
Faulty windshield wiper ECU.

**TEST OPTIONS**
Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
If 24 vdc is present, windshield wiper motor is faulty.

---

3. Windshield washer operates.
Horn operates.
Windshield wiper operates on high speed.
Windshield wiper operates on intermittent speed.

Is continuity present between turn signal switch connector terminals 4 and 5?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace turn signal switch (para 7-26).</td>
<td></td>
</tr>
</tbody>
</table>

**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.
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector PX22-2.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

NOTE

24 vdc is indicated for approximately 1 (one) second.

(5) Position windshield wiper switch to low (TM 9-2320-366-10-1) and note reading on multimeter.

(6) If 24 vdc is not present, go to step 5 of this fault.

(7) Position windshield wiper switch to off (TM 9-2320-366-10-1).

(8) Position master power switch to off (TM 9-2320-366-10-1).

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove instrument panel assembly for access (para 7-15).</td>
</tr>
<tr>
<td>(2) Disconnect turn signal switch connector from connector P18.</td>
</tr>
<tr>
<td>(3) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(4) Connect positive (+) probe of multimeter to turn signal switch connector terminal 4.</td>
</tr>
<tr>
<td>(5) Connect negative (-) probe of multimeter to turn signal switch connector terminal 5.</td>
</tr>
<tr>
<td>(6) Position windshield wiper switch to low position (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If continuity is not present, replace turn signal switch (para 7-26).</td>
</tr>
<tr>
<td>(8) Position windshield wiper switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Connect turn signal switch connector to connector P18.</td>
</tr>
<tr>
<td>(10) Install instrument panel assembly (para 7-15).</td>
</tr>
</tbody>
</table>
4. Is 24 vdc present on connector J2-5?

**KNOWN INFO**
- Windshield washer operates.
- Horn operates.
- Windshield wiper operates on high speed.
- Windshield wiper operates on intermittent speed.
- Turn signal switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty windshield wiper EMI cable.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 24 vdc is not present, wire 1527 is faulty. If 24 vdc is present, windshield wiper EMI cable is faulty.

**YES**
- Repair wire 1527 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**

5. Is continuity present between connector PX21-4 and a known good ground?

**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 3034 is faulty.

**YES**
- Repair wire 3034 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
**WARNING**

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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 9-2320-366-10-1).
6. Position windshield wiper switch to low (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 24 vdc is not present, repair wire 1527 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
8. If 24 vdc is present, replace windshield wiper EMI cable (para 7-68).
11. Connect connector J2 to connector P2.
12. Install PDP on dashboard with three screws.
13. Install three washers and screws in PDP.

### 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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
e78. WINDSHIELD WIPER DOES NOT OPERATE ON LOW SPEED (CONT)

KNOWLEDGE INFOMATION
Windshield washer operates.
Horn operates.
Windshield wiper operates on high speed.
Windshield wiper operates on intermittent speed.
Windshield wiper motor is OK.
Turn signal switch is 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.

6. Is continuity present between connector PX21-3 and connector J2-4?

NO

YES

Repair wire 1916 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

7. Is continuity present between connector P2-4 and connector PX22-2?

NO

YES

Replace windshield wiper EMI cable (para 7-68).

Replace windshield wiper ECU (para 7-69).
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 2-45) 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.

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 7-68).
(5) If continuity is present, replace windshield wiper ECU (para 7-69).
(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).
**INITIAL SETUP**

- **Equipment Condition**: Engine shut down (TM 9-2320-366-10-1).
- **Personnel Required**: (2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

**References**
- TM 9-4910-571-12&P

---

**e79. ALL WINDSHIELD WIPER SPEEDS DO NOT OPERATE**

**KNOWN INFO**
- Windshield washer operates.
- Horn operates.

**POSSIBLE PROBLEMS**
- Faulty turn signal switch.
- Faulty windshield wiper motor.
- Faulty windshield wiper EMI cable.
- Faulty dashboard cable assembly.

**WARNING**
Read WARNING on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
This question eliminates possible problems and determines where troubleshooting continues.

**START**

1. Is 24 vdc present on connector PX22-3?

**NO**

**YES**

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.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(2) Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>(3) Remove three screws from PDP.</td>
</tr>
<tr>
<td>(4) Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>(5) Disconnect connector PX22 from windshield wiper motor.</td>
</tr>
<tr>
<td>(6) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(7) Connect positive (+) probe of multimeter to connector PX22-3.</td>
</tr>
<tr>
<td>(8) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(9) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(10) If 24 vdc is not present, go to step 4 of this fault.</td>
</tr>
<tr>
<td>(11) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
2. Is continuity present between connector PX22-1 and a known good ground?

   YES
   Go to step 5 of this fault.
   NO

3. Is continuity present between turn signal switch connector terminals 4 and 6?

   YES
   Replace turn signal switch (para 7-26).
   NO
   Replace windshield wiper motor (para 18-4).

   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 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 9-2320-366-10-1) and note reading on multimeter.
7. If continuity is not present, replace turn signal switch (para 7-26).
8. If continuity is present, replace windshield wiper motor (para 18-4).
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.
4. Is 24 vdc present on connector J2-2?

- **NO**
  - **WARNING**
    - Read WARNING on following page.
  - **POSSIBLE PROBLEMS**
    - Faulty dashboard cable assembly.
    - Faulty windshield wiper EMI cable.
  - **TEST OPTIONS**
    - Voltage Test or STE/ICE-R #89

- **YES**
  - **Repair wire 1569 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).**
  - Replace windshield wiper EMI cable (para 7-68).

5. Is continuity present between connector J2-3 and a known good ground?

- **NO**
  - **REASON FOR QUESTION**
    - If 24 vdc is not present, wire 1569 in dashboard cable assembly is faulty. If 24 vdc is present, windshield wiper EMI cable is faulty.
  - **TEST OPTIONS**
    - Continuity Test or STE/ICE-R #91

- **YES**
  - **Repair wire 3037 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).**
  - Replace windshield wiper EMI cable (para 7-68).
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

### VOLTAGE TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disconnect connector J2 from connector P2.</td>
</tr>
<tr>
<td>2</td>
<td>Set multimeter to volts dc.</td>
</tr>
<tr>
<td>3</td>
<td>Connect positive (+) probe of multimeter to connector J2-2.</td>
</tr>
<tr>
<td>4</td>
<td>Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>5</td>
<td>Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>6</td>
<td>If 24 vdc is not present, repair wire 1569 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>7</td>
<td>If 24 vdc is present, replace windshield wiper EMI cable (para 7-68).</td>
</tr>
<tr>
<td>8</td>
<td>Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>9</td>
<td>Connect connector P2 to connector J2.</td>
</tr>
<tr>
<td>10</td>
<td>Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>11</td>
<td>Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>12</td>
<td>Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>

### CONTINUITY TEST

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disconnect connector J2 from connector P2.</td>
</tr>
<tr>
<td>2</td>
<td>Set multimeter to ohms.</td>
</tr>
<tr>
<td>3</td>
<td>Connect positive (+) probe of multimeter to connector J2-3.</td>
</tr>
<tr>
<td>4</td>
<td>Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>5</td>
<td>If continuity is not present, repair wire 3037 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>6</td>
<td>If continuity is present, replace windshield wiper EMI cable (para 7-68).</td>
</tr>
<tr>
<td>7</td>
<td>Connect connector P2 to connector J2.</td>
</tr>
<tr>
<td>8</td>
<td>Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>9</td>
<td>Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>10</td>
<td>Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
e80. WINDSHIELD WIPER DOES NOT OPERATE ON INTERMITTENT SPEED

INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

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.

START

WARNING
Read WARNING on following page.

TEST OPTIONS
Voltage Test or STE/ICE-R #89

REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.

Is 24 vdc present on connector PX21-6?

NO

YES

Go to step 5 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 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 9-2320-366-10-1).
7. Position windshield wiper switch to intermittent (TM 9-2320-366-10-1) and note reading on multimeter.
8. If 24 vdc is not present, go to step 5 of this fault.
2. Is continuity present between connector PX21-4 and a known good ground?  
   **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.

   **Test Options**
   - Continuity Test or STE/ICE-R #91
   **Reason For Question**
   If continuity is not present, wire 3034 is faulty.

   **Outcome**
   - **No**
     - Repair wire 3034 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
   - **Yes**

3. Is 24 vdc present on connector PX22-5?  
   **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.

   **Test Options**
   - Voltage Test or STE/ICE-R #89
   **Reason For Question**
   This question eliminates possible problems and determines where troubleshooting continues.

   **Outcome**
   - **No**
     - Go to step 6 of this fault.
   - **Yes**
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 2-45) 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 9-2320-366-10-1).
(9) Position windshield wiper switch to intermittent (TM 9-2320-366-10-1) 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 9-2320-366-10-1).
(12) Position master power switch to off (TM 9-2320-366-10-1).
80. WINDSHIELD WIPER DOES NOT OPERATE ON INTERMITTENT SPEED (CONT)

4.

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windshield washer operates.</td>
</tr>
<tr>
<td>Horn operates.</td>
</tr>
<tr>
<td>Windshield wiper operates on high speed.</td>
</tr>
<tr>
<td>Windshield wiper operates on low speed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty windshield wiper motor.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
<tr>
<td>Faulty windshield wiper ECU.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Test or STE/ICE-R #89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 24 vdc is present, windshield wiper motor is faulty.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
</tr>
</tbody>
</table>

Replace windshield wiper motor (para 18-4).

5.

<table>
<thead>
<tr>
<th>KNOWN INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windshield washer operates.</td>
</tr>
<tr>
<td>Horn operates.</td>
</tr>
<tr>
<td>Windshield wiper operates on high speed.</td>
</tr>
<tr>
<td>Windshield wiper operates on low speed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSSIBLE PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty turn signal switch.</td>
</tr>
<tr>
<td>Faulty dashboard cable assembly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity Test or STE/ICE-R #91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REASON FOR QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>If continuity is not present, turn signal switch is faulty.</td>
</tr>
<tr>
<td>If continuity is present, wire 1597 is faulty.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NO</th>
</tr>
</thead>
</table>

Replace turn signal switch (para 7-26).

<table>
<thead>
<tr>
<th>YES</th>
</tr>
</thead>
</table>

Repair wire 1597 (para 2-45) or replace WTIEC II dashboard cable assembly (para 7-10) or WTIEC 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 PX22-2.
3. Connect negative (-) probe of multimeter to ground.
4. Position master power switch to on (TM 9-2320-366-10-1).
5. Position windshield wiper switch to intermittent (TM 9-2320-366-10-1) 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).
10. 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 4.
5. Connect negative (-) probe of multimeter to turn signal switch connector terminal 7.
6. Position windshield wiper switch to intermittent (TM 9-2320-366-10-1) and note reading on multimeter.
7. If continuity is not present, replace turn signal switch (para 7-26).
8. If continuity is present, repair wire 1597 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
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).
6. Is continuity present between connector PX21-1 and connector P18-9?

   YES

   NO

   Repair wire 1599 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

7. Is continuity present between turn signal switch connector terminals 5 and 9?

   YES

   NO

   Replace turn signal switch (para 7-26).

   YES

   NO

   Faulty dashboard cable assembly.
   Faulty turn signal switch.
   Faulty windshield wiper ECU.

   TEST OPTIONS
   Continuity Test or STE/ICE-R #91
   REASON FOR QUESTION
   If continuity is not present, wire 1599 is faulty.

KNOWLEDGE 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.

KNOWLEDGE 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.

KNOWLEDGE 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.
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 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 9-2320-366-10-1) and note reading on multimeter.
(5) If continuity is not present, replace turn signal switch (para 7-26).
(6) Position windshield wiper switch to off (TM 9-2320-366-10-1).
(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).
80. 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.
- Windshield wiper motor OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- 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.

---

8. Is continuity present between connector PX21-3 and connector J2-4?

- **NO**
  - Repair wire 1916 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

- **YES**
  - Replace windshield wiper ECU (para 7-69).
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) If continuity is present, replace windshield wiper ECU (para 7-69).
(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).
## e81. WINDSHIELD WIPER DOES NOT OPERATE ON HIGH SPEED

### INITIAL SETUP

<table>
<thead>
<tr>
<th>Equipment Condition</th>
<th>Tools and Special Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine shut down (TM 9-2320-366-10-1)</td>
<td>Tool Kit, Genl Mech (Item 46, Appendix C)</td>
</tr>
<tr>
<td>Personnel Required (2)</td>
<td>STE/ICE-R (Item 41, Appendix C)</td>
</tr>
<tr>
<td></td>
<td>Multimeter, Digital (Item 22, Appendix C)</td>
</tr>
</tbody>
</table>

### KNOWN INFO

- Windshield wiper operates on low speed.

### POSSIBLE PROBLEMS

- Faulty windshield wiper motor.
- Faulty turn signal switch.
- Faulty dashboard cable assembly.
- Faulty windshield wiper EMI cable.

### TEST OPTIONS

- Voltage Test or STE/ICE-R #89

### REASON FOR QUESTION

If 24 vdc is present, windshield wiper motor is faulty.

---

**START**

1. **WARNING:** Read WARNING on following page.

   Is 24 vdc present on connector PX22-4?

   - **NO**
     - Go to step 2 of this fault.
   - **YES**
     - Replace windshield wiper motor (para 18-4).
WARNING
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove PDP cover (para 16-2).</td>
</tr>
<tr>
<td>(2) Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>(3) Remove three screws from PDP.</td>
</tr>
<tr>
<td>(4) Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>(5) Disconnect connector PX22 from windshield wiper motor.</td>
</tr>
<tr>
<td>(6) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(7) Connect positive (+) probe of multimeter to connector PX22-4.</td>
</tr>
<tr>
<td>(8) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(9) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Position windshield wiper switch to high (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(11) If 24 vdc is not present, go to step 2 of this fault.</td>
</tr>
<tr>
<td>(12) If 24 vdc is present, replace windshield wiper motor (para 18-4).</td>
</tr>
<tr>
<td>(13) Position windshield wiper switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(14) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(15) Connect connector PX22 to windshield wiper motor.</td>
</tr>
</tbody>
</table>
2.  Is continuity present between turn signal switch connector terminals 4 and 6?

- **YES**
  - Replace turn signal switch (para 7-26).

- **NO**
  - Continuity Test or STE/ICE-R #91
  
  **REASON FOR QUESTION**
  - If continuity is not present, turn signal switch is faulty.

**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.
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 9-2320-366-10-1) and note reading on multimeter.
(7) If continuity is not present, replace turn signal switch (para 7-26).
(8) Position windshield wiper switch to off (TM 9-2320-366-10-1).
(9) Connect turn signal switch connector to connector P18.
(10) Install instrument panel assembly (para 7-15).
3. Is 24 vdc present on connector J2-1?

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 24 vdc is not present, wire 1590 is faulty. If 24 vdc is present, windshield wiper EMI cable is faulty.

**KNOWN INFO**
- Windshield wiper operates on low speed.
- Windshield wiper motor OK.
- Turn signal switch OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty windshield wiper EMI cable.

**YES**
- Replace windshield wiper EMI cable (para 7-68).

**NO**
- Repair wire 1590 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

---

**WARNING**
Read WARNING on following page.
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Disconnect connector J2 from connector P2.</td>
</tr>
<tr>
<td>(2) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(3) Connect positive (+) probe of multimeter to connector J2-1.</td>
</tr>
<tr>
<td>(4) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(5) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(6) Position windshield wiper switch to high (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(7) If 24 vdc is not present, repair wire 1590 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).</td>
</tr>
<tr>
<td>(8) If 24 vdc is present, replace windshield wiper EMI cable (para 7-68).</td>
</tr>
<tr>
<td>(9) Position windshield wiper switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(10) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(11) Connect connector J2 to connector P2.</td>
</tr>
<tr>
<td>(12) Install PDP on dashboard with three screws.</td>
</tr>
<tr>
<td>(13) Install three washers and screws in PDP.</td>
</tr>
<tr>
<td>(14) Install PDP cover (para 16-2).</td>
</tr>
</tbody>
</table>
1. Is 24 vdc present on connector P5?

- **KNOW INFO**
  - Circuit breaker OK.
  - Windshield washer operates.
- **POSSIBLE PROBLEMS**
  - Faulty front lights cable assembly.
  - Faulty horn.
  - Faulty turn signal switch.
  - Faulty dashboard cable assembly.
  - Faulty relay K32.

- **WARNIMG**
  - Read WARNING on following page.

- **TEST OPTIONS**
  - Voltage Test or STE/ICE-R #89
  - Reason for question: This question eliminates possible problems and determines where troubleshooting continues.

- **START**
  - If NO, go to step 3 of this fault.
  - If YES, go to step 3 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.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove two screws and washers from front grille.</td>
</tr>
<tr>
<td>(2) Remove screw and washer from front grille.</td>
</tr>
<tr>
<td>(3) Remove front grille from cab.</td>
</tr>
<tr>
<td>(4) Disconnect connector P5 from horn.</td>
</tr>
<tr>
<td>(5) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(6) Connect positive (+) probe of multimeter to connector P5.</td>
</tr>
<tr>
<td>(7) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(8) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Press horn button (TM 9-2320-366-10-1) and note reading of multimeter.</td>
</tr>
<tr>
<td>(10) If 24 vdc is not present, go to step 3 of this fault.</td>
</tr>
<tr>
<td>(11) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(12) Connect connector P5 to horn.</td>
</tr>
</tbody>
</table>
2. Is continuity present between connector P6 and a known good ground?

**NO**
- If continuity is not present, wire 3035 is faulty.
- If continuity is present, horn is faulty.

**YES**
- Repair wire 3035 (para 2-45) or replace front lights cable assembly (para 7-82).
- Replace horn (para 7-53).
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 2-45) or replace front lights cable assembly (para 7-82).
(6) If continuity is present, replace horn (para 7-53).
(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).
e82. 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.

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If continuity is not present, turn signal switch is faulty.
- If 24 vdc is not present, wire 25 is faulty.

3. Is continuity present between turn signal switch connector terminal 4 and terminal 12?

**YES**
- Replace turn signal switch (para 7-26).

**NO**
- If continuity is not present, turn signal switch is faulty.

4. Is 24 vdc present on relay K32 terminal 86?

**YES**
- Repair wire 25 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
- If 24 vdc is not present, wire 25 is faulty.

**WARNING**
Read WARNING on following page.
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 9-2320-366-10-1) and note reading on multimeter.
7. If continuity is not present, replace turn signal switch (para 7-26).
8. Connect connector P18 to turn signal switch connector.
9. Install instrument panel assembly (para 7-15).

WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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 9-2320-366-10-1).
7. Press horn button (TM 9-2320-366-10-1) and note reading on multimeter.
8. If 24 vdc is not present, repair wire 25 (para 2-45) or WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
5. Is continuity present between relay K32 terminal 85 and a known good ground?

- YES
- NO

If continuity is not present, wire 3036 is faulty.

6. Is 24 vdc present on relay K32 terminal 30?

- YES
- NO

If 24 vdc is not present, wire 26 is faulty.

**WARNING**

Read WARNING on following page.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.
- Faulty relay K32.
- Faulty front lights cable assembly.

**TEST OPTIONS**

- Continuity Test or STE/ICE-R #91
- Voltage Test or STE/ICE-R #89

If continuity is not present, wire 3036 is faulty. If 24 vdc is not present, wire 26 is faulty.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.
- Faulty relay K32.
- Faulty front lights cable assembly.

**TEST OPTIONS**

- Repair wire 3036 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- Repair wire 26 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical 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 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, repair wire 26 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position master power switch to off (TM 9-2320-366-10-1).
e82. HORN DOES NOT OPERATE (CONT)

WARNING
Read WARNING on following page.

7. Is 24 vdc present at relay K32 terminal 87?

YES
Replace relay K32 (para 7-9).

NO

TEST OPTIONS
Voltage Test or STE/ICE-R #89

REASON FOR QUESTION
If 24 vdc is not present, relay K32 is faulty.

KNOWN INFO
Circuit breaker OK.
Windshield washer operates.
Horn OK.
Turn signal switch OK.

POSSIBLE PROBLEMS
Faulty relay K32.
Faulty dashboard cable assembly.
Faulty front lights 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.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove three screws and washers from PDP.</td>
</tr>
<tr>
<td>(2) Remove three screws from PDP.</td>
</tr>
<tr>
<td>(3) Lift PDP outward to gain access.</td>
</tr>
<tr>
<td>(4) Install relay K32 in PDP.</td>
</tr>
<tr>
<td>(5) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(6) Connect positive (+) probe of multimeter to terminal 87 on relay K32.</td>
</tr>
<tr>
<td>(7) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(8) Position master power switch to on (TM 9-2320-366-10-1).</td>
</tr>
<tr>
<td>(9) Press horn button (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(10) If 24 vdc is not present, replace relay K32 (para 7-9).</td>
</tr>
<tr>
<td>(11) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>
82. HORN DOES NOT OPERATE (CONT)

**KNOWN INFO**
- Circuit breaker OK.
- Windshield washer operates.
- Horn OK.
- Turn signal switch OK.
- Relay K32 OK.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty front lights cable assembly.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 24 vdc is not present, wire 26 in dashboard cable assembly is faulty. If 24 vdc is present, wire 26 in front lights cable assembly is faulty.

**WARNING**
Read WARNING on following page.

8. Is 24 vdc present at connector J27-1?

**YES**
- Repair wire 26 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**NO**
- Repair wire 26 (para 2-45) or replace front lights cable assembly (para 7-82).
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around 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 9-2320-366-10-1).
6. Press horn button (TM 9-2320-366-10-1) and note reading on multimeter.
7. If 24 vdc is not present, repair wire 26 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
8. If 24 vdc present, repair wire 26 (para 2-45) or replace front lights cable assembly (para 7-82).
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).
### INITIAL SETUP

**Equipment Condition**
Engine shut down (TM 9-2320-366-10-1).

**Personnel Required**
(2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

**References**
- TM 9-4910-571-12&P

### Troubleshooting Flowchart

**START**

---

**KNOWN INFO**
- Chemical detector indicator operates.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty chemical alarm kit cable assembly.
- Faulty chemical alarm.

**WARNING**
Read WARNING on following page.

1. **TEST OPTIONS**
   - Voltage Test or STE/ICE-R #89

   **REASON FOR QUESTION**
   - If 12 vdc is not present, wire 1803 is faulty.

   **YES**
   - Go to step 3 of this fault.

   **NO**
   - Is 12 vdc present at terminal lug TL97?

---

**REFERENCES**
- TM 9-4910-571-12&P
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to terminal lug TL97.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 12 vdc is not present, go to step 3 of this fault.
(6) Position master power switch to off (TM 9-2320-366-10-1).
2. Is continuity present between terminal lug TL98 and a known good ground?

**KNOWN INFO**
- Chemical detector indicator operates.

**POSSIBLE PROBLEMS**
- Faulty dashboard cable assembly.
- Faulty chemical alarm kit cable assembly.
- Faulty chemical alarm.

**TEST OPTIONS**
- Continuity Test STE/ICE-R #91

**REASON FOR QUESTION**
- If continuity is not present, wire 1804 is faulty. If continuity is present, chemical alarm is faulty.

**IF NO**
- Go to step 4 of this fault.

**IF YES**
- Replace chemical alarm. Notify NBC.

---

---
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).
KNOWN INFO
Chemical detector indicator operates.
Chemical alarm OK.

POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty chemical alarm kit cable assembly.

TEST OPTIONS
<table>
<thead>
<tr>
<th>Voltage Test or STE/ICE-R #89</th>
</tr>
</thead>
<tbody>
<tr>
<td>REASON FOR QUESTION</td>
</tr>
<tr>
<td>If 12 vdc is not present, wire 1803 in dashboard cable assembly is faulty.</td>
</tr>
<tr>
<td>If 12 vdc is present, wire 1803 in chemical alarm kit cable assembly is faulty.</td>
</tr>
</tbody>
</table>

WARNING
Read WARNING on following page.

3. Is 12 vdc present at connector P99-1?

YES

Repair wire 1803 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

NO

Repair wire 1803 (para 2-45) or replace chemical alarm kit cable assembly (para 7-59).
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 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 1803 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If 24 vdc is present, repair wire 1803 (para 2-45) or replace chemical alarm kit cable assembly (para 7-59).
(9) Position master power switch to off (TM 9-2320-366-10-1).
(10) Connect connector P99 to connector J99.
(11) Install kick panel (para 16-3).
4. Is continuity present at connector P99-2?

**NO**

- Faulty dashboard cable assembly.
- Faulty chemical alarm kit cable assembly.

**YES**

Repair wire 1804 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

**TEST OPTIONS**

- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**

- If continuity is not present, wire 1804 in dashboard cable assembly is faulty.
- If continuity is present, wire 1804 in chemical alarm kit cable assembly is faulty.

**KNOWN INFO**

- Chemical detector indicator operates.
- Chemical alarm OK.

**POSSIBLE PROBLEMS**

- Faulty dashboard cable assembly.
- Faulty chemical alarm kit cable assembly.
**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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) If continuity is present, repair wire 1804 (para 2-45) or replace chemical alarm kit cable assembly (para 7-59).
(8) Connect connector P99 to connector J99.
(9) Install kick panel (para 16-3).
### INITIAL SETUP

**Equipment Condition**
Engine shut down (TM 9-2320-366-10-1).

**Personnel Required**
(2)

**Tools and Special Tools**
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)
- Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

**References**
TM 9-4910-571-12&P

---

**START**

**1.** Read WARNING on following page.

**TEST OPTIONS**
- Voltage Test or STE/ICE-R #89

**REASON FOR QUESTION**
- If 12 vdc is not present, wire 1802 is faulty.

**KNOWLEDGMENT**
- Nothing.

**POSSIBLE PROBLEMS**
- Faulty start and charging cable assembly.
- Faulty dashboard cable assembly.
- Faulty lighted indicator display.
- Faulty chemical detector.

**YES**

- Repair wire 1802 (para 2-45) or replace start and charging cable assembly (para 7-132).

**NO**

**2.** Is continuity present between connector J106-B and a known good ground?

**TEST OPTIONS**
- Continuity Test or STE/ICE-R #91

**REASON FOR QUESTION**
- If continuity is not present, wire 3029 is faulty.

**KNOWLEDGMENT**
- Nothing.

**POSSIBLE PROBLEMS**
- Faulty start and charging cable assembly.
- Faulty dashboard cable assembly.
- Faulty lighted indicator display.
- Faulty chemical detector.

**YES**

- Repair wire 3029 (para 2-45) or replace start and charging cable assembly (para 7-132).
WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

<table>
<thead>
<tr>
<th>VOLTAGE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to volts dc.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector J106-E.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground.</td>
</tr>
<tr>
<td>(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.</td>
</tr>
<tr>
<td>(5) If 12 vdc is not present, repair wire 1802 (para 2-45) or replace start and charging cable assembly (para 7-132).</td>
</tr>
<tr>
<td>(6) Position master power switch to off (TM 9-2320-366-10-1).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTINUITY TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Set multimeter to ohms.</td>
</tr>
<tr>
<td>(2) Connect positive (+) probe of multimeter to connector J106-B.</td>
</tr>
<tr>
<td>(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.</td>
</tr>
<tr>
<td>(4) If continuity is not present, repair wire 3029 (para 2-45) or replace start and charging cable assembly (para 7-132).</td>
</tr>
</tbody>
</table>
3. If continuity is not present, wire 1803 is faulty.

**Known Info**
- Start and charging cable assembly OK.

**Possible Problems**
- Faulty dashboard cable assembly.
- Faulty lighted indicator display.
- Faulty chemical detector.

**Test Options**
- Continuity Test or STE/ICE-R #91

**Reason for Question**
- If continuity is not present, wire 1803 is faulty.

**Flowchart**
- If continuity is present between connector J106-A and PX7-2?
  - **Yes**: Repair wire 1803 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
  - **No**: Faulty dashboard cable assembly.
### CONTINUITY TEST

1. Disconnect batteries (para 7-57).
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 2-45) 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.
4. Is continuity present between connector PX7-17 and a known good ground? 

   YES: Repair wire 3030 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
   NO: If continuity is not present, wire 3030 is faulty.

5. Is continuity present between connector PX7-2 and connector PX7-17?

   NO: If continuity is not present, lighted indicator display is faulty. If continuity is present, chemical detector is faulty.
   YES: Replace lighted indicator display (para 7-16).

Replace chemical detector. Notify NBC.
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 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
APPENDIX A
REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals, and other publications referenced in this manual. Those publications that should be consulted for additional information about vehicle operations are also listed.

A-2. PUBLICATIONS INDEX

The following index should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

Consolidated Index of Army Publications and Blank Forms ......................... DA Pam 25-30

A-3. FORMS

The following forms pertain to this manual. See DA Pam 25-30 for index of blank forms. See DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to this material.

Recommended Changes to Publications and Blank Forms ............................. DA Form 2028
Equipment Inspection and Maintenance Worksheet ................................................. DA Form 2404
Maintenance Request ............................................................................................... DA Form 2407
Equipment Control Record ..................................................................................... DA Form 2408-9
Processing and Deprocessing Record of Shipping, Storage, and Issue of Vehicles and Spare Engines ............................................................................................................. DD Form 1397
Packaging Improvement Report ............................................................................ DD Form 6
Report of Item Discrepancy (ROID) ....................................................................... SF 364
Product Quality Deficiency Report ......................................................................... SF 368

A-4. OTHER PUBLICATIONS

The following publications contain information pertinent to the MTV and associated equipment.

a. Safety.

First Aid ............................................................................................................................ FM 4-25.11
Security of Tactical Wheeled Vehicles ................................................................. TB 9-2300-422-20
Safety Inspection and Testing of Lifting Devices ..................................................... TB 43-0142
A-4. OTHER PUBLICATIONS (CONT)

b. MTV.

Direct Support and General Support Maintenance Manual for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) ............................................... TM 9-2320-366-34
Hand Receipt Covering Contents of Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL), for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicles (MTV) ........................................ TM 9-2320-366-10-HR
Operator’s Manual for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) .................................................. TM 9-2320-366-10
Unit, Direct Support, and General Support Repair Parts and Special Tools List for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) .......................... TM 9-2320-366-24P
Warranty Program for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) .................................. TB 9-2300-366-15

General Vehicle Operation.

Army Motor Transport Units and Operations .......................................................... FM 55-30
Manual for the Wheeled Vehicle Driver .................................................................. FM 21-305
Petroleum Tank Vehicle Operations ....................................................................... FM 10-71
Safety Prevention of Motor Vehicle Accidents ..................................................... AR 385-557
Vehicle Recovery Operations .................................................................................. FM 20-22

d. General Maintenance and Repair.

Army Oil Analysis Program ................................................................................. TB 43-0211
Camouflage Pattern Painting .................................................................................. FM 5-20
Charging System Troubleshooting ...................................................................... DA Pam 750-33
Color, Marking, and Camouflage Painting of Military Vehicles ......................... TB 43-0209
Cooling Systems: Tactical Vehicles ....................................................................... TM 750-254
Corrosion Prevention and Control Including Rustproofing Procedures for Tactical Vehicles and Trailers .......................................................... TB 43-0213
Description, Use, Bonding Techniques, and Properties of Adhesives ................. TB ORD 1032
Equipment Improvement Report and Maintenance Digest: TACOM Equipment .......... TB 43-0001-39-1
Equipment Improvement Report and Maintenance Summary ............................ TM 43-0143
Installation Instructions for Installation Kit, Electronic Equipment, MK-2700/VRC (NSN 5895-01-421-0814) (EIC: N/A) to Permit Installation of Radio Set AN/VRC-87/88/90 Series into M1078, M1080, M1081, M1083-M1086, M1088-M1094 and M1096 Family of Medium Tactical Vehicles ................................TB 11-5820-890-20-101
Installation Instructions for Installation Kit, Electronic Equipment, MK-2715/VRC (NSN 5895-01-421-0812) (EIC: N/A) to Permit Installation of Radio Set AN/VRC-89/91/92 Series into M1078, M1080, M1081, M1083-M1086, M1088-M1094 and M1096 Family of Medium Tactical Vehicles ................................TB 11-5820-890-20-92
Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials Including Chemicals .................................................. TM 9-247
Metal Body Repair and Related Operations ......................................................... FM 43-2
Operator’s and Organizational Maintenance Manual for Radio Sets ..................... TM 11-5820-498-12
Operator’s and Organizational Maintenance Manual Including Repair Parts and Special Tools List Simplified Test Equipment for Internal Combustion Engines Reprogrammable (STE/ICE-R) (NSN 4910-01-222-6589) .................................. TM 9-4910-571-12&P
Operator’s Manual, Radio Set, AN/VRC-46 ......................................................... TM 11-5820-401-10-1
Operator’s Manual, Radio Set, AN/VRC-90A ...................................................... TM 11-5820-890-10-1
Operator’s, Unit, Direct Support, and General Support Maintenance Manual for Lead-Acid Storage Batteries .......................................................... TM 9-6140-200-14
Ordnance Tracked and Wheeled Vehicle Hull and Chassis Wiring, Repair of ........................ TB ORD 650
Organizational Care, Maintenance, and Repair of Pneumatic Tires and Inner Tubes .......... TM 9-2610-200-14
Painting Instructions for Field Use .................................................................................. TM 43-0139
Purging, Cleaning, and Coating Interior Ferrous and Terne Sheet Vehicle Fuel Tanks .......... TB 43-0212
Repair of Tents, Canvas, and Webbing ........................................................................... FM 10-16
Rigging Techniques, Procedures, and Applications ....................................................... FM 5-125
Use and Care of Hand Tools and Measuring Tools ..................................................... TM 9-243
Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems ............... TB 750-651
Welding Theory and Application ................................................................................... TM 9-237

e. Cold Weather Operation.

Basic Cold Weather Manual ......................................................................................... FM 31-70
Northern Operations ...................................................................................................... FM 31-71
Operation and Maintenance of Ordnance Materiel in Cold Weather (0° to -65°F) ................. FM 9-207

f. Decontamination.

Decontamination Operations Facilities & Equipment .................................................. TB 700-4
NBC Decontamination .................................................................................................. FM 3-5
NBC Protection .............................................................................................................. FM 3-4

g. Maintenance of Special Purpose Kits.

Operator and Organizational Maintenance Manual for Chemical Alarm ............................ TM 3-6665-225-12
Operator's and Unit Maintenance Manual Including Repair Parts and Special Tools
List for Decontaminating Apparatus: M13 ...................................................................... TM 3-4230-214-12&P
Operator, Organizational, Direct Support, and General Support Maintenance Manual
Including Repair Parts and Special Tools List for Various Machine Gun Mounts ............... TM 9-1005-245-14

h. General.

Operator’s Manual (M998 Series) ............................................................................... TM 9-2320-280-10
Operator’s Manual (M1008 Series) .............................................................................. TM 9-2320-289-10
Operator’s Manual (M35 Series) ................................................................................ TM 9-2320-361-10
Operator’s Manual (M939 Series) .............................................................................. TM 9-2320-272-10
Principles of Automotive Vehicles ............................................................................. TM 9-8000
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use
(US Army Tank-automotive and Armaments Command) .............................................. TM 750-244-6
Route Reconnaissance and Classification ................................................................... FM 5-36
Soldier’s Manual MOS 88M Motor Transport Operator, Skill Levels 1/2 ....................... STP 55-88-M12-SM

i. Land, Sea, and Air Shipment.

Airdrop of Supplies and Equipment: Rigging 5-Ton Trucks ......................................... FM 10-526
Containerization of Military Vehicles ........................................................................ MTMCTEA Ref 95-55-23
Lifting and Tiedown of U.S. Military Helicopters ........................................................ M TMCTEA Ref 95-55-21
Marine Lifting and Lashing Handbook ....................................................................... MTMCTEA Ref 95-55-22
Marine Terminal Lifting Guidance ............................................................................... MTMCTEA Pam 56-1
A-4. OTHER PUBLICATIONS (CONT)

i. Land, Sea, and Air Shipment (Cont).

Multiservice Helicopter External Air Transport: Basic Operations and Equipment ................. FM 55-450-3
Multiservice Helicopter External Air Transport: Dual-Point Load Rigging Procedures ............ FM 55-450-5
Multiservice Helicopter External Air Transport: Single-Point Load Rigging Procedures .......... FM 55-450-4
Standard Characteristics (Dimensions, Weight, and Cube) for Transportability of Military
Vehicles and Other Outsize/Overweight Equipment (in TOE Line Sequence) ..................... TB 55-46-1
Tiedown Handbook for Rail Movements ..................................................... MTMCTEA Pam 55-19
Tiedown Handbook for Truck Movements ..................................................... MTMCTEA Ref 92-55-20
APPENDIX B
MAINTENANCE ALLOCATION CHART (MAC)

SECTION I
INTRODUCTION

B-1. The Army Maintenance System MAC.

a. This introduction (Section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

- **Unit/FIELD** - includes two subcolumns, C (Operator/Crew) and O (Unit) maintenance.
- **Direct Support/FIELD** - includes an F subcolumn.
- **General Support/SUSTAINMENT** - includes an H subcolumn.
- **Depot/SUSTAINMENT** - includes a D subcolumn.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. Maintenance Functions. Maintenance functions are limited to and defined as follows:

a. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g. by sight, sound, or feel).

b. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. **Service.** Operations required periodically to keep an item in proper operating condition; e.g. to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemicals fluids, or gases.

d. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

e. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.

f. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments or Test, Measurement, and Diagnostic Equipment (TMDE) used in precision measurement. Consists of comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
g. **Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace " is authorized by the MAC and assigned maintenance level is shown as the 3d position code of the SMR code.

i. **Repair.** The application of maintenance services\(^1\) including fault location/troubleshooting\(^2\), removal/installation, and disassembly/assembly\(^3\) procedures, and maintenance actions\(^4\) to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. **Overhaul.** That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. **Rebuild.** Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

**B-3. Explanation of Columns in the MAC, Section II.**

a. **Column 1, Group Number.** Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.

b. **Column 2, Component/Assembly.** Column 2 contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. **Column 3, Maintenance Function.** Column 3 lists the functions to be performed on the items listed in Column 2. (For detailed explanation of these functions, see Paragraph B-2.)

d. **Column 4, Maintenance Level.** Column 4 specifies each level of maintenance authorized to perform each function listed in Column 3, by indicating work time required (expressed in man-hours in whole hours or decimals) in the appropriate subcolumn. This work-time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work-time figures are to be shown for each level. The work-time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions.

---

\(^1\)Services – Inspect, test, service, adjust, align calibrate, and/or replace.

\(^2\)Fault location/troubleshooting - The process of investigating and detecting the cause of equipment malfunction; the act of isolating a fault within a system or Unit Under Test (UUT).

\(^3\)Disassembly/assembly - The step-by-step breakdown (taking apart) of a spare/functional group coded item, to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

\(^4\)Actions - Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.
This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

- C ........................................................................................................ Operator or crew maintenance
- O ........................................................................................................ Unit/Field maintenance
- F .................................................................................................... Direct Support/Field maintenance
- L ................................................................................................ Specialized Repair Activity (SRA)\textsuperscript{5}
- H ................................................................................................ General Support/Sustainment maintenance
- D ................................................................................................ Depo

\textsuperscript{5}This maintenance level is not included in Section II, Column (4) of the Maintenance Allocation Chart. Functions to this level of maintenance are identified by a work-time figure in the "H" column of Section II, Column (4), and an associated reference code is used in the Remarks column (6). This code is keyed to Section IV, Remarks, and the SRA complete repair application is explained there.

\textbf{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.

\textbf{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.

\textbf{B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III.}

\textbf{a. Column 1, Reference Code.} The tool and test equipment reference code correlates with a code used in the MAC, Section II column 5.

\textbf{b. Column 2, Maintenance Level.} The lowest level of maintenance authorized to use the tool or test equipment.

\textbf{c. Column 3, Nomenclature.} Name or identification of the tool or test equipment.

\textbf{d. Column 4, National Stock Number.} The National Stock Number of tool or test equipment.

\textbf{e. Column 5, Tool Number.} The manufacturer's part number, model number, or type number.

\textbf{B-5. Explanation of Columns in Remarks, Section IV.}

\textbf{a. Column 1, Remarks Code.} The code recorded in column 6, Section II.

\textbf{b. Column 2, Remarks.} This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.
### Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE

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## Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE

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### Remarks Code

- 65: Code for the description provided.
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**Maintenance Level**

- **FIELD**
  - C: Unit
  - O: Direct Support
  - F: General Support
  - H: Depot
- **SUSTAINMENT**
  - D: Tools and Equipment

**Remarks Code**

- 59,61,80
- 65
- 80
- 22,61,62,80
- 48,61,62,64,80
- 34,58,61,62,64,80
- 80
- 80
- 28,29,31,43,58,59,61,62,63,80,81,87
- 3,22,23,28,29,31,43,58,59,61,62,63,73,80,81,87
- 58,59,61,62,63,80,81,87
- 3,58,61,62,63,80
- 3,23,58,61,62,63,73,80
- 3,58,62,80
- 3,31,58,62,80
- 61,62,80
### Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE

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## Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE

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### Section III. TOOLS AND TEST EQUIPMENT FOR MTV VEHICLES

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Section III. TOOLS AND TEST EQUIPMENT FOR MTV VEHICLES

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Section IV. REMARKS FOR THE MTV VEHICLE

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## 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

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<thead>
<tr>
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## Section II. TOOLS IDENTIFICATION LIST (CONT)

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## Section II. TOOLS IDENTIFICATION LIST (CONT)

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<td>58</td>
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# APPENDIX D
## EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

### Section I. INTRODUCTION

#### D-1. SCOPE

This appendix lists expendable and durable items that you will need to operate and maintain the MTV vehicle. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except medical, class V repair parts, and heraldic items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

#### D-2. EXPLANATION OF COLUMNS

a. **Column (1) - Item Number.** This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item, e.g., "Oil, Lubricating (Item 25, Appendix D).

b. **Column (2) - Level.** This column identifies the lowest level of maintenance that requires the item.

c. **Column (3) - National Stock Number.** This is the national stock number assigned to the item which you can use to requisition it.

d. **Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number.** This provides the other information you need to identify the item.

e. **Column (5) - Unit of Measure.** This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

### Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

<table>
<thead>
<tr>
<th>Item Number</th>
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<td>4730-01-453-9651</td>
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<td>Adhesive (81348) MMM-A-1617 TY3</td>
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<td>4</td>
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<td>Adhesive (71984) 3145 RTV Clear</td>
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<td>Adhesive (81349) (MIL-A-46106)</td>
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**Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)**

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<td>10.2</td>
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<td>8040-00-728-3088</td>
<td>Adhesive (78500) 1199-T-3842 6 oz</td>
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<td>11</td>
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<td>6850-00-174-1806</td>
<td>Antifreeze, Arctic Type (81349) (MIL-A-11755) 55 gl drum</td>
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<td>Antifreeze, Multi-Engine Type (58536) (A-A-52624A)</td>
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## Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

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### Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

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### Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

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APPENDIX E

ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I. INTRODUCTION

E-1. INTRODUCTION

This appendix includes complete instructions for manufacturing or fabricating authorized items locally. All bulk materials needed to manufacture an item are listed by part number or specification number. Figures are provided as needed. See standards and specifications DoD-Std-00100D(AR) and ANSI Y14.5M1982 for required details.

Section II. MANUFACTURED ITEMS INDEX

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<td>12418037</td>
<td>Steering Gear Return Hose</td>
<td>E-14</td>
</tr>
<tr>
<td>12418460-001</td>
<td>Transmission Oil Cooler Hose</td>
<td>E-14</td>
</tr>
<tr>
<td>12418460-002</td>
<td>Transmission Oil Cooler Hose</td>
<td>E-14</td>
</tr>
<tr>
<td>12418763</td>
<td>Lanyard Assembly</td>
<td>E-15</td>
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<td>12420196</td>
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<td>E-15</td>
</tr>
<tr>
<td>12420197-001</td>
<td>Non-Metallic Vent Air Hose</td>
<td>E-16</td>
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<td>12420197-002</td>
<td>Non-Metallic Vent Air Hose</td>
<td>E-16</td>
</tr>
<tr>
<td>12420197-003</td>
<td>Non-Metallic Vent Air Hose</td>
<td>E-16</td>
</tr>
<tr>
<td>12420197-004</td>
<td>Non-Metallic Vent Air Hose</td>
<td>E-16</td>
</tr>
<tr>
<td>12420197-005</td>
<td>Non-Metallic Vent Air Hose</td>
<td>E-16</td>
</tr>
<tr>
<td>12420197-006</td>
<td>Non-Metallic Vent Air Hose</td>
<td>E-16</td>
</tr>
<tr>
<td>12420198-001</td>
<td>Non-Metallic Vent Air Hose</td>
<td>E-16</td>
</tr>
<tr>
<td>12420198-002</td>
<td>Non-Metallic Vent Air Hose</td>
<td>E-16</td>
</tr>
<tr>
<td>12420308-457</td>
<td>Personnel Heater Air Duct Hose</td>
<td>E-17</td>
</tr>
<tr>
<td>12420308-760</td>
<td>Personnel Heater Air Duct Hose</td>
<td>E-17</td>
</tr>
<tr>
<td>12420489</td>
<td>Block Seal</td>
<td>E-18</td>
</tr>
<tr>
<td>3256-H-1048</td>
<td>CTIS Seal Driver</td>
<td>E-19</td>
</tr>
<tr>
<td>3256-K-1051</td>
<td>Wheel Hub Grease Seal Driver</td>
<td>E-20</td>
</tr>
</tbody>
</table>

Dimmer Switch Test Wire
Purge Valve Tool
M1089 30K Winch Air Hoses
M1089 30K Winch Pneumatic Test Adapter
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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Material Description</th>
<th>Size</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N/A</td>
<td>Steel, ASTM A569 Sheet, Hot Rolled</td>
<td>6.0 in. (152.4 mm) x 6.0 in. (152.4 mm) x 0.134 in. (3.4 cm)</td>
<td>2</td>
</tr>
</tbody>
</table>

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.

Figure E-1. Brake Adjusting Tool Support
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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Material Description</th>
<th>Size</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N/A</td>
<td>Steel, Flat Bar</td>
<td>4.0 in. (10.2 cm) X 33.38 in. X (84.8 cm) X 0.38 in. (0.96 cm)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>N/A</td>
<td>Steel, Flat Bar</td>
<td>4.0 in. (10.2 cm) X 12.0 in. (30.5 cm) X 0.38 in. (0.96 cm)</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>N/A</td>
<td>Angle Iron</td>
<td>2.0 in. (5.1 cm) X 2.0 in. (5.1 cm) X 3.5 in. (8.9 cm)</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>H.S.105VW-1</td>
<td>Insulgrip, CSA 105 C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure E-3. Cab Support Tool Strut and Cab Rest

a. All dimensions are in inches (centimeters).
b. Cut cab support tool strut (1) from steel flat bar and bend to shape as shown in Figure E-3. Cab Support Tool Strut and Cab Rest.
c. Cut cab support tool cab rest (2) from steel flat bar.
d. De-burr and remove sharp edges.
e. 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.
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.
m. Position and clamp cab support tool strut (1) to cab support tool cab rest (2) as shown by dimensions on Figure E-6. Cab Support Tool Assembly, before insulgrip (4) is applied.

n. Weld cab support tool strut (1) to cab support tool cab rest (2).

o. Apply Insulgrip (4) to cab support tool cab rest (2) as described on material container.
E-5. DUMP BODY LIFTING BRACKET

Make the dump body lifting bracket assembly from the front, rear, top, guide, and mount plates according to the following instructions. Refer to the parts list tables and accompanying figures for details.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Name/Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N/A</td>
<td>Rear Plate</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>N/A</td>
<td>Top Plate</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>N/A</td>
<td>Front Plate</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>N/A</td>
<td>Guide Brace</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>N/A</td>
<td>Plate, Mounting</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure E-7. Dump Body Lifting Bracket

a. All dimensions are in inches (centimeters).
b. Position and clamp pieces (1 through 5) together as shown by dimensions on Figure E-7. Dump Body Lifting Bracket.
c. Weld pieces together as shown in Figure E-7. Dump Body Lifting Bracket.
d. Coat all surfaces with Plastisol.
### E-5. DUMP BODY LIFTING BRACKET (CONT)

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Material Description</th>
<th>Size</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N/A</td>
<td>Plate, steel, ASTM A-36</td>
<td>6.0 in. (15.2 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>N/A</td>
<td>Plate, steel, ASTM A-36</td>
<td>3.25 in. (8.26 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>N/A</td>
<td>Plate, steel, ASTM A-36</td>
<td>1.875 in. (10.2 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)</td>
<td>1</td>
</tr>
</tbody>
</table>

![Figure E-8. Rear, Top, and Guide Plate](image)

**Figure E-8. Rear, Top, and Guide Plate**

a. All dimensions are in inches (centimeters).

b. Fabricate (1), (2), and (4) from ASTM A-36 steel plate as shown on Figure E-8. Rear, Top, and Guide Plate.

c. De-burr and remove sharp edges.
<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Material Description</th>
<th>Size</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>N/A</td>
<td>Plate steel, ASTM A36</td>
<td>10.5 in. (26.7 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>N/A</td>
<td>Plate steel, ASTM A36</td>
<td>5.25 in. (13.3 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure E-9. Front and Mounting Plate

a. All dimensions are in inches (centimeters).
b. Fabricate (3) and (5) from ASTM A-36 steel plate.
c. Drill 1-1/2 inch (3.84 cm) diameter hoe in (5) as shown on Figure E-9. Front and Mounting Plate.
d. Grind bevel edge of each plate for weld surface as shown on Figure E-9. Front and Mounting Plate.
e. De-burr and remove sharp edges.
E-6. HEADLIGHT ADJUSTMENT SCREEN

The headlight adjustment screen may be drawn on any vertical surface at least 50 in. (127 cm) high and 100 in. (254 cm) wide.

a. Draw two vertical lines (1) 50 in. (127 cm) high and 90.6 in. (230 cm) apart (centered on headlight adjustment screen).

b. Locate two points 40 in. (101.6 cm) from floor and 13 in. (33 cm) toward the center from each vertical line (1).

c. Draw vertical line (2) about 3-5 in. (8-13 cm) centered on each of the two points.

d. Draw horizontal line (3) about 3-5 in. (8-13 cm) centered on each of the two points.

e. Measure out 4 in. (10 cm) along each vertical line (2) and horizontal line (3) from each of the two points to make 8 in. (20 cm) squares (4).

Figure E-10. Headlight Adjustment Screen
E-7. M1089 30K WINCH TEST ADAPTER

Assemble the M1089 30K winch test adapter according to the following steps. Refer to the following parts list and Figure E-11. M1089 30K Winch Test Adapter for details.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Material Description</th>
<th>National Stock Number</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-4-4 100401BA</td>
<td>Tee, Tube</td>
<td>4730-01-095-3430</td>
<td>1</td>
</tr>
<tr>
<td>4-6 100102BA</td>
<td>Adapter, Straight, Pipe to Tube</td>
<td>4730-01-096-9398</td>
<td>1</td>
</tr>
<tr>
<td>207P-4</td>
<td>Coupling, Pipe</td>
<td>4730-00-881-1161</td>
<td>1</td>
</tr>
<tr>
<td>NB-4-035</td>
<td>Tubing, Nonmetallic</td>
<td>4720-01-071-4042</td>
<td>4 in.</td>
</tr>
<tr>
<td>MIL-T-27730</td>
<td>Tape, Antiseizing</td>
<td>8030-00-889-3534</td>
<td>1 roll</td>
</tr>
</tbody>
</table>

Figure E-11. M1089 30K Winch Test Adapter

a. All dimensions are in inches (millimeters).
b. Cut two pieces of nonmetallic tubing (1 and 2) to 2.0 in. (50.8 mm) long.
c. Remove three nuts (3), sleeves (4), and ferrules (5) from tube tee (6).
d. Install two nuts (3), sleeves (4), and ferrules (5) on nonmetallic tubing (1).
e. Install nonmetallic tubing (1) on tube tee (6).
f. Remove nut (7), sleeve (8), and ferrule (9) from straight adapter (10).
g. Install two nuts (3 and 7), sleeves (4 and 8), and ferrules (5 and 9) on nonmetallic tubing (2).
h. Install nonmetallic tubing (2) on tube tee (6).
i. Install nut (9) on straight adapter (10).
j. Apply one wrap of antiseizing tape to threads of straight adapter (10).
k. Install pipe coupling (11) on straight adapter (10).
Assemble the M1089 solenoid test adapter according to the following steps. Refer to the following parts list and Figure E-12. M1089 Solenoid Test Adapter for details.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Material Description</th>
<th>National Stock Number</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-2 080401CA</td>
<td>Tee, Tube</td>
<td>4730-01-214-6990</td>
<td>1</td>
</tr>
<tr>
<td>2-2 080202CA</td>
<td>Elbow, Pipe to Tube</td>
<td>4730-00-845-5345</td>
<td>1</td>
</tr>
<tr>
<td>4-2 130140B</td>
<td>Bushing, Pipe</td>
<td>4730-00-828-0171</td>
<td>1</td>
</tr>
<tr>
<td>NB-2-031</td>
<td>Tubing, Nonmetallic</td>
<td>4720-01-287-4499</td>
<td>24 in</td>
</tr>
</tbody>
</table>

Figure E-12. M1089 Solenoid Test Adapter

a. All dimensions are in inches (millimeters).
b. Cut one piece of nonmetallic tubing (1) to 6.0 in. (152.4 mm) long.
c. Cut one piece of nonmetallic tubing (2) to 18.0 in. (457.2 mm) long.
d. Remove three nuts (3) and ferrule sleeves (4) from tube tee (5).
e. Install two nuts (3) and ferrule sleeves (4) on nonmetallic tubing (1).
f. Install nonmetallic tubing (1) on tube tee (5).
g. Remove nut (6) and ferrule sleeve (7) from pipe to tube elbow (8).
h. Install two nuts (3 and 6) and ferrule sleeves (4 and 7) on nonmetallic tubing (2).
i. Install nonmetallic tubing (2) on tube tee (5).
j. Install nut (6) on pipe to tube elbow (8).
k. Install pipe bushing (9) on pipe to tube elbow (8).
E-9. RELAY TEST WIRE

Fabricate the relay test wire according to the following steps. Refer to the following parts list for materials.

<table>
<thead>
<tr>
<th>Material Description</th>
<th>National Stock Number</th>
<th>Cut Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire, Electrical (MIL-W-16878)</td>
<td>6145-00-330-3318</td>
<td>6 in. (152 mm)</td>
</tr>
</tbody>
</table>

a. Dimensions are in inches (millimeters).
b. Cut a length of wire six inches (152 mm) long.
c. Remove approximately 3/4 in. (19 mm) of electrical insulation from each end of wire.

E-10. TRANSMISSION AUXILIARY OIL COOLER RUBBER SEAL

Fabricate the transmission auxiliary oil cooler rubber seals in accordance with the following parts list.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>National Stock Number</th>
<th>Cut Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIL-R-6130</td>
<td>Tape, Adhesive, Rubber</td>
<td>9320-00-501-7537</td>
<td>24.7 627</td>
</tr>
</tbody>
</table>

E-11. WHEEL BEARING SHIM TOOL REST

Fabricate the wheel bearing shim tool rest according to the following steps. Refer to the following parts list for materials.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>National Stock Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>QQ-T-570</td>
<td>9510-00-866-1037</td>
<td>Bar, Metal</td>
</tr>
</tbody>
</table>

a. Dimensions are in inches (millimeters)
b. Cut metal bar to 9.0 inches (228.6 mm) long.
c. De-burr and remove sharp edges from ends of metal bar.

E-12. PNEUMATIC TUBES FABRICATION

Cut pneumatic tubes from bulk tubing stock listed in Table E-1. Pneumatic Tube Lengths. Use a fine-toothed hacksaw or suitable cutting device and cut tubing to required length.

<table>
<thead>
<tr>
<th>Tube Part Number</th>
<th>Bulk Tubing Part Number</th>
<th>Cut Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>12414690-001</td>
<td>NT-100-4 (79470)</td>
<td>18.1</td>
</tr>
<tr>
<td>12414690-002</td>
<td>NT-100-4 (79470)</td>
<td>16.0</td>
</tr>
<tr>
<td>12414690-003</td>
<td>NT-100-4 (79470)</td>
<td>15.0</td>
</tr>
<tr>
<td>12414690-004</td>
<td>NT-100-4 (79470)</td>
<td>74.8</td>
</tr>
<tr>
<td>12414690-005</td>
<td>NT-100-4 (79470)</td>
<td>69.7</td>
</tr>
</tbody>
</table>
### E-12. PNEUMATIC TUBES FABRICATION (CONT)

#### Table E-1. Pneumatic Tube Lengths (Cont)

<table>
<thead>
<tr>
<th>Tube Part Number</th>
<th>Bulk Tubing Part Number</th>
<th>Cut Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>inches</td>
</tr>
<tr>
<td>12414690-006</td>
<td>NT-100-4 (79470)</td>
<td>239.0</td>
</tr>
<tr>
<td>12414690-007</td>
<td>NT-100-4 (79470)</td>
<td>254.8</td>
</tr>
<tr>
<td>12414690-008</td>
<td>NT-100-4 (79470)</td>
<td>286.3</td>
</tr>
<tr>
<td>12414690-009</td>
<td>NT-100-4 (79470)</td>
<td>294.1</td>
</tr>
<tr>
<td>12414690-010</td>
<td>NT-100-4 (79470)</td>
<td>180.0</td>
</tr>
<tr>
<td>12414690-101</td>
<td>J844TYBSIZE 3/8 (81343)</td>
<td>18.0</td>
</tr>
<tr>
<td>12414690-102</td>
<td>J844TYBSIZE 3/8 (81343)</td>
<td>35.4</td>
</tr>
<tr>
<td>12414690-103</td>
<td>J844TYBSIZE 3/8 (81343)</td>
<td>20.9</td>
</tr>
<tr>
<td>12414690-104</td>
<td>J844TYBSIZE 3/8 (81343)</td>
<td>13.8</td>
</tr>
<tr>
<td>12414690-105</td>
<td>J844TYBSIZE 3/8 (81343)</td>
<td>11.8</td>
</tr>
<tr>
<td>12414690-106</td>
<td>J844TYBSIZE 3/8 (81343)</td>
<td>20.5</td>
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<td>12414690-107</td>
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<td>J844TYBSIZE 3/8 (81343)</td>
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<tr>
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<td>J844TYBSIZE 3/8 (81343)</td>
<td>11.4</td>
</tr>
<tr>
<td>12414690-115</td>
<td>J844TYBSIZE 3/8 (81343)</td>
<td>82.8</td>
</tr>
<tr>
<td>12414690-118</td>
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<td>J844TYBSIZE 3/8 (81343)</td>
<td>39.3</td>
</tr>
<tr>
<td>12414690-130</td>
<td>J844TYBSIZE 3/8 (81343)</td>
<td>164.4</td>
</tr>
<tr>
<td>12414690-131</td>
<td>J844TYBSIZE 3/8 (81343)</td>
<td>180.1</td>
</tr>
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<td>J844TYBSIZE 3/8 (81343)</td>
<td>219.5</td>
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<tr>
<td>12414690-133</td>
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<td>12414690-136</td>
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<td>J844TYBSIZE 3/8 (81343)</td>
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</tr>
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<td>67.0</td>
</tr>
<tr>
<td>12414690-139</td>
<td>J844TYBSIZE 3/8 (81343)</td>
<td>98.5</td>
</tr>
<tr>
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E-12. PNEUMATIC TUBES FABRICATION (CONT)

Table E-1. Pneumatic Tube Lengths (Cont)

<table>
<thead>
<tr>
<th>Tube Part Number</th>
<th>Bulk Tubing Part Number</th>
<th>Cut Length</th>
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<tr>
<td></td>
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<td>inches</td>
</tr>
<tr>
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<td>12414690-221</td>
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<td>12414690-223</td>
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<td>C608-100BLK (13174)</td>
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<td>C608-100BLK (13174)</td>
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<td>12414690-229</td>
<td>C608-100BLK (13174)</td>
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<td>12414690-230</td>
<td>C608-100BLK (13174)</td>
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<td>12414690-231</td>
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<td>C608-100BLK (13174)</td>
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</tr>
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<td>12414690-235</td>
<td>C608-100BLK (13174)</td>
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<td>C608-100BLK (13174)</td>
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<td>PFT-10B-BLK-100 (61424)</td>
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E-13. NON-METALLIC ELECTRICAL CABLE CONDUIT FABRICATION

Make conduit to cover electrical cables described on 1241638 from bulk tube stock listed in Table E-2. Non-Metallic Electrical Cable Conduit Lengths. Use a fine-toothed hacksaw or suitable cutting device and cut hose/tube to required length.

Table E-2. Non-Metallic Electrical Cable Conduit Lengths

<table>
<thead>
<tr>
<th>Tube Part Number</th>
<th>Bulk Tube Part Number</th>
<th>Cut Length</th>
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<tbody>
<tr>
<td>12416381P1</td>
<td>49008</td>
<td>8.9</td>
</tr>
<tr>
<td>12416381P10</td>
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<td>17.8</td>
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<td>12416381P11</td>
<td>49008</td>
<td>29.9</td>
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<td>12416381P12</td>
<td>49008</td>
<td>33.0</td>
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<td>12416381P13</td>
<td>49008</td>
<td>13.9</td>
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<td>12416381P14</td>
<td>49008</td>
<td>4.0</td>
</tr>
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<td>12416381P15</td>
<td>49008</td>
<td>17.4</td>
</tr>
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<td>12416381P16</td>
<td>49008</td>
<td>3.2</td>
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<td>12416381P17</td>
<td>49008</td>
<td>4.5</td>
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<td>12416381P18</td>
<td>49008</td>
<td>16.2</td>
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<td>12416381P20</td>
<td>27413</td>
<td>32.8</td>
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<td>12416381P21</td>
<td>27413</td>
<td>9.2</td>
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<td>27413</td>
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<td>27413</td>
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<td>5.2</td>
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<tr>
<td>12416381P9</td>
<td>49008</td>
<td>16.8</td>
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E-14. STEERING GEAR RETURN HOSE AND TRANSMISSION OIL COOLER HOSES FABRICATION

Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

<table>
<thead>
<tr>
<th>Hose Part Number</th>
<th>Bulk Hose Part Number</th>
<th>Cut Length</th>
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</thead>
<tbody>
<tr>
<td>12418037</td>
<td>A110 (30327)</td>
<td>75.5</td>
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<td></td>
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<td>191.7</td>
</tr>
<tr>
<td>12418460-001</td>
<td>MS521302B110360 (96906)</td>
<td>17.5</td>
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<td></td>
<td></td>
<td>44.4</td>
</tr>
<tr>
<td>12418460-002</td>
<td>MS521301A206R (96906)</td>
<td>16.0</td>
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<td></td>
<td></td>
<td>40.6</td>
</tr>
</tbody>
</table>

E-15. LANYARD ASSEMBLIES P/N 12418763 AND 12420196 FABRICATION

Make the following lanyard assemblies from bulk cable material, sleeves, and tab material and assemble according to Figure E-14. Lanyard Assembly. The following parts list identifies part numbers and lengths of cut pieces.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Material Description</th>
<th>Size</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MIL-W-83420 Type 1, Comp B</td>
<td>1/16 in. stranded wire cable</td>
<td>4 in. (102 mm)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>MS51844-22</td>
<td>Sleeve</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>N/A</td>
<td>Tab, Stainless Steel ASTM A617</td>
<td>.06 in. (16 cm) X .37 in. (9.5 mm) X 1.25 in. (32 mm)</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure E-14. Lanyard Assembly

a. All dimensions are in inches (millimeters).
b. Make from bulk cable and flat steel material as identified in parts list.
c. Drill two 0.19 in. (4.8 mm) diameter holes through tab material as shown on Figure E-14. Lanyard Assembly.
d. De-burr and remove sharp edges.
e. Bend tab as shown on Figure E-14. Lanyard Assembly.
f. Form loops on cable ends and insert sleeve material over cable on one end of cable and over cable and through sleeve at other end of cable as shown in Figure E-14. Lanyard Assembly.
g. Crimp two sleeves over cable ends.
E-16. NON-METALLIC VENT AIR HOSES FABRICATION

Cut the following vent air hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

<table>
<thead>
<tr>
<th>Hose Part Number</th>
<th>Bulk Hose Part Number</th>
<th>Cut Length</th>
</tr>
</thead>
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<td></td>
<td></td>
<td>inches</td>
</tr>
<tr>
<td>12420197-001</td>
<td>483666 (02280)</td>
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<td>12420197-002</td>
<td>483666 (02280)</td>
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<td>483666 (02280)</td>
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<td>12420197-005</td>
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<td>72.0</td>
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<td>12420198-001</td>
<td>881-16 (98441)</td>
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<td>12420198-002</td>
<td>11657469</td>
<td>36.0</td>
</tr>
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E-17. PERSONNEL HEATER AIR DUCT HOSE FABRICATION

Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

<table>
<thead>
<tr>
<th>Hose Part Number</th>
<th>Bulk Hose Part Number</th>
<th>Cut Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>inches</td>
</tr>
<tr>
<td>12420308-457</td>
<td>8711054 (19207)</td>
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</tr>
<tr>
<td>12420308-760</td>
<td>8711054 (19207)</td>
<td>30.4</td>
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</table>

E-18. BLOCK SEAL 12420489 FABRICATION

Make block seal from P/N (0VXY8) STN2.38X.5. Use a suitable cutting tool to cut seal to 0.52 inch (1.3 cm) long.
E-19. CTIS SEAL DRIVER 3256-H-1048

Used on Front, Intermediate, and Rear Axle CTIS Seals.

NOTES ON USE OF DRIVER
1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS, DIRT, NICKS AND BURRS
2) DO NOT USE A METAL HAMMER ON DRIVER
   A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE MALLET
   IS TO BE USED
3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL

Figure E-15. CTIS Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.
E-20. WHEEL HUB GREASE SEAL DRIVER 3256-K-1051

NOTES ON USE OF DRIVER
1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS, DIRT, NICKS AND BURRS
2) DO NOT USE A METAL HAMMER ON DRIVER
   A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE MALLET
   IS TO BE USED
3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL

Figure E-16. Wheel Hub Grease Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.
E-21. DIMMER SWITCH TEST WIRE

Fabricate the dimmer switch test wire according to the following steps. Refer to the following parts list for materials.

<table>
<thead>
<tr>
<th>Material Description</th>
<th>National Stock Number</th>
<th>Quantity</th>
<th>Cut Length</th>
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<td>(M168678/14BKE9)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pin, Grooved, Headless</td>
<td>5315-01-156-6314</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>(12258939-1)</td>
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<td>(12258939-2)</td>
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</table>

a. Dimensions are in inches (millimeters).
b. Cut a length of electrical wire approximately 12 in. (305 mm) long.
c. Remove approximately 1/4 in. (6 mm) of insulation from each end of electrical wire.
d. Crimp headless grooved pin on one end of electrical wire.
e. Crimp electrical contact on opposite end of electrical wire.
E-22. PURGE VALVE TOOL

Fabricate Purge Valve Tool according to the following instructions. Refer to Figure E-17. Purge Valve Tool for details.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Material Description</th>
<th>Size</th>
<th>Qty</th>
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<tr>
<td>1</td>
<td>N/A</td>
<td>Steel, ASTM A 108 or A576 Grade 1015-1025, BAR (Ref UNS G10150-G10250). Finish Black Oxide Coat, Class I, IAW MIL-C-13924.</td>
<td>14.0 in. (356 mm)</td>
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Figure E-17. Purge Valve Tool

a. All dimensions are in inches (cm).
b. Cut steel bar (1) and bend to shape as shown in Figure E-17.
c. Dimensional limits apply after coating.
d. All edges shall be broken and free from burrs.
e. Metal Stamp, electro etch, or engrave with the following marking IAW MIL-STD-130: 19207-12379968 MFR-19207.
Cut air hoses and convoluted tubing from bulk hose stock listed in Table E-3. M1089 30K Winch Air Hose Lengths and Fittings. Use a fine-toothed hacksaw or suitable cutting device and cut air hoses and convoluted tubing to required length.

Table E-3. M1089 30K Air Hose Lengths and Fittings

<table>
<thead>
<tr>
<th>Hose Name</th>
<th>Bulk Hose P/N</th>
<th>Hose Cut Length</th>
<th>Bulk Convoluted Tubing P/N</th>
<th>Convoluted Tubing Cut Length</th>
<th>Fittings P/N</th>
<th>Fittings Qty.</th>
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Assembly the M1089 30K winch pneumatic test adapter to the following steps. Refer to the following parts list and Figure E-18. M1089 30K Winch Pneumatic Test Adapter for details.

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<th>Material Description</th>
<th>National Stock Number</th>
<th>Qty.</th>
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<td>Tubing, Nonmetallic</td>
<td>4720-01-071-4042</td>
<td>14 in. (355.6 mm)</td>
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<td>8030-00-889-3534</td>
<td>1 roll</td>
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<td>207P-4</td>
<td>Coupling, Pipe</td>
<td>4730-00-881-1161</td>
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<td>4-4 100101 BA</td>
<td>Nipple, Tube</td>
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Figure E-18. M1089 30K Winch Pneumatic Test Adapter

a. All dimensions are in inches (millimeter).
b. Cut piece of nonmetallic tubing (1) to 14.0 in. (355.6 mm).
c. Remove two nuts (2), ferrules (3), and sleeves (4) from tube nipple (5).
d. Install nut (2), ferrule (3), and sleeve (4) on nonmetallic tubing (1).
e. Install nonmetallic tubing (1) on tube nipple (5).
f. Remove nut (6), ferrule (7), and sleeve (8) from straight adapter (9).
g. Install nut (6), ferrule (7), and sleeve (8) on nonmetallic tubing (1).
h. Install nonmetallic tubing (1) on straight adapter (9).
i. Apply on wrap of antiseizing tape to threads of straight adapter (9).
j. Install pipe coupling (10) on straight adapter (9).
k. Retain nut (2), ferrule (3), and sleeve (4) for future use.
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.

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.

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.
## APPENDIX F

### TORQUE LIMITS

Table F-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

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**NOTE**
Manufacturer's marks may vary. These are all SAE Grade 5.
Table F-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

Manufacturer's marks may vary. These are all SAE Grade 5

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# APPENDIX F
## TORQUE LIMITS

**Table F-2. Dry Torque Limits for SAE and ANSI Prevailing Torque Nuts**

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Table F-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

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**APPENDIX F**

**TORQUE LIMITS**

Table F-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

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APPENDIX G
MANDATORY REPLACEMENT PARTS

Section I. INTRODUCTION

G-1. SCOPE
This appendix lists mandatory replacement parts you will need to maintain the MTV vehicle.

G-2. EXPLANATION OF COLUMNS

a. Column (1) - Item Number. This number is assigned to each entry in the listing and is referenced in the Initial Setup of the applicable task under Materials/Parts.

b. Column (2) - Nomenclature. Name or identification of the part.

c. Column (3) - Part Number. The manufacturer's part number.

d. Column (4) - National Stock Number. The National stock number of the part.

Section II. MANDATORY REPLACEMENT PARTS LIST

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APPENDIX H  
LUBRICATION ORDER AND SERVICES

SECTION I. INTRODUCTION

H-1. GENERAL

The information contained in this appendix provides the lubrication/services requirements for the MTV vehicle.

a. **Adherence.** Intervals (on-condition or hardtime) and the related man-hour times are based on normal operation. The man-hour time specified is the time needed to do all the services prescribed for a particular interval. On-condition (OC) oil sample intervals will be applied unless changed by the Army Oil Analysis Program (AOAP) laboratory. Change the hardtime interval if the lubricants are contaminated or if operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The calendar interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Hardtime intervals will be applied in the event AOAP laboratory support is not available. Hardtime intervals must be applied during the warranty period.

Intervals shown in this lubrication order and services are based on mileage/calendar, and in some cases mileage alone. An example of a mileage/calendar interval is: **Q**, which means every 3,000 miles (4,827 km) or quarterly (every three months). The lubrication is to be performed at whichever interval occurs first for the vehicle. An example of a mileage alone interval is: **6K**, which stands for every 6,000 miles (9,654 km). The lubrication/services is to be performed at the mileage indicated regardless of the calendar interval.

**WARNING**

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable.** Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breath vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 138°F (50°C). Failure to comply may result in serious injury or death to personnel.

- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help.** If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get medical attention. Failure to comply may result in injury to personnel.

b. **Cleaning fittings before lubricating.** Clean parts with dry cleaning solvent (SD P-D-680) (Item 65, Appendix D) or equivalent. Dry before lubricating. Dashed arrows indicate lubrication on both sides of the equipment.

c. **Lubricating after fording.** If fording occurs, lubricate all fittings below fording depth and check submerged gearboxes for presence of water.

d. **Lubricating after high-pressure washing.** After a thorough washing, lubricate all grease fittings and oil can points outside and underneath vehicle.

e. **Level of Maintenance.** The lowest level of maintenance authorized to lubricate a point is Operator/Unit Maintenance (O). Operator/crew (C) may lubricate points authorized for Unit Maintenance (O) when authorized by Unit Maintenance (O).

f. **Localized views.** A reference to the appropriate localized view is given after most lubrication entries. Localized views begin on page H-13.
H-1. GENERAL (CONT)

g. **Interval Symbols.** The lubrications/services interval symbols will be used as applicable:

- Q-quarterly/3,000 mi (4,827 km) (whichever occurs first)
- S-semiannually/6,000 mi (9,654 km) (whichever occurs first)
- A-annually/12,000 mi (19,308 km) (whichever occurs first)
- B-biennially/24,000 mi (38,616 km) (whichever occurs first)
- 3K-every 3,000 mi (4,827 km) (no calendar interval)
- 6K-every 6,000 mi (9,654 km) (no calendar interval)
- 12K-every 12,000 mi (19,308 km) (no calendar interval)
- 24K-every 24,000 mi (38,616 km) (no calendar interval)

H-2. OIL FILTERS

Oil filters shall be serviced/changed as applicable, when:

a. They are known to be contaminated, or clogged;

b. Service is recommended by AOAP laboratory analysis; or

c. At prescribed hardtime intervals while vehicle is under warranty, or if AOAP is not available/used as required.

H-3. AOAP SAMPLING INTERVAL

- Engine oil is hot and under pressure. The oil sampling valve releases oil proportionally to the amount of pressure applied to valve. Activate oil sampling valve by pressing in slowly to prevent injury to personnel. Failure to comply may result in injury to personnel.

- Wear safety goggles when taking oil sample. Oil is under pressure and could cause injury to personnel. Failure to comply may result in injury to personnel.

Units participating in AOAP will sample engine oil every 3,000 miles (4,827 km) or 6 months, whichever occurs first and change engine oil as directed by AOAP. Units participating in AOAP will sample transmission oil every 6,000 miles (9,654 km) or 12 months, whichever occurs first and change transmission oil as directed by AOAP. Units participating in AOAP will sample hydraulic system oil initially after 6 weeks or 10 hours of operation, whichever occurs first. After initial oil change samples should be taken every 12 months or 50 hours of operation, whichever occurs first and change hydraulic oil as directed by AOAP.

H-4. WARRANTY HARDTIME STATEMENT

"For equipment under manufacturer's warranty, hardtime oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (such as longer than usual operating hours, extended idling periods, extreme dust)."
### SECTION II. LUBRICATION/SERVICES CHART

#### H-5. LUBRICATION/SERVICES KEY

<table>
<thead>
<tr>
<th>Specification</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIL-L-2104 (OE/HDO)</td>
<td>Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service</td>
</tr>
<tr>
<td>MIL-L-46167 (OEA)</td>
<td>Lubricating Oil, Internal Combustion Engine, Arctic</td>
</tr>
<tr>
<td>MIL-L-2105 (GO)</td>
<td>Lubricating Oil, Gear, Multipurpose</td>
</tr>
<tr>
<td>MIL-G-10924 (GAA)</td>
<td>Grease, Automotive and Artillery</td>
</tr>
<tr>
<td>MIL-G-18458 (GW)</td>
<td>Grease, Wire-Rope and Exposed Gear</td>
</tr>
<tr>
<td>MIL-H-5606 (OHA)</td>
<td>Hydraulic Fluid, Petroleum Base, Aircraft, Missile, and Ordnance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>CAPACITY</th>
<th>EXPECTED TEMPERATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Above +40 F</td>
<td>+40 F to -15 F</td>
</tr>
<tr>
<td></td>
<td>(Above +4 C)</td>
<td>(+4 C to -26 C)</td>
</tr>
<tr>
<td>Engine crankcase</td>
<td>25 qt (24 L)</td>
<td>OE/HDO-15/40</td>
</tr>
<tr>
<td>Transmission (total system) (all models except M1088 and M1089)</td>
<td>49.3 qt (46.7 L)</td>
<td>OE/HDO-15/40</td>
</tr>
<tr>
<td>Transmission (at oil change) (all models except M1088 and M1089)</td>
<td>36.8 qt (34.7 L)</td>
<td>OE/HDO-15/40</td>
</tr>
<tr>
<td>Transmission (total system) (M1088 and M1089)</td>
<td>58.6 qt (55.4 L)</td>
<td>OE/HDO-15/40</td>
</tr>
<tr>
<td>Transmission (at oil change) (M1088 and M1089)</td>
<td>31.8 qt (30.0 L)</td>
<td>OE/HDO-15/40</td>
</tr>
<tr>
<td>Transmission (after overhaul)</td>
<td>39.0 qt (37.0 L)</td>
<td>OE/HDO-15/40</td>
</tr>
<tr>
<td>Steering system</td>
<td>5 qt (4.8 L)</td>
<td>OE/HDO-10</td>
</tr>
<tr>
<td>Hydraulic reservoir (except M1089)</td>
<td>27 gal (102.2 L)</td>
<td>OE/HDO-10</td>
</tr>
<tr>
<td>Hydraulic tank (M1089)</td>
<td>74 gal (280 L)</td>
<td>OE/HDO-10</td>
</tr>
<tr>
<td>Front axle differential (maximum capacity)</td>
<td>9.5 qt (9 L)</td>
<td>GO-80/90</td>
</tr>
<tr>
<td>Intermediate axle differential (maximum capacity)</td>
<td>14.7 qt (13.9 L)</td>
<td>GO-80/90</td>
</tr>
<tr>
<td>Rear axle differential (maximum capacity)</td>
<td>12.15 qt (11.5 L)</td>
<td>GO-80/90</td>
</tr>
<tr>
<td>Front axle planetary hubs</td>
<td>11-13 oz (0.33-0.38 L)</td>
<td>GO-80/90</td>
</tr>
</tbody>
</table>
### H-5. LUBRICATION/SERVICES KEY (CONT)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>CAPACITY</th>
<th>EXPECTED TEMPERATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Above +40 °F (Above +4 °C)</td>
</tr>
<tr>
<td>Rear axle bogie</td>
<td>0.5 qt (0.5 L)</td>
<td>GO-85/140</td>
</tr>
<tr>
<td>15K Self-Recovery Winch (SRW)</td>
<td>As Required</td>
<td>GO-85/140</td>
</tr>
<tr>
<td>30K winches</td>
<td>As Required</td>
<td>GO-85/140</td>
</tr>
<tr>
<td>Propeller shaft universal and slip joints</td>
<td>As Required</td>
<td>GAA</td>
</tr>
<tr>
<td>Tie rod ends</td>
<td>As Required</td>
<td>GAA</td>
</tr>
<tr>
<td>Towing pintle assembly</td>
<td>As Required</td>
<td>GAA</td>
</tr>
<tr>
<td>Fifth wheel</td>
<td>As Required</td>
<td>GAA</td>
</tr>
<tr>
<td>Spring bolts and spring shackles</td>
<td>As Required</td>
<td>GAA</td>
</tr>
<tr>
<td>Front axle shaft U-joints and steering knuckles</td>
<td>As Required</td>
<td>GAA</td>
</tr>
<tr>
<td>Front axle inner wheel bearing</td>
<td>As Required</td>
<td>GAA</td>
</tr>
<tr>
<td>Intermediate axle inner wheel bearing</td>
<td>As Required</td>
<td>GAA</td>
</tr>
<tr>
<td>Rear axle inner wheel bearing</td>
<td>As Required</td>
<td>GAA</td>
</tr>
<tr>
<td>Front lifting beam</td>
<td>As Required</td>
<td>GAA</td>
</tr>
<tr>
<td>15K Self-Recovery Winch (SRW) cable</td>
<td>As Required</td>
<td>GW</td>
</tr>
<tr>
<td>30K winch cables</td>
<td>As Required</td>
<td>GW</td>
</tr>
<tr>
<td>Air/hydraulic power unit</td>
<td>3 pt (1.4 L)</td>
<td>OHA</td>
</tr>
<tr>
<td>Backup hydraulic pump</td>
<td>19 oz (562 ml)</td>
<td>OHA</td>
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### COOLANT

<table>
<thead>
<tr>
<th>Specification</th>
<th>Type</th>
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<tbody>
<tr>
<td>A-A-52624A</td>
<td>Antifreeze, Multi-Engine Type</td>
</tr>
<tr>
<td>MIL-A-11755</td>
<td>Antifreeze, Arctic-Type</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>CAPACITY</th>
<th>EXPECTED TEMPERATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Above +40 °F (Above +4 °C)</td>
</tr>
<tr>
<td>Cooling system (engine only)</td>
<td>14 qt (13 L)</td>
<td>A-A-52624A</td>
</tr>
<tr>
<td>Cooling system (total system)</td>
<td>50.3 qt (47.6 L)</td>
<td>A-A-52624A</td>
</tr>
<tr>
<td>Cooling system (total system) (M1088, M1089)</td>
<td>52.8 qt (49.9 L)</td>
<td>A-A-52624A</td>
</tr>
<tr>
<td>Cooling system, Arctic (total system)</td>
<td>64.8 qt (61.3 L)</td>
<td>N/A</td>
</tr>
<tr>
<td>Cooling system, Arctic (total system) (M1088, M1089)</td>
<td>76.5 qt (72.4 L)</td>
<td>N/A</td>
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### CLEANING AGENT

<table>
<thead>
<tr>
<th>Specification</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-D-680</td>
<td>Dry Cleaning Solvent, SD-II</td>
</tr>
<tr>
<td>O-C-1901</td>
<td>Cleaning Compound, Windshield</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>CAPACITY</th>
<th>EXPECTED TEMPERATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Above +15 °F (Above -9 °C)</td>
</tr>
<tr>
<td>All metal parts as required</td>
<td>N/A</td>
<td>SD-II (all temperatures)</td>
</tr>
<tr>
<td>Windshield washer reservoir</td>
<td>7.5 qt (7.1 L)</td>
<td>2/3 water to 1/3 O-C-1901</td>
</tr>
</tbody>
</table>

For arctic operation refer to FM 9-207.

### H-6. LUBRICATION/SERVICES INTERVALS

<table>
<thead>
<tr>
<th>Intervals</th>
<th>Total Man-Hours</th>
</tr>
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<tbody>
<tr>
<td>Quarterly (Q)</td>
<td>2.0</td>
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<tr>
<td>Semi-annually (S)</td>
<td>6.0</td>
</tr>
<tr>
<td>Annually (A)</td>
<td>1.5</td>
</tr>
<tr>
<td>Biennially (B)</td>
<td>3.5</td>
</tr>
<tr>
<td>3K</td>
<td>1.0</td>
</tr>
<tr>
<td>6K</td>
<td>1.0</td>
</tr>
<tr>
<td>12K</td>
<td>6.5</td>
</tr>
<tr>
<td>24K</td>
<td>0.5</td>
</tr>
</tbody>
</table>

* Whichever occurs first.
** No calendar interval.
LUBRICANT INTERVAL

**Engine Crankcase Breather (O)**  
(See note 17 and view A)

**Fuel Filter (O)**  
(See note 6 and view A)

**Fuel/Water Separator (O)**  
(See note 5 and view B)

**Cooling System (O)**  
(See note 7)

**Transmission Filter (O)**  
(See note 3 and view F)

**Transmission Drain and Fill (O)**  
(See note 3 and views D, E, and F)

**Intermediate Axle and Rear Axle Inner Wheel Bearing Repack (O)**  
(See note 27)

**Towing Pintle Fill (O)**  
(See note 16 and views J and K)

---

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.
Spring Shackle Fill (O)
(See note 18 and view I)

Tie Rod Ends Fill (O)
(See note 13 and view N)

Universal and Slip Joints Fill (O)
(See note 9 and view P)

Battery Posts (O)
(See note 19 and view Q)

Air Dryer (O)
(See note 37 and view BB)

Spring Bolt Fill (O)
(See note 18 and view H)

Brake Wedge and Air Chamber (O)
(See note 21 and view L)

Backup Hydraulic Pump Drain and Fill (O)
(See note 10 and view R)

Air/Hydraulic Power Unit Drain and Fill (O)
(See note 10 and view S)

Brake Wedge and Air Chamber (O)
(See note 21 and view M)

Universal Joint and Slip Joints Fill (O)
(See note 9 and view P)

Brake Wedge and Air Chamber (O)
(See note 21 and view M)

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.
LUBRICANT INTERVAL

Front Axle
Check and Fill (O)
(See note 11 and view T)

Axle Shaft U-Joints
Fill (O)
(See note 20 and view U)

Steering Knuckles
Fill (O)
(See note 20 and view U)

Front Lifting Beam
Clean and Grease (O)
(See note 36 and view AI)

Hydraulic Reservoir and Filter
Drain and Fill (O)
(See note 8 and view X)

Intermediate Axle Screen and Plug Oil Filter Assembly
Clean (O)
(See note 31 and view AH)

Intermediate Axle
Check and Fill (O)
(See note 11 and view T)

Rear Axle
Check and Fill (O)
(See note 11 and view T)

Front Axle
Drain and Fill (O)
(See note 11 and view T)

Wheel End Planetary Hubs
Drain and Fill (O)
(See note 12 and view V)

Wheel End Planetary Hubs
Check and Fill (O)
(See note 12 and view V)

15K Self-Recovery Winch (SRW)
Cable Fill (O)
(See note 14 and view W)

15K Self-Recovery Winch (SRW)
Check and Fill (O)
(See note 15 and view Y)

15K Self-Recovery Winch (SRW)
Drain and Fill (O)
(See note 15 and view Y)

Intermediate Axle Drain and Fill (O)
(See note 11 and view T)

Rear Axle
Drain and Fill (O)
(See note 11 and view T)

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.
NOTE: Dashed arrows indicate lubrication on both sides of vehicle.
NOTE: Dashed arrows indicate lubrication on both sides of vehicle.
LUBRICANT INTERVAL

Hoist
Check and Fill (O)
(See note 24 and view AS)

Boom Wear Pads
Fill (O)
(See note 23)

Boom Sheave
Fill (O)
(See note 34 and view AT)

Hoist Cable
Fill (O)
(See note 14)

Turntable Gearbox
Check and Fill (O)
(See note 25 and view AU)

Lift Cylinder Pivots
Fill (O)
(See note 34 and view AV)

Erection Cylinder and Tension Link Pivots
Fill (O)
(See note 34 and view AW)

Erection Cylinder and Tension Link Pivots
Fill (O)
(See note 34 and view AX)

Tension Link
Grease (O)
(See note 38 and view BC)

Turntable Bearing and Pinion Gear Teeth
Fill (O)
(See note 26 and view AY)

Turntable Bearing
Fill (O)
(See note 32 and view AZ)

M1084/M1086 MATERIAL HANDLING CRANE (MHC)

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.
H-7. LOCATOR VIEWS (CONT)

LUBRICANT INTERVAL

INTERVAL LUBRICANT

Left and Right Lift Cylinder
Pivots
Fill (O)
(See note 35)

Camlock Assembly
Fill (O)
(See note 35)

Left and Right Lower Arm
Pivots
Fill (O)
(See note 35)

Crossbar Bushing
Fill (O)
(See note 35)

M1089 UNDERLIFT ASSEMBLY

NOTE: Dashed arrows indicate lubrication on both sides of vehicle
H-8. LOCAL VIEWS (CONT)
H-8. LOCAL VIEWS (CONT)

- Erection Cylinder and Tension Link Pivots
  - AL

- Ring Gear Teeth and Pinion Gear Teeth
  - AM

- Hoist
  - AN

- Hook Block Sheave
  - AO
H-8. LOCAL VIEWS (CONT)

**AT**
- Boom Sheave

**AU**
- Swing Drive Gearbox

**AV**
- Lift Cylinder Pivots

**AW**
- Erection Cylinder and Tension Link Pivots
H-9. LUBRICATION/SERVICES NOTES

1. ENGINE CRANKCASE. Check engine oil level daily. Change engine oil at initial 5,000 miles (8,045 km). During the remainder of the 12,000 mile (19,308 km)/18 month warranty period. Units participating in AOAP will sample engine oil every 3,000 miles (4,827 km) or 6 months, whichever occurs first and change oil as directed by AOAP. Units not participating in AOAP, will change engine oil every 6,000 miles (9,654 km) or every six months, whichever occurs first. After expiration of engine warranty period, Units participating in AOAP will perform engine oil change as directed by AOAP. Units not participating in AOAP will change engine oil every 6,000 miles (9,654 km) or every six months, whichever occurs first, or when operating in dusty areas or under severe operating conditions, change the oil every 3,000 miles (4,827 km) or every three months, whichever occurs first. Drain engine oil when engine is warm. Refill engine crankcase with OE/HDO specified for the ambient temperature. Engine oil is full when level is within crosshatch marks on the dipstick. Do not overfill.

2. ENGINE OIL FILTER. Filter is replaced each time the crankcase is drained. If water or metal particles are detected during oil filter replacement, notify Direct Support Maintenance personnel before refilling crankcase (para 3-4).

3. TRANSMISSION. Check transmission oil level daily. Change transmission oil at initial 5,000 miles (8,045 km). During the remainder of the 24 month/unlimited mileage warranty. Units participating in AOAP will sample transmission oil every 6,000 miles (9,654 km) or 12 months, whichever occurs first and change oil as directed by AOAP. Units not participating in AOAP will perform transmission oil change every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Drain transmission oil when engine is warm. Refill with OE/HDO specified for ambient temperature. Add oil until the proper level is reached (TM 9-2320-366-10-1). Do not overfill. Replace oil filters each time transmission oil is changed (para 8-9).

4. POWER STEERING. Check power steering oil level weekly. Change the oil every 24,000 miles (38,616 km). Disconnect upper and lower hoses from steering gear and drain oil. Refill power steering pump reservoir with OE/HDO specified for the ambient temperature. Reservoir is full when oil is between the two marks on the dipstick. Do not overfill. Remove dipstick, wipe clean and install dipstick fully into reservoir. Remove dipstick and read oil level. Replace oil filter each time power steering oil is changed (para 13-8).
5. FUEL/WATER SEPARATOR. Replace filter element every 6,000 miles (9,654 km) or once every six months, whichever occurs first (para 4-13).

6. FUEL FILTER. The fuel particle filter is replaced when a new fuel/water separator filter element is installed. The normal replacement interval is every 6,000 miles (9,654 km) or once every six months, whichever occurs first (para 4-14).

7. ENGINE COOLANT. Check engine coolant level daily. Change the coolant and flush the cooling system every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Fill radiator overflow tank with an Ethylene Glycol/water mixture as specified in 0-A-548D. Service the cooling system before the specified interval if:
   - Coolant is heavily contaminated.
   - Engine overheats.
   - Oil cooler has failed allowing oil and coolant to mix.

8. HYDRAULIC RESERVOIR AND FILTER (All Models Except M1089). Check oil level weekly and make sure oil level gage reads F (full). Units participating in AOAP will sample oil annually and change oil and filter as directed by AOAP. Units not participating in AOAP will change oil and filter every two years. Drain oil and refill hydraulic reservoir with OE/HDO specified for ambient operating temperature. Fill hydraulic reservoir until oil level gage reads F (full). Do not overfill. Replace oil filter each time oil is changed (para 19-13).

9. DRIVE SHAFT UNIVERSAL and SLIP YOKE. Lubricate drive shafts with GAA every 3,000 miles (4,827 km) or once every three months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first. Perform drive shaft hinging inspection every time drive shafts are serviced (para 9-3).
   - UNIVERSAL JOINT:
     A. Apply grease to both grease fittings until new grease purges from all four bearing caps.
     B. If grease does not purge from all four bearing caps, perform the following steps:
        (1) Loosen two screws on bearing cap that does not purge, approximately 1/4 in.
        (2) Apply grease to grease fitting for bearing cap that does not purge until bearing cap purges.
        (3) Remove and discard the two screws loosened in step (1).
        (4) Position two replacement screws in bearing cap and tighten down evenly.
        (5) Tighten two screws to 26-35 lb-ft (35-47 N m).
   - SLIP JOINT:
     A. Apply grease until grease appears at the vent in the welch plug.
     B. Place your finger over the welch plug vent and add grease until grease purges from the dust seal.
     C. If grease does not purge from the dust seal, inspect drive shaft slip yoke (para 9-2).

10. AIR/HYDRAULIC POWER UNIT and BACKUP HYDRAULIC PUMP. Change OHA oil every 24,000 miles (38,616 km) or once every two years, whichever occurs first. To service air/hydraulic power unit and backup hydraulic pump refer to vehicle para 19-8, Air Transportability Hydraulic System Service.

11. ALL AXLE DIFFERENTIALS. Check oil level in differentials every 3,000 miles (4,827 km). Check oil level with vehicle parked on level surface and axle differential at ambient temperature, allowing at least one hour to cool down after vehicle operation. If oil is checked when axle differential is hot, it is normal for oil to spill out of the port due to expansion from the heat. Oil level is considered full if it is within one inch of the bottom of the fill port. If oil spills from the fill port when the axle differential is cool, it is overfull. Allow oil to drain until no more drains out. If the oil level is more than one inch below the bottom of the fill port, refill axle differential with GO specified for the ambient temperature until level with bottom of fill port. Change the oil every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Drain oil when hot after operation.
H-9. LUBRICATION/SERVICES NOTES (CONT)

12. FRONT AXLE WHEEL END PLANETARY HUBS. There are two lube intervals for the front axle wheel end planetary hubs.

   a. Check and fill front axle wheel end planetary hubs every 3,000 miles (4,827 km) or once every three months, whichever occurs first, as follows:

      (1) Position vehicle on a level surface. Allow 15 minutes for vehicle to cool before checking oil levels.
      (2) Position fill port at 4 o’clock position. If oil flows from fill port when plug is loosened, let oil drain to correct level. If oil level is below fill port, fill hub with GO specified for the ambient temperature until oil is level with fill port.

   b. Drain and fill front axle wheel end planetary hubs every 24,000 miles (38,616 km) or once every two years, whichever occurs first, following the repacking of the inner wheel bearings, or whenever wheel end assemblies are taken apart for other maintenance as follows:

      (1) Position vehicle on a level surface.
      (2) Position fill port at the 6 o’clock (down) position.
      (3) Drain hub oil (allow a minimum of 15 minutes for oil to drain down from vent tubes).
      (4) Refill hubs with 11-13 ounces of GO specified for the ambient temperature.

13. TIE ROD ENDS. Lubricate tie rod ends with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun, until new grease is seen purging from the boot area. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

14. WINCH CABLES:

   CAUTION

   Do not use dry cleaning solvent to clean winch cables. Use of dry cleaning solvent will remove lubricant from inner strands of winch cables. Failure to comply may result in damage to equipment.

   a. After winch operation:
      Refer to FM 5-125.

   b. Care of wire rope:
      Refer to FM 5-125.

   c. Inspection of wire rope:
      Refer to FM 5-125.

   d. Every six months:
      (1) Unwind entire length of winch cable (TM 9-2320-366-10-1).
      (2) Soak and clean winch cable with new OE/HDO 30.
      (3) Wipe off excess OE/HDO 30.
      (4) Coat winch cable with GW.
      (5) Rewind winch cable (TM 9-2320-366-10-1).
15. **15K SRW.** Check 15K SRW gear oil level every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Refill 15K SRW with GO specified for ambient temperature. Change oil every 12,000 miles (19,308 km) or once every year, whichever occurs first. Use procedure (a) to check and fill oil level; use procedure (b) to change oil.

a. Check and fill oil level as follows:

1. Shift the freespool mechanism to the disengage position so the drum can be freely rotated.
2. Rotate the drum to where either plug is near the top of the 15K SRW. Remove the plug.
3. Rotate the drum 90 degrees in the direction that allows the other plug to be near the top of the 15K SRW. Remove the plug.
   
   **NOTE**
   
   Oil level is full if a small amount of oil runs out of lower plug.

4. Add oil until a small amount of oil runs out of lower plug hole.
5. Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
6. Rotate drum until open hole is at top.
7. Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
8. Tighten plugs to 13-15 lb-ft (18-20 N·m).

b. Change oil as follows:

1. Shift the freespool mechanism to the disengage position so the drum can be freely rotated.
2. Rotate the drum to where either plug is near the top of the 15K SRW. Remove the plug.
3. Rotate the drum 90 degrees in the direction that allows the other plug to be near the top of the 15K SRW. Remove the plug.
4. Position drain pan (Item 39, Appendix C) under 15K SRW.
5. Rotate the drum until either hole is straight down to the bottom of the 15K SRW. Allow the oil to drain completely.
6. Rotate the drum until either hole is at top.

   **NOTE**

   Oil level is full if a small amount of oil runs out of lower plug.

7. Add oil until a small amount of oil runs out of lower plug hole.
8. Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
9. Rotate drum until open hole is at top.
10. Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
11. Tighten plugs to 13-15 lb-ft (18-20 N·m).

16. **TOWING PINTLE.** Lubricate towing pintle with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun until new grease is seen purging.
H-9. LUBRICATION/SERVICES NOTES (CONT)

- **WARNING**

- **Dry Cleaning Solvent (P-D-680)** is **TOXIC** and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not 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 138°F (50°C). Failure to comply may result in serious injury or death to personnel.

- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get medical attention. Failure to comply may result in injury to personnel.

17. **ENGINE CRANKCASE BREATHER.** Remove crankcase breather and clean with Dry Cleaning Solvent (SD P-D-680) (Item 65, Appendix D) or equivalent, and replace o-ring seal every 6,000 miles (9,654 km) or once every six months, whichever occurs first (para 3-5).

18. **FRONT AXLE SPRING BOLT and SPRING SHACKLE.** Lubricate front axle spring bolt and spring shackle with GAA every 3,000 miles (4,827 km) or once every three months, whichever occurs first, using a low pressure lubrication gun until grease appears between pins and bushings at both ends of spring bolt and spring shackle. If pins do not accept grease, notify Direct Support to remove pins. Clean and inspect pins and bushings, replace if necessary. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

19. **BATTERY POSTS.** Service batteries in accordance with TM 9-6140-200-14, every 6,000 miles (9,654 km) or once every six months, whichever occurs first.

20. **FRONT AXLE SHAFT UNIVERSAL JOINTS and STEERING KNUCKLES.** Lubricate universal joints every 3,000 miles (4,827 km) or once every three months, whichever occurs first. Lubricate steering knuckles with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

21. **BRAKE WEDGE and AIR CHAMBER: BRAKE SPIDER, SELF-ADJUSTER MECHANISM, AND WEDGE ASSEMBLY.** Clean and lubricate (with GAA) areas of spider and hardware that contact the brake shoes. Disassemble, clean and lubricate the self-adjuster mechanism. Clean and lubricate the wedge head, rollers and ramps in the plungers. Clean and lubricate every 6,000 miles (9,654 km). If operating conditions are severe or abnormal, service at 3,000 miles (4,827 km) or once every three months, whichever occurs first, or when any of the following occur: Refer to para 11-4 and 11-5

- Seals are replaced
- Plungers are removed
- Brakes are relined
- Grease becomes contaminated or hardened

22. **HYDRAULIC TANK (M1089).** Check oil level weekly and make sure oil level indicates FULL. Units participating in AOAP will sample oil annually and change oil and filter as directed by AOAP. Units not participating in AOAP will change oil and filter every two years. Drain oil and refill hydraulic tank with OE/HDO specified for ambient operating temperature. Fill hydraulic tank until oil level is at the FULL mark on the sight glass. Do not overfill. Replace hydraulic oil filter (para 19-20) when oil is changed. Check oil level with Material Handling Crane (MHC) in the stowed position.
23. **BOOM WEAR PADS (M1084/M1086/M1089).** Lubricate every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Coat boom wear pads with GAA while boom is extended, for the lower wear pads, boom must be retracted and access cover removed at rear of base boom to grease the upper wear pads. Extend boom in and out while applying grease. This method assures full lubrication for entire length of boom. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

24. **HOIST ASSEMBLY DRUM (M1084/M1086/M1089).** Check hoist assembly drum oil level every 6,000 miles (9,654 km) or every six months, whichever occurs first. Check oil level in hoist assembly drum using two pipe plugs (90 degrees apart) on the drum housing. Operate hoist assembly drum so that one pipe plug is positioned at top of drum (fill point) and the other is accessible and level with ground (check level point). Oil level is full if a small quantity of oil runs from check level opening. If oil level is low, add oil at fill opening. To drain, operate drum so that one pipe plug is bottom of drum. Remove plug to drain. Drain and refill with GO specified for the ambient temperature, if oil becomes contaminated.

25. **SWING DRIVE GEARBOX (M1084/M1086/M1089).** Check swing drive gearbox oil level every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Oil level is checked by removing pipe plug located on side of gear reducer. Oil level is full if a small quantity of oil runs out of opening. Add oil at fill point if necessary. Notify Direct Support to drain and refill with GO specified for the ambient temperature, if oil becomes contaminated.

26. **RING GEAR TEETH and PINION GEAR TEETH (M1084/M1086/M1089).** Lubricate every 6,000 miles (9,654 km), after washing, or once every six months, whichever occurs first. Apply a light coat of GAA to ring gear teeth and pinion gear teeth. Operate MHC (TM 9-2320-366-10) to rotate turntable. This will allow grease to be applied to all gear teeth. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

27. **FRONT, INTERMEDIATE, and REAR AXLE INNER WHEEL BEARINGS.** Repack inner wheel bearings with GAA every 12,000 miles (19,308 km), when semiannual PMCS inspection of service brakes reveals oil leak from inner hub, or whenever wheel end assemblies are taken apart for other maintenance (para 10-2).

28. **REAR AXLE BOGIE.** Change oil every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Remove six screws and rear axle bogie cover from one side at a time. Raise axle on opposite side of vehicle to allow oil to drain out. Lower axle and repeat on other side of vehicle. Apply thin bead of silicone adhesive sealant 593 to seating surface of housing. Position cover (with fill plug at the 1 o'clock position) and six screws on housing. Tighten six screws to 24 lb-ft (32 N m). Remove plug from cover and plug from top of rear axle bogie housing. Refill rear axle bogie with GO specified for the ambient temperature, until level with port on housing cover. Install plugs in cover and housing.

29. **15K SELF-RECOVERY WINCH (SRW) CABLE ROLLER FAIRLEADS.** Lubricate with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

30. **30K WINCH CABLE GUIDE ROLLERS and PAY-OUT LOWER TENSION SHEAVE.** Lubricate with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.
H-9. LUBRICATION/SERVICES NOTES (CONT)

- **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 138 °F (50 °C). Failure to comply may result in serious injury or death to personnel.

- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get medical attention. Failure to comply may result in injury to personnel.

31. SCREEN and PLUG OIL FILTER ASSEMBLY (intermediate axle only). Clean the area around the screen and plug oil filter assembly. Remove the screen and plug oil filter assembly. Clean with Dry Cleaning Solvent (Item 65, Appendix D) or equivalent, every 12,000 miles (19,308 km) or once every year, whichever occurs first. Clean filter each time the differential is drained. If screen is crushed or bent, replace with a new one. Clean the screen cavity in the carrier of all debris and particles. If excessive amount of metal particles are detected during oil filter servicing, notify Direct Support Maintenance personnel before refilling differential.

32. TURNTABLE BEARING (M1084/M1086/M1089). Lubricate with GAA every 6,000 miles (9,654 km), after washing, or once every six months, whichever occurs first. Use a low pressure lubrication gun. Apply lubrication to grease fitting inside turntable bearing. Operate MHC (TM 9-2320-366-10) to rotate turntable bearing through full range of travel between applications of grease. This method assures full lubrication of the turntable bearing. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

33. TOP and BOTTOM PLATES (M1089). Lubricate every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Coat top and bottom plates with GAA. Extending outriggers in and out while applying grease assures full lubrication for the entire length of top and bottom plates. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

34. CRANE GREASE FITTINGS (M1084/M1086/M1089). Lubricate with GAA every 6,000 miles (9,654), after washing, or once every six months, whichever occurs first. Use a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

35. UNDERLIFT ASSEMBLY GREASE FITTINGS. Lubricate with GAA every 6,000 miles (9,654), after washing, or once every six months, whichever occurs first. Use a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

36. FRONT LIFTING BEAM. Remove left and right lifting beams and clean with Dry Cleaning Solvent (Item 65, Appendix D) or equivalent, every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Apply a light coat of GAA to lifting beams. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

37. AIR DRYER. Service air dryer (para 23-11) every 12,000 miles (19,308 km) or annually, whichever occurs first.

38. TENSION LINKS. Lubricate tension link(s) every three months with GAA.

39. FRONT LEAF SPRING AND REAR BOGIE AXLE. At initial 1000 miles (1609 km) of vehicle operation, tighten U-bolts to 390-510 lb-ft (529-692 Nm).
APPENDIX J
ADDITIONAL AUTHORIZATION LIST (AAL)

Section I. INTRODUCTION

J-1. SCOPE
This appendix lists additional items you are authorized for the support of the MTV.

J-2. GENERAL
This list identifies items that do not have to accompany the MTV and that do not have to be turned in with it. These items are all authorized to you by Common Tables of Allowance (CTA), Modification Table of Organization and Equipment (MTOE), Tables of Distribution and Allowances (TDA), or Joint Table of Allowance (JTA).

J-3. EXPLANATION OF LISTING
National Stock Numbers, description, and quantities are provided to help you identify and request the additional items you require to support this equipment.

Section II. ADDITIONAL AUTHORIZATION LIST

<table>
<thead>
<tr>
<th>(1) National Stock Number</th>
<th>(2) Description (CAGE) Part Number</th>
<th>(3) U/M</th>
<th>(4) Qty Auth</th>
</tr>
</thead>
<tbody>
<tr>
<td>6685-01-193-1733</td>
<td>10,000 PSI Transducer: (19207) 12258956</td>
<td>EA</td>
<td>1</td>
</tr>
</tbody>
</table>
APPENDIX K
TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART

Section I. INTRODUCTION

K-1. INTRODUCTION

This appendix lists the various transmission controls and configuration modifications that may be required to permit the transmission to function correctly. This appendix will guide the mechanic through the hardware selection process by identifying compatibility issues between the transmission controls (WTEC II/WTEC III) and the numerous revisions of the Allison MD3070PT transmission (PRE-ID w/ 24-pin connector, PRE-ID w/ 31-pin connector, TID 1, TID 2, and TID 3). Refer to Figure 1. After replacing any component of the transmission controls or the transmission assembly, perform calibration procedures in TM 9-2320-366-20-4 paragraph 8-2 or 8-3.

K-2. EXPLANATION OF COLUMNS

a. **Column (1) - Installed Controls or Controls Being Installed.** This column lists all of the variables concerning which version of transmission controls are installed in the vehicle, or may need to be installed, to communicate correctly with the transmission.

b. **Column (2) - Installed Transmission or Transmission Being Installed.** This column lists all of the various revisions of the Allison MD3070PT transmissions that may be installed in the vehicle.

c. **Column (3) - Required Modification.** This column lists the various electrical interface (hardware) modifications that may be required to allow the transmission controls to communicate with the transmission.

K-3. HOW TO USE THIS CHART

a. Determine which controls and transmission are installed in the vehicle.

b. Determine which component requires replacement.

c. Read across the row to column (3) to determine the required modification.

### TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART

<table>
<thead>
<tr>
<th>(1) Installed Controls or Controls Being Installed</th>
<th>(2) Installed Transmission or Transmission Being Installed</th>
<th>(3) Required Modification (Refer to Section III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WTEC II (with 24-pin connector)</td>
<td>PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)</td>
<td>No modification required.</td>
</tr>
<tr>
<td>WTEC II (with 24-pin connector)</td>
<td>PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)</td>
<td>Install 31-pin connector.</td>
</tr>
<tr>
<td>WTEC II (with 24-pin connector)</td>
<td>TID 1 (transmission serial number 6510090786 to 6510142171)</td>
<td>Install 31-pin connector.</td>
</tr>
<tr>
<td>WTEC II (with 24-pin connector)</td>
<td>TID 2 (transmission serial number 6510142172 to 6510262116)</td>
<td>Install 31-pin connector and replace transmission internal wiring harness.</td>
</tr>
</tbody>
</table>
## TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART (CONT)

<table>
<thead>
<tr>
<th>Installed Controls or Controls Being Installed</th>
<th>Installed Transmission or Transmission Being Installed</th>
<th>Required Modification (Refer to Section III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WTEC II (with 24-pin connector)</td>
<td>TID 3 (transmission serial number 6510262117 and subsequent)</td>
<td>Install 31-pin connector, replace transmission internal wiring harness, and reprogram WTEC II TEPSS. ¹</td>
</tr>
<tr>
<td>WTEC II (with 31-pin connector)</td>
<td>PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)</td>
<td>Install adapter cable assembly.</td>
</tr>
<tr>
<td>WTEC II (with 31-pin connector)</td>
<td>PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)</td>
<td>No modification required.</td>
</tr>
<tr>
<td>WTEC II (with 31-pin connector)</td>
<td>TID 1 (transmission serial number 6510090786 to 6510142171)</td>
<td>No modification required.</td>
</tr>
<tr>
<td>WTEC II (with 31-pin connector)</td>
<td>TID 2 (transmission serial number 6510142172 to 6510262116)</td>
<td>Replace transmission internal wiring harness.</td>
</tr>
<tr>
<td>WTEC II (with 31-pin connector)</td>
<td>TID 3 (transmission serial number 6510262117 and subsequent)</td>
<td>Replace transmission internal wiring harness and reprogram WTEC II TEPSS. ¹</td>
</tr>
<tr>
<td>WTEC III (with ECU manufactured prior to October 1999)</td>
<td>PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)</td>
<td>Install adapter cable assembly and ID harness.</td>
</tr>
<tr>
<td>WTEC III (with ECU manufactured prior to October 1999)</td>
<td>PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)</td>
<td>Install ID harness.</td>
</tr>
<tr>
<td>WTEC III (with ECU manufactured prior to October 1999)</td>
<td>TID 1 (transmission serial number 6510090786 to 6510142171)</td>
<td>No modification required.</td>
</tr>
<tr>
<td>WTEC III (with ECU manufactured prior to October 1999)</td>
<td>TID 2 (transmission serial number 6510142172 to 6510262116)</td>
<td>No modification required.</td>
</tr>
<tr>
<td>WTEC III (with ECU manufactured prior to October 1999)</td>
<td>TID 3 (transmission serial number 6510262117 and subsequent)</td>
<td>Reprogram WTEC III ECU ¹ or install new WTEC III ECU (P/N 12421787-002).</td>
</tr>
<tr>
<td>WTEC III (with ECU manufactured after October 1999)</td>
<td>PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)</td>
<td>Install adapter cable assembly and ID harness.</td>
</tr>
<tr>
<td>WTEC III (with ECU manufactured after October 1999)</td>
<td>PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)</td>
<td>Install ID harness.</td>
</tr>
<tr>
<td>WTEC III (with ECU manufactured after October 1999)</td>
<td>TID 1 (transmission serial number 6510090786 to 6510142171)</td>
<td>No modification required.</td>
</tr>
</tbody>
</table>

¹ Reprogramming can only be accomplished by an authorized Allison Transmission distributor. You must provide the transmission serial number of the transmission being installed to ensure correct reprogramming. If at a later time, an earlier version transmission is installed in a WTEC II equipped vehicle, WTEC II TEPSS will require reprogramming again.

² Vehicle serial number 012477 and lower. Refer to Figure 1.

³ Vehicle serial number 012478 and higher. Refer to Figure 1.
### Installed Controls or Controls Being Installed

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number/NSN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed Transmission or Transmission Being Installed</td>
<td></td>
<td>Required Modification (Refer to Section III)</td>
</tr>
<tr>
<td>WTEC III (with ECU manufactured after October 1999)</td>
<td>TID 2 (transmission serial number 6510142172 to 6510262116)</td>
<td>No modification required.</td>
</tr>
<tr>
<td>WTEC III (with ECU manufactured after October 1999)</td>
<td>TID 3 (transmission serial number 6510262117 and subsequent)</td>
<td>No modification required.</td>
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</table>

### Section III.

**MODIFICATION PARTS IDENTIFICATION**

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<thead>
<tr>
<th>Identification</th>
<th>Part Number/NSN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31-pin connector</td>
<td>300130 5935-21-921-1813</td>
<td>Converts a transmission external wiring harness from a 24-pin (&quot;D&quot; type) connector to a 31-pin (round type) connector.</td>
</tr>
<tr>
<td>Transmission internal wiring harness</td>
<td>29529474 6150-01-481-8088</td>
<td>Converts a TID 2 transmission to a TID 1 configuration to allow WTEC II controls to communicate with the transmission.</td>
</tr>
<tr>
<td>Gasket</td>
<td>29503283 5330-01-360-9035</td>
<td>Required when replacing transmission internal wiring harness.</td>
</tr>
<tr>
<td>ID harness</td>
<td>200100 6150-21-921-1191</td>
<td>Allows WTEC III controls to communicate with a PRE-ID transmission.</td>
</tr>
<tr>
<td>Adapter cable assembly</td>
<td>29519210 6150-01-420-5987</td>
<td>Adapts a PRE-ID transmission with 24-pin (&quot;D&quot; type) connector to a transmission external wiring harness with a 31-pin (round) connector.</td>
</tr>
</tbody>
</table>
MODIFICATION PARTS IDENTIFICATION (CONT)

![Diagram of vehicle control module with labels and connectors]

- **Manufacture Date**
- **24 Pin Connector**
- **ECU Module Pin**
- **31 Pin Connector**

**Figure 1**

WTEC II Pushbutton Shift Selector

K-4 Change 1
## SUBJECT INDEX

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<th>Para</th>
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<td>M1089 Hydraulic Accumulator Replacement</td>
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<td>Filter Restriction Gauge Replacement</td>
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<td>Front Brake Air Chamber Replacement</td>
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<td>Front Brake Air Indicator Does Not Illuminate When Air Pressure Is Below 65 PSI</td>
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<td>Hydraulic Power Unit and Bracket Replacement</td>
<td>19-3</td>
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<td>Intake Air Cleaner Filter Element, Air Cleaner Assembly, and Particle Extraction Tube Replacement</td>
<td>4-2</td>
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<td>Large Quantity of Moisture Expelled From Air Reservoirs</td>
<td>2-21</td>
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<tr>
<td>M1089 30K Winch Air Hoses Replacement</td>
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<td>M1089 30K Winch Cable Tensioner Air Chamber Replacement</td>
<td>17-19</td>
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GLOSSARY
ABBREVIATIONS

ANSI .................................................... American National Standards Institute
CCW .......................................................... Counterclockwise
CTIS ........................................................ Central Tire Inflation System
CW ............................................................ Clockwise
ECU .......................................................... Electronic Control Unit
EMI ............................................................. Electromagnetic Interference
LED ............................................................ Light Emitting Diode
LH ............................................................. Left Hand
LMHC ..................................................... Light Material Handling Crane
MAC .......................................................... Maintenance Allocation Chart
MHC ............................................................. Material Handling Crane
NATO ...................................................... North Atlantic Treaty Organization
NBC .......................................................... Nuclear, Biological, or Chemical
NO/NC ..................................................... Normally Open/Normally Closed
O/R .............................................................. Outrigger
PDP ............................................................. Power Distribution Panel
PMCS ...................................................... Preventive Maintenance Checks and Services
PTO ............................................................. Power Takeoff
RH ............................................................. Right Hand
SAE .......................................................... Society of Automotive Engineers
SRW .......................................................... Self-Recovery Winch
STE/ICE-R ....................... Simplified Test Equipment/Internal Combustion Engine-Reprogrammable
TEPSS ................................................ Transmission ECU Pushbutton Shift Selector
TM ............................................................ Technical Manual
TPS ............................................................. Throttle Position Sensor
GLOSSARY
ABBREVIATIONS (CONT)

TPSS ................................................... Transmission Pushbutton Shift Selector
VDC ................................................................. Volts Direct Current
VIM ................................................................. Vehicle Interface Module
WTEC II .................................................. World Transmission Electronic Controls (version 2)
WTEC III ................................................ World Transmission Electronic Controls (version 3)
By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:
JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
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SIGNATURE

DATE

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PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

DA FORM 2028, FEB 74

REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

USAPA V3.01
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**PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

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**PART III - REMARKS** *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

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### Recommended Changes to Publications and Blank Forms

For use of this form, see AR 25-30; the proponent agency is OAASA.

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**Part I - All Publications (except RPSTL and SC/SM) and Blank Forms**

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**From:** (Activity and location) (Include ZIP Code)

**Typed Name, Grade or Title**

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**Signature**

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According to the form, Part II (reverse) is used for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM). The form is designed to track recommendations for changes to publications and blank forms. The form contains a table for listing publications and forms with their dates and titles, along with a section for noting recommended changes and reasons. The form is signed and dated, with instructions on how to forward it to the appropriate entities.
**PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

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**PART III - REMARKS**  
(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)

**TYPOGRAPHIC NAME, GRADE OR TITLE**

**TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION**

**SIGNATURE**
RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS

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TO: (Forward to proponent of publication or form) (Include ZIP Code)
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**FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC**
FIGURE FO-4 HYDRAULIC STEERING SYSTEM

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# The Metric System and Equivalents

## Linear Measure
- 1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
- 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
- 1 Kilometer = 1000 Meters = 0.621 Miles

## Square Measure
- 1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
- 1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
- 1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

## Weights
- 1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
- 1 Kilogram = 1000 Grams = 2.2 Lb
- 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

## Cubic Measure
- 1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
- 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet
- 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

## Liquid Measure
- 1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
- 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

## Temperature
- \( \frac{5}{9} (°F - 32) = °C \)
- 212°F is equivalent to 100°C
- 90°F is equivalent to 32.2°C
- 32°F is equivalent to 0°C
- \( \frac{9}{5} C + 32 = F \)

## Approximate Conversion Factors

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