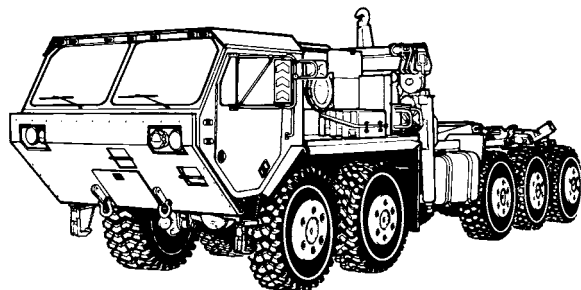


TECHNICAL MANUAL UNIT MAINTENANCE VOLUME III

PALLETIZED LOAD SYSTEM



MODEL M1074/M1075

NSN 2320-01-304-2277

NSN 2320-01-304-2278

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AIR SYSTEM TROUBLESHOOTING	2-2181
LOAD HANDLING SYSTEM TROUBLESHOOTING	2-2226
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DISTRIBUTION RESTRICTION
Approved for public release;
distribution is unlimited.

WARNING

- Drycleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles, face shield, and gloves; use only in a 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 II Drycleaning Solvent is 140 degrees F (60 degrees C) and Type III Drycleaning Solvent is 200 degrees F (93 degrees C). Failure to do so may result in 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 immediate medical attention.

WARNING

Radiator, radiator cap, coolant, and hoses are very hot and pressurized during truck operation. Let radiator cool before checking hoses. Failure to do so may result in serious burns to personnel.

WARNING

Use extreme care when removing the radiator pressure cap. Sudden release of pressure can cause a steam flash which could seriously injure personnel. Slowly loosen cap to the first stop to relieve pressure before removing cap completely. After opening, securely tighten cap.

WARNING

Use a clean, thick waste cloth or like material to remove radiator pressure cap. Avoid using gloves. If hot water soaks through gloves, personnel could be burned.

WARNING

Apply truck brakes and chock wheels before any maintenance tasks are performed. Otherwise serious injury to personnel could result.

WARNING

Never use fuel to clean parts. Fuel is highly flammable. Serious personal injury could result if fuel ignites during cleaning.

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

Steam cleaning creates hazardous noise levels and severe burn potential. Eye, skin, and ear protection is required. Failure to comply may result in injury to personnel.

WARNING

Solvents used with a spray gun must be used in a spray booth with filter. Face shield must be used by personnel operating spray gun. Failure to comply may result in injury to personnel.

WARNING

On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

WARNING

Do not drain engine oil while engine is hot. Severe injury to personnel may result.

WARNING

Ensure engine is cool before performing this task or injury to personnel may result.

WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when released and could cause injury to personnel.

WARNING

Use care when installing springs. Springs are under tension and can act as projectiles when released and could cause injury to personnel.

WARNING

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

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine.

WARNING

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

WARNING

After Nuclear, Biological, or Chemical (NBC) exposure of truck, all air filters shall be handled with extreme caution. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. If truck 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.

WARNING

Brake drum can get very hot during vehicle operation. Place hand near drum to check for excessive heat, but do not touch. Failure to comply may result in injury to personnel.

WARNING

Use extreme care when removing coolant system pressure tester. Sudden release of pressure can cause injury to personnel.

WARNING

Fuel is slippery and can cause falls. To avoid injury, wipe up spilled fuel with rags.

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. Severe injury to personnel may result.

WARNING

Allow engine to cool before performing maintenance on the muffler, exhaust pipe, exhaust manifold or turbocharger. If necessary, use insulated pads and gloves.

WARNING

Muffler weighs 152 lbs (69 kg). Attach suitable lifting device prior to removal to prevent possible injury to personnel.

WARNING

Ensure this task is done only when muffler is cool. Performing this task on a warm or hot muffler may result in severe burning to personnel.

WARNING

Use extreme care when removing coolant system pressure tester. Sudden release of pressure can cause injury to personnel.

WARNING

Excess coolant may splash out upon removal of tube from hump hose. Ensure proper eye protection is worn to prevent possible injury to personnel.

WARNING

Cooling assembly weighs 925 lbs (420 kg). Attach suitable lifting device for removal and properly support cooling assembly to prevent possible injury to personnel.

WARNING

Ensure all personnel stay clear of radiator while engine is running. Air in radiator will be released which may cause hot coolant to spray out and cause injury or death to personnel.

WARNING

Engine cover assembly weighs 55 lbs (25 kg). Use an assistant to help remove engine cover assembly or injury to personnel may result.

WARNING

Radiator assembly weighs 575 lbs (261 kg). Do not stand directly under radiator assembly or injury to personnel may result.

WARNING

Ensure grille assembly is fully supported by lifting device prior to removal of screws. Failure to comply may result in severe injury to personnel.

WARNING

Adhesive causes immediate bonding on contact with eyes, skin, or clothing and also gives off harmful vapors. Wear protective goggles and use in well-ventilated area. If adhesive gets in eyes, try to keep eyes open; flush eyes with water for 15 minutes and get immediate medical attention.

WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

WARNING

Starter weighs 73 lbs. (33 kg). Attach suitable lifting device prior to removal to prevent possible injury to personnel.

WARNING

Starter weighs 73 lbs. (33 kg). Attach suitable lifting device prior to installation to prevent possible injury to personnel.

WARNING

Use care when removing snap and retaining rings. Snap and retaining rings are under spring tension and can act as projectiles when released and could cause severe eye injury.

WARNING

Use care when installing snap and retaining rings. Snap and retaining rings are under spring tension and can act as projectiles when released and could cause severe eye injury.

WARNING

Diesel fuel is flammable. Do not perform this procedure near fire, flame, or sparks. Injury or death to personnel could result.

WARNING

Do not remove screws securing fan brace. Removing screws will cause fan brace to drop and may result in severe injury or death to personnel.

WARNING

Do not start engine or move truck when anyone is working on or under vehicle. Severe injury or death to personnel could result.

WARNING

Upon removal of all wires and cables, ensure no contact is made with battery terminals or other wires and cables. Strap wires and cables away from battery terminals and other wires and cables as required to prevent damage to parts, personal injury, or death.

WARNING

Ensure that exhaust pipe and turbo charger pipe connections are free from soot or debris. Failure to comply may result in exhaust leak and injury or death to personnel.

WARNING

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

WARNING

Be careful not to short out battery terminals. Do not smoke or use open flame near batteries. Batteries may explode from a spark. Battery acid is harmful to skin and eyes.

WARNING

Wear safety goggles and acid-proof gloves when battery cover must be removed or when adding electrolyte.

WARNING

Avoid electrolyte contact with skin, eyes, or clothing. If battery electrolyte spills, take immediate action to stop burning effects:

- External: Immediately flush with cold running water to remove all acid.
- Eyes: Flush with cold water for at least 15 minutes. Seek immediate medical attention.
- Internal: Drink large amounts of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Seek immediate medical attention.
- Clothing or Vehicle: Wash at once with cold water. Neutralize with baking soda or household ammonia solution.

WARNING

Injury will result if acid contacts skin or eyes. Wear rubber apron to prevent clothing being damaged.

WARNING

Corrosion inhibitor contains alkali. Do not get in eyes; wear goggles/safety glasses when using. Avoid contact with skin. In case of contact, immediately wash area with soap and water. If eyes are contacted, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention.

WARNING

Do not allow personnel to perform maintenance directly under boom or mast. Failure to follow proper procedures could cause serious injury or death.

WARNING

22 to 28 vdc are always present on wire 1431 at the ENGINE switch. Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

WARNING

22 to 28 vdc are always present on wire 1281 and DUVAC connectors. Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

WARNING

22 to 28 vdc are always present on wire 1139 at starter solenoid. Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

WARNING

Transmission oil will be extremely hot when drained. Do not come in contact with hot oil to avoid severe burns. If burned with hot oil, seek medical attention immediately.

WARNING

Ensure there are no personnel in front of truck when placing it into drive. Failure to do so may result in injury or death to personnel.

WARNING

Ensure transmission oil and filter are cool prior to removal. Failure to comply may result in injury to personnel.

WARNING

Wear safety goggles when performing tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine.

WARNING

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

WARNING

Driveshafts can weigh up to 100 lbs (45 kg), obtain aid from an assistant to prevent possible injury to personnel.

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.

WARNING

Use jackstands to support axle weight. 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 or death to personnel.

WARNING

Use care when removing brake spring. Spring is under tension and can act as a projectile when released and could cause injury to personnel.

WARNING

Use care when installing brake spring. Spring is under tension and can act as a projectile when released and could cause injury to personnel.

WARNING

22 to 28 vdc are always present at DUVAC connectors. Care must be exercised when removing the DUVAC cover. Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuit, a direct short may result. Damage to equipment, injury or death to personnel may occur.

WARNING

Spring in air chamber is very powerful and is under tension. Failure to cage air chamber before removal will release tension of spring abruptly and could result in injury or death to personnel.

WARNING

Air reservoir will fall when screws are removed. Support air reservoir prior to removing screws to prevent injury to personnel.

WARNING

Do not touch hot exhaust system with bare hands; injury to personnel will result.

WARNING

Allow engine to cool before performing troubleshooting maintenance. If necessary use insulated pads and gloves. Hot engine components will burn and cause injury to personnel.

WARNING

Terminal 1 and terminal 2 at DUVAC controller are electrically hot all of the time. Ensure bracket does not contact either terminal. Damage to equipment, injury or death to personnel may occur.

WARNING

Terminal 1 and terminal 2 at DUVAC controller are electrically hot all of the time. Ensure DUVAC cover or bracket does not contact either terminal. Damage to equipment, injury or death to personnel may occur.

WARNING

Inner wheel weighs 105 lbs (48 kg). Attach suitable lifting device prior to moving rim to prevent possible injury to personnel.

WARNING

Ensure all personnel keep hands and fingers out from between tire and bead lock. Failure to comply may result in injury to personnel.

WARNING

Alternator is capable of producing over 40 vdc. Be careful when taking a voltage reading not to get shocked.

WARNING

High pressure hydraulics [oil under 3,700 psi (25,512 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. High pressure oil stream can pierce body and cause severe injury to personnel.

WARNING

Ensure all personnel wear proper eye protection. Do not stand directly in front of valve stem when draining air from tire. Tire is under extreme air pressure. Failure to comply may result in injury to personnel.

WARNING

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

WARNING

Tie-rod end may unexpectedly pop-up when pressure is applied with hydraulic jack. Keep hands and face clear of tie-rod end. Failure to comply may result in severe injury to personnel.

WARNING

Skid plate weighs 130 lbs (59 kg). Attach suitable lifting device prior to removal to prevent injury to personnel.

WARNING

Skid plate structure weighs 95 lbs (43 kg). Attach suitable lifting device prior to removal to prevent injury to personnel.

WARNING

Skid plate crossmember weighs 55 lbs (25 kg). Attach suitable lifting device prior to removal to prevent possible injury to personnel.

WARNING

Right hand and left hand extension assemblies weigh 110 lb (50 kg) each. Use the aid of an assistant when lifting to prevent injury to personnel.

WARNING

Crossover tube weighs 100 lbs (45 kg). Attach a suitable lifting device prior to removal to prevent possible injury to personnel.

WARNING

Each hard lift bracket weighs 67 lbs (30 kg). Attach a suitable lifting device prior to removal to prevent possible injury to personnel.

WARNING

Self-guided coupler weighs 100 lbs (45 kg). Attach suitable lifting device prior to removal to prevent possible injury to personnel.

WARNING

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 or muffler. Exhaust system parts can become hot enough to cause serious burns.

WARNING

Support hoist extension before removing retaining pin or injury to personnel may occur.

WARNING

Tire carrier weighs 145 lbs (66 kg). Attach suitable lifting device prior to removal to prevent possible injury to personnel.

WARNING

Wire rope can become frayed or contain broken wires. Wear heavy leather-palmed work gloves when handling wire rope. Frayed or broken wires can cause injury to personnel.

WARNING

Never let moving wire rope slide through hands, even when wearing gloves. A broken wire could cut through glove and can cause injury to personnel.

WARNING

Cab door weighs 100 lbs (45 kg). Support with suitable lifting device to avoid injury to personnel.

WARNING

Do not let window fall. Broken glass may cause serious injury to personnel.

WARNING

Platform assembly weighs 62 lbs (28 kg). Attach suitable lifting device prior to removal to prevent possible injury to personnel.

WARNING

Always wear proper eye protection and protective clothing when handling glass. Failure to comply may result in injury to personnel.

WARNING

Seat assembly weighs 55 lbs (25 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Box assembly weighs 92 lbs (42 kg). Ensure box assembly is properly supported to prevent possible injury to personnel.

WARNING

Wear heavy gloves when handling crane cable. Never let cable run through hands; frayed cables can cut.

WARNING

The crane hydraulic system operates at oil pressures up to 3,100 psi (21,375 kPa). Never disconnect any hydraulic line or fitting without first dropping the pressure to zero. Failure to comply may result in serious injury or death to personnel.

WARNING

Self-recovery winch weighs 645 lbs (292 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Front tension guide weighs 60 lbs (27 kg). Use an assistant to prevent possible injury to personnel.

WARNING

Leave top front screw installed in frame to prevent spacer from falling. Failure to comply may result in injury to personnel.

WARNING

Front guide assembly weighs 75 lbs (34 kg). Use an assistant to prevent injury to personnel.

WARNING

Position top front screw in frame to hold spacer in place. Failure to comply may result in injury to personnel.

WARNING

Rear tension guide weighs 50 lbs (23 kg). Use an assistant to prevent injury to personnel.

WARNING

Rear guide assembly weighs 65 lbs (29 kg). Use an assistant to prevent possible injury to personnel.

WARNING

Rear roller assembly weighs 375 lbs (170 kg). Attach suitable lifting device prior to removal to prevent possible injury to personnel.

WARNING

Do not remove heater hoses when engine is hot; steam and hot coolant can escape and burn personnel.

WARNING

Use clean wiping rags or like material to remove heater hoses. Avoid using gloves. If hot water soaks through gloves, personnel could be burned.

WARNING

Coolant is slippery and can cause falls and injury. Clean up spilled coolant immediately.

WARNING

Allow engine to cool prior to removal of heater core to prevent burns and injury to personnel.

WARNING

Use caution when removing hoses to prevent getting antifreeze in eyes or mouth, if antifreeze does get in eyes or mouth, seek medical attention immediately.

WARNING

Extreme care should be taken when removing heater hoses if water temperature gage reads above 180 degrees F (82 degrees C). Contact by steam or hot coolant may result in injury or death to personnel.

WARNING

Allow engine to cool prior to removal of valve to prevent burns and possible injury to personnel.

WARNING

Ensure engine is cool before performing this task or severe burns from hot hydraulic fluid may result.

WARNING

The main hydraulic system operates at oil pressures up to 3,675 psi (25,339 kPa). Never disconnect any hydraulic line, fitting or component without first dropping pressure to zero. Failure to comply may result in serious injury or death to personnel.

WARNING

Use extreme care when loosening filler cap. Sudden release of pressure could seriously injure personnel. Slowly loosen cap to relieve pressure and ensure proper eye protection is worn.

WARNING

Hydraulic reservoir weighs 120 lbs (54 kg). The aid of an assistant is required to prevent possible injury to personnel.

WARNING

Battery weighs 75 lbs (34 kg). Remove battery only with the aid of an assistant to prevent possible injury to personnel.

WARNING

Battery weighs 75 lbs (34 kg). Install battery only with the aid of an assistant to prevent possible injury to personnel.

WARNING

Battery box weighs 75 lbs (34 kg). Use the aid of an assistant to prevent possible injury to personnel.

WARNING

Sharp edges of exhaust pipe could cause injury to personnel.

WARNING

Coolant may run out of water jacket when turned. Wear eye protection or injury to personnel may result.

WARNING

High pressure hydraulics [oil under 3,100 psi (21,374 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

WARNING

Machine gun ring weighs 295 lbs (134 kg). Attach suitable lifting device to prevent injury to personnel.

WARNING

Machine gun ring front support weighs 55 lbs (25 kg). Attach suitable lifting device to prevent injury to personnel.

WARNING

Circuit breakers CB5, CB6, CB12, CB20, CB22, CB23 and relays R3, R13 - R19, R26, R28, R32, R33 are always electrically hot and can cause severe injury to personnel. Care must be exercised when working under the electrical circuit board cover.

WARNING

Ensure equipment will not move while repairing or inspecting it. For trailers, “red tag” the hitch, and block or chock wheels or tracks. For powered equipment, block or chock wheels or tracks, and “red tag” the starter. Prevent a “quick fix” from becoming a quick injury.

WARNING

When adjustment or service requires a running engine, two personnel will be used; one at controls and one at service point. This helps prevent accidental movement of controls.

WARNING

Wires 1866 and 1867 have 12 vdc at all times direct from batteries. Care must be exercised when working with these wires to avoid injury to personnel.

WARNING

Ensure all personnel are clear of rear of truck before shifting into R (reverse). Failure to do so might result in injury or death to personnel.

WARNING

Circuit breakers and relays are always electrically hot and can cause severe injury to personnel. Care must be exercised when working under the electrical circuit board cover.

WARNING

Ether is toxic and highly flammable. Container is pressurized. Never heat container and never discharge ether into confined areas or near open flame. Severe injury to personnel may result.

WARNING

Do not place any part of body in area of fan operation. Failure to do so will result in injury or death to personnel.

WARNING

10 to 14 vdc are always present at terminals E and F of connector MC7.

WARNING

Before inflating or deflating, stand out of the trajectory area or personal injury or death may result.

WARNING

Hot transmission oil can cause severe burns and injury to personnel. Transmission should be allowed to cool before oil is drained.

WARNING

Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

WARNING

If air lines are under high pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when loosening or disconnecting air line fittings.

WARNING

Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

WARNING

Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.

WARNING

Never crawl under equipment when performing maintenance unless equipment is securely blocked. Equipment may fall and cause serious injury or death to personnel.

WARNING

Do not work on any item supported only by lift jacks or hoist. Always use blocks or proper stands to support the item prior to any work. Equipment may fall and cause injury or death to personnel.

WARNING

Ensure transmission is cool before proceeding. Failure to comply may result in injury to personnel.

WARNING

Keep hands and arms away from fan blade and drive while engine is running, or serious injury to personnel will result.

WARNING

Maintain adequate distance from moving steering parts or serious injury to personnel may result.

WARNING

Do not stand between wheels when engine is operating. Movement of vehicle can cause injury or death to personnel.

WARNING

Truck must be on level ground and wheels must be chocked before parking brake is released. Otherwise, truck may roll and cause injury to personnel.

WARNING

Do not use retread tires on vehicles equipped with a Central Tire Inflation System (CTIS). Use only the tires that are specified in the Repair Parts and Special Tools List (RPSTL). Failure to comply may result in tire failure and loss of vehicle control.

WARNING

Ensure transfer case is cool before proceeding. Failure to comply may result in injury to personnel.

WARNING

Failure to place wheel/tire assembly in safety cage prior to initial inflation could result in serious injury or death to personnel.

WARNING

When a wheel/tire is in a restraining device, do not lean any part of body or equipment on or against the restraining device, or injury or death could result.

WARNING

Stand clear of trajectory area during deflation or personal injury or death may result.

WARNING

Always completely deflate tire by removing valve core from valve stem before attempting demounting operation. After air has finished exhausting from valve stem, carefully run a piece of wire through valve stem to ensure it is not plugged and tire is completely deflated. Failure to comply may result in injury to personnel.

WARNING

Wheel/tire assembly must be deflated in a safety cage or personal injury or death may result.

WARNING

Keep hands clear of studs and outer face of wheel to prevent injury to personnel.

WARNING

Wheel/tire assembly weighs 523 lbs (237 kg). Attach suitable lifting device prior to moving to prevent possible injury to personnel.

WARNING

Stay out of the trajectory as indicated by the area shown. Under some circumstances, the trajectory may deviate from its expected path. Injury or death to personnel may result.

WARNING

Container lock could drop suddenly if not supported. Failure to comply may result in injury to personnel.

WARNING

Slider weighs 142 lbs (64 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Right front support bracket weighs 98 lbs (44 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Left front support bracket weighs 98 lbs (44 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Front support assembly weighs 660 lbs (299 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Front crossmember assembly weighs approximately 500 lbs (227 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Stow cone weldment weighs approximately 225 lbs (102 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Rear guide assembly weighs 70 lbs (32 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Slide arm weighs 65 lbs (29 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Lifting frame weighs 1600 lbs (726 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Stow weldment weighs 410 lbs (186 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Rear roller bracket weighs 150 lbs (68 kg). When removing one rear roller bracket, ensure remaining rear roller bracket is supported. Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Arm assembly weighs 240 lbs (109 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Right strut bracket assembly weighs 80 lbs (36 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Alternator weighs 75 lbs (34 kg). Use the aid of an assistant to prevent possible injury to personnel.

WARNING

Starter weighs 73 lbs (33 kg). Attach suitable lifting device prior to installation to prevent possible injury to personnel.

WARNING

Ensure brake drum is not pulled back more than approximately two inches (5 cm). Failure to comply may result in injury or death to personnel.

WARNING

Most circuit breakers are always electrically hot and can cause severe injury to personnel. Care must be exercised when working under the ECB cover.

WARNING

Tip of removal tool is very sharp. Use caution when using tool. Failure to comply may result in injury to personnel.

WARNING

Stand clear of tires while turning them. Failure to do so may result in injury or death to personnel

WARNING

Never inflate the wheel/tire assembly unless all ten outer wheel nuts have been properly torqued or personal injury could result.

WARNING

Brake drum weighs 132 lbs (60 kg). Attach suitable lifting device to prevent possible injury to personnel.

WARNING

Axle's No. 1 and No. 2 brake drums may swing out during removal. Use the aid of an assistant to support lifting device. Failure to comply may result in injury to personnel.

WARNING

Keep hands clear of studs and outer face of axles to prevent injury to personnel.

WARNING

Stand clear of tires while turning. Failure to do so may result in injury or death to personnel.

WARNING

Sharp edges of exhaust pipe could cause injury to personnel.

WARNING

Do not remove hoses when cooling system is hot; steam and hot coolant can escape and burn personnel.

WARNING

The hydraulic system operates at high pressures. Never disconnect any hydraulic line or fitting without first dropping pressure to zero. Failure to comply may result in serious injury or death to personnel.

WARNING

CARC paint contains isocyanate (HDI) which is highly irritating to skin and respiratory system. High concentrations of HDI can produce symptoms of itching and reddening of skin, a burning sensation in throat and nose and watering of the eyes. In extreme concentrations, HDI can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. The following precautions must be taken whenever using CARC paint:

- ALWAYS use air line respirators when using CARC paint unless air sampling shows exposure to be below standards. Use chemical cartridge respirator if air sampling is below standards.
- DO NOT let skin or eyes come in contact with CARC paint. Always wear protective equipment (gloves, ventilation mask, safety goggles, etc.).
- DO NOT use CARC paint without adequate ventilation.
- NEVER weld or cut CARC-coated materials.
- DO NOT grind or sand painted equipment without high-efficiency air purifying respirators in use.
- BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected.

WARNING

Horizontal roller weighs 75 lbs (34 kg). Attach suitable lifting device prior to removal to prevent possible injury to personnel.

WARNING

Do not put fingers in between boom sections when removing wear pads. Use a screwdriver or similar tool to remove wear pads. Failure to comply may result in injury to personnel.

WARNING

Do not put fingers in between boom sections when installing wear pads. Use a screwdriver or similar tool. Failure to comply may result in injury to personnel.

WARNING

Do not inhale fumes; could cause severe injury or death.

WARNING

Do not over-tighten clamp during installation. Accumulator is filled with compressed gas, and a change in pressure could cause crane to malfunction. Failure to comply may result in injury or death to personnel.

WARNING

Wire cable assembly can become frayed or contain broken wires. Wear heavy leather-palmed work gloves when handling wire cable assembly. Frayed or broken wires can cause injury to personnel.

WARNING

Never let moving wire cable assembly slide through hands, even when wearing gloves. A broken wire could cut through glove and cause injury to personnel.

WARNING

Air cleaner assembly can weigh up to 100 lbs (45 kg). Ensure air cleaner assembly is properly supported during removal. Failure to comply may result in injury to personnel.

WARNING

Ensure air cleaner assembly is properly supported. Failure to comply may result in injury to personnel.

WARNING

Use care when removing retaining rings. Retaining rings are under spring tension and can act as projectiles when released and could cause severe eye injury.

WARNING

Use care when installing retaining rings. Retaining rings are under spring tension and can act as projectiles when released and could cause severe eye injury.

WARNING

Pull out ride control valve knob to release pressure in air-ride system. Failure to comply may result in injury to personnel.

LIST OF EFFECTIVE PAGES

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TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 1348 CONSISTING OF THE FOLLOWING:

Page No.	* Change No.	Page No.	* Change No.
Cover.....	0	D-1 thru D-16.....	0
Blank.....	0	E-1 thru E-7.....	0
a thru z.....	0	E-8 Blank.....	0
A.....	0	F-1 thru F-13.....	0
B Blank.....	0	F-14 Blank.....	0
i thru iii.....	0	G-1 thru G-4.....	0
2-1912 thru 2-2179.....	0	INDEX-1 thru INDEX-15.....	0
2-2180 Blank.....	0	INDEX-16 Blank.....	0
2-2181 thru 2-2811.....	0	SCHMTC-1.....	0
2-2812 Blank.....	0	SCHMTC-2 Blank.....	0
2-2813 thru 2-2845.....	0	SCHMTC-3.....	0
2-2846 Blank.....	0	SCHMTC-4 Blank.....	0
2-2847 thru 2-2973.....	0	FP-1 thru FP-69.....	0
2-2974 Blank.....	0	FP-70 Blank.....	0
A-1 and A-2.....	0	SCHMTC-5.....	0
B-1 thru B-33.....	0	SCHMTC-6 Blank.....	0
B-34 Blank.....	0	FP-1 thru FP-51.....	0
B-35 thru B-42.....	0	FP-52 Blank.....	0
C-1 thru C-10.....	0		

* Zero In This Column Indicates An Original Page.

TECHNICAL MANUAL

No. 9-2320-364-20

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., 30 November 2005

Unit Maintenance Manual PALLETIZED LOAD SYSTEM

MODEL M1074/M1075
NSN 2320-01-304-2277
NSN 2320-01-304-2278

Current as of 31 October 2005

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028-2 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is <http://aeps.ria.army.mil>. If you need a password, scroll down and click on "ACCESS REQUEST FORM." The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or email your letter, DA Form 2028, or DA Form 2028-2 direct to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-LC-CIP-WT, Rock Island, IL 61299-7630. The email address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

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This manual supersedes TM 9-2320-364-20-3, dated 01 August 1999.

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HOW TO USE THIS MANUAL

This manual is designed to help maintain the Model M1074/M1075 Palletized Load System (PLS) truck. Listed below are some special features included in this manual to help locate and use the needed information:

- A front cover table of contents is provided for quick reference to chapters and sections that will be used often.
- **WARNING, CAUTION, and NOTE** headings, **subject headings**, and other essential information are printed in bold type making them easier to see.
- The maintenance tasks describe what must be done to the truck before starting the task (Equipment Condition), and what must be done to return the vehicle to operating condition after the task is finished (Follow-On Maintenance).
- The Appendixes are located at the end of the manual. They contain a reference guide to other manuals, the Maintenance Allocation Chart (MAC), a list of expendable supplies and materials, and other material for maintaining the PLS truck.
- In addition to text, there are exploded-view illustrations showing how to take a component off and put it back on. Cleaning and inspection procedures are also included as required.
- Chapter 2 of this manual covers Unit level Preventive Maintenance Checks and Services (PMCS) and basic troubleshooting, as well as general maintenance.

Follow these guidelines when using this manual:

- Read all **WARNINGS** and **CAUTIONS** before performing any procedure.
- The equipment conditions found in the maintenance procedures are of a general nature and the mechanic may be able to perform only certain steps within a procedure to accomplish the equipment condition.

2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING.

This paragraph covers Central Tire Inflation System (CTIS) Troubleshooting. The CTIS Fault Index, Table 2-45, lists faults for the CTIS of the PLS truck. Refer to electrical and CTIS air schematics Figures 2-48 and 2-49 when performing tests and corrective actions.

Table 2-45. Central Tire Inflation System (CTIS) Fault Index

Fault No.	Description	Page
1.	One Tire Will Not Inflate Or Deflate	2-1916
2.	CTIS Inoperative	2-1924
3.	All Tires On Axles No. 3 Through No. 5 Will Not Deflate	2-1938
4.	All Tires On Axles No. 1 And No. 2 Will Not Deflate	2-1952
5.	Excess Inflation Time Axles No. 1 And No. 2, CTIS Green Indicator Flashes Too Long Or Continually	2-1964
6.	Excess Inflation Time Axles No. 3 Through No. 5, CTIS Green Indicator Flashes Too Long Or Continually	2-1988
7.	Axles No. 1 And No. 2 Tire Pressures Do Not Agree With CTIS Settings	2-2012
8.	Axles No. 3 Through No. 5 Tire Pressures Do Not Agree With CTIS Settings	2-2026
9.	CTIS Does Not Automatically Inflate To The Next Higher Setting	2-2040
10.	Front Manifold Clicks Continually/Low Air Light Flashing	2-2046
11.	Rear Manifold Clicks Continually/Low Air Light Flashing	2-2102
12.	Tires On No. 1 Through No. 5 Axles Deflate Upon Completion Of Adjustment Cycle	2-2158
13.	CTIS Low Air Indicator Stays On Over 110 psi	2-2168

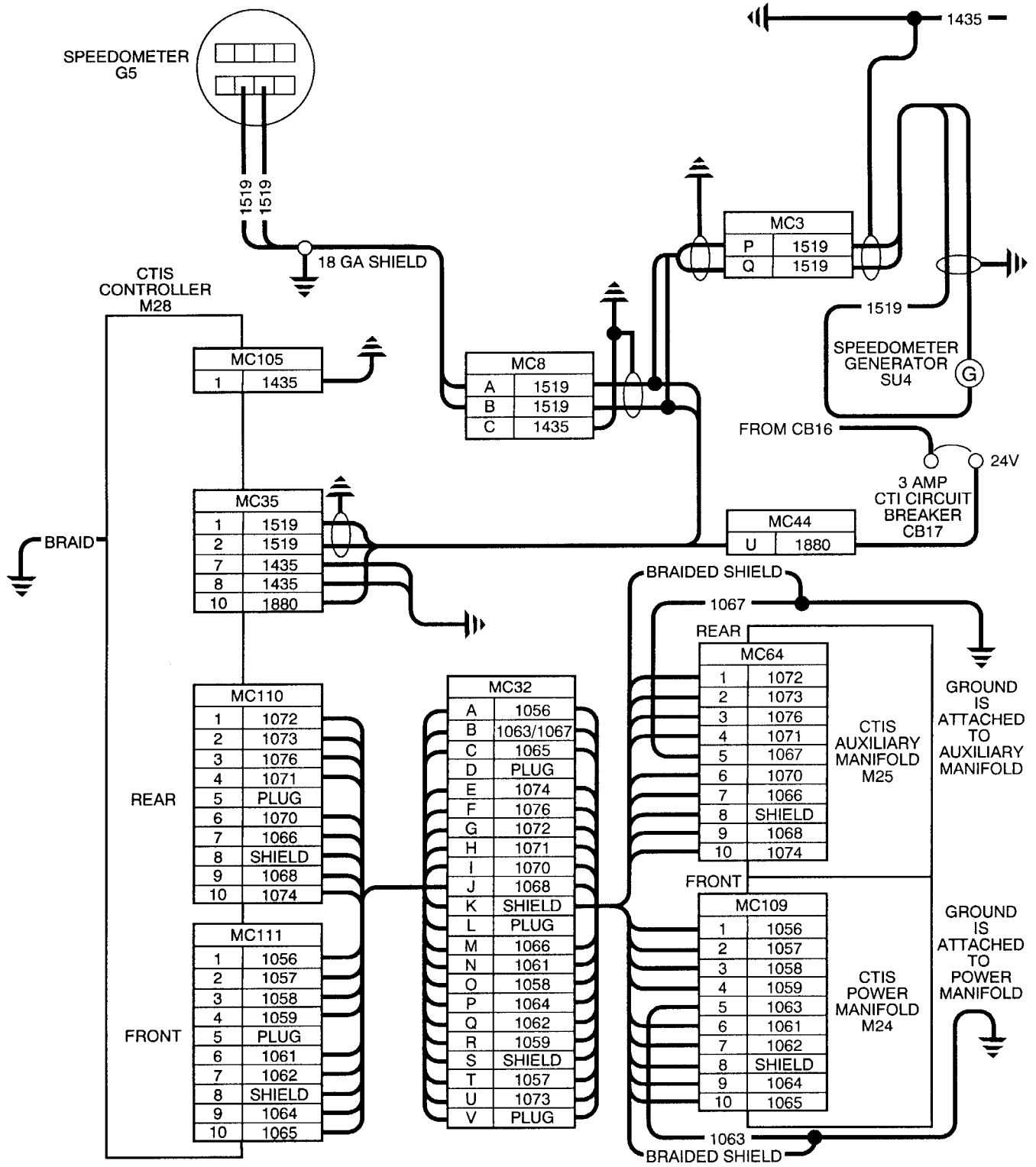


Figure 2-48. CTIS Wiring Schematic (Sheet 1 of 2)

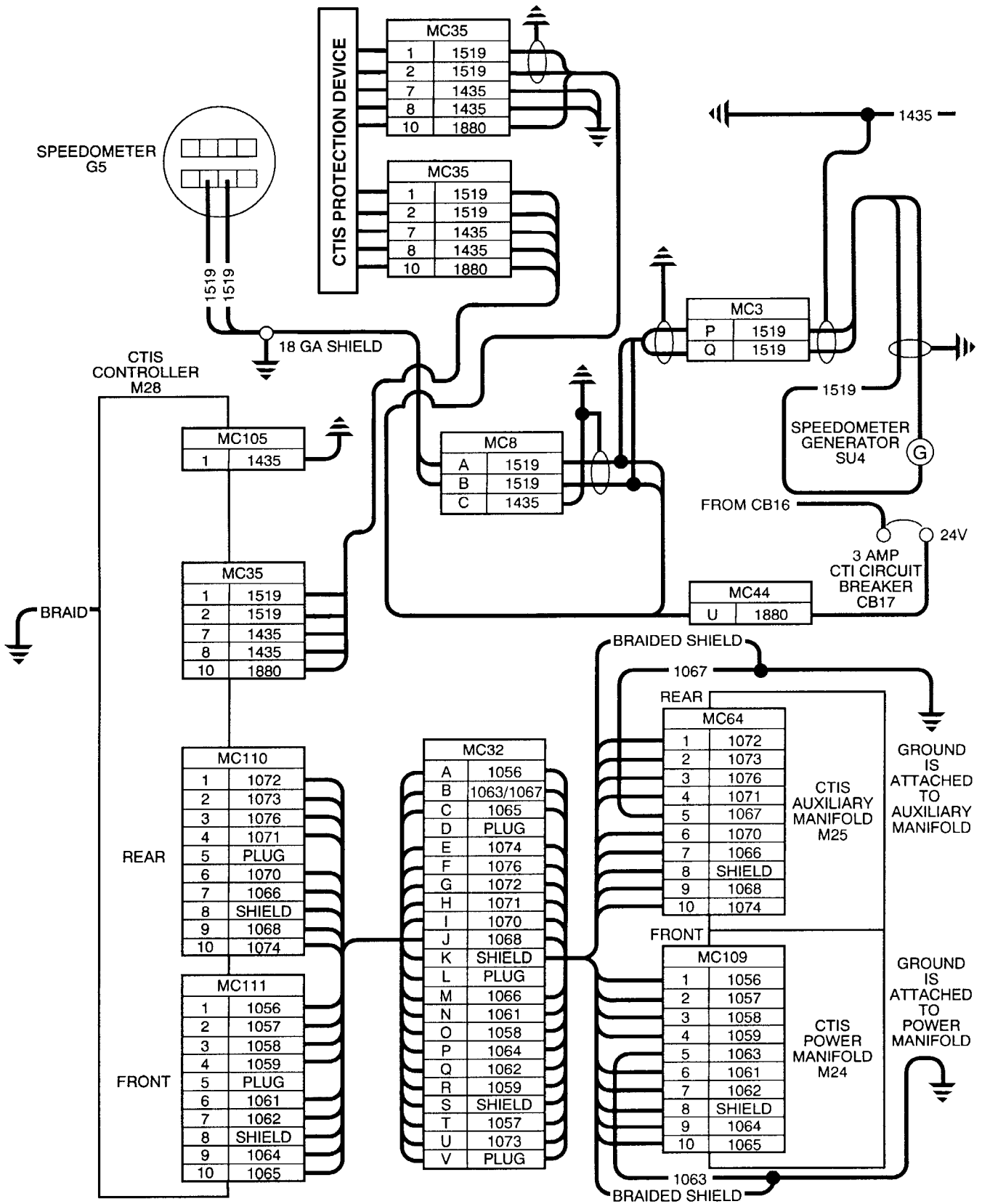


Figure 2-48. CTIS Wiring Schematic (With CTIS Protection Device) (Sheet 2 of 2)

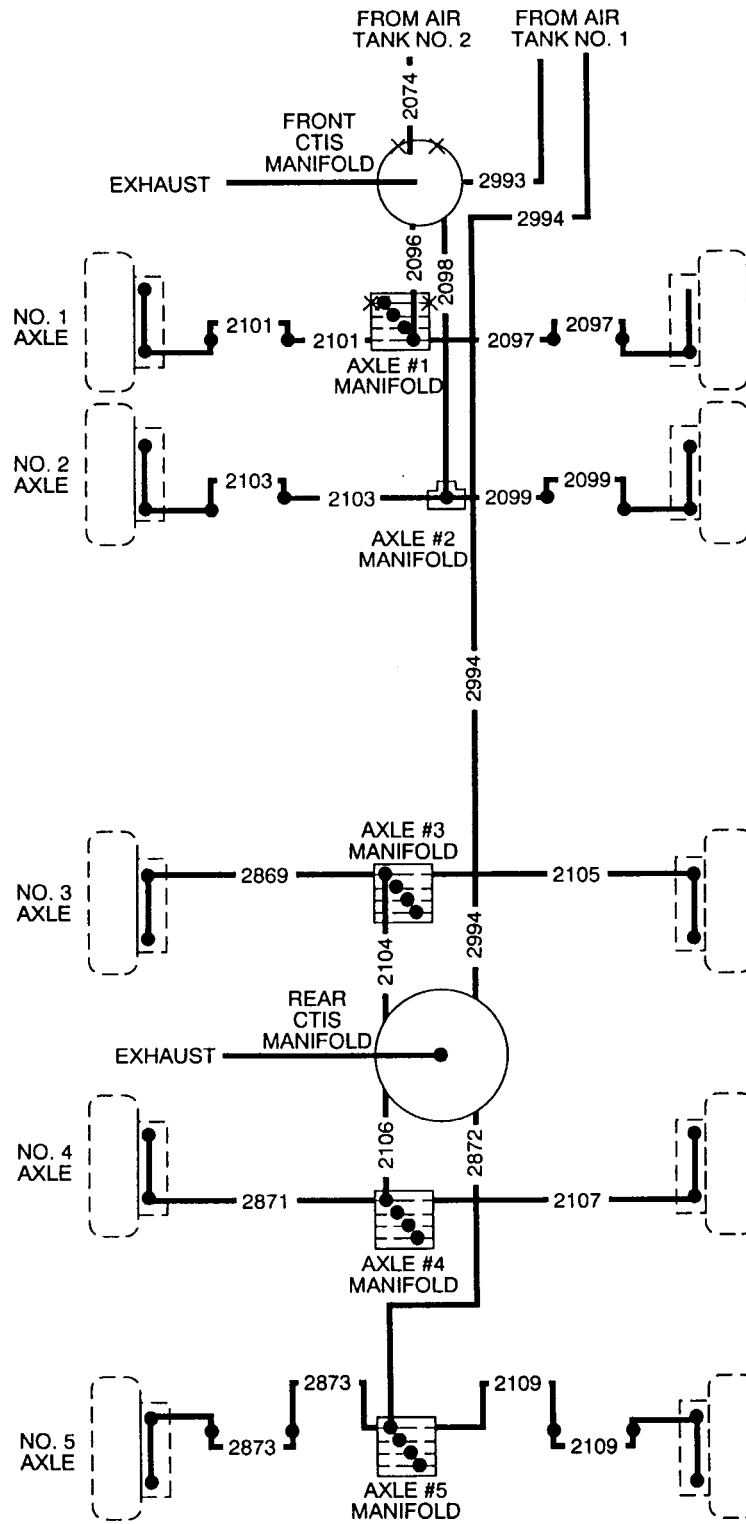


Figure 2-49. CTIS Air Diagram

2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

1. ONE TIRE WILL NOT INFLATE OR DEFLATE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

Goggles, Industrial (Item 30, Appendix G)

Materials/Parts

Solution, Soap (Item 86, Appendix C)

Personnel Required

Two

References

TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)

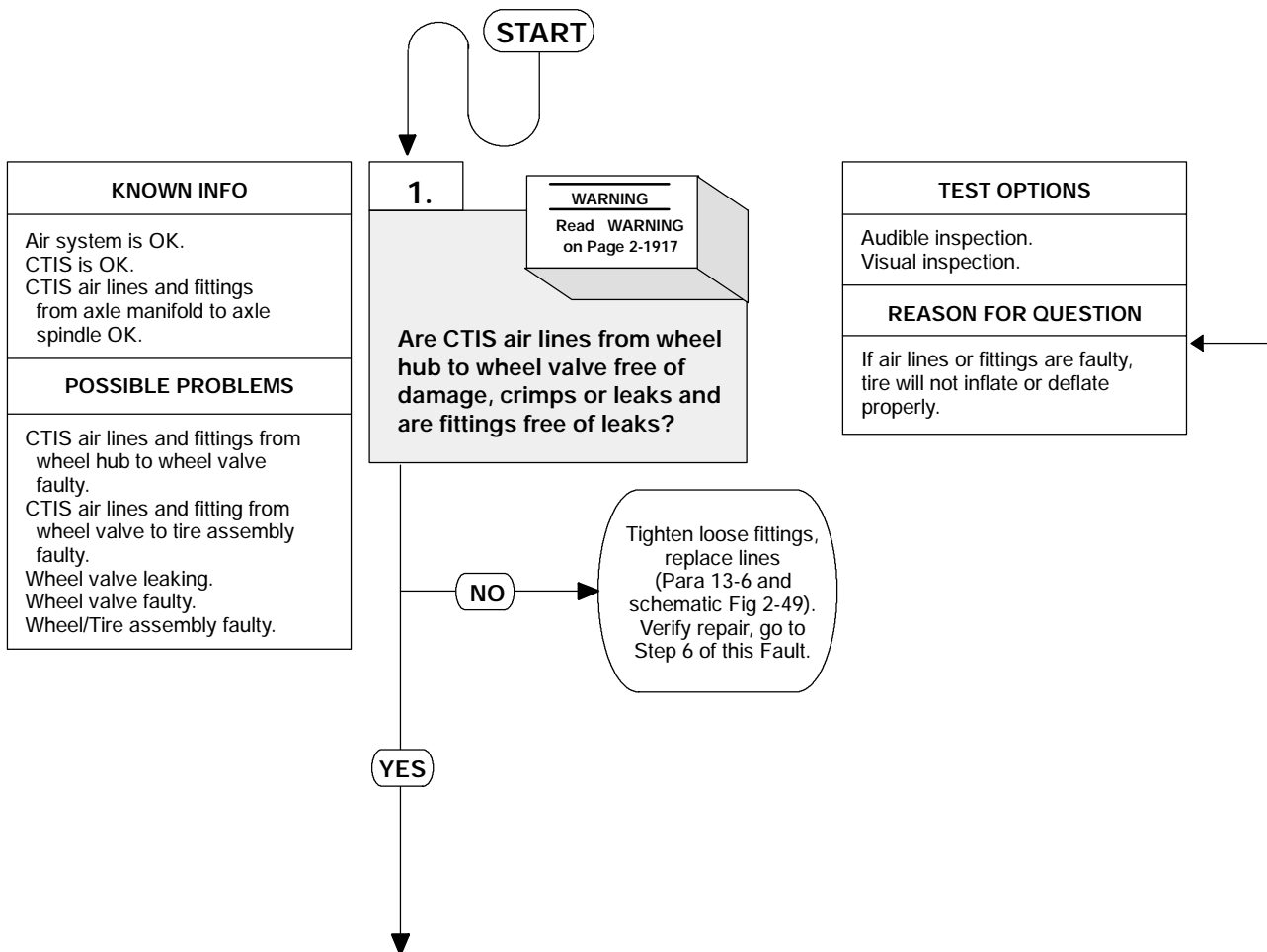
Parking brake applied, (TM 9-2320-364-10)

Wheels chocked, (TM 9-2320-364-10)

CTIS turned on, (TM 9-2320-364-10)

NOTE

Soap and water solution can be used to visually check for leaks.



WARNING

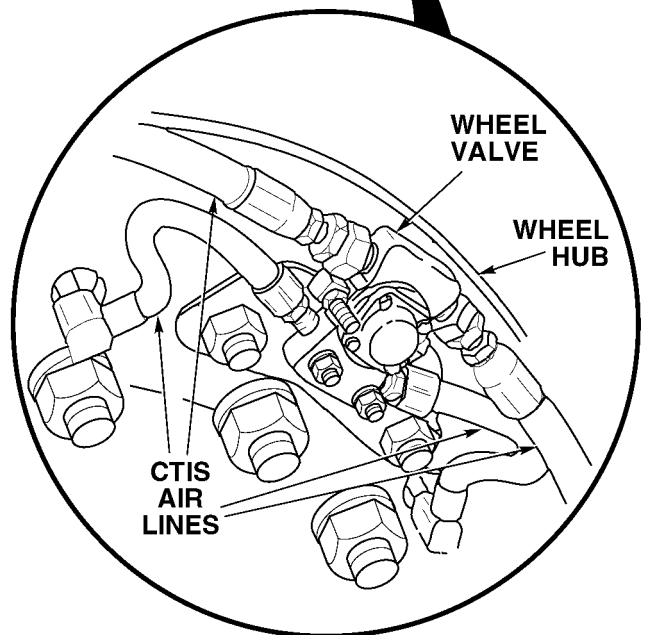
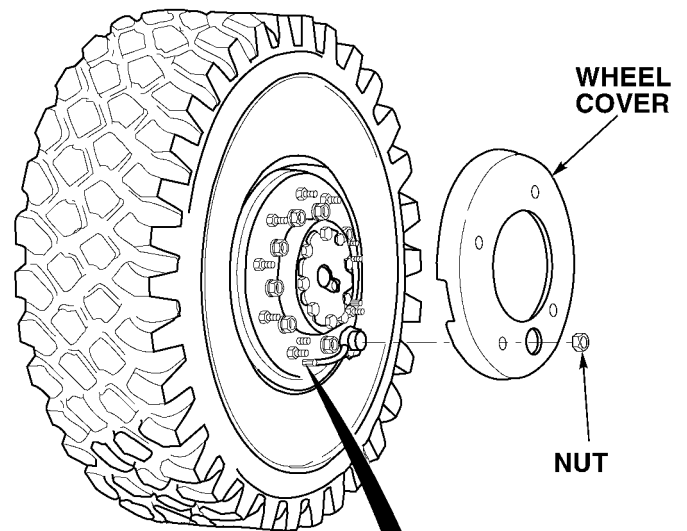
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

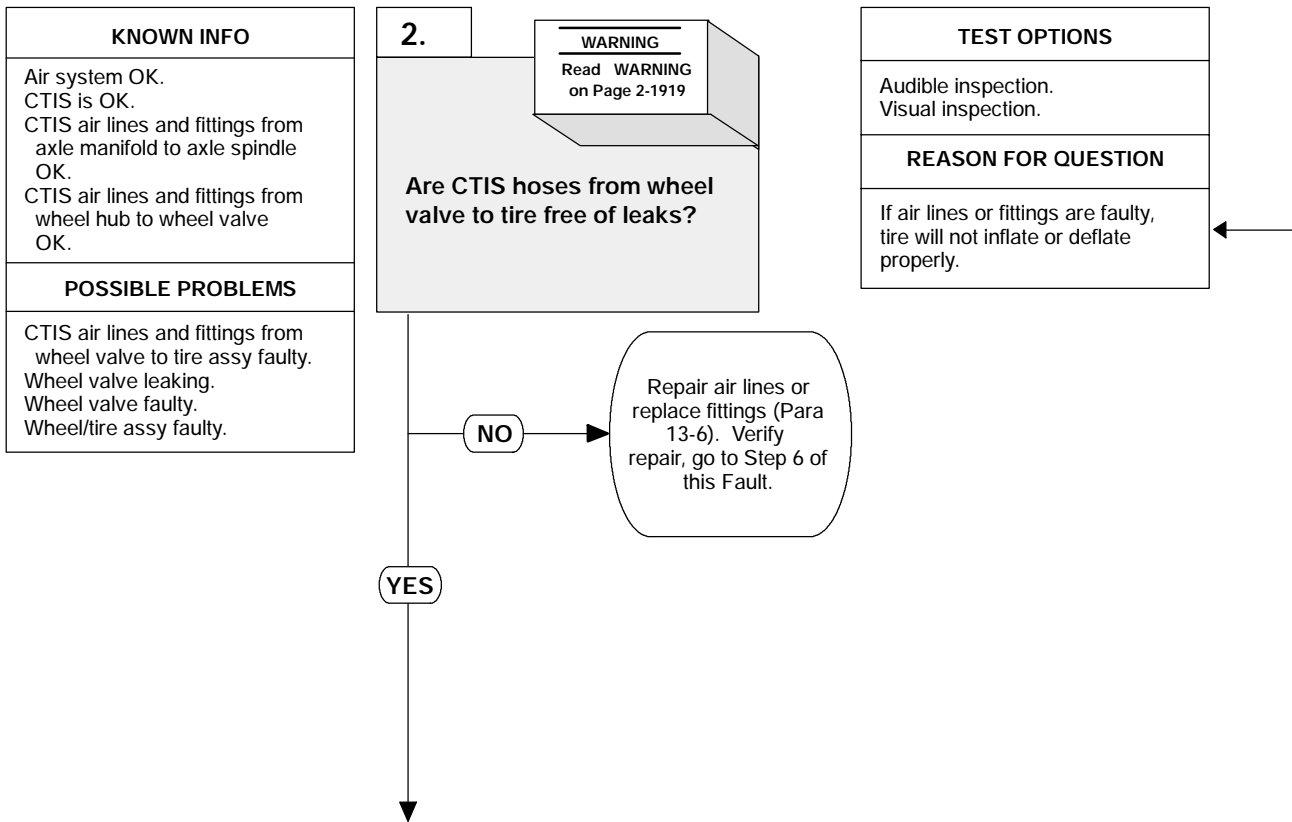
CTIS hub air lines are pressurized only when CTIS is in the inflate, deflate or test cycle.

VISUAL/AUDIBLE INSPECTION

- (1) Remove four nuts and wheel cover.
- (2) Deflate tire to 40 psi (276 kPa) or less, using tire gage.
- (3) Start engine (TM 9-2320-364-10).
- (4) Set CTIS controller to HIGHWAY.
- (5) Push CTIS START button.
- (6) Check air lines from wheel hub to CTIS wheel valve for damage, crimps or leaks.
 - (a) If air lines are damaged, crimped or leaking, tighten fittings, replace air lines (Para 13-6).
 - (b) If there are no leaks, crimps or damage, air lines and fittings are OK.



1. ONE TIRE WILL NOT INFLATE OR DEFLATE (CONT).



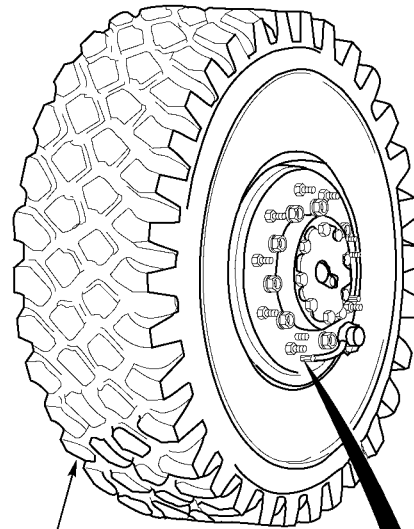
WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

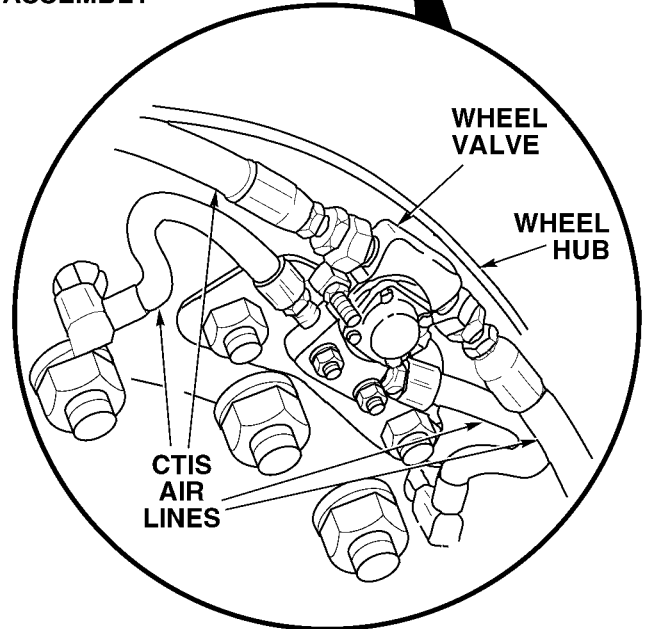
VISUAL/AUDIBLE INSPECTION

Check air lines from wheel valve to tire for damage or leaks.

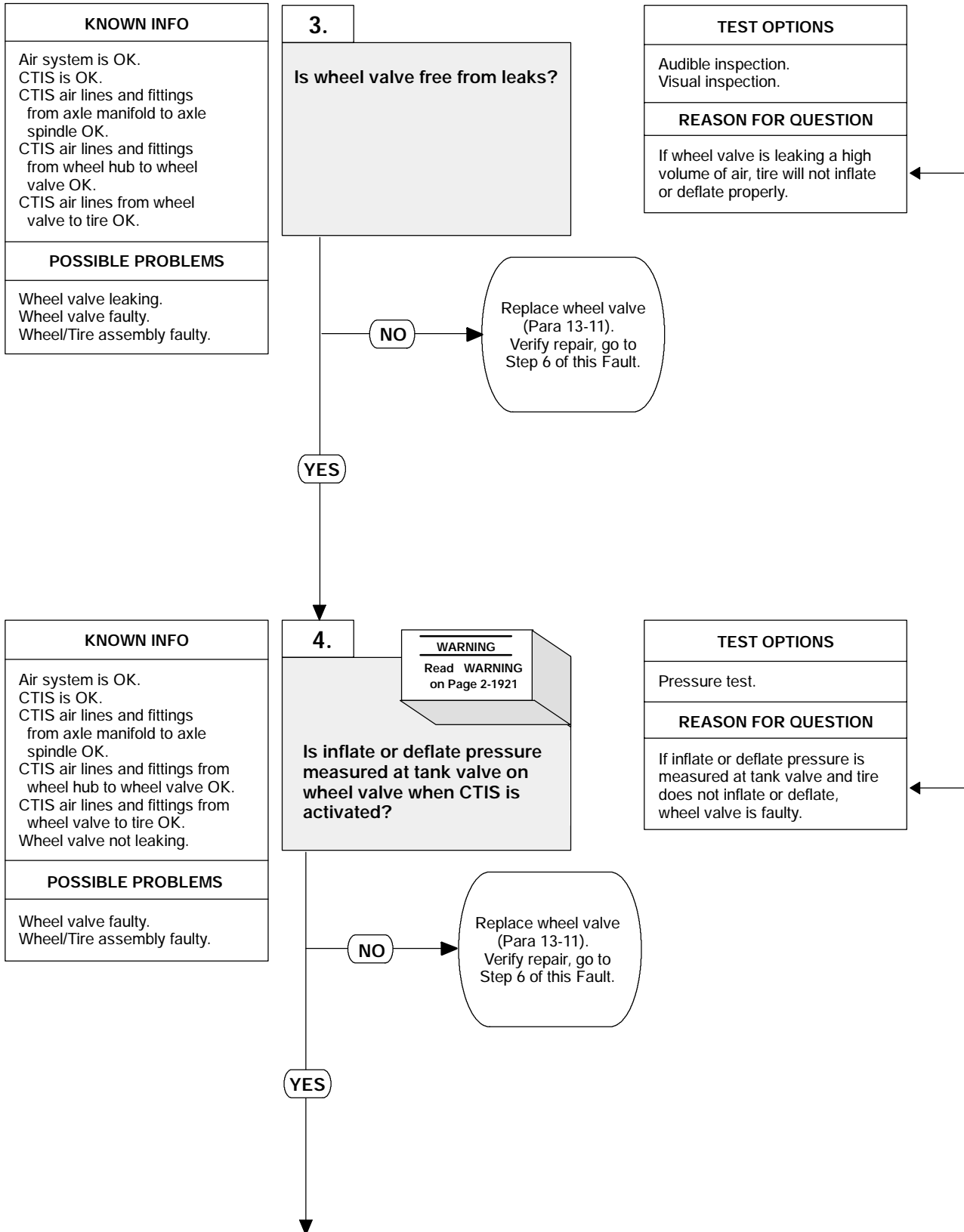
- (1) If air lines are damaged, crimped or leaking; tighten fittings, replace air lines (Para 13-6).
- (2) If there are no leaks, crimps or damage; air lines and fittings are OK.



WHEEL/TIRE ASSEMBLY



1. ONE TIRE WILL NOT INFLATE OR DEFLATE (CONT).



WARNING

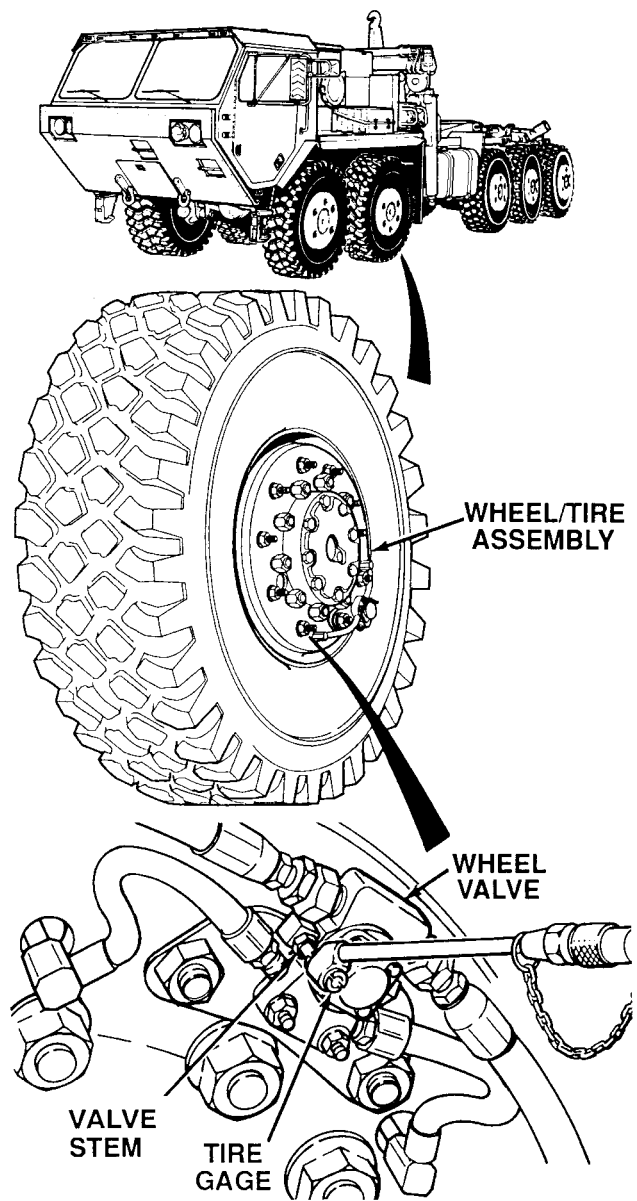
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.
- High air pressure will be released from valve stem when valve core is removed. Stay clear of valve stem after core is removed. Ensure all personnel wear suitable eye protection. Failure to comply may result in injury to personnel.

NOTE

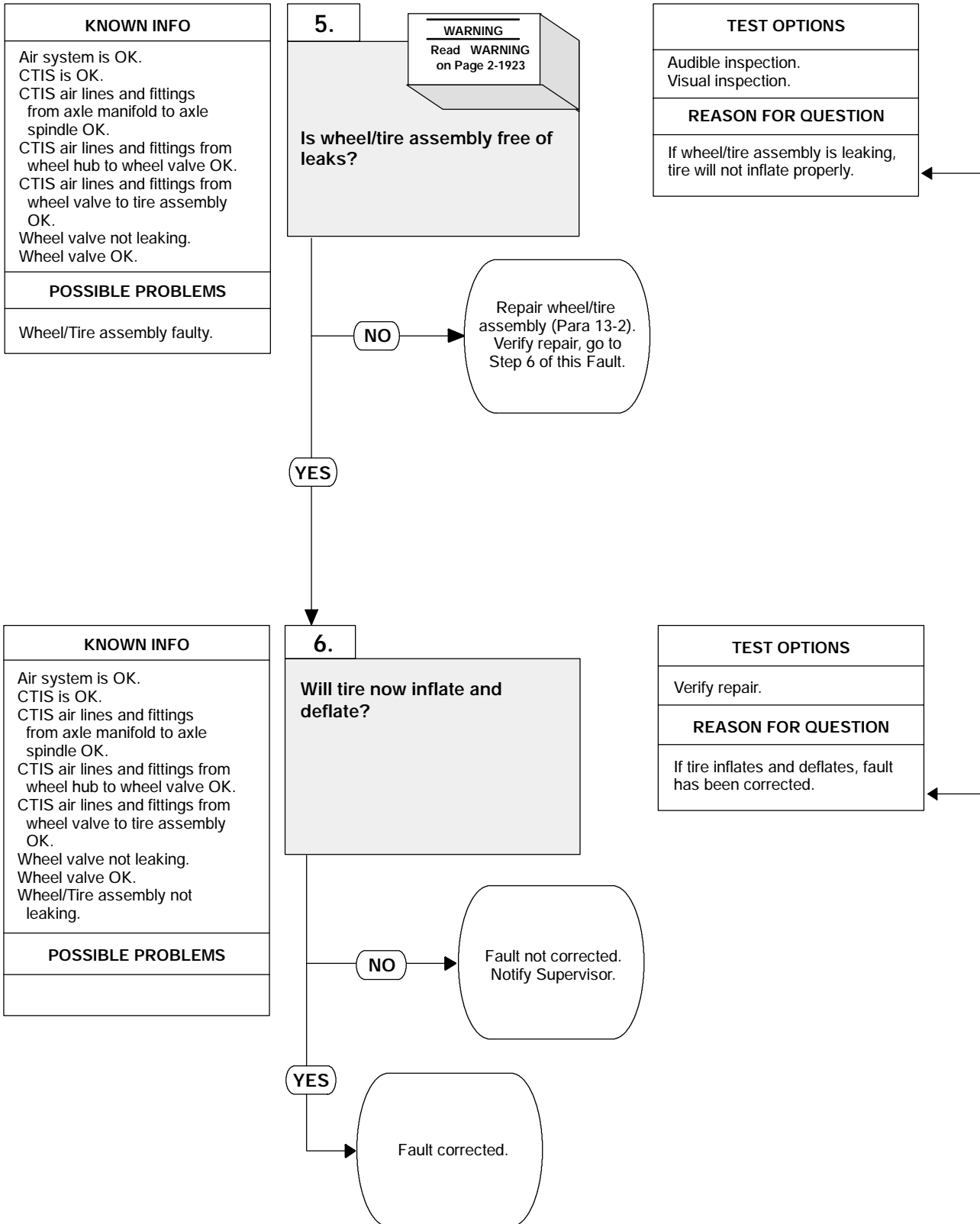
Some air leakage may occur at breather during inflation/deflation cycles. Rapid exhaust of air a breather indicates a faulty valve.

AUDIBLE/VISUAL INSPECTION
(1) Check wheel valve for air leaks (a) If wheel valve is leaking, turn OFF ENGINE switch and replace wheel valve (Para 13-11). (b) If there are no leaks, wheel valve is OK. (2) Turn OFF ENGINE switch.

PRESSURE TEST
(1) Remove valve cap from valve stem. (2) Position air pressure gage on valve stem. (3) Start engine (TM 9-2320-364-10). (4) Position CTIS controller to HIGH-WAY setting. (5) As assistant presses CTIS start button, observe air gage. (a) If there is no increase in air pressure, perform Steps (8) and (9) below and replace wheel valve (Para 13-11). (b) If there is an increase in air pressure, go to Step (6) below. (6) Set CTIS controller to CROSS COUNTRY. (7) As assistant presses CTIS start button, observe air gage. (a) If there is no decrease in air pressure, perform Steps (8) and (9) below and replace wheel valve (Para 13-11). (b) If there is a decrease in air pressure, wheel valve is OK. (8) Turn OFF ENGINE switch. (9) Remove air gage. (10) Install valve cap on valve stem.



1. ONE TIRE WILL NOT INFLATE OR DEFLATE (CONT).

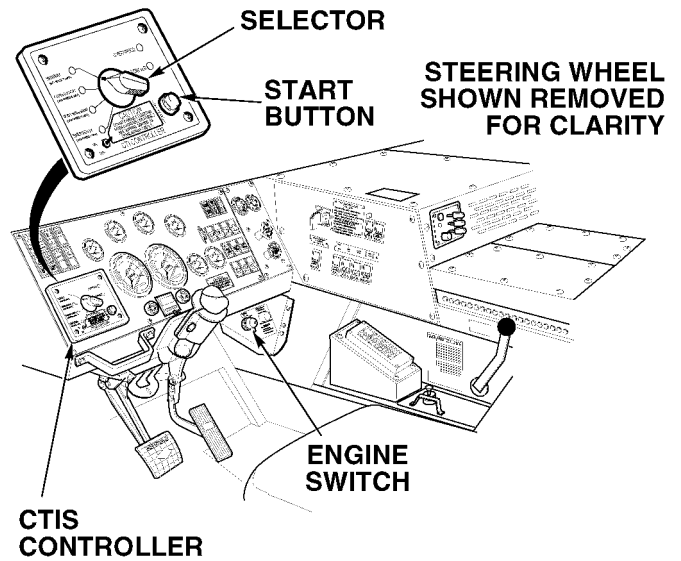


WARNING

Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

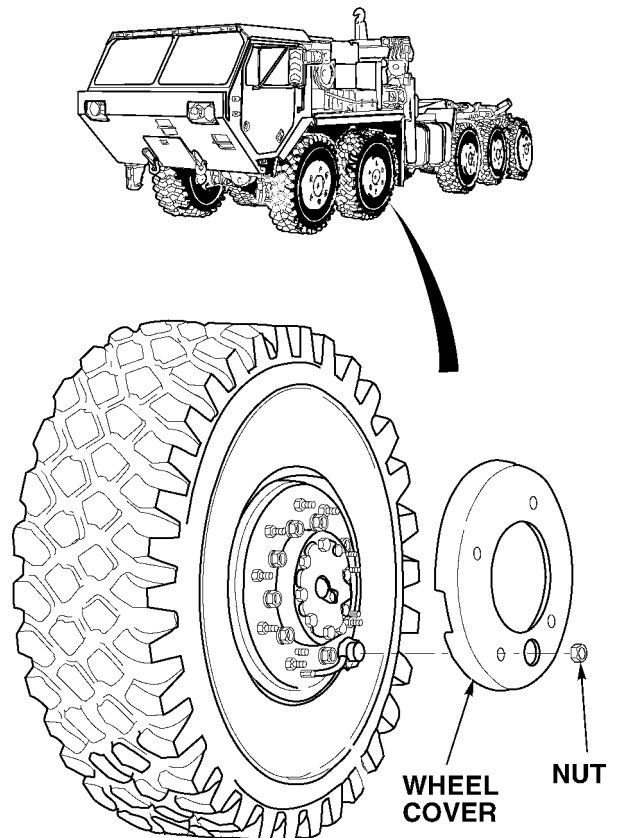
AUDIBLE/VISUAL INSPECTION

- (1) Check wheel/tire assembly for leaks.
 - (a) If wheel/tire assembly is leaking, repair wheel/tire assembly (Para 13-2).
 - (b) If there are no leaks, wheel/tire assembly is OK.
- (2) Install wheel cover and four nuts.



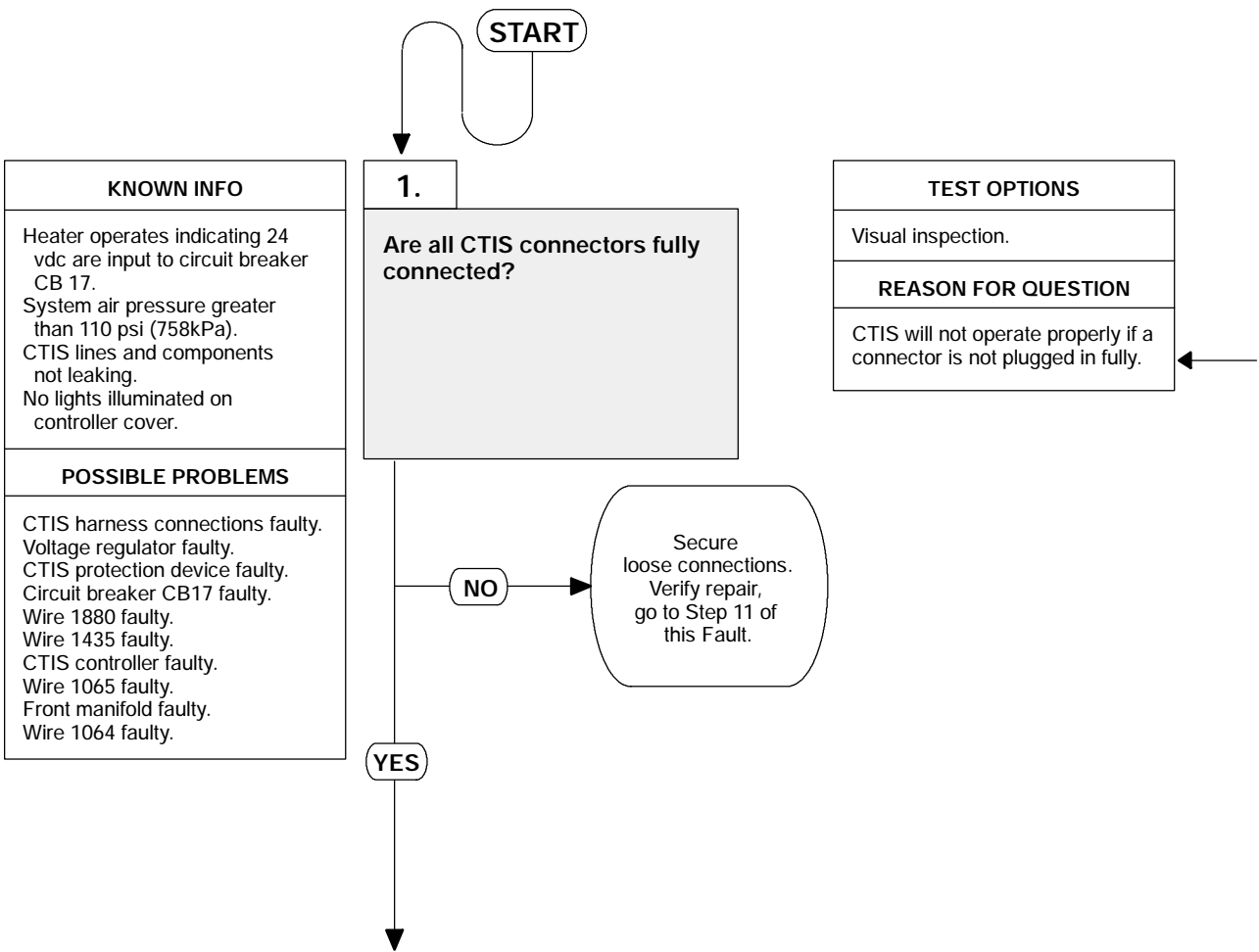
VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button.
 - (a) If tire does not inflate, fault not corrected. Turn OFF ENGINE switch and notify Supervisor.
 - (b) If tire inflates, go to Step (4) below.
- (4) Set CTIS controller selector to CROSS COUNTRY.
- (5) Press CTIS START button.
 - (a) If tire does not deflate, fault not corrected. Turn OFF ENGINE switch and notify Supervisor.
 - (b) If tire deflates, fault has been corrected.
- (6) Turn OFF ENGINE switch.

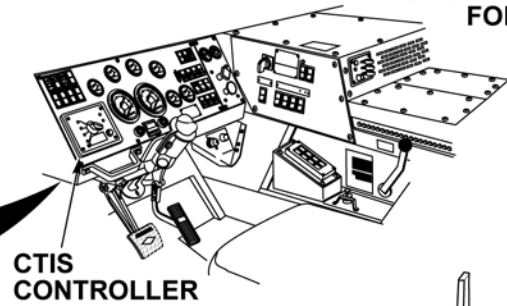


2-25. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

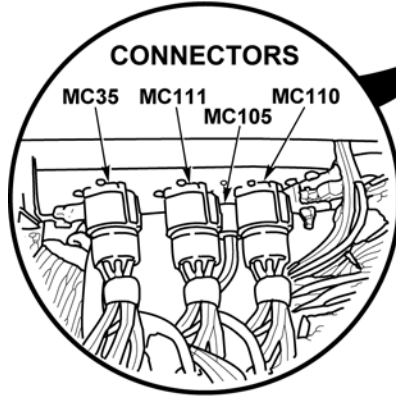
2. CTIS INOPERATIVE.	
INITIAL SETUP	
<p><i>Tools and Special Tools</i></p> <ul style="list-style-type: none"> Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G) STE/ICE-R (optional) (Item 3, Appendix G) Multimeter (Item 44, Appendix G) Jumperwire 	<p><i>References</i></p> <ul style="list-style-type: none"> TM 9-2320-364-10 TM 9-4910-571-12&P <p><i>Equipment Condition</i></p> <ul style="list-style-type: none"> Engine OFF, (TM 9-2320-364-10) Parking brake applied, (TM 9-2320-364-10) Wheels chocked, (TM 9-2320-364-10) Front access cover opened, (TM 9-2320-364-10) CTIS turned on, (TM 9-2320-364-10) LHS fully extended, (TM 9-2320-364-10)



STEERING WHEEL
SHOWN REMOVED
FOR CLARITY

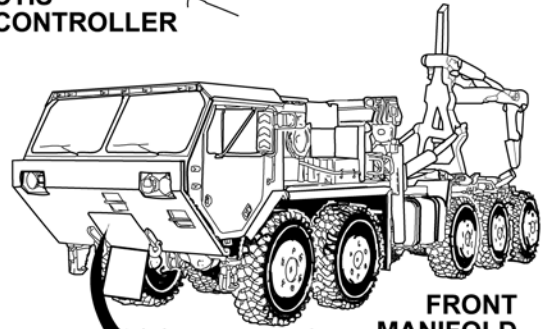


CTIS
CONTROLLER

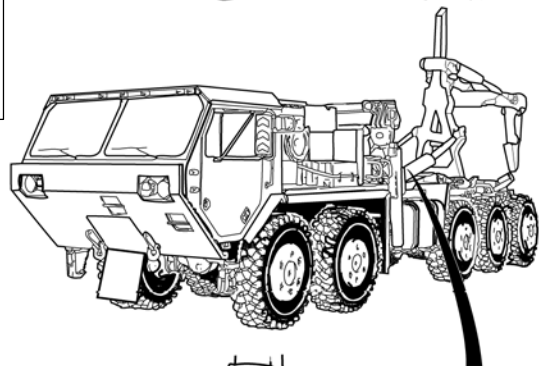
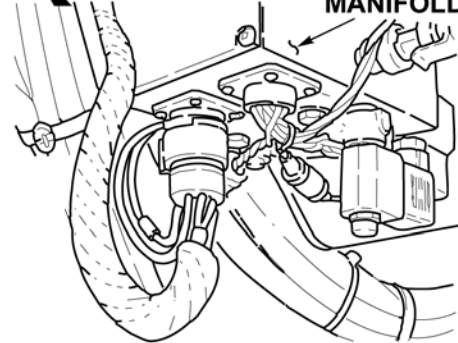


CONNECTORS

MC35 MC111 MC105 MC110



FRONT
MANIFOLD

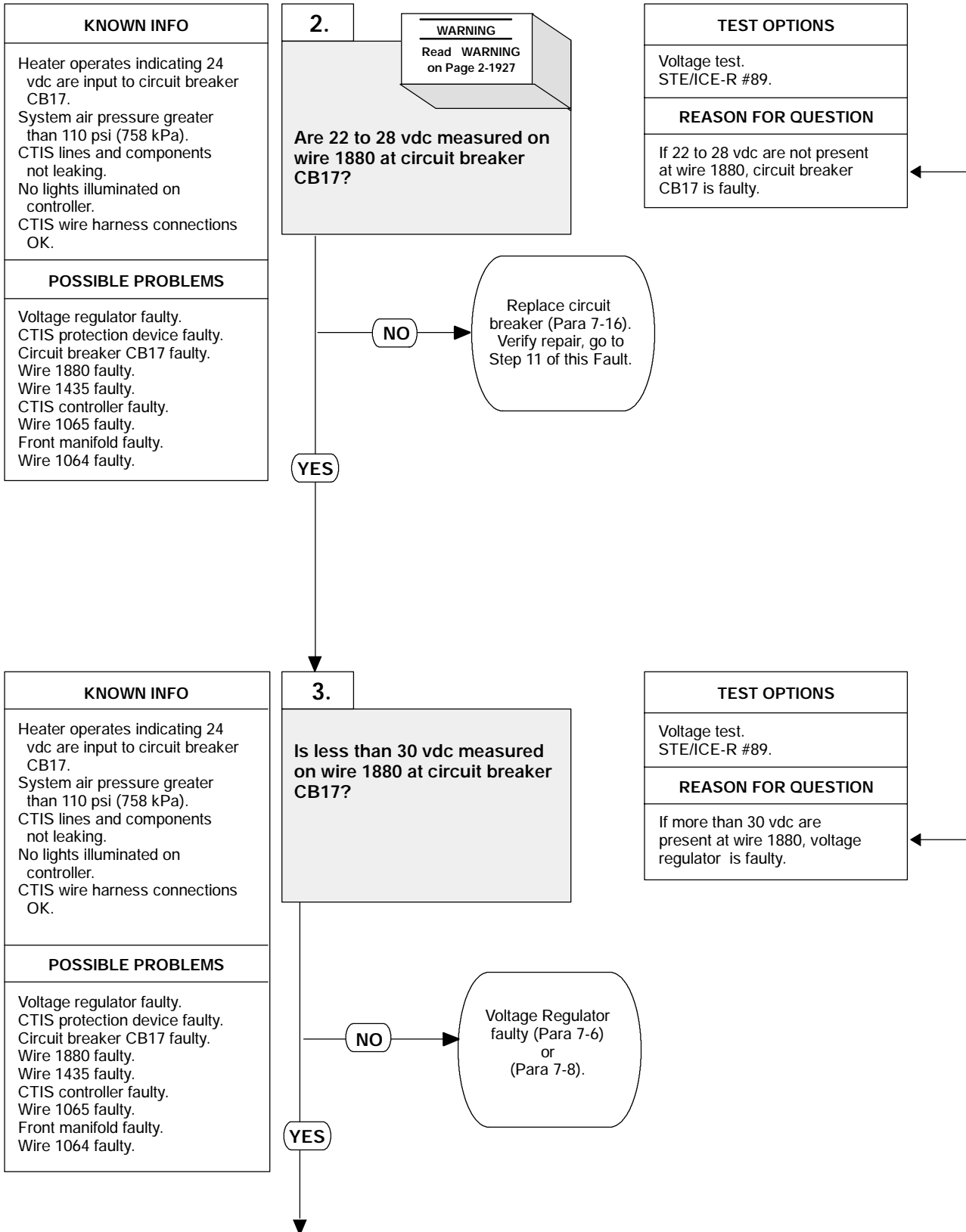


REAR
MANIFOLD

VISUAL INSPECTION

- (1) Inspect CTIS controller, front and rear manifold to see that all connectors are fully plugged in.
 - (a) If connectors are not plugged in, secure connectors.
 - (b) If connectors are plugged in, go to Step 2 of this Fault.
- (2) Put LHS in transit position (TM 9-2320-364-10).

2. CTIS INOPERATIVE (CONT).



WARNING

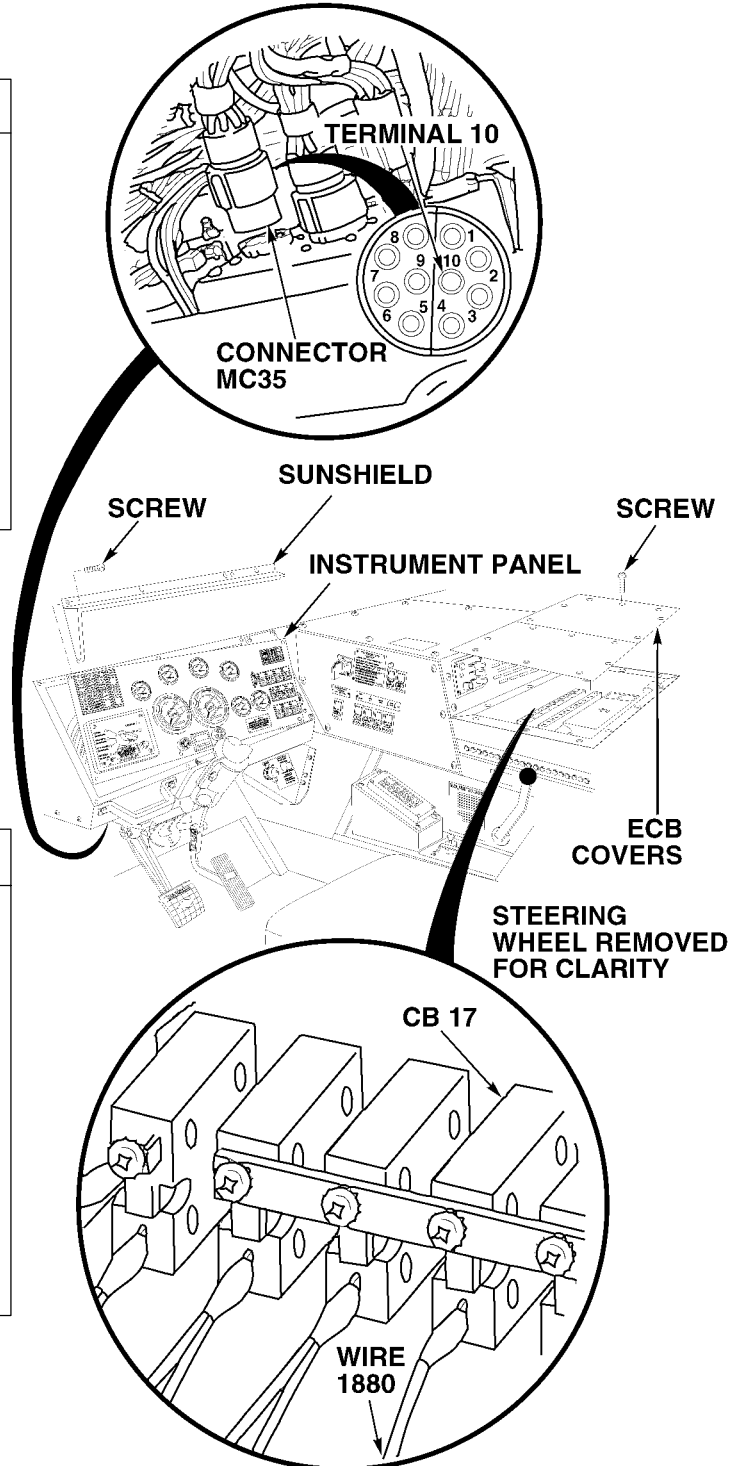
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

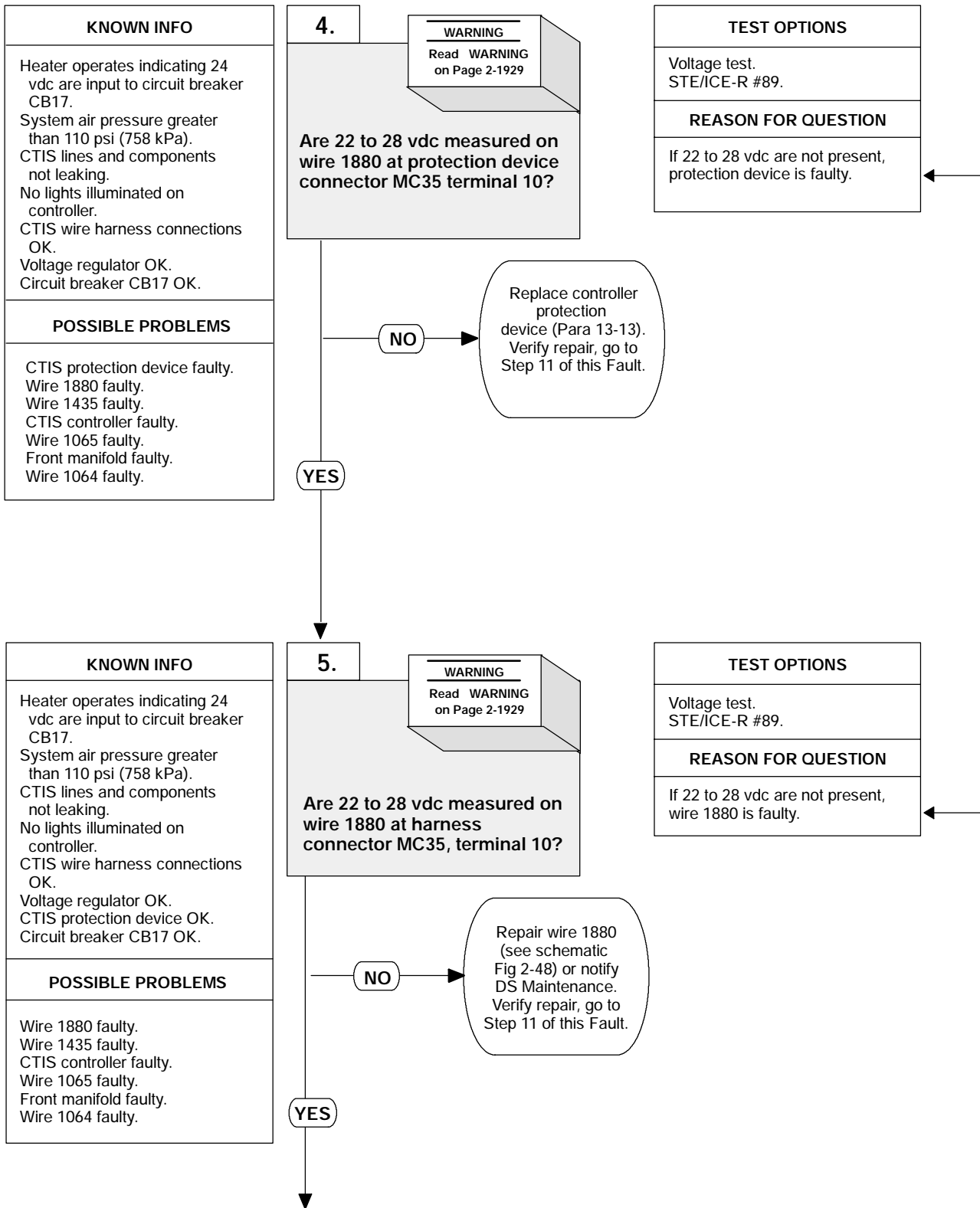
- (1) Remove 15 screws and ECB covers.
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead to wire 1880 at CB17.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and replace CB17 (Para 7-16).
 - (b) If 22 to 28 vdc are present, CB17 is OK.
- (6) Turn OFF ENGINE switch.

VOLTAGE TEST

- (1) Set multimeter select switch to volts dc.
- (2) Connect positive (+) multimeter lead to wire 1880 at CB17.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If $30 \pm$ vdc are present, turn OFF ENGINE switch and replace voltage regulator (Para 7-6) or Para 7-8).
 - (b) If 22 to 28 vdc are present, voltage output is OK.
- (5) Turn OFF ENGINE switch.
- (6) Install ECB covers and 15 screws.



2. CTIS INOPERATIVE (CONT).



WARNING

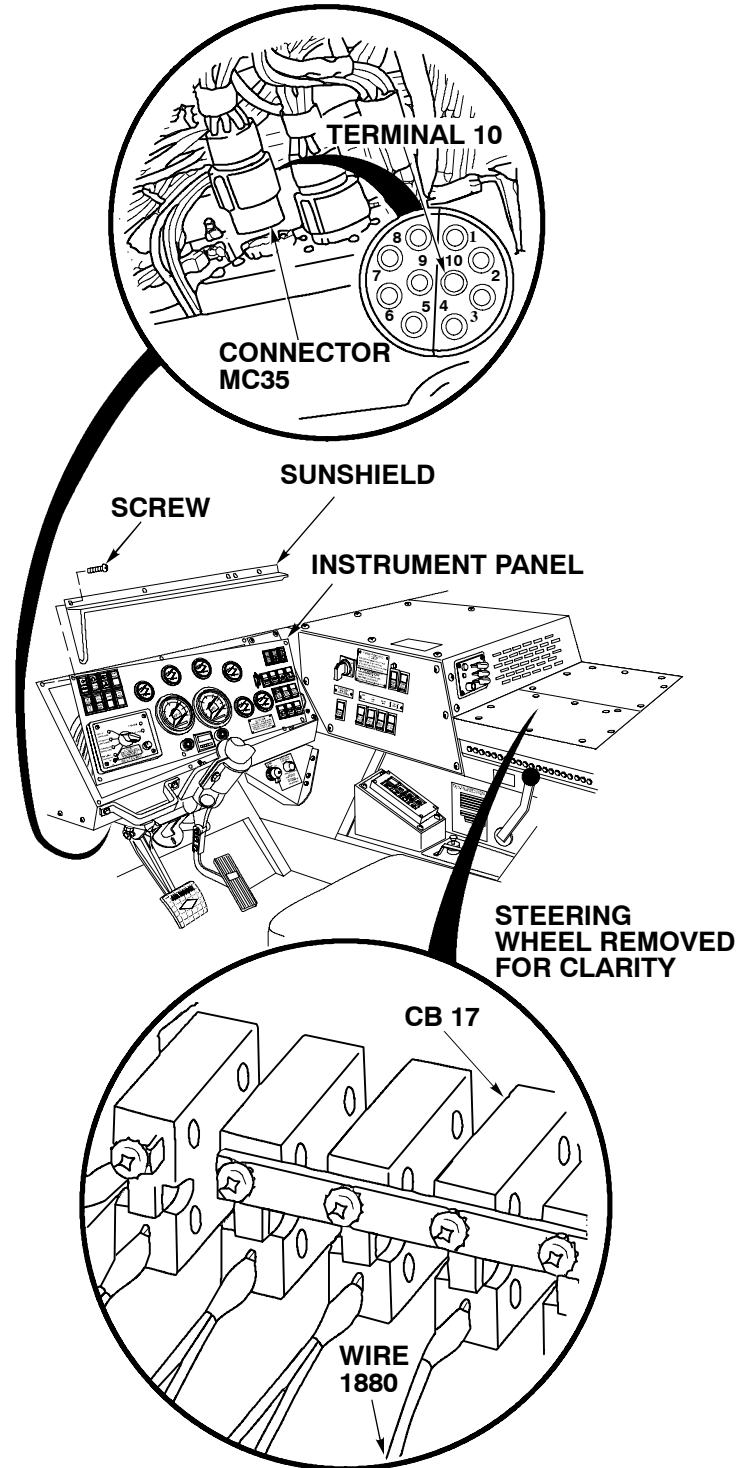
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

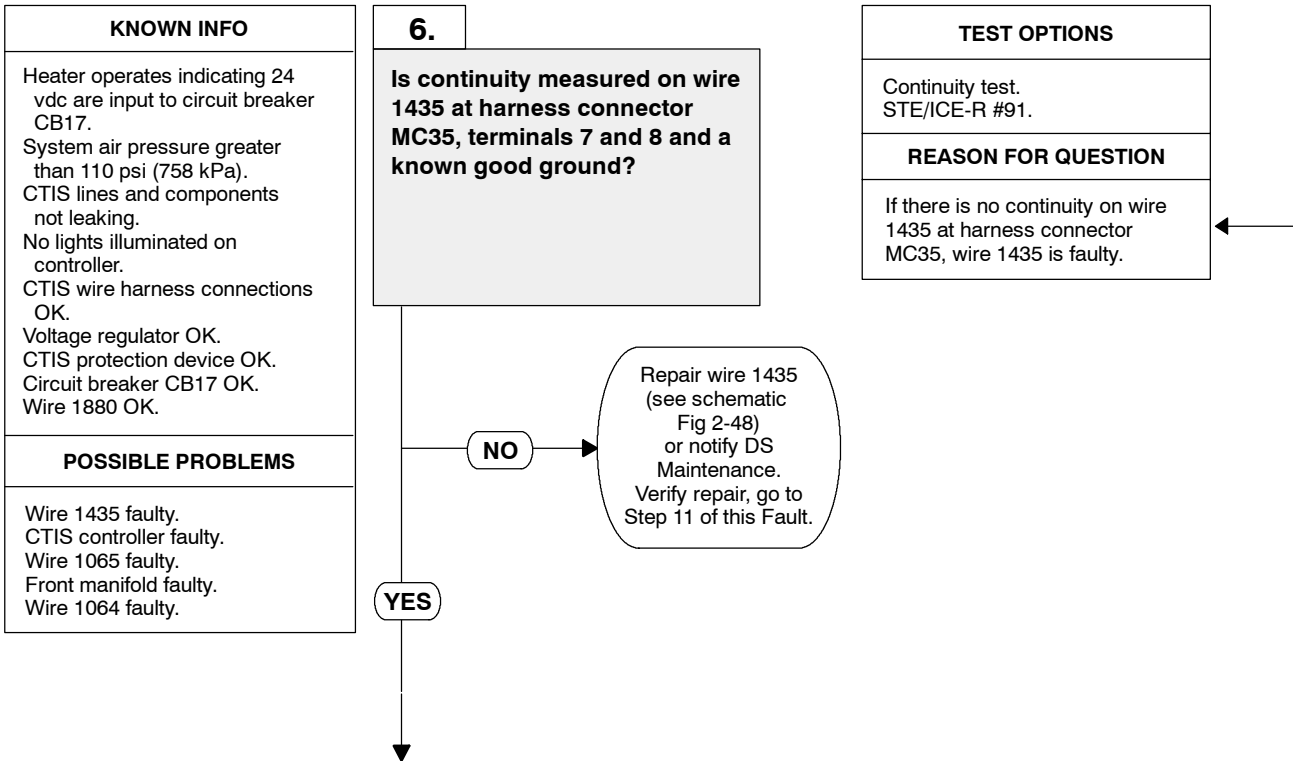
- (1) Remove ten screws and sunshield from instrument panel.
- (2) Pull top of instrument panel toward steering wheel.
- (3) Disconnect harness connector MC35 from back of CTIS controller.
- (4) Connect positive (+) multimeter lead to wire 1880 at harness connector MC35, terminal 10.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present turn OFF ENGINE switch and replace controller protection device (Para 13-13) (see schematic Fig 2-48) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, controller protection device is OK.
- (7) Turn OFF ENGINE switch.

VOLTAGE TEST

- (1) Remove ten screws and sunshield from instrument panel.
- (2) Pull top of instrument panel toward steering wheel.
- (3) Disconnect harness connector MC35 from back of CTIS controller.
- (4) Connect positive (+) multimeter lead to wire 1880 at harness connector MC35, terminal 10.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present turn OFF ENGINE switch and repair wire 1880 (see schematic Fig 2-48) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, wire 1880 is OK.
- (7) Turn OFF ENGINE switch.

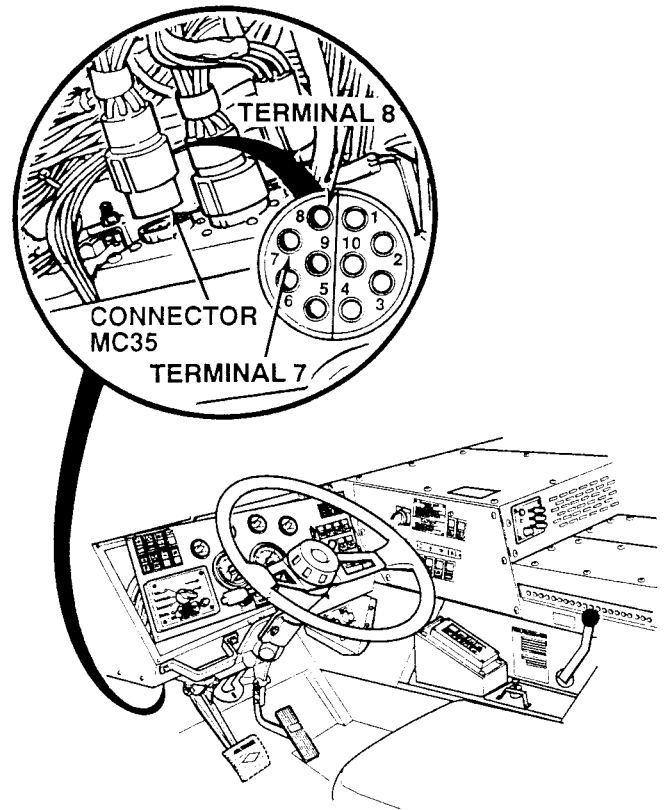


2. CTIS INOPERATIVE (CONT).

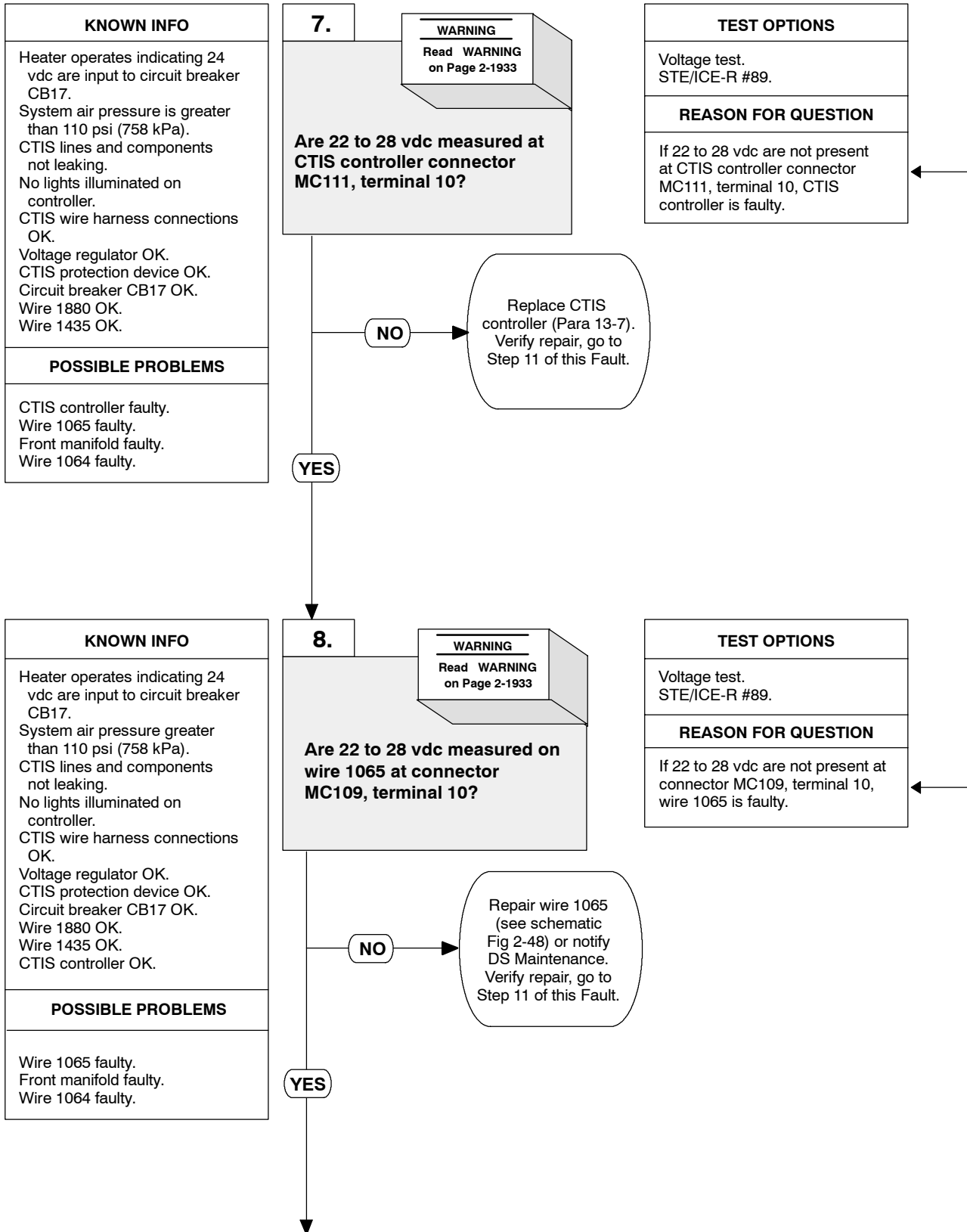


CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between harness connector MC35, terminal 7 and a known good ground and terminal 8 and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-48) or notify DS Maintenance.
 - (b) If there is continuity, wire 1435 is OK.
- (3) Connect harness connector MC35 at CTIS controller.



2. CTIS INOPERATIVE (CONT).

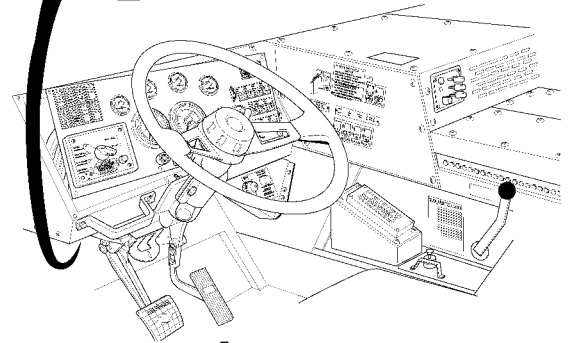
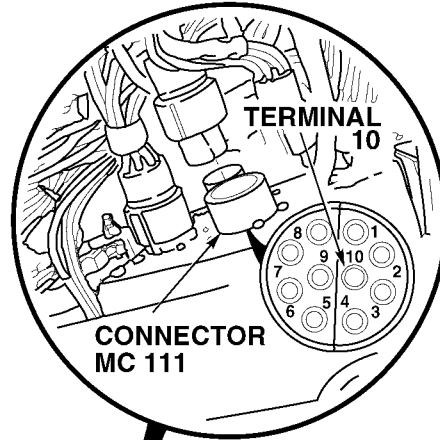


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

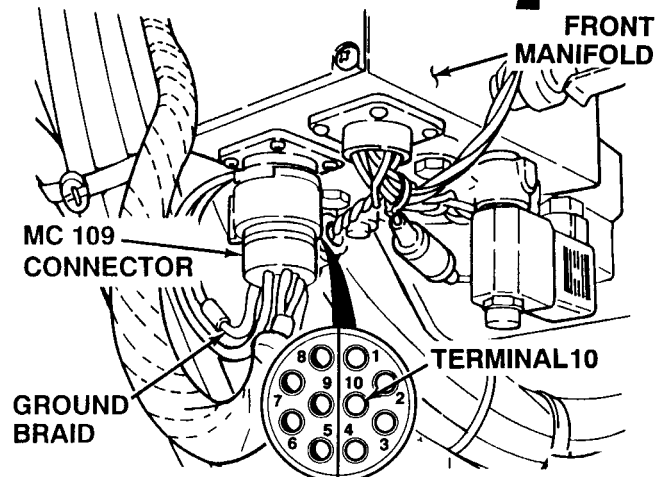
VOLTAGE TEST

- (1) Disconnect harness connector MC111 from back of CTIS controller.
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead to CTIS controller connector MC111, terminal 10.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and replace CTIS controller (Para 13-7).
 - (b) If 22 to 28 vdc are present, CTIS controller is OK.
- (6) Turn OFF ENGINE switch.
- (7) Connect harness connector MC111 on back of CTIS controller.

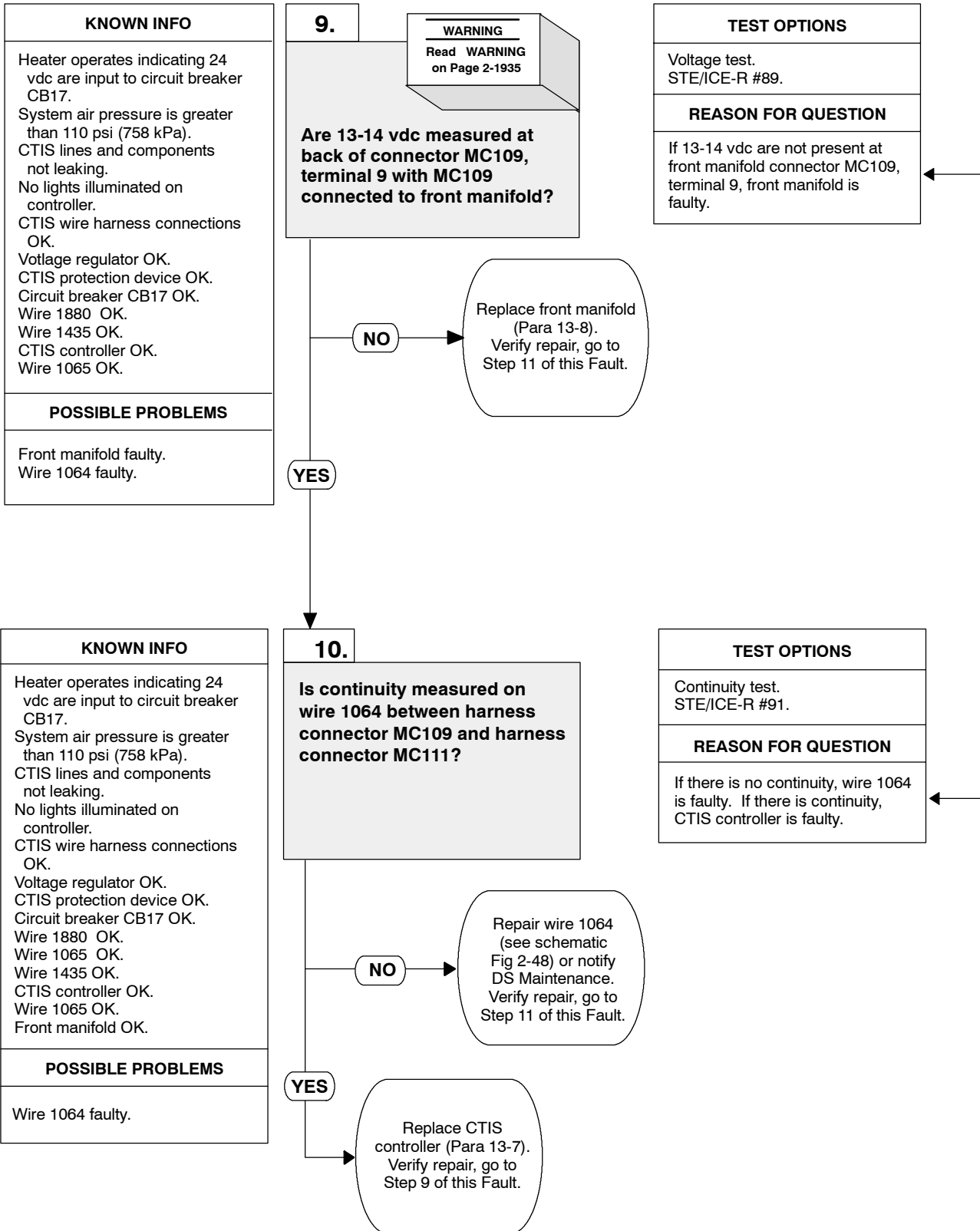


VOLTAGE TEST

- (1) Disconnect front manifold harness connector MC109.
- (2) Connect positive (+) multimeter lead to wire 1065 at harness connector MC109, terminal 10.
- (3) Connect negative (-) multimeter lead to front manifold ground braid.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and repair wire 1065 (see schematic Fig 2-48) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, wire 1065 is OK.
- (5) Turn OFF ENGINE switch.
- (6) Connect harness connector MC109 on front manifold.



2. CTIS INOPERATIVE (CONT).

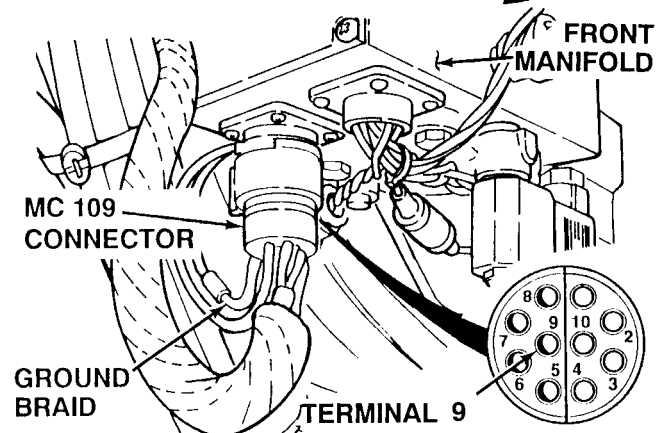
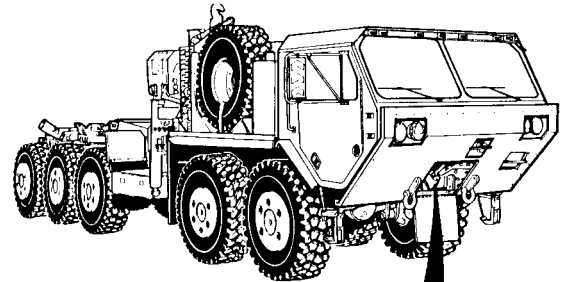


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

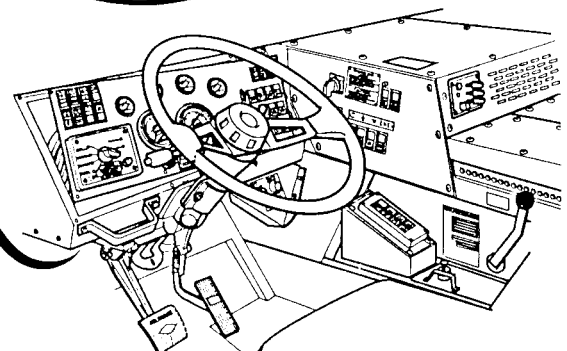
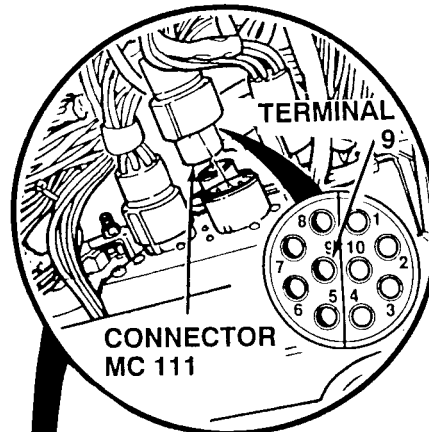
VOLTAGE TEST

- (1) Insert positive (+) multimeter lead, with long probe installed, at back of connector MC109, terminal 9.
- (2) Connect negative (-) multimeter lead to front manifold ground braid.
- (3) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 13-14 vdc are not present, turn OFF ENGINE switch and replace front manifold (Para 13-8).
 - (b) If 13-14 vdc are present, front manifold is OK.
- (4) Turn OFF ENGINE switch.

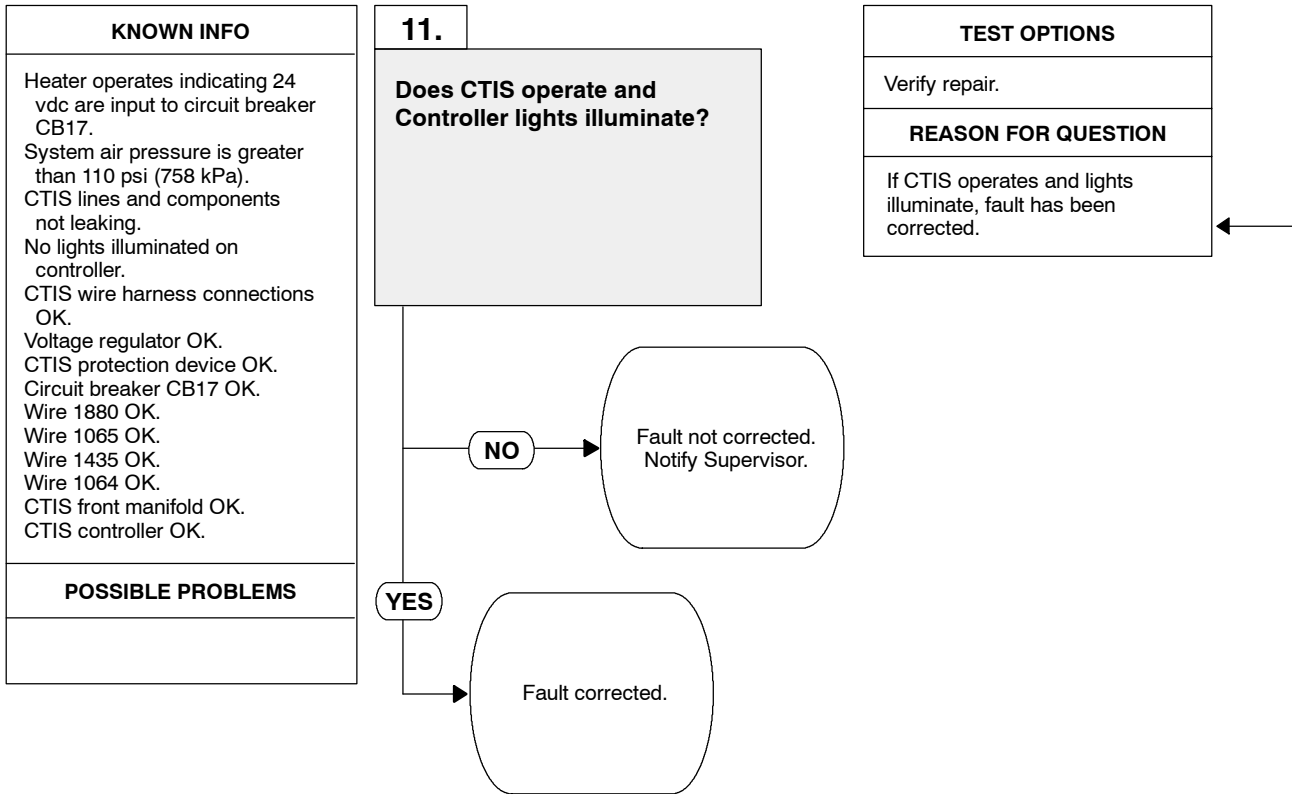


CONTINUITY TEST

- (1) Disconnect harness connectors MC109 and MC111.
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between harness connectors MC109, terminal 9 and MC111, terminal 9?
 - (a) If there is no continuity, repair wire 1064 (see schematic Fig 2-48) or notify DS Maintenance.
 - (b) If there is continuity, wire 1064 is OK, replace CTIS controller (Para 13-7).
- (4) Connect harness connectors MC109 and MC111.
- (5) Close front access cover (TM 9-2320-364-10).

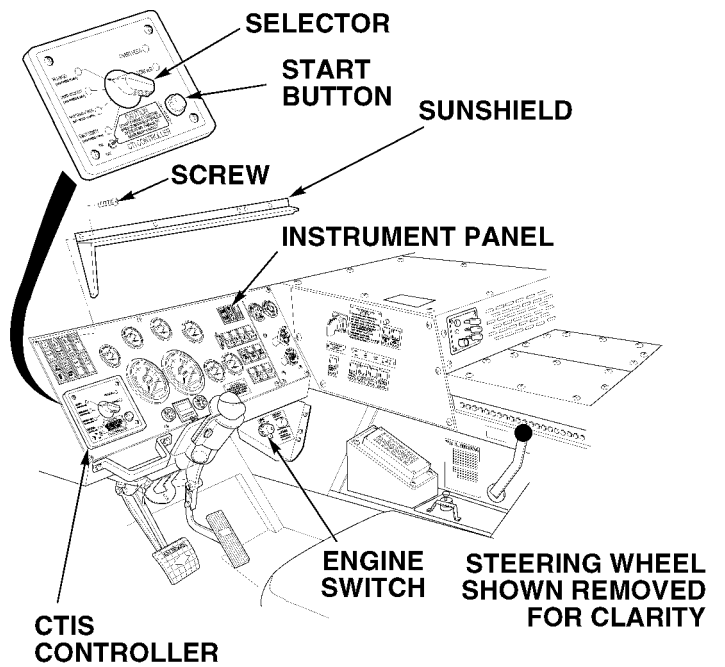


2. CTIS INOPERATIVE (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to CROSS COUNTRY.
- (3) Press CTIS START button.
 - (a) If tires do not deflate, fault not corrected. Turn OFF ENGINE switch and notify Supervisor.
 - (b) If tires deflate, go to Step (4) below.
- (4) Set CTIS controller selector to HIGHWAY.
- (5) Press CTIS START button.
 - (a) If tires do not inflate, fault not corrected. Turn OFF ENGINE switch and notify Supervisor.
 - (b) If tires inflate, fault has been corrected.
- (6) Turn OFF ENGINE switch.
- (7) Install instrument panel and sunshield with ten screws.
- (8) Stow LHS in transit position.



2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

3. ALL TIRES ON AXLES NO. 3 THROUGH NO. 5 WILL NOT DEFLATE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74 Appendix H)
 STE/ICE-R (optional) (Item 3, Appendix H)
 Multimeter (Item 44, Appendix H)
 Jumperwire

Personnel Required

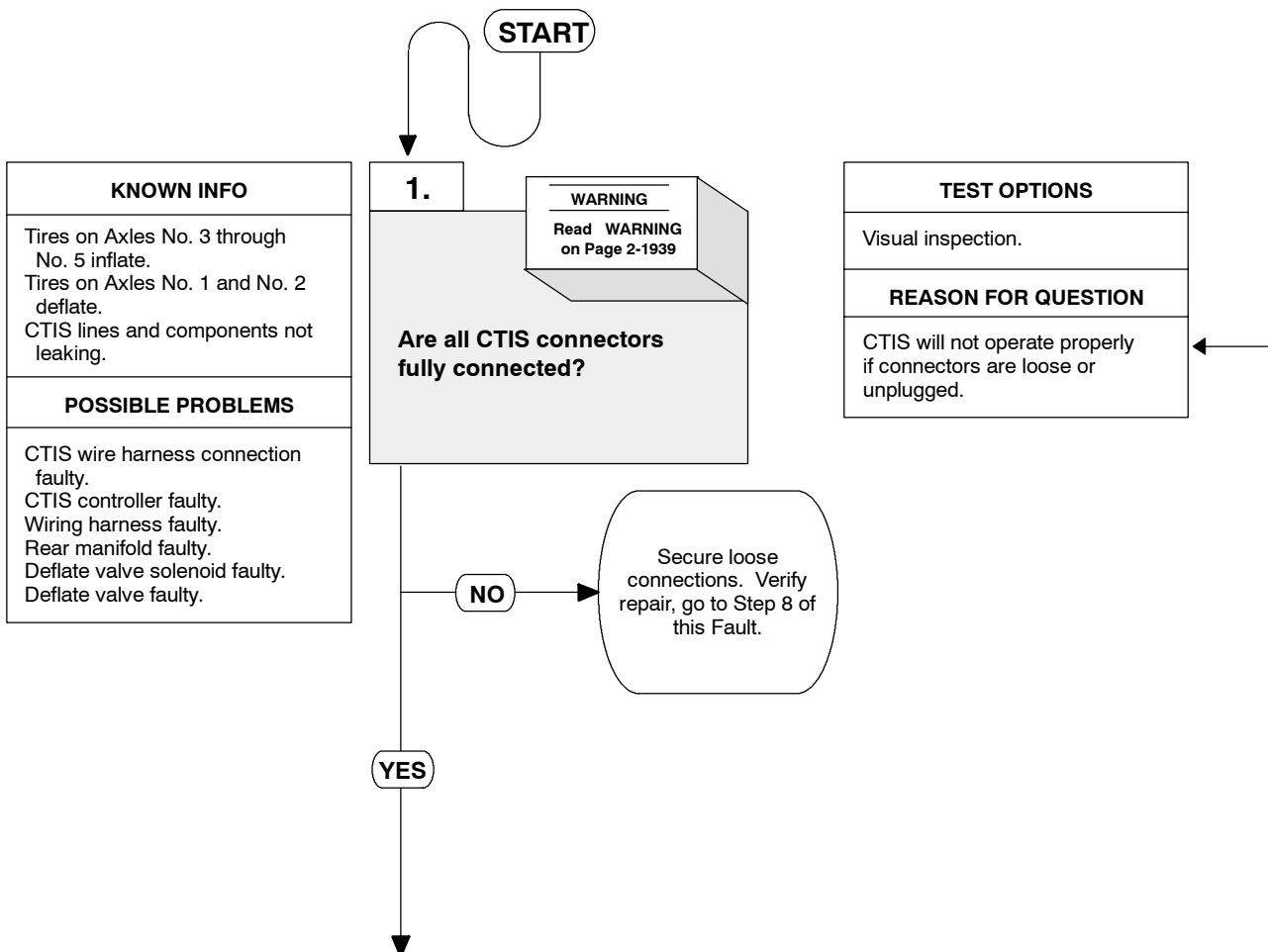
Two

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 CTIS rear manifold cover removed, (Para 13-9)
 Load Handling System (LHS) extended fully, (TM 9-2320-364-10)
 CTIS turned on, (TM 9-2320-364-10)
 Front access cover opened, (TM 9-2320-364-10)



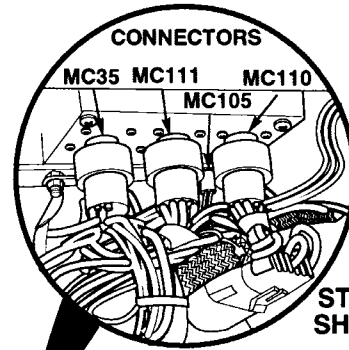
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

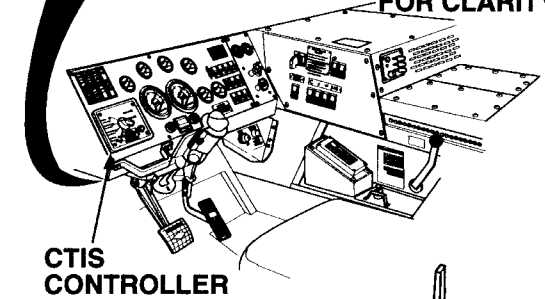
NOTE

The CTIS initially and periodically checks for system air leaks. The CTIS controller will display a flashing Low Air light and shut off if 6 psi(41 kPa) cannot be maintained by the CTIS. The manifold will click during this check for approximately 1-1/2 minutes.

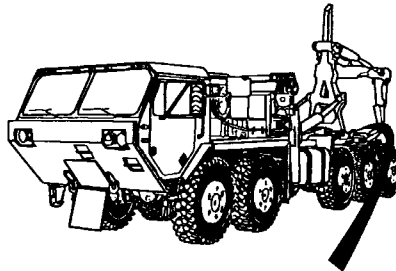
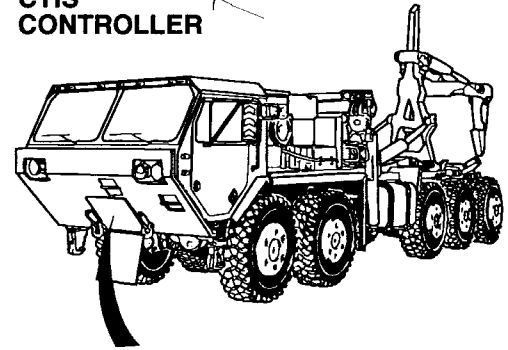
VISUAL INSPECTION
<p>(1) Inspect CTIS controller, front and rear manifolds to ensure that all connectors are fully plugged in.</p> <p>(a) If connectors are not plugged in, secure connectors.</p> <p>(b) If connectors are plugged in, go to Step 2 of this Fault.</p> <p>(2) Close front access cover (TM 9-2320-364-10).</p>



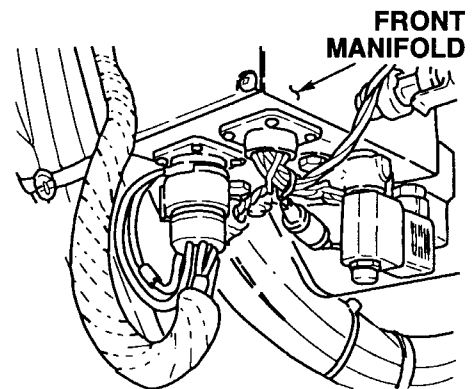
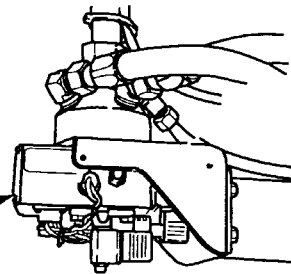
STEERING WHEEL SHOWN REMOVED FOR CLARITY



CTIS CONTROLLER

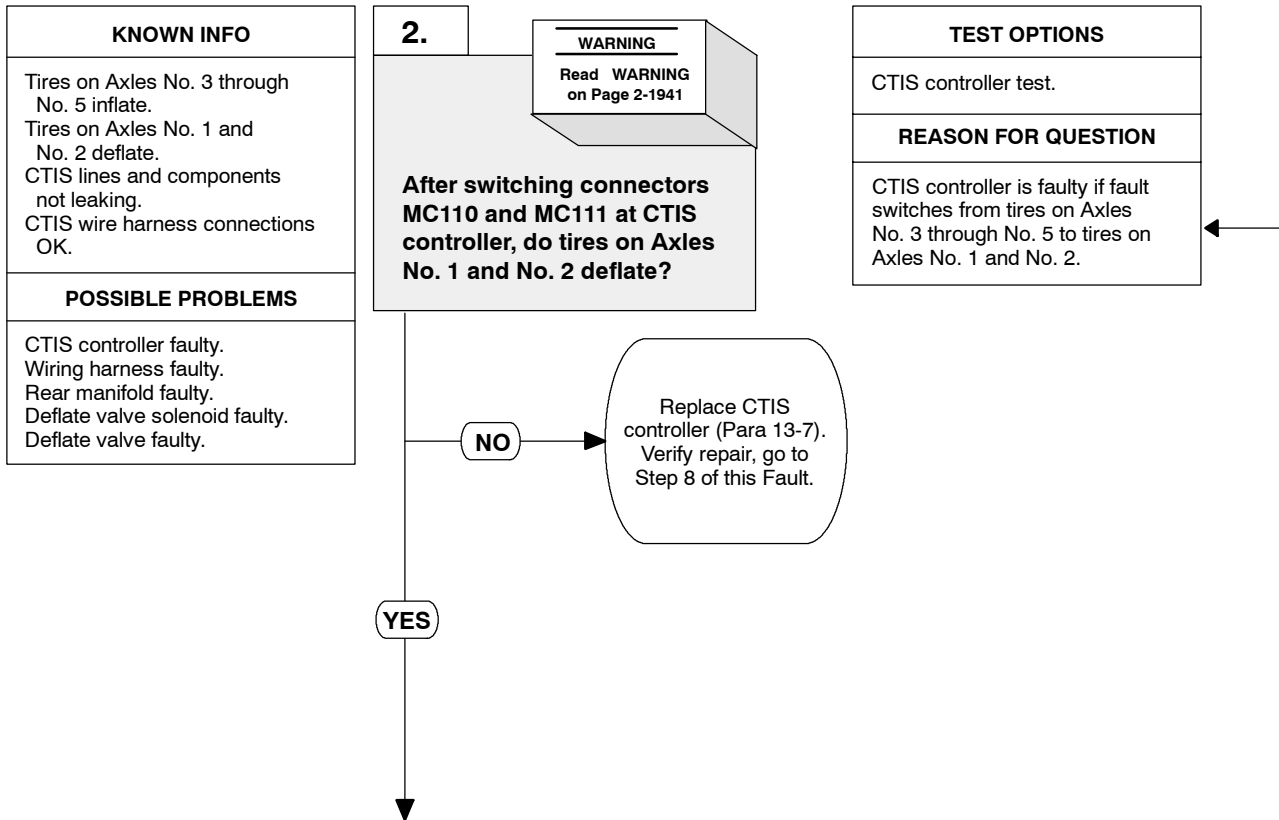


REAR MANIFOLD



FRONT MANIFOLD

3. ALL TIRES ON AXLES NO. 3 THROUGH NO. 5 WILL NOT DEFLATE (CONT).

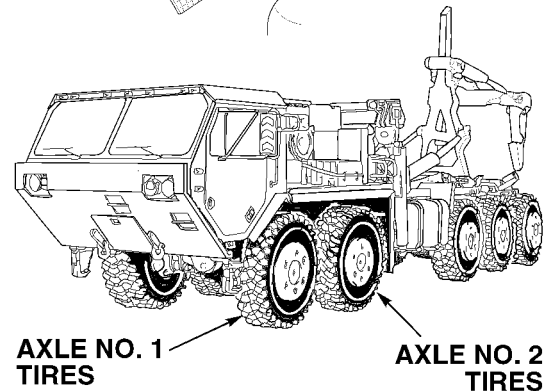
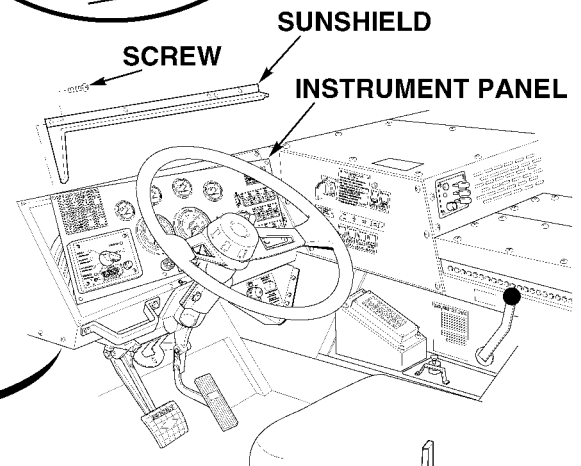
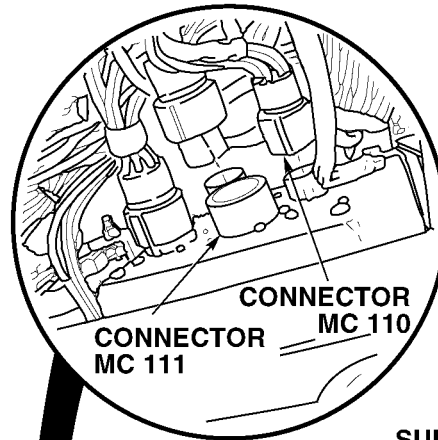


WARNING

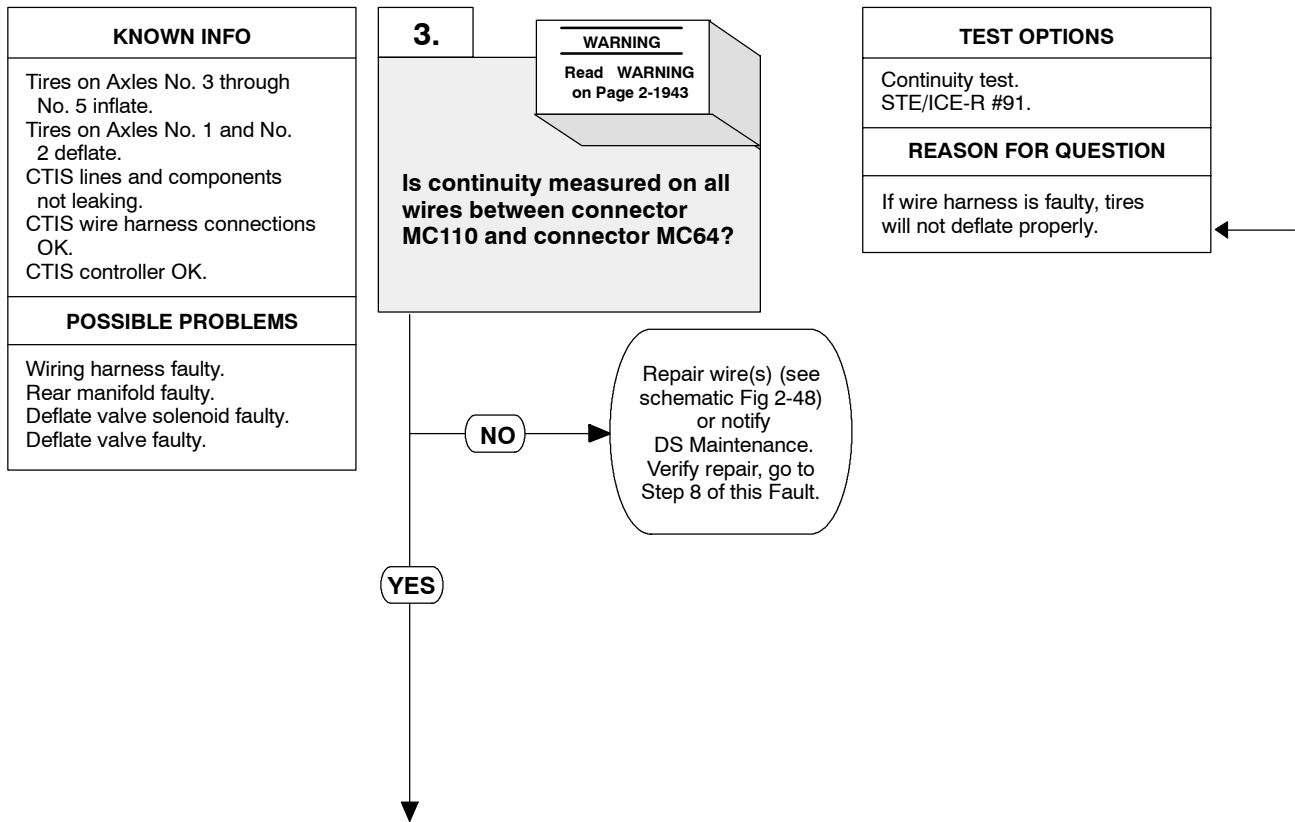
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CTIS CONTROLLER TEST

- (1) Remove ten screws and sunshield from instrument panel.
- (2) Pull top of instrument panel toward steering wheel.
- (3) Disconnect rear manifold harness connector MC110 from back of CTIS controller.
- (4) Disconnect front manifold harness connector MC111 from back of CTIS controller.
- (5) Connect harness connector MC111 into CTIS controller where connector MC110 was disconnected.
- (6) Connect harness connector MC110 into CTIS controller where connector MC111 was disconnected.
- (7) Start engine (TM 9-2320-364-10).
- (8) Set CTIS controller to CROSS COUNTRY.
- (9) As assistant pushes CTIS controller START button, observe tires.
 - (a) If tires on Axles No. 1 and No. 2 do not deflate, replace CTIS controller (Para 13-7).
 - (b) If tires on Axles No. 1 and No. 2 deflate, CTIS controller is OK.
- (10) Turn OFF ENGINE switch.
- (11) Disconnect and connect connectors MC110 and MC111 to correct CTIS controller connectors.
- (12) Start engine.
- (13) Set CTIS controller to HIGHWAY and allow tire pressure to build.
- (14) Turn OFF ENGINE switch.



3. ALL TIRES ON AXLES NO. 3 THROUGH NO. 5 WILL NOT DEFLATE (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

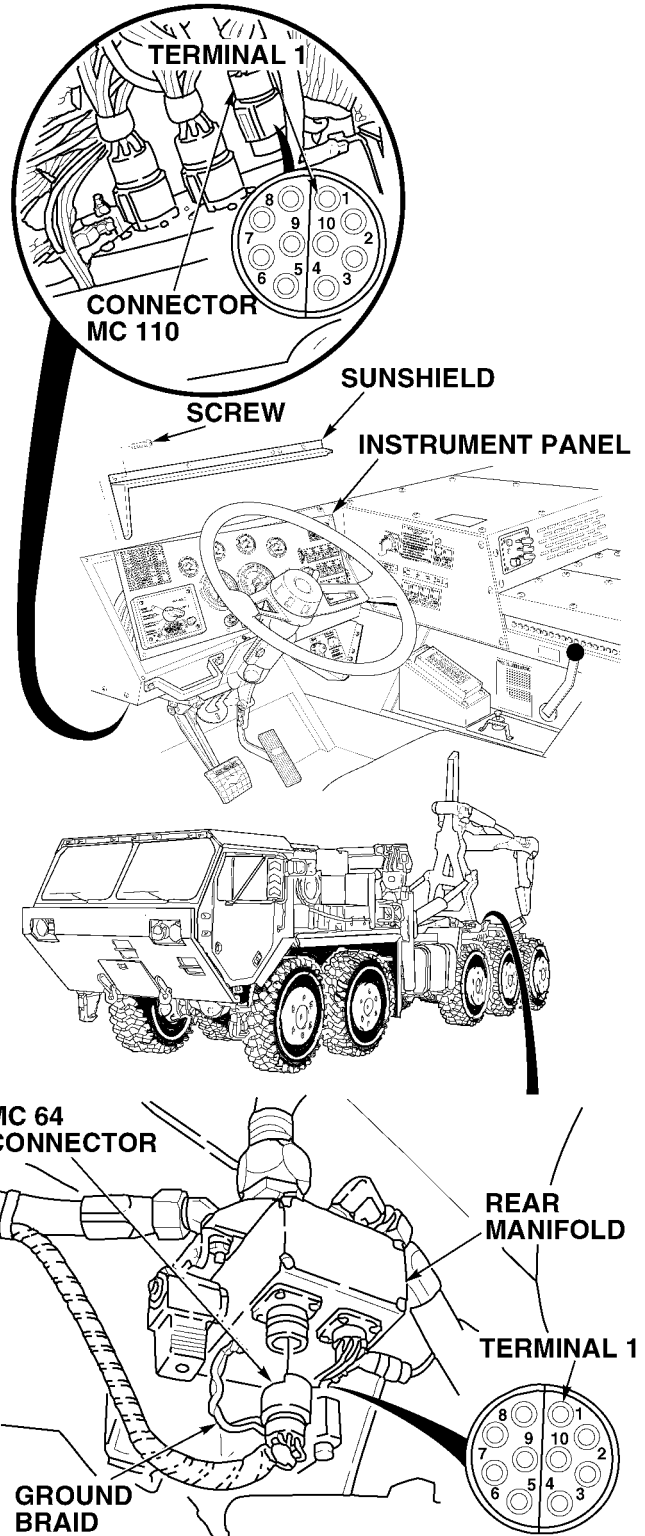
NOTE

Terminal (5) at MC 110 is plugged and does not connect to Terminal (5) on MC 64.

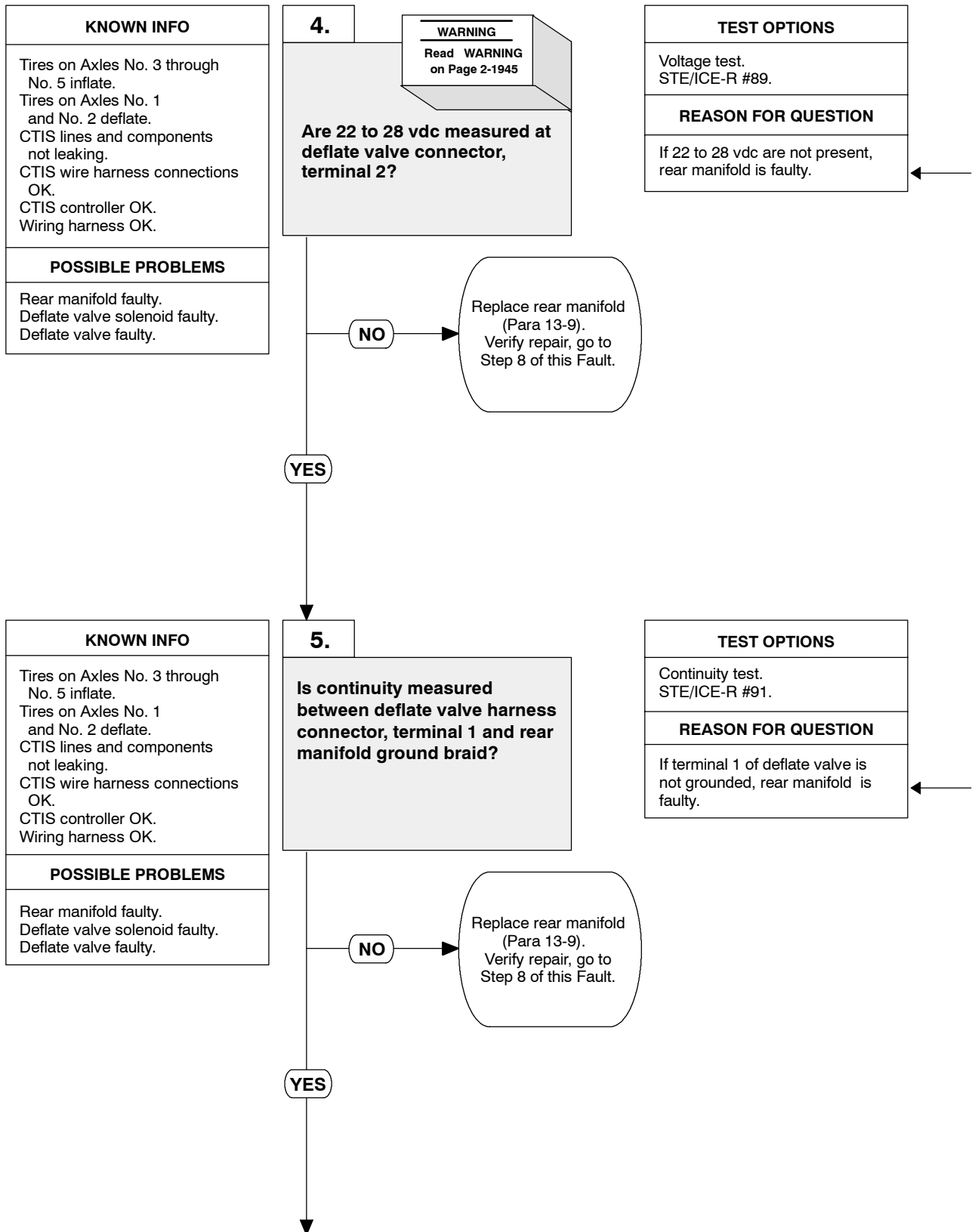
CONTINUITY TEST

- (1) Disconnect connector MC64 from rear manifold.
- (2) Connect jumperwire between wire 1072 on CTIS controller connector MC110, terminal 1 and a known good ground.
- (3) Set multimeter select switch to ohms.
- (4) Is there continuity between connector MC64, terminal 1 and rear manifold ground braid?
 - (a) If there is no continuity, repair wire 1072 (see schematic Fig 2-48) or notify DS Maintenance, and perform Steps (6) through (9) below.
 - (b) If there is continuity, wire 1072 is OK.
- (5) Check continuity of remaining wires and terminals using Steps (2) through (4) above. The wires and corresponding terminals are listed below (see schematic Fig 2-48).

1073(2)	1070(6)	1068(9)
1076(3)	1066(7)	1074(10)
1071(4)	Shield(8)	
1067(5)	to ground (MC 64 only)	
- (6) Remove jumperwire.
- (7) Connect connector MC110 to back of CTIS controller.
- (8) Connect connector MC64 to rear manifold.
- (9) Install instrument panel and sunshield with ten screws.



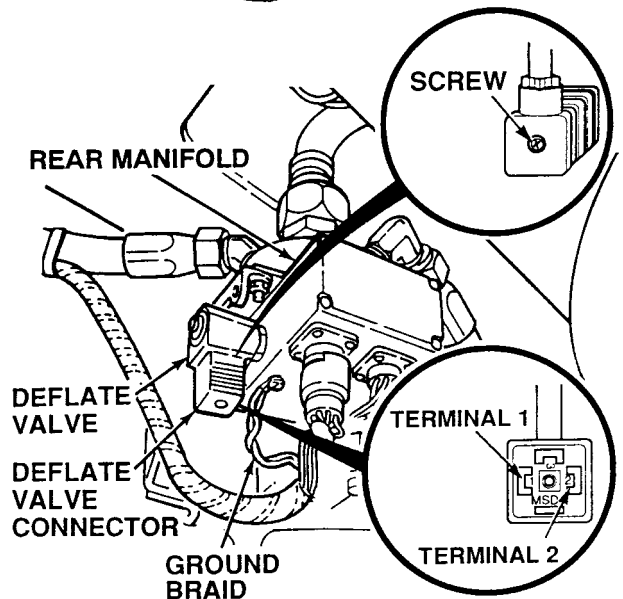
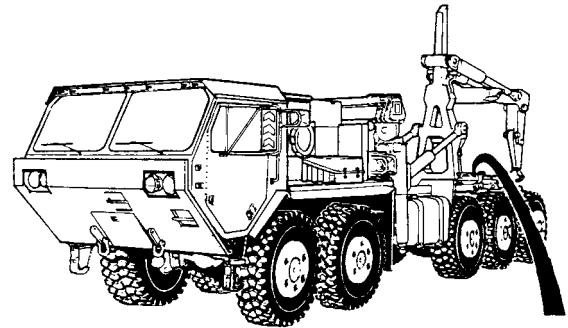
3. ALL TIRES ON AXLES NO. 3 THROUGH NO. 5 WILL NOT DEFLATE (CONT).



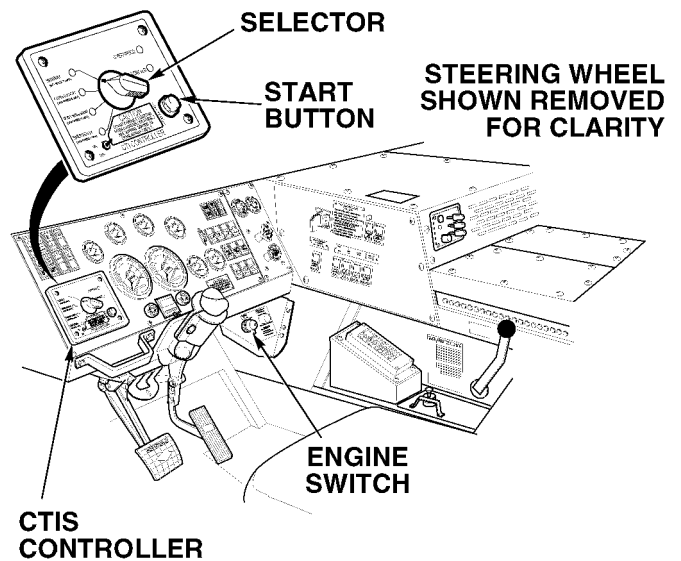
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

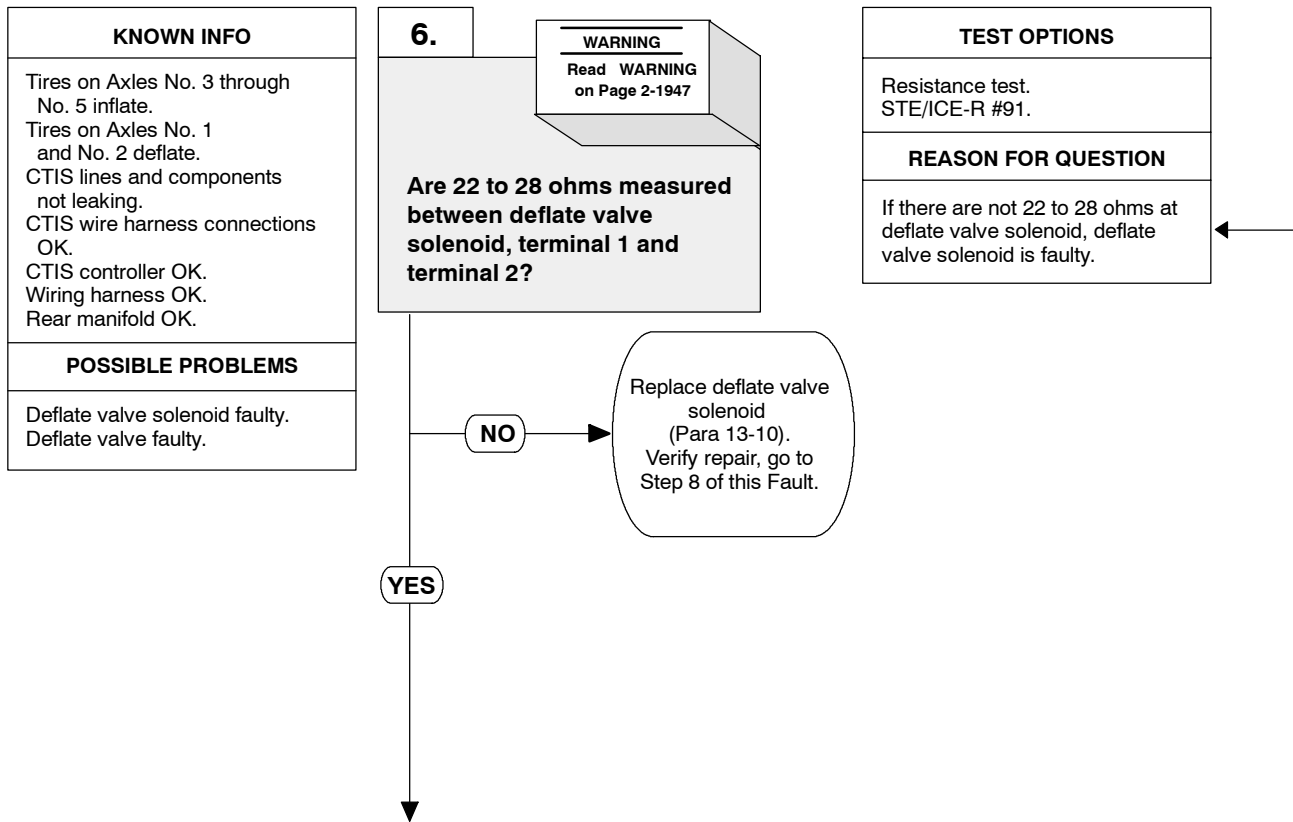
- VOLTAGE TEST**
- (1) Loosen screw and disconnect deflate valve connector.
 - (2) Set multimeter select switch to vdc.
 - (3) Connect positive (+) multimeter lead to deflate valve connector, terminal 2.
 - (4) Connect negative (-) multimeter lead to rear manifold ground braid.
 - (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (6) Set CTIS controller to CROSS-COUNTRY.
 - (7) Assistant pushes CTIS START button.
 - (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and replace rear manifold (Para 13-9).
 - (b) If 22 to 28 vdc are present, turn OFF ENGINE switch and go to Step 5 of this Fault.



- CONTINUITY TEST**
- (1) Set multimeter select switch to ohms.
 - (2) Is there continuity between deflate valve connector, terminal 1 and rear manifold ground braid?
 - (a) If there is no continuity, replace rear manifold (Para 13-9).
 - (b) If there is continuity, go to Step 6 of this Fault.



3. ALL TIRES ON AXLES NO. 3 THROUGH NO. 5 WILL NOT DEFLATE (CONT).



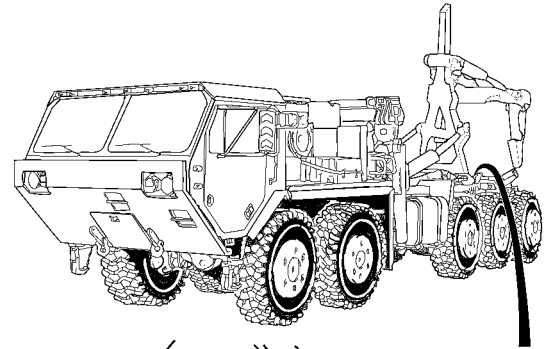
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

RESISTANCE TEST

Read resistance between terminals 1 and 2 of deflate valve solenoid.

- (1) If there are not 22 to 28 ohms, replace deflate valve solenoid (Para 13-10).
- (2) If there are 22 to 28 ohms, deflate valve solenoid is OK.



REAR MANIFOLD

DEFLATE VALVE SOLENOID

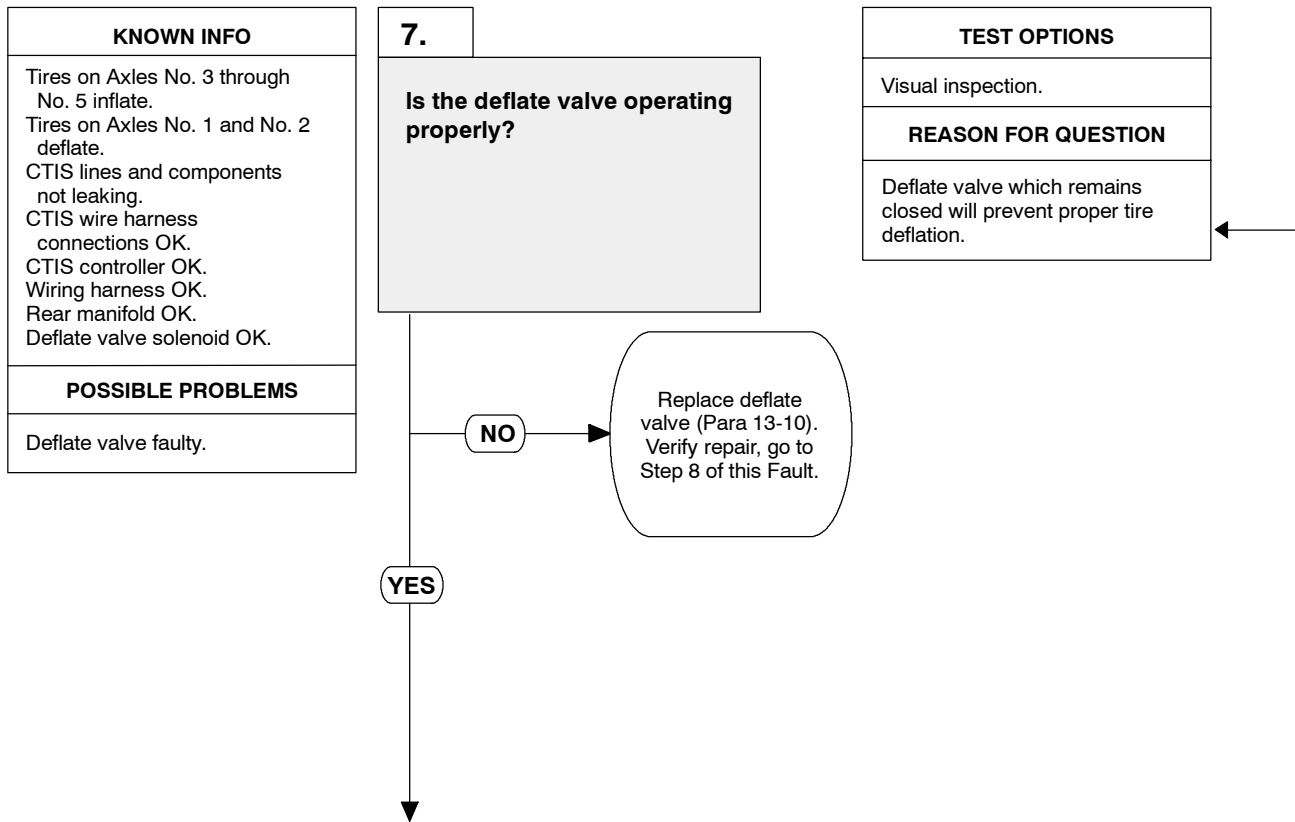
DEFLATE VALVE CONNECTOR

GROUND BRAID

TERMINAL 1

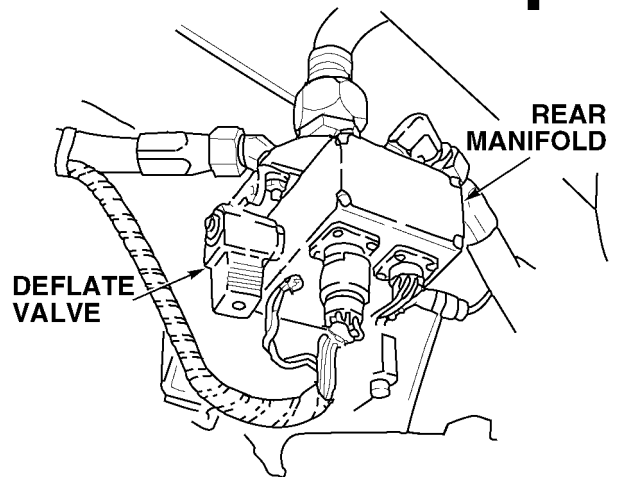
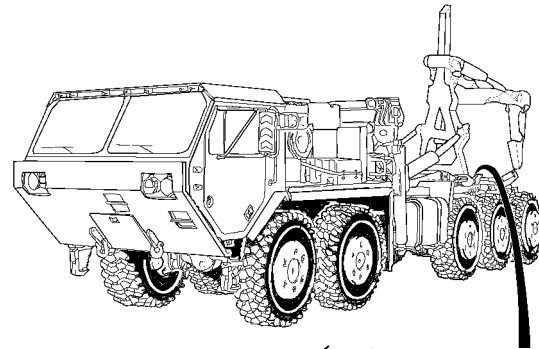
TERMINAL 2

3. ALL TIRES ON AXLES NO. 3 THROUGH NO. 5 WILL NOT DEFLATE (CONT).

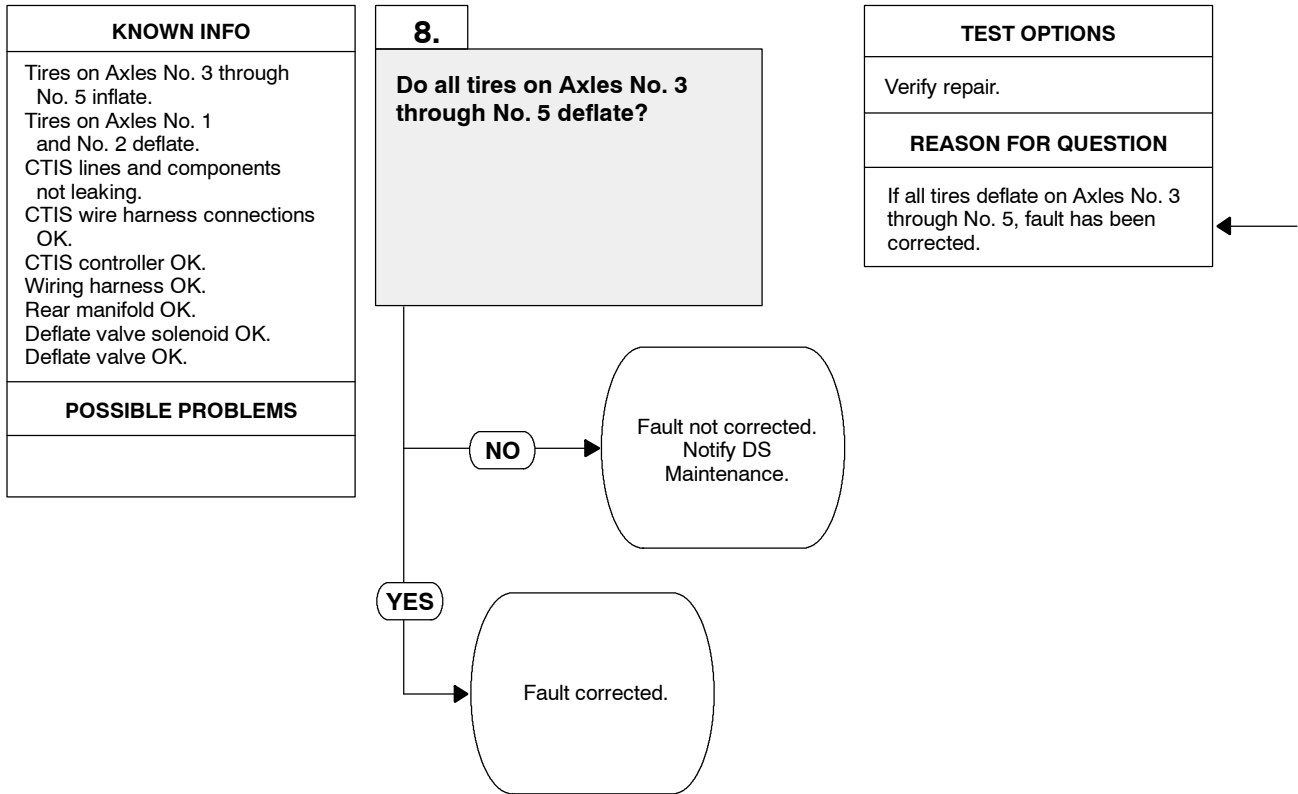


VISUAL INSPECTION

- (1) Remove deflate valve (Para 13-10).
- (2) Inspect valve assembly for broken springs, damaged diaphragm, sticking or any other damage.
 - (a) If damaged parts are found, replace deflate valve.
 - (b) If no damaged parts are found, deflate valve is OK.
- (3) Connect deflate valve connector.
- (4) Install rear manifold cover (Para 13-9).
- (5) Put LHS in transit position (TM 9-2320-364-10).

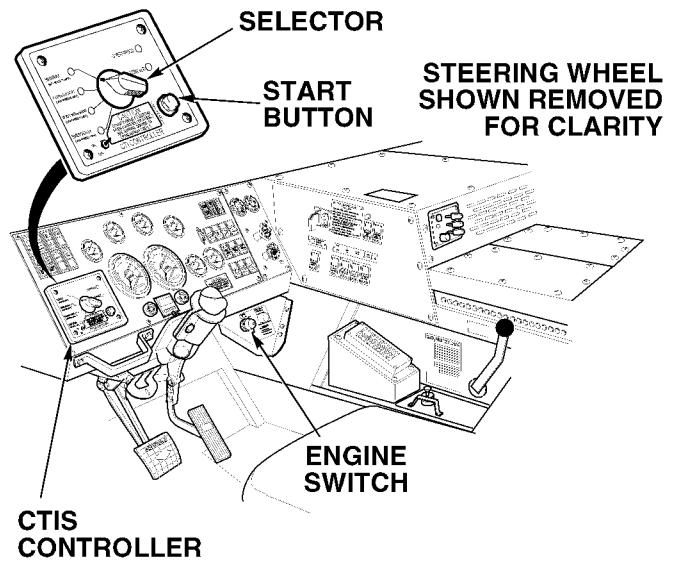


3. ALL TIRES ON AXLES NO. 3 THROUGH NO. 5 WILL NOT DEFLATE (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to CROSS COUNTRY.
- (3) As assistant pushes CTIS START button, observe tires.
 - (a) If tires do not deflate, fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If tires deflate, fault has been corrected.
- (4) Turn OFF ENGINE switch.



2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

4. ALL TIRES ON AXLES NO. 1 AND NO. 2 WILL NOT DEFLATE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix H)
 STE/ICE-R (optional) (Item 3, Appendix H)
 Multimeter (Item 44, Appendix H)
 Jumperwire

Personnel Required

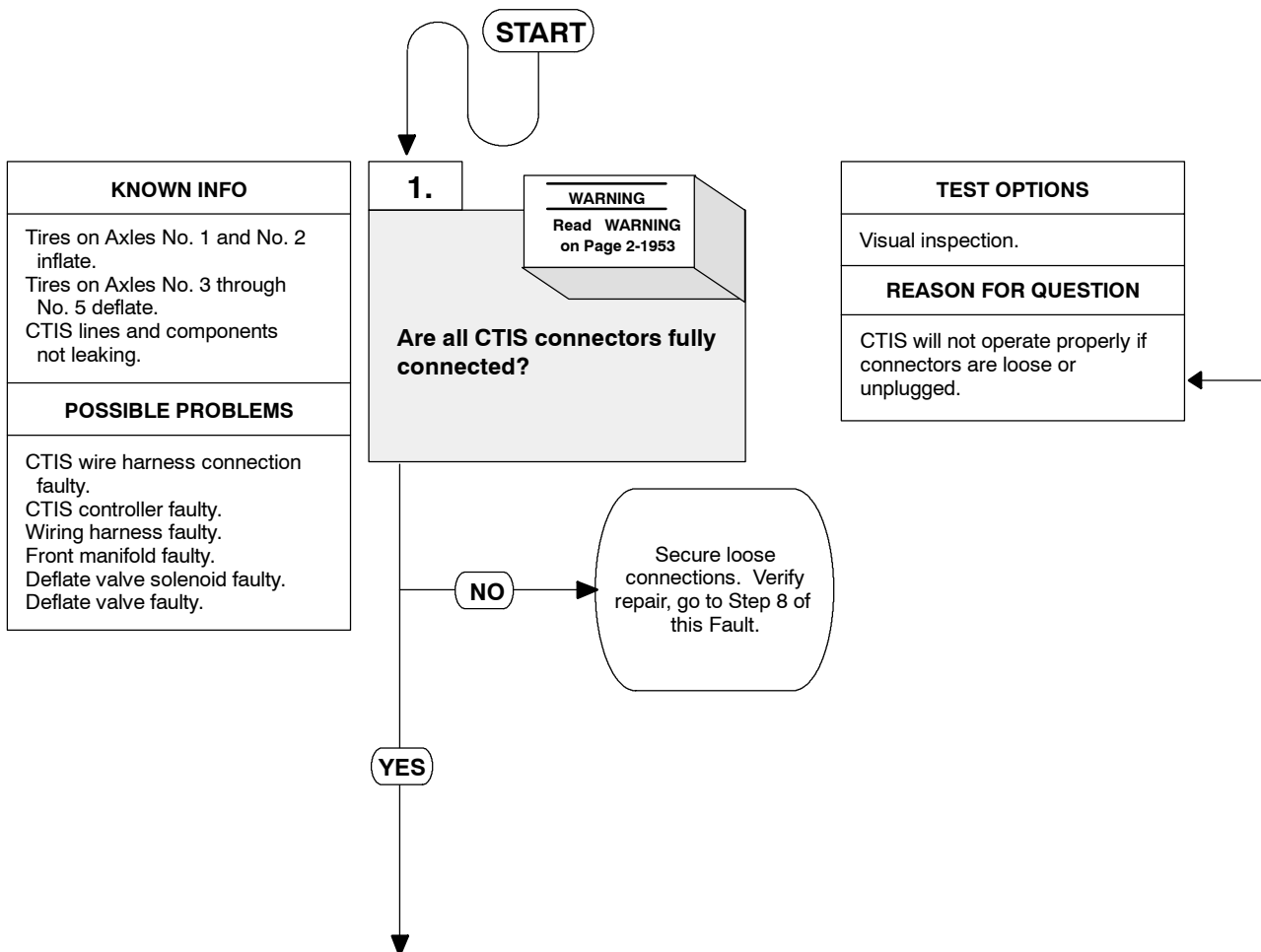
Two

References

TM 9-2320-364-10
 TM 9-4910-517-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 CTIS front manifold cover removed, (Para 13-8)
 CTIS turned on, (TM 9-2320-364-10)
 Front access cover opened, (TM-9-2320-364-10)
 Load Handling System (LHS) extended fully, (TM 9-2320-364-10)



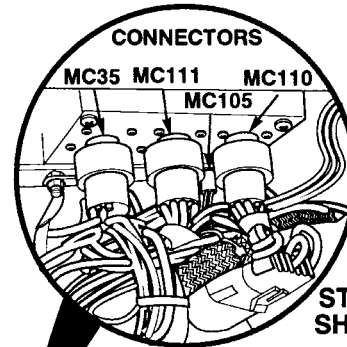
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

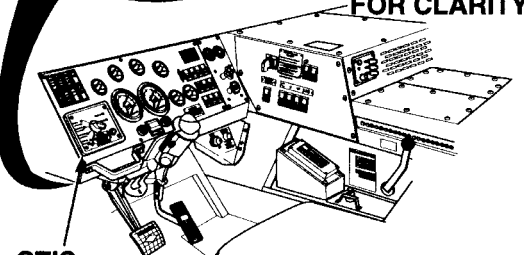
NOTE

The CTIS initially and periodically checks for system air leaks. The CTIS controller will display a flashing LOW AIR light and shut off if 6 psi (41 kPa) cannot be maintained by the CTIS. The manifold will click during this check for approximately 1-1/2 minutes.

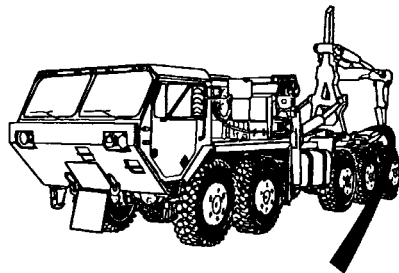
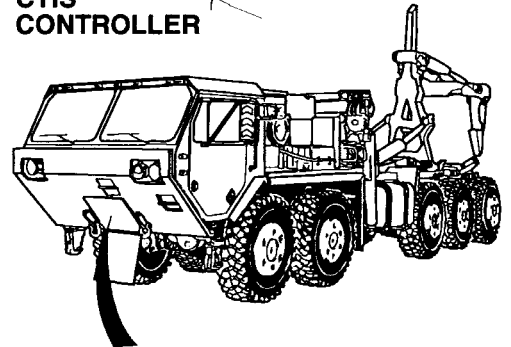
VISUAL INSPECTION
(1) Inspect CTIS controller, front and rear manifolds to ensure that all connectors are fully plugged in. (a) If connectors are not plugged in, secure connectors. (b) If connectors are plugged in, go to Step 2 of this Fault. (2) Put LHS in transit position (TM 9-2320-364-10).



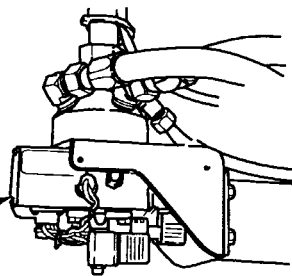
STEERING WHEEL SHOWN REMOVED FOR CLARITY



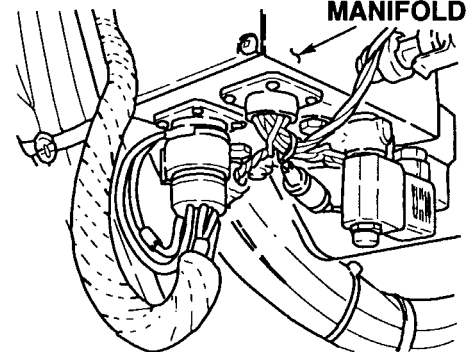
CTIS CONTROLLER



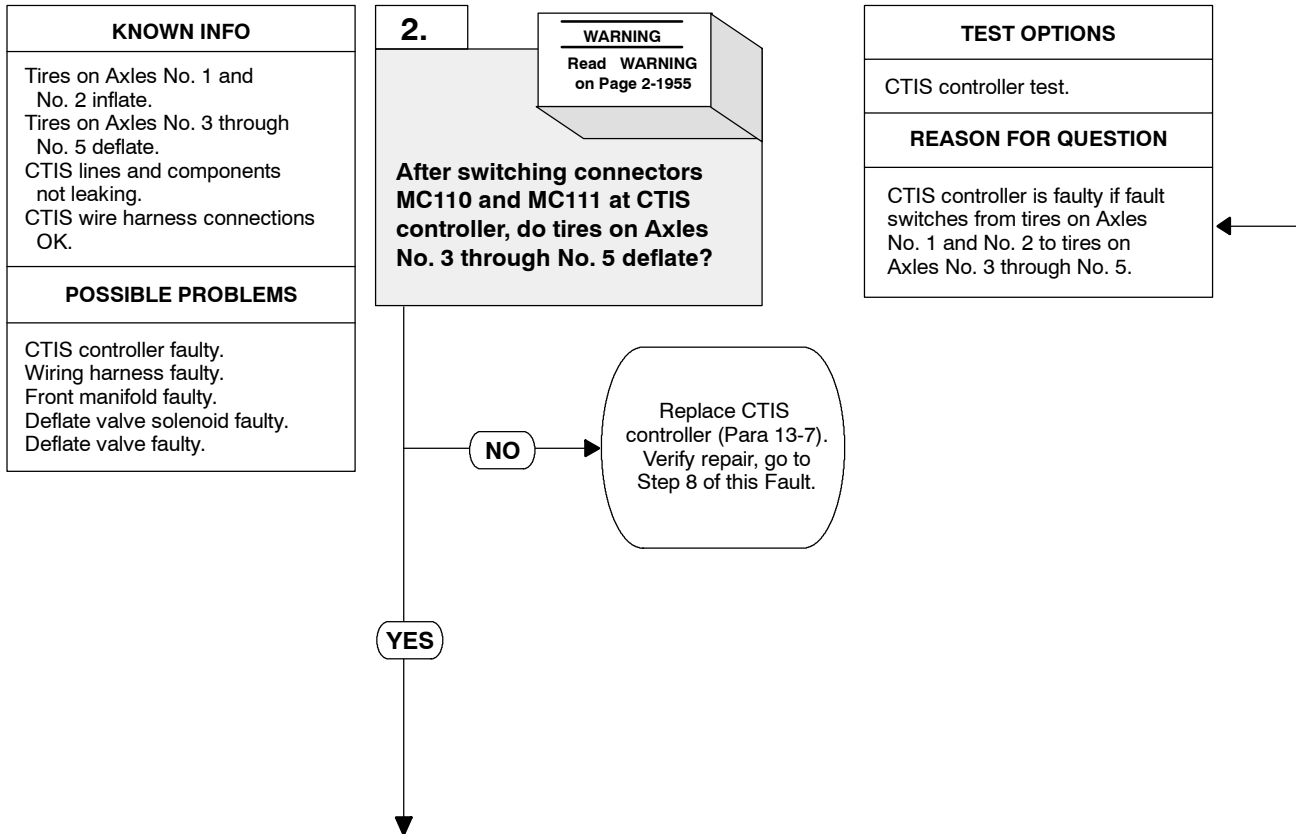
REAR MANIFOLD



FRONT MANIFOLD



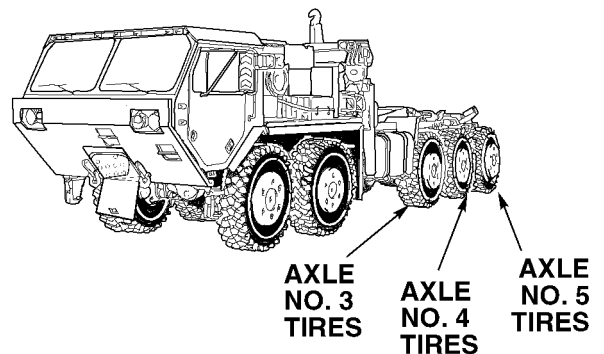
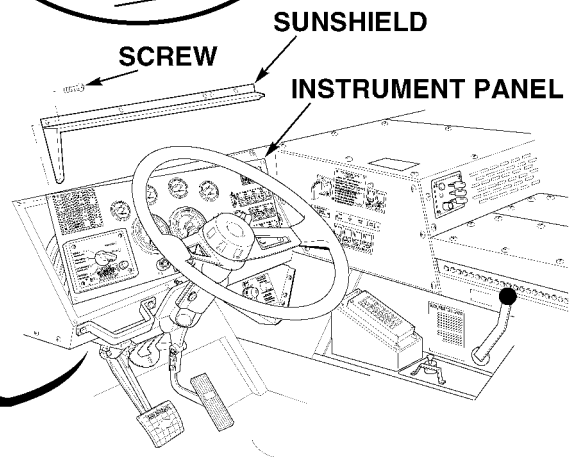
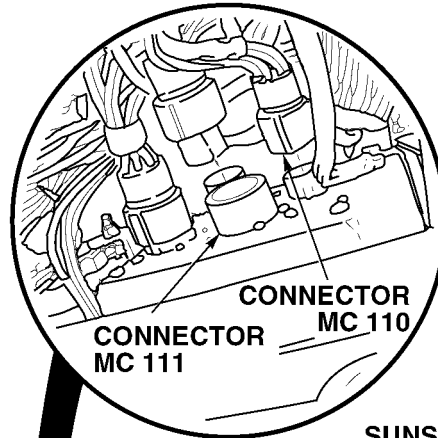
4. ALL TIRES ON AXLES NO. 1 AND NO. 2 WILL NOT DEFLATE (CONT).



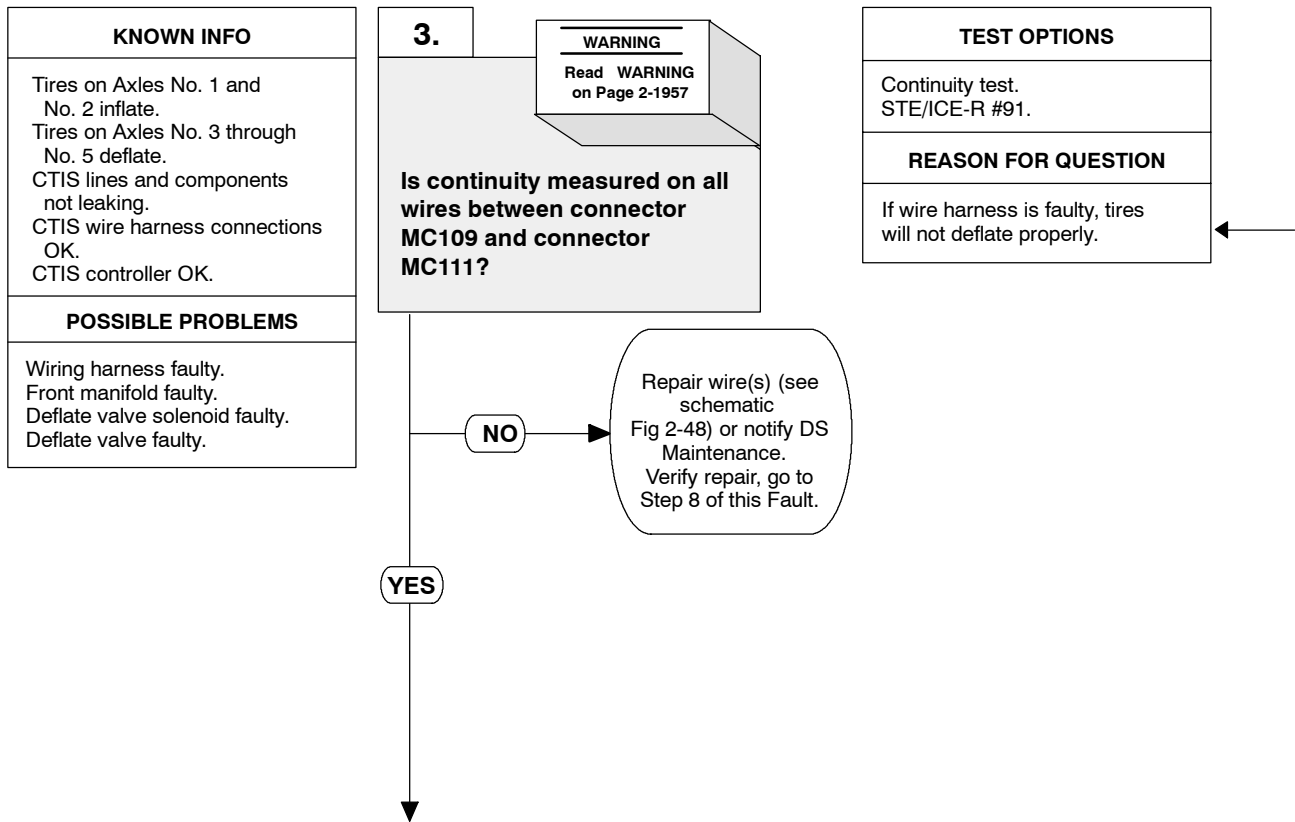
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CTIS CONTROLLER TEST**
- (1) Remove ten screws and sunshield from instrument panel.
 - (2) Pull top of instrument panel toward steering wheel.
 - (3) Disconnect rear manifold harness connector MC110 from back of CTIS controller.
 - (4) Disconnect front manifold harness connector MC111 from back of CTIS controller.
 - (5) Connect harness connector MC111 into CTIS controller where connector MC110 was disconnected.
 - (6) Connect harness connector MC110 into CTIS controller where connector MC111 was disconnected.
 - (7) Start engine (TM 9-2320-364-10).
 - (8) Set CTIS controller to CROSS COUNTRY.
 - (9) As assistant pushes CTIS controller START button, observe tires.
 - (a) If tires on Axles No. 3 through No. 5 do not deflate, turn OFF ENGINE switch and replace CTIS controller (Para 13-7).
 - (b) If tires on Axles No. 3 through No. 5 deflate, CTIS controller is OK.
 - (10) Turn OFF ENGINE switch.
 - (11) Disconnect and connect connector MC110 to correct CTIS controller connector.
 - (12) Start engine.
 - (13) Set CTIS controller to HIGHWAY and allow pressure to build.
 - (14) Turn OFF ENGINE switch.



4. ALL TIRES ON AXLES NO. 1 AND NO. 2 WILL NOT DEFLATE (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

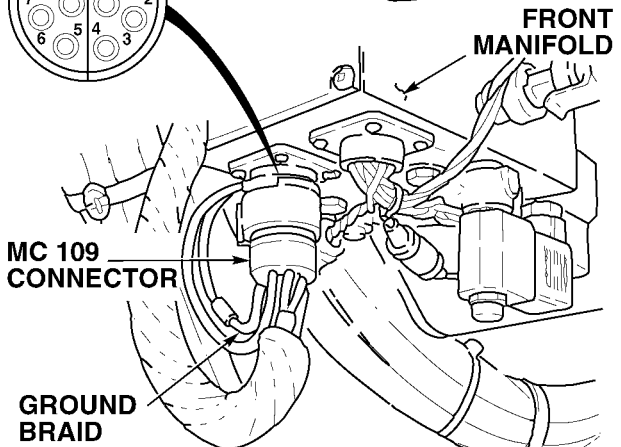
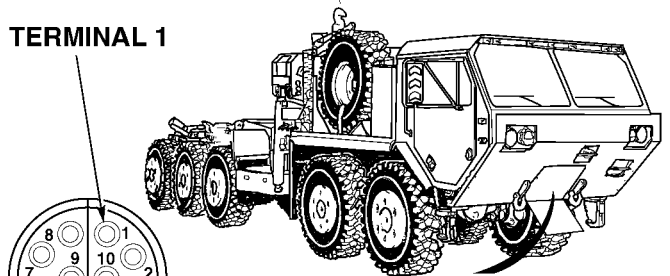
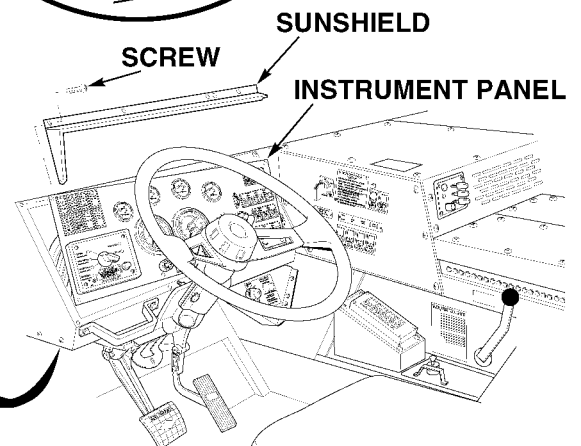
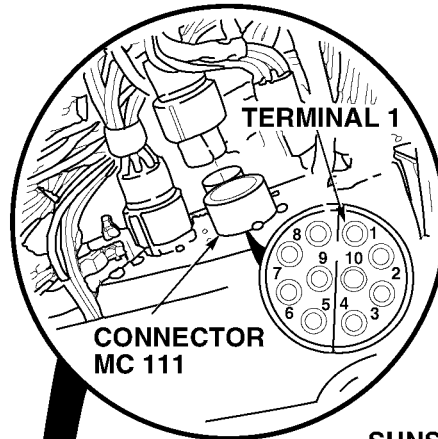
Terminal (5) at MC111 is plugged and does not connect to Terminal (5) on MC109.

CONTINUITY TEST

- (1) Disconnect connector MC109 from CTIS front manifold.
- (2) Set multimeter select switch to ohms.
- (3) Connect jumperwire between wire 1056 on CTIS controller connector MC111, terminal 1 and a known good ground.
- (4) Is there continuity between connector MC109, terminal 1 and front manifold ground braid?
 - (a) If there is no continuity, repair wire 1056 (see schematic Fig 2-48 or notify DS Maintenance, and perform Steps (6) through (9) below.
 - (b) If there is continuity, wire 1056 is OK.
- (5) Check continuity of remaining wires and terminals using Steps (2) through (4) above. The wires and corresponding terminals are listed below (see schematic Fig 2-48).

1057(2)	1061(6)	1064(9)
1058(3)	1062(7)	1065(10)
1059(4)	Shield(8)	
1063(5)	to ground (MC 109 only)	

- (6) Remove jumperwire.
- (7) Connect connector MC111 on back of CTIS controller.
- (8) Connect connector MC109 on CTIS front manifold.
- (9) Install instrument panel and sunshield with ten screws.



4. ALL TIRES ON AXLES NO. 1 AND NO. 2 WILL NOT DEFLATE (CONT).

KNOWN INFO
Tires on Axles No. 1 and No. 2 inflate. Tires on Axles No. 3 through No. 5 deflate. CTIS lines and components not leaking. CTIS wire harness connections OK. CTIS controller OK. Wiring harness OK.
POSSIBLE PROBLEMS
Front manifold faulty. Deflate valve solenoid faulty. Deflate valve faulty.

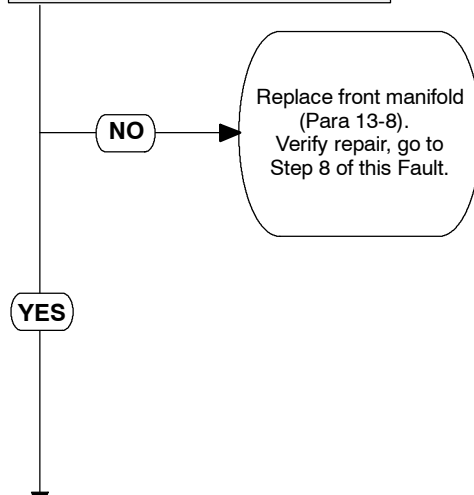
4.

WARNING

Read **WARNING** on Page 2-1959

Are 22 to 28 vdc measured at deflate valve connector, terminal 2?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If 22 to 28 vdc are not present, front manifold is faulty.

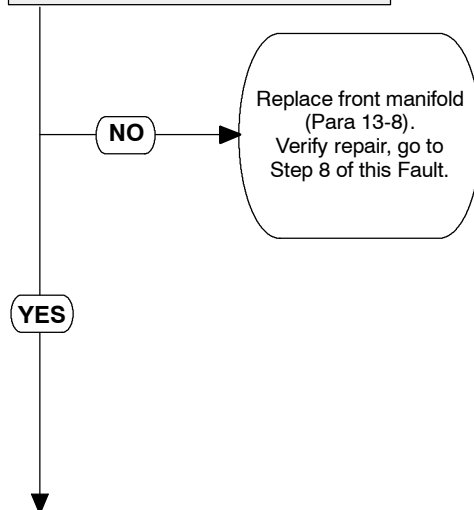


KNOWN INFO
Tires on Axles No. 1 and No. 2 inflate. Tires on Axles No. 3 through No. 5 deflate. CTIS lines and components not leaking. CTIS wire harness connections OK. CTIS controller OK. Wiring harness OK.
POSSIBLE PROBLEMS
Front manifold faulty. Deflate valve solenoid faulty. Deflate valve faulty.

5.

Is continuity measured between deflate valve harness connector, terminal 1 and front manifold ground braid?

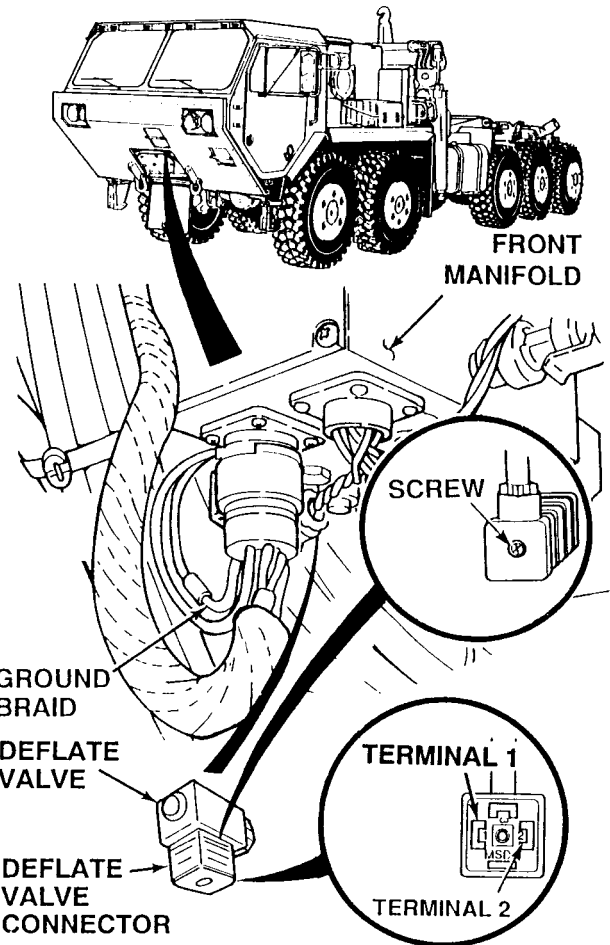
TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If terminal 1 of deflate valve is not grounded, front manifold is faulty.



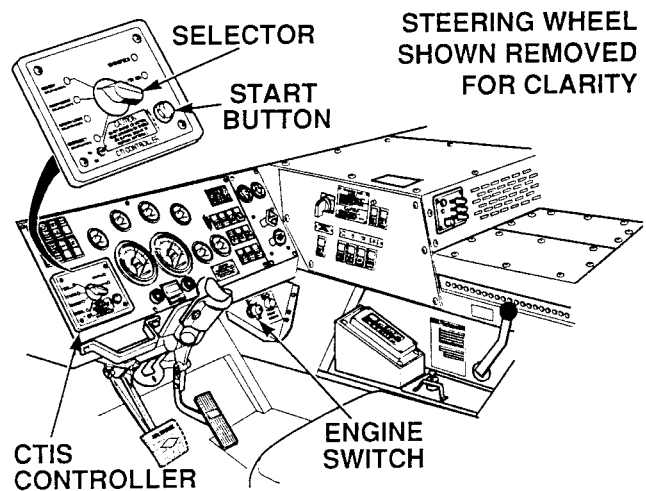
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

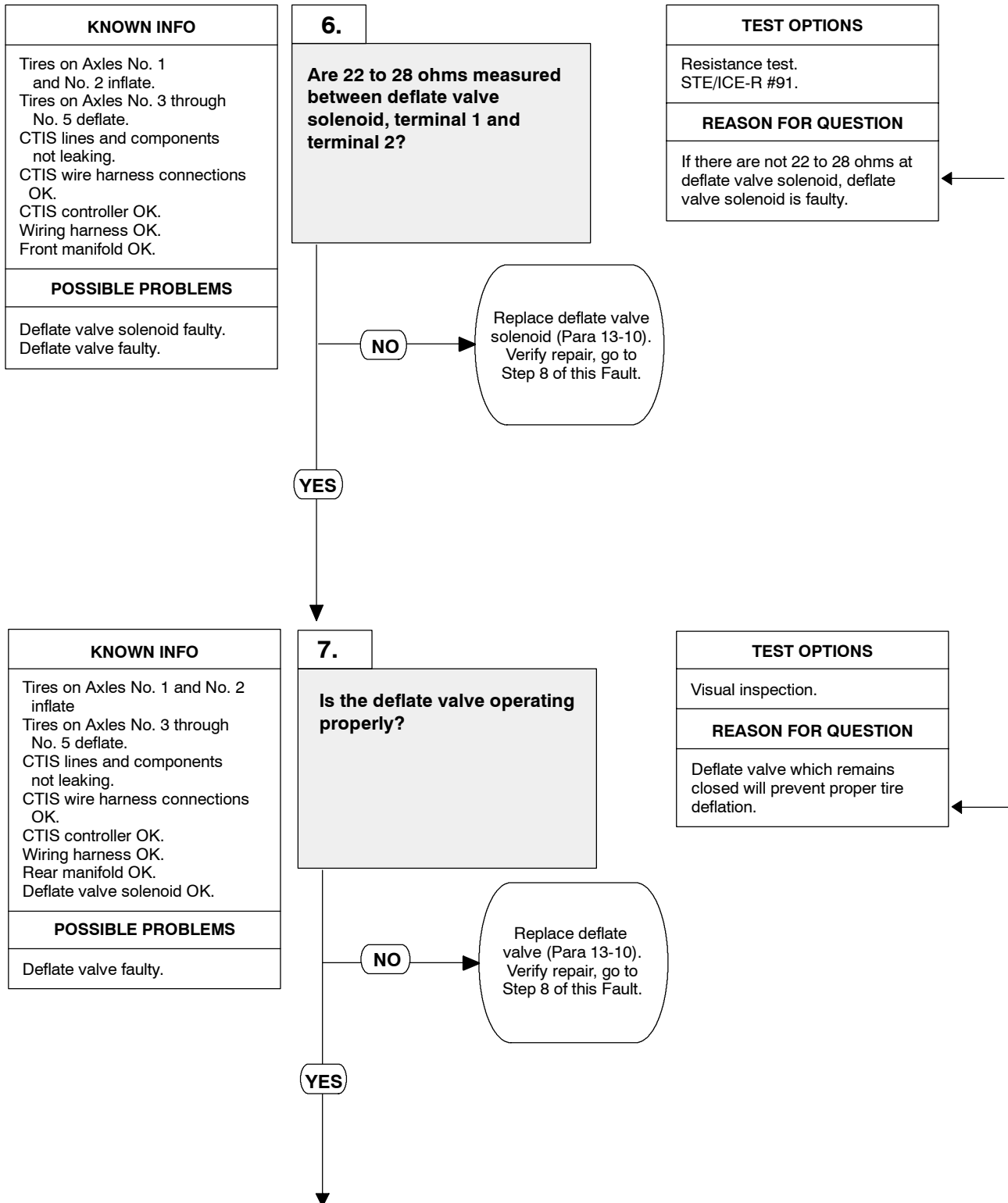
- VOLTAGE TEST**
- (1) Loosen screw and disconnect deflate valve connector.
 - (2) Set multimeter select switch to volts dc.
 - (3) Connect positive (+) multimeter lead to deflate valve connector, terminal 2.
 - (4) Connect negative (-) multimeter lead to front manifold ground braid.
 - (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (6) Set CTIS controller to CROSS-COUNTRY.
 - (7) Assistant pushes CTIS START button.
 - (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and replace front manifold (Para 13-8).
 - (b) If 22 to 28 vdc are present, turn OFF ENGINE switch and go to Step 5 of this Fault.



- CONTINUITY TEST**
- (1) Set multimeter select switch to ohms.
 - (2) Is there continuity between deflate valve connector, terminal 1 and front manifold ground braid?
 - (a) If there is no continuity, replace front manifold (Para 13-8).
 - (b) If there is continuity, go to Step 6 of this Fault.



4. ALL TIRES ON AXLES NO. 1 AND NO. 2 WILL NOT DEFLATE (CONT).

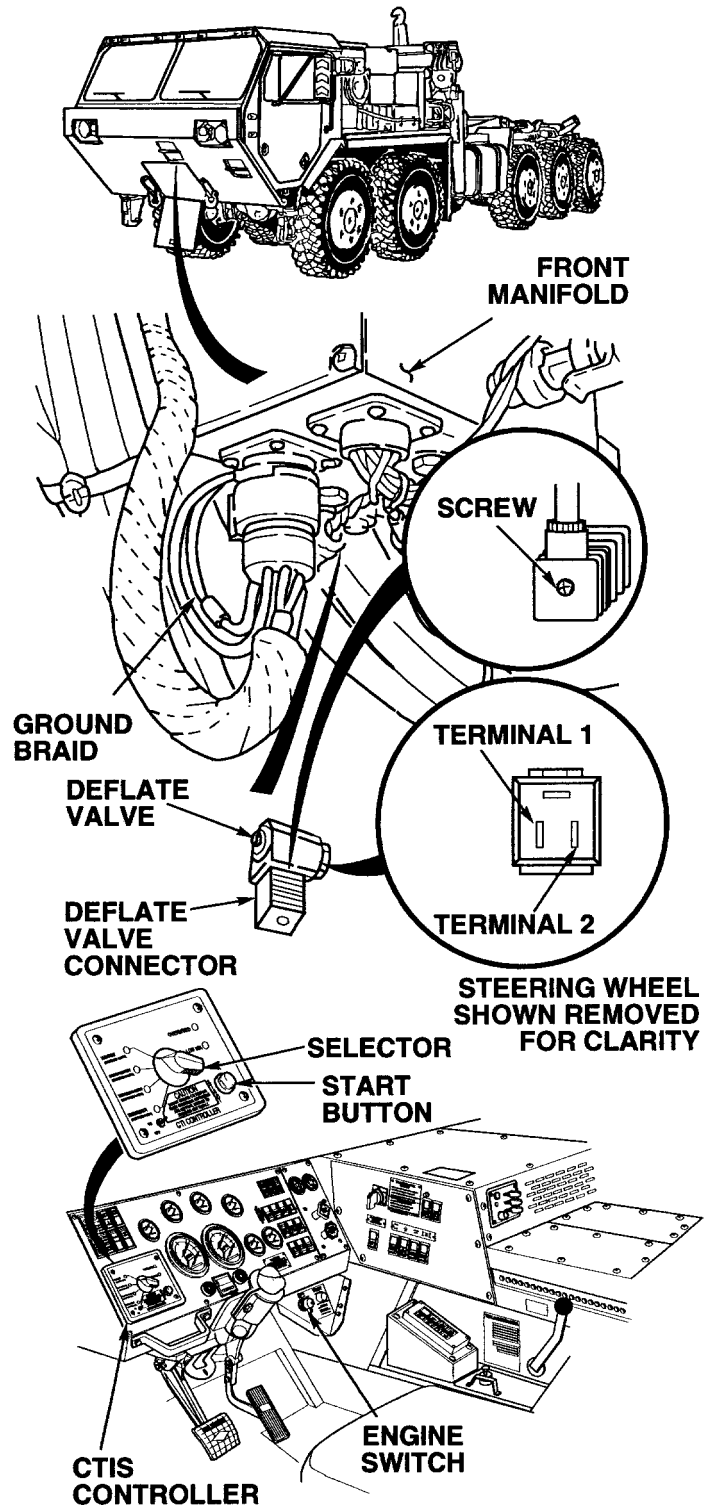


RESISTANCE TEST

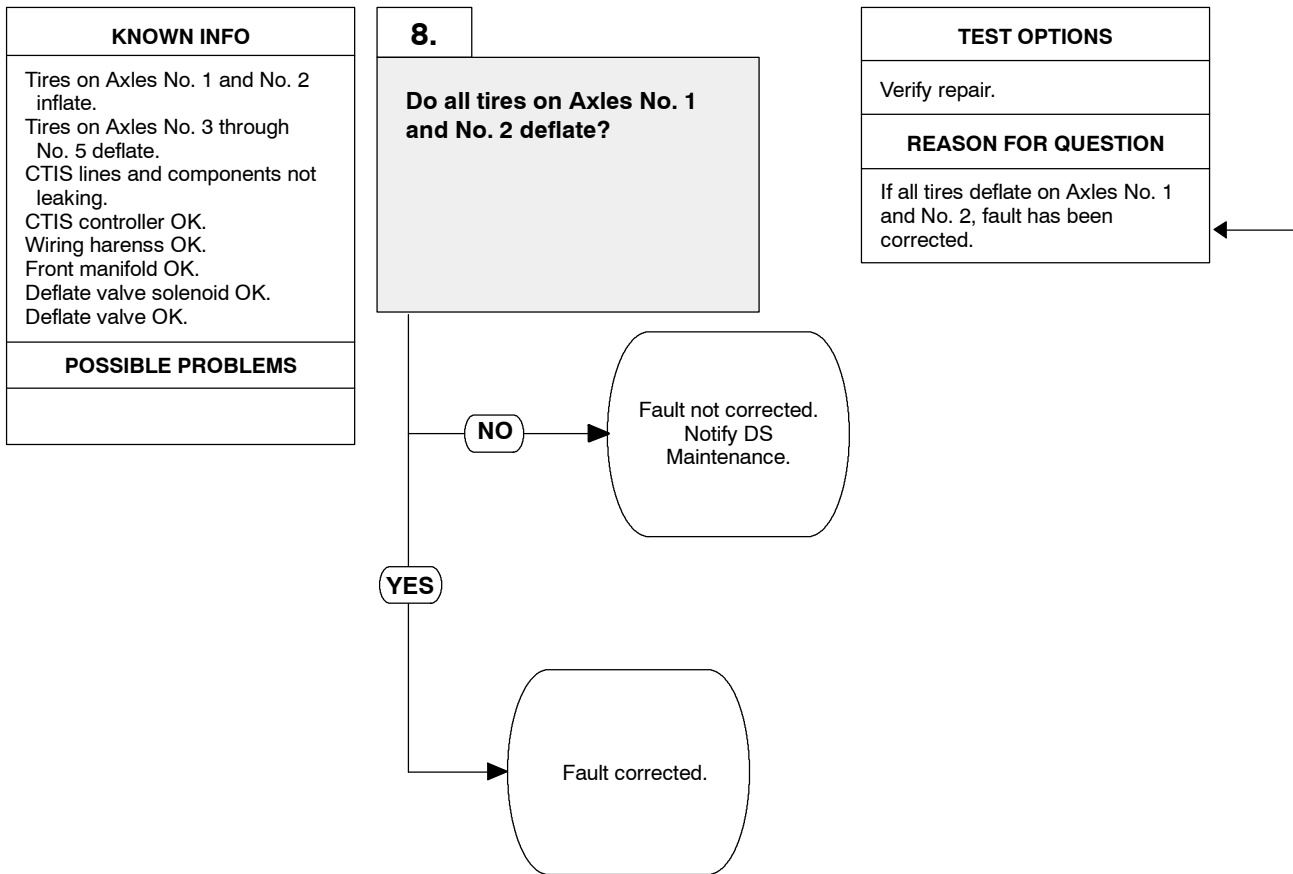
- Read resistance between terminals 1 and 2 of deflate valve solenoid.
- (1) If there are not 22 to 28 ohms, replace deflate valve solenoid (Para 13-10).
 - (2) If there are 22 to 28 ohms, deflate valve solenoid is OK.

VISUAL INSPECTION

- (1) Remove deflate valve (Para 13-10).
- (2) Inspect valve assembly for broken springs, damaged diaphragm, sticking or any other damage.
 - (a) If damaged parts are found, replace deflate valve.
 - (b) If no damaged parts are found, deflate valve is OK.
- (3) Connect deflate valve solenoid connector and tighten screw.
- (4) Install front manifold cover (Para 13-8).
- (5) Close front access cover (TM 9-2320-364-10).

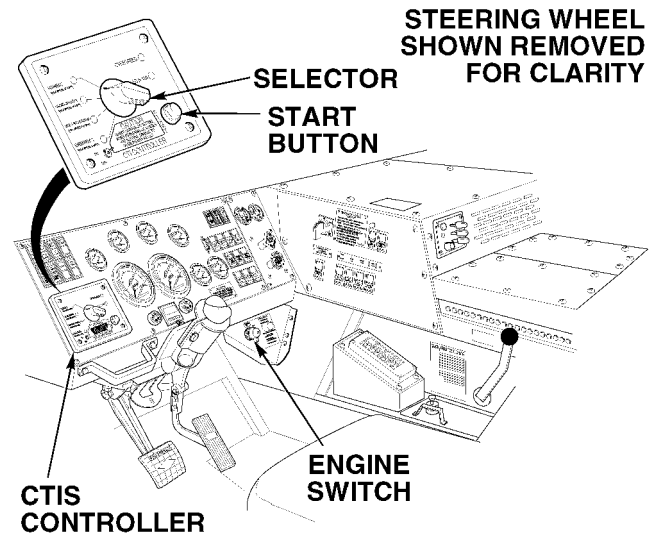


4. ALL TIRES ON AXLES NO. 1 AND NO. 2 WILL NOT DEFLATE (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to CROSS-COUNTRY.
- (3) As assistant pushes CTIS START button, observe tires.
 - (a) If tires do not deflate, fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If tires deflate, fault has been corrected.
- (4) Turn OFF ENGINE switch.



2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix H)
Goggles, Industrial (Item 30, Appendix H)

Materials/Parts

Solution, Soap (Item 86, Appendix C)

Personnel Required

Two

References

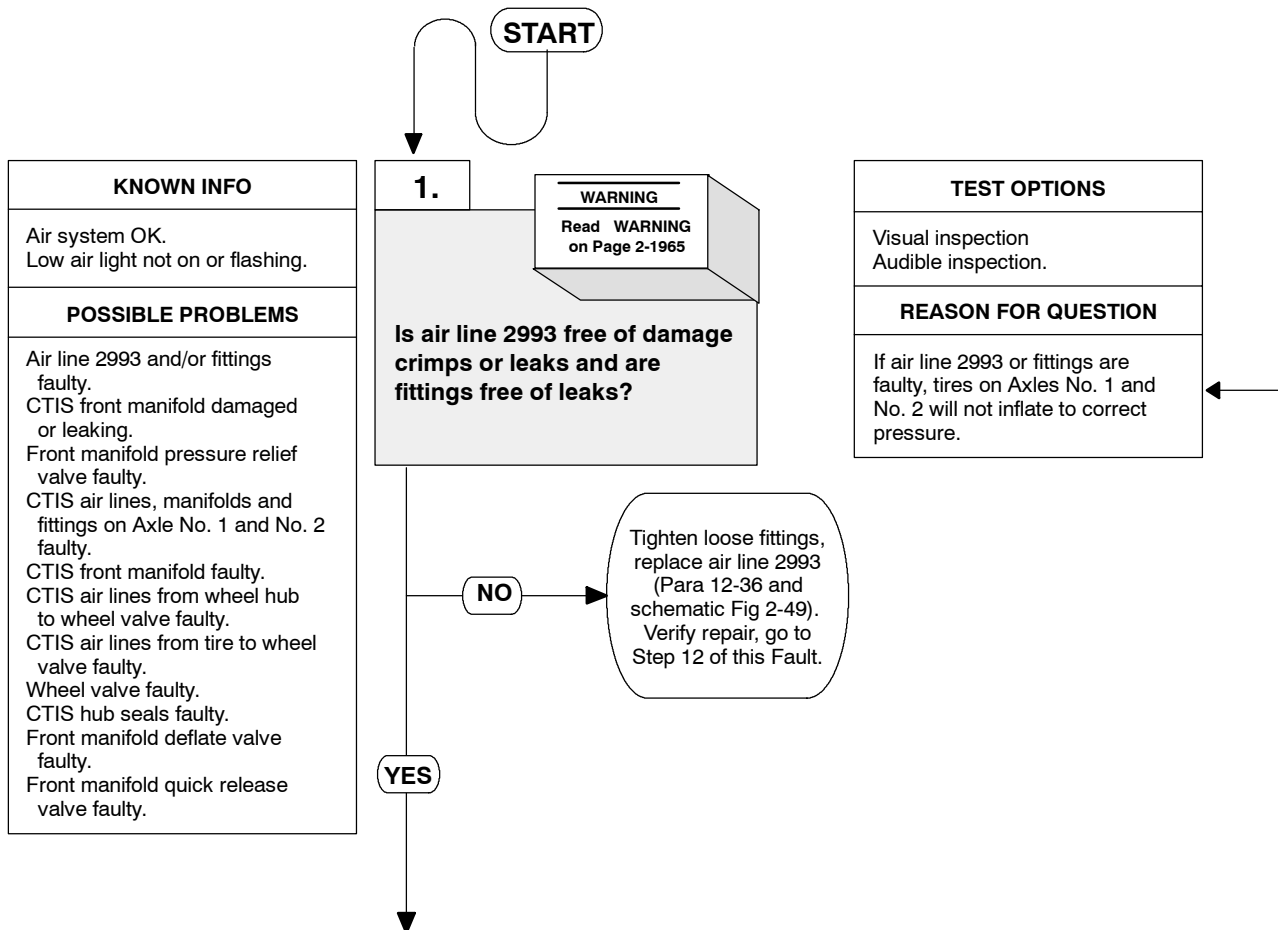
TM 9-2320-364-10
TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Front access cover opened, (TM 9-2320-364-10)
CTIS turned on, (TM 9-2320-364-10)
CTIS front manifold cover removed, (Para 13-8)

NOTE

Soap and water solution can be used to visually check for leaks.

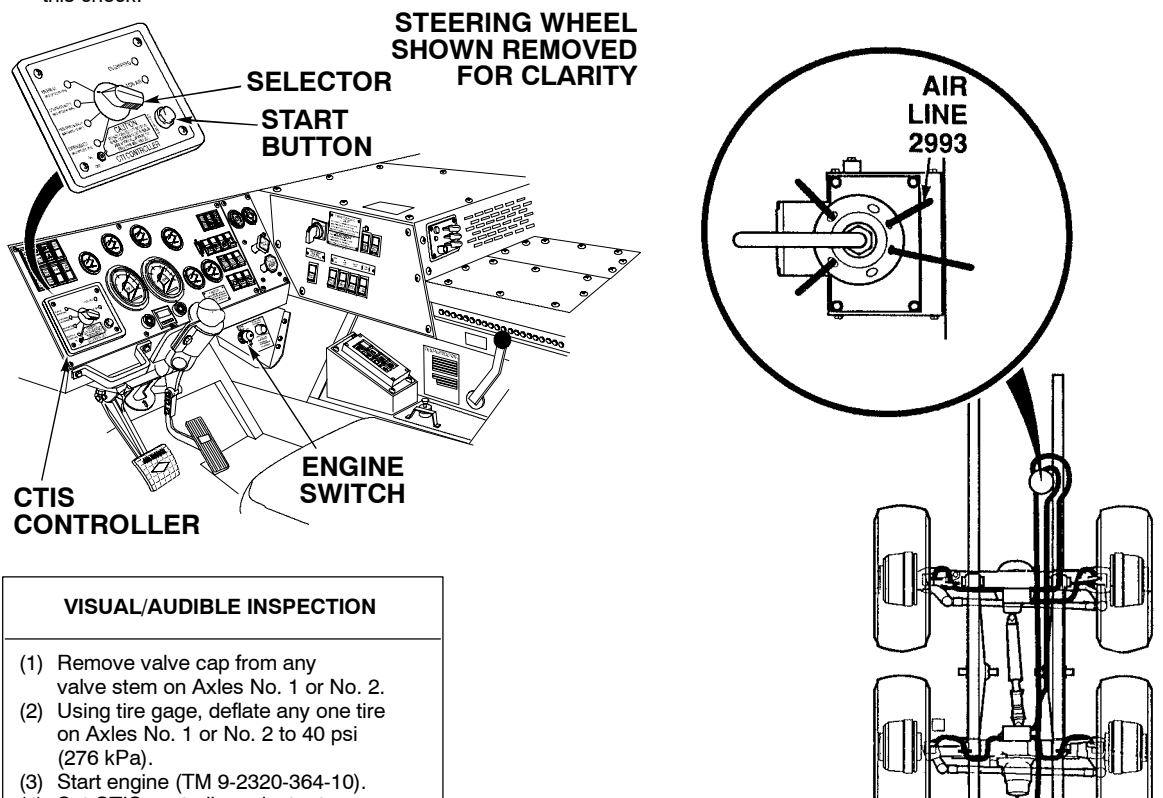


WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

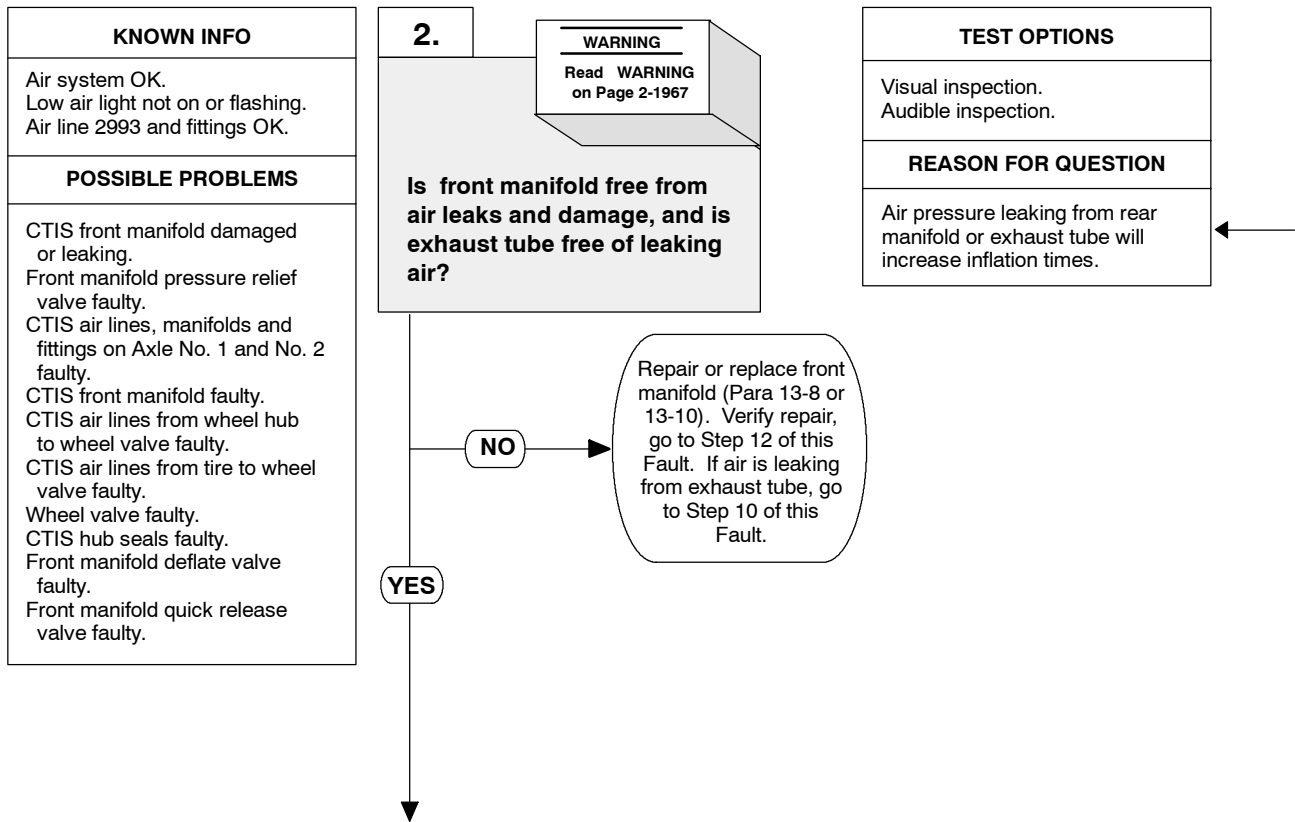
- Excessive inflation times without a low air light are caused by minor leaks in CTIS system.
- CTIS air lines are pressurized only when CTIS is in inflate, deflate or test cycles.
- Excessive inflation times, sometimes accompanied by low air light is normal if engine is at idle speed and/or air operated accessories are being used.
- CTIS initially and periodically checks for system air leaks. CTIS controller will display a flashing LOW AIR light and will shut off if about 6 psi (41 kPa) cannot be maintained by the CTIS system. The manifold will click during this check.



VISUAL/AUDIBLE INSPECTION

- (1) Remove valve cap from any valve stem on Axles No. 1 or No. 2.
- (2) Using tire gage, deflate any one tire on Axles No. 1 or No. 2 to 40 psi (276 kPa).
- (3) Start engine (TM 9-2320-364-10).
- (4) Set CTIS controller selector to HIGHWAY.
- (5) Press CTIS START button.
- (6) Check CTIS air line No. 2993 and fittings for damage, crimps, or leaks (see schematic Fig. 2-49).
 - (a) If air line No. 2993 or fittings are damaged, crimped or leaking, perform Steps (7) and (8) below, and tighten fittings, replace air lines (Para 12-36 and schematic Fig 2-49).
 - (b) If there are no leaks, crimps or damage, air line and fittings are OK.
- (7) Turn OFF ENGINE switch.
- (8) Install valve cap on valve stem.

5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).

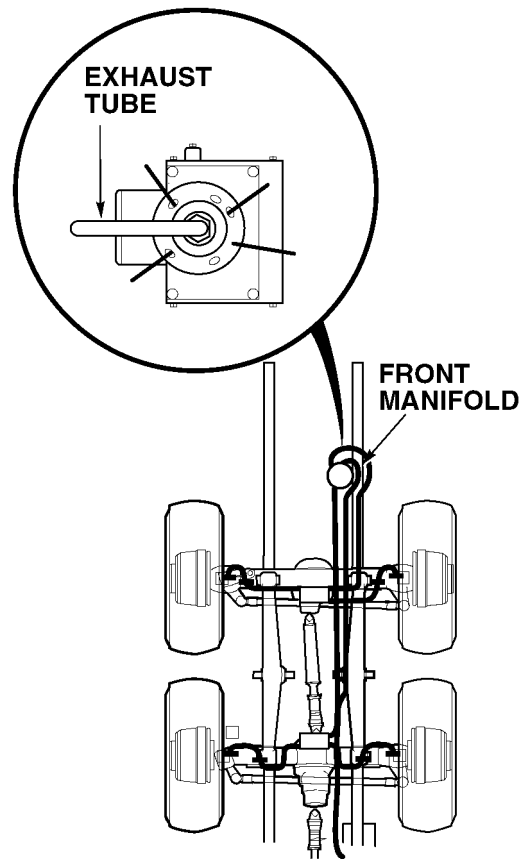


WARNING

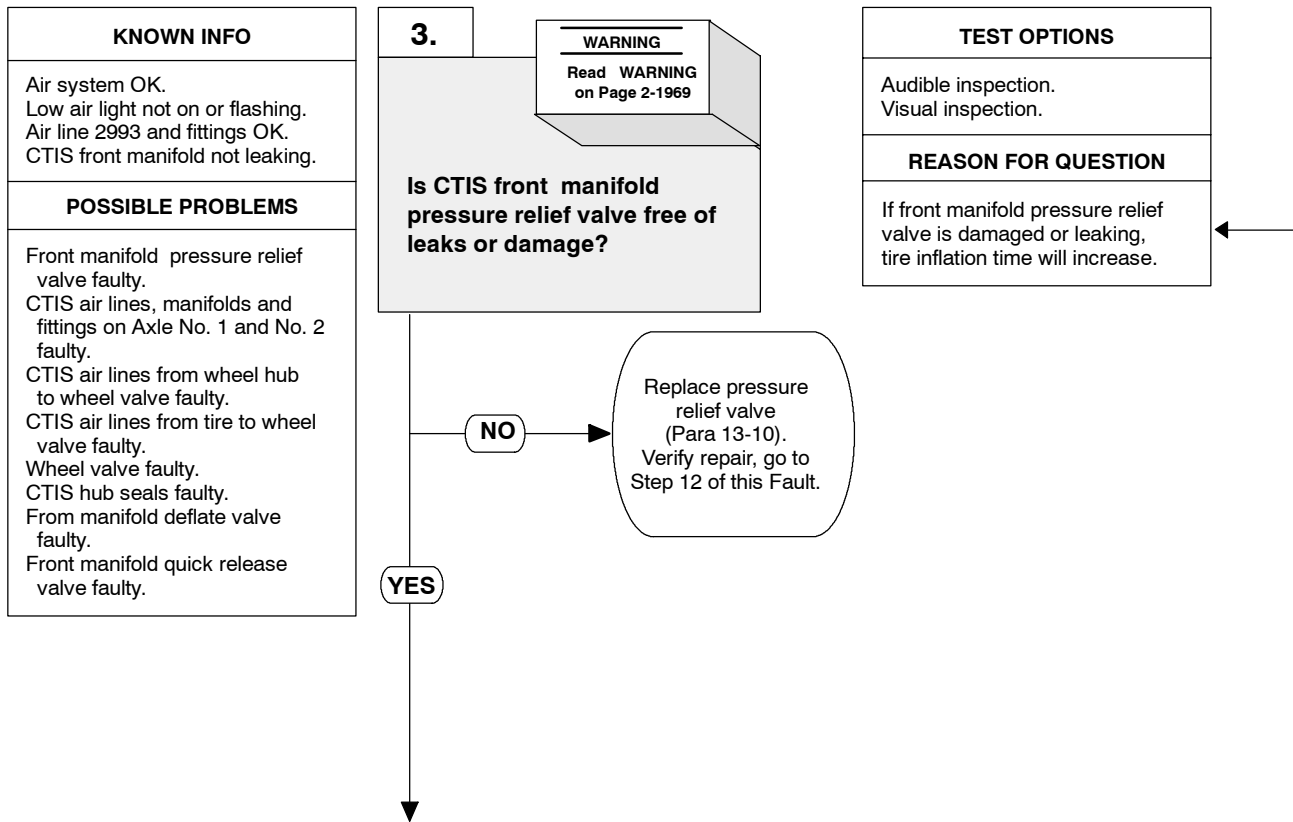
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check CTIS front manifold for damage and leaks.
 - (a) If manifold is damaged or leaking, turn OFF ENGINE switch and repair or replace manifold (Para 13-8 or 13-10).
 - (b) If air is leaking from exhaust tube, turn OFF ENGINE switch and go to Step 10 of this Fault.
 - (c) If manifold is not damaged or leaking, turn OFF ENGINE switch and go to Step 3 of this Fault.



5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

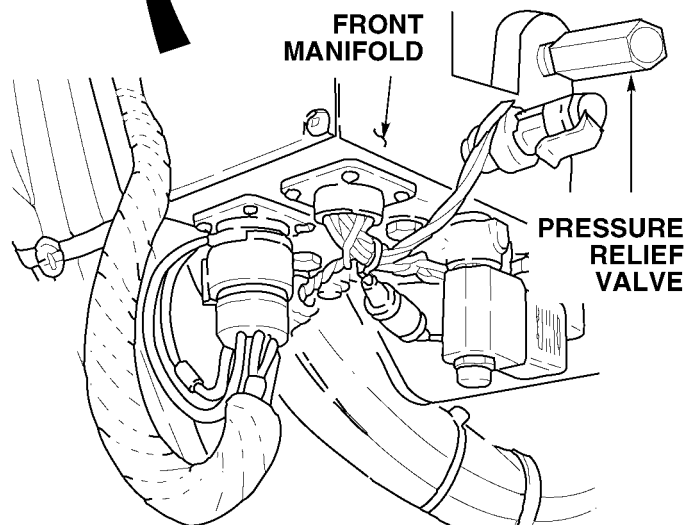
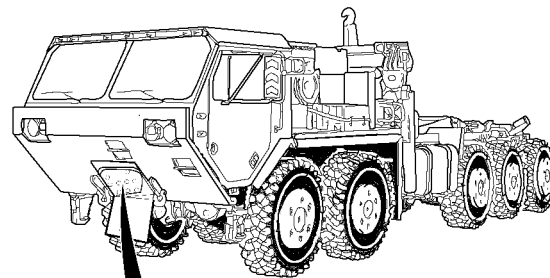
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

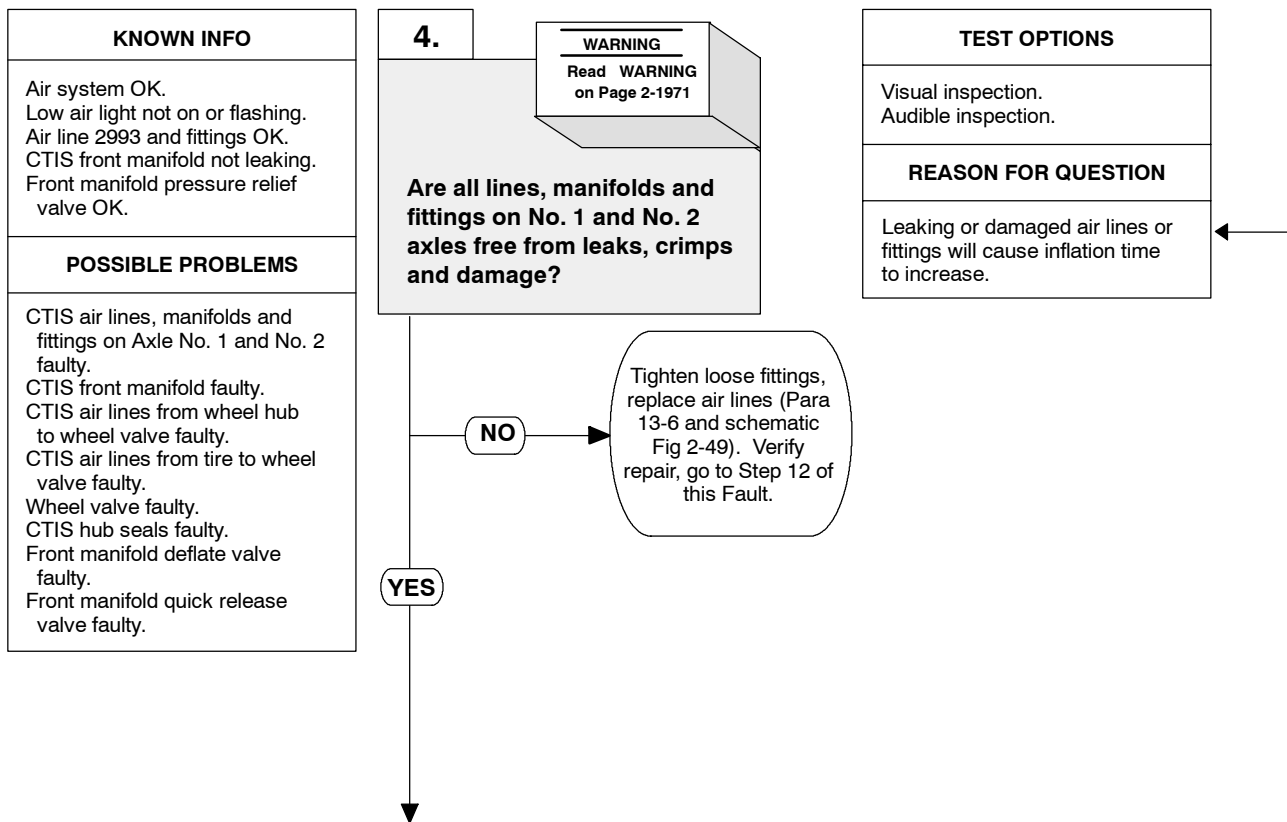
- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.
- Some air leakage (bubbles forming) may occur during inflation/deflation cycle at relief valve. A rapid exhaust of air indicates a problem.
- Pressure relief valve should remain closed up to 85 psi (586 Kpa).

AUDIBLE/VISUAL INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Assistant presses CTIS START button.
- (4) Check CTIS front manifold pressure relief valve for damage and leaks.
 - (a) If pressure relief valve is damaged or leaking, turn OFF ENGINE switch and replace valve (Para 13-10).
 - (b) If pressure relief valve is not damaged or leaking, relief valve is OK.
- (5) Turn OFF ENGINE switch.
- (6) Install front CTIS manifold cover (Para 13-8).



5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

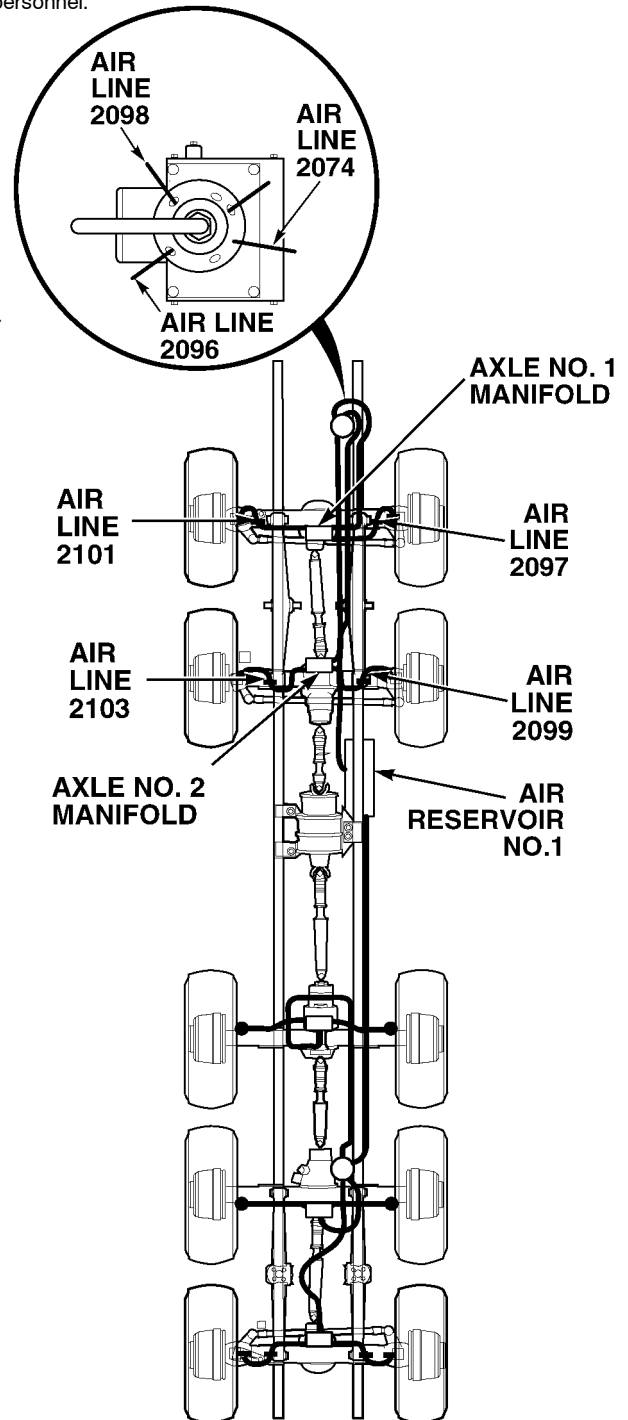
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

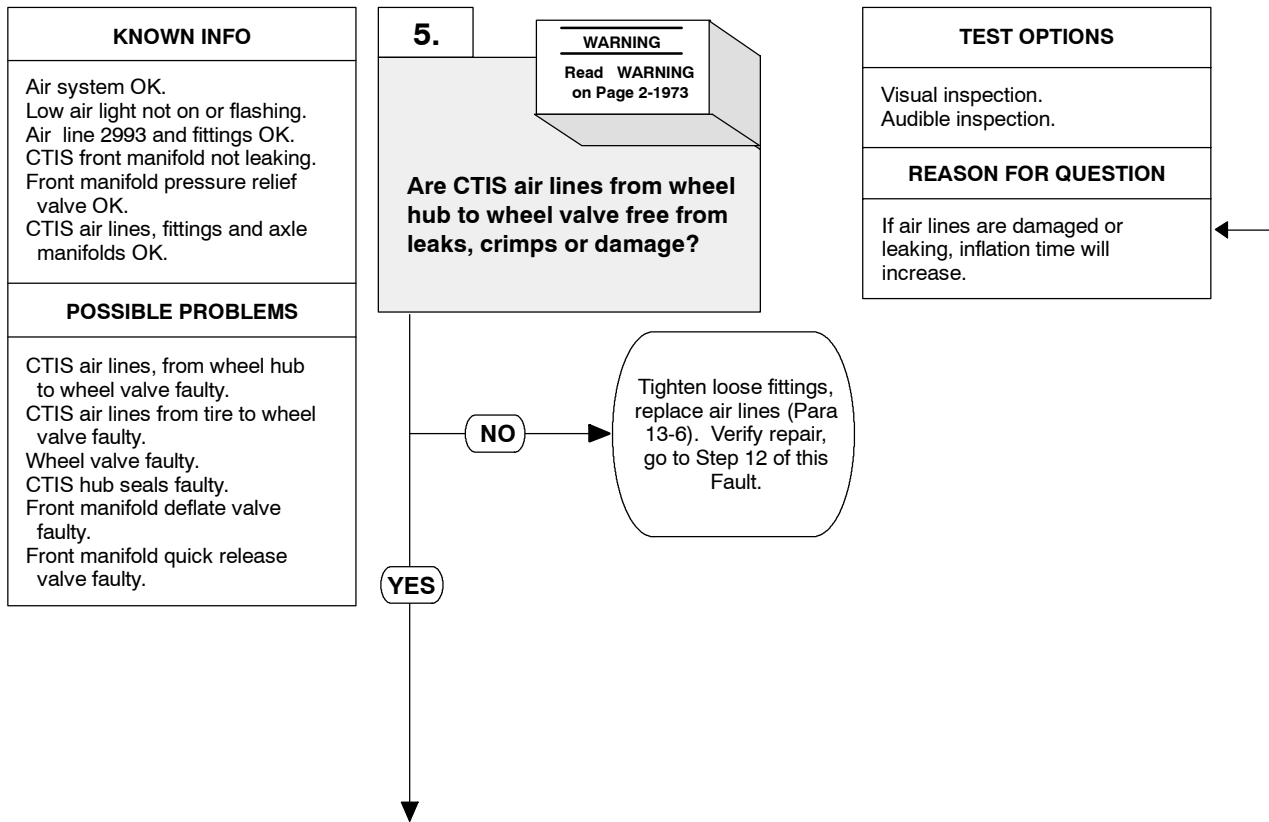
- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check CTIS air lines listed below and axle manifolds and fittings for damage, crimps or leaks (see schematic Fig 2-49).

2074	2101
2096	2103
2097	
2098	
2099	

- (a) If air lines, fittings, or axle manifolds are damaged or leaking, perform Step (5) below and tighten fittings, or replace air lines or axle manifold (Para 13-6 and schematic Fig. 2-49).
 - (b) If there are no leaks, crimps, or damage, air lines, fittings and axle manifolds are OK.
- (5) Turn OFF ENGINE switch.



5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

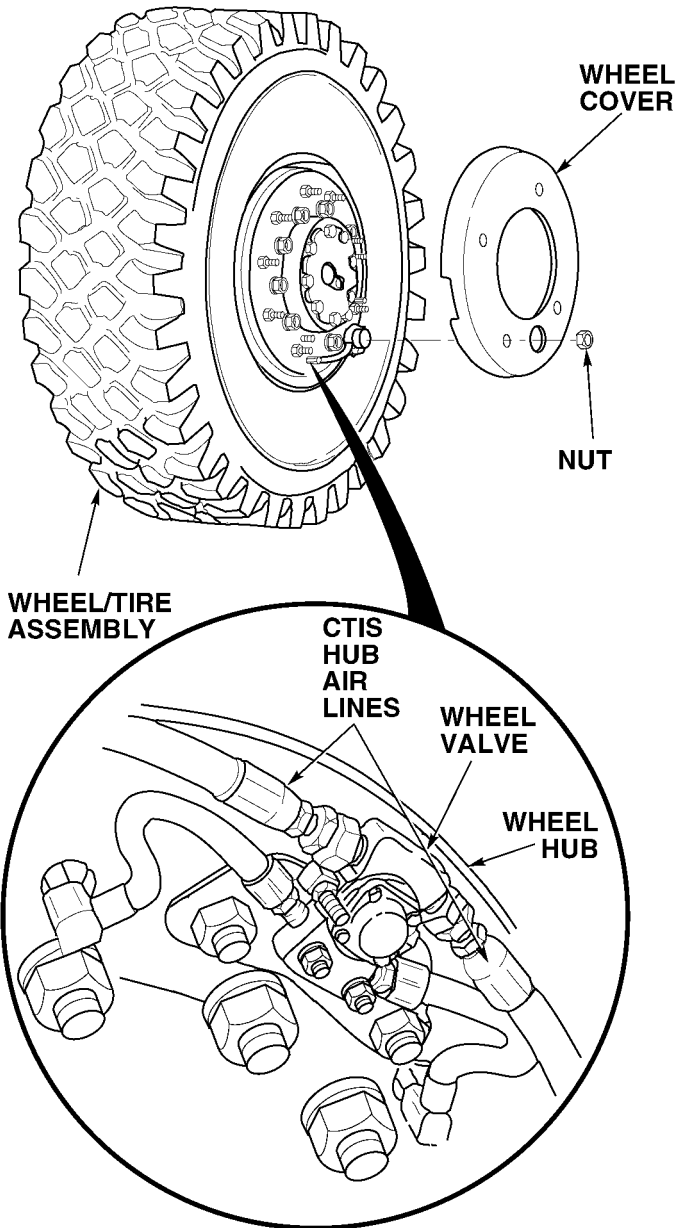
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

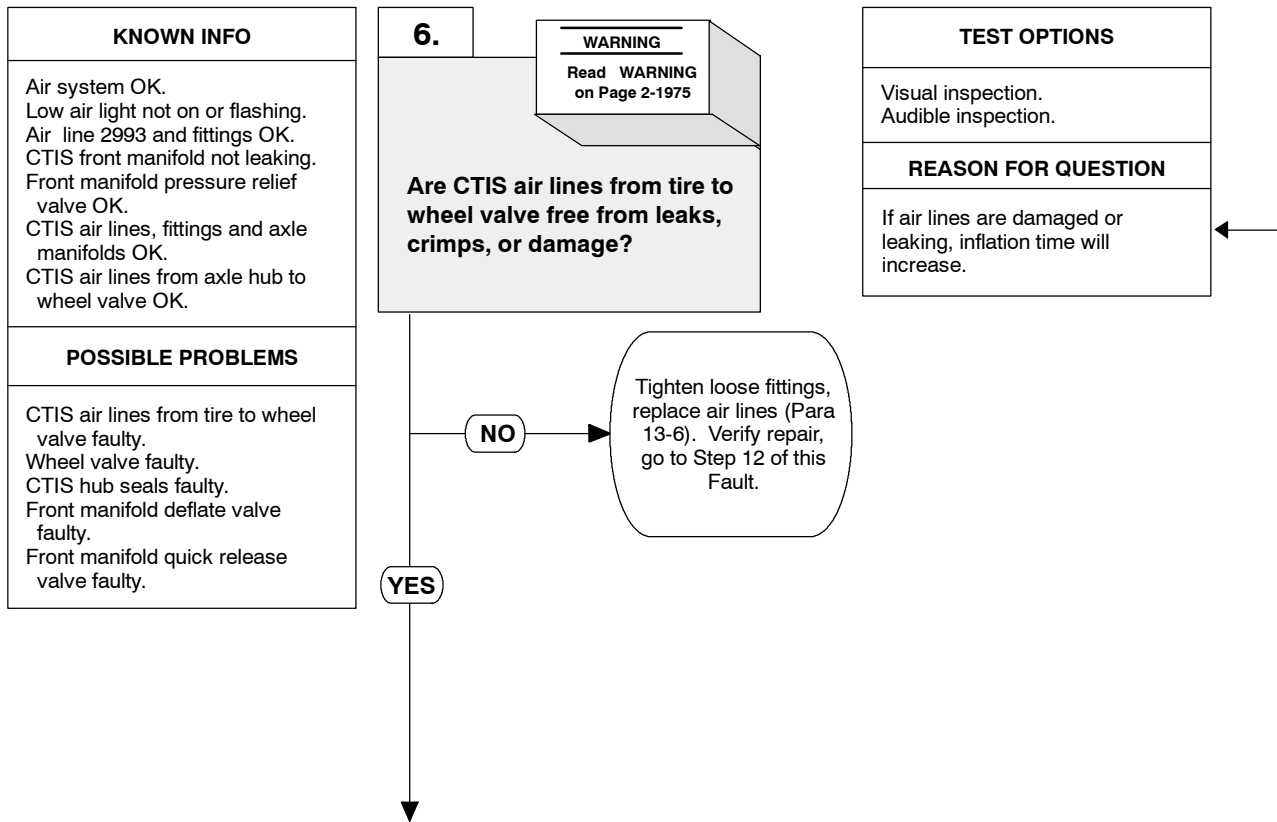
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

- (1) Remove four nuts and wheel cover.
- (2) Start engine (TM 9-2320-364-10).
- (3) Set CTIS controller to HIGHWAY.
- (4) Press CTIS START button.
- (5) Check air lines at wheel hub to wheel valve for air leakage.
 - (a) If air lines are damaged, crimped or leaking, perform Step (6) below, and tighten loose fittings, replace air lines or fittings (Para 13-6).
 - (b) If there are no leaks, crimps, or damage, air lines, and fittings are OK.
- (6) Turn OFF ENGINE switch.



5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

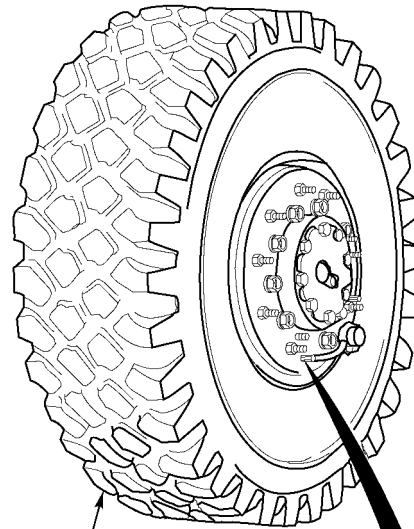
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

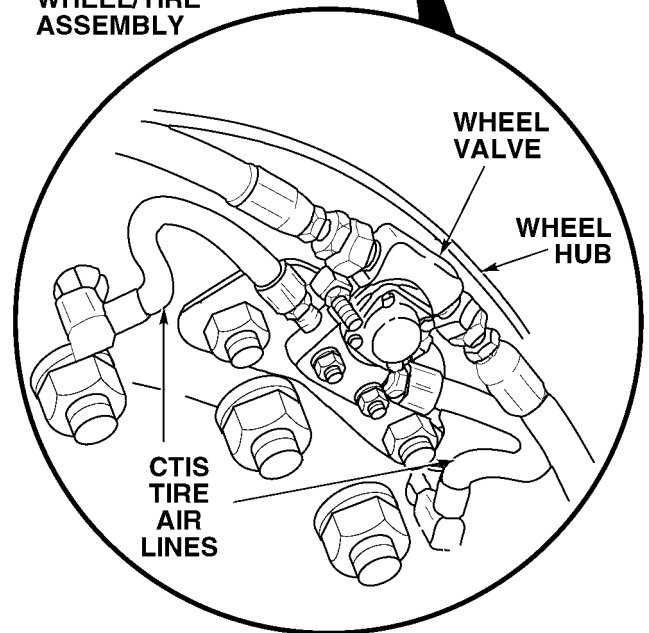
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

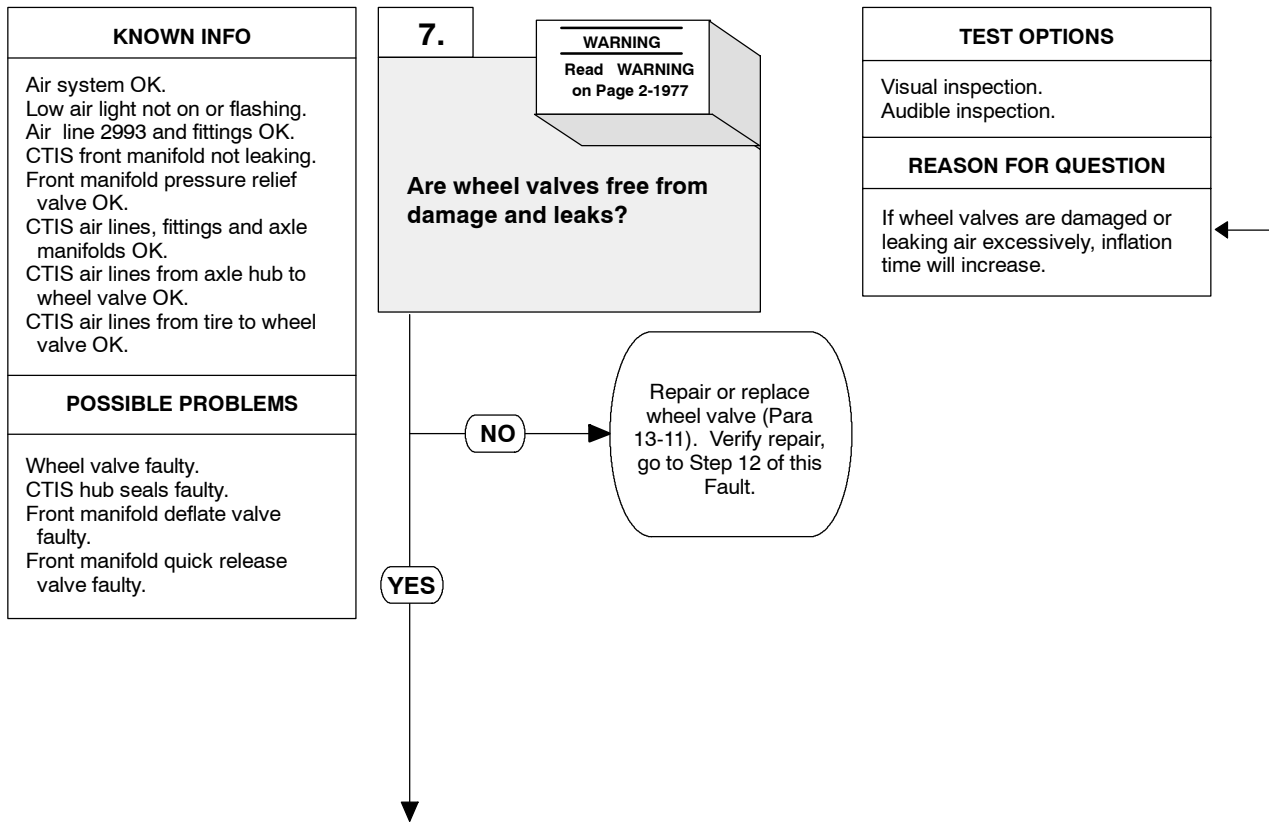
- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check CTIS air lines at tire to wheel valve for air leakage.
 - (a) If air lines are damaged, crimped or leaking, perform Step (5) below and tighten loose fittings, replace air lines or fittings (Para 13-6).
 - (b) If there are no leaks, crimps or damage, air lines and fittings are OK.
- (5) Turn OFF ENGINE switch.



WHEEL/TIRE ASSEMBLY



5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

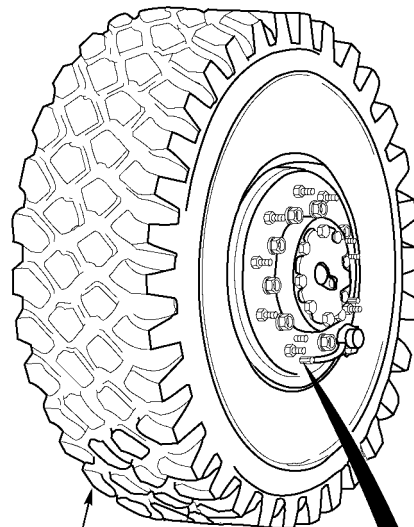
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

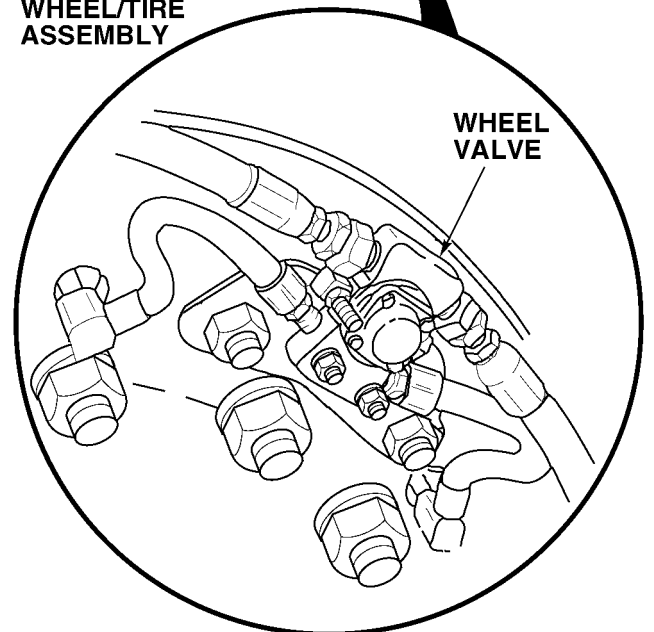
- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.
- Some air leakage may occur at breather during inflation/deflation cycles. Rapid exhaust of air at breather indicates a faulty valve.

VISUAL/AUDIBLE INSPECTION

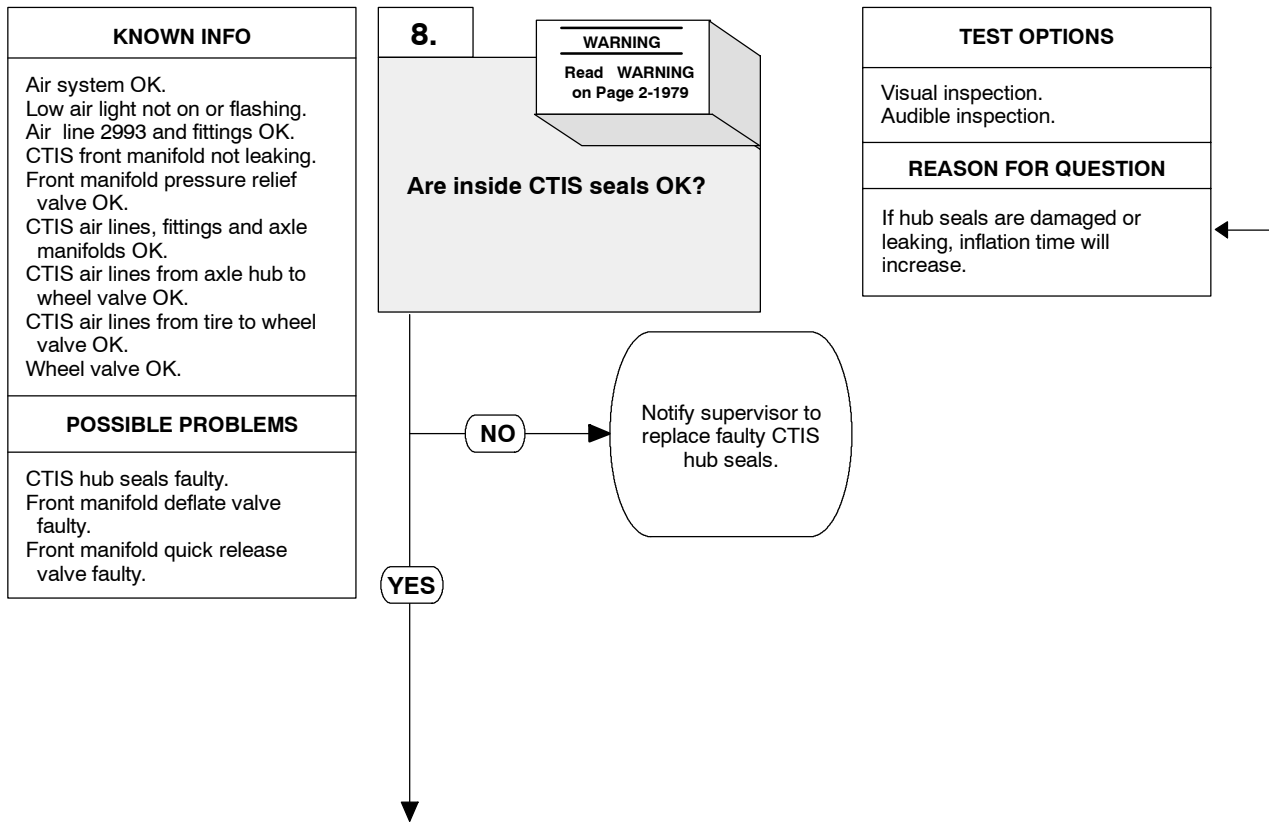
- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check CTIS wheel valves for air leakage.
 - (a) If wheel valve is damaged or leaking air, perform Step (5) below and repair or replace wheel valve (Para 13-11).
 - (b) If there are no leaks or damage, wheel valve is OK.
- (5) Turn OFF ENGINE switch.



WHEEL/TIRE ASSEMBLY



5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

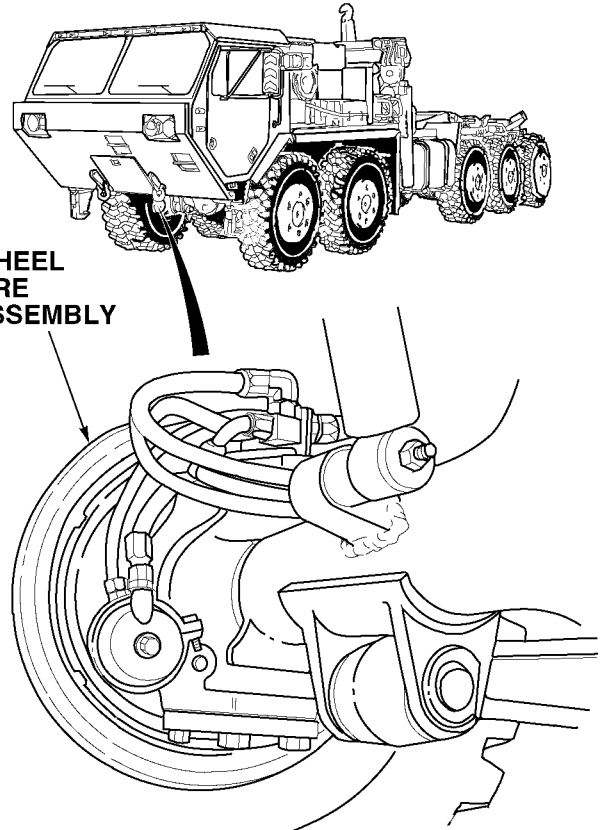
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

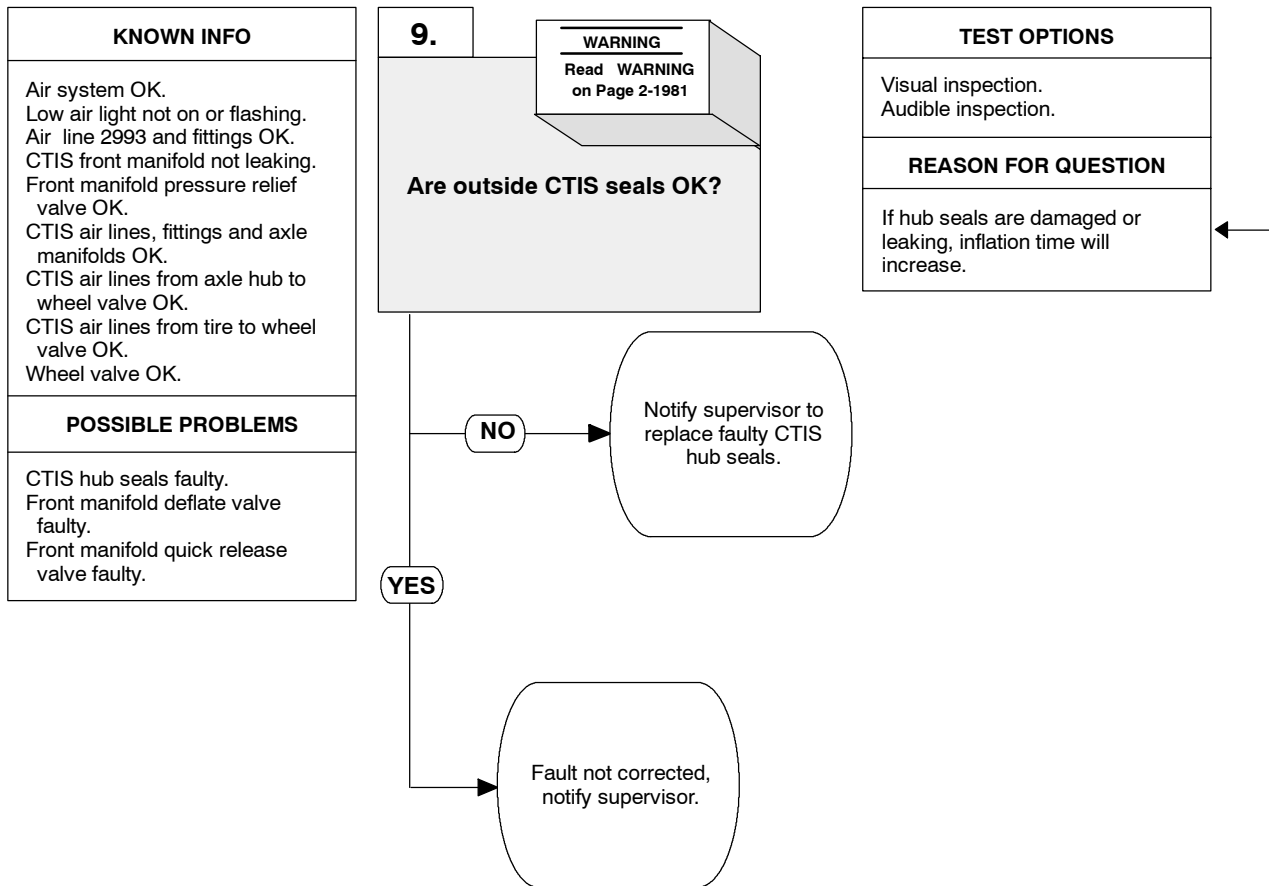
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check for air escaping from the inside portion of the wheel and tire assemblies.
 - (a) If air is escaping, turn OFF ENGINE switch and notify supervisor to replace faulty CTIS hub seals.
 - (b) If there is no air escaping, inside CTIS hub seals are OK.
- (5) Turn OFF ENGINE switch.

**WHEEL
TIRE
ASSEMBLY**

5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

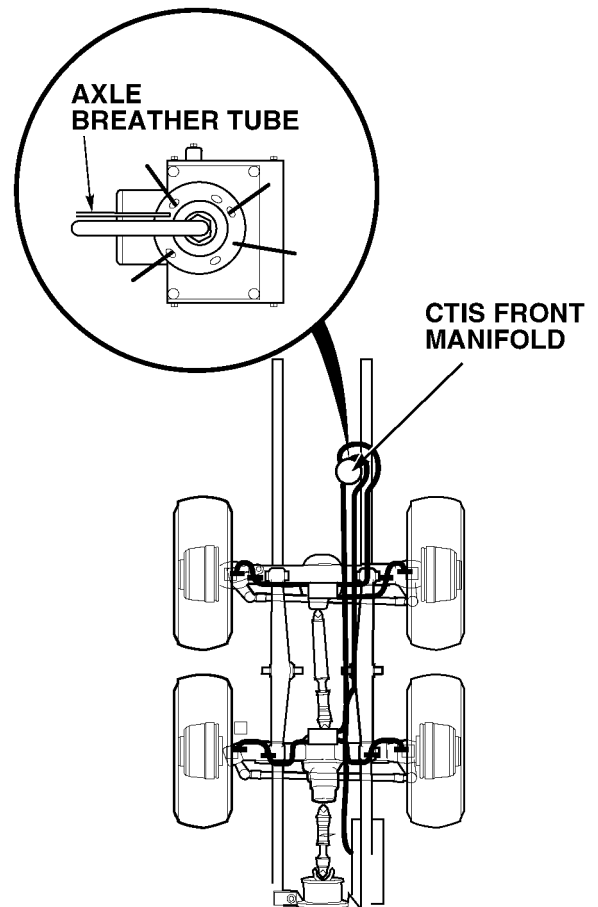
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

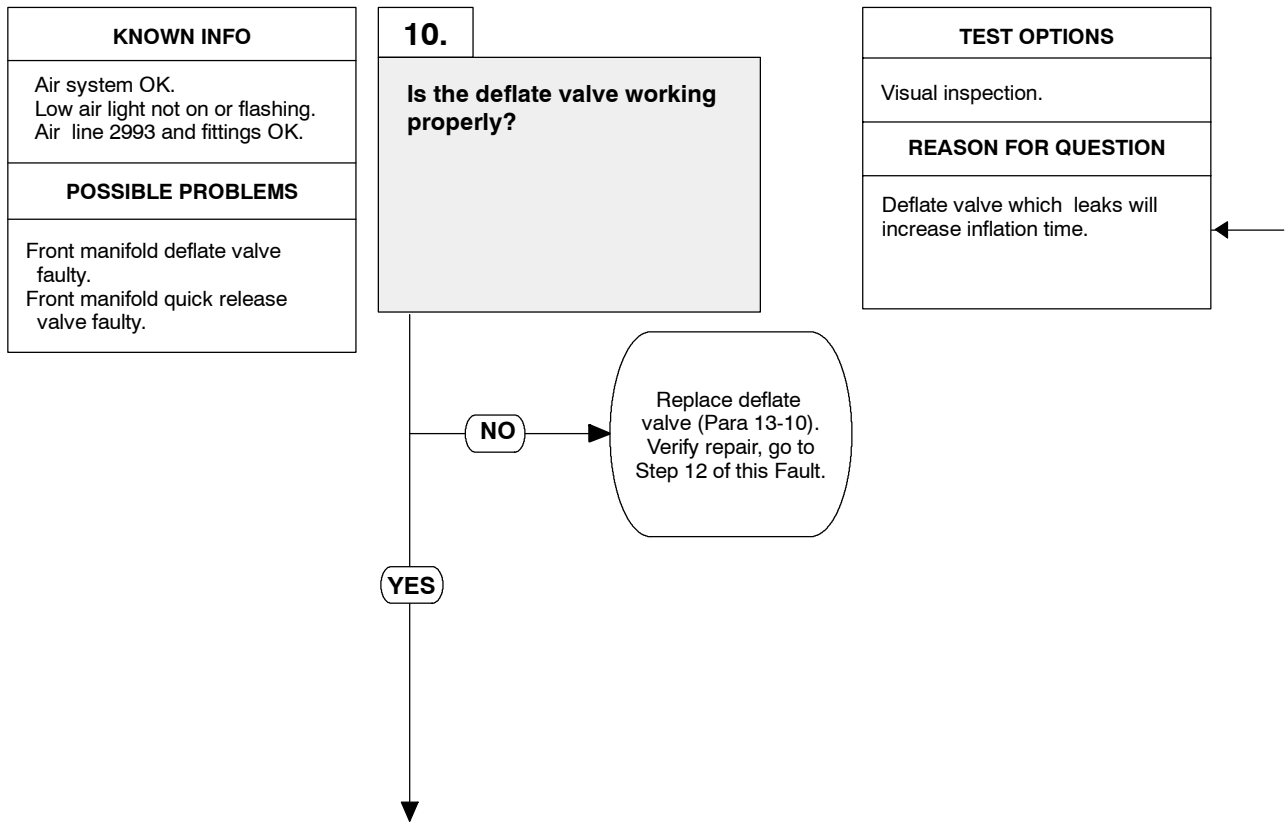
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check for air escaping from the axle breather tube.
 - (a) If air is escaping, turn OFF ENGINE switch and notify supervisor to replace faulty CTIS hub seals.
 - (b) If there is no air escaping, CTIS hub seals are OK. Fault not corrected, notify supervisor.
- (5) Turn OFF ENGINE switch.

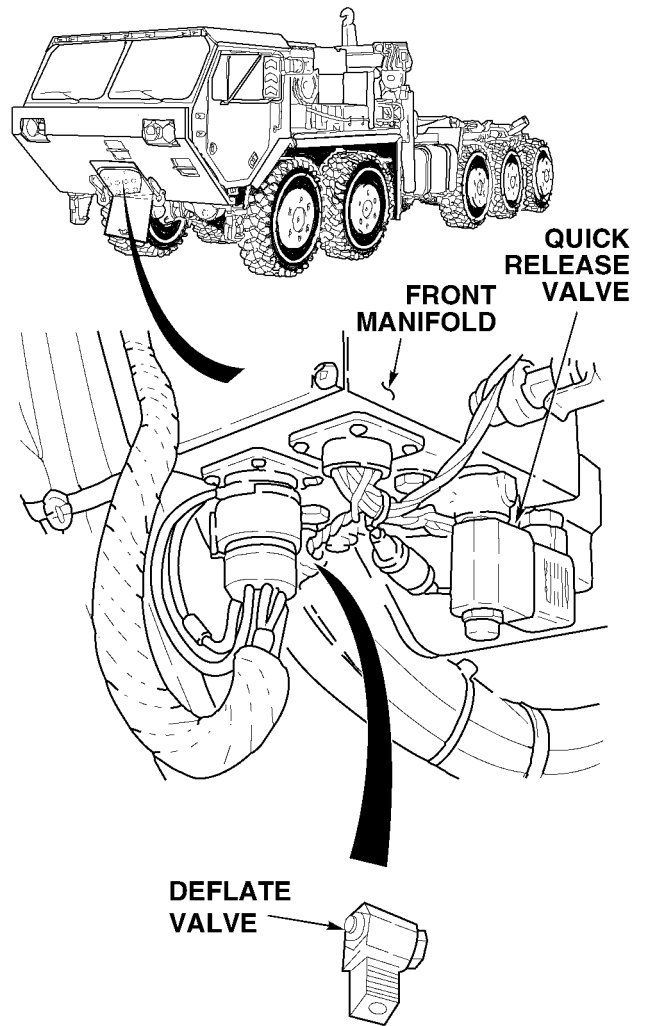


5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).

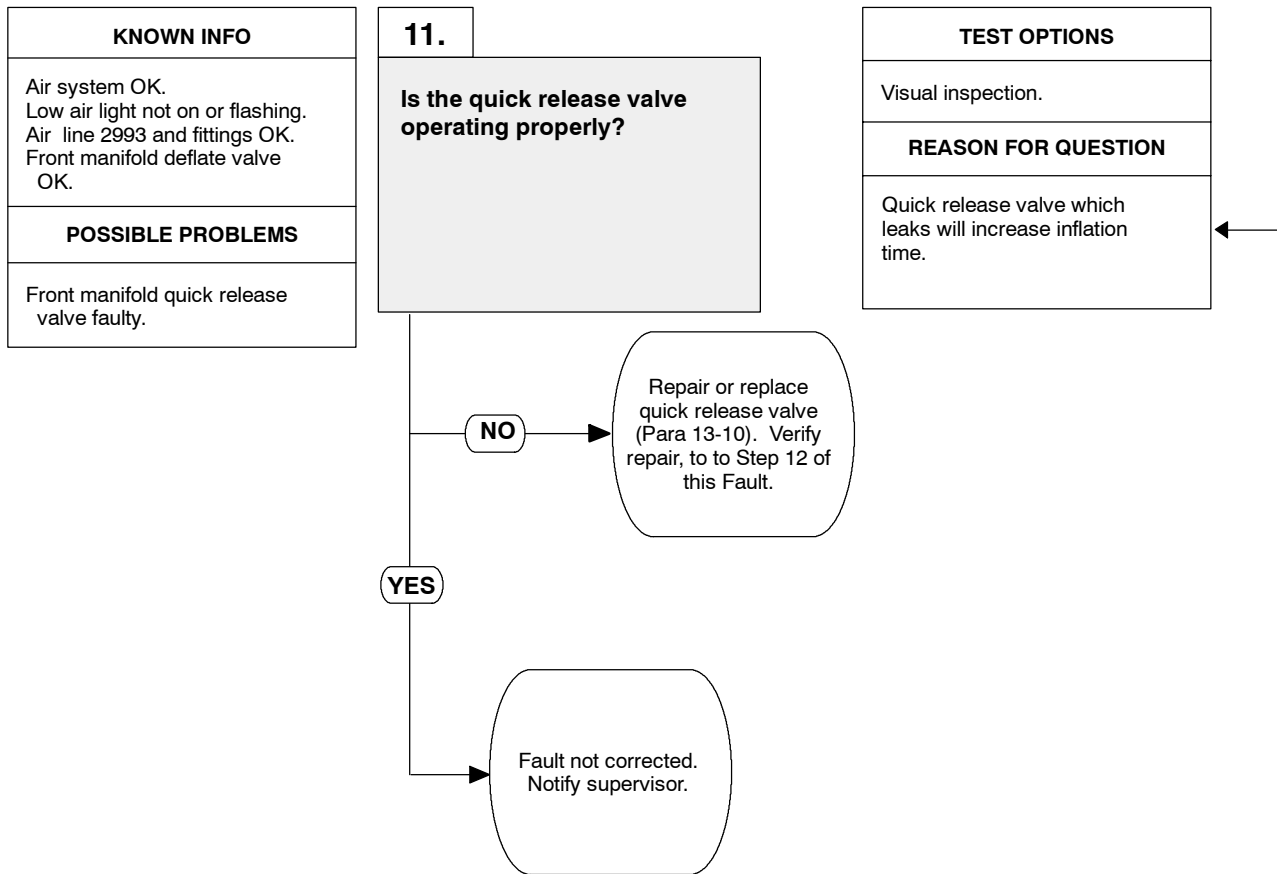


VISUAL INSPECTION

- (1) Remove deflate valve from front manifold (Para 13-10).
- (2) Inspect valve assembly for a broken spring, damaged diaphragm, sticking, or any other physical damage.
 - (a) If deflate valve is damaged, repair or replace deflate valve (Para 13-10).
 - (b) If valve is not damaged, install deflate valve and go to Step 11 of this Fault.

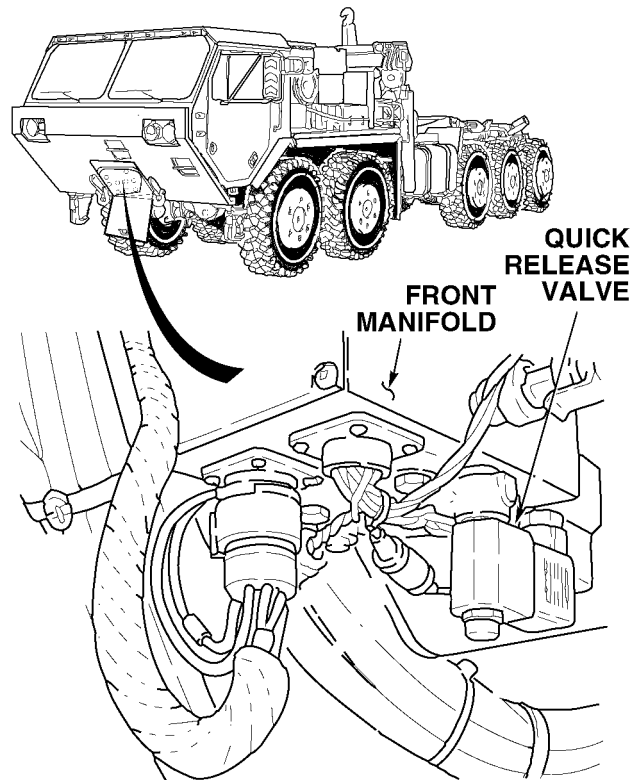


5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).

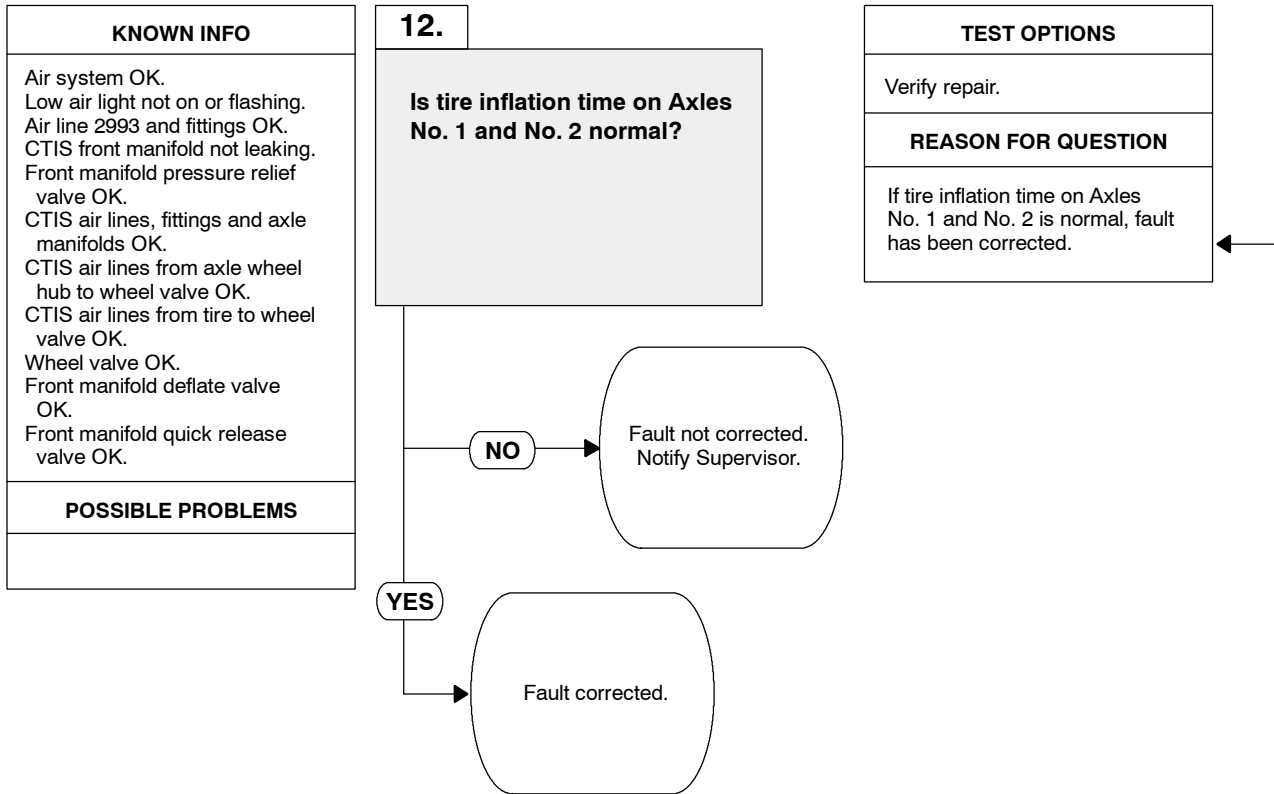


VISUAL INSPECTION

- (1) Remove quick release valve from front manifold (Para 13-10).
- (2) Inspect valve assembly for metal shavings or dirt between the diaphragm and valve seat, or for a broken spring, damaged diaphragm, sticking, or any other physical damage.
 - (a) If quick release valve is damaged, repair or replace quick release valve (Para 13-10).
 - (b) If quick release valve is not damaged, Fault not corrected. Notify supervisor.
- (3) Close front access cover (TM 9-2320-364-10).



5. EXCESS INFLATION TIME AXLES NO. 1 AND NO. 2, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



NOTE

All inflation times are with engine running at full governed speed.

VERIFY REPAIR
(1) Start engine (TM 9-2320-364-10).
(2) Set CTIS controller selector to HIGHWAY.
(3) Press CTIS START button. <ul style="list-style-type: none"> (a) If tire inflation time is excessive (Table 2-46), fault not corrected. Turn OFF ENGINE switch and notify Supervisor. (b) If tire inflation time is normal, fault has been corrected.
(4) Turn OFF ENGINE switch.

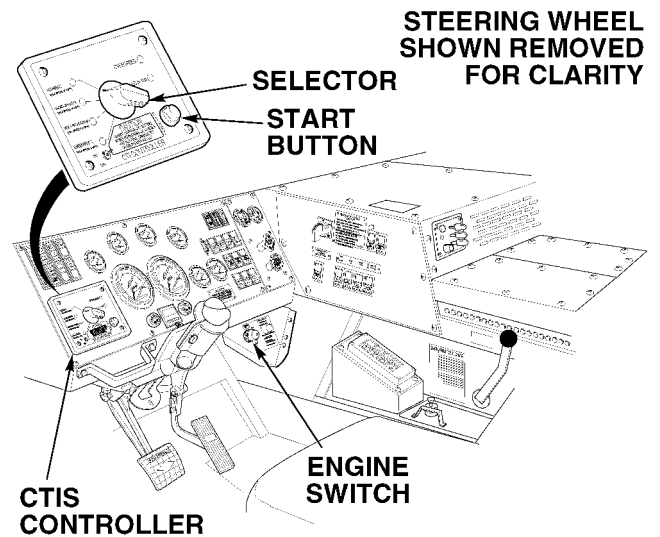


Table 2-46. CTIS Tire Inflation and Deflation Time

From	To	Maximum Time Allowed (Minutes)
<u>Inflation</u>		
Cross-country	Highway	12:30
Mud/Snow/Sand	Cross-country	5:30
Emergency	Mud/Sand/Snow	3:00
<u>Deflation</u>		
Highway	Cross-country	4:00
Cross-country	Mud/Sand/Snow	4:00
Mud/Snow/Sand	Emergency	3:00

2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix H)
Goggles, Industrial (Item 30, Appendix H)

Materials/Parts

Solution, Soap (Item 86, Appendix C)

Personnel Required

Two

References

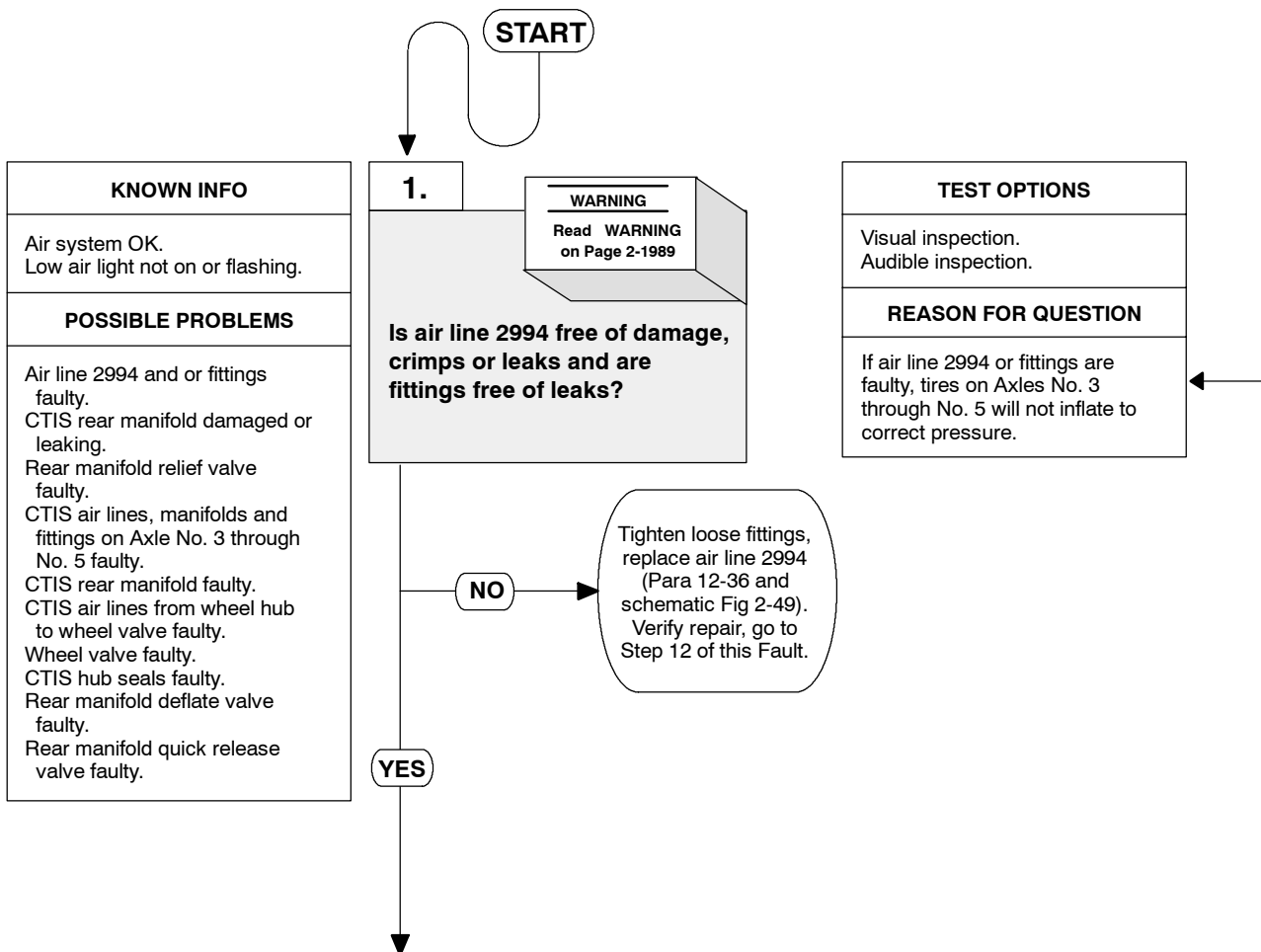
TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Load Handling System (LHS) extended fully, (TM 9-2320-364-10)
CTIS turned on, (TM 9-2320-364-10)
CTIS rear manifold cover removed, (Para 13-9)

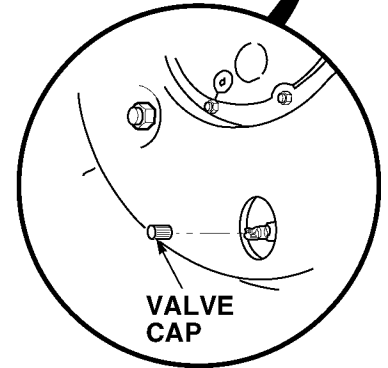
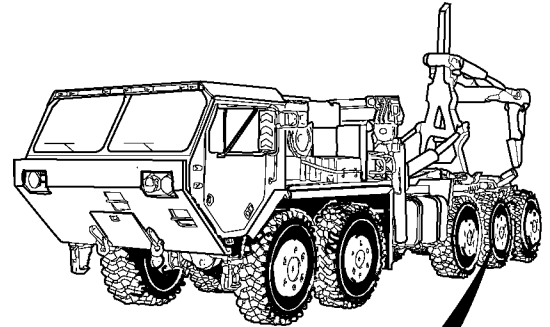
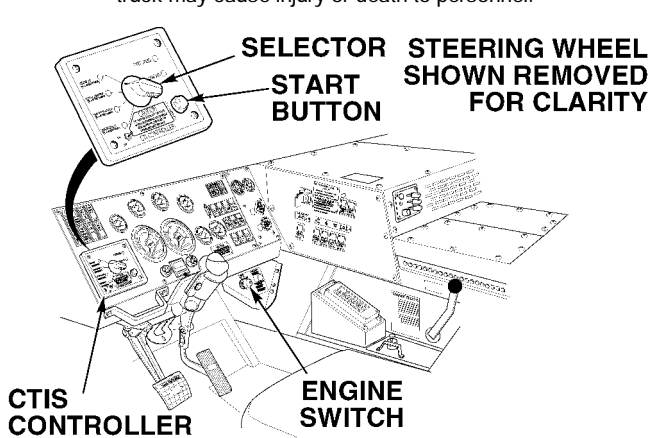
NOTE

Soap and water solution can be used to visually check for leaks.



WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

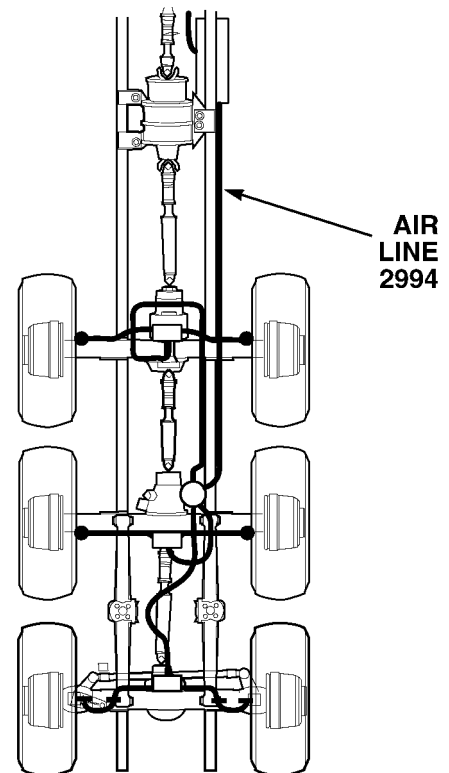


NOTE

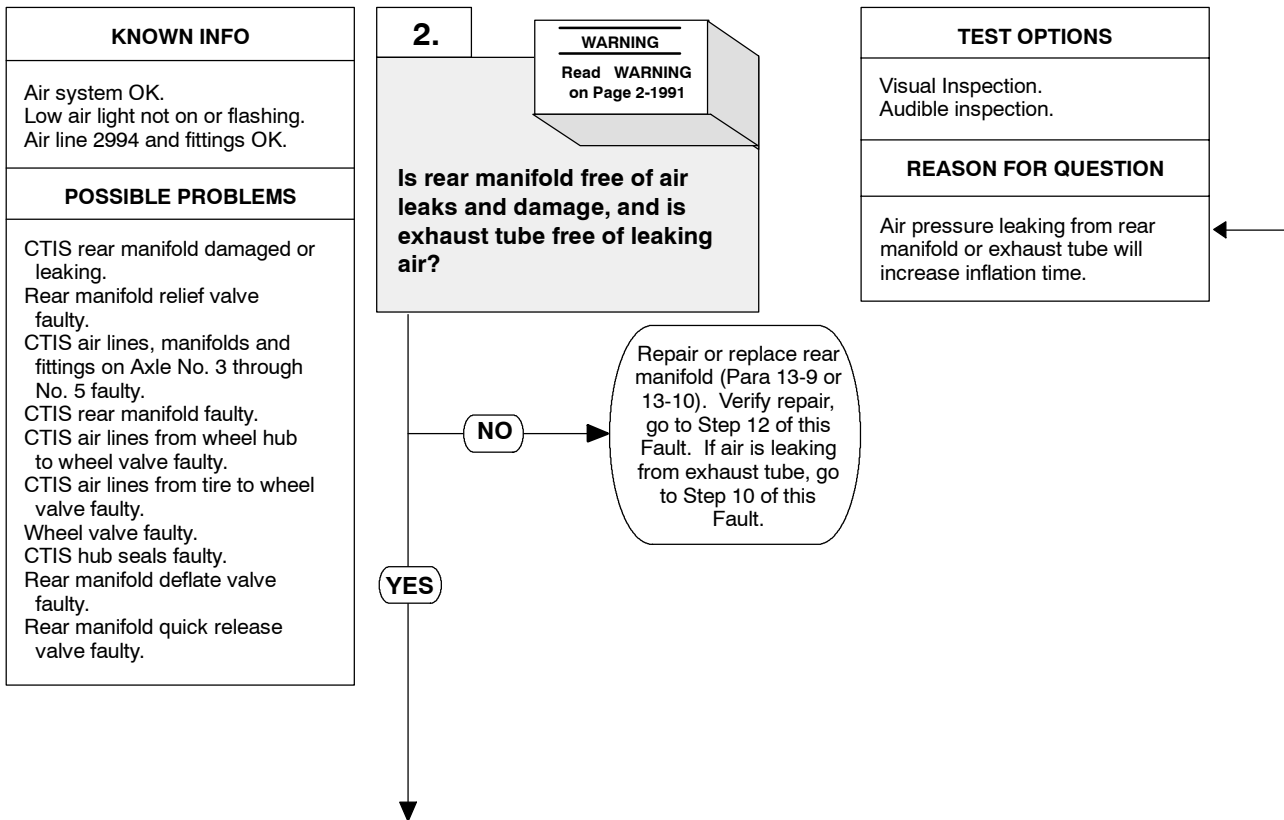
- Excessive inflation times with out a low air light are caused by minor leaks in CTIS system.
- CTIS air lines are pressurized only when CTIS is in inflate, deflate or test cycles.
- Excessive inflation times, sometimes accompanied by low air light is normal if engine is at idle speed and/or air operated accessories are being used.
- CTIS initially and periodically checks for system air leaks. CTIS controller will display a flashing LOW AIR light and will shut off if about 6 psi cannot be maintained.

VISUAL/AUDIBLE INSPECTION

- (1) Remove valve cap from any wheel valve stem on Axles No. 3 through No. 5.
- (2) Using tire gage, deflate any one tire on Axles No. 3 through No. 5 to 40 psi (276 kPa).
- (3) Start engine (TM 9-2320-364-10).
- (4) Set CTIS controller selector to HIGHWAY.
- (5) Press CTIS START button.
- (6) Check CTIS air line 2994 for damage, crimps or leaks (see schematic Fig 2-49).
 - (a) If air line 2994 is damaged, crimped or leaking; perform Steps (7) and (8) below, and tighten fittings, replace air line (Para 12-36 and see schematic Fig 2-49).
 - (b) If there are no leaks, crimps or damage; air line 2994 and fittings are OK.
- (7) Turn OFF ENGINE switch.
- (8) Install valve cap on wheel valve stem.



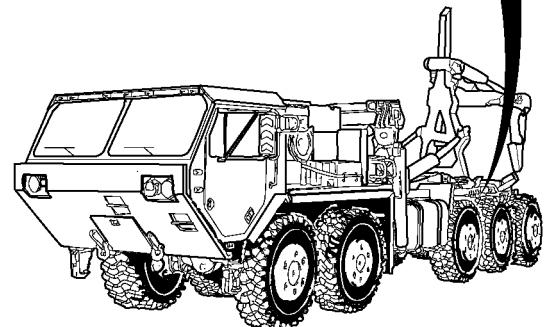
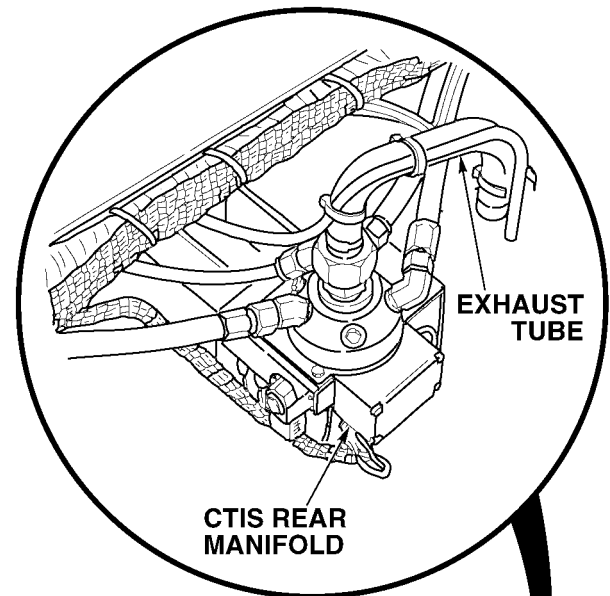
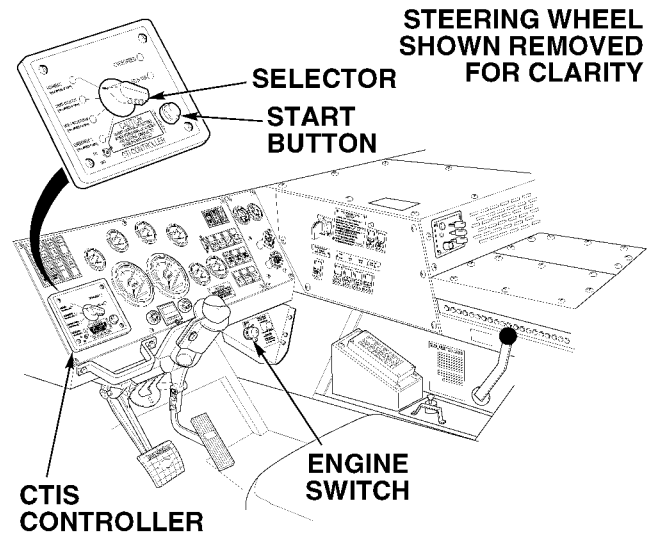
6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



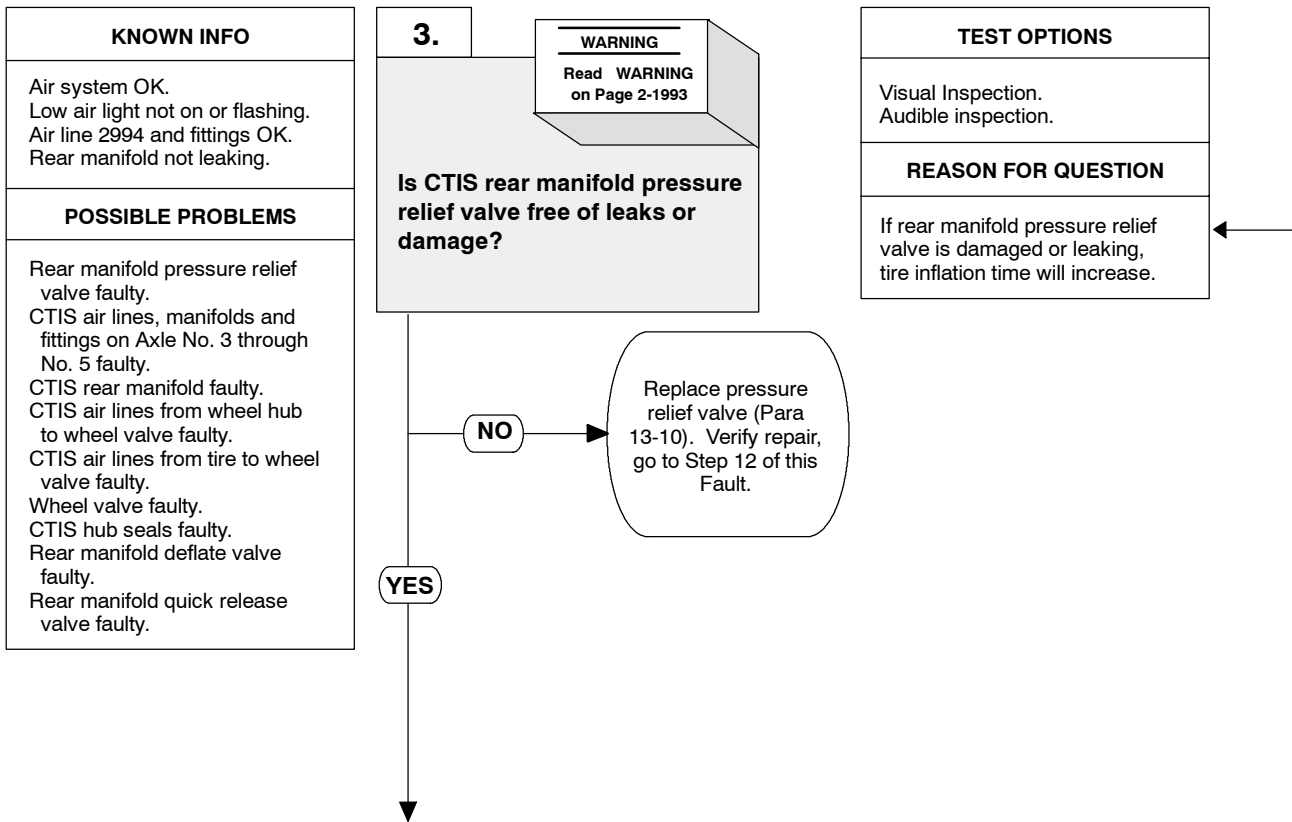
WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

VISUAL/AUDIBLE INSPECTION
(1) Start engine (TM 9-2320-364-10).
(2) Set CTIS controller selector to HIGHWAY.
(3) Press CTIS START button.
(4) Check CTIS rear manifold for damage and leaks. <ul style="list-style-type: none"> (a) If manifold is damaged or leaking, turn OFF ENGINE switch and repair or replace rear manifold (Para 13-9) or (Para 13-10). (b) If air is leaking from exhaust tube, turn OFF ENGINE switch and go to Step 10 of this Fault. (c) If manifold is not damaged or leaking, turn OFF ENGINE switch and go to Step 3 of this Fault.



6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

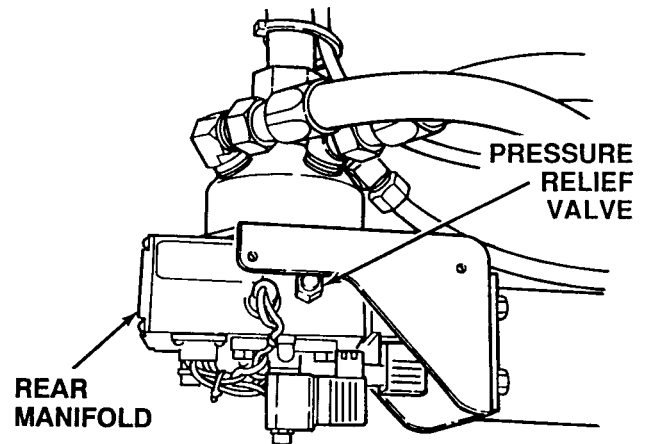
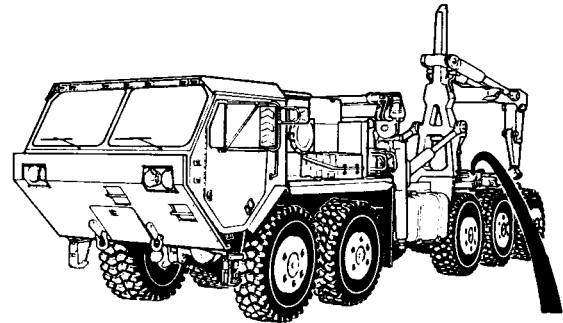
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

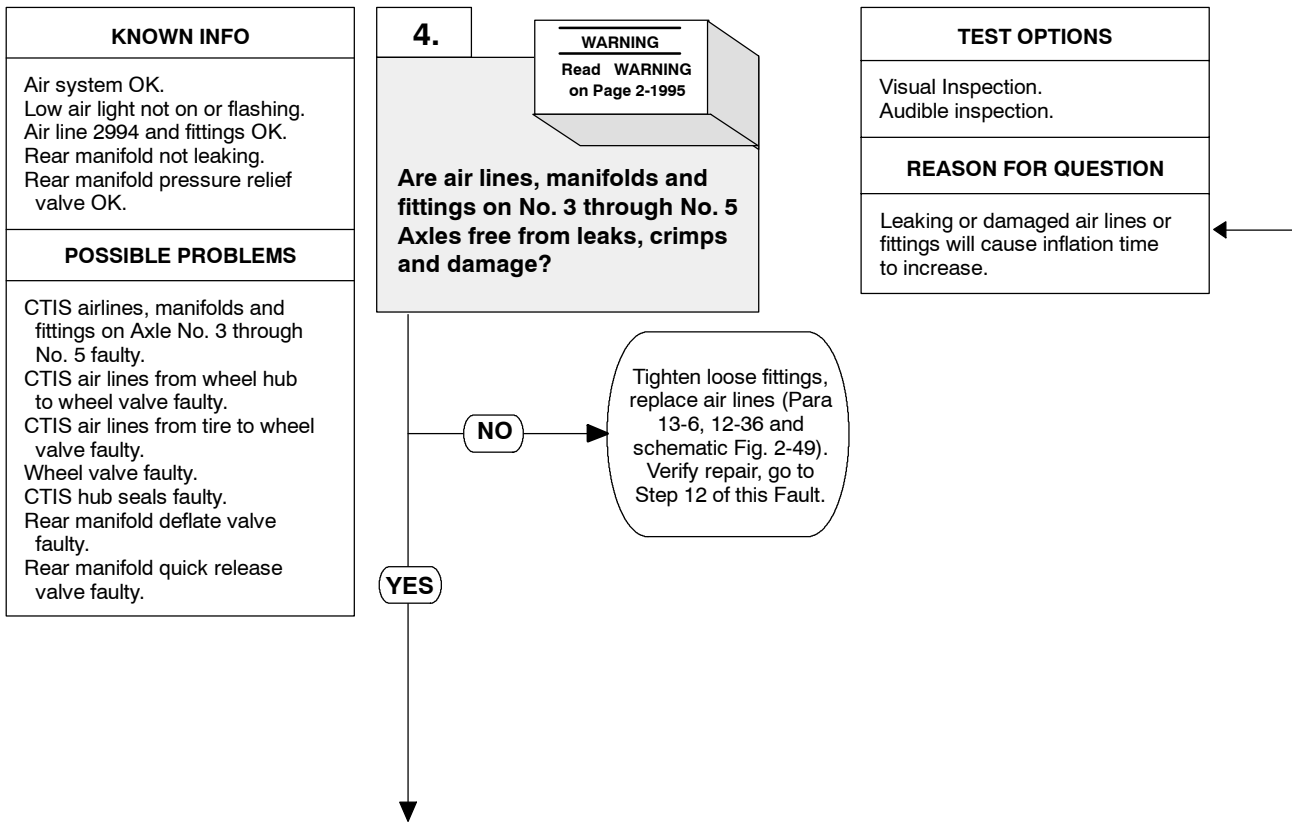
- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.
- Some air leakage (bubbles forming) may occur during inflation/deflation cycle at relief valve. A rapid exhaust of air indicates a problem.
- Pressure relief valve should remain closed up to 85 psi (586 kPa).

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check CTIS rear manifold pressure relief valve for damage and leaks.
 - (a) If pressure relief valve is damaged or leaking, turn OFF ENGINE switch and replace valve (Para 13-10).
 - (b) If pressure relief valve is not damaged or leaking, relief valve is OK.
- (5) Turn OFF ENGINE switch.
- (6) Install rear CTIS manifold cover (Para 13-9).
- (7) Put LHS in transit position.

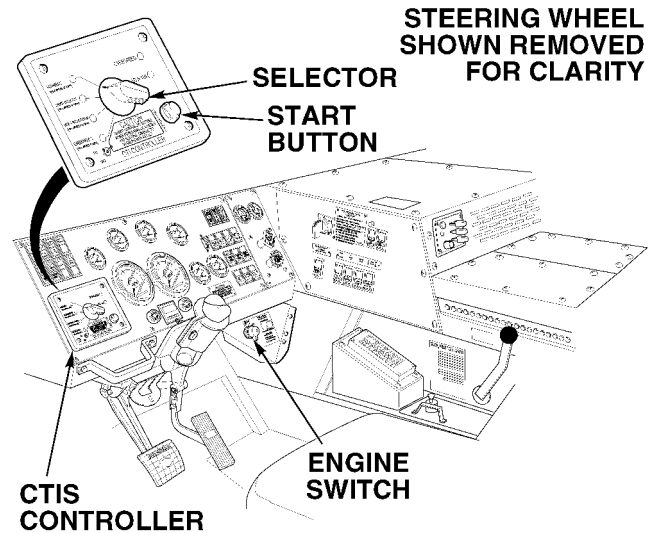


6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

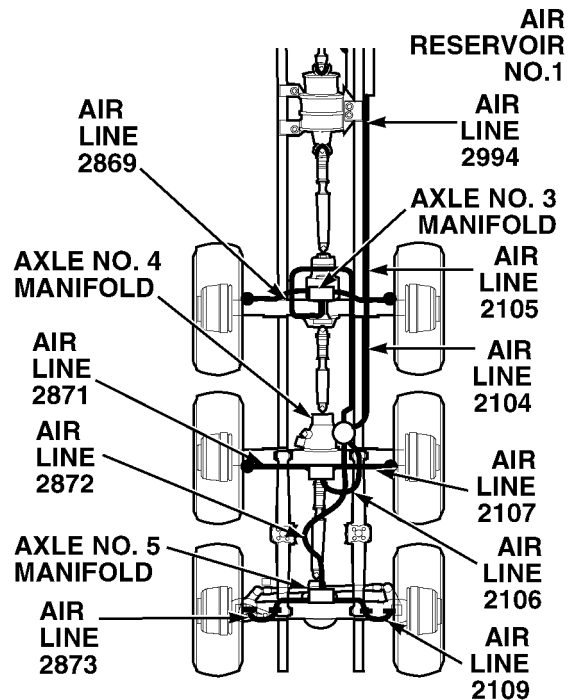
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.



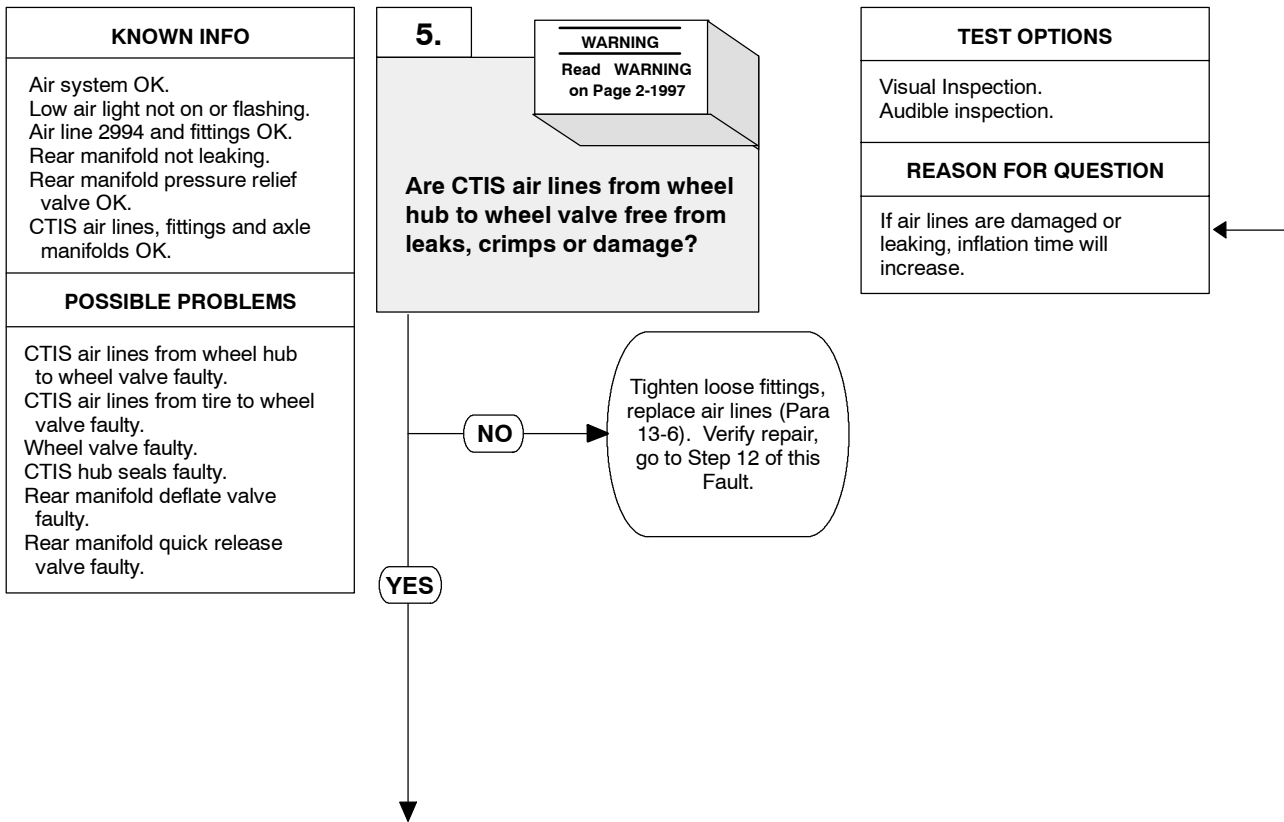
NOTE

Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION	
(1)	Remove valve cap from any valve stem on Axles No. 3 through No. 5.
(2)	Using tire gage, deflate any one tire on Axles No. 3 through No. 5 to 40 psi (276 kPa).
(3)	Start engine (TM 9-2320-364-10).
(4)	Set CTIS controller selector to HIGHWAY.
(5)	Press CTIS START button.
(6)	Check CTIS air lines listed below for damage, crimps or leaks (see schematic Fig 2-49).
	2104 2107 2871 2873 2105 109 2872 2994 2106 2869
(a)	If air lines are damaged, crimped or leaking, perform Steps (7) and (8) below, tighten fittings, replace air lines (Para 13-6, 12-36 and schematic Fig 2-49).
(b)	If there are no leaks, crimps or damage, air lines and fittings are OK.
(7)	Turn OFF ENGINE switch.
(8)	Install valve cap on valve stem.



6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

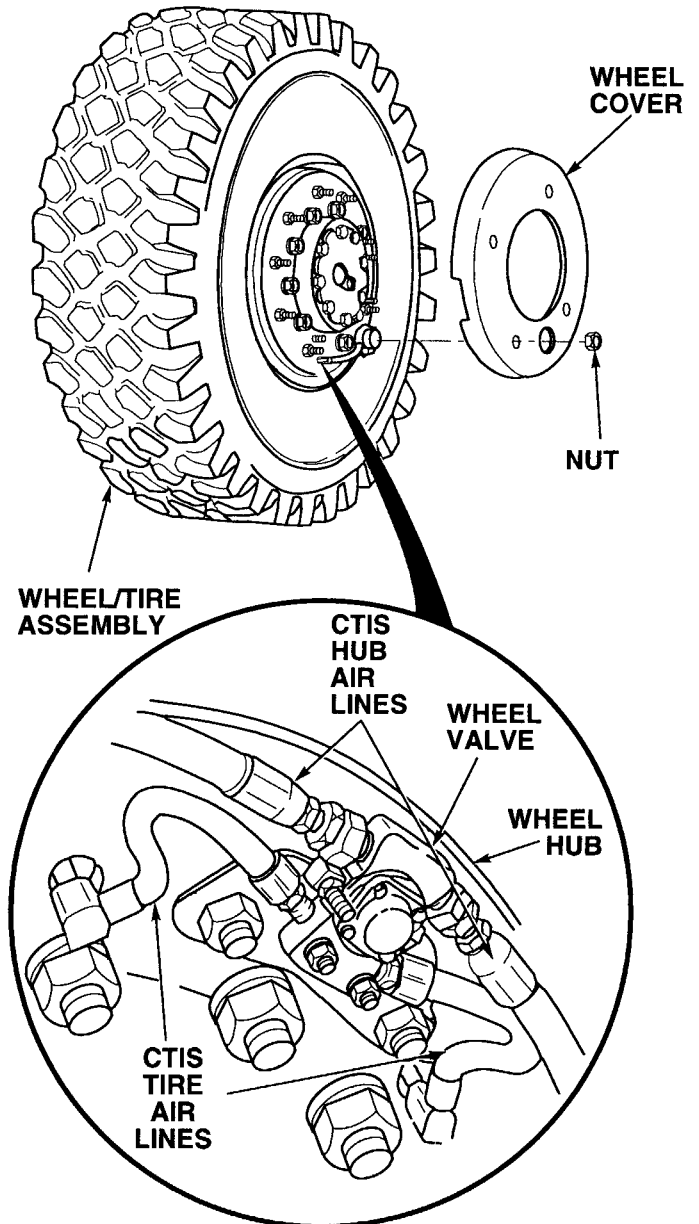
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

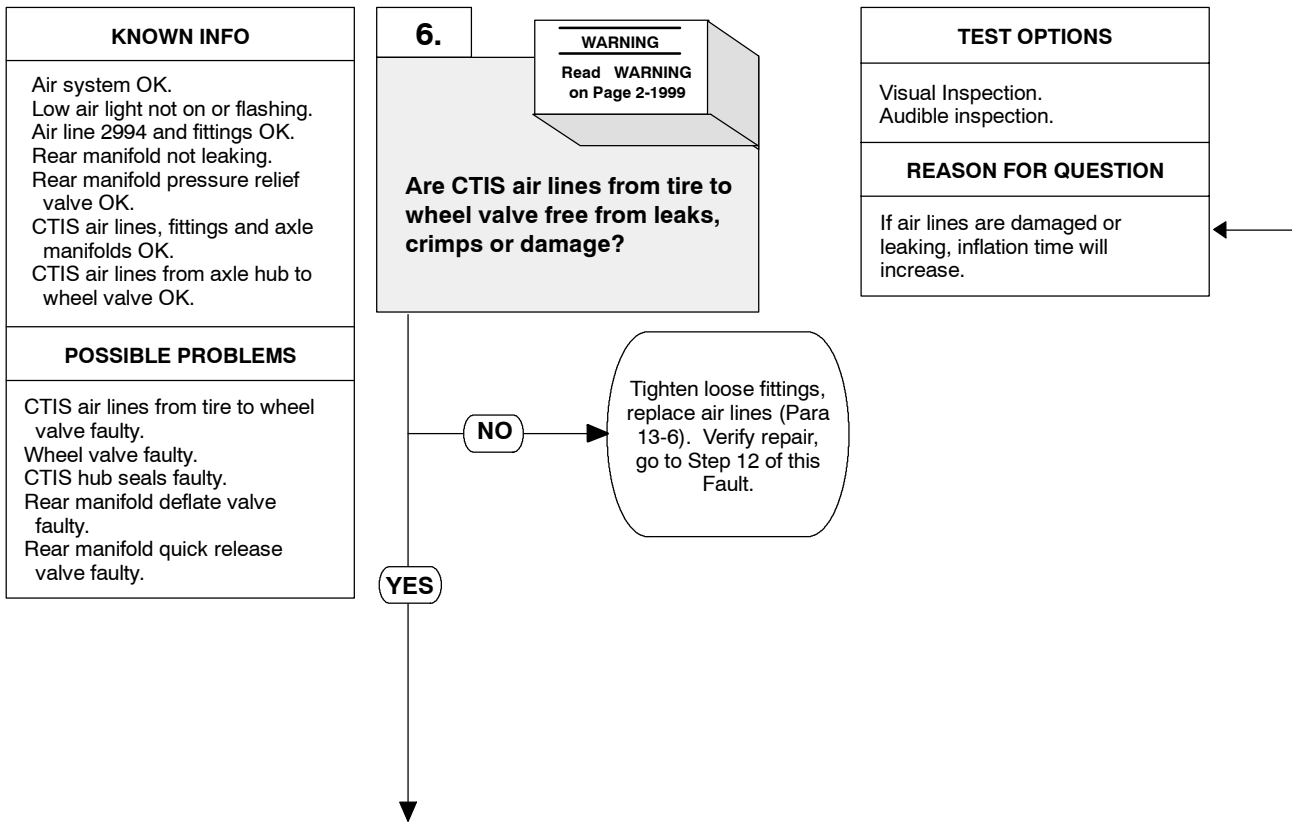
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

- (1) Remove four nuts and wheel cover.
- (2) Start engine (TM 9-2320-364-10).
- (3) Set CTIS controller to HIGHWAY.
- (4) Press CTIS START button.
- (5) Check air lines at wheel hub to wheel valve for air leakage.
 - (a) If air lines are damaged, crimped or leaking, perform step (6) below, and tighten loose fittings, replace air lines or fittings (Para 13-6).
 - (b) If there are no leaks, crimps or damage, air lines and fittings are OK.
- (6) Turn OFF ENGINE switch.



6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

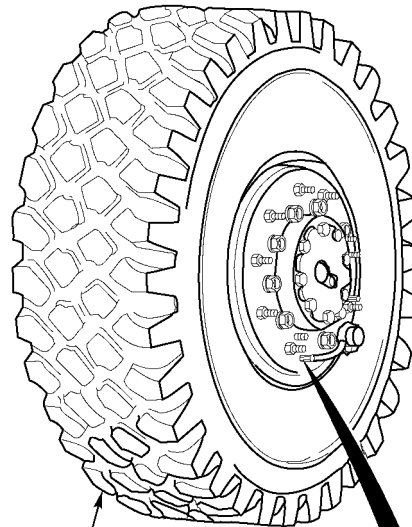
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

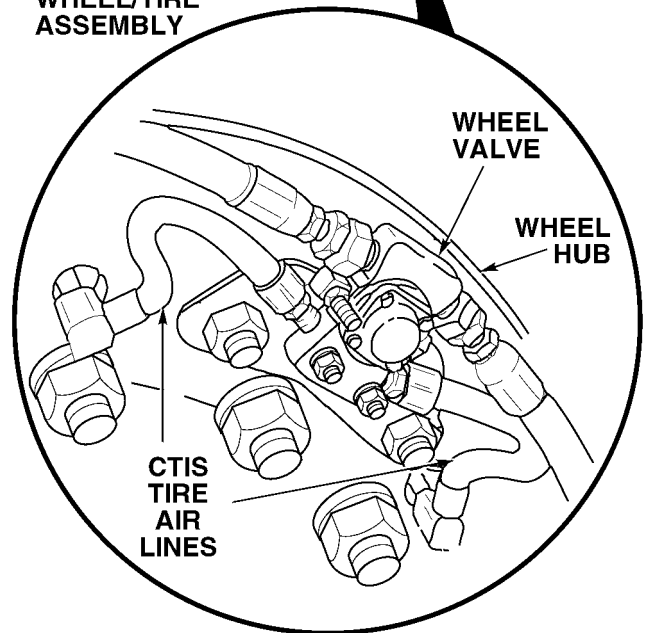
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

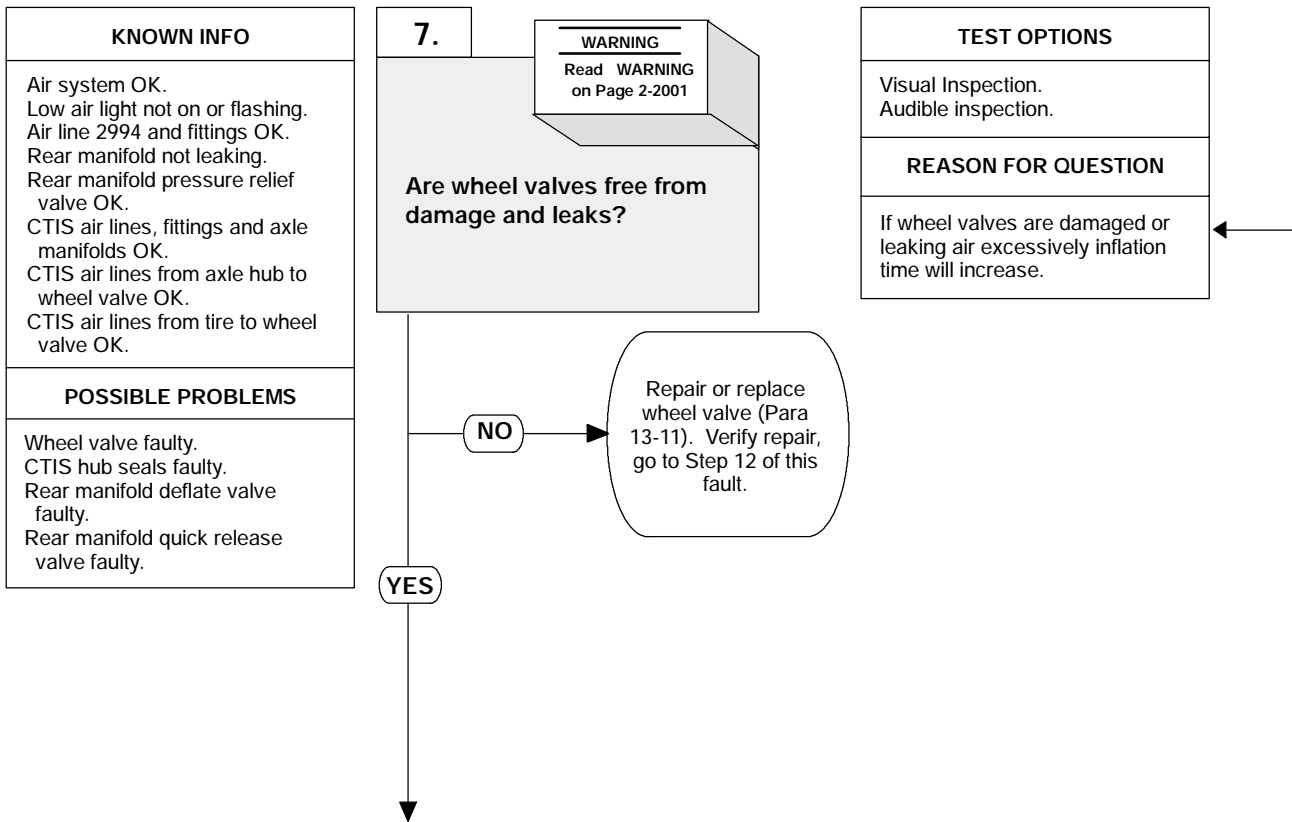
- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check CTIS air lines at tire to wheel valve for air leakage.
 - (a) If air lines are damaged, crimped or leaking, perform Step (5) below and tighten loose fittings, replace air lines or fittings (Para 13-6).
 - (b) If there are no leaks, crimps or damage, air lines and fittings are OK.
- (5) Turn OFF ENGINE switch.



WHEEL/TIRE ASSEMBLY



6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



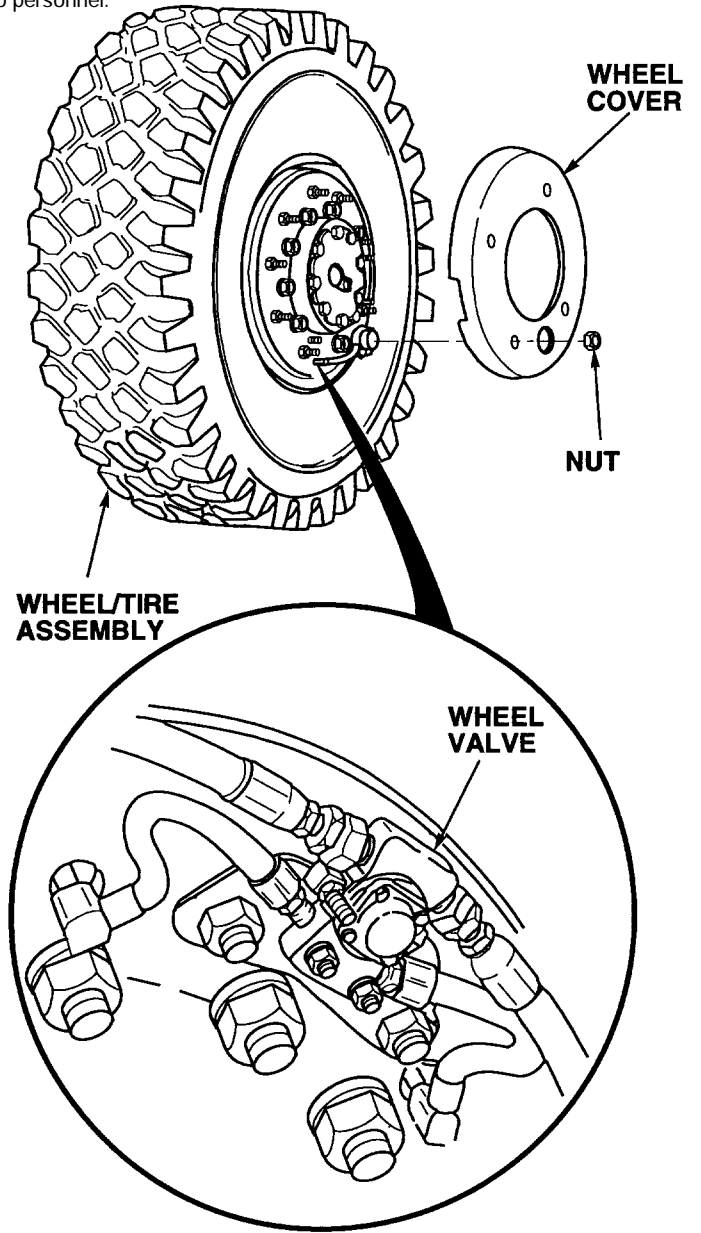
WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

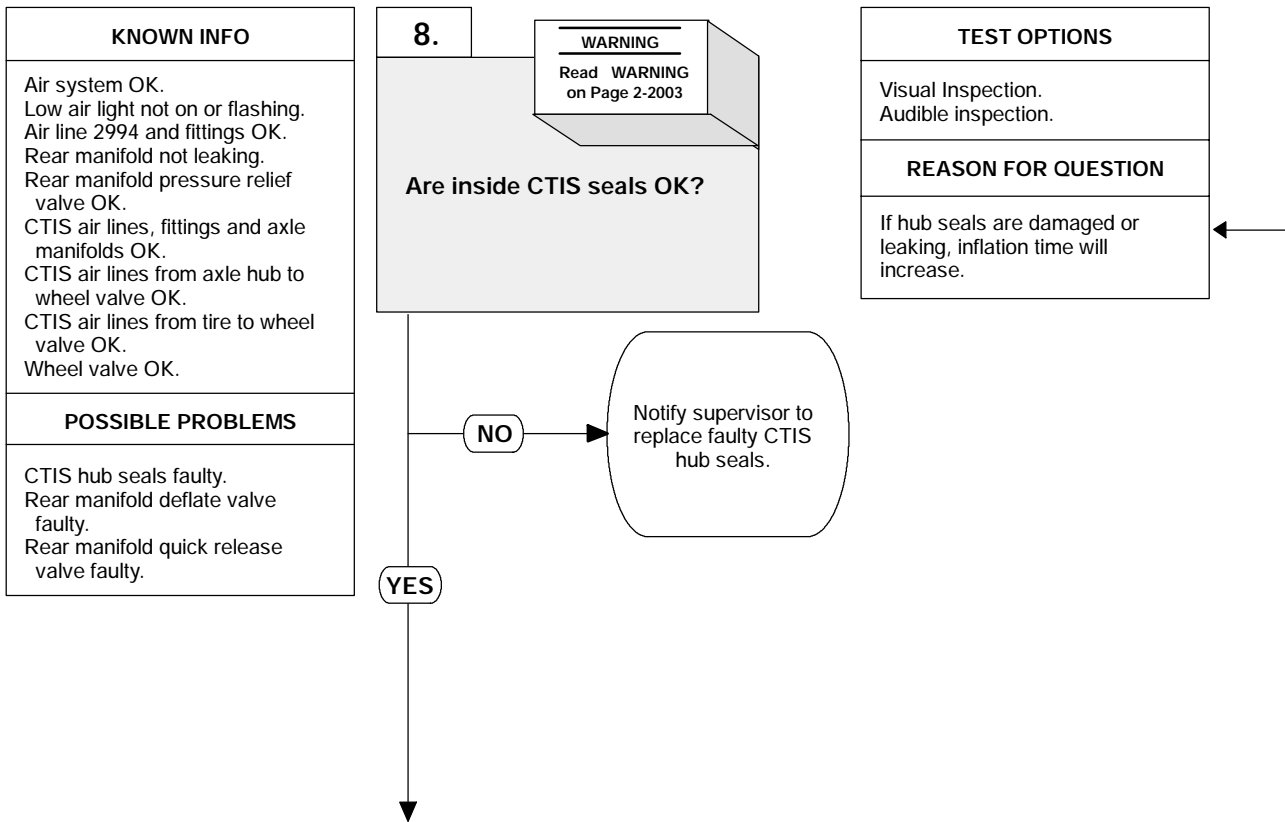
NOTE

- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.
- Some air leakage may occur at breather during inflation/deflation cycles. Rapid exhaust of air at breather indicates a faulty valve.

VISUAL/AUDIBLE INSPECTION
(1) Start engine (TM 9-2320-364-10). (2) Set CTIS controller to HIGHWAY. (3) Press CTIS START button. (4) Check CTIS wheel valves for air leakage. (a) If wheel valve is damaged or leaking air, perform Step (5) below and repair or replace wheel valve (Para 13-11). (b) If there are no air leaks or damage, wheel valve is OK. (5) Turn OFF ENGINE switch. (6) Install wheel cover and four nuts.



6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

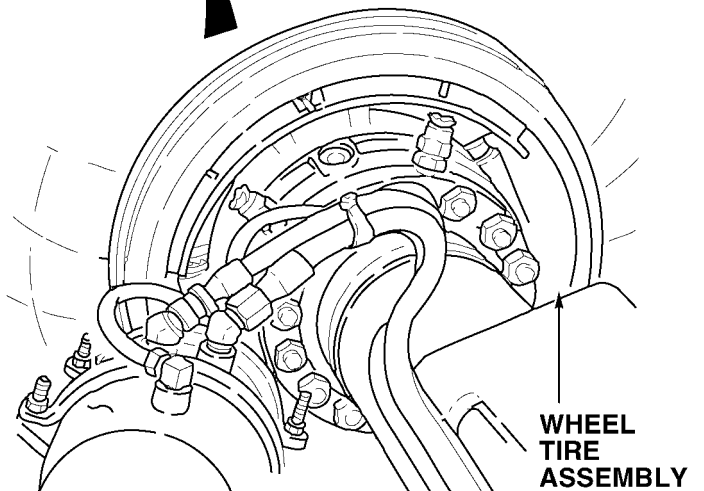
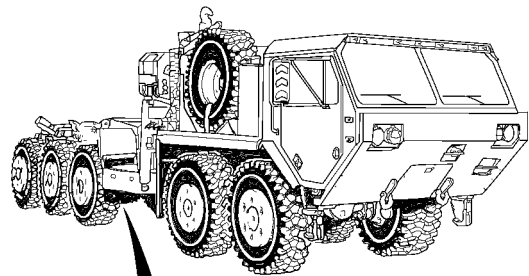
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

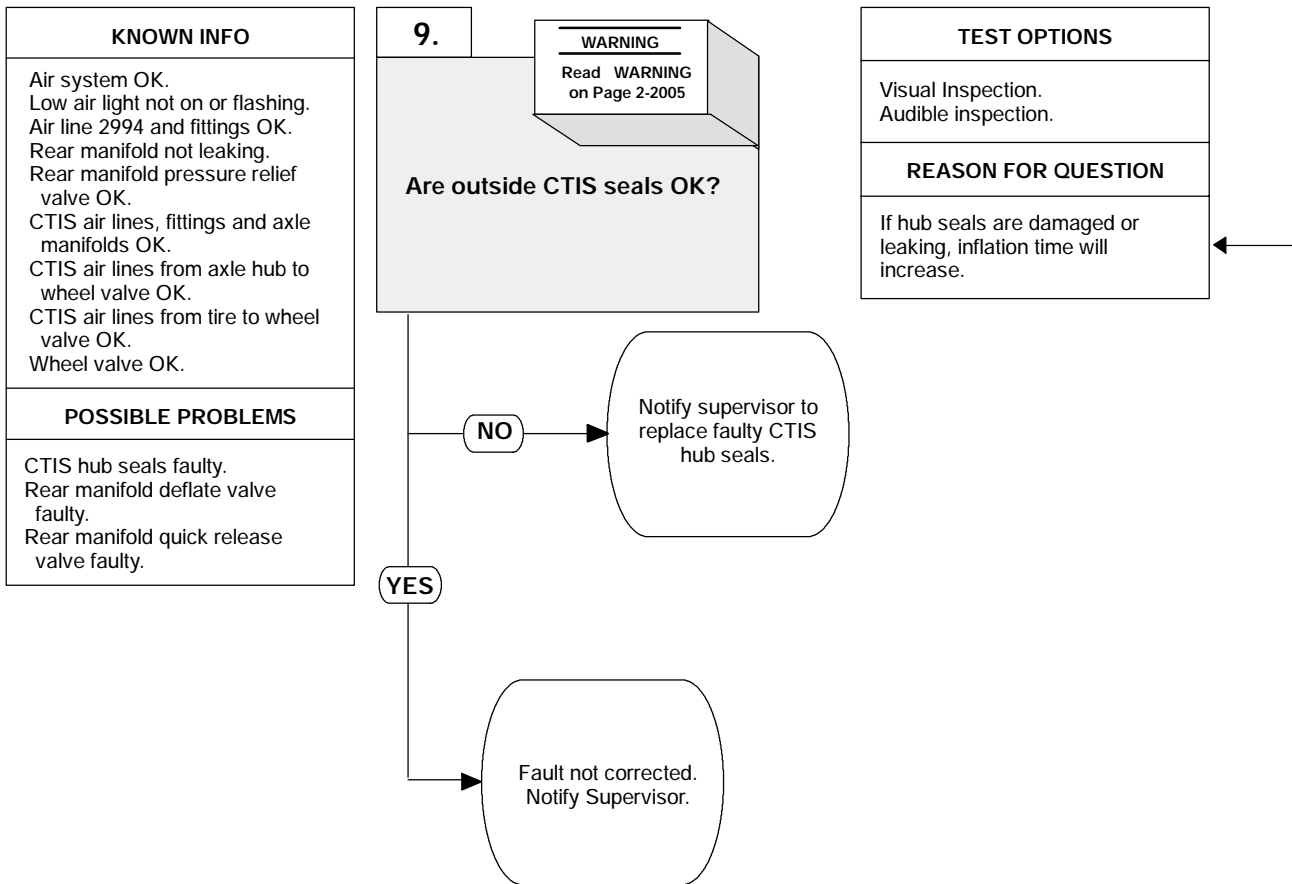
Tires must be deflated to 60 psi (414 kPa) or less to perform this test

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check for air escaping from the inside portion of the wheel and tire assemblies.
 - (a) If air is escaping, turn OFF ENGINE switch and notify supervisor to replace faulty CTIS hub seals.
 - (b) If there is no air escaping, inside CTIS hub seals are OK.
- (5) Turn OFF ENGINE switch.



6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



WARNING

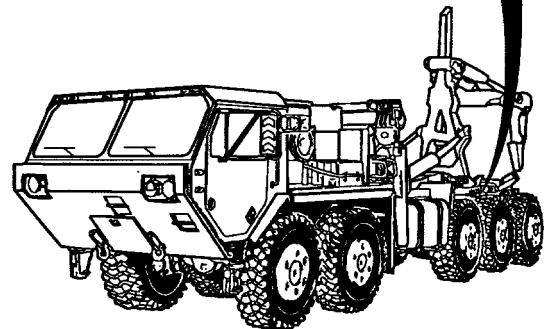
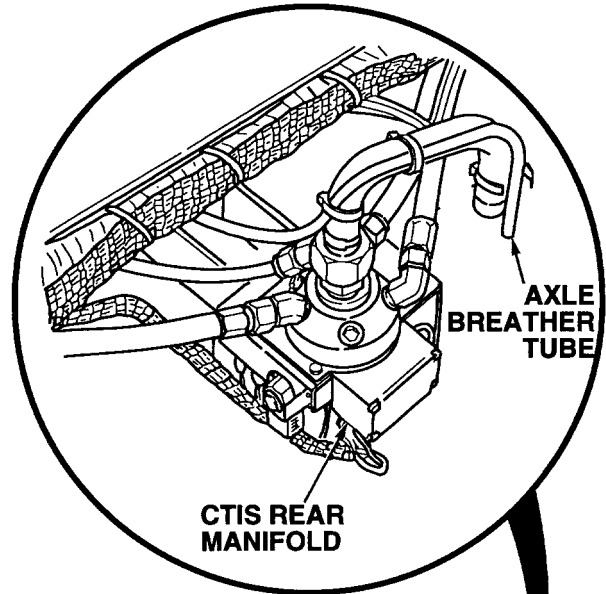
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

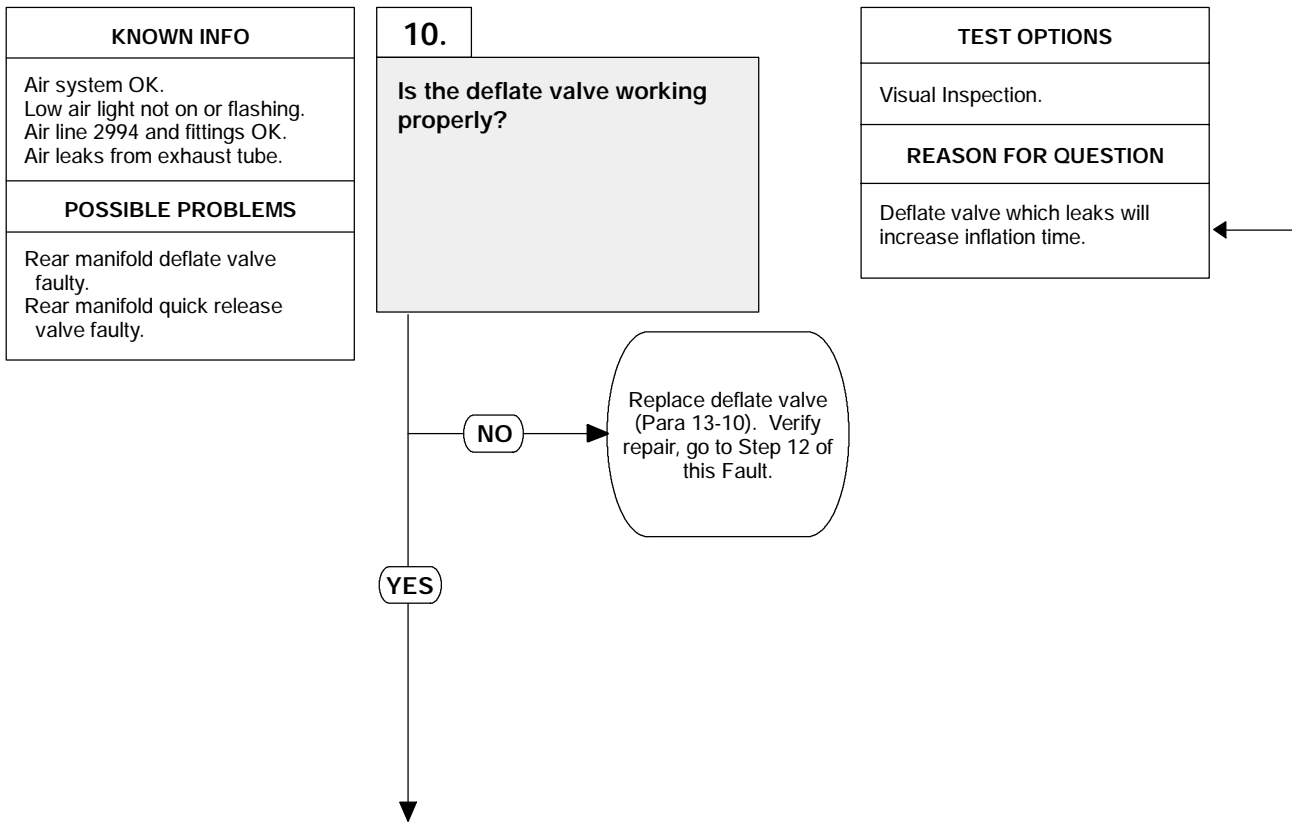
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check for air escaping from the axle breather tube.
 - (a) If air is escaping, turn OFF ENGINE switch and notify supervisor to replace faulty CTIS hub seals.
 - (b) If there is no air escaping, CTIS hub seals are OK. Notify Supervisor.
- (5) Turn OFF ENGINE switch.

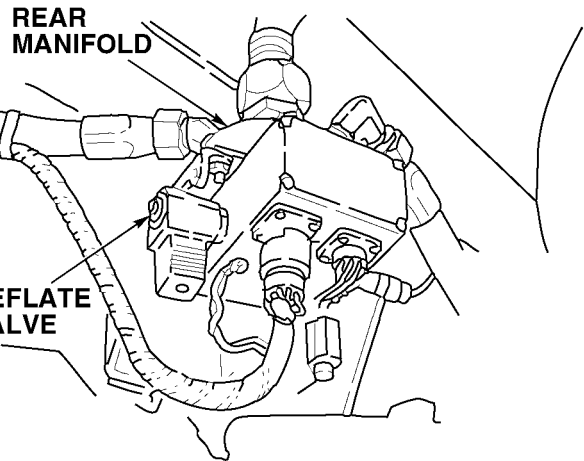
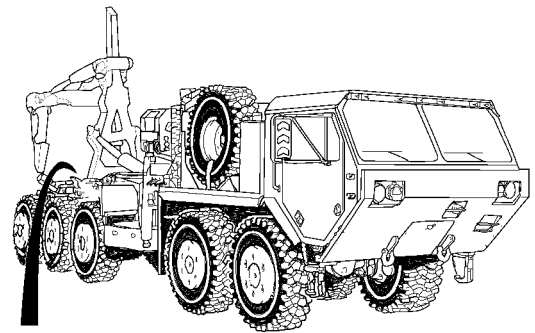


6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).

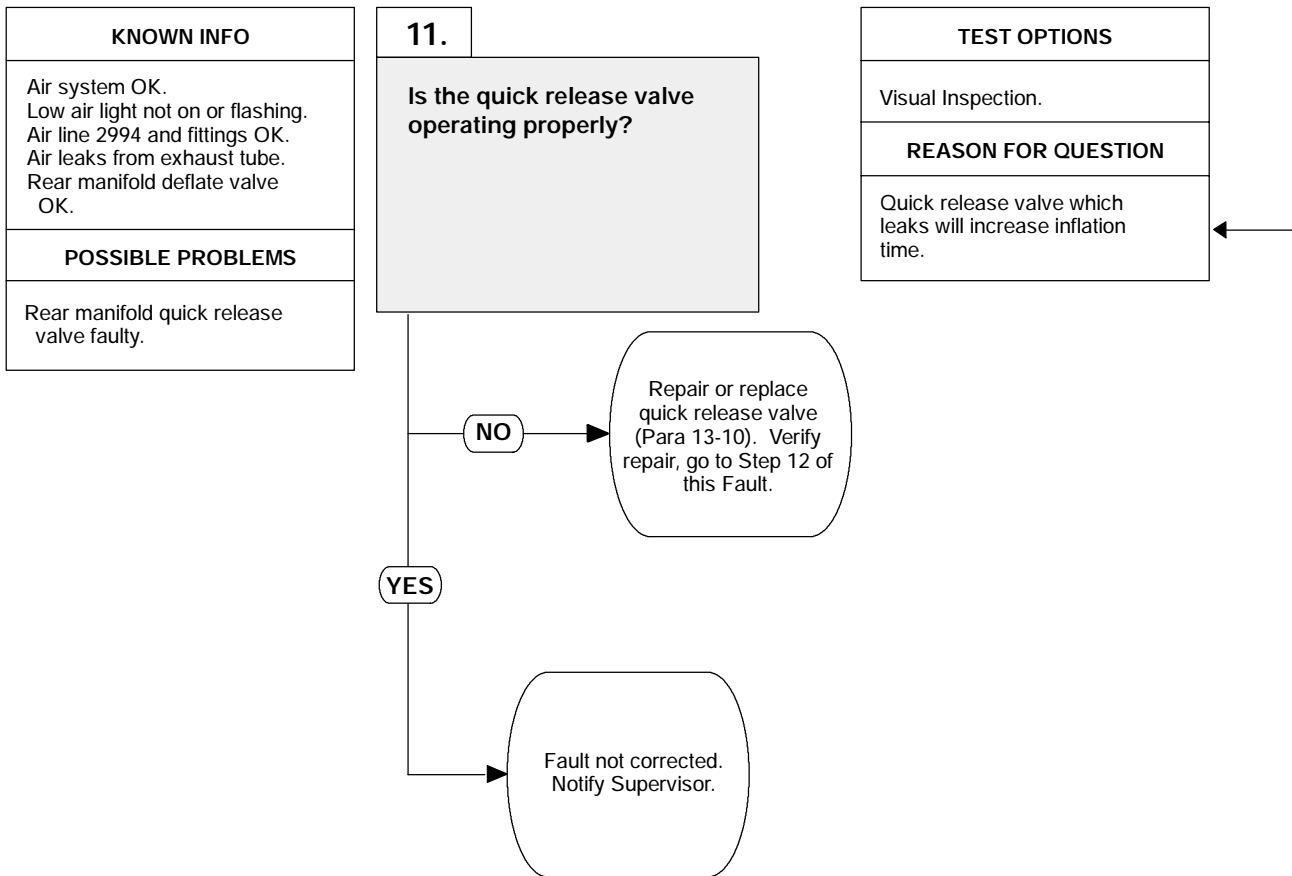


VISUAL INSPECTION

- (1) Remove deflate valve from rear manifold (Para 13-10).
- (2) Inspect valve assembly for a broken spring, damaged diaphragm, sticking, or any other physical damage.
 - (a) If deflate valve is damaged, repair or replace deflation valve (Para 13-10).
 - (b) If deflate valve is not damaged, install deflate valve and go to Step 11 of this Fault.

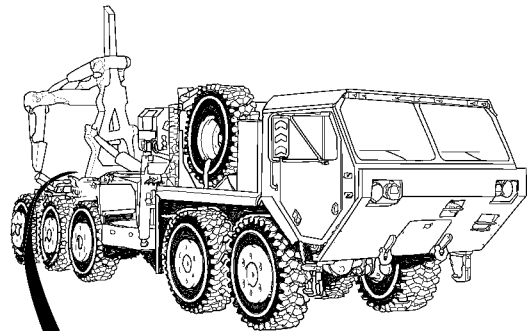


6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



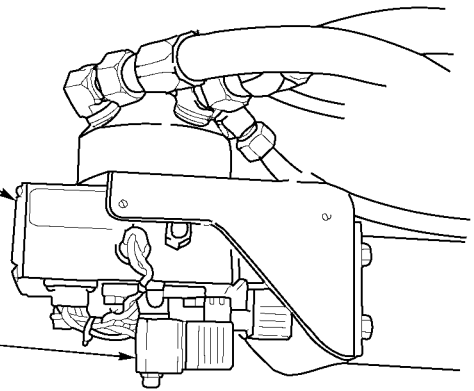
VISUAL INSPECTION

- (1) Remove quick release valve from rear manifold (Para 13-10).
- (2) Inspect valve assembly for metal shavings or dirt between the diaphragm and valve seat, or for a broken spring, damaged diaphragm, sticking, or any other physical damage.
 - (a) If quick release valve is damaged, repair or replace quick release valve (Para 13-10) and perform Steps (3) and (4) below.
 - (b) If valve is not damaged, Fault is not corrected, notify supervisor.
- (3) Install rear manifold cover (Para 13-9).
- (4) Put LHS in transit position (TM 9-2320-364-10).

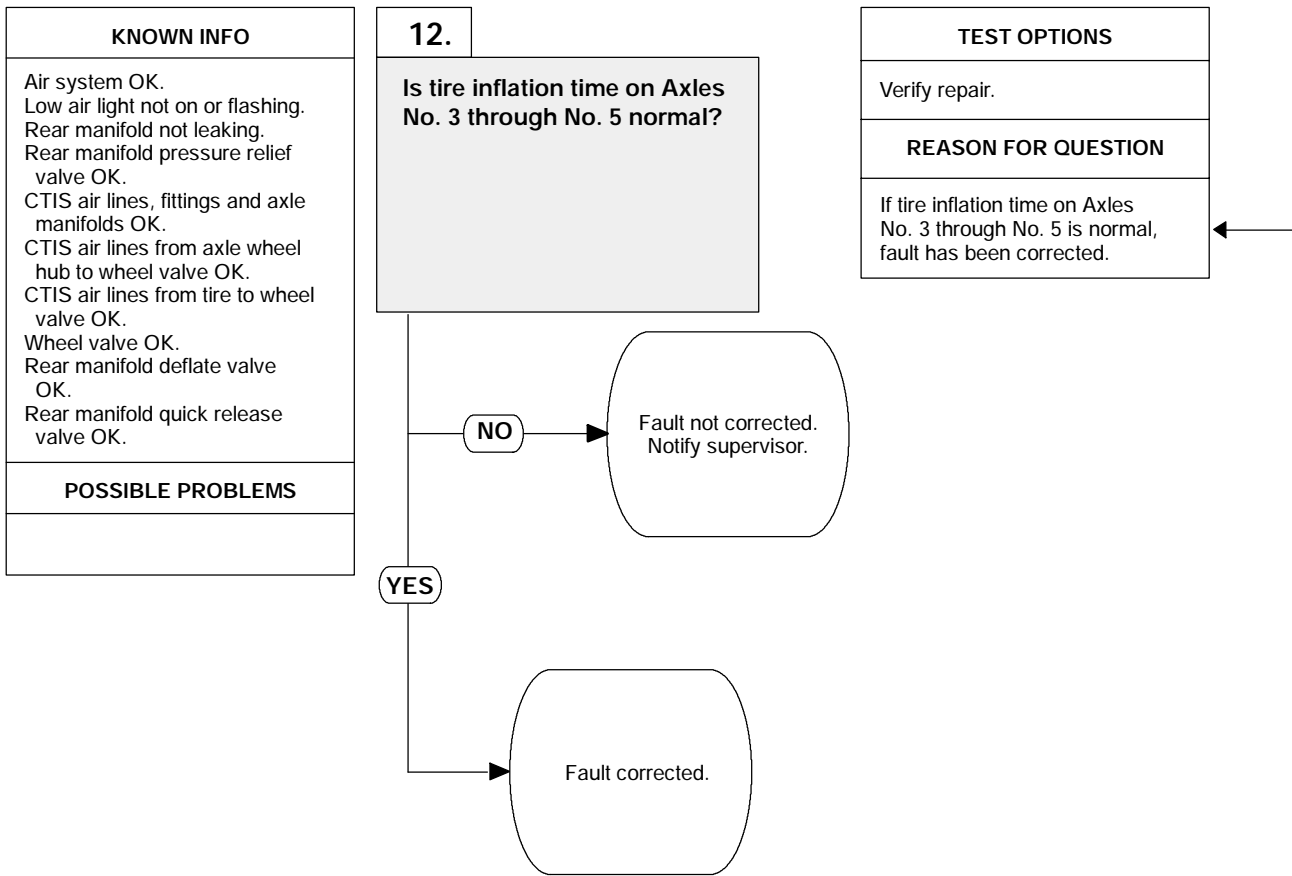


**REAR
MANIFOLD**

**QUICK
RELEASE
VALVE**



6. EXCESS INFLATION TIME AXLES NO. 3 THROUGH NO. 5, CTIS GREEN INDICATOR FLASHES TOO LONG OR CONTINUALLY (CONT).



NOTE

All inflation times are with engine running at full governed speed.

VERIFY REPAIR
(1) Start engine (TM 9-2320-364-10). (2) Set CTIS controller selector to HIGHWAY. (3) Press CTIS START button. (a) If tire inflation time is excessive (Table 2-47), fault not corrected. Turn OFF ENGINE switch and notify Supervisor. (b) If tire inflation time is normal, fault has been corrected. (4) Turn OFF ENGINE switch.

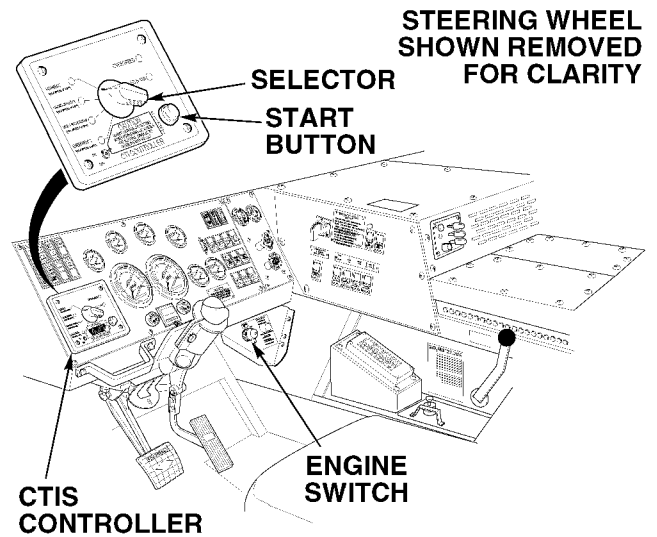


Table 2-47. CTIS Tire Inflation and Deflation Time

From	To	Maximum Time Allowed (Minutes)
<u>Inflation</u>		
Cross-country	Highway	12:30
Mud/Snow/Sand	Cross-country	5:30
Emergency	Mud/Sand/Snow	3:00
<u>Deflation</u>		
Highway	Cross-country	4:00
Cross-country	Mud/Sand/Snow	4:00
Mud/Snow/Sand	Emergency	3:00

2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

7. AXLES NO. 1 AND NO. 2 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS.

INITIAL SETUP

Tools and Special Tools

- Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
- STE/ICE-R (optional) (Item 3, Appendix G)
- Goggles, Industrial (Item 30, Appendix G)
- Multimeter (Item 44, Appendix G)
- Variable Air Supply (Item 99, Appendix G)
- Jumperwire

Materials/Parts

- Solution, Soap (Item 86, Appendix C)

Personnel Required

Two

References

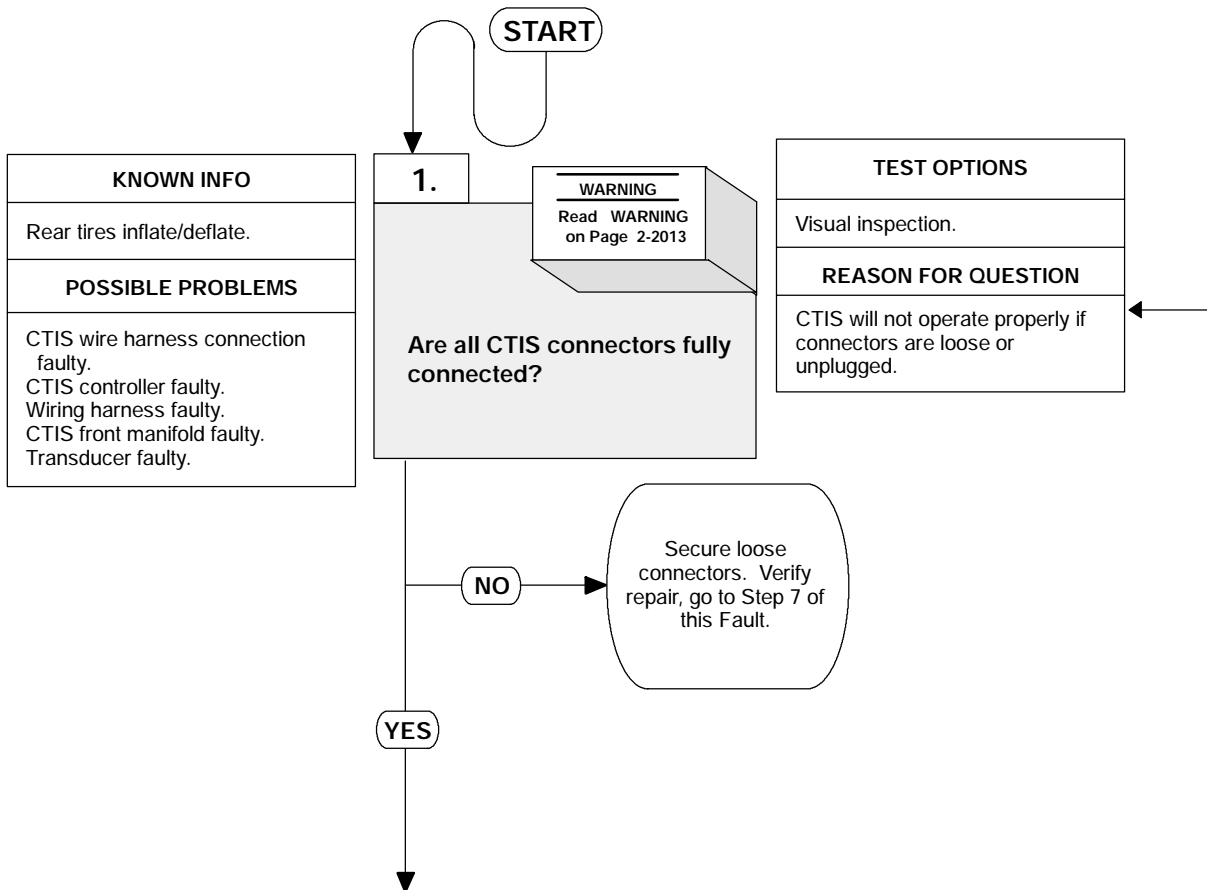
- TM 9-2320-364-10
- TM 9-4910-571-12&P

Equipment Condition

- Engine OFF, (TM 9-2320-364-10)
- Parking brake applied, (TM 9-2320-364-10)
- Wheels chocked, (TM 9-2320-364-10)
- Front access cover opened, (TM 9-2320-364-10)
- CTIS front manifold cover removed, (Para 13-8)
- CTIS turned on, (TM 9-2320-364-10)
- Load Handling System (LHS) extended fully, (TM 9-2320-364-10)

NOTE

Soap and water solution can be used to visually check for leaks.



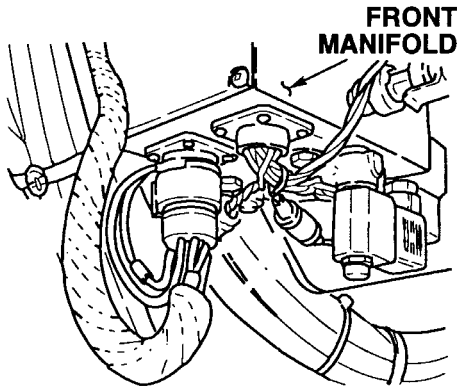
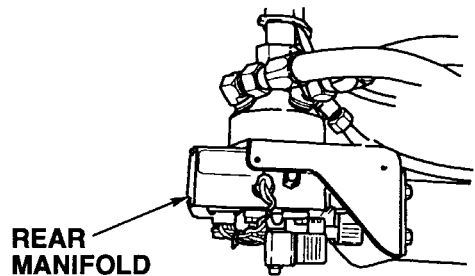
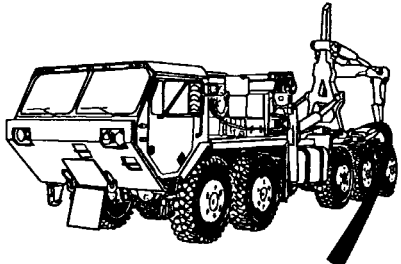
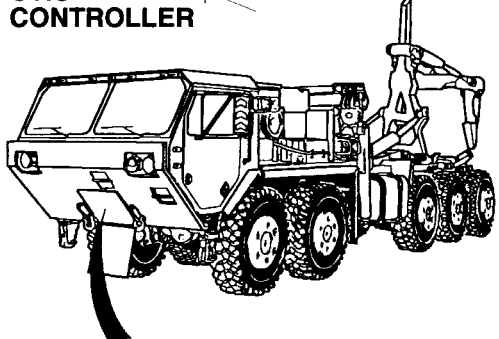
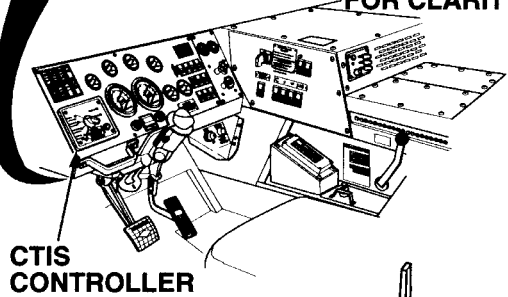
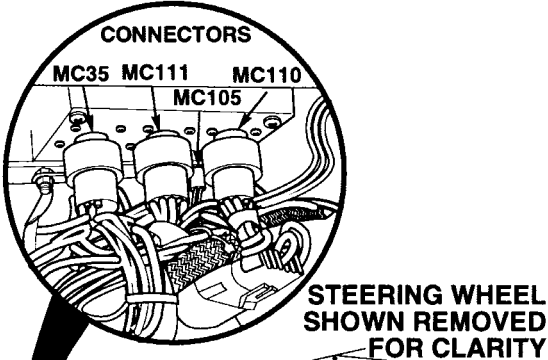
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

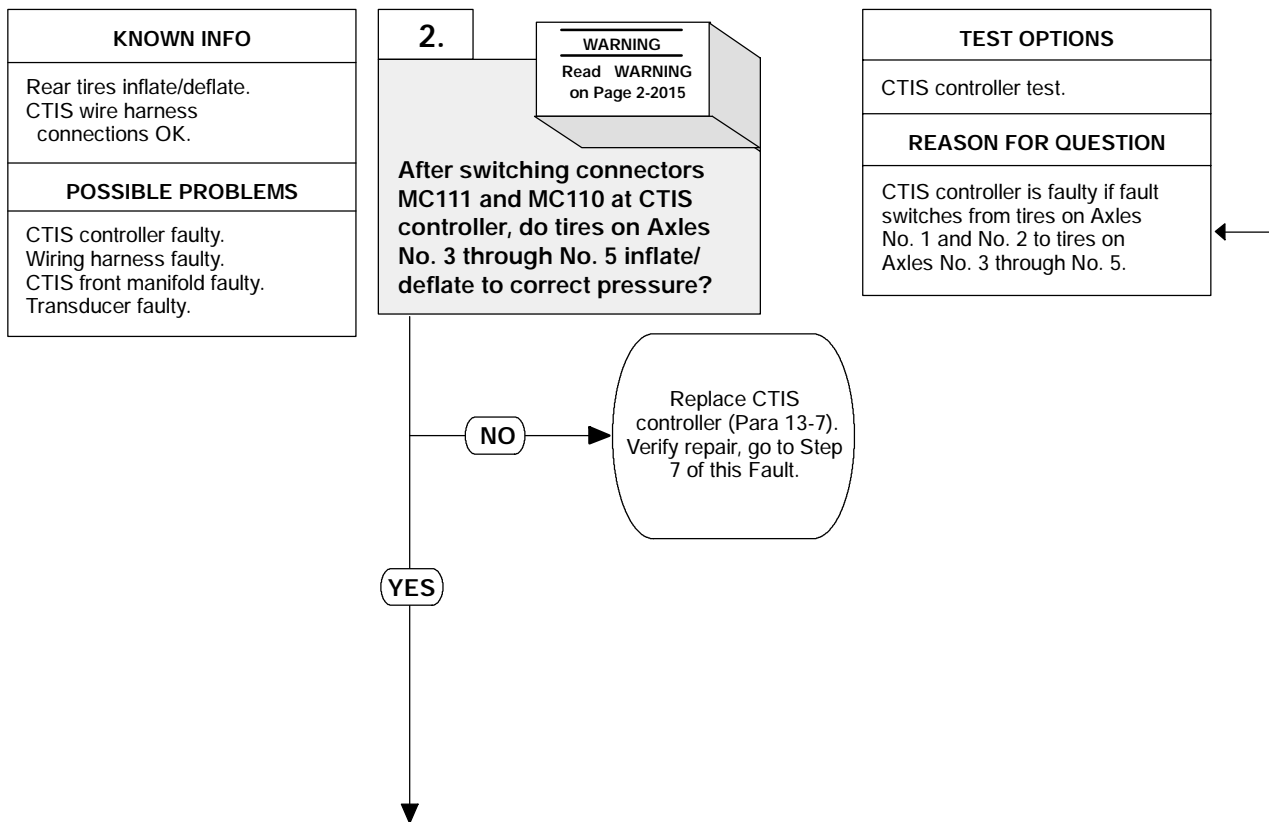
NOTE

The CTIS initially and periodically checks for system air leaks. The CTIS controller will display flashing LOW AIR light and shut off if 6 psi (41 kPa) cannot be maintained by the CTIS. The manifold will click during this check for approximately 1-1/2 minutes.

- | VISUAL INSPECTION | |
|-------------------|---|
| (1) | Inspect CTIS controller, front and rear manifolds to ensure that all connectors are fully plugged in. |
| (a) | If connectors are not plugged in, secure connectors. |
| (b) | If connectors are plugged in, go to Step 2 of this Fault. |
| (2) | Put LHS in transit position (TM 9-2320-364-10). |



7. AXLES NO. 1 AND NO. 2 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).



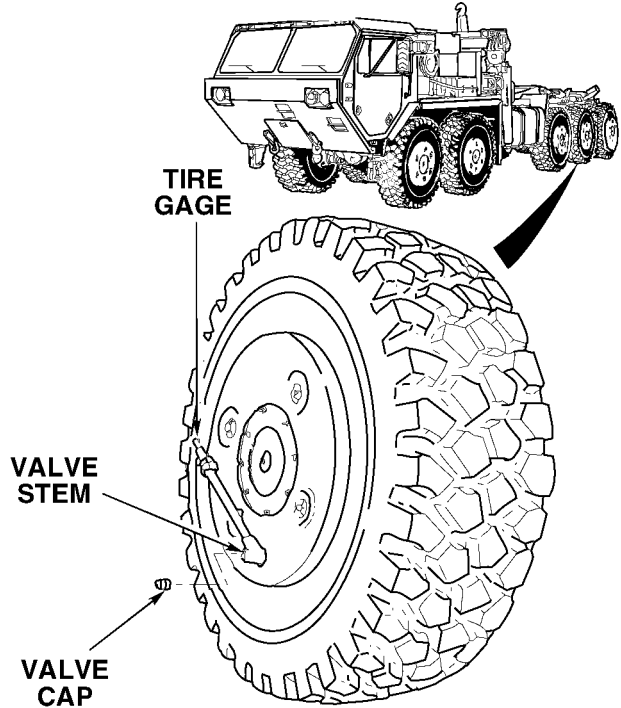
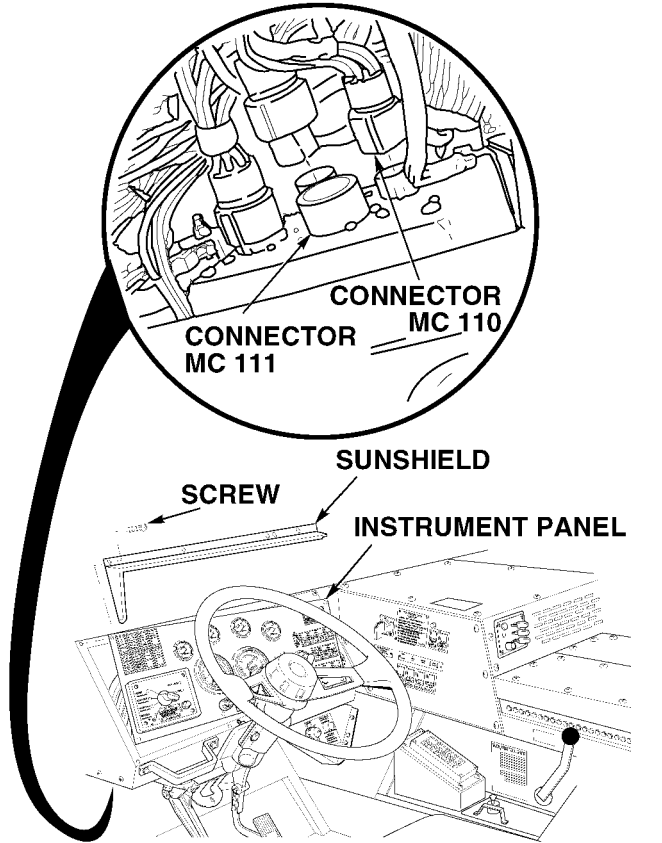
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

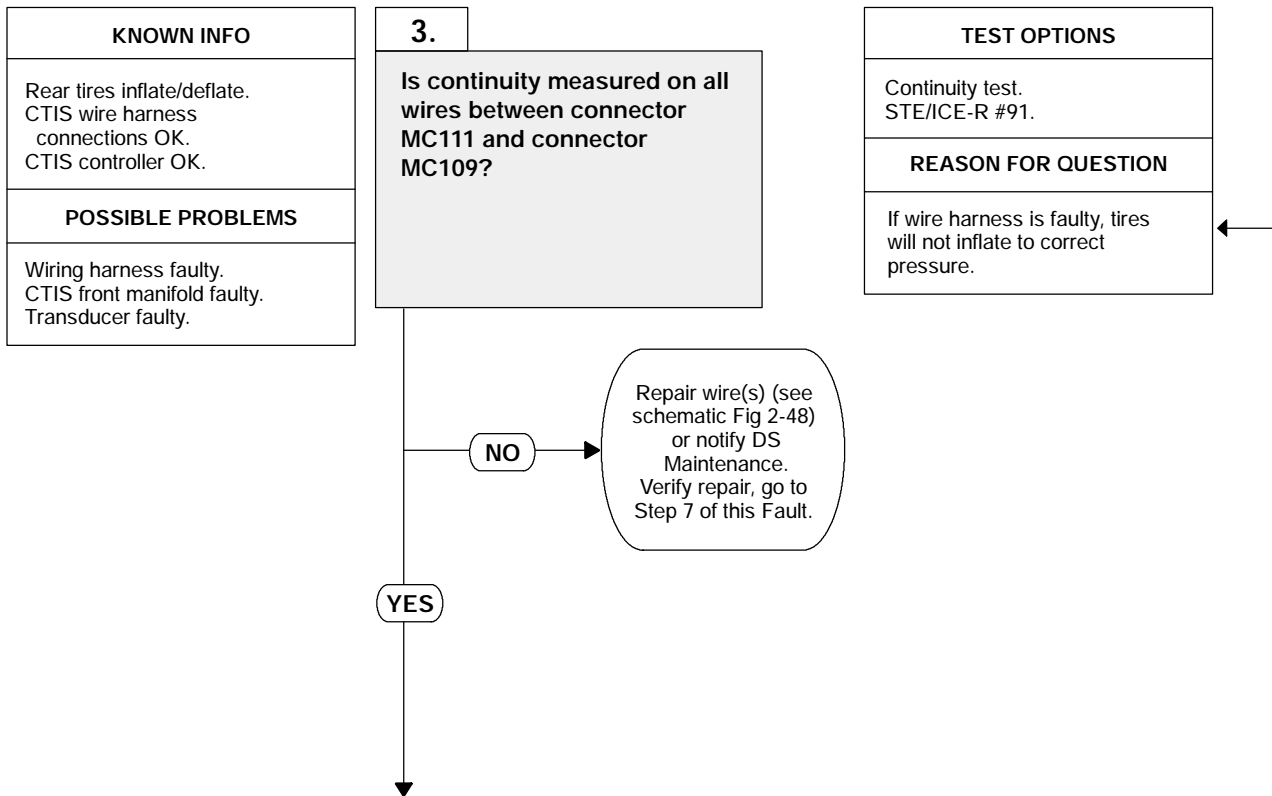
NOTE

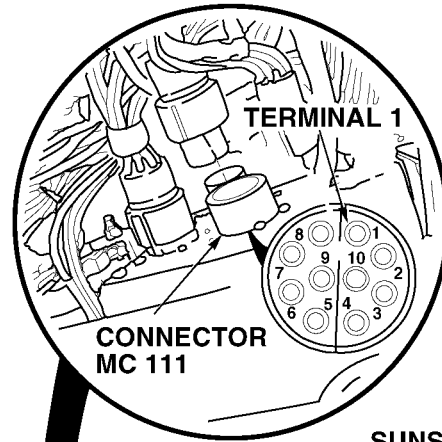
When switching MC110 connector and MC111 connector, tire pressures of front axles and rear axles will also be reversed.

CTIS CONTROLLER TEST	
(1)	Remove ten screws and sunshield from instrument panel.
(2)	Pull top of instrument panel toward steering wheel.
(3)	Disconnect front manifold harness connector MC110 from back of CTIS controller.
(4)	Disconnect rear manifold harness connector MC111 from back of CTIS controller.
(5)	Connect harness connector MC111 into CTIS controller where connector MC110 was disconnected.
(6)	Connect harness connector MC110 into CTIS controller where connector MC111 was disconnected.
(7)	Remove valve cap from any wheel valve stem on Axles No. 3 through No. 5.
(8)	Using tire gage, deflate any one tire on Axles No. 3 through No. 5 to 40 psi (276 kPa).
(9)	Start engine (TM 9-2320-364-10).
(10)	As assistant pushes CTIS START button, observe deflated tires. <ul style="list-style-type: none"> (a) If tires do not inflate or deflate to correct pressures, turn OFF ENGINE switch and replace CTIS controller (Para 13-7). (b) If tires inflate or deflate to correct pressures, CTIS controller is OK.
(11)	Deleted.
(12)	Turn OFF ENGINE switch.
(13)	Disconnect and connect connectors MC 110 and MC111 to correct CTIS controller connectors.



7. AXLES NO. 1 AND NO. 2 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).





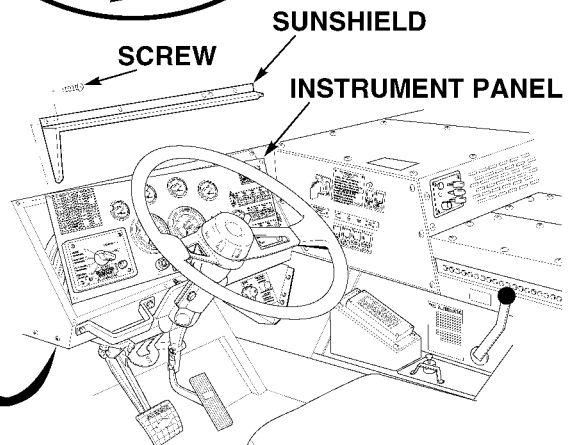
NOTE

Terminal (5) at MC 111 is plugged and does not connect to Terminal (5) on MC 109.

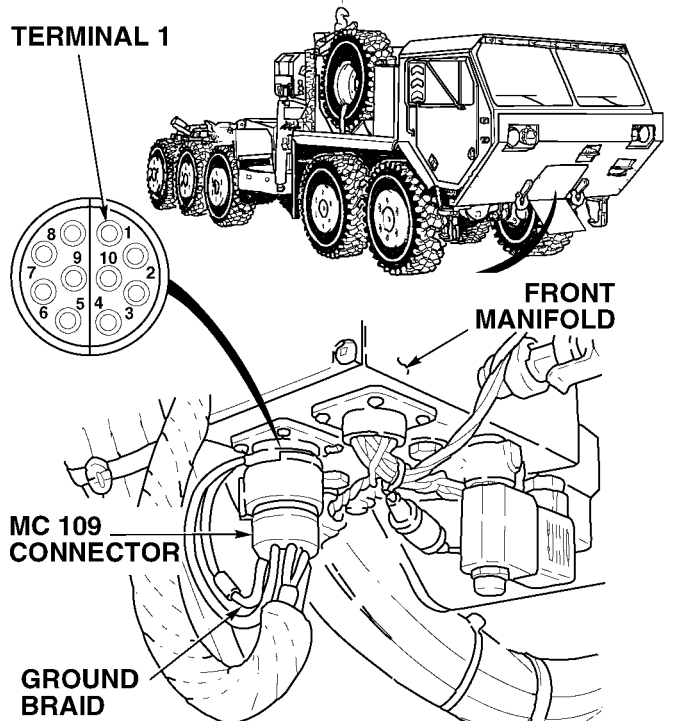
CONTINUITY TEST

- (1) Disconnect connector MC109 from CTIS front manifold.
- (2) Set multimeter select switch to ohms.
- (3) Connect jumperwire between wire 1056 on CTIS controller connector MC111, terminal 1 and a known good ground.
- (4) Is there continuity between connector MC109, terminal 1 and front manifold ground braid?
 - (a) If there is no continuity, repair wire 1056 (see schematic Fig 2-48) or notify DS Maintenance and perform Steps (6) through (9) below.
 - (b) If there is continuity, wire 1056 is OK.
- (5) Check continuity on remaining wires and terminals using Steps (2) through (4) above. The wires and corresponding terminals are listed below (see schematic Fig 2-48).

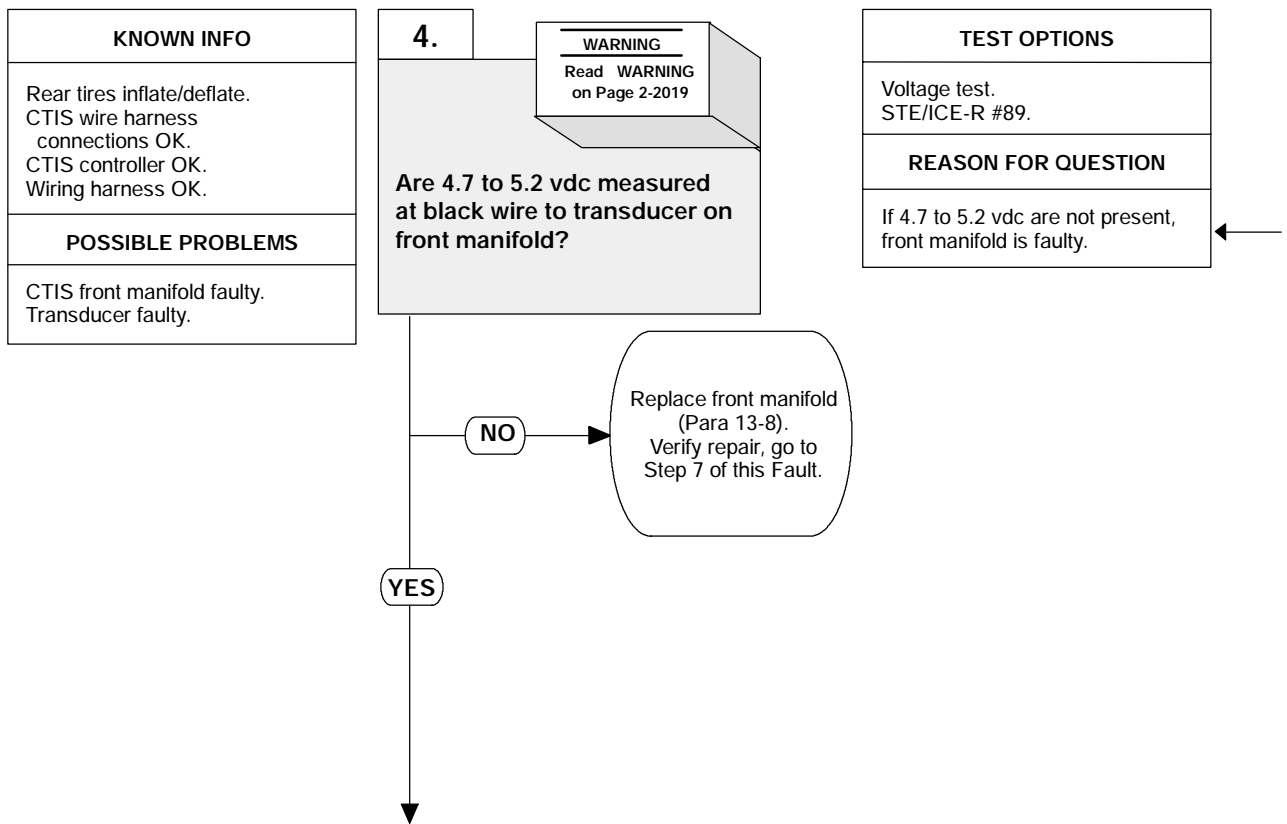
1057(2)	Shield(8)	
1058(3)	1061(6)	1064(9)
1059(4)	1062(7)	1065(10)
1063(5)	to ground (MC 109 only)	
- (6) Remove jumperwire.
- (7) Connect connector MC111 on back of CTIS controller.
- (8) Connect connector MC109 on CTIS front manifold.
- (9) Install instrument panel and sunshield with ten screws.



TERMINAL 1



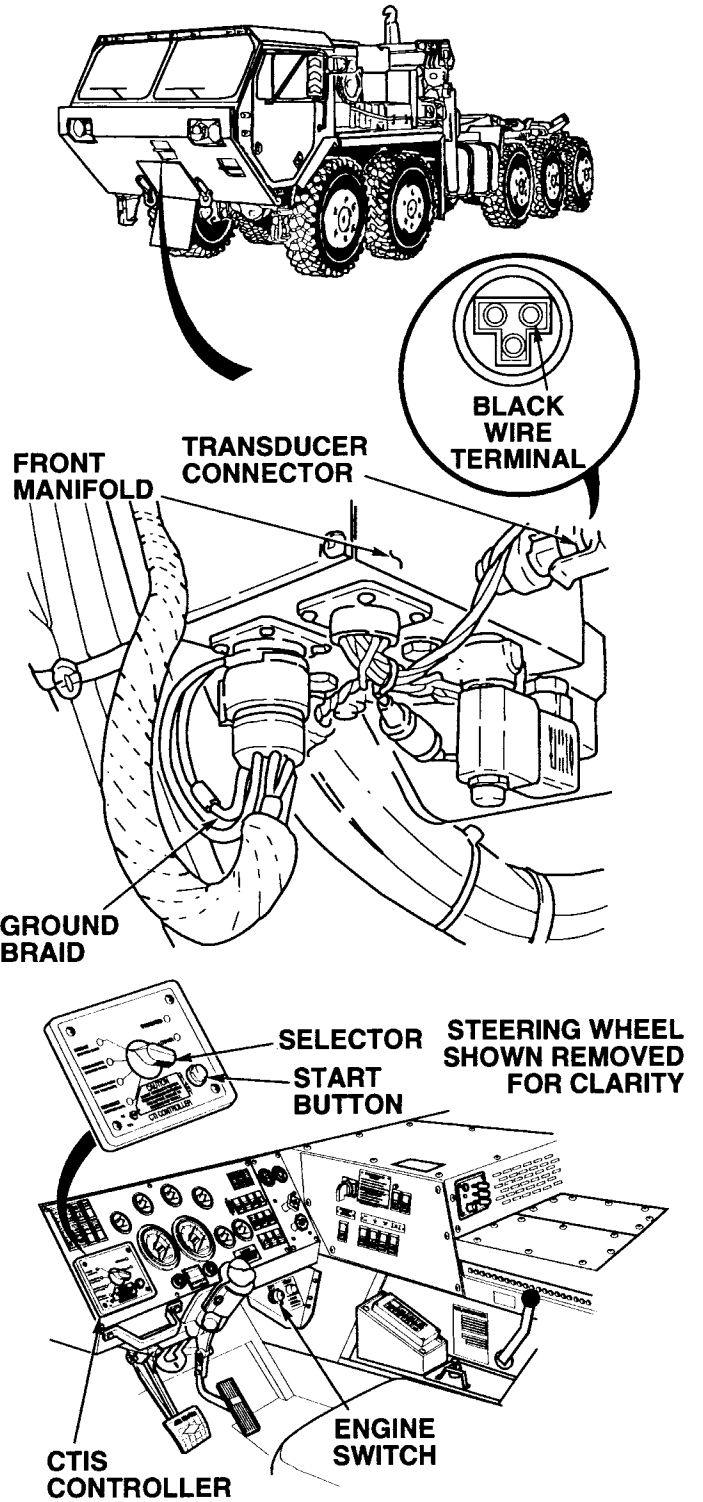
7. AXLES NO. 1 AND NO. 2 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).



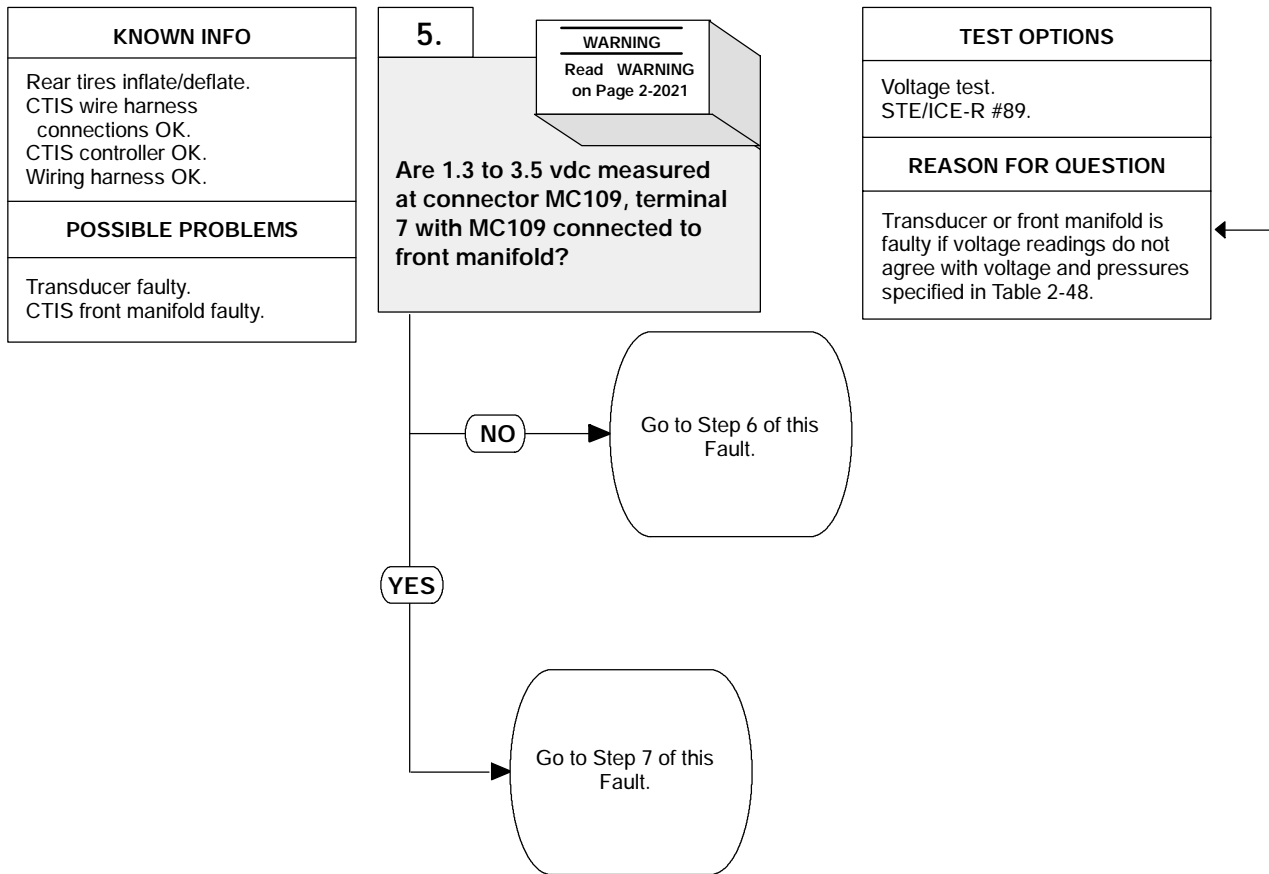
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Disconnect connector from transducer on front manifold.
 - (2) Set multimeter select switch to volts dc.
 - (3) Connect positive (+) multimeter lead to black wire terminal at transducer connector.
 - (4) Connect negative (-) multimeter lead to front manifold ground braid.
 - (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (6) Push CTIS START button.
 - (a) If 4.7 to 5.2 vdc are not present, turn OFF ENGINE switch and replace front manifold (Para 13-8).
 - (b) If there are 4.7 to 5.2 vdc present, turn OFF ENGINE switch and go to Step 5 of this Fault.



7. AXLES NO. 1 AND NO. 2 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).



WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

VOLTAGE TEST	
(1)	Remove pressure transducer (Para 13-10).
(2)	Connect pressure transducer to variable air pressure supply 0 to 75 psi (0 - 517 kPa).
(3)	Connect pressure transducer connector to transducer.
(4)	Deflate any one tire on Axles No. 1 or No. 2 to less than 40 psi (276 kPa).
(5)	Set multimeter select switch to volts dc.
(6)	Insert positive (+) multimeter lead, with long probe installed, at white wire 1062 in back of connector MC109, terminal 7.
(7)	Connect negative (-) multimeter lead to ground braid on front manifold.
(8)	Set CTIS controller switch to HIGHWAY position (TM9-2320-364-10).
(9)	While assistant turns ON ENGINE switch and pushes CTIS START button, observe voltage reading at each pressure specified in Table 2-48.
(a)	If voltage readings do not agree, turn OFF ENGINE switch and go to Step 6 of this Fault.
(b)	If voltage readings agree pressure transducer and front manifold are OK.
(10)	Turn OFF ENGINE switch.
(11)	Disconnect lead from back of connector MC109.
(12)	Disconnect pressure transducer connector from transducer.
(13)	Remove pressure transducer from variable air pressure supply.
(14)	Install pressure transducer in front manifold (Para 13-10).
(15)	Install front manifold cover (Para 13-8).
(16)	Close front access cover.

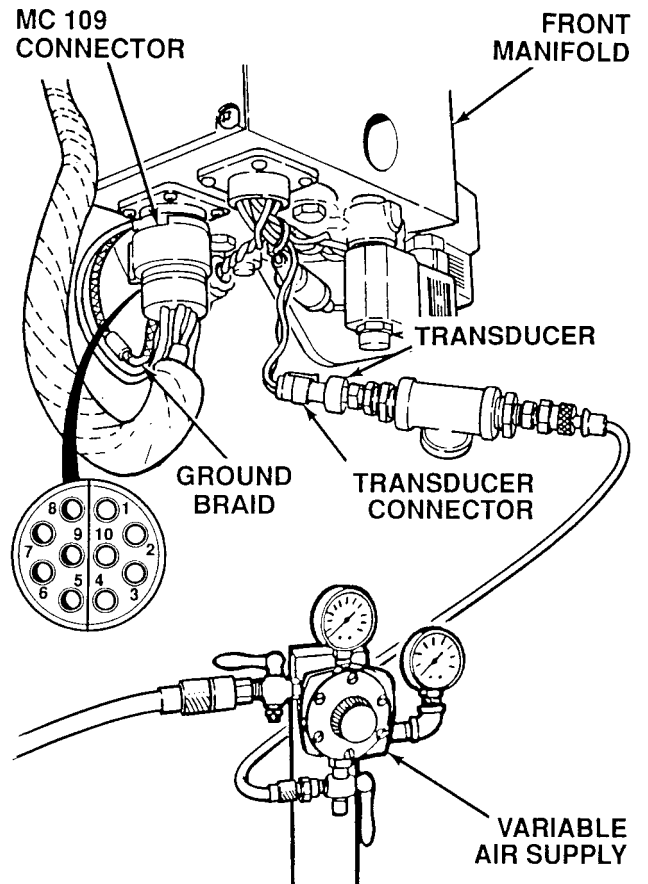
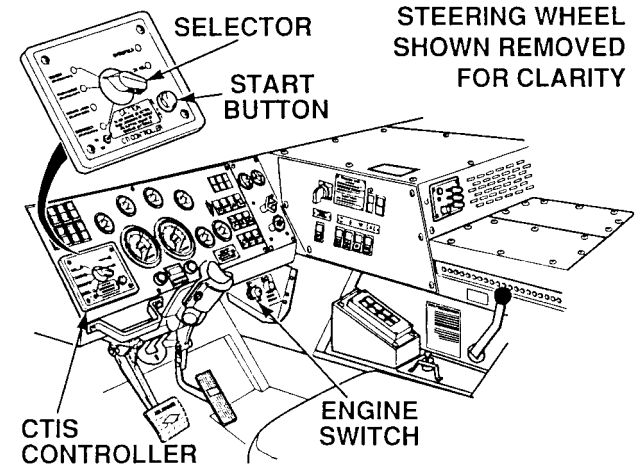
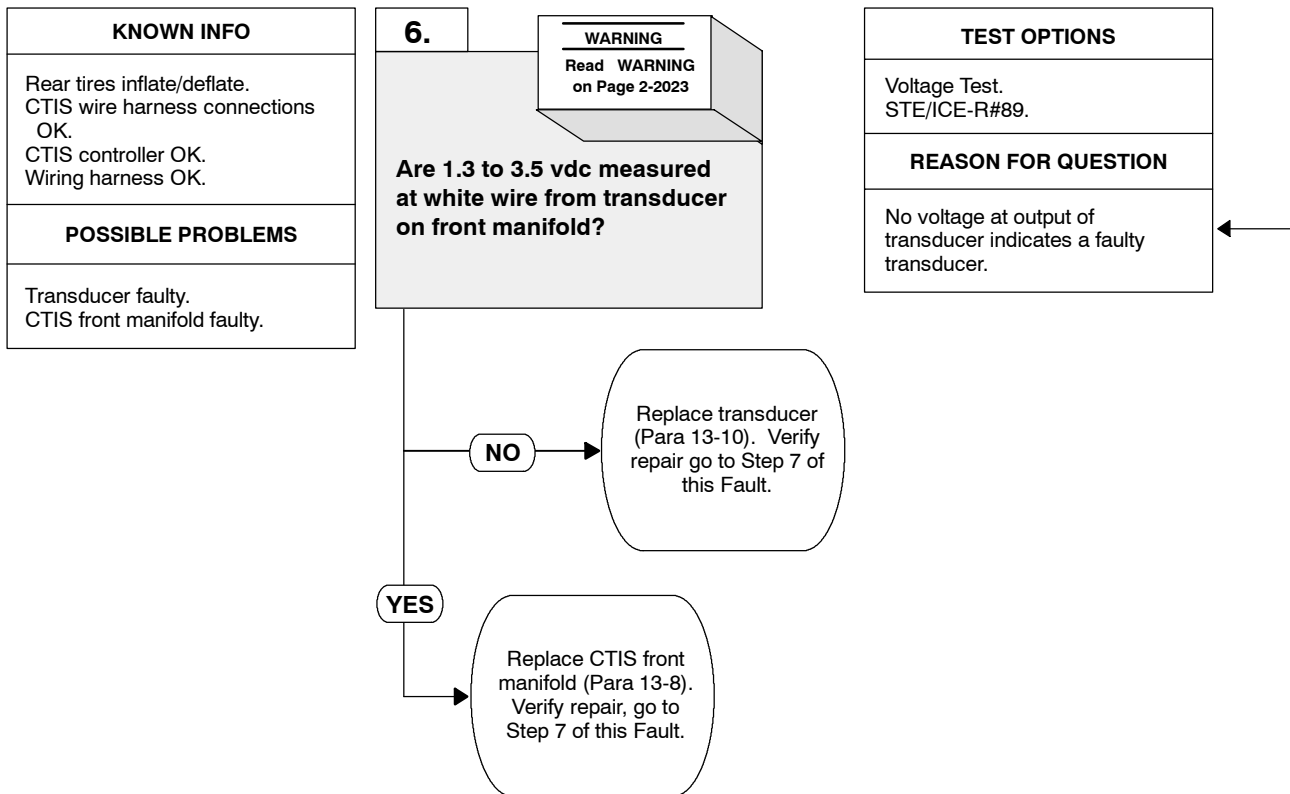


Table 2-48. CTIS Volts Versus Pressure (PSI)

PSI	kPa	Volts
	(Plus/Minus 0.2 volts)	
75	517-	3.5
70	482-	3.3
60	413-	2.9
50	345-	2.5
40	276-	2.0
30	207-	1.7
20	138-	1.3

7. AXLES NO. 1 AND NO. 2 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

All connectors must be connected to manifold and transducer to perform this test.

VOLTAGE TEST	
(1)	Insert positive (+) multimeter lead with long probe installed, at white wire in transducer.
(2)	Connect negative (-) multimeter lead to ground braid on front manifold.
(3)	While assistant turns ON ENGINE switch and pushes CTIS START button, observe voltage reading at each pressure specified in Table 2-49.
(a)	If voltage readings do not agree, turn OFF ENGINE switch and replace transducer (Para 13-10). Perform Steps (5) through (10) below.
(b)	If voltage readings agree, replace CTIS front manifold (Para 13-8).
(4)	Turn OFF ENGINE switch.
(5)	Disconnect lead from back of transducer.
(6)	Disconnect pressure transducer connector from pressure transducer.
(7)	Remove pressure transducer from variable air supply.
(8)	Install pressure transducer in front manifold (Para 13-10).
(9)	Install manifold cover (Para 13-8).
(10)	Close front access cover (TM 9-2320-364-10).

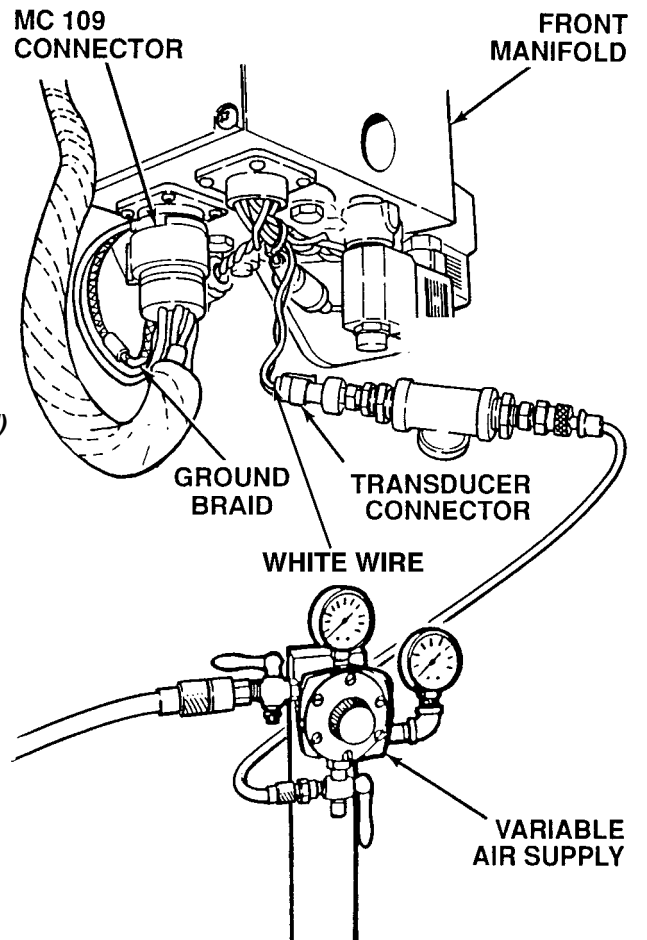
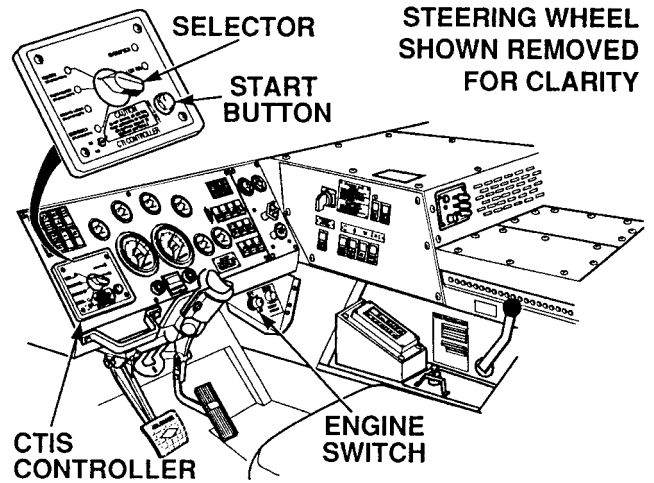
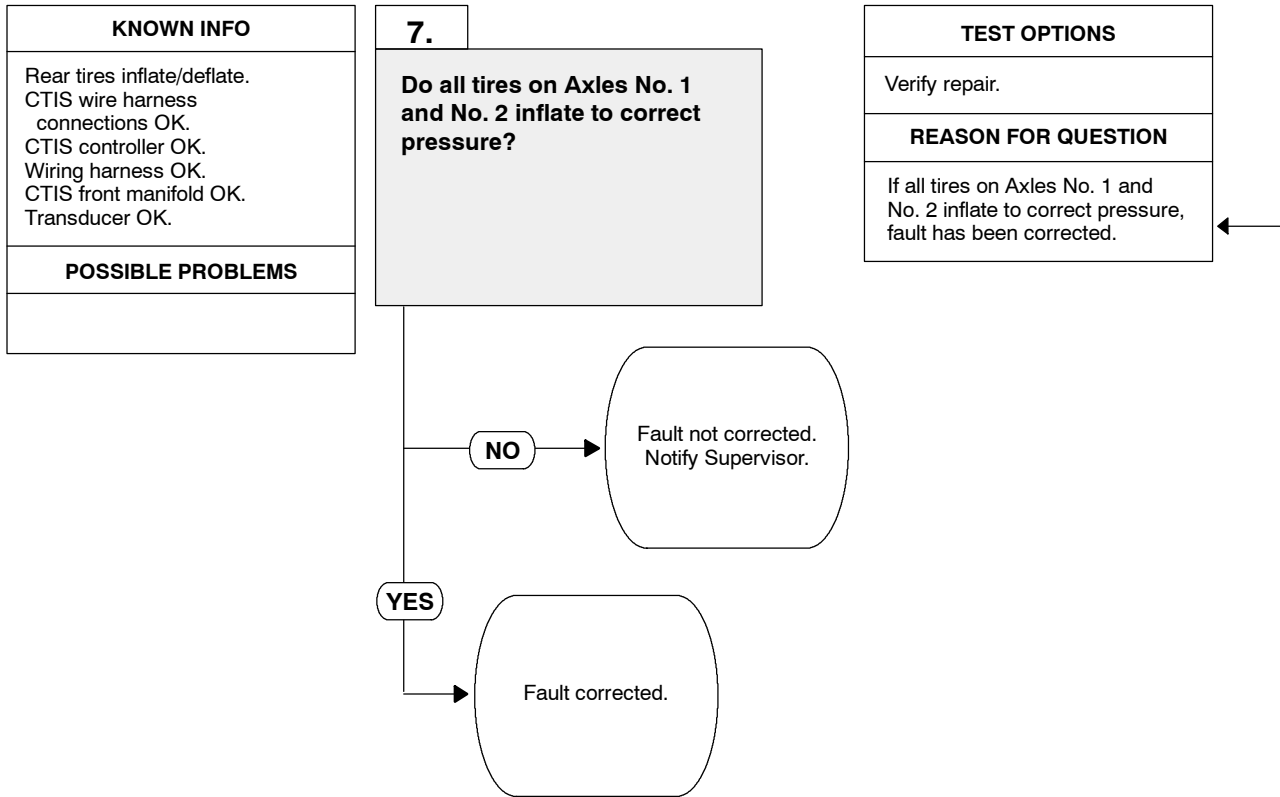
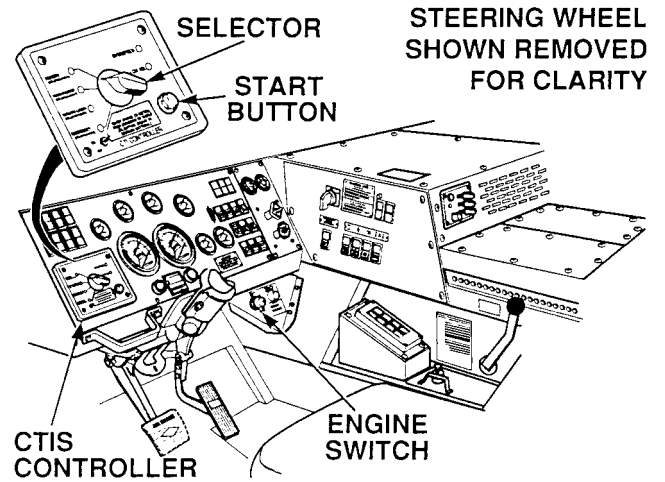


Table 2-49. CTIS Volts Versus Pressure (PSI)

PSI	kPa (Plus/Minus 0.2 volts)	Volts
75	517-	3.5
70	482-	3.3
60	413-	2.9
50	345-	2.5
40	276-	2.0
30	207-	1.7
20	138-	1.3

7. AXLES NO. 1 AND NO. 2 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).





VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button.
 - (a) If tires do not inflate to correct pressure, fault not corrected. Turn OFF ENGINE switch and notify Supervisor.
 - (b) If tires inflate to correct pressure, fault has been corrected.
- (4) Turn OFF ENGINE switch.

2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

8. AXLES NO. 3 THROUGH NO. 5 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix H)
 STE/ICE-R (optional) (Item 3, Appendix H)
 Goggles, Industrial (Item 30, Appendix H)
 Multimeter (Item 44, Appendix H)
 Variable Air Supply (Item 99, Appendix H)
 Jumperwire

Materials/Parts

Solution, Soap (Item 86, Appendix C)

Personnel Required

Two

References

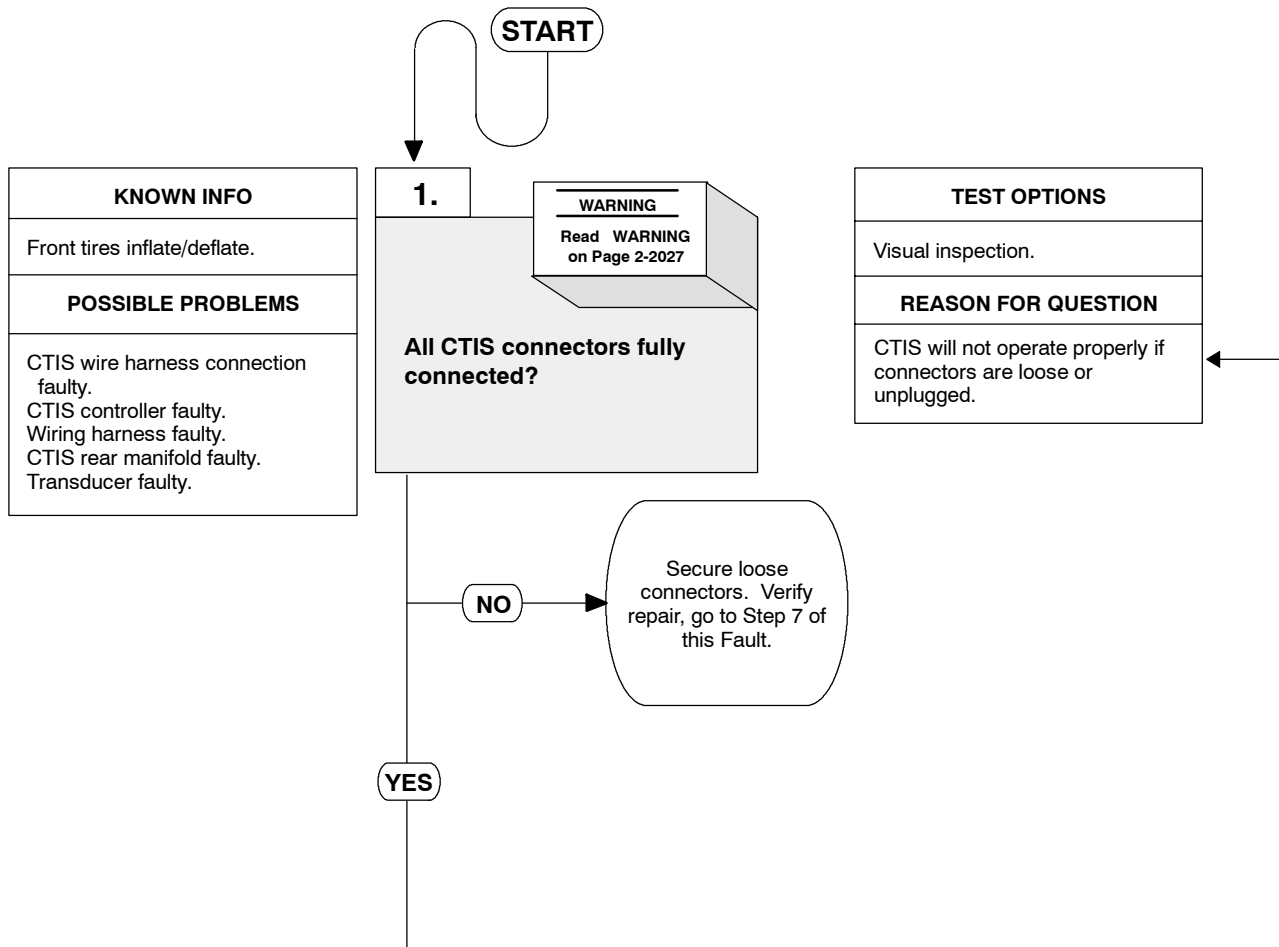
TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Load Handling System (LHS) extended fully, (TM 9-2320-364-10)
 CTIS rear manifold cover removed, (Para 13-9)
 CTIS turned on, (TM 9-2320-364-10)

NOTE

Soap and water solution can be used to visually check for leaks.



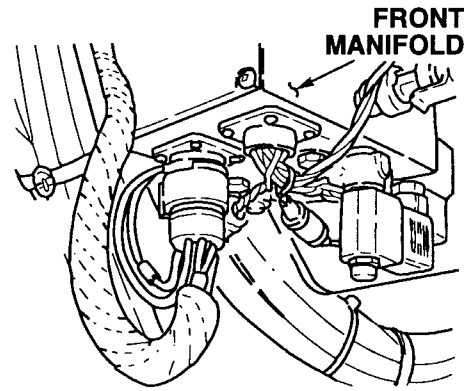
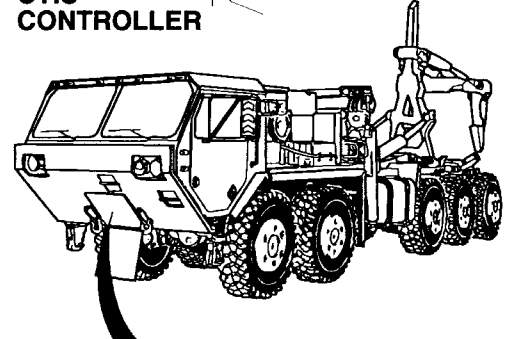
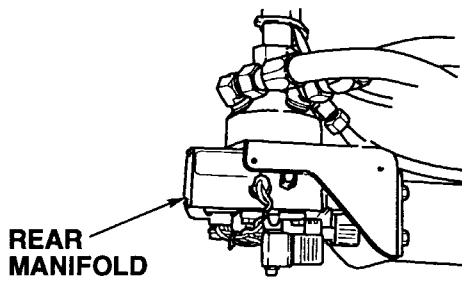
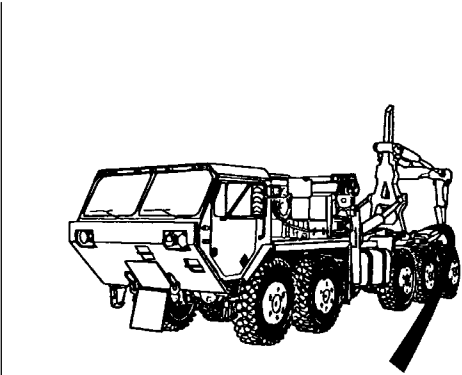
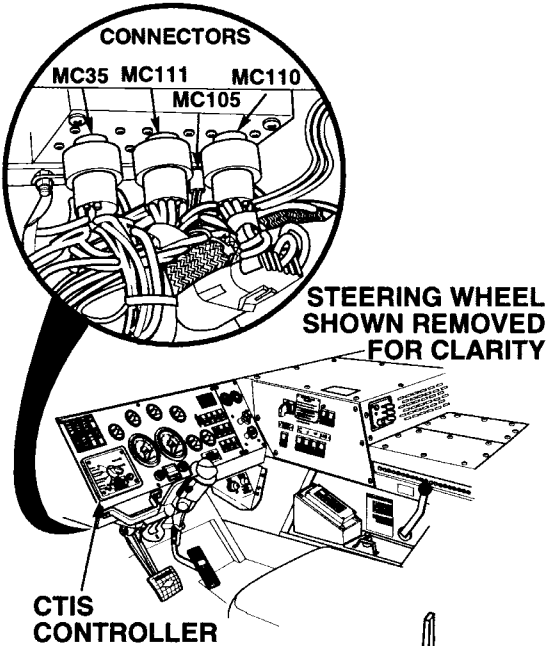
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

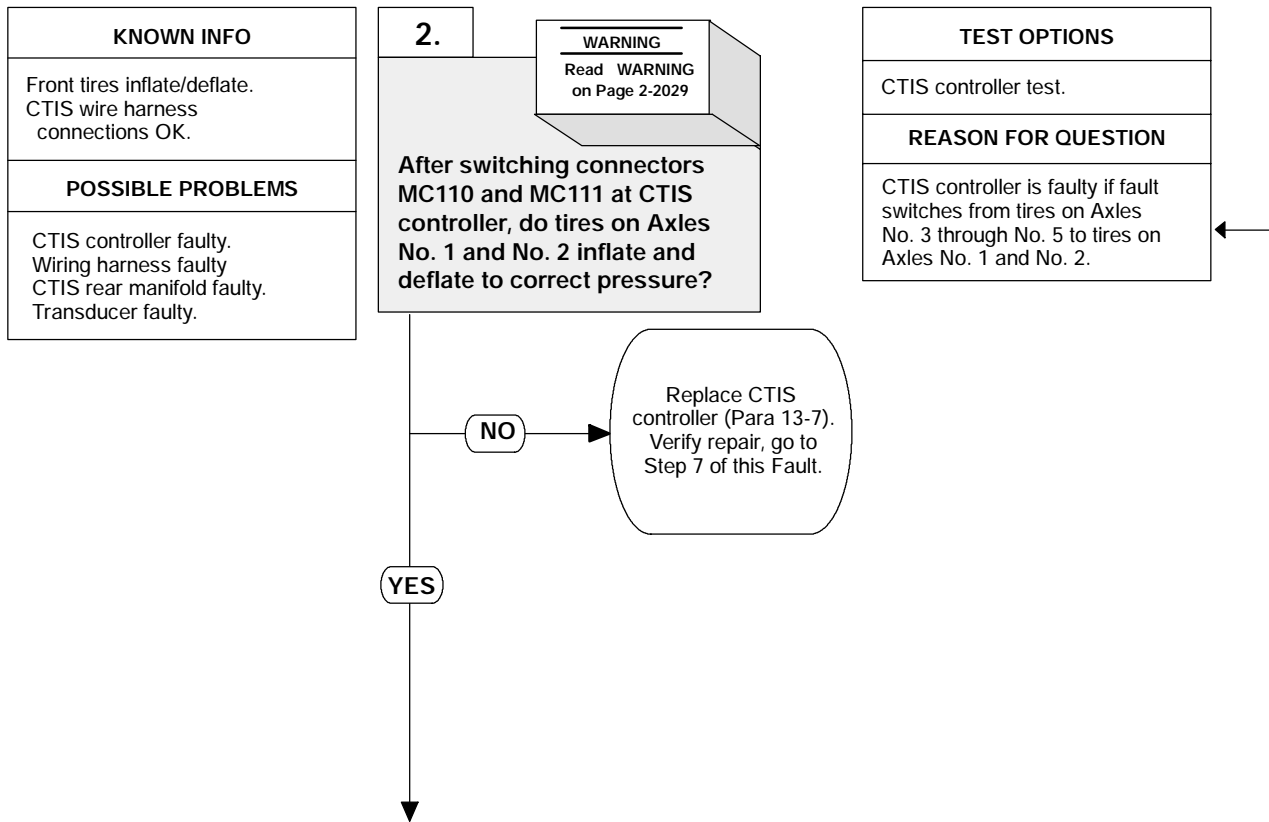
NOTE

The CTIS initially and periodically checks for system air leaks. The CTIS controller will display flashing LOW AIR light and shut off if 6 psi (41 kPa) cannot be maintained by the CTIS. The manifold will click during this check for approximately 1-1/2 minutes.

VISUAL INSPECTION
<p>(1) Inspect CTIS controller, front and rear manifolds to ensure that all connectors are fully plugged in.</p> <p>(a) If connectors are not plugged in, secure connectors.</p> <p>(b) If connectors are plugged in, go to Step 2 of this Fault.</p> <p>(2) Close front access cover (TM 9-2320-364-10).</p>



8. AXLES NO. 3 THROUGH NO. 5 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).



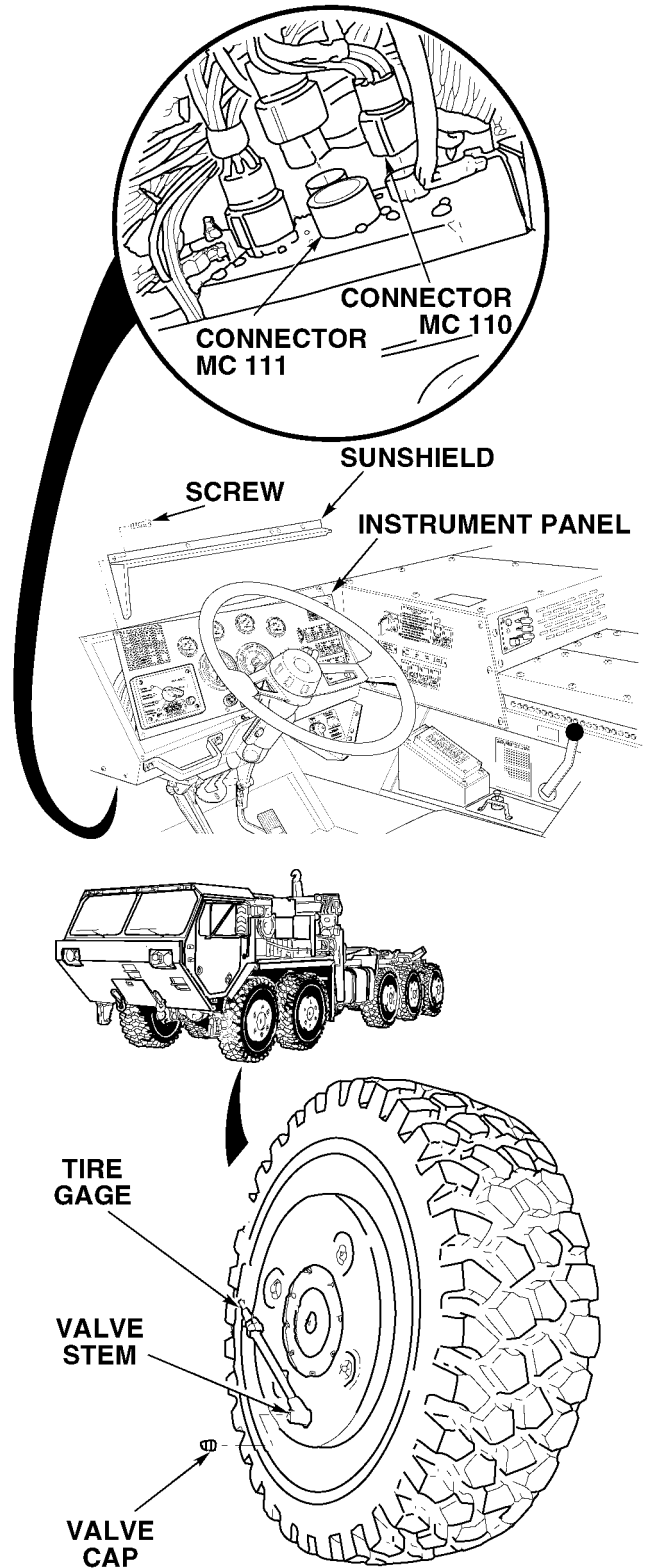
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

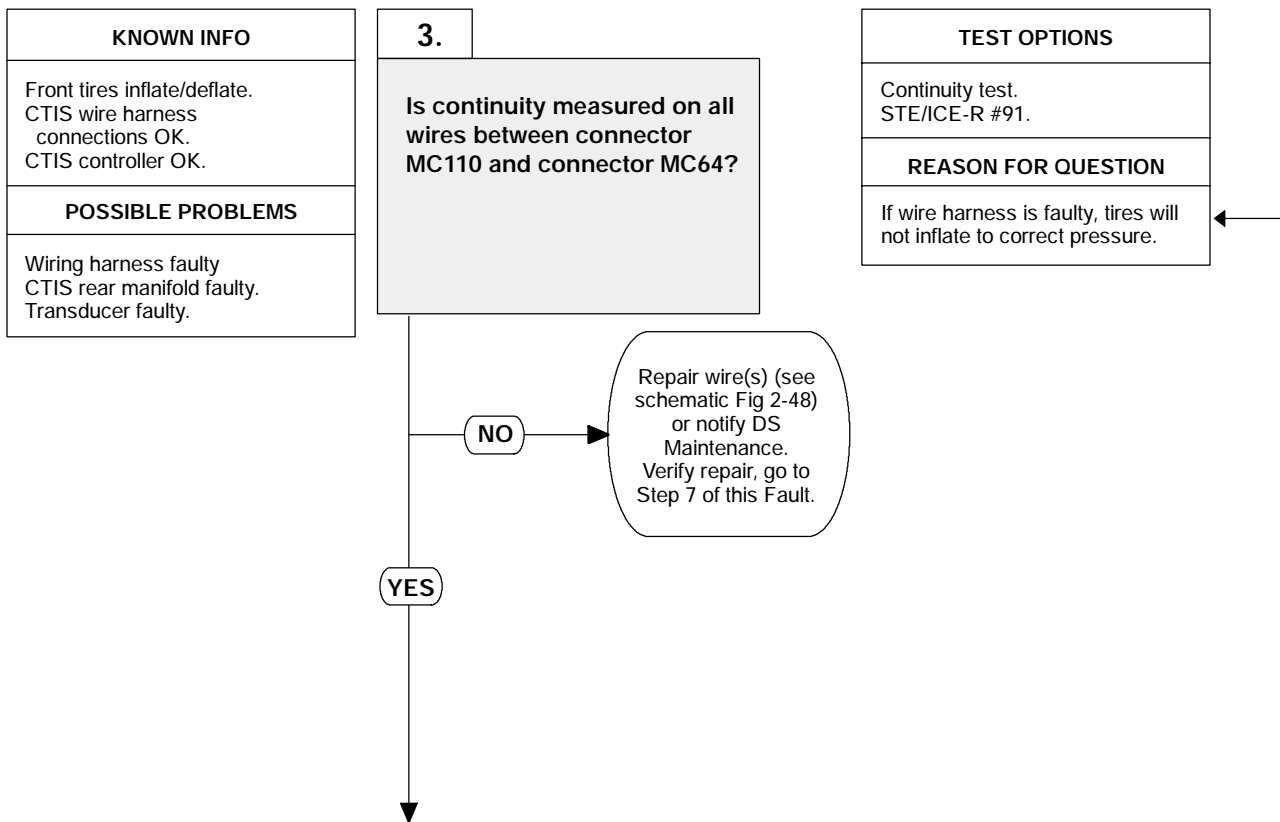
NOTE

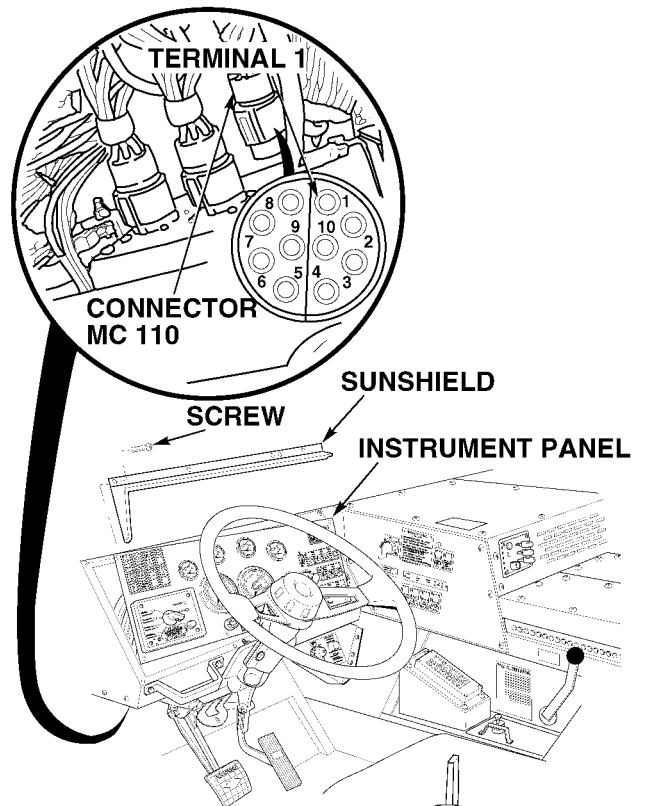
When switching MC110 connector and MC111 connector, tire pressures of front axles and rear axles will also be reversed.

CTIS CONTROLLER TEST	
(1)	Remove ten screws and sunshield from instrument panel.
(2)	Pull top of instrument panel toward steering wheel.
(3)	Disconnect front manifold harness connector MC110 from back of CTIS controller.
(4)	Disconnect rear manifold harness connector MC111 from back of CTIS controller.
(5)	Connect harness connector MC111 into CTIS controller where connector MC110 was disconnected.
(6)	Connect harness connector MC110 into CTIS controller where connector MC111 was disconnected.
(7)	Remove valve cap from any wheel valve stem on Axles No. 1 or No. 2.
(8)	Using tire gage, deflate any one tire on Axles No. 1 or No. 2 to 40 psi (276 kPa).
(9)	Start engine (TM 9-2320-364-10).
(10)	As assistant pushes CTIS START button, observe deflated tires. <ul style="list-style-type: none"> (a) If tires do not inflate or deflate to correct pressures, turn OFF ENGINE switch and replace CTIS controller (Para 13-7). (b) If tires inflate or deflate to correct pressures, CTIS controller is OK.
(11)	Turn OFF ENGINE switch.
(12)	Disconnect and connect connector MC110 and MC 111 to correct CTIS controller connectors.



8. AXLES NO. 3 THROUGH NO. 5 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).





NOTE

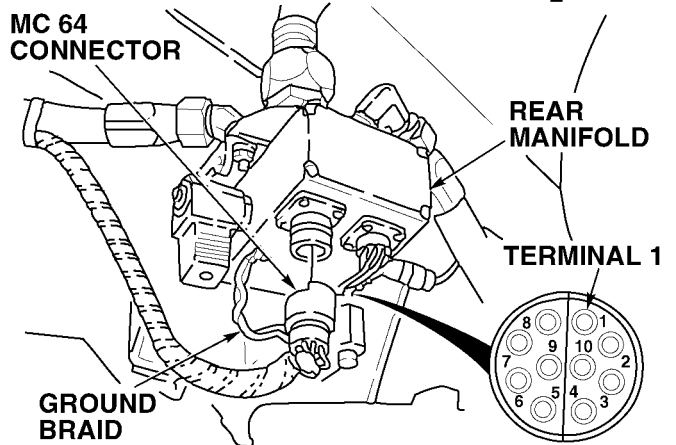
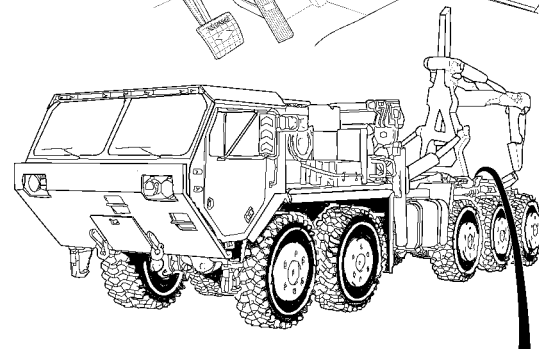
Terminal (5) at MC 110 is plugged and does not connect to terminal (5) on MC 64.

CONTINUITY TEST

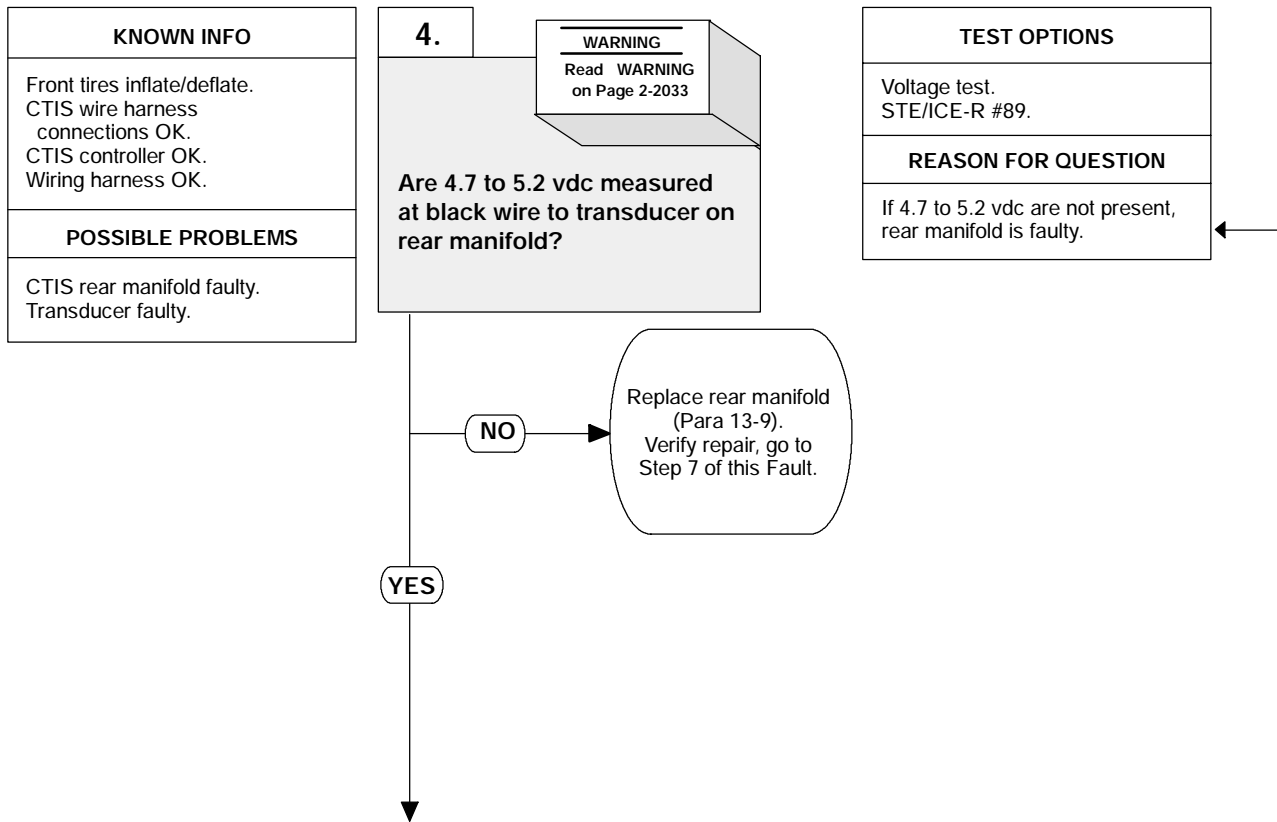
- (1) Disconnect connector MC64 from CTIS rear manifold.
- (2) Set multimeter select switch to ohms.
- (3) Connect jumperwire between wire 1072 on CTIS controller connector MC110, terminal 1 and a known good ground.
- (4) Is there continuity between connector MC64, terminal 1 and rear manifold ground braid?
 - (a) If there is no continuity, repair wire 1072 (see schematic Fig 2-48) or notify DS Maintenance, and perform Steps (6) through (9) below.
 - (b) If there is continuity, wire 1072 is OK.
- (5) Check continuity on remaining wires in harness. The wires and corresponding terminals are listed below (see schematic Fig 2-48).

1073(2)	1070(6)	1068(9)
1076(3)	1066(7)	1074(10)
1071(4)	Shield(8)	
1067(5) to ground (MC 64 only)		

- (6) Remove jumperwire.
- (7) Connect connector MC110 on back of CTIS controller.
- (8) Connect connector MC64 on CTIS rear manifold.
- (9) Install instrument panel and sunshield with ten screws.



8. AXLES NO. 3 THROUGH NO. 5 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).

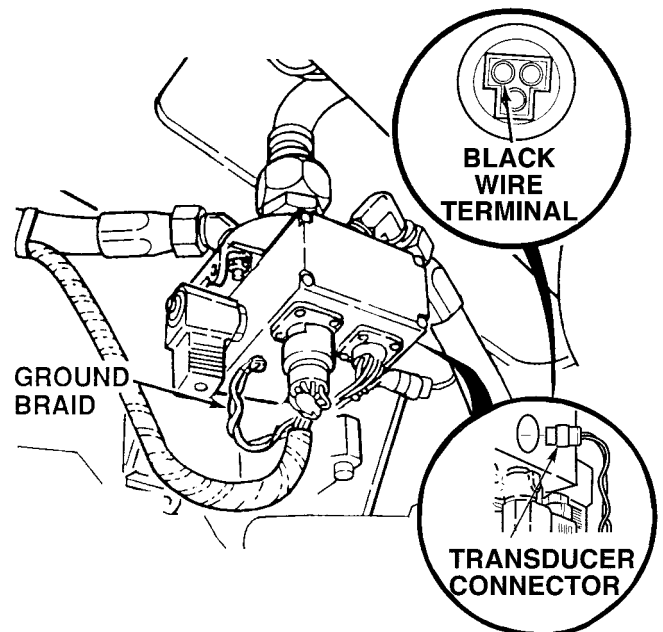
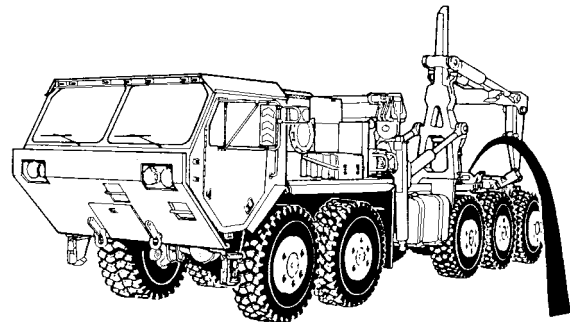


WARNING

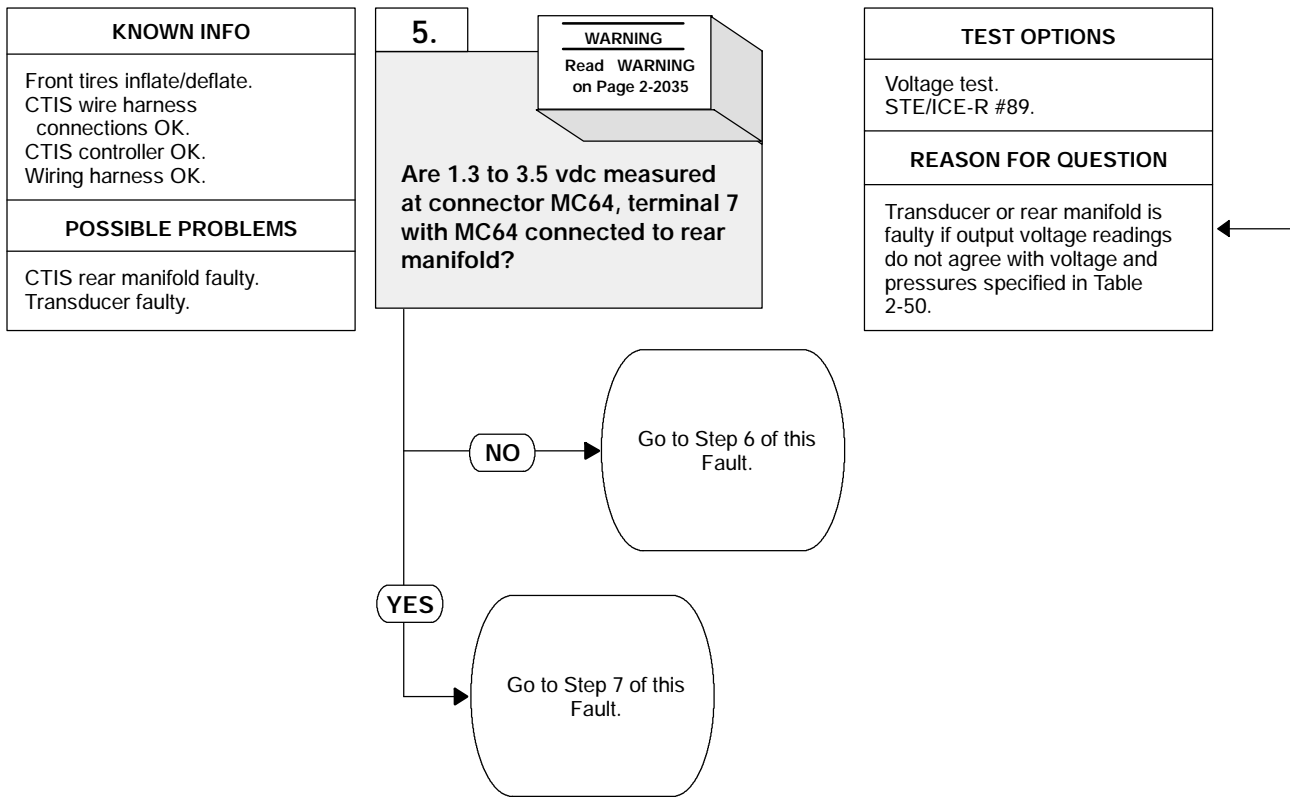
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Disconnect connector from transducer on rear manifold.
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead to black wire terminal at transducer connector.
- (4) Connect negative (-) multimeter lead to rear manifold ground braid.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
- (6) Push CTIS START button.
 - (a) If 4.7 to 5.2 vdc are not present, turn OFF ENGINE switch and replace rear manifold (Para 13-9).
 - (b) If 4.7 to 5.2 vdc are present, turn OFF ENGINE switch and go to Step 5 of this Fault.
- (7) Connect connector on transducer.



8. AXLES NO. 3 THROUGH NO. 5 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).



WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

VOLTAGE TEST
(1) Remove pressure transducer (Para 13-10).
(2) Connect pressure transducer to variable air pressure supply 0 to 75 psi (0 to 517 kPa).
(3) Connect pressure transducer connector to transducer.
(4) Using tire gage, deflate any one tire on Axles No. 3 through No. 5 to less than 40 psi (276 kPa).
(5) Set multimeter select switch to volts dc.
(6) Insert positive (+) multimeter lead, with long probe installed, at white wire 1066 in back of connector MC64, terminal 7.
(7) Connect negative (-) multimeter lead to ground braid on rear manifold.
(8) Set CTIS controller switch to HIGHWAY position (TM 9-2320-364-10).
(9) While assistant turns ON ENGINE switch and pushes CTIS START button, observe voltage reading at each pressure specified in Table 2-50. <ul style="list-style-type: none"> (a) If voltage readings do not agree, turn OFF ENGINE switch and go to Step 6 of this Fault. Perform step (11). (b) If voltage readings agree, pressure transducer and front manifold are OK.
(10) Turn OFF ENGINE switch.
(11) Disconnect lead from back of connector MC64.
(12) Disconnect pressure transducer connector from transducer.
(13) Remove pressure transducer from variable air pressure supply.
(14) Install pressure transducer in rear manifold (Para 13-10).
(15) Install rear manifold cover (Para 13-9).
(16) Put LHS in transit position.

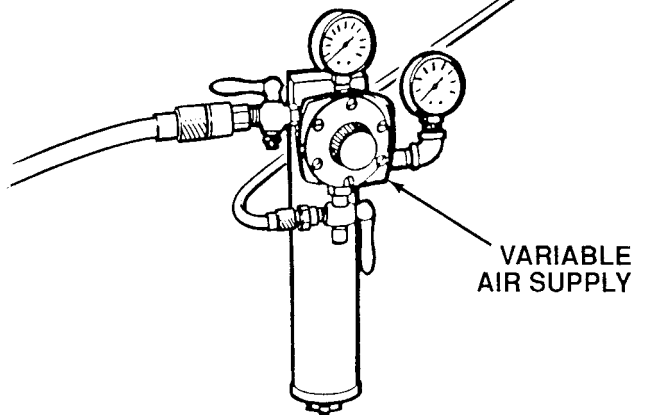
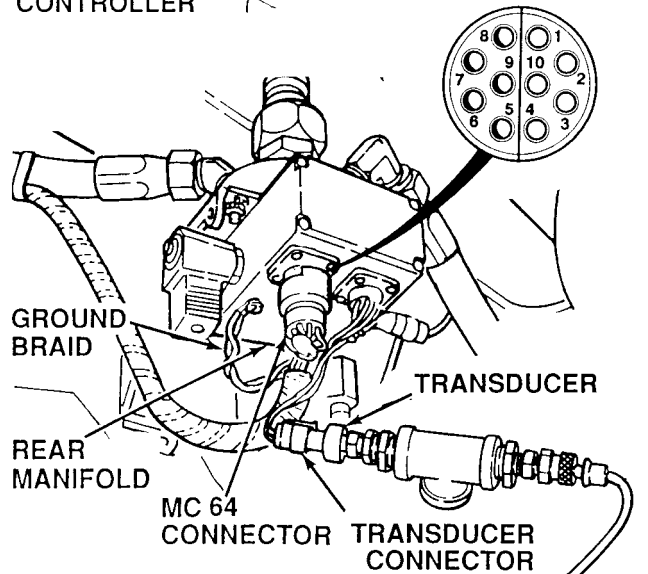
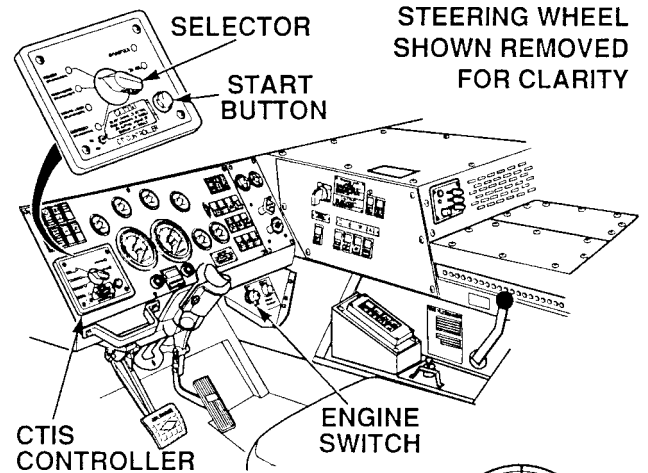
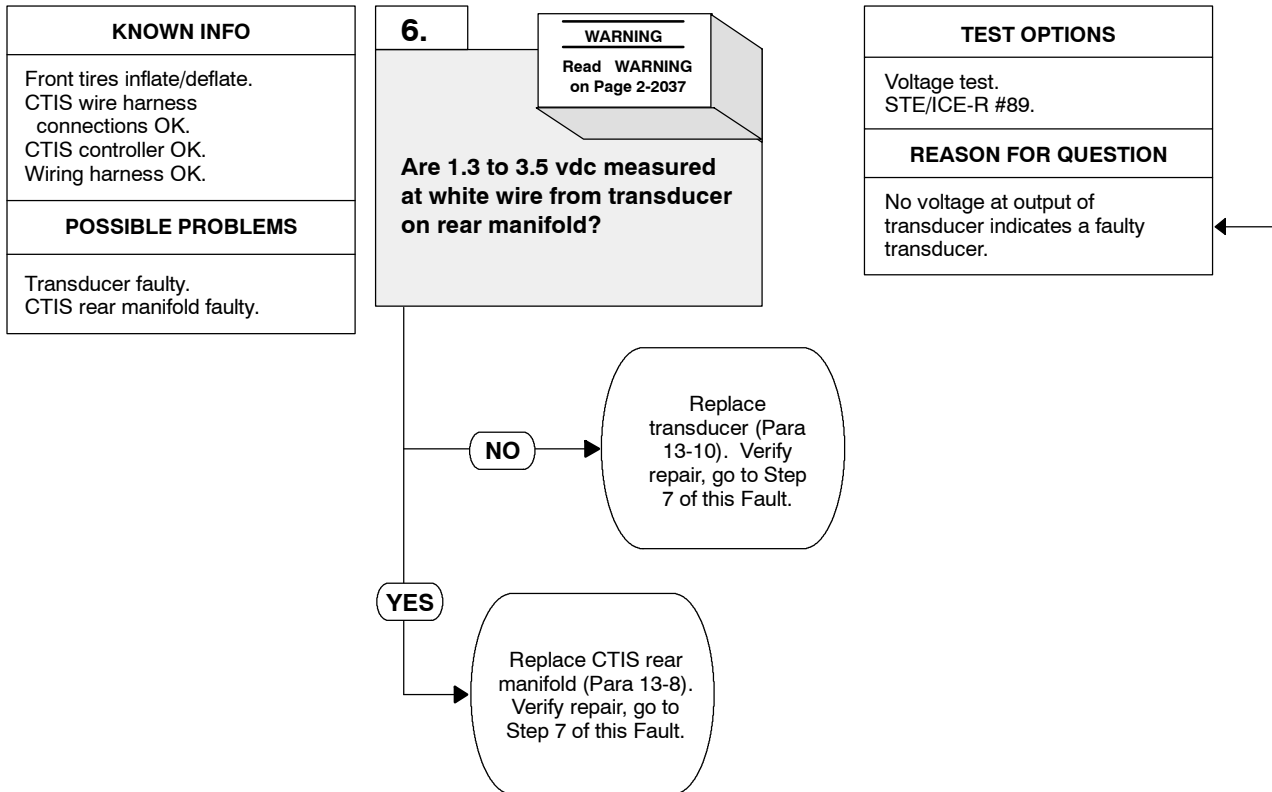


Table 2-50. CTIS Volts Versus Pressure (PSI)

PSI	kPa (Plus/Minus 0.2 volts)	Volts
75	517-	3.5
70	482-	3.3
60	413-	2.9
50	345-	2.5
40	276-	2.0
30	207-	1.7
20	138-	1.3

8. AXLES NO. 3 THROUGH NO. 5 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).



WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

NOTE

All connectors must be connected to manifold and transducer to perform this test.

VOLTAGE TEST	
(1)	Insert positive (+) multimeter lead with long probe installed, at white wire in transducer connector.
(2)	Connect negative (-) multimeter lead to ground braid on front manifold.
(3)	While assistant turns ON ENGINE switch and push CTIS START button, observe voltage reading at each pressure specified in Table 2-51.
(a)	If voltage readings do not agree turn OFF ENGINE switch and replace transducer (Para 13-10). Perform Steps (4) through (10) below.
(b)	If voltage readings agree, replace CTIS rear manifold (Para 13-9).
(4)	Turn OFF ENGINE switch.
(5)	Disconnect lead from back of transducer.
(6)	Disconnect pressure transducer connector from pressure transducer.
(7)	Remove pressure transducer from variable air supply.
(8)	Install pressure transducer in rear manifold (Para 13-10).
(9)	Install rear manifold cover (Para 13-9).
(10)	Put LHS in transit position.

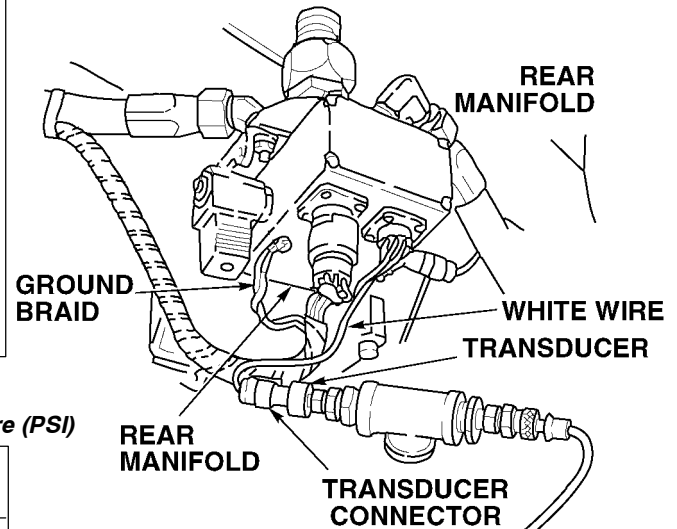
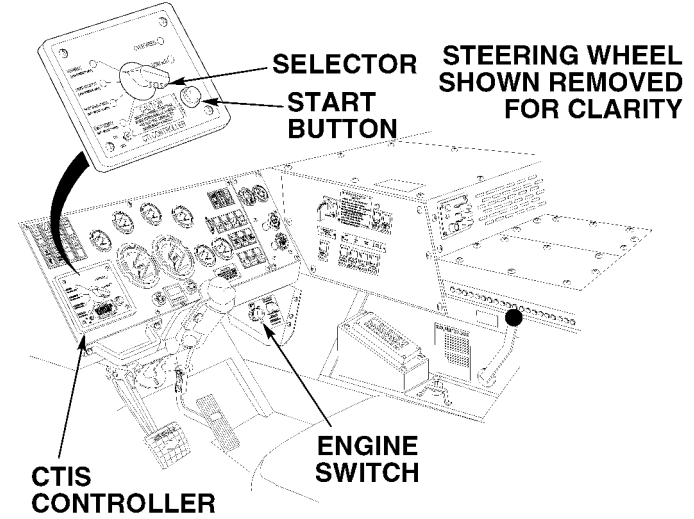
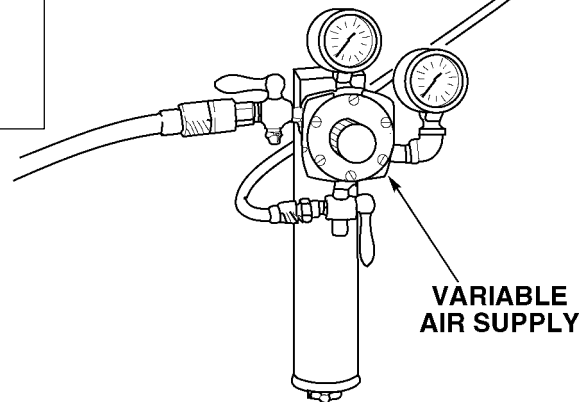
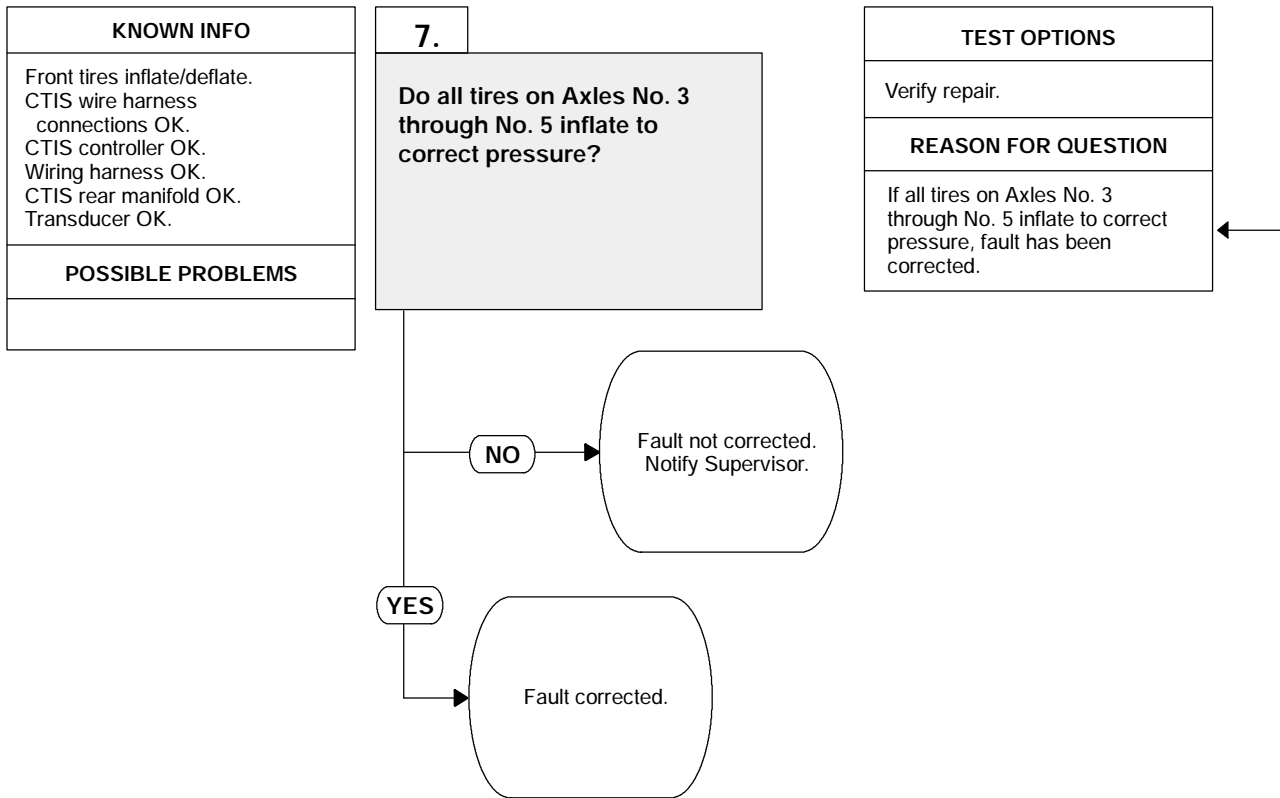


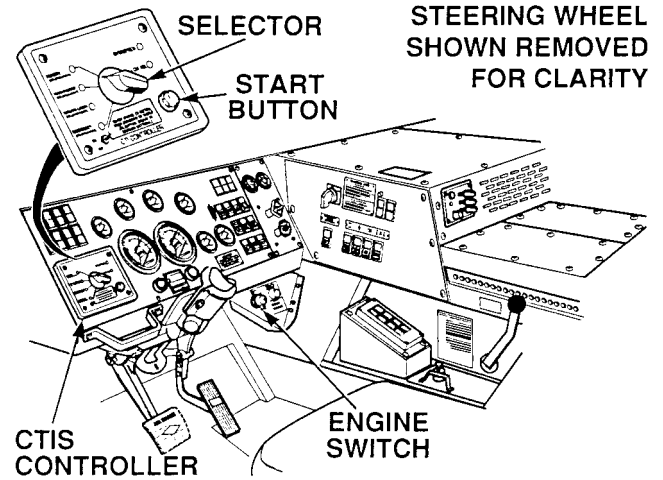
Table 2-51. CTIS Volts Versus Pressure (PSI)

PSI	kPa (Plus/Minus 0.2 volts)	Volts
75	517-	3.5
70	482-	3.3
60	413-	2.9
50	345-	2.5
40	276-	2.0
30	207-	1.7
20	138-	1.3



8. AXLES NO. 3 THROUGH NO. 5 TIRE PRESSURES DO NOT AGREE WITH CTIS SETTINGS (CONT).





VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button.
 - (a) If tires do not inflate to correct pressure, fault not corrected. Turn OFF ENGINE switch and notify Supervisor.
 - (b) If tires inflate to correct pressure, fault has been corrected.
- (4) Turn OFF ENGINE switch.

2-25. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

9. CTIS DOES NOT AUTOMATICALLY INFLATE TO THE NEXT HIGHER SETTING.

INITIAL SETUP

Tools and Special Tools

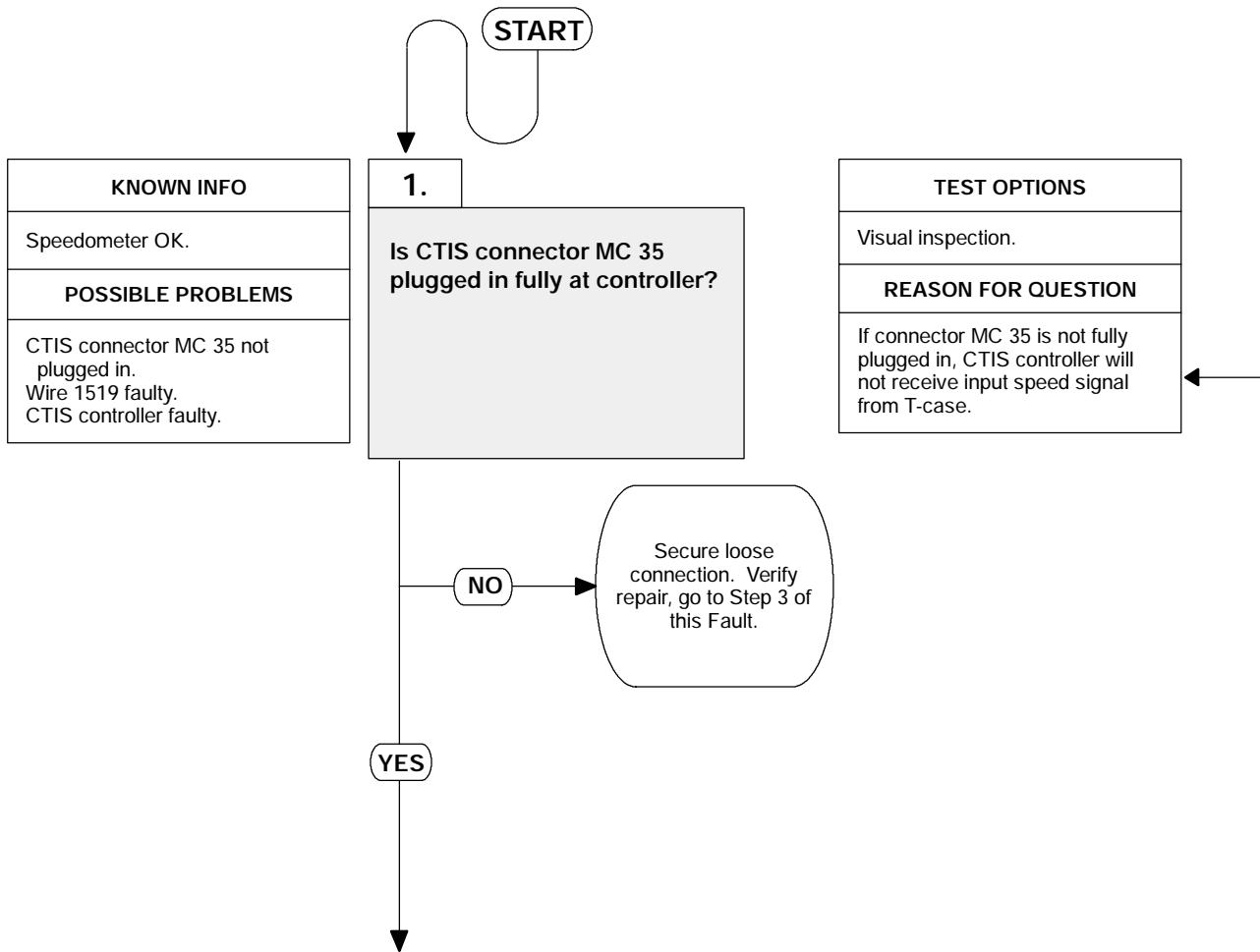
Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

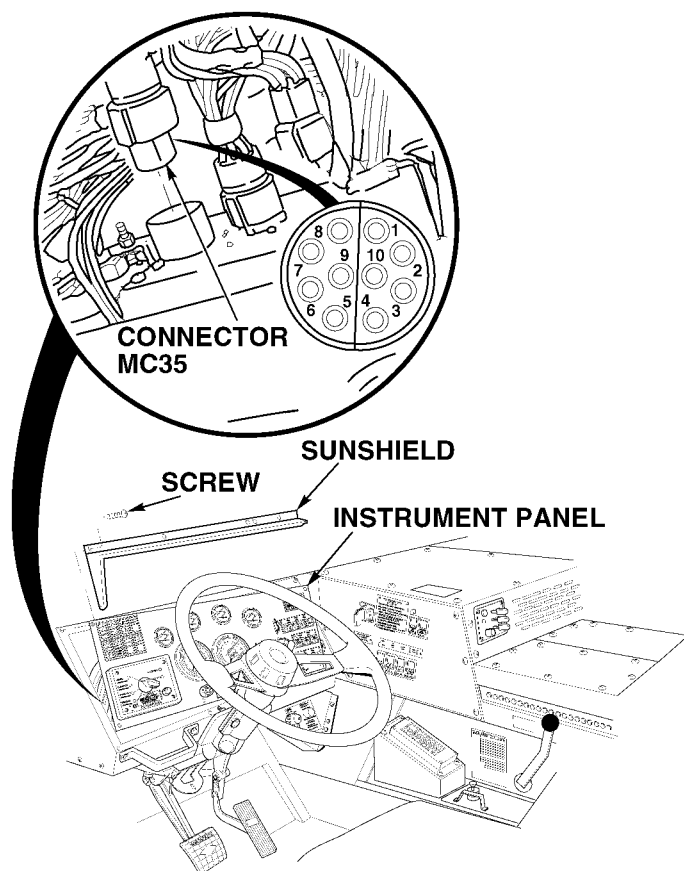
References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)

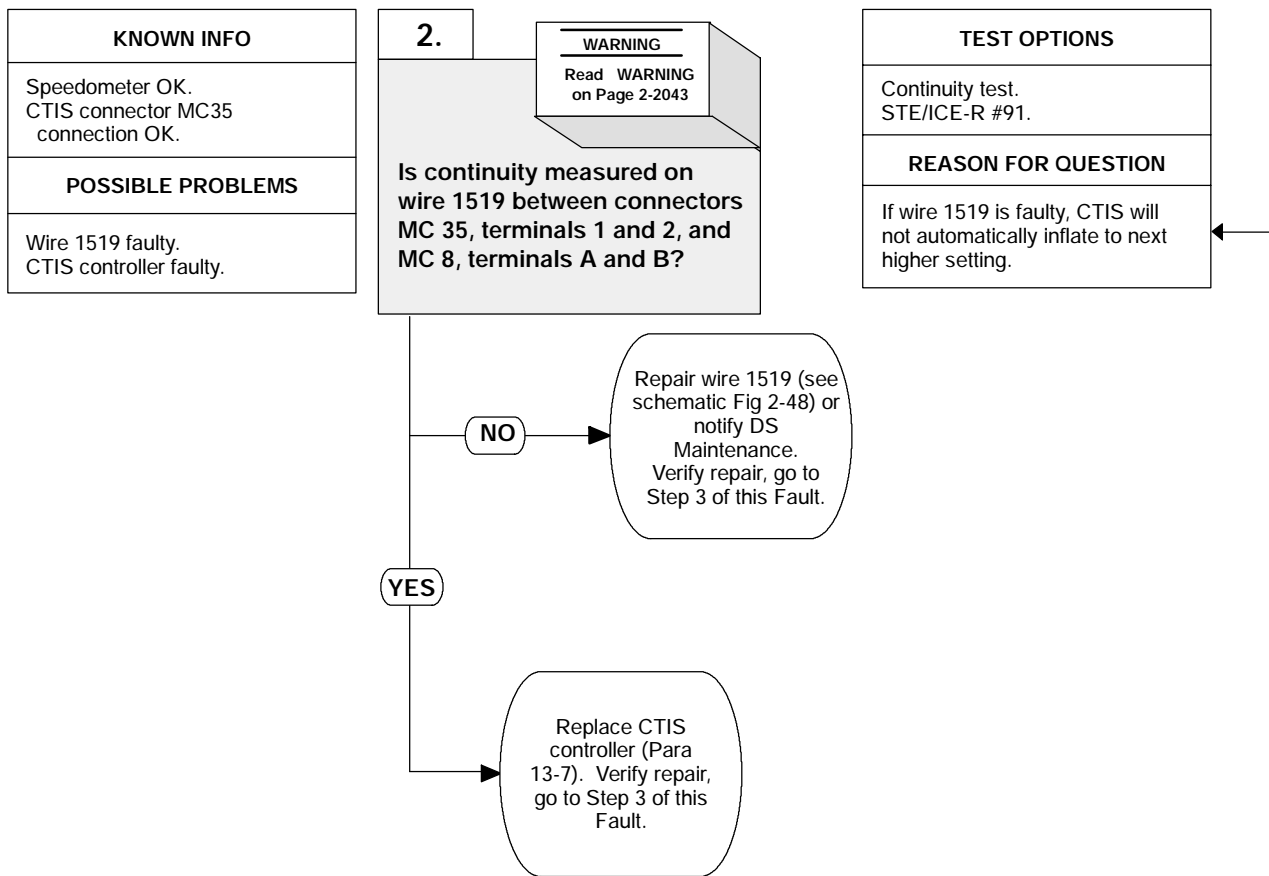




VISUAL INSPECTION

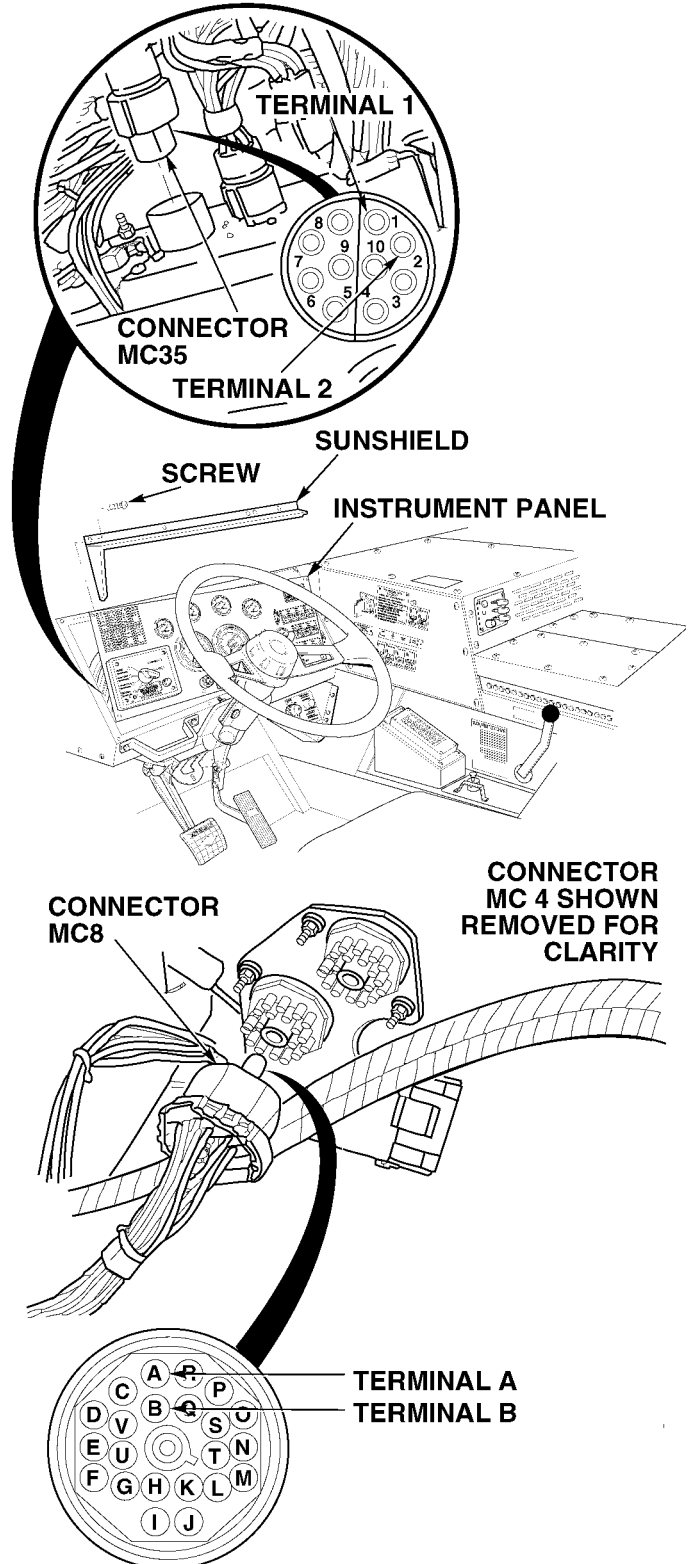
- (1) Remove ten screws and sunshield from instrument panel.
- (2) Pull top of instrument panel toward steering wheel.
- (3) Inspect MC 35 at CTIS controller to ensure it is fully plugged in.
 - (a) If MC 35 is not fully plugged in, secure connector.
 - (b) If MC 35 is fully plugged in, go to Step 2 of this Fault.

9. CTIS DOES NOT AUTOMATICALLY INFLATE TO THE NEXT HIGHER SETTING (CONT).



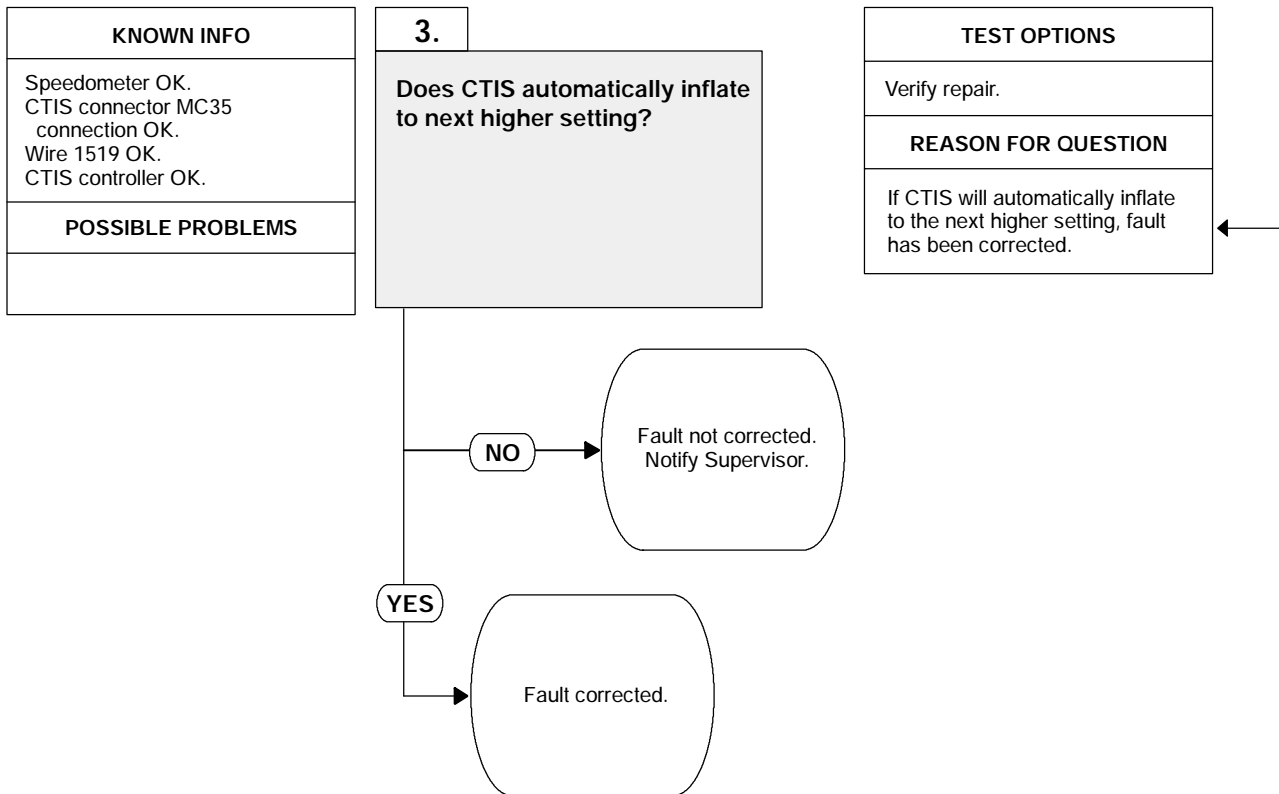
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

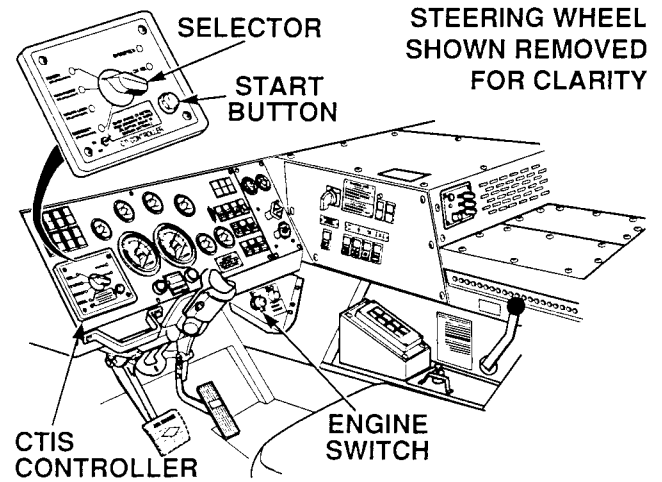


- | CONTINUITY TEST | |
|-----------------|---|
| (1) | Disconnect connector MC35 from CTIS controller. |
| (2) | Disconnect connector MC8 from cab wiring harness. |
| (3) | Set multimeter select switch to ohms. |
| (4) | Is there continuity between connector MC35, terminal 1 and connector MC8, terminal A?
(a) If there is no continuity, repair wire 1519 (see schematic Fig 2-48) or notify DS Maintenance.
(b) If there is continuity, go to Step (5) below. |
| (5) | Is there continuity between connector MC35, terminal 2 and connector MC8, terminal B?
(a) If there is no continuity, repair wire 1519 (see schematic Fig 2-48) or notify DS Maintenance.
(b) If there is continuity, replace CTIS controller (Para 13-7), then perform Steps (6) through (8) below. |
| (6) | Connect connector MC8 on cab wiring harness. |
| (7) | Connect connector MC35 on CTIS controller. |
| (8) | Install instrument panel and sunshield with ten screws. |

9. CTIS DOES NOT AUTOMATICALLY INFLATE TO THE NEXT HIGHER SETTING (CONT).

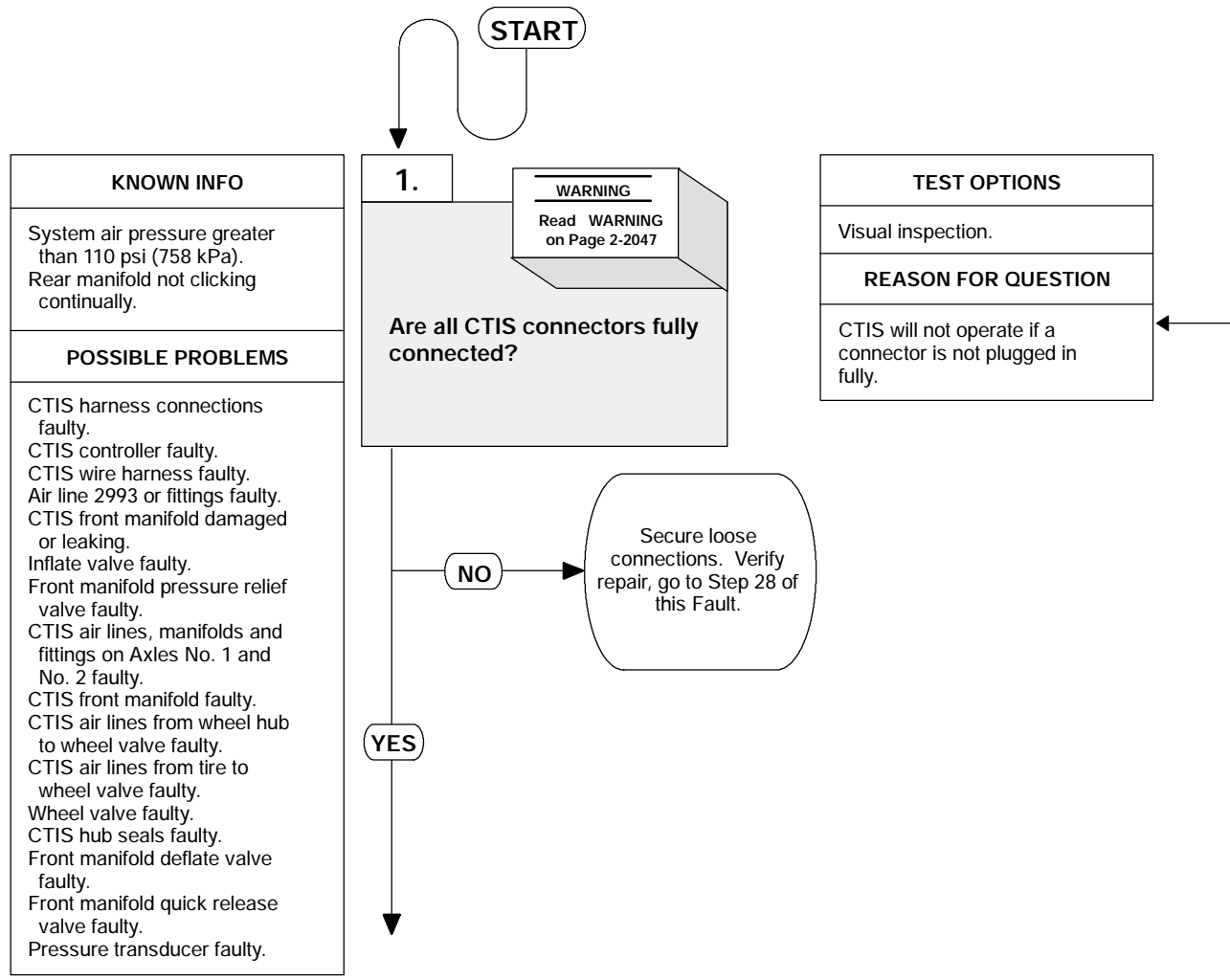


VERIFY REPAIR
<ol style="list-style-type: none"> (1) Start engine (TM 9-2320-364-10). (2) Turn CTIS selector to CROSS COUNTRY position. (3) Press CTIS START button. (4) Operate truck above 40 mph (64 km/h) and verify if CTIS automatically switches to HIGHWAY setting. <ol style="list-style-type: none"> (a) If CTIS does not automatically switch to HIGHWAY setting, fault not corrected. Turn OFF ENGINE switch and notify Supervisor. (b) If CTIS automatically switches to HIGHWAY setting, fault has been corrected. (5) Turn OFF ENGINE switch.



2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING.	
INITIAL SETUP	
<p><i>Tools and Special Tools</i></p> <ul style="list-style-type: none"> Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G) STE/ICE-R (optional) (Item 3, Appendix G) Goggles, Industrial (Item 30, Appendix G) Multimeter (Item 44, Appendix G) Jumperwire <p><i>Materials/Parts</i></p> <ul style="list-style-type: none"> Solution, Soap (Item 86, Appendix C) <p><i>Personnel Required</i></p> <ul style="list-style-type: none"> Two 	<p><i>References</i></p> <ul style="list-style-type: none"> TM 9-2320-364-10 TM 9-4910-571-12&P <p><i>Equipment Condition</i></p> <ul style="list-style-type: none"> Engine OFF, (TM 9-2320-364-10) Parking brake applied, (TM 9-2320-364-10) Wheels chocked, (TM 9-2320-364-10) Front access cover opened, (TM 9-2320-364-10) CTIS front manifold cover removed, (Para 13-8) CTIS turned on, (TM 9-2320-364-10) Load Handling System (LHS) extended fully, (TM 9-2320-364-10)



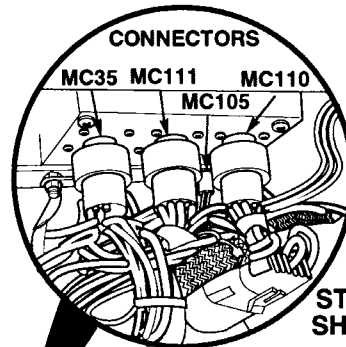
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

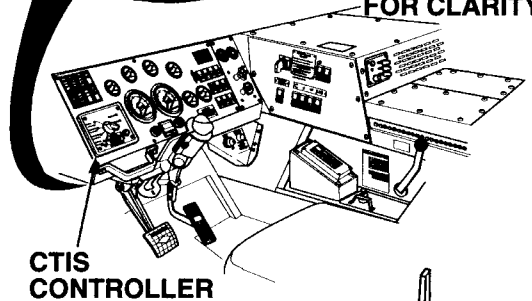
NOTE

The CTIS initially and periodically checks for system air leaks. The CTIS controller will display a flashing LOW AIR light and shut off if 6 psi (41 kPa) cannot be maintained by the CTIS. The manifold will click during this check for approximately 1-1/2 minutes.

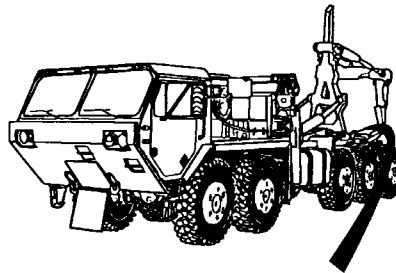
- VISUAL INSPECTION**
- (1) Inspect CTIS controller, front and rear manifolds to ensure that all connectors are fully plugged in.
 - (a) If connectors are not plugged in, secure connectors.
 - (b) If connectors are plugged in, go to Step 2 of this Fault.
 - (2) Put LHS in transit position (TM 9-2320-364-10).



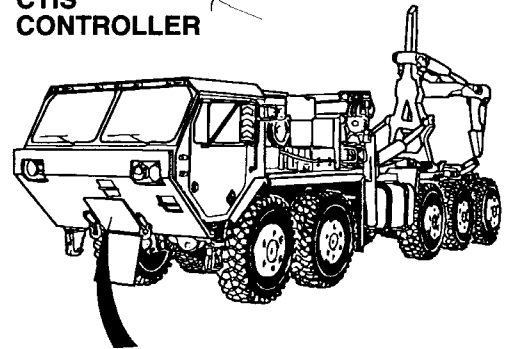
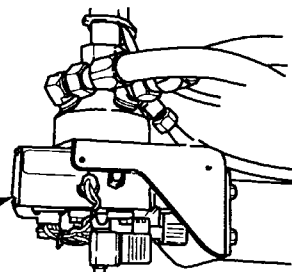
STEERING WHEEL SHOWN REMOVED FOR CLARITY



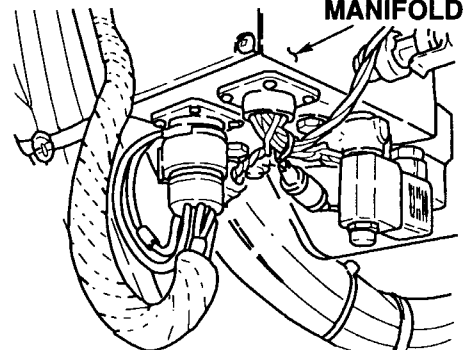
CTIS CONTROLLER



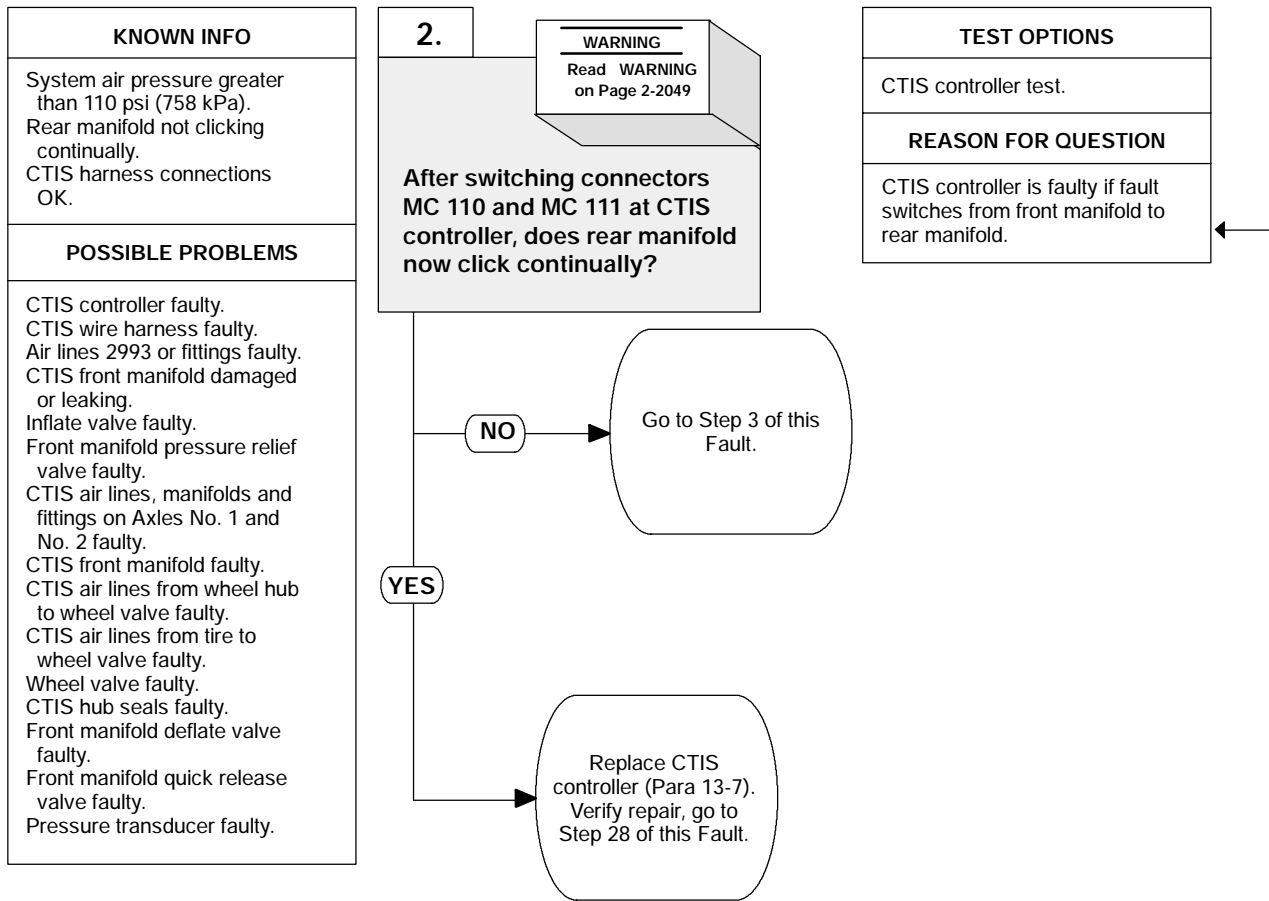
REAR MANIFOLD



FRONT MANIFOLD



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

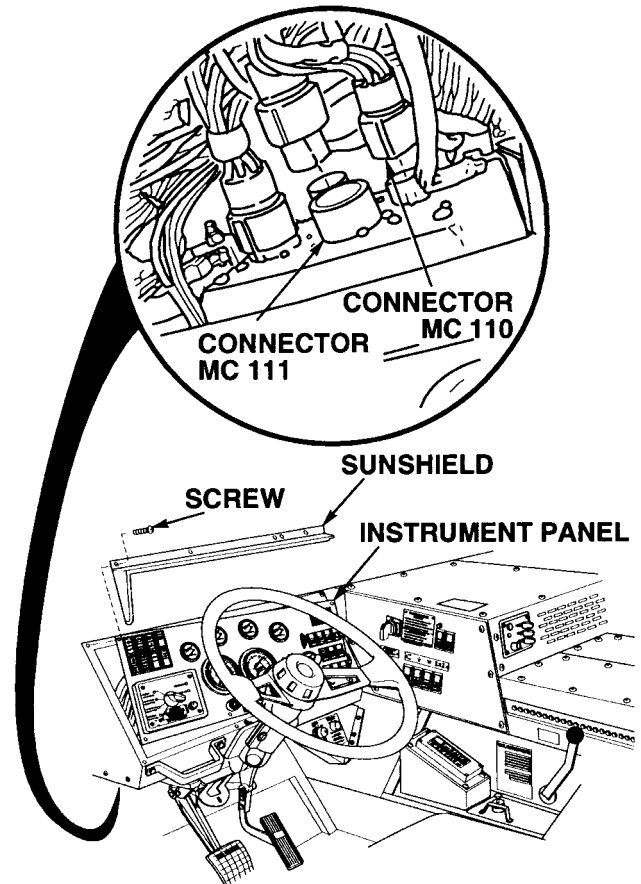


WARNING

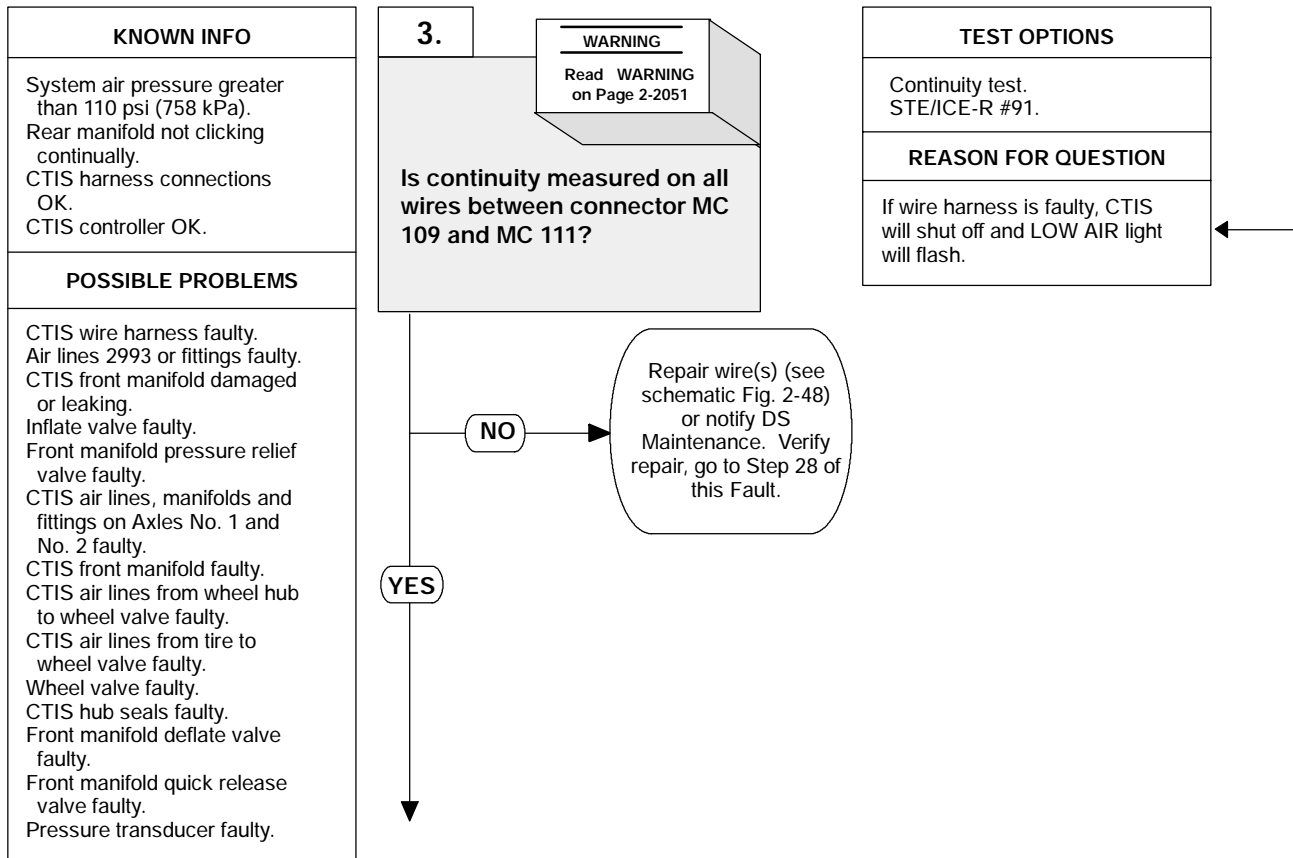
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CTIS CONTROLLER TEST

- (1) Remove ten screws, sunshield and tilt instrument panel.
- (2) Disconnect front manifold harness connector MC 110 from back of CTIS controller.
- (3) Disconnect rear manifold harness connector MC 111 from back of CTIS controller.
- (4) Connect harness connector MC 111 into CTIS controller where connector MC 110 was disconnected.
- (5) Connect harness connector MC 110 into CTIS controller where connector MC 111 was disconnected.
- (6) Start engine (TM 9-2320-364-10).
- (7) As assistant pushes CTIS controller START button, listen to rear manifold for continuous clicking.
 - (a) If rear manifold is clicking continuously, replace CTIS controller (Para 13-7).
 - (b) If rear manifold is not clicking continuously, CTIS controller is OK.
- (8) Turn OFF ENGINE switch.
- (9) Disconnect and connect connectors MC 110 and MC 111 to correct CTIS controller connectors.



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits a direct short may result. Damage to equipment, injury or death to personnel may occur.

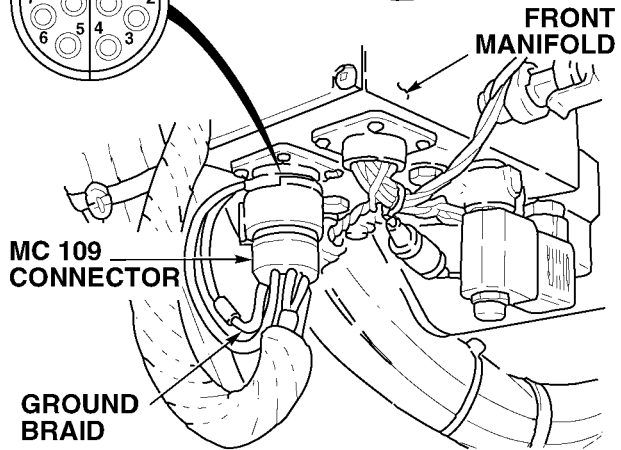
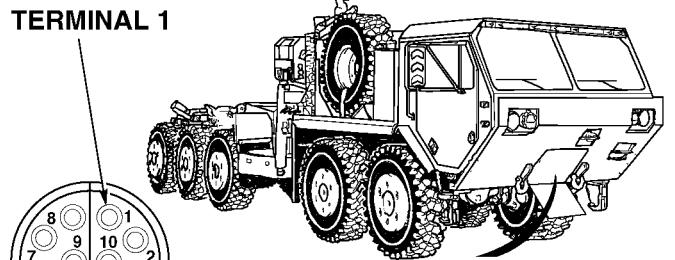
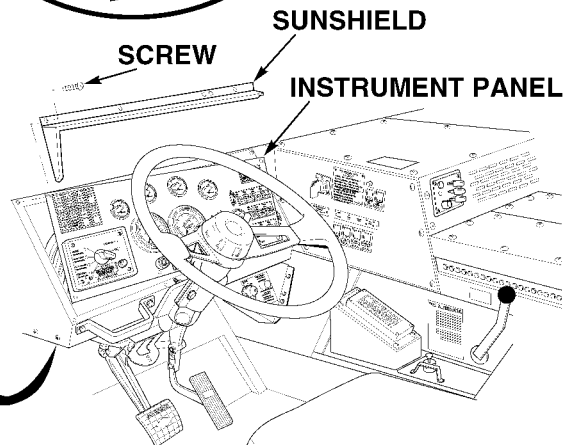
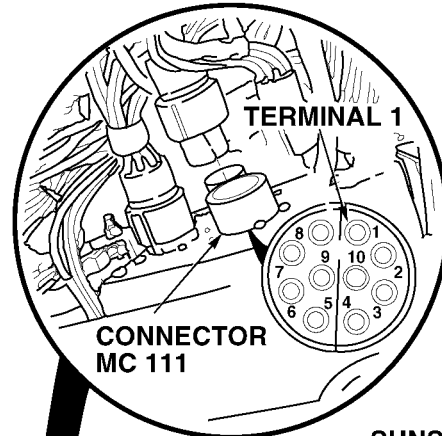
NOTE

Terminal (5) on MC111 is plugged and does not connect to Terminal (5) on MC109.

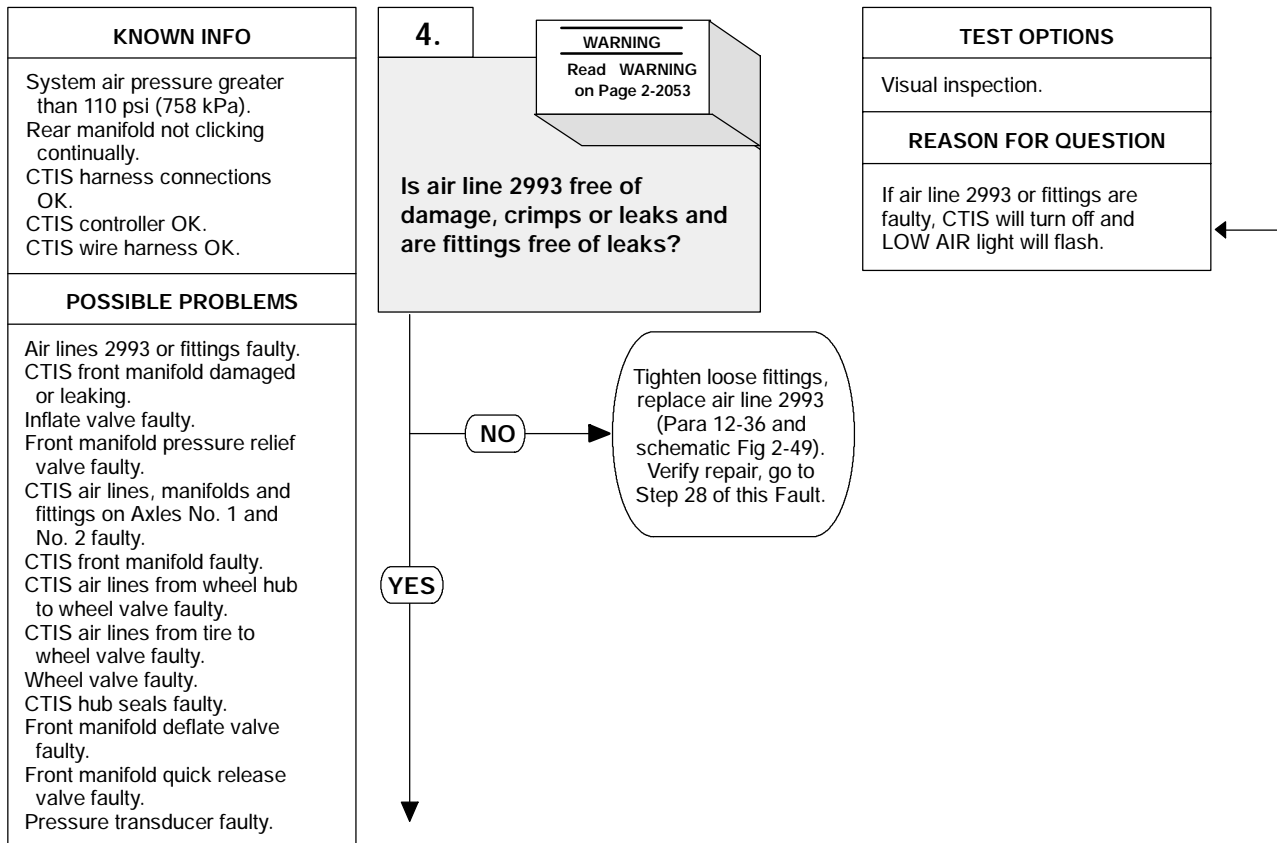
CONTINUITY TEST

- (1) Disconnect connector MC 109 from CTIS front manifold.
- (2) Set multimeter select switch to ohms.
- (3) Connect jumperwire between wire 1056 on CTIS controller connector MC 111, terminal 1 and a known good ground.
- (4) Is there continuity between connector MC 109, terminal 1 and front manifold ground braid?
 - (a) If there is no continuity, repair wire 1056 (see schematic Fig 2-48 or notify DS Maintenance, and perform Steps (6) through (9) below.
 - (b) If there is continuity, wire 1056 is OK.
- (5) Check continuity of remaining wires and terminals using Steps (2) through (4) above. The wires and corresponding terminals are listed below (see schematic Fig 2-48).

1057(2)	Shield(8)
1058(3)	1061(6) 1064(9)
1059(4)	1062(7) 1065(10)
1063(5)	to ground (MC109 only)
- (6) Remove jumperwire.
- (7) Connect connector MC 111 on back of CTIS controller.
- (8) Connect connector MC 109 to CTIS front manifold.
- (9) Install instrument panel, sunshield, and ten screws.

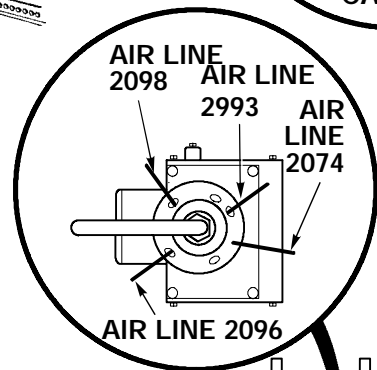
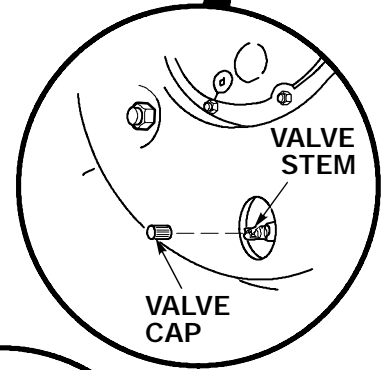
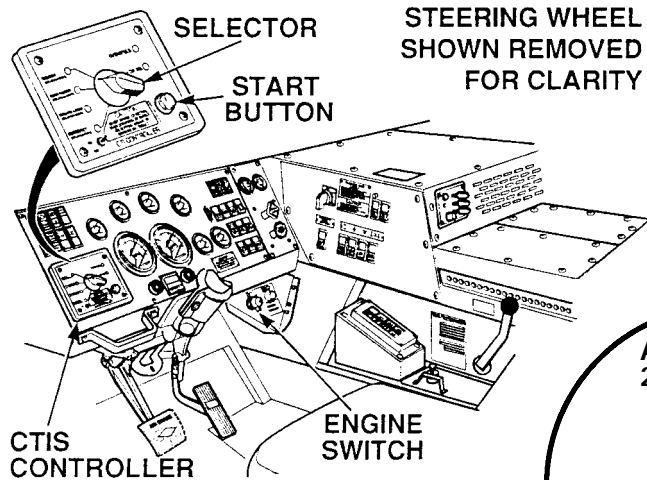
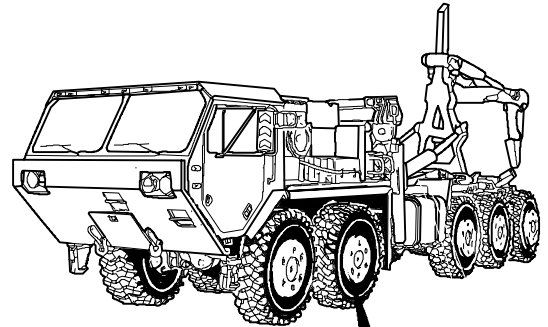


10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

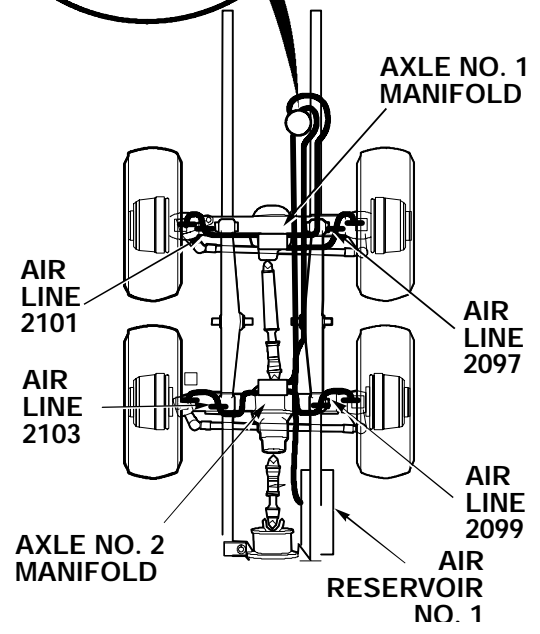


WARNING

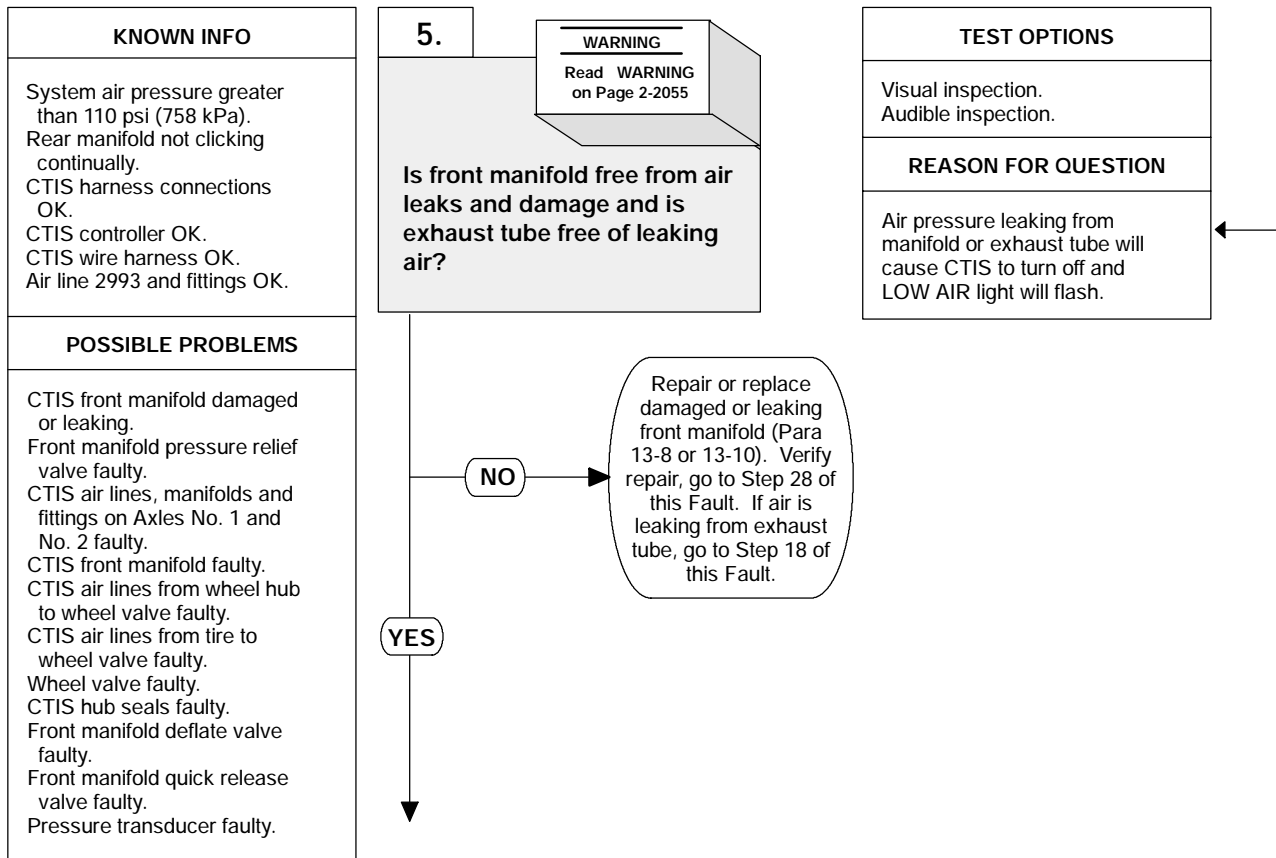
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

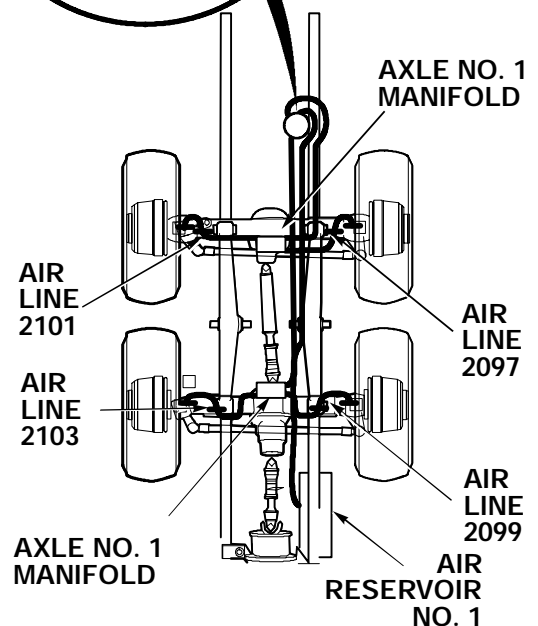
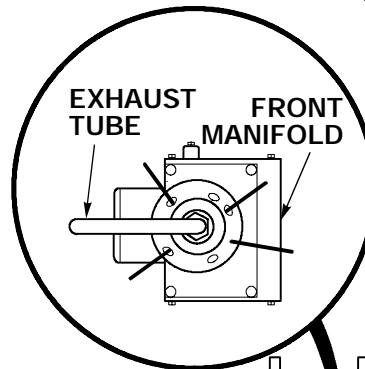
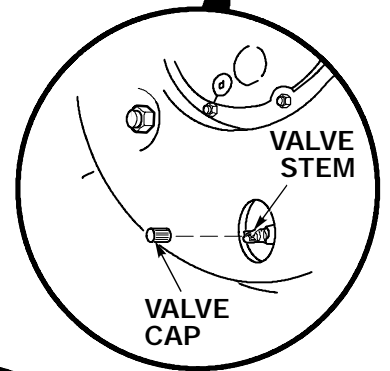
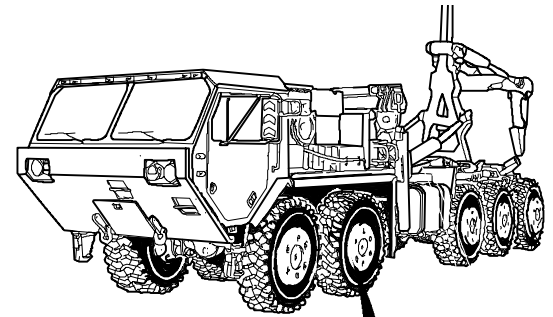
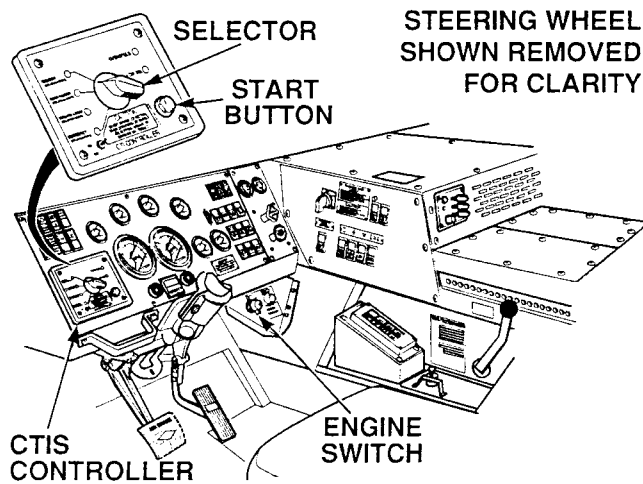


- VISUAL INSPECTION**
- (1) Remove valve cap from any wheel valve stem on Axles No. 1 and No. 2.
 - (2) Using tire gage, deflate any one tire on Axles No. 1 or No. 2 to 40 psi (276 kPa).
 - (3) Start engine (TM 9-2320-364-10).
 - (4) Set CTIS controller selector to HIGHWAY.
 - (5) Press CTIS START button.
 - (6) Check CTIS air line 2993 for damage, crimps or leaks (see schematic Fig 2-49).
 - (a) If air line 2993 is damaged, crimped or leaking; tighten fittings, perform Steps (7) and (8) below, and replace air line (Para 12-36 and schematic Fig 2-49).
 - (b) If there are no leaks, crimps or damage, air line 2993 and fittings are OK.
 - (7) Turn OFF ENGINE switch.
 - (8) Install valve cap on wheel valve stem.



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).





WARNING

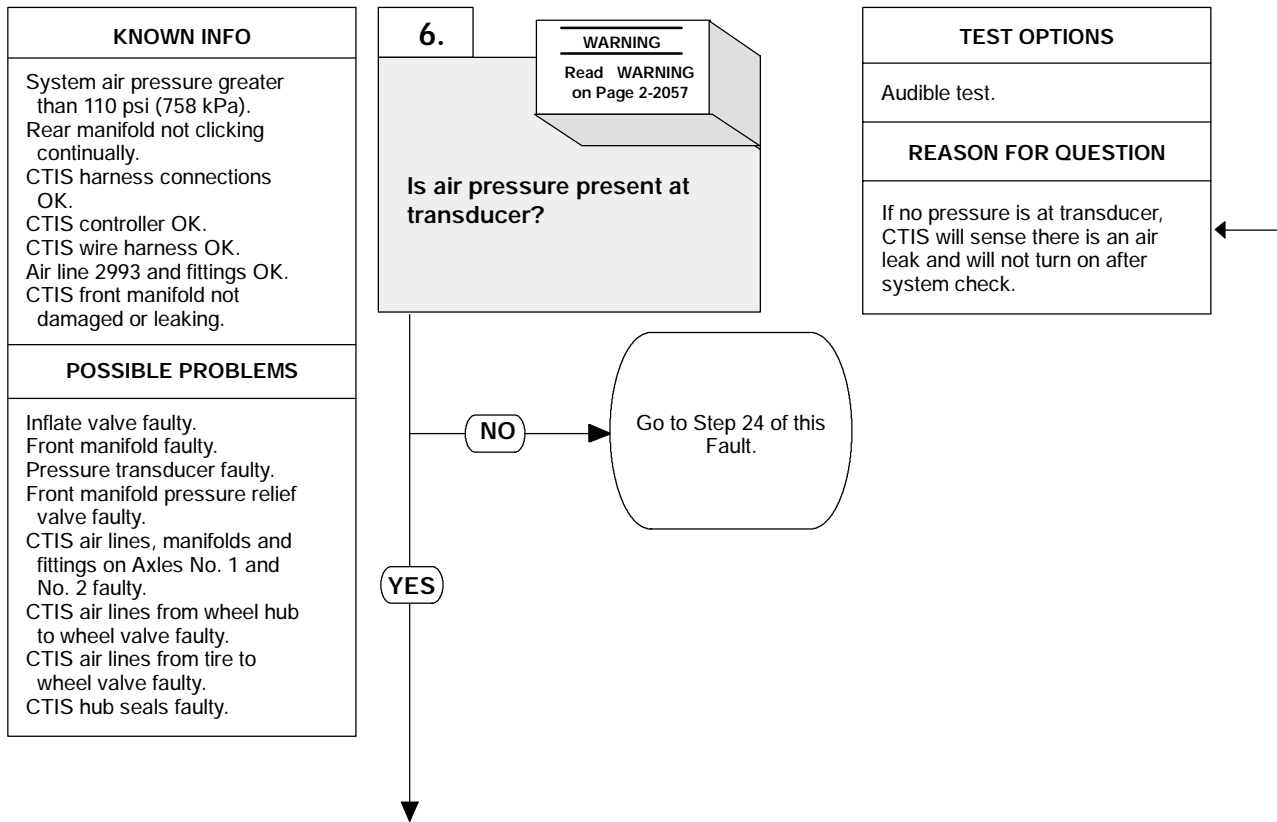
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

- Soap and water solution can be used to visually check for leaks.
- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

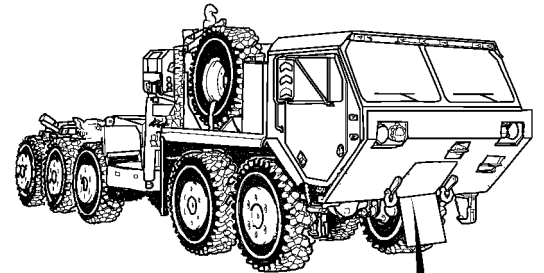
VISUAL INSPECTION	
(1)	Remove valve cap from any wheel valve stems on Axles No. 1 or No. 2.
(2)	Using tire gage, deflate any one tire on Axles No. 1 or No. 2 to 40 psi (276 kPa).
(3)	Start engine (TM 9-2320-364-10).
(4)	Set CTIS controller selector to HIGHWAY.
(5)	Press CTIS START button.
(6)	Check CTIS front manifold for damage, or leaks.
(a)	If front manifold is damaged, or leaking; perform Steps (7) and (8) below, and repair or replace front manifold (Para 13-8 or 13-10).
(b)	If there are no leaks, or damage, front manifold is OK.
(c)	If front manifold is leaking air out of exhaust tube, go to Step 18 of this Fault.
(7)	Turn OFF ENGINE switch.
(8)	Install valve cap on wheel valve stem.

10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

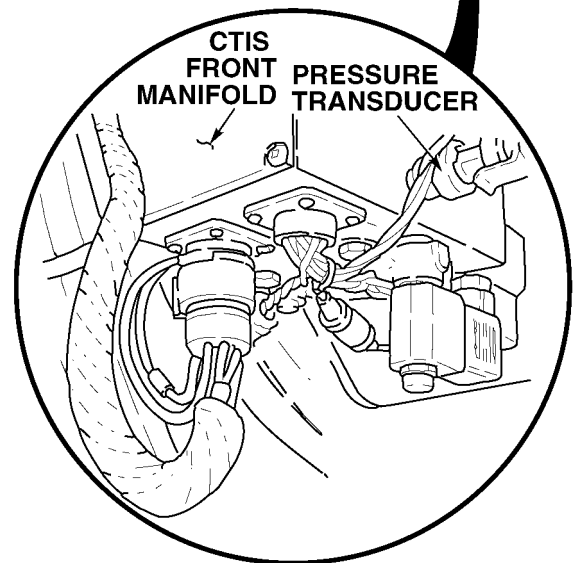


WARNING

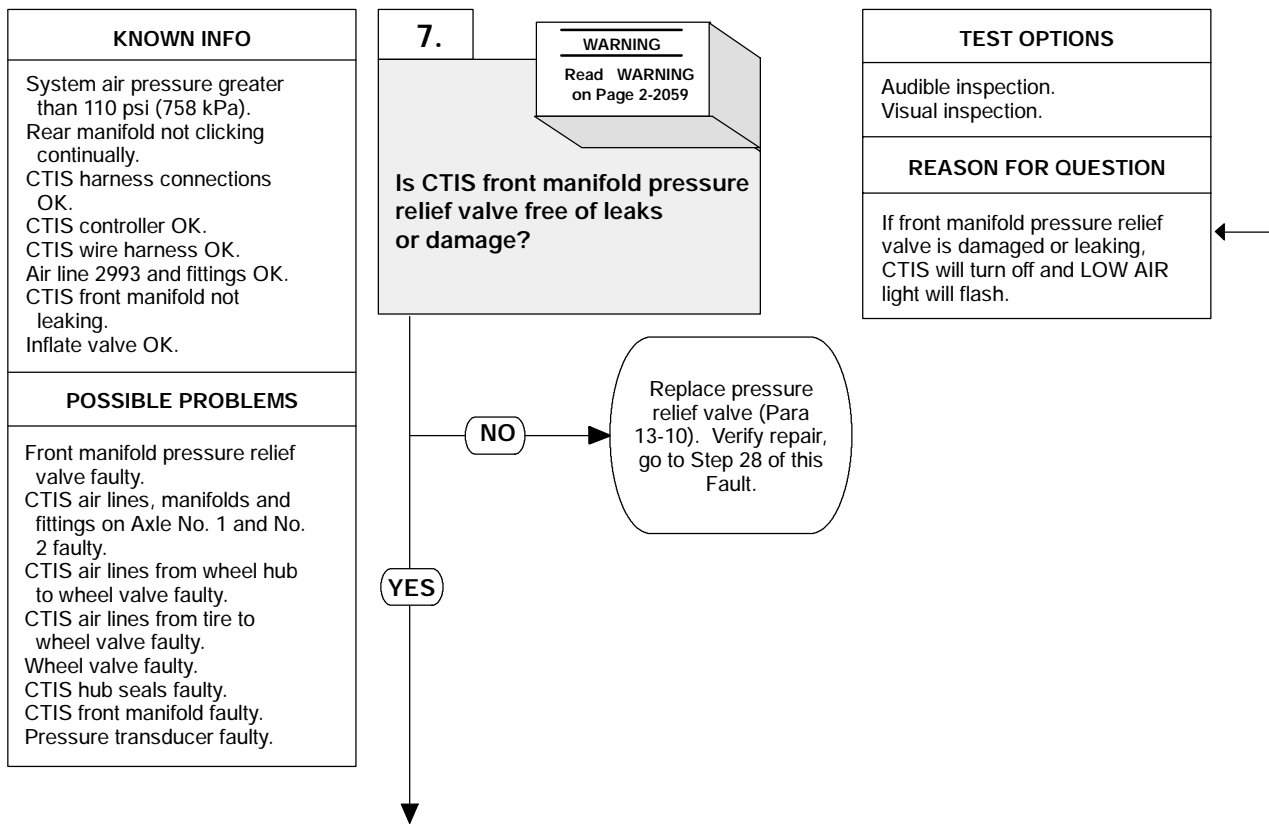
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

**AUDIBLE TEST**

- (1) Remove pressure transducer from front manifold (Para 13-10).
- (2) Set CTIS controller to HIGHWAY (TM 9-2320-364-10).
- (3) Start engine.
- (4) As assistant pushes CTIS controller START button, listen for air exhausting from the transducer port.
 - (a) If air does not exhaust, perform Steps (5) and (6) below, and go to Step 24 of this Fault.
 - (b) If air exhausts, inflate valve is OK.
- (5) Turn OFF ENGINE switch.
- (6) Install pressure transducer in front manifold.



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



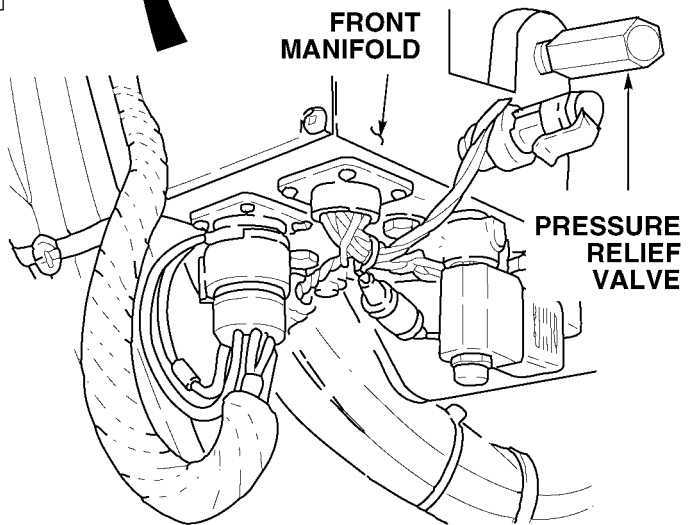
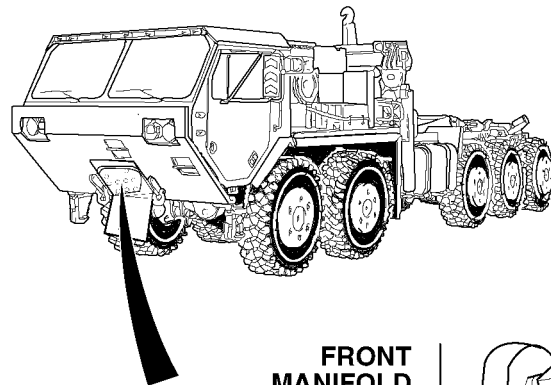
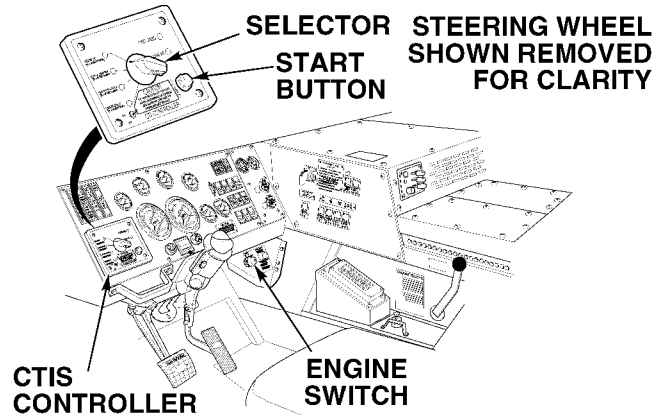
WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

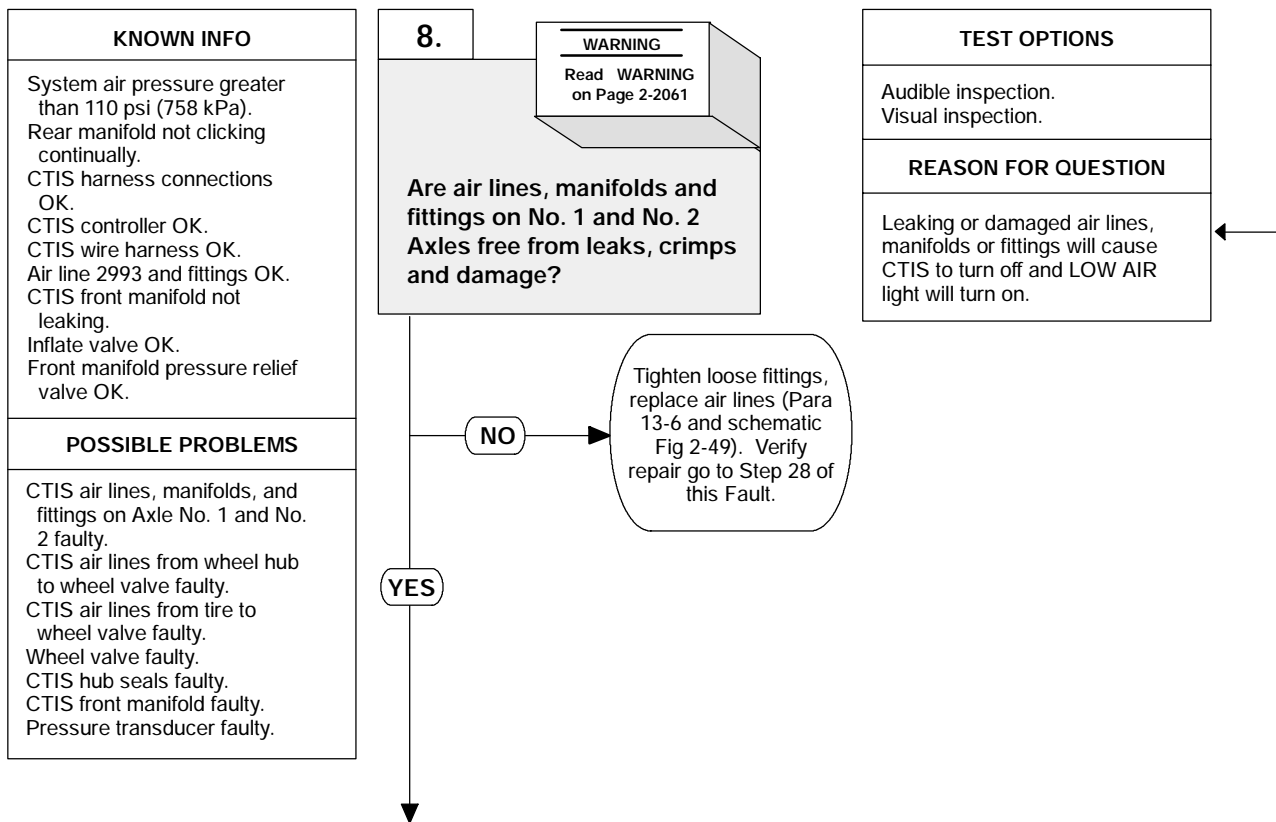
NOTE

- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.
- Some air leakage (bubbles forming) may occur during inflation/deflation cycle at relief valve. A rapid exhaust of air indicates a problem.
- Pressure relief valve should remain closed up to 85 psi (586 kPa).

VISUAL/AUDIBLE INSPECTION
(1) Start engine (TM 9-2320-364-10).
(2) Set CTIS controller selector to HIGHWAY.
(3) Assistant presses CTIS START button.
(4) Check CTIS front manifold pressure relief valve for damage and leaks.
(a) If pressure relief valve is damaged or leaking, turn OFF ENGINE switch and replace valve (Para 13-10).
(b) If pressure relief valve is not damaged or leaking, relief valve is OK.
(5) Turn OFF ENGINE switch.
(6) Install front CTIS manifold cover (Para 13-8).
(7) Close front access cover.



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



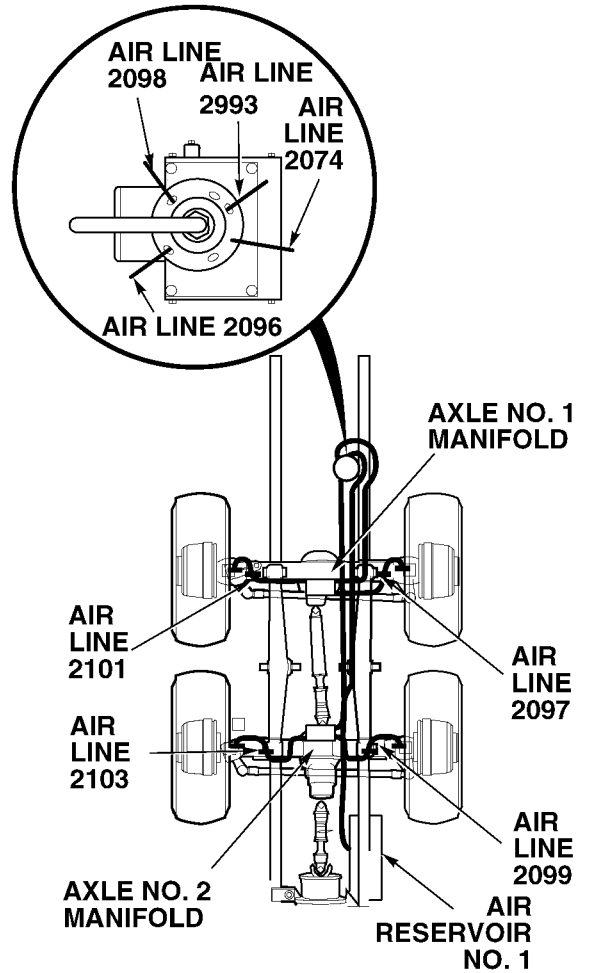
WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

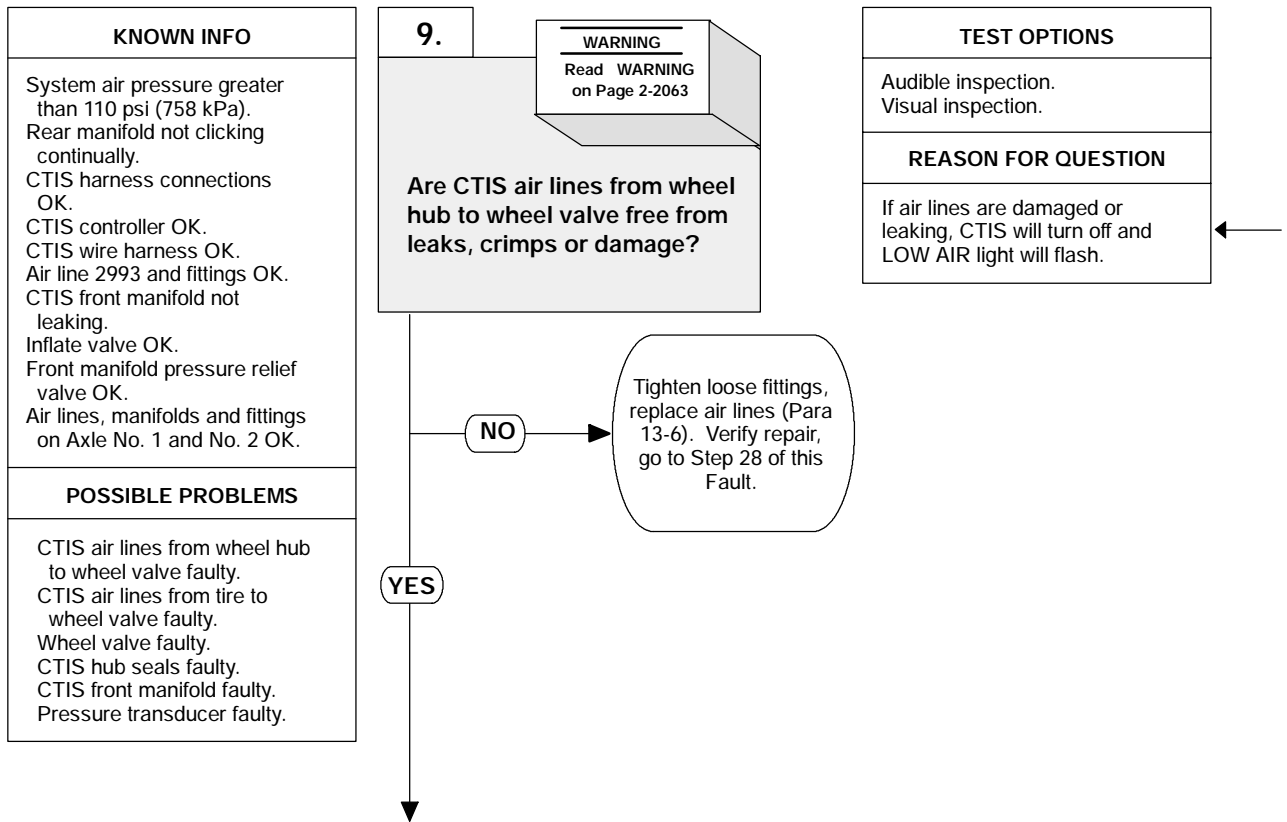
NOTE

Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION	
(1) Start engine (TM 9-2320-364-10). (2) Set CTIS controller selector to HIGHWAY. (3) Press CTIS START button. (4) Check CTIS air lines listed below and axle manifold and fittings for damage, crimps or leaks (see schematic Fig 2-49).	
2074	2101
2096	2103
2097	2993
2098	
2099	
(a) If air lines, fittings or axle manifolds are damaged or leaking, perform Step (5) below and tighten fittings or replace air lines or axle manifold (Para 13-6 and schematic Fig 2-49). (b) If there are no leaks, crimps, or damage, air lines fittings and axle manifolds are OK.	
(5) Turn OFF ENGINE switch.	



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

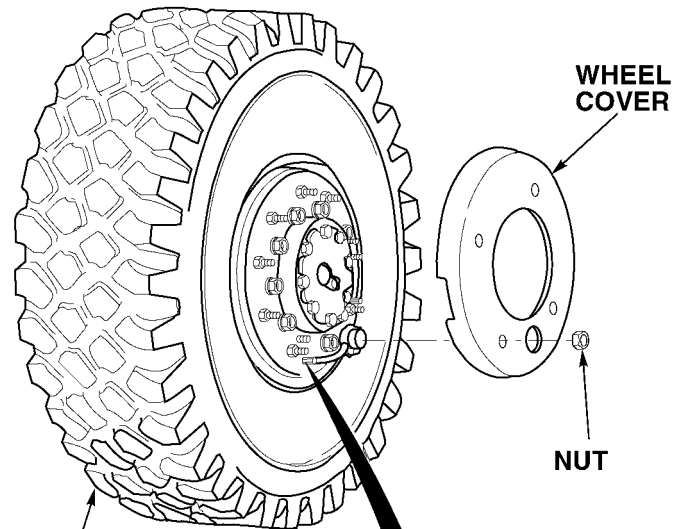
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

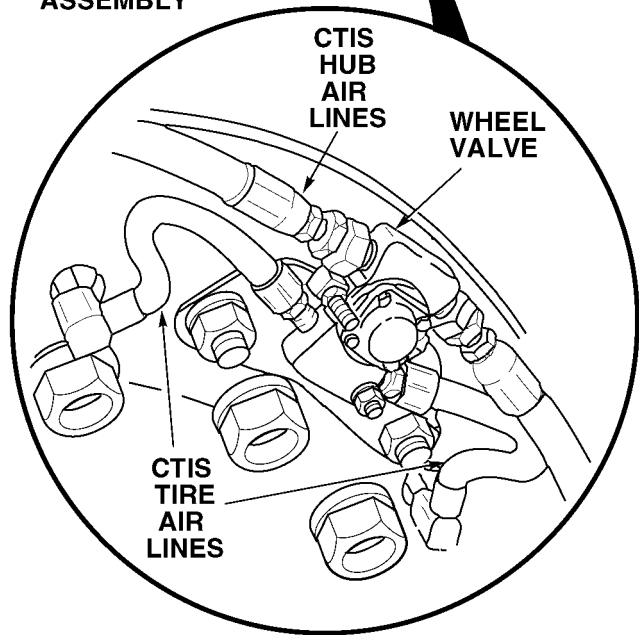
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

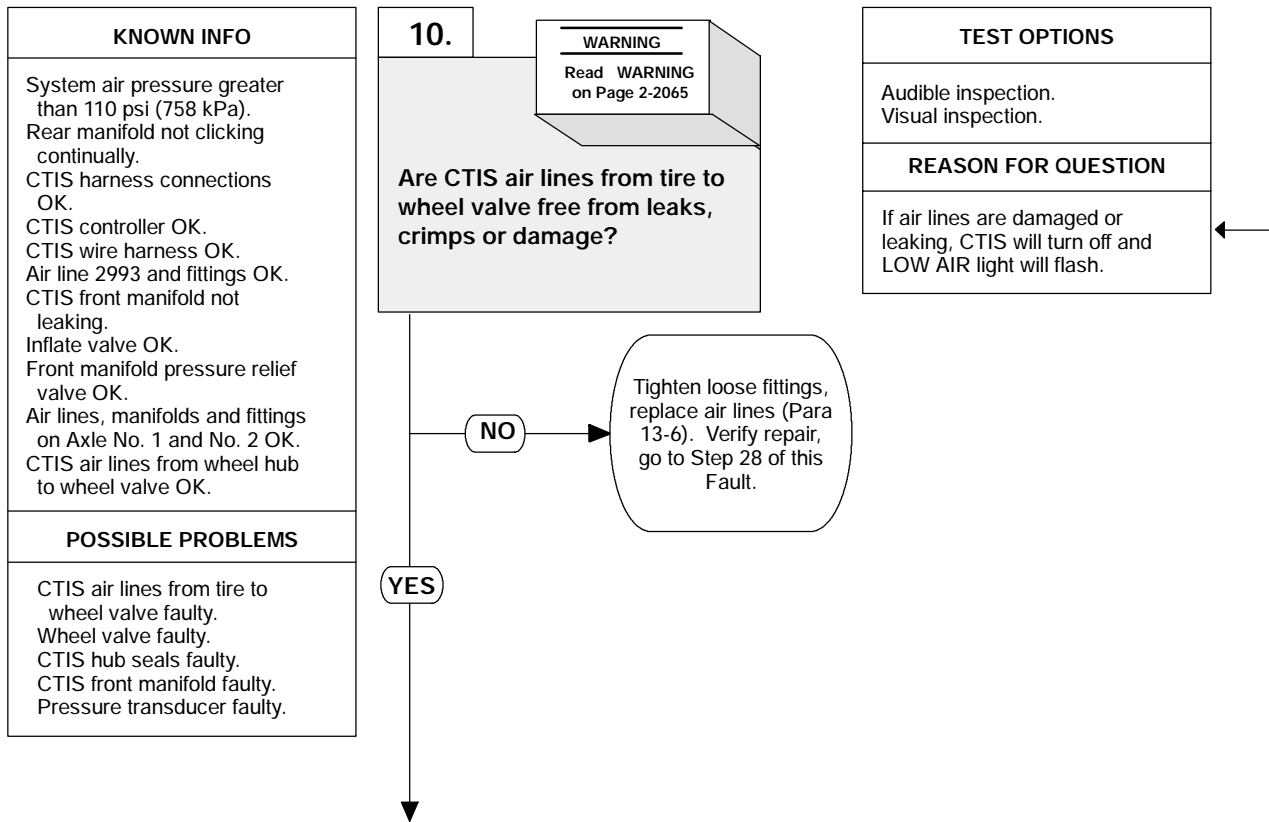
- (1) Remove four nuts and wheel cover.
- (2) Start engine (TM 9-2320-364-10).
- (3) Set CTIS controller to HIGHWAY.
- (4) Press CTIS START button.
- (5) Check air lines at wheel hub to wheel valve for air leakage.
 - (a) If air lines are damaged, crimped or leaking, perform Step (6) below, and tighten loose fittings, replace air lines or fittings (Para 13-6).
 - (b) If there are no leaks, crimps or damage, air lines and fittings are OK.
- (6) Turn OFF ENGINE switch.



WHEEL/TIRE ASSEMBLY



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

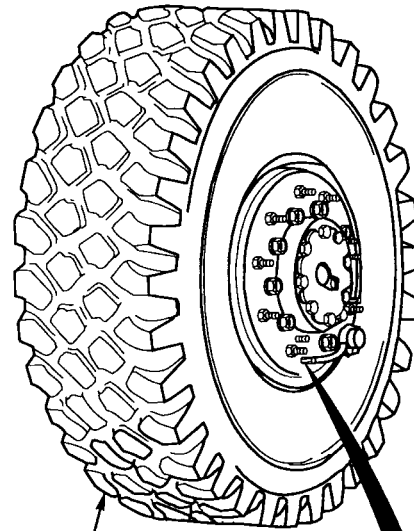
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

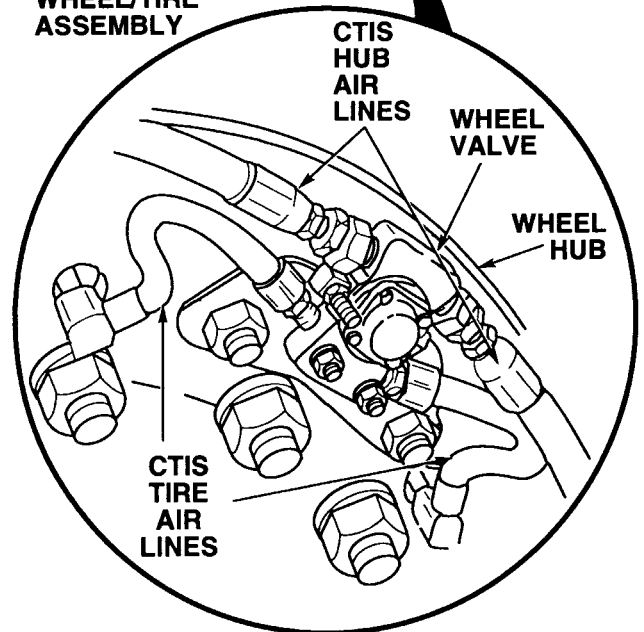
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

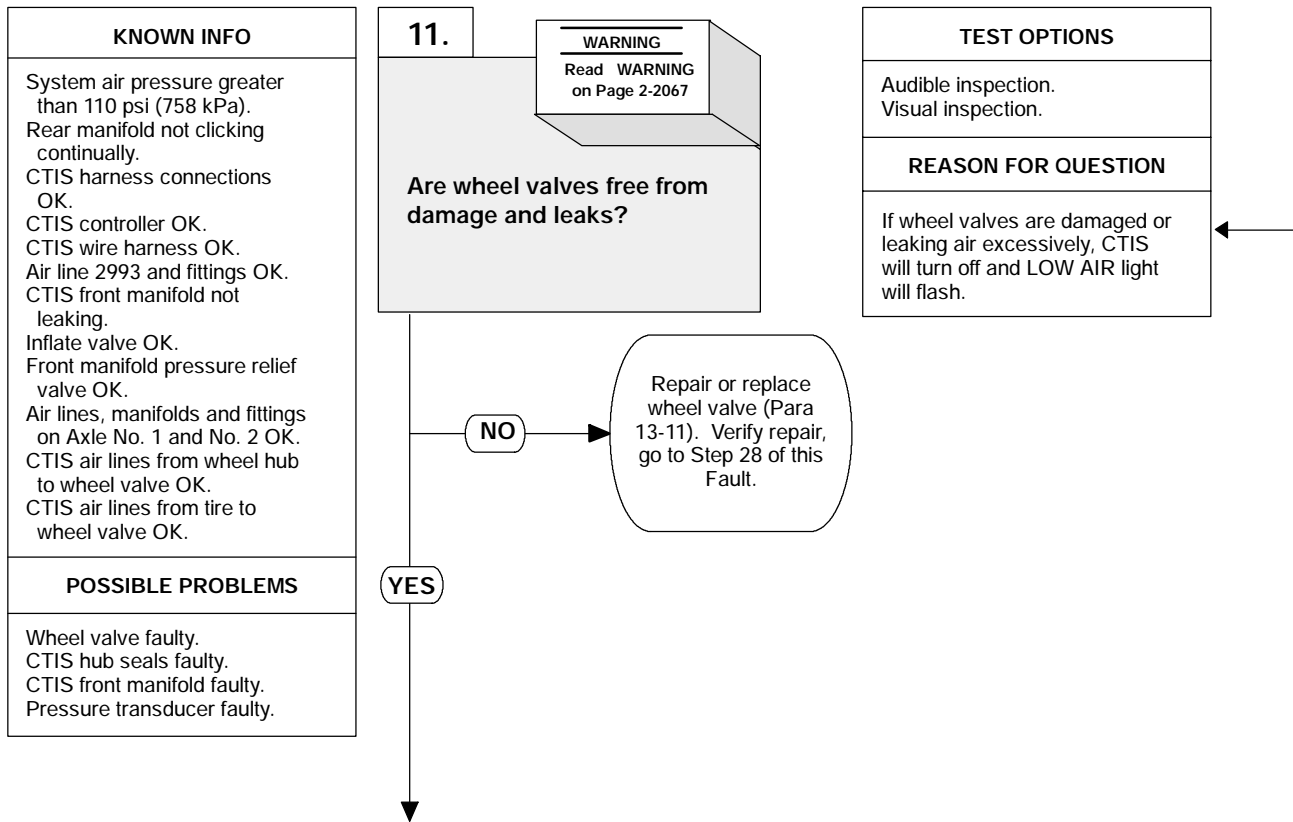
- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check CTIS air lines at tire to wheel valve for air leakage.
 - (a) If air lines are damaged, crimped or leaking, perform Step (5) below and tighten loose fittings, replace air lines or fittings (Para 13-6).
 - (b) If there are no leaks, crimps or damage, air lines and fittings are OK.
- (5) Turn OFF ENGINE switch.



WHEEL/TIRE ASSEMBLY



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



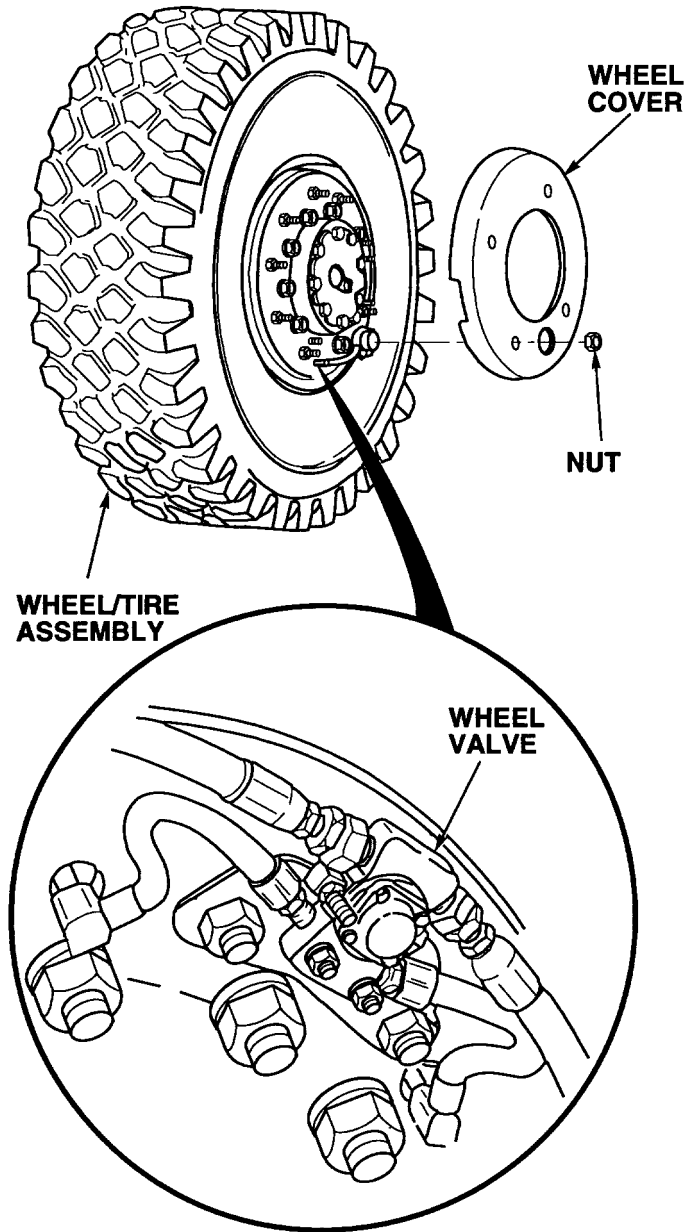
WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

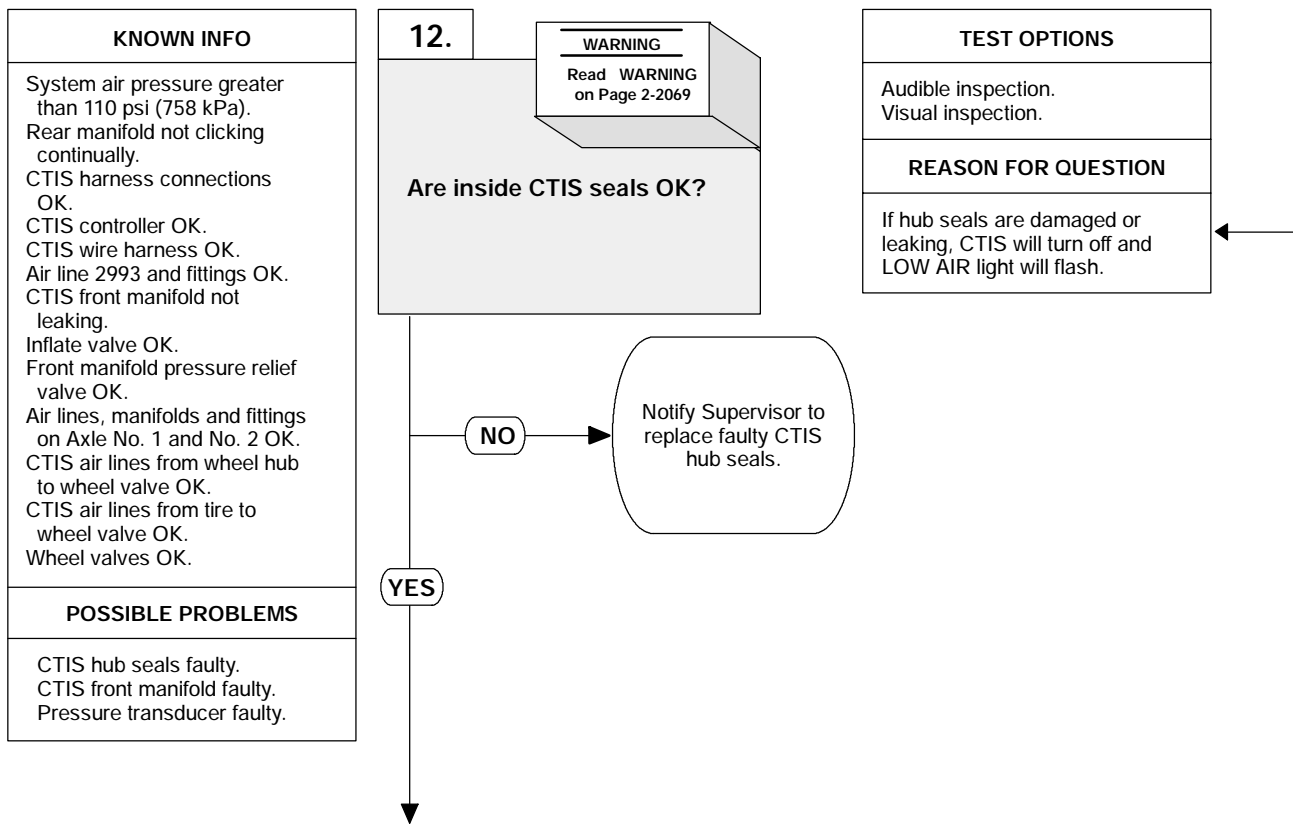
NOTE

- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.
- Some air leakage (bubbles forming) may occur at breather during inflation/deflation cycles. A rapid exhaust of air indicates a problem.

VISUAL/AUDIBLE INSPECTION
(1) Start engine (TM 9-2320-364-10). (2) Set CTIS controller to HIGHWAY. (3) Press CTIS START button. (4) Check CTIS wheel valves for air leakage. (a) If wheel valve is damaged or leaking air, perform Step (5) below and repair or replace wheel valve (Para 13-11). (b) If there are no air leaks or damage, wheel valve is OK. (5) Turn OFF ENGINE switch. (6) Install wheel cover with four nuts.

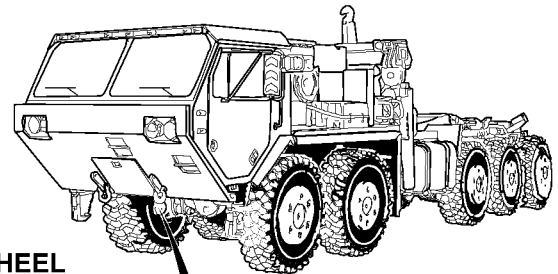


10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.



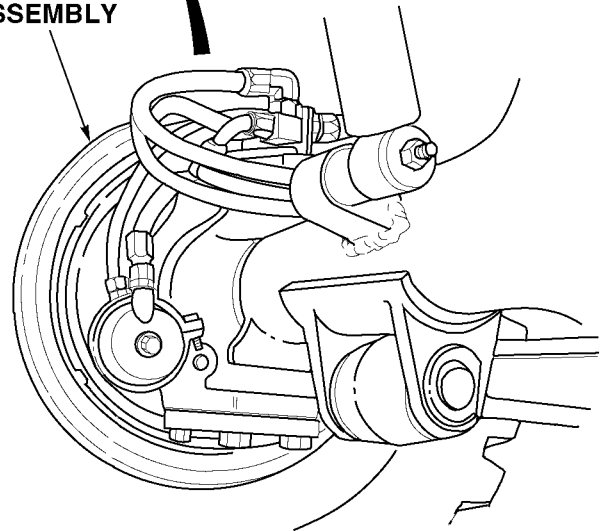
**WHEEL
TIRE
ASSEMBLY**

NOTE

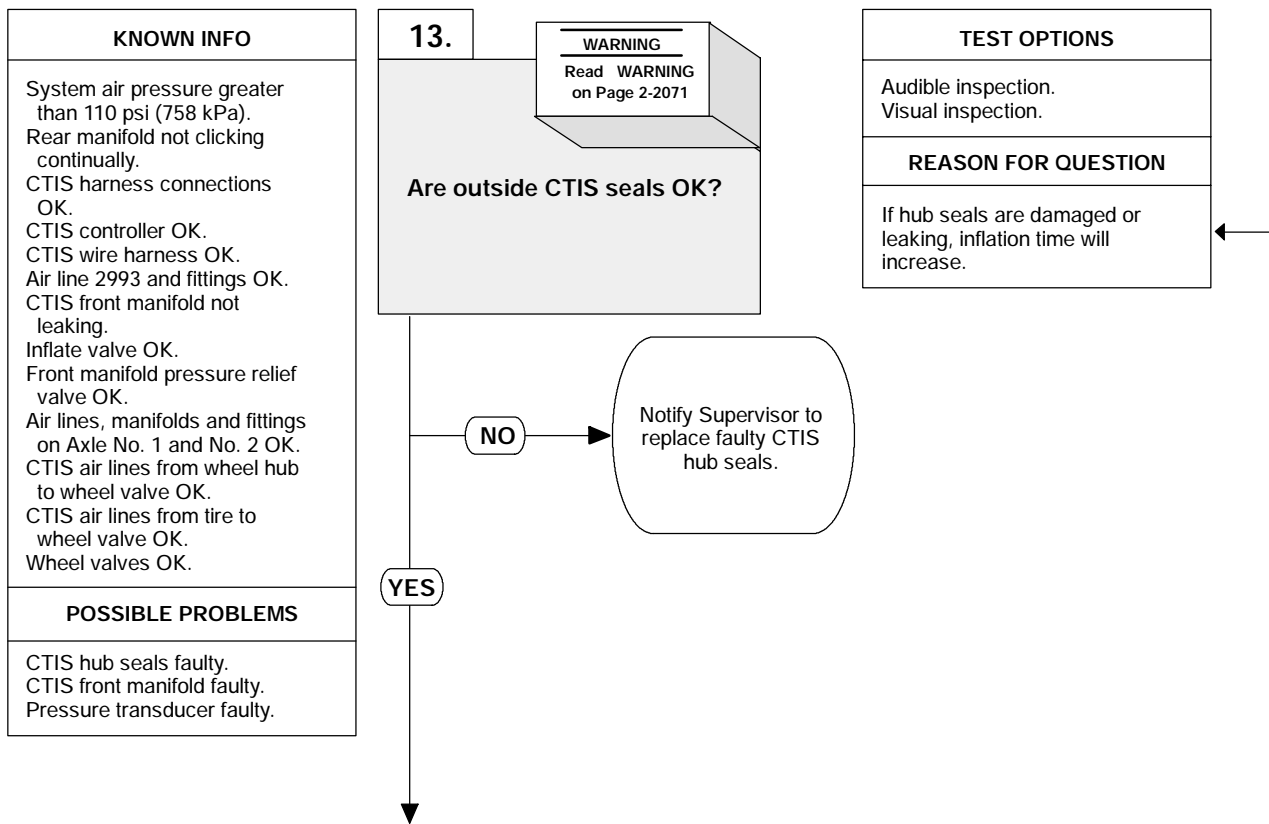
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press START button.
- (4) Check for air escaping from the inside portion of the wheel and tire assemblies.
 - (a) If air is escaping, turn off ENGINE SWITCH and notify Supervisor to replace faulty CTIS hub seals.
 - (b) If there is no air escaping, inside CTIS hub seals are OK.
- (5) Turn OFF ENGINE switch.



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

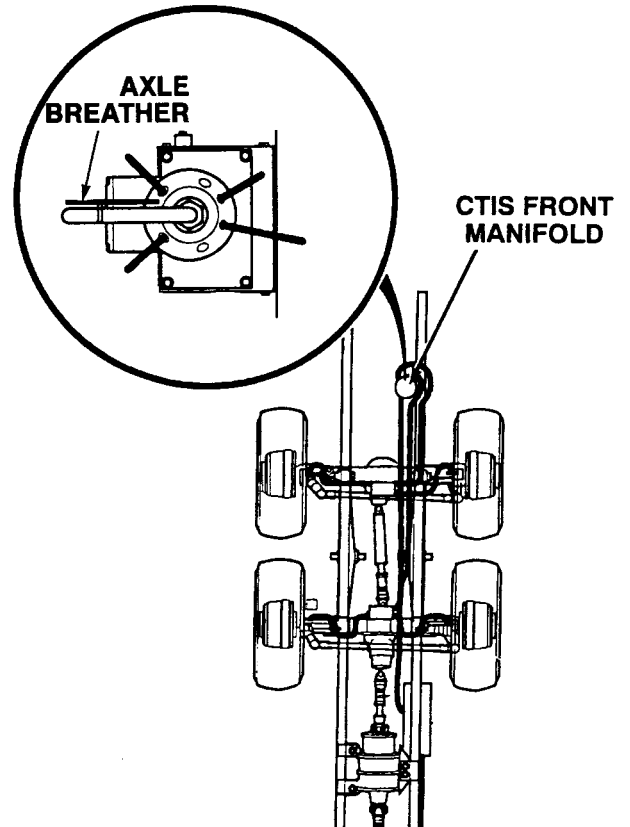
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

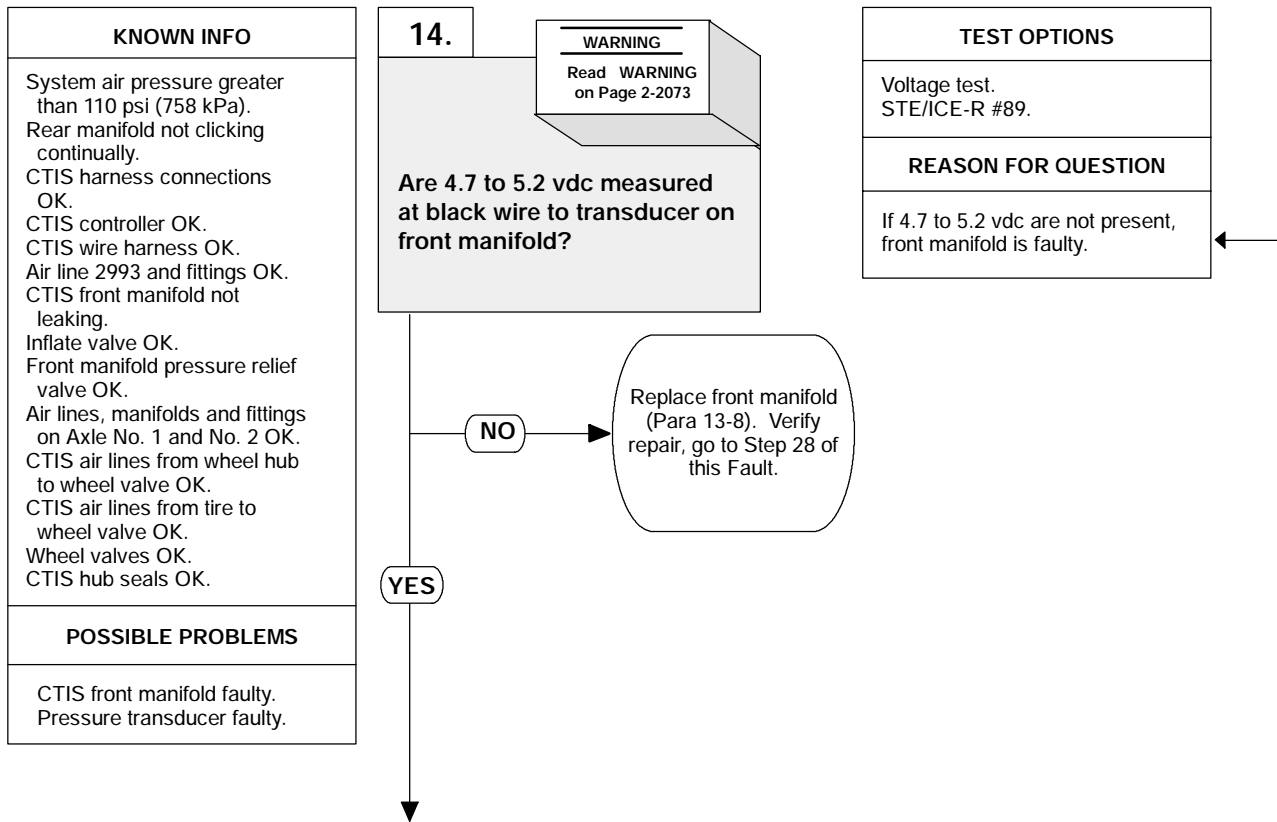
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press START button.
- (4) Check for air escaping from the axle breather tube.
 - (a) If air is escaping, turn OFF ENGINE switch, notify Supervisor to replace faulty CTIS hub seals.
 - (b) If there is no air escaping, CTIS hub seals are OK.
- (5) Turn OFF ENGINE switch.



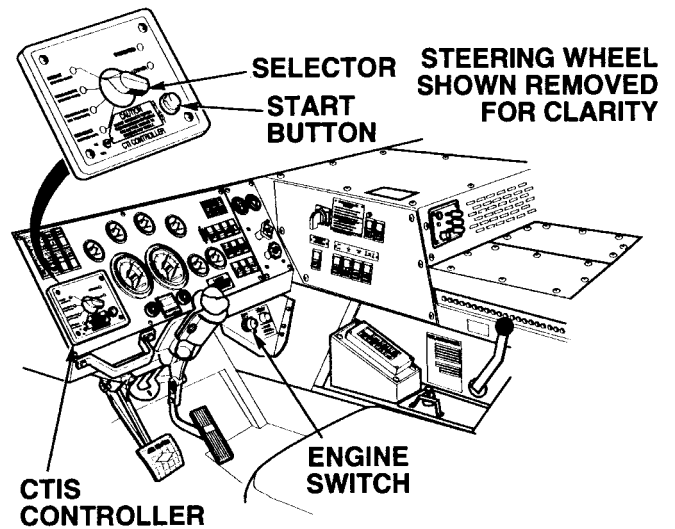
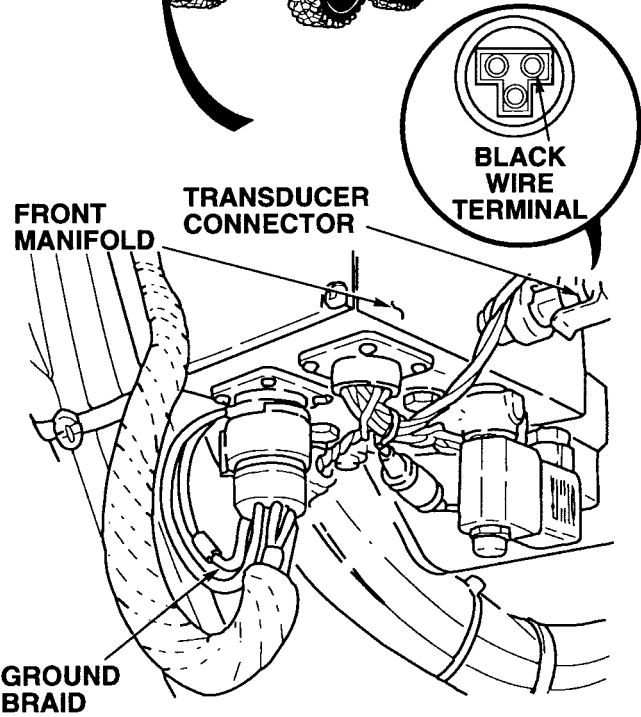
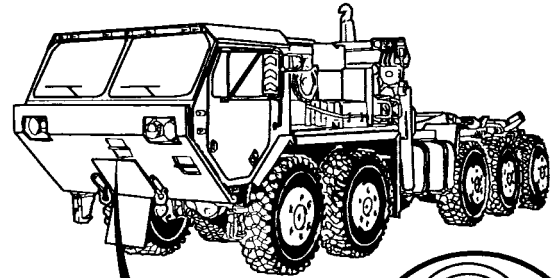
10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



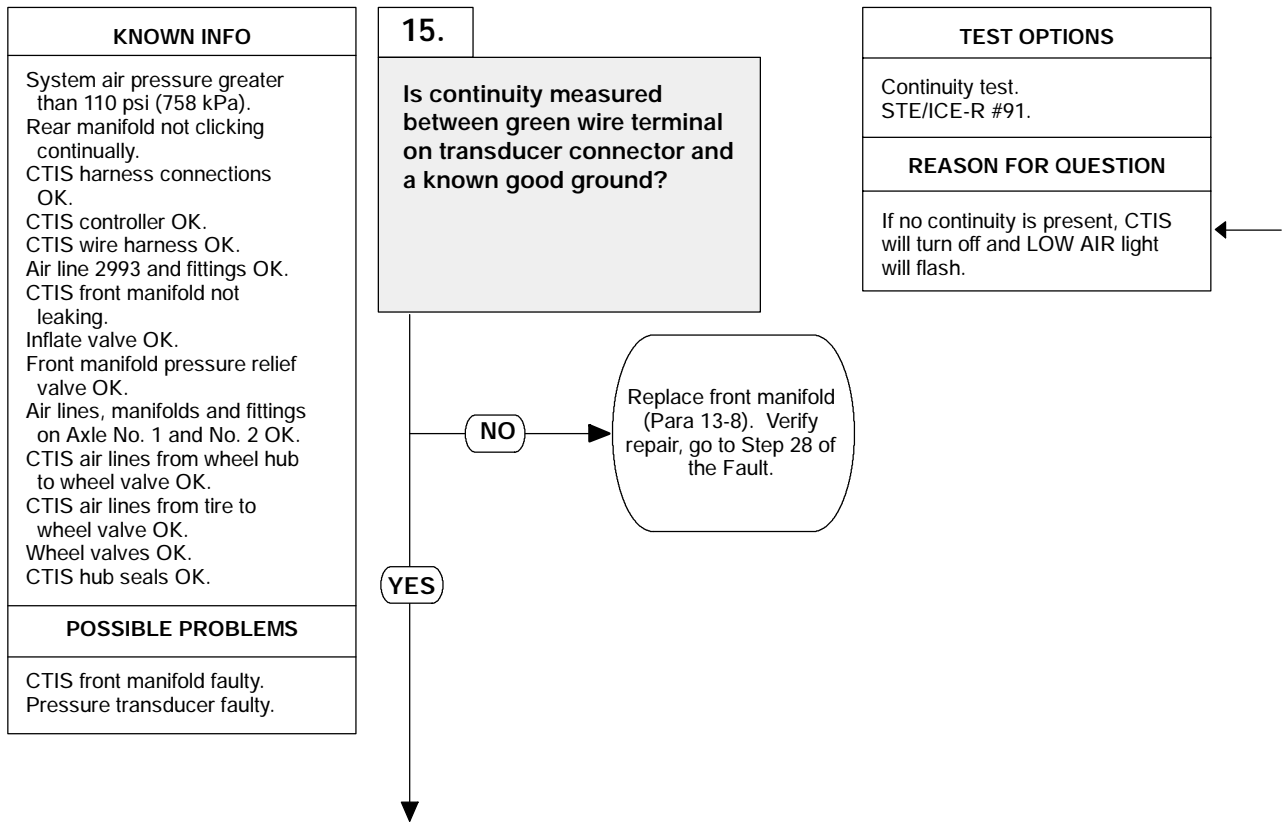
WARNING

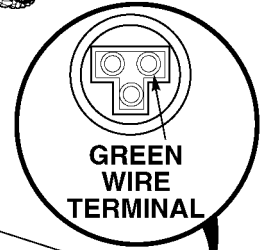
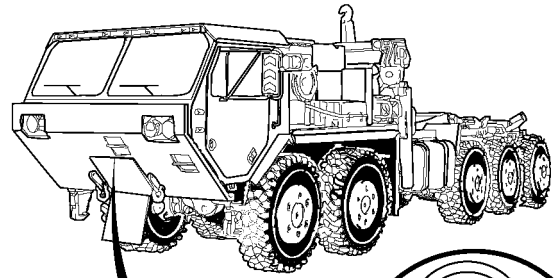
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST	
(1)	Disconnect connector from transducer on front manifold.
(2)	Set multimeter select switch to volts dc.
(3)	Connect positive (+) multimeter lead to black wire terminal at transducer connector.
(4)	Connect negative (-) multimeter lead to front manifold ground braid.
(5)	Turn ON ENGINE switch (TM 9-2320-364-10).
(6)	Push CTIS START button.
(a)	If 4.7 to 5.2 vdc are not present, turn OFF ENGINE switch and replace front manifold (Para 13-8).
(b)	If there are 4.7 to 5.2 vdc present, turn OFF ENGINE switch and go to Step 15 of this Fault.

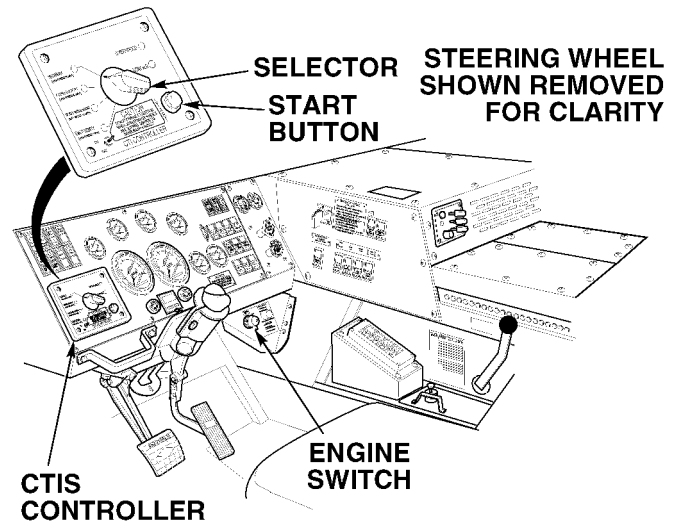
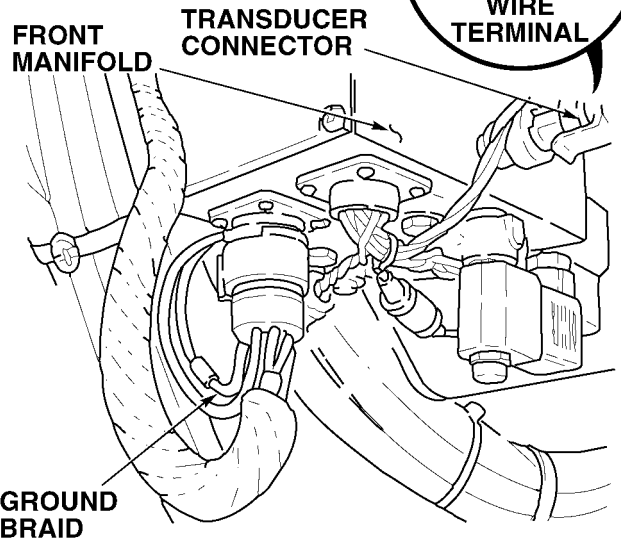


10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

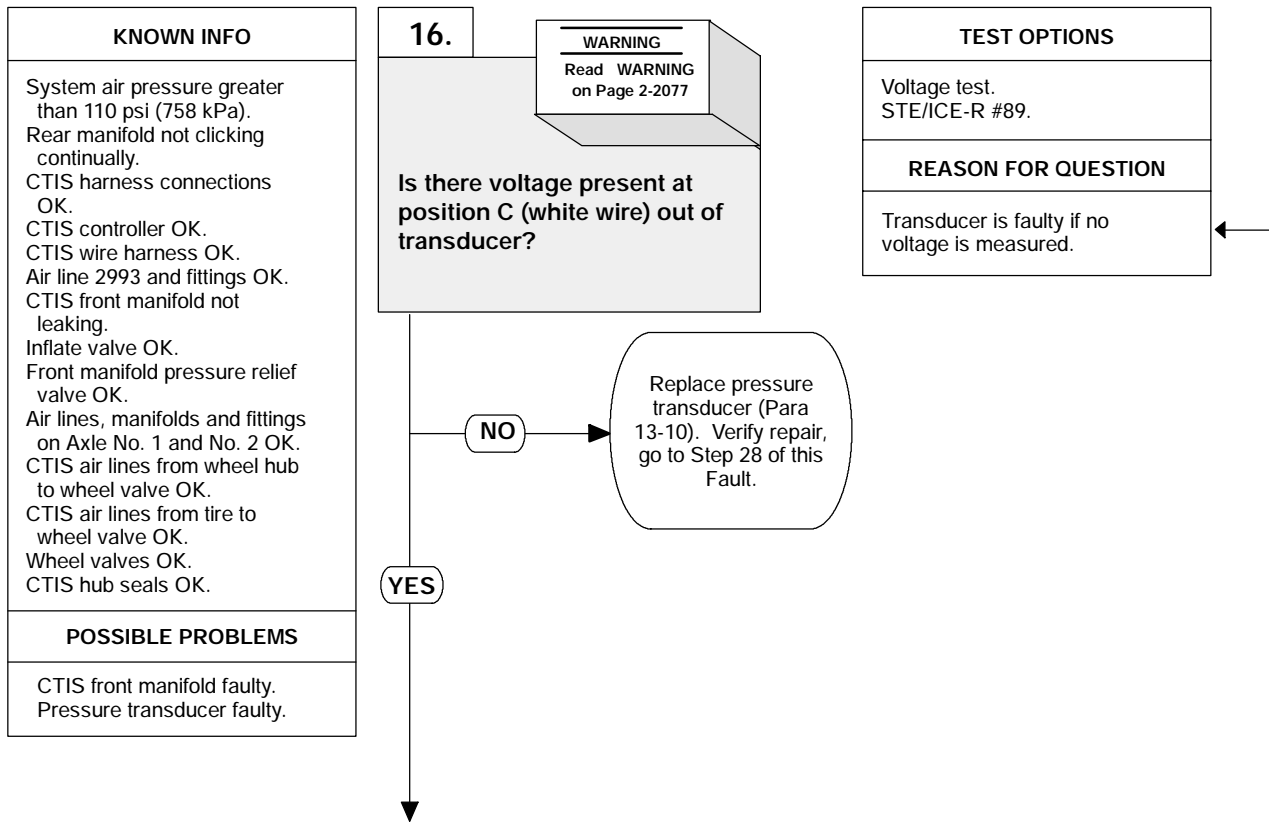




CONTINUITY TEST
(1) Set multimeter select switch to ohms. (2) Is there continuity between pressure transducer connector, green wire terminal and a known good ground? (a) If there is no continuity, replace front manifold (Para 13-8). (b) If there is continuity, go to Step 16 of this Fault.



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



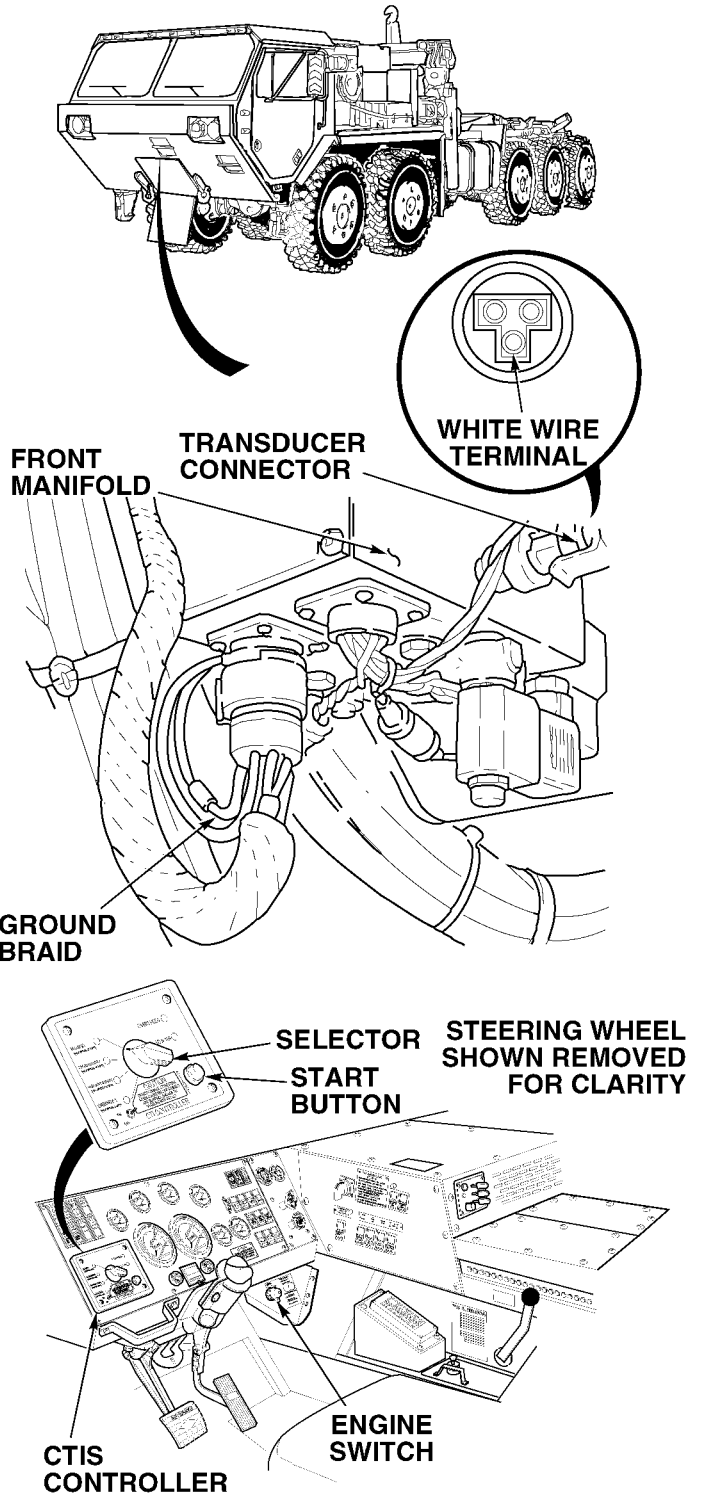
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

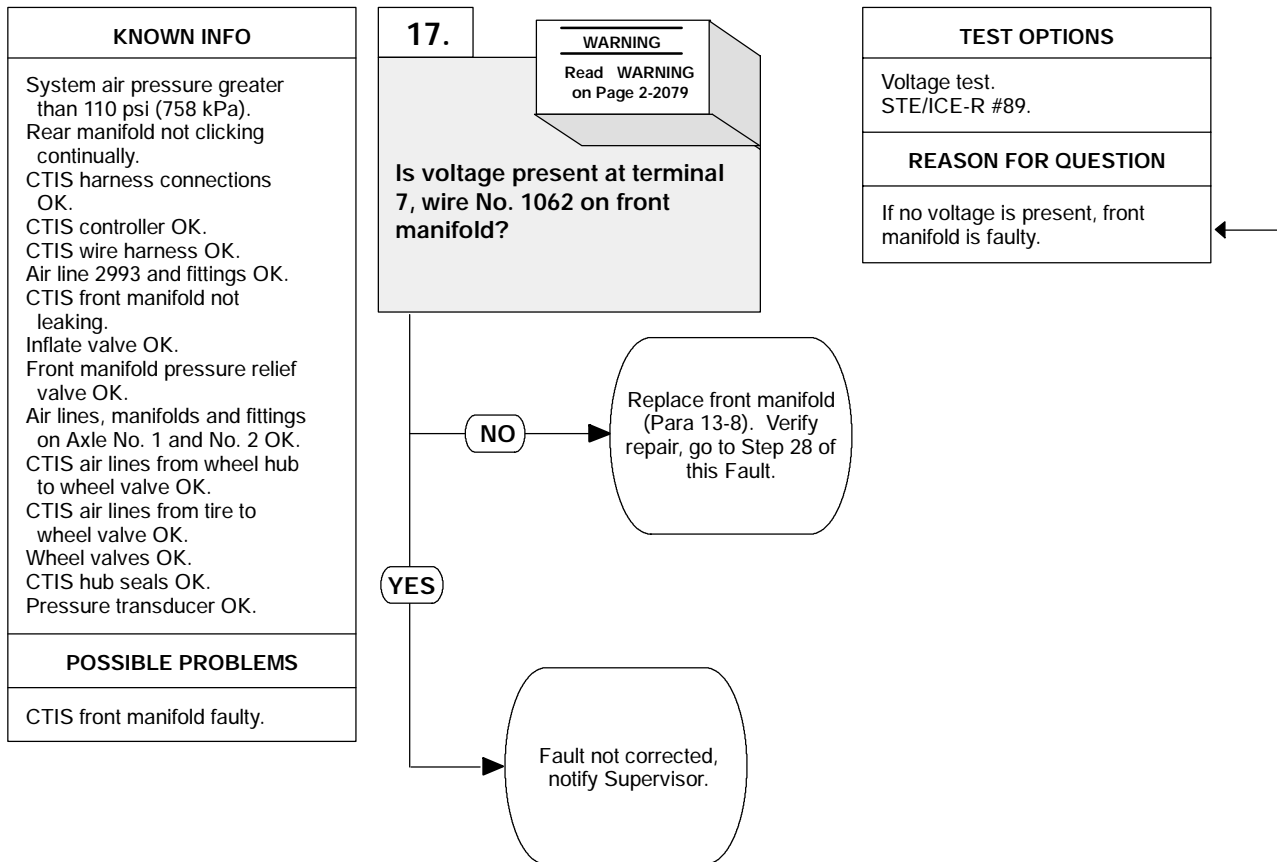
NOTE

All connectors must be fully plugged in to perform this test.

VOLTAGE TEST	
(1)	Connect pressure transducer connector to pressure transducer.
(2)	Set multimeter select switch to volts dc.
(3)	Connect positive (+) multimeter lead to white wire.
(4)	Connect negative (-) multimeter lead to manifold ground braid.
(5)	Turn ON ENGINE switch (TM 9-2320-364-10).
(6)	While assistant presses CTIS START button, check multimeter for any vdc.
(a)	If no vdc is measured, replace transducer (Para 13-10).
(b)	If any vdc is measured, go to Step 17 of this Fault.
(7)	Turn OFF ENGINE switch.



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

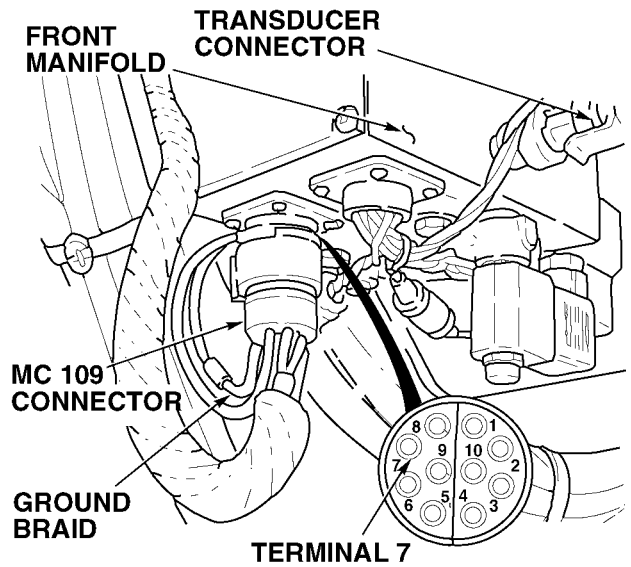
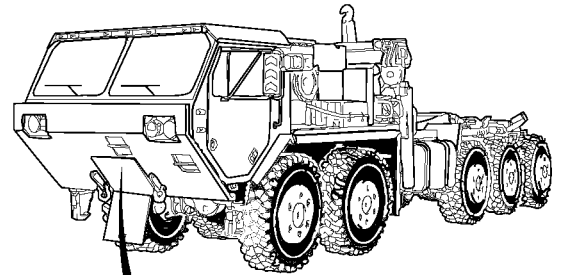
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

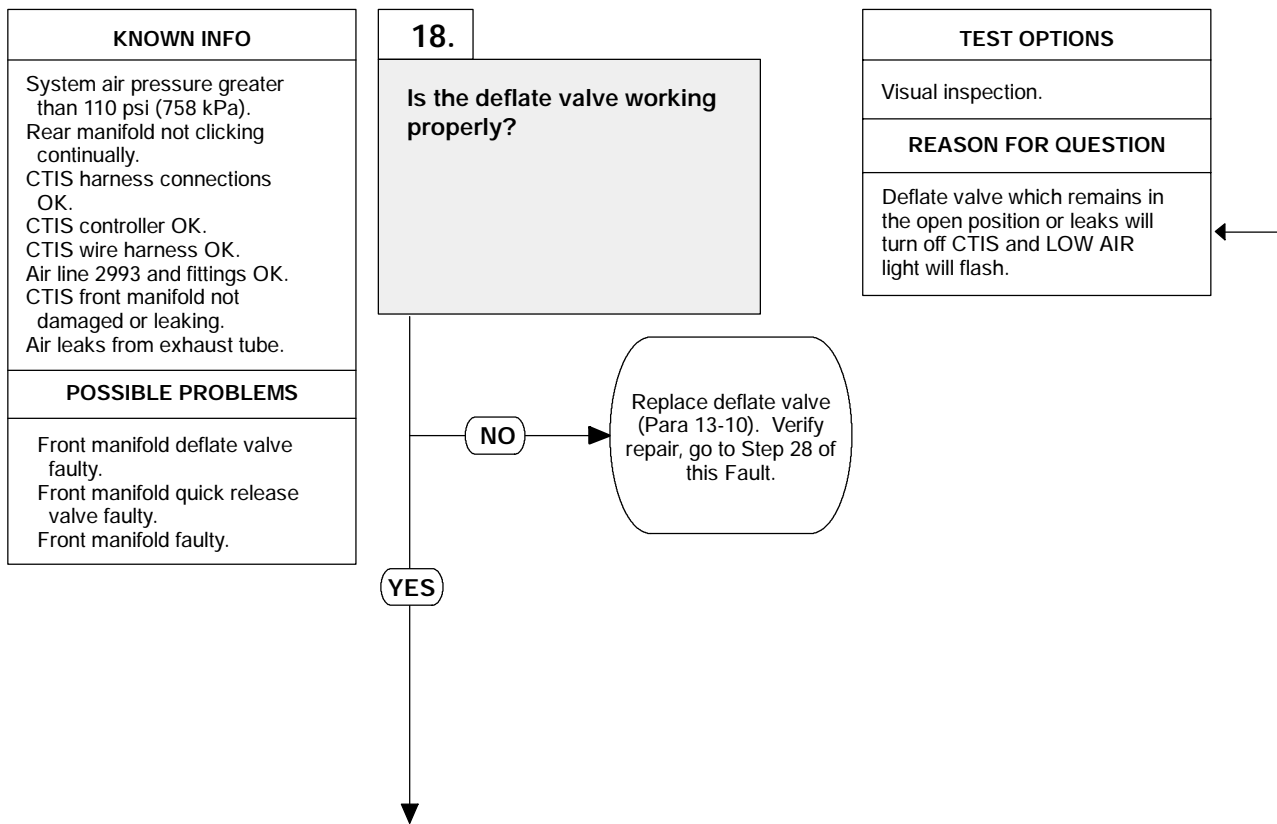
All connectors must be fully plugged in to perform this test.

VOLTAGE TEST

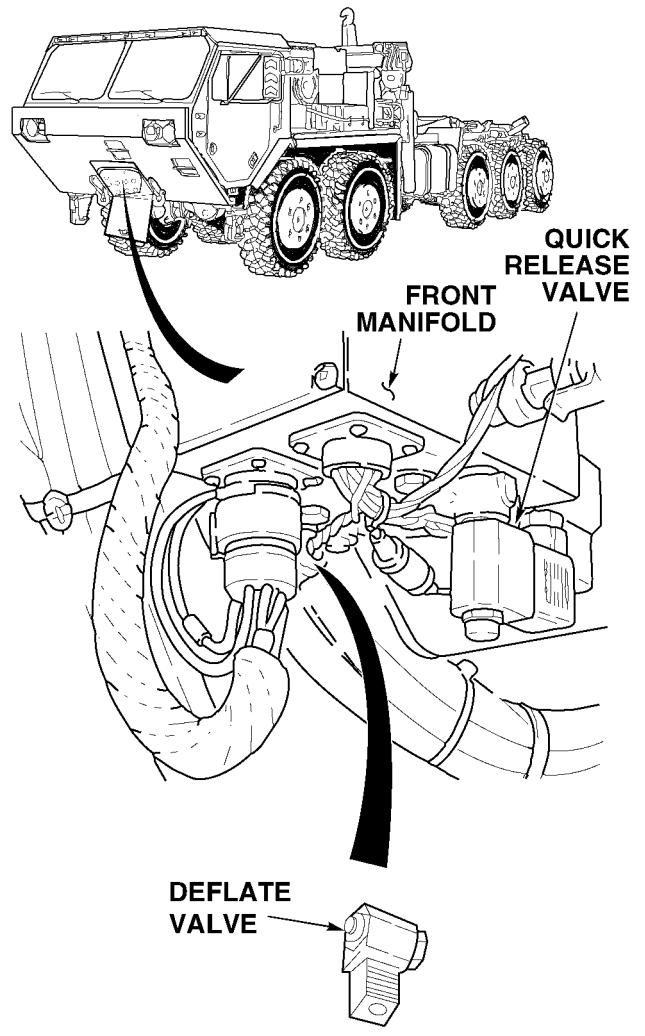
- (1) Connect positive (+) multimeter lead (with long probe installed) on terminal 7 at front manifold wire harness.
- (2) Connect negative (-) multimeter lead to a known good ground.
- (3) Turn ON ENGINE switch.
- (4) As assistant pushes CTIS START button.
 - (a) If there is no voltage present, replace front manifold (Para 13-8).
 - (b) If there is voltage, Fault is not corrected. Notify Supervisor.
- (5) Turn OFF ENGINE switch.
- (6) Close front access cover (TM 9-2320-364-10).



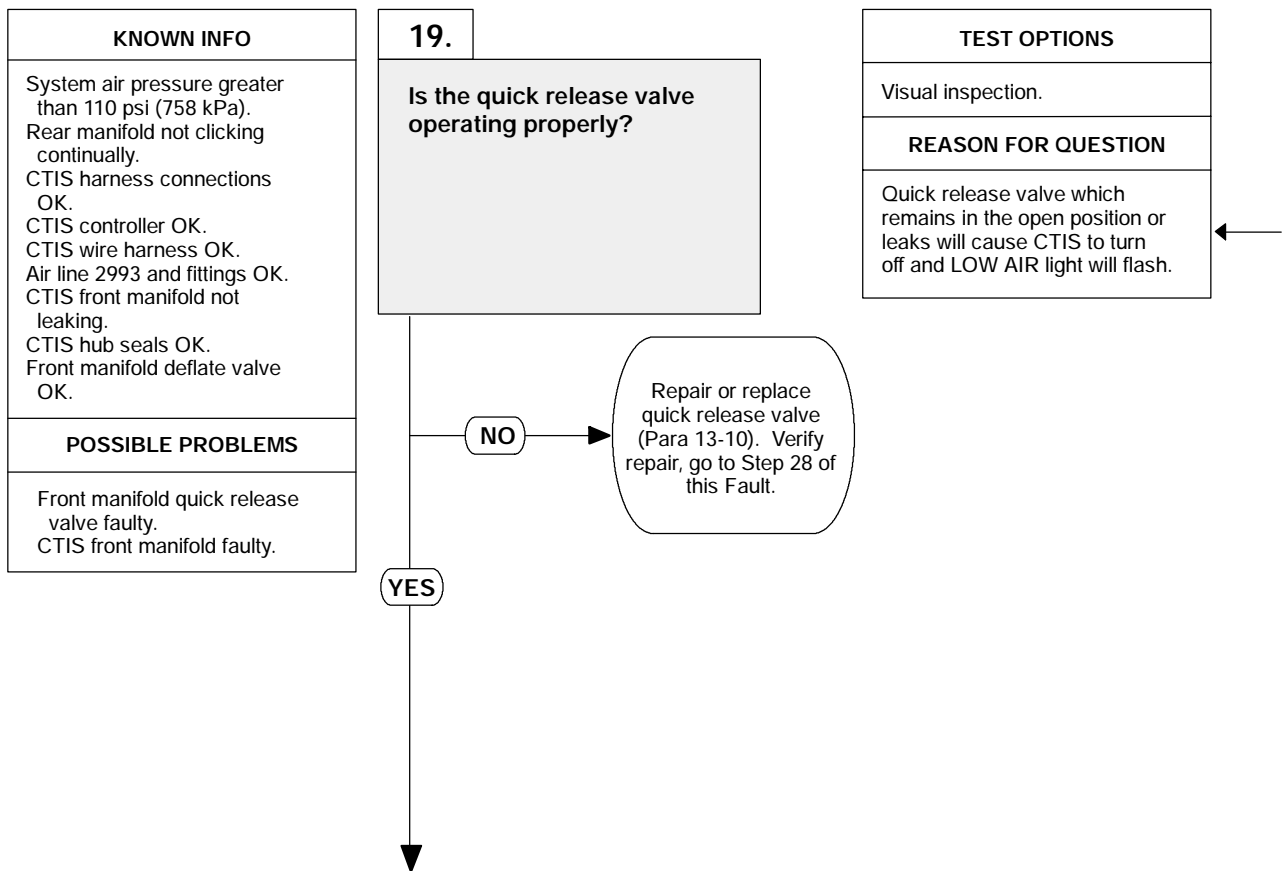
10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

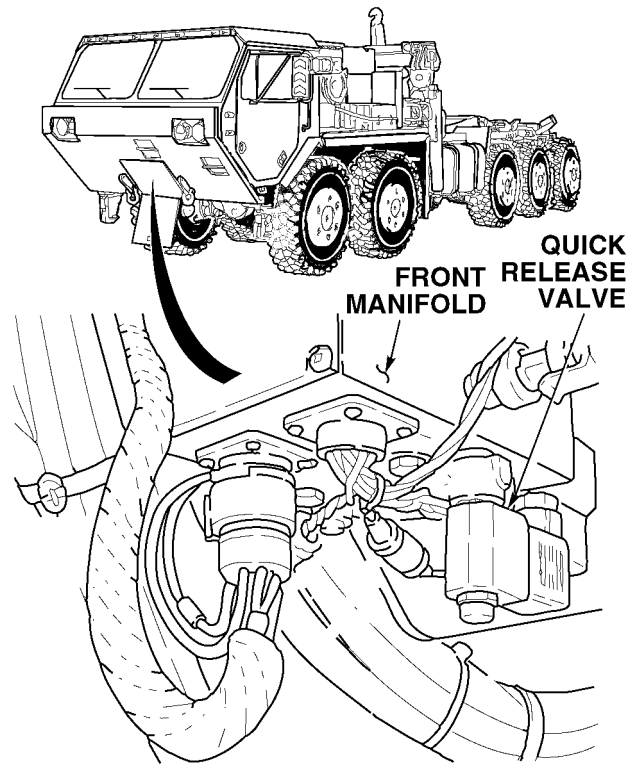


VISUAL INSPECTION	
(1)	Remove deflate valve from front manifold (Para 13-10).
(2)	Inspect valve assembly for a broken spring, damaged diaphragm, sticking, or any other physical damage.
(a)	If deflate valve is damaged, repair or replace deflate valve (Para 13-10).
(b)	If deflate valve is not damaged, install deflate valve and go to Step 19 of this Fault.



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

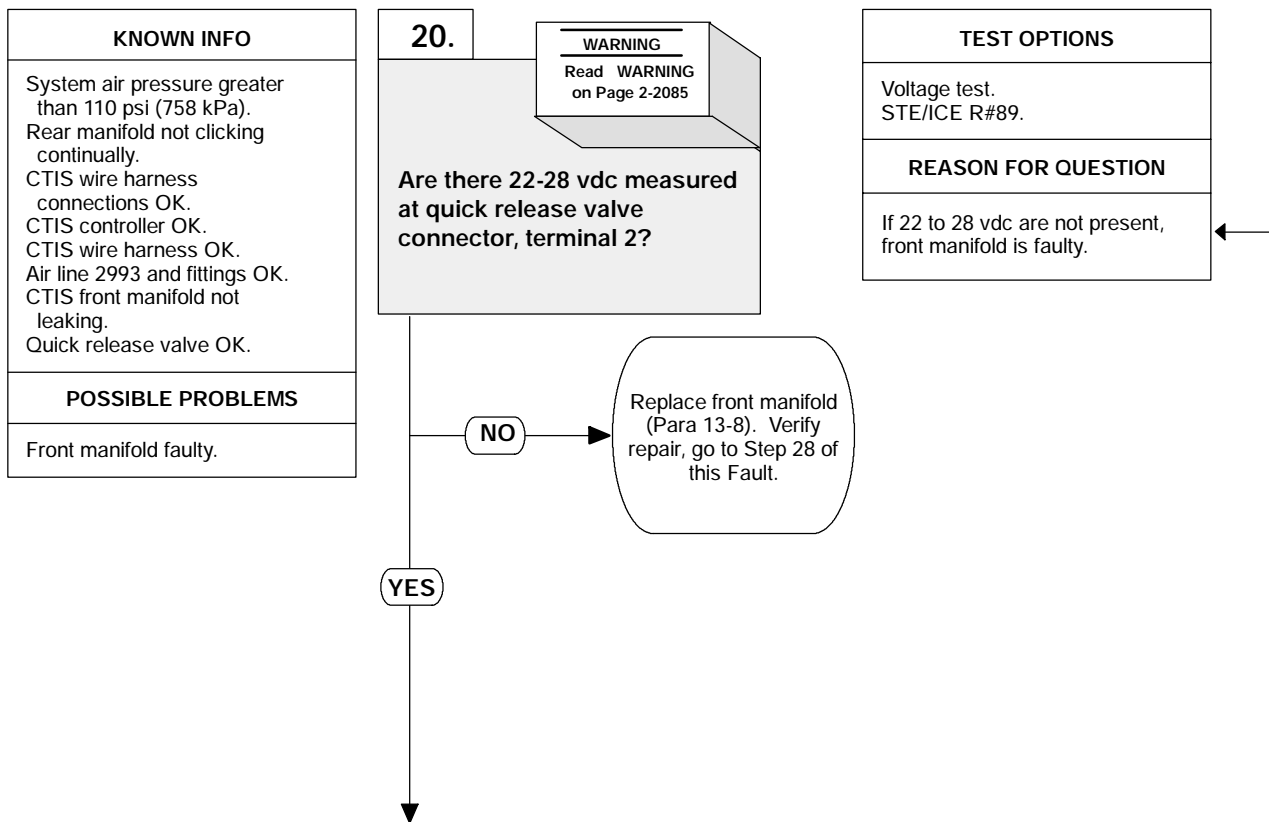




VISUAL INSPECTION

- (1) Remove quick release valve from front manifold (Para 13-10).
- (2) Inspect valve assembly for a broken spring, damaged diaphragm, sticking or any other physical damage.
 - (a) If quick release valve is damaged, repair or replace quick release valve (Para 13-10).
 - (b) If quick release valve is not damaged, go to Step 20 of this Fault.

10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

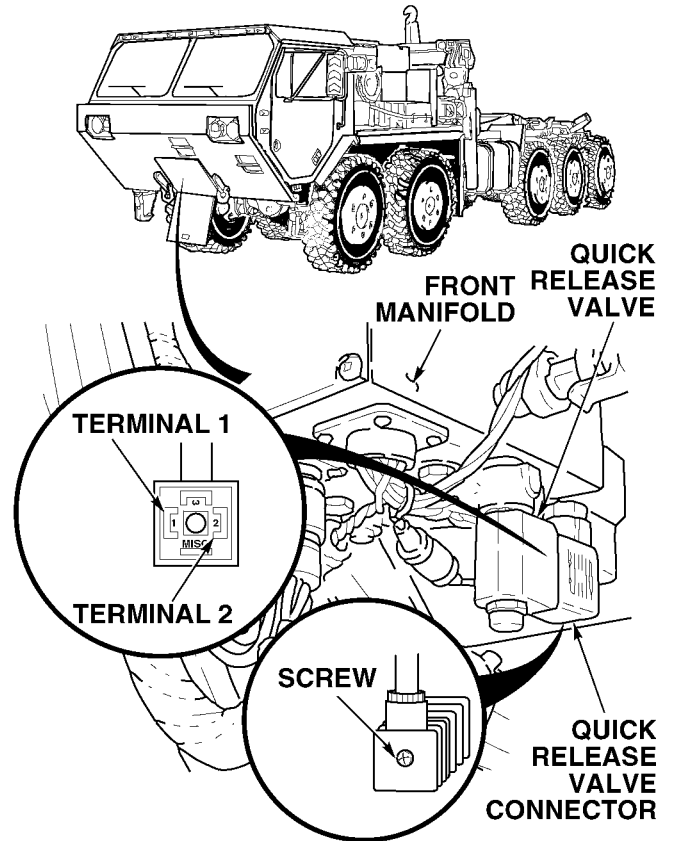


WARNING

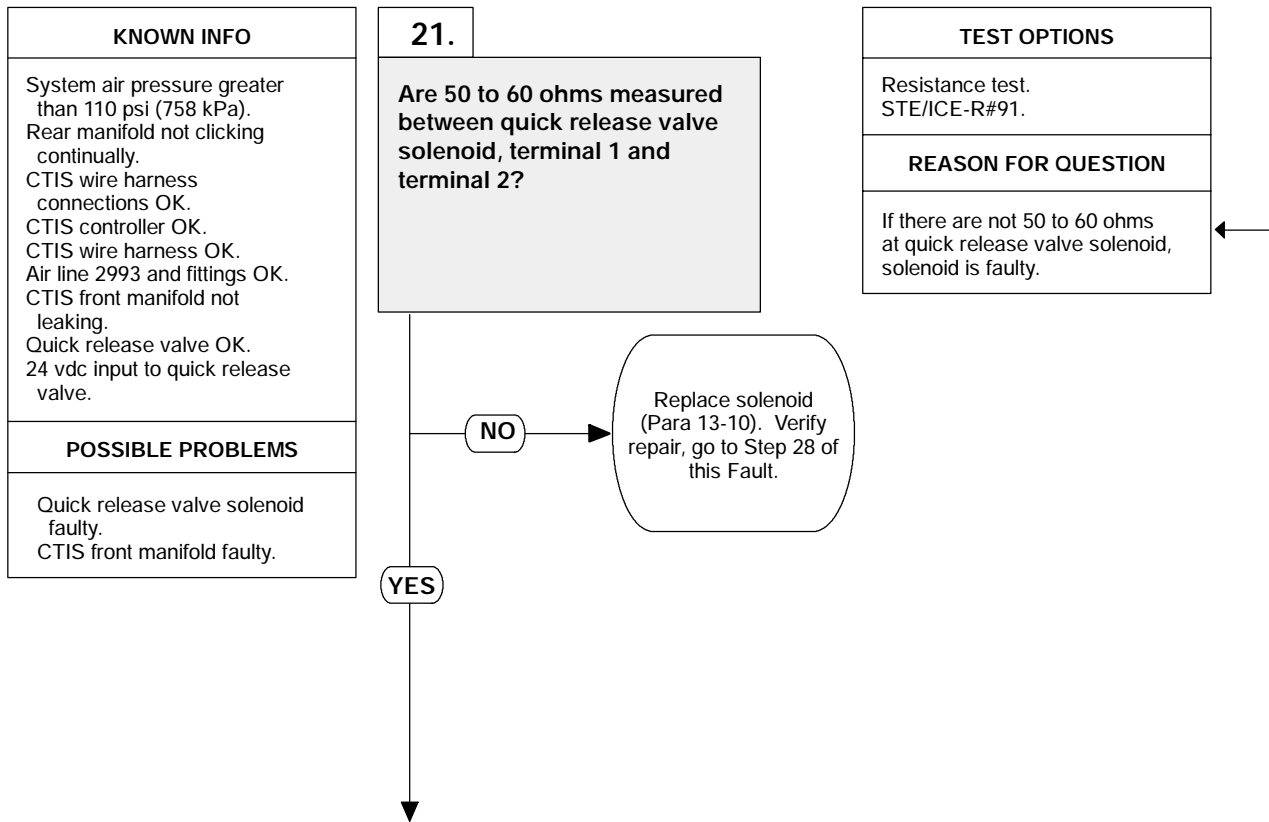
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

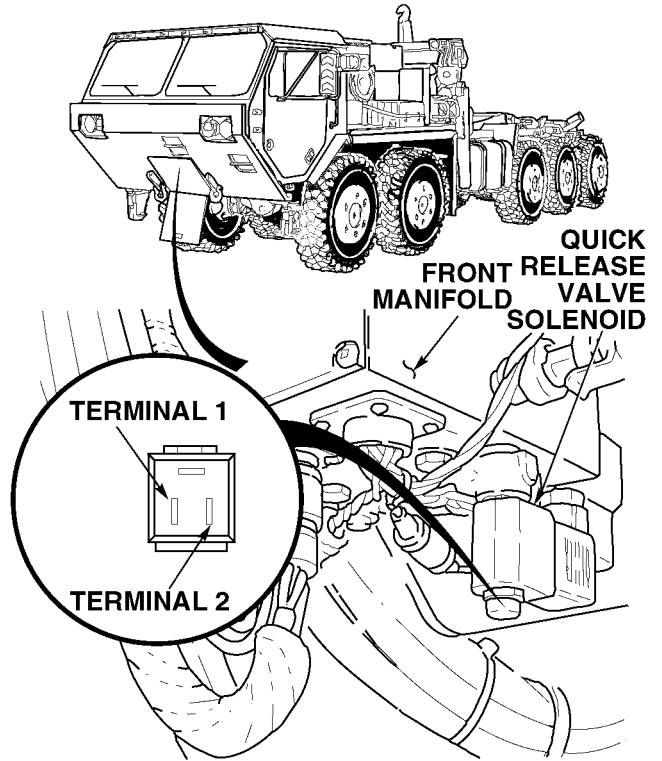
- (1) Loosen screw and disconnect quick release valve connector.
- (2) Connect positive (+) multimeter lead to quick release valve connector, terminal 2.
- (3) Connect negative (-) multimeter lead to front manifold ground braid.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
- (5) Assistant pushes CTIS START button.
 - (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and replace front manifold (Para 13-8).
 - (b) If 22 to 28 vdc are present, go to Step 21 of this Fault.



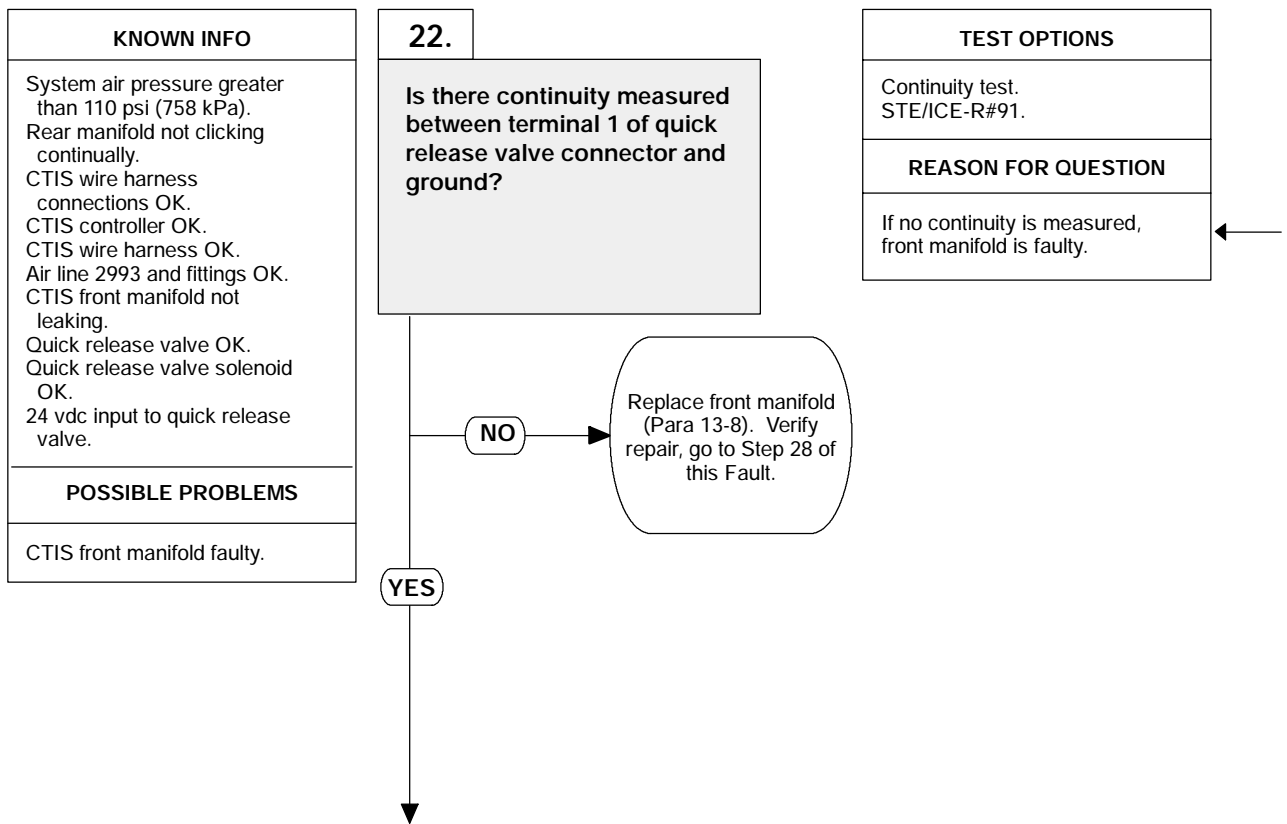
10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



RESISTANCE TEST
<p>(1) Set multimeter select switch to ohms.</p> <p>(2) Read resistance between terminal 1 and 2 of quick release valve solenoid.</p> <p>(a) If there are not 50 to 60 ohms, replace solenoid (Para 13-10).</p> <p>(b) If there are 50 to 60 ohms, solenoid is OK, go to Step 22 of this Fault.</p>



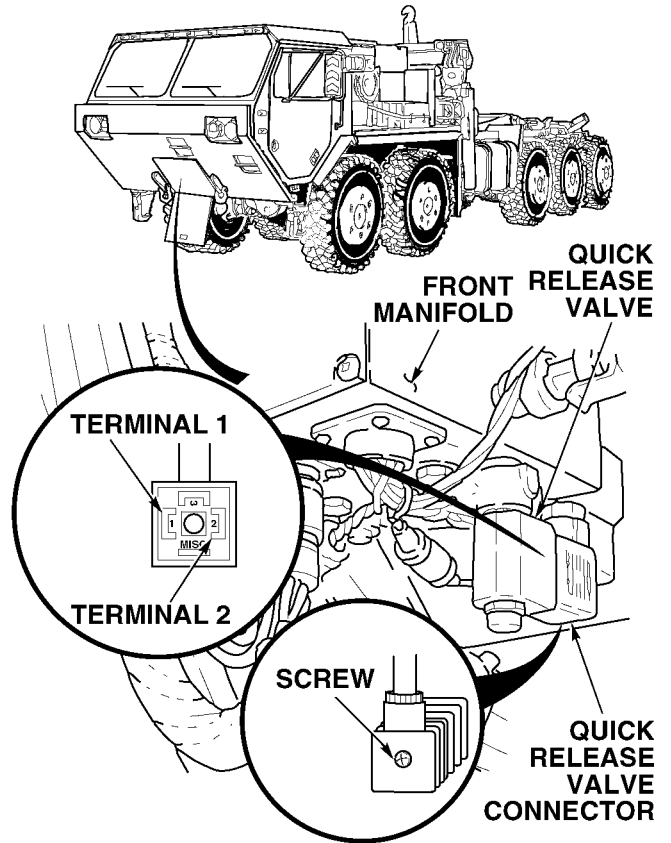
10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



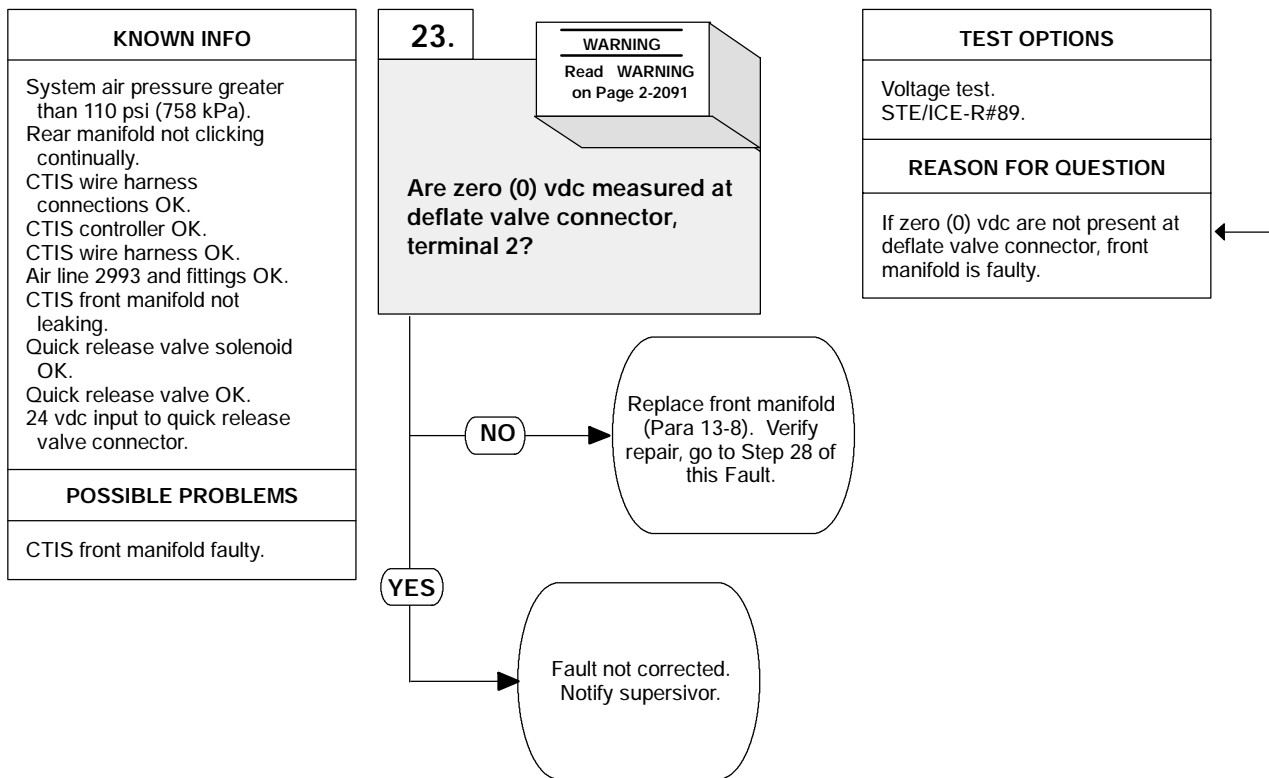
CONTINUITY TEST

Is there continuity measured between terminal 1 at quick release valve connector and a known good ground?

- (1) If there is no continuity measured, replace front manifold (Para 13-8).
- (2) If there is continuity measured, install harness connector on quick release valve and tighten screw.



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



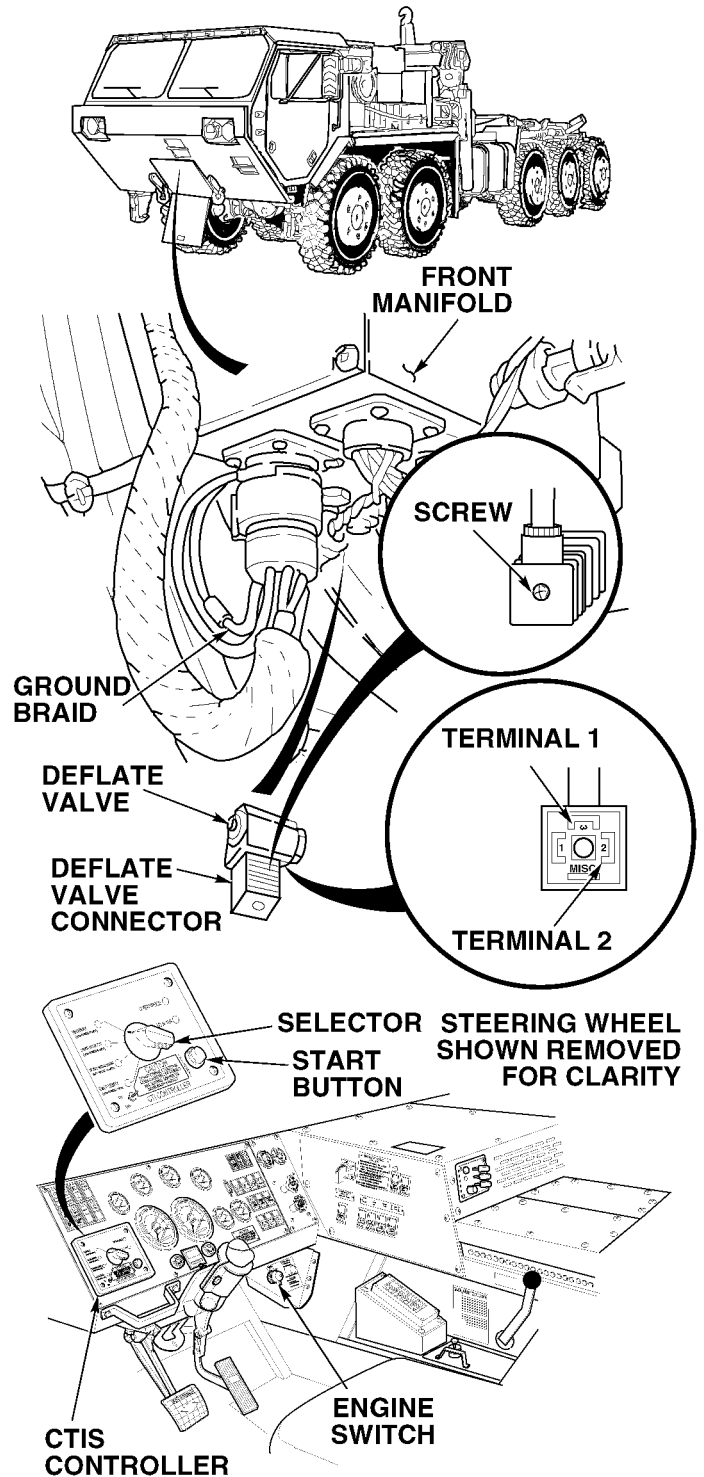
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

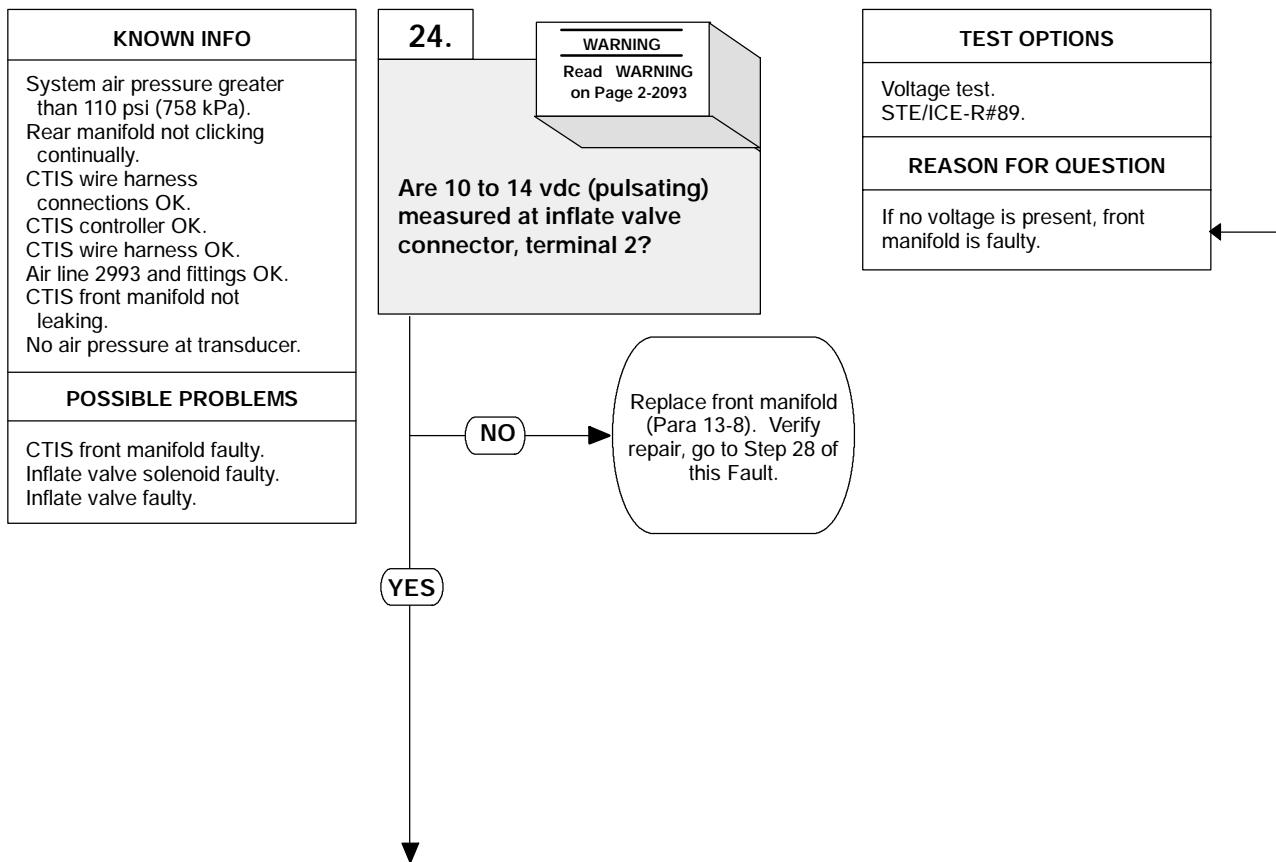
NOTE

Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VOLTAGE TEST
(1) Loosen screw and disconnect deflate valve connector from front manifold.
(2) Connect positive (+) multimeter lead to deflate valve connector, terminal 2.
(3) Connect negative (-) multimeter lead to front manifold ground braid.
(4) Turn ON ENGINE switch
(5) Assistant pushes CTIS START button.
(a) If 22 to 28 vdc are present, turn OFF ENGINE switch and replace front manifold.
(b) If zero (0) vdc are present, manifold is OK. Fault not corrected, notify supervisor.
(6) Turn OFF ENGINE switch.
(7) Connect deflate valve connector and tighten screw.
(8) Install front CTIS manifold cover (Para 13-8).
(9) Close front access cover.



10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

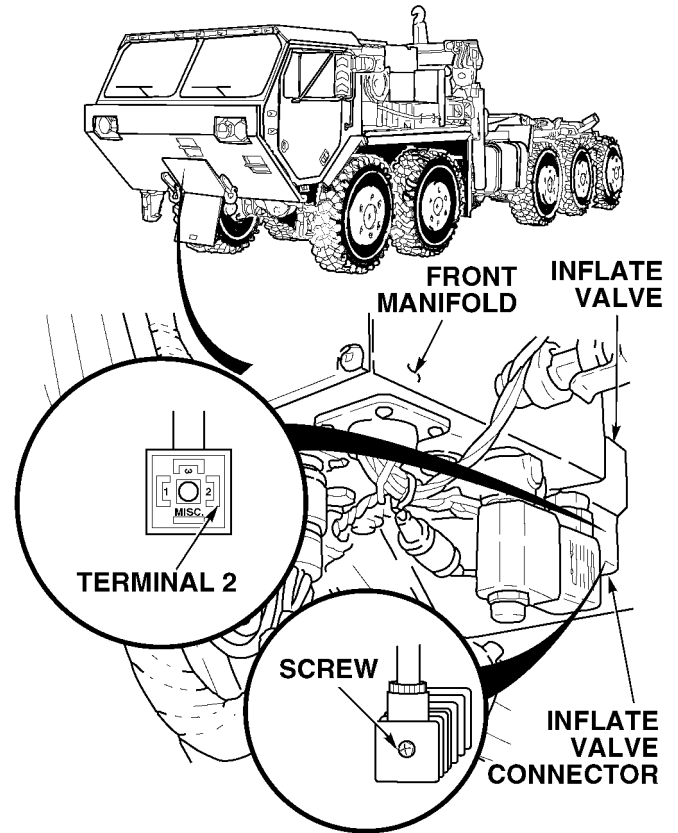
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

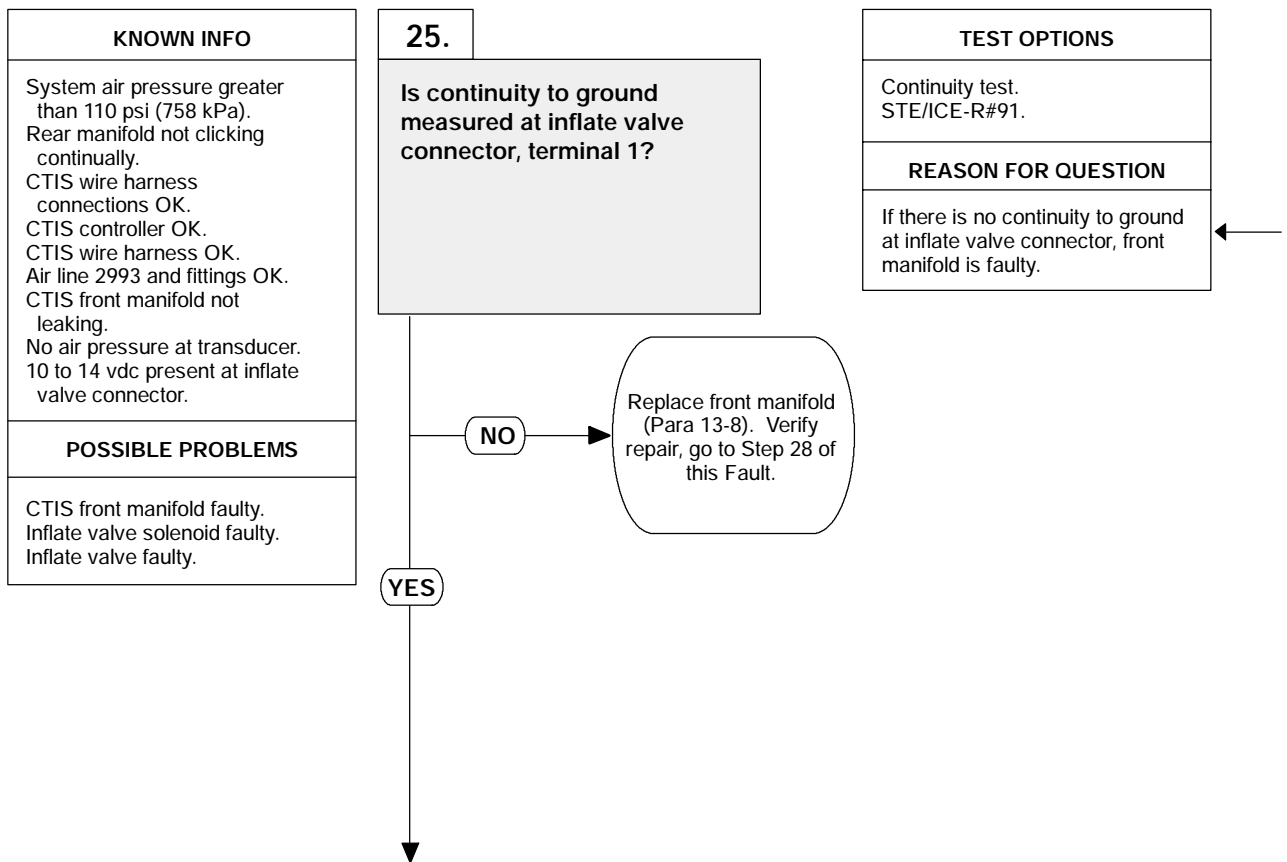
- 10 to 14 vdc (pulsating) will cycle at least five times, then drop to 0 vdc.
- During the cycle course of this test, 10 to 14 vdc will be measured intermittently, then drop to 0 vdc.
- Voltmeter must read 10 to 14 vdc at least one time before dropping to 0 vdc.

VOLTAGE TEST

- (1) Loosen screw and disconnect inflate valve connector.
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead to inflate valve harness connector, terminal 2.
- (4) Connect negative (-) multimeter lead to front manifold ground braid.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
- (6) Assistant pushes CTIS START button.
 - (a) If 10 to 14 vdc (pulsating) are not present, turn OFF ENGINE switch and replace front manifold (Para 13-8).
 - (b) If 10 to 14 vdc (pulsating) are present, turn OFF ENGINE switch and go to Step 25 of this Fault.

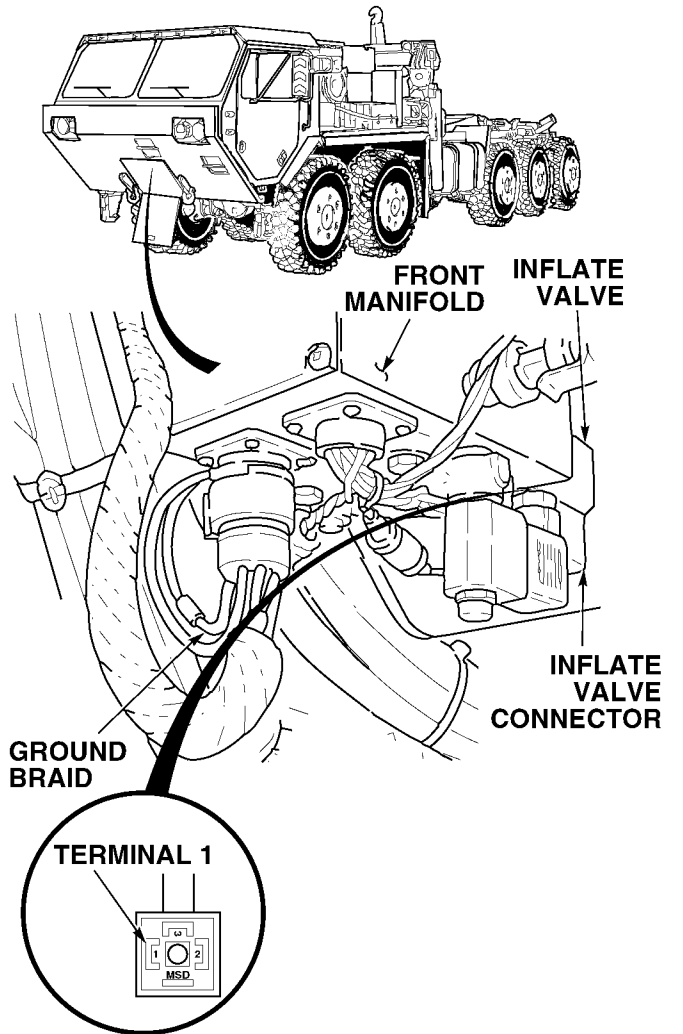


10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

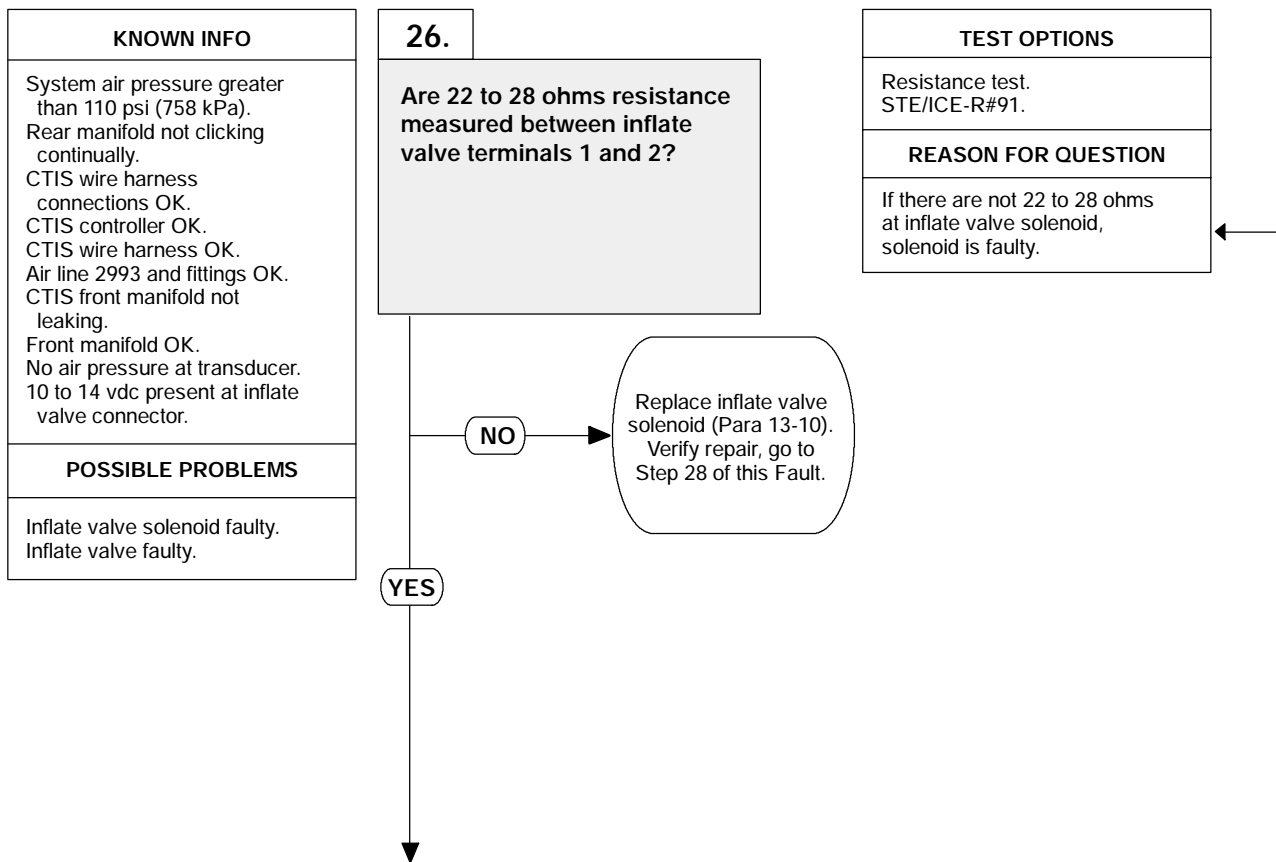


CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between inflate valve connector, terminal 1 and front manifold ground braid?
 - (a) If there is no continuity, replace front manifold (Para 13-8).
 - (b) If there is continuity, go to Step 26 of this Fault.



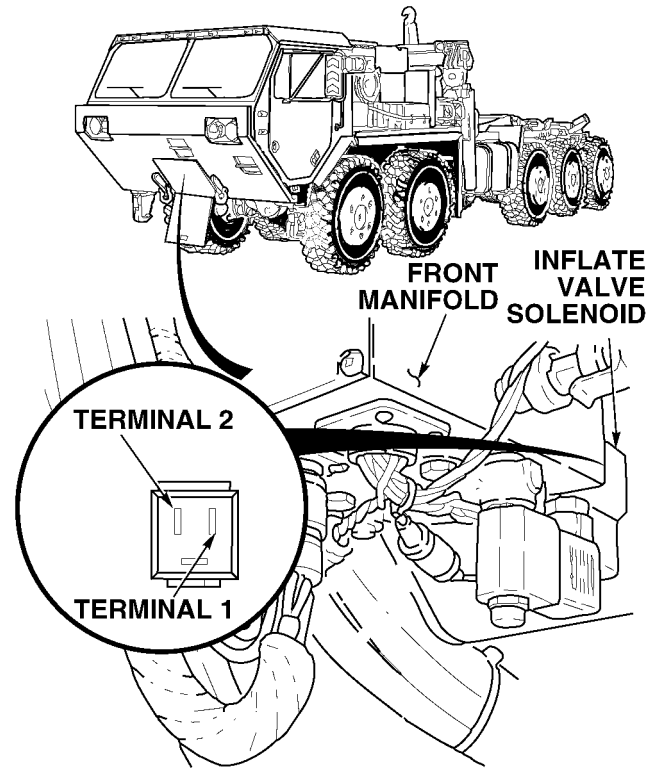
10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



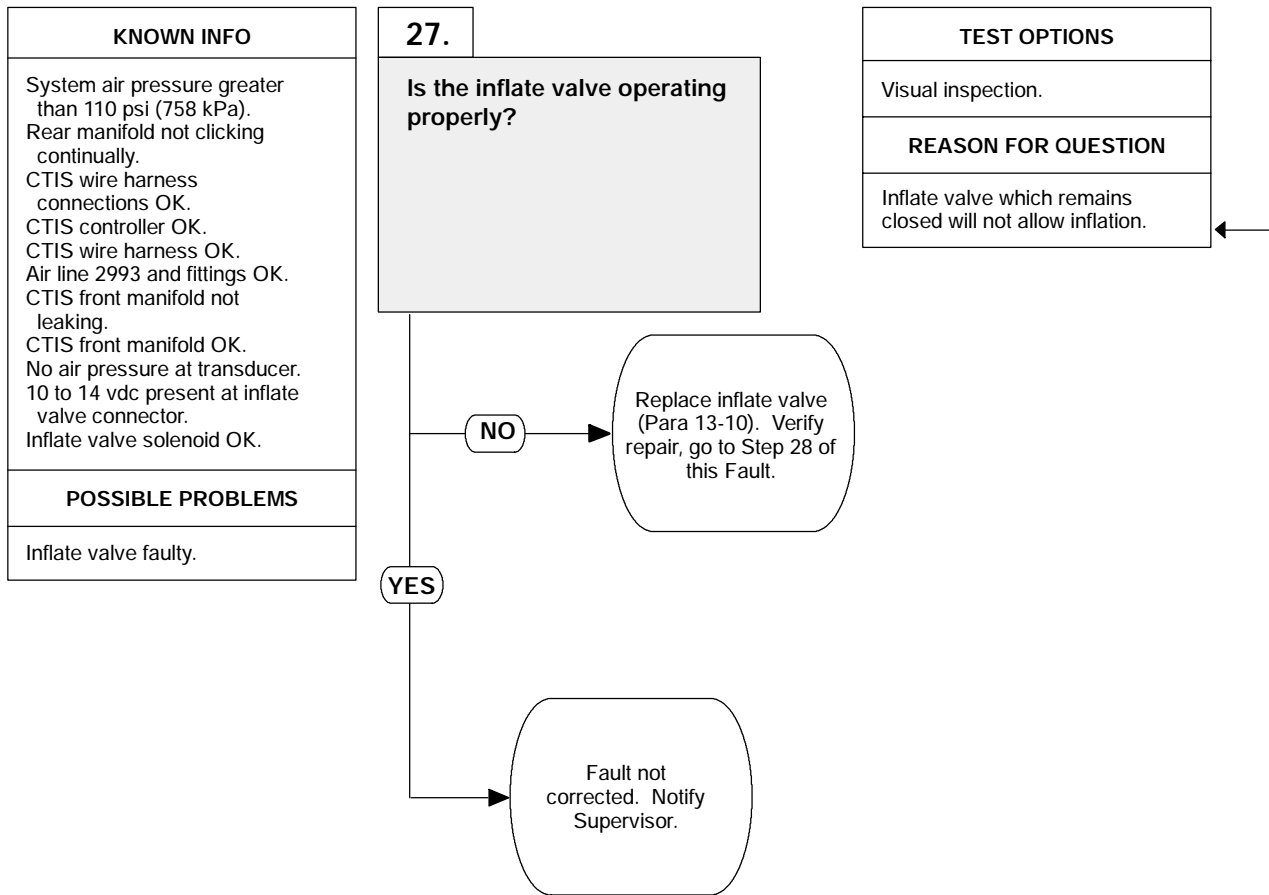
RESISTANCE TEST

Read resistance between terminals 1 and 2 of inflate valve solenoid.

- (1) If there are not 22 to 28 ohms, replace inflate valve solenoid (Para 13-10).
- (2) If there are 22 to 28 ohms, inflate valve solenoid is OK, go to Step 27 of this Fault.

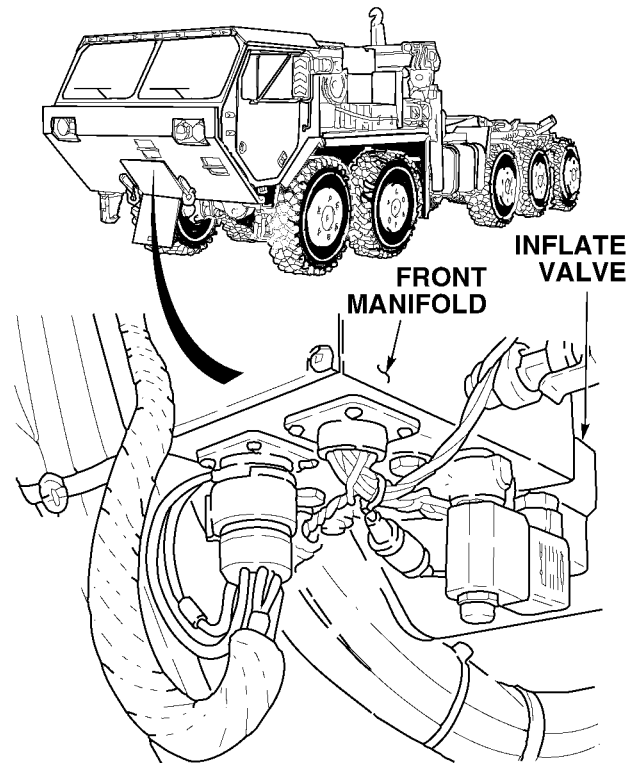


10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

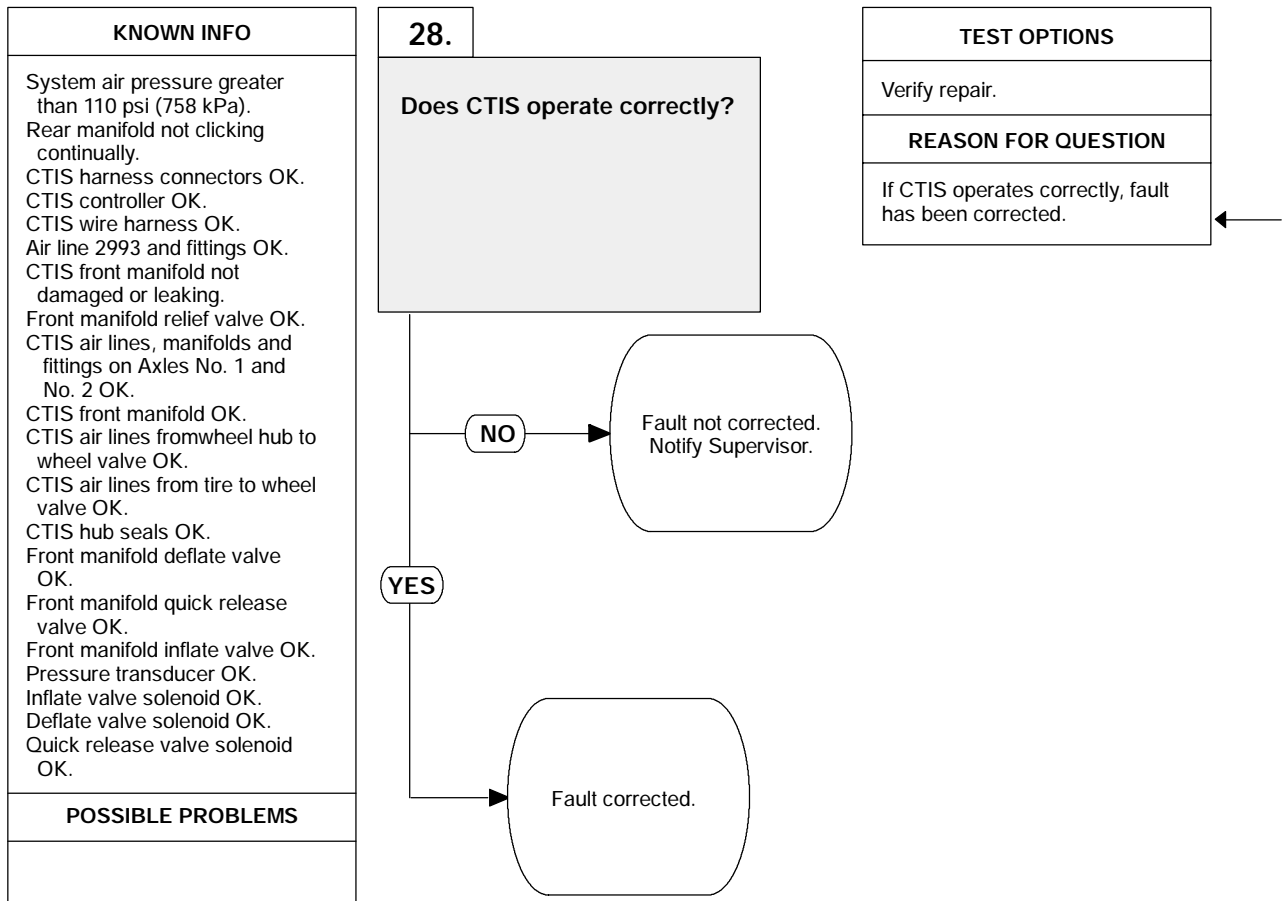


VISUAL INSPECTION

- (1) Remove inflate valve from front manifold (Para 13-10).
- (2) Inspect valve assembly for a broken spring, damaged diaphragm, sticking or any other physical damage.
 - (a) If inflate valve is damaged, repair or replace inflate valve (Para 13-10).
 - (b) If inflate valve is not damaged, fault is not corrected. Notify Supervisor.
- (3) Install inflate valve.
- (4) Connect inflate valve harness connector and tighten screw.
- (5) Install front CTIS manifold cover (Para 13-8).
- (6) Close front access cover (TM 9-2320-364-10).

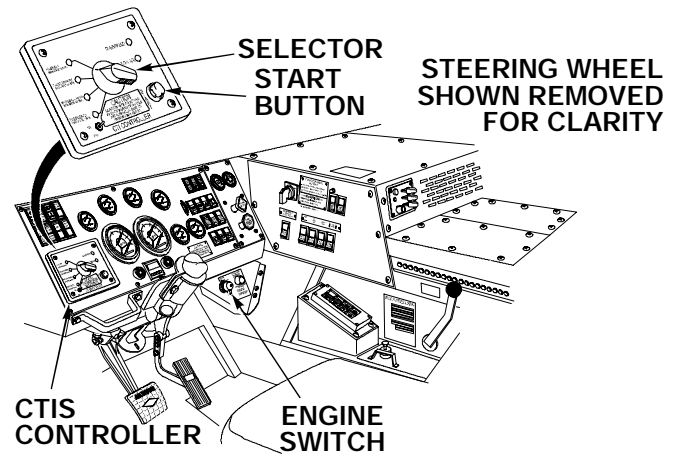


10. FRONT MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button.
 - (a) If front manifold clicks continually and LOW AIR light flashes, fault not corrected. Turn OFF ENGINE switch and notify Supervisor.
 - (b) If front manifold does not click continuously and LOW AIR light does not flash, fault has been corrected.
- (4) Turn OFF ENGINE switch.



2-26. CENTRAL TIRE INFLATION (CTIS) TROUBLESHOOTING (CONT).

11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Goggles, Industrial (Item 30, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

Solution, Soap (Item 86, Appendix C)

Personnel Required

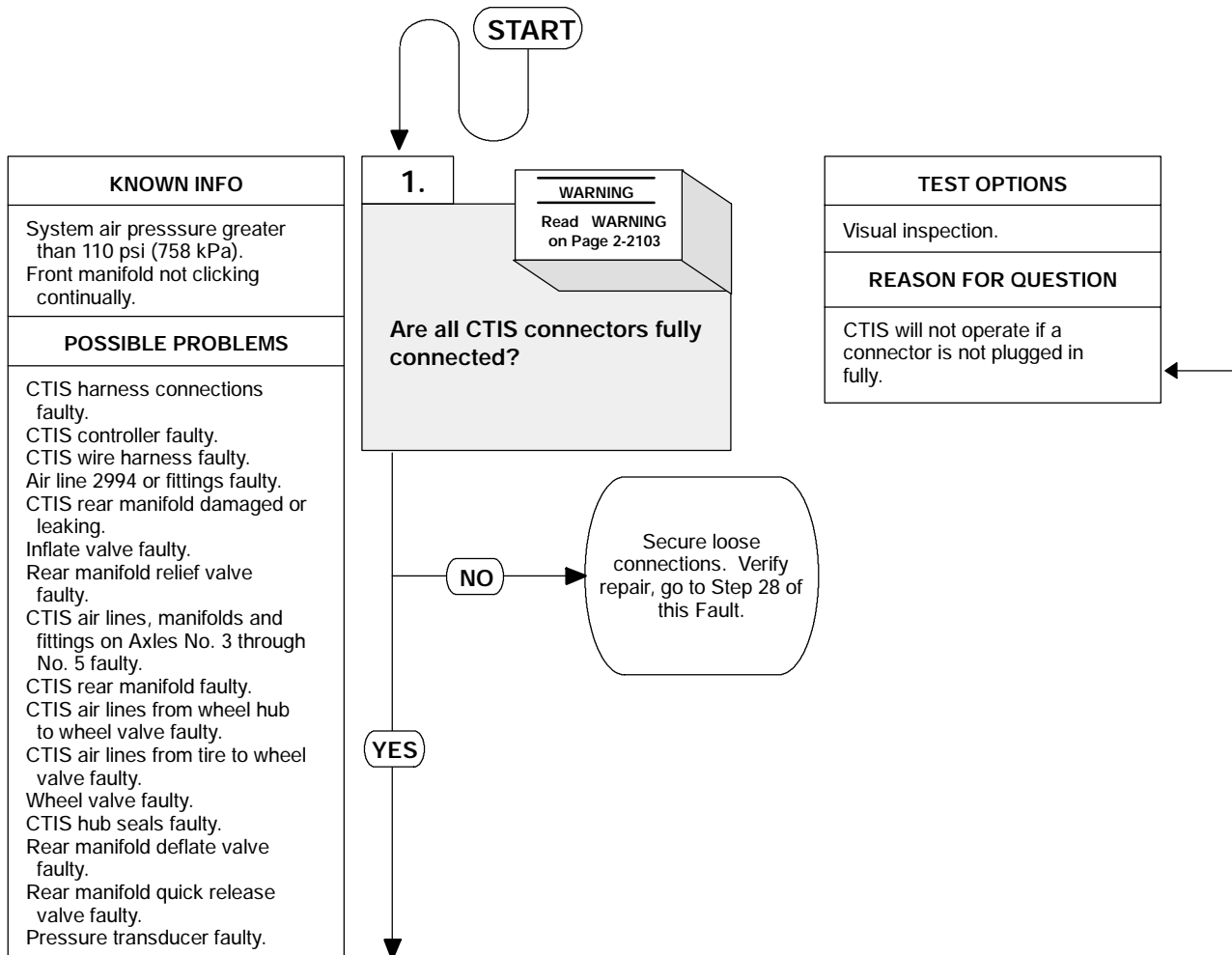
Two

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 LHS extended fully, (TM 9-2320-364-10)
 CTIS rear manifold cover removed, (Para 13-9)
 CTIS turned on, (TM 9-2320-364-10)



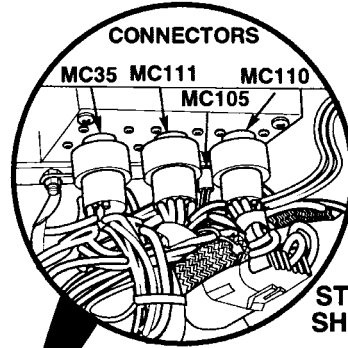
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

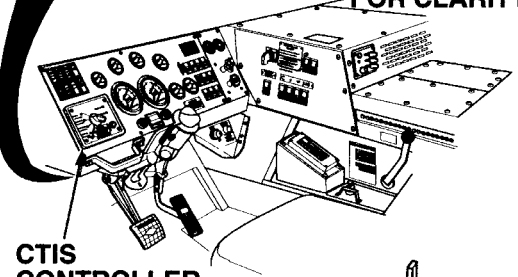
NOTE

The CTIS initially and periodically checks for system air leaks. The CTIS controller will display a flashing LOW AIR light and shut off if 6 psi (41 kPa) cannot be maintained by the CTIS. The manifold will click during this check for approximately 1-1/2 minutes.

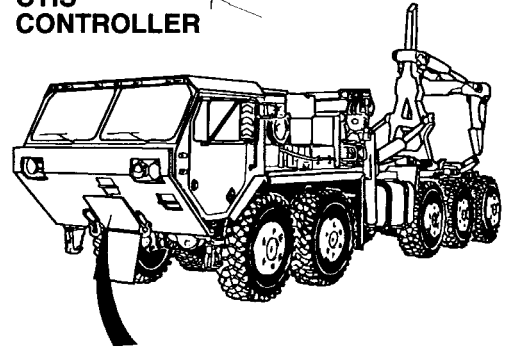
VISUAL INSPECTION
(1) Inspect CTIS controller, front and rear manifolds to ensure that all connectors are fully plugged in. (a) If connectors are not plugged in, secure connectors. (b) If connectors are plugged in, go to Step 2 of this Fault. (2) Close front access cover (TM 9-2320-364-10).



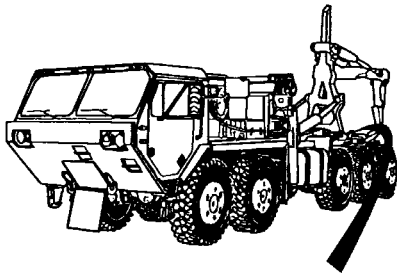
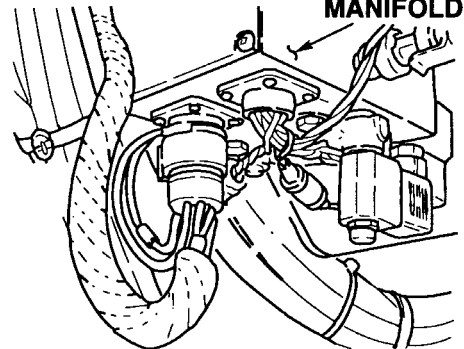
STEERING WHEEL SHOWN REMOVED FOR CLARITY



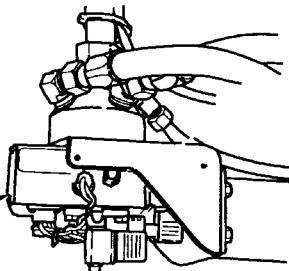
CTIS CONTROLLER



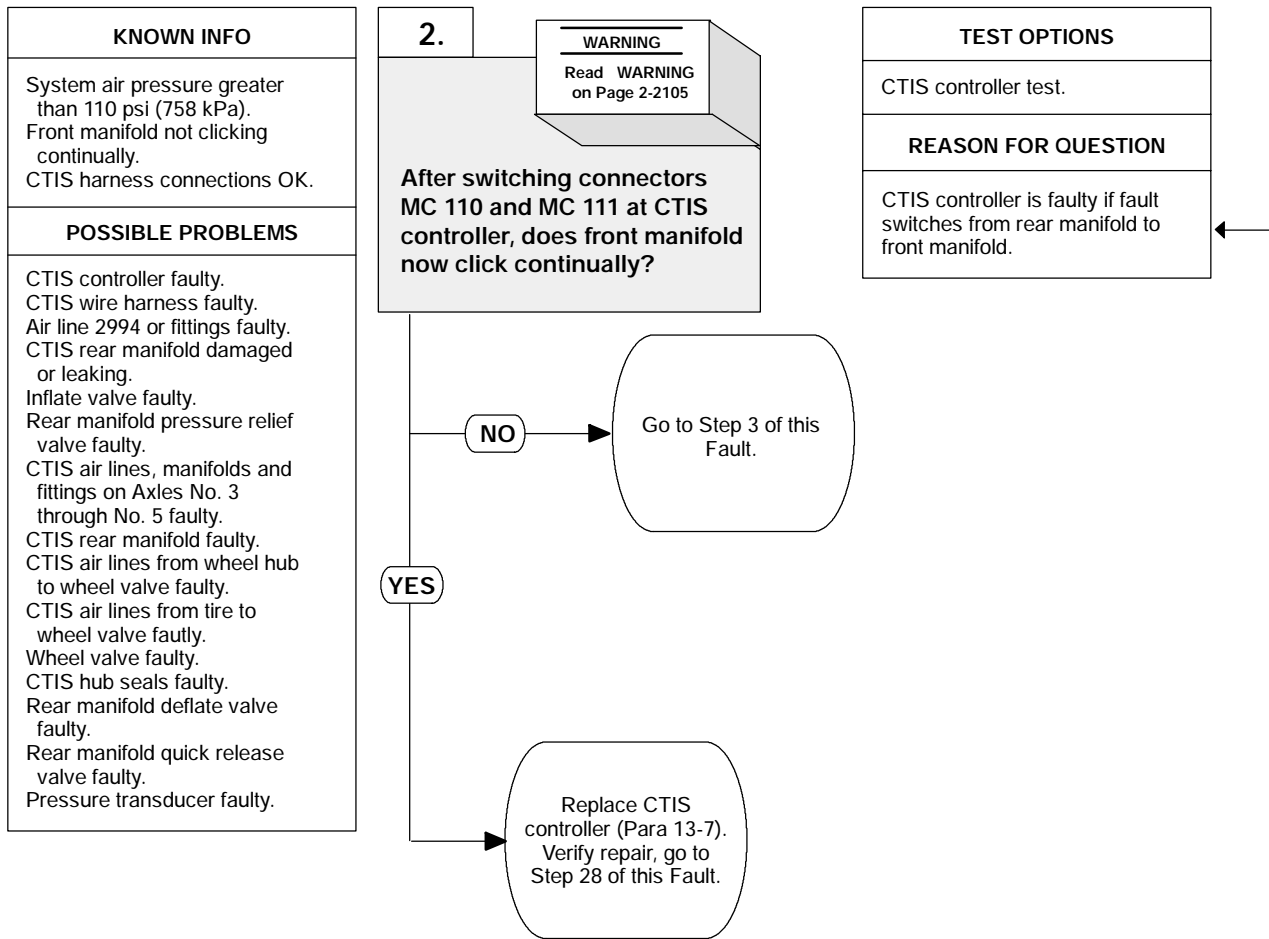
FRONT MANIFOLD



REAR MANIFOLD



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

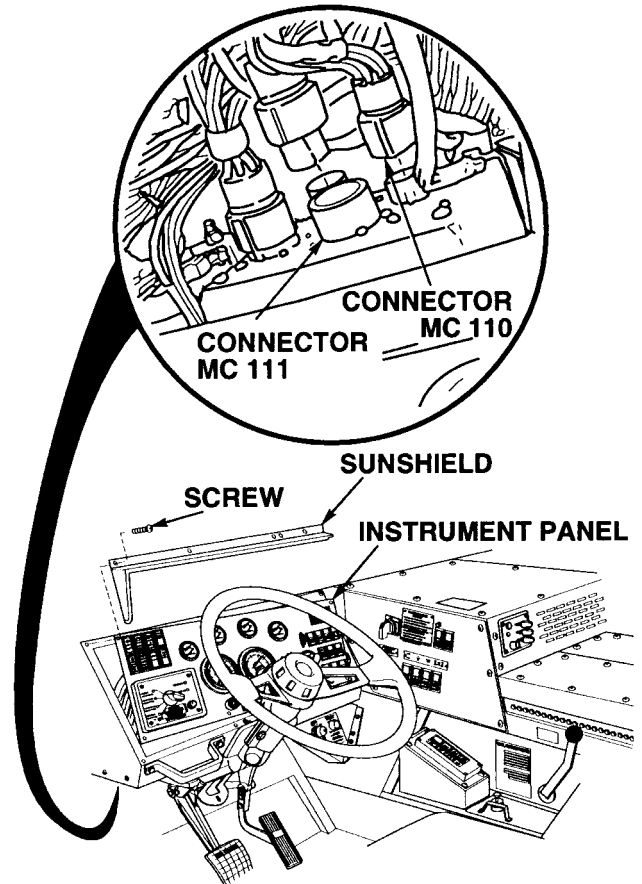


WARNING

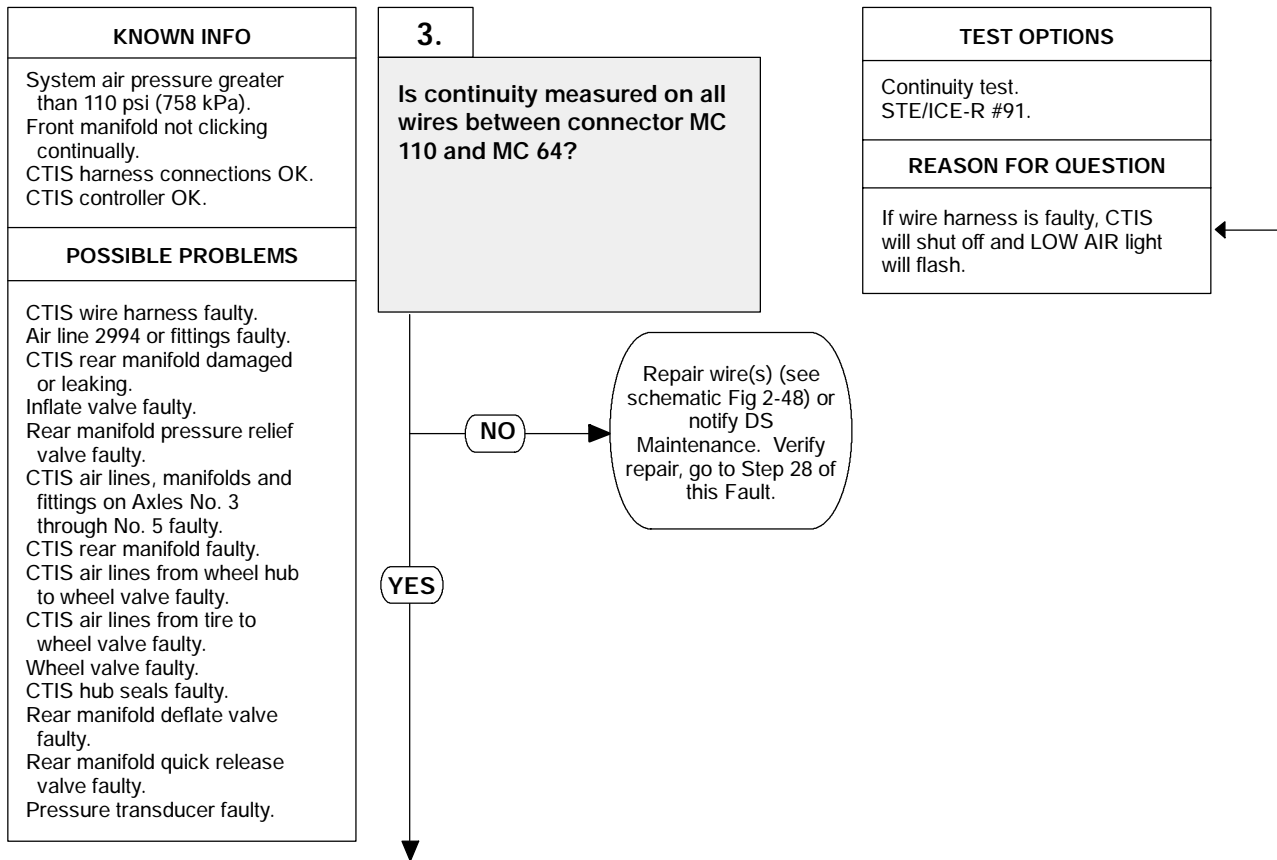
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CTIS CONTROLLER TEST

- (1) Remove ten screws, sunshield and tilt instrument panel.
- (2) Disconnect front manifold harness connector MC 110 from back of CTIS controller.
- (3) Disconnect rear manifold harness connector MC 111 from back of CTIS controller.
- (4) Connect harness connector MC 111 into CTIS controller where connector MC 110 was disconnected.
- (5) Connect harness connector MC 110 into CTIS controller where connector MC 111 was disconnected.
- (6) Start engine (TM-2320-364-10).
- (7) As assistant pushes CTIS controller START button, listen to front manifold for continuous clicking.
 - (a) If front manifold is clicking continuously, replace CTIS controller (Para 13-7).
 - (b) If front manifold is not clicking continuously, CTIS controller is OK.
- (8) Turn OFF ENGINE switch.
- (9) Disconnect and connect connectors MC 110 and MC 111 to correct CTIS controller connectors.



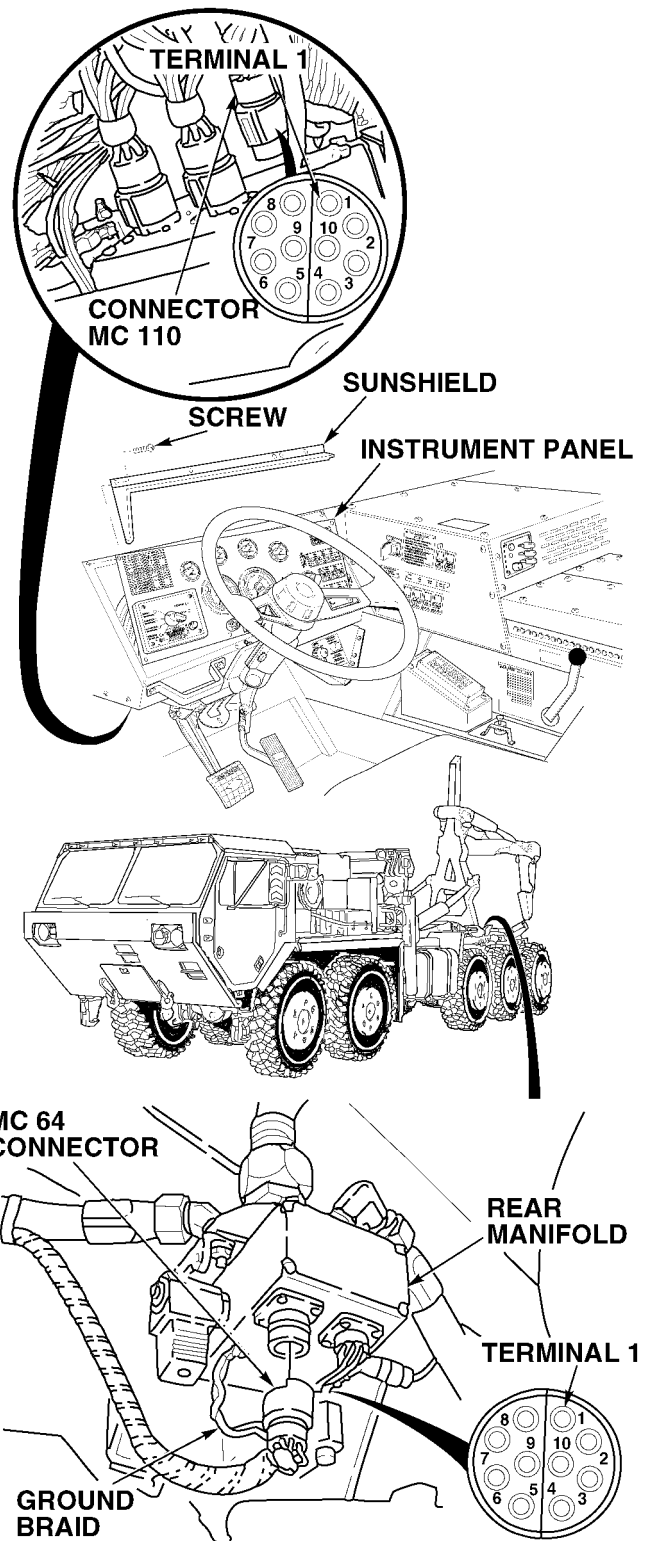
11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



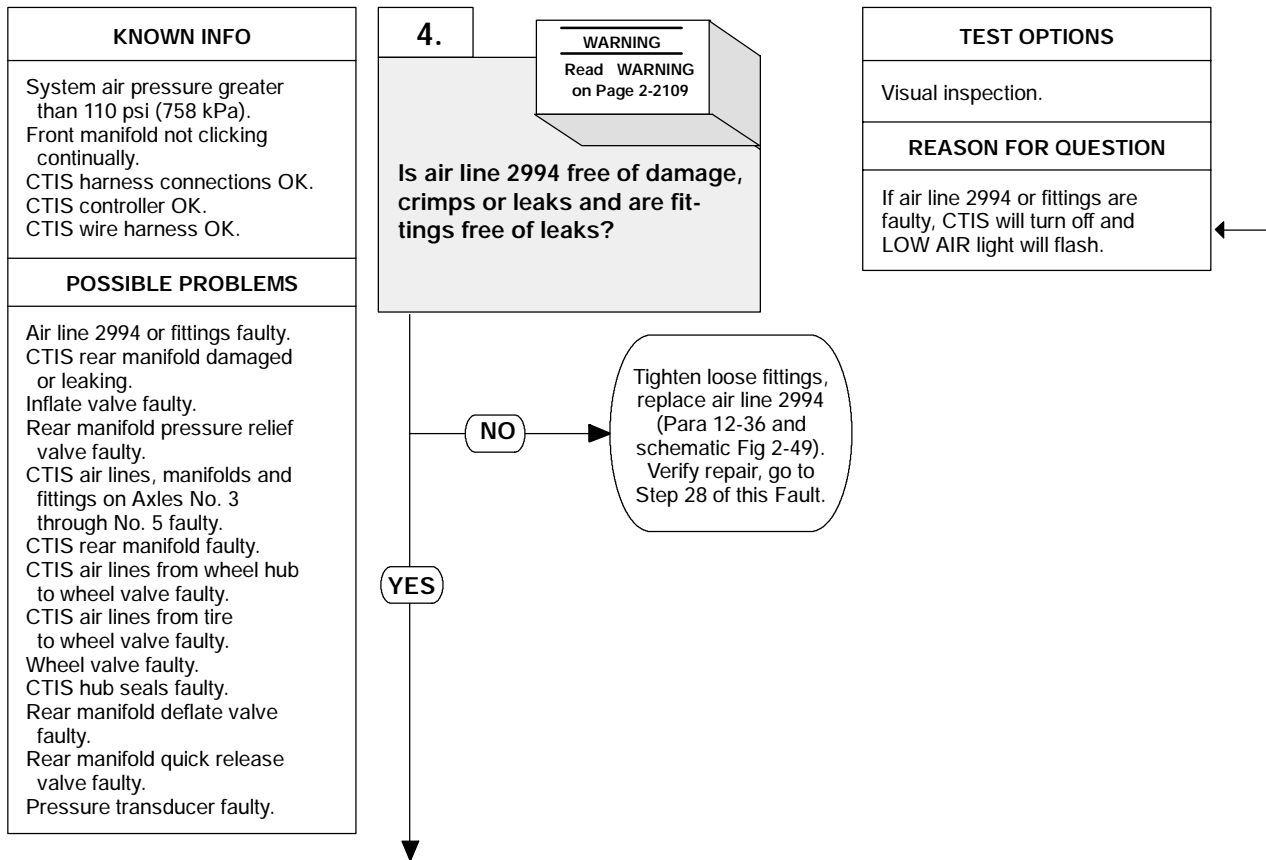
NOTE

Terminal (5) at MC110 is plugged and does not connect to Terminal (5) at MC64.

CONTINUITY TEST		
(1) Disconnect connector MC 64 from CTIS rear manifold.		
(2) Disconnect rear manifold harness connector MC 110 from back of CTIS controller.		
(3) Set multimeter select switch to ohms.		
(4) Connect jumperwire between wire 1072 on CTIS controller connector MC 110, terminal 1 and a known good ground.		
(5) Is there continuity between connector MC 64, terminal 1 and rear manifold ground braid?		
(a) If there is no continuity, repair wire 1072 (see schematic Fig 2-48) or notify DS Maintenance and performs Steps (6) through (9) below.		
(b) If there is continuity, wire 1072 is OK.		
(6) Check continuity of remaining wires and terminals using Steps (4) and (5) above. The wires and corresponding terminals to be checked are listed below (see schematic Fig 2-48).		
1073(2)	1070(6)	1068(9)
1076(3)	1066(7)	1074(10)
1071(4)	Shield(8)	
1067 to ground (5) (MC64 only)		
(7) Remove jumperwire.		
(8) Connect connector MC 110 to back of CTIS controller.		
(9) Install instrument panel, sunshield and ten screws.		

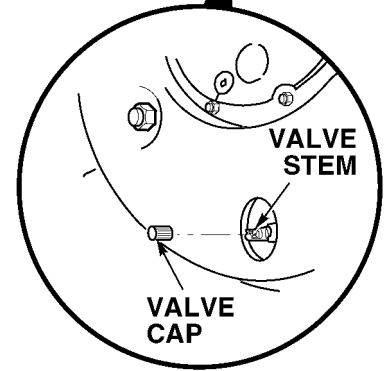
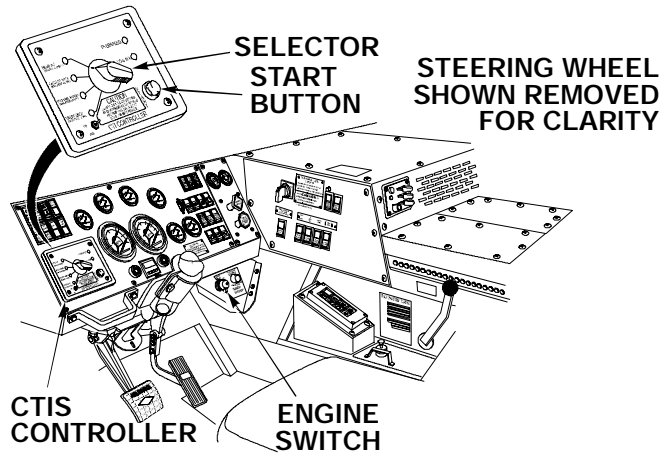
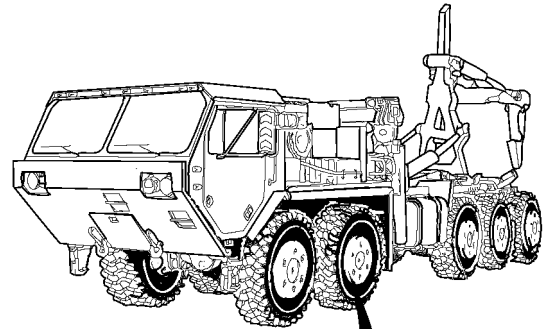


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

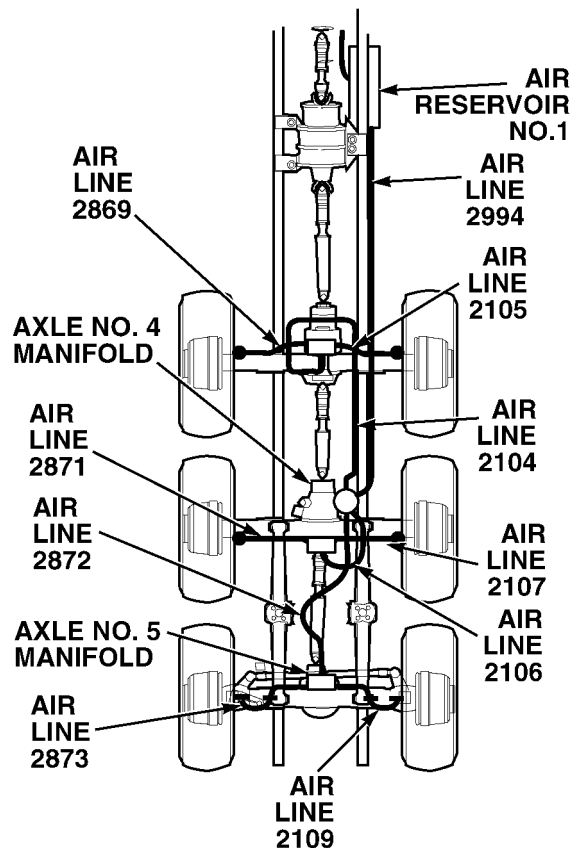
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.



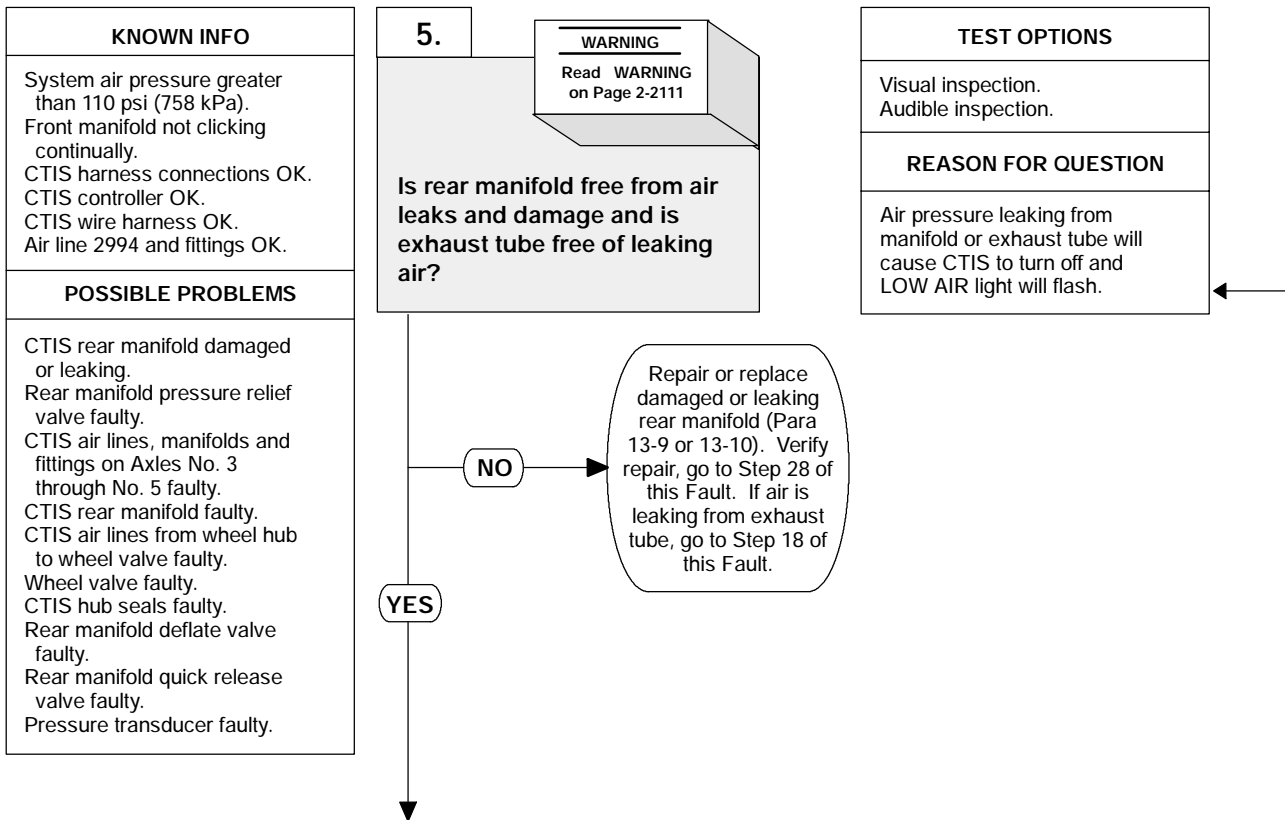
NOTE

Soap and water solution can be used to visually check for leaks.

VISUAL INSPECTION
(1) Remove valve cap from any wheel valve stem on Axles No. 3 through No. 5.
(2) Using tire gage, deflate any one tire on Axles No. 3 through No. 5 to 40 psi (276 kPa).
(3) Start engine (TM 9-2320-364-10).
(4) Set CTIS controller selector to HIGHWAY.
(5) Press CTIS START button.
(6) Check CTIS air line 2994 for damage, crimps or leaks (see schematic Fig 2-49).
(a) If air line 2994 is damaged, crimped or leaking; perform Steps (7) and (8) below, and tighten fittings, replace air line (see Para 12-36 and schematic Fig 2-49).
(b) If there are no leaks, crimps or damage; air line 2994 and fittings are OK.
(7) Turn OFF ENGINE switch.
(8) Install valve cap on wheel valve stem.

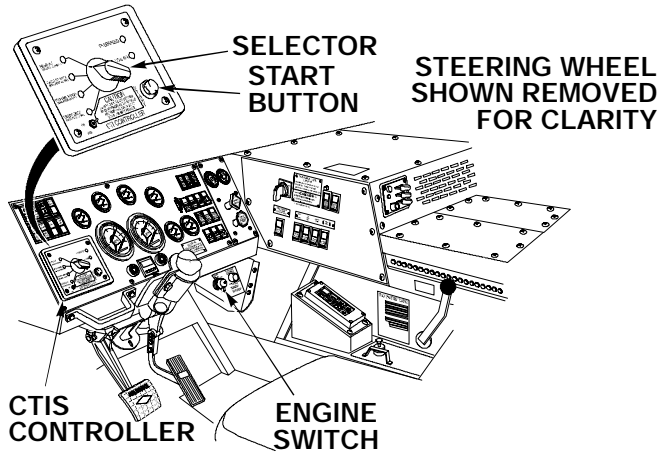


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

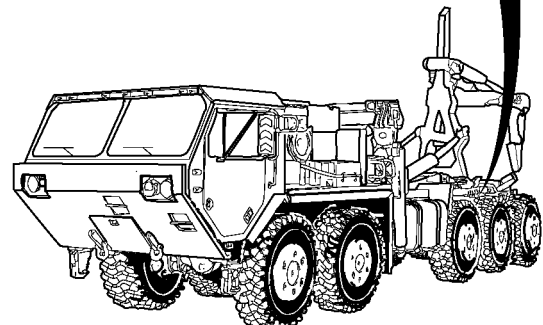
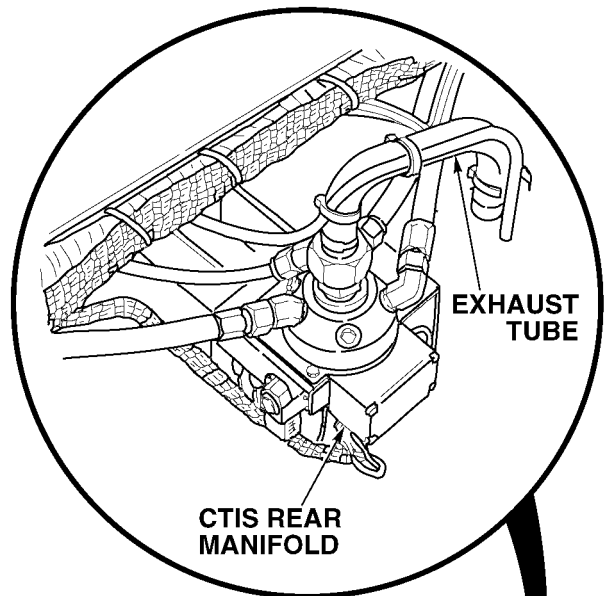
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.



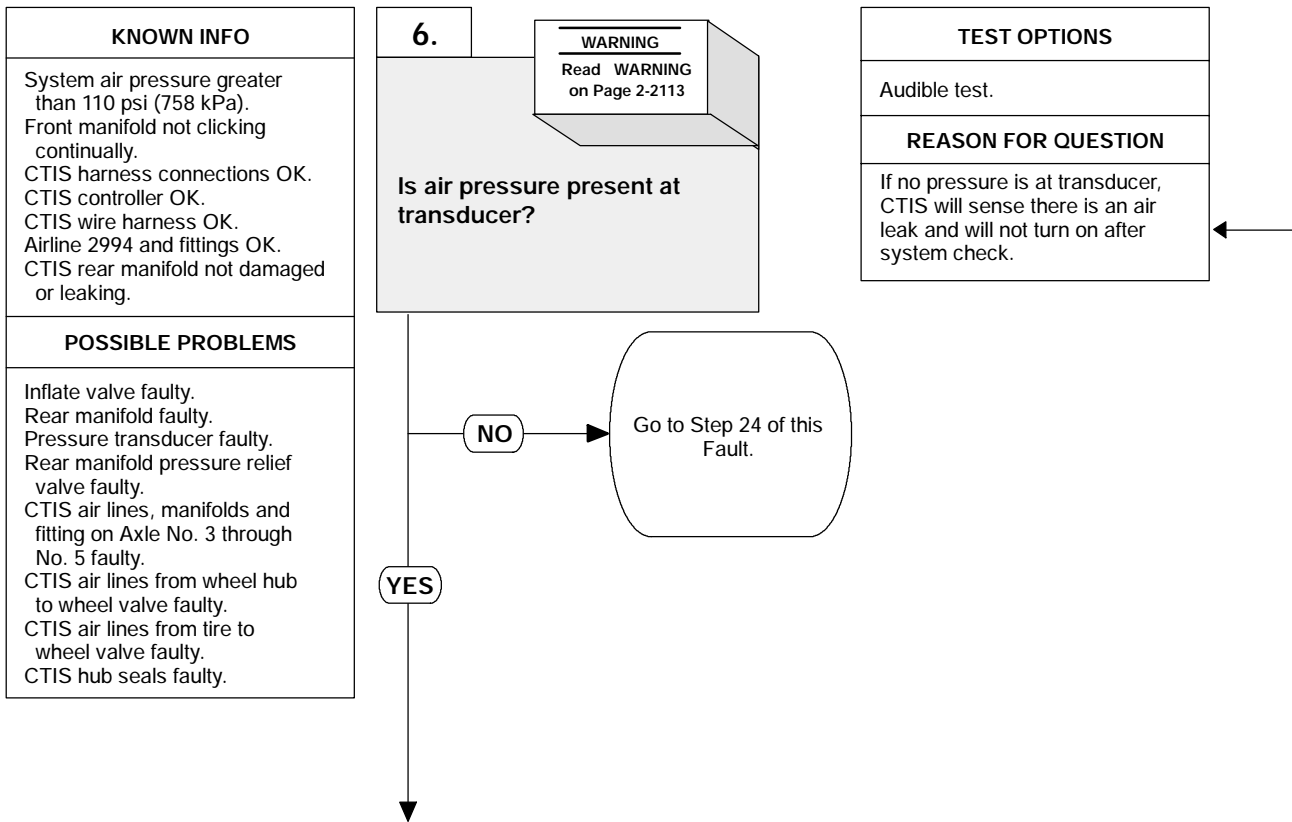
NOTE

- Soap and water solution can be used to visually check for leaks.
- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION
(1) Remove valve cap from any wheel valve stem on Axles No. 3 through No. 5.
(2) Using tire gage, deflate any one tire on Axles No. 3 through No. 5 to 40 psi (276 kPa).
(3) Start engine (TM 9-2320-364-10).
(4) Set CTIS controller selector to HIGHWAY.
(5) Press CTIS START button.
(6) Check CTIS rear manifold for damage, or leaks.
(a) If rear manifold is damaged, or leaking; perform Steps (7) and (8) below, and repair or replace rear manifold (Para 13-9 or 13-10).
(b) If there are no leaks, or damage; rear manifold is OK.
(c) If rear manifold is leaking air out of exhaust tube, go to Step 18 of this Fault.
(7) Turn OFF ENGINE switch.
(8) Install valve cap on wheel valve stem.



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

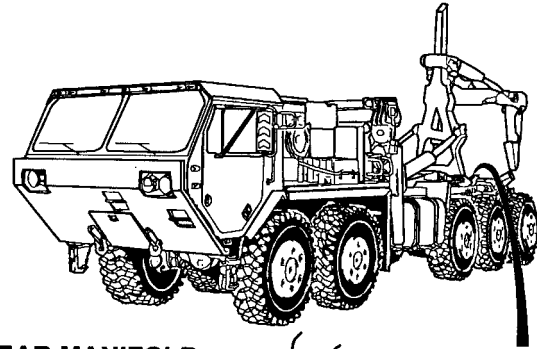
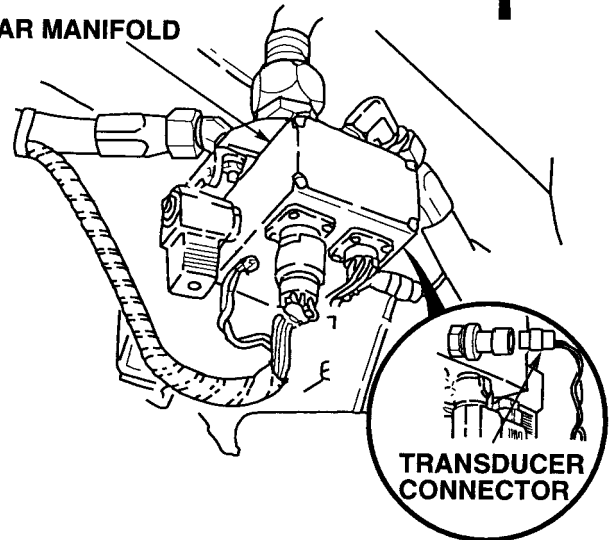


WARNING

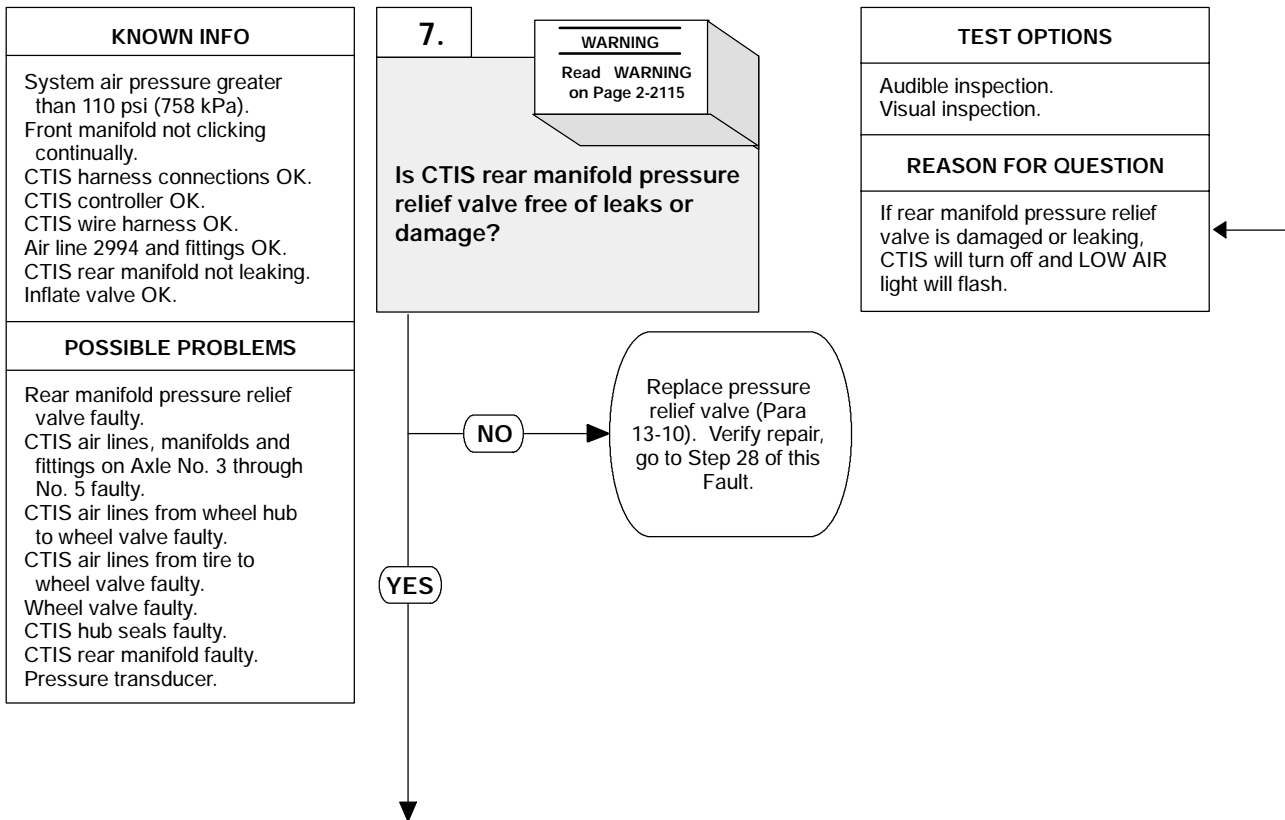
- Wear safety goggles when performing leakage test on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

AUDIBLE TEST

- (1) Remove pressure transducer from rear manifold (Para 13-10).
- (2) Set CTIS controller to HIGHWAY (TM 9-2320-364-10).
- (3) Start engine.
- (4) As assistant pushes CTIS controller START button, listen for air exhausting from the transducer port.
 - (a) If air does not exhaust, perform Steps (5) and (6), and go to Step 24 of this Fault.
 - (b) If air exhausts, inflate valve is OK.
- (5) Turn OFF ENGINE switch.
- (6) Install pressure transducer in rear manifold.

**REAR MANIFOLD****TRANSDUCER CONNECTOR**

11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT.)



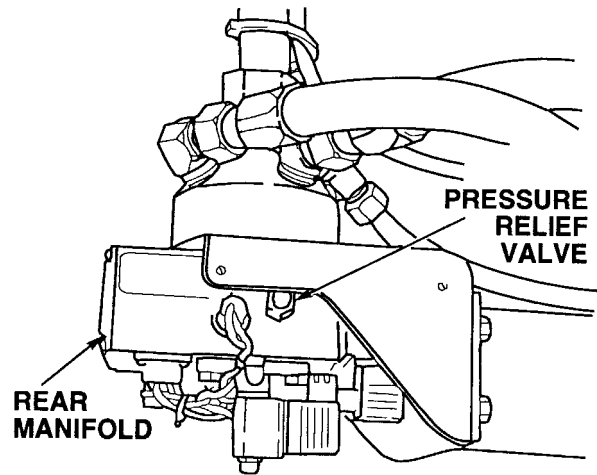
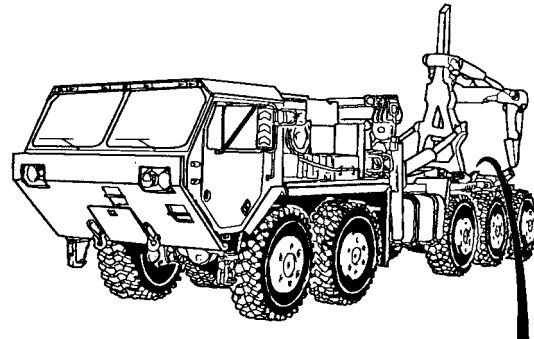
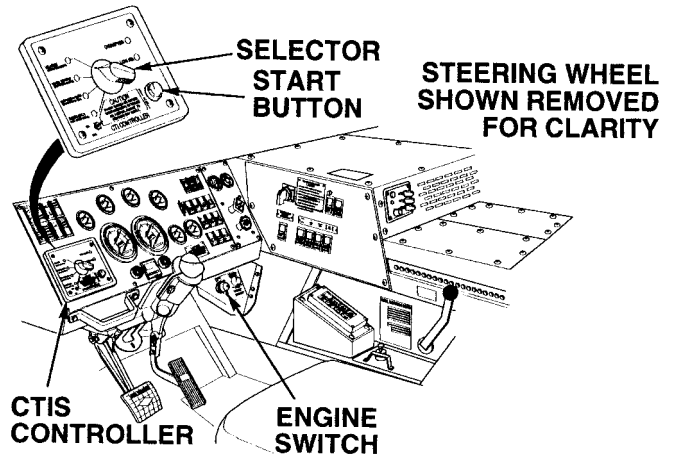
WARNING

- Wear safety goggles when performing leakage test on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

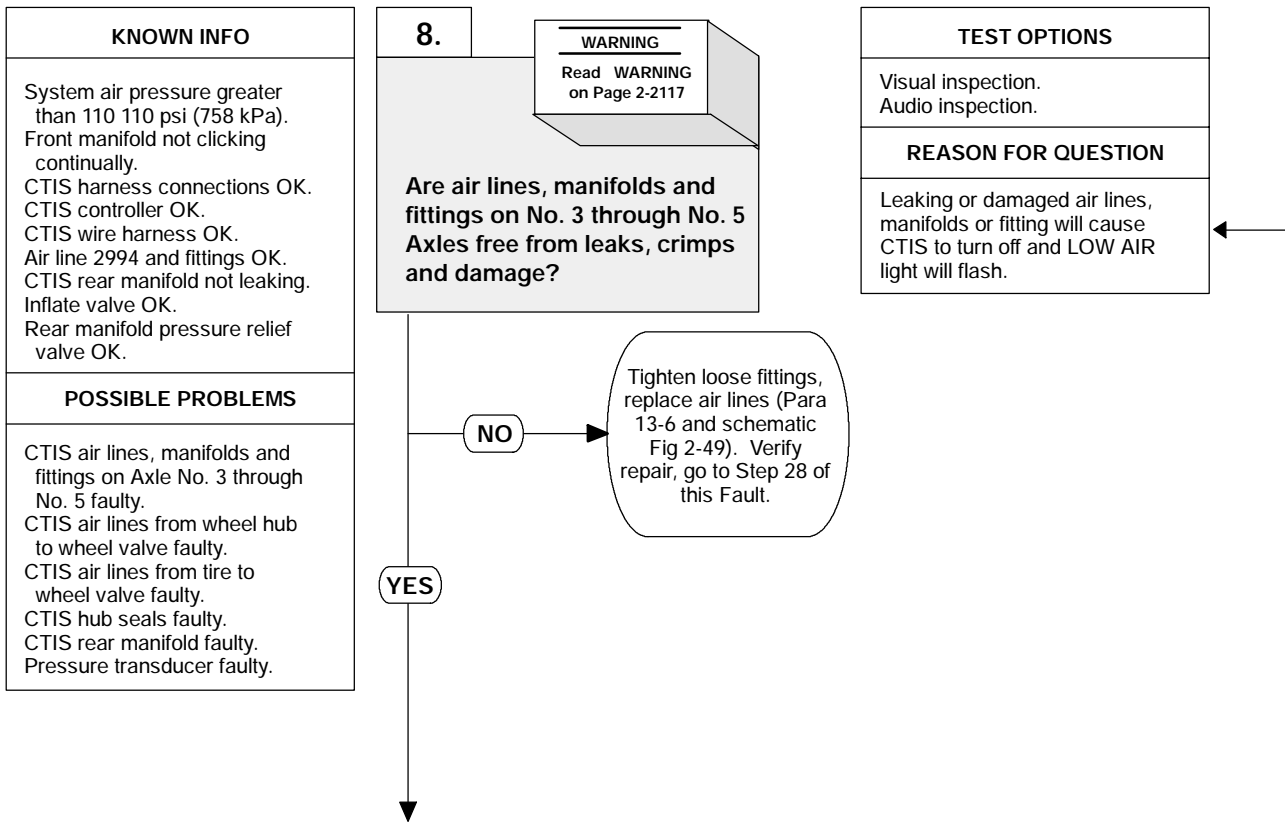
NOTE

- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.
- Some air leakage (bubbles forming) may occur during inflation/deflation cycle at relief valve. A rapid exhaust of air indicates a problem.
- Pressure relief valve should remain closed up to 85 psi (586 kPa).

VISUAL/AUDIBLE INSPECTION
(1) Start engine (TM 9-2320-364-10). (2) Set CTIS controller selector to HIGHWAY. (3) Assistant presses CTIS START button. (4) Check CTIS rear manifold pressure relief valve for damage and leaks. (a) If pressure relief valve is damaged or leaking, turn OFF ENGINE switch and replace valve (Para 13-10). (b) If pressure relief valve is not damaged or leaking, relief valve is OK. (5) Turn OFF ENGINE switch.

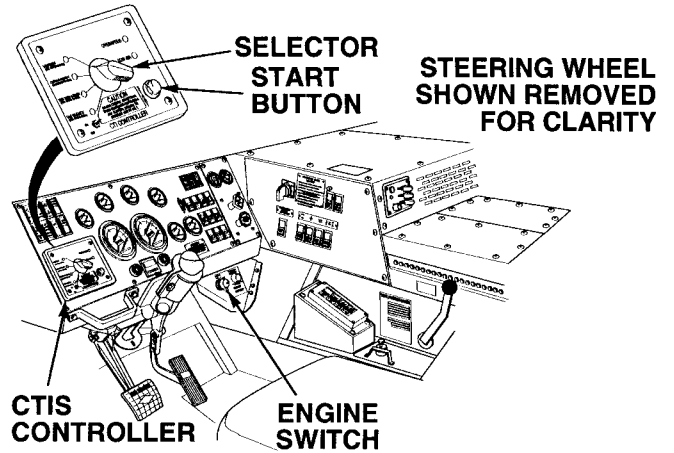


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

- Wear safety goggles when performing leakage test on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.



NOTE

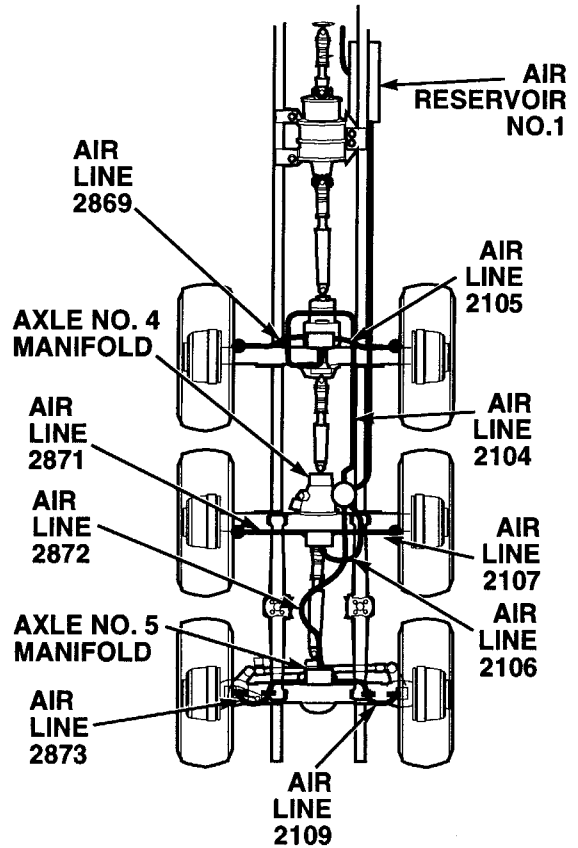
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

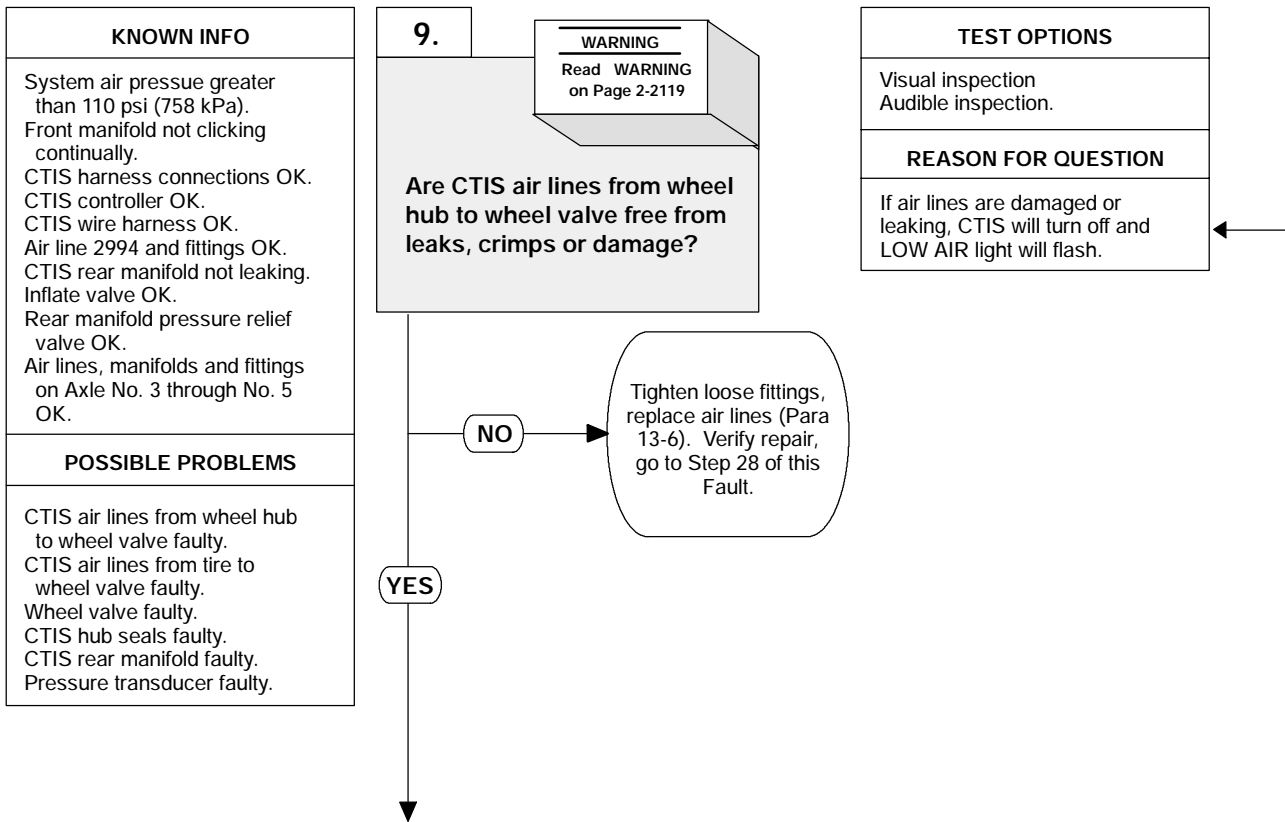
- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check CTIS air lines listed below and axle manifolds and fittings for damage, crimps or leaks (see schematic Fig 2-49).

2869	2105
2871	2104
2872	2107
2873	2106
	2109

- (a) If air lines, fittings or axle manifolds are damaged or leaking, perform Step (5) below and tighten fittings, or replace air lines or axle manifold (see schematic Fig 2-49 and Para 13-6).
 - (b) If there are no leaks, crimps, or damage, air lines, fittings and axle manifolds are OK.
- (5) Turn OFF ENGINE switch.



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

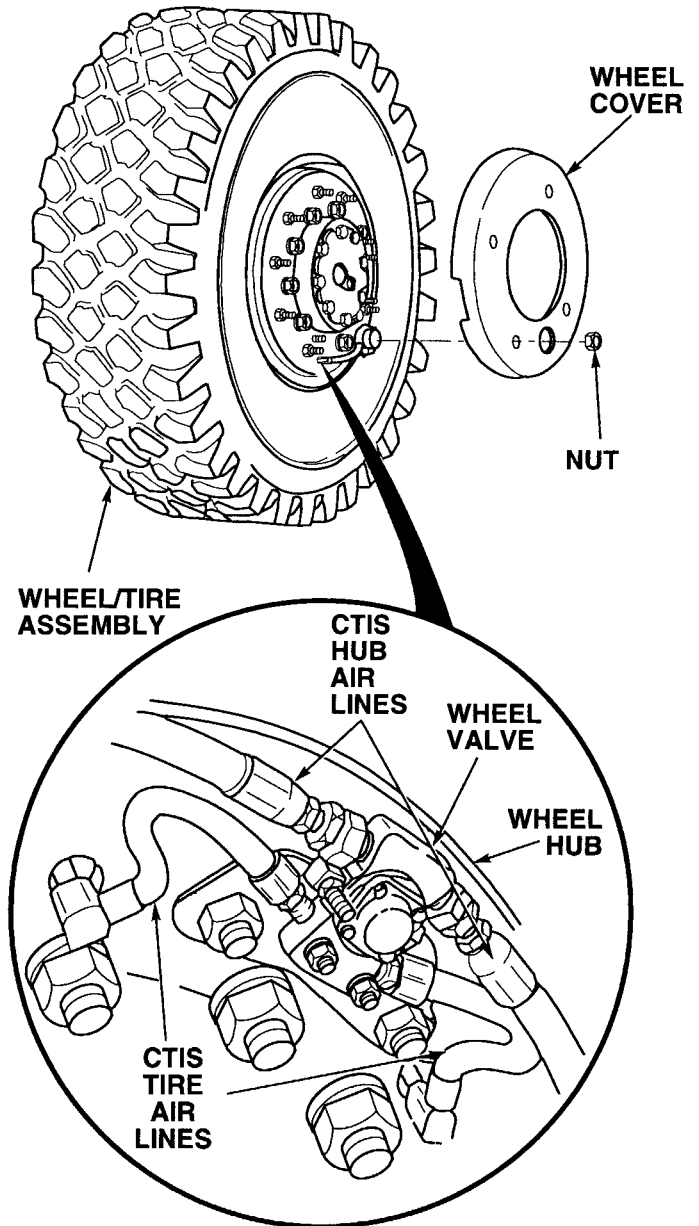
- Wear safety goggles when performing leakage test on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

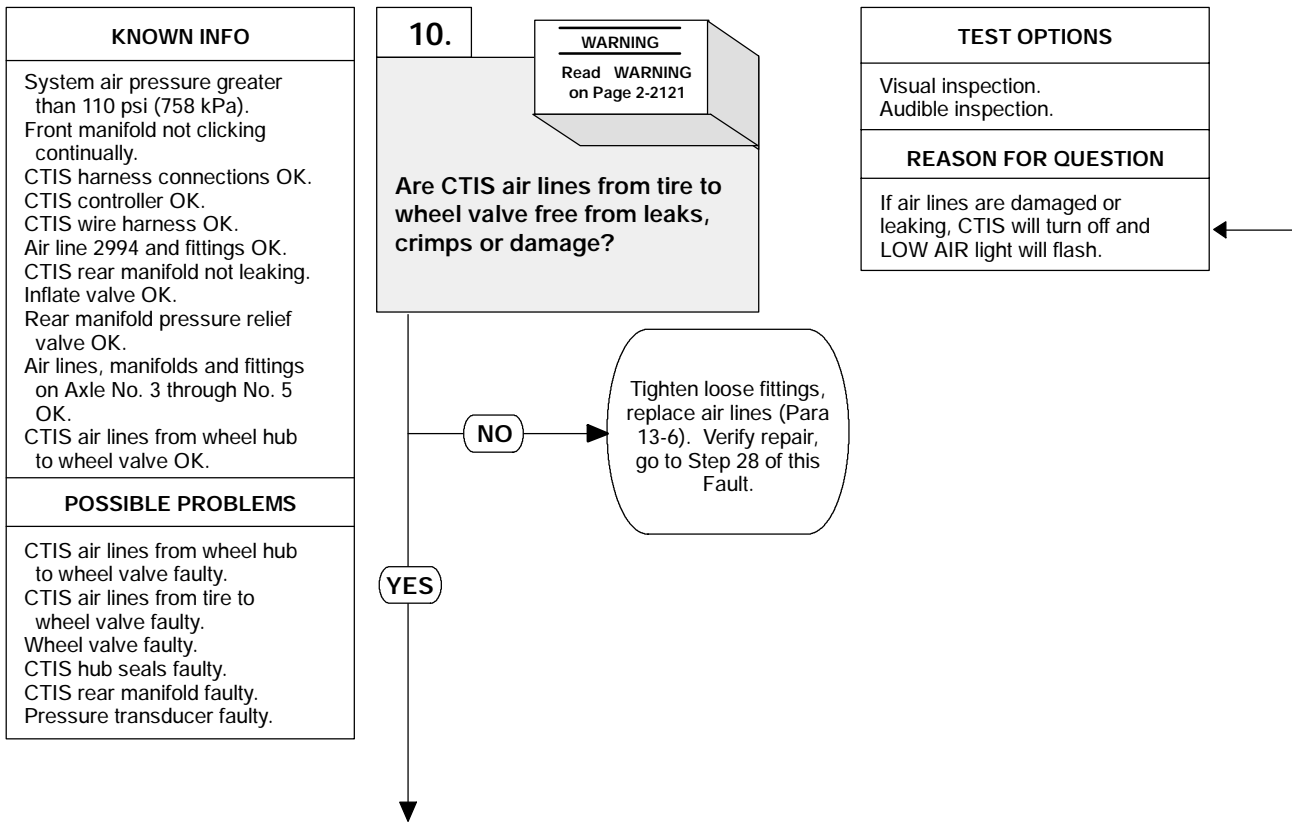
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

- (1) Remove four nuts and wheel cover.
- (2) Start engine (TM 9-2320-364-10).
- (3) Set CTIS controller to HIGHWAY.
- (4) Press CTIS START button.
- (5) Check air lines at wheel hub to wheel valve for air leakage.
 - (a) If air lines are damaged, crimped or leaking, perform Step (6) below, and tighten loose fittings, replace air lines or fittings (Para 13-6).
 - (b) If there are no leaks, crimps or damage, air lines and fittings are OK.
- (6) Turn OFF ENGINE switch.



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

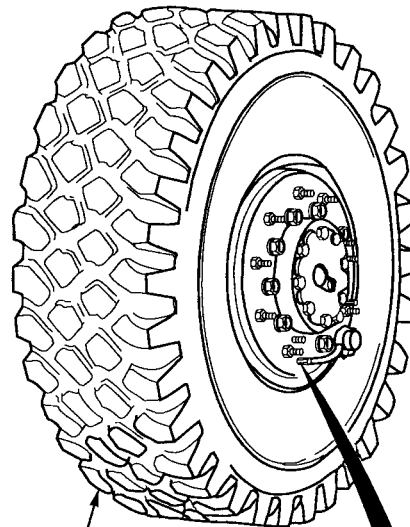
- Wear safety goggles when performing leakage test on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

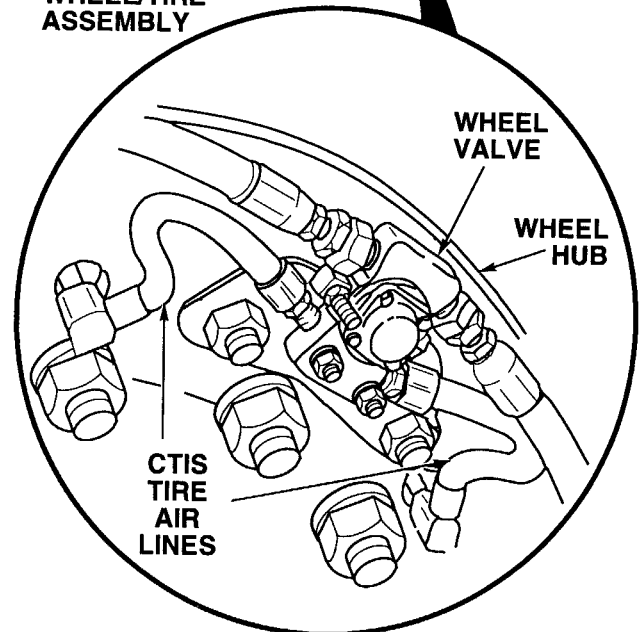
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

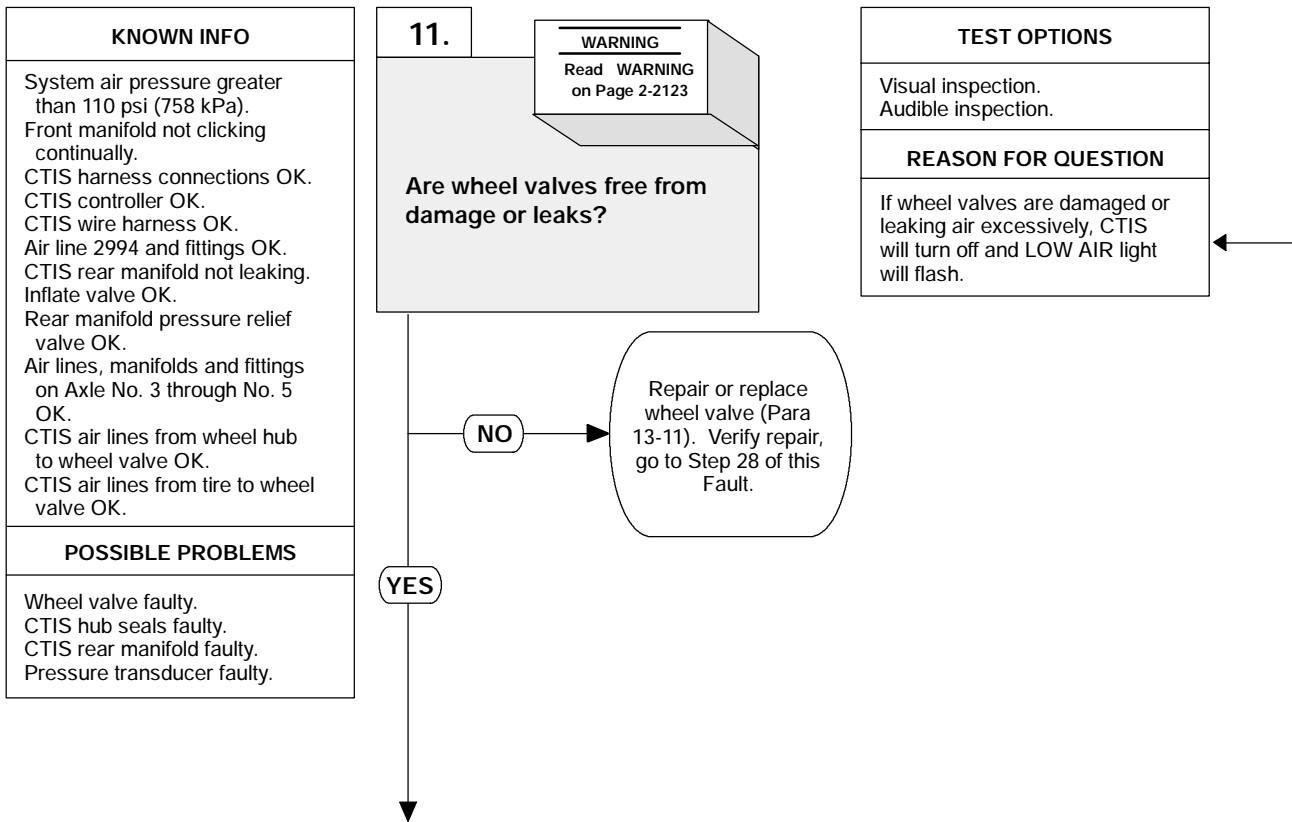
- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check CTIS air lines at tire to wheel valve for air leakage.
 - (a) If air lines are damaged, crimped or leaking, perform Step (5) below, and tighten loose fittings, replace air lines or fittings (Para 13-6).
 - (b) If there are no leaks, crimps or damage, air lines and fittings are OK.
- (5) Turn OFF ENGINE switch.



WHEEL/TIRE ASSEMBLY



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

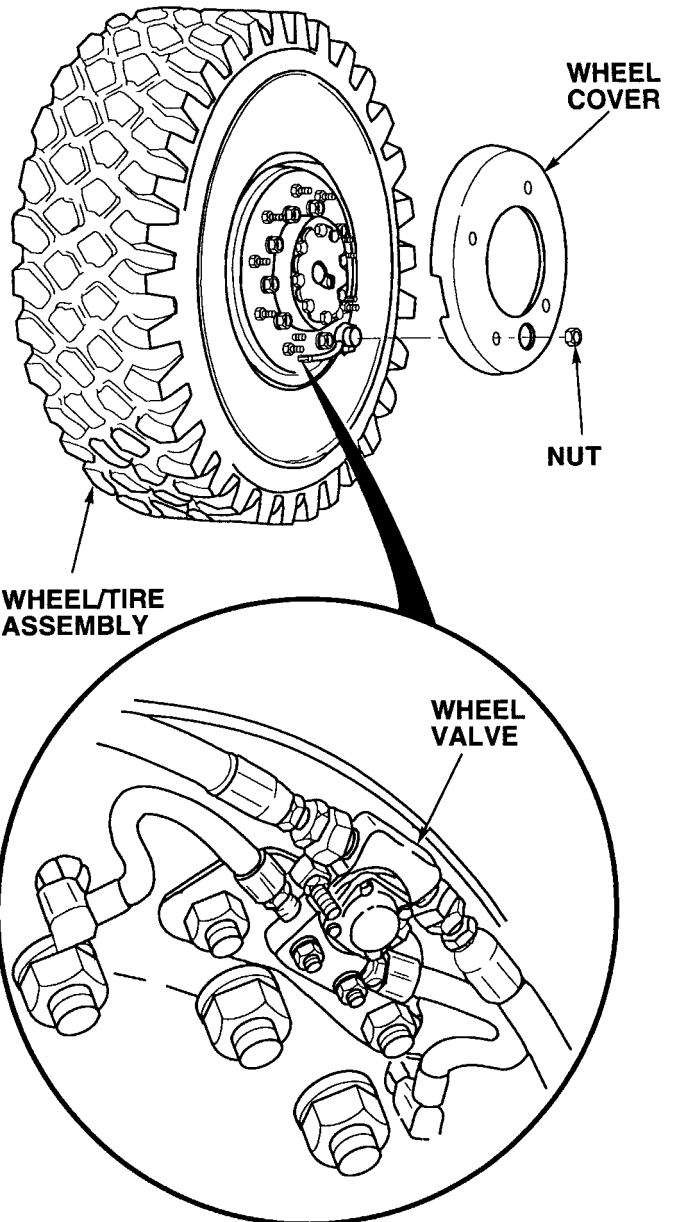
- Wear safety goggles when performing leakage test on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

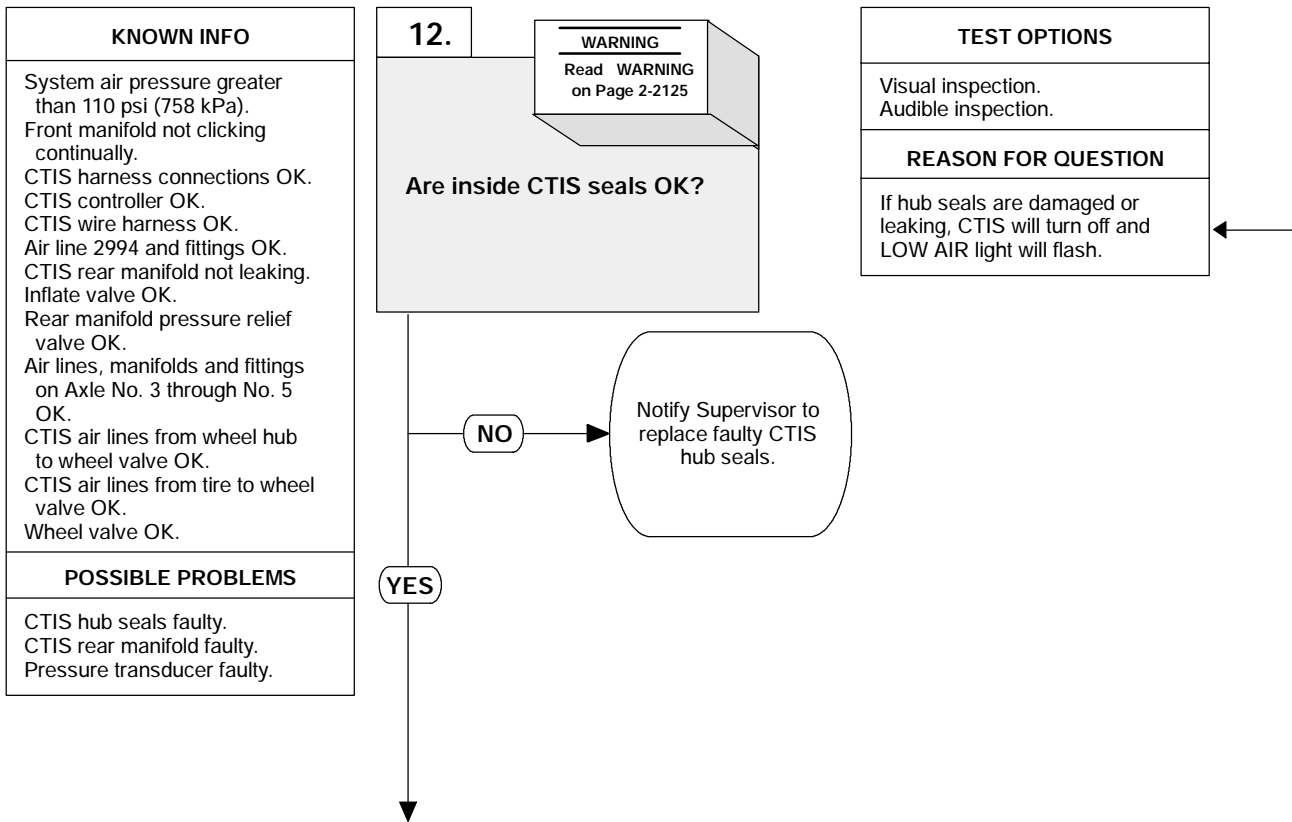
- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.
- Some air leakage may occur at breather during inflation/deflation cycles. Rapid exhaust of air at breather indicates a faulty valve.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check CTIS wheel valves for air leakage.
 - (a) If wheel valve is damaged or leaking air, perform Step (5) below and repair or replace wheel valve (Para 13-11).
 - (b) If there are no air leaks or damage, wheel valve is OK.
- (5) Turn OFF ENGINE switch.
- (6) Install wheel cover with four nuts.



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

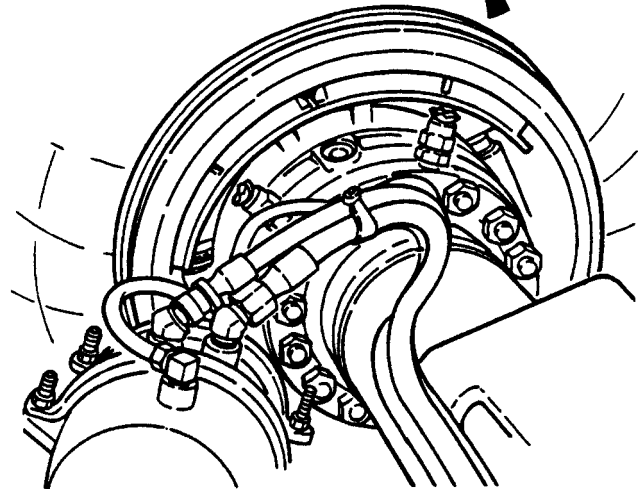
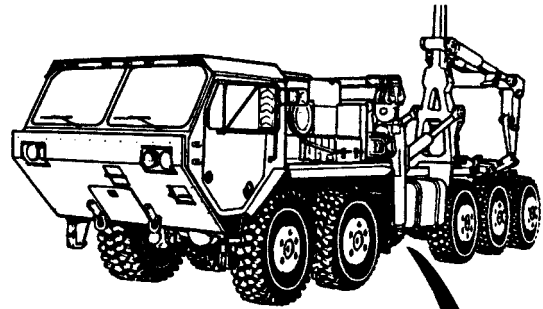
- Wear safety goggles when performing leakage test on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

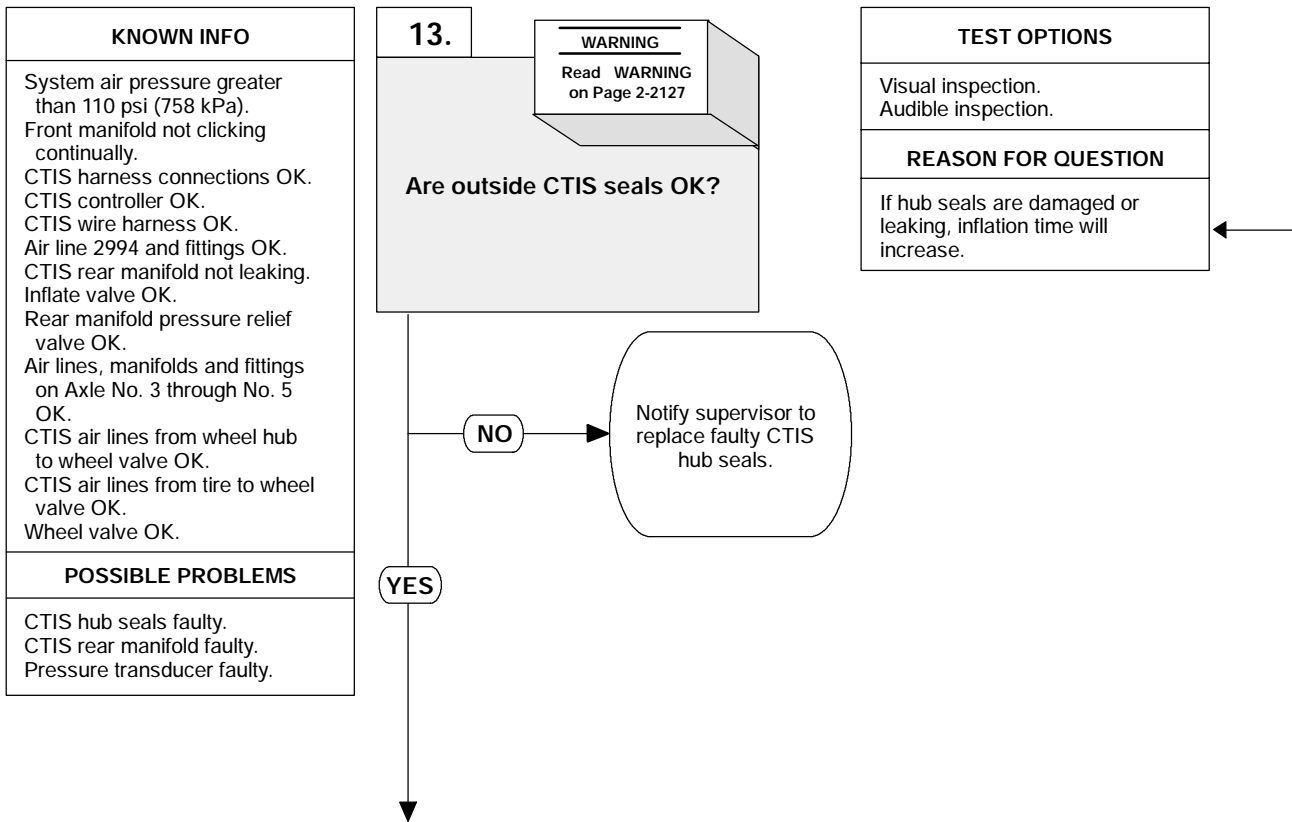
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check for air escaping from the inside portion of the wheel and tire assemblies.
 - (a) If air is escaping, turn OFF ENGINE switch and notify Supervisor to replace faulty CTIS hub seals.
 - (b) If there is no air escaping, inside CTIS hub seals are OK.
- (5) Turn OFF ENGINE switch.



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

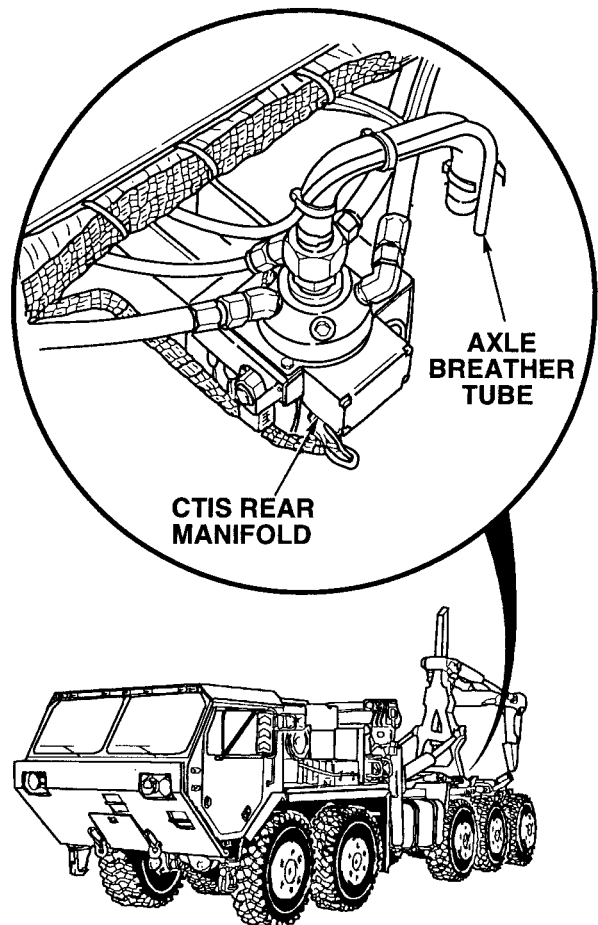
- Wear safety goggles when performing leakage test on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

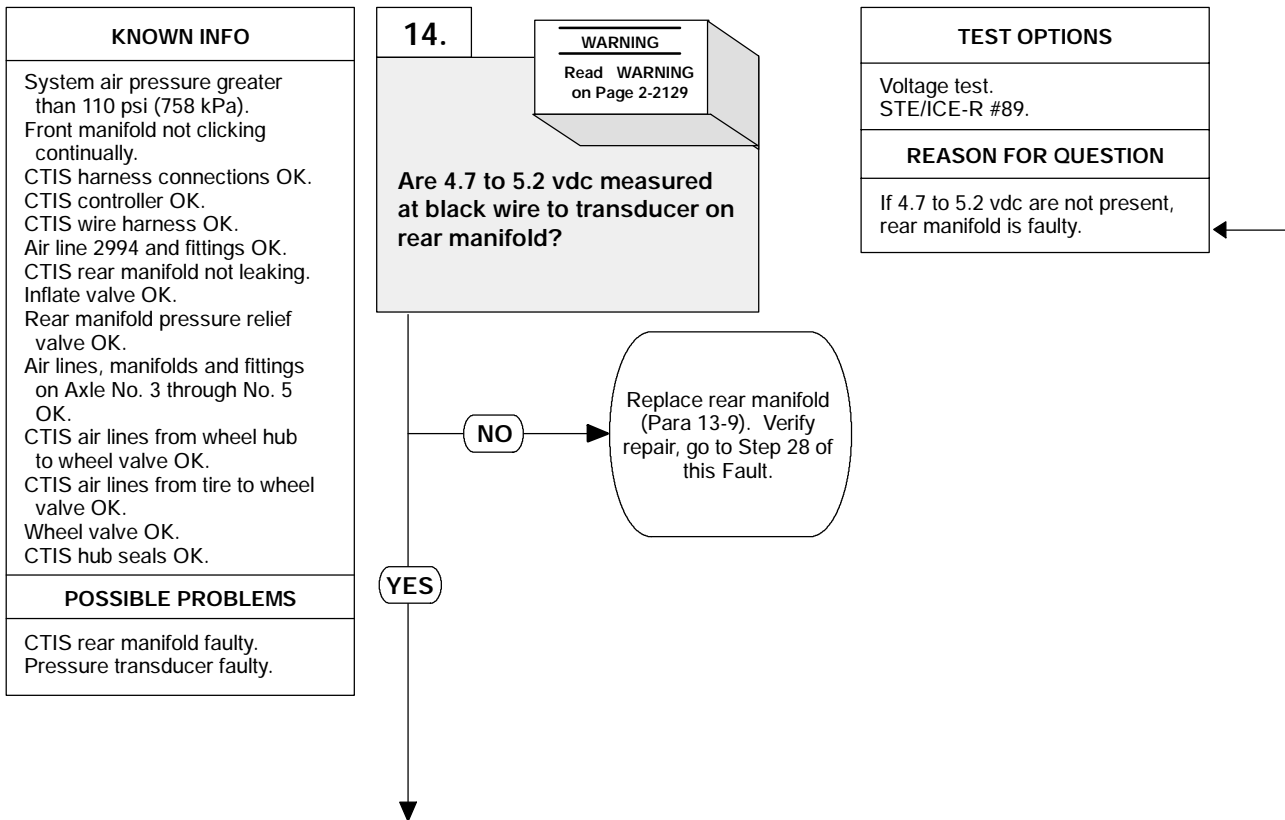
Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller to HIGHWAY.
- (3) Press CTIS START button.
- (4) Check for air escaping from the axle breather tube.
 - (a) If air is escaping, turn OFF ENGINE switch and notify Supervisor to replace faulty CTIS hub seals.
 - (b) If there is no air escaping, inside CTIS hub seals are OK.
- (5) Turn OFF ENGINE switch.

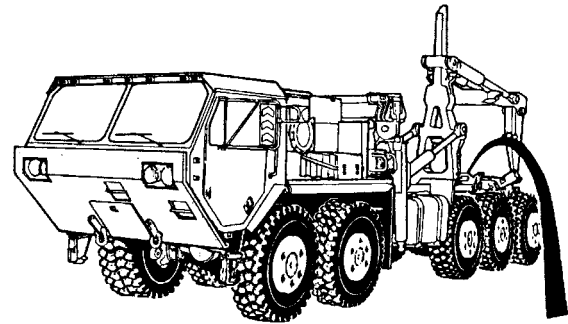


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

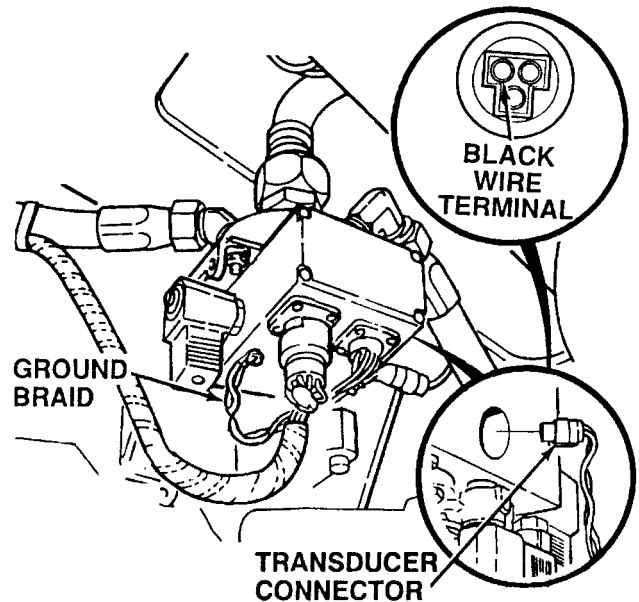


WARNING

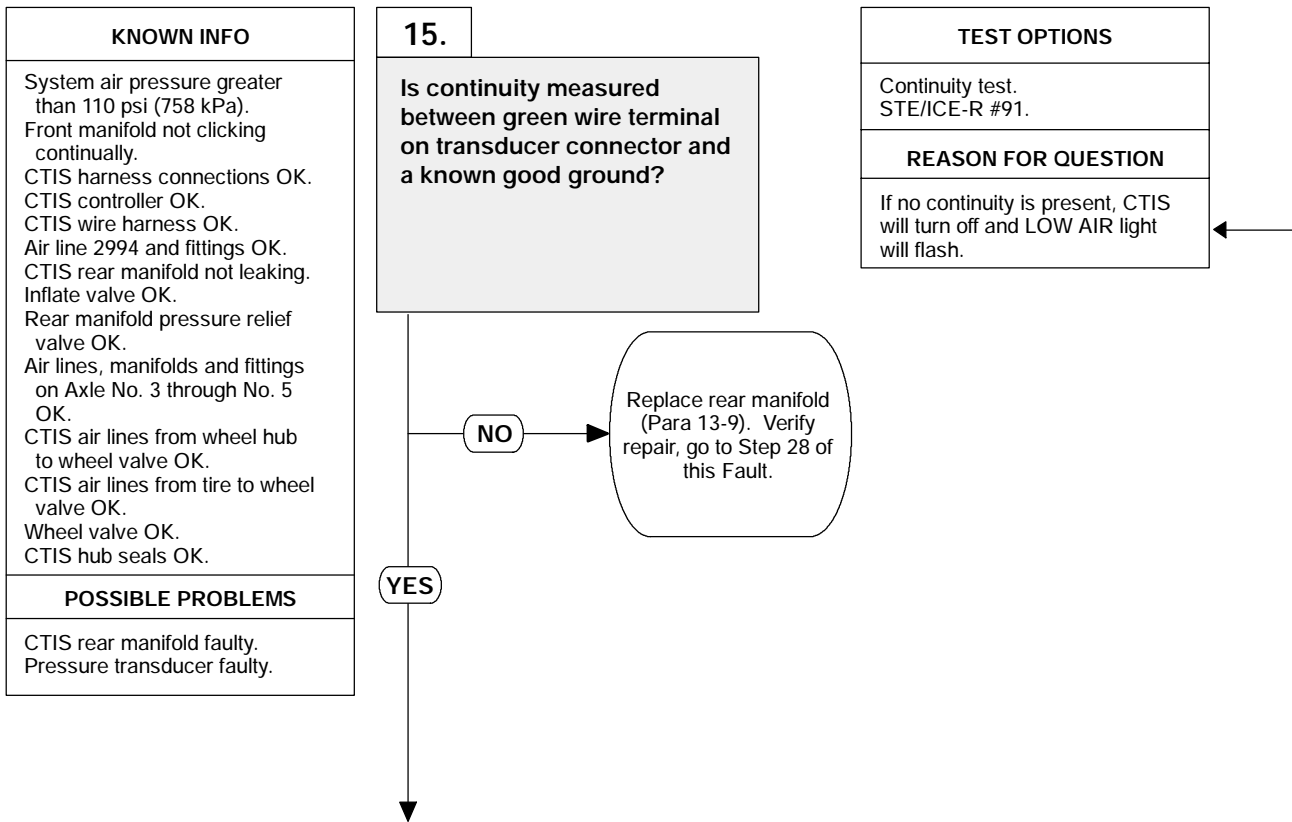
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

**VOLTAGE TEST**

- (1) Disconnect connector from transducer on rear manifold.
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead to blackwire terminal at transducer connector.
- (4) Connect negative (-) multimeter lead to rear manifold ground braid.
- (5) Turn ON ENGINE switch.
- (6) Push CTIS START button.
 - (a) If 4.7 to 5.2 vdc are not present, turn OFF ENGINE switch and replace rear manifold (Para 13-9).
 - (b) If 4.7 to 5.2 vdc are present, turn OFF ENGINE switch and go to Step 15 of this Fault.

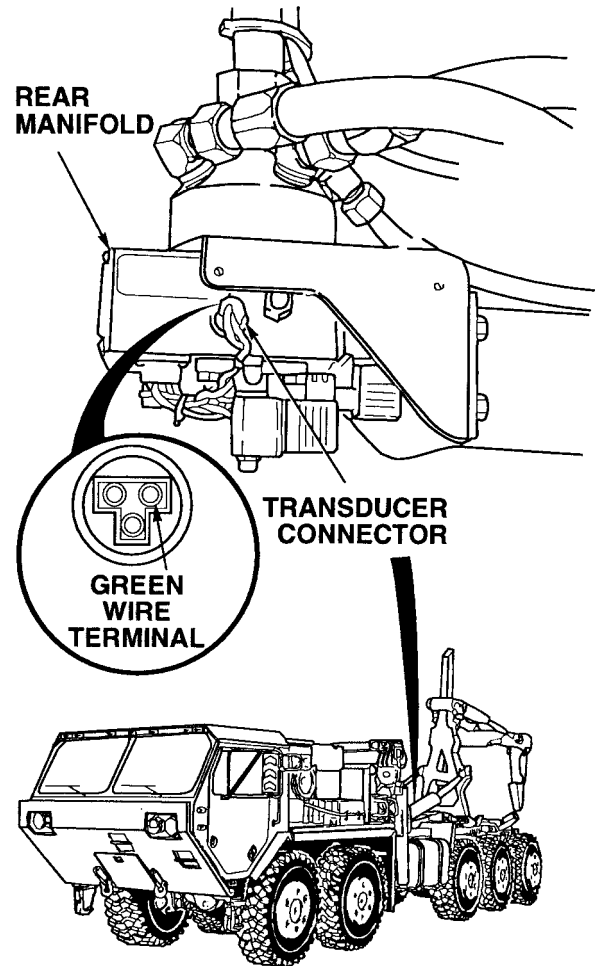


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

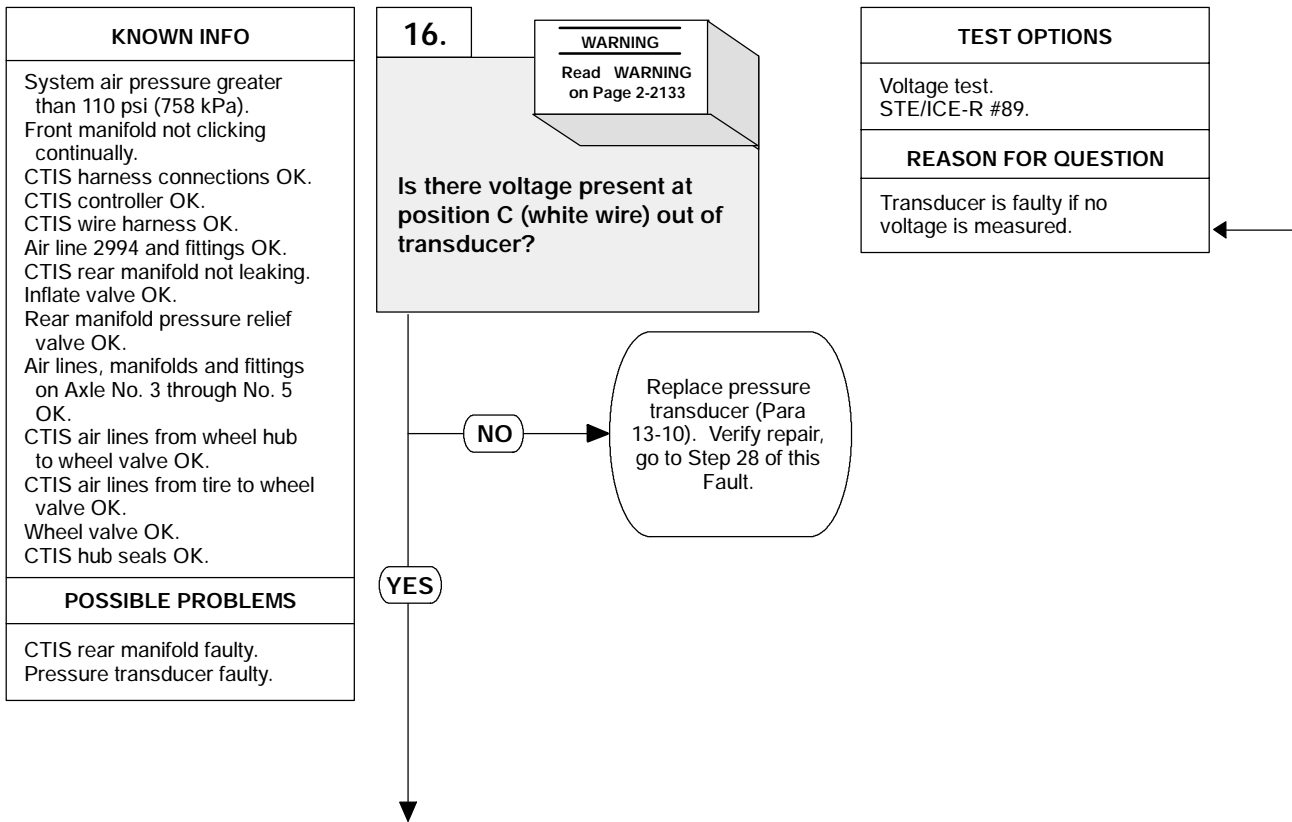


CONTINUITY TEST

- (1) Set Multimeter select switch to ohms.
- (2) Is there continuity between pressure transducer connector, green wire terminal, and a known good ground?
 - (a) If there is no continuity, replace rear manifold (Para 13-9).
 - (b) If there is continuity, go to Step 16 of this Fault.



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

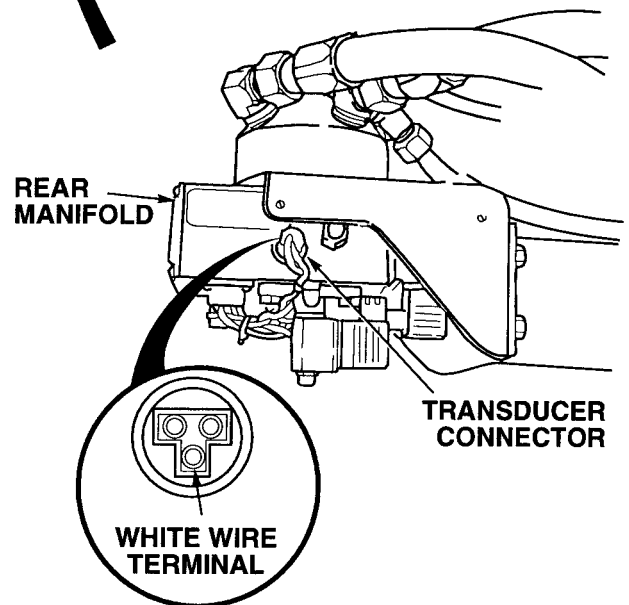
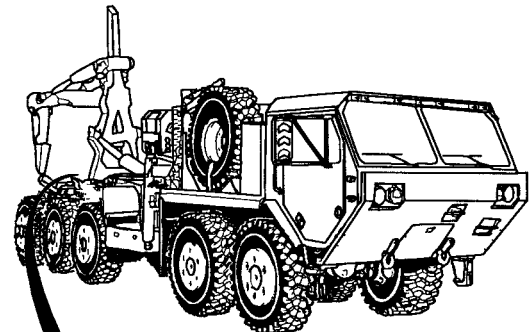
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

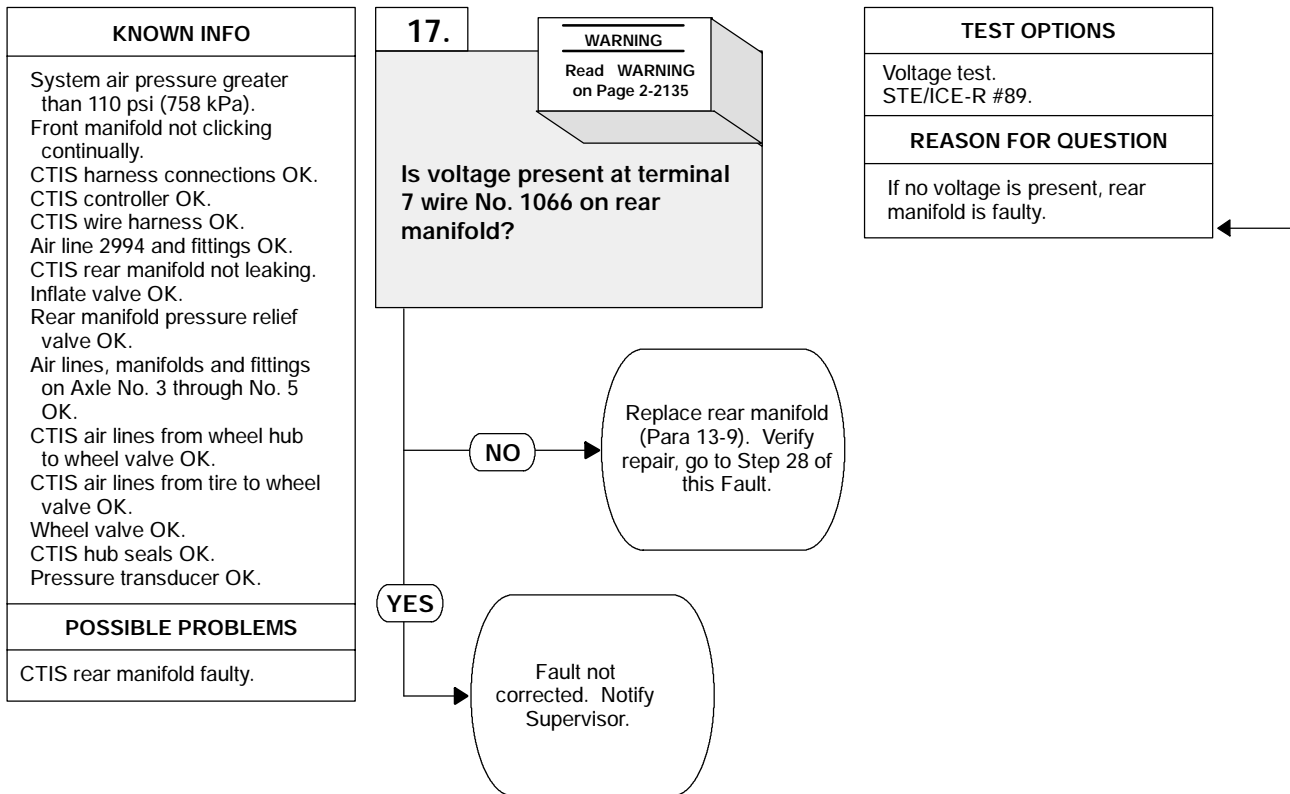
All connectors must be fully plugged in to perform this test

VOLTAGE TEST

- (1) Connect pressure transducer connector to pressure transducer.
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead to white wire.
- (4) Connect negative (-) multimeter lead to manifold ground braid.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
- (6) While assistant presses CTIS START button, check multimeter for any vdc.
 - (a) If no vdc is measured, replace transducer (Para 13-10).
 - (b) If any vdc is measured, go to Step 17 of this Fault.
- (7) Turn OFF ENGINE switch.



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

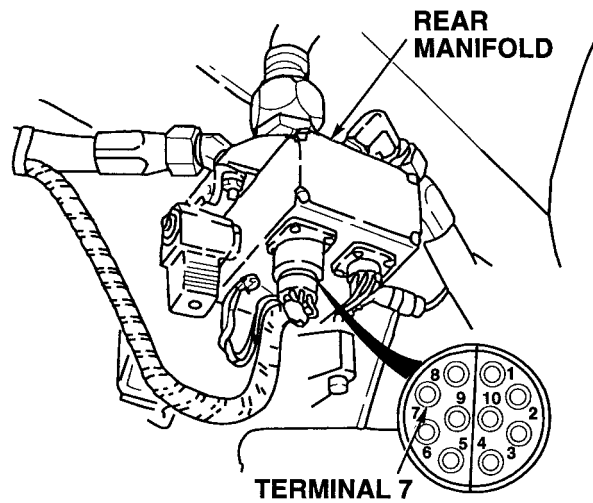
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

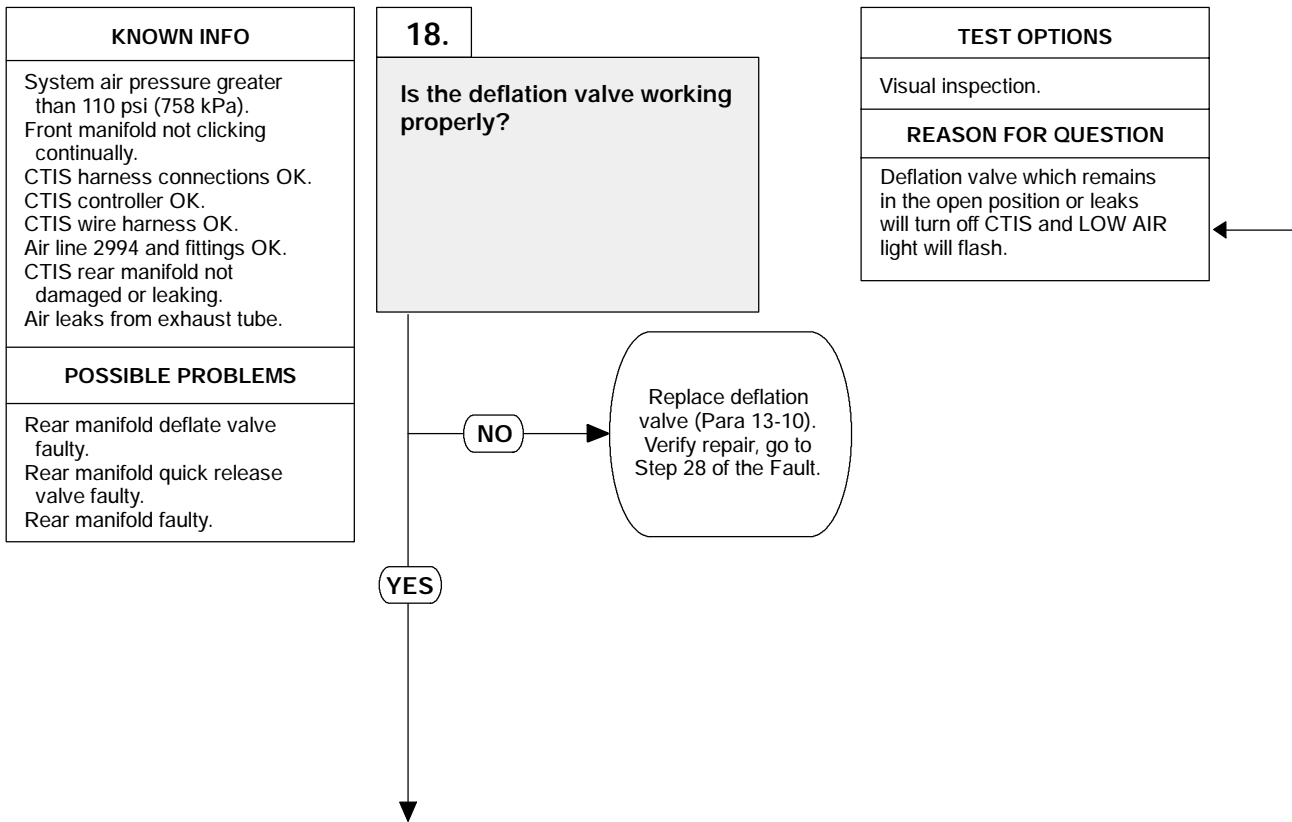
All connectors must be fully plugged in to perform this test.

VOLTAGE TEST

- (1) Connect positive (+) multimeter lead (with long probe installed) on terminal 7 at rear manifold wire harness (MC 64).
- (2) Connect negative (-) multimeter lead to a known good ground.
- (3) Turn ON ENGINE switch.
- (4) Assistant pushes CTIS START button.
 - (a) If there is no voltage present, replace rear manifold (Para 13-9).
 - (b) If there is voltage, Fault is not corrected. Notify Supervisor.
- (5) Turn OFF ENGINE switch.

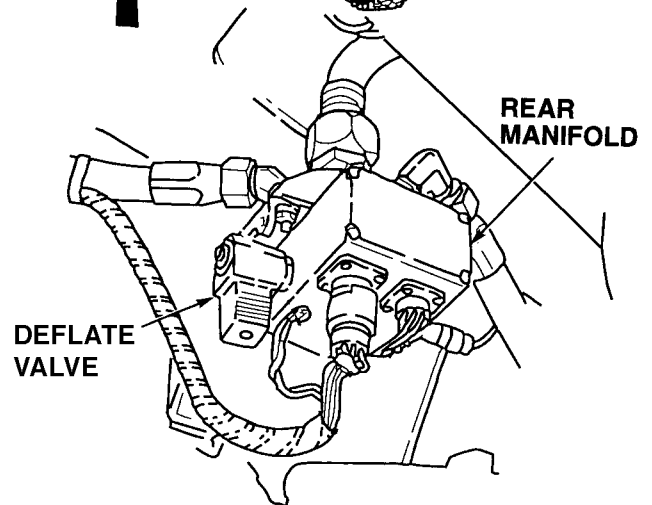
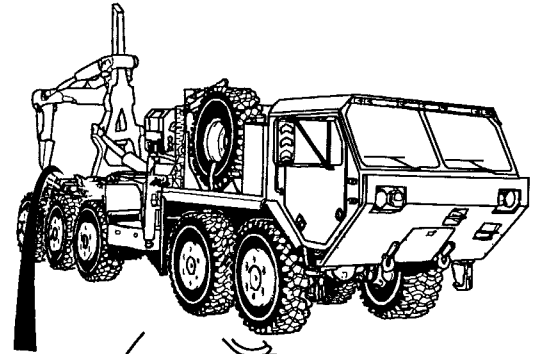


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

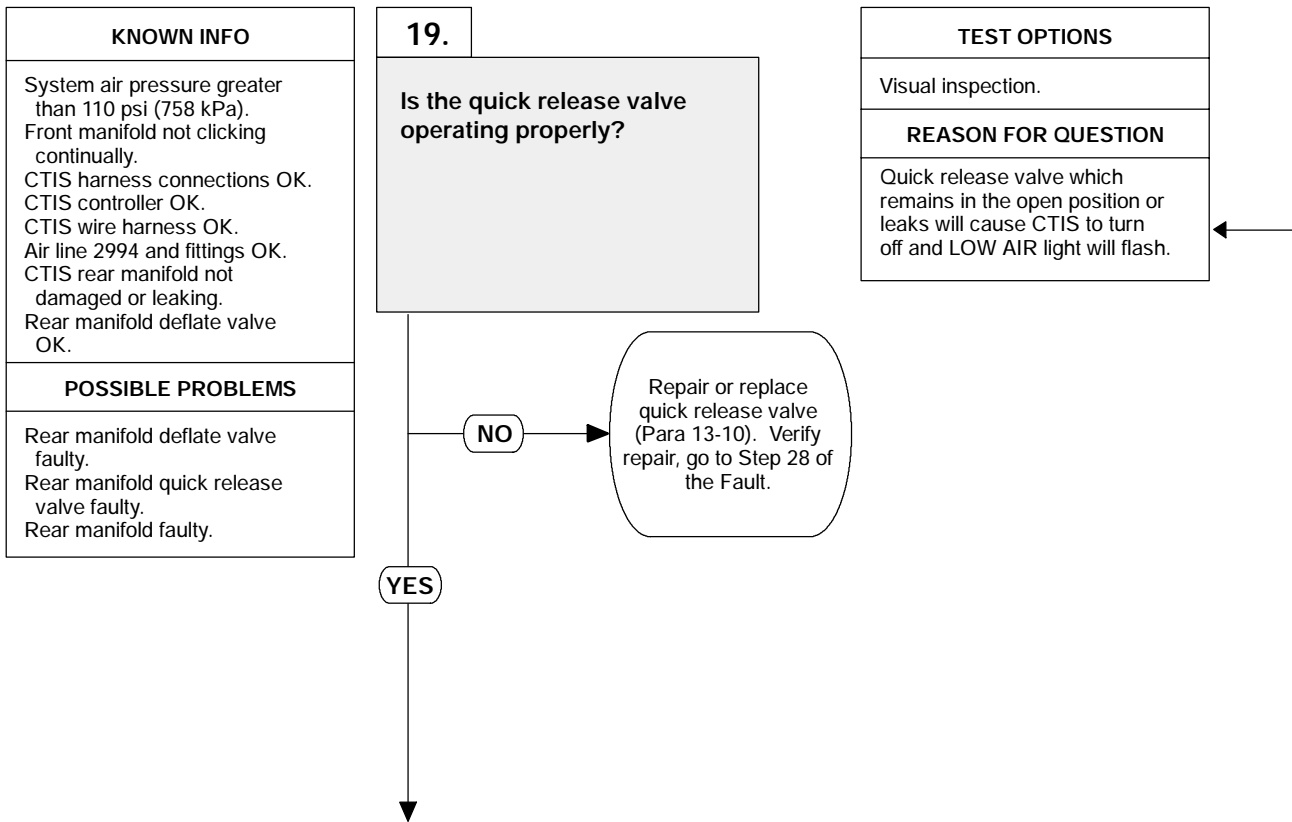


VISUAL INSPECTION

- (1) Remove deflation valve from rear manifold (Para 13-10).
- (2) Inspect valve assembly for a broken spring, damaged diaphragm, sticking, or any other physical damage.
 - (a) If deflation valve is damaged, repair or replace deflation valve (Para 13-10).
 - (b) If deflation valve is not damaged, install deflation valve and go to Step 19 of this Fault.

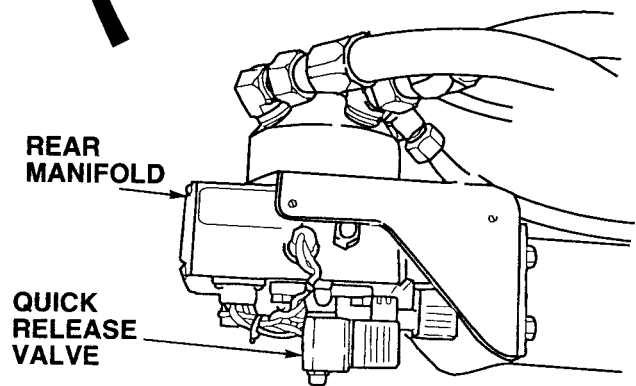
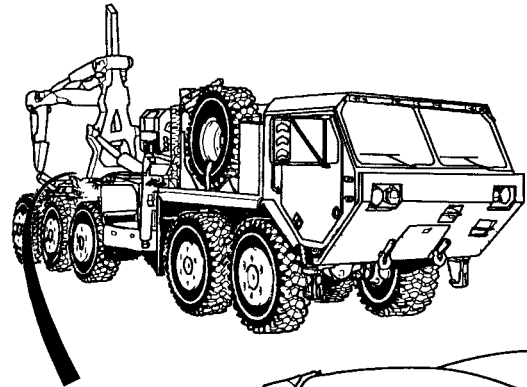


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

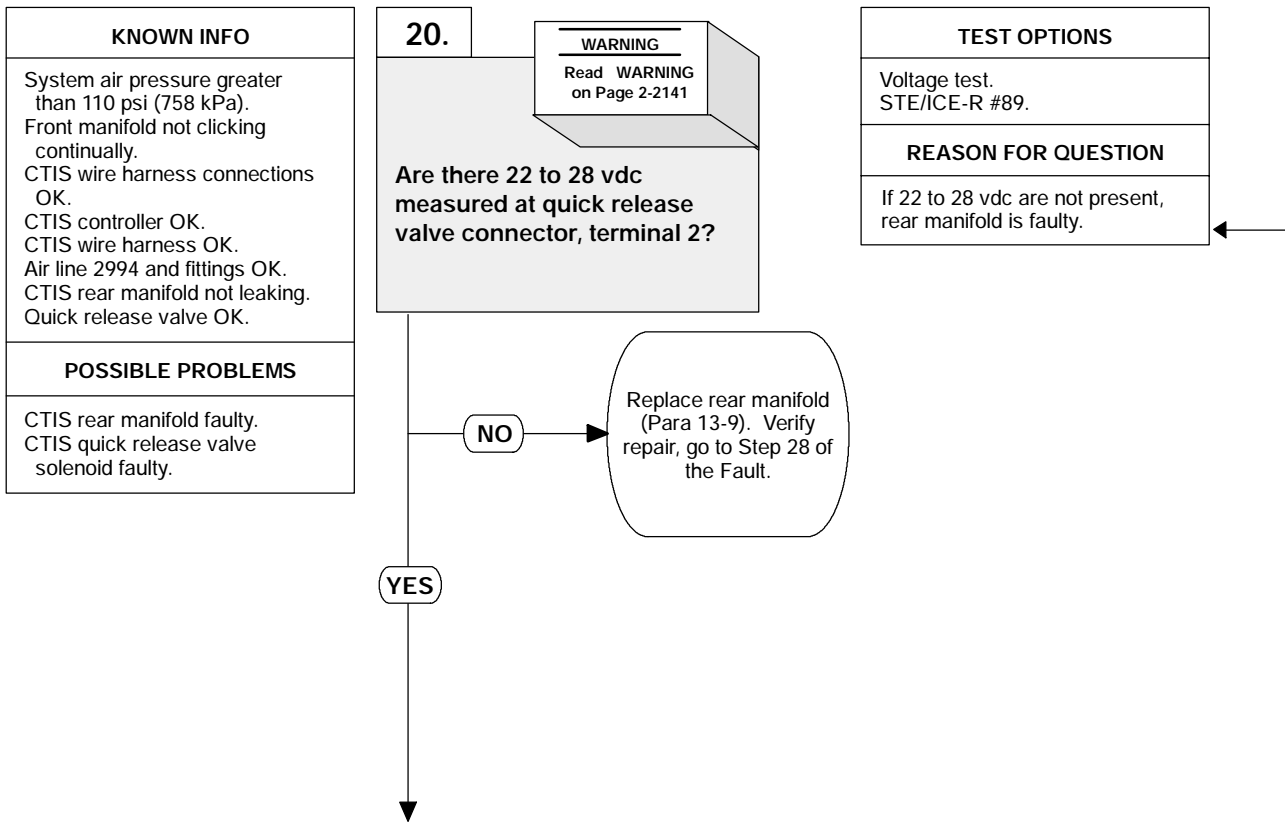


VISUAL INSPECTION

- (1) Remove quick release valve from rear manifold (Para 13-10).
- (2) Inspect valve assembly for a broken spring, damaged diaphragm, sticking or any other physical damage.
 - (a) If quick release valve is damaged, repair or replace quick release valve (Para 13-10).
 - (b) If quick release valve is not damaged, go to Step 20 of this Fault.

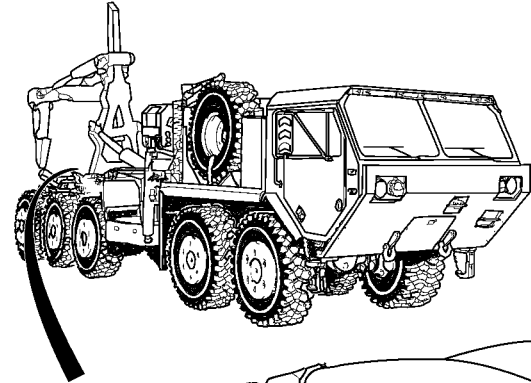


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

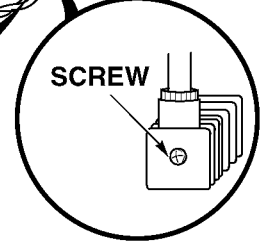
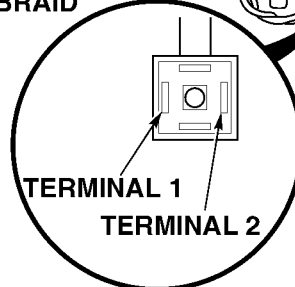


VOLTAGE TEST

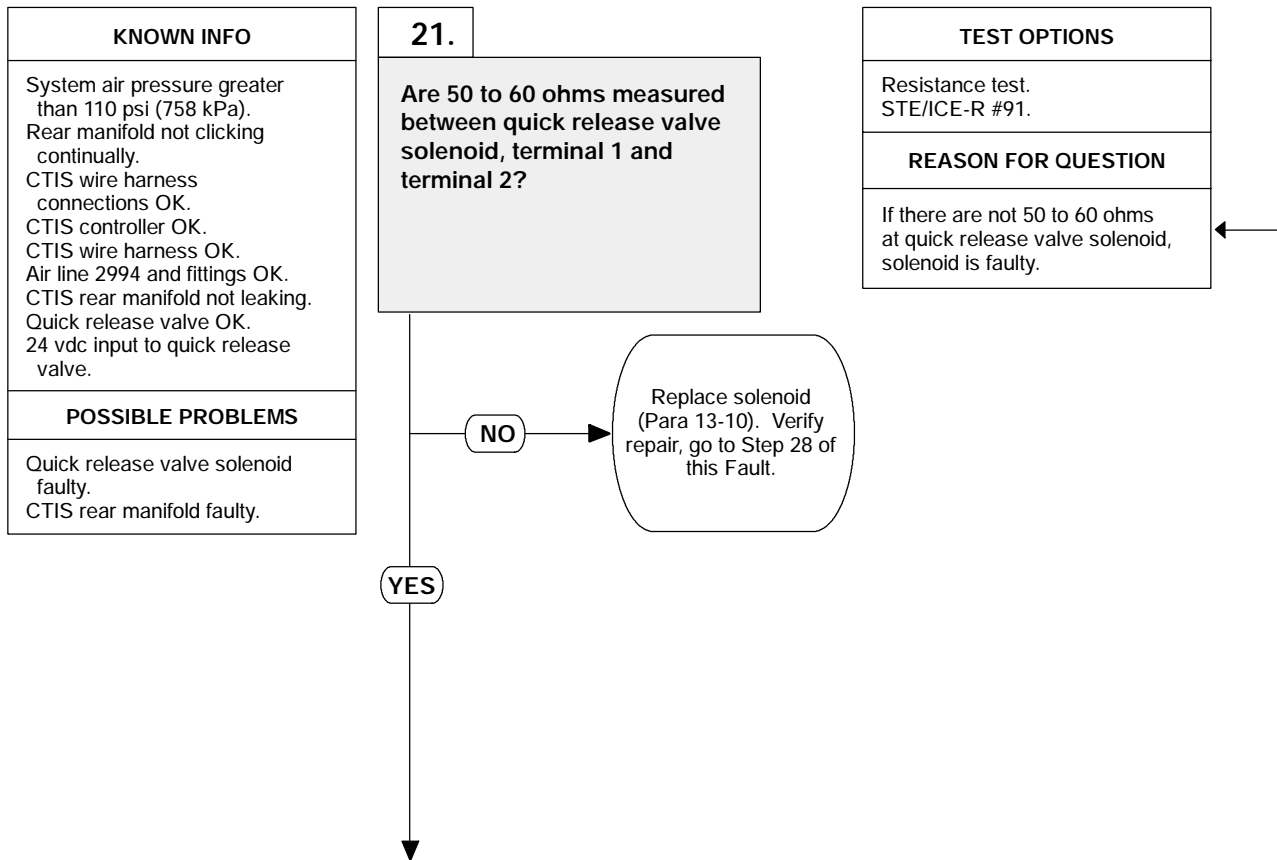
- (1) Loosen screw and disconnect quick release valve connector.
- (2) Connect positive (+) multimeter lead to quick release valve connector terminal 2.
- (3) Connect negative (-) multimeter lead to rear manifold ground braid.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
- (5) Assistant pushes CTIS START button.
 - (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and replace rear manifold (Para 13-8).
 - (b) If 22 to 28 vdc are present, go to Step 21 of this Fault.

REAR MANIFOLD QUICK RELEASE VALVE CONNECTOR

QUICK RELEASE VALVE
GROUND BRAID

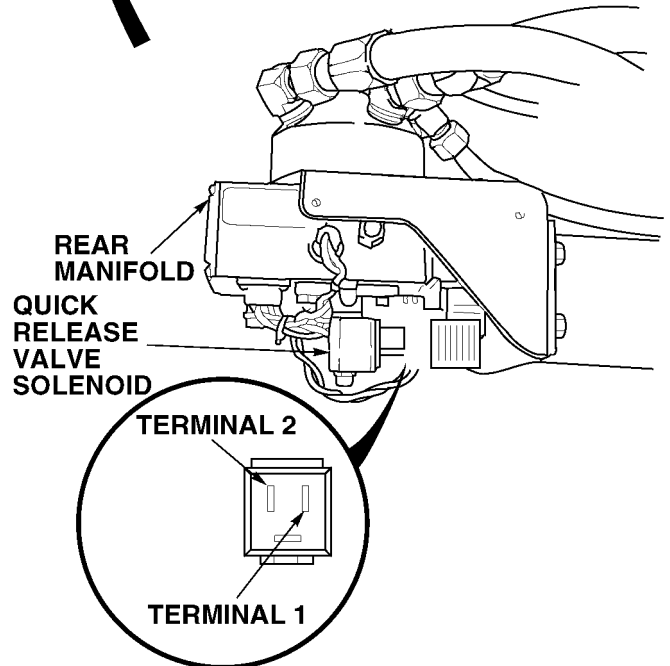
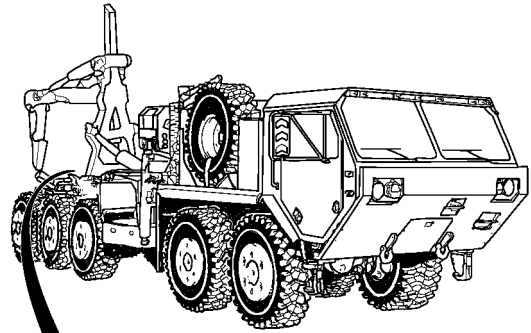


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

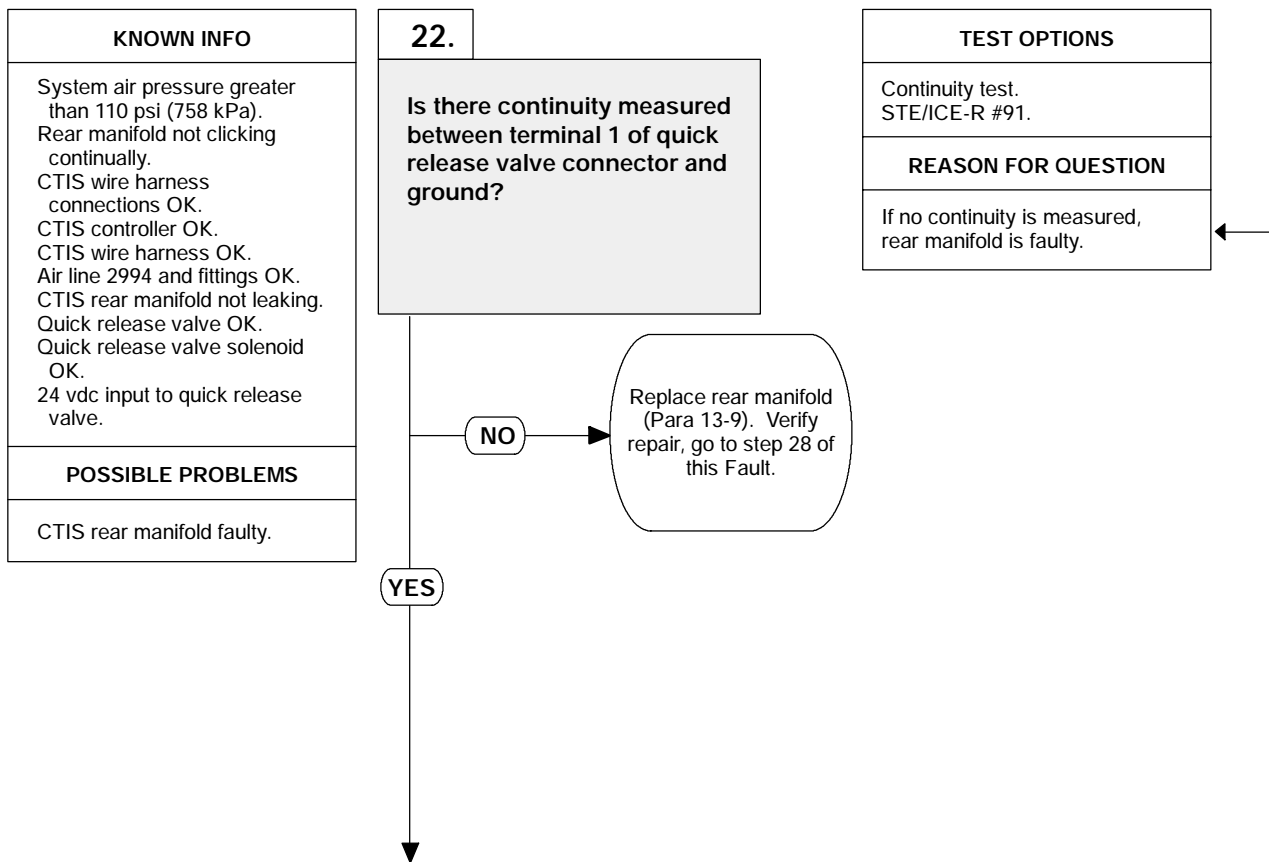


RESISTANCE TEST

- (1) Set multimeter select switch to ohms.
- (2) Read resistance between terminals 1 and 2 of quick release valve solenoid.
 - (a) If there are not 50 to 60 ohms, replace solenoid (Para 13-10).
 - (b) If there are 50 to 60 ohms, solenoid is OK, go to Step 22 of this Fault.



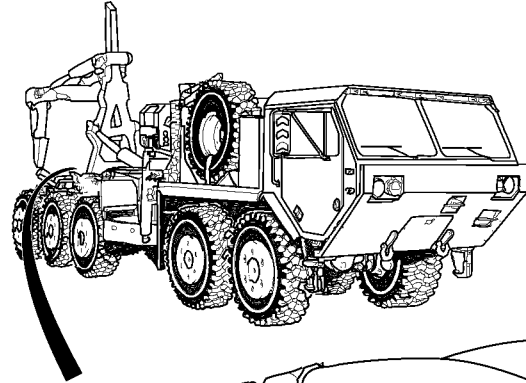
11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



CONTINUITY TEST

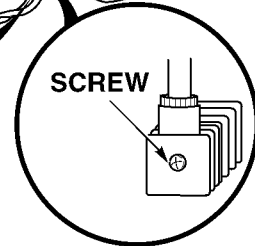
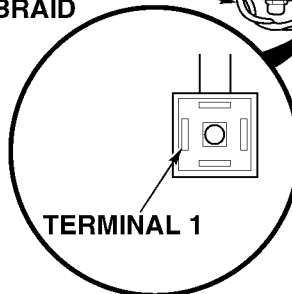
Is there continuity measured between terminal 1 at quick release valve connector and a known good ground?

- (1) If there is no continuity measured, replace rear manifold (Para 13-9).
- (2) If there is continuity measured, install harness connector on quick release valve and tighten screw.

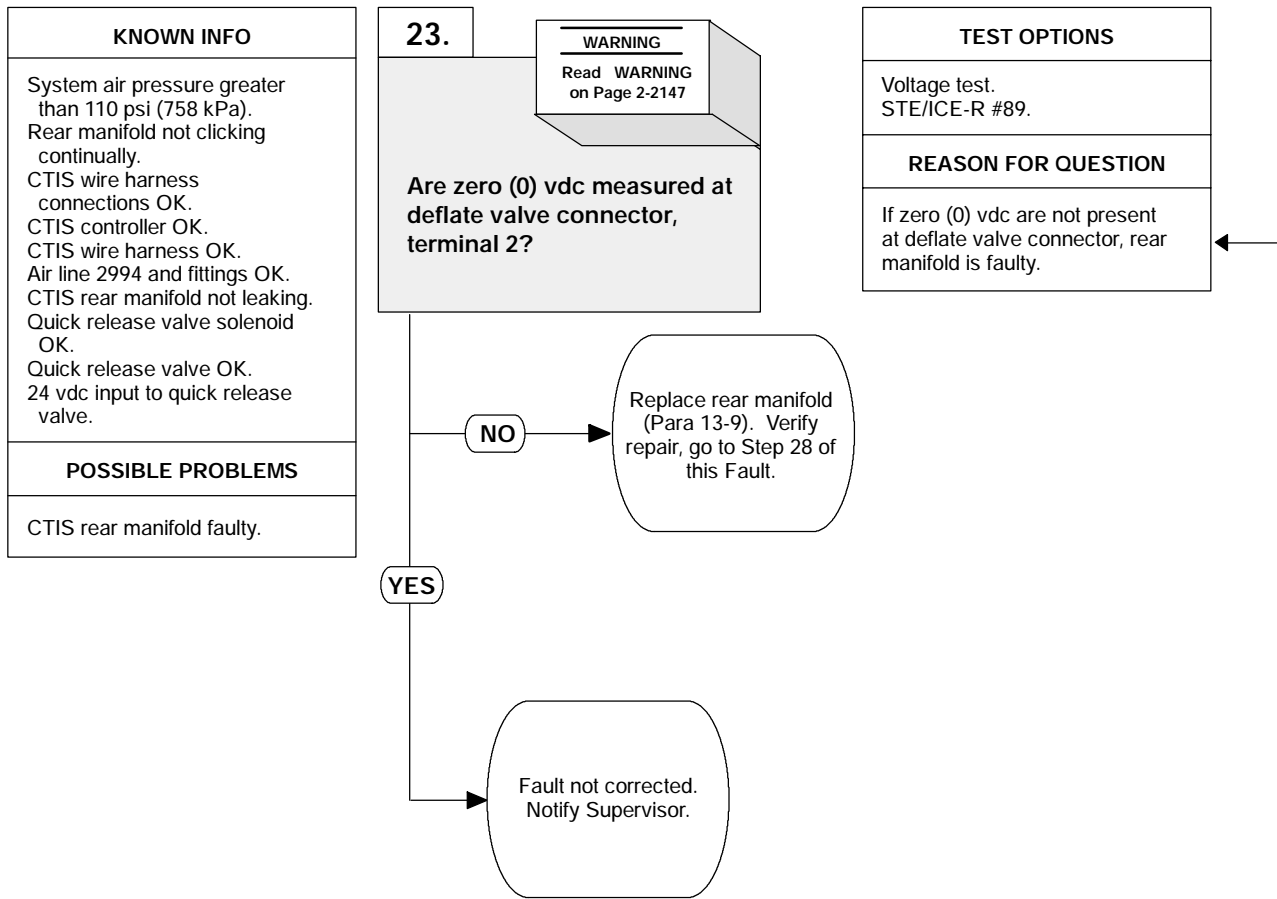


REAR MANIFOLD **QUICK RELEASE VALVE CONNECTOR**

QUICK RELEASE VALVE
GROUND BRAID



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



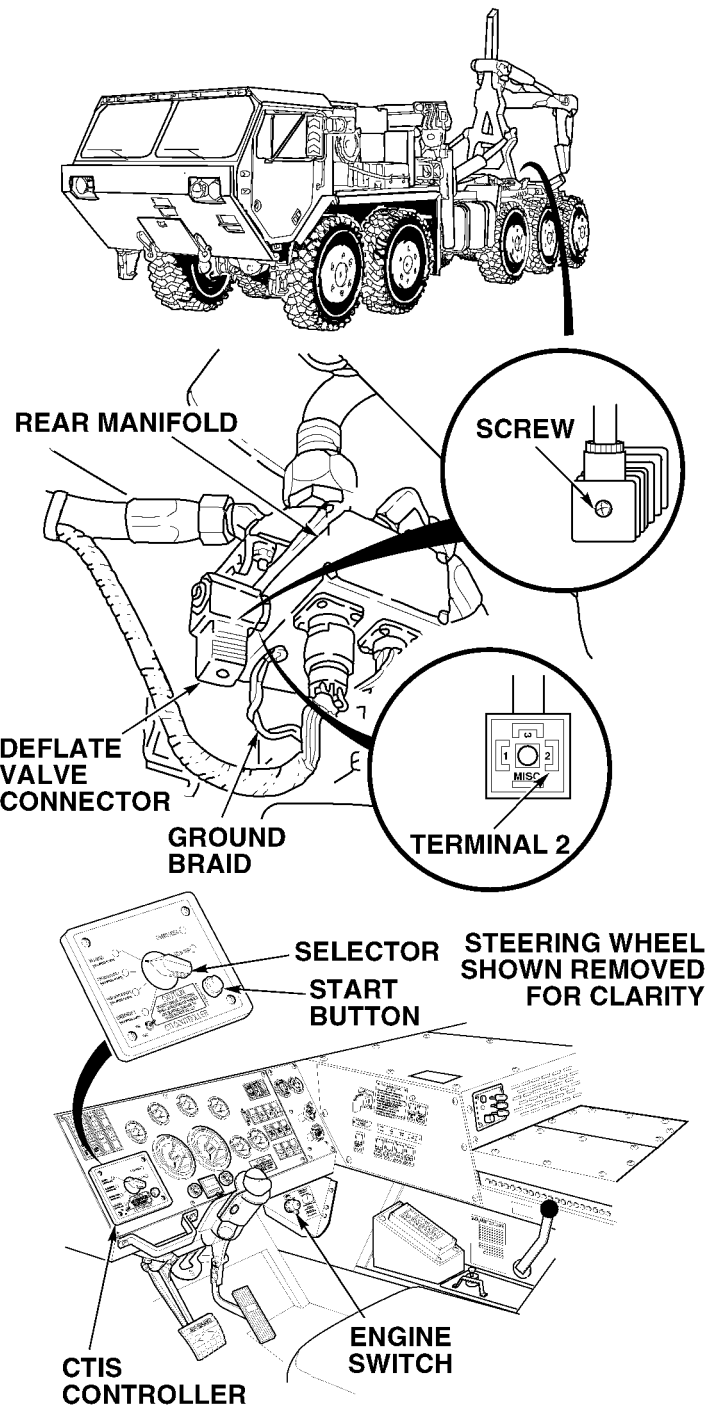
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

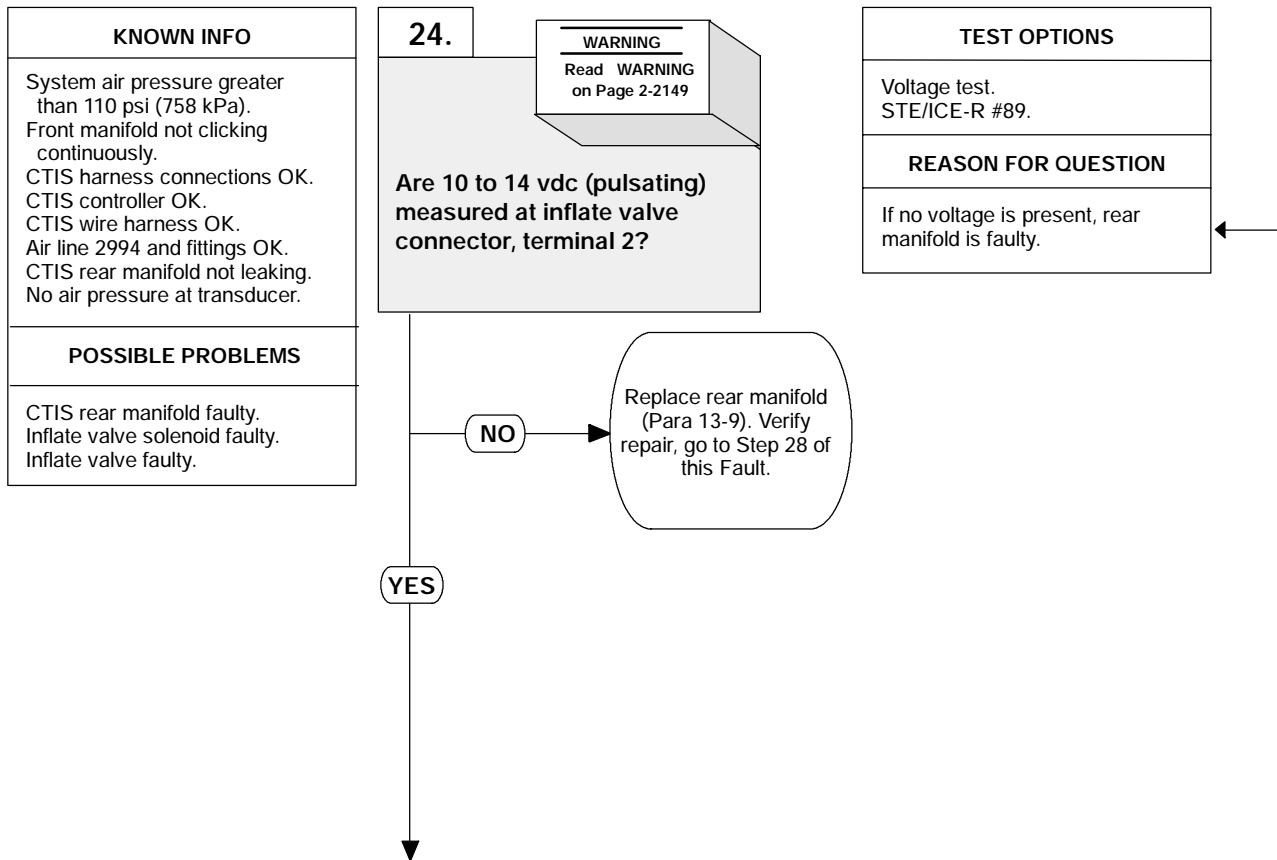
NOTE

Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VOLTAGE TEST
(1) Loosen screw and disconnect deflate valve connector from rear manifold.
(2) Connect positive (+) multimeter lead to deflate valve connector, terminal 2.
(3) Connect negative (-) multimeter lead to rear manifold ground braid.
(4) Turn ON ENGINE switch (TM 9-2320-364-10).
(5) Assistant pushes CTIS START button. <ul style="list-style-type: none"> (a) If any vdc are present, turn OFF ENGINE switch and replace rear manifold. (b) If zero (0) vdc are present manifold is OK. Fault not corrected. Notify Supervisor.
(6) Turn OFF ENGINE switch.
(7) Connect deflate valve connector and tighten screw.



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

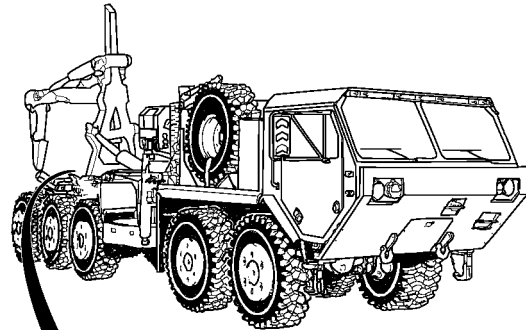


WARNING

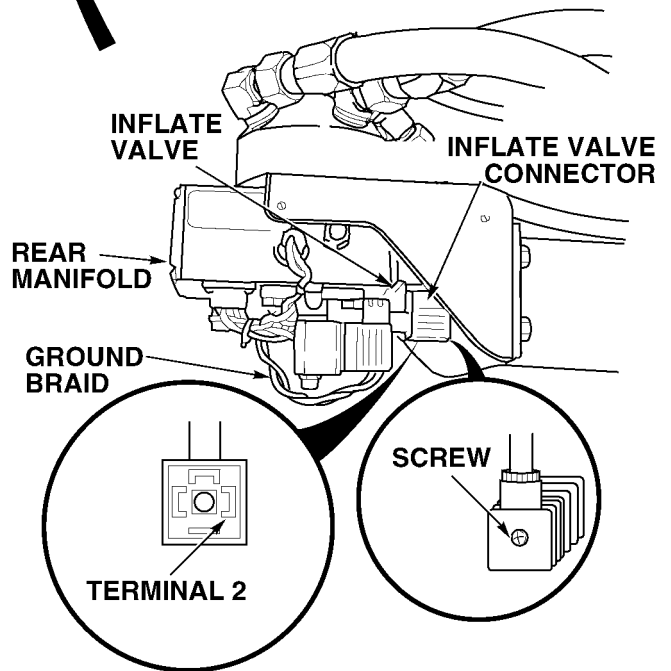
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

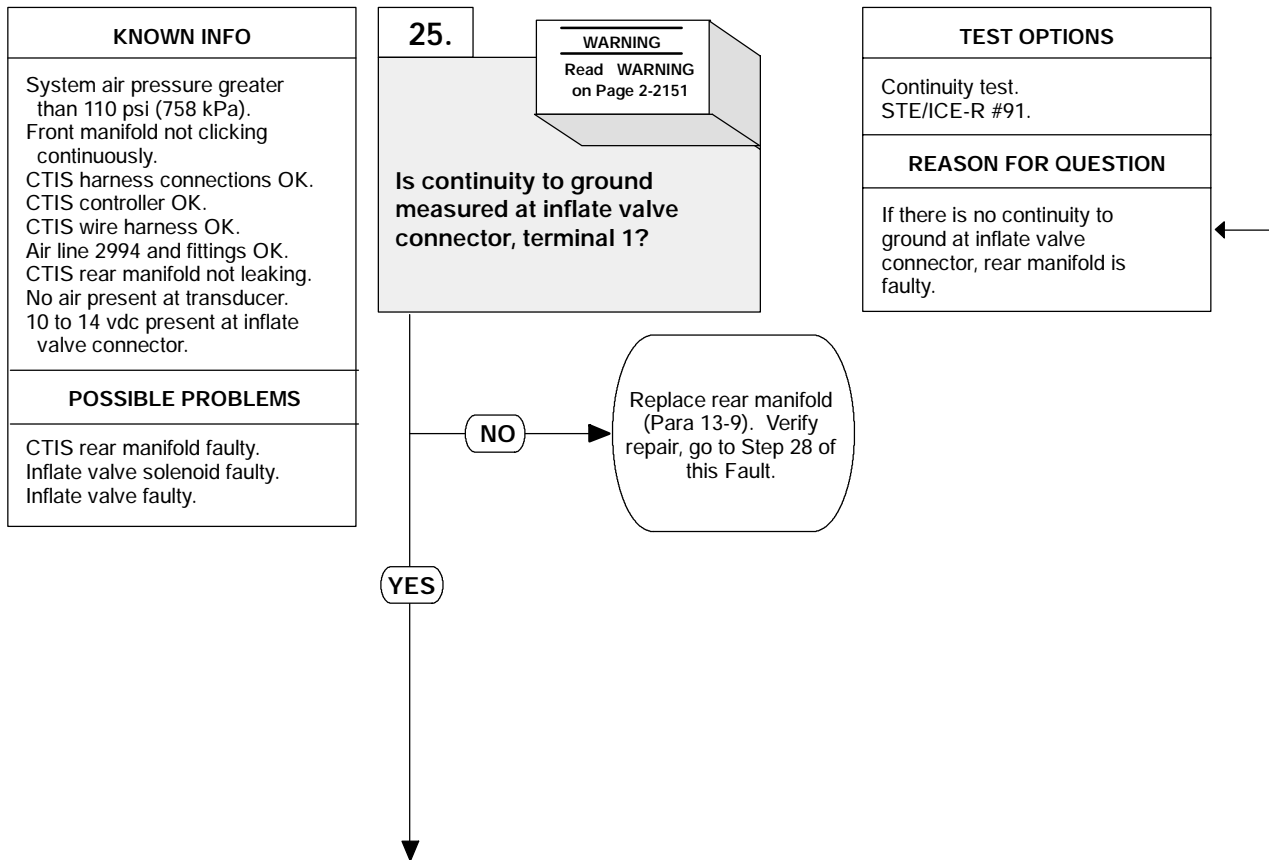
- 10 to 14 vdc (pulsating) will cycle at least five times, then drop to 0 vdc.
- During the cycle course of this test, 10 to 14 vdc will be measured intermittently, then drop to 0 vdc.
- Voltmeter must read 10 to 14 vdc at least one time before dropping to 0 vdc.



VOLTAGE TEST	
(1)	Loosen screw and disconnect inflate valve connector.
(2)	Set multimeter select switch to volts dc.
(3)	Connect positive (+) multimeter lead to inflate valve harness connector, terminal 2.
(4)	Connect negative (-) multimeter lead to rear manifold ground braid.
(5)	Turn ON ENGINE switch (TM 9-2320-364-10).
(6)	Assistant pushes CTIS START button.
(a)	If 10 to 14 vdc (pulsating) are not present, turn OFF ENGINE switch and replace rear manifold (Para 13-9).
(b)	If 10 to 14 vdc (pulsating) are present, turn OFF ENGINE switch and go to Step 25 of this Fault.



11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

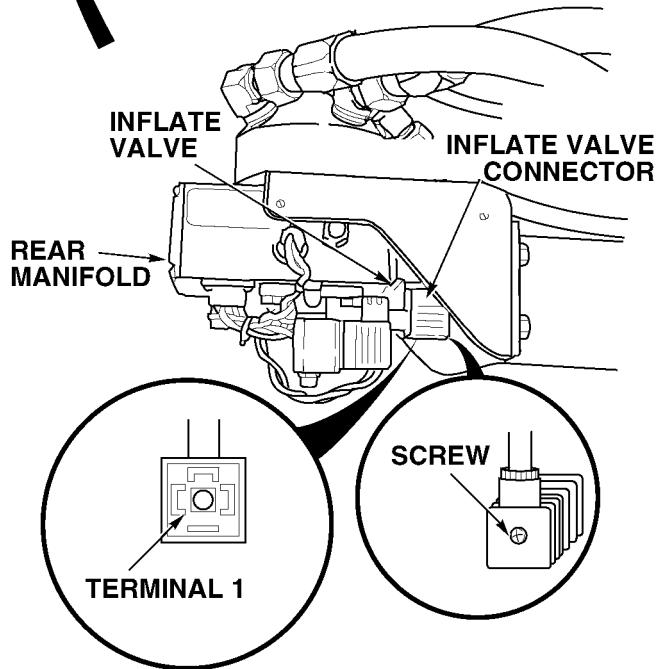
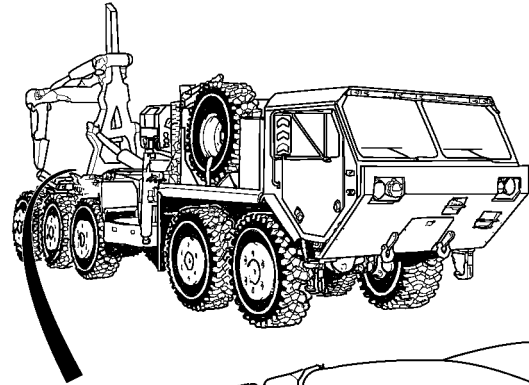


WARNING

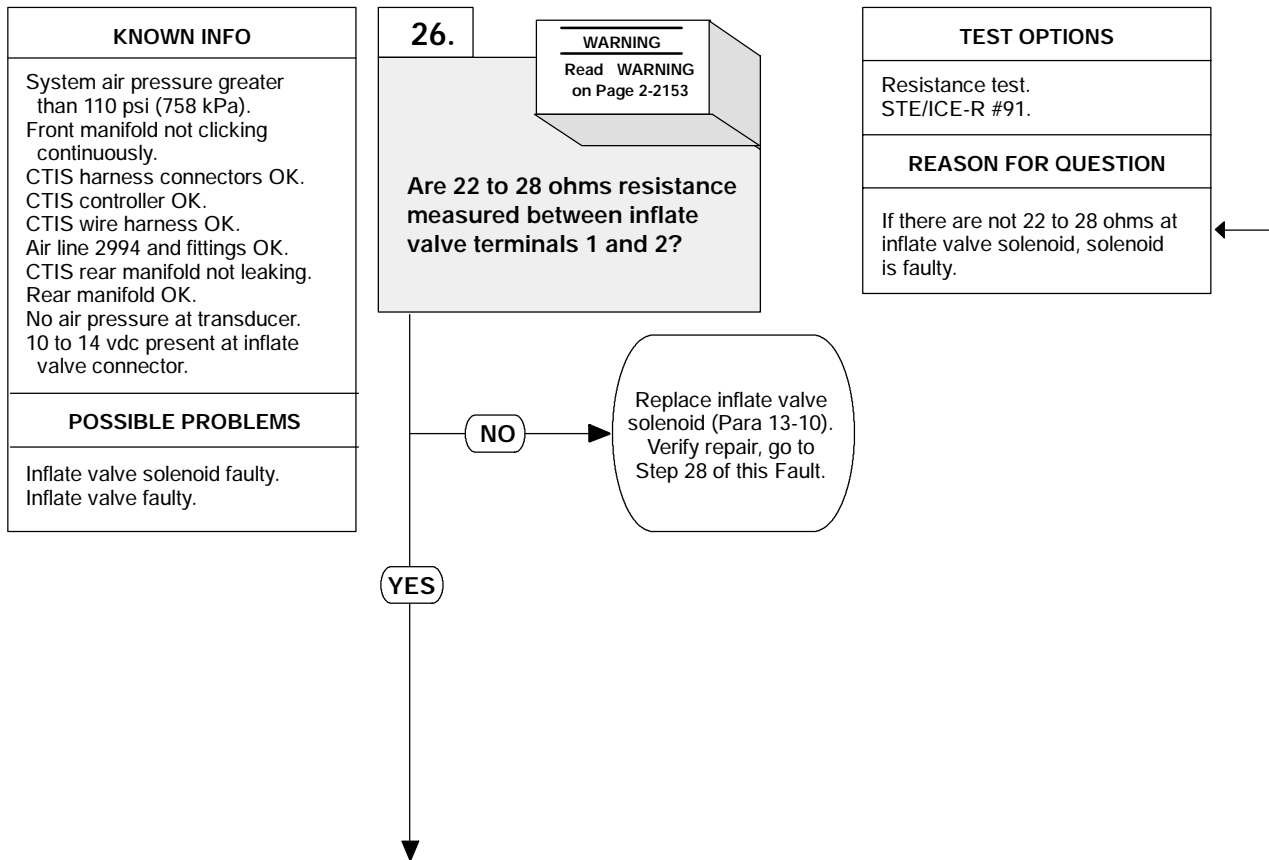
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between inflate valve connector, terminal 1 and rear manifold ground braid?
 - (a) If there is no continuity, replace rear manifold (Para 13-9).
 - (b) If there is continuity, go to Step 26 of this Fault.

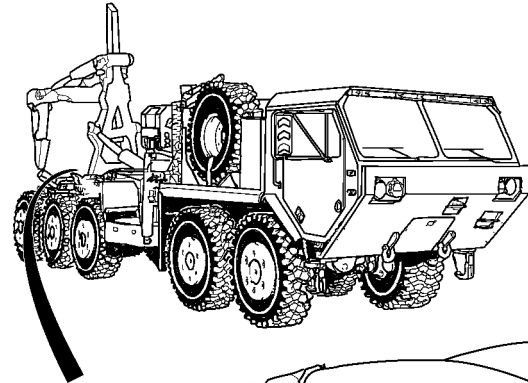


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

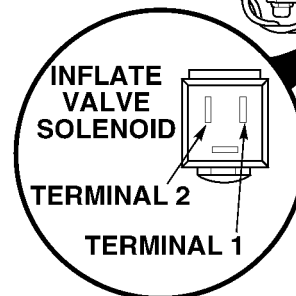


WARNING

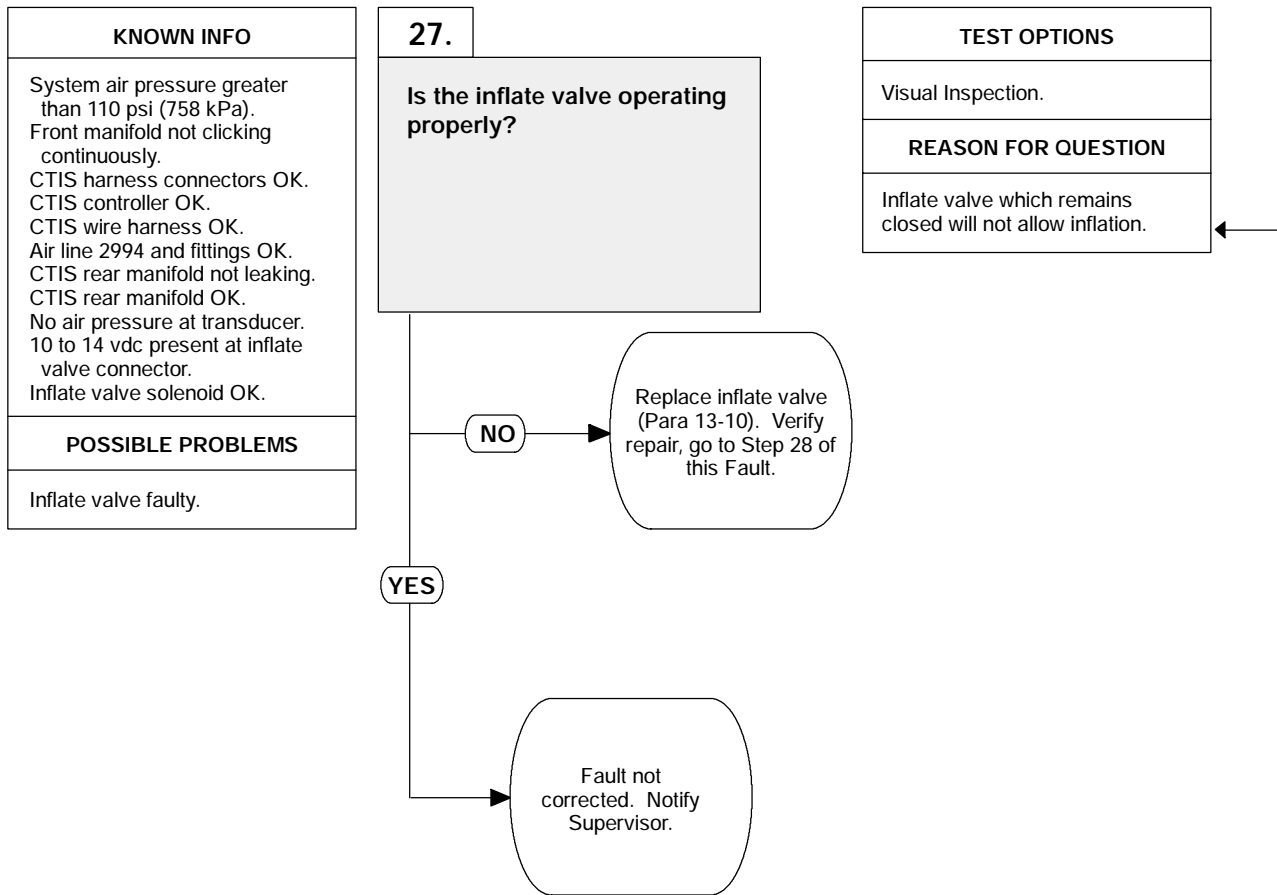
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

**RESISTANCE TEST**

- Read resistance between terminals 1 and 2 of inflate valve solenoid.
- (1) If there are not 22 to 28 ohms, replace inflate valve solenoid (Para 13-10).
 - (2) If there are 22 to 28 ohms, inflate valve solenoid is OK, go to Step 27 of this Fault.

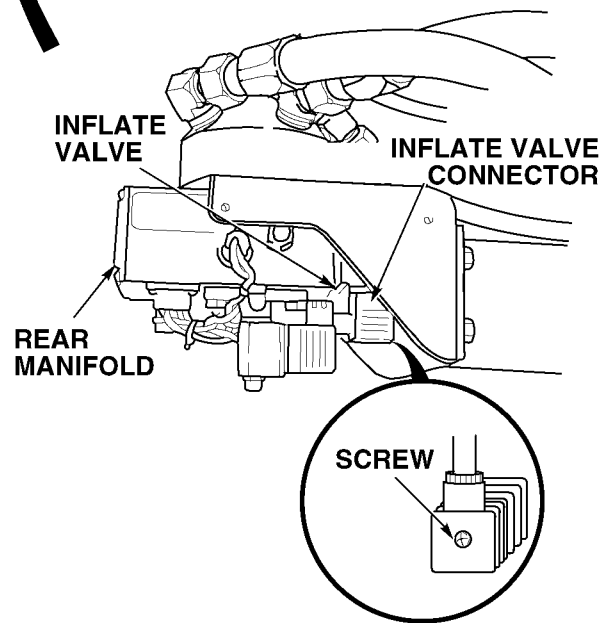
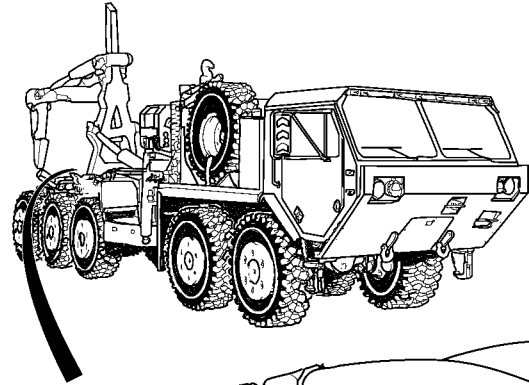
**REAR
MANIFOLD**

11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).

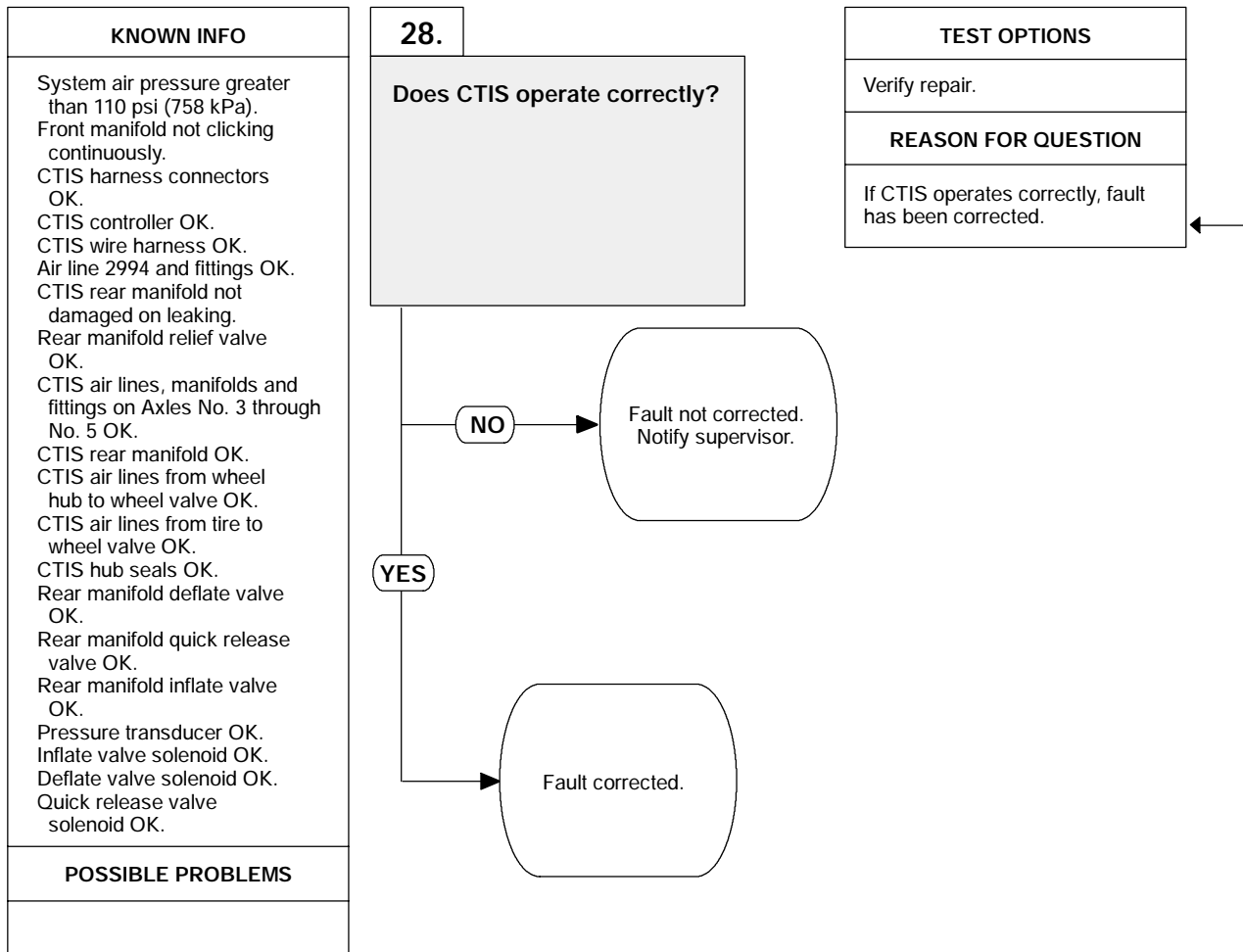


VISUAL INSPECTION

- (1) Remove inflate valve from rear manifold (Para 13-10).
- (2) Inspect valve assembly for a broken spring, damaged diaphragm, sticking, or any other physical damage.
 - (a) If inflate valve is damaged, repair or replace inflate valve (Para 13-10).
 - (b) If inflate valve is not damaged, fault is not corrected. Notify supervisor.
- (3) Install inflate valve.
- (4) Connect inflate valve harness connector and tighten screw.
- (5) Install rear manifold cover.
- (6) Put LHS in transit position (TM 9-2320-364-10).

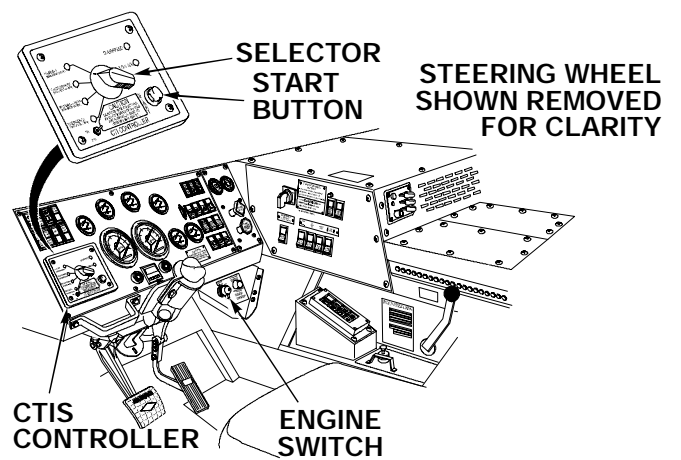


11. REAR MANIFOLD CLICKS CONTINUALLY/LOW AIR LIGHT FLASHING (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button.
 - (a) If rear manifold clicks continually and LOW AIR light flashes, fault not corrected. Turn OFF ENGINE switch and notify Supervisor.
 - (b) If rear manifold does not click continuously and LOW AIR light does not flash, fault has been corrected.
- (4) Turn OFF ENGINE switch.



2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT).

12. TIRES ON NO. 1 THROUGH NO. 5 AXLES, DEFLATE UPON COMPLETION OF ADJUSTMENT CYCLE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
Goggles, Industrial (Item 30, Appendix G)

Materials/Parts

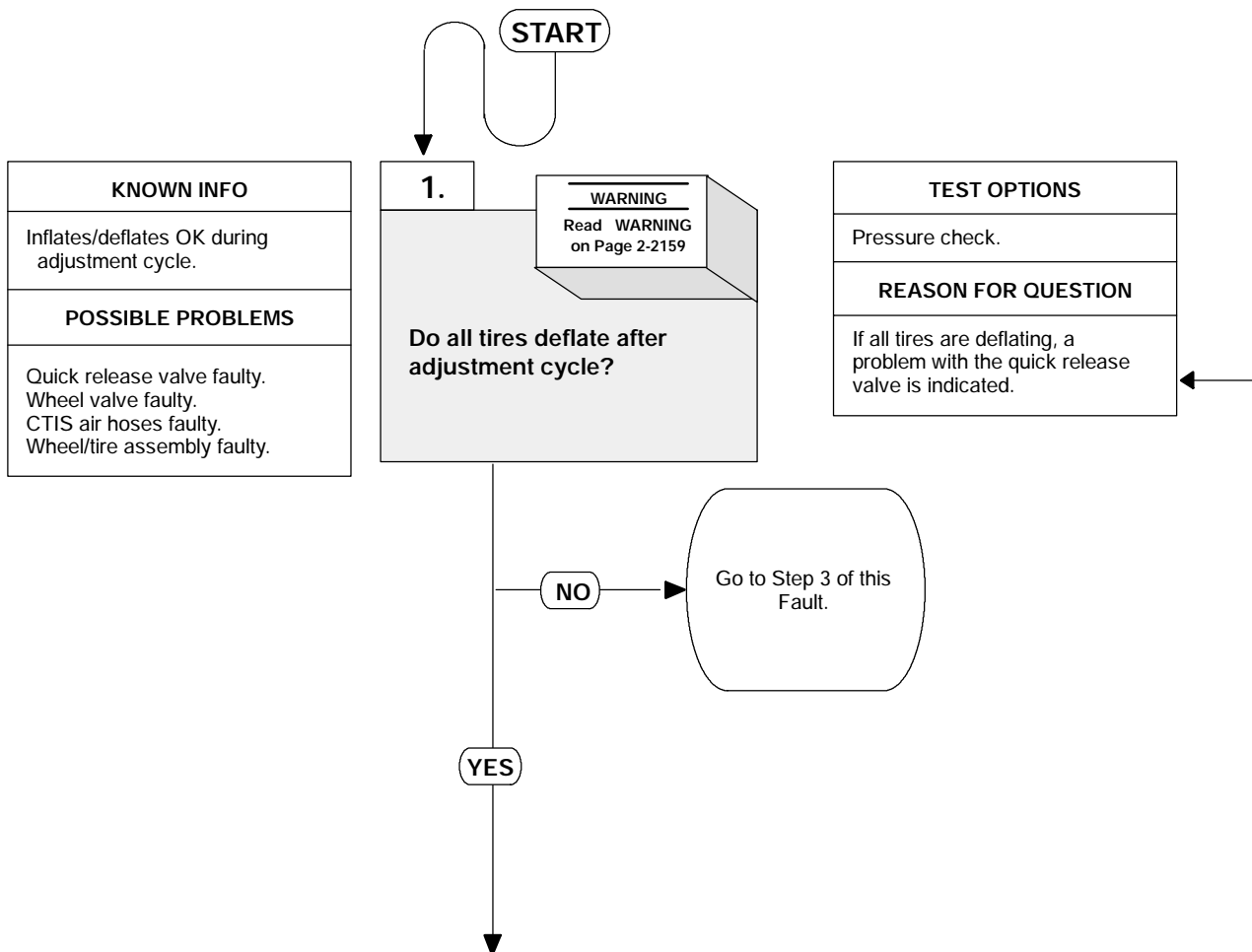
Solution, Soap (Item 86, Appendix C)

References

TM 9-2320-364-10

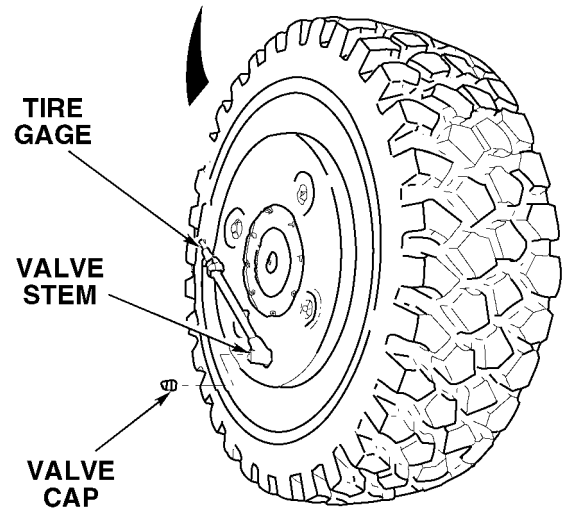
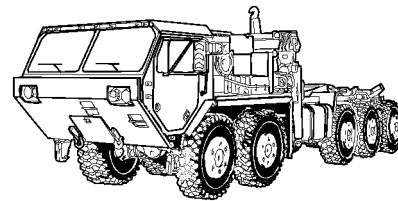
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9 2320-364-10)
Wheels chocked, (TM 9-2320-364-10)



WARNING

- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.



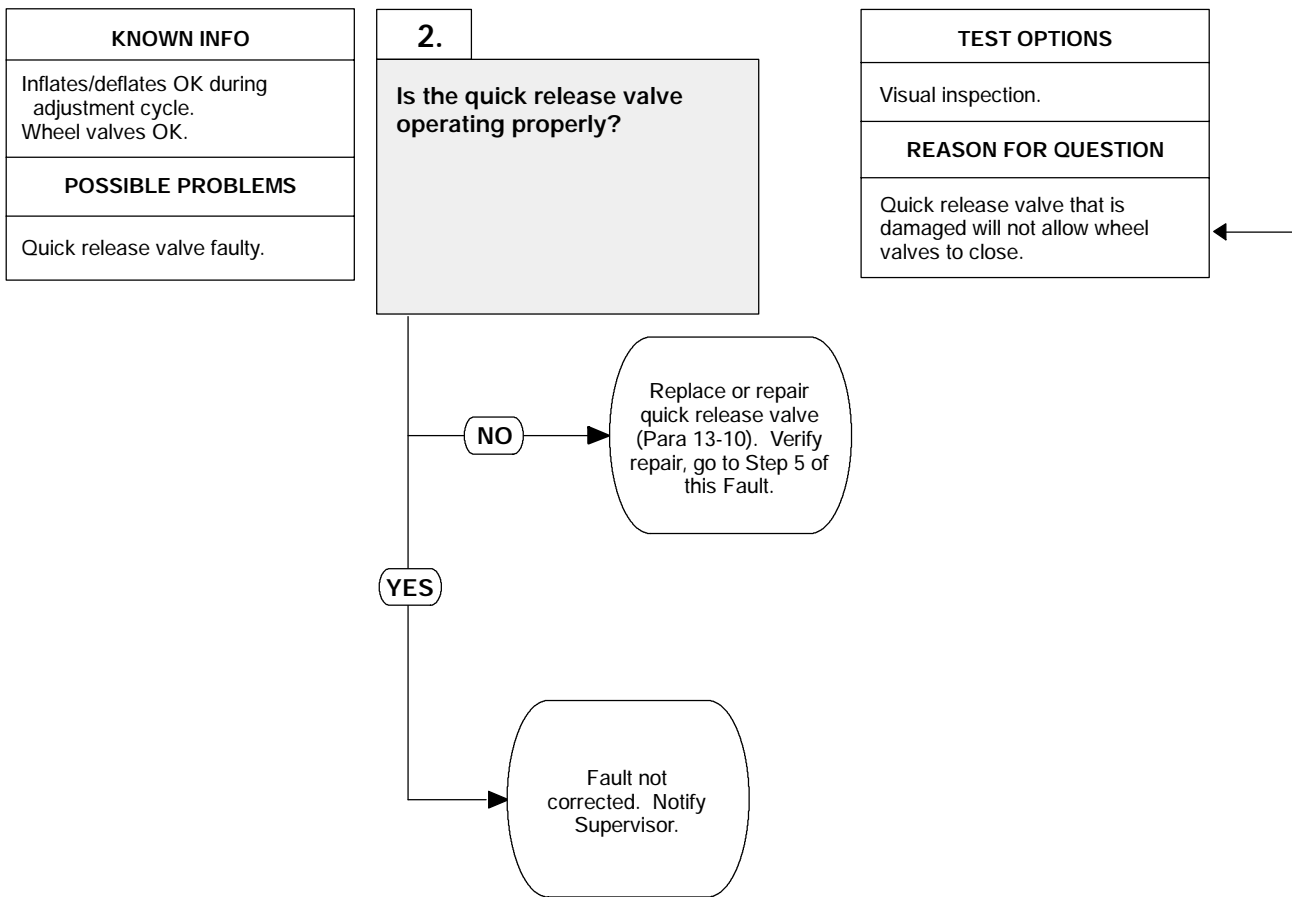
NOTE

- Tires must be deflated to 60 psi (414 kPa) or less to perform this test.
- Troubleshooting procedures are the same for Axles No. 1 and No. 2 as well as Axles No. 3 through No. 5. Axles No. 1 and No. 2 are covered in this procedure.

PRESSURE CHECK

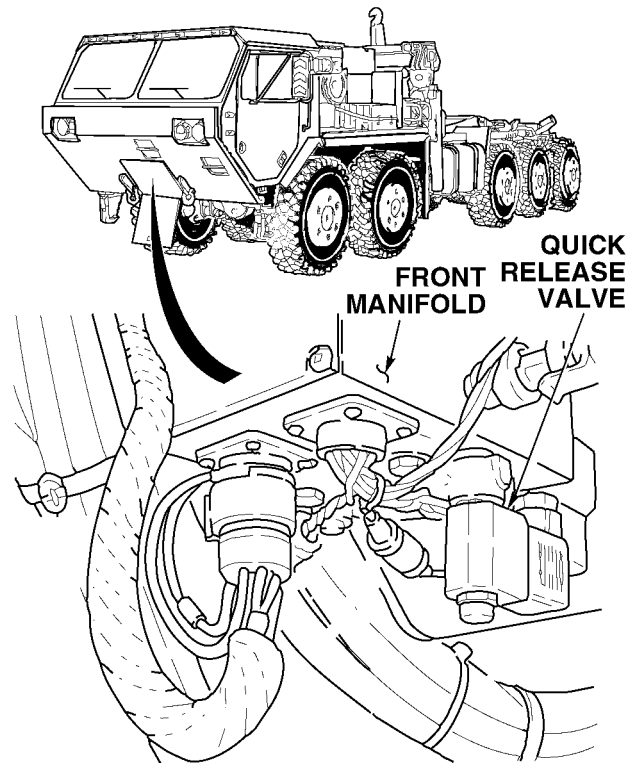
- (1) Remove valve cap from any valve stem on Axles No. 1 or No. 2.
- (2) Using tire gage, deflate any one tire on Axles No. 1 or No. 2 to 40 psi (276 kPa).
- (3) Start engine (TM 9-2320-364-10).
- (4) Set CTIS controller selector to HIGHWAY.
- (5) Press CTIS START button.
- (6) Check pressure in all tires with tire gage.
 - (a) If all tires are not deflating, turn OFF ENGINE switch and go to Step 3 of this Fault.
 - (b) If all tires are deflating, wheel valves are OK.
- (7) Turn OFF ENGINE switch.

12. TIRES ON NO. 1 THROUGH NO. 5 AXLES DEFLATE UPON COMPLETION OF ADJUSTMENT CYCLE (CONT).

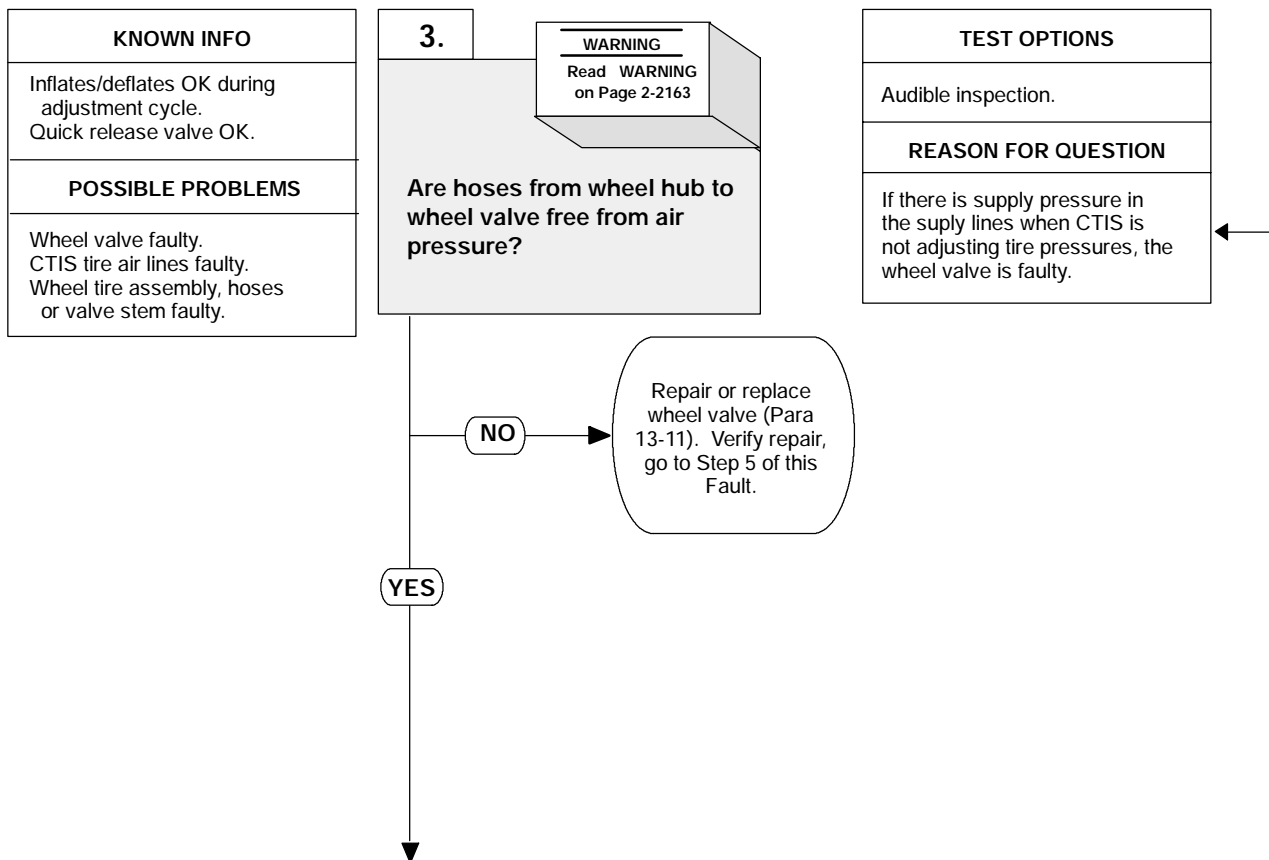


VISUAL INSPECTION

- (1) Remove quick release valve from front manifold (Para 13-10).
- (2) Inspect valve assembly for a broken spring, damaged diaphragm, sticking, or any other physical damage.
 - (a) If quick release valve is damaged, repair or replace valve (Para 13-10).
 - (b) If quick release valve is not damaged, install quick release valve and notify supervisor.



12. TIRES ON NO. 1 THROUGH NO. 5 AXLES DEFLATE UPON COMPLETION OF ADJUSTMENT CYCLE (CONT).

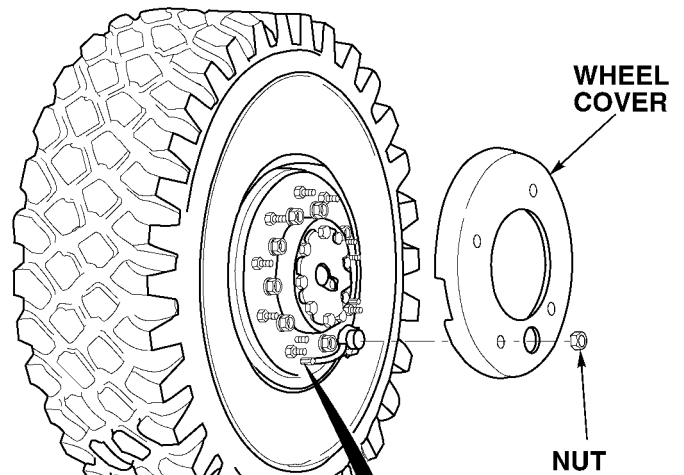


WARNING

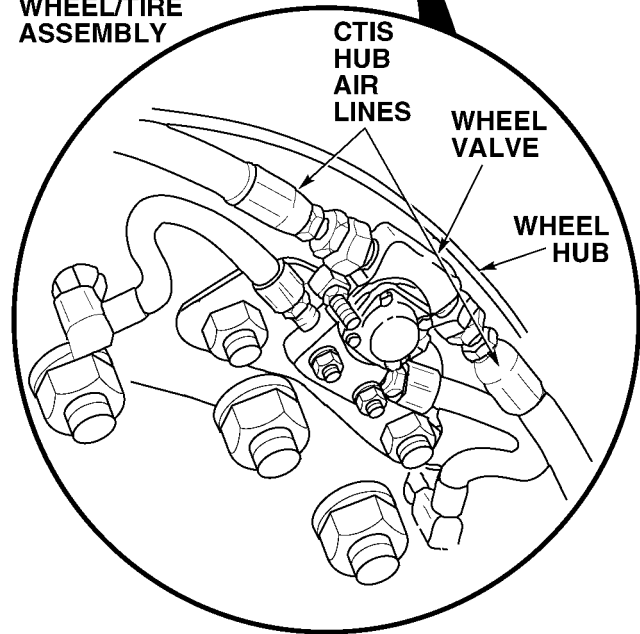
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

AUDIBLE INSPECTION

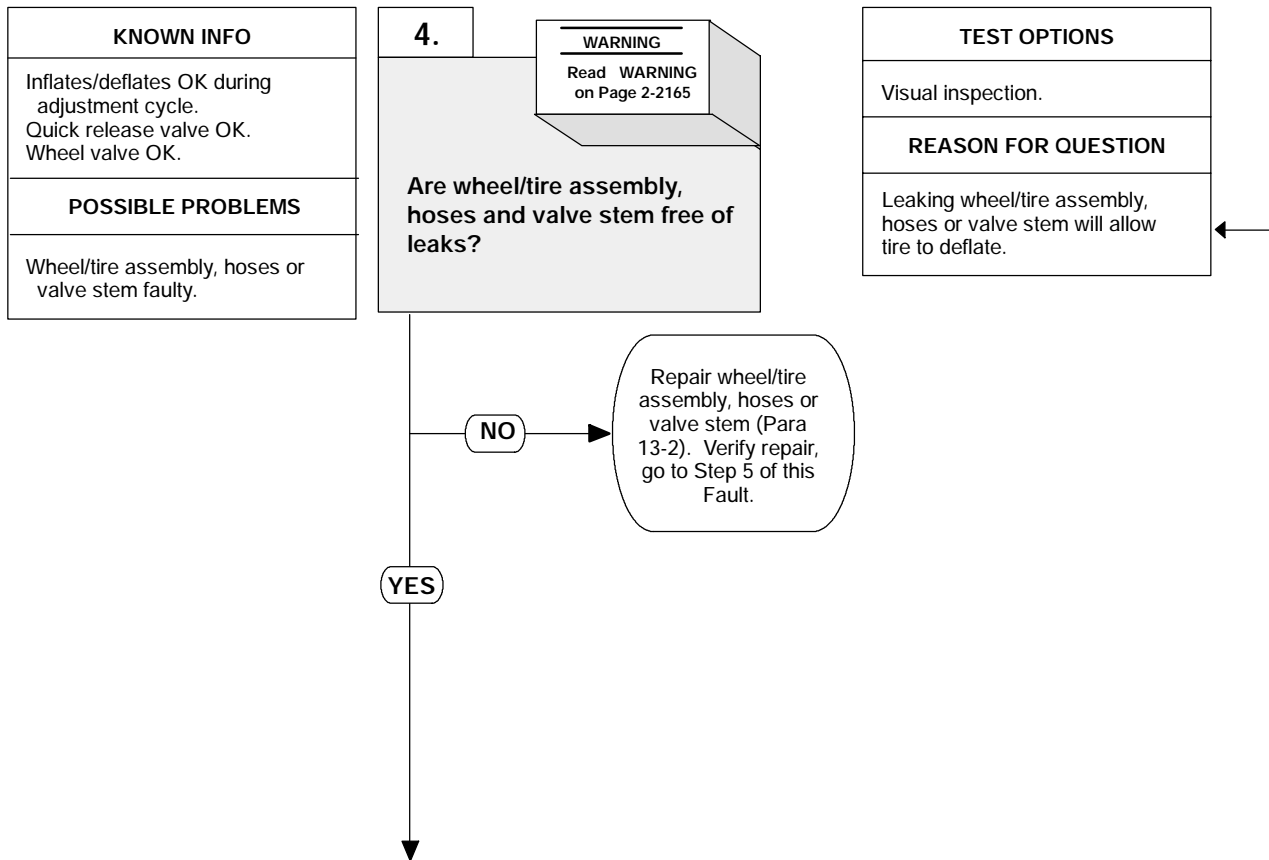
- (1) Remove four nuts and wheel cover.
- (2) Start engine (TM 9-2320-364-10).
- (3) Set CTIS controller to HIGHWAY.
- (4) Press CTIS START button.
- (5) Check for air pressure in hub to wheel valve air lines by cracking open fittings at wheel valve.
 - (a) If air is escaping, turn OFF ENGINE switch and repair or replace wheel valve (Para 13-11).
 - (b) If no air is escaping, wheel valve is OK.
- (6) Turn OFF ENGINE switch.



WHEEL/TIRE ASSEMBLY



12. TIRES ON NO. 1 THROUGH NO. 5 AXLES DEFLATE UPON COMPLETION OF ADJUSTMENT CYCLE (CONT).



WARNING

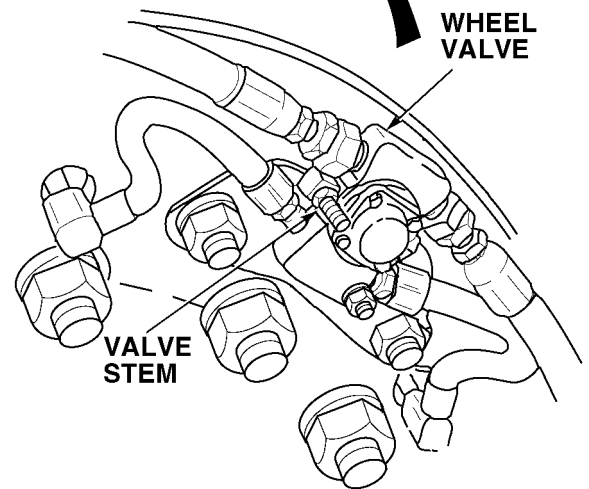
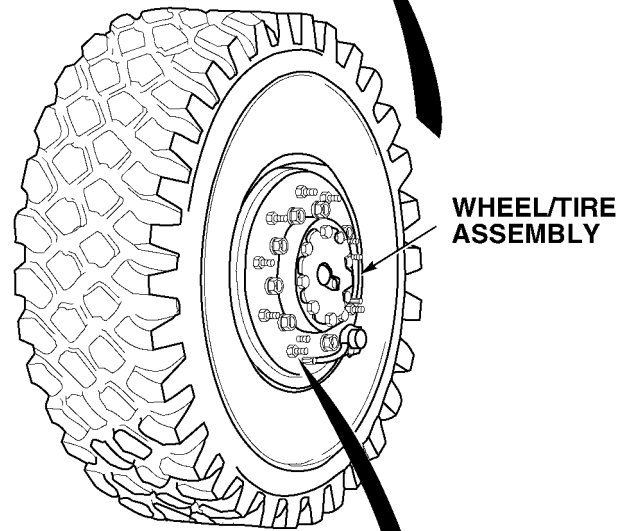
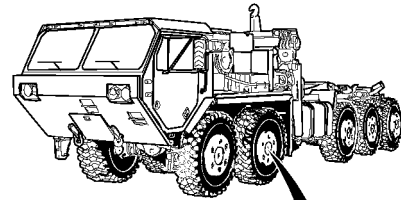
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.
- Exercise extreme caution when working around wheels or under truck while engine is operating. Movement of truck may cause injury or death to personnel.

NOTE

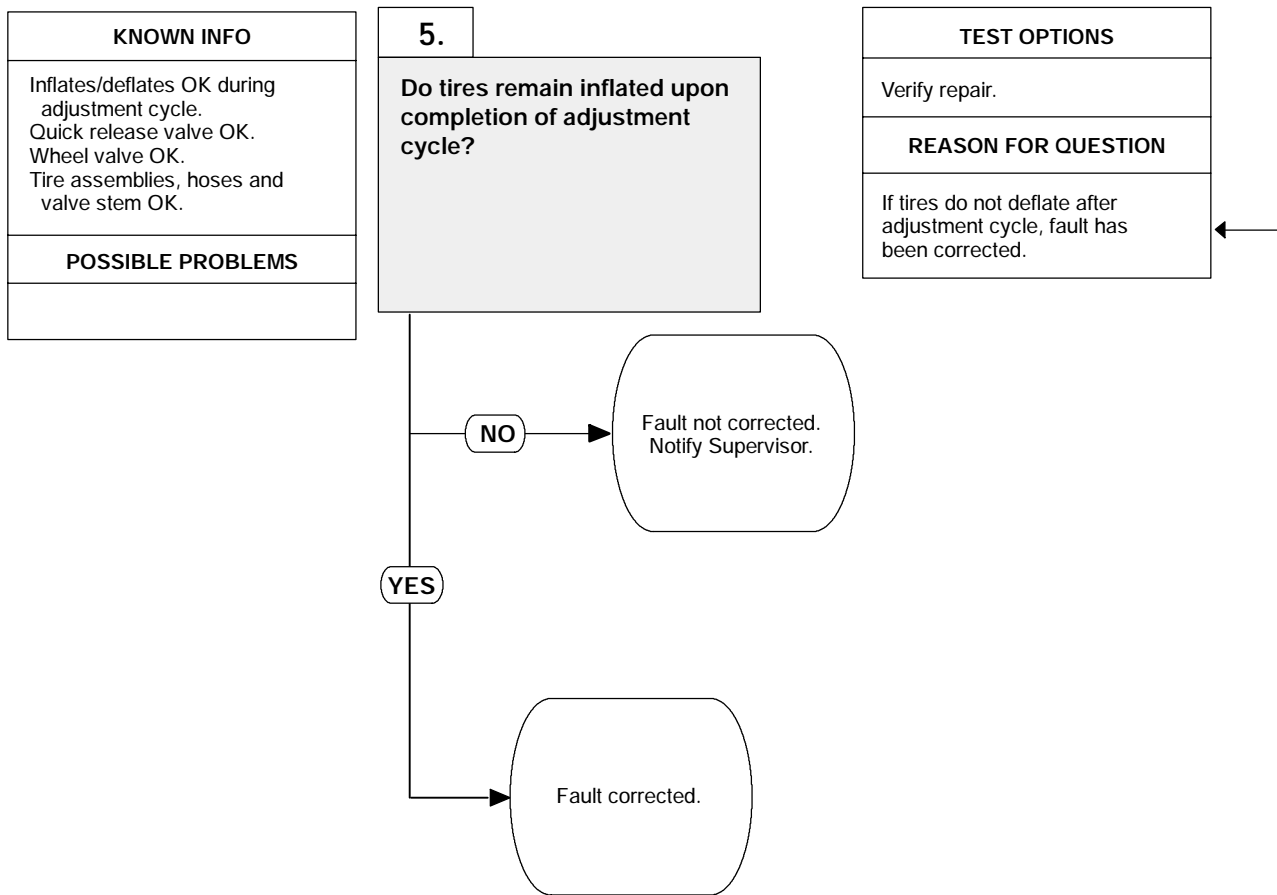
Soap and water solution can be used to check for leaks.

VISUAL INSPECTION

- (1) Inspect wheel/tire assembly, hoses and valve stem for leaks.
 - (a) If leaks are found, repair or replace damaged components (Para 13-2).
 - (b) If no leaks are found, fault is not corrected, notify Supervisor.
- (2) Install wheel cover and four nuts.



12. TIRES ON NO. 1 THROUGH NO. 5 AXLES DEFLATE UPON COMPLETION OF ADJUSTMENT CYCLE (CONT).

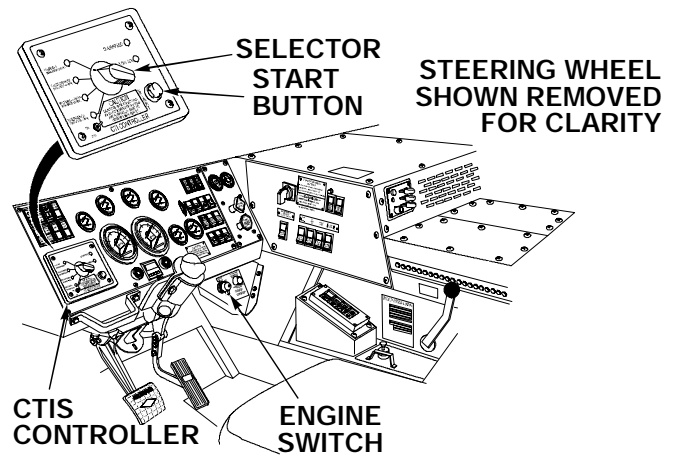


NOTE

Tires must be deflated to 60 psi (414 kPa) or less to perform this test.

VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set CTIS controller selector to HIGHWAY.
- (3) Press CTIS START button and allow tires to fill to HIGHWAY setting.
- (4) Check pressure of tires with tire pressure gage.
 - (a) If tires are deflating, fault is not corrected. Turn OFF ENGINE switch and notify Supervisor.
 - (b) If tires do not deflate, fault has been corrected.
- (5) Turn OFF ENGINE switch.



2-26. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING (CONT.)

13. CTIS LOW AIR INDICATOR STAYS ON OVER 110 PSI.

INITIAL SETUP

Tools and Special Tools

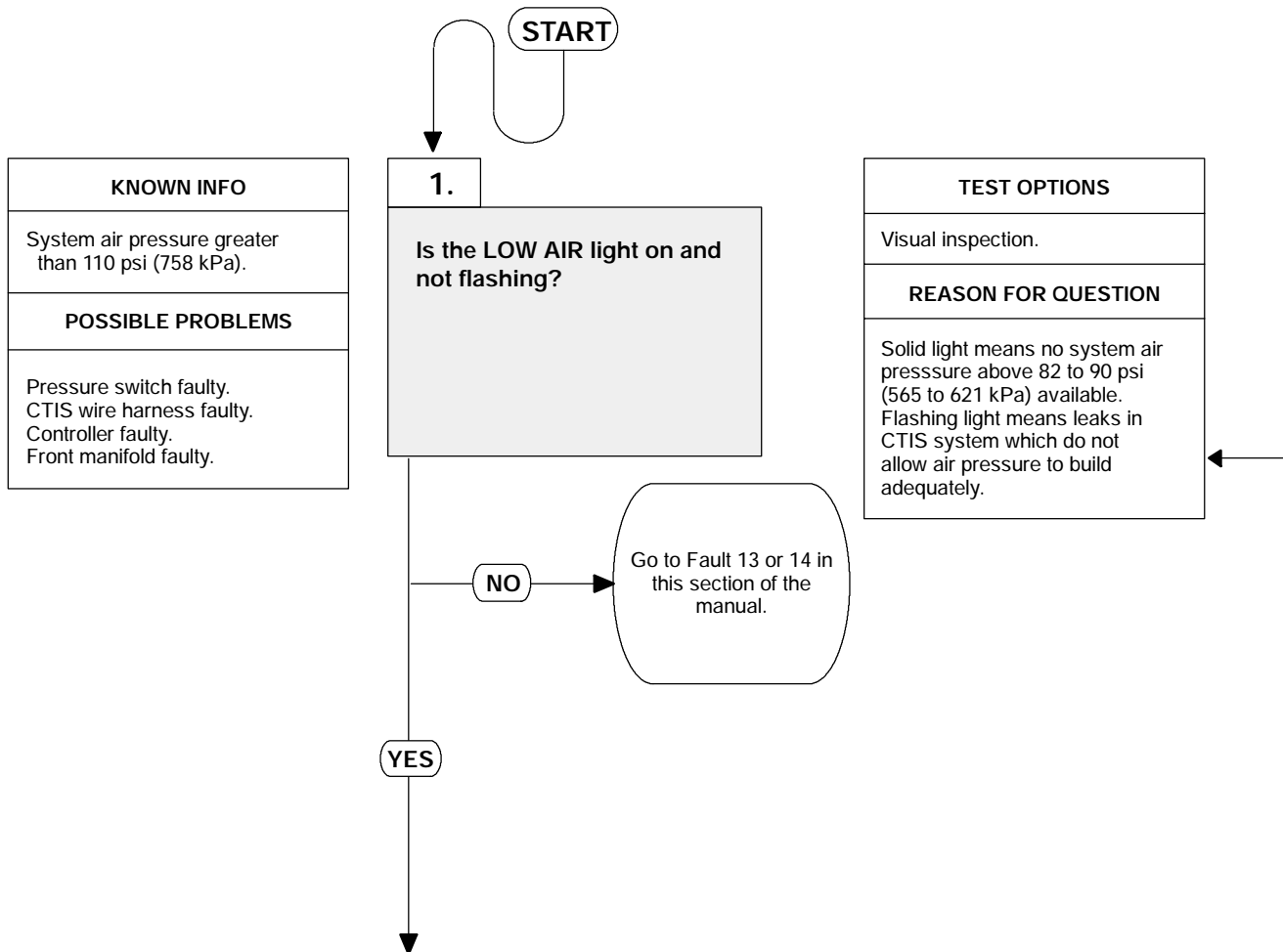
Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Jumperwire
 Multimeter (Item 44, Appendix G)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

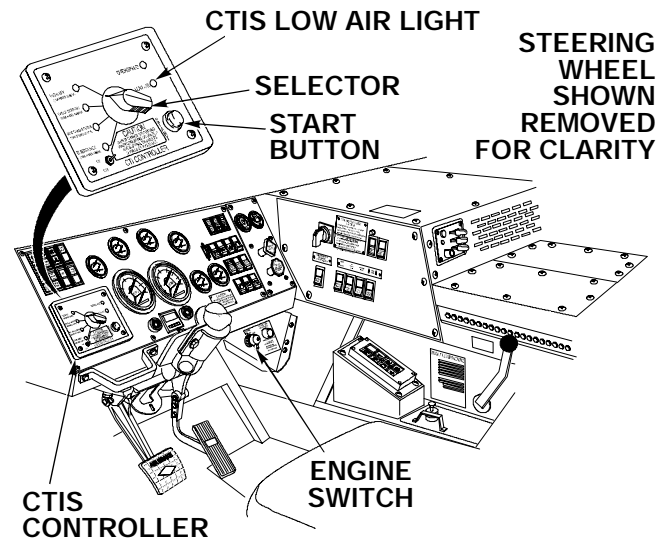
Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheel chocked, (TM 9-2320-364-10)
 CTIS front manifold cover removed, (Para 13-8)
 Front access cover opened, (TM 9-2320-364-10)
 CTIS turned on, (TM 9-2320-364-10)



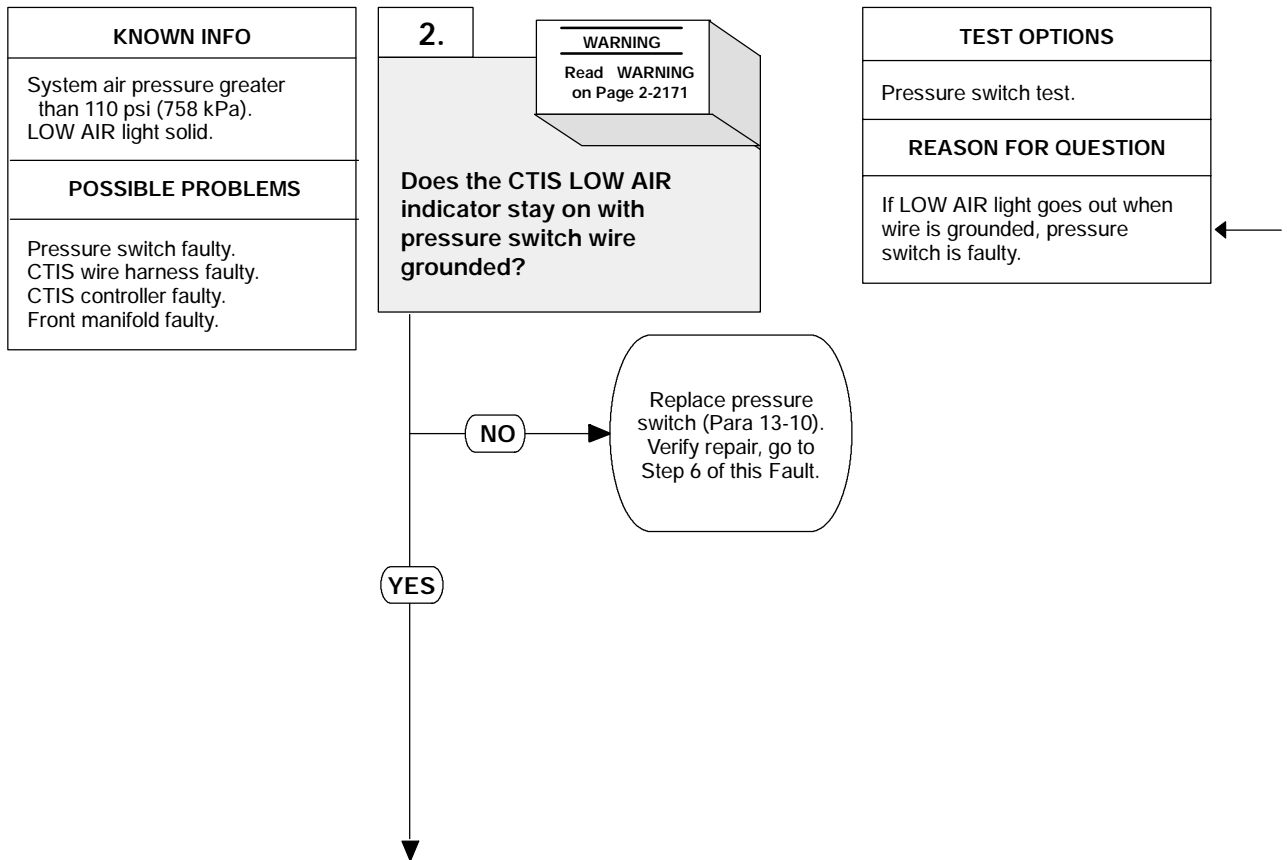
NOTE

- The CTIS initially and periodically checks for system air leaks. The CTIS will display a flashing LOW AIR light and shut off if 6 psi cannot be maintained by the CTIS system. The manifold will click during this check for approximately 1-1/2 minutes.
- CTIS air lines are pressurized only when CTIS is in inflate, deflate, or test cycles.
- Tests 1 thru 5 can be made consecutively while the CTIS system is in the inflate cycle.
- Normal inflation time from EMERGENCY to HIGHWAY setting is approximately 12 minutes at high idle.
- Excess inflation times, sometimes accompanied by a flashing LOW AIR light is normal if engine is at idle rpm and/or air operated accessories are being used.

VISUAL INSPECTION
(1) Start engine (TM 9-2320-364-10).
(2) Build up air pressure to 120 psi \pm 5 (830 kPa \pm 34).
(3) Observe CTIS LOW AIR light. <ul style="list-style-type: none"> (a) If CTIS LOW AIR light is flashing, go to Fault 13 or 14. (b) If CTIS LOW AIR light is on, go to Step 2 of this Fault.



13. CTIS LOW AIR INDICATOR STAYS ON OVER 110 PSI (CONT).

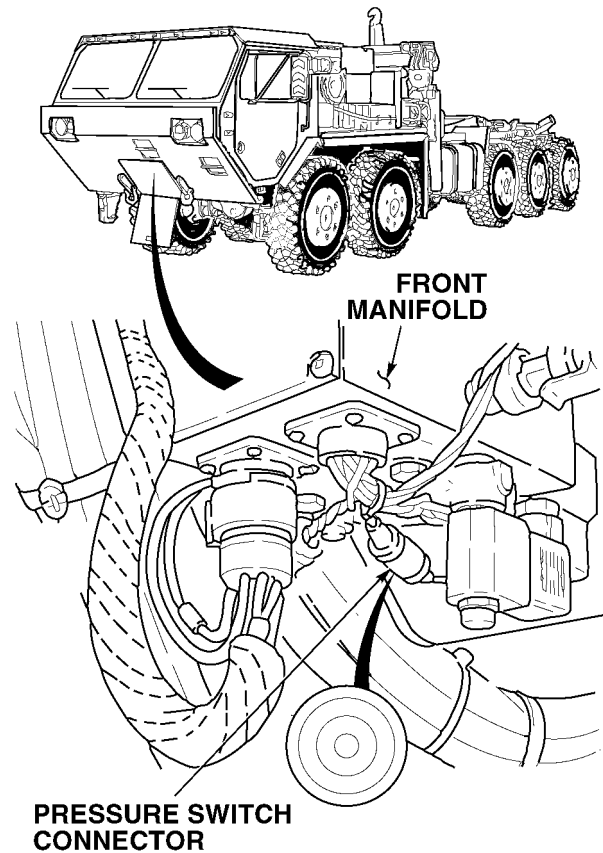


WARNING

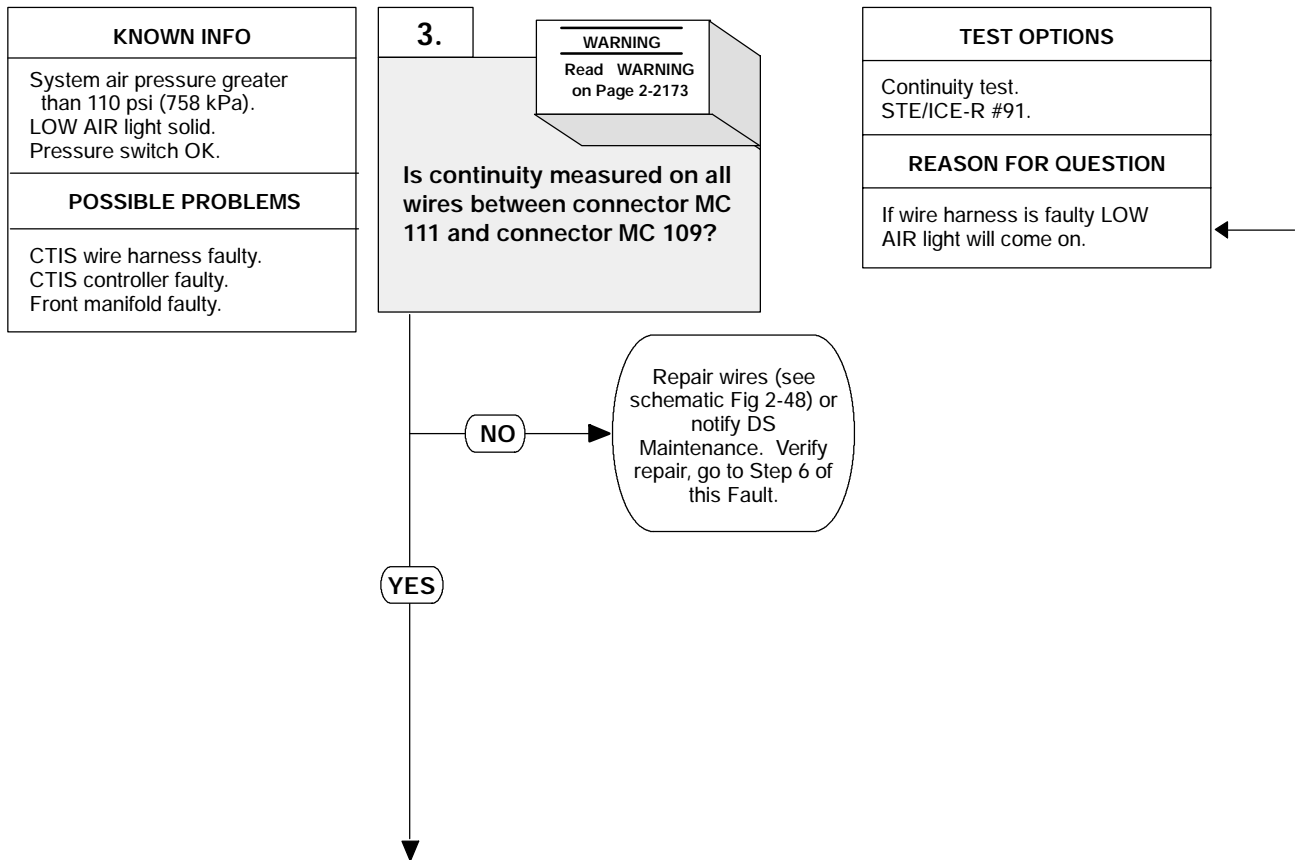
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

PRESSURE SWITCH TEST

- (1) Disconnect pressure switch connector.
- (2) Using jumperwire, attach harness end of pressure switch wire to a known good ground.
 - (a) If LOW AIR light goes out, turn OFF ENGINE switch and replace pressure switch (Para 13-10).
 - (b) If LOW AIR light remains on, pressure switch is OK.
- (3) Turn OFF ENGINE switch (TM 9-2320-364-10).



13. CTIS LOW AIR INDICATOR STAYS ON OVER 110 PSI (CONT).



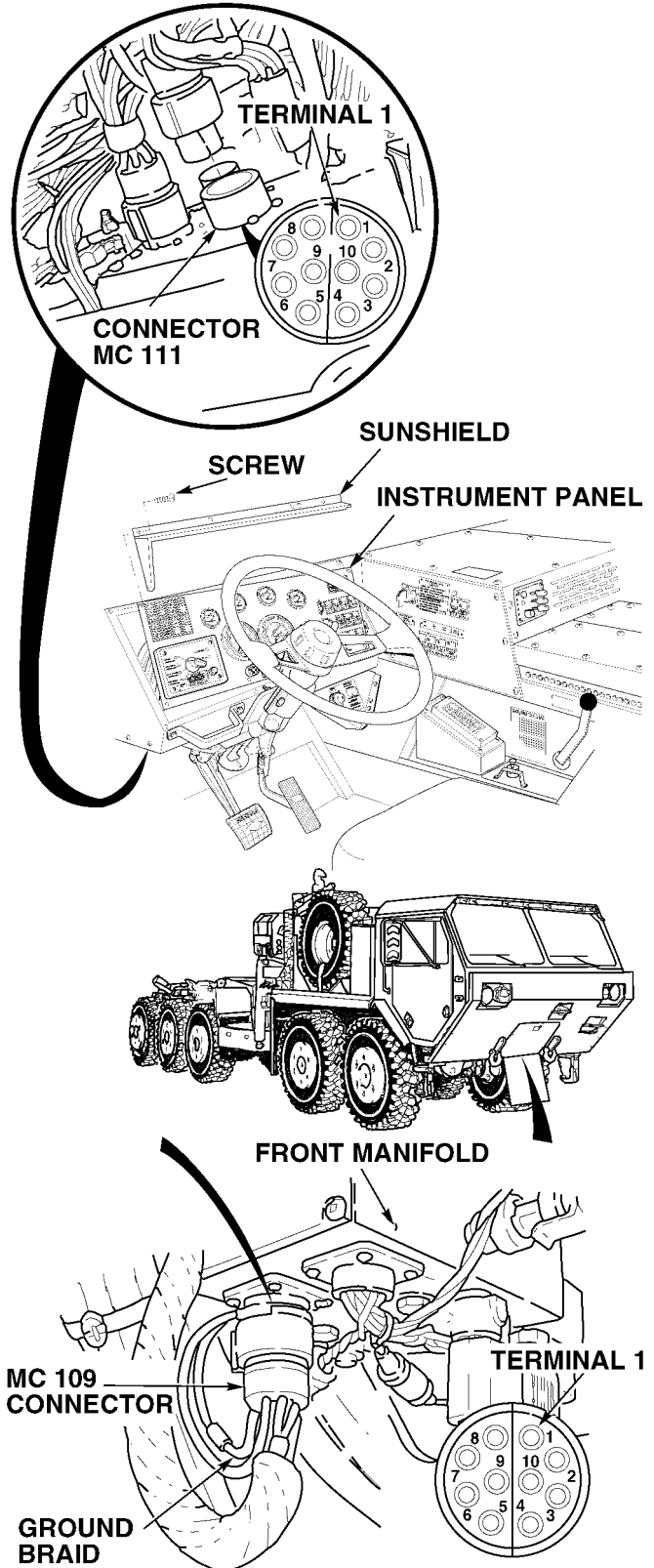
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

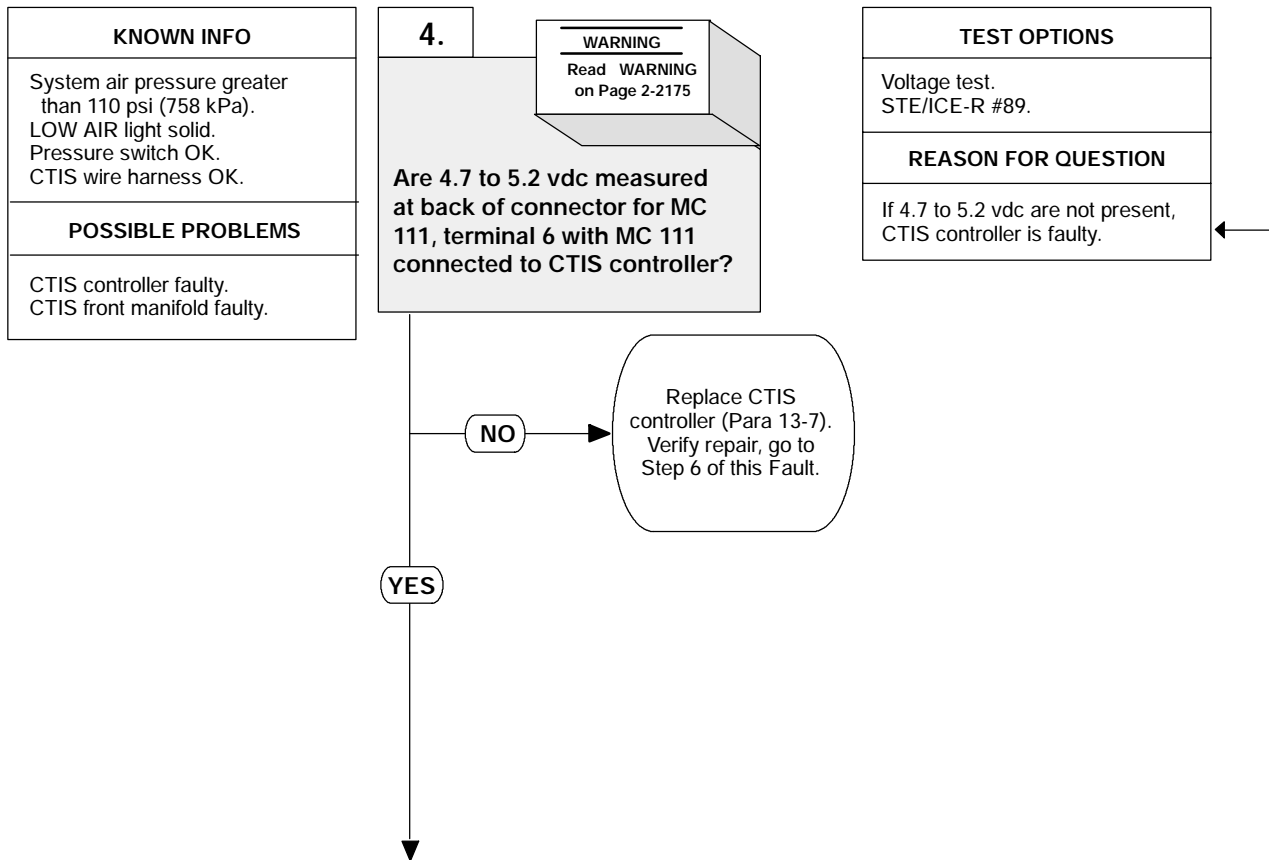
NOTE

Terminal (5) at MC111 is plugged and does not connect to terminal (5) on MC109.

CONTINUITY TEST		
(1) Remove ten screws, sunshield and tilt instrument panel.		
(2) Disconnect connector MC 109 from CTIS front manifold.		
(3) Set multimeter select switch to ohms.		
(4) Disconnect front manifold harness connector MC 111 from back of CTIS controller.		
(5) Connect jumperwire between wire 1056 on CTIS controller connector MC 111, terminal 1 and a known good ground.		
(6) Is there continuity between connector MC 109, terminal 1 and front manifold ground braid?		
(a) If there is no continuity, repair wire 1056 (see schematic Fig 2-48) or notify DS Maintenance, and perform Steps (7) through (9) below.		
(b) If there is continuity, wire 1056 is OK.		
(7) Check continuity of remaining wires and terminals using Steps (5) and (6) above. The wires and corresponding terminals are listed below (see schematic Fig 2-48).		
1057(2)	1063(5)	to ground (MC109 only)
1058(3)	1061(6)	Shield (8)
1059(4)	1062(7)	1064(9)
		1065(10)
(8) Remove jumperwire.		
(9) Connect connector MC 111 to back of CTIS controller.		



13. CTIS LOW AIR INDICATOR STAYS ON OVER 110 PSI (CONT).

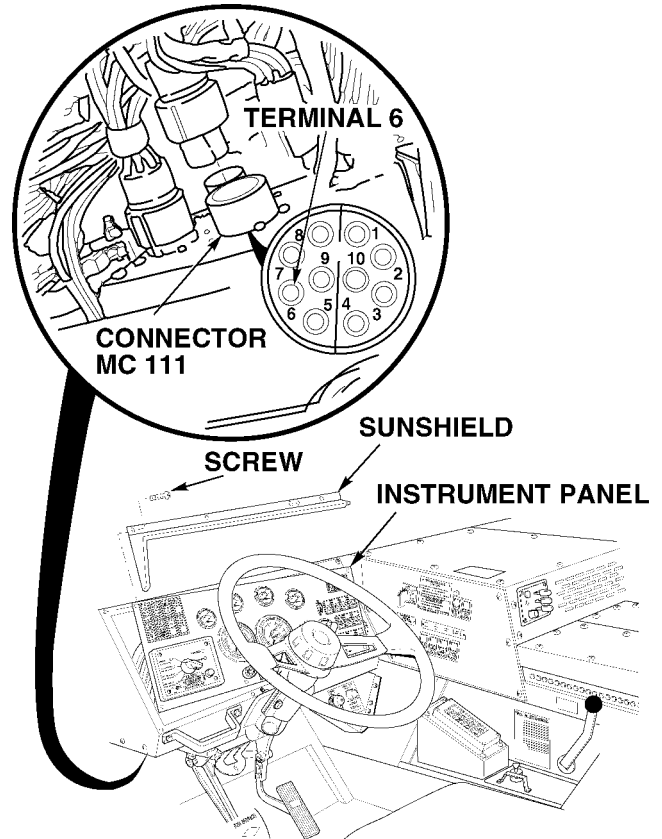


WARNING

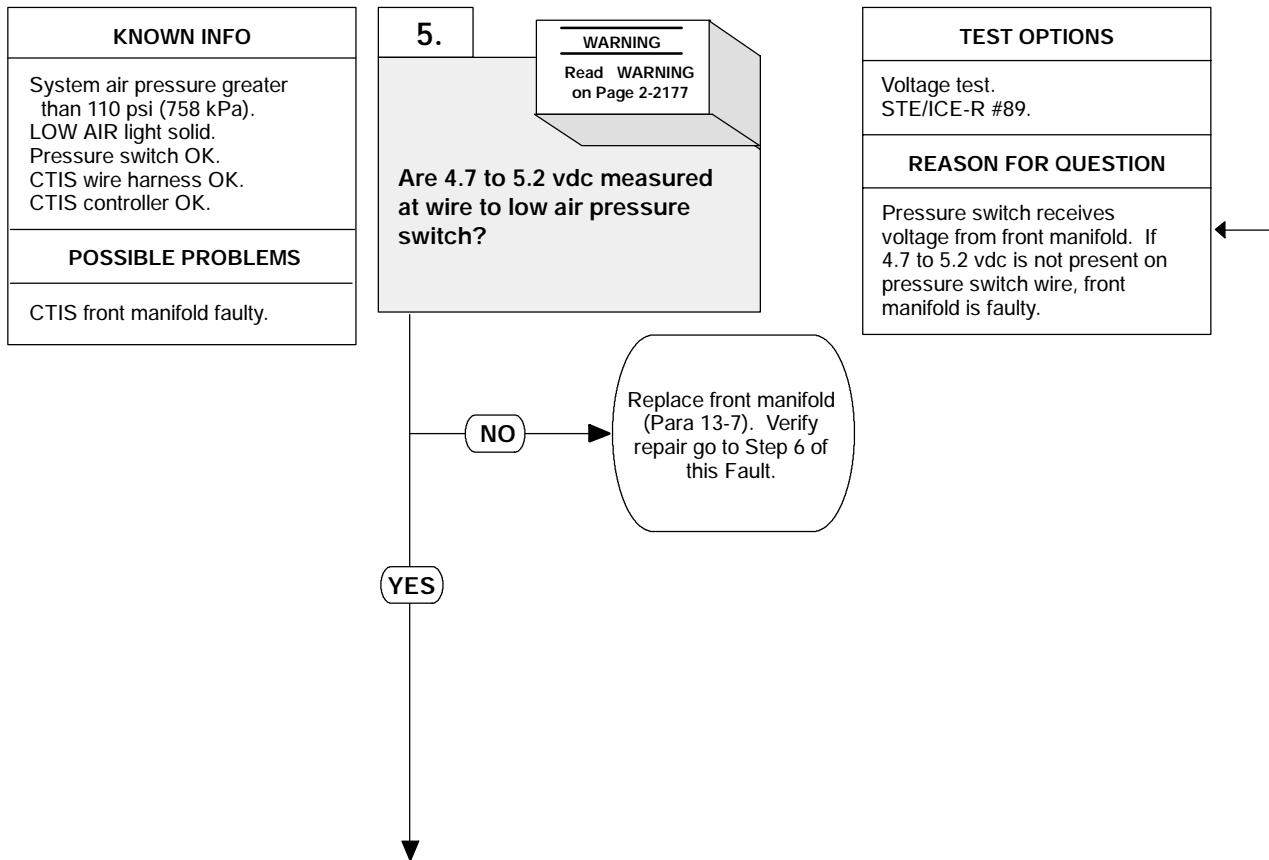
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Set multimeter select switch to vdc.
- (2) Insert positive (+) multimeter lead, with long probe installed, at back of connector MC 111, terminal 6.
- (3) Connect negative (-) multimeter lead to front manifold ground braid.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 4.7 to 5.2 vdc are not present, turn OFF ENGINE switch and replace CTIS controller (Para 13-7).
 - (b) If 4.7 to 5.2 vdc are present, turn OFF ENGINE switch and go to Step 5 of this Fault.
- (5) Install instrument panel, sunshield and ten screws.



13. CTIS LOW AIR INDICATOR STAYS ON OVER 110 PSI (CONT).

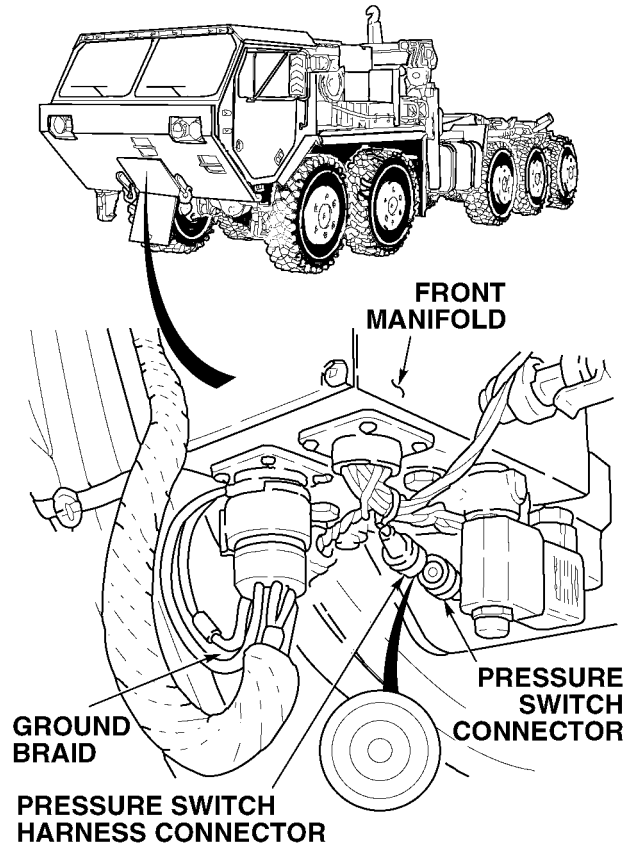


WARNING

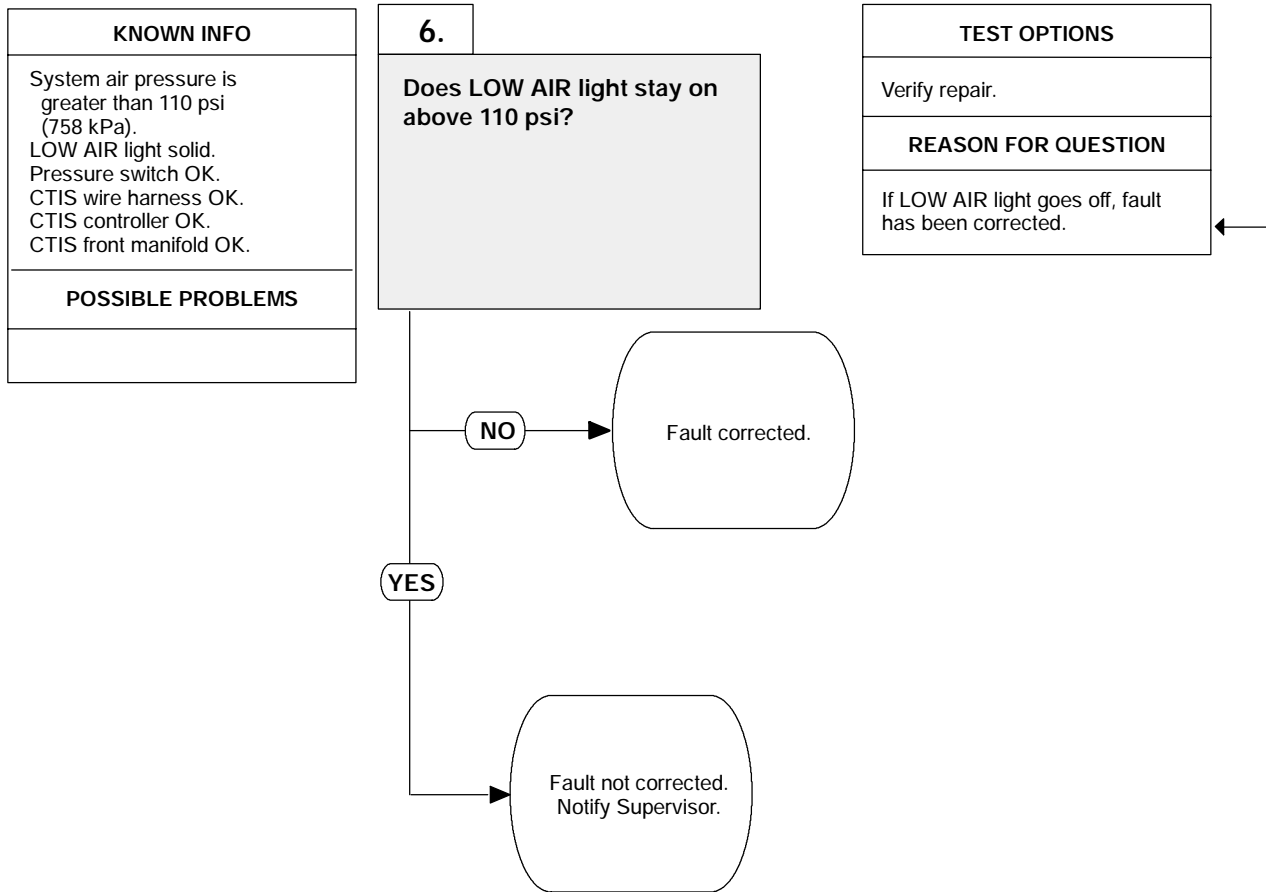
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

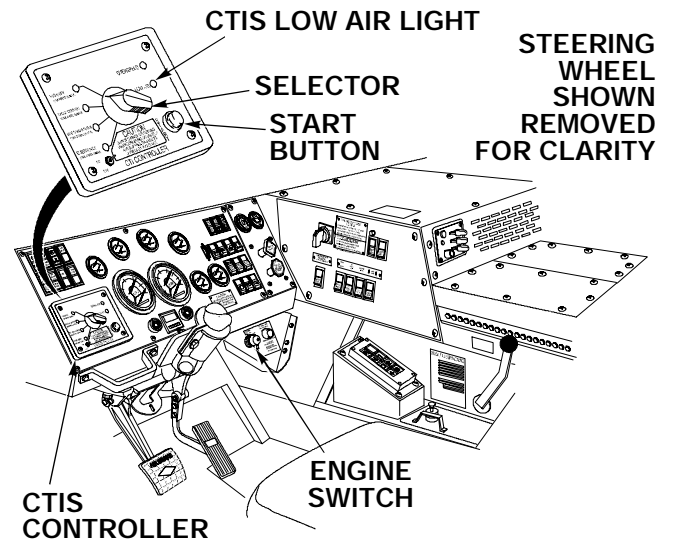
- (1) Disconnect pressure switch harness connector.
- (2) Set multimeter select switch to vdc.
- (3) Connect positive (+) multimeter lead to pressure switch wire harness connector at front manifold.
- (4) Connect negative (-) multimeter lead to front manifold ground braid.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 4.7 to 5.2 vdc are not present, turn OFF ENGINE switch and replace front manifold (Para 13-7).
 - (b) If 4.7 to 5.2 vdc are present, turn OFF ENGINE switch.
- (6) Close front access cover.



13. CTIS LOW AIR INDICATOR STAYS ON OVER 110 PSI (CONT).



VERIFY REPAIR
(1) Start engine (TM 9-2320-364-10).
(2) Set CTIS controller selector to HIGHWAY.
(3) Press CTIS START button. (a) If LOW AIR light goes out, fault has been corrected. (b) If LOW AIR light does not go out, fault is not corrected. Notify Supervisor.
(4) Turn OFF ENGINE switch.



2-27. AIR SYSTEM TROUBLESHOOTING.

This paragraph covers Air System Troubleshooting. The Air System Fault Index, Table 2-52, lists faults for the air system of the PLS truck. Refer to schematic Figures 2-50 and 2-51 when performing tests and corrective actions.

Table 2-52. Air System Fault Index

Fault No.	Description	Page
1.	Air Pressure Buildup Is Slow	2-2184
2.	Air Dryer(s) And/Or Aftercooler Continually Purge	2-2198
3.	Compressor Fails To Unload (Air System Pressure Builds Up To More Than 129 psi [889 kPa])	2-2204
4.	Noisy Air Compressor Operation	2-2208
5.	Air Pressure Drops Rapidly After Engine Shutdown	2-2214
6.	Air Horn Will Not Operate	2-2222

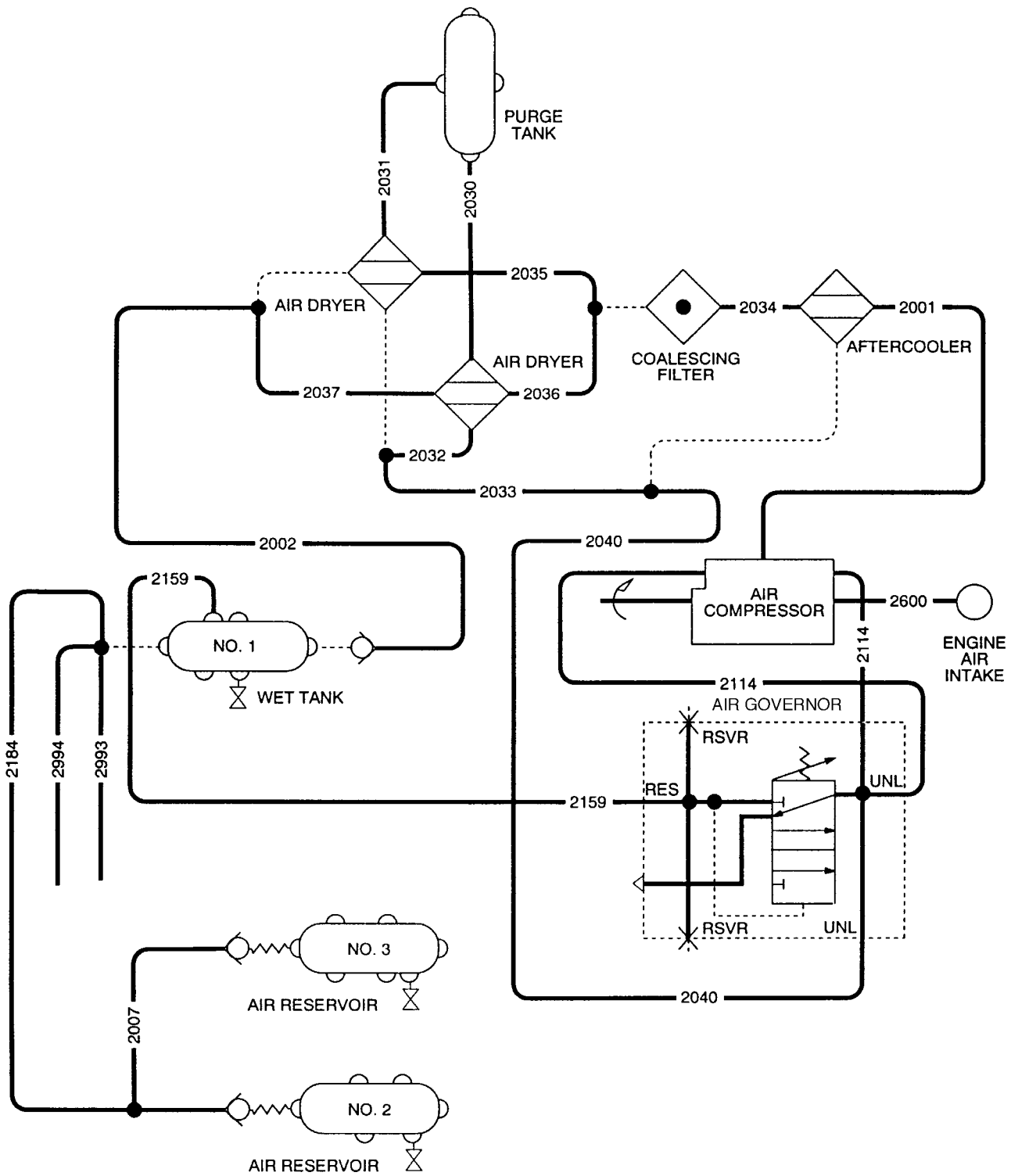


Figure 2-50. Air System Air Diagram

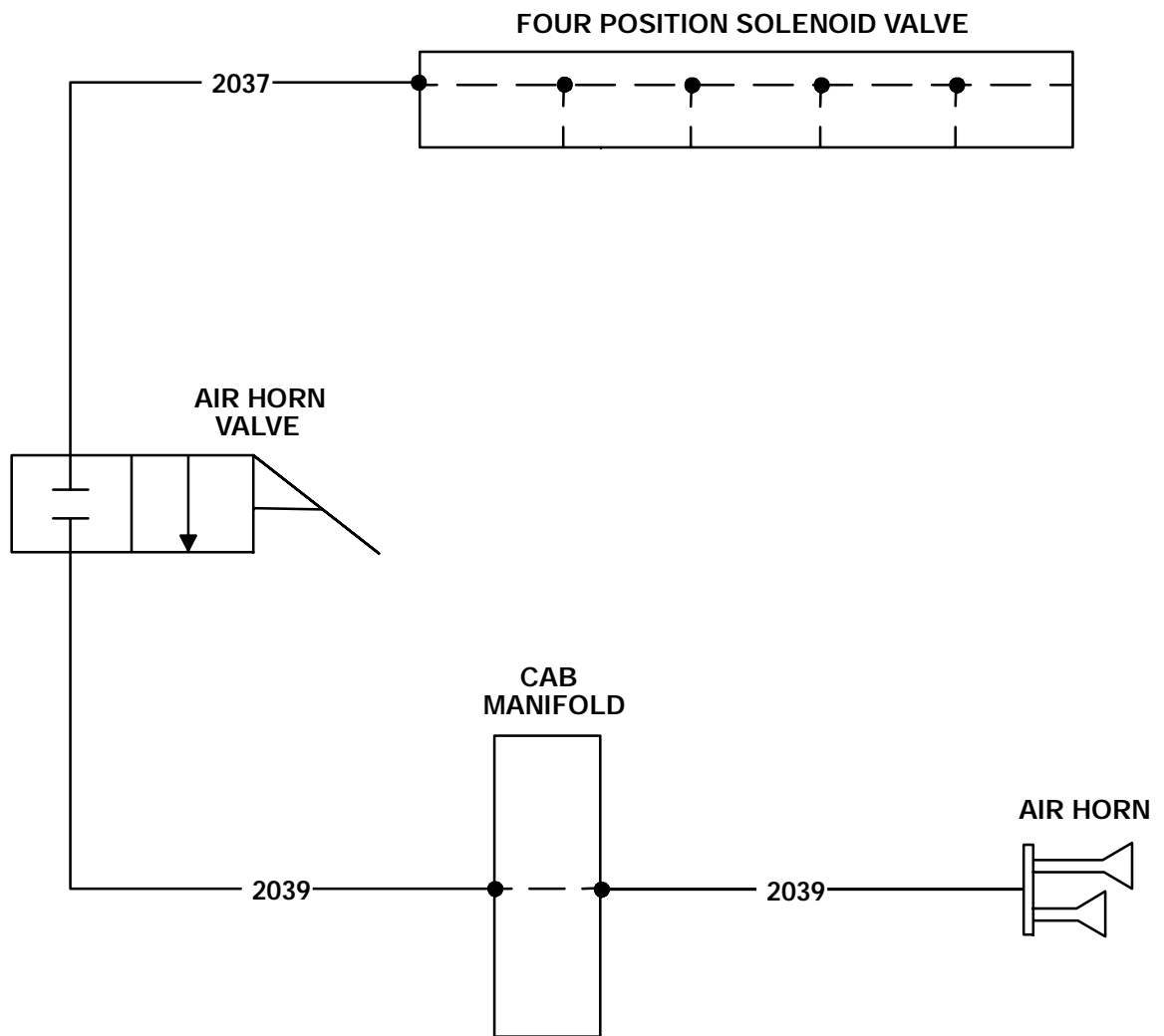


Figure 2-51. Air Horn Diagram

2-27. AIR SYSTEM TROUBLESHOOTING (CONT).

1. AIR PRESSURE BUILDUP IS SLOW.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 Pressure Test Kit (Item 50, Appendix G)

Materials/Parts

Sealant, Teflon Pipe (Item 71, Appendix C)
 Solution, Soap (Item 86, Appendix C)

Personnel Required

Two

References

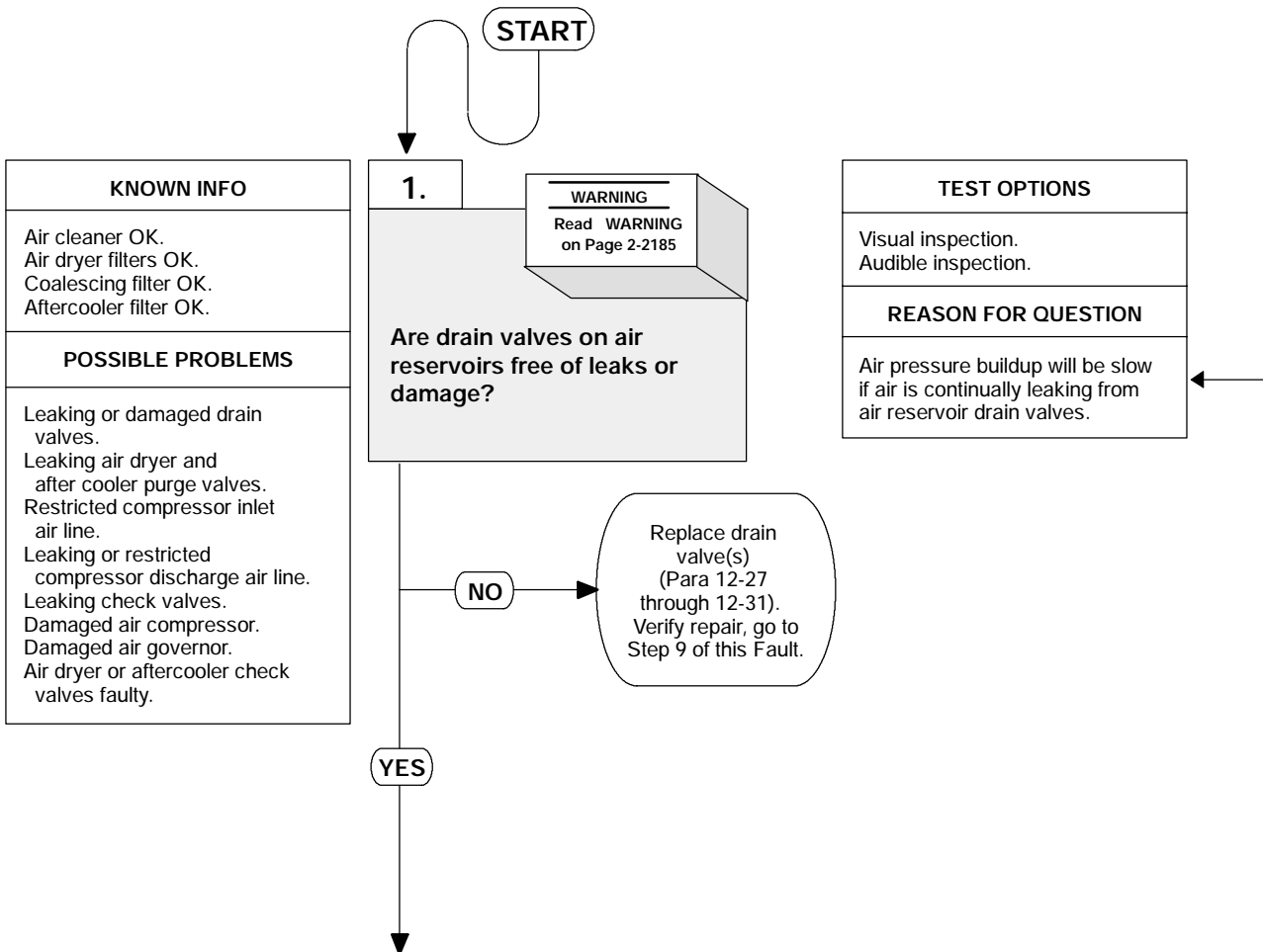
TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Right side noise panel removed, (Para 17-26)

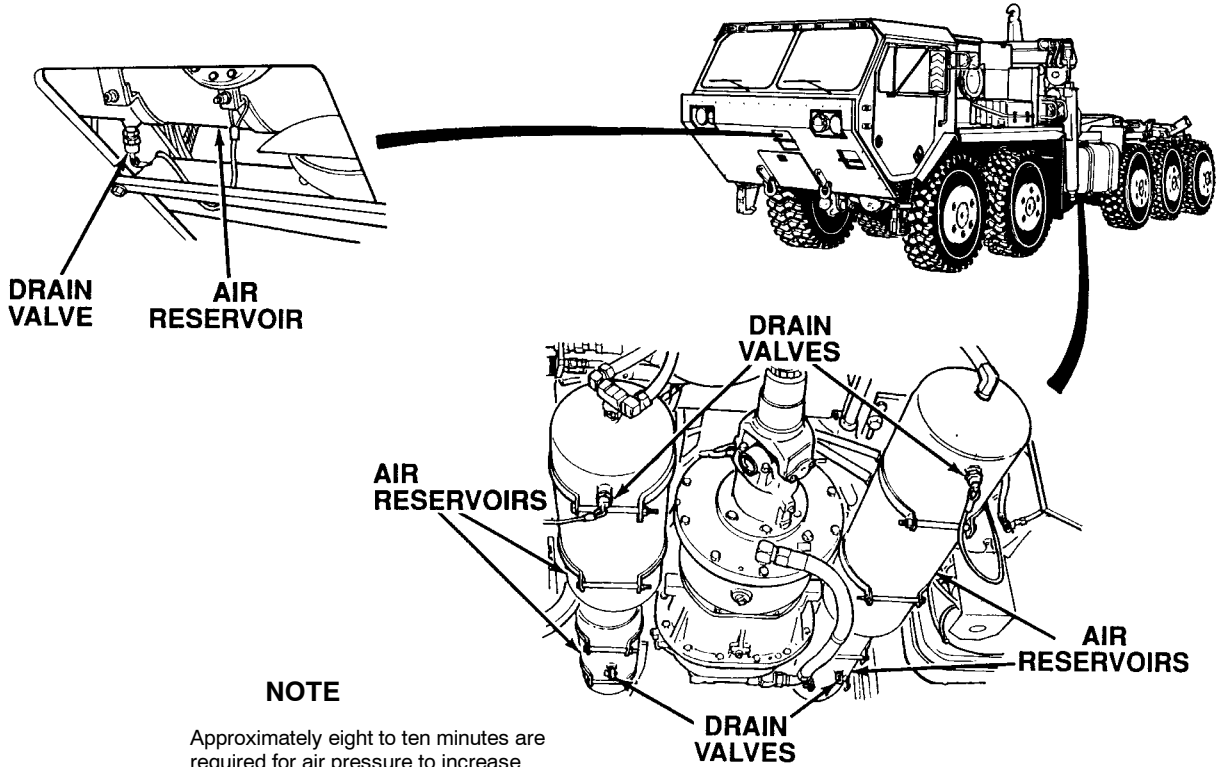
NOTE

Soap and water solution will be used to visually check for leaks.



WARNING

Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.



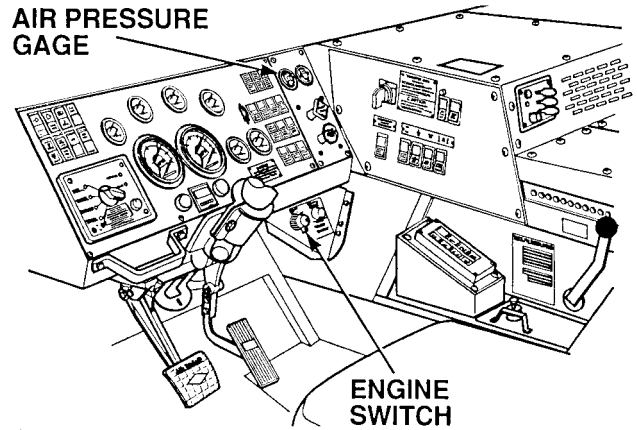
NOTE

Approximately eight to ten minutes are required for air pressure to increase from 0 psi (0 kPa) to 125 ± 4 psi (861 ± 28 kPa) when engine is at idle rpm.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Run at idle until air pressure gage reads 125 ± 4 psi (861 ± 28 kPa).
- (3) Turn OFF ENGINE switch.
- (4) Check drain valves on air reservoirs for leaks or damage.
 - (a) If drain valves are leaking or damaged, replace valves (Para 12-27 through 12-31).
 - (b) If drain valves are not leaking or damaged, valves are OK.

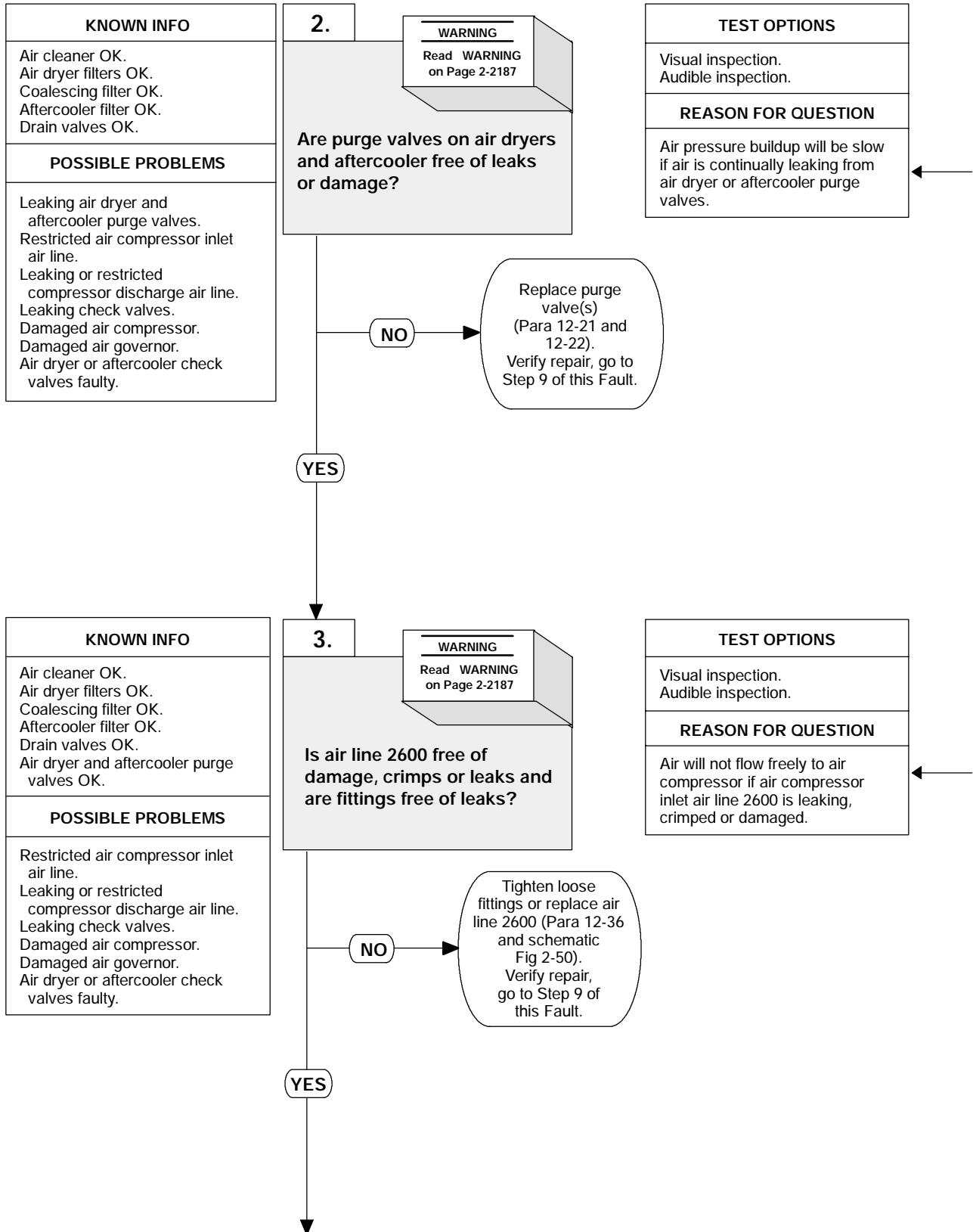
AIR PRESSURE GAGE



STEERING WHEEL SHOWN REMOVED FOR CLARITY

ENGINE SWITCH

1. AIR PRESSURE BUILDUP IS SLOW (CONT).



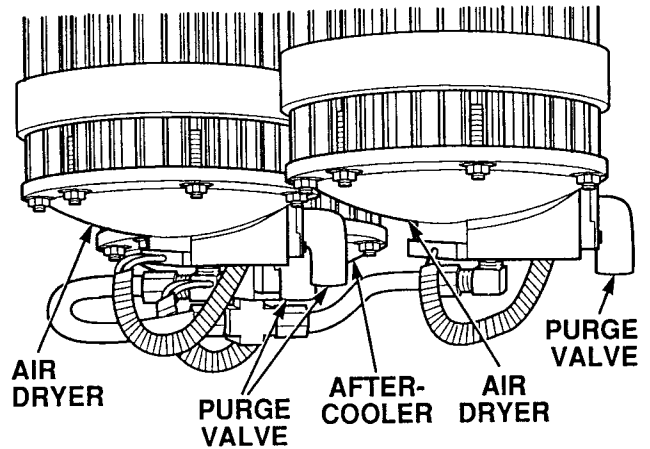
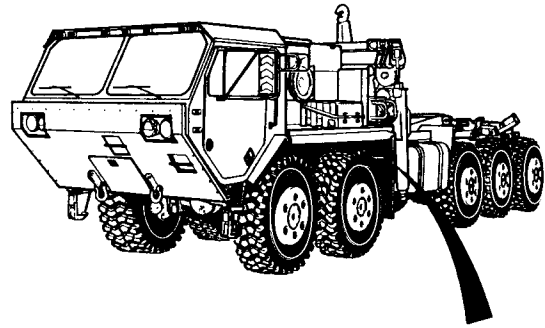
WARNING

- Allow engine to cool before performing troubleshooting maintenance. If necessary use insulated pads and gloves. Hot engine components will burn and cause injury to personnel.
- Wear safety goggles when performing tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

VISUAL/AUDIBLE INSPECTION

Check purge valves on air dryers and aftercooler for air leaks or damage.

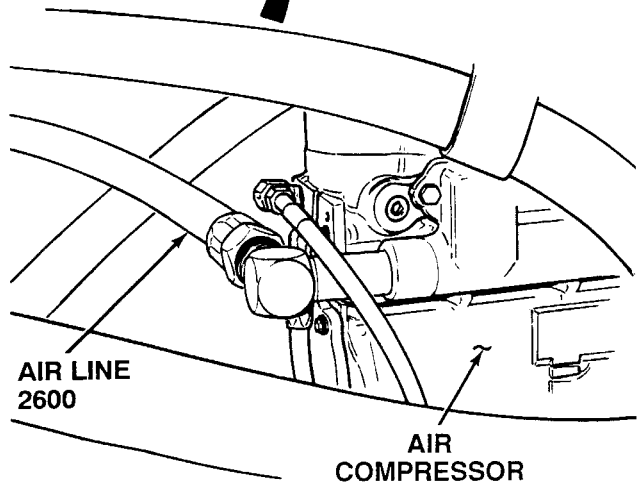
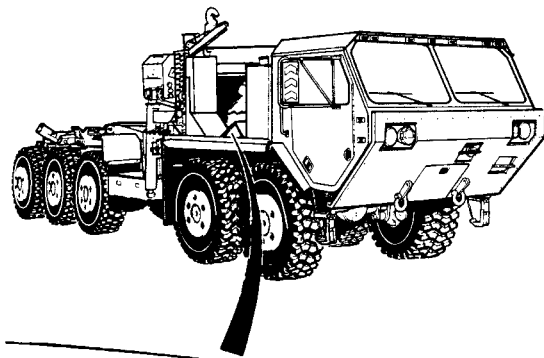
- (1) If purge valves are leaking or damaged, replace valves (Para 12-21 and 12-22).
- (2) If purge valves are not leaking or damaged, valves are OK.



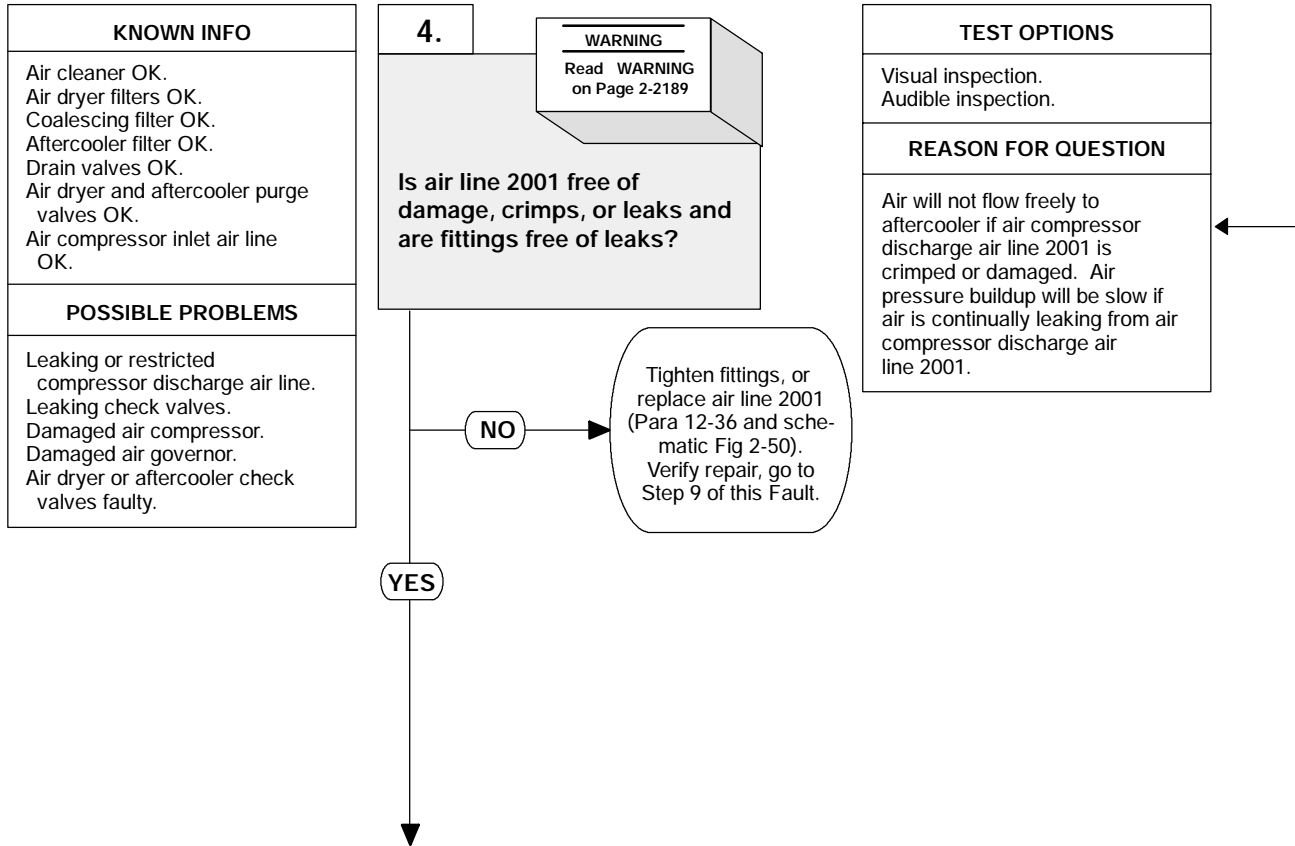
VISUAL/AUDIBLE INSPECTION

Check air line 2600 for damage, crimps or leaks (Para 12-36 and schematic Fig 2-50).

- (1) If air line is damaged, crimped or leaking; tighten fittings, or replace air lines.
- (2) If there are no leaks, crimps, or damage; air line 2600 and fittings are OK.



1. AIR PRESSURE BUILDUP IS SLOW (CONT).



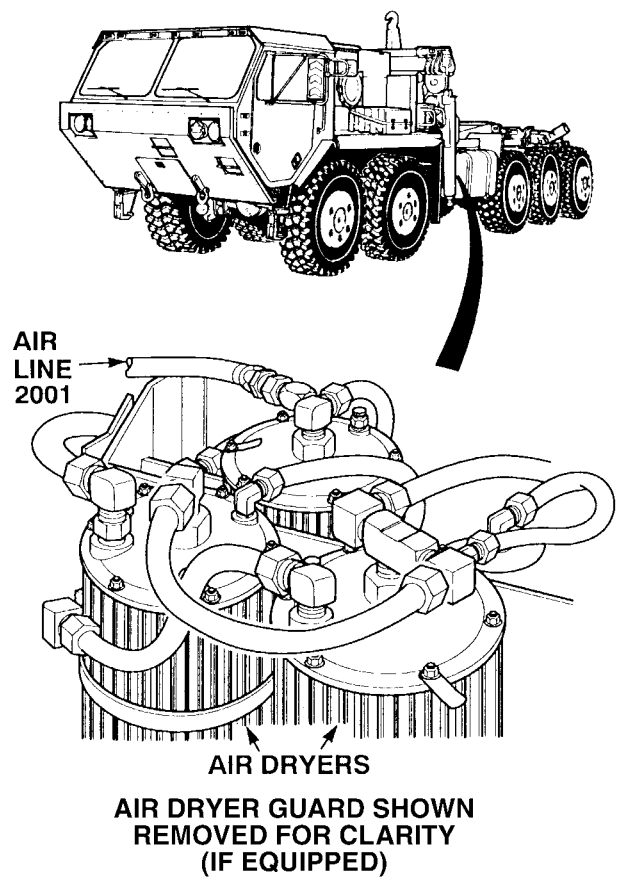
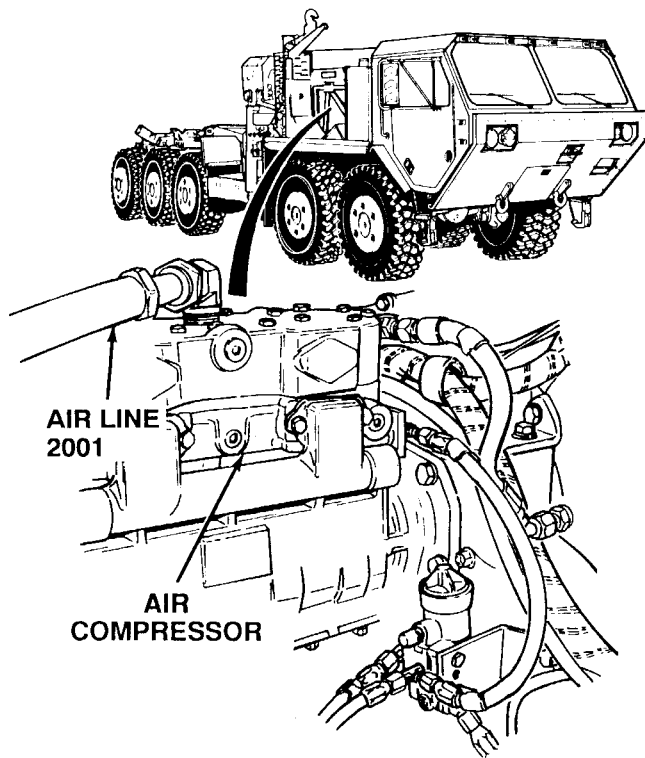
WARNING

- Allow engine to cool before performing troubleshooting maintenance. If necessary use insulated pads and gloves. Hot engine components will burn and cause injury to personnel.
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

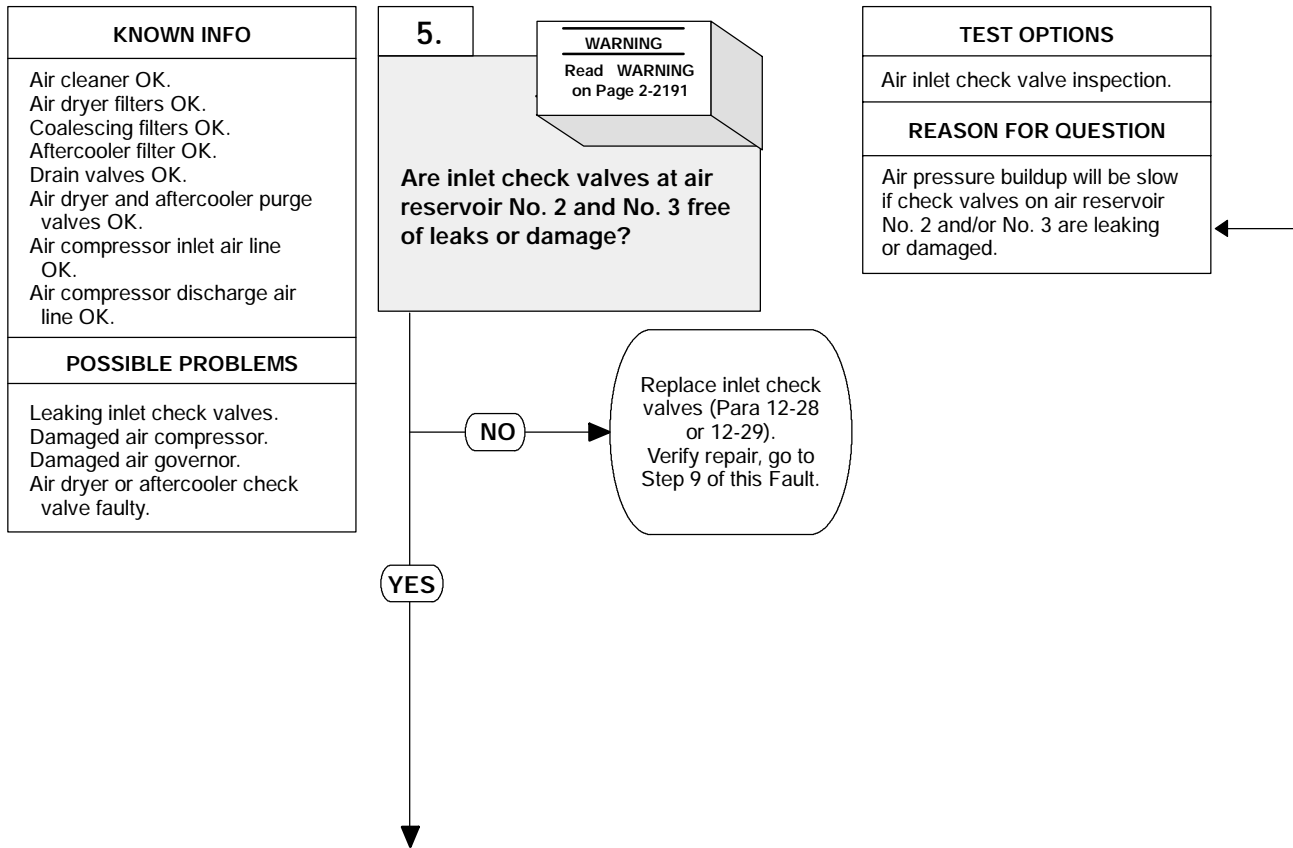
VISUAL/AUDIBLE INSPECTION

Check air line 2001 for damage, crimps or leaks (Para 12-35 and schematic Fig 2-50).

- (1) If air line 2001 is damaged, crimped or leaking; tighten fittings, or replace air line (Para 12-36 and schematic Fig 2-50).
- (2) If there are no leaks, crimps, or damage; air line 2001 and fittings are OK.



1. AIR PRESSURE BUILDUP IS SLOW (CONT).

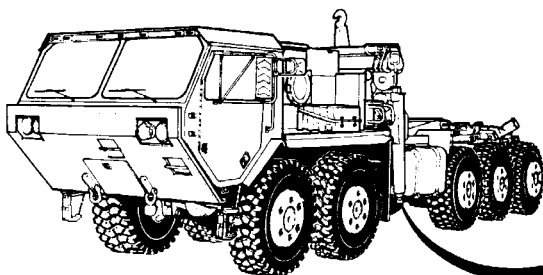
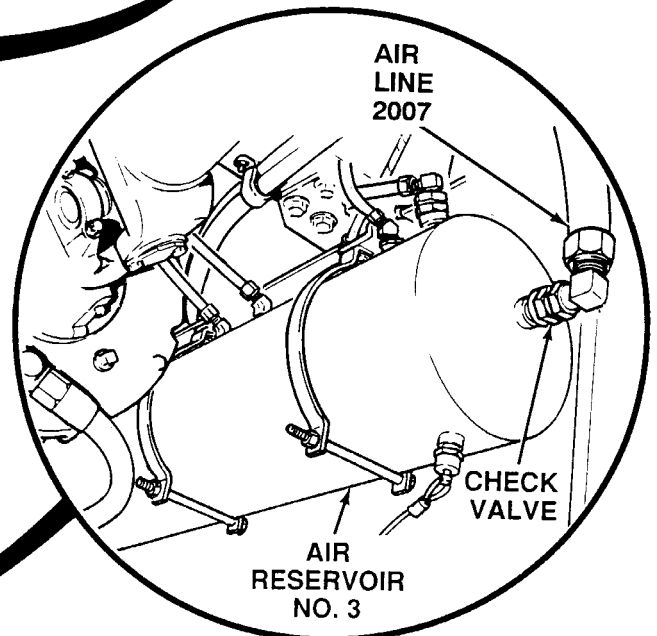
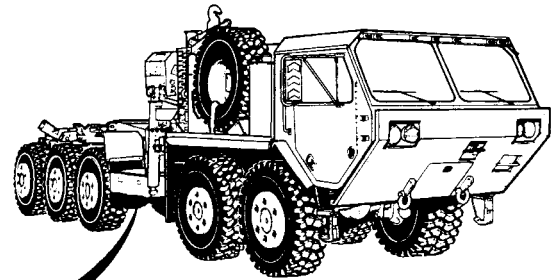
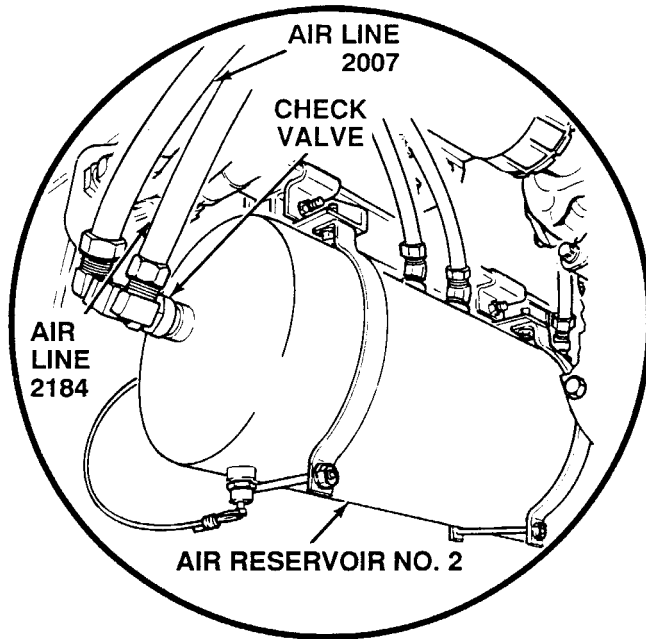


WARNING

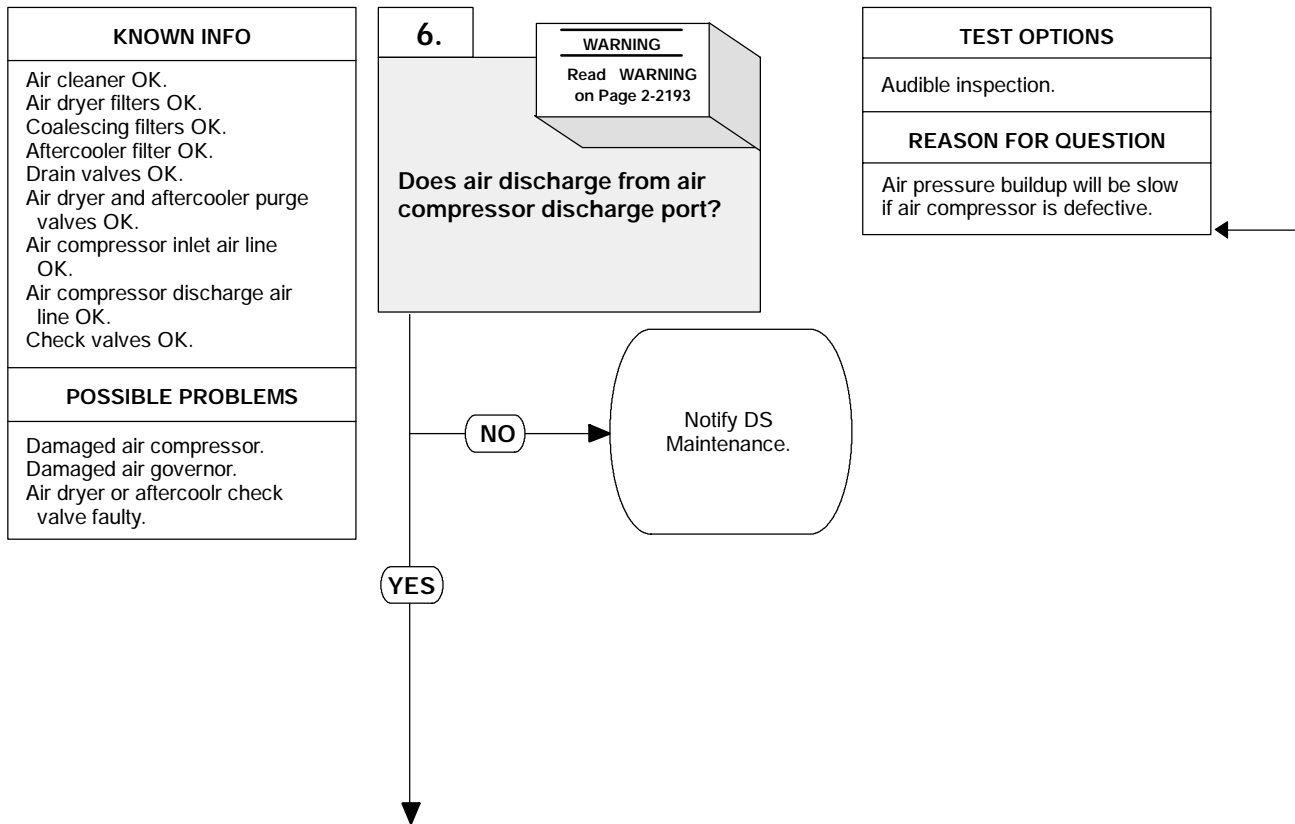
Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

AIR INLET CHECK VALVE INSPECTION

- (1) Drain air system.
- (2) Disconnect air line 2184 from air reservoir No. 2 check valve.
- (3) Remove air line 2007 from air reservoir No. 3 check valve (Para 12-29).
- (4) Inspect check valves at No. 2 and No. 3 air reservoirs for leaks or damage.
 - (a) If check valves are leaking or damaged, replace check valves (Para 12-28 and 12-29) and perform Steps (5) and (6) below.
 - (b) If check valves are not leaking or damaged, valves are OK.
- (5) Install air line 2007 on air reservoir No. 3 check valve.
- (6) Install air line 2184 on air reservoir No. 2 check valve.



1. AIR PRESSURE BUILDUP IS SLOW (CONT).

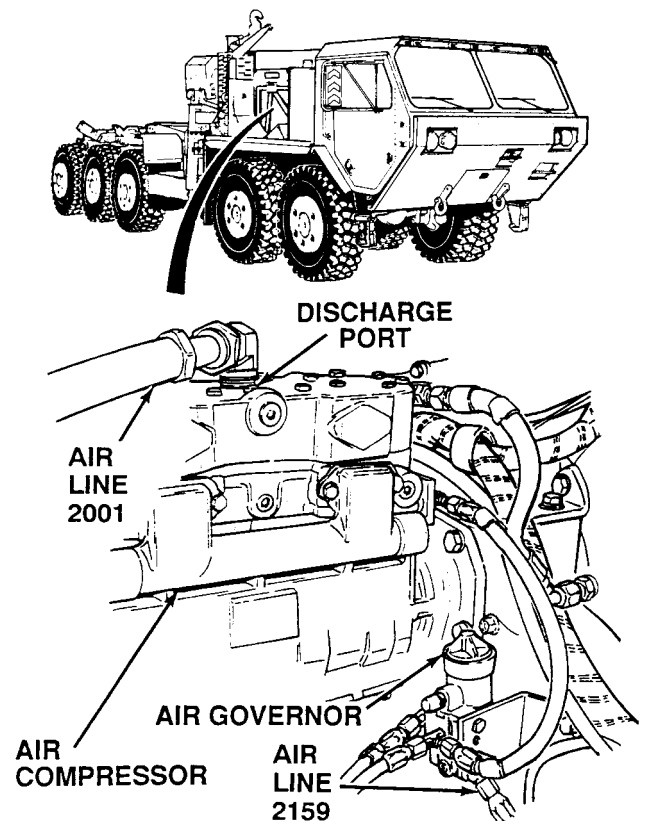


WARNING

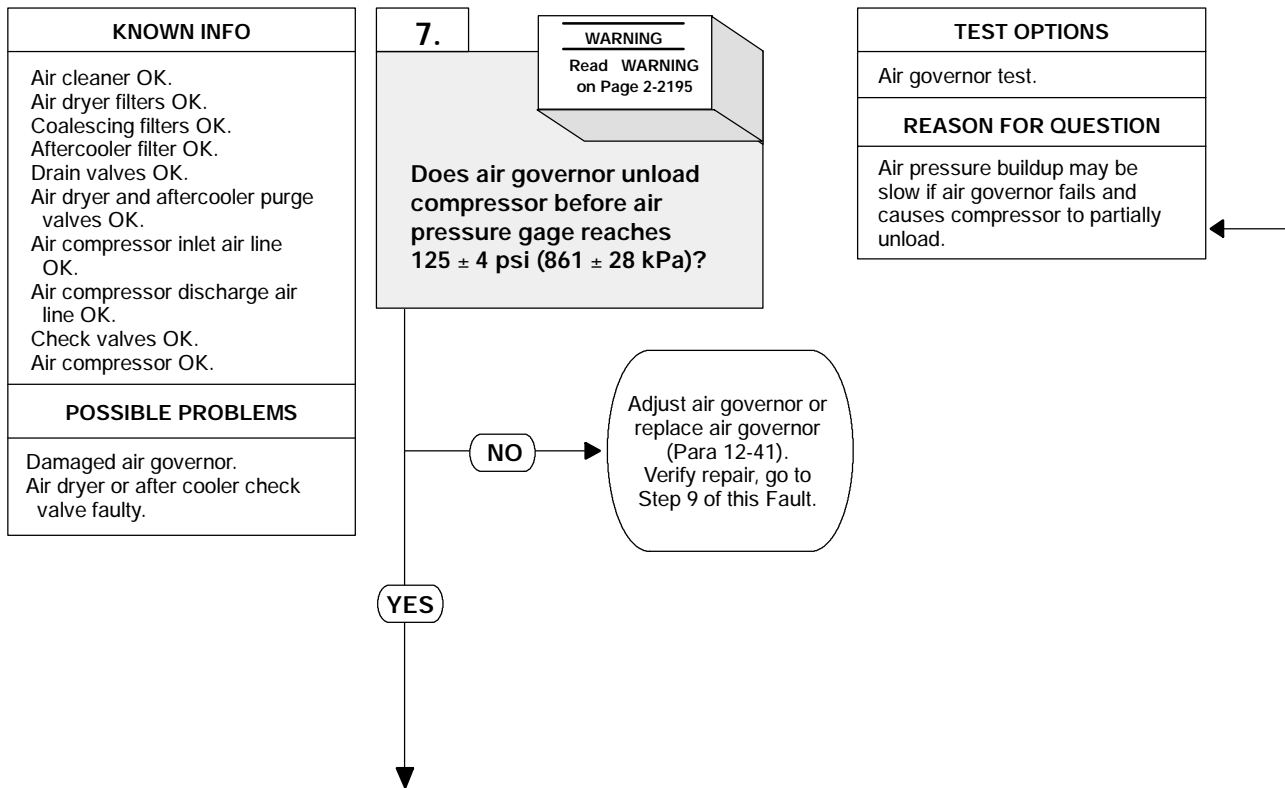
- Allow engine to cool before performing troubleshooting maintenance. If necessary use insulated pads and gloves. Hot engine components will burn and cause injury to personnel.
- Wear safety goggles when performing tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

AUDIBLE INSPECTION

- (1) Drain air system (TM 9-2320-364-10).
- (2) Disconnect governor control air line 2159 from air governor.
- (3) Disconnect air compressor discharge air line 2001 from air compressor.
- (4) While assistant starts engine, listen to air compressor discharge port.
 - (a) If little or no air flows from discharge port, perform Steps (5) through (7) below, and notify DS maintenance.
 - (b) If air flows freely from discharge port, air compressor is OK.
- (5) Turn OFF ENGINE switch.
- (6) Install air compressor discharge air line 2001 on air compressor.
- (7) Install governor control air line 2159 on air governor.



1. AIR PRESSURE BUILDUP IS SLOW (CONT).



WARNING

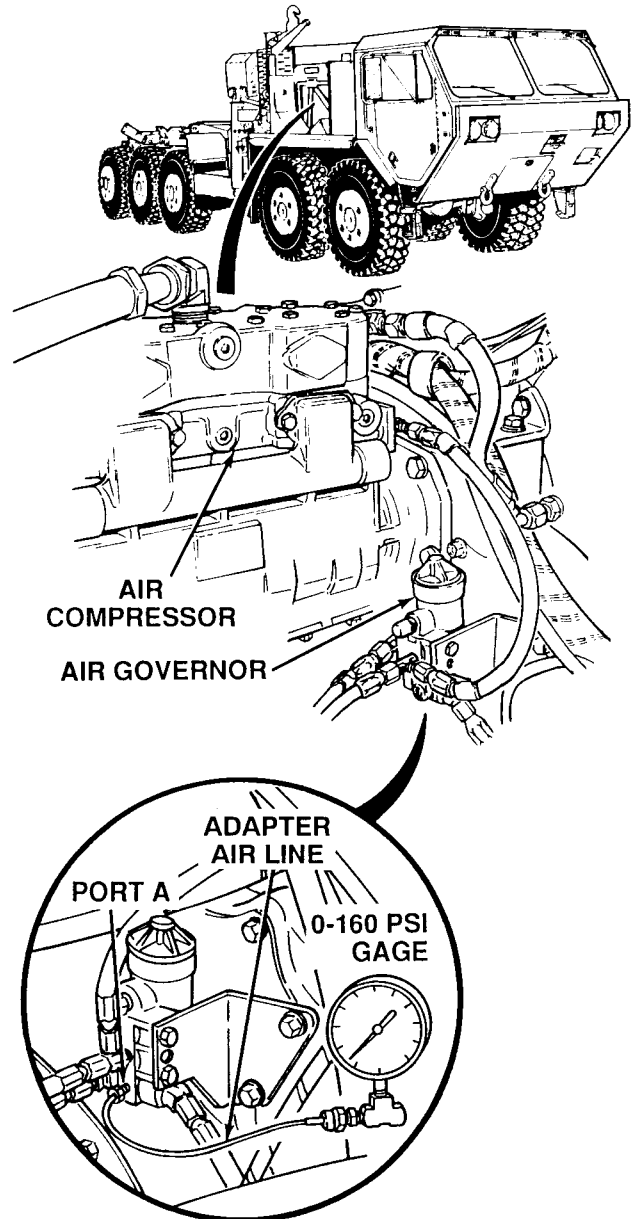
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing wash immediately with soap and water.
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

NOTE

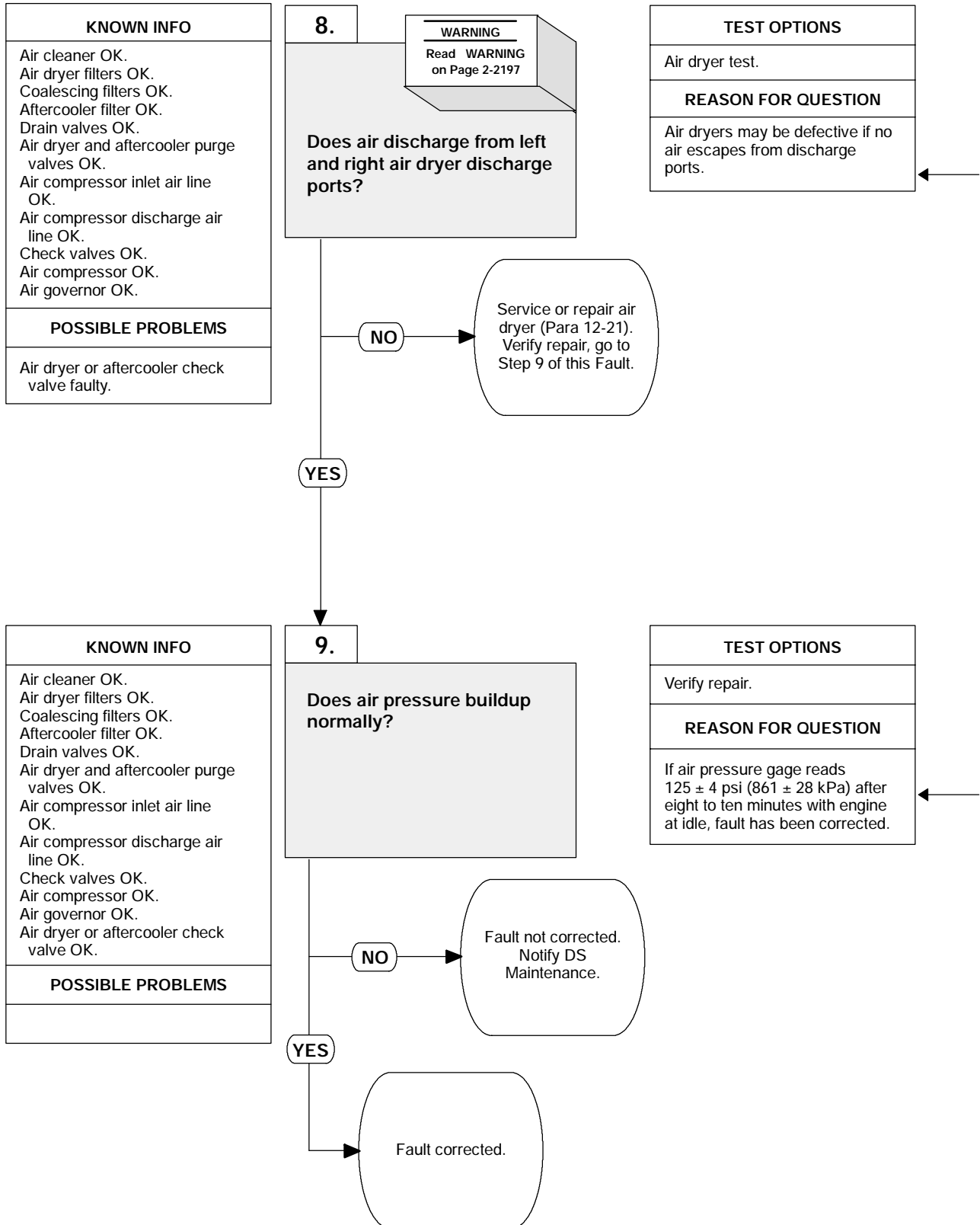
When air governor cuts out, a sudden escape of air from the air dryer will be heard.

AIR GOVERNOR TEST

- (1) Remove plug from air governor port A.
- (2) Connect 0 to 160 psi (0 to 1103 kPa) gage and adapter hose to port A.
- (3) While assistant starts engine, monitor pressure build up until air governor cut out is heard (TM 9-2320-364-10).
- (4) Pressure gage should read 125 ± 4 psi (861 ± 28 kPa) when air governor cuts out.
 - (a) If air governor does not cut out at 125 ± 4 psi (861 ± 28 kPa), turn OFF ENGINE switch and adjust air governor (Para 12-41).
 - (b) If air governor does not cut out at 125 ± 4 psi (861 ± 28 kPa) after adjustment, perform Steps (5) through (8) below and replace air governor (Para 12-41).
 - (c) If air governor cuts out at 125 ± 4 psi (861 ± 28 kPa), air governor is OK.
- (5) Turn OFF ENGINE switch.
- (6) Remove pressure gage adapter hose from port A.
- (7) Apply sealing compound to threads of plug.
- (8) Install plug in port A.



1. AIR PRESSURE BUILDUP IS SLOW (CONT).

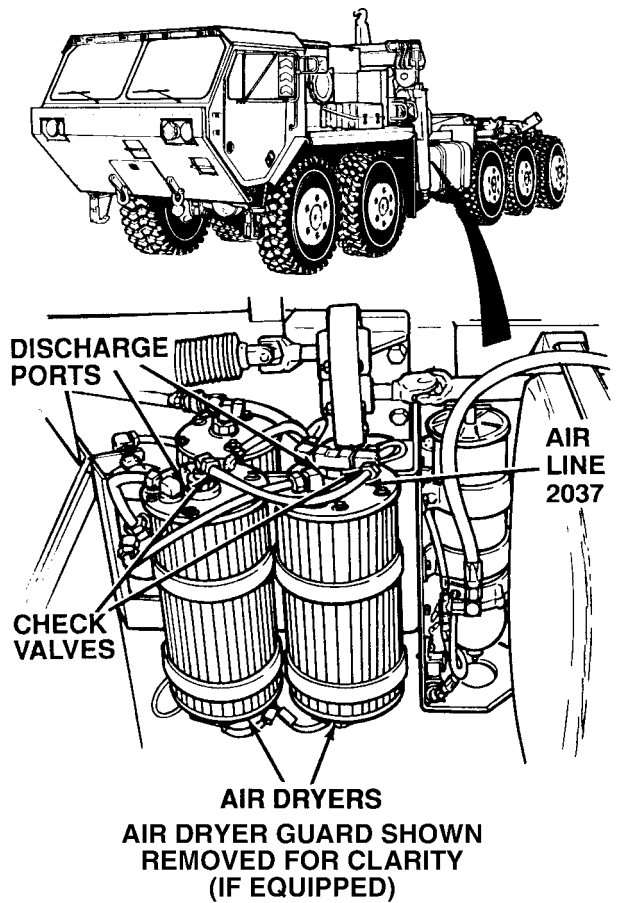


WARNING

Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

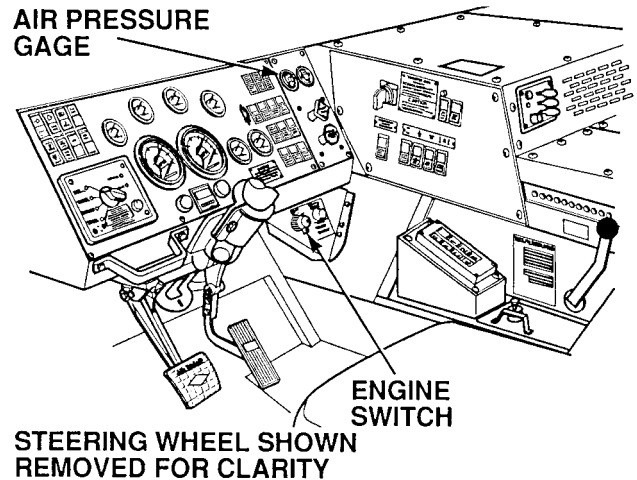
AIR DRYER TEST

- (1) Drain air system.
- (2) Remove air dryer discharge air line 2037 from left and right air dryers.
- (3) Start engine and check for air flow from left and right air dryer discharge ports (TM 9-2320-364-10).
 - (a) If no air flows from discharge ports, perform Steps (4) and (5) below and service air dryers (Para 12-21).
 - (b) If air flows from discharge ports, air dryers are OK.
- (4) Turn OFF ENGINE switch.
- (5) Install air dryer discharge air line 2037 on left and right air dryers.



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Run at idle for 10 minutes.
- (3) Observe air pressure gage.
 - (a) If air pressure gage does not read 125 ± 4 psi (861 ± 28 kPa), fault not corrected. Perform Step (4) below, and notify DS Maintenance.
 - (b) If air pressure gage reads 125 ± 4 psi (861 ± 28 kPa), fault has been corrected.
- (4) Turn OFF ENGINE switch.
- (5) Install right side noise panel (Para 17-26).



2-27. AIR SYSTEM TROUBLESHOOTING (CONT).

2. AIR DRYER(S) AND/OR AFTERCOOLER CONTINUALLY PURGE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)
Pressure Test Kit (Item 50, Appendix G)

Materials/Parts

Sealant, Teflon Pipe (Item 71, Appendix C)
Solution, Soap (Item 86, Appendix C)

Personnel Required

Two

References

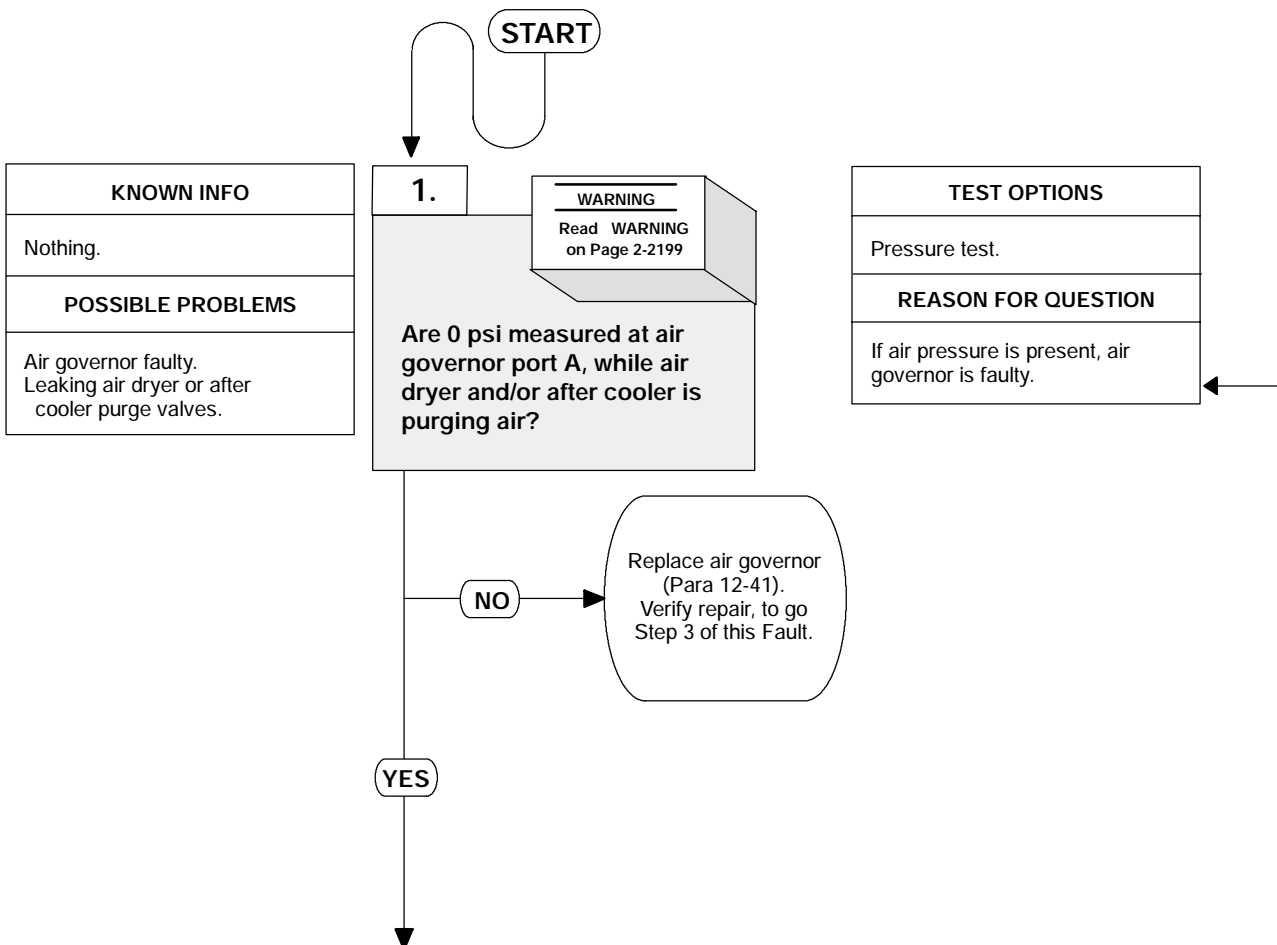
TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)

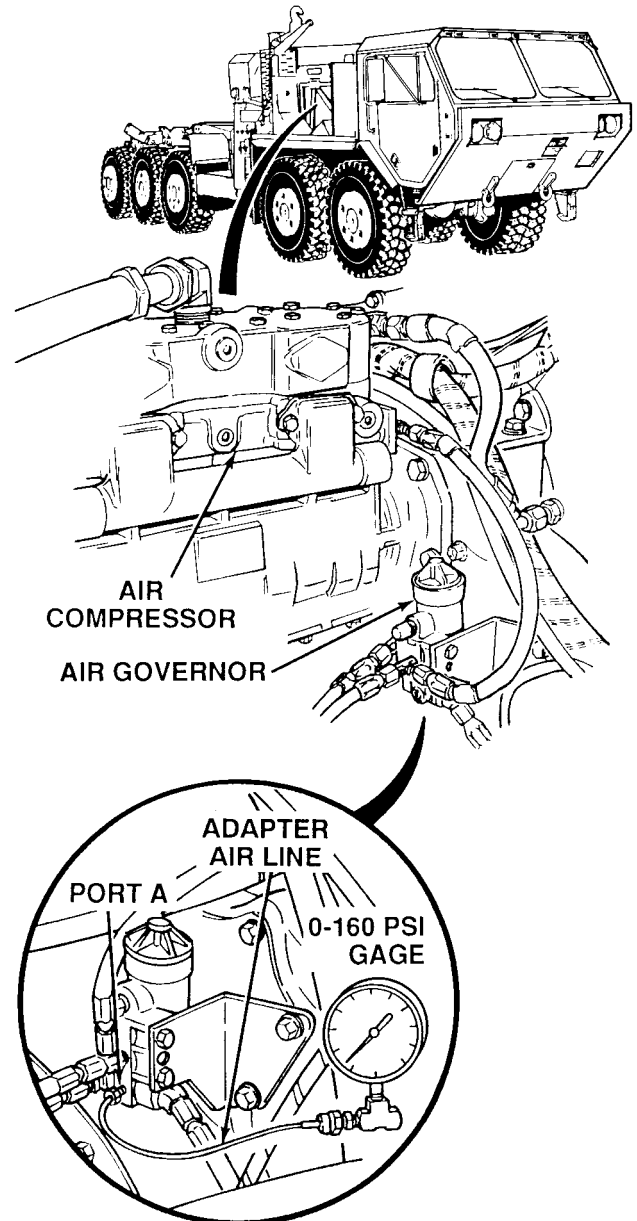
NOTE

Soap and water solution will be used to visually check for leaks.



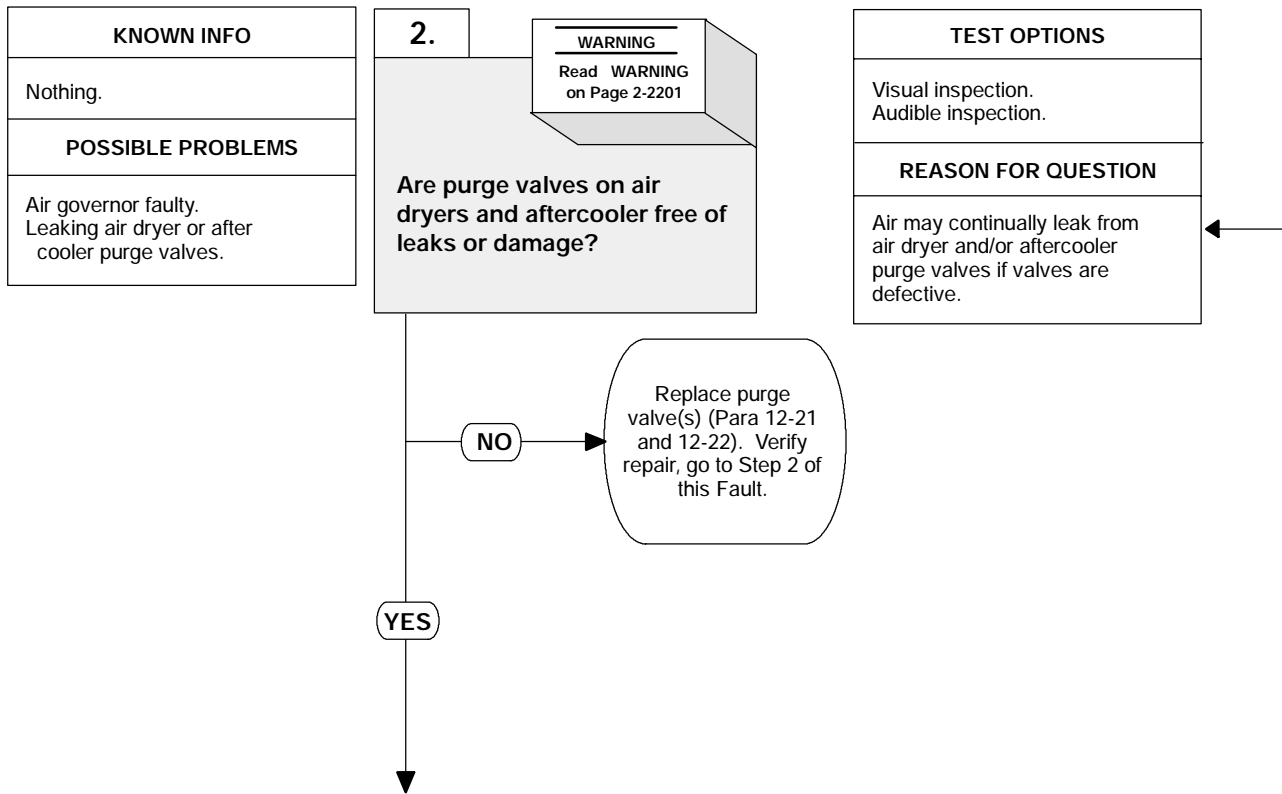
WARNING

- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing wash immediately with soap and water.
- Wear safety goggles when performing tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

**PRESSURE TEST**

- (1) Remove plug from air governor port A.
- (2) Connect 0 to 160 psi (0 to 1103 kPa) gage and adapter hose to port A.
- (3) While assistant starts engine, check for 0 psi (0 kPa) on pressure gage (TM 9-2320-364-10).
 - (a) If 0 psi (0 kPa) is not present, perform Steps (4) through (7) below and replace air governor (Para 12-41).
 - (b) If 0 psi (0 kPa) is present, air governor is OK.
- (4) Turn OFF ENGINE switch.
- (5) Remove pressure gage adapter hose from port A.
- (6) Apply sealing compound to threads of plug.
- (7) Install plug in port A.

2. AIR DRYER(S) AND/OR AFTERCOOLER CONTINUALLY PURGE (CONT).

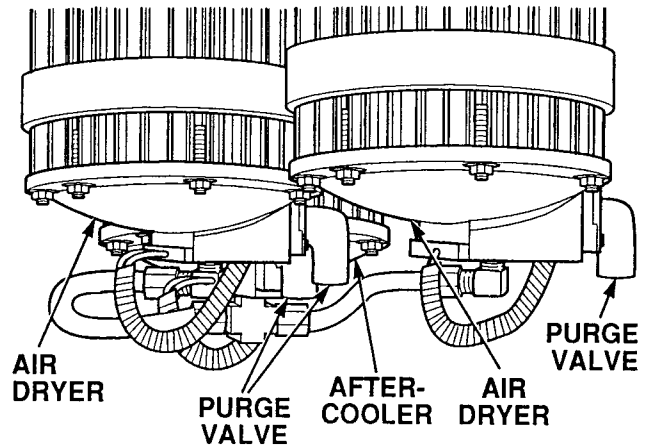
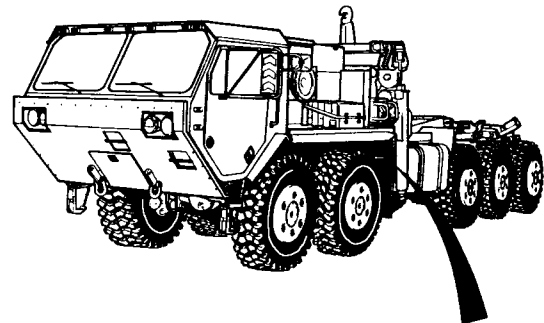
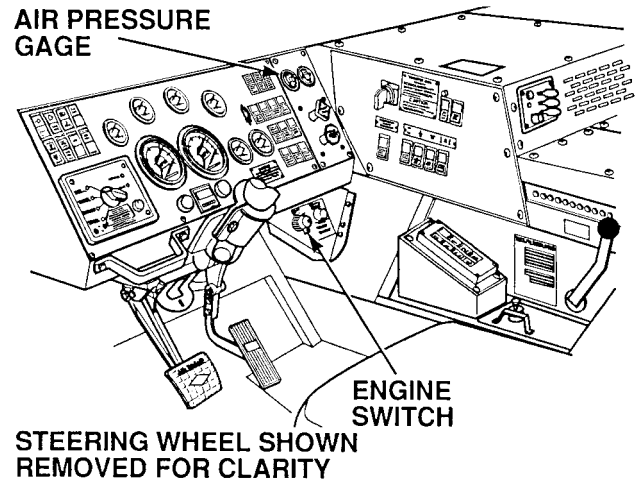


WARNING

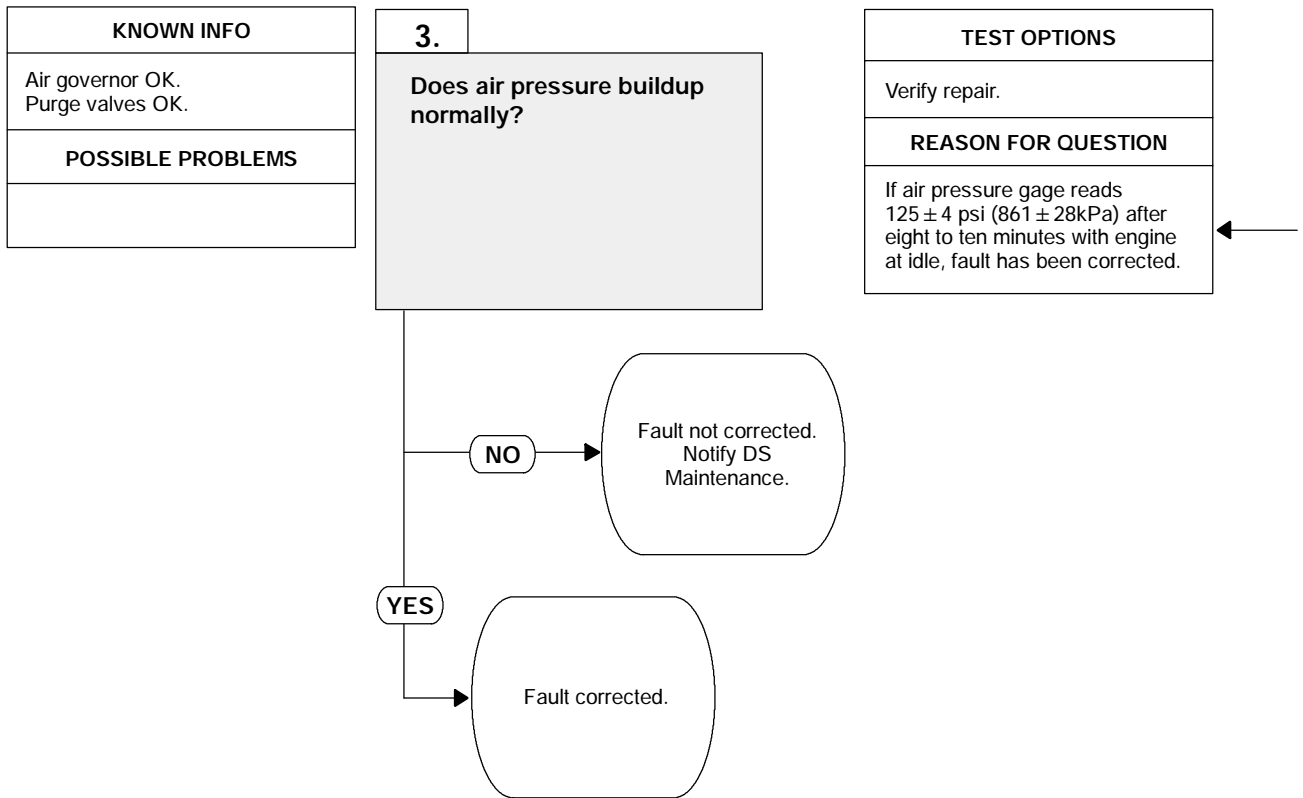
Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

VISUAL/AUDIBLE INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Run at idle until air pressure gage reads 125 ± 4 psi (861 ± 28 kPa).
- (3) Turn OFF ENGINE switch.
- (4) Check purge valves on air dryers and after cooler for air leaks or damage.
 - (a) If purge valves are leaking or damaged, replace valves (Para 12-21 and 12-22).
 - (b) If purge valves are not leaking or damaged, valves are OK.

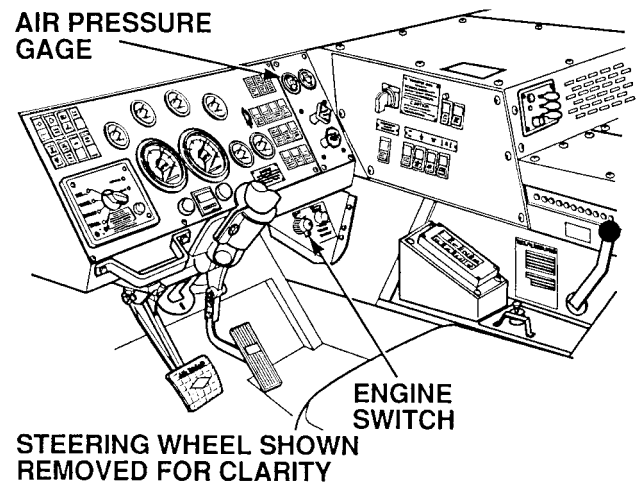


2. AIR DRYER(S) AND/OR AFTERCOOLER CONTINUALLY PURGE (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Run at idle for 10 minutes.
- (3) Observe air pressure gage.
 - (a) If air pressure gage does not read 125 ± 4 psi (861 ± 28 kPa), fault not corrected. Perform Step (4) below and notify DS Maintenance.
 - (b) If air pressure gage reads 125 ± 4 psi (861 ± 28 kPa), fault has been corrected.
- (4) Turn OFF ENGINE switch.



2-27. AIR SYSTEM TROUBLESHOOTING (CONT).

3. COMPRESSOR FAILS TO UNLOAD (AIR SYSTEM PRESSURE BUILDS UP TO MORE THAN 129 PSI (889 KPA)).

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

Personnel Required

Two

Materials/Parts

Solution, Soap (Item 86, Appendix C)

References

TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)

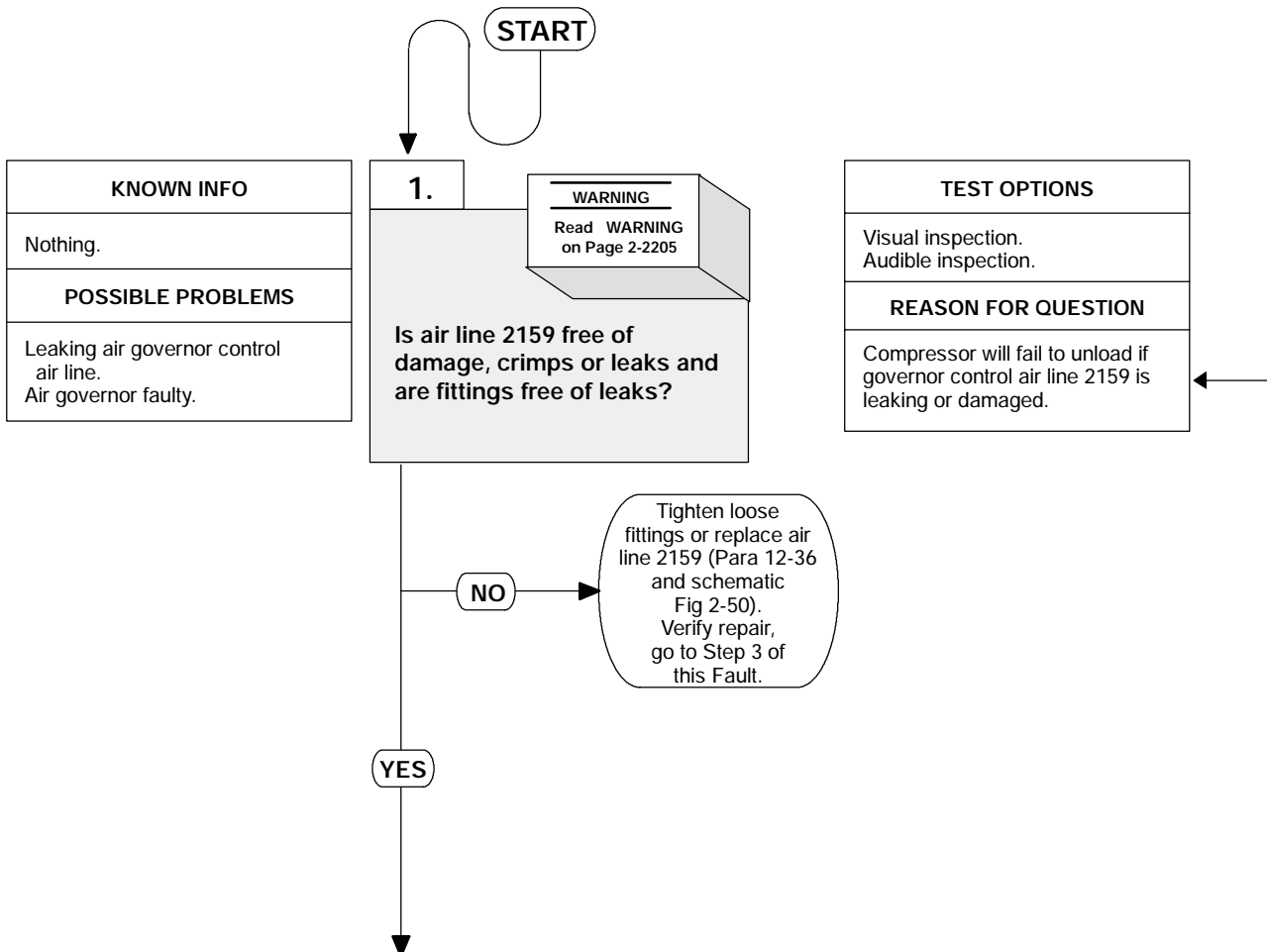
Parking brakes applied, (TM 9-2320-364-10)

Wheels chocked, (TM 9-2320-364-10)

Right side noise panel removed, (Para 17-26)

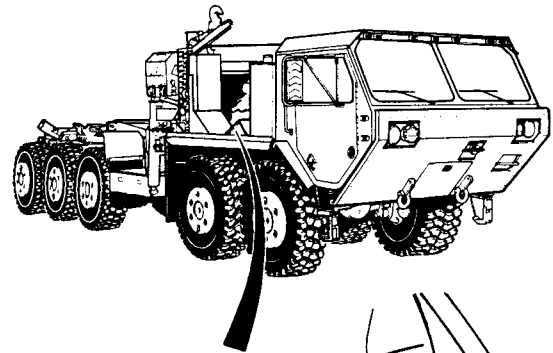
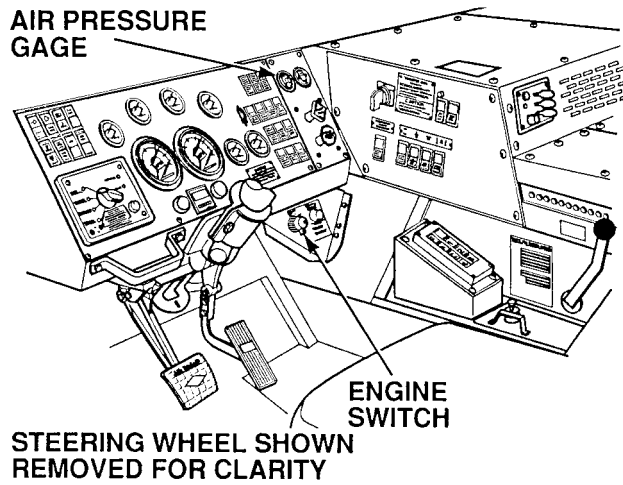
NOTE

Soap and water solution will be used to visually check for leaks.



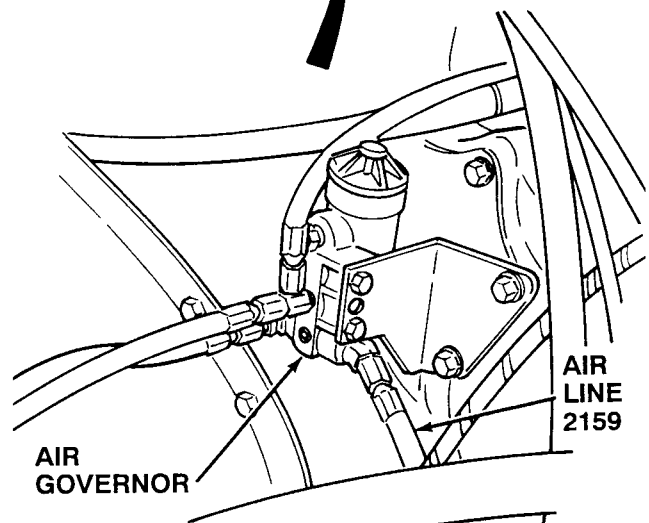
WARNING

Wear safety goggles when performing leakage tests. Failure to do so may result in serious eye injury due to high pressure air.

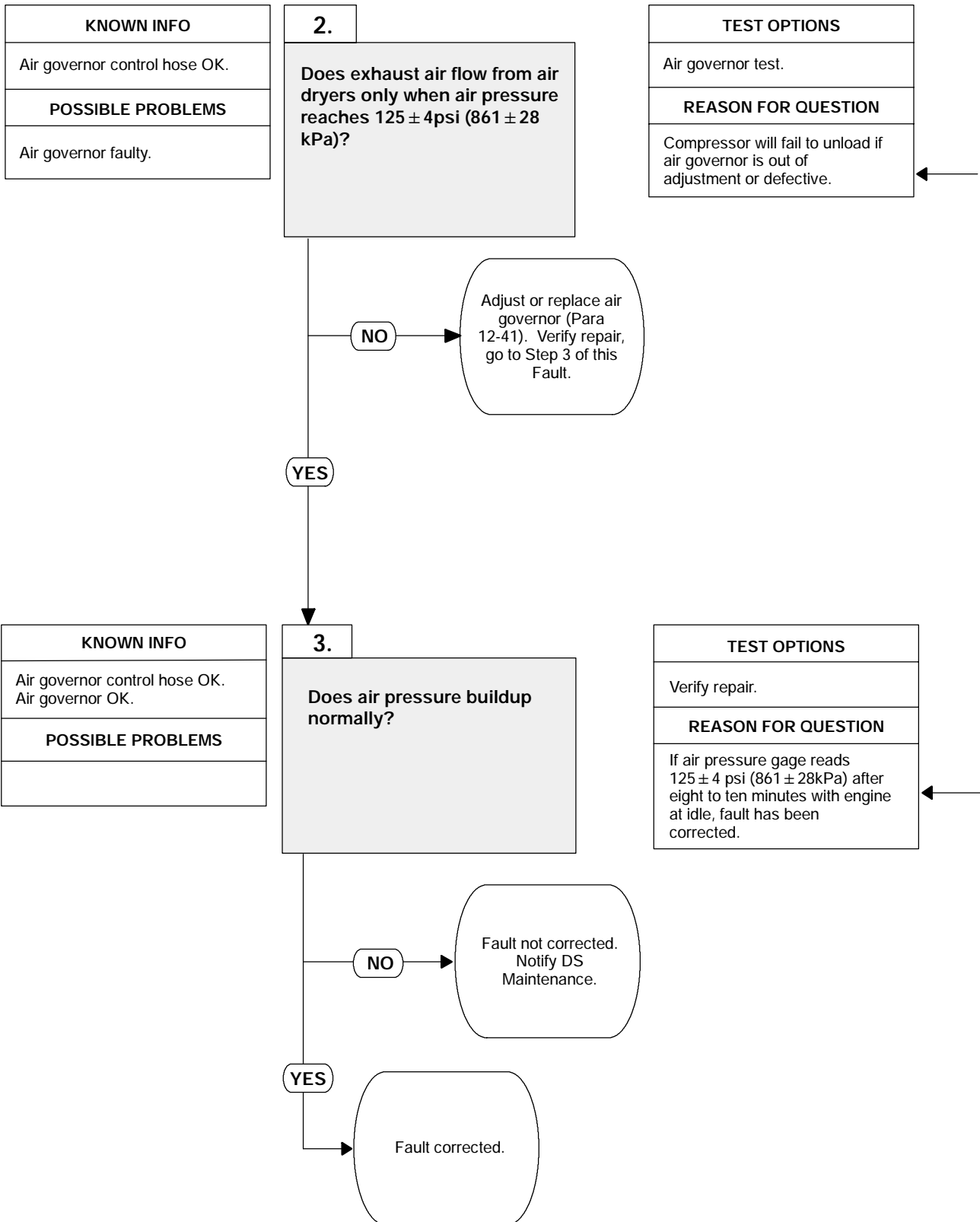


VISUAL INSPECTION

- (1) Start engine (TM 9-2320-364-10).
- (2) Run engine at idle until air pressure gage reads 125 ± 4 psi (861 ± 28 kPa).
- (3) Turn OFF ENGINE switch.
- (4) Check air line 2159 for damage, crimps or leaks (Para 12-36 and schematic Fig 2-50).
 - (a) If air line is damaged, crimped or leaking; tighten fittings, or replace air line 2159 (Para 12-36 and schematic Fig 2-50).
 - (b) If there are no leaks, crimps or damage, air line 2159 and fittings are OK.



3. COMPRESSOR FAILS TO UNLOAD (AIR SYSTEM PRESSURE BUILDS UP TO MORE THAN 129 PSI (899 kPa)) (CONT).

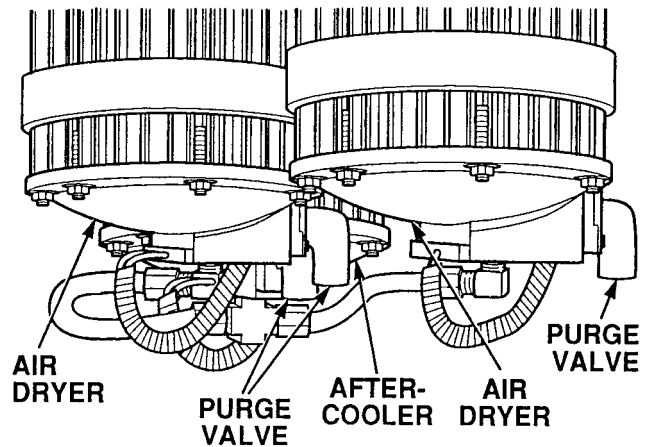
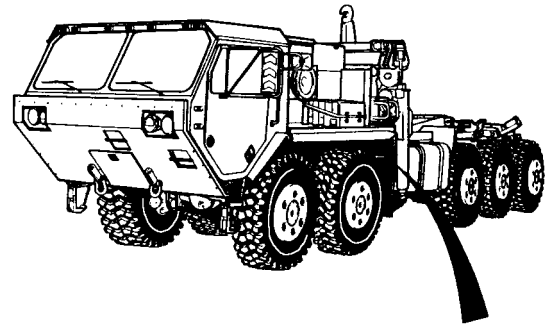


NOTE

Air will be released from air dryer when air governor cuts out.

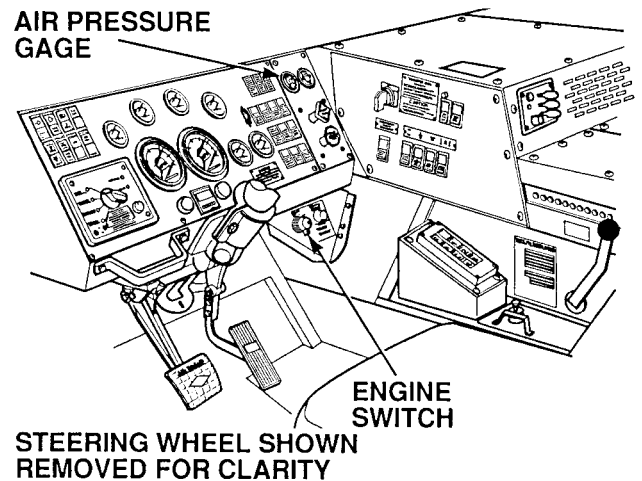
AIR GOVERNOR TEST

- (1) Listen to air dryer while assistant starts engine (TM 9-2320-364-10) and observes AIR PRESS gages in cab. Green and red needles should move up scale as pressure builds up.
 - (a) If exhaust air is heard coming from air dryer before truck air pressure reaches 125 ± 4 psi (861 ± 28 kPa), turn OFF ENGINE switch, and adjust or replace air governor (Para 12-41).
 - (b) If exhaust air can only be heard coming from air dryer when truck air pressure reaches 125 ± 4 psi (861 ± 28 kPa), air governor is OK.
- (2) Turn OFF ENGINE switch.
- (3) Install right side noise panel (Para 17-26).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Run at idle for 10 minutes.
- (3) Observe air pressure gage.
 - (a) If air pressure gage does not read 125 ± 4 psi (861 ± 28 kPa), fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If air pressure gage reads 125 ± 4 psi (861 ± 28 kPa), fault has been corrected.
- (4) Turn OFF ENGINE switch.



2-27. AIR SYSTEM TROUBLESHOOTING (CONT).

4. NOISY AIR COMPRESSOR OPERATION.

INITIAL SETUP

Tools and Special Tools

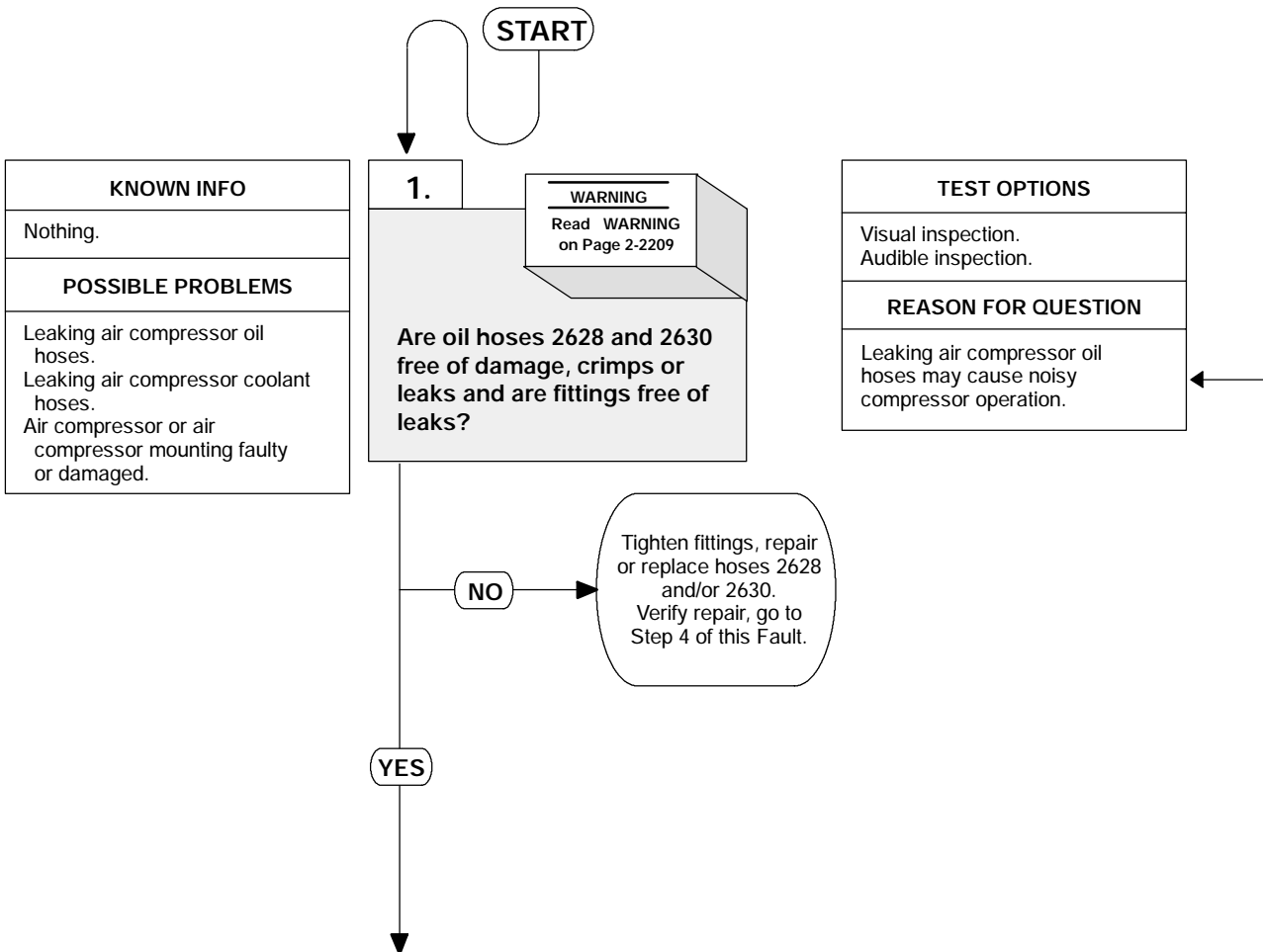
Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

TM 9-2320-364-10

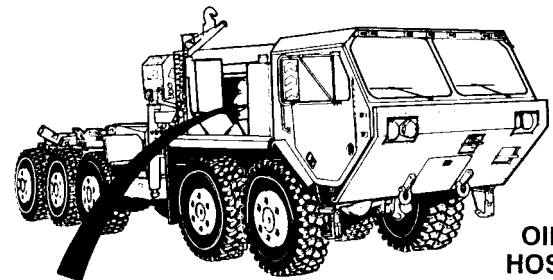
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brakes applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Right side noise panel removed, (Para 17-26)



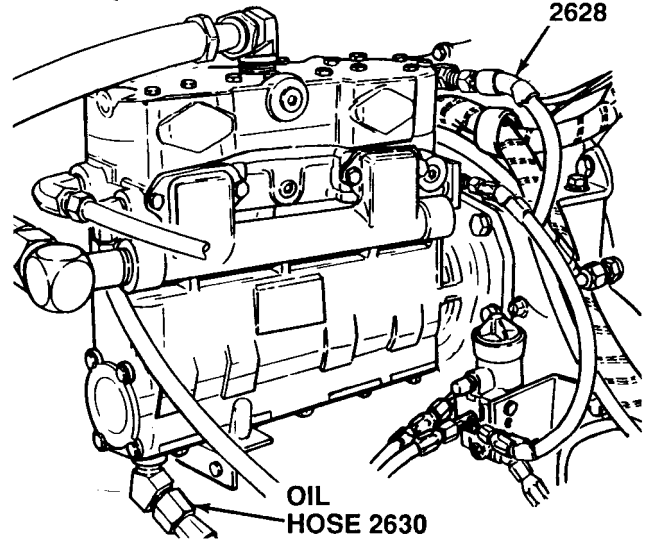
WARNING

- Allow engine to cool before performing troubleshooting maintenance. If necessary use insulated pads and gloves. Hot engine components will burn and cause injury to personnel.
- Wear safety goggles when performing tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

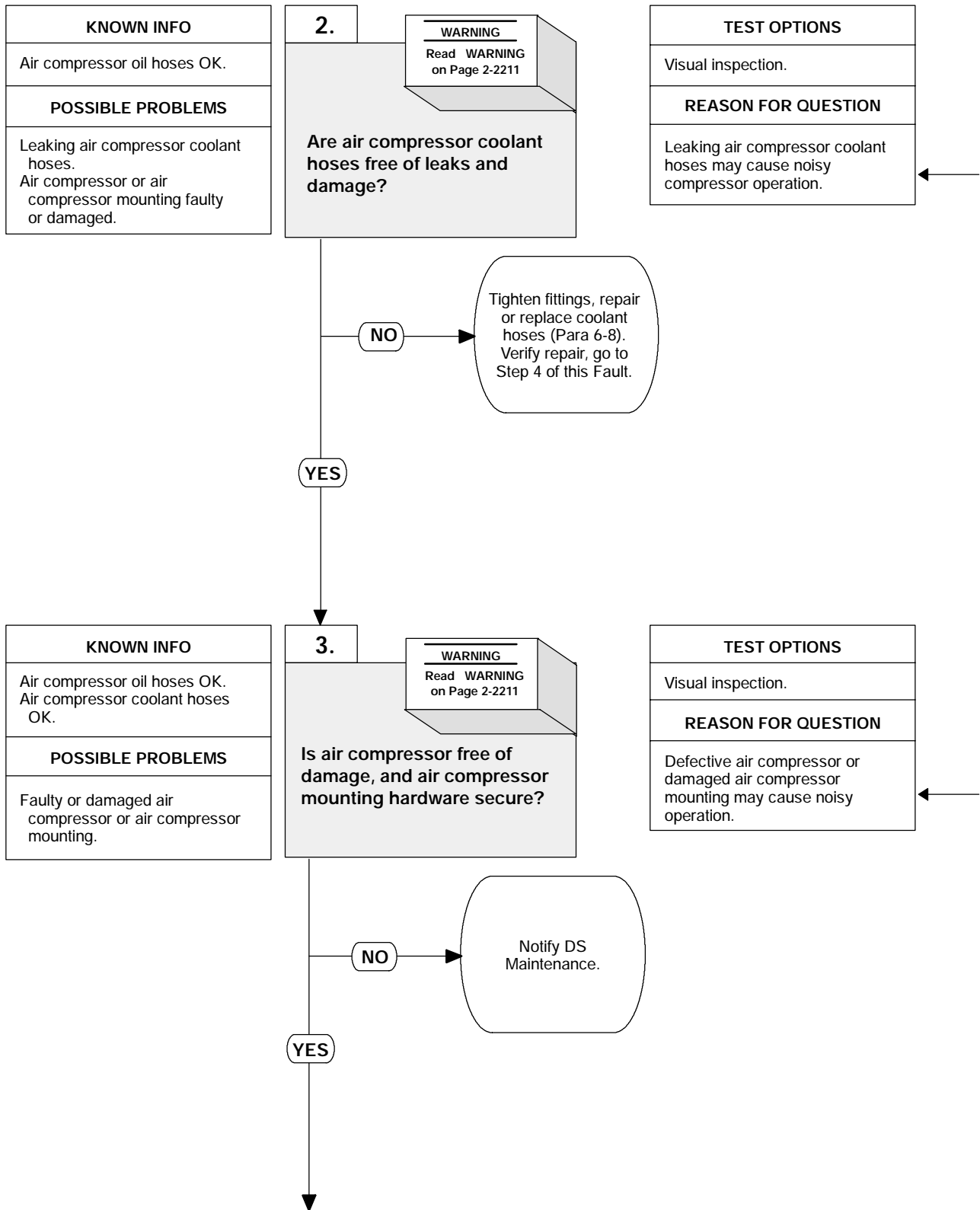
OIL
HOSE
2628**VISUAL/AUDIBLR INSPECTION**

Check oil hoses 2628 and 2630 for damage, crimps or leaks.

- (1) If hose(s) are damaged, crimped or leaking, tighten fittings or replace hose 2628 and/or 2630.
- (2) If there are no leaks, crimps or damage, hoses and fittings are OK.

OIL
HOSE 2630

4. NOISY AIR COMPRESSOR OPERATION (CONT).



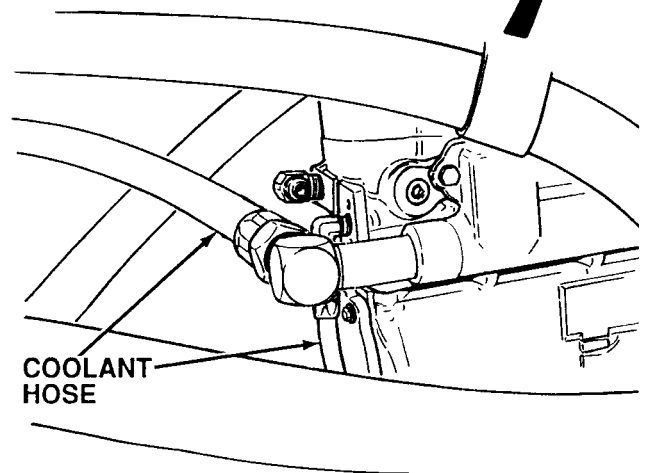
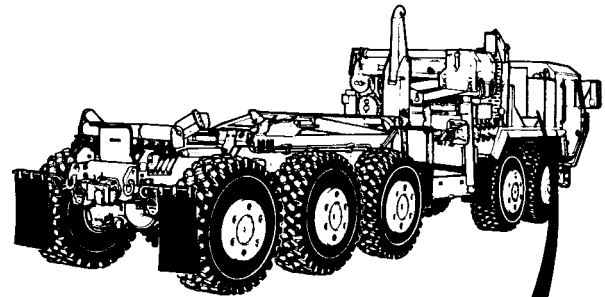
WARNING

- Allow engine to cool before performing troubleshooting maintenance. If necessary use insulated pads and gloves. Hot engine components will burn and cause injury to personnel.
- Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

VISUAL INSPECTION

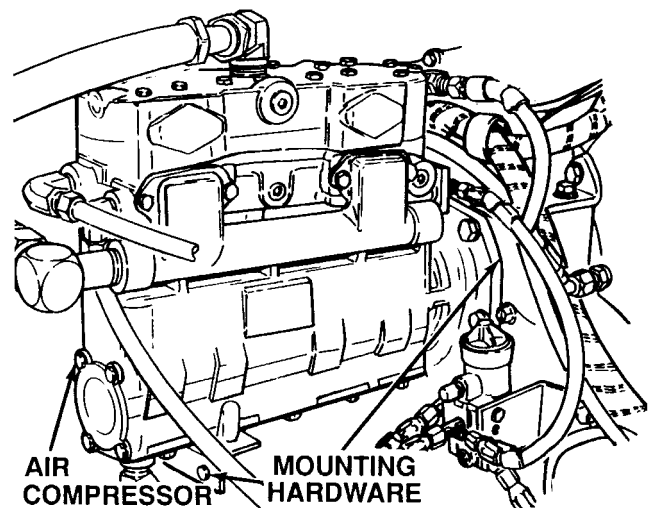
Check air compressor coolant hoses and fittings for leaks or damage.

- (1) If hoses are leaking or damaged, tighten fittings, repair or replace coolant hoses (Para 6-8).
- (2) If hoses are not leaking or damaged, go to Step 3 of this Fault.

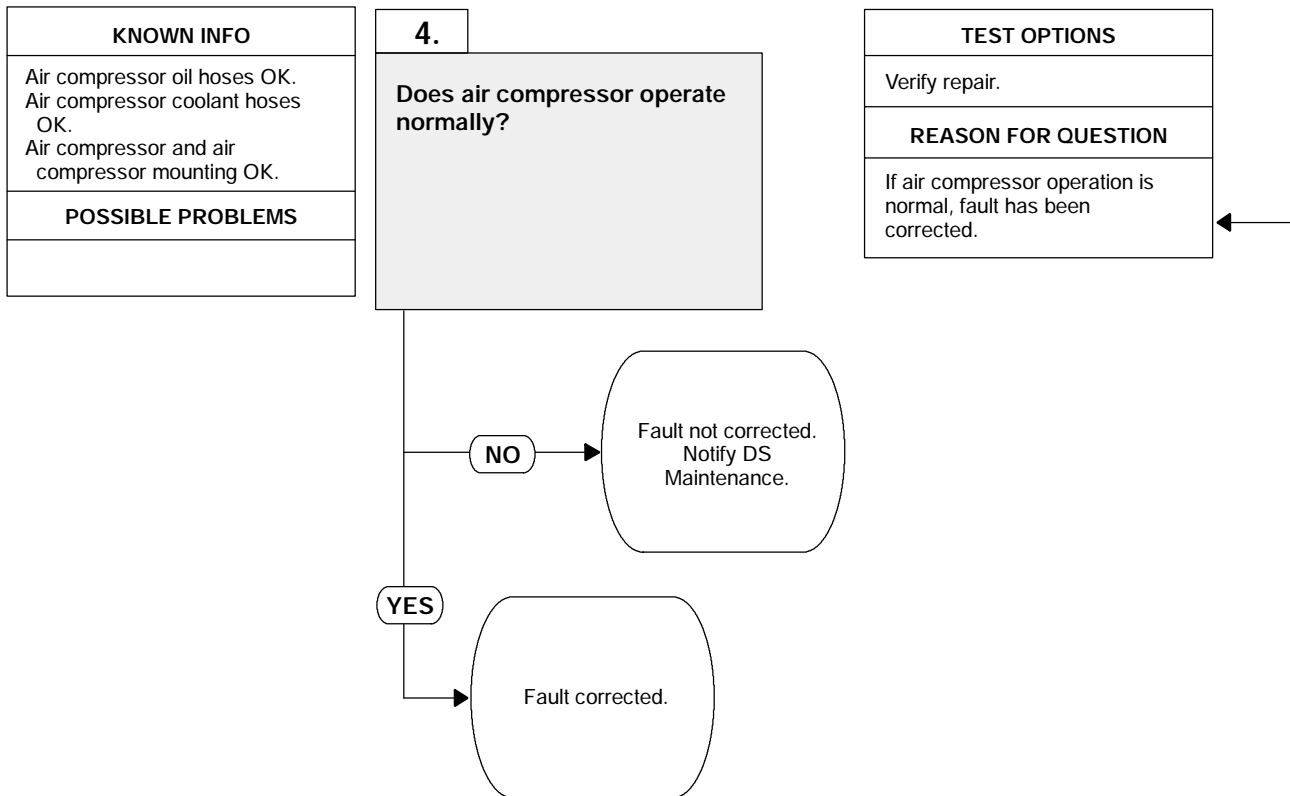


VISUAL INSPECTION

- (1) Check air compressor for damage and loose or damaged mounting hardware.
 - (a) If compressor is cracked, leaking, or seized, notify DS Maintenance.
 - (b) If compressor mounting is loose, notify DS Maintenance.
 - (c) If compressor is securely mounted and not damaged, go to Step 4 of this Fault.
- (2) Install right side noise panel (Para 17-26).

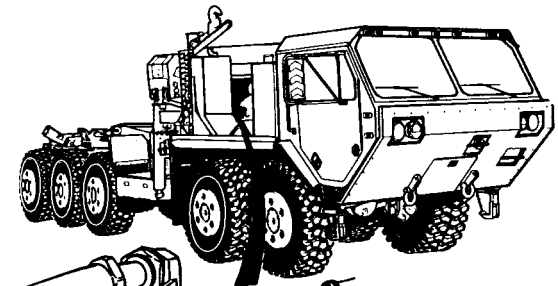


4. NOISY AIR COMPRESSOR OPERATION (CONT).

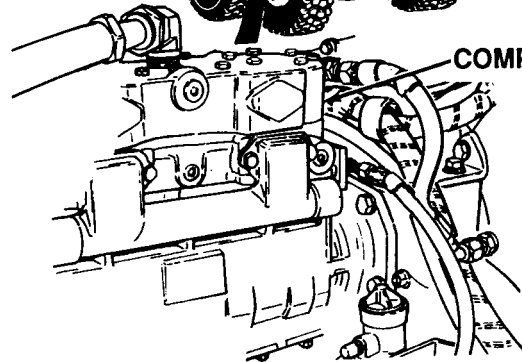


VERIFY REPAIR

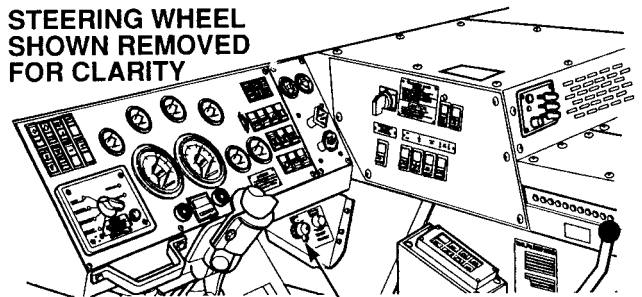
- (1) Start engine (TM 9-2320-364-10).
- (2) Monitor air compressor operation for excessive noise.
 - (a) If air compressor is noisy, fault not corrected. Perform Step (3) below and notify DS Maintenance.
 - (b) If air compressor operates normally, fault has been corrected.
- (3) Turn OFF ENGINE switch.



AIR COMPRESSOR



STEERING WHEEL SHOWN REMOVED FOR CLARITY



ENGINE SWITCH

2-27. AIR SYSTEM TROUBLESHOOTING (CONT).

5. AIR PRESSURE DROPS RAPIDLY AFTER ENGINE SHUTDOWN.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

Materials/Parts

Solution, Soap (Item 86, Appendix C)

References

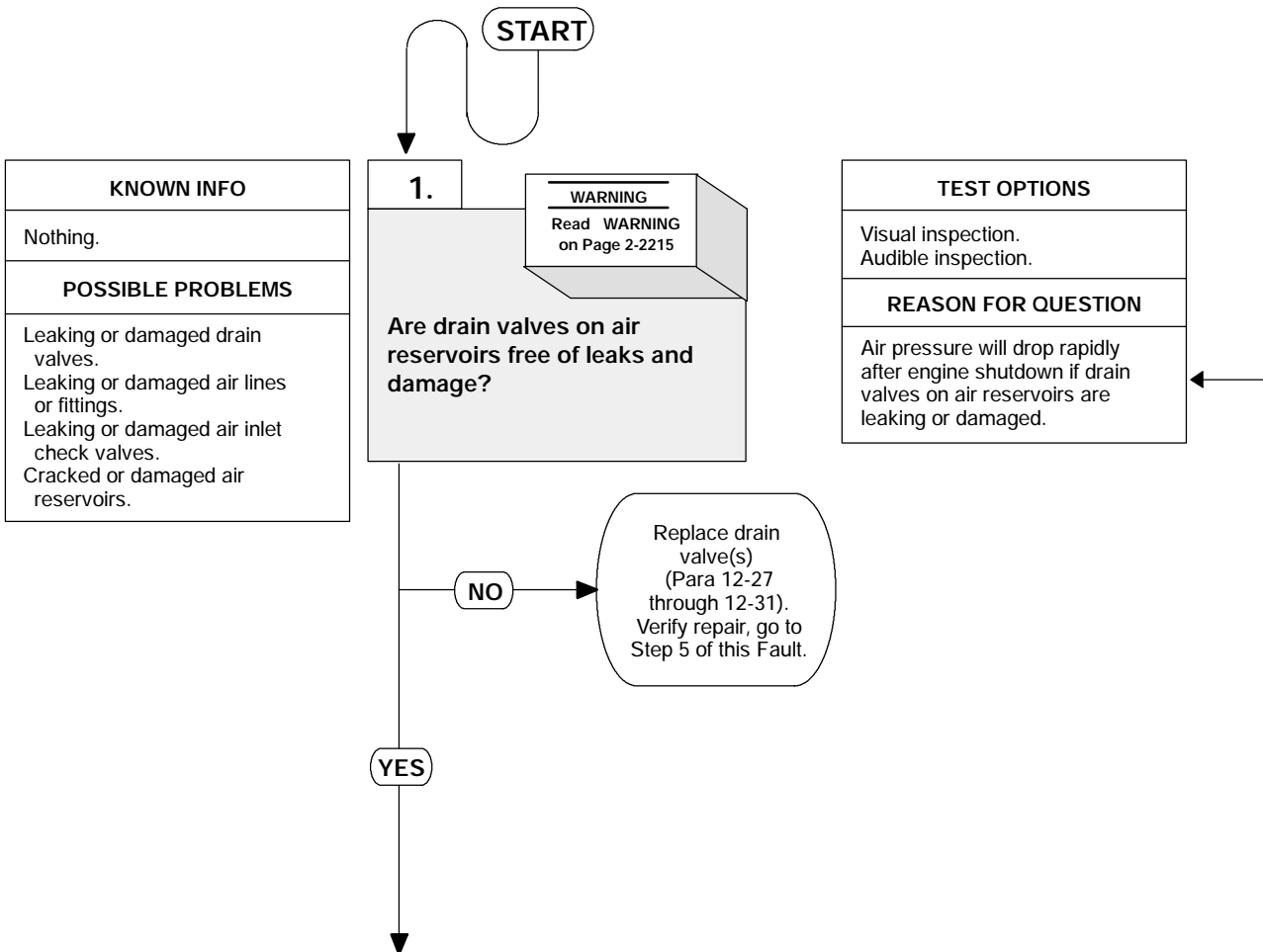
TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brakes applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)

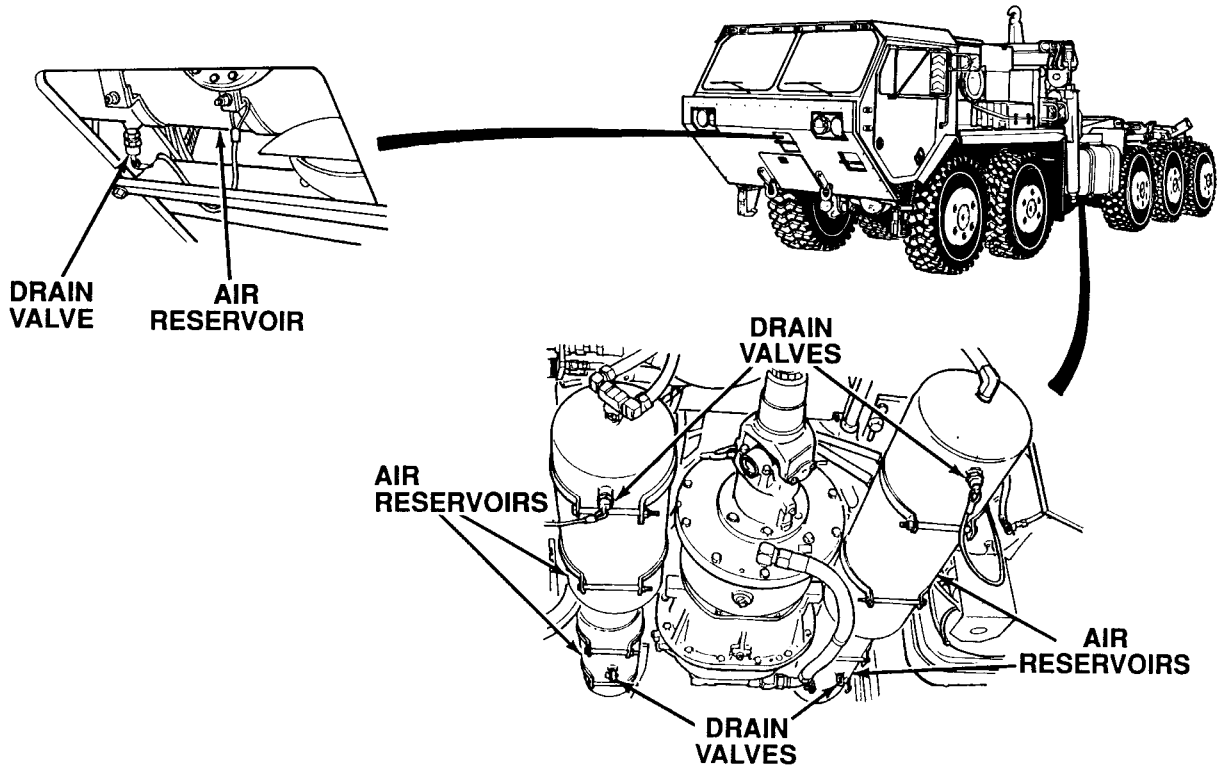
NOTE

Soap and water solution will be used to visually check for leaks.



WARNING

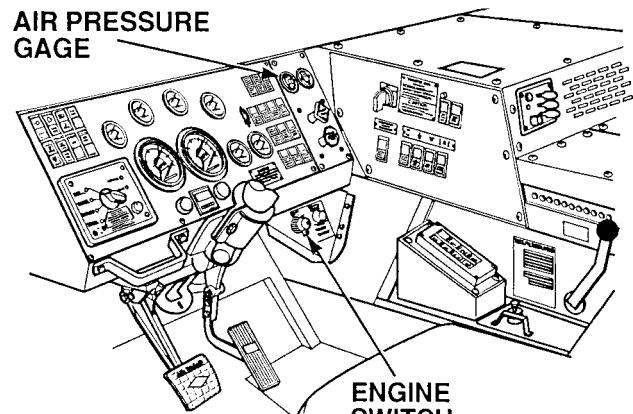
Wear safety goggles when performing leakage tests. Failure to do so may result in serious eye injury due to high pressure air.



VISUAL/AUDIBLE INSPECTION

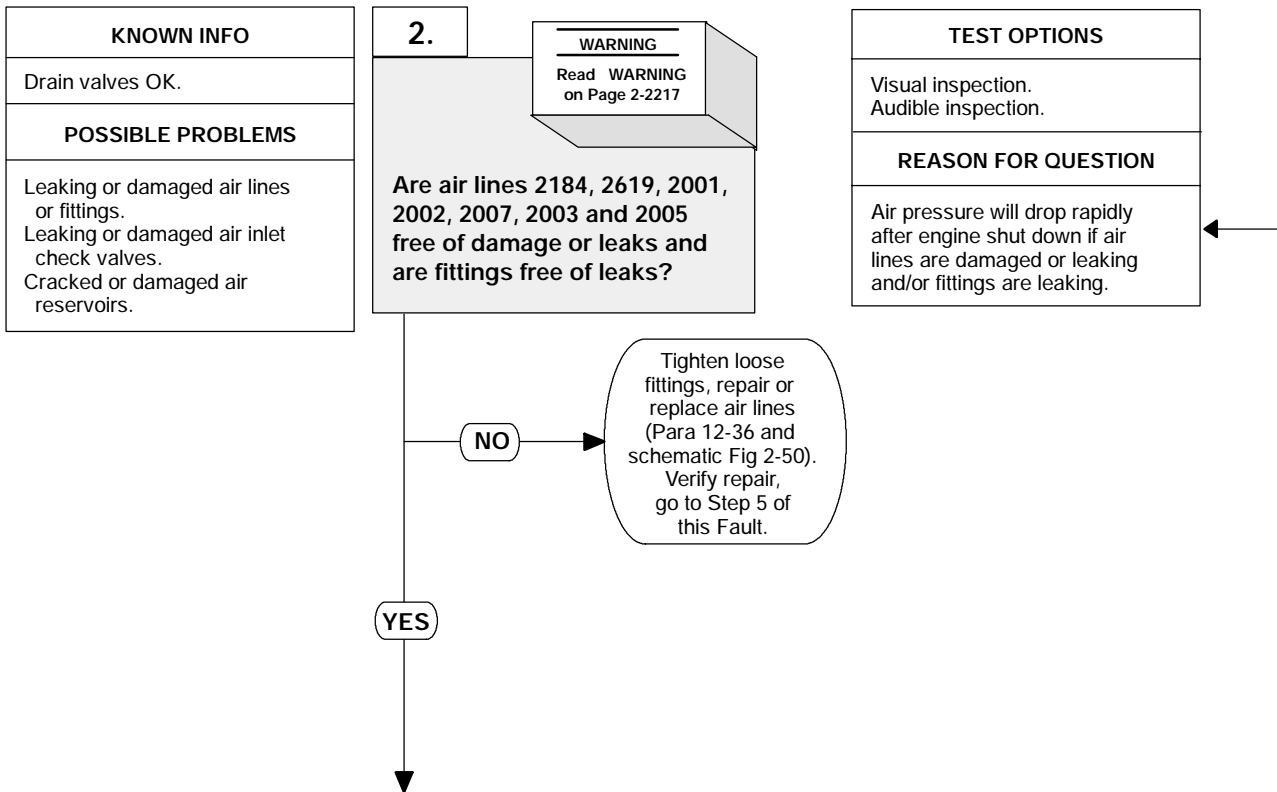
- (1) Start engine (TM 9-2320-364-10).
- (2) Run engine at idle until air pressure gage reads 125 ± 4 psi (861 ± 28 kPa).
- (3) Turn OFF ENGINE switch.
- (4) Check drain valves on air reservoirs for leaks or damage.
 - (a) If drain valves are leaking or damaged, replace valves (Para 12-27 through 12-31).
 - (b) If drain valves are not leaking or damaged, valves are OK.

AIR PRESSURE GAGE



STEERING WHEEL SHOWN REMOVED FOR CLARITY

5. AIR PRESSURE DROPS RAPIDLY AFTER ENGINE SHUTDOWN (CONT).



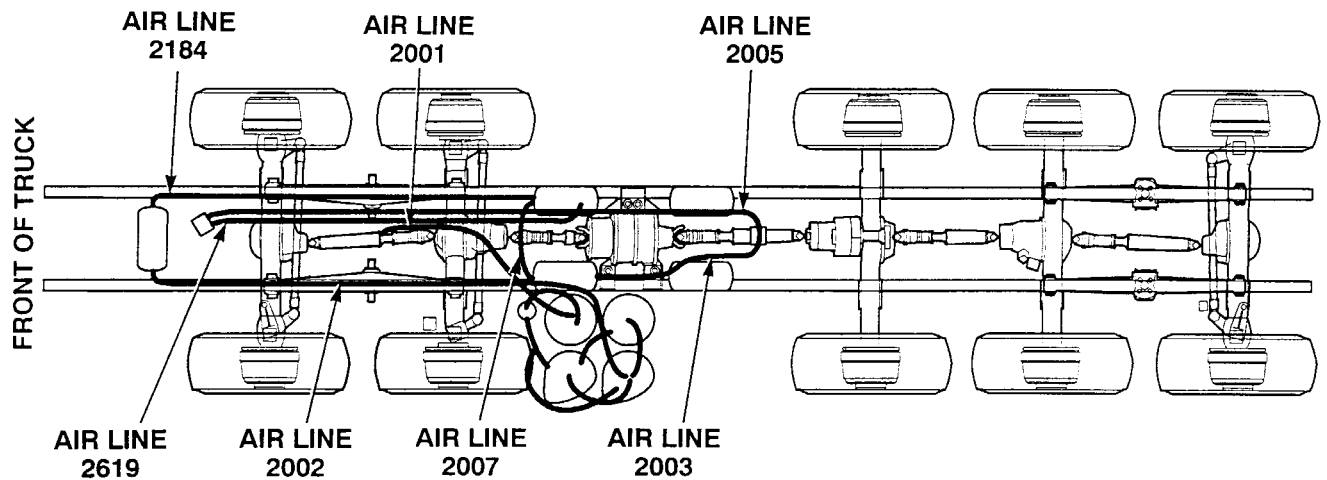
WARNING

Wear safety goggles when performing leakage tests. Failure to do so may result in serious eye injury due to high pressure air.

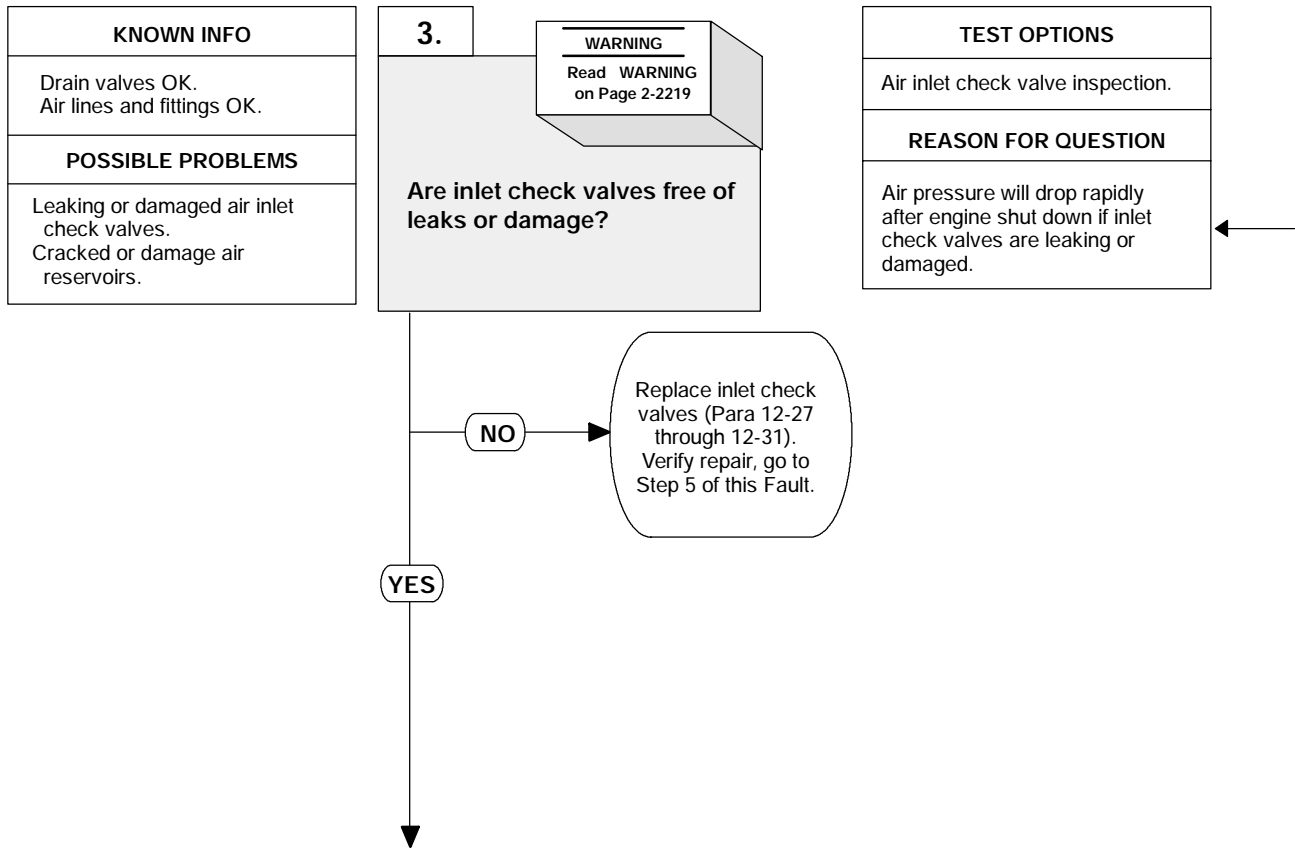
VISUAL/AUDIBLE INSPECTION

Check air lines 2184, 2619, 2001, 2002, 2007, 2003 and 2005 for damage or leaks (Para 12-36 and schematic Fig 2-50).

- (1) If air lines are damaged or leaking, tighten fittings, repair or replace air lines (Para 12-36 and schematic Fig 2-50).
- (2) If there are no leaks or damage, air lines and fittings are OK.



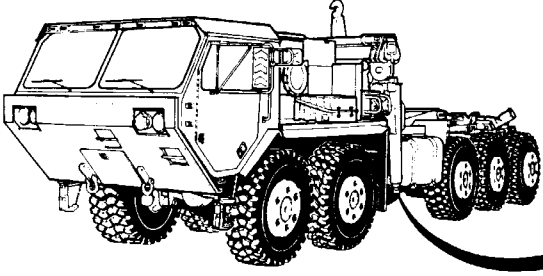
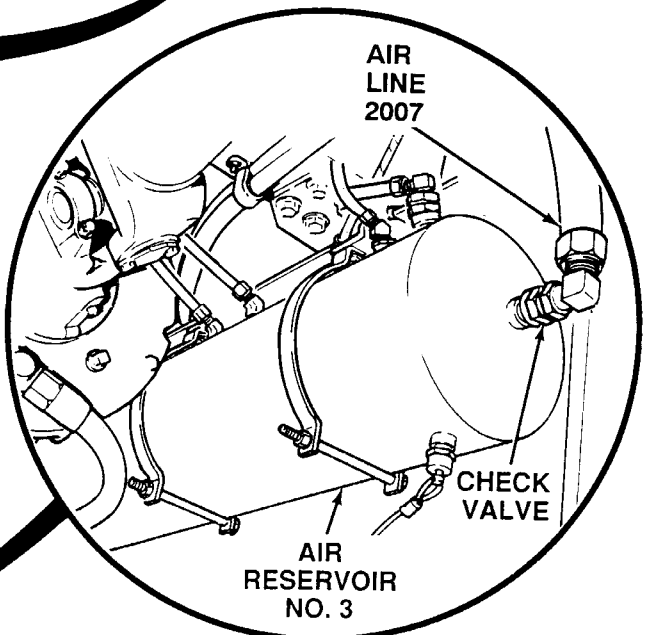
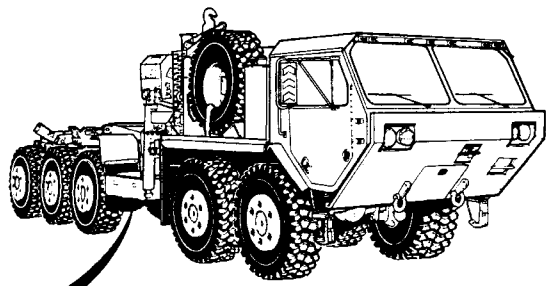
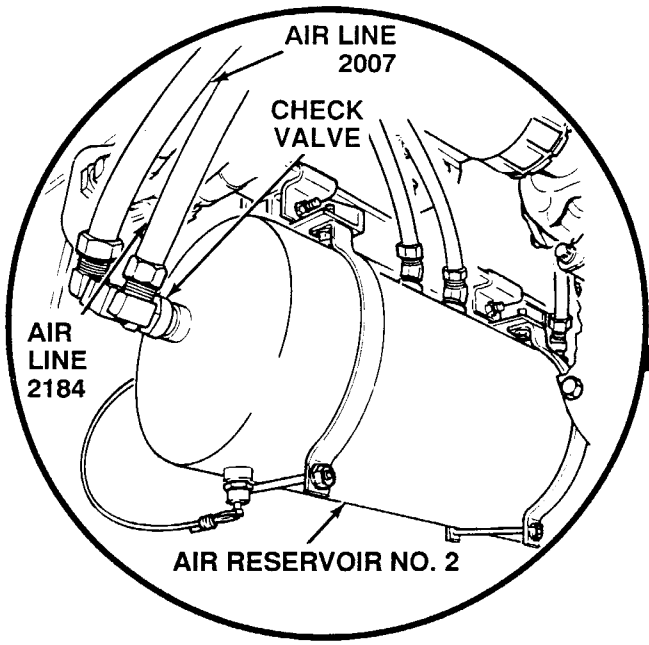
5. AIR PRESSURE DROPS RAPIDLY AFTER ENGINE SHUTDOWN (CONT).



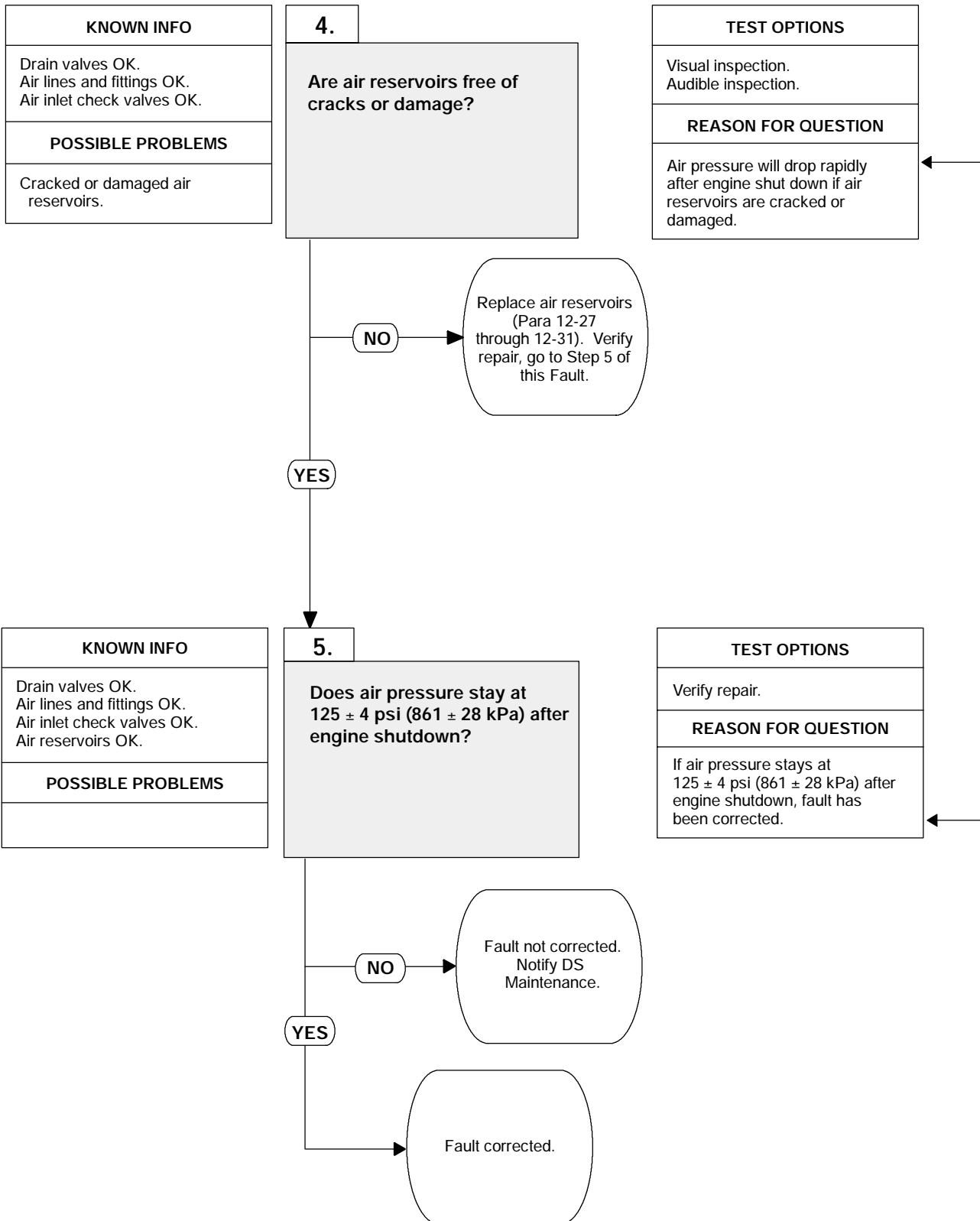
WARNING

Wear safety goggles when performing tests on valves. Failure to do so may result in serious eye injury due to high pressure air.

- AIR INLET CHECK VALVE INSPECTION**
- (1) Drain air system.
 - (2) Disconnect air lines 2184 and 2007 from air reservoirs No. 2 and No. 3.
 - (3) Inspect check valves on air reservoirs No. 2 and No. 3 for air leaks or damage.
 - (a) If check valves are leaking or damaged, replace valves (Para 12-28 and 12-29).
 - (b) If check valves are not leaking or damaged, valves are OK.
 - (4) Connect air lines 2184 and 2007 to air reservoirs No. 2 and No. 3.



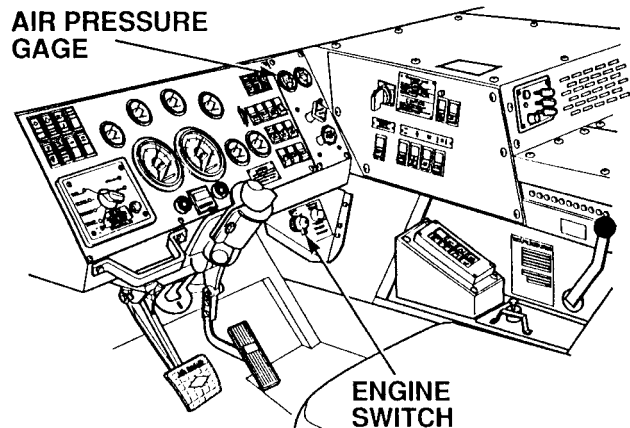
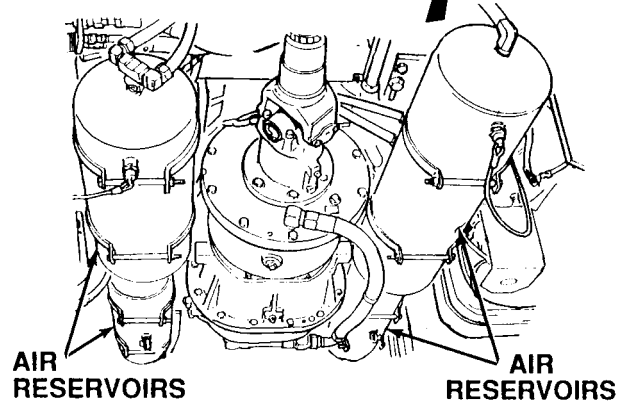
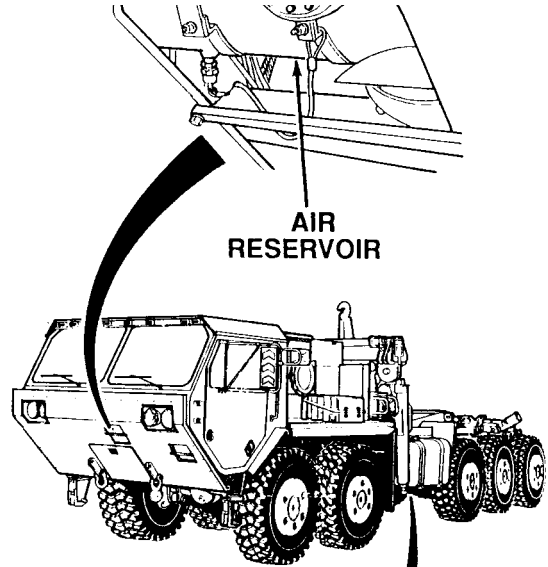
5. AIR PRESSURE DROPS RAPIDLY AFTER ENGINE SHUTDOWN (CONT).



VISUAL/AUDIBLE INSPECTION

Check air reservoirs for cracks, dents, split seams, holes or other damage.

- (1) If air reservoirs are damaged, replace air reservoir(s) (Para 12-27 through 12-31).
- (2) If air reservoirs are not damaged, reservoirs are OK.



STEERING WHEEL SHOWN REMOVED FOR CLARITY

VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Run at idle for 10 minutes.
- (3) Turn OFF ENGINE switch.
- (4) Observe air pressure gage.
 - (a) If air pressure gage drops below 125 ± 4 psi (861 ± 28 kPa), fault not corrected. Notify DS Maintenance.
 - (b) If air pressure gage stays at 125 ± 4 psi (861 ± 28 kPa), fault has been corrected.

2-27. AIR SYSTEM TROUBLESHOOTING (CONT).

6. AIR HORN WILL NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
Goggles, Industrial (Item 30, Appendix G)

Materials/Parts

Solution, Soap (Item 86, Appendix C)

References

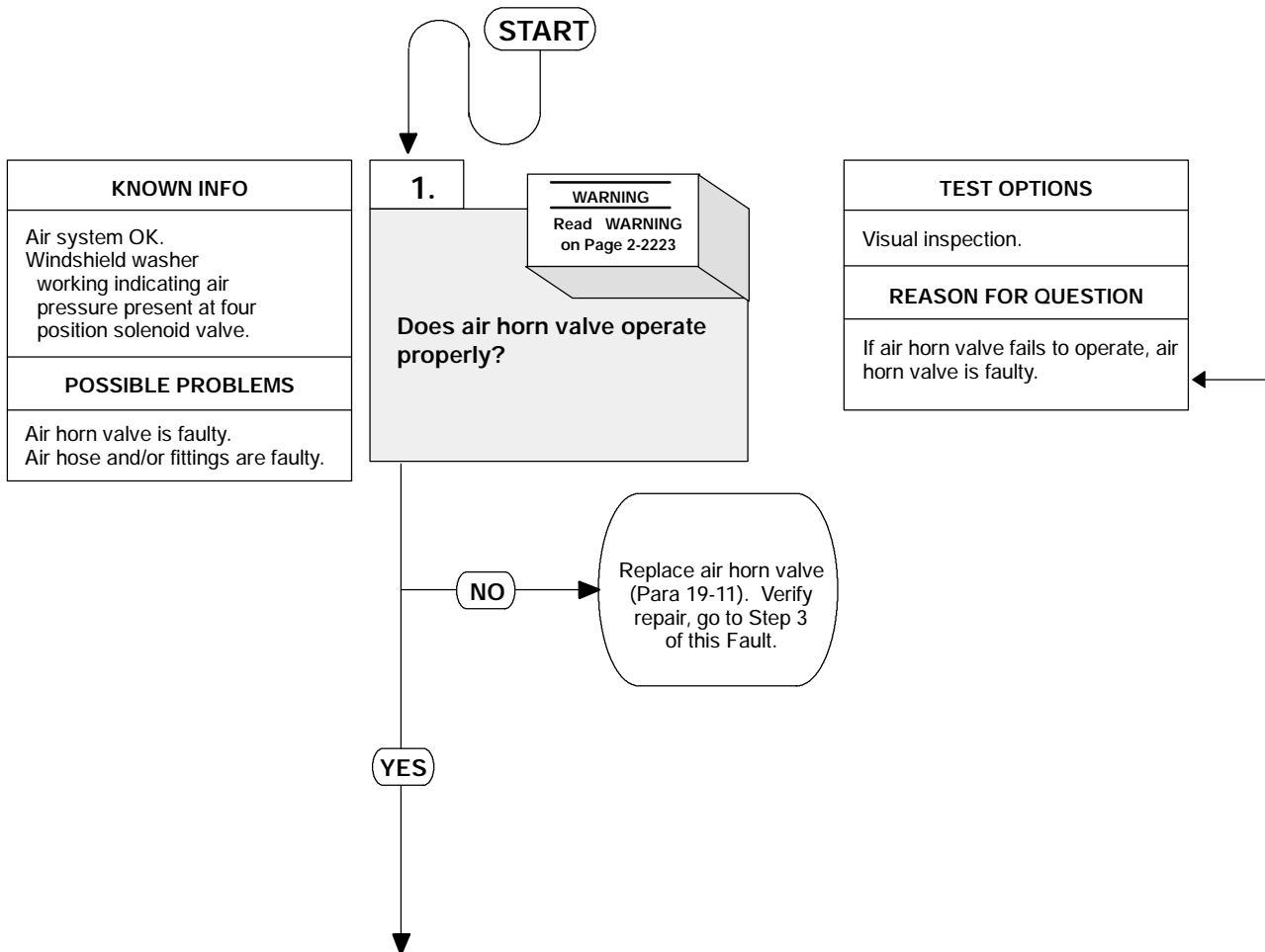
TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brakes applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Air system charged, (TM 9-2320-364-10)

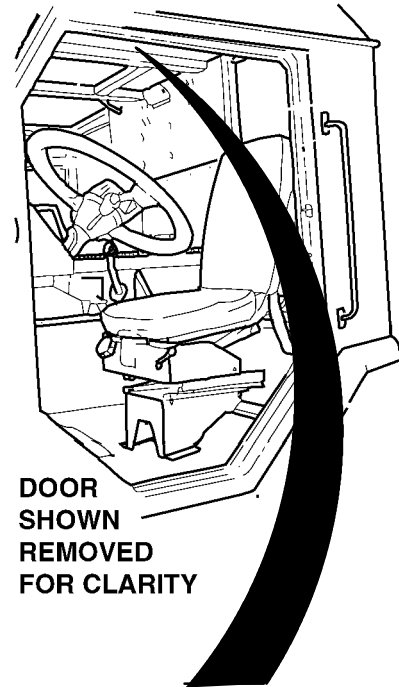
NOTE

Soap and water solution will be used to visually check for leaks.



WARNING

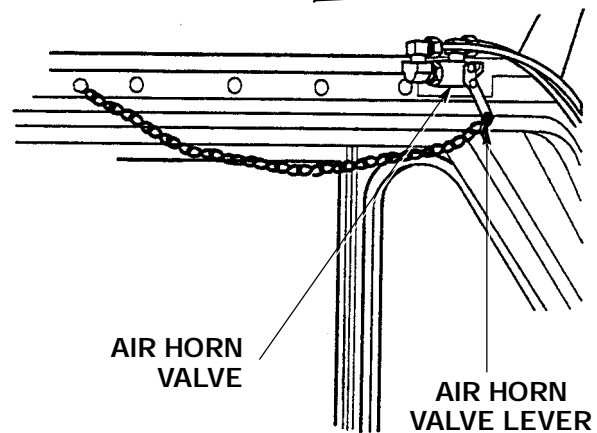
Wear safety goggles when performing leakage tests on valves. Failure to do so may result in serious eye injury due to high pressure air.



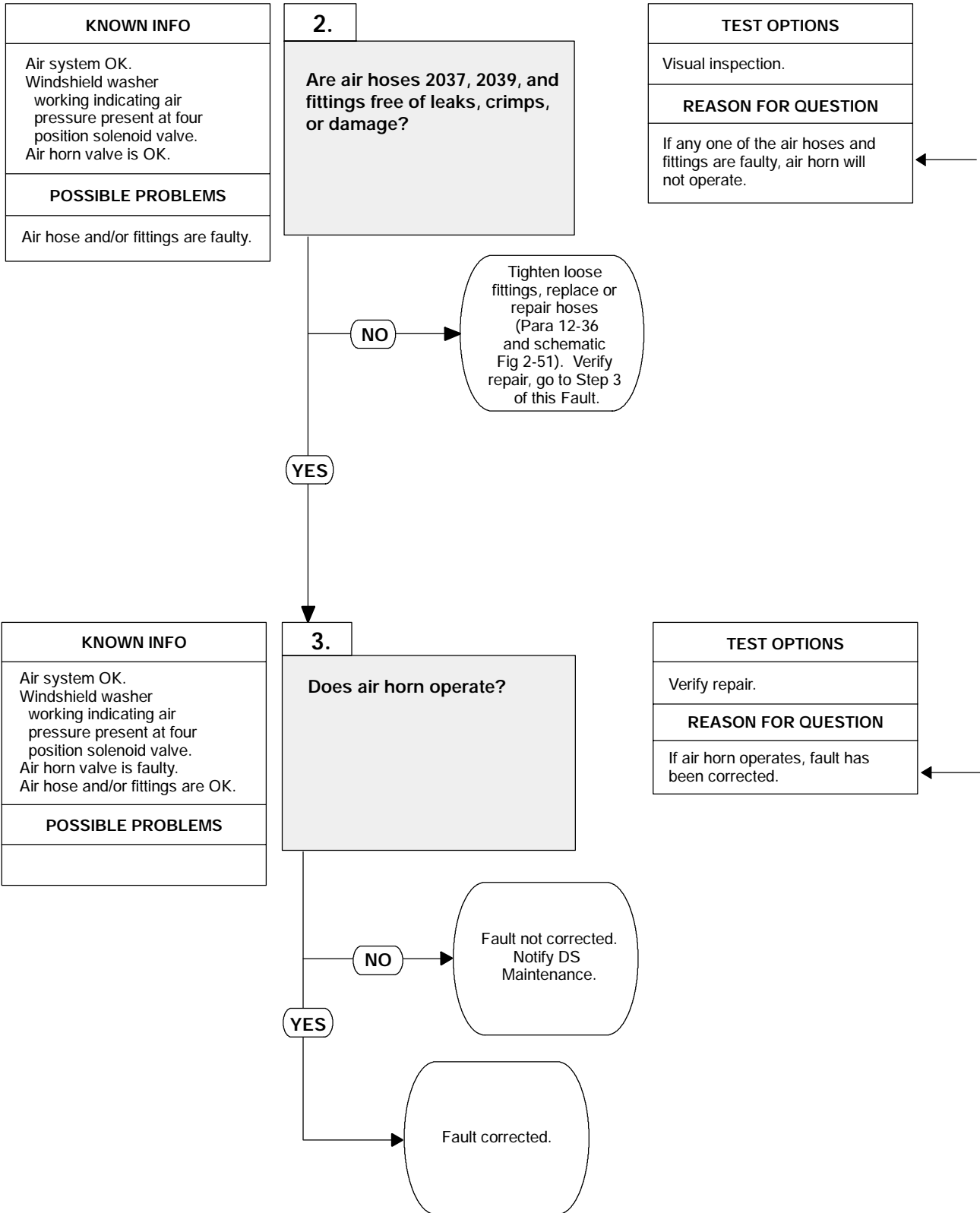
VISUAL INSPECTION

Check air horn valve lever for free movement and air horn valve for damage or leaks.

- (1) If air horn valve lever does not have free movement and/or air horn valve is damaged or leaking, replace air horn valve (Para 19-11).
- (2) If air horn valve lever has free movement and/or air horn valve is not damaged or leaking, go to Step 2 of this Fault.



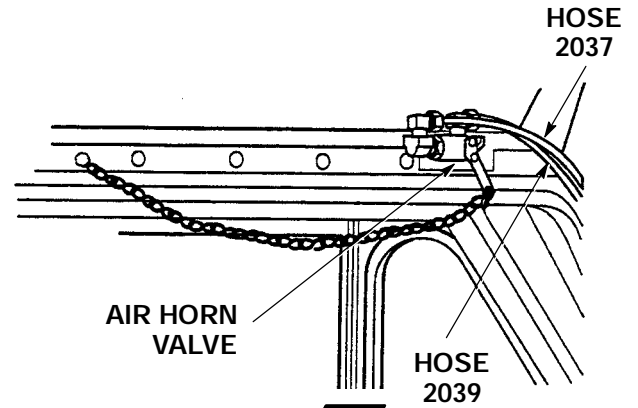
6. AIR HORN WILL NOT OPERATE (CONT).



VISUAL INSPECTION

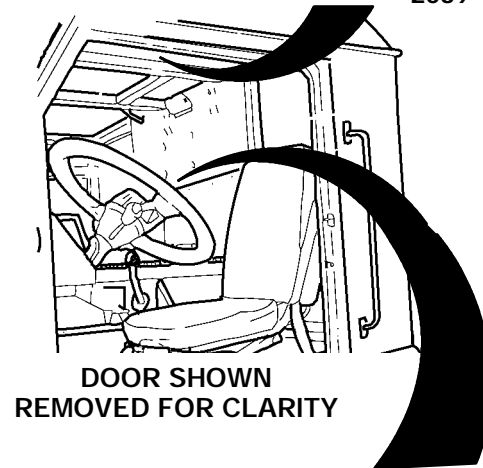
Check air hose 2037 and 2039 for damage, crimps or leaks (Para 12-36 and schematic Fig 2-51).

- (1) If air hose(s) are damaged, crimped or leaking; tighten fittings, replace hoses (Para 12-36 and schematic Fig 2-51).
- (2) If there are no leaks, crimps or damage, air hoses and fittings are OK.



AIR HORN VALVE

HOSE 2039

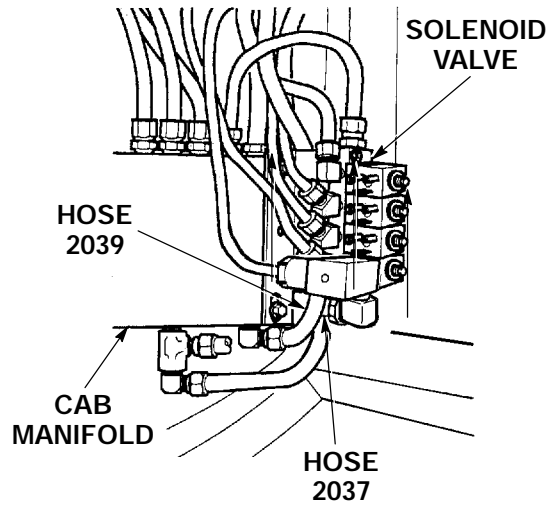


DOOR SHOWN REMOVED FOR CLARITY

VERIFY REPAIR

Pull down on air horn chain.

- (1) If air horn fails to operate, fault not corrected. Notify DS Maintenance.
- (2) If air horn operates, fault has been corrected.

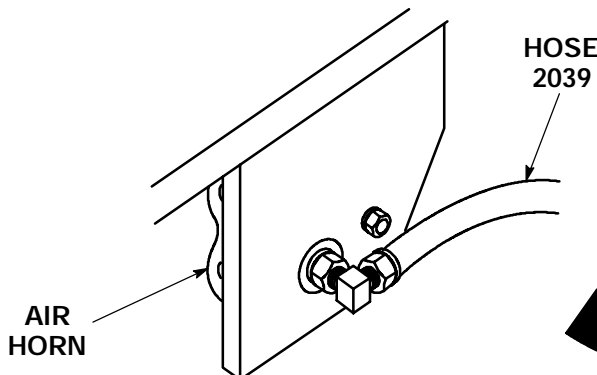


SOLENOID VALVE

HOSE 2039

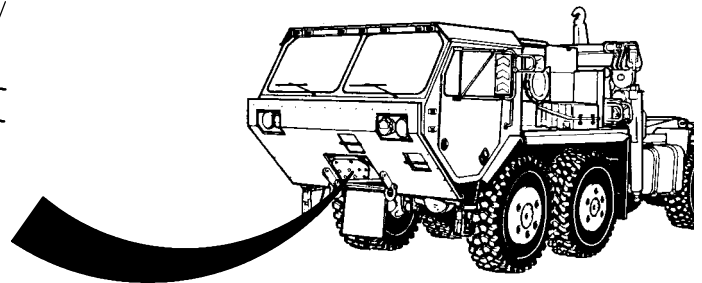
CAB MANIFOLD

HOSE 2037



AIR HORN

HOSE 2039



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING.

This paragraph covers Load Handling System (LHS) Troubleshooting. The LHS Fault Index, Table 2-53, lists faults for the LHS of the PLS truck. Refer to schematics, Figures 2-52 through 2-57 when performing tests and corrective actions.

Table 2-53. Load Handling System Fault Index

Fault No.	Description	Page
1.	LHS Light Does Not Operate	2-2236
2.	LHS No Trans Light Does Not Operate	2-2258
3.	LHS Overload Light Does Not Operate	2-2282
4.	LHS Overload Light Does Not Go Out	2-2300
5.	Loss Of Supply Voltage To Main Junction Box	2-2304
6.	Loss Of Middle Frame Safe Lowering Function	2-2308
7.	Loss Of Hook Arm Safe Lowering Function	2-2324
8.	LHS Does Not Operate	2-2340
9.	Hook Arm Does Not Unload In Manual Mode	2-2362
10.	Hook Arm Does Not Load In Manual Mode	2-2382
11.	Middle Frame Does Not Unload In Manual Mode	2-2402
12.	Middle Frame Does Not Load In Manual Mode	2-2422
13.	LHS Does Not Load In Auto Mode	2-2440
14.	LHS Does Not Unload In Auto Mode	2-2458
15.	LHS Inoperative With Interface Kit Installed	2-2474

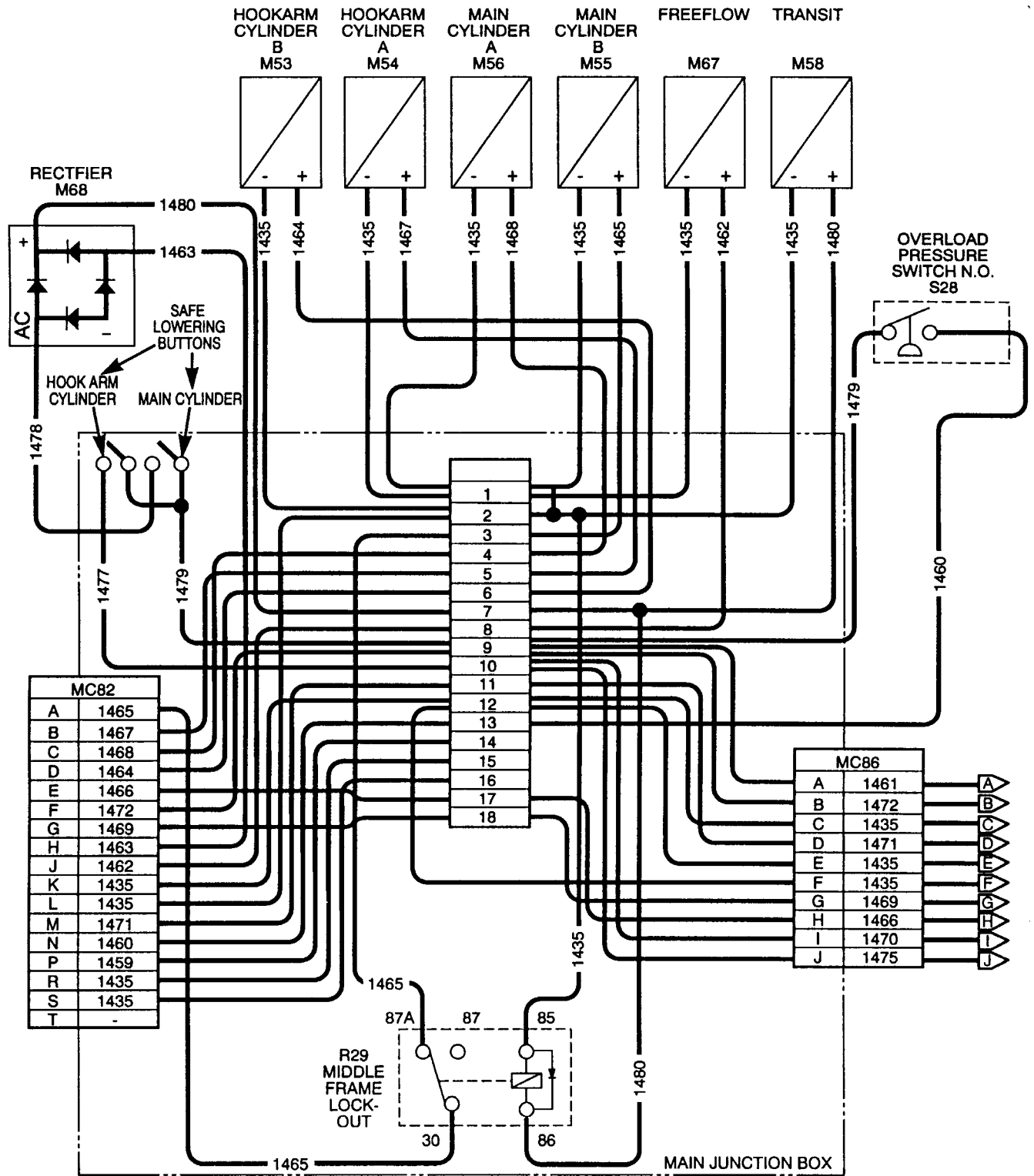


Figure 2-52. LHS and Main Hydraulics Wiring Schematic (Sheet 1 of 4)

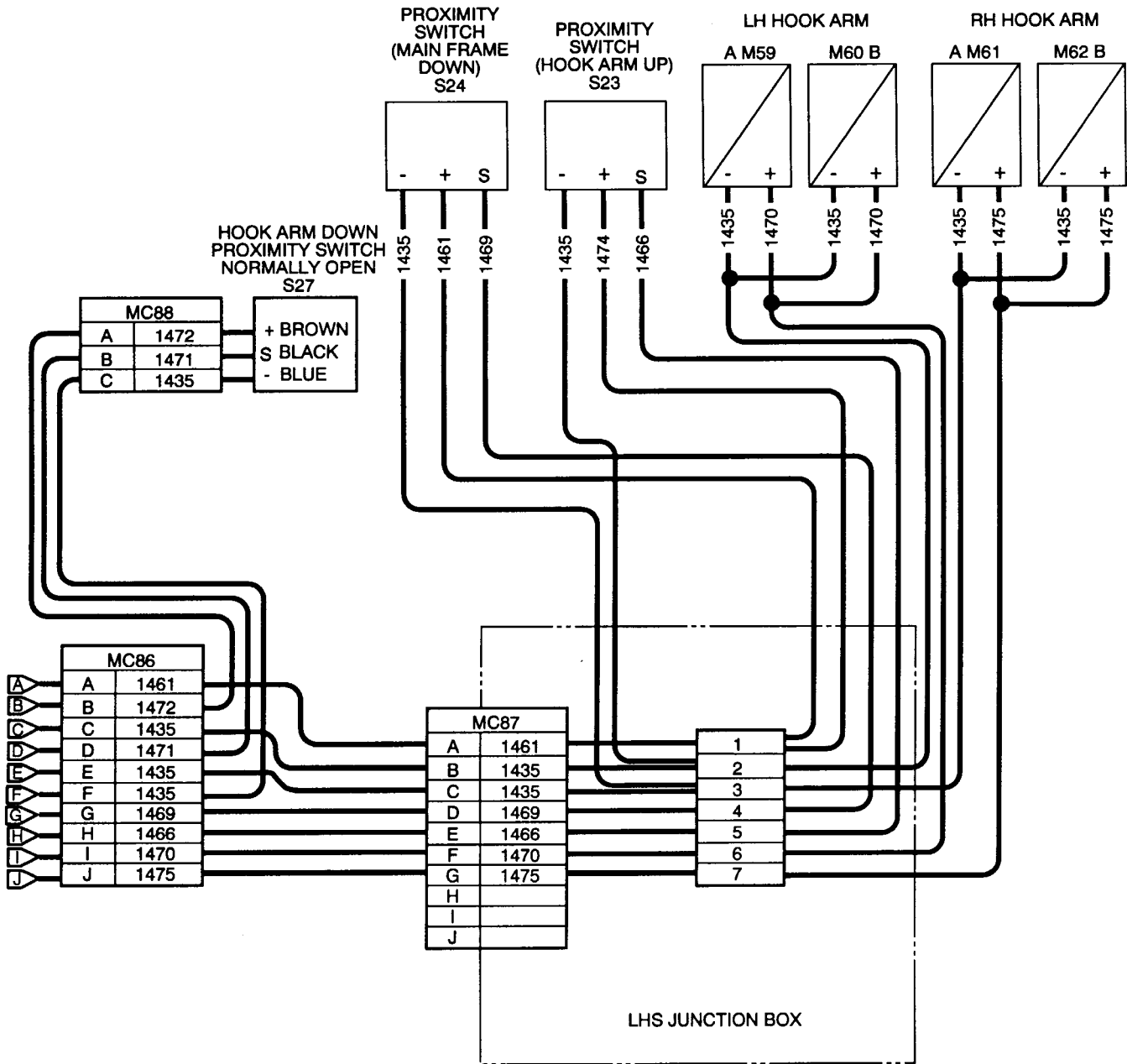


Figure 2-52. LHS and Main Hydraulics Wiring Schematic (Sheet 2 of 4)

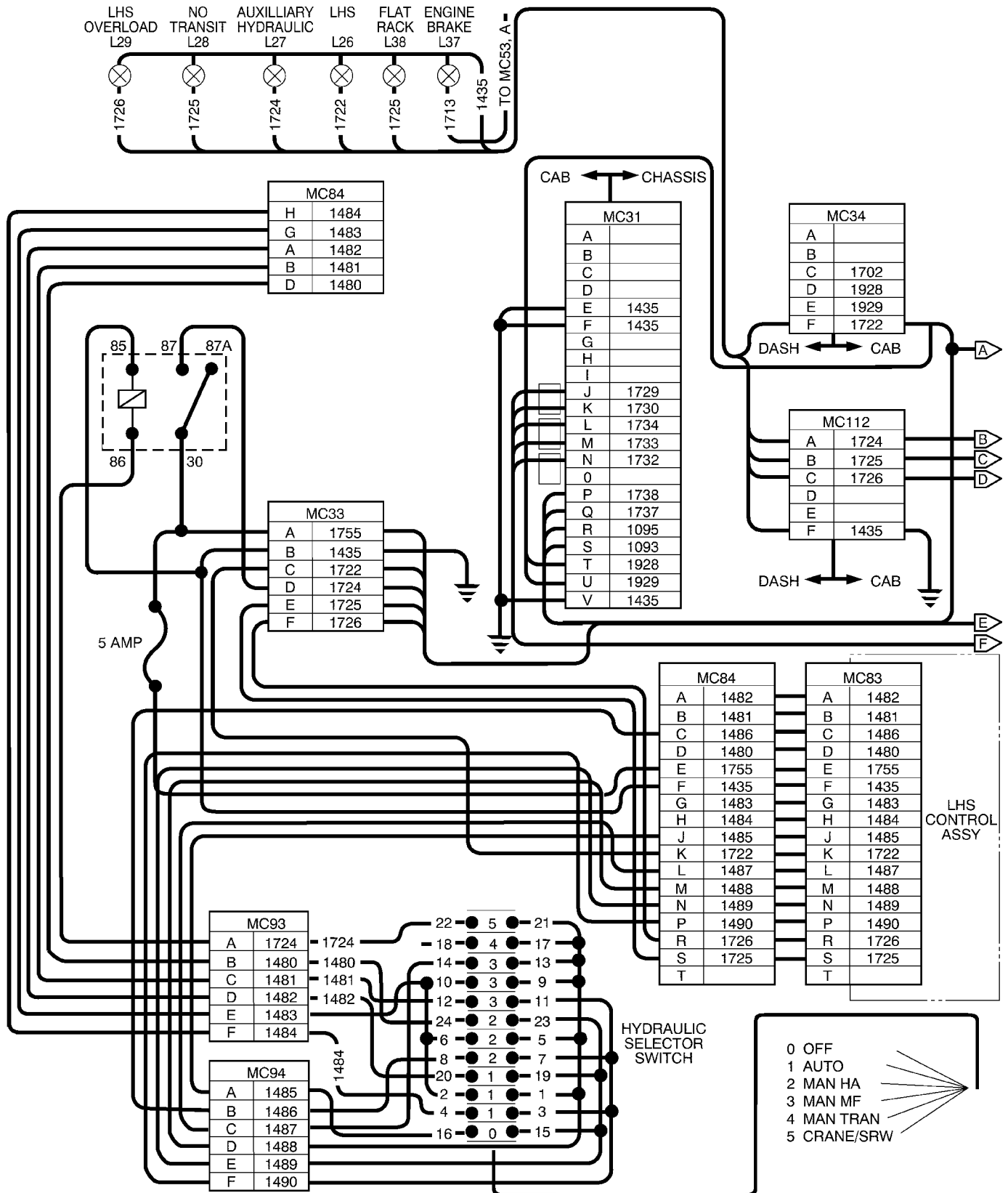


Figure 2-52. LHS and Main Hydraulics Wiring Schematic (Sheet 3 of 4)

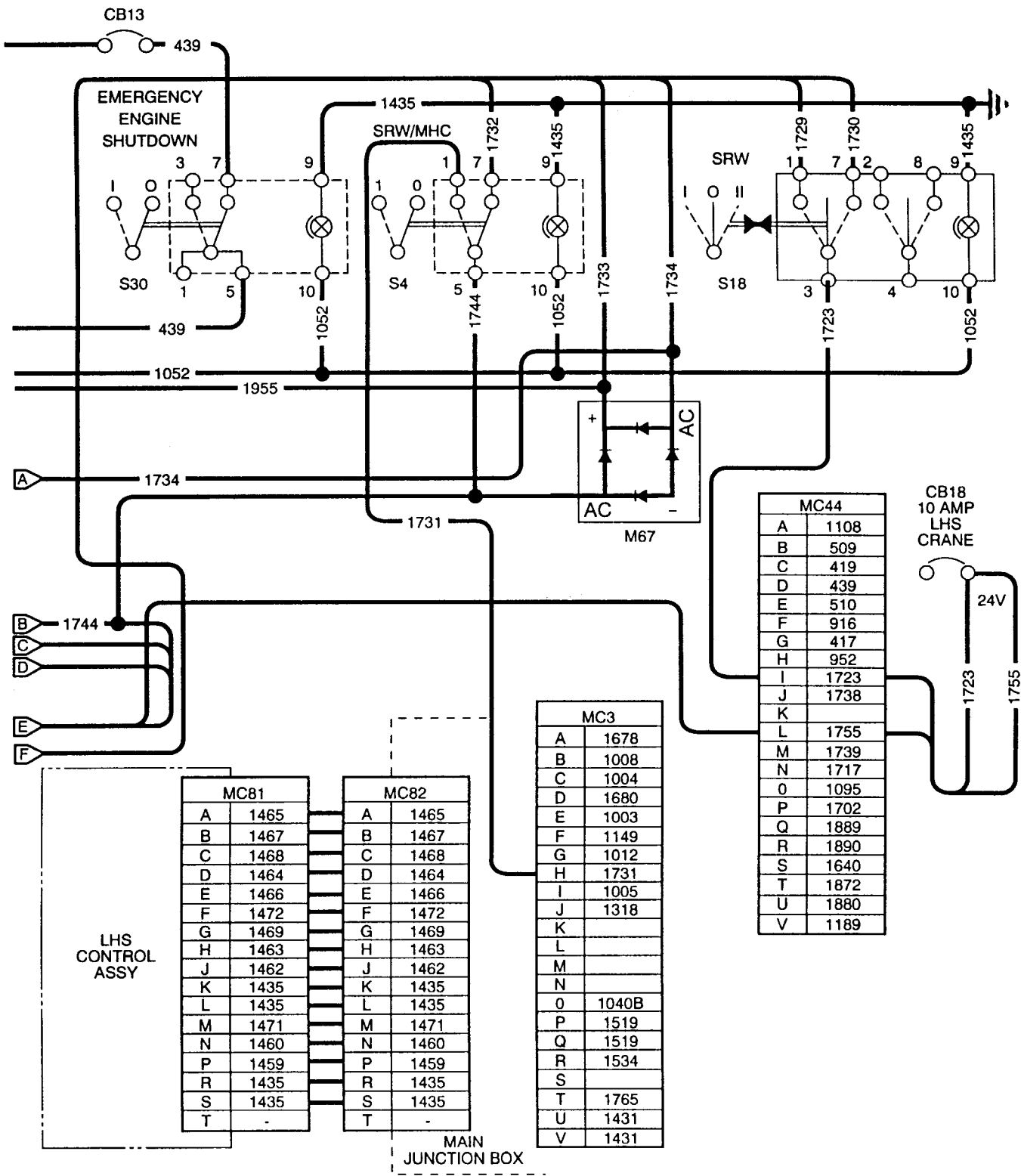


Figure 2-52. LHS and Main Hydraulics Wiring Schematic (Sheet 4 of 4)

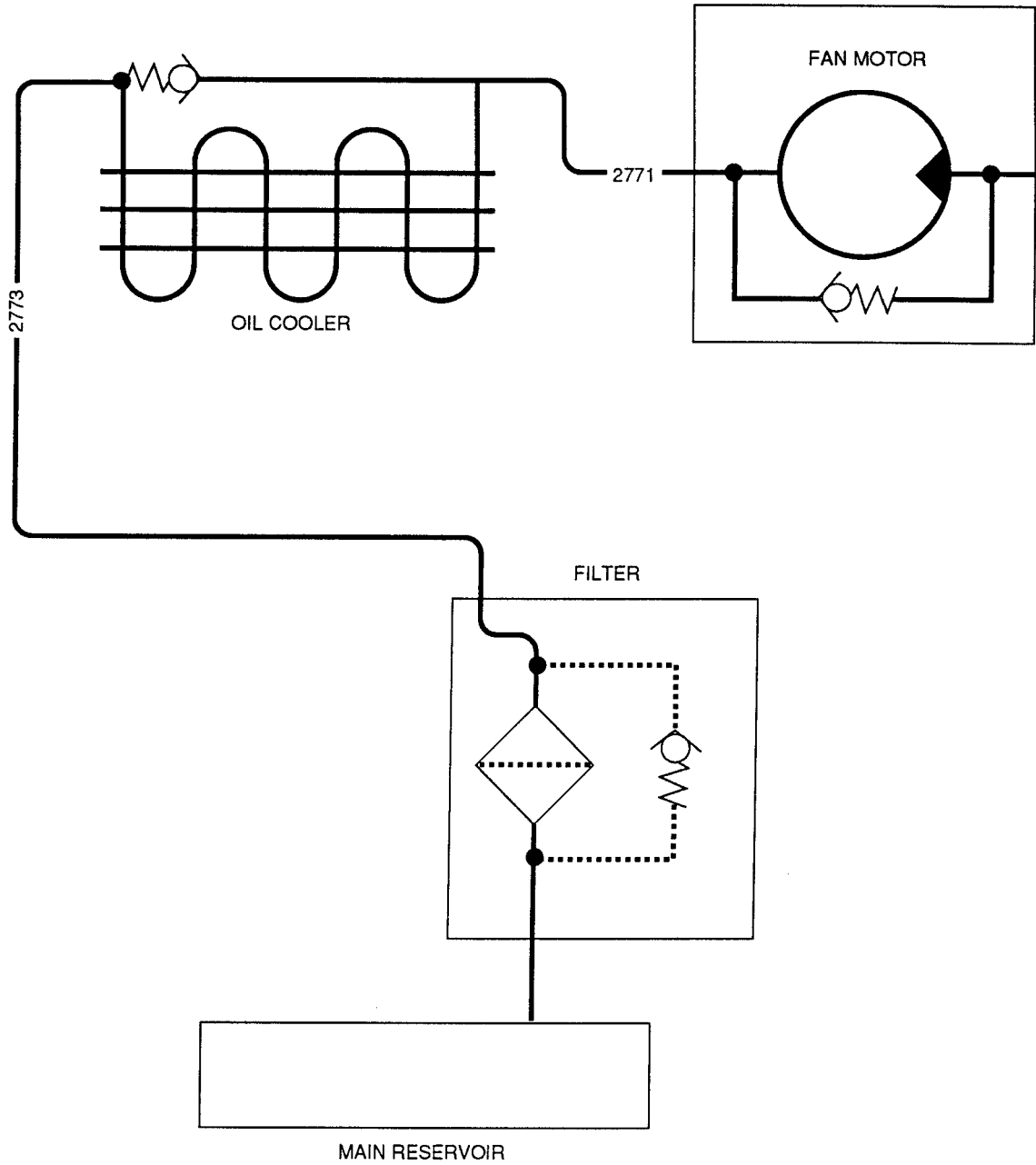


Figure 2-53. LHS Hydraulic Diagram

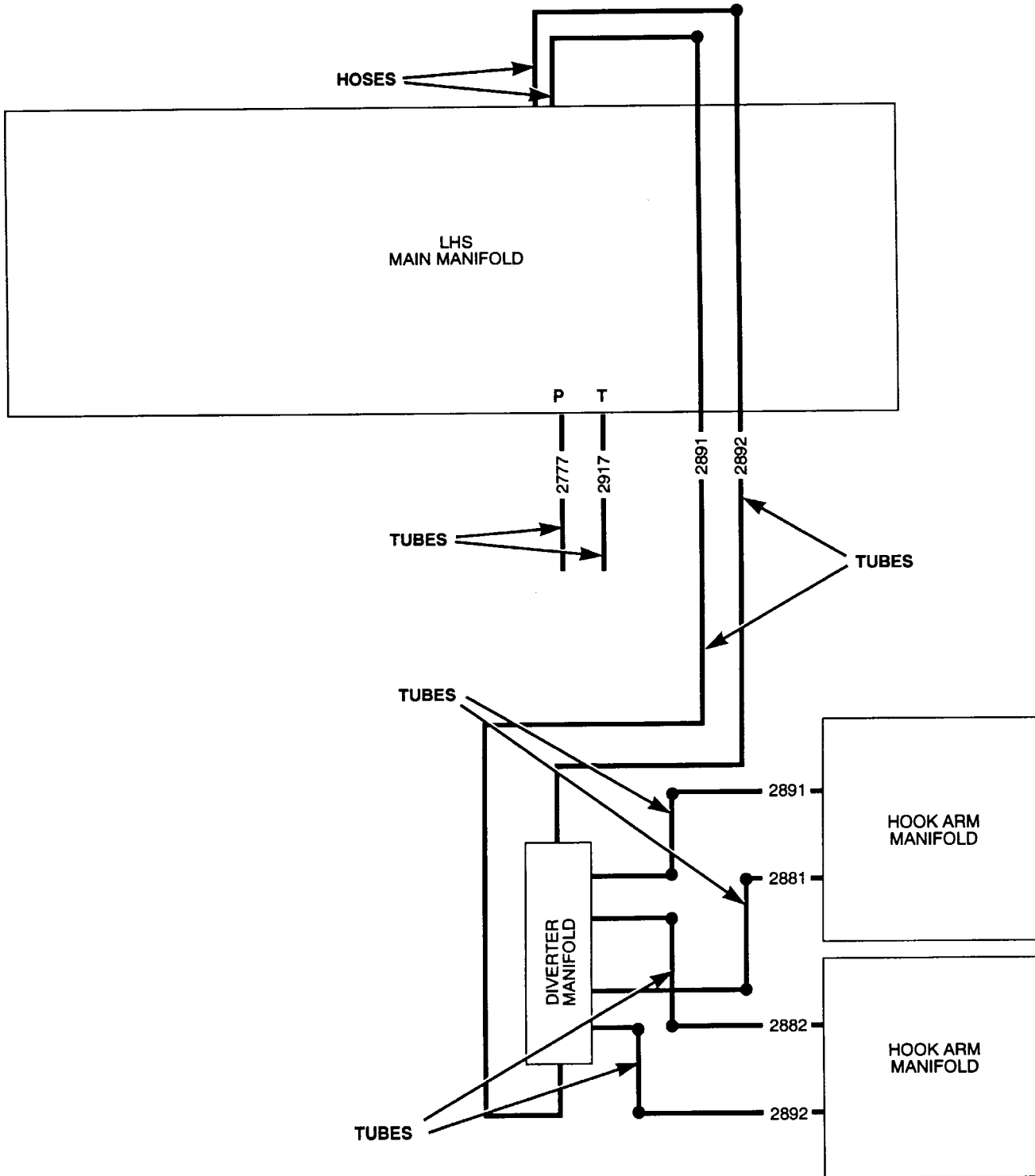


Figure 2-54. LHS Hook Arm Hydraulic Diagram

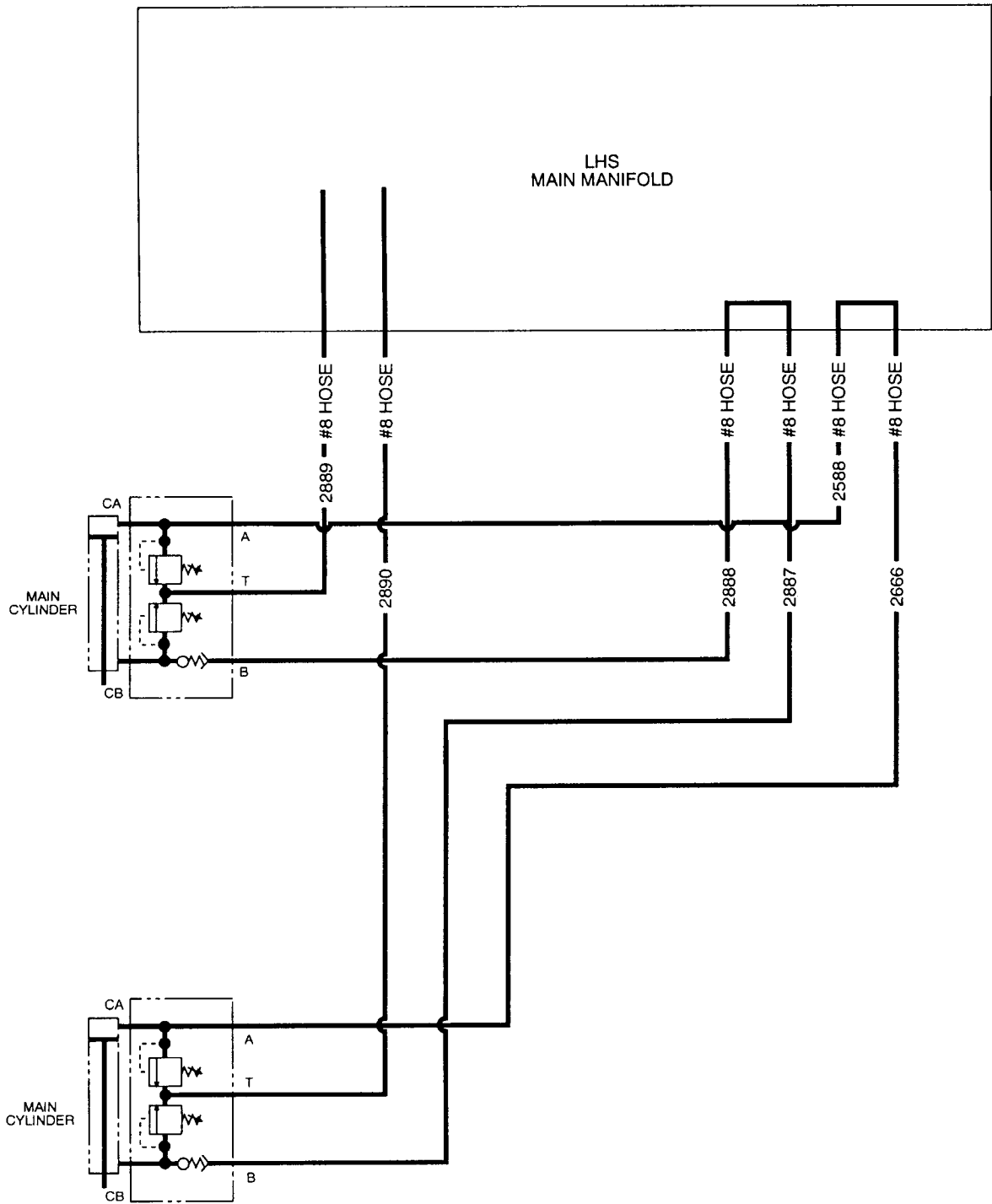


Figure 2-55. LHS Middle Frame Hydraulic Diagram

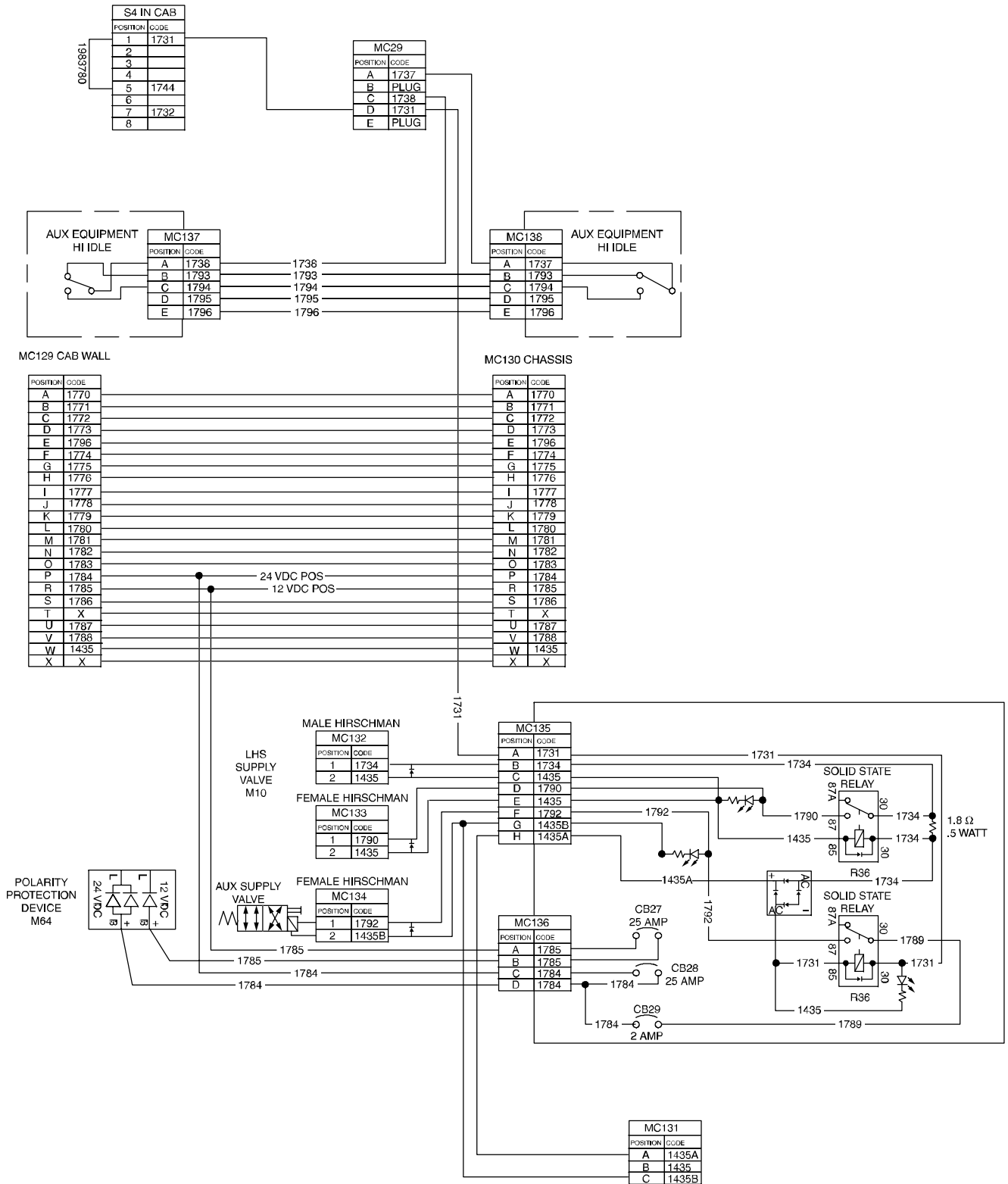


Figure 2-57. Interface Wiring Diagram

2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

1. LHS LIGHT DOES NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

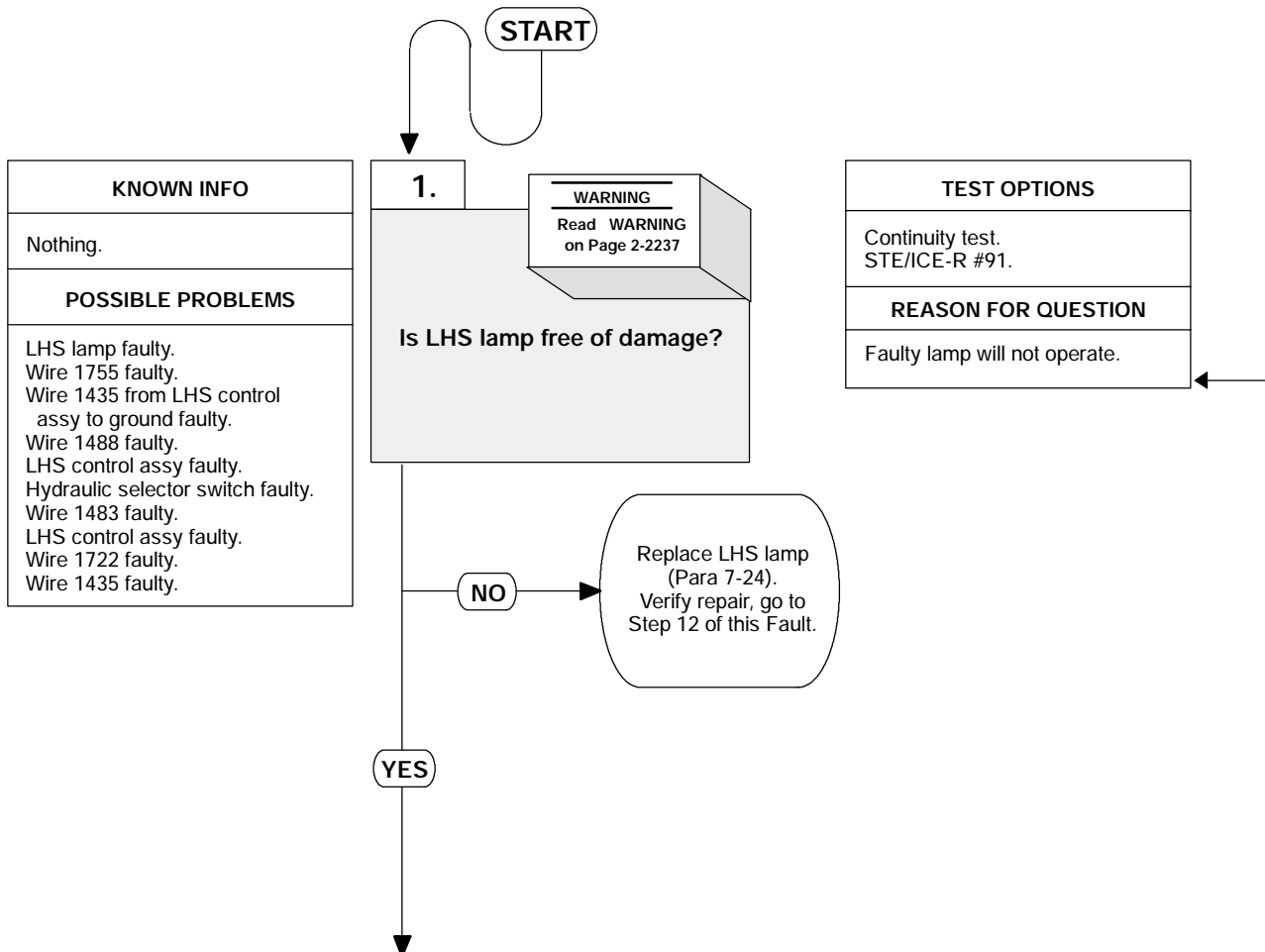
Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

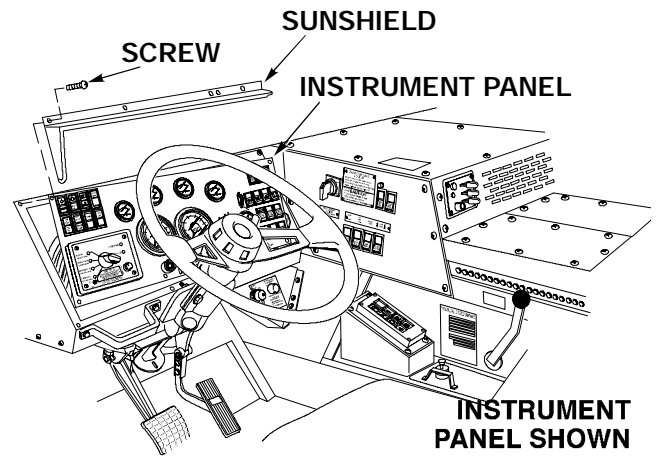
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brakes applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)

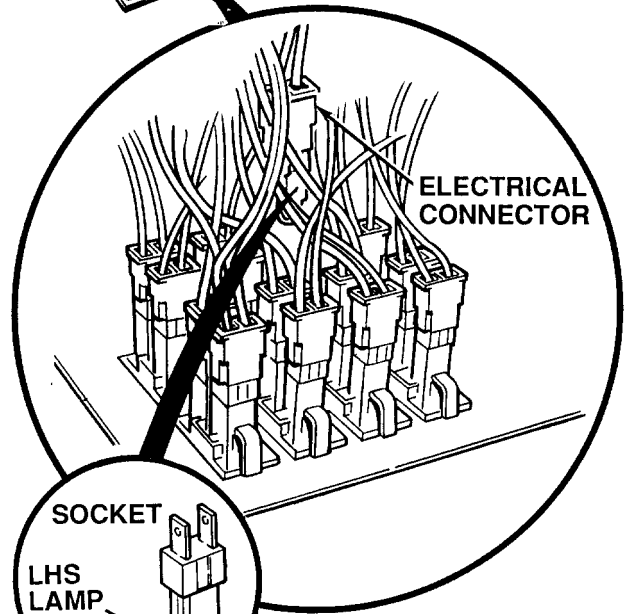
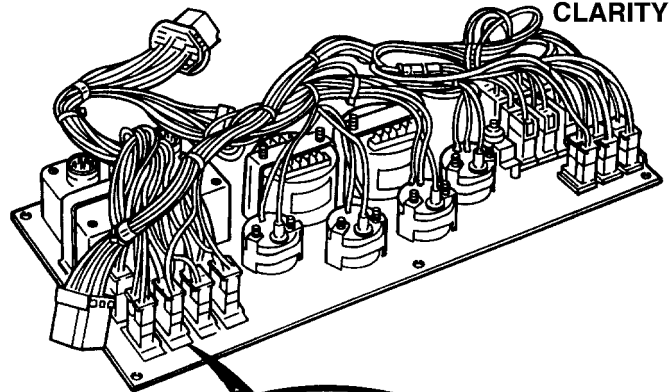


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- CONTINUITY TEST**
- (1) Remove ten screws and sunshield from instrument panel.
 - (2) Pull top of instrument panel toward steering wheel.
 - (3) Disconnect electrical connector from LHS lamp socket.
 - (4) Remove lamp and socket from instrument panel.
 - (5) Set multimeter select switch to ohms.
 - (6) Is there continuity between terminals of lamp?
 - (a) If there is no continuity, replace LHS lamp (Para 7-24) and perform Steps (7) and (8) below.
 - (b) If there is continuity, LHS lamp is OK, go to Step 2 of this Fault.
 - (7) Install LHS lamp and socket in instrument panel.
 - (8) Install instrument panel and sunshield with ten screws.



1. LHS LIGHT DOES NOT OPERATE (CONT).

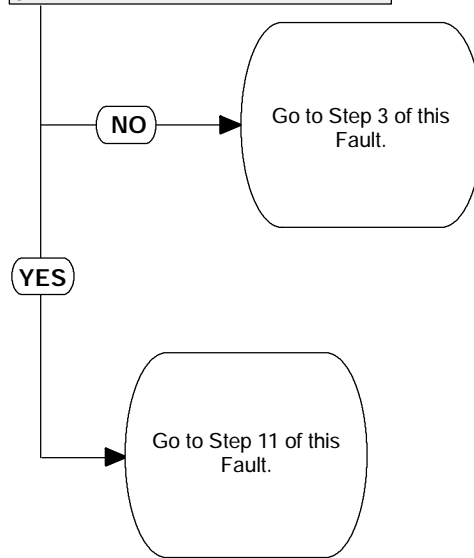
KNOWN INFO
LHS lamp OK.
POSSIBLE PROBLEMS
Wire 1755 faulty. Wire 1435 from LHS control assy to ground faulty. Wire 1488 faulty. LHS control assy faulty. Hydraulic selector switch faulty. Wire 1483 faulty. LHS control assy faulty. Wire 1722 faulty. Wire 1435 faulty.

2.

WARNING
Read **WARNING** on Page 2-2239

Are 22 to 28 vdc measured on wire 1722 at LHS lamp connector with ENGINE switch ON and hydraulic selector switch in MAN HA position?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If components supplying voltage to LHS lamp are faulty, 22 to 28 vdc will not be present at LHS lamp.

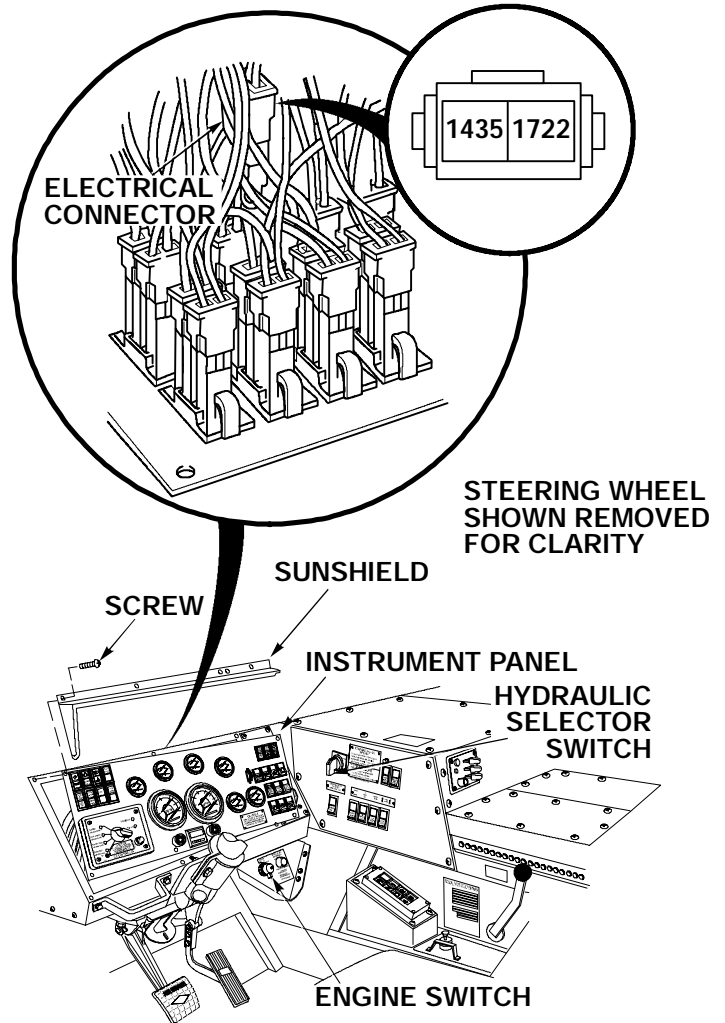


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Set multimeter select switch to volts dc.
- (2) Connect positive (+) multimeter lead to wire 1722 at LHS lamp electrical connector terminal.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
- (5) Set hydraulic selector switch to MAN HA position.
 - (a) If 22 to 28 vdc are not present, perform Steps (6) through (9) below and go to Step 3 of this Fault.
 - (b) If 22 to 28 vdc are present, perform Steps (6) through (9) below and go to Step 11 of this Fault.
- (6) Set hydraulic selector switch to OFF position.
- (7) Turn OFF ENGINE switch.
- (8) Install LHS lamp and socket in instrument panel.
- (9) Install instrument panel and sunshield with ten screws.



1. LHS LIGHT DOES NOT OPERATE (CONT).

KNOWN INFO
LHS lamp OK.
POSSIBLE PROBLEMS
Wire 1755 faulty. Wire 1435 from LHS control assy to ground faulty. Wire 1488 faulty. LHS control assy faulty. Hydraulic selector switch faulty. Wire 1483 faulty. LHS control assy faulty. Wire 1722 faulty. Wire 1435 faulty.

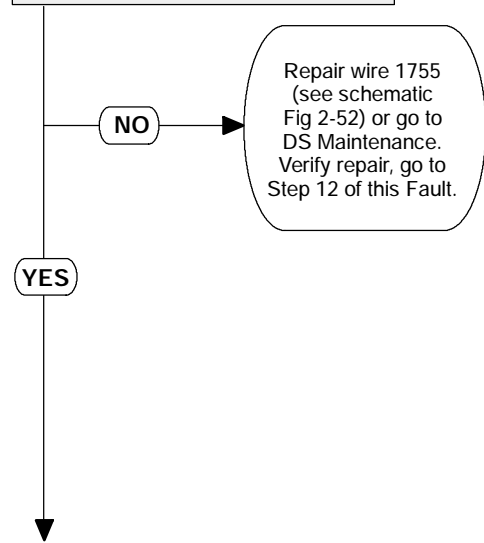
3.

WARNING

Read **WARNING** on Page 2-2241

Are 22 to 28 vdc measured on wire 1755 at connector MC83, terminal E with ENGINE switch ON?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If wire 1755 is loose, faulty, or shorted to ground, 22 to 28 vdc will not be present at LHS control assy. ←



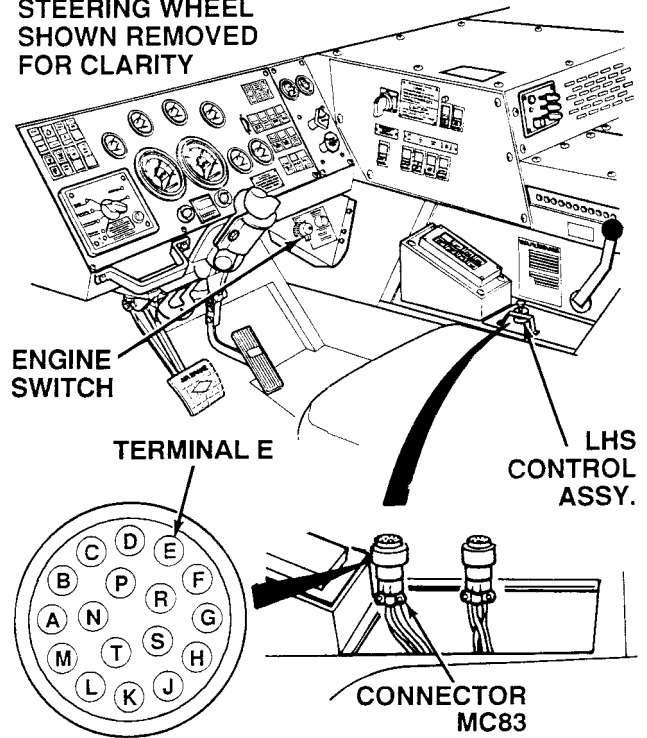
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

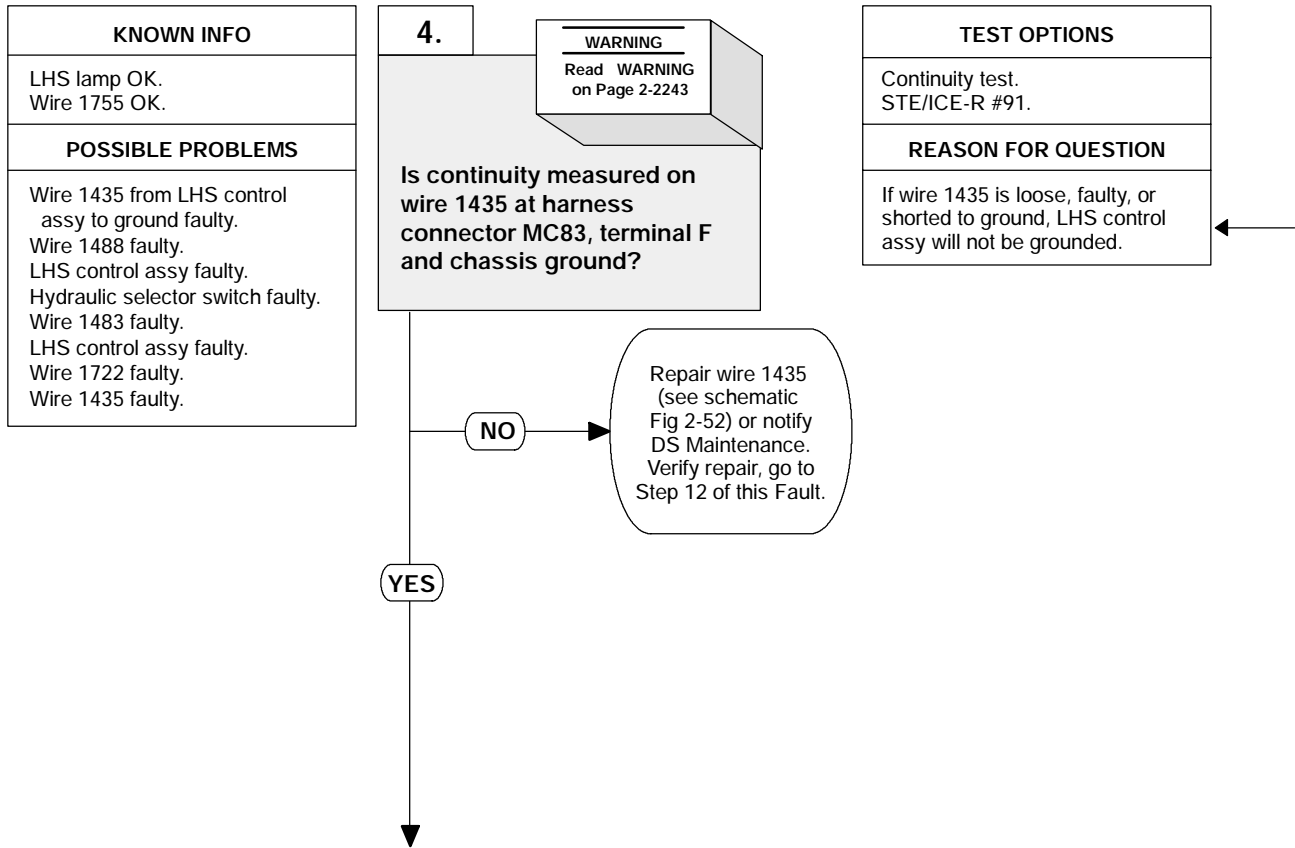
VOLTAGE TEST

- (1) Remove LHS control assy (Para 7-40).
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead to wire 1755 at connector MC83, terminal E.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch.
 - (a) If there are not 22 to 28 vdc present, perform Step (6) below and repair wire 1755 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there are 22 to 28 vdc present, wire 1755 is OK.
- (6) Turn OFF ENGINE switch.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**



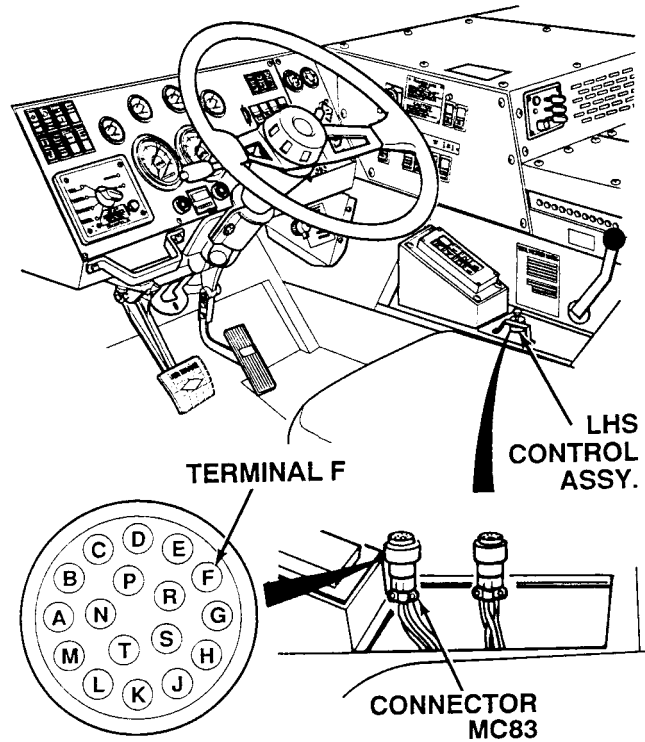
1. LHS LIGHT DOES NOT OPERATE (CONT).



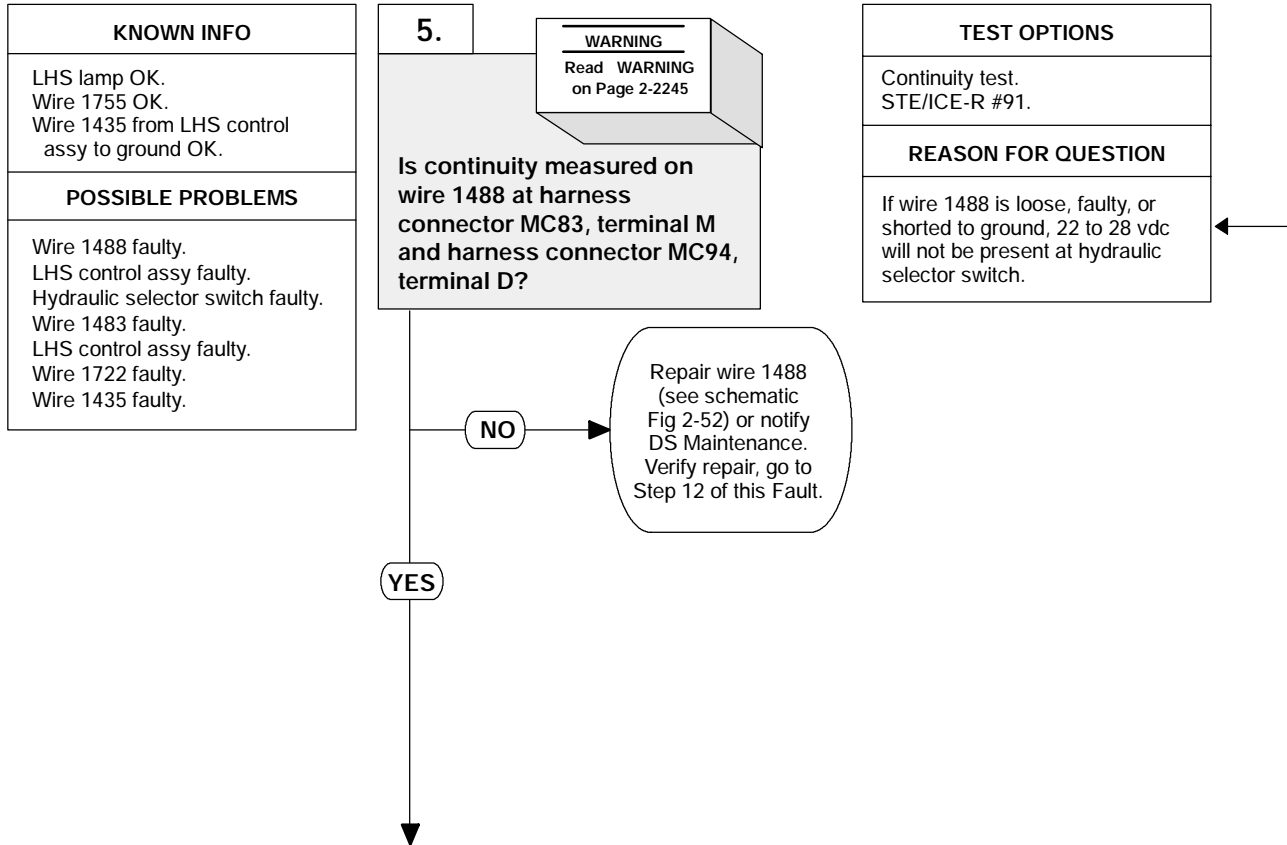
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | CONTINUITY TEST | |
|-----------------|--|
| (1) | Set multimeter select switch to ohms. |
| (2) | Is there continuity between harness connector MC83, terminal F and a known good ground? |
| (a) | If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance. |
| (b) | If there is continuity, wire 1435 is OK. |



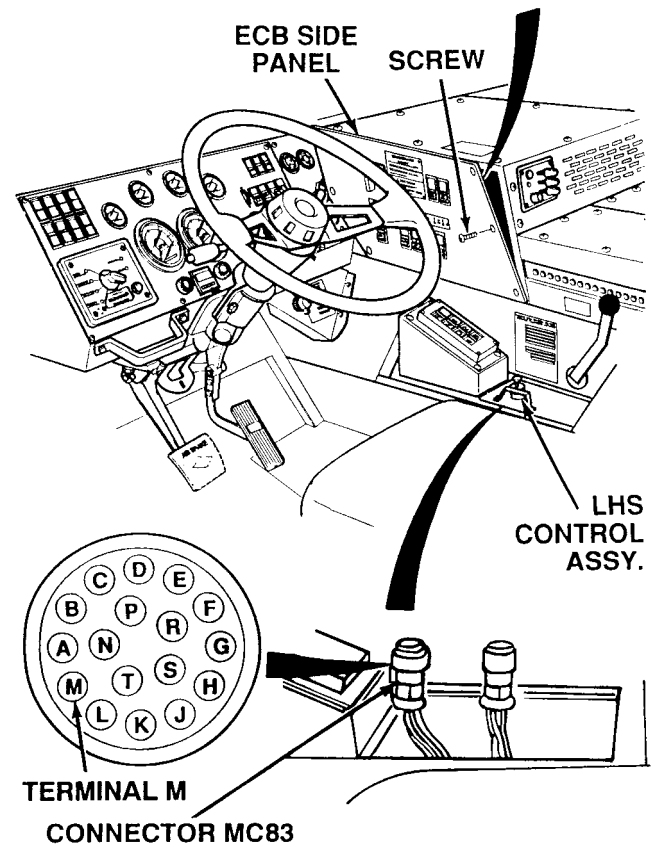
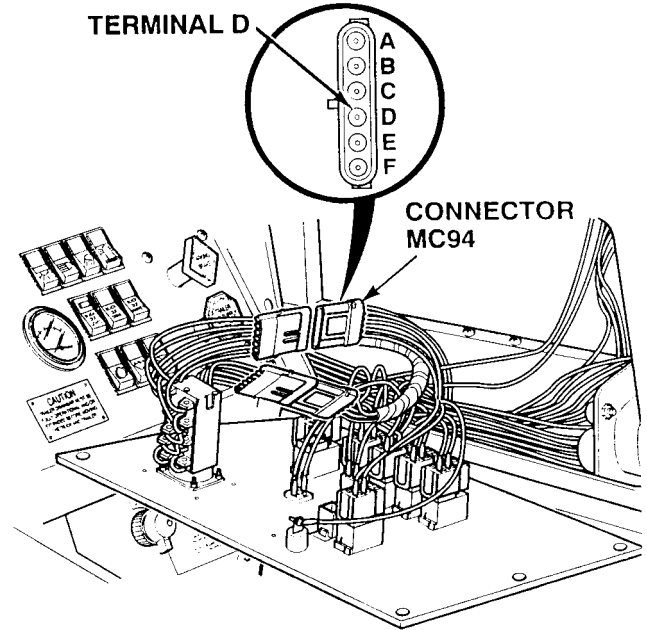
1. LHS LIGHT DOES NOT OPERATE (CONT).



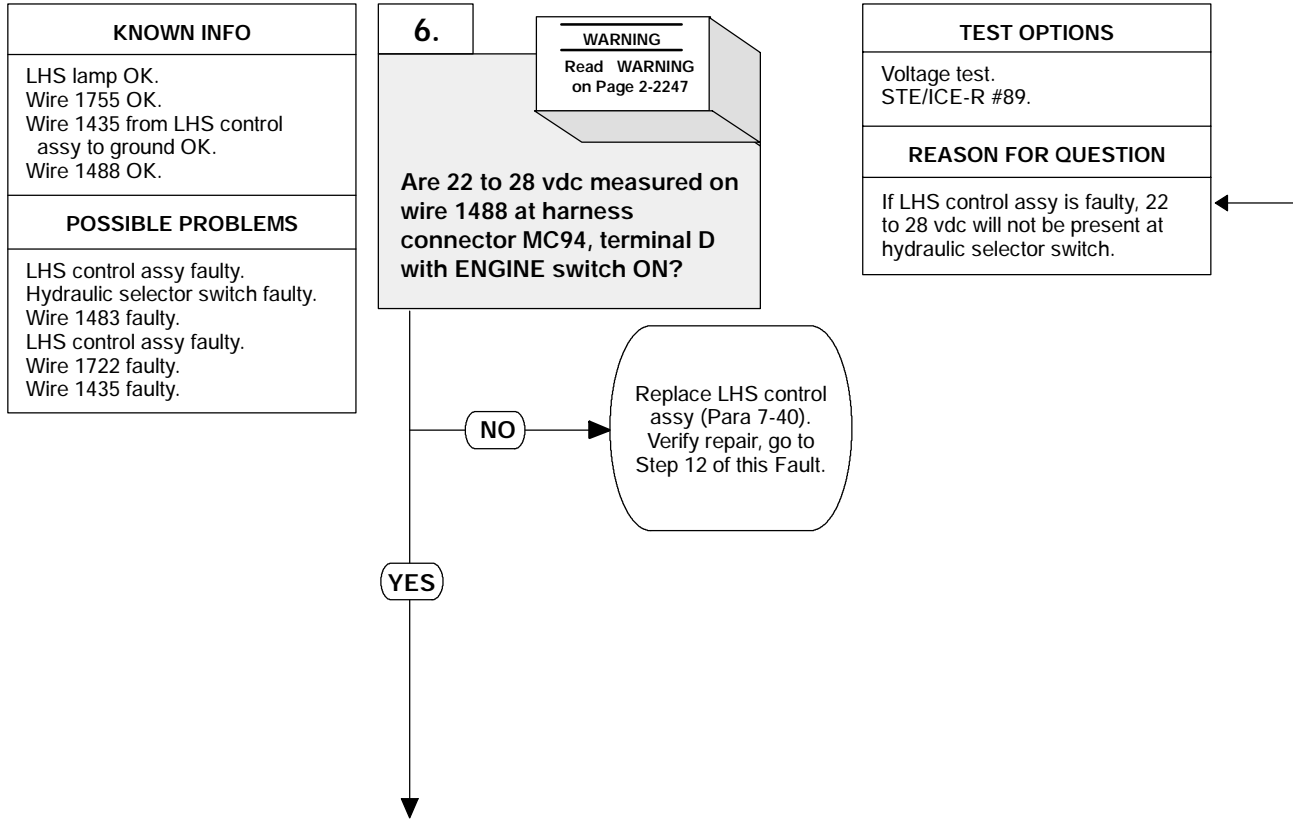
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | CONTINUITY TEST |
|--|
| (1) Remove six screws and tilt ECB side panel. |
| (2) Disconnect harness connector MC94. |
| (3) Is there continuity between harness connector MC83, terminal M and harness connector MC94, terminal D? |
| (a) If there is no continuity, repair wire 1488 (see schematic Fig 2-52) and perform Step (4) below or notify DS Maintenance). |
| (b) If there is continuity, wire 1488 is OK. |
| (4) Install LHS control assy (Para 7-40). |



1. LHS LIGHT DOES NOT OPERATE (CONT).

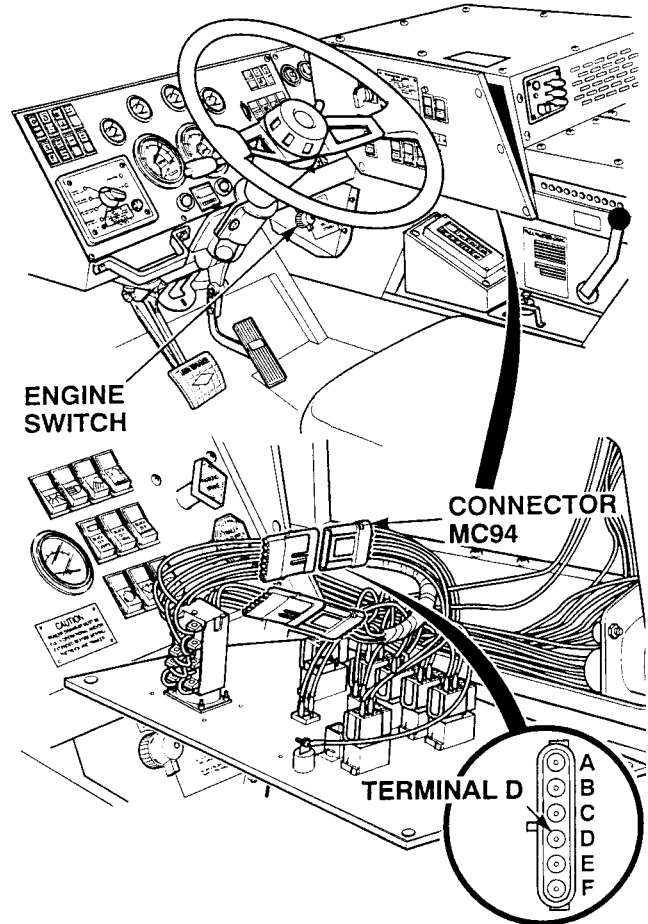


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Set multimeter select switch to volts dc.
- (2) Connect positive (+) multimeter lead on wire 1488 at harness connector MC94, terminal D.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch.
 - (a) If there are not 22 to 28 vdc present, perform Step (5) below and replace LHS control assy (Para 7-40).
 - (b) If there are 22 to 28 vdc present, LHS control assy is OK.
- (5) Turn OFF ENGINE switch.



1. LHS LIGHT DOES NOT OPERATE (CONT).

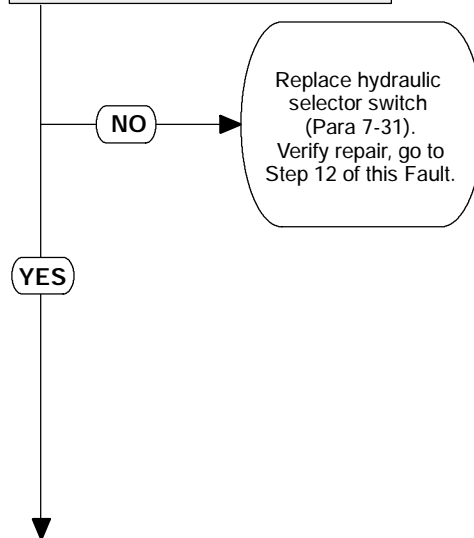
KNOWN INFO
LHS lamp OK. Wire 1755 OK. Wire 1435 from LHS control assy to ground OK. Wire 1488 OK. LHS control assy OK.
POSSIBLE PROBLEMS
Hydraulic selector switch faulty. Wire 1483 faulty. LHS control assy faulty. Wire 1722 faulty. Wire 1435 faulty.

7.

Is continuity measured at hydraulic selector switch harness connector MC93, terminal E and harness connector MC94, terminal D with switch in the MAN HA, MAN MF and AUTO positions?

WARNING
Read WARNING on Page 2-2249

TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If hydraulic selector switch is faulty, 22 to 28 vdc will not be present at LHS light.

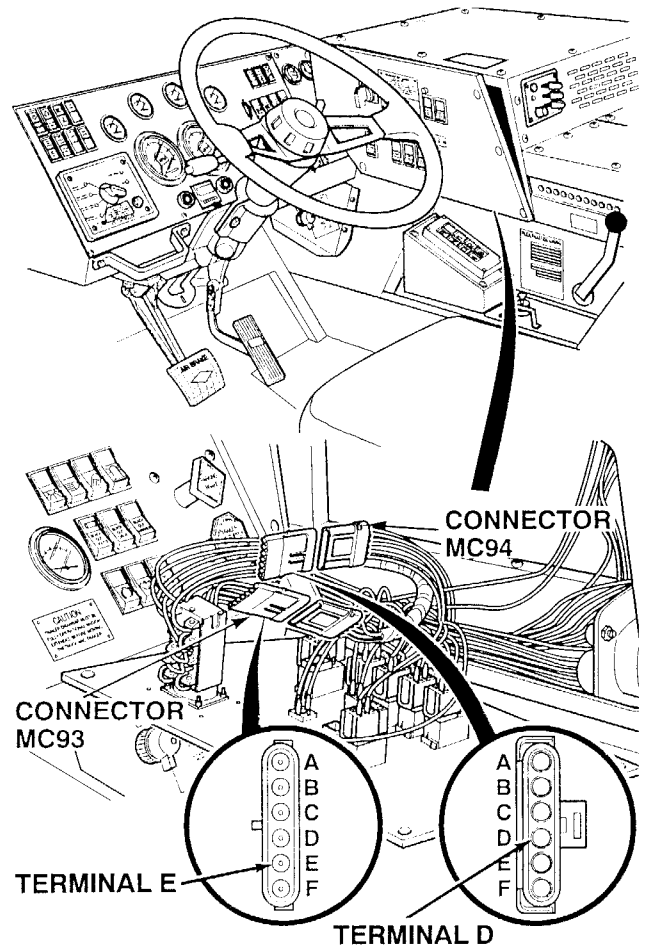


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect harness connector MC93 from switch connector.
- (2) Set hydraulic selector switch to MAN HA position (TM 9-2320-364-10).
- (3) Set multimeter select switch to ohms.
- (4) Is there continuity between harness connector MC93, terminal E and harness connector MC94, terminal D?
 - (a) If there is no continuity, replace hydraulic selector switch (Para 7-31) and perform Steps (7) and (8) below.
 - (b) If there is continuity, perform Step (5) below.
- (5) Set hydraulic selector switch to MAN MF and repeat Step (4) above. If there is continuity, perform Step (6) below.
- (6) Set hydraulic selector switch to AUTO and repeat Step (4) above. If there is continuity, hydraulic selector switch is OK and perform Steps (7) and (8) below.
- (7) Set hydraulic selector switch to OFF position.
- (8) Connect harness connector MC94 to switch connector.



1. LHS LIGHT DOES NOT OPERATE (CONT).

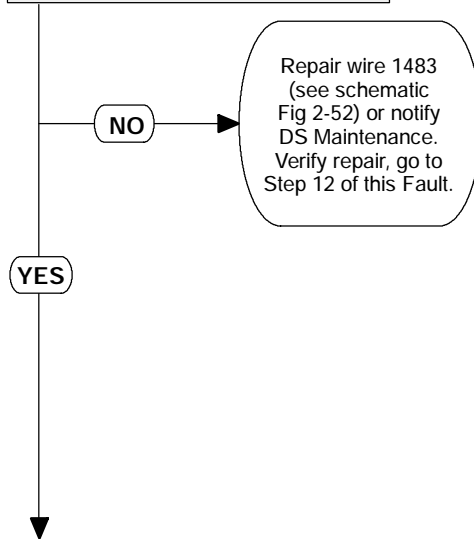
KNOWN INFO
LHS lamp OK. Wire 1755 OK. Wire 1435 from LHS control assy to ground OK. Wire 1488 OK. LHS control assy OK. Hydraulic selector switch OK.
POSSIBLE PROBLEMS
Wire 1483 faulty. LHS control assy faulty. Wire 1722 faulty. Wire 1435 faulty.

8.

WARNING
Read WARNING
on Page 2-2251

Is continuity measured on wire 1483 at harness connector MC83, terminal G and harness connector MC93, terminal E?

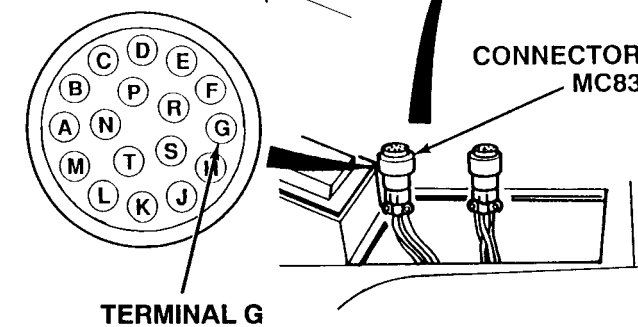
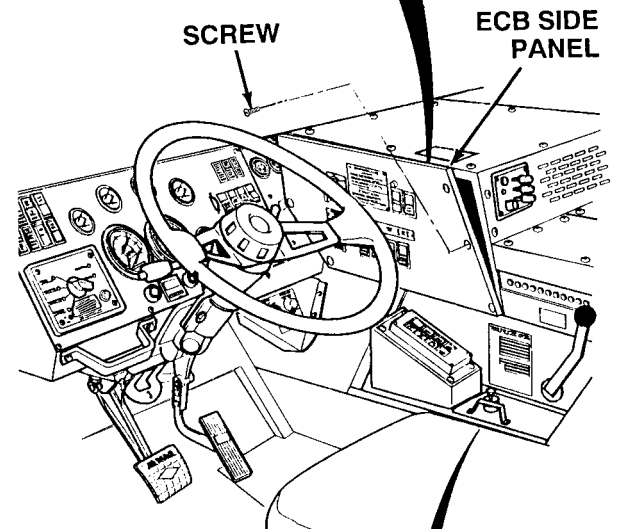
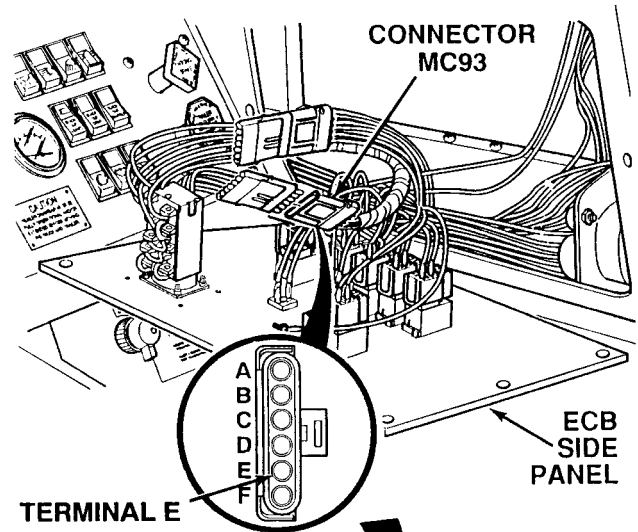
TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1483 is loose, faulty, or shorted to ground, 22 to 28 vdc will not be present at LHS control assy.



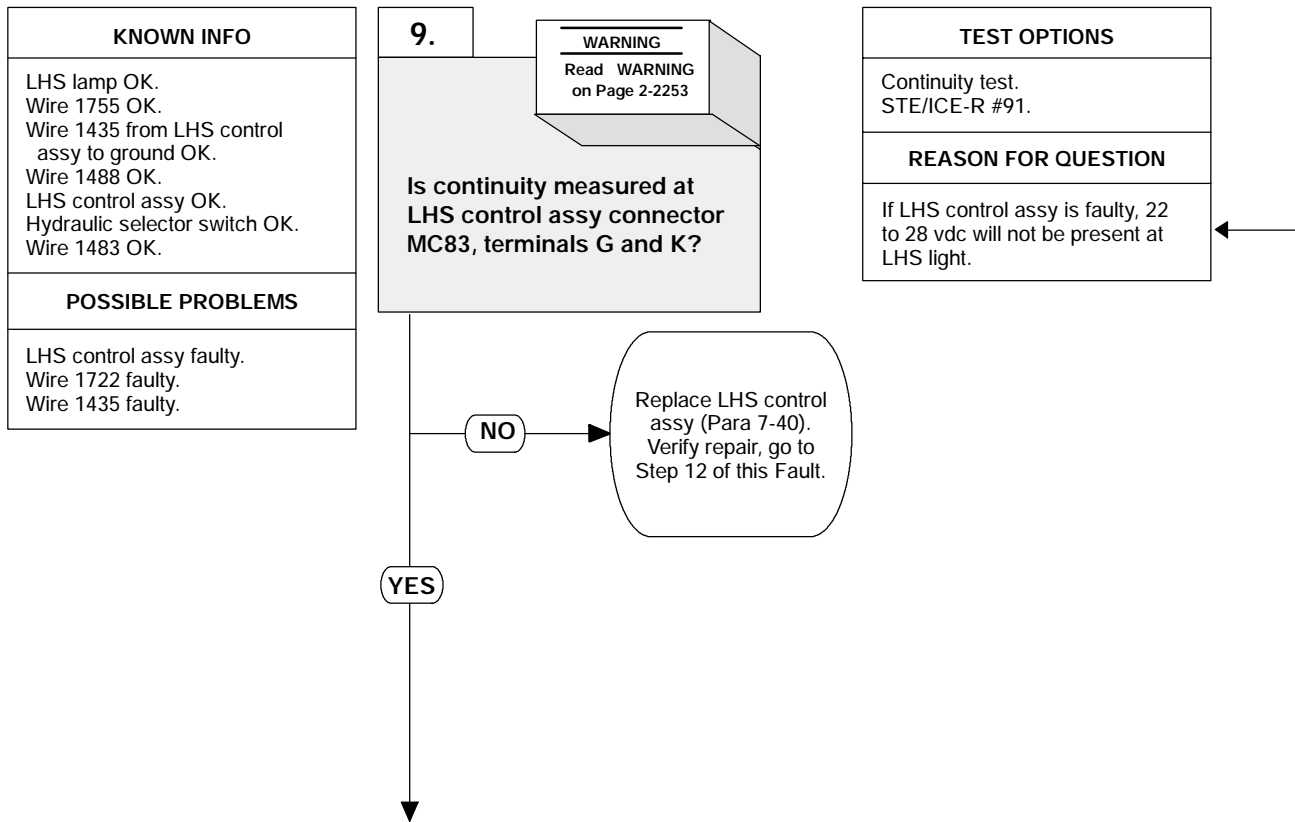
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Remove LHS control assy (Para 7-40).
 - (2) Set multimeter select switch to ohms.
 - (3) Is there continuity between harness connector MC83, terminal G and harness connector MC93, terminal E?
 - (a) If there is no continuity, repair wire 1483 (see schematic Fig 2-52) and perform Steps (4) and (5) below or notify DS Maintenance.
 - (b) If there is continuity, wire 1483 is OK.
 - (4) Connect harness connector MC93.
 - (5) Install ECB side panel and six screws.



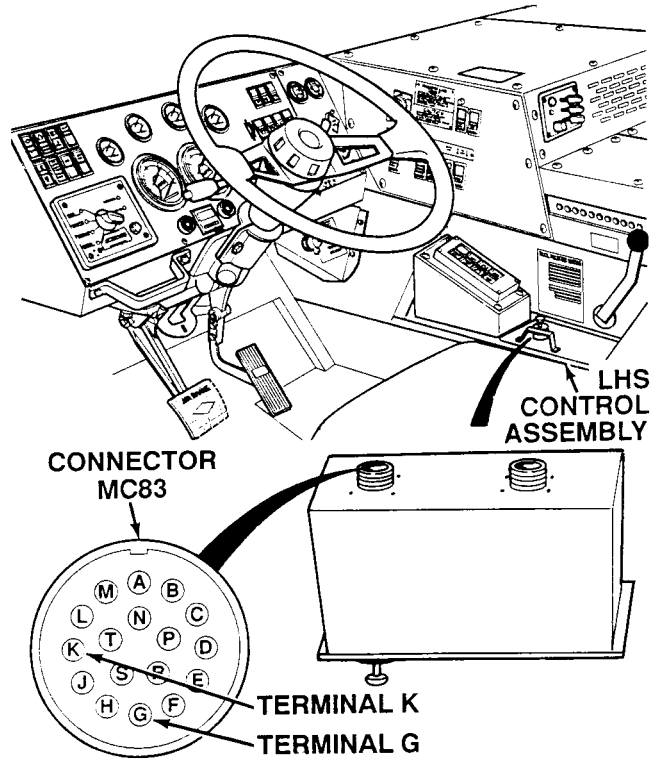
1. LHS LIGHT DOES NOT OPERATE (CONT).



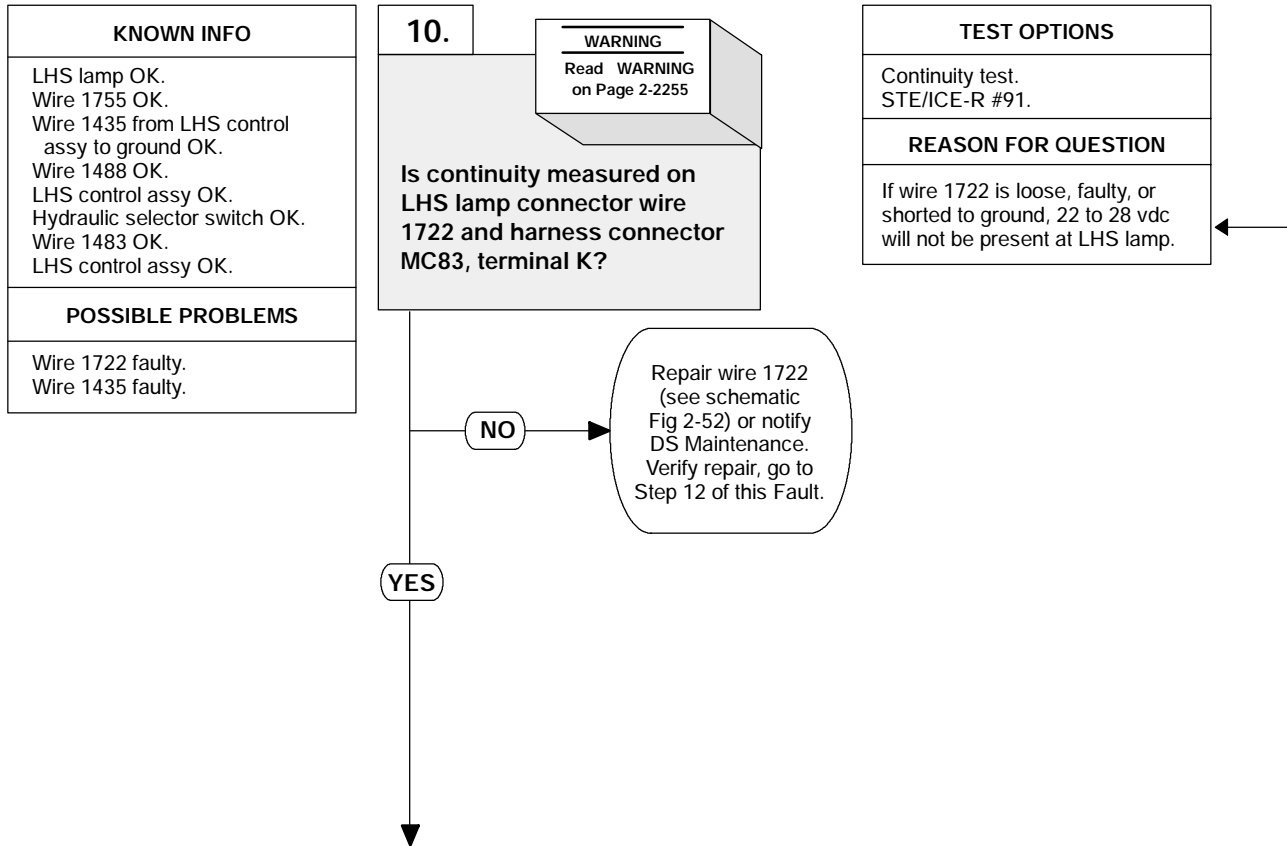
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
(1) Set multimeter select switch to ohms. (2) Is there continuity between LHS control assy connector MC83, terminals G and K? (a) If there is no continuity, replace LHS control assy (Para 7-40). (b) If there is continuity, LHS control assy is OK.



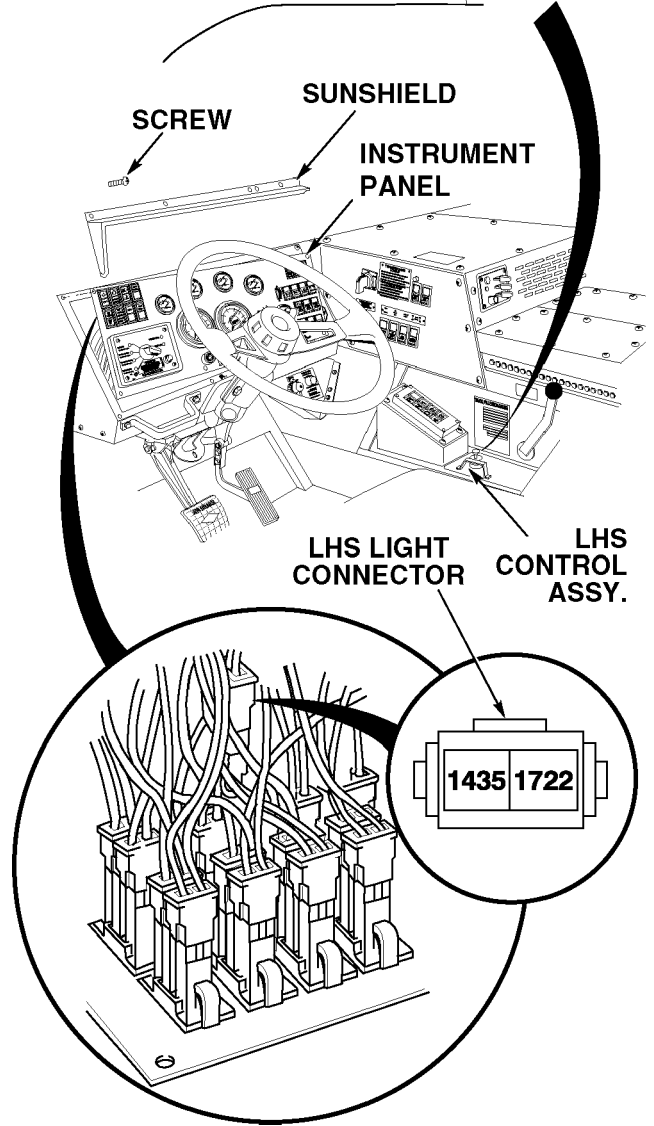
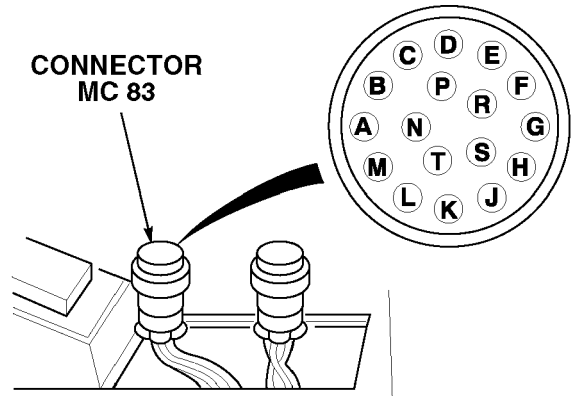
1. LHS LIGHT DOES NOT OPERATE (CONT).



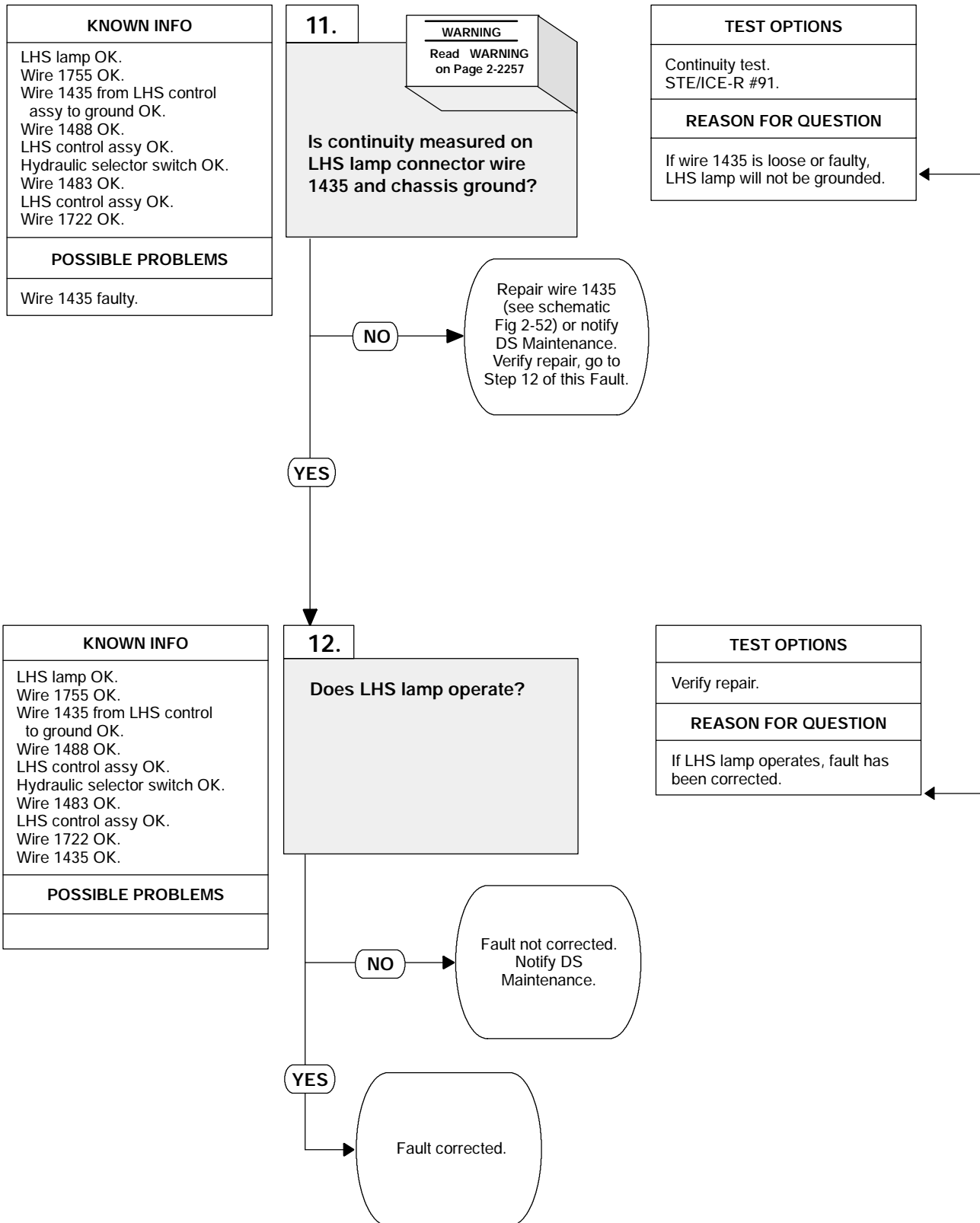
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST	
(1)	Remove ten screws and sunshield from instrument panel.
(2)	Pull top of instrument panel toward steering wheel.
(3)	Set multimeter select switch to ohms.
(4)	Is there continuity between harness connector MC83, terminal K and LHS lamp connector wire 1722 terminal?
(a)	If there is no continuity, repair wire 1722 (see schematic Fig 2-52) and perform Step (3) below or notify DS Maintenance.
(b)	If there is continuity, wire 1722 is OK.
(5)	Install LHS control assy (Para 7-40).

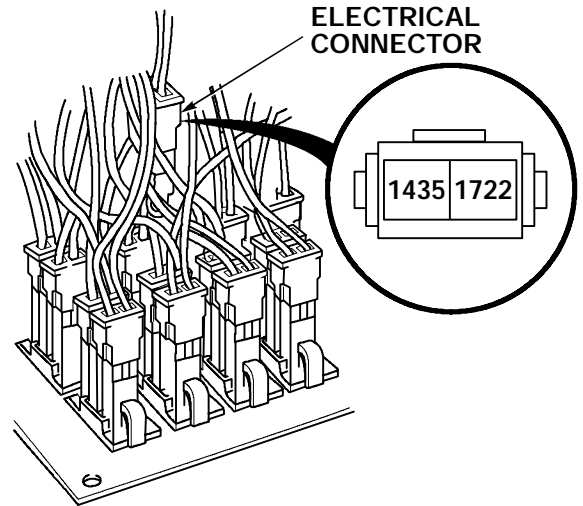


1. LHS LIGHT DOES NOT OPERATE (CONT).



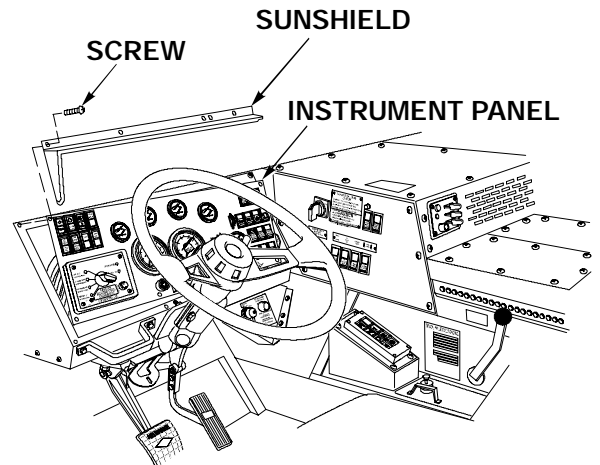
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



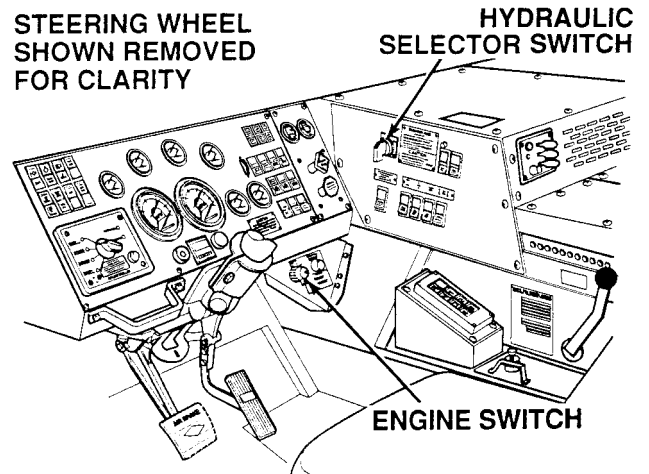
CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between LHS lamp electrical connector wire 1435 terminal and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) and perform Steps (3) and (4) below or notify DS Maintenance.
 - (b) If there is continuity, wire 1435 is OK.
- (3) Connect electrical connector to LHS lamp socket.
- (4) Install instrument panel and sunshield with ten screws.



VERIFY REPAIR

- (1) Turn ON ENGINE switch.
- (2) While observing LHS light, cycle hydraulic selector switch to MAN HA, MAN MF and AUTO positions.
 - (a) If LHS light does not operate, fault not corrected. Perform Steps (3) and (4) below and notify DS Maintenance.
 - (b) If LHS light does operate, fault has been corrected.
- (3) Set hydraulic selector switch to OFF position.
- (4) Turn OFF ENGINE switch.



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

2. LHS NO TRANS LIGHT DOES NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

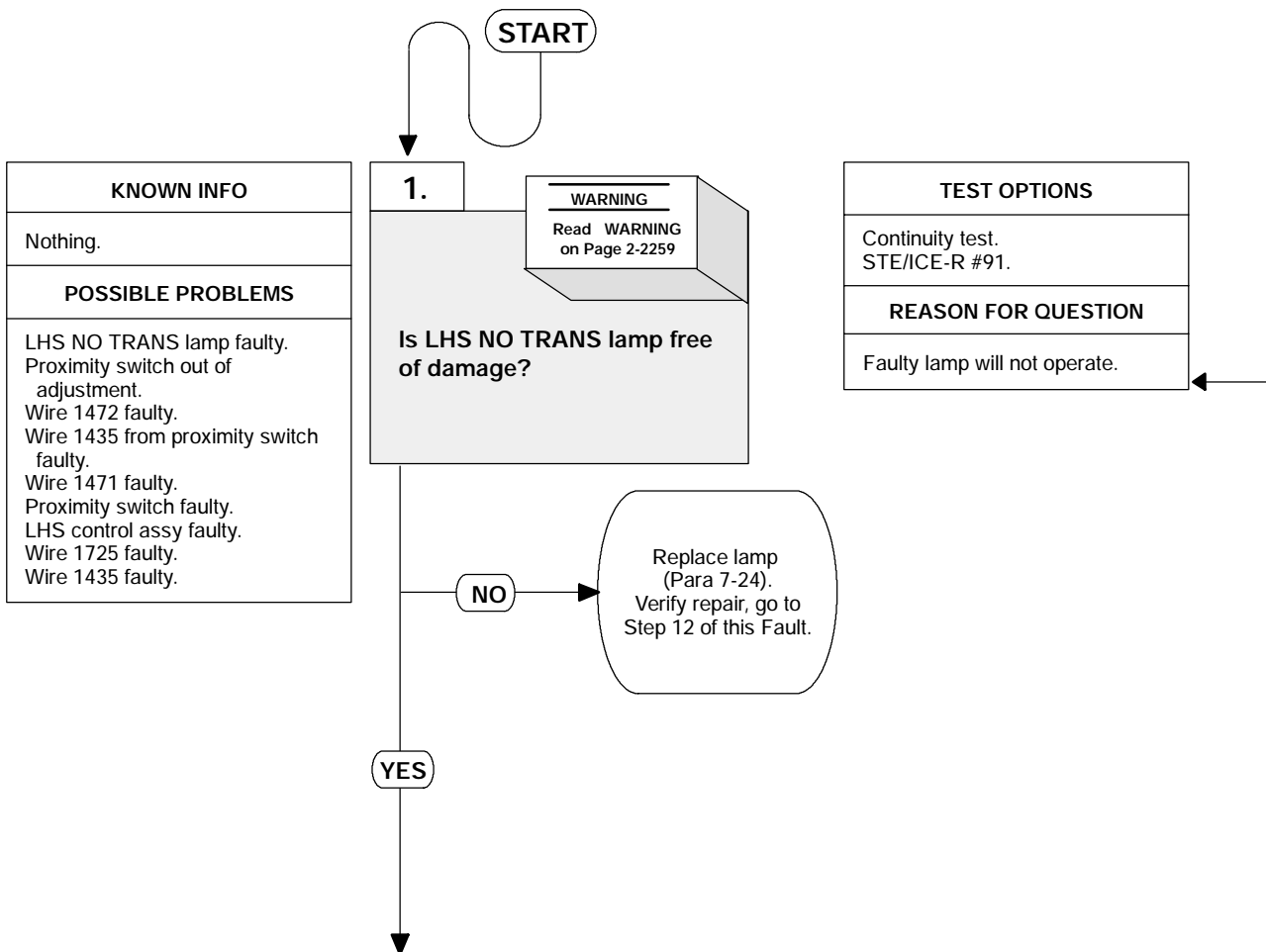
Lockwasher (4) (Item 180, Appendix F)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

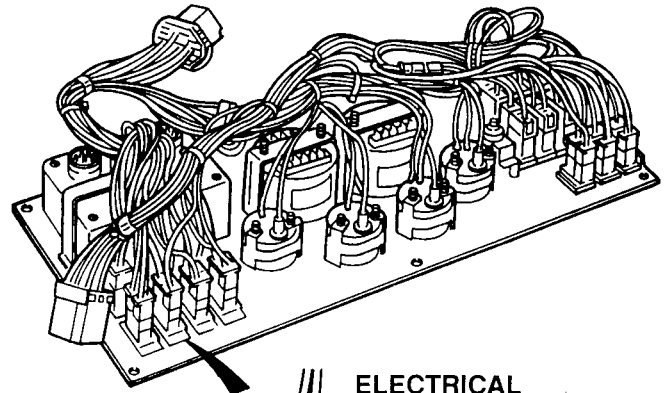
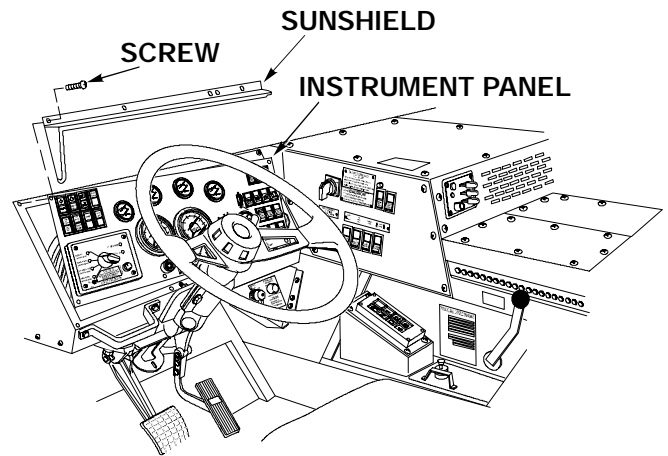
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)

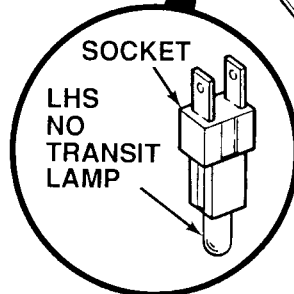
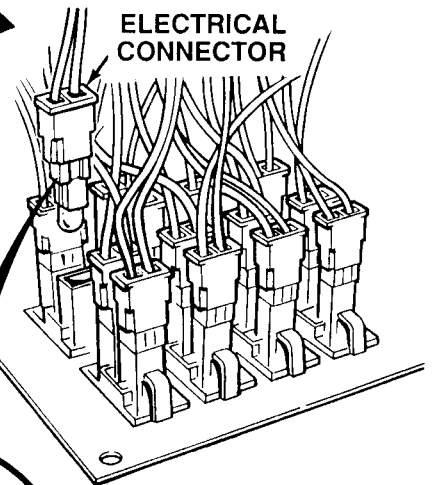


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- CONTINUITY TEST**
- (1) Remove ten screws and sunshield from instrument panel.
 - (2) Pull top of instrument panel toward steering wheel.
 - (3) Disconnect electrical connector from LHS NO TRANS lamp socket.
 - (4) Remove lamp and socket from instrument panel.
 - (5) Set multimeter select switch to ohms.
 - (6) Is there continuity between terminals of lamp?
 - (a) If there is no continuity, replace LHS NO TRANS lamp (Para 7-24) and perform Step (7) below.
 - (b) If there is continuity, LHS NO TRANS lamp is OK.
 - (7) Install LHS NO TRANS lamp and socket in instrument panel.



2. LHS NO TRANS LIGHT DOES NOT OPERATE (CONT).

KNOWN INFO
LHS NO TRANS lamp OK.
POSSIBLE PROBLEMS
Proximity switch out of adjustment. Wire 1472 faulty. Wire 1435 from proximity switch faulty. Wire 1471 faulty. Proximity switch faulty. LHS control assy faulty. Wire 1725 faulty. Wire 1435 faulty.

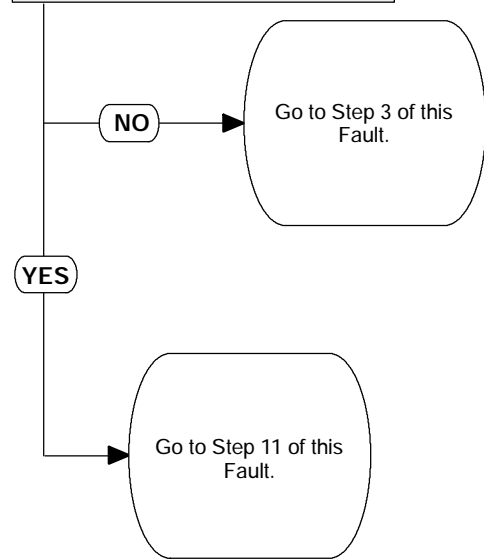
2.

WARNING

Read **WARNING** on Page 2-2261

Are 22 to 28 vdc measured on wire 1725 at LHS NO TRANS lamp connector with ENGINE switch ON and LHS raised?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If components supplying voltage to LHS NO TRANS lamp are faulty, 22 to 28 vdc will not be present at LHS NO TRANS lamp.

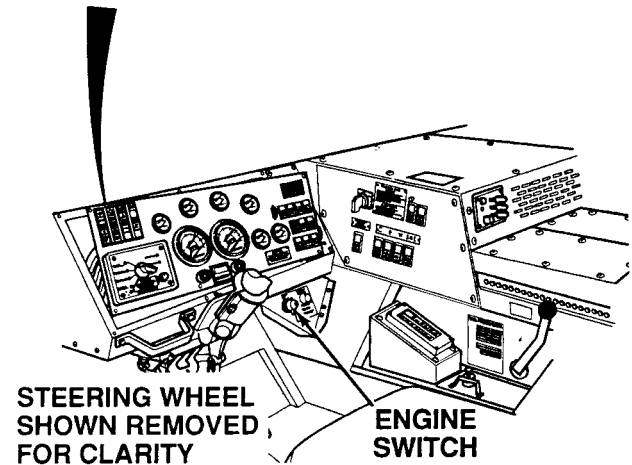
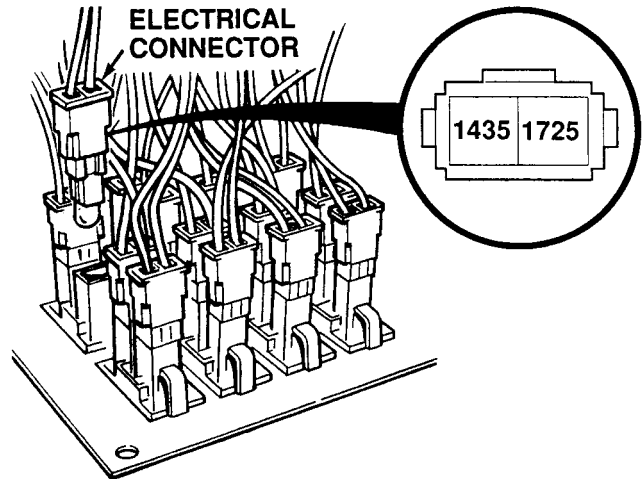


WARNING

- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Start engine (TM 9-2320-364-10).
- (2) Raise LHS until middle frame is approximately 3 ft (91 cm) above the transit position.
- (3) Turn OFF ENGINE switch.
- (4) Turn ON ENGINE switch.
- (5) Set multimeter select switch to volts dc.
- (6) Connect positive (+) multimeter lead to wire 1725 at LHS NO TRANS lamp electrical connector terminal.
- (7) Connect negative (-) multimeter lead to a known good ground.
 - (a) If there are not 22 to 28 vdc present, perform Steps (8) and (9) below and go to Step 3 of this Fault.
 - (b) If there are 22 to 28 vdc present, perform Steps (8) and (9) below and go to Step 11 of this Fault.
- (8) Set hydraulic selector switch to OFF position.
- (9) Turn OFF ENGINE switch.



2. LHS NO TRANS LIGHT DOES NOT OPERATE (CONT).

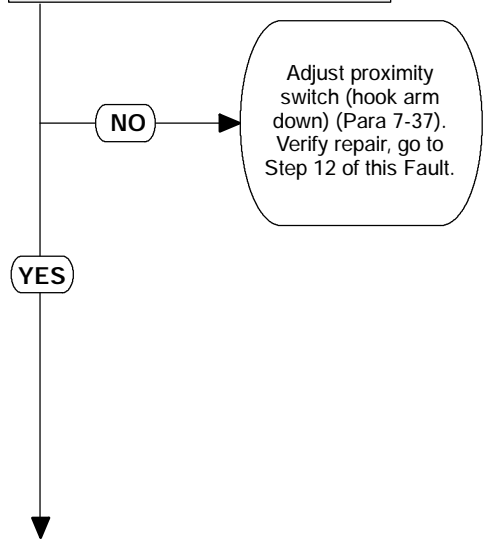
KNOWN INFO
LHS NO TRANS lamp OK.
POSSIBLE PROBLEMS
Proximity switch out of adjustment. Wire 1472 faulty. Wire 1435 from proximity switch faulty. Wire 1471 faulty. Proximity switch faulty. LHS control assy faulty. Wire 1725 faulty. Wire 1435 faulty.

3.

WARNING
Read **WARNING** on Page 2-2263

Is clearance between proximity switch and hook arm .11 in. to .13 in. (2.79 to 3.30 mm)?

TEST OPTIONS
Proximity switch clearance test.
REASON FOR QUESTION
If there is too much clearance between proximity switch and hook arm, switch will not close to input 22 to 28 vdc to LHS NO TRANS lamp.

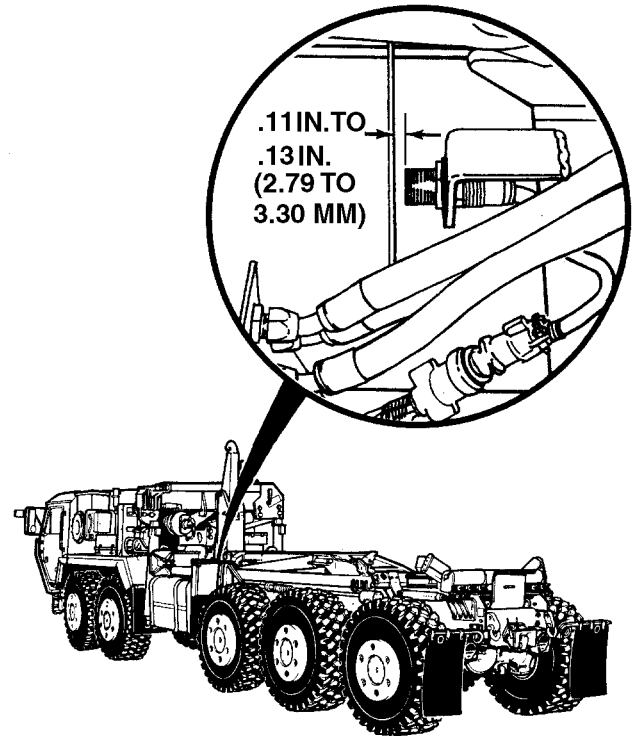


WARNING

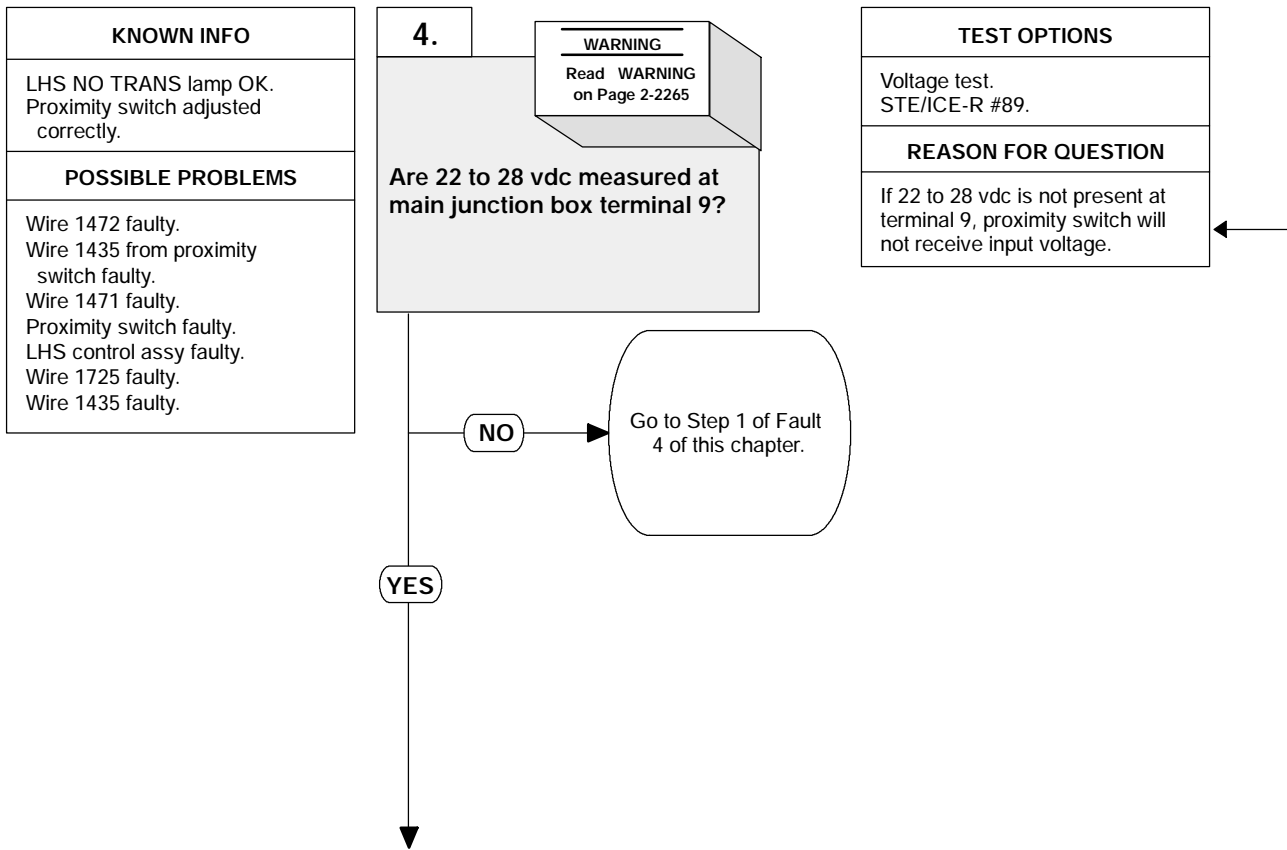
Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.

PROXIMITY SWITCH CLEARANCE TEST

- (1) Put LHS in transit position (TM 9-2320-364-10).
- (2) Turn OFF ENGINE switch.
- (3) Check clearance between proximity switch and hook arm.
 - (a) If clearance is more than .13 in. (3.30 mm) or less than .11 in. (2.79 mm), adjust proximity switch (Para 7-37).
 - (b) If clearance is between .13 in. (3.30 mm) and .11 in. (2.79 mm), proximity switch is adjusted correctly.



2. LHS NO TRANS LIGHT DOES NOT OPERATE (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

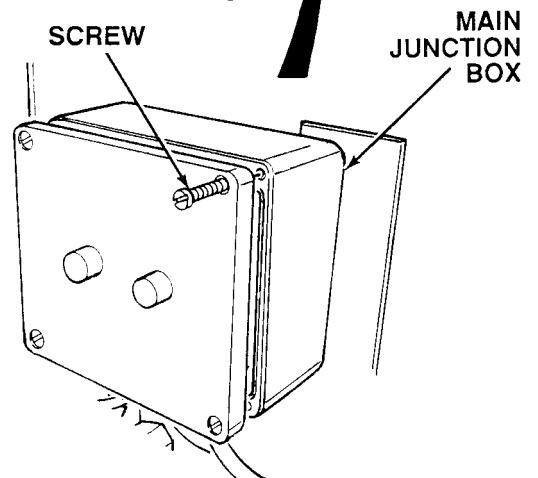
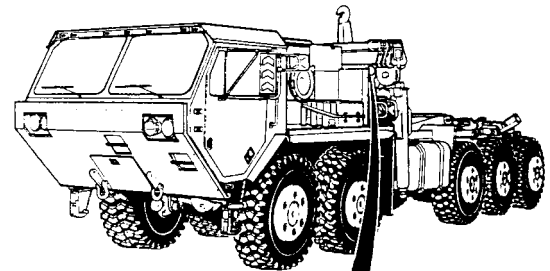
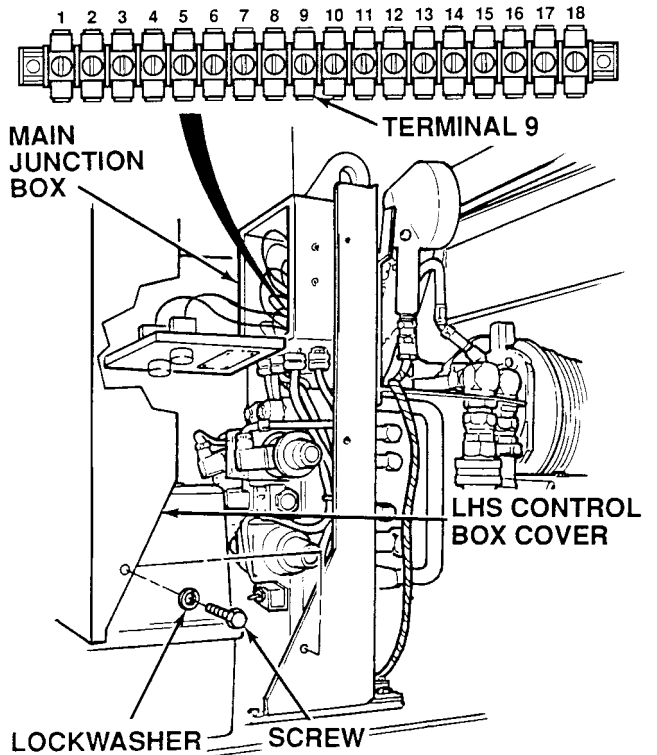
When opening the main junction box, do not pull or allow front of junction box to hang by the wire connections. Failure to comply will damage the wire connections.

NOTE

Only remove center screw on engine side of LHS control box cover.

VOLTAGE TEST

- (1) Remove four screws, lockwashers and LHS control box cover. Discard lockwashers.
- (2) Loosen four screws to open main junction box.
- (3) Set multimeter select switch to volts dc.
- (4) Connect positive (+) multimeter lead at main junction box terminal 9.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If there are not 22 to 28 vdc present, perform Step (7) below and go to Step 1 of Fault 4 of this chapter.
 - (b) If there are 22 to 28 vdc present, perform Step (7) below.
- (7) Turn OFF ENGINE switch.



2. LHS NO TRANS LIGHT DOES NOT OPERATE (CONT).

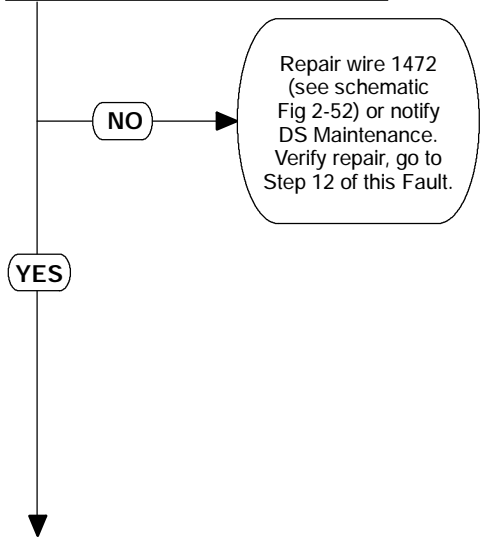
KNOWN INFO
LHS NO TRANSIT lamp OK. Proximity switch adjusted correctly.
POSSIBLE PROBLEMS
Wire 1472 faulty. Wire 1435 from proximity switch faulty. Wire 1471 faulty. Proximity switch faulty. LHS control assy faulty. Wire 1725 faulty. Wire 1435 faulty.

5.

WARNING
Read **WARNING** on Page 2-2267

Are 22 to 28 vdc measured on wire 1472 at harness connector MC88, terminal A with ENGINE switch in the ON position?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If wire 1472 is loose, faulty, or shorted to ground, 22 to 28 vdc will not be present at proximity switch.

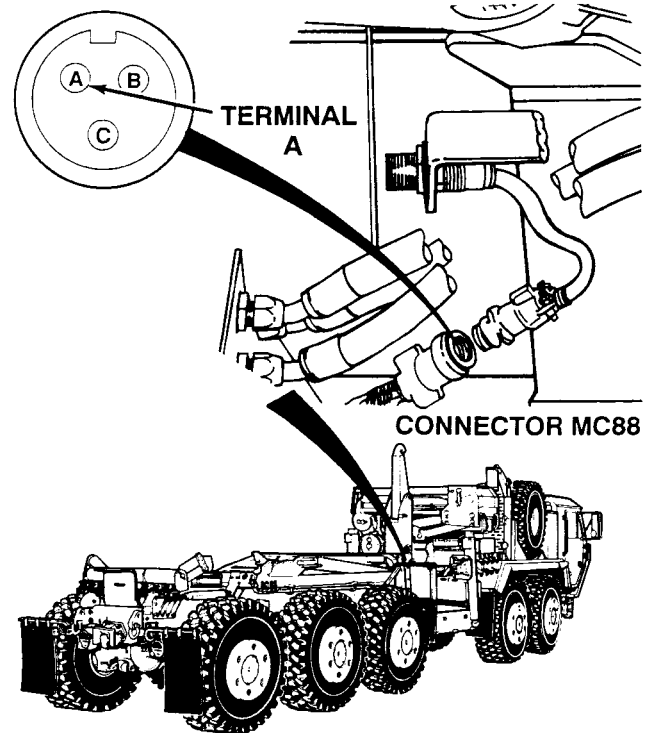


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Disconnect harness connector MC88 from proximity switch (hook arm down) connector.
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead on wire 1472 at harness connector MC88, terminal A.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch.
 - (a) If there are not 22 to 28 vdc present, turn OFF ENGINE switch and repair wire 1472 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there are 22 to 28 vdc present, wire 1472 is OK.
- (6) Turn OFF ENGINE switch.



2. LHS NO TRANS LIGHT DOES NOT OPERATE (CONT).

KNOWN INFO
LHS NO TRANS lamp OK. Proximity switch adjusted correctly. Wire 1472 OK.
POSSIBLE PROBLEMS
Wire 1435 from proximity switch faulty. Wire 1471 faulty. Proximity switch faulty. LHS control assy faulty. Wire 1725 faulty. Wire 1435 faulty.

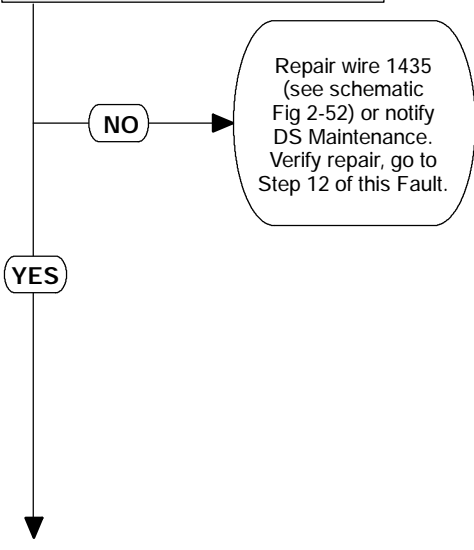
6.

WARNING

Read **WARNING** on Page 2-2269

Is continuity measured on wire 1435 at harness connector MC88, terminal C and chassis ground?

TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1435 is loose or faulty, proximity switch will not be grounded.

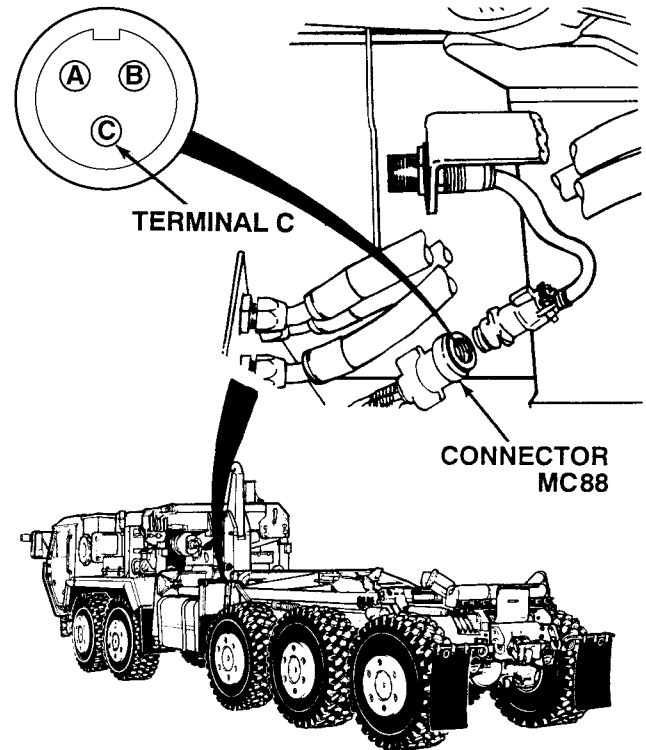


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between harness connector MC88, terminal C and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1435 is OK.



2. LHS NO TRANS LIGHT DOES NOT OPERATE (CONT).

KNOWN INFO
LHS NO TRANS lamp OK. Proximity switch adjusted correctly. Wire 1472 OK. Wire 1435 from proximity switch OK.
POSSIBLE PROBLEMS
Wire 1471 faulty. Proximity switch faulty. LHS control assy faulty. Wire 1725 faulty. Wire 1435 faulty.

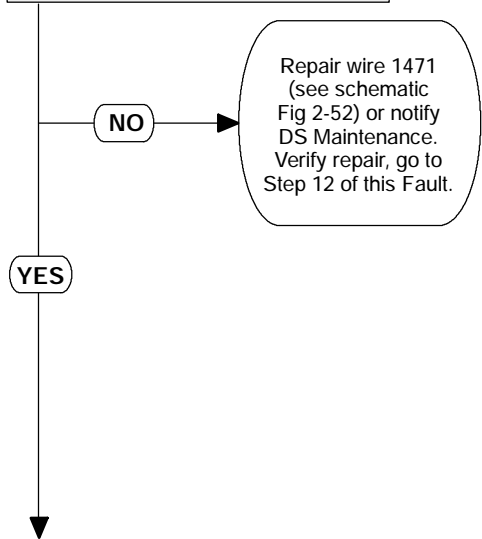
7.

WARNING

Read WARNING on Page 2-2271

Is continuity measured on wire 1471 at harness connector MC88, terminal B and chassis ground with harness connector MC81, terminal M jumpered to ground?

TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1471 is loose, faulty, or shorted to ground, 22 to 28 vdc will not be present at LHS NO TRANS lamp.

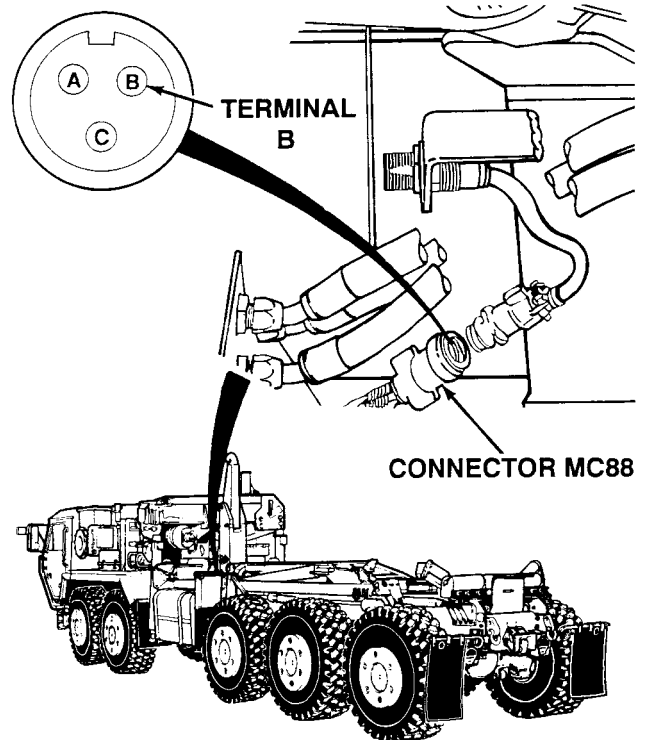
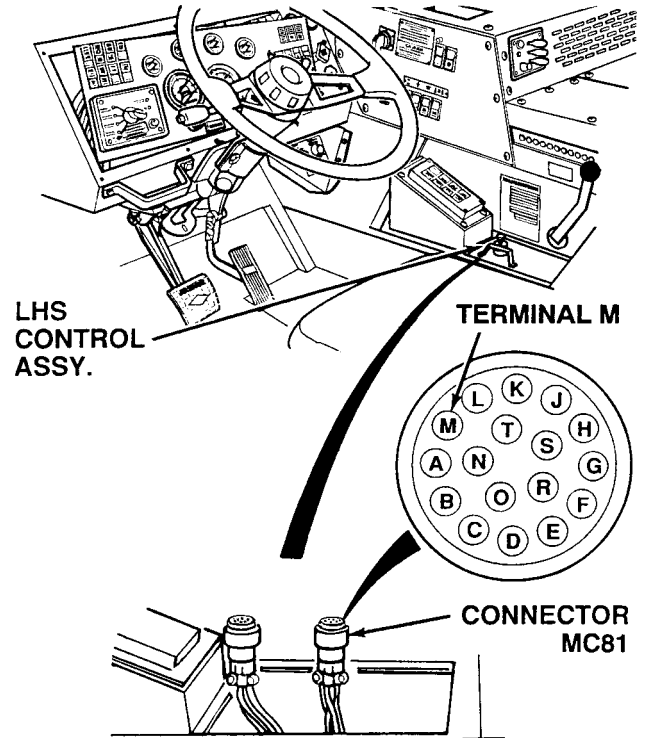


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Remove LHS control assy (Para 7-40).
- (2) Connect harness connector MC81, terminal M to ground using jumperwire.
- (3) Is there continuity between harness connector MC88, terminal B and a known good ground?
 - (a) If there is no continuity, repair wire 1471 (see schematic Fig 2-52) and perform Steps (4) through (6) below or notify DS Maintenance.
 - (b) If there is continuity, wire 1471 is OK.
- (4) Remove jumperwire from harness connector MC81 terminal M and ground.
- (5) Connect harness connector MC88 to proximity switch connector.
- (6) Install LHS control assy (Para 7-40).



2. LHS NO TRANS LIGHT DOES NOT OPERATE (CONT).

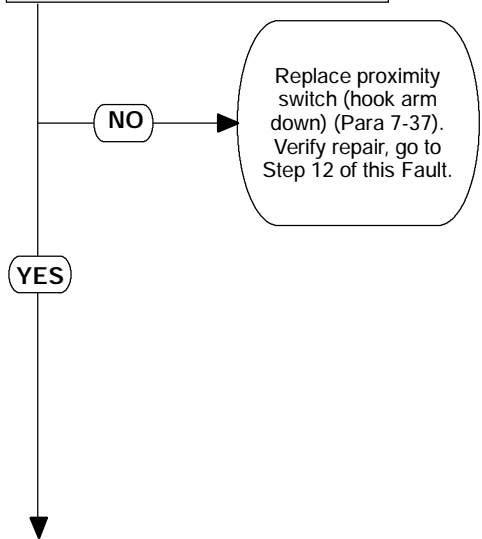
KNOWN INFO
LHS NO TRANS lamp OK. Proximity switch adjusted correctly. Wire 1472 OK. Wire 1435 from proximity switch OK. Wire 1471 OK.
POSSIBLE PROBLEMS
Proximity switch faulty. LHS control assy faulty. Wire 1725 faulty. Wire 1435 faulty.

8.

WARNING
Read **WARNING** on Page 2-2273

Are 22 to 28 vdc measured on main junction box terminal 11 with hook arm up and ENGINE switch in the ON position?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If proximity switch is faulty, 22 to 28 vdc will not be present at LHS NO TRANS light.



WARNING

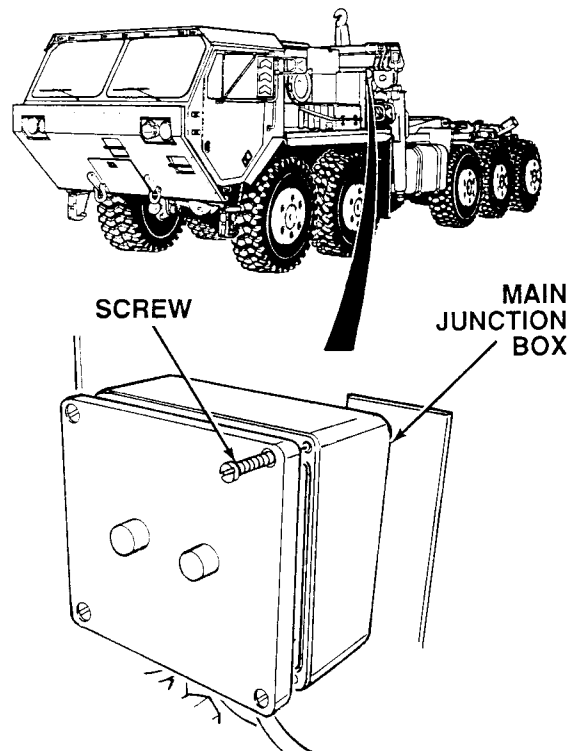
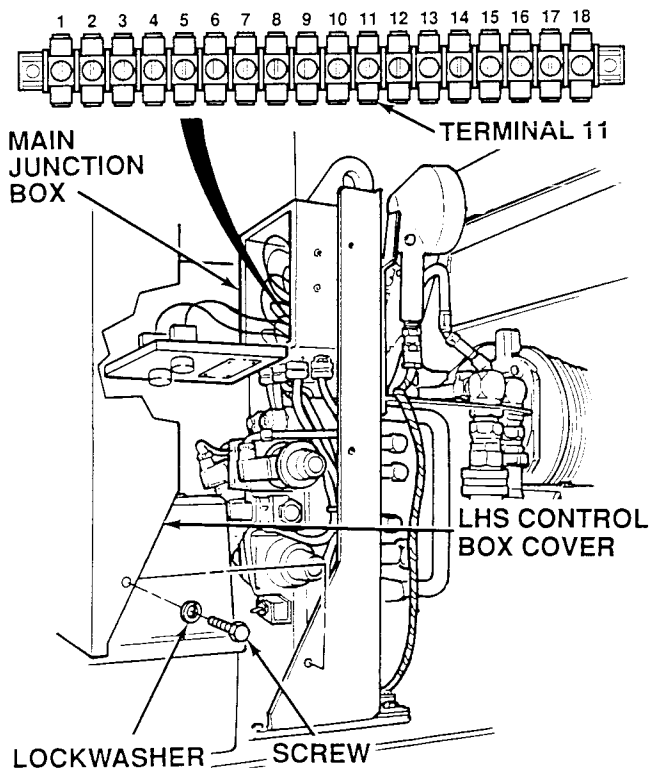
- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

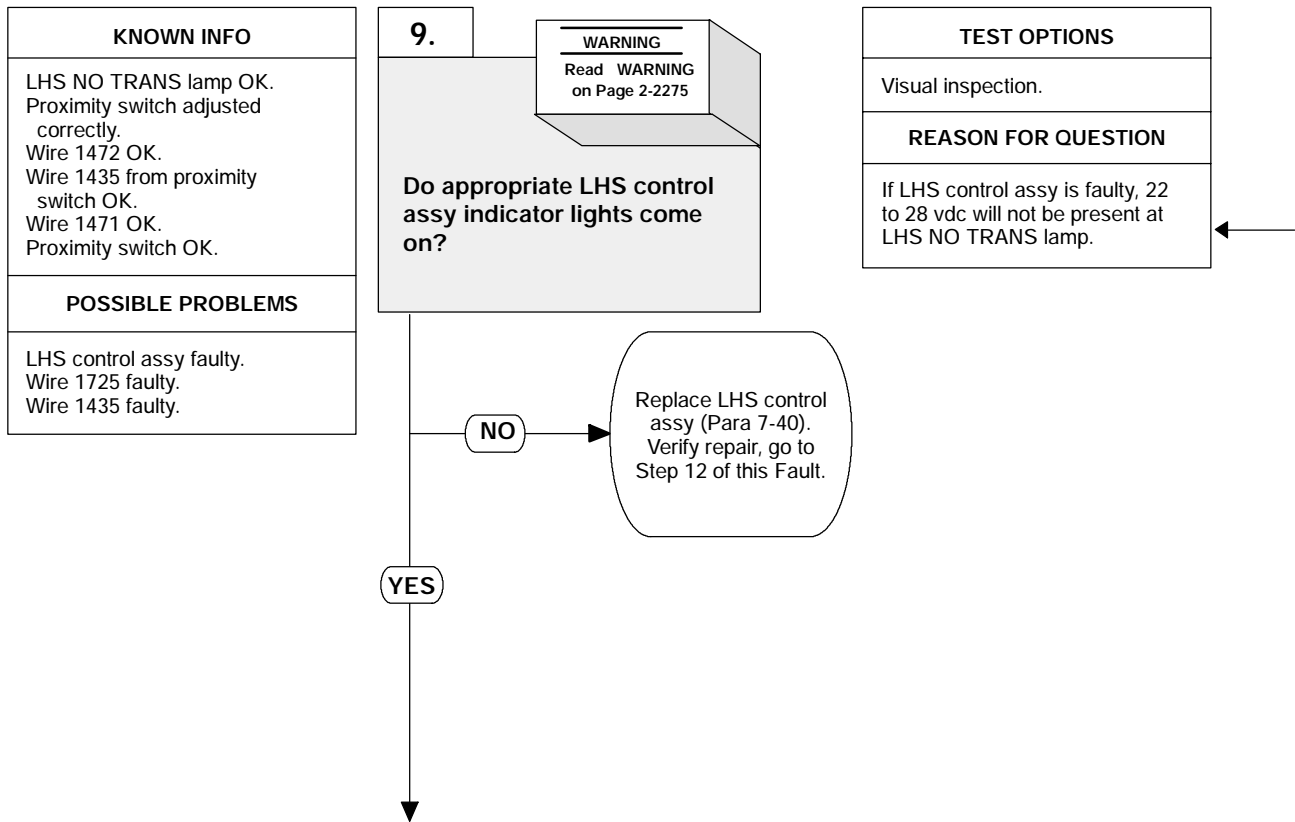
When opening the main junction box, do not pull or allow front of junction box to hang by the wire connections. Failure to comply will damage the wire connections.

VOLTAGE TEST

- (1) Start engine (TM 9-2320-364-10).
- (2) Raise LHS until middle frame is approximately 3 ft (91 cm) above the transit position.
- (3) Turn OFF ENGINE switch.
- (4) Set multimeter select switch to volts dc.
- (5) Connect positive (+) multimeter lead at main junction box terminal 11.
- (6) Connect negative (-) multimeter lead to a known good ground.
- (7) Turn ON ENGINE switch.
 - (a) If there are not 22 to 28 vdc present, turn OFF ENGINE switch, replace proximity switch (Para 7-37) and perform Steps (8) through (12) below.
 - (b) If there are 22 to 28 vdc present, proximity switch is OK. Perform Steps (8) through (12) below.
- (8) Start engine.
- (9) Put LHS in transit position.
- (10) Turn OFF ENGINE switch.
- (11) Close main junction box and tighten four screws.
- (12) Install LHS control box cover, four lockwashers and screws.



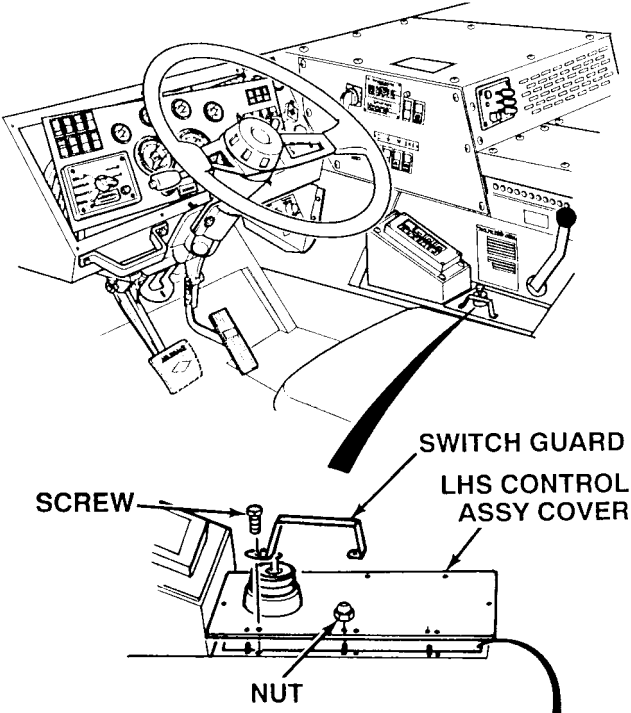
2. LHS NO TRNS LIGHT DOES NOT OPERATE (CONT).



WARNING

- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VISUAL INSPECTION	
(1)	Remove eight nuts, screws and switch guard from LHS control assy.
(2)	Carefully lift off LHS control assy cover. Do not allow cover to dangle by joystick connecting wires.
(3)	Observe red indicator light at bottom of LHS control assy while turning ON ENGINE switch (TM 9-2320-364-10). (a) If NO TRANSIT LIGHT lamp is illuminated, turn OFF ENGINE switch and replace LHS control assy (Para 7-40). (b) If NO TRANSIT LIGHT lamp is not illuminated, perform Steps (4) through (7) below.
(3.1)	Start engine.
(4)	Raise LHS completely.
(5)	Observe red indicator light at bottom of LHS control assy while turning ON ENGINE switch. (a) If NO TRANSIT LIGHT lamp is not illuminated, turn OFF ENGINE switch and replace LHS control assy (Para 7-40). (b) If NO TRANSIT LIGHT lamp is illuminated, LHS control assy is OK.
(5.1)	Lower LHS completely.
(5.2)	Set hydraulic selector switch to OFF
(6)	Turn OFF ENGINE switch.
(7)	Install cover, switch guard and eight nuts and screws on LHS control assy.



- AUTO LOAD IN
- AUTO UNLOAD IN
- MAN/AUTO MODE
- MAN TRANSIT IN

- UNLOAD OUT
- LOAD OUT
- AUX MODE IN
- NO TRANSIT LIGHT
- OVERLOAD LIGHT
- HOOK ARM "A" SOL
- MAIN RAM "B" SOL
- HOOK ARM "B" SOL
- MAIN RAM "A" SOL
- +24V IN
- HOOK ARM UP

- FREE FLOW VALVE
- HOOK ARM DOWN
- TRANSIT VALVE
- OVERLOAD IN
- MID FRAME DOWN

2. LHS NO TRANS LIGHT DOES NOT OPERATE (CONT).

KNOWN INFO
LHS NO TRANS lamp OK. Proximity switch adjusted correctly. Wire 1472 OK. Wire 1435 from proximity switch OK. Wire 1471 OK. Proximity switch OK. LHS control assy OK.
POSSIBLE PROBLEMS
Wire 1725 faulty. Wire 1435 faulty.

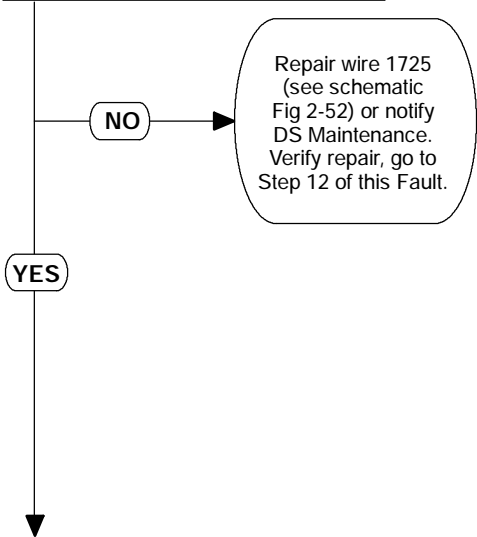
10.

WARNING

Read **WARNING** on Page 2-2277

Is continuity measured on wire 1725 at harness connector MC83, terminal S and LHS NO TRANS lamp harness connector?

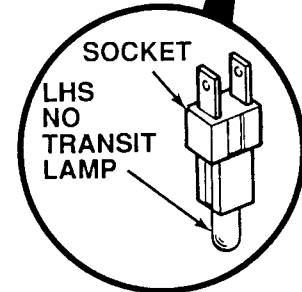
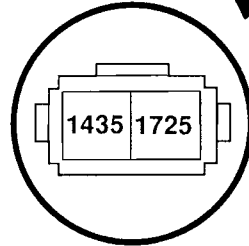
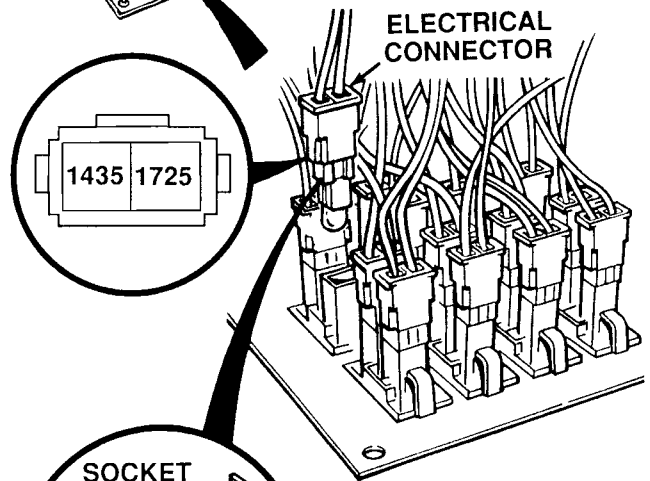
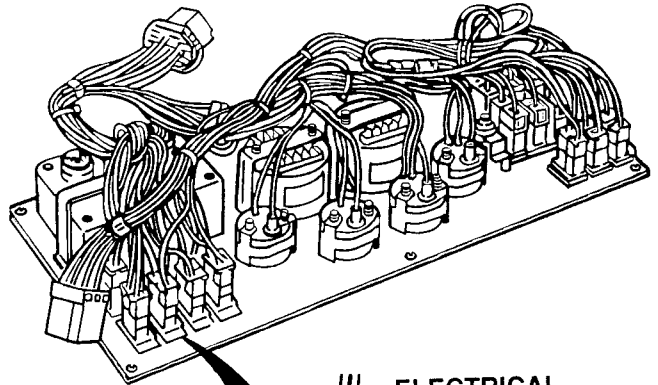
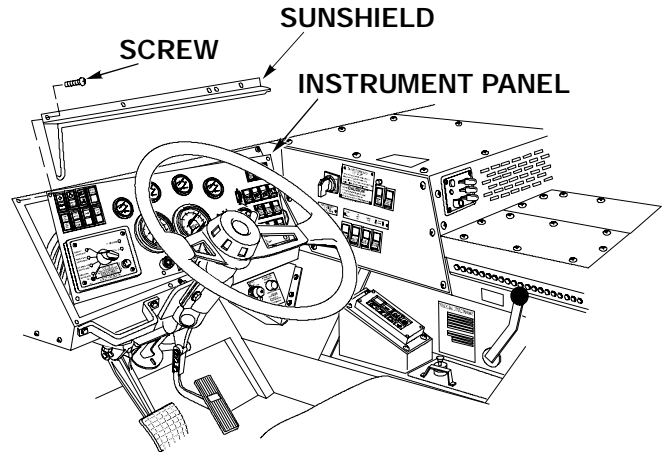
TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1725 is loose, faulty, or shorted to ground, 22 to 28 vdc will not be present at LHS NO TRANS lamp.



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | CONTINUITY TEST |
|---|
| (1) Set multimeter select switch to ohms. |
| (2) Remove LHS control assy (Para 7-40). |
| (3) Is there continuity between LHS NO TRANS lamp electrical connector wire 1725 terminal and harness connector MC83, terminal S? |
| (a) If there is no continuity, repair wire 1725 (see schematic Fig 2-52) and perform Step (4) below or notify DS Maintenance. |
| (b) If there is continuity, wire 1725 is OK. |
| (4) Install LHS control assy (Para 7-40). |



2. LHS NO TRANS LIGHT DOES NOT OPERATE (CONT).

KNOWN INFO
LHS NO TRANS lamp OK. Proximity switch adjusted correctly. Wire 1472 OK. Wire 1435 from proximity switch OK. Wire 1471 OK. Proximity switch OK. LHS control assy OK. Wire 1725 OK.
POSSIBLE PROBLEMS
Wire 1435 faulty.

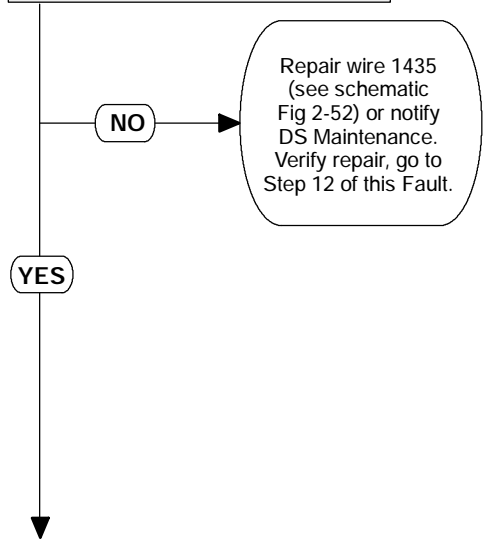
11.

WARNING

Read **WARNING** on Page 2-2279

Is continuity measured on wire 1435 at LHS NO TRANS lamp connector and chassis ground?

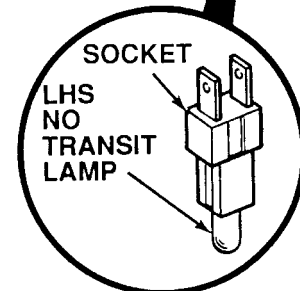
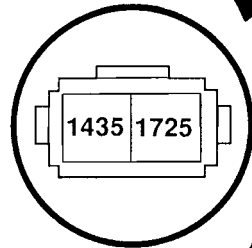
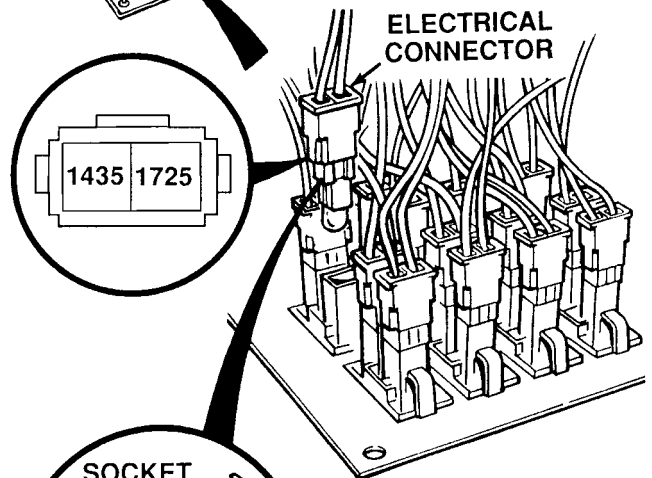
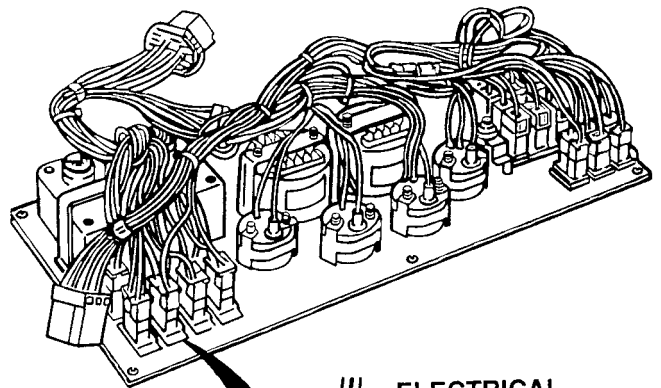
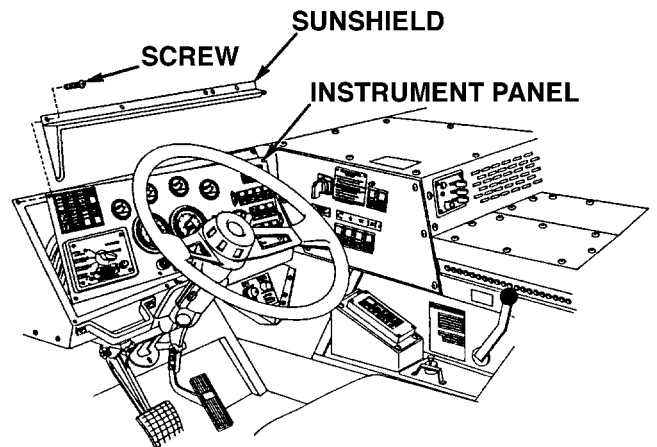
TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1435 is loose or faulty, LHS NO TRANS lamp will not be grounded.



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Set multimeter select switch to ohms.
 - (2) Is there continuity between LHS NO TRANS lamp electrical connector wire 1435 terminal and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) and perform Steps (3) and (4) below or notify DS Maintenance.
 - (b) If there is continuity, wire 1435 is OK.
 - (3) Connect electrical connector to LHS NO TRANS lamp socket.
 - (4) Install instrument panel and sunshield with ten screws.



2. LHS NO TRANS LIGHT DOES NOT OPERATE (CONT).

KNOWN INFO
LHS NO TRANS lamp OK. Proximity switch adjusted correctly. Wire 1472 OK. Wire 1435 from proximity switch OK. Wire 1471 OK. Proximity switch OK. LHS control assy OK. Wire 1725 OK. Wire 1435 OK.
POSSIBLE PROBLEMS

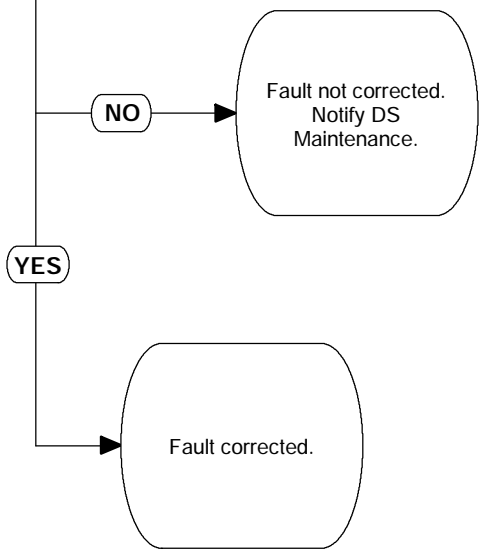
12.

WARNING

Read **WARNING** on Page 2-2281

Does LHS NO TRANS light operate?

TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If LHS NO TRANS light operates, fault has been corrected.



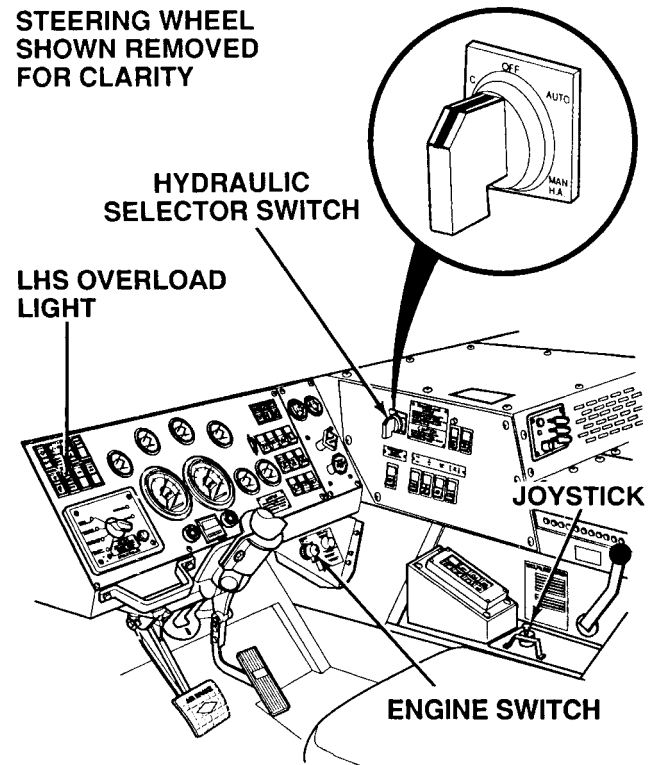
WARNING

Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.

VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) While observing LHS NO TRANS light, raise LHS in AUTO mode using joystick until middle frame is approximately 3 ft (91 cm) above transit position.
 - (a) If LHS NO TRANS light does not operate, fault not corrected. Perform Steps (3) and (4) below and notify DS Maintenance.
 - (b) If LHS NO TRANS light does operate, fault has been corrected.
- (3) Set hydraulic selector switch to OFF position.
- (4) Turn OFF ENGINE switch.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

3. LHS OVERLOAD LIGHT DOES NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

Lockwasher (4) (Item 180, Appendix F)
 Adhesive (Item 8, Appendix C)

Personnel Required

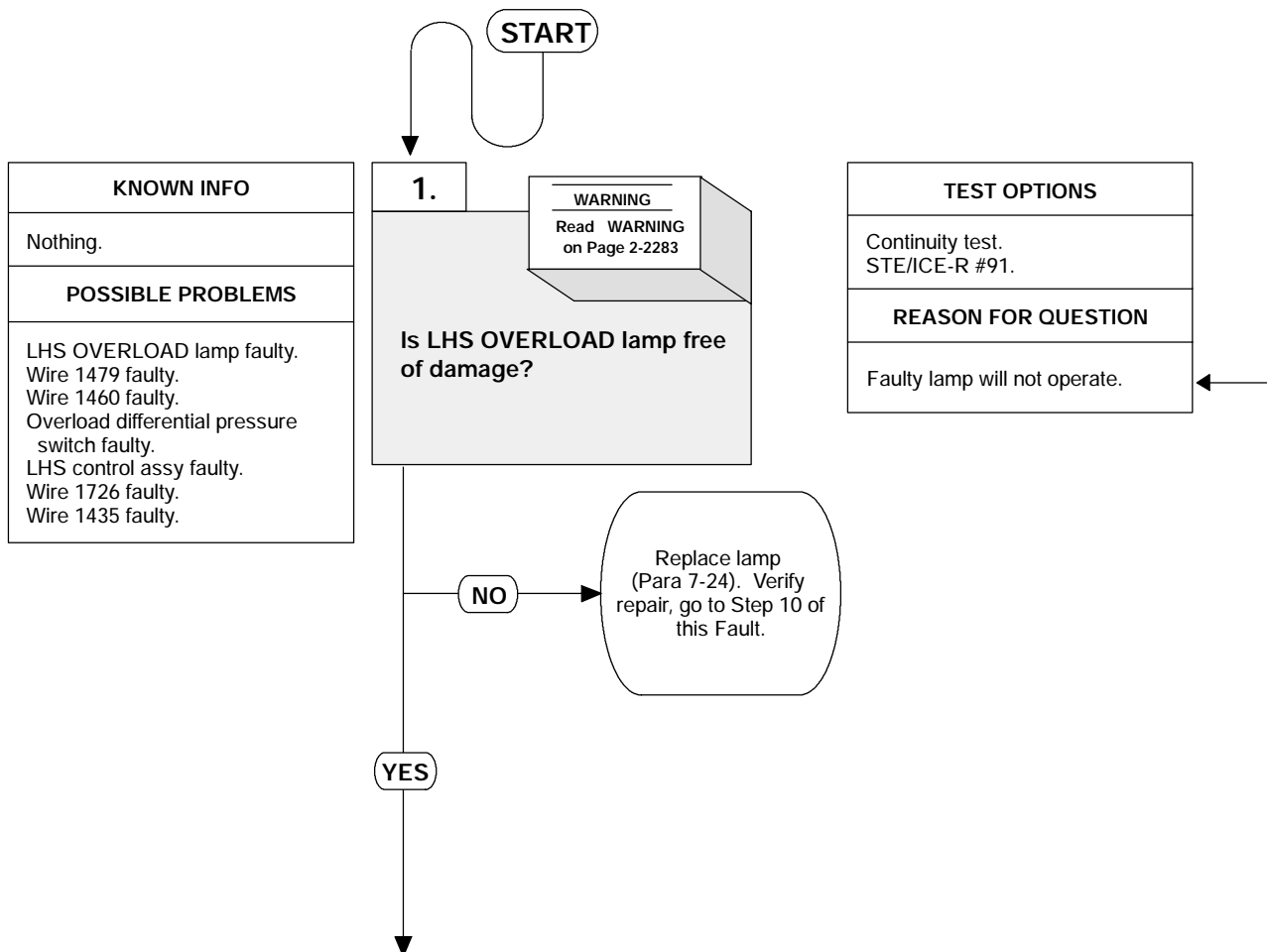
Two

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

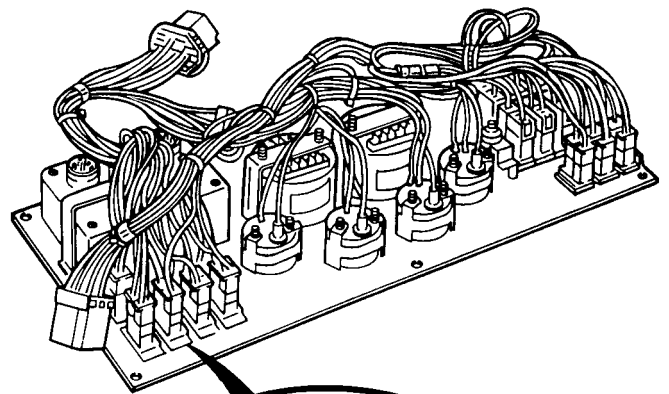
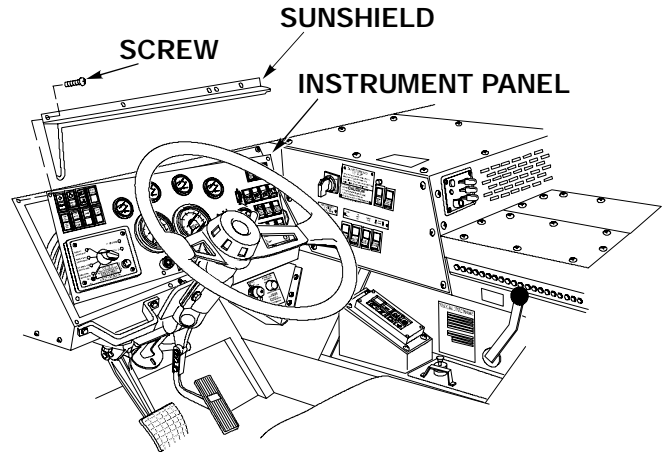
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)



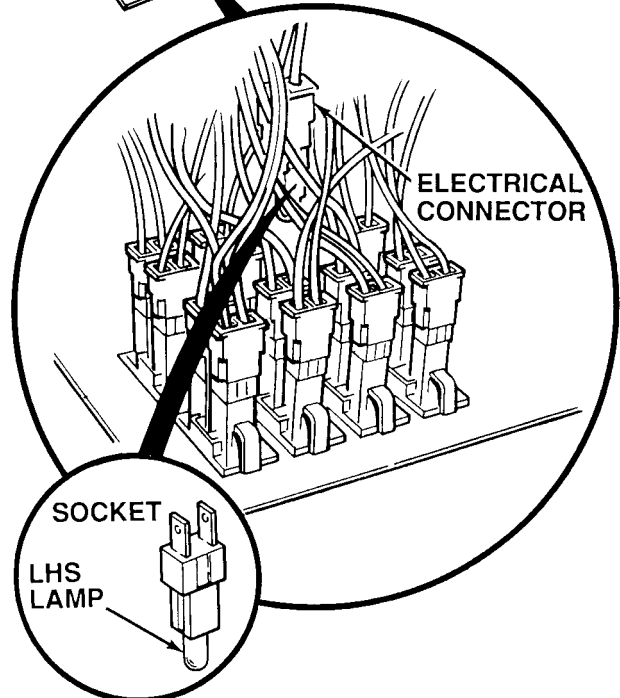
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



CONTINUITY TEST

- (1) Remove ten screws and sunshield from instrument panel.
- (2) Pull top of instrument panel toward steering wheel.
- (3) Disconnect electrical connector from LHS OVERLOAD lamp socket.
- (4) Remove lamp and socket from instrument panel.
- (5) Set multimeter select switch to ohms.
- (6) Is there continuity between terminals of lamp?
 - (a) If there is no continuity, replace LHS OVERLOAD lamp (Para 7-24) and perform Step (7) below.
 - (b) If there is continuity, LHS OVERLOAD lamp is OK.
- (7) Install LHS OVERLOAD lamp and socket in instrument panel.



3. LHS OVERLOAD LIGHT DOES NOT OPERATE (CONT).

KNOWN INFO
LHS OVERLOAD lamp OK.
POSSIBLE PROBLEMS
Wire 1479 faulty. Wire 1460 faulty. Overload differential pressure switch faulty. LHS control assy faulty. Wire 1726 faulty. Wire 1435 faulty.

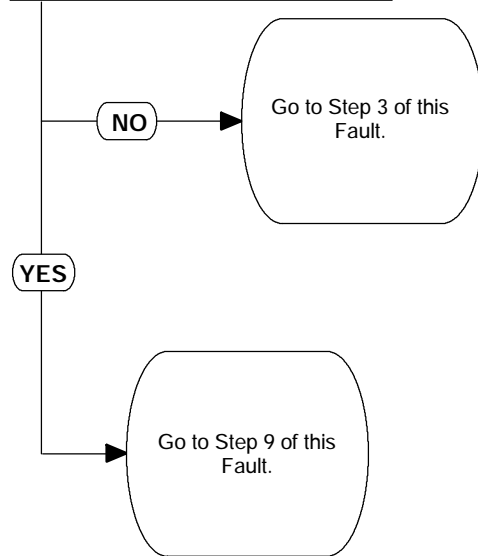
2.

WARNING

Read **WARNING** on Page 2-2285

Are 22 to 28 vdc measured on wire 1726 at LHS OVERLOAD lamp with LHS in transit position and joystick held in LOAD position and then released?

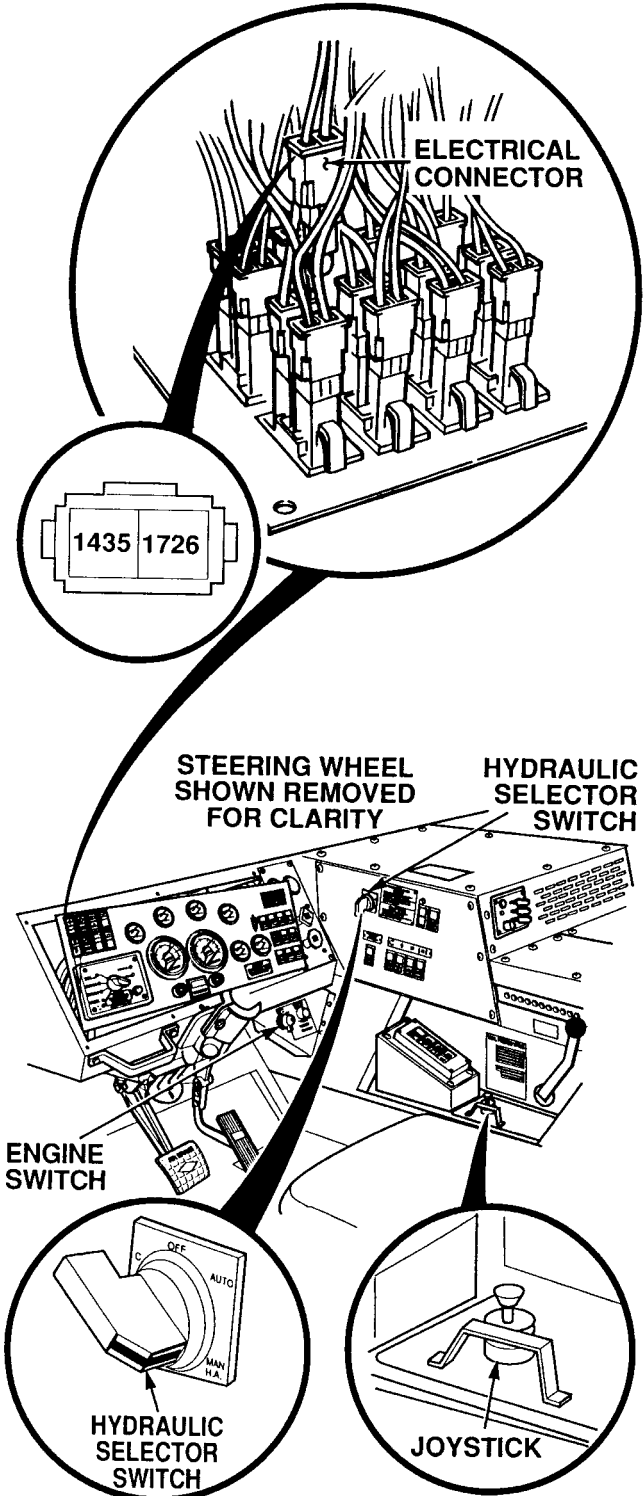
TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If components supplying voltage to LHS OVERLOAD lamp are faulty, 22 to 28 vdc will not be present at LHS OVERLOAD lamp.



WARNING

- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST
<ol style="list-style-type: none"> (1) Set multimeter select switch to volts dc. (2) Connect positive (+) multimeter lead to wire 1726 at LHS OVERLOAD lamp electrical connector terminal. (3) Connect negative (-) multimeter lead to a known good ground. (4) Start engine (TM 9-2320-364-10). (5) Put LHS in transit position. (6) Set hydraulic selector switch to MAN HA position. (7) Put joystick in LOAD position for five seconds and release. <ol style="list-style-type: none"> (a) If there are not 22 to 28 vdc present immediately after joystick is released, perform Steps (8) and (9) below and go to Step 3 of this Fault. (b) If there are 22 to 28 vdc present, perform Steps (8) and (9) below and go to Step 9 of this Fault. (8) Set hydraulic selector switch to OFF position. (9) Turn OFF ENGINE switch.



3. LHS OVERLOAD LIGHT DOES NOT OPERATE (CONT).

KNOWN INFO
LHS OVERLOAD lamp OK.
POSSIBLE PROBLEMS
Wire 1479 faulty. Wire 1460 faulty. Overload differential pressure switch faulty. LHS control assy faulty. Wire 1726 faulty. Wire 1435 faulty.

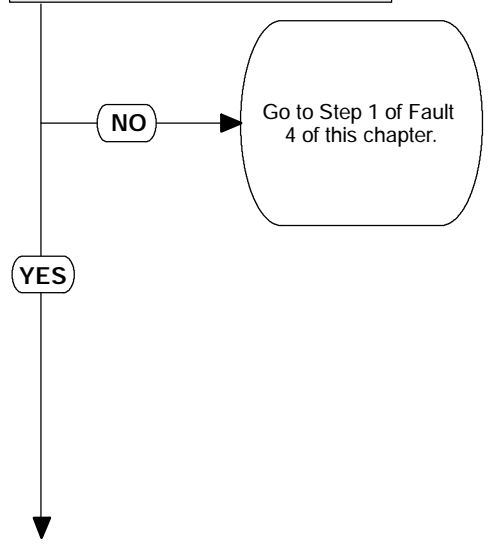
3.

WARNING

Read **WARNING** on Page 2-2287

Are 22 to 28 vdc measured at main junction box terminal 9 with ENGINE switch in the ON position?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If 22 to 28 vdc are not present at terminal 9, overload differential pressure switch will not receive input voltage.



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

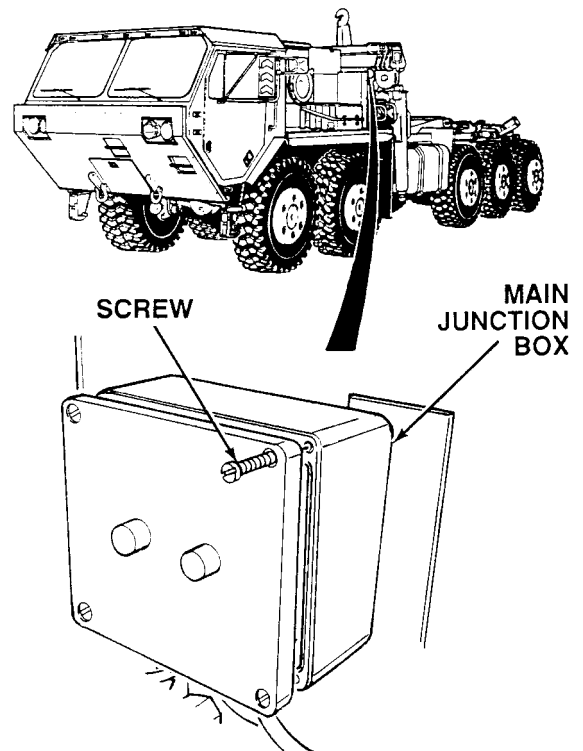
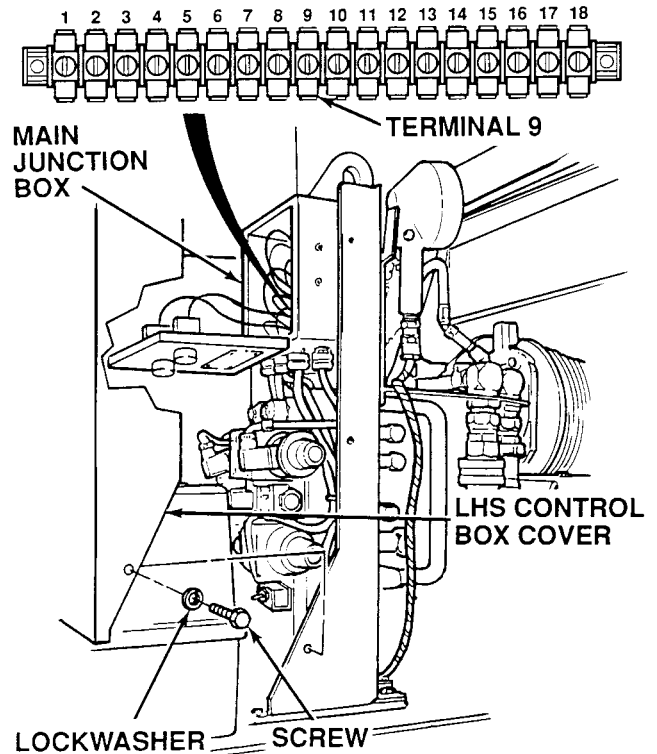
When opening the main junction box, do not pull or allow front of junction box to hang by the wire connections. Failure to comply will damage the wire connections.

NOTE

Only remove center screw on engine side of LHS control box cover.

VOLTAGE TEST

- (1) Remove four screws, lockwashers and LHS control box cover. Discard lockwashers.
- (2) Loosen four screws and open main junction box.
- (3) Set multimeter select switch to volts dc.
- (4) Connect positive (+) multimeter lead at main junction box terminal 9.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch.
 - (a) If there are not 22 to 28 vdc present, perform Steps (7) and (8) below and go to Step 1 of Fault 4 of this Chapter.
 - (b) If there are 22 to 28 vdc present, perform Steps (7) and (8) below.
- (7) Turn OFF ENGINE switch (TM 9-2320-364-10).
- (8) Close main junction box and tighten four screws.



3. LHS OVERLOAD LIGHT DOES NOT OPERATE (CONT).

KNOWN INFO
LHS OVERLOAD lamp OK.
POSSIBLE PROBLEMS
Wire 1479 faulty. Wire 1460 faulty. Overload differential pressure switch faulty. LHS control assy faulty. Wire 1726 faulty. Wire 1435 faulty.

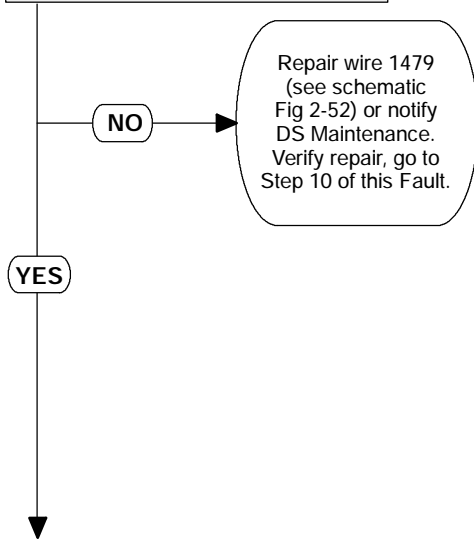
4.

WARNING

Read **WARNING**
on Page 2-2289

Are 22 to 28 vdc measured on wire 1479 at overload differential pressure switch harness connector, terminal 2 with ENGINE switch in the ON position?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If wire 1479 is loose, faulty, or shorted to ground, 22 to 28 vdc will not be input to overload differential pressure switch.

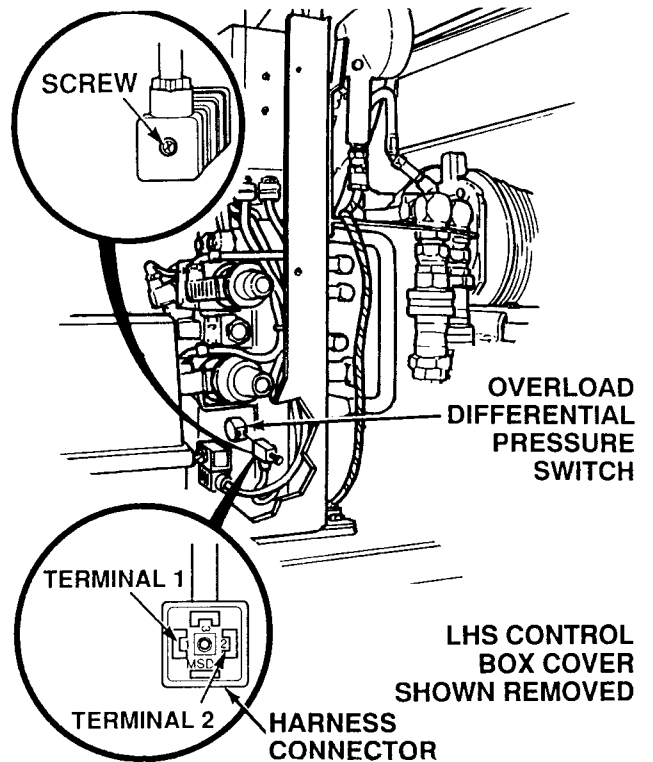


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Disconnect harness connector from overload differential pressure switch connector.
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead at harness connector, terminal 2.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If there are not 22 to 28 vdc present, turn OFF ENGINE switch and repair wire 1479 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there are 22 to 28 vdc present, wire 1479 is OK.
- (6) Turn OFF ENGINE switch.



3. LHS OVERLOAD LIGHT DOES NOT OPERATE (CONT).

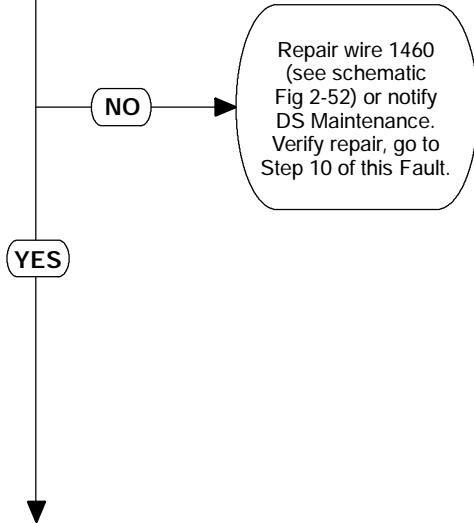
KNOWN INFO
LHS OVERLOAD lamp OK. Wire 1479 OK.
POSSIBLE PROBLEMS
Wire 1460 faulty. Overload differential pressure switch faulty. LHS control assy faulty. Wire 1726 faulty. Wire 1435 faulty.

5.

Is continuity measured on wire 1460 at overload pressure switch harness connector, terminal 1 with harness connector MC81, terminal N jumpered to ground?

WARNING
Read WARNING on Page 2-2291

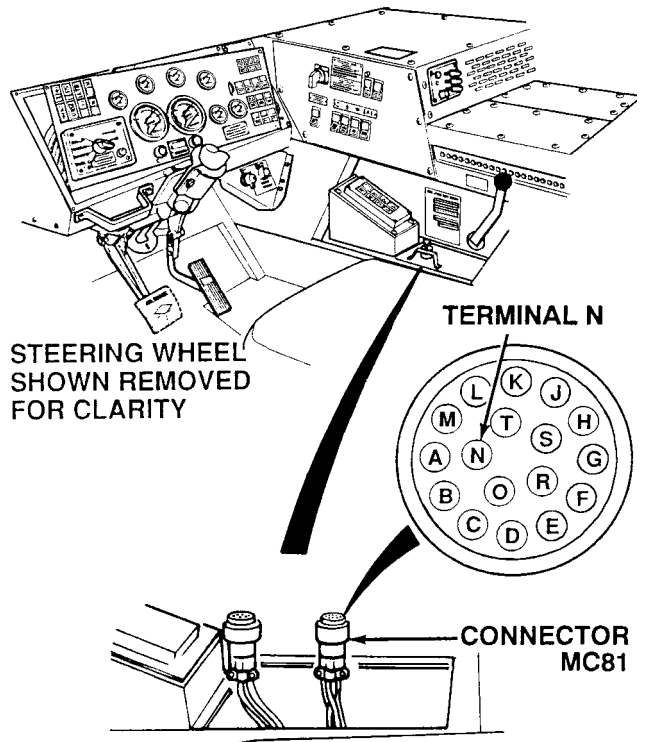
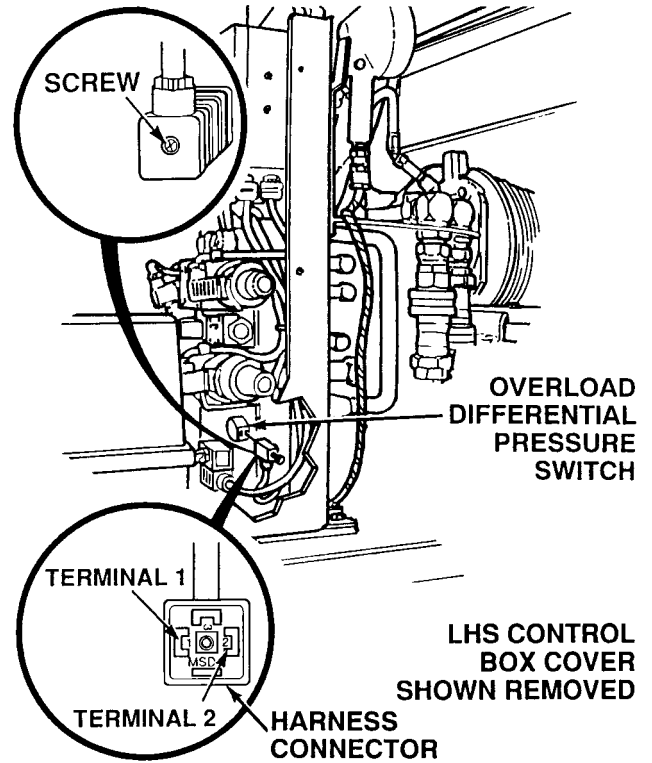
TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1460 is loose, faulty, or shorted to ground, 22 to 28 vdc will not be present at LHS control assy.



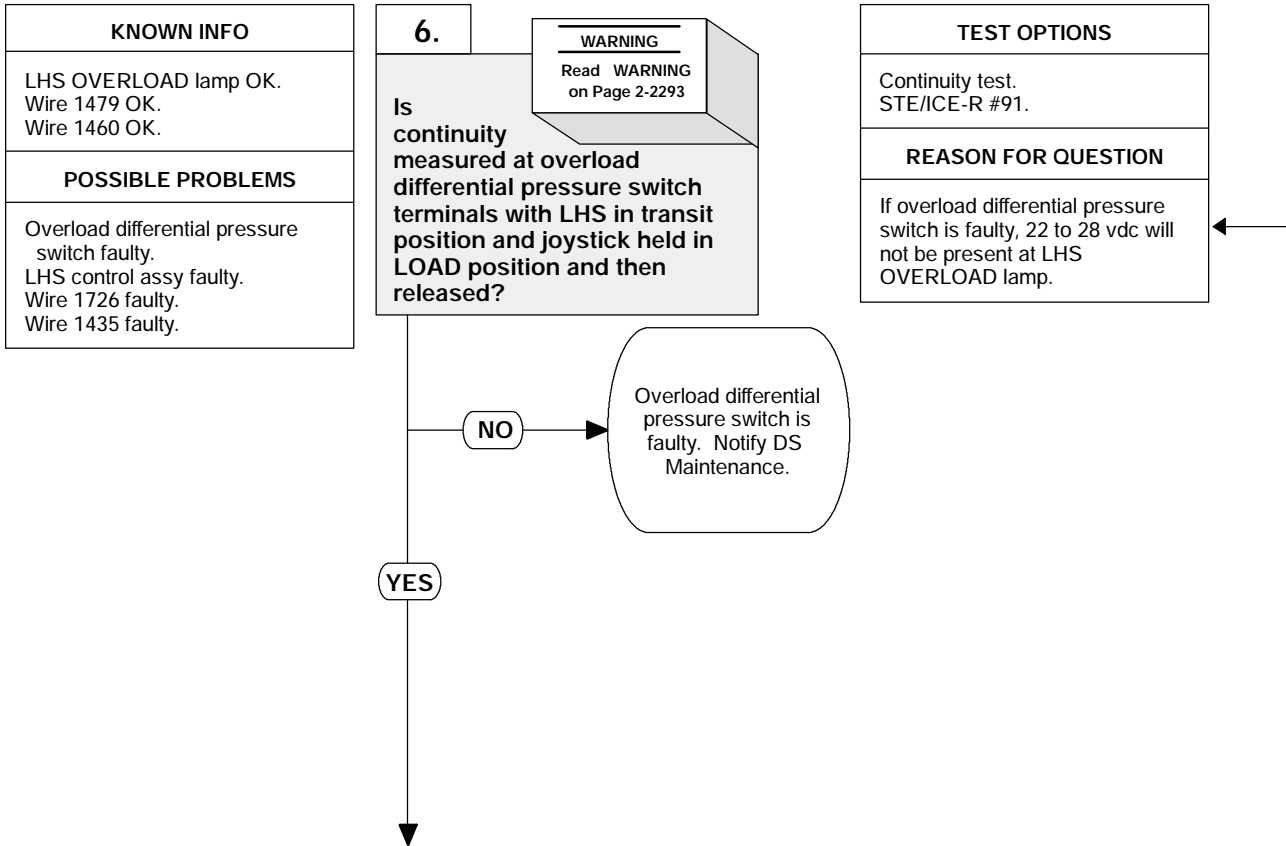
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Remove LHS control assy (Para 7-40).
 - (2) Set multimeter select switch to ohms.
 - (3) Connect harness connector MC81, terminal N to ground using jumperwire.
 - (4) Is there continuity between overload differential pressure switch harness connector, terminal 1 and a known good ground?
 - (a) If there is no continuity, remove jumperwire from harness connector MC81 to ground and repair wire 1460 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1460 is OK.
 - (5) Remove jumperwire from harness connector MC81, terminal N and ground.
 - (6) Install LHS control assembly (Para 7-40).



3. LHS OVERLOAD LIGHT DOES NOT OPERATE (CONT).

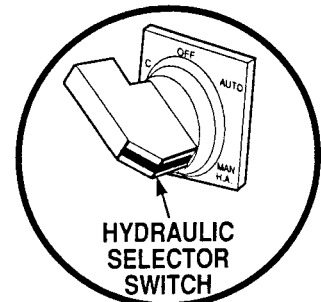


WARNING

- Adhesive causes immediate bonding on contact with eyes, skin, or clothing and also gives off harmful vapors. Wear protective goggles and use in well-ventilated area. If adhesive gets in eyes, try to keep eyes open; flush eyes with water for 15 minutes and get immediate medical attention.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

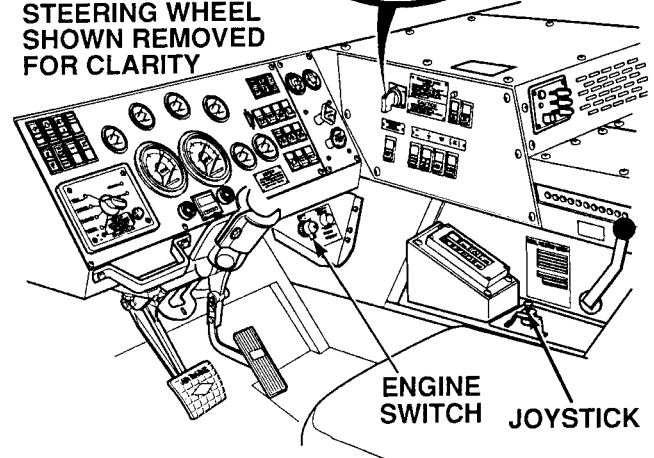
CONTINUITY TEST

- (1) Set hydraulic selector switch to MAN HA position (TM 9-2320-364-10).
- (2) Set multimeter select switch to ohms.
- (3) Hold joystick in LOAD position for five seconds and release joystick while assistant observes multimeter.
- (4) Is there continuity between overload differential pressure switch terminals?
 - (a) If there is no continuity when joystick is released, notify DS Maintenance.
 - (b) If there is continuity, switch is OK.
- (5) Set hydraulic selector switch to OFF position.
- (6) Connect harness connector to overload differential pressure switch and tighten screw, coat head of connector screw with adhesive.
- (7) Install LHS control box cover, four lockwashers and screws.



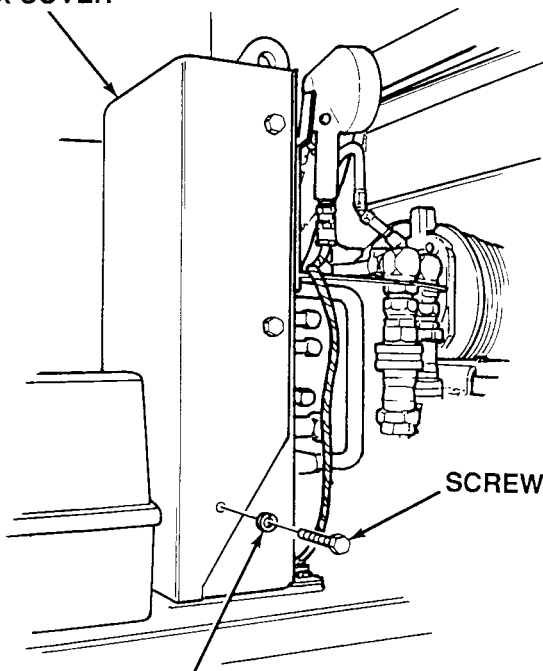
HYDRAULIC SELECTOR SWITCH

STEERING WHEEL SHOWN REMOVED FOR CLARITY



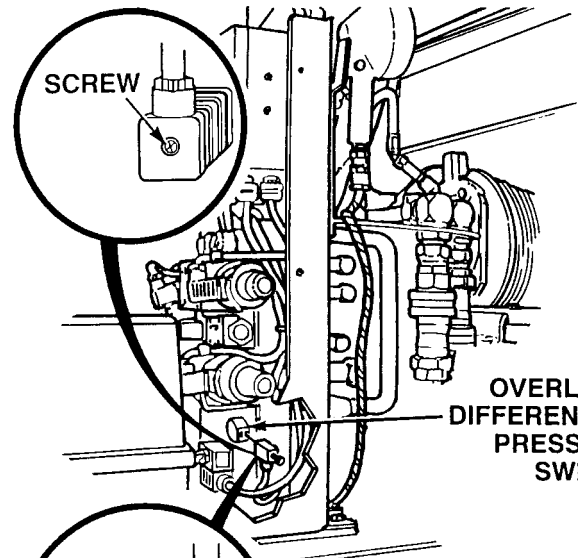
ENGINE SWITCH JOYSTICK

MAIN JUNCTION BOX COVER

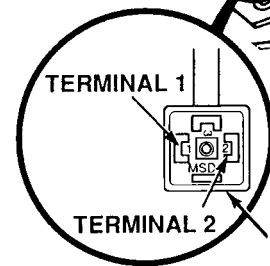


SCREW

LOCKWASHER



OVERLOAD DIFFERENTIAL PRESSURE SWITCH



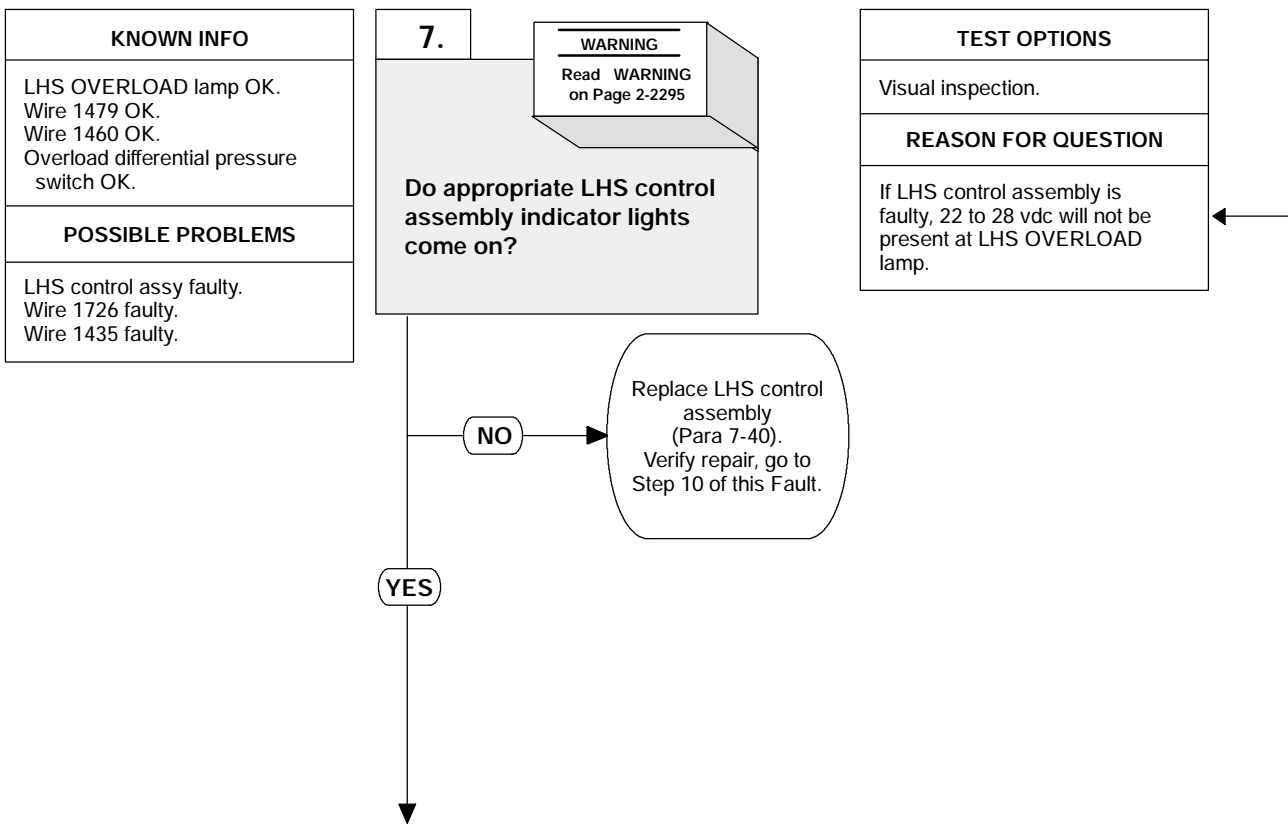
TERMINAL 1

TERMINAL 2

HARNESS CONNECTOR

LHS CONTROL BOX COVER SHOWN REMOVED

3. LHS OVERLOAD LIGHT DOES NOT OPERATE (CONT).

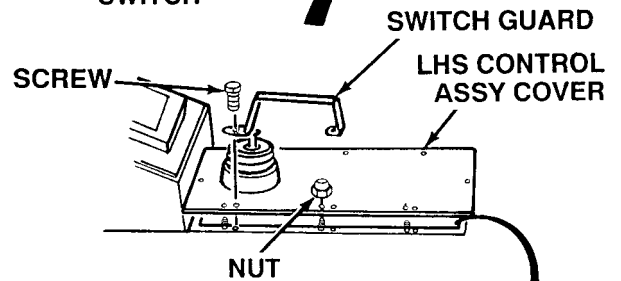
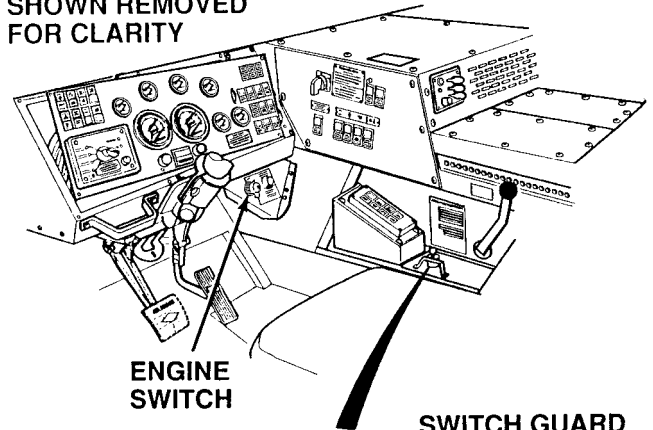


WARNING

- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tool contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

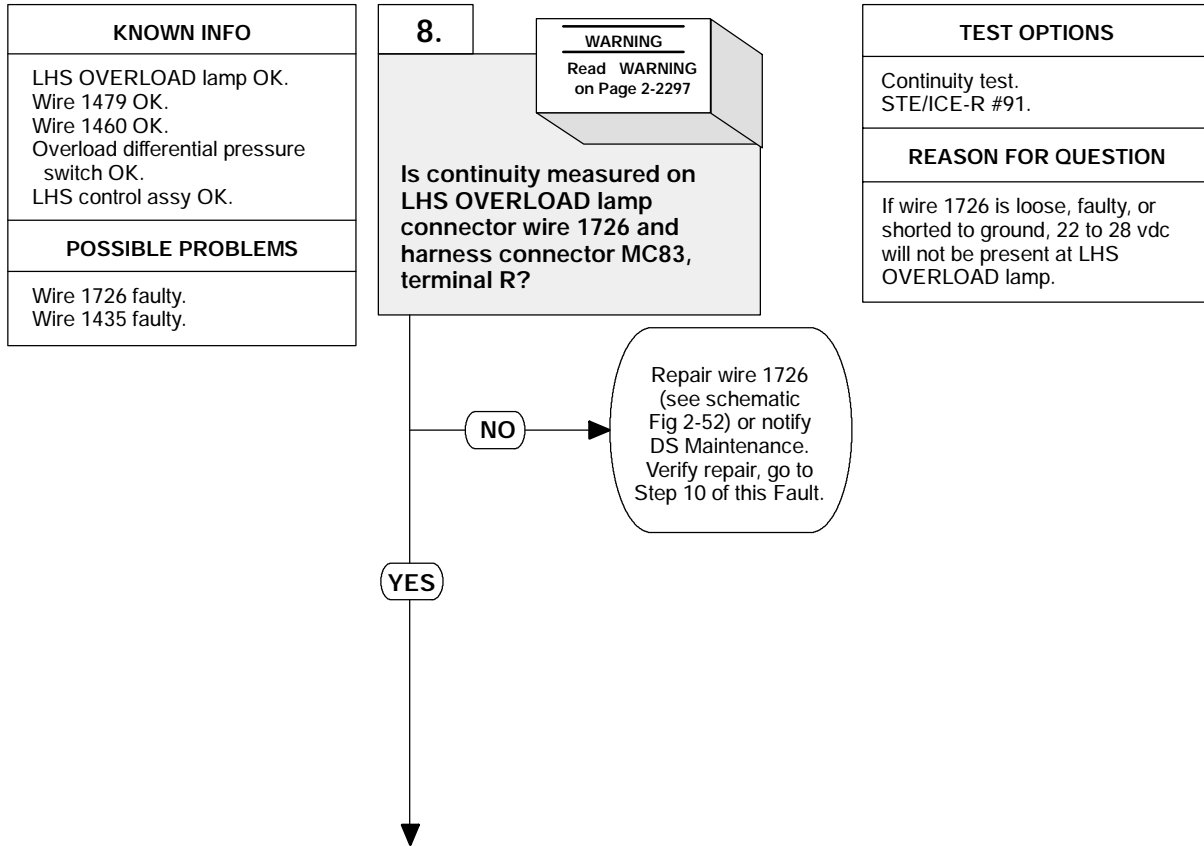
VISUAL INSPECTION
<ol style="list-style-type: none"> (1) Remove eight nuts, screws, and switch guard from LHS control assy. (2) Carefully lift off LHS control assy cover. Do not allow cover to dangle by joystick connecting wires. (3) Start engine (TM 9-2320-364-10). (4) Set hydraulic selector switch to MAN HA position. (5) Hold joystick in LOAD position for five seconds and release joystick while observing red indicator lights at bottom of LHS control assy. <ol style="list-style-type: none"> (a) If OVERLOAD LIGHT lamp is not illuminated, replace LHS control assy (Para 7-40). (b) If OVERLOAD LIGHT is illuminated, LHS control assy is OK. (6) Turn OFF ENGINE switch. (7) Set hydraulic selector switch to OFF position.

STEERING WHEEL SHOWN REMOVED FOR CLARITY



- | |
|--|
| <input type="radio"/> AUTO LOAD IN |
| <input type="radio"/> AUTO UNLOAD IN |
| <input type="radio"/> MAN/AUTO MODE |
| <input type="radio"/> MAN TRANSIT IN |
|
 |
| <input type="radio"/> UNLOAD OUT |
| <input type="radio"/> LOAD OUT |
| <input type="radio"/> AUX MODE IN |
| <input type="radio"/> NO TRANSIT LIGHT |
| <input type="radio"/> OVERLOAD LIGHT |
| <input type="radio"/> HOOK ARM "A" SOL |
| <input type="radio"/> MAIN RAM "B" SOL |
| <input type="radio"/> HOOK ARM "B" SOL |
| <input type="radio"/> MAIN RAM "A" SOL |
| <input type="radio"/> +24V IN |
| <input type="radio"/> HOOK ARM UP |
|
 |
| <input type="radio"/> FREE FLOW VALVE |
| <input type="radio"/> HOOK ARM DOWN |
| <input type="radio"/> TRANSIT VALVE |
| <input type="radio"/> OVERLOAD IN |
| <input type="radio"/> MID FRAME DOWN |

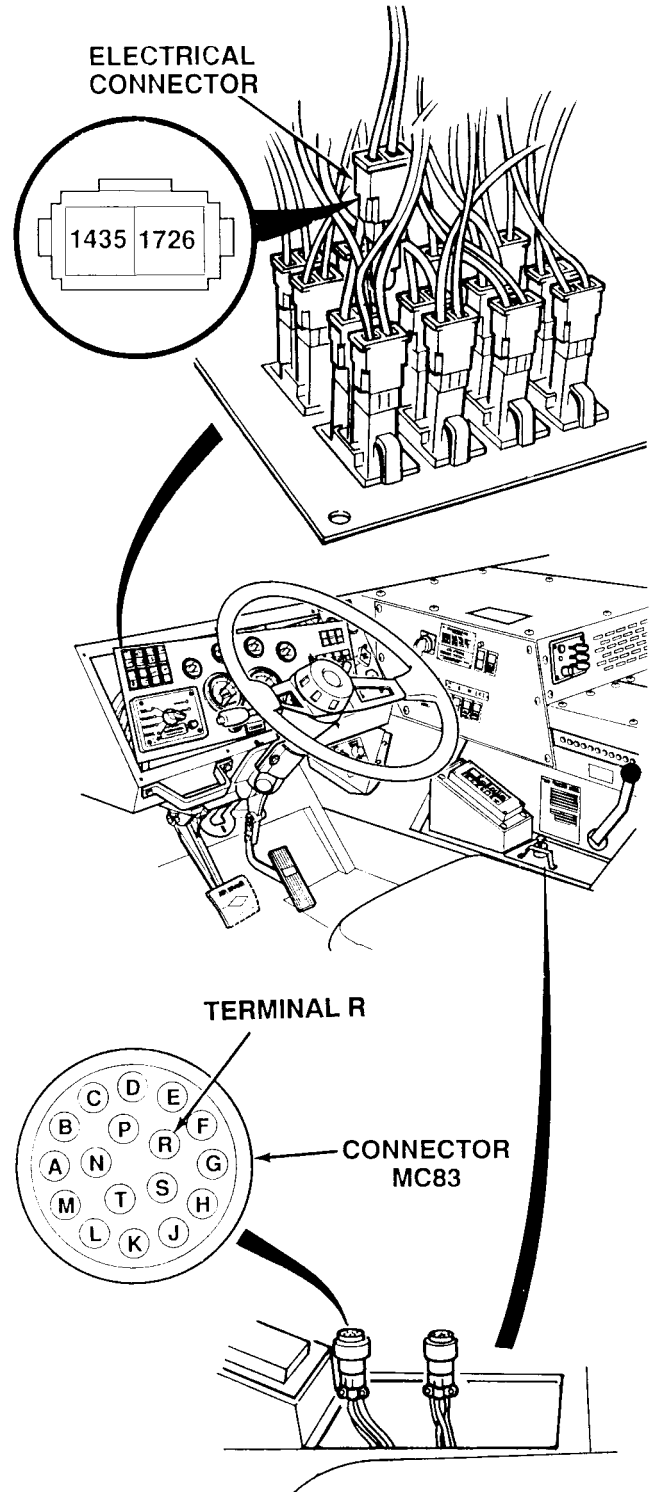
3. LHS OVERLOAD LIGHT DOES NOT OPERATE (CONT).



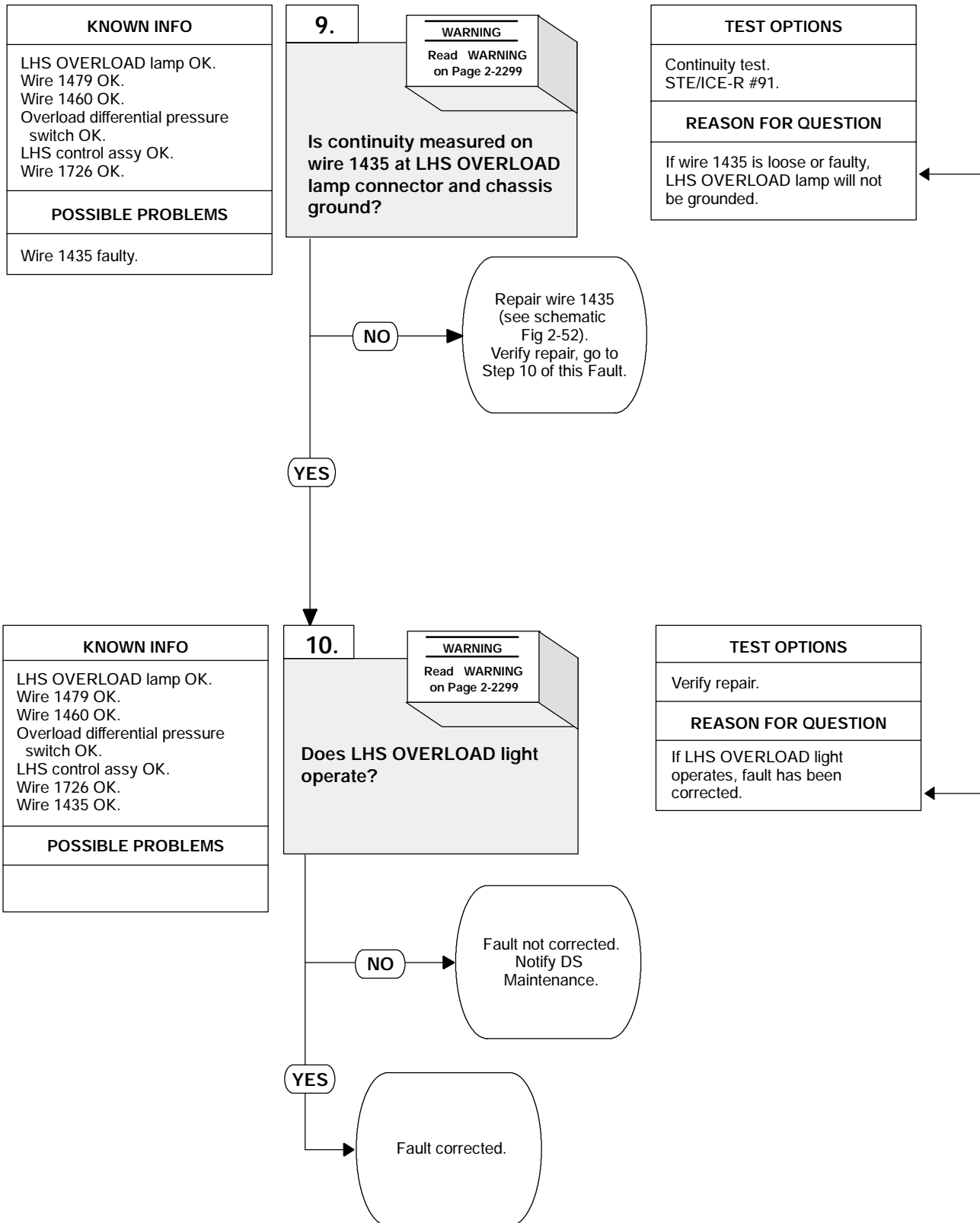
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Disconnect LHS control assembly from harness connectors.
 - (2) Set multimeter select switch to ohms.
 - (3) Is there continuity between harness connector MC83, terminal R and LHS OVERLOAD lamp connector wire 1726 terminal?
 - (a) If there is no continuity, repair wire 1726 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1726 is OK.
 - (4) Install LHS control assy (Para 7-40).



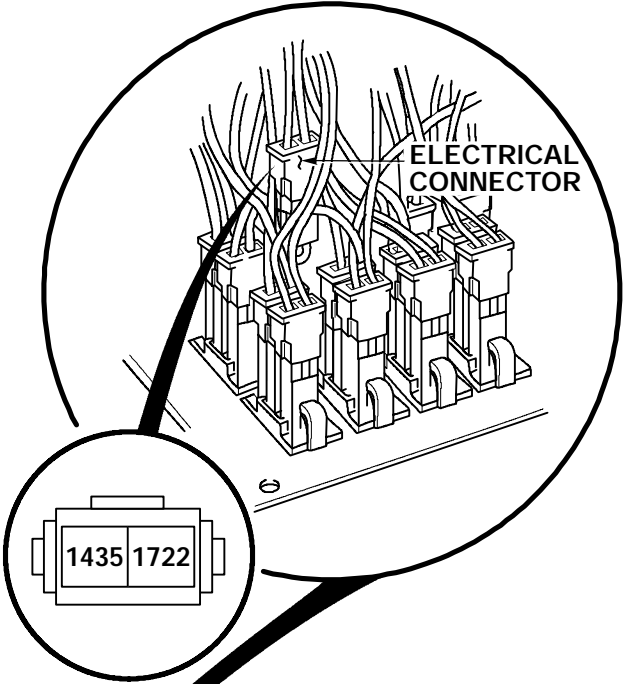
3. LHS OVERLOAD LIGHT DOES NOT OPERATE (CONT).



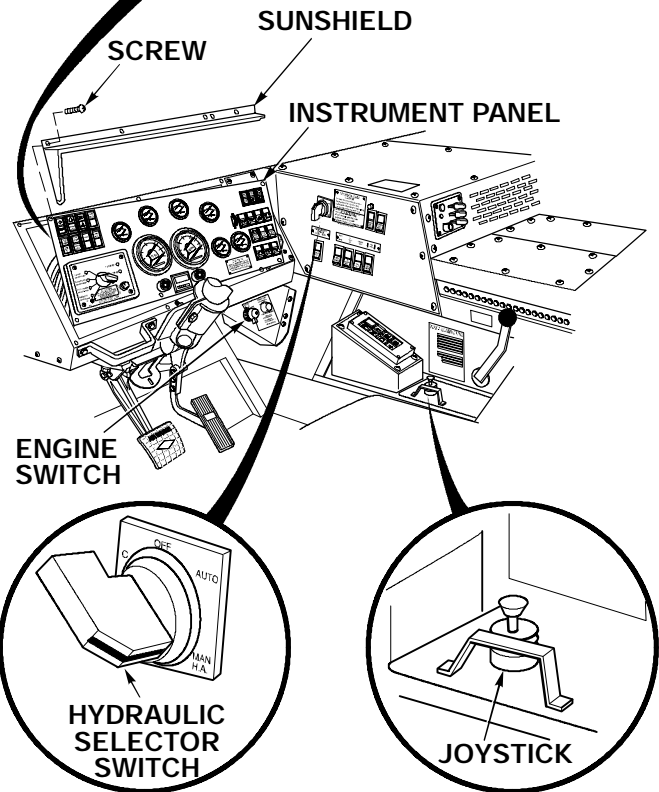
WARNING

- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
<ol style="list-style-type: none"> (1) Set multimeter select switch to ohms. (2) Is there continuity between LHS OVERLOAD lamp electrical connector wire 1435 terminal and a known good ground? <ol style="list-style-type: none"> (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) and perform Steps (3) and (4) below or notify DS Maintenance. (b) If there is continuity, wire 1435 is OK. (3) Connect electrical connector to LHS OVERLOAD lamp socket. (4) Install instrument panel and sunshield with ten screws.



VERIFY REPAIR
<ol style="list-style-type: none"> (1) Start engine (TM 9-2320-364-10). (2) Set hydraulic selector switch to MAN HA position. (3) While observing LHS OVERLOAD light, put joystick in LOAD position for five seconds and release. <ol style="list-style-type: none"> (a) If LHS OVERLOAD light does not operate, fault not corrected. Perform Steps (4) and (5) below and notify DS Maintenance. (b) If LHS OVERLOAD light operates, fault has been corrected. (4) Set hydraulic selector switch to OFF position. (5) Turn OFF ENGINE switch.



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

4. LHS OVERLOAD LIGHT DOES NOT GO OUT.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

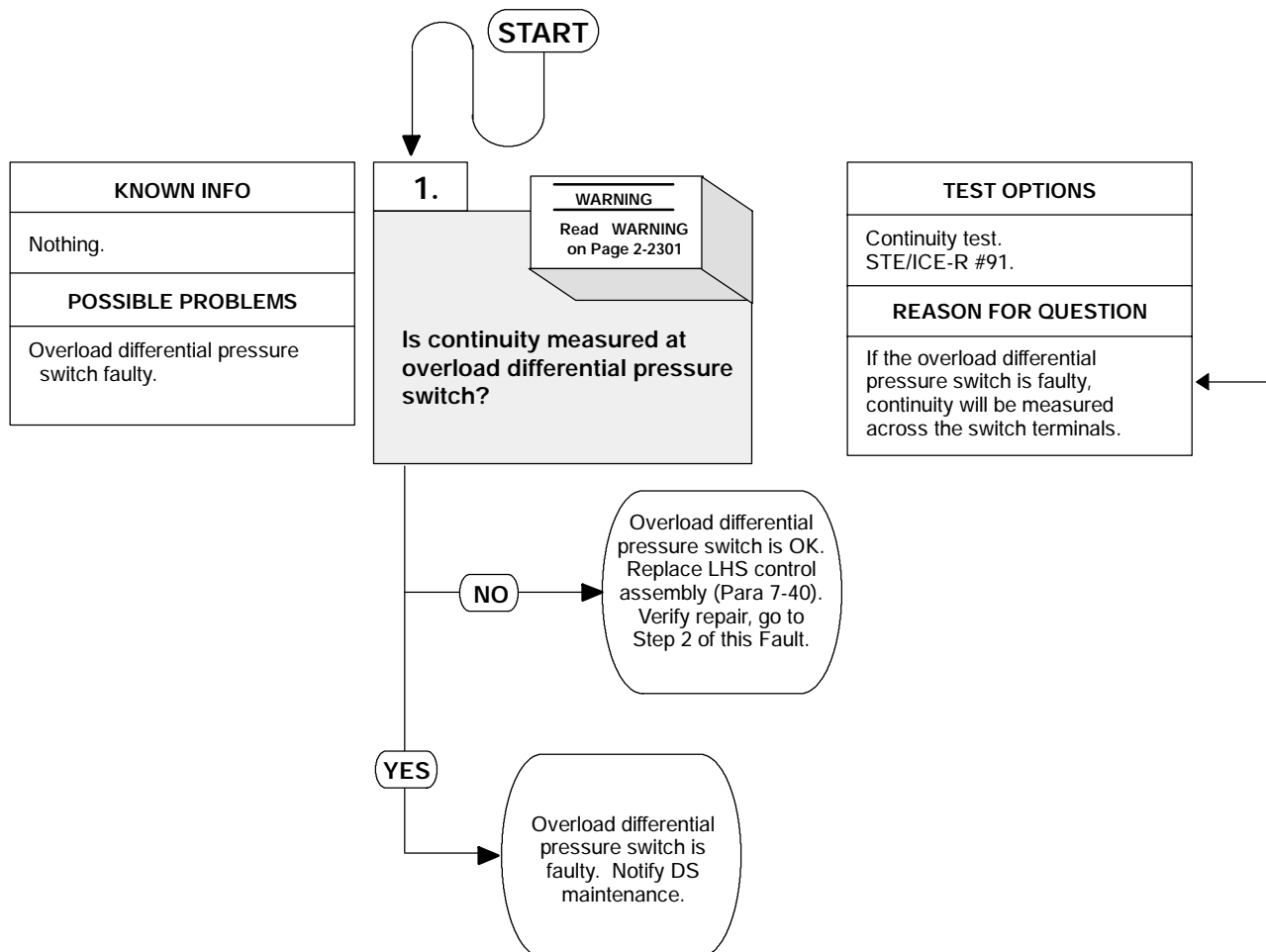
Lockwasher (4) (Item 180, Appendix F)
 Adhesive (Item 8, Appendix C)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)

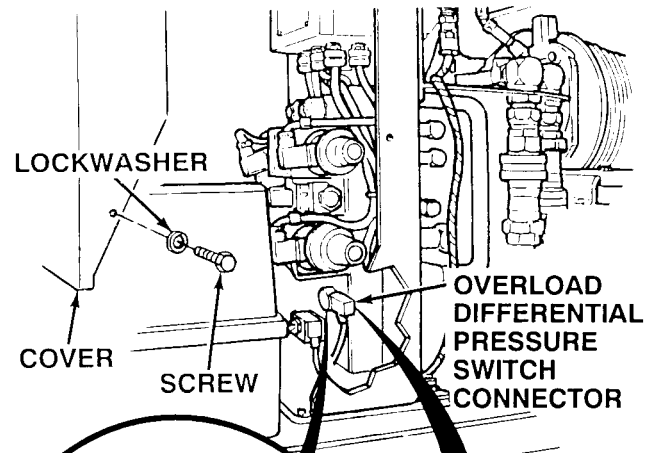
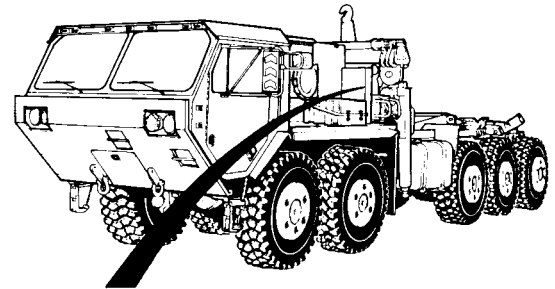


WARNING

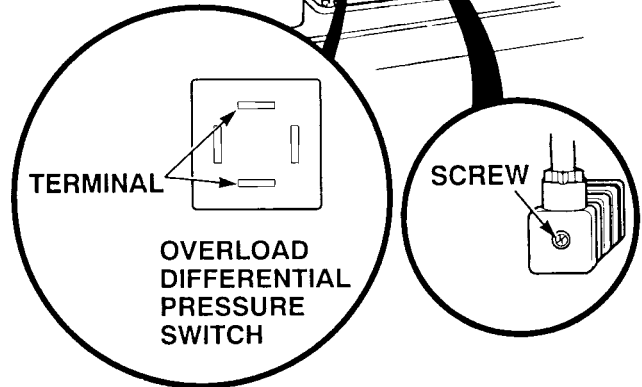
Adhesive causes immediate bonding on contact with eyes, skin, or clothing and also gives off harmful vapors. Wear protective goggles and use in well-ventilated area. If adhesive gets in eyes, try to keep eyes open; flush eyes with water for 15 minutes and get immediate medical attention.

NOTE

Only remove center screw on engine side of LHS control box cover.



CONTINUITY TEST	
(1)	Remove four screws, lockwashers and LHS control box cover. Discard lockwashers.
(2)	Loosen screw and disconnect harness connector from overload differential pressure switch.
(3)	Set multimeter select switch to ohms.
(4)	Is there continuity measured across overload differential pressure switch terminals?
(a)	If there is continuity, overload differential pressure switch is faulty. Notify DS maintenance.
(b)	If there is no continuity, switch is OK. Replace LHS control assembly (Para 7-40). Verify repair, go to Step 2 of this fault.
(5)	Connect harness connector to overload differential pressure switch and tighten screw, coat head of screw with adhesive.
(6)	Install LHS control box cover, four lockwashers and screws.



4. LHS OVERLOAD LIGHT DOES NOT GO OUT (CONT).

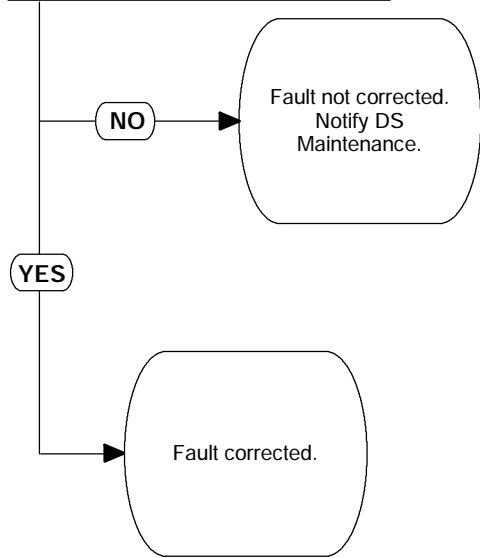
KNOWN INFO
Overload differential pressure switch OK.
POSSIBLE PROBLEMS

2.

WARNING
 Read WARNING on Page 2-2303

Does LHS overload light operate properly?

TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If LHS overload light operates, fault has been corrected. ←



WARNING

Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.

VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch to MAN HA position.
- (3) While observing LHS overload light, put joystick in LOAD position for five seconds and release.
 - (a) If LHS overload light operates and fails to go out, fault is not corrected. Perform Step (4) below and notify DS Maintenance.
 - (b) If LHS overload light operates and goes out, fault has been corrected.
- (4) Turn OFF ENGINE switch.

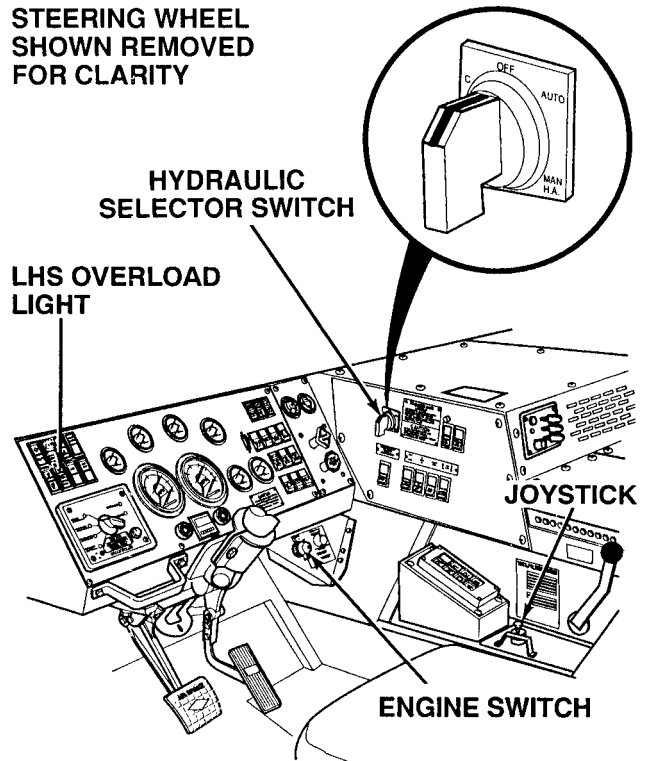
**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR SWITCH**

**LHS OVERLOAD
LIGHT**

JOYSTICK

ENGINE SWITCH



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

5. LOSS OF SUPPLY VOLTAGE TO MAIN JUNCTION BOX.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

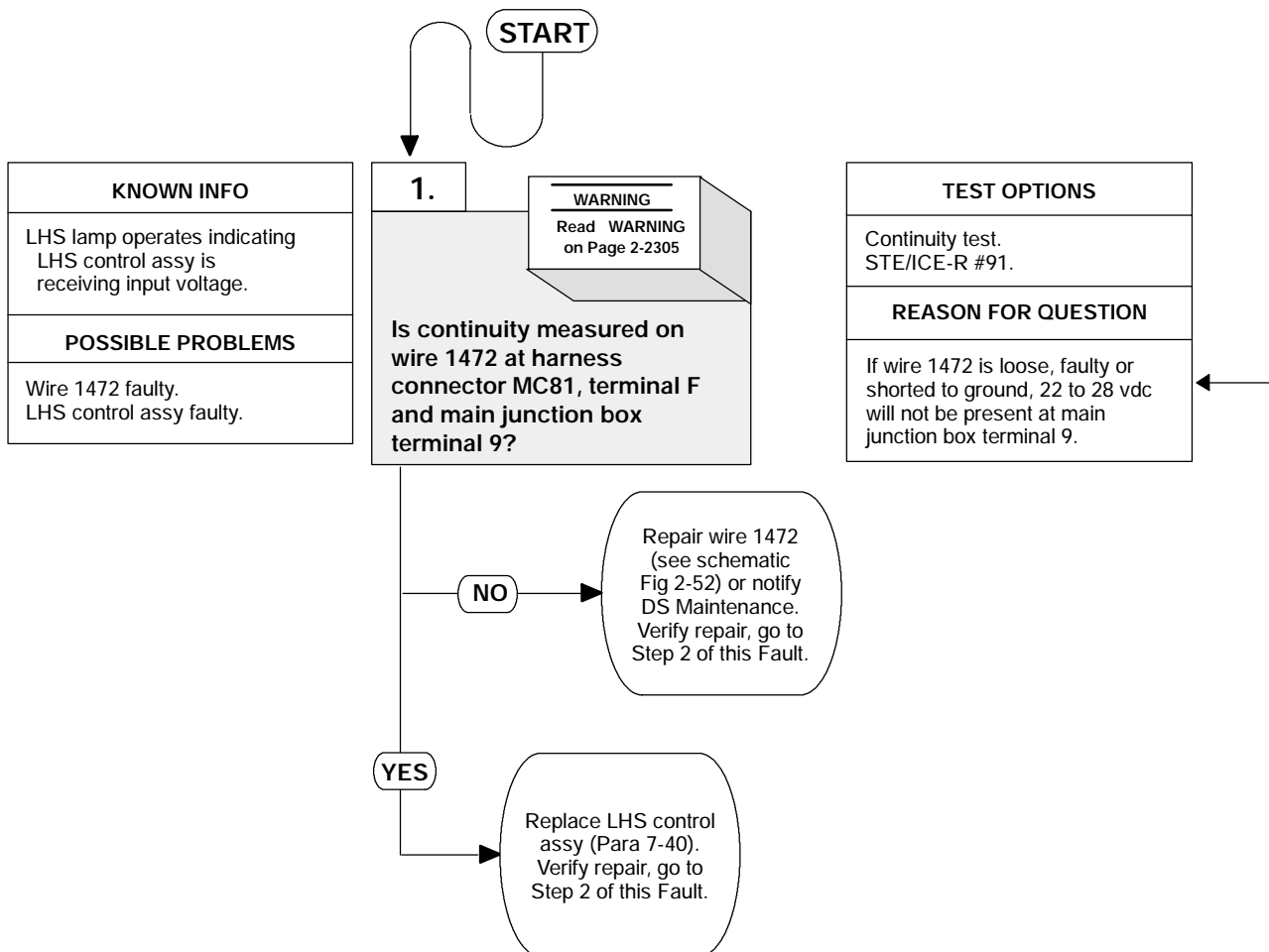
Lockwasher (4) (Item 180, Appendix F)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)



WARNING

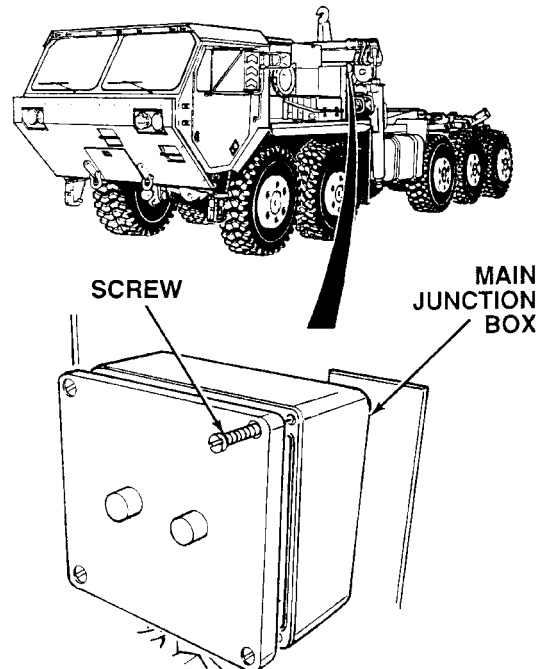
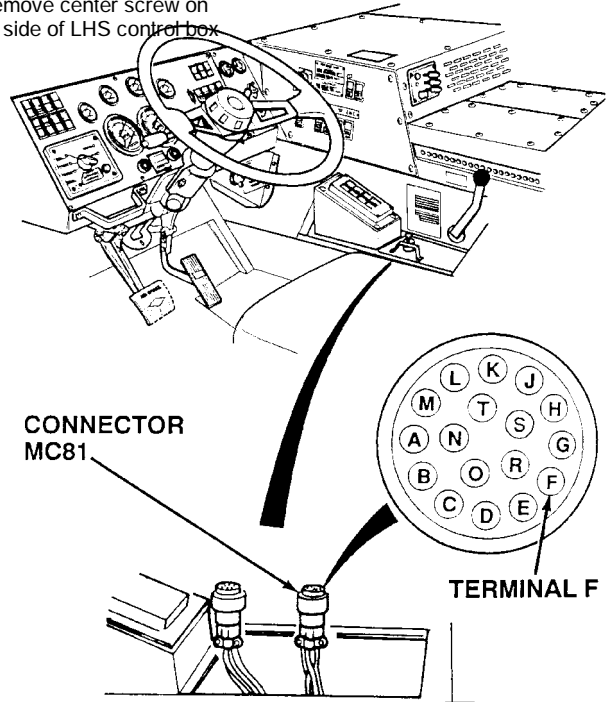
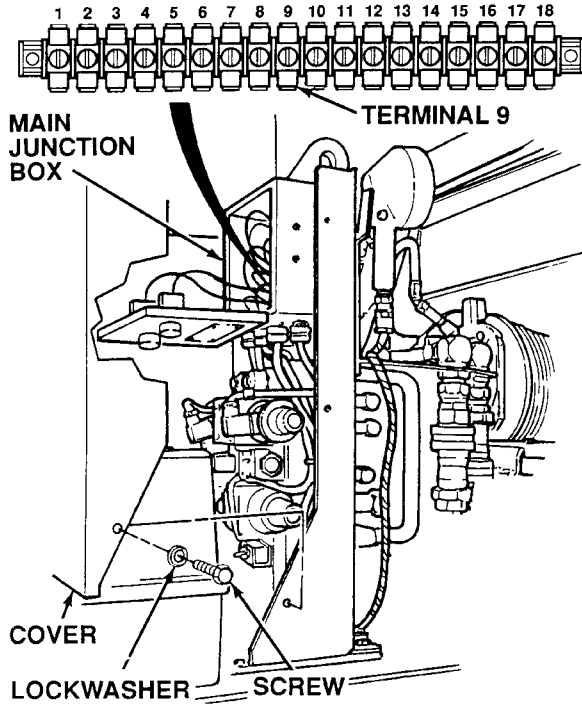
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

When opening the main junction box, do not pull or allow front of junction box to hang by the wire connections. Failure to comply will damage the wire connections.

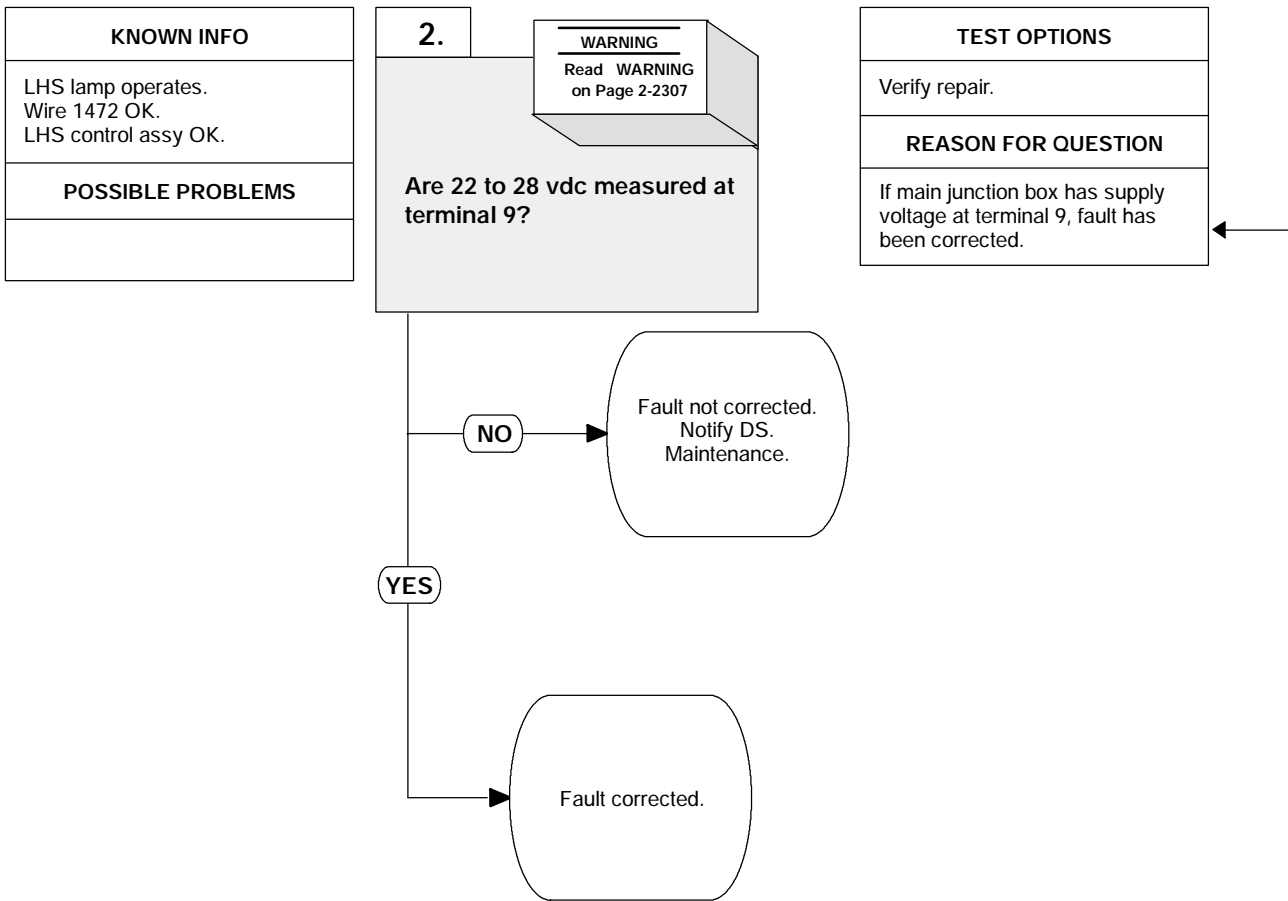
NOTE

Only remove center screw on engine side of LHS control box cover.



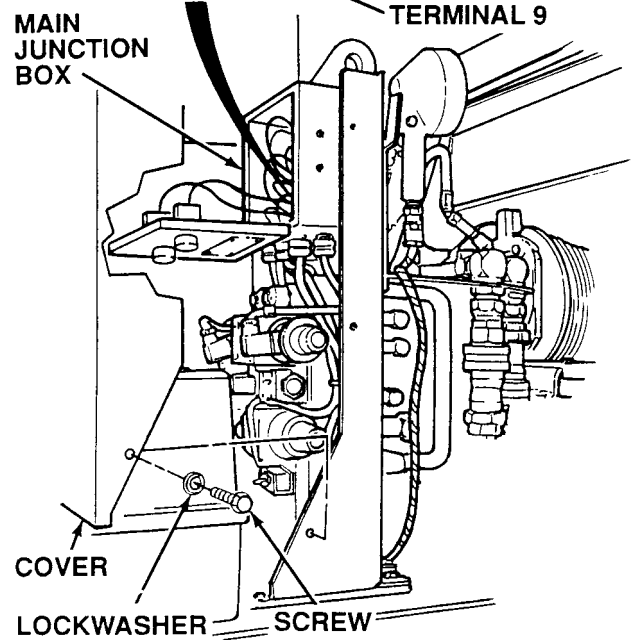
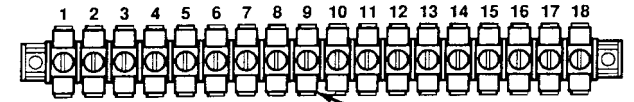
CONTINUITY TEST	
(1)	Remove LHS control assy (Para 7-40).
(2)	Remove four screws, lockwashers and LHS control box cover. Discard lockwashers.
(3)	Loosen four screws and open main junction box.
(4)	Connect main junction box terminal 9 to a known good ground using jumperwire.
(5)	Set multimeter select switch to ohms.
(6)	Is there continuity between harness connector MC81, terminal F and a known good ground?
(a)	If there is no continuity, repair wire 1472 (see schematic Fig 2-52) or notify DS Maintenance.
(b)	If there is continuity, replace LHS control assy (Para 7-40) and perform Steps (7) and (8) below.
(7)	Remove jumperwire from main junction box terminal F and ground.
(8)	Install LHS control assy (Para 7-40).

5. LOSS OF SUPPLY VOLTAGE TO MAIN JUNCTION BOX (CONT).

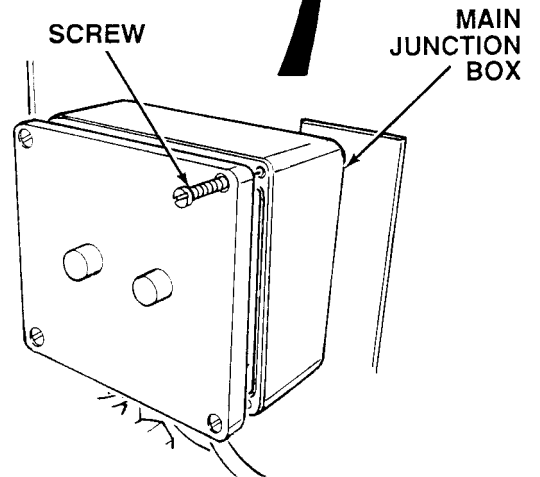
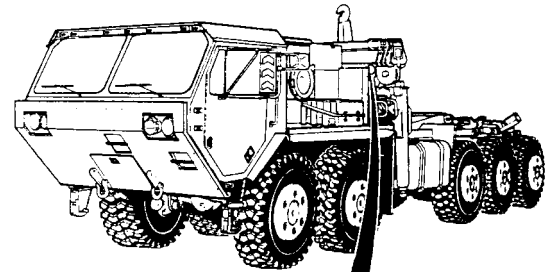


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- VERIFY REPAIR**
- (1) Set multimeter select switch to volts dc.
 - (2) Connect positive (+) multimeter lead at main junction box terminal 9.
 - (3) Connect negative (-) multimeter lead to a known good ground.
 - (4) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If there are not 22 to 28 vdc present, Perform Steps (5) through (7) below and notify DS Maintenance.
 - (b) If there are 22 to 28 vdc present, fault has been corrected.
 - (5) Turn OFF ENGINE switch.
 - (6) Close main junction box and tighten four screws.
 - (7) Install LHS control box cover, four lockwashers and screws.



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

6. LOSS OF MIDDLE FRAME SAFE LOWERING FUNCTION.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

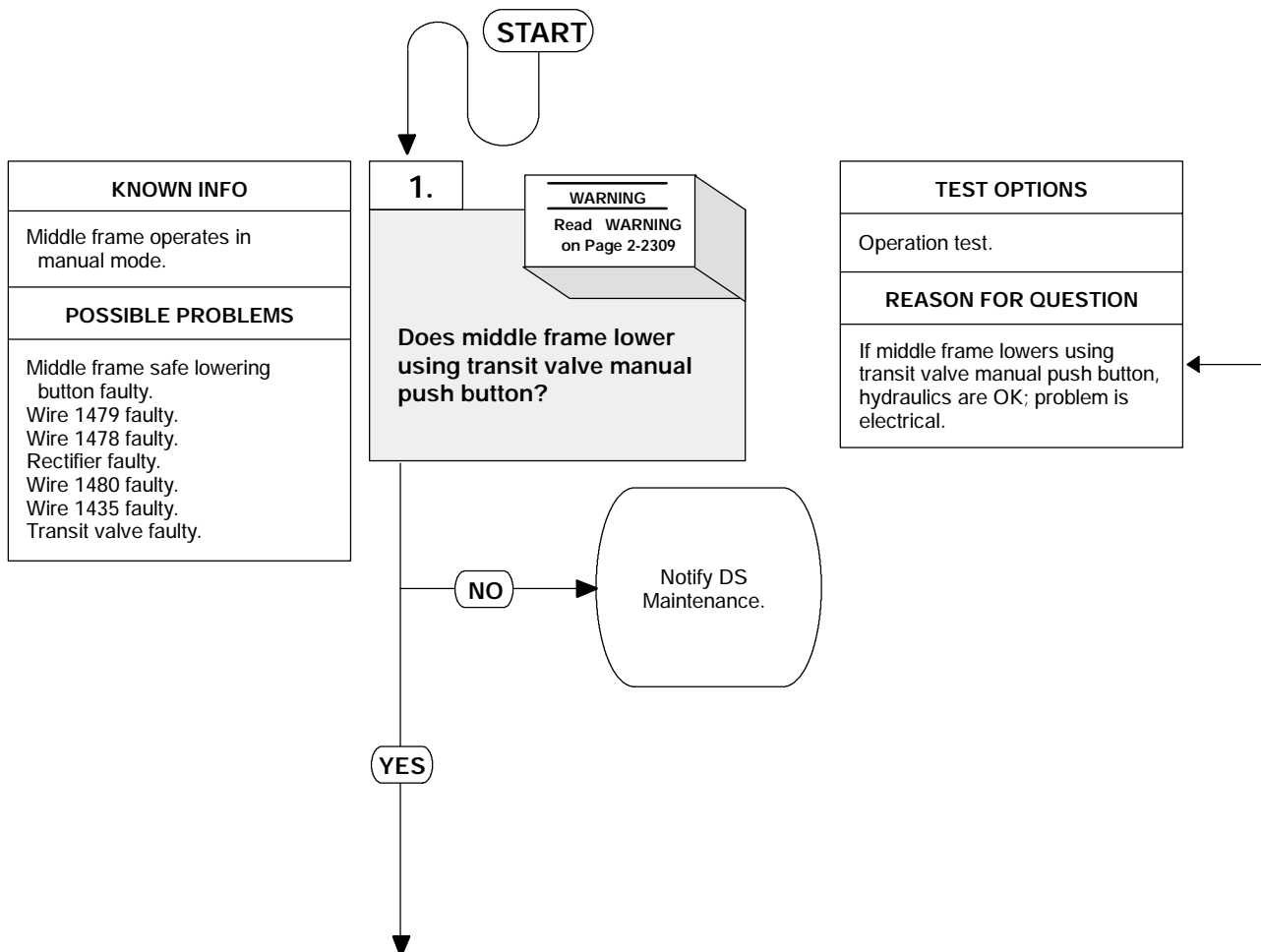
Lockwasher (4) (Item 180, Appendix F)
 Adhesive (Item 8, Appendix C)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)



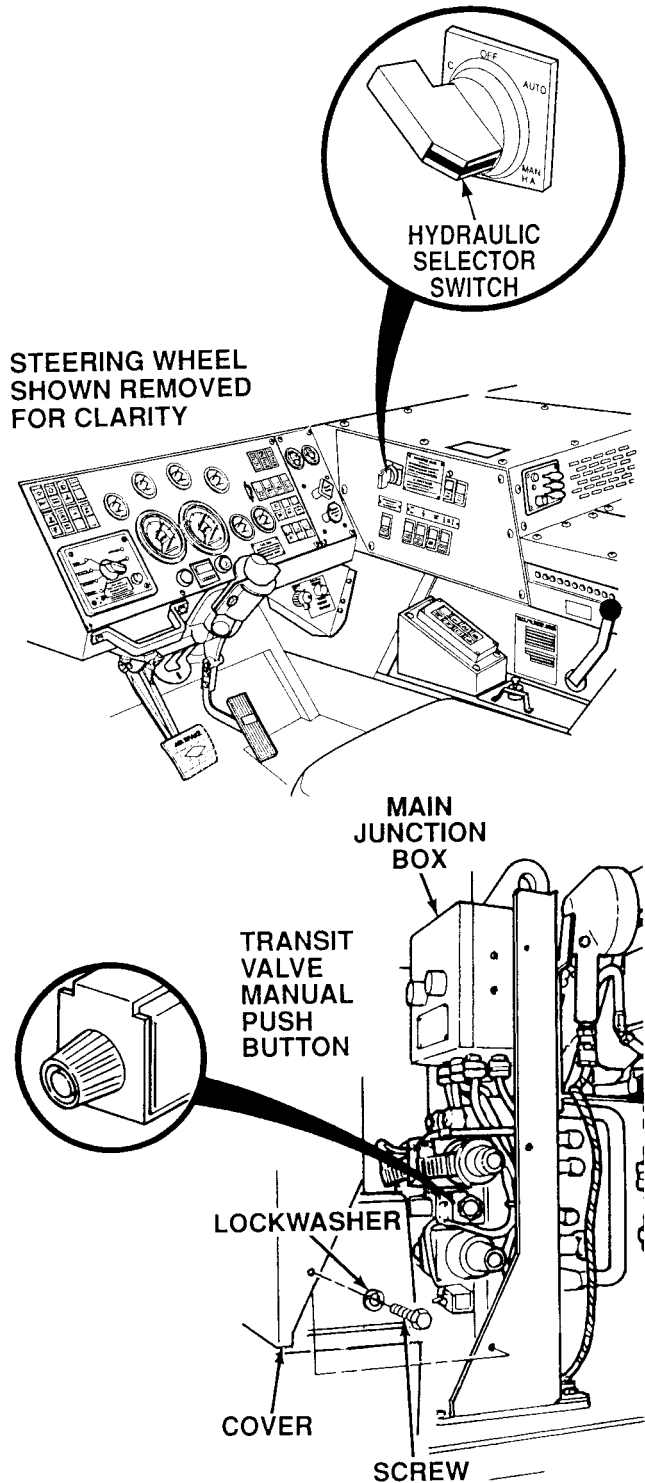
WARNING

Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.

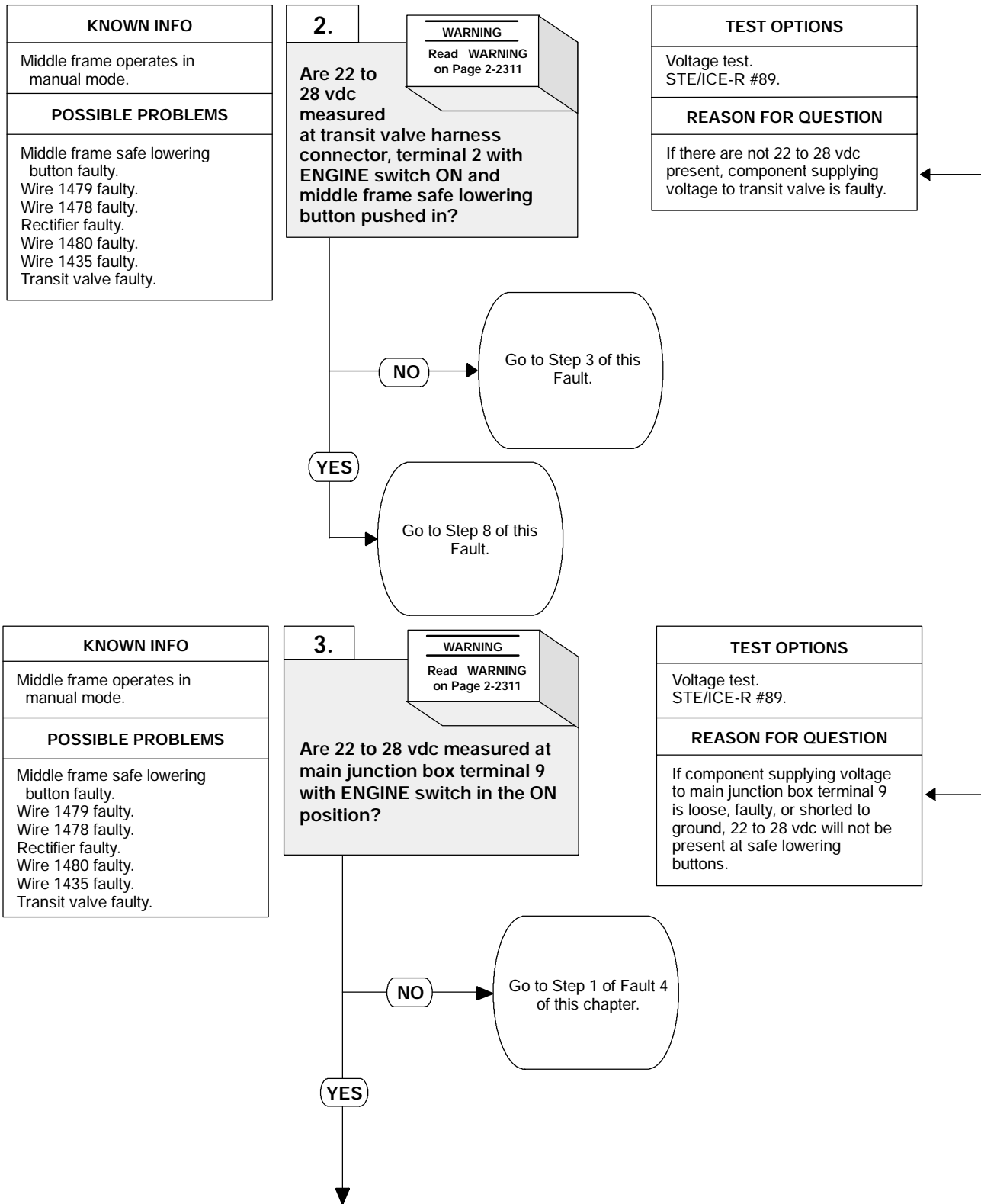
NOTE

Only remove center screw on engine side of LHS control box cover.

OPERATION TEST	
(1)	Remove four screws, lockwashers and LHS control box cover. Discard lockwashers.
(2)	Start engine (TM 9-2320-364-10).
(3)	Set hydraulic selector switch to MAN MF position.
(4)	Raise LHS until middle frame is approximately 3 ft (91 cm) above transit position.
(5)	Push in transit valve manual push button to lower middle frame. <ul style="list-style-type: none"> (a) If middle frame does not lower to transit position, lower middle frame using joystick. Perform Steps (6) and (7) below and notify DS Maintenance. (b) If middle frame lowers to transit position, perform Steps (6) and (7) below.
(6)	Set hydraulic selector switch to OFF position.
(7)	Turn OFF ENGINE switch.



6. LOSS OF MIDDLE FRAME SAFE LOWERING FUNCTION (CONT).



WARNING

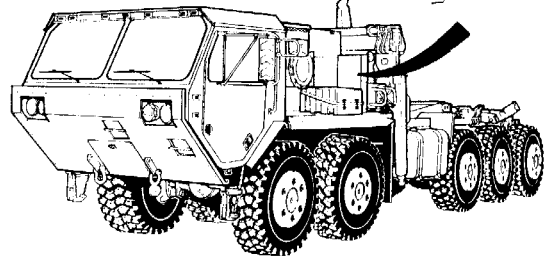
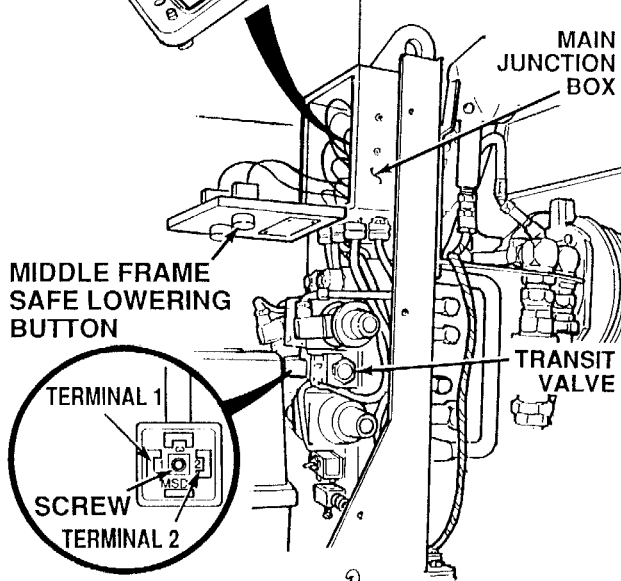
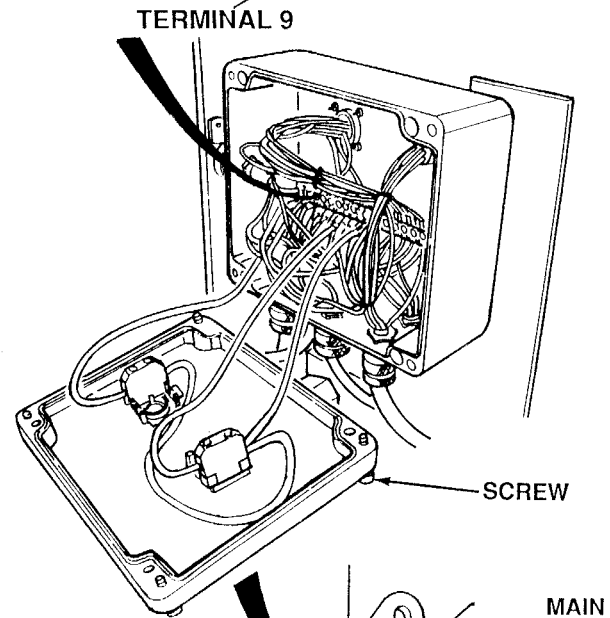
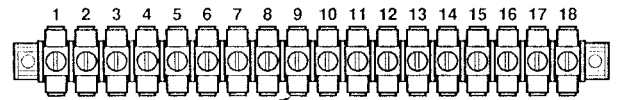
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment and injury or death to personnel may occur.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CAUTION

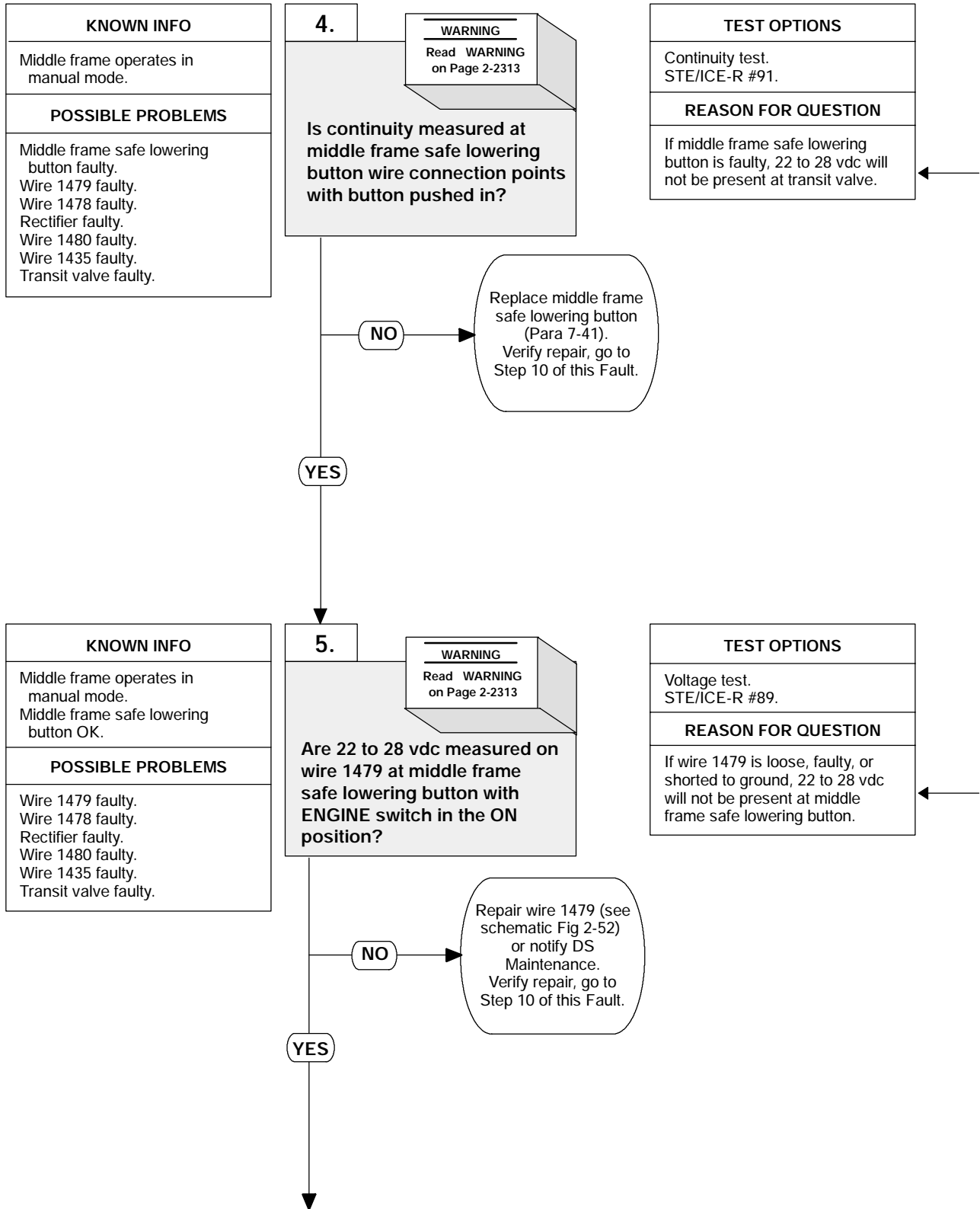
Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.

VOLTAGE TEST
<ol style="list-style-type: none"> (1) Remove harness connector from transit valve. (2) Set multimeter select switch to volts dc. (3) Connect positive (+) multimeter lead at connector, terminal 2. (4) Connect negative (-) multimeter lead to a known good ground. (5) Turn ON ENGINE switch (TM 9-2320-364-10). (6) Push in middle frame safe lowering button. <ol style="list-style-type: none"> (a) If there are not 22 to 28 vdc present, perform Steps (7) through (9) below and go to Step 3 of this Fault. (b) If there are 22 to 28 vdc present, perform Steps (7) through (9) below and go to Step 8 of this Fault. (7) Turn OFF ENGINE switch. (8) Install harness connector on transit valve. (9) Tighten connector screw and coat head of screw with adhesive.

VOLTAGE TEST
<ol style="list-style-type: none"> (1) Loosen four screws and open main junction box. (2) Connect positive (+) multimeter lead at main junction box terminal 9. (3) Connect negative (-) multimeter lead to a known good ground. (4) Turn ON ENGINE switch (TM 9-2320-364-10). <ol style="list-style-type: none"> (a) If there are not 22 to 28 vdc present, perform Step (5) below and go to Step 1 of Fault 4 of this Chapter. (b) If there are 22 to 28 vdc present, perform Step (5) below. (5) Turn OFF ENGINE switch.



6. LOSS OF MIDDLE FRAME SAFE LOWERING FUNCTION (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

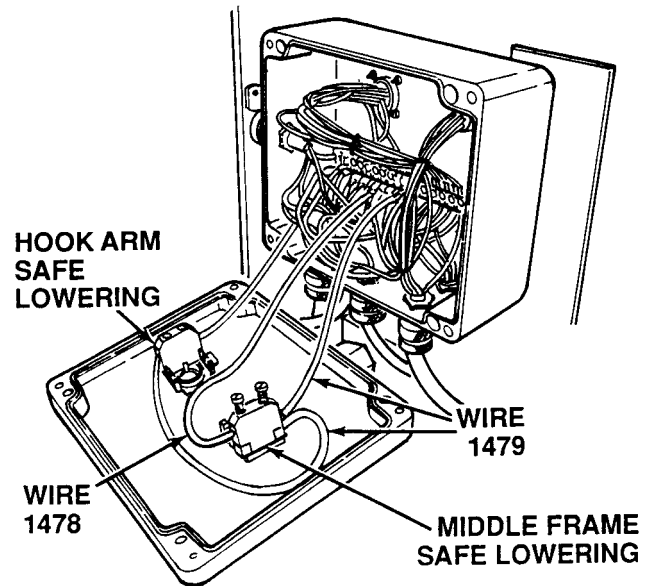
Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Push in middle frame safe lowering button.
- (3) Is there continuity between middle frame safe lowering button wire 1478 and wire 1479?
 - (a) If there is no continuity, replace middle frame safe lowering button (Para 7-41).
 - (b) If there is continuity, safe lowering button is OK.

VOLTAGE TEST

- (1) Set multimeter select switch to volts dc.
- (2) Connect positive (+) multimeter lead at middle frame safe lowering button wire 1479.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If there are not 22 to 28 vdc present, turn OFF ENGINE switch and repair wire 1479 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there are 22 to 28 vdc present, wire 1479 is OK.
- (5) Turn OFF ENGINE switch.



6. LOSS OF MIDDLE FRAME SAFE LOWERING FUNCTION (CONT).

KNOWN INFO
Middle frame operates in manual mode. Middle frame safe lowering button OK. Wire 1479 OK.
POSSIBLE PROBLEMS
Wire 1478 faulty. Rectifier faulty. Wire 1480 faulty. Wire 1435 faulty. Transit valve faulty.

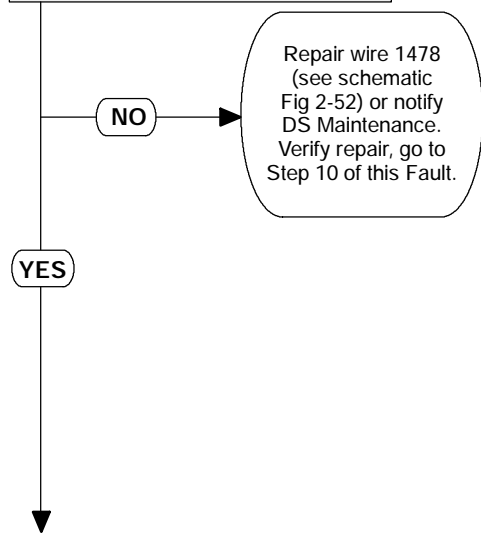
6.

WARNING

Read **WARNING** on Page 2-2315

Are 22 to 28 vdc measured on wire 1478 at main junction box rectifier with ENGINE switch ON and middle frame safe lowering button pushed in?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If wire 1478 is loose, faulty, or shorted to ground, 22 to 28 vdc will not be present at transit valve.



WARNING

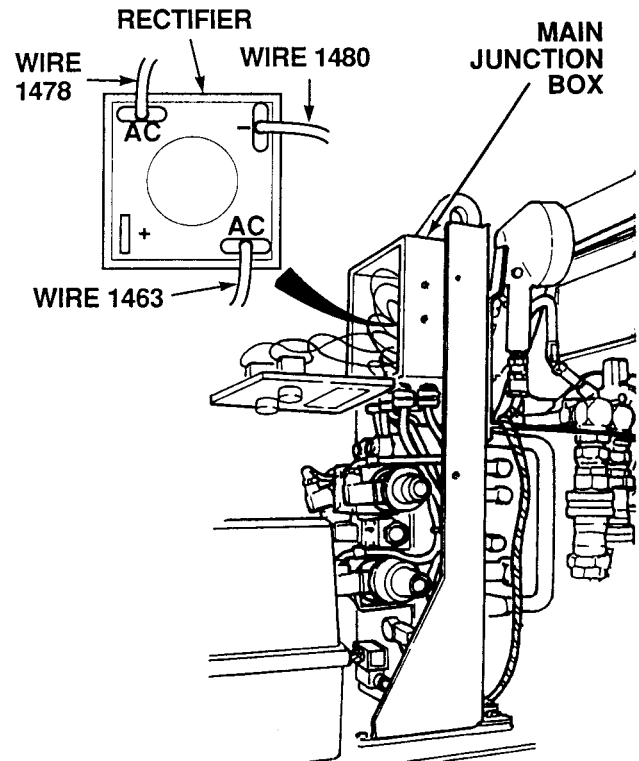
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

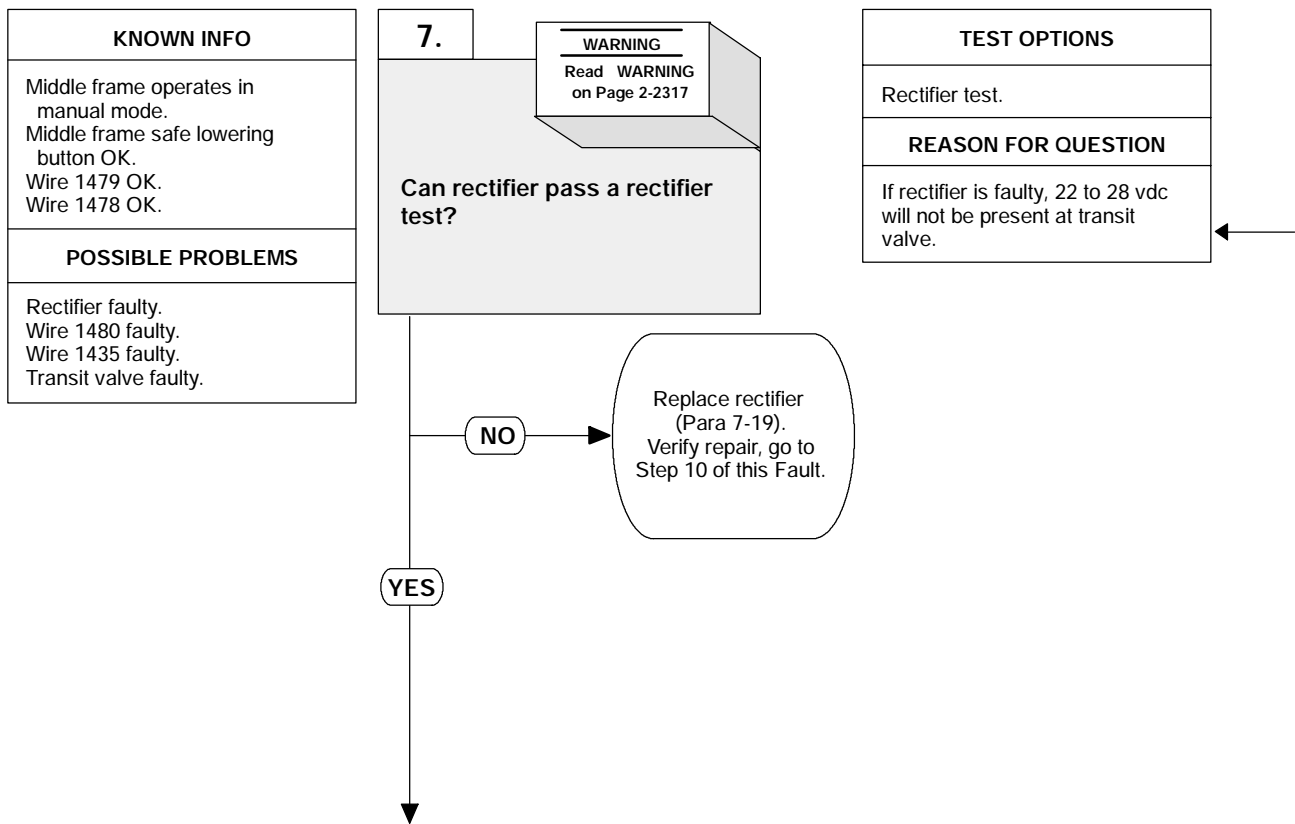
Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.

VOLTAGE TEST

- (1) Set multimeter select switch to volts dc.
- (2) Connect positive (+) multimeter lead at rectifier wire 1478.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
- (5) Push in middle frame safe lowering button.
 - (a) If there are not 22 to 28 vdc present, turn OFF ENGINE switch and repair wire 1478 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there are 22 to 28 vdc present, wire 1478 is OK.
- (6) Turn OFF ENGINE switch.



6. LOSS OF MIDDLE FRAME SAFE LOWERING FUNCTION (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

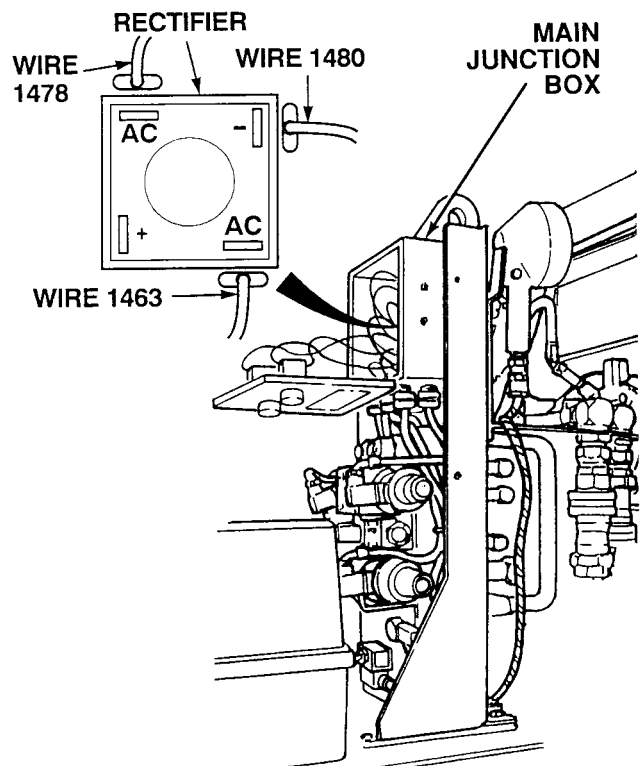
Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.

NOTE

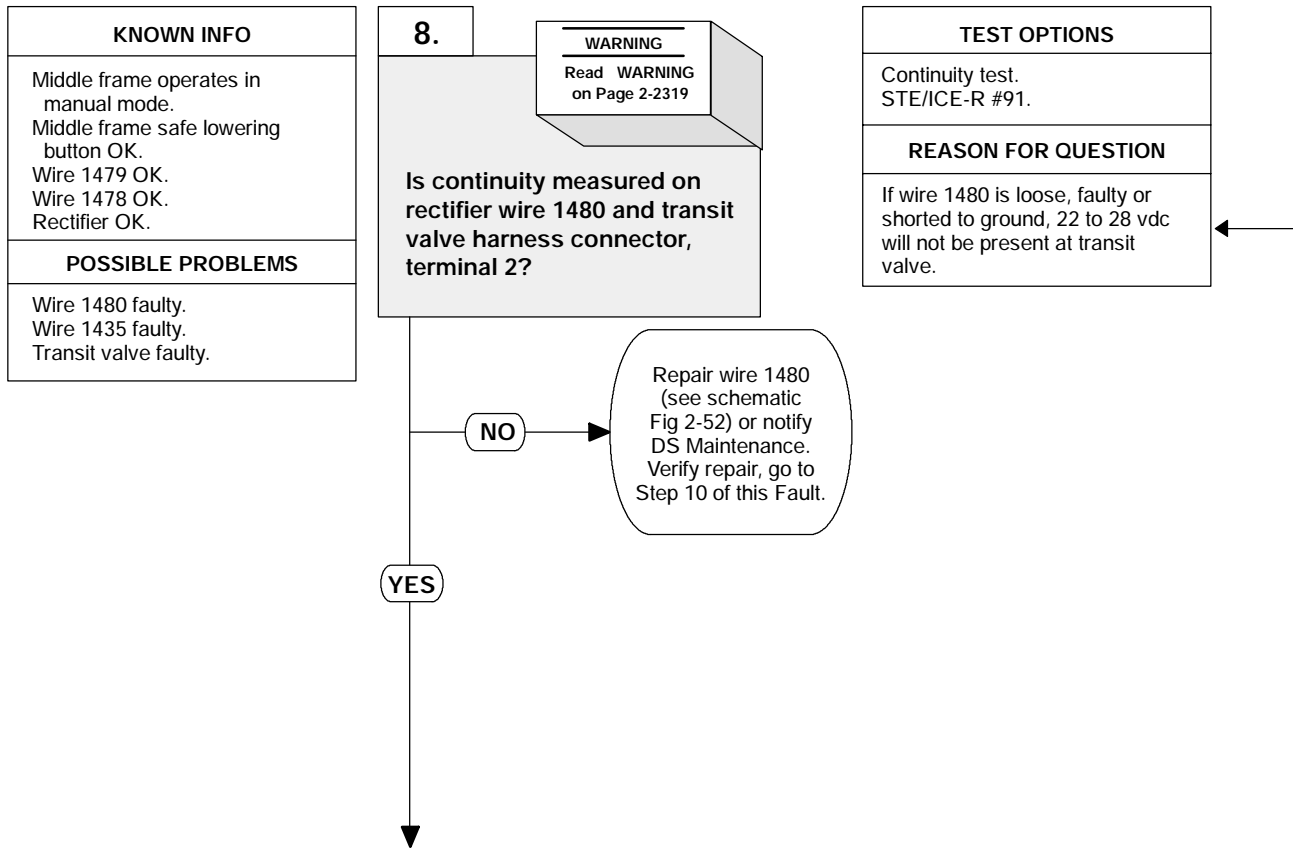
Tag and mark all wires prior to disconnecting.

RECTIFIER TEST

- (1) Disconnect all wires from rectifier.
- (2) Set multimeter select switch to diode position.
- (3) Connect positive (+) multimeter lead at negative terminal.
- (4) Connect negative (-) multimeter lead at each AC terminal.
 - (a) If there are not any vdc present at both AC terminals, replace rectifier (Para 7-19).
 - (b) If there is any vdc present at both AC terminals, perform Steps (5) and (6) below.
- (5) Connect negative (-) multimeter lead at positive terminal on rectifier.
- (6) Connect positive (+) multimeter lead at each AC terminal.
 - (a) If there is not any vdc present at both AC terminals, replace rectifier (Para 7-19) and perform Step (7) below.
 - (b) If there is any vdc present, rectifier is OK.
- (7) Connect wires to rectifier.



6. LOSS OF MIDDLE FRAME SAFE LOWERING FUNCTION (CONT).

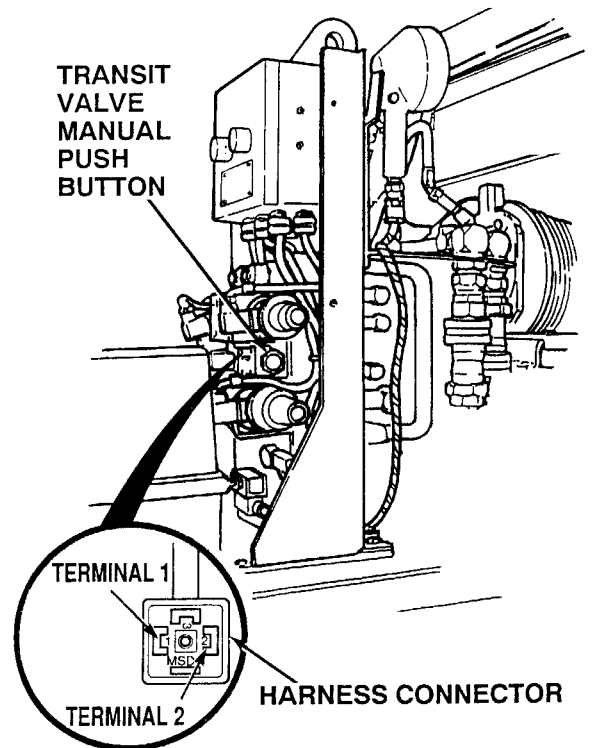
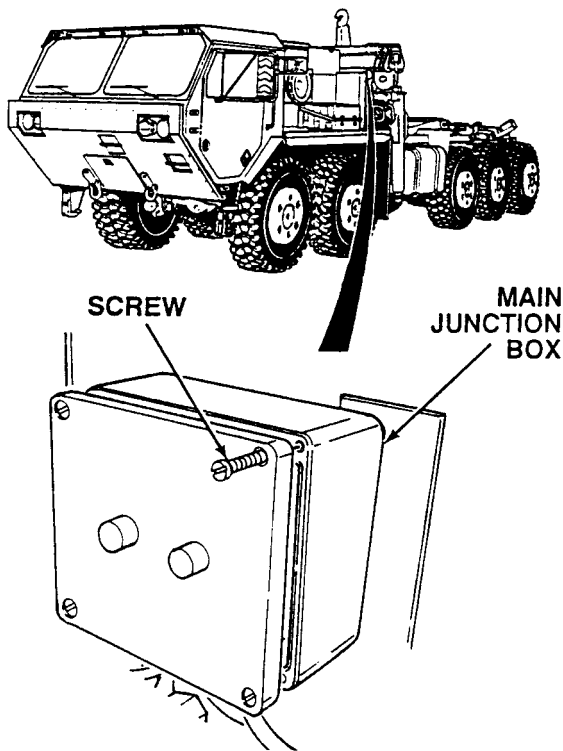
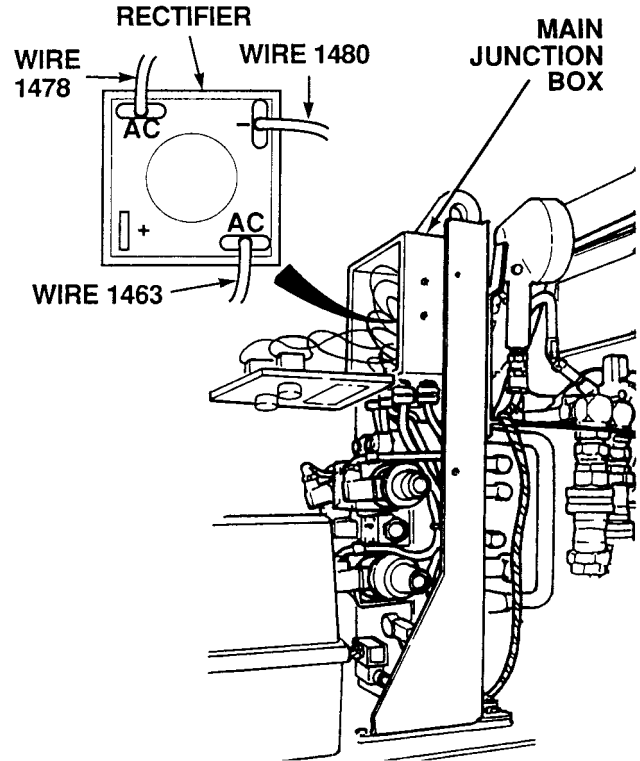


WARNING

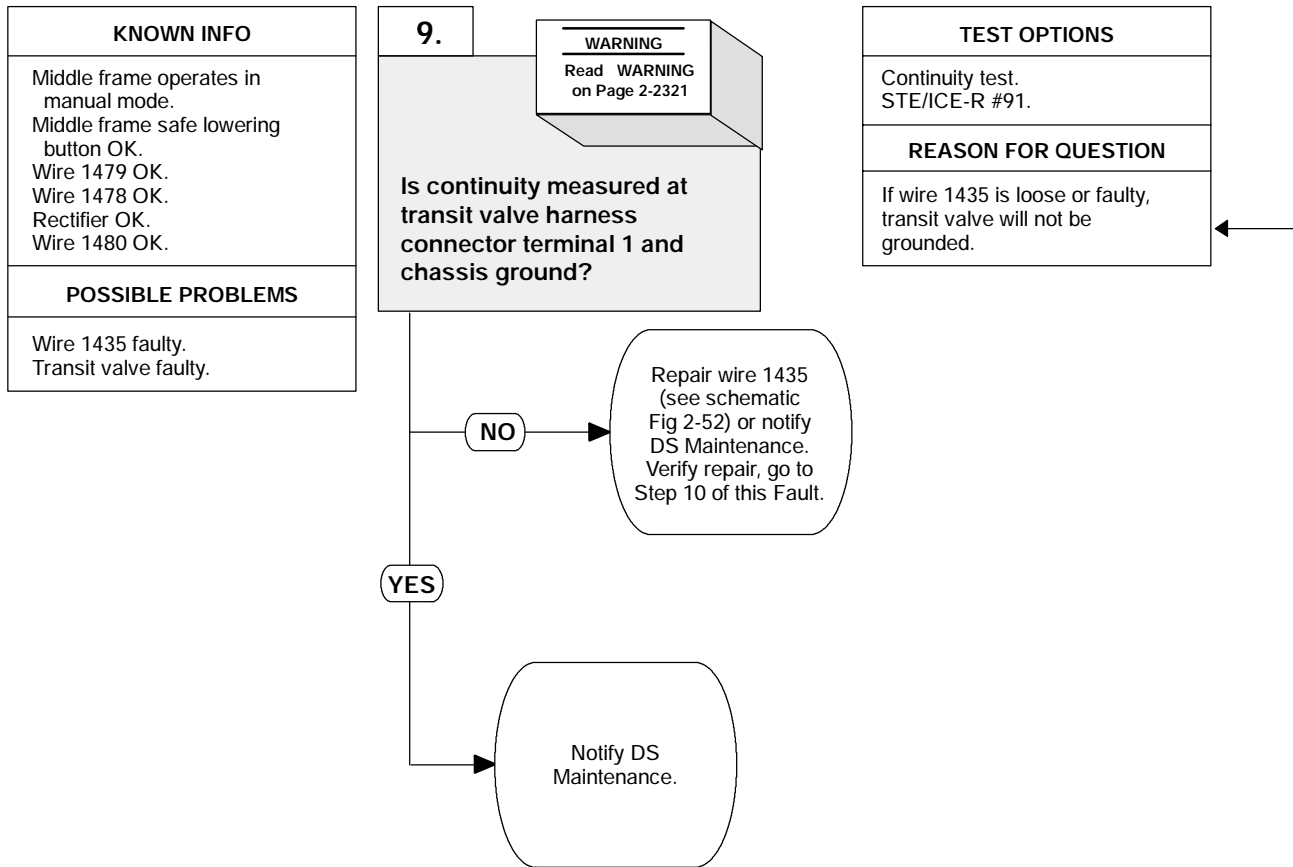
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Loosen screw and remove harness connector from transit valve.
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between main junction box rectifier wire 1480 and transit valve harness connector terminal 2?
 - (a) If there is no continuity, repair wire 1480 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1480 is OK.
- (4) Close main junction box and tighten four screws.



6. LOSS OF MIDDLE FRAME SAFE LOWERING FUNCTION (CONT).

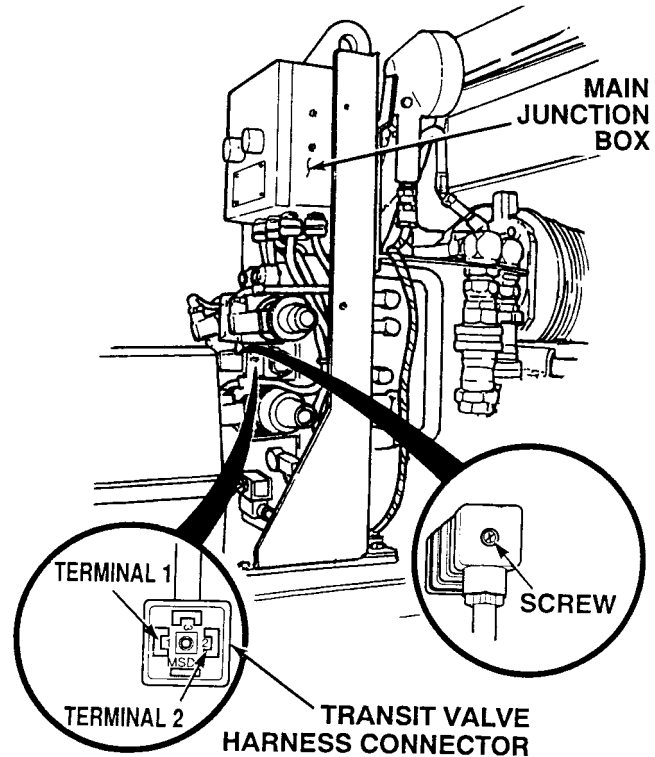


WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between transit valve harness connector terminal 1 and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1435 is OK. Notify DS Maintenance.
- (3) Install connector on transit valve and tighten connector screw, coat head of connector screw with adhesive.



6. LOSS OF MIDDLE FRAME SAFE LOWERING FUNCTION (CONT).

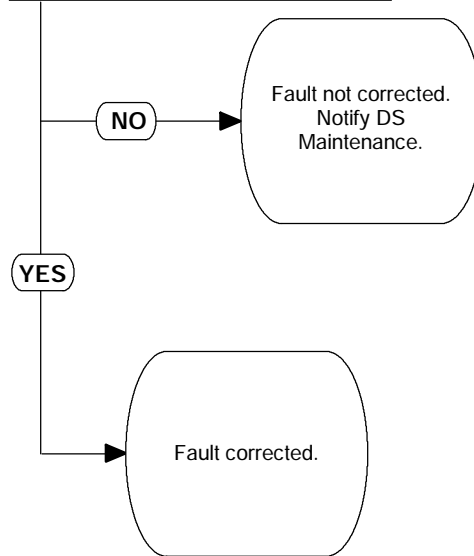
KNOWN INFO
Middle frame operates in manual mode. Middle frame safe lowering button OK. Wire 1479 OK. Wire 1478 OK. Rectifier OK. Wire 1480 OK. Wire 1435 OK. Transit valve OK.
POSSIBLE PROBLEMS

10.

WARNING
 Read WARNING on Page 2-2323

Does middle frame safe lowering operate?

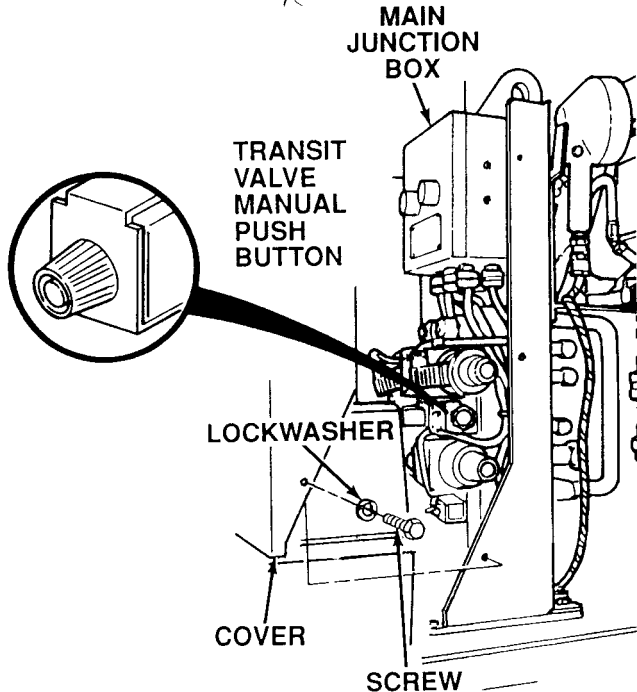
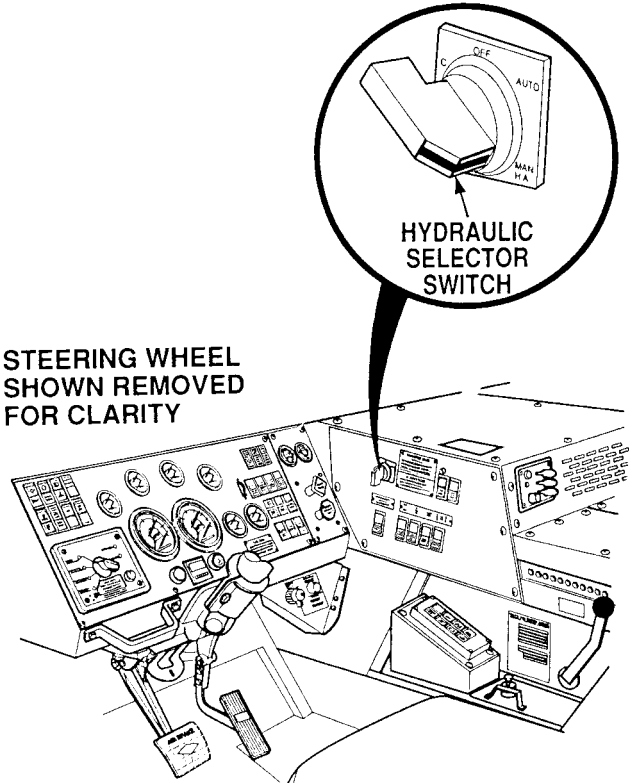
TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If middle frame safe lowering operates, fault has been corrected.



WARNING

Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.

- | VERIFY REPAIR |
|--|
| <ol style="list-style-type: none"> (1) Start engine (TM 9-2320-364-10). (2) Set hydraulic selector switch to MAN MF position. (3) Raise LHS until middle frame is approximately 3 ft (91 cm) above the transit position. (4) Push in transit valve manual push button to lower middle frame. <ol style="list-style-type: none"> (a) If middle frame does not lower, fault not corrected. Perform Steps (5) through (8) below and notify DS Maintenance. (b) If middle frame lowers, fault has been corrected. (5) Put LHS in transit position. (6) Set hydraulic selector switch to OFF position. (7) Turn OFF ENGINE switch. (8) Install LHS control box cover, four lockwashers and screws. |



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

7. LOSS OF HOOK ARM SAFE LOWERING FUNCTION.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

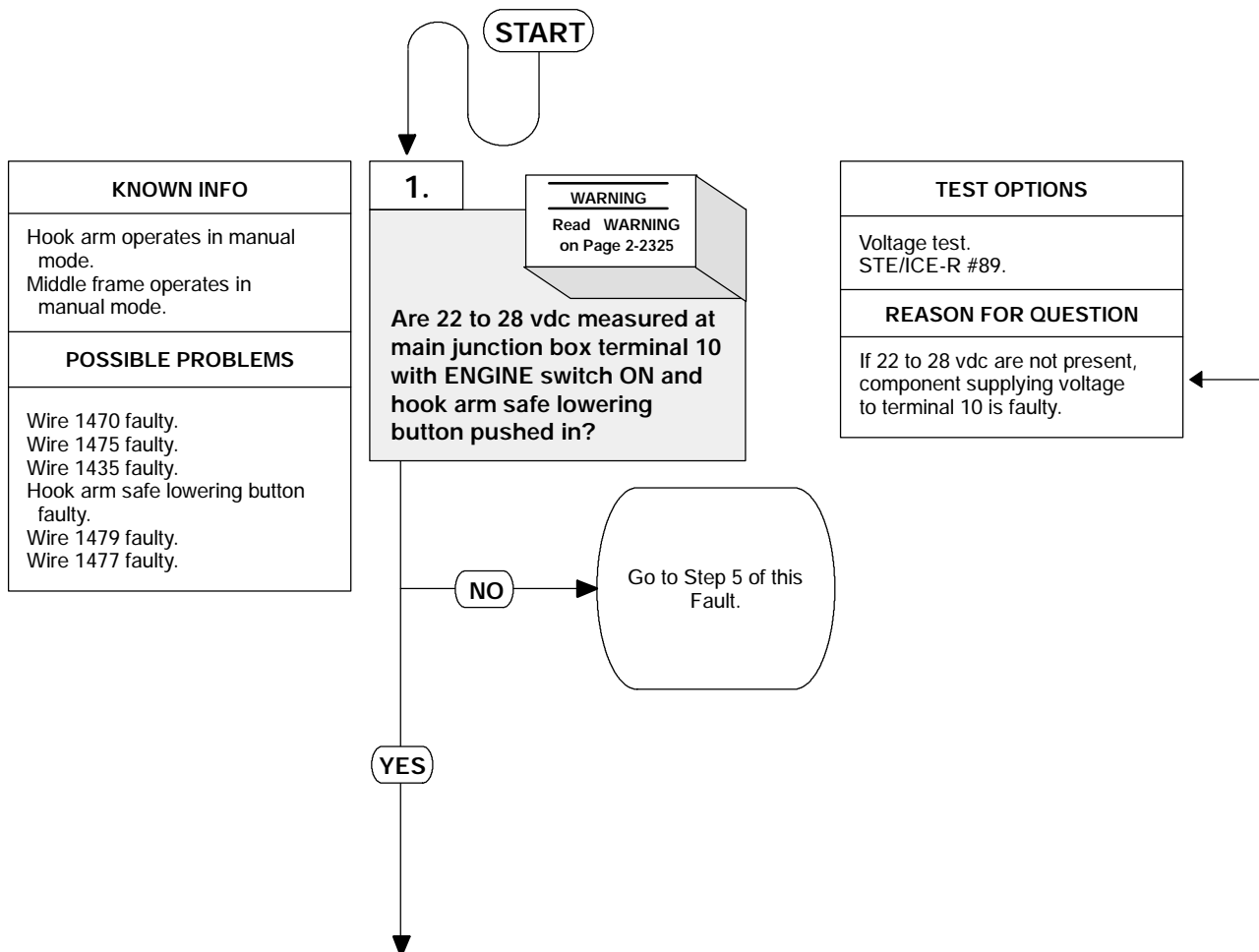
Wooden blocks (2) (Appendix D)
 Lockwasher (4) (Item 180, Appendix F)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

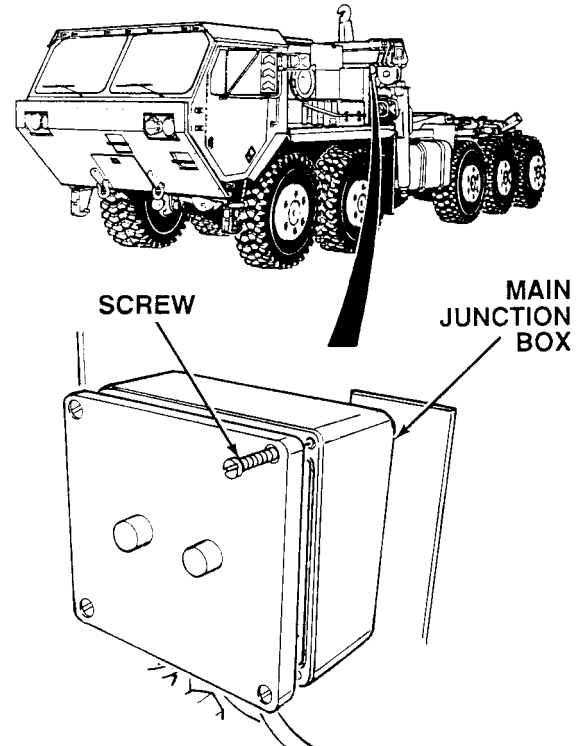
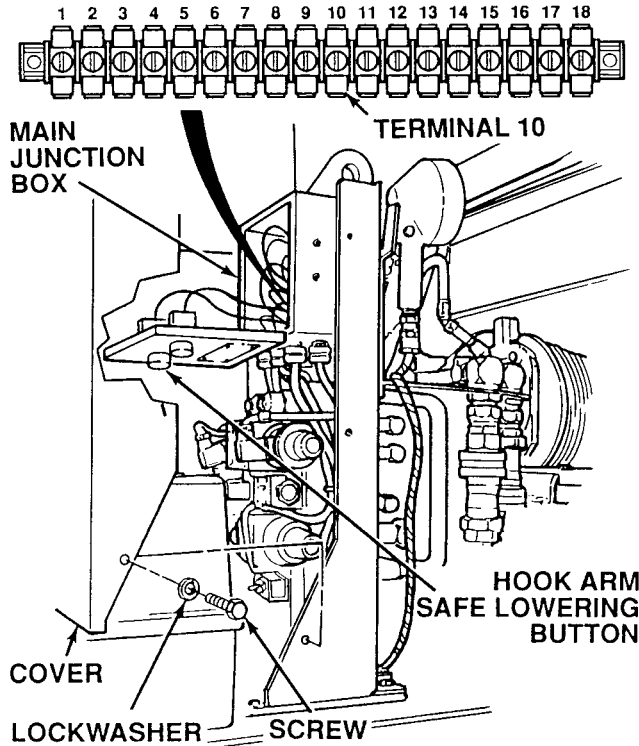
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)



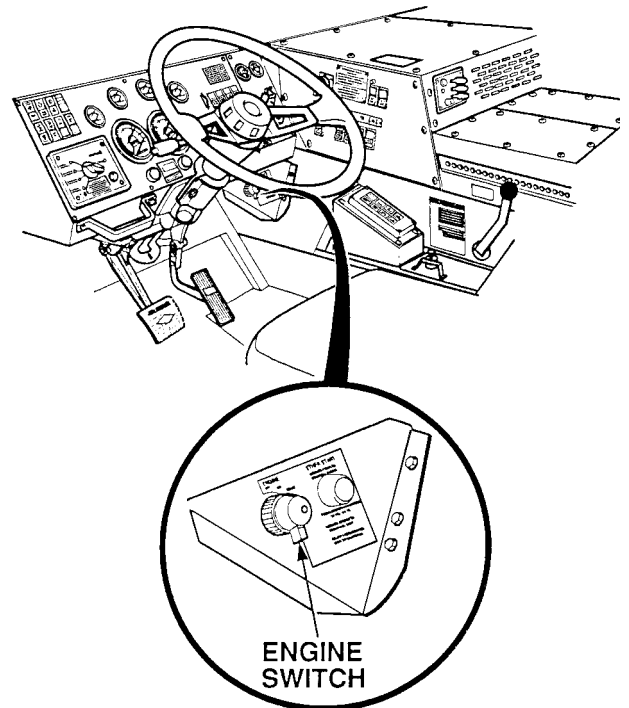
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

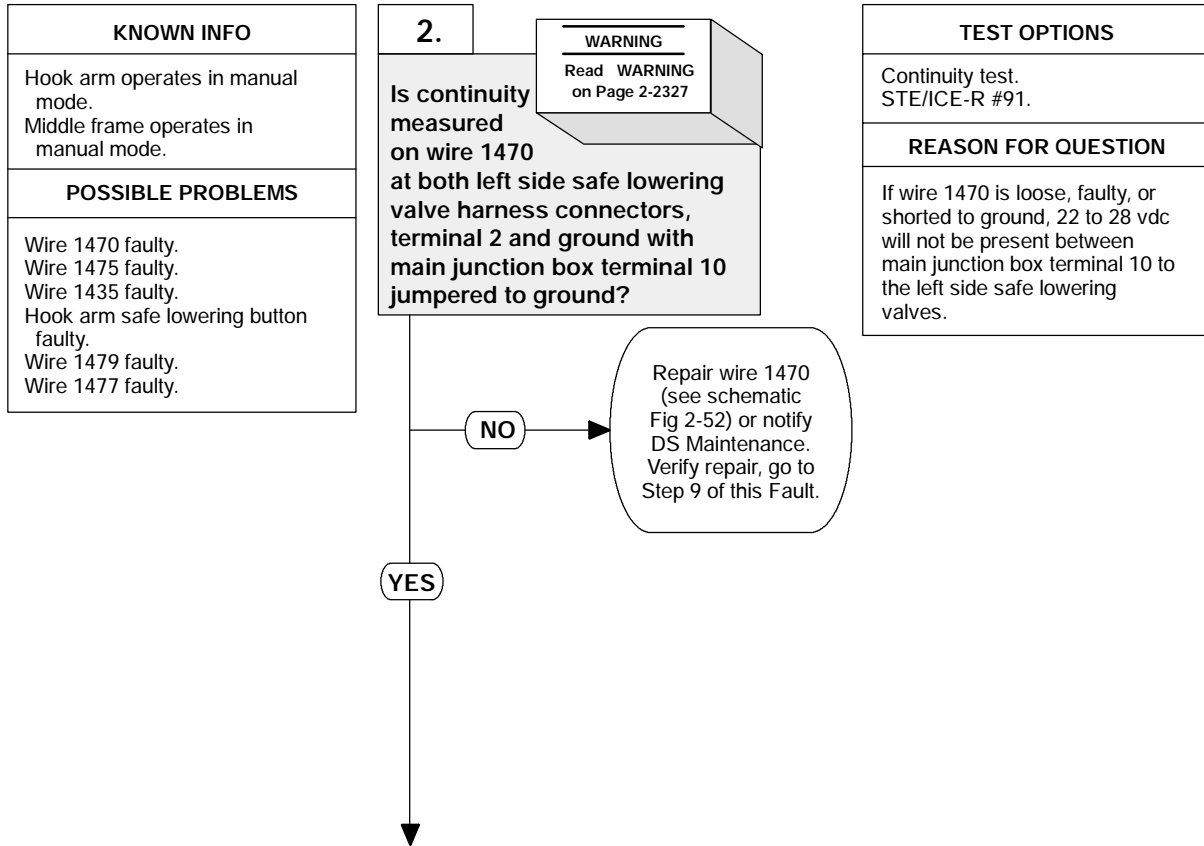


NOTE

- Only remove center screw on engine side of LHS control box cover. Discard lockwashers.
- | VOLTAGE TEST | TEST on engine side of LHS control box cover. |
|--------------|--|
| (1) | Remove four screws, lockwashers and LHS control box cover. Discard lockwashers. |
| (2) | Loosen four screws and open main junction box. |
| (3) | Set multimeter select switch to volts dc. |
| (4) | Connect positive (+) multimeter lead at main junction box terminal 10. |
| (5) | Connect negative (-) multimeter lead to a known good ground. |
| (6) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (7) | Push in hook arm safe lowering button. <ul style="list-style-type: none"> (a) If there are not 22 to 28 vdc present, perform Step (8) below and go to Step 5 of this Fault. (b) If there are 22 to 28 vdc present, components supplying voltage to terminal 10 are OK. Perform Step (8) below. |
| (8) | Turn OFF ENGINE switch. |



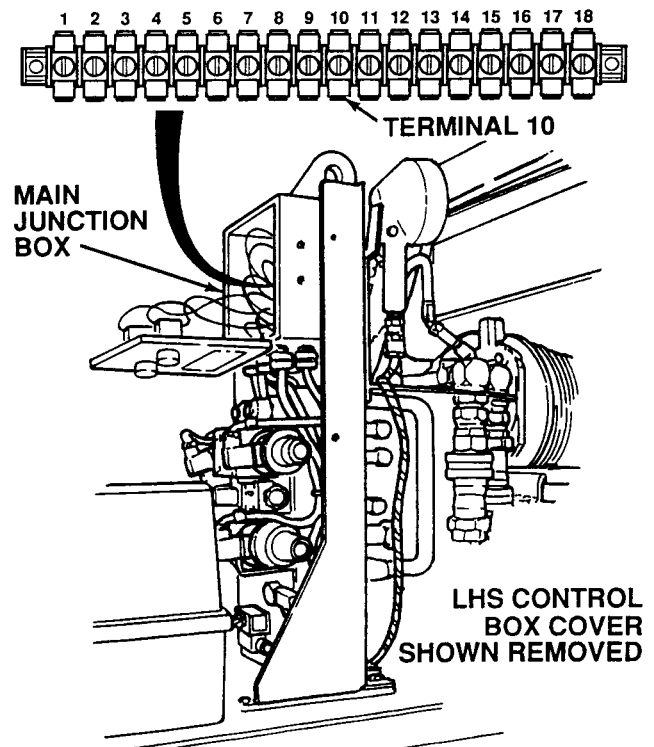
7. LOSS OF HOOK ARM SAFE LOWERING FUNCTION (CONT).



WARNING

- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Equipment may fall and cause serious injury or death to personnel.
- Do not work on any item supported only by lift jacks or hoist. Always use blocks or proper stands to support the item prior to any work. Equipment may fall and cause injury or death to personnel.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST	
(1)	Start engine (TM 9-2320-364-10).
(2)	Set hydraulic selector switch to AUTO position.
(3)	Raise LHS until middle frame is approximately 3 ft (91 cm) above transit position.
(4)	Turn OFF ENGINE switch.
(5)	Set hydraulic selector switch to OFF position.
(6)	Block middle frame up in two places securely.
(7)	Set multimeter select switch to ohms.
(8)	Connect main junction box terminal 10 to a known good ground using jumperwire.
Continued next page.	

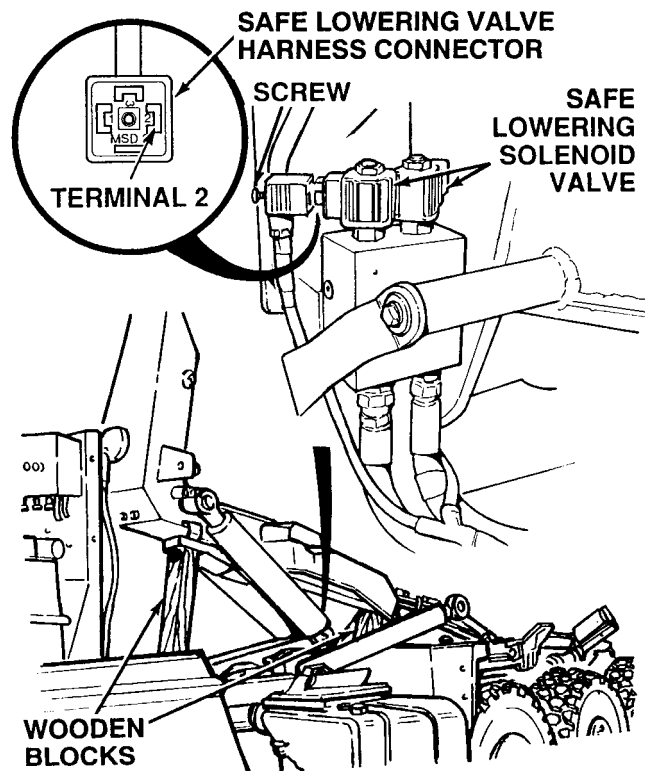


WARNING

- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Equipment may fall and cause serious injury or death to personnel.
- Do not work on any item supported only by lift jacks or hoist. Always use blocks or proper stands to support the item prior to any work. Equipment may fall and cause injury or death to personnel.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST (cont).

- (9) Loosen screw and disconnect connector from one of the safe lowering valves on the LH side of the LHS.
- (10) Is there continuity between either left side safe lowering valve harness connector terminal 2 and a known good ground.
 - (a) If there is no continuity, repair wire 1470 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, perform Steps (11) through (14) below.
- (11) Connect connector to safe lowering valve.
Continued next page.

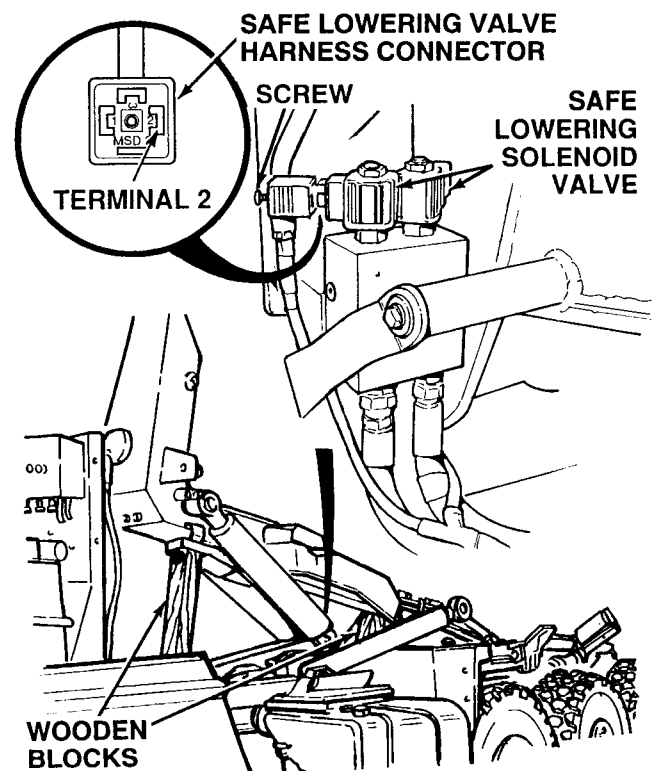


WARNING

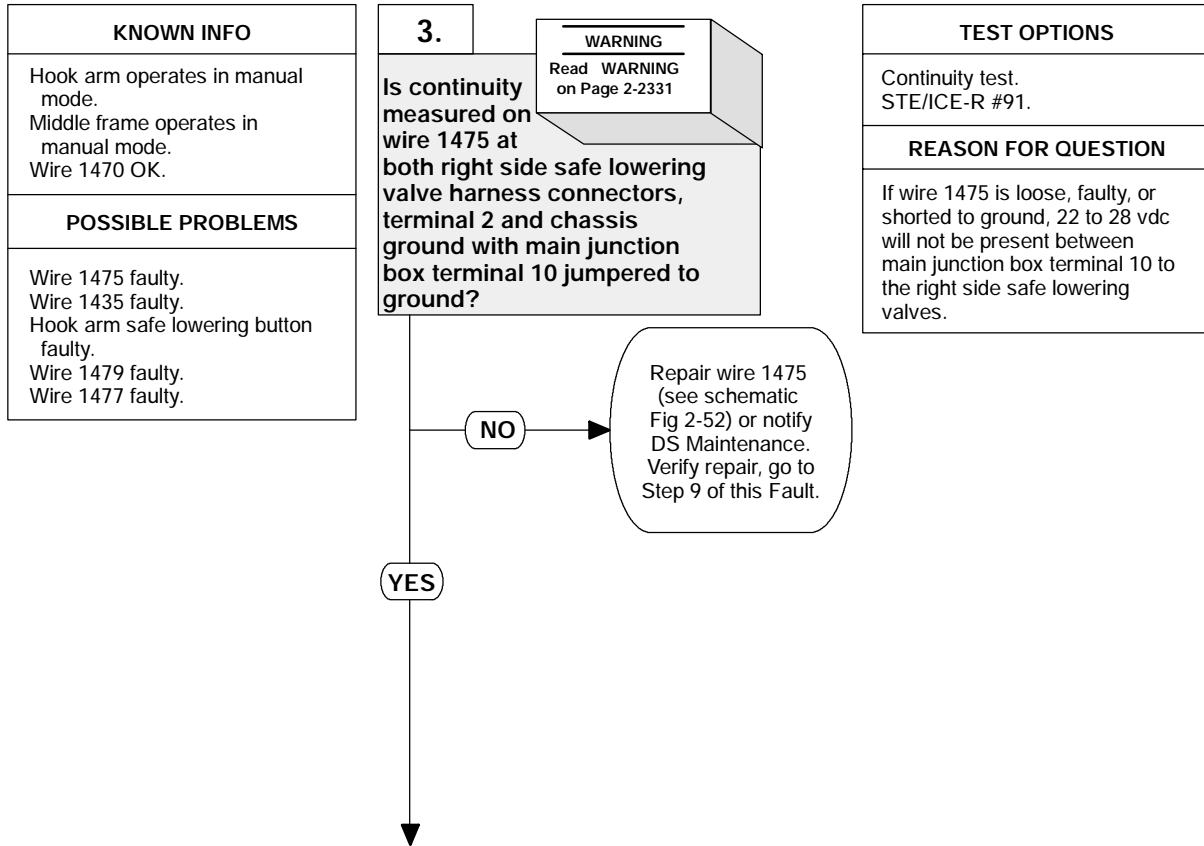
- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Equipment may fall and cause serious injury or death to personnel.
- Do not work on any item supported only by lift jacks or hoist. Always use blocks or proper stands to support the item prior to any work. Equipment may fall and cause injury or death to personnel.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST (cont).

- (12) Tighten screw and coat head of connector screw with adhesive.
- (13) Loosen screw and disconnect connector from the remaining safe lowering valve on the LH side of the LHS.
- (14) Is there continuity between remaining left side lowering valve harness connector terminal 2 and a known good ground?
 - (a) If there is no continuity, repair wire 1470 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, perform Steps (15) and (16) below.
- (15) Connect connector to safe lowering valve.
- (16) Tighten connector screw and coat head of connector screw with adhesive.



7. LOSS OF HOOK ARM SAFE LOWERING FUNCTION (CONT).

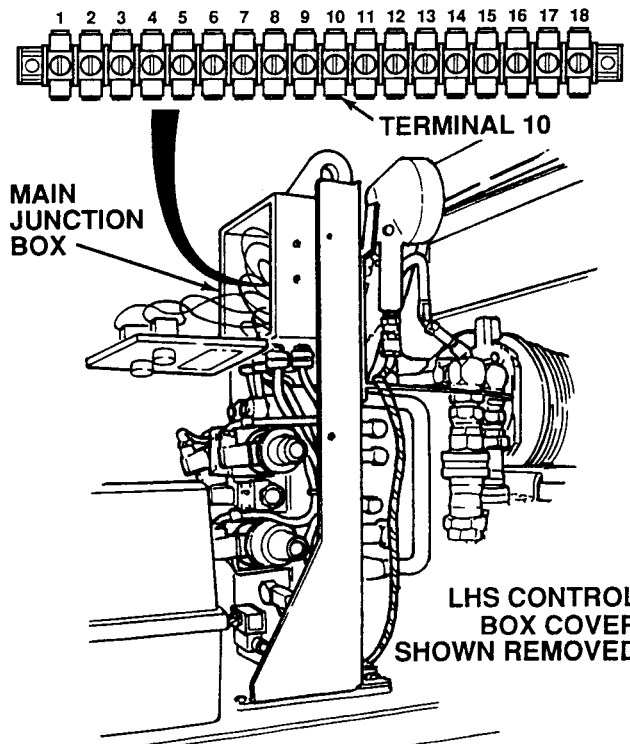
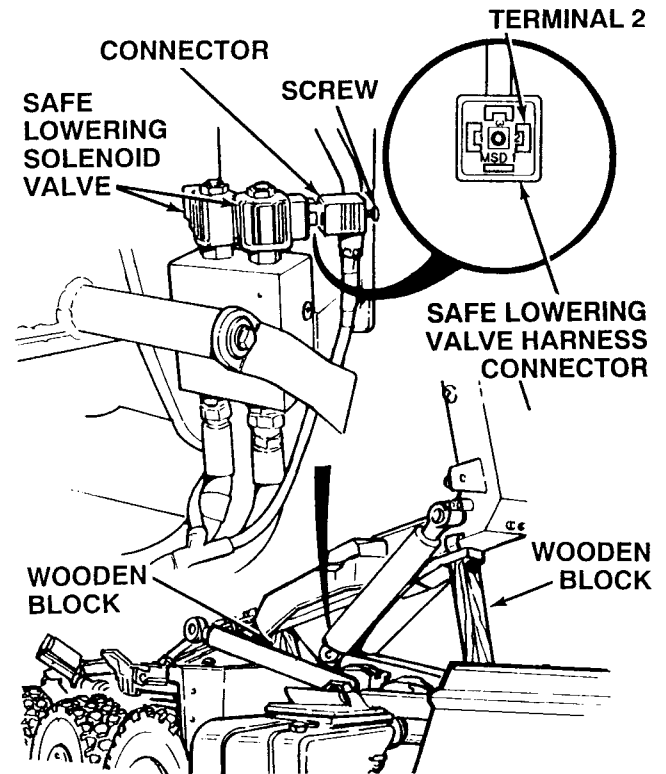


WARNING

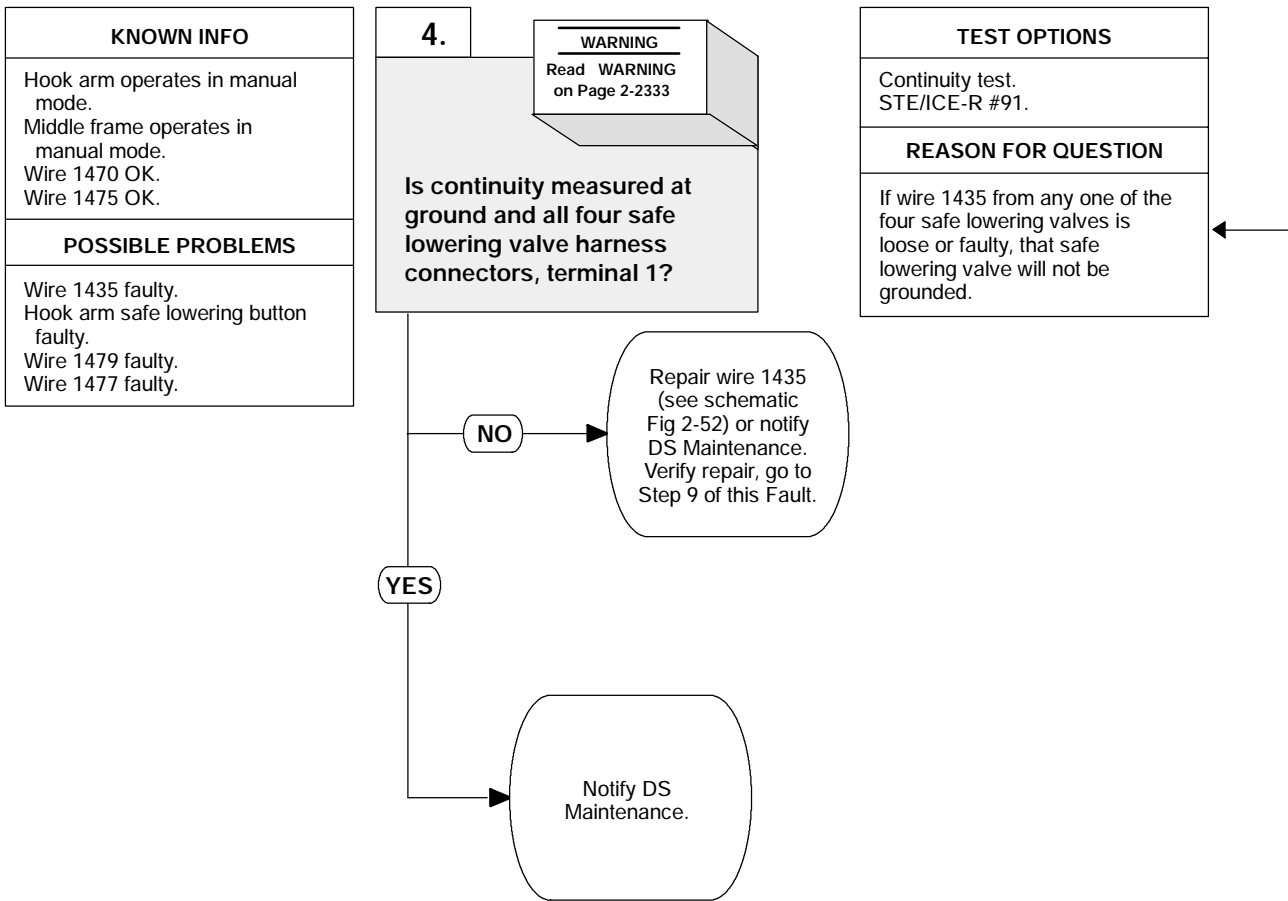
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Loosen screw and disconnect connector from one of the safe lowering valves on the RH side of the LHS.
- (3) Is there continuity between either right side safe lowering valve harness connector, terminal 2 and a known good ground.
 - (a) If there is no continuity, repair wire 1475 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, perform Steps (4) through (7) below.
- (4) Connect connector to safe lowering valve.
- (5) Tighten connector screw and coat head of connector screw with adhesive.
- (6) Loosen screw and disconnect connector from the remaining safe lowering valve on the RH side of the LHS.
- (7) Is there continuity between remaining right side safe lowering valve harness connector, terminal 2 and a known good ground?
 - (a) If there is no continuity, repair wire 1475 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, perform Steps (8) through (10) below.
- (8) Remove jumperwire from main junction box terminal 10 and ground.
- (9) Connect connector to safe lowering valve.
- (10) Tighten connector screw and coat head of connector screw with adhesive.

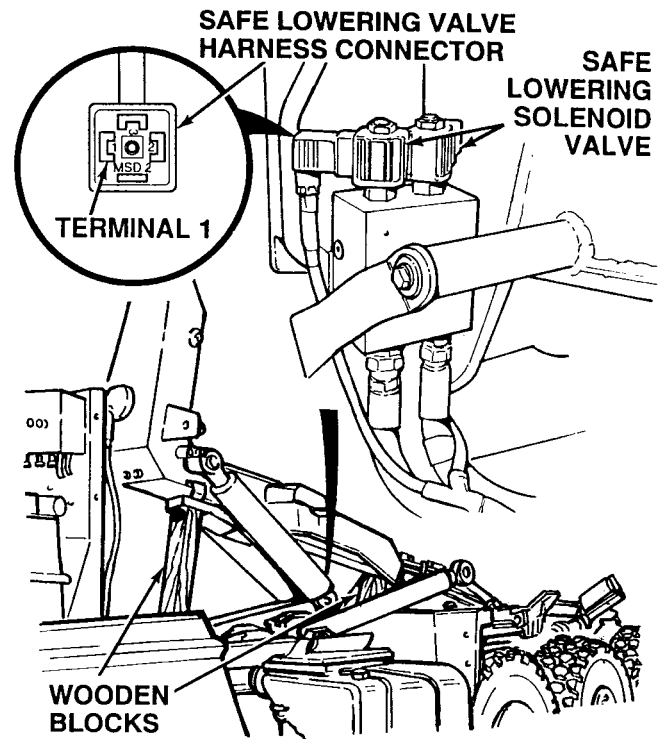


7. LOSS OF HOOK ARM SAFE LOWERING FUNCTION (CONT).

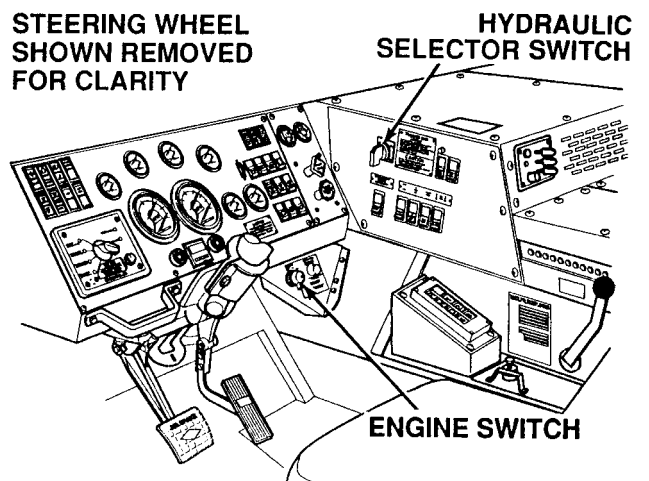


WARNING

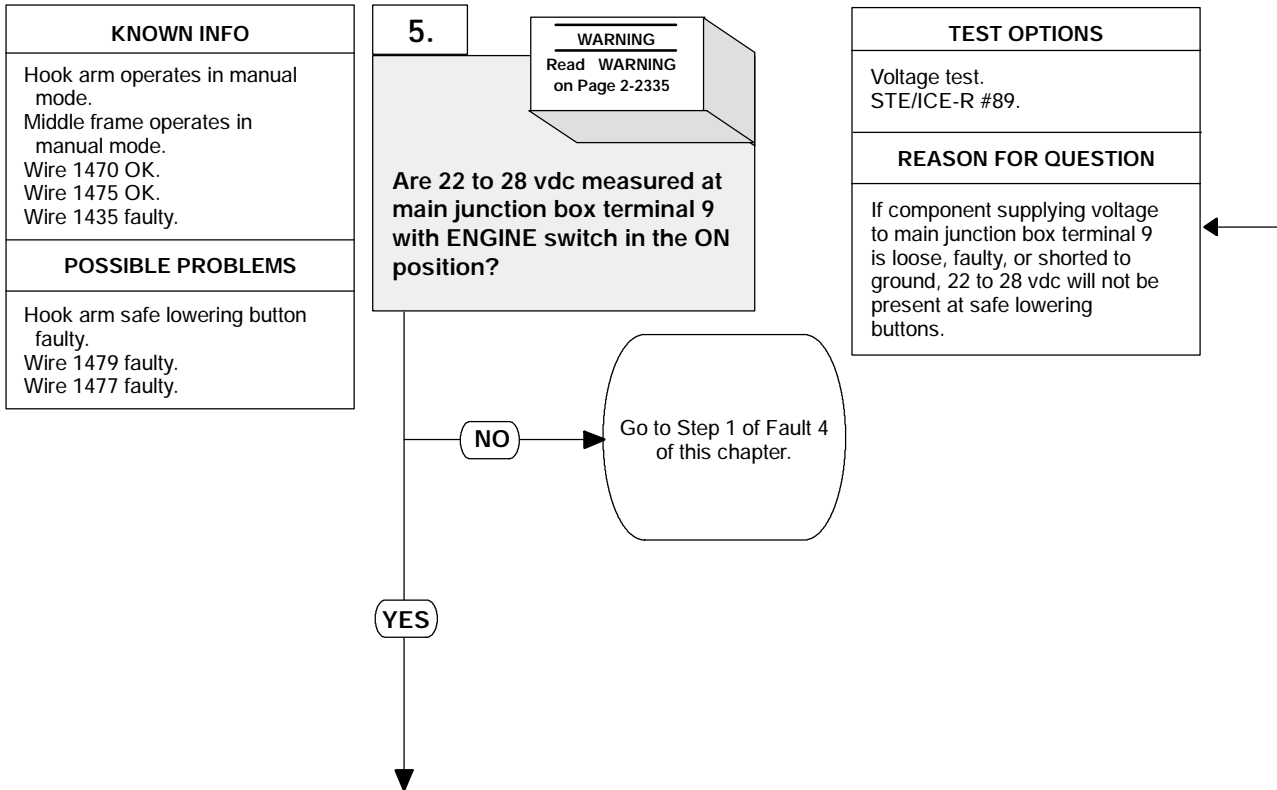
- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Equipment may fall and cause serious injury or death to personnel.
- Do not work on any item supported only by lift jacks or hoist. Always use blocks or proper stands to support the item prior to any work. Equipment may fall and cause injury or death to personnel.



CONTINUITY TEST	
(1)	Set multimeter select switch to ohms.
(1.1)	Loosen screws and disconnect connectors from four safe lowering valves.
(2)	Is there continuity between one of the four safe lowering valve harness connectors at terminal 1 and a known good ground?
(a)	If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance.
(b)	If there is continuity, notify DS Maintenance.
(3)	Check remaining three safe lowering valve harness connectors at terminal 1 for continuity with ground and repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance if there is no continuity. If there is continuity, notify DS Maintenance.
(4)	Connect connectors to the four safe lowering valves.
(4.1)	Tighten connector screws and coat heads of connector screws with adhesive.
(5)	Start engine (TM 9-2320-364-10).
(6)	Set hydraulic selector switch to AUTO position.
(7)	Raise LHS until middle frame is approximately 3 ft (91 cm) above transit position.
(8)	Remove blocking from middle frame.
(9)	Lower LHS to transit position.
(10)	Set hydraulic selector switch to OFF position.
(11)	Turn OFF ENGINE switch.

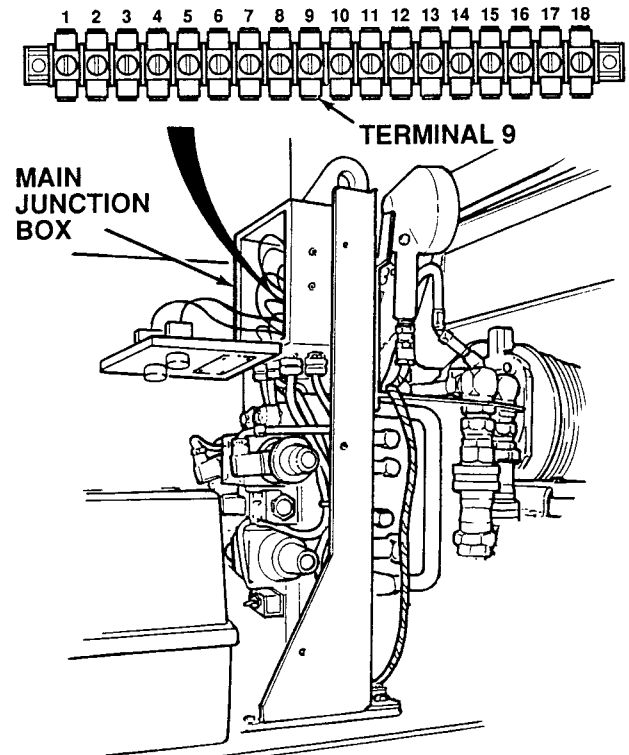


7. LOSS OF HOOK ARM SAFE LOWERING FUNCTION (CONT).



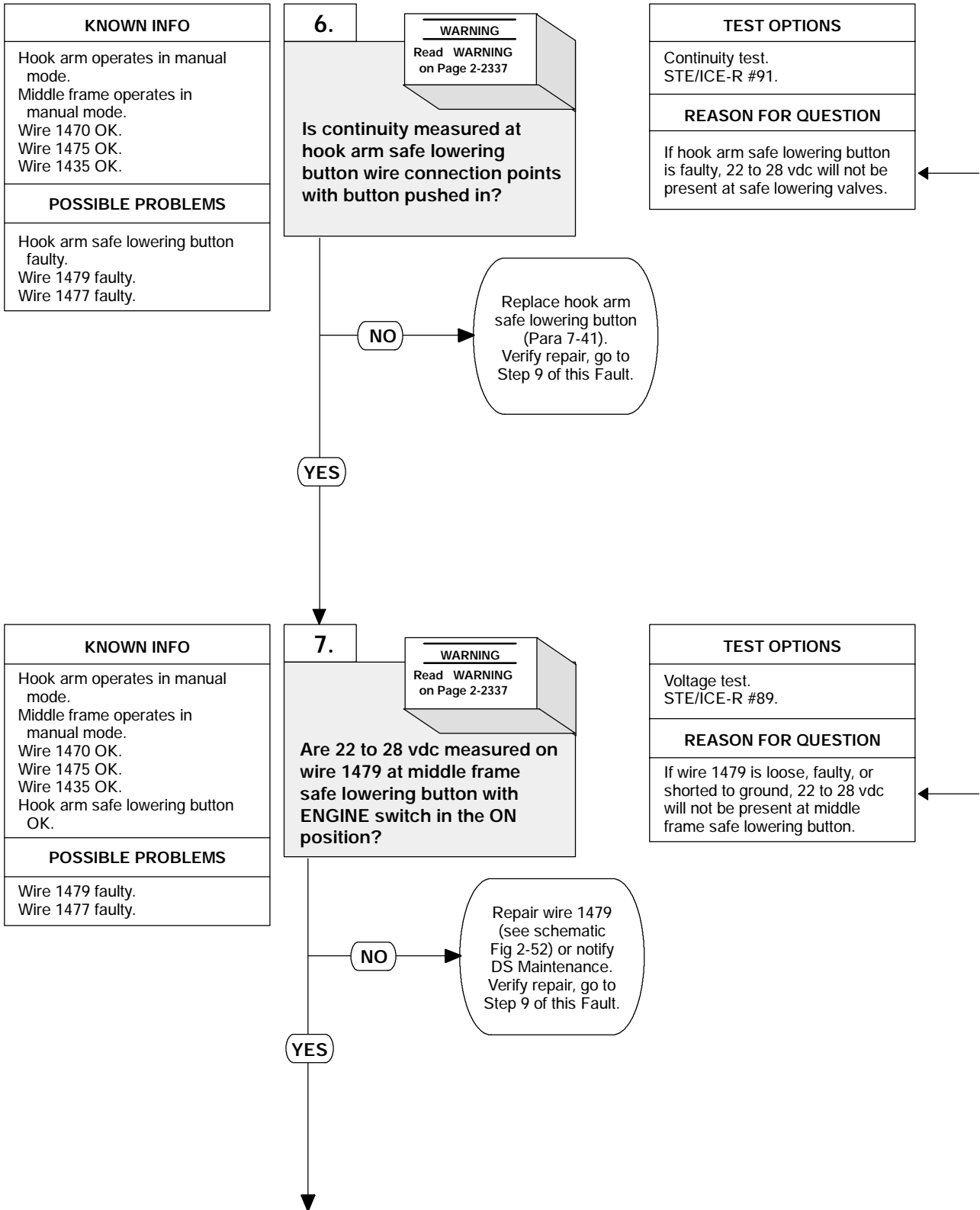
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

**VOLTAGE TEST**

- (1) Set multimeter select switch to volts dc.
- (2) Connect positive (+) multimeter lead at main junction box terminal 9.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If there are not 22 to 28 vdc present, perform Step (5) below and go to Step 1 of Fault 4 of this Chapter.
 - (b) If there are 22 to 28 vdc present, components supplying input voltage to main junction box, terminal 9 are OK.
- (5) Turn OFF ENGINE switch.

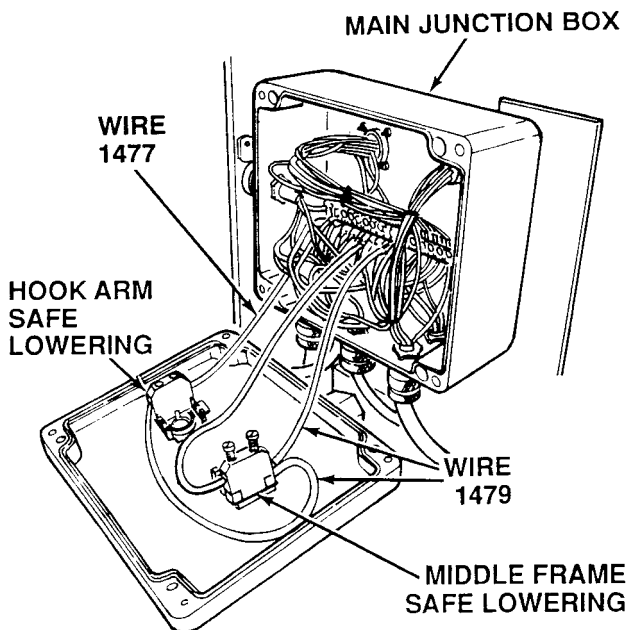
7. LOSS OF HOOK ARM SAFE LOWERING FUNCTION (CONT).



WARNING

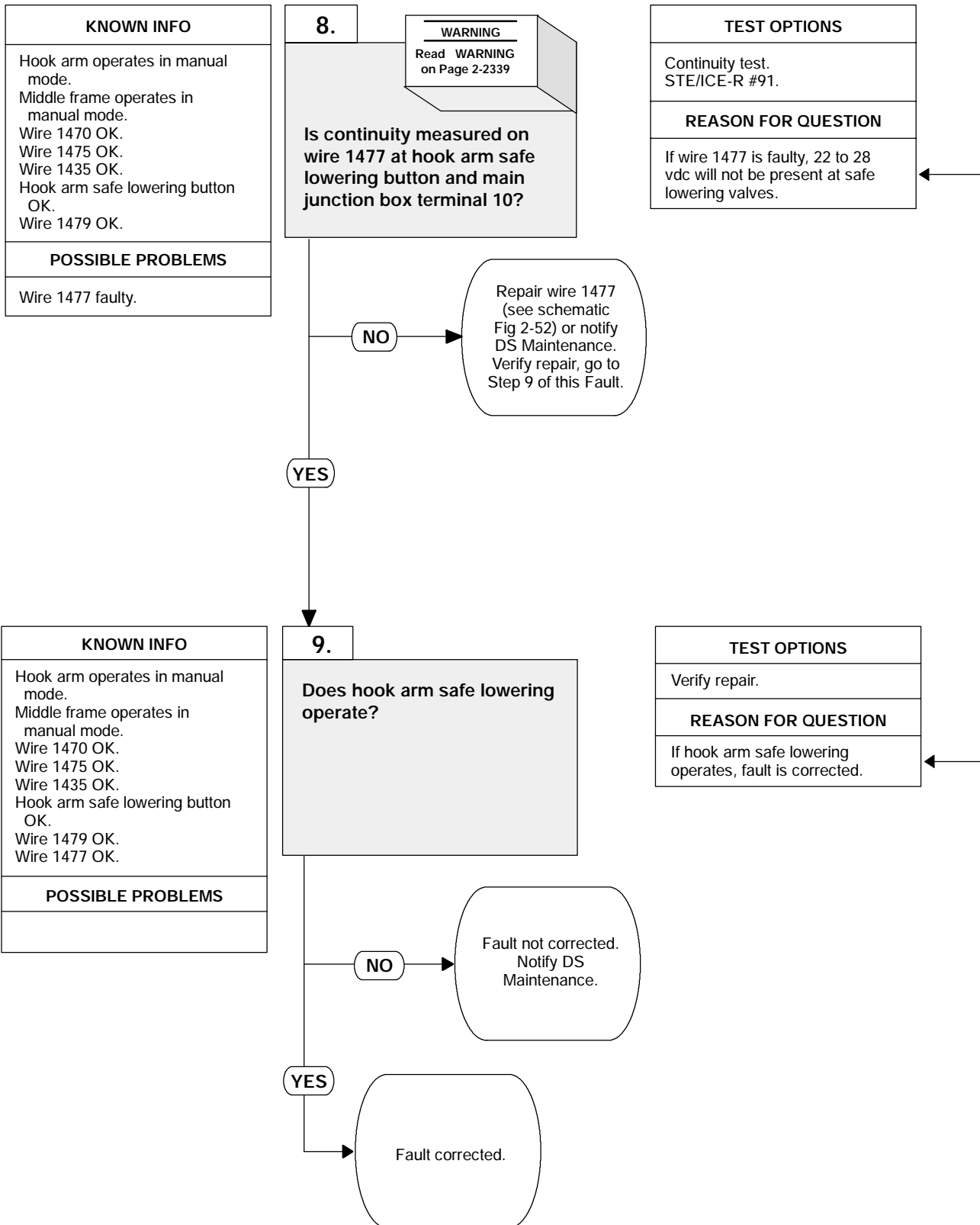
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
(1) Set multimeter select switch to ohms. (2) Push in hook arm safe lowering button. (3) Is there continuity between hook arm safe lowering button wire 1477 and button wire 1479? (a) If there is no continuity, replace hook arm safe lowering button (Para 7-41). (b) If there is continuity, safe lowering button is OK.



VOLTAGE TEST
(1) Set multimeter select switch to volts dc. (2) Connect positive (+) multimeter lead to middle frame safe lowering button wire 1479. (3) Connect negative (-) multimeter lead to a known good ground. (4) Turn ON ENGINE switch (TM 9-2320-364-10). (a) If there are not 22 to 28 vdc present, perform Step (5) below and repair wire 1479 (see schematic Fig 2-52) or notify DS Maintenance. (b) If there are 22 to 28 vdc present, wire 1479 is OK. (5) Turn OFF ENGINE switch.

7. LOSS OF HOOK ARM SAFE LOWERING FUNCTION (CONT).

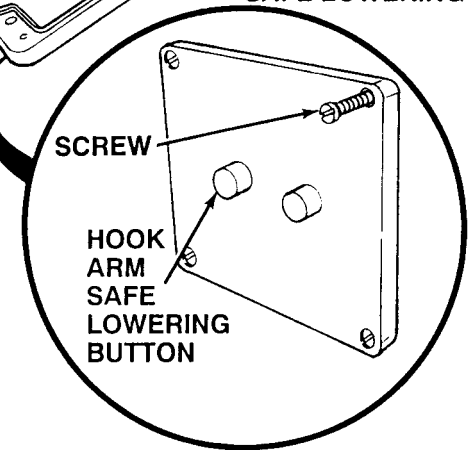
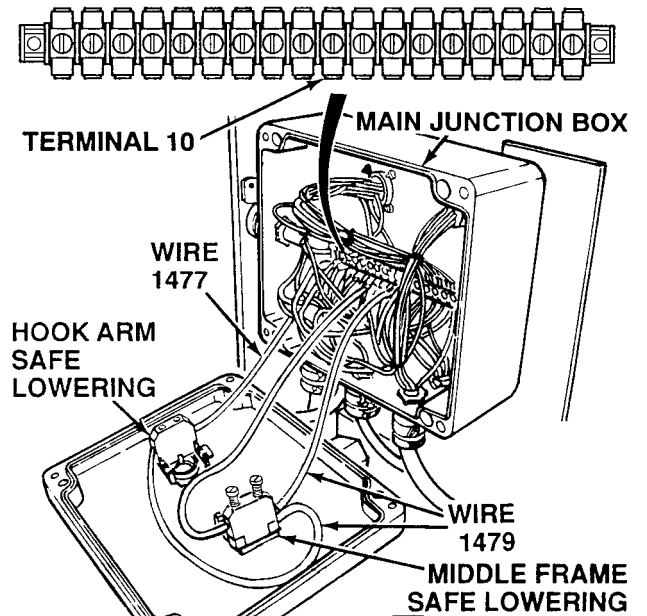


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

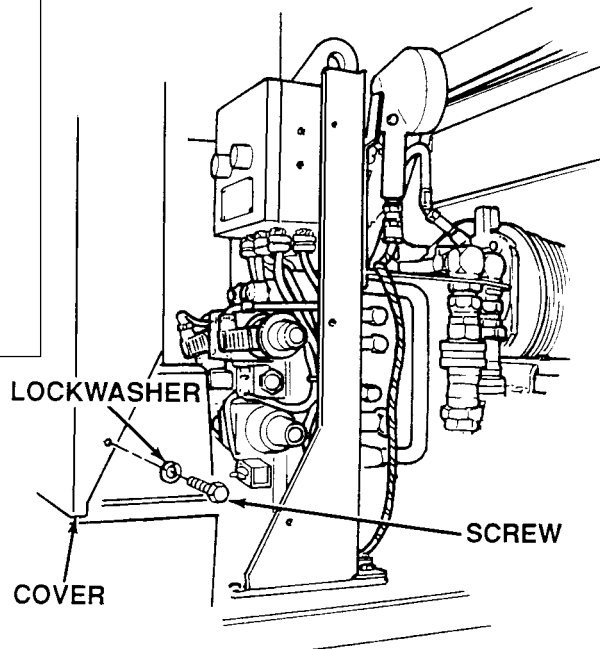
CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between safe lowering button wire 1477 and main junction box terminal 10?
 - (a) If there is no continuity, repair wire 1477 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1477 is OK.
- (3) Close main junction box and tighten four screws.



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch to AUTO position.
- (3) Raise LHS until middle frame is approximately 3 ft (91 cm) above transit position.
- (4) Push in hook arm safe lowering button.
 - (a) If hook arm does not lower to the transit position, fault not corrected. Perform Steps (5) through (7) below and notify DS Maintenance.
 - (b) If hook arm lowers to the transit position, fault has been corrected.
- (5) Set hydraulic selector switch to OFF position.
- (6) Turn OFF ENGINE switch.
- (7) Install LHS control box cover, four lockwashers and screws.



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

8. LHS DOES NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

Lockwasher (4) (Item 180, Appendix F)
 Adhesive (Item 8, Appendix C)

Personnel Required

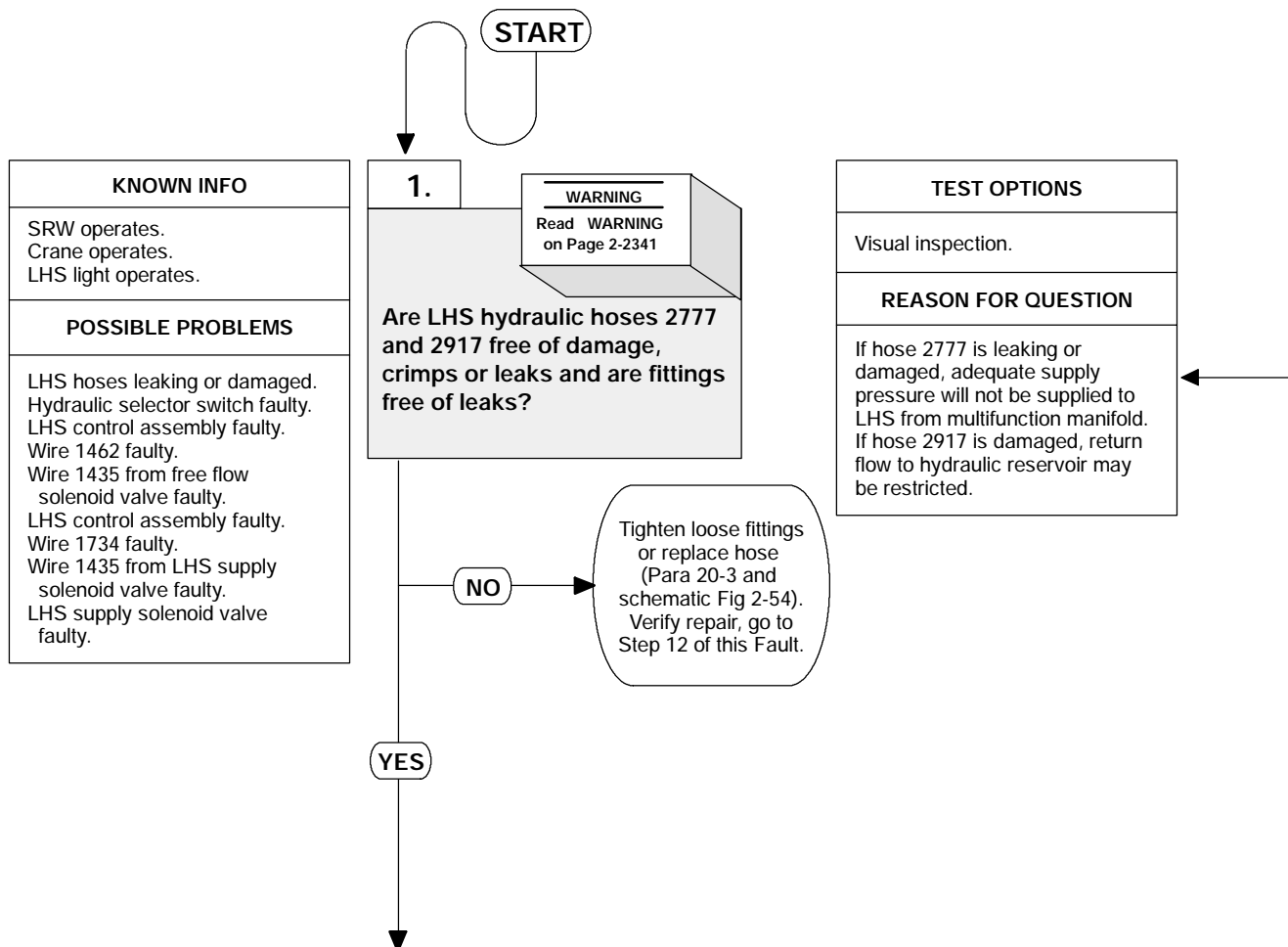
Two

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

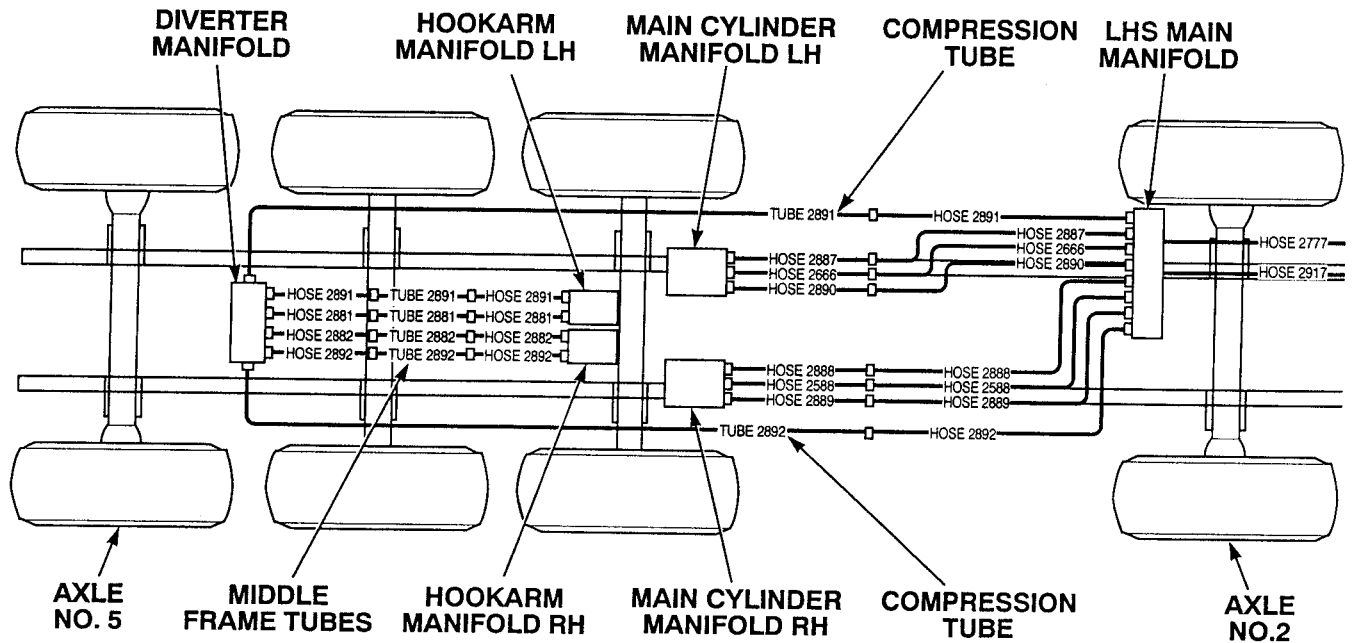
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)



WARNING

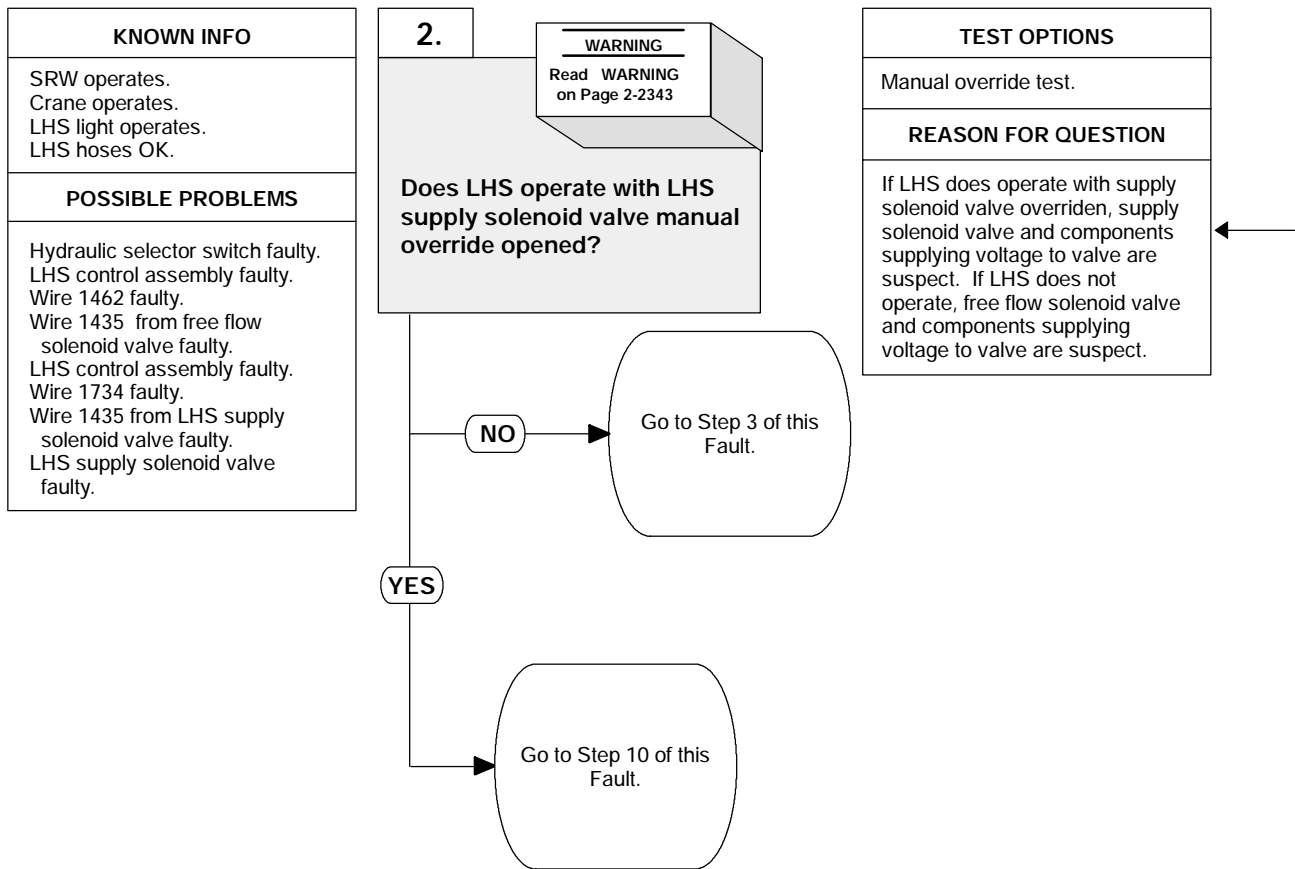
High pressure hydraulics [oil under 3,700 psi (25,512 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.



VISUAL INSPECTION

- Inspect LHS hydraulic hoses 2777 and 2917 for damage, crimps or leaks.
- (1) If hoses are damaged, crimped or leaking, tighten fittings or replace hoses (Para 20-3 and schematic Fig 2-54).
 - (2) If there are no leaks, crimps or damage, hoses and fittings are OK.

8. LHS DOES NOT OPERATE (CONT).



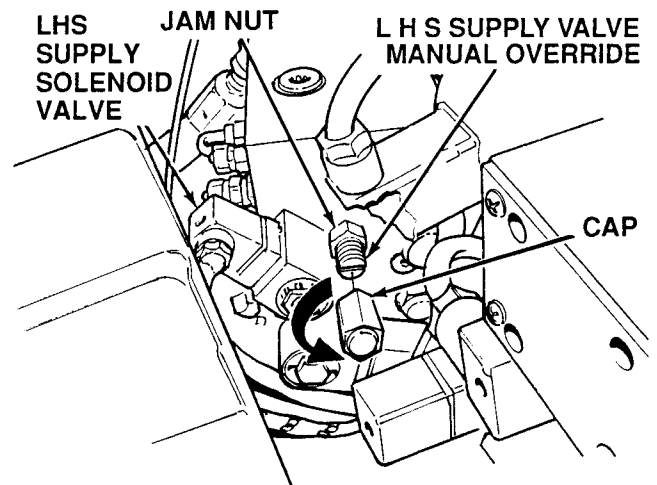
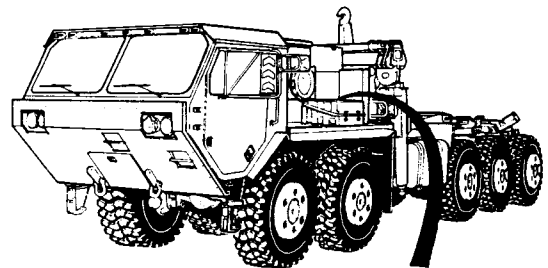
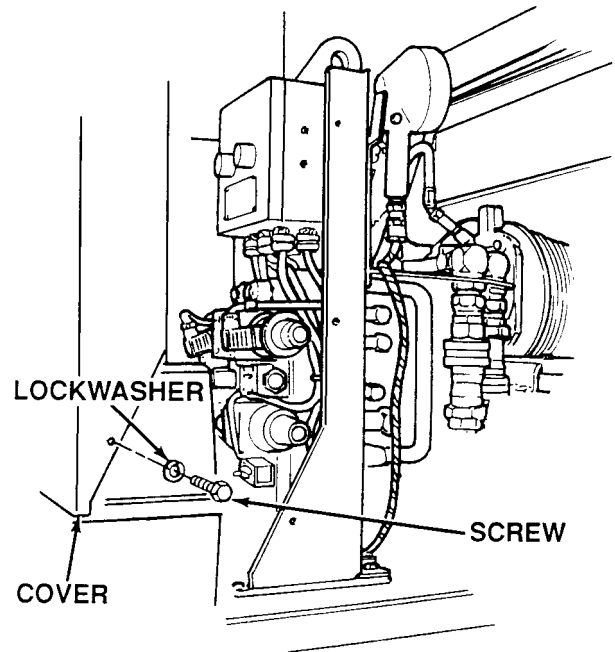
WARNING

Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.

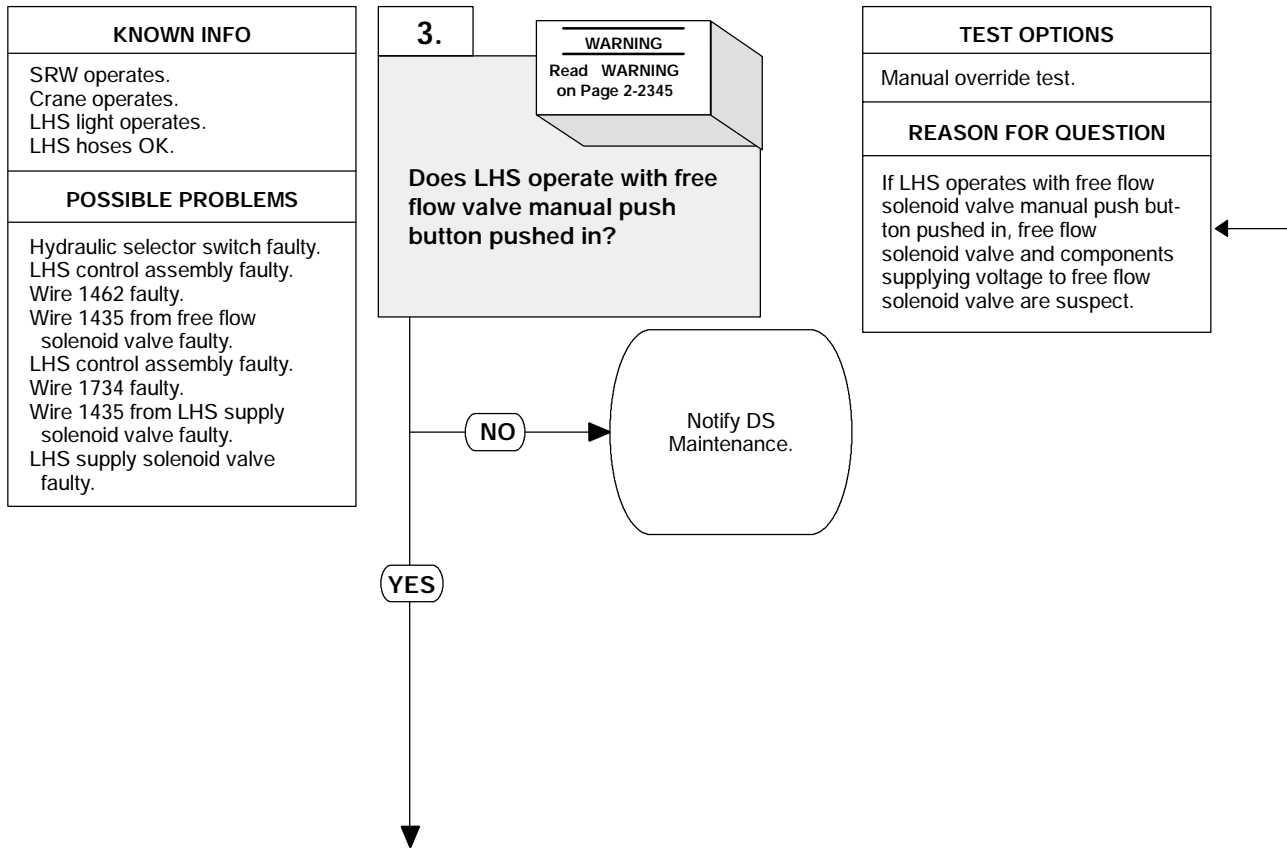
NOTE

Only remove center screw on engine side of LHS control box cover.

MANUAL OVERRIDE TEST	
(1)	Remove four screws and lockwashers and LHS control box cover.
(2)	Remove cap from LHS supply solenoid valve manual override and loosen jam nut.
(3)	Open manual override by turning set screw counter clockwise no more than three turns.
(4)	Start ENGINE switch (TM 9-2320-364-10).
(5)	Deleted.
(6)	Set hydraulic selector switch to MAN HA position.
(7)	Operate LHS. <ul style="list-style-type: none"> (a) If LHS does not operate, perform Steps (8) through (11) below and go to Step 3 of this Fault. (b) If LHS operates, perform Steps (8) through (11) below and go to step 10 of this Fault.
(8)	Set hydraulic selector switch to OFF position.
(9)	Turn OFF ENGINE switch.
(10)	Close LHS supply solenoid valve manual override and tighten jam nut.
(11)	Install cap on LHS supply solenoid valve manual override, and tighten securely.



8. LHS DOES NOT OPERATE (CONT).



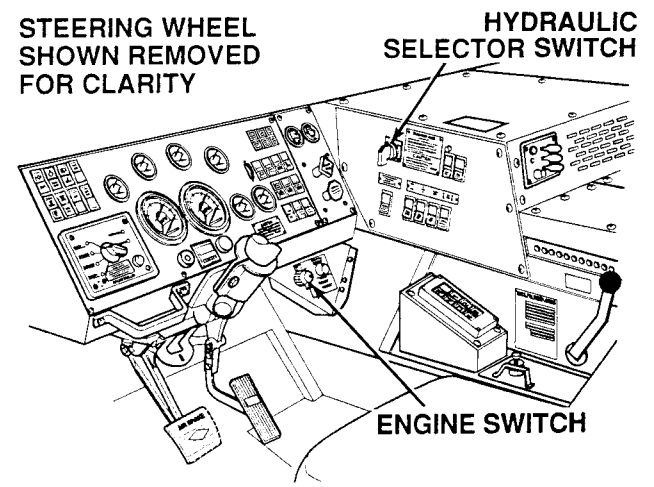
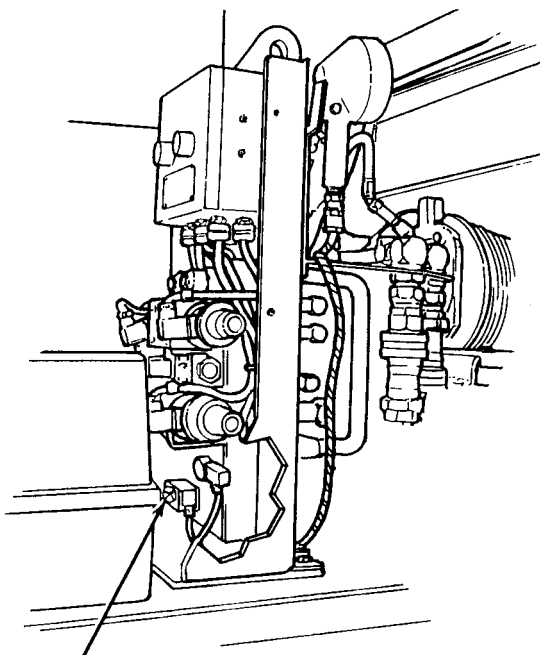
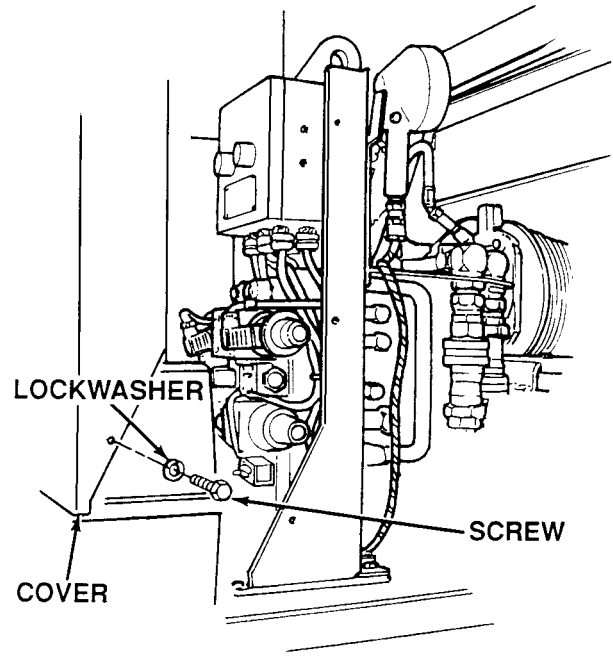
WARNING

Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.

NOTE

Only remove center screw on engine side of LHS control box cover.

MANUAL OVERRIDE TEST
(1) Deleted.
(2) Start engine (TM 9-2320-364-10).
(3) Set hydraulic selector switch to MAN HA position.
(4) Push in free flow solenoid valve manual pushbutton while assistant operates LHS. <ul style="list-style-type: none"> (a) If LHS does not operate, notify DS Maintenance. (b) If LHS operates, perform Steps (5) and (6) below.
(5) Set hydraulic selector switch to OFF position.
(6) Turn OFF ENGINE switch.



8. LHS DOES NOT OPERATE (CONT).

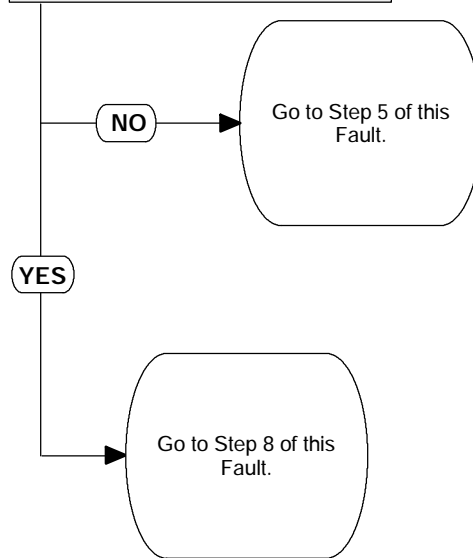
KNOWN INFO
SRW operates. Crane operates. LHS light operates. LHS hoses OK.
POSSIBLE PROBLEMS
Hydraulic selector switch faulty. LHS control assembly faulty. Wire 1462 faulty. Wire 1435f from free flow solenoid valve faulty. LHS control assembly faulty. Wire 1734 faulty. Wire 1435 from LHS supply solenoid valve faulty. LHS supply solenoid valve faulty.

4.

Are 22 to 28 vdc measured at free flow valve harness connector, terminal 2 with hydraulic selector switch in MAN HA, ENGINE switch ON and joystick in LOAD position?

WARNING
Read **WARNING** on Page 2-2347

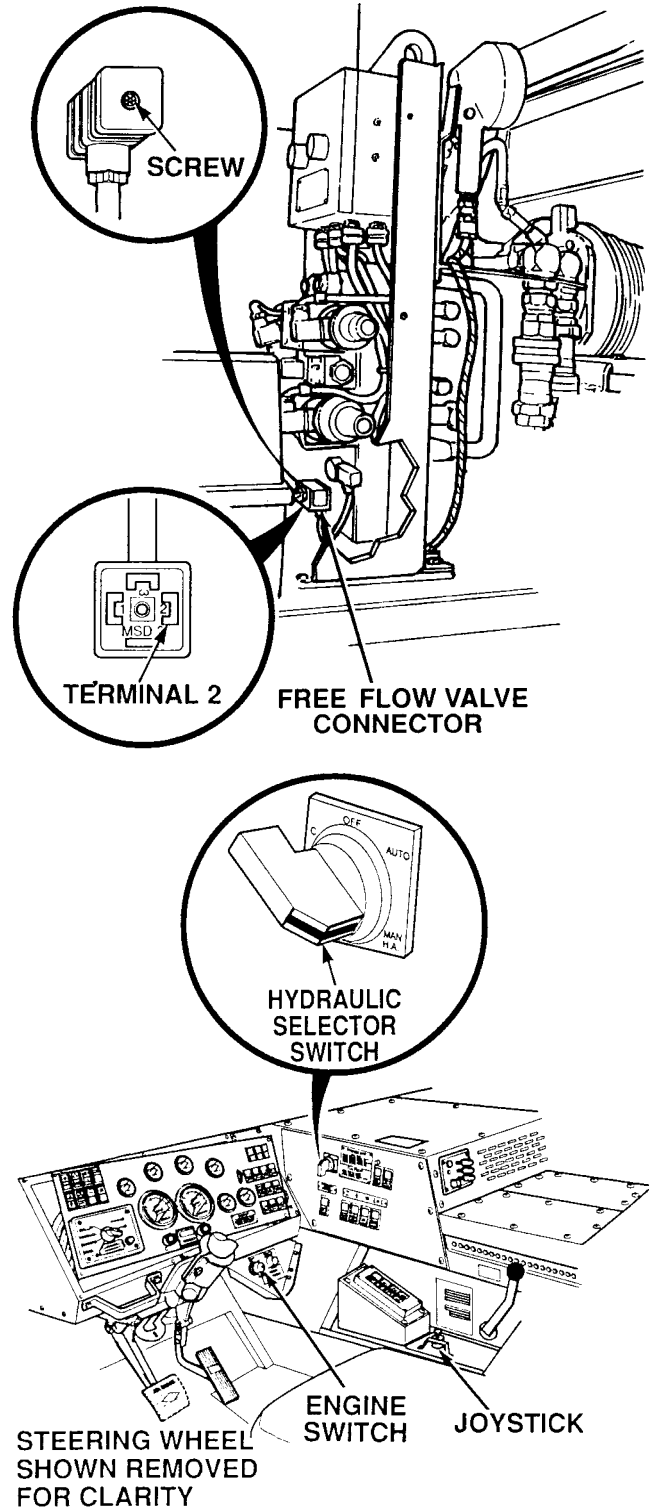
TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If there are not 22 to 28 vdc present, component supplying voltage to free flow solenoid valve is faulty.



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST | |
|--------------|--|
| (1) | Remove harness connector from free flow solenoid valve. |
| (2) | Set multimeter select switch to volts dc. |
| (3) | Connect positive (+) multimeter lead to harness connector, terminal 2. |
| (4) | Connect negative (-) multimeter lead to a known good ground. |
| (5) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (6) | Set hydraulic selector switch to MAN HA position. |
| (7) | Hold joystick in LOAD position. <ul style="list-style-type: none"> (a) If there are not 22 to 28 vdc present, perform Steps (8) and (9) below and go to Step 5 of this Fault. (b) If there are 22 to 28 vdc present, perform Steps (8) and (9) below and go to Step 8 of this Fault. |
| (8) | Set hydraulic selector switch to OFF position. |
| (9) | Turn OFF ENGINE switch. |



8. LHS DOES NOT OPERATE (CONT).

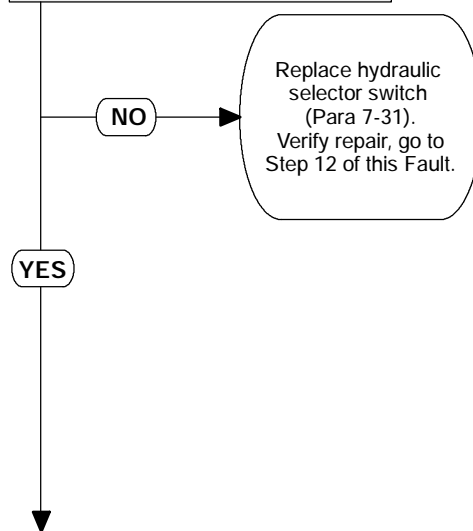
KNOWN INFO
SRW operates. Crane operates. LHS light operates. LHS hoses OK.
POSSIBLE PROBLEMS
Hydraulic selector switch faulty. LHS control assembly faulty. Wire 1462 faulty. Wire 1435 from free flow solenoid valve faulty. LHS control assembly faulty. Wire 1734 faulty. Wire 1435 from LHS supply solenoid valve faulty. LHS supply solenoid valve faulty.

5.

Is continuity measured at hydraulic selector switch connector MC94, terminal F and terminal B and also between switch connector MC94 terminal D and MC93 terminal E with switch in MAN HA position?

WARNING
Read **WARNING** on Page 2-2349

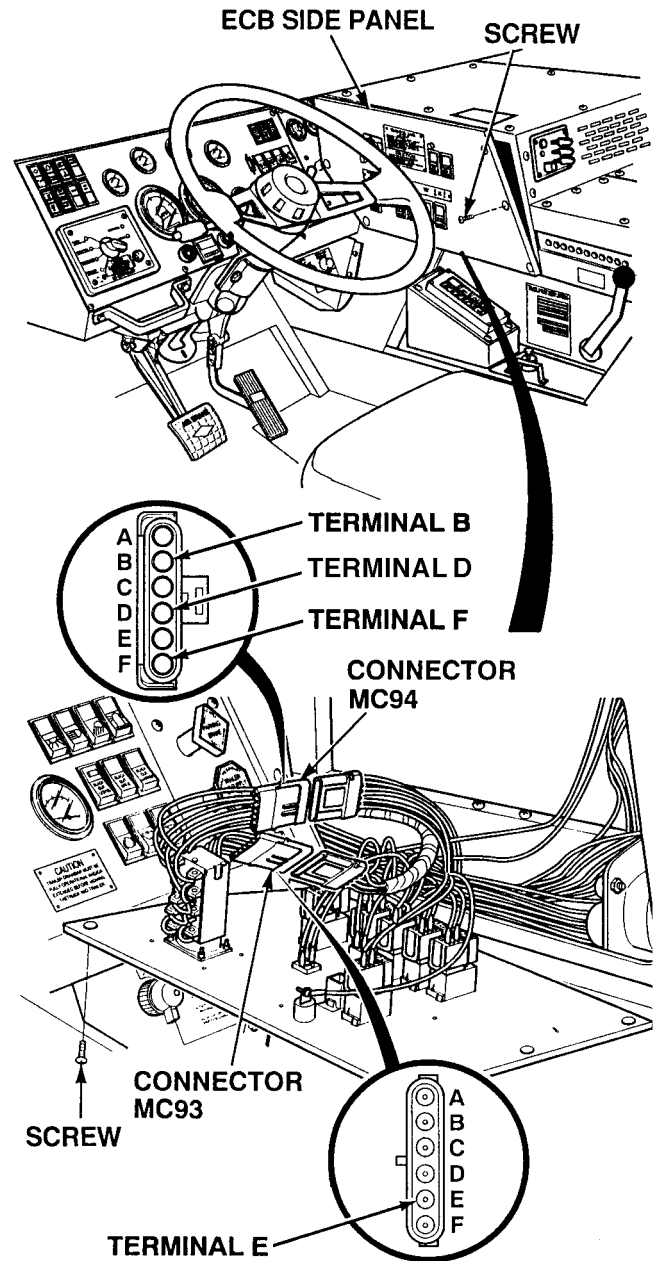
TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If hydraulic selector switch is faulty, 22 to 28 vdc will not be present at free flow solenoid valve.



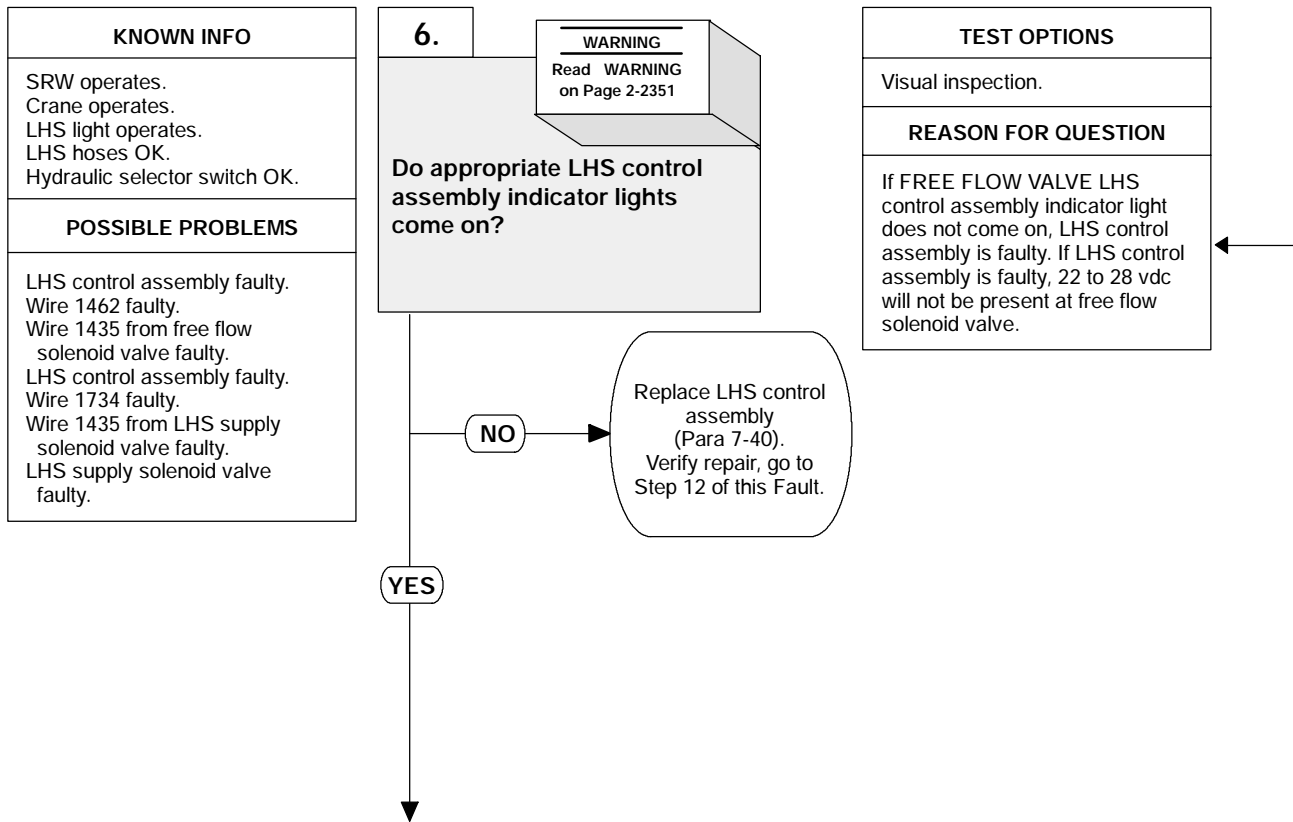
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Remove six screws and tilt ECB side panel.
 - (2) Disconnect harness connectors MC93 and MC94 from hydraulic selector switch connectors.
 - (3) Set hydraulic selector switch to MAN HA position (TM 9-2320-364-10).
 - (4) Set multimeter select switch to ohms.
 - (5) Is there continuity between harness connector MC94, terminal F and terminal B?
 - (a) If there is no continuity, replace hydraulic selector switch (Para 7-31).
 - (b) If there is continuity, perform Step (6) below. - (6) Is there continuity between connector MC93, terminal E and connector MC94, terminal D?
 - (a) If there is no continuity, replace hydraulic selector switch (Para 7-31).
 - (b) If there is continuity, hydraulic selector switch is OK. - (7) Set hydraulic selector switch to OFF position.
 - (8) Connect harness connector MC93 and MC94 to hydraulic selector switch connector.
 - (9) Install ECB side panel and six screws.



8. LHS DOES NOT OPERATE (CONT).



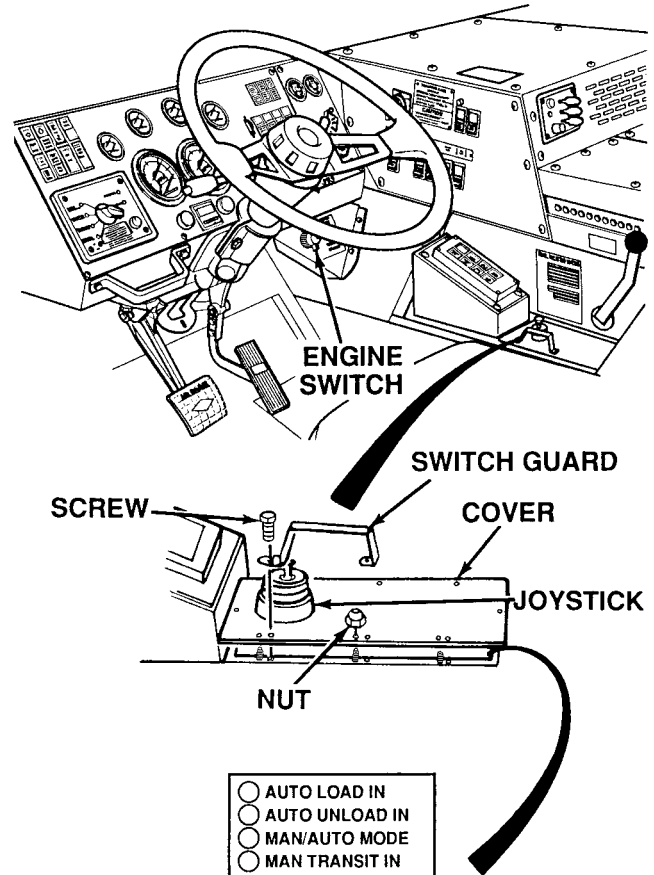
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.

- VISUAL INSPECTION**
- (1) Remove eight nuts, screws, and switch guard from LHS control assembly.
 - (2) Carefully lift LHS control assembly cover off. Do not allow cover to dangle by joystick connecting wires.
 - (3) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (4) Set hydraulic selector switch to MAN HA position.
 - (5) Observe red indicator lights at bottom of LHS control assembly while holding joystick in LOAD position.
 - (a) If FREE FLOW VALVE light does not illuminate, replace LHS control assembly (Para 7-40).
 - (b) If FREE FLOW VALVE light illuminates, LHS control assembly is OK.
 - (6) Set hydraulic selector switch to OFF position.
 - (7) Turn OFF ENGINE switch.
 - (8) Install cover, switch guard and eight nuts on LHS control assembly.

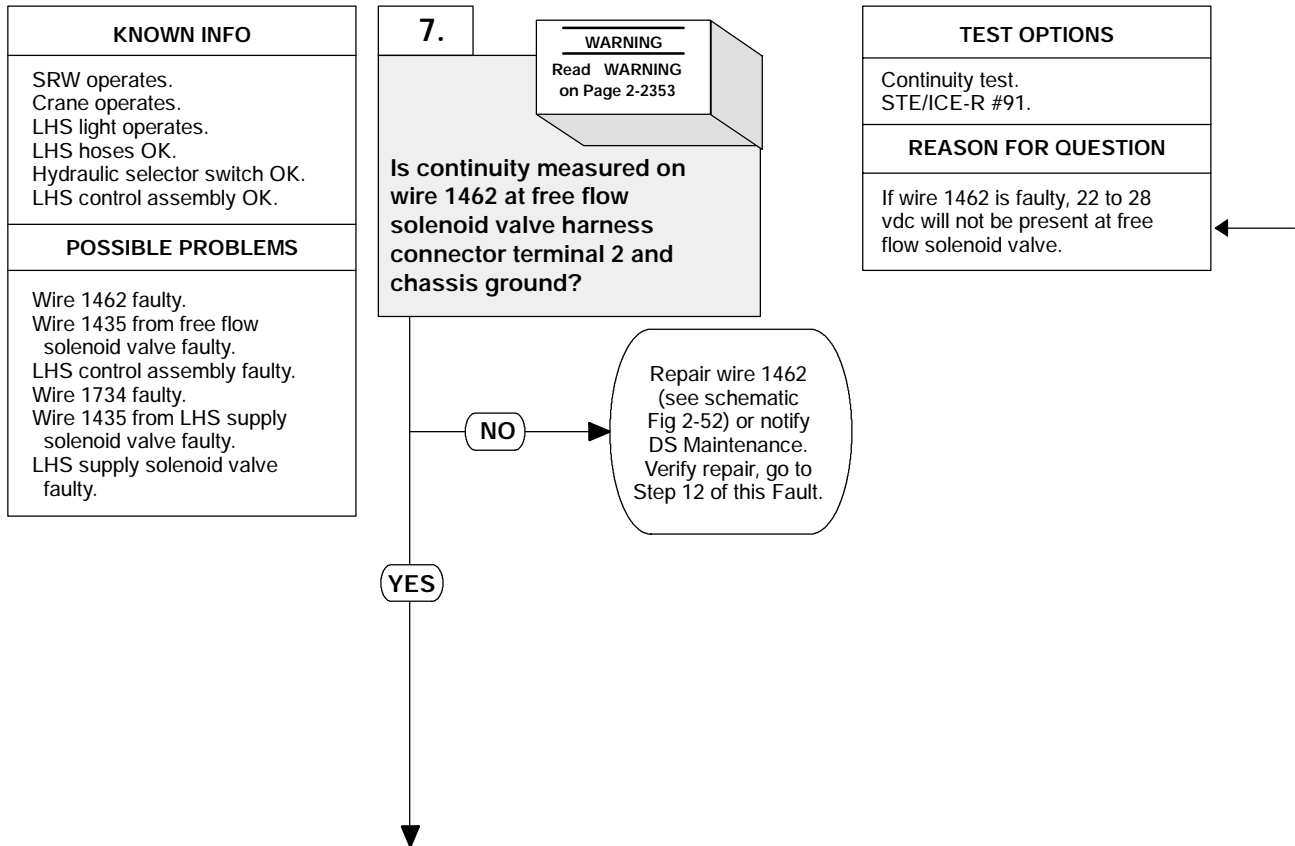


- AUTO LOAD IN
- AUTO UNLOAD IN
- MAN/AUTO MODE
- MAN TRANSIT IN

- UNLOAD OUT
- LOAD OUT
- AUX MODE IN
- NO TRANSIT LIGHT
- OVERLOAD LIGHT
- HOOK ARM "A" SOL
- MAIN RAM "B" SOL
- HOOK ARM "B" SOL
- MAIN RAM "A" SOL
- +24V IN
- HOOK ARM UP

- FREE FLOW VALVE
- HOOK ARM DOWN
- TRANSIT VALVE
- OVERLOAD IN
- MID FRAME DOWN

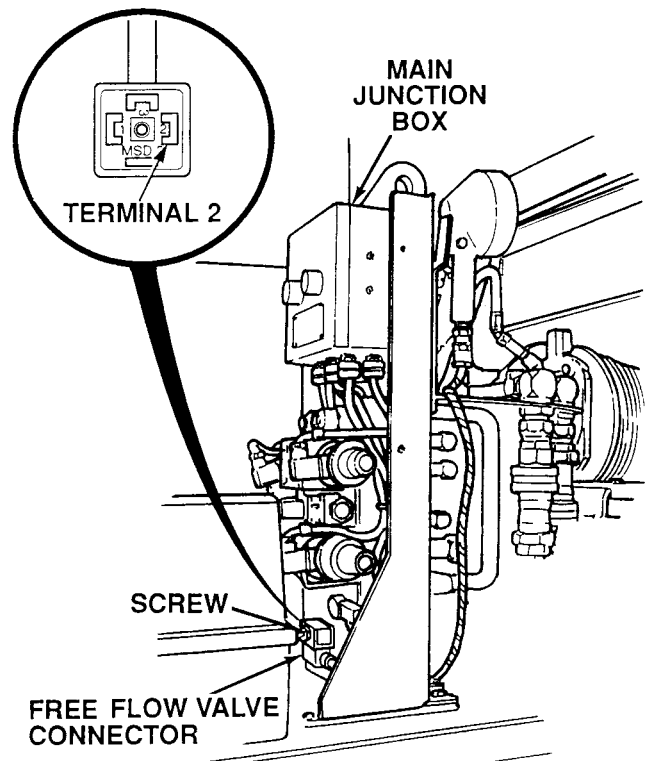
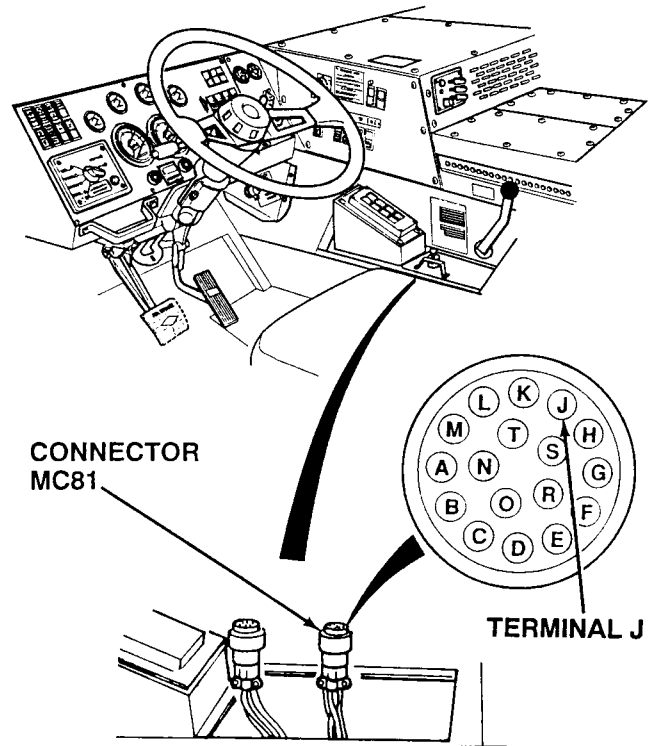
8. LHS DOES NOT OPERATE (CONT).



WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST	
(1)	Remove LHS control assembly (Para 7-40).
(2)	Disconnect free flow valve harness connector.
(3)	Connect harness connector MC81, terminal J to a known good ground using jumperwire.
(4)	Set multimeter select switch to ohms.
(5)	Is there continuity between free flow valve harness connector, terminal 2 and a known good ground?
(a)	If there is no continuity, repair wire 1462 (see schematic Fig 2-52) or notify DS Maintenance.
(b)	If there is continuity, wire 1462 is OK.
(5.1)	Remove jumper wire.
(6)	Install harness connector on free flow solenoid valve.
(7)	Tighten connector screw and coat head of connector screw with adhesive.



8. LHS DOES NOT OPERATE (CONT).

KNOWN INFO
SRW operates. Crane operates. LHS light operates. LHS hoses OK. Hydraulic selector switch OK. LHS control assembly OK. Wire 1462 OK.
POSSIBLE PROBLEMS
Wire 1435 from free flow solenoid valve faulty. LHS control assembly faulty. Wire 1734 faulty. Wire 1435 from LHS supply solenoid valve faulty. LHS supply solenoid valve faulty.

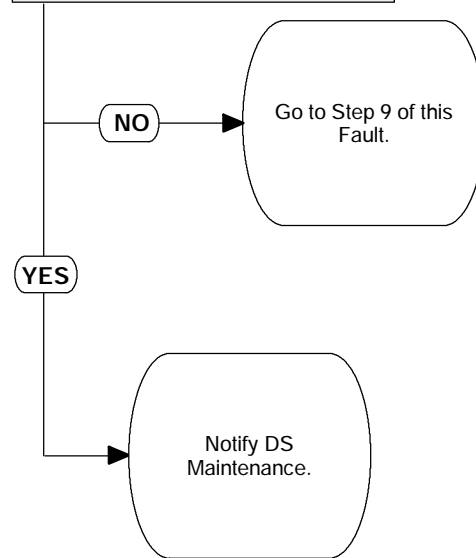
8.

WARNING

Read **WARNING** on Page 2-2355

Is continuity measured on wire 1435 at free flow solenoid valve harness connector, terminal 1 and chassis ground?

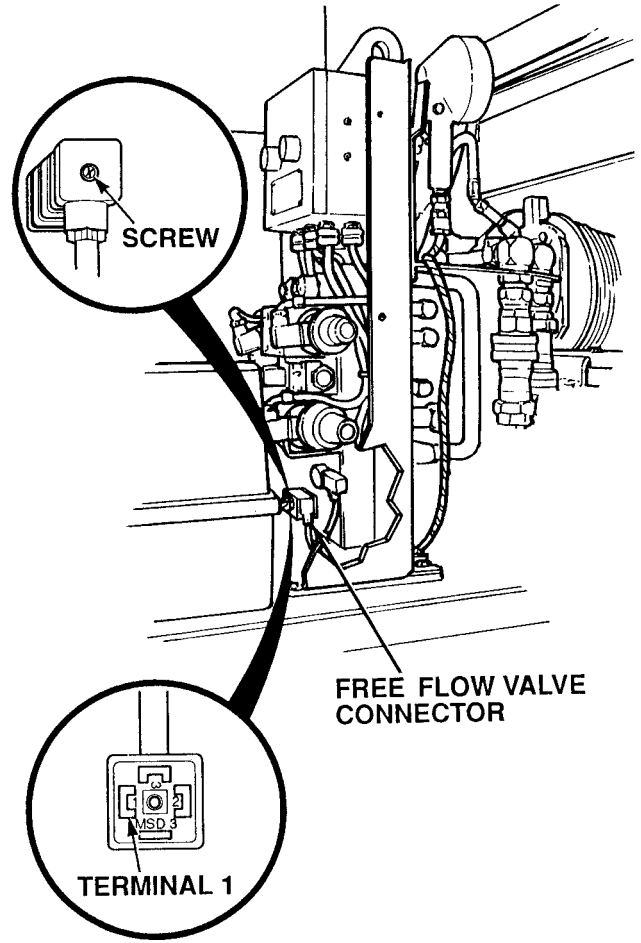
TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1435 or LHS control assembly is faulty, free flow solenoid valve will not be grounded.



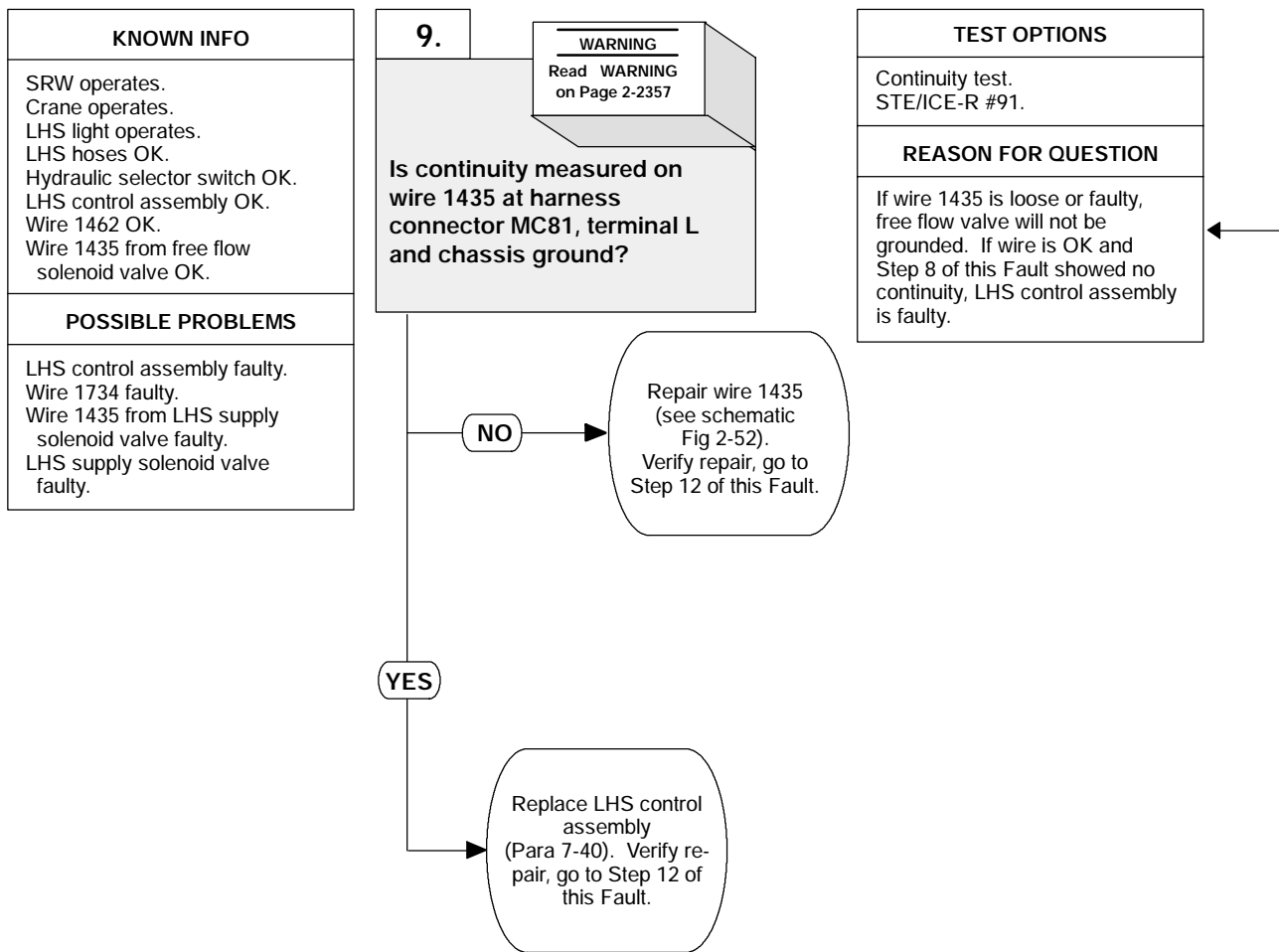
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
<ol style="list-style-type: none"> (1) Loosen screw and disconnect free flow solenoid valve harness connector. (2) Set multimeter select switch to ohms. (3) Is there continuity between free flow solenoid valve harness connector, terminal 1 and a known good ground? <ol style="list-style-type: none"> (a) If there is no continuity, go to Step 9 of this Fault. (b) If there is continuity, notify DS Maintenance.



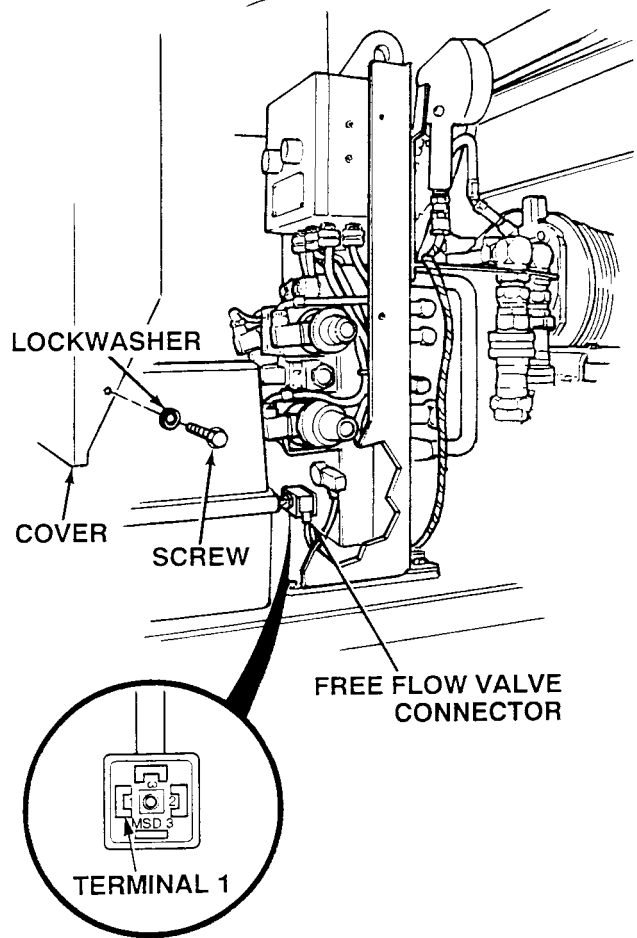
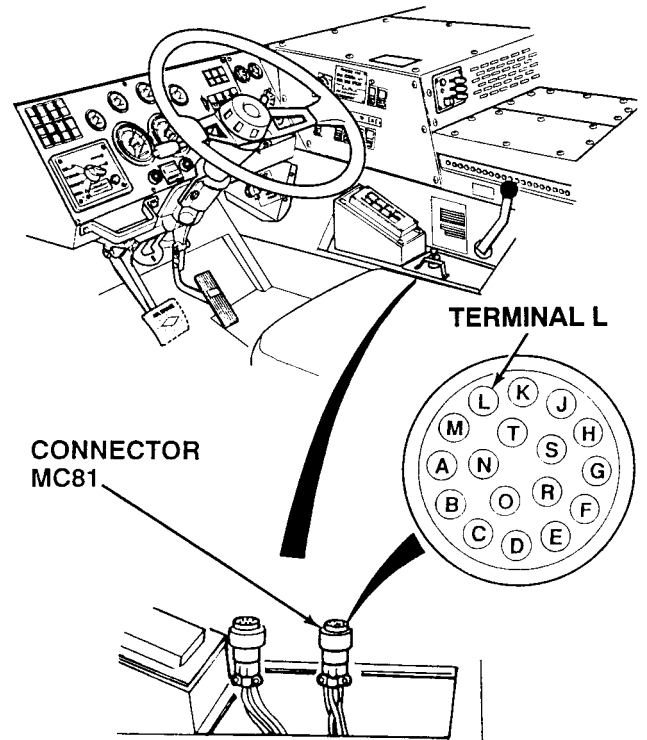
8. LHS DOES NOT OPERATE (CONT).



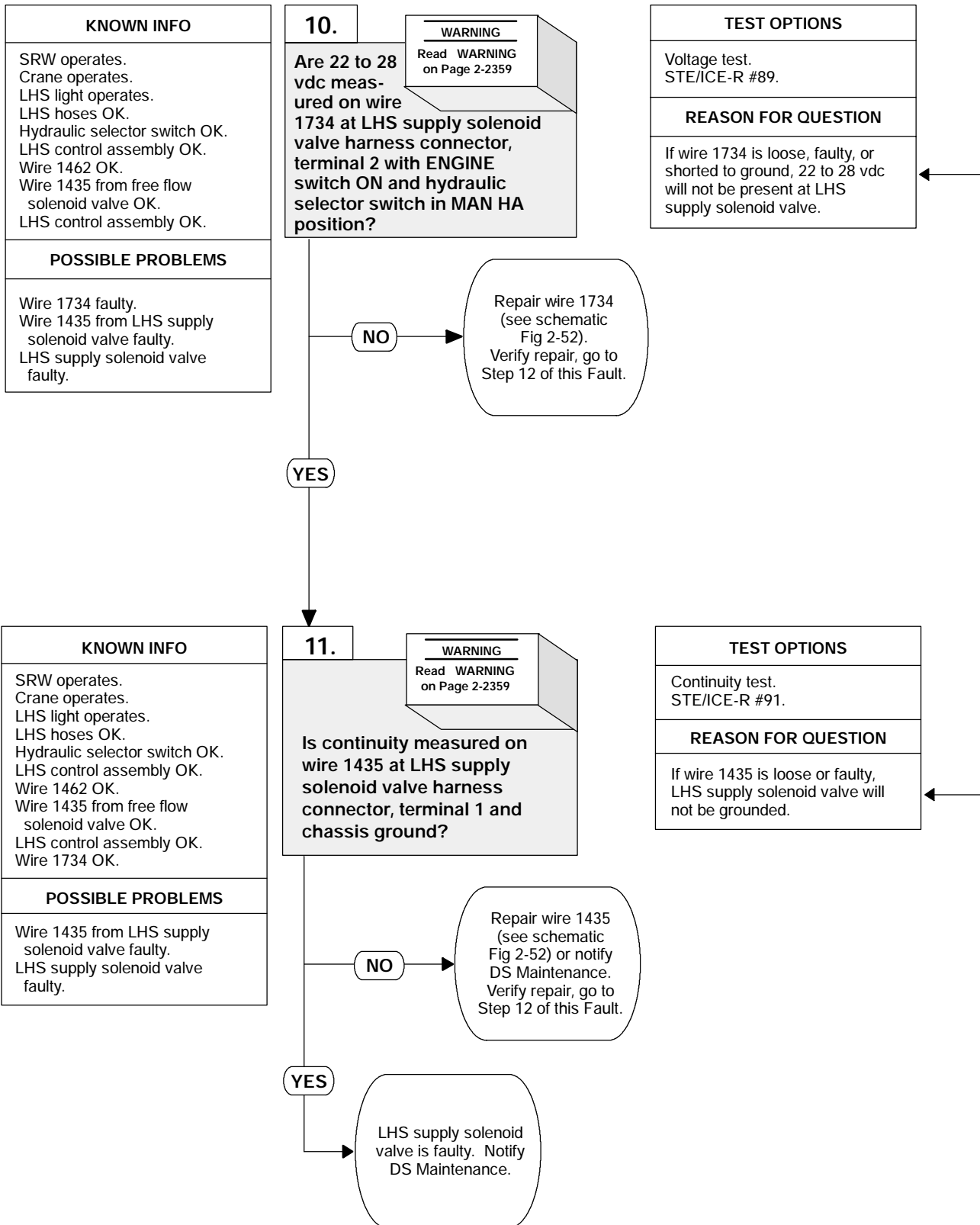
WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST	
(1)	Remove LHS control assembly (Para 7-40).
(1.1)	Connect free flow valve connector terminal 1 to a known good ground using jumperwire.
(2)	Set multimeter select switch to ohms.
(3)	Is there continuity between harness connector MC81 terminal L and a known good ground?
(a)	If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance.
(b)	If there is continuity, wire 1435 is OK. Replace LHS control assembly (Para 7-40).
(4)	Remove jumperwire from free flow solenoid valve harness connector terminal 1 and ground.
(5)	Install harness connector on free flow solenoid valve.
(6)	Tighten connector screw and coat head of connector screw with adhesive.
(7)	Install LHS control assembly (Para 7-40).
(8)	Install LHS control box cover with four screws and lockwashers.

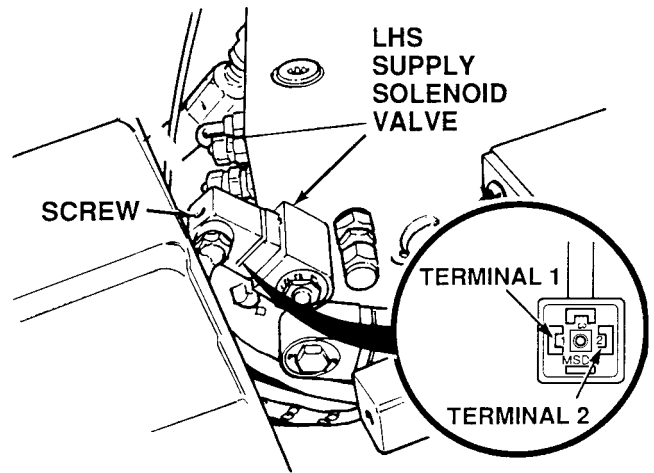
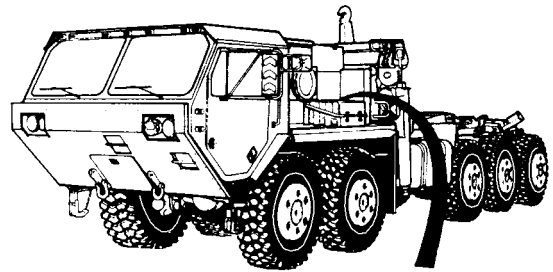


8. LHS DOES NOT OPERATE (CONT).

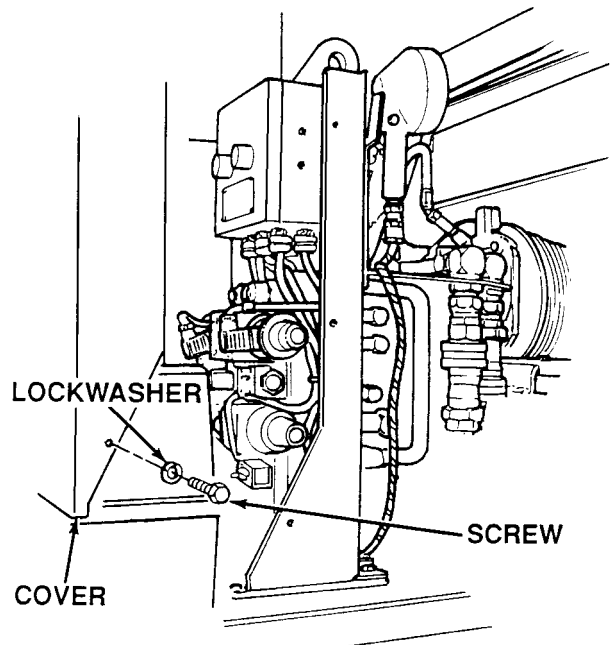


WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

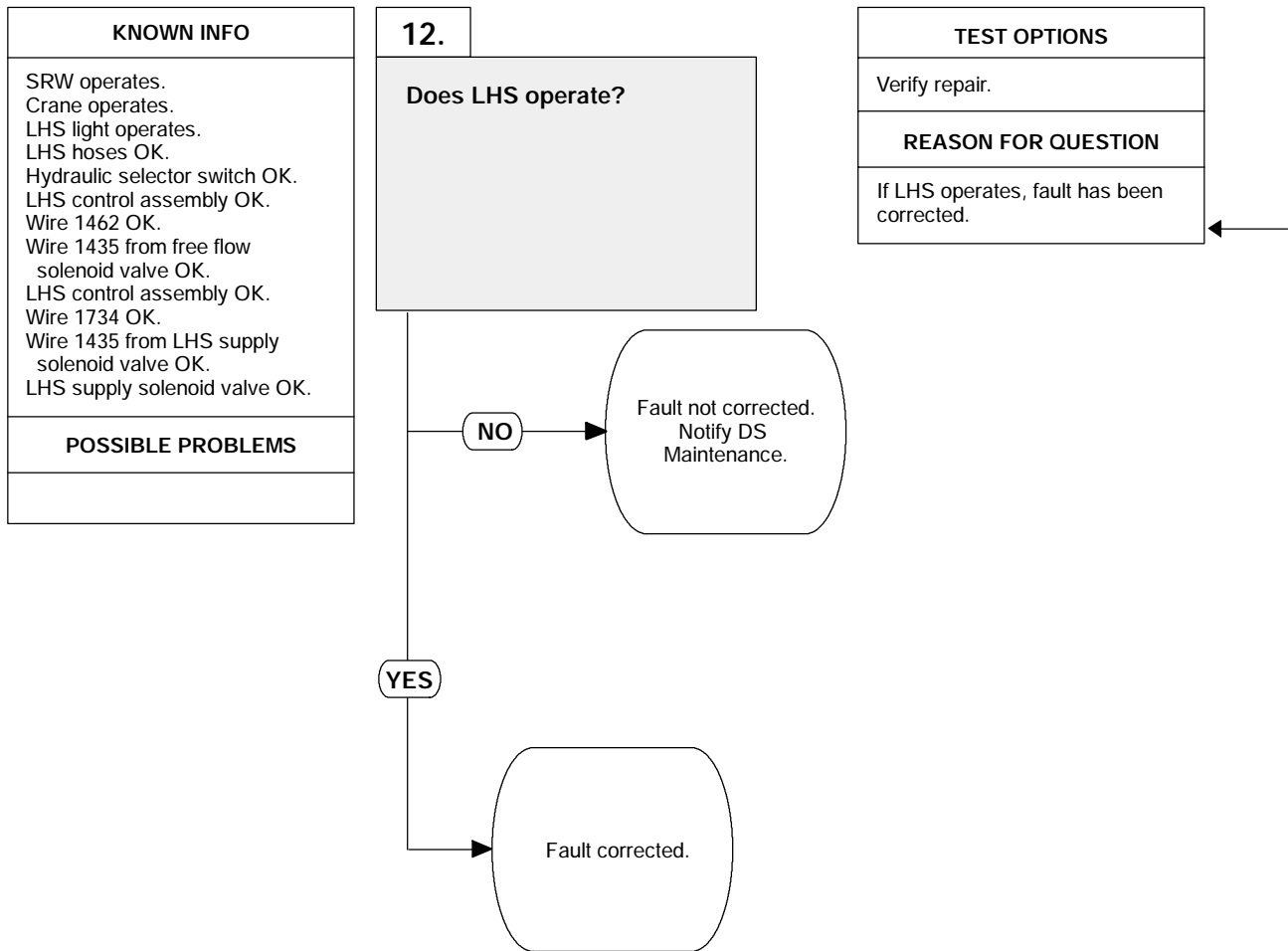


VOLTAGE TEST
<ol style="list-style-type: none"> Set multimeter select switch to volts dc. Remove harness connector from LHS supply solenoid valve. Connect positive (+) multimeter lead at harness connector, terminal 2. Connect negative (-) multimeter lead to a known good ground. Turn ON ENGINE switch (TM 9-2320-364-10). Set hydraulic selector switch to MAN HA position. <ol style="list-style-type: none"> If there are not 22 to 28 vdc present, perform Steps (7) and (8) below and repair wire 1734 (see schematic Fig 2-52) or notify DS Maintenance. If there are 22 to 28 vdc present, wire 1734 is OK. Set hydraulic selector switch to OFF position. Turn OFF ENGINE switch.



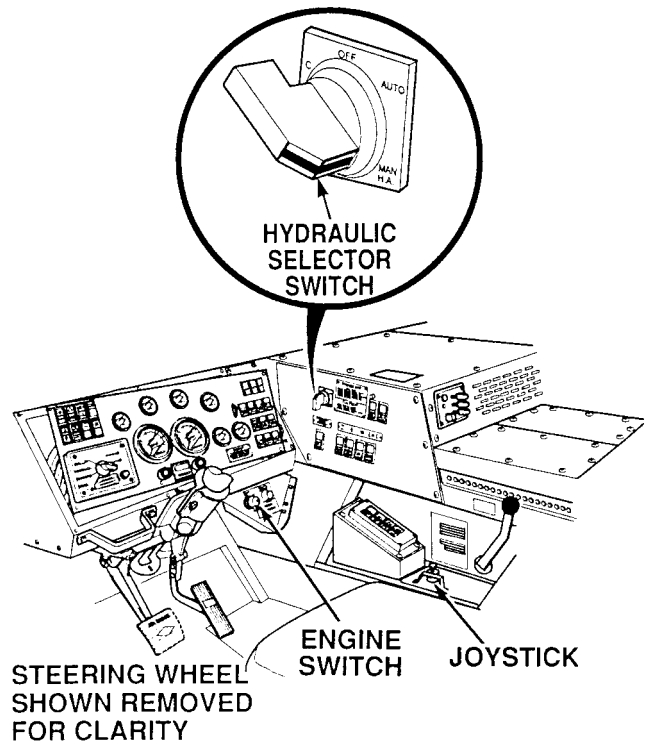
CONTINUITY TEST
<ol style="list-style-type: none"> Set multimeter select switch to ohms. Is there continuity between LHS supply solenoid valve harness connector, terminal 1 and a known good ground? <ol style="list-style-type: none"> If there is no continuity, repair wire 1435 (see schematic Fig 2-52). If there is continuity, wire is OK. Notify DS Maintenance. Install harness connector on LHS supply solenoid valve. Tighten connector screw and coat head of connector screw with adhesive. Install LHS control box cover, four lockwashers and screws.

8. LHS DOES NOT OPERATE (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch to AUTO position.
- (3) Operate LHS.
 - (a) If LHS does not operate, fault not corrected. Perform Steps (4) and (5) below and notify DS Maintenance.
 - (b) Is LHS operates, fault has been corrected.
- (4) Set hydraulic selector switch to OFF position.
- (5) Turn OFF ENGINE switch.



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

9. HOOK ARM DOES NOT UNLOAD IN MANUAL MODE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

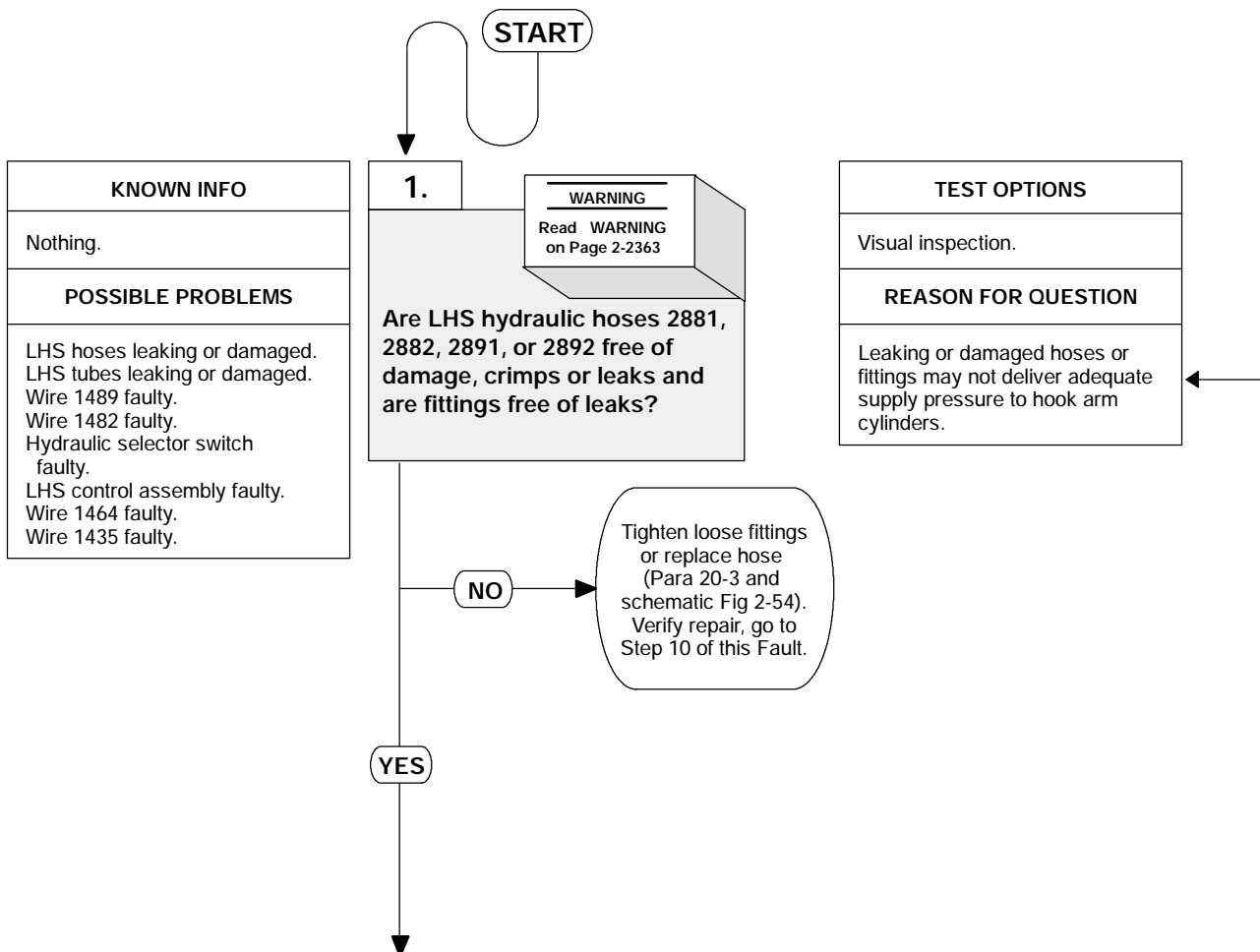
Lockwasher (4) (Item 180, Appendix F)
 Adhesive (Item 8, Appendix C)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

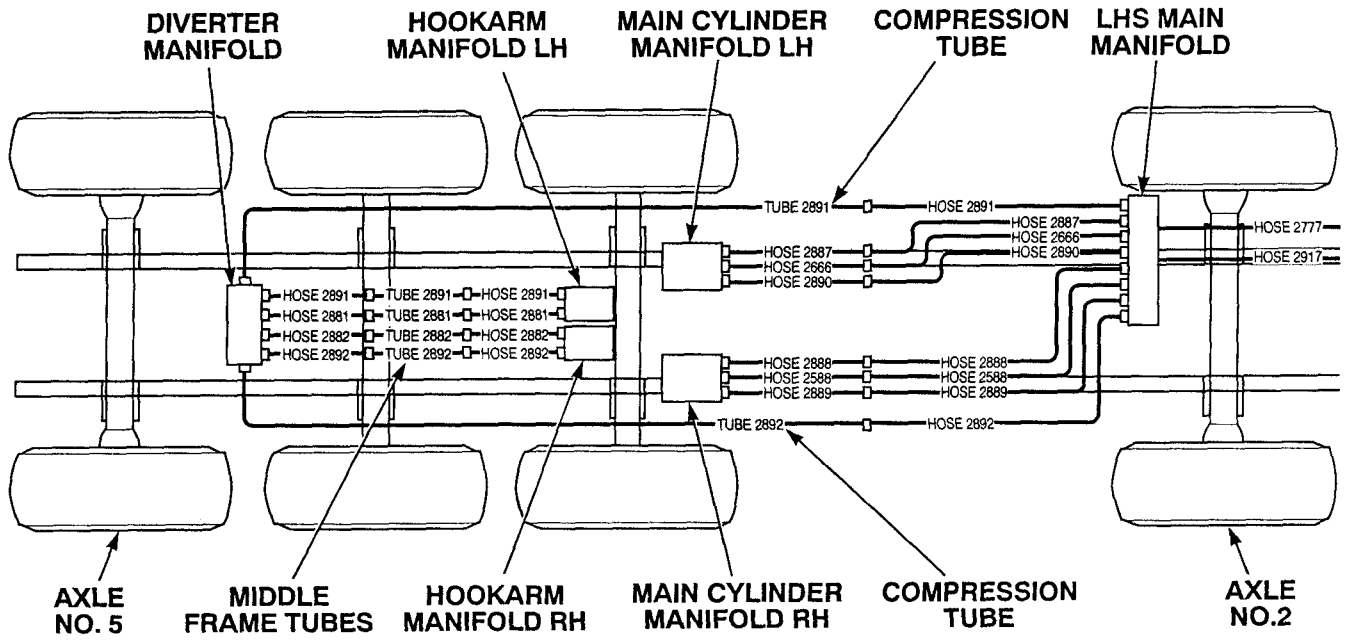
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)



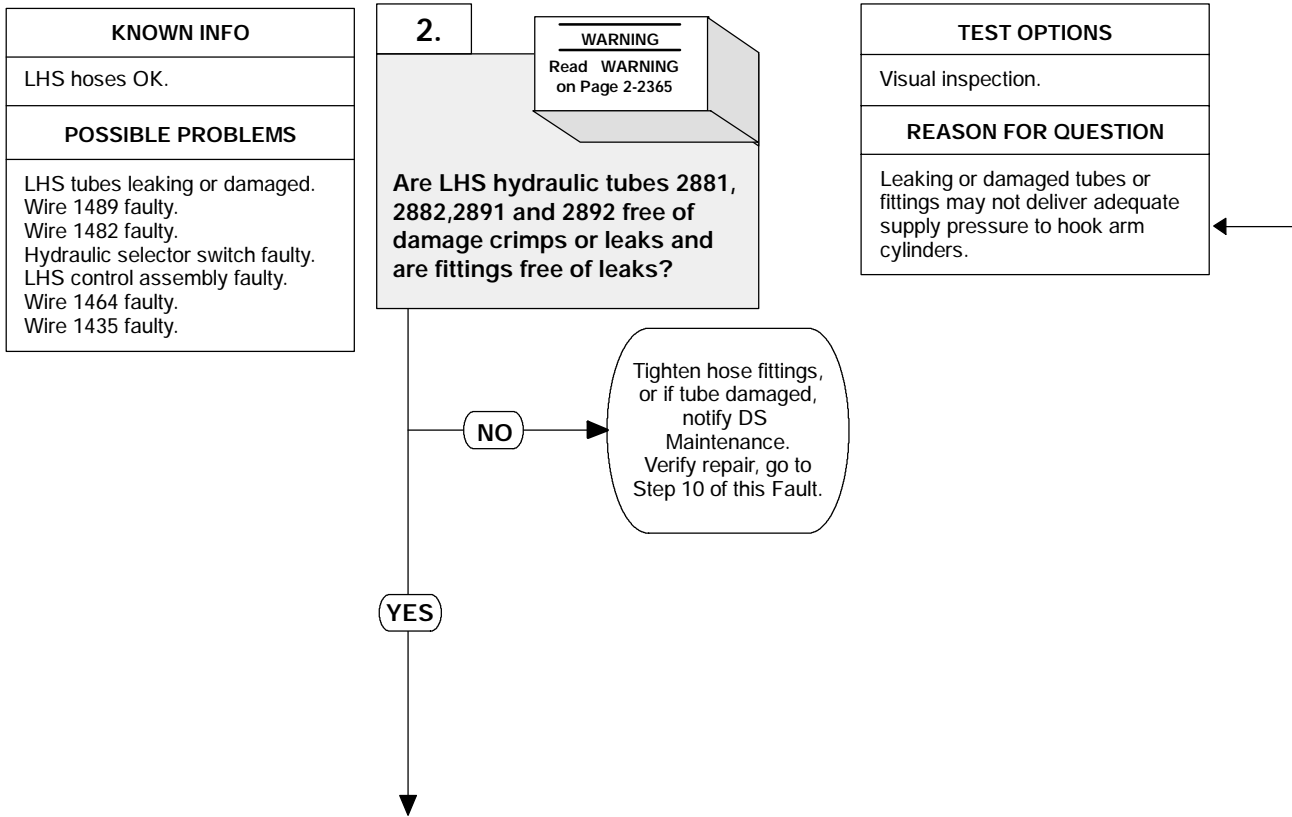
WARNING

High pressure hydraulics [oil under 3,700 psi (25,512 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.



VISUAL INSPECTION	
Inspect LHS hydraulic hoses 2881, 2882, 2891 and 2892 for damage, crimps or leaks.	
(1)	If hoses are damaged, crimped or leaking; tighten fittings or replace hoses (Para 20-3 and schematic Fig 2-54).
(2)	If there are no leaks, crimps or damage; hoses and fittings are OK.

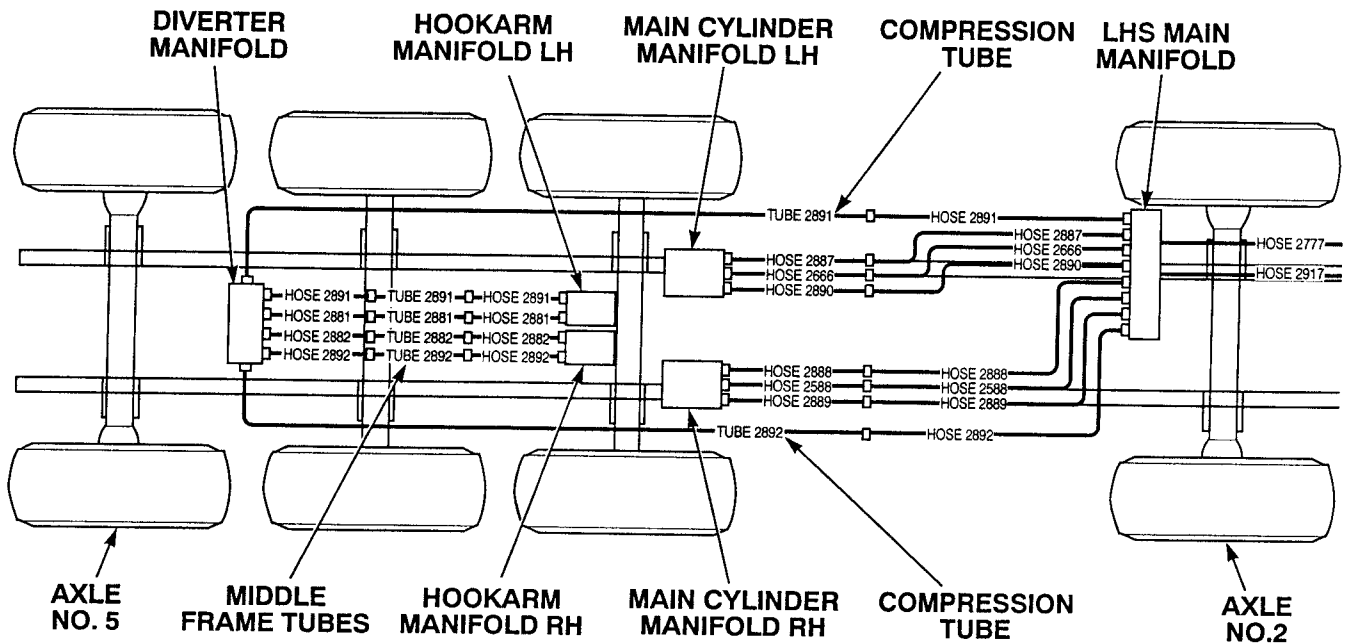
9. HOOK ARM DOES NOT UNLOAD IN MANUAL MODE (CONT).



WARNING

High pressure hydraulics [oil under 3,700 psi (25,512 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

- | VISUAL INSPECTION |
|--|
| <p>(1) Inspect two compression frame, LHS hydraulic tubes for damage, crimps or leaks.</p> <p>(2) Inspect four middle frame LHS hydraulic tubes 2881, 2882, 2891, and 2892 for damage, crimps or leaks.</p> <p style="margin-left: 20px;">(a) If tubes are leaking, tighten fittings.</p> <p style="margin-left: 20px;">(b) If tubes are damaged, notify DS Maintenance.</p> <p style="margin-left: 20px;">(c) If there are no leaks, crimps or damage; tubes and fittings are OK.</p> |



9. HOOK ARM DOES NOT UNLOAD IN MANUAL MODE (CONT).

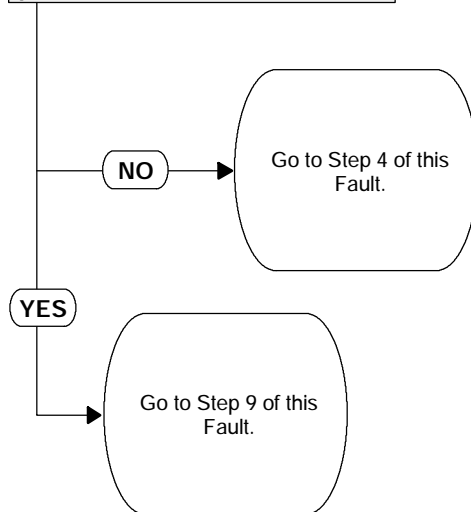
KNOWN INFO
LHS hoses OK. LHS tubes OK.
POSSIBLE PROBLEMS
Wire 1489 faulty. Wire 1482 faulty. Hydraulic selector switch faulty. LHS control assembly faulty. Wire 1464 faulty. Wire 1435 faulty.

3.

Are 22 to 28 vdc measured at hook arm up directional control (DC) valve harness connector, terminal 2 with ENGINE switch ON, hydraulic selector switch in MAN HA, and joystick in UNLOAD position?

WARNING
Read WARNING on Page 2-2367

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If there are not 22 to 28 vdc present, component supplying voltage to hook arm DC valve is faulty.



WARNING

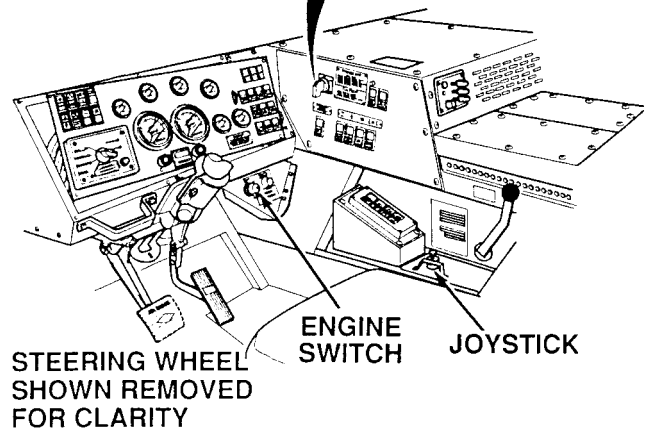
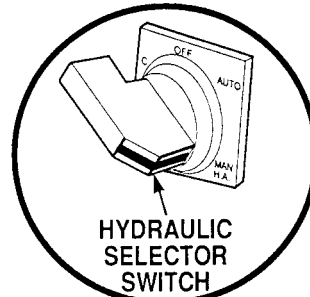
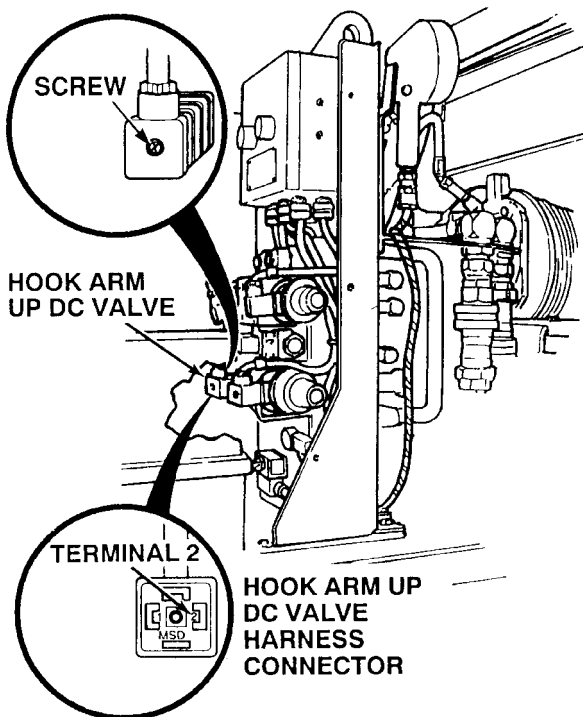
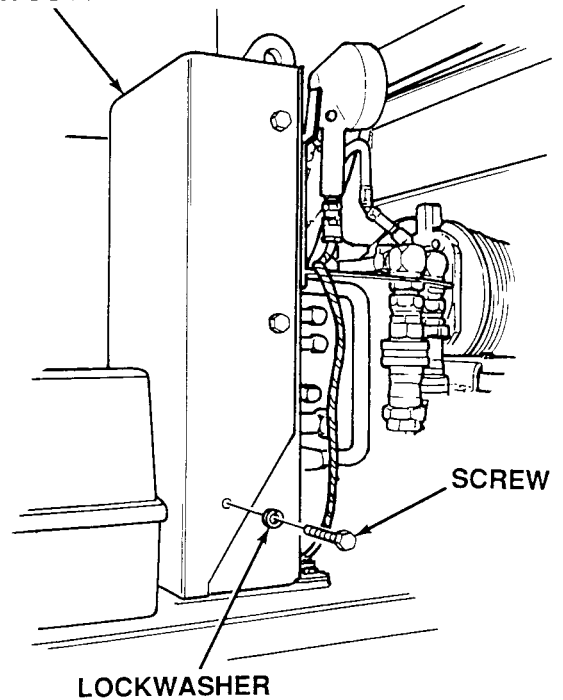
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

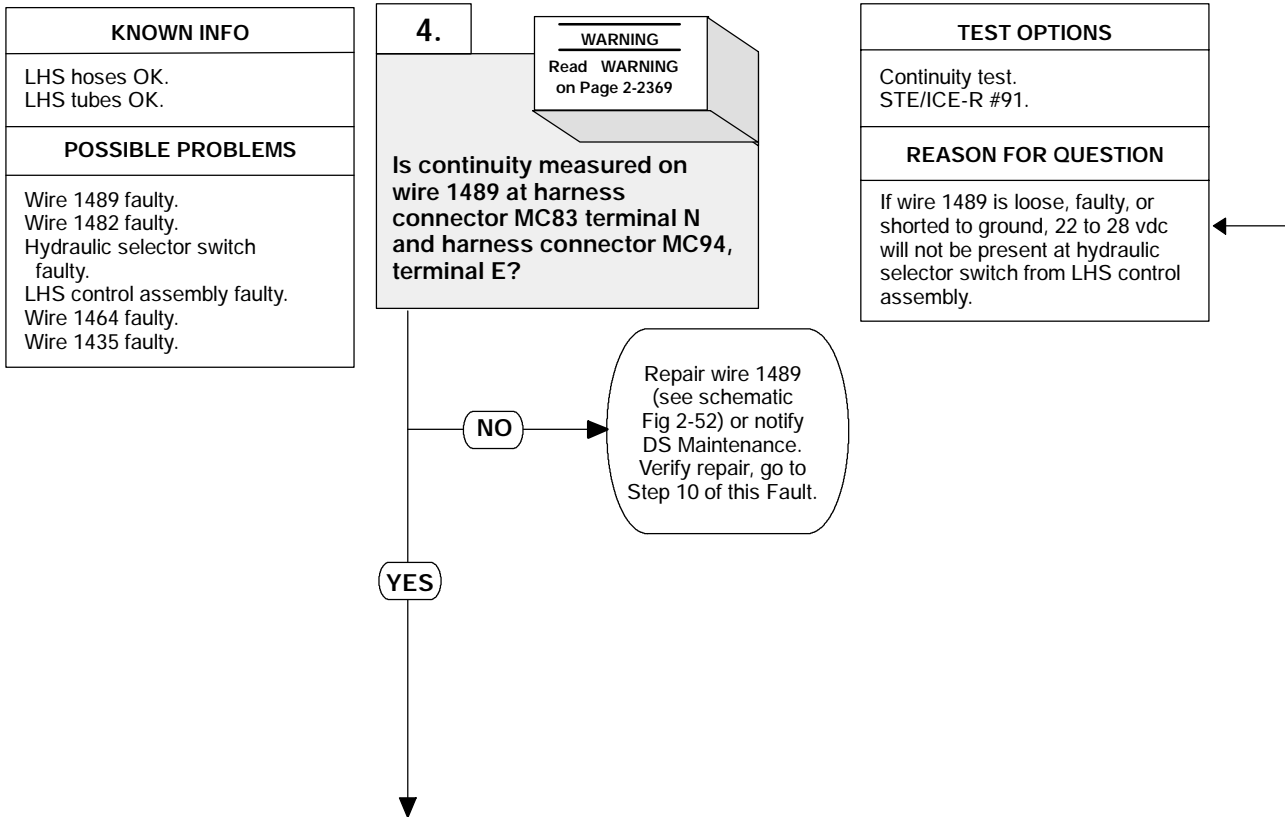
Only remove center screw on engine side of LHS control box cover.

VOLTAGE TEST	
(1)	Remove four screws, lockwashers and LHS control box cover. Discard lockwashers.
(2)	Loosen screw and disconnect harness connector from hook arm up DC valve.
(3)	Set multimeter select switch to volts dc.
(4)	Connect positive (+) multimeter lead at harness connector, terminal 2.
(5)	Connect negative (-) multimeter lead to a known good ground.
(6)	Turn ON ENGINE switch (TM 9-2320-364-10).
(7)	Set hydraulic selector switch to MAN HA position.
(8)	Hold joystick in UNLOAD position. <ul style="list-style-type: none"> (a) If there are not 22 to 28 vdc present, perform Steps (9) and (10) below and go to Step 4 of this Fault. (b) If there are 22 to 28 vdc present, perform Steps (9) and (10) below and go to Step 9 of this Fault.
(9)	Set hydraulic selector switch to OFF position.
(10)	Turn OFF ENGINE switch.

MAIN JUNCTION BOX COVER



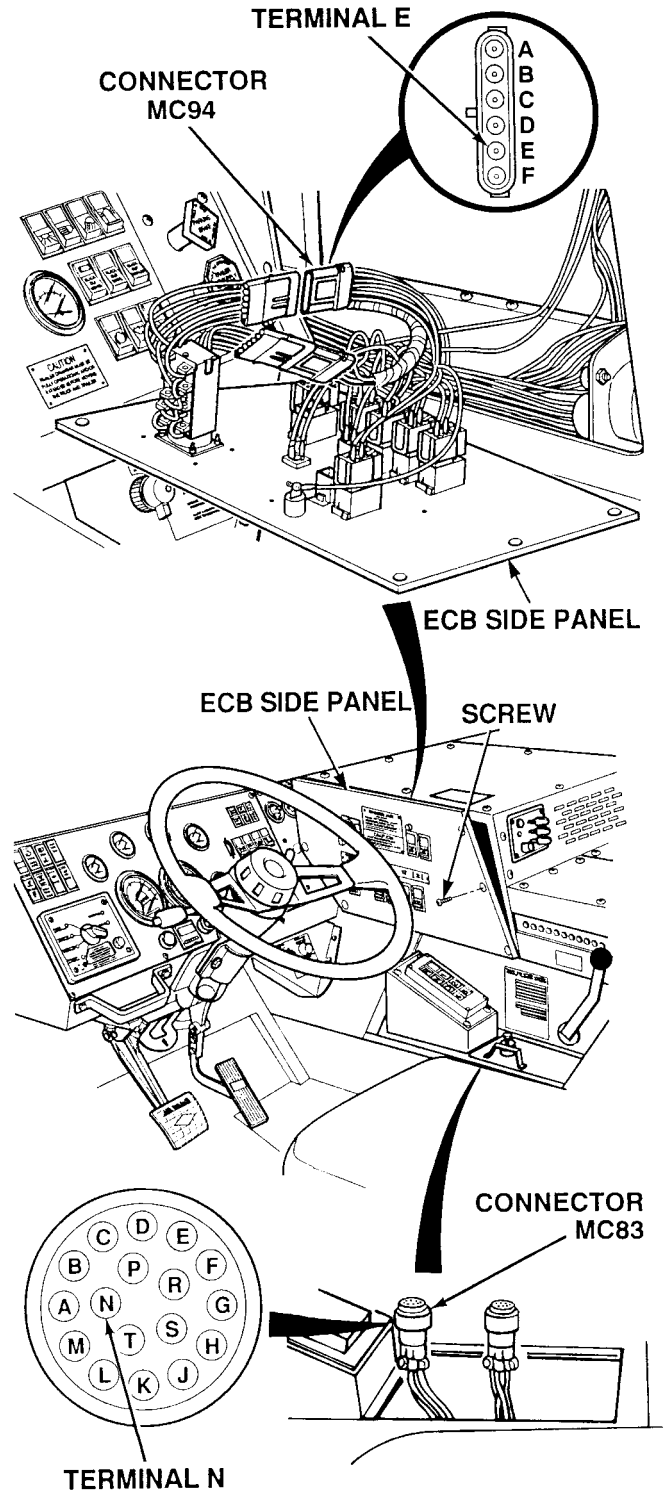
9. HOOK ARM DOES NOT UNLOAD IN MANUAL MODE (CONT).



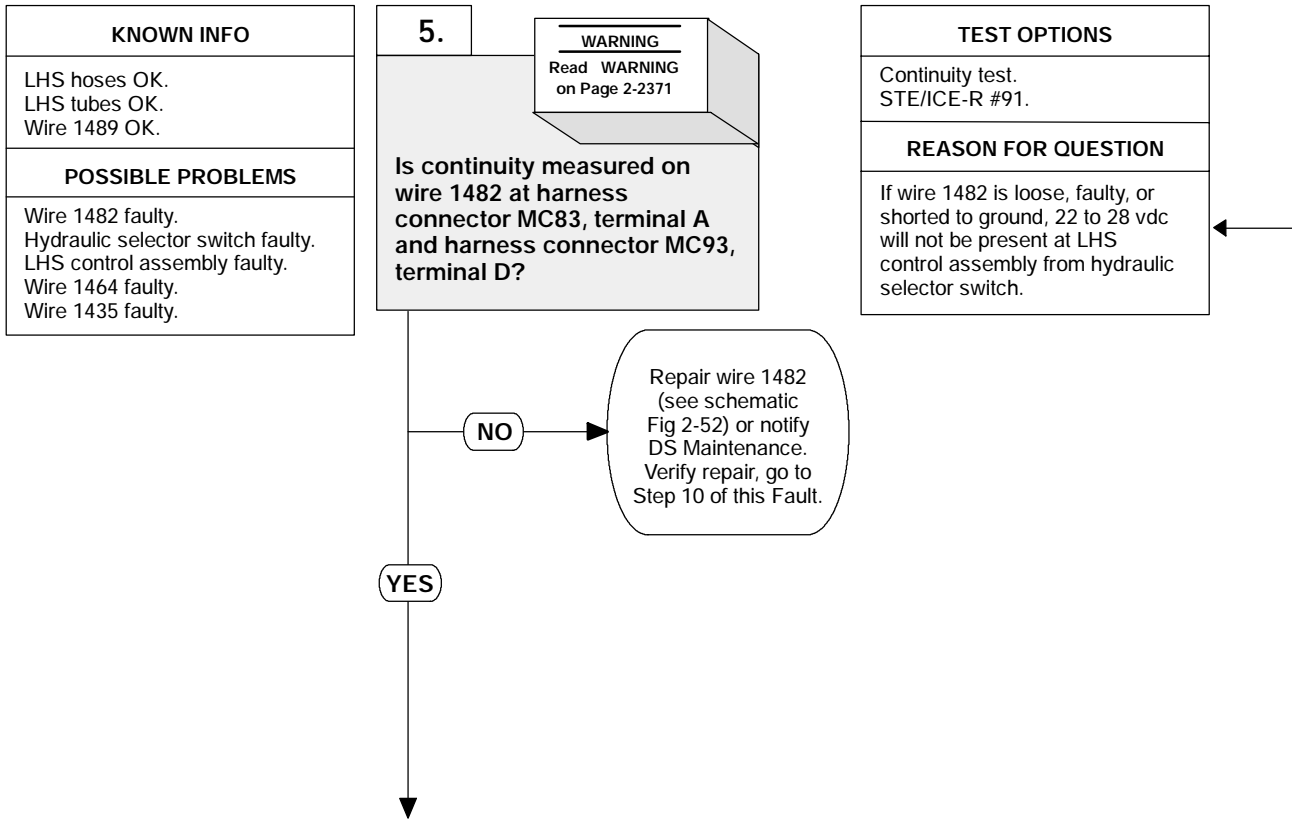
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | CONTINUITY TEST |
|--|
| (1) Remove LHS control assembly (Para 7-40). |
| (2) Remove six screws and tilt ECB side panel. |
| (3) Disconnect harness connector MC94 from hydraulic selector switch connector. |
| (4) Set multimeter select switch to ohms. |
| (5) Is there continuity between harness connector MC83, terminal N and harness connector MC94, terminal E? |
| (a) If there is no continuity, repair wire 1489 (see schematic Fig 2-52) or notify DS Maintenance. |
| (b) If there is continuity, wire 1489 is OK. |



9. HOOK ARM DOES NOT UNLOAD IN MANUAL MODE (CONT).

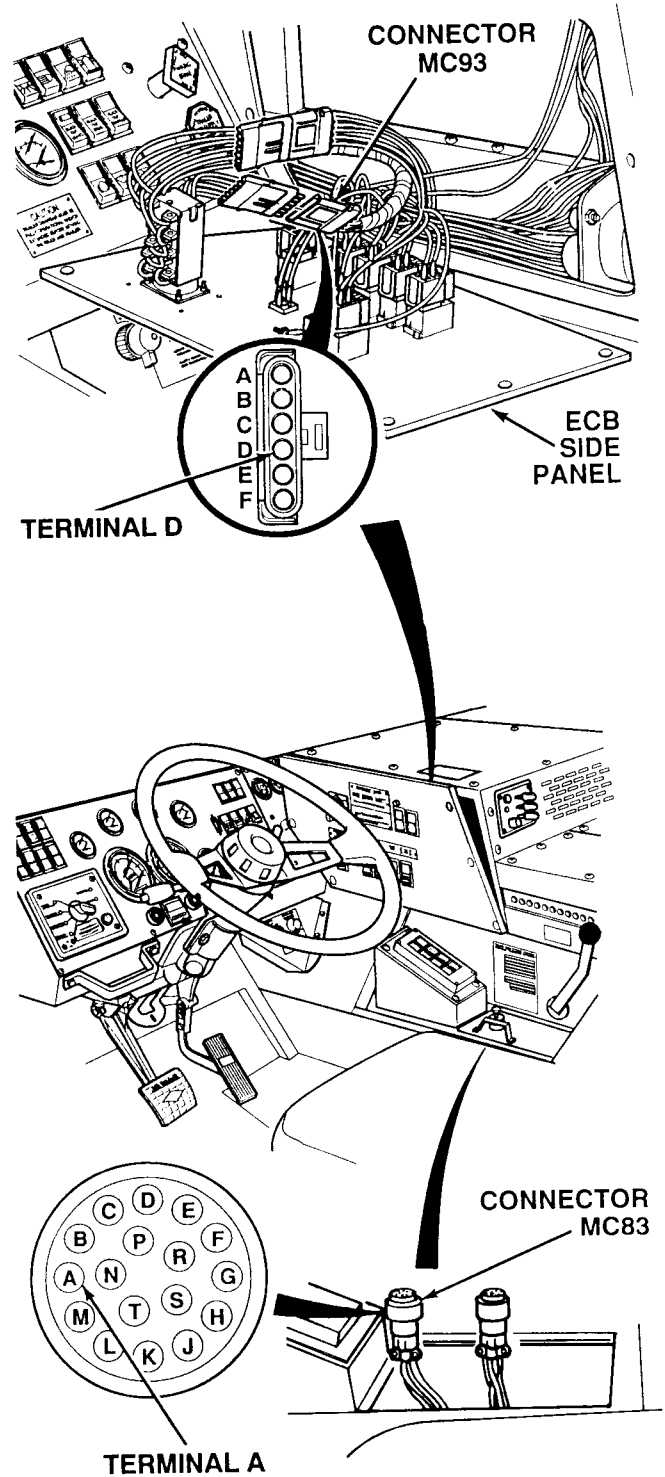


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect harness connector MC93 from hydraulic selector switch connector.
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between harness connector MC83, terminal A and harness connector MC93, terminal D?
 - (a) If there is no continuity, repair wire 1482 (see schematic Fig 2-52).
 - (b) If there is continuity, wire 1482 is OK.
- (4) Install LHS control assembly (Para 7-40).



9. HOOK ARM DOES NOT UNLOAD IN MANUAL MODE (CONT).

KNOWN INFO
LHS hoses OK. LHS tubes OK. Wire 1489 OK. Wire 1482 OK.
POSSIBLE PROBLEMS
Hydraulic selector switch faulty. LHS control assembly faulty. Wire 1464 faulty. Wire 1435 faulty.

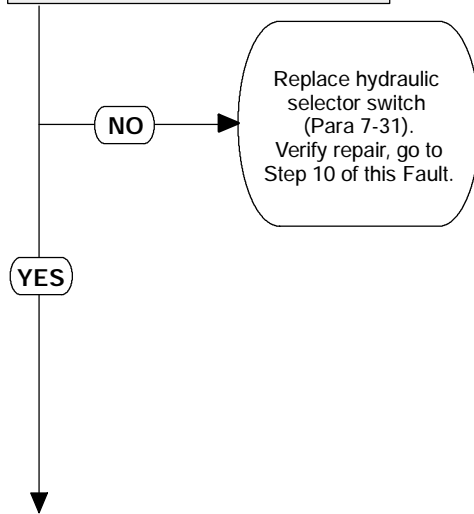
6.

WARNING

Read WARNING on Page 2-2373

Is continuity measured at hydraulic selector switch harness connector MC93 terminal D and harness connector MC94, terminal E with switch in MAN HA position?

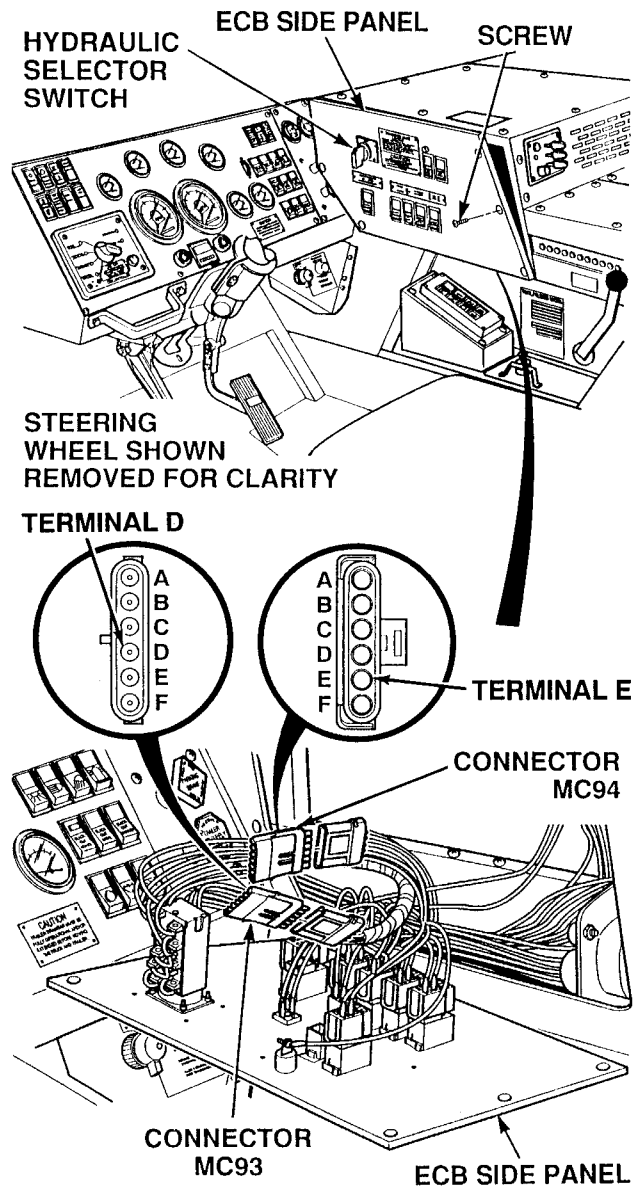
TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If hydraulic selector switch is faulty, 22 to 28 vdc will not be present at LHS control assembly.



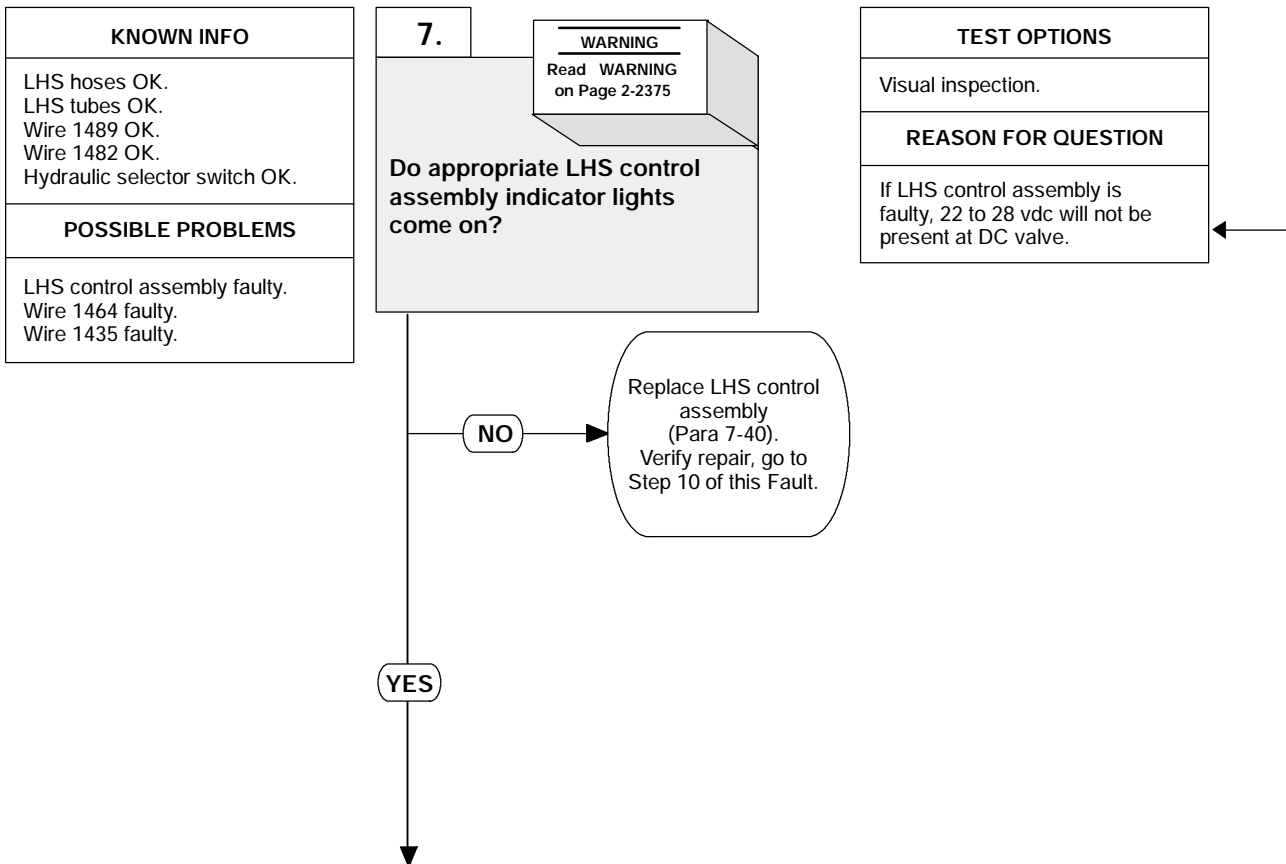
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Set hydraulic selector switch to MAN HA position (TM 9-2320-364-10).
 - (2) Set multimeter select switch to ohms.
 - (3) Is there continuity between harness connector MC93, terminal D and harness connector MC94, terminal E?
 - (a) If there is no continuity, replace hydraulic selector switch (Para 7-31).
 - (b) If there is continuity, hydraulic selector switch is OK.
 - (4) Connect harness connector MC94 to hydraulic selector switch connector.
 - (5) Connect harness connector MC93 to hydraulic selector switch connector.
 - (6) Install ECB side panel and six screws.



9. HOOK ARM DOES NOT UNLOAD IN MANUAL MODE (CONT).

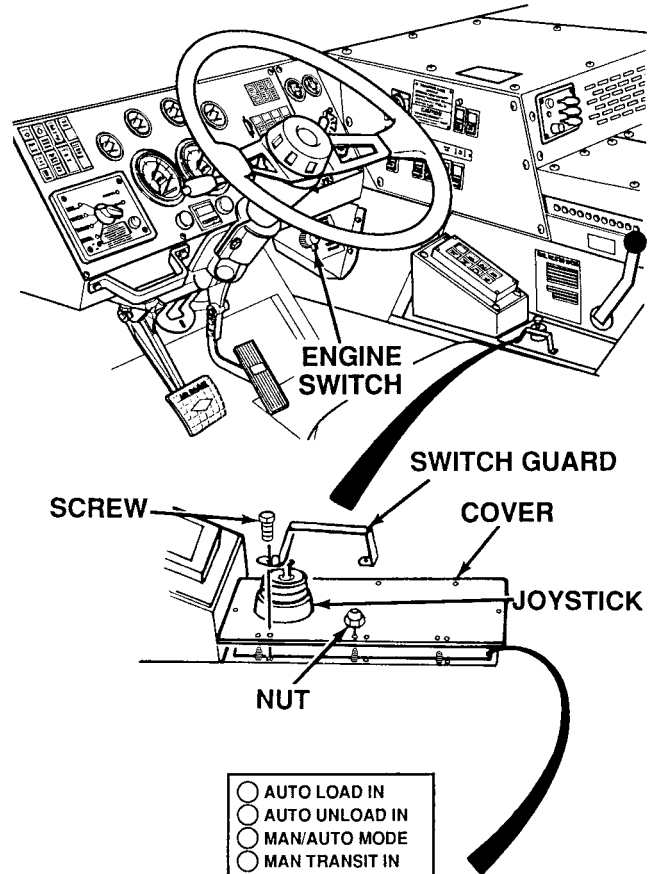


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.



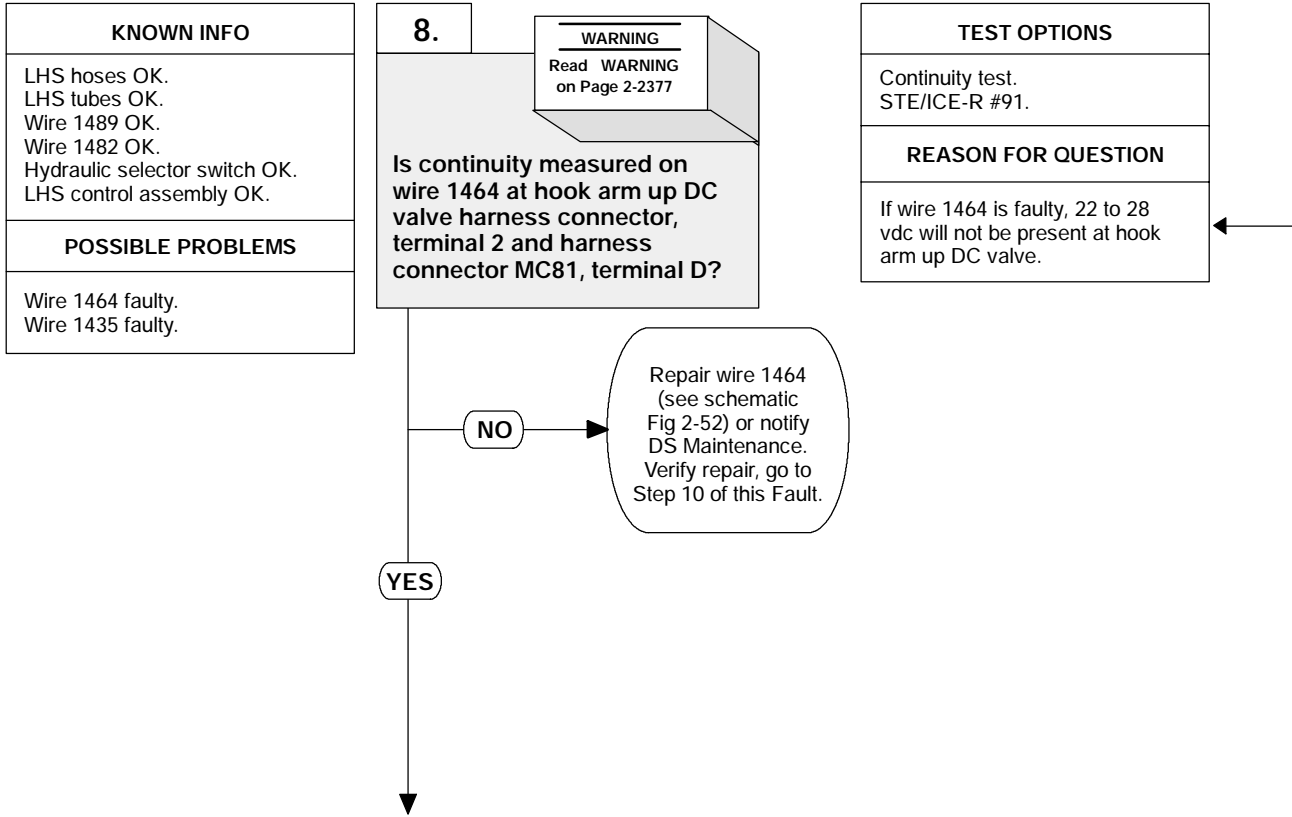
- VISUAL INSPECTION**
- (1) Remove eight screws, switch guard and eight nuts from LHS control assembly.
 - (2) Carefully lift off LHS control assembly cover. Do not allow cover to dangle by joystick connecting wires.
 - (3) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (4) Set hydraulic selector switch to MAN HA position.
 - (5) Hold joystick in UNLOAD position.
 - (6) Observe red indicator lights in bottom of LHS control assembly.
 - (a) If HOOK ARM A indicator lamp does not illuminate with joystick in UNLOAD position, perform Steps (7) and (8) below and install LHS control assembly cover, switch guard and eight nuts and replace LHS control assembly (Para 7-40).
 - (b) If HOOK ARM A indicator lamp illuminates, LHS control assembly is OK.
 - (7) Set hydraulic selector switch to OFF position.
 - (8) Turn OFF ENGINE switch.

- AUTO LOAD IN
- AUTO UNLOAD IN
- MAN/AUTO MODE
- MAN TRANSIT IN

- UNLOAD OUT
- LOAD OUT
- AUX MODE IN
- NO TRANSIT LIGHT
- OVERLOAD LIGHT
- HOOK ARM "A" SOL
- MAIN RAM "B" SOL
- HOOK ARM "B" SOL
- MAIN RAM "A" SOL
- +24V IN
- HOOK ARM UP

- FREE FLOW VALVE
- HOOK ARM DOWN
- TRANSIT VALVE
- OVERLOAD IN
- MID FRAME DOWN

9. HOOK ARM DOES NOT UNLOAD IN MANUAL MODE (CONT).

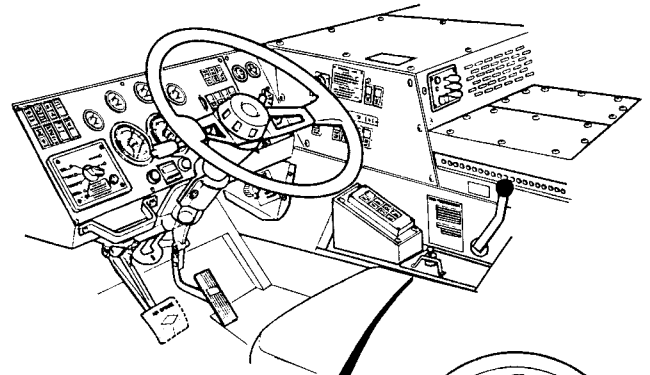


WARNING

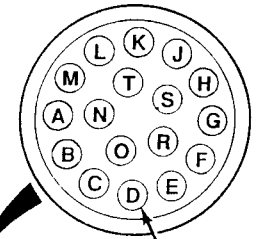
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

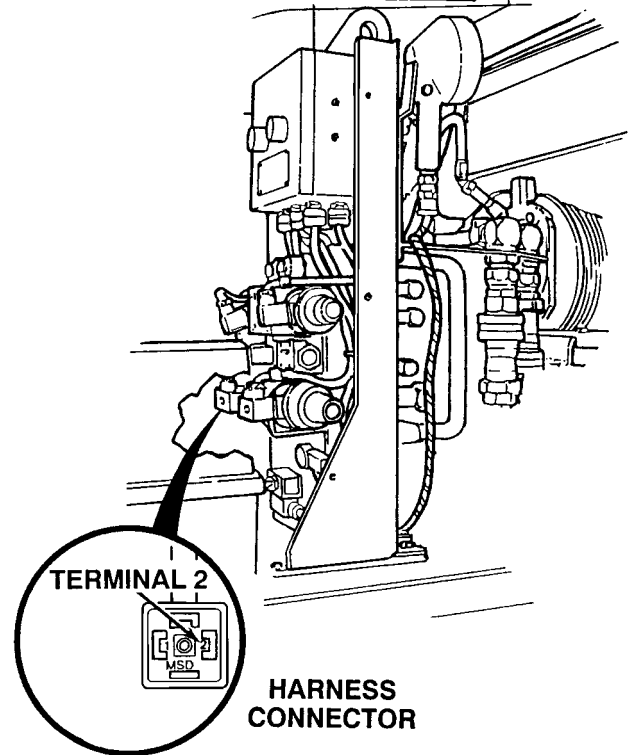
- (1) Disconnect LHS control assembly from connectors.
- (2) Set multimeter select switch to ohms.
- (3) Using jumperwire, connect DC valve harness connector, terminal 2 to known good ground.
- (4) Is there continuity between harness connector MC81, terminal D and known good ground?
 - (a) If there is no continuity, repair wire 1464 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1464 is OK.
- (4.1) Remove jumper wire.
- (5) Install LHS control assembly (Para 7-40).



CONNECTOR MC81



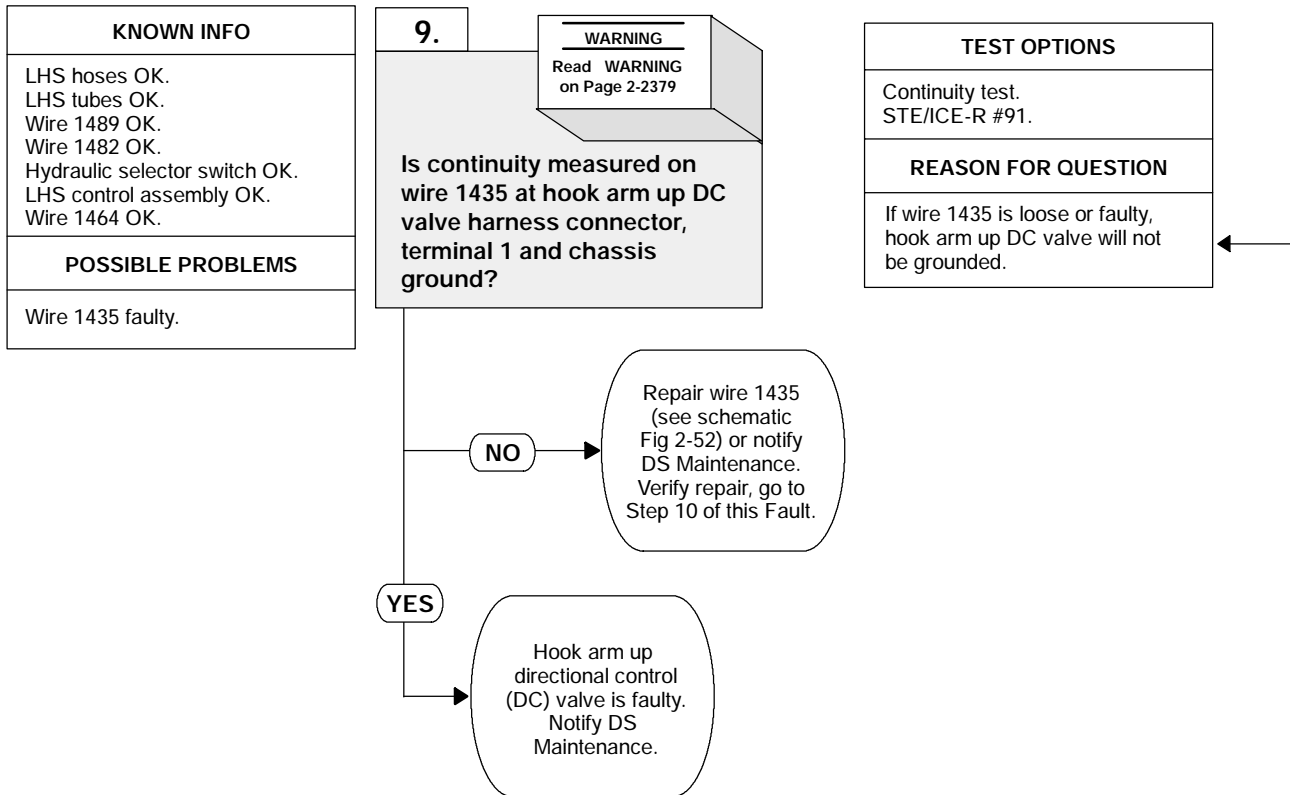
TERMINAL D



TERMINAL 2

HARNESS CONNECTOR

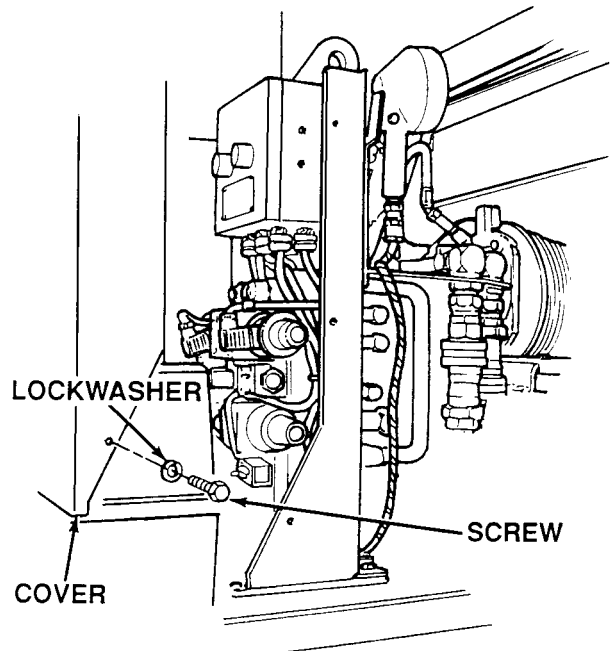
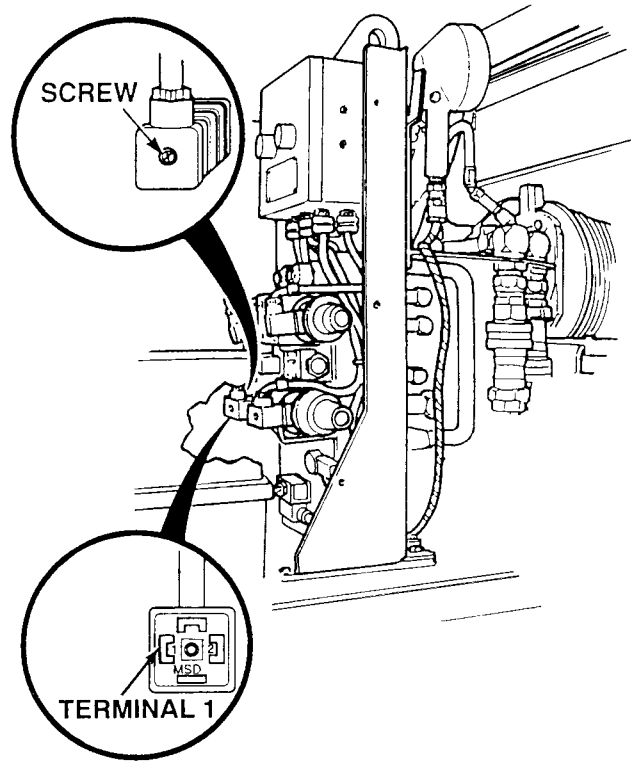
9. HOOK ARM DOES NOT UNLOAD IN MANUAL MODE (CONT).



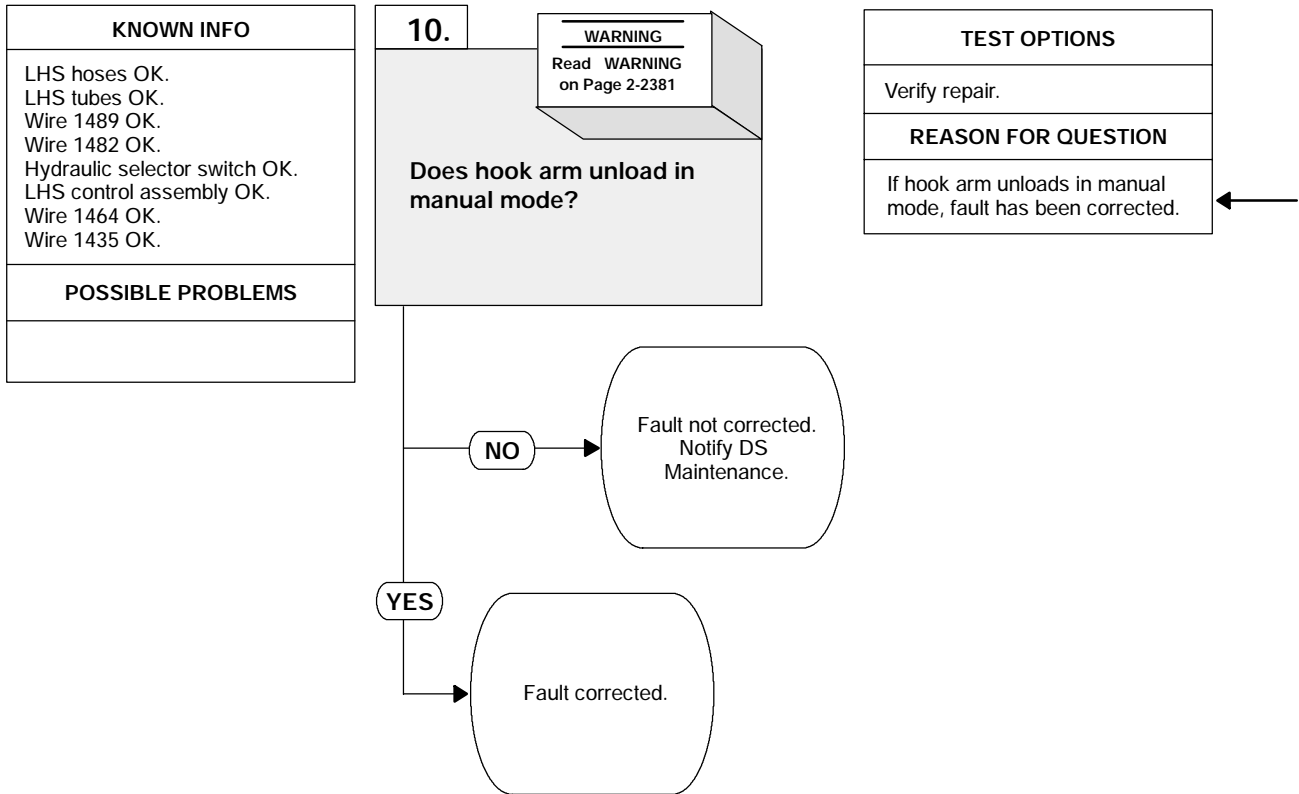
WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST
<p>(1) Set multimeter select switch to ohms.</p> <p>(2) Is there continuity between hook arm up DC valve harness connectors, terminal 1 and a known good ground?</p> <p>(a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52).</p> <p>(b) If there is continuity, wire 1435 is OK.</p> <p>(3) Install harness connector on hook arm up DC valve.</p> <p>(4) Tighten connector screw and coat head of connector screw with adhesive.</p> <p>(5) Install LHS control box cover, four lockwashers and screws.</p>



9. HOOK ARM DOES NOT UNLOAD IN MANUAL MODE (CONT).

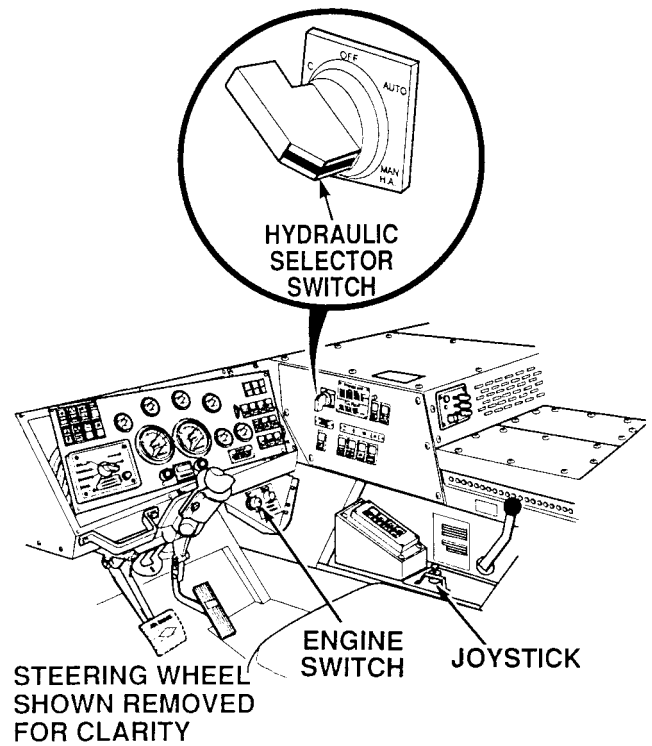


WARNING

Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.

VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch in MAN HA position.
- (3) Hold joystick in UNLOAD position.
 - (a) If hook arm does not unload, fault not corrected. Perform Steps (4) through (6) below and notify DS Maintenance.
 - (b) If hook arm unloads, fault has been corrected.
- (4) Release joystick.
- (5) Set hydraulic selector switch to OFF position.
- (6) Turn OFF ENGINE switch.



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING PROCEDURES (CONT).

10. HOOK ARM DOES NOT LOAD IN MANUAL MODE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

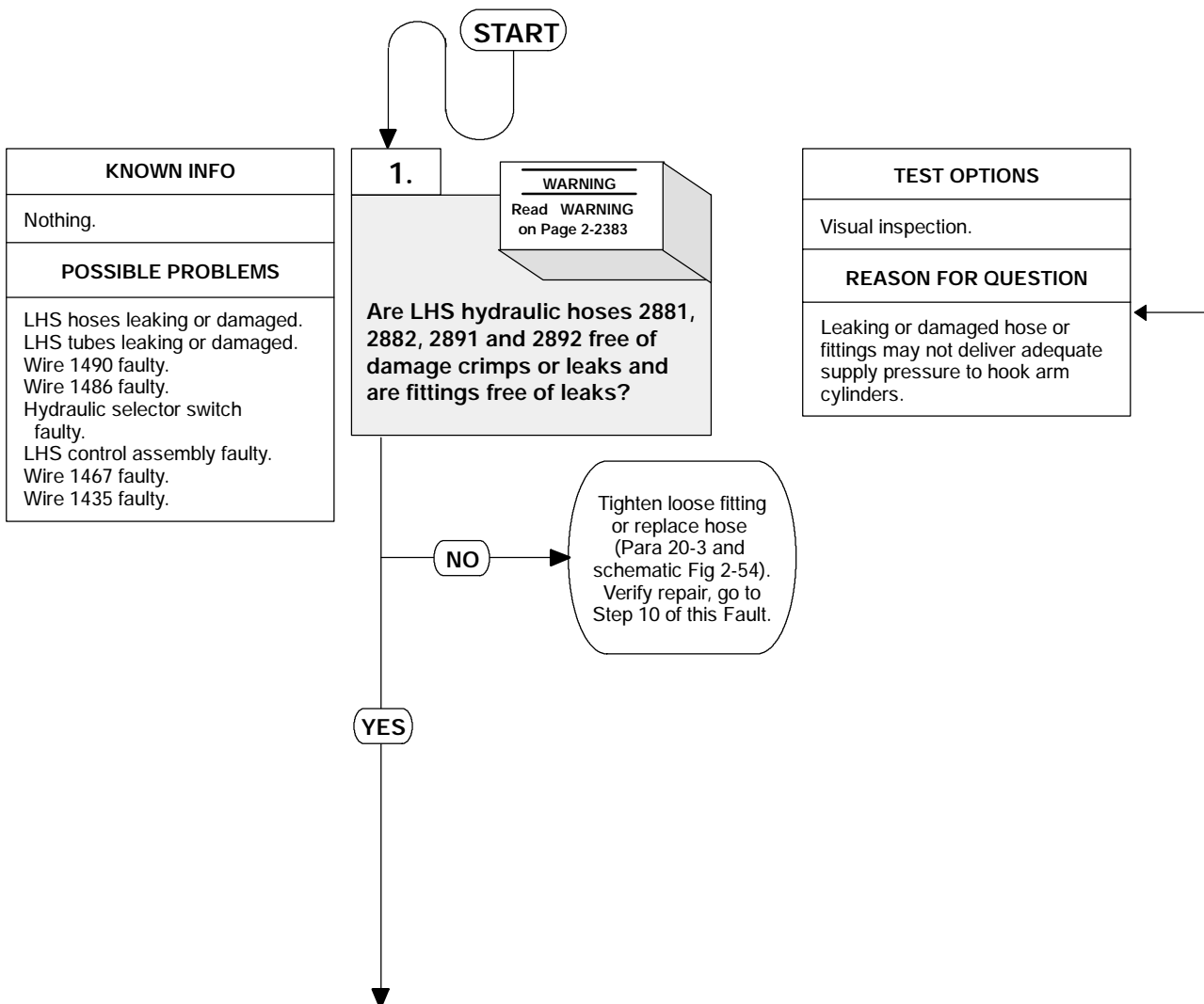
Lockwasher (4) (Item 180, Appendix F)
 Adhesive (Item 8, Appendix C)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

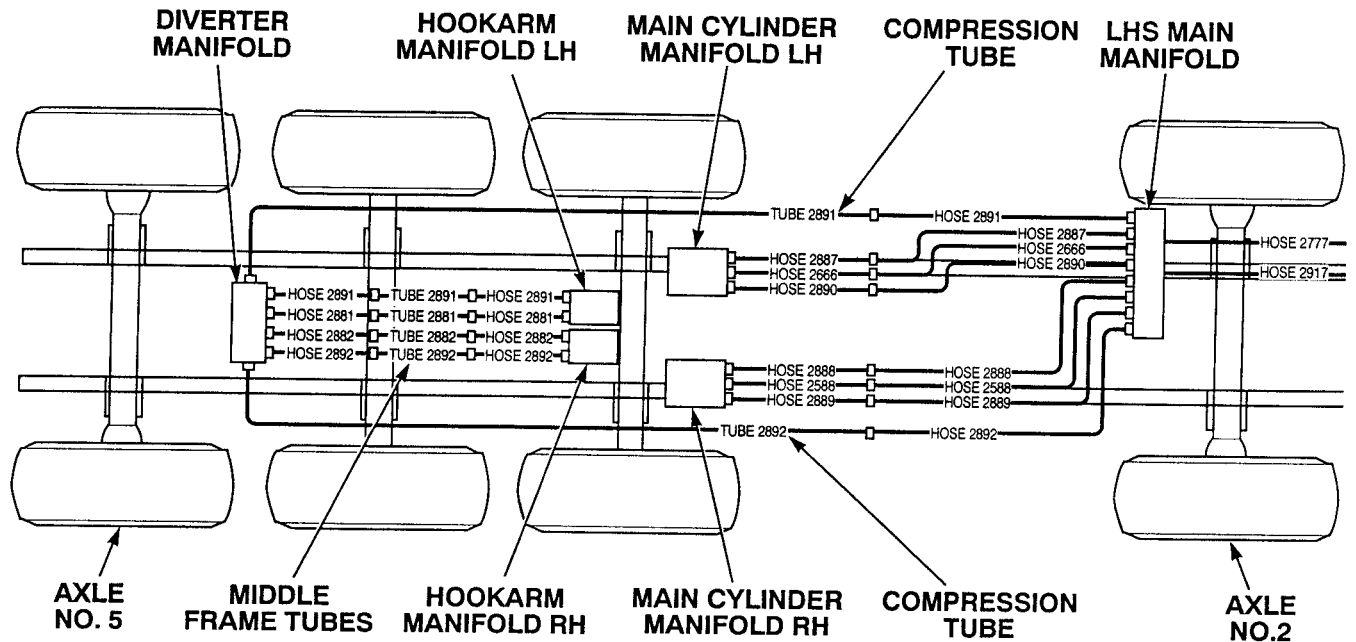
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)



WARNING

High pressure hydraulics [oil under 3,700 psi (25,512 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.



VISUAL INSPECTION

Inspect LHS hydraulic hoses 2881, 2882, 2891 and 2892 for damage, crimps or leaks.

- (1) If hoses are damaged, crimped or leaking; tighten fittings or replace hoses (Para 20-3 and schematic Fig 2-54).
- (2) If there are no leaks, crimps and damage; hoses and fittings are OK.

10. HOOK ARM DOES NOT LOAD IN MANUAL MODE (CONT).

KNOWN INFO
LHS hoses OK.
POSSIBLE PROBLEMS
LHS tubes leaking or damaged. Wire 1490 faulty. Wire 1486 faulty. Hydraulic selector switch faulty. LHS control assembly faulty. Wire 1467 faulty. Wire 1435 faulty.

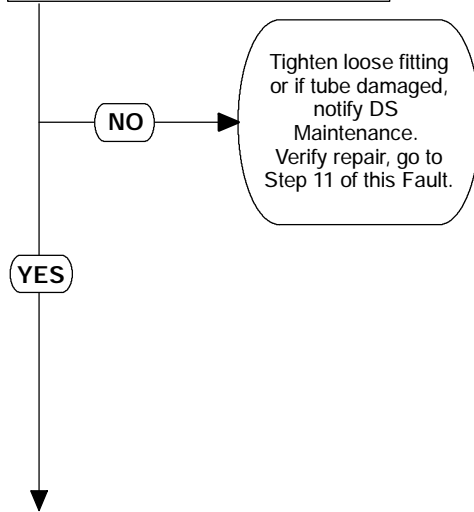
2.

WARNING

Read WARNING on Page 2-2385

Are LHS hydraulic tubes 2881, 2882, 2891 and 2892 free of damage, crimps or leaks and are fittings free of leaks?

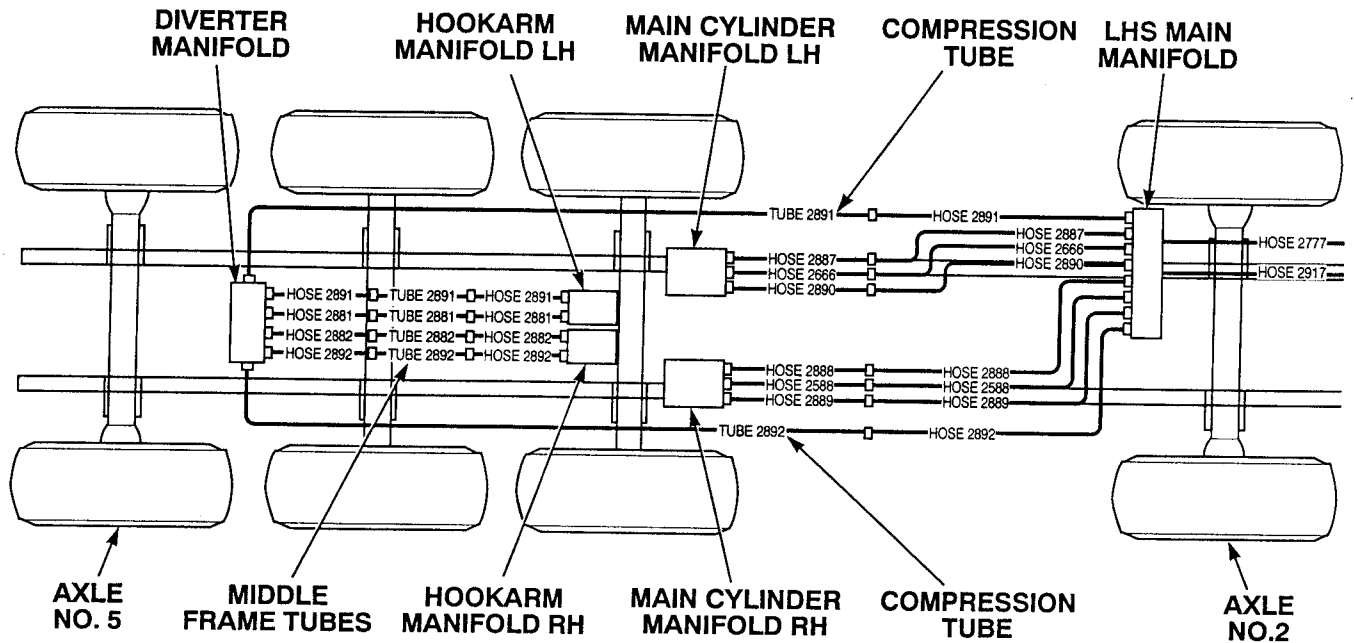
TEST OPTIONS
Visual inspection.
REASON FOR QUESTION
Leaking or damaged tube or fittings may not deliver adequate supply pressure to hook arm cylinders.



WARNING

High pressure hydraulics [oil under 3,700 psi (25,512 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

VISUAL INSPECTION
(1) Inspect two compression frame LHS hydraulic tubes for damage, crimps or leaks.
(2) Inspect four middle frame LHS hydraulic tubes for damage, crimps or leaks.
(a) If tubes are leaking, tighten fittings.
(b) If tubes are damaged, notify DS Maintenance.
(c) If there are no leaks, crimps or damage, tubes and fittings are OK.



10. HOOK ARM DOES NOT LOAD IN MANUAL MODE (CONT).

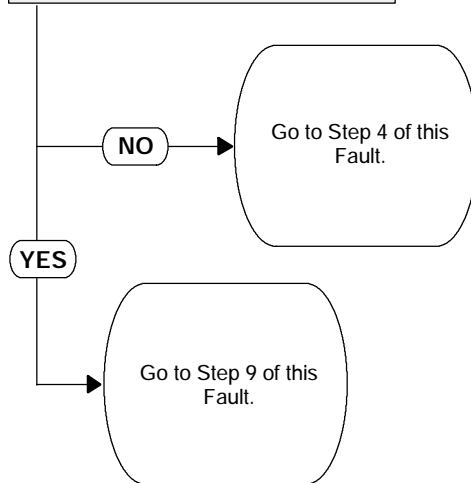
KNOWN INFO
Hoses OK. Tubes OK.
POSSIBLE PROBLEMS
Wire 1490 faulty. Wire 1486 faulty. Hydraulic selector switch faulty. LHS control assembly faulty. Wire 1467 faulty. Wire 1435 faulty.

3.

Are 22 to 28 vdc measured at hook arm down directional control (DC) valve harness connector, terminal 2 with ENGINE switch ON, hydraulic selector switch in MAN HA, and joystick in LOAD position?

WARNING
Read WARNING on Page 2-2387

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If there are not 22 to 28 vdc present, component supplying voltage to hook arm down DC valve is faulty.



WARNING

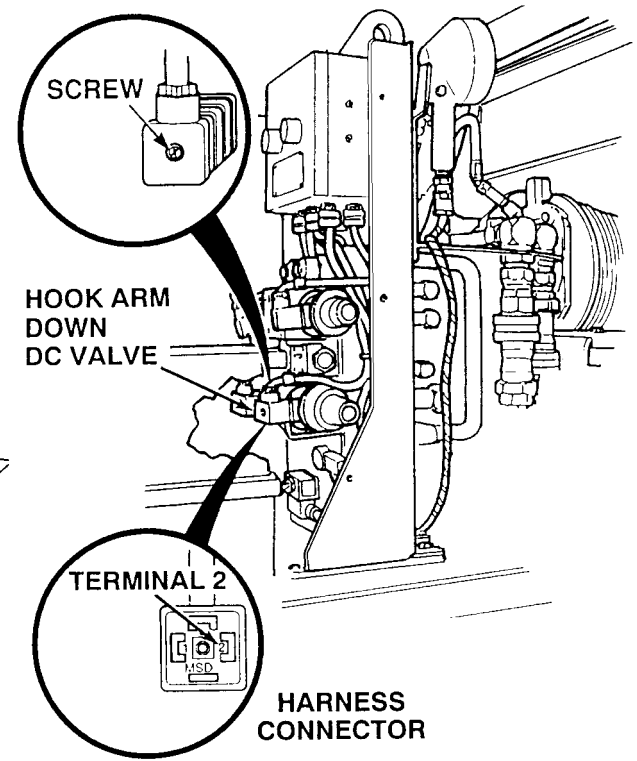
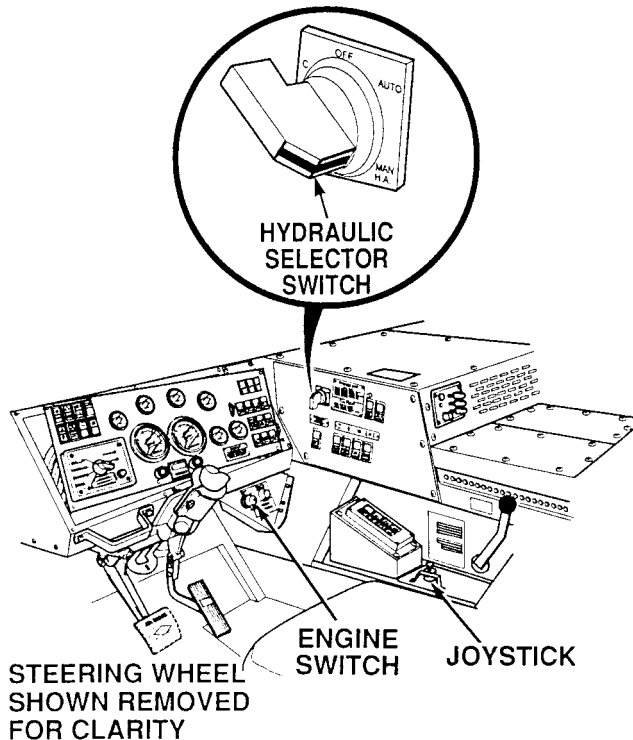
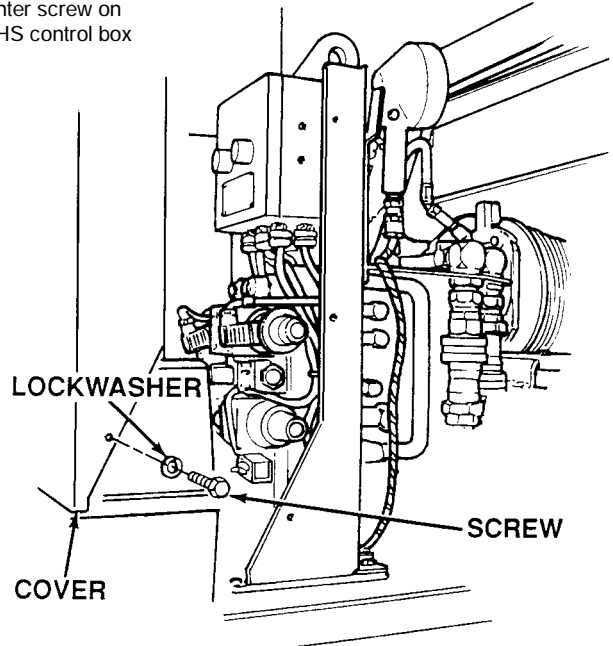
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

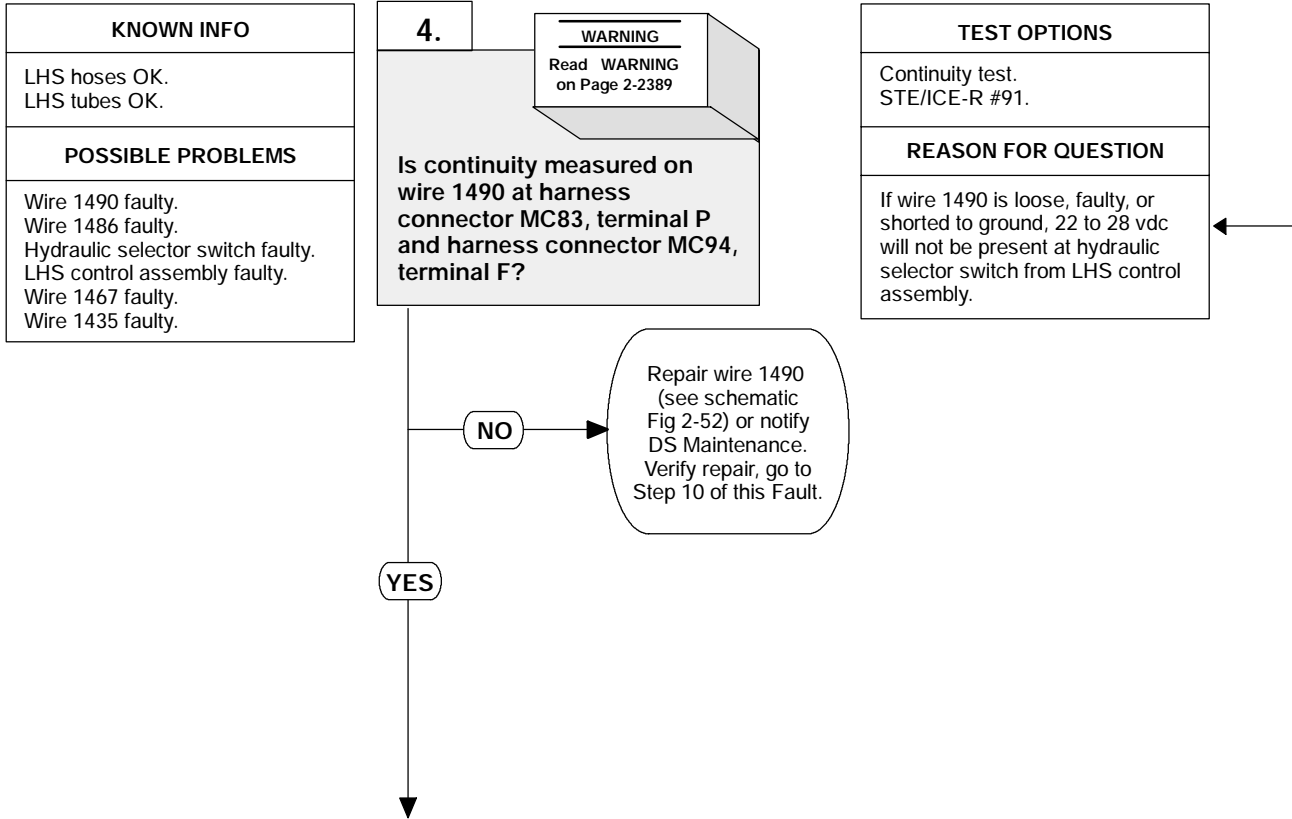
Only remove center screw on engine side of LHS control box cover.

VOLTAGE TEST

- (1) Remove four screws, lockwashers, and LHS control box cover. Discard lockwashers.
- (2) Loosen screw and remove harness connector from hook arm down DC valve.
- (3) Set multimeter select switch to volts dc.
- (4) Connect positive (+) multimeter lead at harness connector, terminal 2.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch (TM 9-2320-364-10).
- (7) Set hydraulic selector switch to MAN HA position.
- (8) Hold joystick in LOAD position.
 - (a) If there are not 22 to 28 vdc present, perform Steps (9) and (10) below and go to Step 4 of this Fault.
 - (b) If there are 22 to 28 vdc present, perform Steps (9) and (10) below and go to Step 9 of this Fault.
- (9) Set hydraulic selector switch to OFF position.
- (10) Turn OFF ENGINE switch.



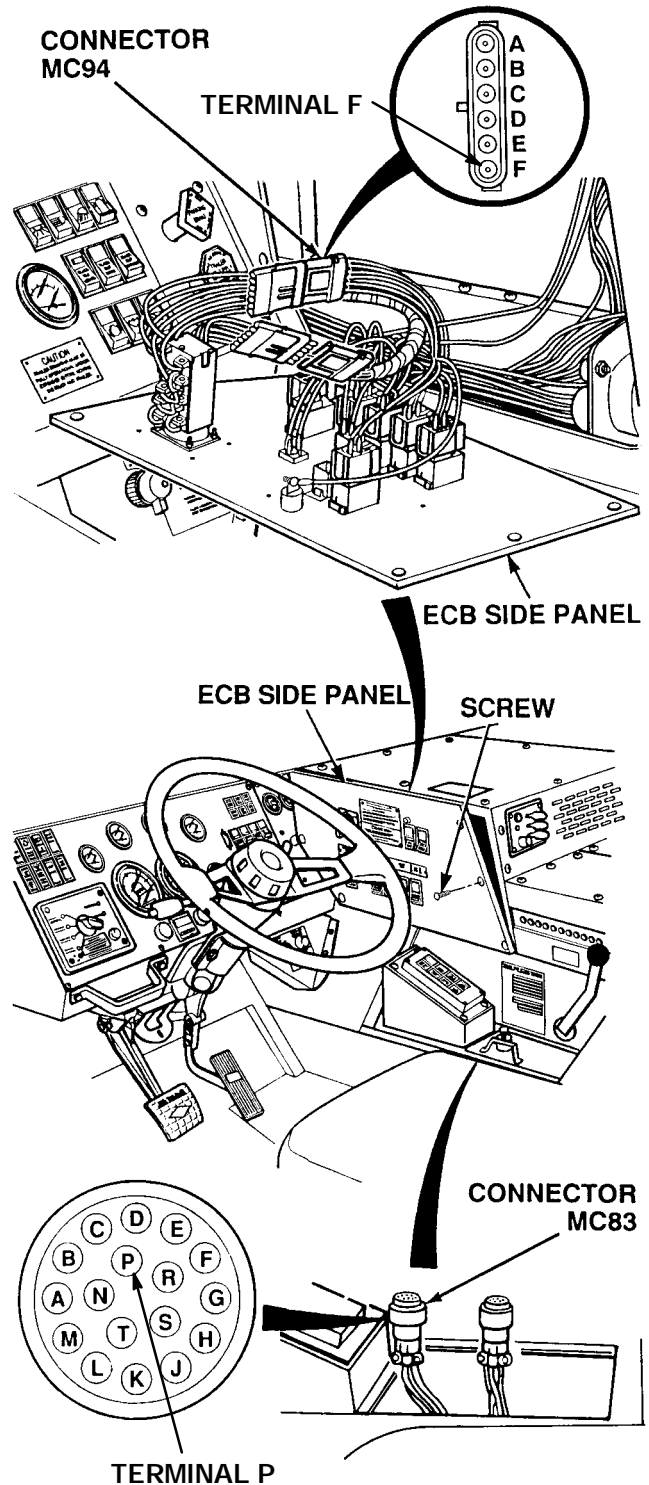
10. HOOK ARM DOES NOT LOAD IN MANUAL MODE (CONT).



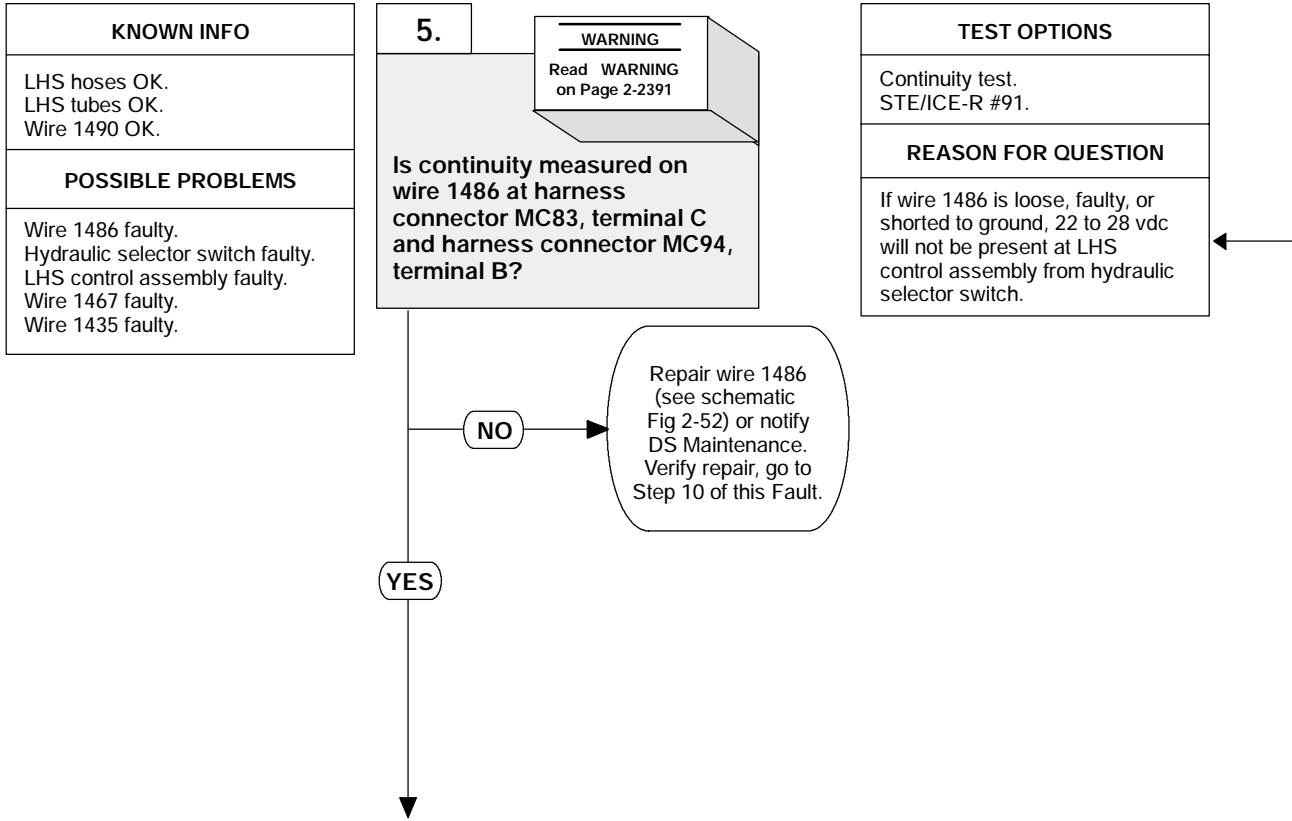
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | CONTINUITY TEST |
|--|
| (1) Remove LHS control assembly (Para 7-40). |
| (2) Remove six screws and tilt ECB side panel. |
| (3) Disconnect harness connector MC94 from hydraulic selector switch connector. |
| (4) Set multimeter select switch to ohms. |
| (5) Is there continuity between harness connector MC83, terminal P and harness connector MC94, terminal F? |
| (a) If there is no continuity, repair wire 1490 (see schematic Fig 2-52) or notify DS Maintenance. |
| (b) If there is continuity, wire 1490 is OK. |



10. HOOK ARM DOES NOT LOAD IN MANUAL MODE (CONT).

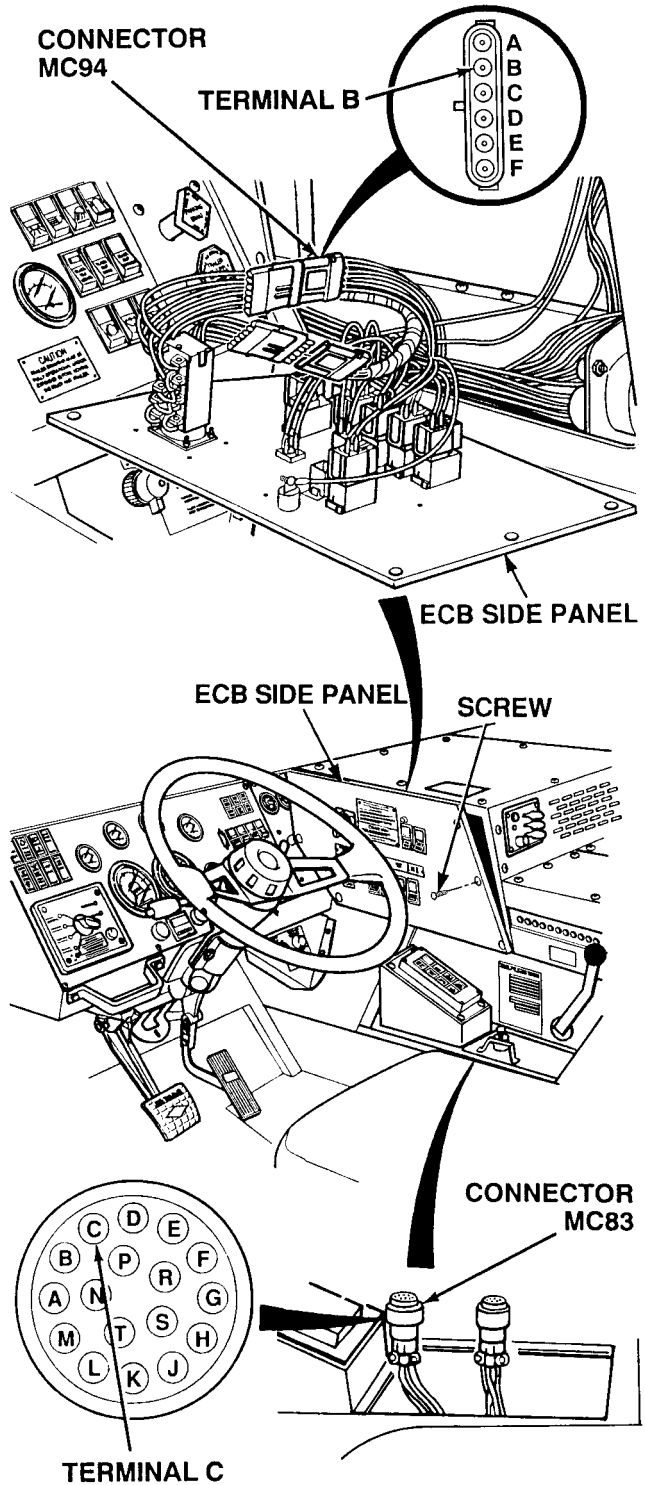


WARNING

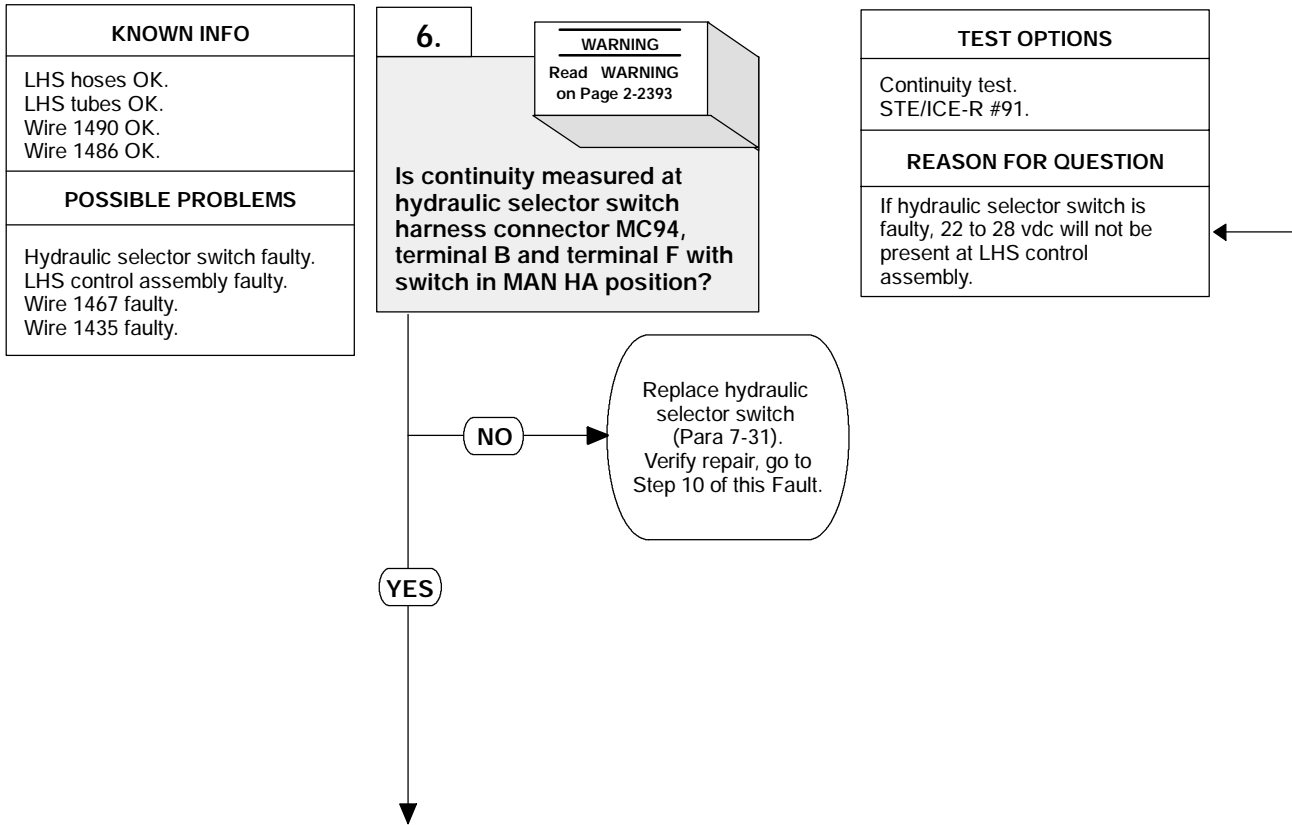
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between harness connector MC 83, terminal C and harness connector MC94, terminal B?
 - (a) If there is no continuity, repair wire 1486 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1486 is OK.
- (3) Install LHS control assembly (Para 7-40).



10. HOOK ARM DOES NOT LOAD IN MANUAL MODE (CONT).

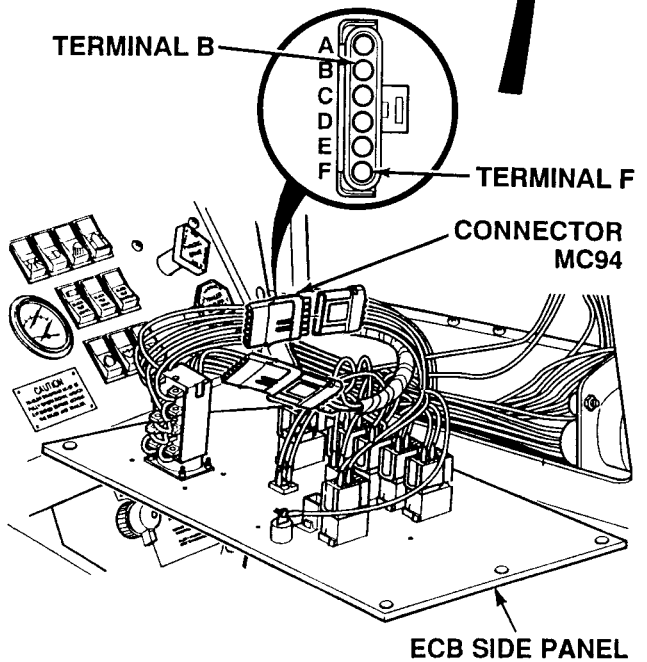
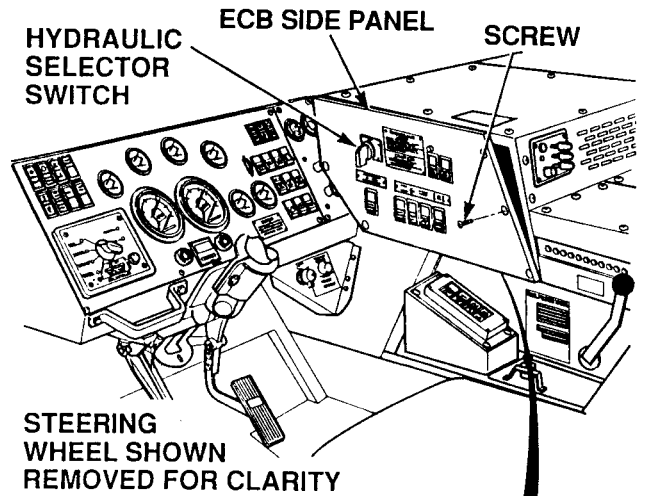


WARNING

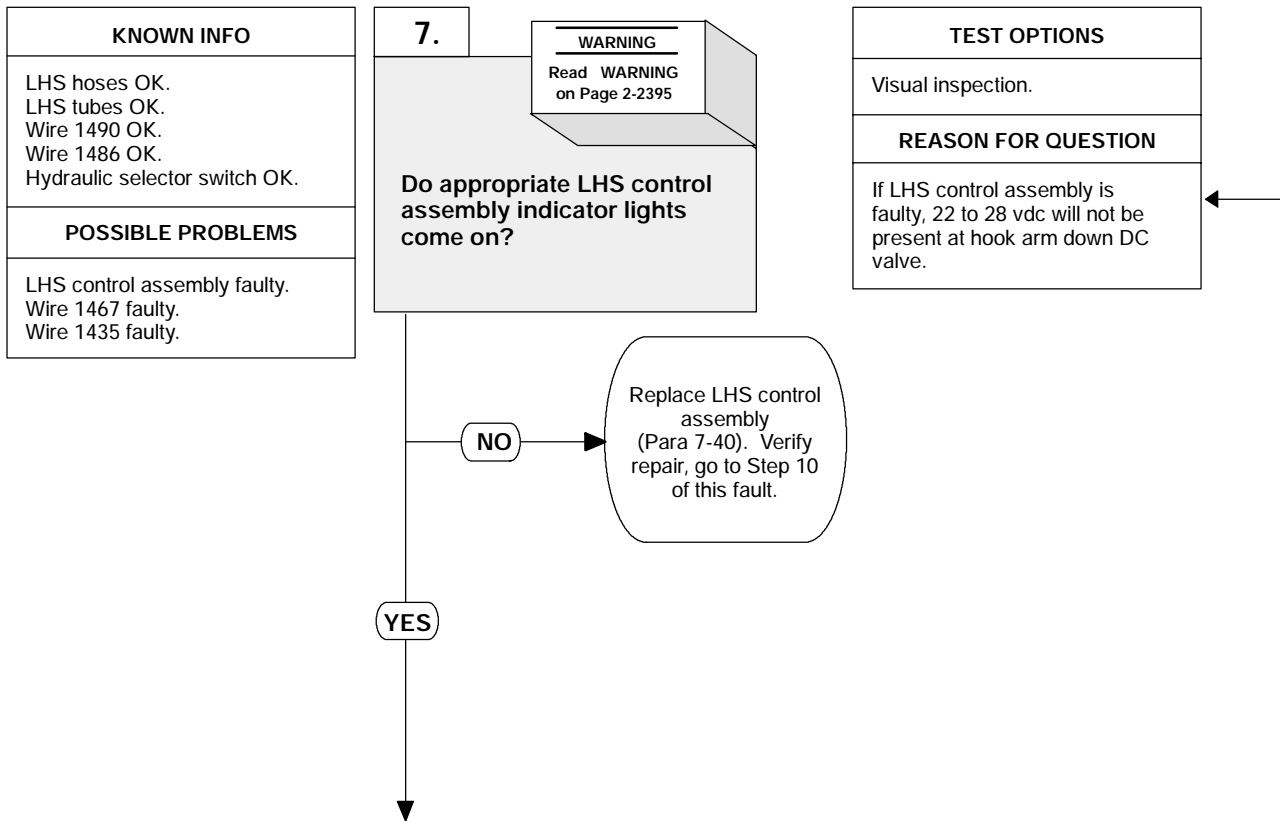
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set hydraulic selector switch to MAN HA position (TM 9-2320-364-10).
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between switch harness connector MC94, terminal B and terminal F?
 - (a) If there is no continuity, replace hydraulic selector switch (Para 7-31).
 - (b) If there is continuity, hydraulic selector switch is OK.
- (4) Install harness connector MC94 on hydraulic selector switch connector.
- (5) Install ECB side panel and six screws.



10. HOOK ARM DOES NOT LOAD IN MANUAL MODE (CONT).

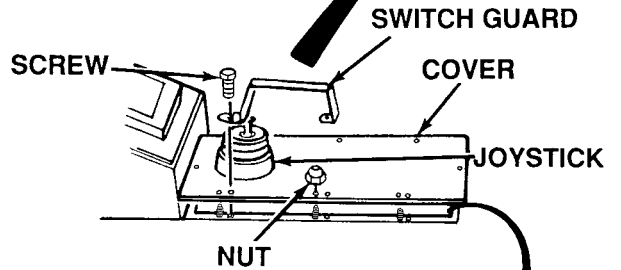
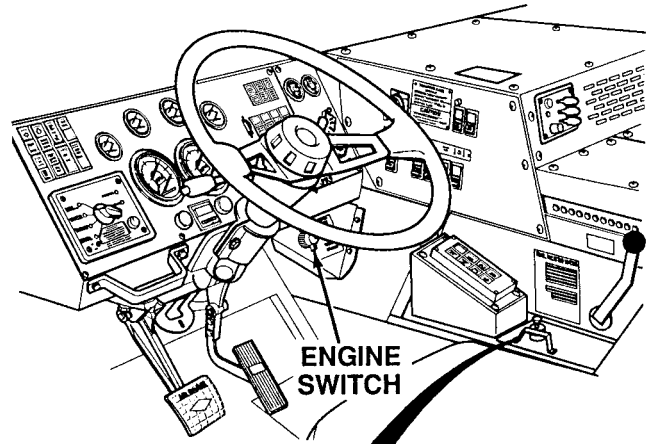


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.



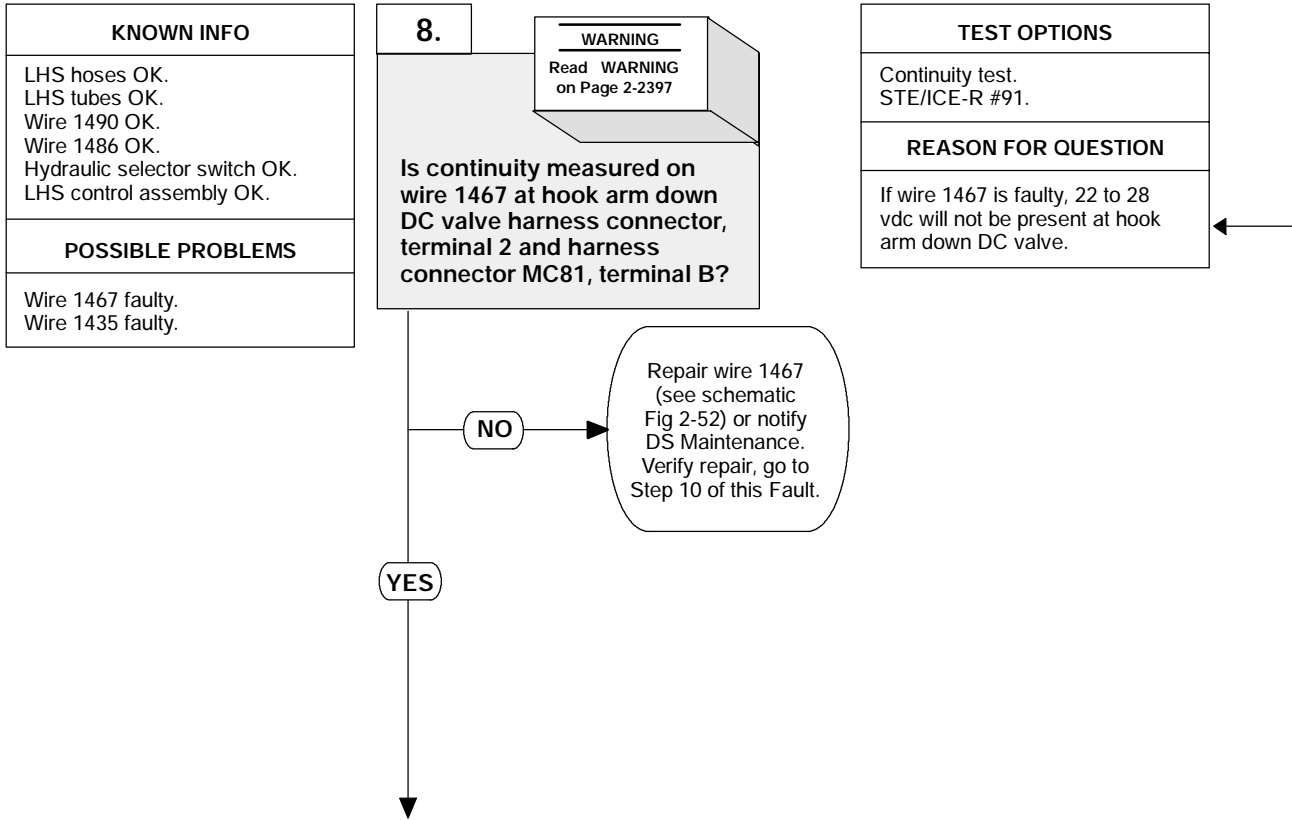
- VISUAL INSPECTION**
- (1) Remove eight screws, switch guard and eight nuts from LHS control assembly.
 - (2) Carefully lift control box cover off. Do not allow cover to dangle by joystick connecting wires.
 - (3) Turn ON ENGINE switch, (TM 9-2320-364-10).
 - (4) Set hydraulic selector switch to MAN HA position.
 - (5) Hold joystick in LOAD position.
 - (6) Observe red indicator lights in bottom of LHS control assembly.
 - (a) If HOOK ARM B indicator lamp does not illuminate with joystick in LOAD position, perform Steps (7) and (8) below and replace LHS control assembly (Para 7-40).
 - (b) If HOOK ARM B indicator lamp illuminates, LHS control assembly is OK.
 - (7) Turn OFF ENGINE switch.
 - (8) Set hydraulic selector switch to OFF position.

- AUTO LOAD IN
- AUTO UNLOAD IN
- MAN/AUTO MODE
- MAN TRANSIT IN

- UNLOAD OUT
- LOAD OUT
- AUX MODE IN
- NO TRANSIT LIGHT
- OVERLOAD LIGHT
- HOOK ARM "A" SOL
- MAIN RAM "B" SOL
- HOOK ARM "B" SOL
- MAIN RAM "A" SOL
- +24V IN
- HOOK ARM UP

- FREE FLOW VALVE
- HOOK ARM DOWN
- TRANSIT VALVE
- OVERLOAD IN
- MID FRAME DOWN

10. HOOK ARM DOES NOT LOAD IN MANUAL MODE (CONT).

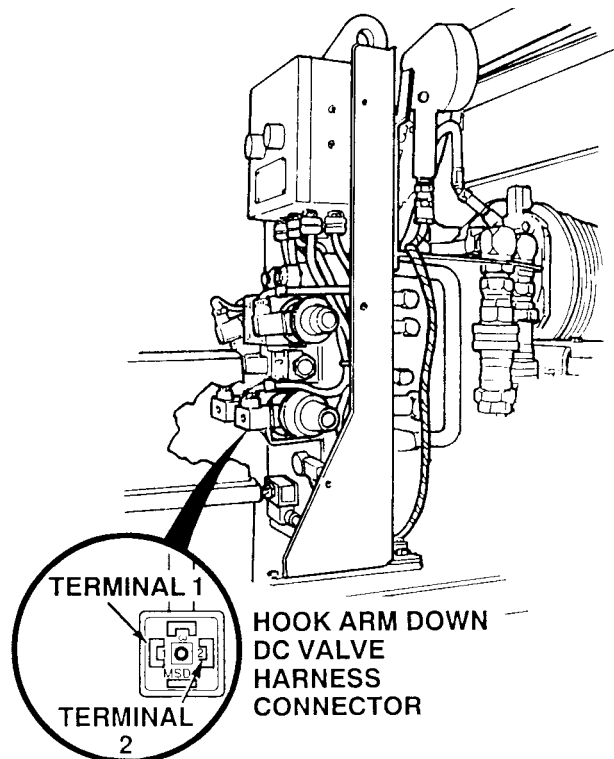
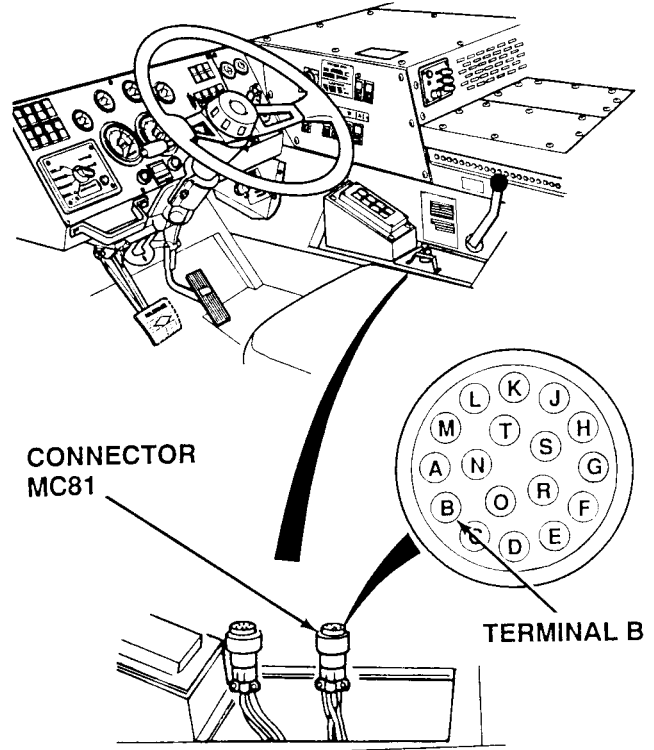


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect LHS control assembly from connectors.
- (2) Set multimeter select switch to ohms.
- (3) Connect DC valve harness connector, terminal 2 to a known good ground.
- (4) Is there continuity between harness connector MC81, terminal B and a known good ground.
 - (a) If there is no continuity, repair wire 1467 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1467 is OK.
- (5) Install LHS control assembly (Para 7-40).



10. HOOK ARM DOES NOT LOAD IN MANUAL MODE (CONT).

KNOWN INFO
LHS hoses OK. LHS tubes OK. Wire 1490 OK. Wire 1486 OK. Hydraulic selector switch OK. LHS control assembly OK. Wire 1467 OK.
POSSIBLE PROBLEMS
Wire 1435 faulty.

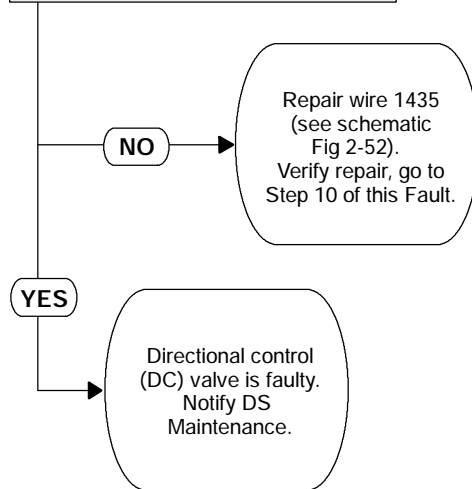
9.

WARNING

Read **WARNING** on Page 2-2399

Is continuity measured on wire 1435 at hook arm down DC valve harness connector, terminal 1 and chassis ground?

TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1435 is loose or faulty, hook arm down DC valve will not be grounded.

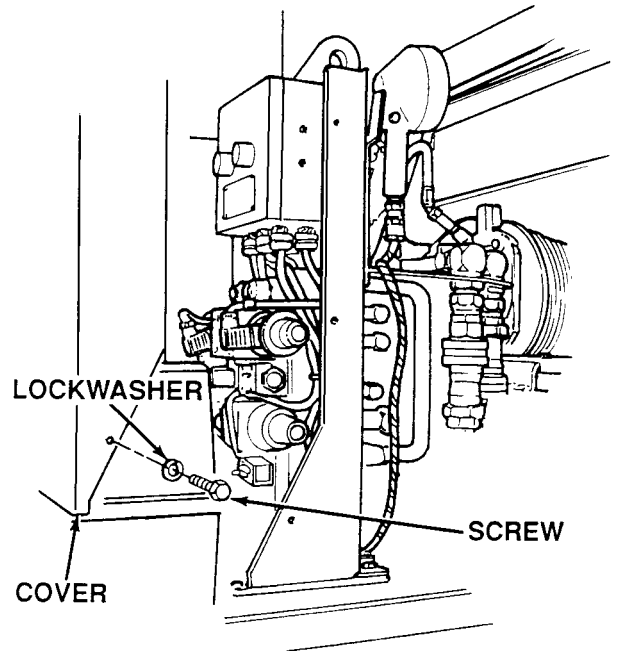
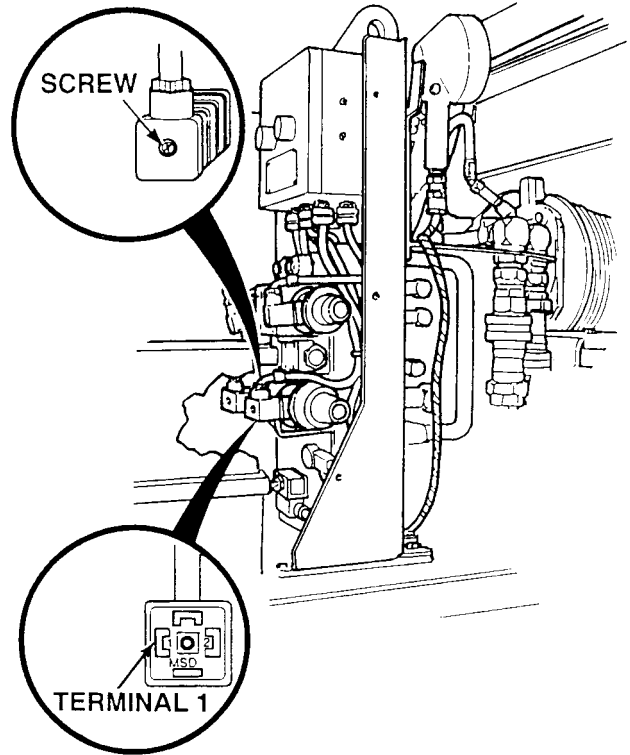


WARNING

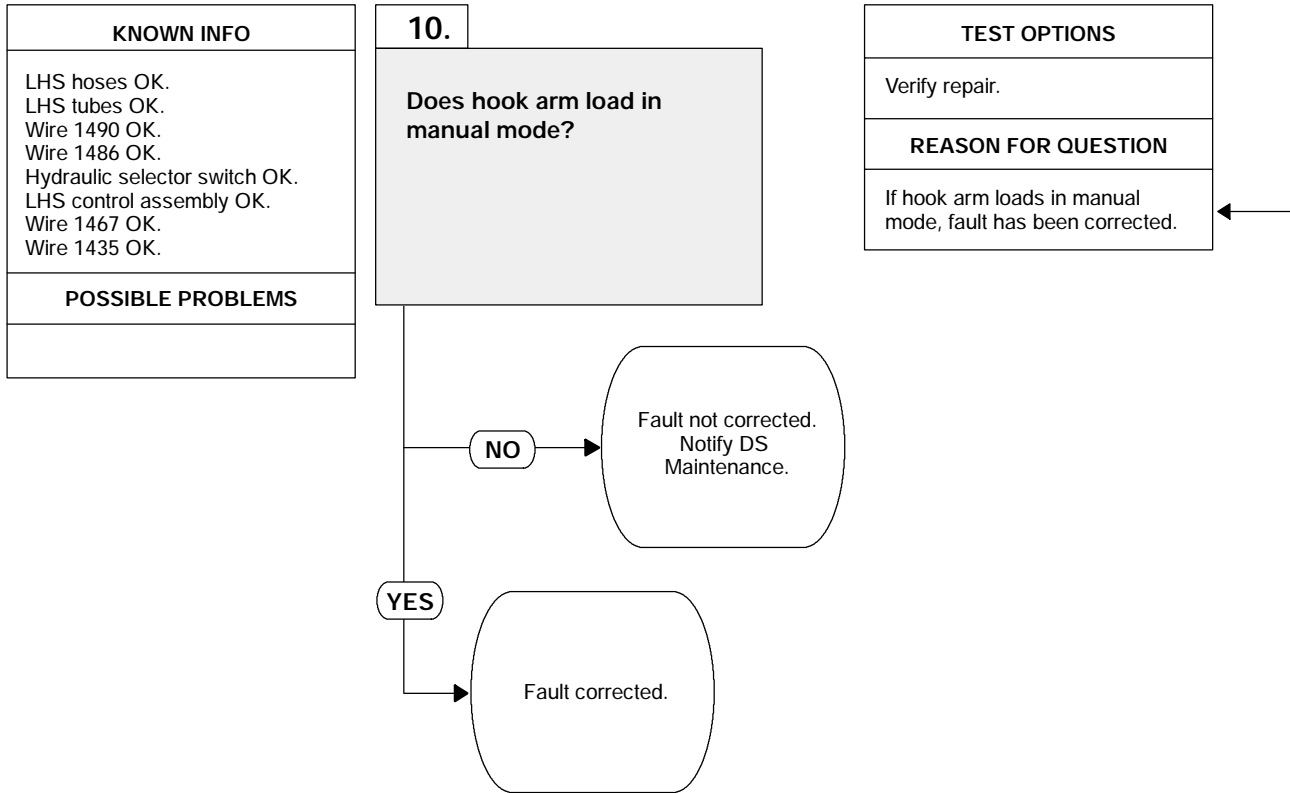
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesive causes immediate bonding on contact with eyes, skin, or clothing and also gives off harmful vapors. Wear protective goggles and use in well-ventilated area. If adhesive gets in eyes, try to keep eyes open; flush eyes with water for 15 minutes and get immediate medical attention.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between hook arm down DC valve harness connector, terminal 1 and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1435 is OK. Notify DS Maintenance.
- (3) Install harness connector on hook arm down DC valve.
- (4) Tighten connector screw and coat head of screw with adhesive.
- (5) Install LHS control box cover, four lock washer and four screws.

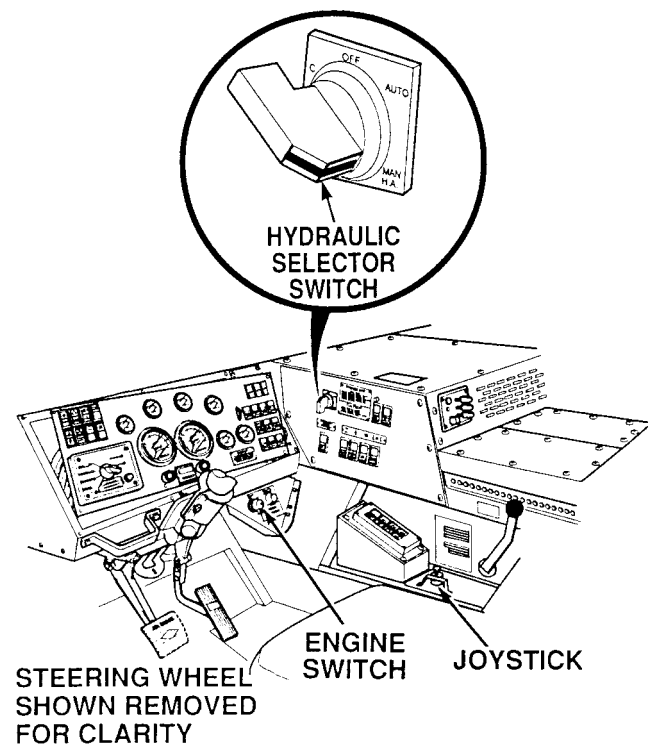


10. HOOK ARM DOES NOT LOAD IN MANUAL MODE (CONT).



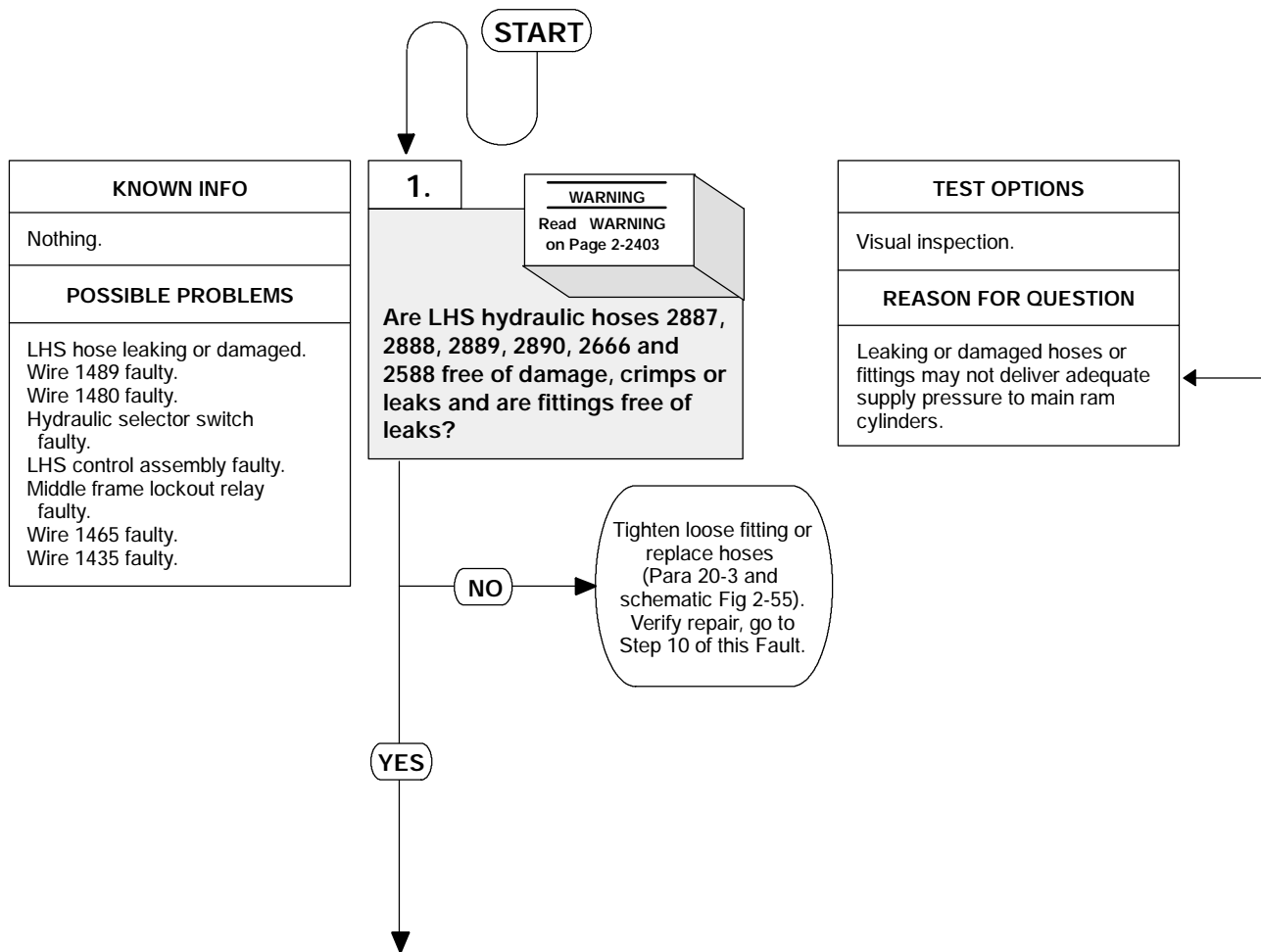
VERIFY REPAIR

- (1) Turn ON ENGINE switch.
- (2) Start engine.
- (3) Set hydraulic selector switch in MAN HA position.
- (4) Hold joystick in LOAD position.
 - (a) If hook arm does not load, fault not corrected. Perform Steps (5) through (7) below and notify DS Maintenance.
 - (b) If hook arm loads, fault has been corrected.
- (5) Release joystick.
- (6) Set hydraulic selector switch to OFF position.
- (7) Turn OFF ENGINE switch.



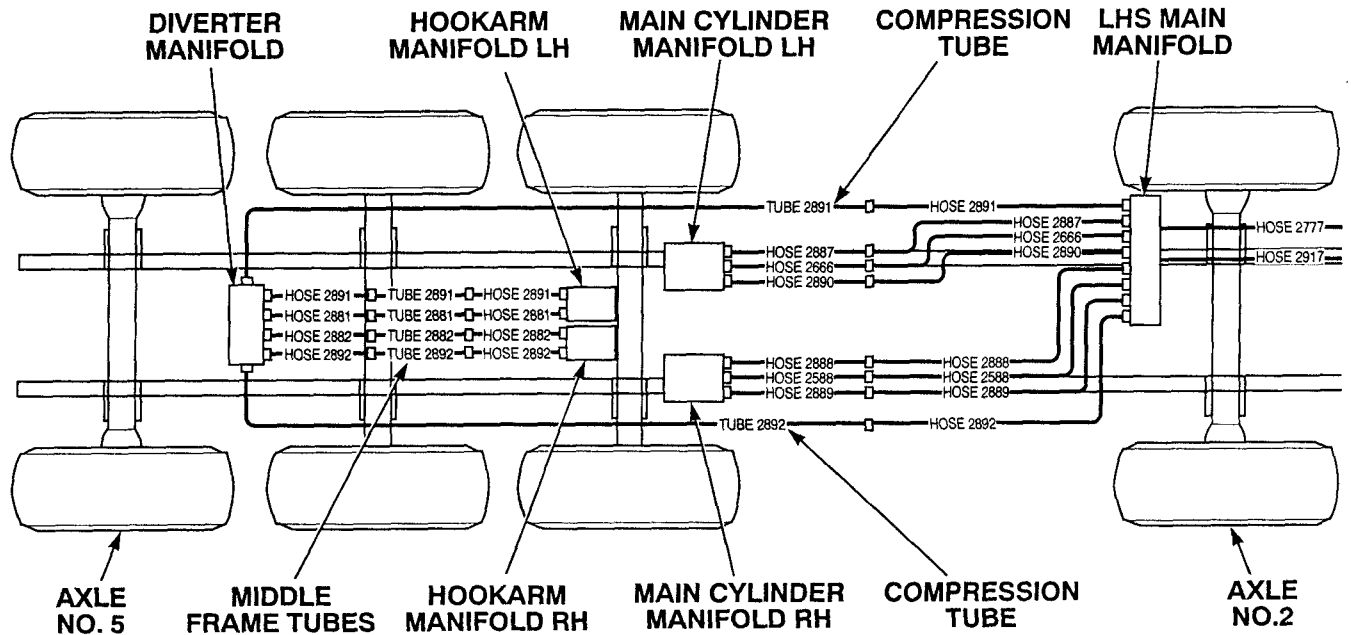
2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING PROCEDURES (CONT).

11. MIDDLE FRAME DOES NOT UNLOAD IN MANUAL MODE.	
INITIAL SETUP	
<p><i>Tools and Special Tools</i></p> <ul style="list-style-type: none"> Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G) STE/ICE-R (optional) (Item 3, Appendix G) Multimeter (Item 44, Appendix G) Jumperwire <p><i>Materials/Parts</i></p> <ul style="list-style-type: none"> Lockwasher (4) (Item 180, Appendix F) Adhesive (Item 8, Appendix C) 	<p><i>References</i></p> <ul style="list-style-type: none"> TM 9-2320-364-10 TM 9-4910-571-12&P <p><i>Equipment Condition</i></p> <ul style="list-style-type: none"> Engine OFF, (TM 9-2320-364-10) Parking brake applied, (TM 9-2320-364-10) Wheels chocked, (TM 9-2320-364-10)



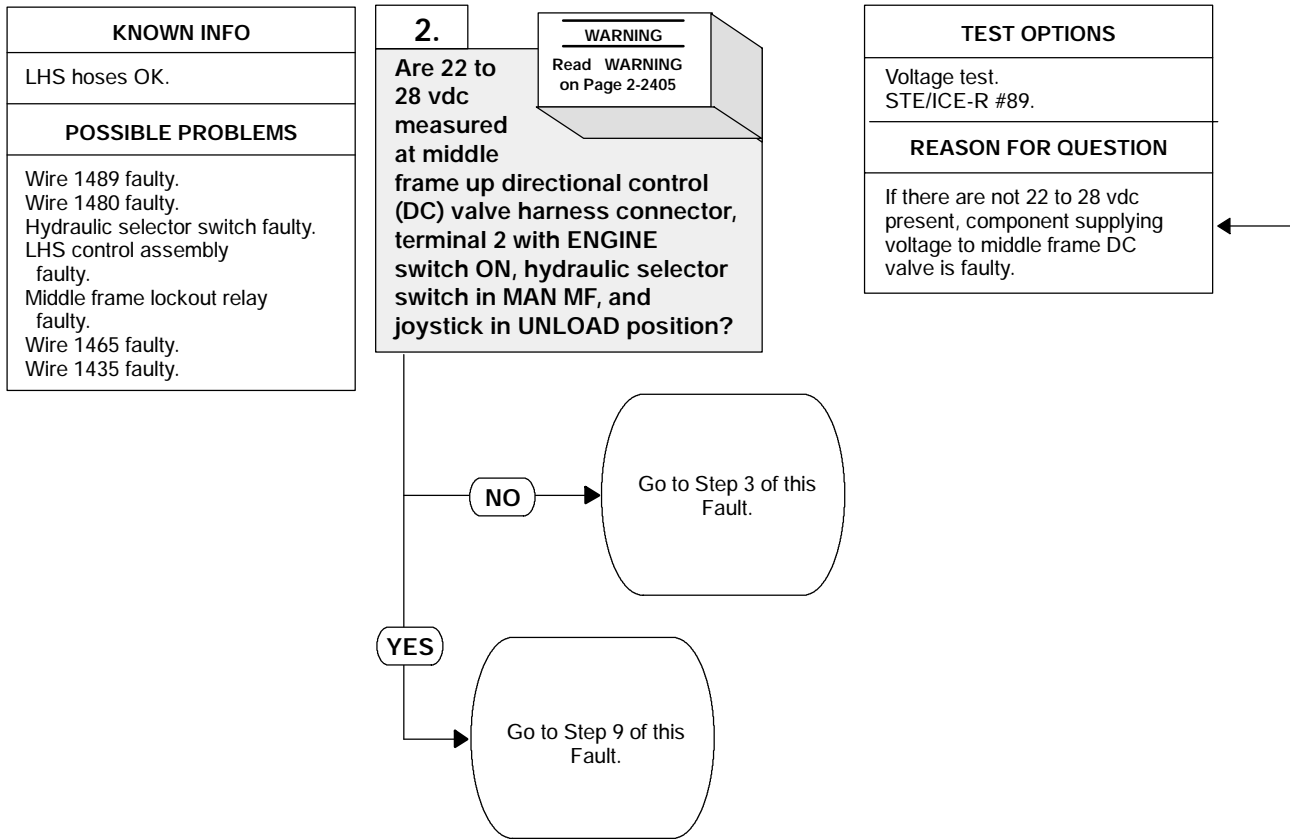
WARNING

High pressure hydraulics [oil under 3,700 psi (25,512 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.



VISUAL INSPECTION
<p>Inspect LHS hydraulic hoses 2887, 2888, 2889, 2890, 2666 and 2588 for damage, crimps or leaks.</p> <p>(1) If hoses are damaged, crimped or leaking; tighten fittings or replace hoses (Para 20-3 and schematic Fig. 2-55).</p> <p>(2) If there are not leaks, crimps or damage; hoses and fitting are OK.</p>

11. MIDDLE FRAME DOES NOT UNLOAD IN MANUAL MODE (CONT).



WARNING

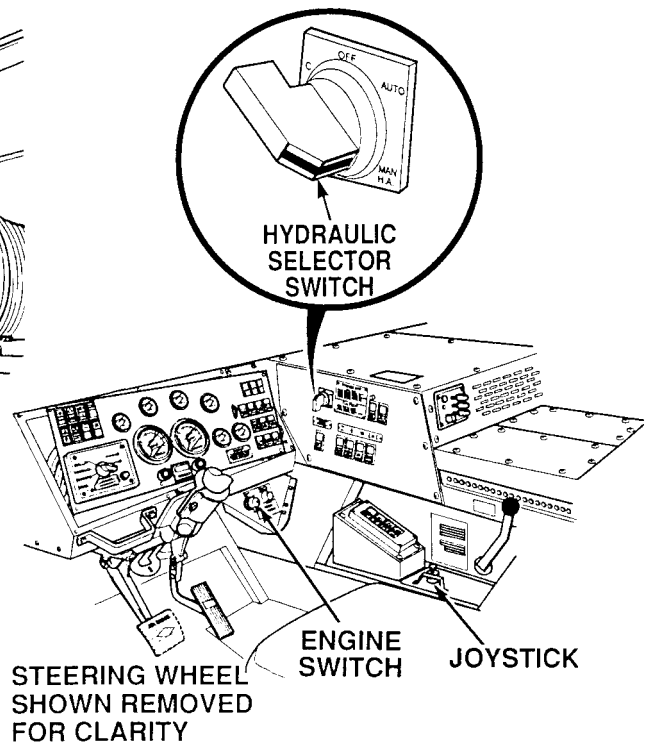
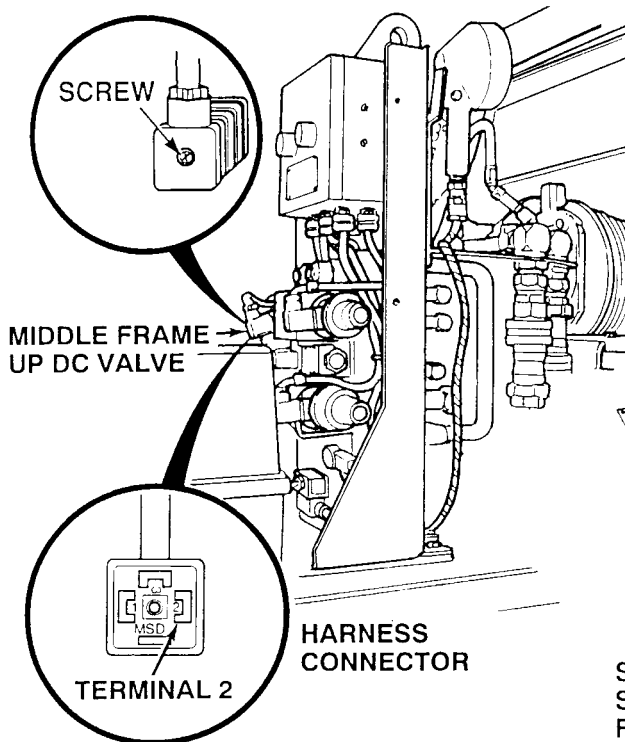
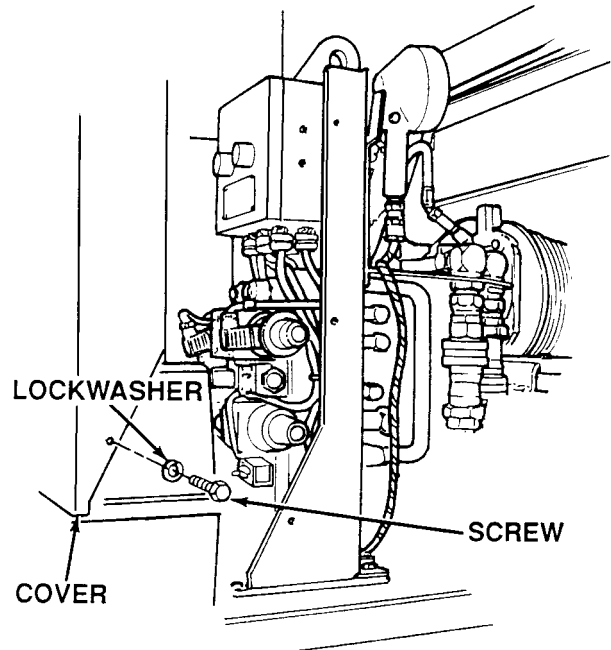
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

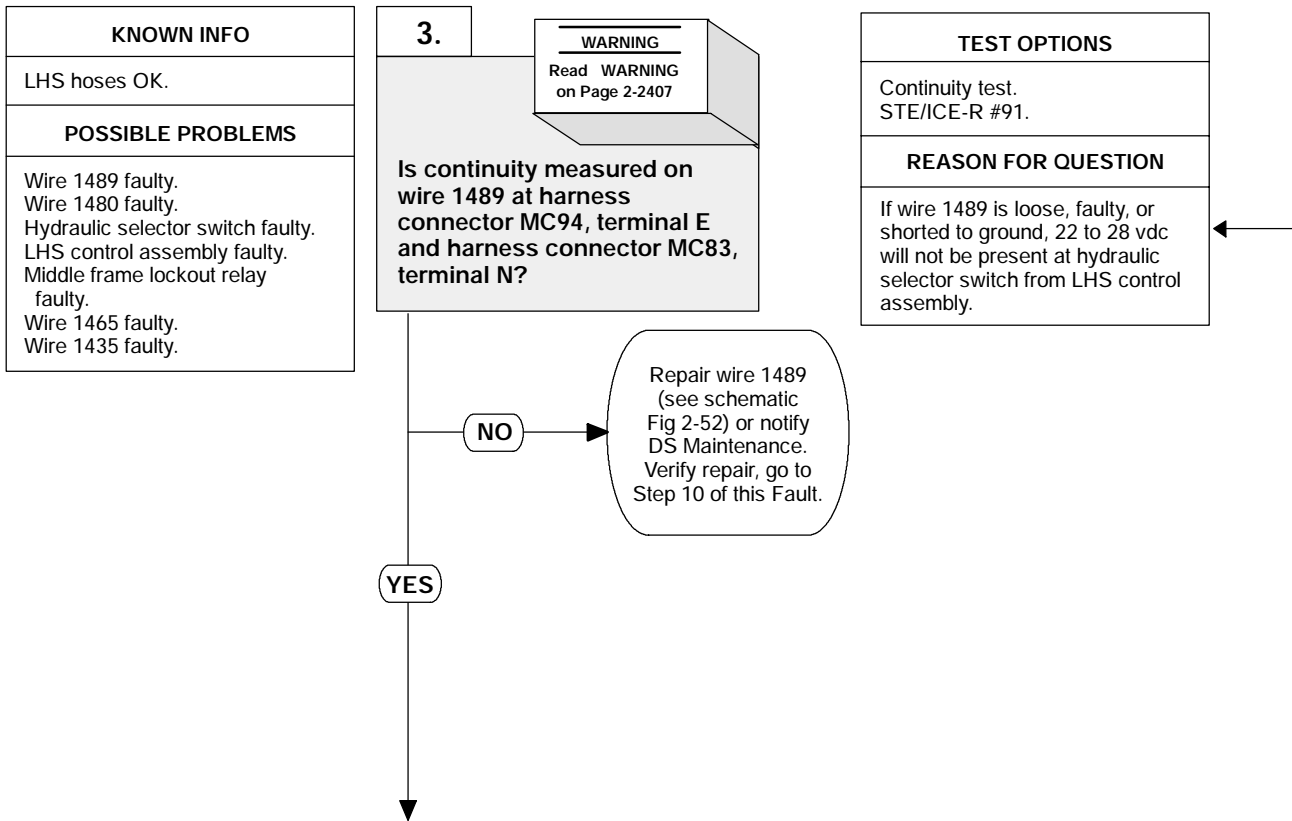
Only remove center screw on engine side of LHS control box cover.

VOLTAGE TEST

- (1) Remove four screws, lockwashers and LHS control box cover. Discard lockwasher.
- (2) Loosen screw and remove harness connector from middle frame up (top left) DC valve.
- (3) Set multimeter select switch to volts dc.
- (4) Connect positive (+) multimeter lead to harness connector, terminal 2.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch (TM 9-2320-364-10).
- (7) Set hydraulic selector switch to MAN MF position.
- (8) Hold joystick in UNLOAD position.
 - (a) If there are not 22 to 28 vdc present, perform Steps (9) and (10) below and go to Step 3 of this Fault.
 - (b) If there are 22 to 28 vdc present, perform Steps (9) and (10) below and go to Step 9 of this Fault.
- (9) Set hydraulic selector switch to OFF position.
- (10) Turn OFF ENGINE switch.



11. MIDDLE FRAME DOES NOT UNLOAD IN MANUAL MODE (CONT).

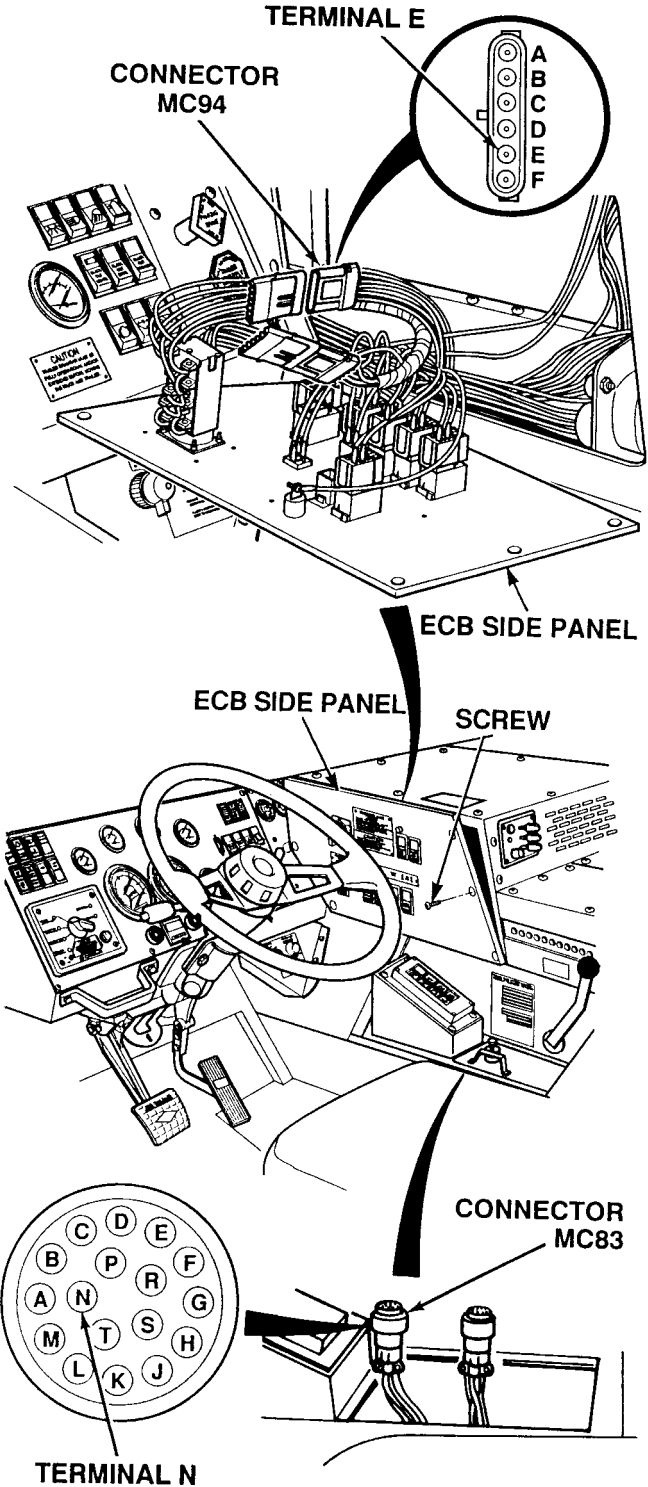


WARNING

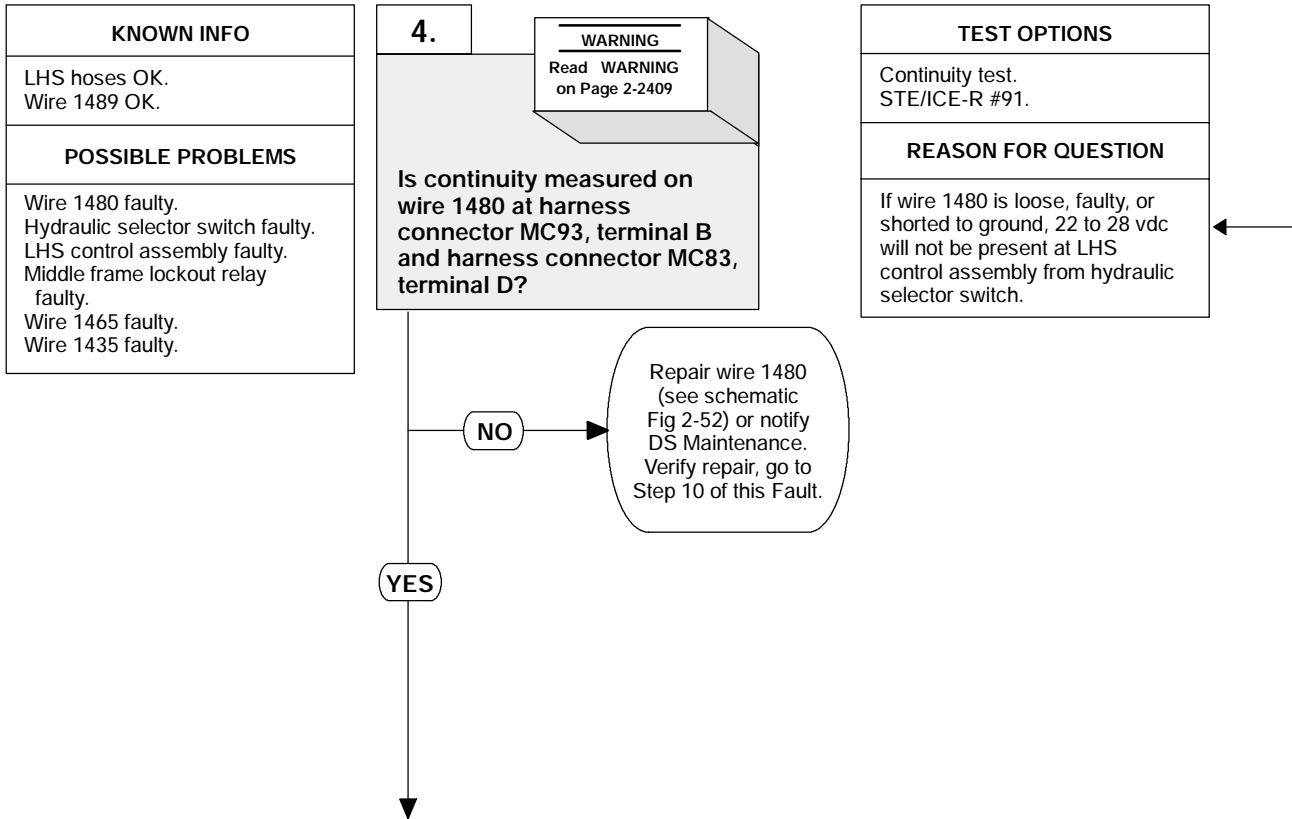
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Remove LHS control assembly (Para 7-40).
- (2) Remove six screw and tilt ECB side panel.
- (3) Disconnect harness connector MC94 from hydraulic selector switch connector.
- (4) Set multimeter select switch ohms.
- (5) Is there continuity between switch harness connector MC94, terminal E and harness connector MC83, terminal N?
 - (a) If there is no continuity, repair wire 1489 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there continuity, wire 1489 is OK.



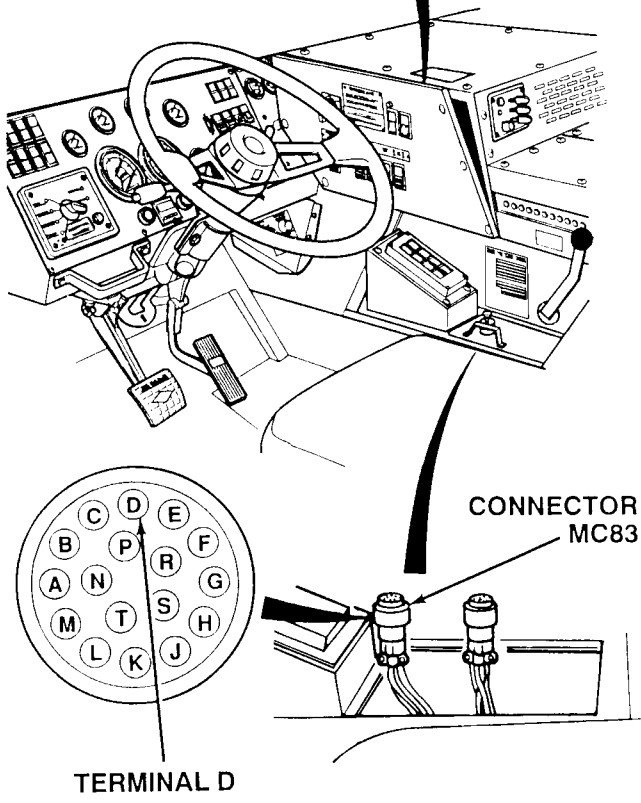
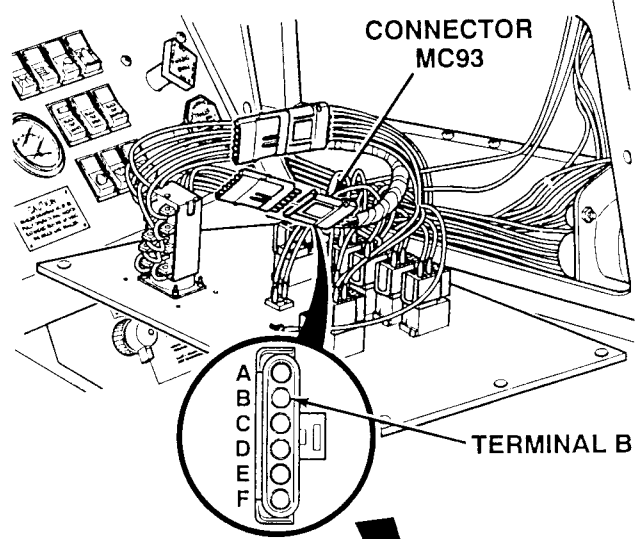
11. MIDDLE FRAME DOES NOT UNLOAD IN MANUAL MODE (CONT).



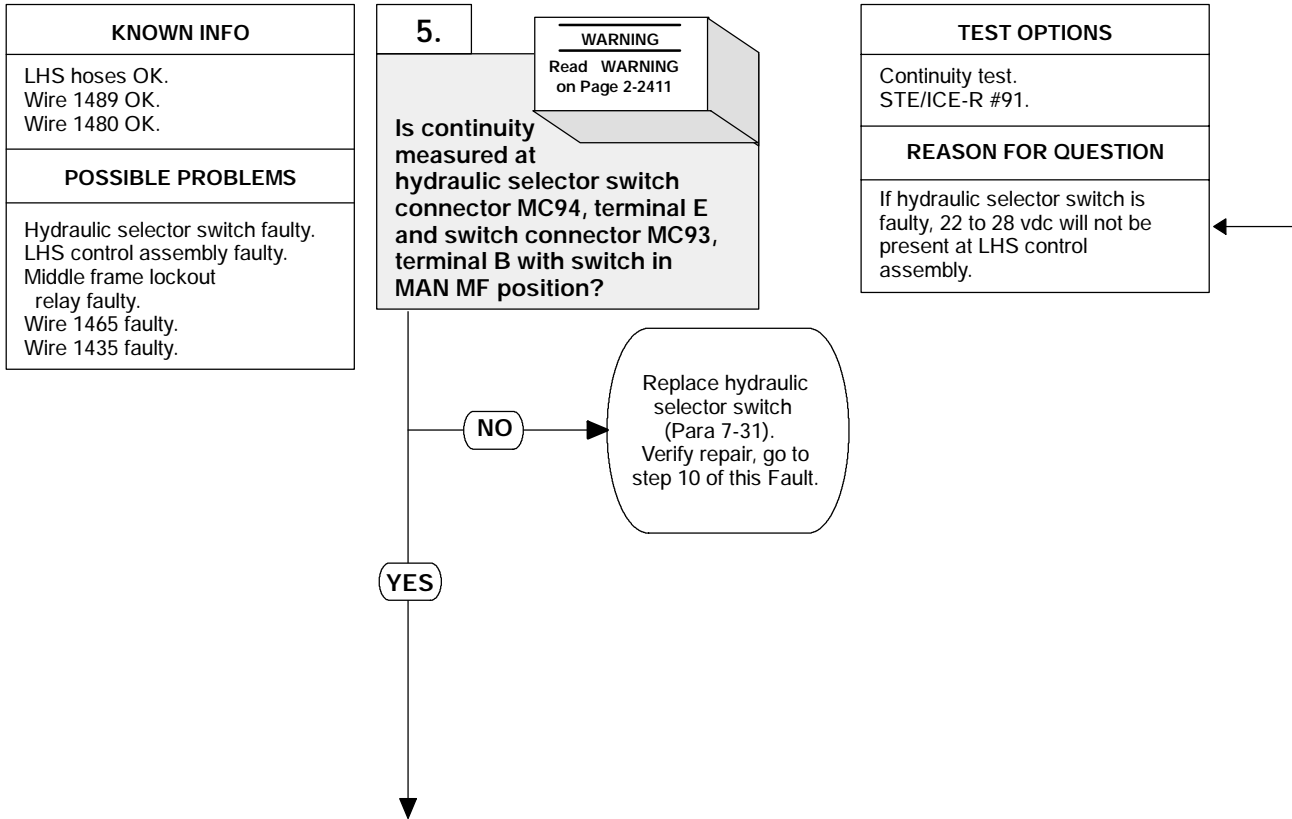
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | CONTINUITY TEST |
|--|
| (1) Disconnect harness connector MC93 from hydraulic selector switch connector. |
| (2) Set multimeter select switch to ohms. |
| (3) Is there continuity between harness connector MC93, terminal B and harness connector MC83, terminal D? |
| (a) If there is no continuity, repair wire 1480 (see schematic Fig 2-52) or notify DS Maintenance. |
| (b) If there is continuity, wire 1480 is OK. |
| (4) Install LHS control assembly (Para 7-40). |



11. MIDDLE FRAME DOES NOT UNLOAD IN MANUAL MODE (CONT).

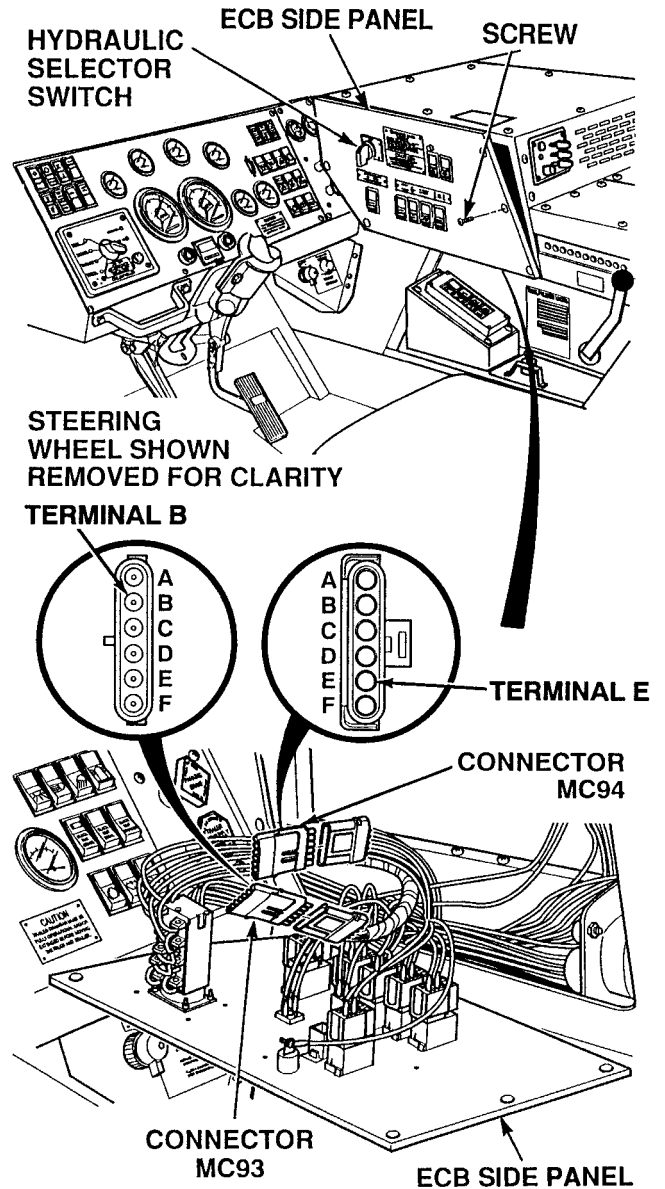


WARNING

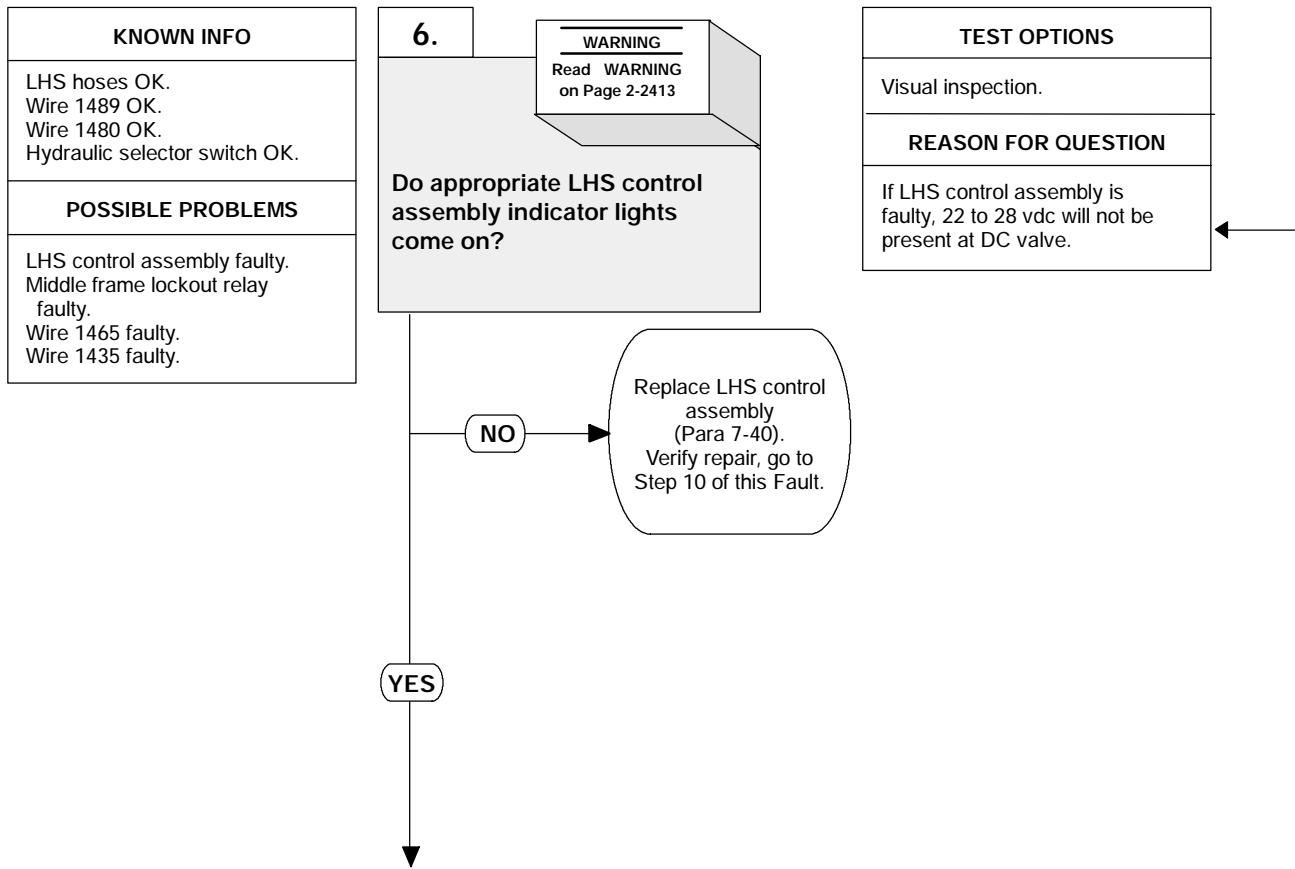
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set hydraulic selector switch to MAN MF position (TM 9-2320-364-10).
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between switch harness connector MC94, terminal E and harness connector MC93, terminal B?
 - (a) If there is no continuity, replace hydraulic selector switch (Para 7-31).
 - (b) If there is continuity, hydraulic selector switch is OK.
- (4) Install harness connector MC94 on hydraulic selector switch connector.
- (5) Install harness connector MC93 on hydraulic selector switch connector.
- (6) Install ECB side panel and six screws.



11. MIDDLE FRAME DOES NOT UNLOAD IN MANUAL MODE (CONT).



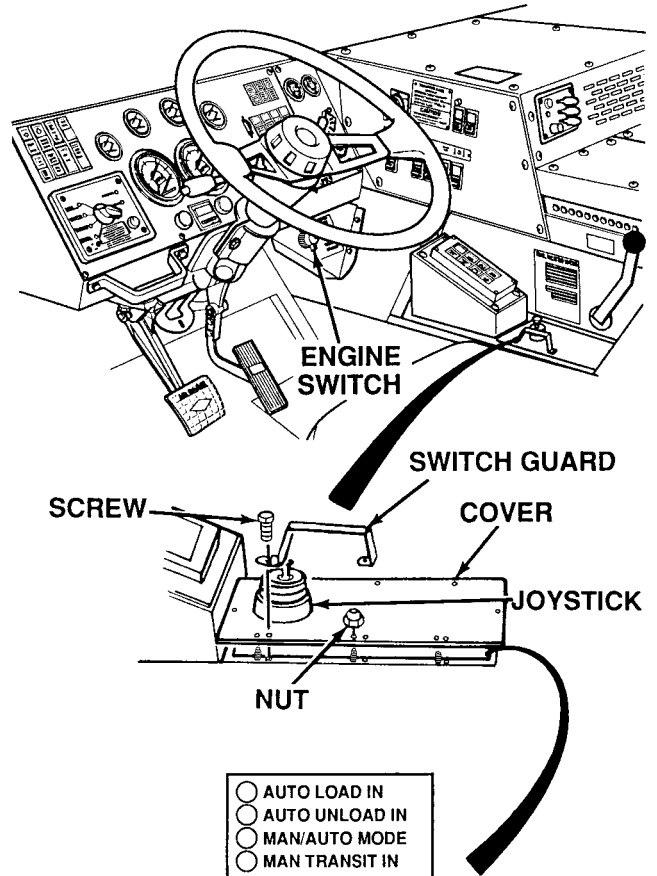
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.

VISUAL INSPECTION
(1) Remove eight screws, switch guard and eight nuts from LHS control assembly.
(2) Carefully lift off LHS control assembly cover. Do not allow cover to dangle by joystick connecting wires.
(3) Turn ON ENGINE switch (TM 9-2320-364-10).
(4) Set hydraulic selector switch to MAN MF position.
(5) Hold joystick in UNLOAD position.
(6) Observe red indicator lights in bottom of LHS control assembly. <ul style="list-style-type: none"> (a) If MAIN RAM A indicator lamp does not illuminate with joystick in UNLOAD position replace LHS control assembly (Para 7-40). (b) If MAIN RAM A indicator lamp does illuminate, LHS control assembly is OK.
(7) Turn OFF ENGINE switch.
(8) Set hydraulic selector switch to OFF position.

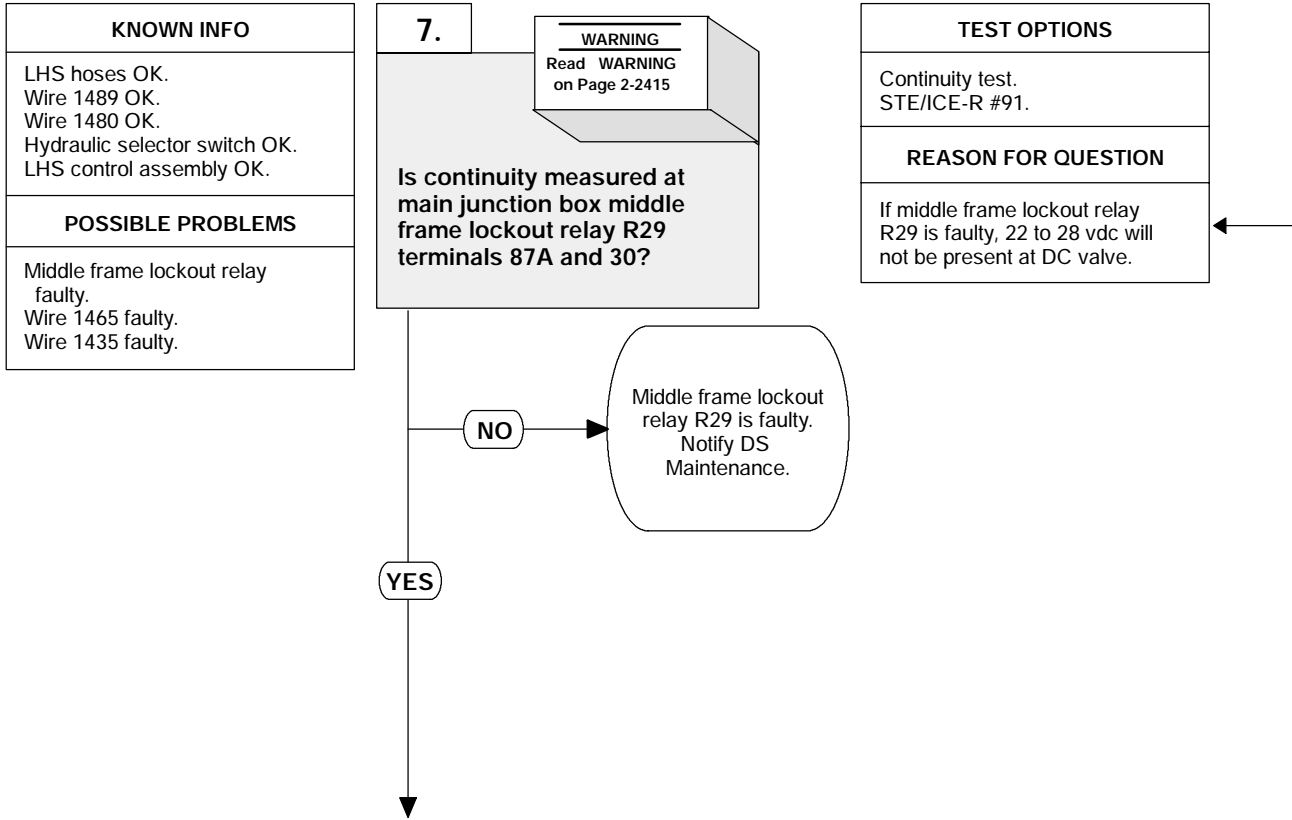


- AUTO LOAD IN
- AUTO UNLOAD IN
- MAN/AUTO MODE
- MAN TRANSIT IN

- UNLOAD OUT
- LOAD OUT
- AUX MODE IN
- NO TRANSIT LIGHT
- OVERLOAD LIGHT
- HOOK ARM "A" SOL
- MAIN RAM "B" SOL
- HOOK ARM "B" SOL
- MAIN RAM "A" SOL
- +24V IN
- HOOK ARM UP

- FREE FLOW VALVE
- HOOK ARM DOWN
- TRANSIT VALVE
- OVERLOAD IN
- MID FRAME DOWN

11. MIDDLE FRAME DOES NOT UNLOAD IN MANUAL MODE (CONT).



WARNING

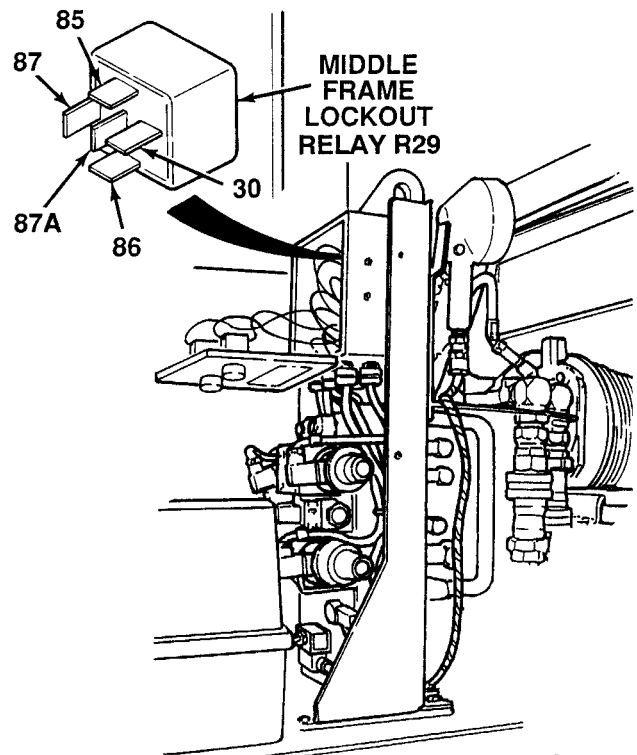
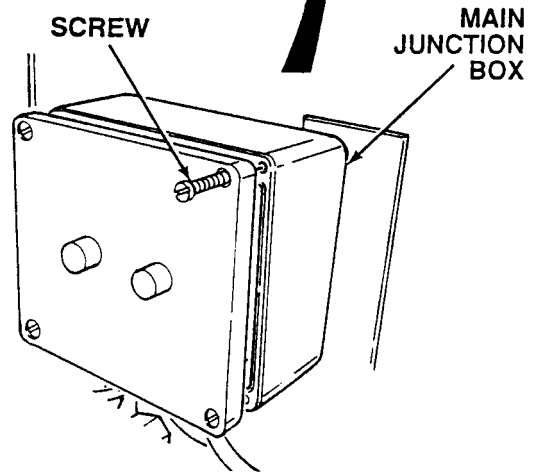
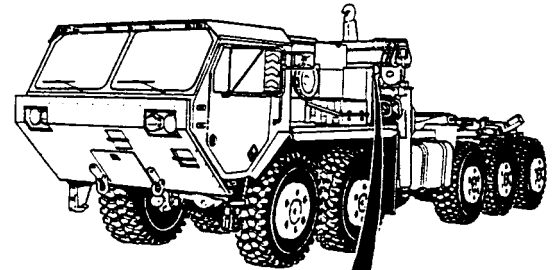
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

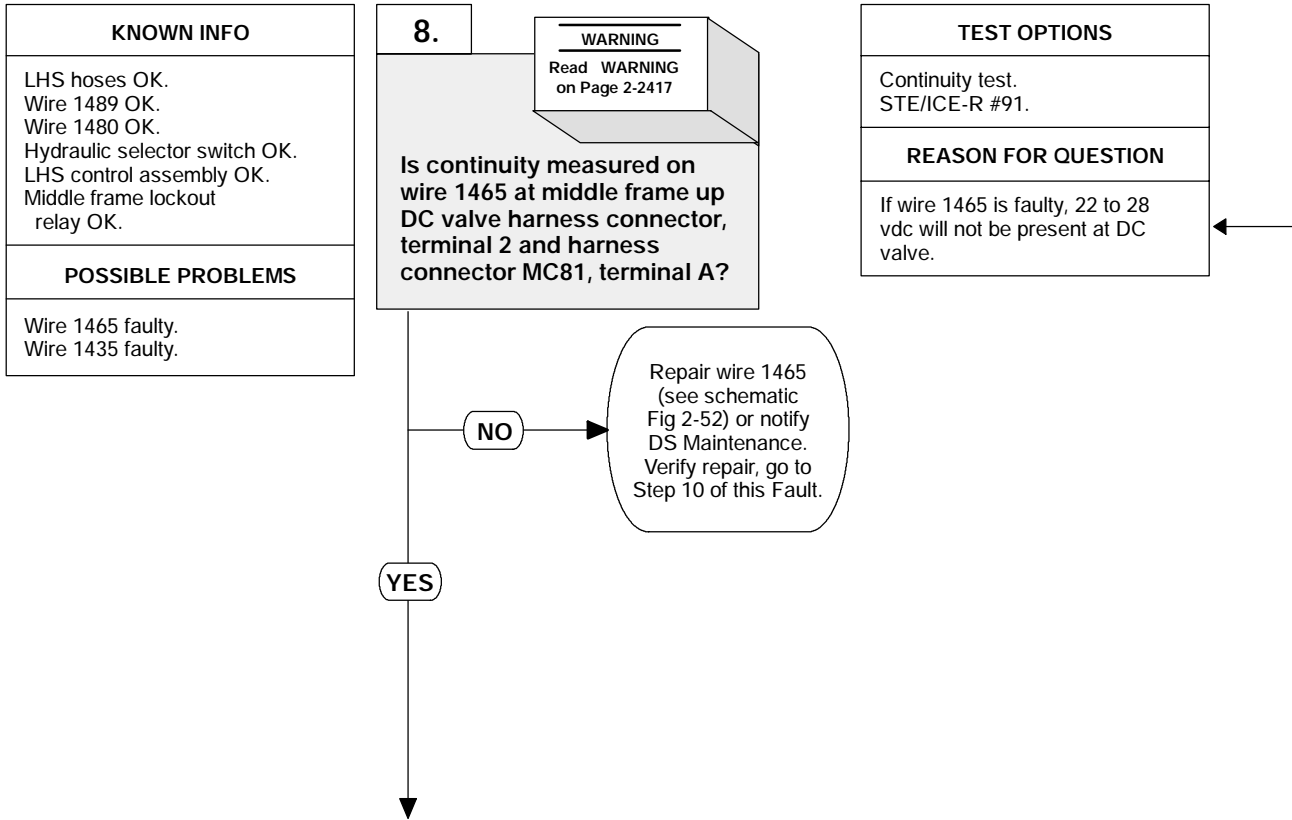
When opening the main junction box, do not pull or allow front of junction box to hang by the wire connections. Failure to comply will damage the wire connections.

CONTINUITY TEST

- (1) Loosen four screws and open main junction box.
- (2) Remove middle frame lockout relay R29 from main junction box.
- (3) Set multimeter select switch to ohms.
- (4) Is there continuity between main junction box middle frame lockout relay R29 terminals 87A and 30?
 - (a) If there is no continuity, notify DS Maintenance.
 - (b) If there is continuity, middle frame lockout relay R29 is OK.
- (5) Install middle frame lockout relay R29 in main junction box.
- (6) Close main junction box and tighten four screws.



11. MIDDLE FRAME DOES NOT UNLOAD IN MANUAL MODE (CONT).

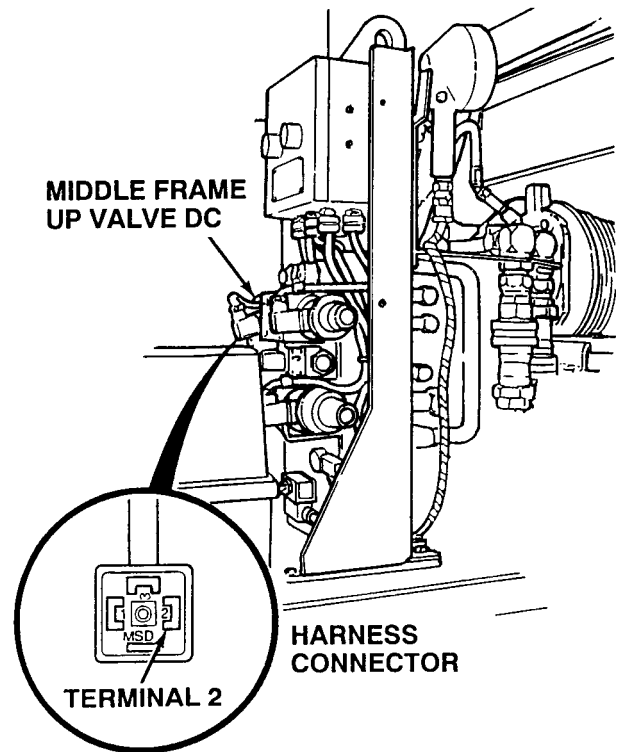
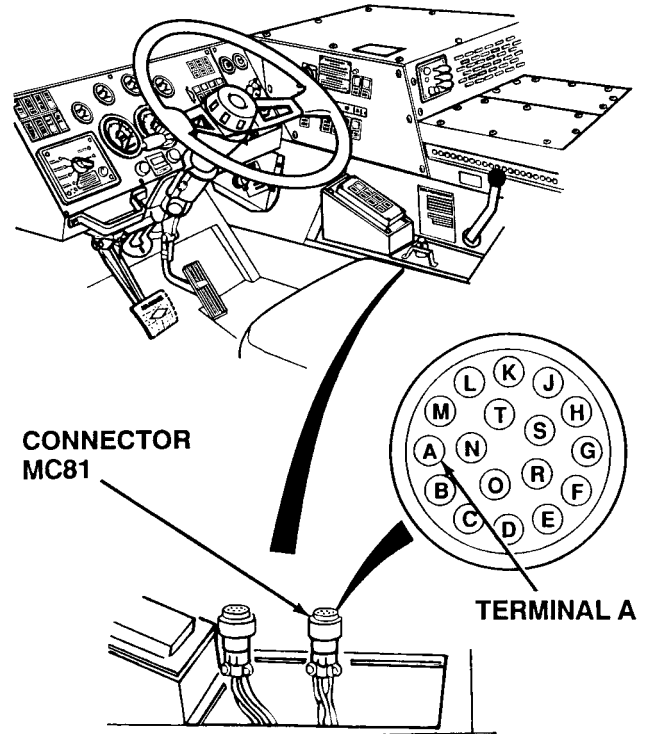


WARNING

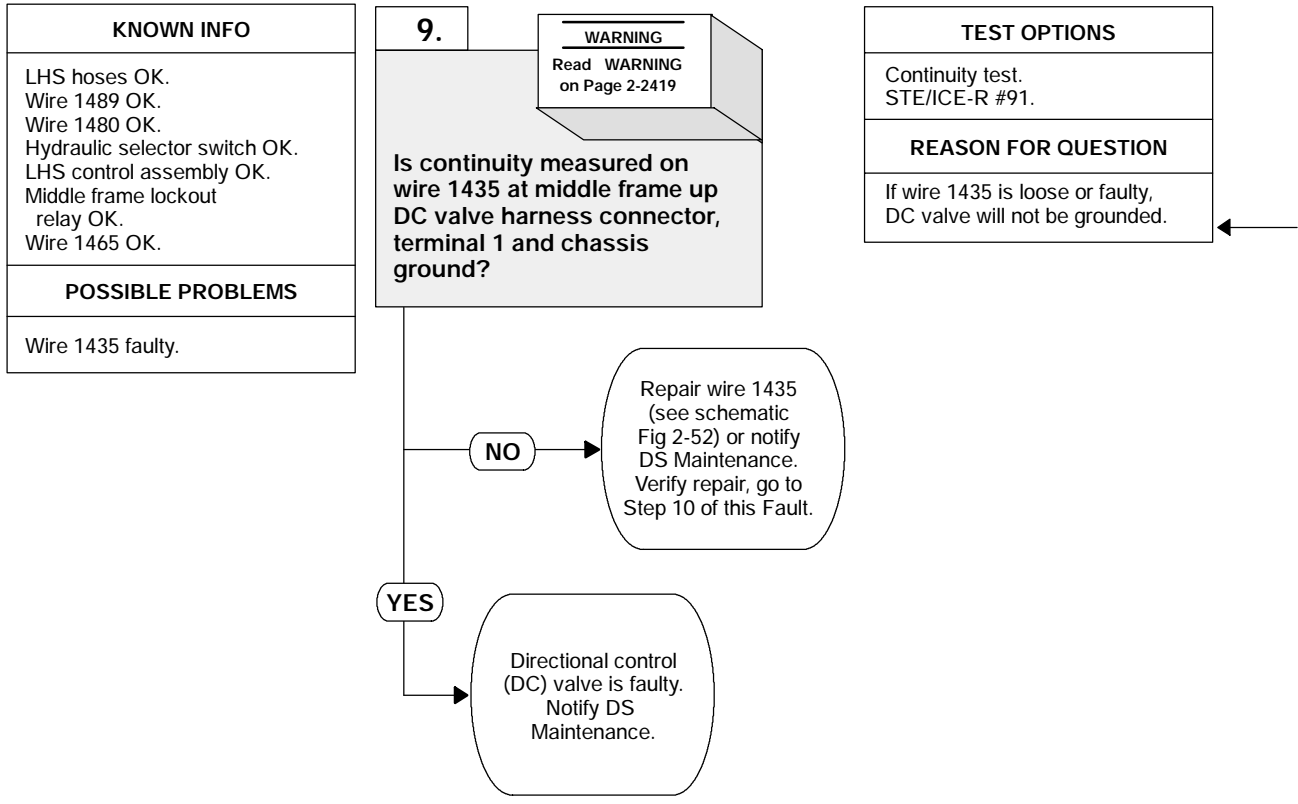
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Remove LHS control assembly (Para 7-40).
- (2) Set multimeter select switch to ohms.
- (3) Using jumperwire, connect DC valve harness connector, terminal 2 to known good ground.
- (3) Is there continuity between connector MC81, terminal A and a known good ground?
 - (a) If there is no continuity, repair wire 1465 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1465 is OK.
- (4) Install LHS control assembly (Para 7-40).



11. MIDDLE FRAME DOES NOT UNLOAD IN MANUAL MODE (CONT).



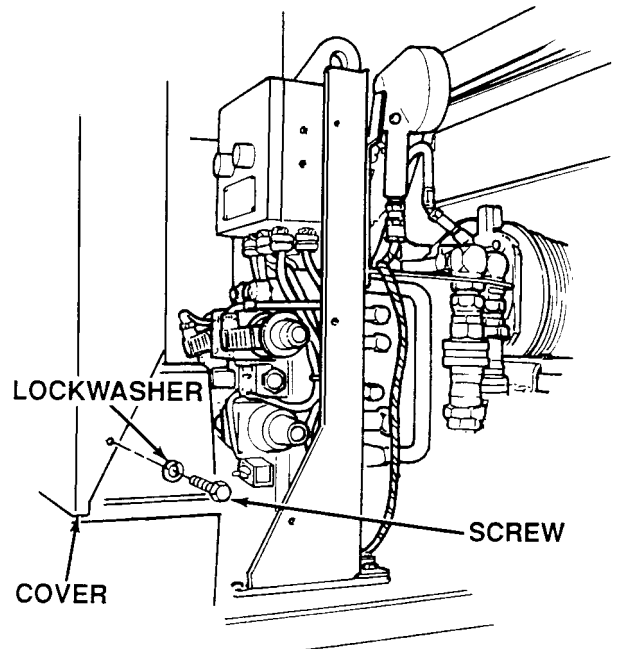
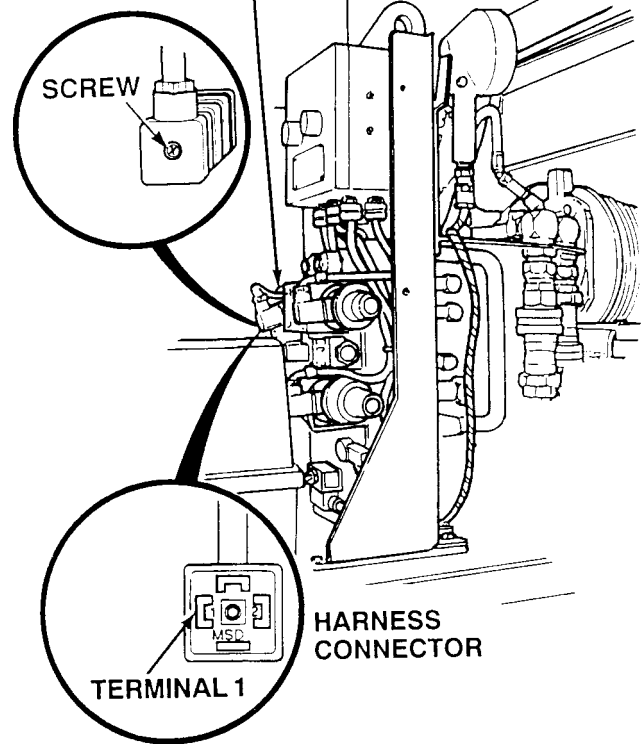
WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between middle frame up DC valve harness connector, terminal 1 and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1435 is OK. Notify DS Maintenance.
- (3) Install harness connector on middle frame up DC valve.
- (4) Tighten screw and coat head of connector screw with adhesive.
- (5) Install LHS control box cover, four lockwashers and screws.

MIDDLE FRAME UP VALVE DC



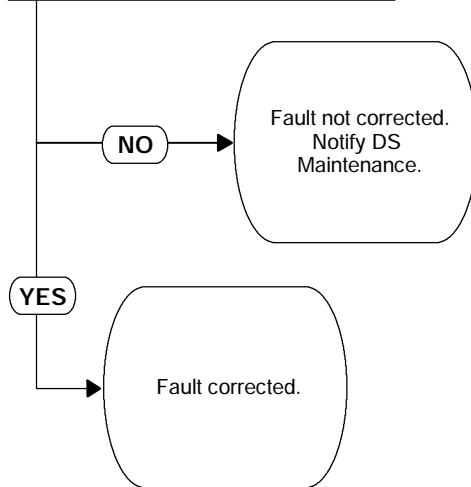
11. MIDDLE FRAME DOES NOT UNLOAD IN MANUAL MODE (CONT).

KNOWN INFO
LHS hoses OK. Wire 1489 OK. Wire 1480 OK. Hydraulic selector switch OK. LHS Control assembly OK. Middle frame lockout relay OK. Wire 1465 OK. Wire 1435 OK.
POSSIBLE PROBLEMS

10.

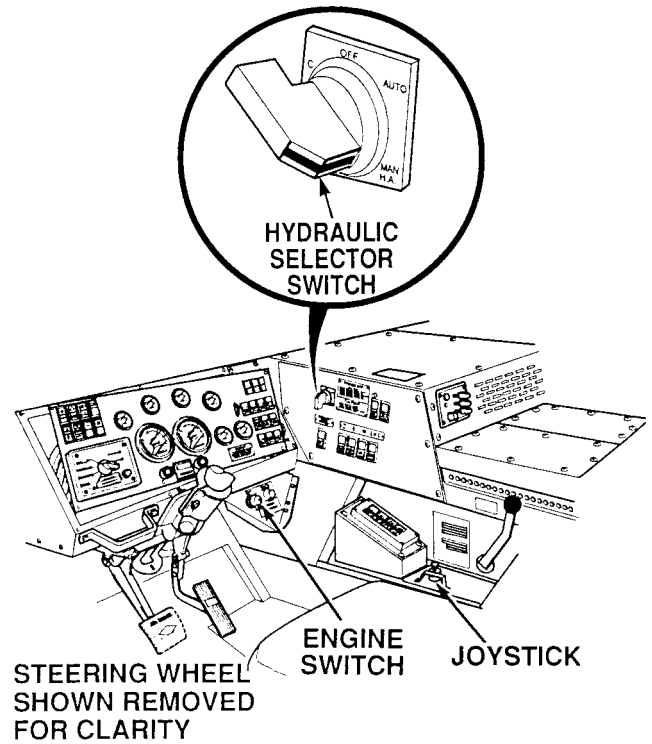
Does middle frame unload in manual mode?

TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If middle frame unloads in manual mode, fault has been corrected.



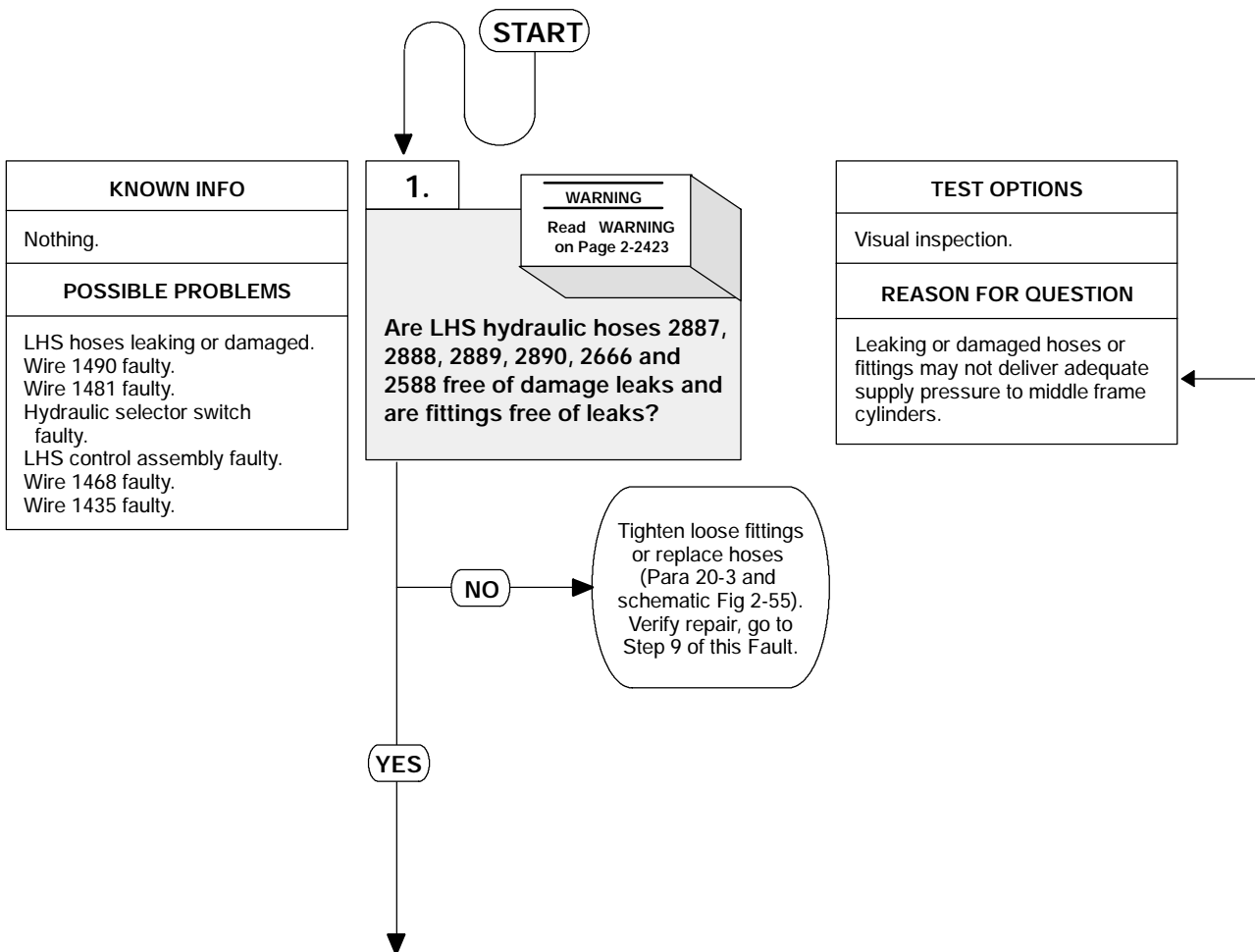
VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch in MAN MF position.
- (3) Hold joystick in UNLOAD position.
 - (a) If middle frame does not unload, fault not corrected. Perform Steps (4) through (6) below and notify DS Maintenance.
 - (b) If middle frame unloads, fault has been corrected.
- (4) Release joystick.
- (5) Set hydraulic selector switch to OFF position.
- (6) Turn OFF ENGINE switch.



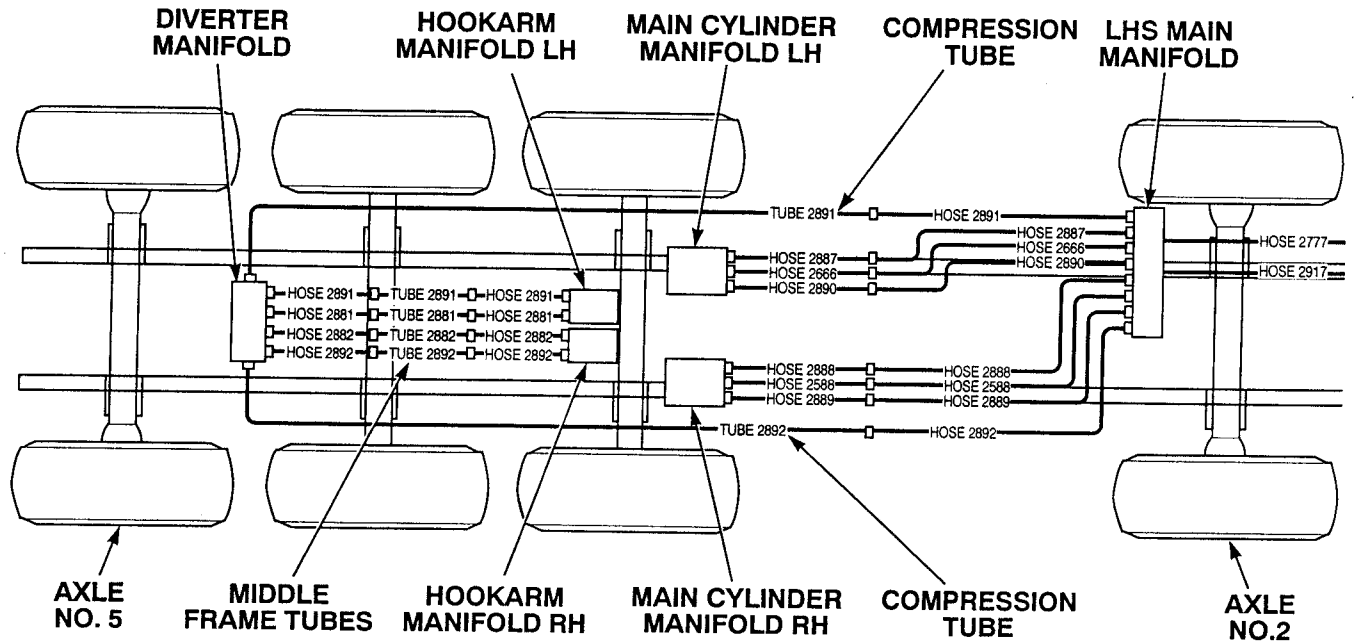
2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

12. MIDDLE FRAME DOES NOT LOAD IN MANUAL MODE.	
INITIAL SETUP	
<p><i>Tools and Special Tools</i></p> <ul style="list-style-type: none"> Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G) STE/ICE-R (optional) (Item 3, Appendix G) Multimeter (Item 44, Appendix G) Jumperwire <p><i>Materials/Parts</i></p> <ul style="list-style-type: none"> Lockwasher (4) (Item 180, Appendix F) Adhesive (Item 8, Appendix C) 	<p><i>References</i></p> <ul style="list-style-type: none"> TM 9-2320-364-10 TM 9-4910-571-12&P <p><i>Equipment Condition</i></p> <ul style="list-style-type: none"> Engine OFF, (TM 9-2320-364-10) Parking brake applied, (TM 9-2320-364-10) Wheels chocked, (TM 9-2320-364-10)



WARNING

High pressure hydraulics [oil under 3,700 psi (25,512 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.



VISUAL INSPECTION
Inspect LHS hoses 2887, 2888, 2889, 2890, 2666 and 2588 for damage, crimps, or leaks.
(1) If hoses are damaged, crimped or leaking; tighten fittings or replace hoses (Para 20-3 and schematic Fig 2-55).
(2) If there are no leaks, crimps or damage; hoses and fittings are OK.

12. MIDDLE FRAME DOES NOT LOAD IN MANUAL MODE (CONT).

KNOWN INFO
LHS Hoses OK.
POSSIBLE PROBLEMS
Wire 1490 faulty. Wire 1481 faulty. Hydraulic selector switch faulty. LHS control assembly faulty. Wire 1468 faulty. Wire 1435 faulty.

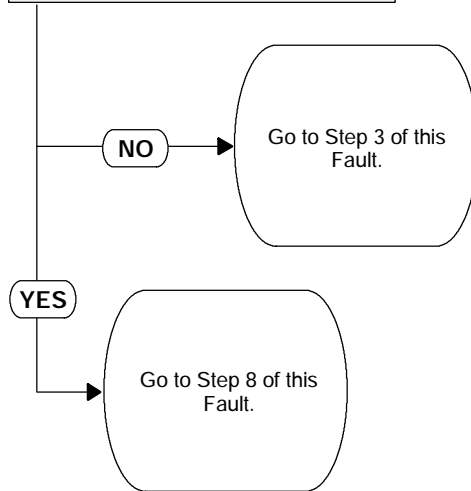
2.

WARNING

Read **WARNING** on Page 2-2425

Are 22 to 28 vdc measured at middle frame down directional control (DC) valve harness connector, terminal 2 with ENGINE switch ON, hydraulic selector switch in MAN MF and joystick in LOAD position?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If there are not 22 to 28 vdc present, component supplying voltage to middle frame DC valve is faulty.



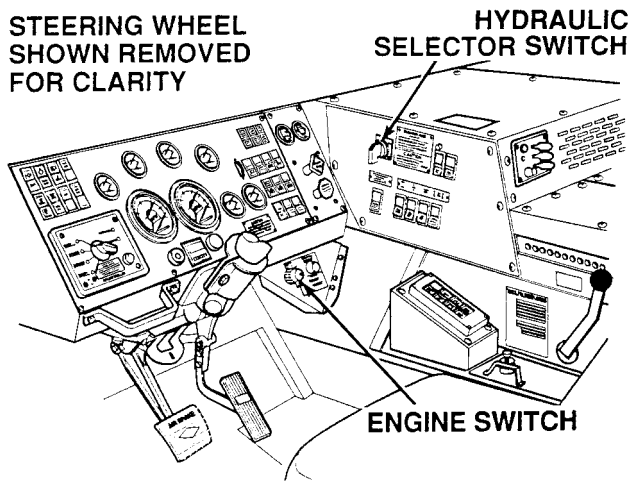
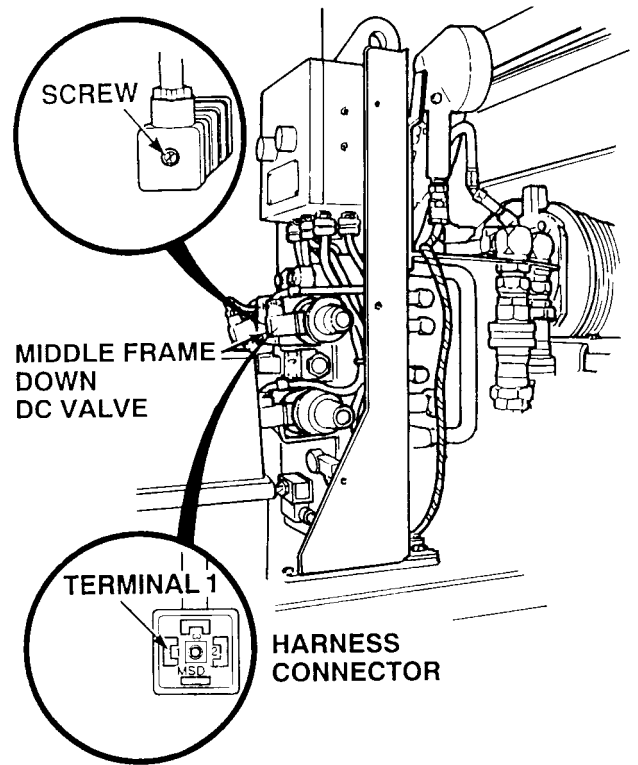
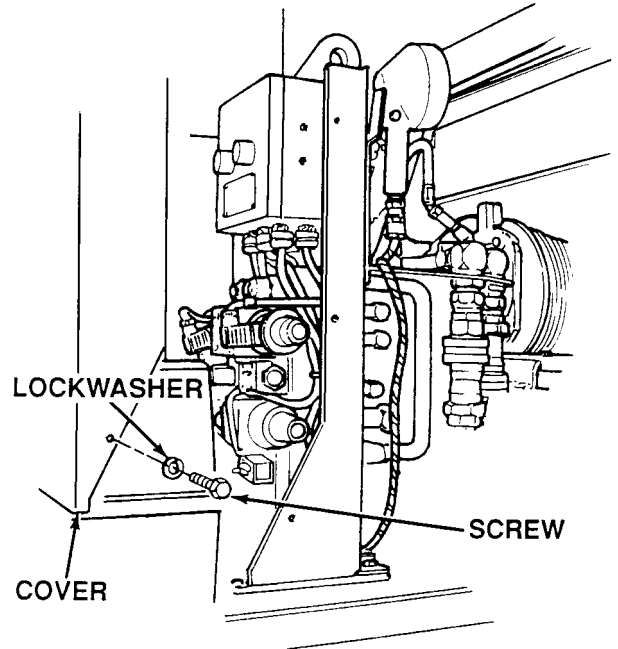
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

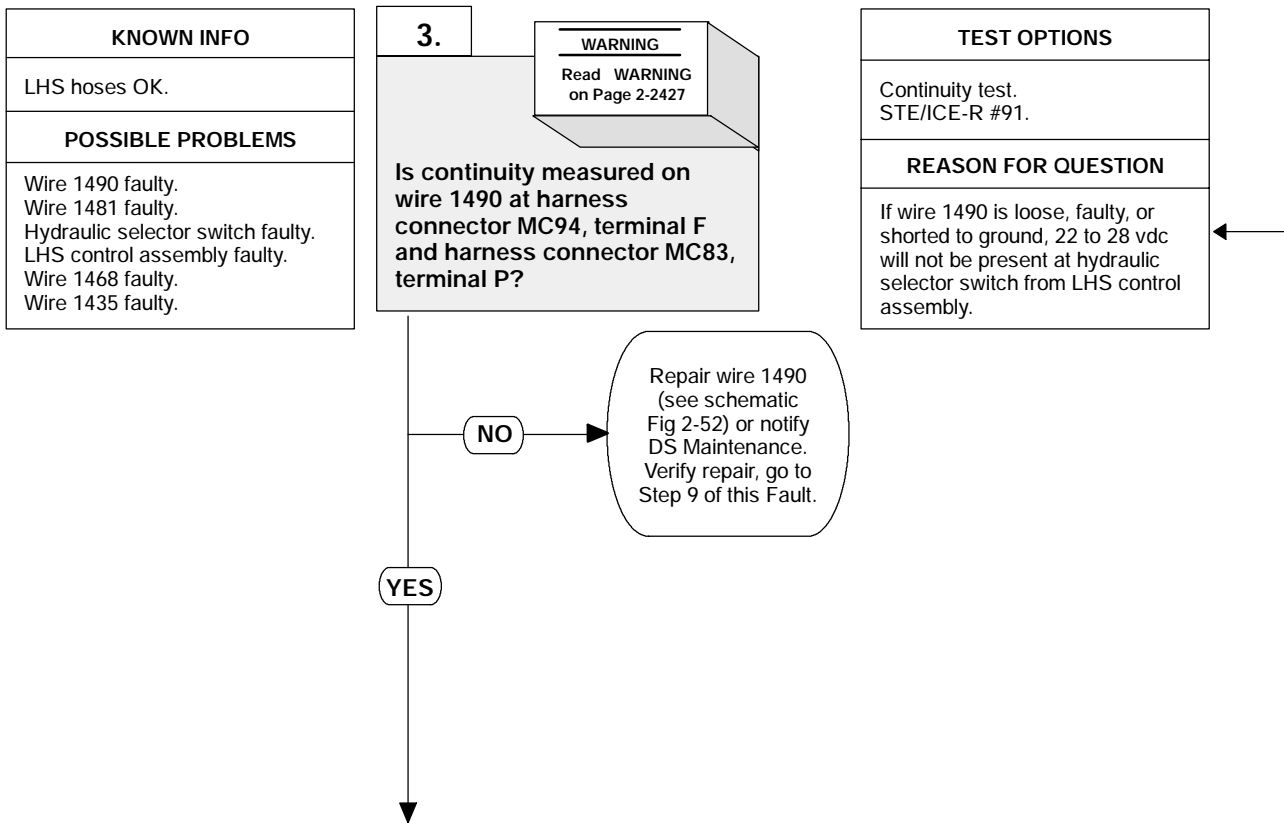
NOTE

Only remove center screw on engine side of LHS control box cover.

- VOLTAGE TEST**
- (1) Remove four screws, lockwashers and LHS control box cover. Discard lockwashers.
 - (2) Loosen screw and remove harness connector from middle frame down (top left) DC valve.
 - (3) Set multimeter select switch to volts dc.
 - (4) Connect positive (+) multimeter lead to harness connector, terminal 2.
 - (5) Connect negative (-) multimeter lead to a known good ground.
 - (6) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (7) Set hydraulic selector switch to MAN MF position.
 - (8) Hold joystick in LOAD position.
 - (a) If there are not 22 to 28 vdc present, perform Steps (9) and (10) below and go to Step 3 of this Fault.
 - (b) If there are 22 to 28 vdc present, perform Steps (9) and (10) below and go to Step 8 of this Fault.
 - (9) Set hydraulic selector switch to OFF position.
 - (10) Turn OFF ENGINE switch.



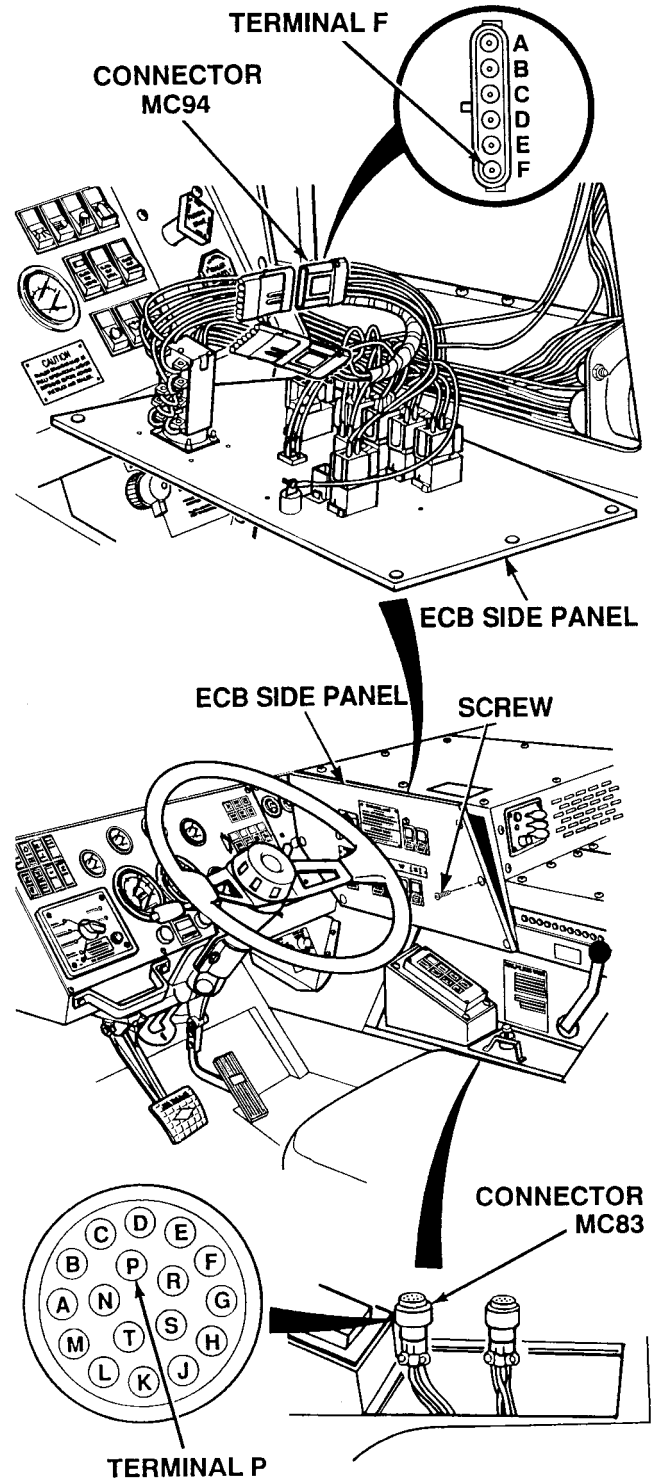
12. MIDDLE FRAME DOES NOT LOAD IN MANUAL MODE (CONT).



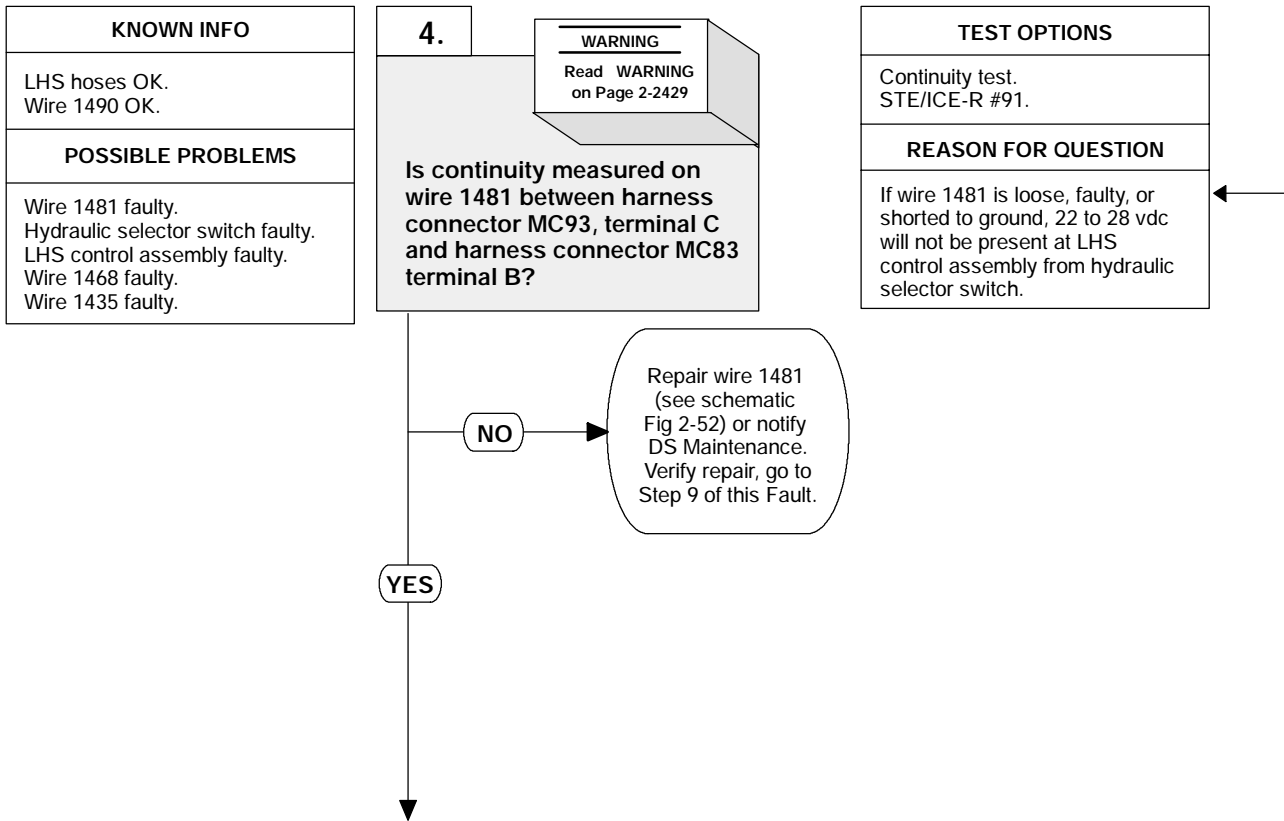
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
(1) Remove LHS control assembly (Para 7-40).
(2) Remove six screws and tilt ECB side panel.
(3) Disconnect harness connector MC94 from hydraulic selector switch connector.
(4) Set multimeter select switch to ohms.
(5) Is there continuity between harness connector MC94, terminal F and harness connector MC83, terminal P?
(a) If there is no continuity, repair wire 1490 (see schematic Fig 2-52) or notify DS Maintenance.
(b) If there is continuity, wire 1490 is OK.



12. MIDDLE FRAME DOES NOT LOAD IN MANUAL MODE (CONT).

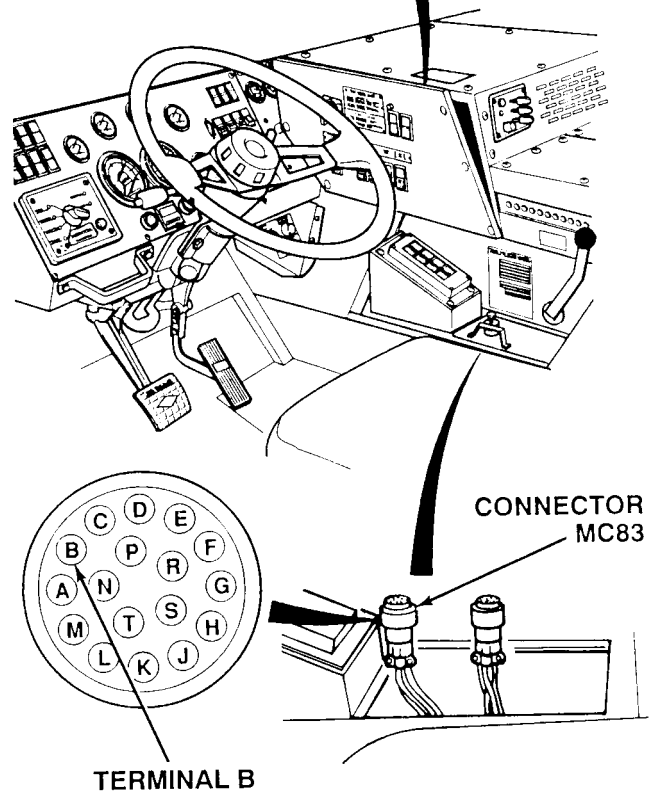
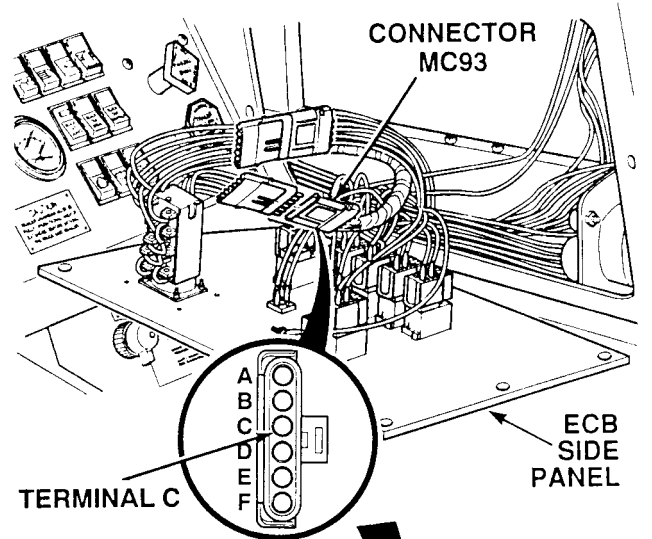


WARNING

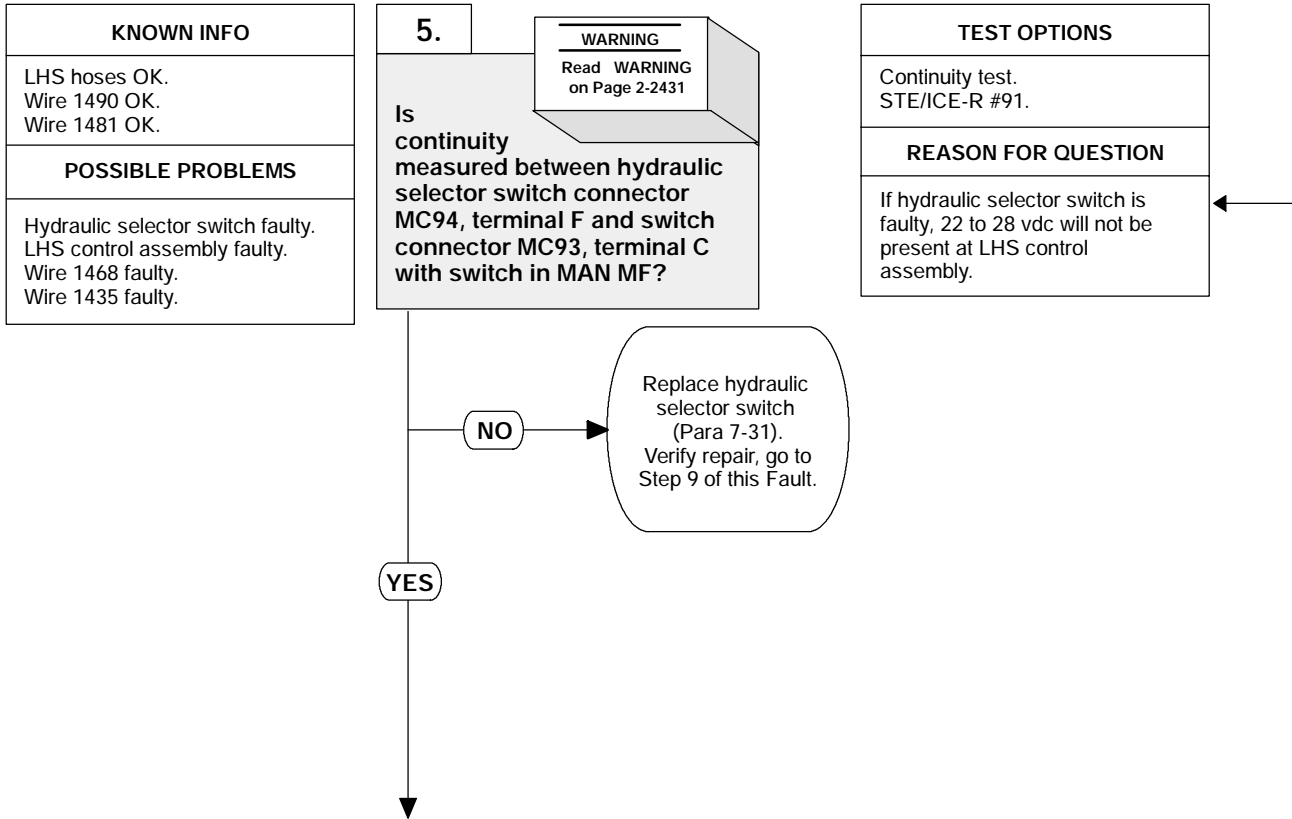
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect harness connector MC93 from hydraulic selector switch connector.
- (2) Set multimeter selector switch to ohms.
- (3) Is there continuity between harness connector MC93, terminal C and harness connector MC83, terminal B?
 - (a) If there is no continuity, repair wire 1481 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1481 is OK.
- (4) Install LHS control assembly (Para 7-40).



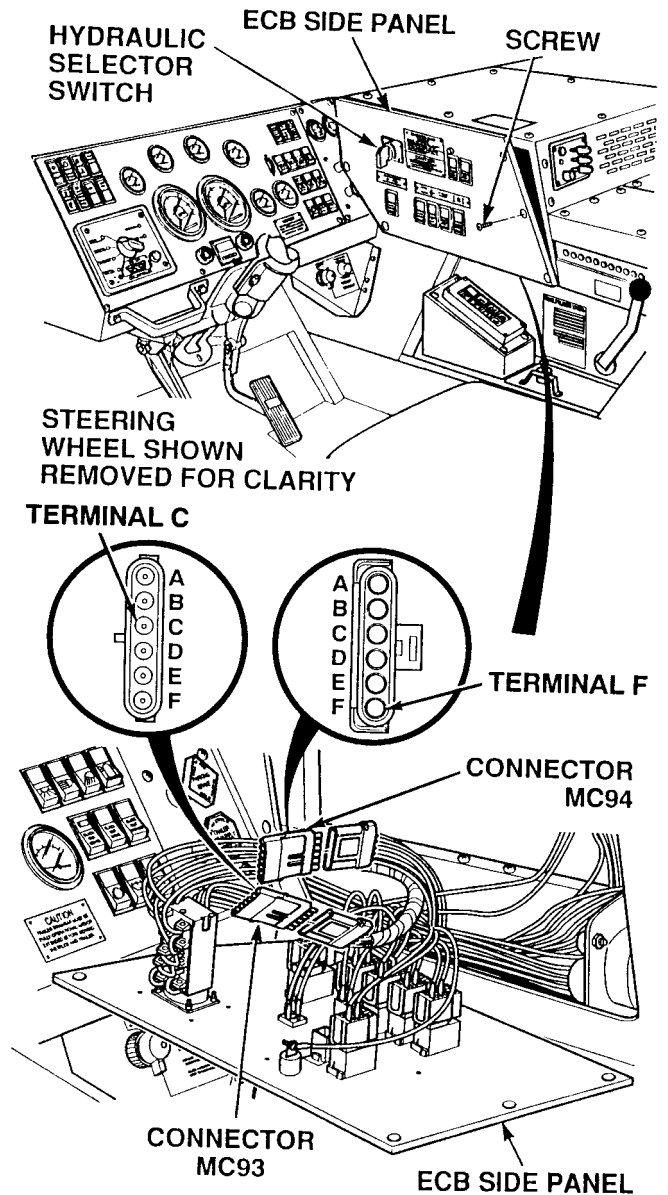
12. MIDDLE FRAME DOES NOT LOAD IN MANUAL MODE (CONT).



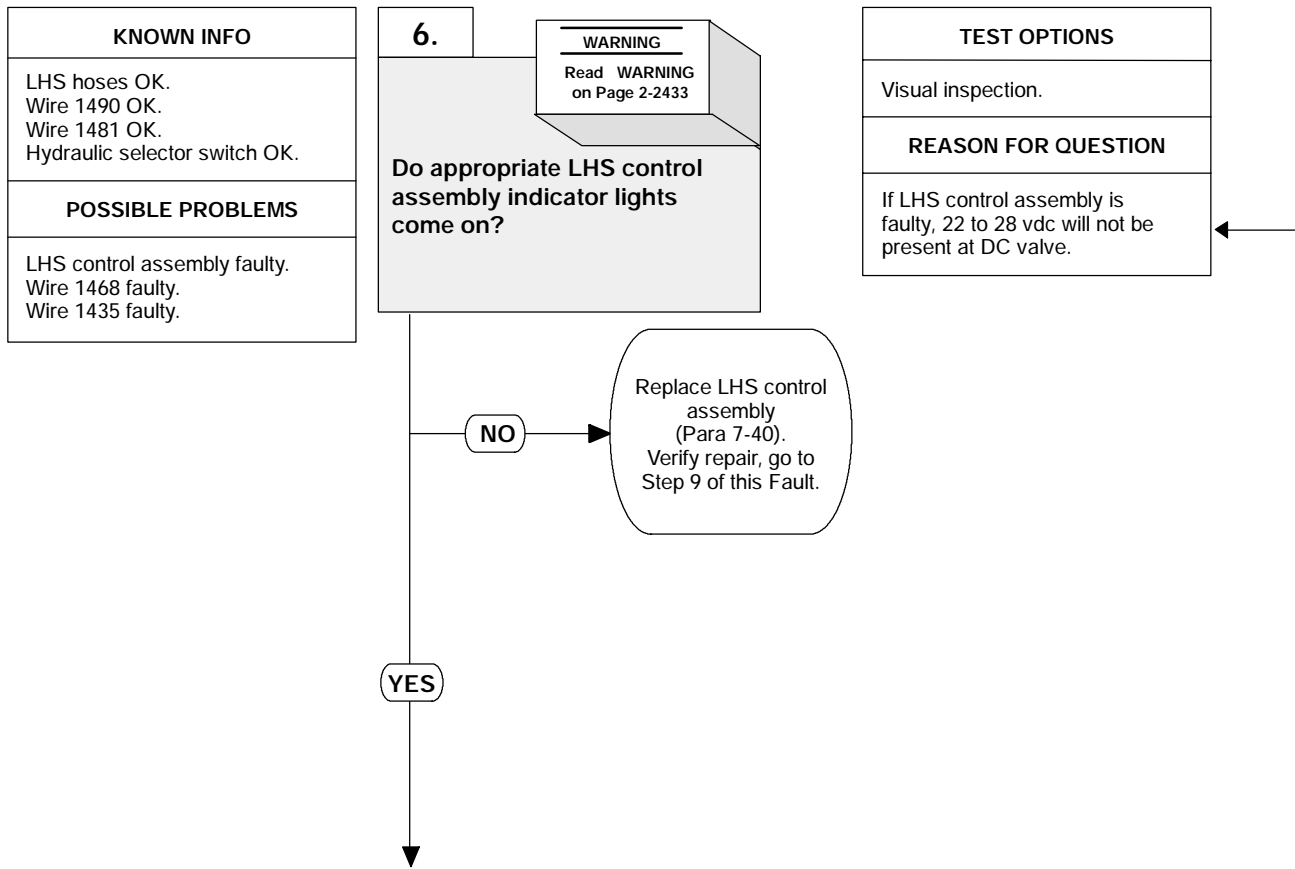
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
(1) Set hydraulic selector switch to MAN MF position (TM 9-2320-364-10).
(2) Set multimeter selector switch to ohms.
(3) Is there continuity between switch harness connector MC94, terminal F and harness connector MC93, terminal C?
(a) If there is no continuity, replace hydraulic selector switch (Para 7-31).
(b) If there is continuity, hydraulic selector switch is OK.
(4) Connect harness connector MC94 on hydraulic selector switch connector.
(5) Connect harness connector MC93 on hydraulic selector switch connector.
(6) Install ECB side panel and six screws.



12. MIDDLE FRAME DOES NOT LOAD IN MANUAL MODE (CONT).



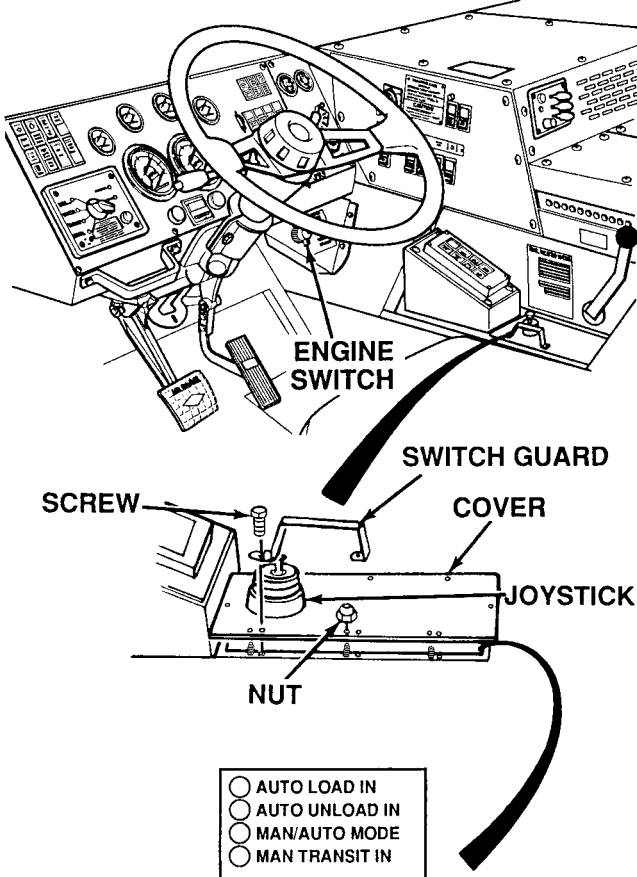
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.

- VISUAL INSPECTION**
- (1) Remove eight screws, switch guard and eight nuts from LHS control assembly.
 - (2) Carefully lift off control assembly cover. Do not allow cover to dangle by joystick connecting wires.
 - (3) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (4) Set hydraulic selector switch to MAN MF position.
 - (5) Hold joystick in LOAD position.
 - (6) Observe red indicator lights in bottom of LHS control assembly.
 - (a) If MAIN RAM B indicator lamp does not illuminate with joystick in LOAD position, turn OFF ENGINE switch and install cover and replace LHS control assembly (Para 7-40).
 - (b) If MAIN RAM B indicator lamp does illuminate, LHS control assembly is OK.
 - (7) Turn OFF ENGINE switch.
 - (8) Set hydraulic selector switch to OFF position.

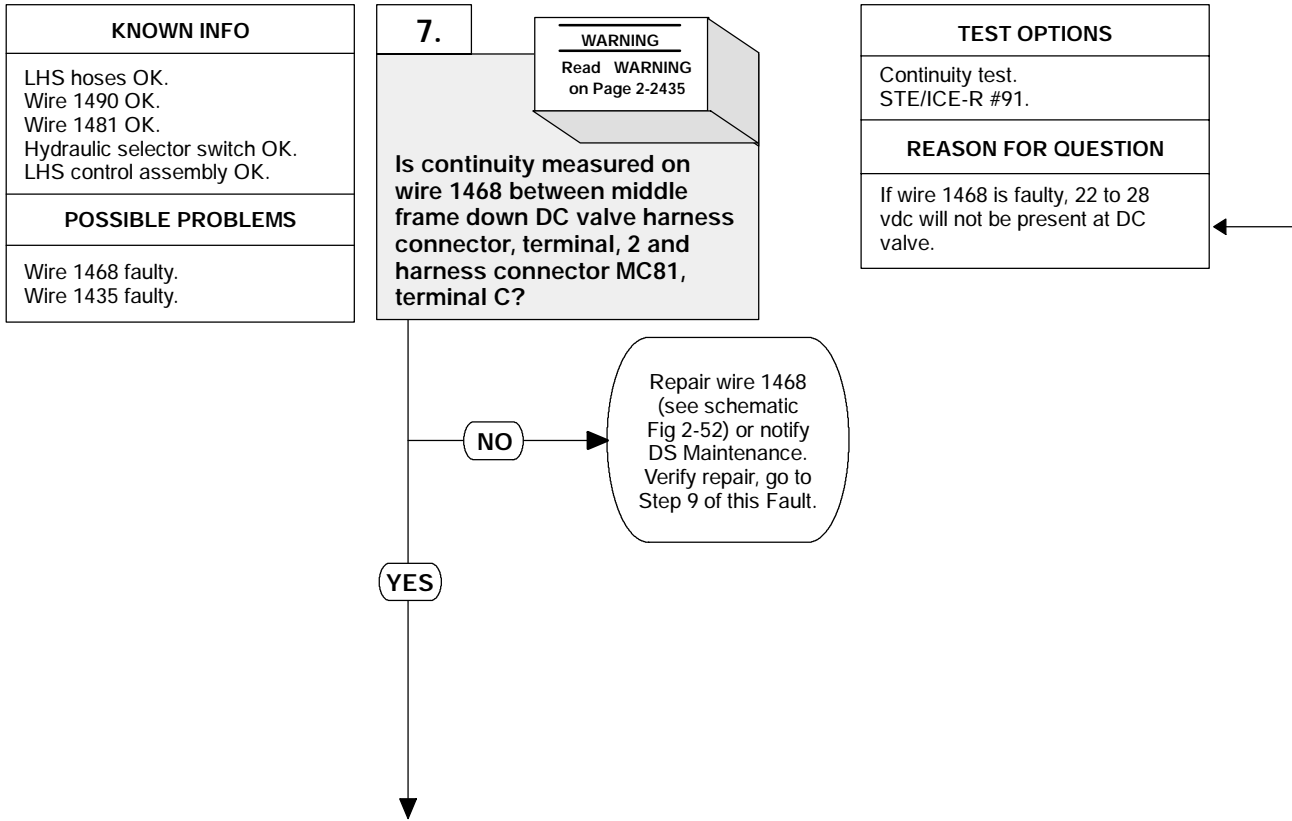


- AUTO LOAD IN
- AUTO UNLOAD IN
- MAN/AUTO MODE
- MAN TRANSIT IN

- UNLOAD OUT
- LOAD OUT
- AUX MODE IN
- NO TRANSIT LIGHT
- OVERLOAD LIGHT
- HOOK ARM "A" SOL
- MAIN RAM "B" SOL
- HOOK ARM "B" SOL
- MAIN RAM "A" SOL
- +24V IN
- HOOK ARM UP

- FREE FLOW VALVE
- HOOK ARM DOWN
- TRANSIT VALVE
- OVERLOAD IN
- MID FRAME DOWN

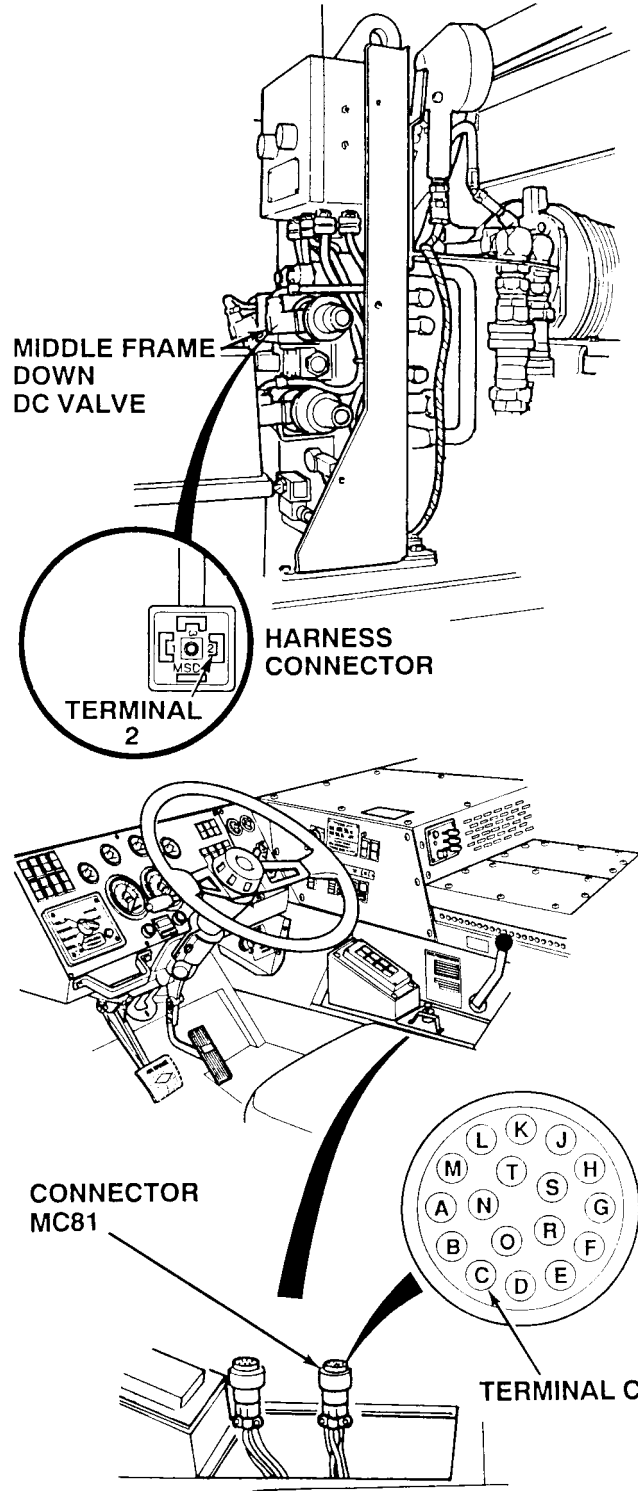
12. MIDDLE FRAME DOES NOT LOAD IN MANUAL MODE (CONT).



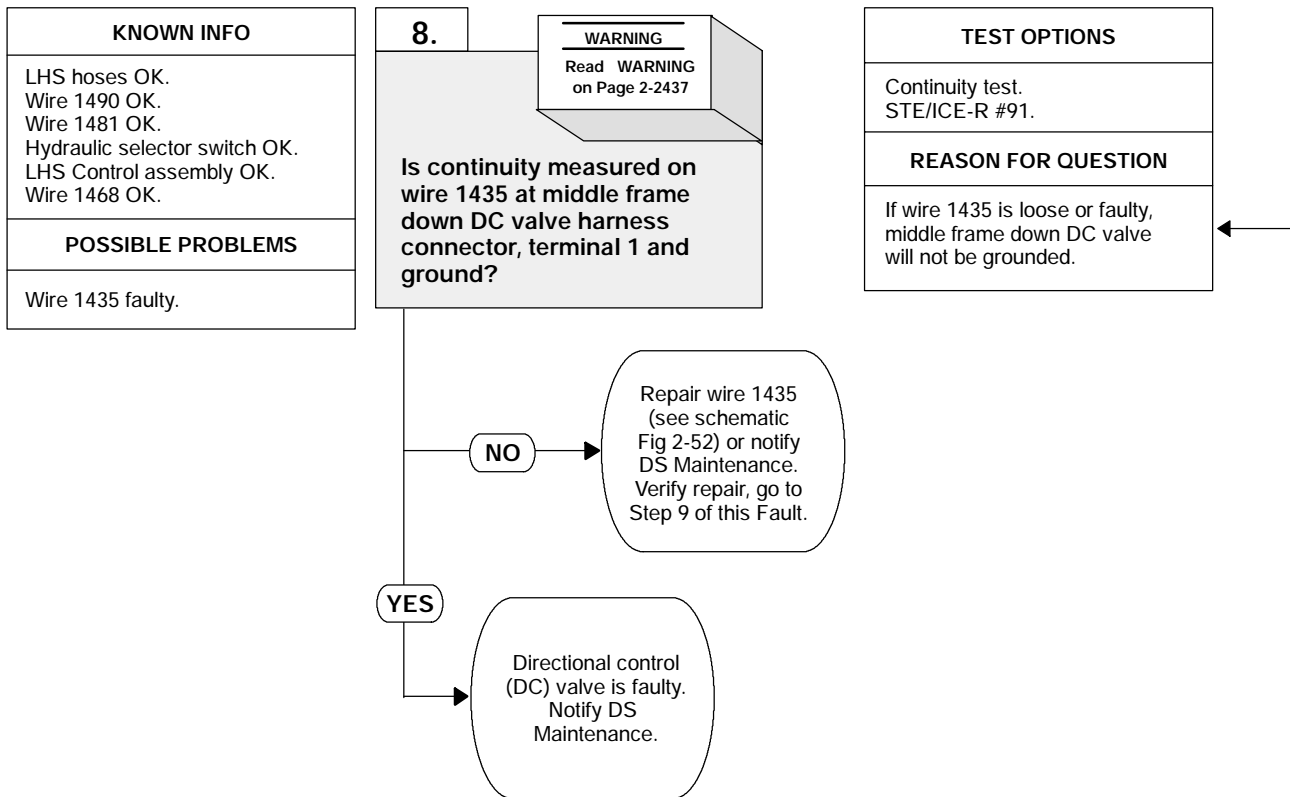
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | CONTINUITY TEST | |
|-----------------|--|
| (1) | Disconnect LHS control assembly from connectors. |
| (2) | Set multimeter selector switch to ohms. |
| (3) | Is there continuity between middle frame down DC valve harness connector, terminal 2 and harness connector MC81, terminal C? |
| (a) | If there is no continuity, repair wire 1468 (see schematic Fig 2-52) or notify DS Maintenance. |
| (b) | If there is continuity, wire 1468 is OK. |
| (4) | Install LHS control assembly (Para 7-40). |



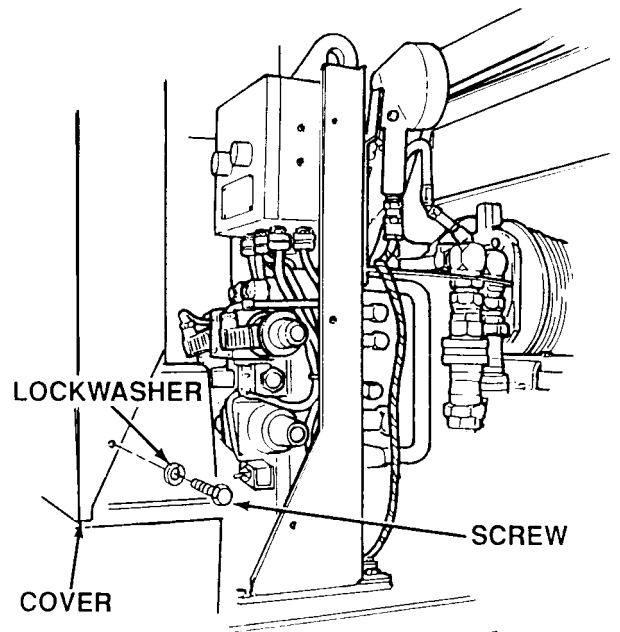
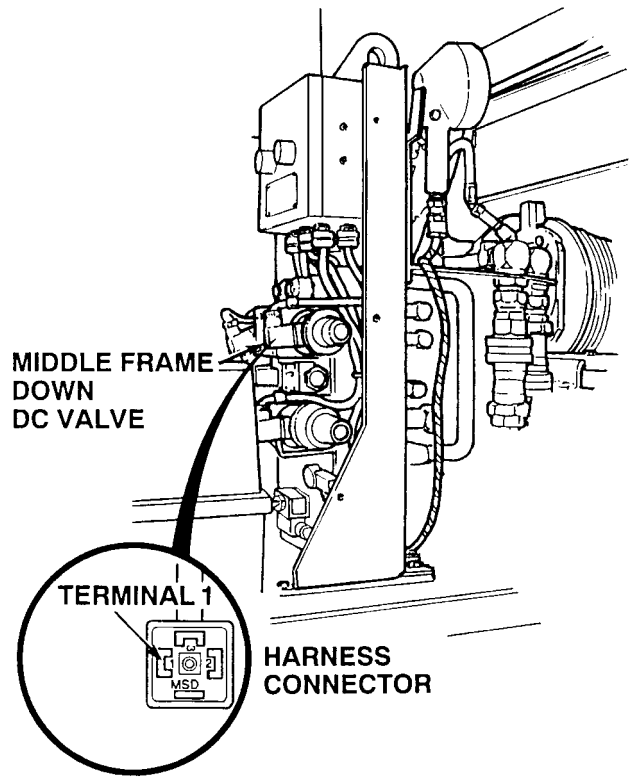
12. MIDDLE FRAME DOES NOT LOAD IN MANUAL MODE (CONT).



WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesive, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST
<ol style="list-style-type: none"> (1) Set multimeter selector switch to ohms. (2) Is there continuity on wire 1435 between middle frame down DC valve harness connector, terminal 1 and a known good ground? <ol style="list-style-type: none"> (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance. (b) If there is continuity, wire 1435 is OK. (3) Install harness connector on middle frame down DC valve. (4) Tighten connector screw and coat head of connector screw with adhesive. (5) Install LHS control box cover, four lockwashers and screws.



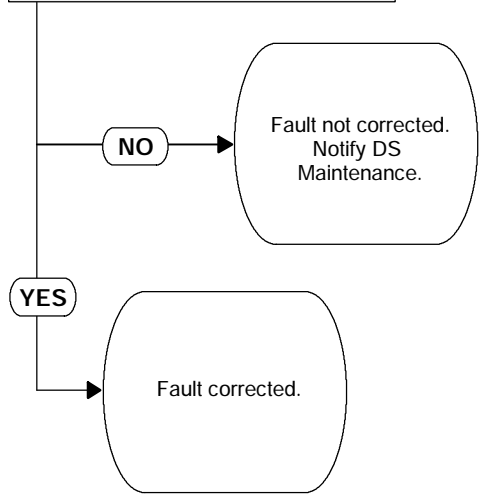
12. MIDDLE FRAME DOES NOT LOAD IN MANUAL MODE (CONT).

KNOWN INFO
LHS hoses OK. Wire 1490 OK. Wire 1481 OK. Hydraulic selector switch OK. LHS Control assembly OK. Wire 1468 OK. Wire 1435 OK.
POSSIBLE PROBLEMS

9.

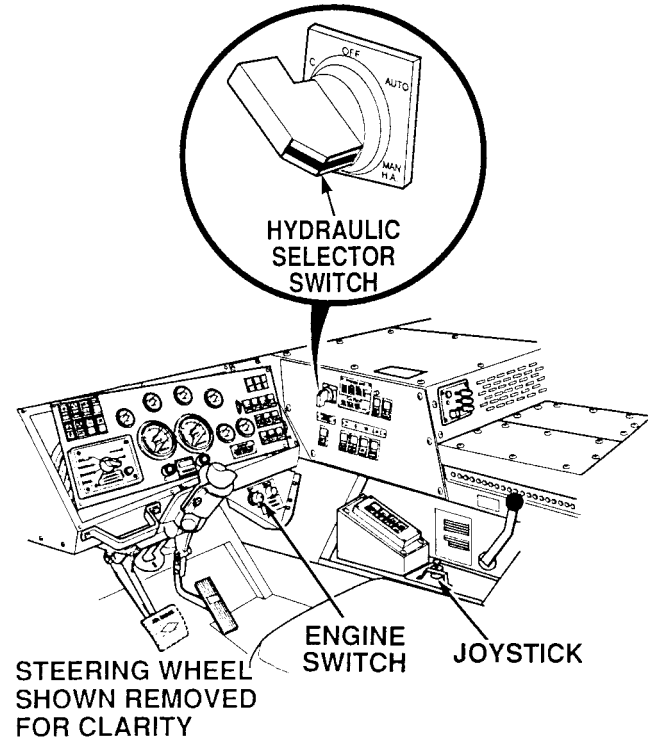
Does middle frame load in manual mode?

TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If middle frame loads in manual mode, fault has been corrected. ←



VERIFY REPAIR

- (1) Turn ON ENGINE switch.
- (2) Start engine.
- (3) Set hydraulic selector switch in MAN MF position.
- (4) Hold joystick in LOAD position.
 - (a) If middle frame does not load, fault not corrected. Perform Steps (5) through (7) below and notify DS Maintenance.
 - (b) If middle frame loads, fault has been corrected.
- (5) Release joystick.
- (6) Set hydraulic selector switch to OFF position.
- (7) Turn OFF ENGINE switch.



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

13. LHS DOES NOT LOAD IN AUTO MODE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Jumperwire

Materials/Parts

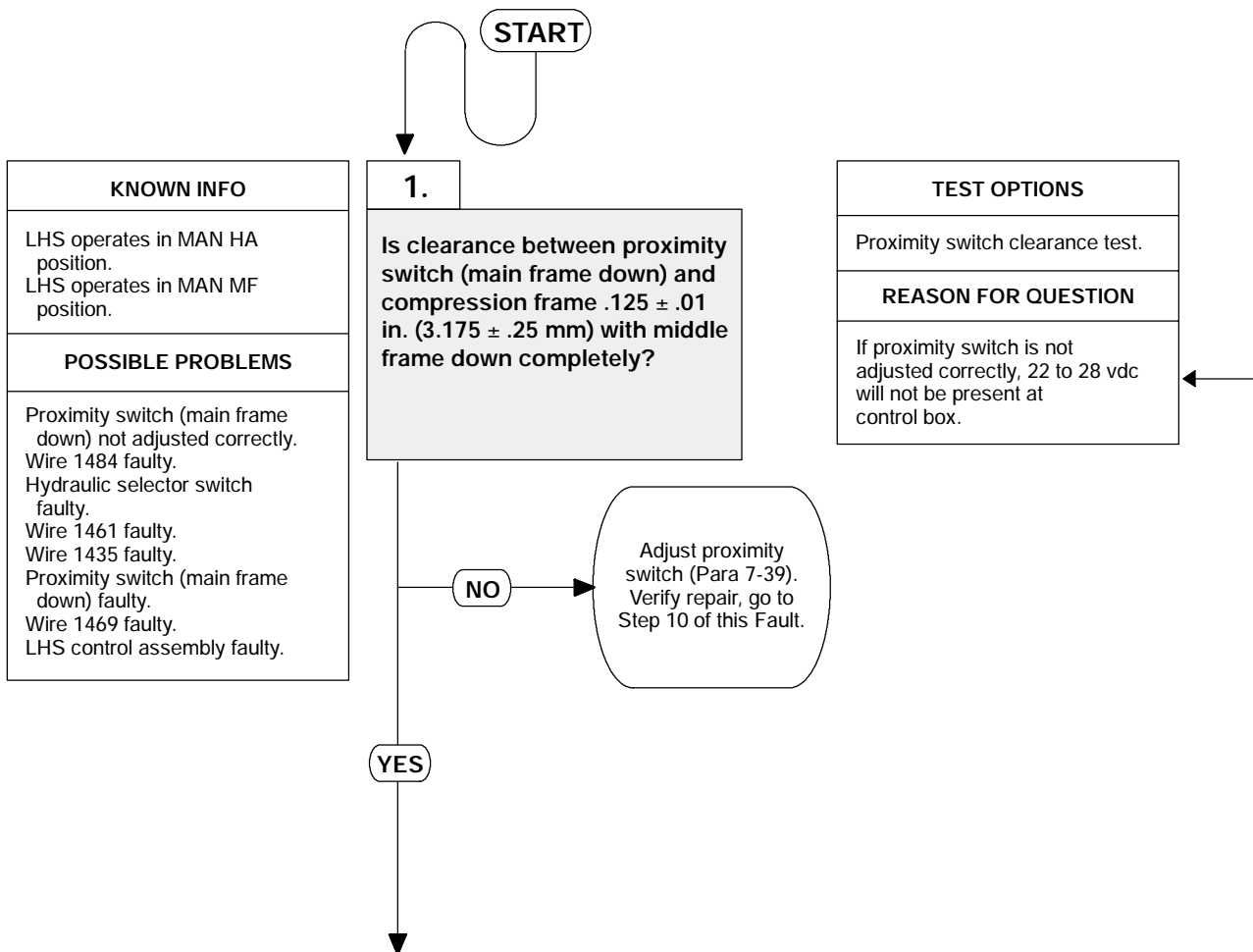
Lockwasher (4) (Item 180, Appendix F)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

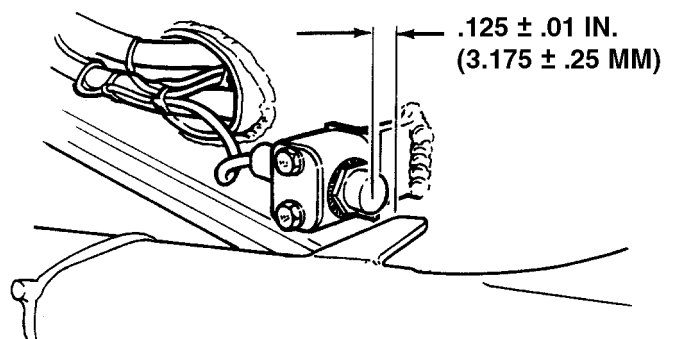
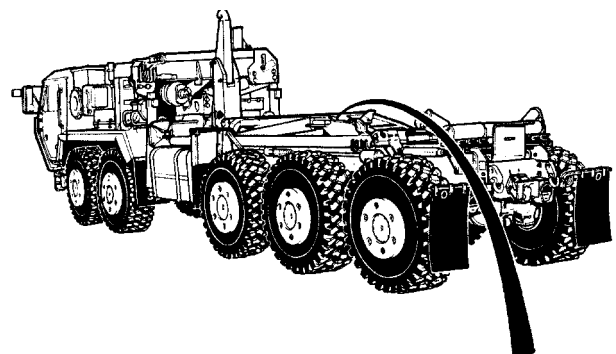
Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 LHS in transit position, (TM 9-2320-364-10)



PROXIMITY SWITCH CLEARANCE TEST

Check clearance between proximity switch and compression frame.

- (1) If clearance is more than .135 in. (3.43 mm) or less than .115 in. (2.92 mm), proximity switch is not adjusted correctly. Adjust proximity switch (main frame down) (Para 7-39).
- (2) If clearance is between .135 in. (3.43 mm) and .115 in. (2.92 mm), proximity switch adjustment is OK.



13. LHS DOES NOT LOAD IN AUTO MODE (CONT).

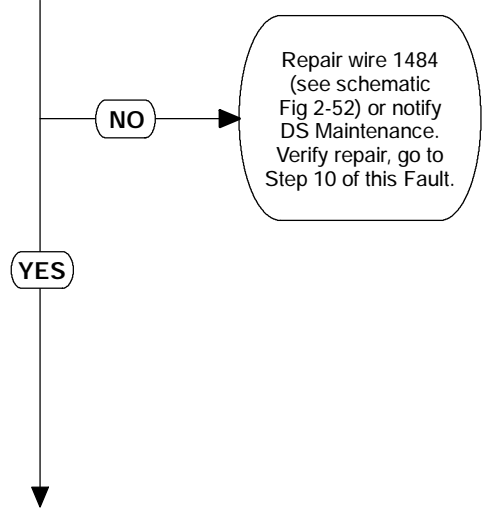
KNOWN INFO
LHS operates in MAN HA position. LHS operates in MAN MF position. Proximity switch (main frame down) adjustment OK.
POSSIBLE PROBLEMS
Wire 1484 faulty. Hydraulic selector switch faulty. Wire 1461 faulty. Wire 1435 faulty. Proximity switch (main frame down) faulty. Wire 1469 faulty. LHS control assembly faulty.

2.

WARNING
Read WARNING on Page 2-2443

Is continuity measured on wire 1484 between harness connector MC93, terminal F and harness connector MC83, terminal H?

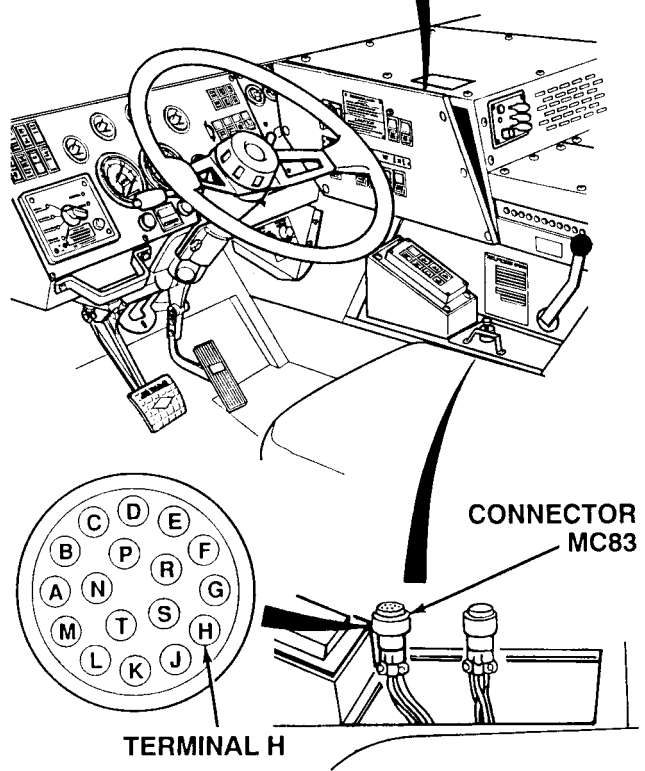
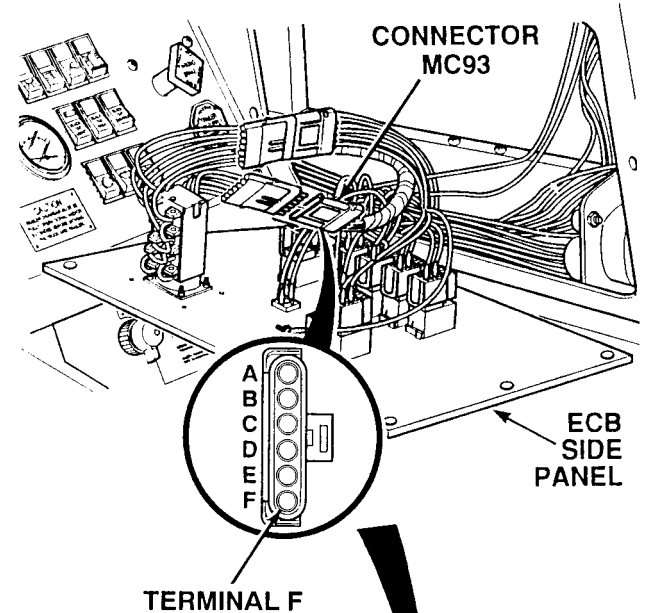
TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1484 is faulty, 22 to 28 vdc will not be present at LHS control assembly.



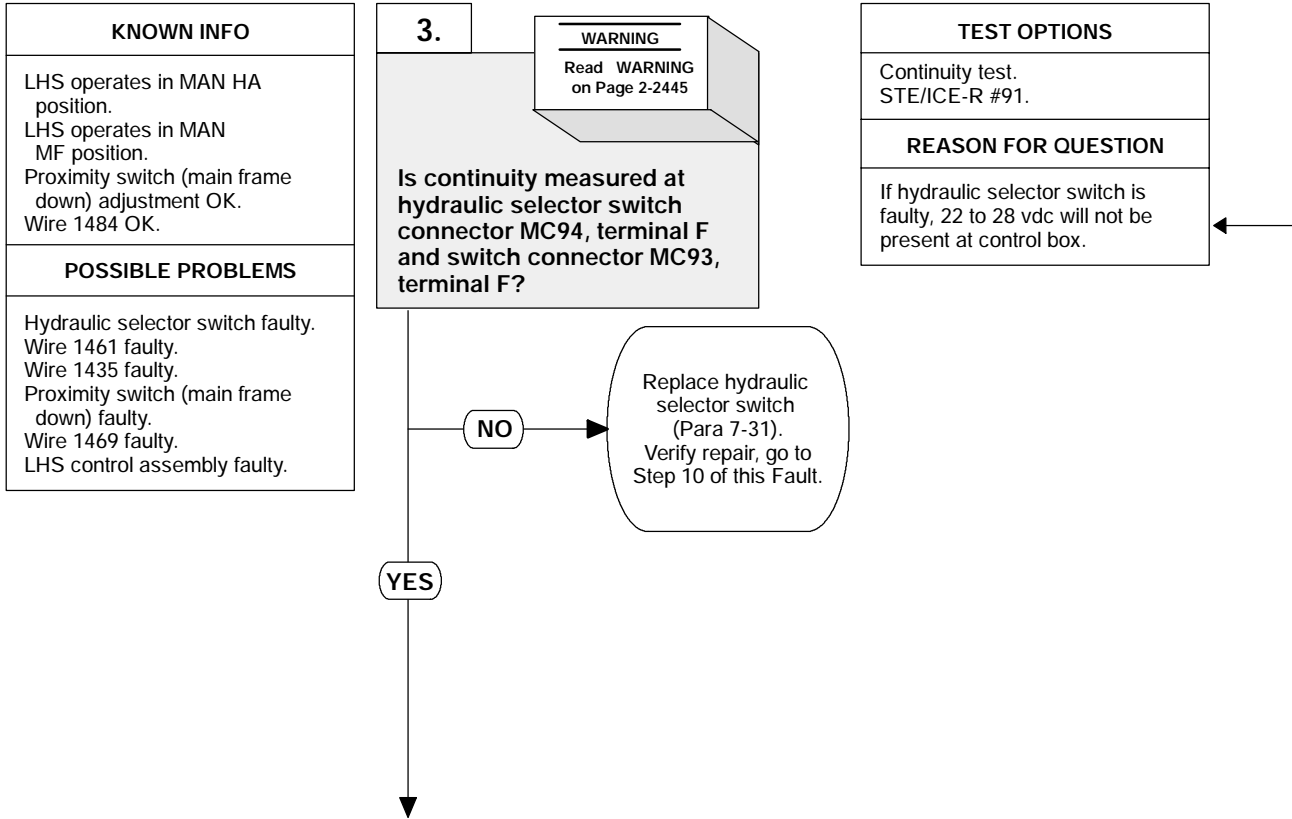
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
(1) Remove LHS control assembly (Para 7-40).
(2) Remove six screws and tilt ECB side panel.
(3) Disconnect harness connector MC93 from hydraulic selector switch connector.
(4) Set multimeter select switch to ohms.
(5) Is there continuity between harness connector MC93 terminal F and harness connector MC83, terminal H?
(a) If there is no continuity, repair wire 1484 (see schematic Fig 2-52) or notify DS Maintenance.
(b) If there is continuity, wire 1484 is OK.
(6) Install LHS control assembly.



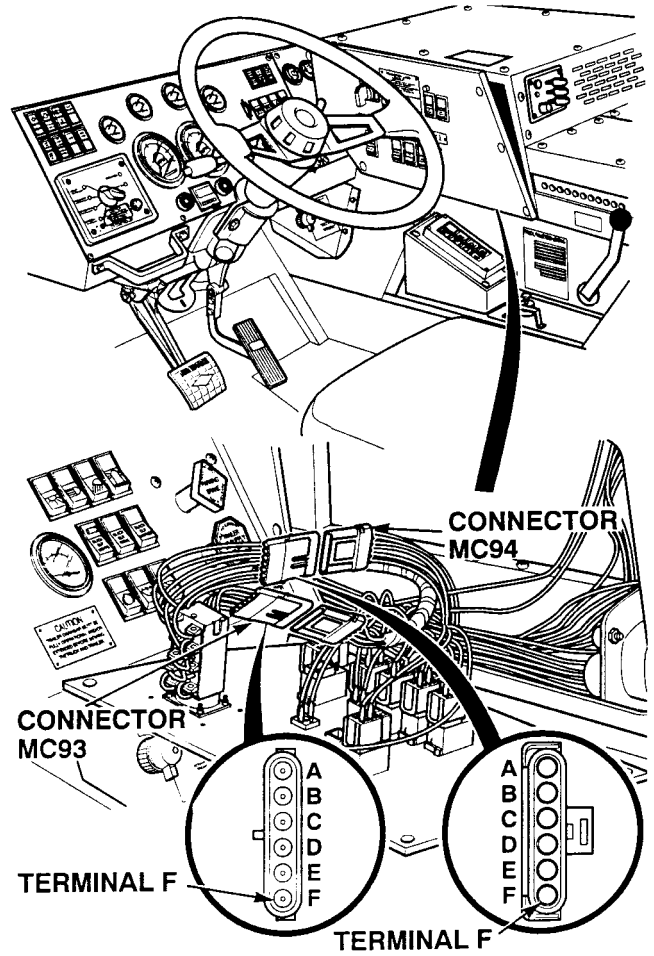
13. LHS DOES NOT LOAD IN AUTO MODE (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur

- | CONTINUITY TEST |
|---|
| (1) Set hydraulic selector switch to AUTO position (TM 9-2320-364-10). |
| (2) Disconnect harness connector MC94 from hydraulic selector switch connector. |
| (3) Set multimeter selector switch to ohms. |
| (4) Is there continuity between switch harness connector MC94, terminal F and harness connector MC93, terminal F? |
| (a) If there is no continuity, replace hydraulic selector switch (Para 7-31). |
| (b) If there is continuity, hydraulic selector switch is OK. |
| (5) Install harness connector MC94 on hydraulic selector switch connector. |
| (6) Install harness connector MC93 on hydraulic selector switch connector. |
| (7) Install ECB side panel and six screws. |



13. LHS DOES NOT LOAD IN AUTO MODE (CONT).

KNOWN INFO
LHS operates in MAN HA position. LHS operates in MAN MF position. Proximity switch (main frame down) adjustment OK. Wire 1484 OK. Hydraulic selector switch OK.
POSSIBLE PROBLEMS
Wire 1461 faulty. Wire 1435 faulty. Proximity switch (main frame down) faulty. Wire 1469 faulty. LHS control assembly faulty.

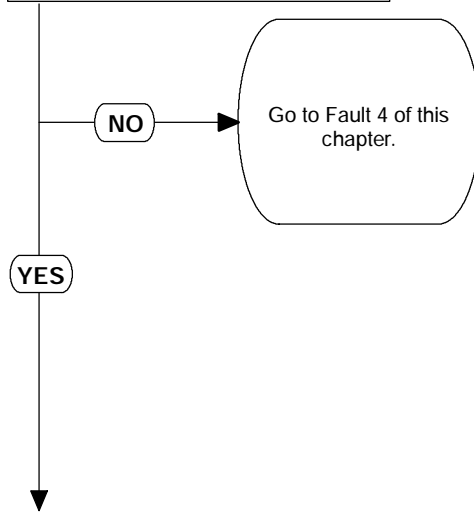
4.

WARNING

Read **WARNING** on Page 2-2447

Are 22 to 28 vdc measured at main junction box, terminal 9 with ENGINE switch in the ON position?

TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If component supplying voltage to main junction box terminal 9 is faulty, 22 to 28 vdc will not be present at proximity switch.



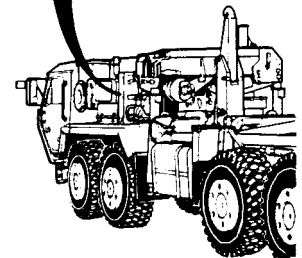
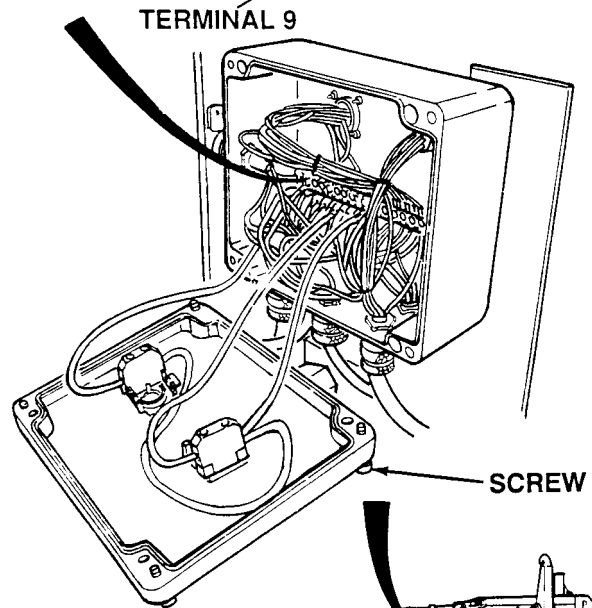
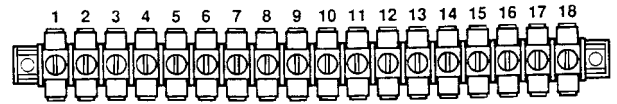
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

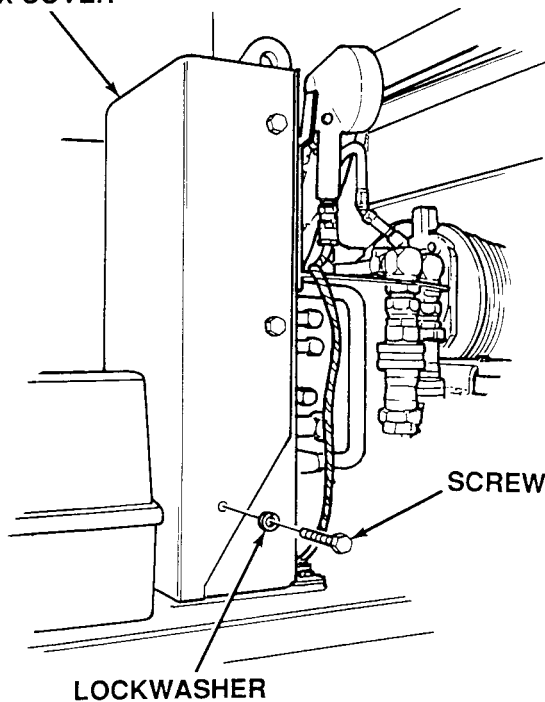
NOTE

Only remove center screw on engine side of LHS control box cover.

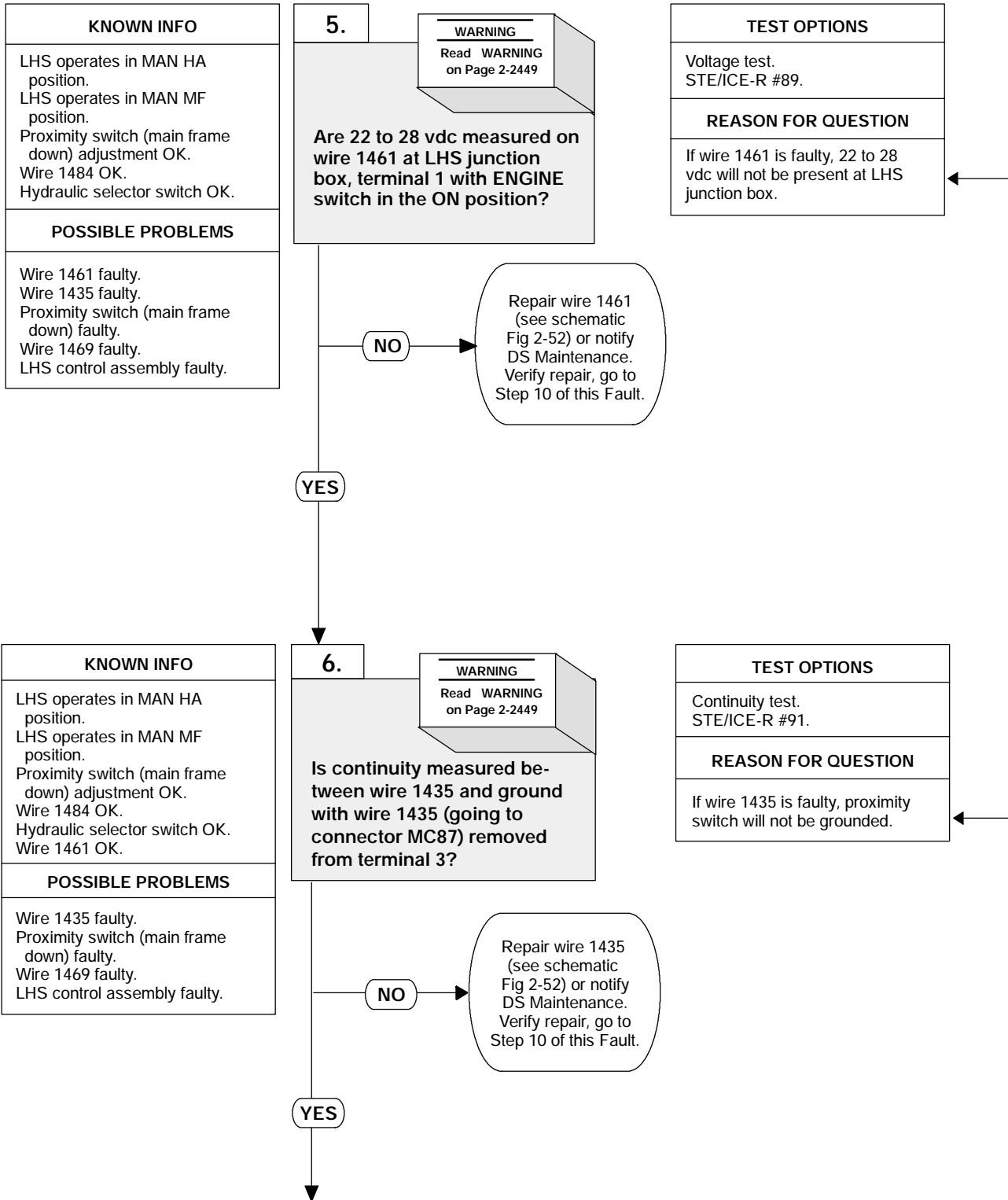
VOLTAGE TEST	
(1)	Remove four screws, lockwashers and LHS control box cover. Discard lockwashers.
(2)	Loosen four screws and open main junction box.
(3)	Set multimeter selector switch to volts dc.
(4)	Connect positive (+) multimeter lead to main junction box, terminal 9.
(5)	Connect negative (-) multimeter lead to a known good ground.
(6)	Turn ON ENGINE switch (TM 9-2320-364-10).
(7)	Turn OFF ENGINE switch.
(8)	Close main junction box and tighten four screws.
(9)	Install LHS control box cover, four lockwashers and screws.



MAIN JUNCTION BOX COVER



13. LHS DOES NOT LOAD IN AUTO MODE (CONT).

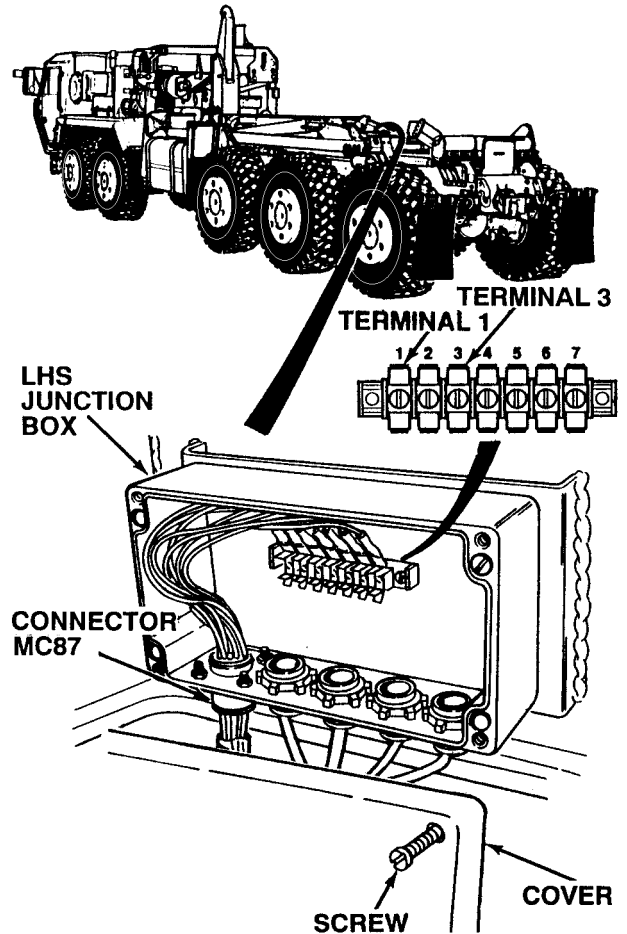


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

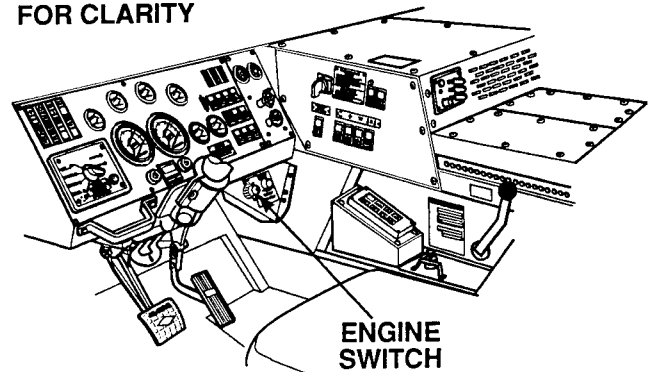
- (1) Loosen four screws and open LHS junction box.
- (2) Set multimeter selector switch to volts dc.
- (3) Connect positive (+) multimeter lead to LHS junction box, terminal 1.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If there are not 22 to 28 vdc present, repair wire 1461 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there are 22 to 28 vdc are present, wire 1461 is OK.
- (6) Turn OFF ENGINE switch.



CONTINUITY TEST

- (1) Disconnect wire 1435 from terminal 3.
- (2) Set multimeter selector switch to ohms.
- (3) Is there continuity between wire 1435 and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance and perform Step (5) below.
 - (b) If there is continuity, wire 1435 is OK.

STEERING WHEEL SHOWN REMOVED FOR CLARITY



13. LHS DOES NOT LOAD IN AUTO MODE (CONT).

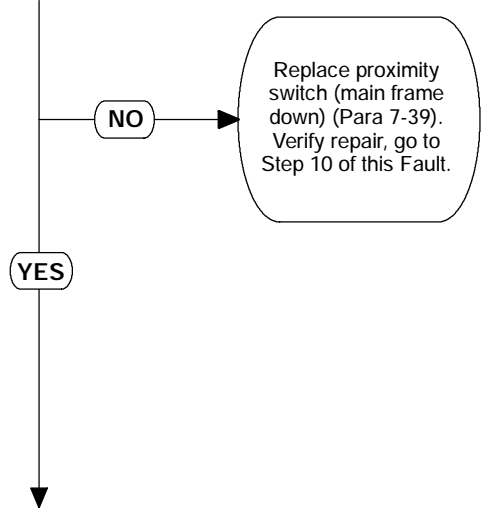
KNOWN INFO
LHS operates in MAN HA position. LHS operates in MAN MF position. Proximity switch (main frame down) adjustment OK. Wire 1484 OK. Hydraulic selector switch OK. Wire 1461 OK. Wire 1435 OK.
POSSIBLE PROBLEMS
Proximity switch (main frame down) faulty. Wire 1469 faulty. LHS control assembly faulty.

7.

WARNING
Read **WARNING** on Page 2-2451

Are 22 to 28 vdc measured at LHS junction box, terminal 4 with middle frame down and 0 vdc measured with middle frame up?

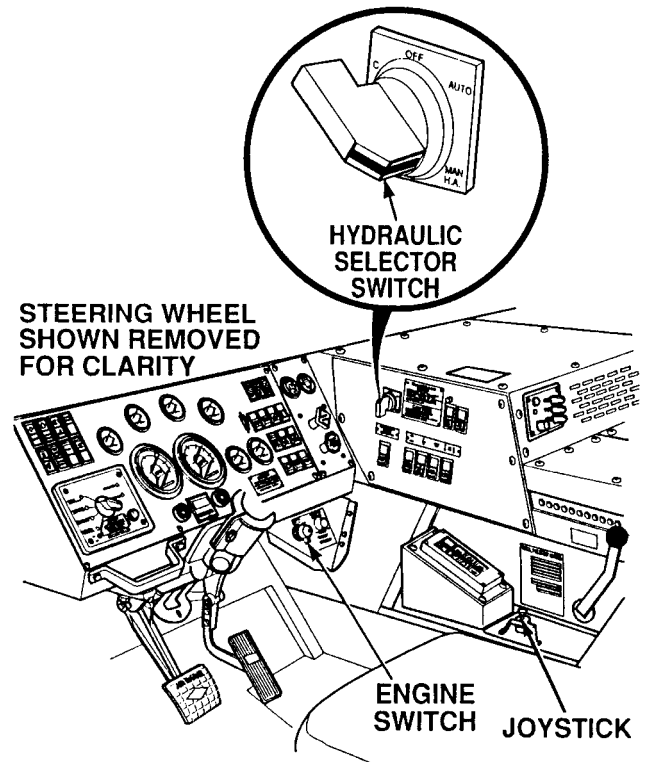
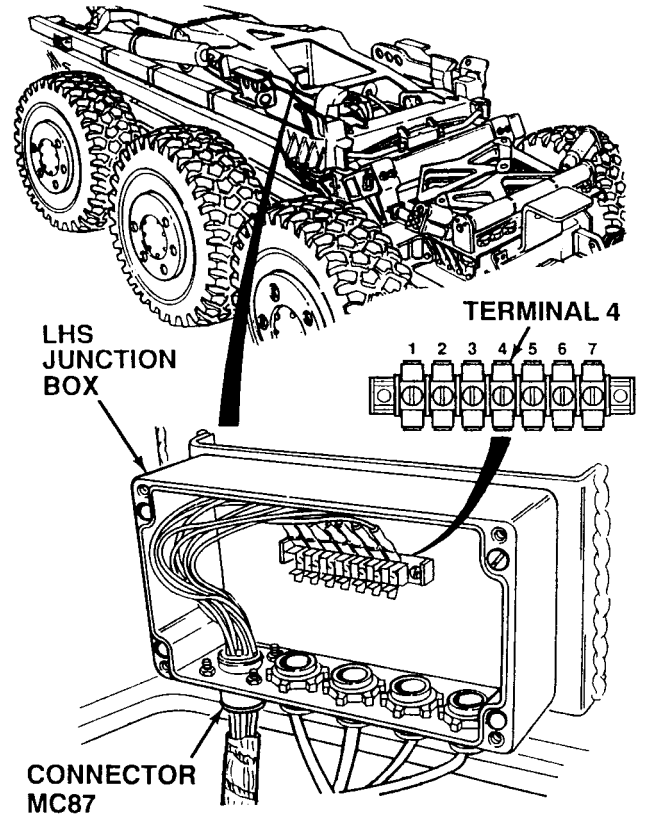
TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If proximity switch is faulty, 22 to 28 vdc will not be present at LHS junction box, terminal 4.



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Set multimeter selector switch to vdc.
 - (2) Connect positive (+) multimeter lead to LHS junction box, terminal 4.
 - (3) Connect negative (-) multimeter lead to a known good ground.
 - (4) Turn ON ENGINE switch
 - (a) If there are not 22 to 28 vdc present, turn OFF ENGINE switch and replace proximity switch (main frame down) (Para 7-39).
 - (b) If there are 22 to 28 vdc present, perform Steps (5) through (8) below.
 - (5) Start engine.
 - (6) Raise LHS completely in AUTO mode.
 - (7) Turn OFF ENGINE switch.
 - (8) Turn ON ENGINE switch.
 - (a) If there are 22 to 28 vdc present, replace proximity switch (main frame down) (Para 7-39).
 - (b) If there are not 22 to 28 vdc present, proximity switch is OK.
 - (9) Put LHS in transit position.
 - (10) Turn OFF ENGINE switch.



13. LHS DOES NOT LOAD IN AUTO MODE (CONT).

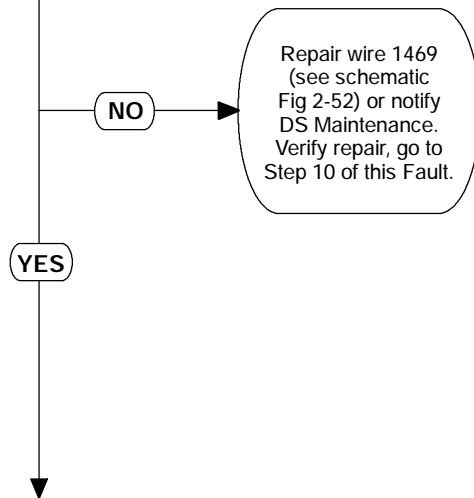
KNOWN INFO
LHS operates in MAN HA position. LHS operates in MAN MF position. Proximity switch (main frame down) adjustment OK. Wire 1484 OK. Hydraulic selector switch OK. Wire 1461 OK. Wire 1435 OK. Proximity switch (main frame down) OK.
POSSIBLE PROBLEMS
Wire 1469 faulty. LHS control assembly faulty.

8.

WARNING
Read **WARNING** on Page 2-2453

Is continuity measured between wire 1469 and ground at harness connector MC81, terminal G and ground with LHS junction box terminal 4 jumpered to ground?

TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1469 is loose, faulty or shorted to ground, 22 to 28 vdc will not be present at LHS control assembly.

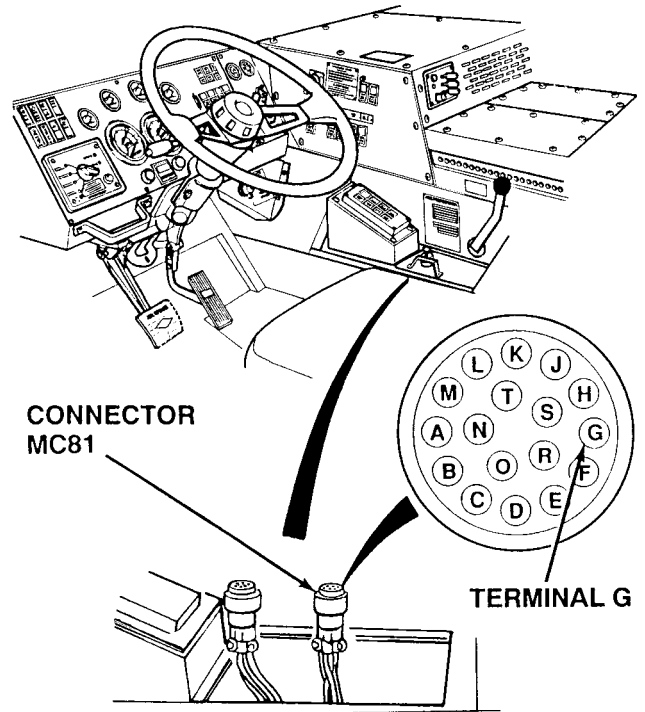
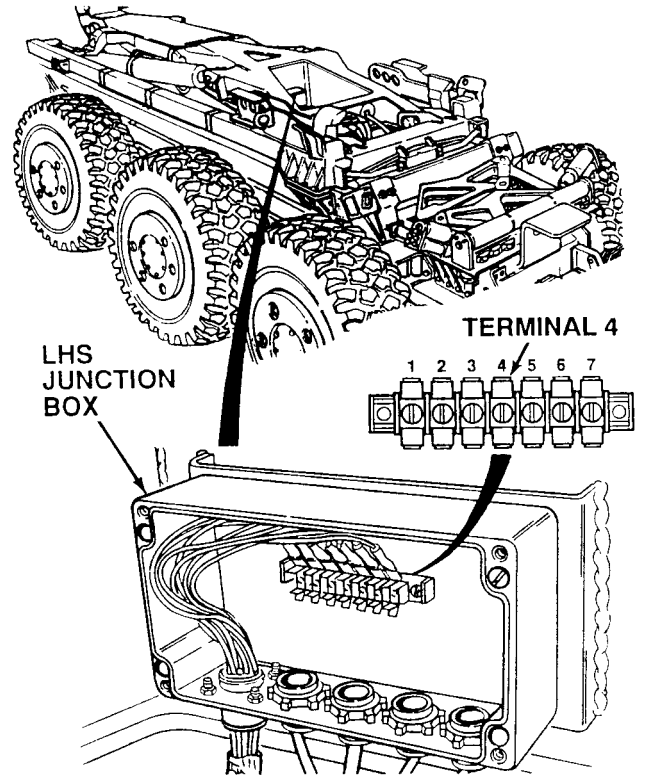


WARNING

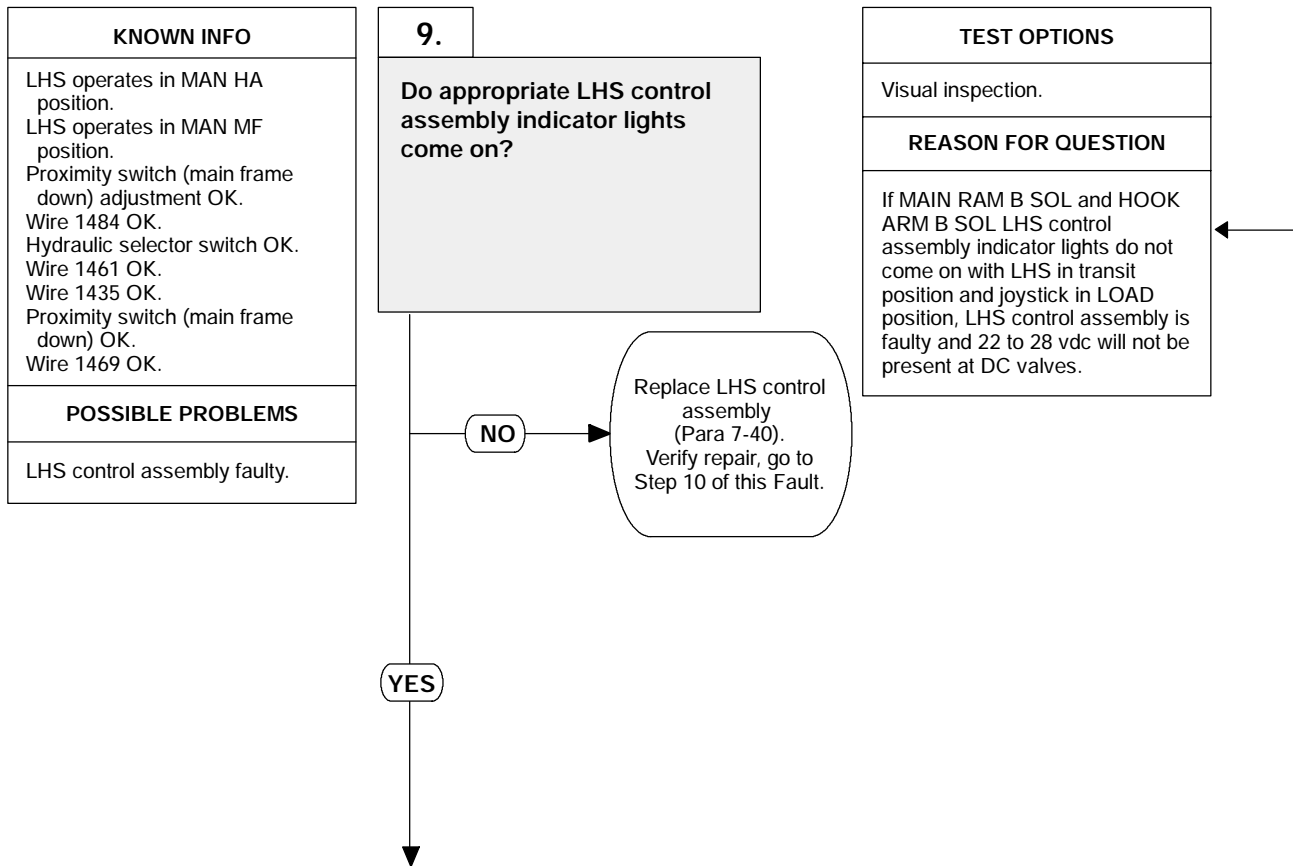
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Connect LHS junction box terminal 4 to a known good ground using jumperwire.
- (3) Remove LHS control assembly (Para 7-40).
- (4) Set multimeter selector switch to ohms.
- (5) Is there continuity between harness connector MC81, terminal G and a known good ground?
 - (a) If there is no continuity, repair wire 1469 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1469 is OK.
- (6) Remove jumperwire form terminal 4.
- (7) Close LHS junction box cover and tighten four screws.



13. LHS DOES NOT LOAD IN AUTO MODE (CONT).



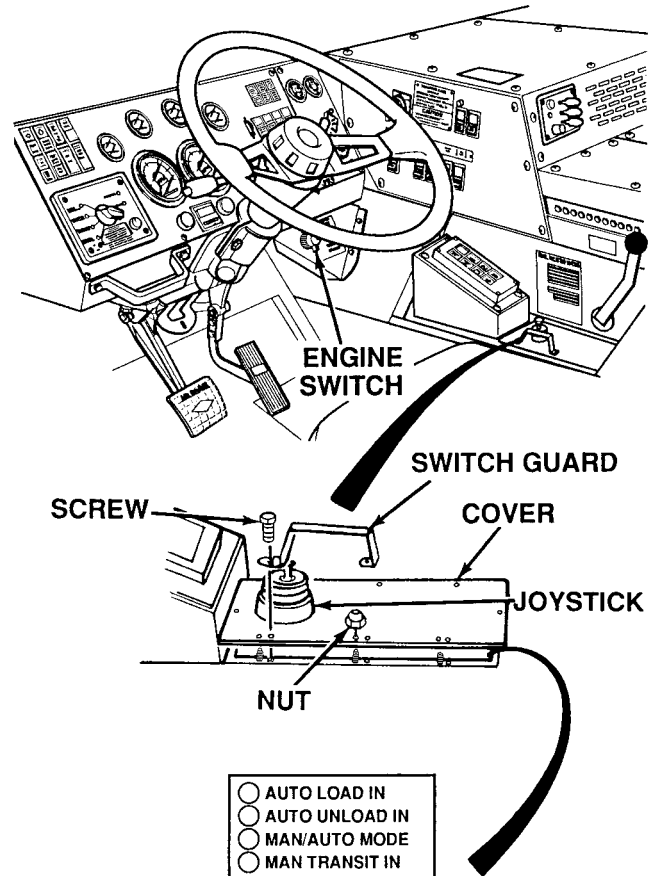
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.

- VISUAL INSPECTION**
- (1) Connect LHS control assembly.
 - (2) Carefully lift off LHS control assembly cover from LHS control box assembly. Do not allow cover to dangle by joystick connecting wires.
 - (3) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (4) Observe red indicator lights at bottom of LHS control assembly while holding joystick in LOAD position.
 - (a) If HOOK ARM B SOL light and MAIN RAM B SOL light are not on, LHS control assembly is faulty. Replace LHS control assembly (Para 7-40).
 - (b) If HOOK ARM B SOL light and MAIN RAM B SOL light are on, perform Steps (5) through (9) below.
 - (5) Start engine.
 - (6) Raise LHS in AUTO mode until middle frame is approximately 3 ft (91 cm) above transit position.
 - (7) Turn OFF ENGINE switch.
 - (8) Turn ON ENGINE switch.
 - (9) Observe red indicator lights at bottom of LHS control box assembly while holding joystick in LOAD position.
 - (a) If HOOK ARM B SOL light is on or MAIN RAM B SOL light is not on, replace LHS control assembly (Para 7-40).
 - (b) If HOOK ARM B SOL light is not on and MAIN RAM B SOL light is on, LHS control box assembly is OK.
 - (10) Install cover and switch guard on LHS control assembly with eight screws and nuts.



- AUTO LOAD IN
- AUTO UNLOAD IN
- MAN/AUTO MODE
- MAN TRANSIT IN

- UNLOAD OUT
- LOAD OUT
- AUX MODE IN
- NO TRANSIT LIGHT
- OVERLOAD LIGHT
- HOOK ARM "A" SOL
- MAIN RAM "B" SOL
- HOOK ARM "B" SOL
- MAIN RAM "A" SOL
- +24V IN
- HOOK ARM UP

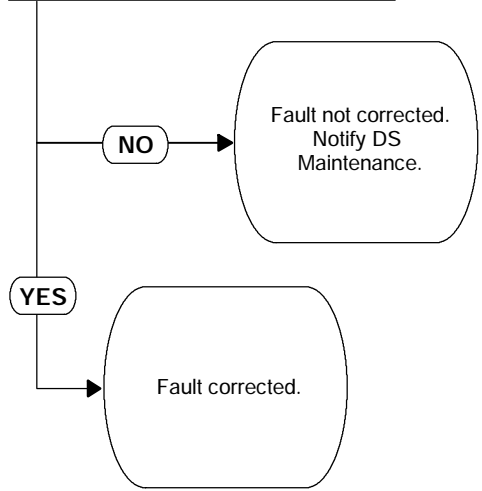
- FREE FLOW VALVE
- HOOK ARM DOWN
- TRANSIT VALVE
- OVERLOAD IN
- MID FRAME DOWN

13. LHS DOES NOT LOAD IN AUTO MODE (CONT).

KNOWN INFO
LHS operates in MAN HA position. LHS operates in MAN MF position. Proximity switch (main frame down) adjustment OK. Wire 1484 OK. Hydraulic selector switch OK. Wire 1461 OK. Wire 1435 OK. Proximity switch (main frame down) OK. Wire 1469 OK. LHS control assembly OK.
POSSIBLE PROBLEMS

10.

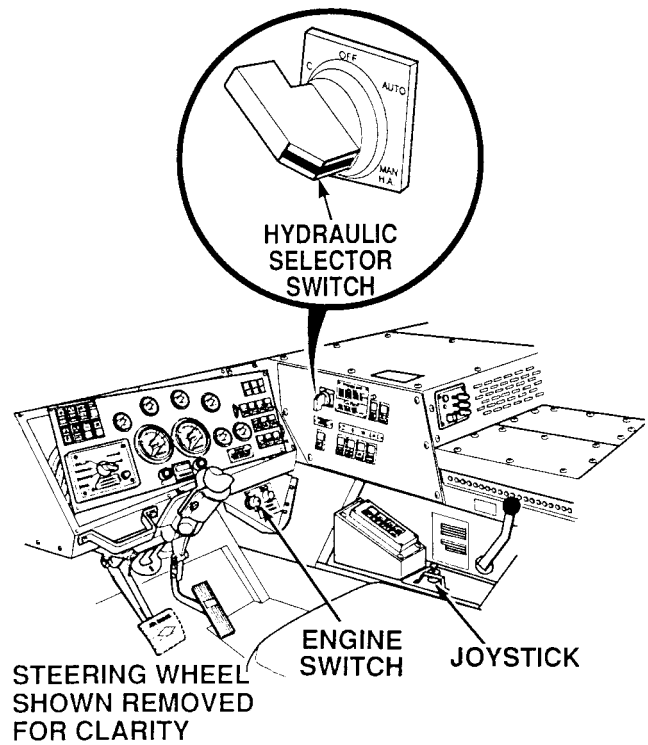
Does LHS load in the AUTO mode?



TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If LHS loads in the AUTO mode fault has been corrected.

VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch in the AUTO position.
- (3) Hold joystick in the LOAD position.
 - (a) If LHS does not load, fault not corrected. Perform Steps (4) through (6) below and notify DS maintenance.
 - (b) If LHS loads, fault has been corrected.
- (4) Position LHS in transit position.
- (5) Set hydraulic selector switch to OFF.
- (6) Turn OFF ENGINE switch.



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

14. LHS DOES NOT UNLOAD IN AUTO MODE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)
STE/ICE-R (optional) (Item 3, Appendix G)
Multimeter (Item 44, Appendix G)
Jumperwire

Materials/Parts

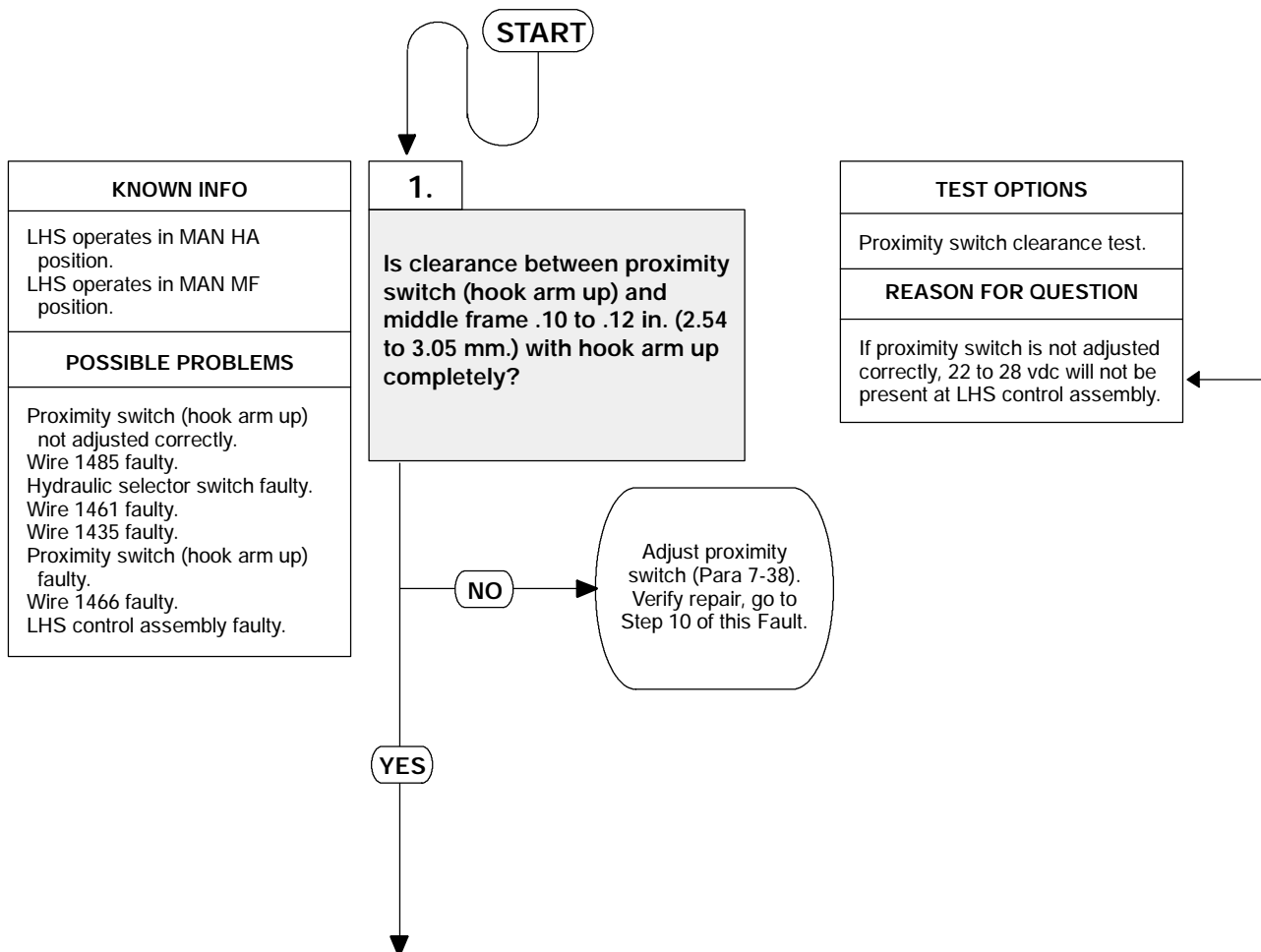
Lockwasher (4) (Item 180, Appendix F)

References

TM 9-2320-364-10
TM 9-4910-571-12&P

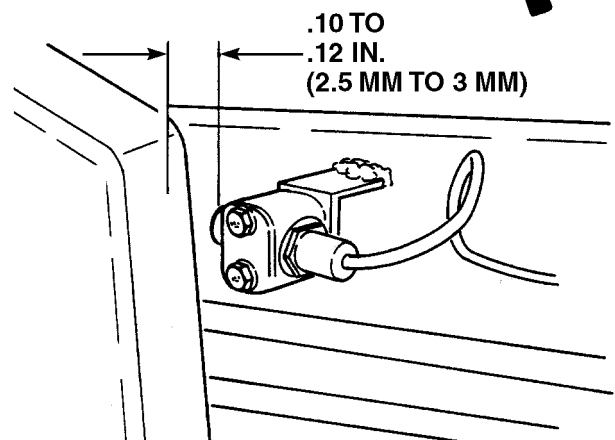
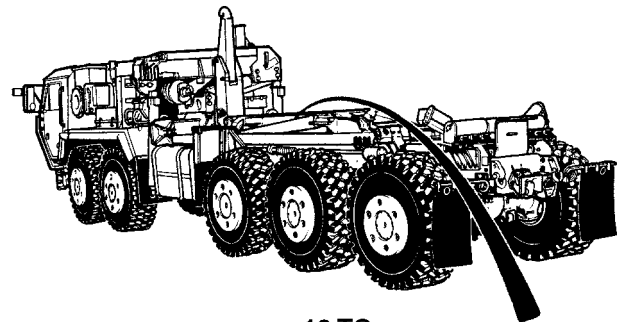
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)

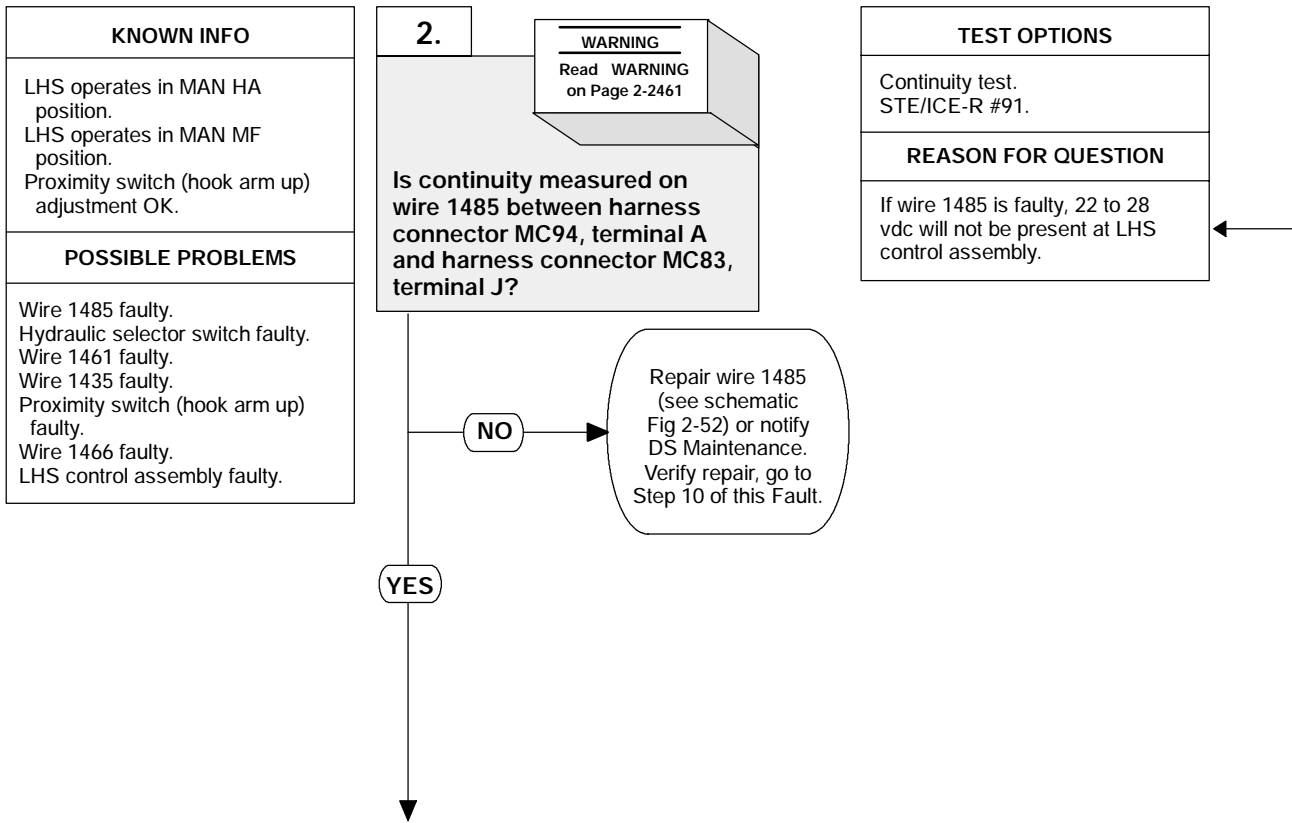


PROXIMITY SWITCH CLEARANCE TEST

- (1) Raise hook arm completely (TM 9-2320-364-10).
- (2) Check clearance between proximity switch and middle frame.
 - (a) If clearance is more than .12 in. (3.05 mm) or less than .10 in. (2.54 mm), adjust proximity switch (hook arm up) (Para 7-38).
 - (b) If clearance is between .12 in. (3.05 mm) and .10 in. (2.54 mm), proximity switch adjustment is OK.



14. LHS DOES NOT UNLOAD IN AUTO MODE (CONT).

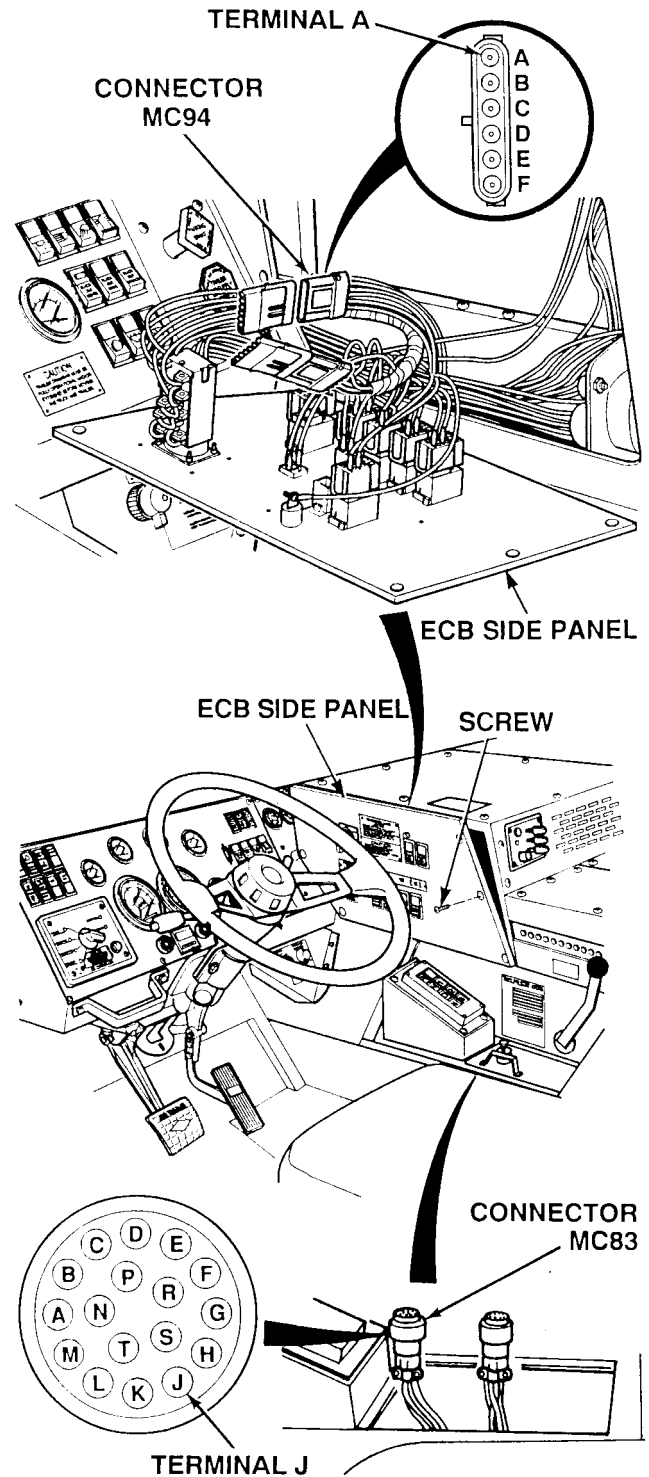


WARNING

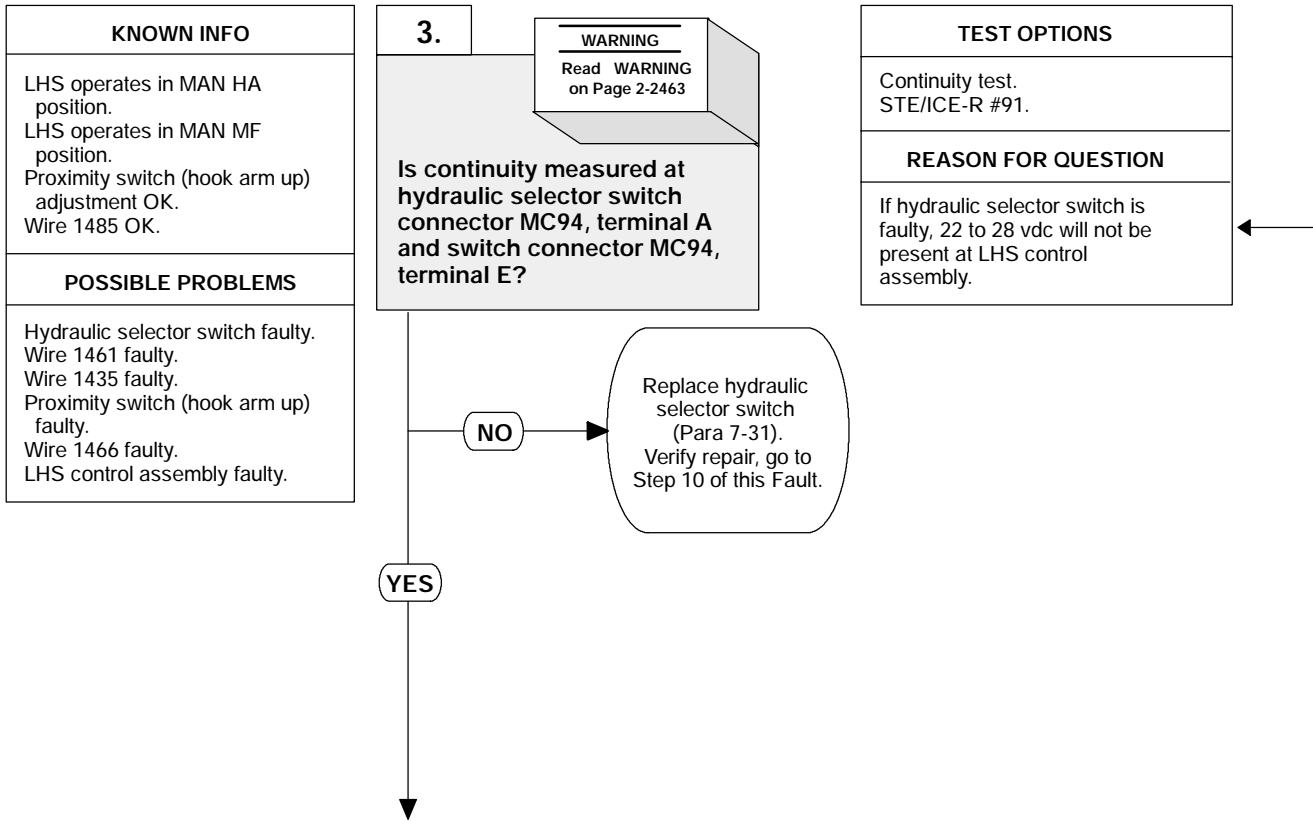
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Remove LHS control assembly (Para 7-40).
- (2) Remove six screws and tilt ECB side panel.
- (3) Disconnect harness connector MC94 from hydraulic selector switch connector.
- (4) Set multimeter select switch to ohms.
- (5) Is there continuity between harness connector MC94, terminal A and harness connector MC83, terminal J?
 - (a) If there is no continuity, repair wire 1485 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1485 is OK.
- (6) Install LHS control assembly (Para 7-40).



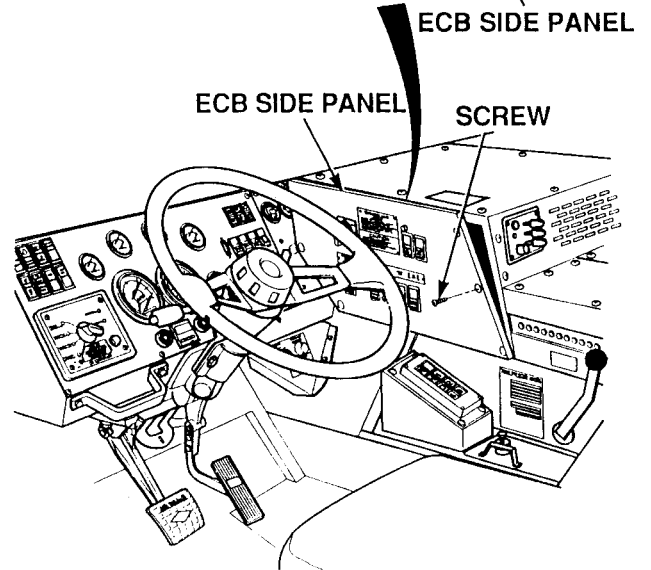
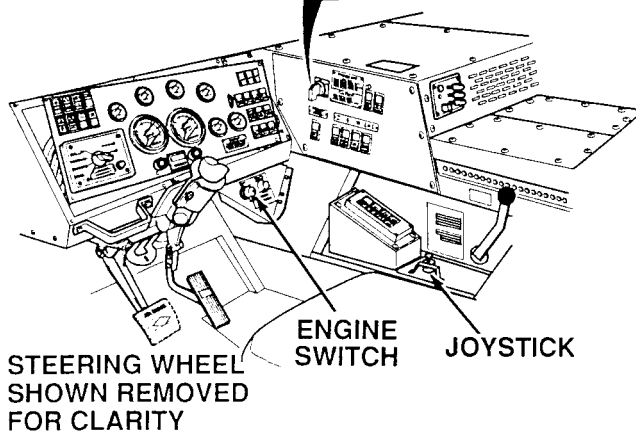
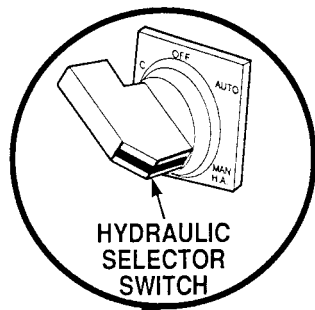
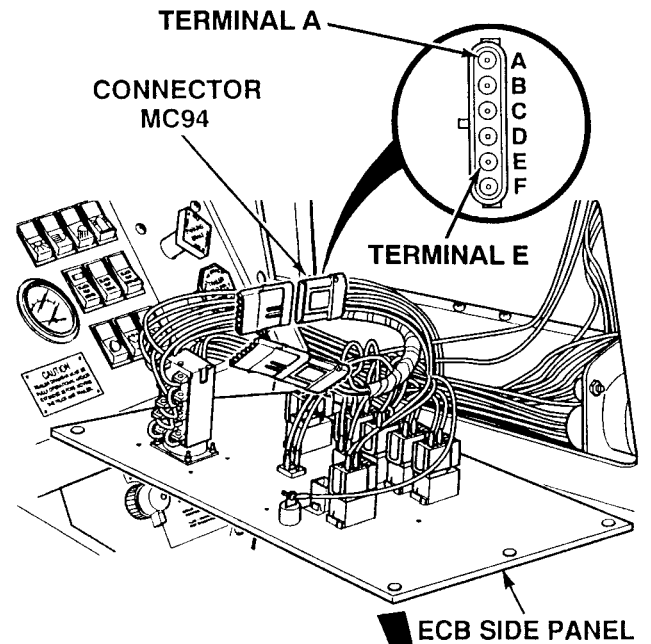
14. LHS DOES NOT UNLOAD IN AUTO MODE (CONT).



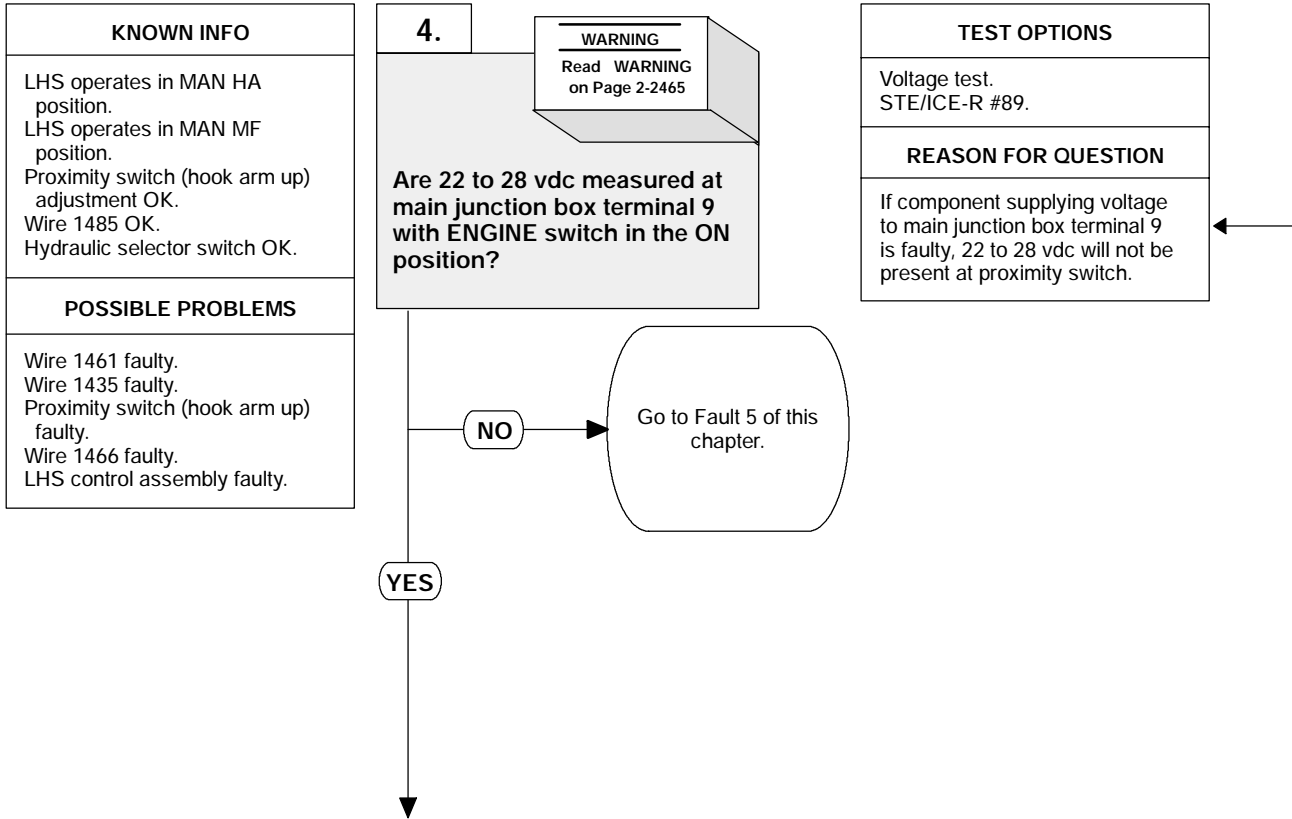
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Set hydraulic selector switch to AUTO position (TM 9-2320-364-10).
 - (2) Set multimeter selector switch to ohms.
 - (3) Is there continuity between switch connector MC94, terminal E and terminal A?
 - (a) If there is no continuity, replace hydraulic selector switch (Para 7-31).
 - (b) If there is continuity, hydraulic selector switch is OK.
 - (4) Install harness connector MC94 on hydraulic selector switch connector.
 - (5) Install ECB side panel and six screws.



14. LHS DOES NOT UNLOAD IN AUTO MODE (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

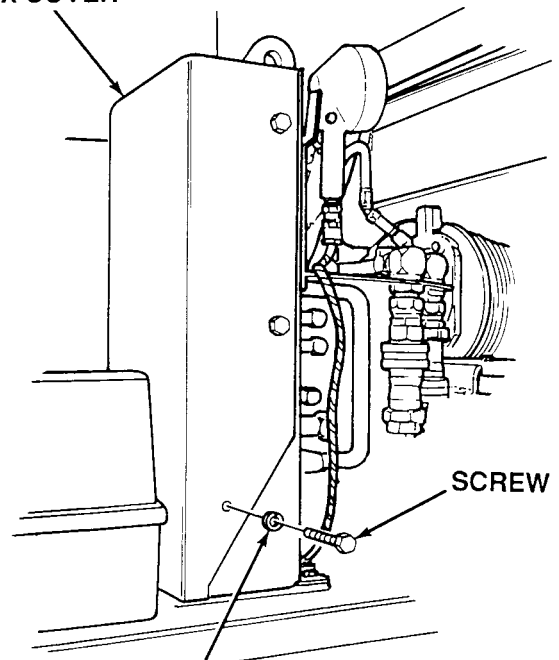
NOTE

Only remove center screw on engine side of LHS control box cover.

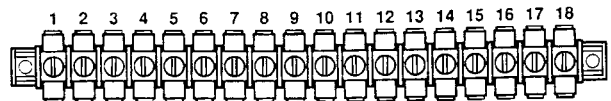
VOLTAGE TEST

- (1) Remove four screws, lockwashers and LHS control box cover. Discard lockwashers.
- (2) Loosen four screws and open main junction box.
- (3) Set multimeter selector switch to volts dc.
- (4) Connect positive (+) multimeter lead to main junction box, terminal 9.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If there are not 22 to 28 vdc present, perform Steps (7) through (9) below and go to Fault 5 of this chapter.
 - (b) If there are 22 to 28 vdc present, perform Steps (7) through (9) below and go to Step 5 of this Fault.
- (7) Turn OFF ENGINE switch.
- (8) Close main junction box and tighten four screws.
- (9) Install LHS control box cover, four lockwashers and screws.

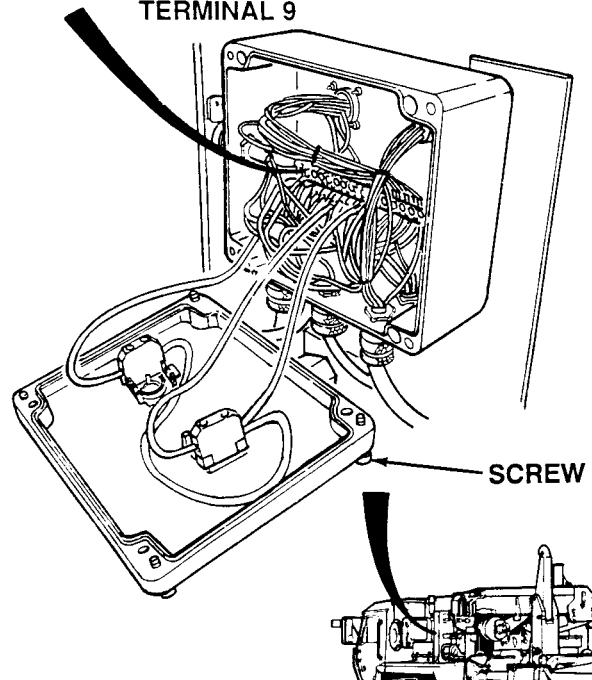
MAIN JUNCTION BOX COVER



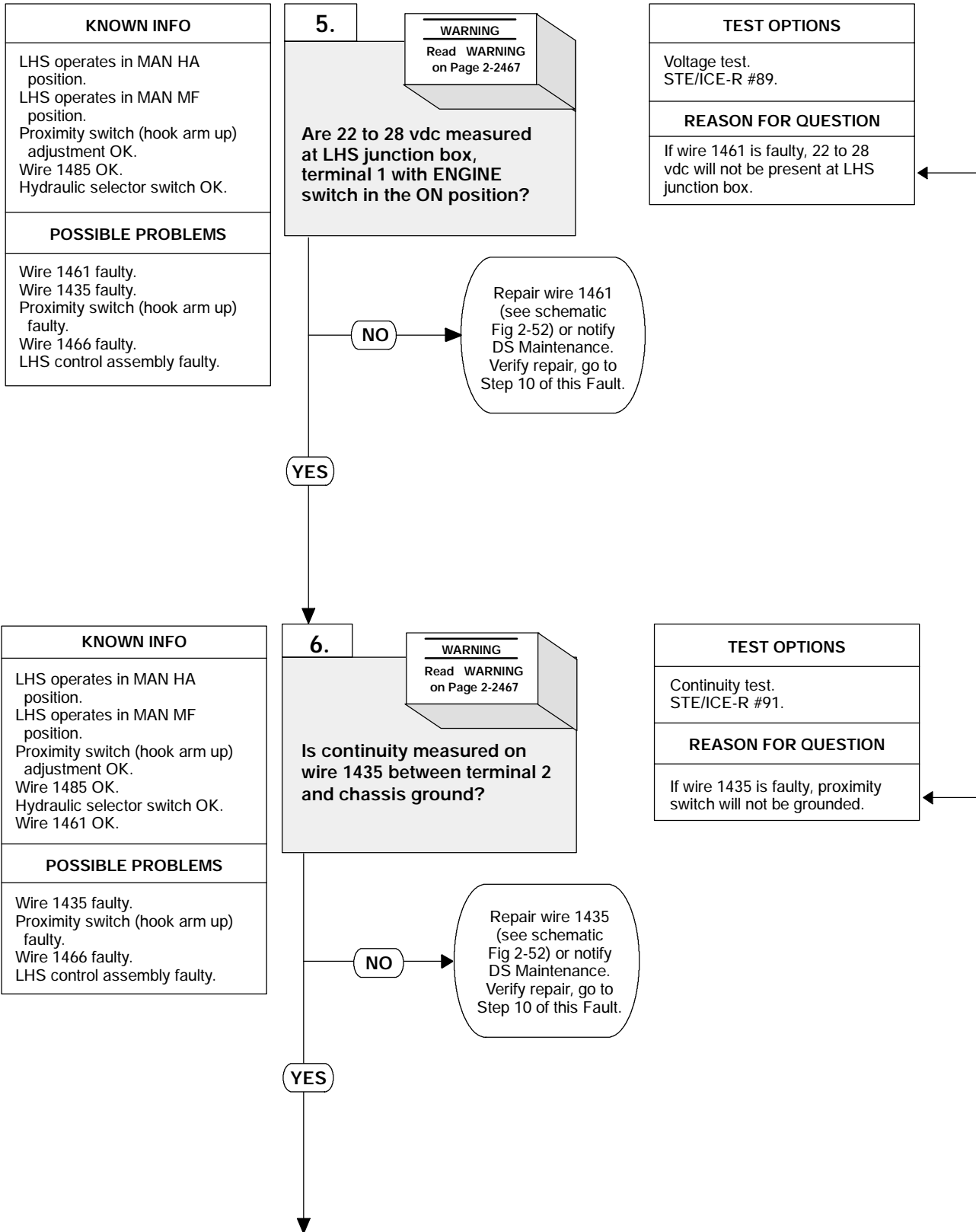
LOCKWASHER



TERMINAL 9



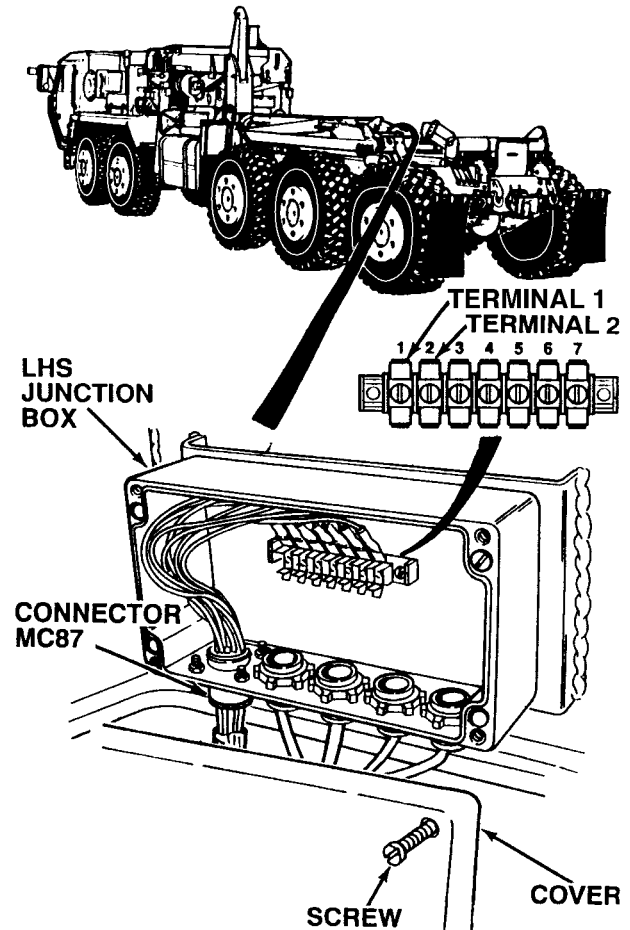
14. LHS DOES NOT UNLOAD IN AUTO MODE (CONT).



WARNING

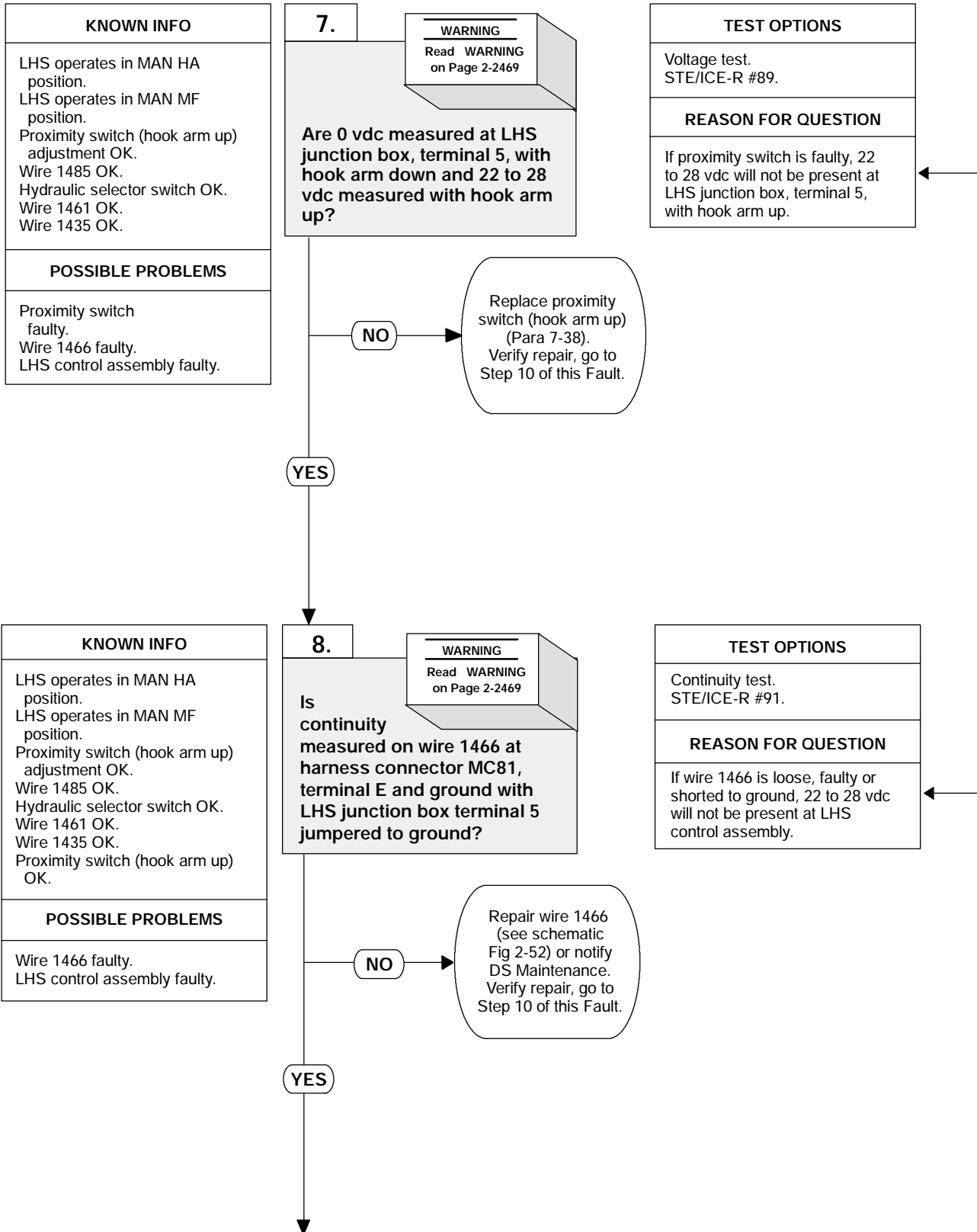
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST |
|--|
| <ol style="list-style-type: none"> (1) Loosen four screws and open LHS junction box. (2) Set multimeter selector switch to volts dc. (3) Connect positive (+) multimeter lead to LHS junction box, terminal 1. (4) Connect negative (-) multimeter lead to a known good ground. (5) Turn ON ENGINE switch (TM 9-2320-364-10). <ol style="list-style-type: none"> (a) If there are not 22 to 28 vdc present, perform Step (6) below. Repair wire 1461 (see schematic Fig 2-36) or notify DS Maintenance. (b) If there are 22 to 28 vdc present, wire 1461 is OK. (6) Turn OFF ENGINE switch, (TM 9-2320-364-10). |



- | CONTINUITY TEST |
|--|
| <ol style="list-style-type: none"> (1) Disconnect wire 1435 (coming from harness connector MC87) from terminal 2. (2) Set multimeter selector switch to ohms. (3) Is there continuity between harness connector MC87, terminal 2 wire 1435 and a known good ground? <ol style="list-style-type: none"> (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance. (b) If there is continuity, wire 1435 is OK. (4) Connect wire 1435 to terminal 2. |

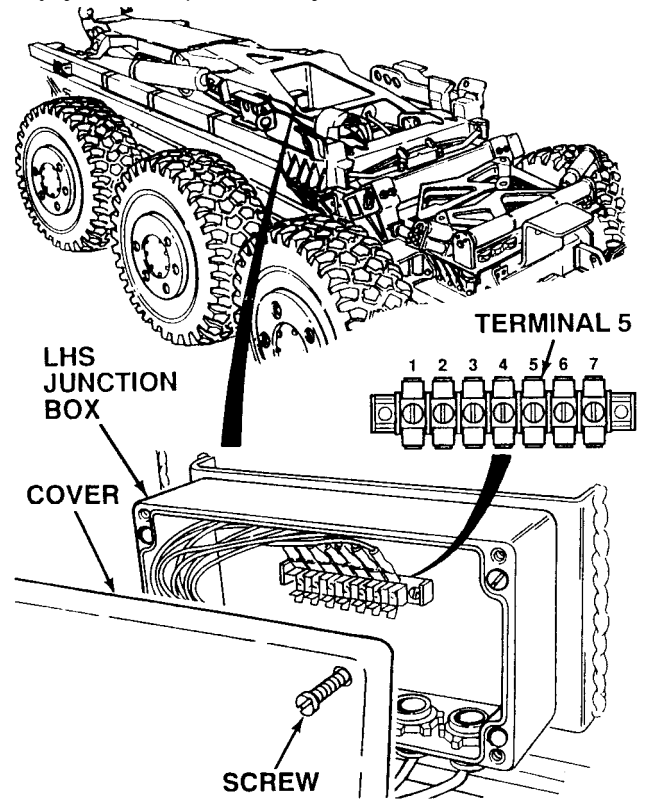
14. LHS DOES NOT UNLOAD IN AUTO MODE (CONT).



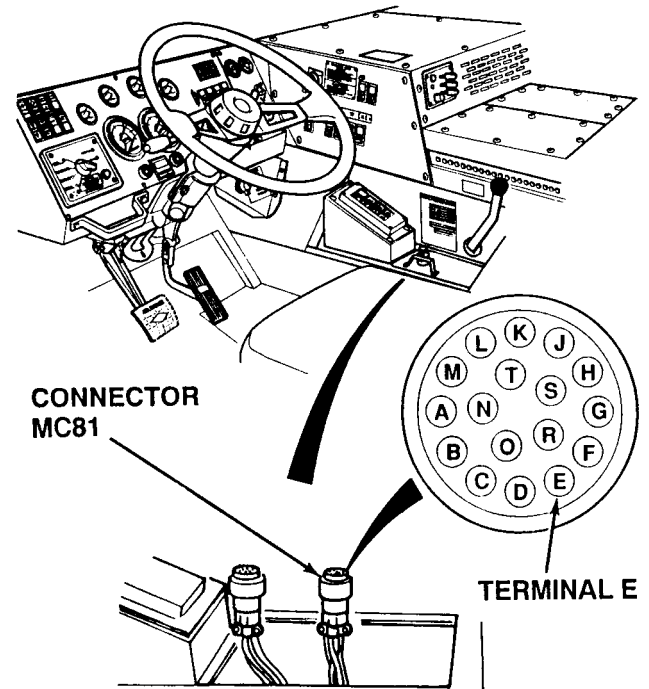
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

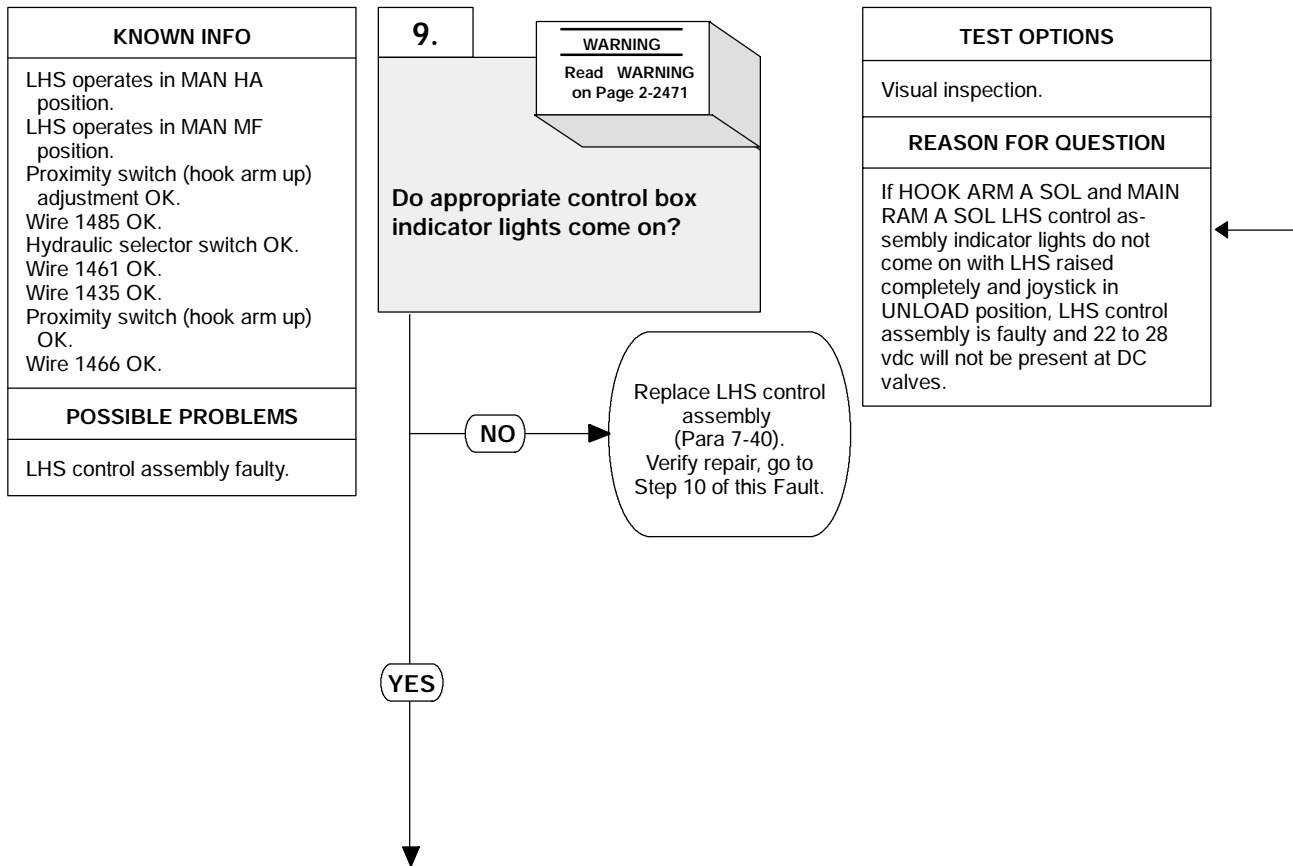
- VOLTAGE TEST**
- (1) Put LHS in transit position (TM 9-2320-364-10).
 - (2) Set multimeter selector switch to volts dc.
 - (3) Connect positive (+) multimeter lead to LHS junction box, terminal 5.
 - (4) Connect negative (-) multimeter lead to a known good ground.
 - (5) Turn ON ENGINE switch.
 - (a) If there are 22 to 28 vdc present, perform Steps (10) through (18) below and replace proximity switch (hook arm up) (Para 7-38).
 - (b) If there are not 22 to 28 vdc present, perform Step (6) below.
 - (6) Start engine.
 - (7) Raise hook arm completely.
 - (8) Turn OFF ENGINE switch.
 - (9) Turn ON ENGINE switch.
 - (a) If there are not 22 to 28 vdc present, perform Step (10) below and replace proximity switch (hook arm up) (Para 7-38).
 - (b) If there are 22 to 28 vdc present, proximity switch is OK.
 - (10) Start engine.
 - (11) Put LHS in transit position.
 - (12) Turn OFF ENGINE switch.



- CONTINUITY TEST**
- (1) Connect LHS junction box terminal 5 to a known good ground using jumperwire.
 - (2) Remove LHS control assembly (Para 7-40).
 - (3) Set multimeter selector switch to ohms.
 - (4) Is there continuity between harness connector MC81, terminal E and a known good ground?
 - (a) If there is no continuity, repair wire 1466 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1466 is OK.
 - (5) Remove jumperwire from LHS junction box terminal 5 and ground.
 - (6) Close LHS junction box and tighten four screws.



14. LHS DOES NOT UNLOAD IN AUTO MODE (CONT).



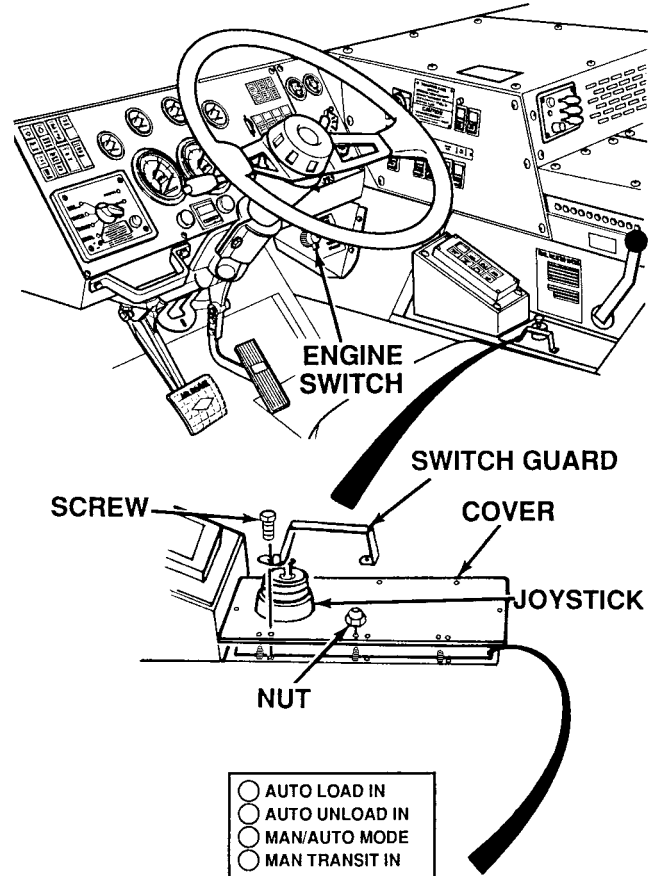
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CAUTION

Do not allow the LHS control box assembly cover to hang from console by the wire connections to the control box assembly. Failure to comply will damage the wire connections.

- VISUAL INSPECTION**
- (1) Connect LHS control assembly.
 - (2) Start engine (TM 9-2320-364-10).
 - (3) Raise LHS completely so that both hook arm and middle frame are off compression frame.
 - (4) Turn OFF ENGINE switch.
 - (5) Carefully lift off LHS control assembly cover. Do not allow cover to dangle by joystick connecting wires.
 - (6) Turn ON ENGINE switch.
 - (7) Observe red indicator lights at bottom of LHS control assembly while holding joystick in UNLOAD position.
 - (a) If HOOK ARM A SOL light and MAIN RAM A SOL light are not on, replace LHS control assembly (Para 7-40).
 - (b) If HOOK ARM A SOL light and MAIN RAM A SOL light are on, perform Steps (8) and (9) below.
 - (8) Put LHS in transit position.
 - (9) Observe red indicator lights at bottom of LHS control assembly while holding joystick in UNLOAD position.
 - (a) If HOOK ARM A SOL light is not on or MAIN RAM A SOL light is on, replace LHS control assembly (Para 7-40).
 - (b) If HOOK ARM A SOL light is on and MAIN RAM A SOL light is not on, LHS control assembly is OK.
 - (10) Install cover and switch guard on LHS control assembly with eight screws and nuts.

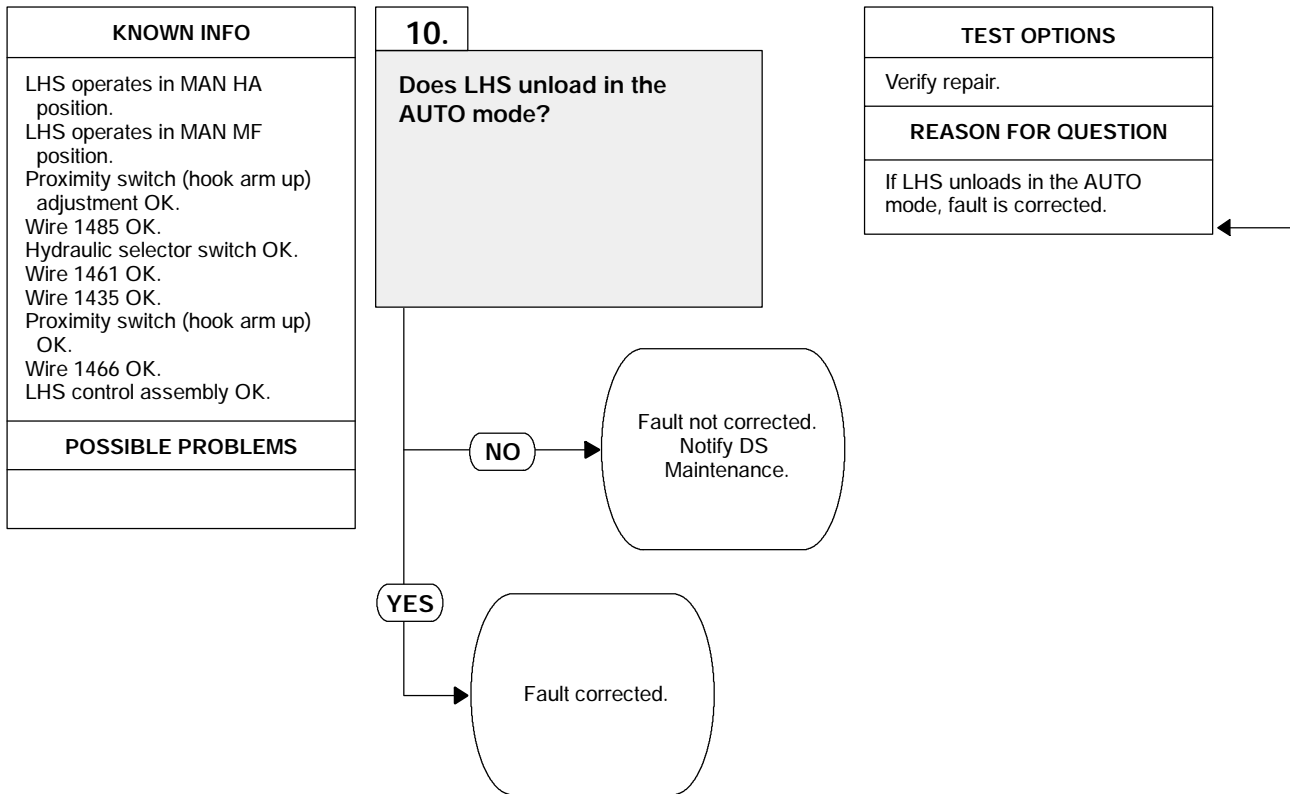


- AUTO LOAD IN
- AUTO UNLOAD IN
- MAN/AUTO MODE
- MAN TRANSIT IN

- UNLOAD OUT
- LOAD OUT
- AUX MODE IN
- NO TRANSIT LIGHT
- OVERLOAD LIGHT
- HOOK ARM "A" SOL
- MAIN RAM "B" SOL
- HOOK ARM "B" SOL
- MAIN RAM "A" SOL
- +24V IN
- HOOK ARM UP

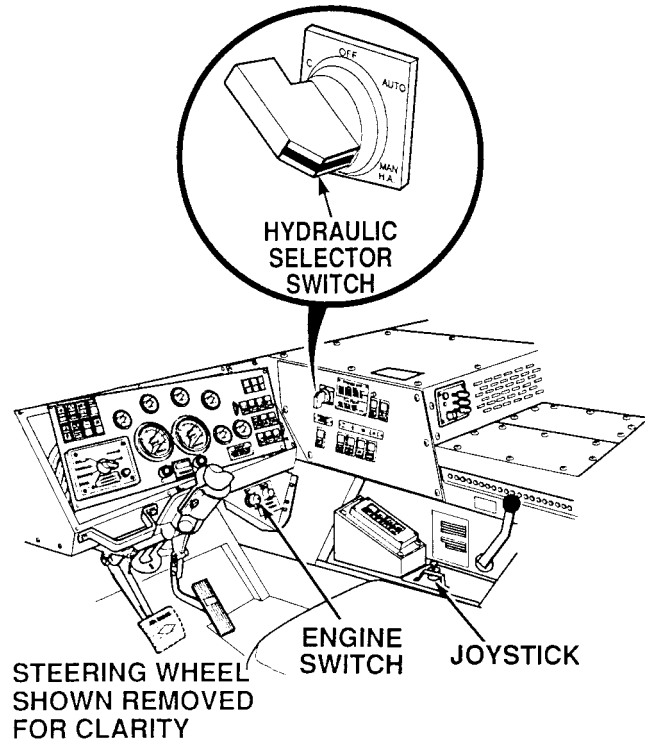
- FREE FLOW VALVE
- HOOK ARM DOWN
- TRANSIT VALVE
- OVERLOAD IN
- MID FRAME DOWN

14. LHS DOES NOT UNLOAD IN AUTO MODE (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch in the AUTO position.
- (3) Hold joystick in the UNLOAD position.
 - (a) If LHS does not unload, fault not corrected. Perform Steps (4) through (6) below and notify DS Maintenance.
 - (b) If LHS unloads, fault has been corrected.
- (4) Position LHS in transit position.
- (5) Set hydraulic selector switch in OFF position.
- (6) Turn OFF ENGINE switch.



2-28. LOAD HANDLING SYSTEM (LHS) TROUBLESHOOTING (CONT).

15. LHS INOPERATIVE WITH INTERFACE KIT INSTALLED.

INITIAL SETUP

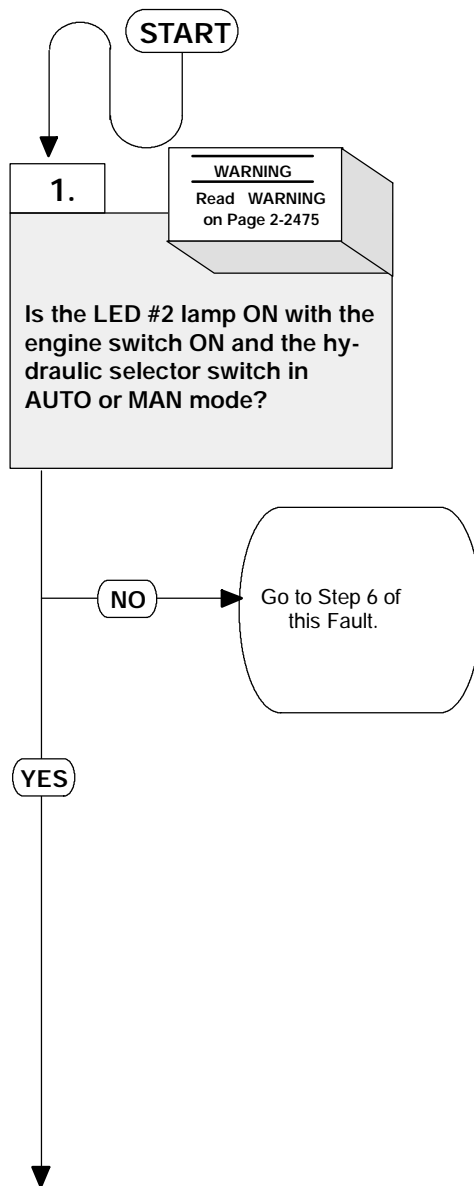
Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)

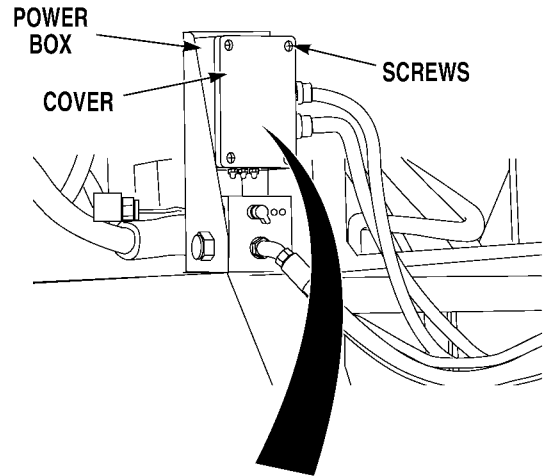
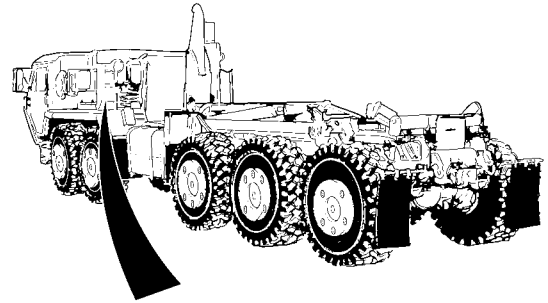
KNOWN INFO
No mission module hooked up to interface quick disconnect.
POSSIBLE PROBLEMS
LED #2 lamp is not ON. Wire 1790 from LED #2 lamp to connector MC135 terminal D faulty. Wire 1790 from connector MC135 terminal D to connector MC133 terminal 1 faulty. Wire 1435 between connector MC133 terminal 2 and connector MC135 terminal E faulty. Wire 1435 between connector MC135 terminal E and LED #2 lamp faulty. LED #2 lamp faulty. Wire 1790 between LED #2 lamp and relay R35 terminal 87 faulty. Relay R35 faulty. Wire 1734 between relay R35 terminal 30 and resistor faulty. Resistor faulty. Wire 1734 between resistor and rectifier terminal AC faulty. Wire 1734 between resistor and connector MC135 terminal B faulty. Wire 1734 between connector MC135 terminal B and connector MC132 terminal 1 faulty. Wire 1435 between connector MC132 terminal 2 and connector MC135 terminal C faulty. Wire 1435 between connector MC135 terminal C and LED #2 lamp faulty. Wire 1435 between LED #2 lamp and relay R35 terminal 85 faulty. Wire 1734 between relay R35 terminal 86 and resistor faulty.



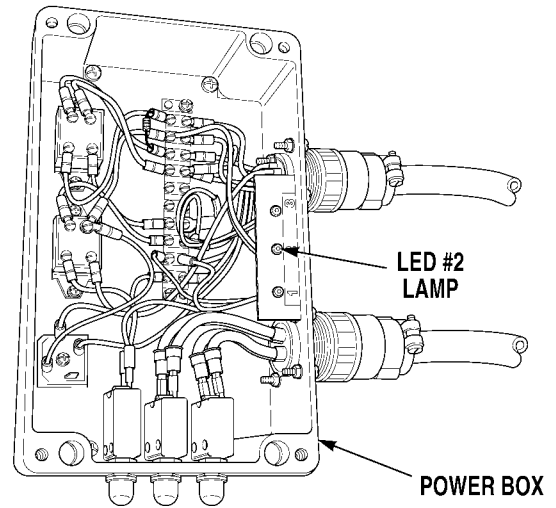
TEST OPTIONS
Visual Inspection.
REASON FOR QUESTION
If LED #2 lamp is ON and LHS is inoperative, power is present up to LED #2 lamp.

WARNING

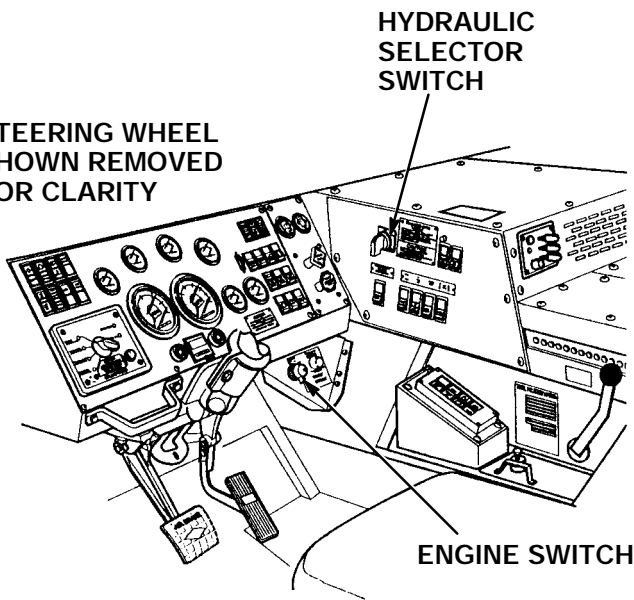
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



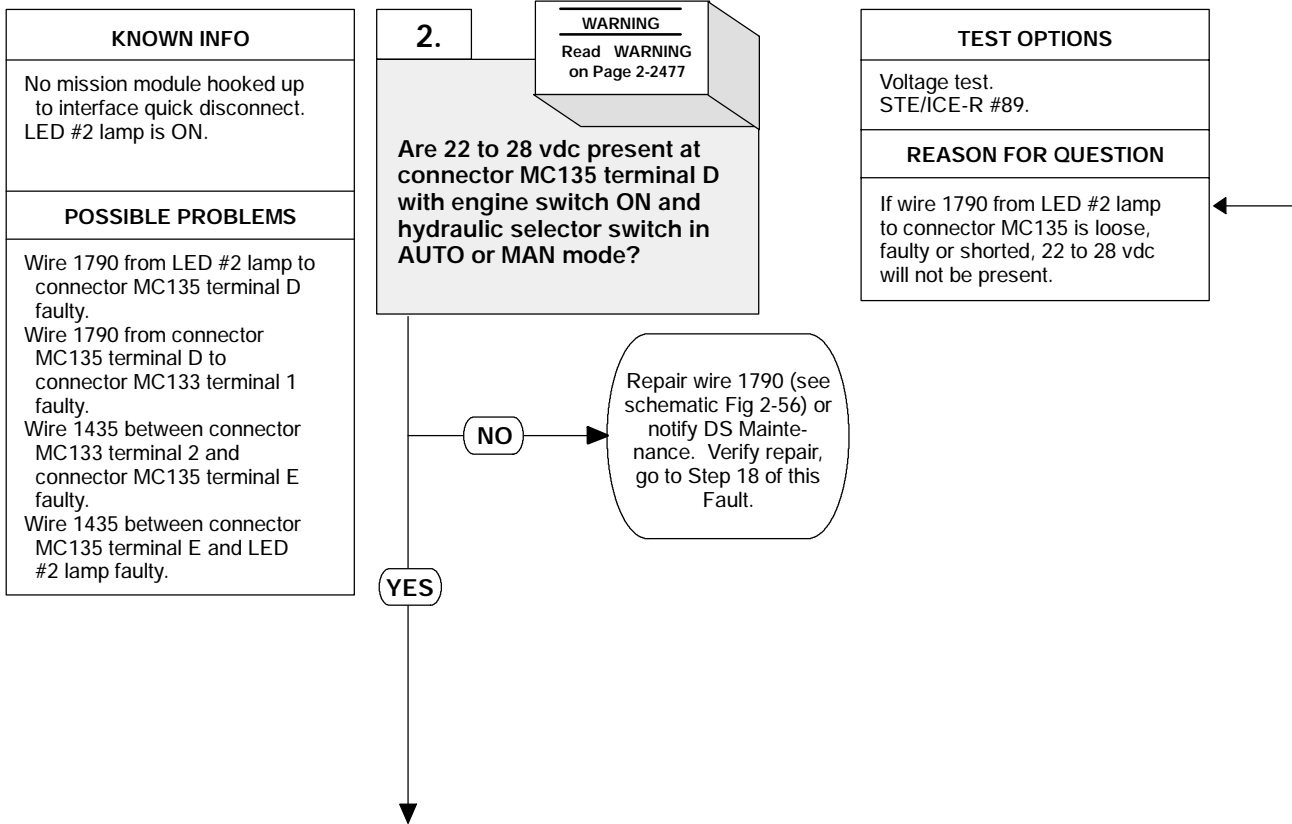
- VISUAL INSPECTION**
- (1) Loosen four screws and remove powerbox cover (Para 21-16).
 - (2) Turn ON engine switch (TM 9-2320-364-10).
 - (3) Set hydraulic selector switch to AUTO or MAN mode.
 - (4) Observe LED #2 lamp in powerbox.
 - (a) If lamp is not ON, perform STEP (5) below and go to Step 6 of this Fault.
 - (b) If LED #2 lamp is on and LHS is inoperative, perform Step (5) below and go to Step 2 of this Fault.
 - (5) Turn OFF engine switch.



STEERING WHEEL SHOWN REMOVED FOR CLARITY



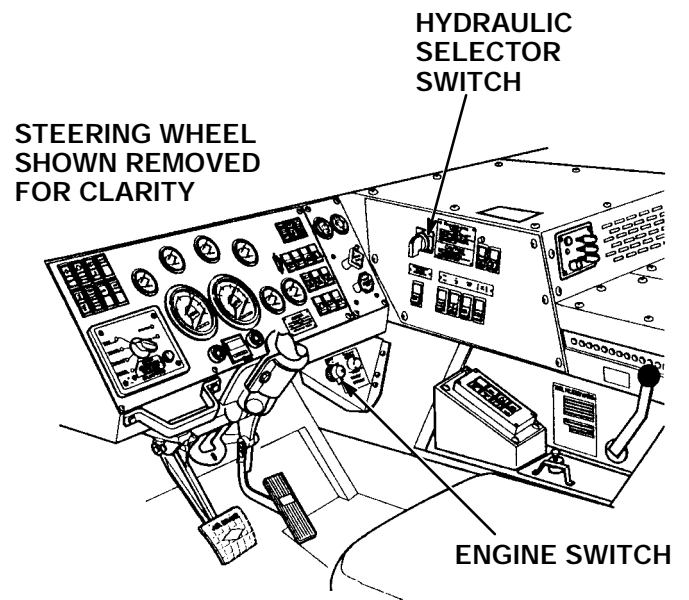
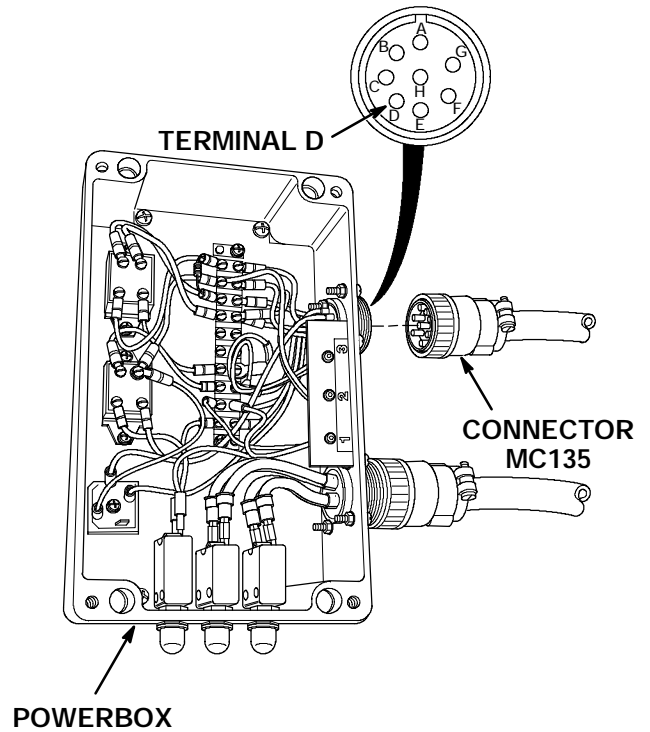
15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).



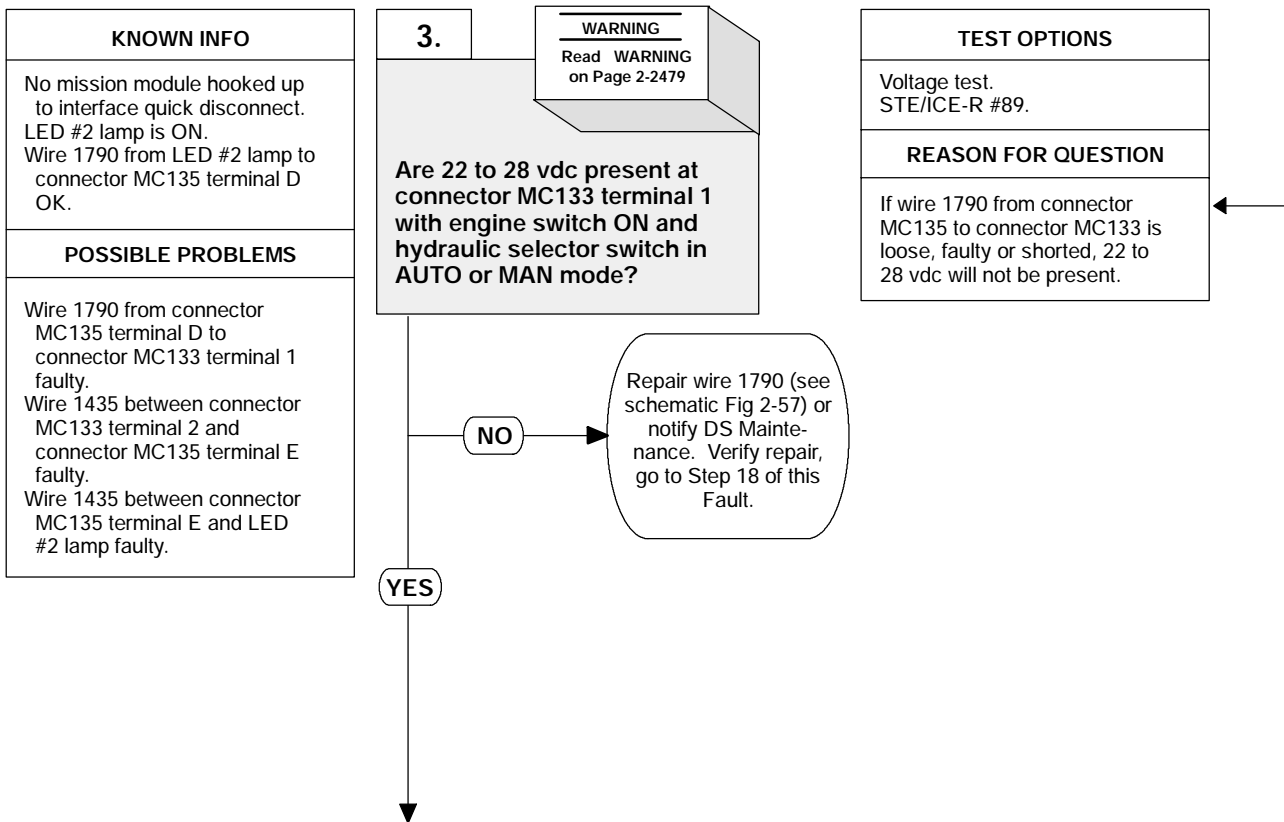
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST | |
|--------------|---|
| (1) | Disconnect connector MC135 from powerbox. |
| (2) | Set multimeter select switch to volts DC. |
| (3) | Connect positive (+) multimeter lead to connector MC135 terminal D. |
| (4) | Connect negative (-) multimeter lead to a known good ground. |
| (5) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (a) | If 22 to 28 vdc are not present, perform Step (6) below and repair wire 1790 (see schematic Fig 2-56) or notify DS Maintenance. |
| (b) | If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 3 of this Fault. |
| (6) | Turn OFF ENGINE switch. |
| (7) | Connect connector MC135 to powerbox. |



15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).

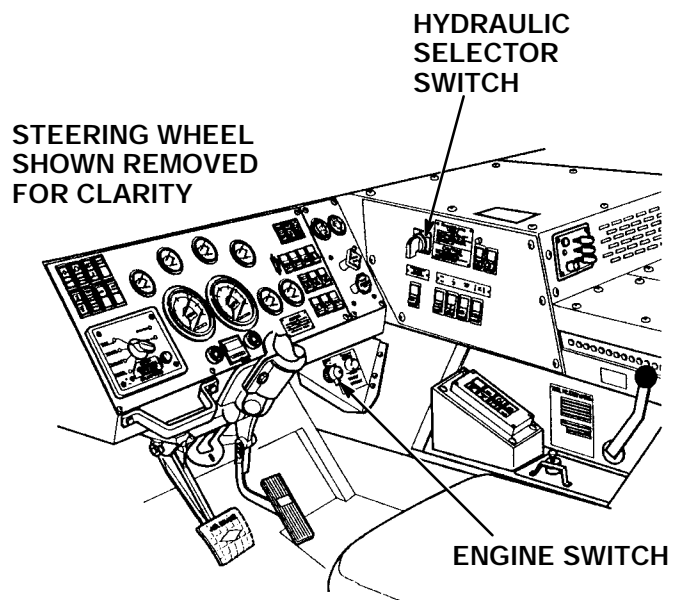
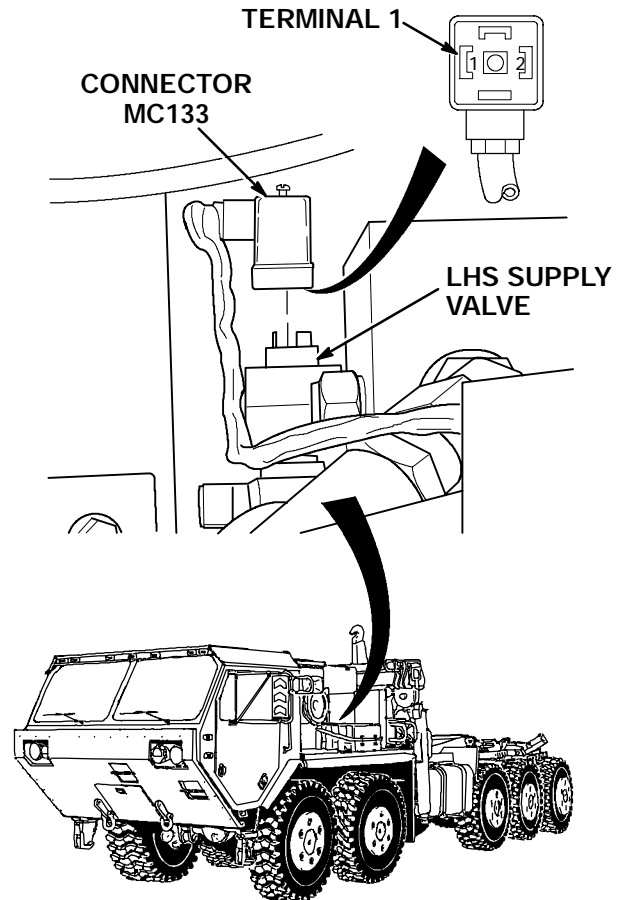


WARNING

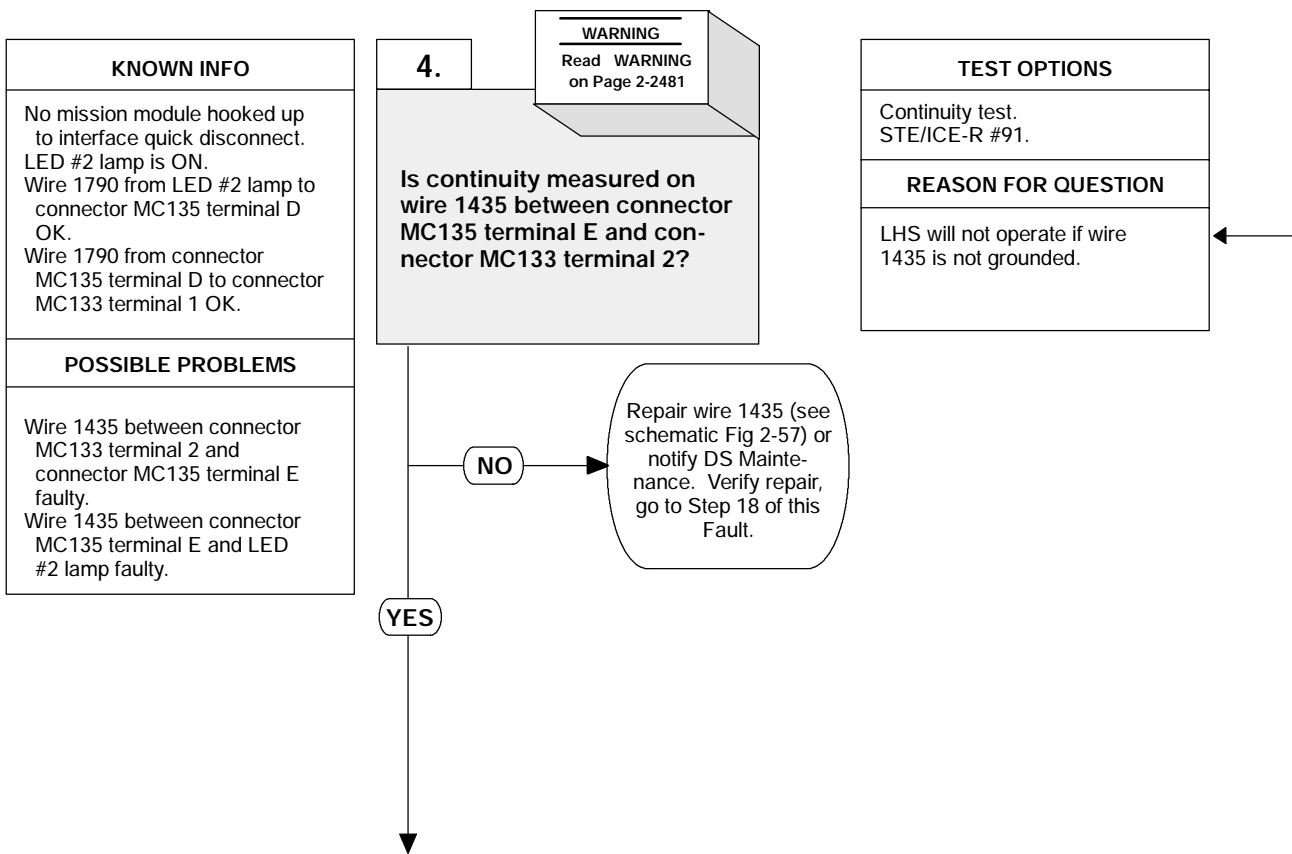
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Disconnect connector MC133 from LHS supply valve.
- (2) Set multimeter select switch to volts DC.
- (3) Connect positive (+) multimeter lead to connector MC133 terminal 1.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Step (6) below and repair wire 1790 (see schematic Fig 2-57) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 4 of this Fault.
- (6) Turn OFF ENGINE switch.
- (7) Connect connector MC133 to LHS supply valve.



15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).

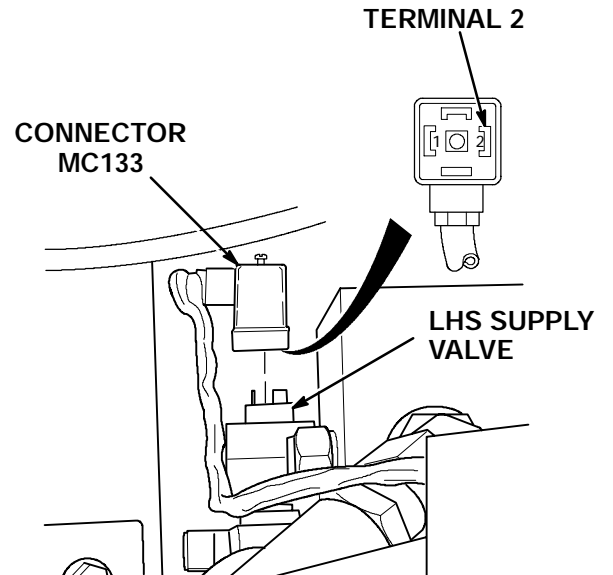


WARNING

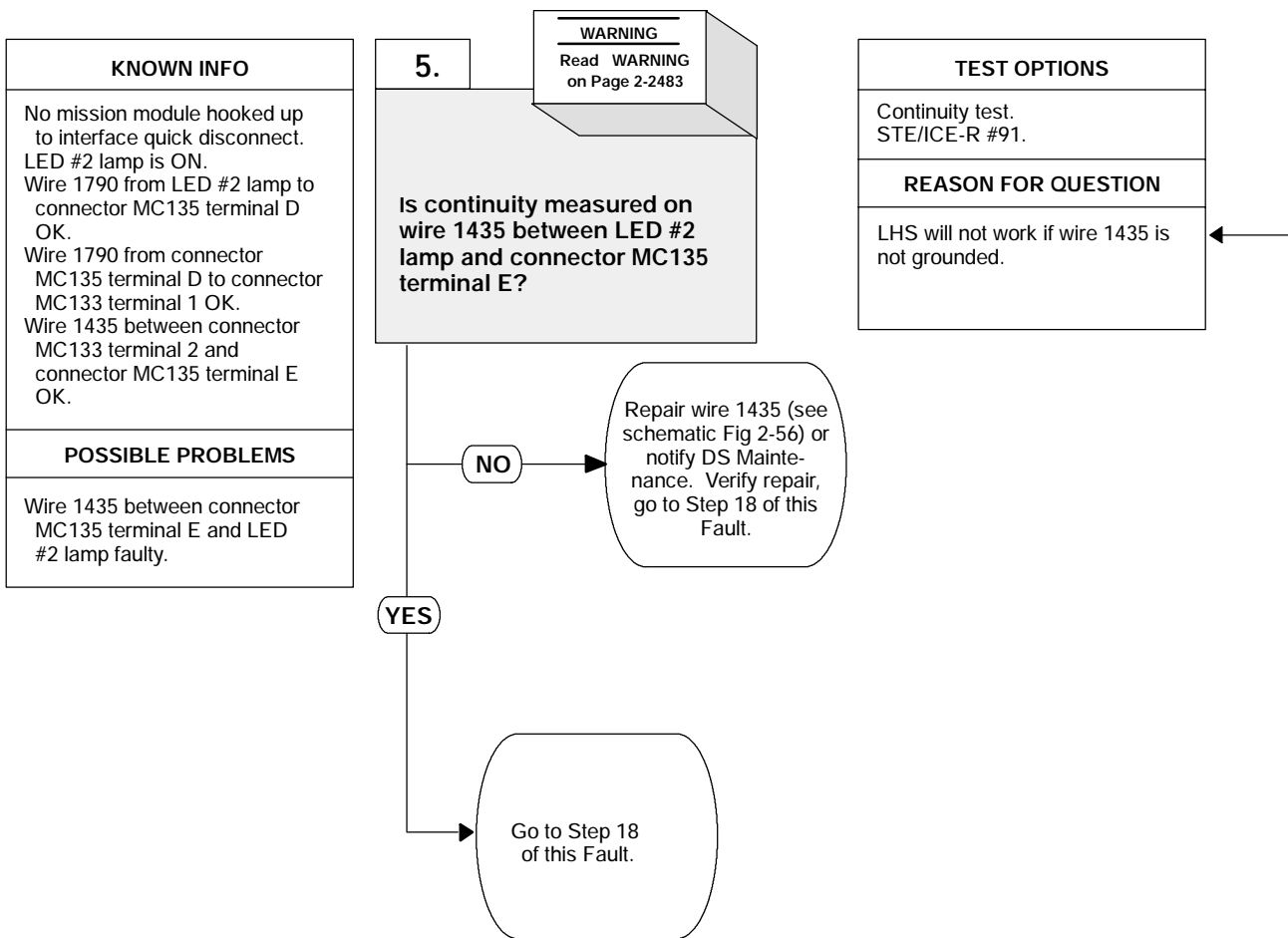
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector MC133 from LHS supply valve.
- (2) Set multimeter select switch to OHMS.
- (3) If there is continuity between wire 1435 connector MC133 terminal 2 and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-57) or notify DS Maintenance.
 - (b) If there is continuity, perform Step (4) below and go to Step 5 of this Fault.
- (4) Connect connector MC133 to LHS supply valve.



15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).

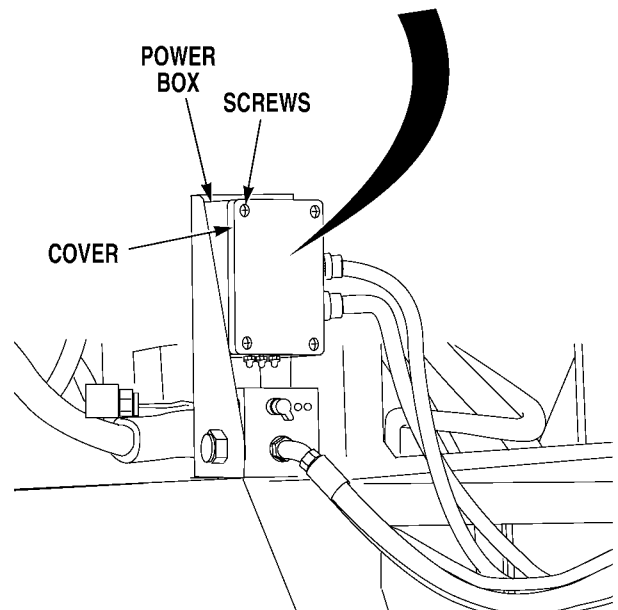
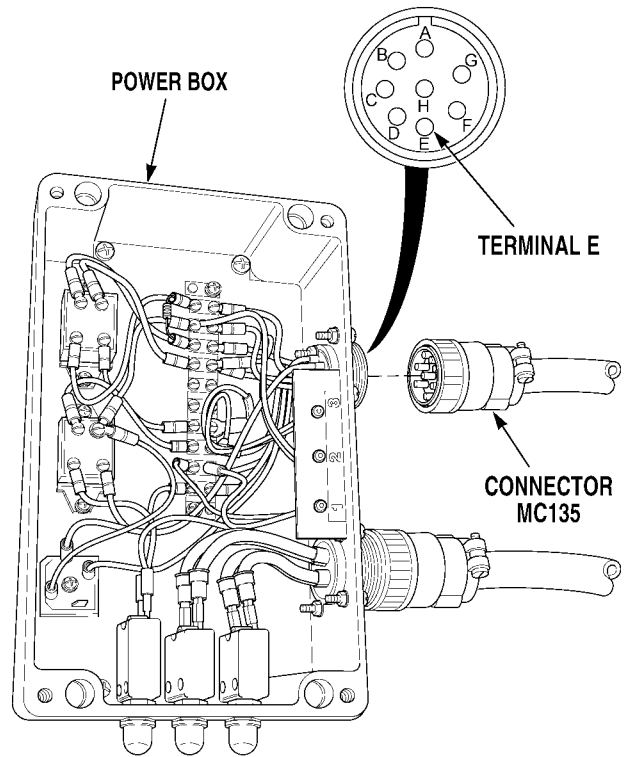


WARNING

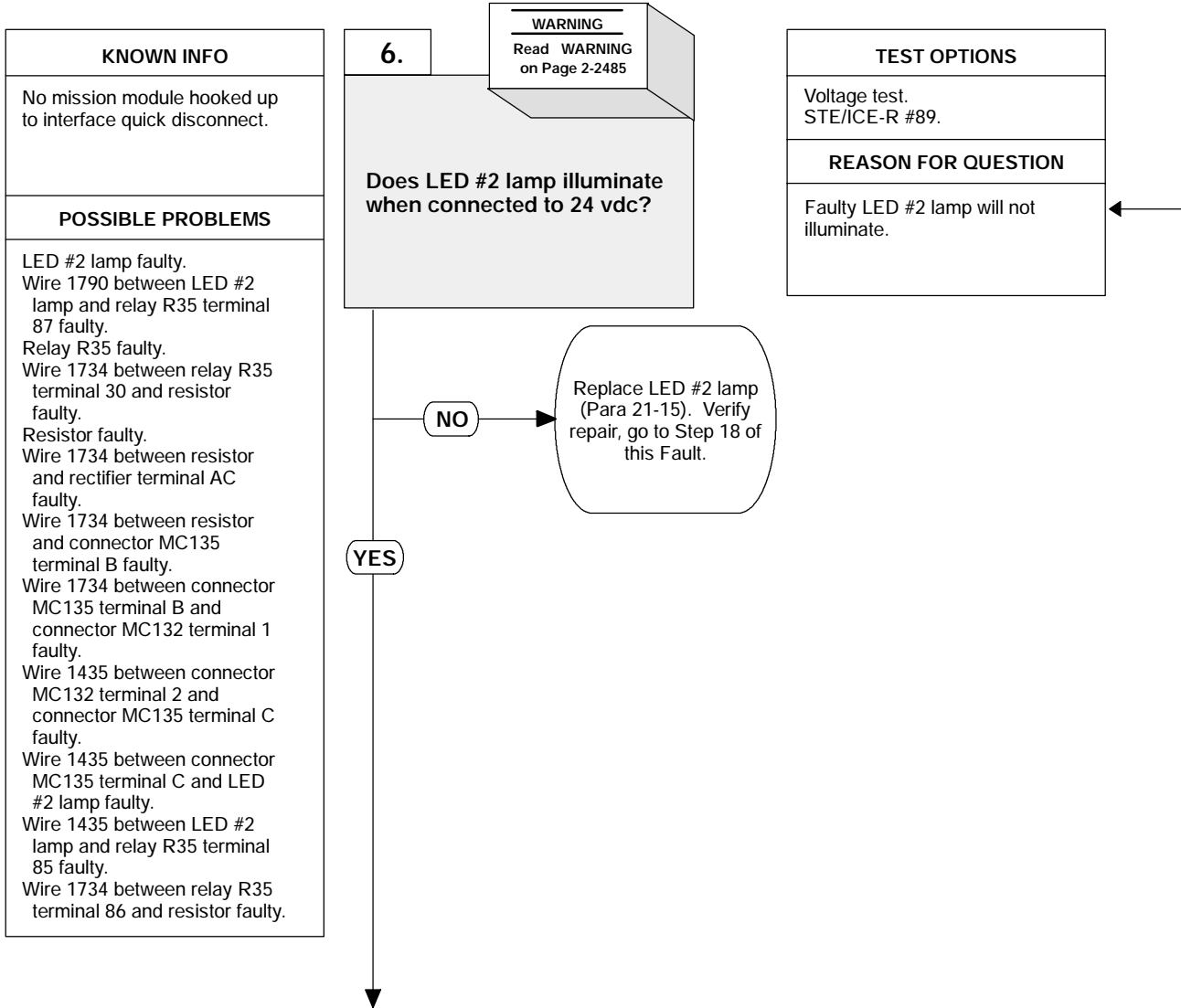
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Remove connector MC135 from powerbox.
- (2) Set multimeter select switch to OHMS.
- (3) Is there continuity between connector MC135 terminal E and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-56) or notify DS Maintenance. Perform Steps (4) and (5) below and go to Step 18 of this Fault.
 - (b) If there is continuity, perform Steps (4) and (5) below and go to Step 18 of this Fault.
- (4) Connect connector MC135 to powerbox.
- (5) Install cover on powerbox with four screws.



15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).



WARNING

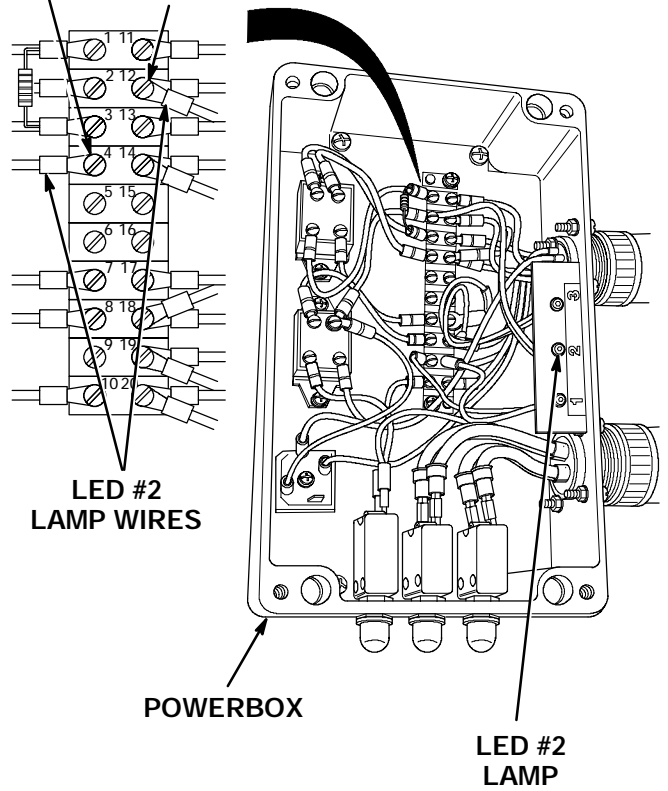
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

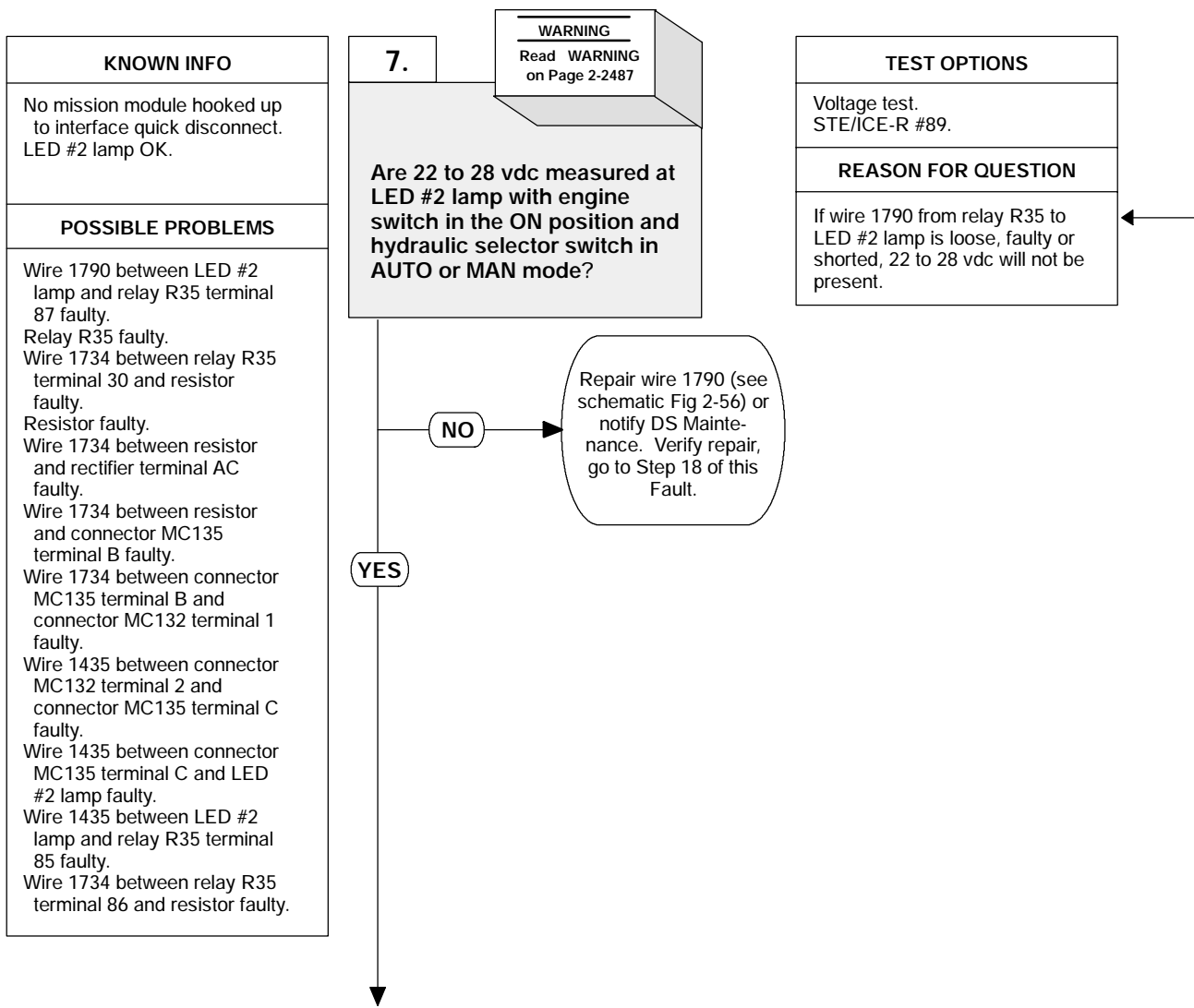
Tag and mark all wires prior to removal.

VOLTAGE TEST
<ol style="list-style-type: none"> (1) Remove LED #2 lamp wires from powerbox terminals 4 and 12. (2) Connect LED #2 lamp wires to known good 24 vdc source. <ol style="list-style-type: none"> (a) If LED #2 lamp does not illuminate, replace LED #2 lamp (Para 21-15). (b) If LED #2 lamp illuminates, perform Step (3) below and go to Step 7 of this Fault. LED #2 lamp is OK. (3) Connect LED #2 lamp wires to powerbox terminals 4 and 12.

TERMINAL 4 TERMINAL 12



15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).

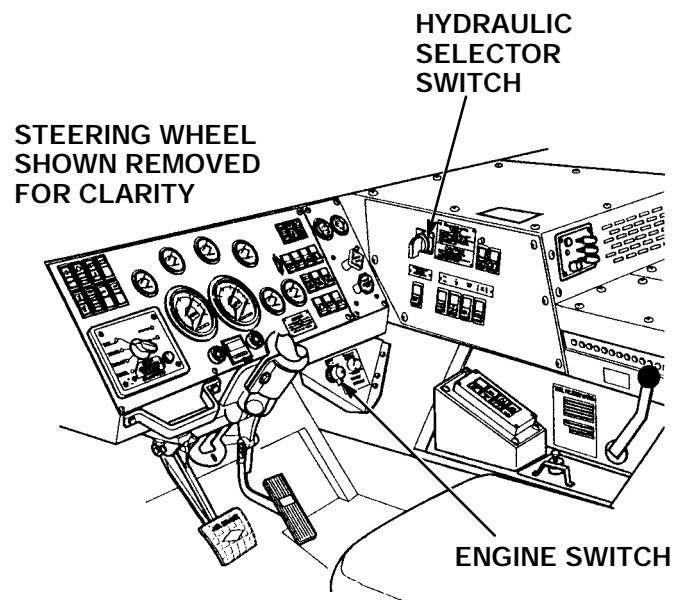
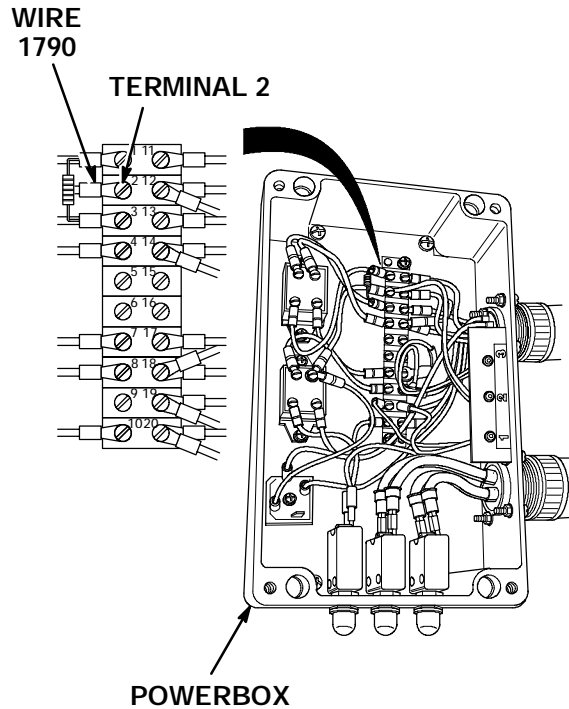


WARNING

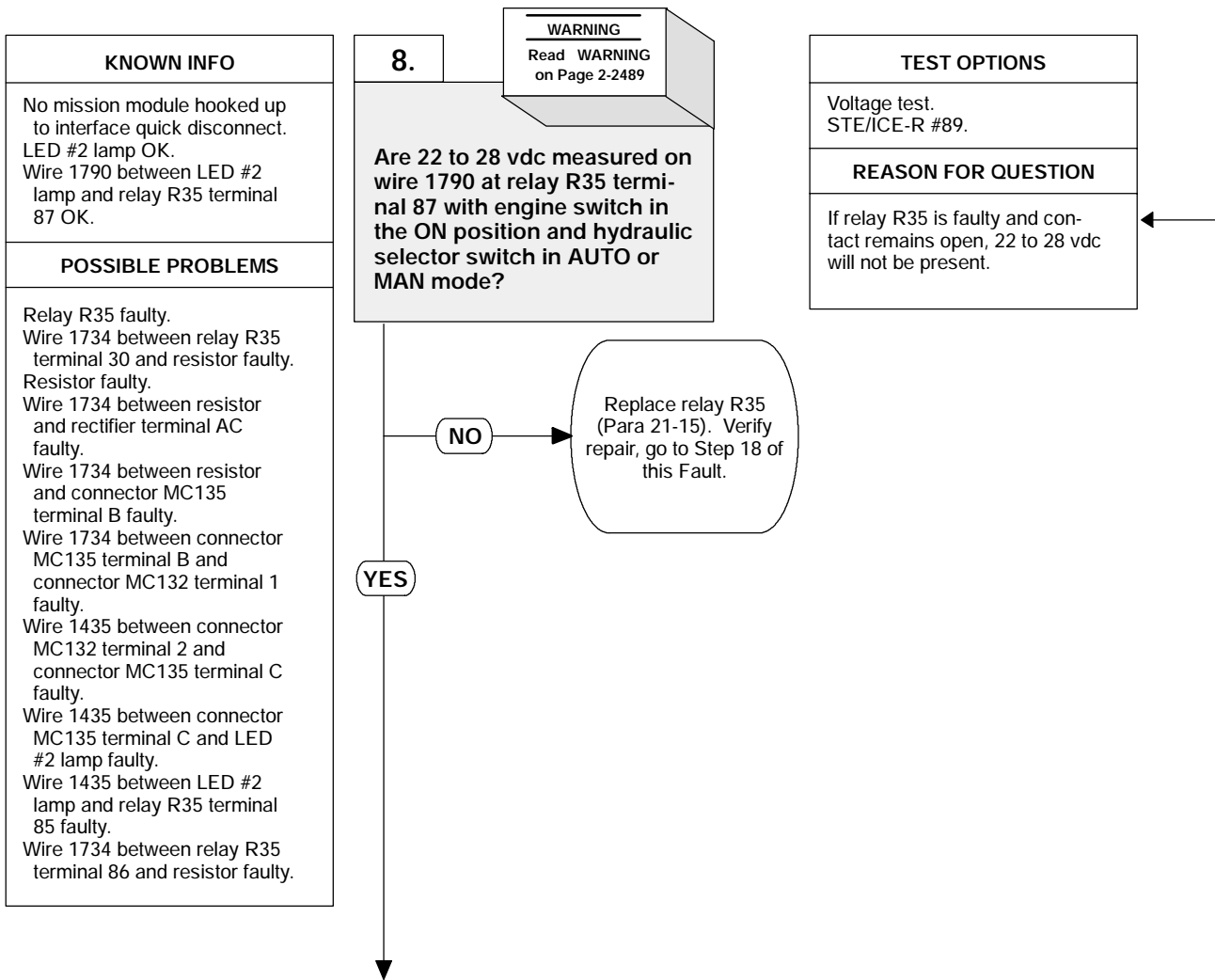
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Disconnect wire 1790 from powerbox terminal 2.
- (2) Set multimeter select switch to volts DC.
- (3) Connect positive (+) multimeter lead to wire 1790.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch.
 - (a) If 22 to 28 vdc are not present, perform Step (6) below and repair wire 1790 (see schematic Fig 2-56) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 8 of this Fault.
- (6) Turn OFF ENGINE switch.
- (7) Connect wire 1790 to powerbox terminal 2.



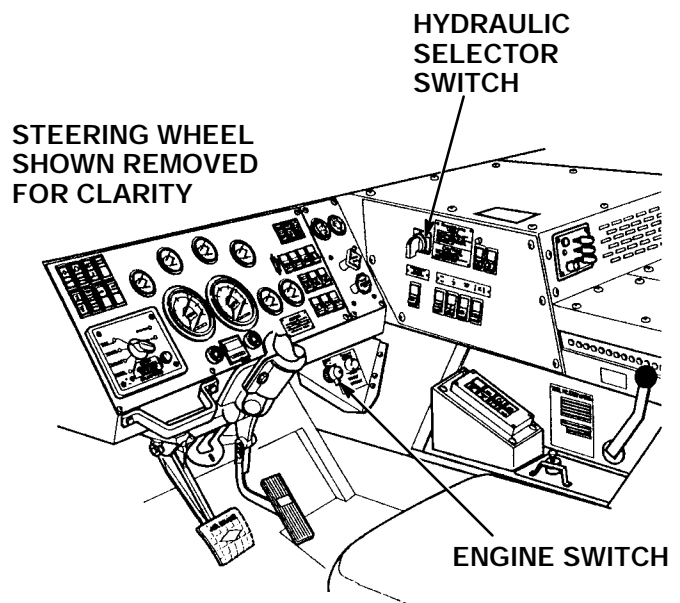
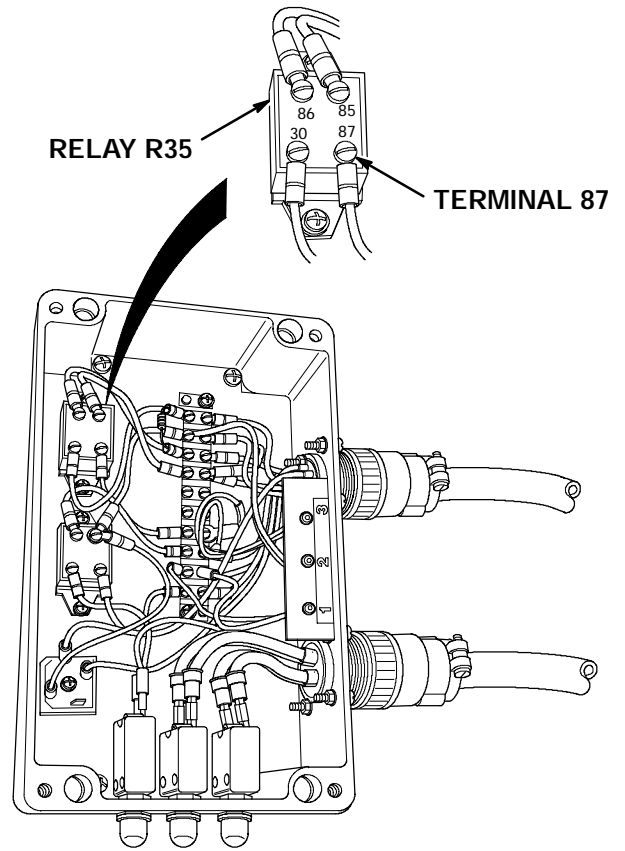
15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).



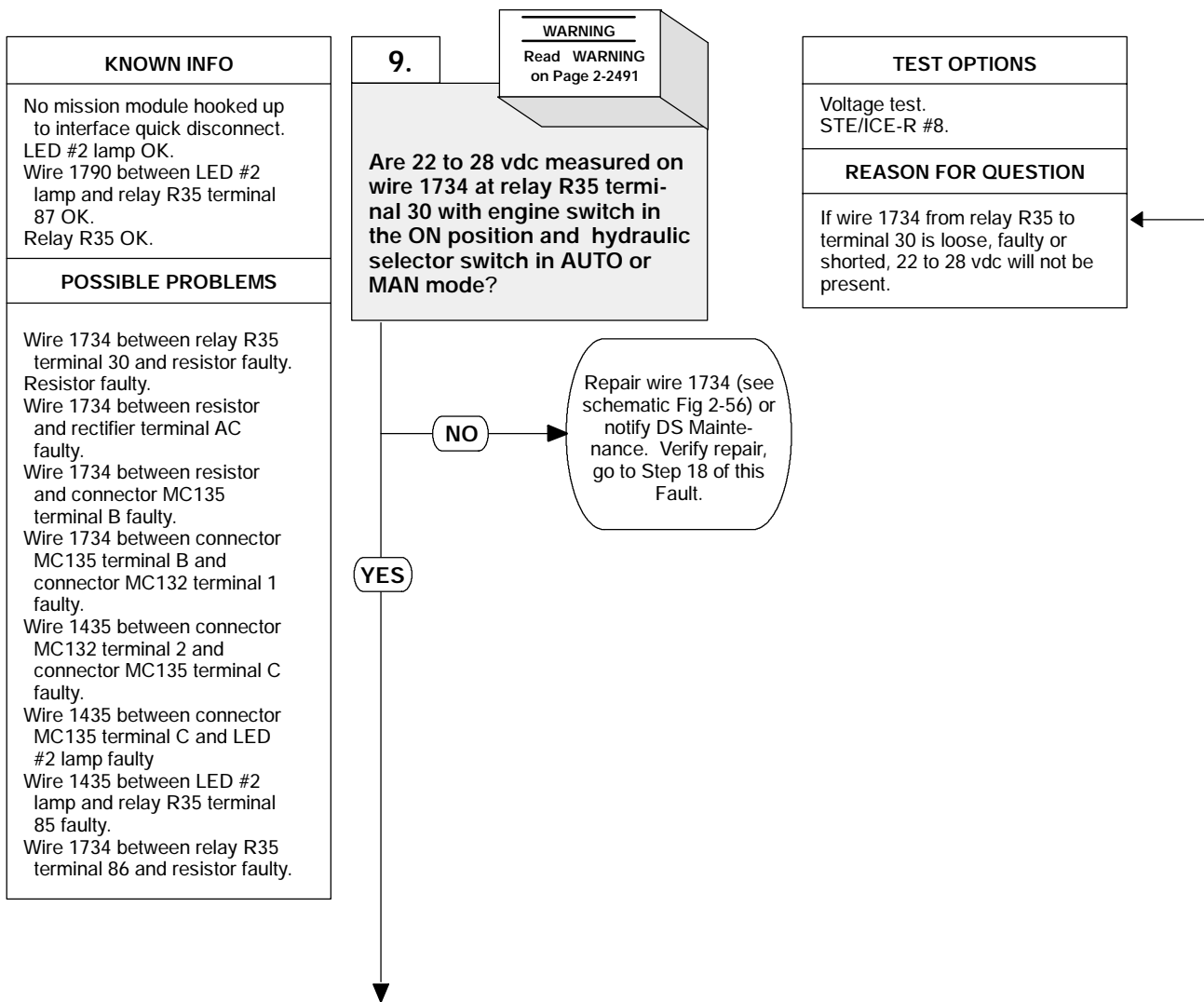
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Set multimeter select switch to volts DC.
 - (2) Connect positive (+) multimeter lead to relay R35 at terminal 87.
 - (3) Connect negative (-) multimeter lead to a known good ground.
 - (4) Turn ON ENGINE switch
 - (a) If 22 to 28 vdc are not present, replace relay R35 (Para 21-15) and perform Step (5) below.
 - (b) If 22 to 28 vdc are present, perform Step (5) below and go to Step 9 of this Fault.
 - (5) Turn OFF ENGINE switch.

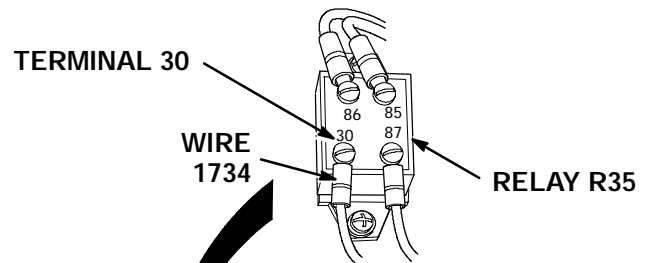


15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).

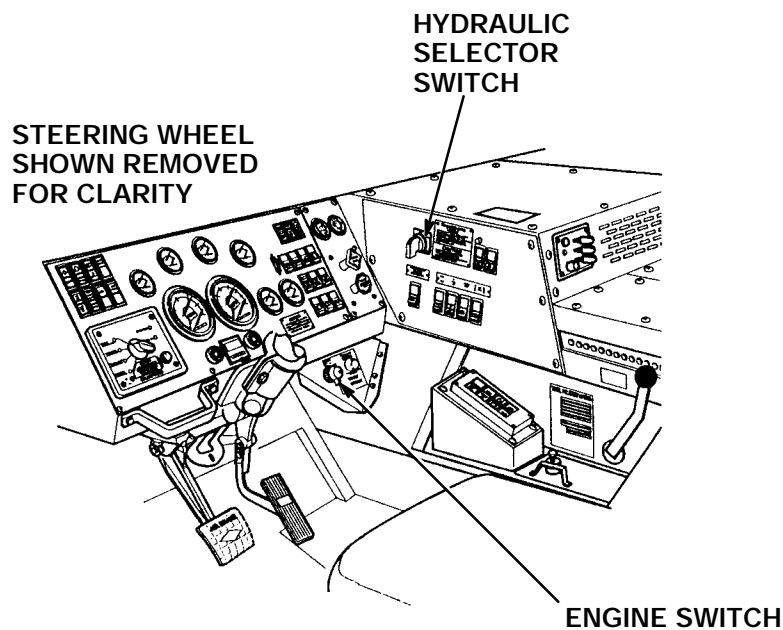
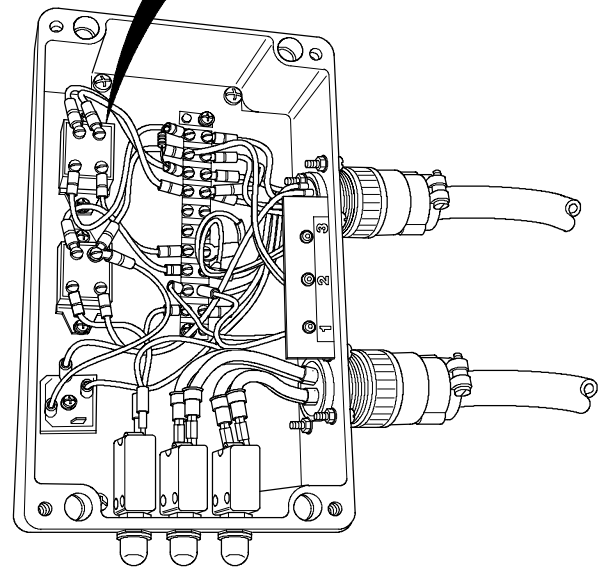


WARNING

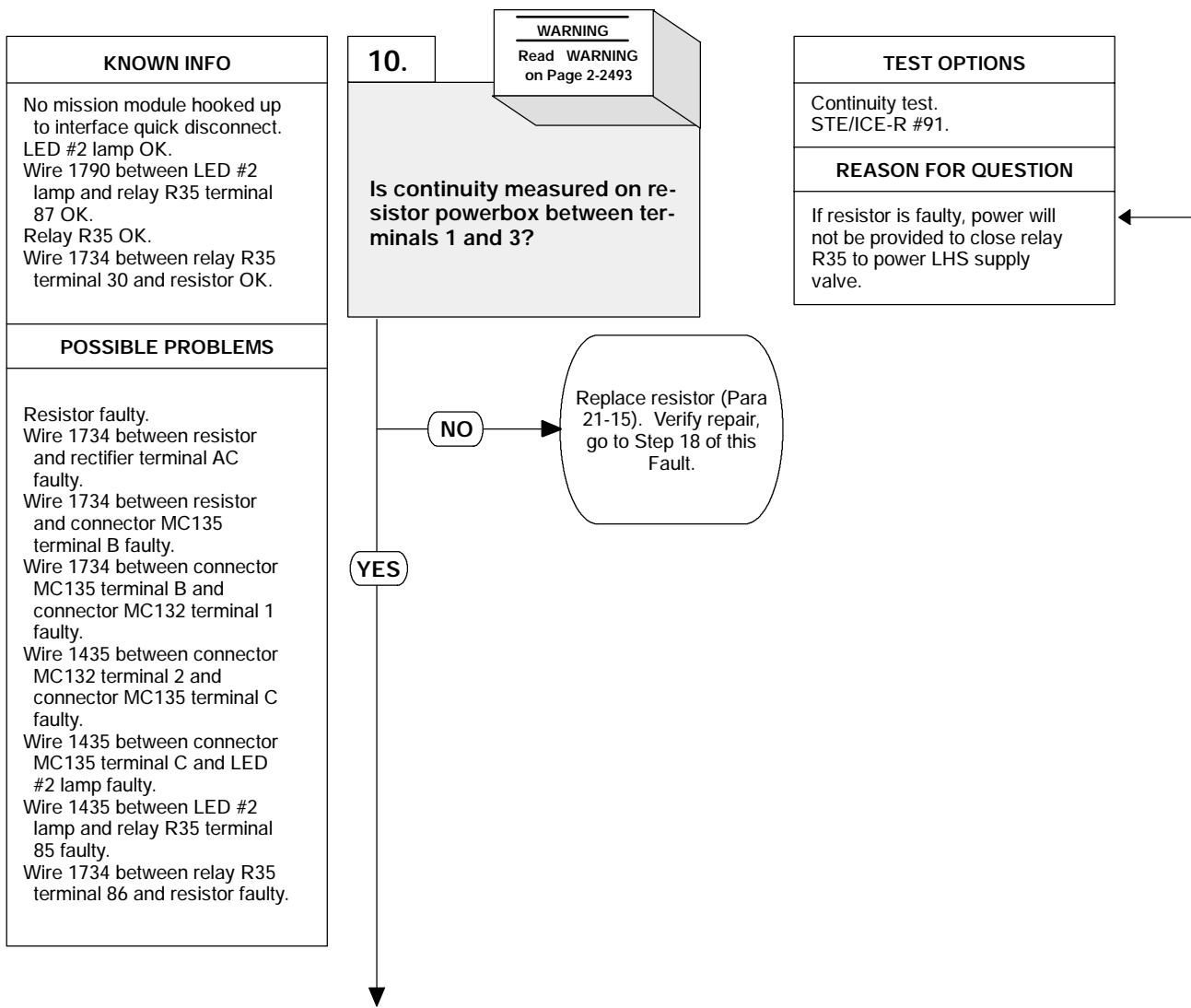
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- | VOLTAGE TEST | |
|--------------|---|
| (1) | Disconnect wire 1734 from relay R35 terminal 30. |
| (2) | Set multimeter select switch to volts DC. |
| (3) | Connect positive (+) multimeter lead to wire 1734. |
| (4) | Connect negative (-) multimeter lead to a known good ground. |
| (5) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (a) | If 22 to 28 vdc are not present, perform Step (6) below and repair wire 1734 (see schematic Fig 2-56) or notify DS Maintenance. |
| (b) | If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 10 of this Fault. |
| (6) | Turn OFF ENGINE switch. |
| (7) | Connect wire 1734 to relay R35 terminal 30. |



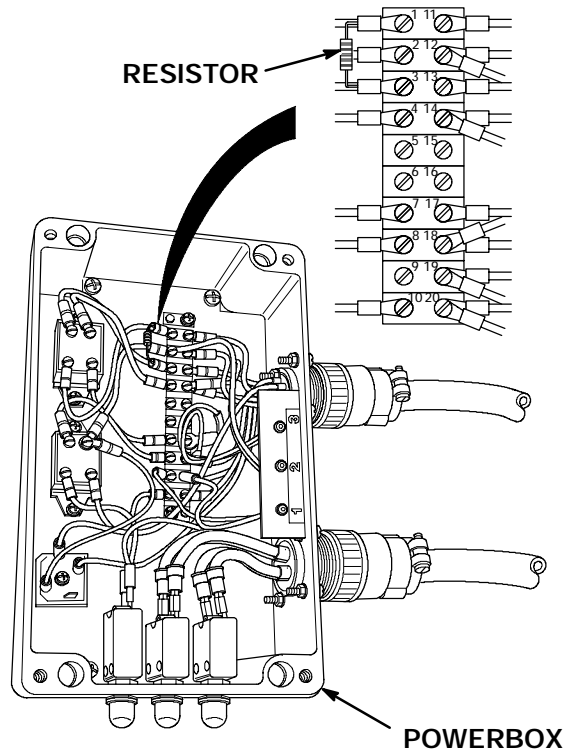
15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).



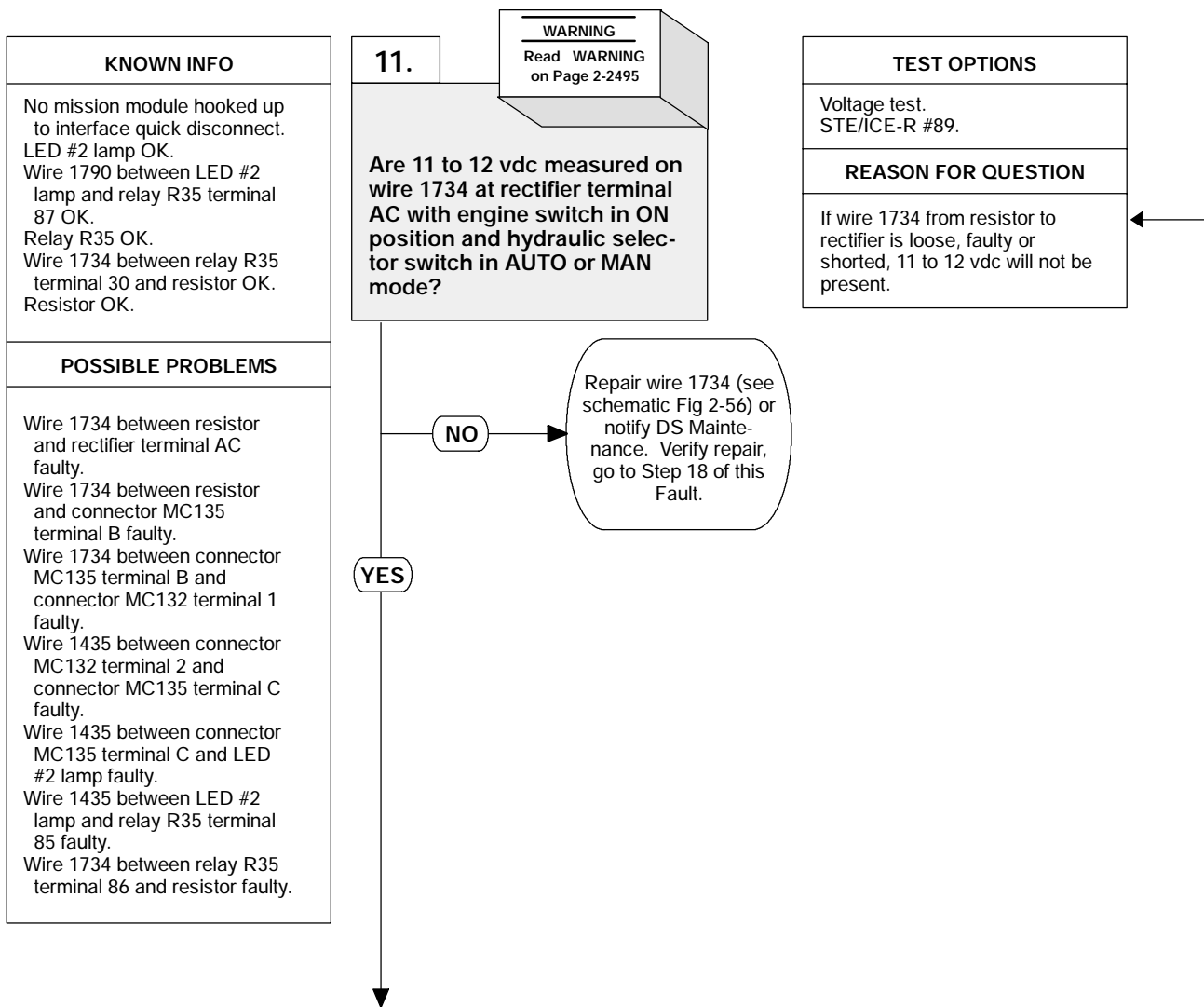
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | CONTINUITY TEST | |
|-----------------|---|
| (1) | Set multimeter select switch to OHMS. |
| (2) | Measure resistance at ends of resistor. Refer to schematic Fig 2-56. |
| (a) | If resistance is not approximately 1.8k, replace resistor (Para 21-15). |
| (b) | If resistance is approximately 1.8k, resistor is OK, go to Step 11 of this Fault. |



15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).

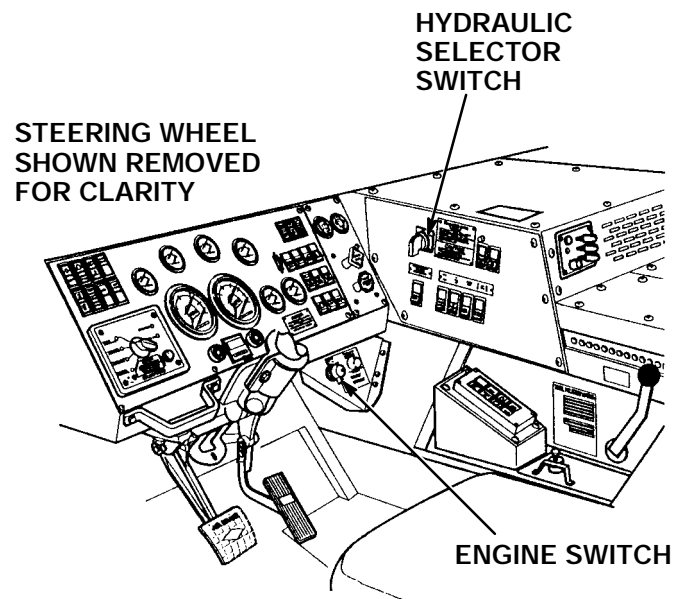
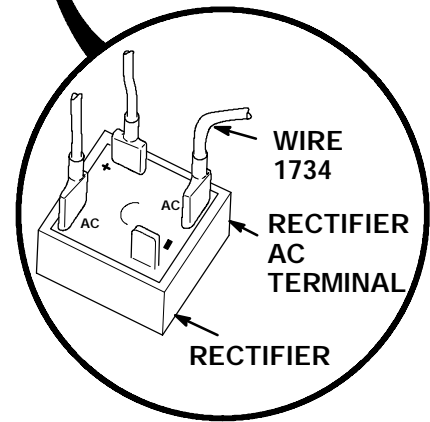
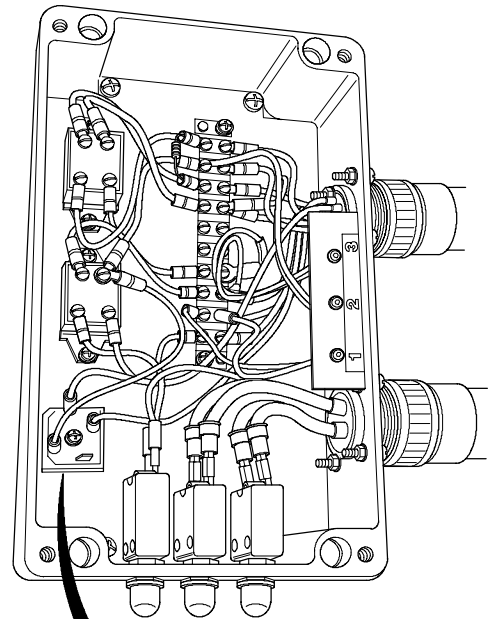


WARNING

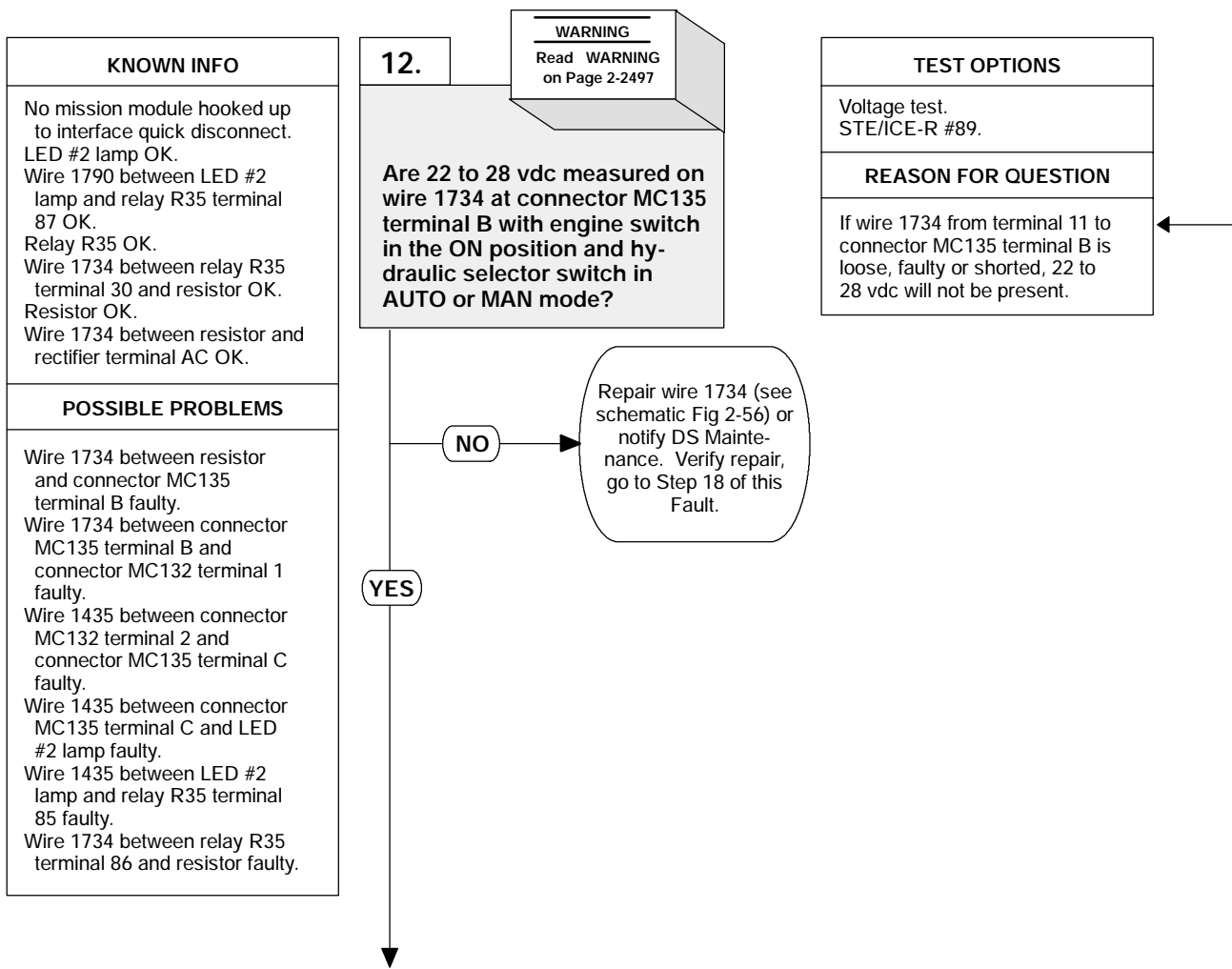
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Disconnect wire 1734 from rectifier terminal AC.
- (2) Set multimeter select switch to volts DC.
- (3) Connect positive (+) multimeter lead to wire 1734.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 11 to 12 vdc are not present, perform Step (6) below and repair wire 1734 (see schematic Fig 2-56) or notify DS Maintenance.
 - (b) If 11 to 12 vdc are present, perform Steps (6) and (7) below and go to Step 12 of this Fault.
- (6) Turn OFF ENGINE switch.
- (7) Connect wire 1734 to rectifier terminal AC.



15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).

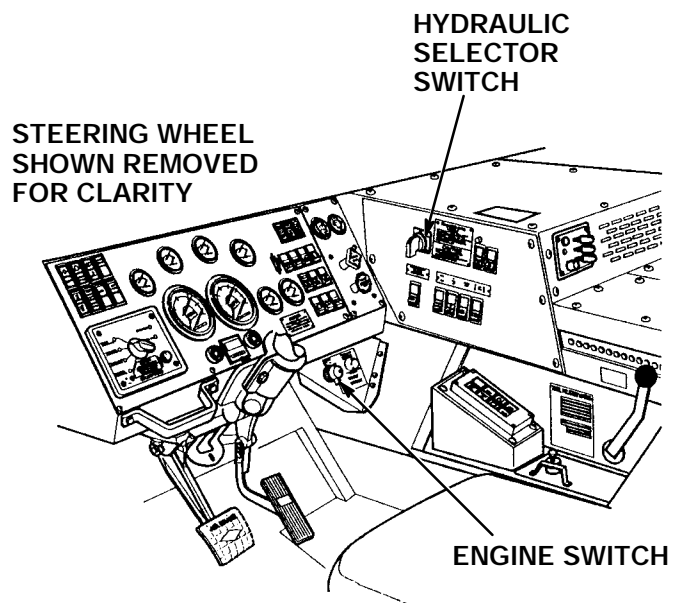
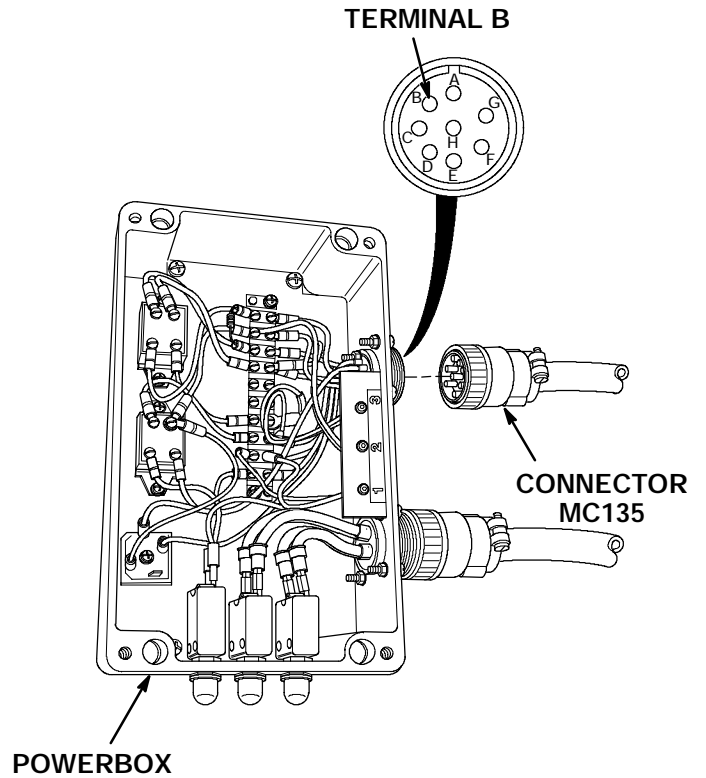


WARNING

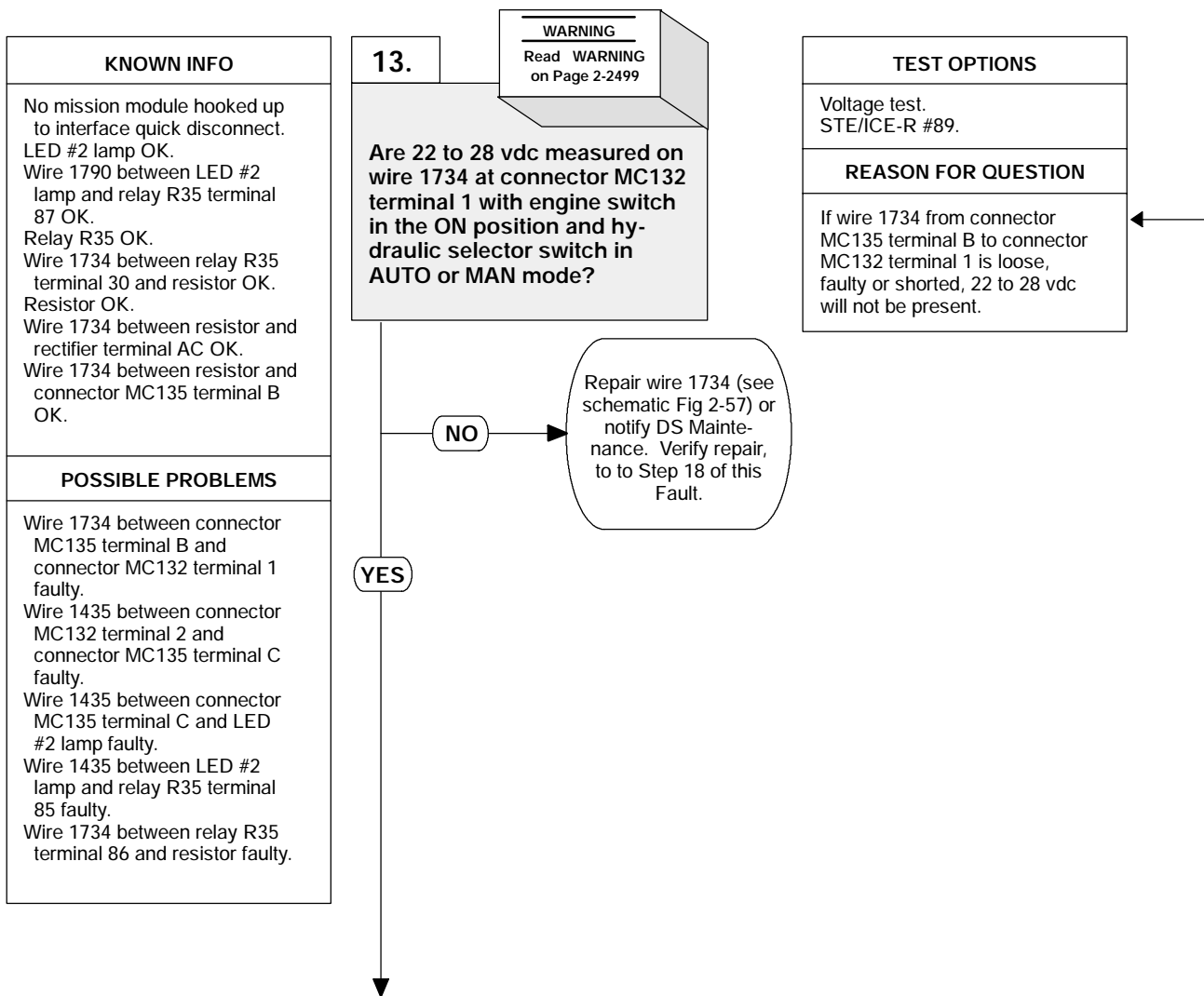
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Disconnect connector MC135 from powerbox.
- (2) Set multimeter select switch to volts DC.
- (3) Connect positive (+) multimeter lead to connector MC135 terminal B.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Step (6) below and repair wire 1734 (see schematic Fig 2-56) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 13 of this Fault.
- (6) Turn OFF ENGINE switch.
- (7) Connect connector MC135 to powerbox.

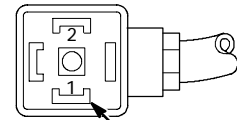
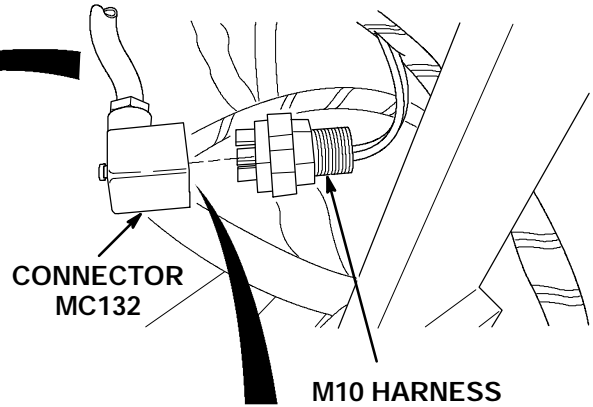
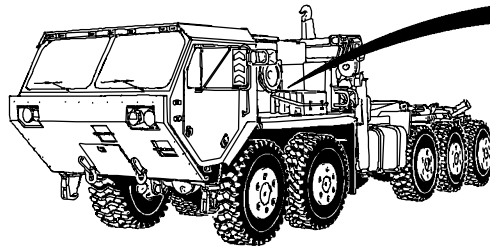


15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



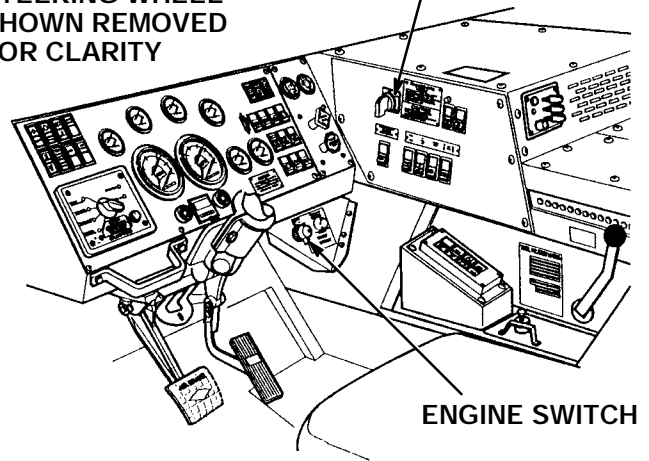
TERMINAL 1

VOLTAGE TEST

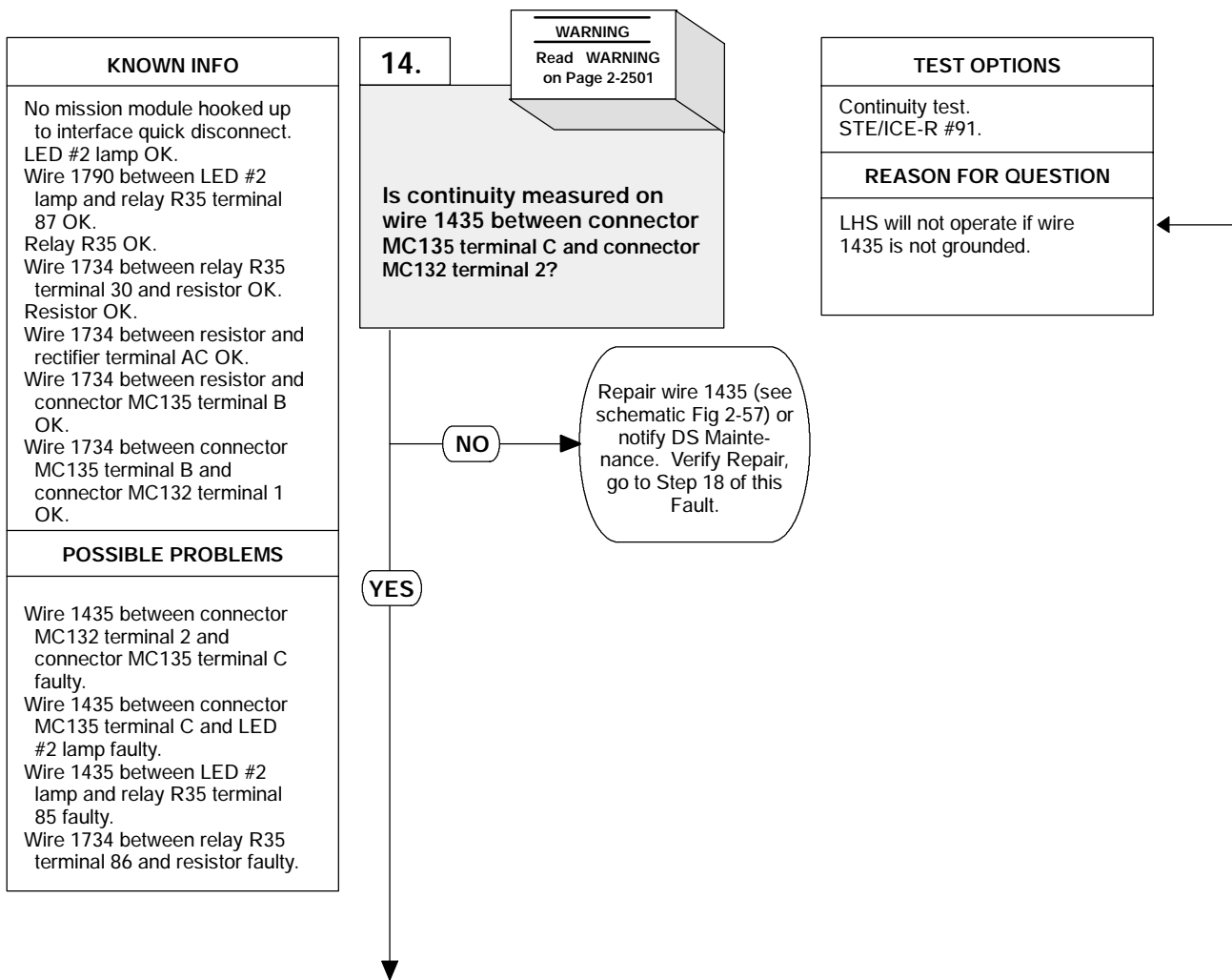
- (1) Disconnect connector MC132 from M10 harness.
- (2) Set multimeter select switch to volts DC.
- (3) Connect positive (+) multimeter lead to connector MC132 terminal 1.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Step (6) below and repair wire 1734 (see schematic Fig 2-57) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 14 of this Fault.
- (6) Turn OFF ENGINE switch.
- (7) Connect connector MC132 to M10 harness.

HYDRAULIC SELECTOR SWITCH

STEERING WHEEL SHOWN REMOVED FOR CLARITY

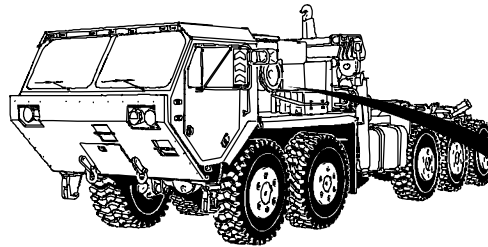


15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).

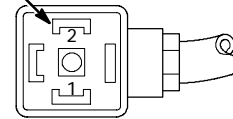


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



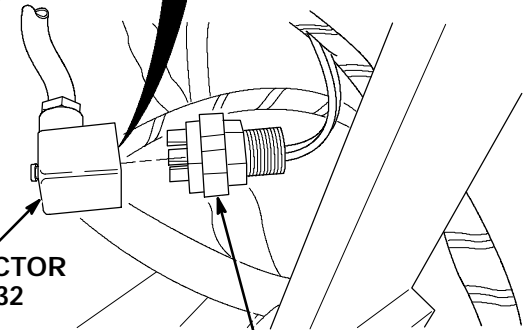
TERMINAL 2



CONTINUITY TEST

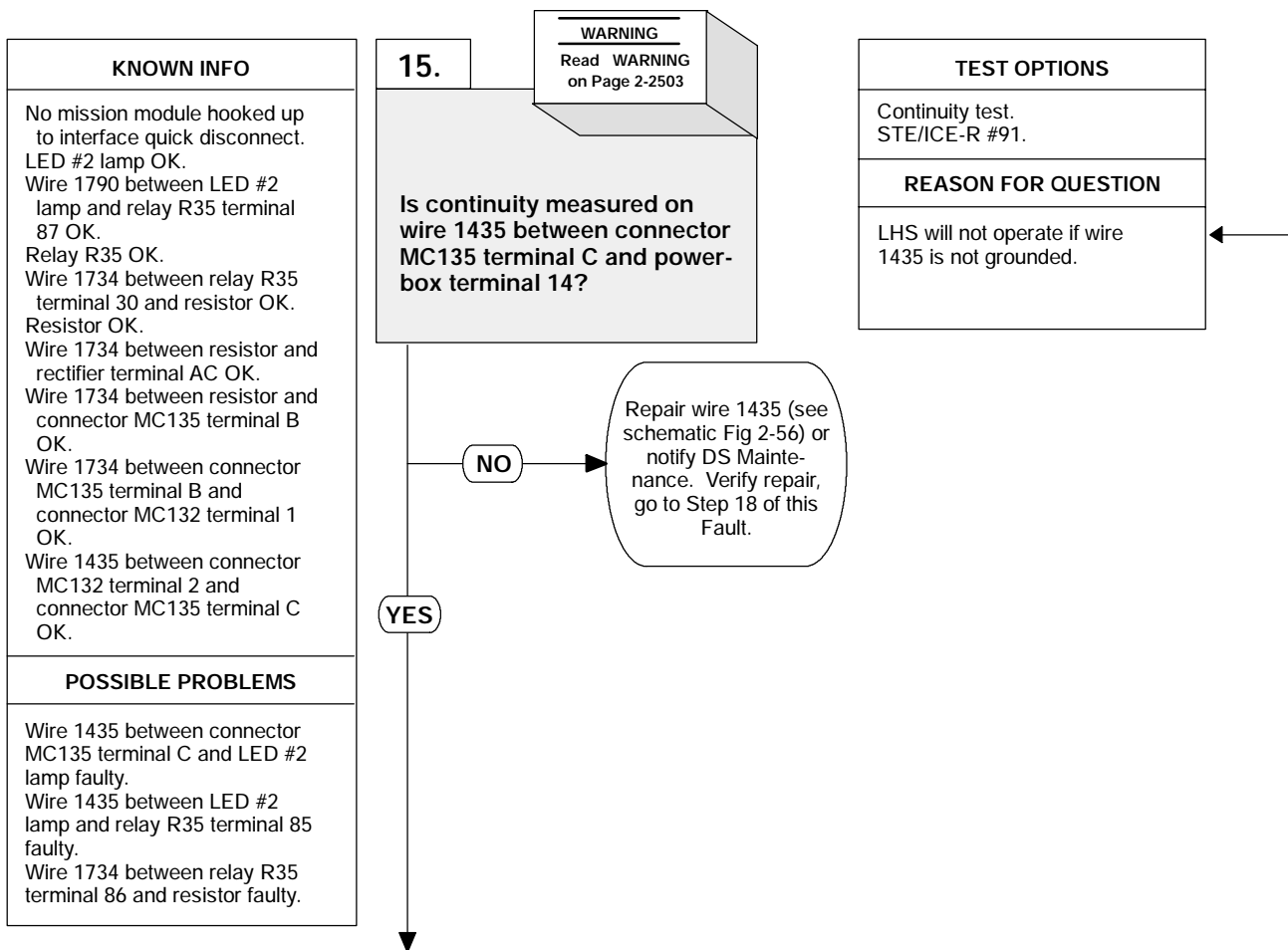
- (1) Disconnect connector MC132 from M10 harness.
- (2) Set multimeter switch to OHMS.
- (3) Is there continuity between wire 1435 connector MC132 terminal 2 and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-57) or notify DS Maintenance.
 - (b) If there is continuity, perform Step (4) below and go to Step 15 of this Fault.
- (4) Connect connector MC132 to M10 harness.

CONNECTOR MC132



M10 HARNESS

15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).

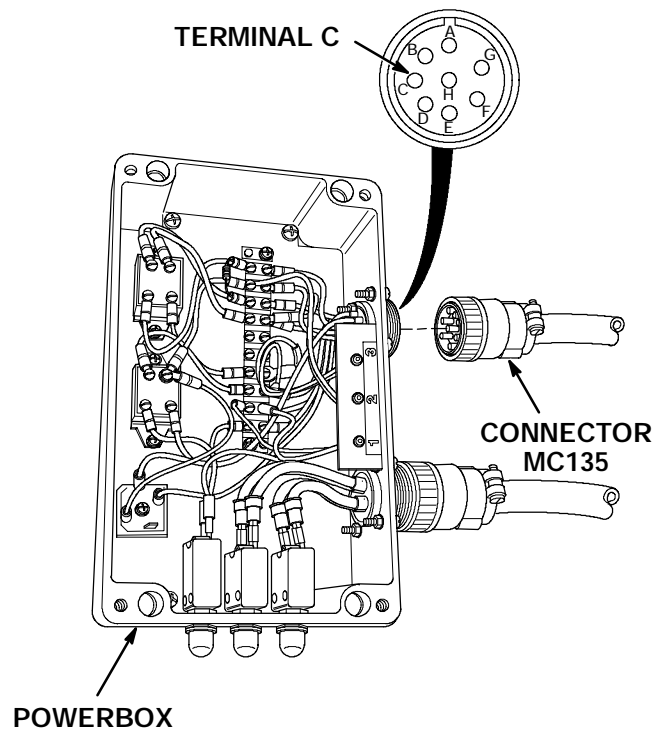


WARNING

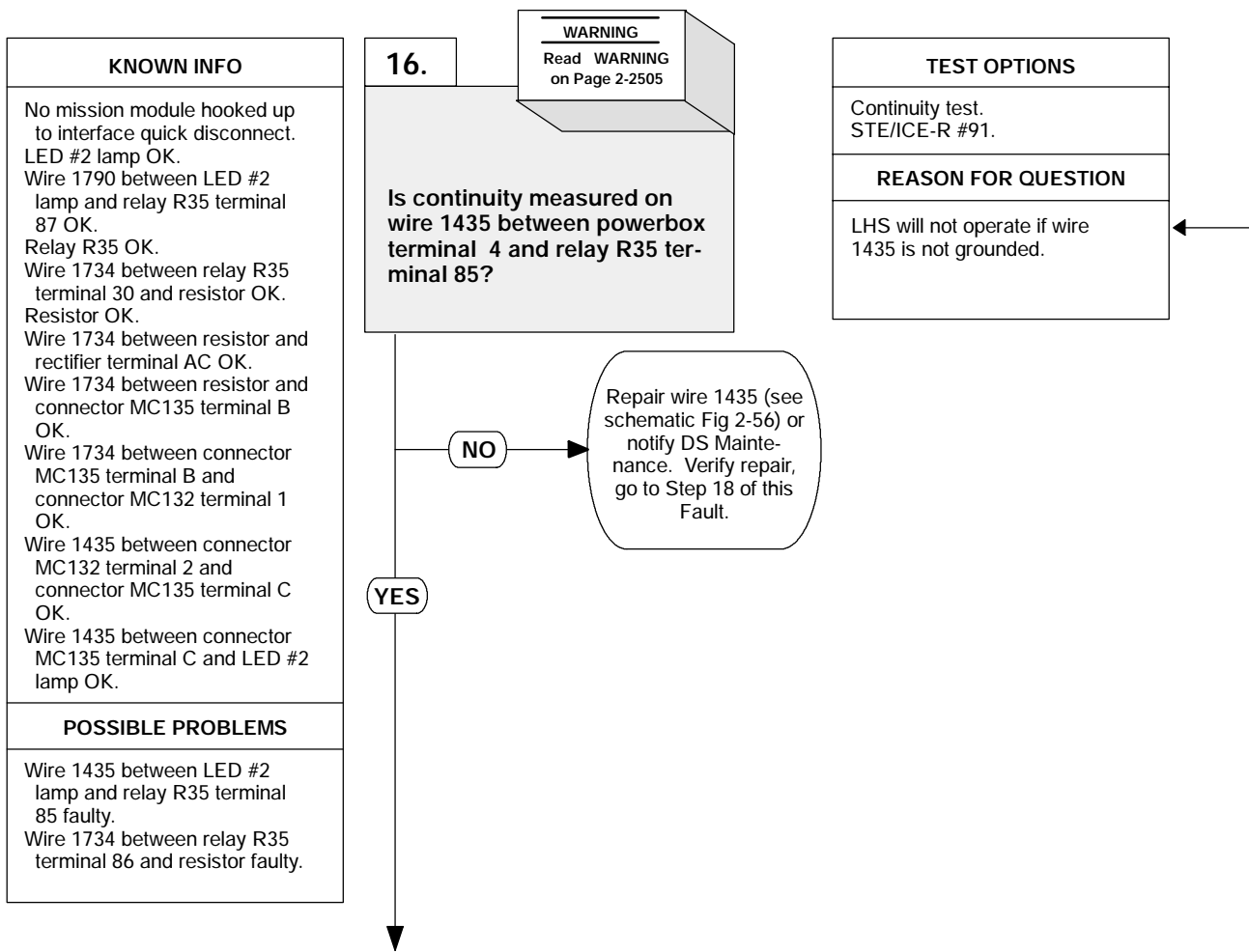
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector MC135 from powerbox.
- (2) Set multimeter switch to OHMS.
- (3) Is there continuity between wire 1435 connector MC135 terminal C and a known good ground?
 - (a) If there is continuity, repair wire 1435 (see schematic Fig 2-56) or notify DS Maintenance.
 - (b) If there is continuity, perform Step (4) below and go to Step 16 of this Fault.
- (4) Connect connector MC135 to powerbox.

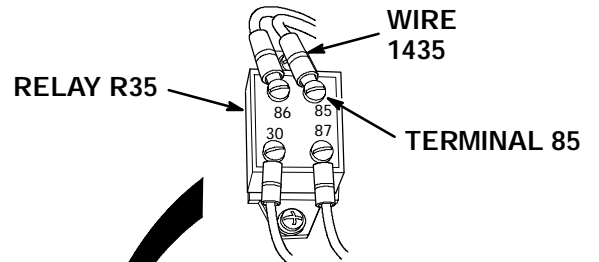


15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).



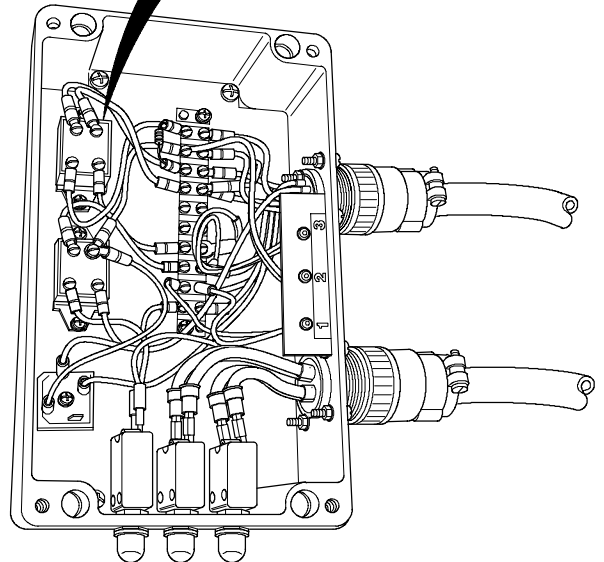
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

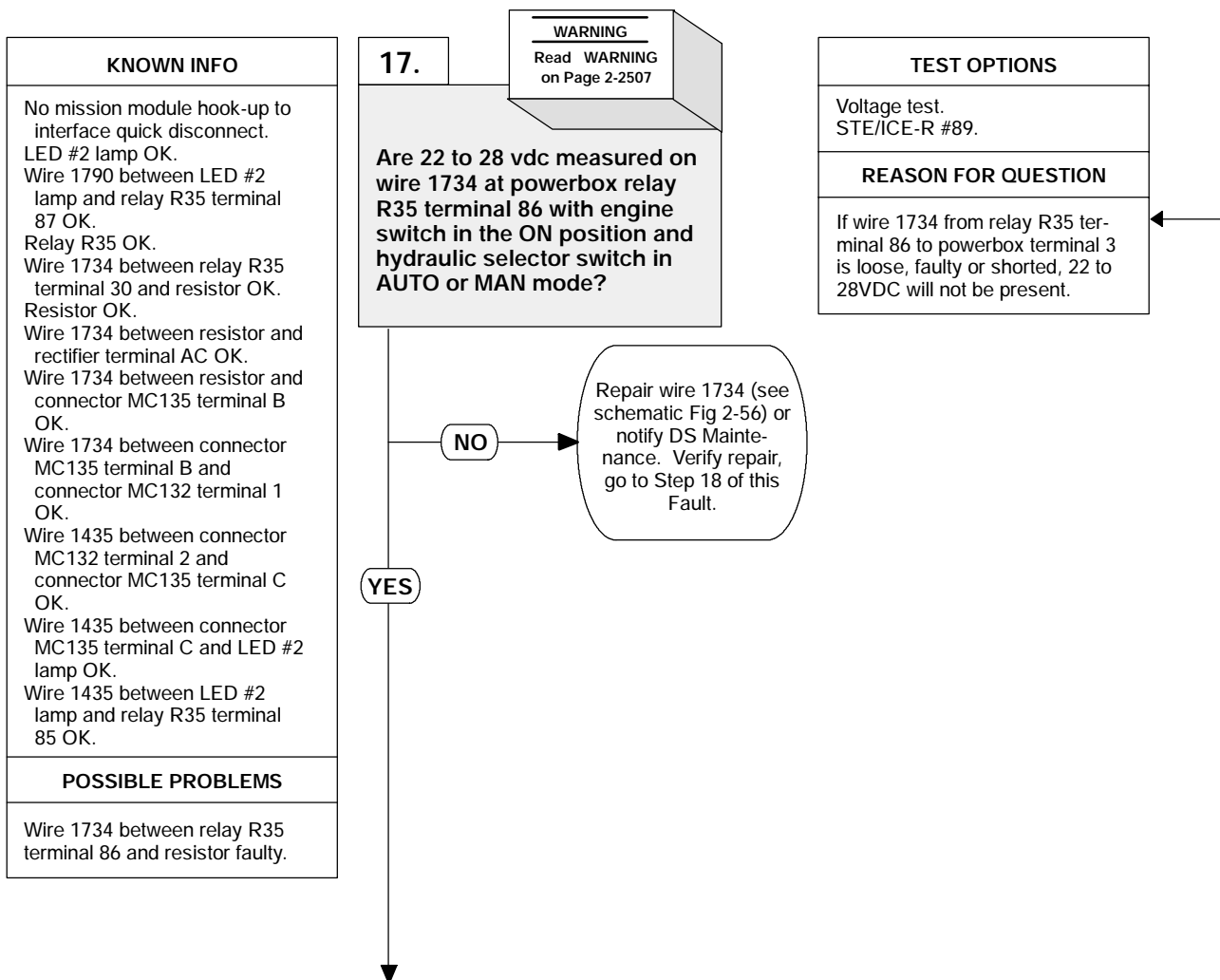


CONTINUITY TEST

- (1) Set multimeter select switch to OHMS.
- (2) Is there continuity between wire 1435 relay R35 terminal 85 and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-56) or notify DS Maintenance.
 - (b) If there is continuity, go to Step 17 of this Fault.



15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).

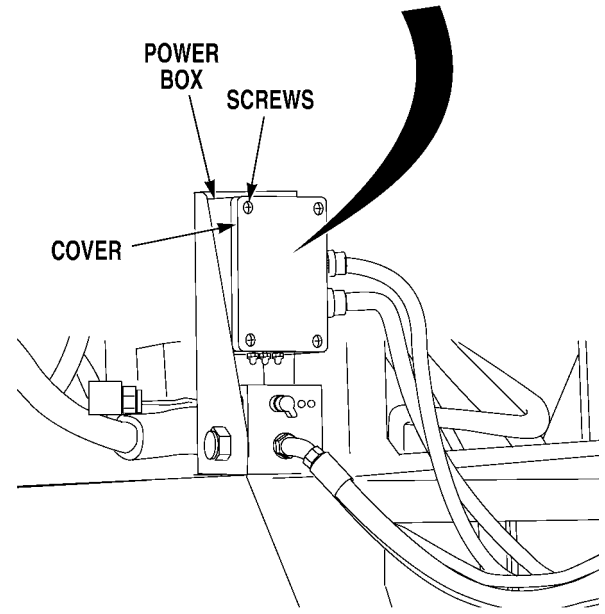
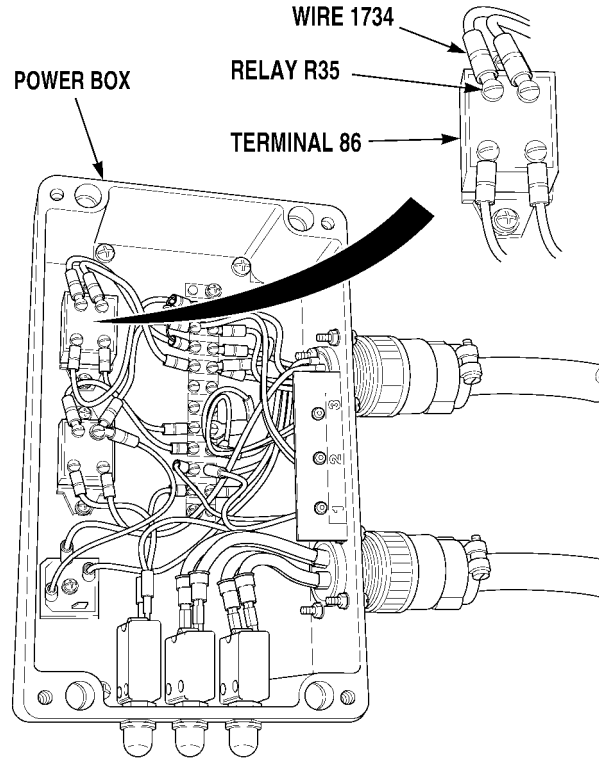


WARNING

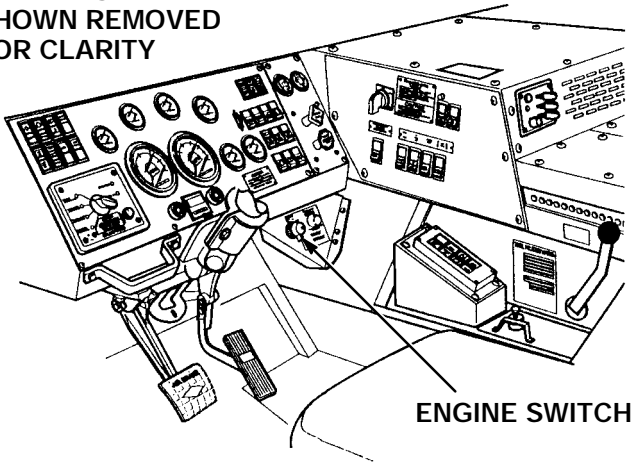
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

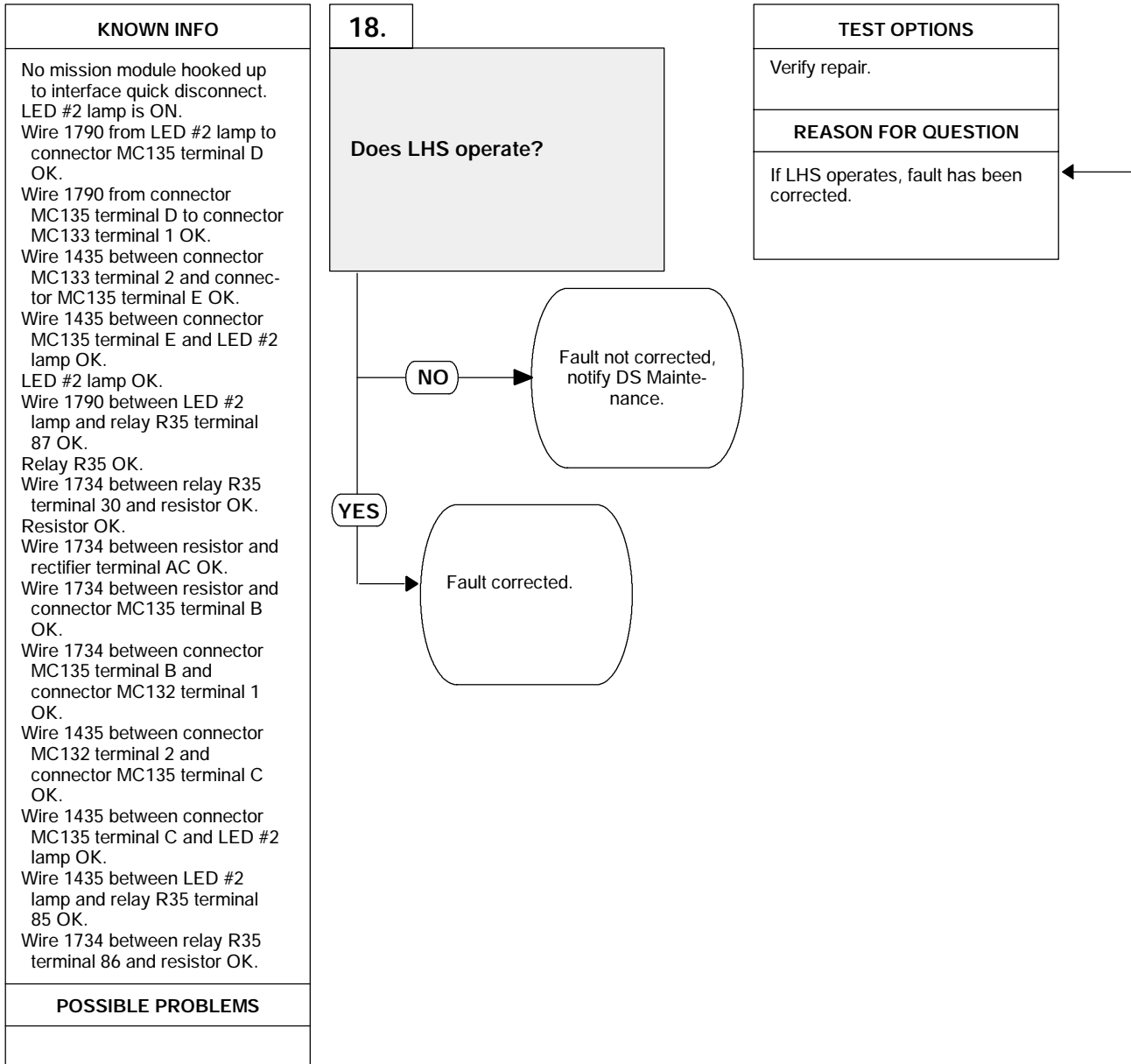
- (1) Disconnect wire 1734 from relay R35 terminal 86.
- (2) Set multimeter select switch to volts DC.
- (3) Connect positive (+) multimeter lead to wire 1734.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON engine switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Steps (6) below and repair wire 1734 or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Steps (6), (7) and (8) below.
- (6) Turn OFF ENGINE switch.
- (7) Connect wire 1734 to relay R35 terminal 86.
- (8) Install powerbox cover with four screws.



STEERING WHEEL
SHOWN REMOVED
FOR CLARITY

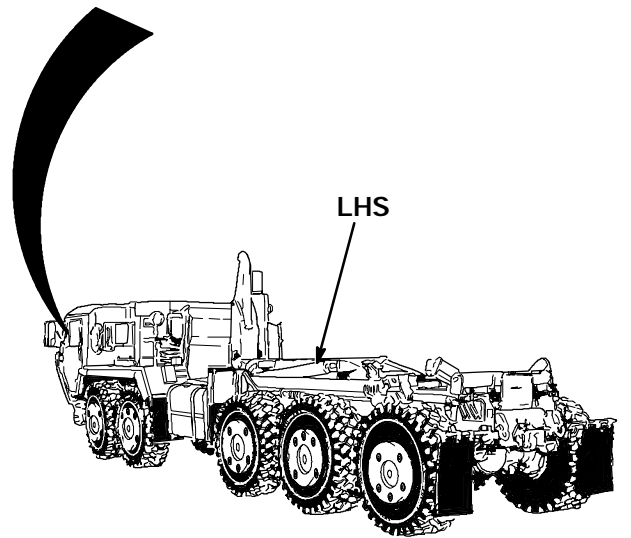
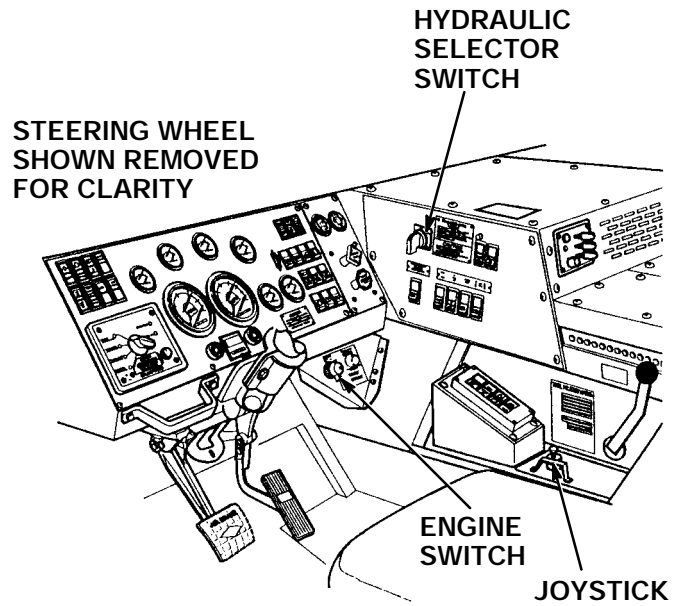


15 LHS INOPERATIVE WITH INTERFACE KIT INSTALLED (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch to AUTO or MAN mode.
- (3) Hold joystick in UNLOAD position and then in LOAD position.
 - (a) If LHS does not operate, fault is not corrected. Perform Steps (4) and (5) below and notify supervisor.
 - (b) If LHS does operate, fault has been corrected.
- (4) Set hydraulic selector switch to OFF position.
- (5) Turn OFF ENGINE switch.



2-29. CRANE TROUBLESHOOTING.

This paragraph covers Crane System Troubleshooting. The Crane System Fault Index, Table 2-54, lists faults for the crane system of the PLS truck. Refer to the schematics Figures 2-58 through 2-64 when performing tests and corrective actions

Table 2-54. Crane System Fault Index

Fault No.	Description	Page
1.	No Crane Functions Work Using Remote Control	2-2518
2.	Hoist Will Not Lower Using Remote Control Unit	2-2528
3.	Hoist Will Not Raise Using Remote Control Unit	2-2546
4.	Boom Will Not Lower Using Remote Control Unit	2-2564
5.	Boom Will Not Raise Using Remote Control Unit	2-2582
6.	Boom Will Not Telescope In Using Remote Control Unit	2-2600
7.	Boom Will Not Telescope Out Using Remote Control Unit	2-2618
8.	Crane Will Not Swing CW Using Remote Control Unit	2-2636
9.	Crane Will Not Swing CCW Using Remote Control Unit	2-2654
10.	Outriggers Do Not Operate	2-2672
11.	Loss Of Crane Functions (Swing, Telescope, Boom, And Hoist)	2-2720
12.	Boom Does Not Operate	2-2750
13.	Telescope Does Not Operate	2-2754
14.	Hoist Does Not Operate	2-2758
15.	Crane Does Not Swing	2-2762
16.	Mast Does Not Operate	2-2766
17.	Lift And Hoist Do Not Operate Or Operate Slowly	2-2770
18.	Swing And Telescope Do Not Operate Or Operate Slowly	2-2772
19.	Crane High Idle Not Working	2-2774

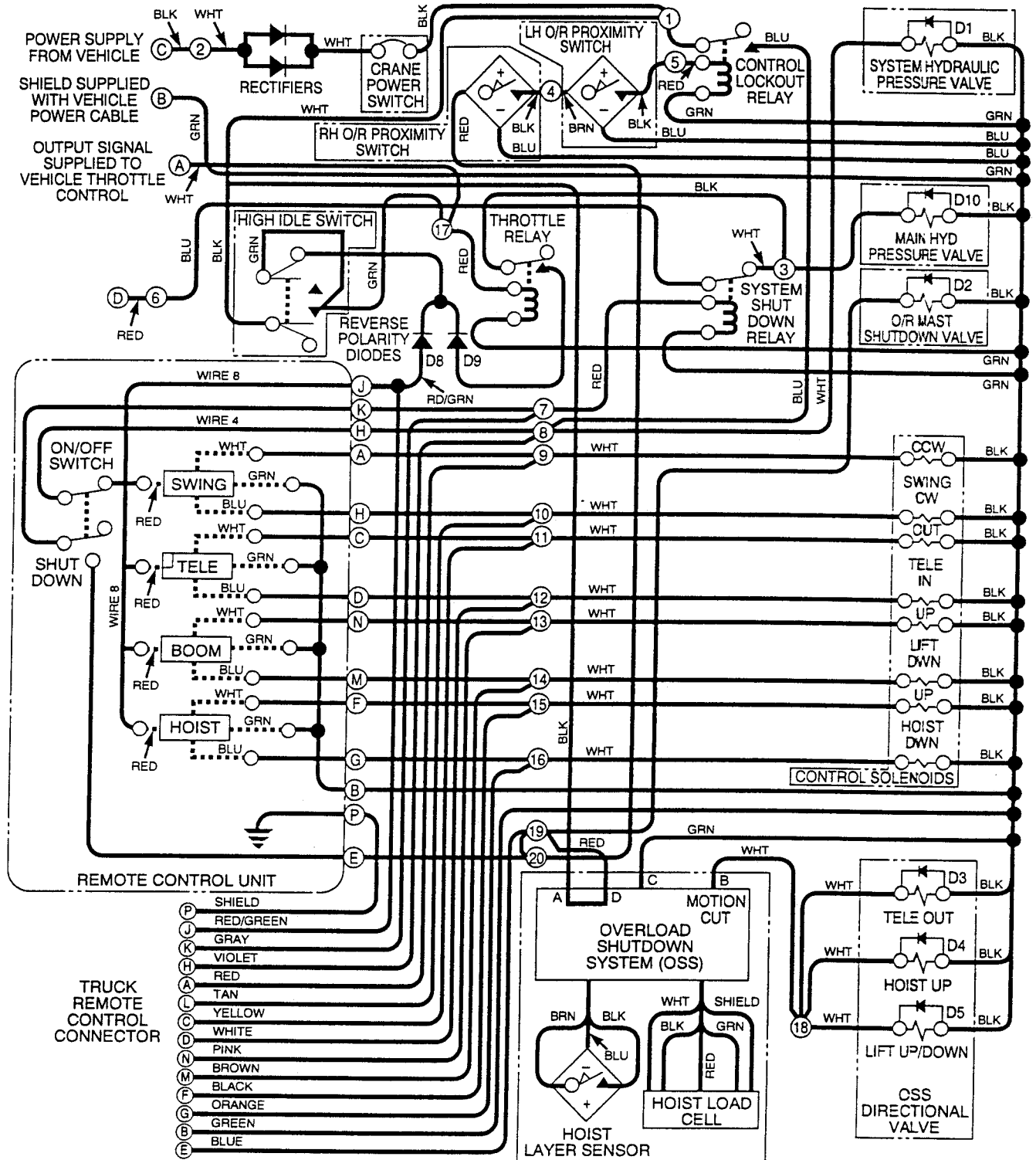


Figure 2-58. Crane Wiring Schematic

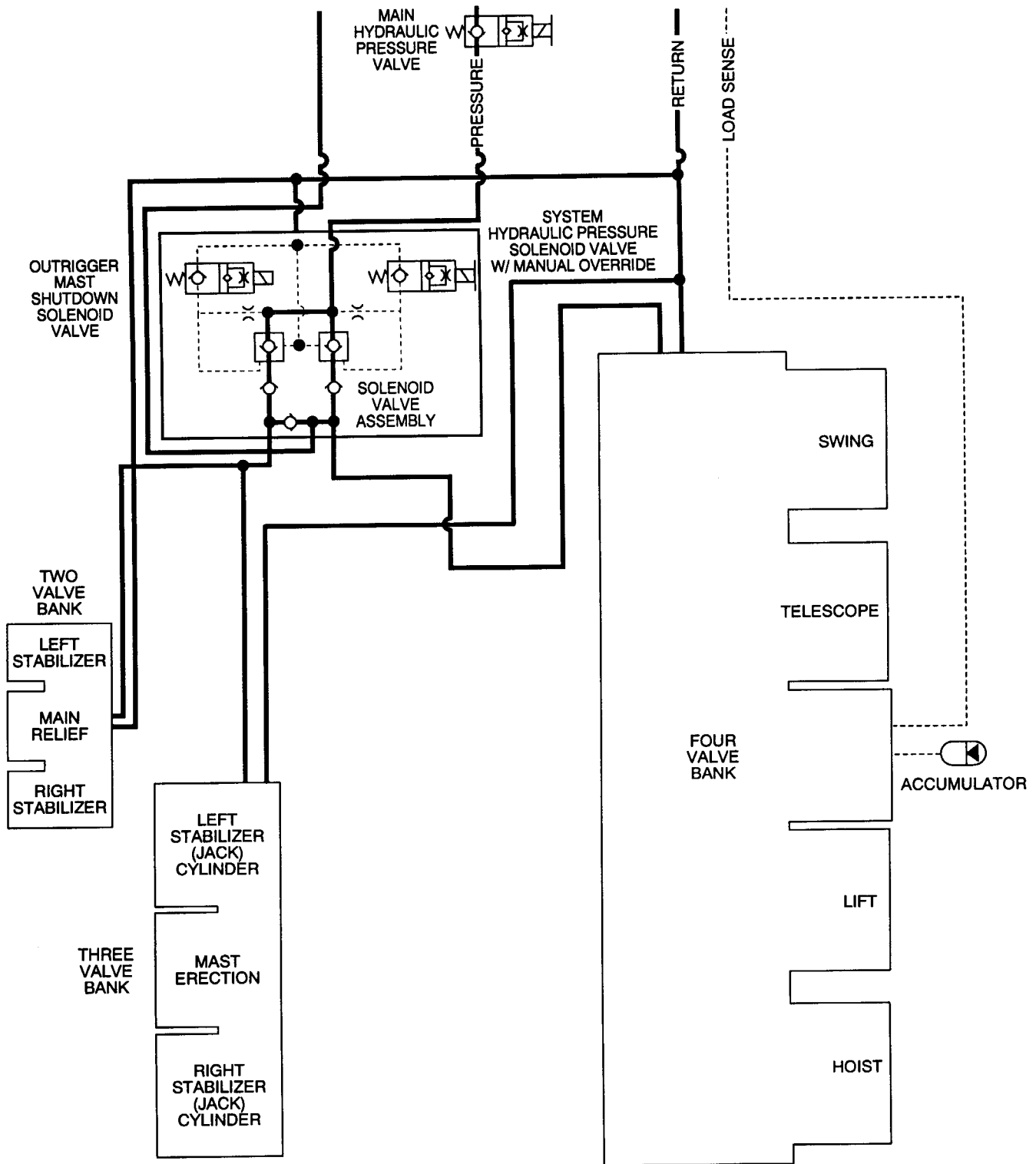


Figure 2-59. Crane Hydraulic Diagram

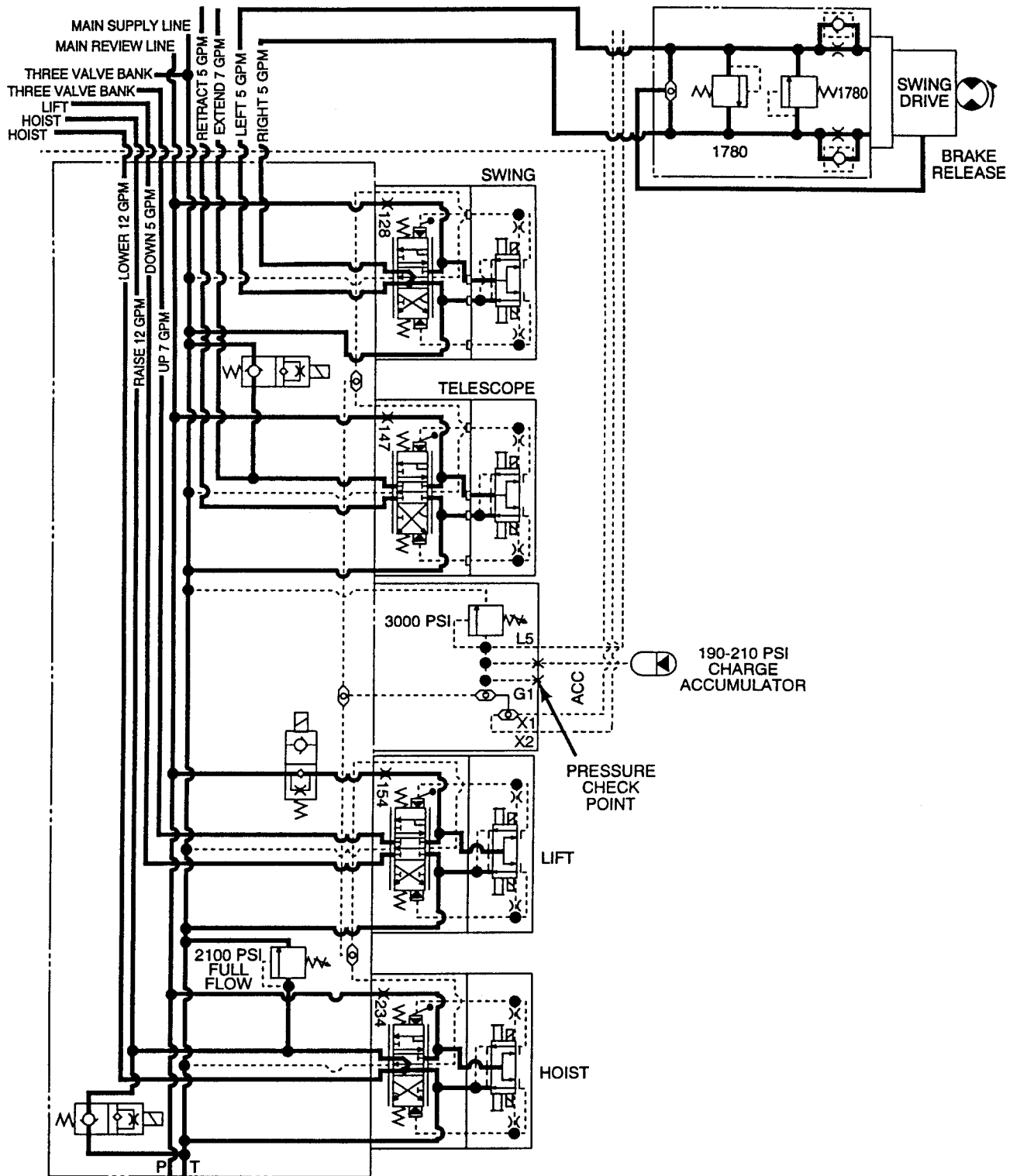


Figure 2-60. Crane Swing Hydraulic Diagram

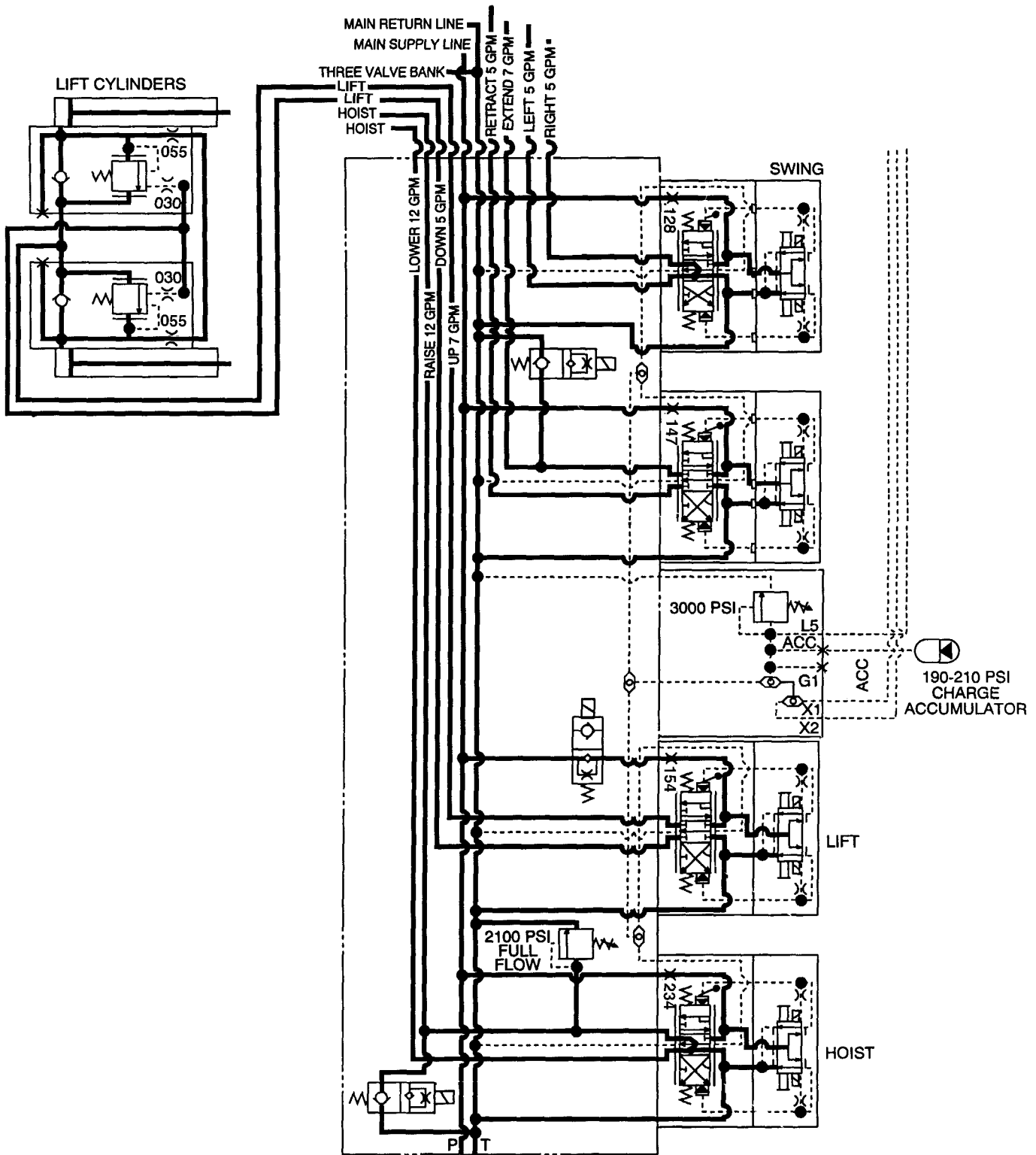


Figure 2-61. Crane Boom Hydraulic Diagram

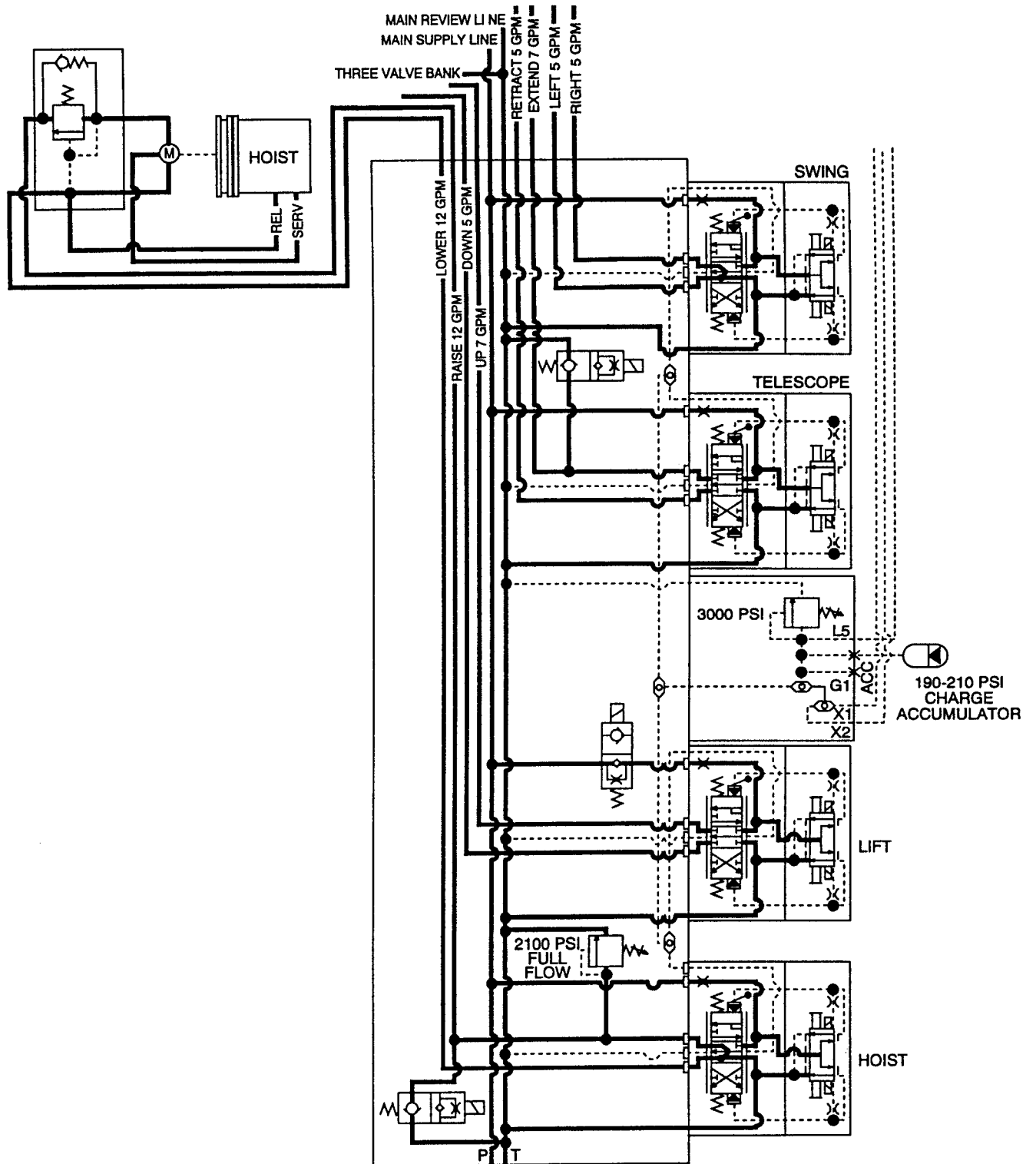


Figure 2-62. Crane Hoist Hydraulic Diagram

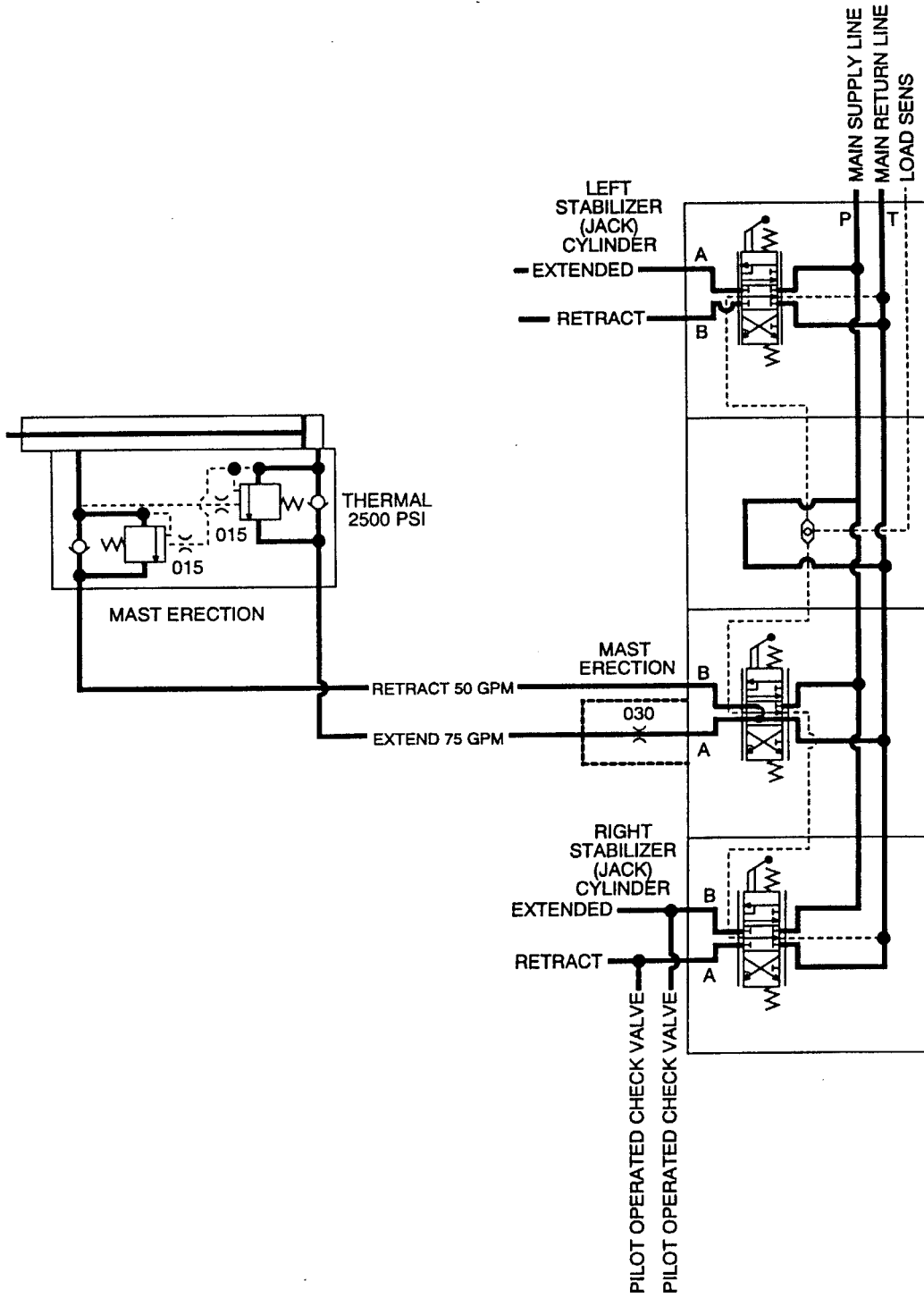


Figure 2-63. Crane Mast Hydraulic Diagram

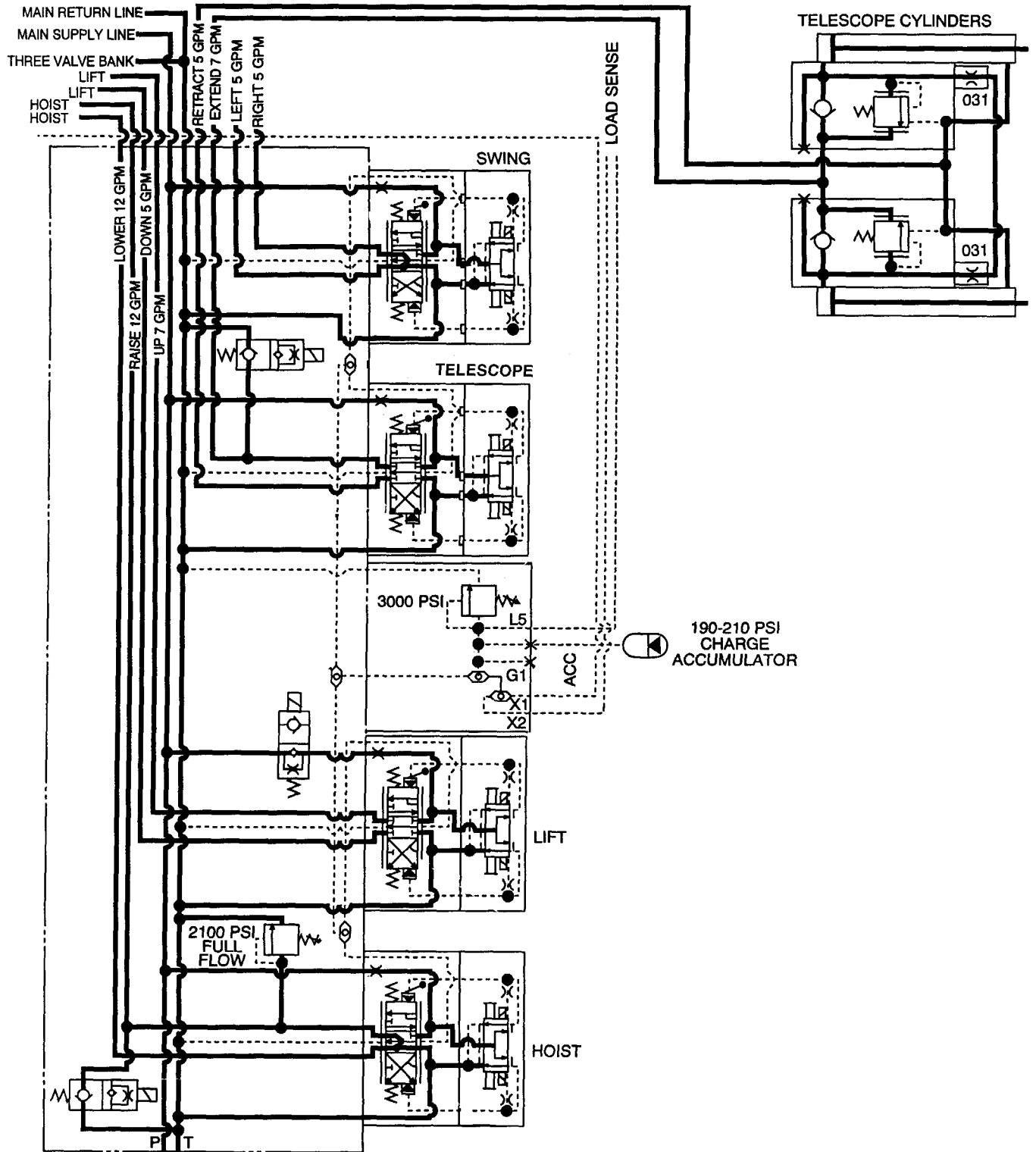


Figure 2-64. Crane Telescope Hydraulic Diagram

2-29. CRANE TROUBLESHOOTING (CONT).

1. NO CRANE FUNCTIONS WORK USING REMOTE CONTROL.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

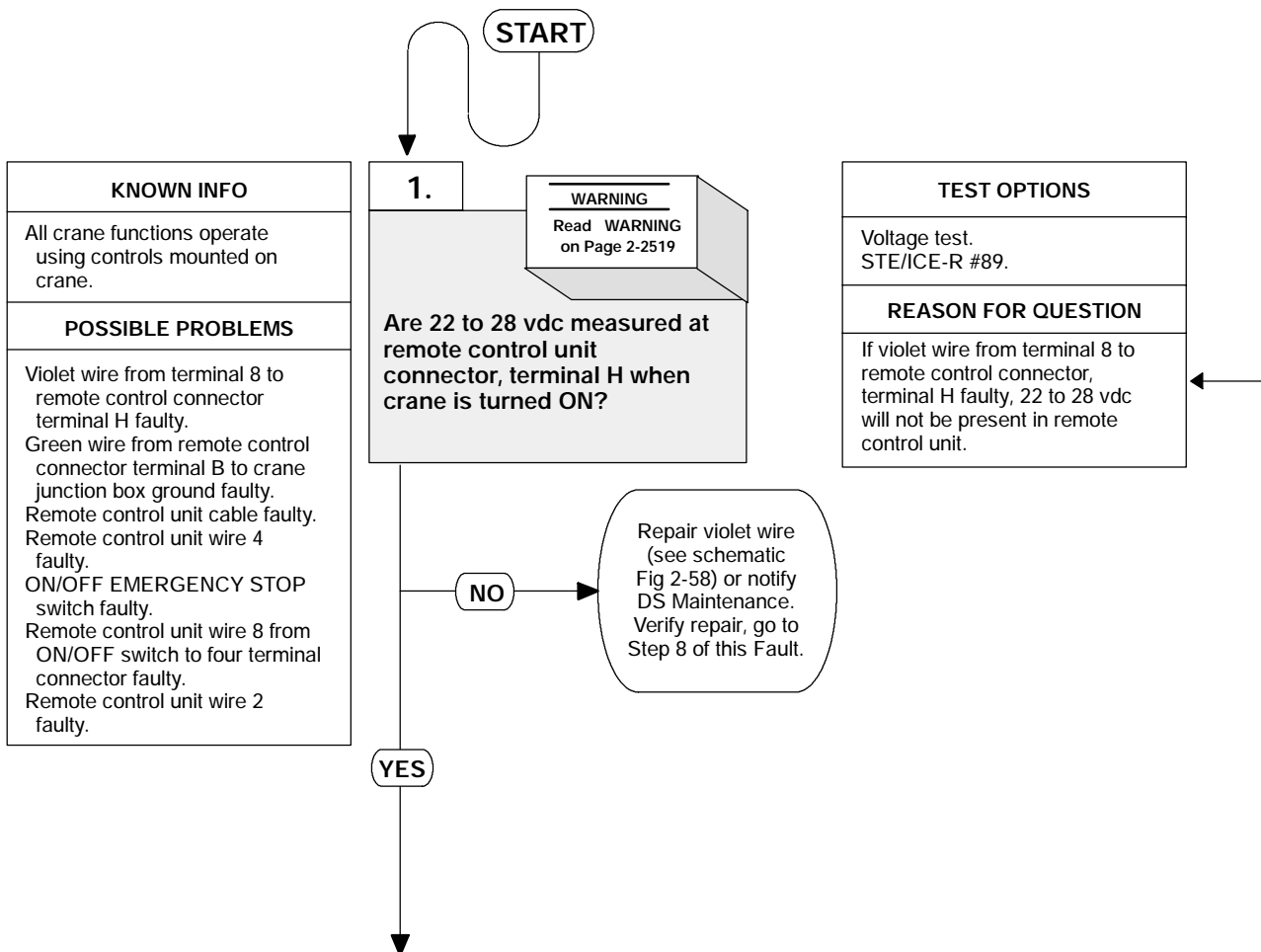
TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)
 Remote control unit connected, (TM 9-2320-364-10)

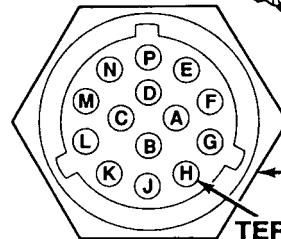
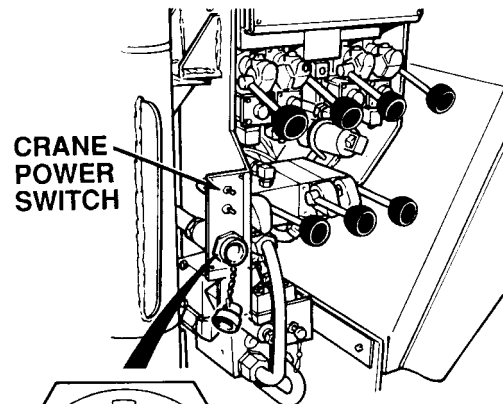
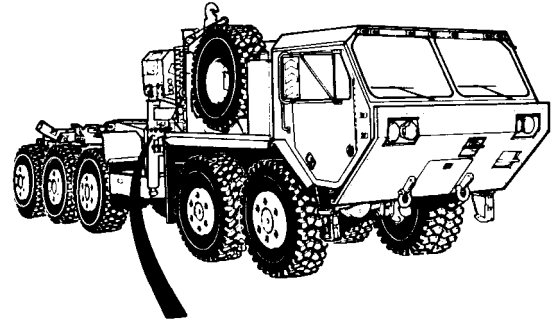
NOTE

Tag and mark all wires prior to removal.



WARNING

Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

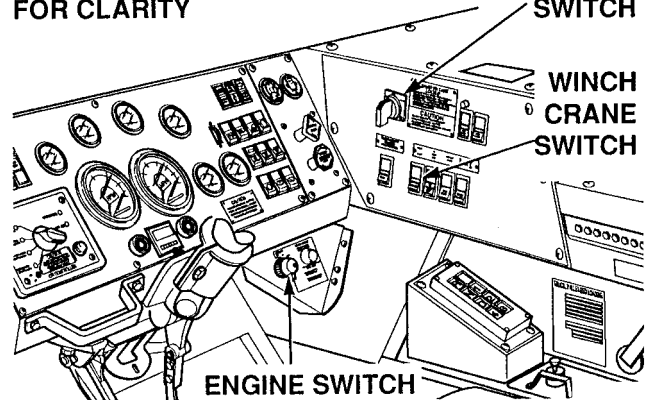


REMOTE CONTROL CONNECTOR TERMINAL H

- VOLTAGE TEST**
- (1) Disconnect remote control cable from truck remote control connector (TM 9-2320-364-10).
 - (2) Turn ON ENGINE switch.
 - (3) Put WINCH/CRANE switch in CRANE position.
 - (4) Put hydraulic selector switch in CRANE/SRW position.
 - (5) Turn ON crane POWER switch.
 - (6) Connect positive (+) multimeter lead to terminal H of LH or RH remote control connector outlet.
 - (7) Connect negative (-) multimeter lead to a known good ground.
 - (a) If 22 to 28 vdc are not present, perform Step (8) below and repair violet wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 are vdc present, perform Step (8) below and go to Step 2 of this Fault.
 - (8) Put the following switches in the OFF position: crane POWER switch, hydraulic selector switch and ENGINE switch.

STEERING WHEEL SHOWN REMOVED FOR CLARITY

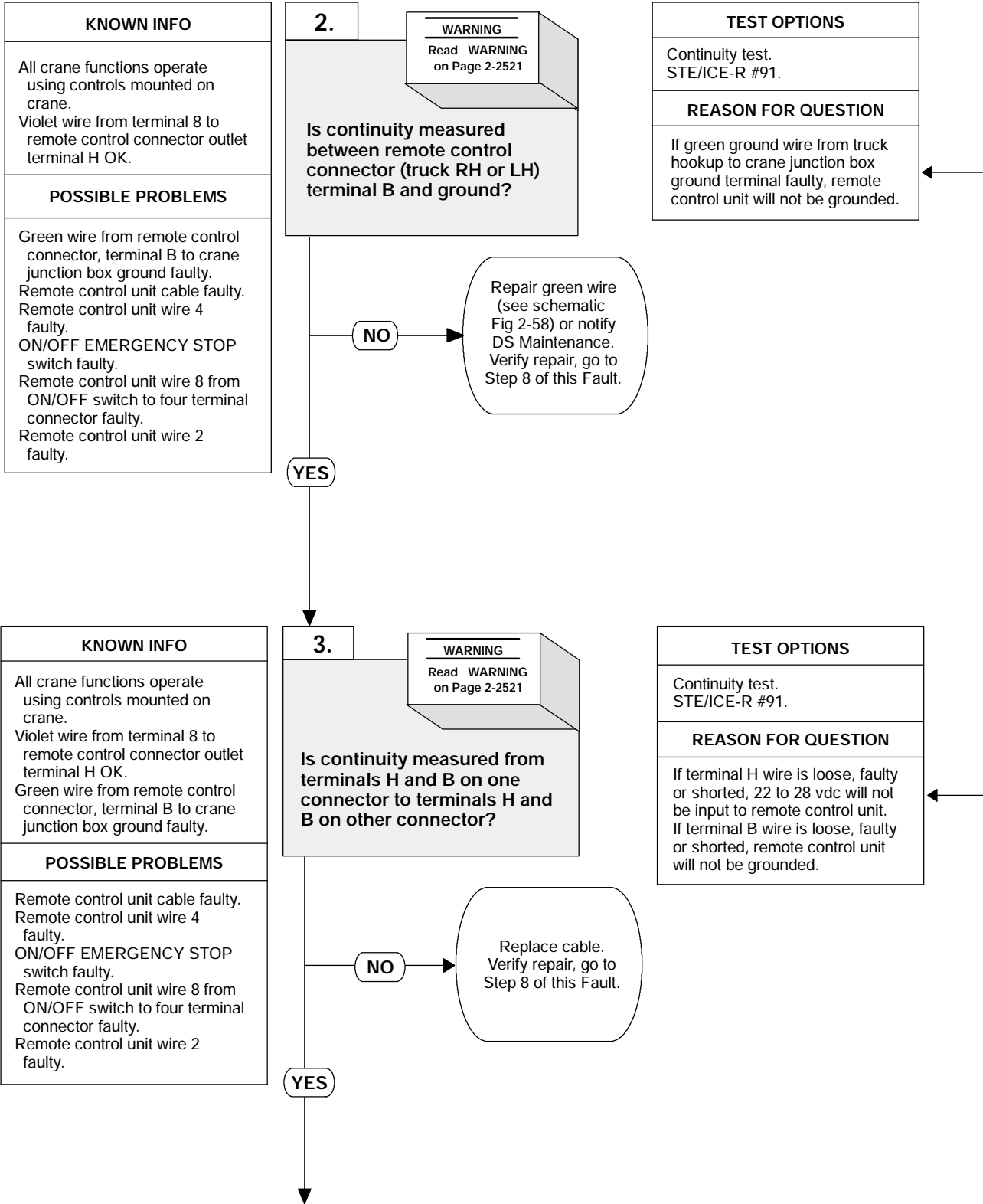
HYDRAULIC SELECTOR SWITCH



WINCH CRANE SWITCH

ENGINE SWITCH

1. NO CRANE FUNCTIONS WORK USING REMOTE CONTROL (CONT).



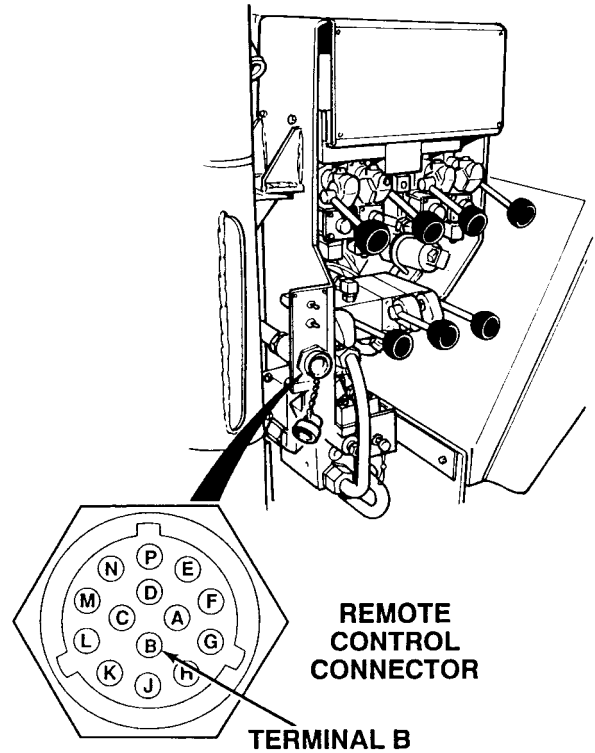
WARNING

Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

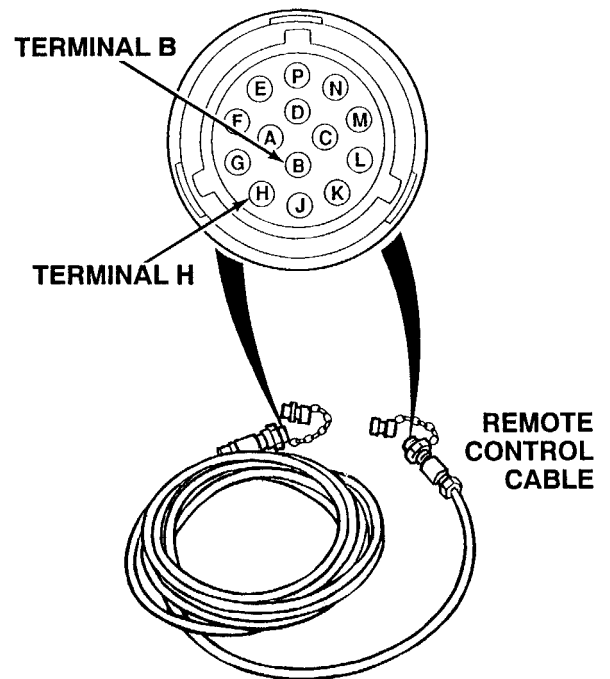
Is there continuity between remote control connector, terminal B and a known good ground?

- (1) If there is no continuity, repair green wire between hookup and ground terminal strip in crane junction box (see schematic Fig 2-58) or notify DS Maintenance.
- (2) If there is continuity, wire is OK.

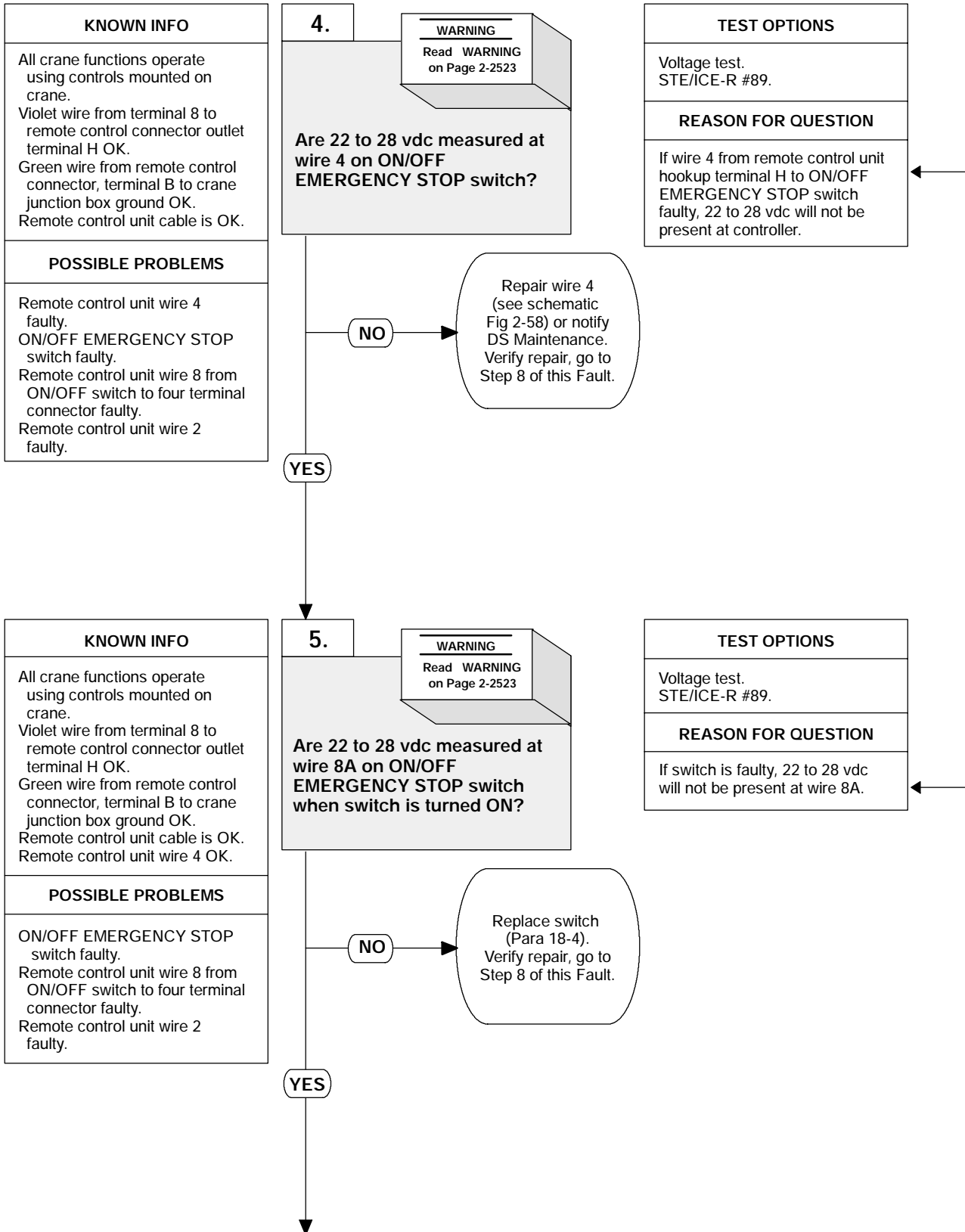


CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between terminal H at one end of cable and terminal H at other end?
 - (a) If there is no continuity, replace cable.
 - (b) If there is continuity, go to Step (3) below.
- (3) Is there continuity between terminal B at one end of cable and terminal B at other end?
 - (a) If there is no continuity, replace cable.
 - (b) If there is continuity, perform Step (4) below and go to Step 4 of this Fault.
- (4) Connect remote control unit cable to truck hookup and remote control unit connector.



1. NO CRANE FUNCTIONS WORK USING REMOTE CONTROL (CONT).

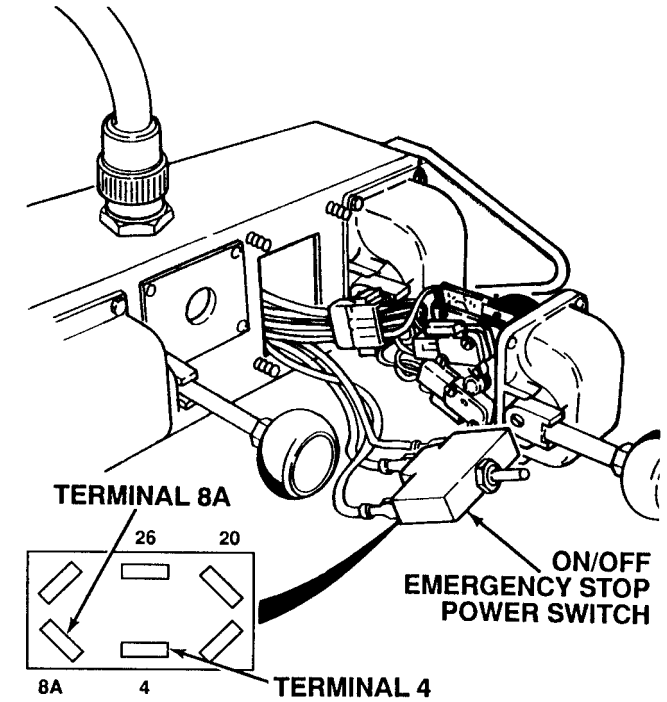


WARNING

Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

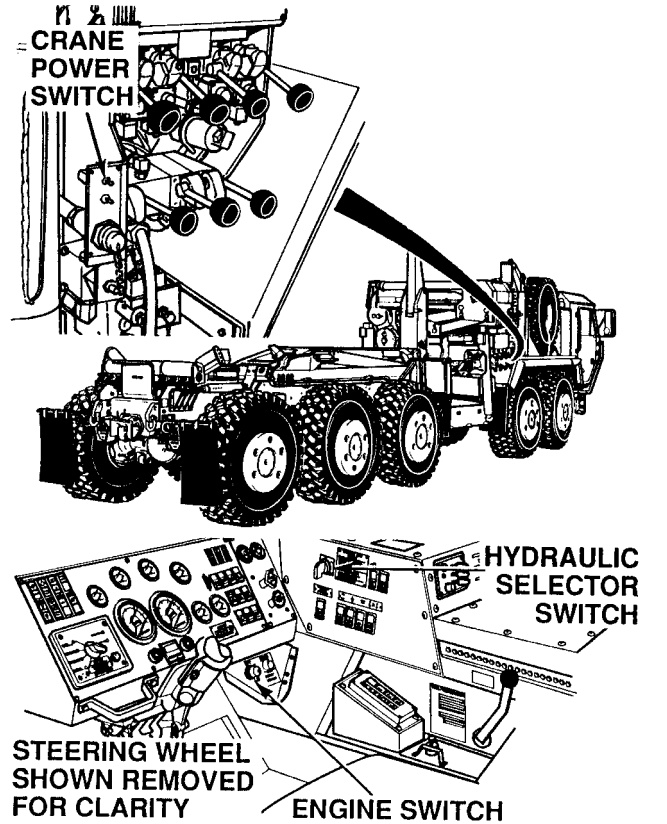
VOLTAGE TEST

- (1) Remove Boom controller and ON/OFF EMERGENCY STOP switch from remote control unit, but do not disconnect wires (Para 18-4).
- (2) Set multimeter select switch to volts.
- (3) Connect positive (+) multimeter lead to terminal 4 on ON/OFF EMERGENCY STOP switch.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
- (6) Put hydraulic selector switch in CRANE/SRW position.
- (7) Turn ON crane POWER switch.
 - (a) If 22 to 28 vdc are not present, perform Step (8) below and repair wire 4 from remote control unit hookup terminal H to ON/OFF EMERGENCY STOP switch (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 -28 vdc are present, perform Step (8) below and go to Step 5 of this Fault.
- (8) Put following switches in OFF position: crane POWER switch, hydraulic selector switch and ENGINE switch.

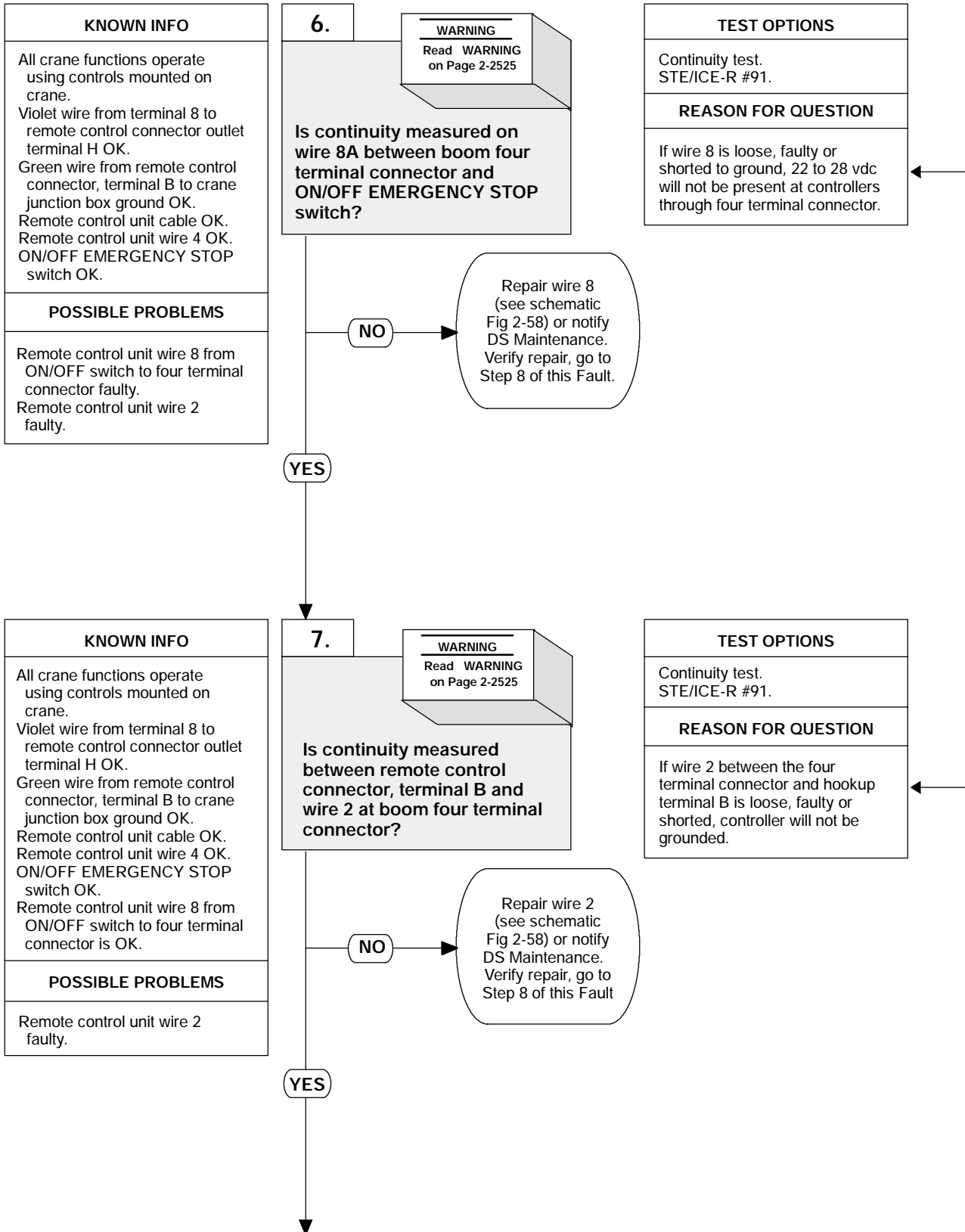


VOLTAGE TEST

- (1) Connect positive (+) multimeter lead to terminal 8A where connected to ON/OFF EMERGENCY STOP switch.
- (2) Connect negative (-) multimeter lead to a known good ground.
- (3) Turn ON ENGINE switch (TM 9-2320-364-10).
- (4) Put hydraulic selector switch in CRANE/SRW position.
- (5) Turn ON crane POWER switch.
- (6) Turn ON remote control unit ON/OFF EMERGENCY STOP switch.
 - (a) If 22 to 28 vdc are not present, perform Step (7) below and replace switch (Para 18-4).
 - (b) If 22 to 28 vdc are present, perform Step (7) below and go to Step 6 of this Fault.
- (7) Put following switches in OFF position: crane POWER switch, hydraulic selector switch and ENGINE switch.



1. NO CRANE FUNCTIONS WORK USING REMOTE CONTROL (CONT).

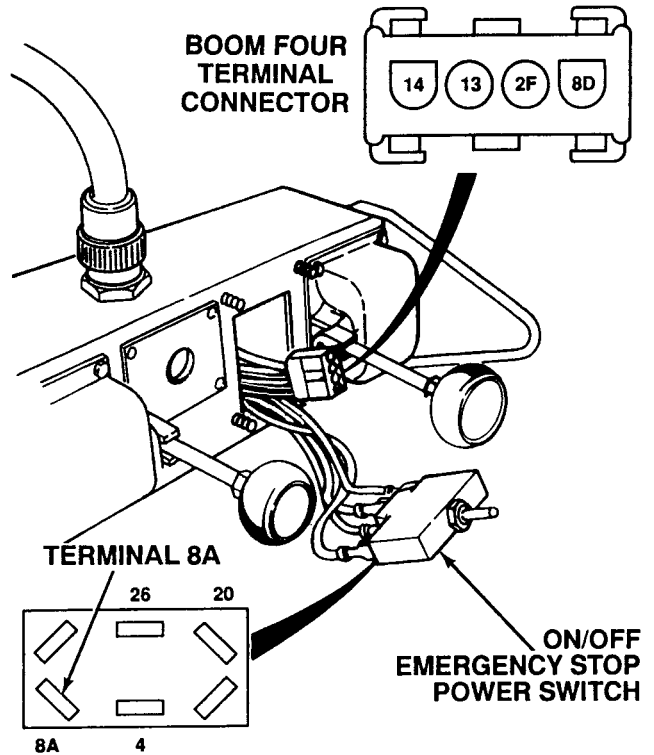


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may result.

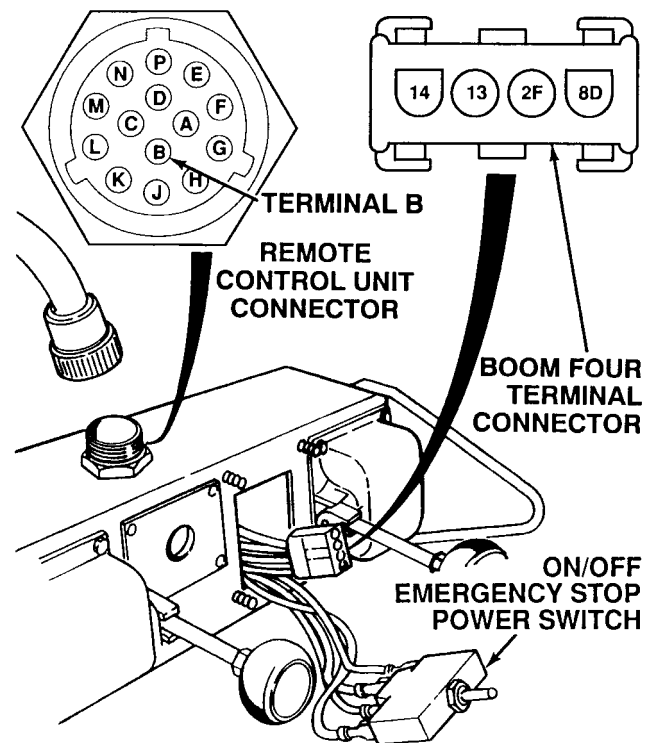
CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between ON/OFF EMERGENCY STOP switch, terminal 8A and Boom four terminal connector, terminal 8D?
 - (a) If there is no continuity, repair wire 8 between switch and BOOM four terminal connector (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, wire 8 is OK.

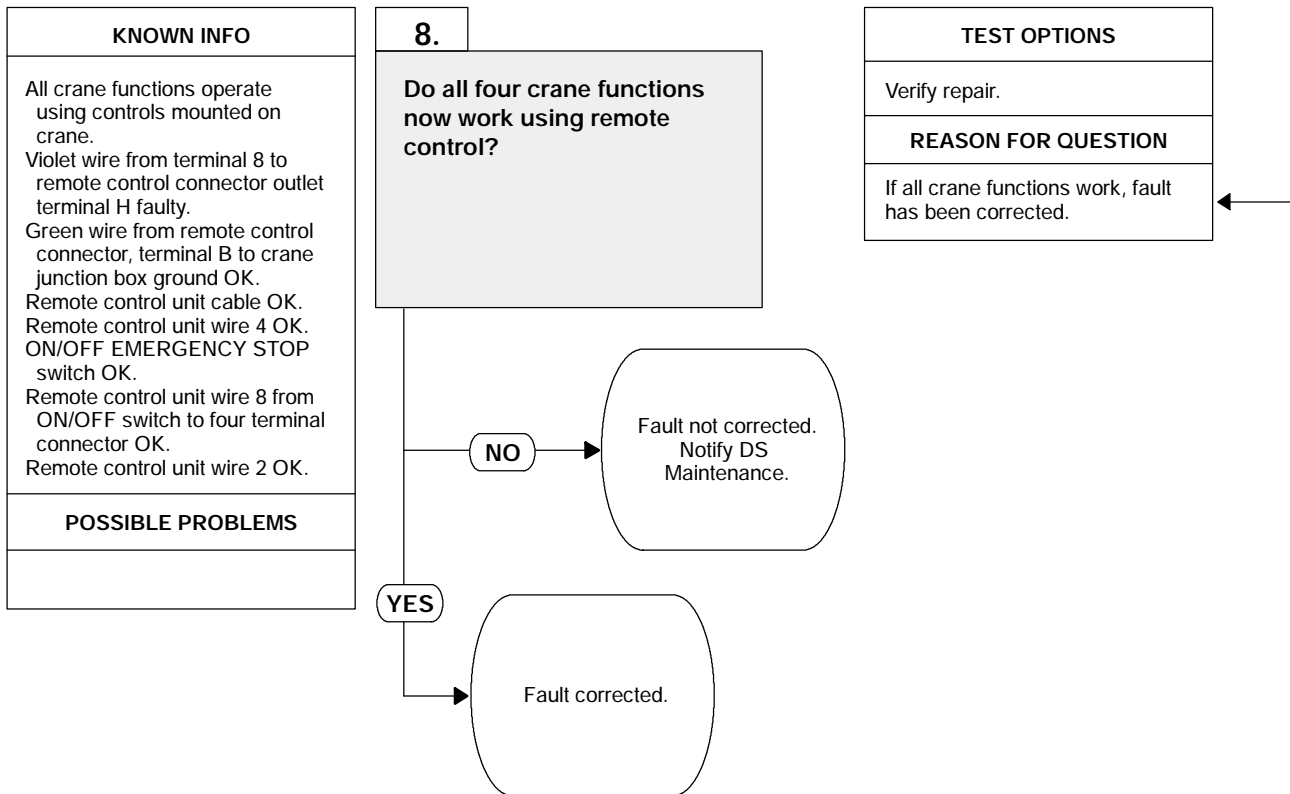


CONTINUITY TEST

- (1) Disconnect remote control unit cable (TM 9-2320-364-10).
- (2) Is there continuity between remote control unit hookup, terminal B and four terminal connector, terminal 2F?
 - (a) If there is no continuity, repair wire 2 between hookup and connector (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, perform Steps (3) through (5) below and go to Step 8 of this Fault.
- (3) Install ON/OFF EMERGENCY STOP switch (Para 18-4).
- (4) Install controller (Para 18-4).
- (5) Install boom controller (Para 18-4).

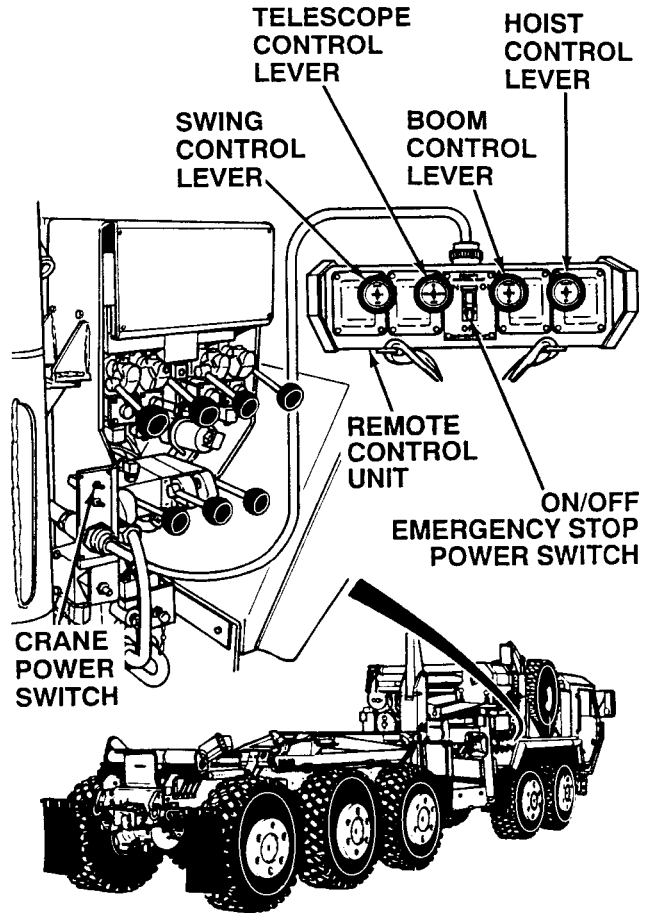


1. NO CRANE FUNCTIONS WORK USING REMOTE CONTROL (CONT).



VERIFY REPAIR

- (1) Connect remote control unit cable to truck hookup and remote control connector (TM 9-2320-364-10).
- (2) Operate crane using remote control unit.
 - (a) If no crane functions work, fault not corrected. Notify DS Maintenance.
 - (b) If all crane functions work, fault has been corrected.



2-29. CRANE TROUBLESHOOTING (CONT).

2. HOIST WILL NOT LOWER USING REMOTE CONTROL UNIT.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

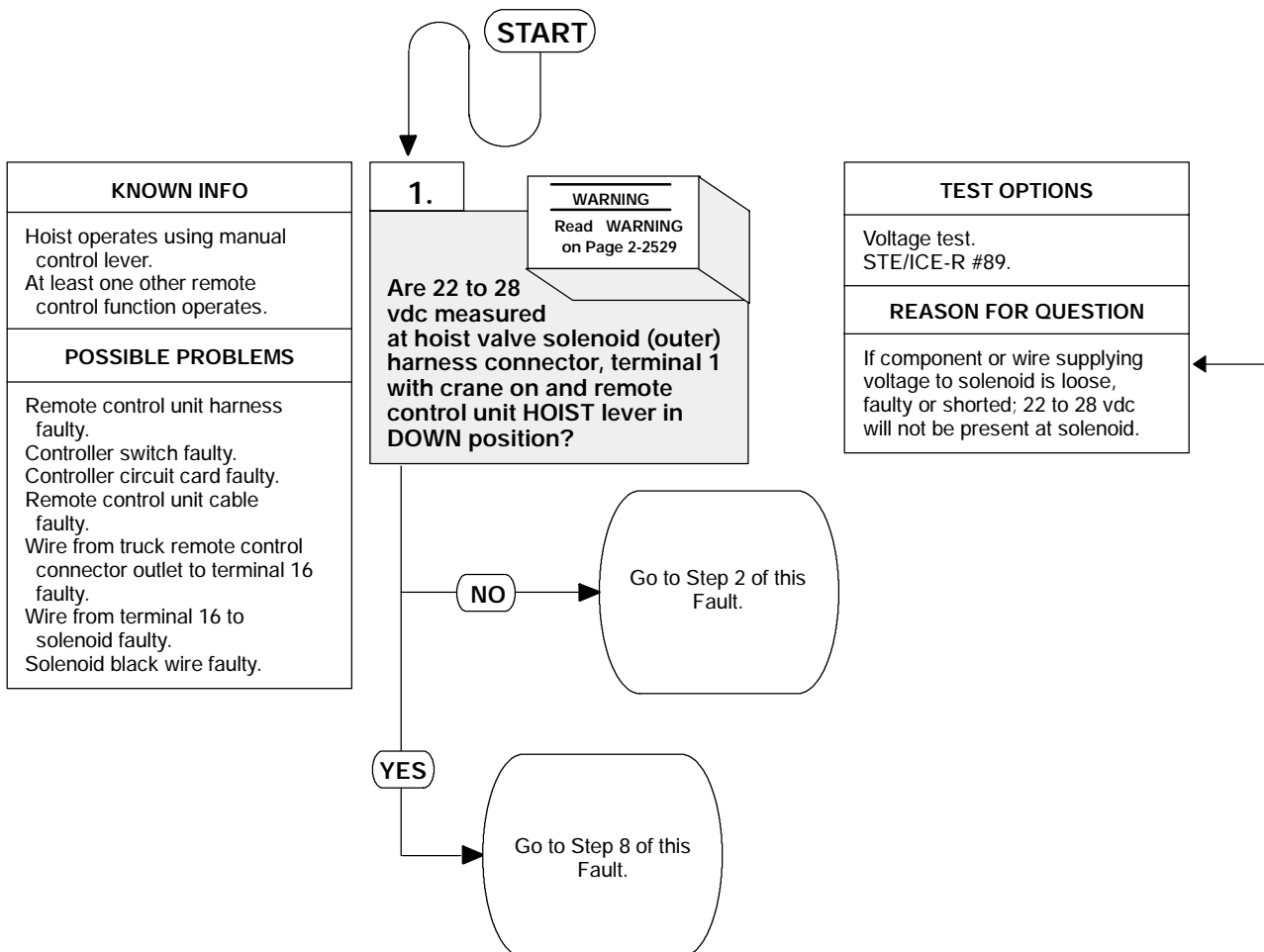
TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Remote control unit connected, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)

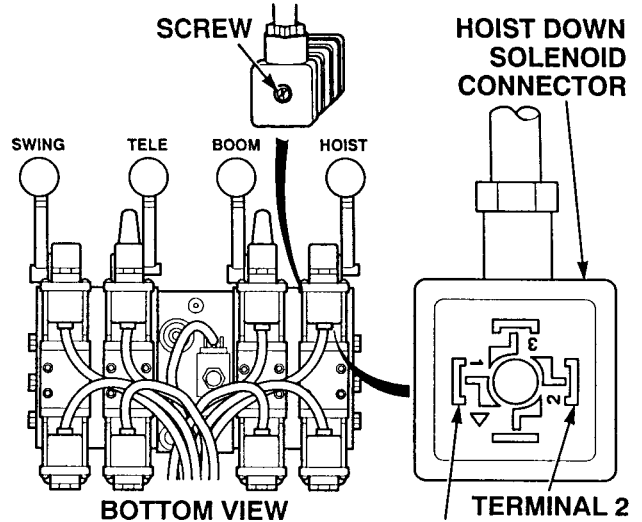
NOTE

This problem can occur at the right or left hand remote control connector. Only the right hand connector is illustrated.

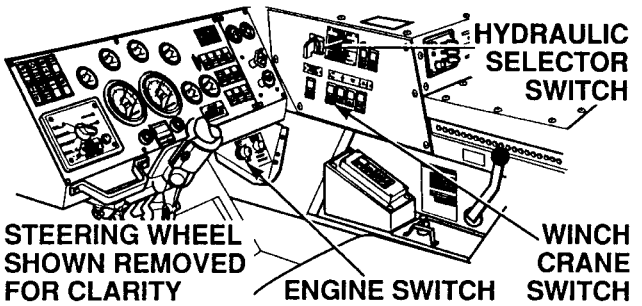
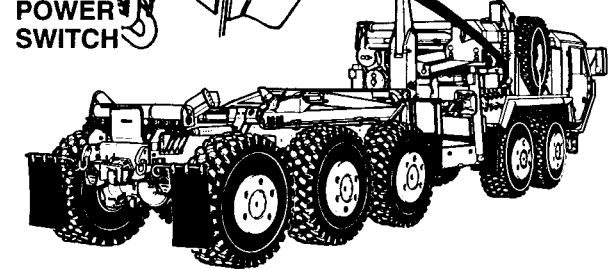
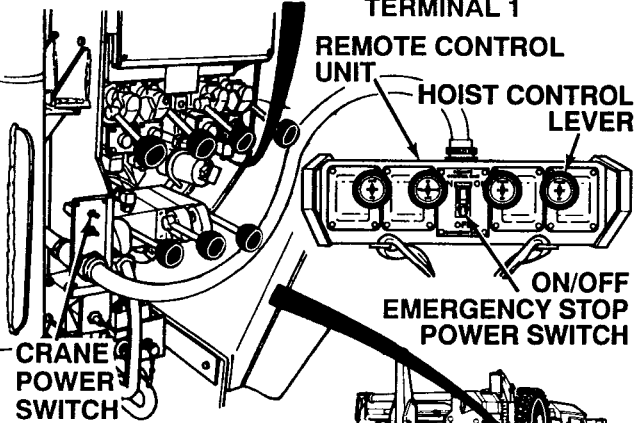


WARNING

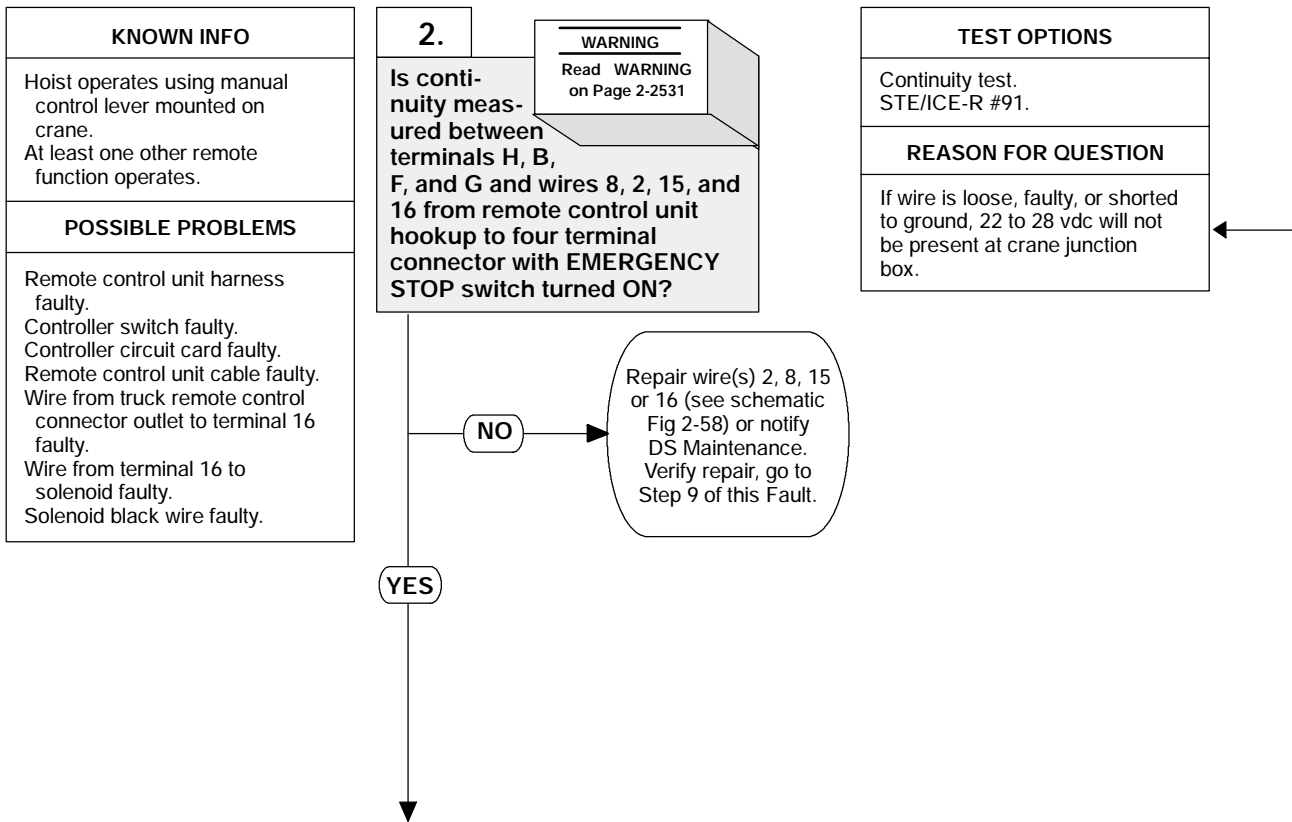
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- VOLTAGE TEST**
- (1) Loosen screw and remove connector from hoist DOWN solenoid.
 - (2) Set multimeter select switch to volts.
 - (3) Connect positive (+) multimeter lead to connector, terminal 1.
 - (4) Connect negative (-) multimeter lead to a known good ground.
 - (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (6) Set WINCH/CRANE switch to CRANE position.
 - (7) Set hydraulic selector switch to CRANE/SRW position.
 - (8) Set crane POWER switch to ON position.
 - (9) Set remote control ON/OFF EMERGENCY STOP POWER switch to ON position.
 - (10) Hold remote control unit hoist controller in DOWN position.
 - (a) If 22 to 28 vdc are not present, perform Step (11) below and go to Step 2 of this Fault.
 - (b) If 22 to 28 vdc are present, perform Step (11) below and go to Step 8 of this Fault.
 - (11) Put the following switches in OFF position: REMOTE CONTROL UNIT ON/OFF EMERGENCY STOP switch, crane POWER switch, hydraulic selector switch and ENGINE switch.



2. HOIST WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

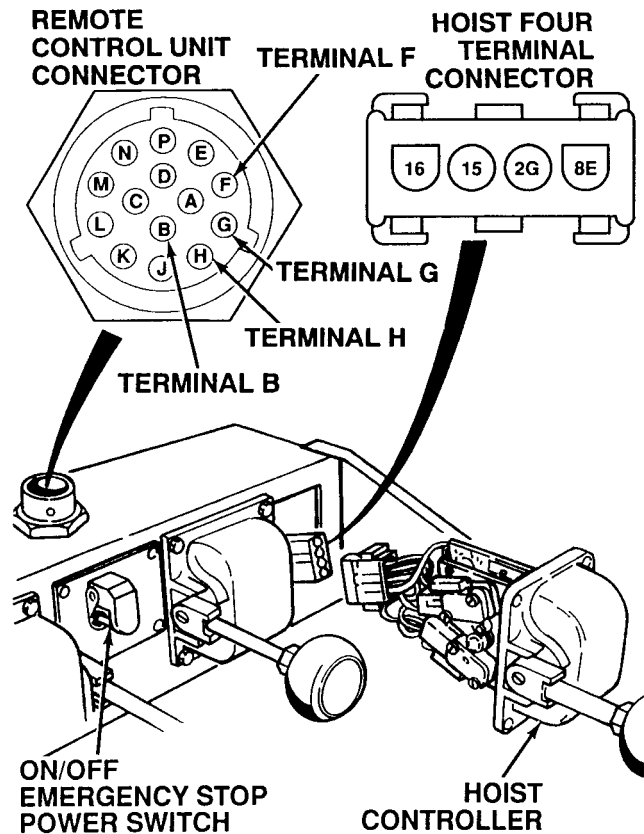


WARNING

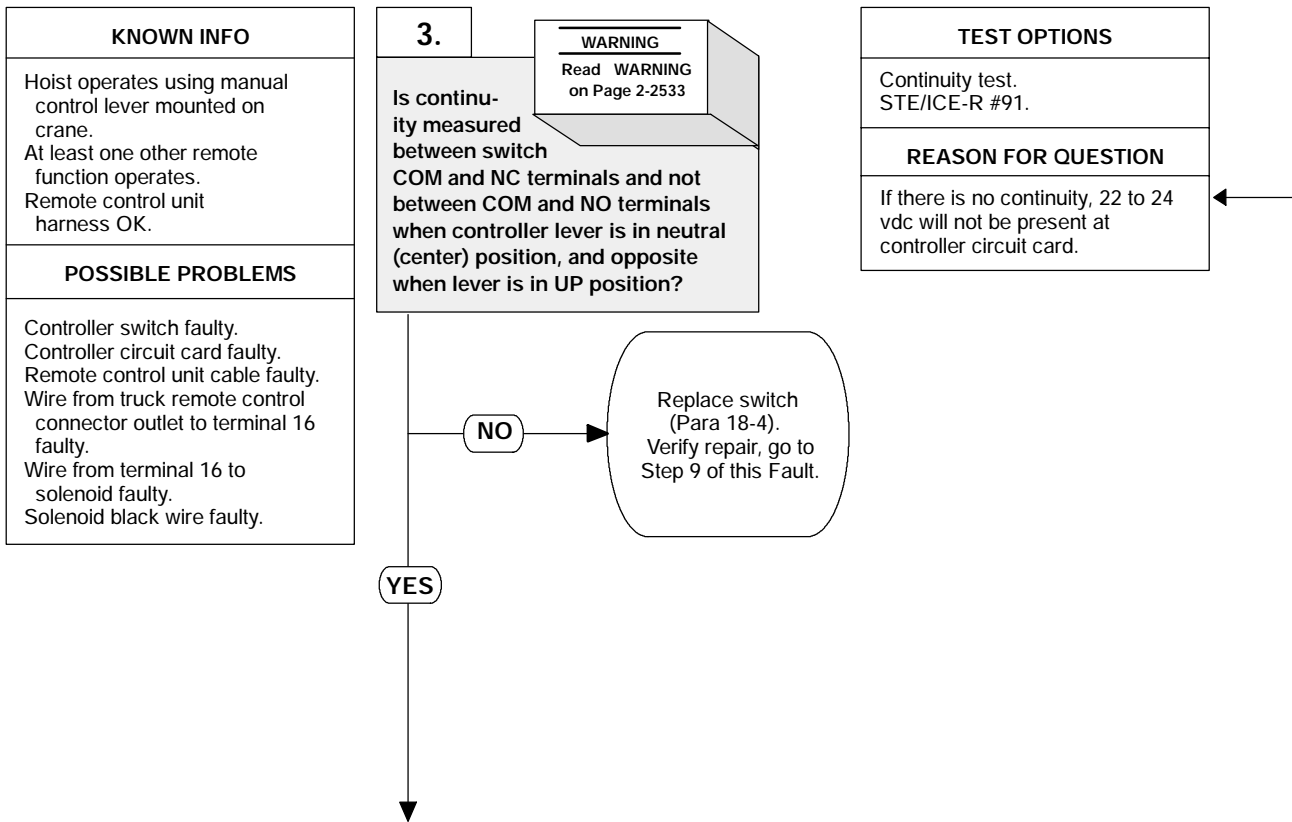
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect cable from remote control unit (TM 9-2320-364-10).
- (2) Remove HOIST controller from remote control unit (Para 18-4).
- (3) Set multimeter select switch to ohms.
- (4) Turn ON remote control unit ON/OFF EMERGENCY STOP switch.
- (5) Is there continuity between remote control unit hookup, terminal H and four terminal connector, terminal 8E?
 - (a) If there is no continuity, repair wire 8 between switch and four terminal connector (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (6) below.
- (6) Is there continuity between remote control unit hookup, terminal B and four terminal connector, terminal 2G?
 - (a) If there is no continuity, repair wire 2 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (7) below.
- (7) Is there continuity between remote control unit hookup, terminal F and four terminal connector, terminal 15?
 - (a) If there is no continuity, repair wire 15 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (8) below.
- (8) Is there continuity between remote control unit hookup, terminal G and four terminal connector, terminal 16?
 - (a) If there is no continuity, repair wire 16 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step 3 of this Fault.



2. HOIST WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

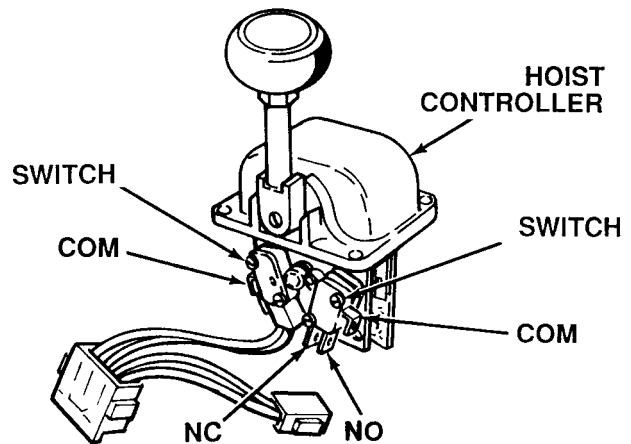


WARNING

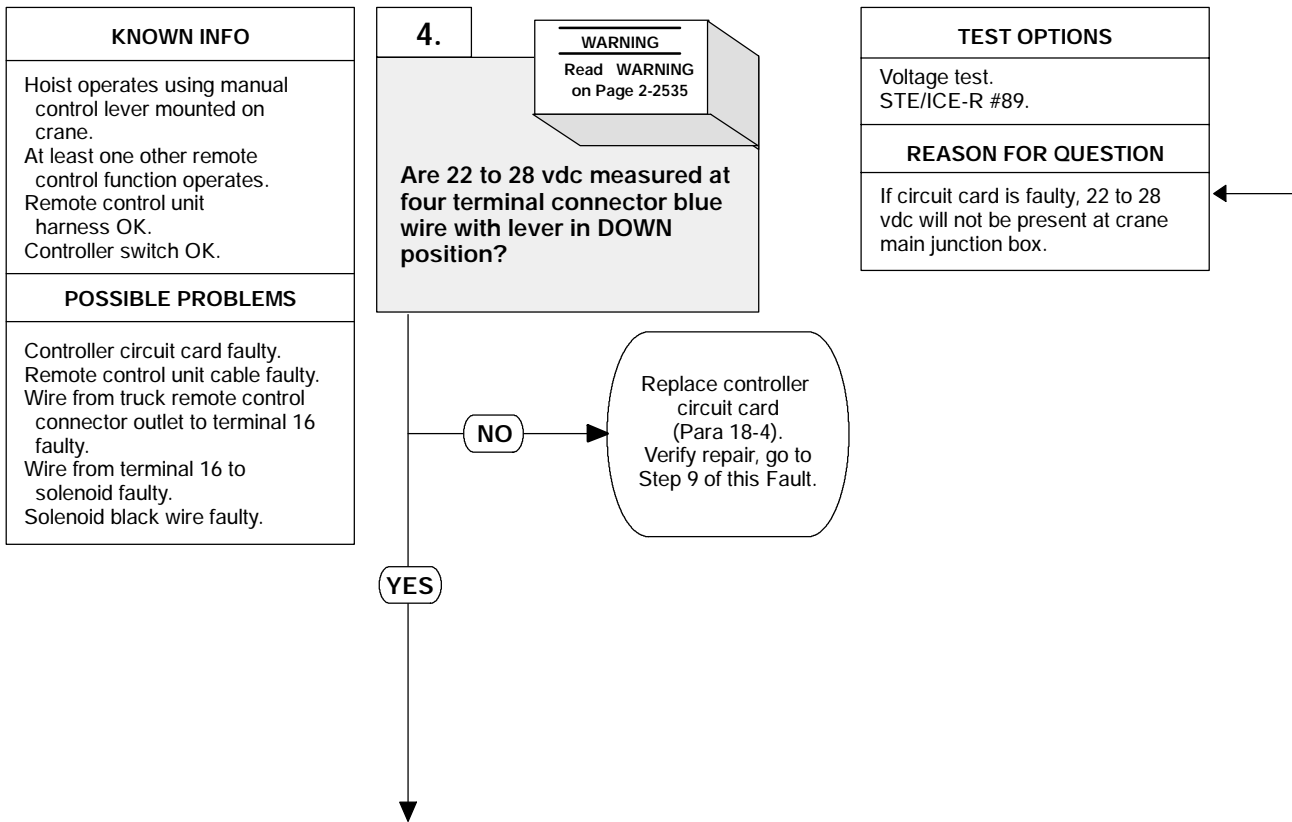
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector from one of the two switches.
- (2) Is there continuity between switch NC terminal and switch COM terminal?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (3) below.
- (3) Is there continuity between switch COM terminal and switch NO terminal?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (4) below.
- (4) Is there continuity between switch NC terminal and switch COM terminal with controller lever held in UP position?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (5) below.
- (5) Is there continuity between switch COM terminal and switch NO terminal with controller lever held in UP position?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (6) below.
- (6) Repeat Steps (1) through (5) for other switch.
- (7) Install both connectors on switches.



2. HOIST WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

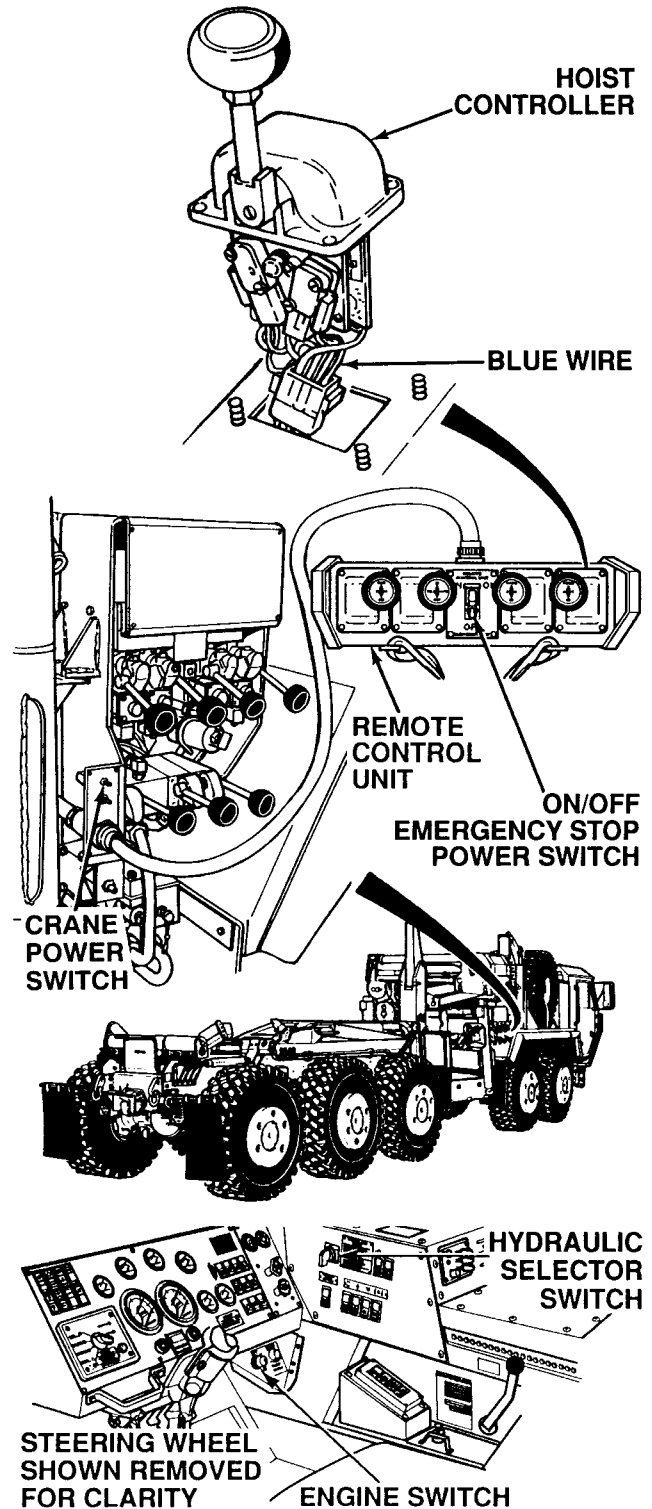


WARNING

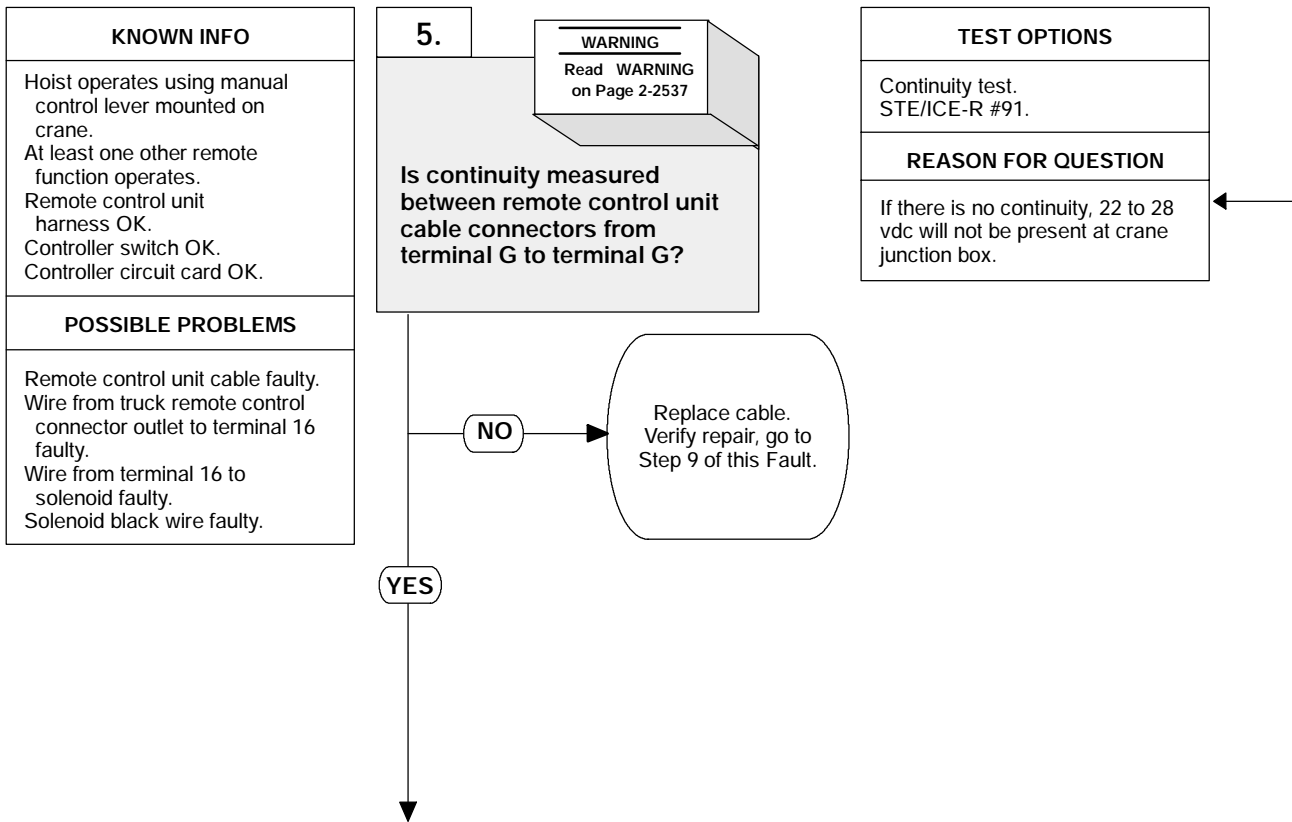
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Connect remote control unit to remote control unit cable.
- (2) Connect controller four terminal connector to remote control unit harness four terminal connector.
- (3) Set multimeter select switch to volts dc.
- (4) Connect positive lead to blue wire terminal.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch (TM 9-2320-364-10).
- (7) Set hydraulic selector switch to CRANE/SRW position.
- (8) Set crane POWER switch to ON position.
- (9) Set remote control ON/OFF EMERGENCY STOP POWER switch to ON position.
- (10) Hold HOIST controller in DOWN position.
 - (a) If 22 to 28 vdc are not present, perform Step (11) below and replace circuit card (Para 18-4).
 - (b) If 22 to 28 vdc are present, perform Steps (11) and (12) below and go to Step 5 of this Fault.
- (11) Set the following switches to the OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch.
- (12) Assemble remote control unit (Para 18-4).



2. HOIST WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

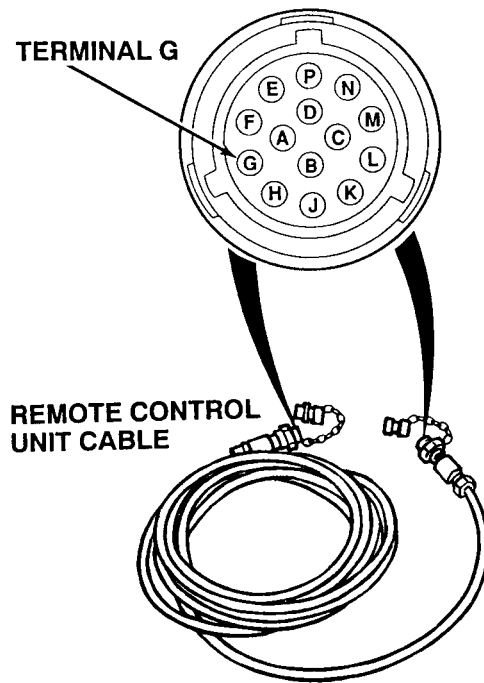


WARNING

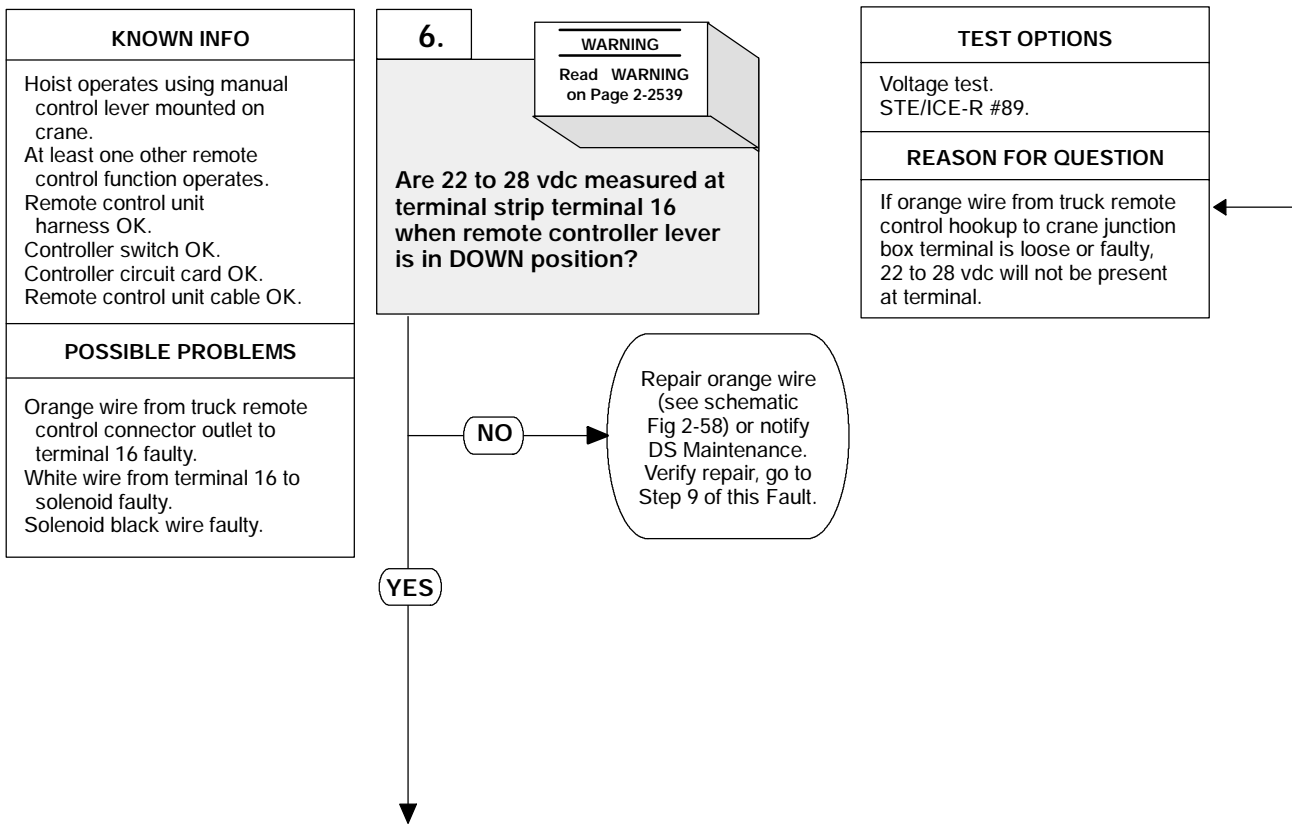
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect remote control unit cable from truck and remote control unit (TM 9-2320-364-10).
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between cable connector terminal G at both ends?
 - (a) If there is no continuity, replace cable and perform Step (4) below. Go to Step 9 of this Fault.
 - (b) If there is continuity, perform Step (4) below and go to Step 6 of this Fault.
- (4) Reconnect cable to truck hookup and remote control unit hookup.

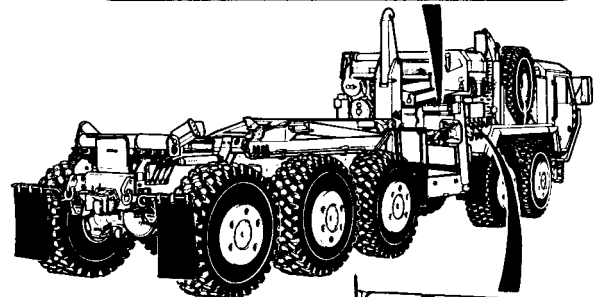
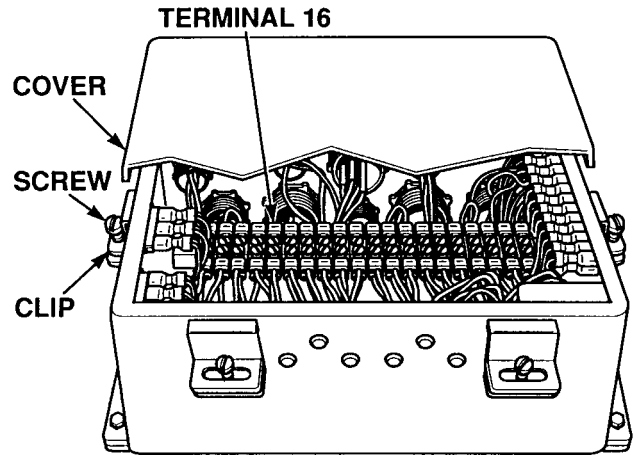


2. HOIST WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

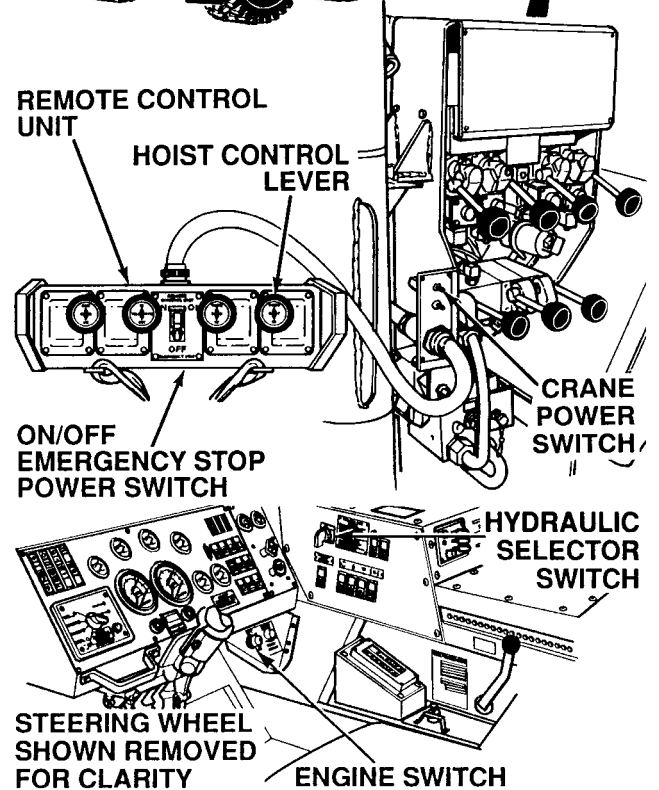


WARNING

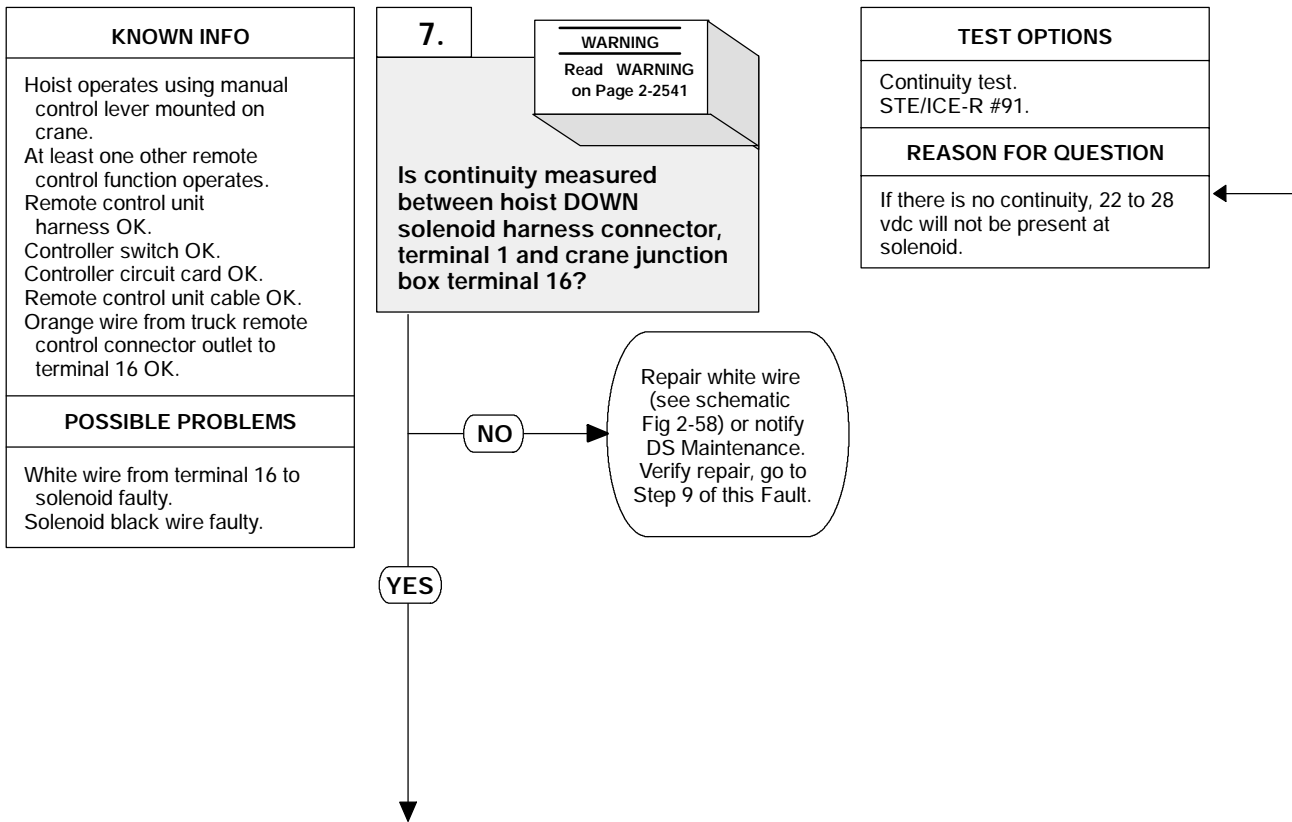
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- VOLTAGE TEST**
- (1) Loosen six screws, clips and remove crane junction box cover.
 - (2) Set multimeter select switch to volts.
 - (3) Connect positive (+) multimeter lead to crane junction box terminal 16.
 - (4) Connect negative (-) multimeter lead to a known good ground.
 - (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (6) Set hydraulic selector switch to CRANE/SRW position.
 - (7) Set crane switch to ON position.
 - (8) Set remote control ON/OFF EMERGENCY STOP power switch to ON.
 - (9) Put remote control unit HOIST control lever in the DOWN position.
 - (a) If 22 to 28 vdc are not present, perform Step (10) below and repair orange wire from truck remote control hookup to terminal 16 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Step (10) below and go to Step 7 of this Fault.
 - (10) Put the following switches in OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch.



2. HOIST WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

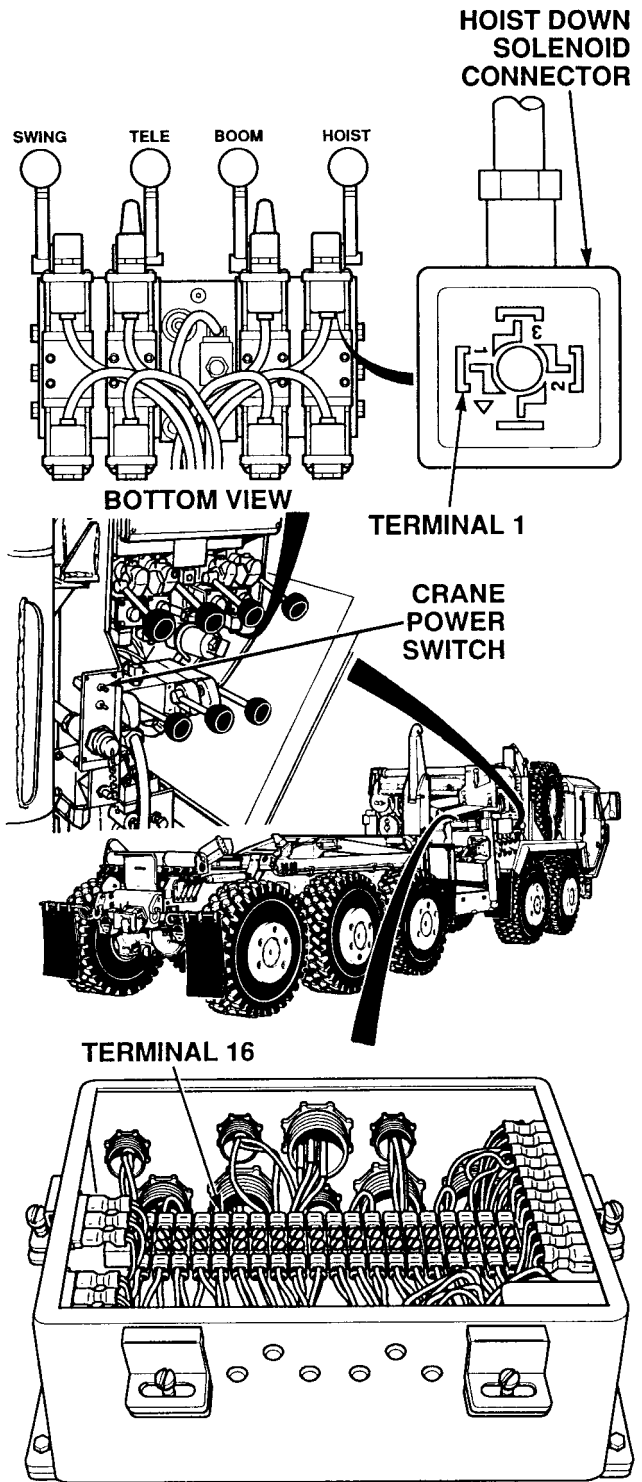


WARNING

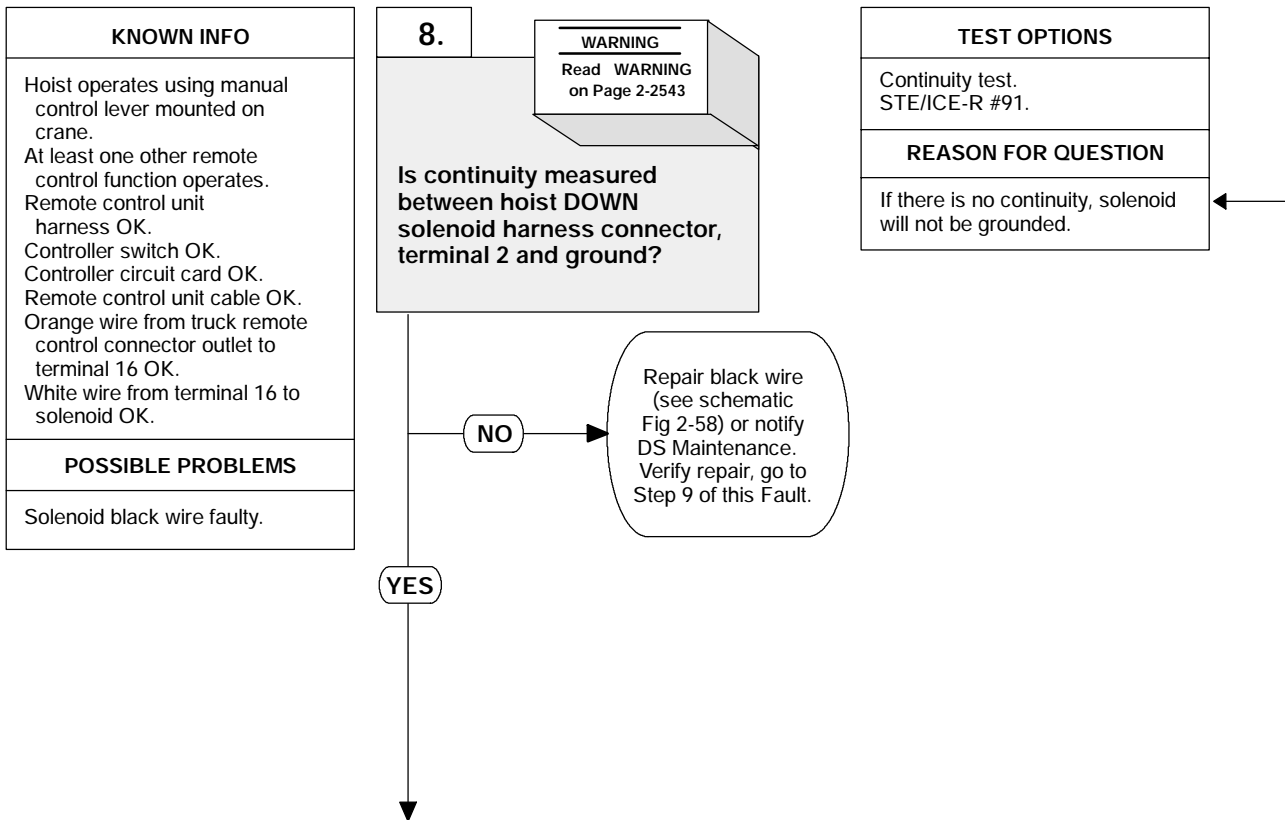
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between connector, terminal 1 and crane main junction box, terminal 16?
 - (a) If there is no continuity, repair white wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, white wire is OK.



2. HOIST WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

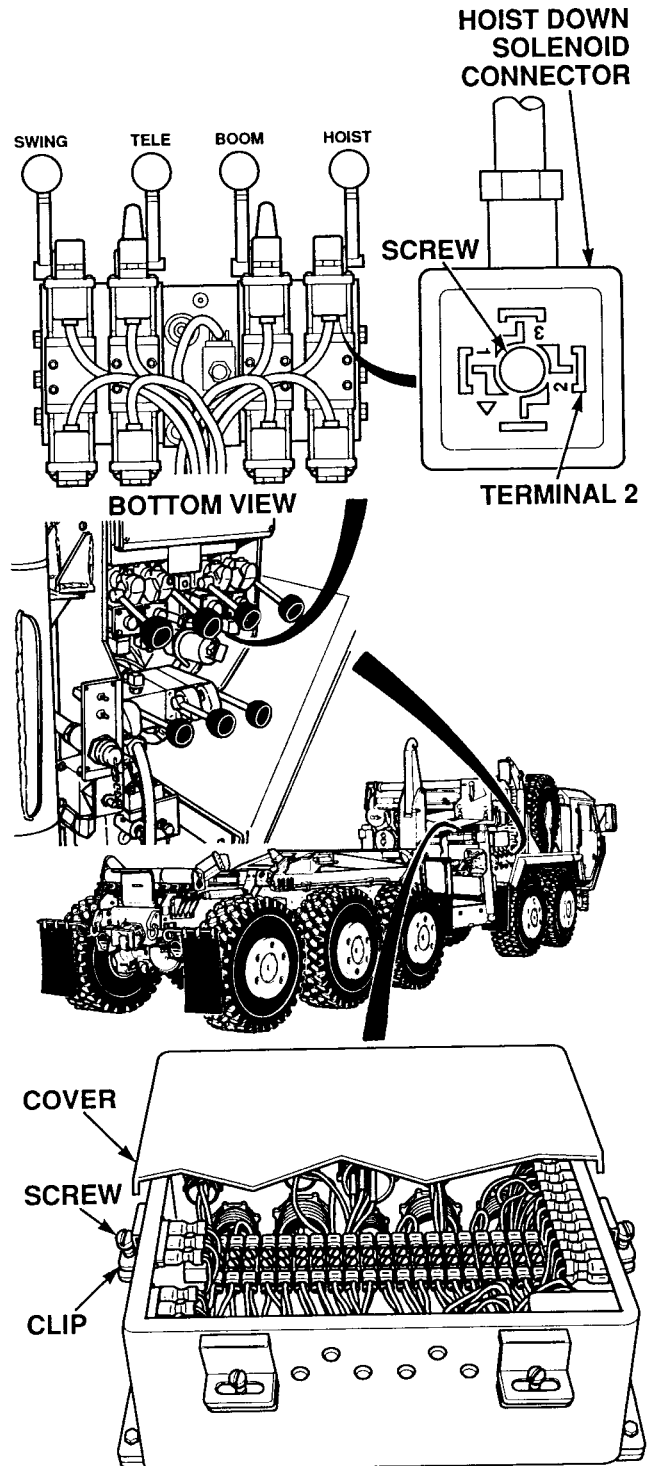


WARNING

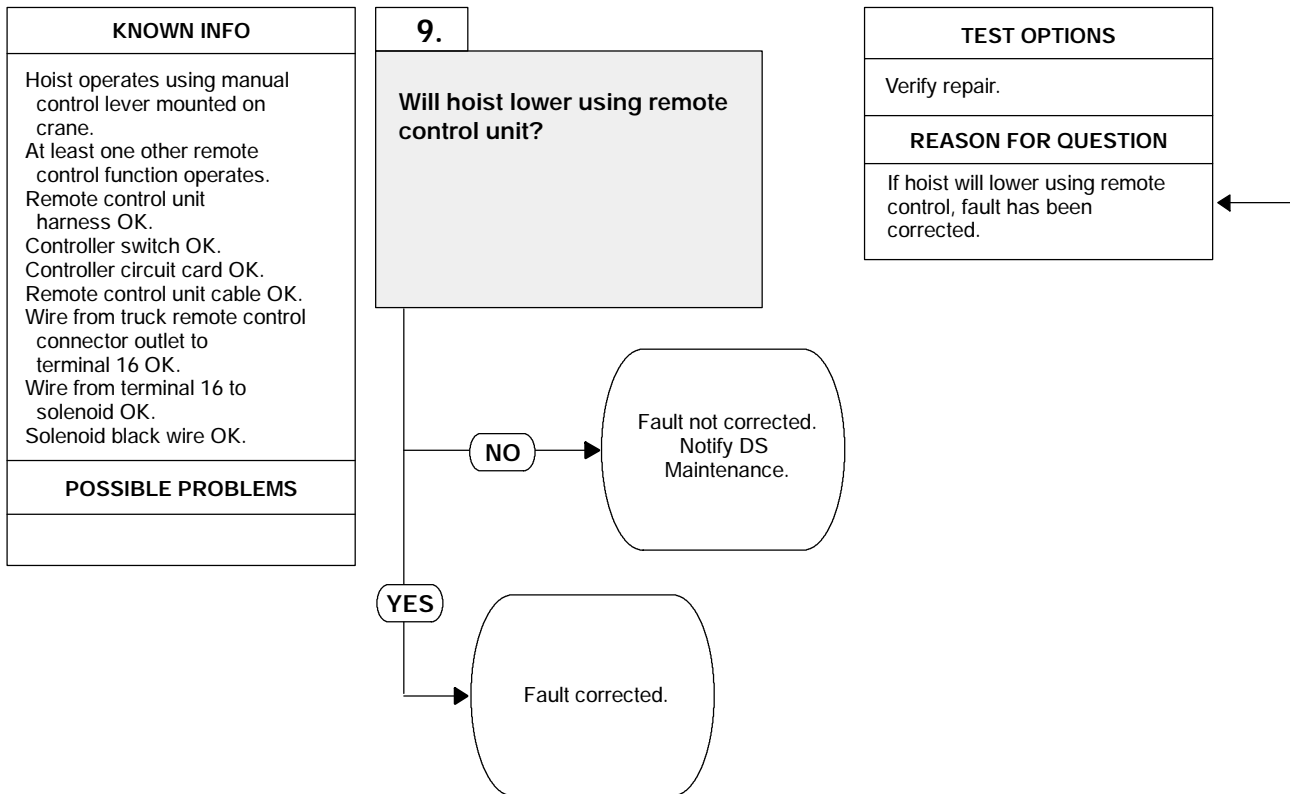
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Is there continuity between connector terminal 2 and a known good ground?
 - (a) If there is no continuity, repair connector black wire (see schematic Fig 2-58) or notify DS Maintenance and perform Steps (2) and (3) below.
 - (b) If there is continuity, perform Steps (2) and (3) below and go to Step 9 of this Fault.
- (2) Install connector on hoist DOWN solenoid and tighten screw.
- (3) Install crane junction box cover with six clips and screws.

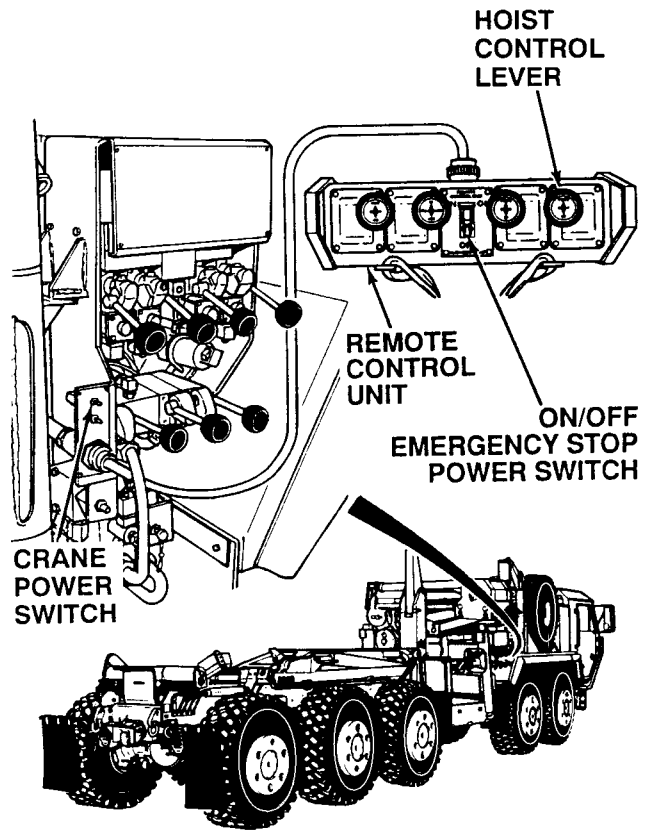


2. HOIST WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).



VERIFY REPAIR

- Operate crane using remote control unit (TM 9-2320-364-10).
- (1) If hoist will not lower using remote control unit, Fault not corrected. Notify DS Maintenance.
 - (2) If hoist will lower, fault has been corrected.



2-29. CRANE TROUBLESHOOTING (CONT).

3. HOIST WILL NOT RAISE USING REMOTE CONTROL UNIT.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

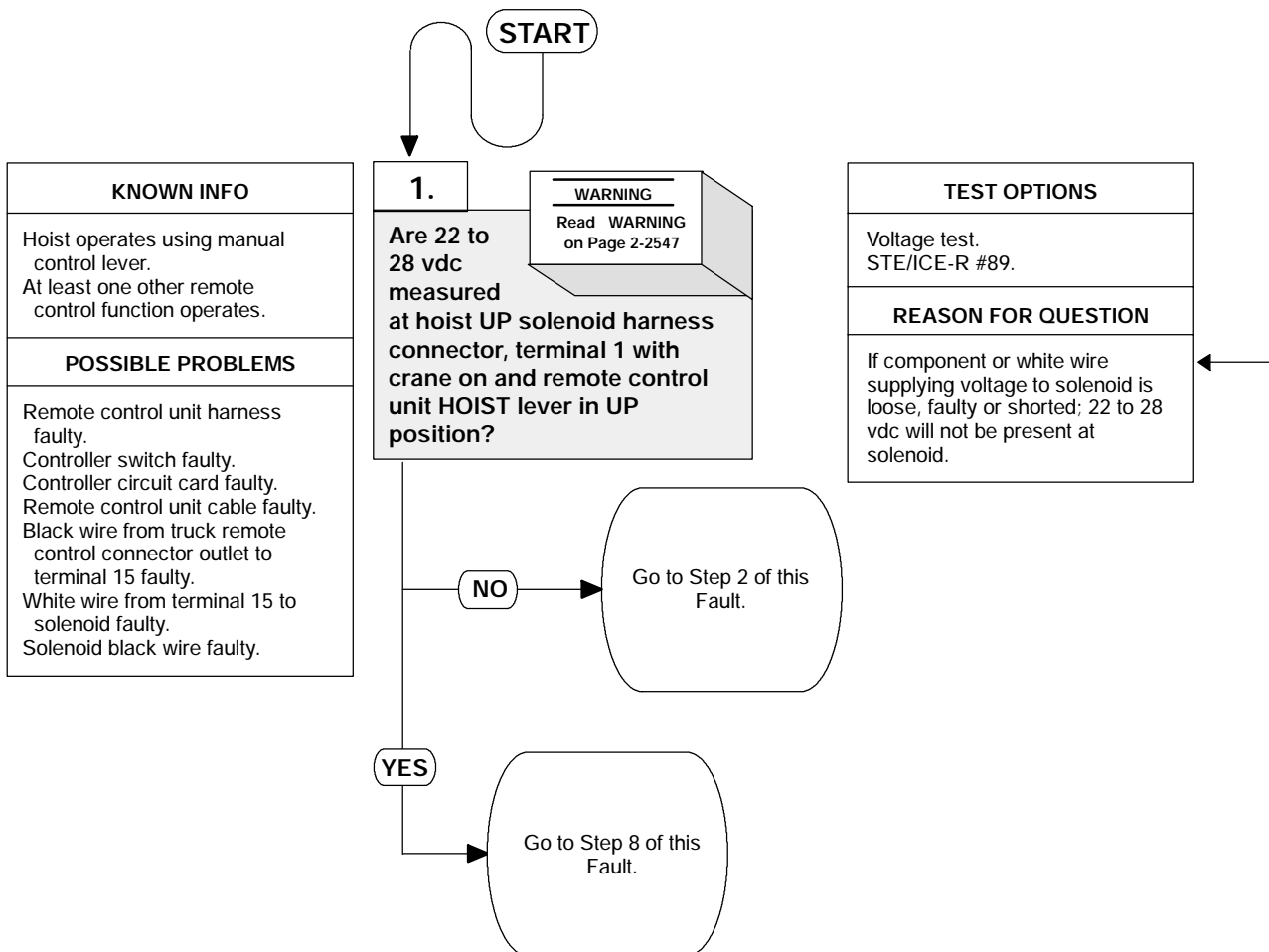
TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Remote control unit connected, (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)

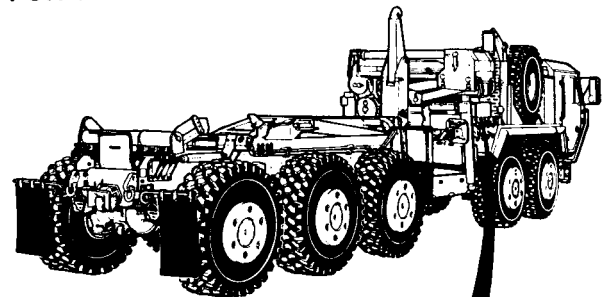
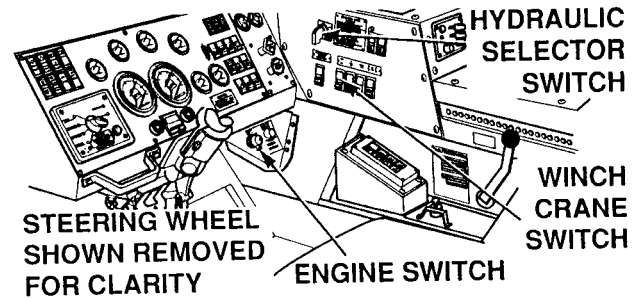
NOTE

This problem can occur at the right or left hand remote control connector. Only the right hand connector is illustrated herein.

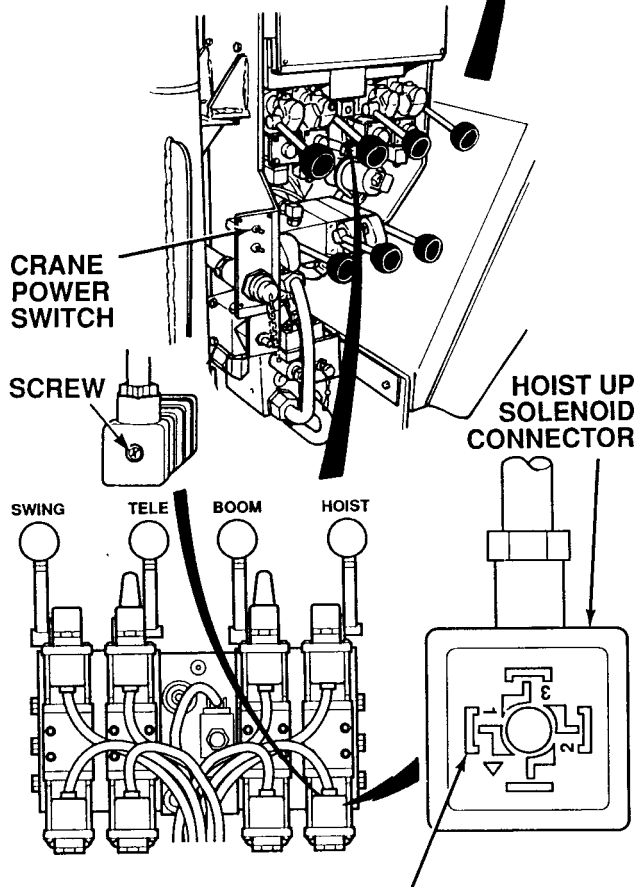


WARNING

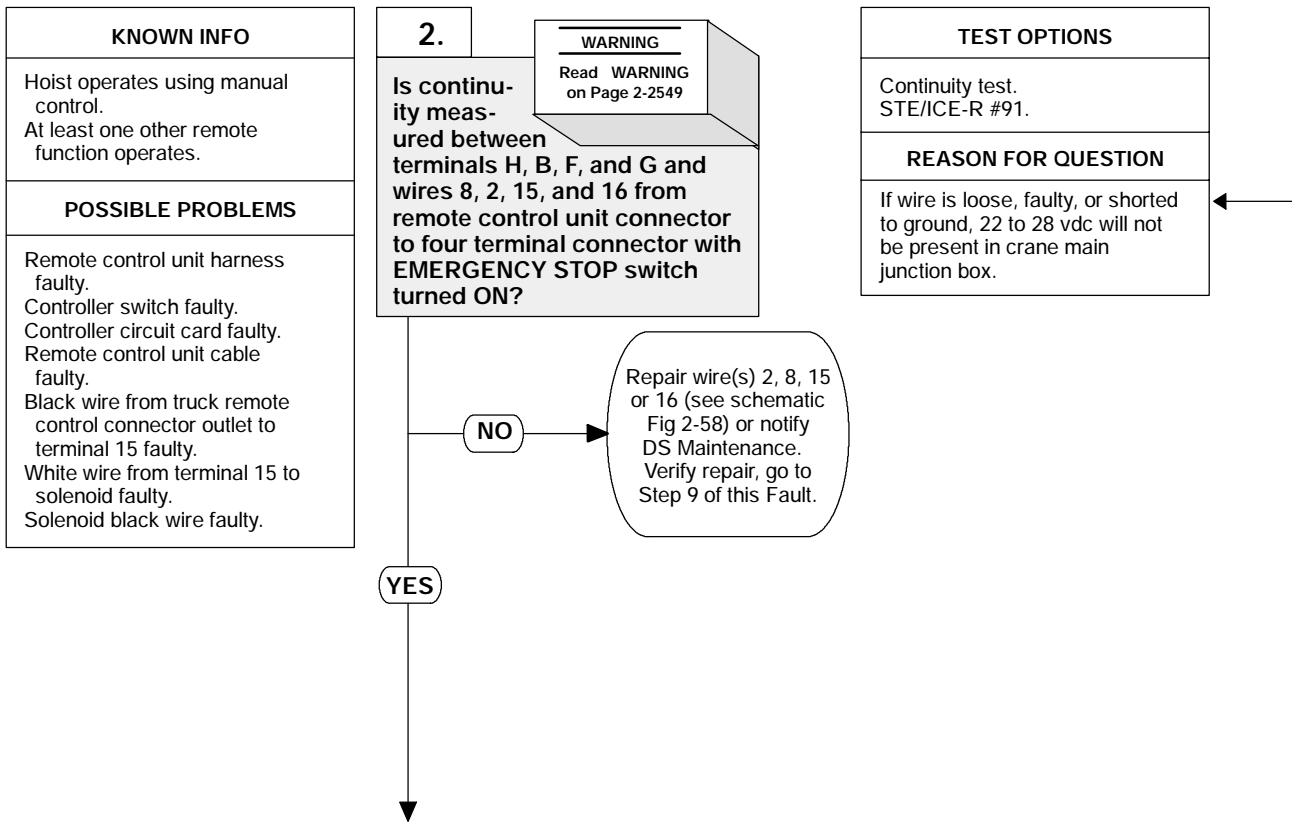
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- VOLTAGE TEST**
- (1) Loosen screw and remove connector from hoist UP solenoid.
 - (2) Set multimeter select switch to volts dc.
 - (3) Connect positive (+) multimeter lead to connector, terminal 1.
 - (4) Connect negative (-) multimeter lead to a known good ground.
 - (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (6) Set WINCH/CRANE switch to CRANE position.
 - (7) Set hydraulic selector switch to CRANE/SRW position.
 - (8) Set crane main POWER switch to ON position.
 - (9) Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
 - (10) Hold remote control unit hoist controller in UP position.
 - (a) If 22 to 28 vdc are not present, perform Step (11) below and go to Step 2 of this Fault.
 - (b) If 22 to 28 vdc are present, perform Step (11) below and go to Step 8 of this Fault.
 - (11) Set the following switches in OFF position: REMOTE CONTROL UNIT ON/OFF EMERGENCY STOP switch, crane main POWER switch, hydraulic selector switch and ENGINE switch.



3. HOIST WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).

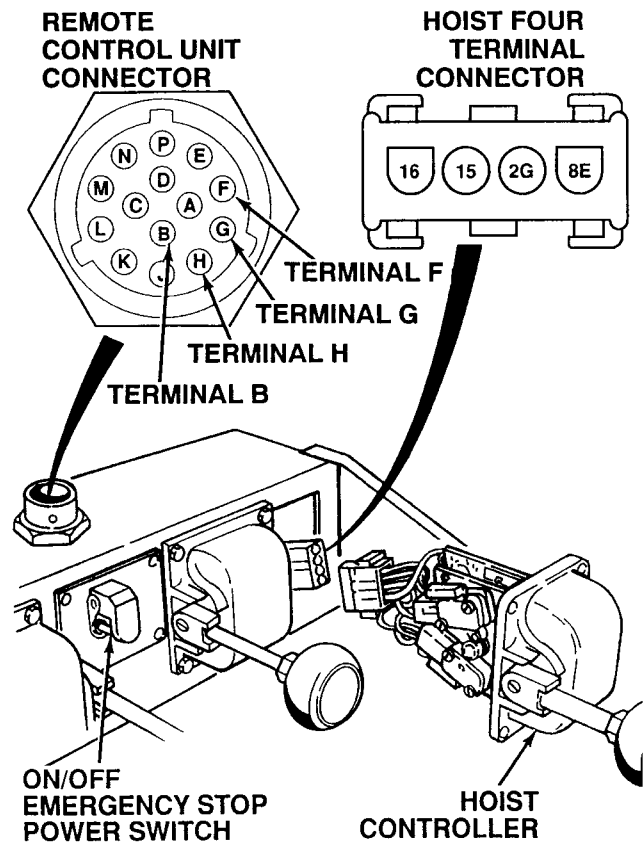


WARNING

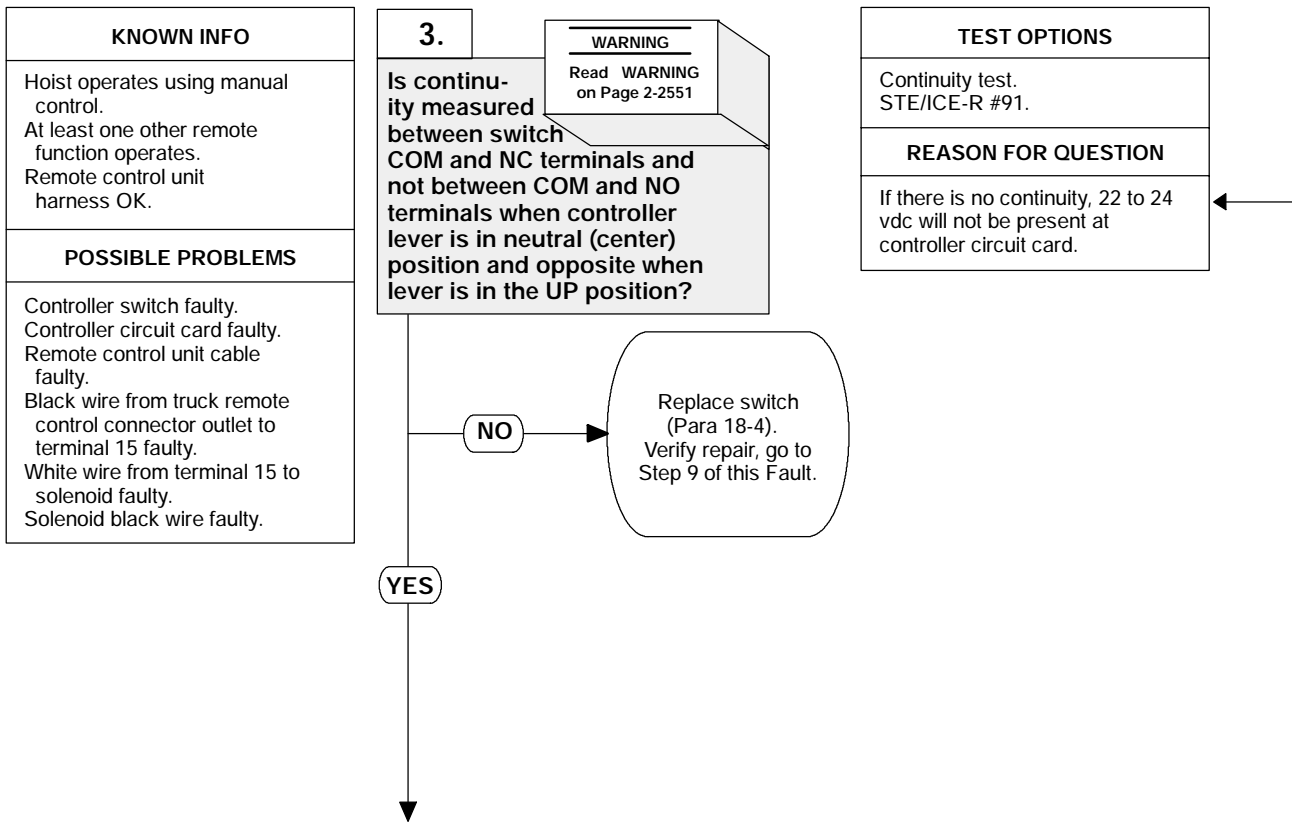
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect cable from remote control unit (TM 9-2320-364-10).
- (2) Remove controller from remote control unit (Para 18-4).
- (3) Set multimeter select switch to ohms.
- (4) Turn ON remote control unit ON/OFF EMERGENCY STOP switch.
- (5) Is there continuity at violet wire between remote control unit connector, terminal H and four terminal connector, terminal 8E?
 - (a) If there is no continuity, repair wire 8 between switch and four terminal connector (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (6) below.
- (6) Is there continuity between remote control unit connector, terminal B and four terminal connector, terminal 2G?
 - (a) If there is no continuity, repair wire 2 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (7) below.
- (7) Is there continuity between remote control unit connector, terminal F and four terminal connector, terminal 15?
 - (a) If there is no continuity, repair wire 15 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (8) below.
- (8) Is there continuity between remote control unit connector, terminal G and four terminal connector, terminal 16?
 - (a) If there is no continuity, repair wire 16 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step 3 of this Fault.



3. HOIST WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).

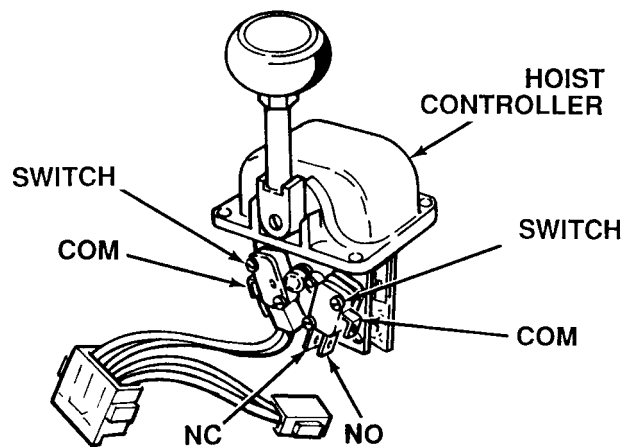


WARNING

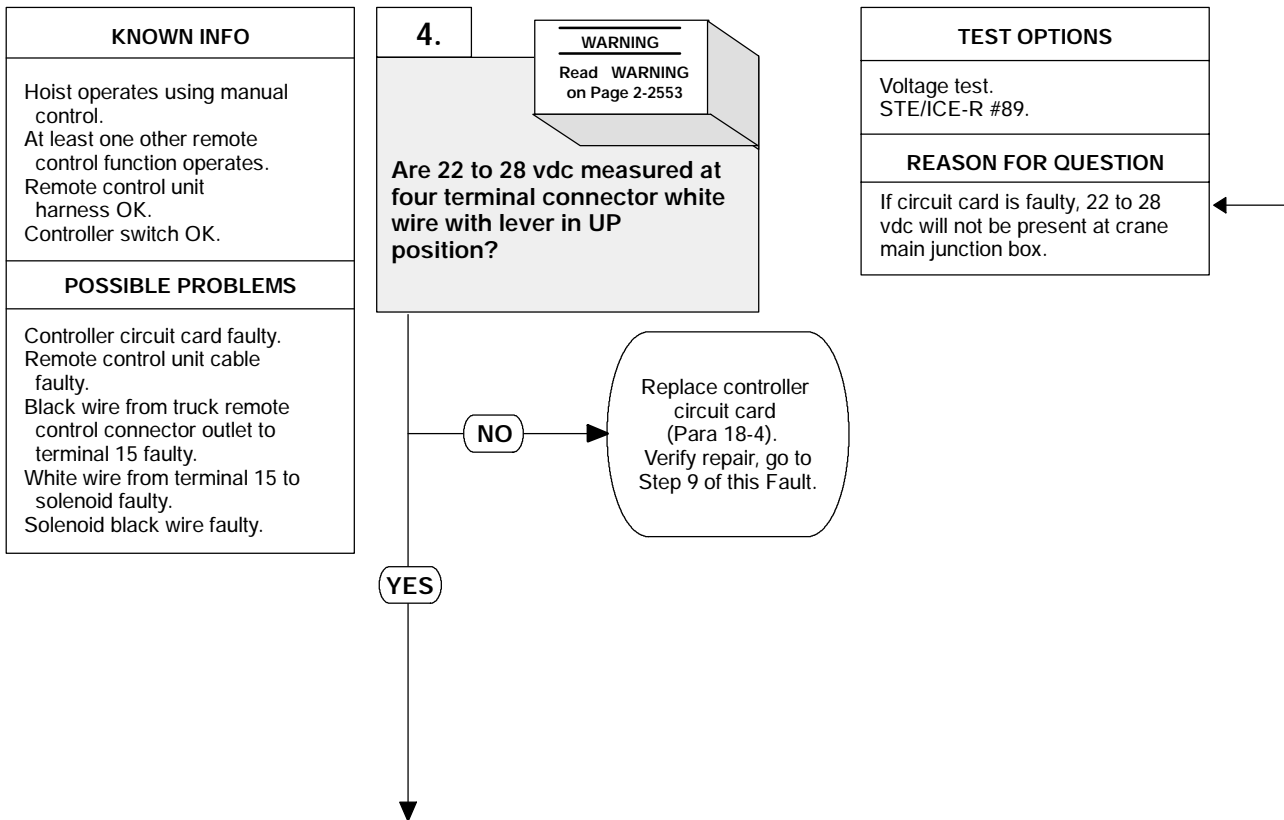
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector from one of the two switches.
- (2) Is there continuity between switch NC terminal and switch COM terminal?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (3) below.
- (3) Is there continuity between switch COM terminal and switch NO terminal?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (4) below.
- (4) Is there continuity between switch NC terminal and switch COM terminal with controller lever held in UP position?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (5) below.
- (5) Is there continuity between switch COM terminal and switch NO terminal with controller lever held in UP position?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (6) below.
- (6) Repeat Steps (1) through (5) for other switches.
- (7) Install both connectors on switches.



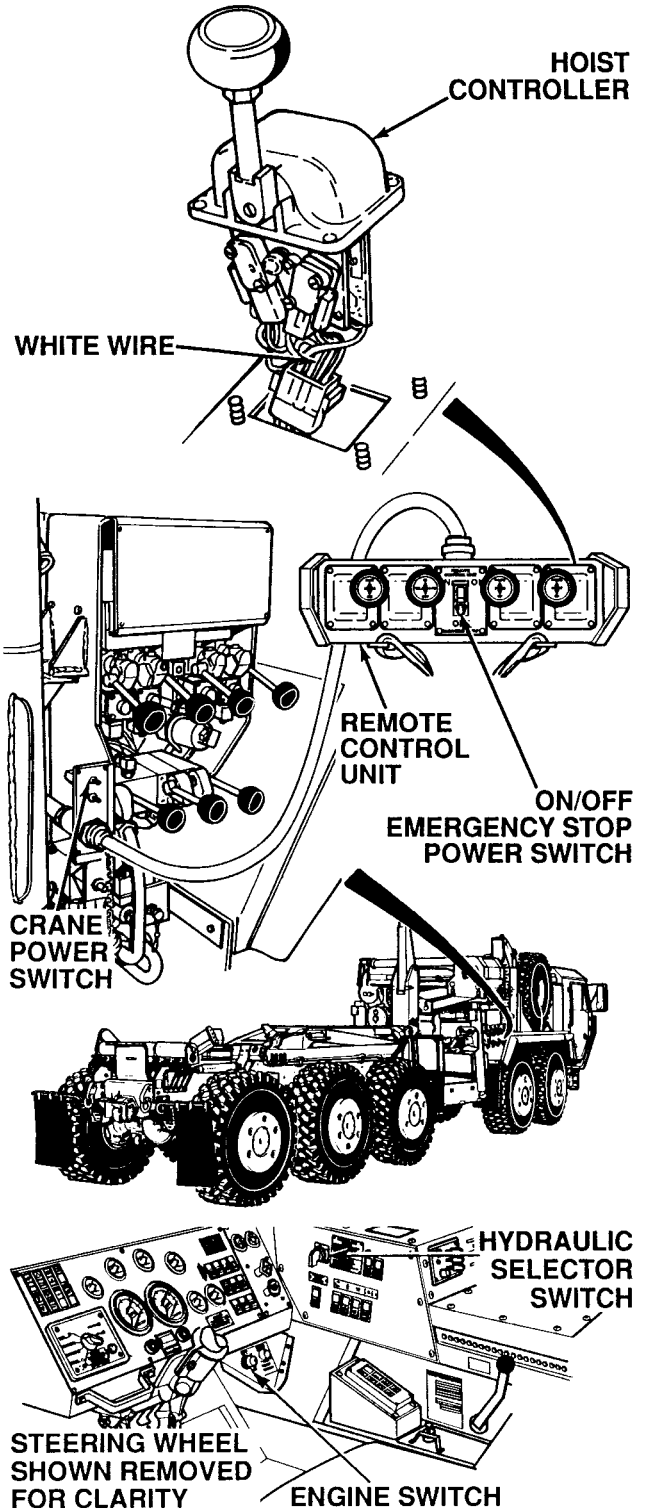
3. HOIST WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).



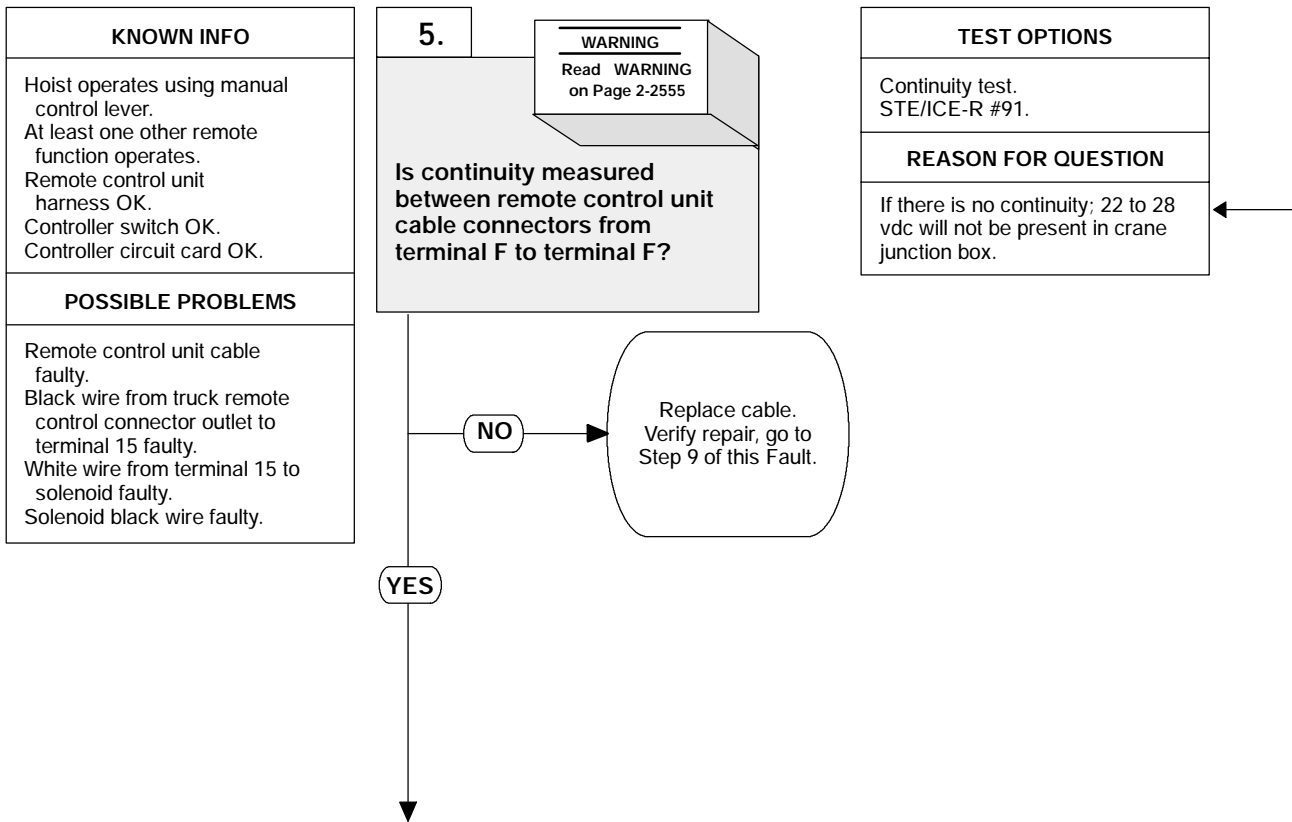
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST | |
|--------------|---|
| (1) | Connect remote control unit to remote control unit cable (TM 9-2320-364-10). |
| (2) | Connect hoist controller four terminal connector to remote control unit harness four terminal connector. |
| (3) | Set multimeter select switch to volts dc. |
| (4) | Connect positive (+) multimeter lead to white wire terminal in four terminal connector. |
| (5) | Connect negative (-) multimeter lead to a known good ground. |
| (6) | Turn ON ENGINE switch. |
| (7) | Set hydraulic selector switch to CRANE/SRW position. |
| (8) | Set crane MAIN POWER switch to ON position. |
| (9) | Set remote control ON/OFF EMERGENCY STOP power switch to ON position. |
| (10) | Hold HOIST controller in UP position. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Step (11) below and replace circuit card (Para 18-4). (b) If 22 to 28 vdc are present, go to Step (11) below. |
| (11) | Set the following switches to the OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane MAIN POWER switch, hydraulic selector switch and ENGINE switch. |
| (12) | Assemble remote control unit (Para 18-4). |



3. HOIST WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).

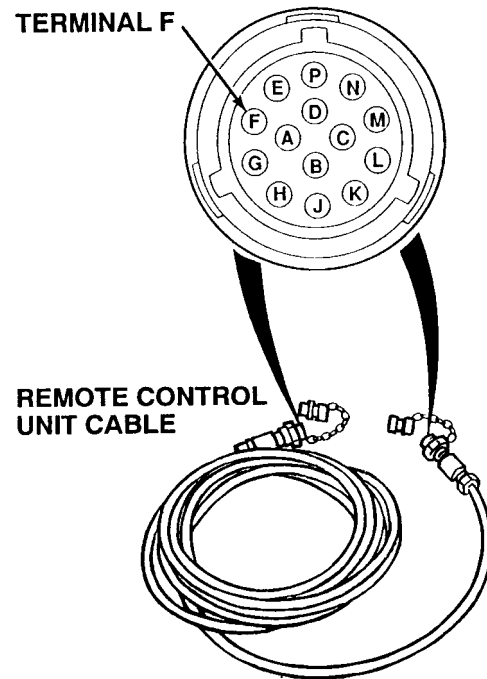


WARNING

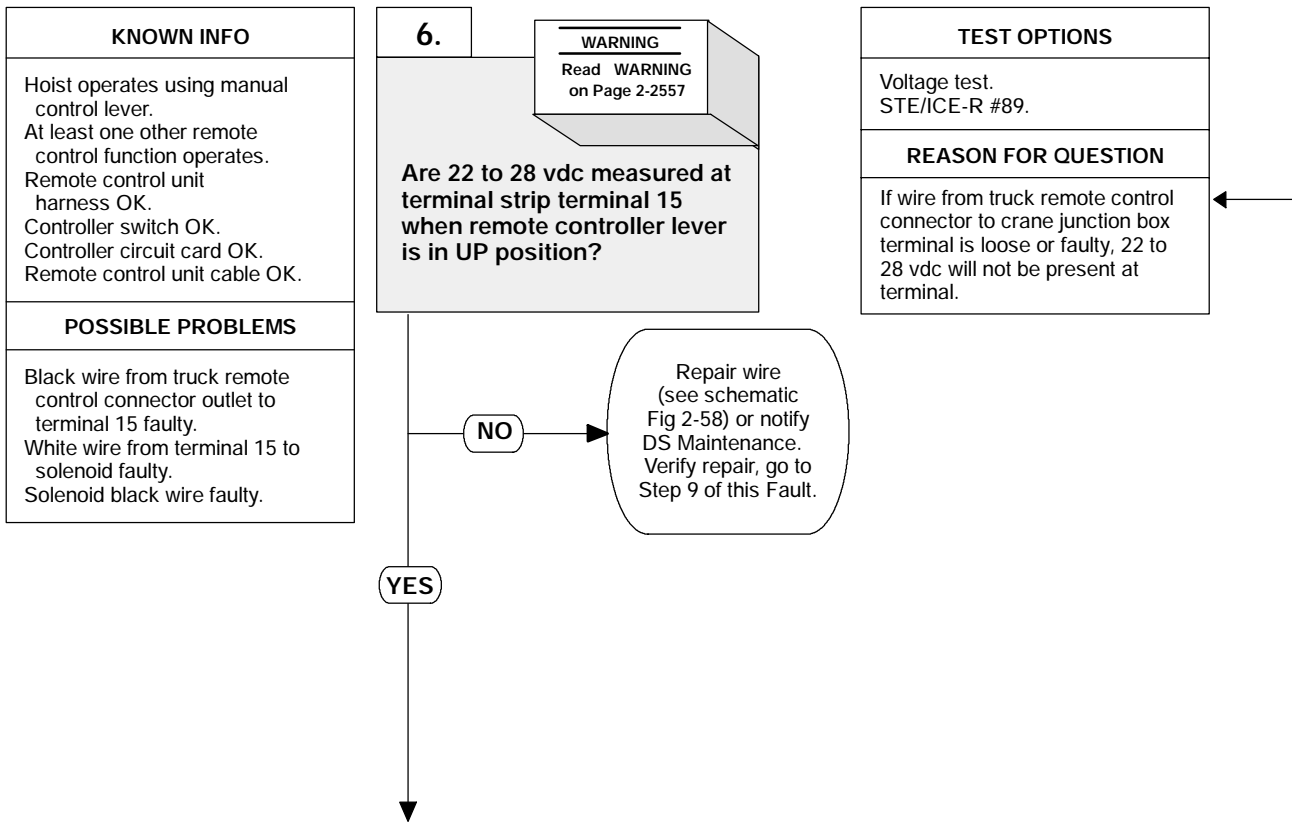
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect remote control unit cable from truck and remote control unit (TM 9-2320-364-10).
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between cable connector terminal F at both ends?
 - (a) If there is no continuity, replace cable.
 - (b) If there is continuity, reconnect cable to truck connector and remote control unit connector and go to Step 9 of this Fault.



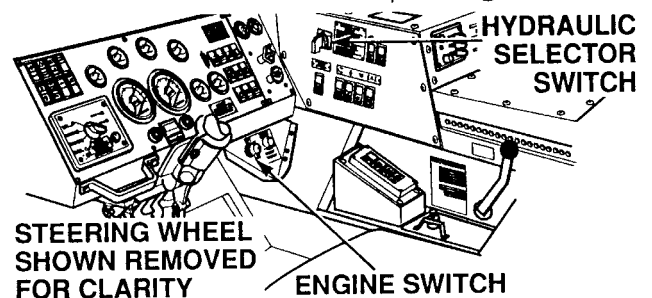
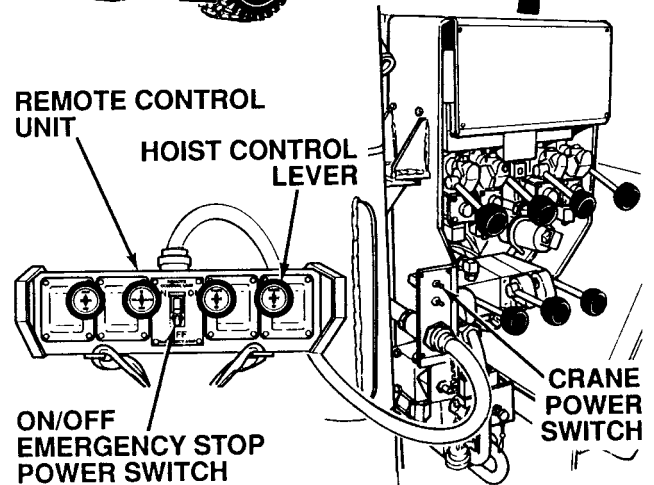
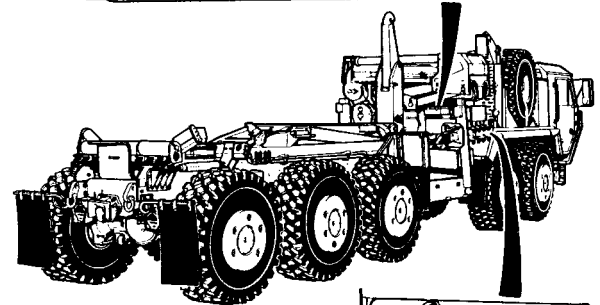
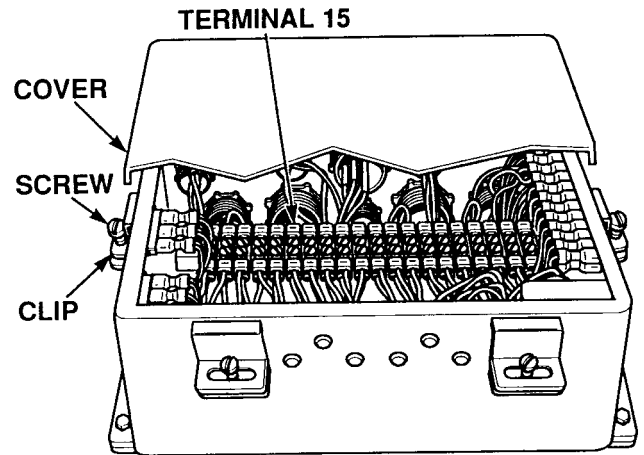
3. HOIST WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).



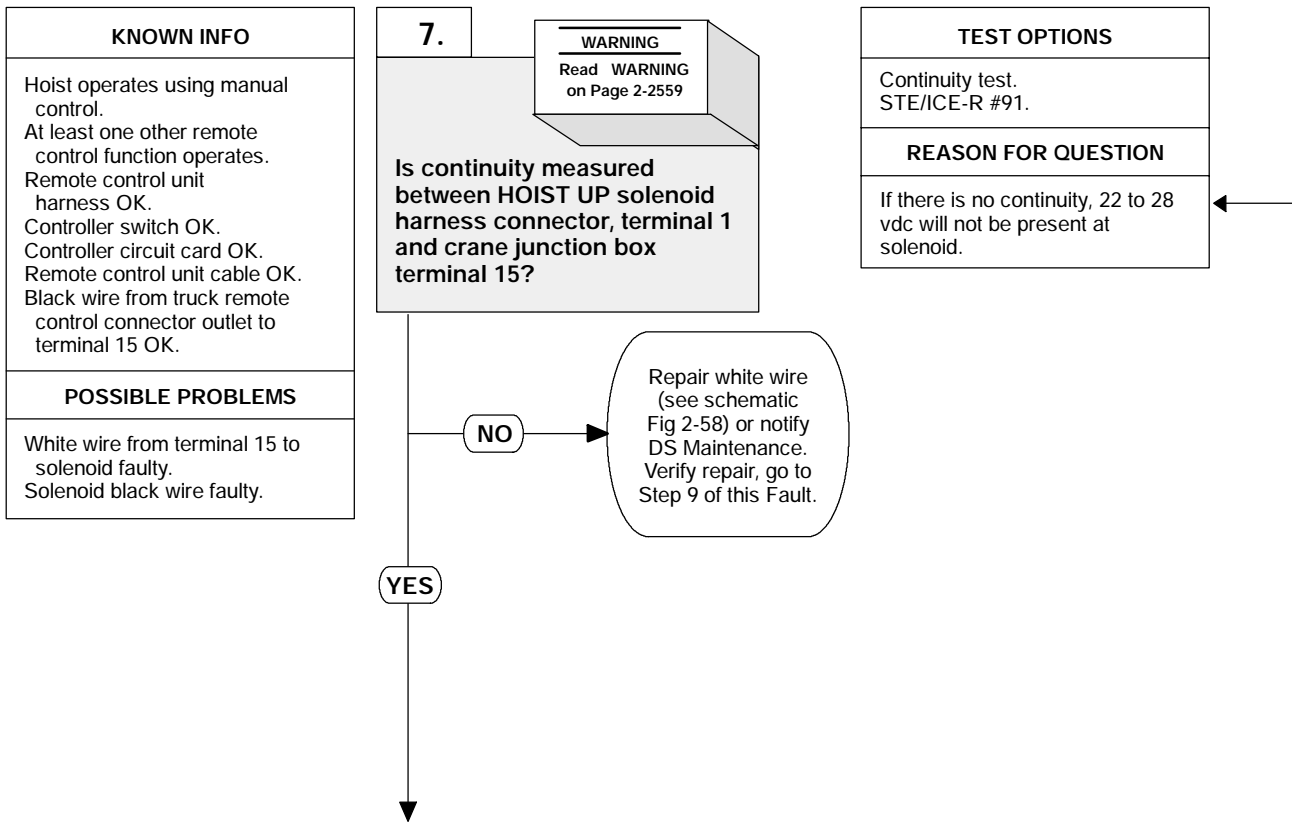
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST | |
|--------------|--|
| (1) | Loosen six screws, clips and remove crane junction box cover. |
| (2) | Set multimeter select switch to volts. |
| (3) | Connect positive (+) multimeter lead to crane junction box terminal 15. |
| (4) | Connect negative (-) multimeter lead to a known good ground. |
| (5) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (6) | Set hydraulic selector switch to SRW/CRANE position. |
| (7) | Set crane main POWER switch to ON position. |
| (8) | Set remote control ON/OFF EMERGENCY STOP power switch to ON. |
| (9) | Put remote control unit HOIST control lever in the UP position. |
| (a) | If 22 to 28 vdc are not present, perform Step (10) below and repair black wire from truck remote control connector to terminal 15 (see schematic Fig 2-58) or notify DS Maintenance. |
| (b) | If 22 to 28 vdc are present, perform Step (10) below and go to Step 7 of this Fault. |
| (10) | Put the following switches in OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane main POWER switch, hydraulic selector switch and ENGINE switch. |



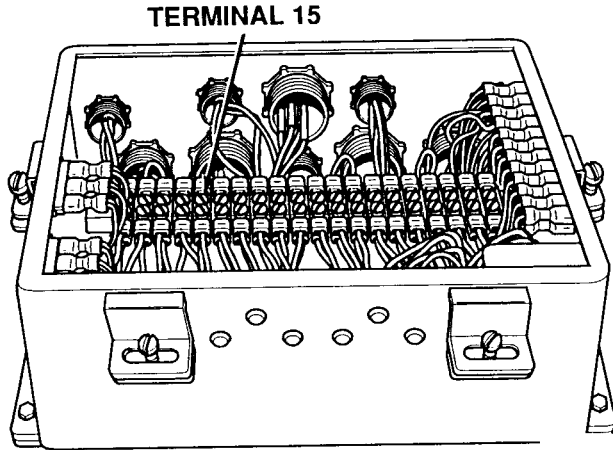
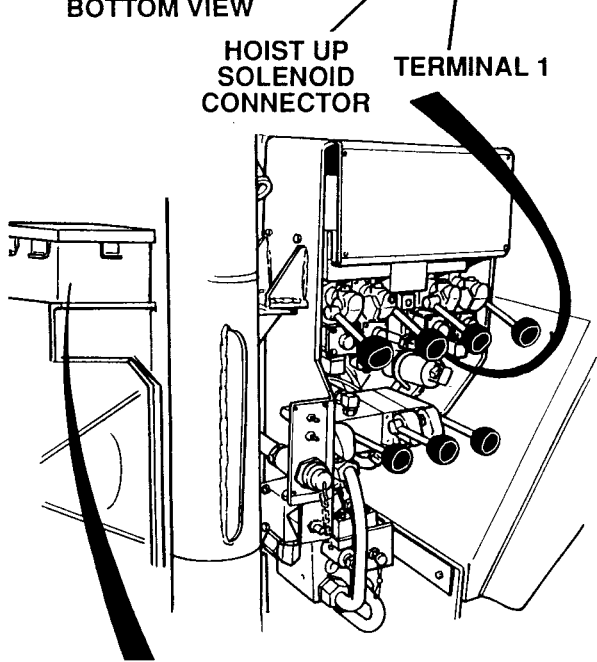
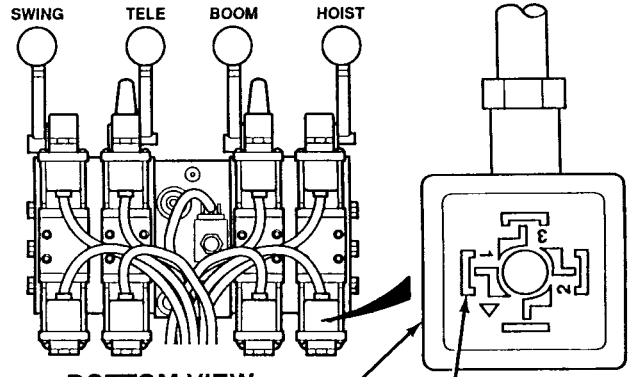
3. HOIST WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).



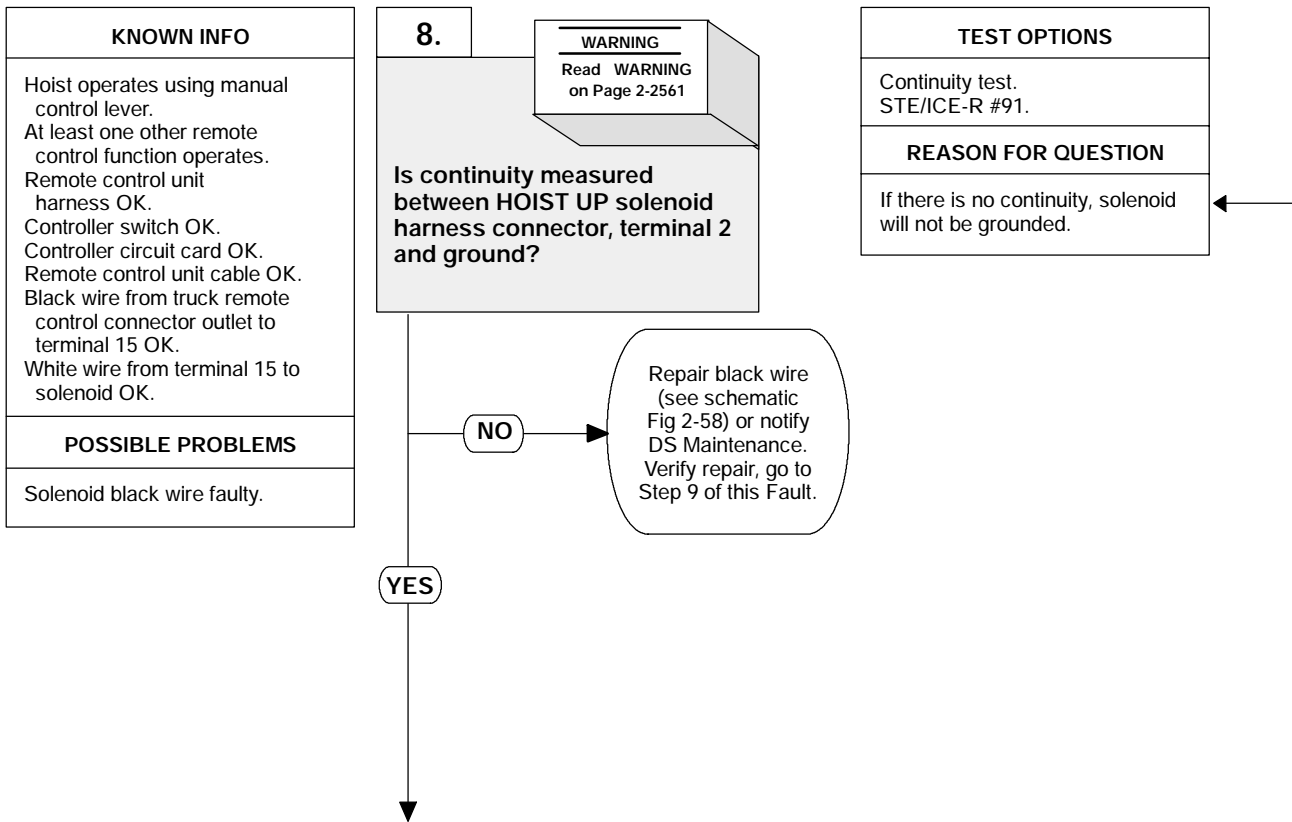
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Set multimeter select switch to ohms.
 - (2) Is there continuity between connector terminal 1 and crane main junction box terminal strip 15?
 - (a) If there is no continuity, repair connector white wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, white wire is OK.



3. HOIST WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).

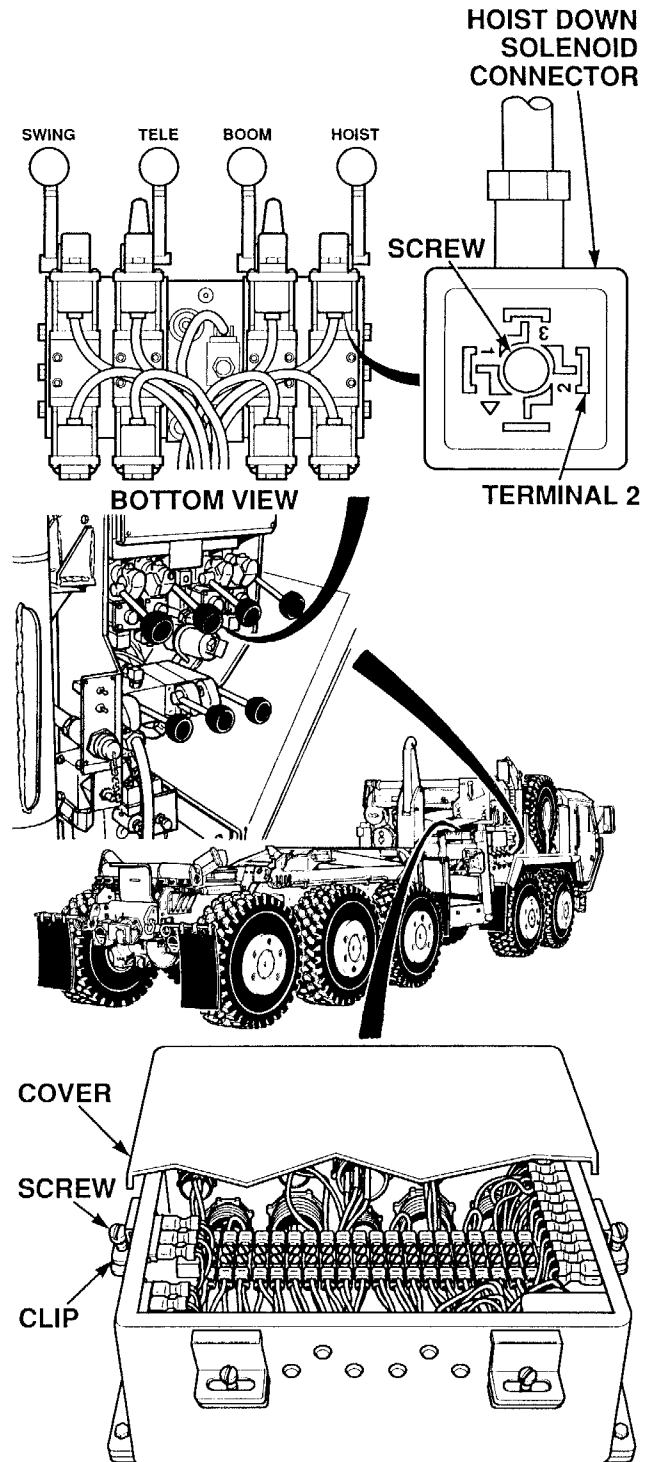


WARNING

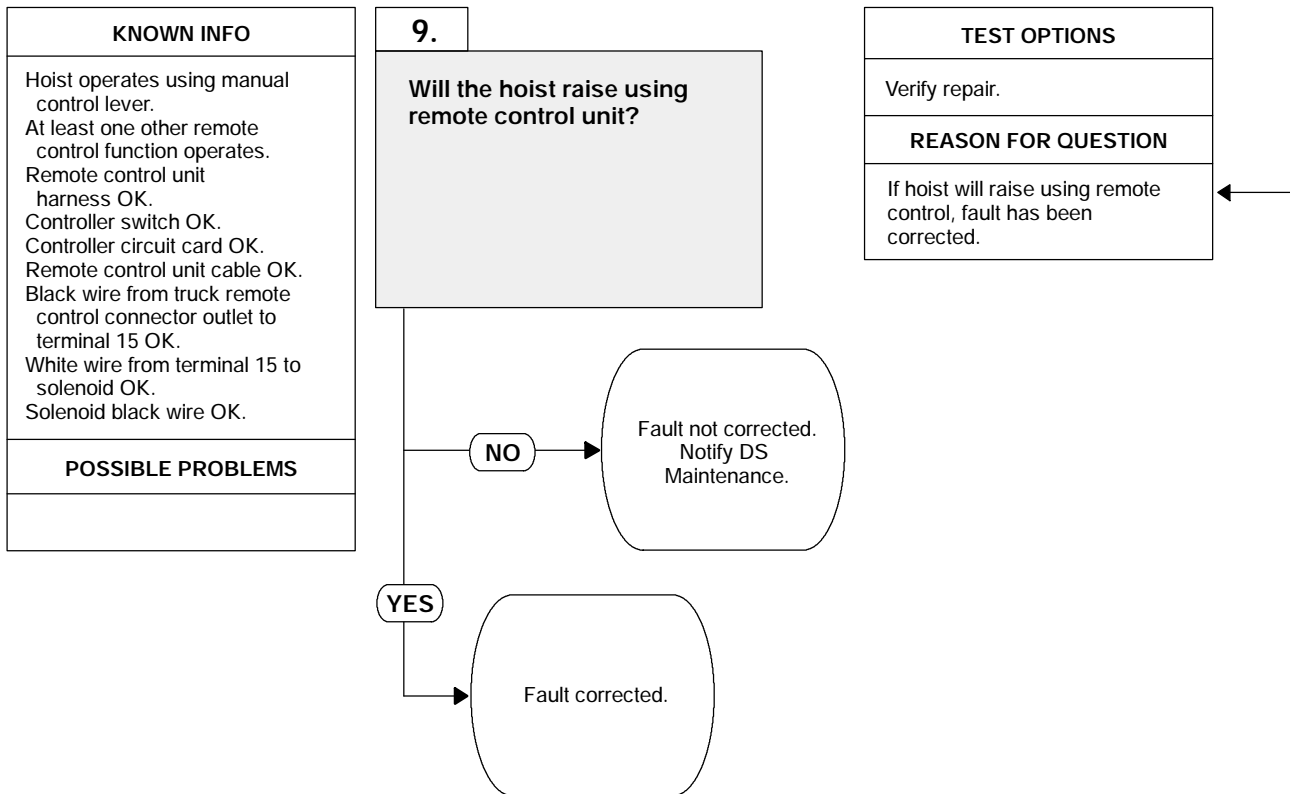
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Is there continuity between connector terminal 2 and a known good ground?
 - (a) If there is no continuity, repair connector black wire (see schematic Fig 2-58) or notify DS Maintenance and perform Steps (2) and (3) below.
 - (b) If there is continuity, perform Steps (2) and (3) below and go to Step 9 of this Fault.
- (2) Install connector on hoist valve solenoid and tighten screw.
- (3) Install crane junction box cover with six clips and screws.



3. HOIST WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).



VERIFY REPAIR

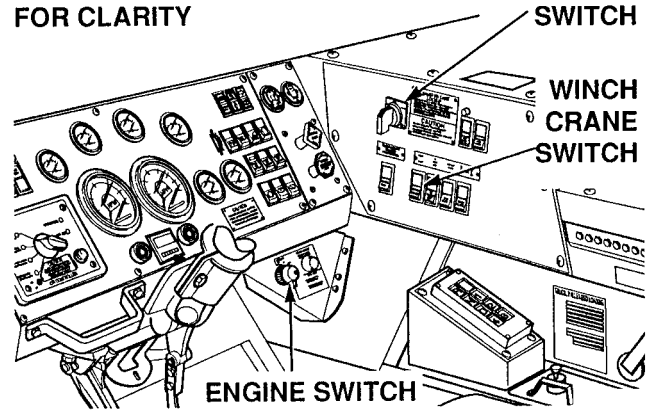
- (1) Connect remote control unit cable to truck connector and remote control unit connector (TM 9-2320-364-10).
- (2) Operate crane using remote control unit.
 - (a) If hoist will not raise using remote control unit, fault not corrected. Notify DS Maintenance.
 - (b) If hoist will raise, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

4. BOOM WILL NOT LOWER USING REMOTE CONTROL UNIT.

INITIAL SETUP

Tools and Special Tools

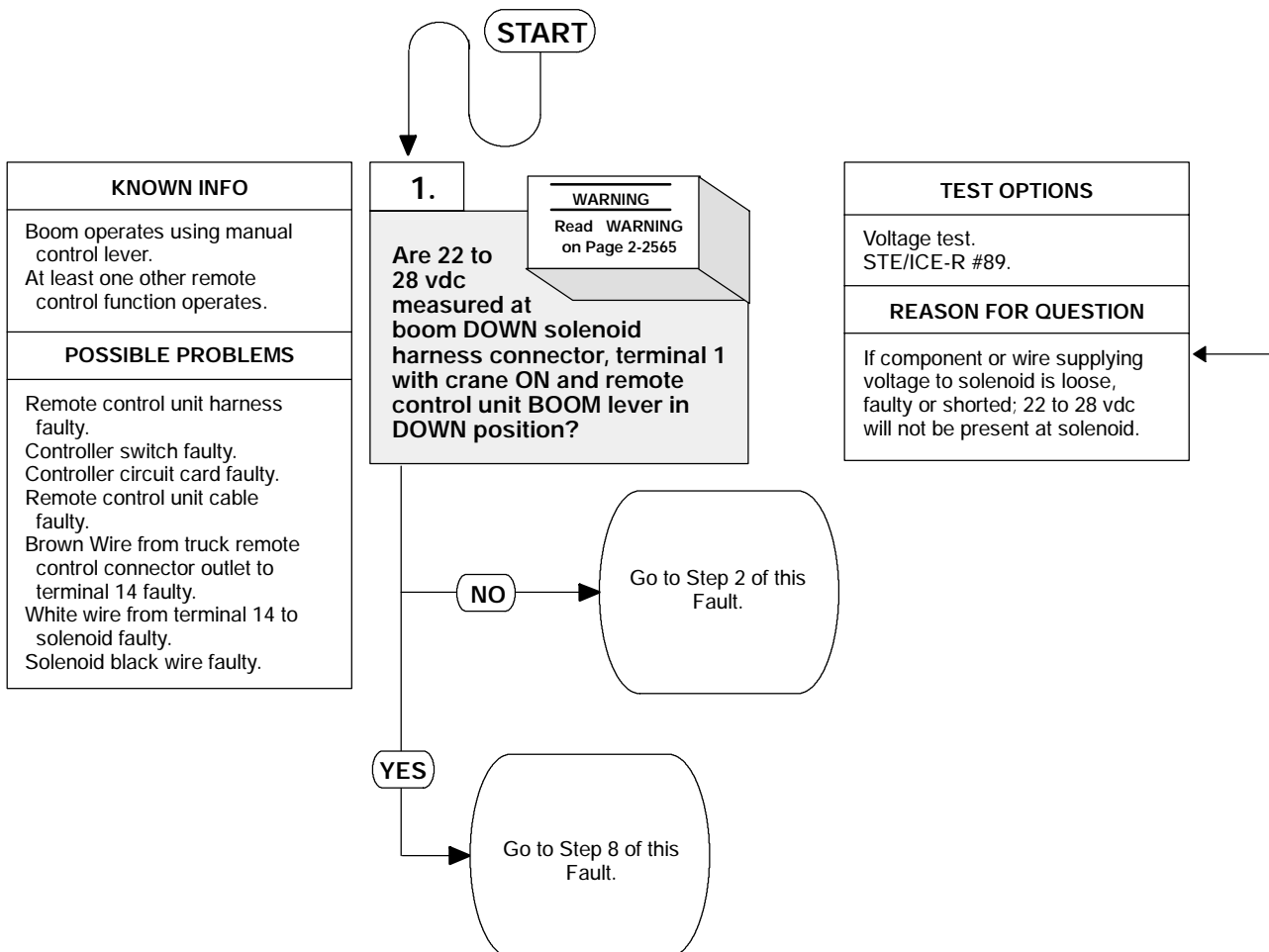
Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

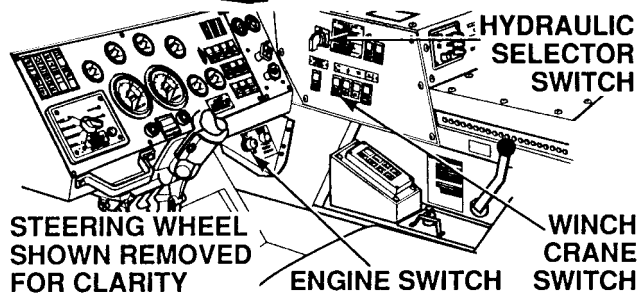
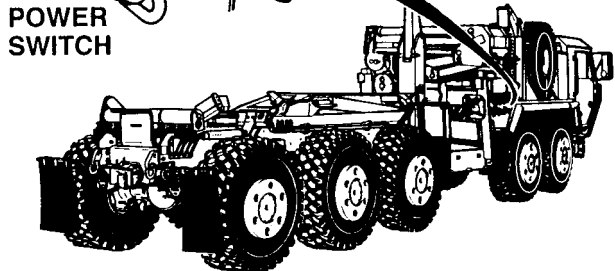
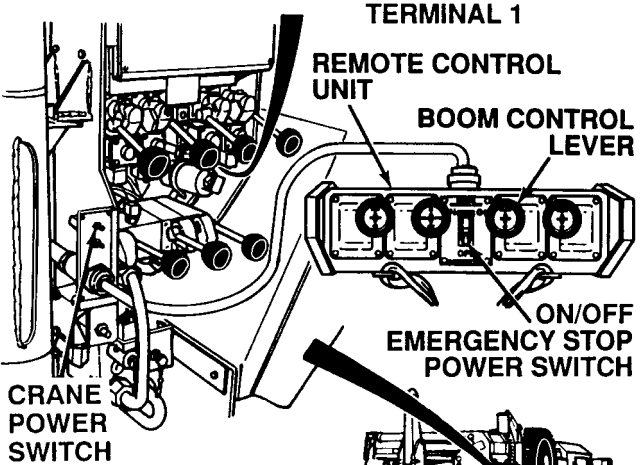
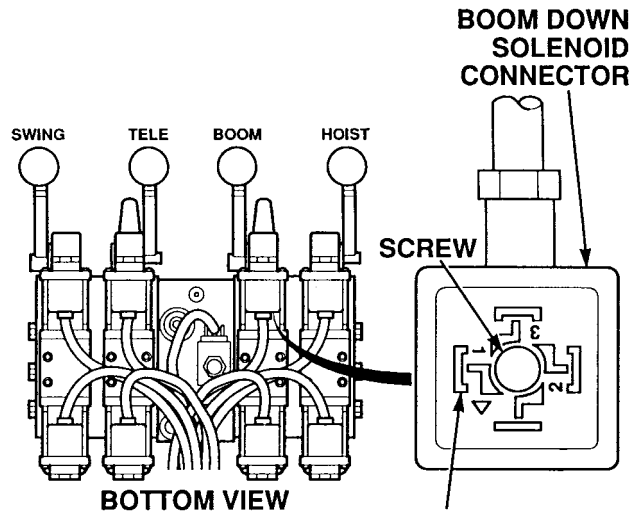
Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Remote control unit connected, (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)



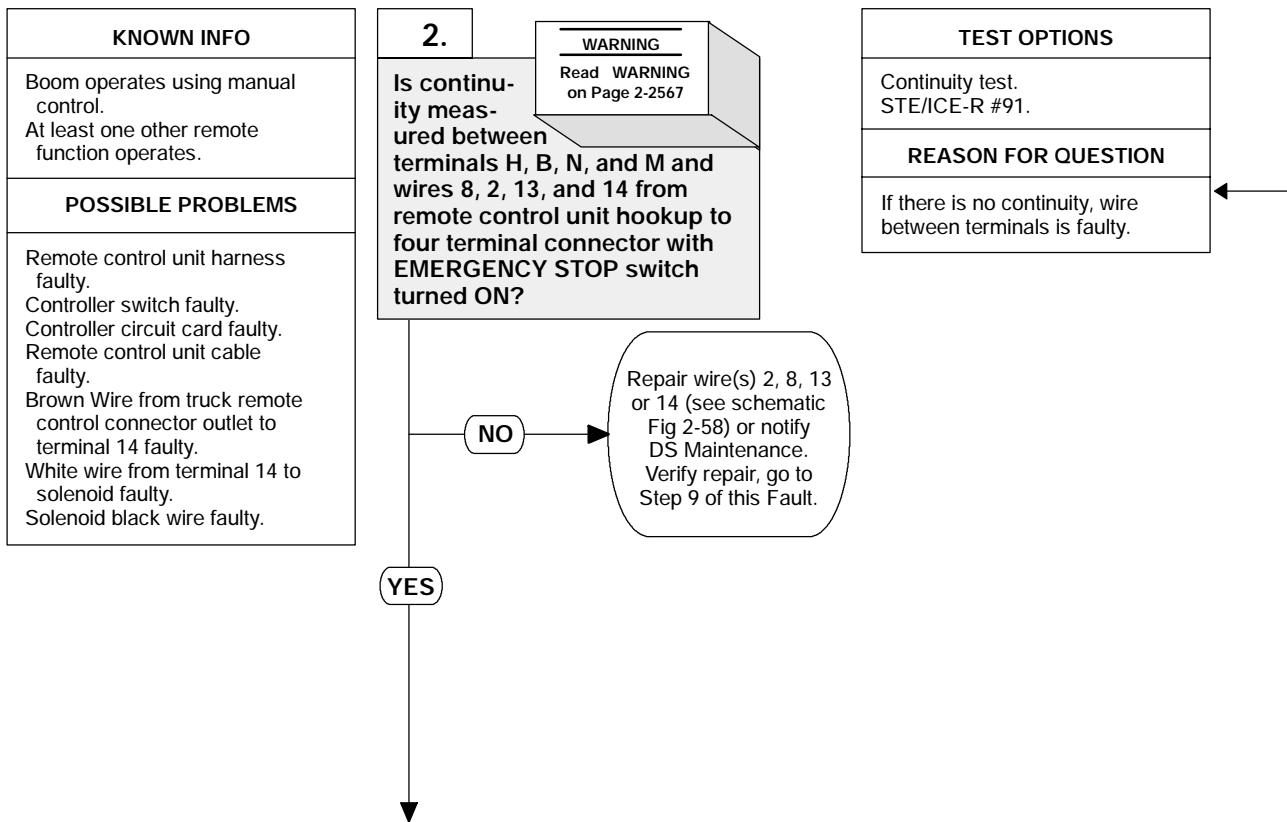
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Loosen screw and remove connector from boom DOWN solenoid.
 - (2) Set multimeter select switch to volts.
 - (3) Connect positive (+) multimeter lead to connector, terminal 1.
 - (4) Connect negative (-) multimeter lead to a known good ground.
 - (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (6) Set WINCH/CRANE switch to CRANE position.
 - (7) Set hydraulic selector switch to CRANE/SRW position.
 - (8) Set crane POWER switch to ON position.
 - (9) Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
 - (10) Hold remote control unit BOOM controller in DOWN position.
 - (a) If 22 to 28 vdc are not present, go to Step 2 of this Fault.
 - (b) If 22 to 28 vdc are present, perform Step (11) below and go to Step 8 of this Fault.
 - (11) Set following switches in OFF position: REMOTE CONTROL UNIT ON/OFF EMERGENCY STOP switch, crane POWER switch, hydraulic selector switch and ENGINE switch.



4. BOOM WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

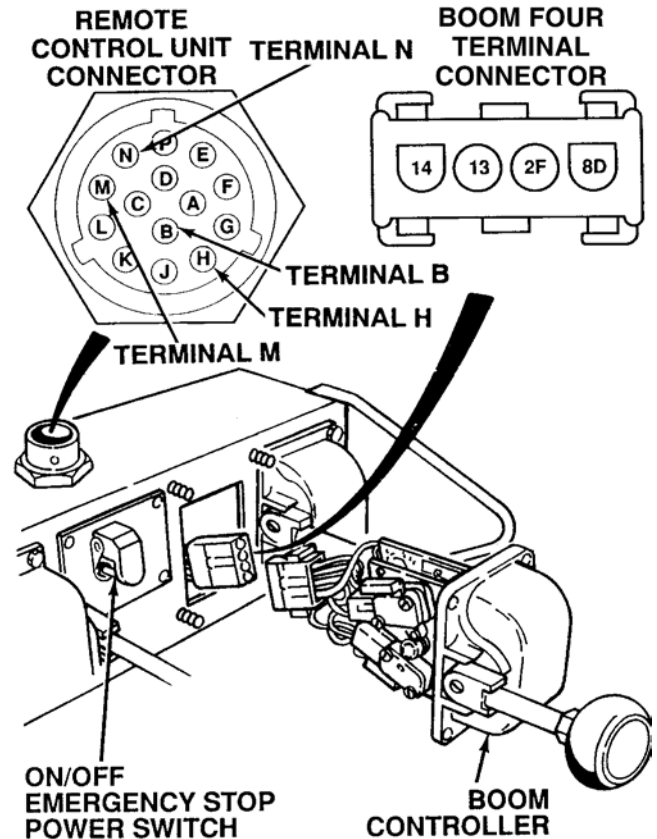


WARNING

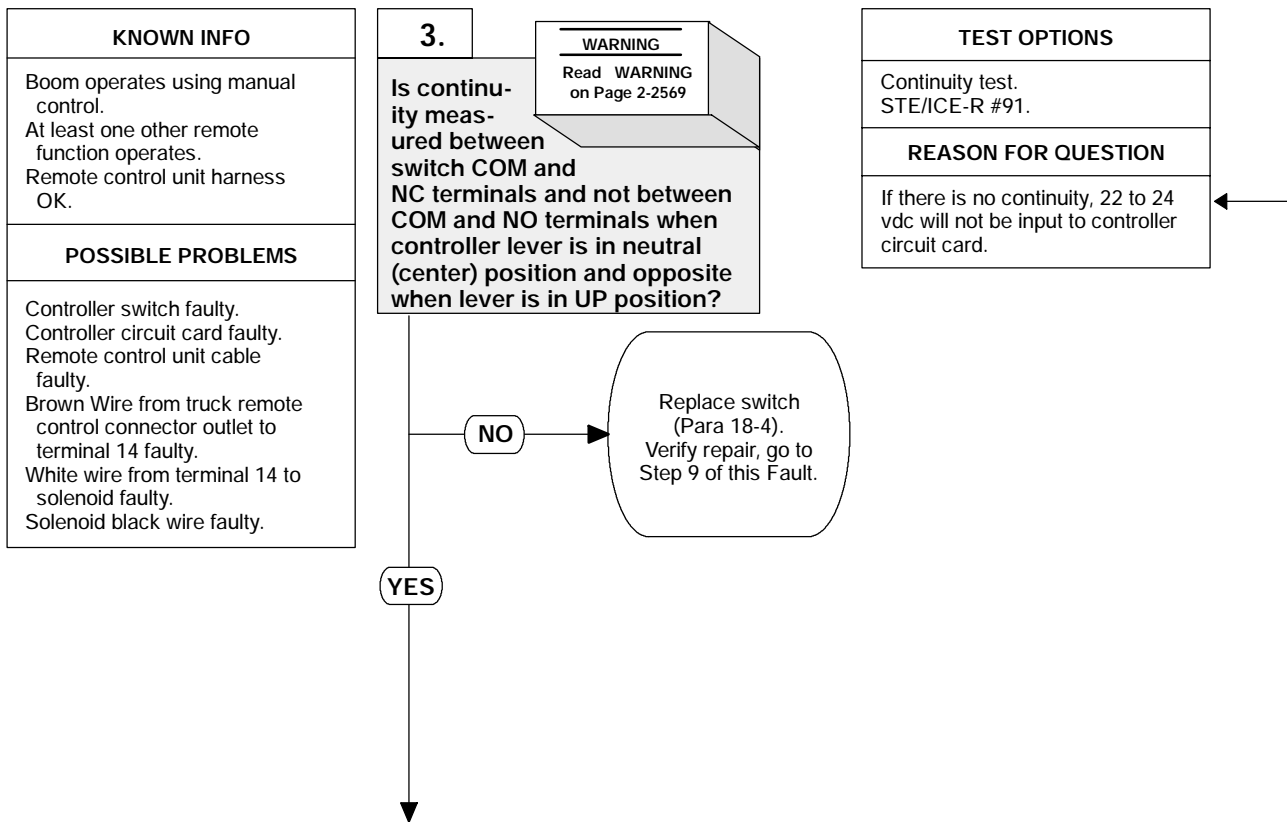
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect cable from remote control unit (TM 9-2320-364-10).
- (2) Remove BOOM controller from remote control unit (Para 18-4).
- (3) Set multimeter select switch to ohms.
- (4) Turn ON remote control unit ON/OFF EMERGENCY STOP switch.
- (5) Is there continuity between remote control unit hookup, terminal H and four terminal connector, terminal 8D?
 - (a) If there is no continuity, repair wire 8 between switch and four terminal connector (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (6) below.
- (6) Is there continuity between remote control unit hookup, terminal B and four terminal connector, terminal 2F?
 - (a) If there is no continuity, repair wire 2 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (7) below.
- (7) Is there continuity between remote control unit hookup, terminal N and four terminal connector, terminal 13?
 - (a) If there is no continuity, repair wire 13 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (8) below.
- (8) Is there continuity between remote control unit hookup, terminal M and four terminal connector, terminal 14?
 - (a) If there is no continuity, repair wire 14 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step 3 of this Fault.



4. BOOM WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

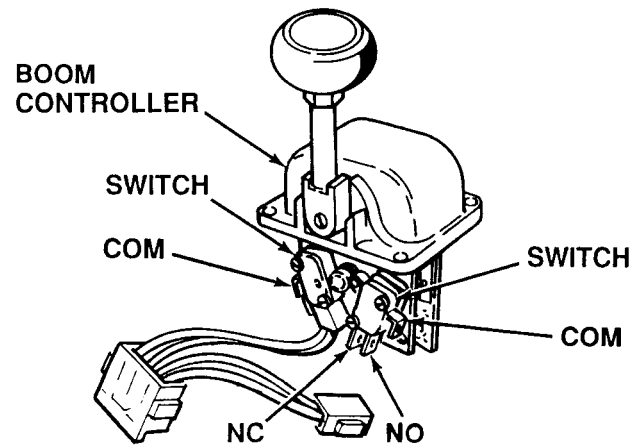


WARNING

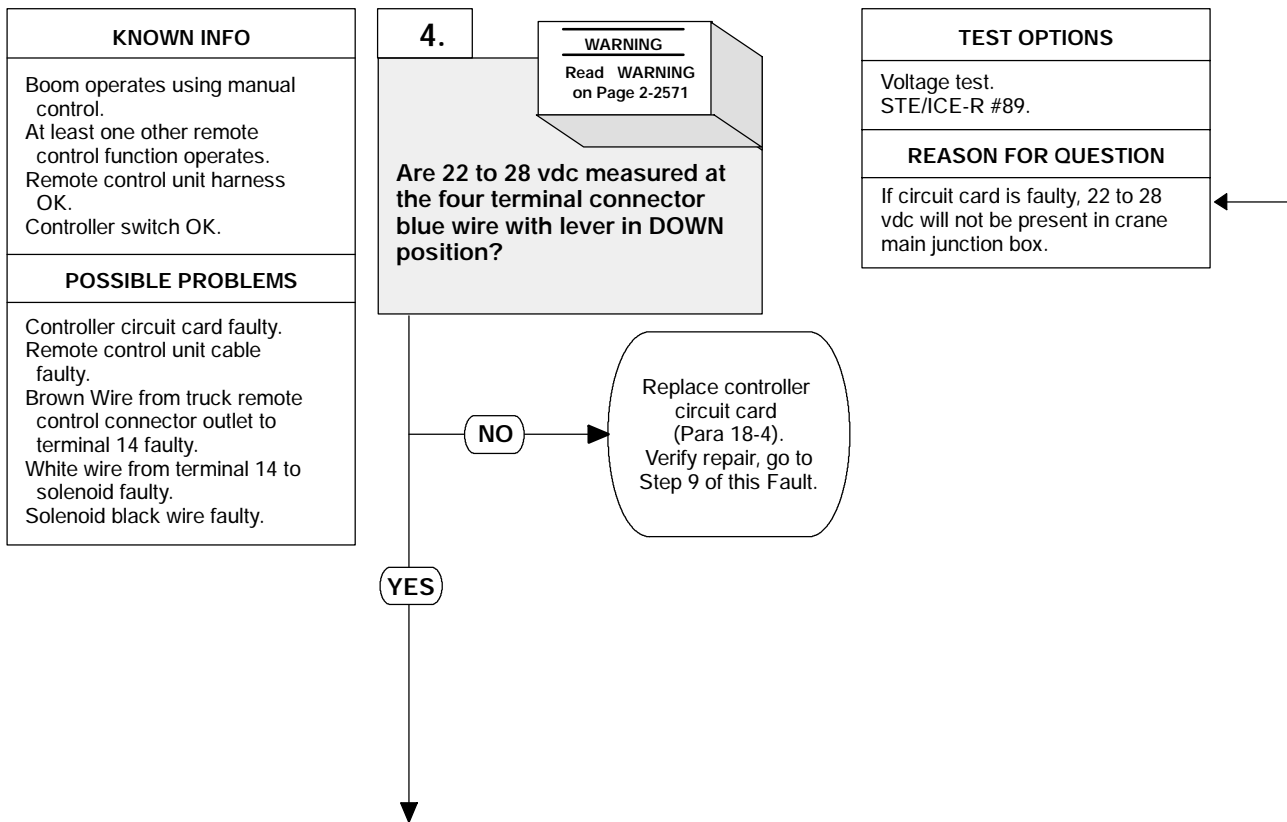
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector from one of the two switches.
- (2) Is there continuity between switch NC terminal and switch COM terminal?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (3) below.
- (3) Is there continuity between switch COM terminal and switch NO terminal?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (4) below.
- (4) Is there continuity between switch NC terminal and switch COM terminal with controller lever held in UP position?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (5) below.
- (5) Is there continuity between switch COM terminal and switch NO terminal with controller lever held in UP position?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (6) below.
- (6) Repeat Steps (1) through (5) for other switch.
- (7) Install both connectors on switches.



4. BOOM WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

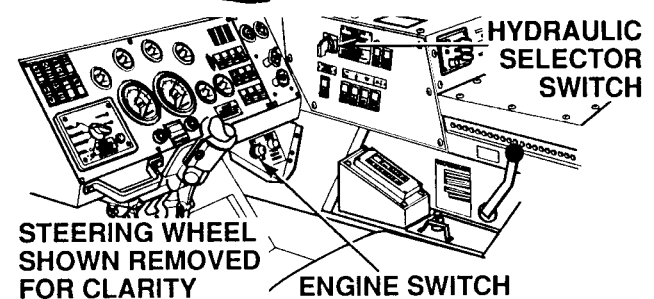
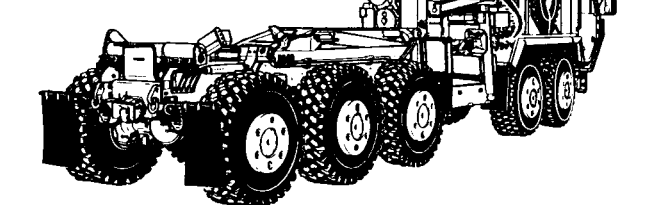
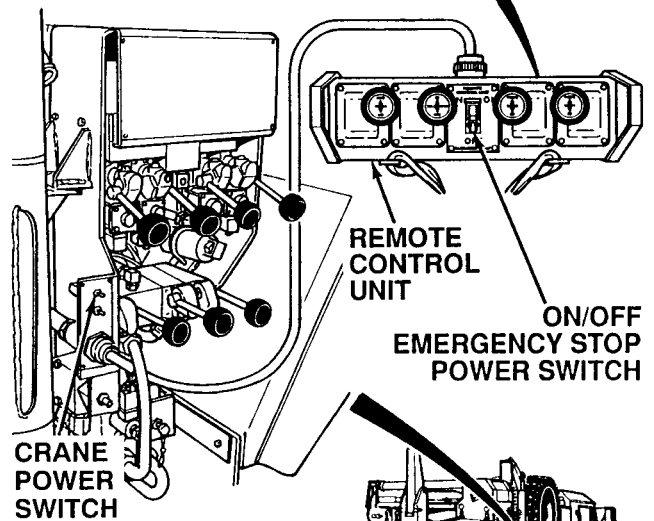
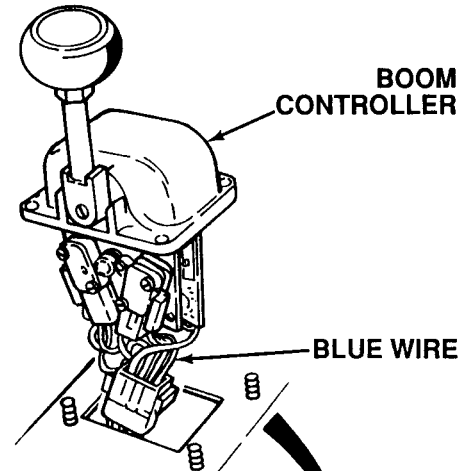


WARNING

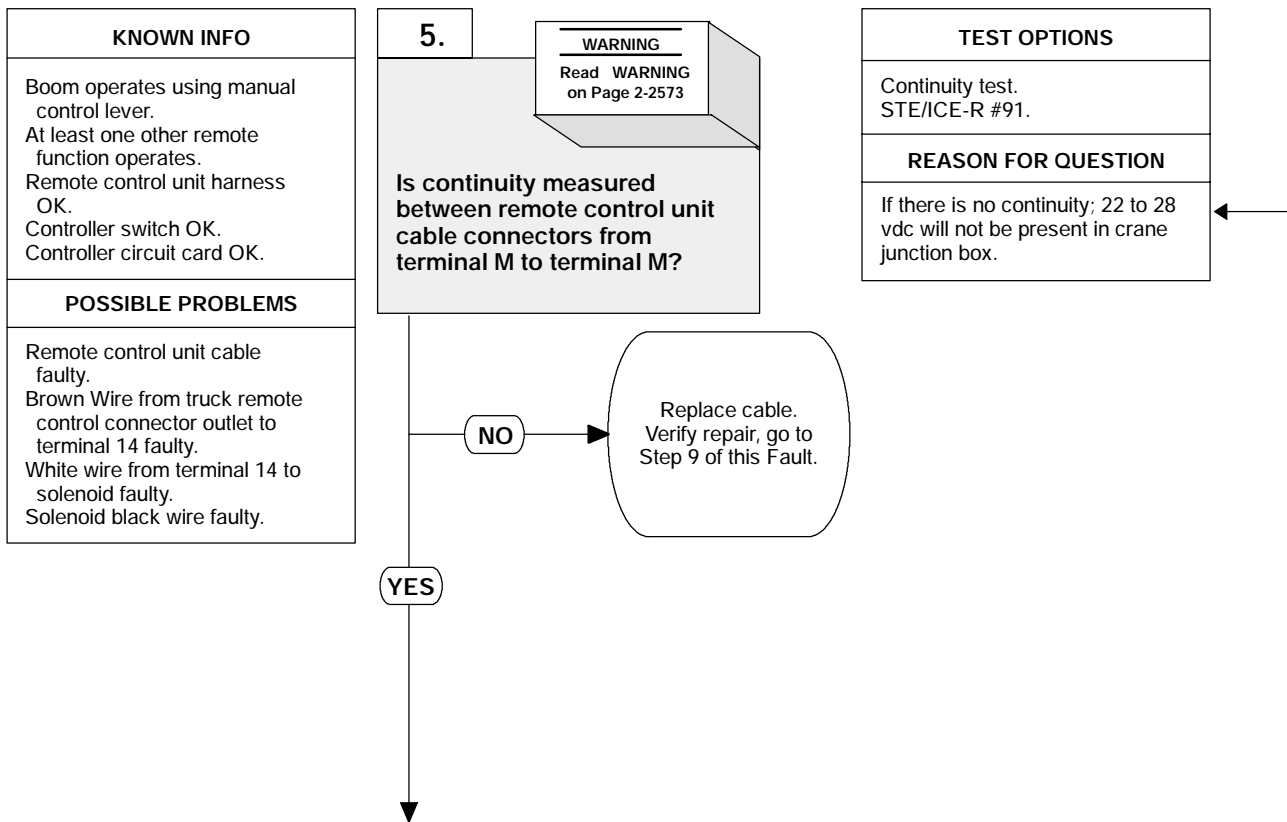
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Connect remote control unit to remote control unit cable.
- (2) Connect BOOM controller four terminal connector to remote control unit harness four terminal connector.
- (3) Set multimeter select switch to volts dc.
- (4) Connect positive (+) multimeter lead to blue wire terminal in four terminal connector.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch (TM 9-2320-364-10).
- (7) Set hydraulic selector switch to CRANE/SRW position.
- (8) Set crane POWER switch to ON position.
- (9) Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
- (10) Hold BOOM controller in the DOWN position.
 - (a) If 22 to 28 vdc are not present, perform Step (11) below and replace circuit card (Para 18-4).
 - (b) If 22 to 28 vdc are present, perform Step (11) below and go to Step 5 of this Fault.
- (11) Set the following switches to the OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch.
- (12) Assemble remote control unit (Para 18-4).



4. BOOM WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

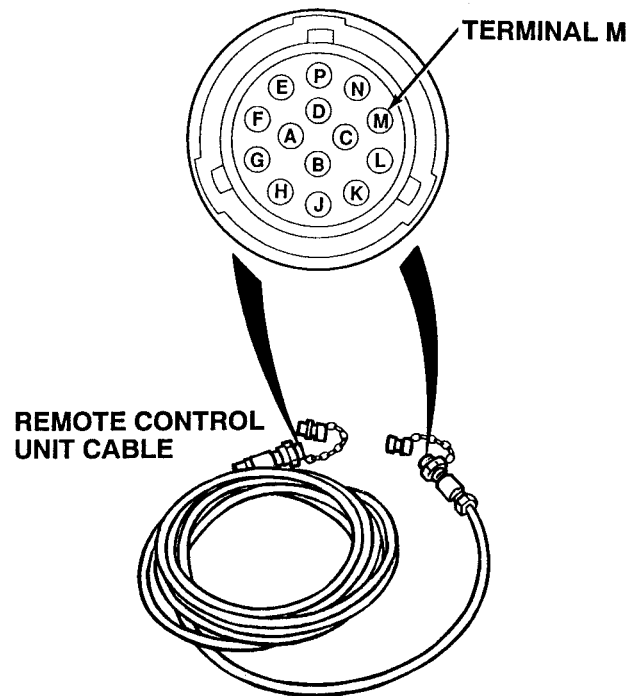


WARNING

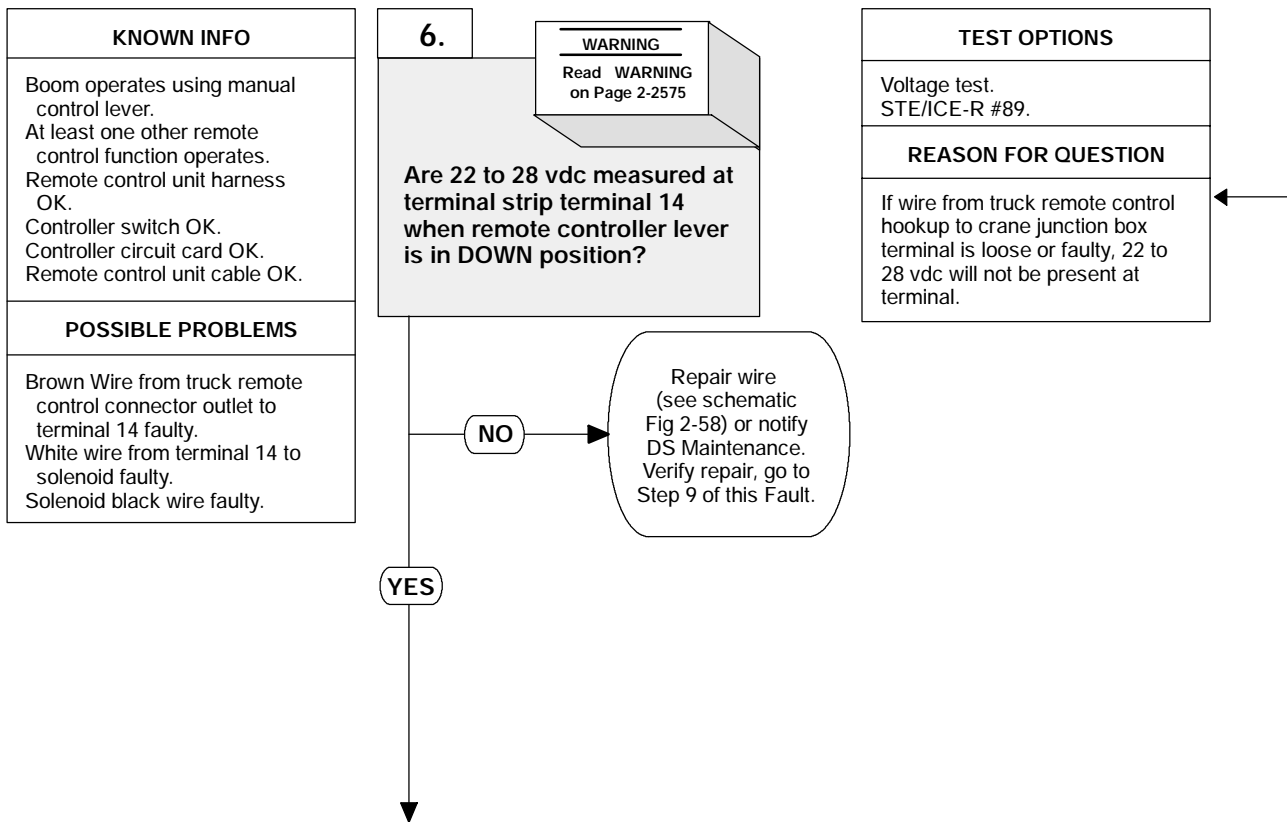
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect remote control unit cable from truck and remote control unit.
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between cable connector terminal M at both ends?
 - (a) If there is no continuity, replace cable.
 - (b) If there is continuity, perform Step (4) below and go to Step 6 of this Fault.
- (4) Reconnect cable to truck hookup and remote control unit hookup.

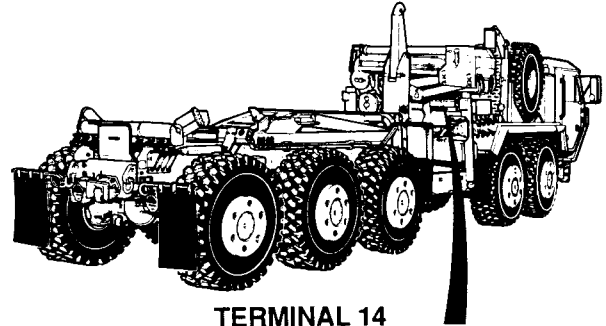


4. BOOM WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

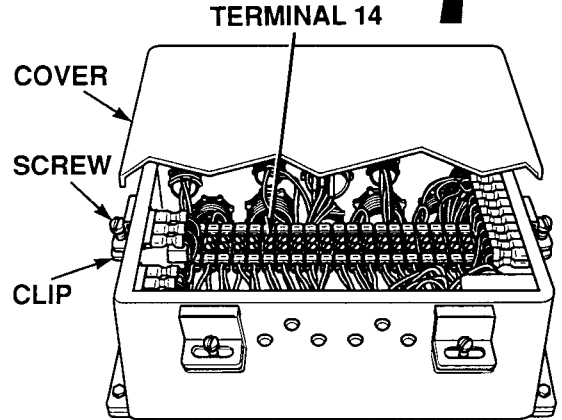


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

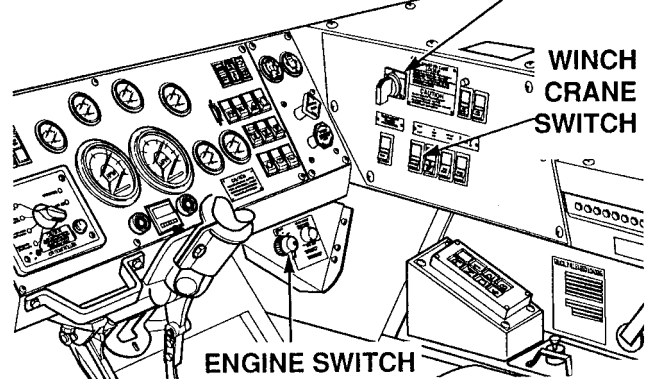


- | VOLTAGE TEST | |
|--------------|--|
| (1) | Loosen six screws, clips and remove crane junction box cover. |
| (2) | Set multimeter select switch to volts. |
| (3) | Connect positive (+) multimeter lead to crane junction box terminal 14. |
| (4) | Connect negative (-) multimeter lead to a known good ground. |
| (5) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (6) | Set hydraulic selector switch to SRW/CRANE position. |
| (7) | Set crane POWER switch to ON position. |
| (8) | Set remote control ON/OFF EMERGENCY STOP power switch to ON. |
| (9) | Put remote control unit BOOM control lever in the DOWN position. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Step (10) below and repair brown wire from truck remote control hookup to terminal 14 (see schematic Fig 2-58) or notify DS Maintenance. (b) If there are 22 to 28 vdc are present, perform Step (10) below and go to Step 7 of this Fault. |
| (10) | Put the following switches in OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch. |

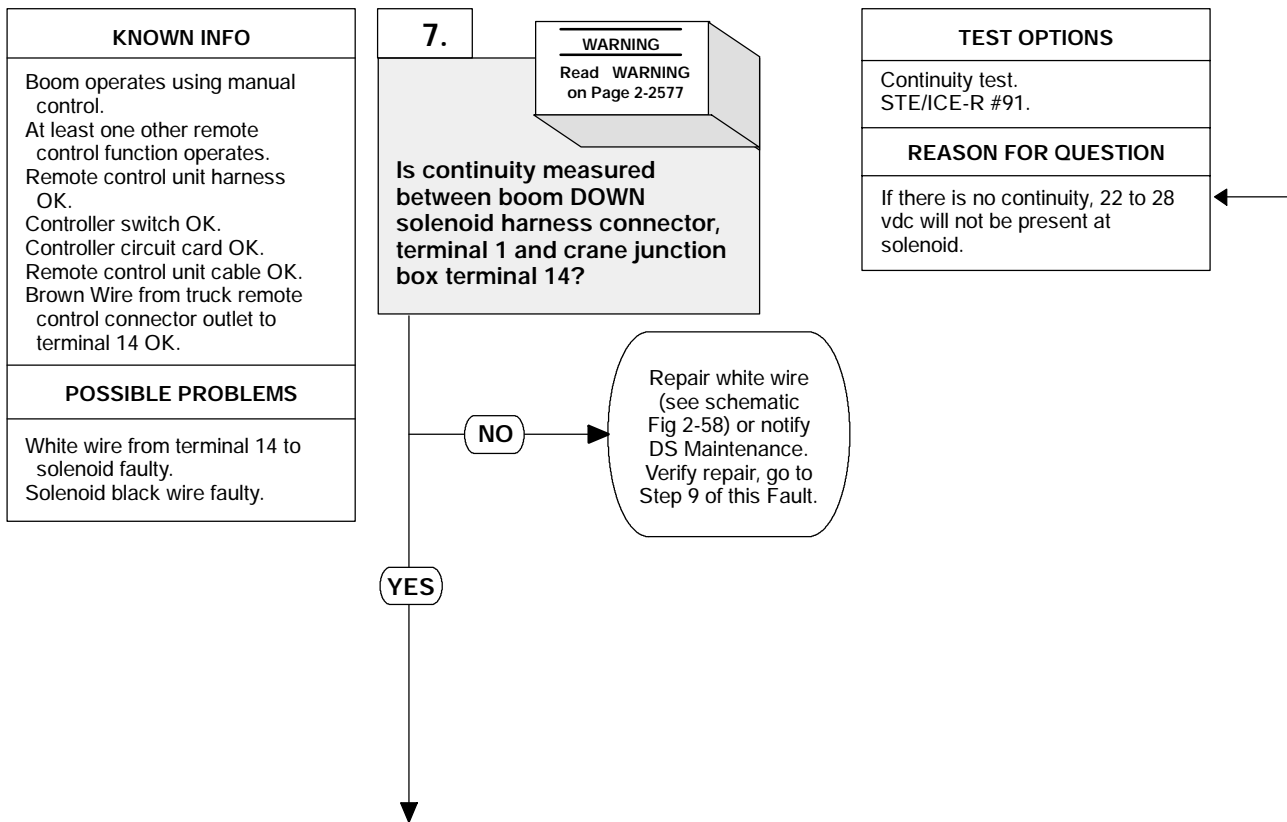


STEERING WHEEL SHOWN REMOVED FOR CLARITY

HYDRAULIC SELECTOR SWITCH



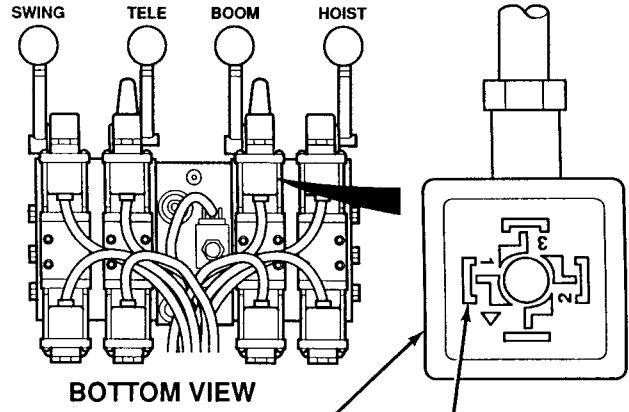
4. BOOM WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).



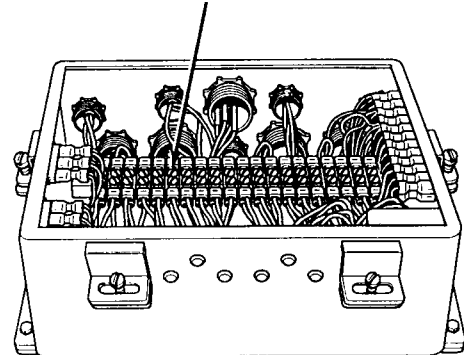
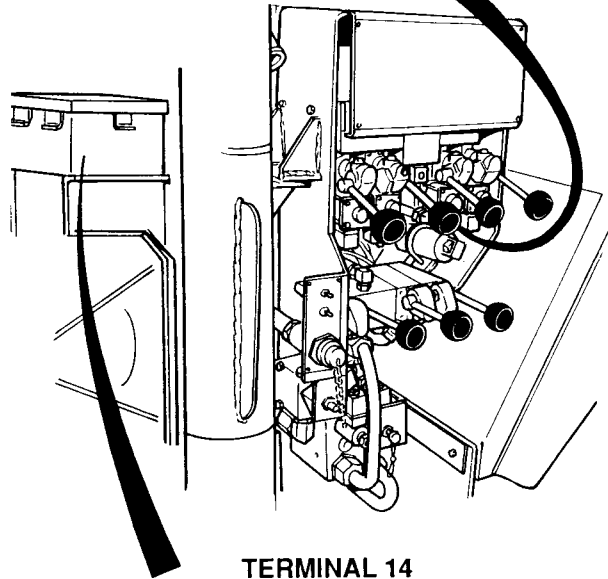
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

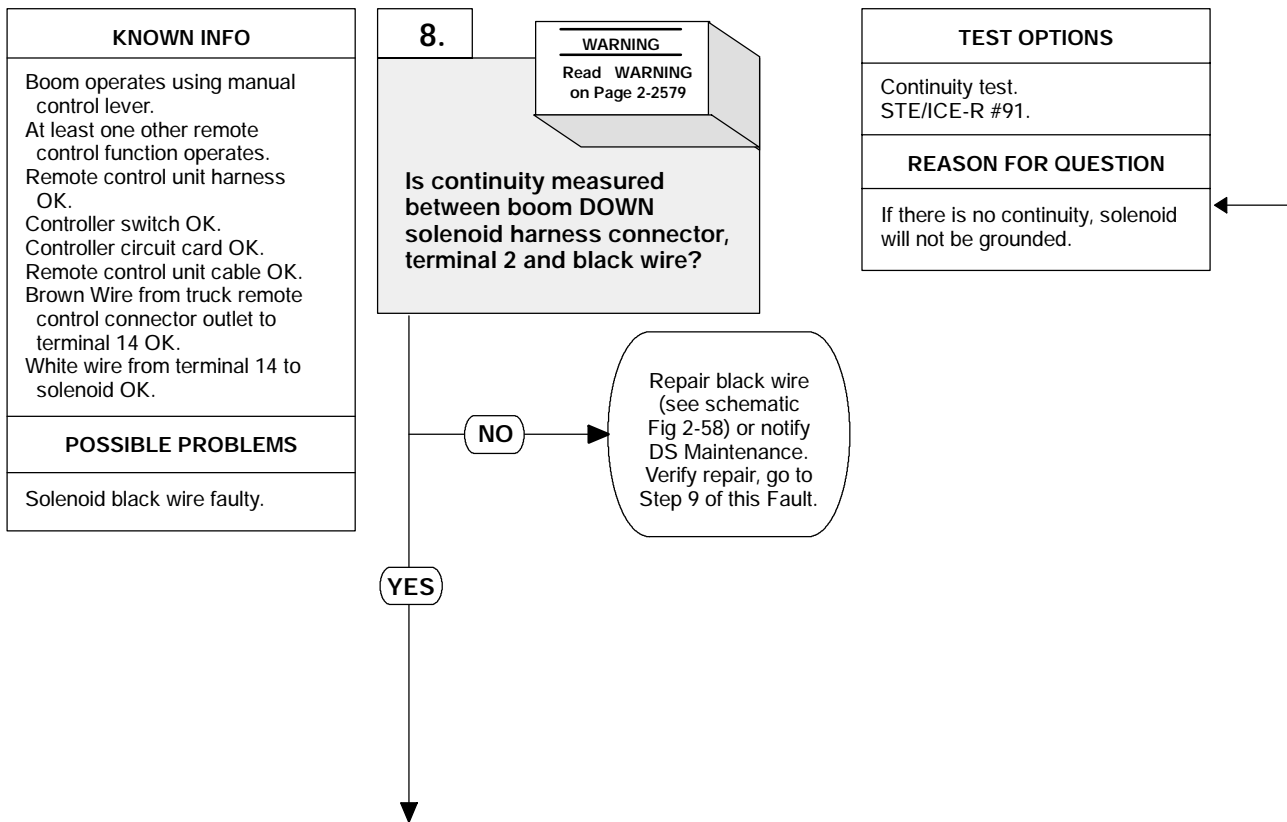
- CONTINUITY TEST**
- (1) Set multimeter select switch to ohms.
 - (2) Is there continuity between connector terminal 1 and crane main junction box terminal 14.
 - (a) If there is no continuity, repair white wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, white wire is OK.



BOOM DOWN SOLENOID CONNECTOR **TERMINAL 1**



4. BOOM WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).

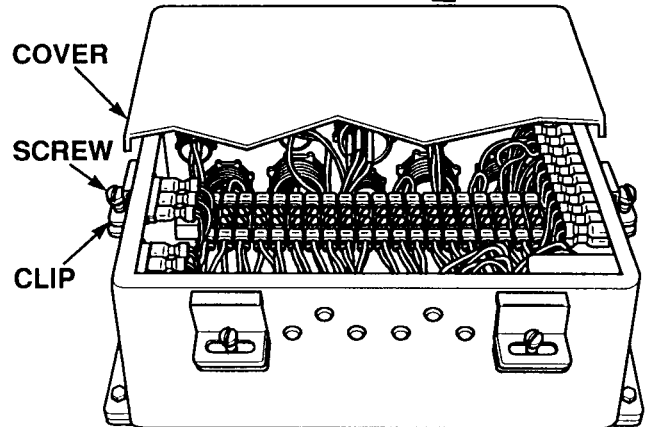
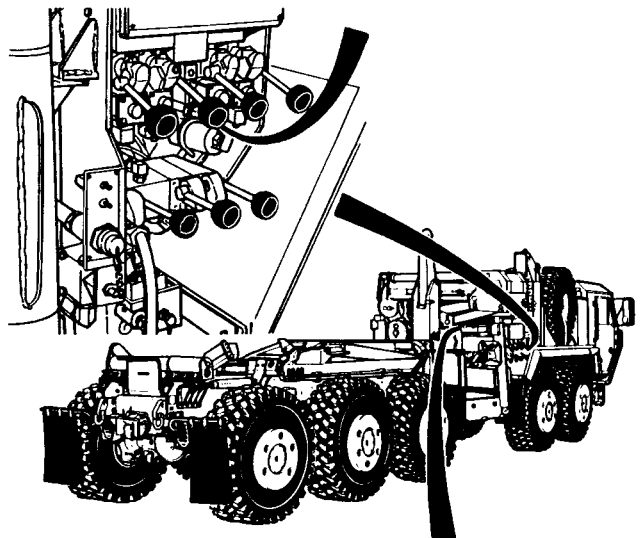
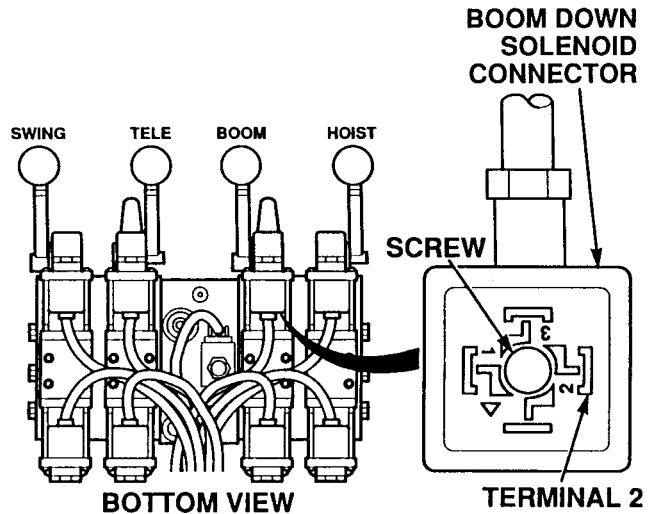


WARNING

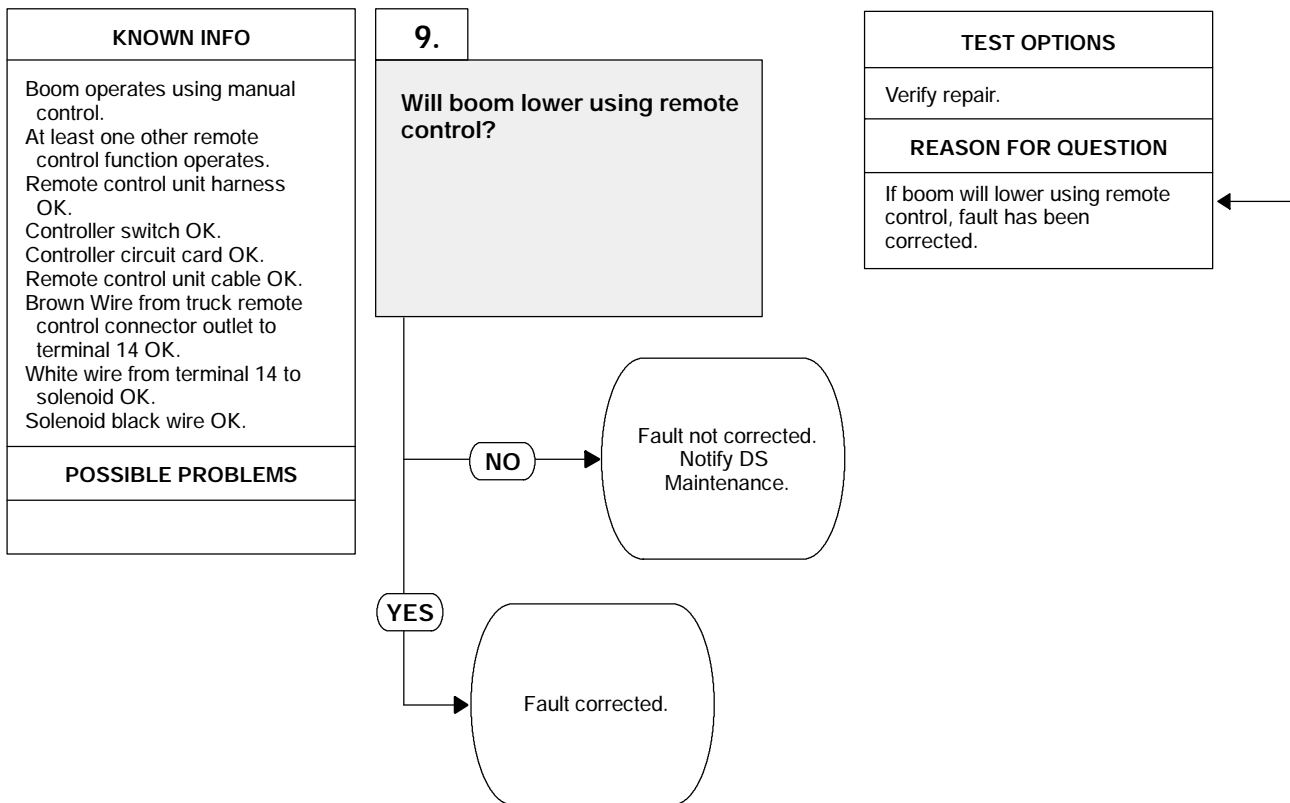
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Is there continuity between connector terminal 2 and a known good ground?
 - (a) If there is no continuity, repair black wire (see schematic Fig 2-58) or notify DS Maintenance and perform Steps (2) and (3) below.
 - (b) If there is continuity, perform Steps (2) and (3) below and go to Step 9 of this Fault.
- (2) Install connector on boom DOWN hoist control solenoid and tighten screw.
- (3) Install crane junction box cover with six clips and screws.



4. BOOM WILL NOT LOWER USING REMOTE CONTROL UNIT (CONT).



VERIFY REPAIR

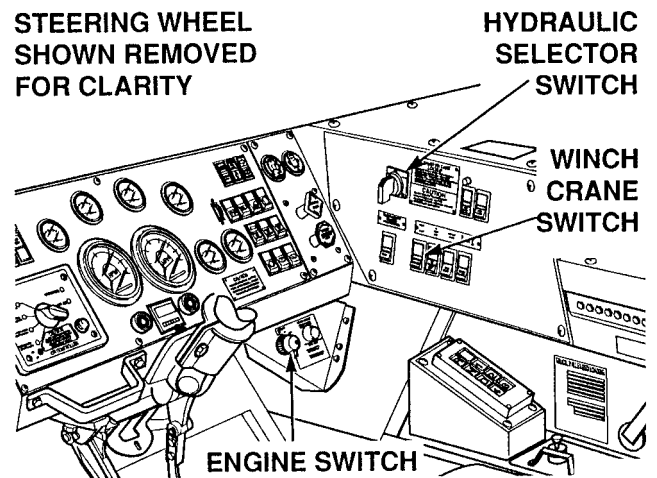
- (1) Connect remote control unit cable to truck hookup and remote control unit hookup (TM 9-2320-364-10).
- (2) Operate crane using remote control unit.
 - (a) If boom will not lower using remote control unit, fault not corrected. Notify DS Maintenance.
 - (b) If boom will lower, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

5. BOOM WILL NOT RAISE USING REMOTE CONTROL UNIT.

INITIAL SETUP

Tools and Special Tools

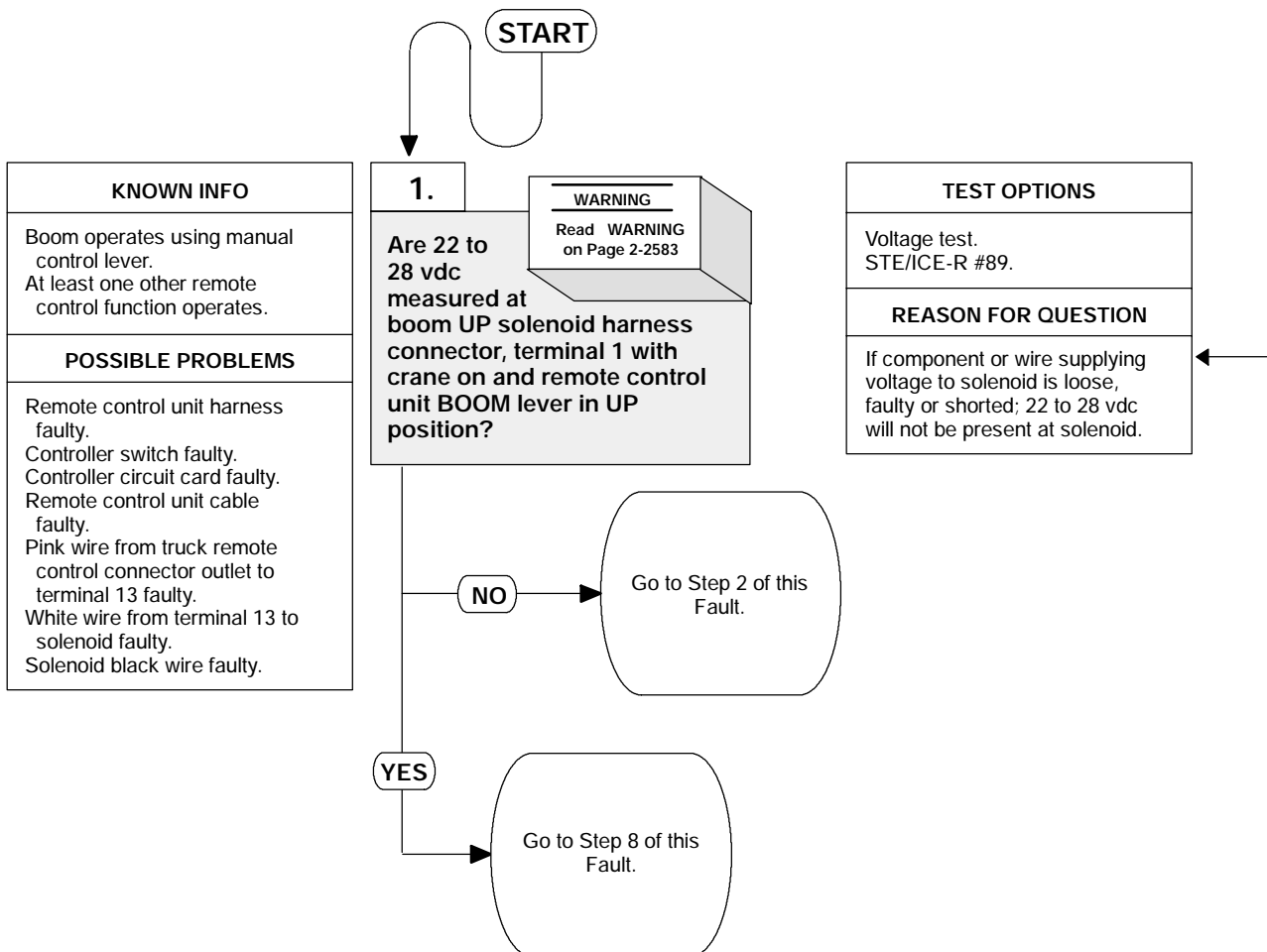
Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

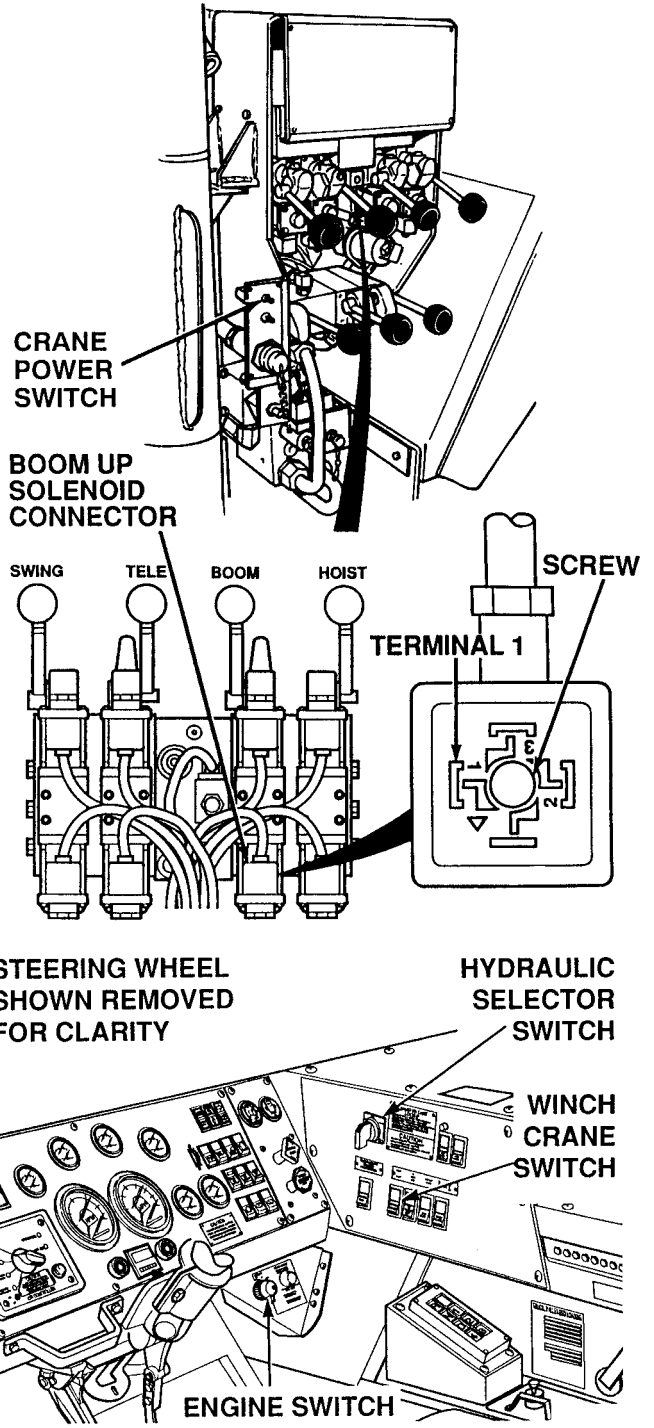
Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Remote control unit connected, (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)



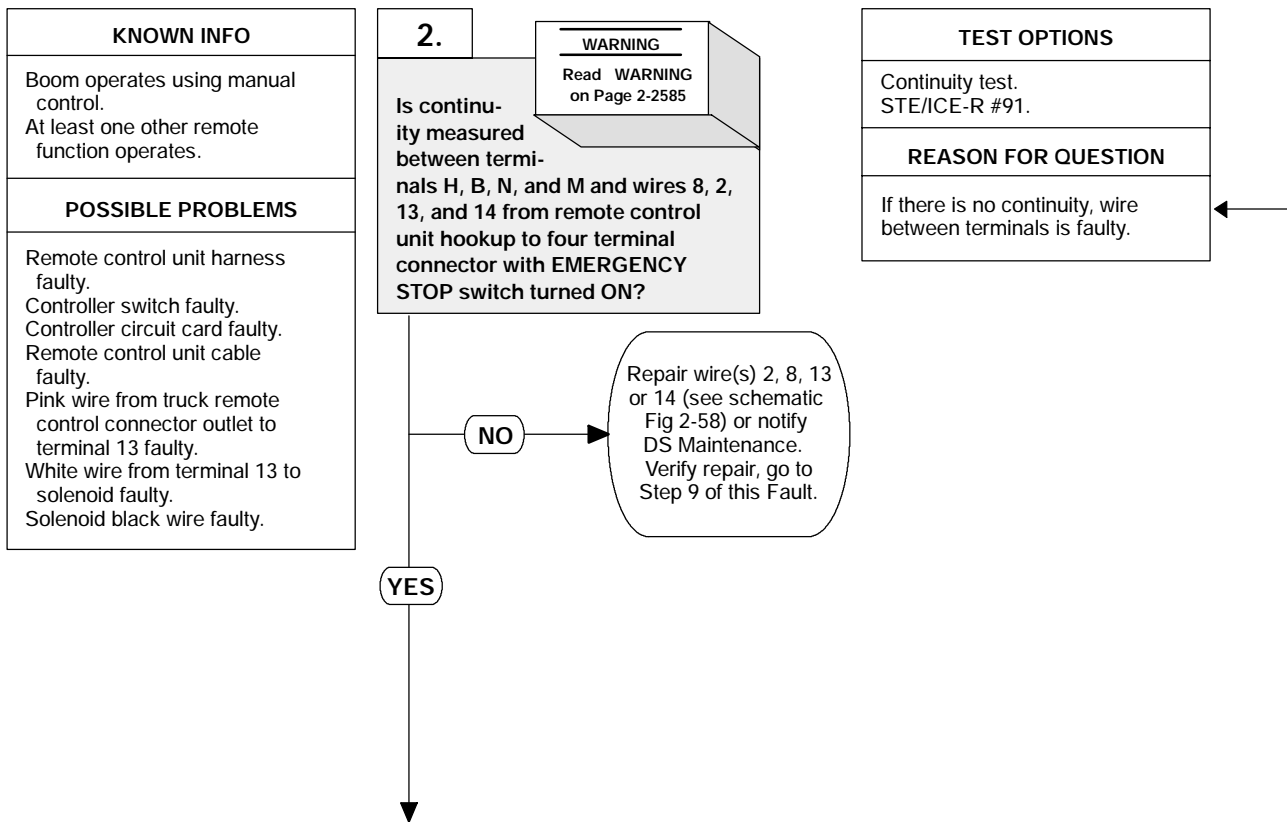
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST	
(1)	Loosen screw and remove connector from boom UP solenoid.
(2)	Set multimeter select switch to volts.
(3)	Connect positive (+) multimeter lead to harness connector, terminal 1.
(4)	Connect negative (-) multimeter lead to a known good ground.
(5)	Turn ON ENGINE switch (TM 9-2320-364-10).
(6)	Set WINCH/CRANE switch to CRANE position.
(7)	Set hydraulic selector switch to CRANE/SRW position.
(8)	Set crane POWER switch to ON position.
(9)	Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
(10)	Hold remote control unit BOOM controller in the UP position. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Step (11) below and go to Step 2 of this Fault. (b) If 22 to 28 vdc are present, perform Step (11) below and go to Step 8 of this Fault.
(11)	Set the following switches in OFF position: REMOTE CONTROL UNIT ON/OFF EMERGENCY STOP switch, crane POWER switch, hydraulic selector switch and ENGINE switch.



5. BOOM WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).

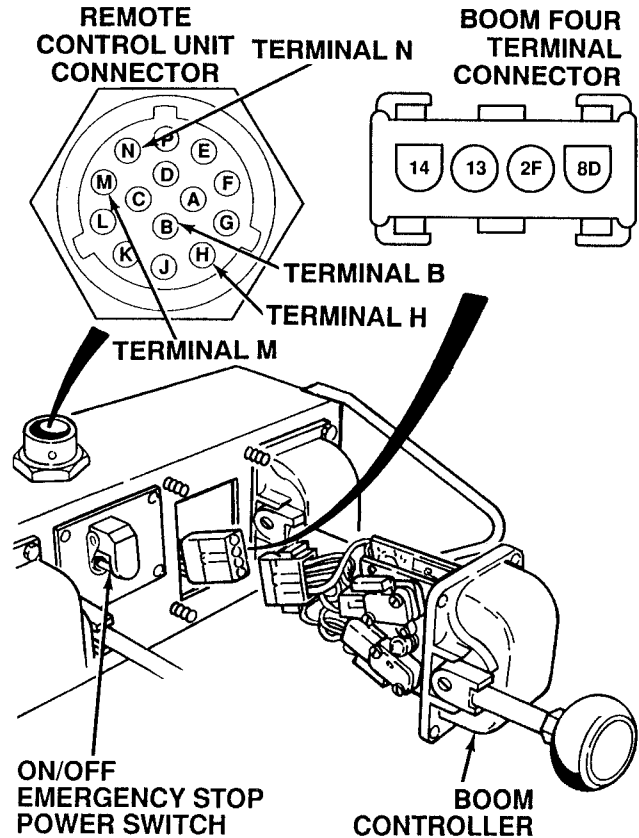


WARNING

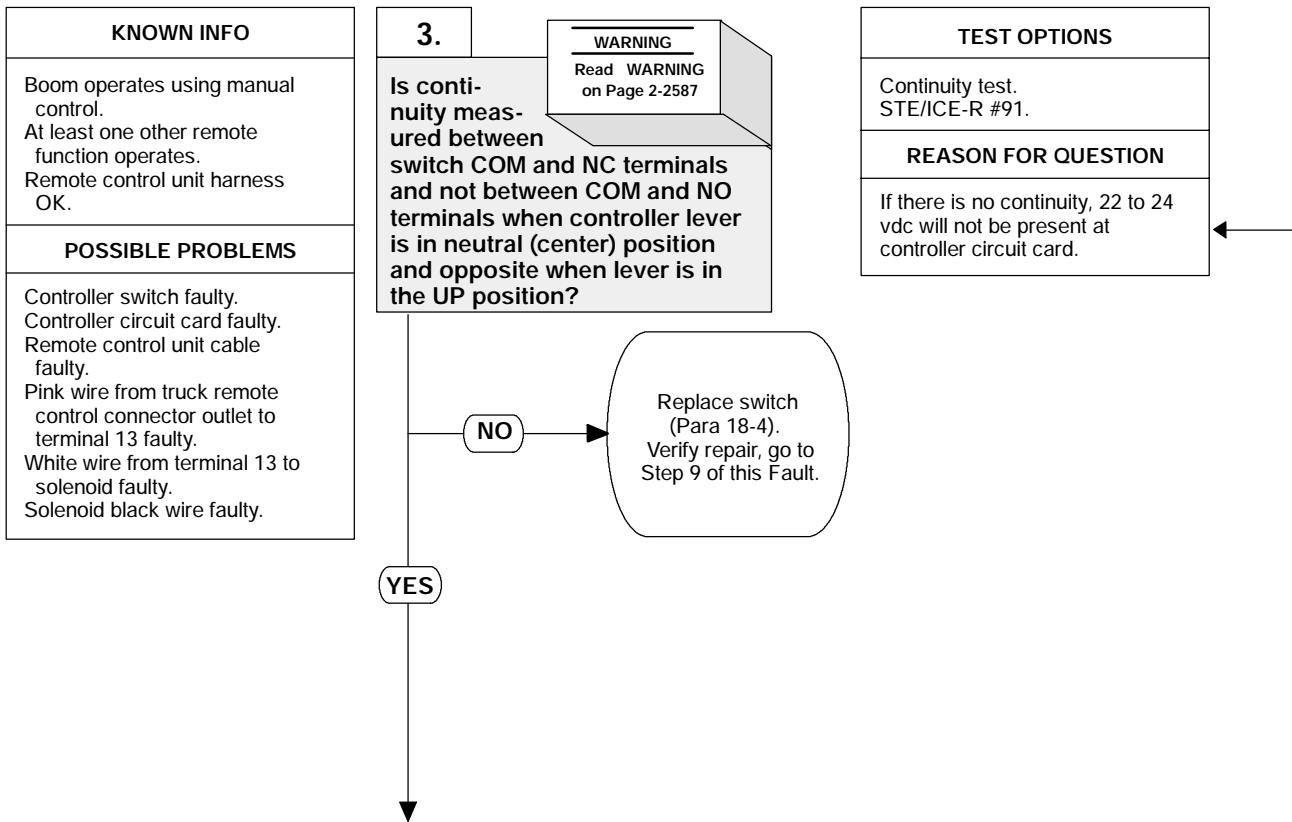
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect cable from remote control unit (TM 9-2320-364-10).
- (2) Remove BOOM controller from remote control unit (Para 18-4).
- (3) Set multimeter select switch to ohms.
- (4) Turn ON remote control unit ON/OFF EMERGENCY STOP switch.
- (5) Is there continuity between remote control unit hookup, terminal H and four terminal connector, terminal 8D?
 - (a) If there is no continuity, repair wire 8 between switch and four terminal connector (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (6) below.
- (6) Is there continuity between remote control unit hookup, terminal B and four terminal connector, terminal 2F?
 - (a) If there is no continuity, repair wire 2 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (7) below.
- (7) Is there continuity between remote control unit hookup, terminal N and four terminal connector, terminal 13?
 - (a) If there is no continuity, repair wire 13 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (8) below.
- (8) Is there continuity between remote control unit hookup, terminal M and four terminal connector, terminal 14?
 - (a) If there is no continuity, repair wire 14 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step 3 of this Fault.



5. BOOM WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).

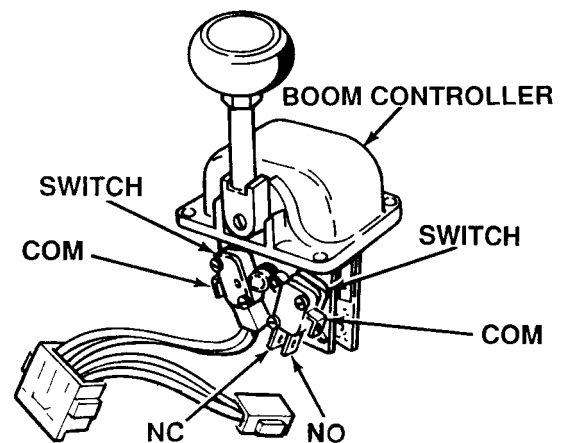


WARNING

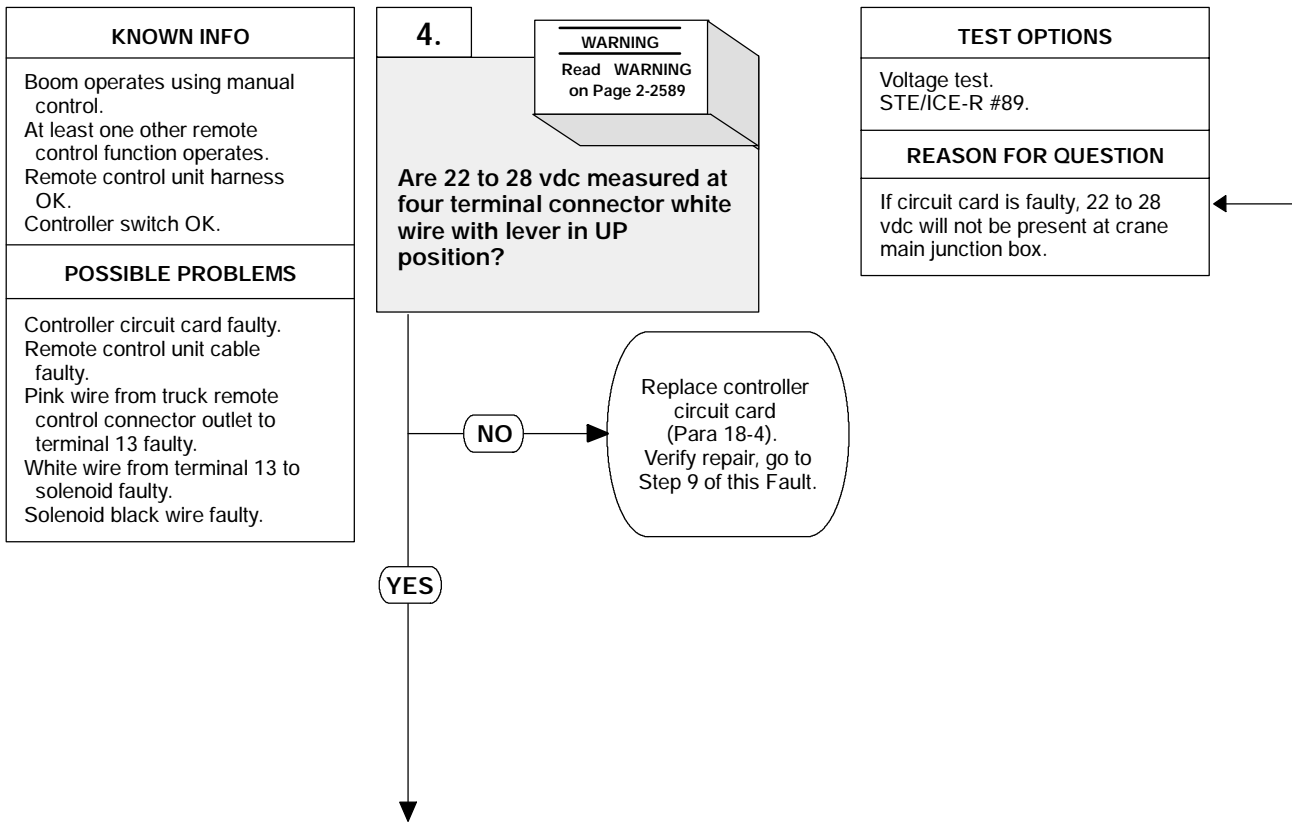
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector from one of the two switches.
- (2) Is there continuity between switch COM terminal and switch COM terminal?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (3) below.
- (3) Is there continuity between switch COM terminal and switch NO terminal?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (4) below.
- (4) Is there continuity between switch NC terminal and switch COM terminal with controller lever held in UP position?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (5) below.
- (5) Is there continuity between switch COM terminal and switch NO terminal with controller lever held in UP position?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (6) below.
- (6) Repeat Steps (1) through (5) for other switch.
- (7) Install both connectors on switches.



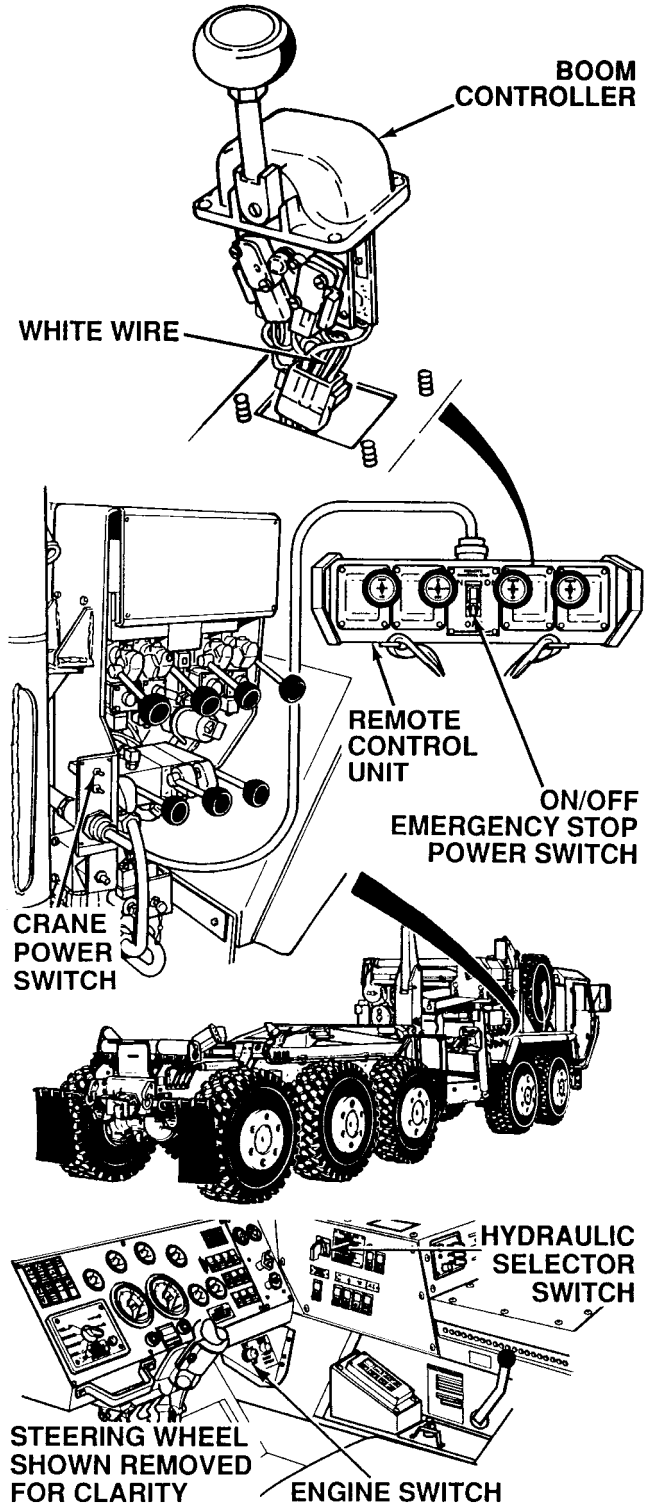
5. BOOM WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).



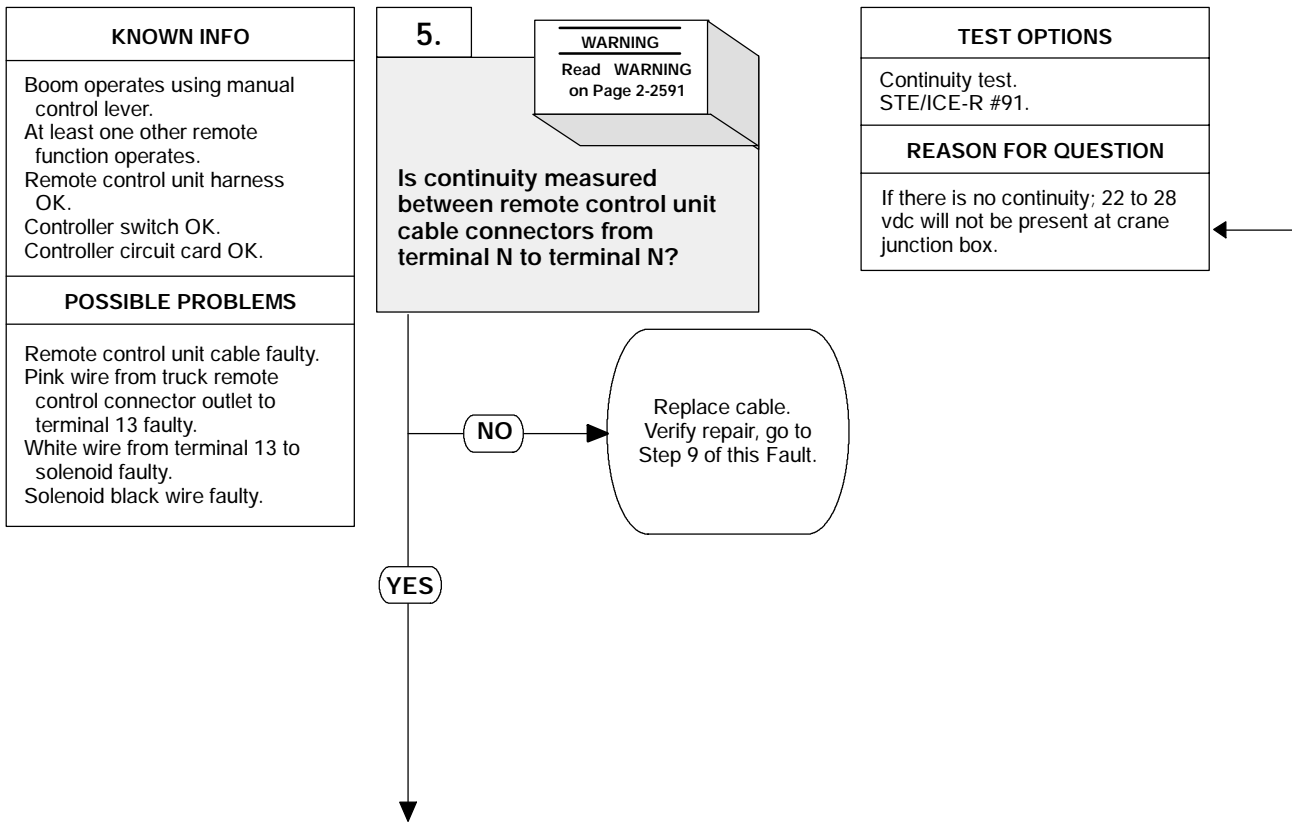
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Connect remote control unit to remote control unit cable (TM 9-2320-364-10).
 - (2) Connect controller four terminal connector to remote control unit harness four terminal connector.
 - (3) Set multimeter select switch to volts dc.
 - (4) Connect positive (+) multimeter lead to white wire terminal in four terminal connector.
 - (5) Connect negative (-) multimeter lead to a known good ground.
 - (6) Turn ON ENGINE switch.
 - (7) Set hydraulic selector switch to CRANE/SRW position.
 - (8) Set crane POWER switch to ON position.
 - (9) Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
 - (10) Hold BOOM controller in the UP position.
 - (a) If 22 to 28 vdc are not present, perform Step (11) below and replace circuit card (Para 18-4).
 - (b) If 22 to 28 vdc are present, perform Steps (11) through (13) below.
 - (11) Set crane POWER switch to OFF position.
 - (12) Set the following switches to the OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch.
 - (13) Assemble remote control unit (Para 18-4).



5. BOOM WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).

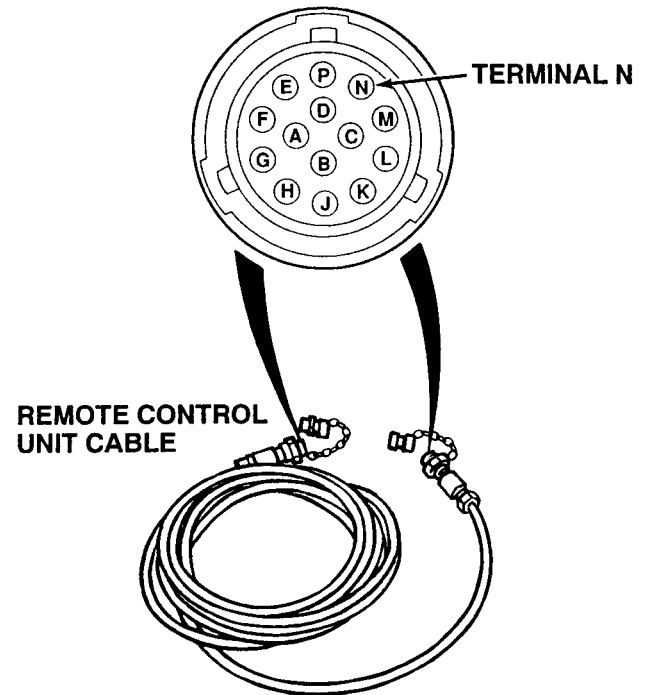


WARNING

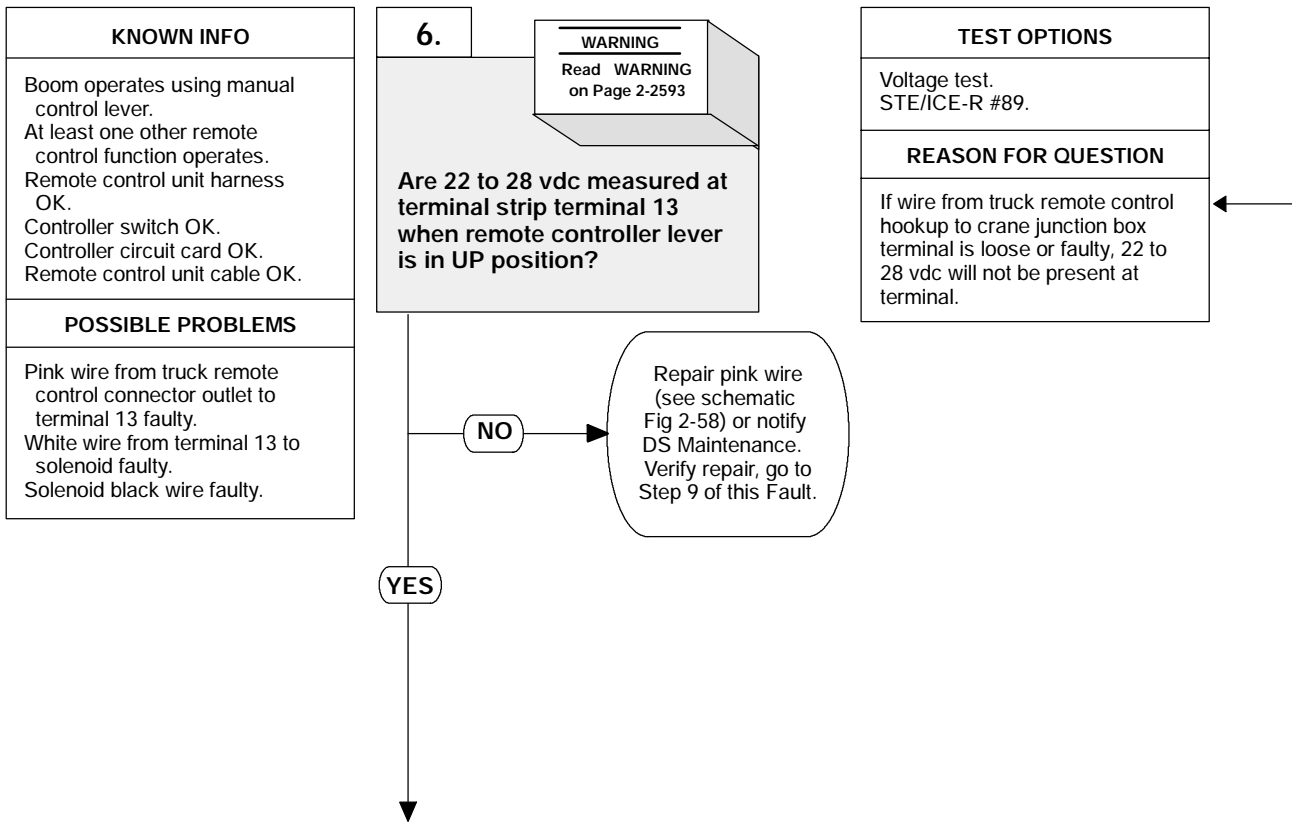
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect remote control unit cable from truck and remote control unit.
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between cable connector terminal N at both ends?
 - (a) If there is no continuity, replace cable.
 - (b) If there is continuity, connect cable to truck hookup and remote control unit hookup and go to Step 6 of this Fault.



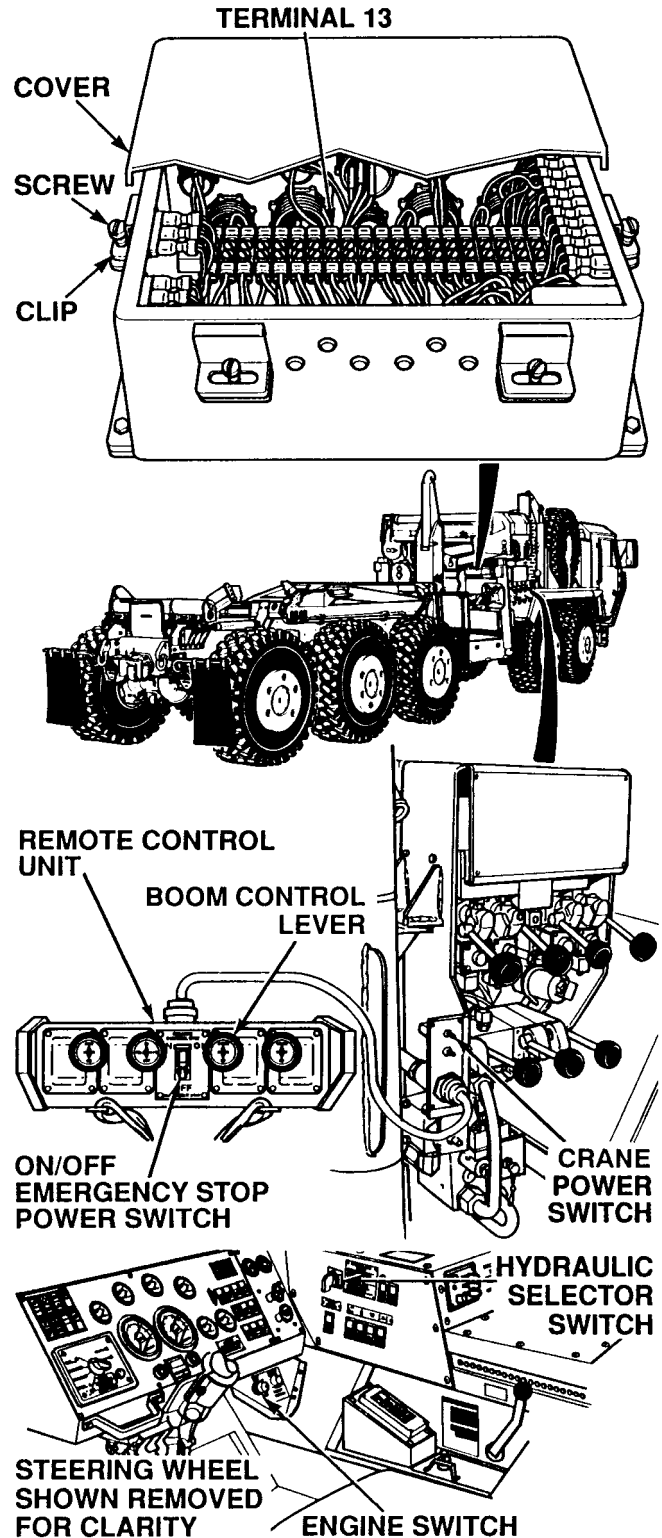
5. BOOM WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).



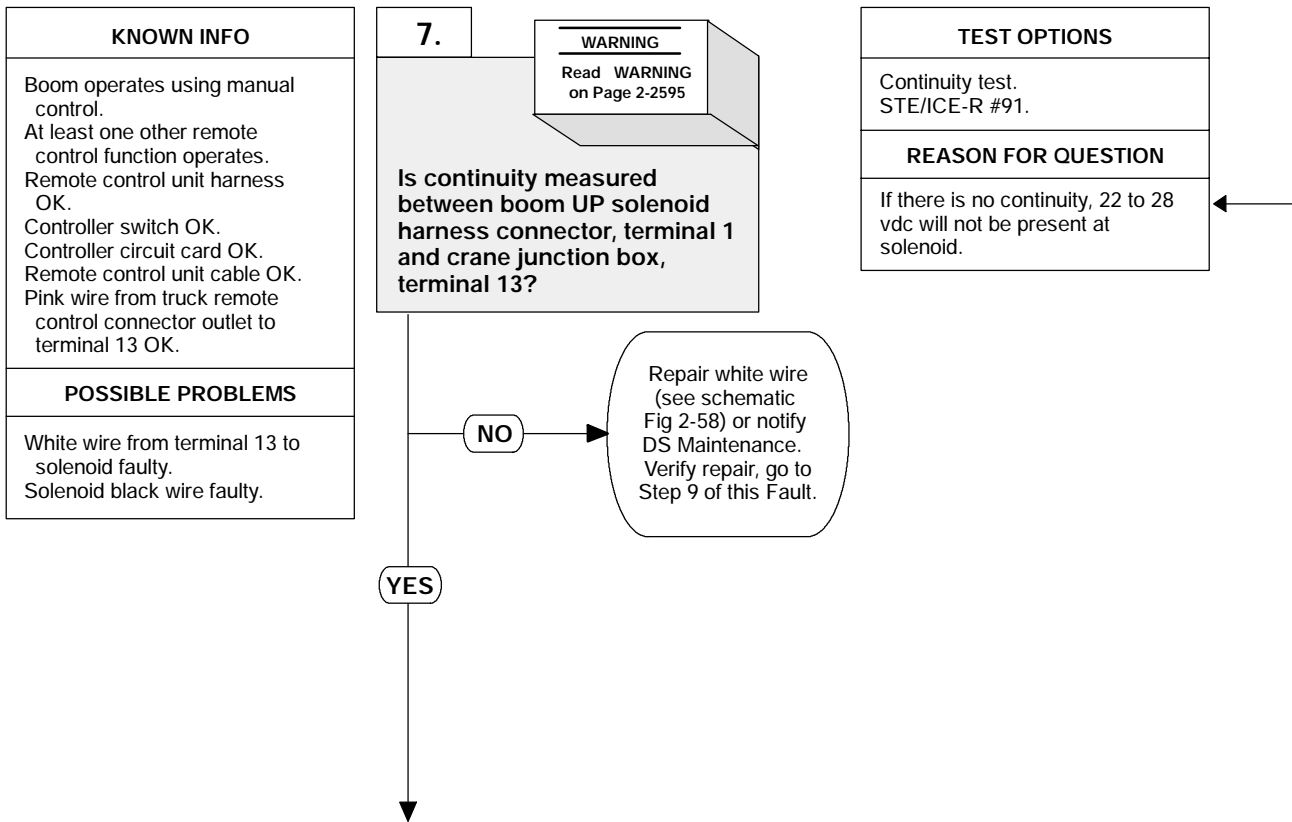
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST | |
|--------------|---|
| (1) | Loosen six screws, clips and remove crane junction box cover. |
| (2) | Set multimeter select switch to volts. |
| (3) | Connect positive (+) multimeter lead to crane junction box, terminal 13. |
| (4) | Connect negative (-) multimeter lead to a known good ground. |
| (5) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (6) | Set hydraulic selector switch to SRW/CRANE position. |
| (7) | Set crane POWER switch to ON position. |
| (8) | Set remote control ON/OFF EMERGENCY STOP power switch to ON. |
| (9) | Put remote control unit BOOM control lever in the UP position. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Step (10) below and repair pink wire from truck remote control hookup to terminal 13 (see schematic Fig 2-58) or notify DS Maintenance. (b) If 22 to 28 vdc are present, perform Step (10) below and go to Step 7 of this Fault. |
| (10) | Put the following switches in OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch. |



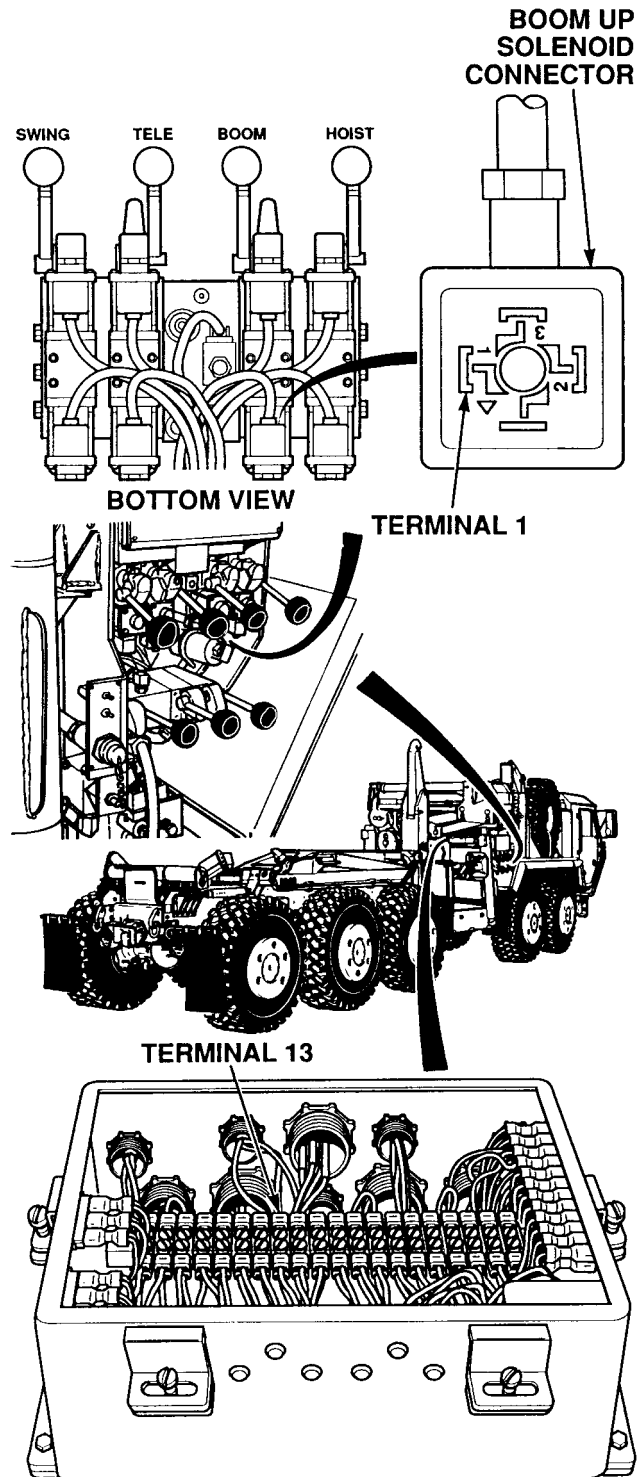
5. BOOM WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).



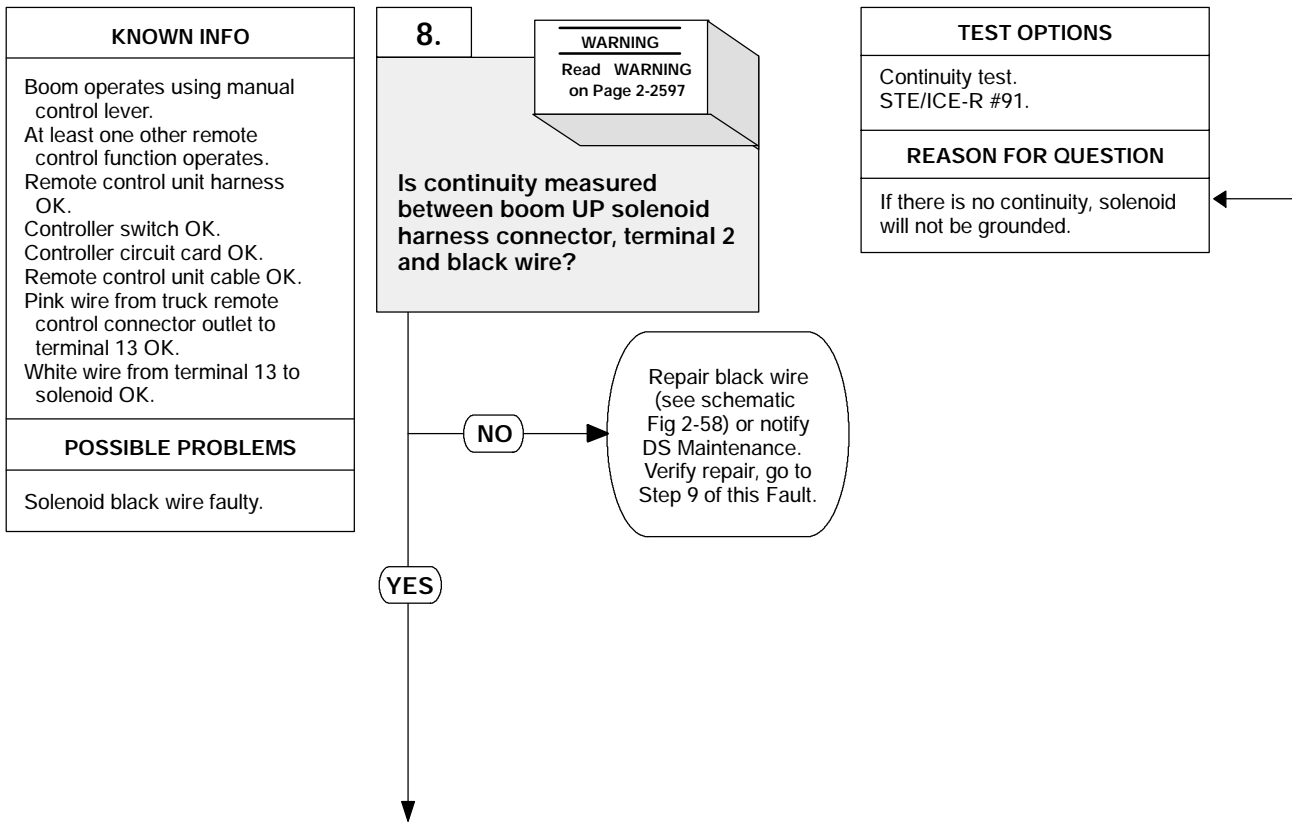
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Set multimeter select switch to ohms.
 - (2) Is there continuity between connector terminal 1 and crane main junction box terminal 13?
 - (a) If there is no continuity, repair white wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, white wire is OK.



5. BOOM WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).

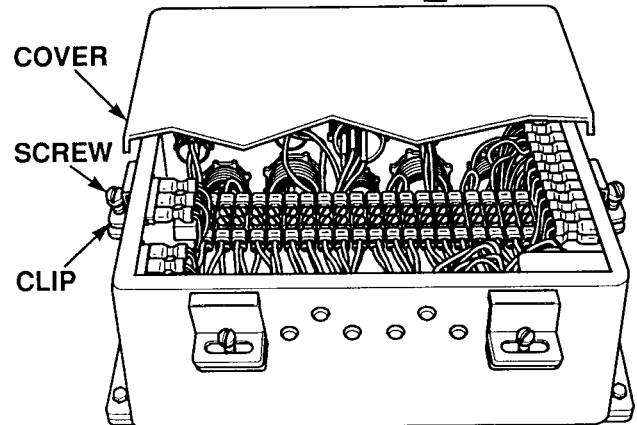
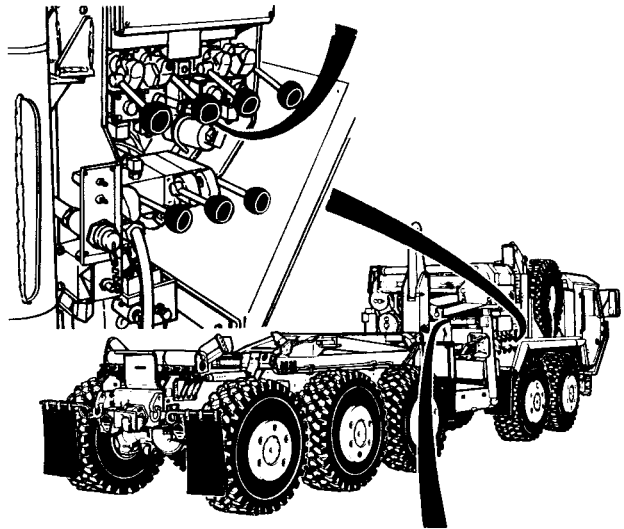
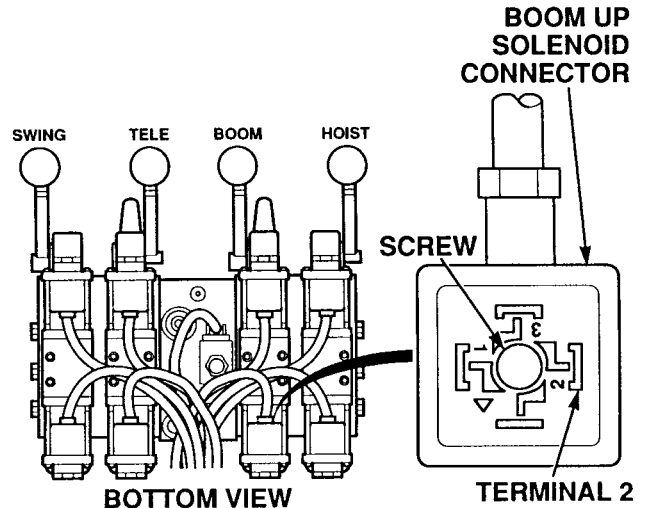


WARNING

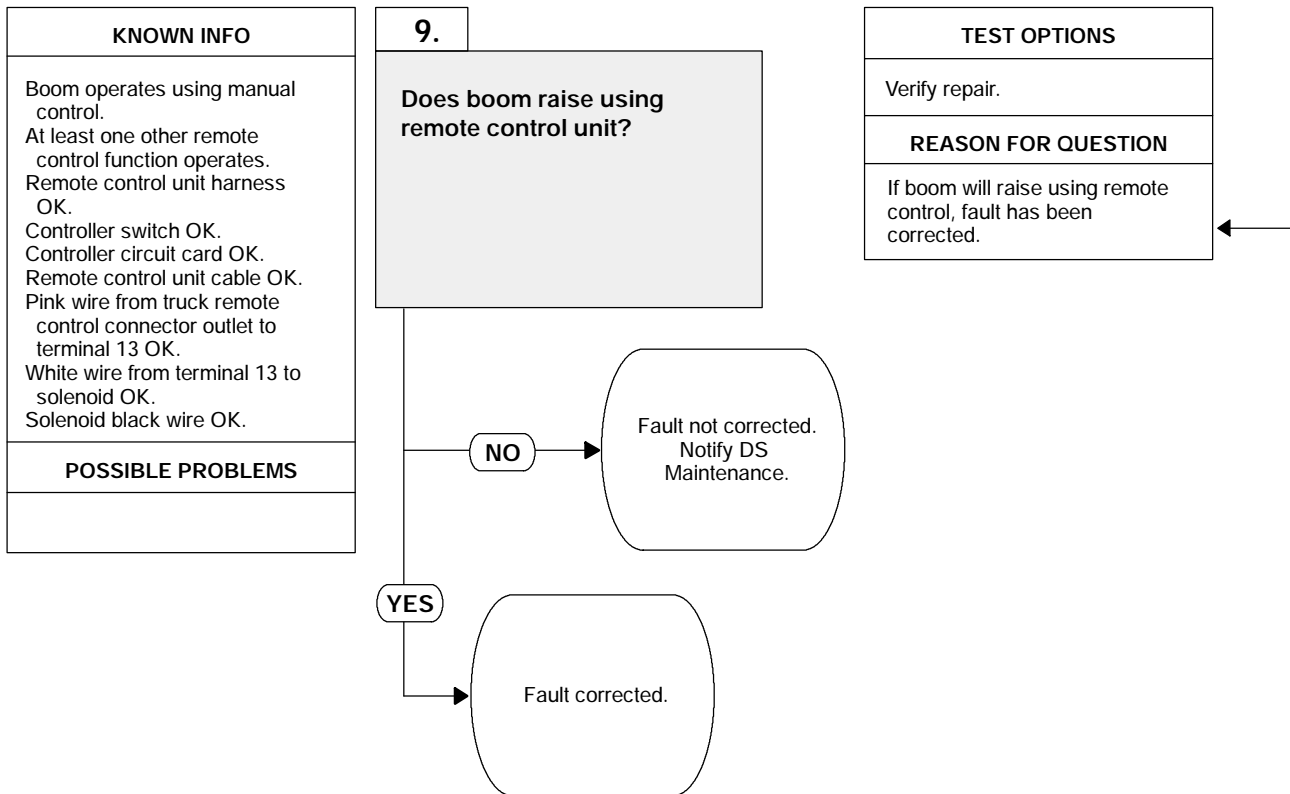
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Is there continuity between connector terminal 2 and a known good ground?
 - (a) If there is no continuity, repair connector black wire (see schematic Fig 2-58) or notify DS Maintenance and perform Steps (2) and (3) below.
 - (b) If there is continuity, perform Steps (2) and (3) below and go to Step 9 of this Fault.
- (2) Install connector on boom UP solenoid and tighten screw.
- (3) Install crane junction box cover with six clips and screws.



5. BOOM WILL NOT RAISE USING REMOTE CONTROL UNIT (CONT).



VERIFY REPAIR

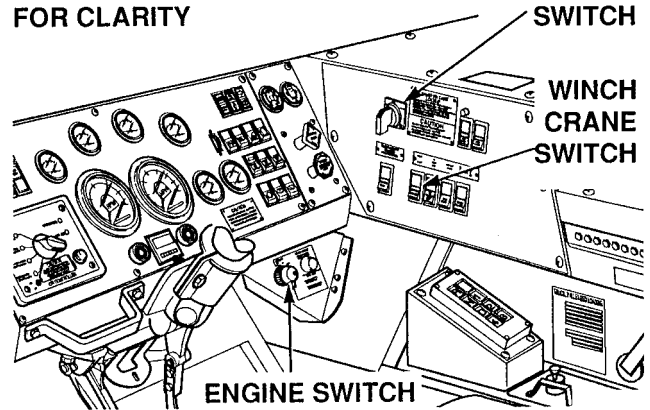
- (1) Connect remote control unit cable to truck hookup and remote control unit hookup (TM 9-2320-364-10).
- (2) Operate crane using remote control unit.
 - (a) If boom will not raise using remote control unit, fault not corrected. Notify DS Maintenance.
 - (b) If boom will raise, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

6. BOOM WILL NOT TELESCOPE IN USING REMOTE CONTROL UNIT.

INITIAL SETUP

Tools and Special Tools

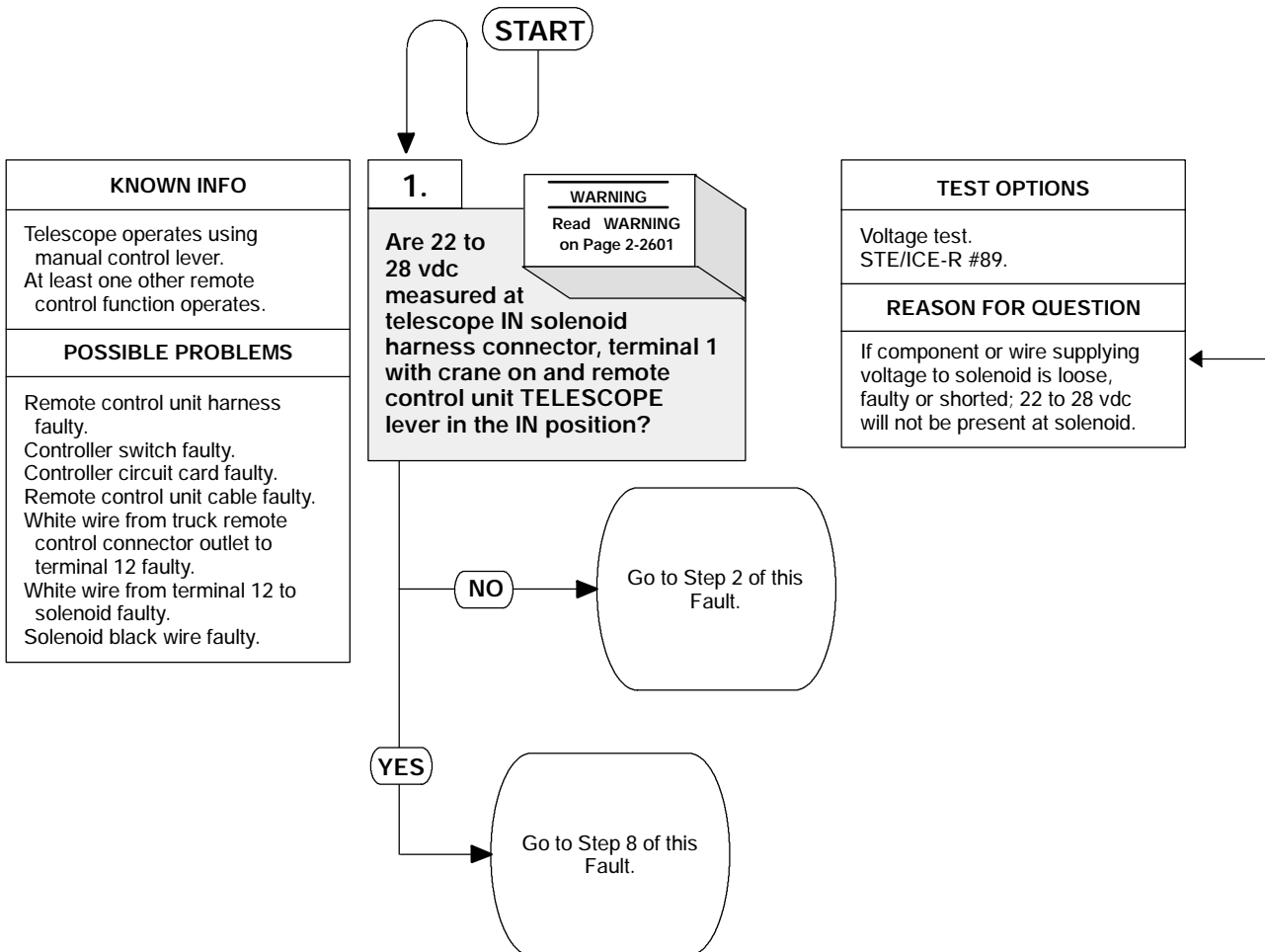
Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

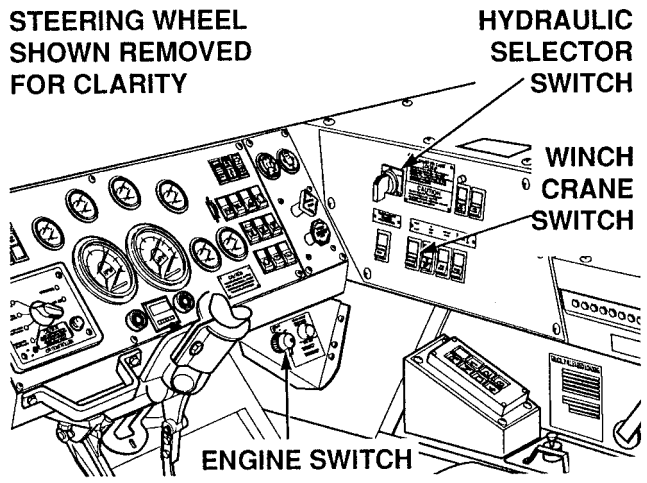
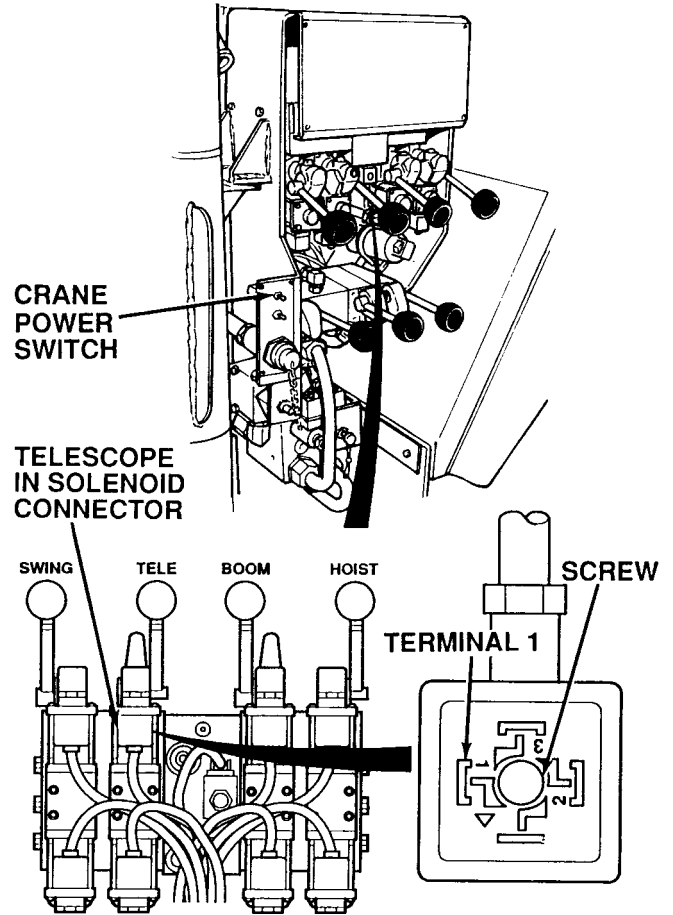
Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Remote control unit connected, (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)



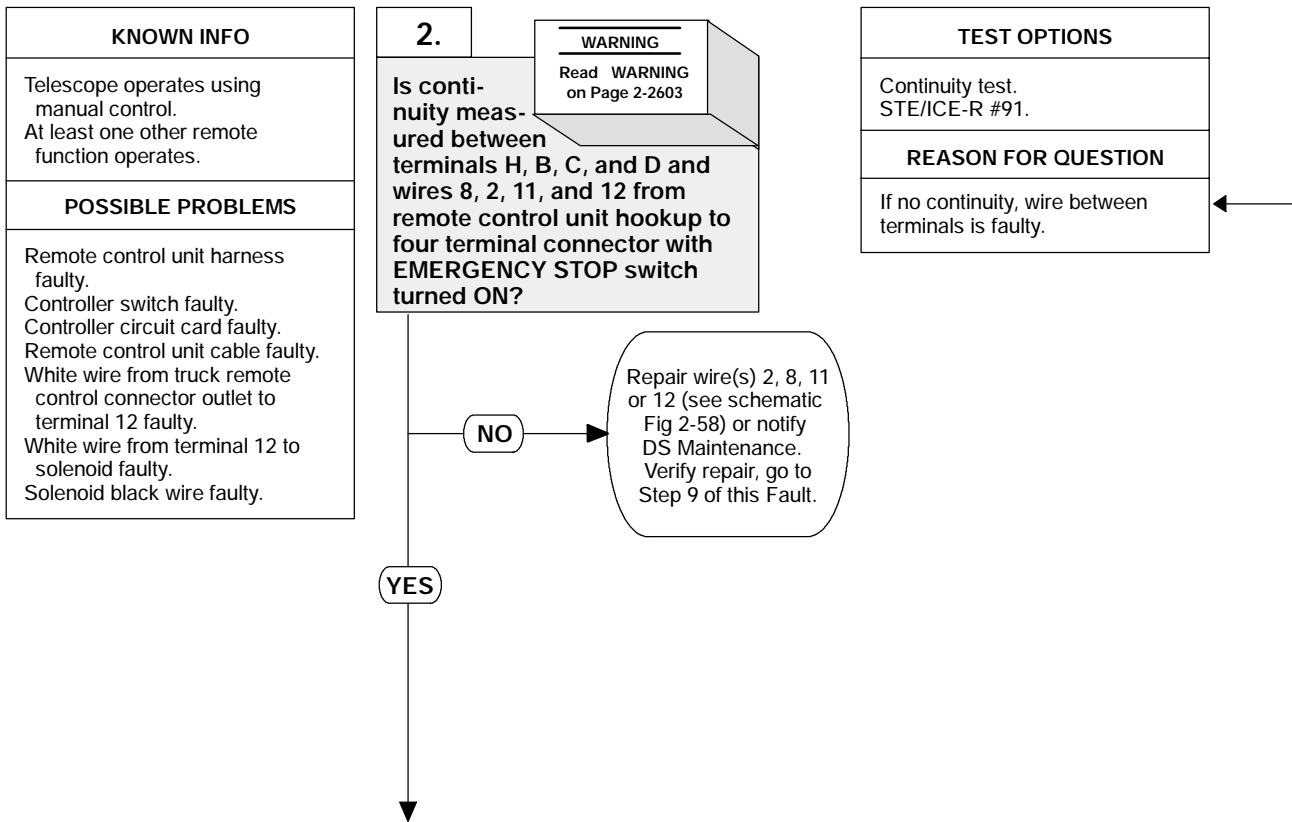
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST	
(1)	Loosen screw and remove connector from telescope IN solenoid.
(2)	Set multimeter select switch to volts.
(3)	Connect positive (+) multimeter lead to harness connector, terminal 1.
(4)	Connect negative (-) multimeter lead to a known good ground.
(5)	Turn ON ENGINE switch (TM 9-2320-364-10).
(6)	Set WINCH/CRANE switch to CRANE position.
(7)	Set hydraulic selector switch to CRANE/SRW position.
(8)	Set crane POWER switch to ON position.
(9)	Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
(10)	Hold remote control unit TELESCOPE controller in the IN position. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Step (11) below and go to Step 2 of this Fault. (b) If 22 to 28 vdc are present, perform Step (11) below and go to Step 8 of this Fault.
(11)	Set the following switches in OFF position: REMOTE CONTROL UNIT ON/OFF EMERGENCY STOP switch, crane POWER switch, hydraulic selector switch and ENGINE switch.



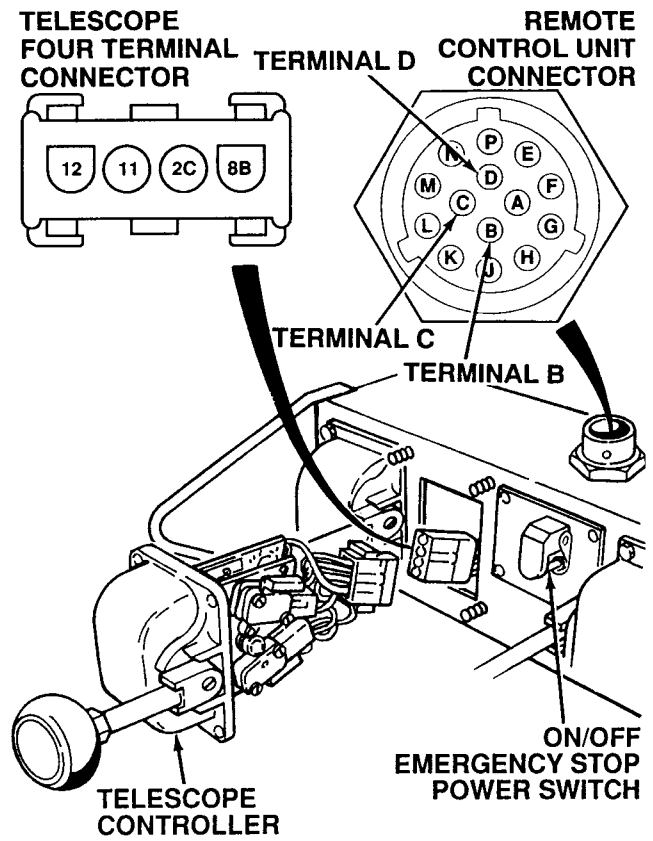
6. BOOM WILL NOT TELESCOPE IN USING REMOTE CONTROL UNIT (CONT).



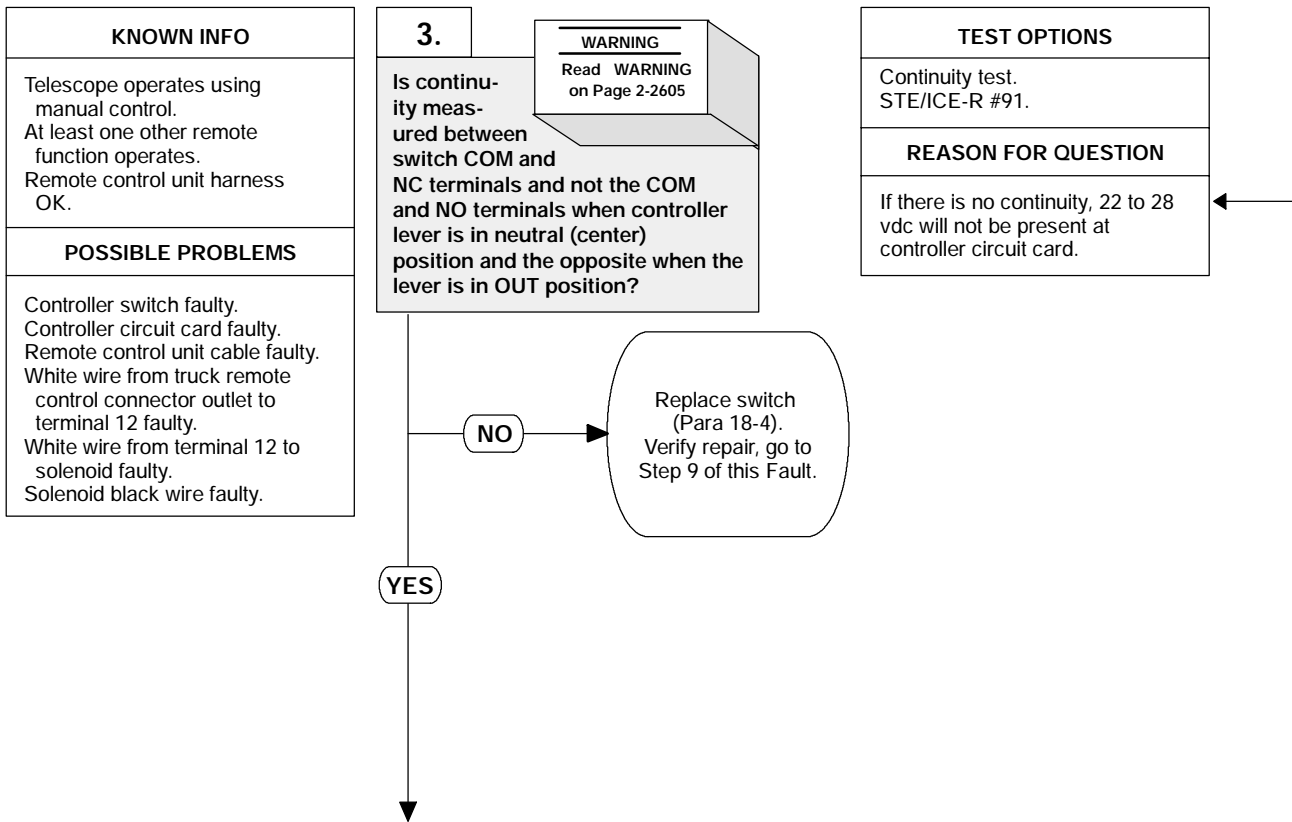
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
<p>(1) Disconnect cable from remote control unit (TM 9-2320-364-10).</p> <p>(2) Remove TELESCOPE controller from remote control unit (Para 18-4).</p> <p>(3) Set multimeter select switch to ohms.</p> <p>(4) Turn ON remote control unit ON/OFF EMERGENCY STOP switch.</p> <p>(5) Is there continuity between remote control unit hookup, terminal H and four terminal connector, terminal 8B?</p> <p style="padding-left: 20px;">(a) If there is no continuity, repair wire 8 between switch and four terminal connector (see schematic Fig 2-58) or notify DS Maintenance.</p> <p style="padding-left: 20px;">(b) If there is continuity, go to Step (6) below.</p> <p>(6) Is there continuity between remote control unit hookup, terminal B and four terminal connector, terminal 2C?</p> <p style="padding-left: 20px;">(a) If there is no continuity, repair wire 2 (see schematic Fig 2-58) or notify DS Maintenance.</p> <p style="padding-left: 20px;">(b) If there is continuity, go to Step (7) below.</p> <p>(7) Is there continuity between remote control unit hookup, terminal C and four terminal connector, terminal 11?</p> <p style="padding-left: 20px;">(a) If there is no continuity, repair wire 11 (see schematic Fig 2-58) or notify DS Maintenance.</p> <p style="padding-left: 20px;">(b) If there is continuity, go to Step (8) below.</p> <p>(8) Is there continuity between remote control unit hookup, terminal D and four terminal connector, terminal 12?</p> <p style="padding-left: 20px;">(a) If there is no continuity, repair wire 12 (see schematic Fig 2-58) or notify DS Maintenance.</p> <p style="padding-left: 20px;">(b) If there is continuity, go to Step 3 of this fault.</p>



6. BOOM WILL NOT TELESCOPE IN USING REMOTE CONTROL UNIT (CONT).

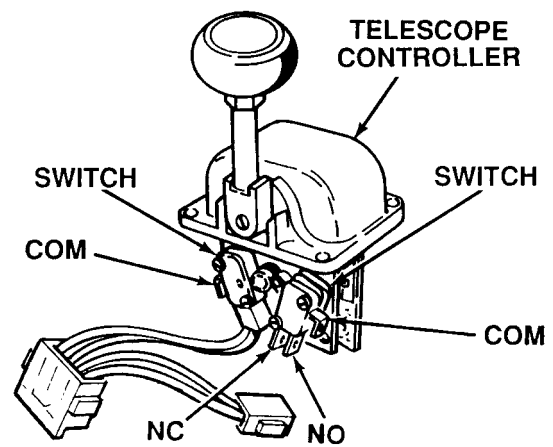


WARNING

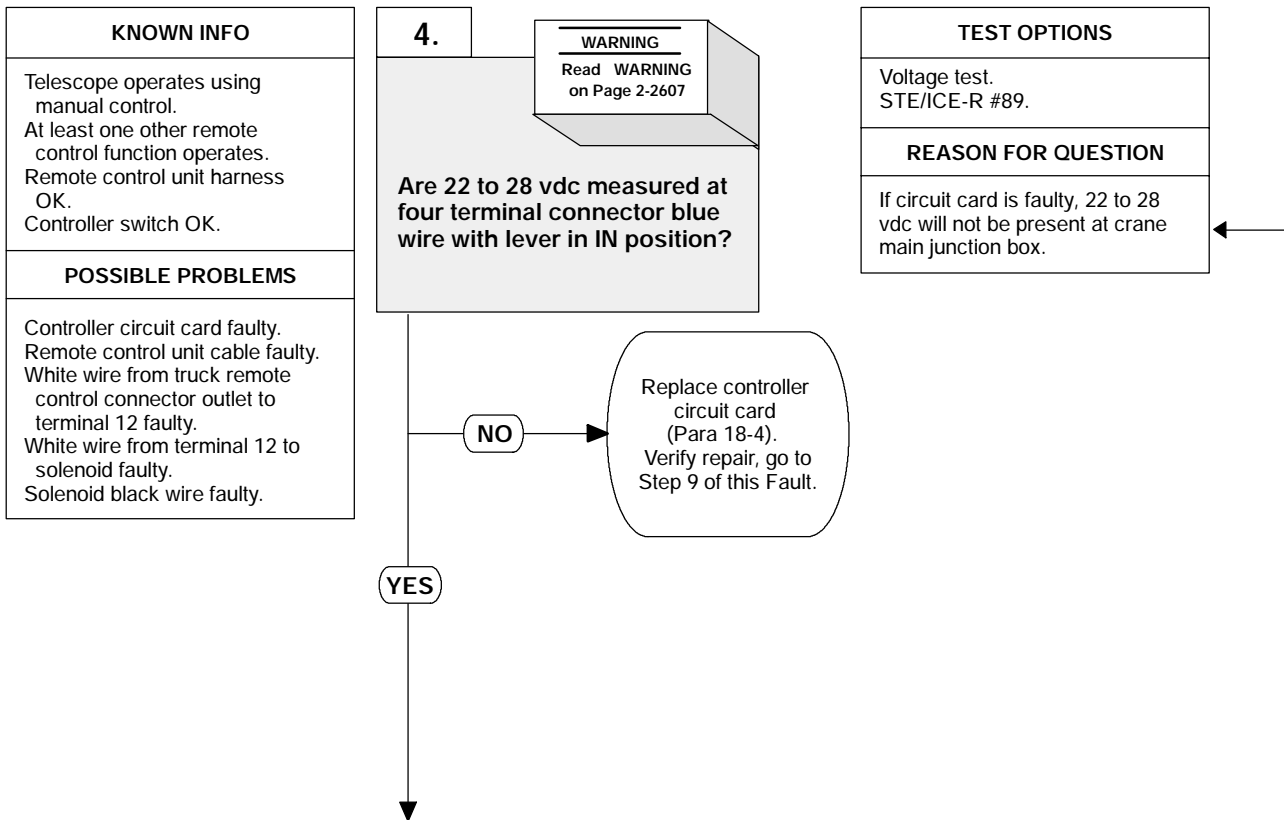
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector from one of the two switches.
- (2) Is there continuity between switch NC terminal and switch COM terminal?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (3) below.
- (3) Is there continuity between switch COM terminal and switch NO terminal?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (4) below.
- (4) Is there continuity between switch NC terminal and switch COM terminal with controller lever held in OUT position?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (5) below.
- (5) Is there continuity between switch COM terminal and switch NO terminal with controller lever held in OUT position?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (6) below.
- (6) Repeat Steps (1) thru (5) for other switch.
- (7) Install both connectors on switches.



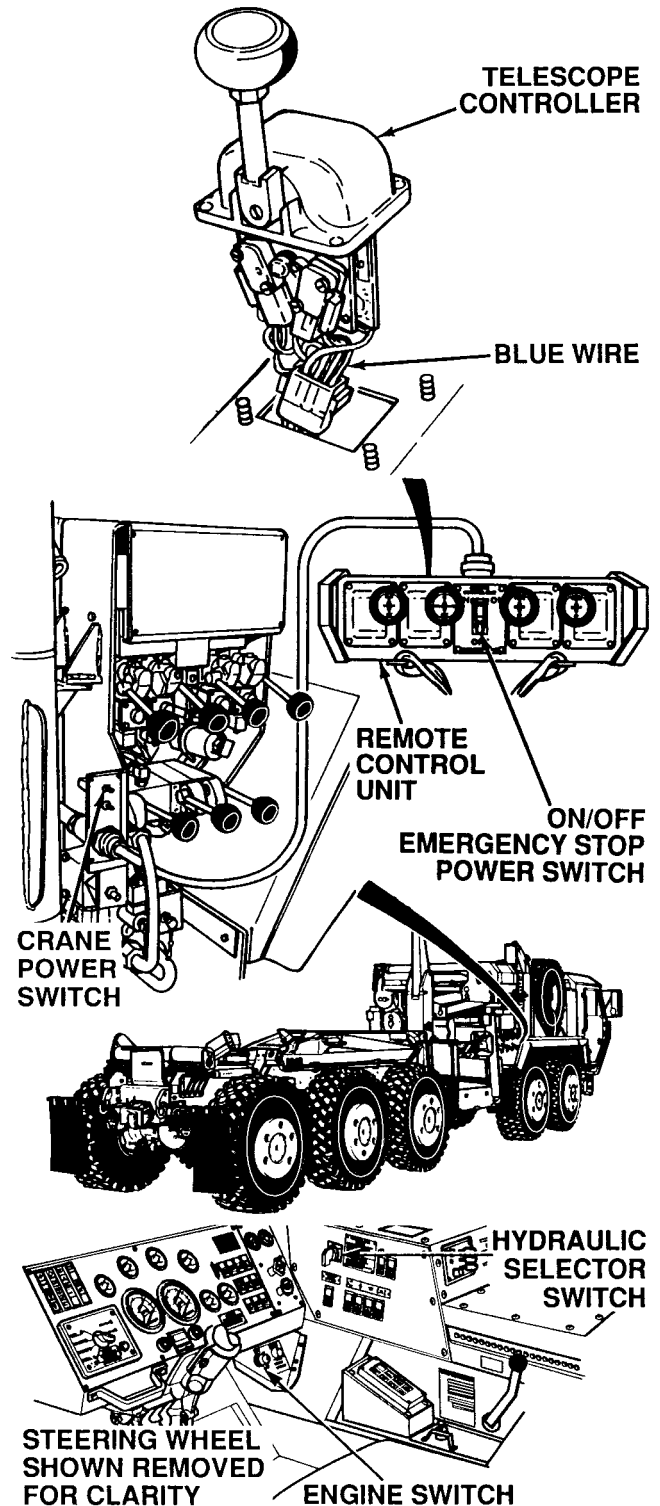
6. BOOM WILL NOT TELESCOPE IN USING REMOTE CONTROL UNIT (CONT).



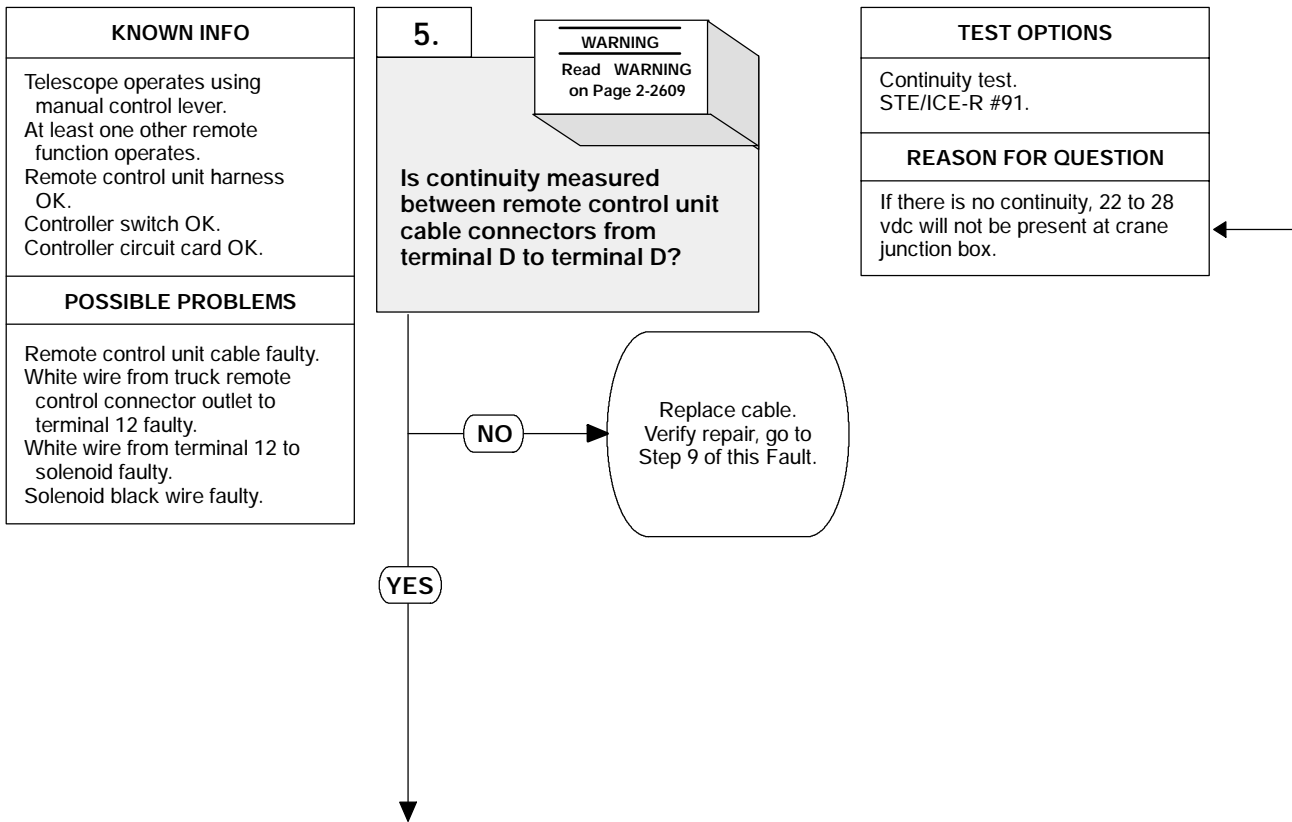
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST | |
|--------------|---|
| (1) | Connect remote control unit to remote control unit cable. |
| (2) | Connect controller four terminal connector to remote control unit harness four terminal connector. |
| (3) | Set multimeter select switch to volts dc. |
| (4) | Connect positive (+) multimeter lead to blue wire terminal in four terminal connector. |
| (5) | Connect negative (-) multimeter lead to a known good ground. |
| (6) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (7) | Set hydraulic selector switch to CRANE/SRW position. |
| (8) | Set crane POWER switch to ON position. |
| (9) | Set remote control ON/OFF EMERGENCY STOP power switch to ON position. |
| (10) | Hold TELESCOPE controller in the IN position. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Step (11) below and replace circuit card (Para 18-4). (b) If 22 to 28 vdc are present, perform Steps (11) and (12) below. |
| (11) | Set the following switches to the OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch. |
| (12) | Assemble remote control unit (Para 18-4). |



6. BOOM WILL NOT TELESCOPE IN USING REMOTE CONTROL UNIT (CONT).

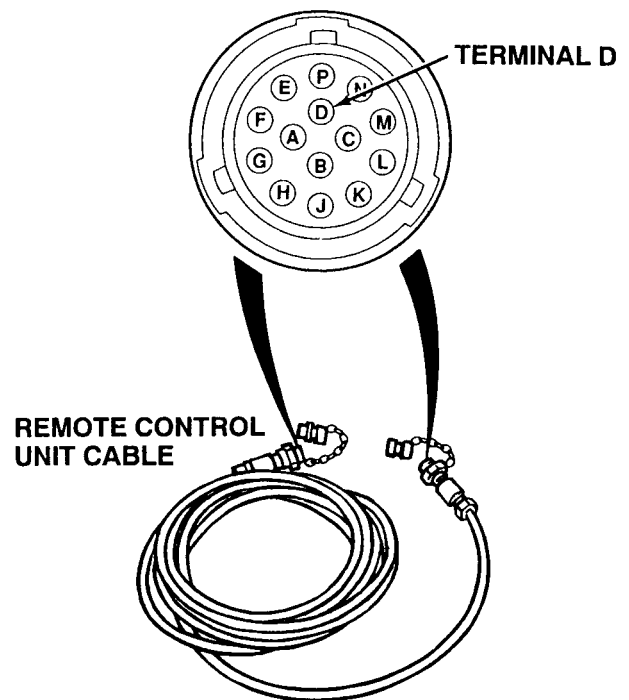


WARNING

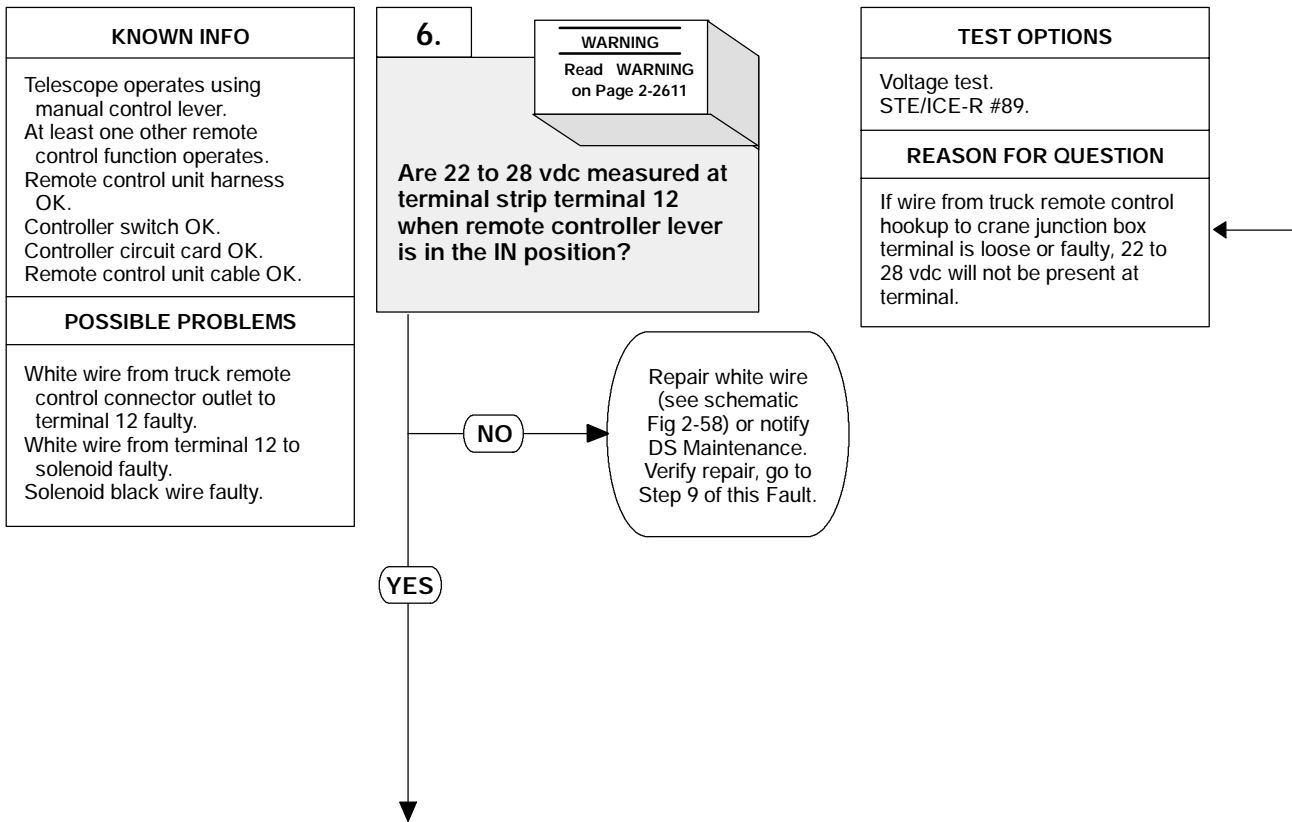
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect remote control unit cable from truck and remote control unit.
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between cable connector terminal D at both ends?
 - (a) If there is no continuity, replace cable.
 - (b) If there is continuity, connect cable to truck hookup and remote control unit hookup and go to Step 6 of this Fault.



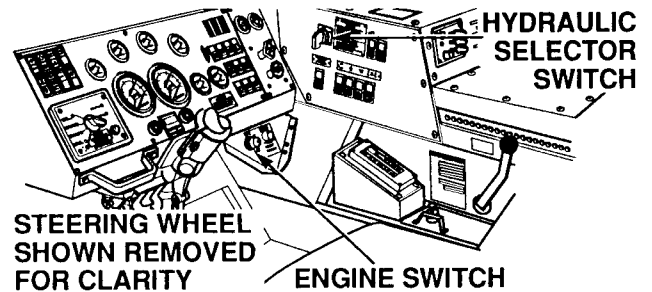
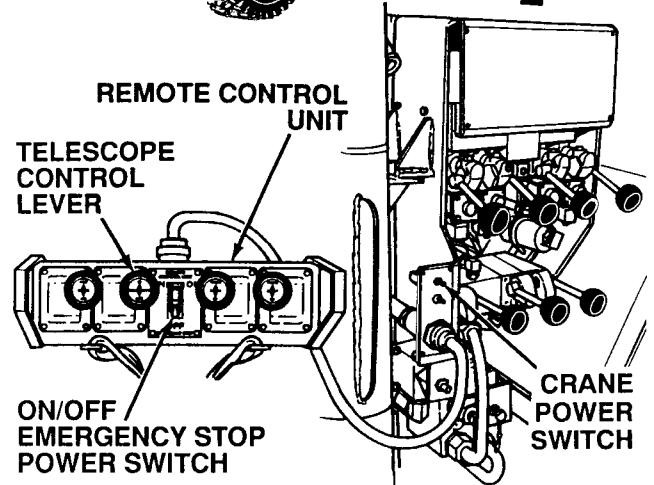
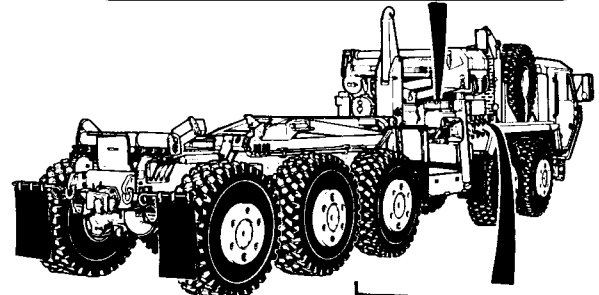
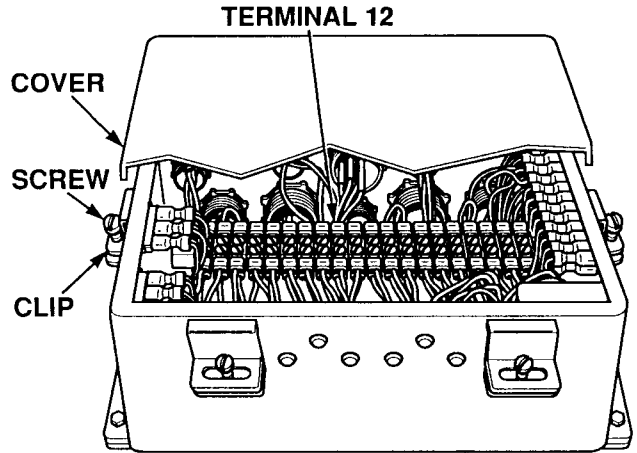
6. BOOM WILL NOT TELESCOPE IN USING REMOTE CONTROL UNIT (CONT).



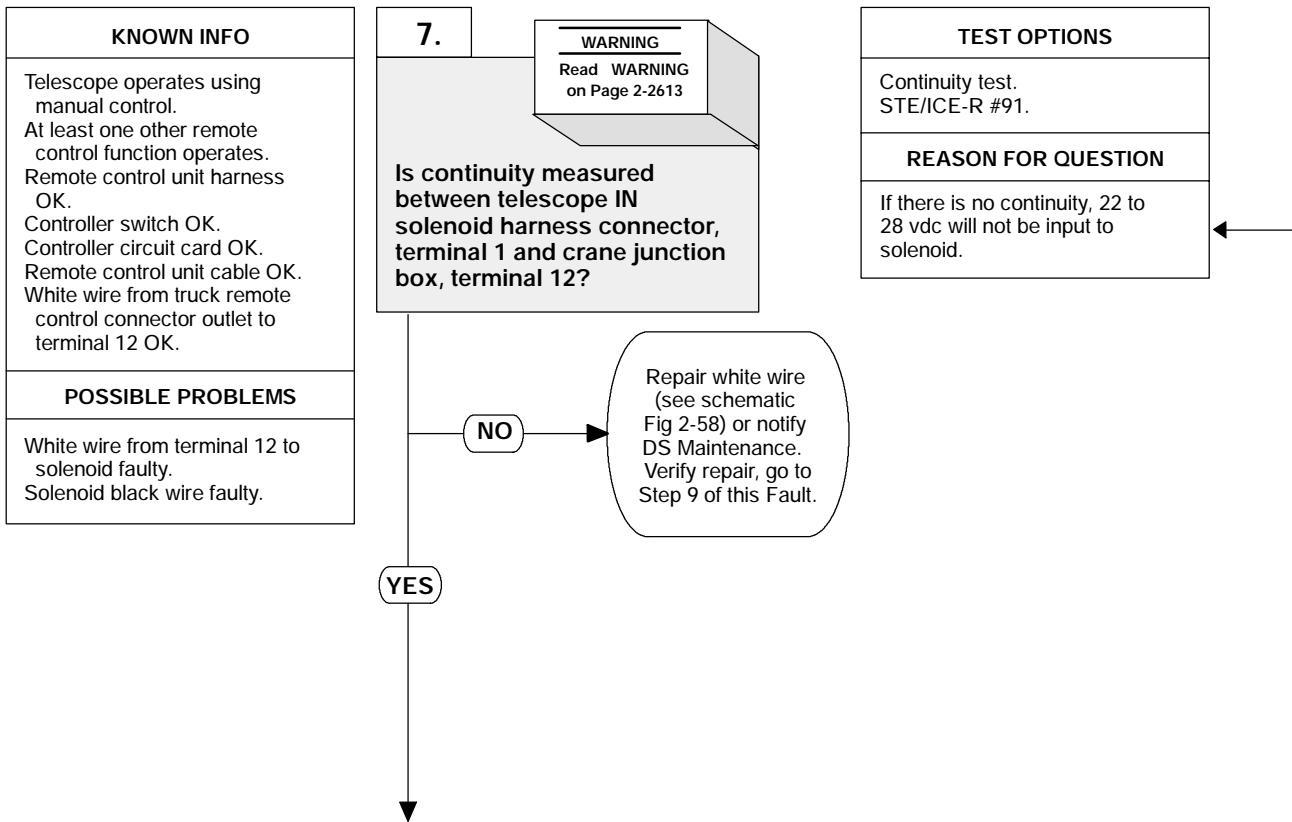
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Loosen six screws, clips and remove crane junction box cover.
 - (2) Set multimeter select switch to volts.
 - (3) Connect positive (+) multimeter lead to crane junction box, terminal 12.
 - (4) Connect negative (-) multimeter lead to a known good ground.
 - (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (6) Set hydraulic selector switch to SRW/CRANE position.
 - (7) Set crane POWER switch to ON position.
 - (8) Set remote control ON/OFF EMERGENCY STOP power switch to ON.
 - (9) Put remote control unit TELESCOPE control lever in the IN position.
 - (a) If 22 to 28 vdc are not present, perform Step (10) below and repair white wire from truck remote control hookup to terminal 12 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Step (10) below and go to Step 7 of this Fault.
 - (10) Put the following switches in OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch.



6. BOOM WILL NOT TELESCOPE IN USING REMOTE CONTROL UNIT (CONT).

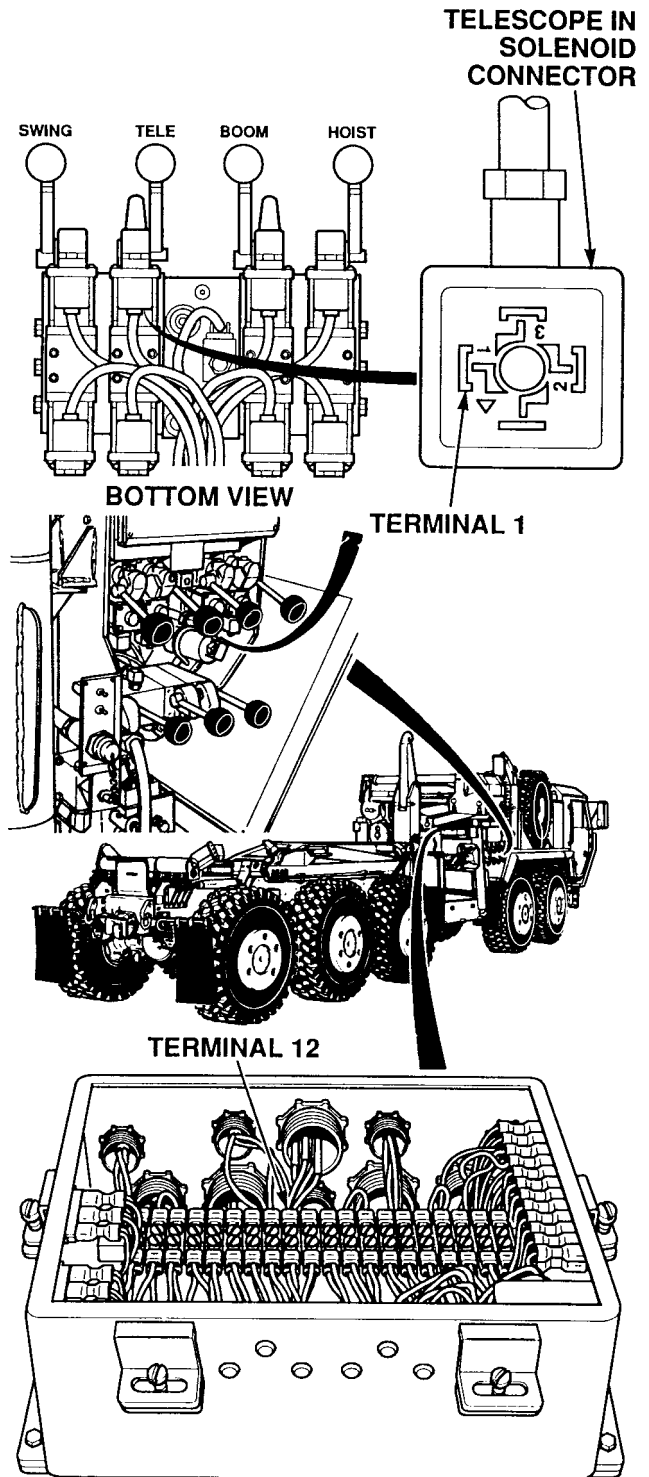


WARNING

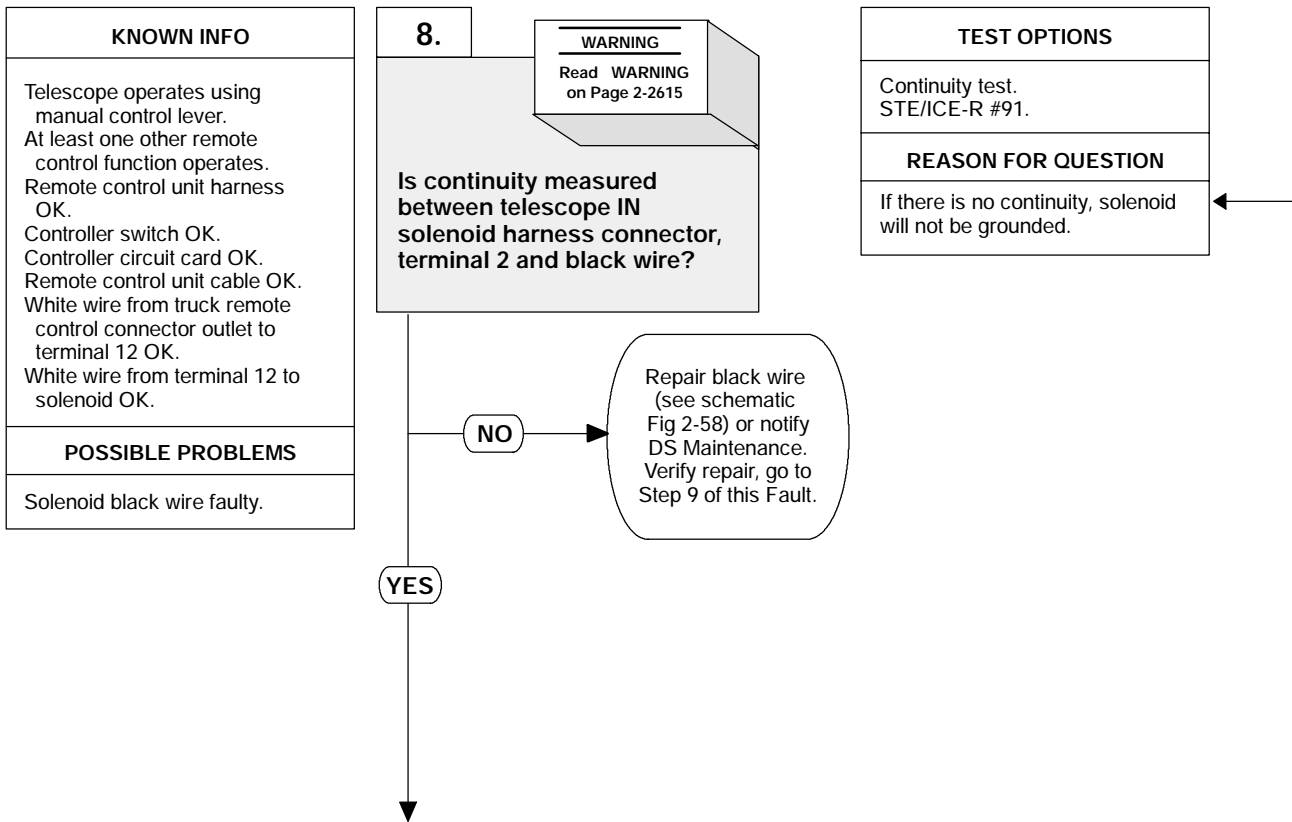
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between connector terminal 1 and crane main junction box, terminal 12?
 - (a) If there is no continuity, repair connector white wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, white wire is OK.



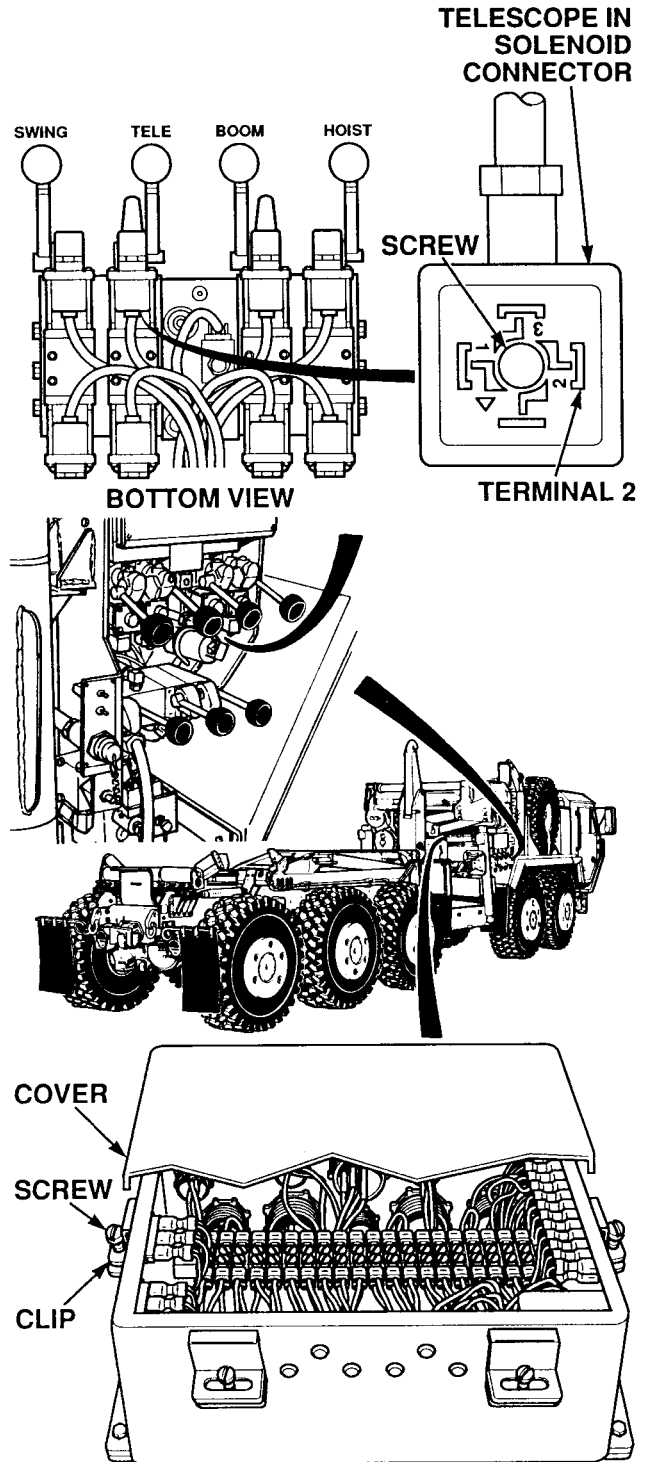
6. BOOM WILL NOT TELESCOPE IN USING REMOTE CONTROL UNIT (CONT).



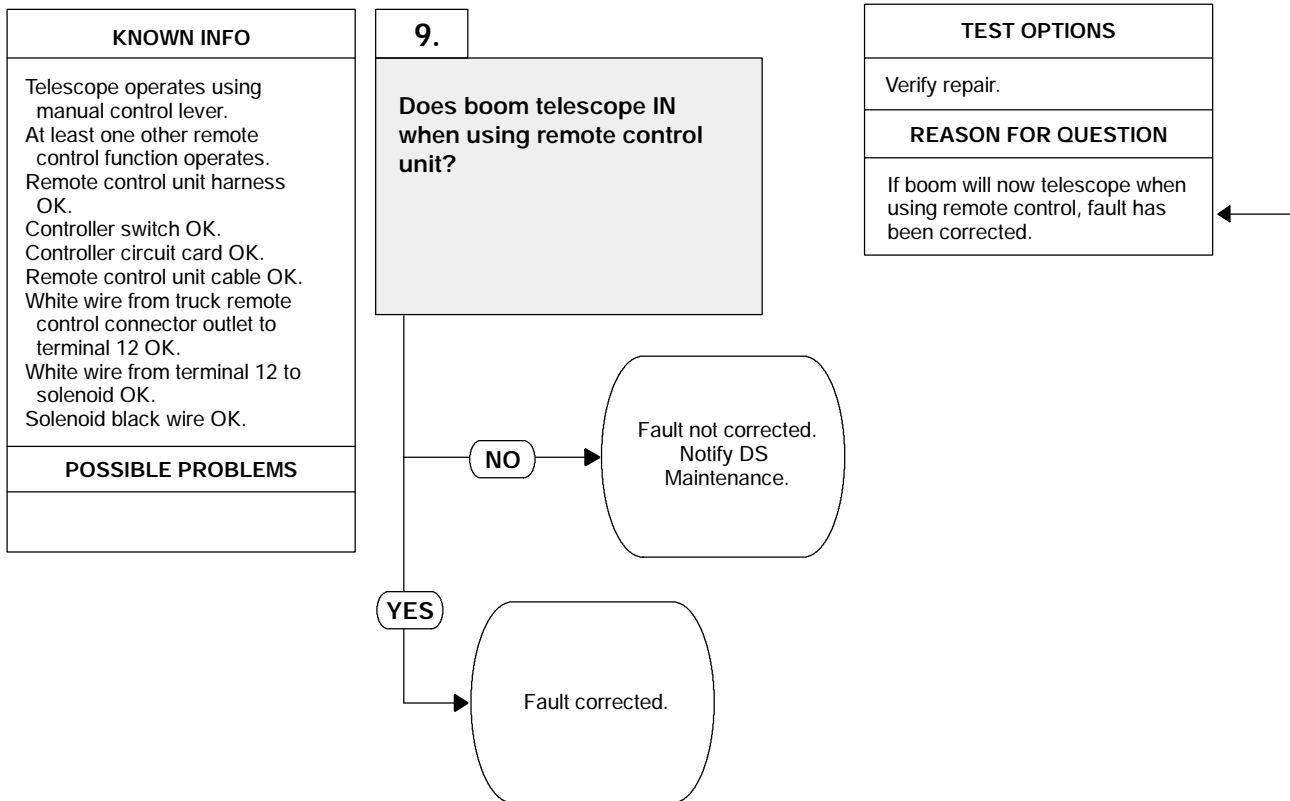
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Is there continuity between connector, terminal 2 and a known good ground?
 - (a) If there is no continuity, repair black wire (see schematic Fig 2-58) or notify DS Maintenance and perform Steps (2) and (3) below.
 - (b) If there is continuity, perform Steps (2) and (3) below and go to Step 9 of this Fault.
 - (2) Install connector on telescope IN solenoid and tighten screw.
 - (3) Install crane junction box cover with six clips and screws.



6. BOOM WILL NOT TELESCOPE IN USING REMOTE CONTROL UNIT (CONT).



VERIFY REPAIR

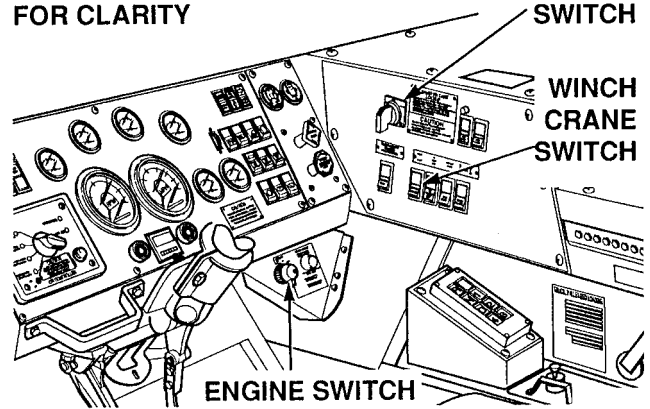
- (1) Connect remote control unit cable to truck hookup and remote control unit hookup (TM 9-2320-364-10).
- (2) Operate crane using remote control unit.
 - (a) If boom will not telescope IN using remote control unit, fault not corrected. Notify DS Maintenance.
 - (b) If boom will telescope IN, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

7. BOOM WILL NOT TELESCOPE OUT USING REMOTE CONTROL UNIT.

INITIAL SETUP

Tools and Special Tools

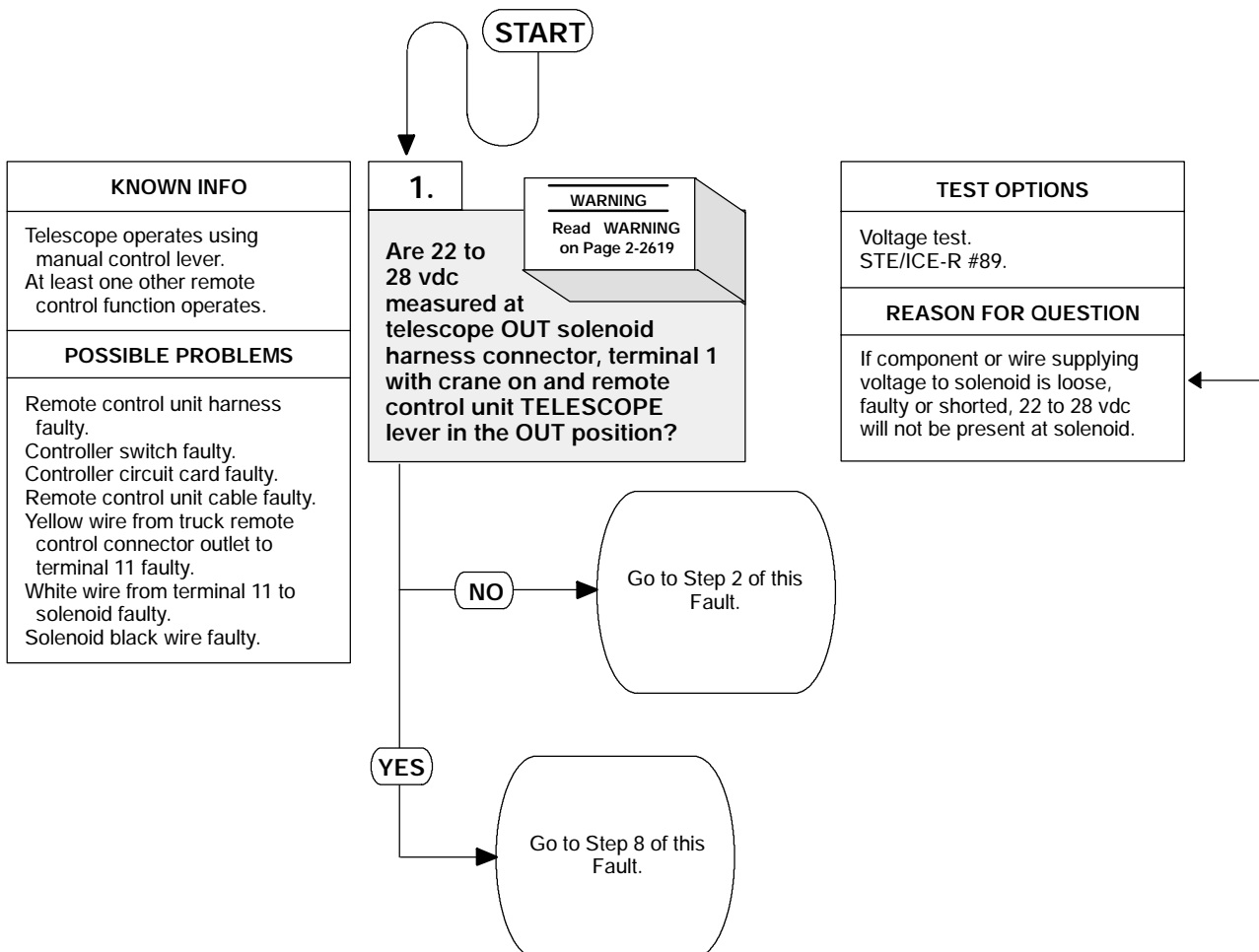
Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Remote control unit connected, (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)



WARNING

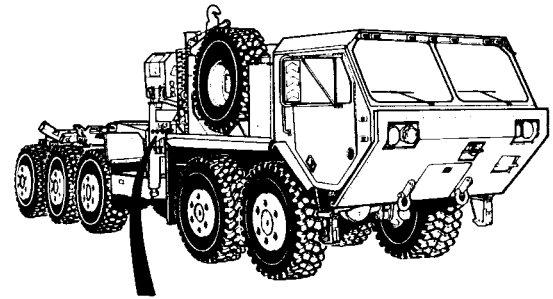
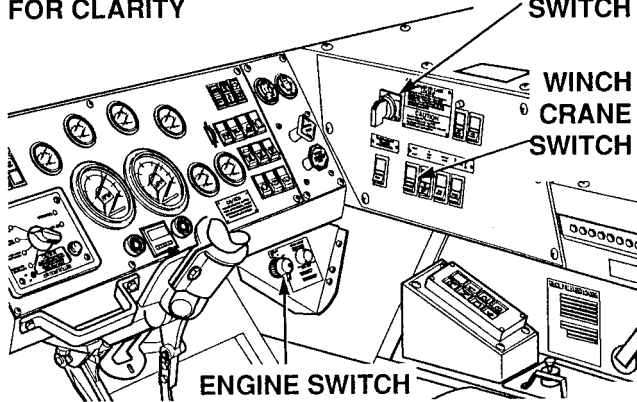
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

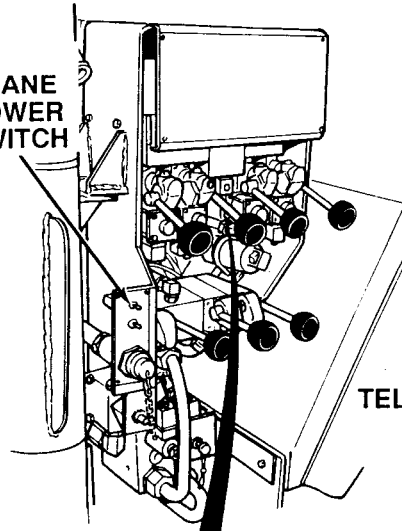
**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

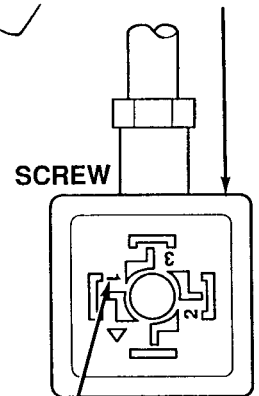
ENGINE SWITCH



**CRANE
POWER
SWITCH**

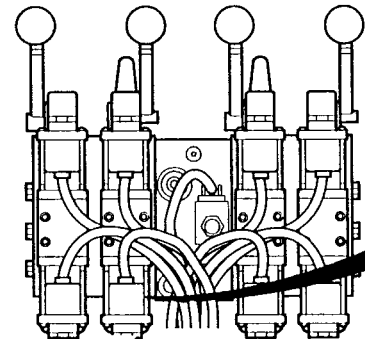


**TELESCOPE OUT
SOLENOID
CONNECTOR**



TERMINAL 1

SWING TELE BOOM HOIST

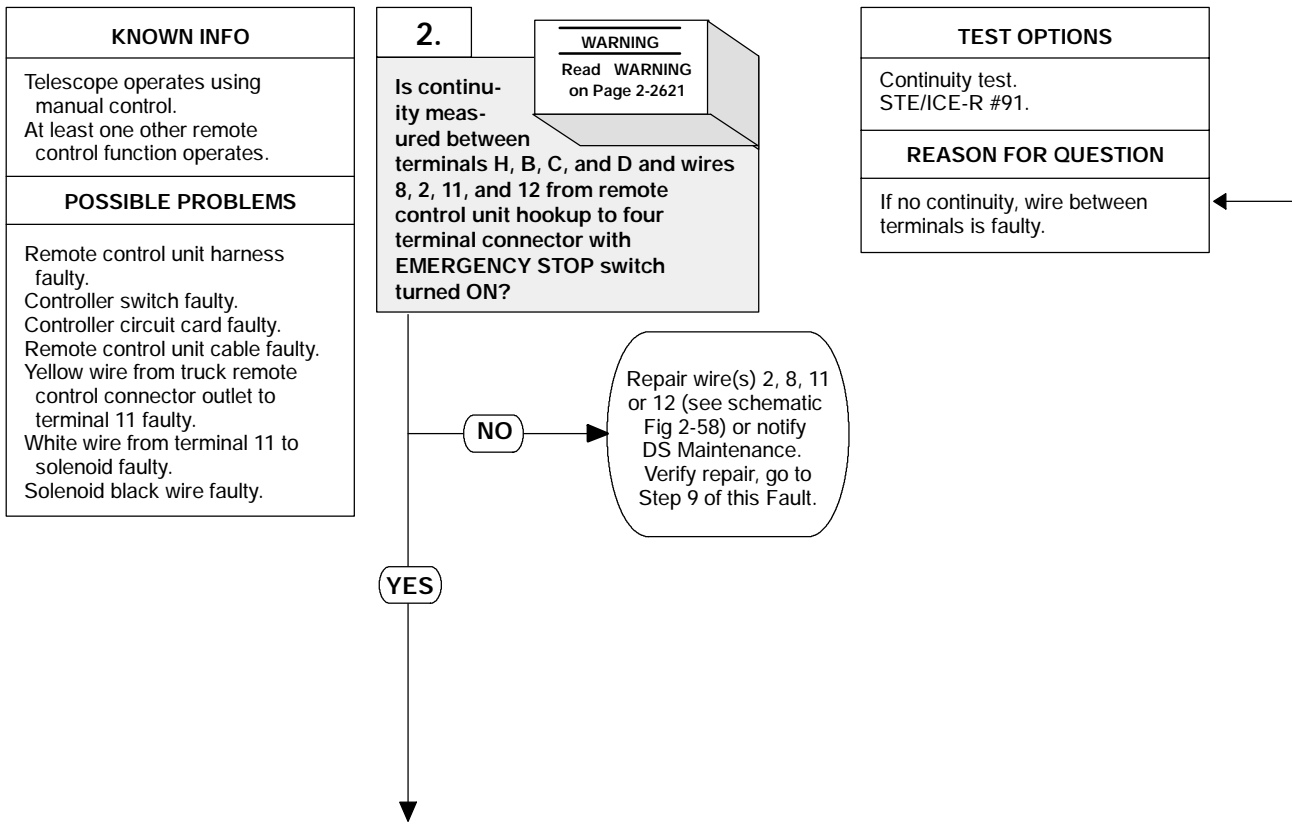


BOTTOM VIEW

VOLTAGE TEST

- (1) Loosen screw and remove connector from telescope OUT solenoid.
- (2) Set multimeter select switch to volts.
- (3) Connect positive (+) multimeter lead to harness connector, terminal 1.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
- (6) Set WINCH/CRANE switch to CRANE position.
- (7) Set hydraulic selector switch to CRANE/SRW position.
- (8) Set crane POWER switch to ON position.
- (9) Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
- (10) Hold remote control unit TELESCOPE controller in the OUT position.
 - (a) If 22 to 28 vdc are not present, perform Step (11) below and go to Step 2 of this Fault.
 - (b) If 22 to 28 vdc are present, perform Step (11) below and go to Step 8 of this Fault.
- (11) Set the following switches in OFF position: REMOTE CONTROL UNIT ON/OFF EMERGENCY STOP switch, crane POWER switch, hydraulic selector switch and ENGINE switch.

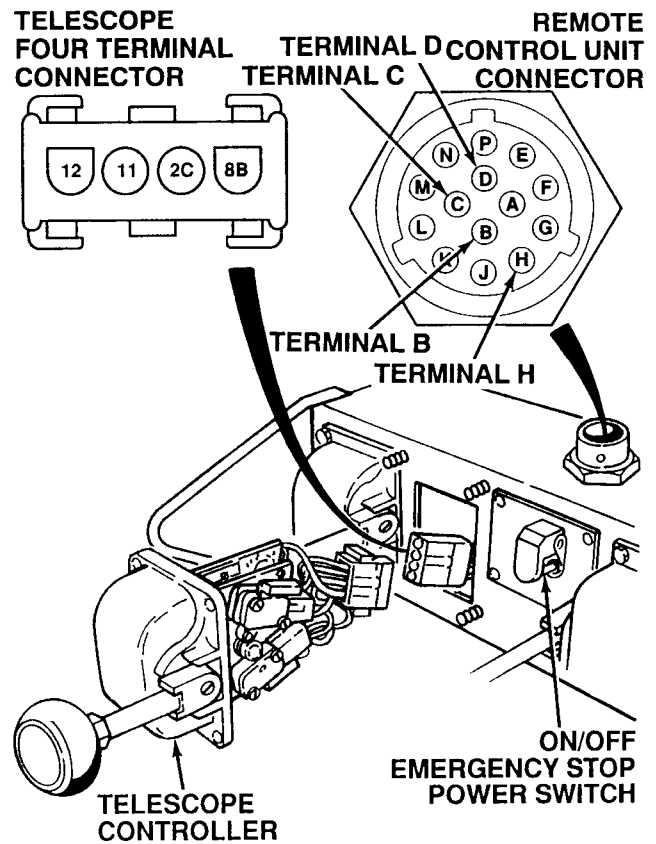
7. BOOM WILL NOT TELESCOPE OUT USING REMOTE CONTROL UNIT (CONT).



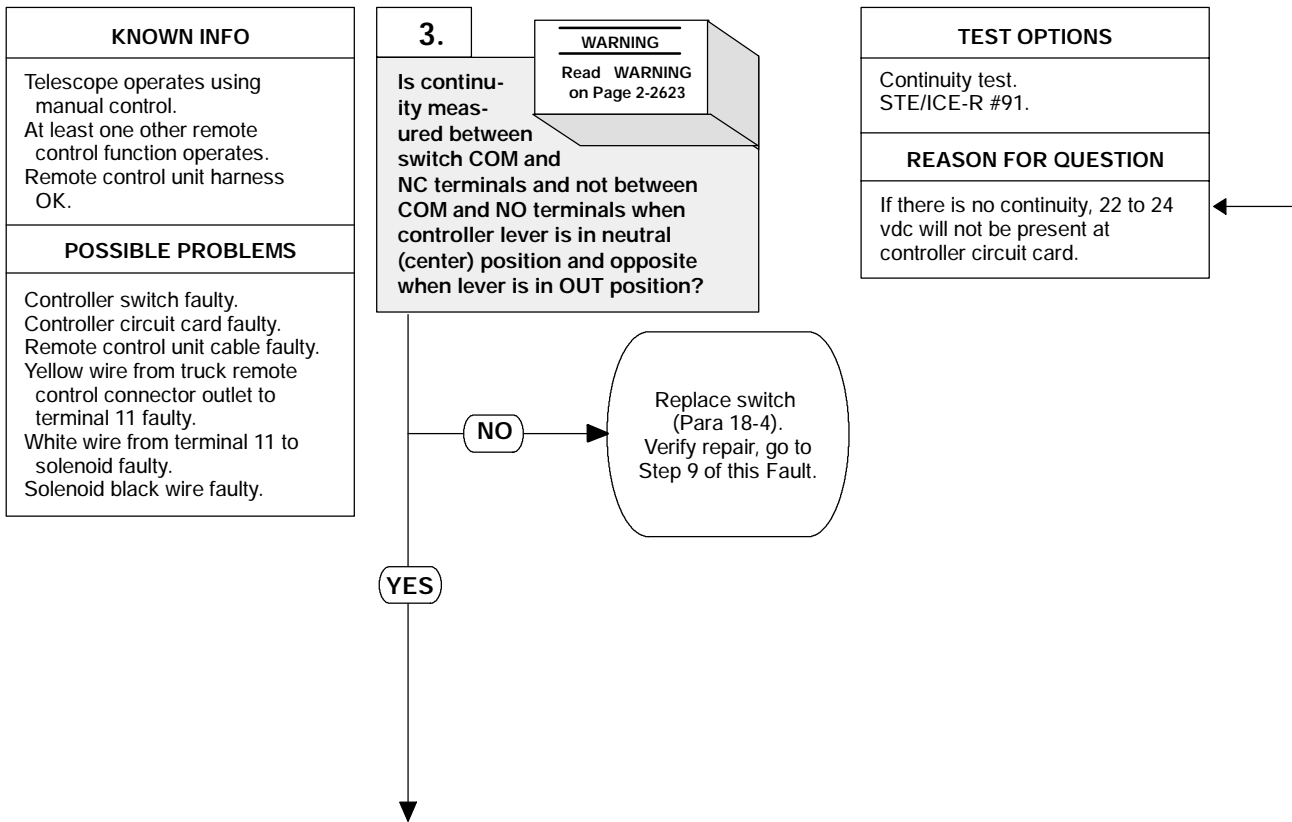
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
<p>(1) Disconnect cable from remote control unit (TM 9-2320-364-10).</p> <p>(2) Remove TELESCOPE controller from remote control unit (Para 18-4).</p> <p>(3) Set multimeter select switch to ohms.</p> <p>(4) Turn ON remote control unit ON/OFF EMERGENCY STOP switch.</p> <p>(5) Is there continuity between remote control unit hookup, terminal H and four terminal connector, terminal 8B?</p> <p style="padding-left: 20px;">(a) If there is no continuity, repair wire 8 between switch and four terminal connector (see schematic Fig 2-58) or notify DS Maintenance.</p> <p style="padding-left: 20px;">(b) If there is continuity, go to Step (6) below.</p> <p>(6) Is there continuity between remote control unit hookup, terminal B and four terminal connector, terminal 2C?</p> <p style="padding-left: 20px;">(a) If there is no continuity, repair wire 2 (see schematic Fig 2-58) or notify DS Maintenance.</p> <p style="padding-left: 20px;">(b) If there is continuity, go to Step (7) below.</p> <p>(7) Is there continuity between remote control unit hookup, terminal C and four terminal connector, terminal 11?</p> <p style="padding-left: 20px;">(a) If there is no continuity, repair wire 11 (see schematic Fig 2-58) or notify DS Maintenance.</p> <p style="padding-left: 20px;">(b) If there is continuity, go to Step (8) below.</p> <p>(8) Is there continuity between remote control unit hookup, terminal D and four terminal connector, terminal 12?</p> <p style="padding-left: 20px;">(a) If there is no continuity, repair wire 12 (see schematic Fig 2-58) or notify DS Maintenance.</p> <p style="padding-left: 20px;">(b) If there is continuity, go to Step 3 of this Fault.</p>



7. BOOM WILL NOT TELESCOPE OUT USING REMOTE CONTROL UNIT (CONT).

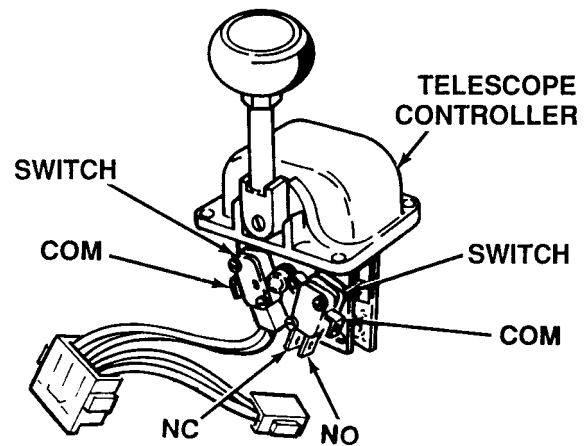


WARNING

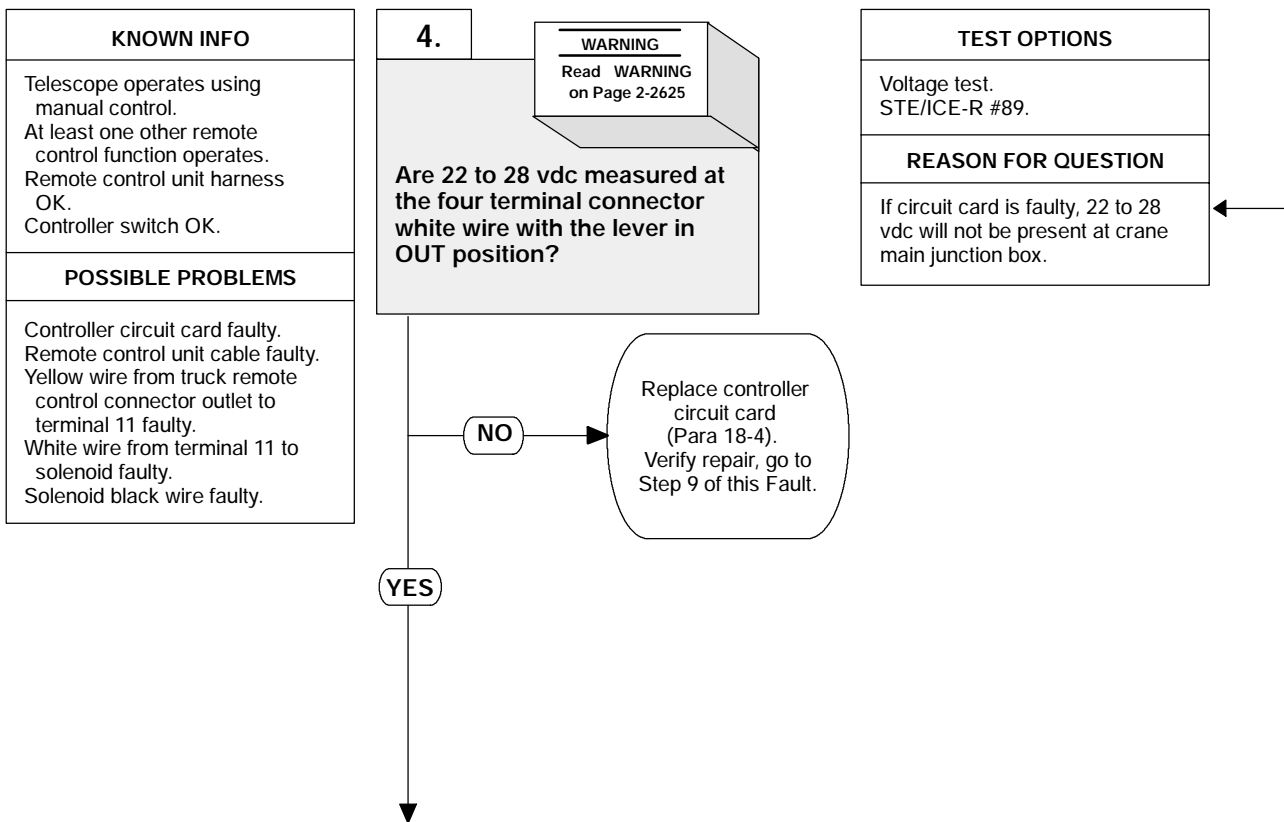
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector from one of the two switches.
- (2) Is there continuity between switch NC terminal and switch COM terminal?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (3) below.
- (3) Is there continuity between switch COM terminal and switch NO terminal?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (4) below.
- (4) Is there continuity between switch NC terminal and switch COM terminal with controller lever held in OUT position?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (5) below.
- (5) Is there continuity between switch COM terminal and switch NO terminal with controller lever held in OUT position?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (6) below.
- (6) Repeat Steps (1) thru (5) for other switch.
- (7) Install both connectors on switches.



7. BOOM WILL NOT TELESCOPE OUT USING REMOTE CONTROL UNIT (CONT).

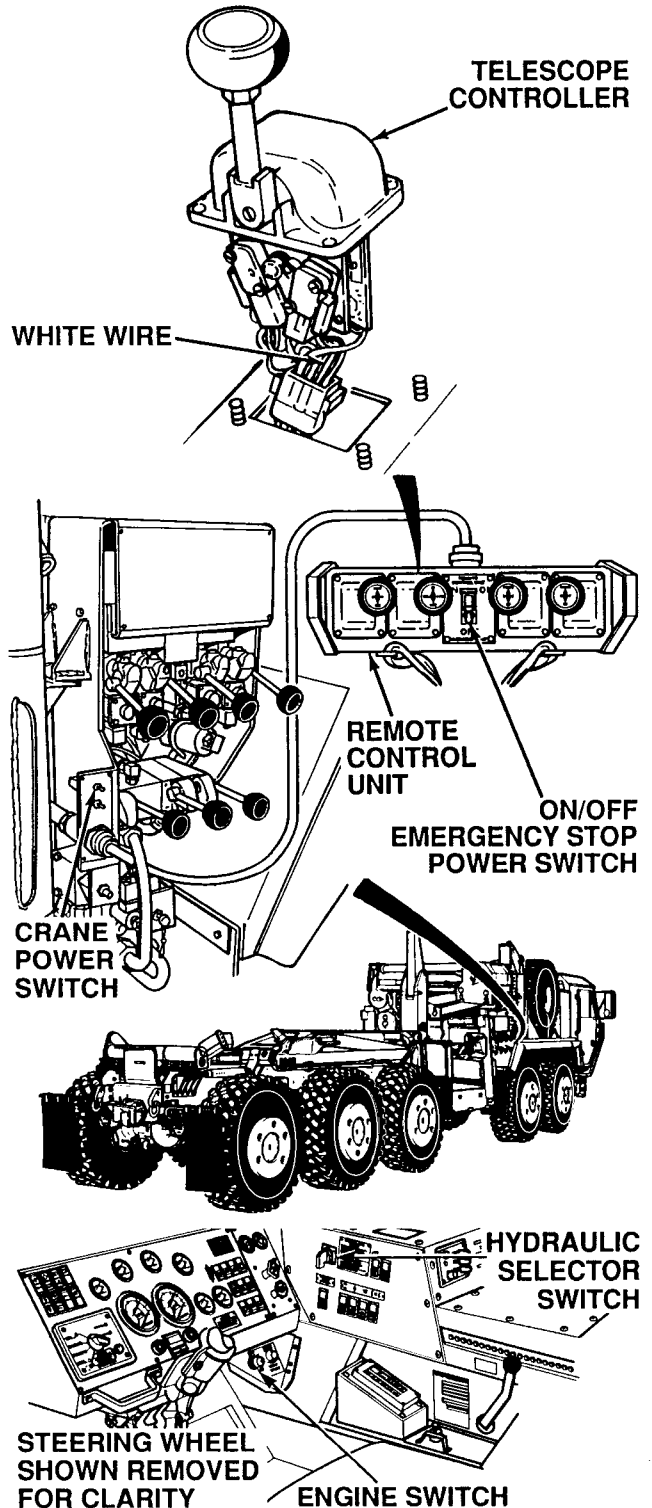


WARNING

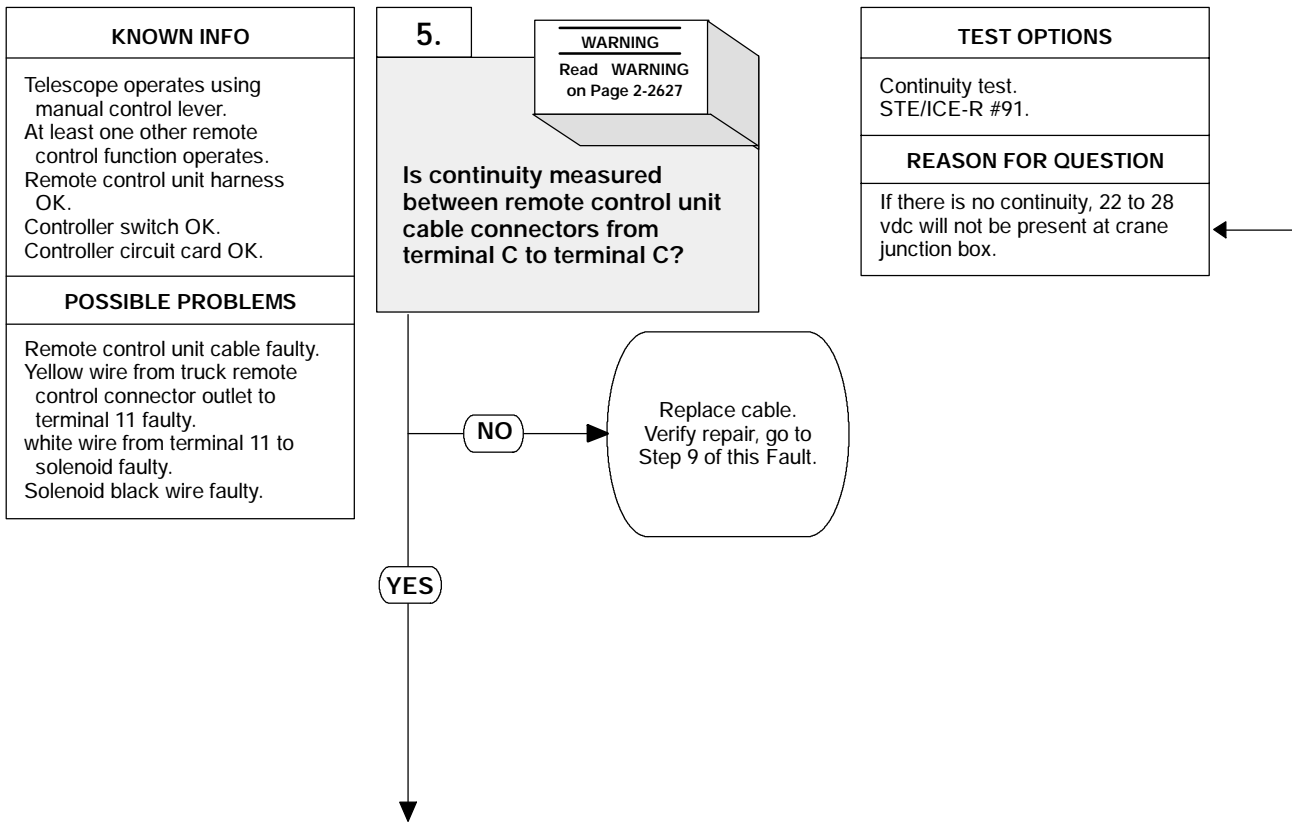
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Connect remote control unit to remote control unit cable.
- (2) Connect controller four terminal connector to remote control unit harness four terminal connector.
- (3) Set multimeter select switch to volts dc.
- (4) Connect positive (+) multimeter lead to white wire terminal in four terminal connector.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch (TM 9-2320-364-10).
- (7) Set hydraulic selector switch to CRANE/SRW position.
- (8) Set crane POWER switch to ON position.
- (9) Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
- (10) Hold TELESCOPE controller in the OUT position.
 - (a) If 22 to 28 vdc are not present, perform Step (11) below and replace circuit card (Para 18-4).
 - (b) If 22 to 28 vdc are present, perform Steps (11) and (12) below.
- (11) Set the following switches to the OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch.
- (12) Assemble remote control unit (Para 18-4).



7. BOOM WILL NOT TELESCOPE OUT USING REMOTE CONTROL UNIT (CONT).

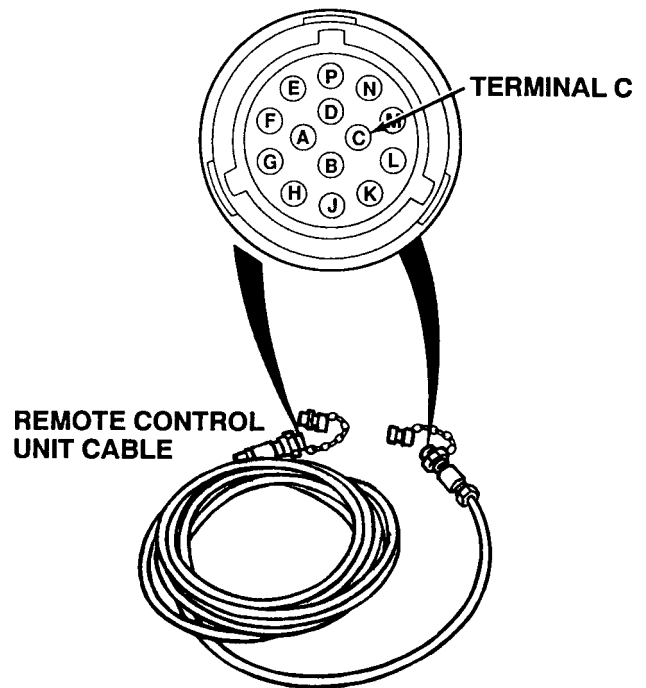


WARNING

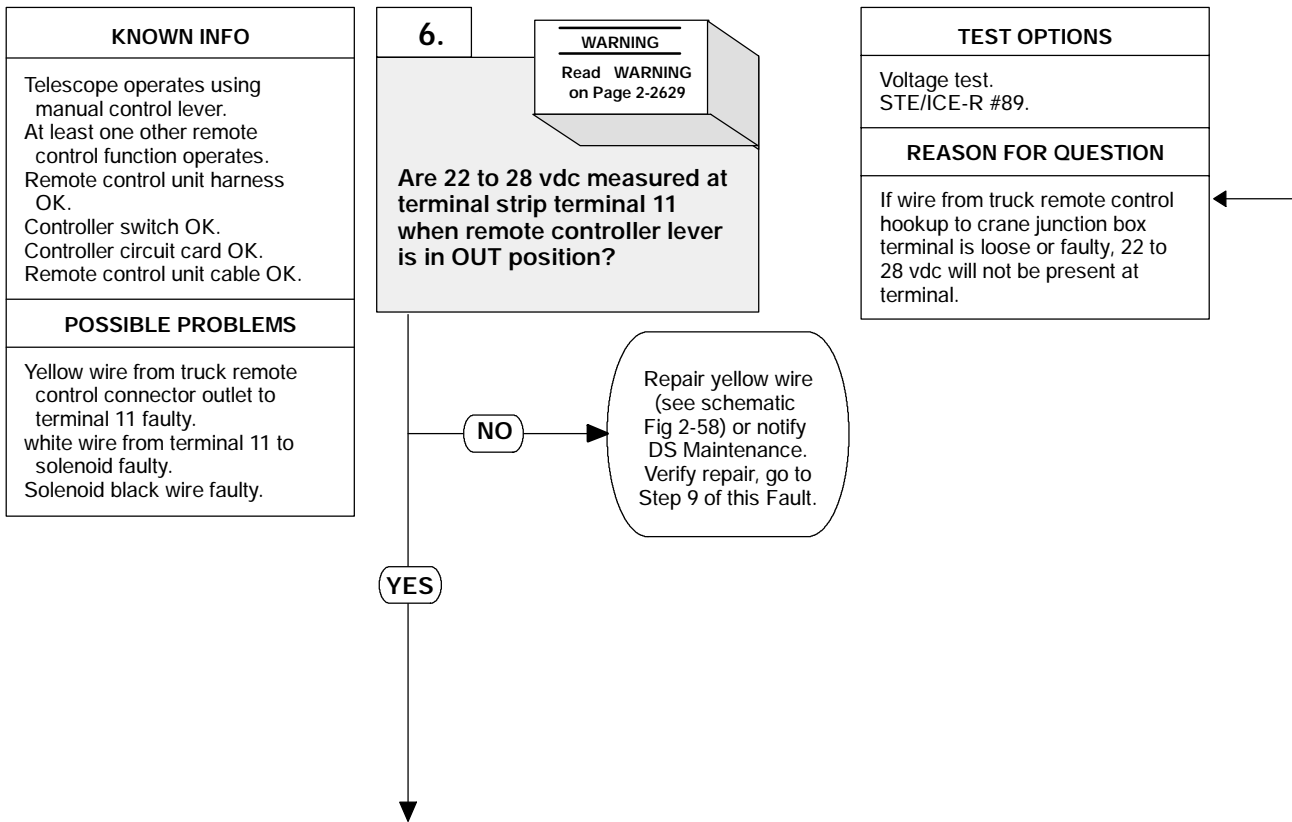
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect remote control unit cable from truck and remote control unit (TM 9-2320-364-10).
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between cable connector terminal C at both ends?
 - (a) If there is no continuity, replace cable.
 - (b) If there is continuity, connect cable to truck hookup and remote control unit hookup and go to Step 6 of this Fault.



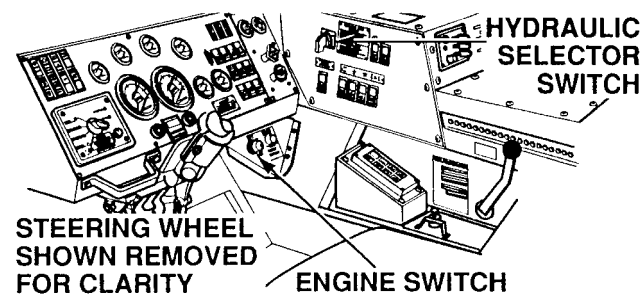
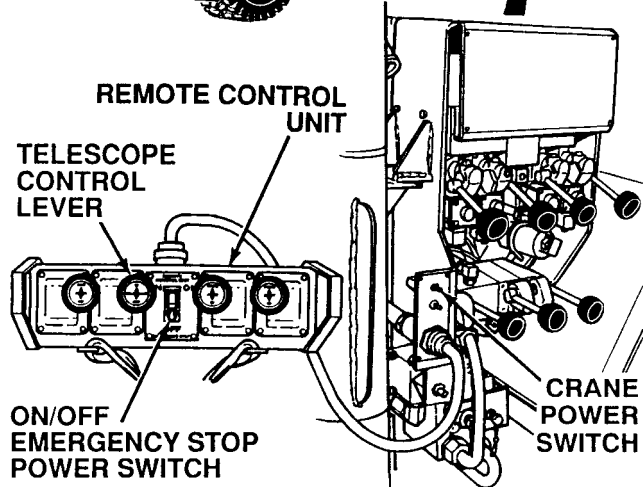
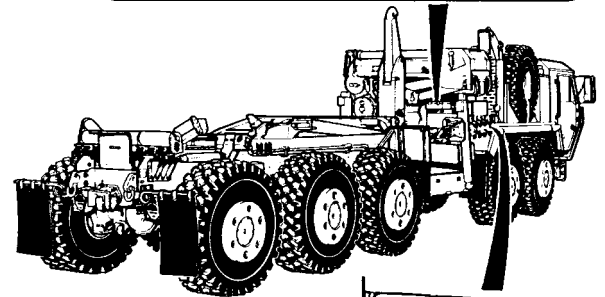
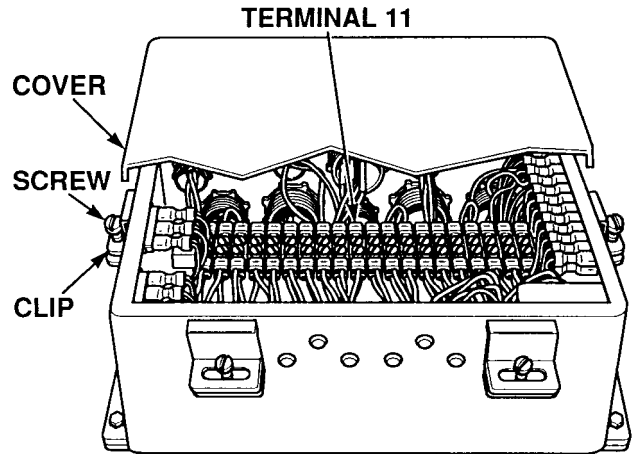
7. BOOM WILL NOT TELESCOPE OUT USING REMOTE CONTROL UNIT (CONT).



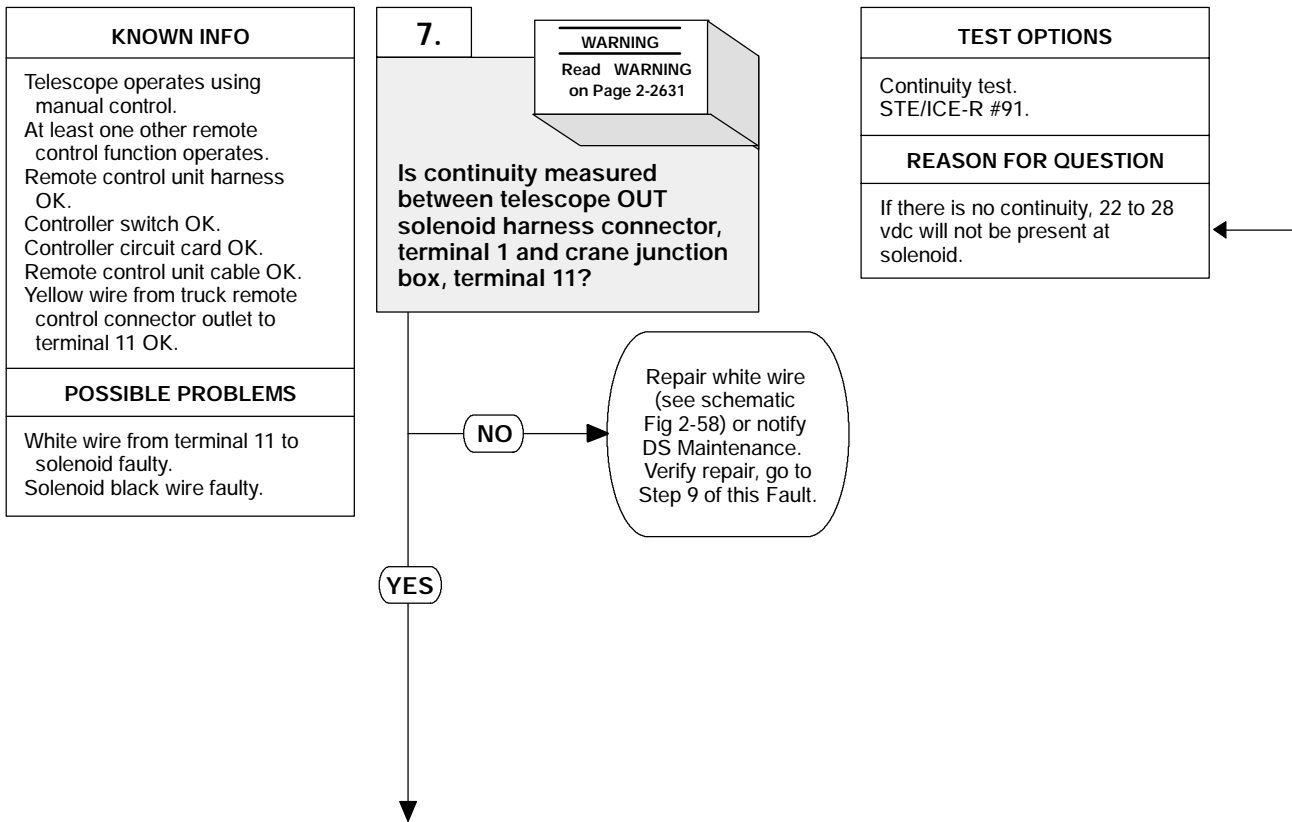
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Loosen six screws, clips and remove crane junction box cover.
 - (2) Set multimeter select switch to volts.
 - (3) Connect positive (+) multimeter lead to crane junction box, terminal 11.
 - (4) Connect negative (-) multimeter lead to a known good ground.
 - (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (6) Set hydraulic selector switch to CRANE/SRW position.
 - (7) Set crane main switch to ON position.
 - (8) Set remote control ON/OFF EMERGENCY STOP power switch to ON.
 - (9) Put remote control unit TELESCOPE control lever in the OUT position.
 - (a) If 22 to 28 vdc are not present, perform Step (10) below and repair yellow wire from truck remote control hookup to terminal 11 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Step (10) below and go to Step 7 of this Fault.
 - (10) Put the following switches in OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch.



7. BOOM WILL NOT TELESCOPE OUT USING REMOTE CONTROL UNIT (CONT).

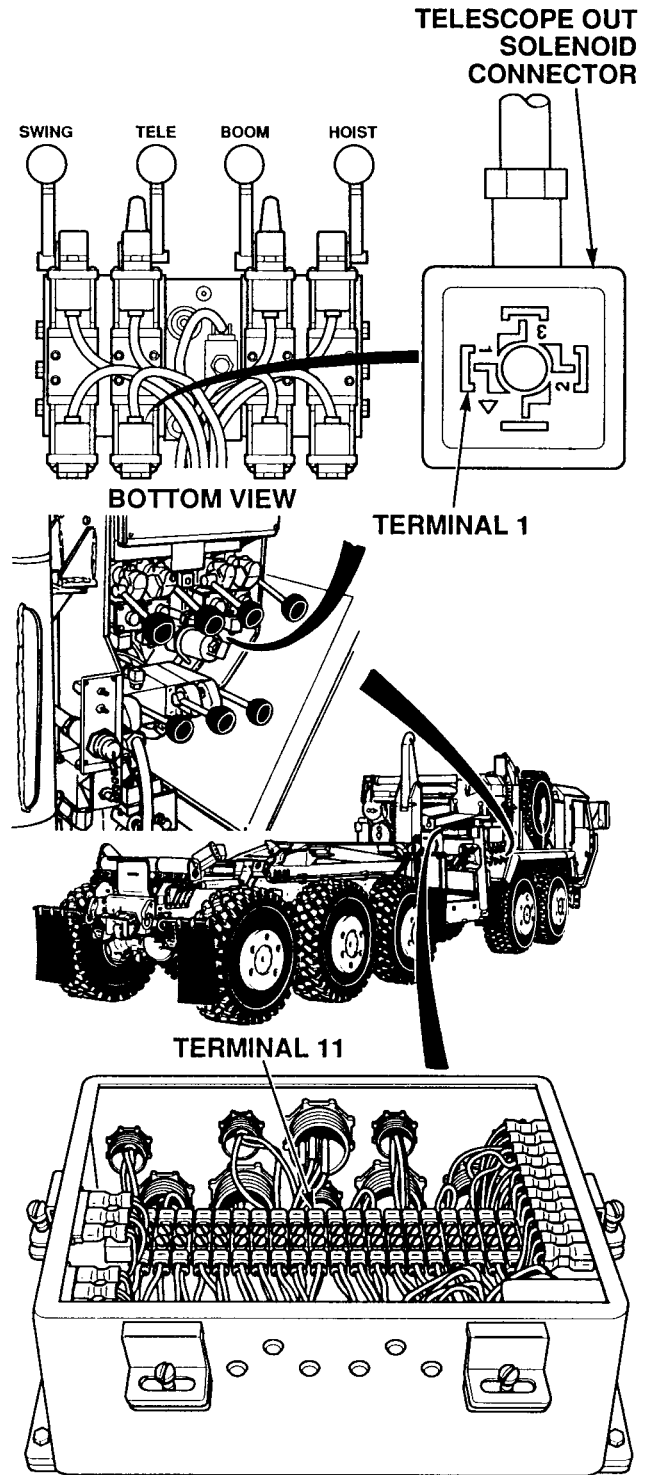


WARNING

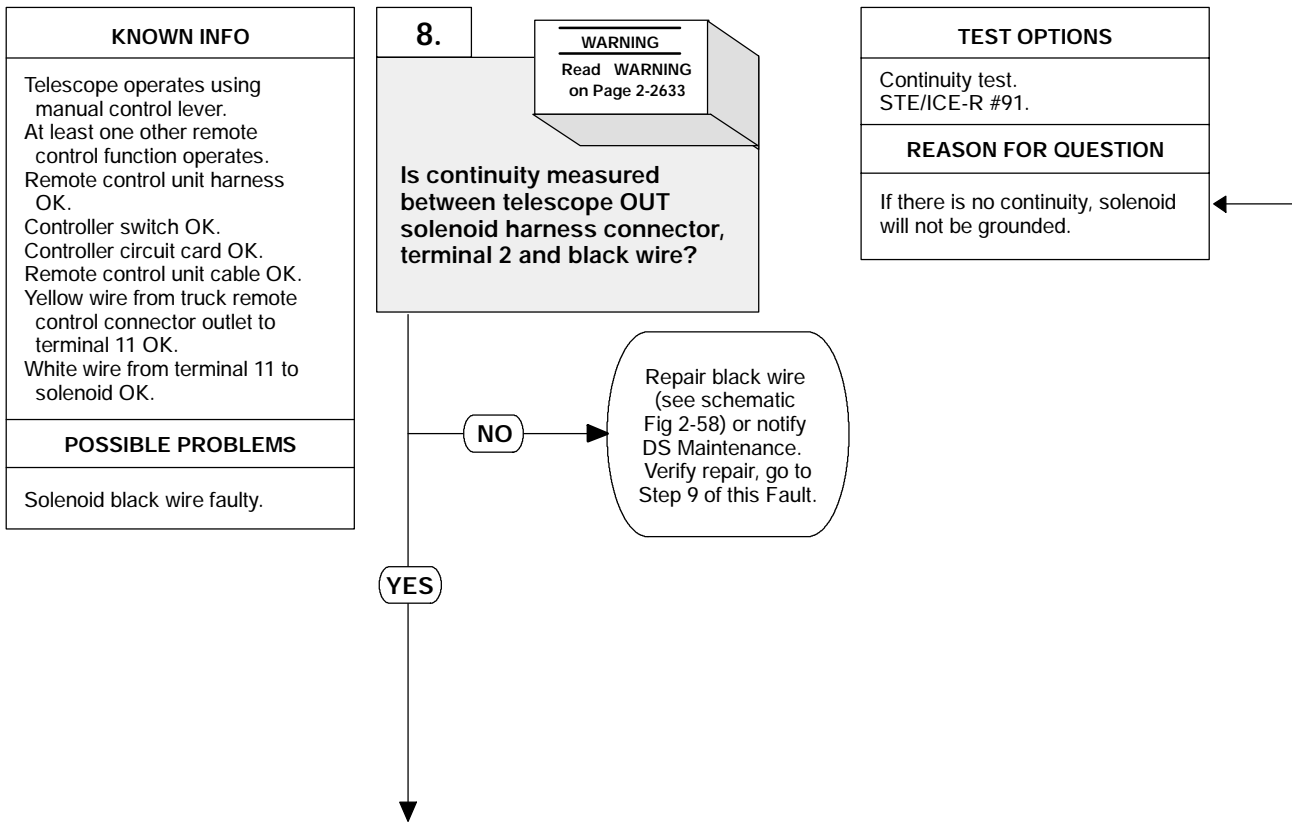
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

(1) Set multimeter select switch to ohms.
 (2) Is there continuity between connector, terminal 1 and crane main junction box, terminal 11?
 (a) If there is no continuity, repair connector white wire (see schematic Fig 2-58) or notify DS Maintenance.
 (b) If there is continuity, white wire is OK.



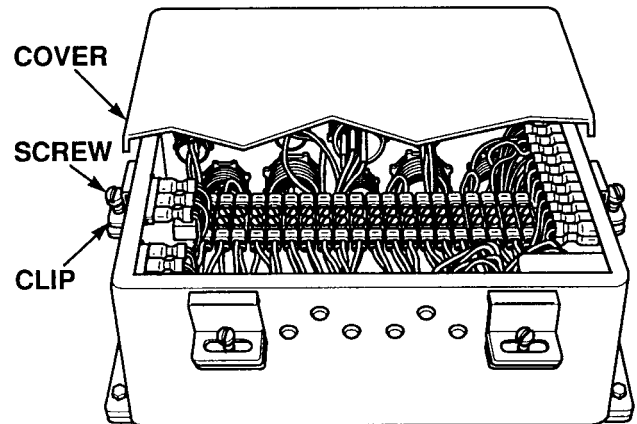
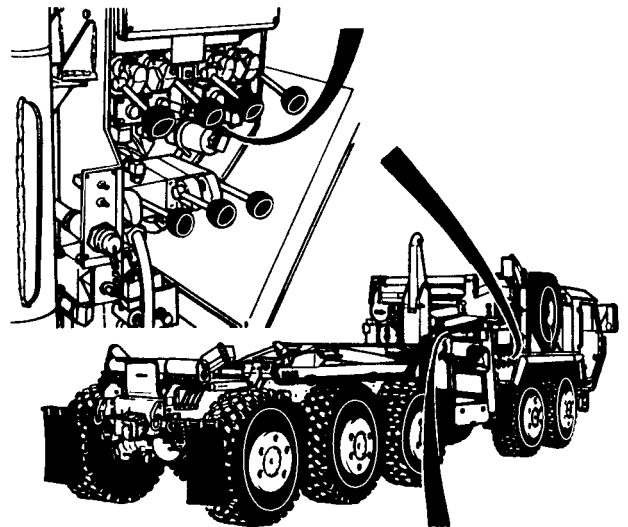
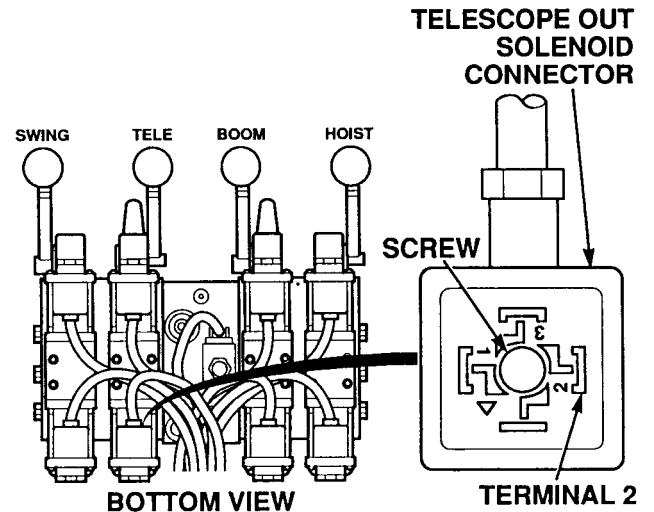
7. BOOM WILL NOT TELESCOPE OUT USING REMOTE CONTROL UNIT (CONT).



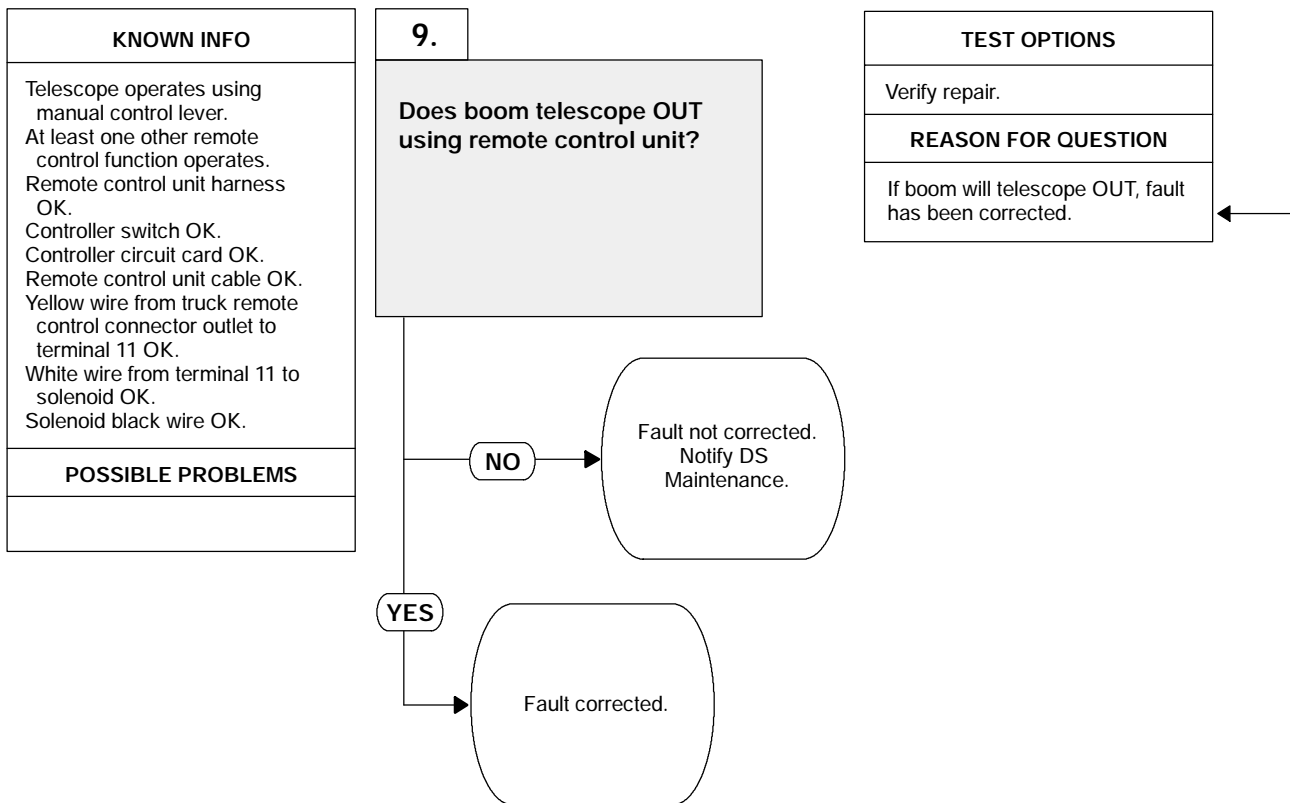
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Is there continuity between connector, terminal 2 and a known good ground?
 - (a) If there is no continuity, repair connector black wire (see schematic Fig 2-58) or notify DS Maintenance and perform Steps (2) and (3) below.
 - (b) If there is continuity, perform Steps (2) and (3) below and go to Step 9 of this Fault.
 - (2) Install connector on telescope OUT solenoid and tighten screw.
 - (3) Install crane junction box cover with six clips and screws.



7. BOOM WILL NOT TELESCOPE OUT USING REMOTE CONTROL UNIT (CONT).



VERIFY REPAIR

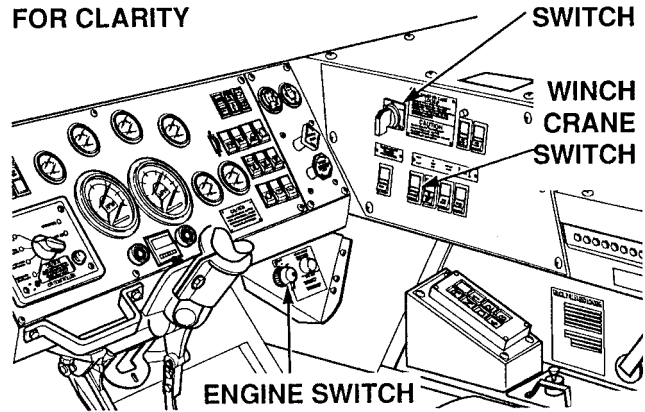
- (1) Connect remote control unit cable to truck hookup and remote control unit hookup (TM 9-2320-364-10).
- (2) Operate crane using remote control unit.
 - (a) If boom will not telescope out using remote control unit, fault not corrected. Notify DS Maintenance.
 - (b) If boom will telescope OUT, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

8. CRANE WILL NOT SWING CW USING REMOTE CONTROL UNIT.

INITIAL SETUP

Tools and Special Tools

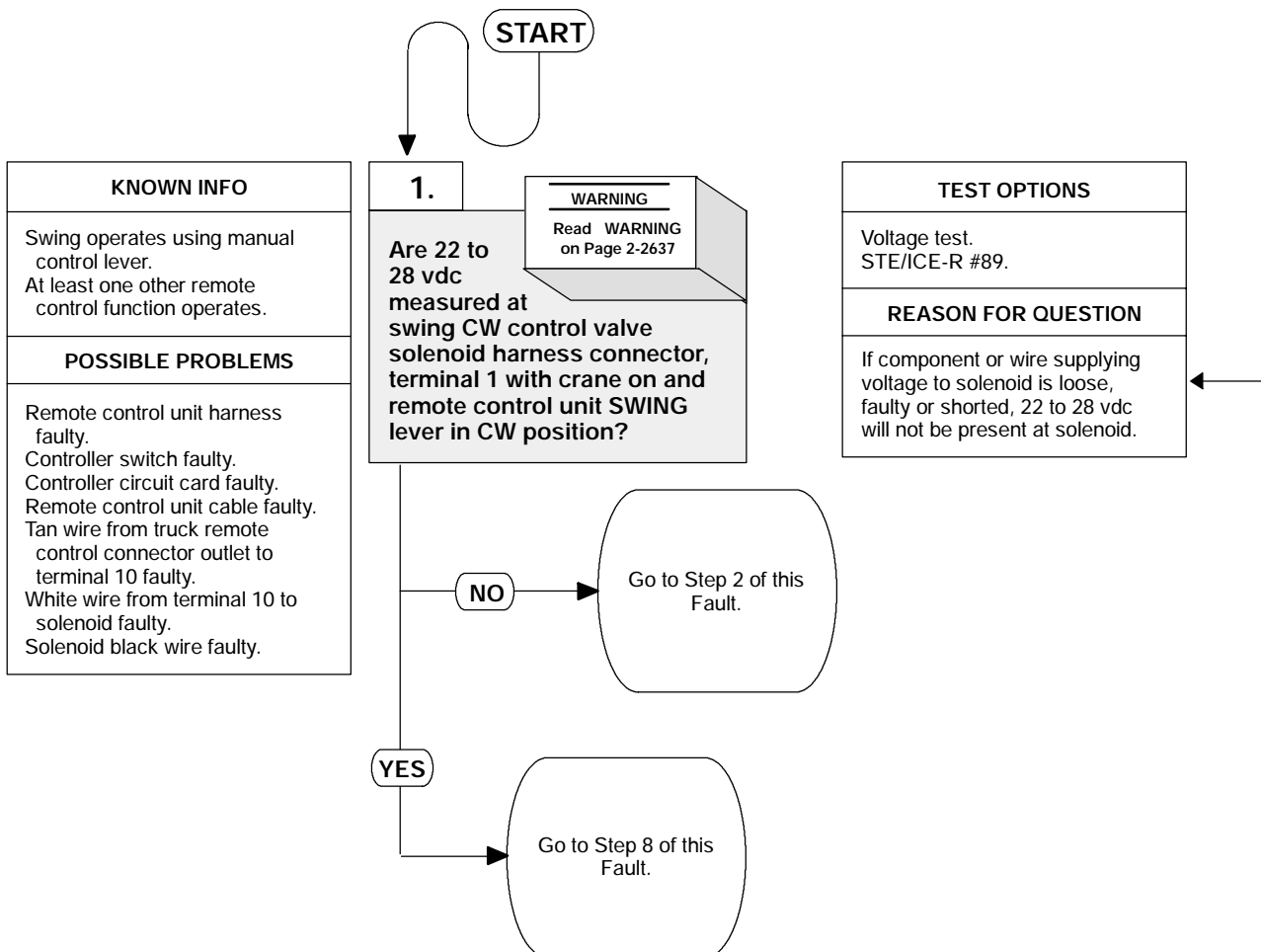
Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

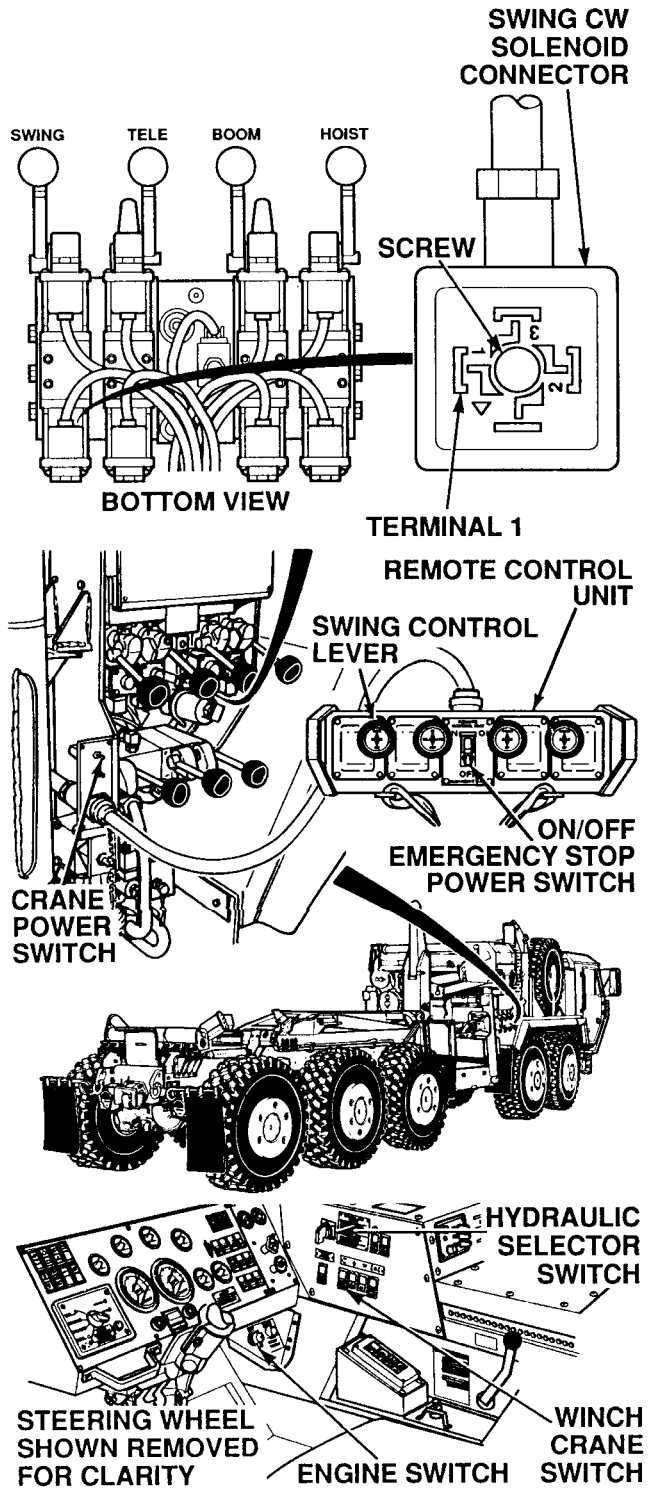
Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Remote control unit connected,
 (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)



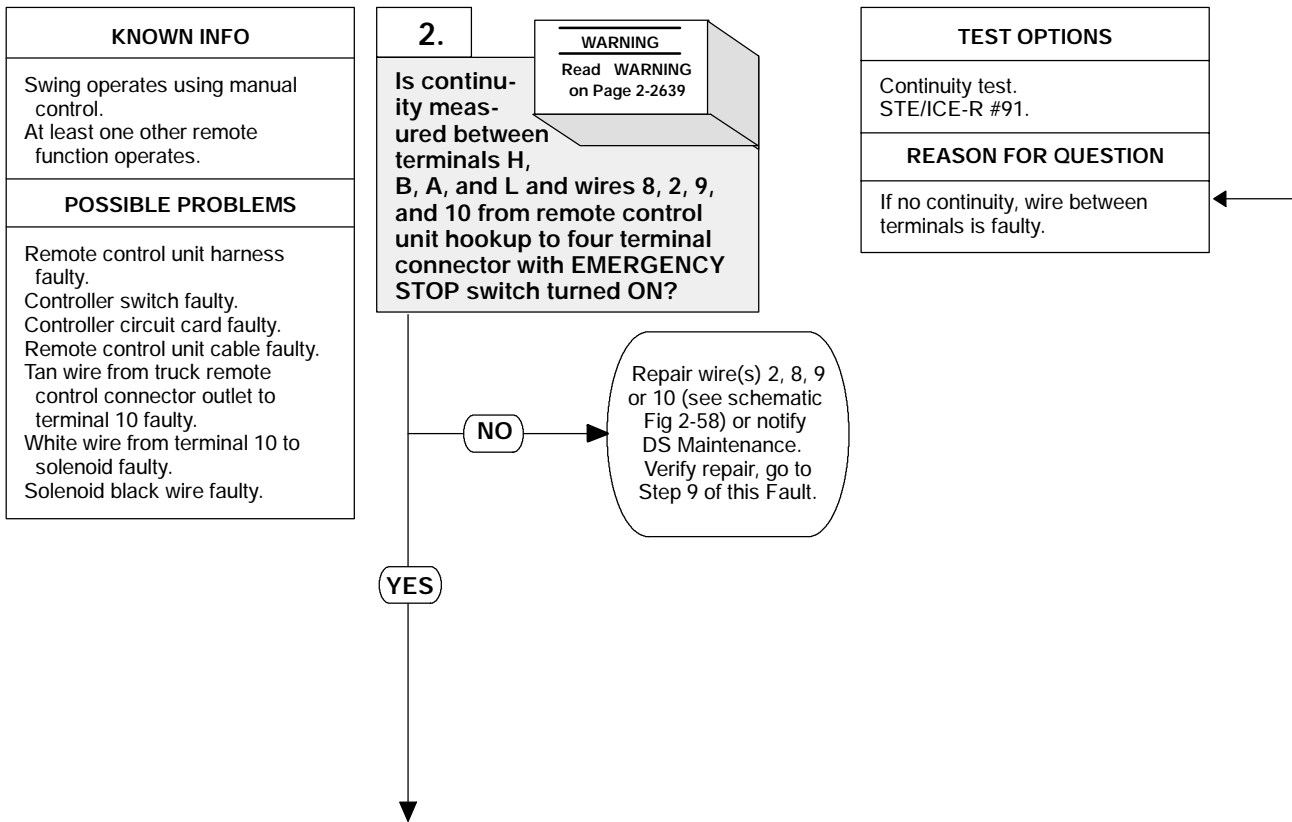
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Loosen screw and remove connector from swing CW solenoid.
 - (2) Set multimeter select switch to volts.
 - (3) Connect positive (+) multimeter lead to harness connector, terminal 1.
 - (4) Connect negative (-) multimeter lead to a known good ground.
 - (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (6) Set WINCH/CRANE switch to CRANE position.
 - (7) Set hydraulic selector switch to CRANE/SRW position.
 - (8) Set crane POWER switch to ON position.
 - (9) Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
 - (10) Hold remote control unit SWING controller in the CW position.
 - (a) If 22 to 28 vdc are not present, perform Step (11) below and go to Step 2 of this Fault.
 - (b) If 22 to 28 vdc are present, perform Step (11) below and go to Step 8 of this Fault.
 - (11) Set the following switches in OFF position: REMOTE CONTROL UNIT ON/OFF EMERGENCY STOP switch, crane POWER switch, hydraulic selector switch and ENGINE switch.



8. CRANE WILL NOT SWING CW USING REMOTE CONTROL UNIT (CONT).

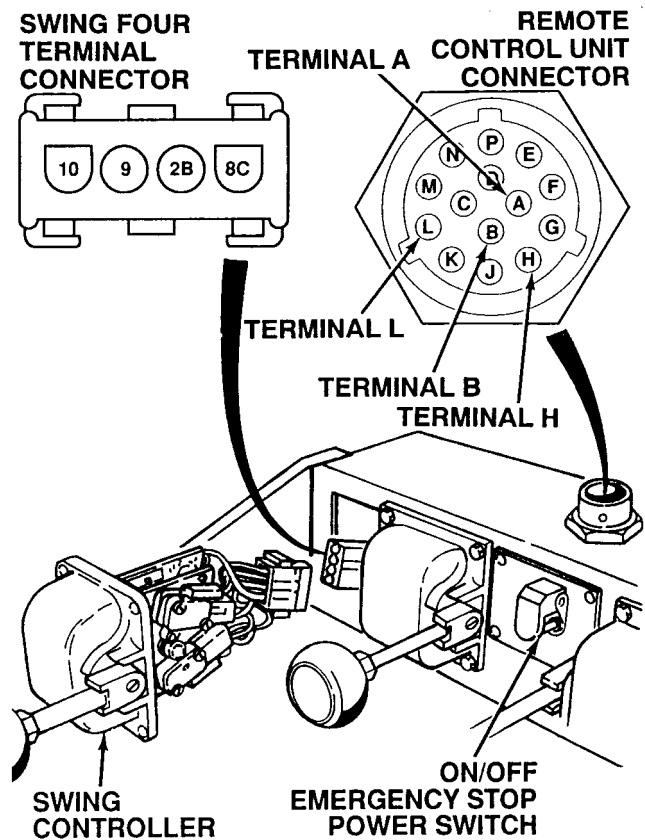


WARNING

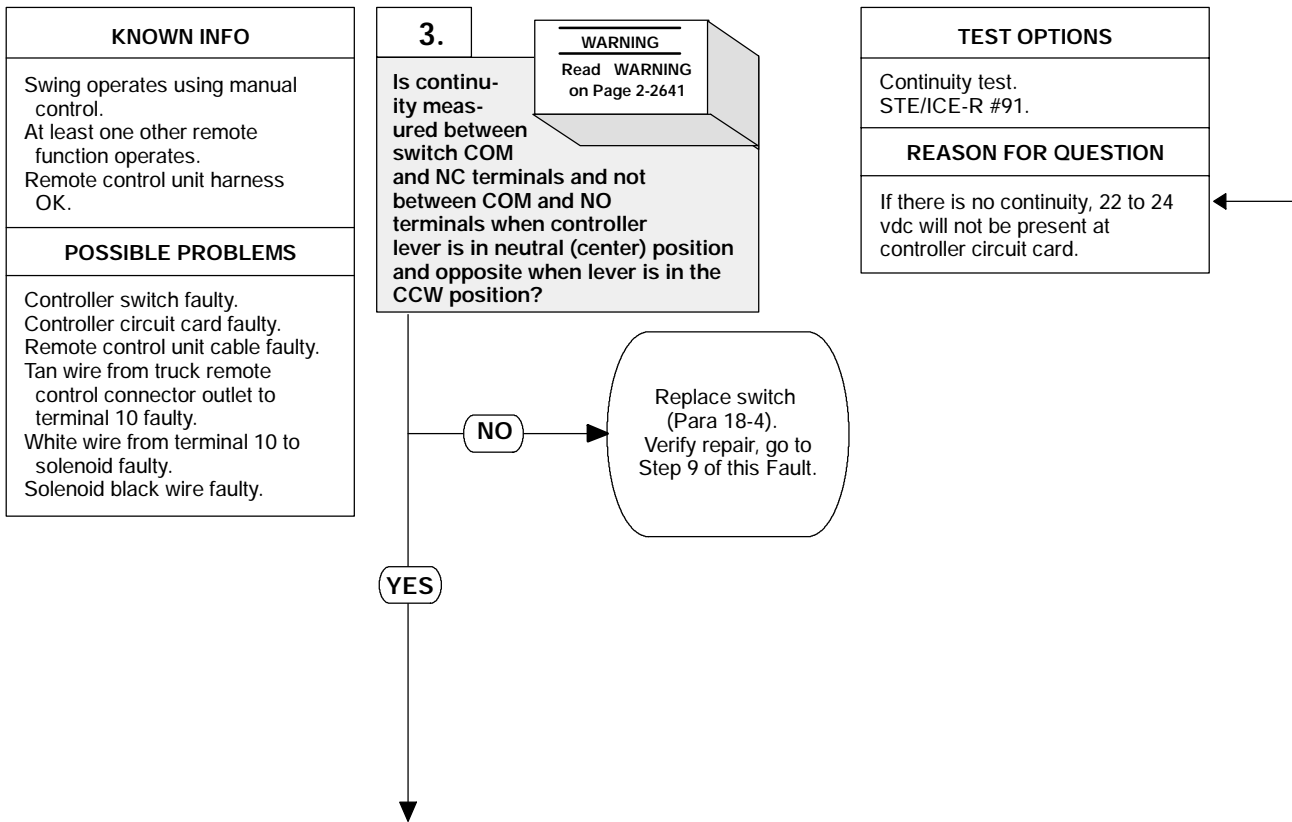
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect cable from remote control unit (TM 9-2320-364-10).
- (2) Remove SWING controller from remote control unit (Para 18-4).
- (3) Set multimeter select switch to ohms.
- (4) Turn ON remote control unit ON/OFF EMERGENCY STOP switch.
- (5) Is there continuity between remote control unit connector, terminal H and four terminal connector, terminal 8C?
 - (a) If there is no continuity, repair wire 8 between switch and four terminal connector (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (6) below.
- (6) Is there continuity between remote control unit connector, terminal B and four terminal connector, terminal 2B?
 - (a) If there is no continuity, repair wire 2 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (7) below.
- (7) Is there continuity between remote control unit connector, terminal A and four terminal connector, terminal 9?
 - (a) If there is no continuity, repair wire 9 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step (8) below.
- (8) Is there continuity between remote control unit hookup, terminal L and four terminal connector, terminal 10?
 - (a) If there is no continuity, repair wire 10 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step 3 of this Fault.



8. CRANE WILL NOT SWING CW USING REMOTE CONTROL UNIT (CONT).

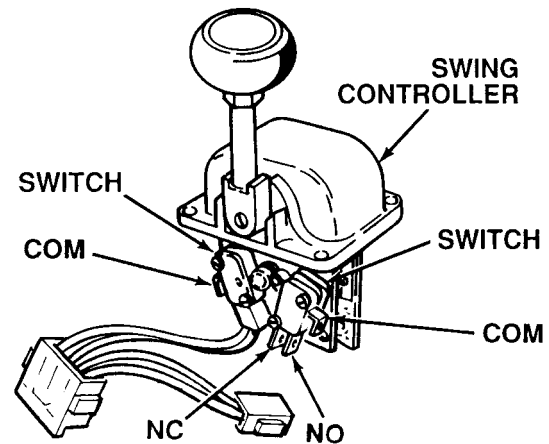


WARNING

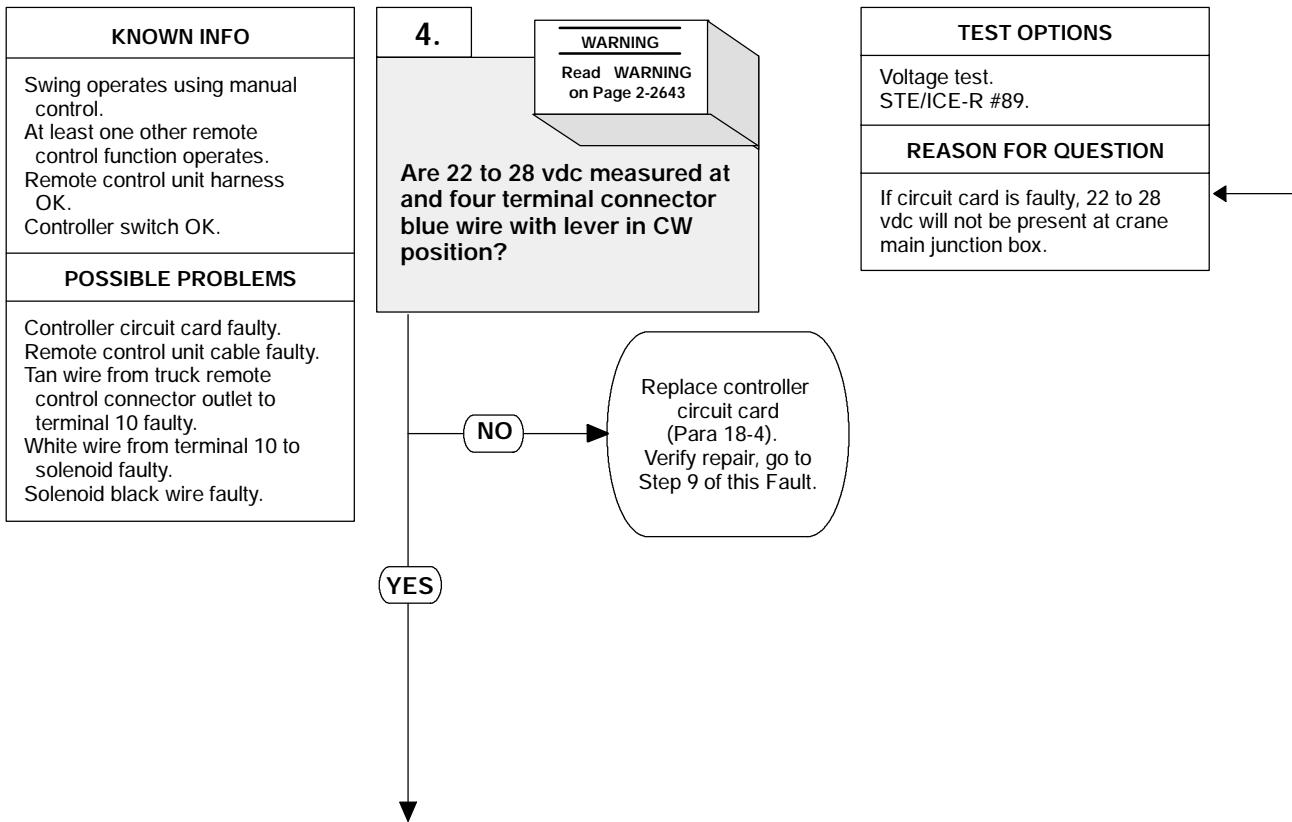
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector from one of the two switches.
- (2) Is there continuity between switch NC terminal and switch COM terminal?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (3) below.
- (3) Is there continuity between switch COM terminal and switch NO terminal?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (4) below.
- (4) Is there continuity between switch NC terminal and switch COM terminal with controller lever held in CCW position?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (5) below.
- (5) Is there continuity between switch COM terminal and switch NO terminal with controller lever held in CCW position?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step 6 below.
- (6) Repeat Steps (1) through (5) for other switch.
- (7) Install both connectors on switches.



8. CRANE WILL NOT SWING CW USING REMOTE CONTROL UNIT (CONT).

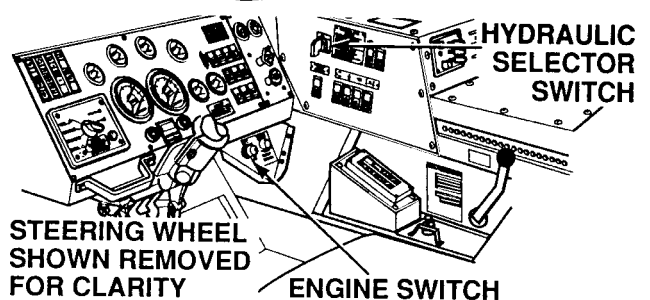
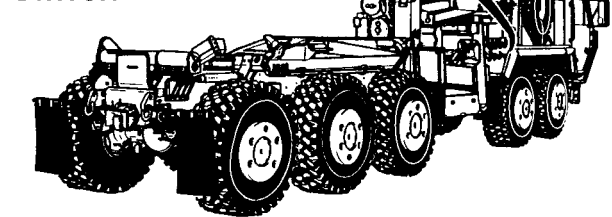
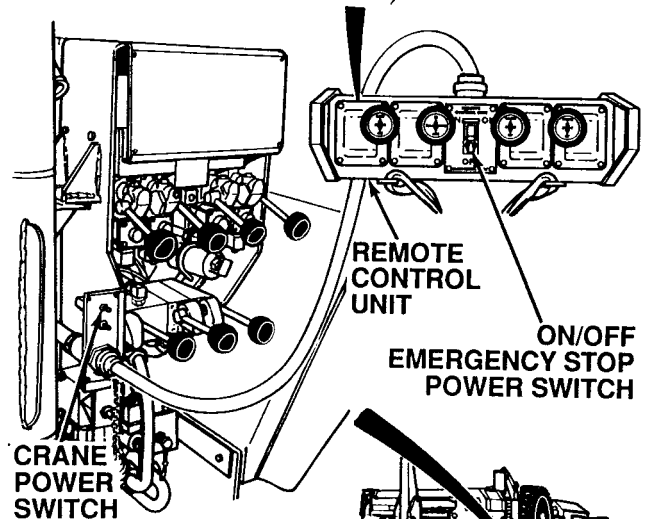
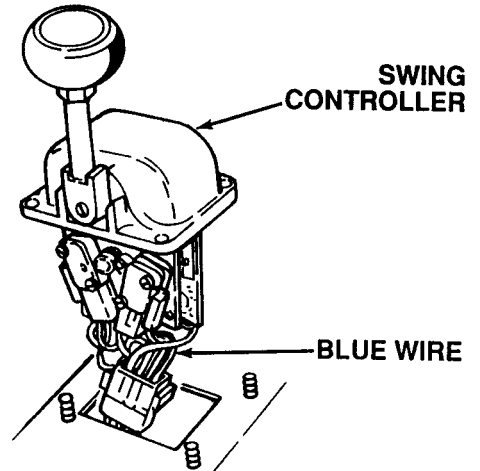


WARNING

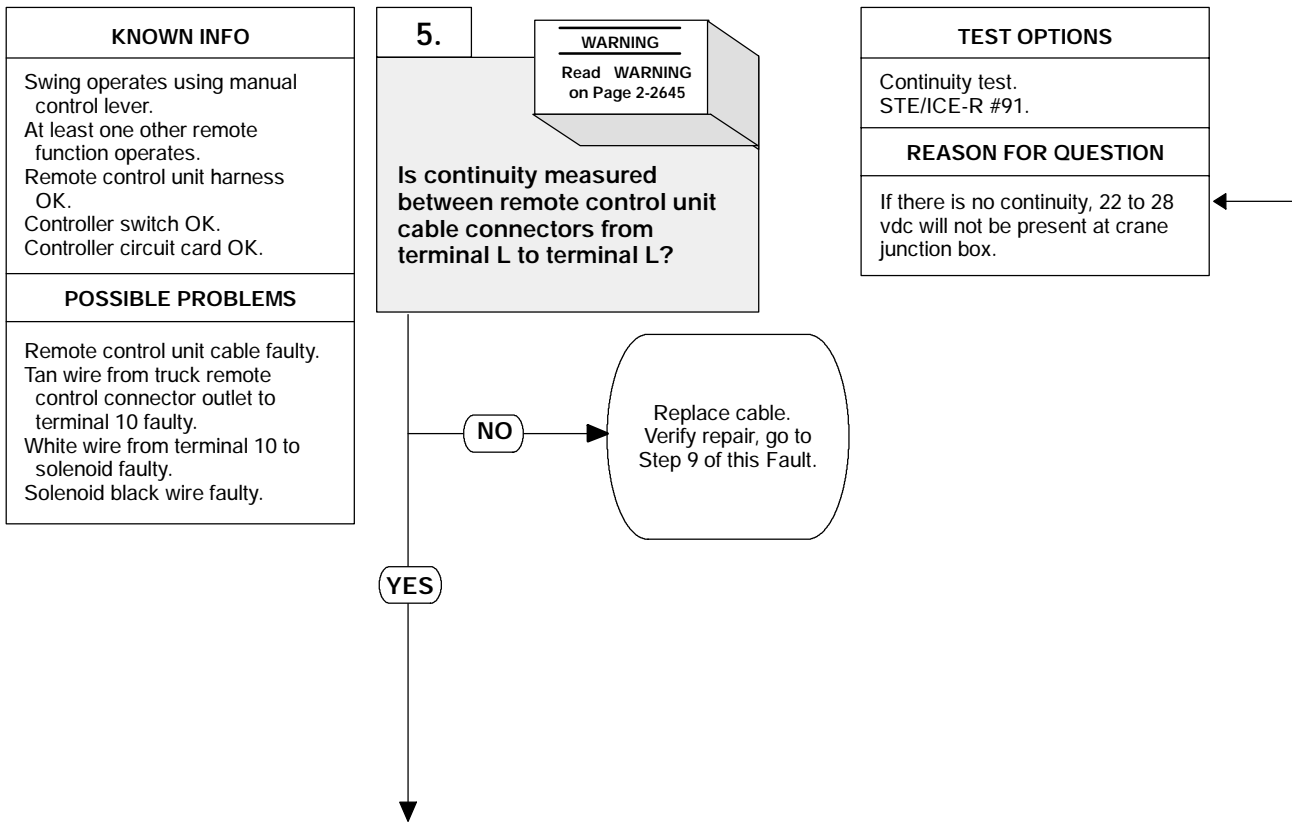
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Connect remote control unit to remote control unit cable (TM 9-2320-364-10).
- (2) Connect controller four terminal connector to remote control unit harness four terminal connector.
- (3) Set multimeter select switch to volts dc.
- (4) Connect positive (+) multimeter lead to blue wire terminal in four terminal connector.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch.
- (7) Set hydraulic selector switch to CRANE/SRW position.
- (8) Set crane POWER switch to ON position.
- (9) Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
- (10) Hold SWING controller in the CW position.
 - (a) If 22 to 28 vdc are not present, perform Step (11) below and replace circuit card (Para 18-4).
 - (b) If 22 to 28 vdc are present, perform Steps (11) and (12) below and go to Step 5 of this Fault.
- (11) Set the following switches to the OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch.
- (12) Assemble remote control unit (Para 18-4).



8. CRANE WILL NOT SWING CW USING REMOTE CONTROL UNIT (CONT).

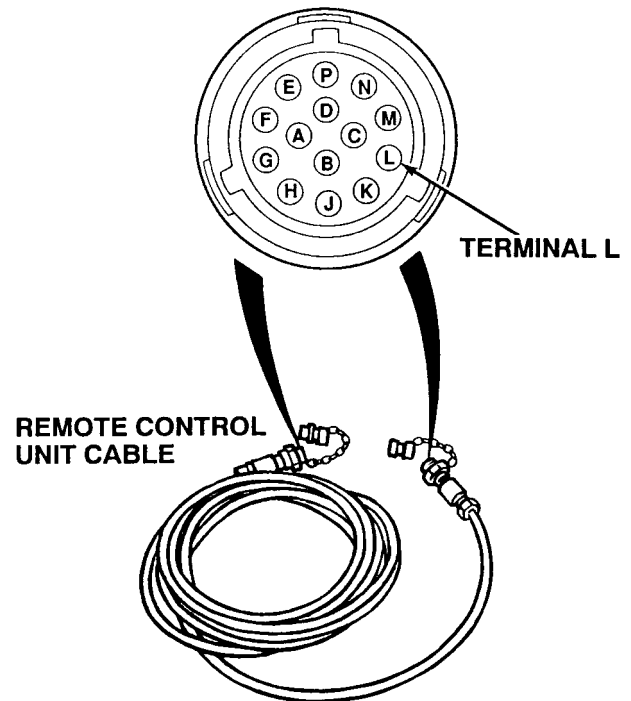


WARNING

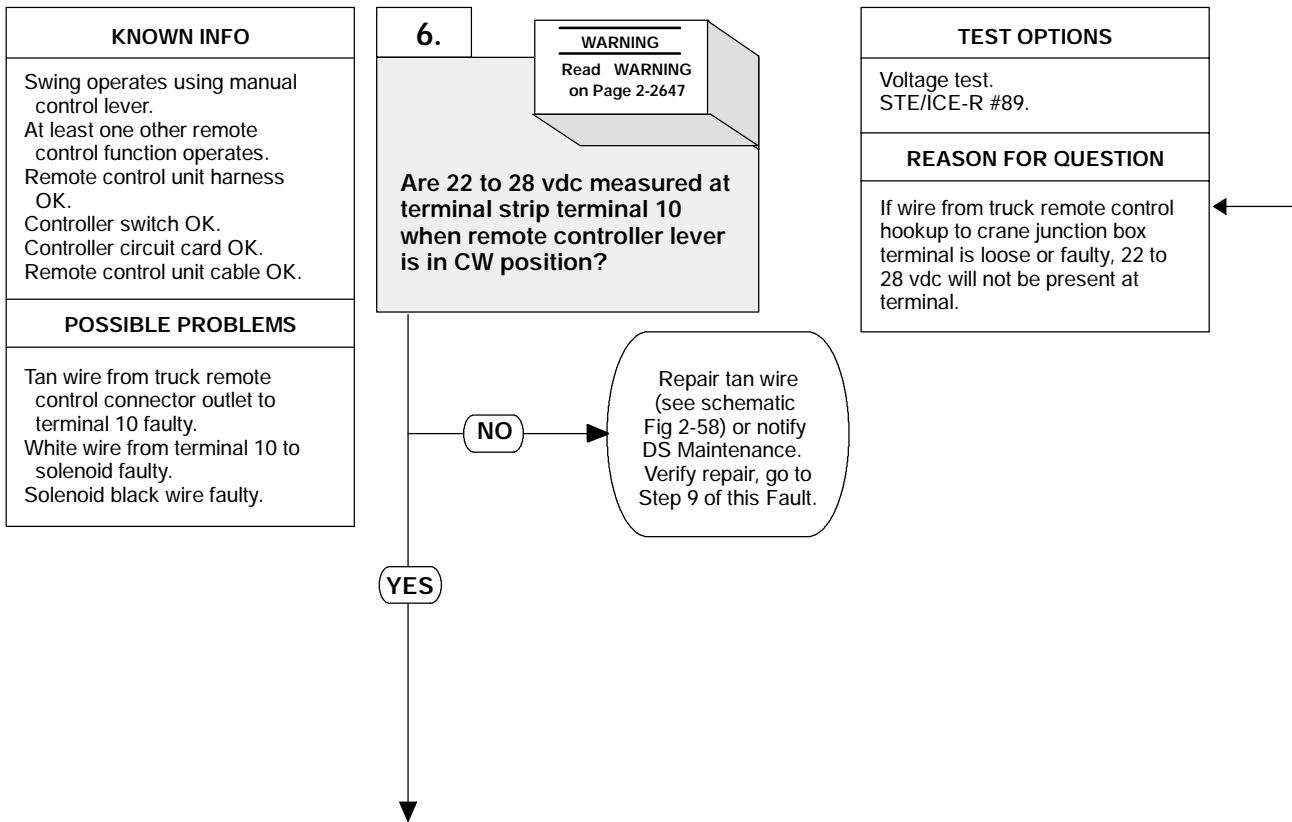
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect remote control unit cable from truck and remote control unit (TM 9-2320-364-10).
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between cable connector terminal L at both ends?
 - (a) If there is no continuity, replace cable.
 - (b) If there is continuity, connect cable to truck hookup and remote control unit hookup and go to Step 6 of this Fault.



8. CRANE WILL NOT SWING CW USING REMOTE CONTROL UNIT (CONT).

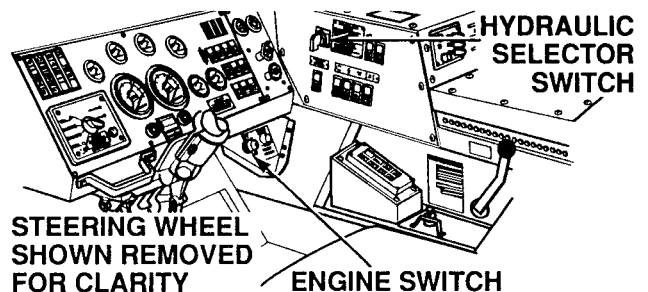
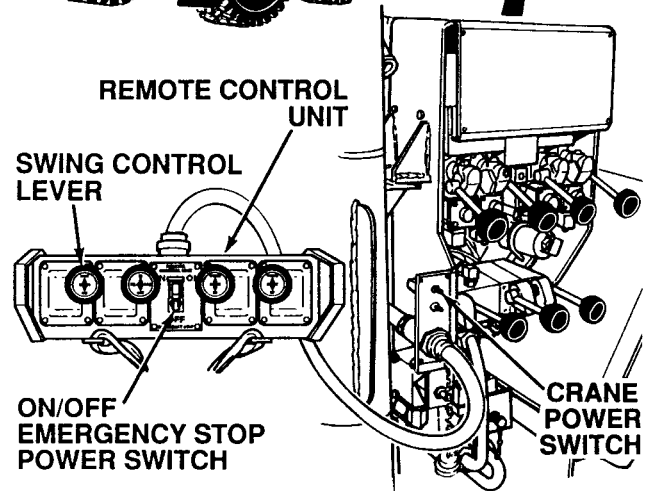
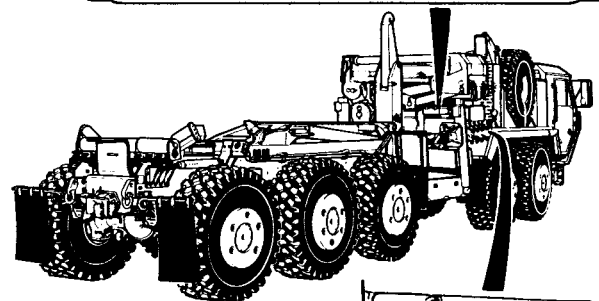
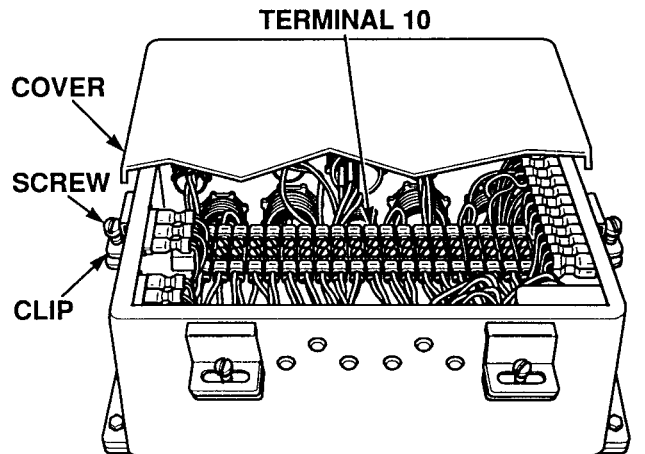


WARNING

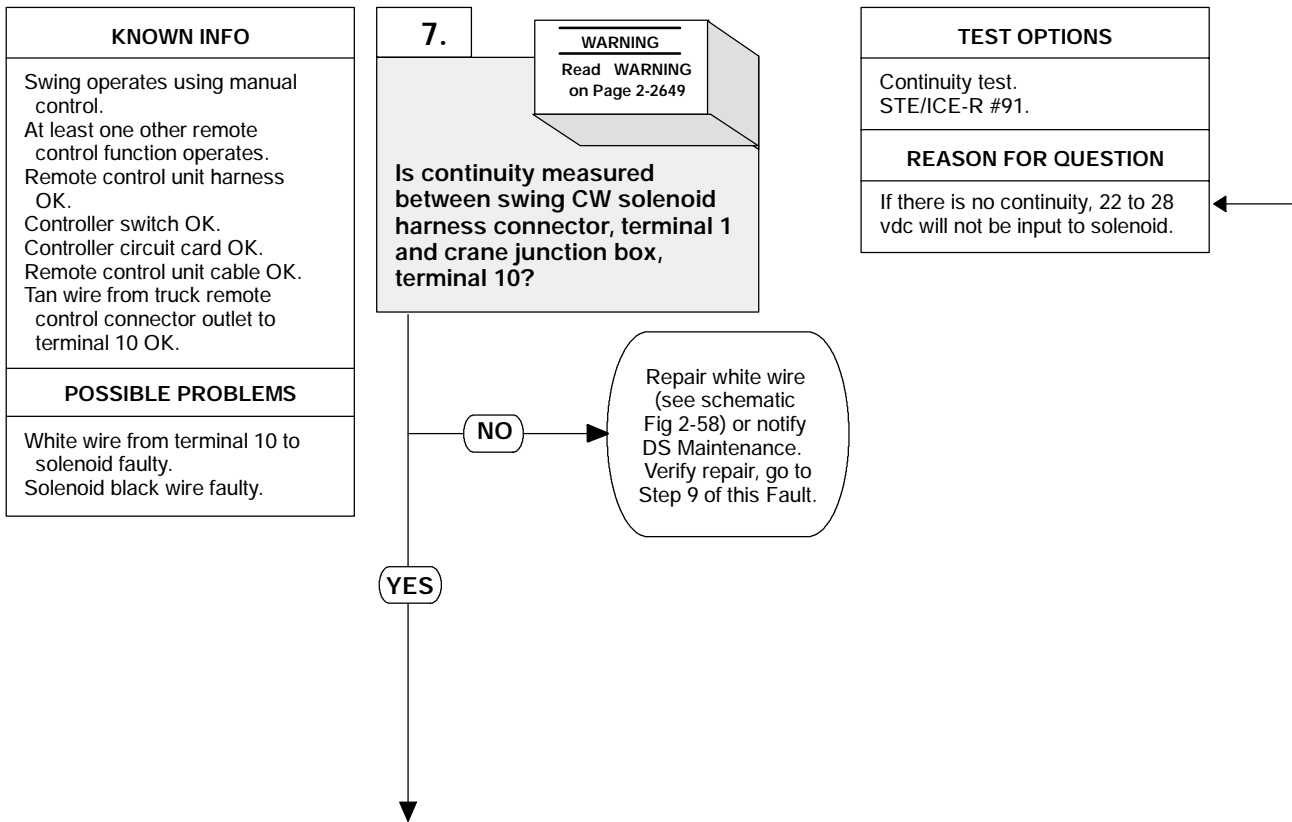
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Loosen six screws, clips and remove crane junction box cover.
- (2) Set multimeter select switch to volts.
- (3) Connect positive (+) multimeter lead to crane junction box, terminal 10.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
- (6) Set hydraulic selector switch to CRANE/SRW position.
- (7) Set crane POWER switch to ON position.
- (8) Set remote control ON/OFF EMERGENCY STOP power switch to ON.
- (9) Put remote control unit SWING control lever in the CW position.
 - (a) If 22 to 28 vdc are not present, perform Step (10) below and repair tan wire from truck remote control hookup to terminal 10 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Step (10) below and go to Step 7 of this Fault.
- (10) Put the following switches in OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch.



8. CRANE WILL NOT SWING CW USING REMOTE CONTROL UNIT (CONT).

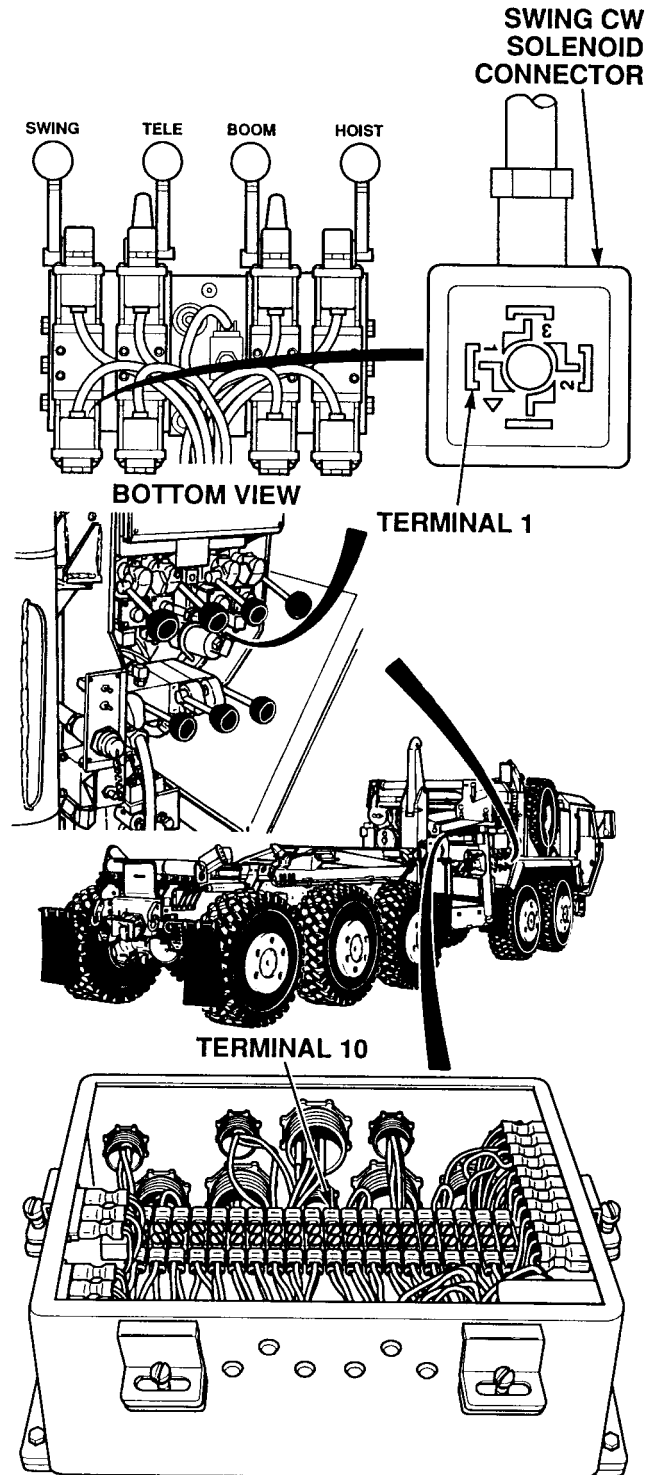


WARNING

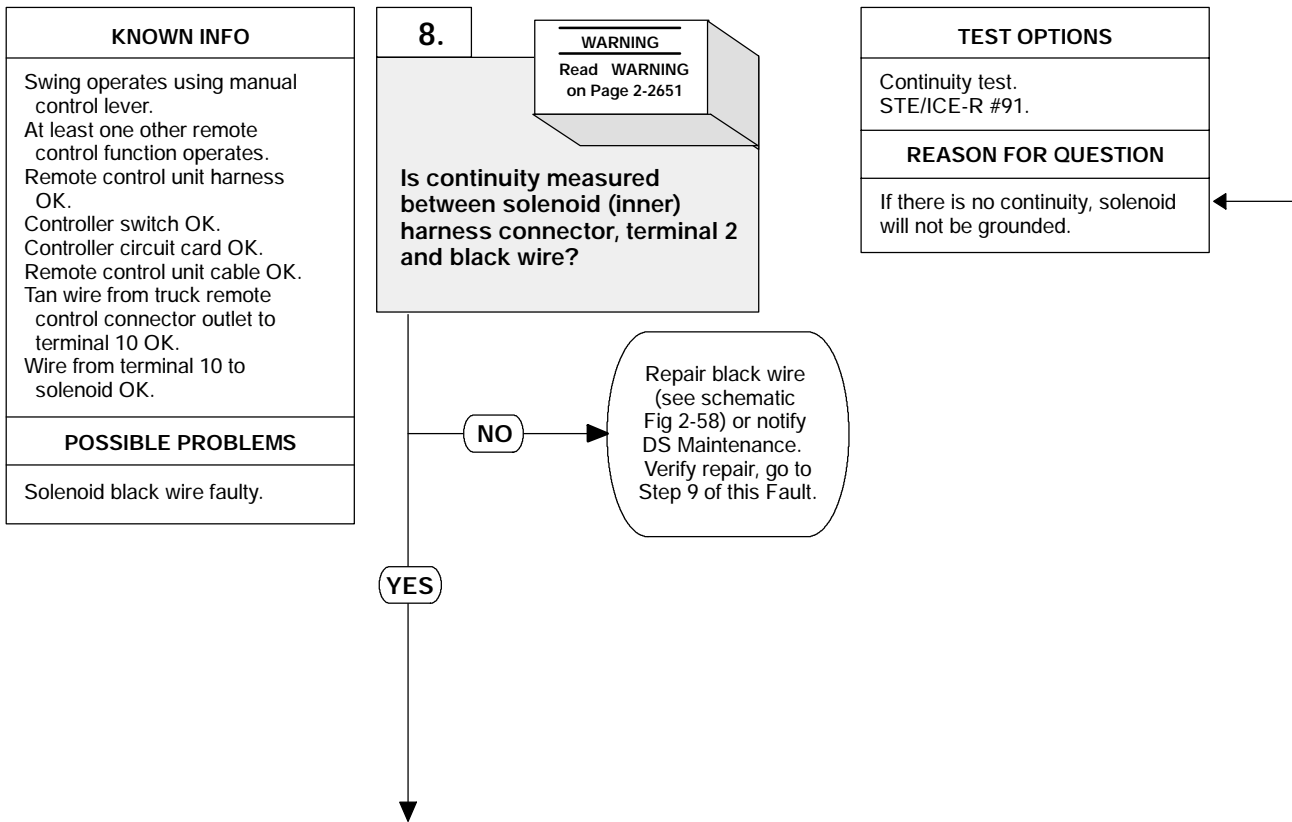
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between connector, terminal 1 and crane main junction box, terminal 10?
 - (a) If there is no continuity, repair connector white wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, white wire is OK.



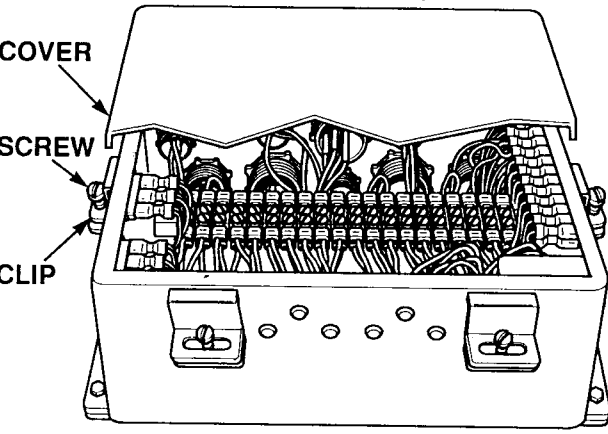
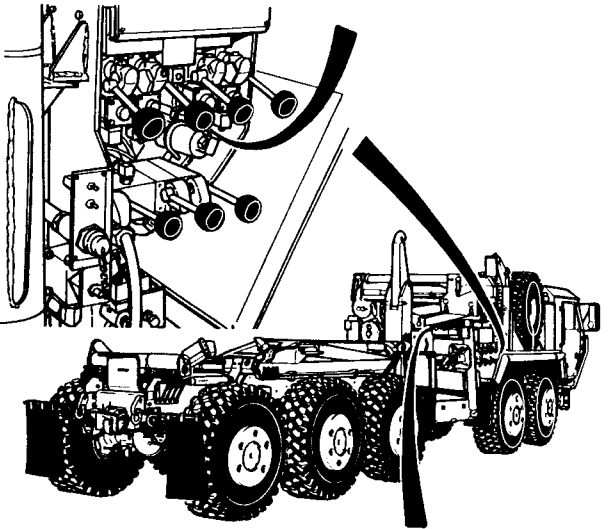
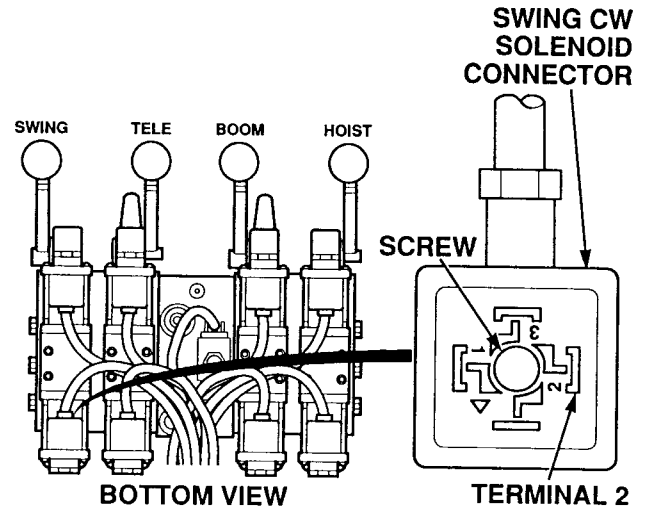
8. CRANE WILL NOT SWING CW USING REMOTE CONTROL UNIT (CONT).



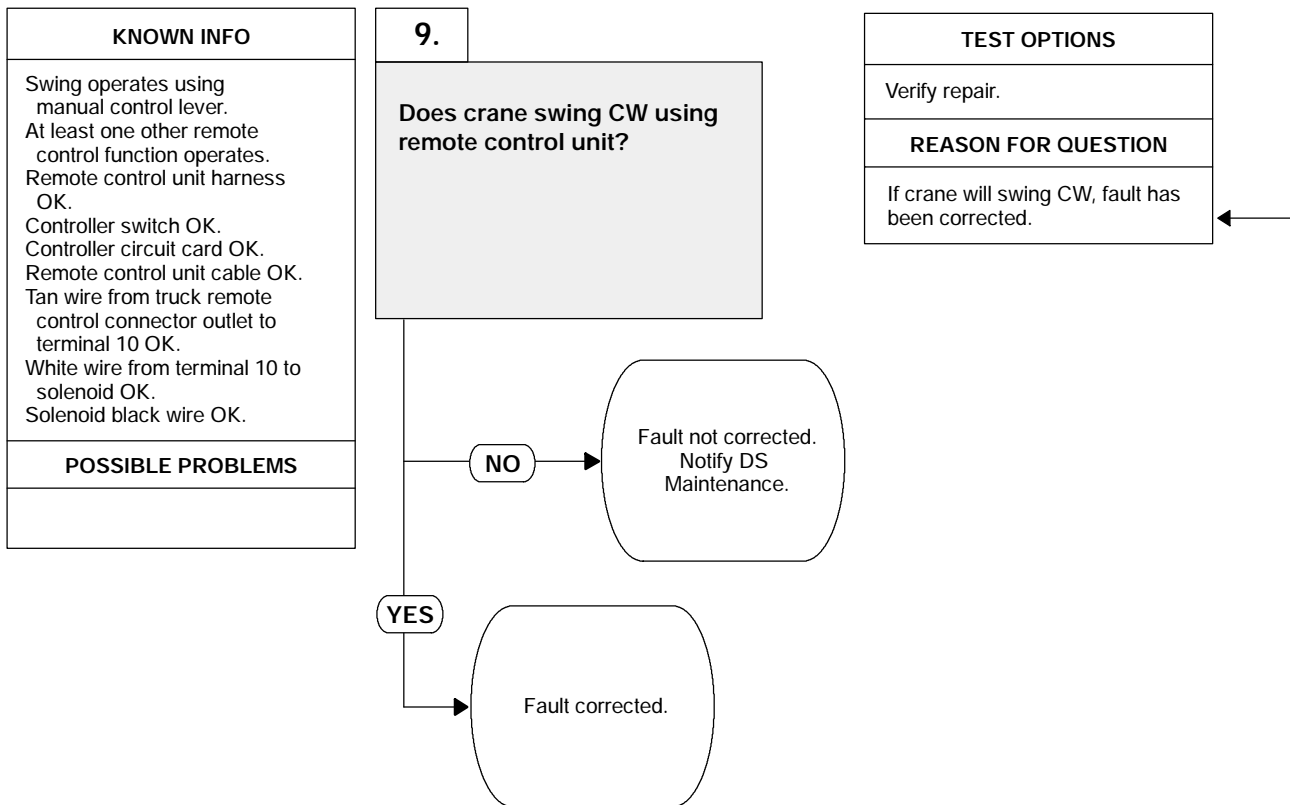
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Is there continuity between connector, terminal 2 and a known good ground?
 - (a) If there is no continuity, repair connector black wire (see schematic Fig 2-58) or notify DS Maintenance and perform Steps (2) and (3) below.
 - (b) If there is continuity, perform Steps (2) and (3) below and go to Step 9 of this Fault.
 - (2) Install connector on swing CW solenoid and tighten screw.
 - (3) Install crane junction box cover with six clips and screws.

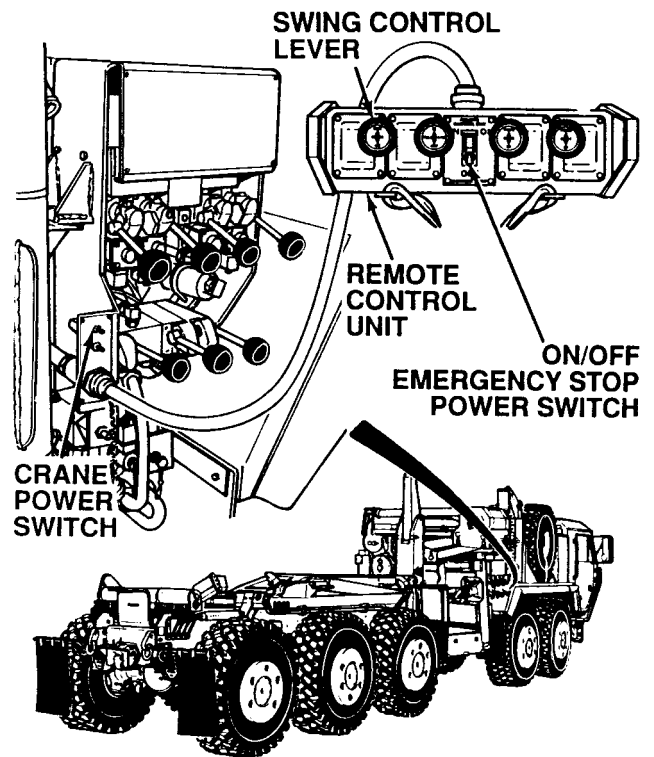


8. CRANE WILL NOT SWING CW USING REMOTE CONTROL UNIT (CONT).



VERIFY REPAIR

- (1) Connect remote control unit cable to truck hookup and remote control unit hookup (TM 9-2320-364-10).
- (2) Operate crane using remote control unit.
 - (a) If crane will not swing CW using remote control unit, fault not corrected. Notify DS Maintenance.
 - (b) If crane will swing CW, fault has been corrected.



2-29. CRANE TROUBLESHOOTING (CONT).

9. CRANE WILL NOT SWING CCW USING REMOTE CONTROL UNIT.

INITIAL SETUP

Tools and Special Tools

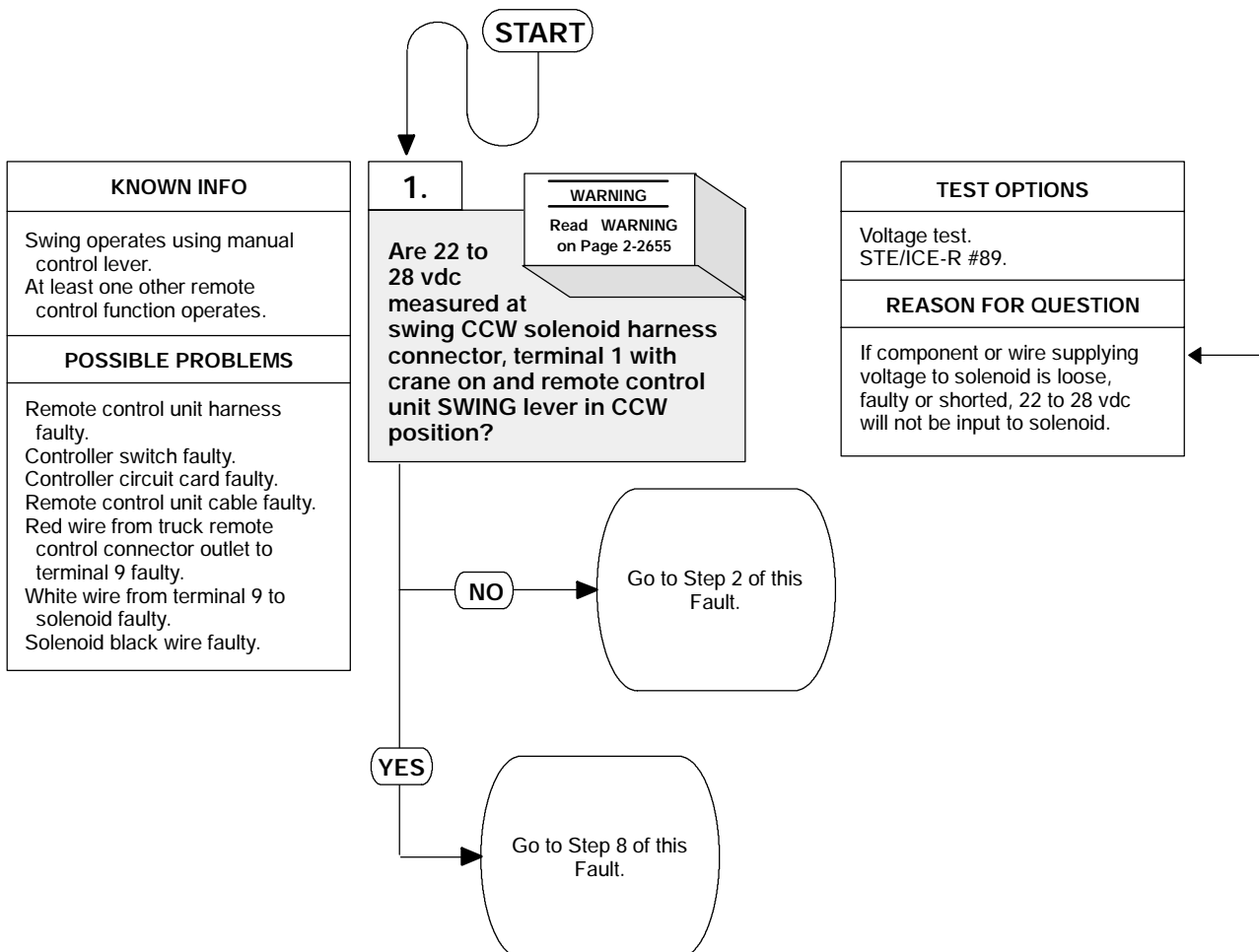
Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

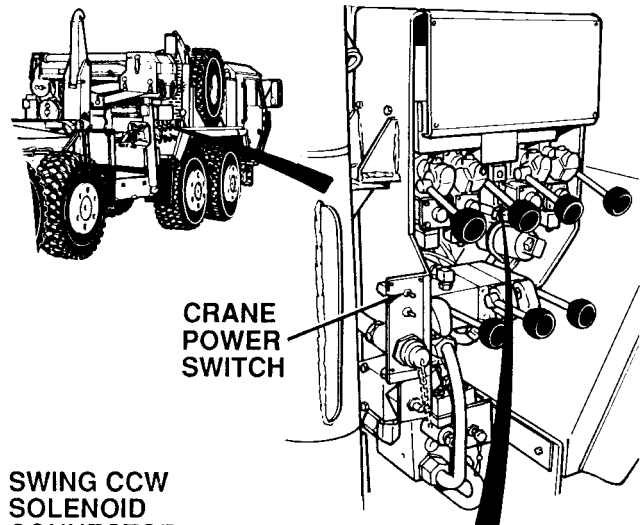
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)
 Remote control unit connected
 (TM 9-2320-364-10)



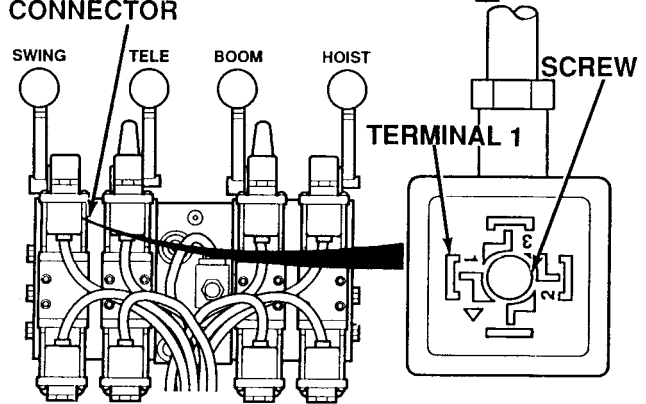
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

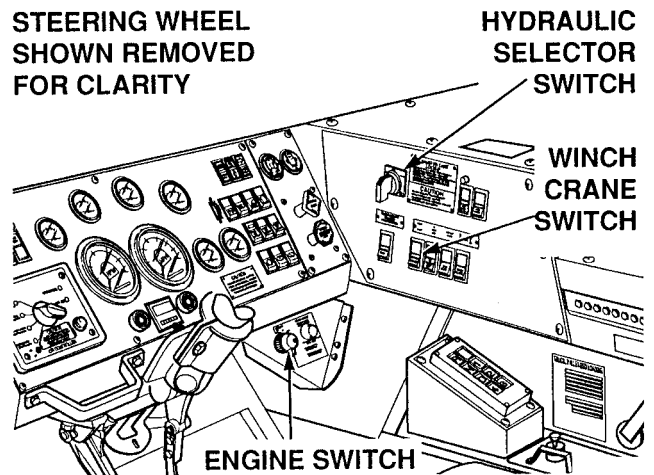


- | VOLTAGE TEST | |
|--------------|---|
| (1) | Loosen screw and remove connector from swing CCW solenoid. |
| (2) | Set multimeter select switch to volts. |
| (3) | Connect positive (+) multimeter lead to harness connector, terminal 1. |
| (4) | Connect negative (-) multimeter lead to a known good ground. |
| (5) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (6) | Set WINCH/CRANE switch to CRANE position. |
| (7) | Set hydraulic selector switch to CRANE/SRW position. |
| (8) | Set crane POWER switch to ON position. |
| (9) | Set remote control ON/OFF EMERGENCY STOP power switch to ON position. |
| (10) | Hold remote control unit SWING controller in the CCW position. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Step (11) below and go to Step 2 of this Fault. (b) If 22 to 28 vdc are present, perform Step (11) below and go to Step 8 of this Fault. |
| (11) | Set the following switches in OFF position: REMOTE CONTROL UNIT ON/OFF EMERGENCY STOP switch, crane POWER switch, hydraulic selector switch and ENGINE switch. |

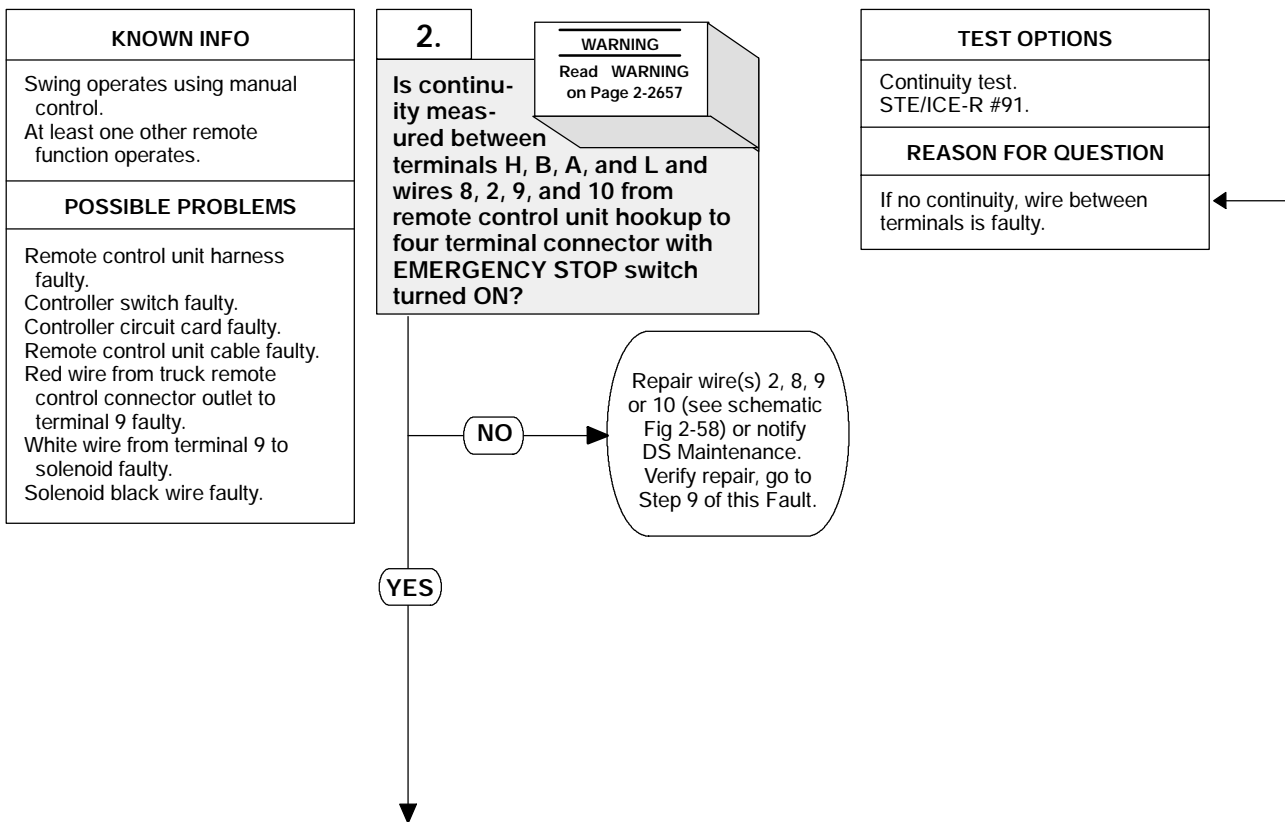
SWING CCW SOLENOID CONNECTOR



STEERING WHEEL SHOWN REMOVED FOR CLARITY



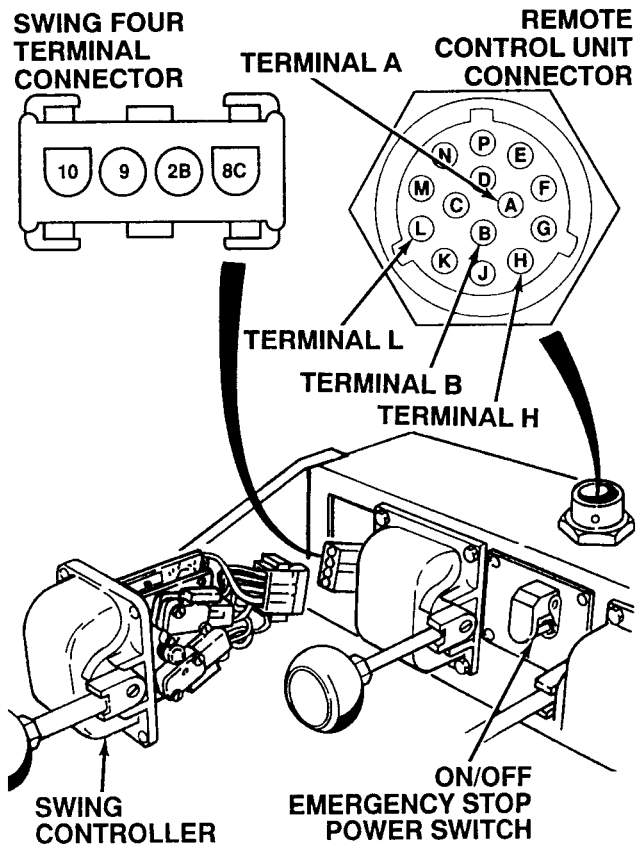
9. CRANE WILL NOT SWING CCW USING REMOTE CONTROL UNIT (CONT).



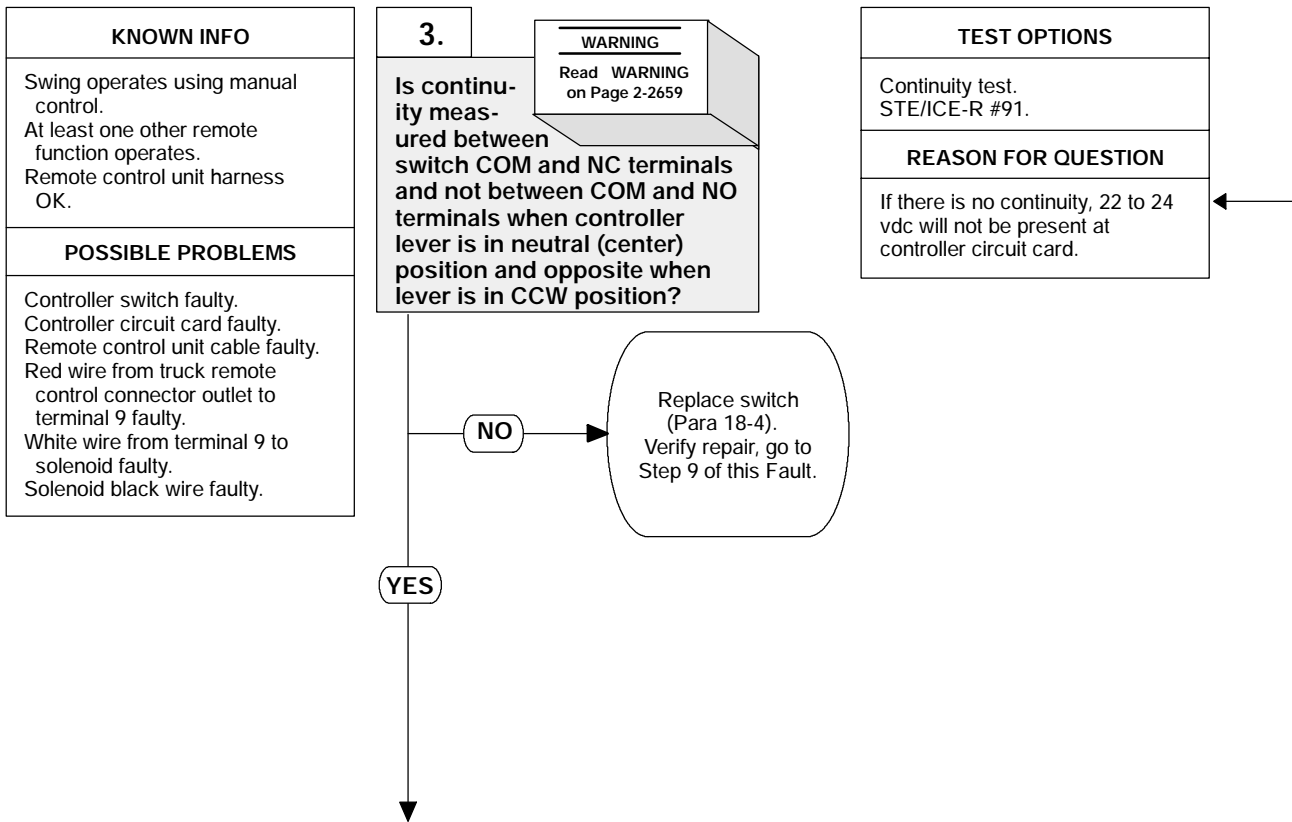
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
(1) Disconnect cable from remote control unit (TM 9-2320-364-10).
(2) Remove SWING controller from remote control unit (Para 18-4).
(3) Set multimeter select switch to ohms.
(4) Turn ON remote control unit ON/OFF EMERGENCY STOP switch.
(5) Is there continuity between remote control unit hookup, terminal H and four terminal connector, terminal 8C? (a) If there is no continuity, repair wire 8 between switch and four terminal connector (see schematic Fig 2-58) or notify DS Maintenance. (b) If there is continuity, go to Step (6) below.
(6) Is there continuity between remote control unit hookup, terminal B and four terminal connector, terminal 2B? (a) If there is no continuity, repair wire 2 (see schematic Fig 2-58) or notify DS Maintenance. (b) If there is continuity, go to Step (7) below.
(7) Is there continuity between remote control unit hookup, terminal A and four terminal connector, terminal 9? (a) If there is no continuity, repair wire 9 (see schematic Fig 2-58) or notify DS Maintenance. (b) If there is continuity, go to Step (8) below.
(8) Is there continuity between remote control unit hookup, terminal L and four terminal connector, terminal 10? (a) If there is no continuity, repair wire 10 (see schematic Fig 2-58) or notify DS Maintenance. (b) If there is continuity, go to Step 3 of this Fault.
(9) Install both connectors on switches.



9. CRANE WILL NOT SWING CCW USING REMOTE CONTROL UNIT (CONT).

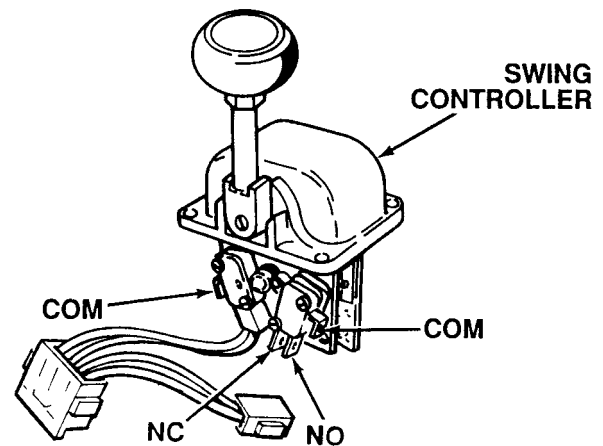


WARNING

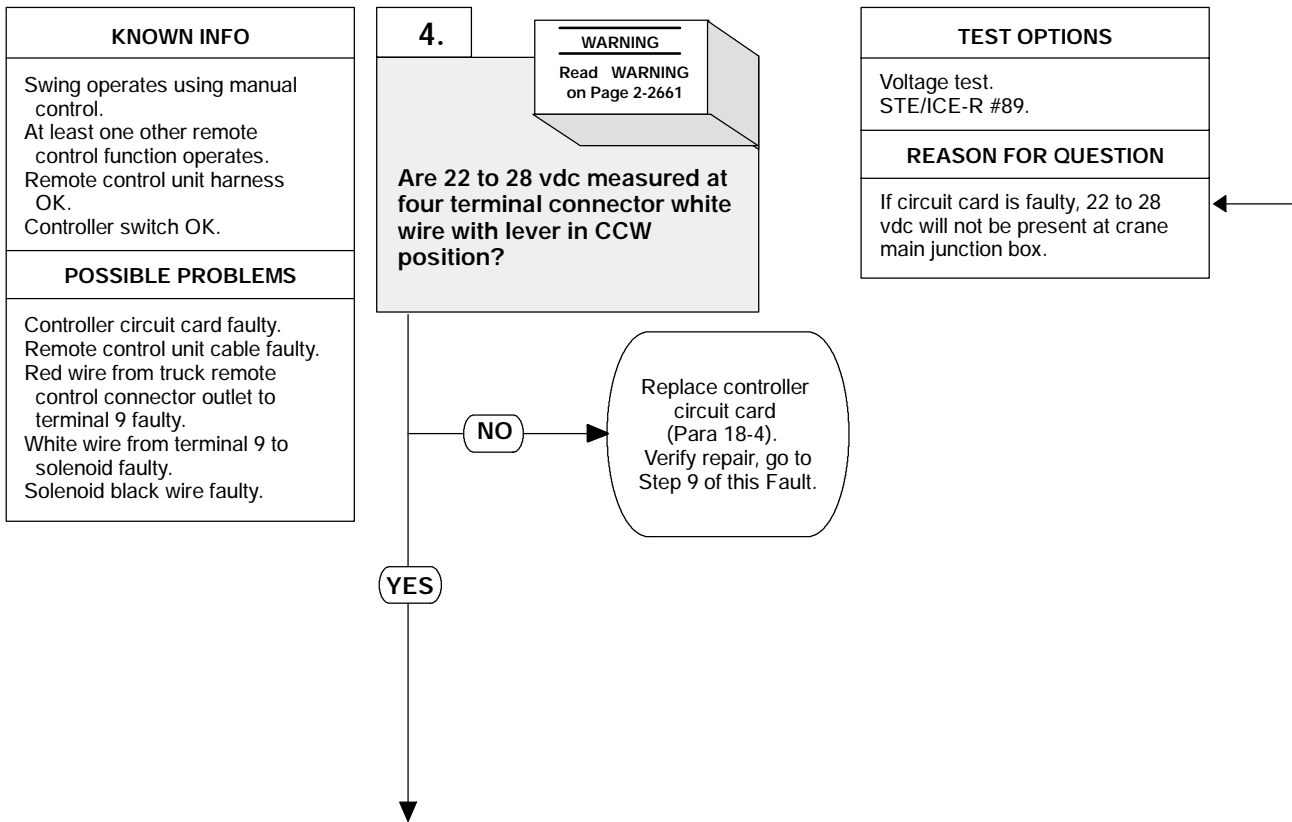
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector from one of the two switches.
- (2) Is there continuity between switch NC terminal and switch COM terminal?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (3) below.
- (3) Is there continuity between switch COM terminal and switch NO terminal?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (4) below.
- (4) Is there continuity between switch NC terminal and switch COM terminal with controller lever held in CCW position?
 - (a) If there is continuity, replace switch (Para 18-4).
 - (b) If there is no continuity, go to Step (5) below.
- (5) Is there continuity between switch COM terminal and switch NO terminal with controller lever held in CCW position?
 - (a) If there is no continuity, replace switch (Para 18-4).
 - (b) If there is continuity, go to Step (6) below.
- (6) Repeat Steps (1) through (5) for other switch.
- (7) Install both connectors on switches.



9. CRANE WILL NOT SWING CCW USING REMOTE CONTROL UNIT (CONT).

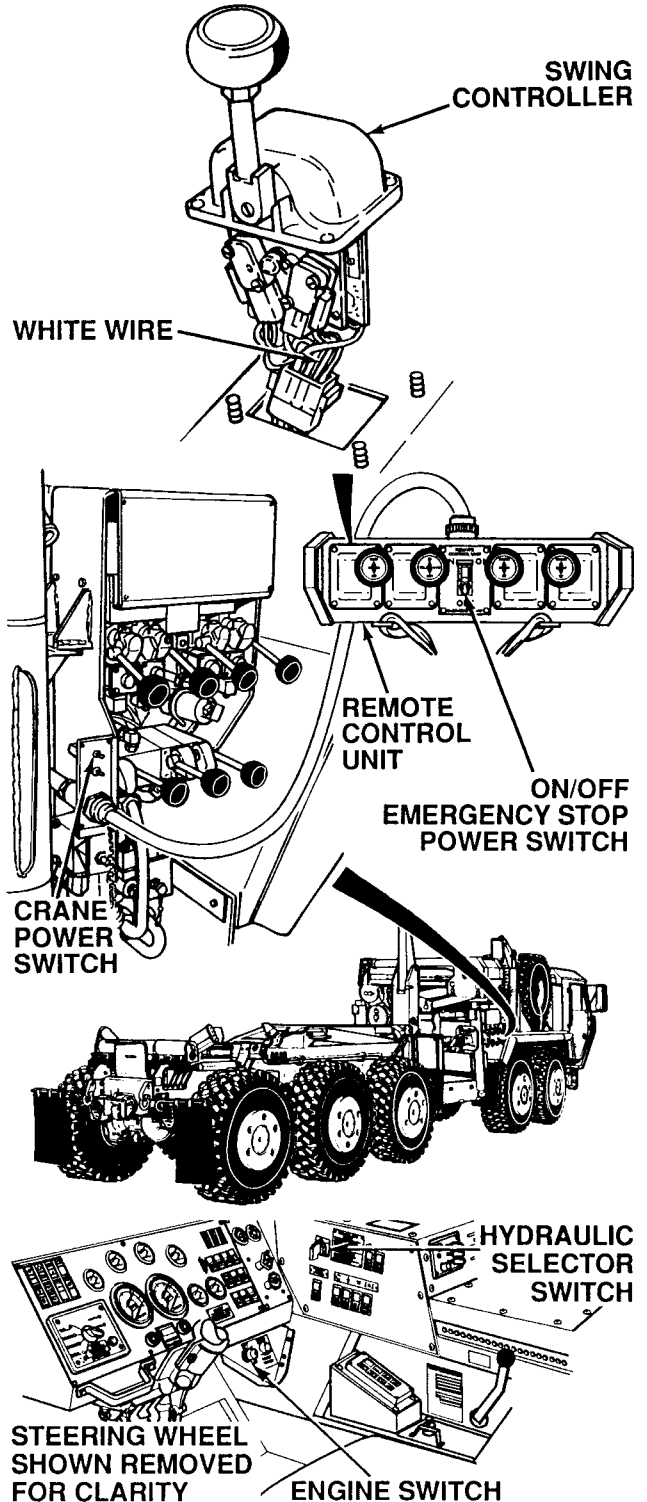


WARNING

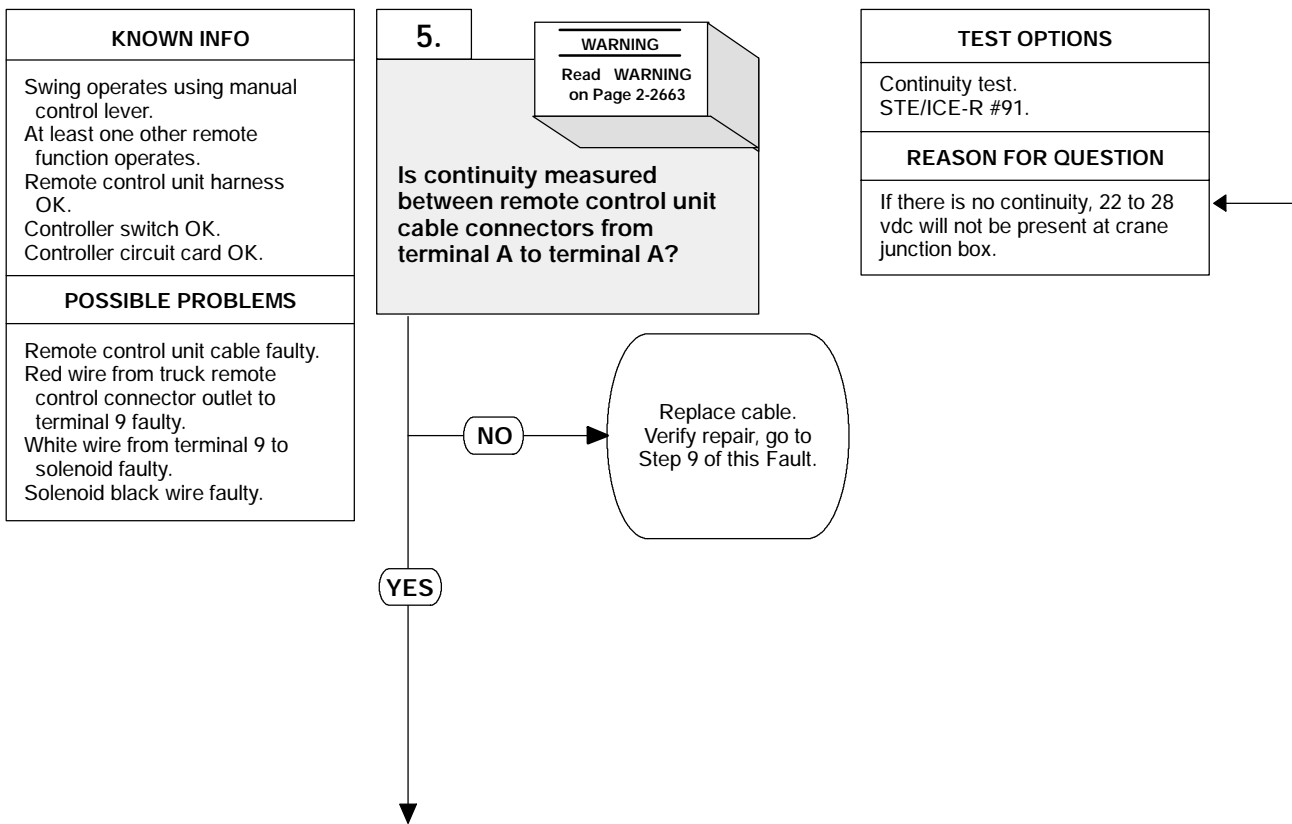
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Connect remote control unit to remote control unit cable.
- (2) Connect controller four terminal connector to remote control unit harness four terminal connector.
- (3) Set multimeter select switch to volts dc.
- (4) Connect positive (+) multimeter lead to white wire terminal in four terminal connector.
- (5) Connect negative (-) multimeter lead to a known good ground.
- (6) Turn ON ENGINE switch (TM 9-2320-364-10).
- (7) Set hydraulic selector switch to CRANE/SRW position.
- (8) Set crane POWER switch to ON position.
- (9) Set remote control ON/OFF EMERGENCY STOP power switch to ON position.
- (10) Hold SWING controller in the CCW position.
 - (a) If 22 to 28 vdc are not present, perform Step (11) below and replace circuit card (Para 18-4).
 - (b) If 22 to 28 vdc are present, go to Step (11) below.
- (11) Set the following switches to the OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch.
- (12) Assemble remote control unit (Para 18-4).



9. CRANE WILL NOT SWING CCW USING REMOTE CONTROL UNIT (CONT).

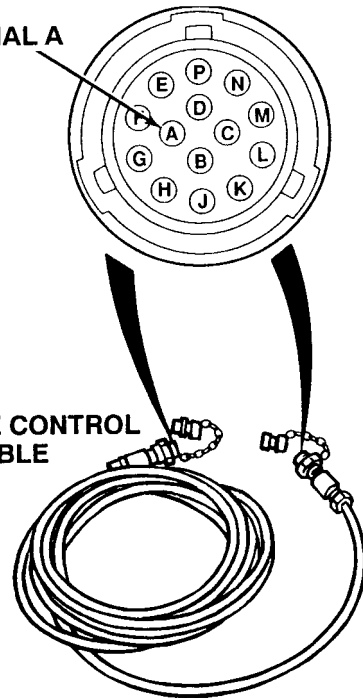


WARNING

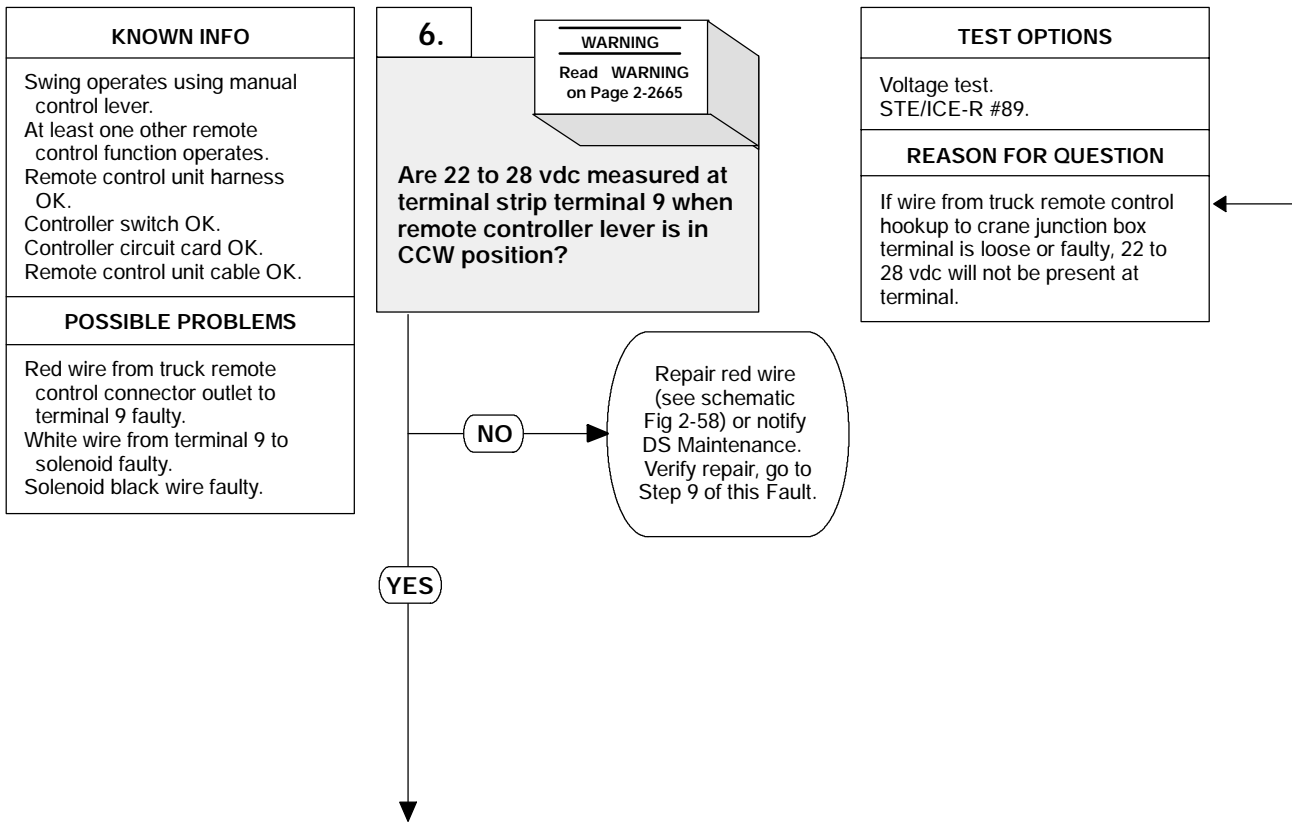
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect remote control unit cable from truck and remote control unit (TM 9-2320-364-10).
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between cable connector terminal A at both ends?
 - (a) If there is no continuity, replace cable.
 - (b) If there is continuity, connect cable to truck hookup and remote control unit hookup and go to Step 6 of this Fault.

TERMINAL A**REMOTE CONTROL
UNIT CABLE**

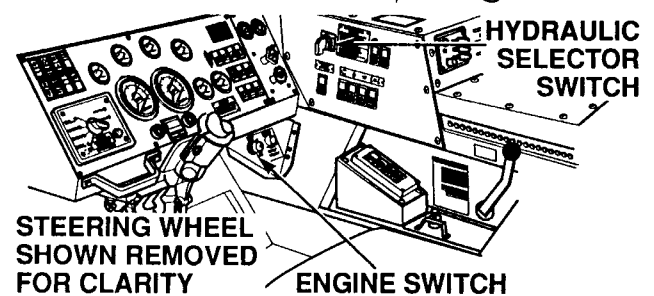
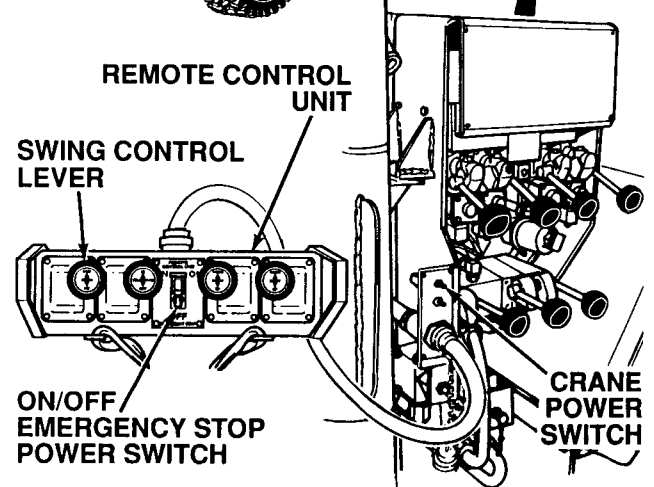
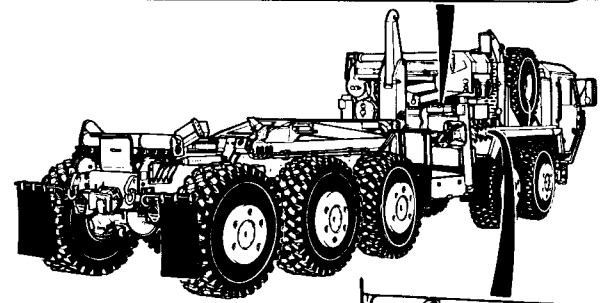
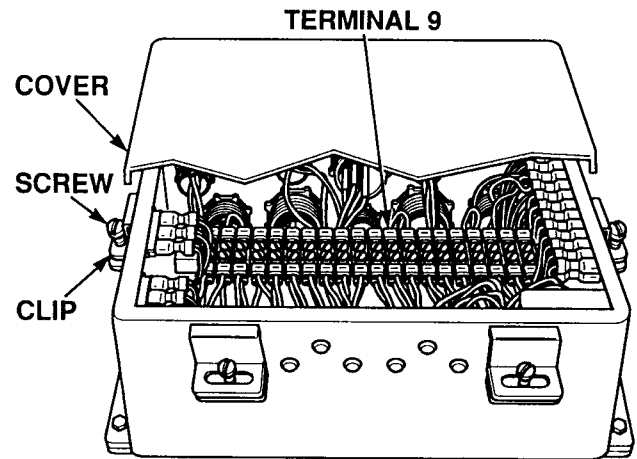
9. CRANE WILL NOT SWING CCW USING REMOTE CONTROL UNIT (CONT).



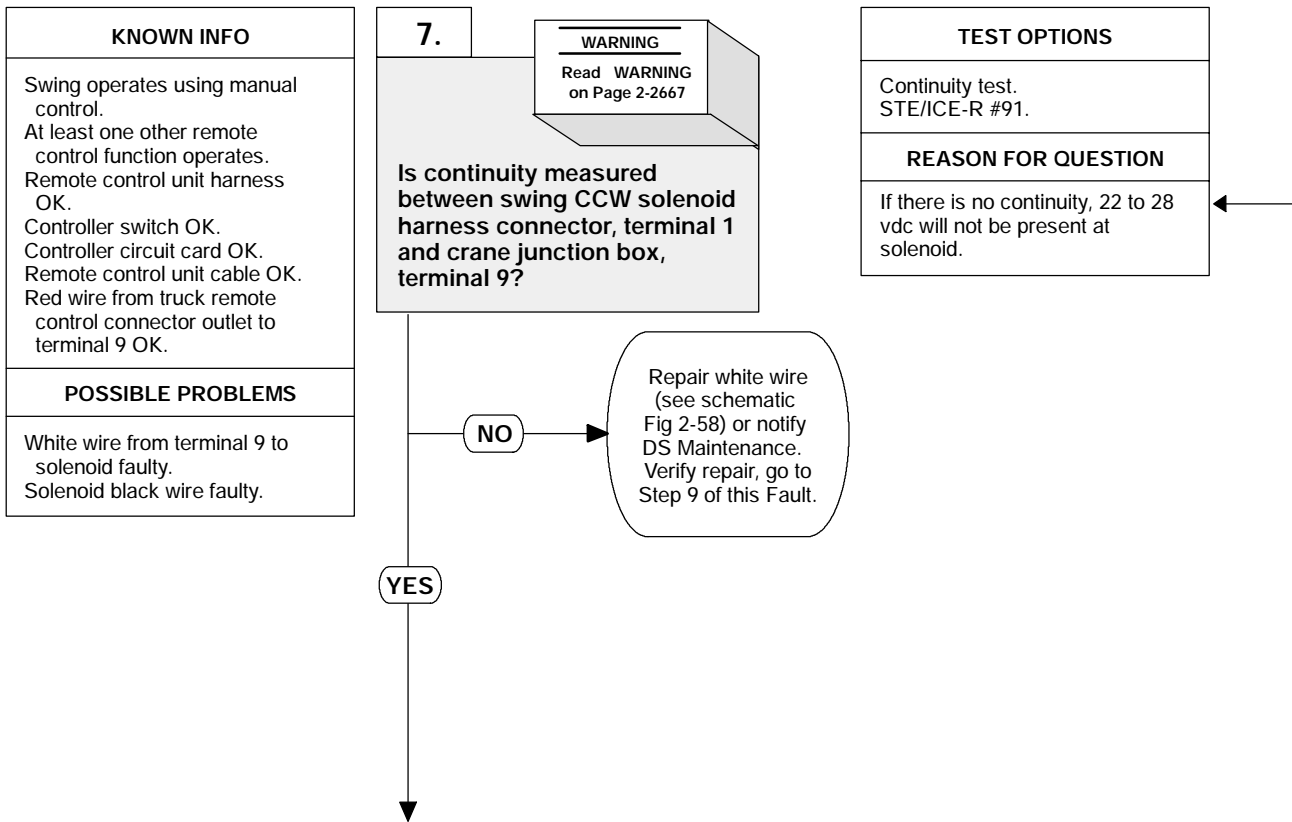
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST | |
|--------------|--|
| (1) | Loosen six screws, clips and remove crane junction box cover. |
| (2) | Set multimeter select switch to volts. |
| (3) | Connect positive (+) multimeter lead to crane junction box, terminal 9. |
| (4) | Connect negative (-) multimeter lead to a known good ground. |
| (5) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (6) | Set hydraulic selector switch to CRANE/SRW position. |
| (7) | Set crane POWER switch to ON position. |
| (8) | Set remote control ON/OFF EMERGENCY STOP power switch to ON. |
| (9) | Put remote control unit SWING control lever in the CCW position. |
| (a) | If 22 to 28 vdc are not present, perform Step (10) below and repair red wire from truck remote control hookup to terminal 9 (see schematic Fig 2-58) or notify DS Maintenance. |
| (b) | If 22 to 28 vdc are present, perform Step (10) below and go to Step 7 of this Fault. |
| (10) | Put the following switches in OFF position: remote control ON/OFF EMERGENCY STOP power switch, crane POWER switch, hydraulic selector switch and ENGINE switch. |



9. CRANE WILL NOT SWING CCW USING REMOTE CONTROL UNIT (CONT).

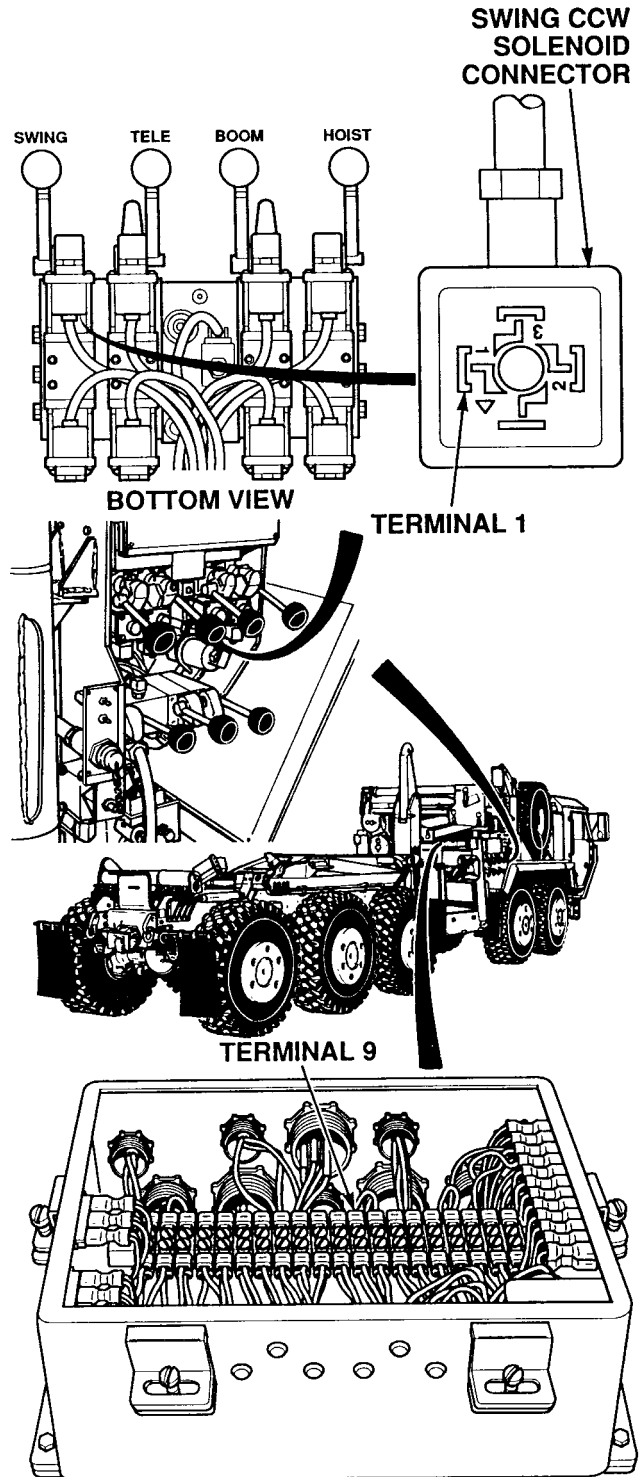


WARNING

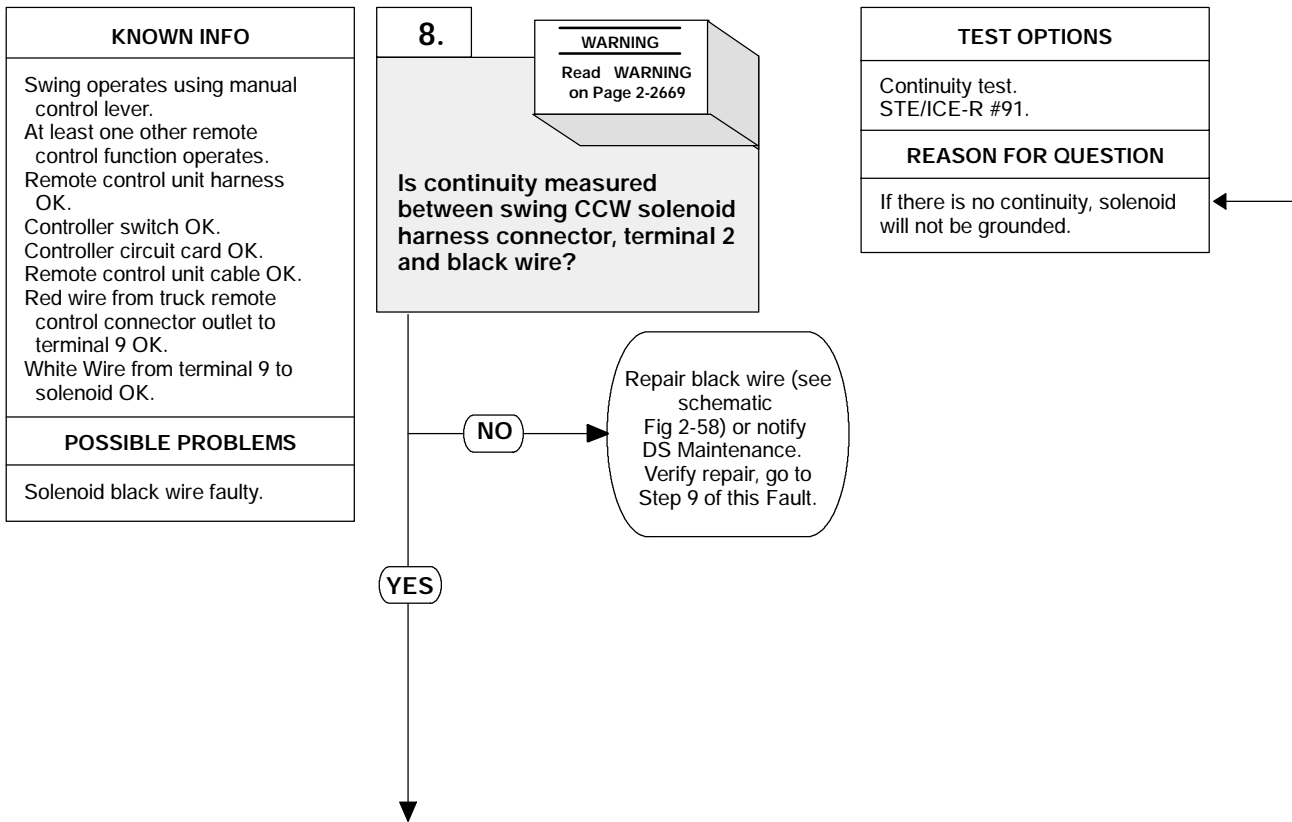
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between connector, terminal 1 and crane main junction box, terminal 9?
 - (a) If there is no continuity, repair connector white wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, white wire is OK.



9. CRANE WILL NOT SWING CCW USING REMOTE CONTROL UNIT (CONT).

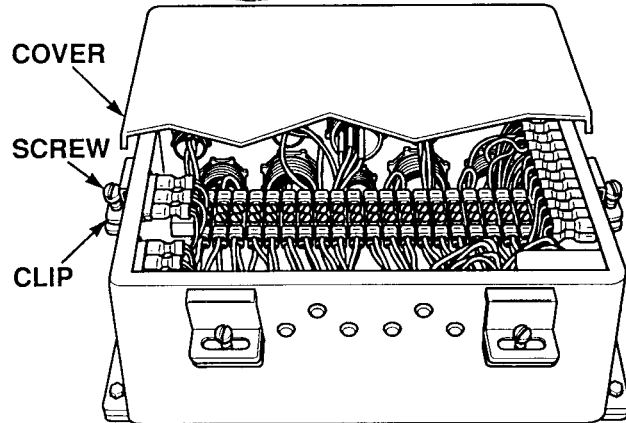
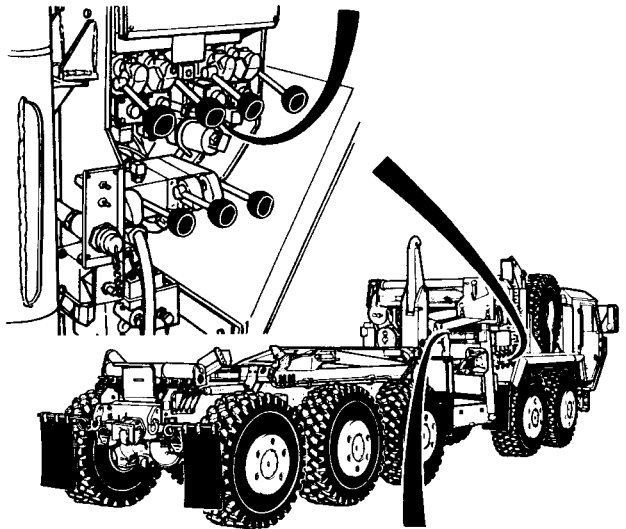
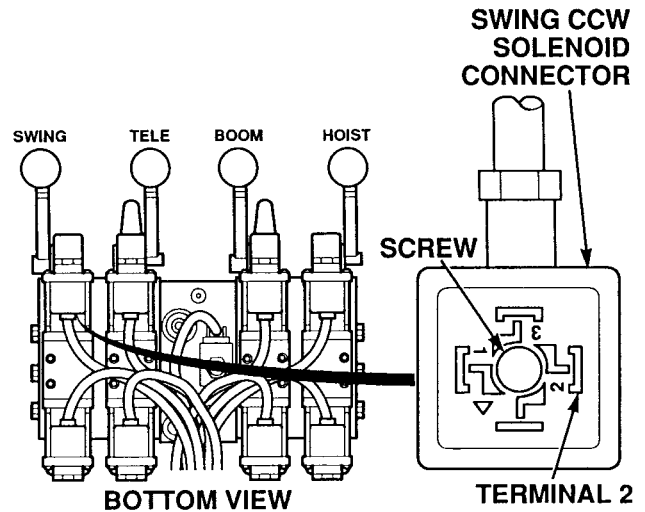


WARNING

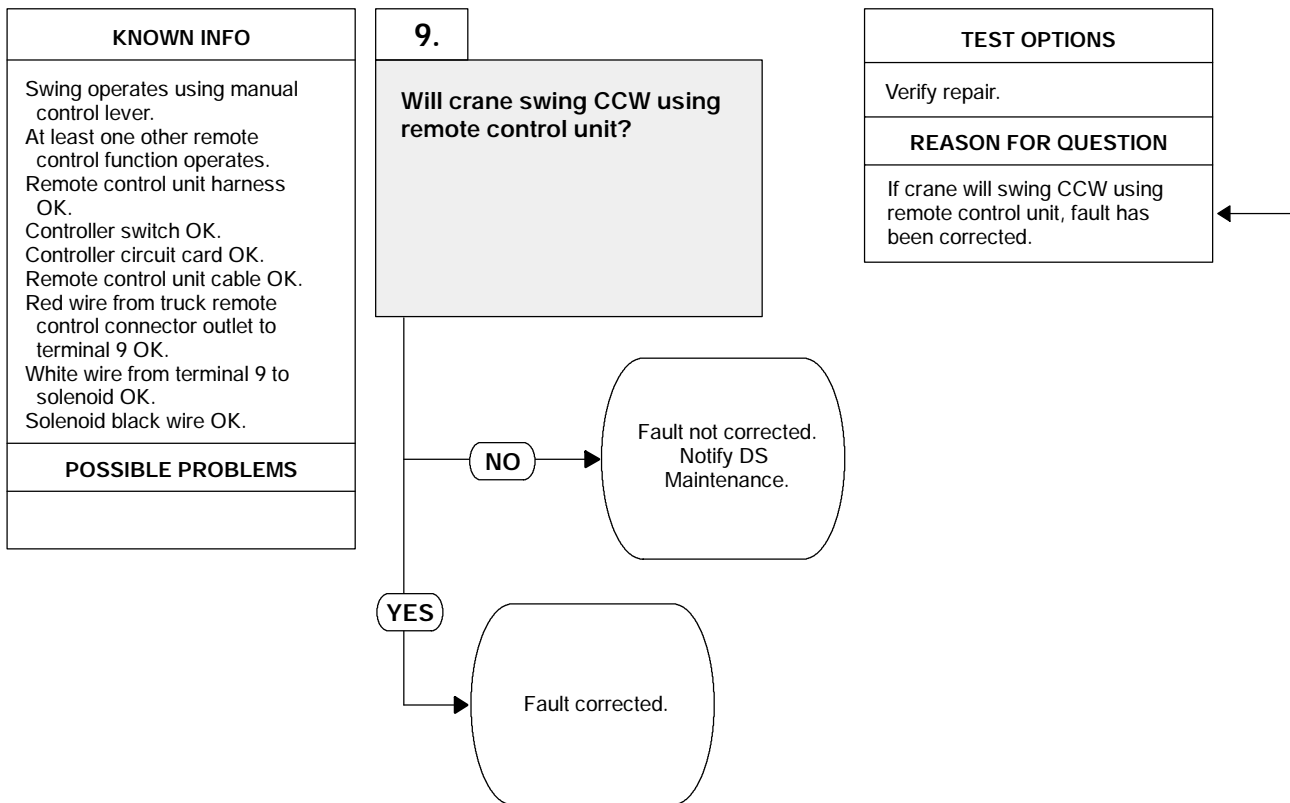
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Is there continuity between connector, terminal 2 and a known good ground?
 - (a) If there is no continuity, repair connector black wire (see schematic Fig 2-58) or notify DS Maintenance and perform Steps (2) and (3) below.
 - (b) If there is continuity, perform Steps (2) and (3) below and go to Step 9 of this Fault.
- (2) Install connector on swing control solenoid and tighten screw.
- (3) Install crane junction box cover with six clips and screws.

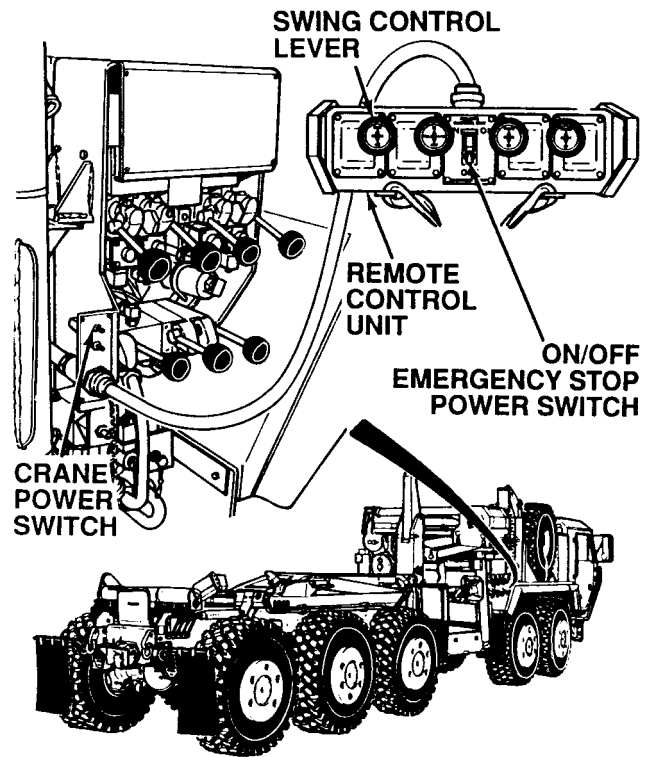


9. CRANE WILL NOT SWING CCW USING REMOTE CONTROL UNIT (CONT).



VERIFY REPAIR

- (1) Connect remote control unit cable to truck hookup and remote control unit hookup (TM 9-2320-364-10).
- (2) Operate crane using remote control unit.
 - (a) If crane will not swing CCW using remote control unit, fault not corrected. Notify DS Maintenance.
 - (b) If crane swings CCW, fault has been corrected.



2-29. CRANE TROUBLESHOOTING (CONT).

10. OUTRIGGERS DO NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

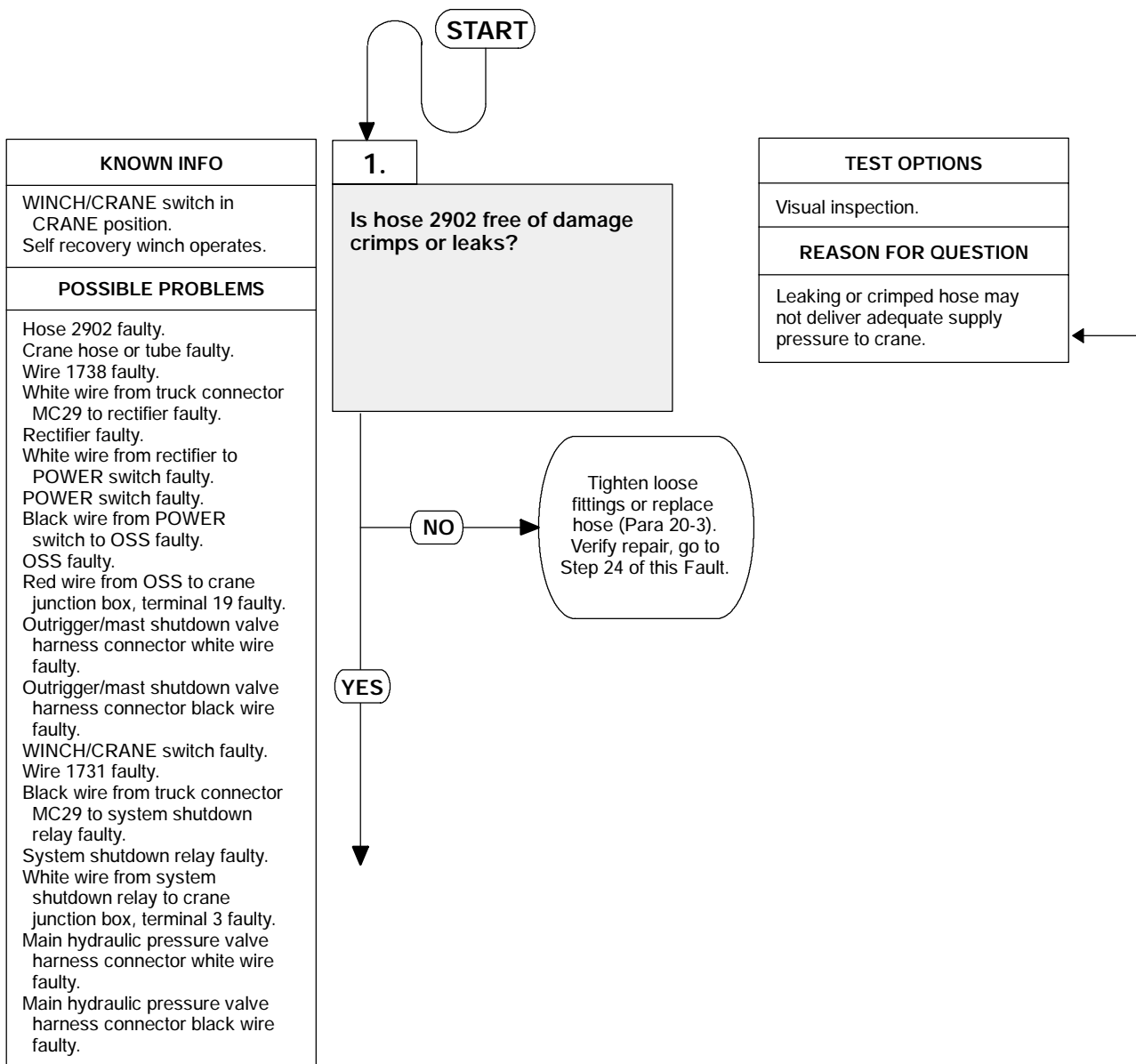
Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

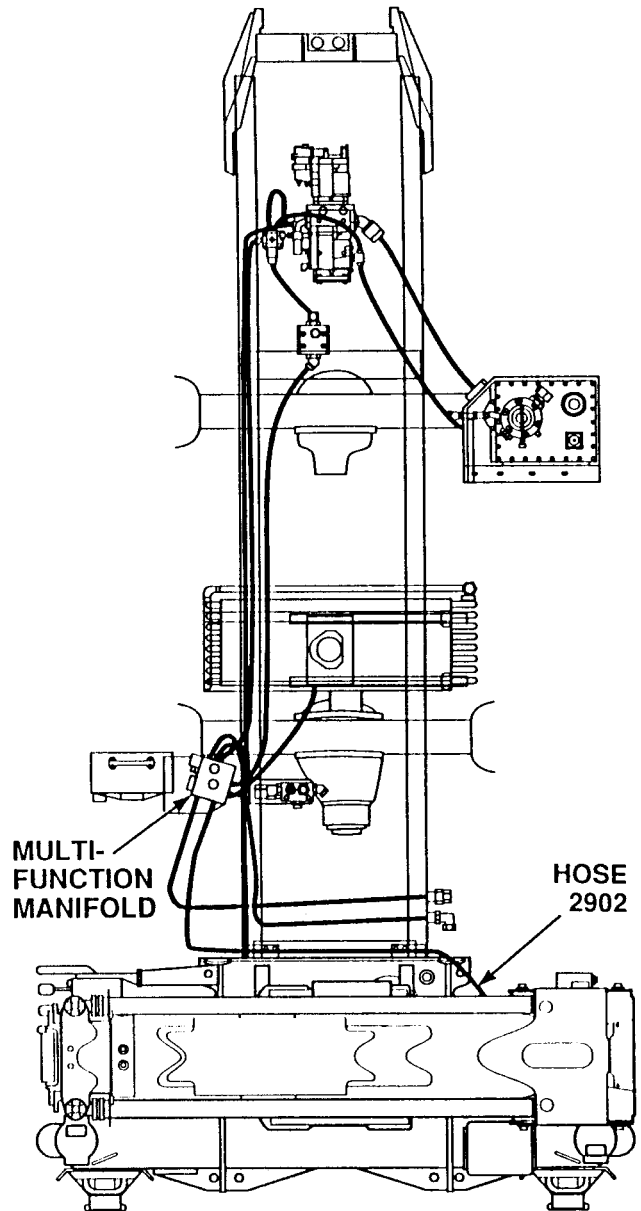
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)

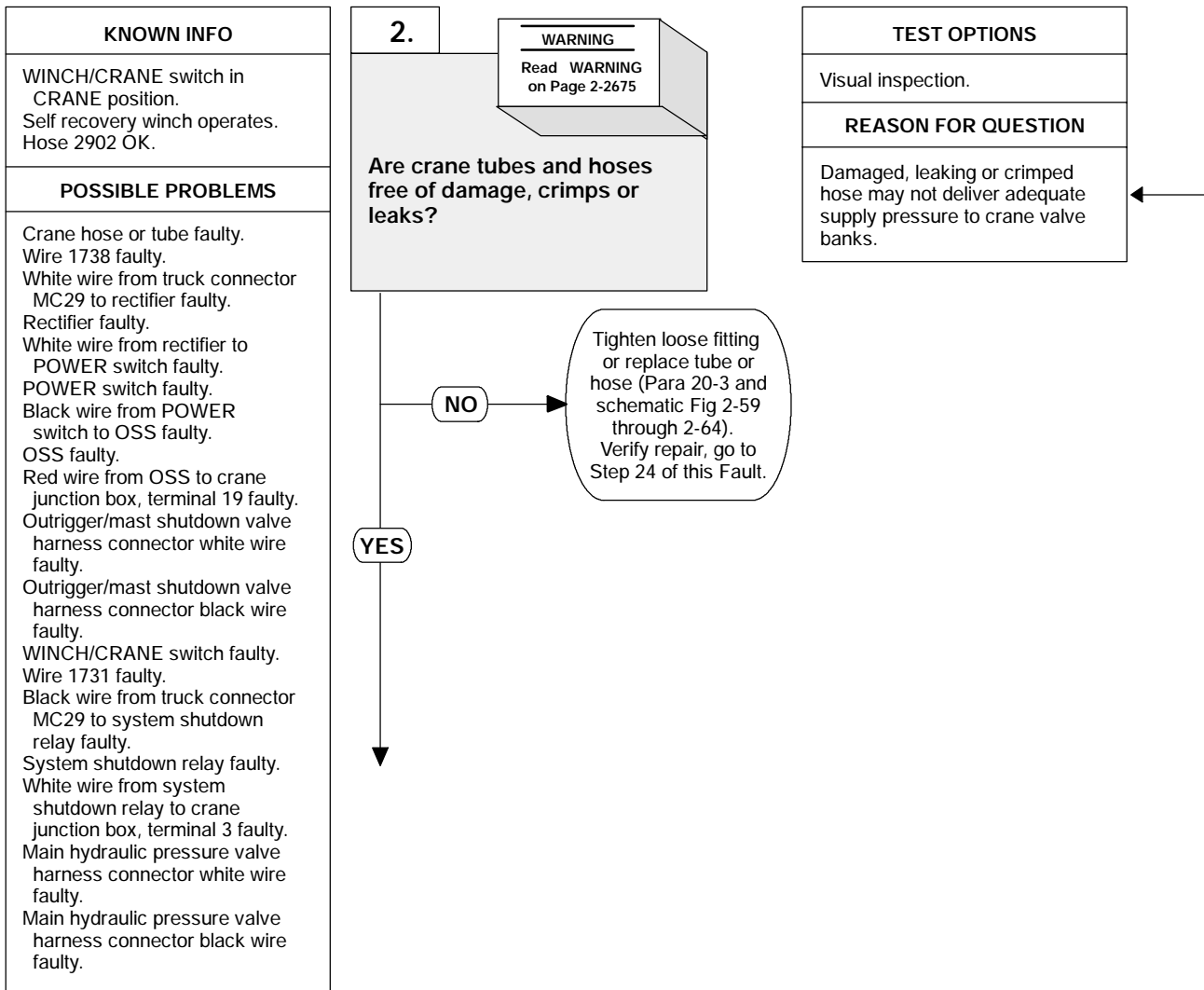


VISUAL INSPECTION

- Inspect hose 2902 for leaks and crimps.
- (1) If hose is found to be leaking or crimped, replace hose (Para 20-3).
 - (2) If hose is not leaking or crimped, go to Step 2 of this Fault.



10. OUTRIGGERS DO NOT OPERATE (CONT).

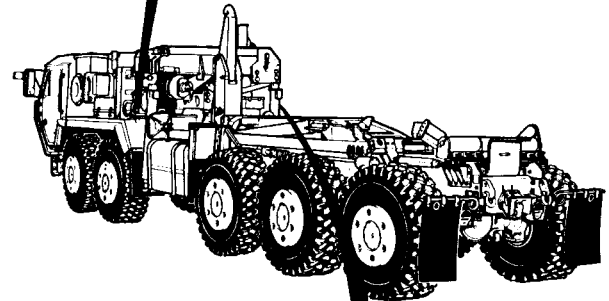
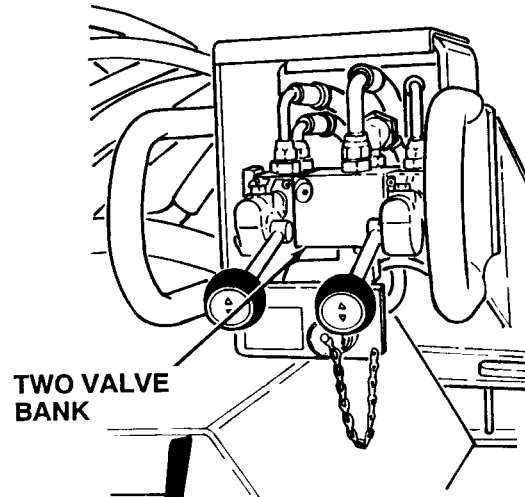


WARNING

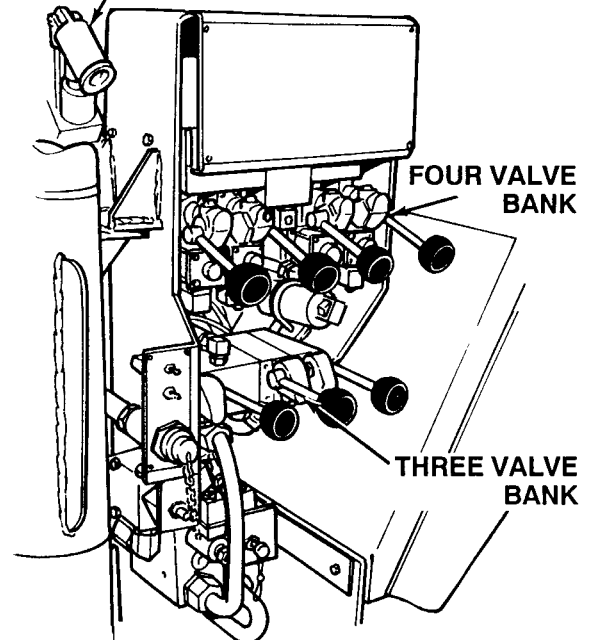
High pressure hydraulics [oil under 3,100 psi (21,374 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

VISUAL INSPECTION

- (1) Inspect all tubes around crane control valve banks and hand pump.
 - (a) If tube is damaged, crimped or leaking, tighten loose fitting or replace tube (Para 20-3 and schematic Fig 2-59 through 2-64).
 - (b) If tubes are not damaged, crimped or leaking, go to Step (2).
- (2) Inspect all hoses around crane control valve banks.
 - (a) If hose is damaged, crimped or leaking, tighten loose fitting or replace hose (Para 20-3).
 - (b) If hoses are not leaking or crimped, go to Step 3 of this Fault.



HAND PUMP

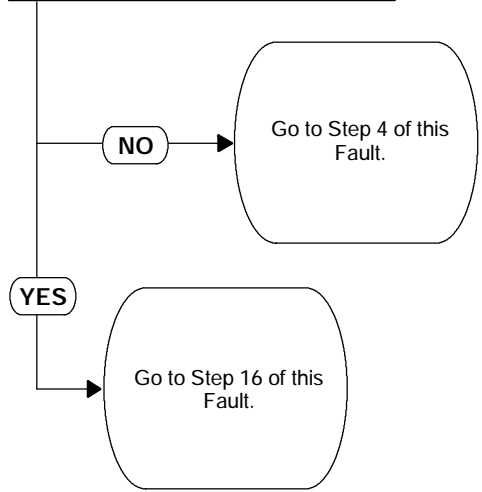


10. OUTRIGGERS DO NOT OPERATE (CONT).

KNOWN INFO
WINCH/CRANE switch in CRANE position. Self recovery winch operates. Crane hoses and tubes OK.
POSSIBLE PROBLEMS
Wire 1738 faulty. White wire from truck connector MC29 to rectifier faulty. Rectifier faulty. White wire from rectifier to POWER switch faulty. POWER switch faulty. Black wire from POWER switch to OSS faulty. OSS faulty. Red wire from OSS to crane junction box, terminal 19 faulty. Outrigger/mast shutdown valve harness connector white wire faulty. Outrigger/mast shutdown valve harness connector black wire faulty. WINCH/CRANE switch faulty. Wire 1731 faulty. Black wire from truck connector MC29 to system shutdown relay faulty. System shutdown relay faulty. White wire from system shutdown relay to crane junction box, terminal 3 faulty. Main hydraulic pressure valve harness connector white wire faulty. Main hydraulic pressure valve harness connector black wire faulty.

3.

Do outriggers operate when main hydraulic pressure valve is overridden?



TEST OPTIONS
Manual override test.
REASON FOR QUESTION
If outriggers operate with valve manually overridden, solenoid or component supplying power to solenoid is faulty.

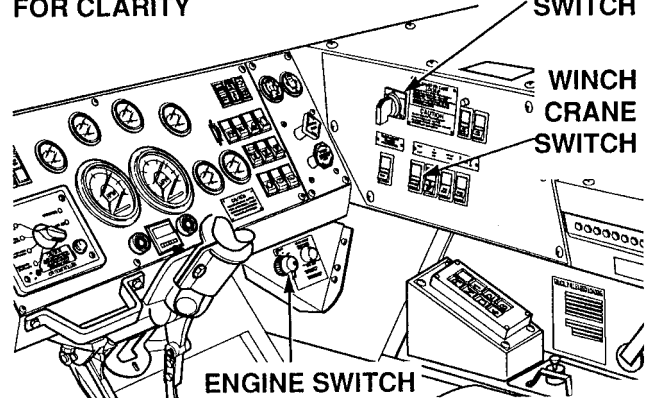


STEERING WHEEL
SHOWN REMOVED
FOR CLARITY

HYDRAULIC
SELECTOR
SWITCH

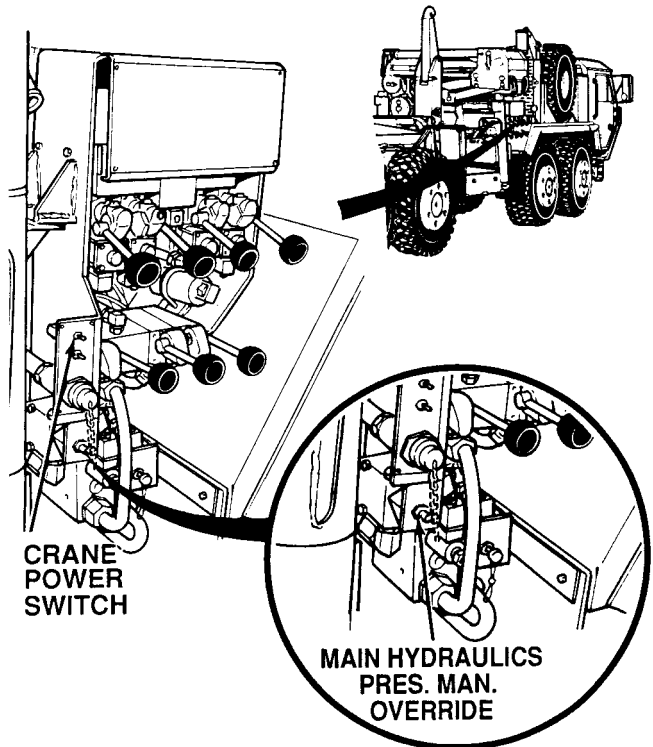
WINCH
CRANE
SWITCH

ENGINE SWITCH



MANUAL OVERRIDE TEST

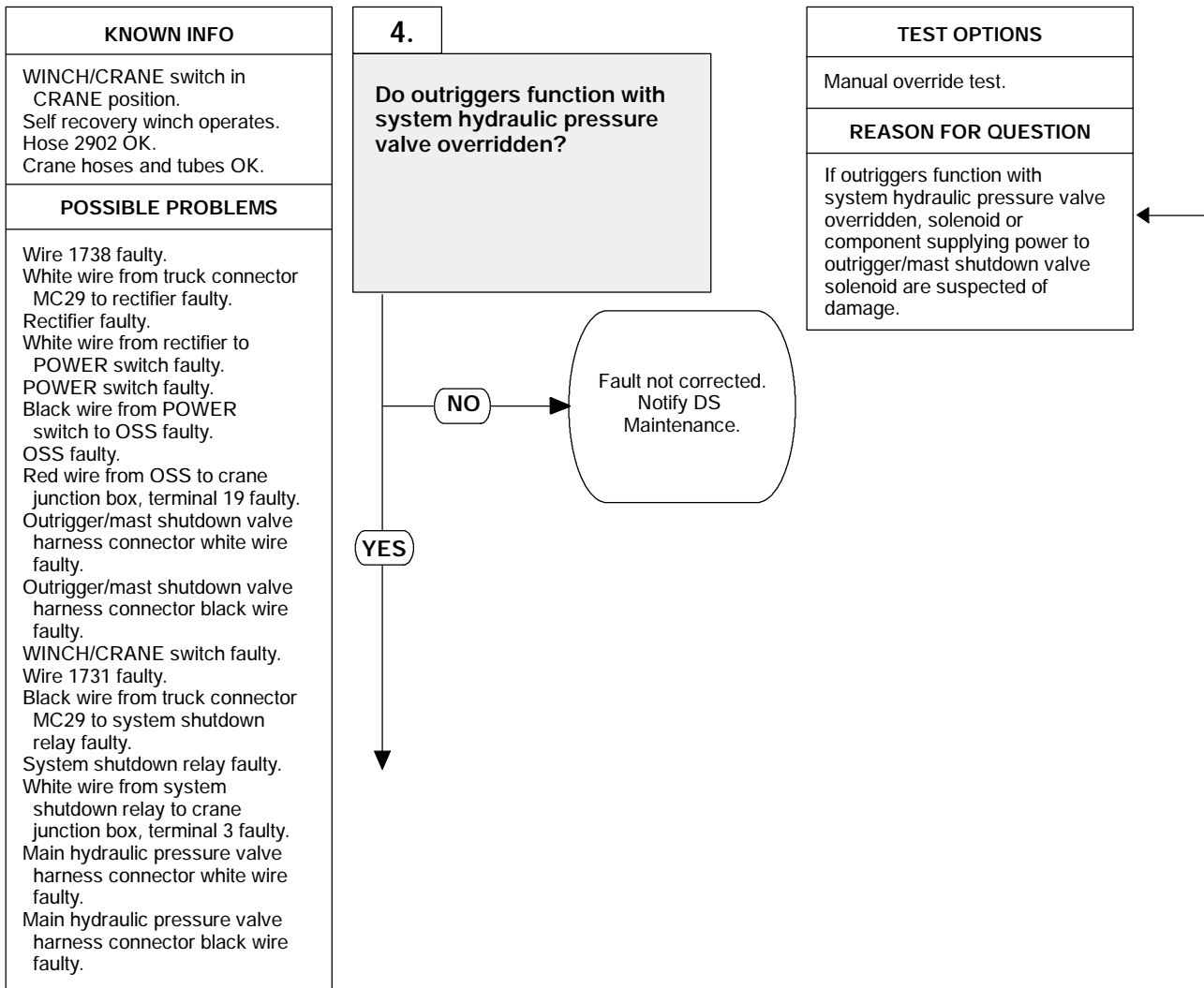
- (1) START engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch to CRANE/SRW position.
- (3) Turn ON crane POWER switch.
- (4) Release MHC MAIN HYDRAULIC PRESSURE MANUAL OVERRIDE.
- (5) Operate outriggers.
 - (a) If outriggers function with override released, perform Steps (7) through (9) below and go to Step 4 of this Fault.
 - (b) If outriggers do not function with override released, perform Steps (6) through (9) below and go to Step 16 of this Fault.
- (6) Push in MHC MAIN HYDRAULIC PRESSURE MANUAL OVERRIDE and rotate to lock in position.
- (7) Turn OFF crane POWER switch.
- (8) Set hydraulic selector switch to the OFF position.
- (9) Turn OFF ENGINE switch.

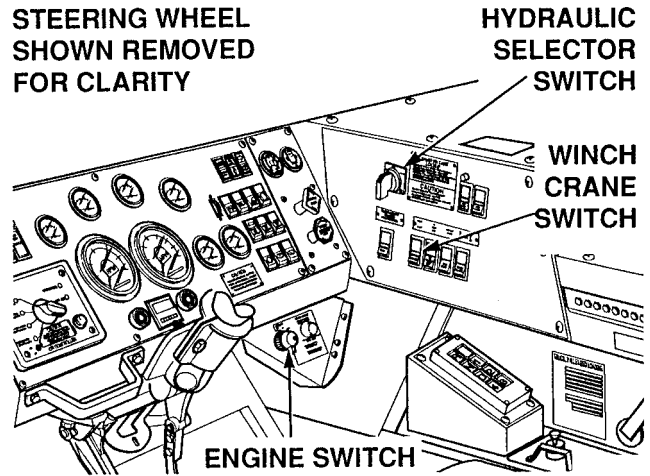


CRANE
POWER
SWITCH

MAIN HYDRAULICS
PRES. MAN.
OVERRIDE

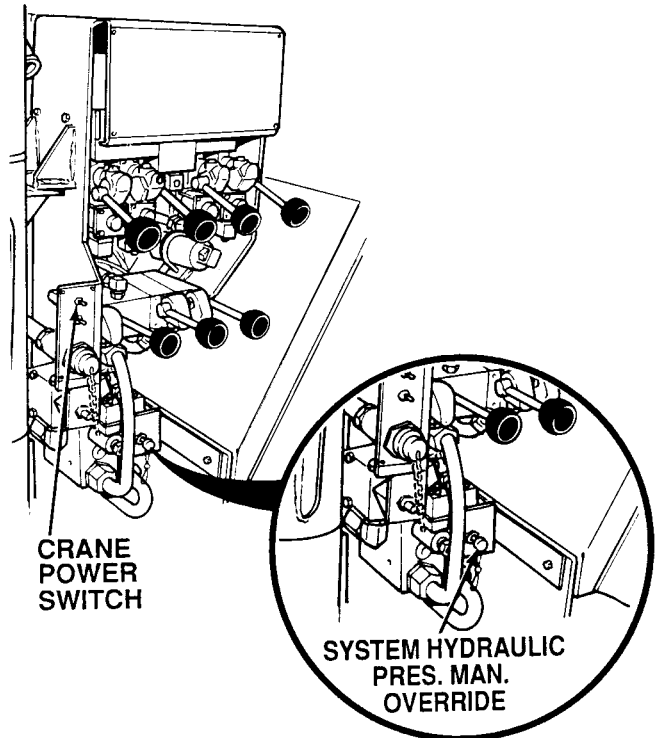
10. OUTRIGGERS DO NOT OPERATE (CONT).



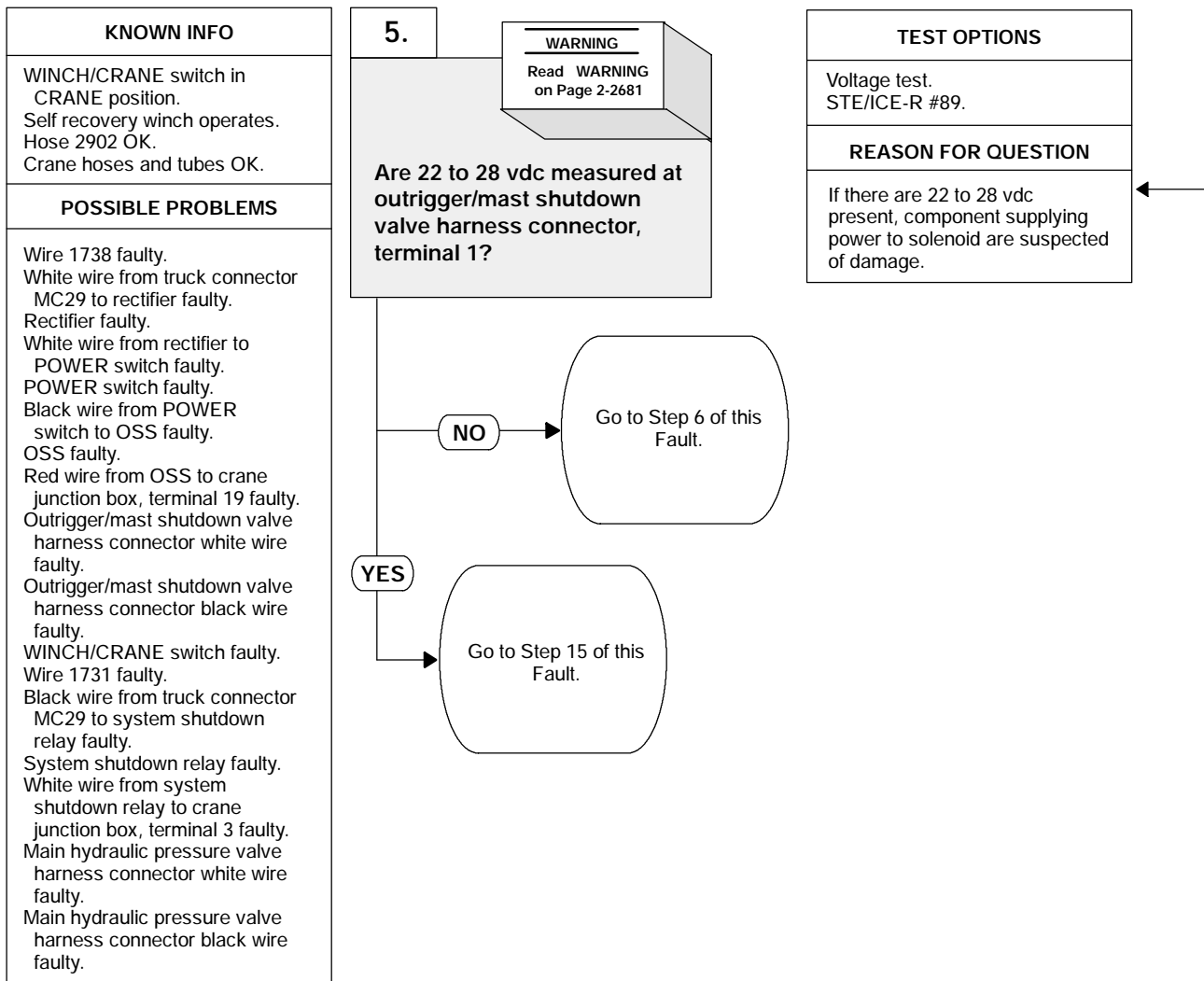


MANUAL OVERRIDE TEST

- (1) START engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch to CRANE/SRW position.
- (3) Turn ON crane POWER switch.
- (4) Remove wire and push MHC SYSTEM HYDRAULIC PRESSURE MANUAL OVERRIDE in and hold in position.
 - (a) If outriggers do not operate with override locked in position, perform Steps (5) through (8) below and notify DS Maintenance.
 - (b) If outriggers operate with override locked in position, perform Steps (5) through (8) below and go to Step 5 of this Fault.
- (5) Unlock and pull out MHC SYSTEM HYDRAULIC PRESSURE MANUAL OVERRIDE.
- (6) Turn OFF crane POWER switch.
- (7) Set hydraulic selector switch to the OFF position.
- (8) Turn OFF ENGINE switch.



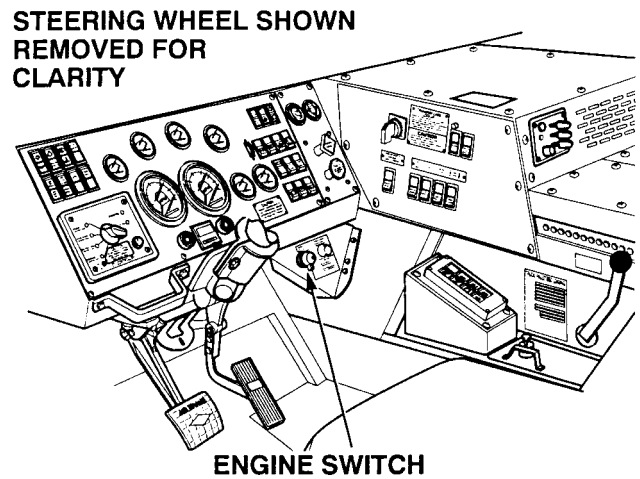
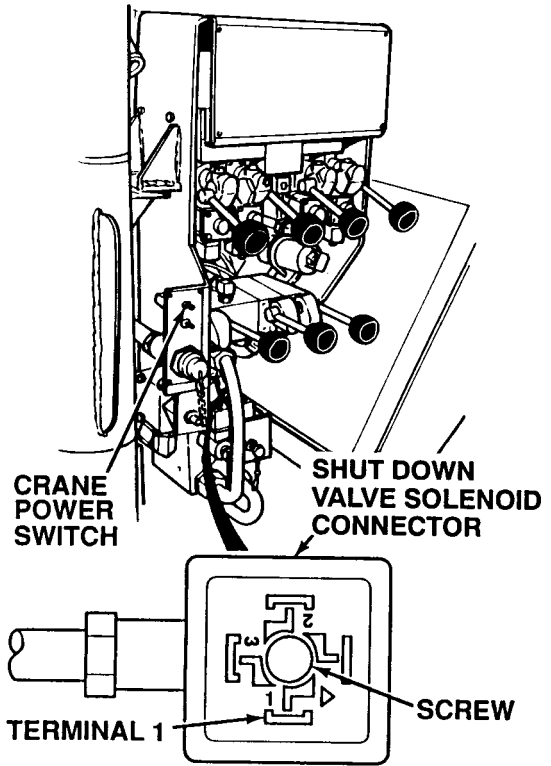
10. OUTRIGGERS DO NOT OPERATE (CONT).



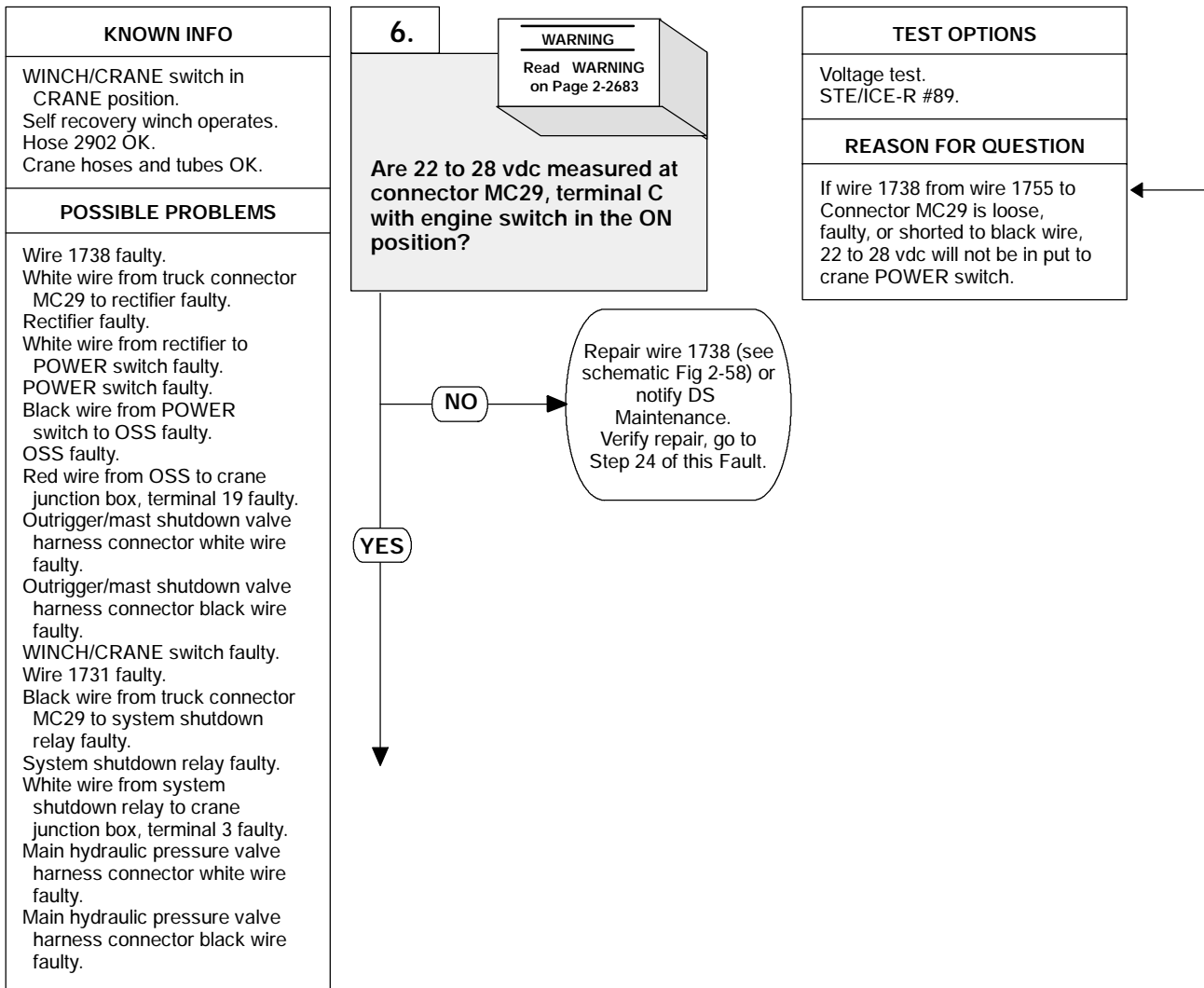
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST |
|--|
| <ol style="list-style-type: none"> (1) Loosen screw and disconnect harness connector from outrigger/mast shutdown valve solenoid. (2) Set multimeter select switch to volts. (3) Connect positive (+) multimeter lead to harness connector, terminal 1. (4) Connect negative (-) multimeter lead to a known good ground. (5) Turn ON ENGINE switch (TM 9-2320-364-10). (6) Turn ON crane POWER switch. <ol style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Steps (7) and (8) below and go to Step 6 of this Fault. (b) If 22 to 28 vdc are present, perform Steps (7) and (8) below and go to Step 15 of this Fault. (7) Turn OFF crane POWER switch. (8) Turn OFF ENGINE switch. |



10. OUTRIGGERS DO NOT OPERATE (CONT).

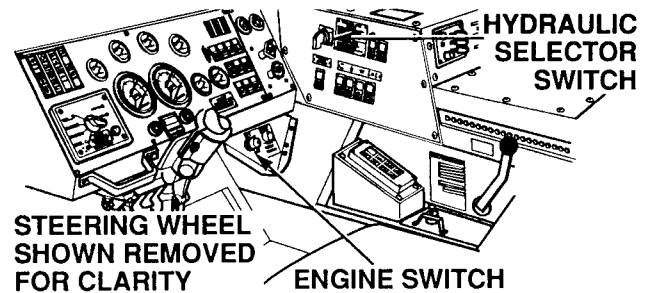
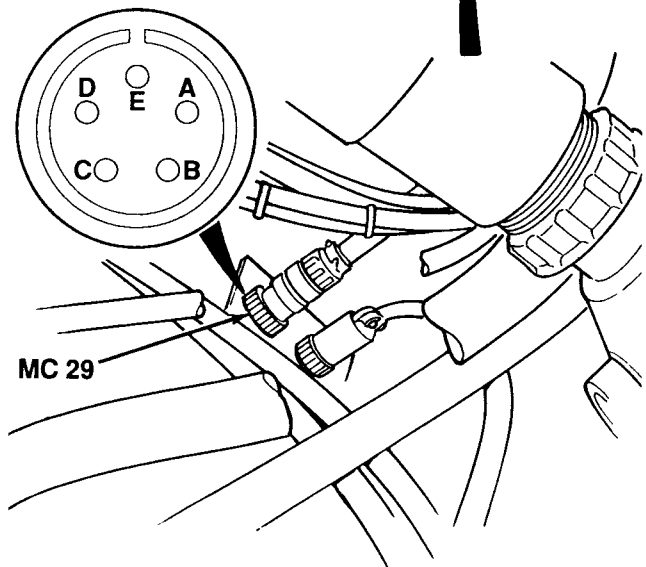
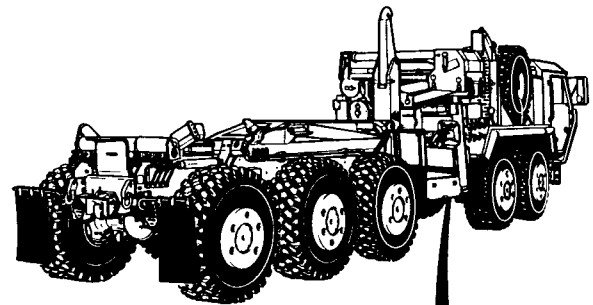


WARNING

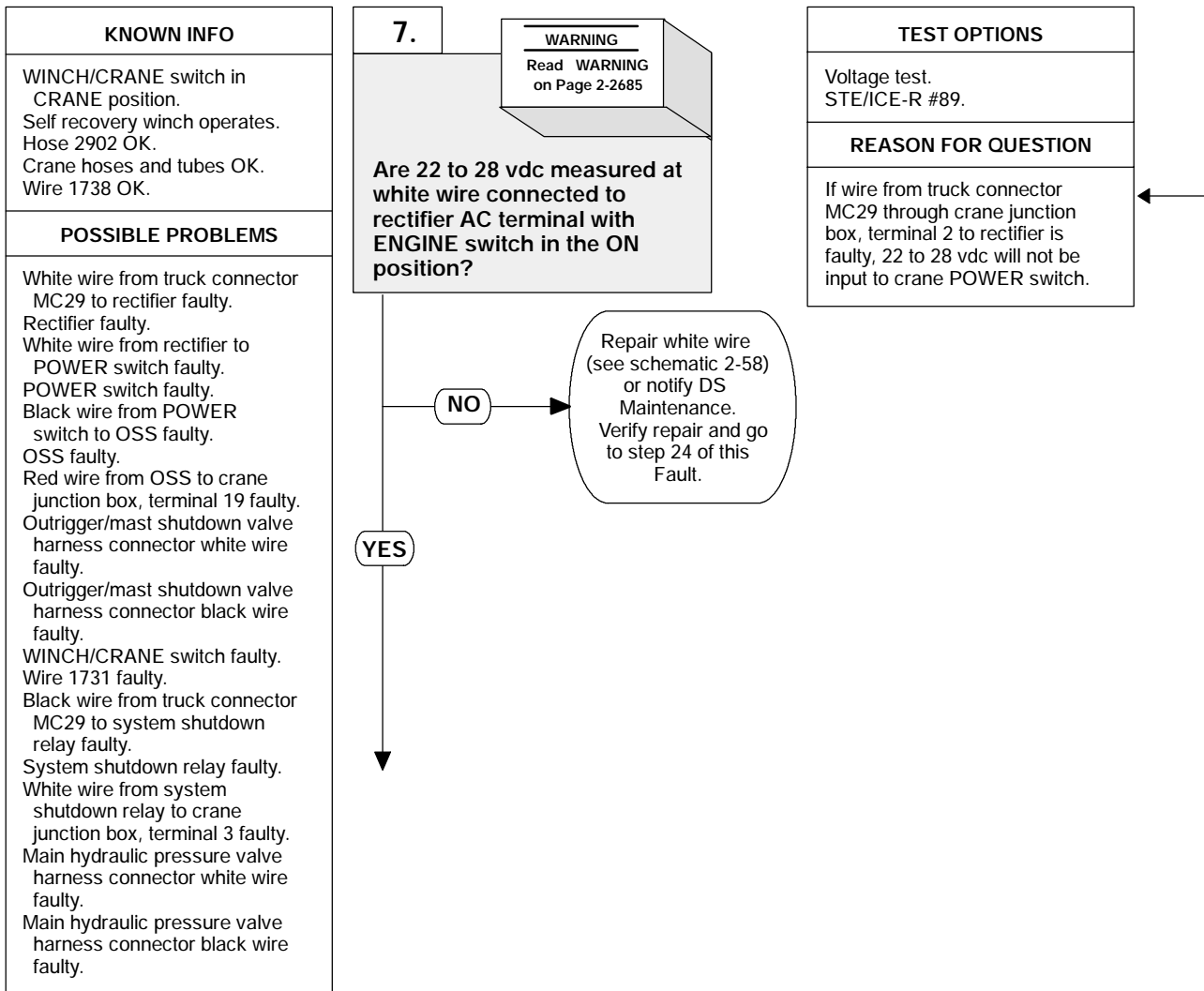
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Disconnect connector MC29 from crane connector.
- (2) Connect positive (+) multimeter lead to connector MC29, terminal C.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Step (5) below and repair wire 1738 from its splice into wire 1755 to connector MC29 (see schematic 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Steps (5) and (6) below and go to Step 7 of this Fault.
- (5) Turn OFF ENGINE switch.
- (6) Connect connector MC29 to crane connector.



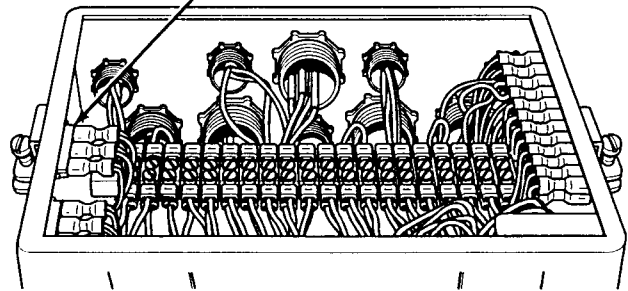
10. OUTRIGGERS DO NOT OPERATE (CONT).



WARNING

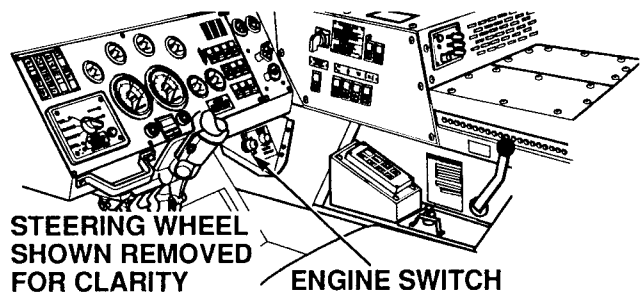
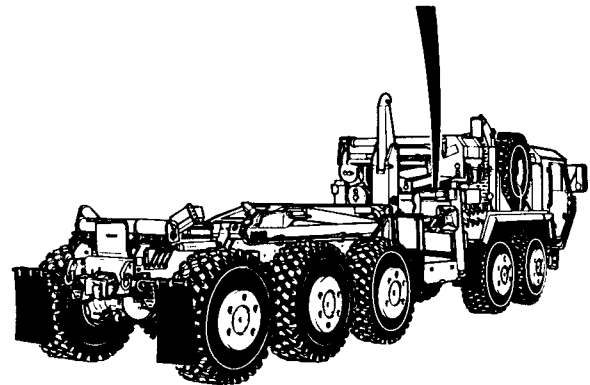
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

RECTIFIER

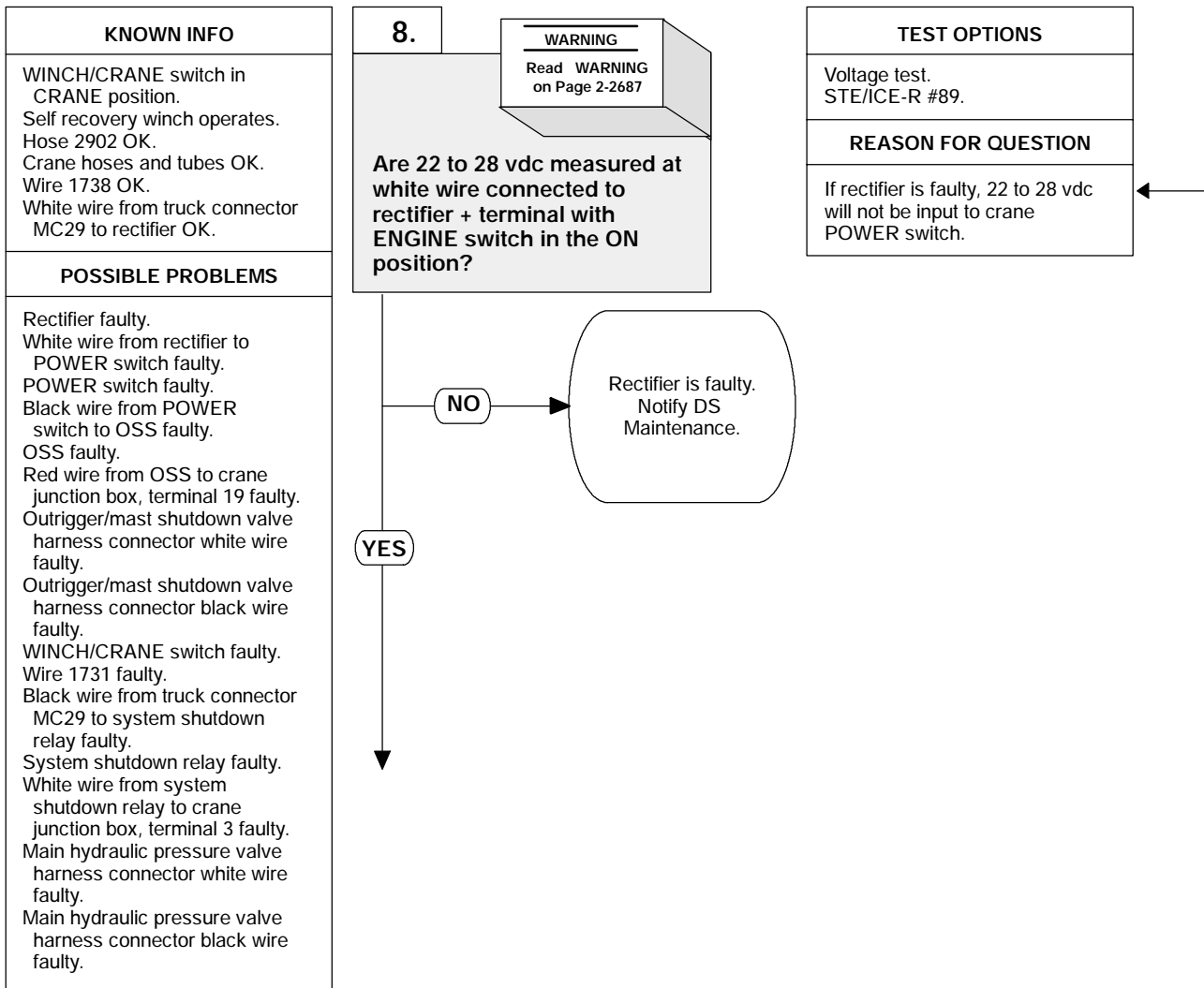


VOLTAGE TEST

- (1) Loosen six screws, clips and remove crane junction box cover.
- (2) Connect positive (+) multimeter lead to front AC terminal of rectifier where white wire is connected.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Step (5) below and repair white wire from connector MC29 through terminal 2 to rectifier (see schematic 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Step (5) below and go to Step (8) of this Fault.
- (5) Turn OFF ENGINE switch.



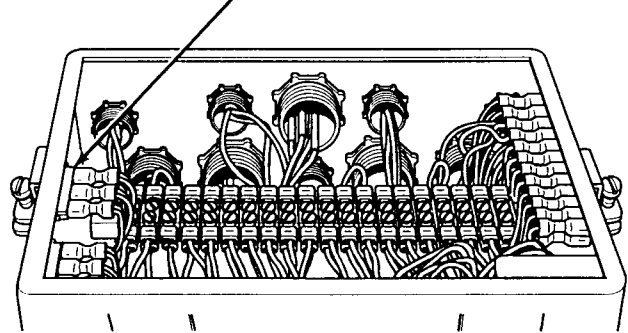
10. OUTRIGGERS DO NOT OPERATE (CONT).



WARNING

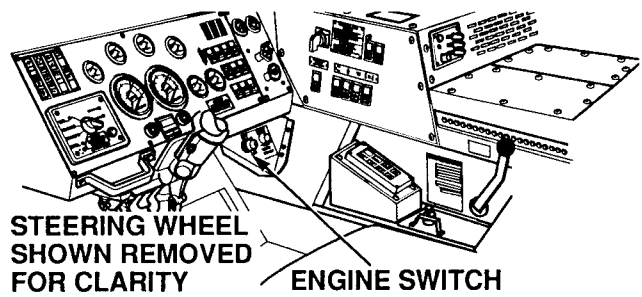
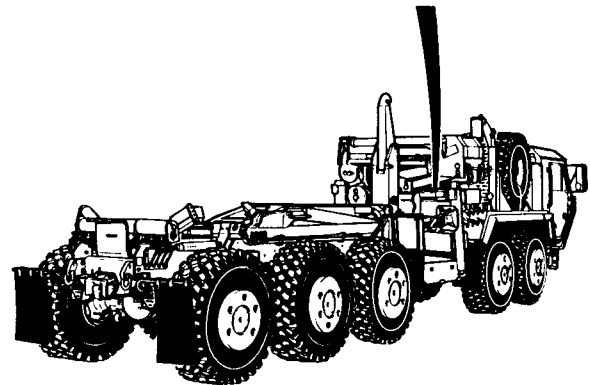
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

RECTIFIER

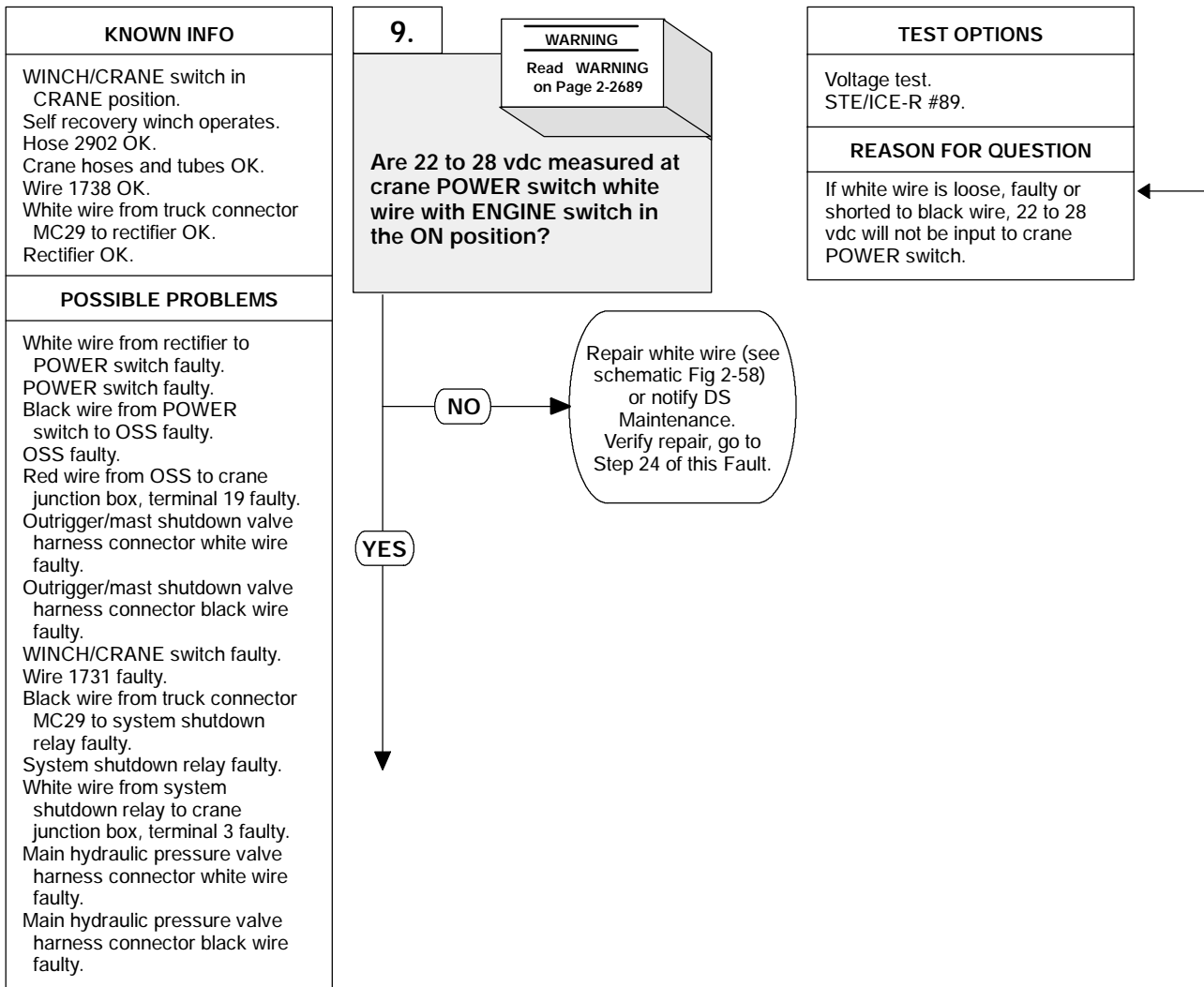


VOLTAGE TEST

- (1) Connect positive (+) multimeter lead to (+) terminal of rectifier.
- (2) Connect negative (-) multimeter lead to a known good ground.
- (3) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Step (4) below and notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Step (4) below and go to Step 9 of this Fault.
- (4) Turn OFF ENGINE switch.



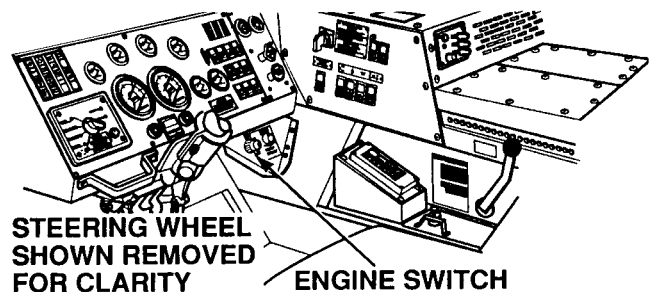
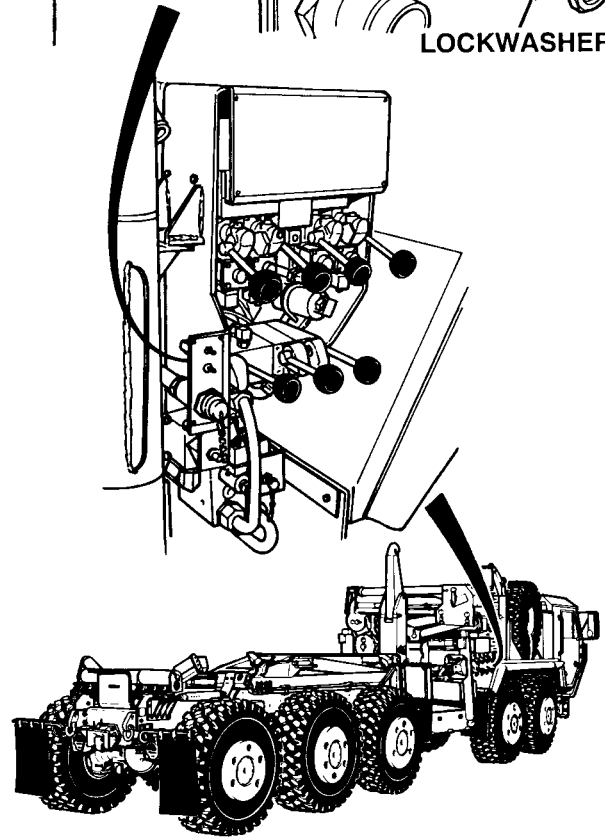
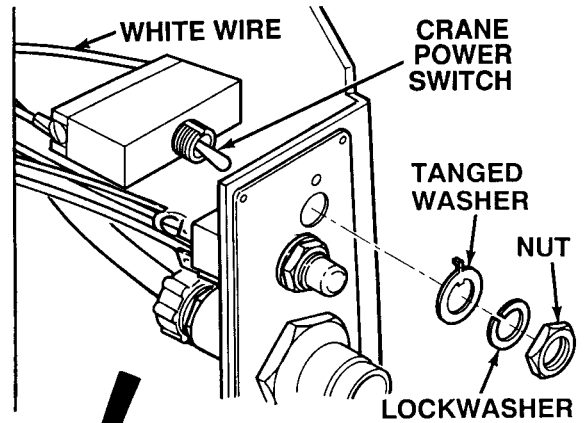
10. OUTRIGGERS DO NOT OPERATE (CONT).



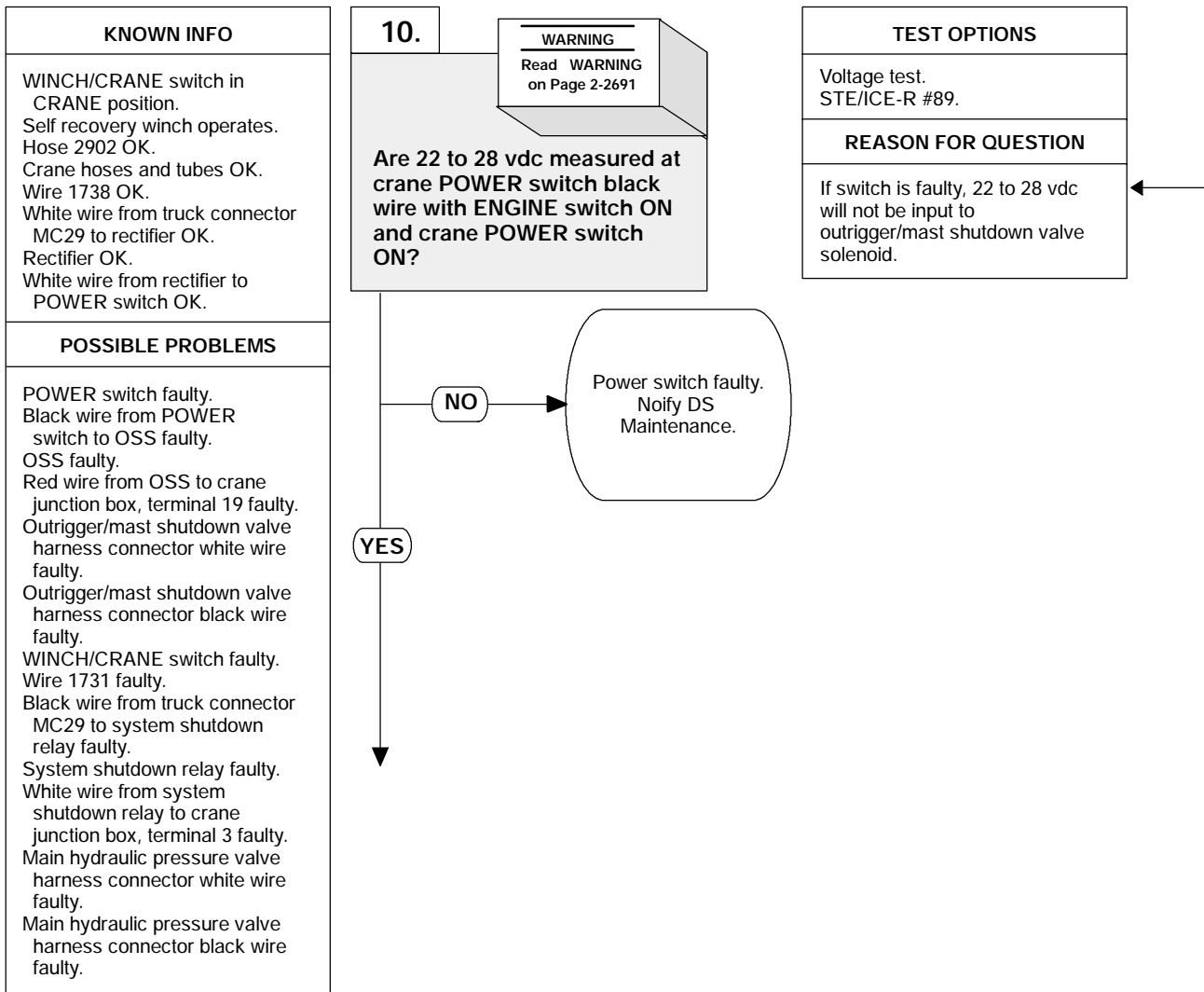
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Remove nut, lockwasher, tanged washer and crane POWER switch.
 - (2) Connect positive (+) multimeter lead to crane POWER switch white wire.
 - (3) Connect negative (-) multimeter lead to a known good ground.
 - (4) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Step (5) below and repair wire from rectifier to crane POWER switch (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Step (5) below and go to Step 10 of this Fault.
 - (5) Turn OFF ENGINE switch.

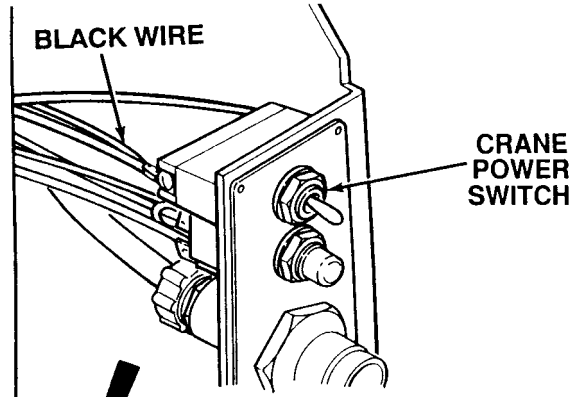


10. OUTRIGGERS DO NOT OPERATE (CONT).

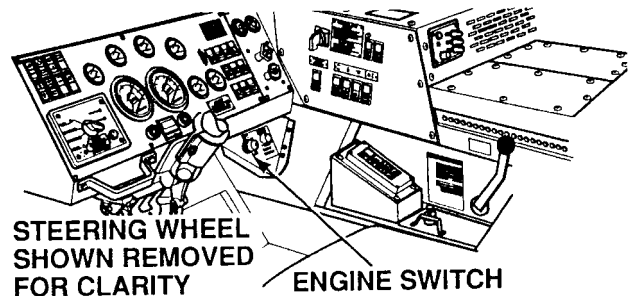
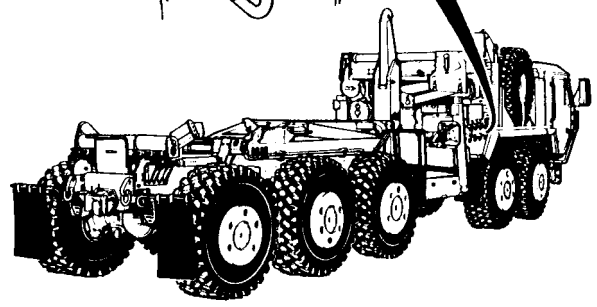
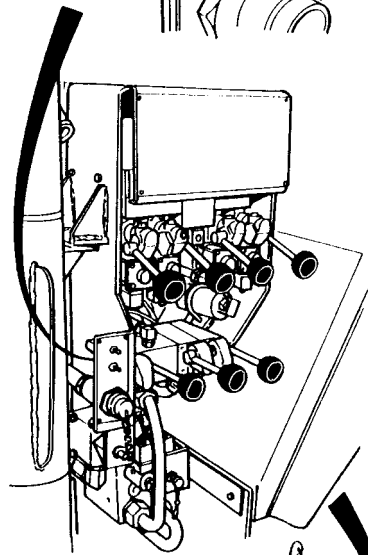


WARNING

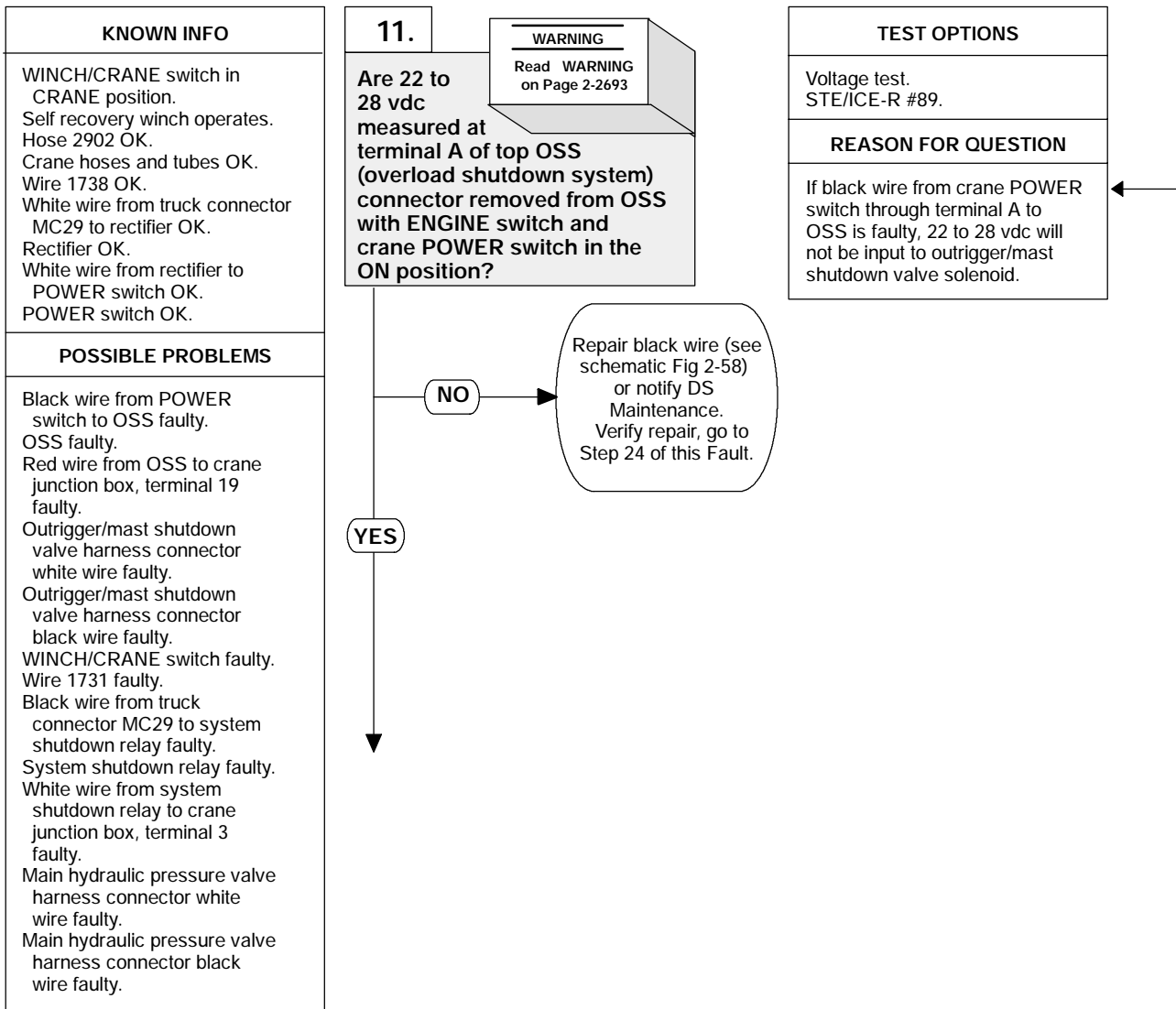
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- VOLTAGE TEST**
- (1) Connect positive (+) multimeter lead to crane POWER switch black wire.
 - (2) Connect negative (-) multimeter lead to a known good ground.
 - (3) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (4) Turn ON crane POWER switch.
 - (a) If 22 to 28 vdc are not present, power switch faulty, perform Steps (5) through (7) below and notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, install switch, perform Steps (5) through (7) below and go to Step 11 of this Fault.
 - (5) Install crane POWER switch, tanged washer, lockwasher and nut.
 - (6) Turn OFF crane POWER switch.
 - (7) Turn OFF ENGINE switch.



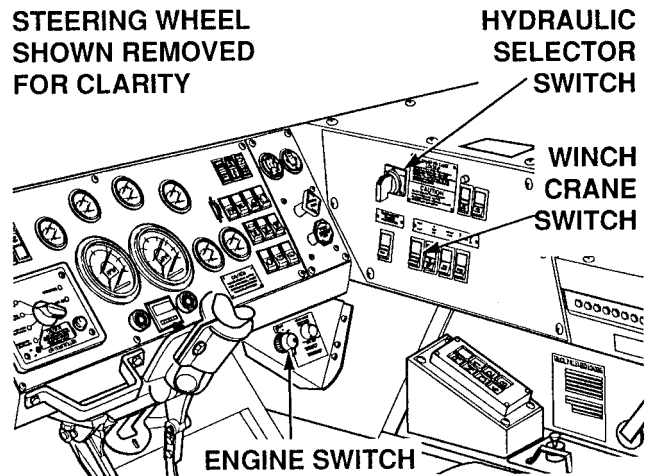
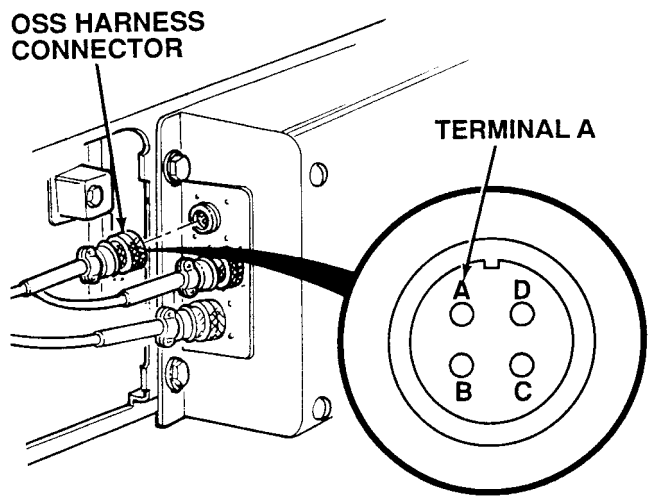
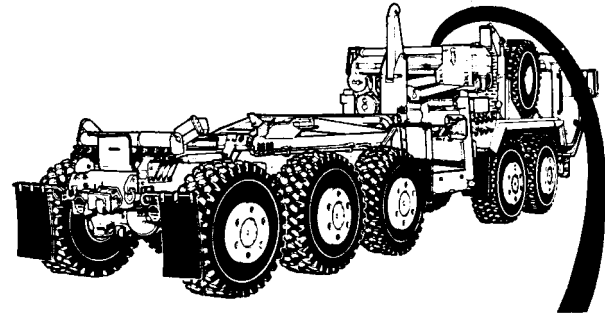
10. OUTRIGGERS DO NOT OPERATE (CONT).



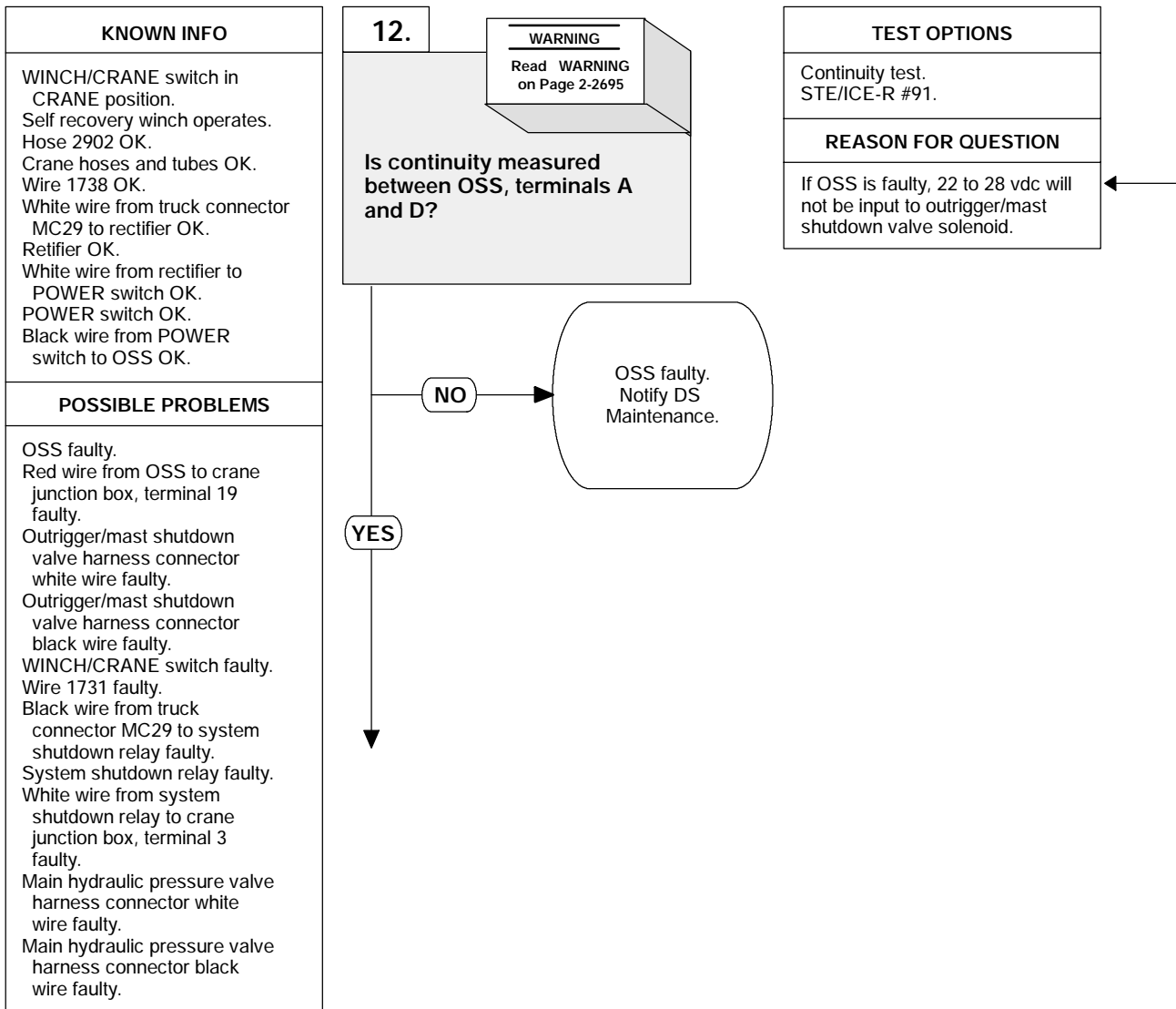
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST | |
|--------------|---|
| (1) | Disconnect top connector from OSS. |
| (2) | Connect positive (+) multimeter lead to terminal A of removed connector. |
| (3) | Connect negative (-) multimeter lead to a known good ground. |
| (4) | Turn ON ENGINE switch
TM 9-2320-364-10). |
| (5) | Turn ON crane POWER switch. |
| (a) | If 22 to 28 vdc are not present, perform Steps (6) and (7) below and repair black wire from POWER switch through terminal A to connector (see schematic Fig 2-58) or notify DS Maintenance. |
| (b) | If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 12 of this Fault. |
| (6) | Turn OFF crane POWER switch. |
| (7) | Turn OFF ENGINE switch. |



10. OUTRIGGERS DO NOT OPERATE (CONT).

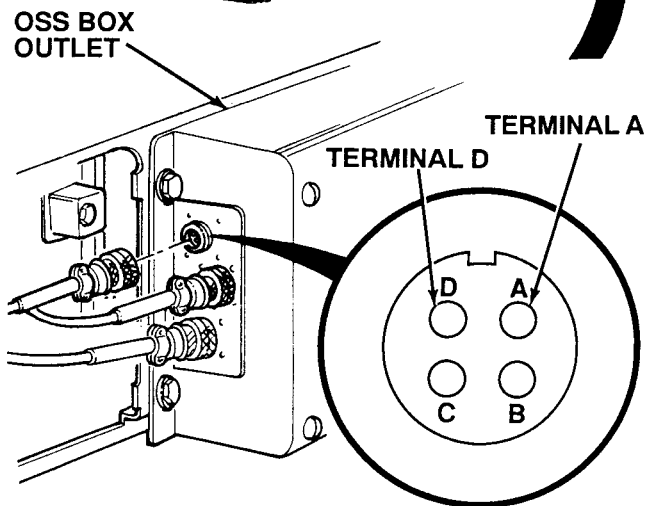
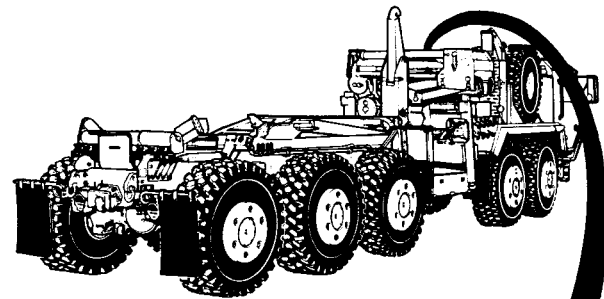


WARNING

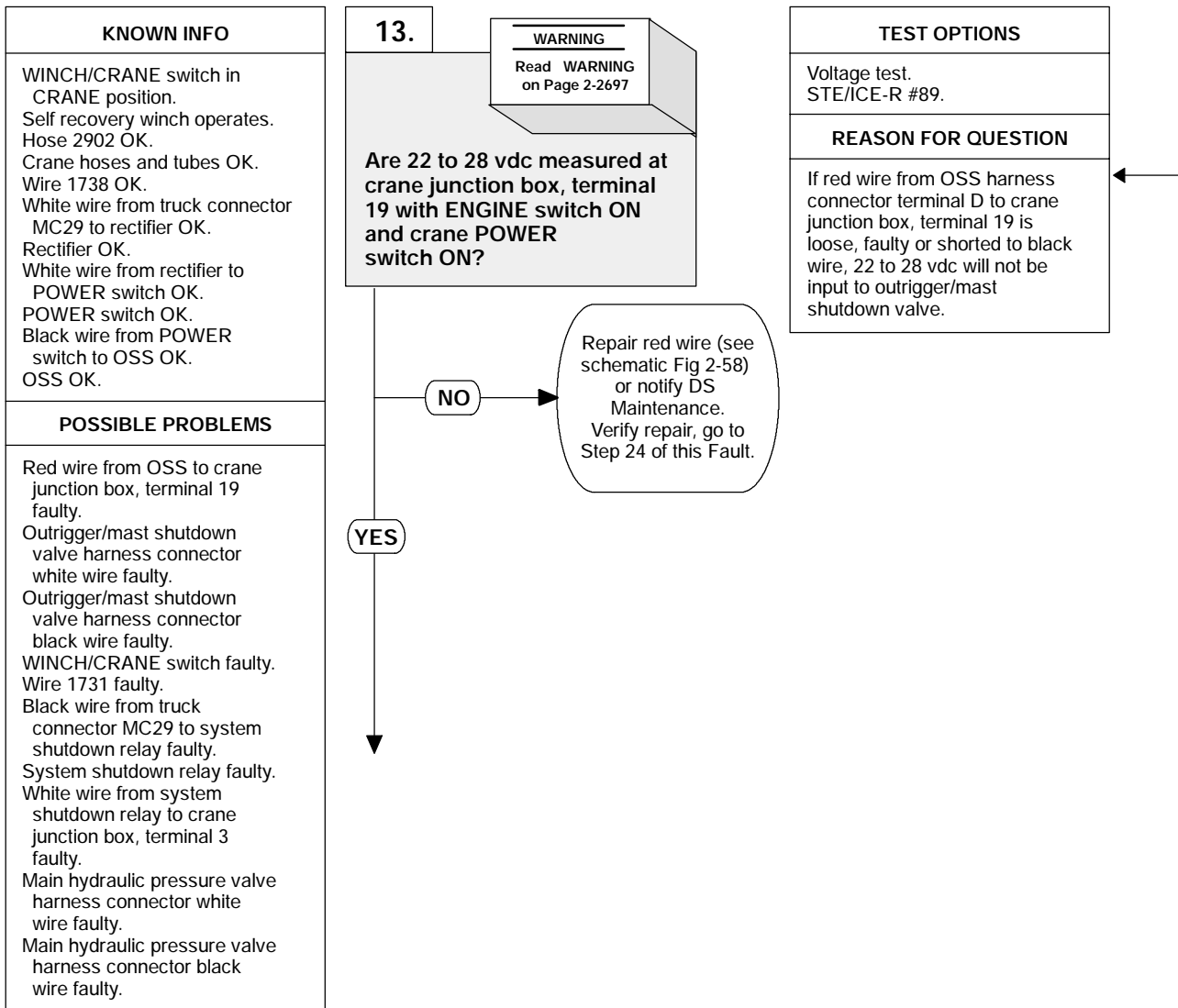
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between OSS top outlet, terminals D and A?
 - (a) If there is no continuity, OSS is faulty, notify DS Maintenance.
 - (b) If there is continuity present, OSS is OK, perform Step (3) below and go to Step 13 of this Fault.
- (3) Connect connector to top OSS outlet.



10. OUTRIGGERS DO NOT OPERATE (CONT).



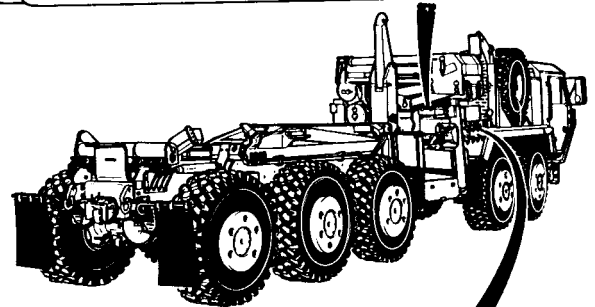
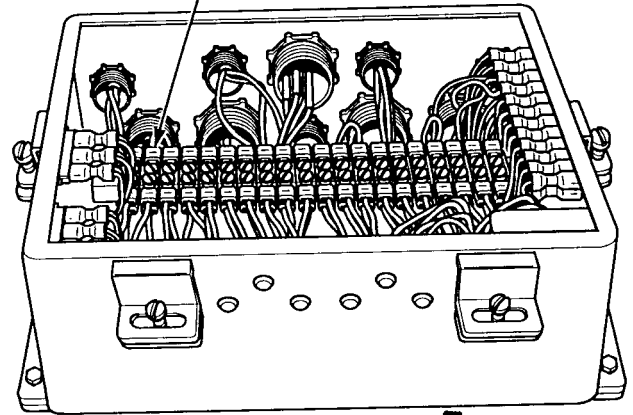
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

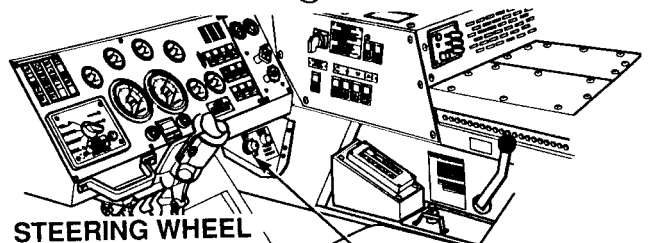
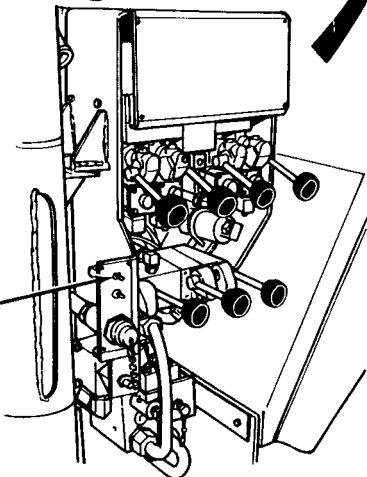
VOLTAGE TEST

- (1) Set multimeter select switch to volts.
- (2) Connect positive (+) multimeter lead crane junction box, terminal 19.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
- (5) Turn ON crane POWER switch.
 - (a) If 22 to 28 vdc are not present, perform Steps (6) and (7) below and repair red wire from OSS harness connector terminal D to crane junction box terminal 19 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 14 of this Fault.
- (6) Turn OFF crane POWER switch.
- (7) Turn OFF ENGINE switch.

TERMINAL 19



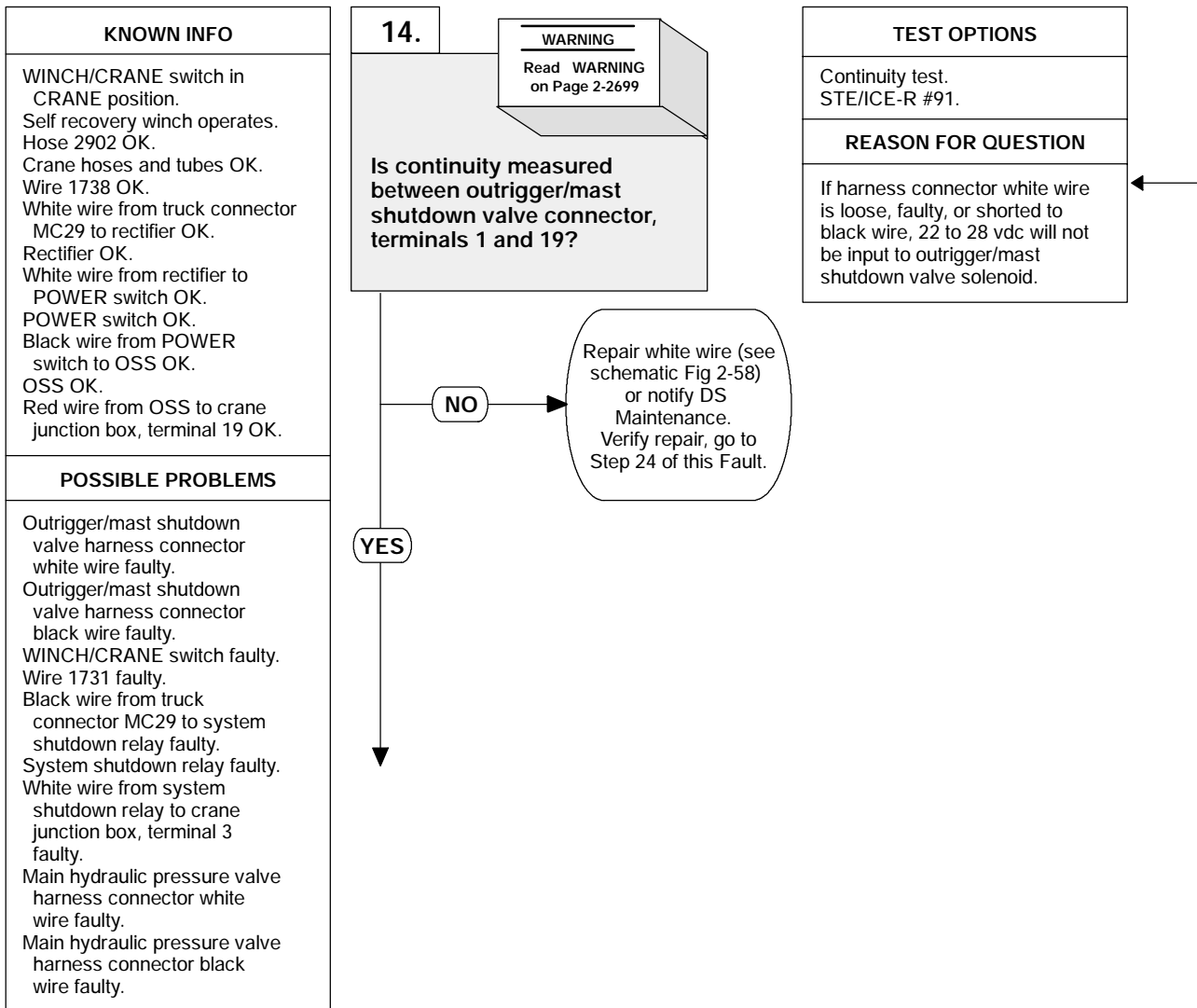
CRANE POWER SWITCH



STEERING WHEEL SHOWN REMOVED FOR CLARITY

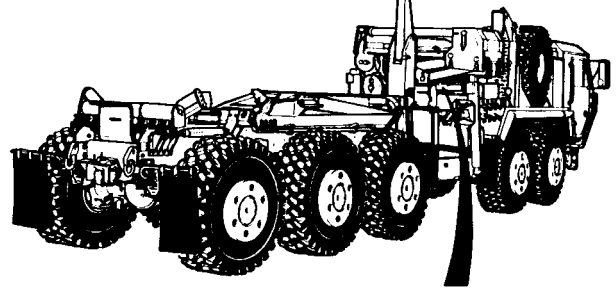
ENGINE SWITCH

10. OUTRIGGERS DO NOT OPERATE (CONT).

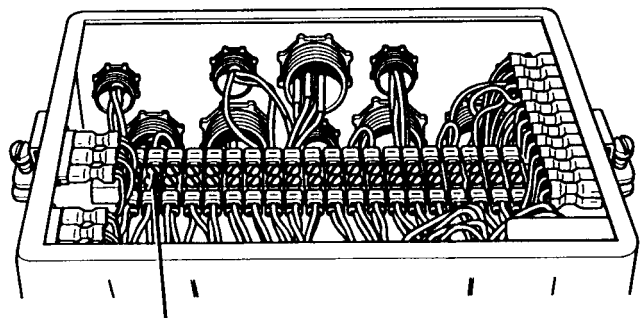


WARNING

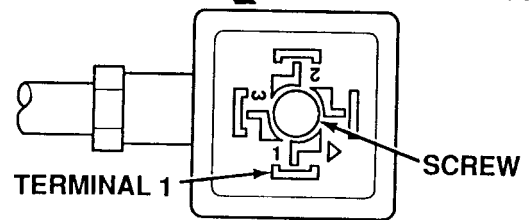
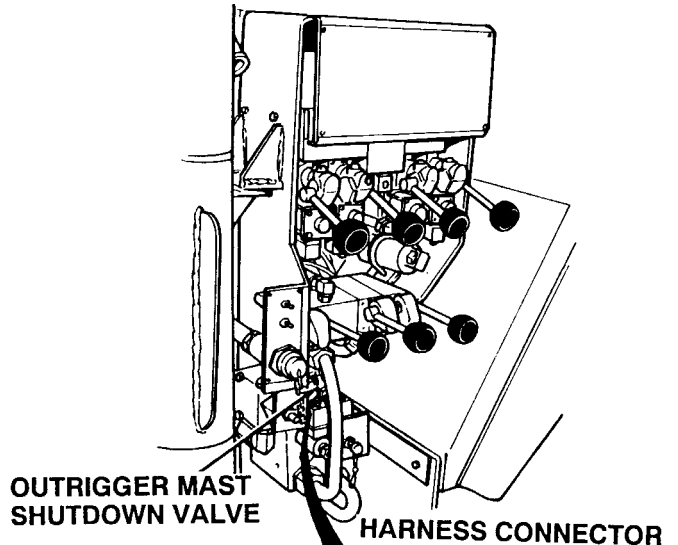
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



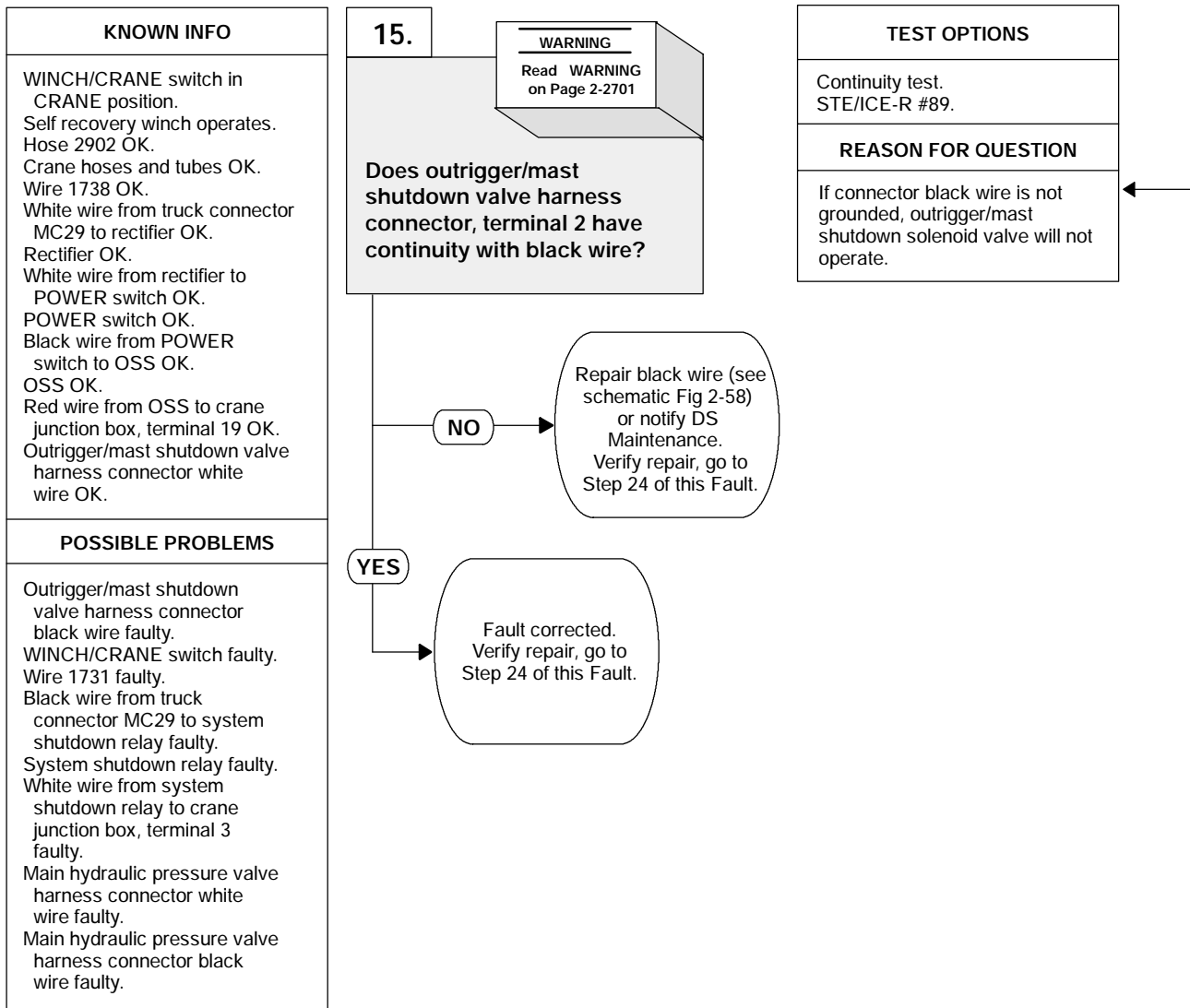
CONTINUITY TEST
<p>(1) Loosen screw and disconnect outrigger mast shutdown valve harness connector.</p> <p>(2) Set multimeter select switch to ohms.</p> <p>(3) Is there continuity between crane junction box, terminal 19 and outrigger mast shutdown valve connector, terminal 1?</p> <p>(a) If there is no continuity, repair connector white wire (see schematic Fig 2-58) or notify DS Maintenance.</p> <p>(b) If there is continuity, wire is OK.</p>



TERMINAL 19



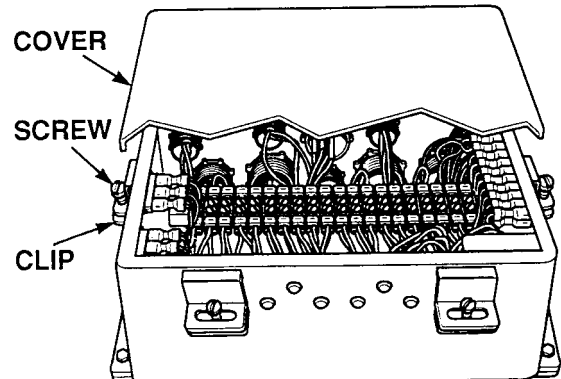
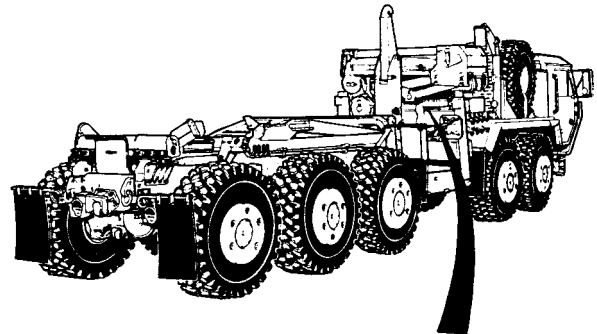
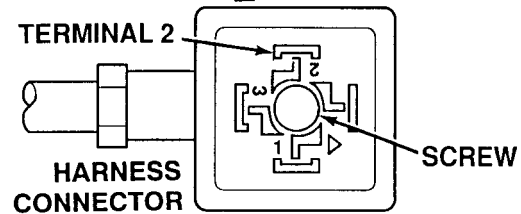
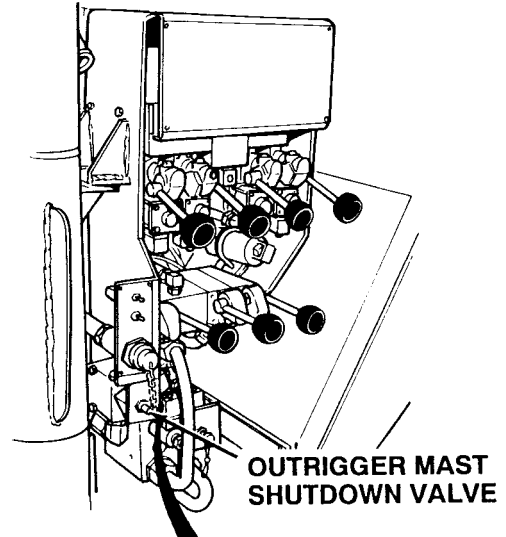
10. OUTRIGGERS DO NOT OPERATE (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Is there continuity between outrigger mast shutdown valve harness connector, terminal 2 and a known good ground?
 - (a) If there is no continuity, repair connector black wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, perform Steps (2) and (3) below and go to Step 24 of this Fault.
 - (2) Install harness connector on outrigger/mast shutdown valve solenoid and tighten screw.
 - (3) Install crane main junction box cover with six clips and screws.



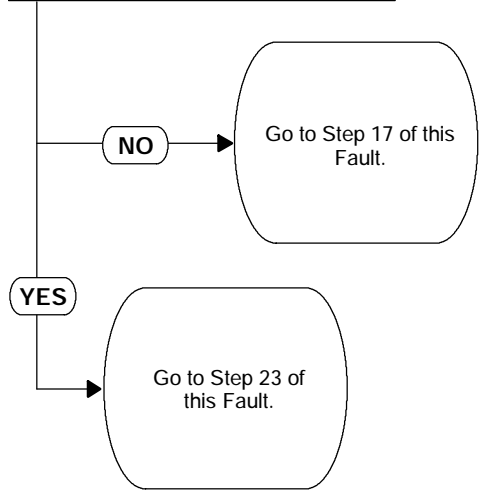
10. OUTRIGGERS DO NOT OPERATE (CONT).

KNOWN INFO
WINCH/CRANE switch in CRANE position. Self recovery winch operates. Hose 2902 OK. Crane hoses and tubes OK. Wire 1738 OK. White wire from truck connector MC29 to rectifier OK. Rectifier OK. White wire from rectifier to POWER switch OK. POWER switch OK. Black wire from POWER switch to OSS OK. OSS OK. Red wire from OSS to crane junction box, terminal 19 OK. Outrigger/mast shutdown valve harness connector white wire OK. Outrigger/mast shutdown valve harness connector black wire OK.
POSSIBLE PROBLEMS
WINCH/CRANE switch faulty. Wire 1731 faulty. Black wire from truck connector MC29 to system shutdown relay faulty. System shutdown relay faulty. White wire from system shutdown relay to crane junction box, terminal 3 faulty. Main hydraulic pressure valve harness connector white wire faulty. Main hydraulic pressure valve harness connector black wire faulty.

16.

Are 22 to 28 vdc measured at main hydraulic pressure valve harness connector, terminal 1 with ENGINE switch ON and hydraulic selector switch in CRANE/SRW position?

WARNING
Read WARNING on Page 2-2703



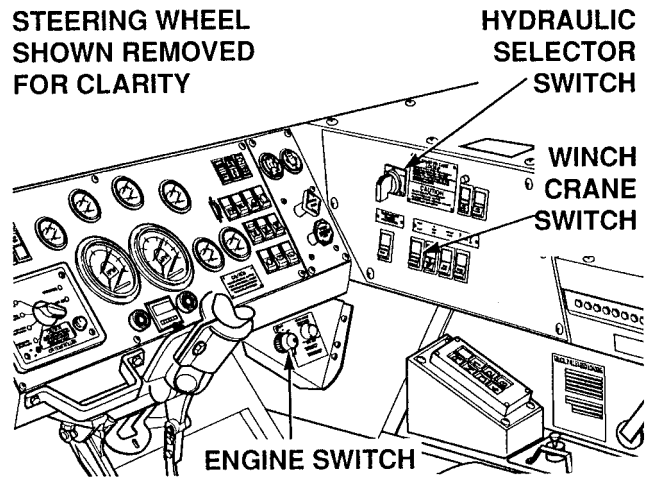
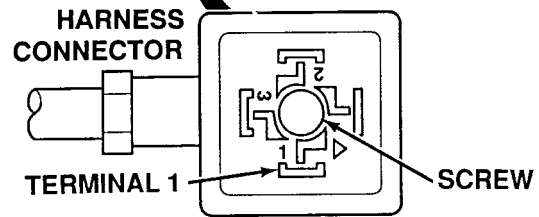
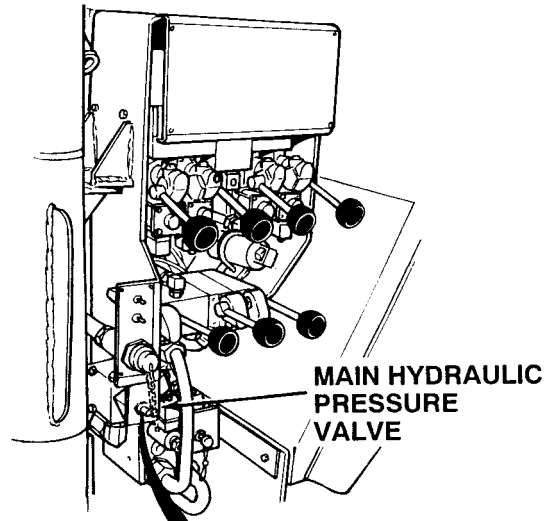
TEST OPTIONS
Voltage test. STE/ICE-R #89.
REASON FOR QUESTION
If 22 to 28 vdc are not present, component supplying voltage is faulty.



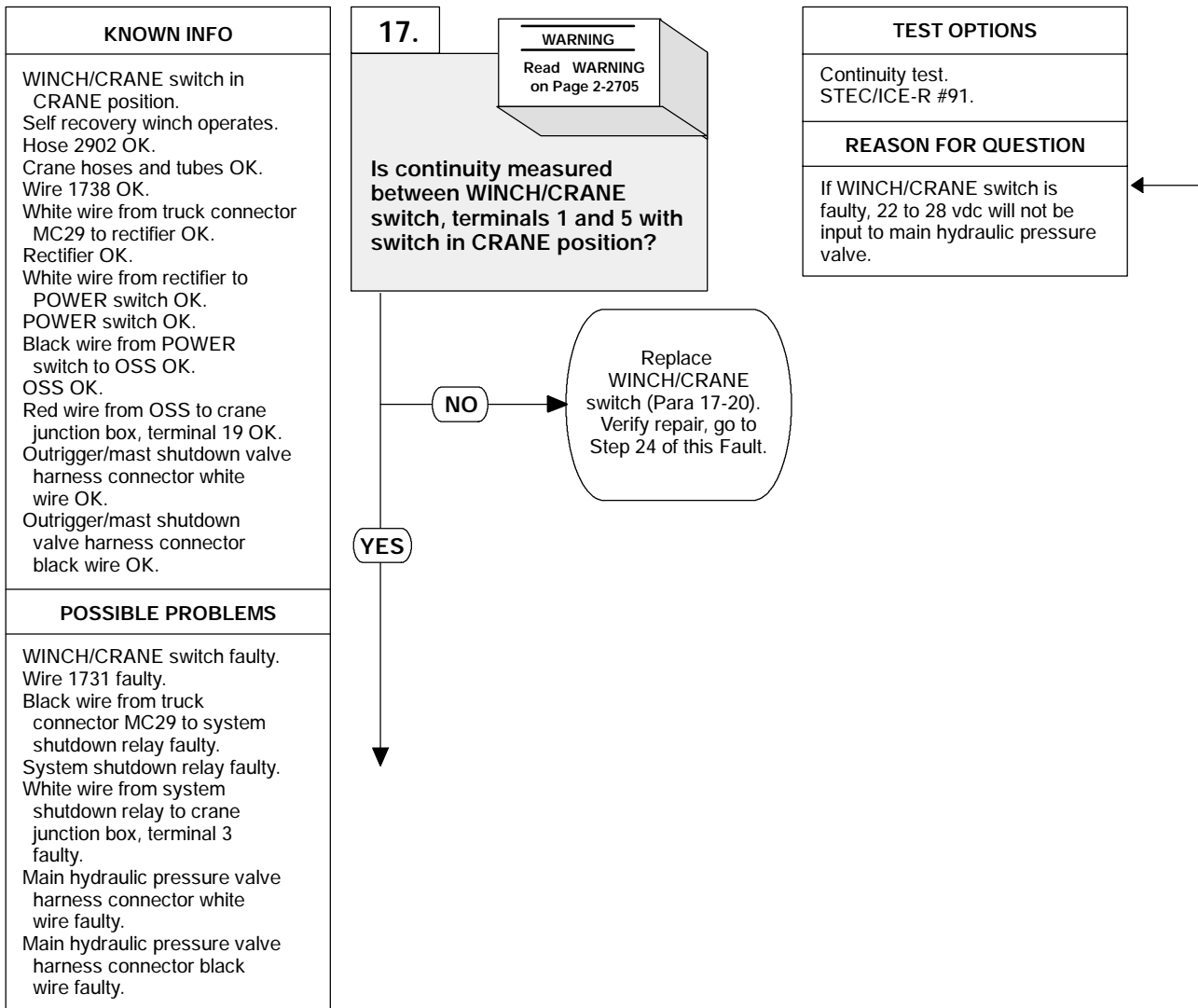
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST
<ol style="list-style-type: none"> (1) Loosen screw and disconnect harness connector from main hydraulic pressure valve. (2) Set multimeter select switch to volts dc. (3) Connect positive (+) multimeter lead to harness connector, terminal 1. (4) Connect negative (-) multimeter lead to a known good ground. (5) Turn ON ENGINE switch (TM 9-2320-364-10). (6) Set hydraulic selector switch in CRANE/SRW position. <ol style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Steps (7) and (8) below and go to Step 17 of this Fault. (b) If 22 to 28 vdc are present, perform Steps (7) and (8) below and go to Step 23 of this Fault. (7) Turn OFF ENGINE switch. (8) Put hydraulic selector switch in OFF position.



10. OUTRIGGERS DO NOT OPERATE (CONT).

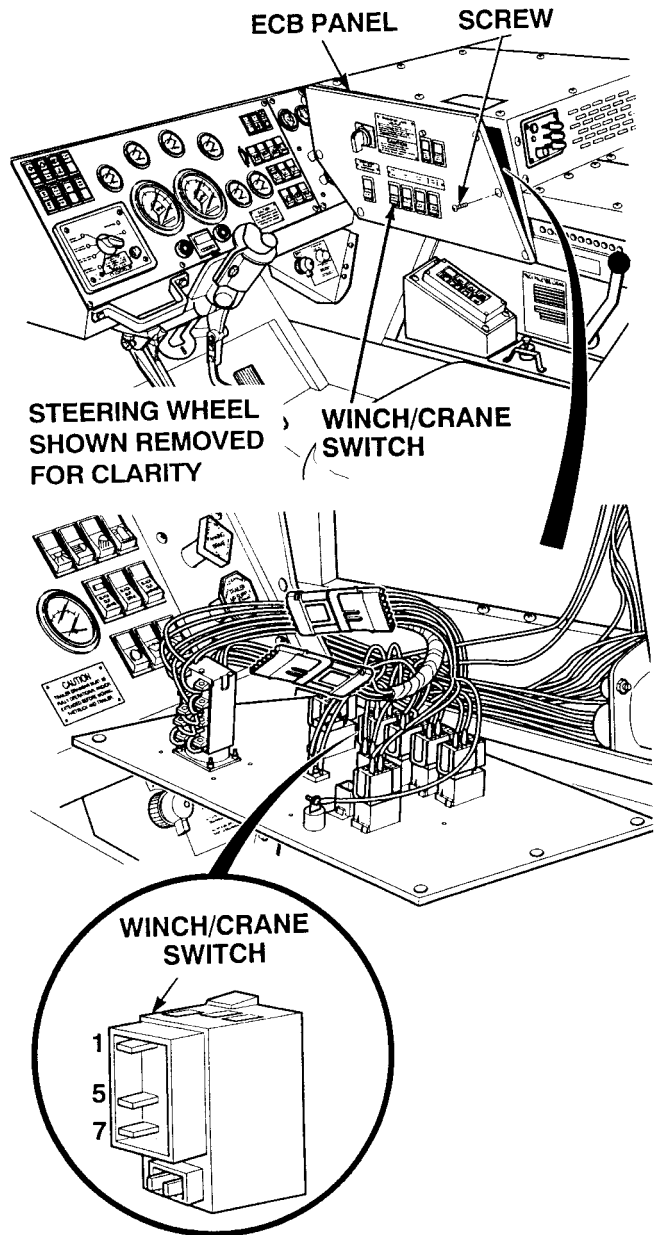


WARNING

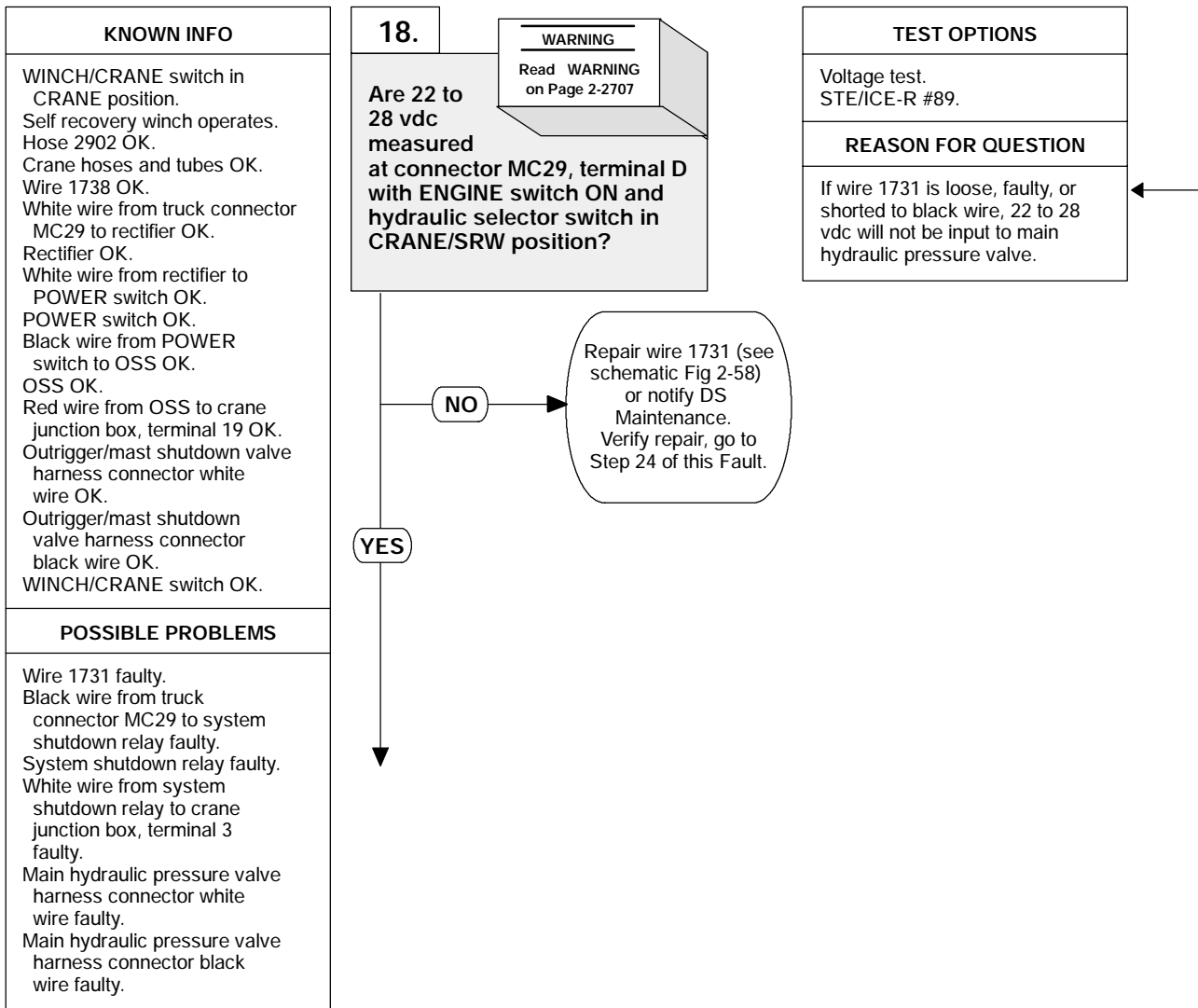
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Remove six screws and tilt ECB panel.
- (2) Set WINCH/CRANE switch to CRANE position.
- (3) Is there continuity between WINCH/CRANE switch, terminals 5 and 1?
 - (a) If there is no continuity, replace WINCH/CRANE switch (Para 17-20).
 - (b) If there is continuity, install ECB side panel with six screws and go to Step 18 of this Fault.

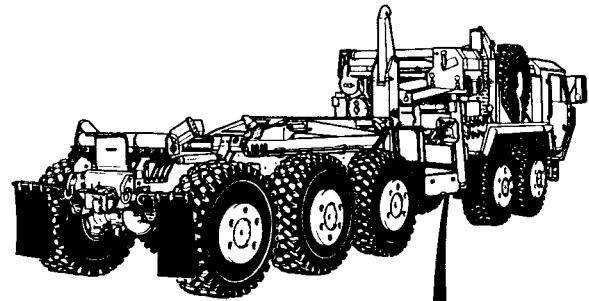


10. OUTRIGGERS DO NOT OPERATE (CONT).



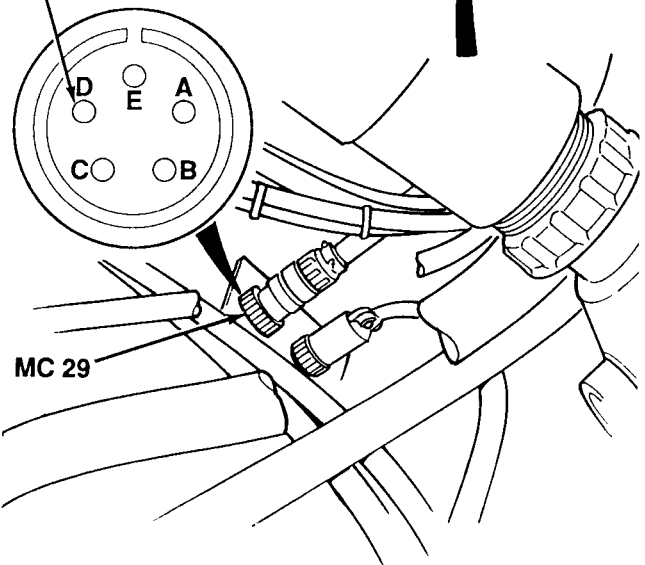
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

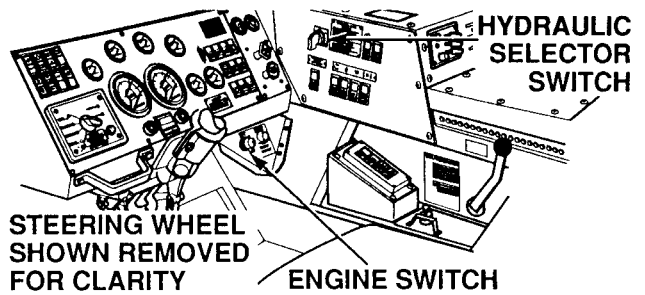


- | VOLTAGE TEST |
|---|
| <ol style="list-style-type: none"> (1) Disconnect connector MC29 from crane connector. (2) Connect positive (+) multimeter lead to connector MC29, terminal D. (3) Connect negative (-) multimeter lead to a known good ground. (4) Turn ON ENGINE switch (TM 9-2320-364-10). (5) Set hydraulic selector switch to CRANE/SRW position. <ol style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Steps (6) and (7) below and repair wire 1731 between WINCH/CRANE switch and connector MC29 (see schematic Fig 2-58) or notify DS Maintenance. (b) If 22 to 28 vdc are present, perform Steps (6) through (8) below and go to Step 19 of this Fault. (6) Set hydraulic selector switch to OFF position. (7) Turn OFF ENGINE switch. (8) Connect connector MC29 to crane connector. |

TERMINAL D



MC 29

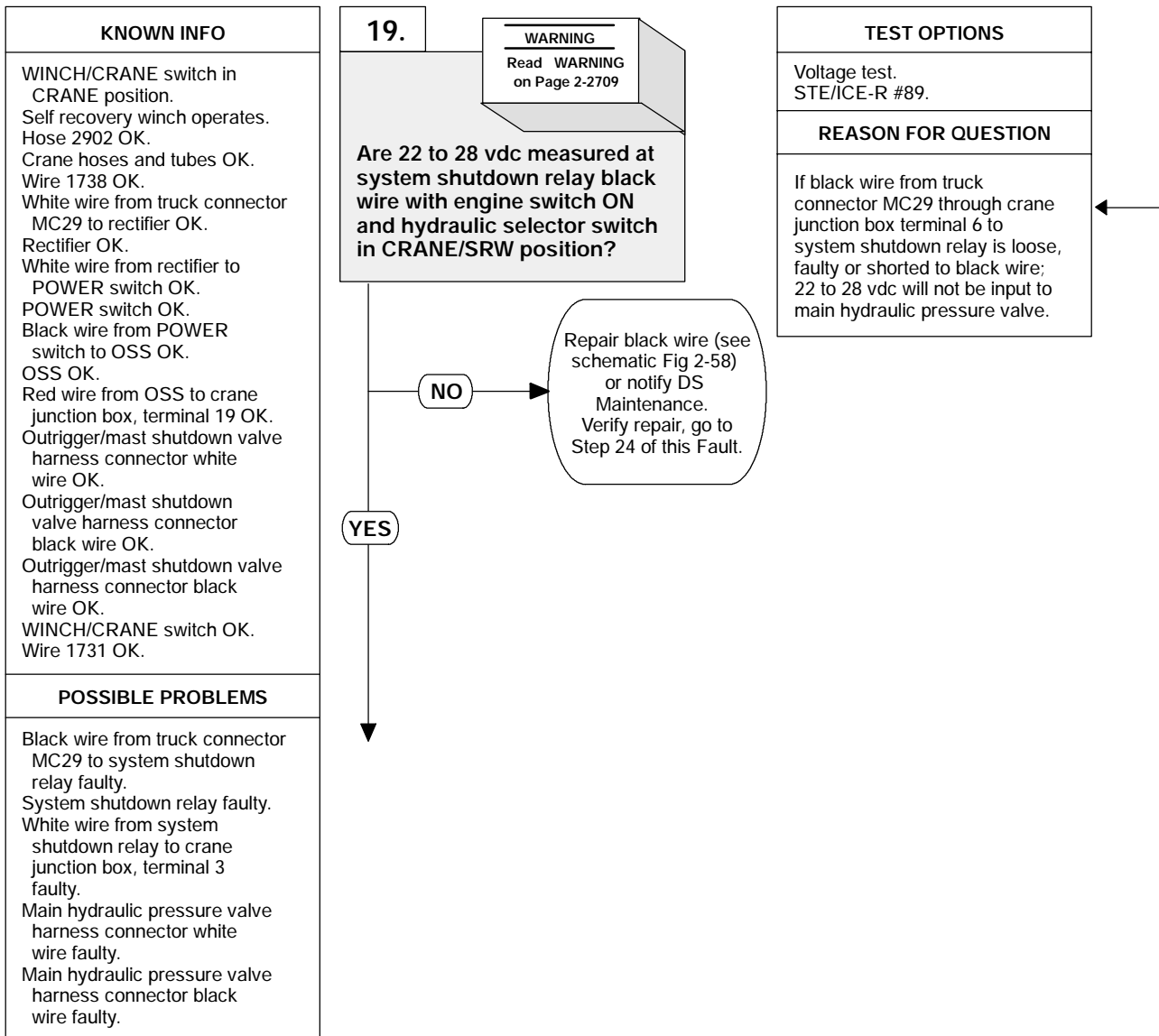


STEERING WHEEL SHOWN REMOVED FOR CLARITY

HYDRAULIC SELECTOR SWITCH

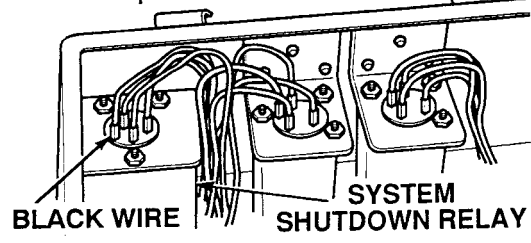
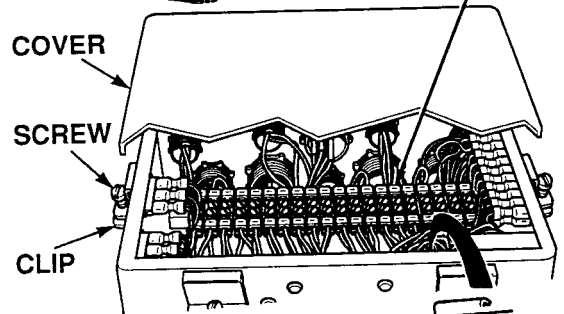
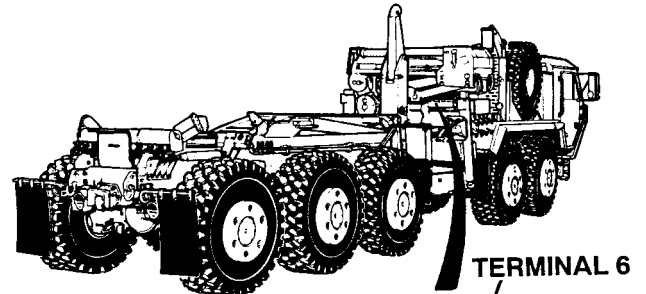
ENGINE SWITCH

10. OUTRIGGERS DO NOT OPERATE (CONT).



WARNING

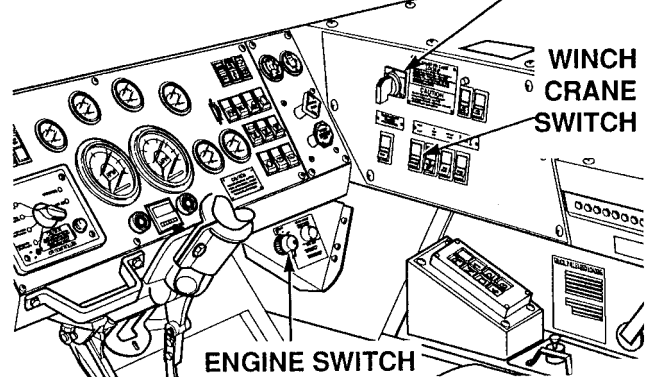
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- VOLTAGE TEST**
- (1) Loosen six screws, clips and remove crane junction box cover.
 - (2) Connect positive (+) multimeter lead to system shutdown relay black wire.
 - (3) Connect negative (-) multimeter lead to a known good ground.
 - (4) Turn ON ENGINE switch
 - (5) Set hydraulic selector switch in CRANE/SRW position.
 - (a) If 22 to 28 vdc are not present, perform Steps (6) and (7) below and repair black wire from connector MC29 through crane terminal 6 to system shutdown relay (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 20 of this Fault.
 - (6) Set hydraulic selector switch in OFF position.
 - (7) Turn OFF ENGINE switch.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

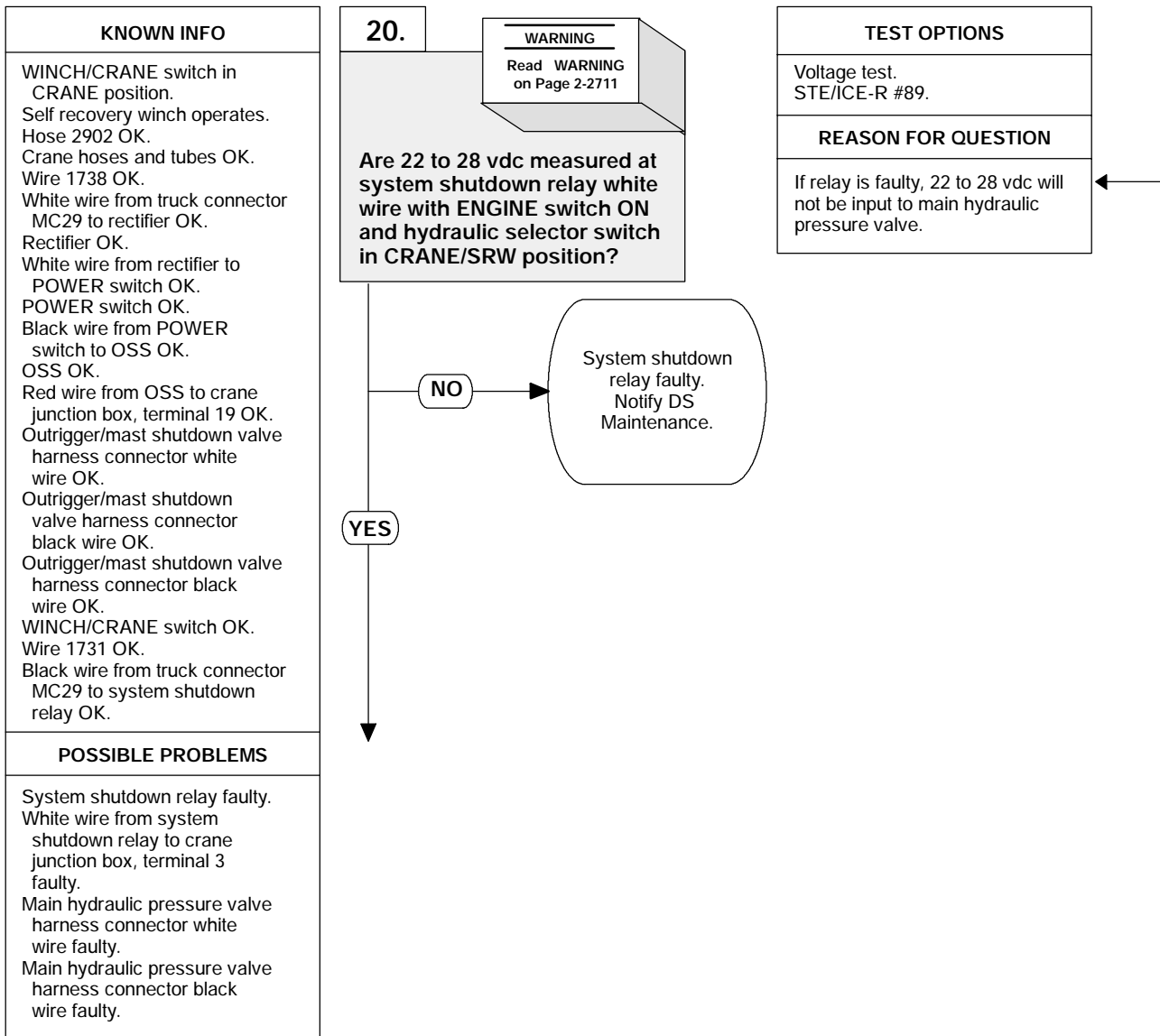
**HYDRAULIC
SELECTOR
SWITCH**



**WINCH
CRANE
SWITCH**

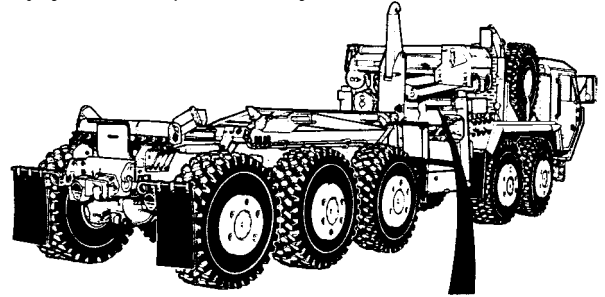
ENGINE SWITCH

10. OUTRIGGERS DO NOT OPERATE (CONT).

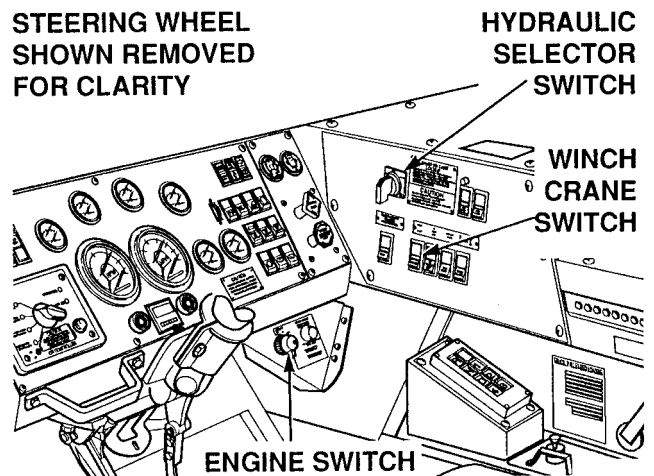
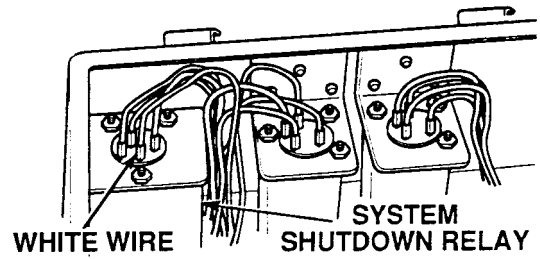
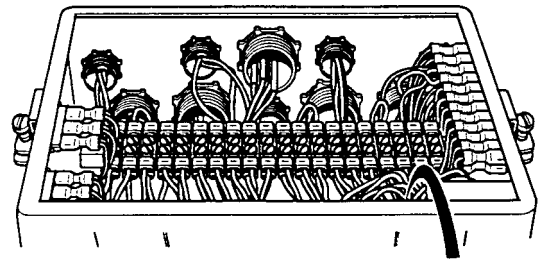


WARNING

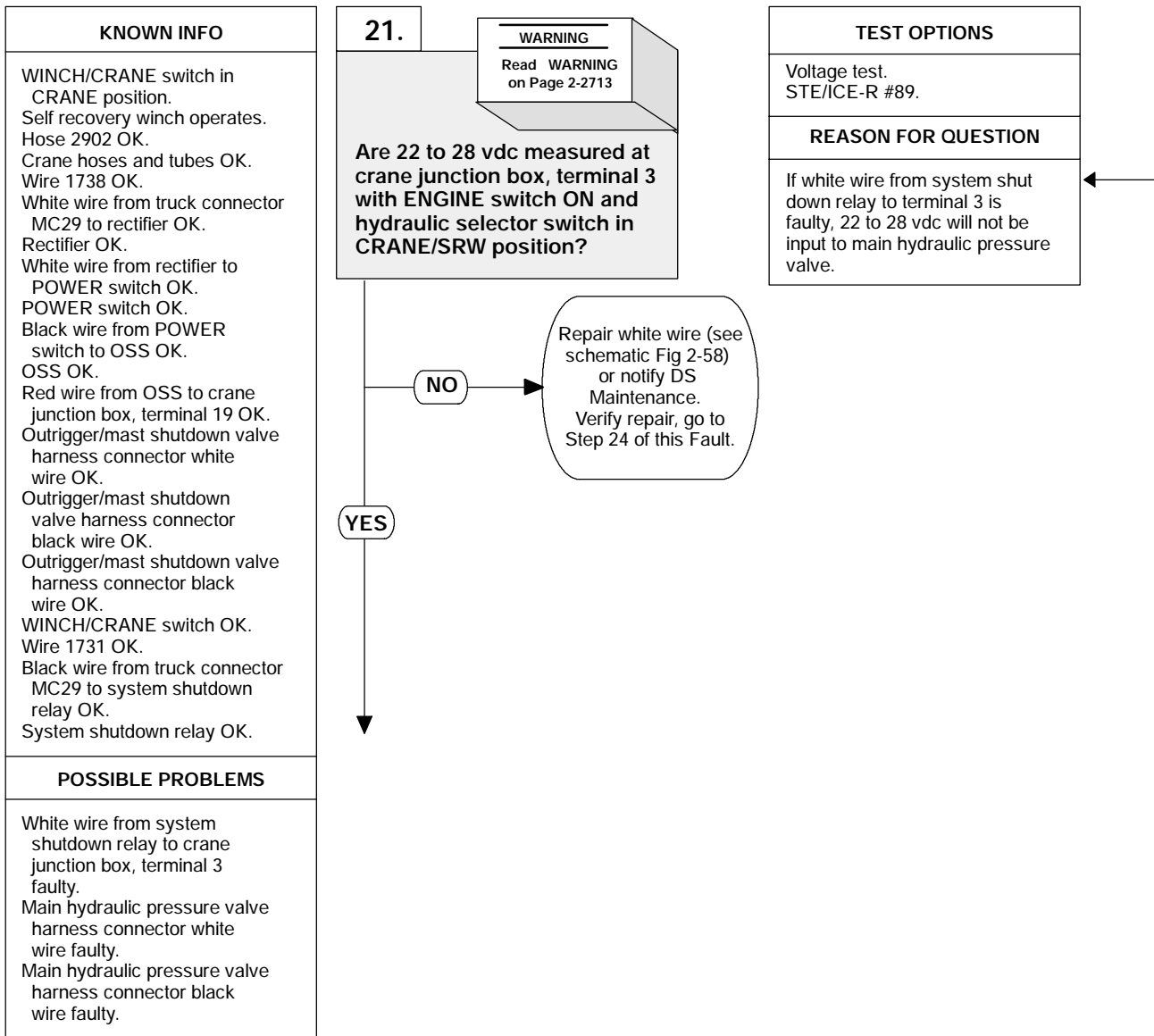
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- | VOLTAGE TEST | |
|--------------|---|
| (1) | Connect positive (+) multimeter lead to system shutdown relay white wire. |
| (2) | Connect negative (-) multimeter lead to a known good ground. |
| (3) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (4) | Set hydraulic selector switch in CRANE/SRW position. |
| (a) | If 22 to 28 vdc are not present, system shutdown relay faulty, perform Steps (5) and (6) below and notify DS Maintenance. |
| (b) | If 22 to 28 vdc are present, perform Steps (5) and (6) below and go to Step 21 of this Fault. |
| (5) | Set hydraulic selector switch in OFF position. |
| (6) | Turn OFF ENGINE switch. |



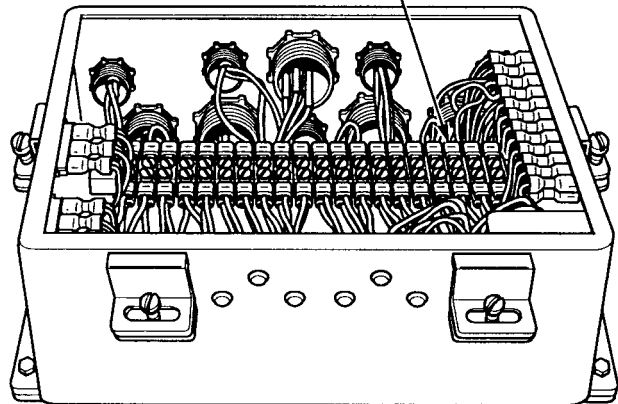
10. OUTRIGGERS DO NOT OPERATE (CONT).



WARNING

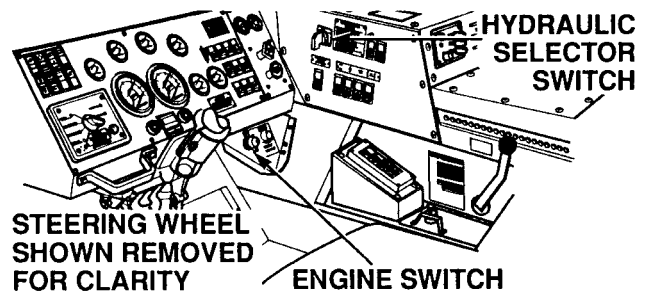
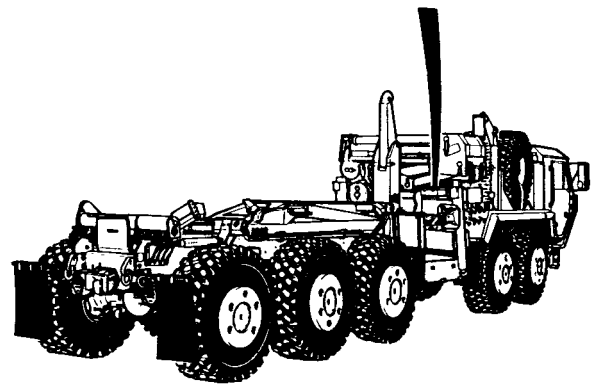
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

TERMINAL 3

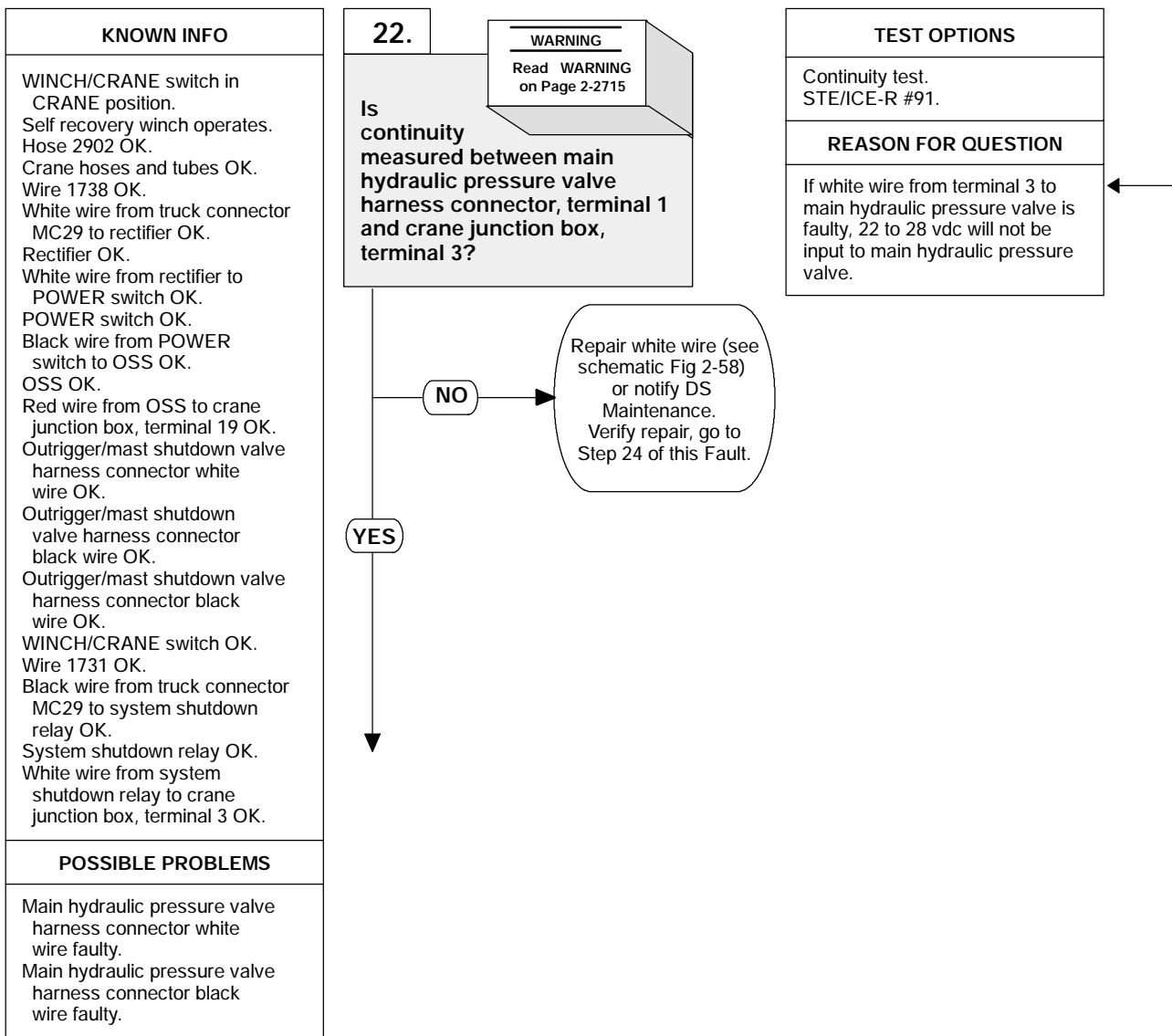


VOLTAGE TEST

- (1) Connect positive (+) multimeter lead to crane junction box, terminal 3.
- (2) Connect negative (-) multimeter lead to a known good ground.
- (3) Turn ON ENGINE switch (TM 9-2320-364-10).
- (4) Set hydraulic selector switch in CRANE/SRW position.
 - (a) If 22 to 28 vdc are not present, perform Steps (5) and (6) below and repair white wire from system shutdown relay to terminal 3 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Steps (5) and (6) below and go to Step 22 of this Fault .
- (5) Set hydraulic selector switch in OFF position.
- (6) Turn OFF ENGINE switch.

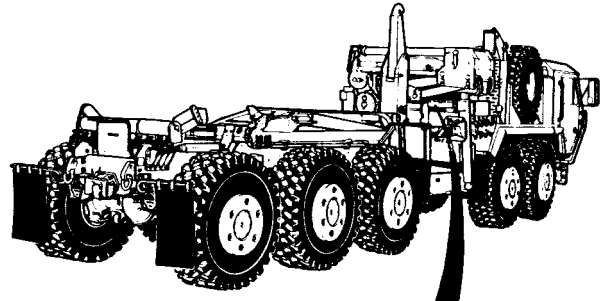


10. OUTRIGGERS DO NOT OPERATE (CONT).

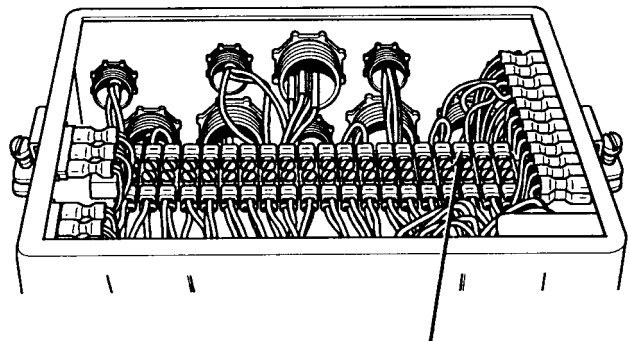


WARNING

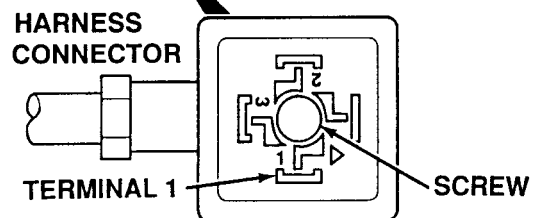
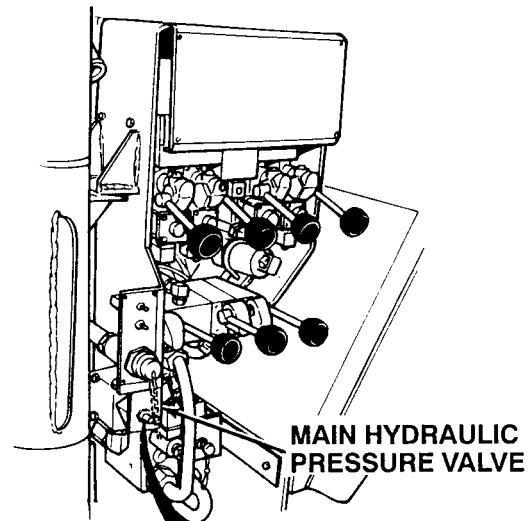
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- CONTINUITY TEST**
- (1) Set multimeter select switch to ohms.
 - (2) Is there continuity between crane junction box, terminal 3 and main hydraulic pressure valve harness connector, terminal 1?
 - (a) If there is no continuity, repair connector white wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, install cover with six clips and screws and go to Step 23 of this Fault.



TERMINAL 3



10. OUTRIGGERS DO NOT OPERATE (CONT).

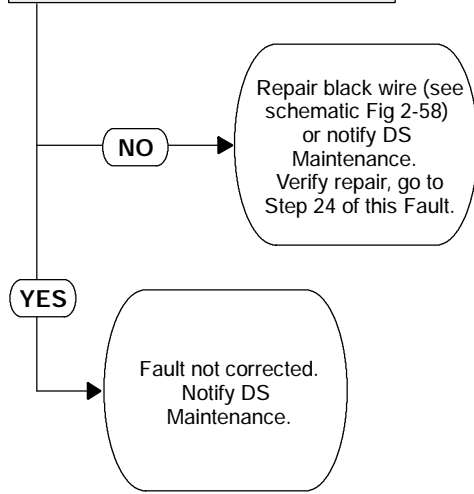
KNOWN INFO
<p>WINCH/CRANE switch in CRANE position. Self recovery winch operates. Hose 2902 OK. Crane hoses and tubes OK. Wire 1738 OK. White wire from truck connector MC29 to rectifier OK. Rectifier OK. White wire from rectifier to POWER switch OK. POWER switch OK. Black wire from POWER switch to OSS OK. OSS OK. Red wire from OSS to crane junction box, terminal 19 OK. Outrigger/mast shutdown valve harness connector white wire OK. Outrigger/mast shutdown valve harness connector black wire OK. Outrigger/mast shutdown valve harness connector black wire OK. WINCH/CRANE switch OK. Wire 1731 OK. Black wire from truck connector MC29 to system shutdown relay OK. System shutdown relay OK. White wire from system shutdown relay to crane junction box, terminal 3 OK. Main hydraulic pressure valve harness connector white wire OK.</p>
POSSIBLE PROBLEMS
<p>Main hydraulic pressure valve harness connector black wire faulty.</p>

23.

WARNING

Read **WARNING** on Page 2-2717

Is continuity measured between main hydraulic pressure valve harness connector, terminal 2 and black wire?



TEST OPTIONS
<p>Continuity test. STE/ICE-R #91.</p>
REASON FOR QUESTION
<p>If connector black wire is loose or faulty, main hydraulic pressure valve solenoid will not be grounded.</p>



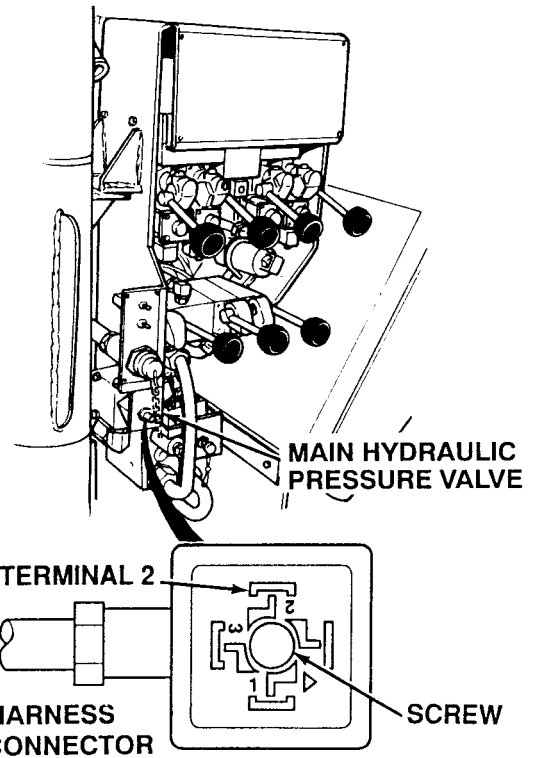
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

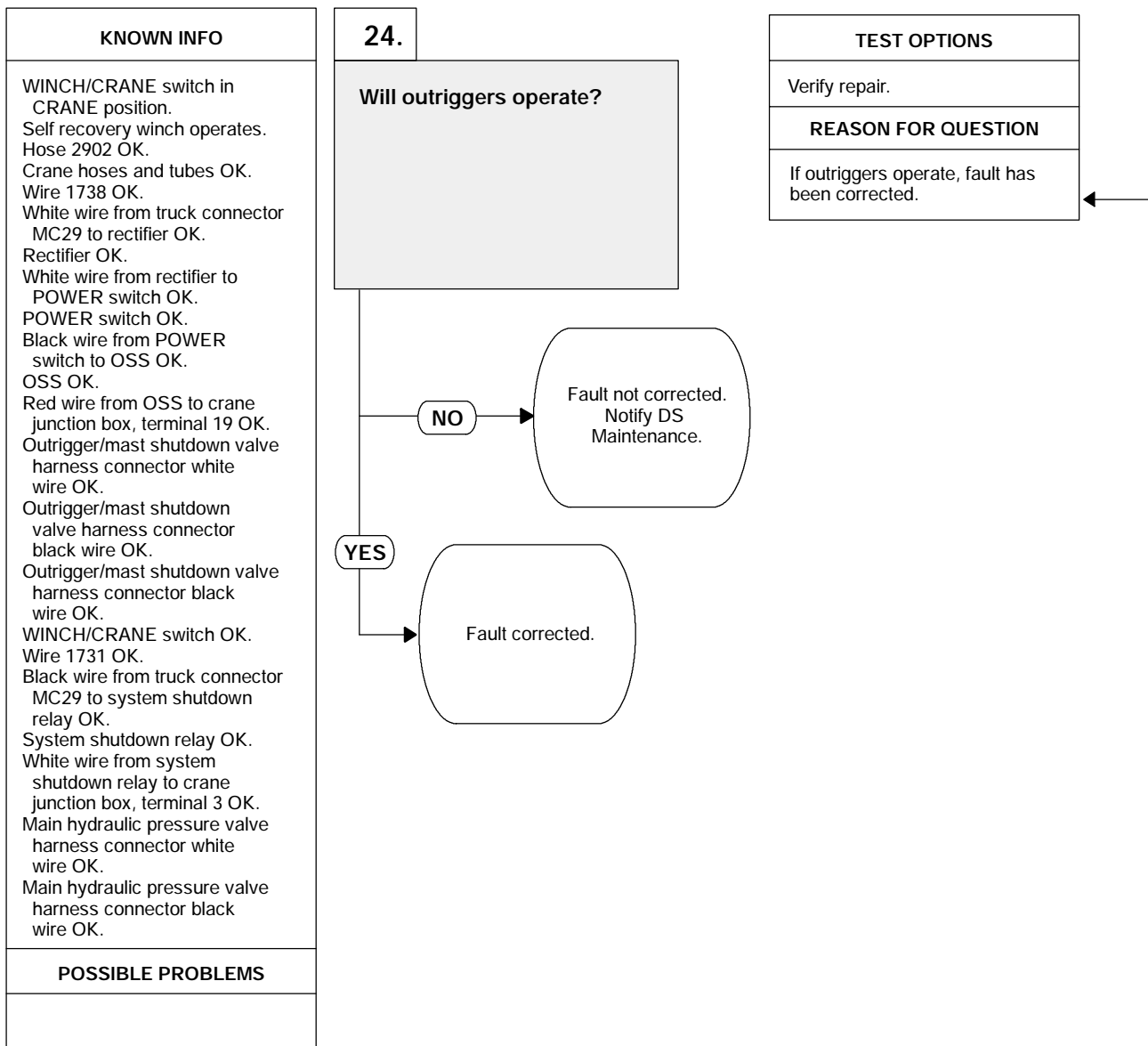
CONTINUITY TEST

Is there continuity between main hydraulic pressure valve connector, terminal 2 and a known good ground?

- (1) If there is no continuity, repair connector black wire (see schematic Fig 2-58) or notify DS Maintenance.
- (2) If there is continuity, connect connector, and tighten screw. Fault not corrected, notify DS Maintenance.



10. OUTRIGGERS DO NOT OPERATE (CONT).

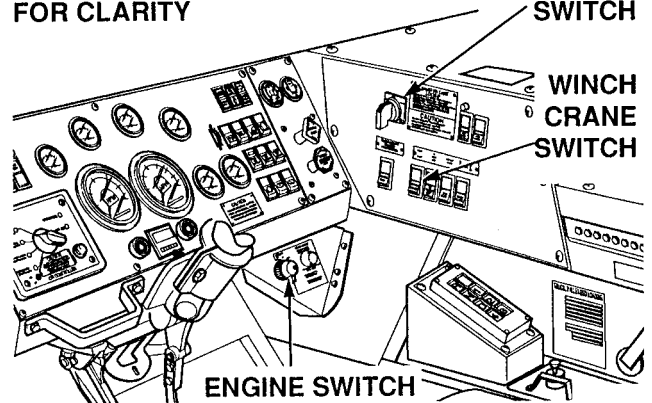


STEERING WHEEL
SHOWN REMOVED
FOR CLARITY

HYDRAULIC
SELECTOR
SWITCH

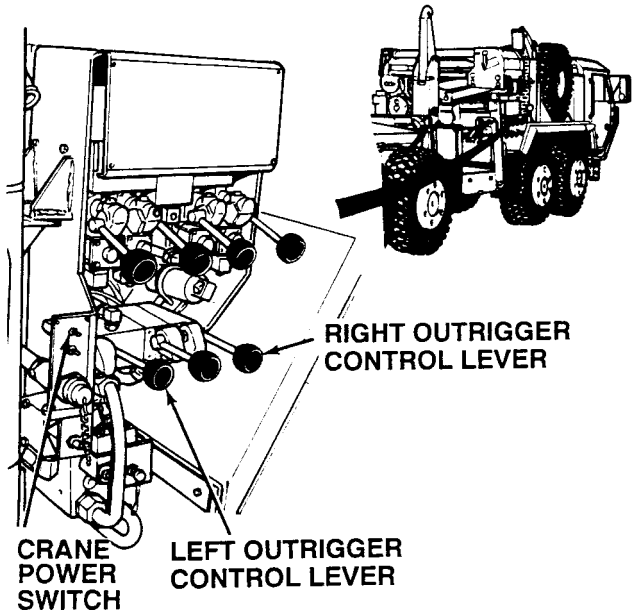
WINCH
CRANE
SWITCH

ENGINE SWITCH



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set hydraulic selector switch to CRANE/SRW position.
- (3) Turn ON crane POWER switch.
- (4) Operate outriggers.
 - (a) If outriggers do not function, fault not corrected. Perform Steps (5) and (6) below and notify DS Maintenance.
 - (b) If outriggers function, fault has been corrected.
- (5) Set hydraulic selector switch to OFF position.
- (6) Turn OFF ENGINE switch.



2-29. CRANE TROUBLESHOOTING (CONT).

11. LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM, AND HOIST).

INITIAL SETUP

Tools and Special Tools

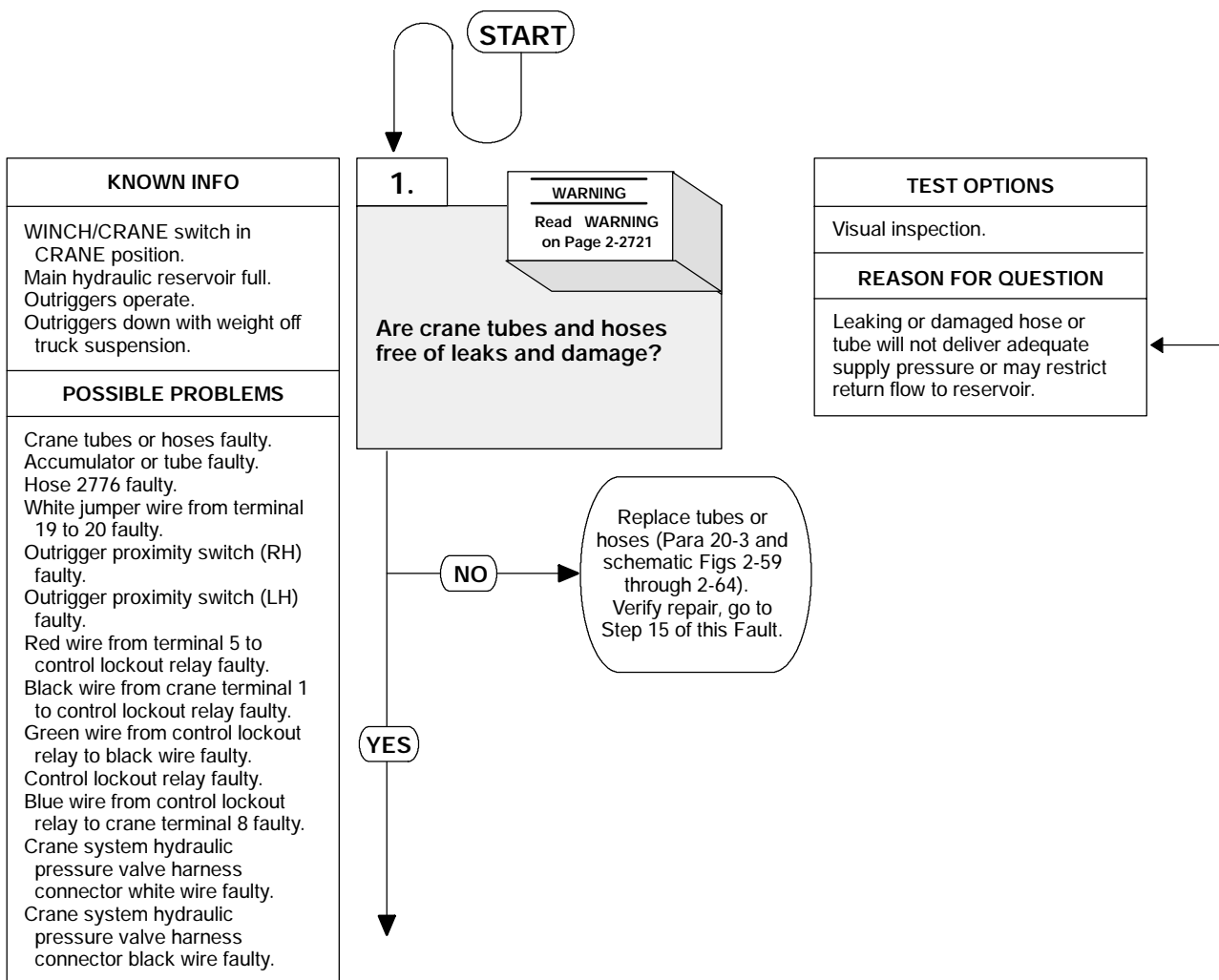
Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

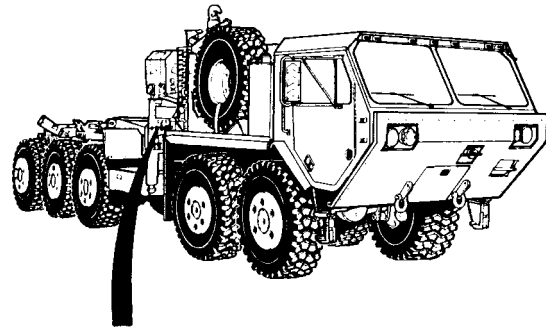
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)



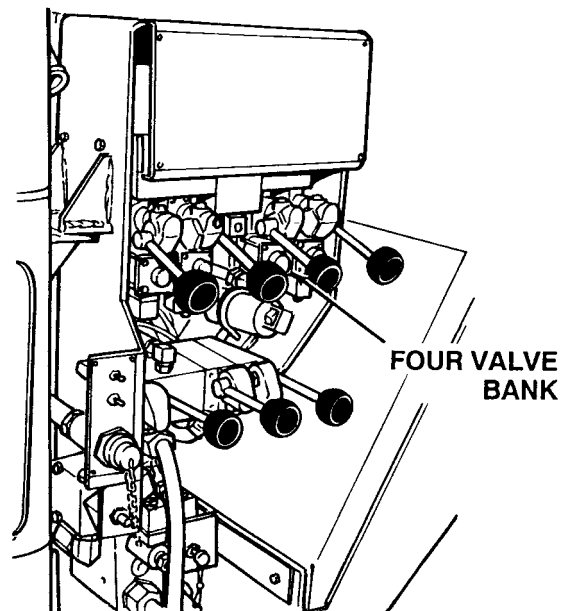
WARNING

High pressure hydraulics [oil under 3,100 psi (21,374 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

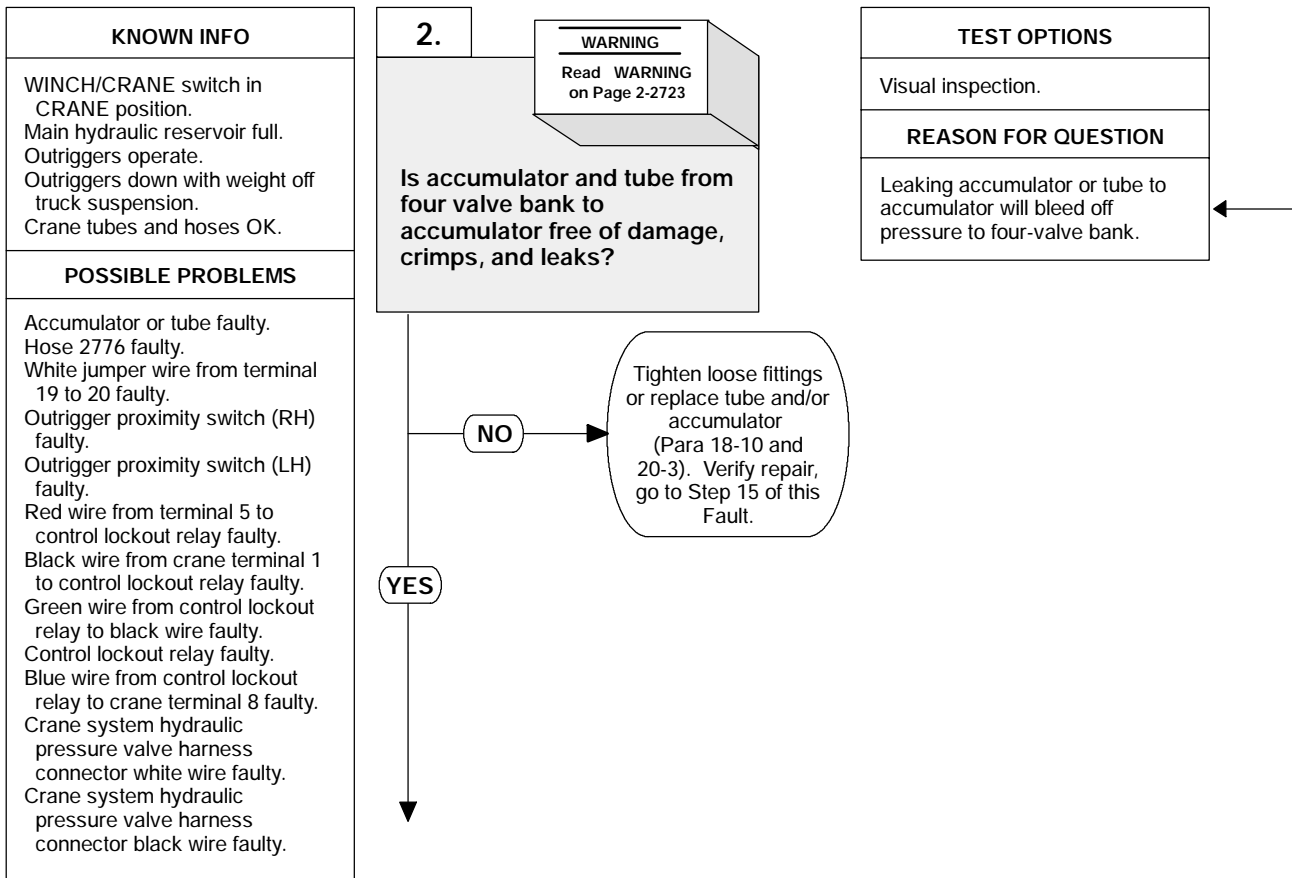
**VISUAL INSPECTION**

Inspect tubes and hoses around four valve bank for leaks and damage.

- (1) If hoses are damaged, crimped or leaking, tighten loose fittings or repair hoses (Para 20-3 and schematic Figs 2-59 through 2-64).
- (2) If hoses are not damaged, crimped or leaking, go to Step 2 of this Fault.



11. LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).



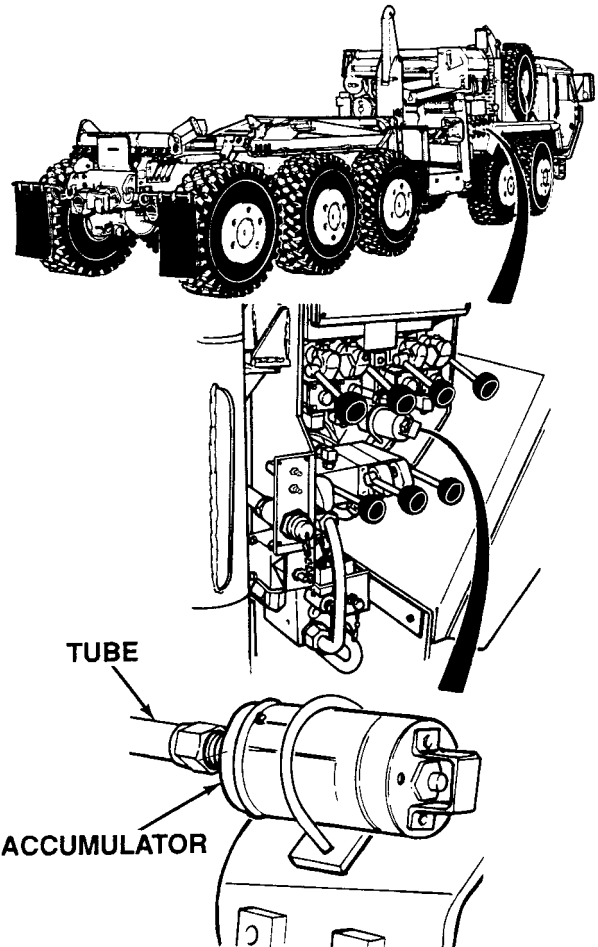
WARNING

High pressure hydraulics [oil under 3,100 psi (21,374 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

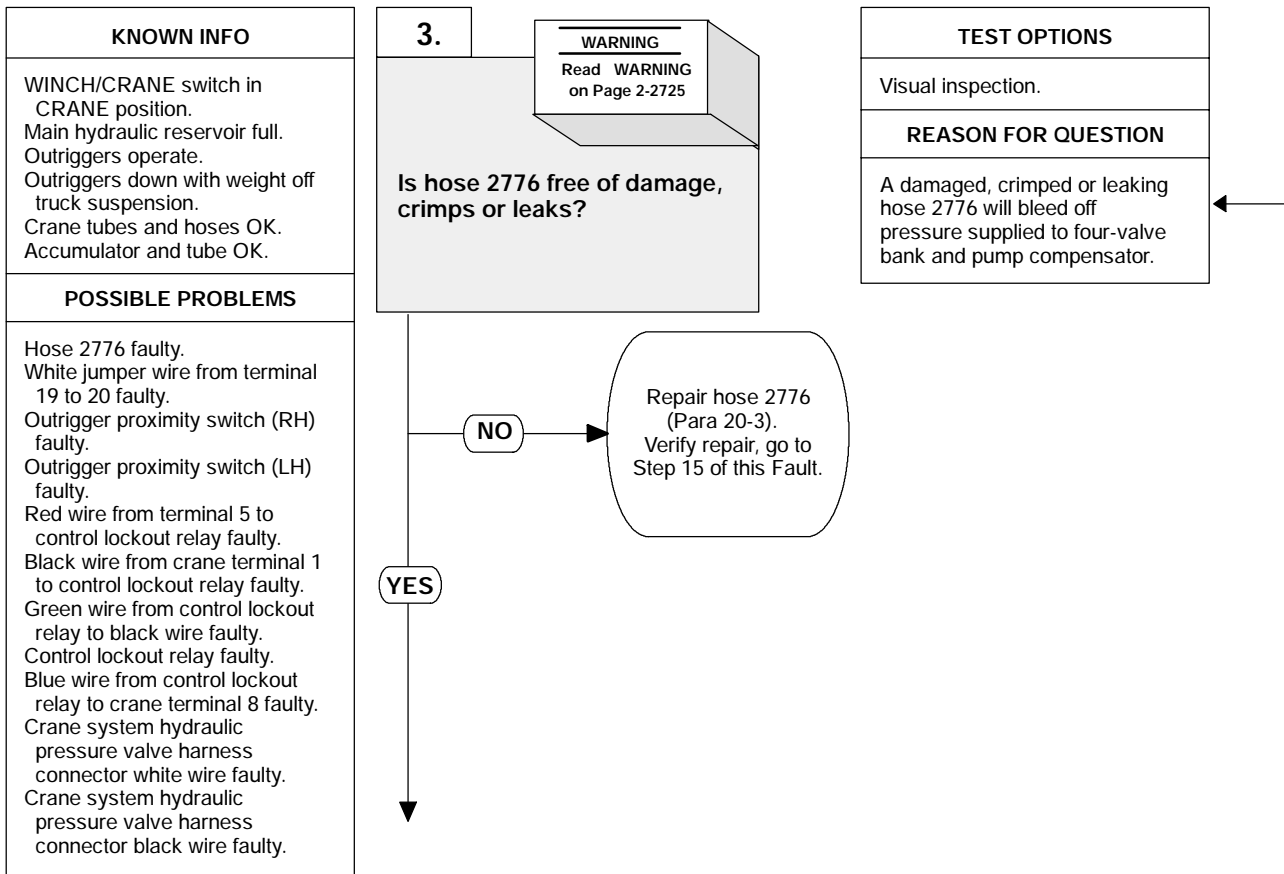
VISUAL INSPECTION

Inspect accumulator and tube from four bank valve to accumulator for damage, crimps or leaks.

- (1) If accumulator or tube is leaking, tighten loose fittings or replace tube (Para 20-3) or accumulator (Para 18-10).
- (2) If no damage, crimps or leaks are found, go to Step 3 of this Fault.



11. LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).

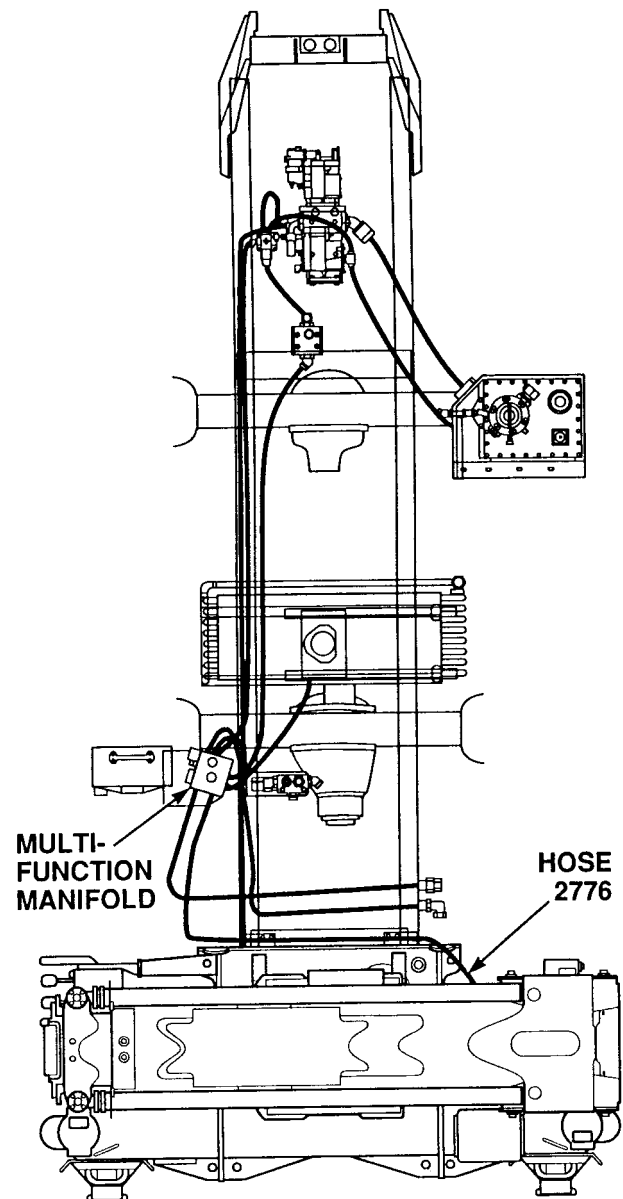


WARNING

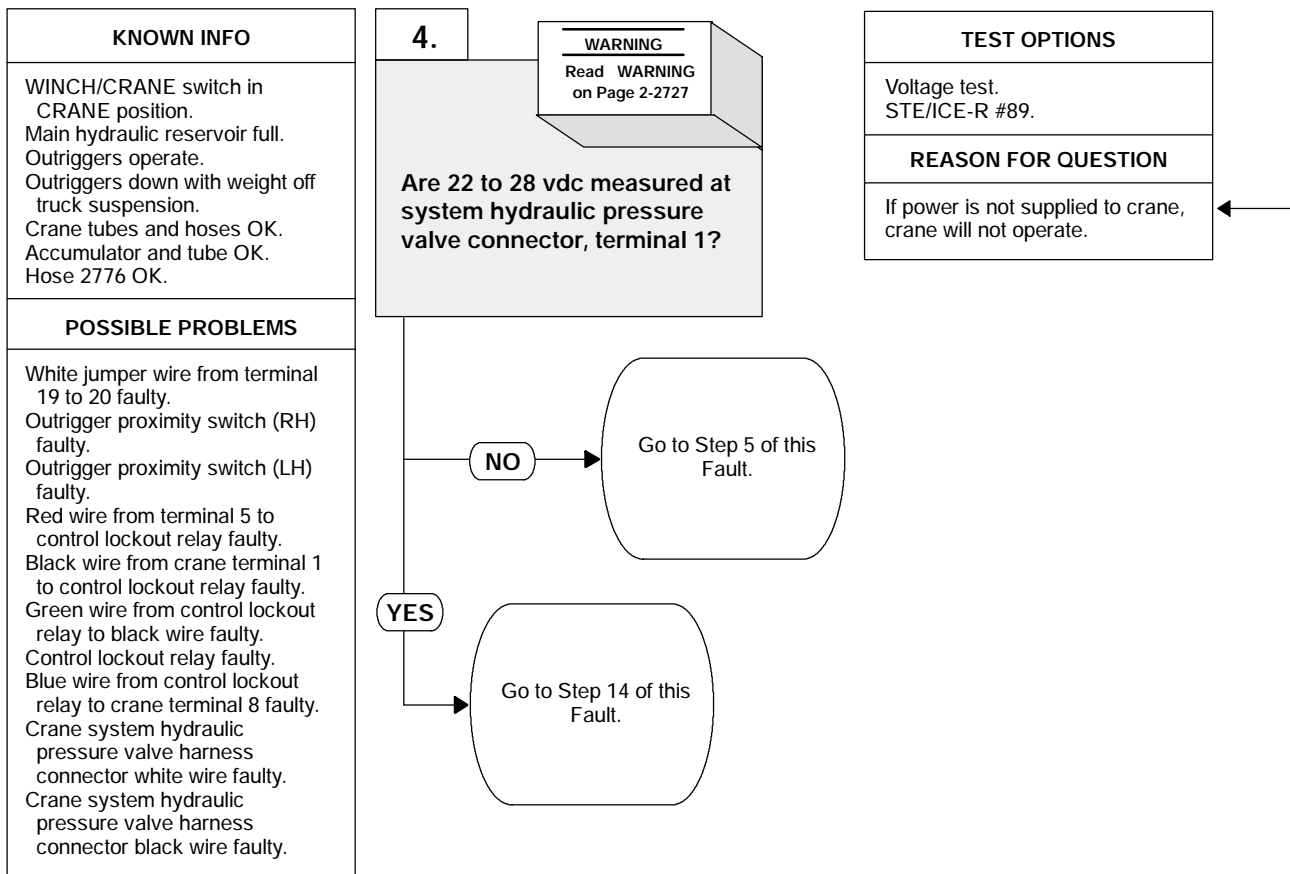
High pressure hydraulics [oil under 3,100 psi (21,374 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

VISUAL INSPECTION

- Inspect hose 2776 for leaks.
- (1) If hose is damaged, crimped or leaking, tighten loose fittings or repair hose (Para 20-3).
 - (2) If hose is not damaged, crimped or leaking, go to Step 4 of this Fault.

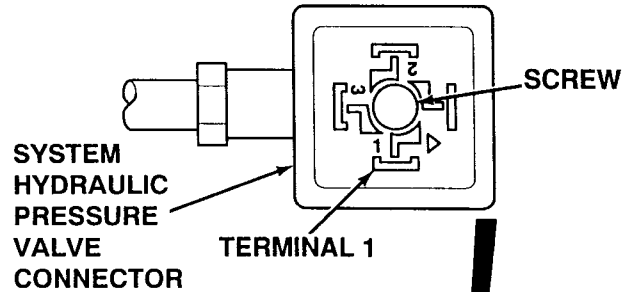


11. LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).

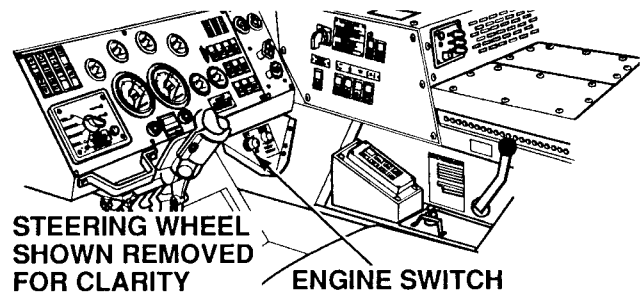
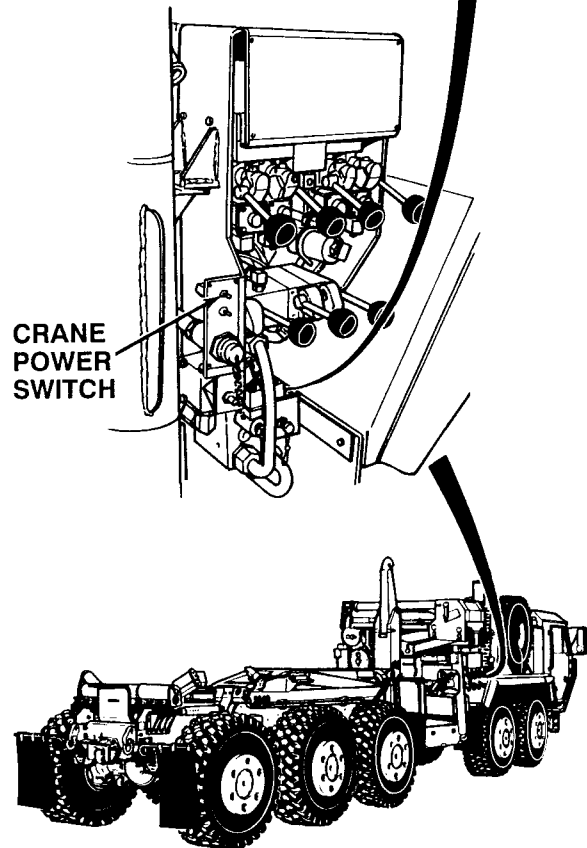


WARNING

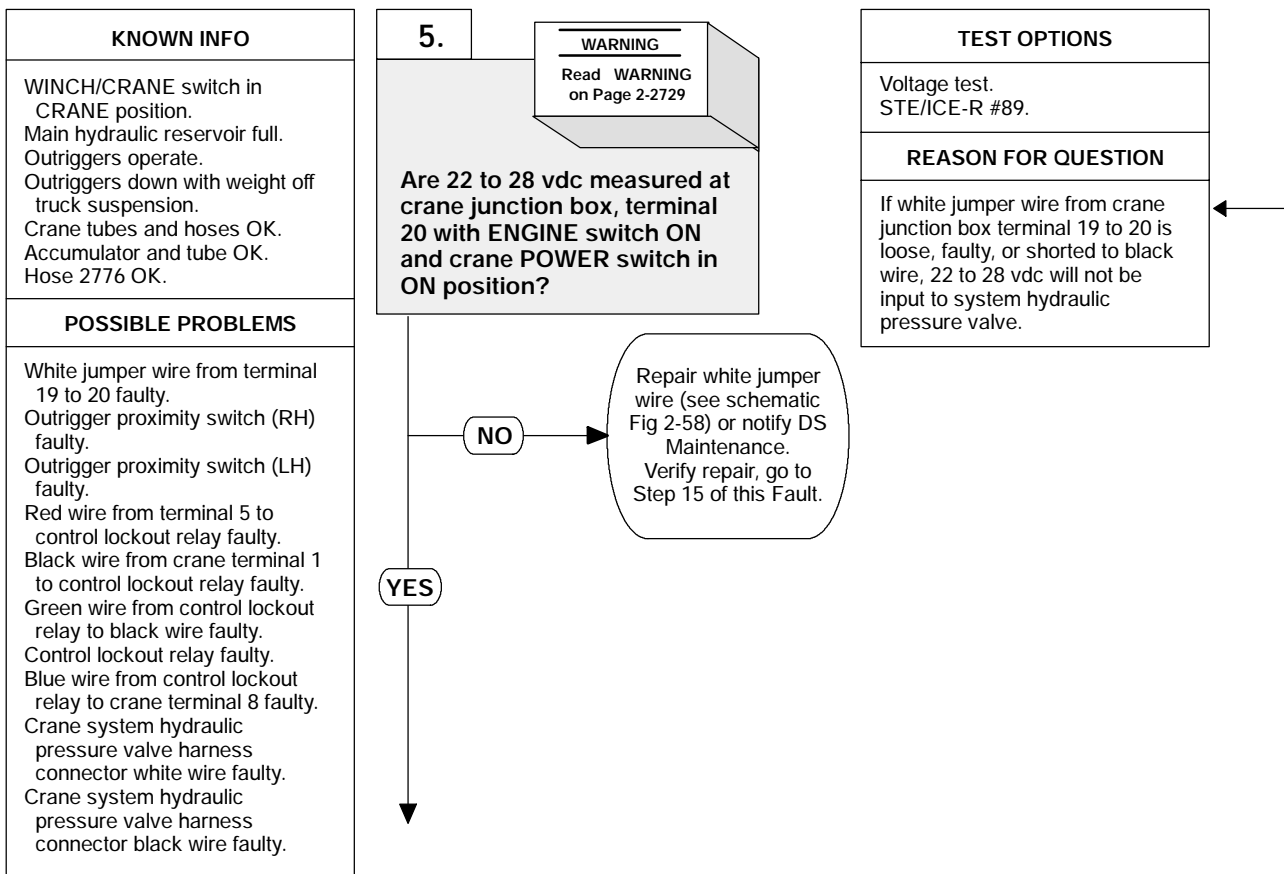
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



- | VOLTAGE TEST | |
|--------------|---|
| (1) | Loosen screw and remove harness connector from system hydraulic pressure valve solenoid. |
| (2) | Set multimeter selector switch to volts. |
| (3) | Connect positive (+) multimeter lead to connector, terminal 1. |
| (4) | Connect negative (-) multimeter lead to a known good ground. |
| (5) | Turn ON ENGINE switch (TM 9-2320-264-10). |
| (6) | Turn on crane POWER switch. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Steps (7) and (8) below and go to Step 5 of this Fault. (b) If 22 to 28 vdc are present, perform Steps (7) and (8) below and go to Step 14 of this Fault. |
| (7) | Turn off crane POWER switch. |
| (8) | Turn OFF ENGINE switch. |



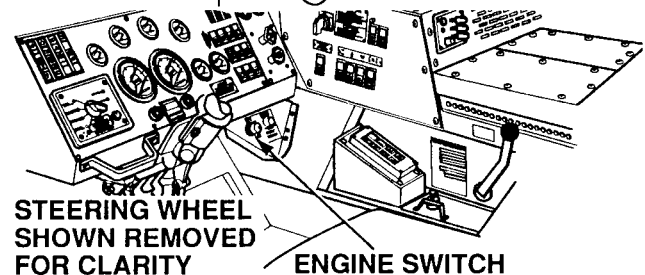
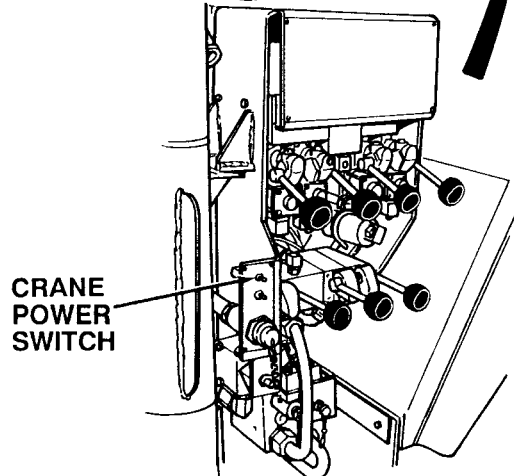
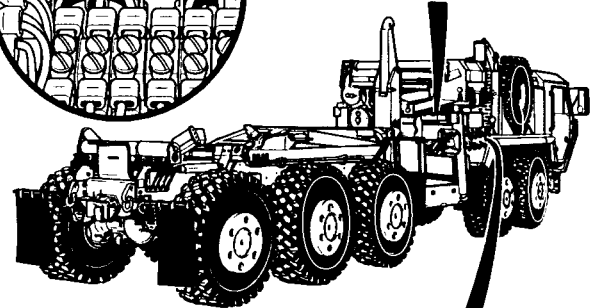
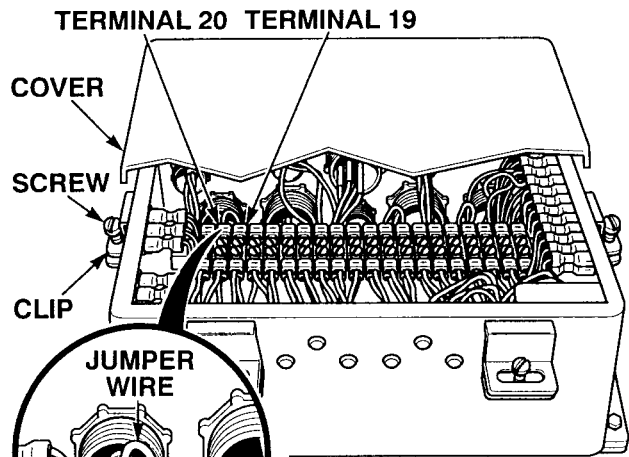
11. LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).



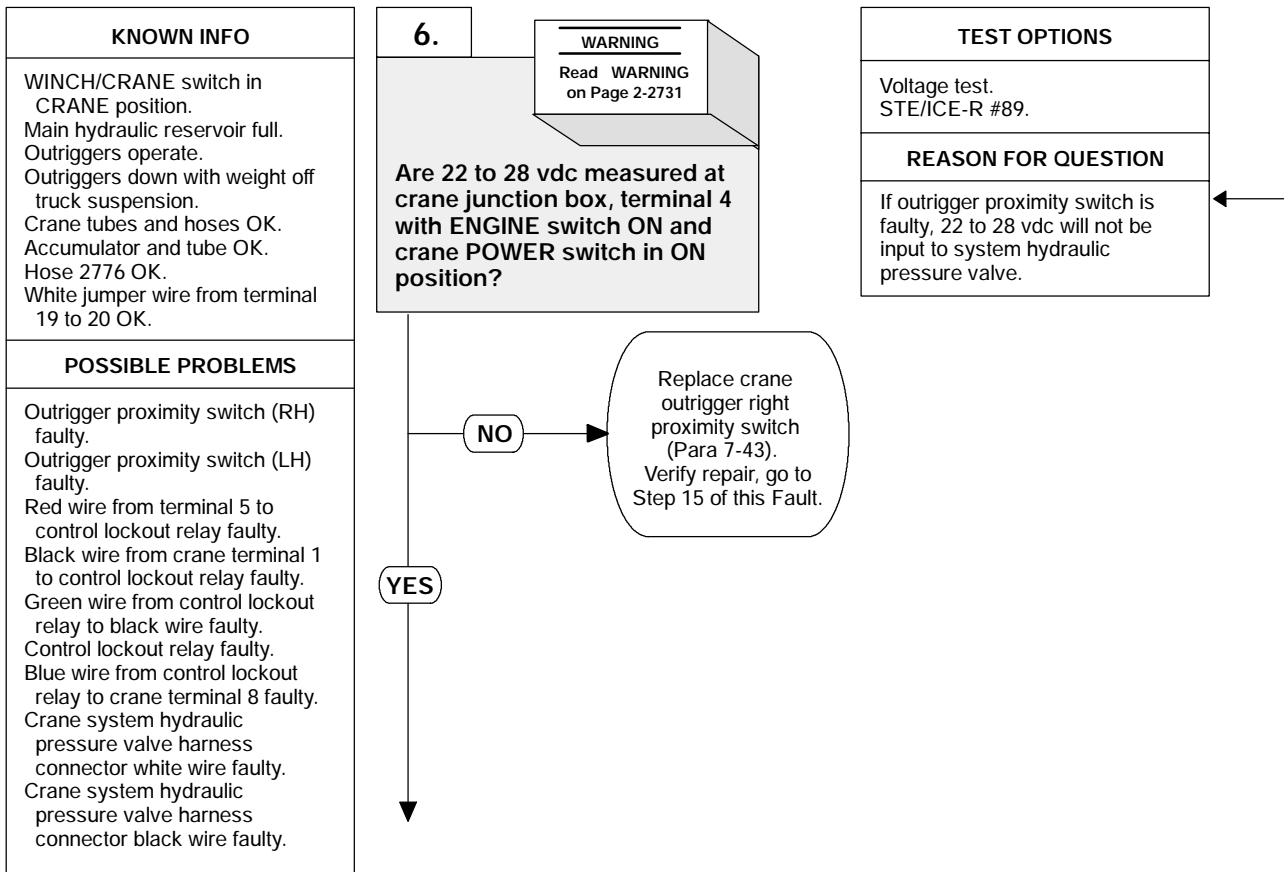
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Loosen six screws, clips and remove crane junction box cover.
 - (2) Connect positive (+) multimeter lead to crane junction box, terminal 20.
 - (3) Connect negative (-) multimeter lead to a known good ground.
 - (4) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (5) Turn on crane POWER switch.
 - (a) If 22 to 28 vdc are not present, perform Steps (6) and (7) below and repair white jumper wire from terminal 19 to 20 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Step (6) and (7) below and go to Step 6 of this Fault.
 - (6) Turn off crane POWER switch.
 - (7) Turn OFF ENGINE switch.



11. LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).



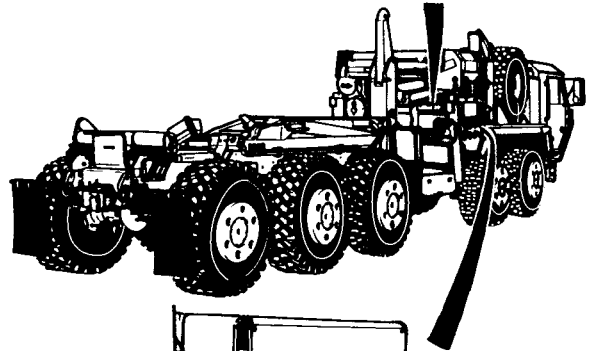
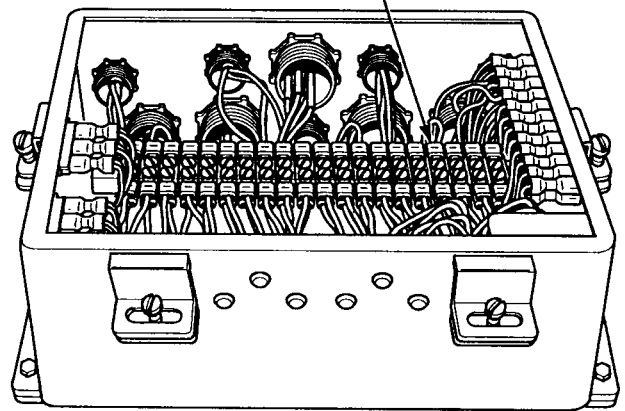
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

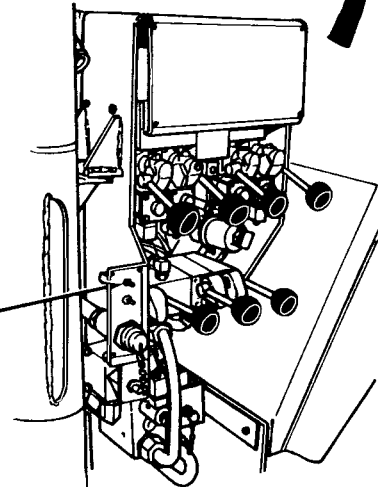
VOLTAGE TEST

- (1) Connect positive (+) multimeter lead to crane junction box, terminal 4.
- (2) Connect negative (-) multimeter lead to a known good ground.
- (3) Turn ON ENGINE switch (TM 9-2320-364-10).
- (4) Turn on crane POWER switch.
 - (a) If 22 to 28 vdc are not present, perform Steps (5) and (6) below and replace RH proximity switch (Para 7-43).
 - (b) If 22 to 28 vdc are present, perform Steps (5) and (6) below and go to Step 7 of this Fault.
- (5) Turn off crane POWER switch.
- (6) Turn OFF ENGINE switch.

TERMINAL 4

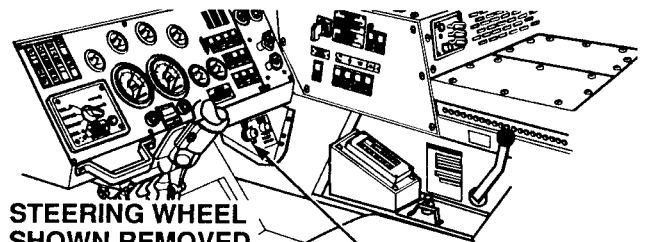


POWER SWITCH

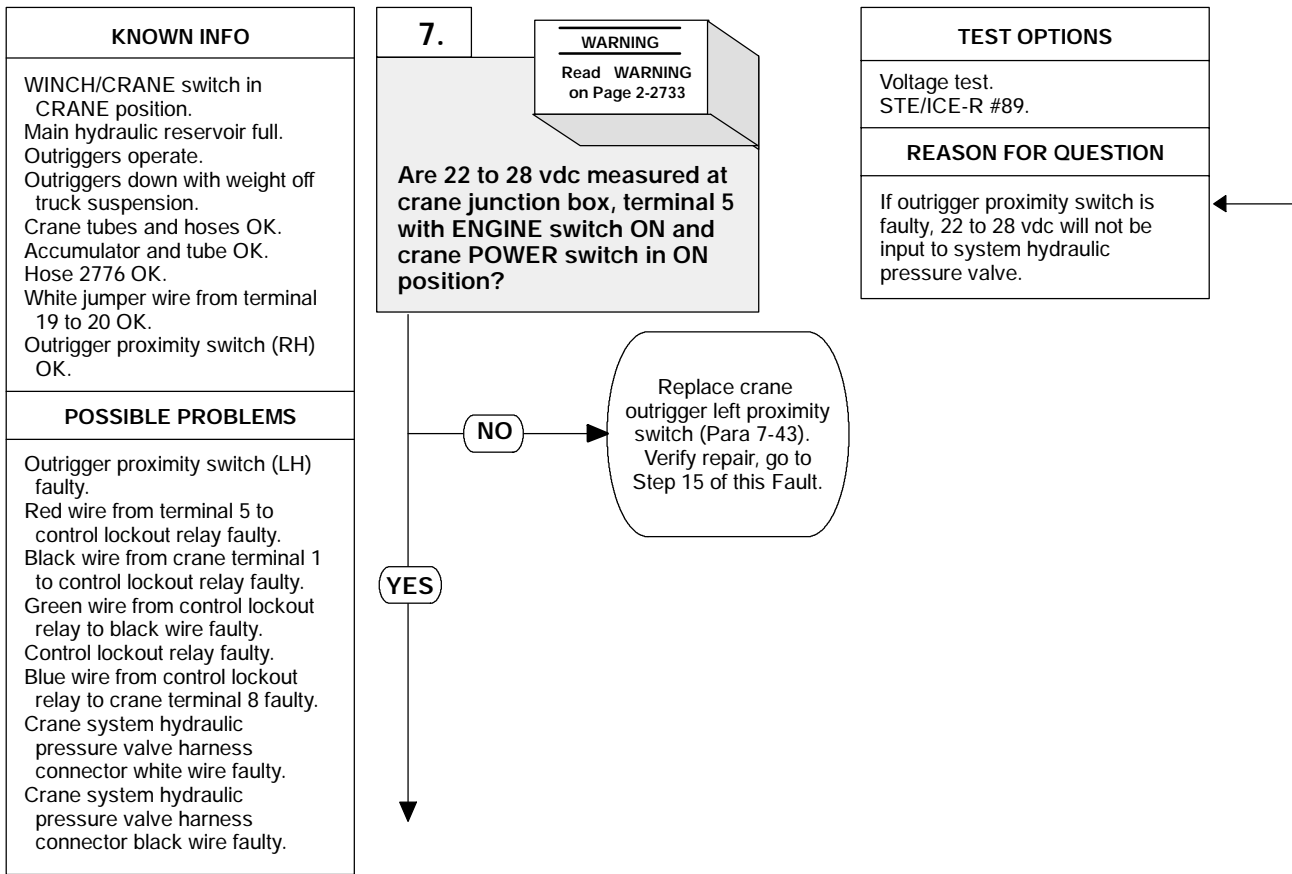


STEERING WHEEL SHOWN REMOVED FOR CLARITY

ENGINE SWITCH



11. LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).

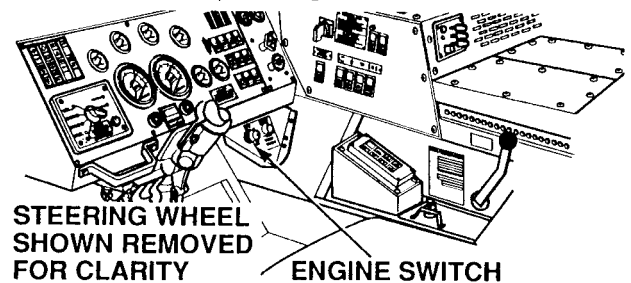
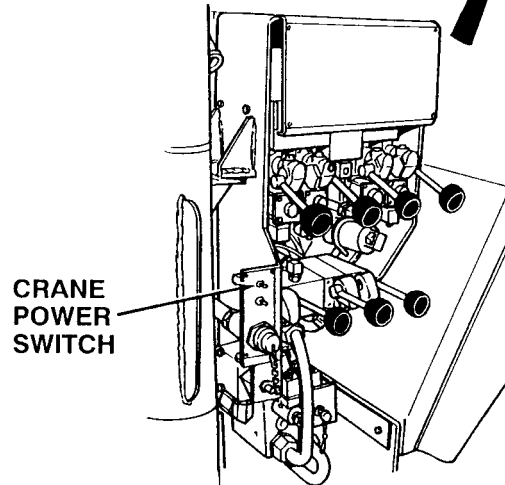
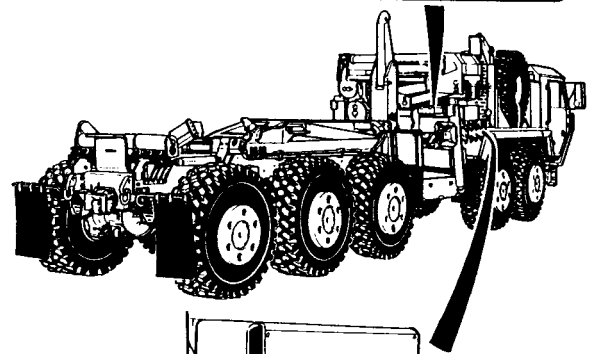
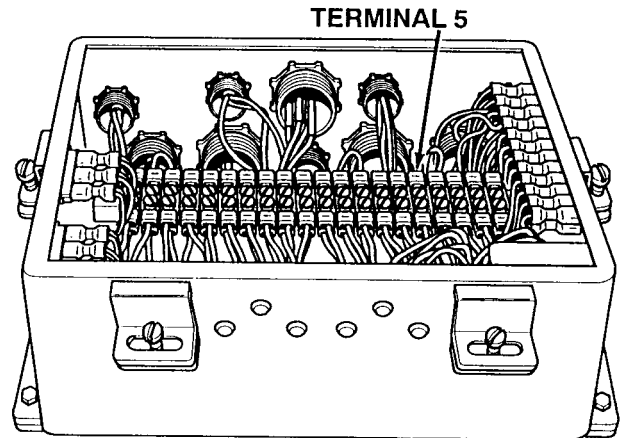


WARNING

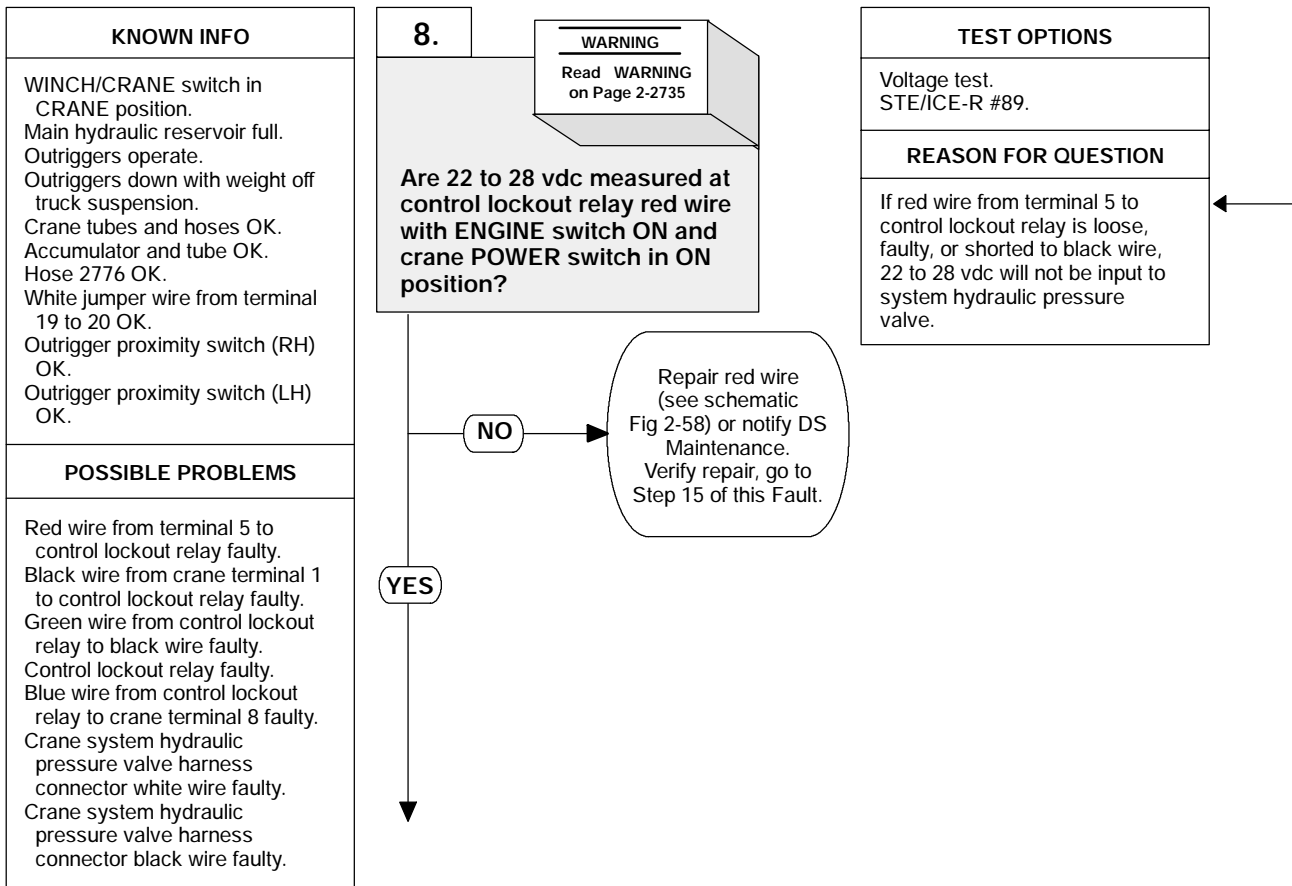
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Connect positive (+) multimeter lead to crane junction box, terminal 5.
- (2) Connect negative (-) multimeter lead to a known good ground.
- (3) Turn ON ENGINE switch.
- (4) Turn on crane POWER switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Steps (5) and (6) below and replace LH proximity switch (Para 7-43).
 - (b) If 22 to 28 vdc are present, perform Steps (5) and (6) below and go to Step 8 of this Fault.
- (5) Turn off crane POWER switch.
- (6) Turn OFF ENGINE switch.

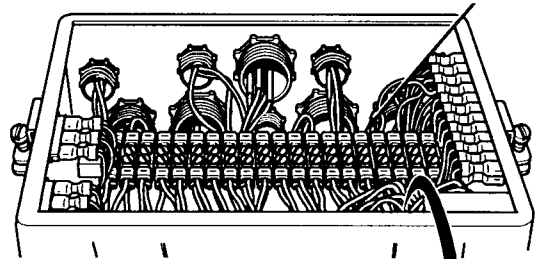
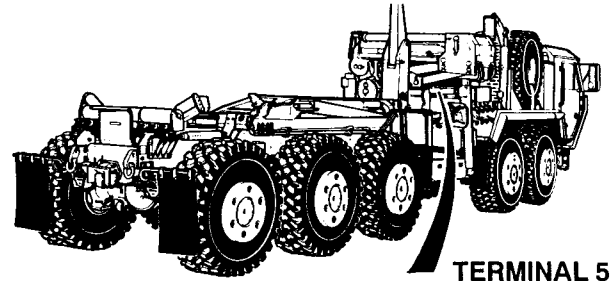


11. LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).

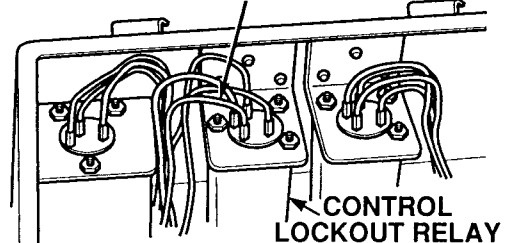


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



RED WIRE

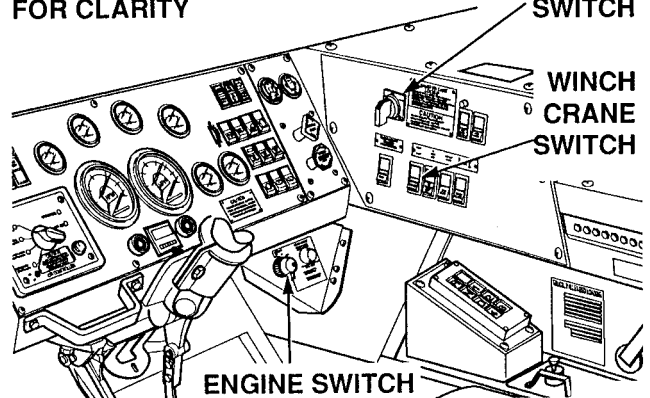


CONTROL LOCKOUT RELAY

VOLTAGE TEST	
(1)	Connect positive (+) multimeter lead to control lockout relay red wire.
(2)	Connect negative (-) multimeter lead to a known good ground.
(3)	Turn ON ENGINE switch (TM 9-2320-364-10).
(4)	Turn on crane POWER switch. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Steps (5) and (6) below and repair red wire from crane junction box terminal 5 to control lockout relay (see schematic Fig 2-58) or notify DS Maintenance. (b) If 22 to 28 vdc are present, perform Steps (5) and (6) below and go to Step 10 of this Fault.
(5)	Turn off crane POWER switch.
(6)	Turn OFF ENGINE switch.

STEERING WHEEL SHOWN REMOVED FOR CLARITY

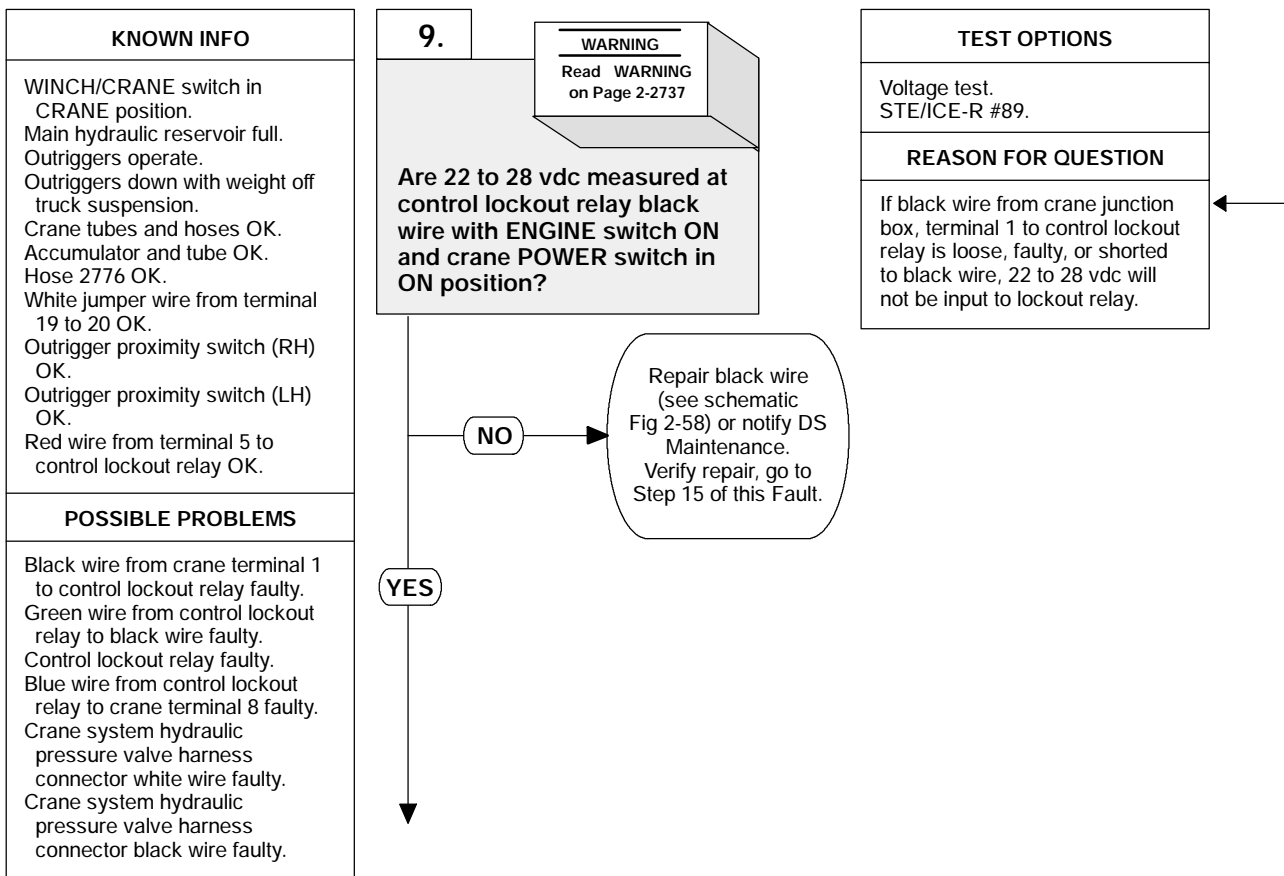
HYDRAULIC SELECTOR SWITCH



WINCH CRANE SWITCH

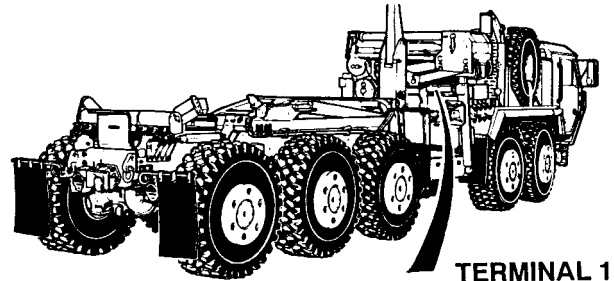
ENGINE SWITCH

11. LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).

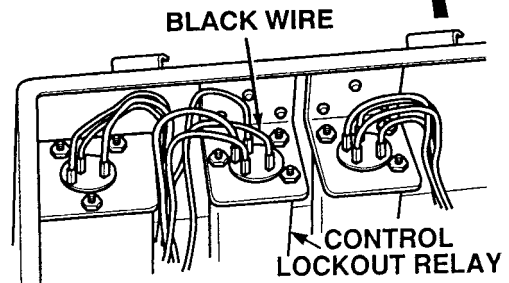
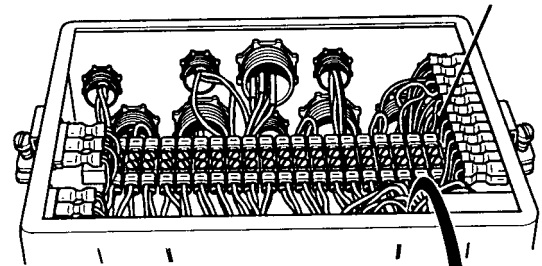


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

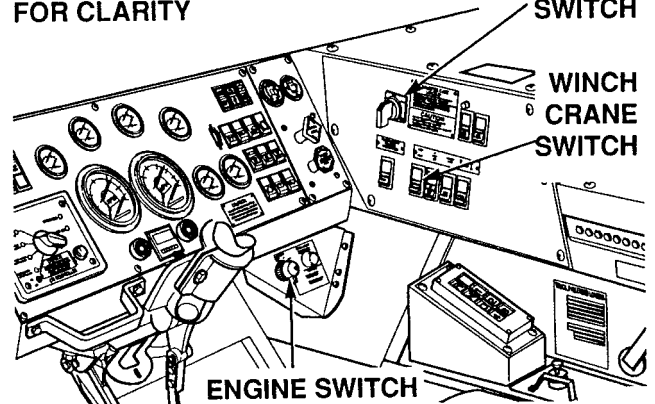


- | VOLTAGE TEST |
|--|
| (1) Connect positive (+) multimeter lead control lockout relay black wire. |
| (2) Connect negative (-) multimeter lead to a known good ground. |
| (3) Turn ON ENGINE switch (TM 9-2320-364-10). |
| (4) Turn on crane POWER switch. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Steps (5) and (6) below and repair black wire from crane junction box terminal 1 to control lockout relay (see schematic Fig 2-58) or notify DS Maintenance. (b) If 22 to 28 vdc are present, perform Steps (5) and (6) below and go to Step 11 of this Fault. |
| (5) Turn off crane POWER switch. |
| (6) Turn OFF ENGINE switch. |

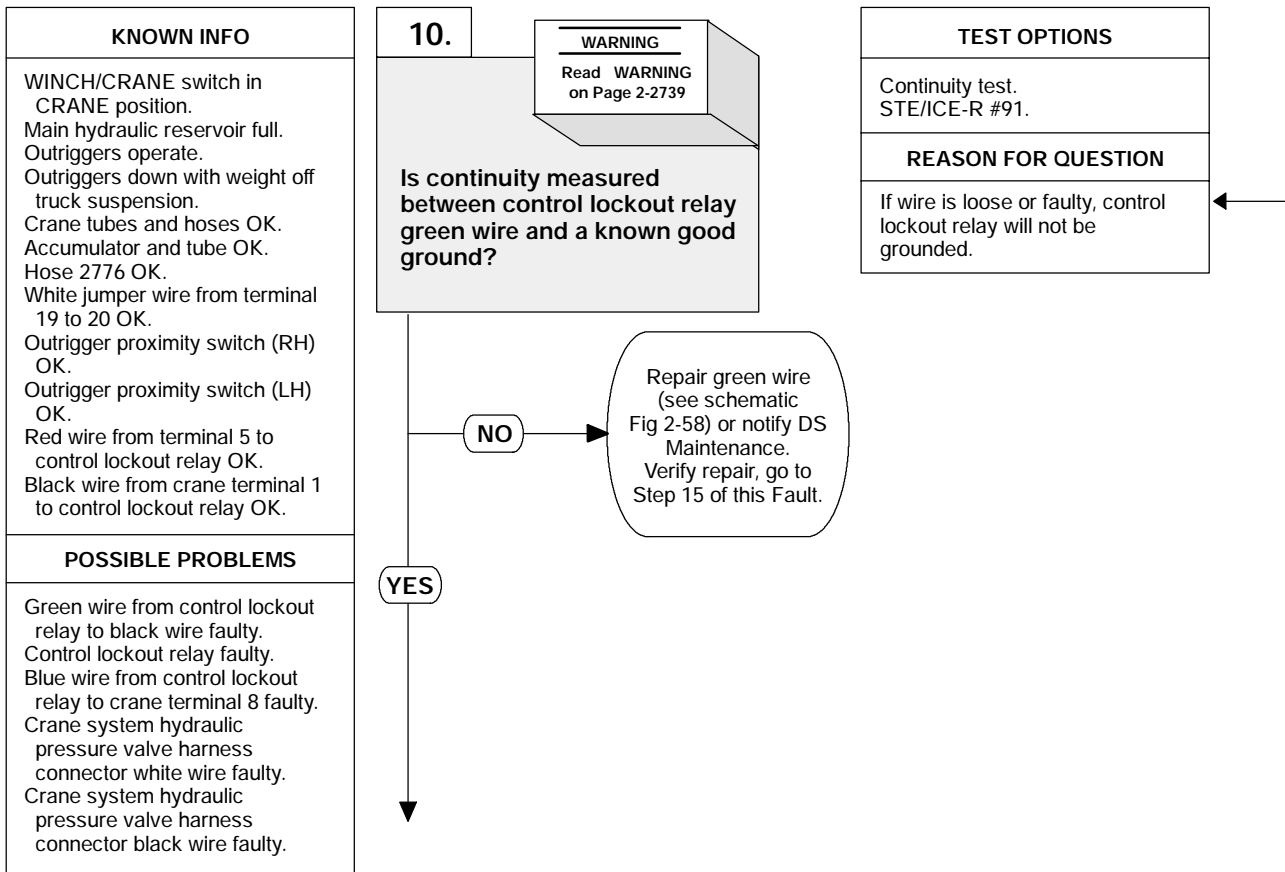


STEERING WHEEL SHOWN REMOVED FOR CLARITY

HYDRAULIC SELECTOR SWITCH

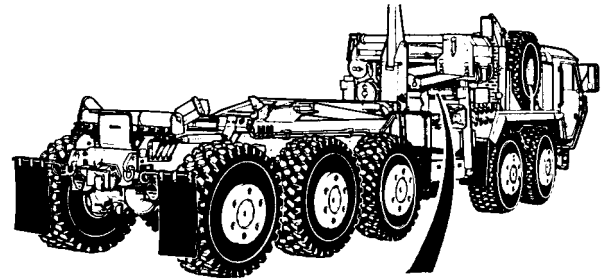


11. LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).

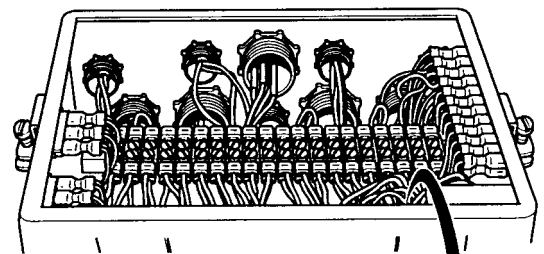
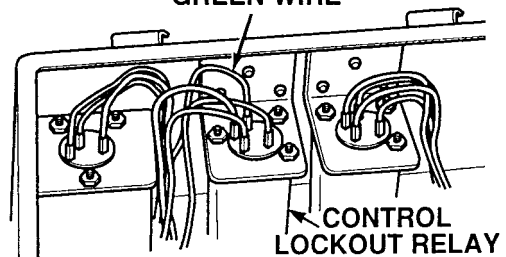


WARNING

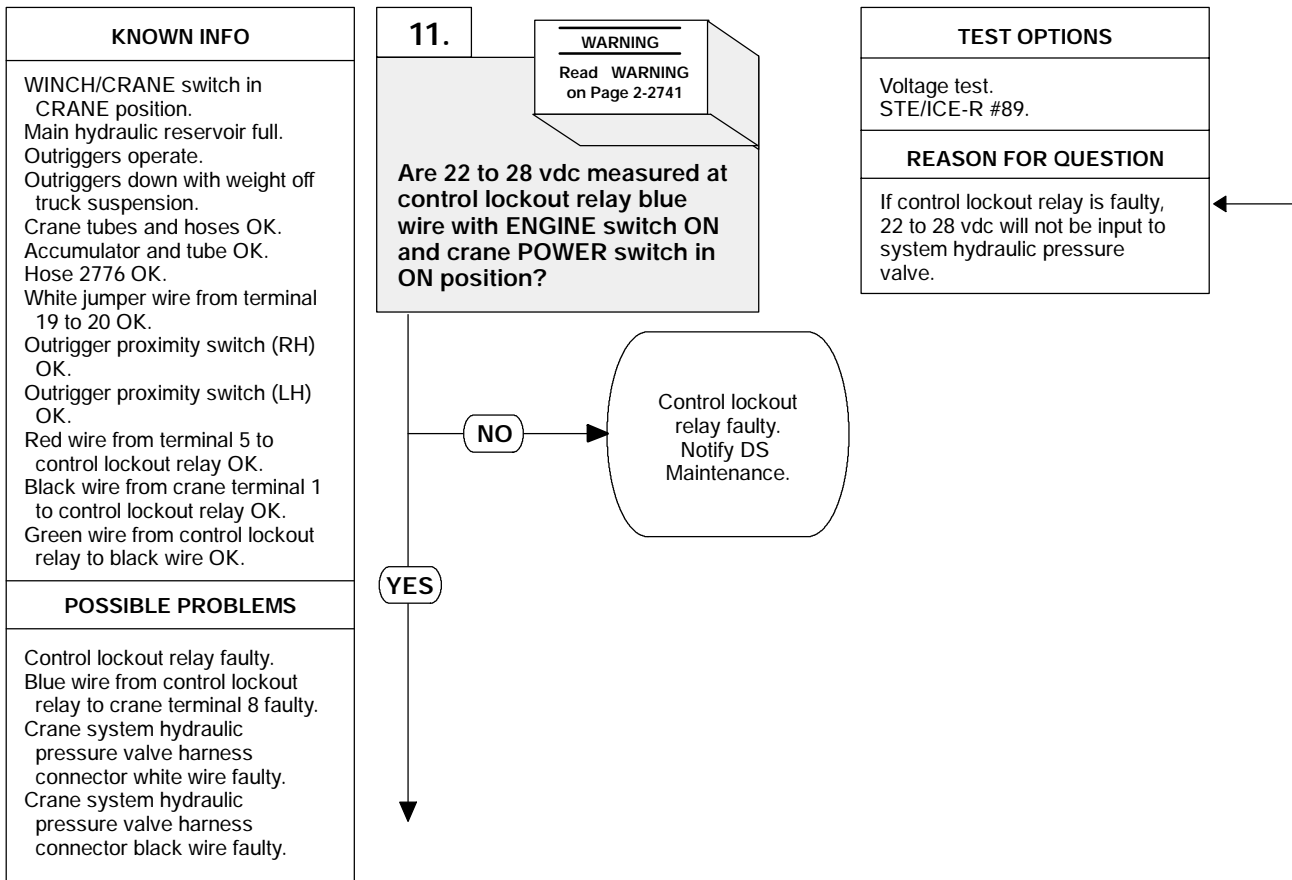
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

**CONTINUITY TEST**

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between control lockout relay green wire and a known good ground?
 - (a) If there is no continuity, repair green wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, wire is OK.

**GREEN WIRE****CONTROL
LOCKOUT RELAY**

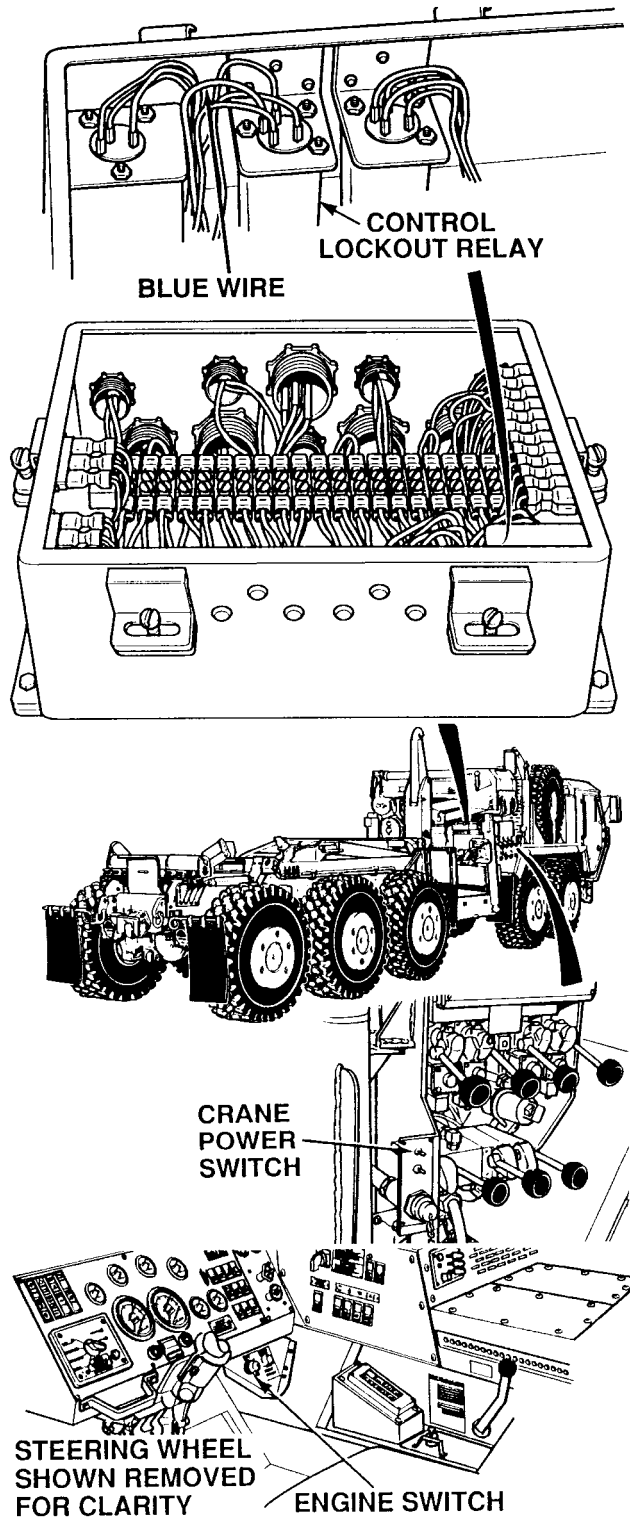
11 LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).



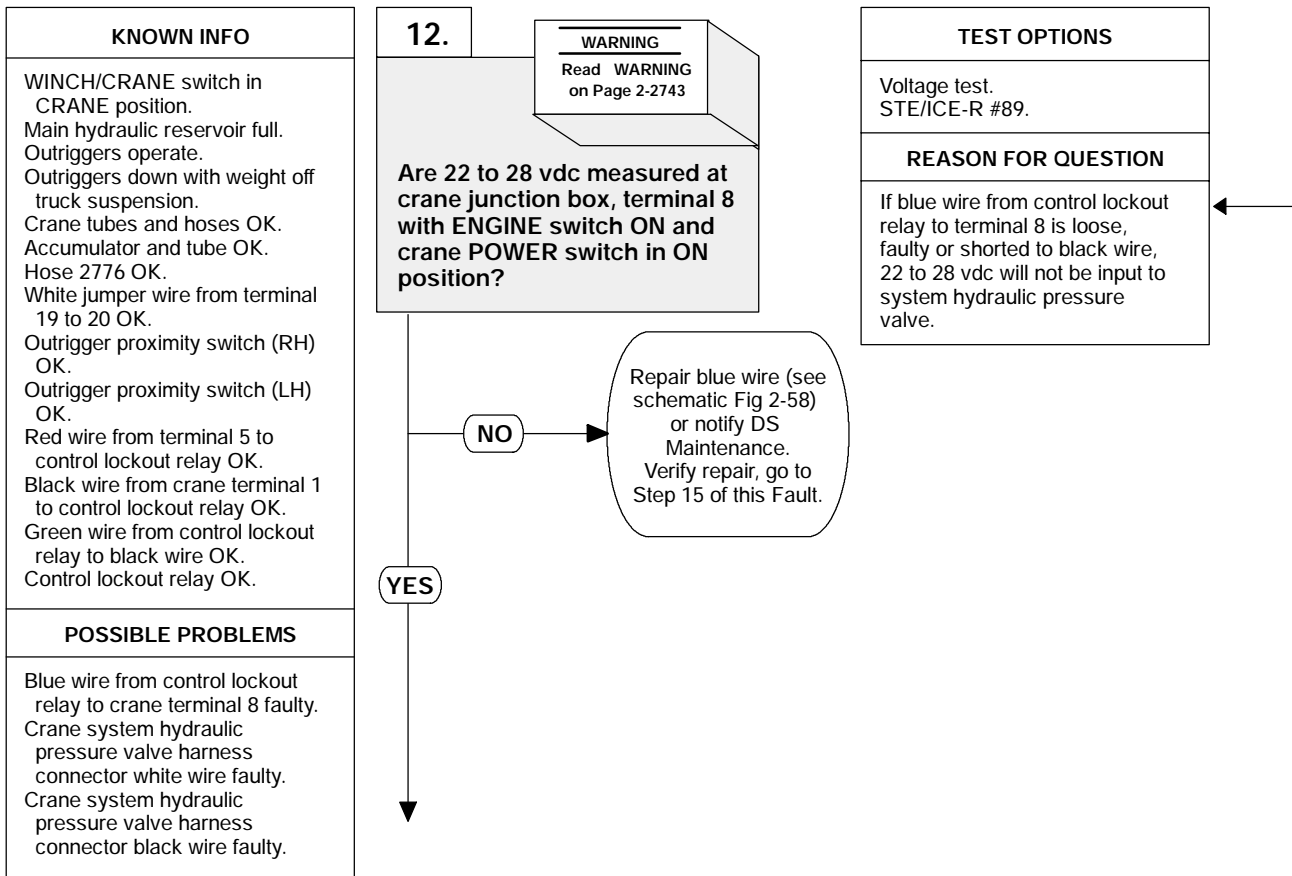
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | VOLTAGE TEST |
|---|
| (1) Set multimeter select switch to volts. |
| (2) Connect positive (+) multimeter lead to control lockout relay blue wire. |
| (3) Connect negative (-) multimeter lead to a known good ground. |
| (4) Turn ON ENGINE switch (TM 9-2320-364-10). |
| (5) Turn on crane POWER switch. |
| (a) If 22 to 28 vdc are not present, control lockout relay faulty. Perform Steps (6) and (7) below and notify DS Maintenance. |
| (b) If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 12 of this Fault. |
| (6) Turn off crane POWER switch. |
| (7) Turn OFF ENGINE switch. |



11 LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).

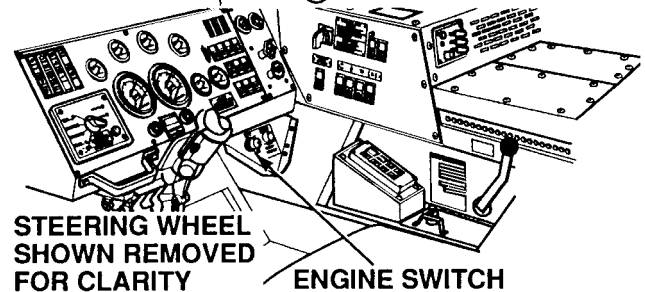
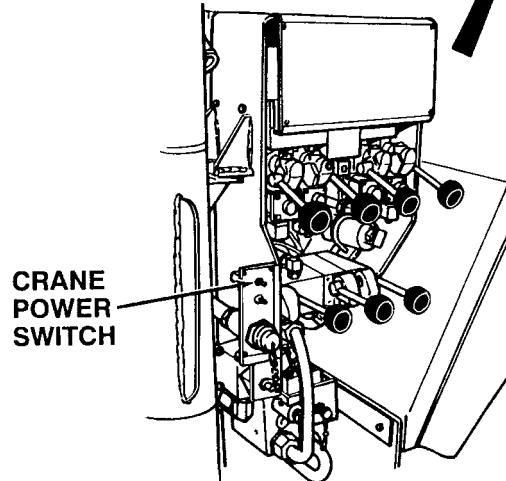
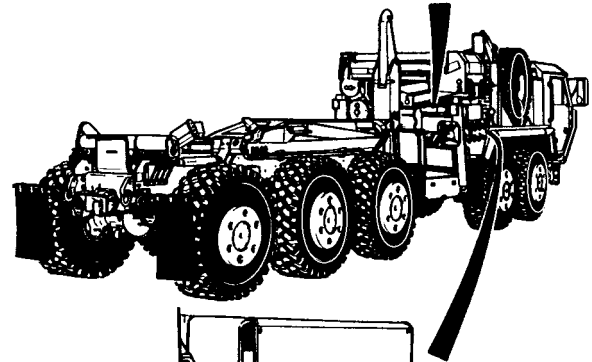
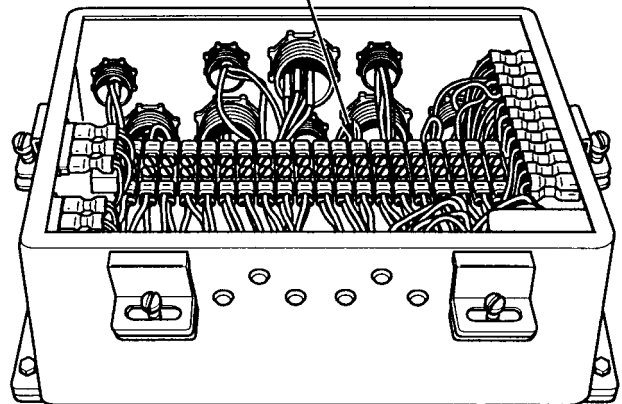


WARNING

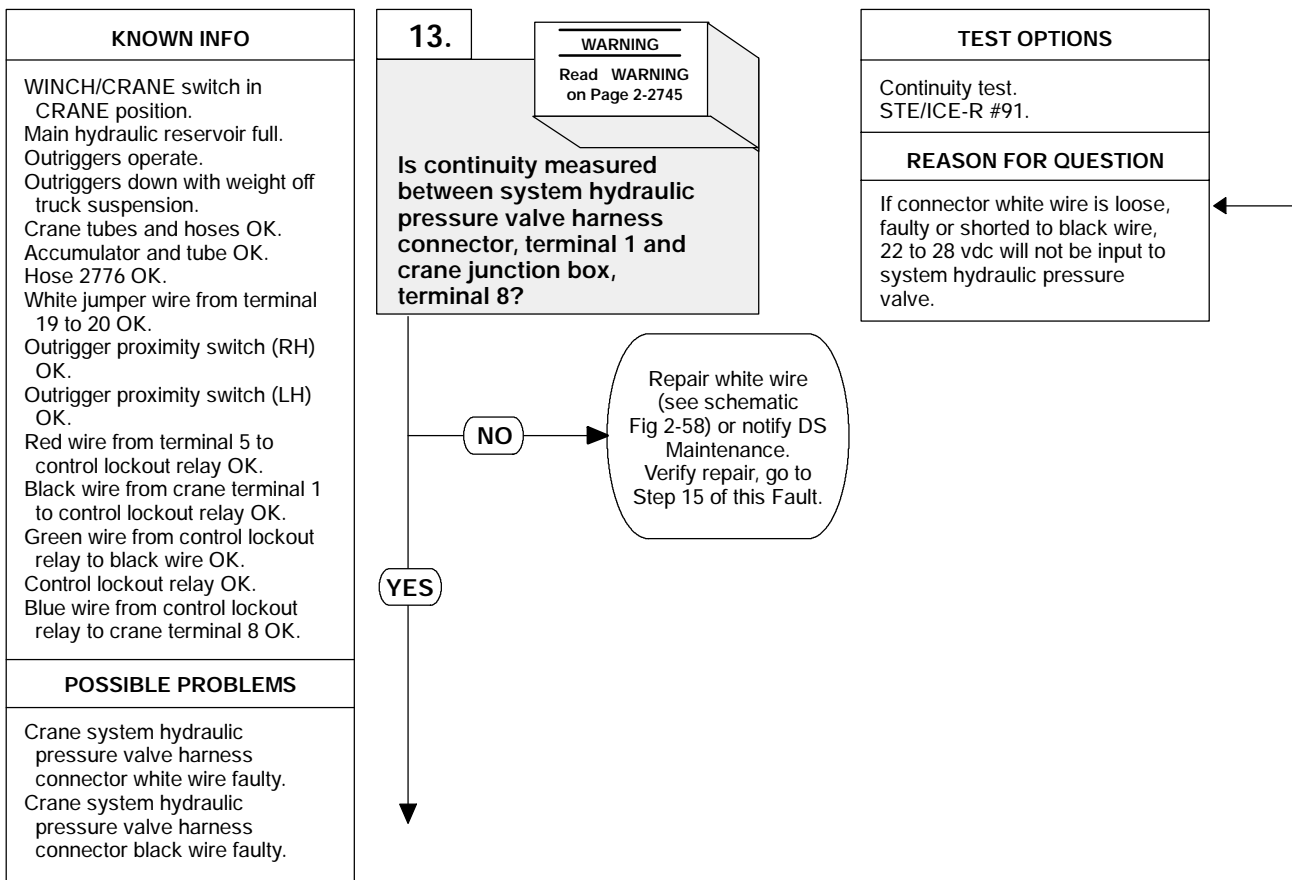
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- VOLTAGE TEST**
- (1) Connect positive (+) multimeter lead to crane junction box, terminal 8.
 - (2) Connect negative (-) multimeter lead to a known good ground.
 - (3) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (4) Turn on crane POWER switch.
 - (a) If 22 to 28 vdc are not present, perform Steps (5) and (6) below and repair blue wire from control lockout relay to terminal 8 (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, perform Steps (5) and (6) below and go to Step 13 of this Fault.
 - (5) Turn off crane POWER switch.
 - (6) Turn OFF ENGINE switch.

TERMINAL 8



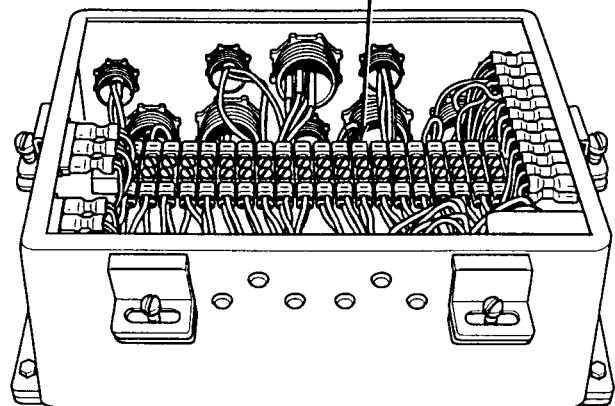
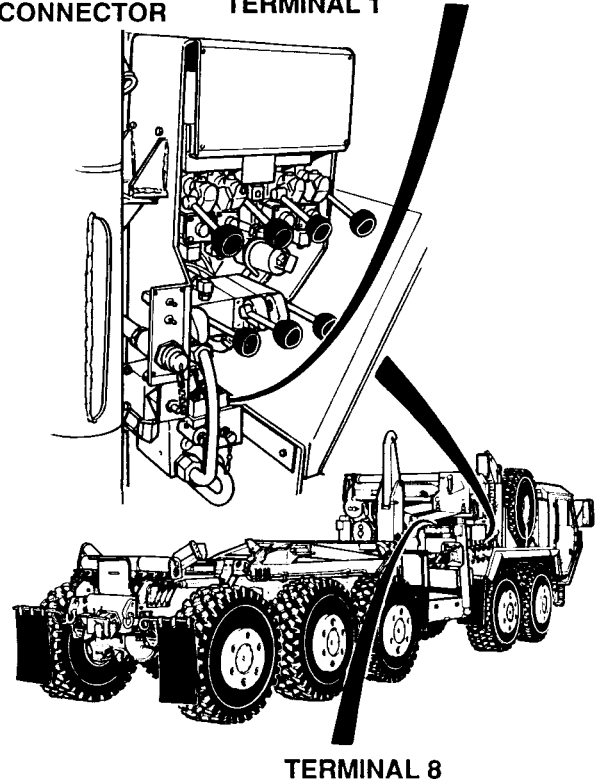
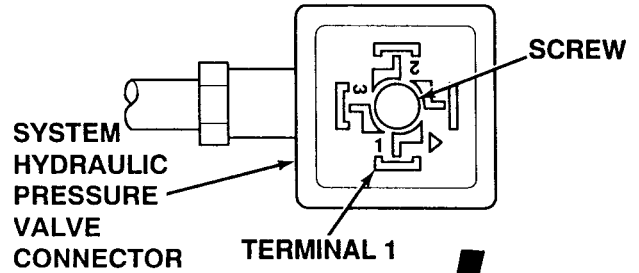
11 LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).



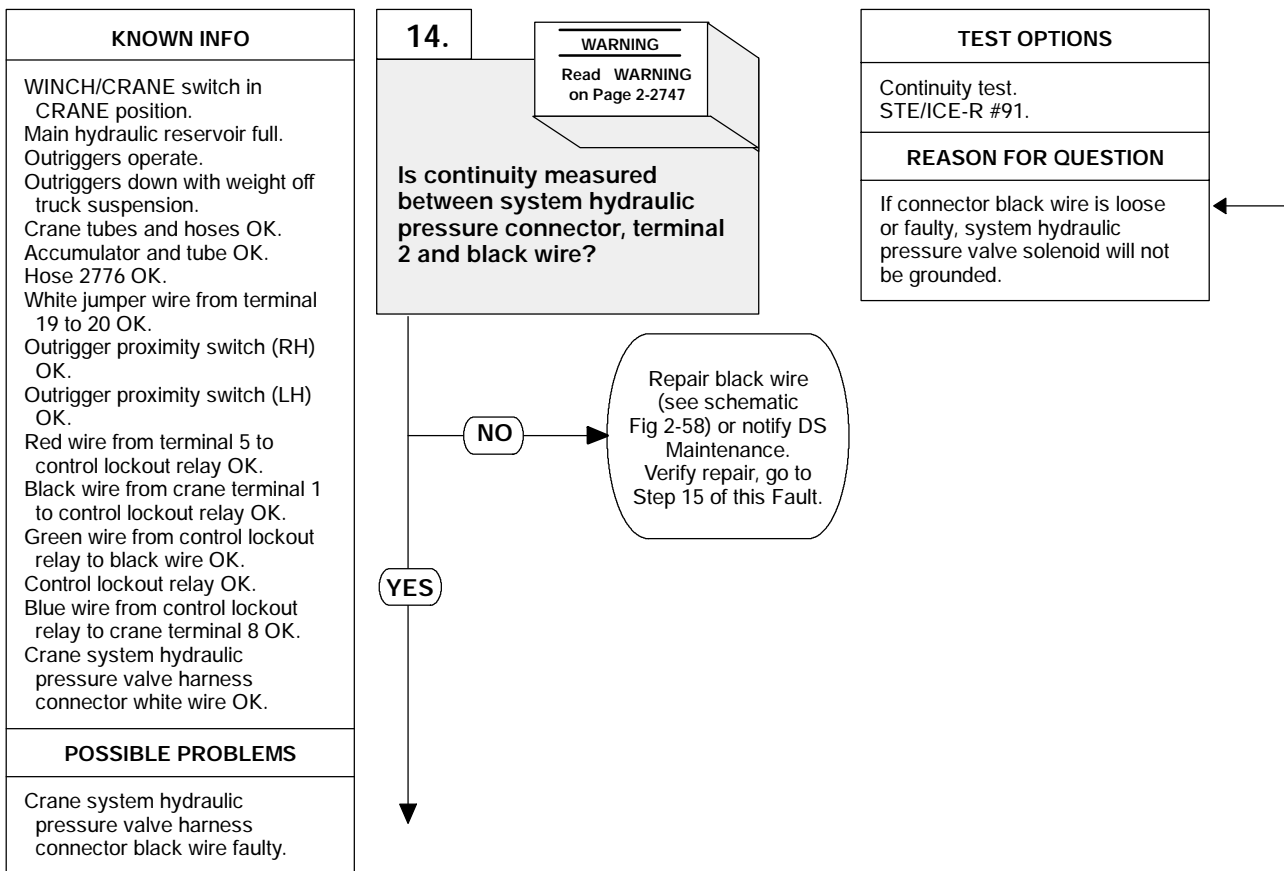
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST
(1) Set multimeter select switch to ohms. (2) Is there continuity between system hydraulic pressure valve connector, terminal 1 and crane junction box, terminal 8? (a) If there is no continuity, repair connector white wire (see schematic Fig 2-58) or notify DS Maintenance. (b) If there is continuity, go to Step 14 of this Fault. (3) Deleted.



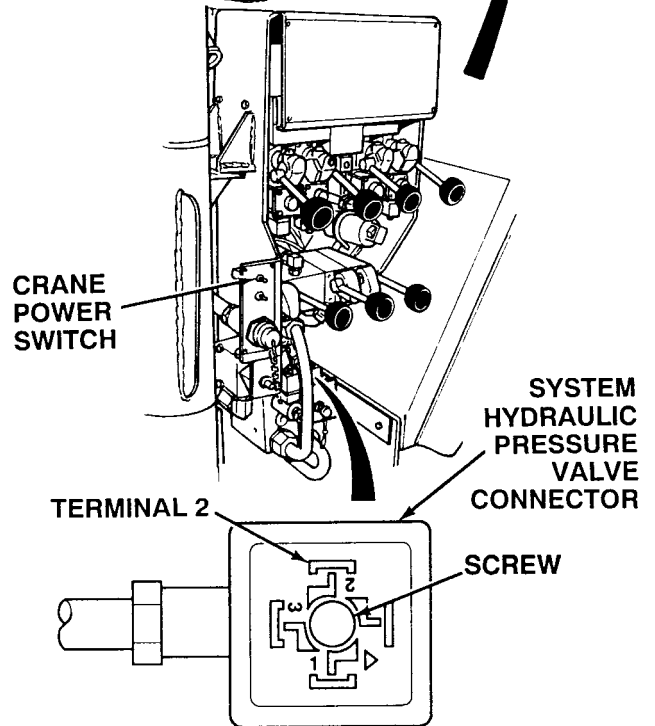
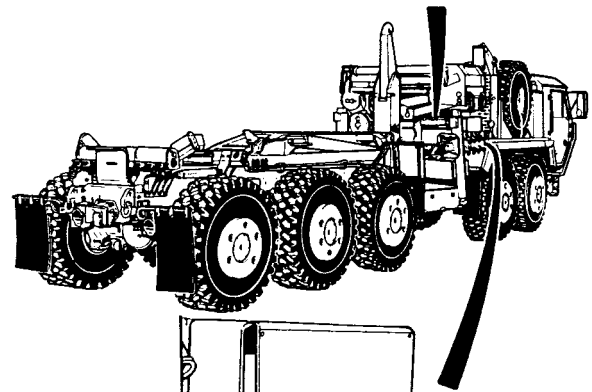
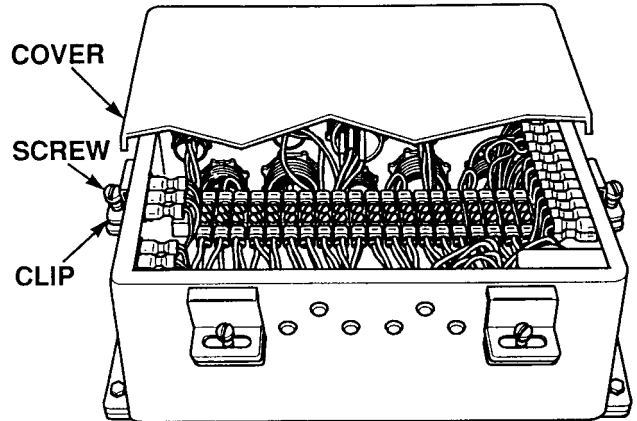
11 LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).



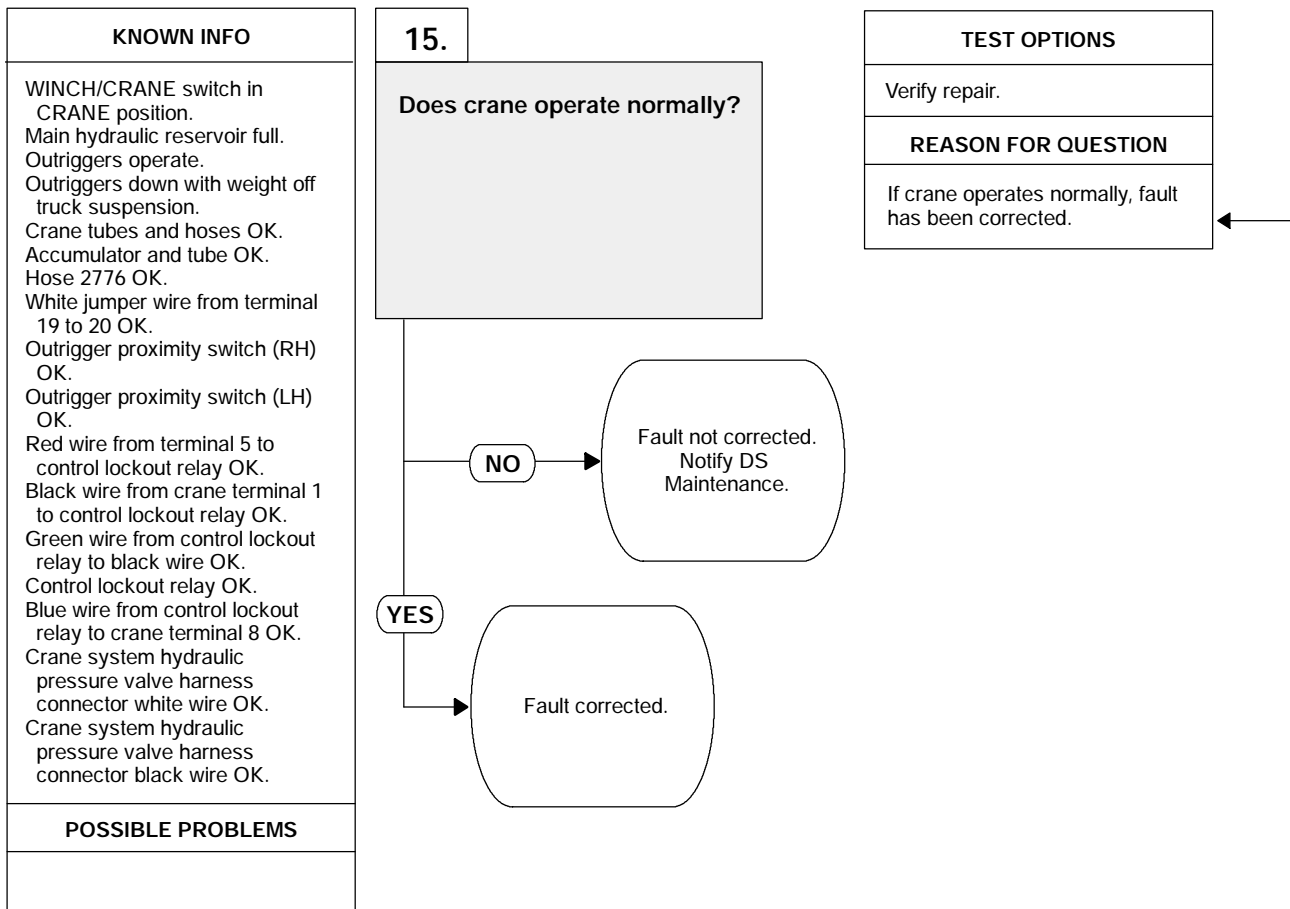
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | CONTINUITY TEST |
|--|
| <p>(1) Is there continuity between system hydraulic pressure valve connector, terminal 2 and a known good ground?</p> <p>(a) If there is no continuity, repair connector black wire (see schematic Fig 2-58) or notify DS Maintenance.</p> <p>(b) If there is continuity, perform Step (2) below, connector black wire is OK.</p> <p>(2) Connect system hydraulic pressure harness connector and tighten screw.</p> <p>(3) Install junction box cover, six screws and clips.</p> |



11 LOSS OF CRANE FUNCTIONS (SWING, TELESCOPE, BOOM AND HOIST) (CONT).



VERIFY REPAIR

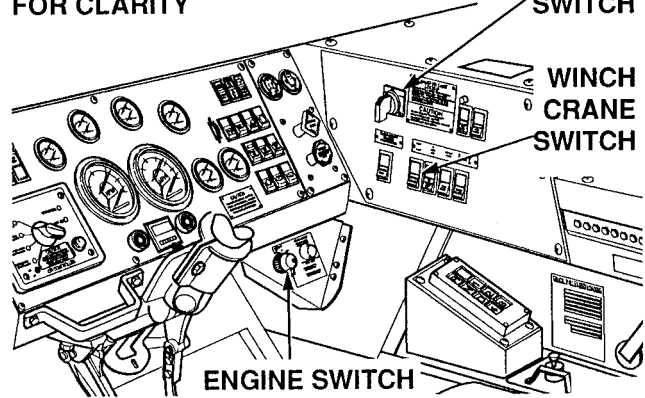
- Operate crane (TM 9-2320-364-10).
- (1) If crane does not operate normally, fault not corrected. Notify DS Maintenance.
 - (2) If crane operates normally, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

12. BOOM DOES NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

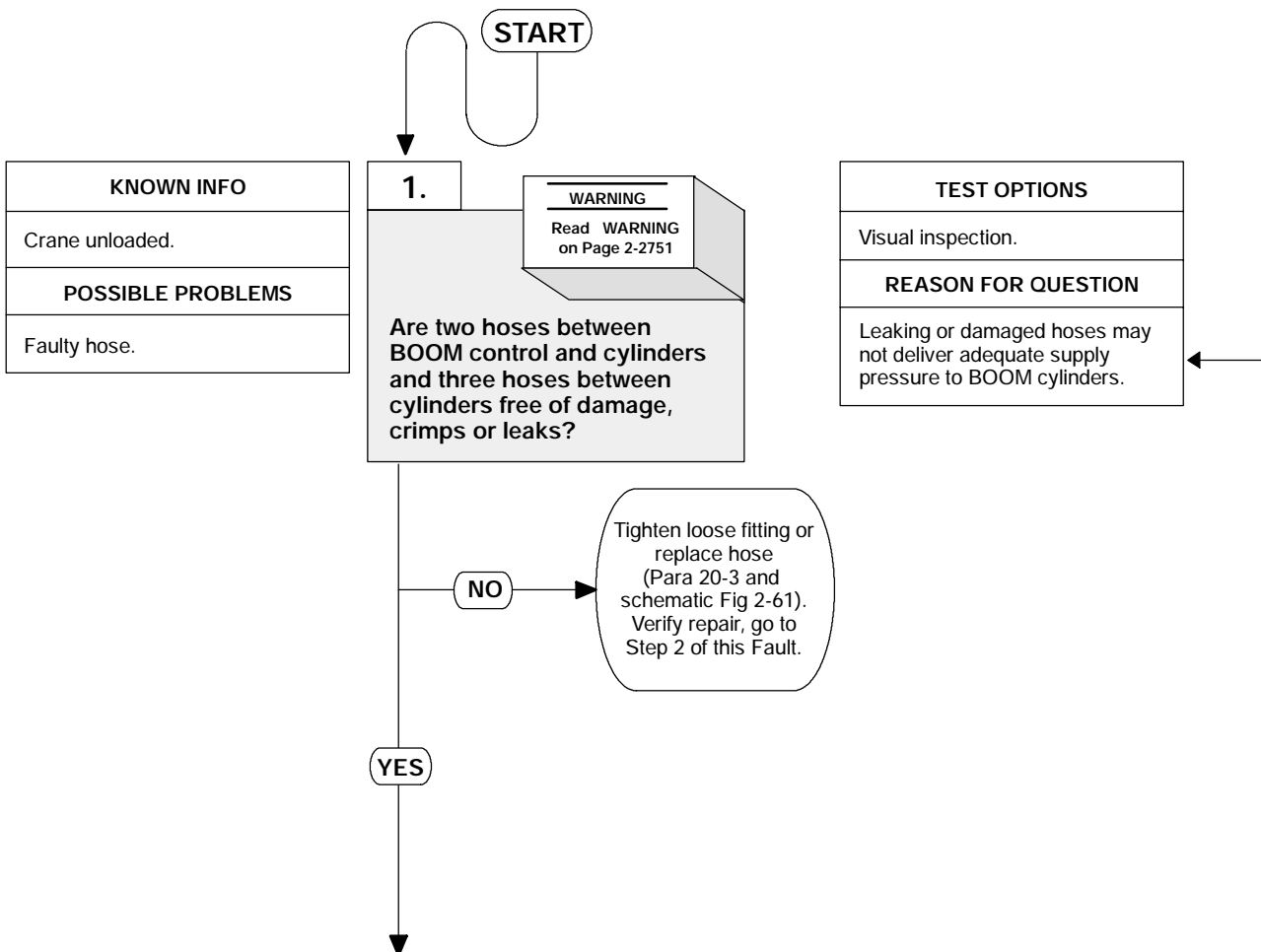
Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Outriggers down with weight off truck suspension,
(TM 9-2320-364-10)



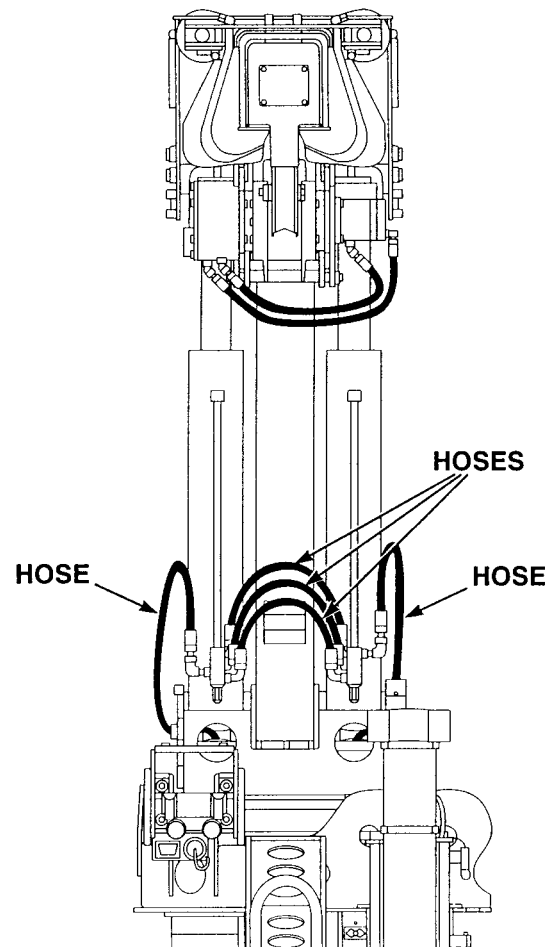
WARNING

High pressure hydraulics [oil under 3,100 psi (21,374 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

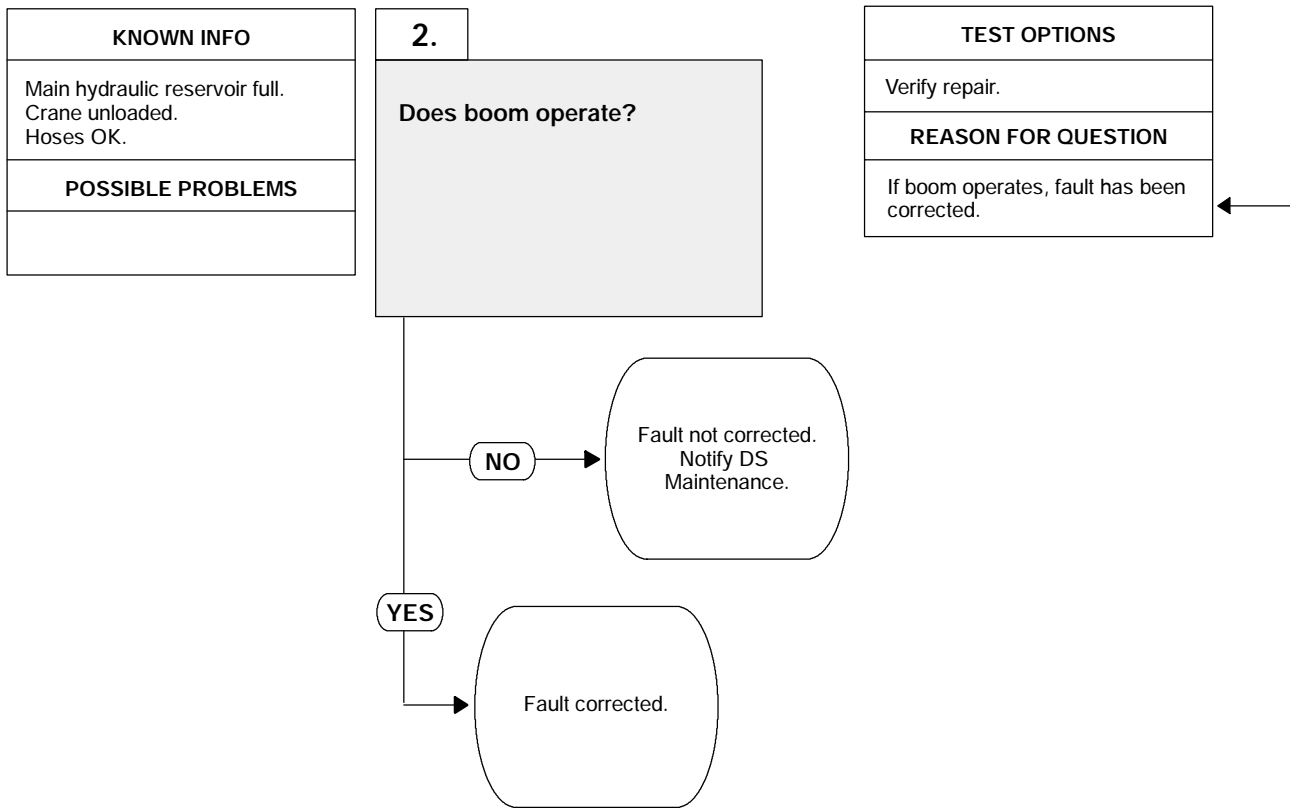
VISUAL INSPECTION

Inspect two hoses between BOOM control and cylinders and three hoses between cylinders for leaks and damage.

- (1) If hoses are damaged, crimped or leaking repair hoses (Para 20-3 and schematic Fig 2-61).
- (2) If hoses are not crimped or leaking, notify DS Maintenance.



12. BOOM DOES NOT OPERATE (CONT).



VERIFY REPAIR

Operate crane (TM 9-2320-364-10).

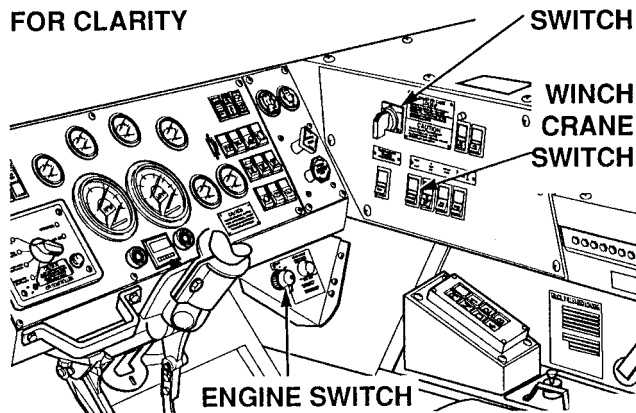
- (1) If boom does not operate, fault not corrected. Notify DS Maintenance.
- (2) If crane operates, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

13. TELESCOPE DOES NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

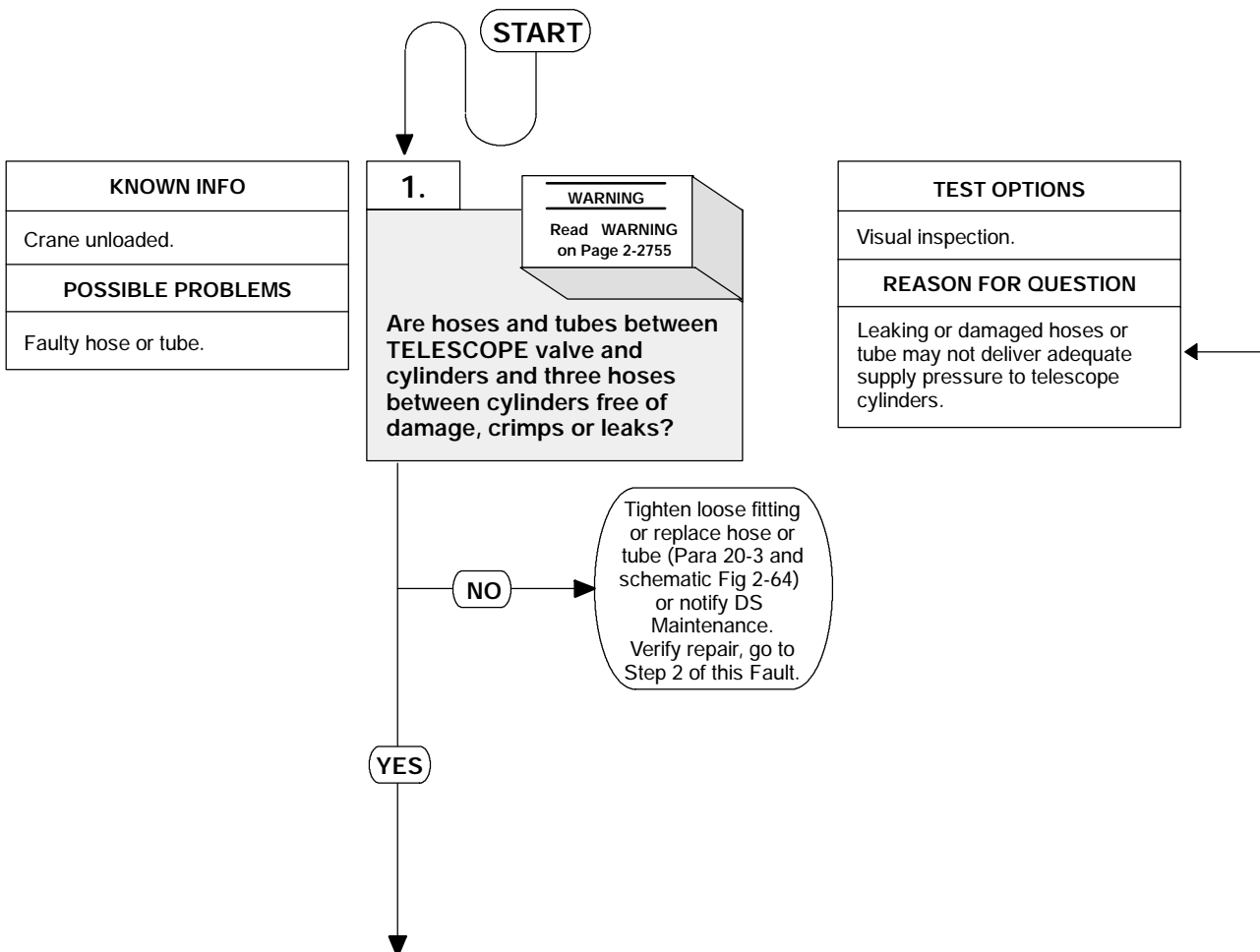
Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

TM 9-2320-364-10

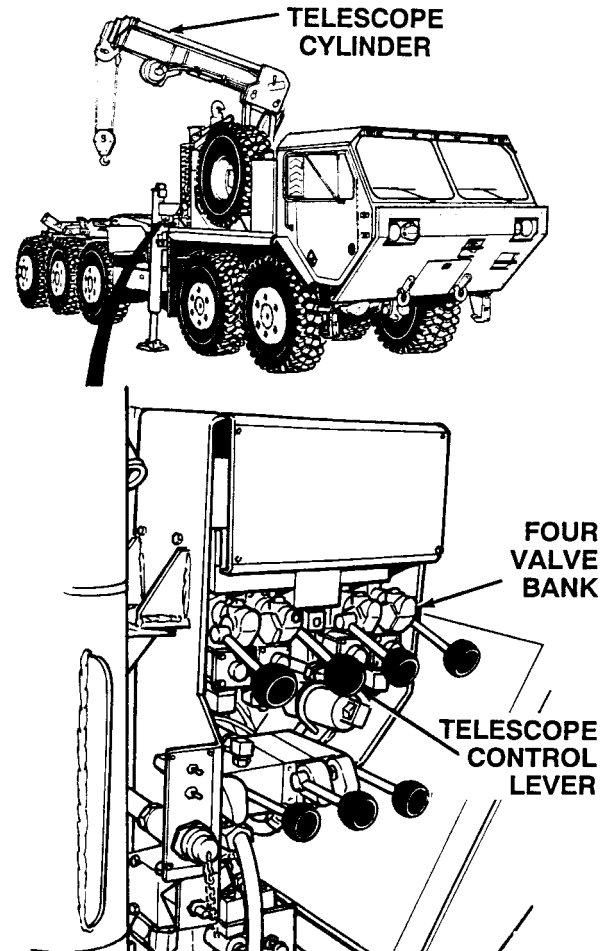
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Outriggers down with weight off truck suspension,
(TM 9-2320-364-10)



WARNING

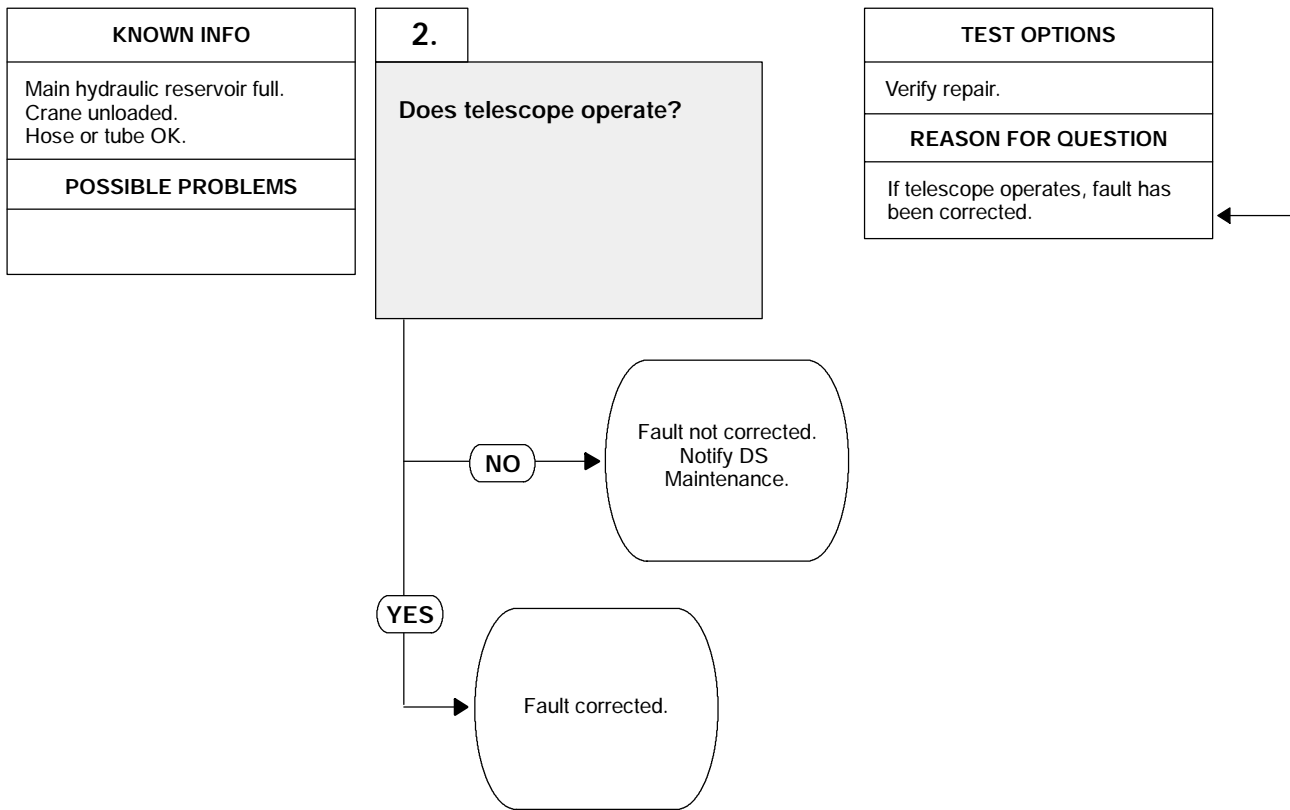
High pressure hydraulics [oil under 3100 psi (21,374 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

**VISUAL INSPECTION**

Inspect hoses and tubes between TELESCOPE valve and cylinders and three hoses between cylinders for damage, crimps or leaks.

- (1) If hoses are damaged, crimped or leaking secure loose fittings repair hose (Para 20-3 and schematic Fig 2-64) or notify DS Maintenance.
- (2) If hoses are not damaged, crimped or leaking, notify DS Maintenance.

13. TELESCOPE DOES NOT OPERATE (CONT).



VERIFY REPAIR

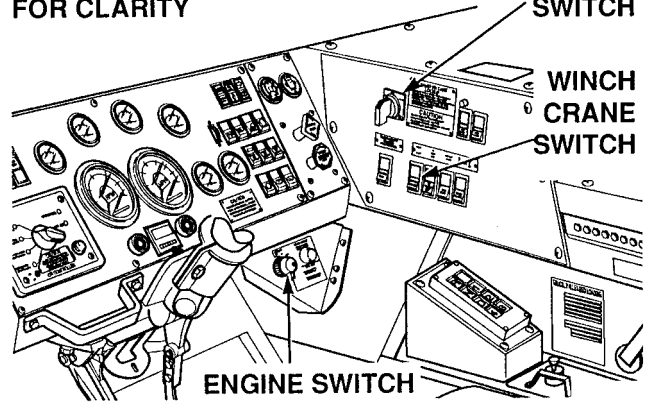
- Operate crane (TM 9-2320-364-10).
- (1) If telescope does not operate, fault not corrected, notify DS Maintenance.
 - (2) If telescope operates, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

14. HOIST DOES NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

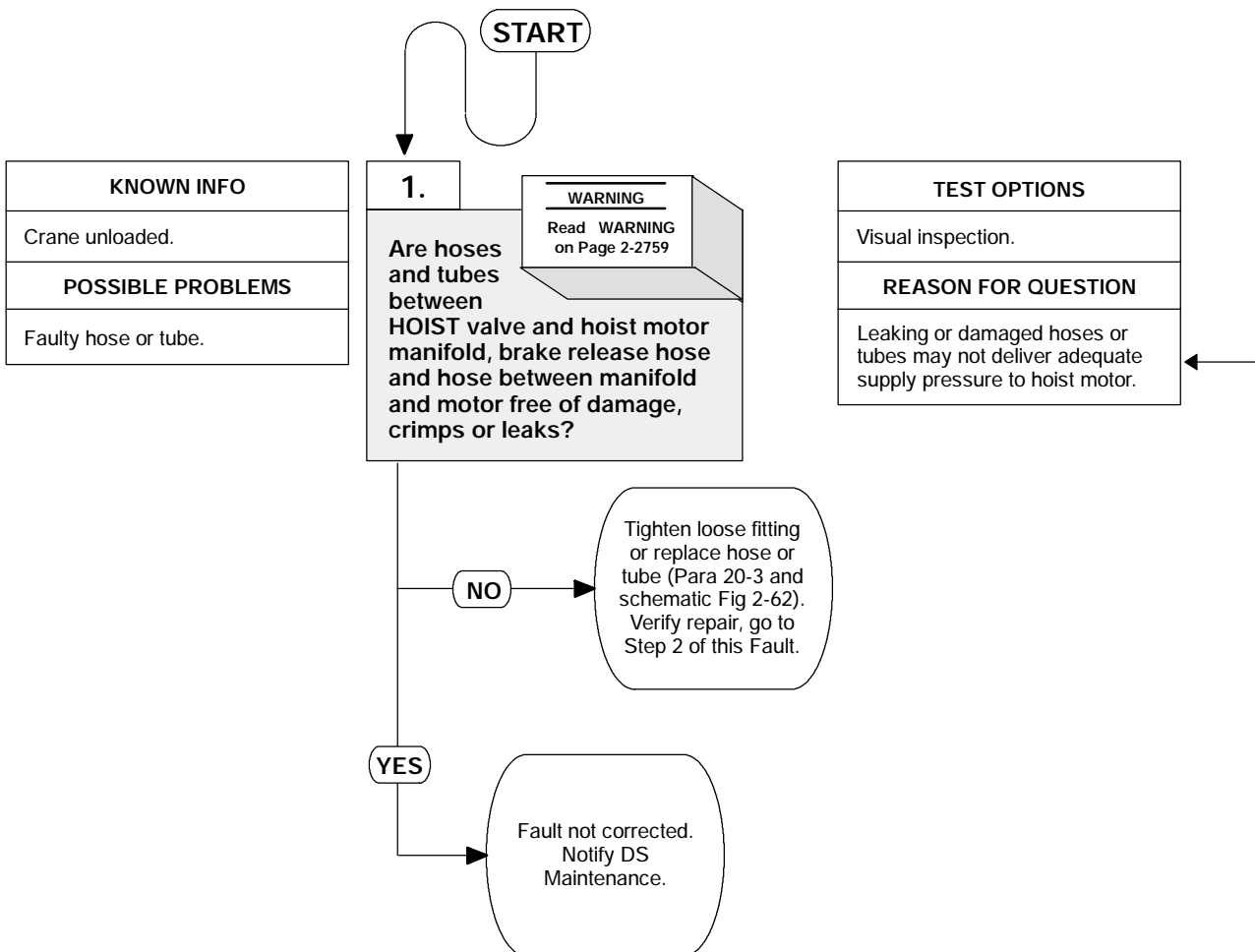
Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

TM 9-2320-364-10

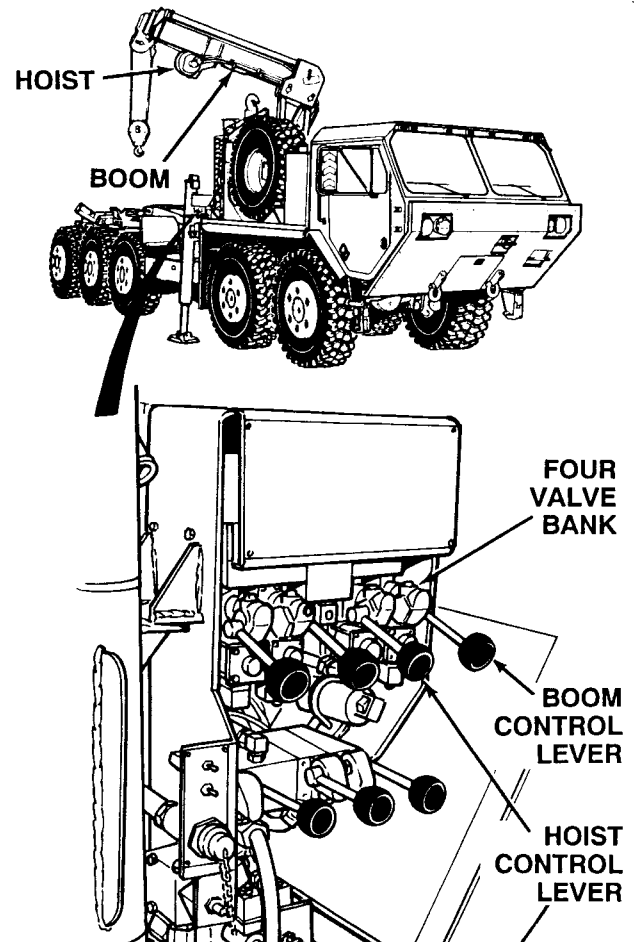
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Outriggers down with weight off truck suspension,
(TM 9-2320-364-10)



WARNING

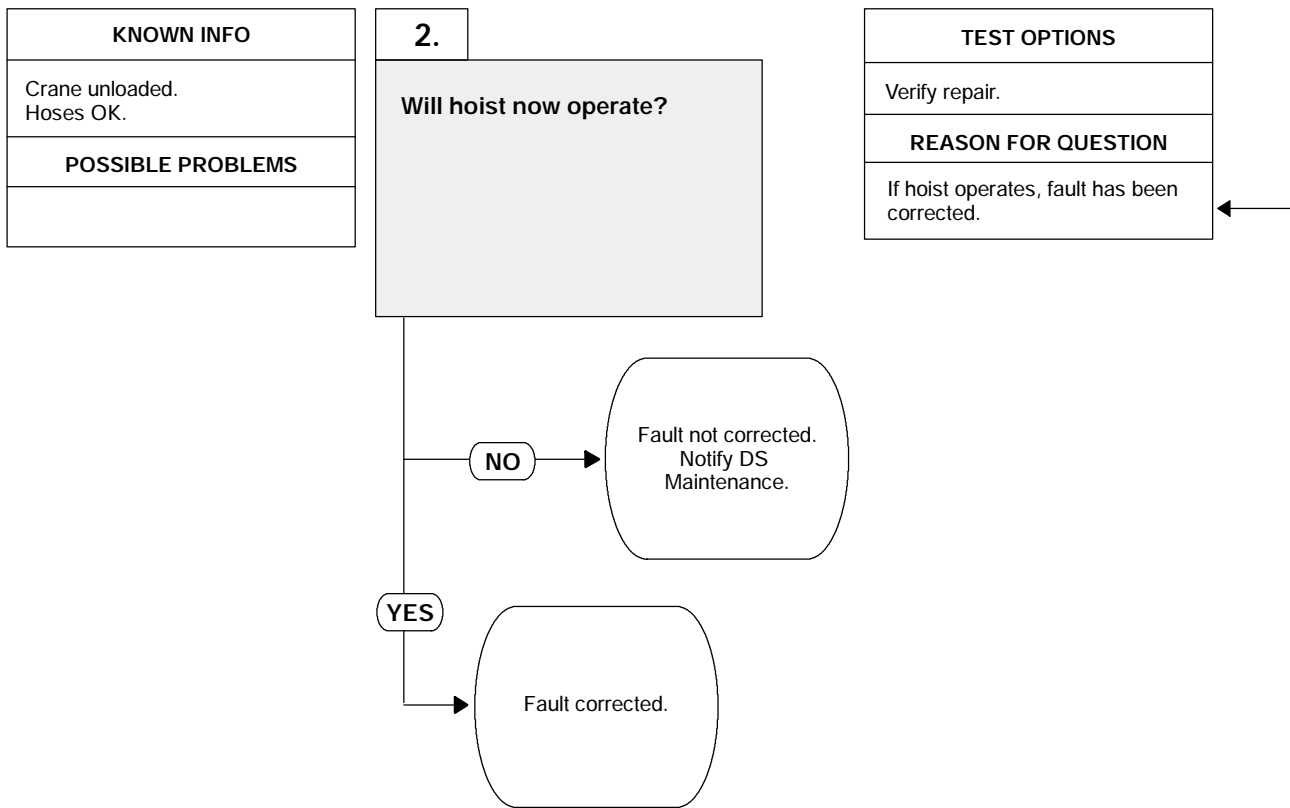
High pressure hydraulics [oil under 3100 psi (21,374 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

**VISUAL INSPECTION**

Inspect hoses and tubes between HOIST valve and hoist motor manifold, hose between manifold and motor and hose between motor and brake for damage, crimps or leaks.

- (1) If hoses are damage, crimps or leaks secure loose fittings repair hose (Para 20-3 and schematic Fig 2-62).
- (2) If hoses are not crimped or leaking, notify DS Maintenance.

14. HOIST DOES NOT OPERATE (CONT).



VERIFY REPAIR

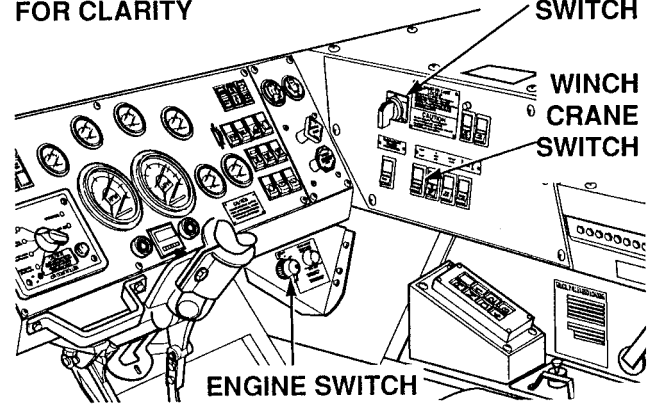
- Operate crane (TM 9-2320-364-10).
- (1) If hoist does not operate, fault not corrected, notify DS Maintenance.
 - (2) If hoist operates, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

15. CRANE DOES NOT SWING.

INITIAL SETUP

Tools and Special Tools

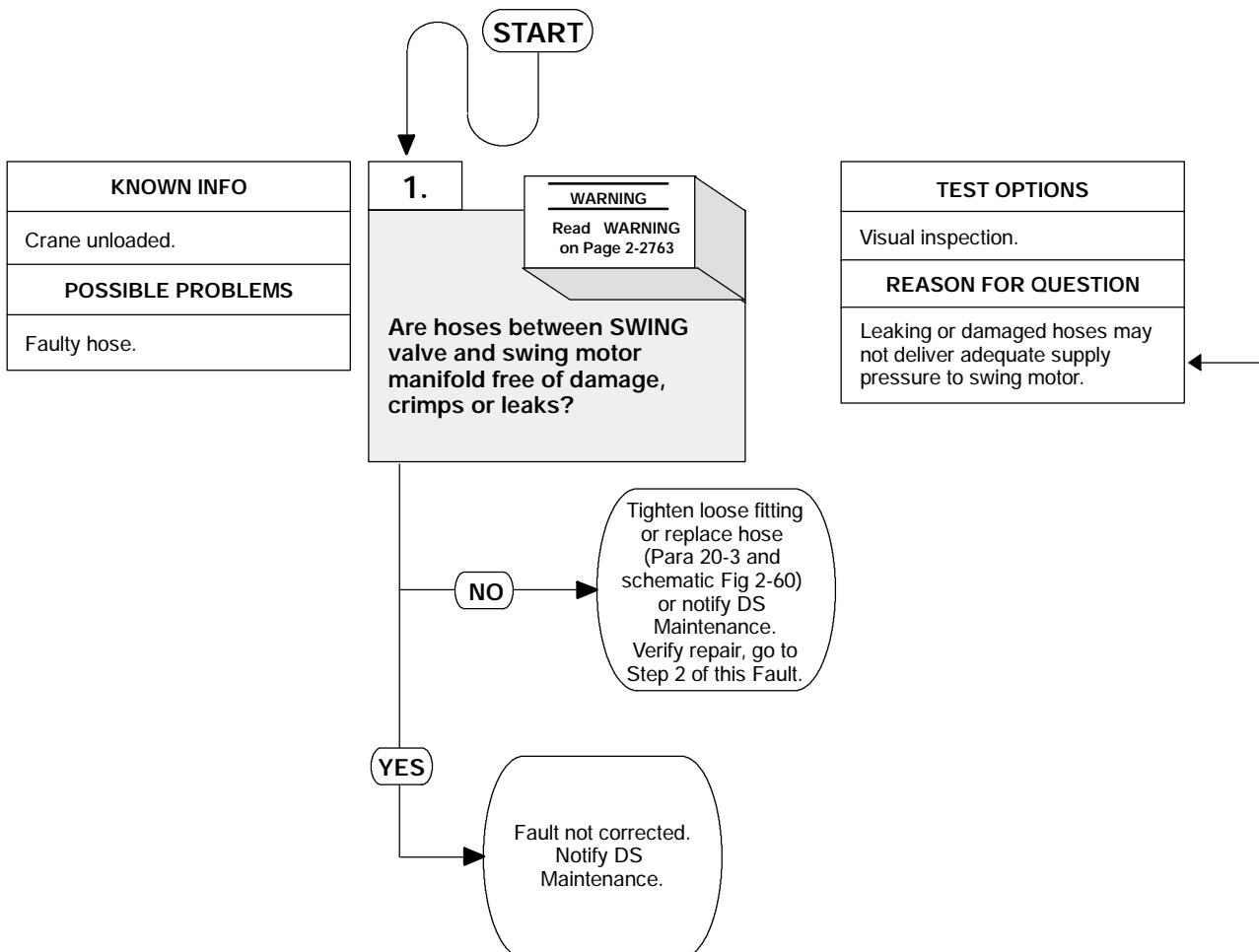
Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

TM 9-2320-364-10

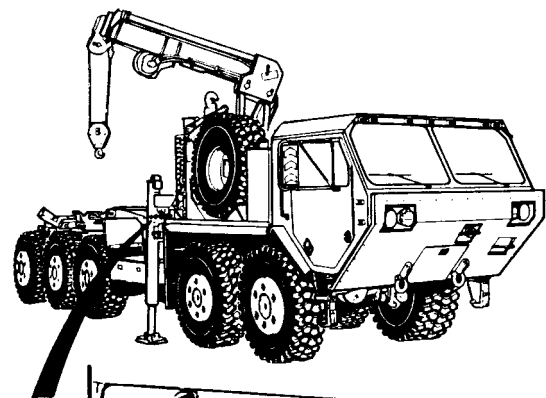
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Outriggers down with weight off truck suspension,
(TM 9-2320-364-10)



WARNING

High pressure hydraulics [oil under 3100 psi (21,374 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.



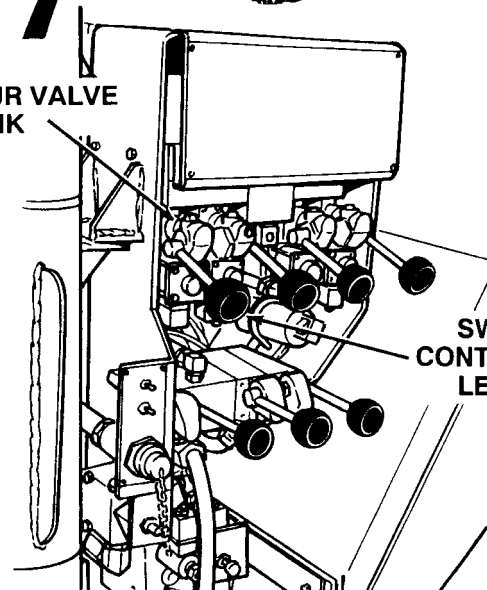
**FOUR VALVE
BANK**

**SWING
CONTROL
LEVER**

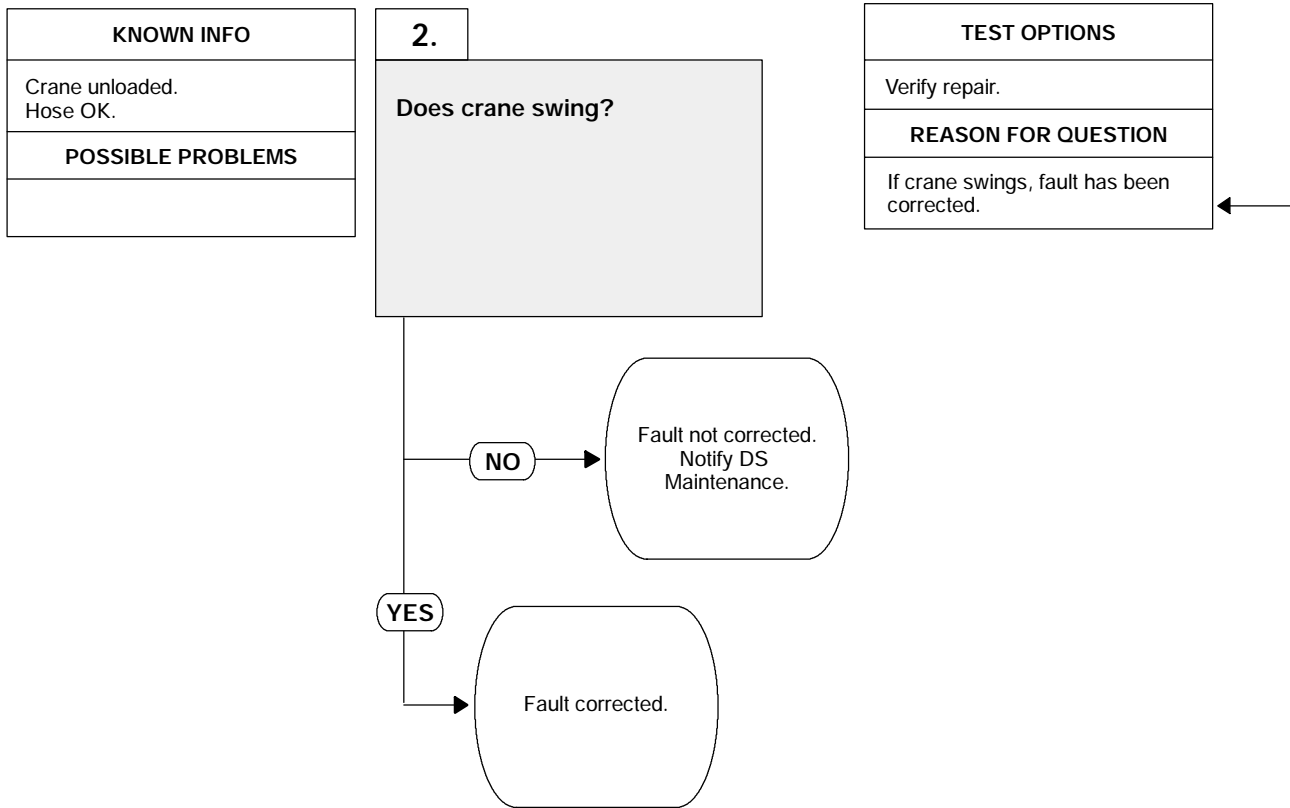
VISUAL INSPECTION

Inspect hoses between SWING valve and swing motor manifold for damage, crimps or leaks.

- (1) If hoses are damaged, crimped or leaking secure loose fittings repair hose (Para 20-3 and schematic Fig 2-60) or notify DS Maintenance.
- (2) If hoses are not damaged, crimped or leaking, notify DS Maintenance.



15. CRANE DOES NOT SWING (CONT).



VERIFY REPAIR

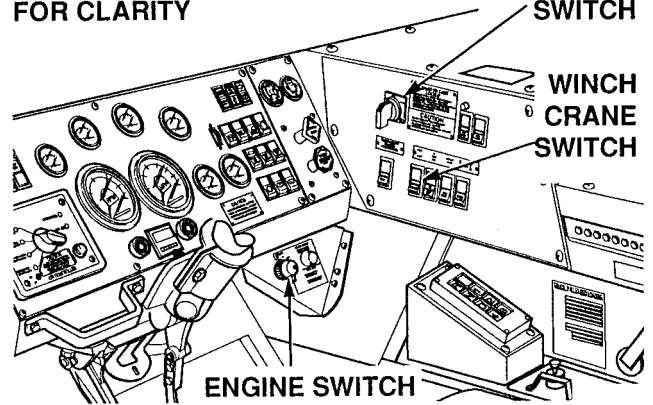
- Operate crane (TM 9-2320-364-10).
- (1) If crane will not swing, fault not corrected. Notify DS Maintenance.
 - (2) If crane swings, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

16. MAST DOES NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

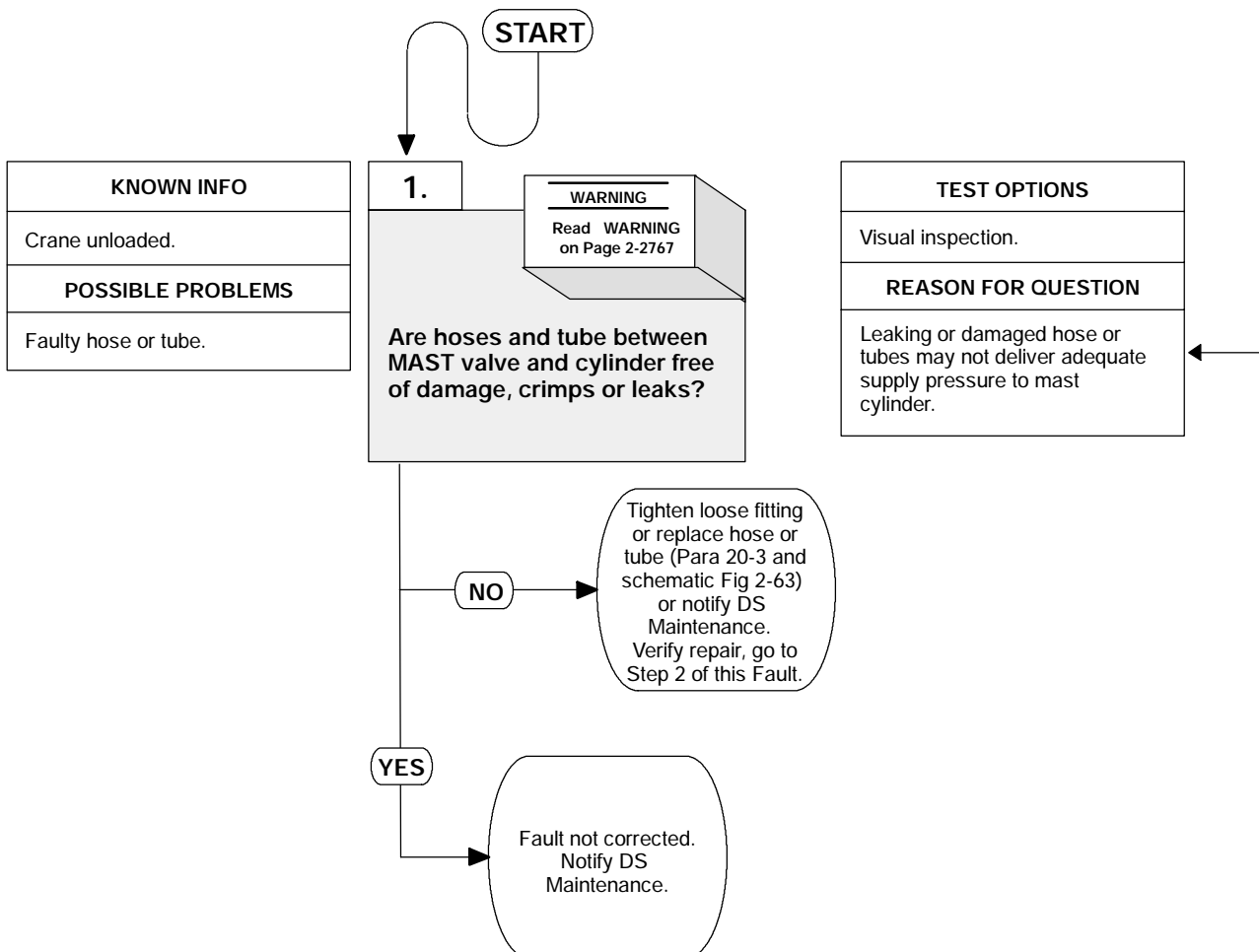
Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

TM 9-2320-364-10

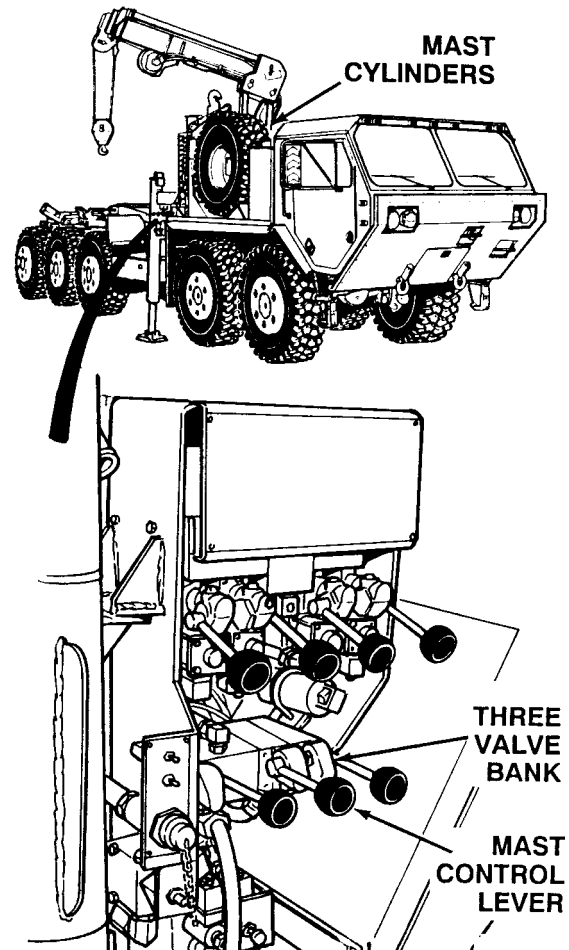
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Outriggers down with weight off truck suspension,
(TM 9-2320-364-10)



WARNING

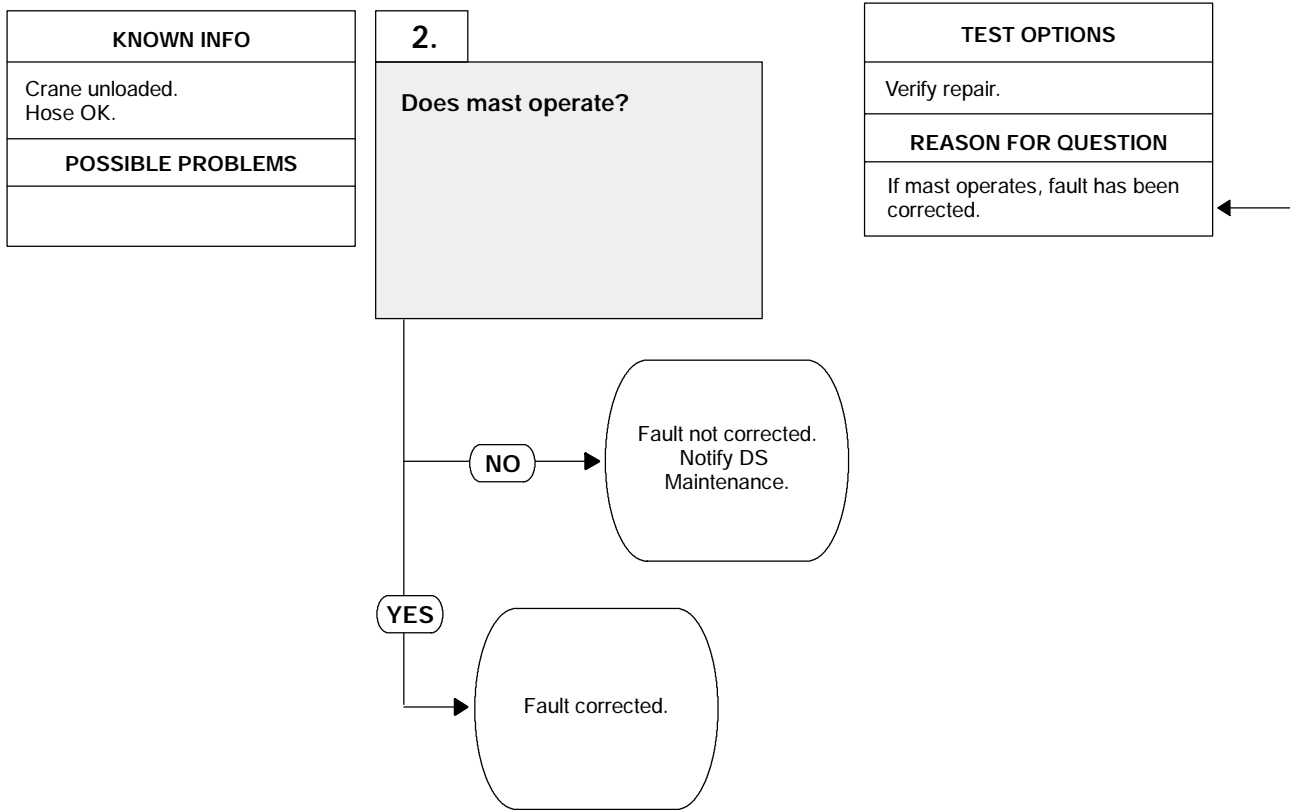
High pressure hydraulics [oil under 3100 psi (21,374 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.

**VISUAL INSPECTION**

Inspect hoses and tube between mast control valve and cylinder for damage, crimps or leaks.

- (1) If hoses are damaged, crimped or leaking secure loose fittings or repair hose (Para 20-3 and schematic Fig 2-63) or notify DS Maintenance.
- (2) If hoses are not damaged, crimped or leaking, notify DS Maintenance.

16. MAST DOES NOT OPERATE (CONT).



VERIFY REPAIR

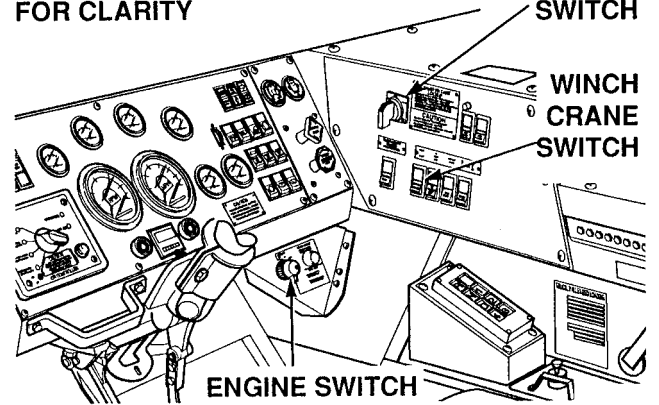
- Operate crane (TM 9-2320-364-10).
- (1) If mast does not operate, fault not corrected. Notify DS Maintenance.
 - (2) If mast operates, fault has been corrected.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-29. CRANE TROUBLESHOOTING (CONT).

17. LIFT AND HOIST DO NOT OPERATE OR OPERATE SLOWLY.

INITIAL SETUP

Tools and Special Tools

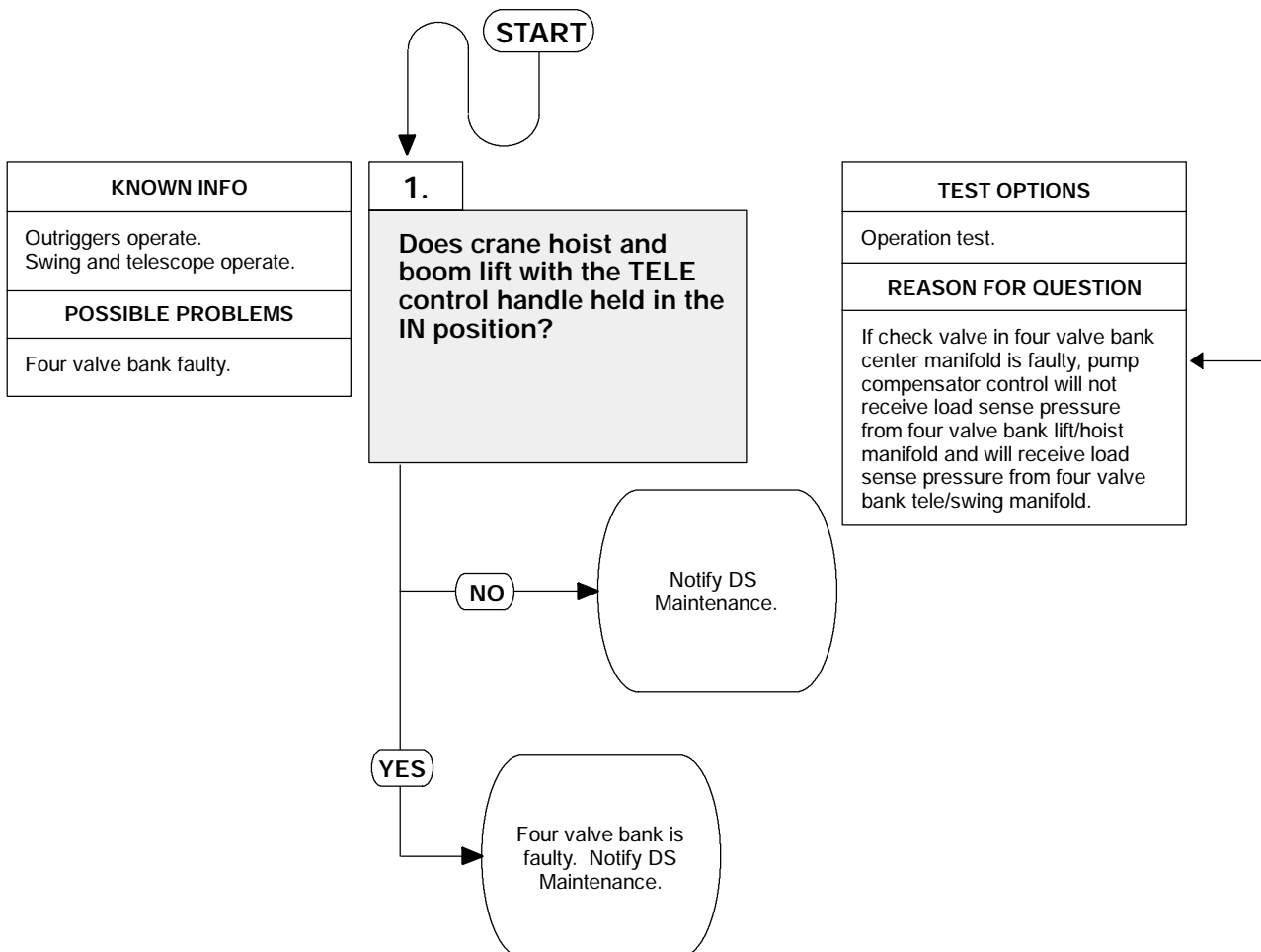
Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

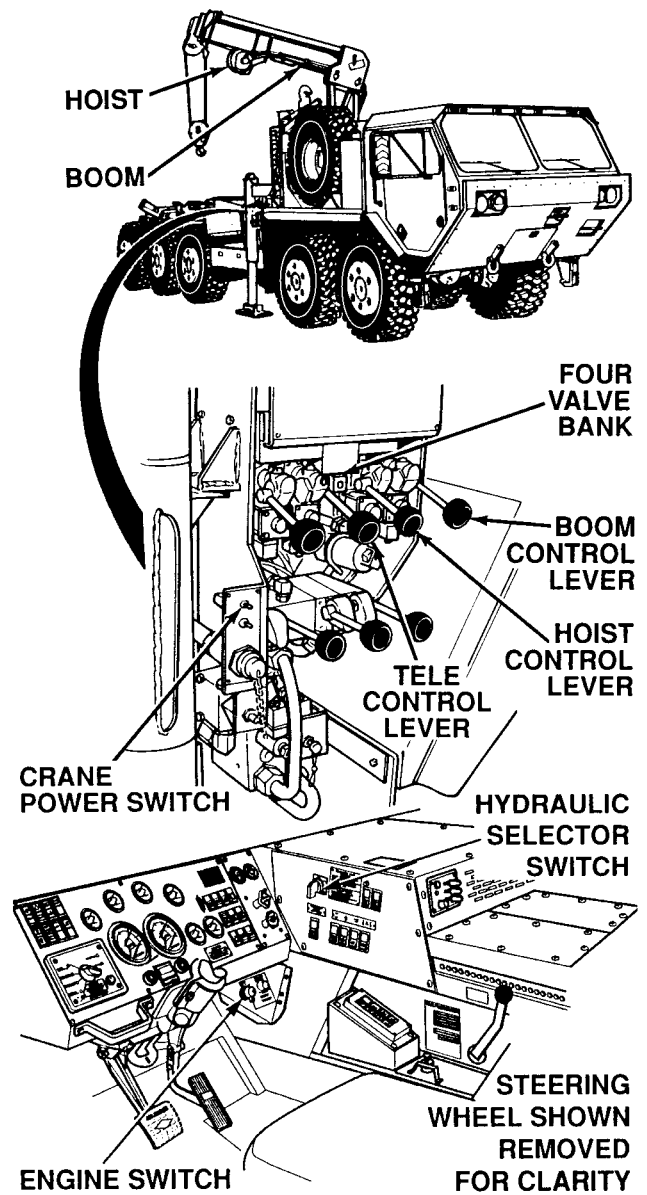
TM 9-2320-364-10

Equipment Condition

Engine Off, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Outriggers down with weight off vehicle suspension, (TM 9-2320-364-10)
Mast fully erected, (TM 9-2320-364-10)



OPERATION TEST
<p>(1) Attempt to operate hoist and then boom lift using HOIST and BOOM control levers while holding TELE control lever in the IN position (TM 9-2320-364-10).</p> <p>(a) If hoist and boom lift do not operate, perform Steps (2) through (4) below and notify DS Maintenance.</p> <p>(b) If hoist and boom do operate, check valve in four valve bank center manifold is faulty. Perform Steps (2) through (4) below and notify DS Maintenance.</p> <p>(2) Set crane power switch to OFF position.</p> <p>(3) Set hydraulic selector switch to OFF position.</p> <p>(4) Turn OFF ENGINE switch.</p>



2-29. CRANE TROUBLESHOOTING (CONT).

18. SWING AND TELESCOPE DO NOT OPERATE OR OPERATE SLOWLY.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

Personnel Required

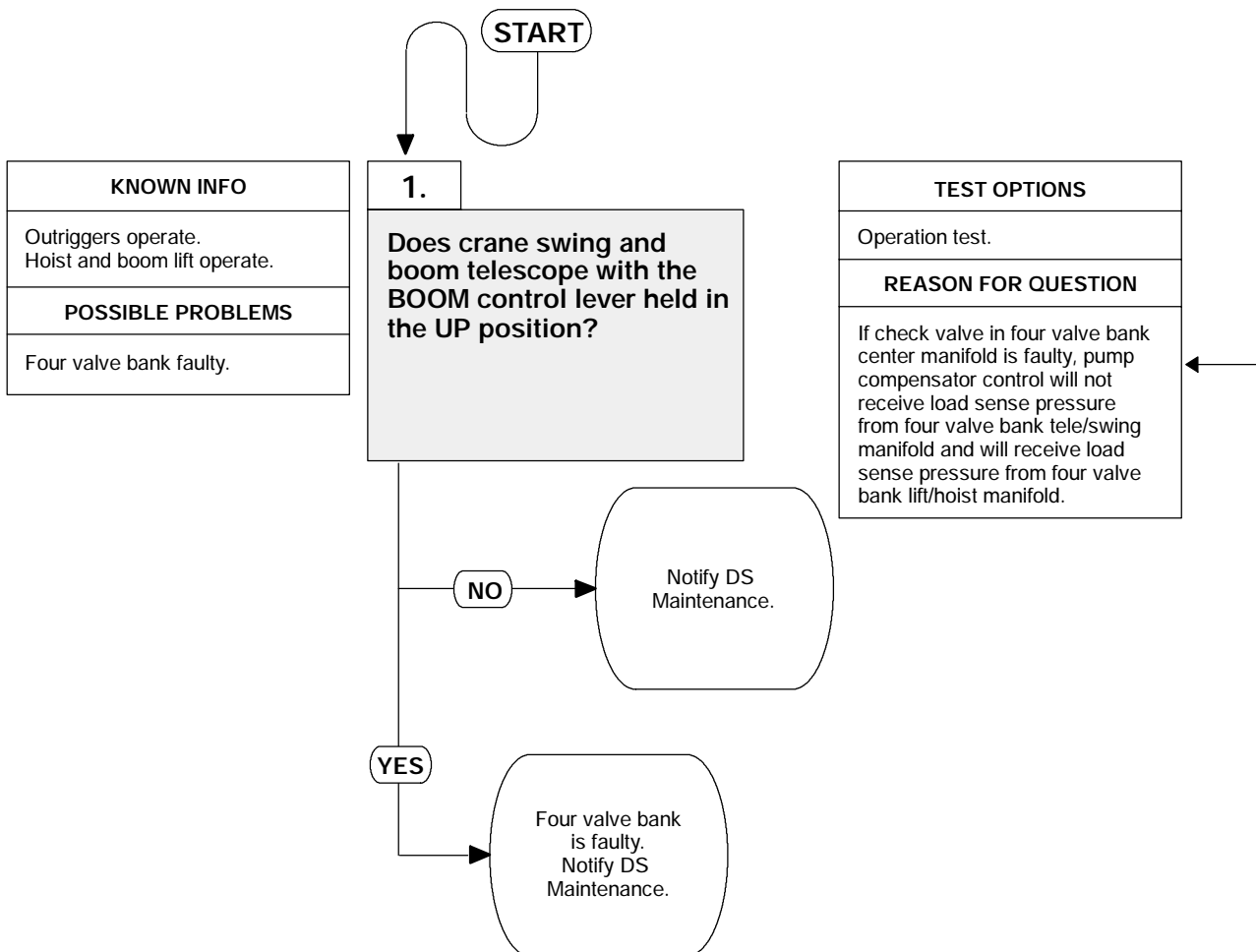
Two

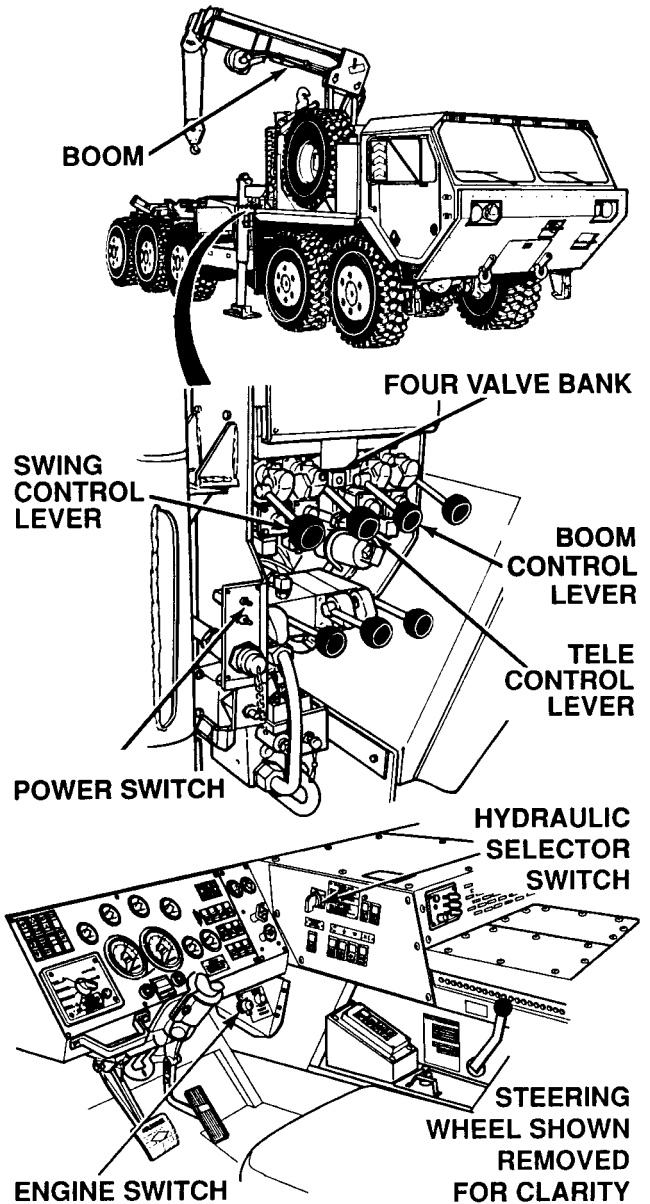
References

TM 9-2320-364-10

Equipment Condition

Engine Off, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Outriggers down with weight off
vehicle suspension, (TM 9-2320-364-10)
Mast fully erected, (TM 9-2320-364-10)





OPERATION TEST

- (1) With aid of assistant, attempt to swing crane and then telescope boom using SWING and TELE control levers while holding BOOM control lever in the UP position (TM 9-2320-364-10).
 - (a) If swing and telescope do not operate, perform Steps (2) through (4) below and notify DS Maintenance.
 - (b) If swing and telescope operate, shuttle valve in four valve bank center manifold is faulty. Perform Steps (2) through (4) below and Notify DS Maintenance.
- (2) Set crane power switch to OFF position.
- (3) Set hydraulic selector switch to OFF position.
- (4) Turn OFF ENGINE switch.

2-29. CRANE TROUBLESHOOTING (CONT).

19. CRANE HIGH IDLE NOT WORKING.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)
 Rivet Gun (Item 58, Appendix G)

References

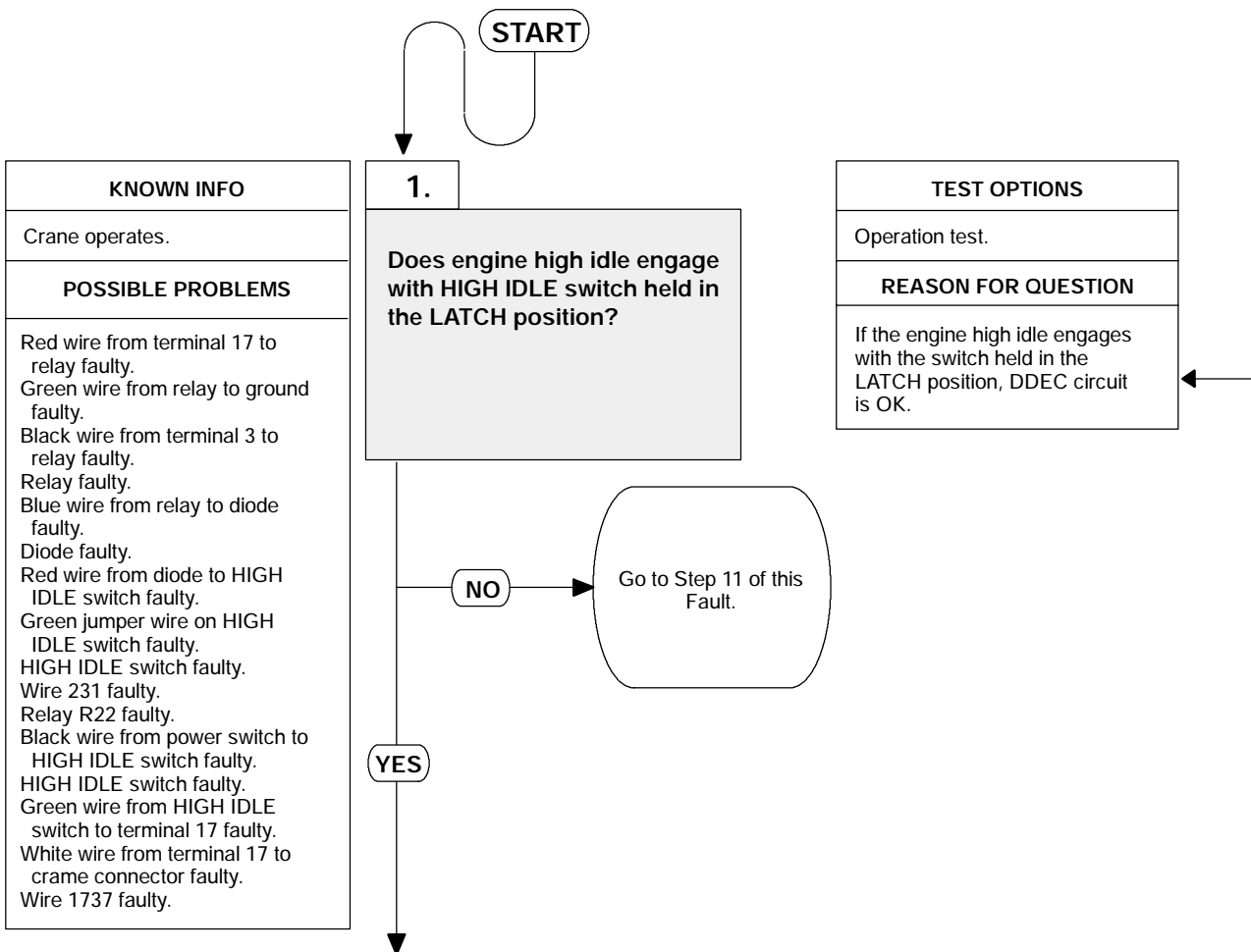
TM 9-2320-364-10
 TM 9-4910-571-12&P

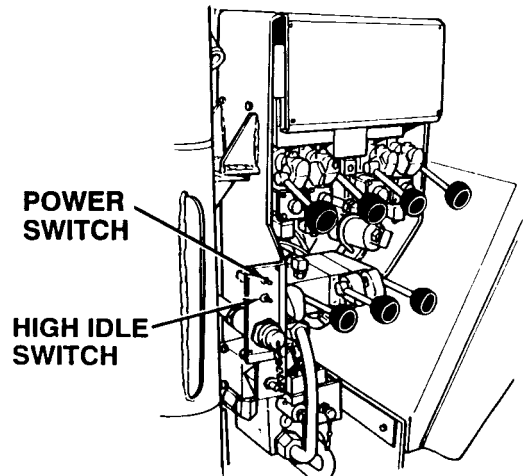
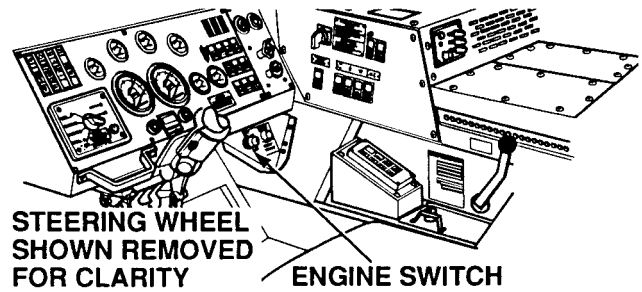
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Crane outriggers down, (TM 9-2320-364-10)
 Mast fully erected, (TM 9-2320-364-10)

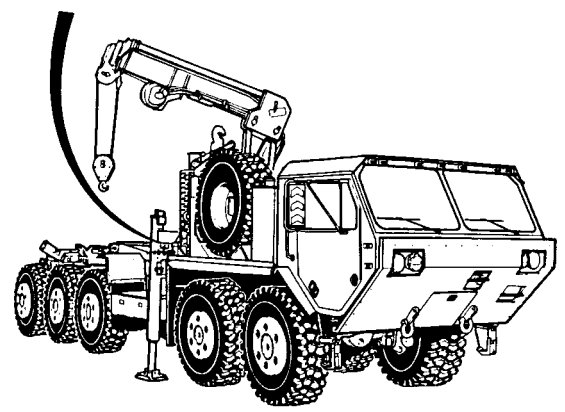
Personnel Required

Two

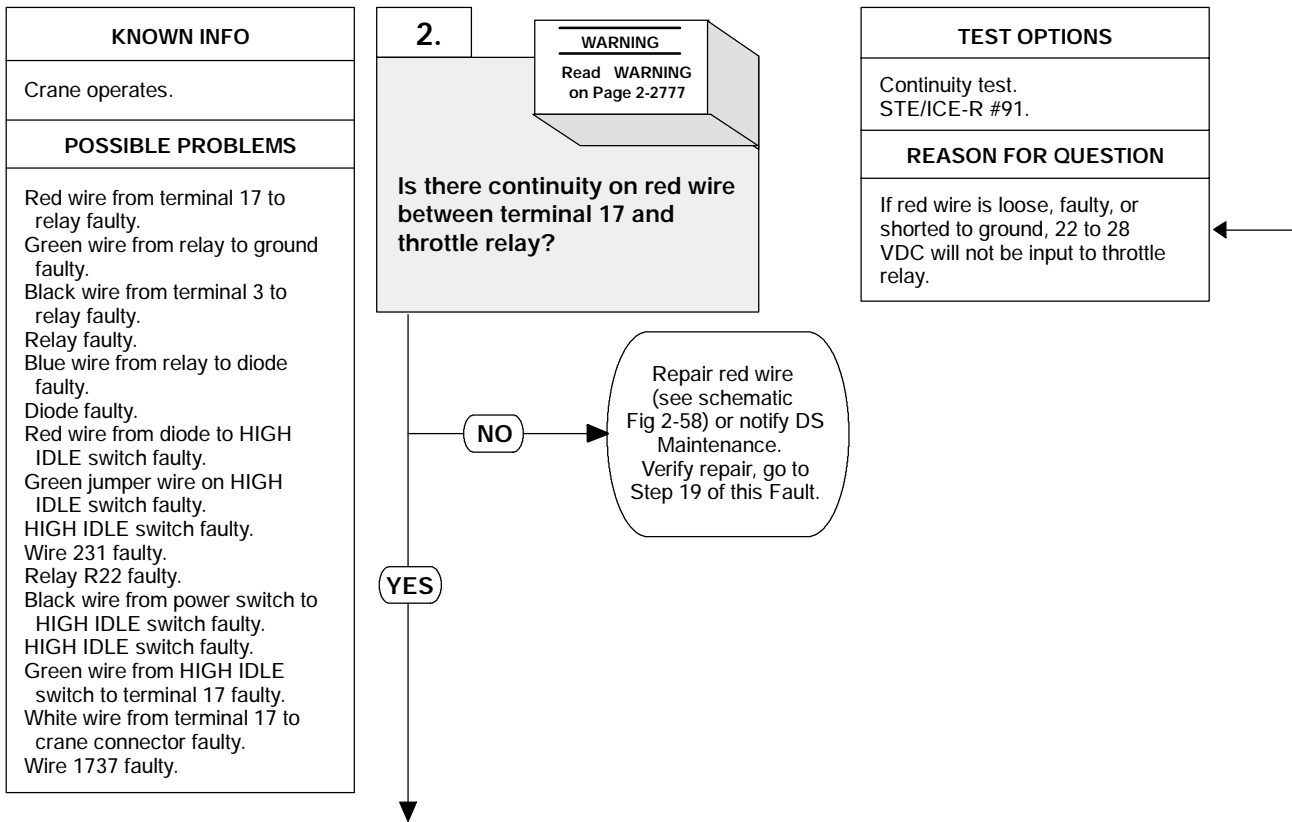




OPERATION TEST
(1) Start engine (TM 9-2320-364-10).
(2) Set crane POWER switch to ON position.
(3) Hold HIGH IDLE switch in LATCH position.
(a) If engine high idle does not engage perform Steps (4) and (5) below and go to Step 11 of this Fault.
(b) If engine high idle engages, perform Steps (4) and (5) below and go to Step 2 of this Fault.
(4) Set crane POWER switch to OFF position.
(5) Turn OFF ENGINE switch.



19. CRANE HIGH IDLE NOT WORKING (CONT).

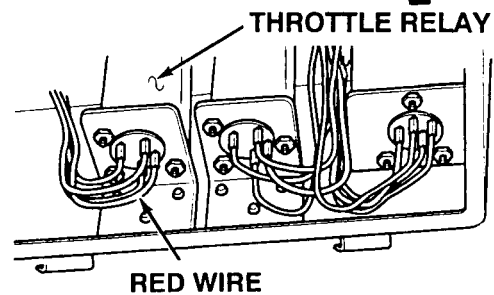
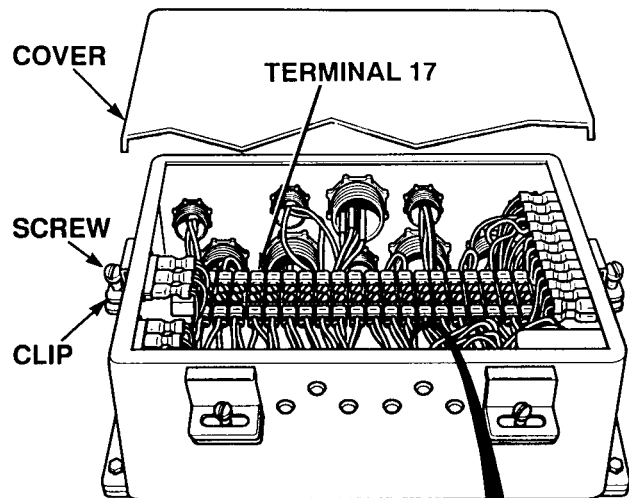
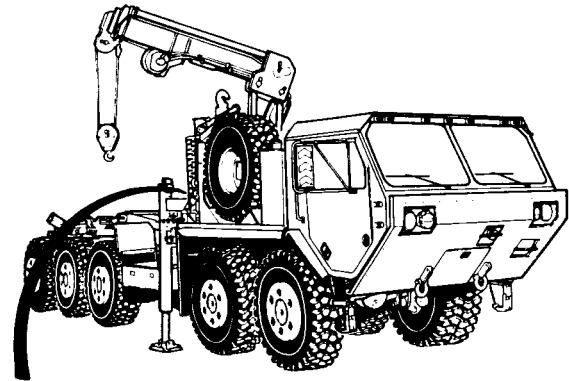


WARNING

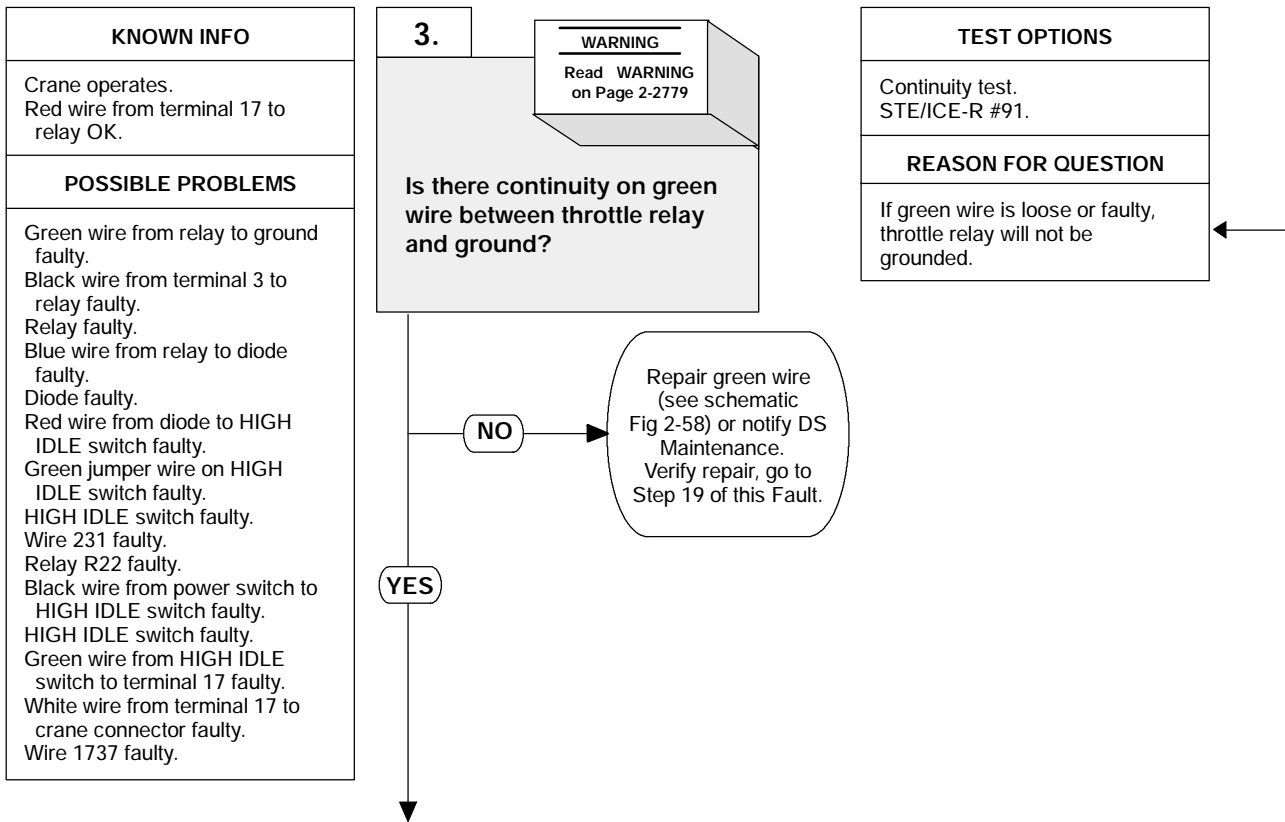
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Loosen six screws, clips and remove crane junction box cover.
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity on red wire between throttle relay and terminal 17?
 - (a) If there is no continuity, repair red wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, go to Step 3 of this Fault.



19. CRANE HIGH IDLE NOT WORKING (CONT).



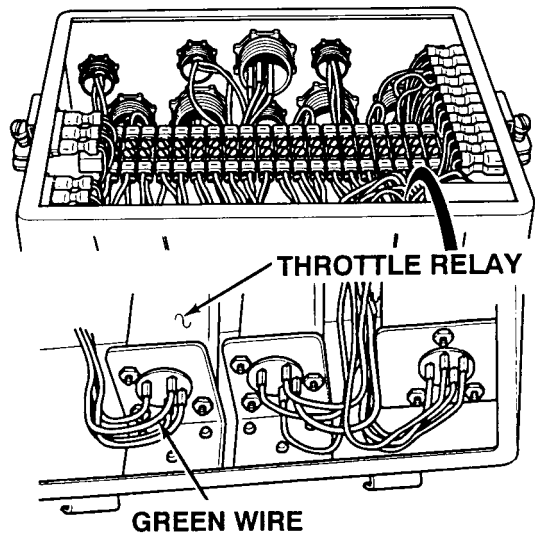
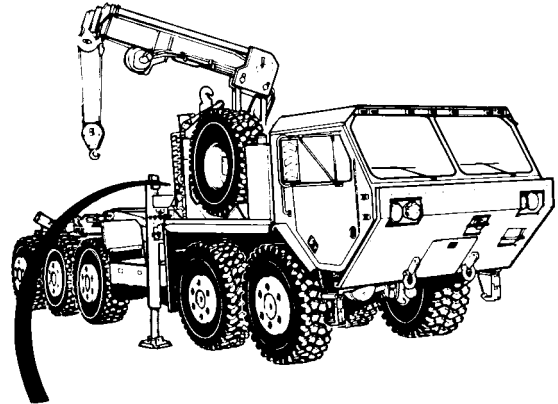
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

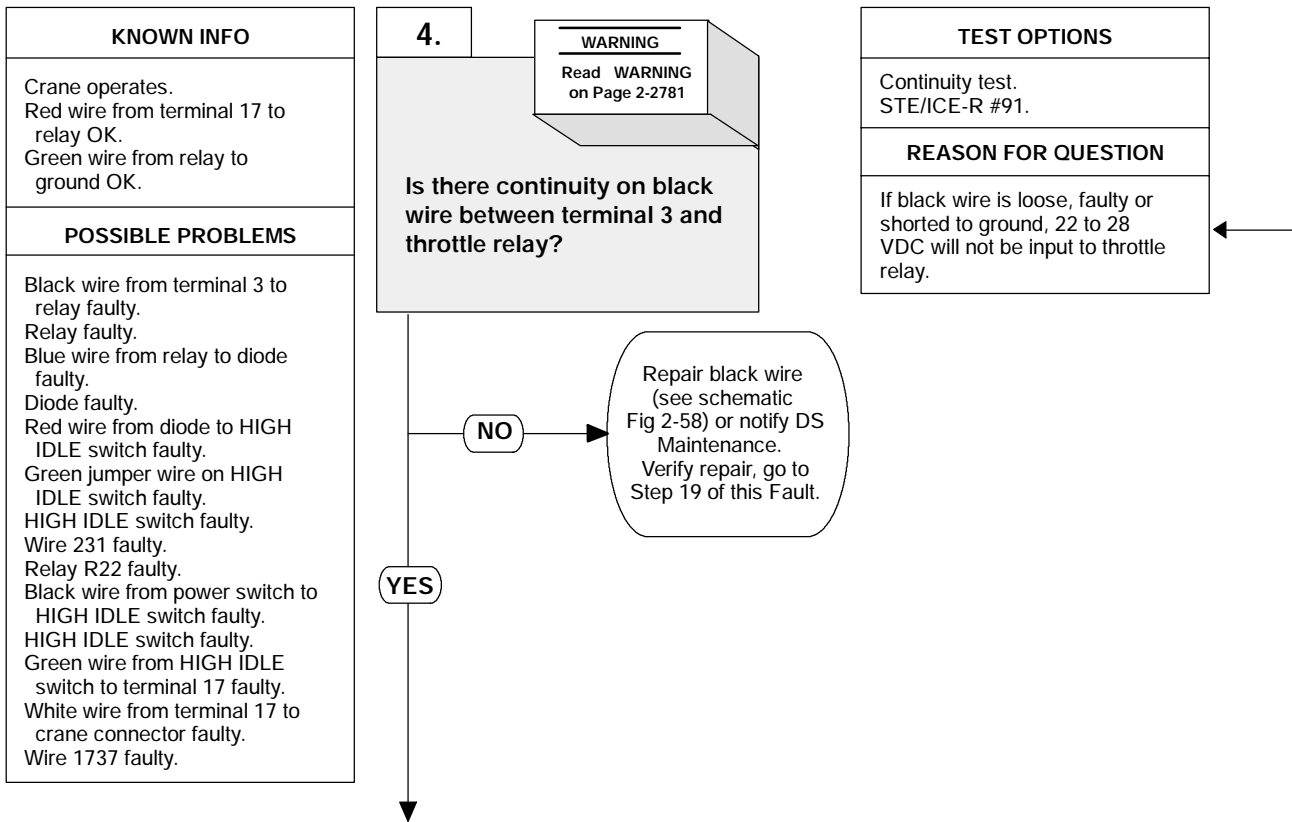
CONTINUITY TEST

Is there continuity on green wire between throttle relay and a known good ground?

- (1) If there is no continuity, repair green wire (see schematic Fig 2-58) or notify DS Maintenance.
- (2) If there is continuity, go to Step 4 of this Fault.



19. CRANE HIGH IDLE NOT WORKING (CONT).



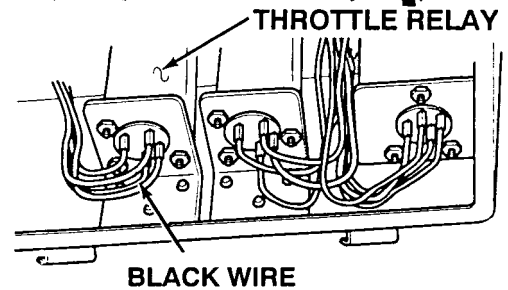
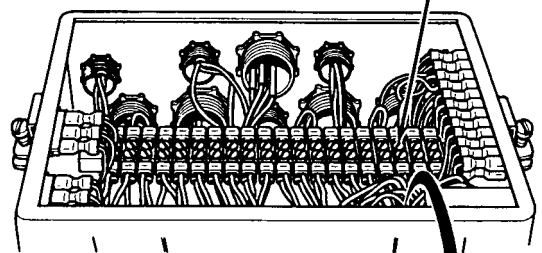
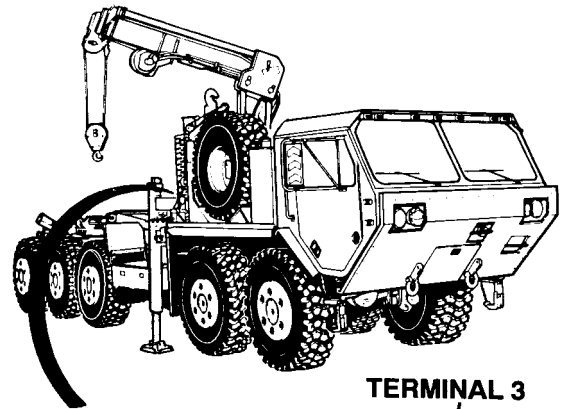
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

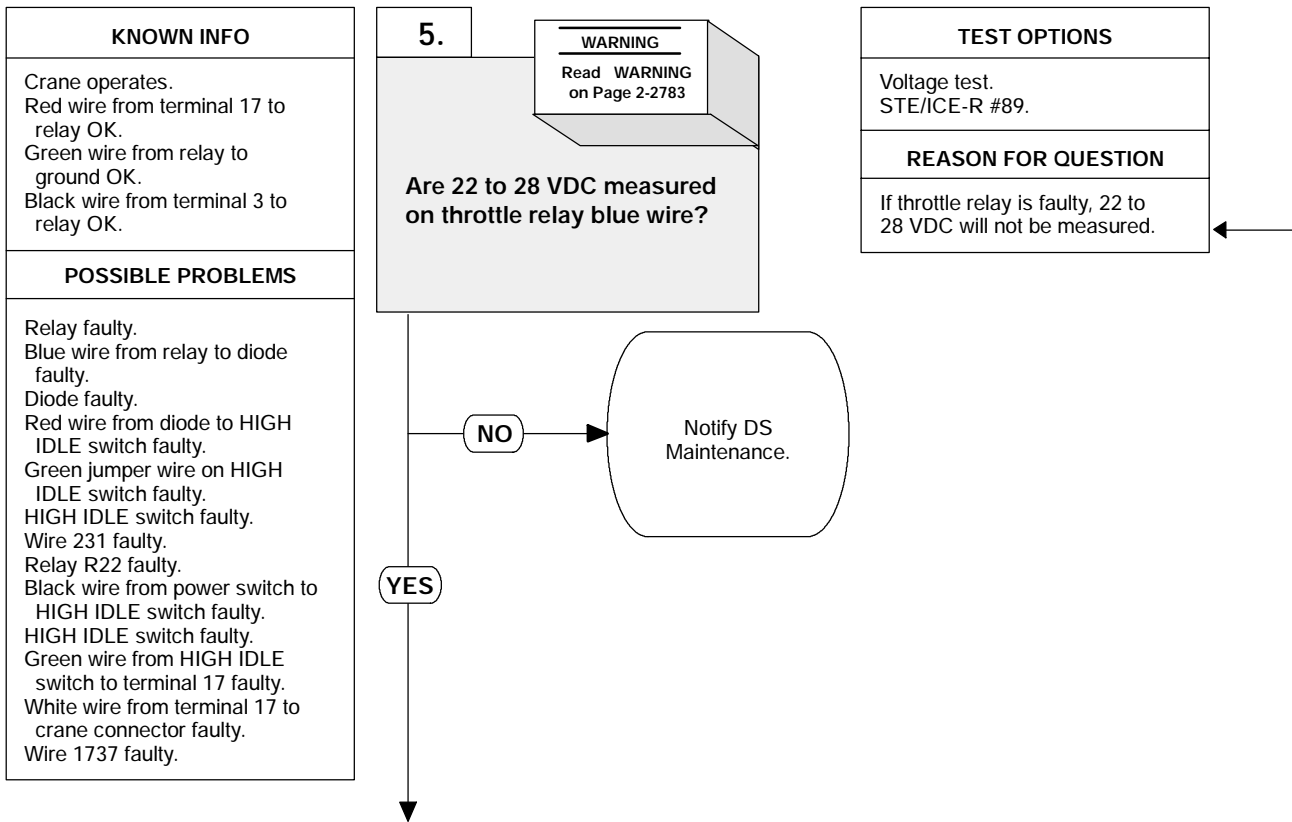
CONTINUITY TEST

Is there continuity on black wire between terminal 3 and throttle relay?

- (1) If there is no continuity, repair black wire (see schematic Fig 2-58) or notify DS Maintenance.
- (2) If there is continuity, go to Step 5 of this Fault.



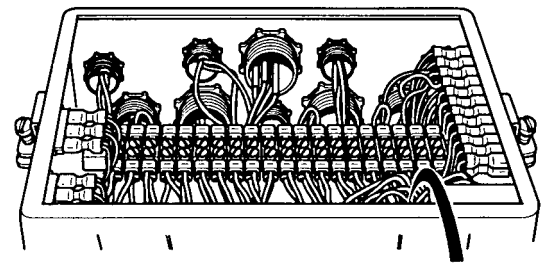
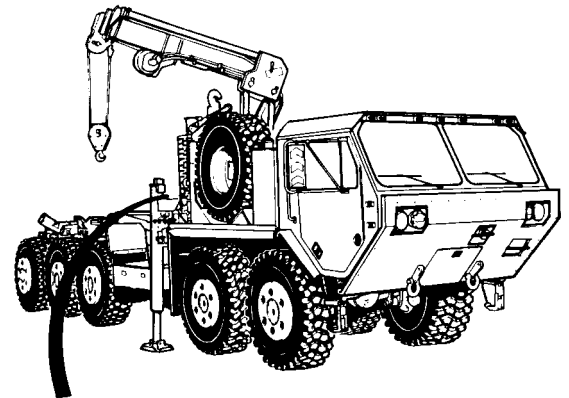
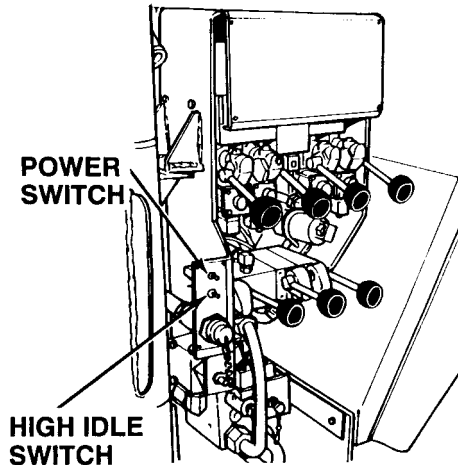
19. CRANE HIGH IDLE NOT WORKING (CONT).



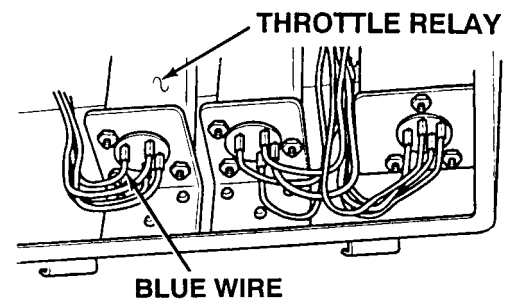
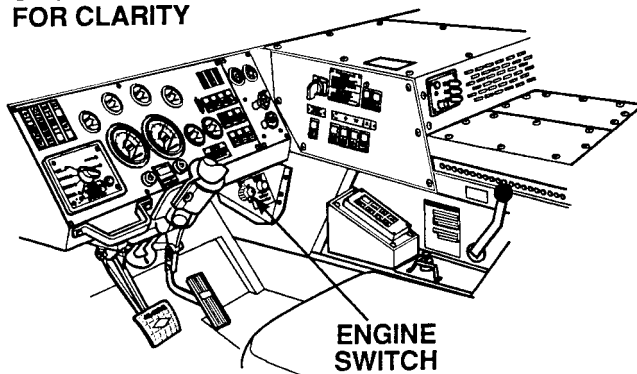
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

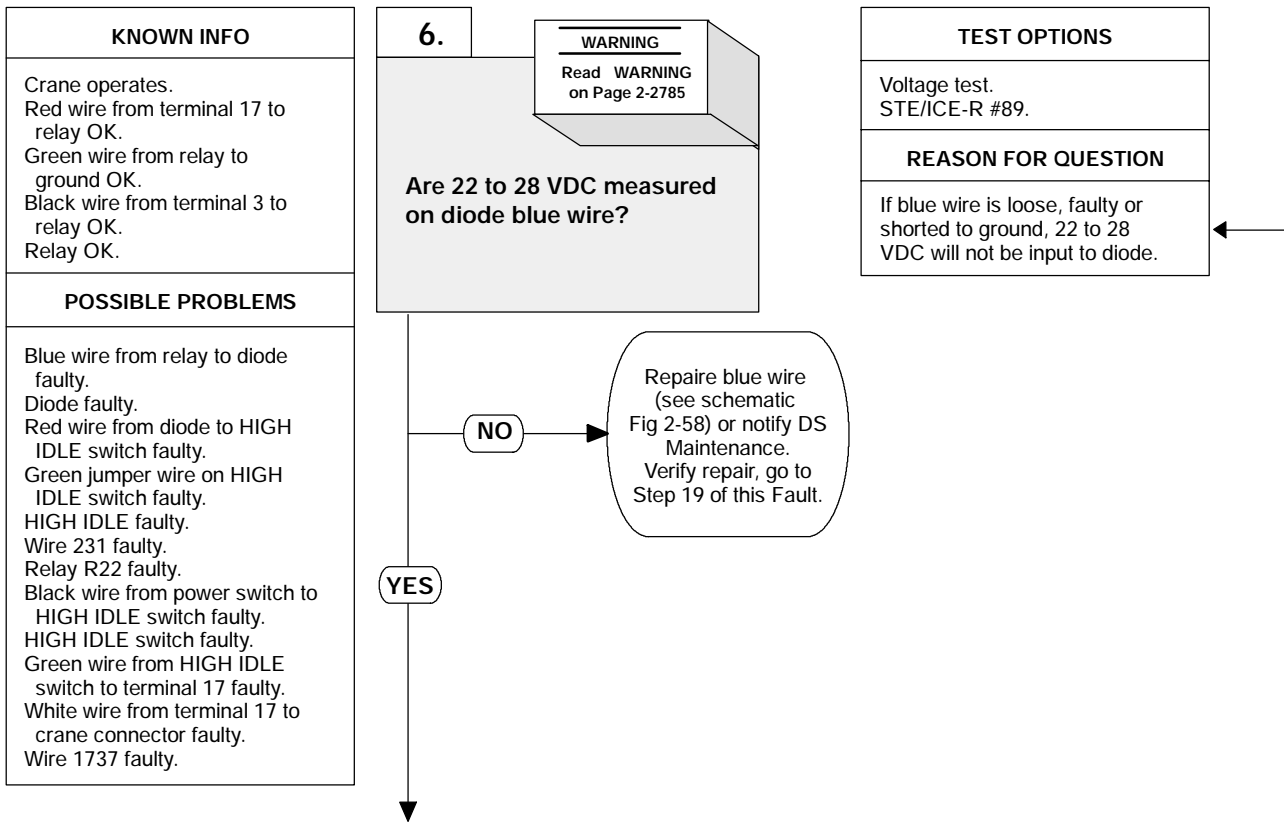
- | VOLTAGE TEST | |
|--------------|--|
| (1) | Set multimeter select switch to volts. |
| (2) | Connect positive (+) multimeter lead to throttle relay at the blue wire. |
| (3) | Connect negative multimeter (-) lead to a known good ground. |
| (4) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (5) | Set crane POWER switch to ON position. |
| (6) | With the aid of an assistant, observe multimeter while HIGH IDLE switch is held in the LATCH position. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Steps (7) and (8) below and notify DS Maintenance. (b) If 22 to 28 vdc are present, perform Steps (7) and (8) below and go to Step 6 of this Fault. |
| (7) | Set crane POWER switch to OFF position. |
| (8) | Turn OFF ENGINE switch. |



STEERING WHEEL SHOWN REMOVED FOR CLARITY



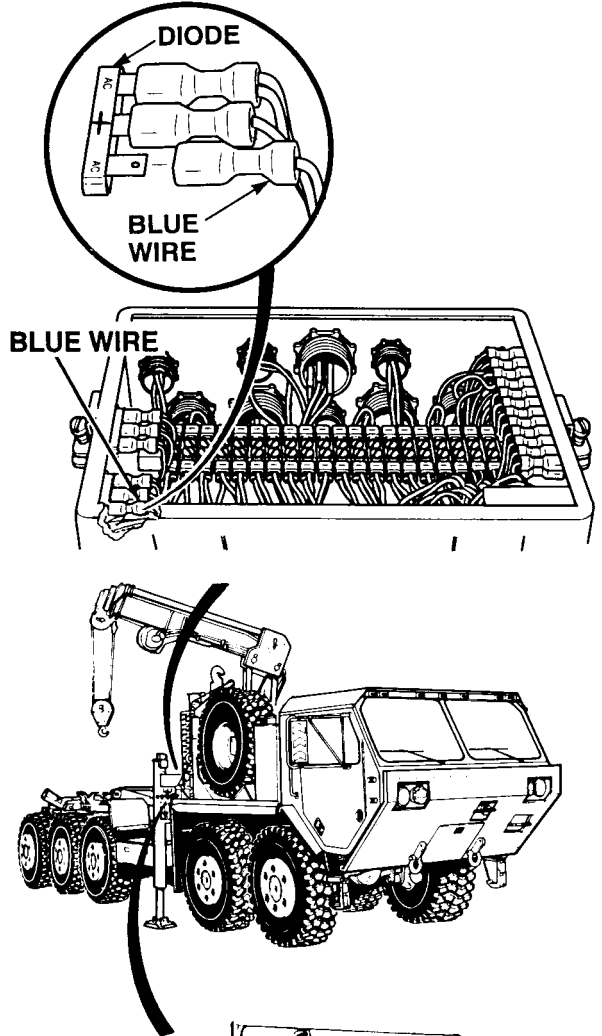
19. CRANE HIGH IDLE NOT WORKING (CONT).



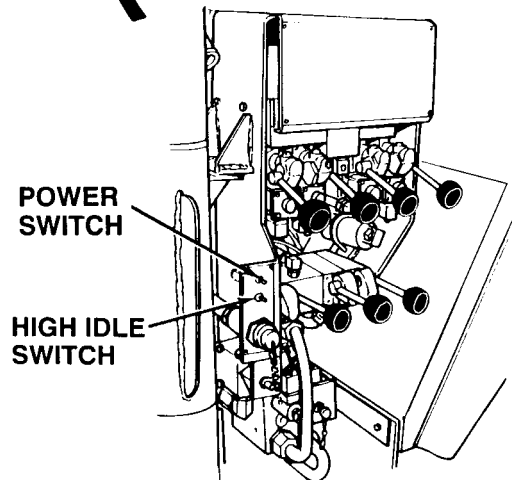
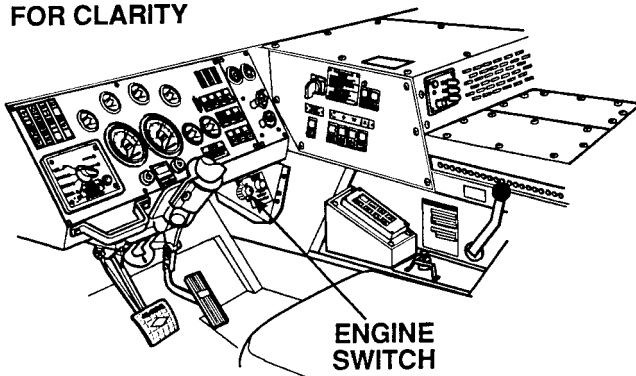
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

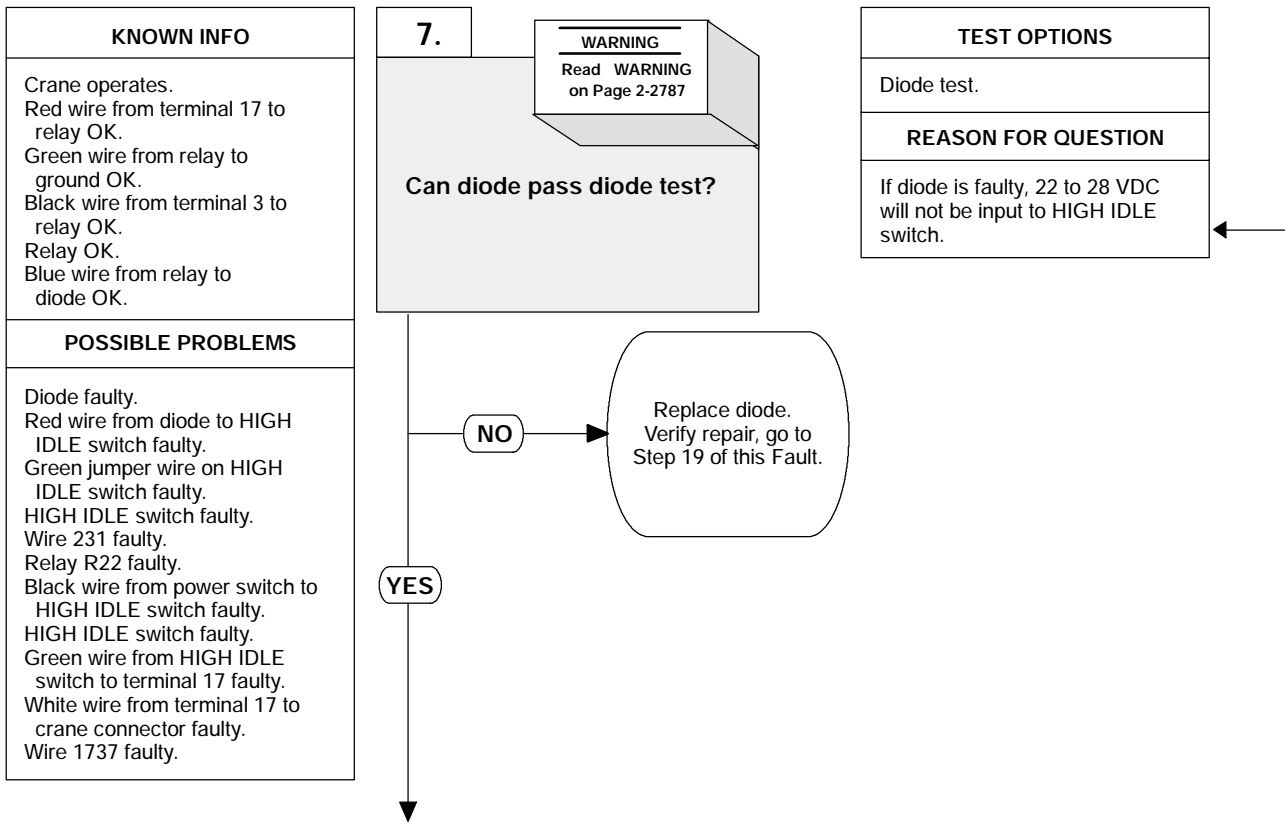
- | VOLTAGE TEST | |
|--------------|--|
| (1) | Connect positive (+) multimeter lead to diode at blue wire. |
| (2) | Connect negative multimeter (-) lead to a known good ground. |
| (3) | Turn ON ENGINE switch (TM 9-2320-364-10). |
| (4) | Set crane POWER switch to ON position. |
| (5) | With the aid of an assistant, observe multimeter while HIGH IDLE switch is held in the LATCH position. |
| (a) | If 22 to 28 vdc are not present, perform Steps (6) and (7) below and repair blue wire (see schematic Fig 2-58) or notify DS Maintenance. |
| (b) | If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 7 of this Fault. |
| (6) | Set crane POWER switch to OFF position. |
| (7) | Turn OFF ENGINE switch. |



STEERING WHEEL SHOWN REMOVED FOR CLARITY



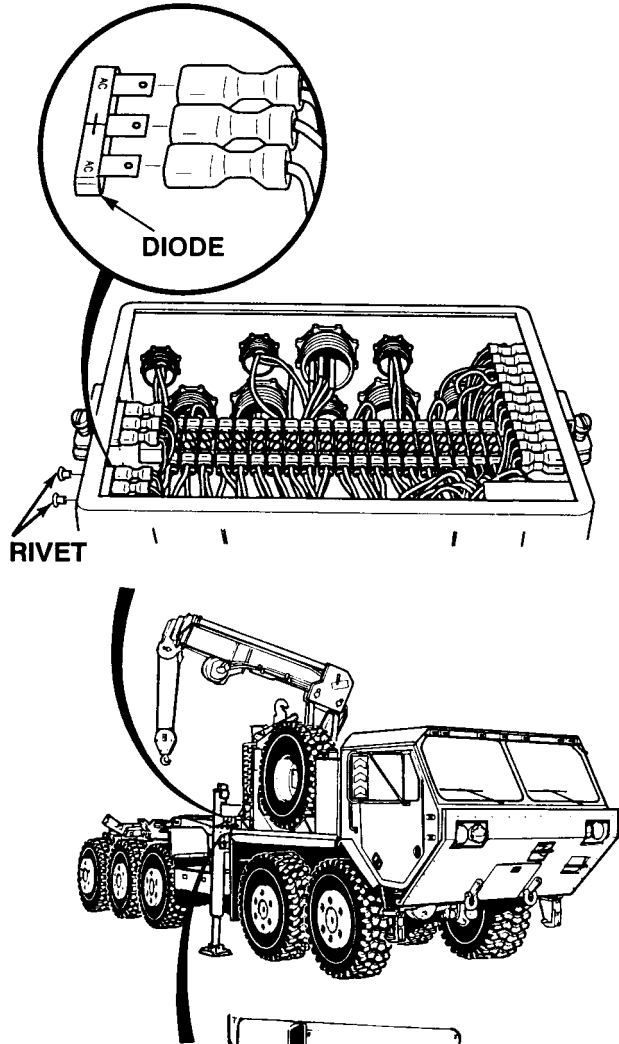
19. CRANE HIGH IDLE NOT WORKING (CONT).



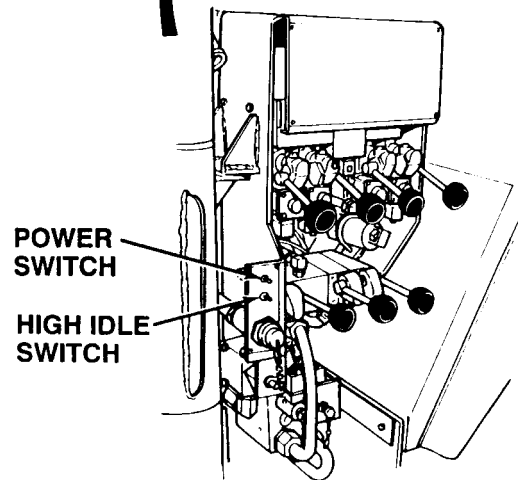
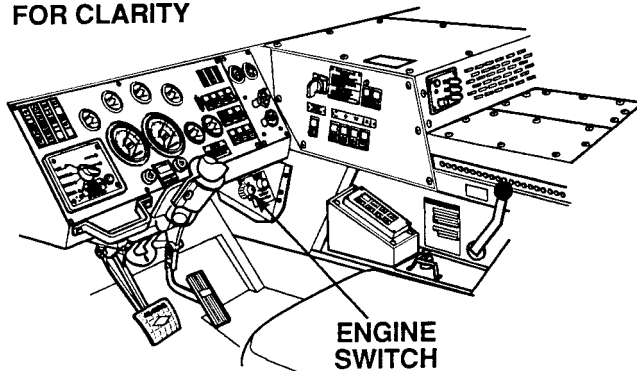
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

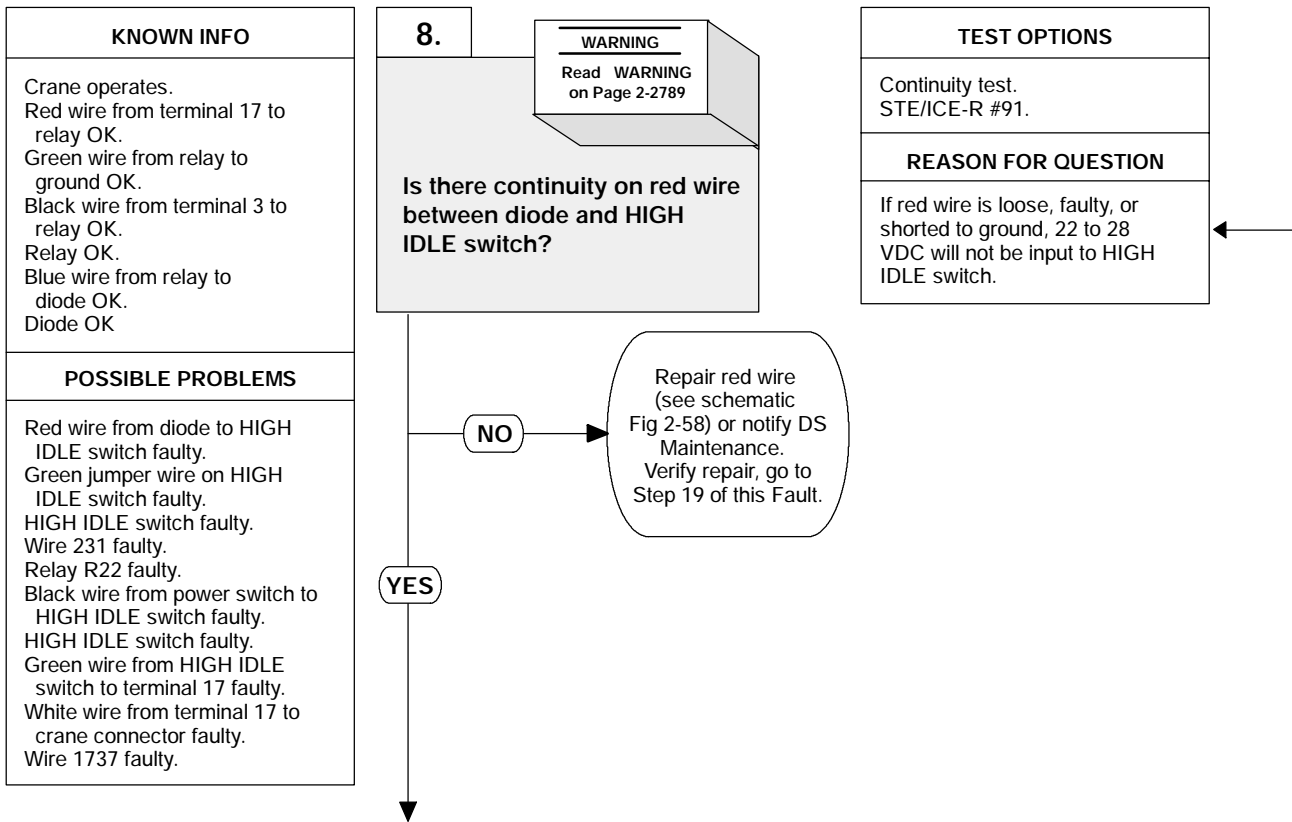
- | DIODE TEST |
|--|
| <ol style="list-style-type: none"> (1) Set multimeter select switch to diode test. (2) Tag, mark and disconnect three wires from diode. (3) Connect negative (-) multimeter lead to diode middle (+) terminal. (4) Connect positive multimeter (+) lead to each of the AC terminals, one at a time. <ol style="list-style-type: none"> (a) If any vdc are not present, perform Steps (7) through (9) below. (b) If any vdc are present, go to Step (5) below. (5) Connect positive (+) multimeter lead to diode middle (+) terminal. (6) Connect negative multimeter (-) lead to each of the AC terminals, one at a time. <ol style="list-style-type: none"> (a) If any vdc are present at either terminal, perform Steps (7) through (9) below. (b) If any vdc are not present at both terminals, perform Step (9) below and go to Step 8 of this Fault. (7) Remove two rivets and diode from junction box. Discard rivets and diode. (8) Install new diode with rivets. (9) Connect three wires to diode. |



STEERING WHEEL SHOWN REMOVED FOR CLARITY



19. CRANE HIGH IDLE NOT WORKING (CONT).



WARNING

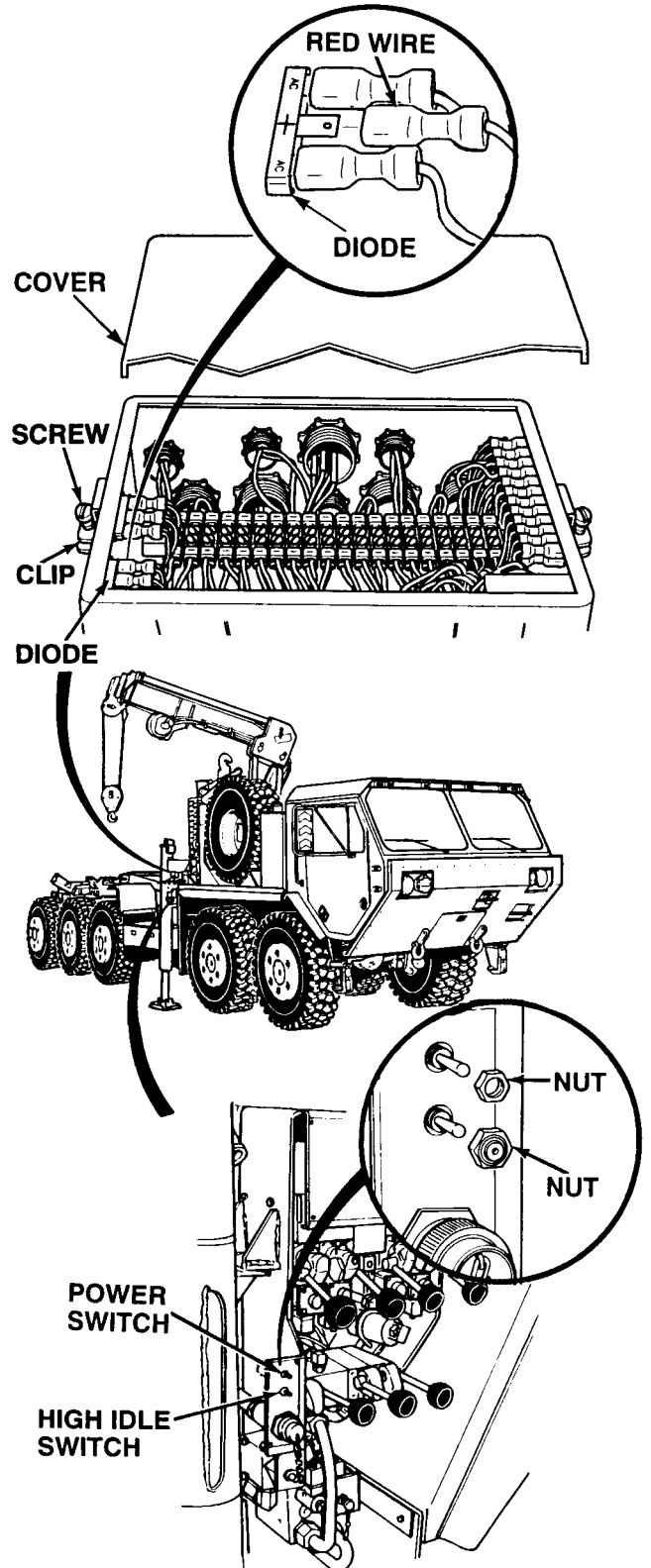
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

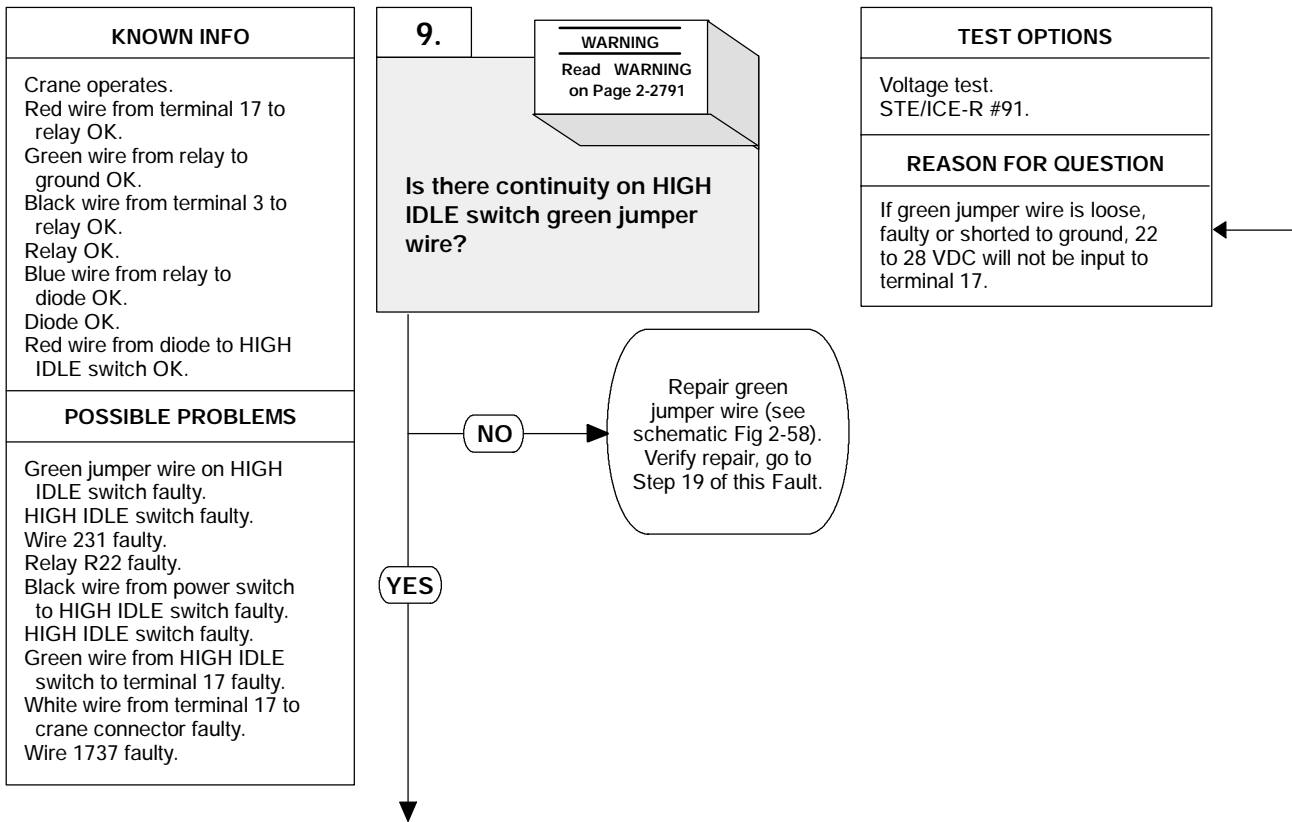
Leave all wires connected to switches.

CONTINUITY TEST

- (1) Remove nut and POWER switch.
- (2) Remove nut and HIGH IDLE switch.
- (3) Set multimeter select switch to ohms.
- (4) Is there continuity on red wire (middle of diode) between diode and HIGH IDLE switch?
 - (a) If there is no continuity, repair red wire (see schematic Fig 2-58) or Notify DS Maintenance.
 - (b) If there is continuity, perform Step (5) below and go to Step 9 of this Fault.
- (5) Install crane junction box cover with six clips and screws.



19. CRANE HIGH IDLE NOT WORKING (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

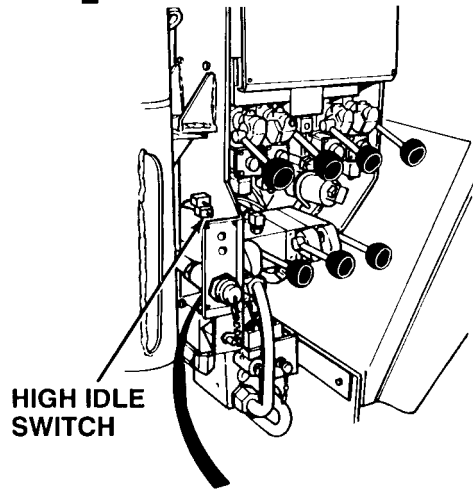
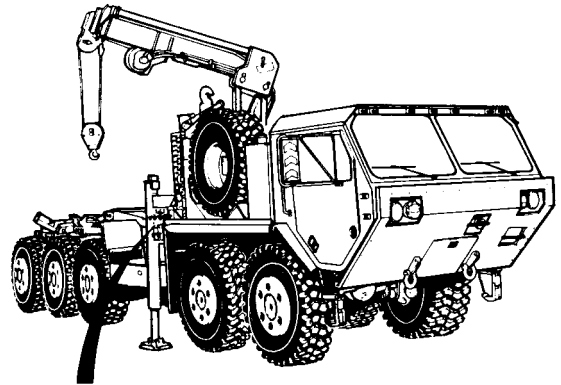
NOTE

Leave all wires connected to switches.

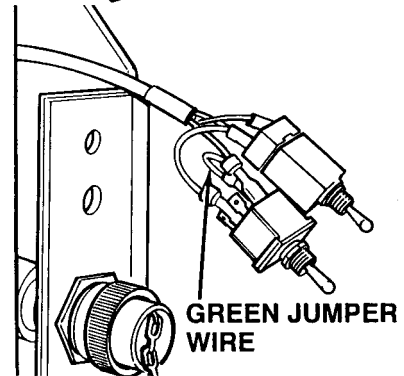
CONTINUITY TEST

Is there continuity on green jumper wire between its ends where it is connected to HIGH IDLE switch?

- (1) If there is no continuity, repair wire (see schematic Fig 2-58).
- (2) If there is continuity, go to Step 10 of this Fault.

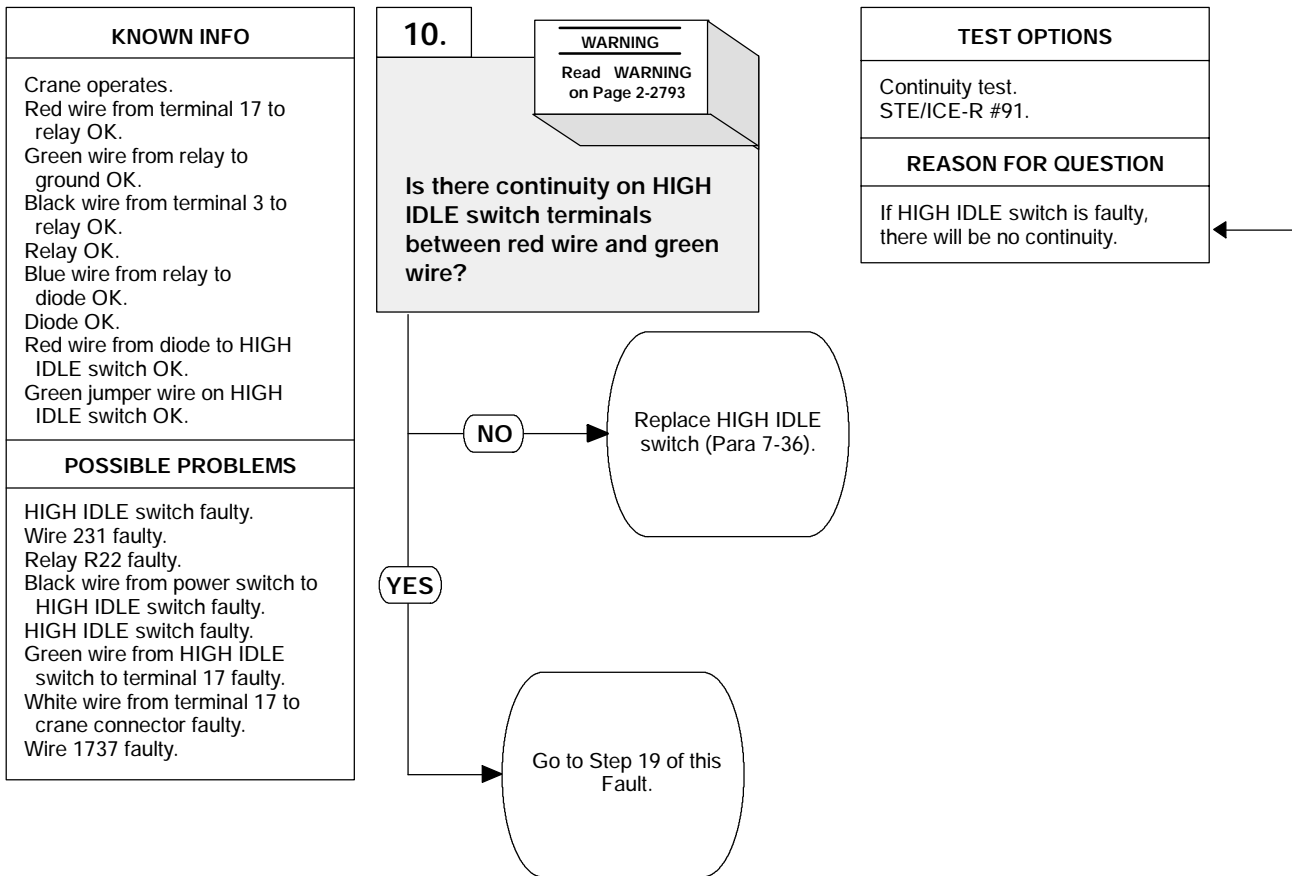


HIGH IDLE SWITCH



GREEN JUMPER WIRE

19. CRANE HIGH IDLE NOT WORKING (CONT).

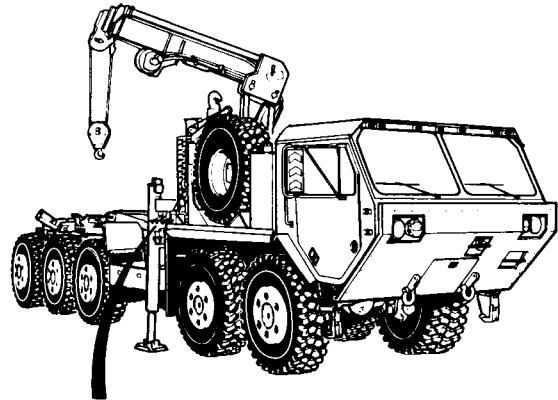


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

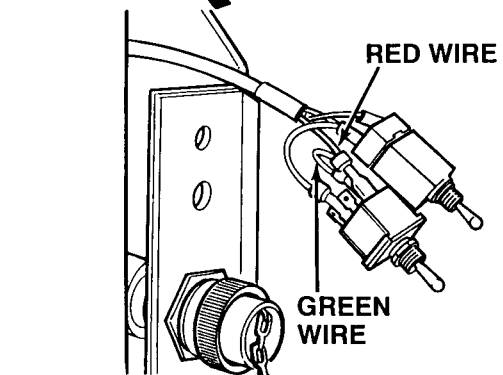
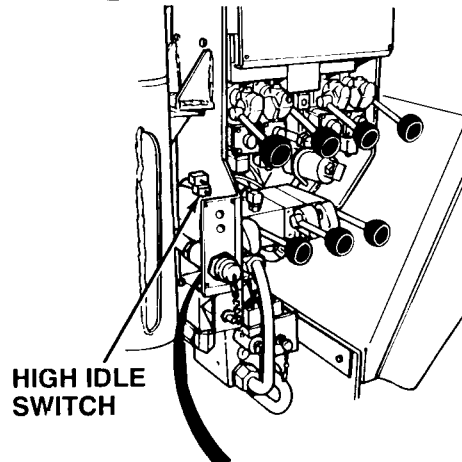
- Leave all wires connected to switches.
- Terminals of switch are being tested, not the wires.
- Switch terminal with two green wires if terminal is to be tested.



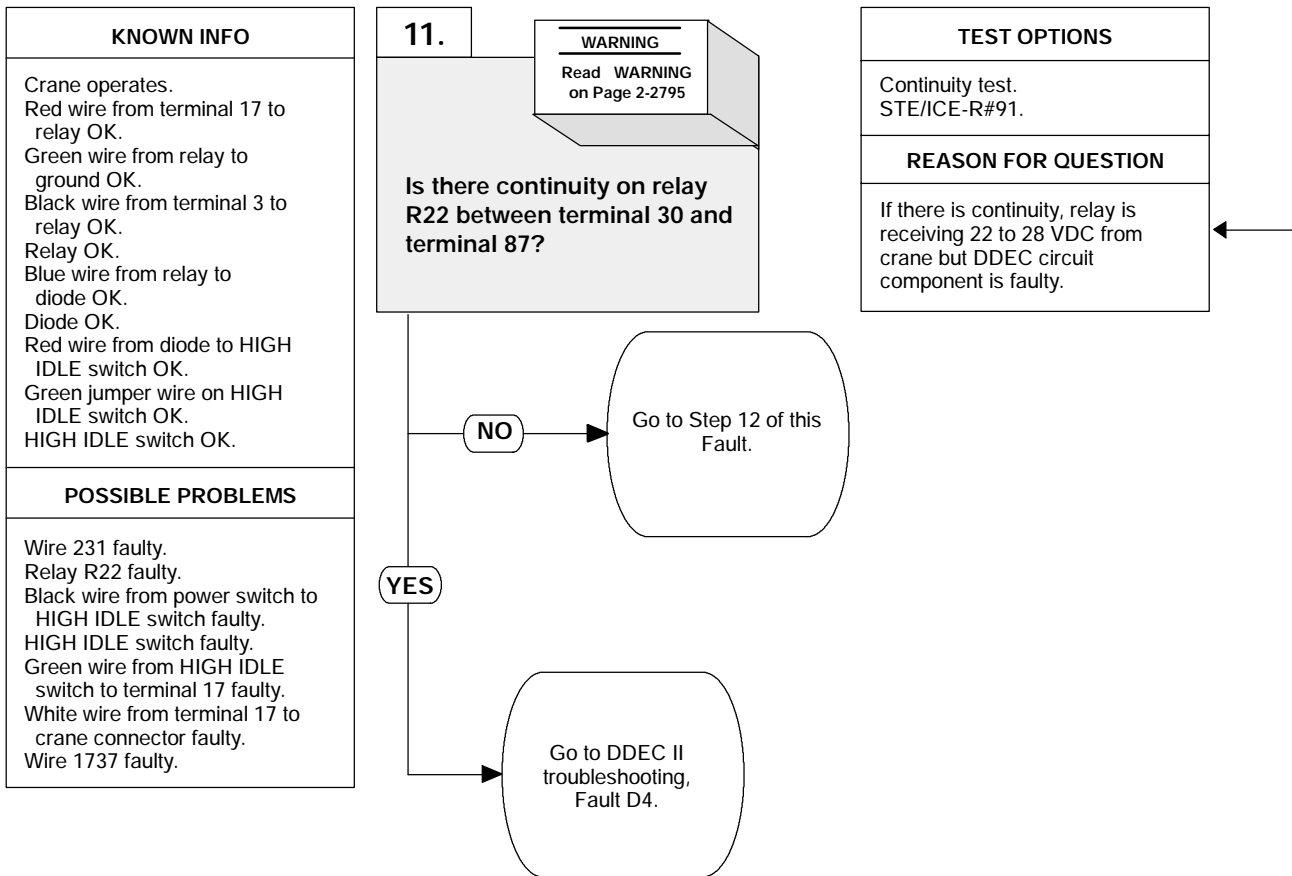
CONTINUITY TEST

Is there continuity on HIGH IDLE switch terminals between green wire and red wire?

- (1) If there is no continuity, replace HIGH IDLE switch (Para 7-36).
- (2) If there is continuity, go to Step 19 of this Fault.



19. CRANE HIGH IDLE NOT WORKING (CONT).



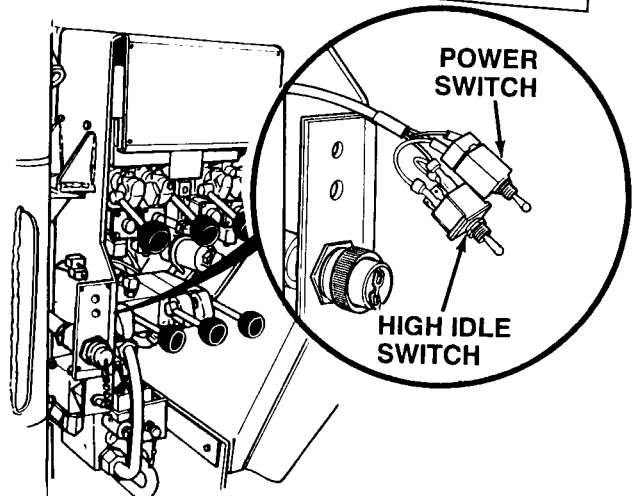
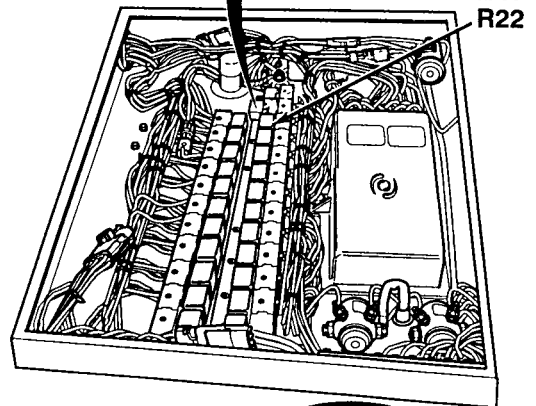
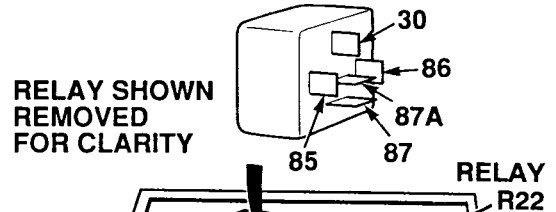
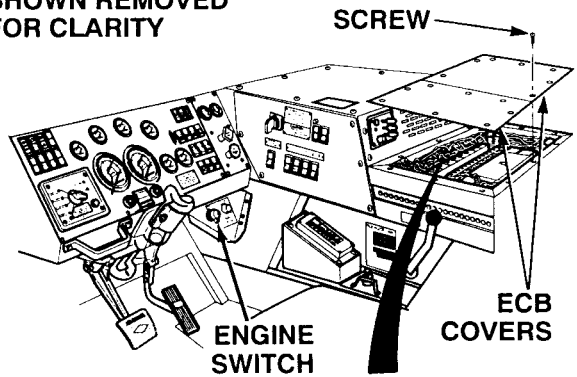
WARNING

- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury, or death to personnel may occur.
- Circuit breakers CB5, CB6, CB12, CB20, CB22, CB23 and relays R3, R13 - R19, R26, R28, R32 and R33 are always electrically hot and can cause severe injury to personnel. Care must be exercised when working under the electrical circuit board cover.

NOTE

- Relay test must be performed with relay partially removed.
- Use of insulated test leads are required for Steps (3) and (4).

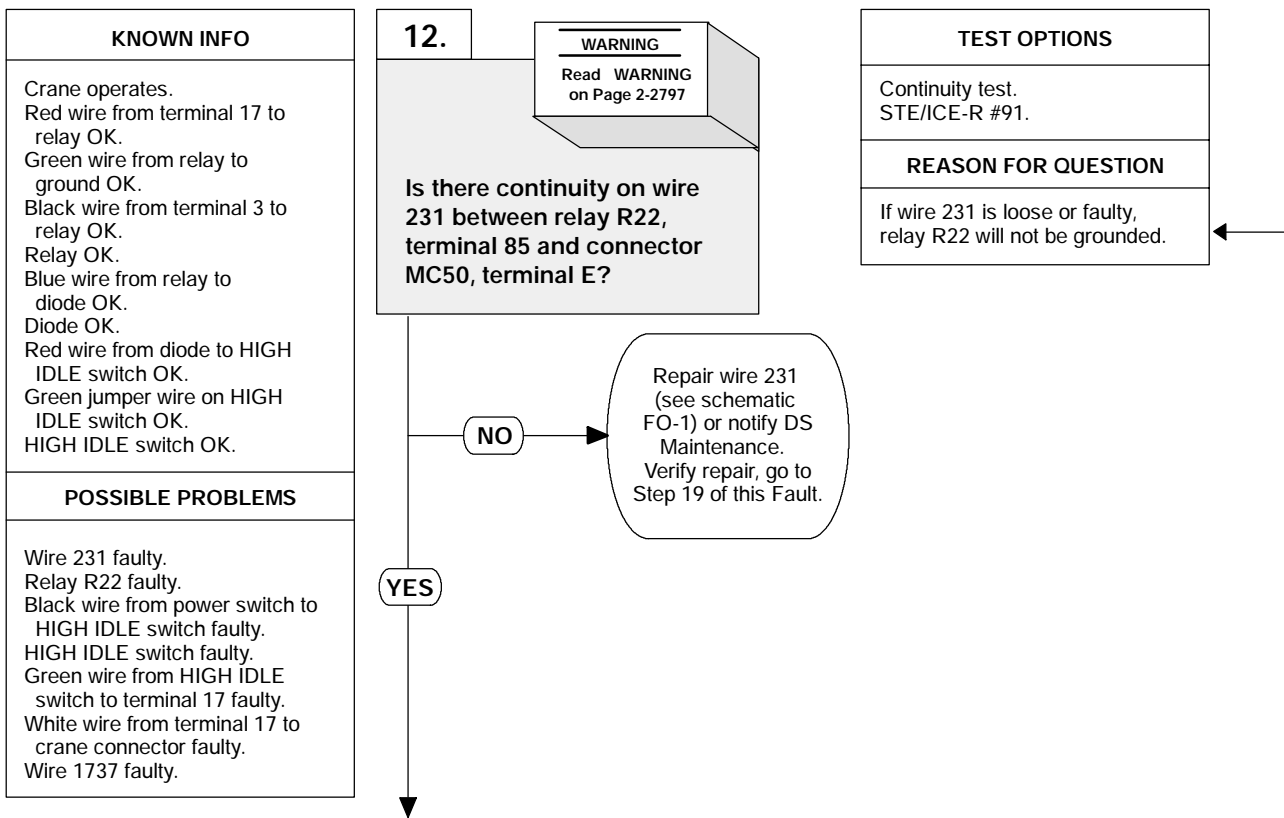
STEERING WHEEL SHOWN REMOVED FOR CLARITY



CONTINUITY TEST

- (1) Remove 15 screws and ECB covers.
- (2) Set multimeter select switch to ohms.
- (3) Connect multimeter positive (+) lead to relay R22, terminal 30.
- (4) Connect negative multimeter (-) lead to relay R22, terminal 87.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
- (6) Set crane POWER switch to ON position.
- (7) Press the HIGH IDLE switch to LATCH position and release.
 - (a) If there is no continuity, perform Steps (8) and (9) below and go to Step 12 of this Fault.
 - (b) If there is continuity, perform Steps (8) through (10) below and go to DDEC II troubleshooting, Fault 4.
- (8) Set crane POWER switch to OFF position.
- (9) Turn OFF ENGINE switch.
- (10) Install ECB covers with 15 screws.

19. CRANE HIGH IDLE NOT WORKING (CONT).



WARNING

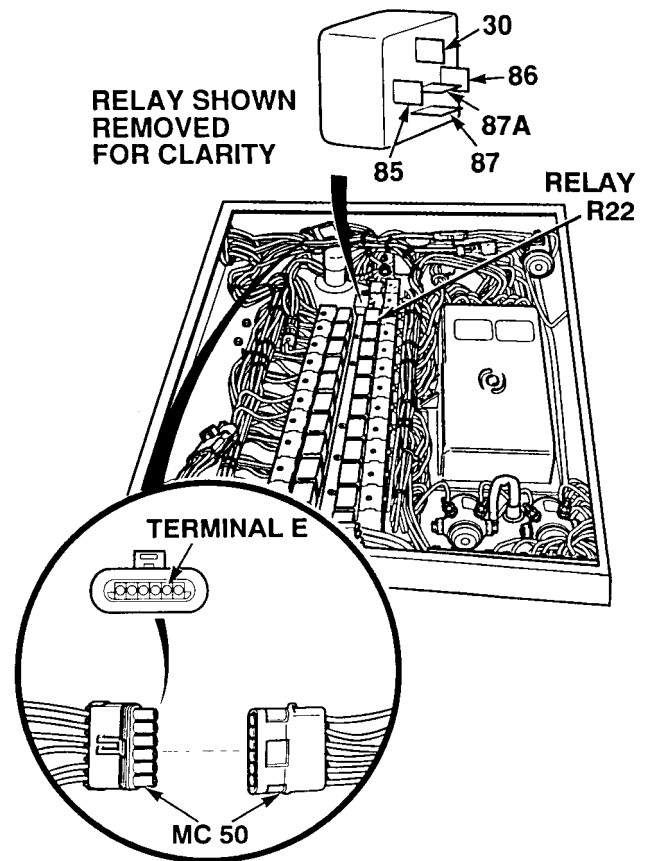
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury, or death to personnel may occur.
- Circuit breakers and relays are always electrically hot and can cause severe injury to personnel. Care must be exercised when working under the electrical circuit board cover.

NOTE

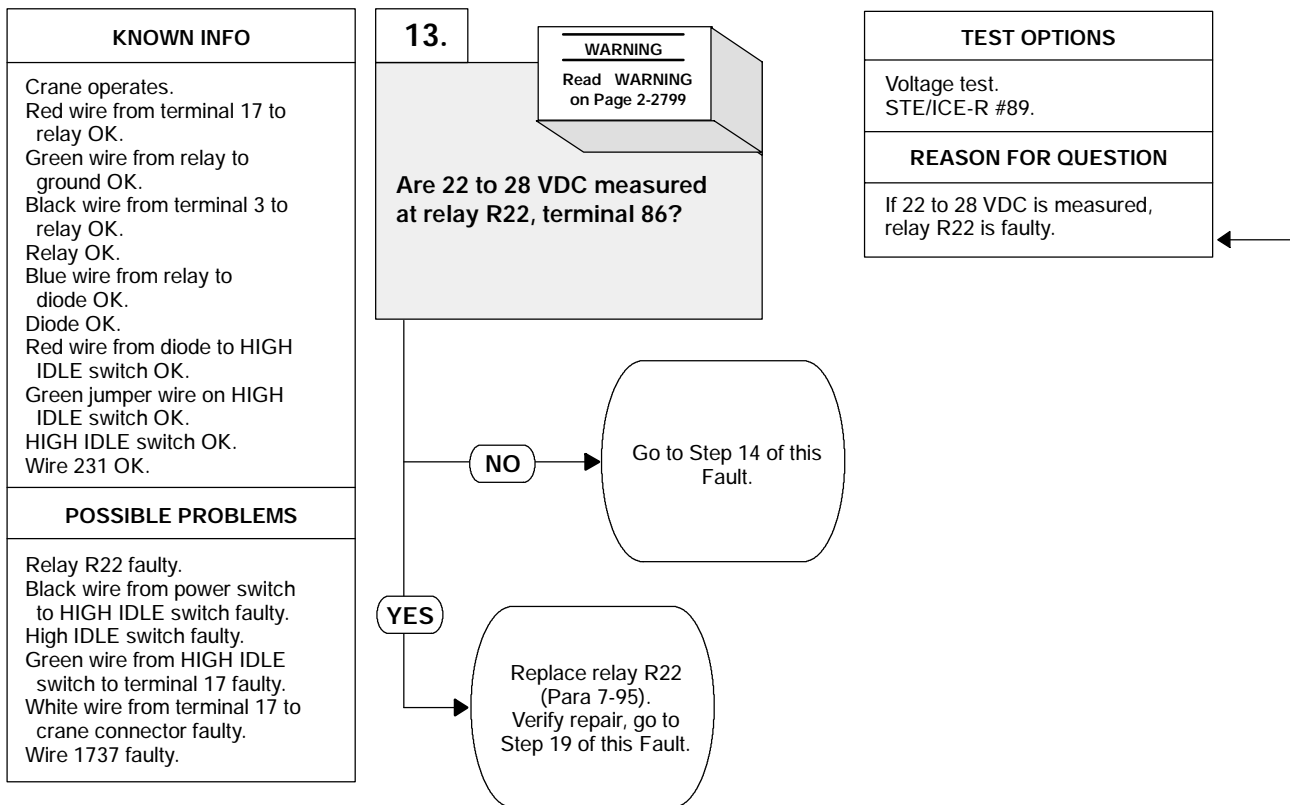
Relay test must be performed with relay partially removed.

CONTINUITY TEST

- (1) Disconnect connector MC50.
- (2) Is there continuity between MC50, terminal E and relay R22, terminal 85?
 - (a) If there is no continuity, repair wire 231 (see schematic FO-1) or notify DS Maintenance.
 - (b) If there is continuity, perform Step (3) below and go to Step 13 of this Fault.
- (3) Connect connector MC50.



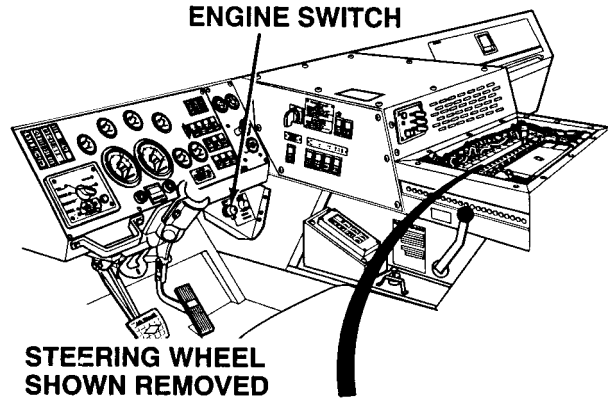
19. CRANE HIGH IDLE NOT WORKING (CONT).



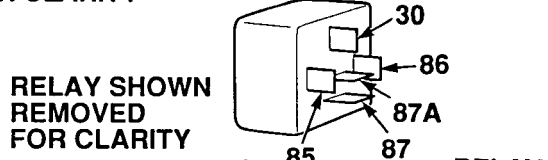
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment and injury or death to personnel may occur.

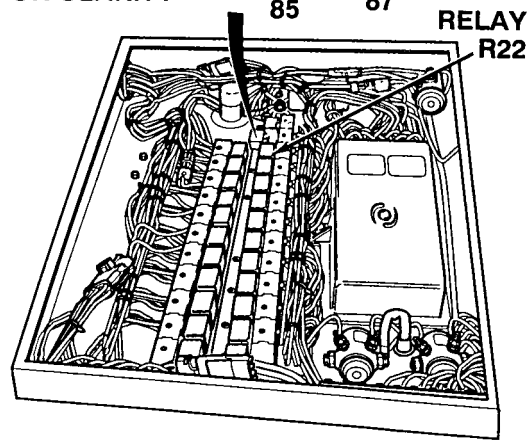
- | VOLTAGE TEST | |
|--------------|--|
| (1) | Set multimeter select switch to volts dc. |
| (2) | Connect positive multimeter (+) lead to relay R22, terminal 86. |
| (3) | Connect negative multimeter (-) lead to a known good ground. |
| (4) | Turn ON ENGINE switch. |
| (5) | Set crane POWER switch to ON position. |
| (6) | Press HIGH IDLE switch to LATCH position and release. <ul style="list-style-type: none"> (a) If 22 to 28 VDC are not present, perform Steps (7) and (8) below and go to Step 14 of this Fault. (b) If 22 to 28 VDC are present, perform Steps (7) and (8) below and replace relay R22 (Para 7-95). |
| (7) | Set crane POWER switch to OFF position. |
| (8) | Turn OFF ENGINE switch. |



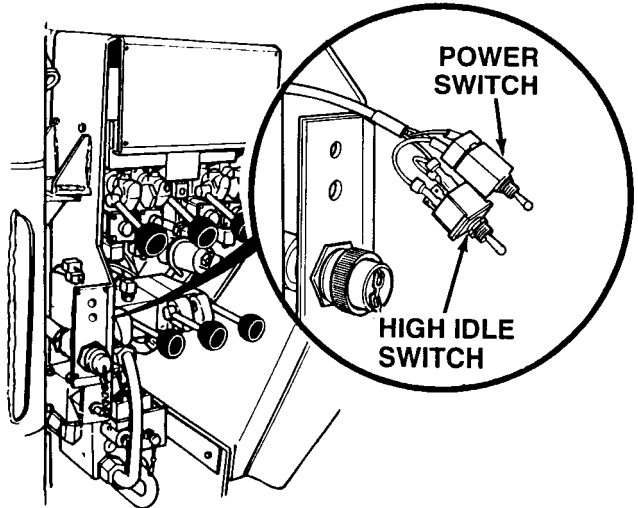
ENGINE SWITCH
STEERING WHEEL SHOWN REMOVED FOR CLARITY



RELAY SHOWN REMOVED FOR CLARITY



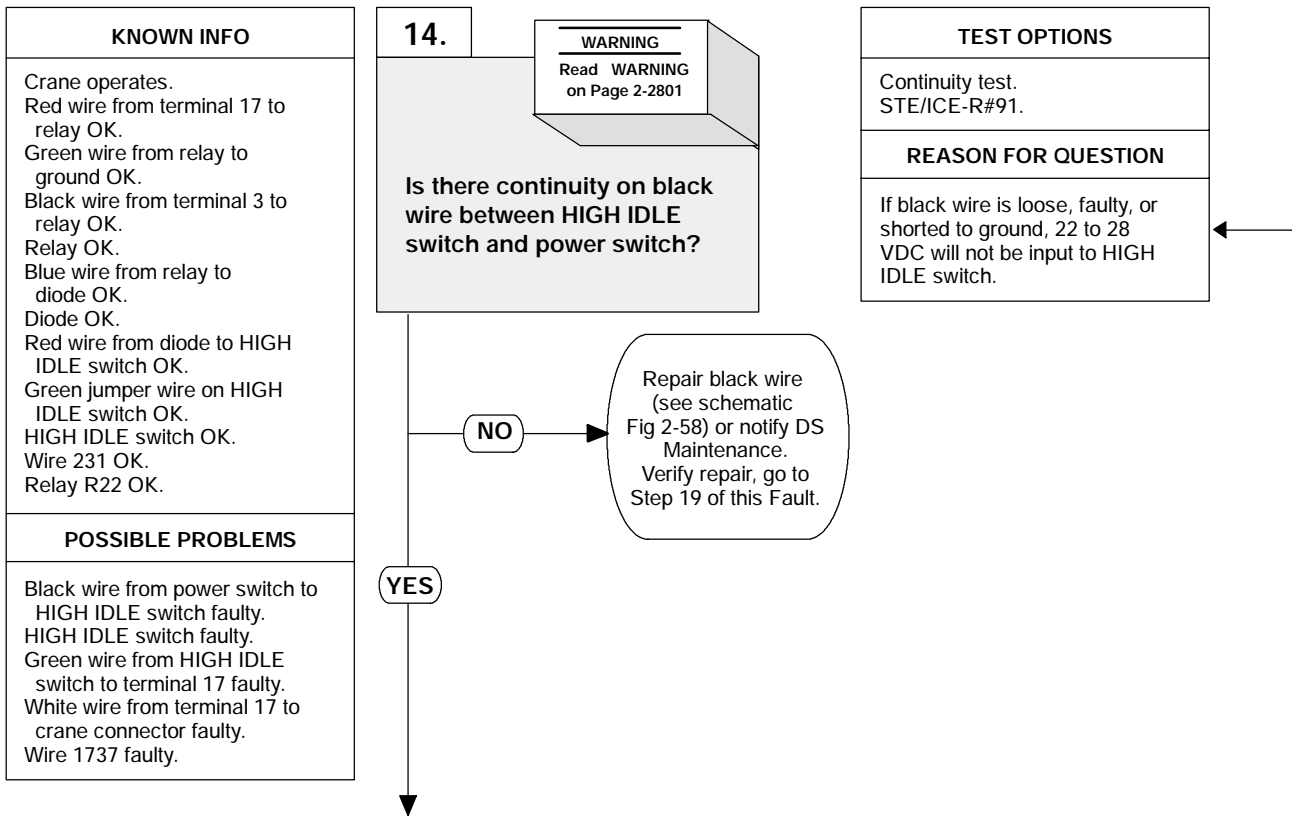
RELAY R22



POWER SWITCH

HIGH IDLE SWITCH

19. CRANE HIGH IDLE NOT WORKING (CONT).



WARNING

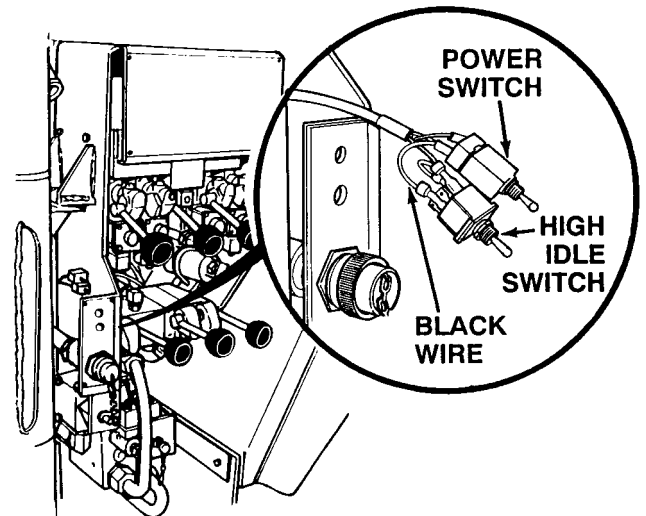
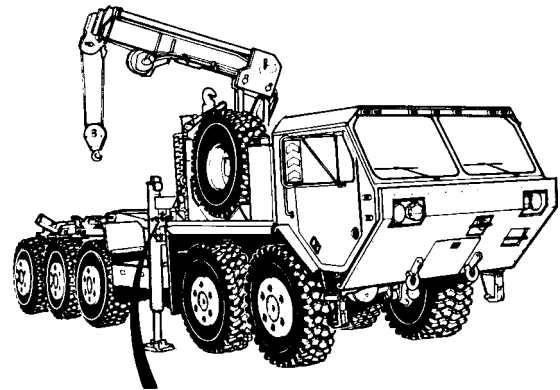
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

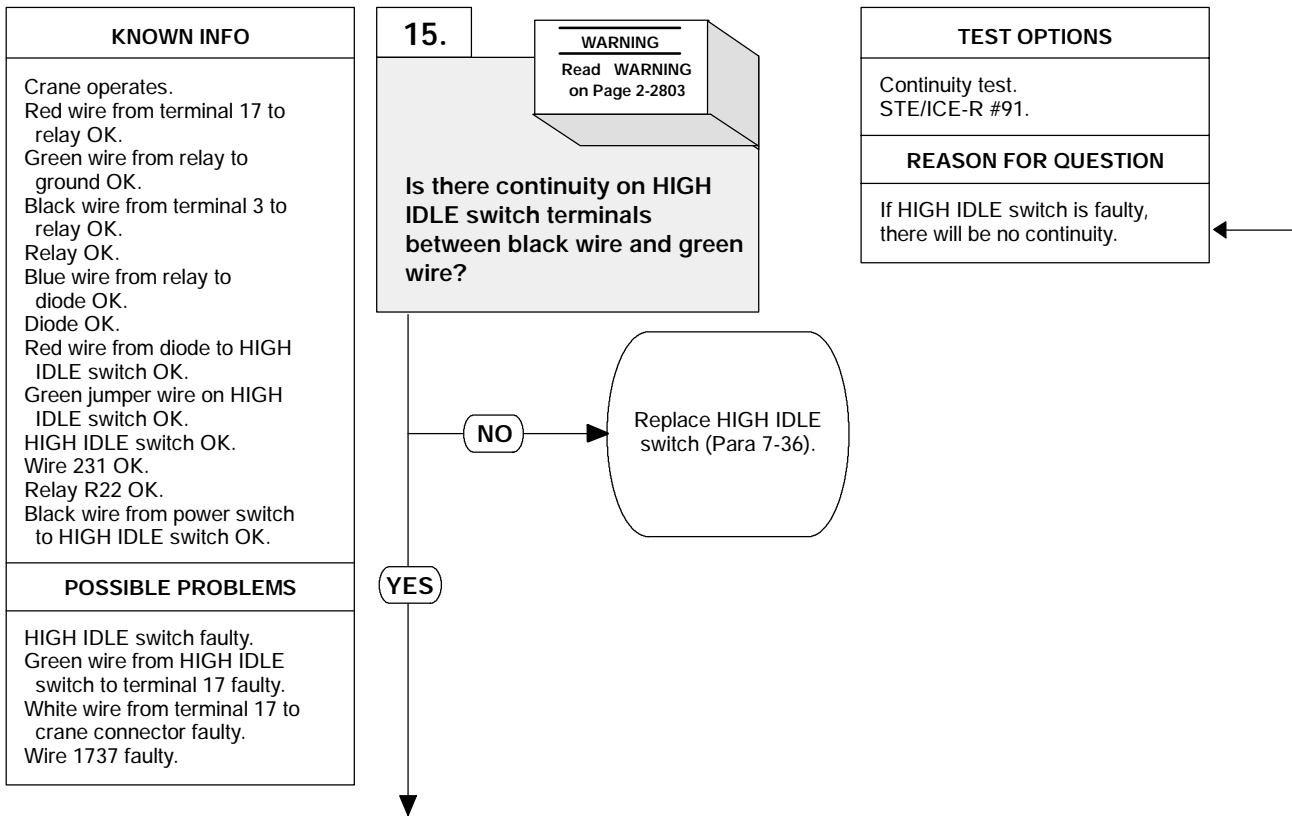
Leave all wires attached to switches.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity on black wire between HIGH IDLE switch and power switch?
 - (a) If there is no continuity, repair black wire (see schematic Fig 2-58).
 - (b) If there is continuity, go to Step 15 of this Fault.



19. CRANE HIGH IDLE NOT WORKING (CONT).



WARNING

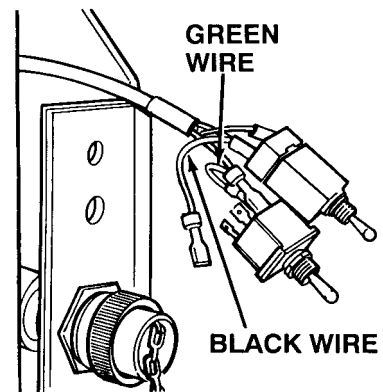
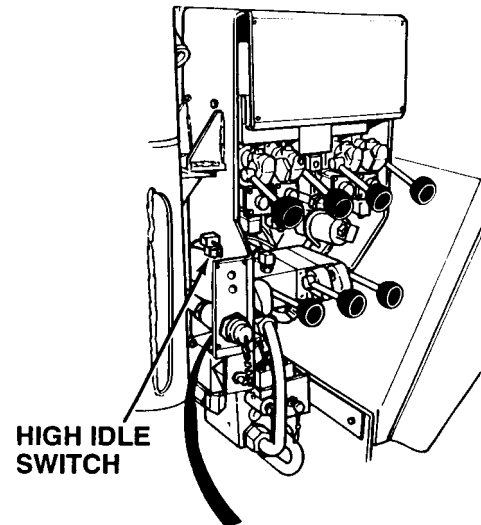
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

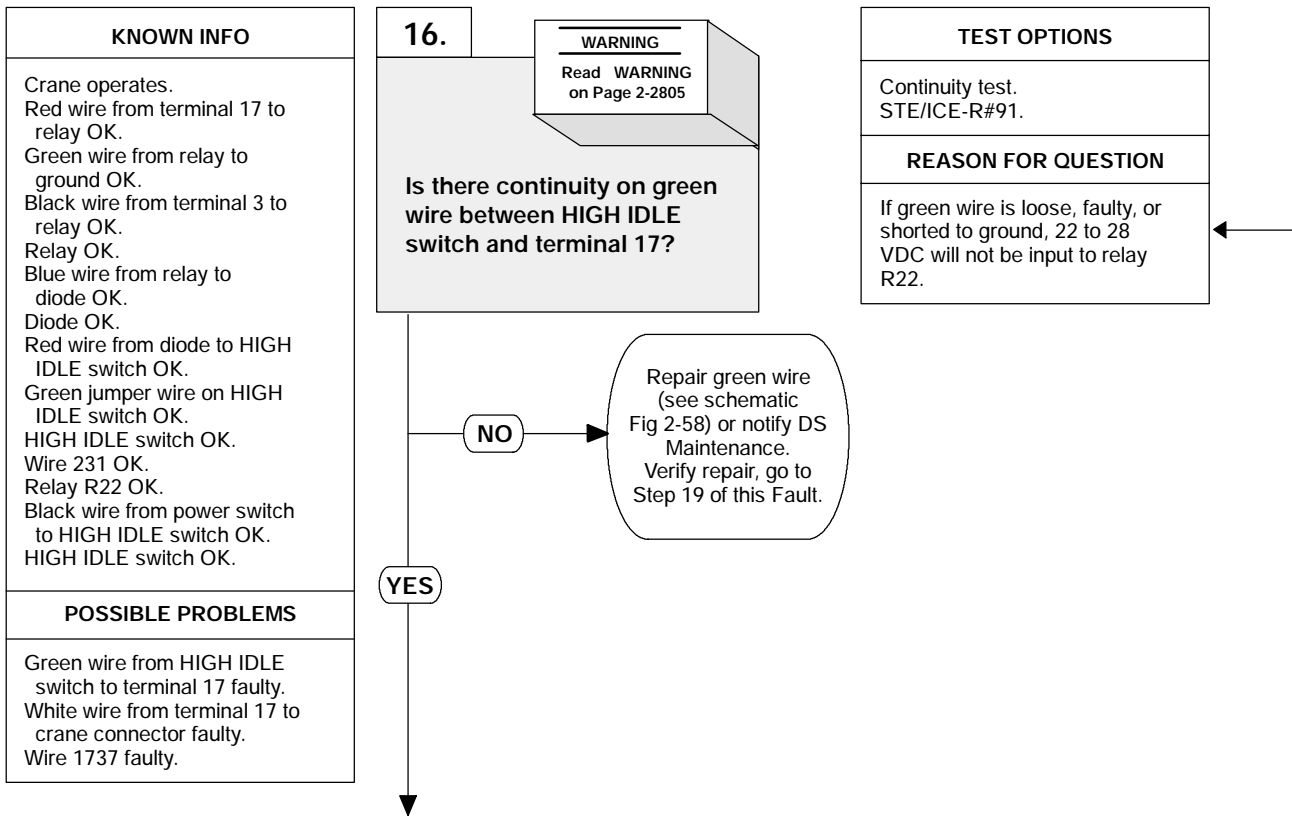
Terminals of switch are being tested, not the wires.

CONTINUITY TEST

- (1) Remove black wire from HIGH IDLE switch.
- (2) Is there continuity on HIGH IDLE switch between green wire and black wire while holding switch in LATCH position?
 - (a) If there is no continuity, replace HIGH IDLE switch (Para 7-36).
 - (b) If there is continuity, perform Step (3) below and go to Step 16 of this Fault.
- (3) Connect black wire to HIGH IDLE switch.



19. CRANE HIGH IDLE NOT WORKING (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

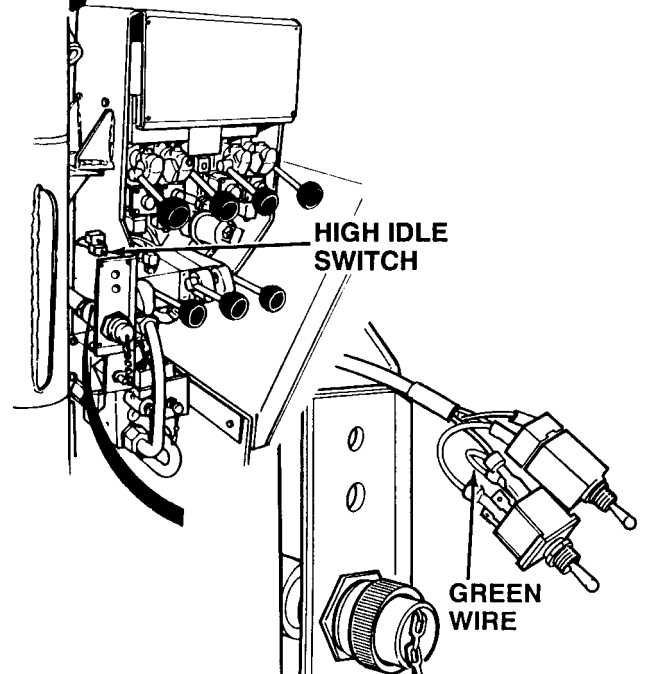
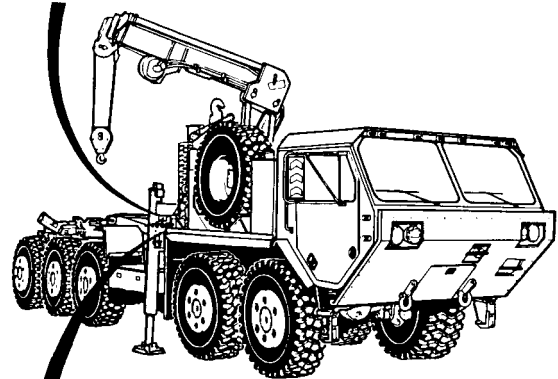
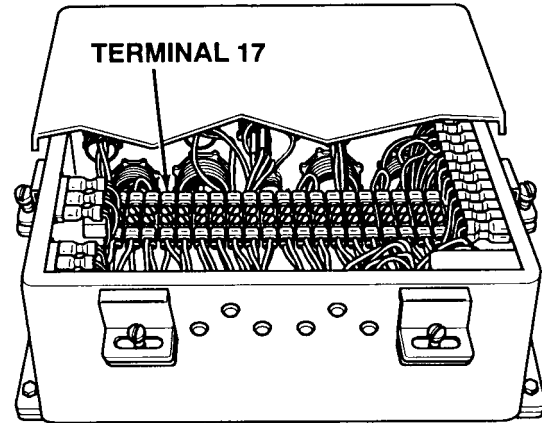
NOTE

Leave all wires attached to switches.

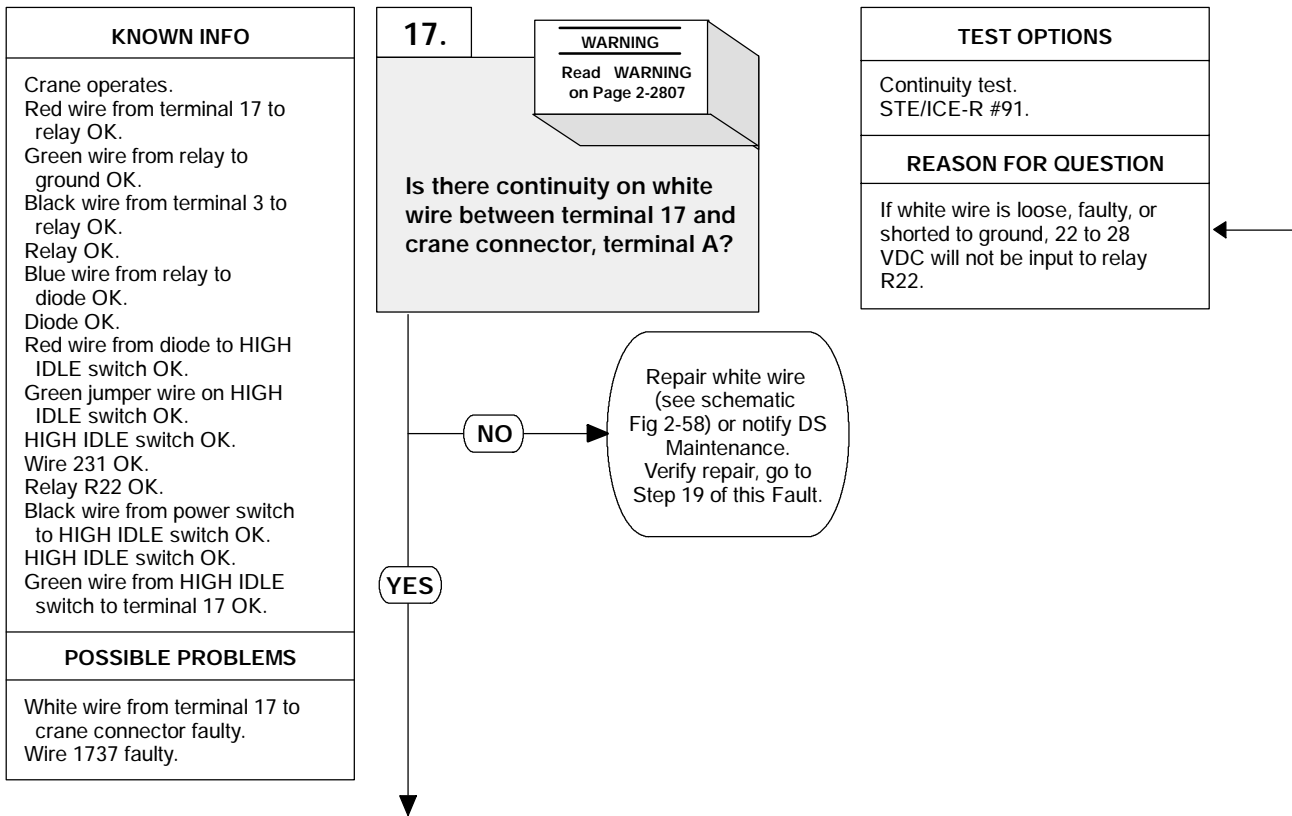
CONTINUITY TEST

Is there continuity on green wire between HIGH IDLE switch and terminal 17?

- (1) If there is no continuity, repair green wire (see schematic Fig 2-58) or notify DS Maintenance.
- (2) If there is continuity, go to Step 17 of this Fault.



19. CRANE HIGH IDLE NOT WORKING (CONT).

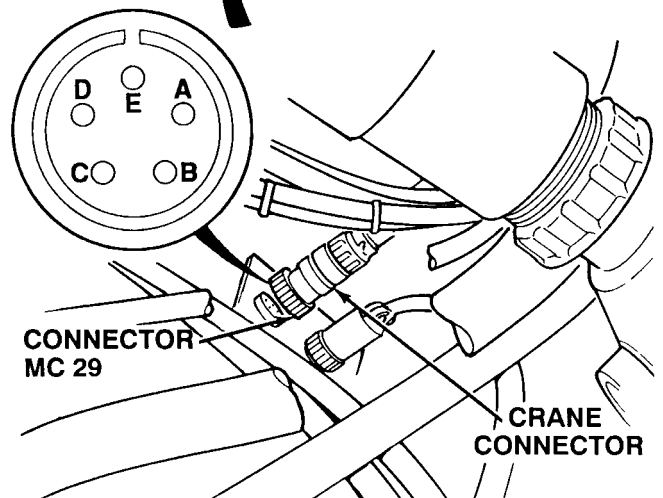
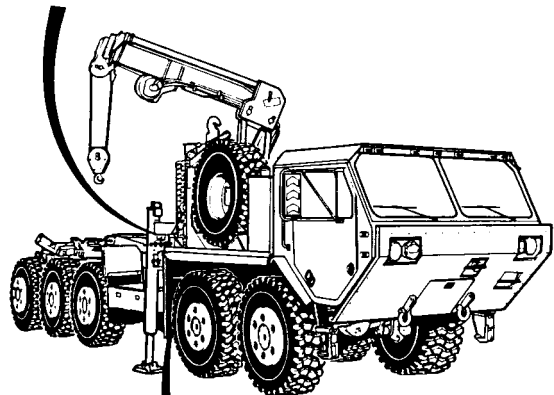
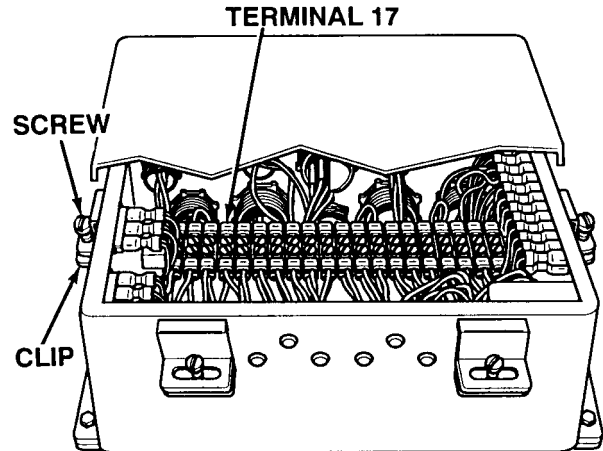


WARNING

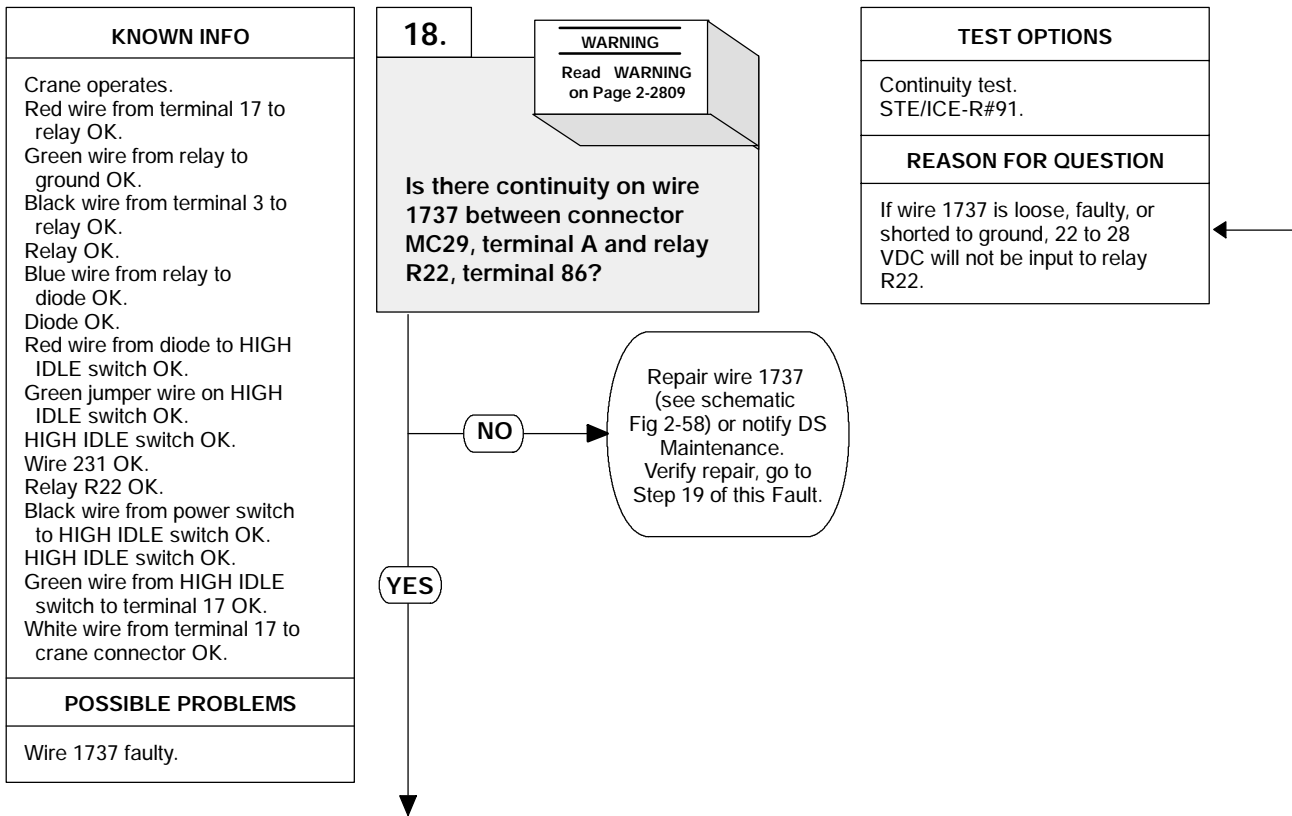
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect crane connector from truck connector MC29.
- (2) Using a jumper wire, connect connector MC29, terminal A to a known good ground.
- (3) Is there continuity on white wire at terminal 17 and a known good ground?
 - (a) If there is no continuity, repair white wire (see schematic Fig 2-58) or notify DS Maintenance.
 - (b) If there is continuity, perform Step (4) and (5) below and go to Step 18 of this Fault.
- (4) Install junction box cover with six clips and screws.
- (5) Remove jumper wire.



19. CRANE HIGH IDLE NOT WORKING (CONT).



WARNING

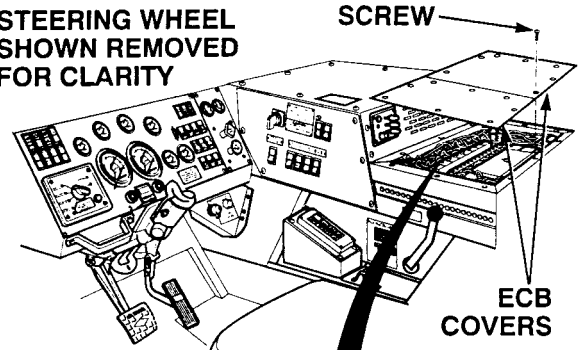
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury, or death to personnel may occur.
- Circuit breakers CB5, CB6, CB12, CB20, CB22, CB23 and relays R3, R13 - R19, R26, R28, R32, and R33 are always electrically hot and can cause severe injury to personnel. Care must be exercised when working under the electrical circuit board cover.

NOTE

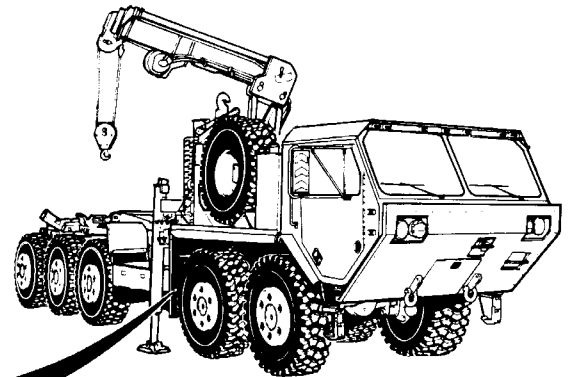
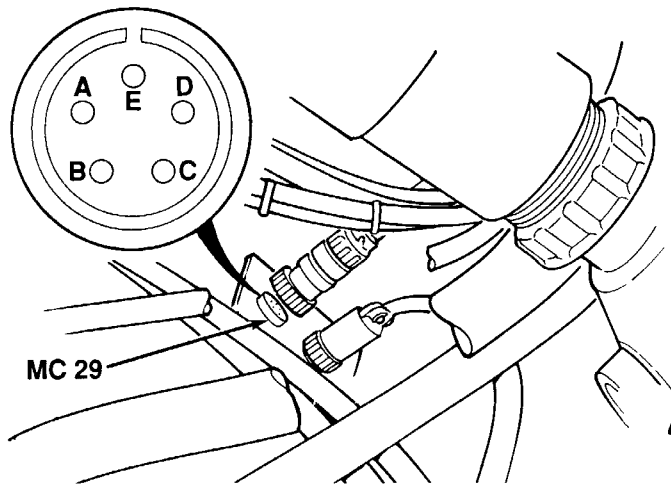
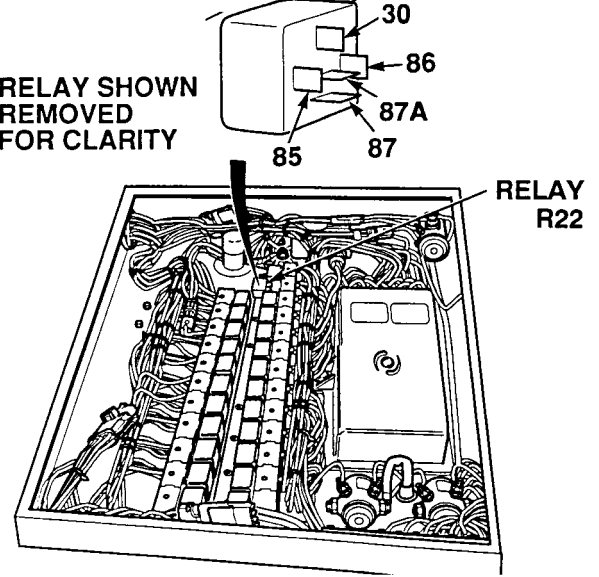
Relay test must be performed with relay partially removed.

CONTINUITY TEST	
(1)	Using a jumper wire, connect connector MC29, terminal A to a known good ground.
(2)	Is there continuity on wire 1737 between relay R22, terminal 86 and a known good ground?
(a)	If there is no continuity, repair wire 1737 (see schematic Fig 2-58) or notify DS Maintenance.
(b)	If there is continuity, perform Steps (3) and (4) below.
(3)	Connect crane connector to truck connector MC29.
(4)	Install ECB covers with 15 screws.

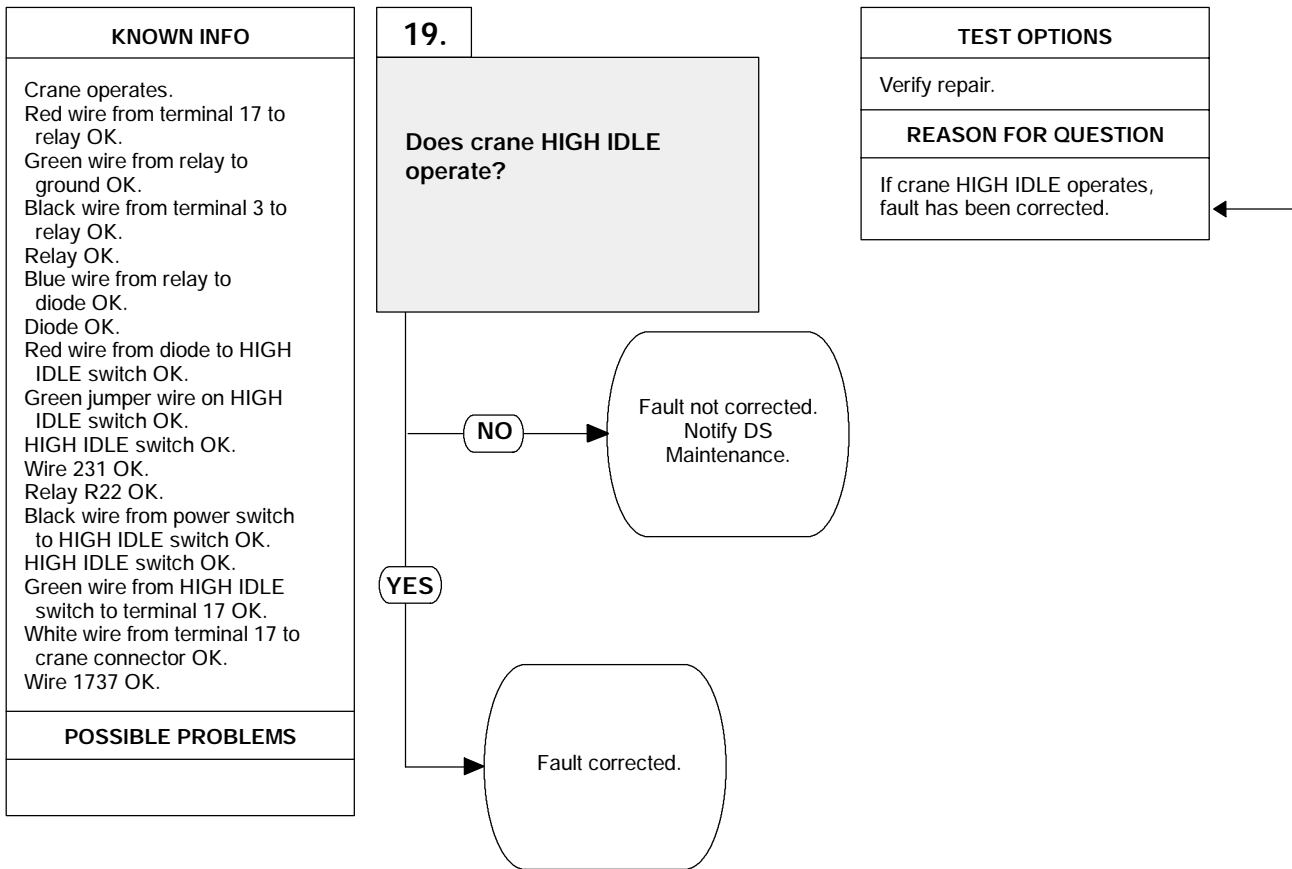
STEERING WHEEL SHOWN REMOVED FOR CLARITY

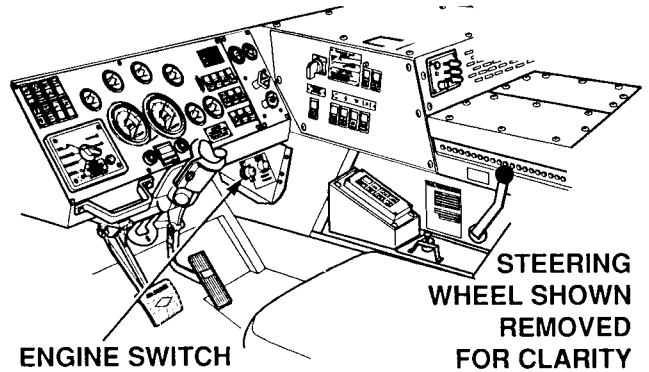


RELAY SHOWN REMOVED FOR CLARITY

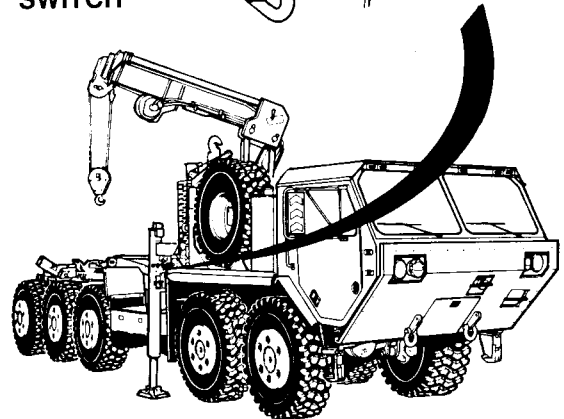
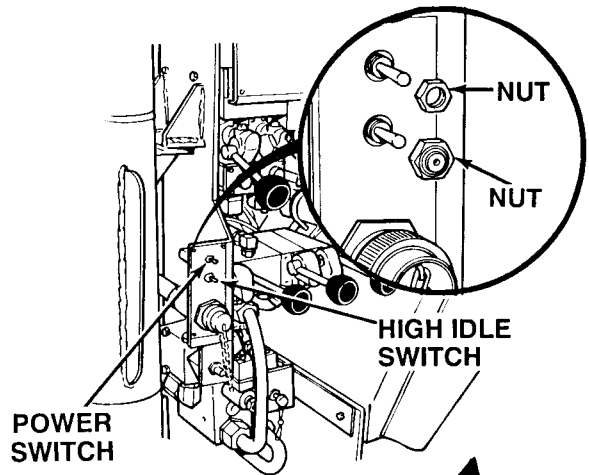


19. CRANE HIGH IDLE NOT WORKING (CONT).





- | VERIFY REPAIR |
|---|
| <ol style="list-style-type: none"> (1) Install HIGH IDLE switch with nut. (2) Install POWER switch with nut. (3) Start engine (TM 9-2320-364-10). (4) Set crane POWER switch to ON position. (5) Press HIGH IDLE switch to LATCH position and release. <ol style="list-style-type: none"> (a) If high idle does not engage and latch, fault not corrected. Perform Steps (6) through (8) below and notify DS Maintenance. (b) If high idle does engage and latch, fault corrected. (6) Stow crane. (7) Set crane POWER switch to OFF position. (8) Turn OFF ENGINE switch. |



2-30. SELF RECOVERY WINCH (SRW) TROUBLESHOOTING.

This paragraph covers Self Recovery Winch (SRW) System Troubleshooting. The Self Recovery Winch (SRW) System Fault Index, Table 2-55, lists faults for the Self Recovery Winch (SRW) system of the PLS truck. Refer to schematics Figure 2-65 and 2-66 when performing tests and corrective actions.

Table 2-55. Self Recovery Winch (SRW) System Fault Index

Fault No.	Description	Page
1.	Self Recovery Winch (SRW) Will Not Pay In Or Out Using Control Lever	2-2816
2.	Self Recovery Winch (SRW) Will Not Pay In Or Out Using Cab Winch In/Out Switch	2-2824
3.	Self Recovery Winch (SRW) Will Not Pay In Using Cab Winch In/Out Switch	2-2828
4.	Self Recovery Winch (SRW) Will Not Pay Out Using Cab Winch In/Out Switch	2-2834
5.	Cable Cannot Be Free-Spoiled Out From Front Or Rear Of Truck	2-2840

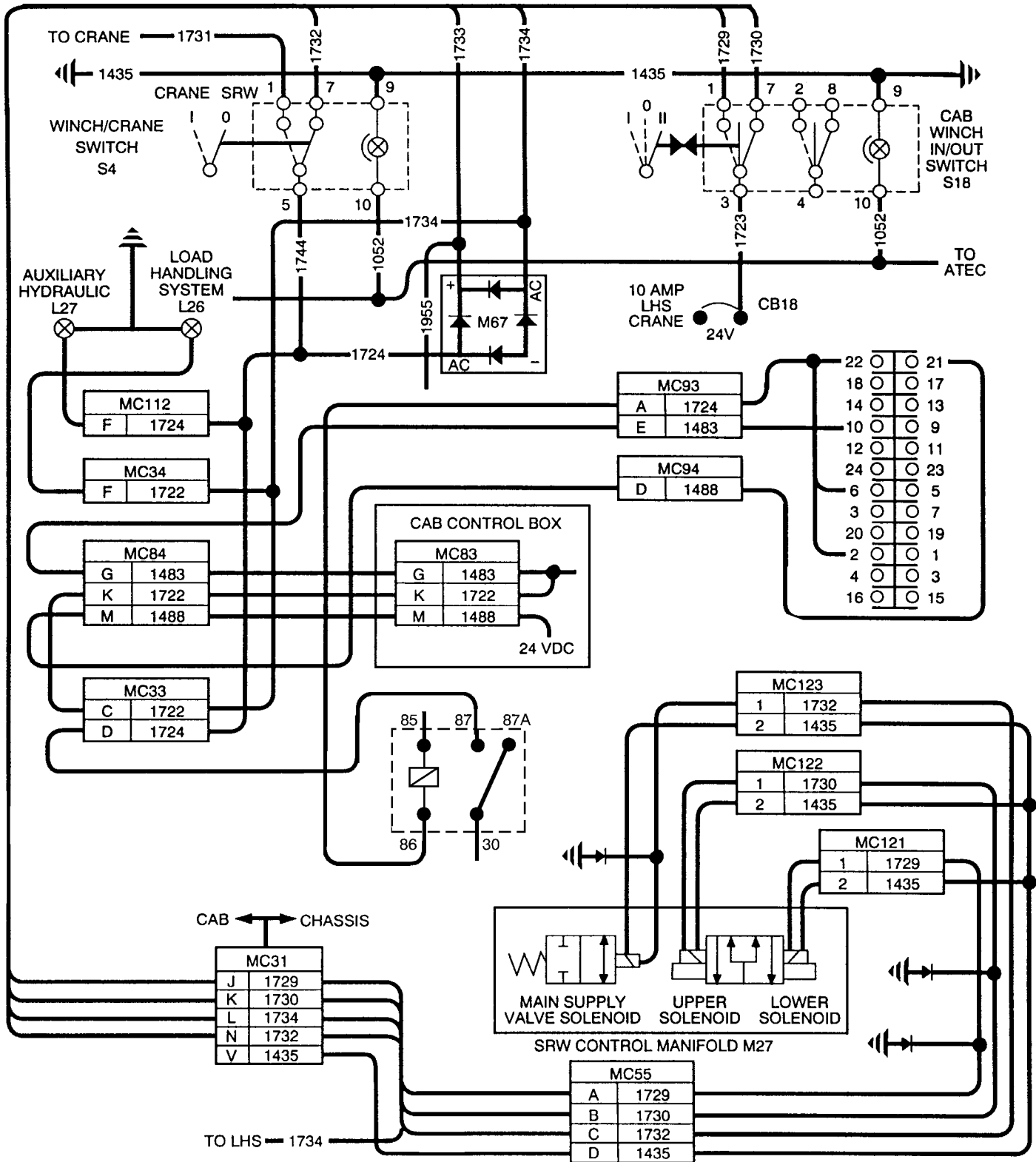


Figure 2-65. Winch Wiring Schematic

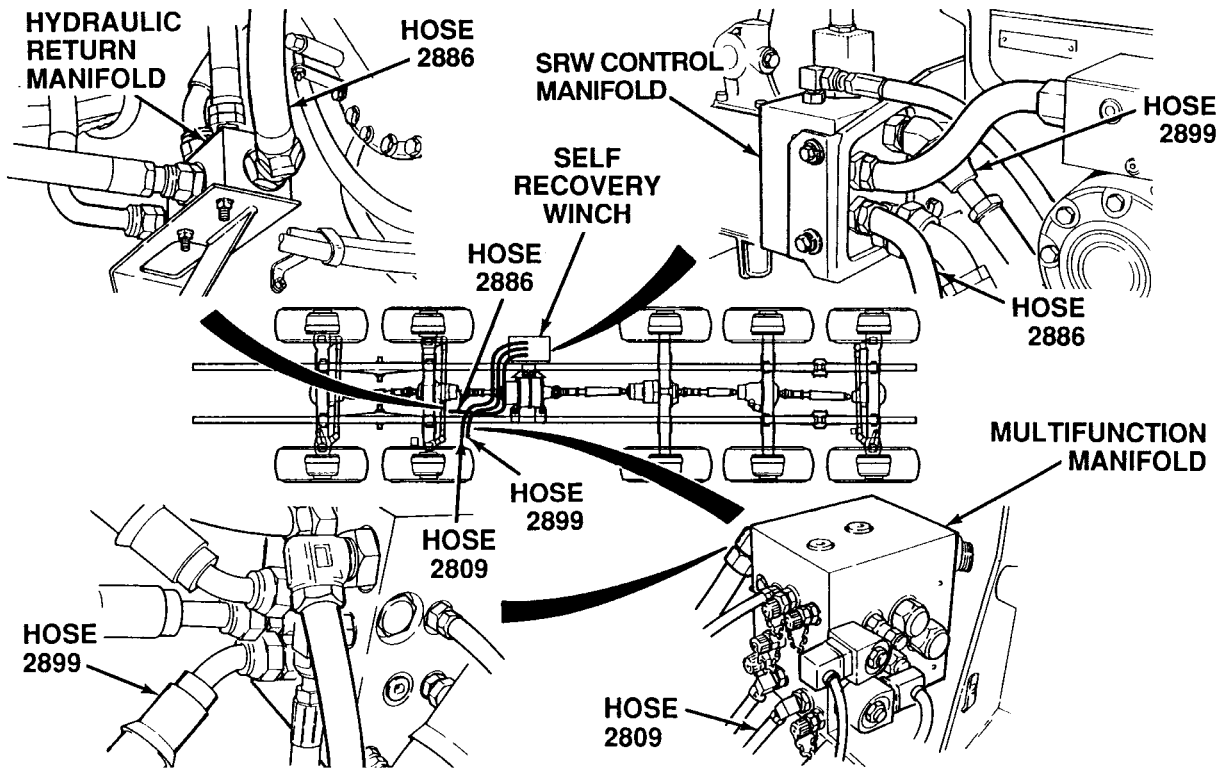


Figure 2-66. Winch Hydraulic Diagram

2-30. SELF RECOVERY WINCH (SRW) TROUBLESHOOTING (CONT).

1. SELF RECOVERY WINCH (SRW) WILL NOT PAY IN OR OUT USING CONTROL LEVER.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

Materials/Parts

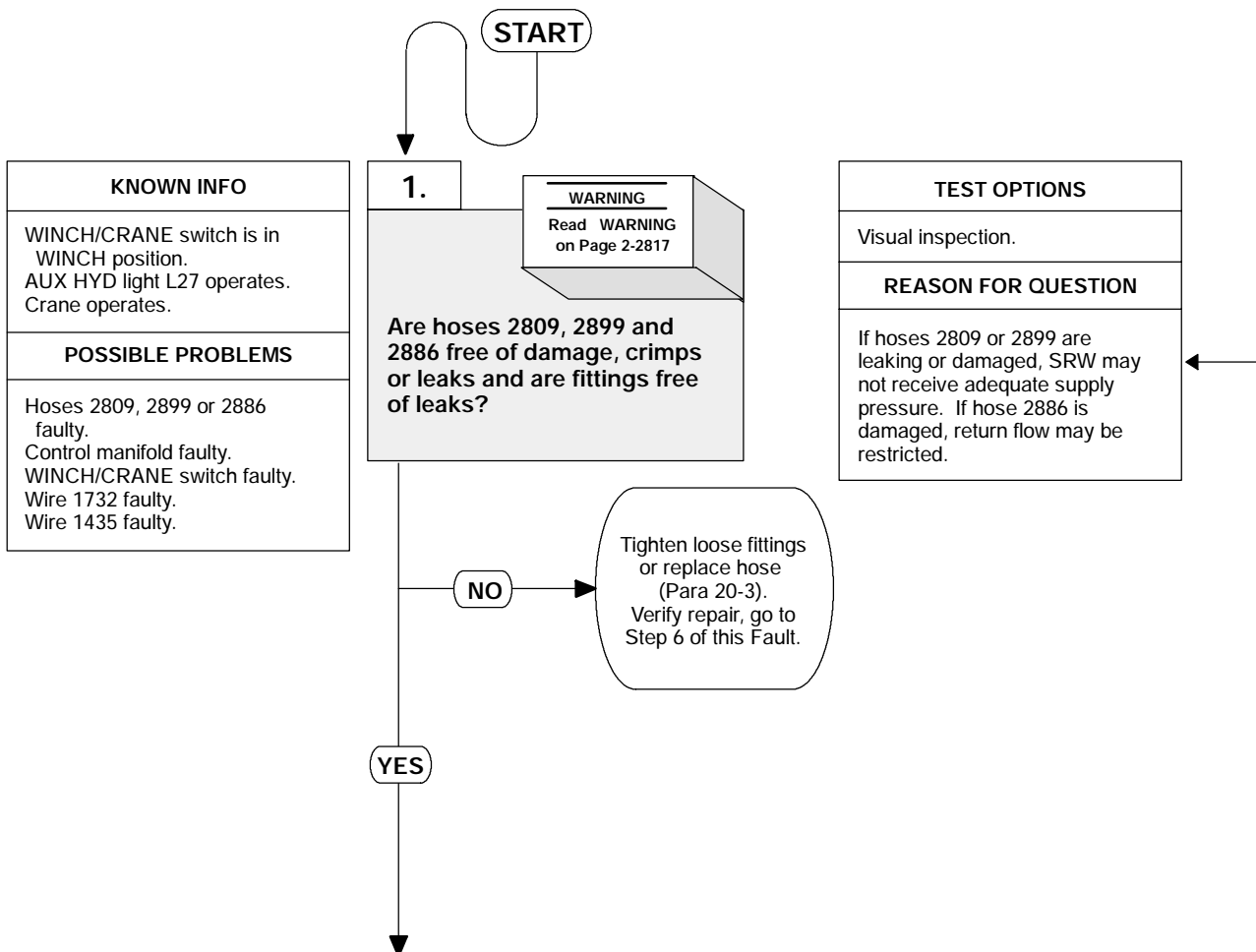
Adhesive (Item 9, Appendix C)

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

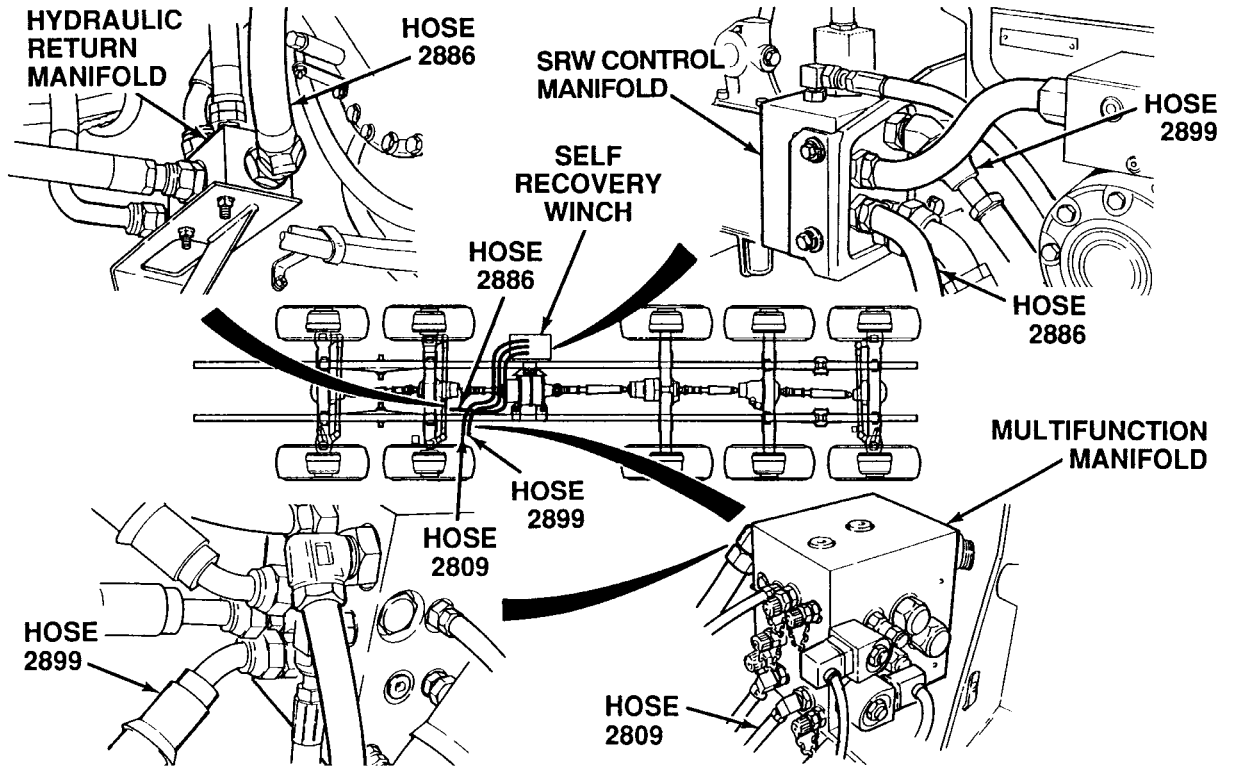
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)



WARNING

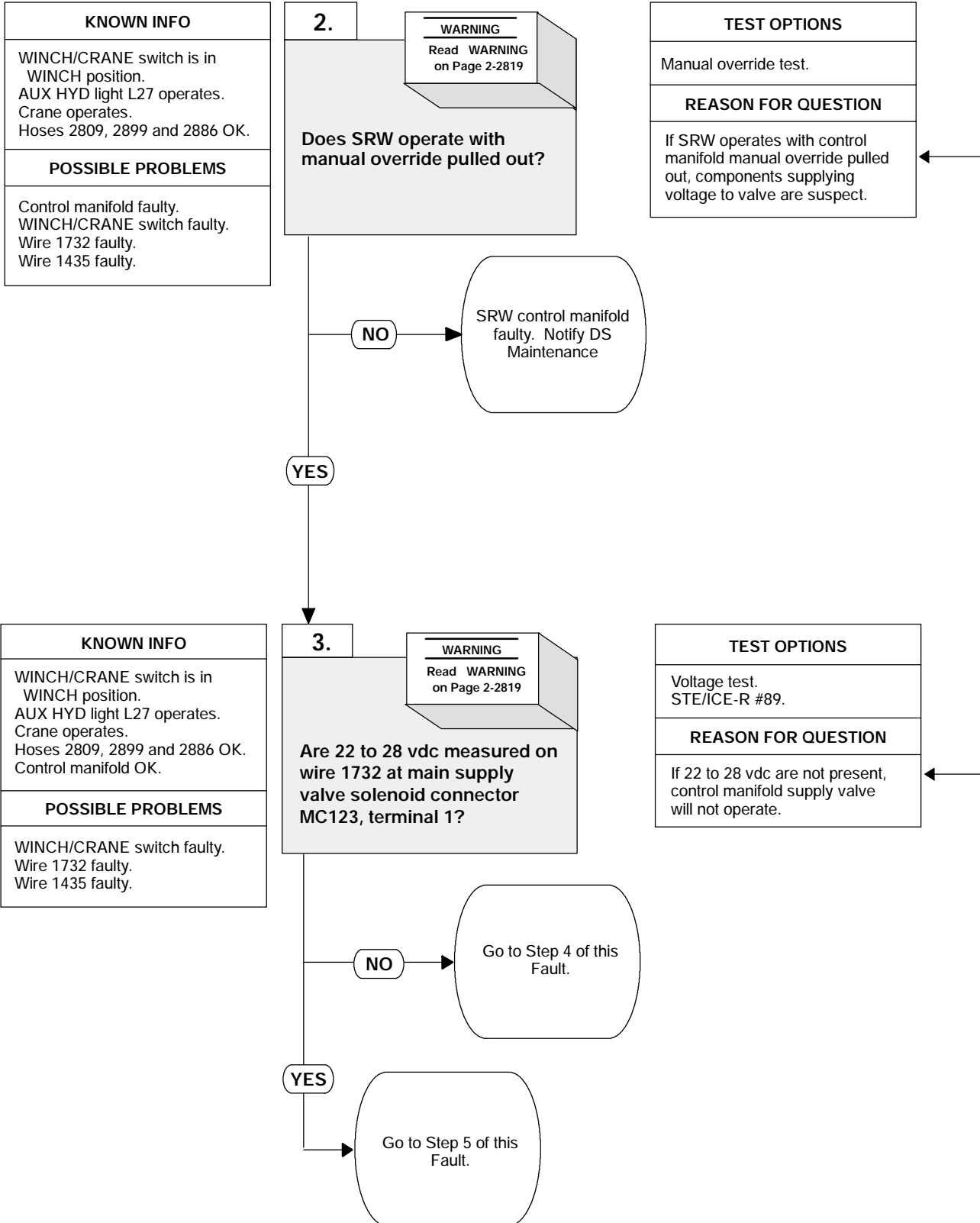
High pressure hydraulics [oil under 3,700 psi (25,512 kPa) pressure] operate this equipment. Refer to vehicle operator and maintenance manuals for hydraulic oil pressure. Never disconnect any hydraulic line or fittings without first dropping pressure to zero. A high pressure oil stream can pierce body and cause severe injury to personnel.



VISUAL INSPECTION

- Inspect hoses 2809, 2899 and 2886 for leaks and damage (Fig 2-66).
- (1) If hose is leaking or damaged, tighten loose fittings or replace hose (Para 20-3).
 - (2) If hoses are OK, go to Step 2 of this Fault.

1. SELF RECOVERY WINCH (SRW) WILL NOT PAY IN OR OUT USING CONTROL LEVER (CONT).



WARNING

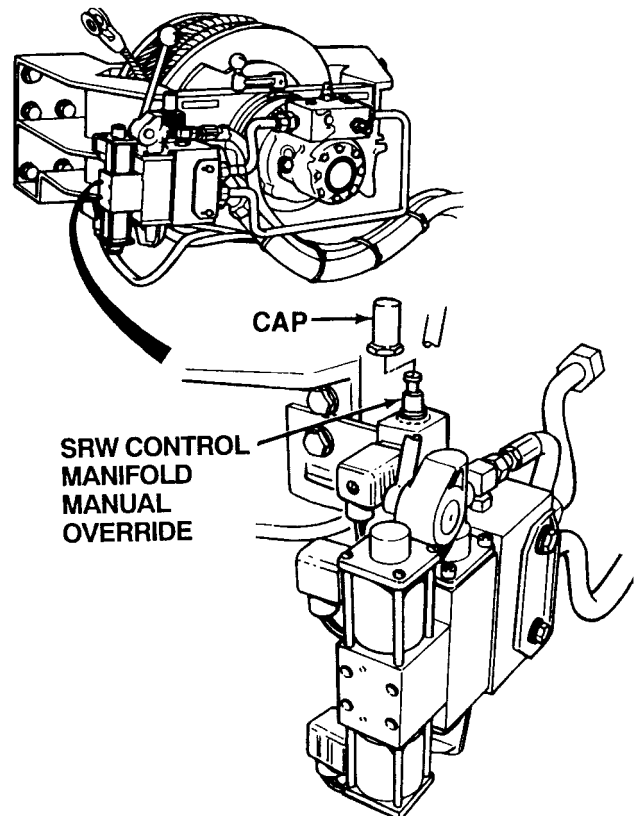
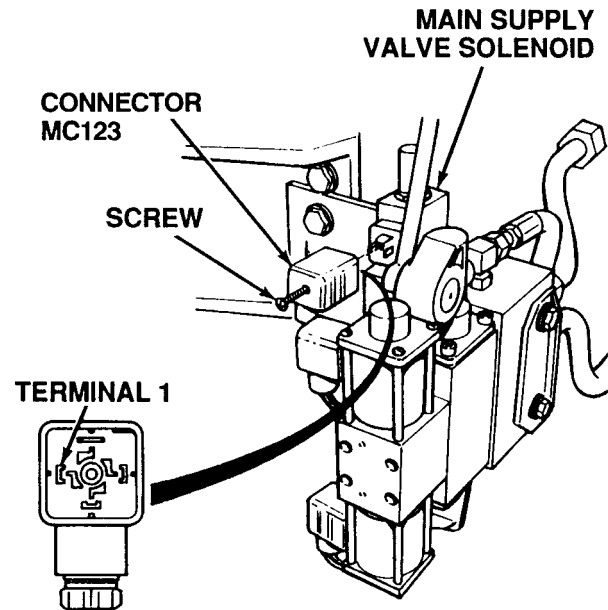
- Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

MANUAL OVERRIDE TEST

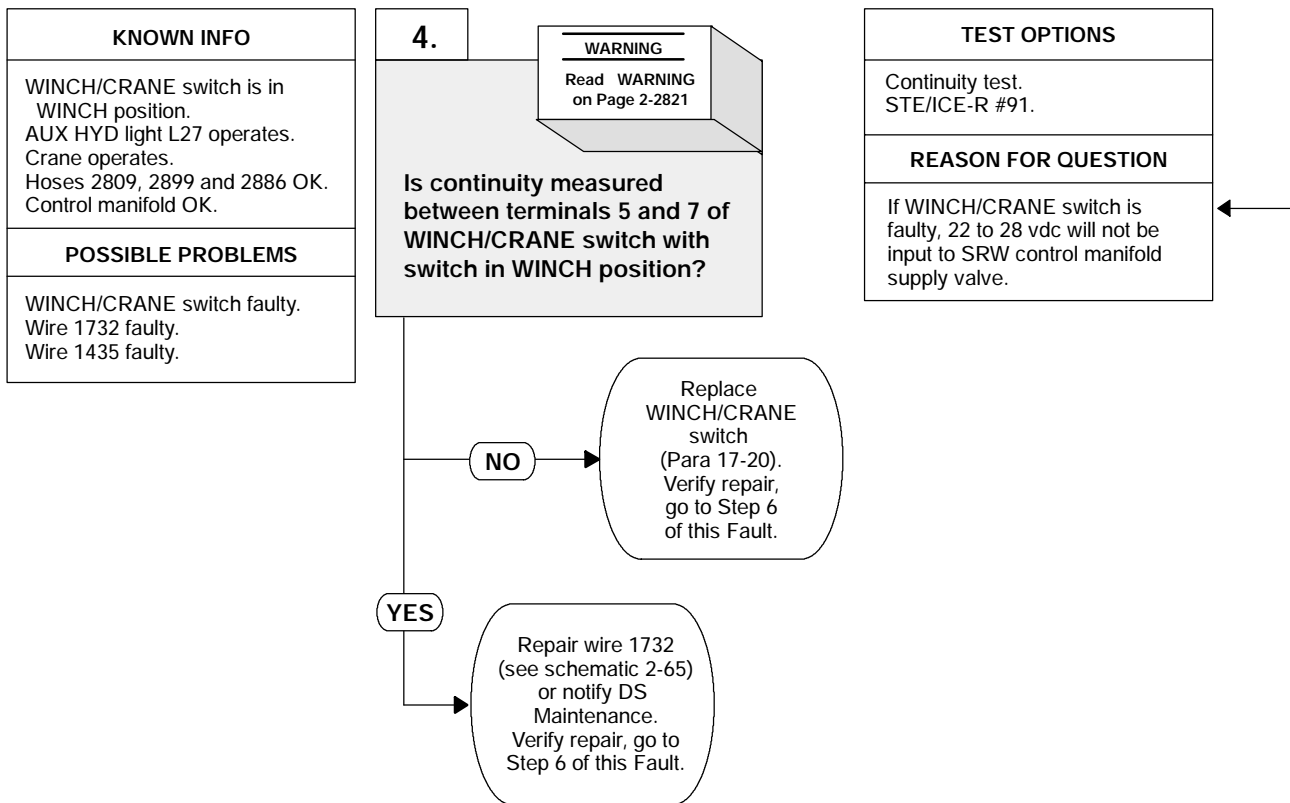
- (1) Start engine (TM 9-2320-364-10).
- (2) Remove cap from SRW control manifold manual override.
- (3) Rotate manual override button and pull up.
- (4) Operate SRW.
 - (a) If SRW does not operate, SRW control manifold is faulty. Perform Steps (5) through (7) below and notify DS Maintenance.
 - (b) If SRW does operate, perform Steps (5) through (7) below and go to Step 3 of this Fault.
- (5) Push down on manual override button and rotate to lock in down position.
- (6) Install cap on manual override and tighten securely.
- (7) Turn OFF ENGINE switch.

VOLTAGE TEST

- (1) Loosen screw and disconnect solenoid connector MC123 from SRW control manifold main supply valve.
- (2) Connect positive (+) multimeter lead to wire 1732 at main supply valve solenoid connector MC123, terminal 1.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
- (5) Set hydraulic selector switch to CRANE/SRW position.
 - (a) If 22 to 28 vdc are not present, perform Steps (6) through (9) below and go to Step 4 of this Fault.
 - (b) If 22 to 28 vdc are present, wire 1732 is OK. Perform Steps (6) and (7) below and go to Step 5 of this Fault.
- (6) Set hydraulic selector switch to OFF position.
- (7) Turn OFF ENGINE switch.
- (8) Install connector on SRW control.
- (9) Tighten connector screw and coat head of connector screw with adhesive.



1. SRW WILL NOT PAY IN OR OUT USING CONTROL LEVER (CONT).

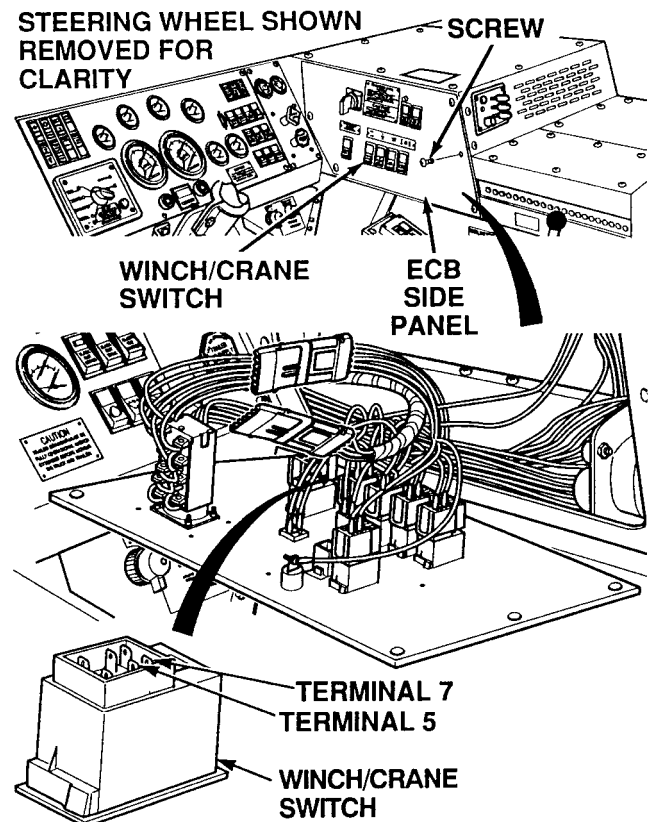


WARNING

Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Remove six screws and tilt ECB side panel.
- (2) Disconnect WINCH/CRANE switch harness connector.
- (3) Set multimeter select switch to ohms.
- (4) Is there continuity between terminals 5 and 7 on the CRANE/WINCH switch?
 - (a) If there is no continuity, replace switch (Para 17-20) and go to Step 6 of this Fault.
 - (b) If there is continuity, CRANE/WINCH switch is OK. Repair wire 1732 (see schematic Fig 2-65) or notify DS Maintenance. Go to Step 6 of this Fault.
- (5) Connect WINCH/CRANE harness connector.
- (6) Install ECB side panel with six screws.



1. SRW WILL NOT PAY IN OR OUT USING CONTROL LEVER (CONT).

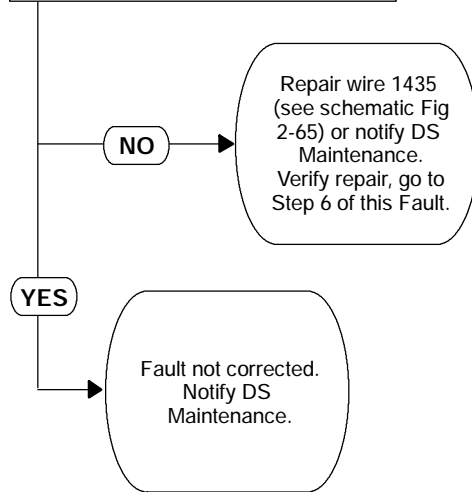
KNOWN INFO
WINCH/CRANE switch is in WINCH position. AUX HYD light L27 operates. Crane operates. Hoses 2809, 2899 and 2886 OK. Control manifold OK. WINCH/CRANE switch OK. Wire 1732 OK.
POSSIBLE PROBLEMS
Wire 1435 faulty.

5.

WARNING
Read **WARNING** on Page 2-2823

Is continuity measured on wire 1435 between main supply valve solenoid connector MC123, terminal 2 and a known good ground?

TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1435 is loose or faulty, SRW control manifold supply valve solenoid will not be grounded.

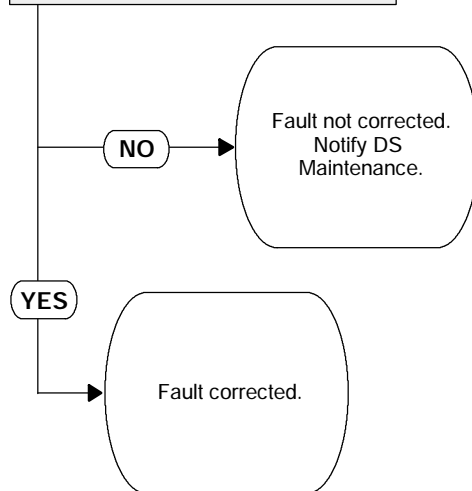


KNOWN INFO
WINCH/CRANE switch is in WINCH position. AUX HYD light L27 operates. Crane operates. Hoses 2809, 2899 and 2886 OK. Control manifold OK. WINCH/CRANE switch OK. Wire 1732 OK. Wire 1435 OK.
POSSIBLE PROBLEMS

6.

Does winch operate correctly when operating the control lever?

TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If winch operates correctly, the fault is corrected.



WARNING

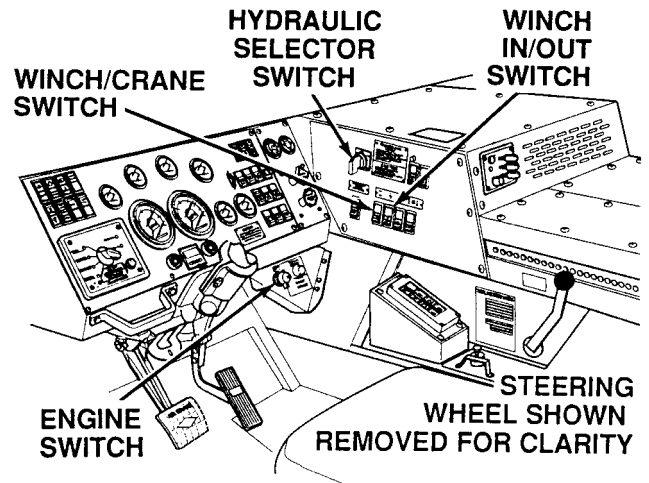
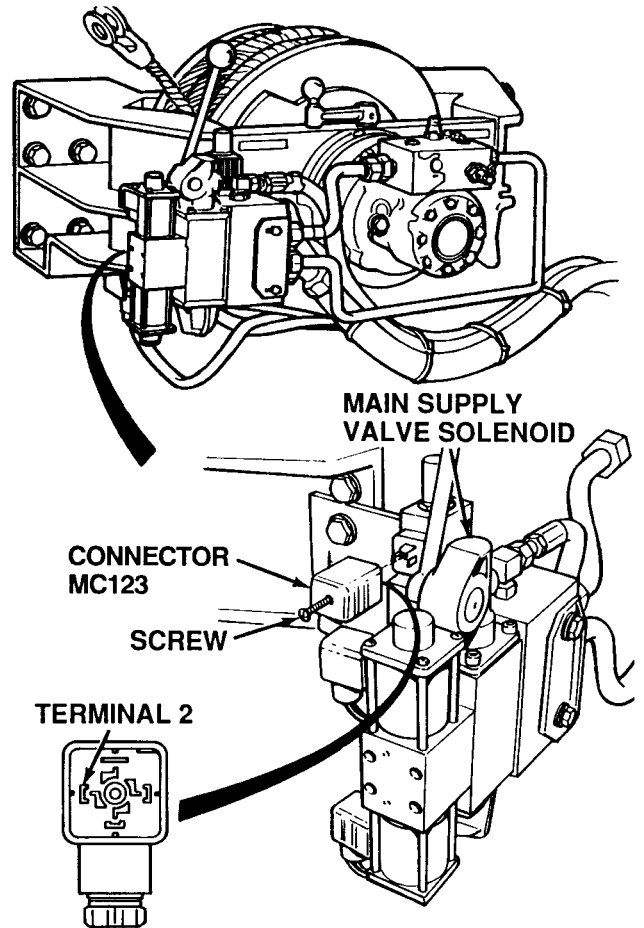
- Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST

- (1) Is there continuity between main supply valve solenoid connector MC123, terminal 2 and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-65) or notify DS Maintenance.
 - (b) If there is continuity, wire 1435 is OK. Perform Steps (2) and (3) below and notify DS Maintenance.
- (2) Connect solenoid connector to supply valve.
- (3) Tighten screw and coat head of connector screw with adhesive.

VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Operate SRW.
 - (a) If SRW does not operate correctly, fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If SRW operates correctly, fault has been corrected.
- (3) Turn OFF engine switch.



2-30. SELF RECOVERY WINCH (SRW) TROUBLESHOOTING (CONT).

2. SELF RECOVERY WINCH (SRW) WILL NOT PAY IN OR OUT USING CAB WINCH IN/OUT SWITCH.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

Personnel Required

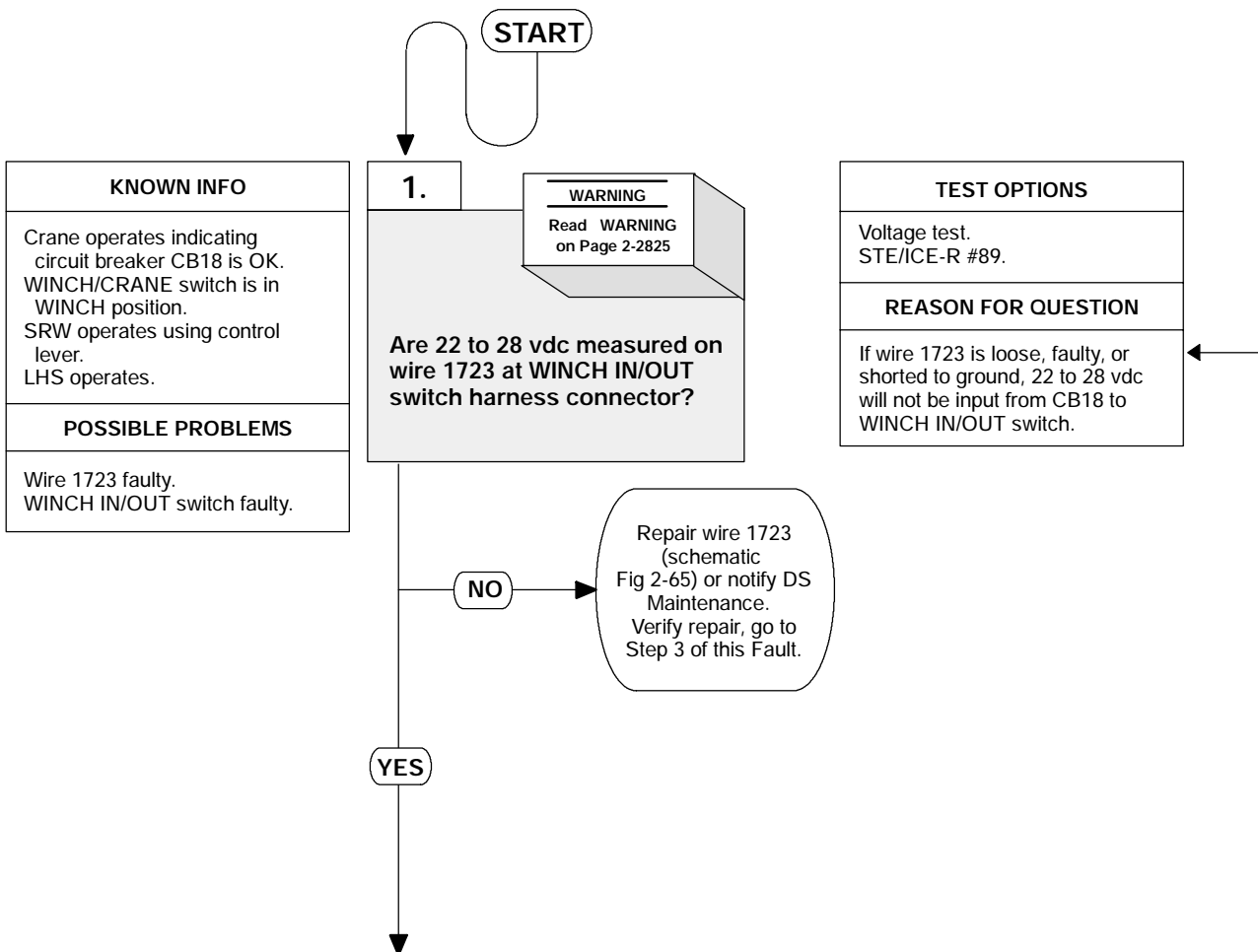
Two

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)

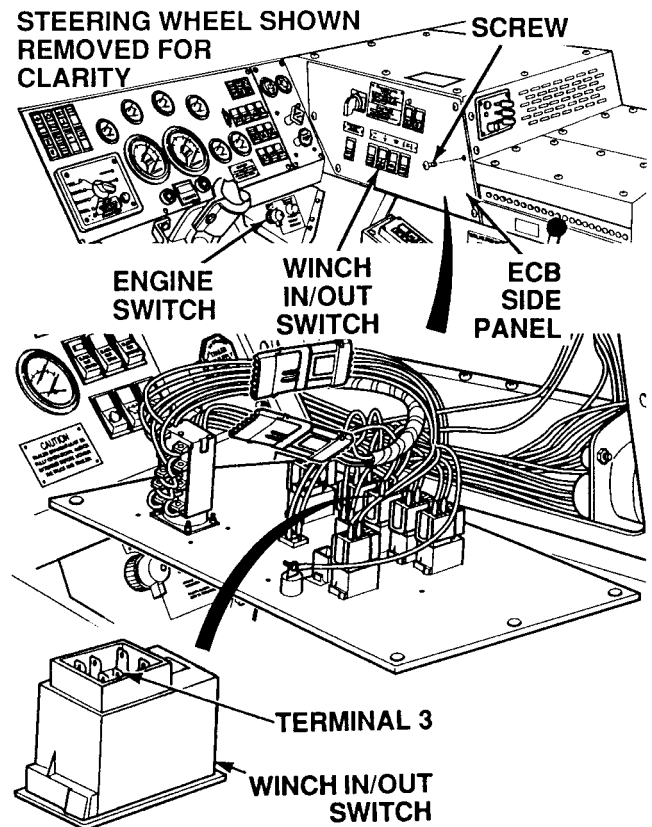


WARNING

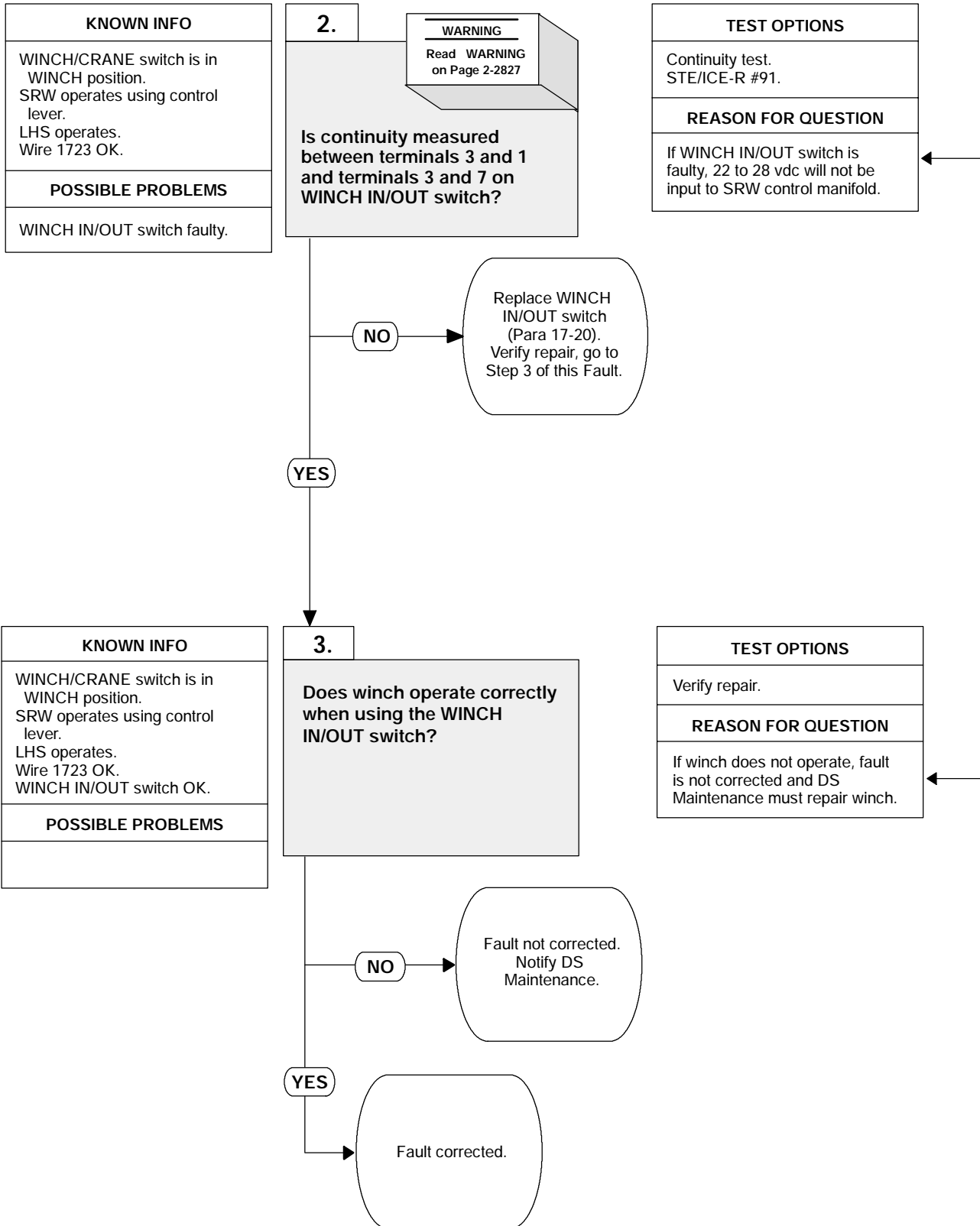
Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Remove six screws and ECB side panel.
- (2) Disconnect harness connector from WINCH IN/OUT switch.
- (3) Connect positive (+) multimeter lead to WINCH IN/OUT switch harness connector, terminal 3.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Step (6) below and repair wire 1723 (see schematic Fig 2-65) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, wire 1723 is OK. Perform Step (6) below and go to Step 2 of this Fault.
- (6) Turn OFF ENGINE switch.



2. SRW WILL NOT PAY IN OR OUT USING CAB WINCH IN/OUT SWITCH (CONT).

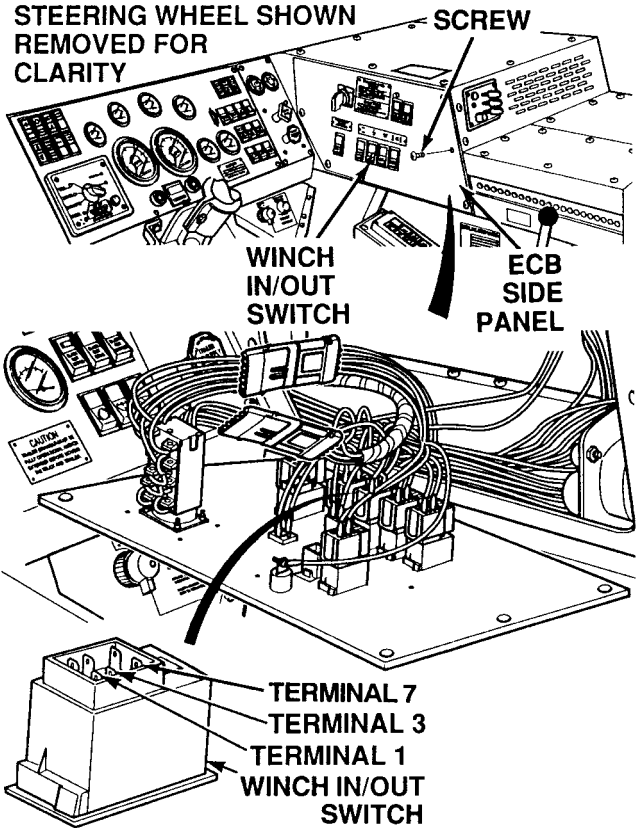


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

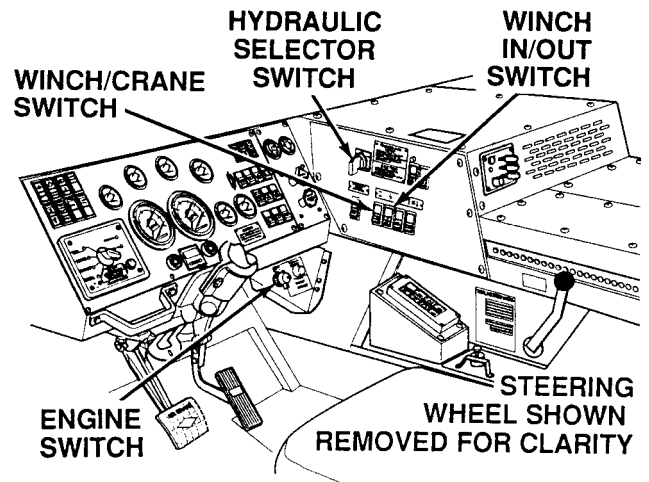
CONTINUITY TEST

- (1) Set WINCH IN/OUT switch to OUT position (TM 9-2320-364-10).
- (2) Set multimeter select switch to ohms.
- (3) Is there continuity between WINCH IN/OUT switch terminals 3 and 1?
 - (a) If there is no continuity, replace switch (Para 17-20).
 - (b) If there is continuity, go to Step (4) below.
- (4) Set WINCH IN/OUT switch to the IN position.
- (5) Is there continuity between WINCH IN/OUT switch terminals 3 and 7?
 - (a) If there is no continuity, replace switch (Para 17-20).
 - (b) If there is continuity, perform Steps (6) and (7) below and go to Step 3 of this Fault.
- (6) Connect harness connector to WINCH IN/OUT switch.
- (7) Install ECB side panel and six screws.



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set WINCH/CRANE switch to WINCH position.
- (3) Set hydraulic selector switch to CRANE/SRW position.
- (4) Attempt to operate SRW using WINCH IN/OUT switch while assistant observes operation.
 - (a) If winch does not operate, fault not corrected. Perform Steps (5) and (6) below and notify DS Maintenance.
 - (b) If winch operates, fault has been corrected.
- (5) Set hydraulic selector switch to OFF position.
- (6) Turn OFF ENGINE switch.



2-30. SELF RECOVERY WINCH (SRW) TROUBLESHOOTING (CONT).

3. SELF RECOVERY WINCH (SRW) WILL NOT PAY IN USING CAB WINCH IN/OUT SWITCH.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

Materials/Parts

Adhesive (Item 9, Appendix C)

Personnel Required

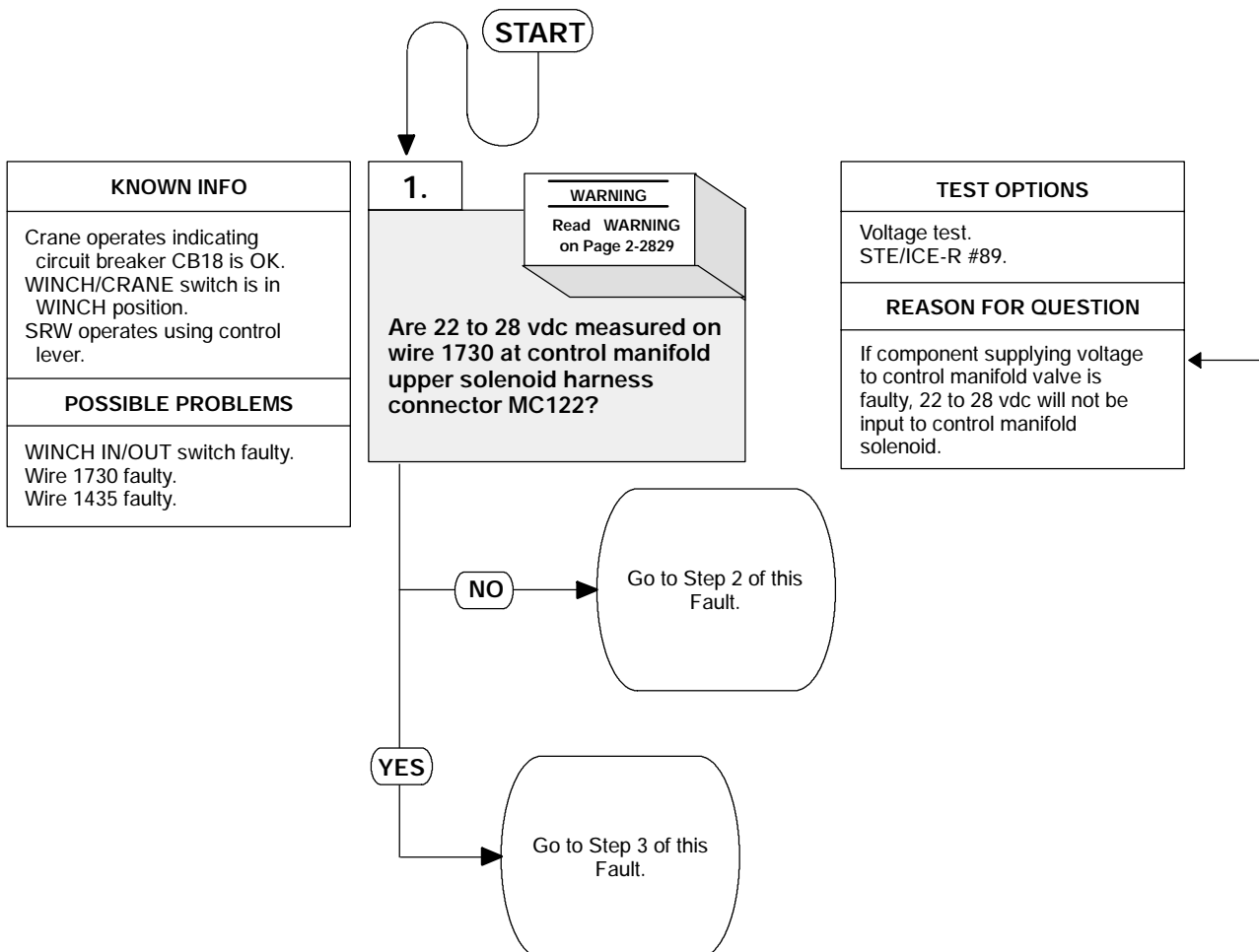
Two

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

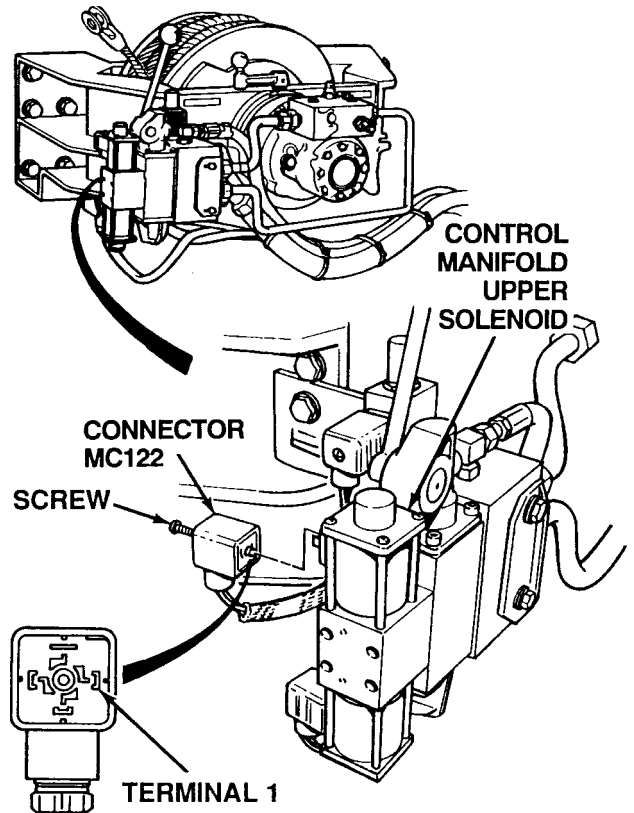
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)

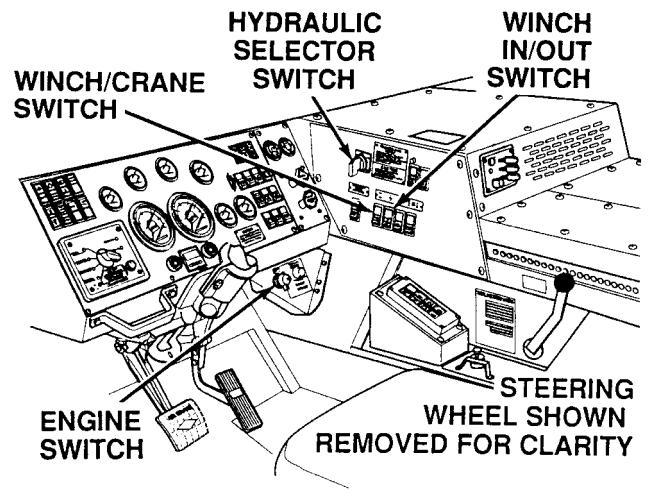


WARNING

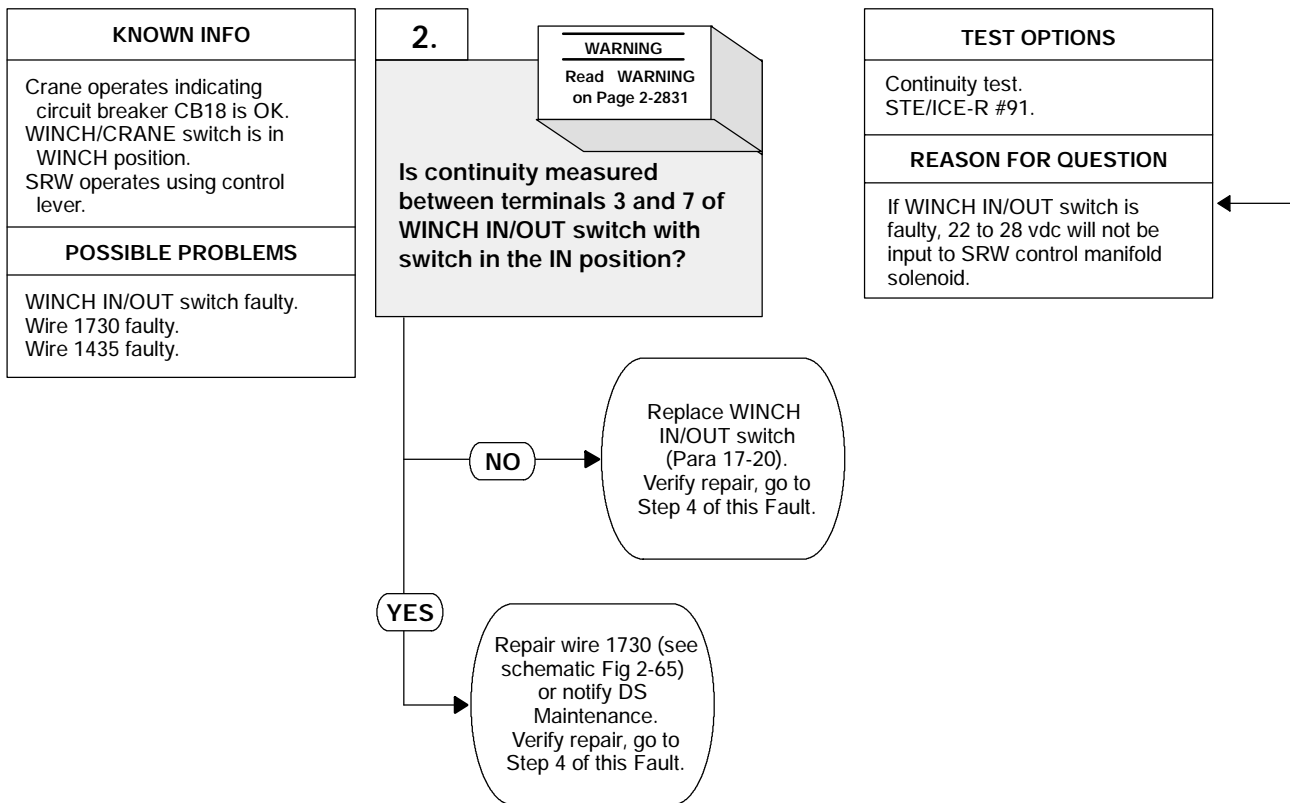
- Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.



VOLTAGE TEST	
(1)	Loosen screw and disconnect connector MC122 from control manifold upper control solenoid.
(2)	Connect positive (+) multimeter lead to wire 1730 at harness connector MC122, terminal 1.
(3)	Connect negative (-) multimeter lead to a known good ground.
(4)	Turn ON ENGINE switch (TM 9-2320-364-10).
(5)	With the aid of an assistant, hold WINCH IN/OUT switch in the IN position. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Steps (6) through (8) below and go to Step 2 of this Fault. (b) If 22 to 28 vdc are present, wire 1730 is OK. Perform Step (6) below and go to Step 3 of this Fault.
(6)	Turn OFF ENGINE switch.
(7)	Connect connector MC122 to control manifold upper solenoid.
(8)	Tighten screw and coat head of connector screw with adhesive.



3. SRW WILL NOT PAY IN USING CAB WINCH IN/OUT SWITCH (CONT).

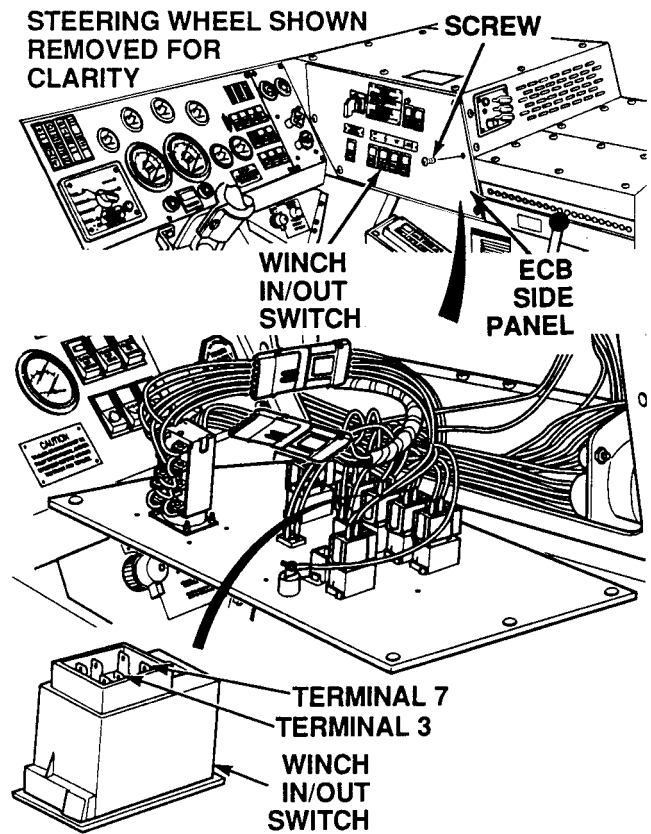


WARNING

Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Remove six screws and tilt ECB side panel.
- (2) Disconnect harness connector from WINCH IN/OUT switch.
- (3) Set multimeter select switch to ohms.
- (4) Hold winch switch in the IN position.
- (5) Check continuity between WINCH IN/OUT switch terminals 3 and 7 with switch in the IN position.
 - (a) If there is no continuity, replace switch (Para 17-20) and go to Step 4 of this Fault.
 - (b) If there is continuity, repair wire 1730 (see schematic Fig 2-65) or notify DS Maintenance. Perform Steps (6) and (7) below.
- (6) Connect harness connector to WINCH IN/OUT switch.
- (7) Install ECB side panel with six screws.



3. SRW WILL NOT PAY IN USING CAB WINCH IN/OUT SWITCH (CONT).

KNOWN INFO
Crane operates indicating circuit breaker CB18 is OK. WINCH/CRANE switch is in WINCH position. SRW operates using control lever. WINCH IN/OUT switch OK. Wire 1730 OK.
POSSIBLE PROBLEMS
Wire 1435 faulty.

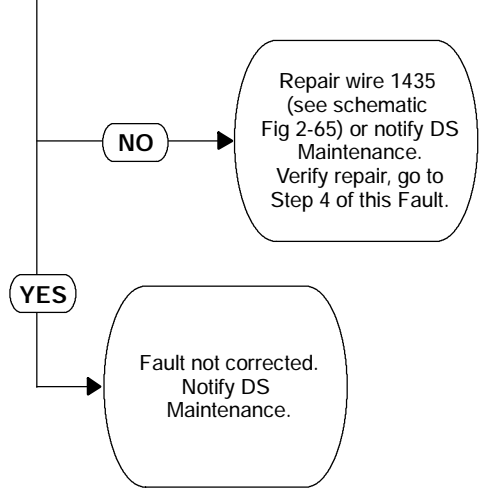
3.

WARNING

Read WARNING on Page 2-2833

Is continuity measured on wire 1435 between control manifold upper control solenoid connector MC122, terminal 2 and a known good ground?

TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1435 is loose or faulty, control manifold valve will not be grounded.

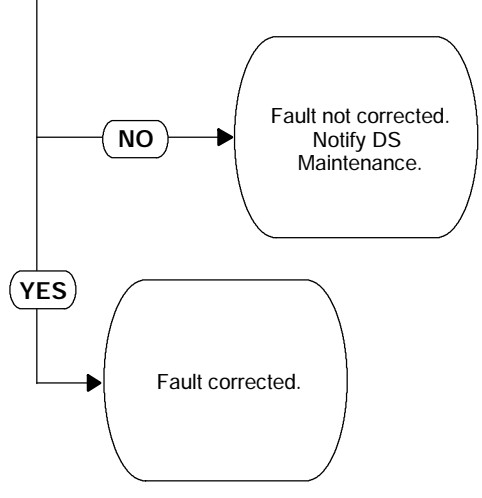


KNOWN INFO
Crane operates indicating circuit breaker CB18 is OK. WINCH/CRANE switch is in WINCH position. SRW operates using control lever. WINCH IN/OUT switch OK. Wire 1730 OK. Wire 1435 OK.
POSSIBLE PROBLEMS

4.

Does winch operate correctly when using WINCH IN/OUT switch?

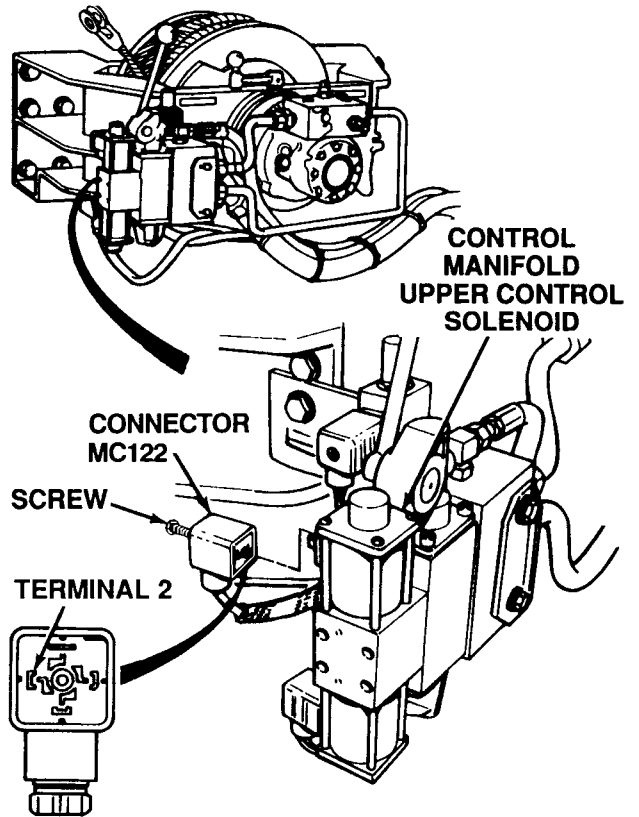
TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If winch operates, Fault has been corrected.



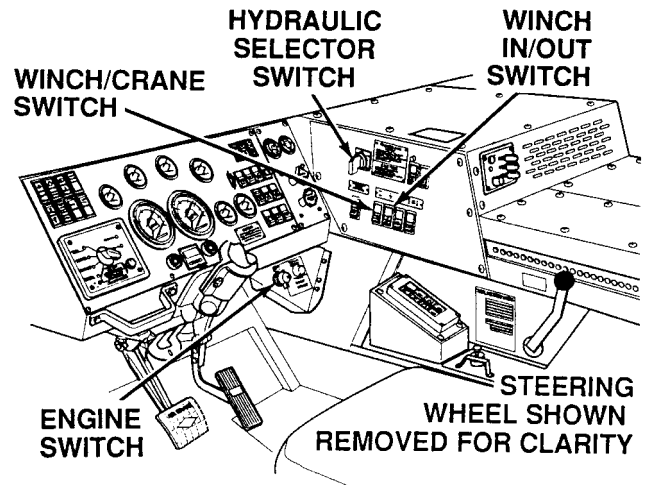
WARNING

- Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

CONTINUITY TEST
<p>(1) Is there continuity between upper control solenoid harness connector MC122, terminal 2 and a known good ground?</p> <p>(a) If there is no continuity, repair wire 1435 (see schematic Fig 2-65) or notify DS Maintenance. Go to Step 4 of this Fault.</p> <p>(b) If there is continuity, wire 1435 is OK. Perform Steps (2) and (3) below and go to Step 4 of this Fault.</p> <p>(2) Connect solenoid connector MC122 to upper solenoid.</p> <p>(3) Tighten connector screw and coat head of connector screw with adhesive.</p>



VERIFY REPAIR
<p>(1) Start engine (TM 9-2320-364-10).</p> <p>(2) Set WINCH/CRANE switch to WINCH position.</p> <p>(3) Set hydraulic selector switch to CRANE/SRW position.</p> <p>(4) Attempt to operate SRW using WINCH IN/OUT switch while assistant observes operation.</p> <p>(a) If winch does not operate, fault not corrected. Perform Steps (5) and (6) below and notify DS Maintenance.</p> <p>(b) If winch operates, fault has been corrected.</p> <p>(5) Set hydraulic selector switch to OFF position.</p> <p>(6) Turn OFF ENGINE switch.</p>



2-30. SELF RECOVERY WINCH (SRW) TROUBLESHOOTING (CONT).

4. SELF RECOVERY WINCH (SRW) WILL NOT PAY OUT USING CAB WINCH IN/OUT SWITCH.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

Materials/Parts

Adhesive (Item 9, Appendix C)

Personnel Required

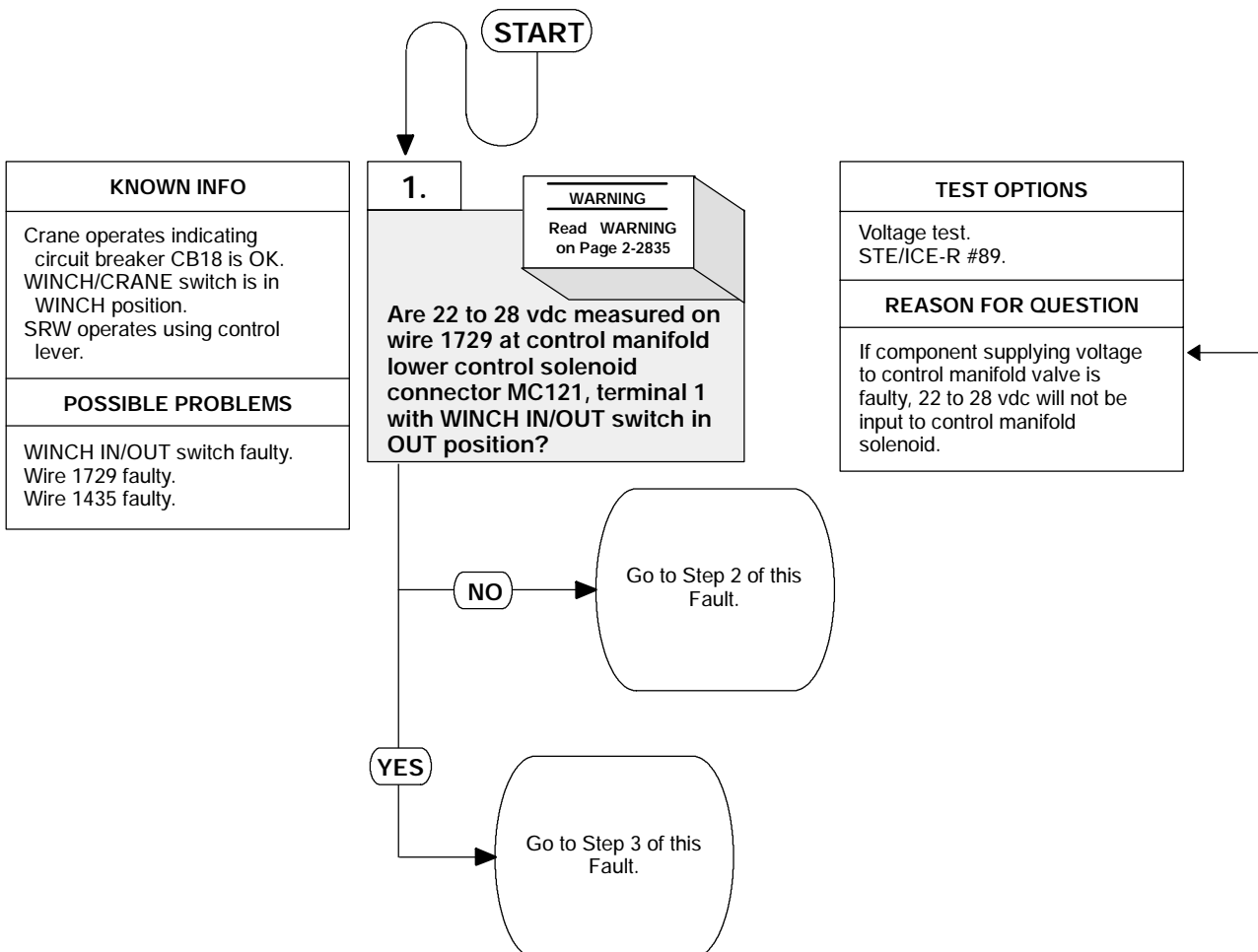
Two

References

TM 9-2320-364-10
 TM 9-4910-571-12&P

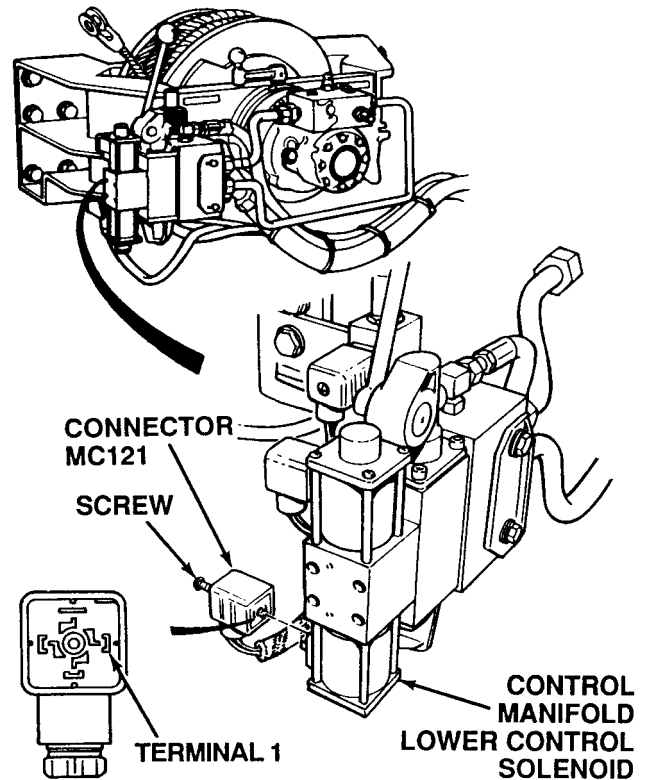
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)

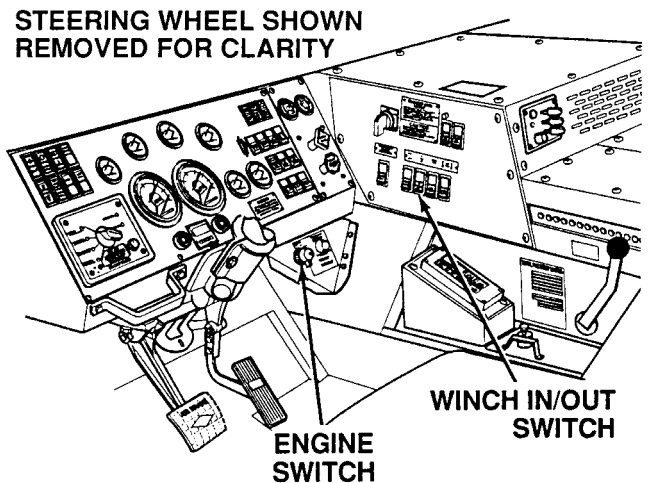


WARNING

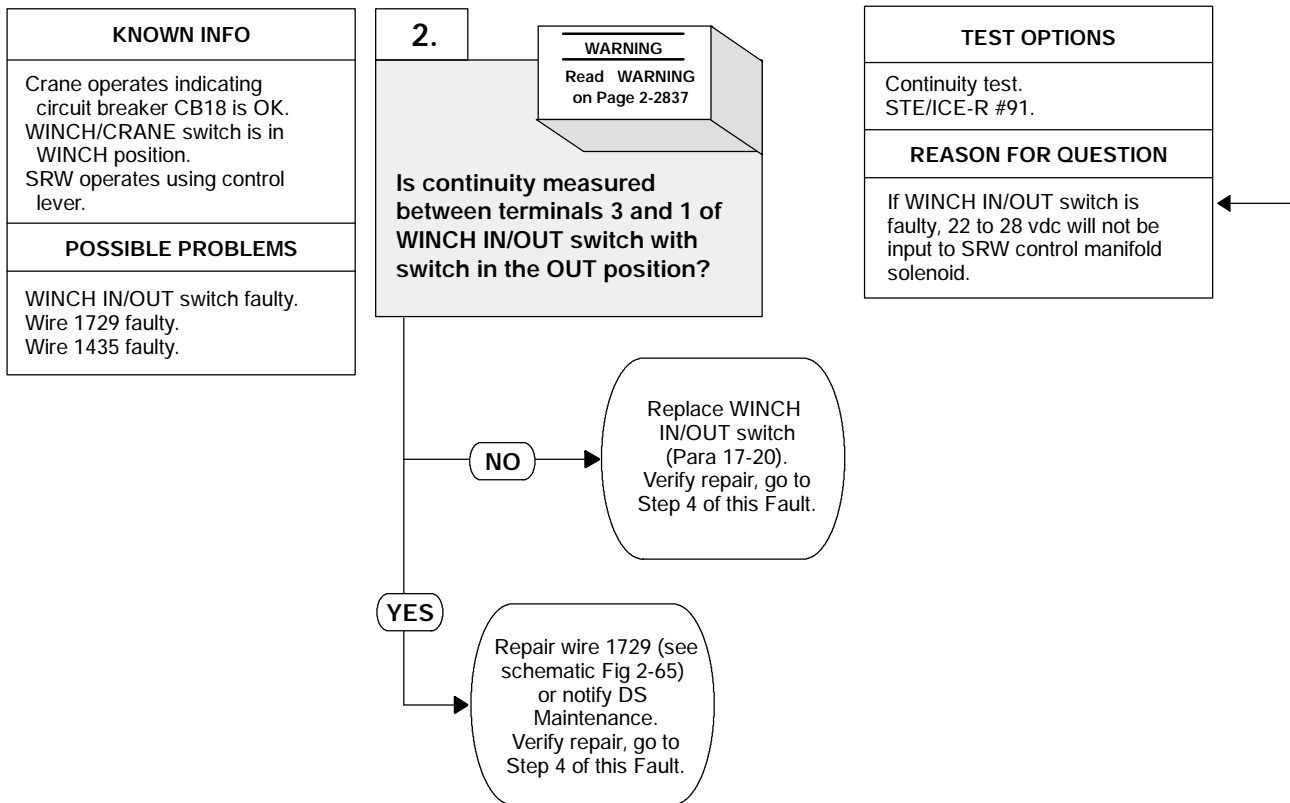
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.



VOLTAGE TEST	
(1)	Loosen screw and disconnect connector MC121 from control manifold lower control solenoid.
(2)	Connect positive (+) multimeter lead to wire 1729 at harness connector MC121, terminal 1.
(3)	Connect negative (-) multimeter lead to a known good ground.
(4)	Turn ON ENGINE switch (TM 9-2320-364-10).
(5)	With the aid of an assistant, hold WINCH IN/OUT switch in the OUT position. <ul style="list-style-type: none"> (a) If 22 to 28 vdc are not present, perform Steps (6) through (8) below and go to Step 2 of this Fault. (b) If 22 to 28 vdc are present, wire 1729 is OK. Perform Step (6) below and go to Step 3 of this Fault.
(6)	Turn OFF ENGINE switch.
(7)	Connect connector to control manifold lower control solenoid.
(8)	Tighten connector screw and coat head of connector screw with adhesive.



4. SRW WILL NOT PAY OUT USING CAB WINCH IN/OUT SWITCH (CONT).

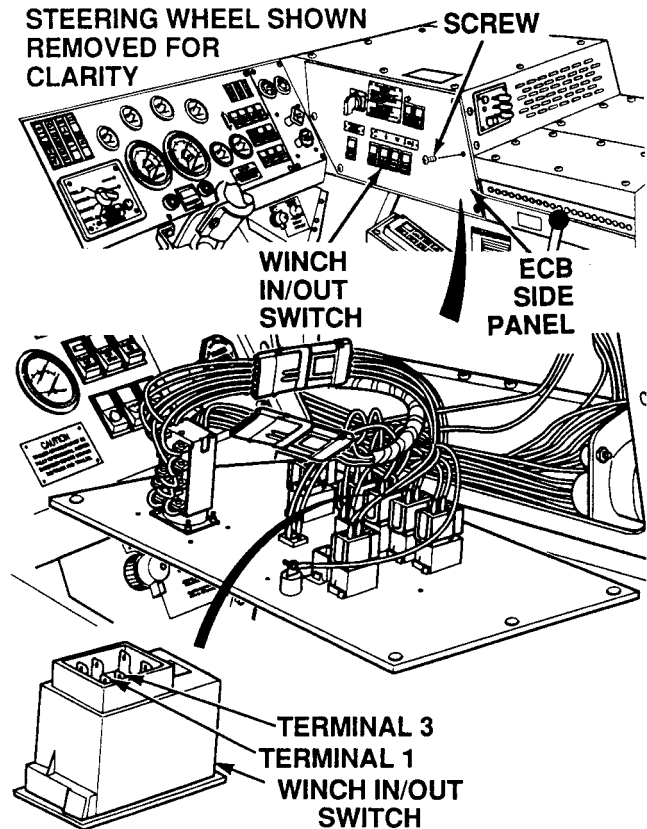


WARNING

Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Remove six screws and tilt ECB side panel. Do not disconnect wires.
- (2) Disconnect harness connector from WINCH IN/OUT switch.
- (3) Set multimeter select switch to ohms.
- (4) Is there continuity between WINCH IN/OUT terminals 1 and 3 with switch in the OUT position.
 - (a) If there is no continuity, replace switch (Para 17-20) and go to Step 4 of this Fault.
 - (b) If there is continuity, repair wire 1729 (see schematic Fig 2-65) and perform Steps (5) and (6) below or notify DS Maintenance.
- (5) Connect harness connector to WINCH IN/OUT switch.
- (6) Install ECB side panel with six screws.



4. SRW WILL NOT PAY IN USING CAB WINCH IN/OUT SWITCH (CONT).

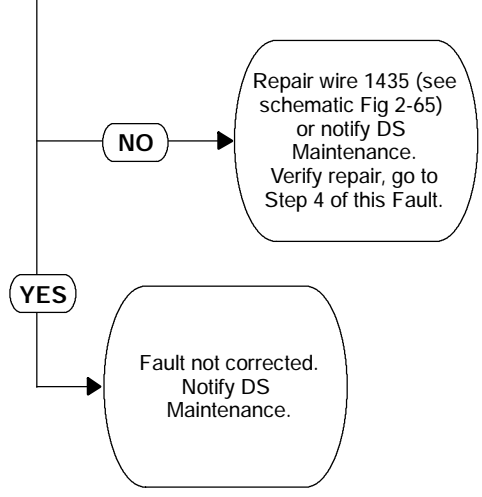
KNOWN INFO
Crane operates indicating circuit breaker CB18 is OK. WINCH/CRANE switch is in WINCH position. Winch operates using control lever. WINCH IN/OUT switch OK. Wire 1729 OK.
POSSIBLE PROBLEMS
Wire 1435 faulty.

3.

WARNING
Read WARNING on Page 2-2839

Is continuity measured on wire 1435 between control manifold lower control solenoid connector MC121 and a known good ground?

TEST OPTIONS
Continuity test. STE/ICE-R #91.
REASON FOR QUESTION
If wire 1435 is loose or faulty, control manifold valve will not be grounded.

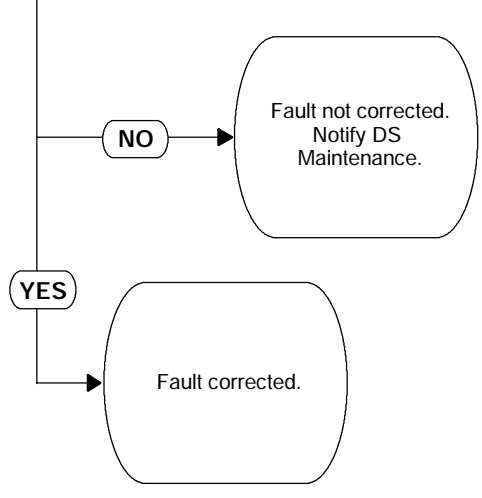


KNOWN INFO
Crane operates indicating circuit breaker CB18 is OK. WINCH/CRANE switch is in WINCH position. SRW operates using control lever. WINCH IN/OUT switch OK. Wire 1729 OK. Wire 1435 OK.
POSSIBLE PROBLEMS

4.

Does winch pay in when using WINCH IN/OUT switch?

TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If winch operates, Fault has been corrected.

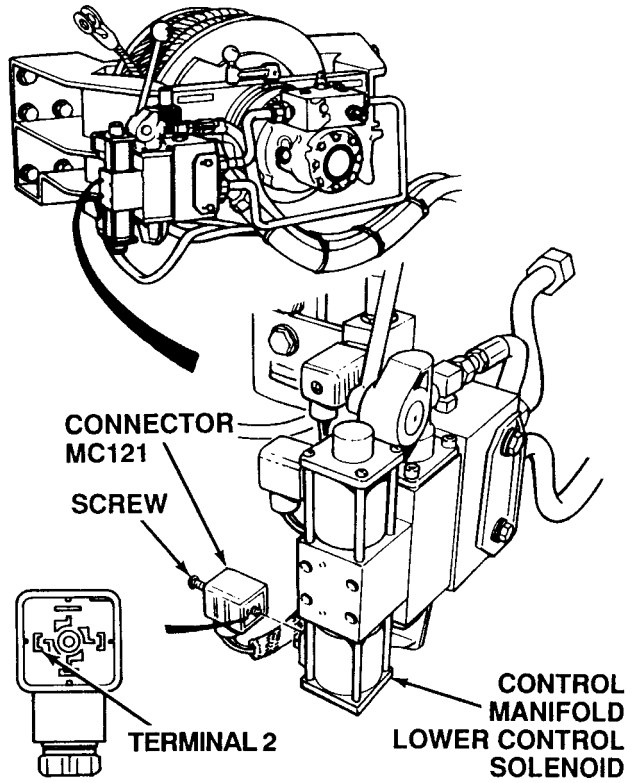


WARNING

- Remove all jewelry such as rings, dog tags, bracelets etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.
- Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

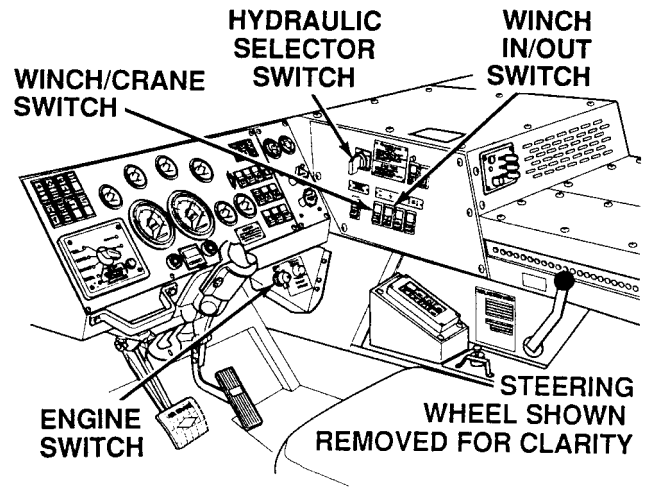
CONTINUITY TEST

- (1) Is there continuity between control manifold lower control solenoid harness connector MC121, terminal 2 and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-65) or notify DS Maintenance. Perform Steps (2) and (3) below.
 - (b) If there is continuity, wire 1435 is OK. Perform Step (2) and (3) below and Notify DS Maintenance.
- (2) Connect solenoid connector to solenoid.
- (3) Tighten connector screw and coat head of connector screw with adhesive.



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Set WINCH/CRANE switch to WINCH position.
- (3) Set hydraulic selector switch to CRANE/SRW position.
- (4) Attempt to operate SRW using WINCH IN/OUT switch while assistant observes operation.
 - (a) If winch does not operate, fault not corrected. Perform Steps (5) and (6) below and notify DS Maintenance.
 - (b) If winch operates, fault has been corrected.
- (5) Set hydraulic selector switch to OFF position.
- (6) Turn OFF ENGINE switch.



2-30. SELF RECOVERY WINCH (SRW) TROUBLESHOOTING (CONT).

5. CABLE CANNOT BE FREE-SPOOLED OUT FROM FRONT OR REAR OF TRUCK.

INITIAL SETUP

Tools and Special Tools

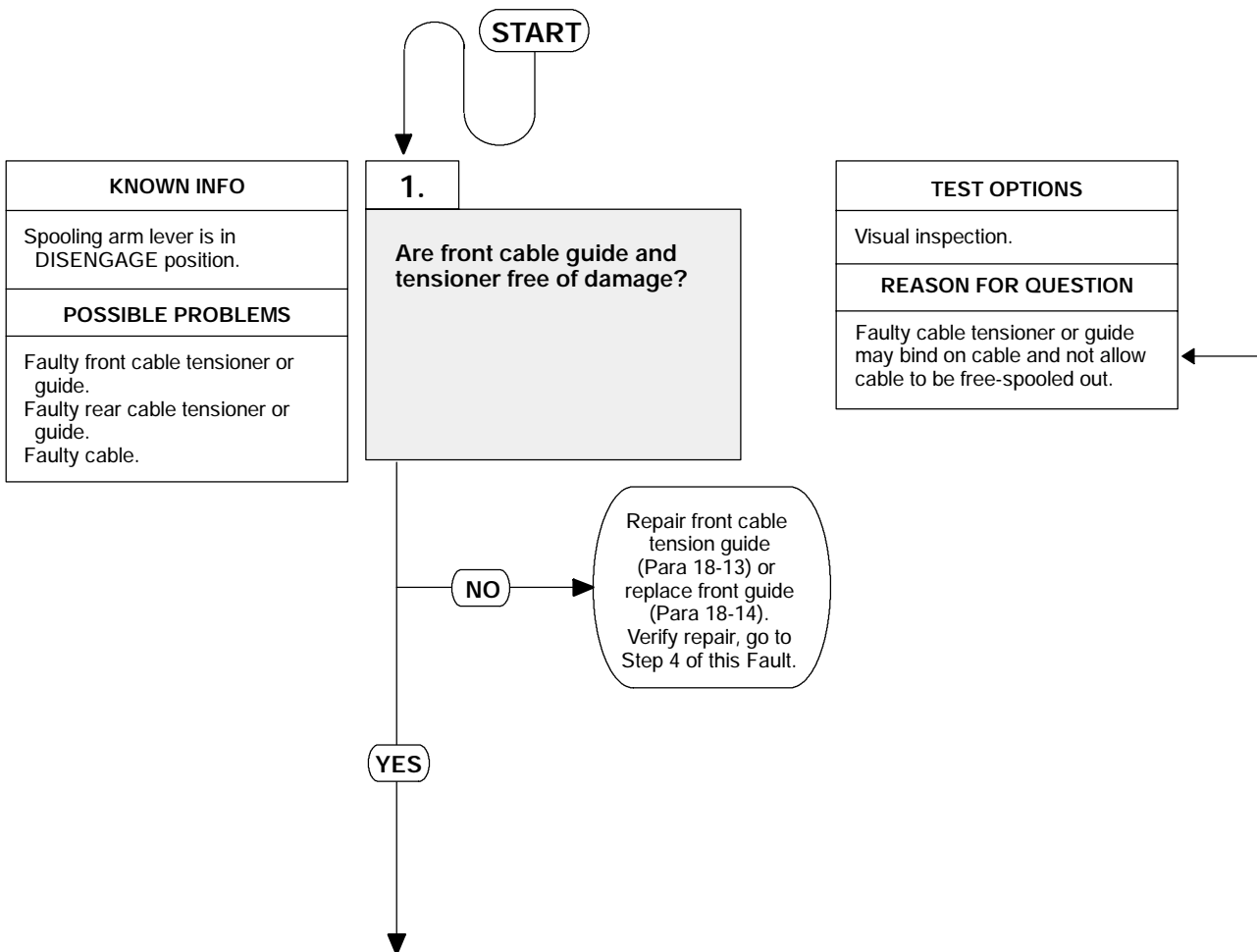
Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 Gloves, Heavy Duty (Item 29, Appendix G)

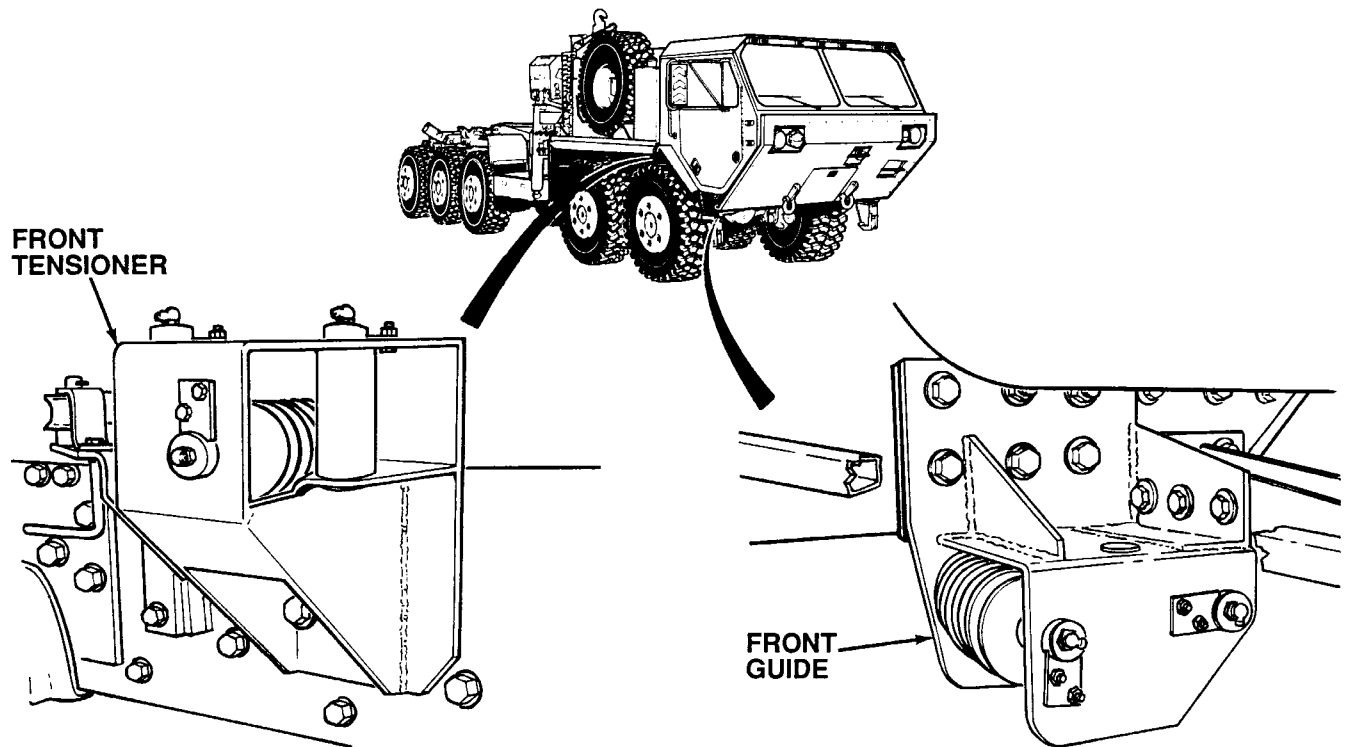
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)

References

TM 9-2320-364-10



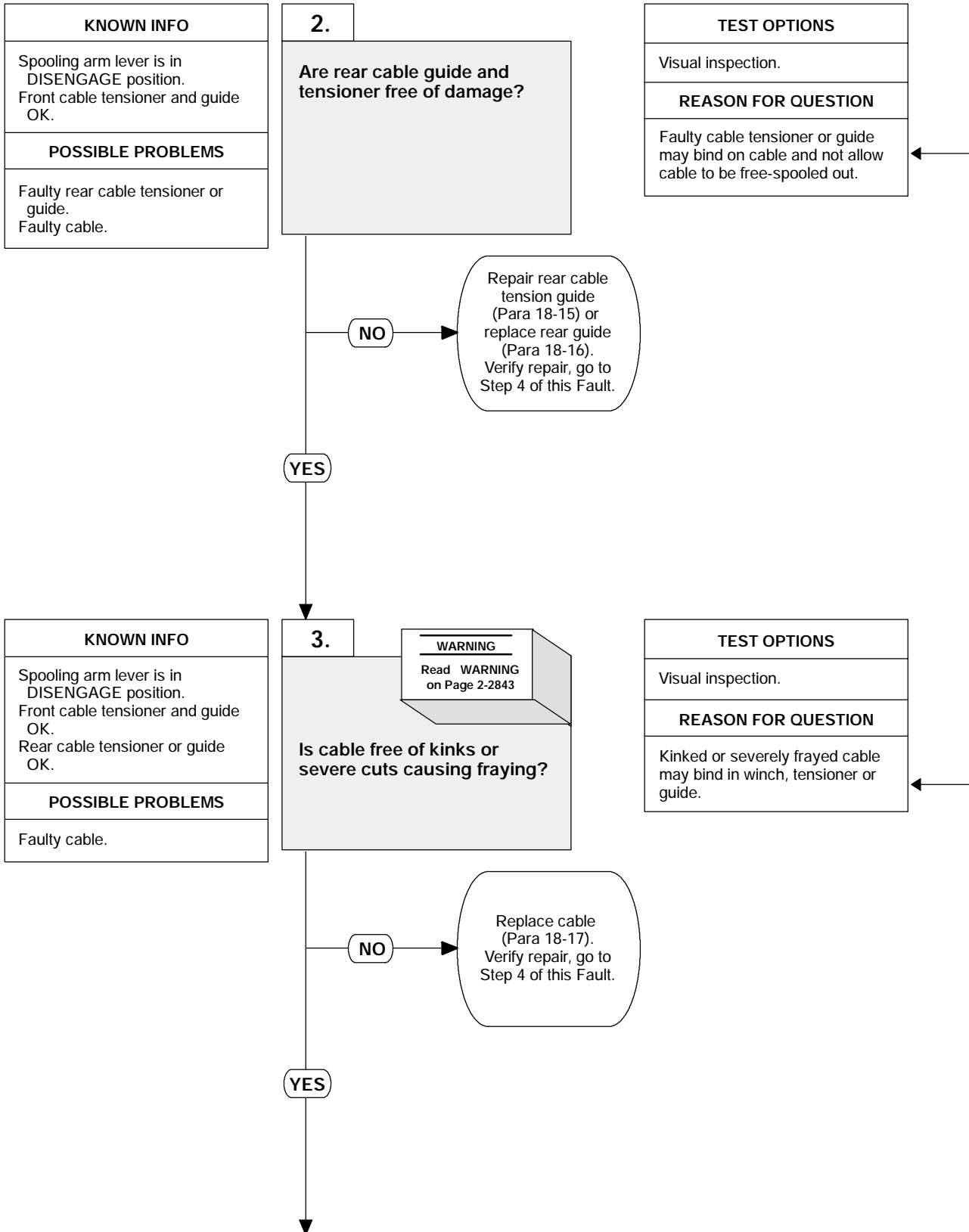


VISUAL INSPECTION

Inspect front cable tensioner and guide for damage.

- (1) If tension guide or guide is damaged or will not roll freely, repair tension guide (Para 18-13) or replace guide (Para 18-14).
- (2) If tension guide and guide are not damaged and roll freely, go to Step 2 of this Fault.

5. CABLE CANNOT BE FREE-SPOOLED OUT FROM FRONT OR REAR OF TRUCK (CONT).



WARNING

- Wire cable assembly can become frayed or contain broken wires. Wear heavy leather-palmed work gloves when handling wire cable assembly. Frayed or broken cable can and cause injury to personnel.
- Never let moving wire cable assembly slide through hands, even when wearing gloves. A broken wire could cut through glove and cause injury to personnel.

VISUAL INSPECTION

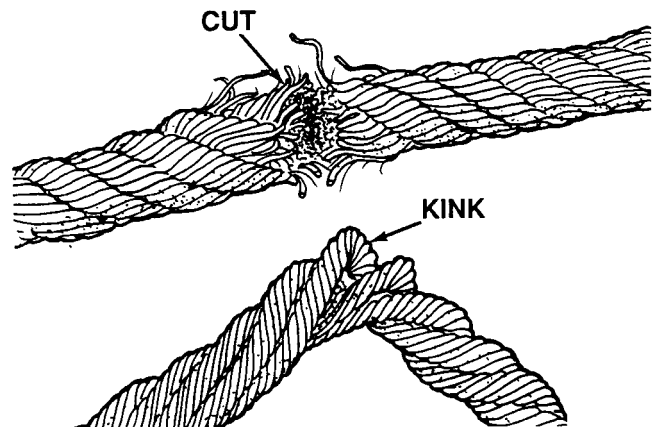
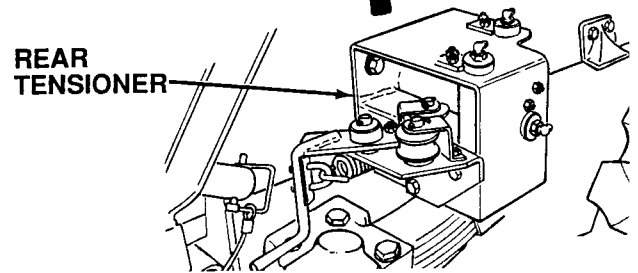
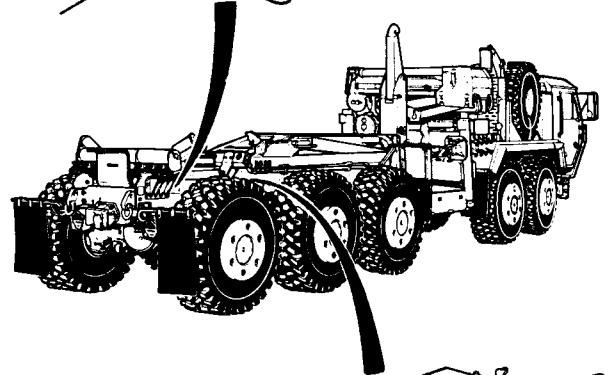
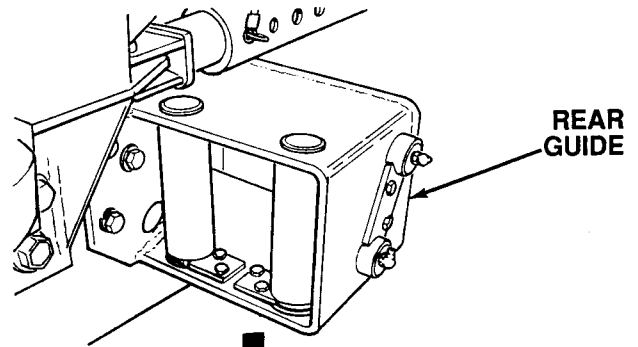
Inspect rear cable tensioner and guide for damage.

- (1) If tension guide or guide is damaged or will not roll freely, repair tension guide (Para 18-15) or replace guide (Para 18-16).
- (2) If tension guide and guide are not damaged and roll freely, go to Step 3 of this Fault.

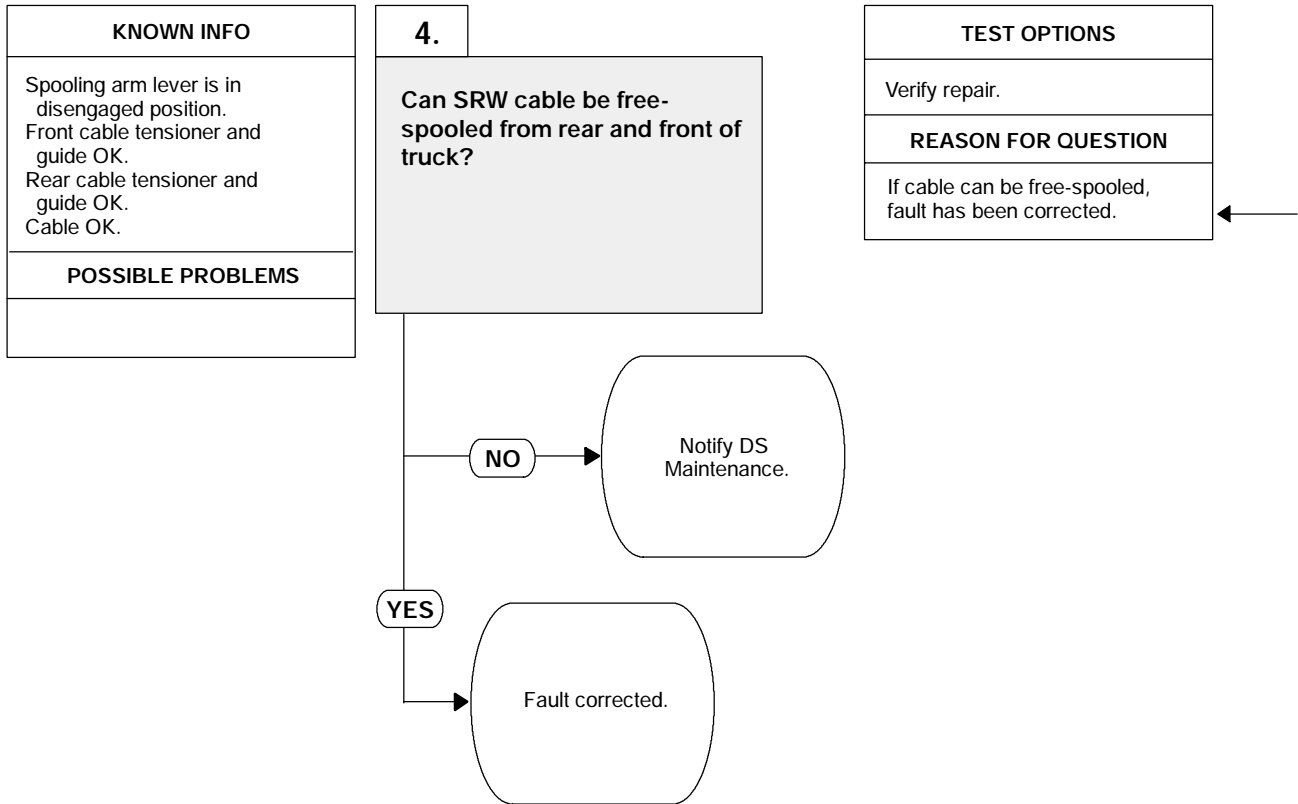
VISUAL INSPECTION

Inspect cable for severe kinks or fraying causing it to bind with winch, cable guide, tensioner or truck where cable is routed.

- (1) If cable is severely kinked to the point that it will not roll up properly on winch cable drum, replace cable (Para 18-17).
- (2) If cable has more than three broken wires per inch on same strand or more than six broken wires on all strands in a one-inch running length of cable, replace cable (Para 18-17). The maximum number of broken wires must not occur in any two consecutive inches of cable; that is, if six wires are broken in one inch of cable, none would be allowed in the next consecutive inch.
- (3) If cable is not severely kinked or frayed, cable is OK.

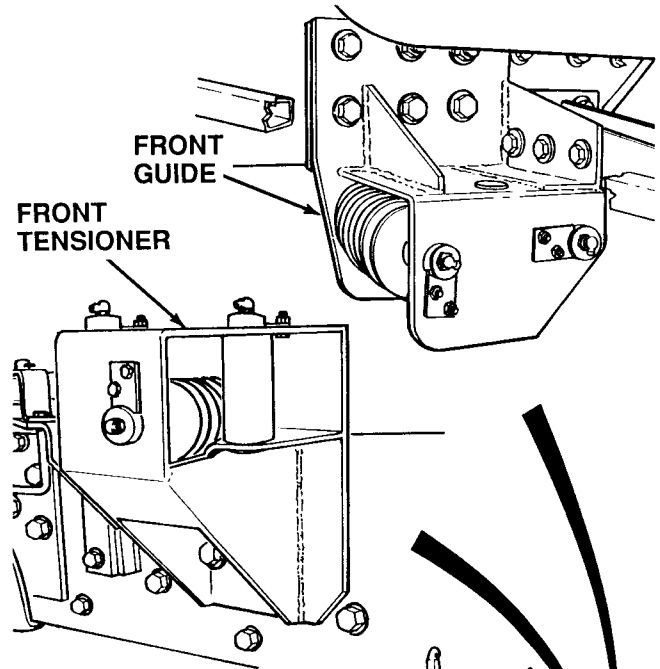


5. CABLE CANNOT BE FREE-SPOOLED OUT FROM FRONT OR REAR OF TRUCK (CONT).

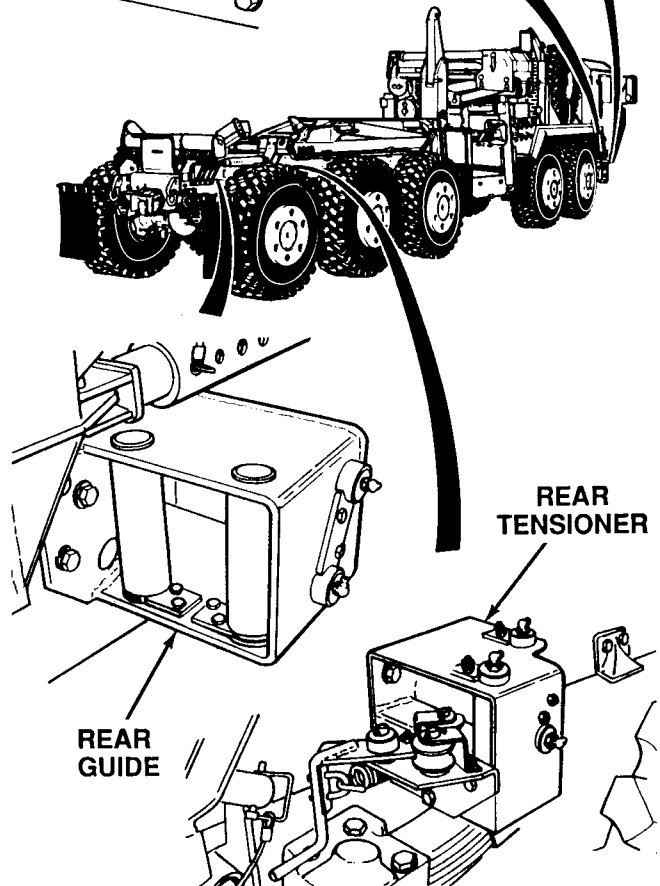
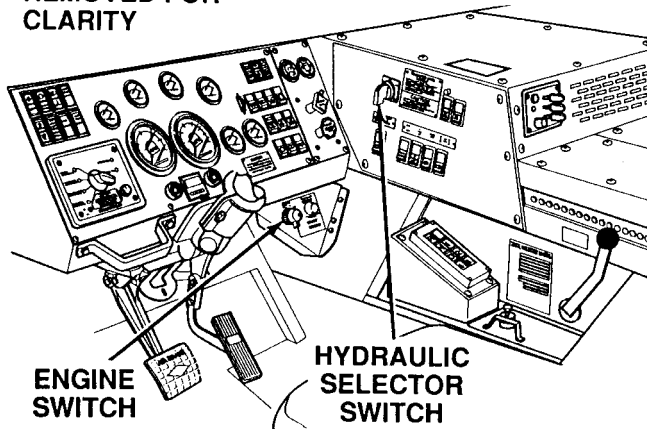


VERIFY REPAIR

- (1) Route SRW cable through front guide and tensioner (TM 9-2320-364-10).
- (2) Attempt to free-spool SRW cable.
 - (a) If SRW does not free-spool, fault not corrected. Perform Steps (5) through (7) below and notify DS Maintenance.
 - (b) If SRW free-spools, pay in SRW cable and go to Step (3) below.
- (3) Route SRW cable through rear guide and tensioner (TM 9-2320-364-10).
- (4) Attempt to free-spool SRW cable.
 - (a) If SRW does not free-spool, fault not corrected. Perform Steps (5) through (7) below and notify DS Maintenance.
 - (b) If SRW free-spools, fault has been corrected.
- (5) Pay in SRW cable.
- (6) Set hydraulic selector switch to OFF position.
- (7) Turn OFF ENGINE switch.



**STEERING WHEEL SHOWN
REMOVED FOR
CLARITY**



2-31. HYDRAULIC SYSTEM TROUBLESHOOTING.

This paragraph covers Hydraulic System Troubleshooting. The Hydraulic System Fault Index, Table 2-56, lists faults for the hydraulic system of the PLS truck. Refer to schematics Figures 2-67 through 2-70 when performing tests and corrective actions.

Table 2-56. Hydraulic System Fault Index

Fault No.	Description	Page
1.	Auxiliary Hydraulics (Aux Hyd) Light Does Not Operate	2-2852
2.	Crane And Winch (SRW) Do Not Operate	2-2874
3.	LHS, Winch And Crane Do Not Operate	2-2884
4.	Fan, LHS, Winch And Crane Do Not Operate	2-2894
5.	Fan Does Not Operate	2-2904
6.	Fan Speed Does Not Lower From High Speed To Low Speed	2-2908

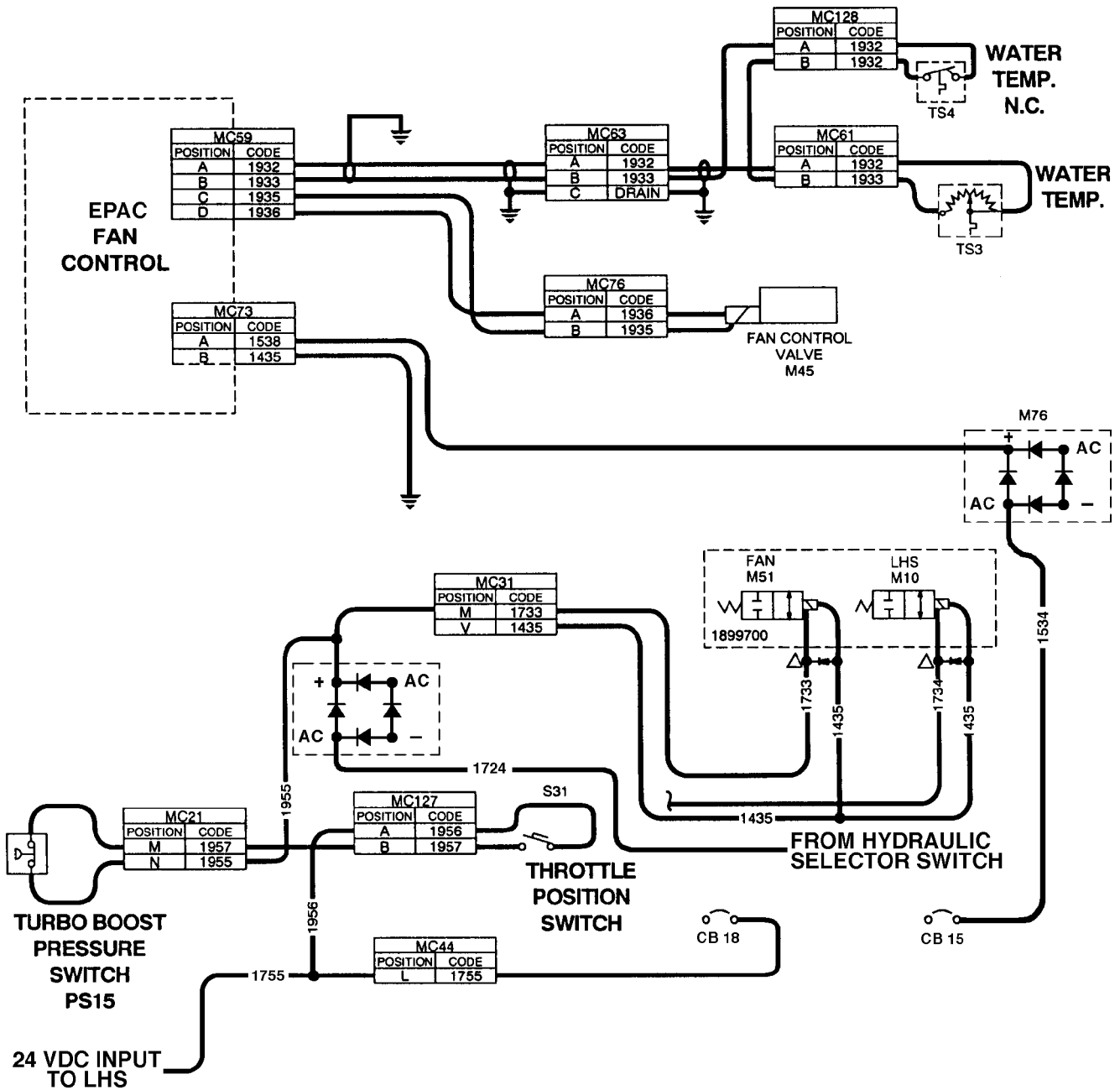


Figure 2-67. Hydraulic Fan System Wiring Schematic

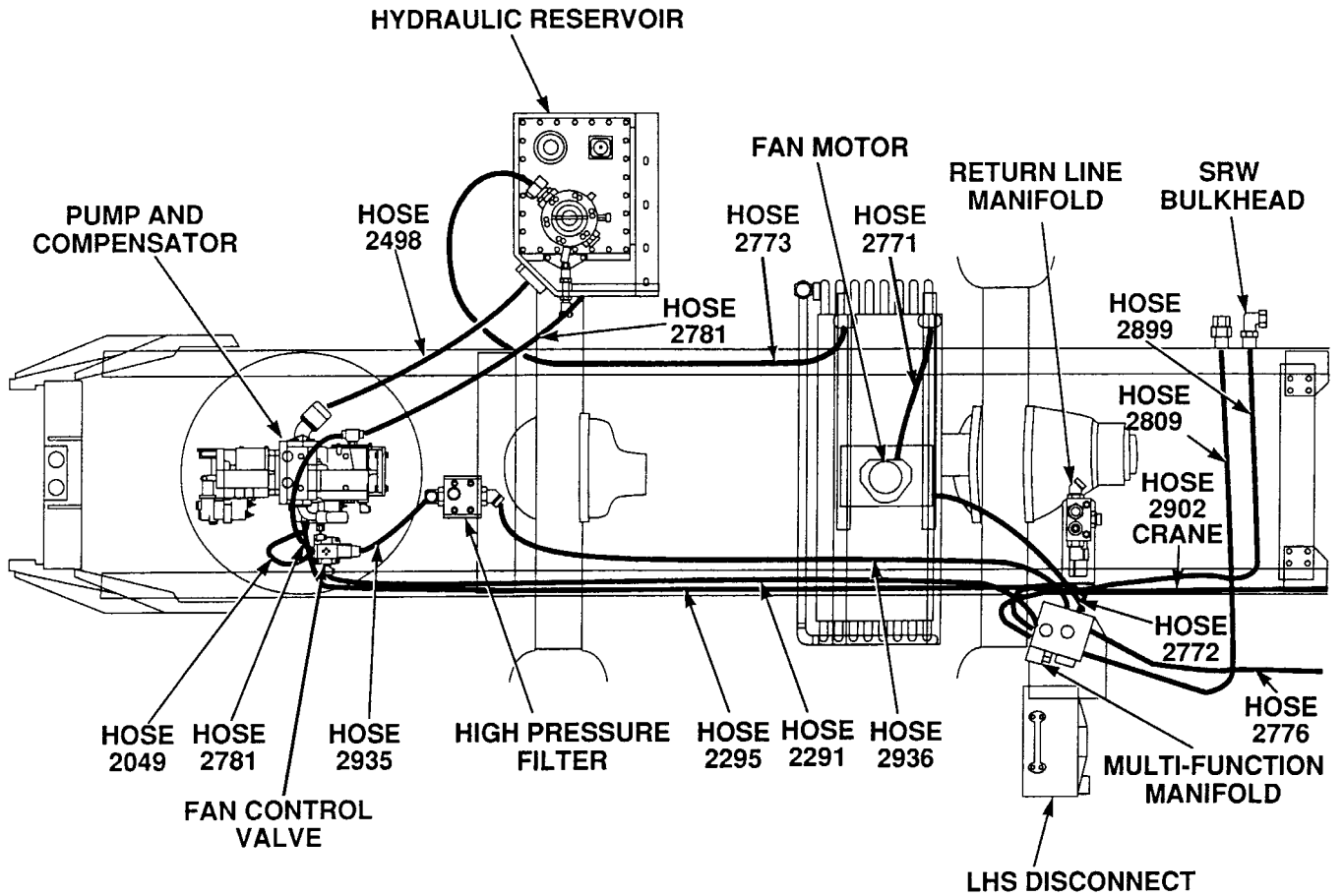


Figure 2-68. Main Hydraulic System Routing Diagram

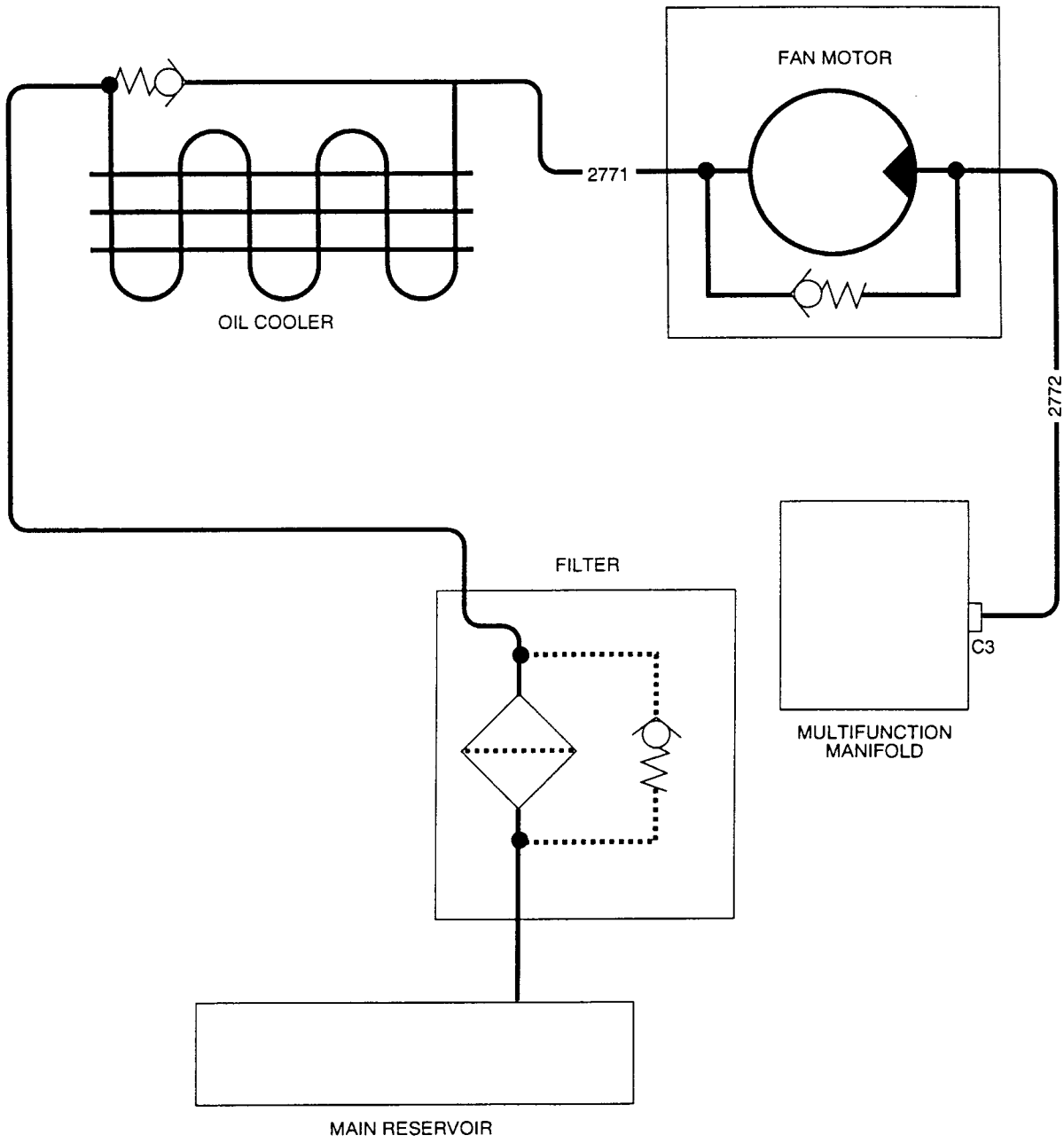


Figure 2-69. Fan Hydraulic Diagram

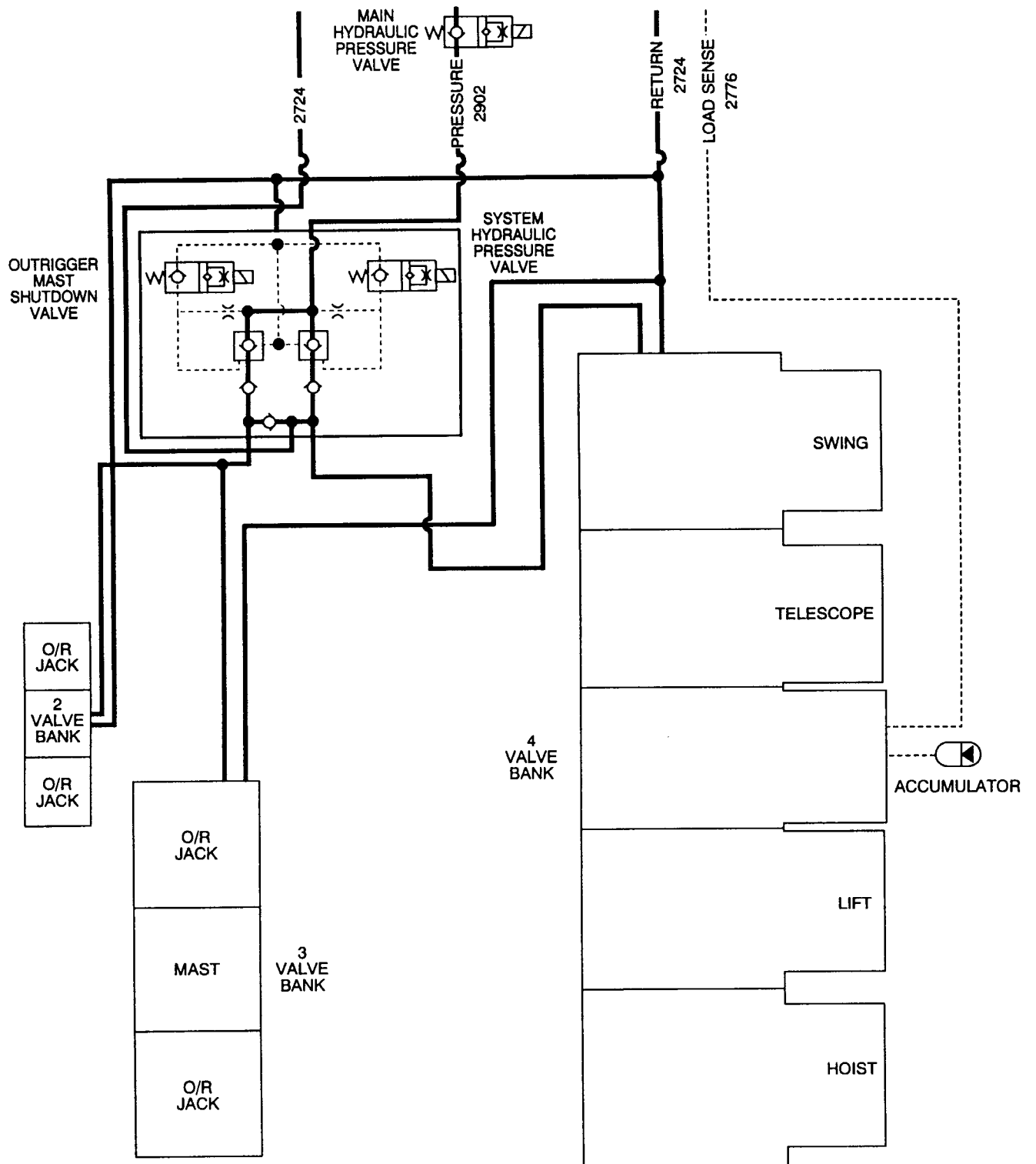


Figure 2-70. Crane Hydraulic Diagram

2-31. HYDRAULIC SYSTEM TROUBLESHOOTING (CONT).

1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

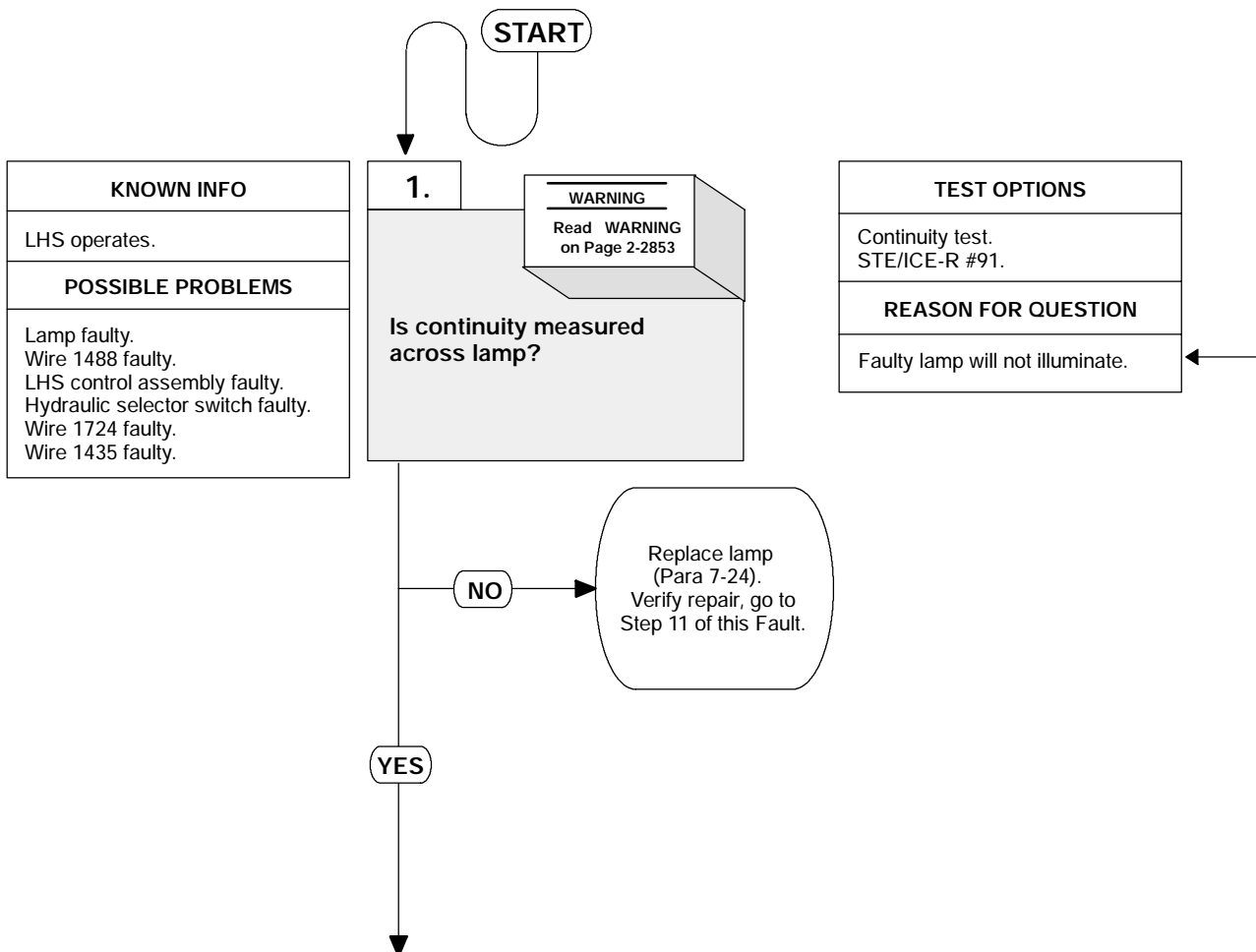
Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)

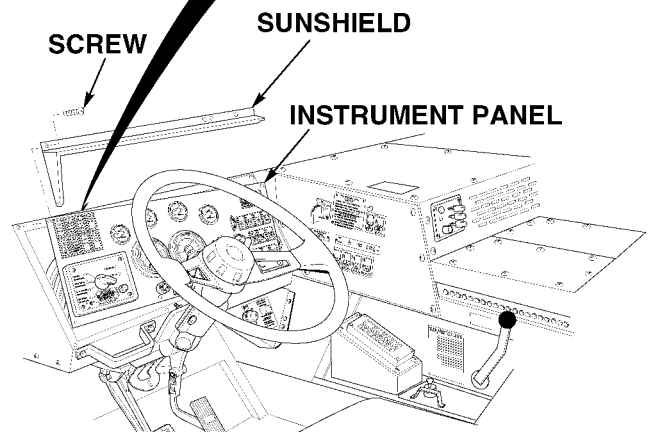
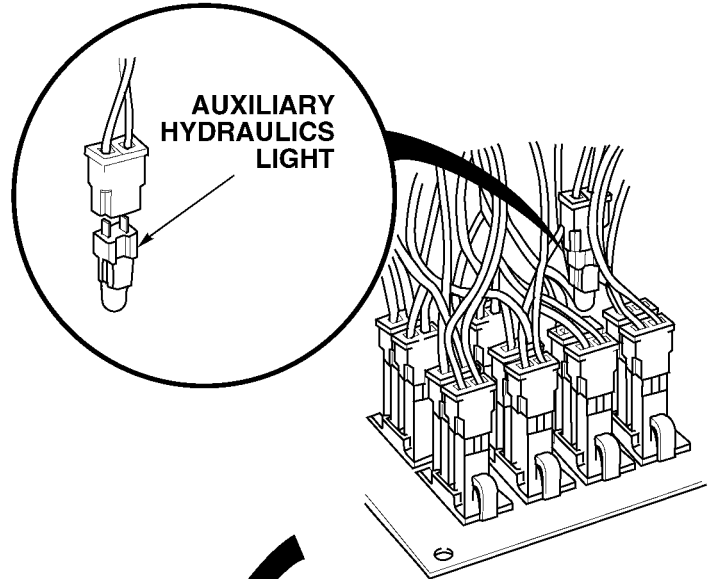
References

TM 9-2320-364-10
 TM 9-4910-571-12&P



WARNING

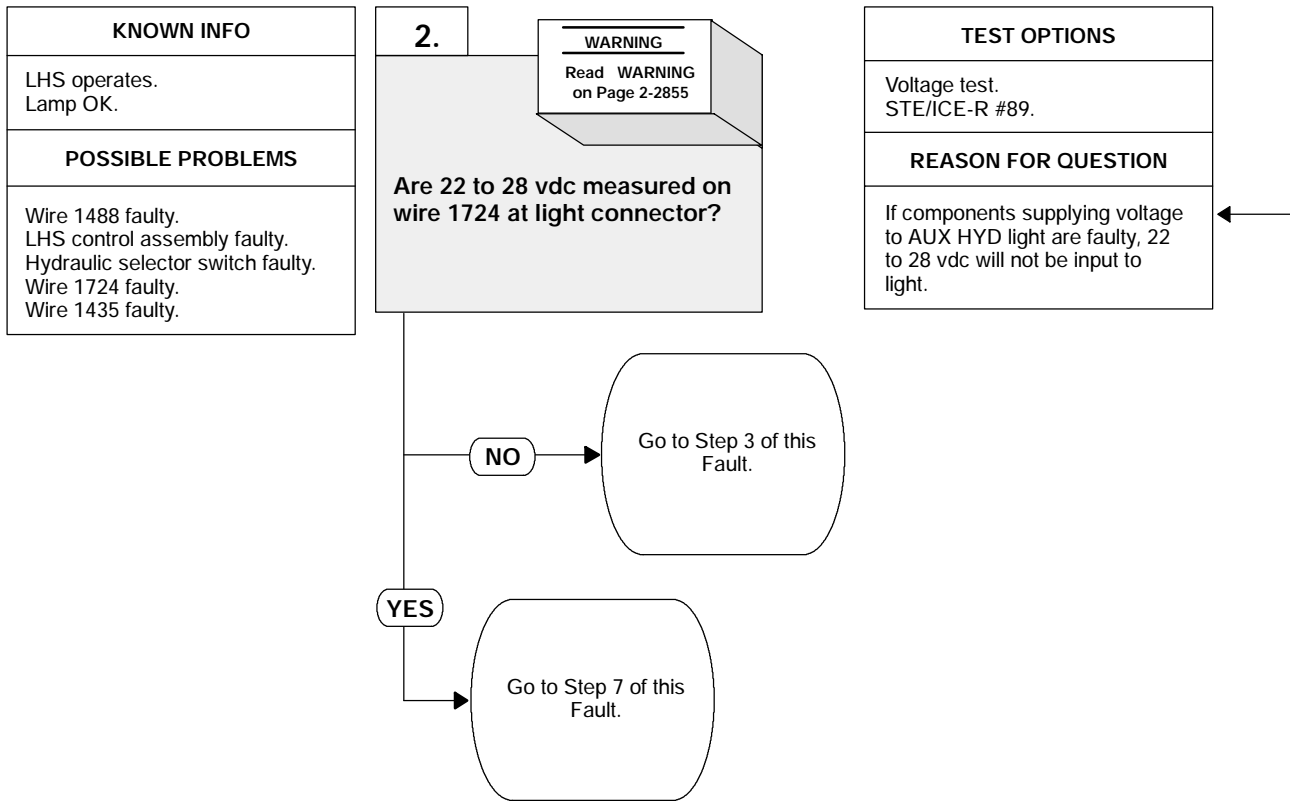
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment and injury or death to personnel may occur.



CONTINUITY TEST

- (1) Remove ten screws and sunshield from instrument panel.
- (2) Pull top of instrument panel toward steering wheel.
- (3) Remove AUX HYD lamp.
- (4) Set multimeter select switch to ohms.
- (5) Is continuity measured across terminals of lamp?
 - (a) If there is no continuity, replace lamp (Para 7-24).
 - (b) If there is continuity, go to Step 2 of this Fault.

1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE (CONT).

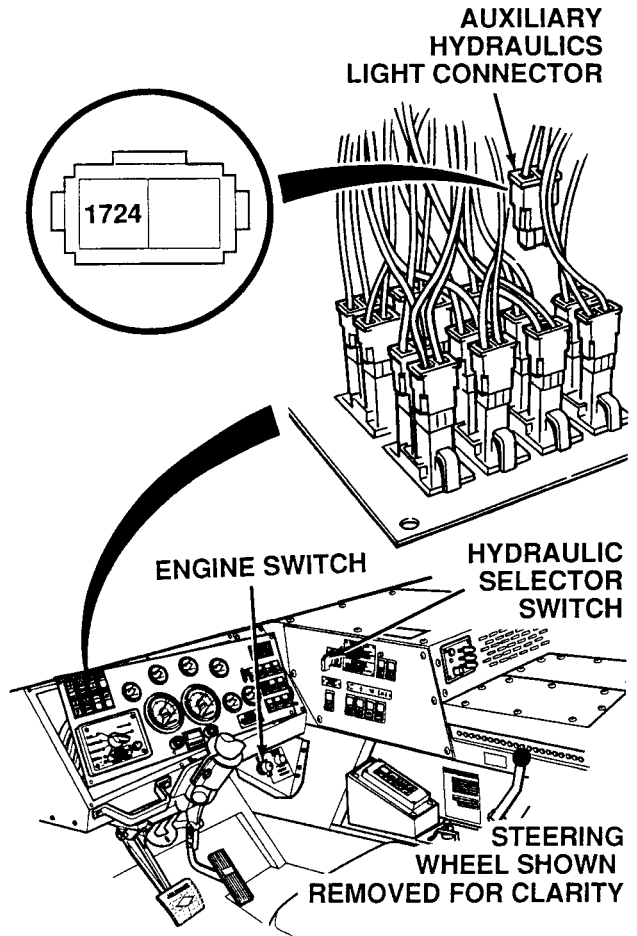


WARNING

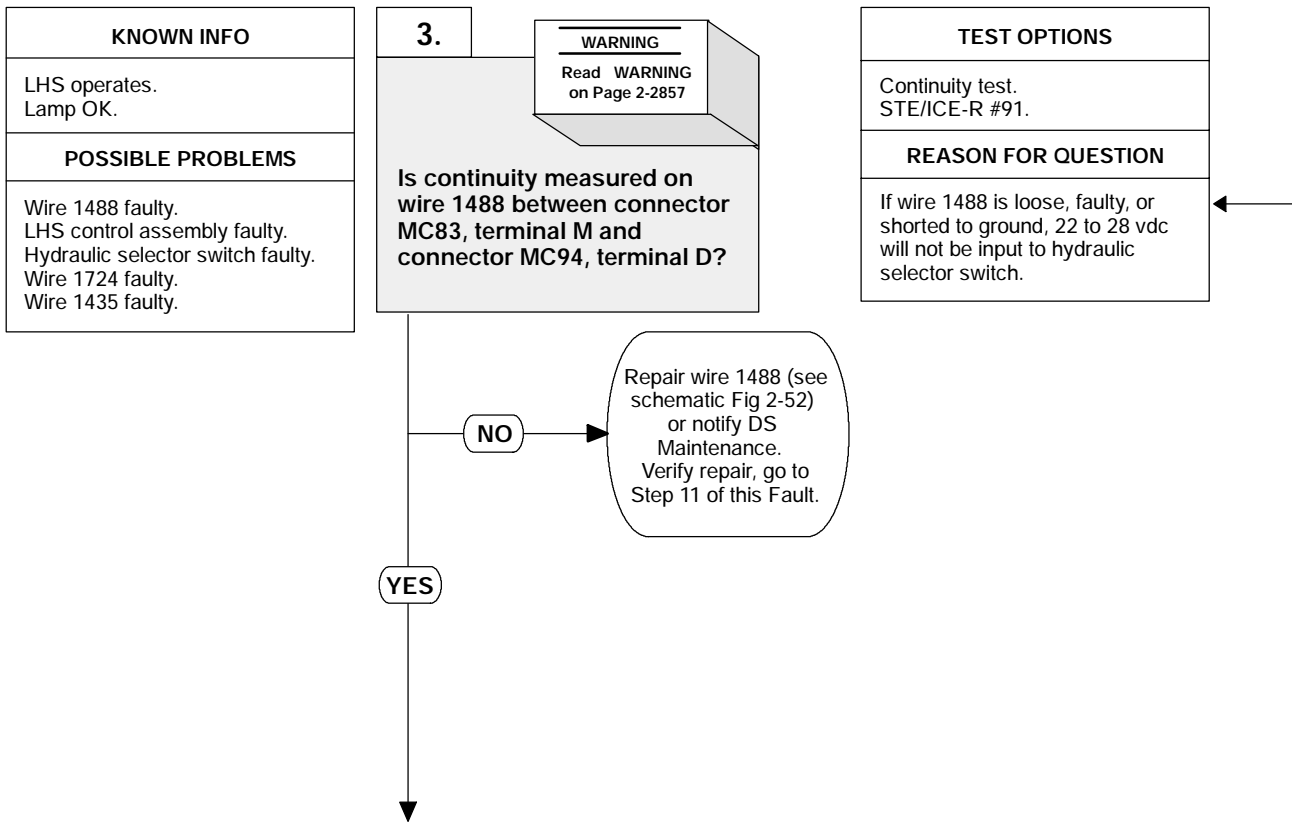
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contacts positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Set multimeter select switch to volts dc.
- (2) Connect positive (+) multimeter lead to wire 1724 at AUX HYD light connector terminal.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch (TM 9-2320-364-10).
- (5) Set hydraulic selector switch to WINCH/CRANE position.
 - (a) If 22 to 28 vdc are not present, perform Steps (6) and (7) below and go to Step 3 of this Fault.
 - (b) If 22 to 28 vdc are present, perform Steps (6) and (7) below and go to Step 7 of this Fault.
- (6) Turn OFF ENGINE switch.
- (7) Set hydraulic selector switch to OFF position.



1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE (CONT).



WARNING

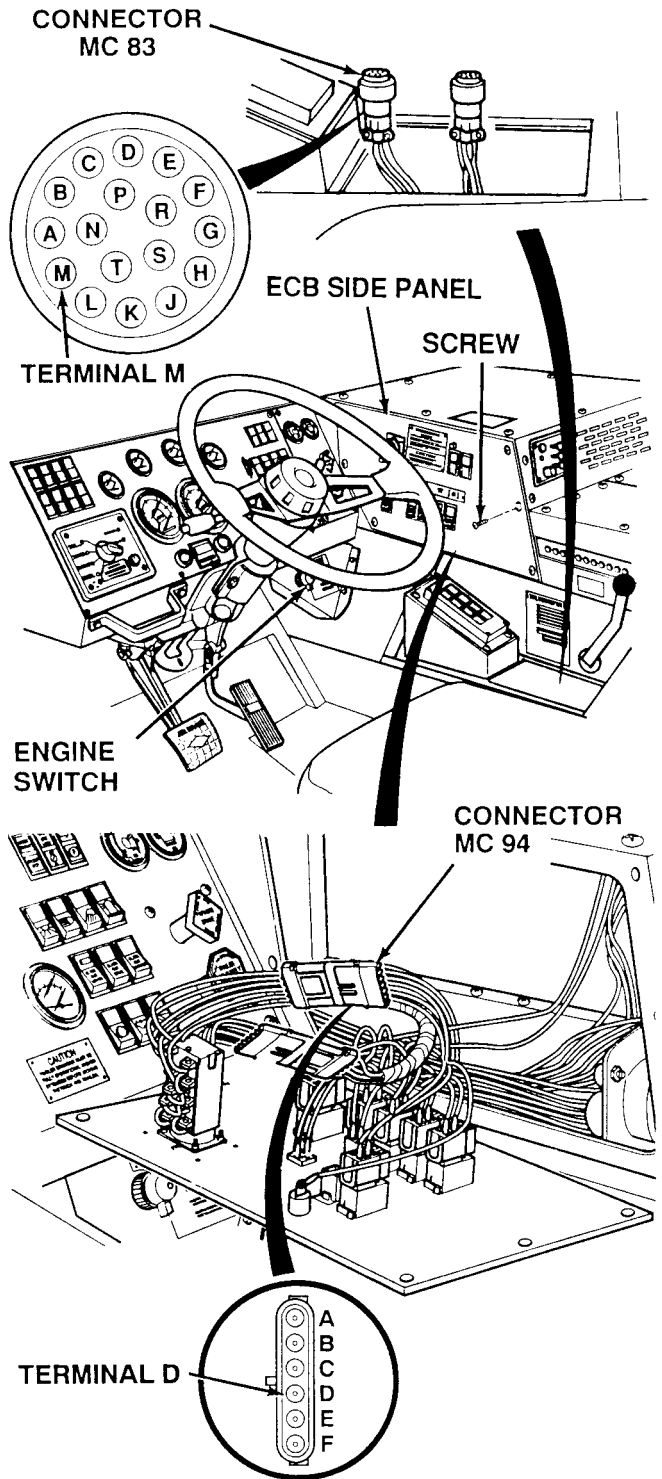
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment and injury or death to personnel may occur.

NOTE

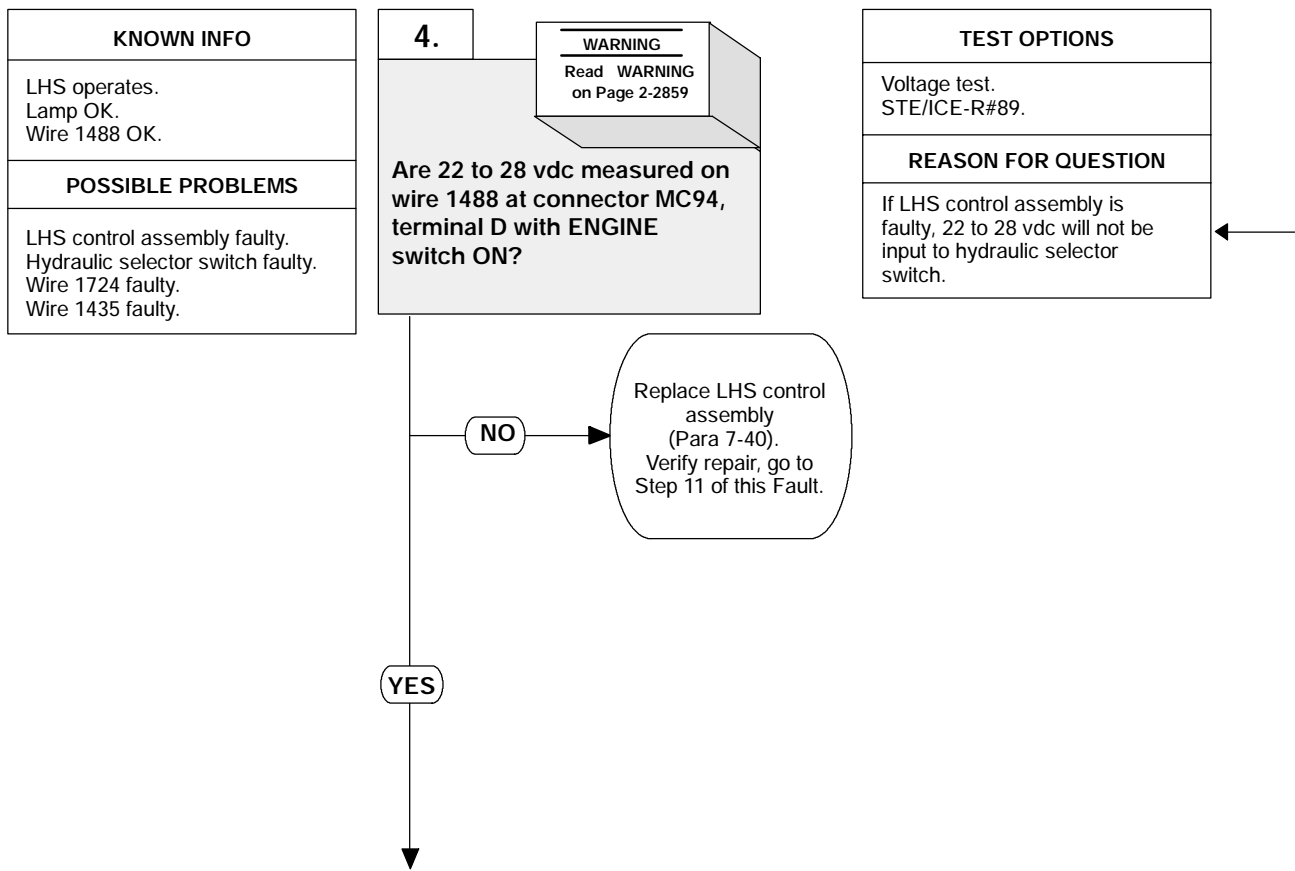
Connectors are removed by gently prying up on tabs.

CONTINUITY TEST

- (1) Remove LHS control assembly (Para 7-40).
- (2) Remove six screws and tilt ECB side panel.
- (3) Disconnect connector MC94 from hydraulic selector switch connector.
- (4) Set multimeter select switch to ohms.
- (5) Is there continuity on wire 1488 between connector MC94, terminal D and connector MC83, terminal M?
 - (a) If there is no continuity, repair wire 1488 (see schematic Fig 2-52) and perform Step (6) below.
 - (b) If there is continuity, wire 1488 is OK.
- (6) Install LHS control assembly (Para 7-40).



1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE (CONT).

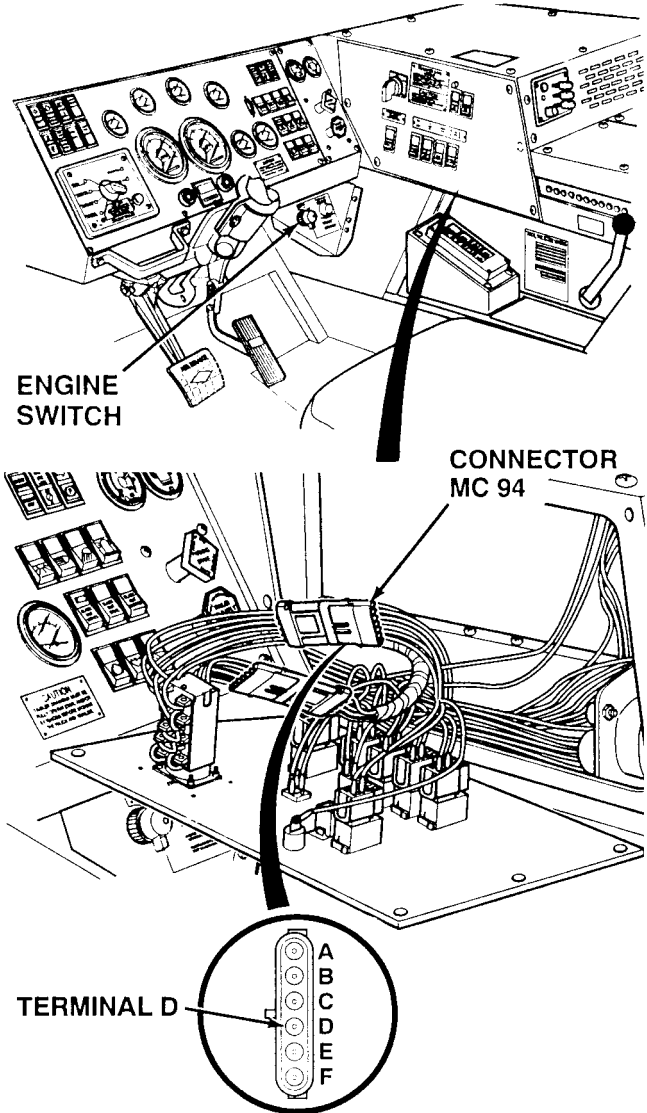


WARNING

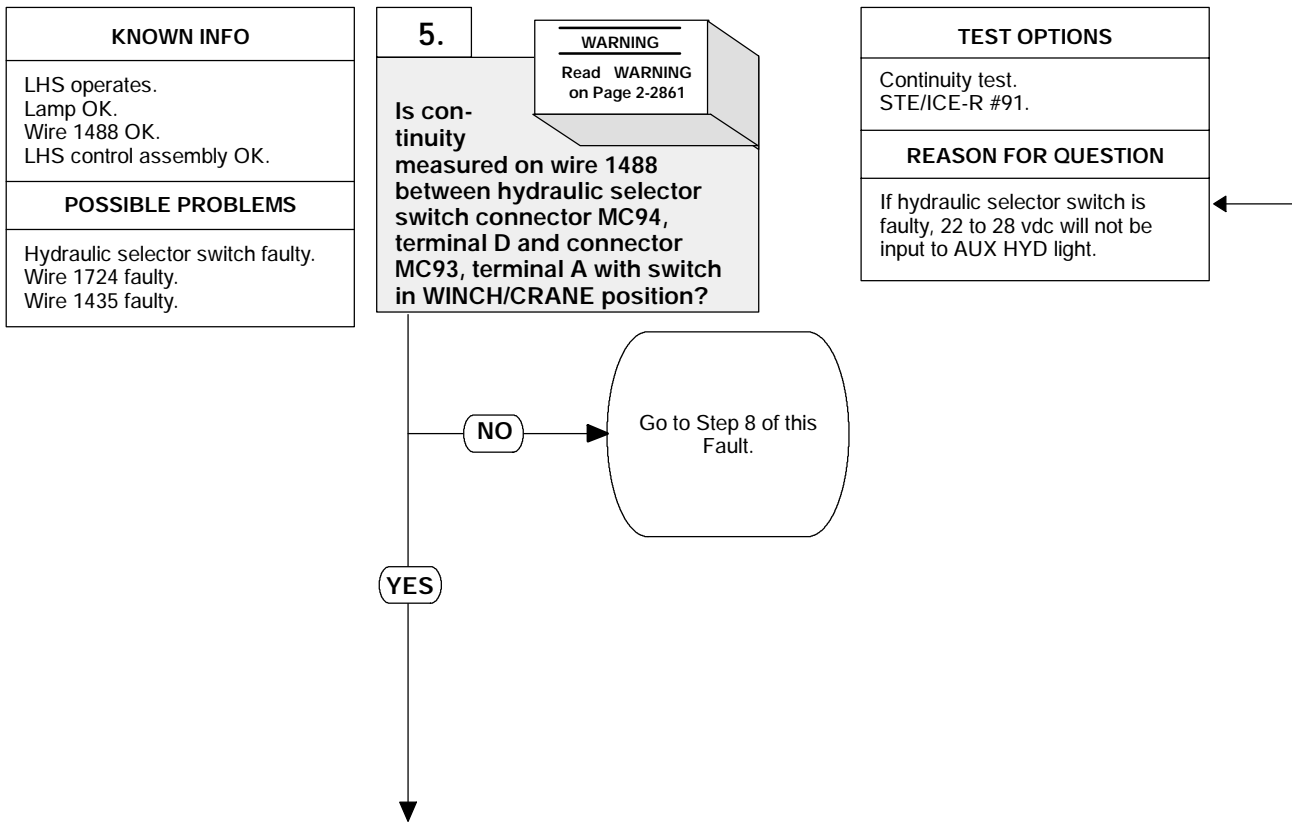
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment and injury or death to personnel may occur.

VOLTAGE TEST

- (1) Set multimeter select switch to volts dc.
- (2) Connect positive (+) multimeter lead to wire 1488 on connector MC94, terminal D.
- (3) Connect negative (-) multimeter lead to a known good ground (TM 9-2320-364-10).
- (4) Turn ON ENGINE switch.
 - (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and replace LHS control assembly (Para 7-40).
 - (b) If 22 to 28 vdc are present, LHS control assembly is OK.
- (5) Turn OFF ENGINE switch.



1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE (CONT).



WARNING

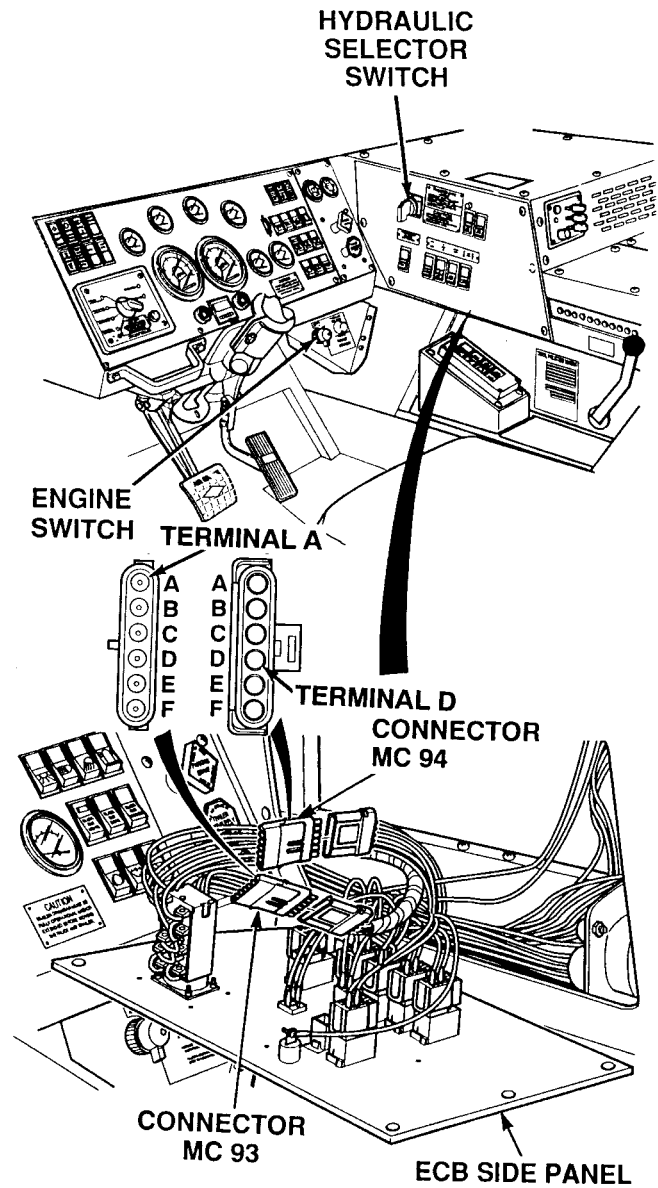
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

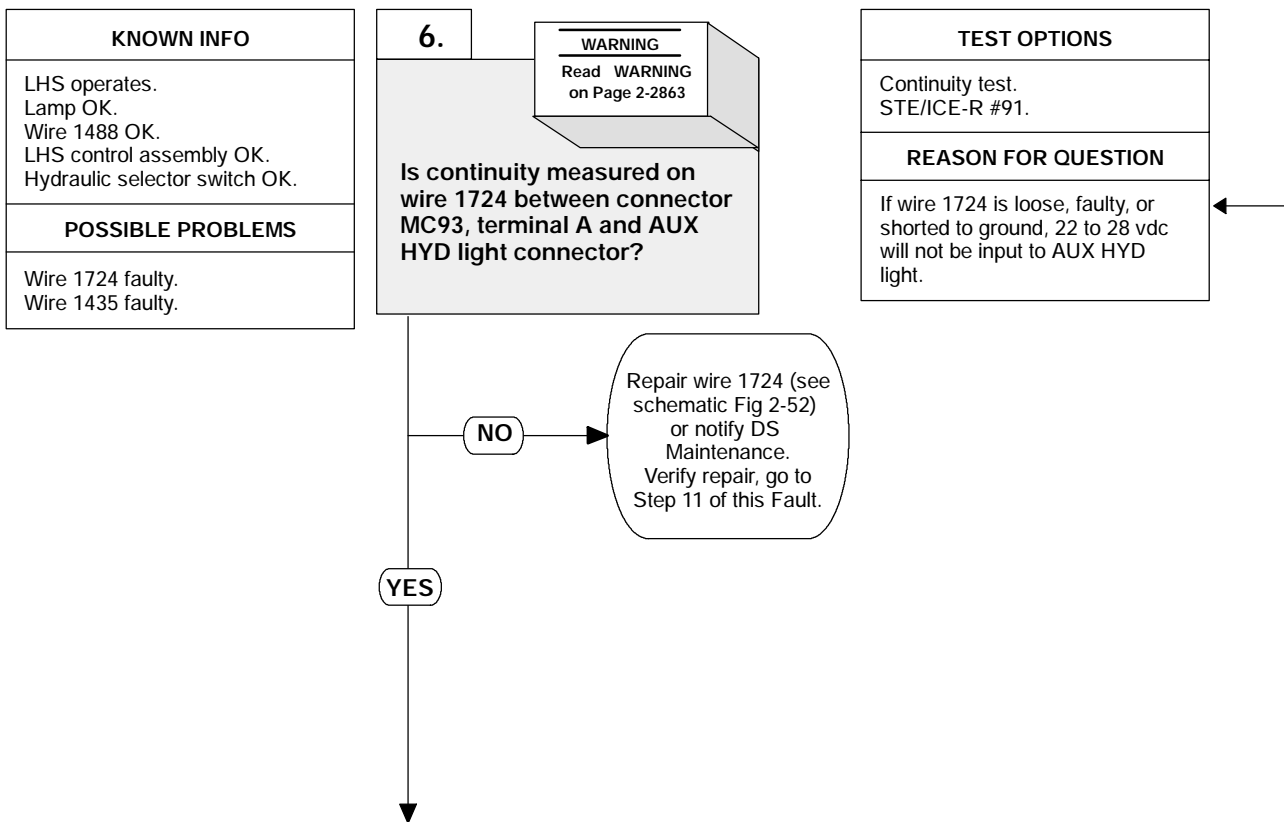
Connectors are removed by gently prying up on tabs.

CONTINUITY TEST

- (1) Disconnect connector MC93 from hydraulic selector switch connector.
- (2) Set hydraulic selector switch to WINCH/CRANE position.
- (3) Set multimeter select switch to ohms.
- (4) Is there continuity on wire 1488 between MC94, terminal D and MC93, terminal A switch connectors?
 - (a) If there is no continuity, set hydraulic selector switch to OFF and go to Step 8 of this Fault.
 - (b) If there is continuity, hydraulic selector switch is OK.
- (5) Set hydraulic selector switch to OFF.



1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE (CONT).

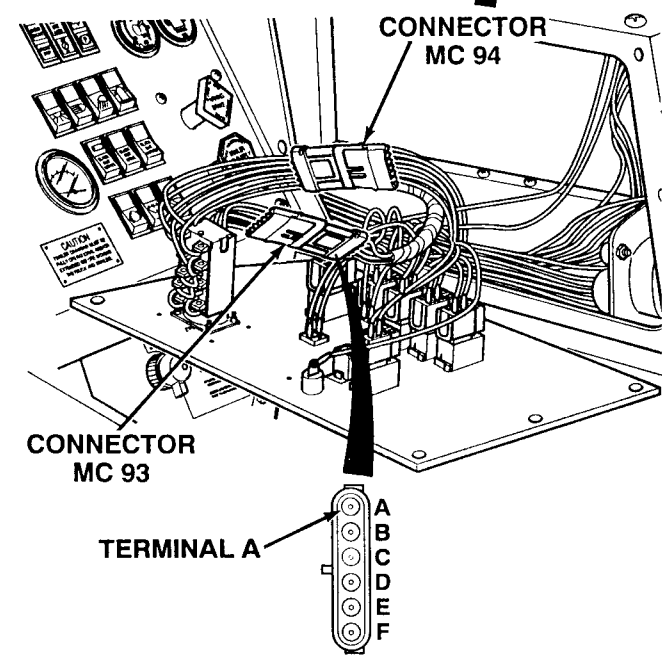
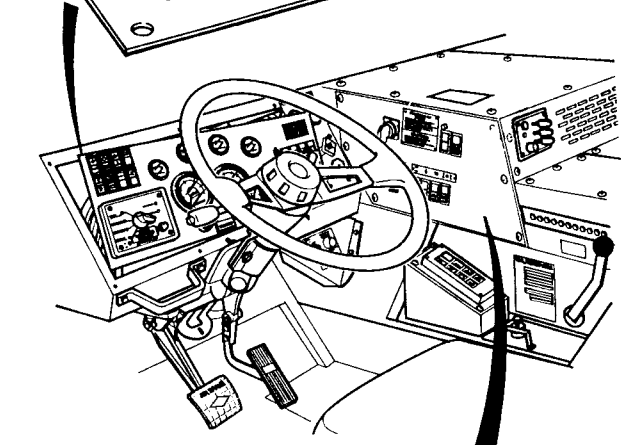
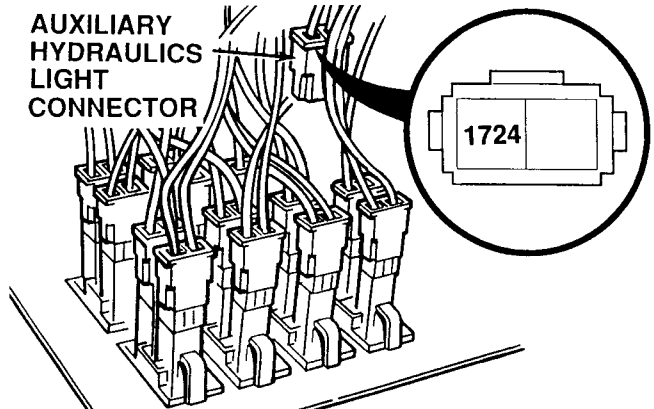


WARNING

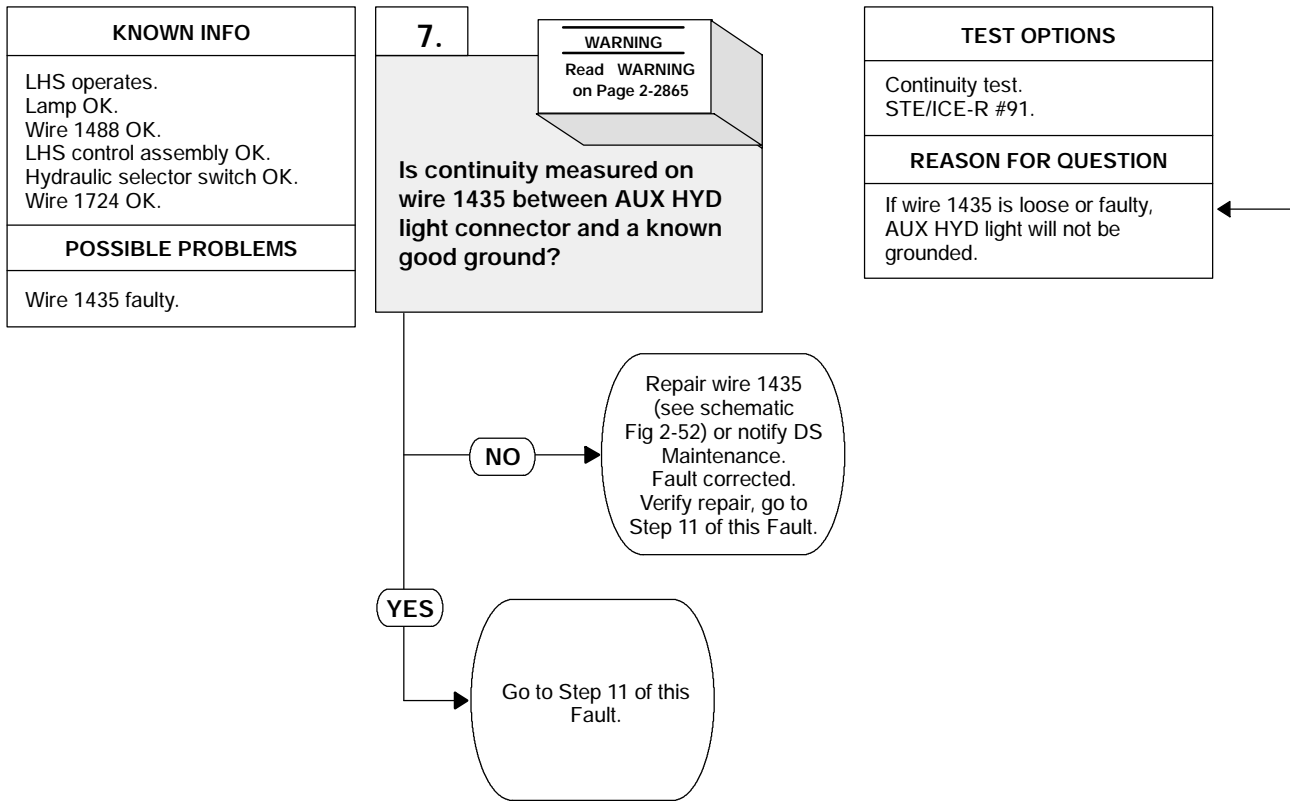
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

(1) Is there continuity on wire 1724 between connector MC93, terminal A and AUX HYD light connector?
 (a) If there is no continuity, repair wire 1724 (see schematic Fig 2-52) or notify DS Maintenance. Perform Step (2) below.
 (b) If there is continuity, wire 1724 is OK.
 (2) Install connectors MC93 and MC94 on hydraulic selector switch connectors.



1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE (CONT).



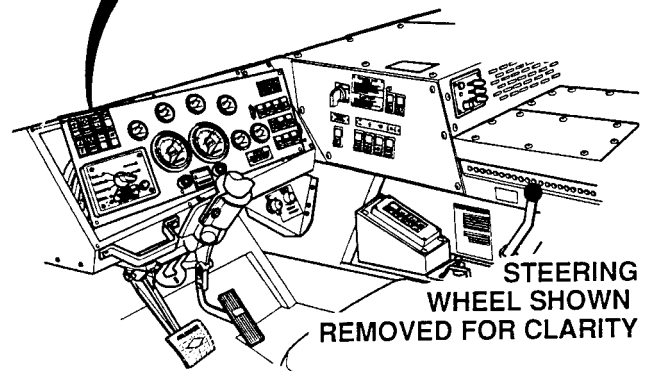
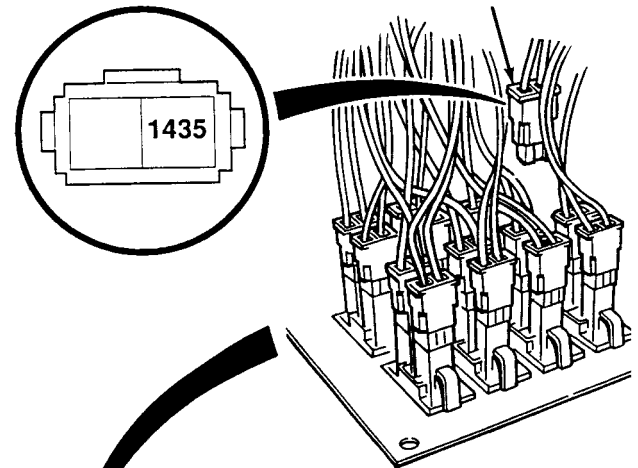
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

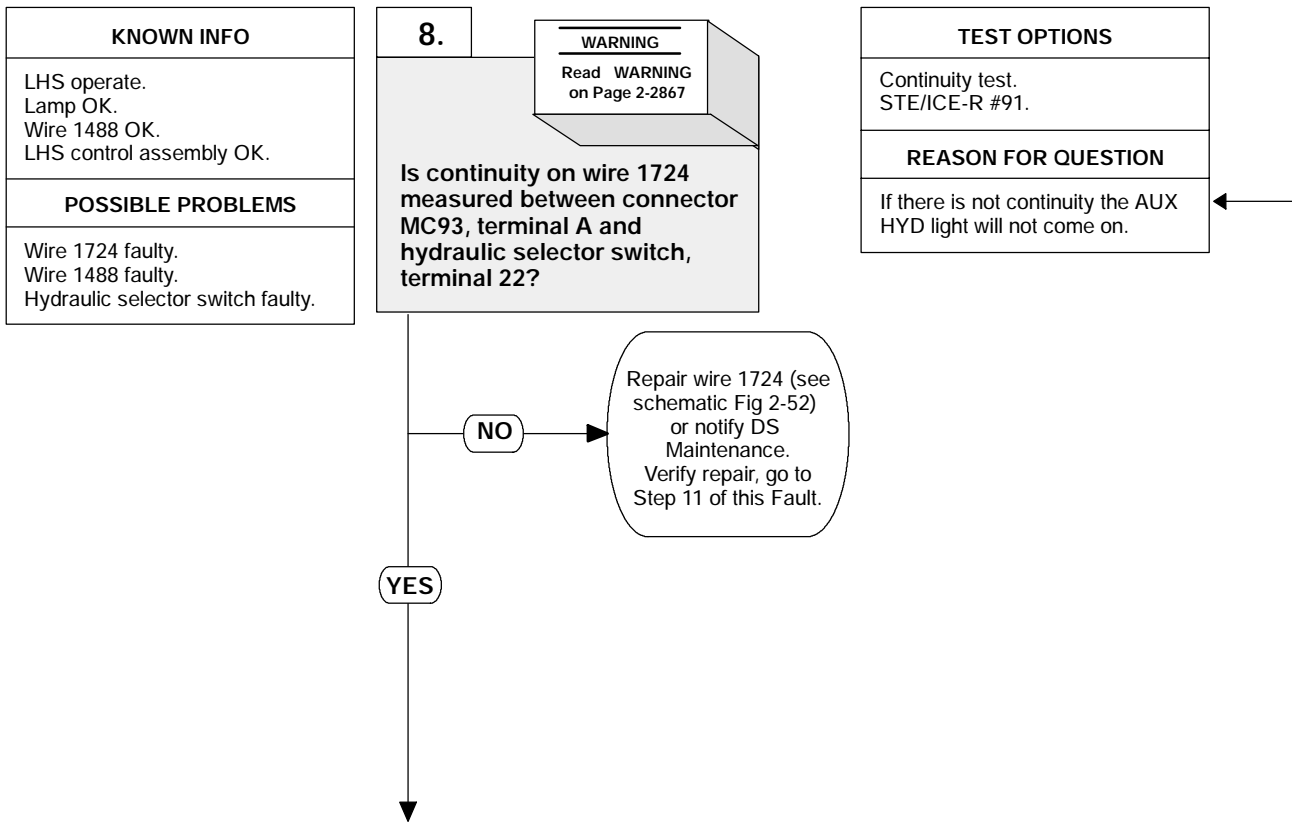
- (1) Set multimeter select switch to ohms.
- (2) Is there continuity on wire 1435 between AUX HYD light connector and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance. Perform Step (3) below.
 - (b) If there is continuity, wire 1435 is OK.
- (3) Install AUX HYD light.

**AUXILIARY
HYDRAULICS
LIGHT CONNECTOR**



**STEERING
WHEEL SHOWN
REMOVED FOR CLARITY**

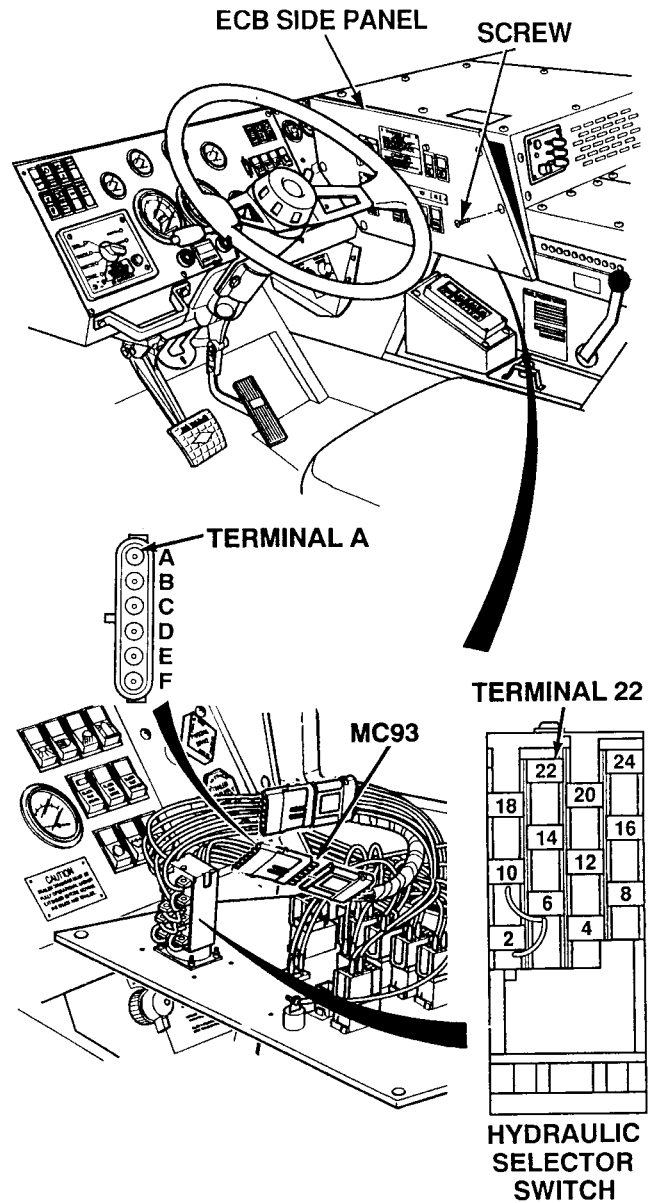
1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE (CONT).



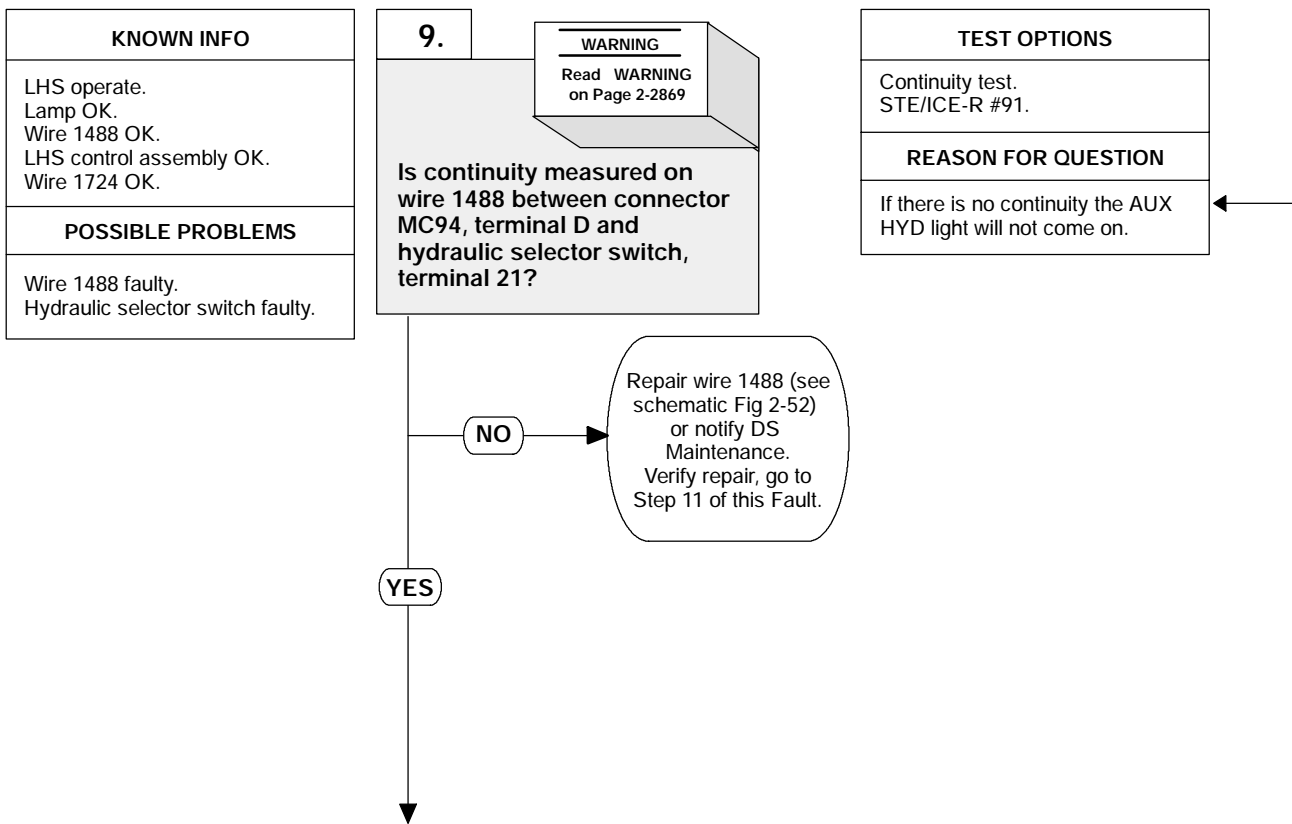
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- CONTINUITY TEST**
- (1) Disconnect connector MC93 from switch connector.
 - (2) Is there continuity on wire 1724 between connector MC93, terminal A and hydraulic selector switch, terminal 22?
 - (a) If there is no continuity, repair wire 1724 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1724 is OK.



1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE (CONT).

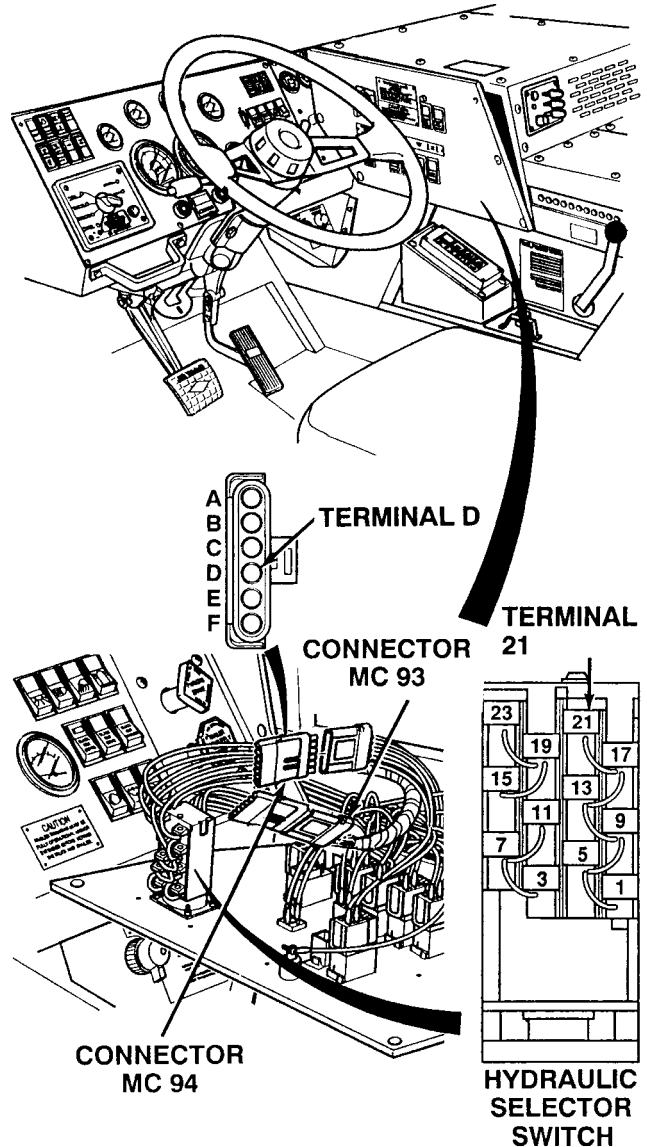


WARNING

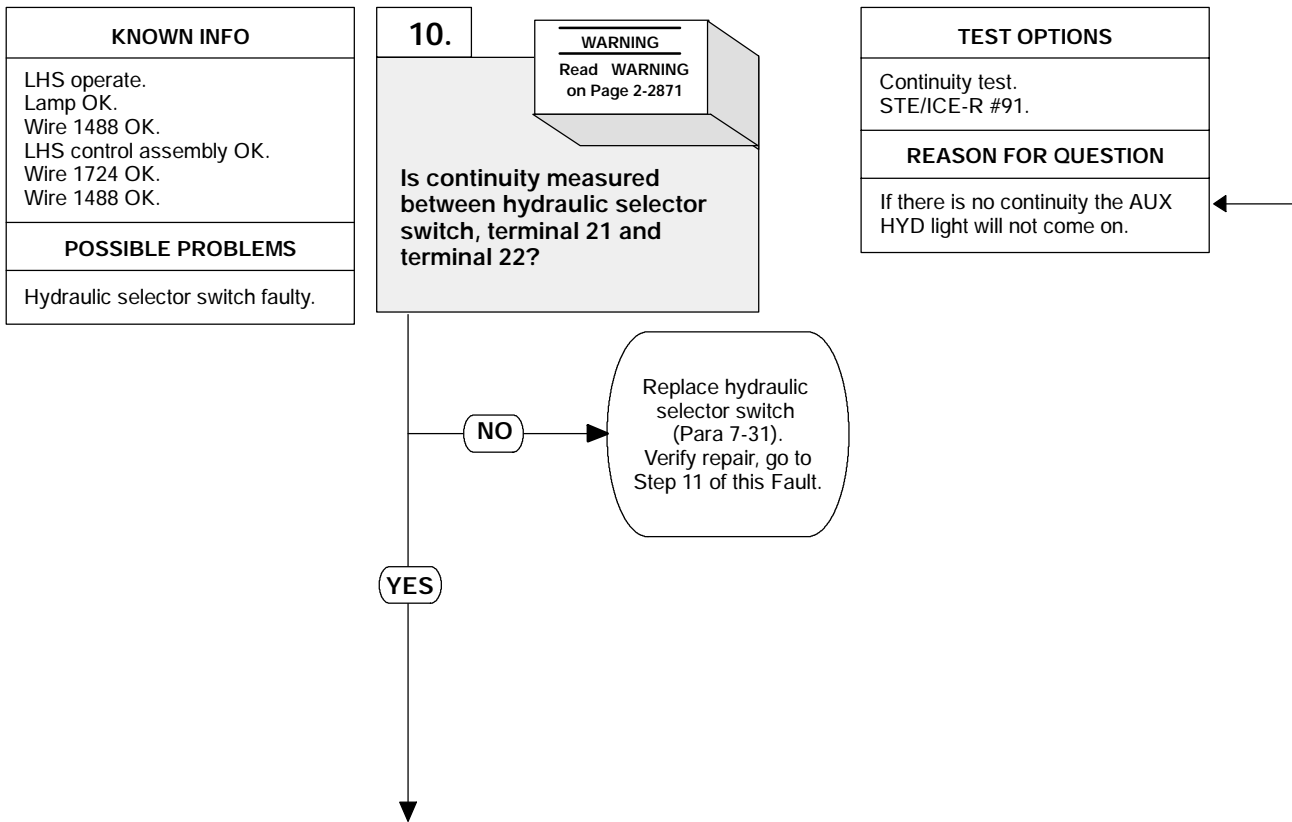
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Disconnect connector MC94 from switch connector.
- (2) Is there continuity on wire 1488 between switch connector MC94, terminal D and hydraulic selector switch, terminal 21?
 - (a) If there is no continuity, repair wire 1488 (see schematic Fig 2-52) or notify DS Maintenance. Perform Step (2) below.
 - (b) If there is continuity, wire 1488 is OK.
- (3) Connect connectors MC94 and MC93 to hydraulic selector switch connectors.

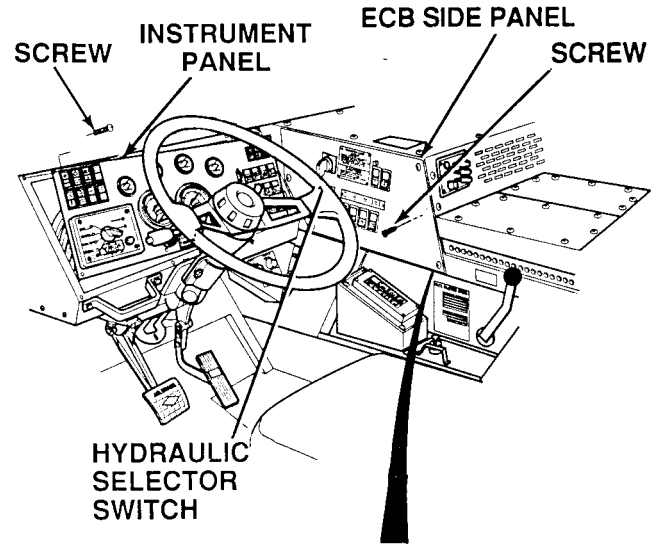


1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE (CONT).

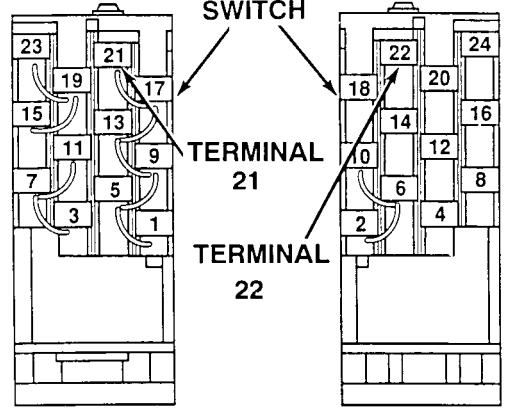
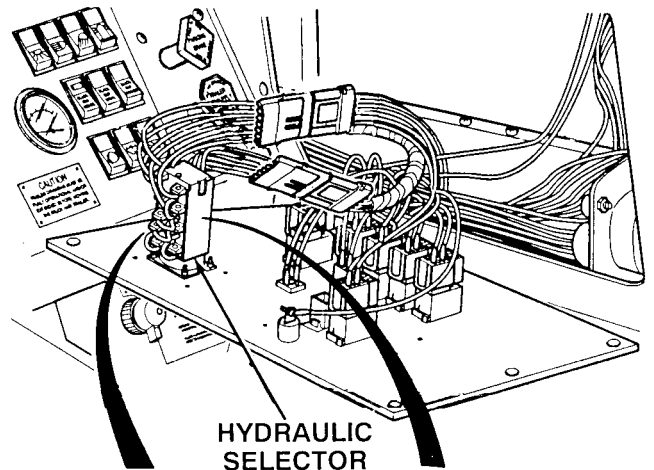


WARNING

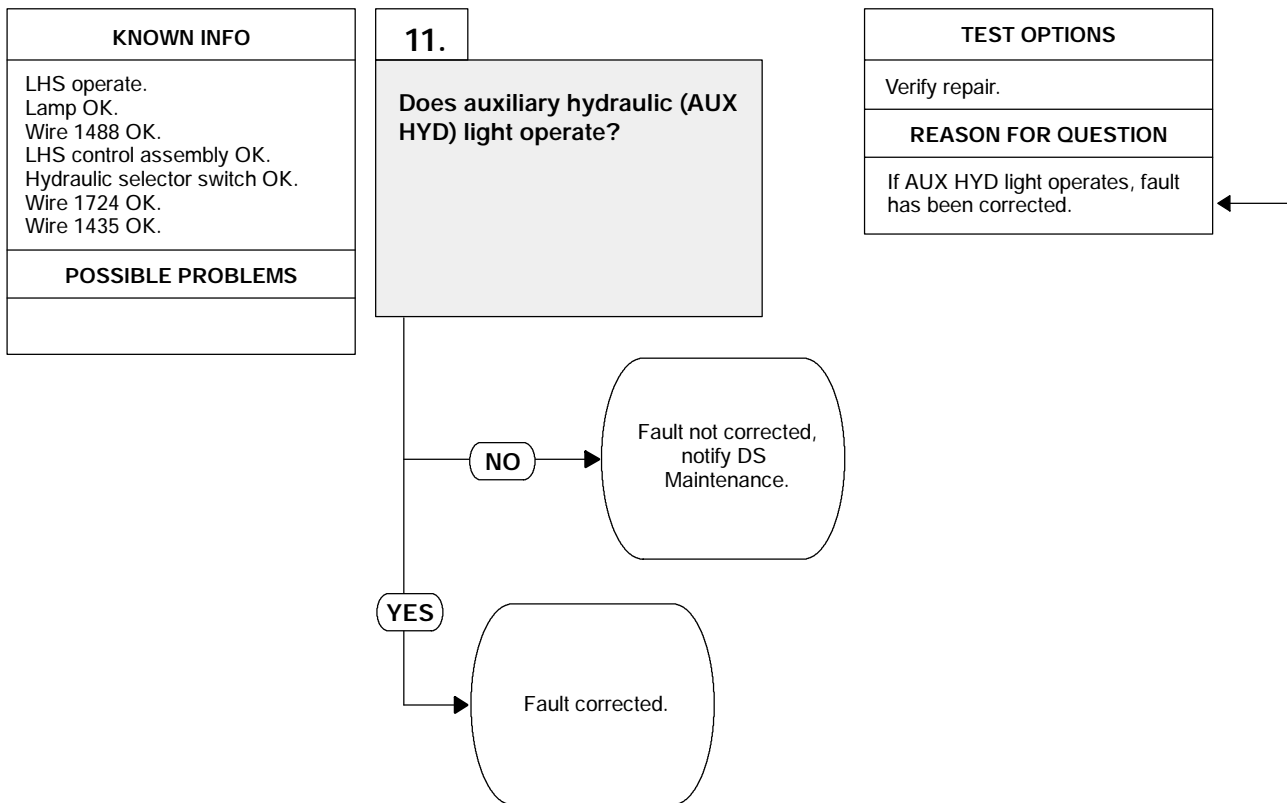
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment and injury or death to personnel may occur.

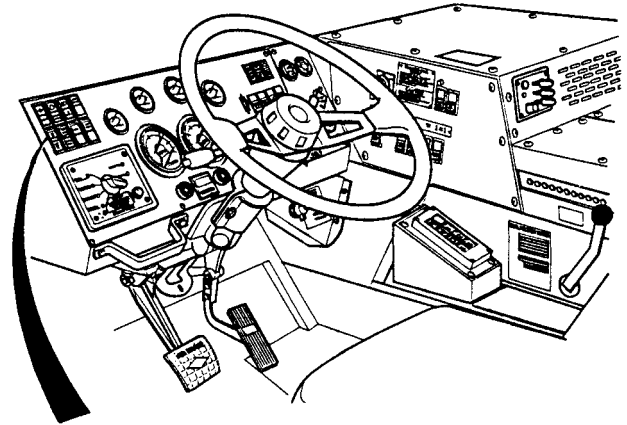


- CONTINUITY TEST**
- (1) Set hydraulic selector switch to WINCH/CRANE position.
 - (2) Is there continuity between hydraulic selector switch, terminal 21 and 22?
 - (a) If there is no continuity, replace the hydraulic selector switch (Para 7-31).
 - (b) If there is continuity, hydraulic selector switch is OK.
 - (3) Install instrument panel and sunshield with ten screws.
 - (4) Install ECB side panel with six screws.



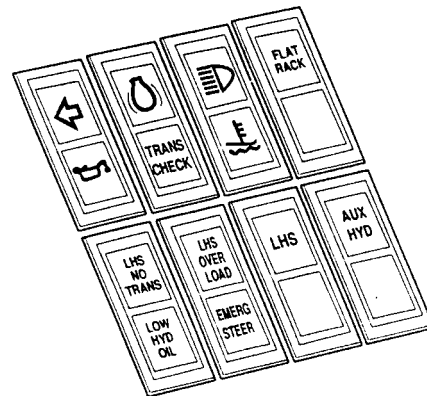
1. AUXILIARY HYDRAULICS (AUX HYD) LIGHT DOES NOT OPERATE (CONT).





VERIFY REPAIR

- Operate auxiliary hydraulic (AUX HYD) light (TM 9-2320-364-10).
- (1) If lamp does not light, fault not corrected. Notify DS Maintenance.
 - (2) If lamp lights, fault has been corrected.



2-31. HYDRAULIC SYSTEM TROUBLESHOOTING (CONT).

2. CRANE AND WINCH (SRW) DO NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

Materials/Parts

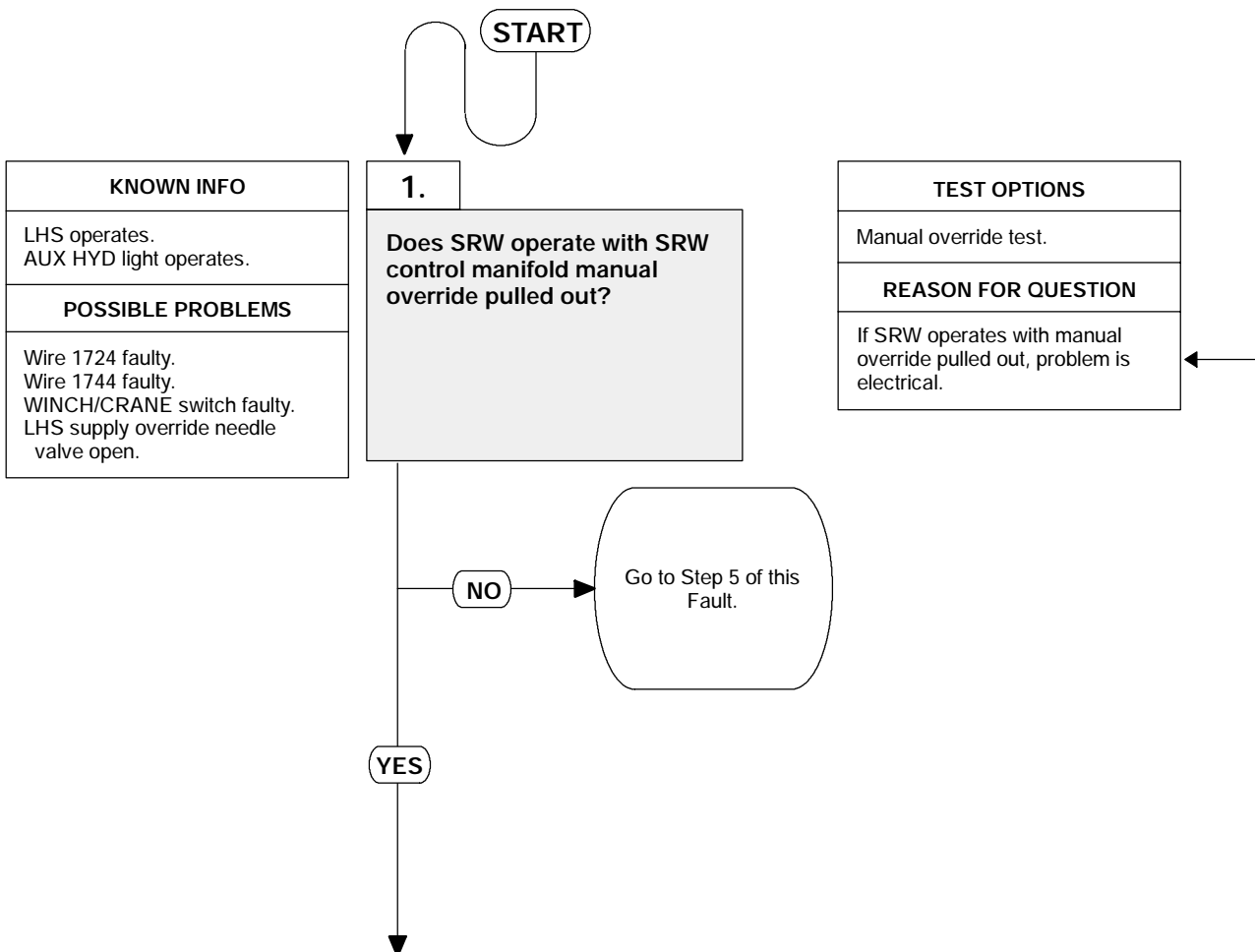
Lockwashers (6) (Item 195, Appendix F)

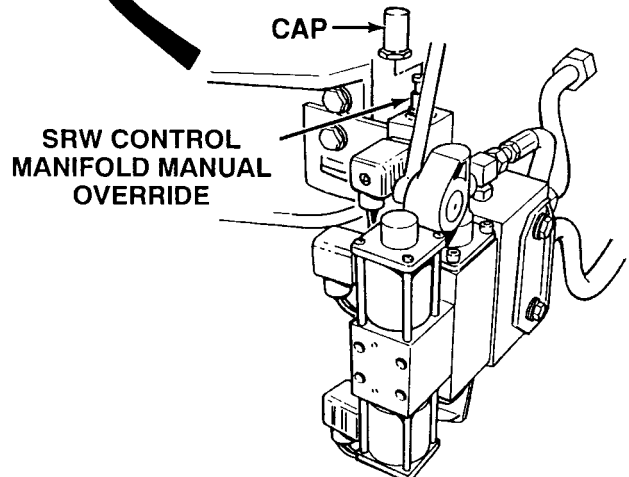
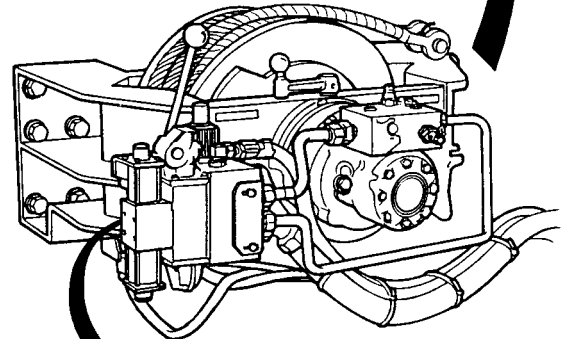
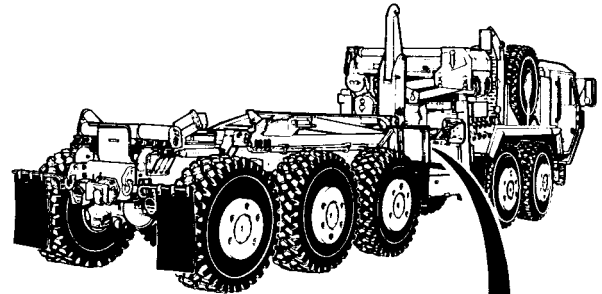
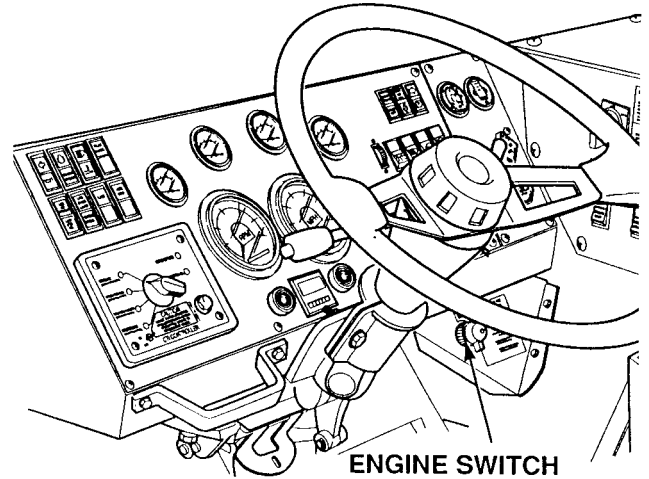
References

TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)

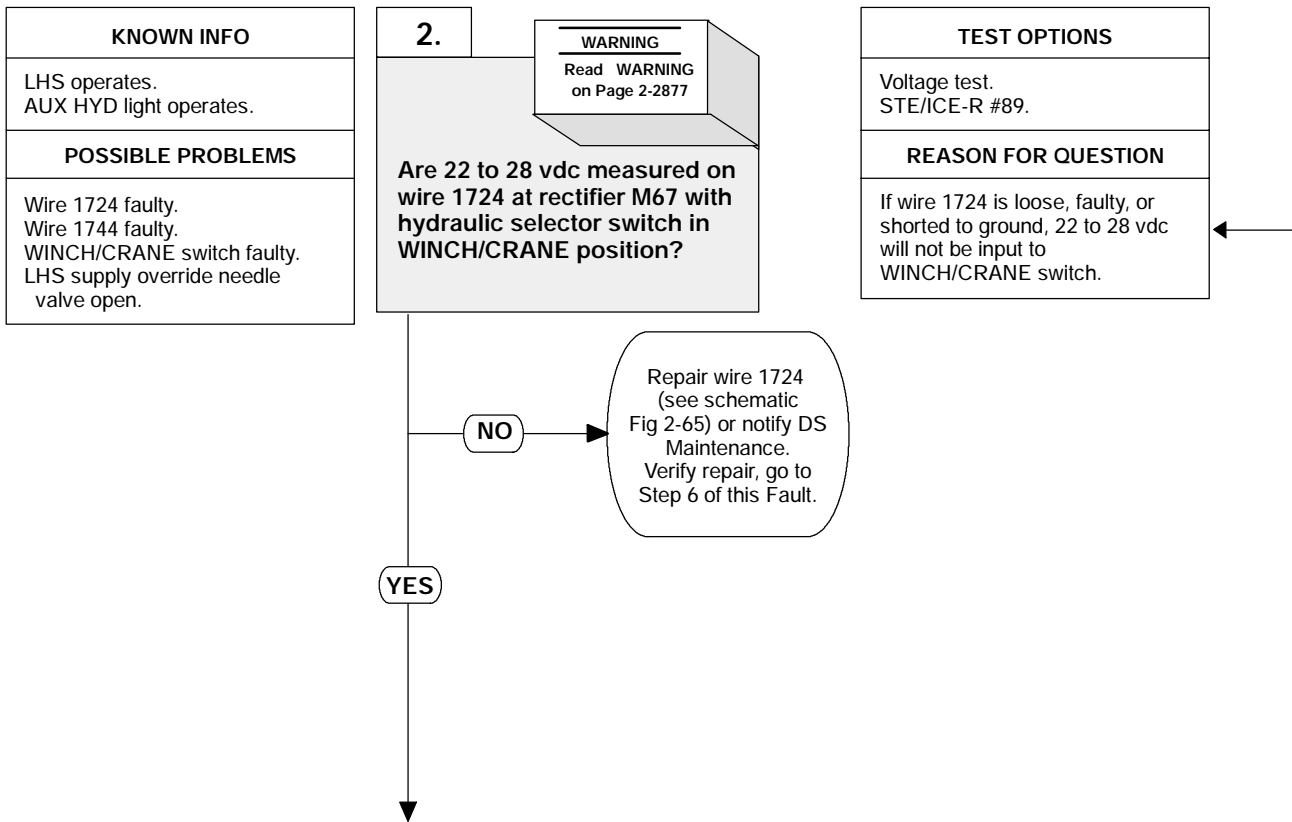




MANUAL OVERRIDE TEST

- (1) START engine (TM 9-2320-364-10).
- (2) Remove cap from SRW control manifold supply override.
- (3) Rotate manual override to unlock and pull up.
- (4) Operate SRW using manual control.
 - (a) If SRW does not operate, problem is hydraulic. Perform Steps (5) through (7) below and go to Step 5 of this Fault.
 - (b) If SRW operates, problem is electrical.
- (5) Push down on manual override and rotate to lock in down position.
- (6) Install cap on manual override.
- (7) Turn OFF ENGINE switch.

2. CRANE AND WINCH (SRW) DO NOT OPERATE (CONT).

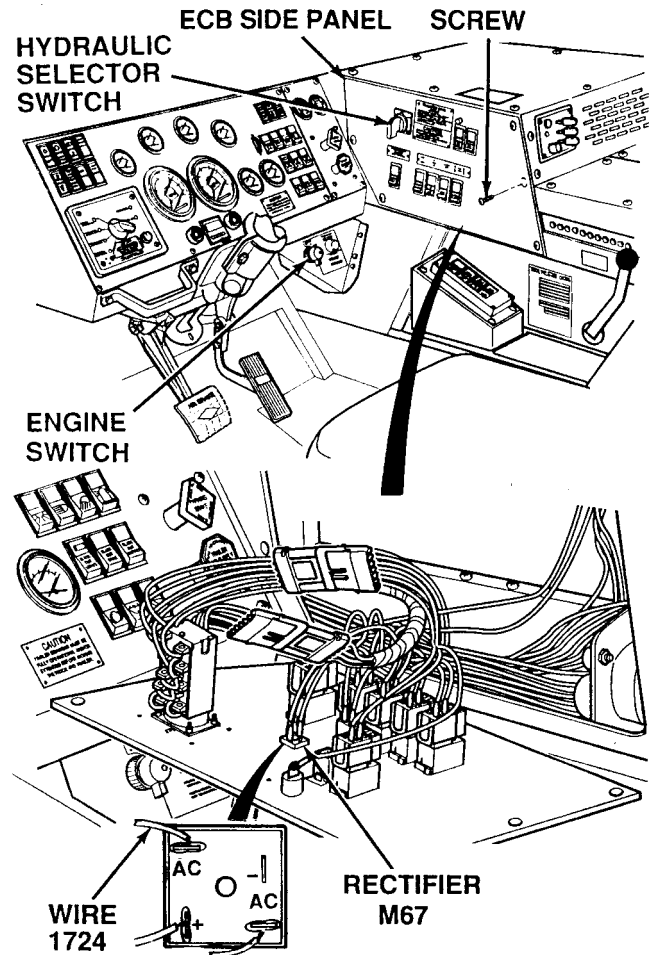


WARNING

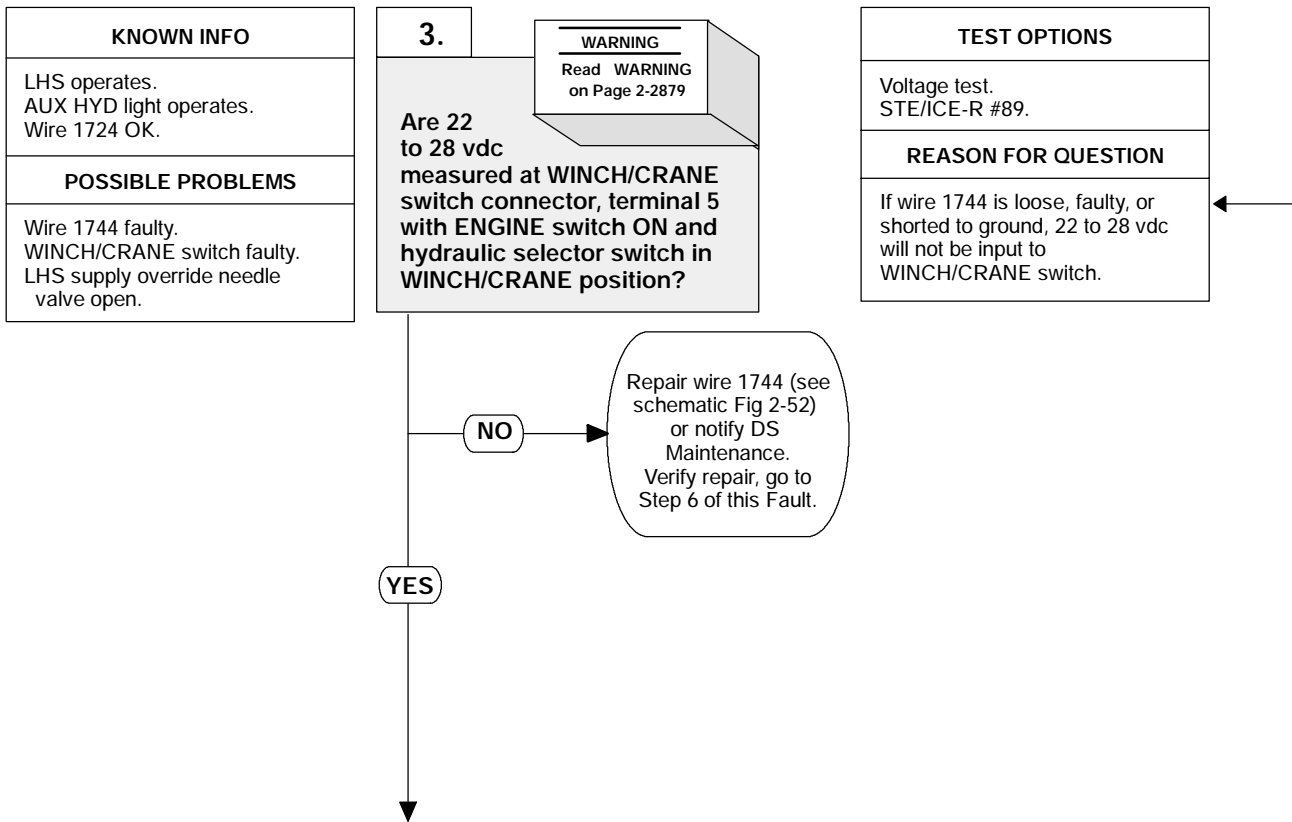
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Remove six screws and tilt ECB side panel.
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead to wire 1724 at rectifier M67.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
- (6) Set hydraulic selector switch to WINCH/CRANE position.
 - (a) If 22 to 28 vdc are not present, perform Steps (7) and (8) below and repair wire 1724 (see schematic Fig 2-65) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, wire is OK.
- (7) Set hydraulic selector switch to OFF position.
- (8) Turn OFF ENGINE switch.



2. CRANE AND WINCH (SRW) DO NOT OPERATE (CONT).



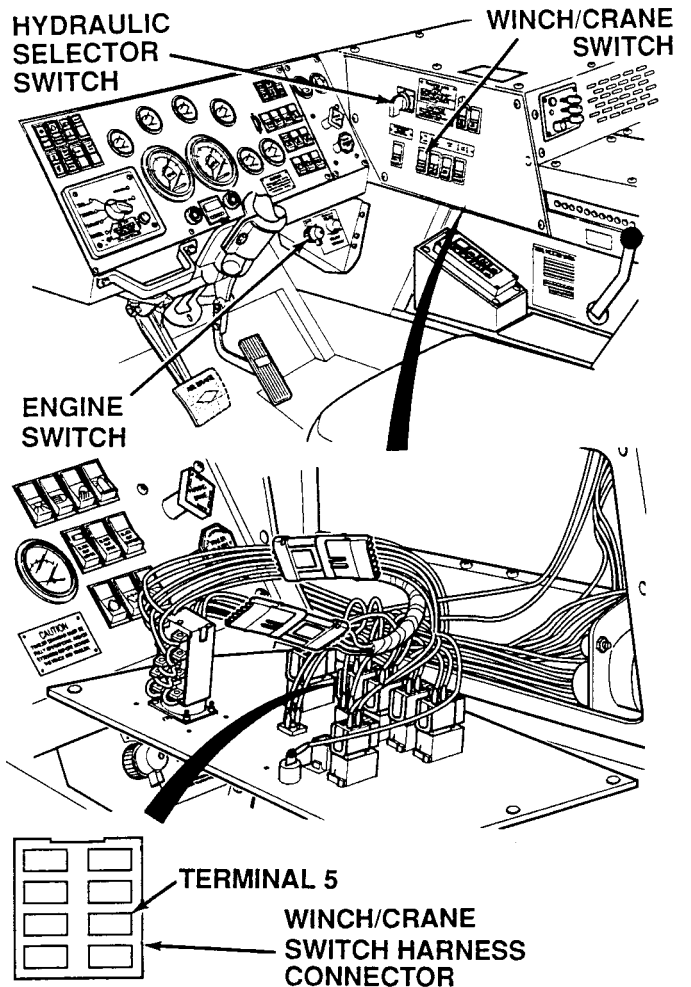
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

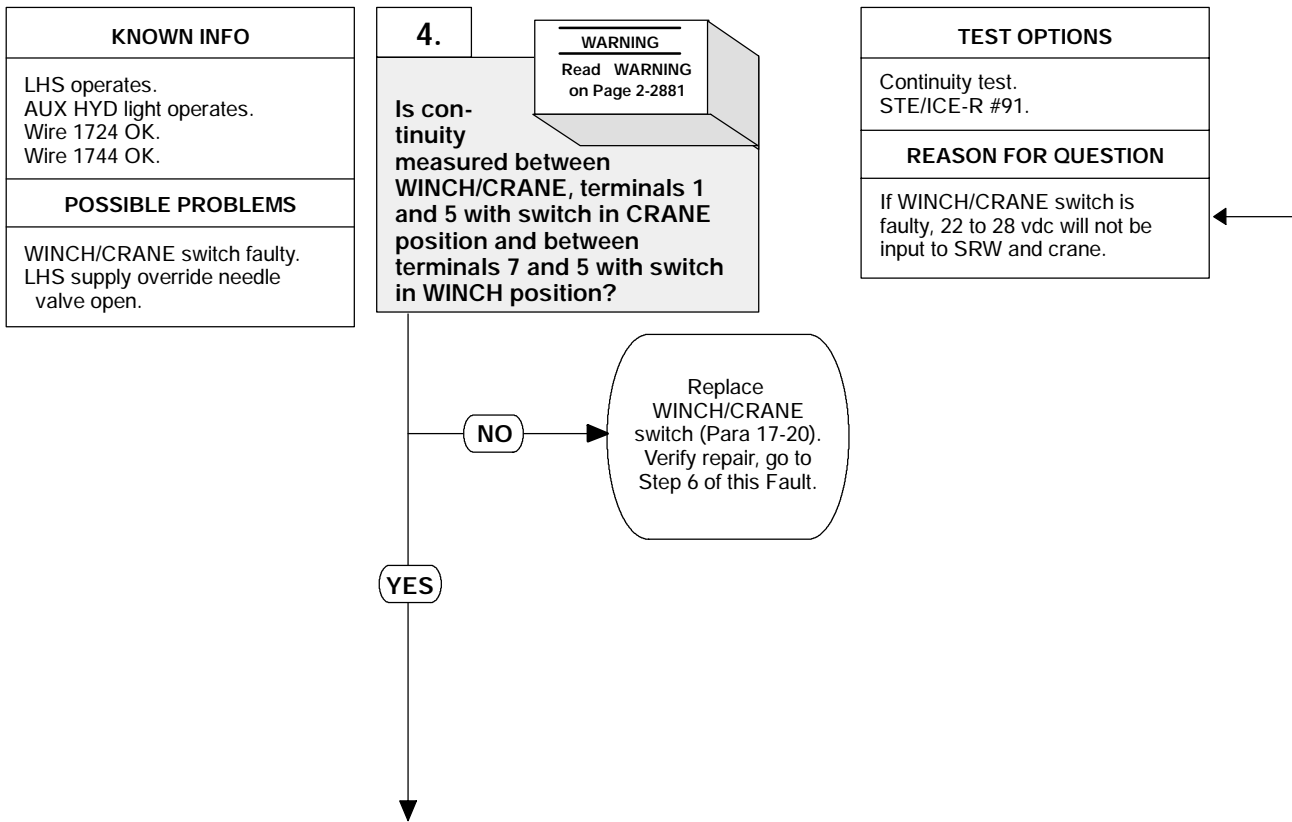
NOTE

Connectors are removed by gently prying up on tabs.

VOLTAGE TEST	
(1)	Disconnect connector from WINCH/CRANE switch.
(2)	Connect positive (+) multimeter lead to wire 1744 at WINCH/CRANE switch connector, terminal 5.
(3)	Connect negative (-) multimeter lead to a known good ground.
(4)	Turn ON ENGINE switch (TM 9-2320-364-10).
(5)	Set hydraulic selector switch to WINCH/CRANE position.
(a)	If 22 to 28 vdc are not present, perform Steps (6) and (7) below and repair wire 1744 (see schematic Fig 2-52) or notify DS Maintenance.
(b)	If 22 to 28 vdc are present, wire 1744 is OK.
(6)	Set hydraulic selector switch to OFF position.
(7)	Turn OFF ENGINE switch.



2. CRANE AND WINCH (SRW) DO NOT OPERATE (CONT).

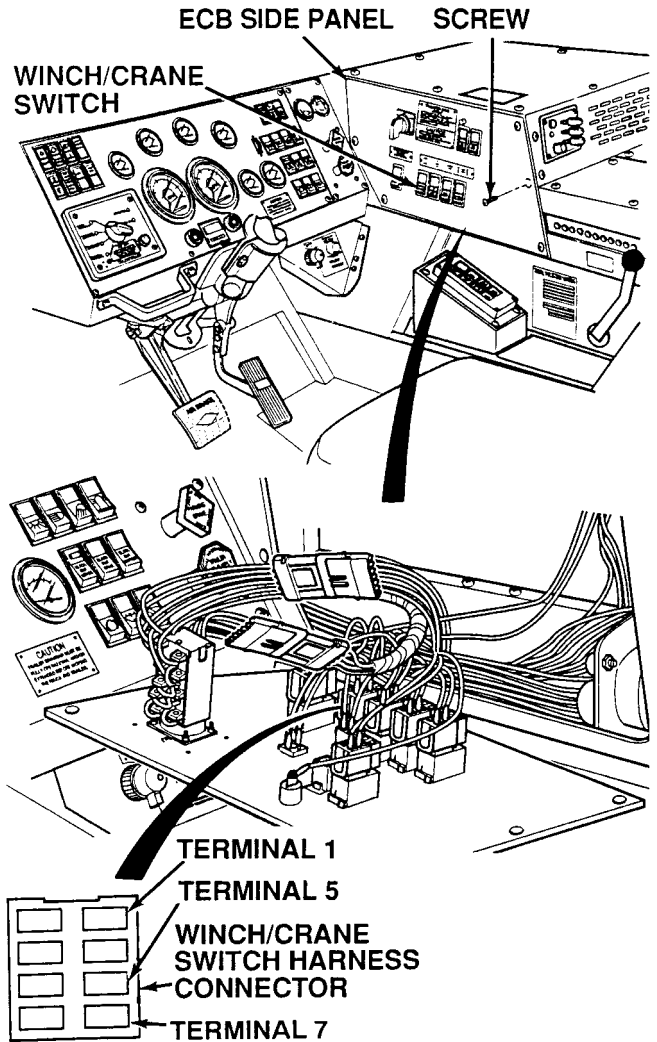


WARNING

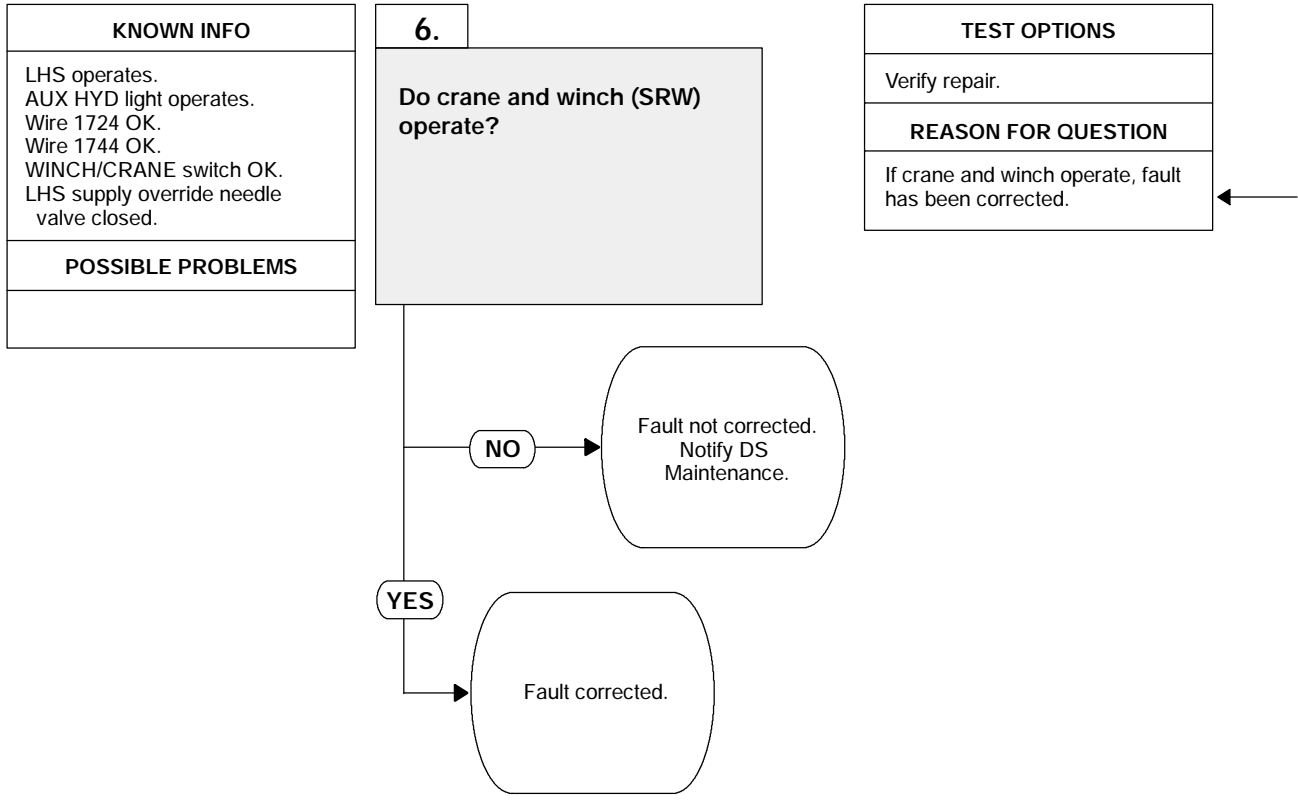
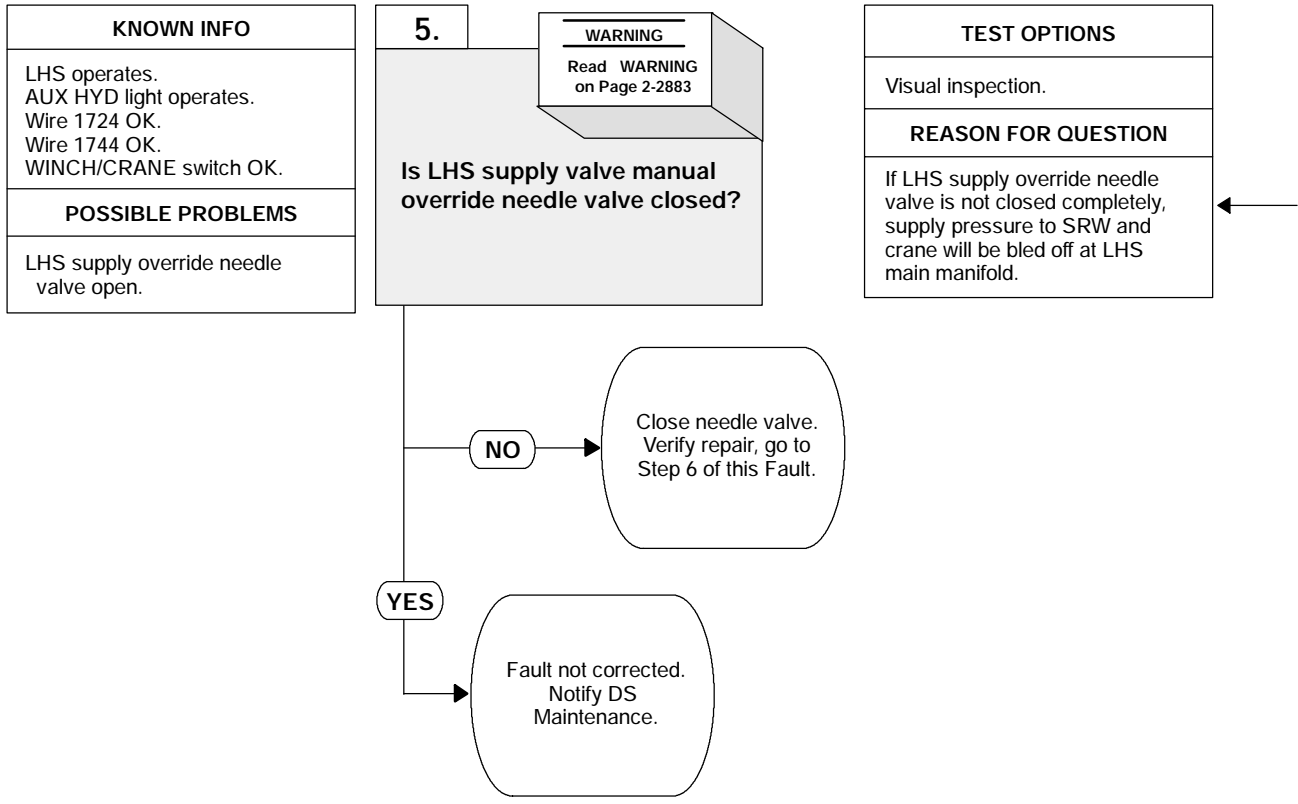
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Set WINCH/CRANE switch to CRANE position (TM 9-2320-364-10).
- (3) Is there continuity between WINCH/CRANE switch, terminals 1 and 5?
 - (a) If there is no continuity, replace switch (Para 17-20).
 - (b) If there is continuity, go to Step (4) below.
- (4) Set WINCH/CRANE switch to WINCH position.
- (5) Is there continuity between WINCH/CRANE switch, terminals 5 and 7?
 - (a) If there is no continuity, replace switch (Para 17-20).
 - (b) If there is continuity, switch is OK.
- (6) Connect connector to WINCH/CRANE switch.
- (7) Install ECB side panel with six screws.



2. CRANE AND WINCH (SRW) DO NOT OPERATE (CONT).

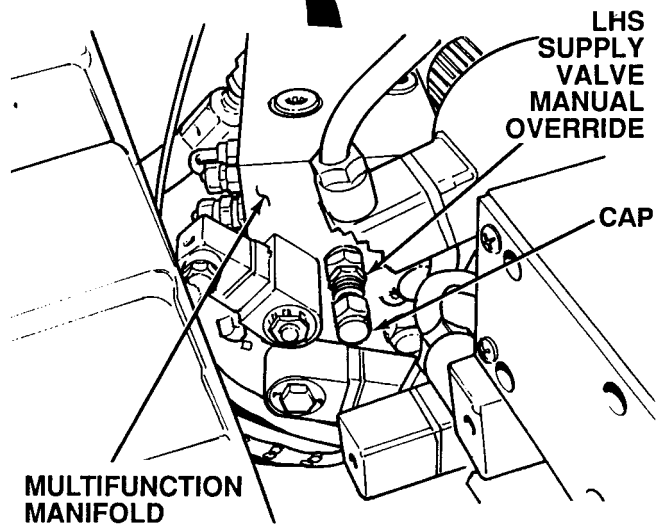
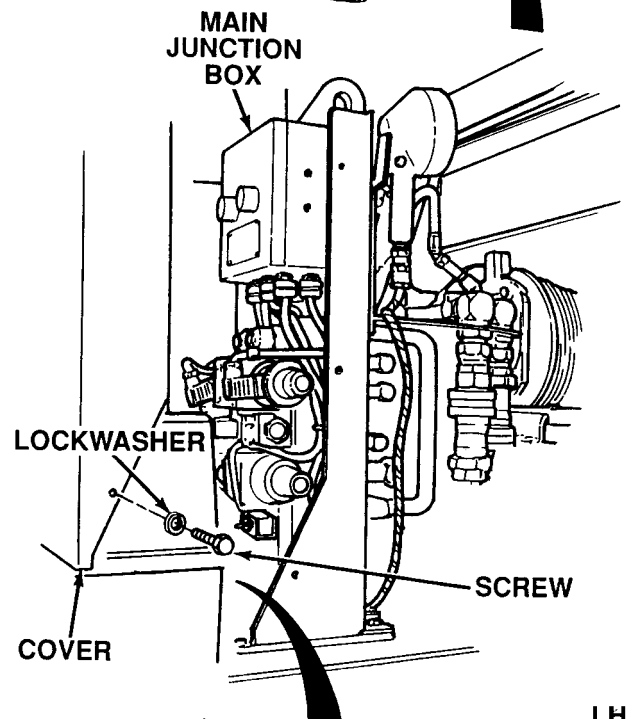
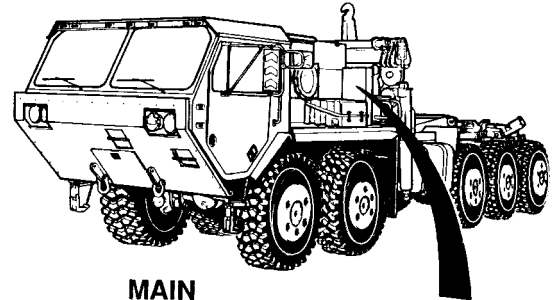


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VISUAL INSPECTION

- (1) Remove six screws, lockwashers and LHS control box cover. Discard lockwashers.
- (2) Remove cap from LHS supply override needle valve.
- (3) Using hex key, check position of override valve. Override valve is closed if turned all the way in against stop.
 - (a) If override is not closed, close override by turning screw in and perform Steps (4) and (5) below.
 - (b) If override is closed, perform Step (4) and (5) below.
- (4) Install cap on manual override.
- (5) Install LHS control box cover with six screws and lockwashers.



VERIFY REPAIR

- (1) Start engine (TM 9-2220-364-10).
- (2) Operate SRW.
 - (a) If SRW does not operate, fault not corrected, turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If SRW operates normally, fault has been corrected.
- (3) Turn OFF ENGINE switch.

2-31. HYDRAULIC SYSTEM TROUBLESHOOTING (CONT).

3. LHS, WINCH AND CRANE DO NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

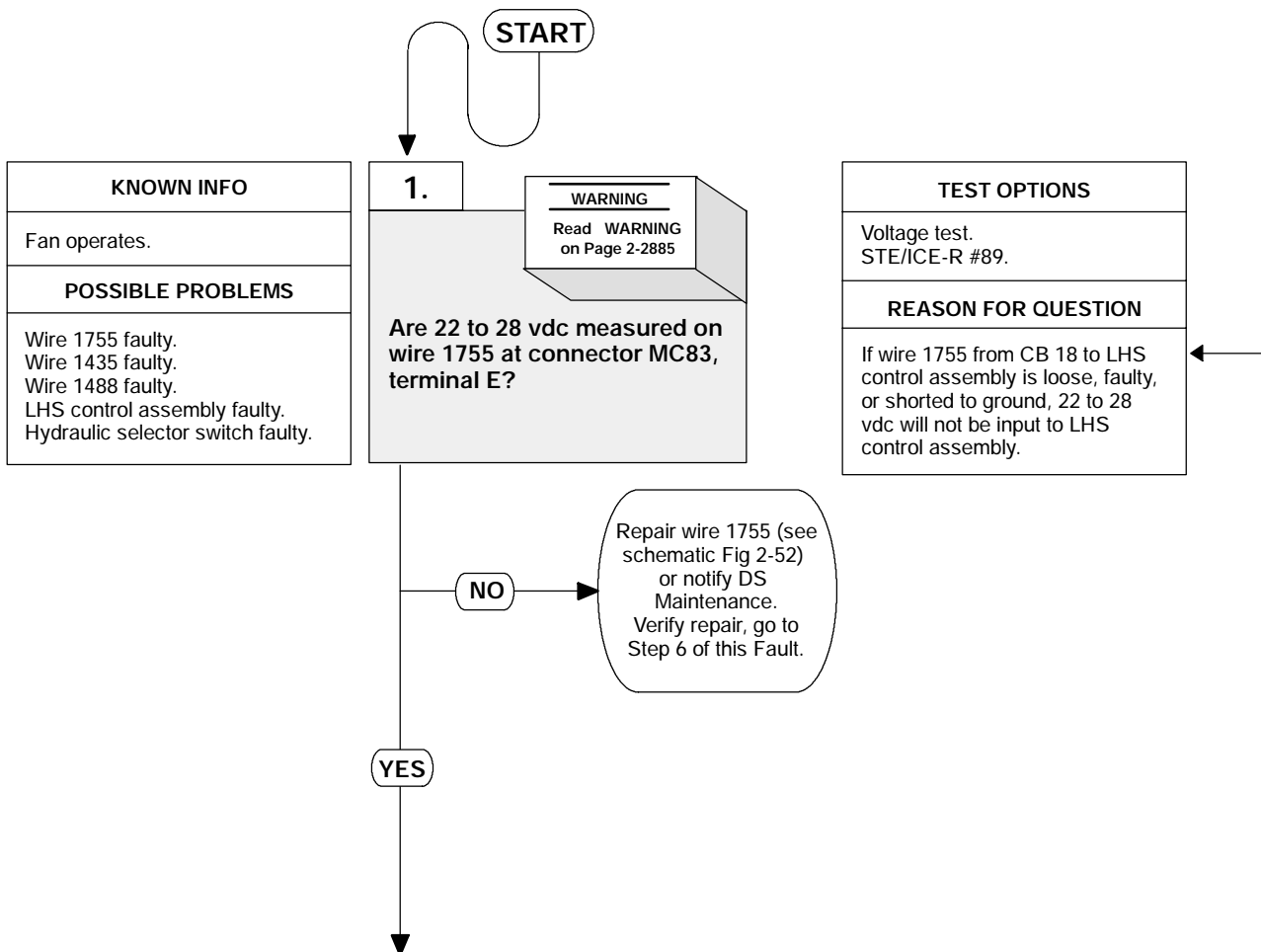
Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)

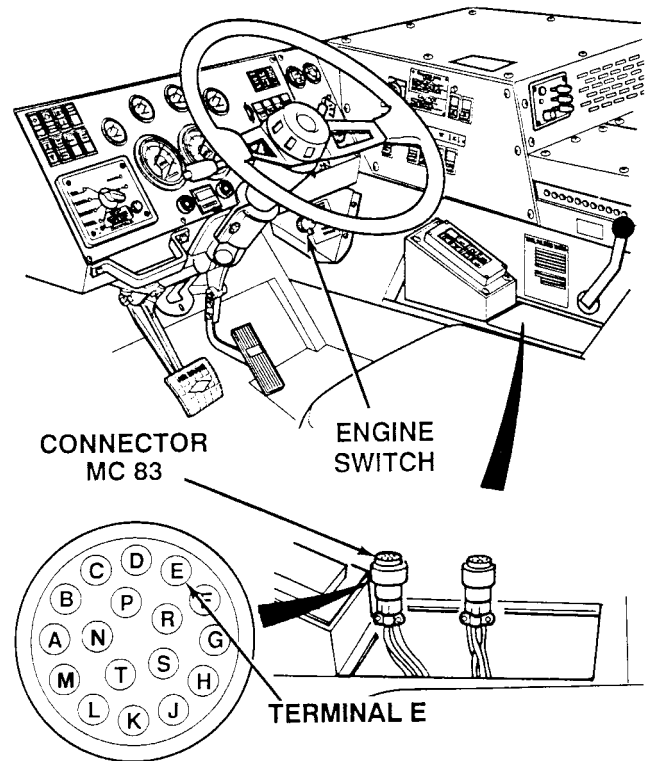
References

TM 9-2320-364-10
 TM 9-4910-571-12&P



WARNING

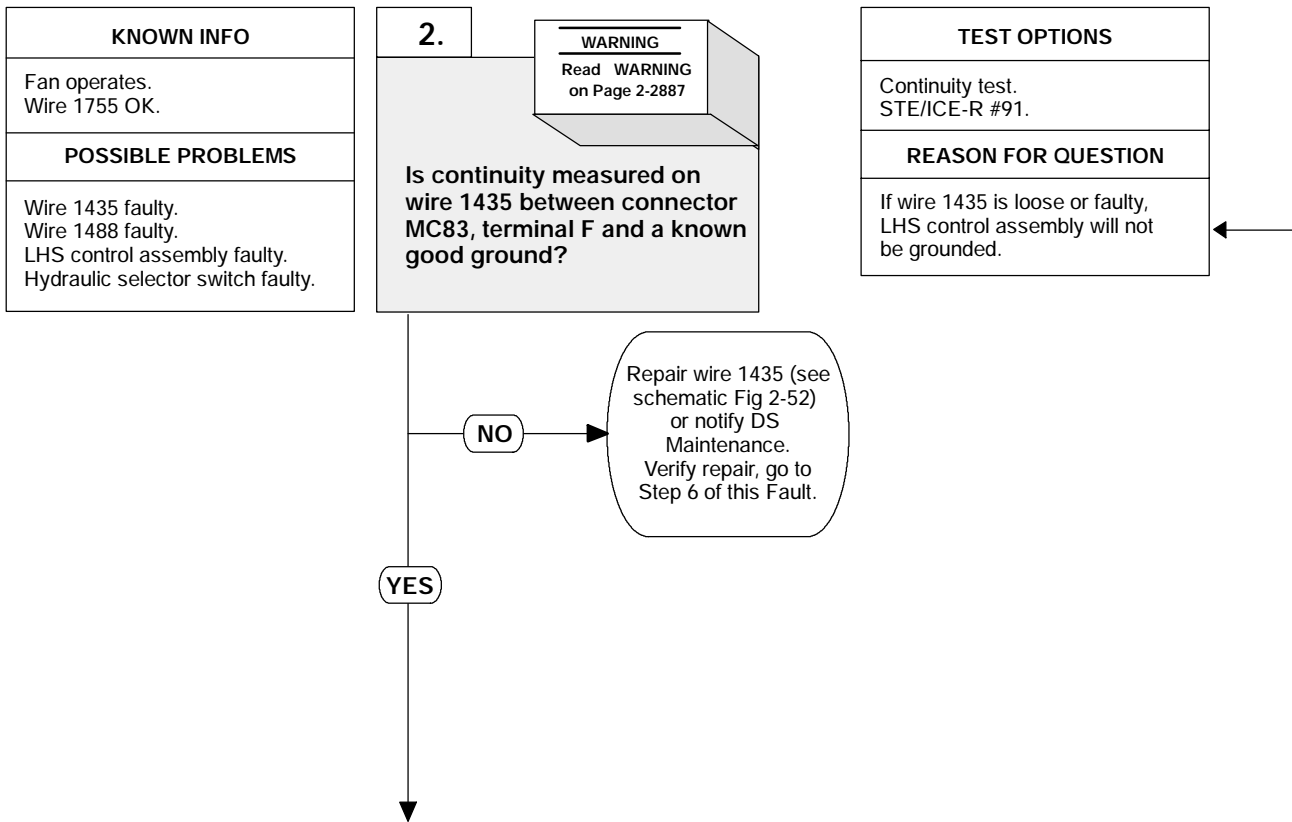
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment and injury or death to personnel may occur.



VOLTAGE TEST

- (1) Remove LHS control assembly (Para 7-40).
- (2) Set multimeter select switch to volts dc.
- (3) Connect positive (+) multimeter lead to wire 1755 on connector MC83, terminal E.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and repair wire 1755 (see schematic Fig 2-52) or notify DS Maintenance. Install LHS control assembly (Para 7-40).
 - (b) If 22 to 28 vdc are present, wire 1755 is OK.
- (6) Turn OFF ENGINE switch.

3. LHS, WINCH, AND CRANE DO NOT OPERATE (CONT).

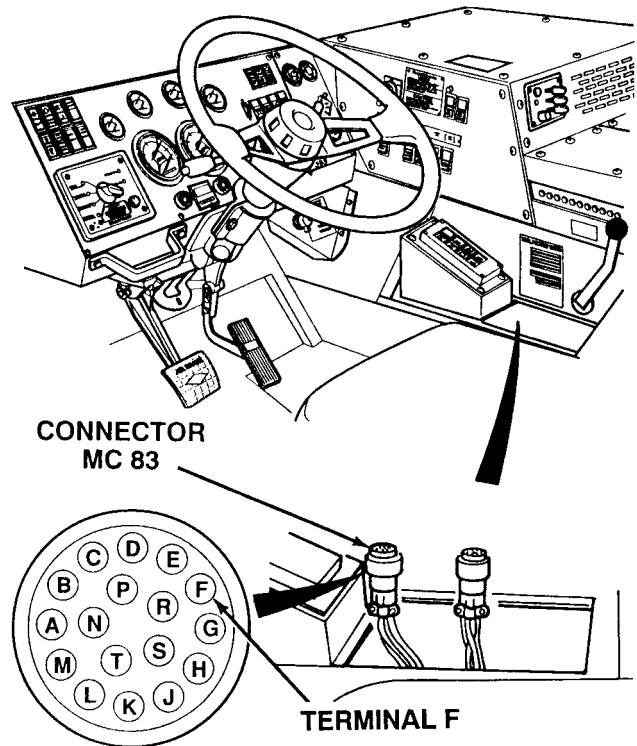


WARNING

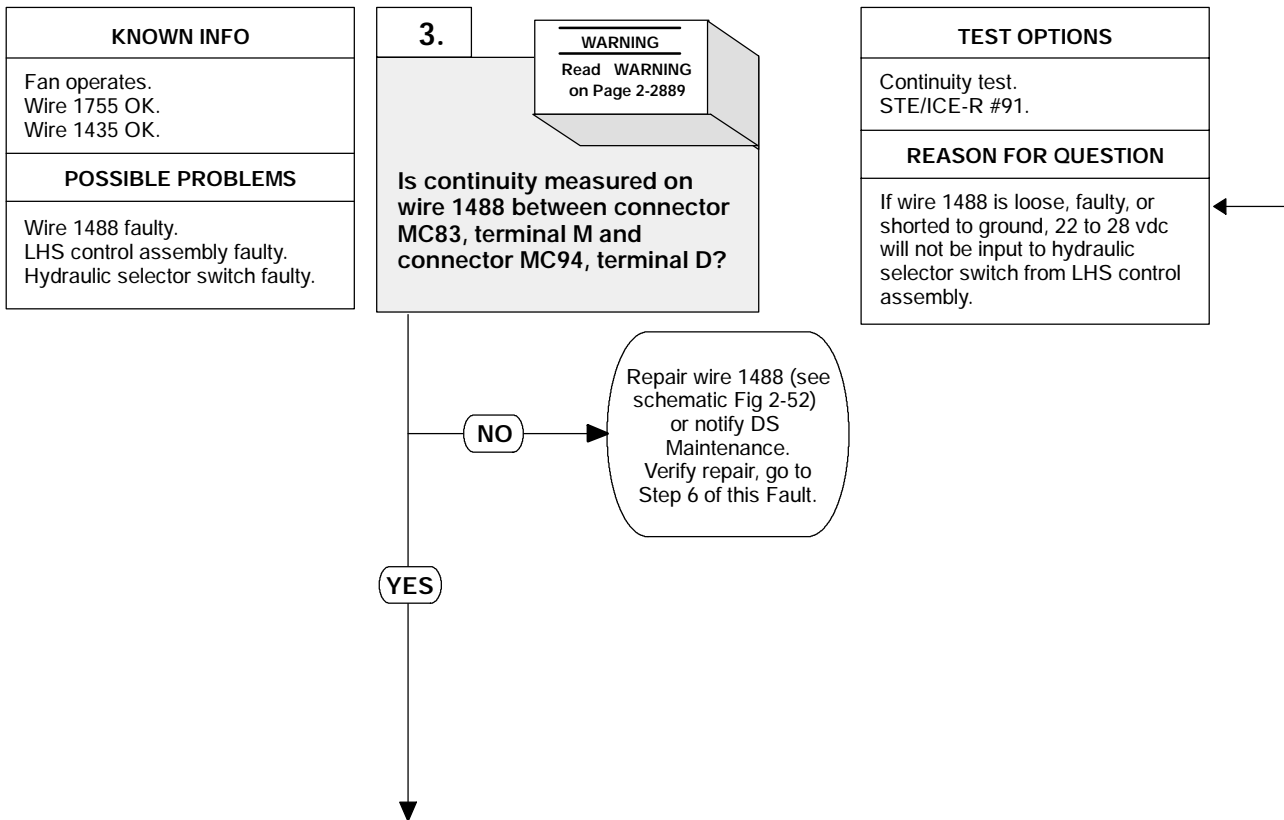
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity on wire 1435 between connector MC83, terminal F and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-52) or notify DS Maintenance.
 - (b) If there is continuity, wire 1435 is OK.



3. LHS, WINCH, AND CRANE DO NOT OPERATE (CONT).



WARNING

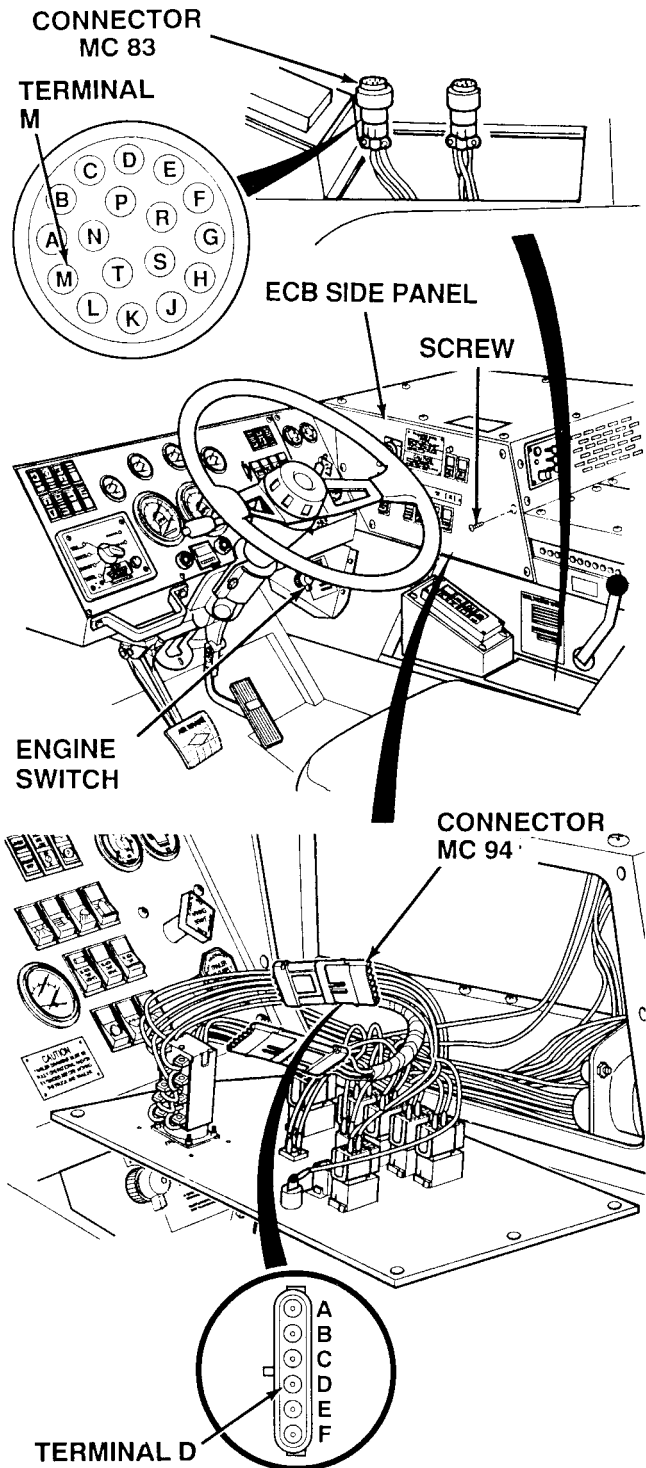
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

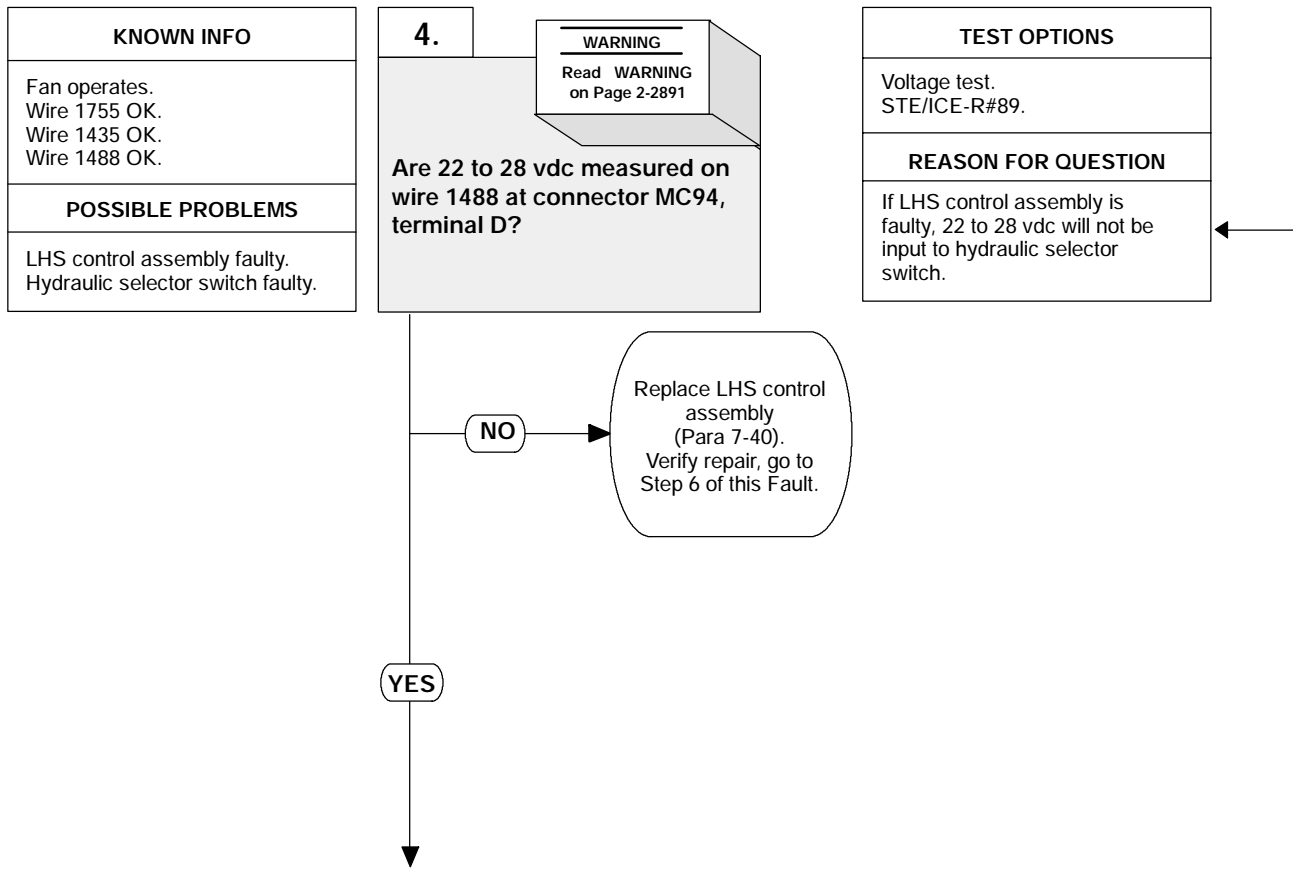
Connectors are removed by gently prying up on tabs.

CONTINUITY TEST

- (1) Remove six screws and ECB side panel.
- (2) Disconnect connector MC94 from hydraulic selector switch connector.
- (3) Is there continuity on wire 1488 between connector MC94, terminal D and connector MC83, terminal M?
 - (a) If there is no continuity, repair wire 1488 (see schematic Fig 2-52) or notify DS Maintenance. Perform Step (4) below.
 - (b) If there is continuity, wire 1488 is OK.
- (4) Install LHS control assembly (Para 7-40).



3. LHS, WINCH, AND CRANE DO NOT OPERATE (CONT.)

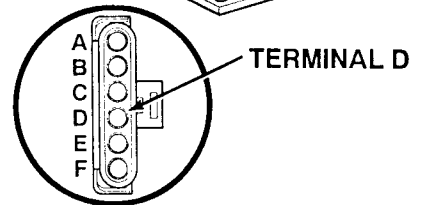
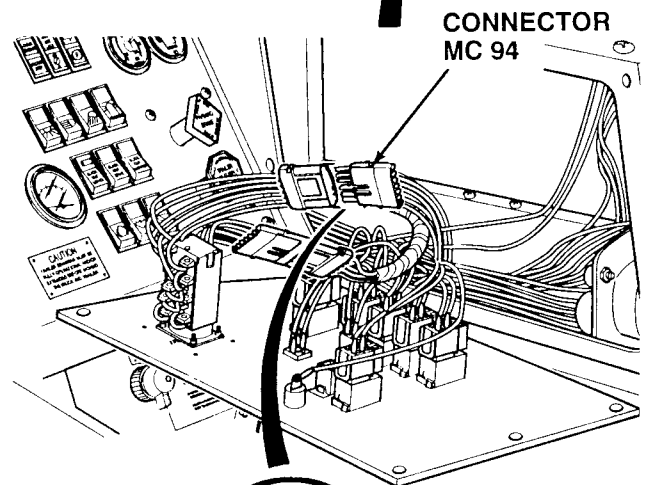
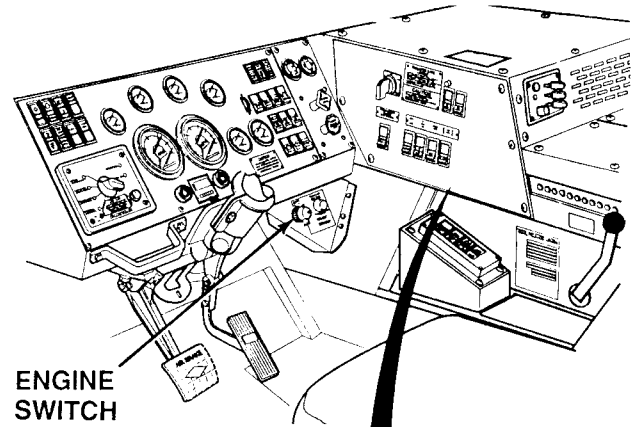


WARNING

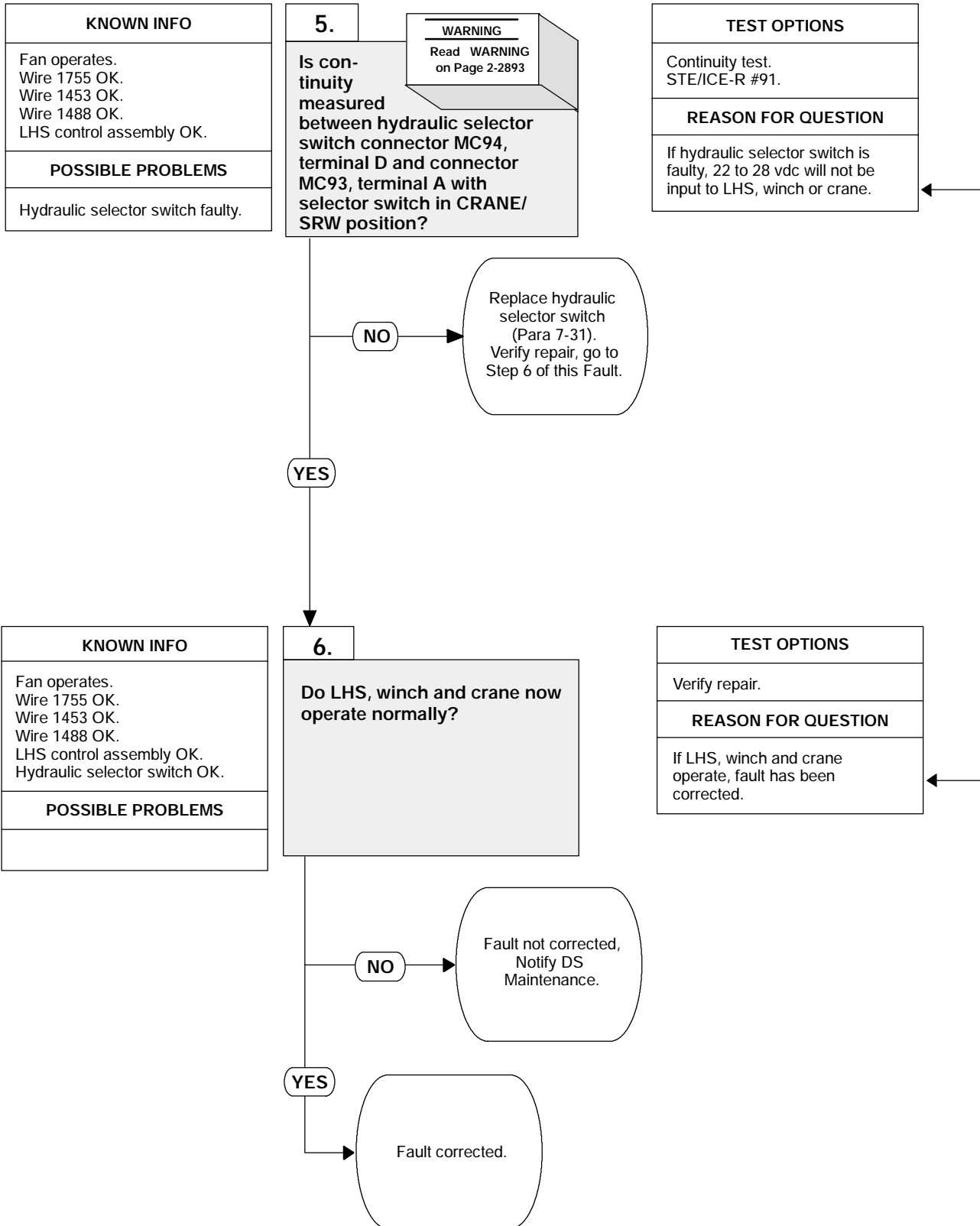
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Set multimeter select switch to volts dc.
- (2) Connect positive (+) multimeter lead to connector MC94, terminal D.
- (3) Connect negative (-) multimeter lead to a known good ground.
- (4) Turn ON ENGINE switch
 - (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and replace LHS control assembly (Para 7-40).
 - (b) If 22 to 28 vdc are present, LHS control assembly is OK.
- (5) Turn OFF ENGINE switch.



3. LHS, WINCH, AND CRANE DO NOT OPERATE (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

NOTE

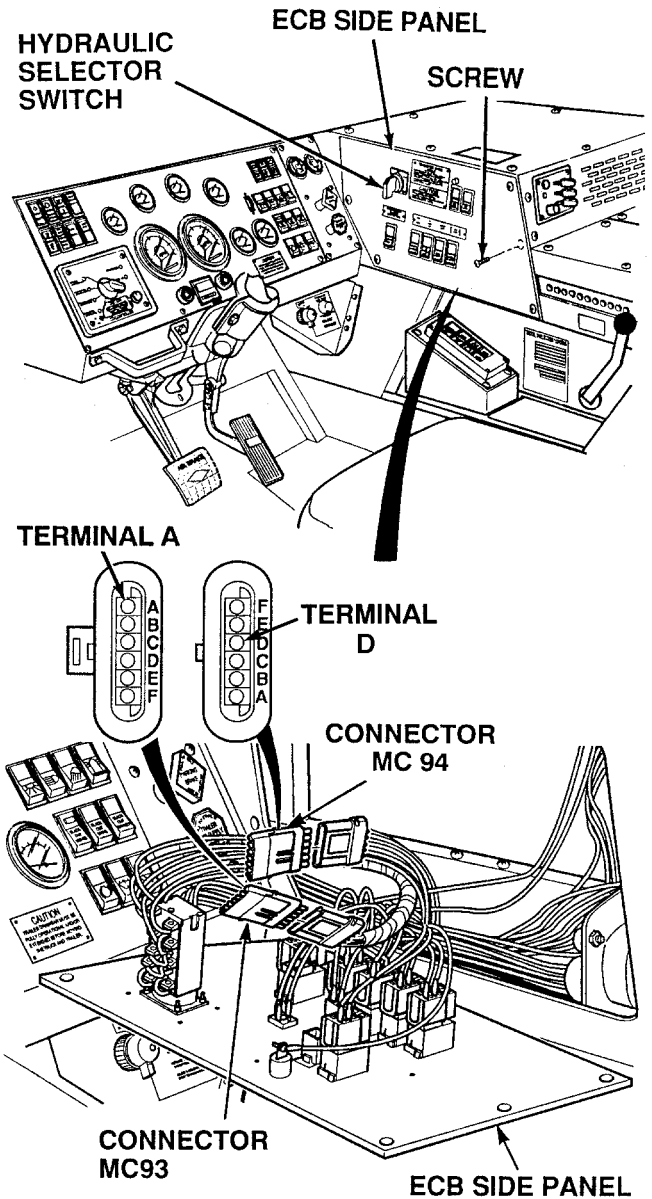
Connectors are removed by gently prying up on tabs.

CONTINUITY TEST

- (1) Disconnect connector MC93 from hydraulic selector switch connector.
- (2) Set hydraulic selector switch to WINCH/CRANE position (TM 9-2320-364-10).
- (3) Set multimeter select switch to ohms.
- (4) Is there continuity between MC94, terminal D and MC93, terminal A switch connectors?
 - (a) If there is no continuity, replace hydraulic selector switch (Para 7-31).
 - (b) If there is continuity, hydraulic selector switch is OK.
- (5) Set hydraulic selector switch to OFF position and perform Step (6) below.
- (6) Connect connectors MC94 and MC93 to hydraulic selector switch connectors.
- (7) Install ECB side cover with six screws.

VERIFY REPAIR

- (1) Operate LHS, winch and crane (TM 9-2320-364-10).
 - (a) If LHS, winch, and crane do not operate, fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If LHS, winch, and crane operate, fault has been corrected.
- (2) Turn OFF ENGINE switch.



2-31. HYDRAULIC SYSTEM TROUBLESHOOTING (CONT).

4. FAN, LHS, WINCH AND CRANE DO NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

Materials/Parts

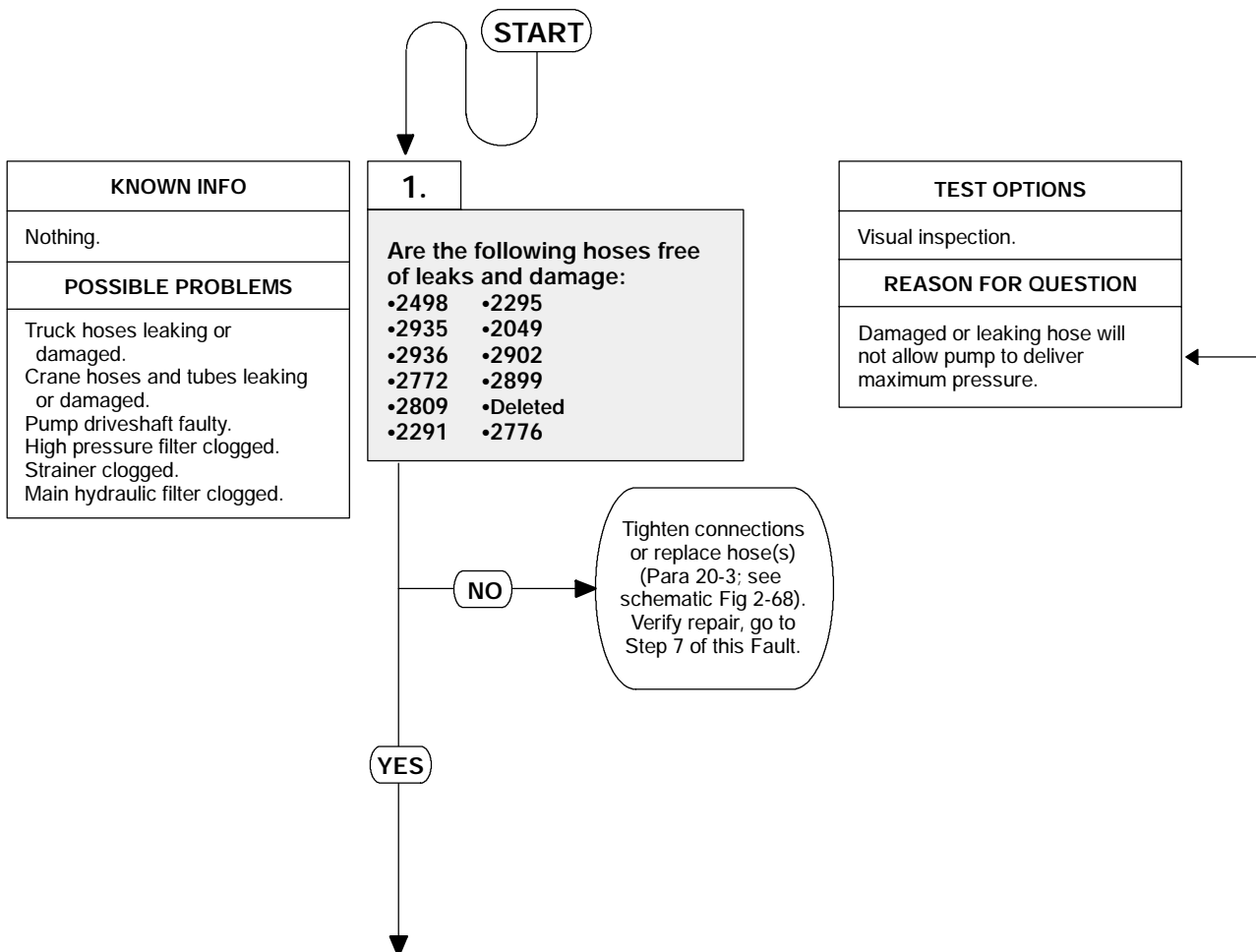
Lockwashers (22) (Item 195, Appendix F)

References

TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)



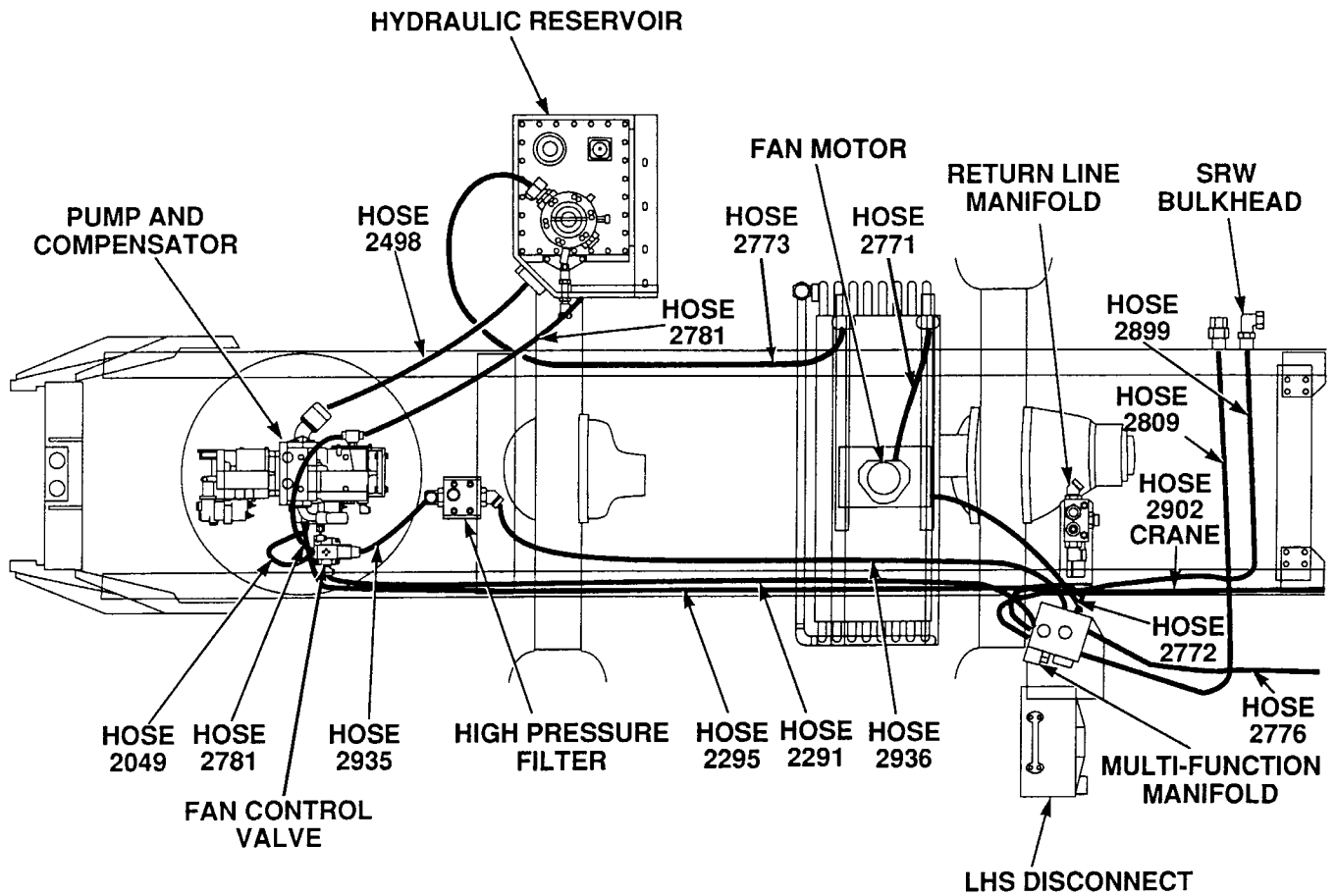
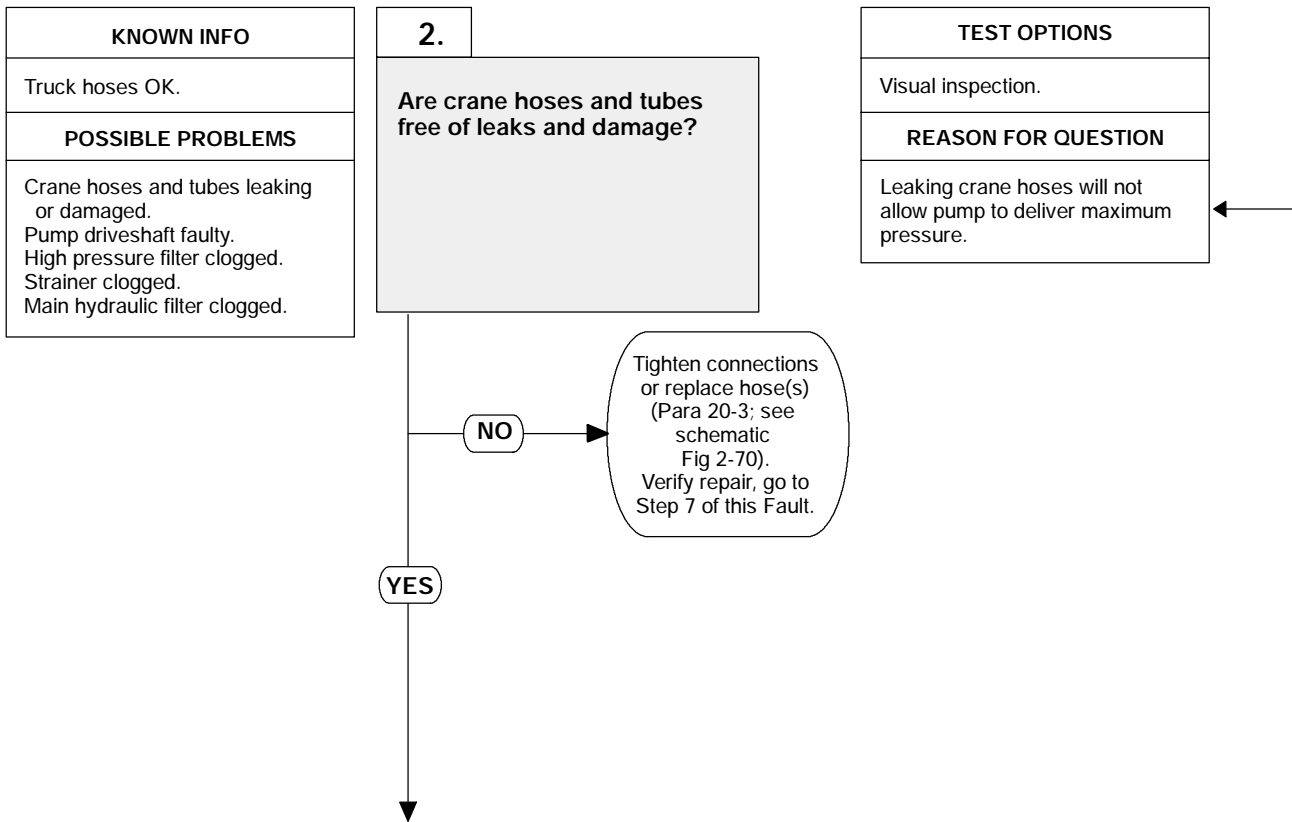


Table 2-57. Hydraulic System Hoses

VISUAL INSPECTION
Check hoses and fittings listed in Table 2-57 for leaks and/or damage.
(1) If hoses and/or fittings leak, tighten fittings or replace hoses (Para 20-3).
(2) If hoses and fittings are free from damage, go to Step 2 of this Fault.

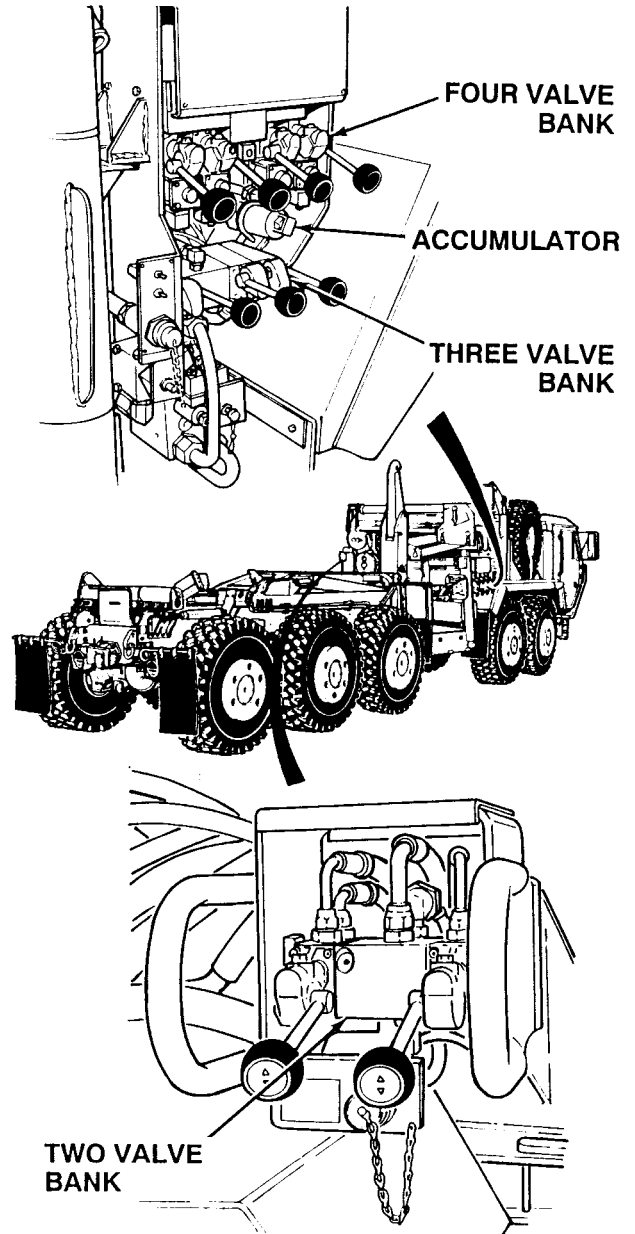
HOSE NO.	FROM	TO
2498	Hydraulic reservoir	Hydraulic pump
2935	Hydraulic pump	High pressure filter
2936	High pressure filter	Multifunction manifold
2772	Multifunction manifold	Fan motor
2899	Multifunction manifold	Self recovery winch
2902	Multifunction manifold	Crane
2291	Multifunction manifold	Fan control solenoid valve
2295	Multifunction manifold	Pump control
2049	Pump control	Pump drain
2776	Multifunction manifold	Crane
2809	Multifunction manifold	Self recovery winch

4. FAN, LHS, WINCH AND CRANE DO NOT OPERATE (CONT).

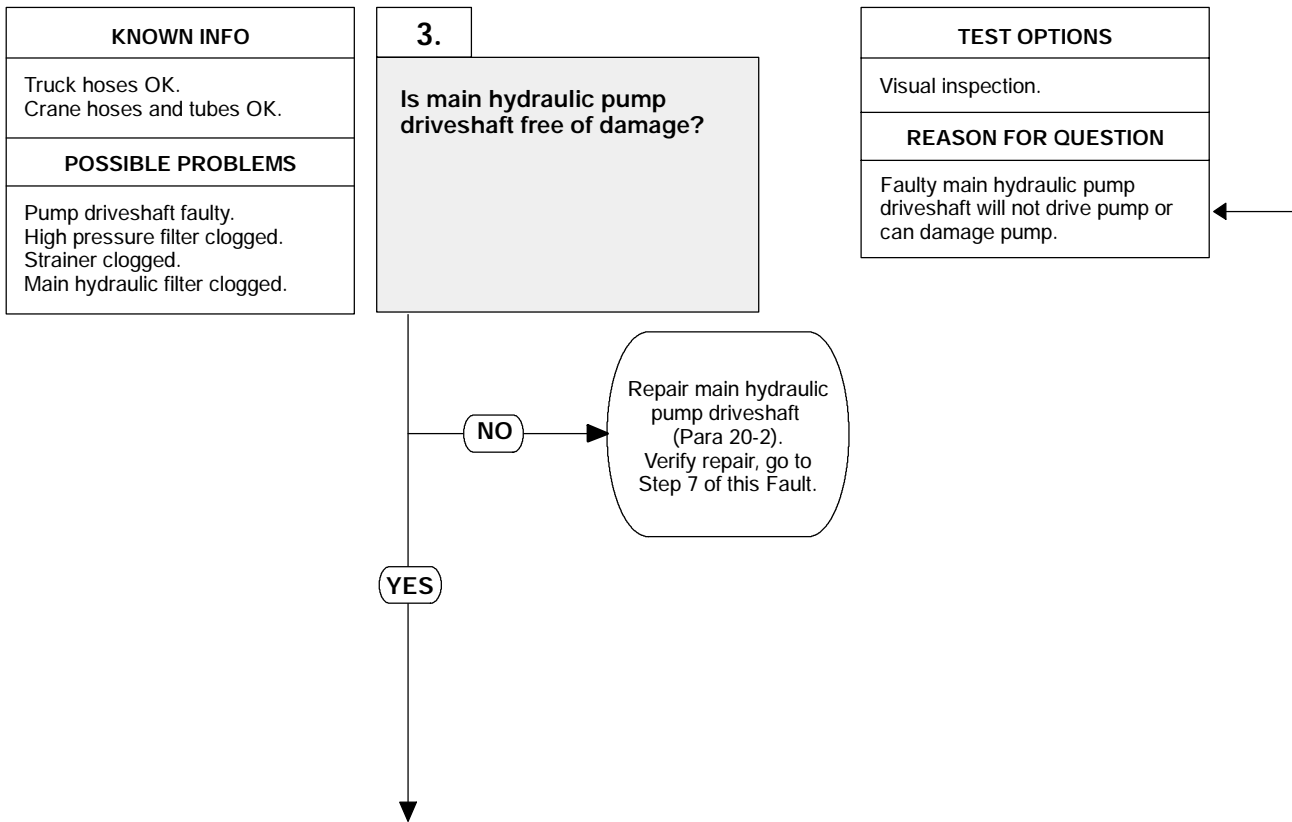


VISUAL INSPECTION

- Inspect the following crane hoses and tubes (see schematic Fig 2-70):
- tube from hose 2902 to main hydraulic pressure valve.
 - hose from four valve bank to accumulator.
 - load sensing hose from hose 2776 to four valve bank.
 - load sensing hose from four valve bank to two valve bank.
 - load sensing hose from four valve bank to three valve bank.
- (1) If hose or tube is leaking, tighten connection or replace hose or tube (Para 20-3; see schematic Fig 2-70).
 - (2) If hoses and tubes are OK, go to Step 3 of this Fault.

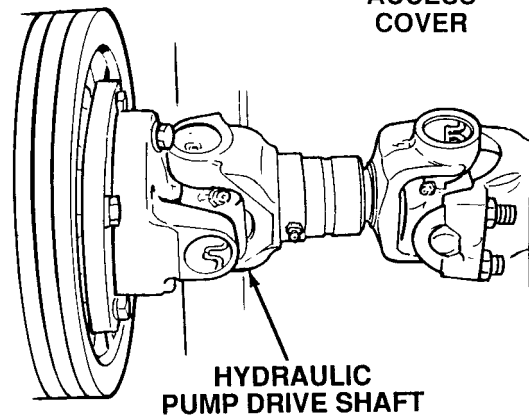
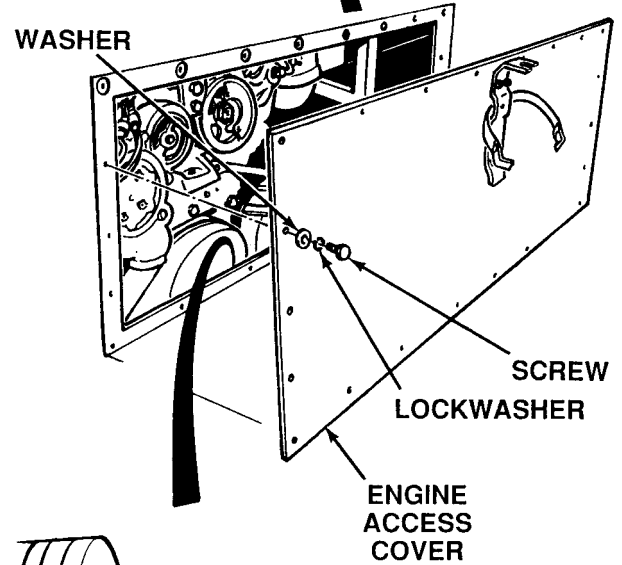
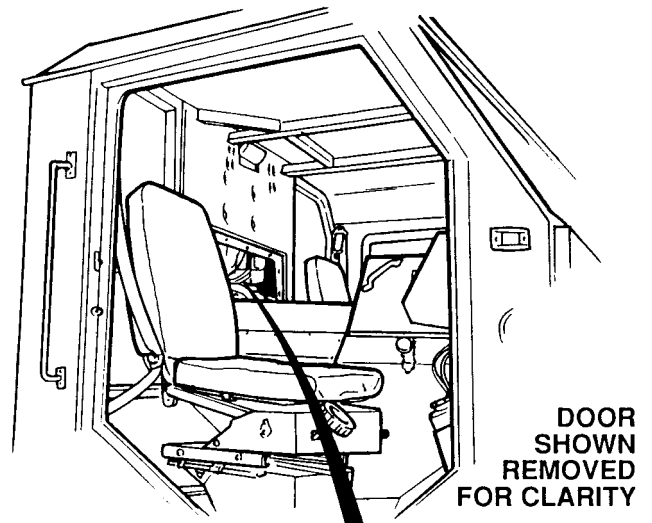


4. FAN, LHS, WINCH AND CRANE DO NOT OPERATE (CONT).

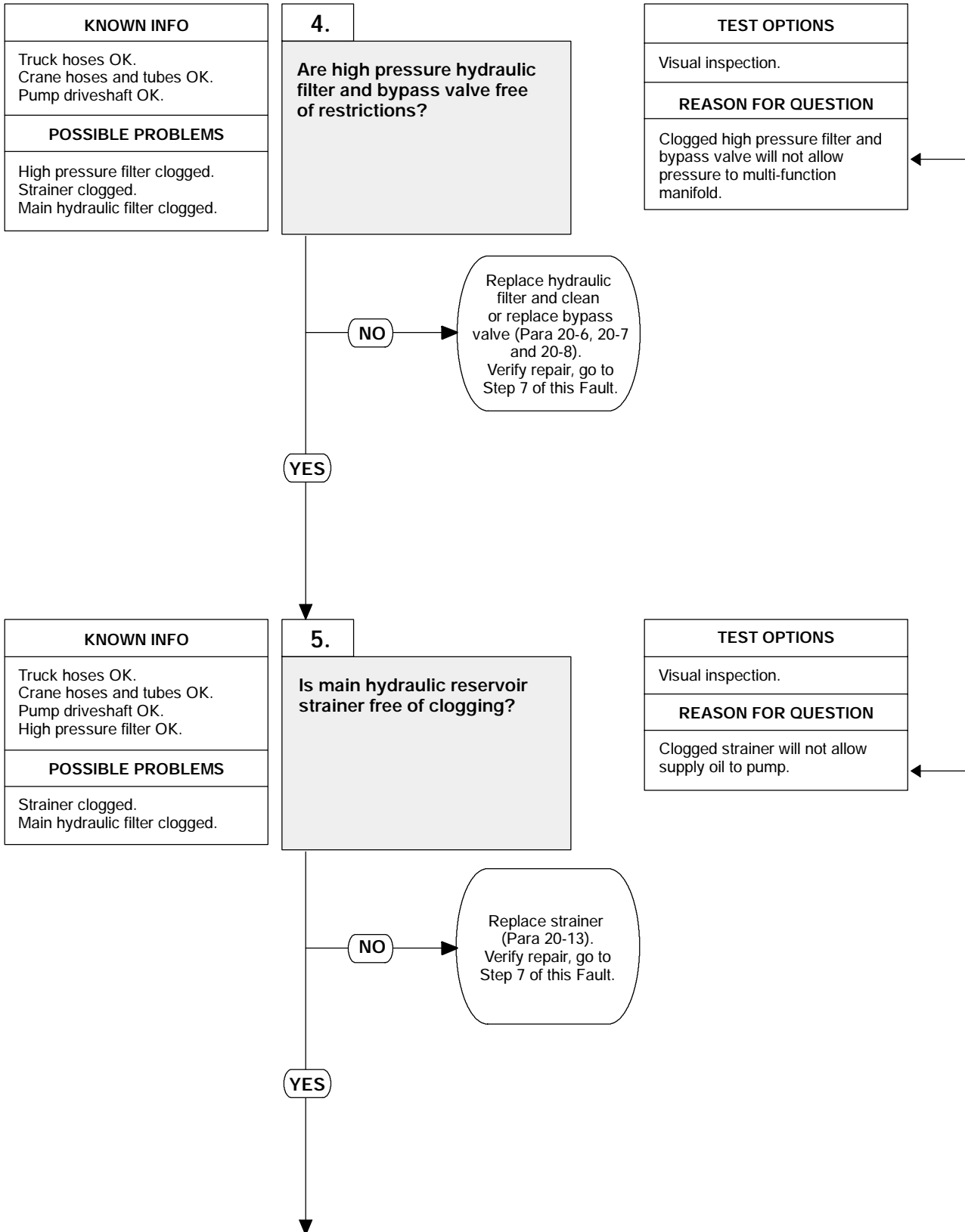


VISUAL INSPECTION

- (1) Remove 22 screws, lockwashers and washers and engine access cover. Discard lockwashers.
- (2) Inspect main hydraulic pump driveshaft for damage.
 - (a) If driveshaft is damaged, repair driveshaft (Para 20-2).
 - (b) If driveshaft is not damaged, go to Step 4 of this Fault.
- (3) Install engine access cover with 22 screws, lockwashers and washers.

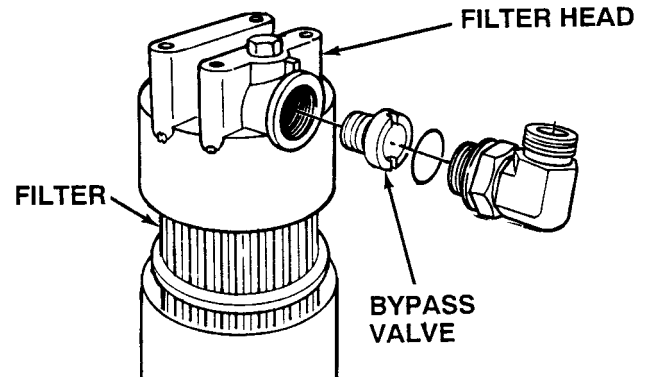


4. FAN, LHS, WINCH AND CRANE DO NOT OPERATE (CONT).



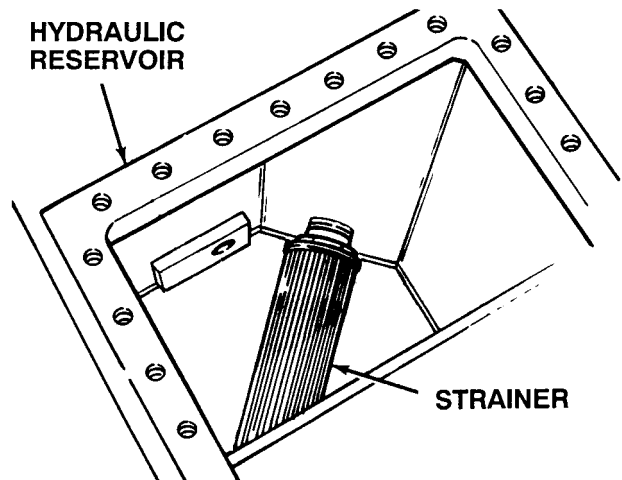
VISUAL INSPECTION

- (1) Remove high pressure hydraulic filter (Para 20-6).
- (2) Remove high pressure hydraulic filter head from truck (Para 20-7).
- (3) Remove bypass valve from head (Para 20-8).
 - (a) If filter is clogged, replace filter.
 - (b) If bypass valve is clogged, clean or replace bypass valve.
 - (c) If filter and bypass valve are not clogged, perform Steps (4) through (6) below and go to Step 5 of this Fault.
- (4) Assemble high pressure filter head (Para 20-8).
- (5) Install high pressure hydraulic filter head on truck (Para 20-7).
- (6) Install high pressure filter (Para 20-6).

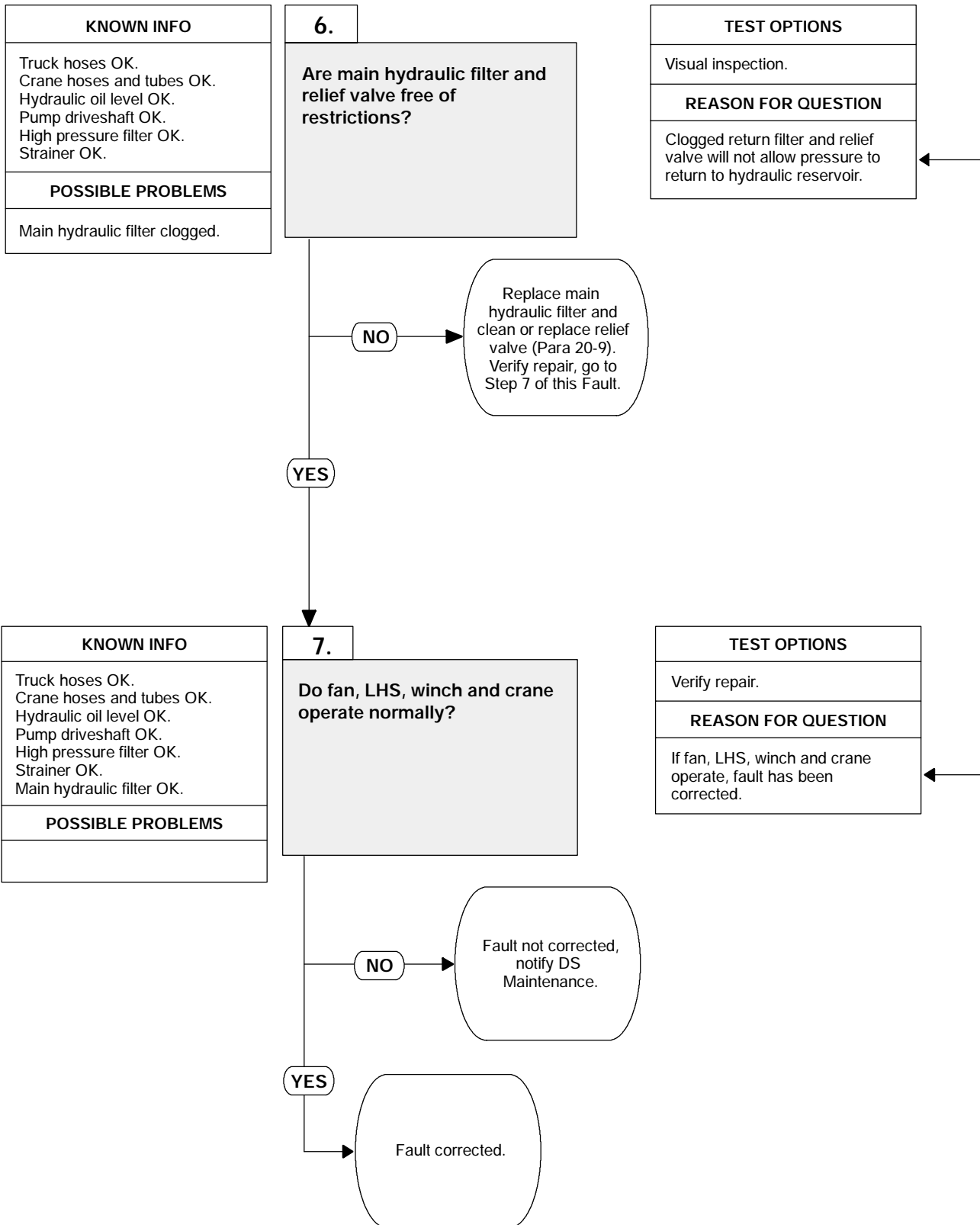


VISUAL INSPECTION

- (1) Remove strainer from hydraulic reservoir (Para 20-13).
- (2) Inspect strainer for contaminants clogging strainer.
 - (a) If strainer is clogged, replace strainer (Para 20-13).
 - (b) If strainer is not clogged, perform Step (3) below.
- (3) Install strainer in hydraulic reservoir (Para 20-13).

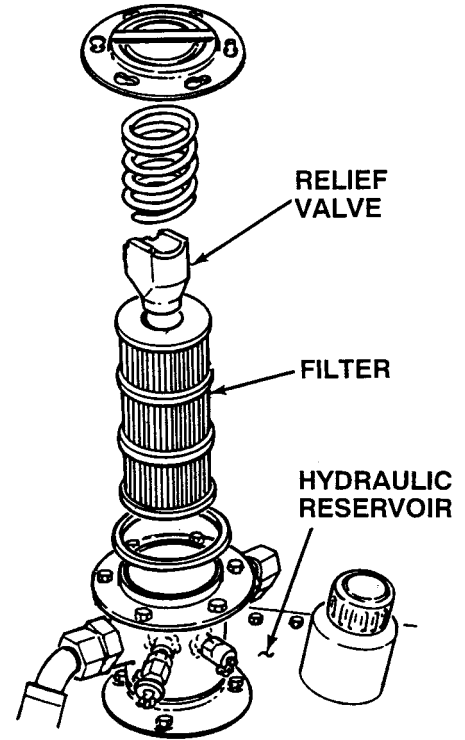


4. FAN, LHS, WINCH AND CRANE DO NOT OPERATE (CONT).



VISUAL INSPECTION

- (1) Remove main hydraulic filter from hydraulic reservoir (Para 20-9).
- (2) Inspect filter and relief valve for excessive contaminants clogging filter and relief valve.
 - (a) If filter is clogged, replace filter.
 - (b) If relief valve is clogged, clean or replace relief valve.
 - (c) If filter and relief valve are not clogged with debris, perform Step (3) below.
- (3) Install main hydraulic filter in hydraulic reservoir (Para 20-9).



VERIFY REPAIR

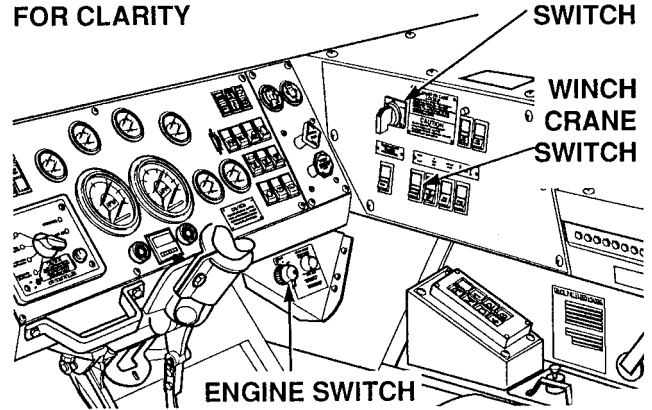
- (1) Operate fan, LHS, winch and crane (TM 9-2320-364-10).
 - (a) If fan, LHS, winch, and crane do not operate, fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If fan, LHS, winch and crane operate, fault has been corrected.
- (2) Turn OFF ENGINE switch.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

**HYDRAULIC
SELECTOR
SWITCH**

**WINCH
CRANE
SWITCH**

ENGINE SWITCH



2-31. HYDRAULIC SYSTEM TROUBLESHOOTING (CONT).

5. FAN DOES NOT OPERATE.

INITIAL SETUP

Tools and Special Tools

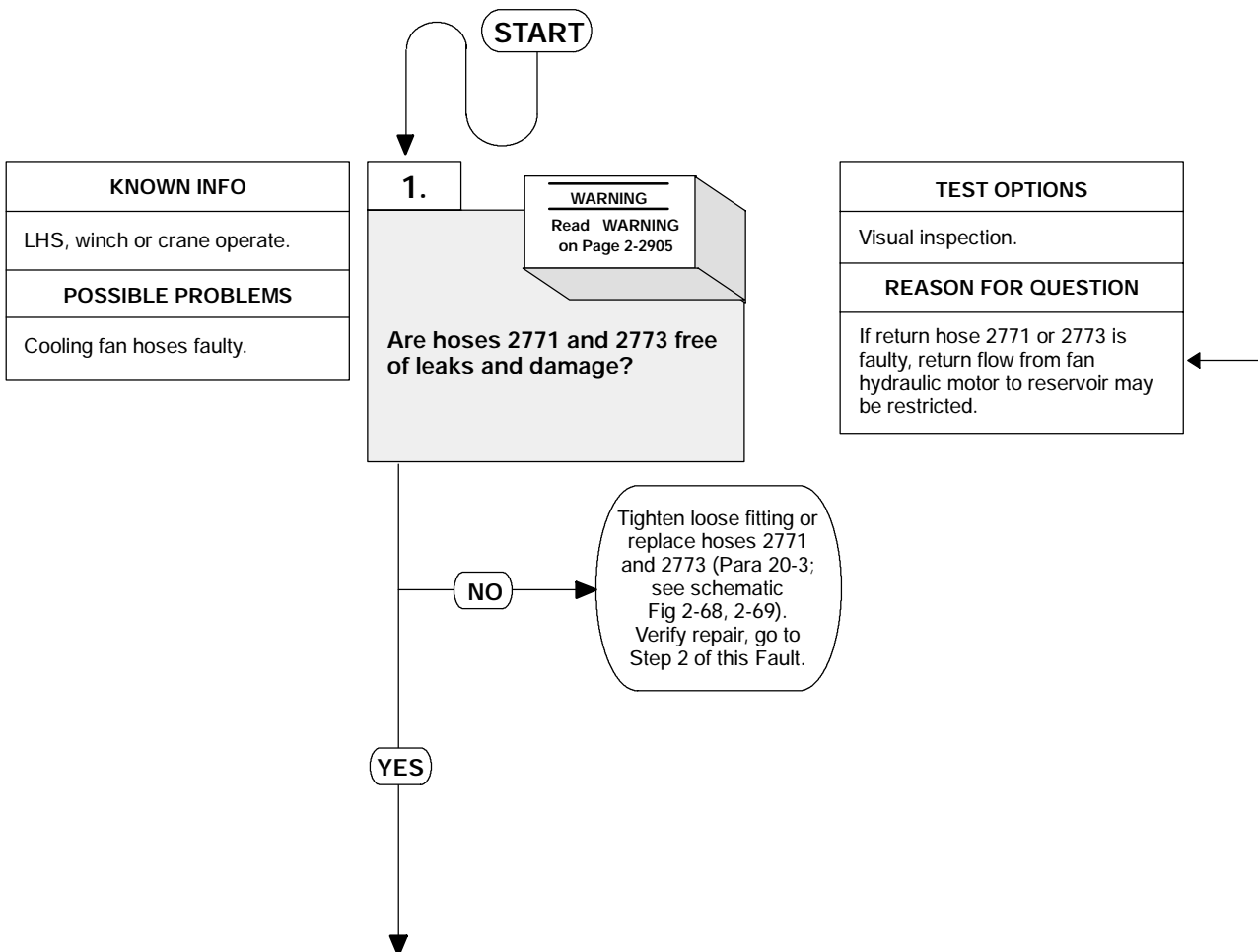
Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

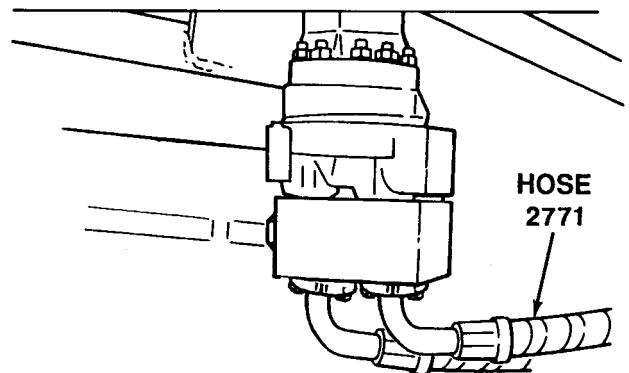
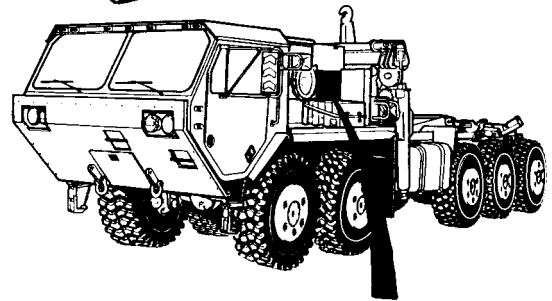
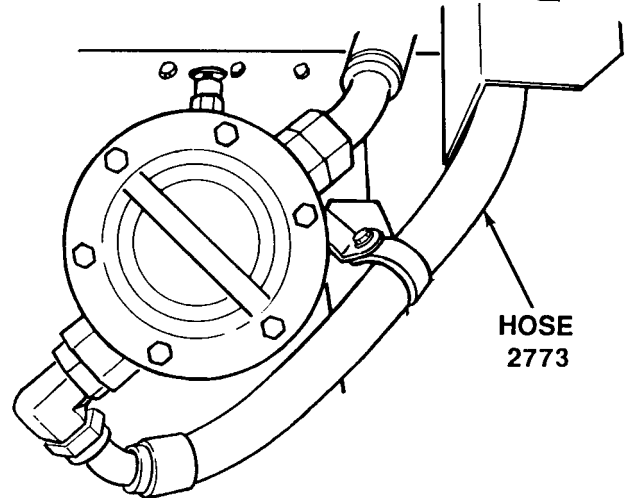
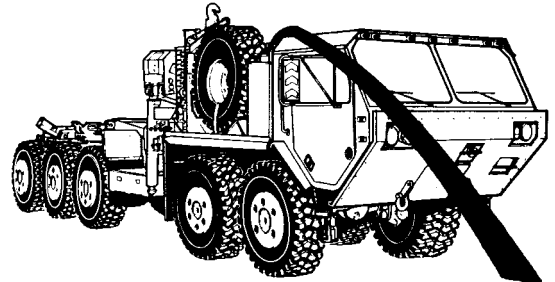
References

TM 9-2320-364-10

Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)
Right and left side noise panels removed,
(Para 17-26 and 17-28)



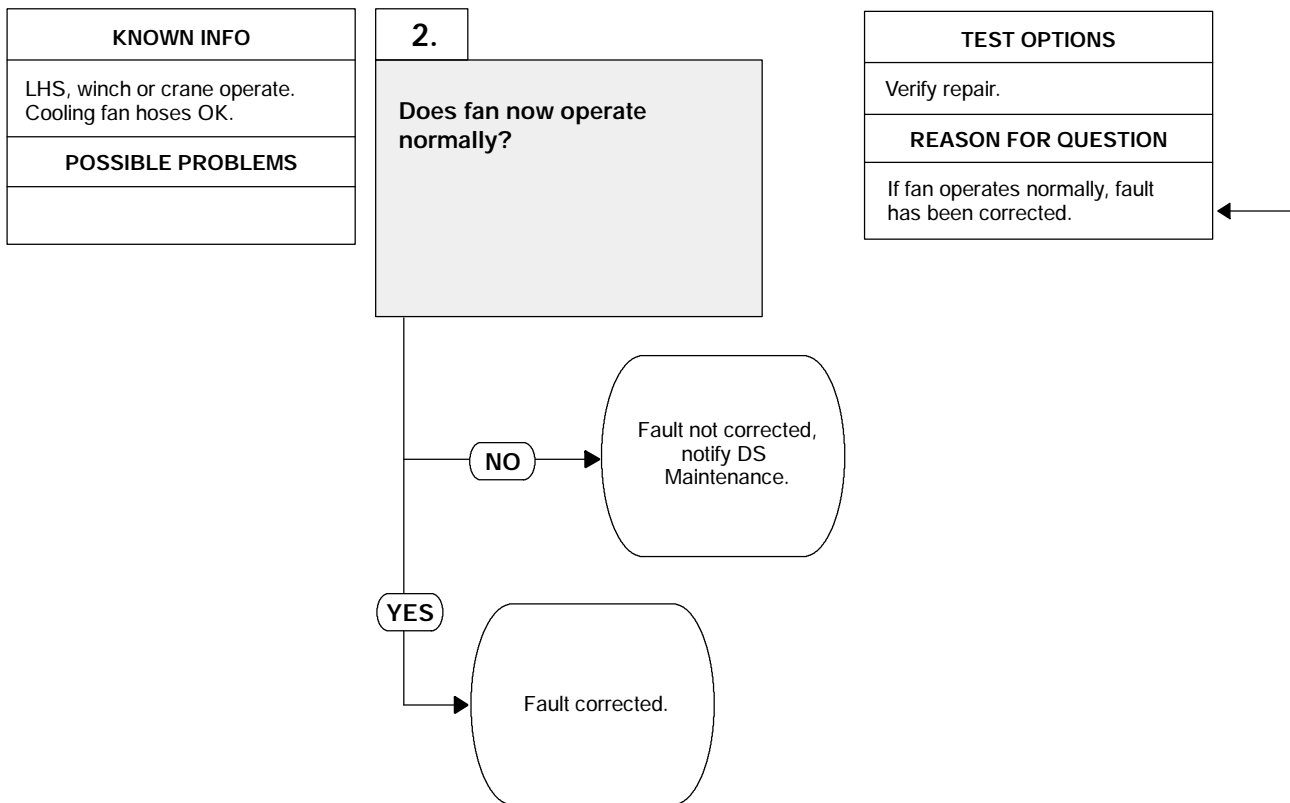


WARNING

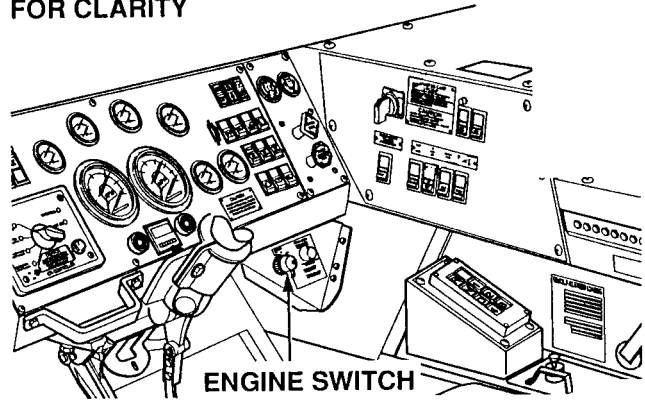
Keep hands and arms away from fan blade and drive while engine is running, or serious injury to personnel will result.

VISUAL INSPECTION	
(1)	Inspect hose 2771 from fan motor to cooler in cooling system module for leaks and damage. <ul style="list-style-type: none"> (a) If hose is leaking or damaged, tighten loose fittings or replace hose (Para 20-3; see schematic Fig 2-68, 2-69). (b) If hose is OK, go to Step (2) below.
(2)	Inspect hose 2773 from cooling system module to hydraulic reservoir for leaks and damage. <ul style="list-style-type: none"> (a) If hose is leaking or damaged, tighten loose fittings or replace hose (Para 20-3; see schematic Fig 2-68 and 2-69). (b) If hose is OK, go to Step 2 of this Fault.
(3)	Install left and right side noise panels (Para 17-26 and 17-28).

5. FAN DOES NOT OPERATE (CONT).

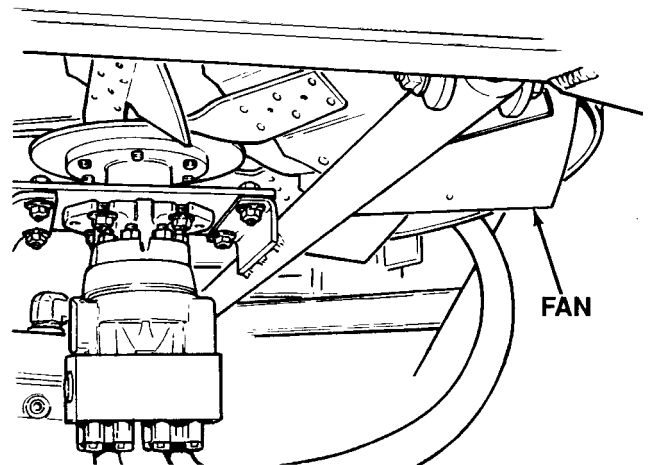
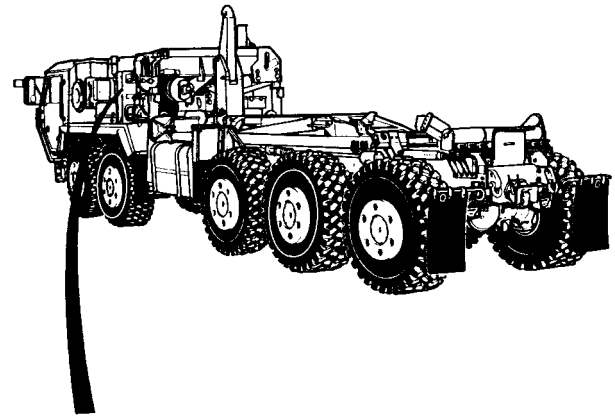


**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
 - (a) If fan does not operate, fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If fan operates, fault has been corrected.
- (2) Turn OFF ENGINE switch.



2-31. HYDRAULIC SYSTEM TROUBLESHOOTING (CONT).

6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
 (Item 74, Appendix G)
 STE/ICE-R (optional) (Item 3, Appendix G)
 Multimeter (Item 44, Appendix G)

Materials/Parts

Adhesive (Item 8, Appendix C)
 Lockwasher (22) (Item 157, Appendix F)

Personnel Required

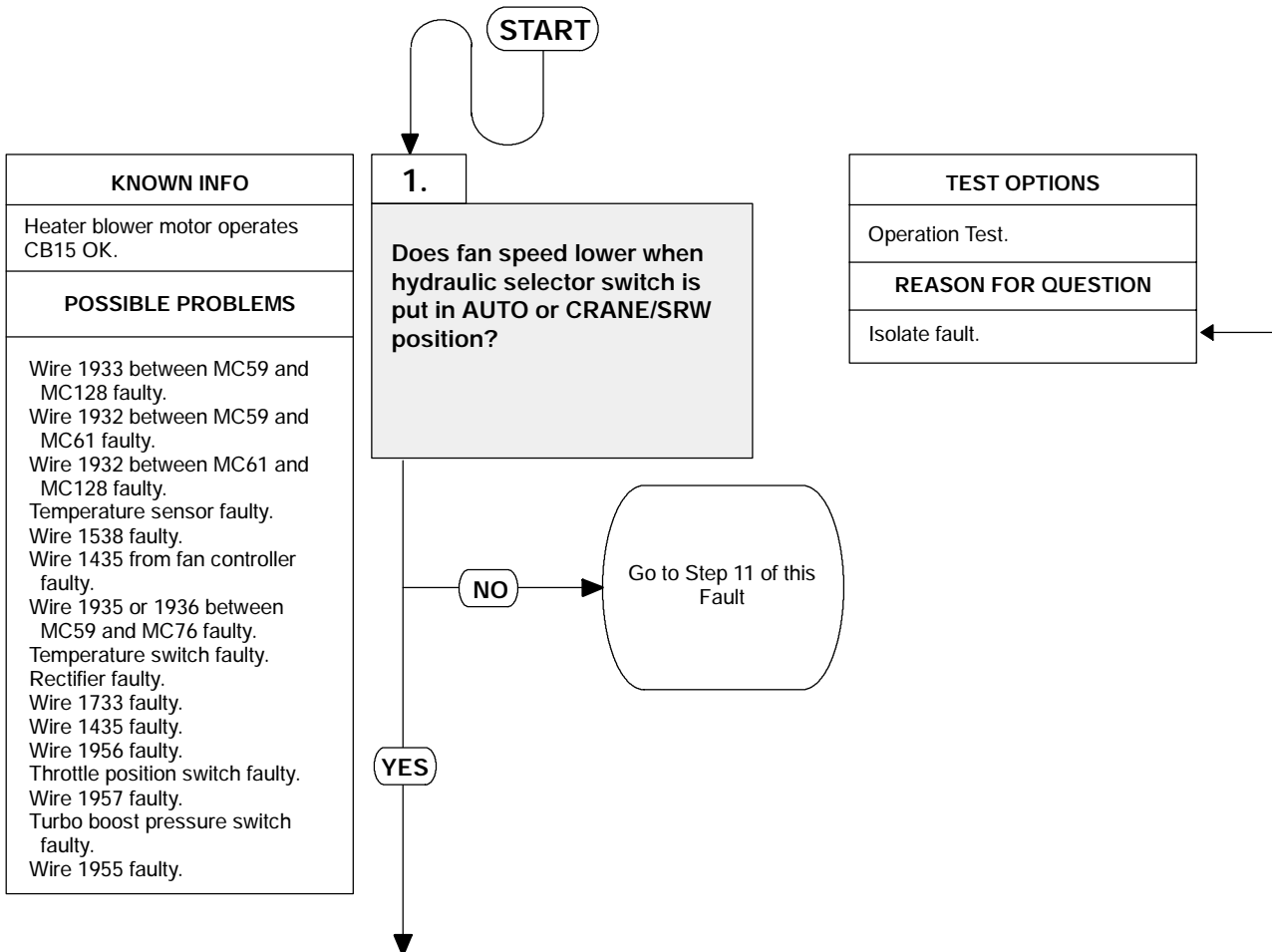
Two

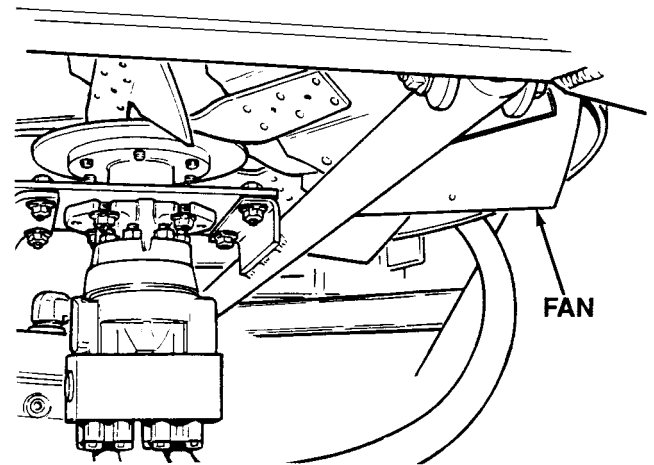
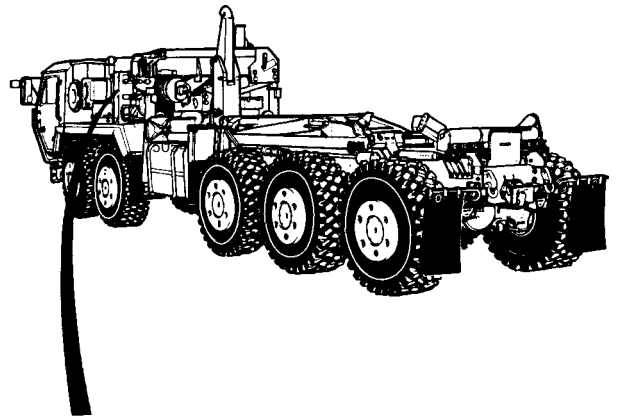
References

TM 9-2320-364-10
 TM 9-4910-571-12&P

Equipment Condition

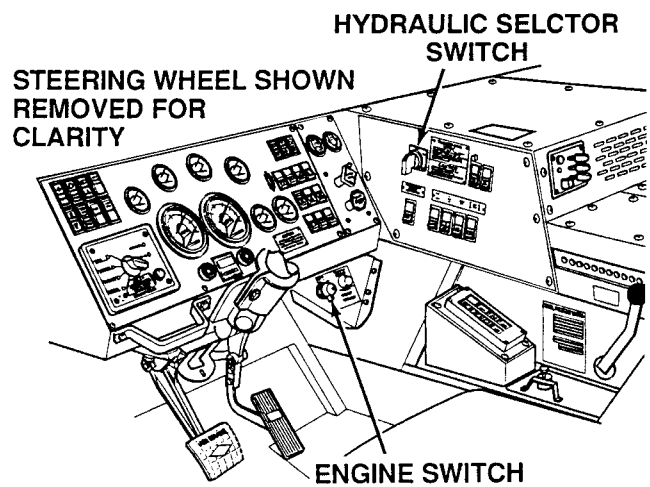
Engine OFF, (TM 9-2320-364-10)
 Parking brake applied, (TM 9-2320-364-10)
 Wheels chocked, (TM 9-2320-364-10)



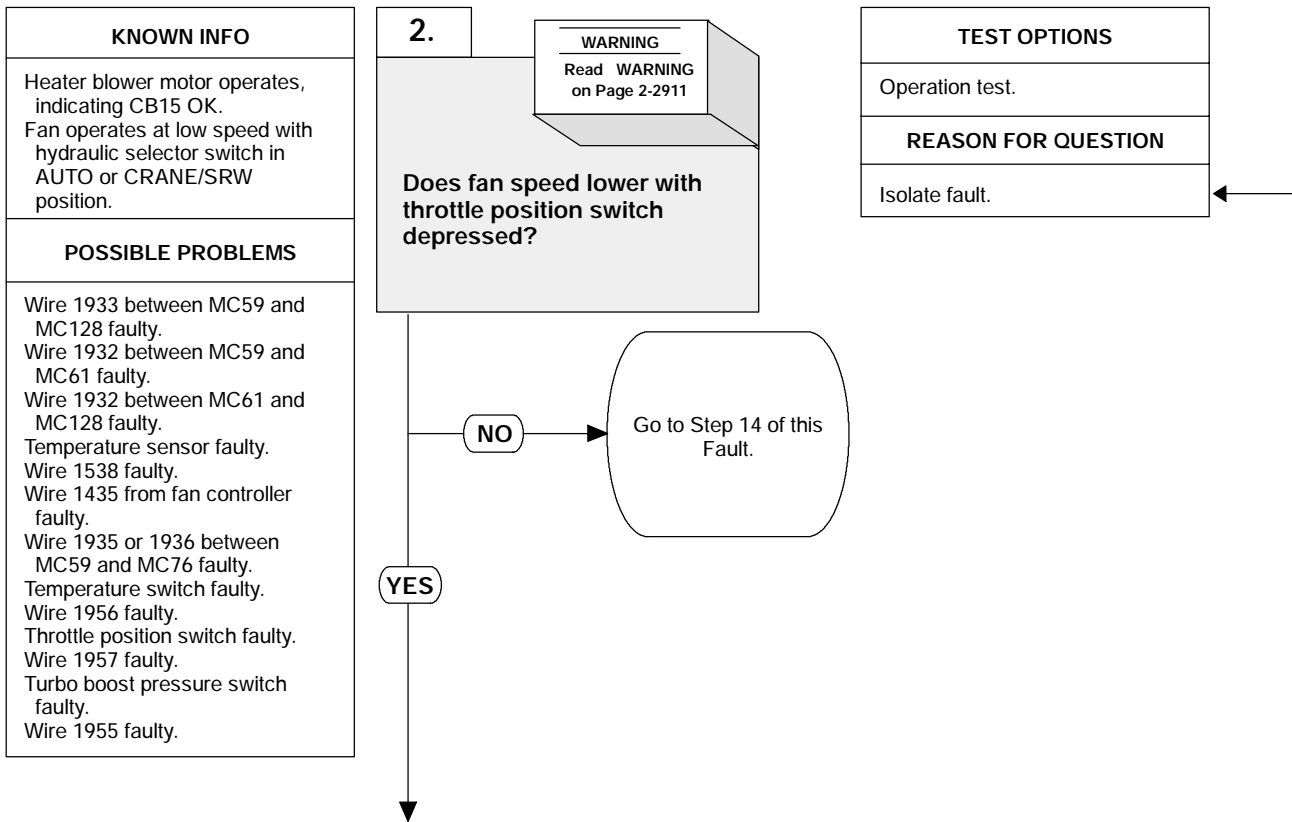


OPERATION TEST

- (1) Start engine (TM 9-2320-364-10).
- (2) With the aid of an assistant, observe fan operation while setting hydraulic selector switch to AUTO or CRANE/SRW position.
 - (a) If fan does not slow, perform Steps (3) and (4) below and go to Step 11 of this Fault.
 - (b) If fan speed does slow, perform Steps (3) and (4) below and go to Step 2 of this Fault.
- (3) Set hydraulic selector switch to OFF position.
- (4) Turn OFF ENGINE switch.



6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).

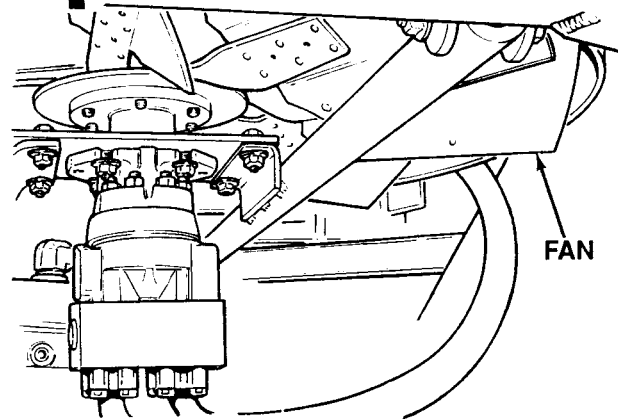
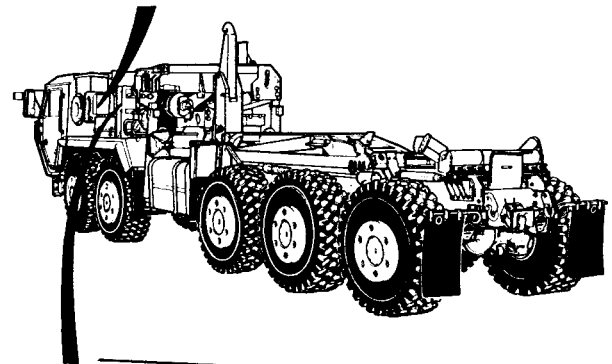
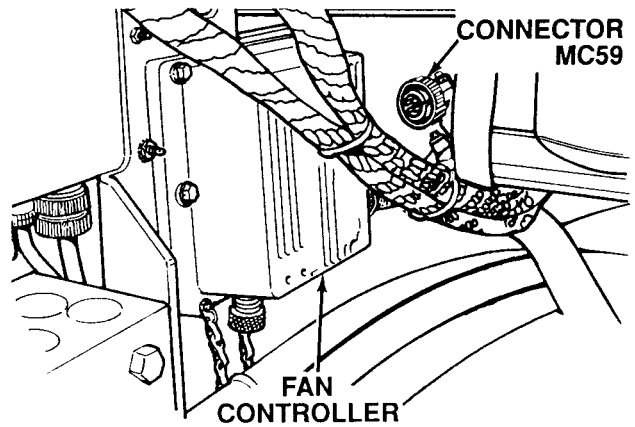


WARNING

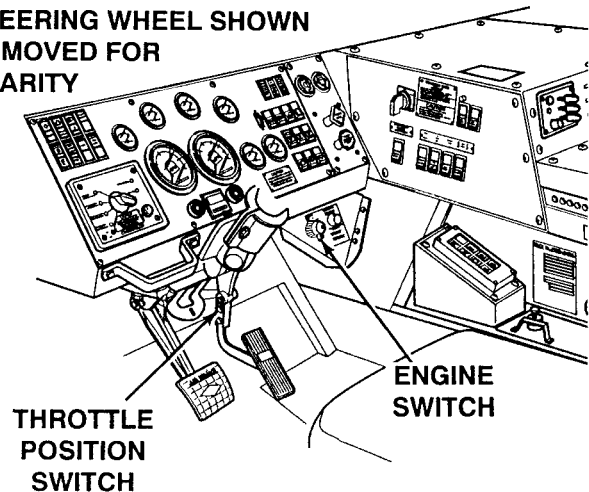
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

OPERATION TEST

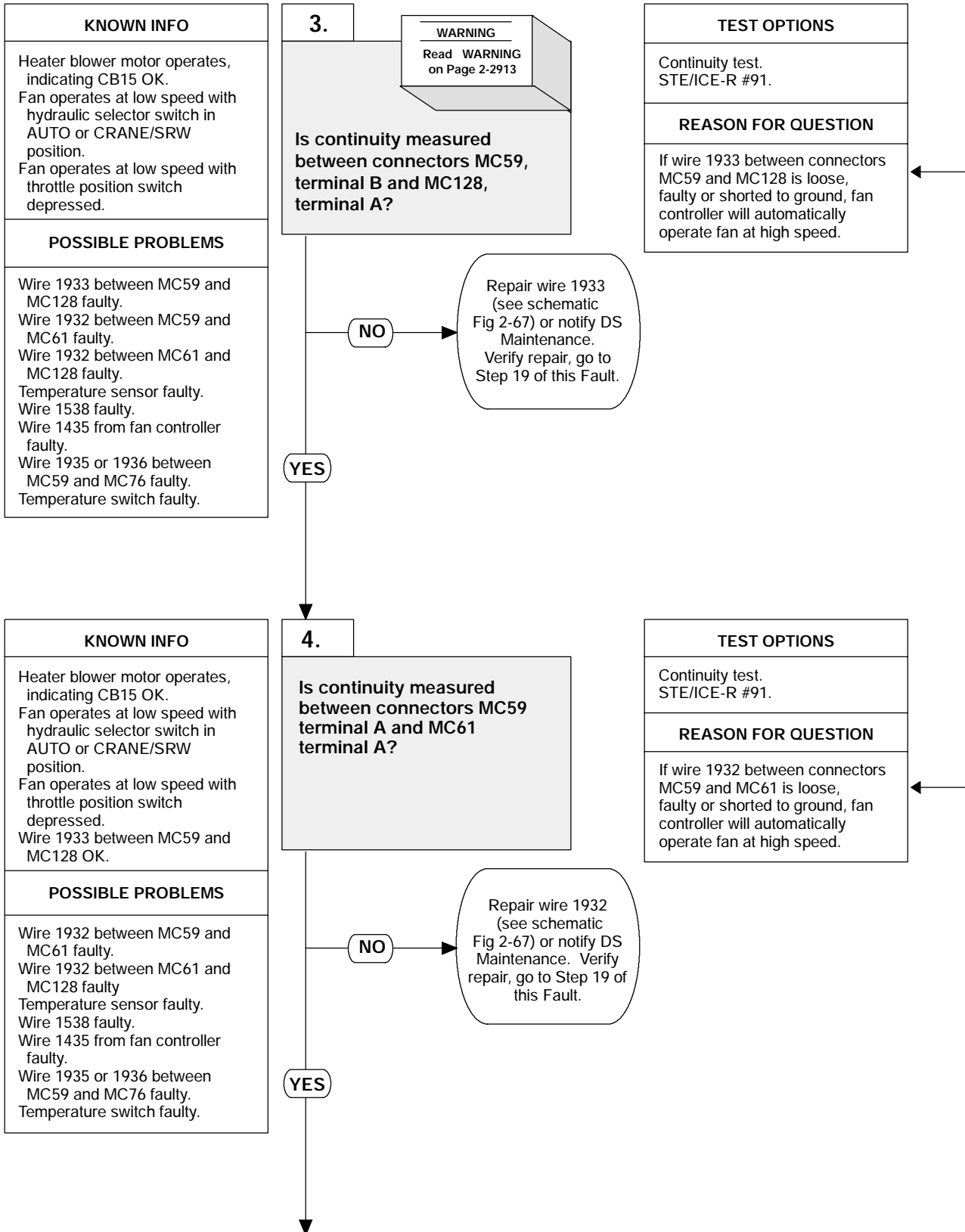
- (1) Disconnect connector MC59 from fan controller.
- (2) Start engine (TM 9-2320-364-10).
- (3) Observe fan, it should be operating at high speed.
- (4) Push in on throttle position switch.
 - (a) If fan speed does not slow, perform Steps (5) and (6) below and go to Step 14 of this Fault.
 - (b) If fan speed does slow, perform Step (5) below and go to Step 3 of this Fault.
- (5) Turn OFF ENGINE switch.
- (6) Connect connector MC59 to fan controller.



STEERING WHEEL SHOWN REMOVED FOR CLARITY



6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).

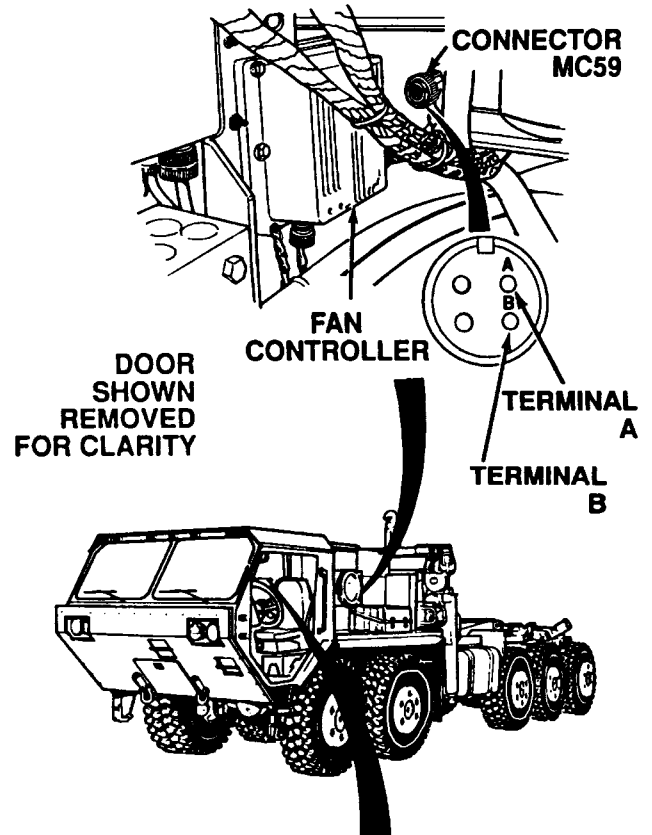


WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may result.

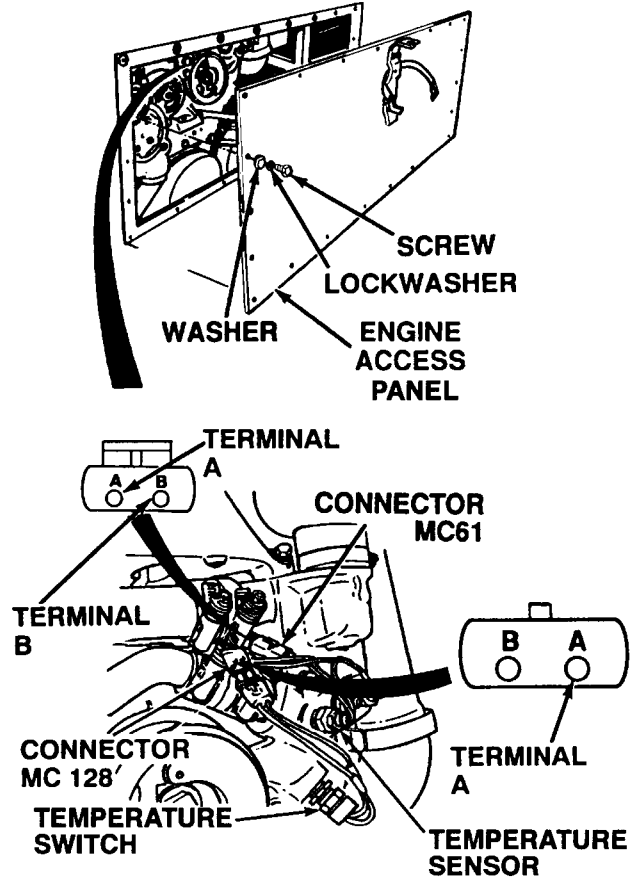
CONTINUITY TEST

- (1) Remove 22 screws, lockwashers, washers and engine access panel. Discard lockwashers.
- (2) Disconnect connector MC128 from temperature switch.
- (3) Set multimeter select switch to ohms.
- (4) Is there continuity on wire 1933 between harness connector MC59, terminal B and connector MC128, terminal A?
 - (a) If there is no continuity, repair wire 1933 (see schematic Fig 2-67) or notify DS Maintenance. Perform Steps (5) and (6) below.
 - (b) If there is continuity, wire 1933 is OK. Go to Step 4 of this Fault.
- (5) Connect connector MC128 to temperature switch.
- (6) Connect connector MC59 to fan controller.

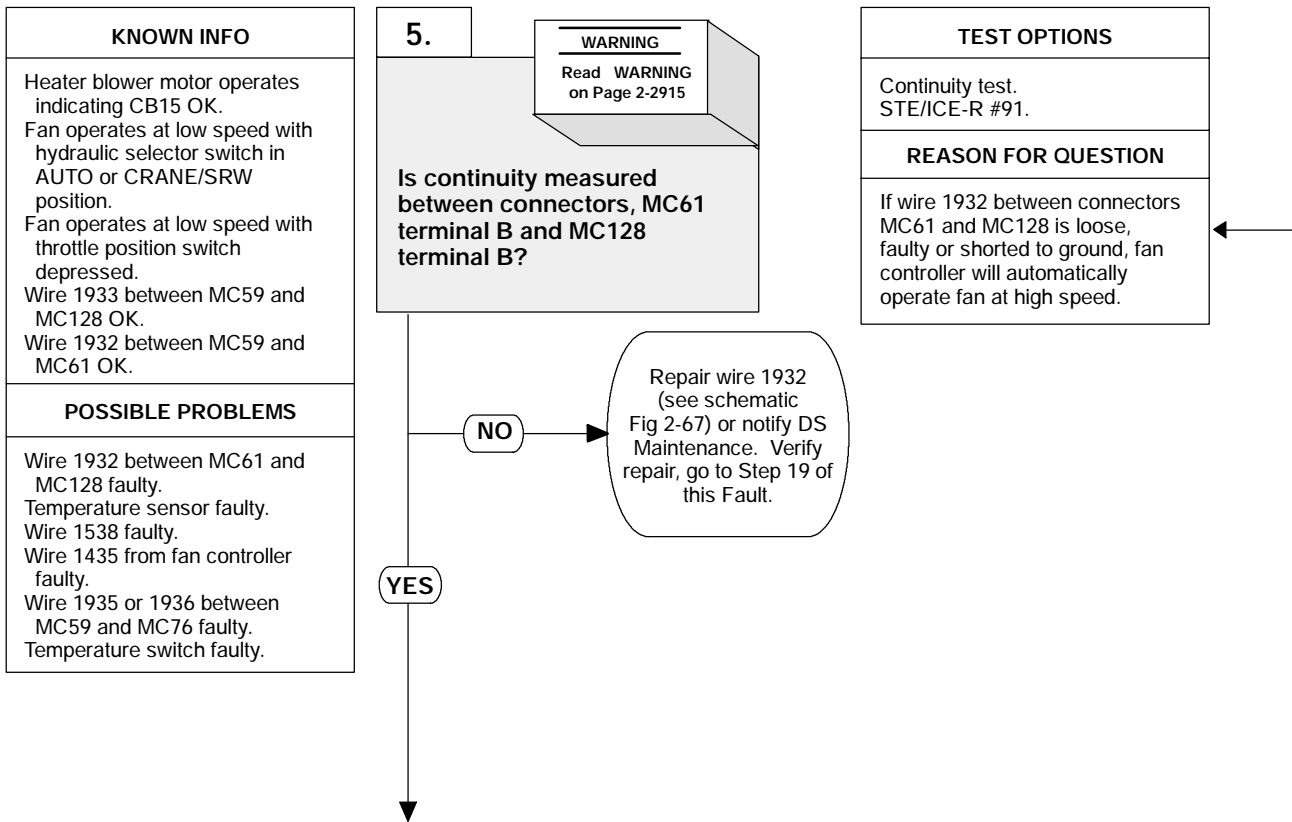


CONTINUITY TEST

- (1) Disconnect connector MC61 from temperature sensor.
- (2) Is there continuity on wire 1932 between harness connector MC59, terminal A and harness connector MC61, terminal A?
 - (a) If there is no continuity, repair wire 1932 (see schematic Fig 2-67) or notify DS Maintenance. Perform Steps (3) and (4) below.
 - (b) If there is continuity, go to Step 5 of this Fault.
- (3) Deleted.
- (4) Connect connector MC61 to temperature sensor.



6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).

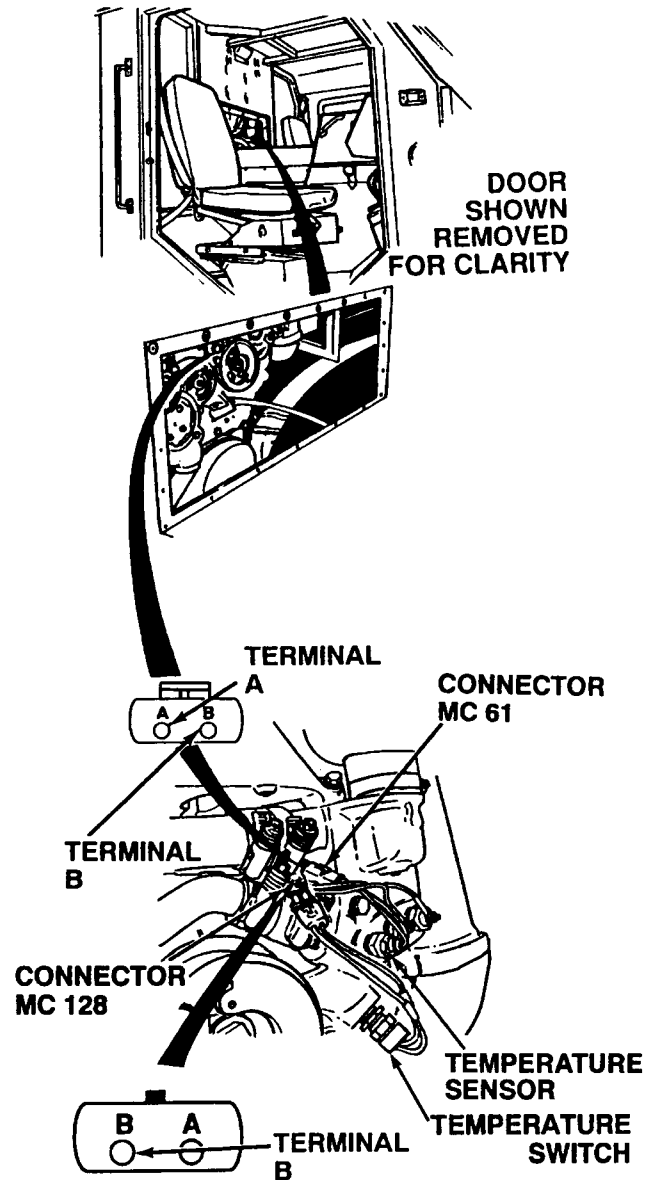


WARNING

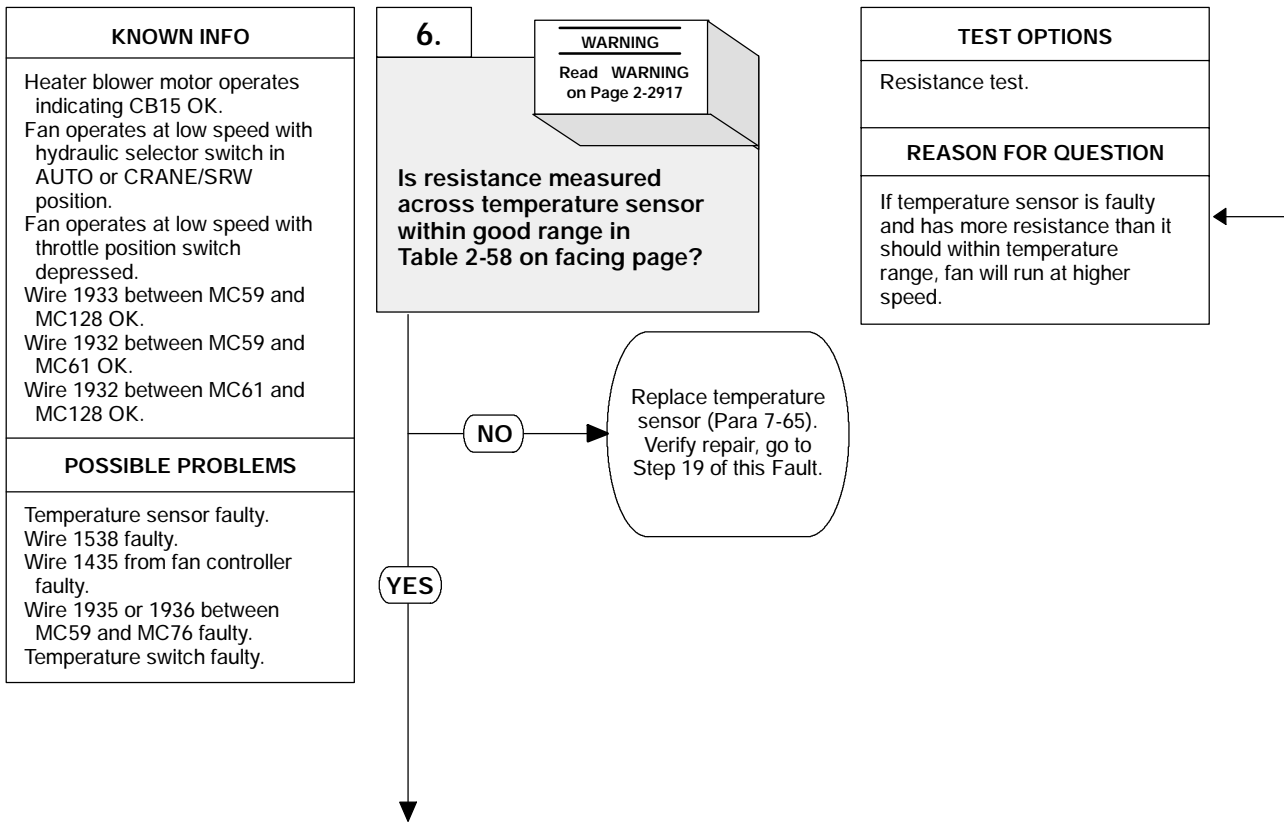
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may result.

CONTINUITY TEST

- (1) Is there continuity on wire 1932 between harness connector MC128, terminal B and harness connector MC61, terminal B?
 - (a) If there is no continuity, repair wire 1932 (see schematic Fig 2-67) or notify DS Maintenance. Perform Steps (2) and (3) below.
 - (b) If there is continuity, perform Step (2) and (3) below and go to Step 6 of this fault.
- (2) Connect connector MC128 to temperature switch.
- (3) Connect connector MC61 to temperature sensor.

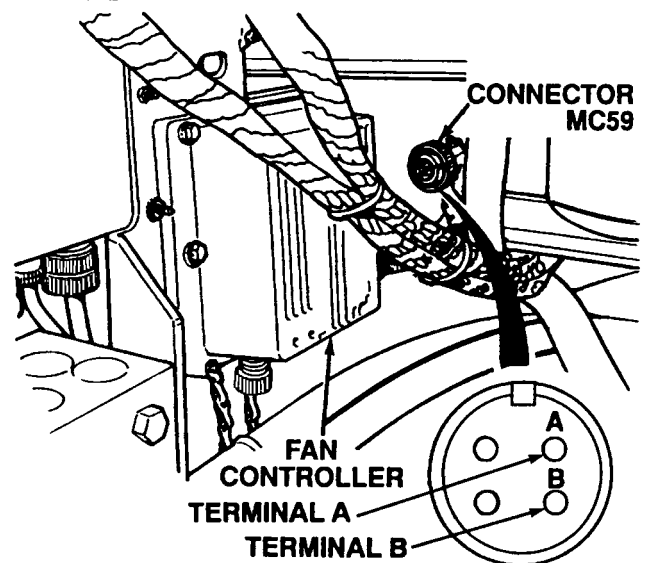
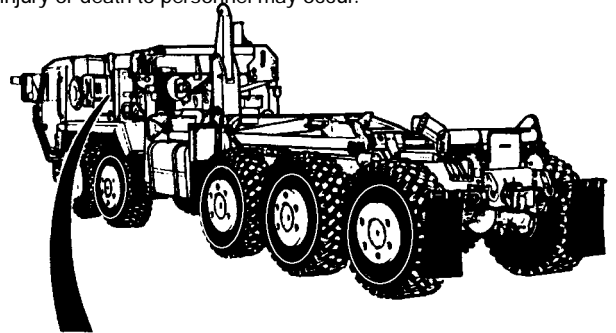


6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.



RESISTANCE TEST	
(1)	Set multimeter select switch to ohms.
(2)	START engine (TM 9-2320-364-10). Do not increase engine rpm over idle.
(3)	Measure resistance between connector MC59, terminals A and B.
(a)	If resistance is not within range in Table 2-58, perform Steps (4) and (5) below and replace temperature sensor (Para 7-65).
(b)	If resistance is within range in Table 2-58, temperature sensor is OK.
(4)	Turn OFF ENGINE switch.
(5)	Connect connector MC59 to fan controller.

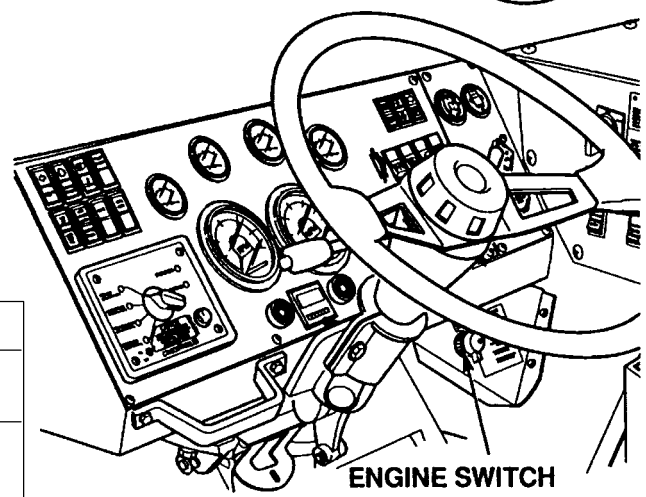
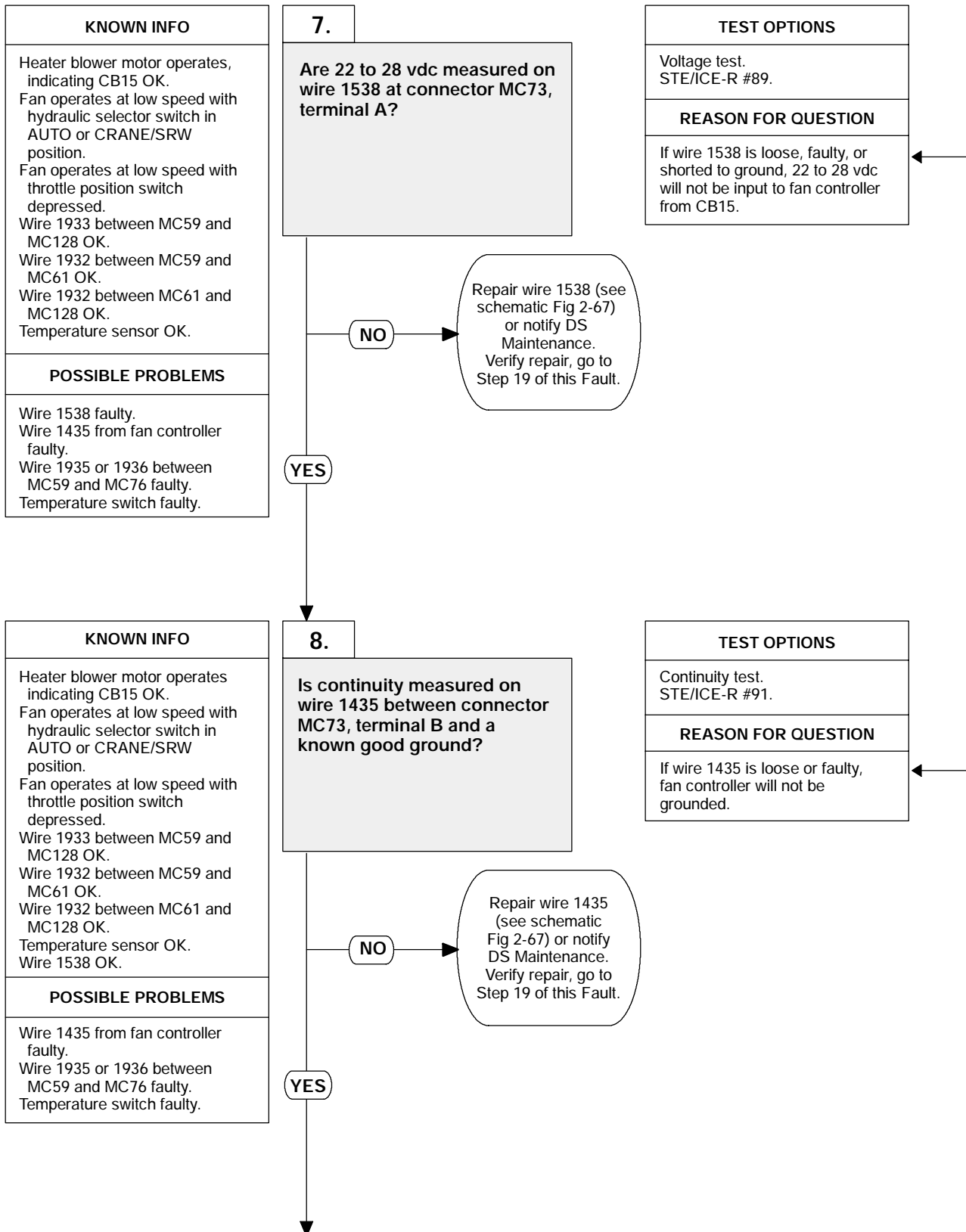


Table 2-58. Water Temperature Sensor Resistance

TEMPERATURE vs RESISTANCE CALIBRATION POINTS			
Temperature	Resistance (ohms)	Temperature	Resistance (ohms)
-40°C (-40°F)	684 ± 30	60°C (140°F)	1199 ± 30
-30°C (-22°F)	728 ± 30	70°C (158°F)	1259 ± 30
-20°C (-4°F)	774 ± 30	80°C (176°F)	1322 ± 30
-10°C (14°F)	821 ± 30	90°C (194°F)	1385 ± 30
0°C (32°F)	870 ± 30	100°C (212°F)	1451 ± 30
10°C (50°F)	921 ± 30	110°C (230°F)	1518 ± 30
20°C (68°F)	973 ± 30	120°C (248°F)	1587 ± 30
30°C (86°F)	1027 ± 30	130°C (266°F)	1657 ± 30
40°C (104°F)	1083 ± 30	140°C (284°F)	1729 ± 30
50°C (122°F)	1140 ± 30	150°C (302°F)	1803 ± 30

6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).



WARNING

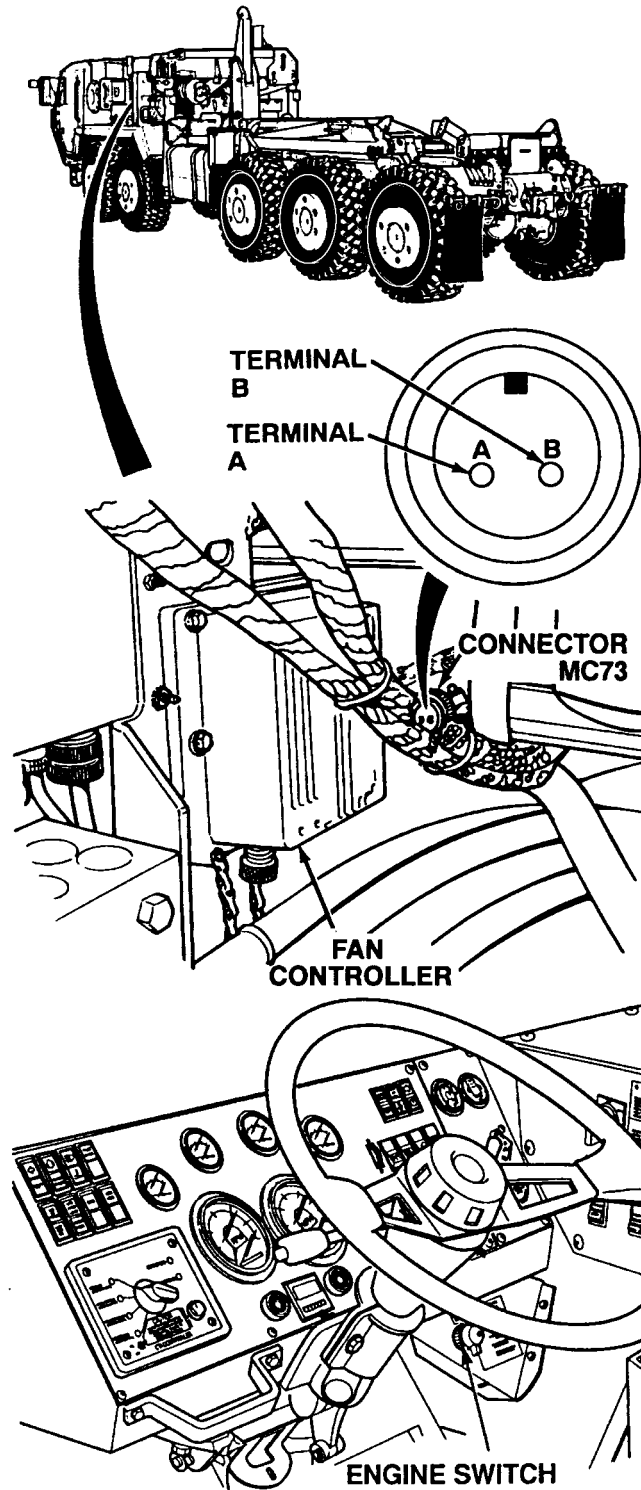
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

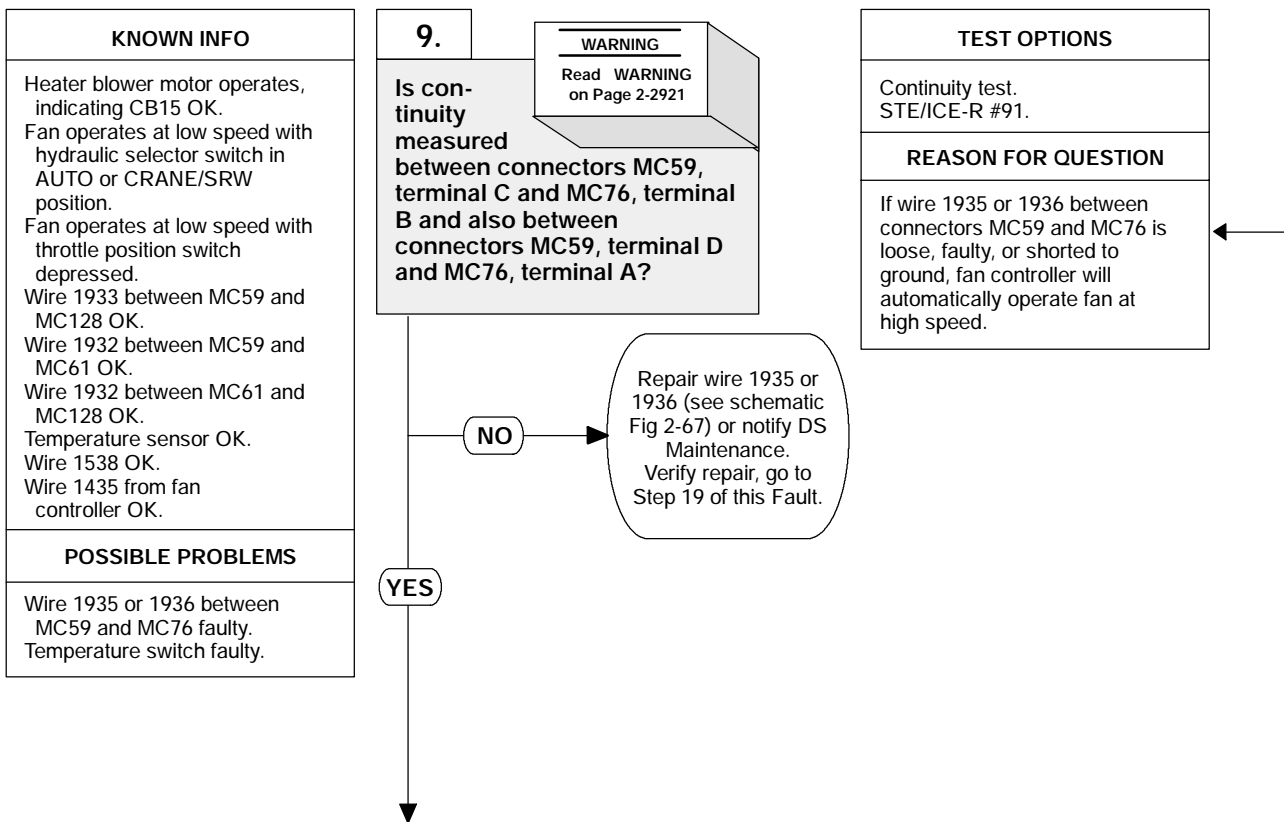
- (1) Disconnect connector MC73 from fan controller.
- (2) Set multimeter select switch to volts dc.
- (3) Turn ON ENGINE switch (TM 9-2320-364-10).
- (4) Connect positive multimeter lead to connector MC73, terminal A.
- (5) Connect negative (-) multimeter lead to a known good ground.
 - (a) If 22 to 28 vdc are not present, perform Step (6) below and repair wire 1538 (see schematic Fig 2-67), or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, wire 1538 is OK.
- (6) Turn OFF ENGINE switch.

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between connector MC73, terminal B and a known good ground?
 - (a) If there is no continuity, repair wire 1435 (see schematic Fig 2-67) or notify DS Maintenance. Perform Step (3) below.
 - (b) If there is continuity, wire 1435 is OK.
- (3) Connect connector MC73 to fan controller.



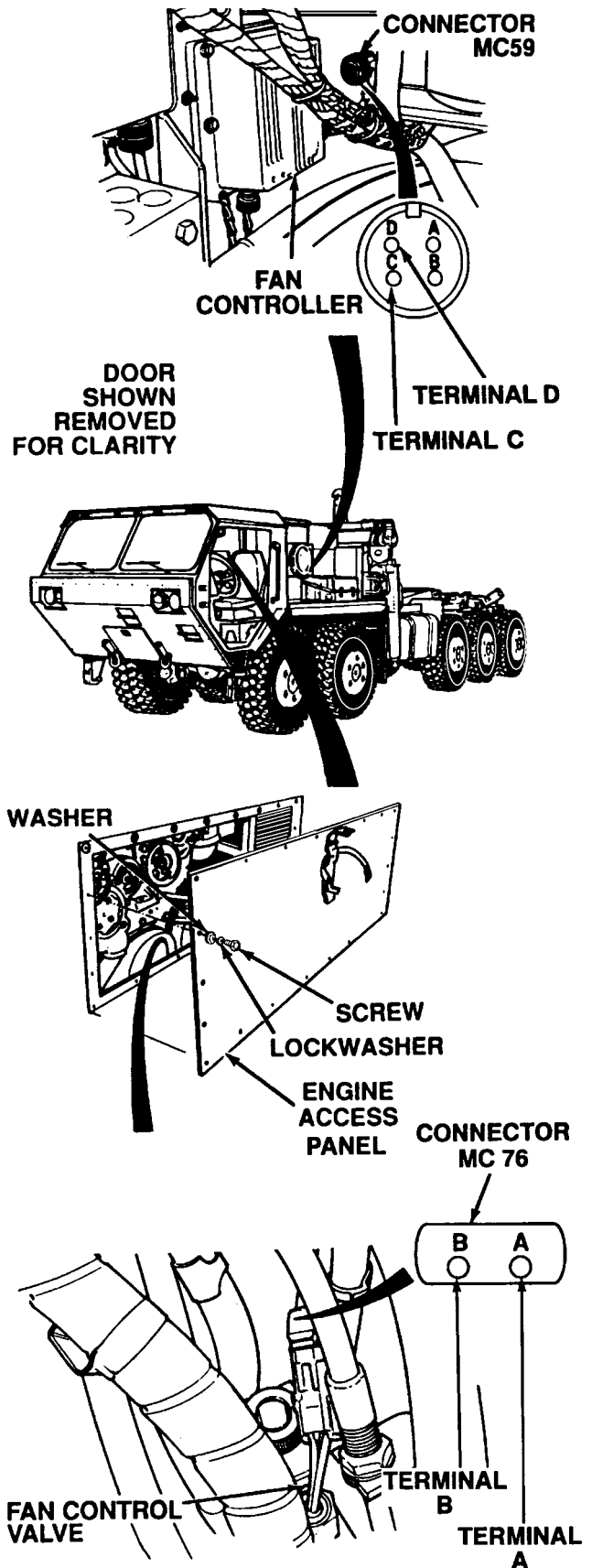
6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).



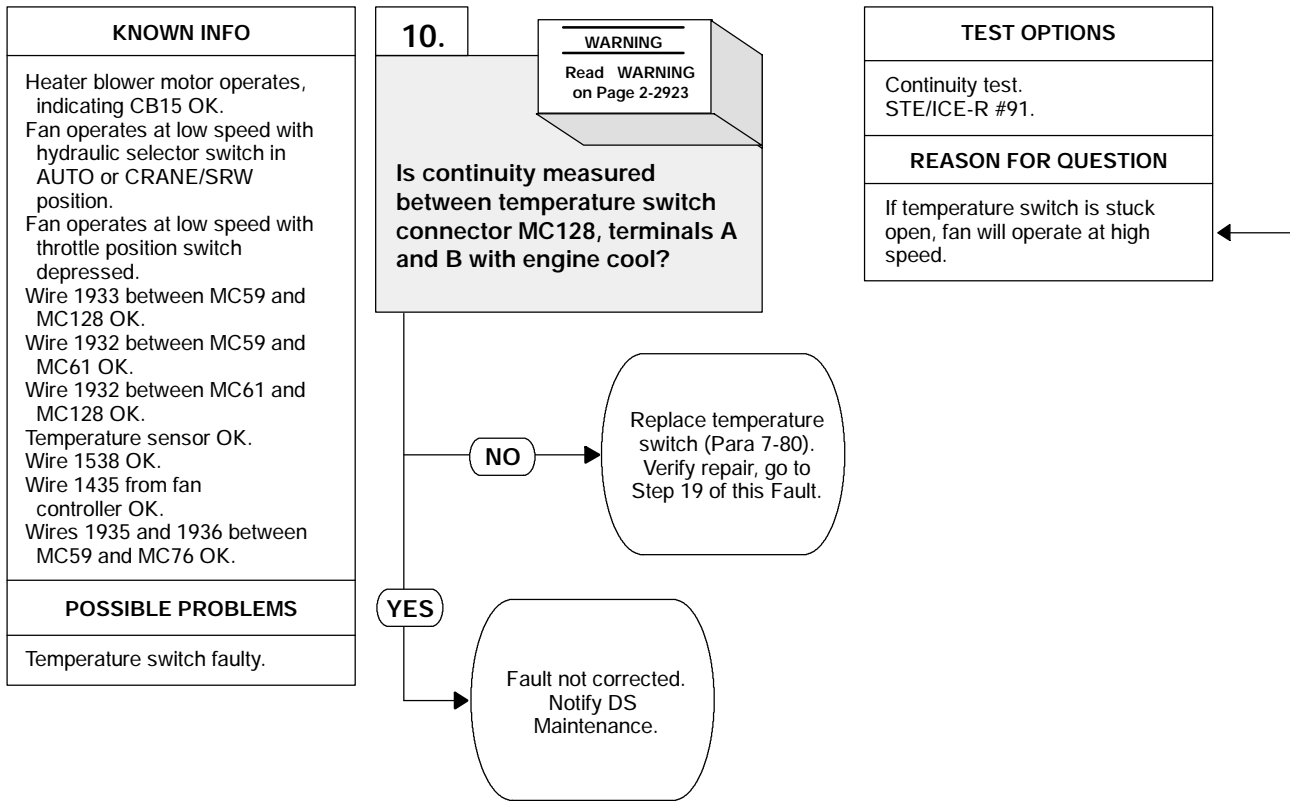
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may result.

CONTINUITY TEST	
(1)	Disconnect connector MC76 from fan control solenoid valve.
(2)	Disconnect connector MC59 from fan controller.
(3)	Is there continuity between connector MC76, terminal B and connector MC59, terminal C? (a) If there is no continuity, repair wire 1935 (see schematic Fig 2-67) or notify DS Maintenance. Perform Steps (6) and (7) below. (b) If there is continuity, go to Step (4) below.
(4)	Is there continuity between connector MC76, terminal A and connector MC59, terminal D? (a) If there is no continuity, repair wire 1936 (see schematic Fig 2-67) or notify DS Maintenance. Perform Steps (5) through (7) below. (b) If there is continuity, wires 1935 and 1936 OK, perform Steps (5) and (6) below.
(5)	Connect connector MC76 to fan control solenoid valve connector.
(6)	Connect connector MC59 to fan controller.
(7)	Install engine access panel with 22 washers, lockwashers and screws.



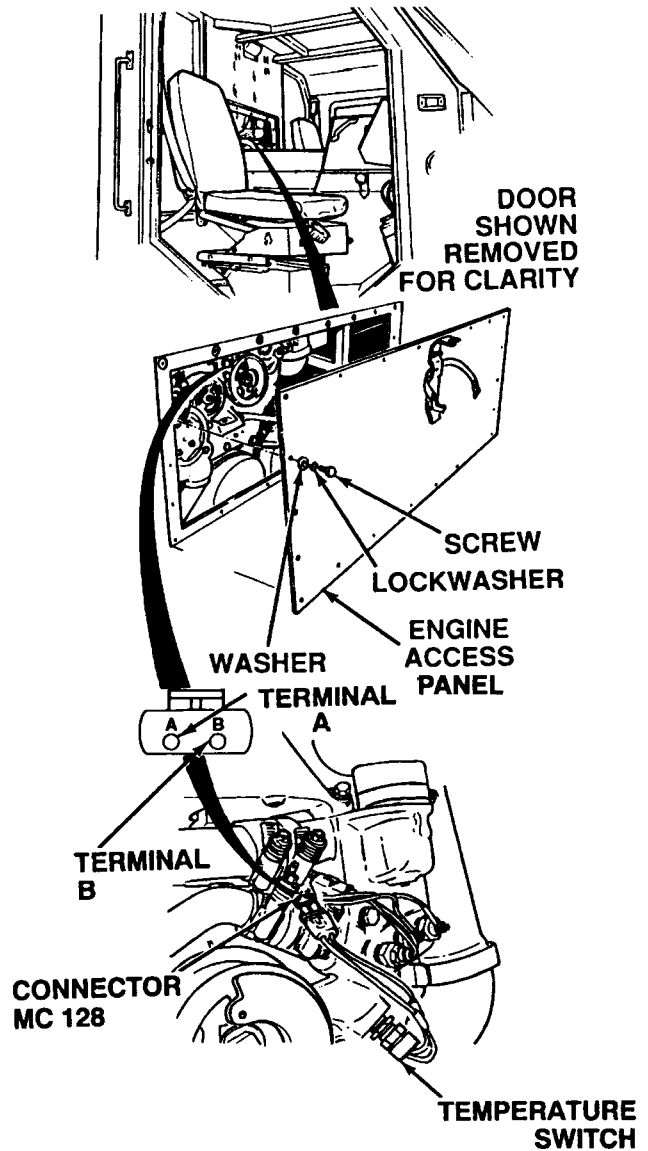
6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).



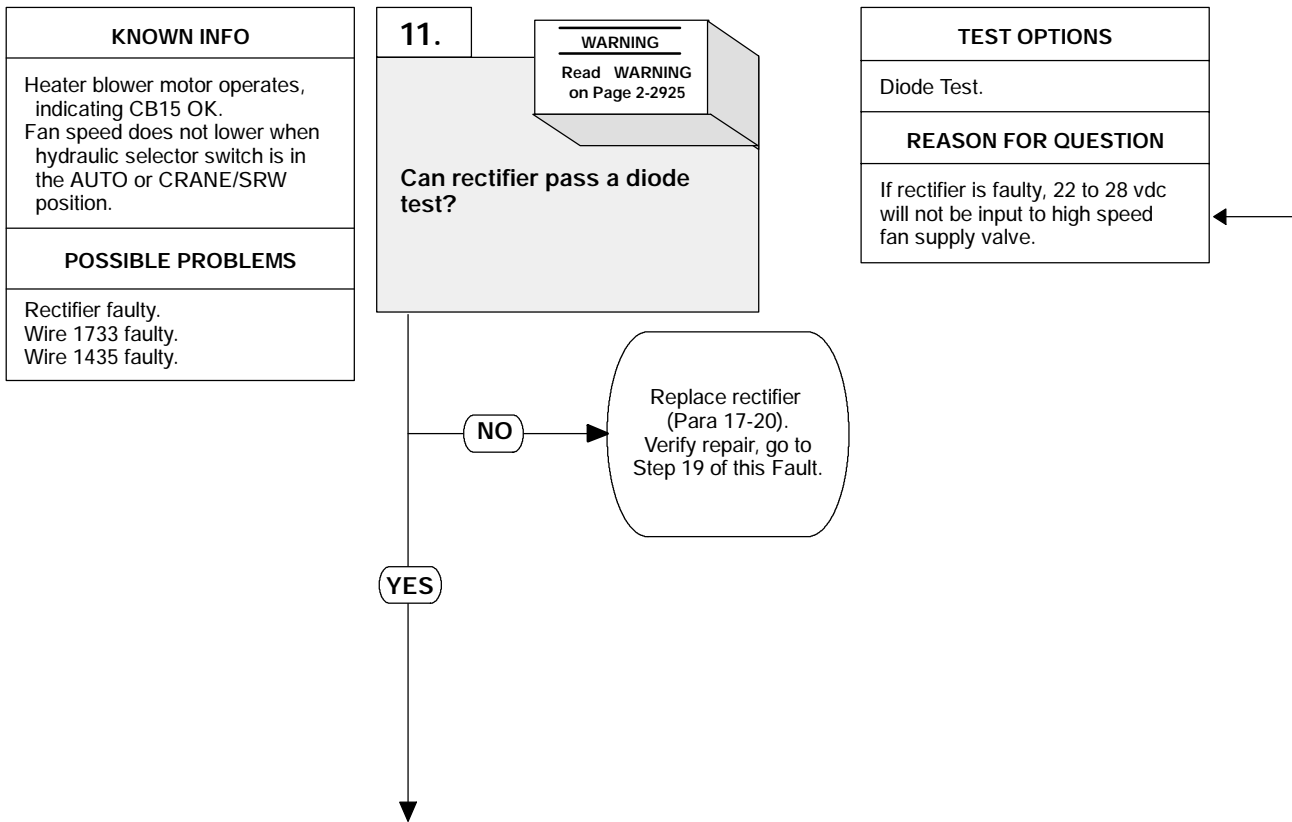
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

- | CONTINUITY TEST |
|--|
| (1) Disconnect connector MC128 from temperature switch. |
| (2) Is there continuity between temperature switch terminals A and B?
(a) If there is no continuity, replace temperature switch (Para 7-80).
(b) If there is continuity, notify DS Maintenance. Perform Steps (3) and (4) below. |
| (3) Connect connector MC128 to temperature switch. |
| (4) Install engine access panel with 22 screws, lockwashers and washers. |



6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).

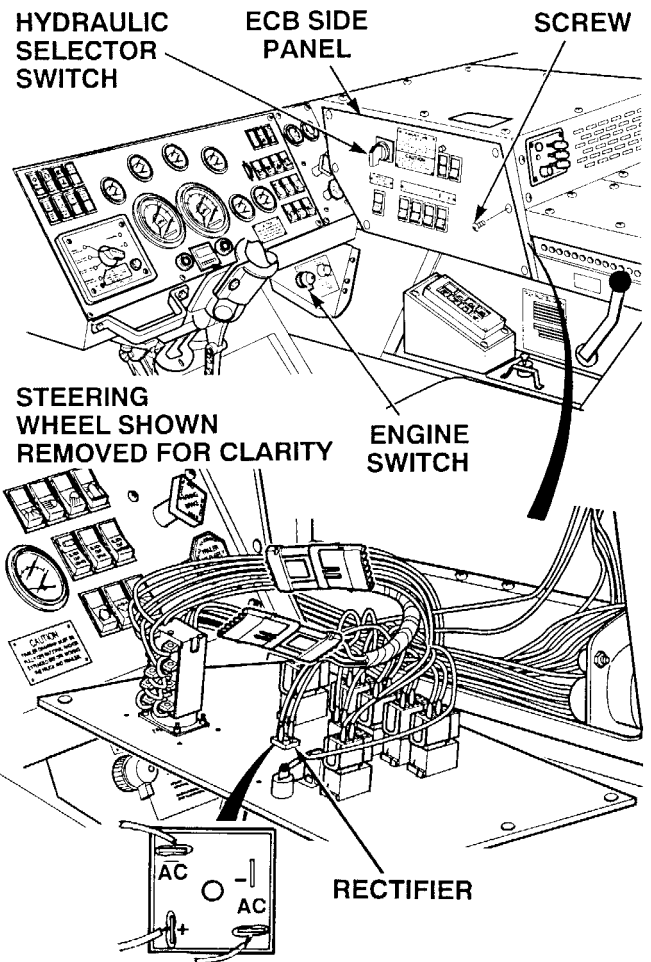


WARNING

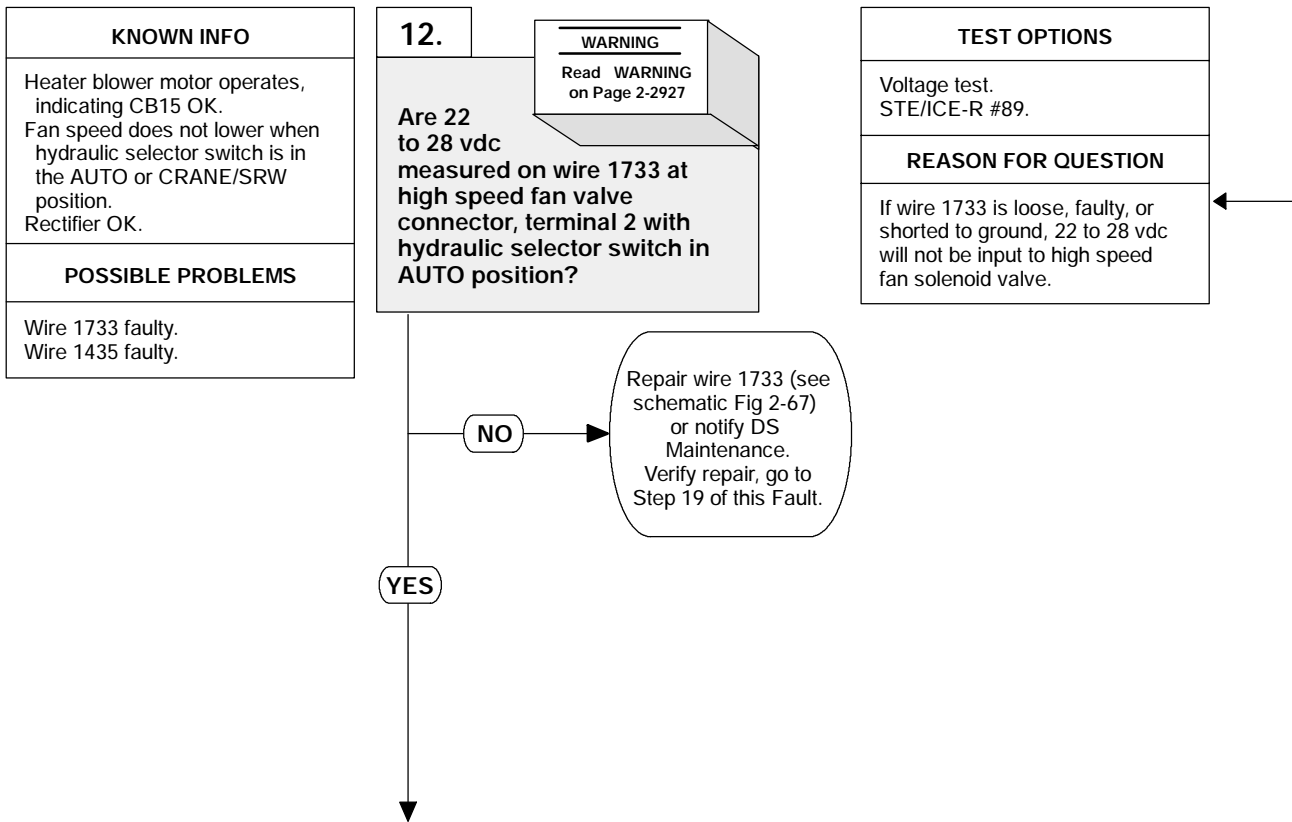
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

DIODE TEST

- (1) Remove six screws and ECB side panel.
- (2) Tag, mark and disconnect three wires from rectifier.
- (3) Set multimeter to diode check.
- (4) Connect positive (+) multimeter lead to negative (-) rectifier terminal.
- (5) Connect negative (-) multimeter lead to each rectifier AC terminal one at a time.
 - (a) If any VDC are not present at either AC terminal, replace rectifier.
 - (b) If any VDC are present at both AC terminals, go to Step (6) below.
- (6) Connect negative (-) multimeter lead to positive (+) rectifier terminal.
- (7) Connect positive (+) multimeter lead to each rectifier AC terminal one at a time.
 - (a) If any VDC are not present at either AC terminal, replace rectifier (Para 17-20).
 - (b) If any VDC are present at both AC terminals, rectifier is OK.
- (8) Connect three wires to rectifier.
- (9) Install ECB side panel with six screws.



6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).

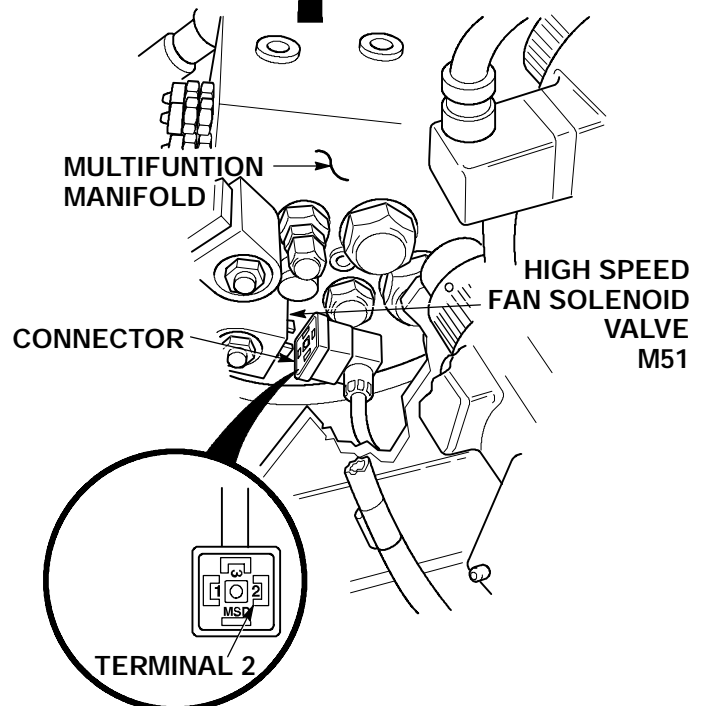
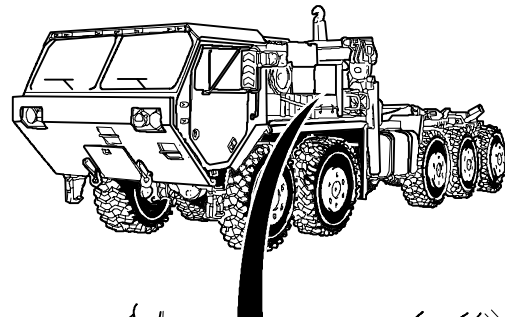
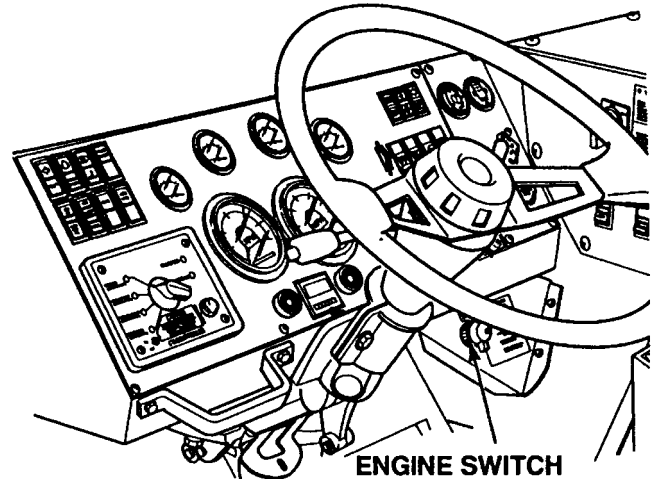


WARNING

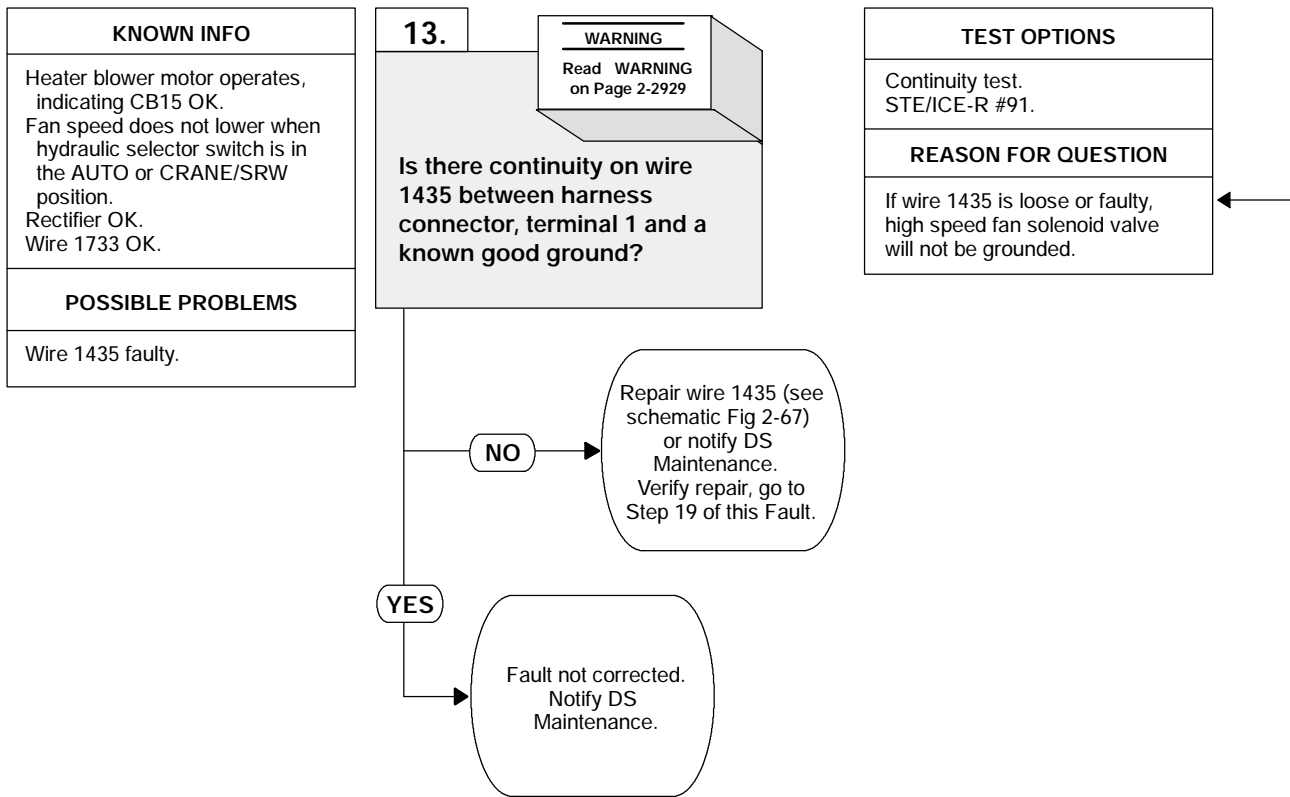
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

- (1) Set multimeter select switch to volts dc.
- (2) Loosen screw and disconnect connector from high speed fan solenoid valve M51.
- (3) Connect positive (+) multimeter lead to wire 1733 at connector, terminal 2.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
- (6) Set hydraulic selector switch to AUTO position.
 - (a) If 22 to 28 vdc are not present, perform Steps (7) and (8) below and repair wire 1733 (see schematic Fig 2-67) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, wire 1733 is OK.
- (7) Turn OFF ENGINE switch.
- (8) Set hydraulic selector switch to OFF position.



6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).

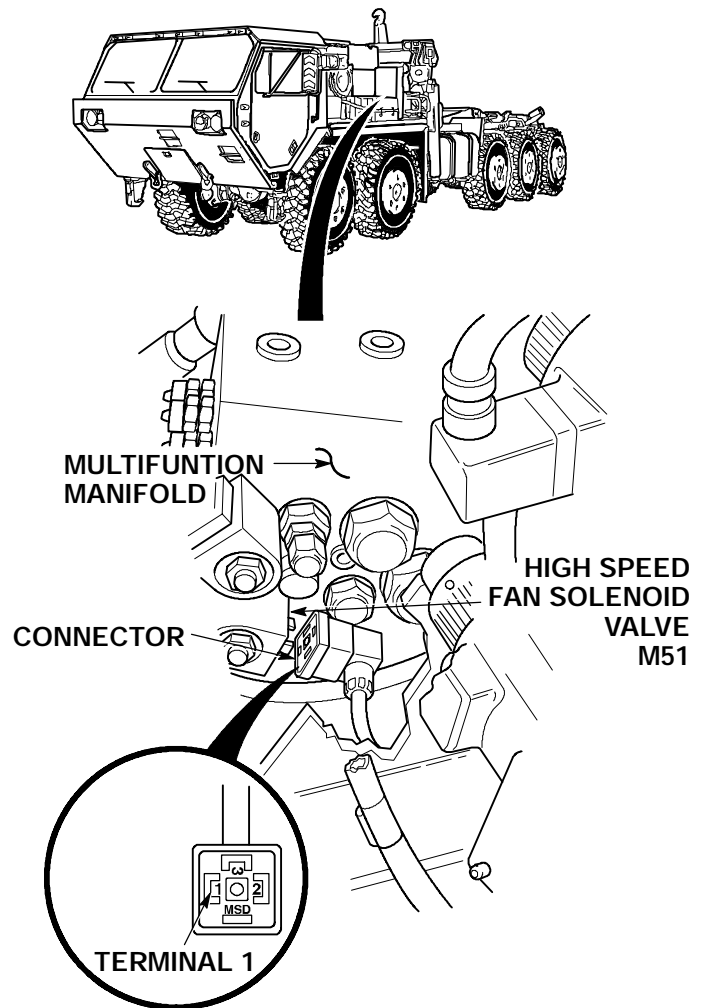


WARNING

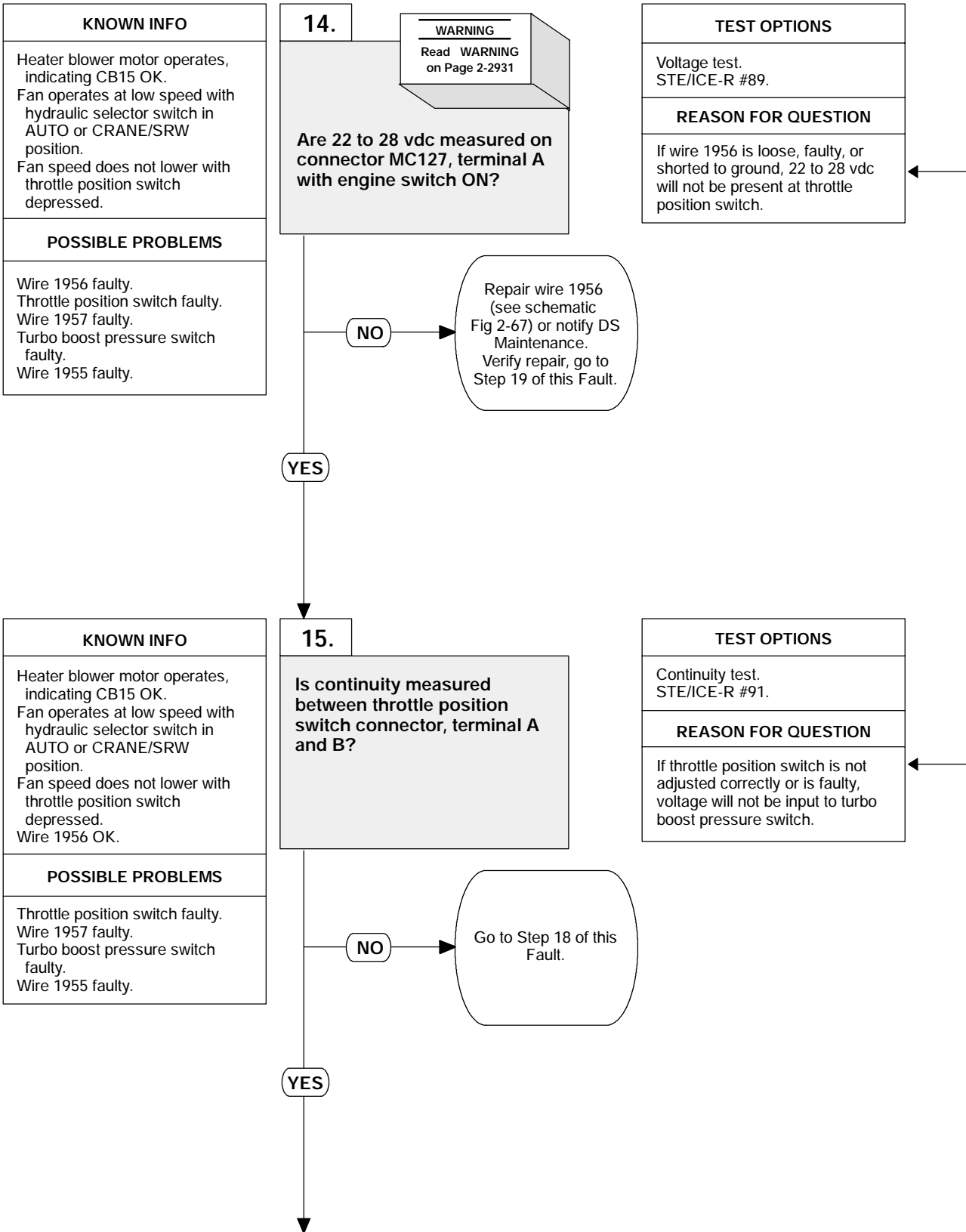
Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with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

CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity on wire 1435 between connector, terminal 1 and a known good ground?
 - (a) If there is no continuity, perform Steps (3) and (4) below and repair wire 1435 (see schematic Fig 2-67), or notify DS Maintenance.
 - (b) If there is continuity, fault not corrected, notify DS Maintenance.
- (3) Connect connector to high speed solenoid valve M51.
- (4) Tighten screw and coat head of screw with adhesive.



6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).



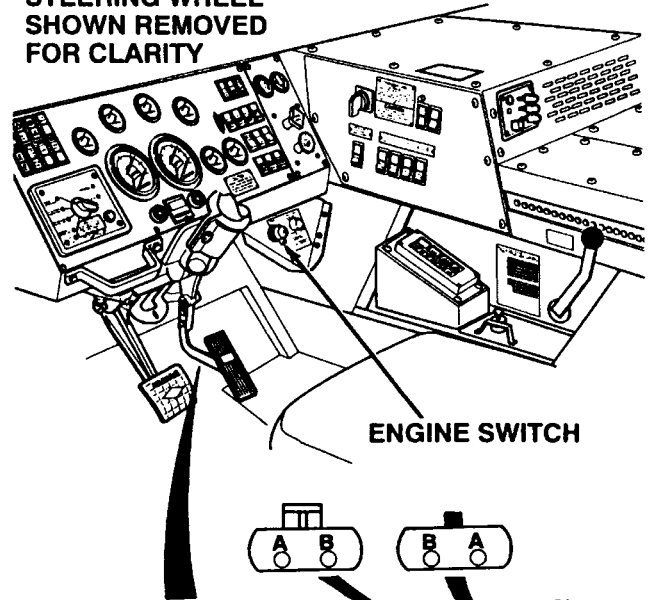
WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment, injury or death to personnel may occur.

VOLTAGE TEST

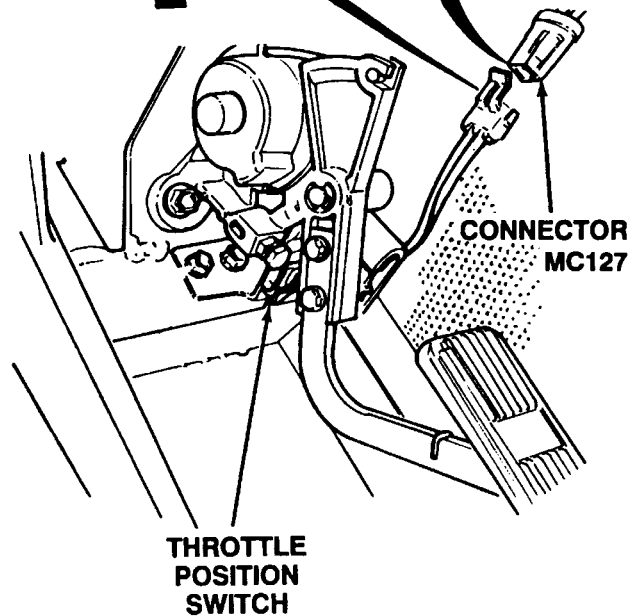
- (1) Set multimeter select switch to volts dc.
- (2) Disconnect connector MC127 from throttle position switch.
- (3) Connect positive (+) multimeter lead to harness connector MC127, terminal A.
- (4) Connect negative (-) multimeter lead to a known good ground.
- (5) Turn ON ENGINE switch (TM 9-2320-364-10).
 - (a) If 22 to 28 vdc are not present, perform Steps (6) and (7) below and repair wire 1956 (see schematic Fig 2-67) or notify DS Maintenance.
 - (b) If 22 to 28 vdc are present, turn OFF ENGINE switch and go to Step 15 of this Fault.
- (6) Turn OFF ENGINE switch.
- (7) Connect connector MC127 to throttle position switch.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**

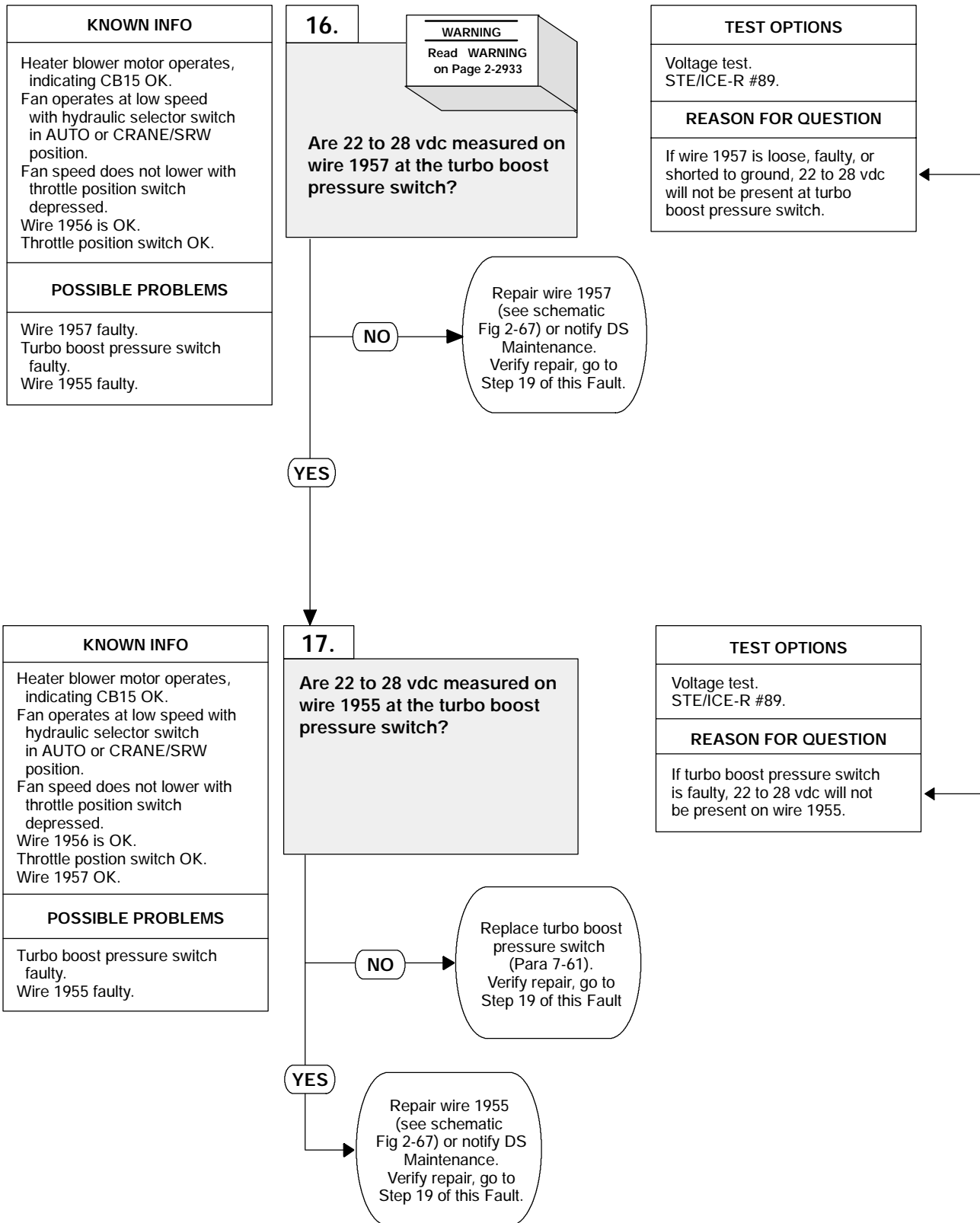


CONTINUITY TEST

- (1) Set multimeter select switch to ohms.
- (2) Is there continuity between throttle position switch, terminals A and B with the throttle control pushed down completely?
 - (a) If no continuity is measured, connect connector MC127 to throttle position switch and go to Step 18 of this Fault
 - (b) If continuity is measured, connect connector MC127 to throttle position switch and go to Step 16 of this Fault.



6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).



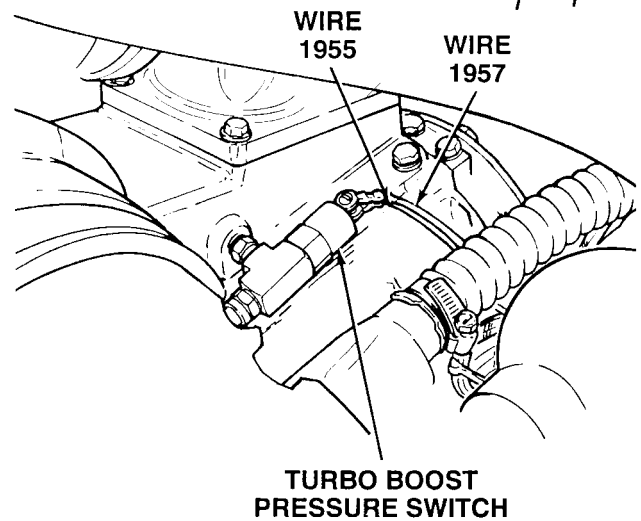
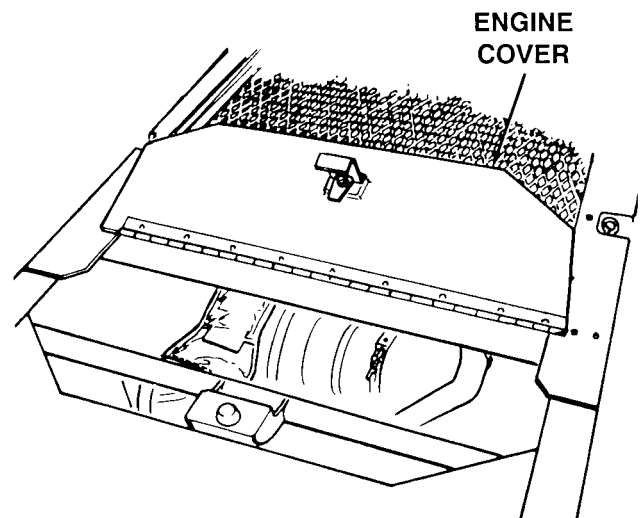
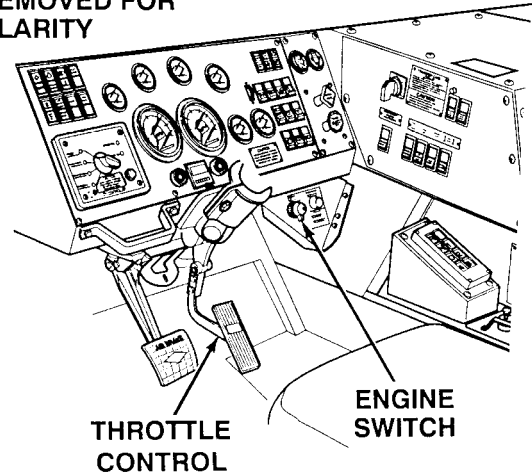
WARNING

Allow engine to cool before performing trouble-shooting maintenance. If necessary use insulated pads and gloves. Hot engine components will burn and cause injury to personnel.

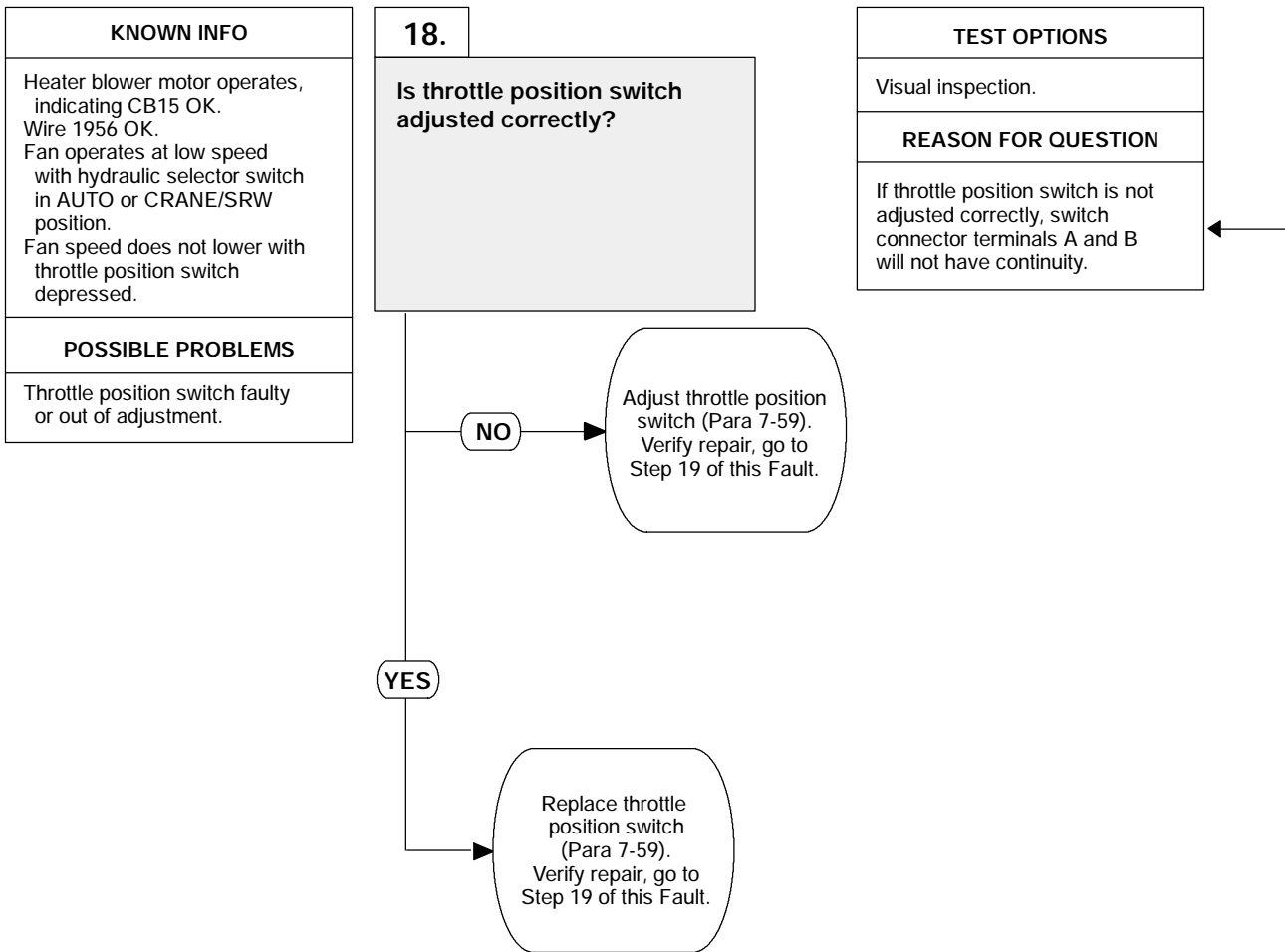
VOLTAGE TEST
<ol style="list-style-type: none"> (1) Set multimeter select switch to volts dc. (2) Open engine cover (TM 9-2320-364-10). (3) Connect positive (+) multimeter lead to wire 1957 at the turbo boost pressure switch. (4) Connect negative (-) multimeter lead to a known good ground. (5) Turn ON ENGINE switch. (6) With the aid of an assistant, observe multimeter while throttle control is pushed down completely. <ol style="list-style-type: none"> (a) If 22 to 28 vdc are not present, repair wire 1957 (see schematic Fig 2-67) or notify DS Maintenance. (b) If 22 to 28 vdc are present perform Step (7) below and go to Step 17 of this Fault. (7) Turn OFF ENGINE switch. (8) Close engine cover.

VOLTAGE TEST
<ol style="list-style-type: none"> (1) Connect positive (+) multimeter lead to wire 1955 at the turbo boost pressure switch. (2) Connect negative (-) multimeter lead to a known good ground. (3) Turn ON ENGINE switch (TM 9-2320-364-10). (4) With the aid of an assistant, observe multimeter while throttle control is pushed down completely. <ol style="list-style-type: none"> (a) If 22 to 28 vdc are not present, turn OFF ENGINE switch and replace turbo boost pressure switch (Para 7-61). (b) If 22 to 28 vdc are present, perform Step (5) below and repair wire 1955 (see schematic Fig 2-67) or notify DS Maintenance. (5) Turn OFF ENGINE switch. (6) Close engine cover.

STEERING WHEEL SHOWN REMOVED FOR CLARITY



6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).



NOTE

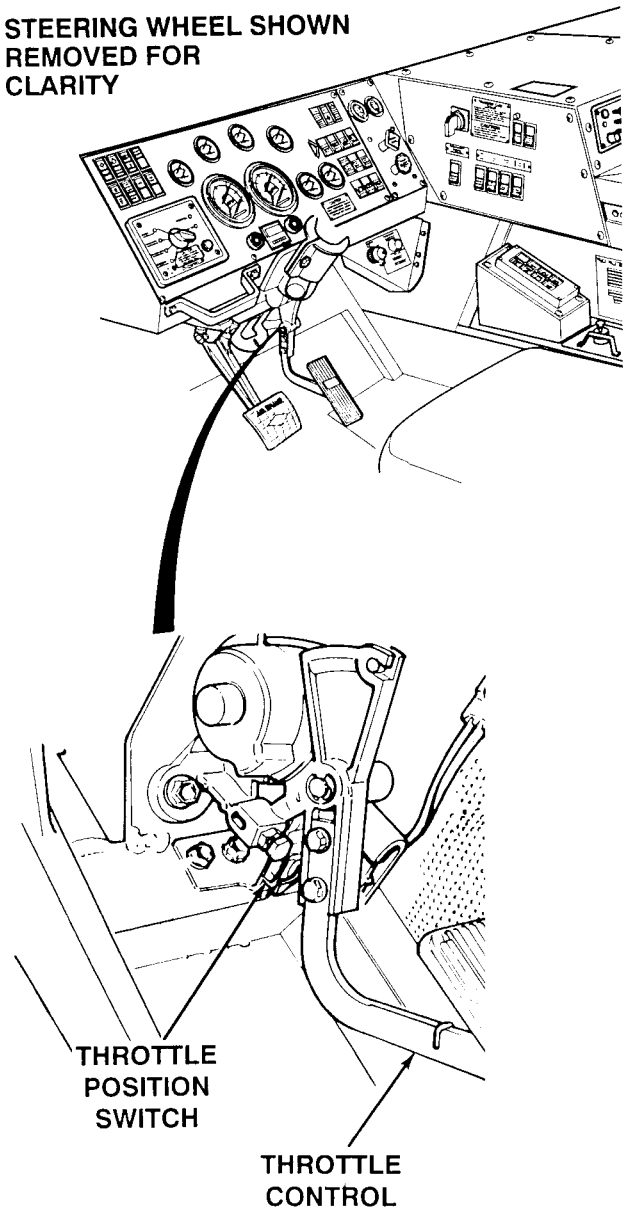
Throttle control should contact throttle position switch 1/4 to 3/8 in. (6.35-9.5 mm) before throttle control is completely down.

VISUAL INSPECTION

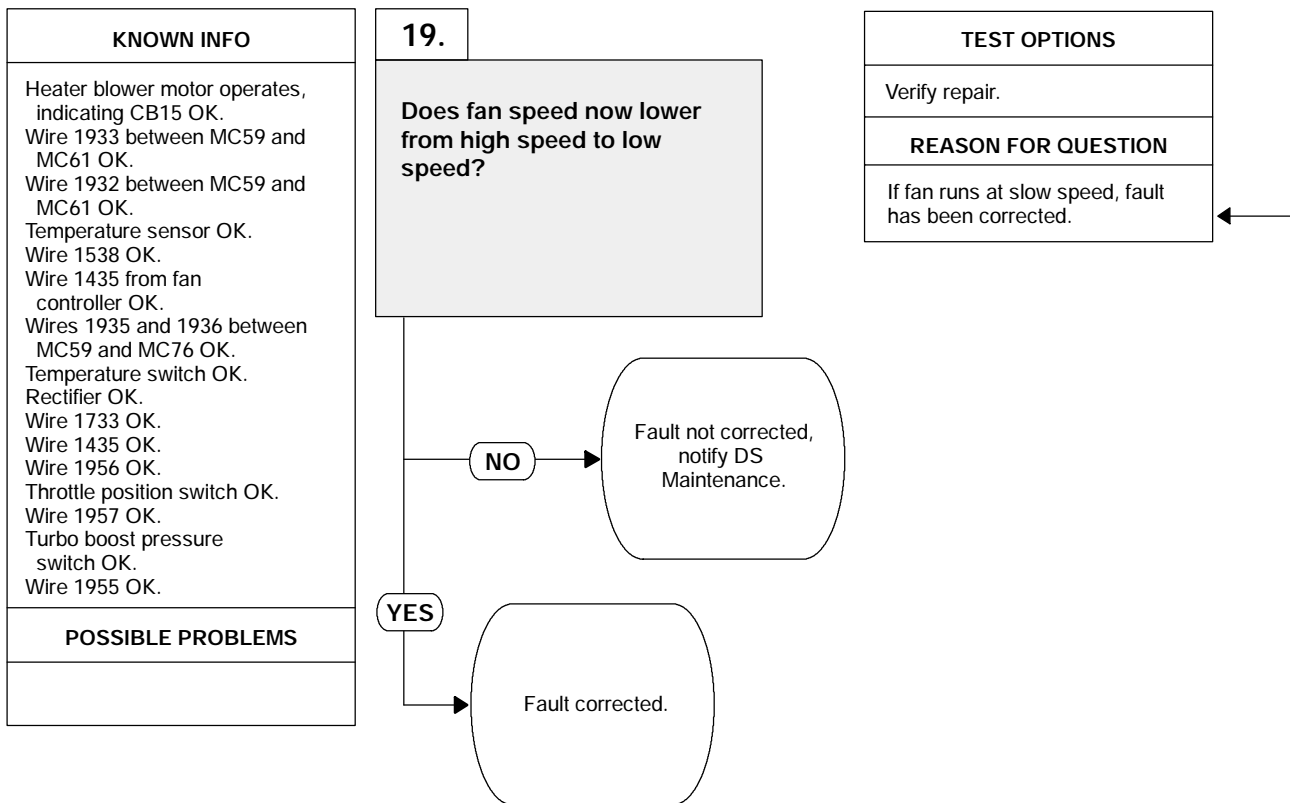
Observe throttle control when it contacts throttle position switch.

- (1) If throttle control does not contact throttle position switch 1/4 to 3/8 in. (6.35 to 9.5 mm) before throttle control is completely down, adjust throttle position switch (Para 7-59).
- (2) If throttle control does contact throttle position switch 1/4 to 3/8 in. (6.35 to 9.5 mm) before being completely down replace throttle position switch (Para 7-59).

**STEERING WHEEL SHOWN
REMOVED FOR
CLARITY**



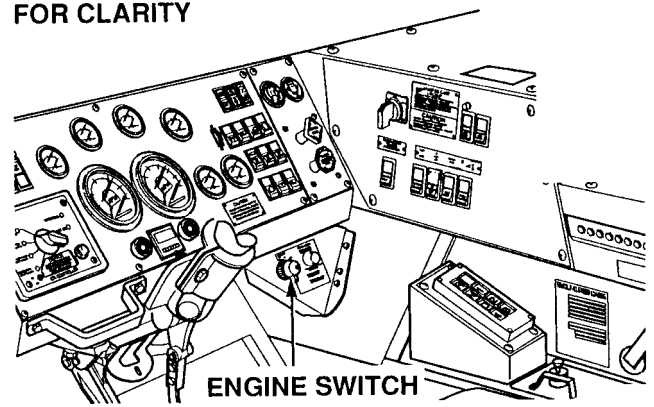
6. FAN SPEED DOES NOT LOWER FROM HIGH SPEED TO LOW SPEED (CONT).



VERIFY REPAIR

- (1) START engine (TM 9-2320-364-10).
- (2) Observe fan speed.
 - (a) If fan speed does not slow, fault not corrected. Perform Step (3) below and notify DS Maintenance.
- (3) Turn OFF ENGINE switch.

**STEERING WHEEL
SHOWN REMOVED
FOR CLARITY**



2-32. STEERING SYSTEM TROUBLESHOOTING.

This paragraph covers Steering System Troubleshooting. The Steering System Fault Index, Table 2-59, lists faults for the steering system of the PLS truck. Refer to schematic Figure 2-53 when performing tests and corrective actions.

Table 2-59. Steering System Fault Index

Fault No.	Description	Page
1.	Truck Is Hard To Steer	2-2940
2.	Truck Wanders, Pulls To One Side, Or Shimmies	2-2952
3.	Excessive Play When Turning Steering Wheel	2-2962
4.	No Response When Turning Steering Wheel	2-2966
5.	No Response At Axle No. 5 When Turning Steering Wheel	2-2970

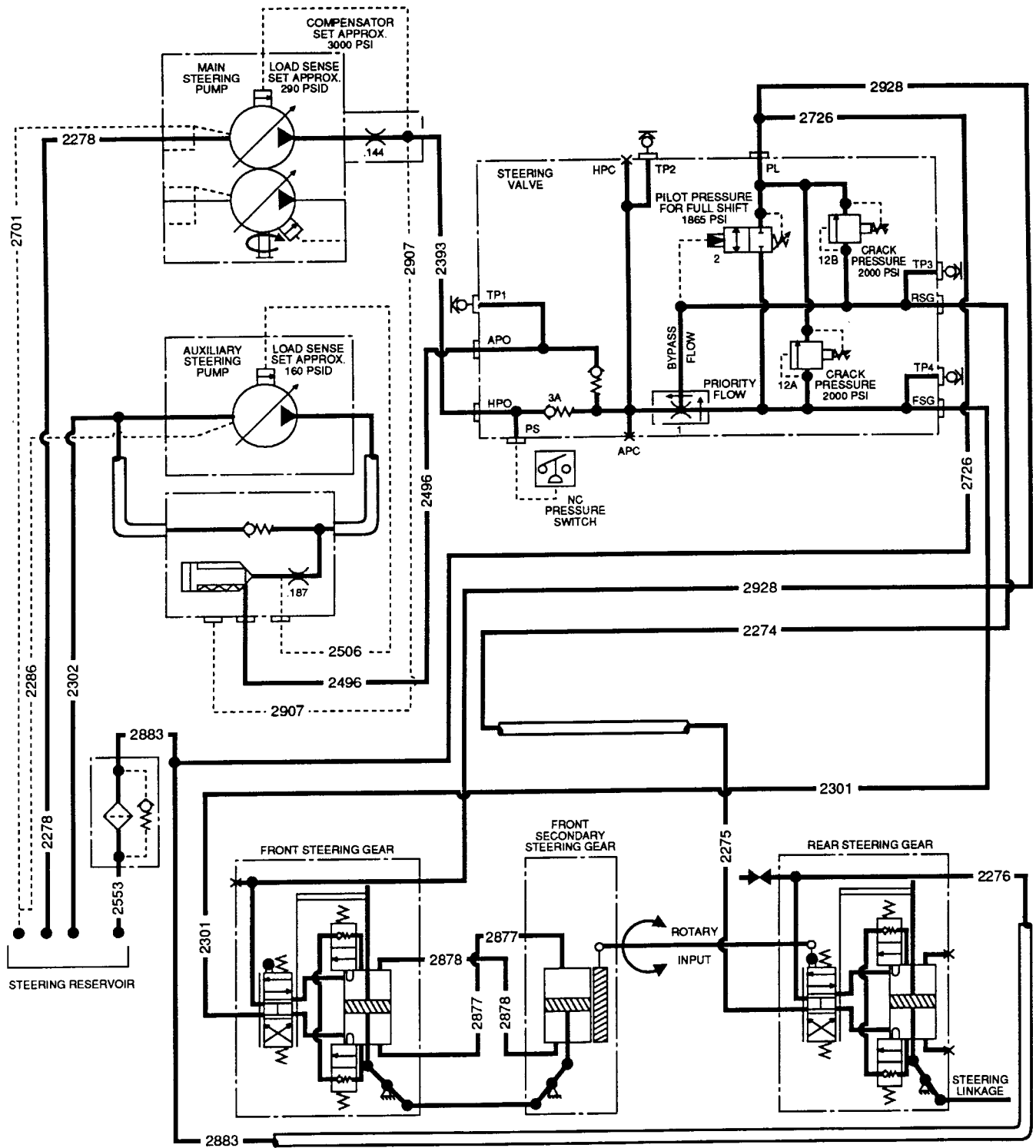


Figure 2-71. Steering Hydraulic Diagram

2-32. STEERING SYSTEM TROUBLESHOOTING (CONT).

1. TRUCK IS HARD TO STEER.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

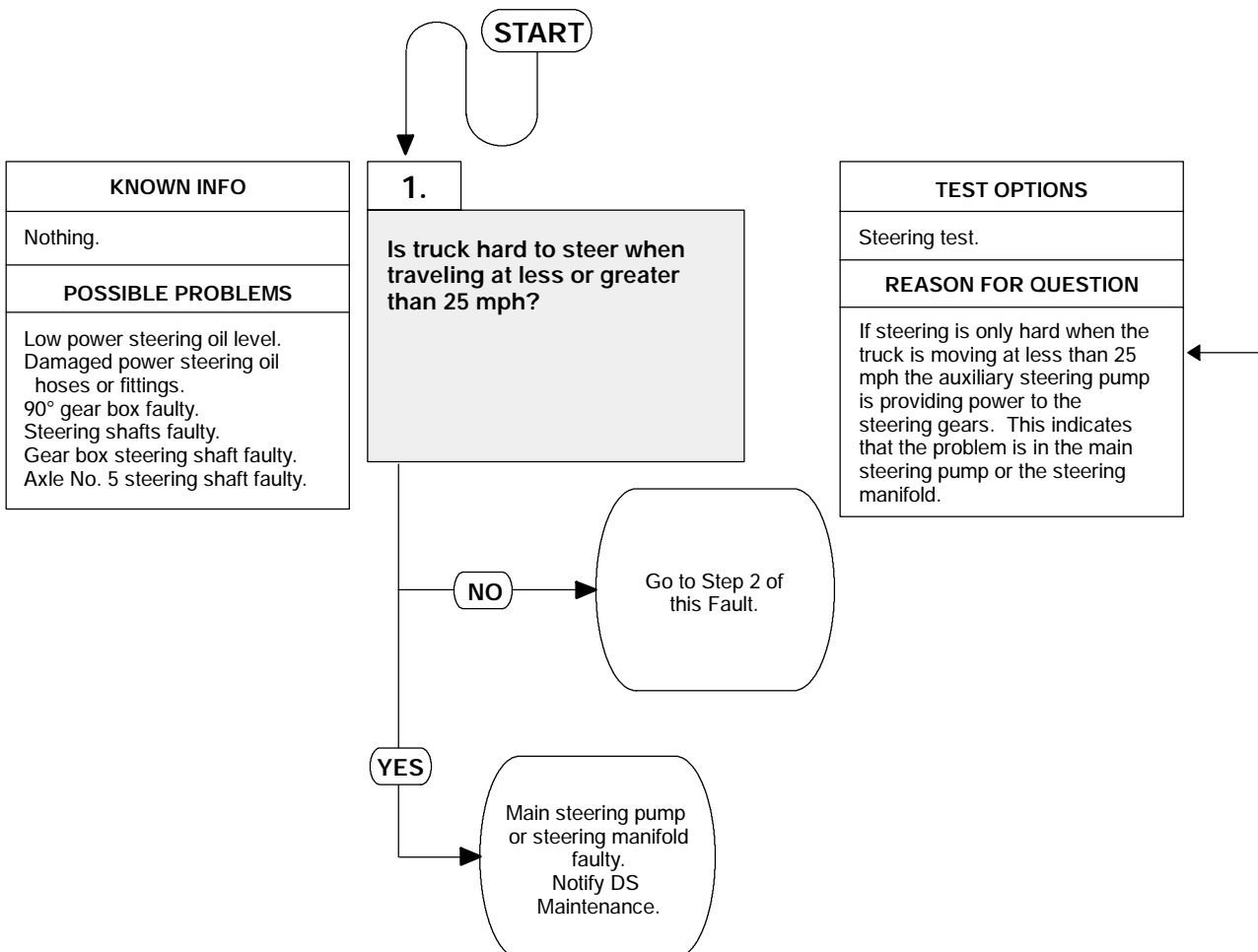
TM 9-2320-364-10

Personnel Required

Two

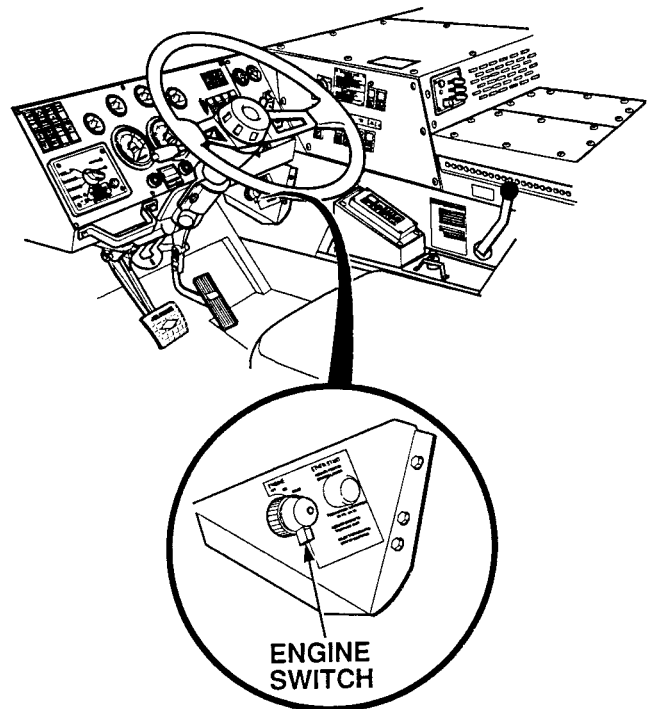
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)

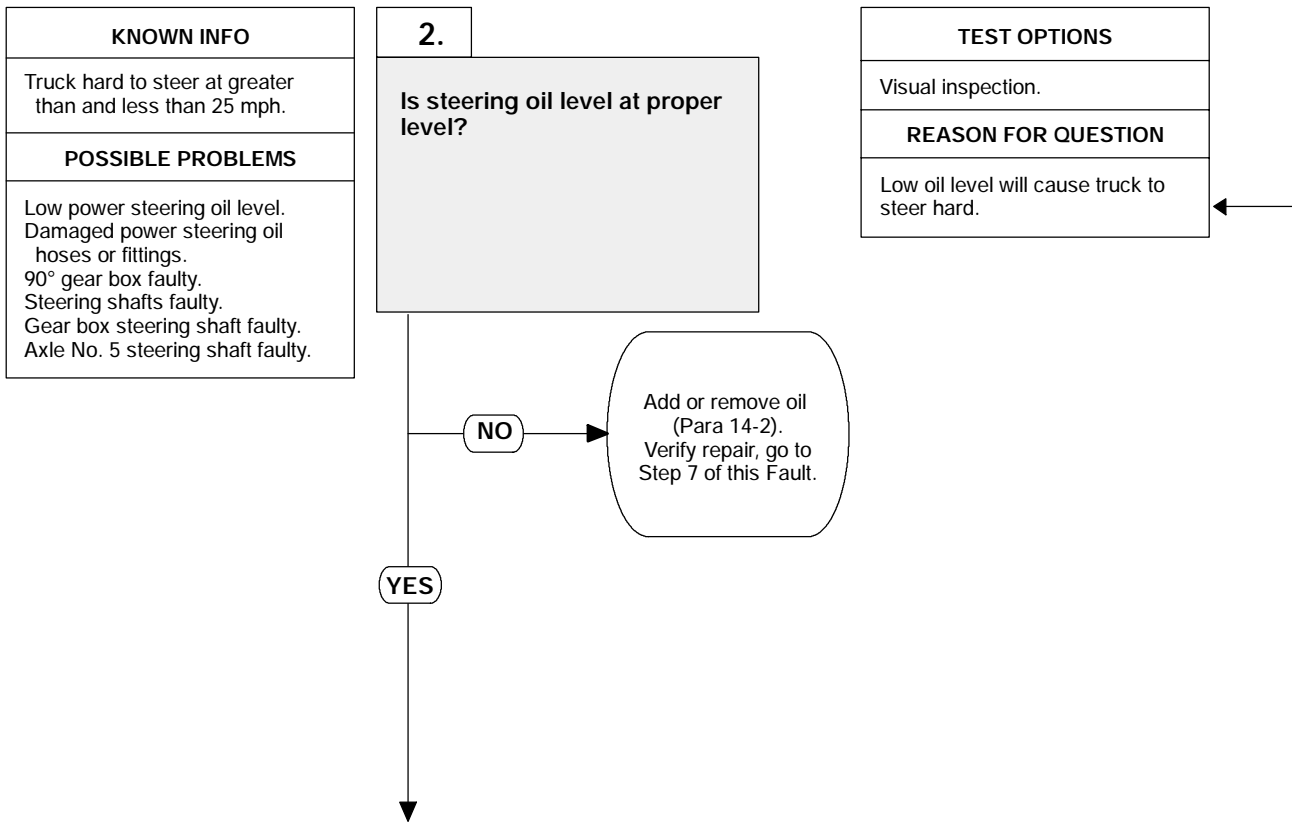


STEERING TEST

- (1) Start engine and check steering while truck is moving at less than 25 mph (TM 9-2330-364-10).
- (2) Check steering while truck is moving at greater than 25 mph.
 - (a) If the truck is hard to steer above and below 25 mph, the problem is in the steering system; turn OFF ENGINE switch and go to Step 2 of this Fault.
 - (b) If the truck is hard to steer at less than 25 mph only, the problem is in the steering hydraulic system. Turn OFF ENGINE switch and notify DS Maintenance.

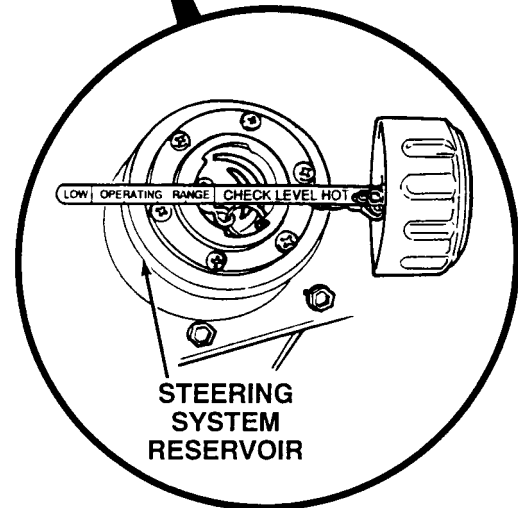
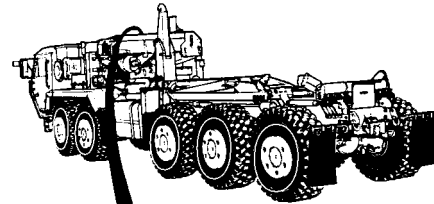


1. TRUCK IS HARD TO STEER (CONT).

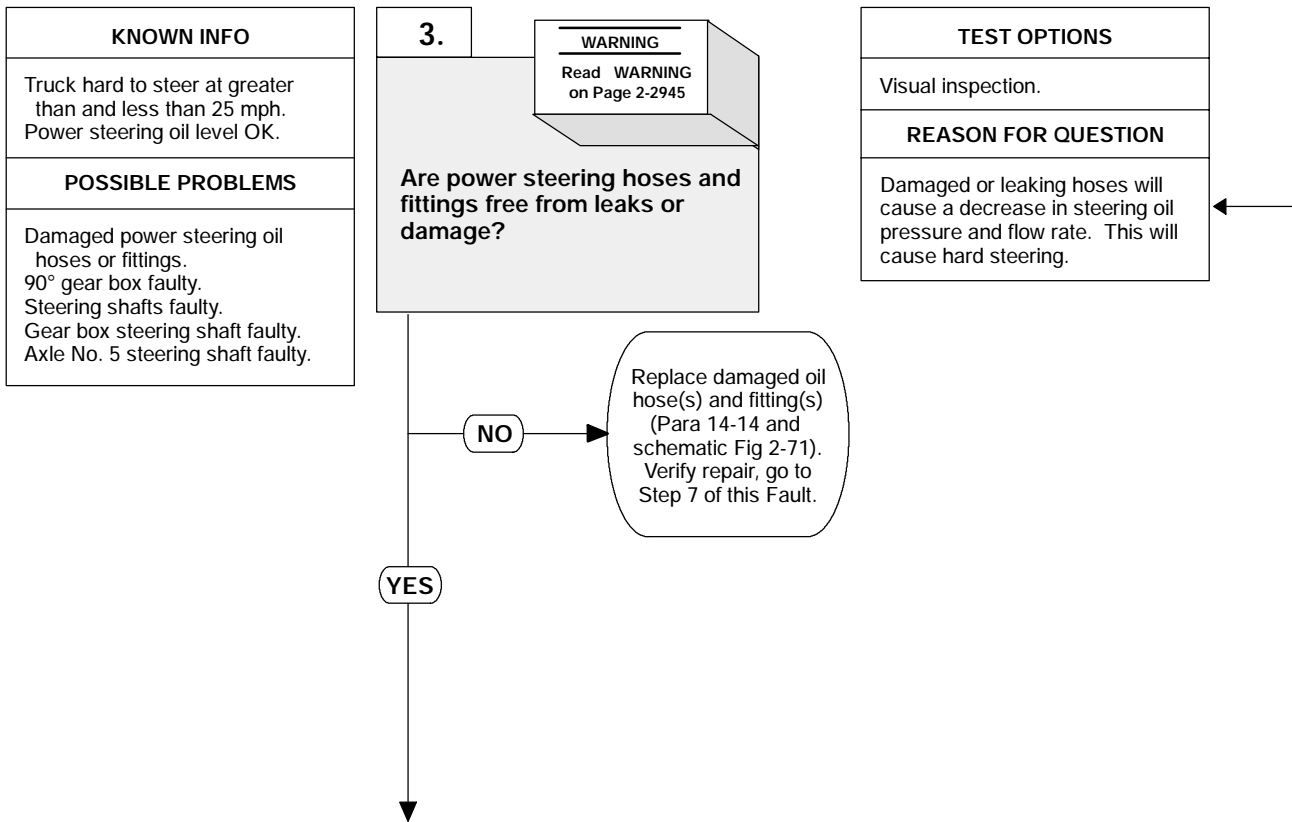


VISUAL INSPECTION

- (1) Check steering reservoir oil level (Para 14-2).
 - (a) If oil is low, add oil and go to Step 7 of this Fault.
 - (b) If oil level is too high, drain oil from oil sampling valve until proper level is reached (Para 14-2).
- (2) If oil level is OK, go to Step 4 of this Fault.



1. TRUCK IS HARD TO STEER (CONT).



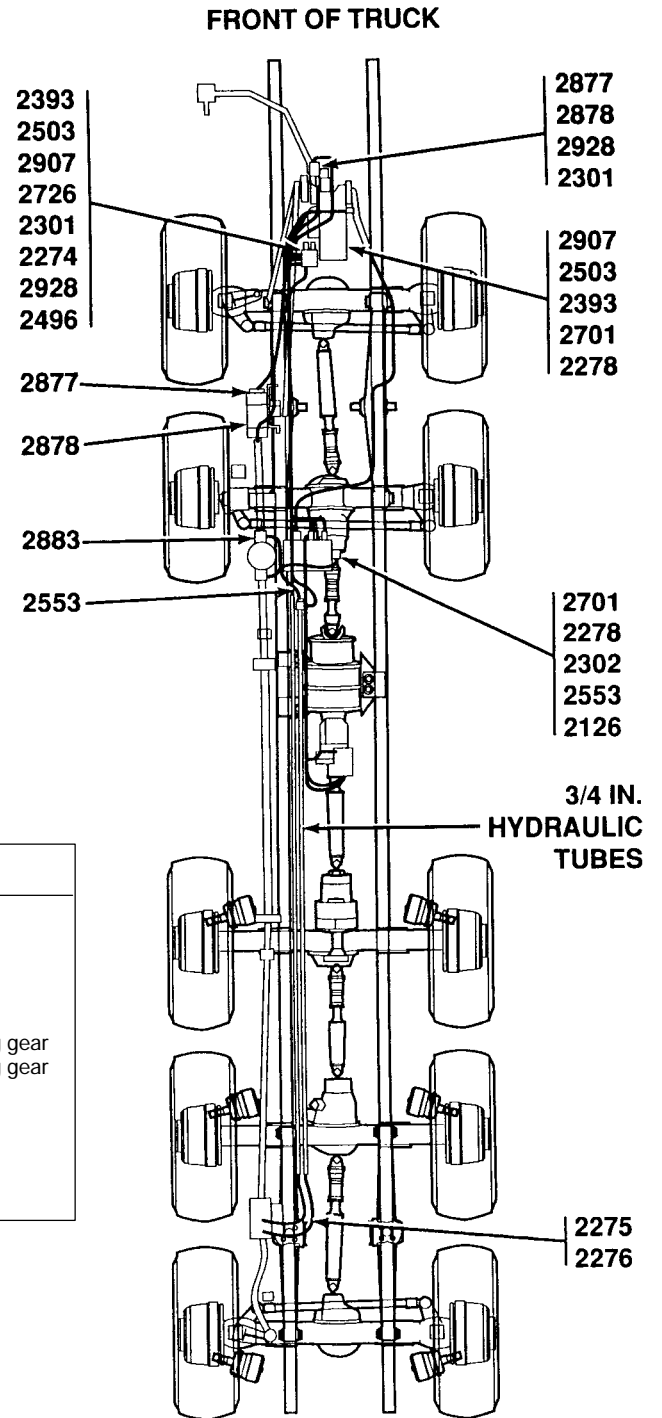
WARNING

Maintain adequate distance from moving steering parts or serious injury to personnel may result.

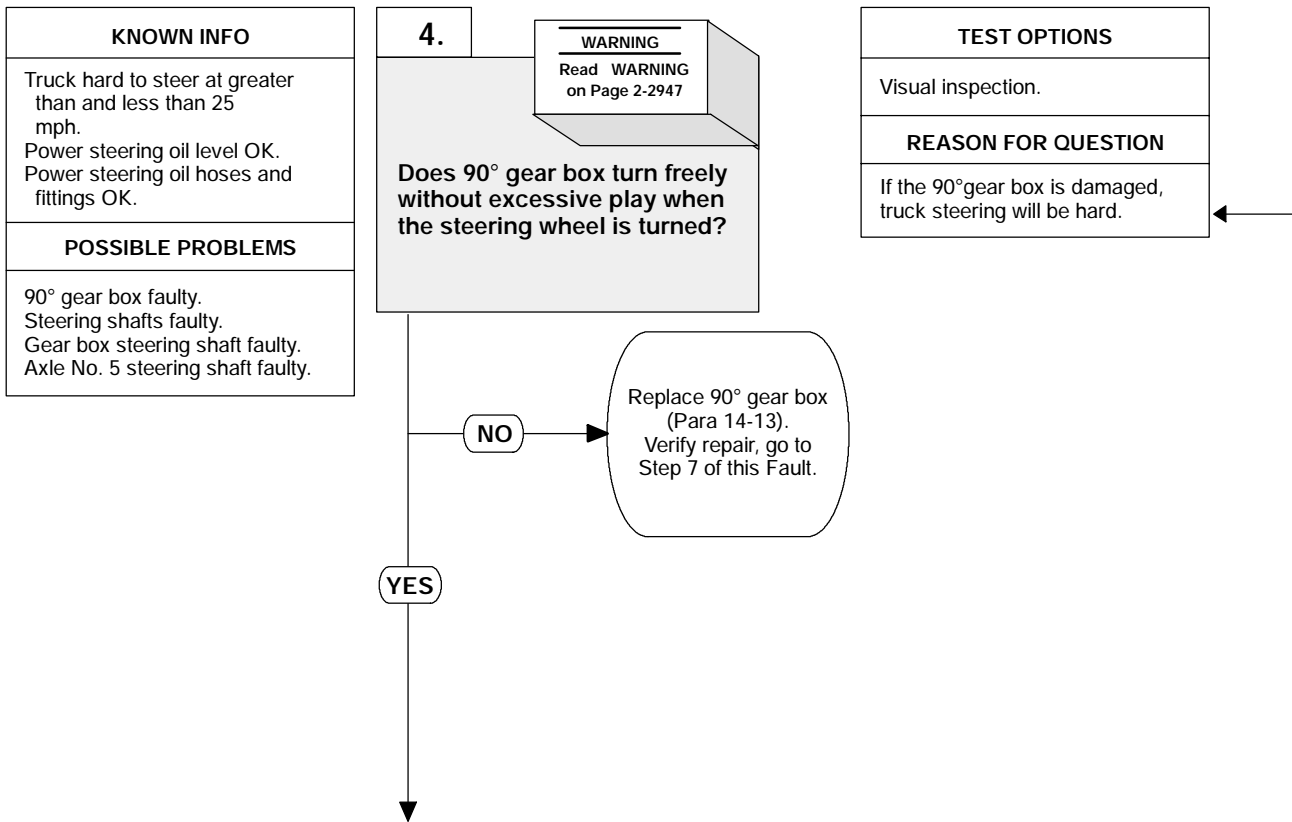
VISUAL INSPECTION	
(1)	Start engine (TM 9-2320-364-10).
(2)	While assistant turns the steering wheel right and left, check power steering hoses and fittings listed in Table 2-60 for leaks and damage.
(a)	If hoses are leaking or damaged, tighten fittings, turn OFF ENGINE switch and replace hoses as necessary (Para 14-14 and schematic Fig 2-71).
(b)	If hoses are free of leaks and/or damage, components are OK.
(3)	Turn OFF ENGINE switch.

Table 2-60. Steering System Hoses

HOSE NO.	FROM	TO
2278	Steering oil reservoir	Steering pump
2393	Steering pump	Steering manifold
2726	Hose 2928	Steering oil reservoir
2301	Steering manifold	Front steering gear
2928	Front steering gear	Hose 2726
2877	Front steering gear	Intermediate steering gear
2878	Front steering gear	Intermediate steering gear
2274	Steering manifold	Power steering tube
2275	Power steering tube	Rear steering gear
2276	Rear steering gear	Power steering tube
2883	Power steering tube	Steering oil filter
2553	Steering oil filter	Steering oil reservoir



1. TRUCK IS HARD TO STEER (CONT).

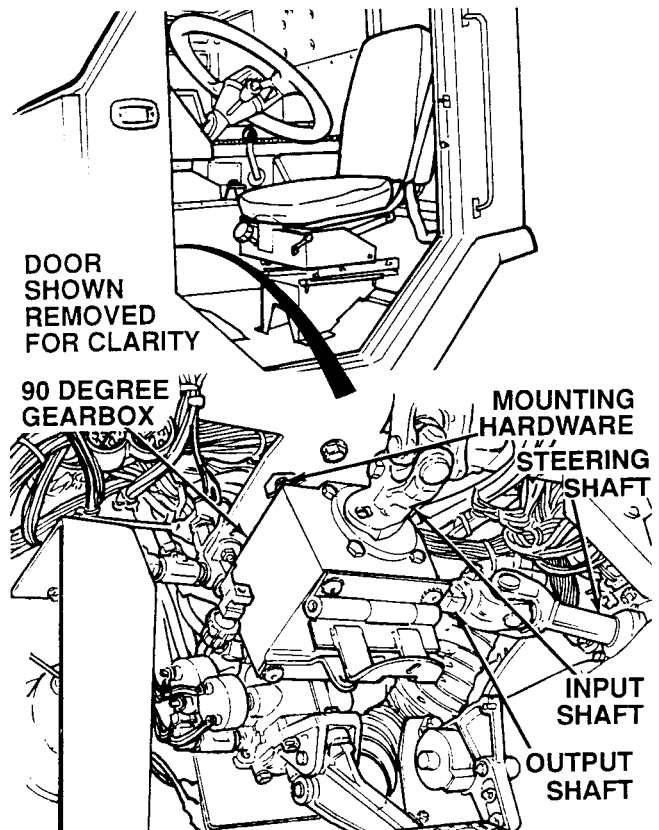


WARNING

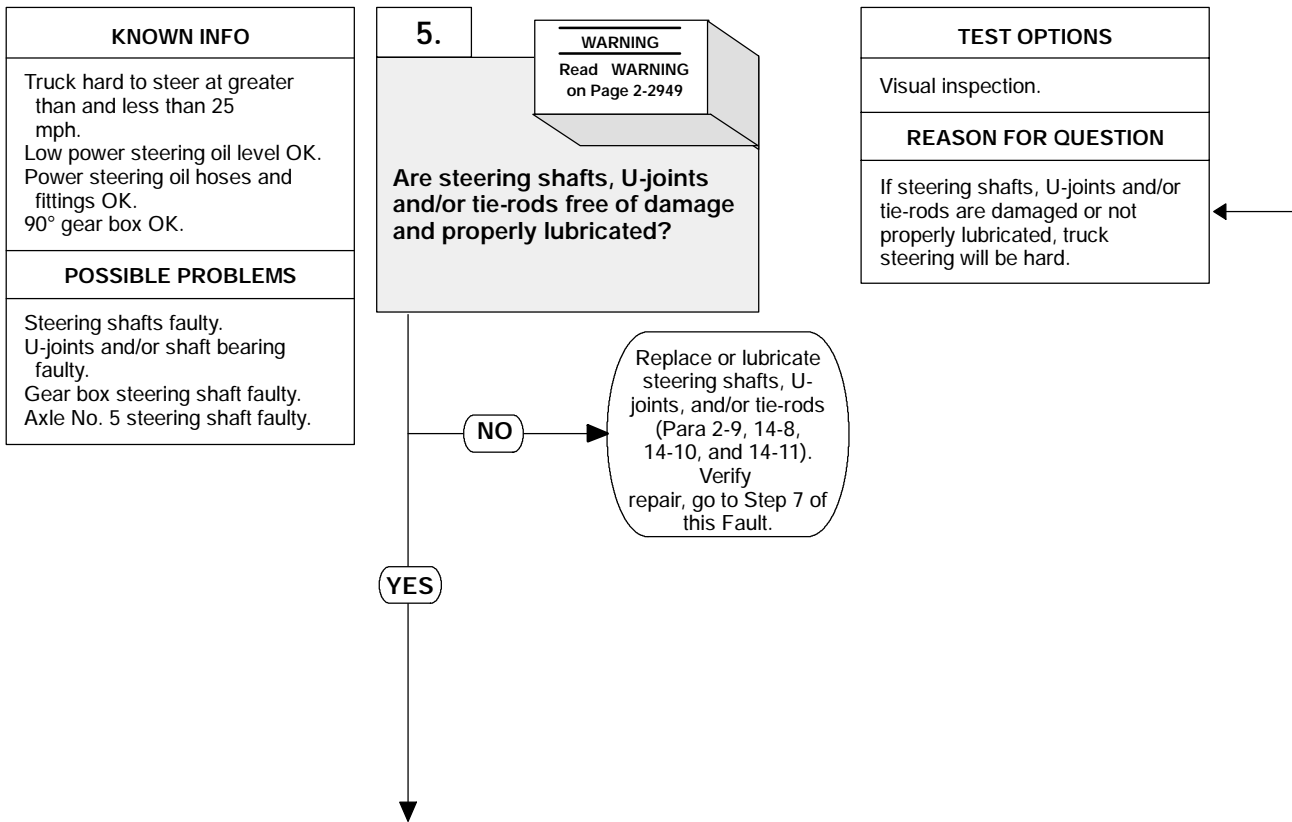
Maintain adequate distance from moving steering parts or serious injury to personnel may result.

VISUAL INSPECTION

- (1) Check 90° gear box mounting hardware (Para 14-13).
 - (a) If gear box is not securely mounted tighten or replace mounting hardware (Para 14-13).
 - (b) If gear box mounting hardware is OK, go to Step (2) below.
- (2) Disconnect steering shaft from output shaft of 90° gear box (Para 14-13).
- (3) Turn steering wheel by hand while checking for binding or excessive play.
 - (a) If binding or excessive play is present, replace gear box (Para 14-13).
 - (b) If binding or excessive play is not present, gear box is OK.
- (4) Reconnect steering shaft to output shaft of 90° gear box (Para 14-13).



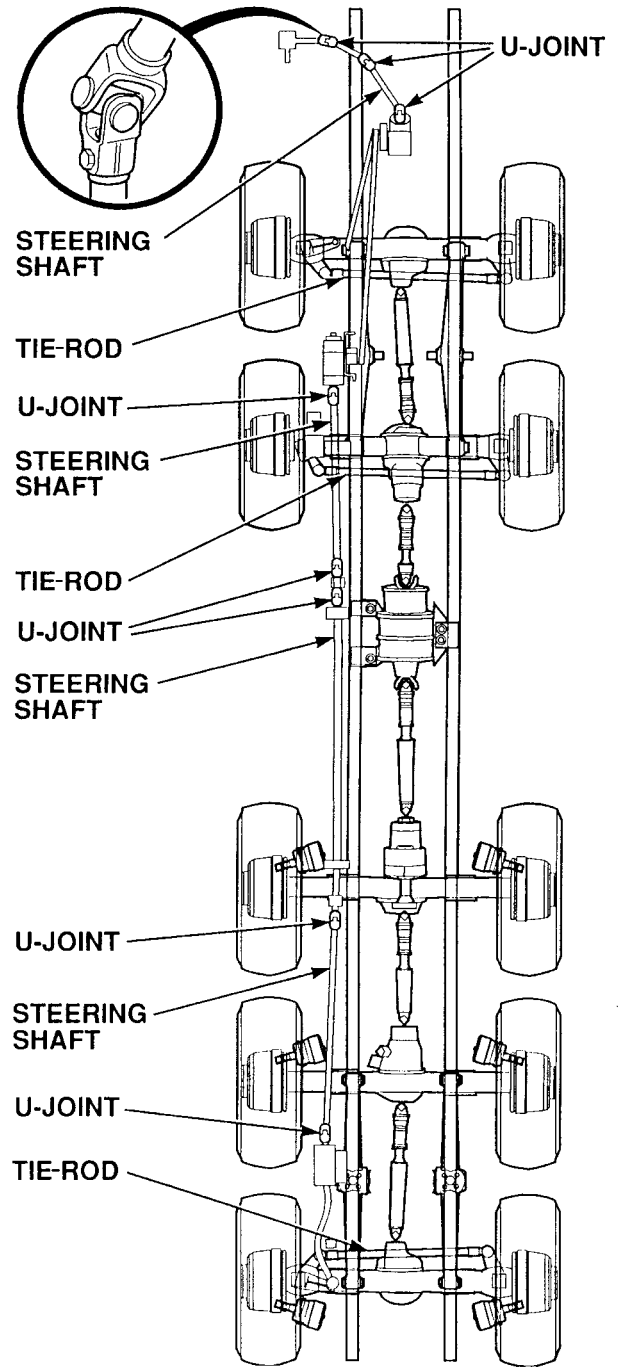
1. TRUCK IS HARD TO STEER (CONT).



WARNING

Maintain adequate distance from moving steering parts or serious injury to personnel may result.

VISUAL INSPECTION
<p>(1) While assistant starts engine (TM 9-2320-364-10) and turns steering wheel, observe steering shafts, tie-rods and U-joints.</p> <p>(a) If steering shafts, tie-rods, drag links and/or U-joints are loose, binding or damaged, turn OFF ENGINE switch and replace damaged parts (Para 14-8, 14-10 and/or 14-11).</p> <p>(b) If steering shafts, tie-rods, drag links and/or U-joints are OK, turn OFF ENGINE switch and go to Step (2) below.</p> <p>(2) Inspect tie-rods, steering shafts and U-joints for correct lubrication.</p> <p>(a) If tie-rods and/or U-joints require lubrication, lubricate (Para 2-9).</p> <p>(b) If tie-rods and/or U-joints do not require lubrication, go to Step 6 of this Fault.</p>

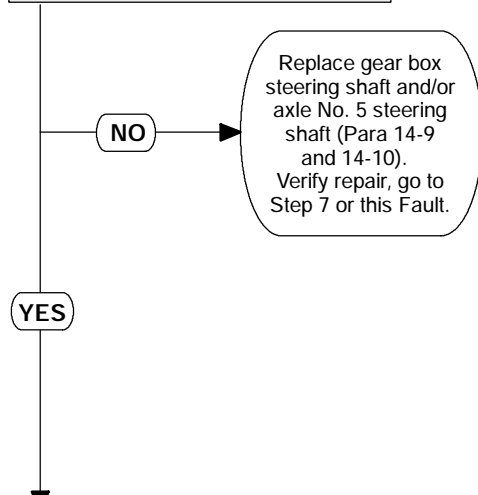


1. TRUCK IS HARD TO STEER (CONT).

KNOWN INFO
Truck hard to steer at greater than and less than 25 mph. Power steering oil level OK. Power steering oil hoses and fittings OK. 90° gear box OK. Steering shafts OK. U-joints and shaft bearing OK.
POSSIBLE PROBLEMS
Gear box steering shaft faulty. Axle No. 5 steering shaft faulty.

6.
Are gear box and axle No. 5 steering shafts free of damage?

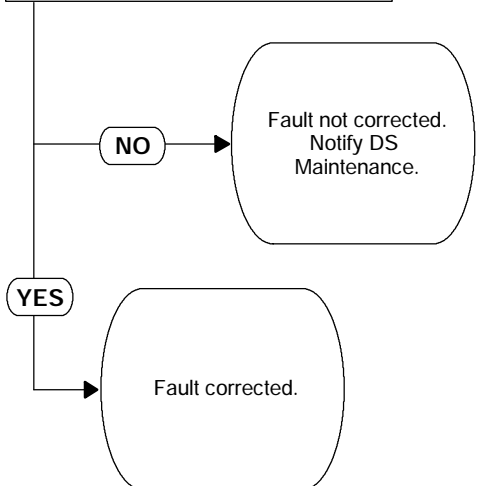
TEST OPTIONS
Visual inspection.
REASON FOR QUESTION
If the gear box or Axle No. 5 steering shafts are damaged, truck steering will be hard.



KNOWN INFO
Truck hard to steer at greater than and less than 25 mph. Power steering oil level OK. Power steering oil hoses and fittings OK. 90° gear box OK. Steering shafts OK. U-joints and shaft bearing OK. Gear box steering shaft OK. Axle No. 5 steering shaft OK.
POSSIBLE PROBLEMS

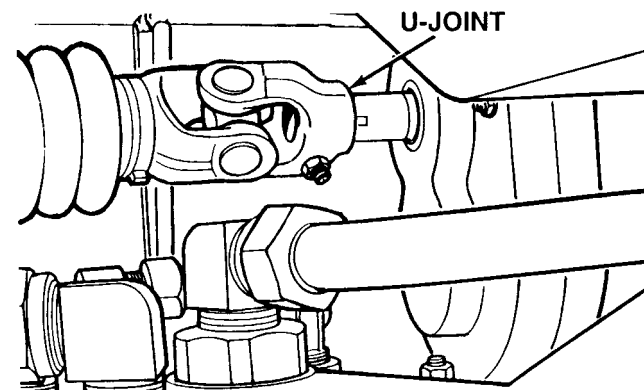
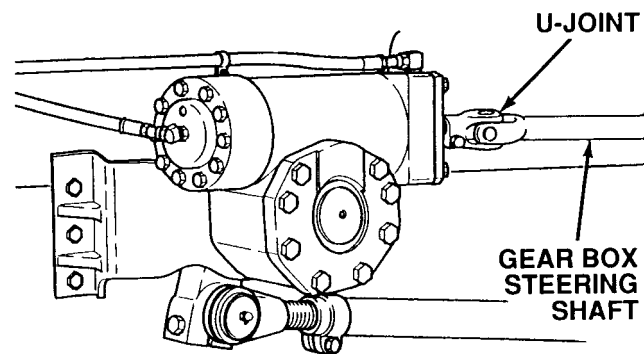
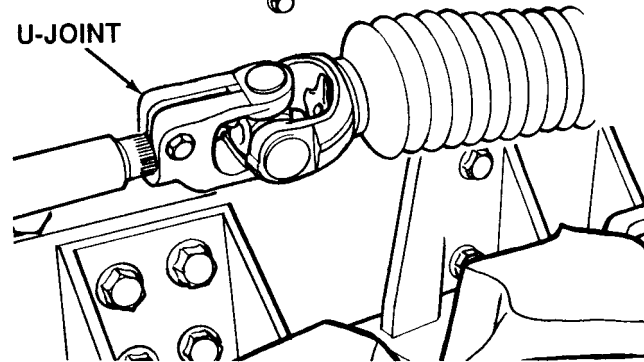
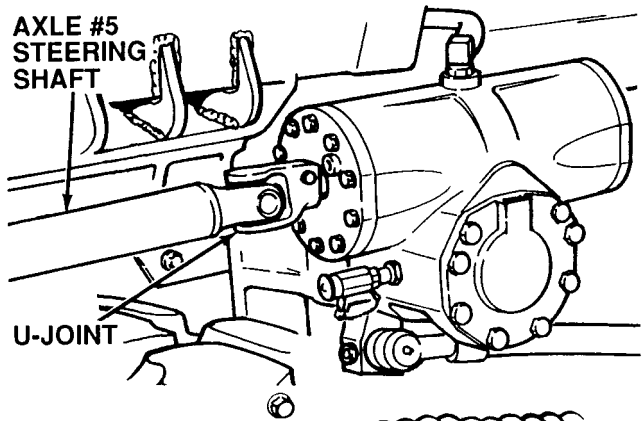
7.
Does truck steer correctly?

TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If truck is not hard to steer, fault has been corrected.



VISUAL INSPECTION

- (1) Remove axle No. 5 steering shaft (Para 14-10).
- (2) Remove gear box steering shaft (Para 14-9).
- (3) Check steering shafts for damage.
 - (a) If steering shafts and/or U-joints are damaged, replace the shafts and/or U-joints (Para 14-9 and 14-10).
 - (b) If steering shafts and U-joints are free of damage, go to Step (4) below.
- (4) Install axle No. 5 and gear box steering shafts (Para 14-9 and 14-10).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Check steering while truck is moving at greater than 25 mph.
 - (a) If truck will not steer correctly, fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If truck is not hard to steer, fault has been corrected.
- (3) Turn OFF ENGINE switch.

2-32. STEERING SYSTEM TROUBLESHOOTING (CONT).

2. TRUCK WANDERS, PULLS TO ONE SIDE, OR SHIMMIES.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

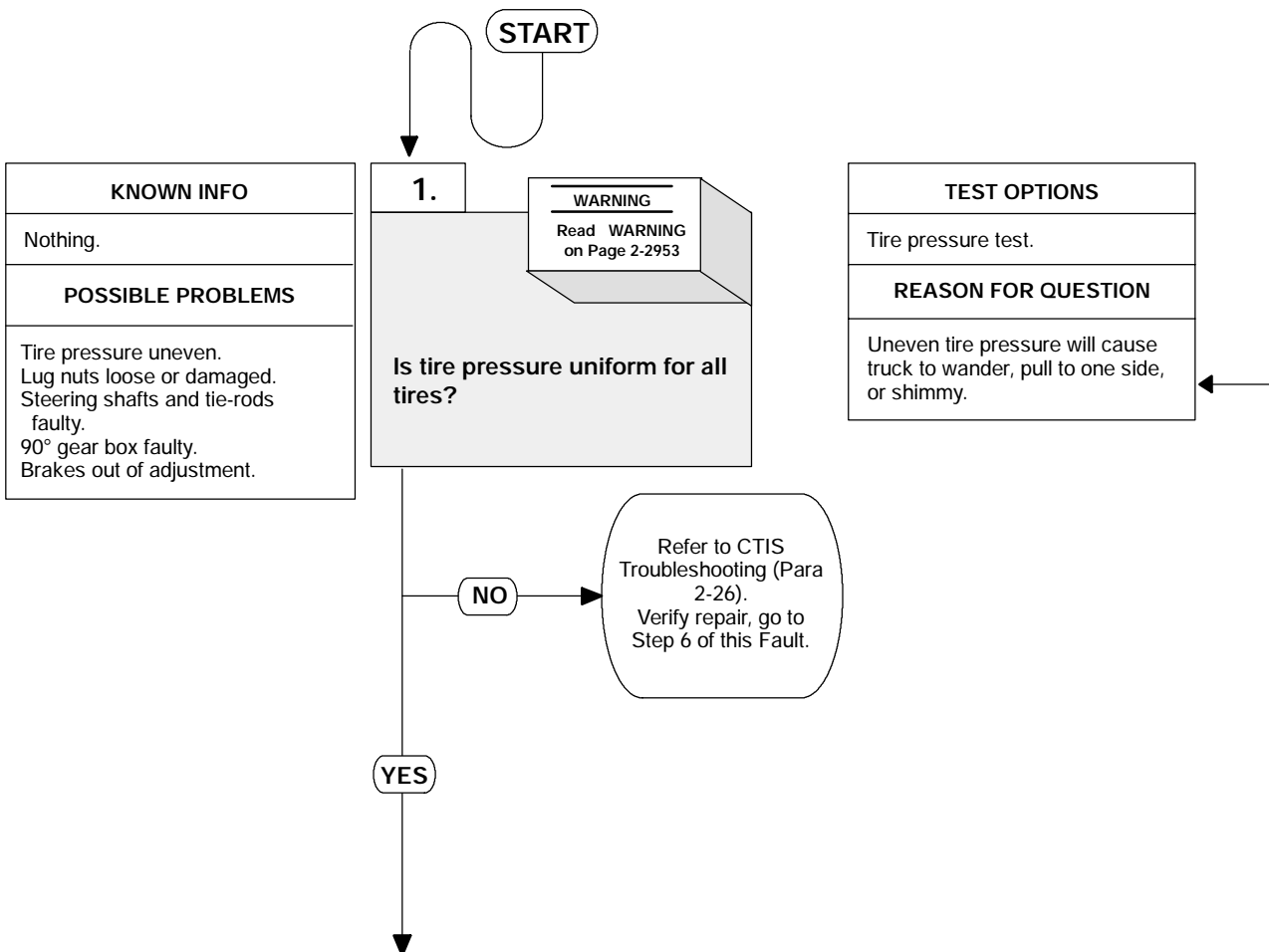
TM 9-2320-364-10

Personnel Required

Two

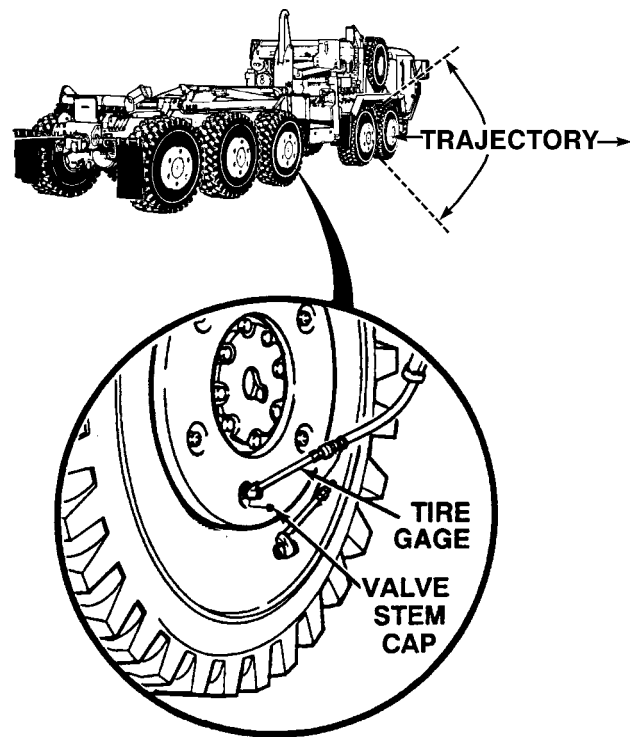
Equipment Condition

Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)



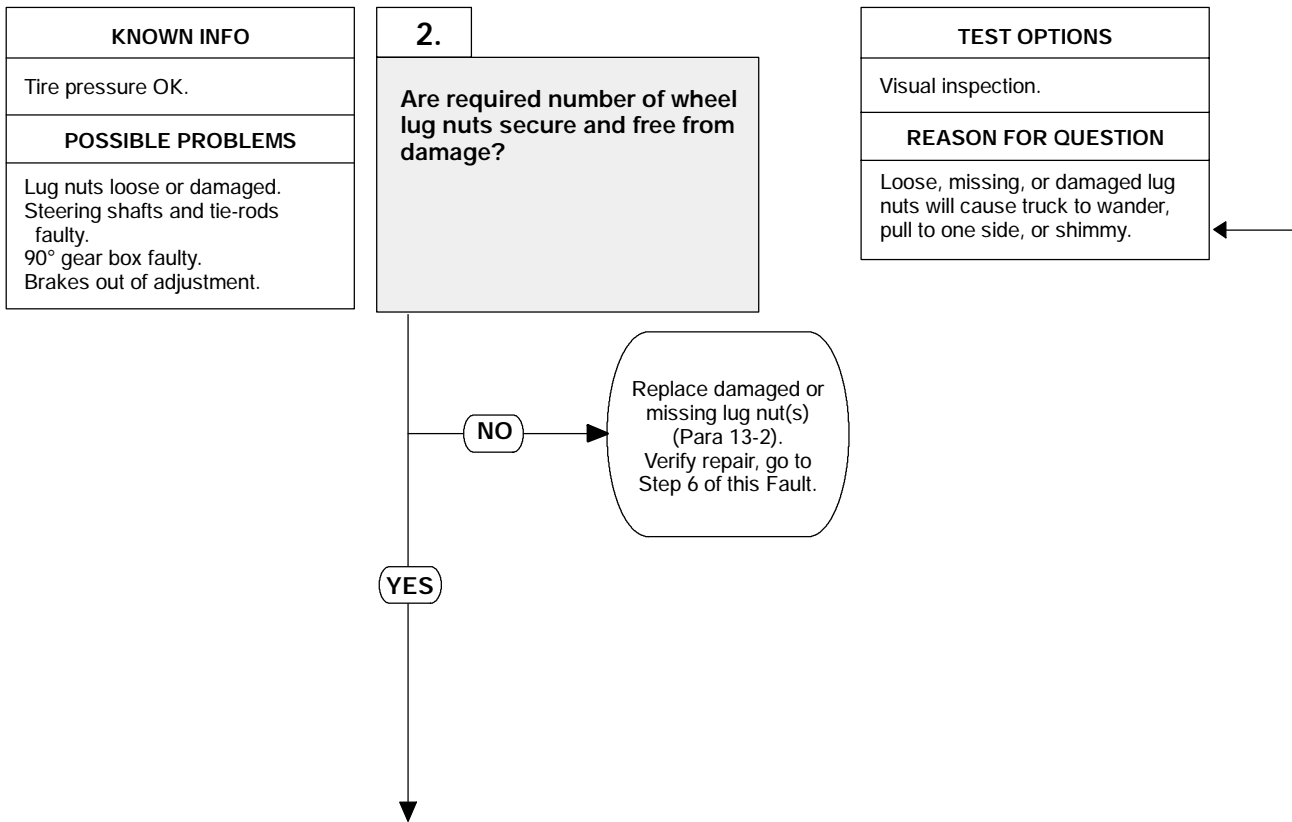
WARNING

Before inflating or deflating, stand out of the trajectory area or personal injury or death may result.

**TIRE PRESSURE TEST**

- Check tire pressure (TM 9-2320-364-10).
- (1) If tire pressure is not correct, go to CTIS troubleshooting (Para 2-26).
 - (2) If tire pressure is correct, go to Step 2 of this Fault.

2. TRUCK WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT).

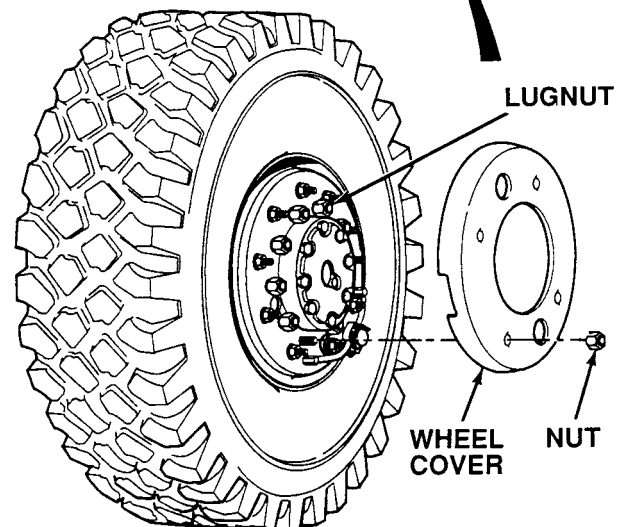
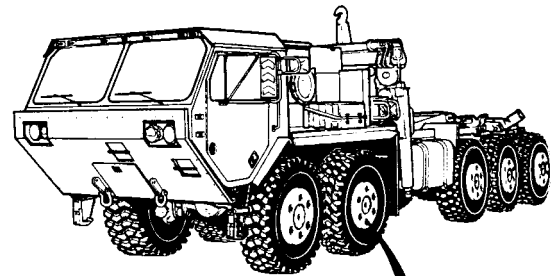


NOTE

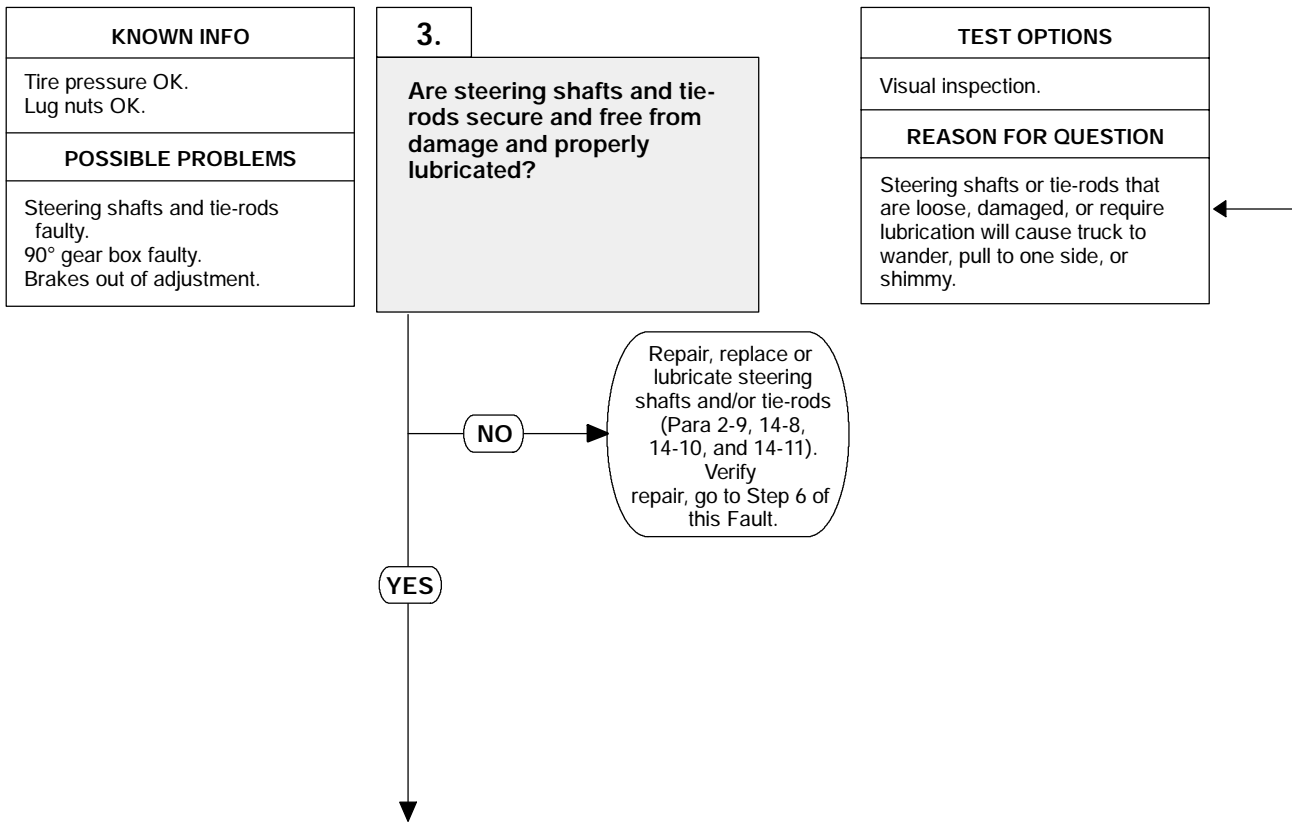
All wheels on truck are the same. Axle No. 2 wheel shown.

VISUAL INSPECTION

- (1) Remove four locknuts and wheel cover from tire assembly (TM 9-2320-364-10).
- (2) Check if any lug nuts are loose, missing, or damaged.
 - (a) If lug nuts are loose or missing, tighten and/or replace lug nuts and perform Step (3) below.
 - (b) If lug nuts are OK, perform Step (3) below and go to Step 3 of this Fault.
- (3) Install wheel cover and four locknuts.

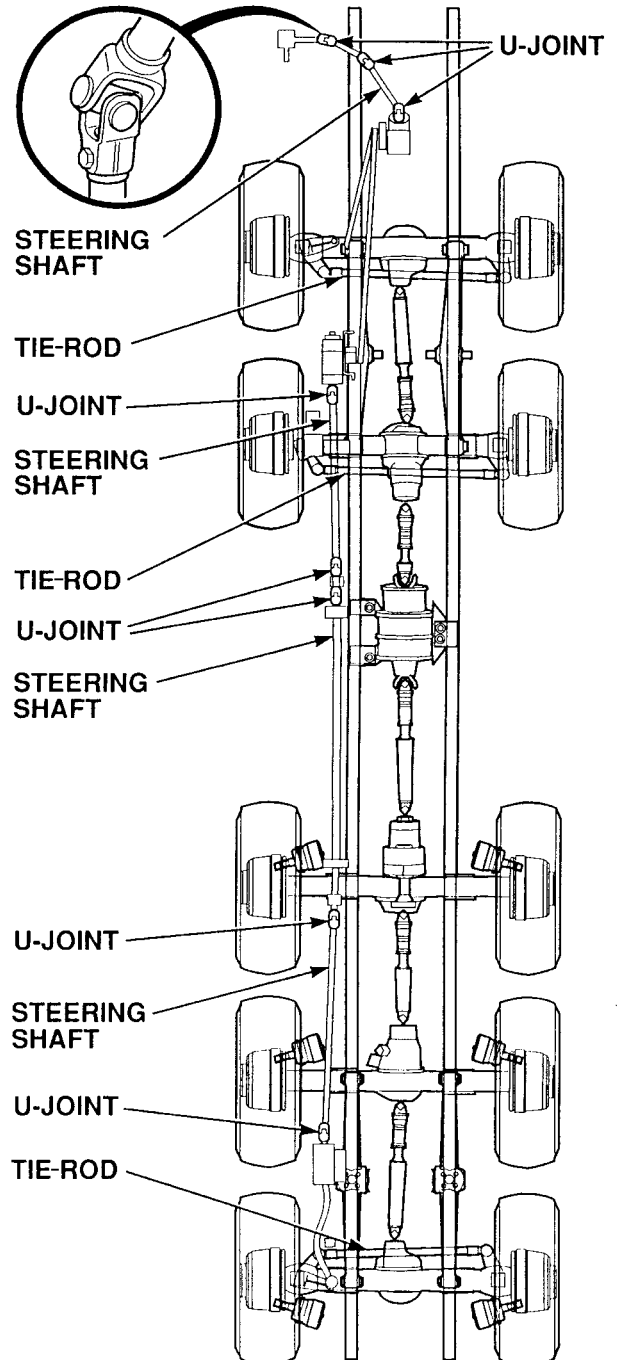


2. TRUCK WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT).

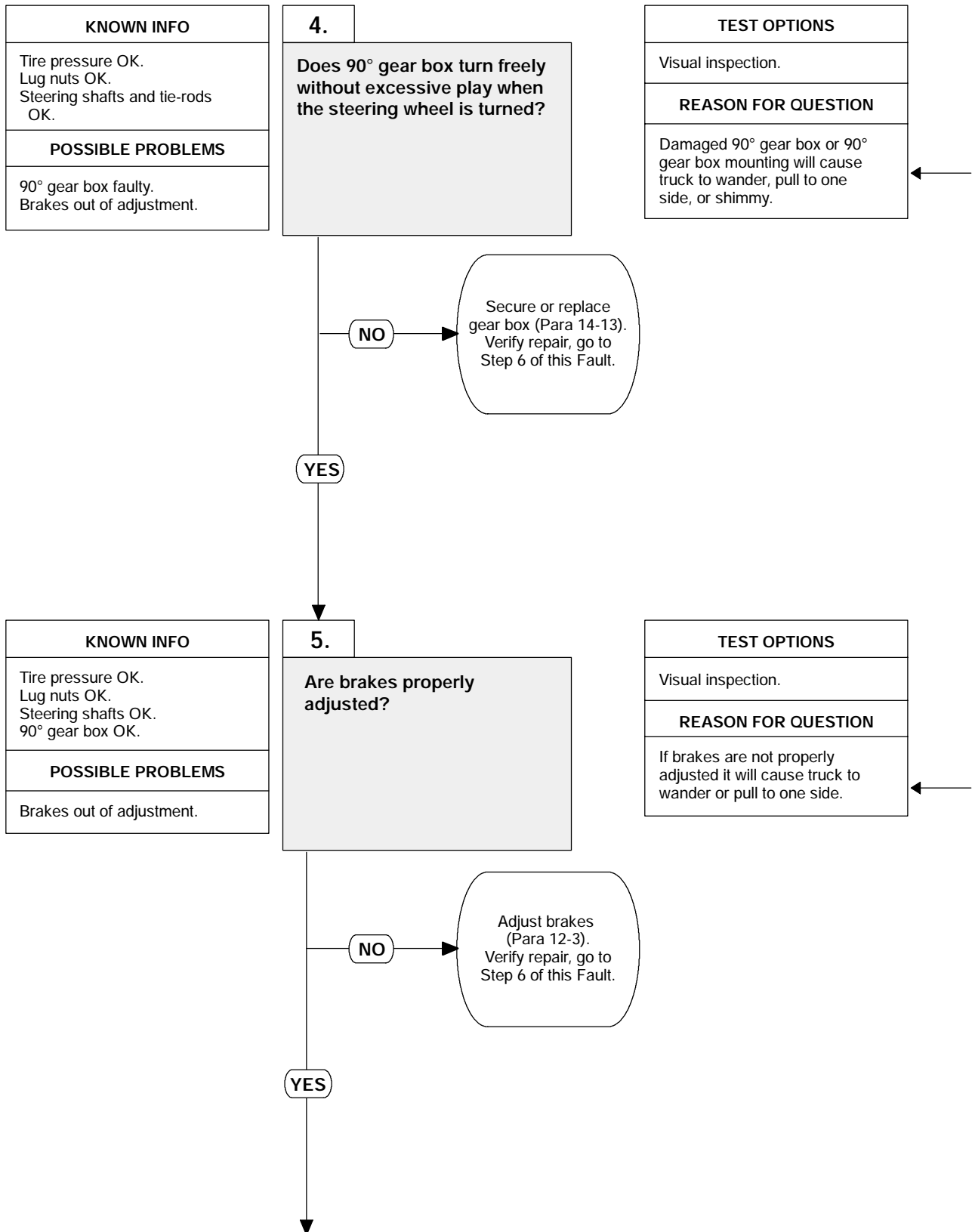


VISUAL INSPECTION

- (1) While assistant starts engine (TM 9-2320-364-10) and turns steering wheel, observe steering shafts, tie-rods and U-joints.
 - (a) Check for wear of tie-rod ends or drag link ends (Para 14-12).
 - (b) If steering shafts, tie-rods, drag links, and/or U-joints are loose, binding or damaged, turn OFF ENGINE switch and replace damaged parts (Para 14-8, 14-10, and/or 14-11).
 - (c) If steering shafts, tie-rods, drag links, and/or U-joints are OK, turn OFF ENGINE switch and go to Step (2) below.
- (2) Inspect tie-rods and steering shaft's U-joints for correct lubrication.
 - (a) If tie-rods and/or U-joints require lubrication, lubricate (Para 2-9).
 - (b) If tie-rods and/or U-joints do not require lubrication, go to Step 4 of this Fault.

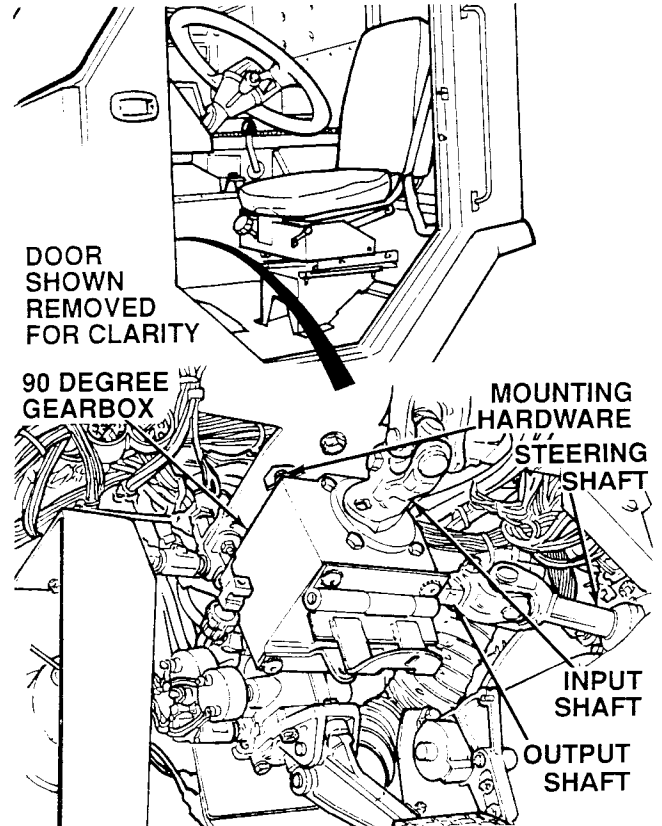


2. TRUCK WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT).



VISUAL INSPECTION

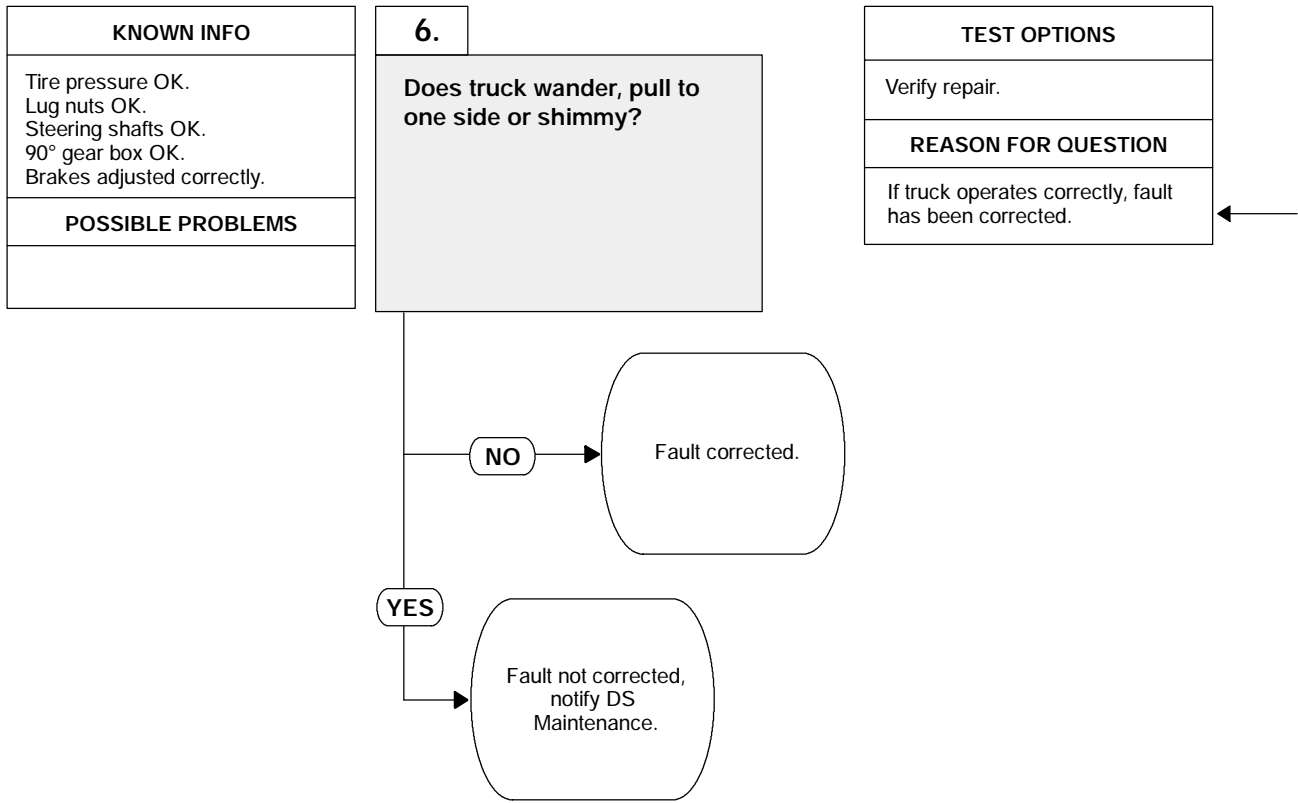
- (1) Check 90° gear box mounting hardware (Para 14-13).
 - (a) If gear box is not securely mounted tighten or replace mounting hardware (Para 14-13).
 - (b) If gear box mounting hardware is OK, go to Step (2) below.
- (2) Disconnect steering shaft from output shaft of 90° gear box (Para 14-13).
- (3) Turn steering wheel by hand while checking for binding or excessive play.
 - (a) If binding or excessive play is present, replace gear box (Para 14-13).
 - (b) If binding or excessive play is not present, gear box is OK.
- (4) Reconnect steering shaft to output shaft of 90° gear box (Para 14-13).



VISUAL INSPECTION

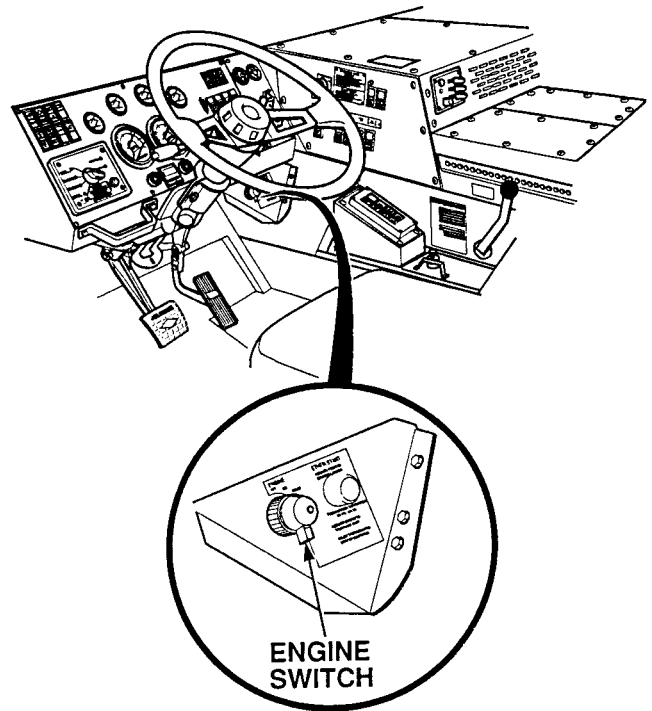
Check brake adjustment and adjust brakes as necessary (Para 12-3).

2. TRUCK WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Check steering while operating the truck.
 - (a) If truck steers correctly, fault has been corrected, turn OFF ENGINE switch.
 - (b) If truck wanders, pulls to one side or shimmies, fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.



2-32. STEERING SYSTEM TROUBLESHOOTING (CONT).

3. EXCESSIVE PLAY WHEN TURNING STEERING WHEEL.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

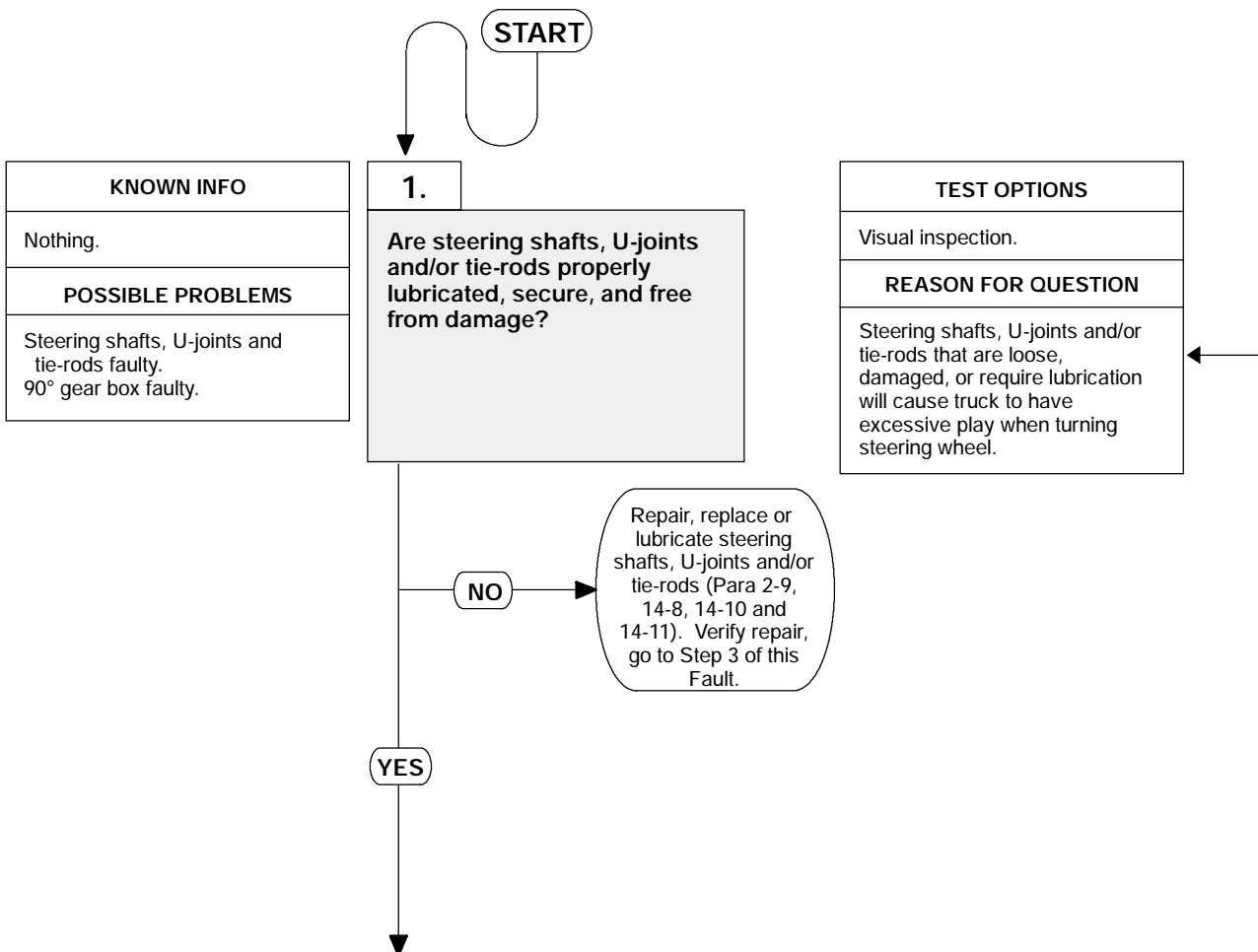
TM 9-2320-364-10

Personnel Required

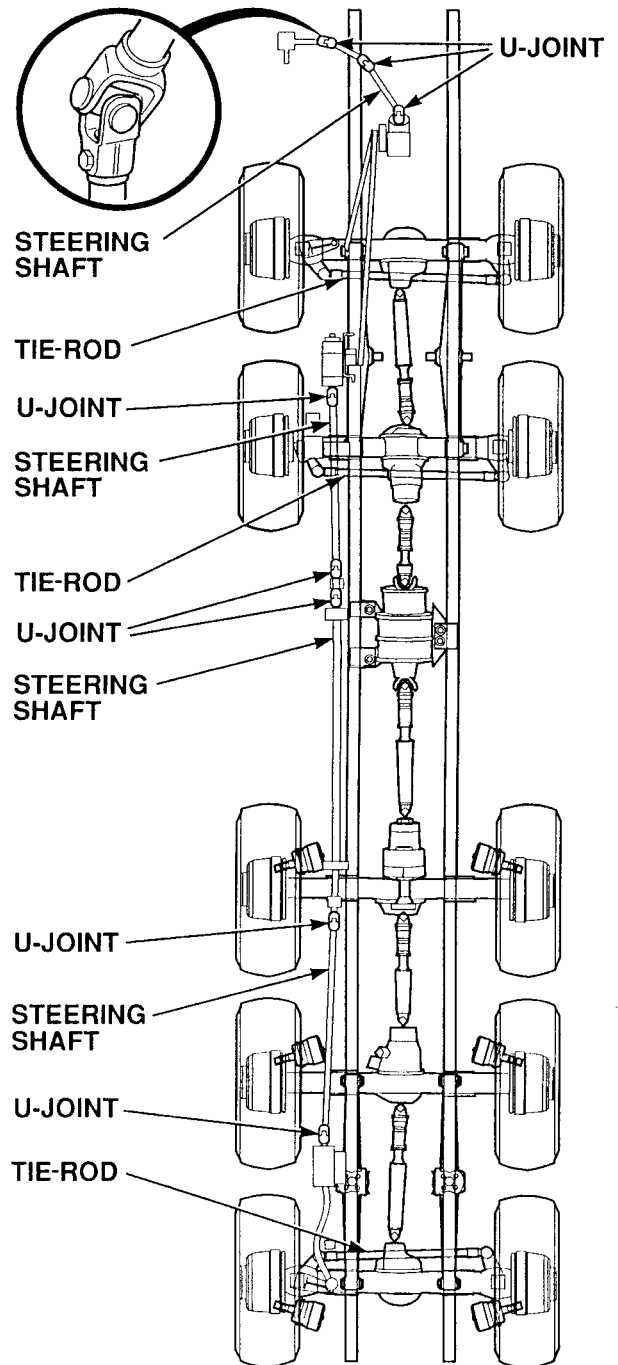
Two

Equipment Condition

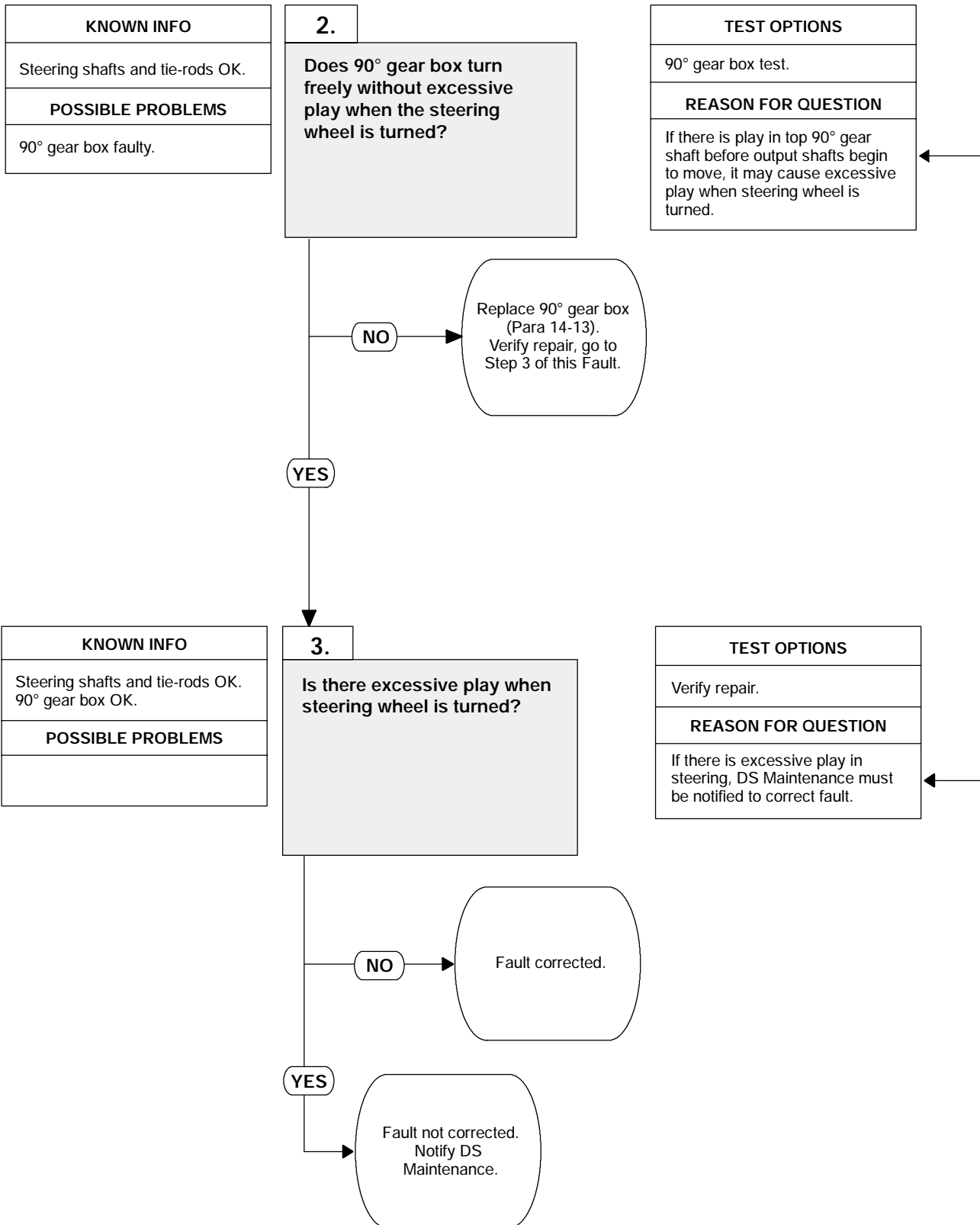
Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)



VISUAL INSPECTION
<p>(1) While assistant starts engine (TM 9-2320-364-10) and turns steering wheel, observe steering shafts, tie-rods and U-joints.</p> <p>(a) Check for wear of tie-rod ends or drag link ends (Para 14-12).</p> <p>(b) If steering shafts, tie-rods, drag links, and/or U-joints are loose, binding or damaged, turn OFF ENGINE switch and replace damaged parts (Para 14-8, 14-10, and/or 14-11).</p> <p>(c) If steering shafts, tie-rods, drag links, and/or U-joints are OK, turn OFF ENGINE switch and go to Step (2) below.</p> <p>(2) Inspect tie-rods and steering shaft's U-joints for correct lubrication.</p> <p>(a) If tie-rods and/or U-joints require lubrication, lubricate (Para 2-9).</p> <p>(b) If tie-rods and/or U-joints do not require lubrication, go to Step 2 of this Fault.</p>

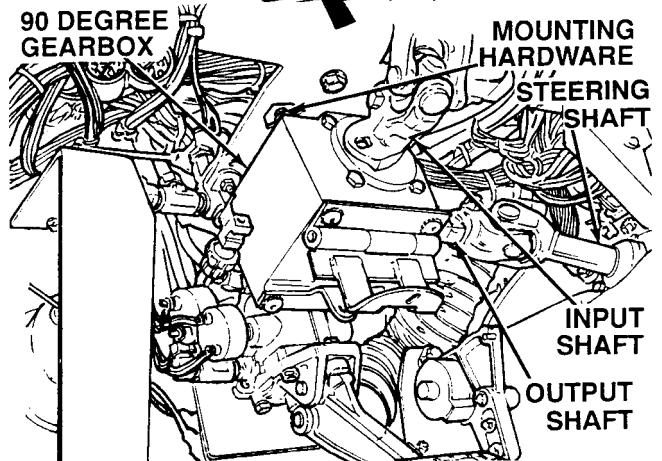
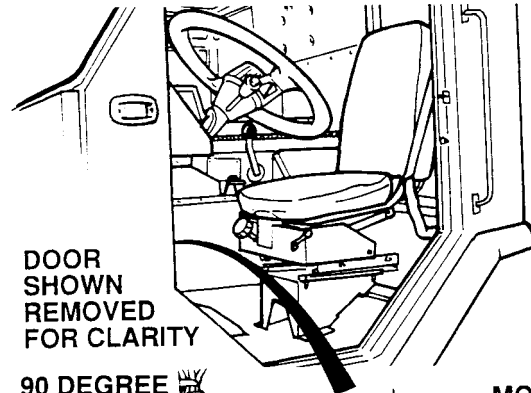


3. EXCESSIVE PLAY WHEN TURNING STEERING WHEEL (CONT).



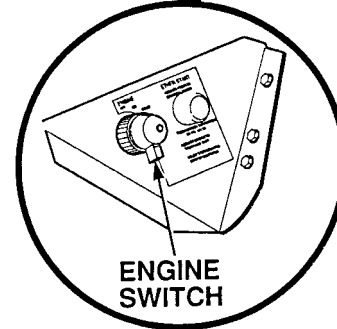
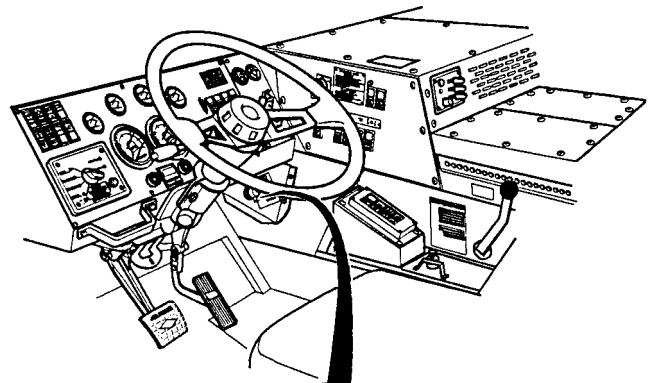
90° GEAR BOX TEST

- (1) Check 90° gear box mounting hardware (Para 14-13).
 - (a) If gear box is not securely mounted tighten or replace mounting hardware (Para 14-13).
 - (b) If gear box mounting hardware is OK, go to Step (2) below.
- (2) Disconnect steering shaft from output shaft of 90° gear box (Para 14-13).
- (3) Turn steering wheel by hand while checking for binding or excessive play.
 - (a) If binding or excessive play is present, replace gear box (Para 14-13).
 - (b) If binding or excessive play is not present, gear box is OK.
- (4) Connect steering shaft to output shaft of 90° gear box (Para 14-13).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Check steering while operating the truck.
 - (a) If there is excessive play in steering, fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If there is no excessive play in steering, fault has been corrected.
- (3) Turn OFF ENGINE switch.



2-32. STEERING SYSTEM TROUBLESHOOTING (CONT).

4. NO RESPONSE WHEN TURNING STEERING WHEEL.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

Personnel Required

Two

References

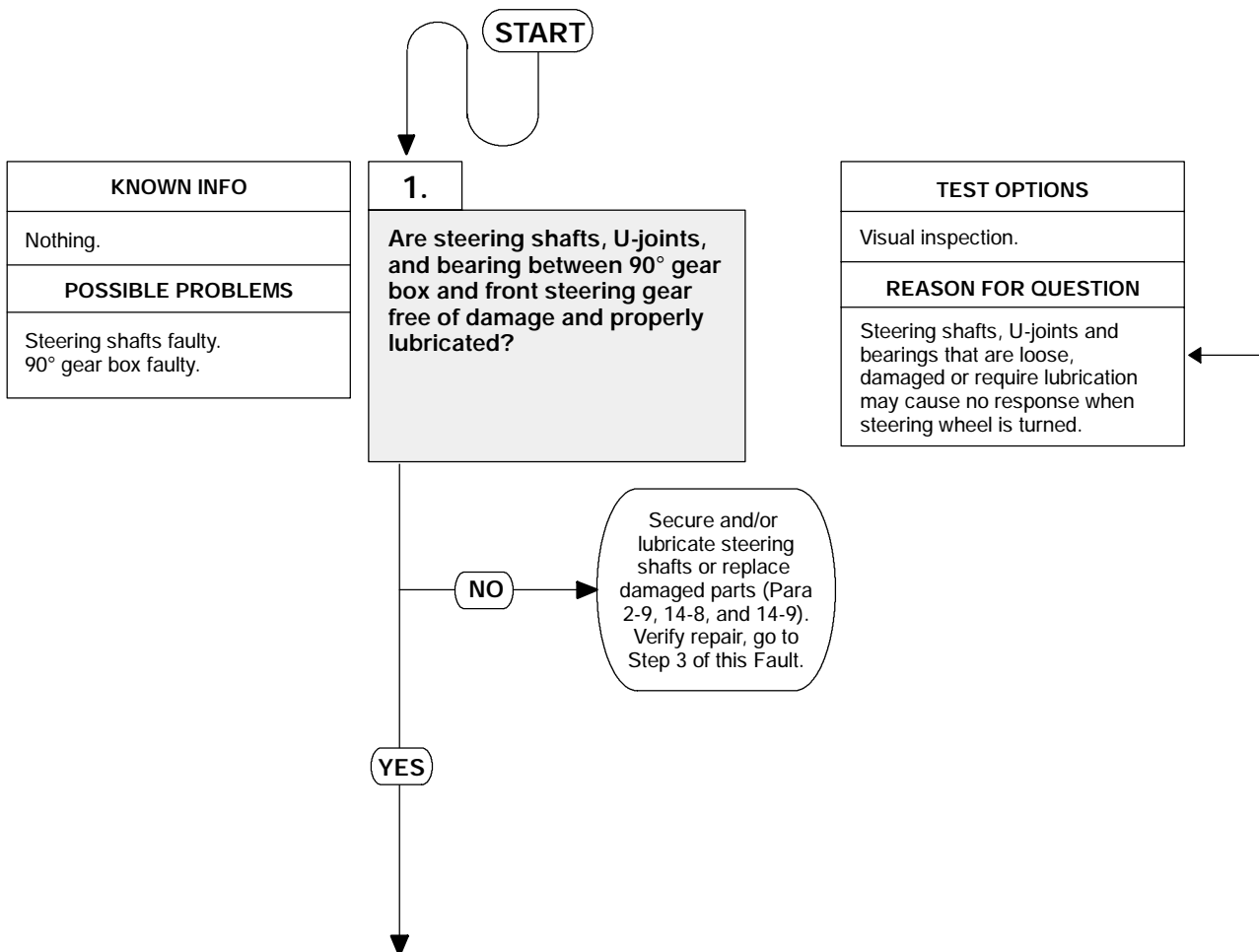
TM 9-2320-364-10

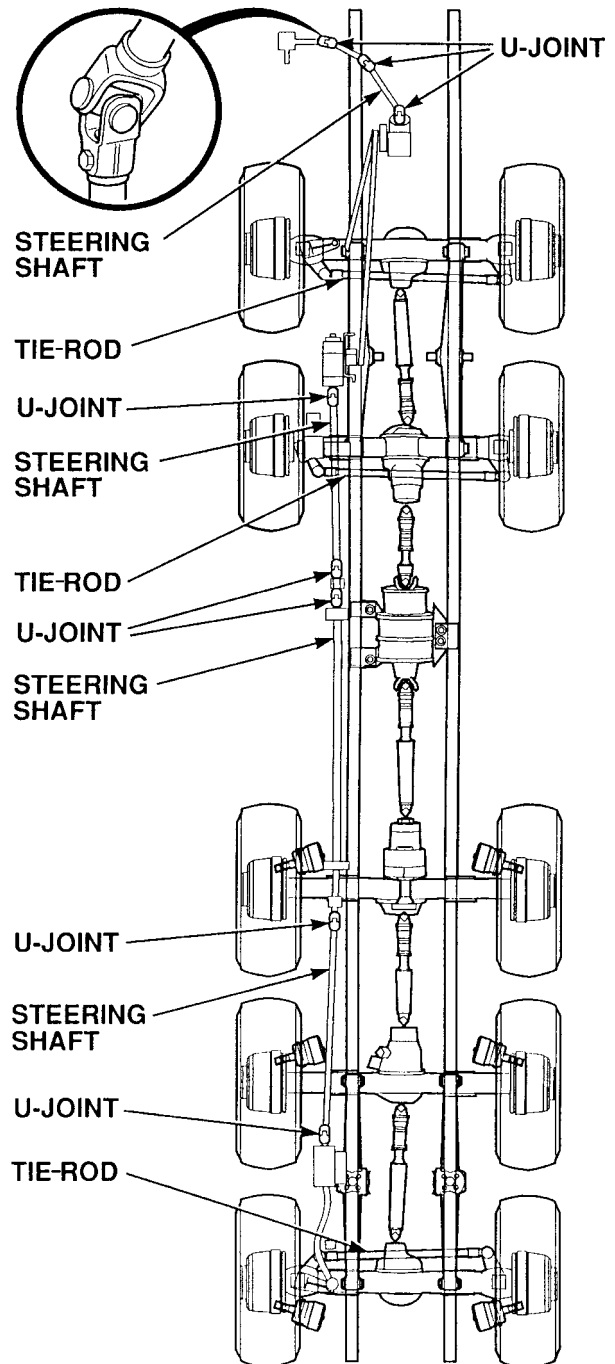
Equipment Condition

Engine OFF, (TM 9-2320-364-10)

Parking brake applied, (TM 9-2320-364-10)

Wheels chocked, (TM 9-2320-364-10)





VISUAL INSPECTION	
(1)	While assistant starts engine (TM 9-2320-364-10) and turns steering wheel, observe steering shafts, tie-rods and U-joints.
(a)	If steering shafts, tie-rods, drag links, and/or U-joints are loose, binding or damaged, turn OFF ENGINE switch and replace damaged parts (Para 14-8, 14-10, and/or 14-11).
(b)	If steering shafts, tie-rods, drag links, and/or U-joints are OK, turn OFF ENGINE switch and go to Step (2) below.
(2)	Inspect tie-rods and steering shaft's U-joints for correct lubrication.
(a)	If tie-rods and/or U-joints require lubrication, lubricate (Para 2-9).
(b)	If tie-rods and/or U-joints do not require lubrication, go to Step 2 of this Fault.

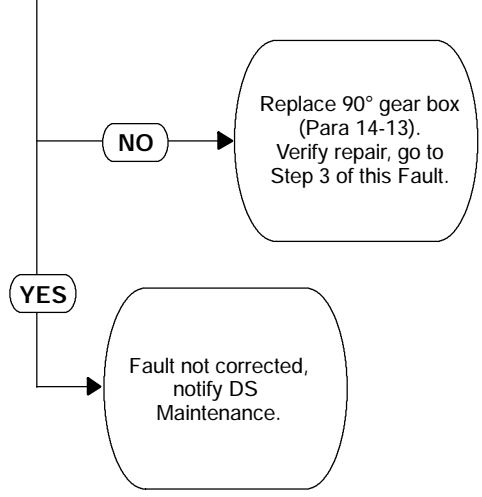
4. NO RESPONSE WHEN TURNING STEERING WHEEL (CONT).

KNOWN INFO
Top steering shafts OK.
POSSIBLE PROBLEMS
90° gear box faulty.

2.

Does 90° gear box shaft turn freely when input shaft is turned?

TEST OPTIONS
90° gear box test.
REASON FOR QUESTION
Faulty 90° gear box may cause no response when steering wheel is turned.

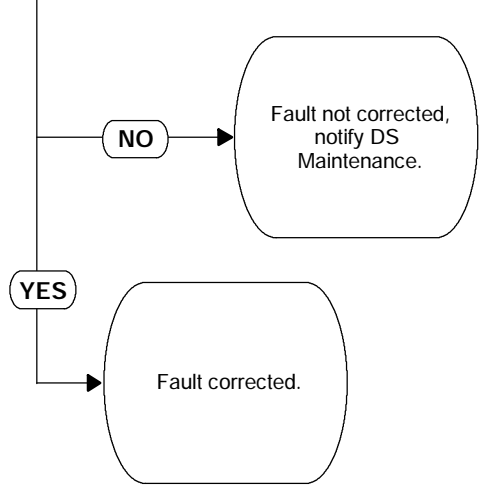


KNOWN INFO
Steering shafts OK. 90° gear box OK.
POSSIBLE PROBLEMS

3.

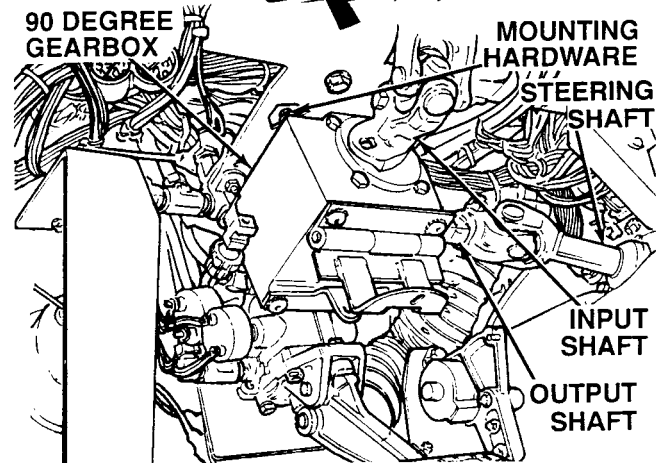
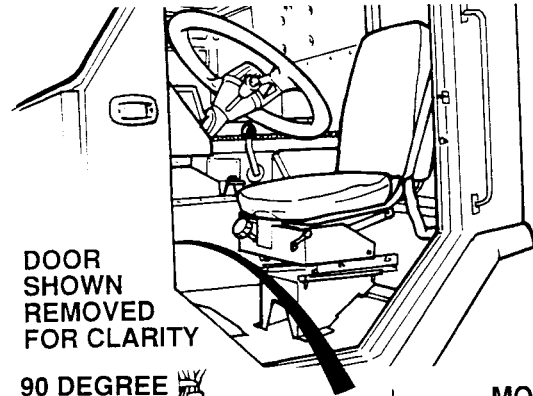
Does truck turn correctly when the steering wheel is turned?

TEST OPTIONS
Verify repair.
REASON FOR QUESTION
If wheels turn when steering wheel is turned, fault is corrected.



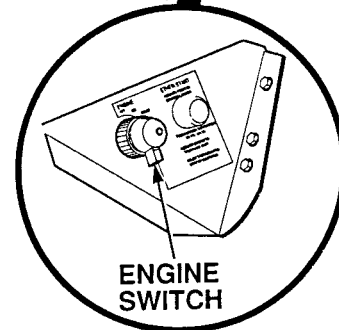
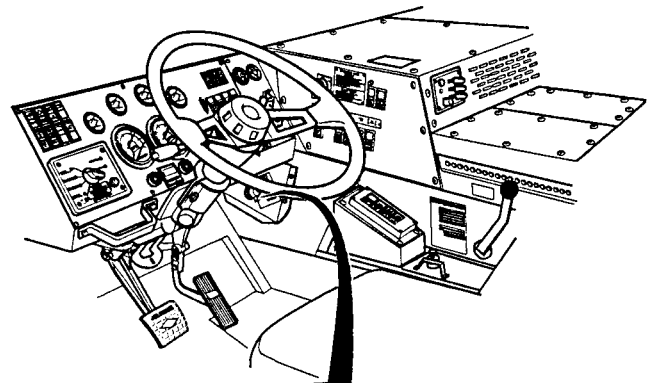
90° GEAR BOX TEST

- (1) Check 90° gear box mounting hardware (Para 14-13).
 - (a) If gear box is not securely mounted tighten or replace mounting hardware (Para 14-13)
 - (b) If gear box mounting hardware is OK, go to Step (2) below.
- (2) Disconnect steering shaft from output shaft of 90° gear box (Para 14-13).
- (3) Turn steering wheel by hand while checking for binding or excessive play.
 - (a) If binding or excessive play is present, replace gear box (Para 14-13).
 - (b) If binding or excessive play is not present, gear box is OK.
- (4) Connect steering shaft to output shaft of 90° gear box (Para 14-13).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Turn steering wheel to ensure wheels turn.
 - (a) If wheels do not respond to turning of steering wheel, fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If wheels do turn correctly when steering wheel is turned, fault has been corrected.
- (3) Turn OFF ENGINE switch.



2-32. STEERING SYSTEM TROUBLESHOOTING (CONT).

5. NO RESPONSE AT AXLE NO. 5 WHEN TURNING STEERING WHEEL.

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Item 74, Appendix G)

References

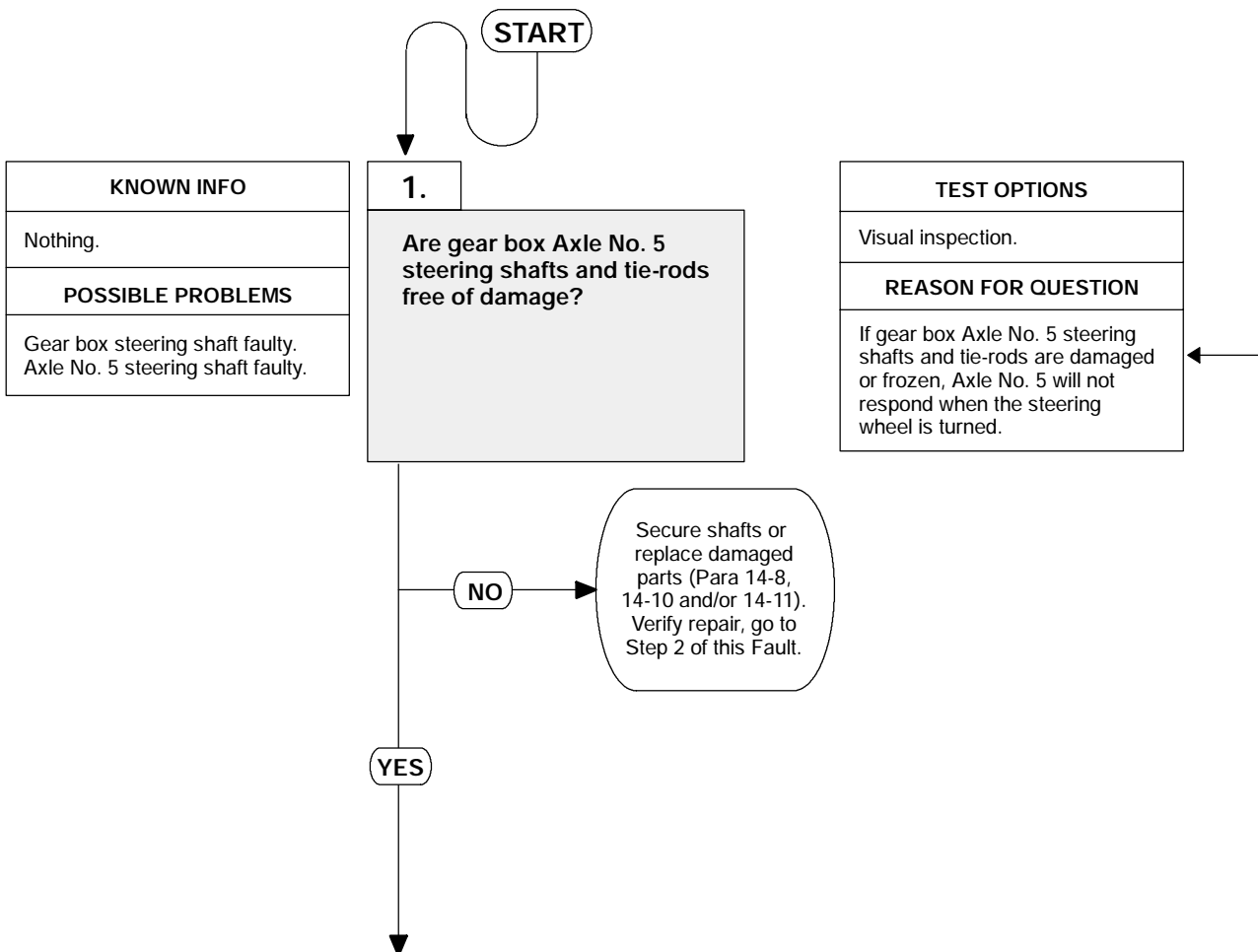
TM 9-2320-364-10

Personnel Required

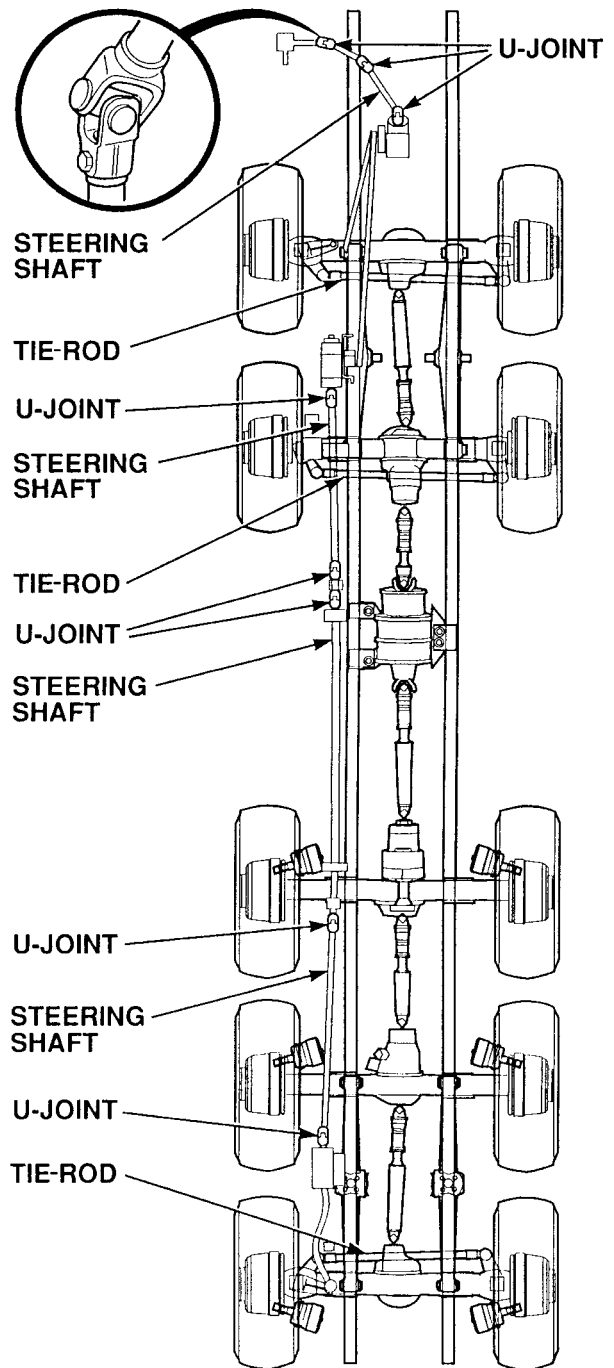
Two

Equipment Condition

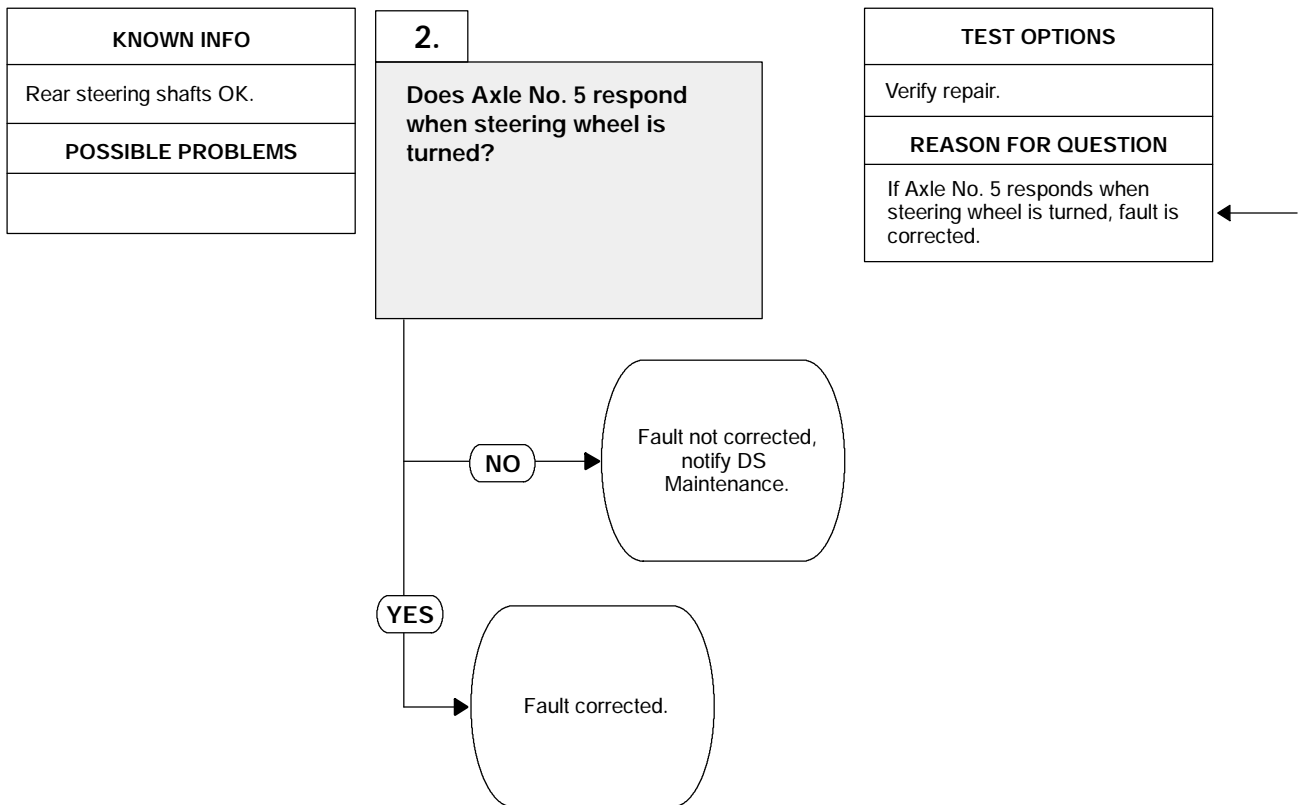
Engine OFF, (TM 9-2320-364-10)
Parking brake applied, (TM 9-2320-364-10)
Wheels chocked, (TM 9-2320-364-10)



VISUAL INSPECTION	
(1)	While assistant starts engine (TM 9-2320-364-10) and turns steering wheel, observe steering shafts, tie-rods and U-joints.
(a)	If steering shafts, tie-rods and/or U-joints are loose, binding or damaged, turn OFF ENGINE switch and replace damaged parts (Para 14-8, 14-10, and/or 14-11).
(b)	If steering shafts, tie-rods and/or U-joints are OK, turn OFF ENGINE switch and go to Step 2 of this Fault.
(2)	Inspect tie-rods and steering shaft's U-joints for correct lubrication.
(a)	If tie-rods and/or U-joints require lubrication, lubricate (Para 2-9).
(b)	If tie-rods and/or U-joints do not require lubrication, go to Step 2 of this Fault.

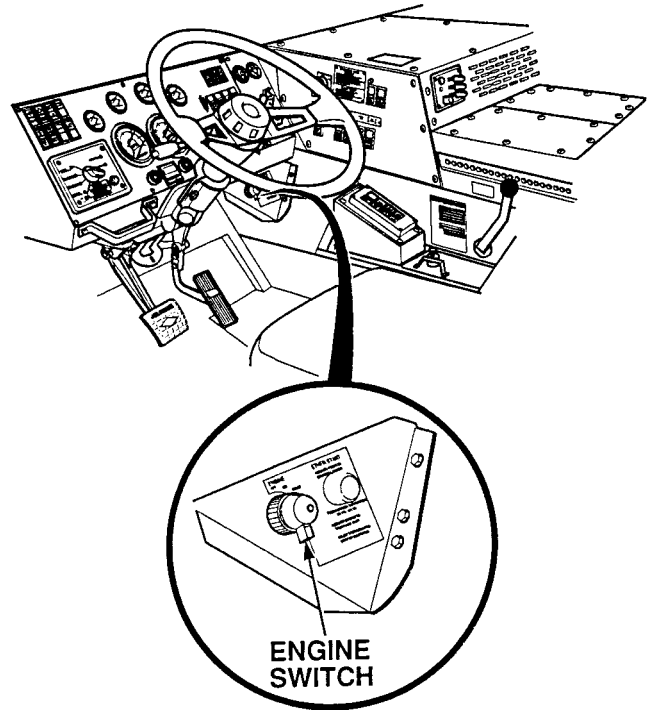


5. NO RESPONSE AT AXLE NO. 5 WHEN TURNING STEERING WHEEL (CONT).



VERIFY REPAIR

- (1) Start engine (TM 9-2320-364-10).
- (2) Turn steering wheel to ensure Axle No. 5 wheels turn.
 - (a) If Axle No. 5 wheels do not turn fault not corrected. Turn OFF ENGINE switch and notify DS Maintenance.
 - (b) If Axle No. 5 turns correctly, fault has been corrected.
- (3) Turn OFF ENGINE switch.



APPENDIX A

REFERENCES

A-1. SCOPE.

Indexes should be consulted frequently for latest changes or revisions of references given in this appendix and for new publications relating to material covered in this publication.

Military Publication Indexes.

Consolidated Index of Army Publications and Forms DA PAM 310-1

A-2. FORMS.

Refer to DA PAM 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to the vehicle.

A-3. FIELD MANUALS.

The following publications contain information pertinent to the vehicle material.

Camouflage	FM 20-3
Manual for Wheel Vehicle Driver	FM 21-305
Nuclear, Biological, and Chemical Defense	FM 21-40
Basic Cold Weather Manual	FM 31-70
Northern Operations	FM 31-71
Chemical, Biological, and Radiological (CBR) Decontamination	FM 3-5
Nuclear, Biological, and Chemical (NBC) Reconnaissance and Decontamination Operations (How to Fight)	FM 3-87 (HTF)
Army Motor Transport Units and Operations	FM 55-30
Operation and Maintenance of Ordnance Materiel in Cold Weather 0°F to -65°F	FM 9-207

A-4. TECHNICAL MANUALS.

Painting Instructions	TM 43-0139
General Shop Practice Requirements for Repair, Maintenance, and Test of Electronic Equipment	TM 43-0158

A-4. TECHNICAL MANUALS (CONT).

Procedures for Destruction of Tank Automotive Equipment to Prevent

Enemy Use (U.S. Army Tank-Automotive Command) TM 750-244-6

Inspection, Care, and Maintenance of Antifriction Bearings TM 9-214

Materials Used for Cleaning, Preserving, Abrading, and Cementing

Ordinance Material and Related Materials Including Chemicals TM 9-247

Operator/Unit/Direct Support/General Support Maintenance Manual

for Care, Maintenance, Repair, and Inspection of Pneumatic

Tires and Inner Tubes TM 9-2610-200-14

Operator's and Organizational Maintenance Manual Including Repair Parts and

Special Tools List for Simplified Test Equipment for Internal

Combustion Engines TM 9-4910-571-12&P

Maintenance and Repair for Lead-Acid Storage Batteries TM 9-6140-200-14

Cooling System: Tactical Vehicles TM 750-254

A-5. MISCELLANEOUS PUBLICATIONS.

Description, Use, Bonding Techniques, and Properties of Adhesives TB ORD1032

Safety Inspection and Testing of Lifting Devices TB 43-0142

Operator's Circular for Welding Theory and Application TC 9-237

APPENDIX B
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION**THE ARMY MAINTENANCE SYSTEM (AMS)**

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

The MAC (immediately following the introduction) 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 shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column 4 as:

Field - includes two subcolumns, Unit C (operator/crew) and O (unit/organizational maintenance) and Direct Support (F) maintenance

Sustainment - includes two subcolumns, general support (H) and depot (D).

The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

MAINTENANCE FUNCTIONS

Maintenance functions are limited to and defined as follows:

1. 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).
2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. 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, chemical fluids, or gases.
4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.
5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

MAINTENANCE FUNCTIONS - Continued

6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons 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.
7. 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.
8. 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 third position code of the Source, Maintenance and Recoverability (SMR) code.

NOTE

The following definitions are applicable to the "repair" maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunctioning: the act of isolating a fault within a system or Unit Under Test (UUT).

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).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

9. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures, and maintenance actions 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.
10. 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. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
11. 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.

EXPLANATION OF COLUMNS IN THE MAC

Column 1, Group Number. Column 1 lists FGC numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column 2, Component/Assembly. Column 2 contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. (For a detailed explanation of these functions, refer to "Maintenance Functions" outlined above.)

EXPLANATION OF COLUMNS IN THE MAC - Continued

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 as manhours 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 varies 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. 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 MAC. The symbol designations for the various maintenance levels are as follows:

Field:

C Operator or crew maintenance
O Unit maintenance
F Direct support maintenance

Sustainment:

H General support maintenance
D Depot maintenance

NOTE

The "L" maintenance level is not included in Column 4 of the MAC. Functions to this level of maintenance are identified by a work time figure in the "H" column of Column 4, and an associated reference code is used in the REMARKS Column 6. This code is keyed to the remarks and the SRA complete repair application is explained there.

Column 5, Tools and Equipment Reference Code. Column 5 specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column 6, Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

EXPLANATION OF COLUMNS IN THE TOOLS AND TEST EQUIPMENT REQUIREMENTS

Column 1, Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in Column 5 of the MAC.

Column 2, Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column 3, Nomenclature. Name or identification of the tool or test equipment.

Column 4, National Stock Number (NSN). The NSN of the tool or test equipment.

Column 5, Tool Number. The manufacturer's part number, model number, or type number.

Explanation of Columns in the Remarks

Column 1, Remarks Code. The code recorded in Column 6 of the MAC.

Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
01	ENGINE								
0100	Engine Assembly: Engine Assembly	Inspect Test Service Adjust Replace Repair	0.4	1.0 1.0	2.0 21.5	44.4	23, 31, 148 1, 126 5, 6, 79 5, 6, 7, 205 5, 14, 86, 179	A B D	
0101	Crankcase, Block, Cylinder Head: Cylinder Block Assembly Cylinder Head Assembly (One) Cylinder Liner	Replace Repair Replace Repair			17.7	4.0 3.0 3.0	5, 6, 10, 12, 67, 81, 97 117, 133, 166, 187 5, 6, 41, 62, 100, 128 5, 6, 10, 29, 64	C C	
0102	Crankshaft: Crankshaft and Main Bearing Crankcase Front Cover And Oil Seal	Replace Repair Inspect Replace	0.2		6.5	6.8 *	5, 6, 144 5, 6, 24, 26 5, 6, 107	C	
0103	Flywheel Assembly: Flexplate Assembly	Replace			25.9		5, 6		

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
0103	Flywheel Assembly - CONT: Rear Oil Seal	Inspect Replace	0.2		26.2			5, 6, 53, 81, 102, 163	
0104	Pistons, Connecting Rods: Piston and Connecting Rods	Replace Repair				4.4 *		5, 6, 155 5, 6, 10, 22, 46, 73, 115	C
0105	Valves, Camshafts and Timing System Rocker Covers	Replace Repair		3.2		*		1, 2, 4 5, 6, 10	C
	Exhaust Valve Bridge	Replace Repair			7.1	*		5, 6 5, 6, 10	C
	Exhaust Bridge Guide	Repair				*		5, 6, 113, 151, 156	C
	Exhaust Valve	Replace Repair				25.6 *		5, 6, 10, 100 5, 6, 42, 95, 106, 179	C
	Exhaust Valve Guide	Repair				*		5, 100, 157	C
	Valve Seat Insert	Repair				*		5, 116, 153	C
	Camshaft Assembly	Replace Repair				1.5 *		5, 6 5, 6, 10	C
	Cam Follower/ Push Rod	Replace Repair			23.5	*		5, 6 5, 6, 10	C
	Rocker Arm	Replace Repair			5.4	0.5		5 5, 6, 10	
	Idler Gear Assembly	Replace Repair				0.5 0.3		5, 6 5, 6, 10, 130	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
0106	Engine Lubrication System:								
	Adapter Assembly	Replace		1.1				1, 2	C
	Oil Filter	Repair		*				2, 4	
	Oil Cooler Assembly	Replace			4.9		*	5, 6	A
	Engine	Test						5, 6, 10	
0108	Manifolds:								
	Exhaust Manifold	Inspect		0.3					5, 6
		Replace			4.6				
0112	Engine Brake:								
	Engine Brake Retarder	Adjust			0.9			5	C
		Replace			4.2			5, 6	
		Repair				*		5, 6, 10	
03	FUEL SYSTEM								
0301	Carburetor, Fuel Injector:								
	Fuel Injector	Adjust			0.5			5	1, 4, 5, 31, 42, 91, 148
		Test			1.5				
		Replace			4.9			5, 6, 30, 208	
0302	Fuel Pumps:								
	Fuel Pump Assembly	Replace			3.2			5, 6, 20	
	Fuel Pump, Priming	Replace		1.5				1, 2, 30	
0304	Air Cleaner:								
	Air Cleaner Assembly	Replace		1.6				1, 4	1, 2, 4
		Repair		2.8					
0305	Supercharger, Blower, Turbocharger or Altitude Compensator:								
	Blower Assembly	Replace			12.1		3.0	5, 6, 20	5, 6, 10, 14, 117, 189
		Repair							
	Blower Drive Assembly	Replace			12.4		1.0	5, 6	5, 6, 10

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
0305	Supercharger, Blower, Turbocharger or Altitude Compensator - CONT:								
	Turbocharger Assembly	Inspect Replace Repair	0.1		5.6		2.0	5, 6 5, 6, 10, 61 89, 132	
0306	Tanks, Lines, Fittings, Headers:								
	Fuel Lines and Fittings (each)	Inspect Replace	0.1	0.2				1, 30	
0309	Fuel Filters:								
	Fuel Strainer	Service		0.1				1, 4	
	Fuel/Water Separator	Inspect Service Replace Repair	0.1 0.4	2.0	0.8			1, 2, 30 1, 2, 30 5, 6	
0311	Engine Starting Aids:								
	Ether Starting Aid	Replace		1.0				1	
04	EXHAUST SYSTEM								
0401	Muffler and Pipes:								
	Muffler	Inspect Replace	0.1	1.9				1, 2, 4	
	Pipes	Inspect Replace	0.1	1.5				1	
05	COOLING SYSTEM								
0501	Radiator, Evaporative Cooler or Heat Exchanger:								
	Cooling Assembly	Inspect Test Replace	0.1	0.2 1.9				1, 15, 186 1, 2, 4, 30, 126	
	Radiator	Service Test Replace Repair	0.3	6.6	0.5	0.5	1.0	1, 2, 52 186 1, 2, 4, 30, 126 5, 6, 30	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
0503	Water Manifold, Headers, Thermo- Stats and Housing Gaskets:								
	Right Thermostat Housing	Replace			8.4			5, 6, 84, 109	
	Left Thermostat Housing	Replace			2.4			5, 6, 84, 109	
	Cooling System Hoses And Tubes (each)	Inspect Replace	0.1	0.4				1, 4, 30	
	Aftercooler	Inspect Replace			*			5, 6	
0504	Water Pump:								
	Water Pump Assembly	Replace Repair			2.0	0.6		5, 6, 30 5, 6, 15, 49 84, 114, 143, 158	
0505	Fan Assembly:								
	Fan	Inspect Adjust Replace	0.1		0.5 1.9			5, 6	
	Fan Control Solenoid Valve	Inspect Test Replace		0.1 0.5 0.5				1 1, 30, 126	
06	ELECTRICAL SYSTEM								
0601	Generator, Alternator:								
	Alternator Assembly	Test Replace Repair		0.3 2.0		3.2		2 1, 2, 65 6, 8, 10	
	Alternator Belts	Inspect Adjust Replace	0.1	0.2 1.2				1, 2, 65 1, 2, 65	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
0602	Generator Alternator (Voltage):								
	Voltage Regulator	Adjust Test Replace		0.3 0.5 0.1				1, 4 4 1	A
	Polarity Protection Control (145 AMP)	Adjust Test Replace		0.3 0.5 1.5				1, 4 1	A
	Polarity Protection Control (200 AMP)	Test Replace		0.5 1.5				4 1	A
0603	Starting Motor:								
	Starter Motor	Test Replace Repair		0.3 2.6		4.0		4 1, 2, 4 6, 8, 10	
0607	Instrument or Engine Control Panel:								
	Instrument Panel Gages Wire Harness	Replace Repair		2.5 *				1	C, E
	Instrument Panel Switch Wire Harness	Replace Repair		1.0 *				1	C, E
0608	Miscellaneous Items:								
	Ether Start Aid Switch	Service Replace		0.4 1.2				1	
	Crane Junction Box	Replace Repair		2.0 1.0				5, 6 5, 6	
	Proximity Switches (LHS) (each)	Replace Adjust Test		0.5 * 0.5				1, 2, 71 1, 4	C
	Proximity Switch (Outrigger)	Replace Adjust Test		0.5 * 0.5				1 1, 2	C

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
0609	Lights:								
	Head Light Assembly (each)	Inspect Adjust Replace	0.1	0.2 0.2				1 1, 4	
	Lights (each)	Inspect Replace Repair	0.1	0.5 *				1 1, 4	C
0610	Work Lamp	Replace Repair		1.0 0.3				1, 4 1, 4	
	Sending Units and Warning Switches:								
	Engine Cold Plate/ECM	Inspect Test		0.2 *				1, 4, 23, 31, 148	
		Replace		2.0				1, 2, 4, 42	
	Warning Buzzer	Inspect Replace	0.1	0.5				1	
	TRS/SRS	Replace Test			3.0 *			5, 6 1, 4, 23, 31, 32, 148	A
		Adjust			*			88, 194	A
	Engine Throttle Sensor	Test		0.3				1, 4, 23, 31, 32, 148	
		Replace		0.8				1	
	Fuel Temperature Sensor	Test		0.4				1, 4, 23, 31, 32, 148	
		Replace		0.4				1	
	Engine Water Temperature Sensor	Test Replace		0.3 0.5				1, 4 1	
	Engine Oil Temperature Sensor	Test Replace		0.3 0.5				1, 4 1, 2	
	DDEC Engine Oil Pressure Sensor	Test Replace		0.3 0.5				1, 4, 23, 31, 32, 42, 148 1, 2	
	Manifold Pressure	Test		0.3				1, 4, 23, 31, 32, 148	
	Replace		0.5				1, 4		

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
0610	Sending Units and Warning Switches- CONT:								
	Engine Fuel Pressure Sensor	Test Replace		0.3 1.0				1, 4 1	
	Transmission Electronic Control Unit (ECU)	Test Replace		0.5 1.0				1, 4 1	
	Magnetic Speed Sensor	Test Replace			0.3 0.7			5 5, 6	
	Tachometer Drive Assembly	Test Replace		* 1.1				1 A	
	Sending Units (each)	Test Replace		* 0.5				1, 4 A	
	EPAC	Test Adjust Replace			* * *			5, 6 5 5 A C C	
	Differential Pressure Switch	Test Replace		* 0.9				1, 2, 4, 30 A	
0611	Horn, Siren:								
	Electric Horn	Replace		0.2				1	
	Horn Relay	Replace		0.4				1	
	Horn Button	Replace		0.1				1 C	
0612	Batteries, Storage (Wet or Dry):								
	Batteries	Inspect Test	0.1						
				0.3				1, 4, 23, 31, 32, 42, 148	
		Service Replace		0.3 1.0				1, 4 1	
	Battery Box Assembly	Inspect Replace Repair	0.1					1 1, 2	
				1.6 1.0					

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks	
			Field		Sustainment					
			Unit		DS	GS	Depot			
			C	O	F	H	D			
0613	Hull or Chassis Wiring Harness									
	Engine Wiring Harness	Test		*				1, 4, 23, 31, 32, 42, 148	A	
		Replace			12.0			5	F	
		Repair		*	*			1, 4, 45, 96	C, E	
	DDEC Wiring Harness	Test		*				1, 4, 23, 31, 32, 148	A	
		Replace			0.5			5, 42		
		Repair		0.5				1, 4, 42, 43, 44, 56, 57, 183, 184, 185, 197, 198		
	Cab Wiring Harness	Test		*				1, 4, 23, 31, 32, 42, 148	A	
		Replace			12.0			2, 5	F	
		Repair		*	*			1, 4, 45, 96	C, E	
		STE/ICE Wiring Harness	Test		*					A
			Replace			2.0		5	F	
		Repair		*	*		1, 4, 45, 96	C, E		
	Chassis Wiring Harness	Test		*					A	
		Replace			4.0		5	F		
		Repair		*	*		1, 4, 45, 96	C, E		
	Crane Wiring Harness	Replace			*		5	C		
		Repair		*	*		1, 4	C, E		
	LHS/Cab Interface Harness	Replace			0.8		5			
		Repair		0.5			1, 4, 45, 96			
07	TRANSMISSION									
0705	Transmission Shifting Components:									
	Transmission Shift Selector	Replace		0.4			1			
		Repair		0.2			1			
	Electronic Shifter Harness	Replace			*		5, 6			

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks	
			Field		Sustainment					
			Unit		DS	GS	Depot			
			C	O	F	H	D			
0710	Transmission Assy: Flywheel	Replace			0.8			5, 6, 121 127		
		Repair				0.2		5, 6		
	Torque Converter Stator	Replace				1.0		5, 10, 86	C	
		Repair				*				
	Torque Converter Housing	Replace				0.6		5, 6	G	
		Repair				0.3		5, 6, 10, 41, 73, 82, 83, 99, 108, 127, 152		
	Torque Converter Pump	Replace				1.0		5, 6, 142, 164	G	
		Repair				0.3		5, 10, 150		
	Transmission Assembly	Inspect	0.1	0.5	*				5, 6, 32, 85, 148	A
		Test								
		Service								
	Output Shaft Assembly	Replace							5, 6, 30, 61	B
		Repair		1.0		3.0		27.4	86, 177	D
Rear Transmission Cover Assembly	Replace							*		
	Repair					0.2		5		
Transmission Yoke/ Dust Shield/Oil Seal	Replace				3.0			5, 6	C	
	Repair					0.2		5, 6, 10, 41, 83, 99, 104, 111, 137		
0713	Intermediate Clutch: First Clutch Assembly	Replace				0.1		5	C	
		Repair				*		5, 6, 10, 101		
	Adapter Housing	Replace				0.2		5	C	
Repair					*		5, 6			

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field			Sustainment			
			Unit		DS	GS	Depot		
			C	O	F	H	D		
0713	Intermediate Clutch- CONT:								
	Forward Clutch And Input Shaft	Replace Repair				0.1 0.7	5, 6, 10, 192 5, 10, 21, 39, 138		
	Fifth Clutch	Replace Repair				0.1 0.3	5, 6, 123 5, 39		
	Fourth Clutch	Replace Repair				0.6 2.5	5, 6, 39 5, 10, 39		
	Third Clutch	Replace Repair				0.6 2.5	5, 27 5, 105		
	Center Support	Replace Repair				0.1 1.0	5, 6, 27, 123 5, 6, 10, 35, 66, 72, 101, 122		
0714	Servo Unit:								
	Control Valve Assembly	Replace Repair				* *	5, 6 5, 6	C C	
	Front Plate Assembly	Replace Repair				0.5 *	5, 6 5	C	
	First Shift Valve Body Assembly	Replace Repair				* *	5 5, 6, 10	C C	
	First Trimmer Valve Body Assembly	Replace Repair				0.1 0.1	5 5, 6, 10		
0721	Coolers, Pumps, Motors:								
	Oil Pump Assembly	Replace Repair				* *	5 5, 6	C C	
	Low Oil Sensor Assembly	Test Replace				0.1 3.2	5 5, 6		
08	TRANSFER, FINAL DRIVE, PLANETARY AND DROP GEARBOX ASSEMBLIES (ON VEHICLE)								

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
0801	Power Transfer and Final Drive Assy:								
	Transfer Case Assembly	Inspect Service Replace Repair	0.1	0.3	*	8.0		1, 2, 126 5, 6, 30 5, 6, 19 58, 59, 60, 61, 177	C B C D
		Overhaul					*		
	Yokes	Replace			2.8			5, 6	C
	Oil Seats	Inspect Replace	0.1		1.6			5	
	Upper Shaft Assembly	Repair				1.0		5, 6, 10	
	Center Shaft Assembly	Repair				0.5		5, 6, 10, 58	
	Rear Shaft Assembly	Repair				1.0		5, 6, 10	
	Differential Shaft Assembly	Repair				1.0		5, 6, 10	
	Front Shaft Assembly	Repair				1.0		5, 6, 10	
	Differential Assembly	Repair				0.6		5, 6, 10, 60	
0803	Gear Shift, Vacuum Booster and Controls:								
	Air Chamber, Differential	Inspect Adjust Replace	0.3	0.5 1.0				1 1, 2, 4	
	Upper Shift Rod Assembly	Repair				1.0		5, 6, 10	
	Lower Shift Rod Assembly	Repair				1.0		5, 6, 10	
	Shift Control Cable	Adjust Replace		0.3 2.5				1 1, 2	
0804	Lubrication, Cooling, Or Hyd Components:								
	Lube Pump	Replace Repair			0.8	0.5		5, 6, 30 5, 6	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Dep ot		
			C	O	F	H	D		
0804	Lubrication, Cooling Or Hyd Components- CONT:								
	Lube Hoses (each)	Inspect Replace	0.1	0.5				1, 2, 4, 30	
	Breather	Inspect Service Replace	0.1	0.1 0.1				1 1	
09	PROPELLER, PROPELLER SHAFTS, UNIVERSAL JOINTS, COUPLER ASSEMBLY								
0900	Propeller Shafts:								
	Propeller Shafts and Universal Joints	Inspect Service Replace Repair	0.2	0.1 0.9 0.9				1 1, 2, 4 1, 2, 4	
10	FRONT AXLE								
1000	Front Axle Assembly:								
	Axle No. 1 Assy	Inspect Service Replace Repair	0.1	0.6	15.2	10.0		1, 2 5, 6, 119 5, 176	
	Axle No. 2 Assy	Inspect Service Replace Repair	0.1	0.5	11.0	10.0		1, 2 5, 6, 119 5, 176	
1002	Differential:								
	Axle No. 1	Replace Repair				1.0 5.5		5, 6 5, 6, 10, 13, 19, 177	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
1002	Differential: (CONT)								
	Axle No. 2 Differential Assembly	Replace Repair				1.5 9.8	5, 6 5, 6, 10, 13, 19, 177		
	Axle No. 2 Rear Output Assembly	Replace Repair				1.0 1.0	5, 6 5		
1003	Planetary or Final Drive:								
	Axles No. 1 and 2 Planetary Hub Gears	Service Replace		*	2.9		2, 5, 58	A	
1004	Steering and Leaning Wheel Mechanism:								
	Constant Velocity Joint	Service Replace Repair	0.2		4.5 2.0		5, 6 6, 54, 55		
	Pivot and Spindle Assembly	Inspect Service Replace Repair		0.1 *	3.0	3.0	2, 4 5, 6, 54, 55, 69, 191 5, 6, 54, 55, 91	A	
11	REAR AXLE								
1100	Rear Axle Assembly:								
	Axle No. 3 Assy	Inspect Service Replace	0.1	0.5	8.0		1, 2 5, 6, 119, 201		
	Axle No. 4 Assy	Inspect Service Replace	0.1	0.5	8.0		1, 2 5, 6, 119		
	Axle No. 5 Assy	Inspect Service Replace	0.1	0.5	11.0		1, 2 5, 6, 119		
	Axles No. 3 and 4 Spindle Assembly	Replace Repaire			3.2 *		5, 6 5, 6, 142	C	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
1102	Differential: (CONT)								
	Axle No. 3 Differential Assembly	Replace Repair				1.6 4.9	5, 6 5, 6, 10, 13, 19, 51, 142, 173, 174, 175, 176		
	Axle No. 4 Differential Assembly	Replace Repair				1.6 4.9	5, 6 5, 6, 10, 13, 19, 177		
	Axle No. 5 Differential Assembly	Replace Repair				1.0 5.5	5, 6 5, 6, 10, 13, 19, 177		
1103	Planetary or Final Drive:								
	Axles No. 3, 4 and 5 Planetary Hub Gears	Service Replace		*	2.9		2, 5, 58	A	
1104	Steering, Sideshift, and Wheel Leaning Mechanisms								
	Axle No. 5 Constant Velocity, Pivot & Spindle Assembly	Replace Repair			*		5, 6, 54, 55, 69, 191 5, 6, 10, 165	C C	
12	BRAKES								
1202	Service Brakes:								
	Brakes	Inspect		0.2			1		
	Brake Assemblies (all)	Replace Repair			1.0 7.5		5, 6 5, 6,		
	Brake Shoes	Inspect Adjust Replace		0.2 0.5 1.0			1, 71 1, 4, 71		
1206	Mechanical Brake System:								
	Pneumatic Brake Valve	Replace Repair		3.0		1.5	1 1, 6, 135		

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
1208	Air Brake System:								
	Air Dryer	Inspect Service Replace Repair	0.1	0.6 3.0 1.0				1 1, 2 1, 2, 4	
	Coalescing Filter/ Aftercooler	Inspect Replace Repair		0.1 0.7 0.1				1, 2 1, 4	
1209	Air Compressor Assembly:								
	Air Compressor	Inspect Replace Repair	0.2		3.2		4.0	5, 6, 30 5, 6, 10, 36, 117	
	Air Governor Assembly	Adjust Replace		0.2 1.5				1 1, 30	
	Air Lines	Replace Repair		* *				1, 30 1, 4	C C
1211	Trailer Brake Connections And Controls:								
	Load Sensing Valve	Adjust Replace		1.0 2.0				1, 135 1, 4	
13	WHEELS AND TRACKS								
1311	Wheel Assembly:								
	Wheel Assembly	Inspect Replace Repair	0.1 0.2	1.0				1, 4, 74	
	Wheel Hub Assembly	Inspect Service Replace Repair		0.2 0.1	3.4 2.1			1, 4 5, 6, 169 5, 6, 50, 51, 81, 139	
	Brake Drums (all axles)	Inspect Replace Repair		0.2 1.2			*	5, 6 1, 4	C

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field			Sustainment			
			Unit		DS	GS	Dep ot		
			C	O	F	H	D		
1311	Wheel Assembly - CONT:								
	Central Tire Inflation System (CTIS)	Inspect	0.2						
	CTIS Controller	Replace Repair		0.2 0.1			1 1		
	CTIS Front Manifold	Replace Repair Test		0.7 0.7 2.0			1, 4, 30, 206 1 1		
	CTIS Rear Manifold	Replace Repair		0.3 0.7			1, 4, 30, 206 1		
1313	Tires, Tubes, Tire Chains:								
	Tire	Inspect Replace Repair	0.1	* *			1	C C	
14	STEERING								
1400	Steering System	Inspect Service Adjust	0.2	0.6 *	3.5		1, 2 1, 2, 4 5, 136	A	
1401	Mechanical Steering Gear Assembly:								
	Steering Column	Inspect Service Replace	0.2	* 2.2			1, 2	A	
	Drag Links	Inspect Service Replace Repair		0.1	* * *		5, 6 5, 6, 10	A C C	
	Intergear Link	Inspect Service Replace Repair		0.1 *	* *		5, 6 5, 6, 10	A C C	
	Steering Shafts	Inspect Service Replace		0.2 * 1.5			1, 2	A	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field			Sustainment			
			Unit		DS	GS	Depot		
			C	O	F	H	D		
1401	Mechanical Steering Gear Assembly - CONT:								
	Tie-Rod	Inspect Service Adjust Replace Repair		0.1 * 2.5 1.3 2.2				1, 2 1, 2, 4, 119 1, 2, 4	A
	90 Degree Gear Box	Replace Repair		1.0	3.2			1, 2 5, 6, 10	
	2.21:1 Gear Reducer	Service Replace Repair		*	0.5	0.1		5, 6 5, 6, 10, 143	A
	Axle No. 1	Align			4.0			5, 6, 26 134	
	Axle No. 2	Align			4.0			5, 6, 26, 134	
	Axle No. 5	Align			1.0			5, 6, 26, 134	
1407	Power Steering Gear Assembly:								
	Front Steering Gear Assembly	Inspect Service Adjust Replace Repair		0.1 * 	0.5 1.3	2.1		5 5, 6, 30, 196 5, 6, 10, 143, 196	A
	Intermediate Steering	Inspect Service Replace Repair		0.1 * 	1.0	0.7		5, 6, 30, 196 5, 6, 10 143, 196	A
	Rear Steering	Inspect Service Adjust Replace Repair		0.1 * 	0.5 1.0	2.2		5 5, 6, 30, 196 5, 6, 10 143, 196	A

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Dep ot		
			C	O	F	H	D		
1410	Hydraulic Pump or Fluid Motor Assembly:								
	Emergency Steering Hydraulic Pump	Adjust Replace		1.0 2.0			1 1		
	Emergency Steering Hydraulic Valve	Adjust Replace			1.0 1.5		5 5, 6, 205		
1411	Hoses, Lines, and Fittings:								
	Hydraulic Lines And Fittings	Replace		*			1, 30	C	
1413	Tanks, Reservoirs:								
	Steering Reservoir	Inspect Service Replace	0.1	* 1.2			1, 2, 4, 30, 126, 205	A	
		Repair		1.3			1, 2, 4, 205		
	Steering Hydraulic Filter	Service Replace		* 0.2			1, 2, 4	A	
	Steering Hydraulic Manifold	Replace Repair			1.3 0.3		5, 6, 30 5, 6		
15	FRAME, TOWING ATTACHMENTS, DRAWBARS, AND ARTICULATION SYSTEMS								
1501	Frame Assembly:								
	Cab Step Assembly	Replace Repair		0.5 0.2			1 1		
	Frame Assembly	Inspect Repair	0.1				5, 6, 9, 205		
1503	Pintles and Towing Attachments:								
	Self-Guided Coupler	Inspect Service Replace Repair	0.1	0.1 1.0 1.5			1 1, 2, 4 1, 2, 4, 6		

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
1504	Spare Wheel Carrier And Tire Lock:								
	Tire Carrier and Davit	Inspect Service Replace	0.1	* 2.3				1	A
16	SPRINGS AND SHOCKS ABSORBERS								
1601	Springs:								
	Spring Hangers	Inspect Service Replace	0.1	*	*			5	A C
	Springs	Inspect Replace	0.1		*			5, 6, 118	C
	No. 3 Axle Suspension Air Bags	Inspect Replace	0.1		1.0			5, 6	
1604	Shock Absorber Equipment:								
	Shock Absorber and Bushings (each)	Inspect Replace		0.1 0.3				1, 2	
1605	Torque, Radius, and Stabilizer Rods:								
	Equalizer Beam (each)	Replace Repair			2.2 2.0			5, 6, 118 5, 93, 190	
	No. 3 Axle Air Suspension Beam Assembly	Replace Repair			3.0 1.5			5, 6 5	
	No. 3 Axle Suspension Arm	Inspect Replace Repair	0.1		*	3.0		5, 6 5, 6 35, 202	C
	Torque Rods (each)	Inspect Replace		0.1		1.3		5, 6, 119	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Dep ot		
			C	O	F	H	D		
18	BODY, CAB, HOOD AND HULL								
1801	Body, Cab, Hood, and Hull Assemblies:								
	Cab Assembly	Inspect Service Replace	0.2 0.1		7.5			5, 6	
	Cab Door	Adjust Replace Repair		0.3 1.5 2.5				1 1 1, 4	
	Engine Cover Assembly	Replace Repair		0.1 0.4				1 1	
1802	Fenders, Running Boards with Mount- ing and Attaching Parts, Windshield, Glass, Etc.:								
	Windshield Glass	Inspect Replace	0.1		1.4			5	
1806	Upholstery Seats and Carpets:								
	Seat Assembly	Replace Repair Alignment		0.6 1.5 0.4				1, 4 1, 4 1, 4	
	Sun Visor Assembly	Inspect Replace		0.1 0.3				1	
1808	Stowage Racks, Boxes, Straps, Carrying Cases, Cable Reels, Hose Reels:								
	Ladder Support	Replace Repair		0.5 *				1, 2 1, 2	
	Stowage Box, Crane	Replace Repair		0.5 0.4				1, 4 1, 2, 4	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
20	HOIST, WINCH, CAPSTAN, WINDLASS, POWER CONTROL UNIT, AND POWER TAKE-OFF								
2001	Hoist, Capstan, Windlass, Crane or Winch Assembly:								
	Crane Assembly	Inspect Service Test Adjust Replace	0.1	0.5 *	* 0.5 4.0			1 1, 5, 158 5, 6 5, 6, 30, 201	A
	Boom Assembly	Replace Repair			2.0 4.8			5, 6, 30 5, 6	
	Erection Cylinder	Replace Repair			0.6	1.5		5, 6, 30 5, 6	
	Lift Cylinder Assembly	Replace Repair			0.7	0.9		5, 6, 30 5, 6, 196	
	Tension Link Assembly	Replace Repair			0.2	0.5		5, 6 5, 6	
	Mast Assembly	Replace Repair			0.6	*		5, 6, 30 5, 6	C
	Telescope Cylinder	Replace Repair			0.7	0.8		5, 6, 30 5, 6	
	Hoist Assembly	Inspect Service Replace Repair	0.1	0.3	1.4	1.6		1 5, 6 5, 6, 10	
	Hydraulic Hoist Motor	Replace Repair			0.2	1.0		5, 6, 30 5, 6	
	Remote Control Box	Replace Repair		0.3 1.0				1 1, 2, 4, 202	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Dep ot		
			C	O	F	H	D		
2001	Hoist, Capstan, Windlass Crane Or Winch Assembly - CONT:								
	Crane Cable	Inspect Service Replace		*				A A	
				*					
			1.0				1, 4		
	Motor Valve Assembly	Replace Repair			0.1 0.4		5, 6, 30 5, 6		
	Hoist Brake Assembly	Replace Repair			0.4	1.4	5, 6, 30 5, 6		
	Cable Follower Assembly	Replace Repair			0.7 0.6		5, 6, 30 5, 6		
	Sub-Frame Assembly	Replace Repair			1.7	7.0	5, 6 5, 6		
	Swing Drive Brake	Replace Repair			2.0	1.0	5, 6 5, 6		
	Gear Reducer	Replace Repair			1.7	1.2	5, 6, 30, 172 5, 6, 175		
	Override Solenoid	Replace Repair Test			1.3 2.1 0.5		5, 6, 30 5, 6 6		
	Hook Block Assembly	Replace Repair		0.5 0.5			1, 2 1, 2, 4, 132		
	Hoist Motor	Replace Repair			0.5 0.1		5, 6, 30, 201 5, 6		
	Hand Pump	Replace Repair		1.5 0.5			1, 2, 30 1, 2, 4		
	Accumulator	Service Replace			*		1, 33 1	A	
	Remote Control Box Cable Assembly	Replace Repair Test		0.3 0.2 0.5			1 1 2		

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks	
			Field		Sustainment					
			Unit		DS	GS	Depot			
			C	O	F	H	D			
2001	Hoist, Capstan, Windlass, Crane or Winch Assembly: CONT:									
	Self-Recovery Winch Assembly	Inspect Service Replace Repair	0.1	0.3 4.5				1, 2, 4, 30, 201 5, 6, 10	C	
	Counter Balance Valve	Replace Repair			0.9 0.9			5, 6, 30 5, 6, 10		
	Winch Brake	Replace Repair				1.0 *		4, 5 5, 6, 10		
	Front Tensioner Assembly	Service Replace Repair		* 1.0 0.4				1 1, 2, 4	A	
	Front Cable Guide	Service Replace		* 0.1				1, 4	A	
	Rear Tensioner	Service Replace Repair		* 1.0 0.4				1, 4 1, 2, 4	A	
	Rear Cable Guide	Service Replace		* 1.0				1	A	
	Winch Cable	Inspect Service Replace	*	* 0.8				1, 4	A A	
	Hook Machining Arm	Replace Repair			1.8 *			5, 6, 207 5, 6	C	
	Middle Mach Frame	Replace Repair			6.8 *			5, 6, 30, 204 5	C	
	2006	Bulldozer Tripod, Main Frame, Jack And Mounting:								
		Outrigger Cylinder	Replace Repair			1.0		4.1	5, 6, 30 5, 6	
	Outrigger Pad Assembly	Replace Repair		0.2 0.2				1, 2, 4		

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Dep ot		
			C	O	F	H	D		
22	BODY, CHASSIS, AND HULL ACCESSORY ITEMS								
2202	Accessory Items:								
	Heater	Replace Repair		1.3 3.2			1, 30 1		
	Heater Blower Motor	Replace Repair		1.0 *			1 1, 4	C	
	Heater Control Panel	Replace Repair		0.8 *			1 1	C	
2210	Data Plates and Instruction Holders:								
	Data Plate (each)	Replace		0.2			1, 2		
24	HYDRAULIC AND FLUID SYSTEMS								
2400	Major Assemblage (Load Handling System):								
	Load Handling System	Inspect Service Test Replace Repair	0.1	* 	0.6 2.0 2.0		5, 6 5, 6, 30, 201	A	
2401	Hydraulic Pump:								
	Main Hydraulic Pump Assembly	Inspect Replace Repair		0.2	12 19.3		5, 6, 30, 146 5, 6, 10, 199		
	Pump Driveshaft	Inspect Service Replace Repair		* * 1.0 0.5			1, 2 1, 2, 4	A C	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
2402	Manifold and/or Control Valves:								
	LHS Load Sensing Valve	Replace Test		*				1, 2	C
	Multifunction Manifold	Replace Repair			3.0 *			5, 6 5, 6	C
2405	Mast Column:								
	LHS Hook Arm Cylinder	Service Replace		*					A
		Repair			1.4 2.5			5, 6, 131, 210 5, 6, 23, 196	
2406	Strainers, Filters, Lines and Fittings, Etc.:								
	LHS Main Manifold Relief Valve	Adjust Replace Test			0.5 1.0 0.5			6 5, 6 6	
	LHS Main Cylinder	Replace Repair			1.1 2.5			5 5, 6, 23, 196	
	Hose Assembly, Low Pressure	Replace Repair		1.0 *				1, 30, 126	C
	High Pressure Hydraulic Filter Head	Replace Repair		2.0 *				1, 4	C
	LHS Hook Arm Manifold Assembly	Replace Repair			1.6 1.6			1, 201, 205	
	LHS Main Manifold	Replace Repair			0.6 0.6			5, 6, 30 5	
2408	Liquid Tanks or Reservoirs:								
	Hydraulic Reservoir Assembly	Service		0.5				1, 2, 4, 52 126	
		Replace		5.9				1, 2, 4, 201 205, 207	
		Repair		0.5				1	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Dep ot		
			C	O	F	H	D		
33	SPECIAL PURPOSE KITS								
3303	Winterization Kits: Engine Arctic Kits	Inspect Install Replace Repair	0.1	4.5 *	*		5, 6 1 1, 2, 4	C C	
3307	Special Purpose Kits: EMM Power Interface Kit	Replace Repair Install							
	CHU Control Box	Repair		*			1	C	
	CHU Proximity Switch And Sensing Plate (Hook Arm Up)	Adjust Replace		* *			1, 71	A C	
	CHU Mode Switch	Adjust Replace		* *			1	A C	
	CHU Rear Lock Limit Switch	Adjust Replace		* *			1	A C	
	CHU Light Bar and Brackets Assembly	Repair		*			1	C	
	CHU Container Guide	Repair		*			1	C	
	CHU Slider/Pivot Assembly	Repair		*		*	1, 132	C	
	CHU Short Strut and Pin Bracket Assembly	Repair		*			1, 132	C	
	CHU Slider Arm Assembly	Repair		*		*	1, 132	C	
	CHU Long Strut Bracket Assembly	Repair		*			1, 132	C	
	CHU Lifting Frame Lower Container Lock Plate	Repair		*			1	C	
	CHU Lifting Frame Flipper Bracket and Lock Plate	Repair		*			1	C	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Depot		
			C	O	F	H	D		
3307	Special Purpose Kits - CONT:								
	CHU Air Cylinder and Rotary Paddle	Adjust Replace		*				1, 132	A C
	CHU Pivot	Repair		*				1	C
	CHU Lifting Frame Lower Container Lock Handle	Repair		*				1	C
	CHU Rail Transport ISO Corner Locks	Repair		*				1	C
34	ARMAMENT AND SIGHTING AND FIRE CONTROL (ELECTRIC/ ELECTRONIC MATERIAL)								
3402	Small Arms:								
	Machine Gun Mounting Kit	Inspect Replace	0.1	1.0				1, 2	
47	GAGES (NON- ELECTRICAL) WEIGHING AND MEASURING DEVICES								
4702	Gages, Mounting, Lines, and Fittings:								
	Restrictor Indicator Assembly	Inspect Replace	0.1	0.5				1	
68	RADIO TELEPHONE SYSTEMS								
6809	Radio Telephone System:								
	Radio Kit	Replace Install		1.0	*			1, 2 5	C

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Field		Sustainment				
			Unit		DS	GS	Dep ot		
			C	O	F	H	D		
91	CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL (CBR) EQUIPMENT								
9111	Gas Particulate Filter Kits:								
	Gas Particulate Filter Unit Kit	Inspect Install Replace	0.2	2.2	2.0		5 1		
9131	Chemical Agent Alarms:								
	Chemical Alarm Kit	Inspect Install Replace	0.2	1.8	2.3		5, 6 1		
	Decontamination Kit	Inspect Install Replace	0.2	0.5	1.0		5 1, 2		

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

Table B-1. Tool and Test Equipment Requirements

Tool or Test Equipment Ref Code	Maintenance Category	Nomenclature	National/ NATO Stock Number	Tool Number
1	O	TOOL KIT, General Mechanic's: Automotive	5180-00-177-7033	SC 5180-90-N26
2	O	SHOP EQUIPMENT, Automotive Maint and Repair: Common No. 1	4910-00-754-0654	SC 4910-95-A74
3	O	SHOP EQUIPMENT, Automotive Maintenance and Repair: Supp. 1	4910-00-754-0653	SC 4910-95-A73
4	O	SHOP EQUIPMENT, Automotive Maint and Repair: Common No. 2	4910-00-754-0650	SC 4910-95-A72-HR
5	F	TOOL KIT, General Mechanic's	5180-00-699-5273	SC 5180-90-N05-HR
6	F	SHOP EQUIPMENT, Automotive Maintenance and Repair: Field Maintenance, Basic	4910-00-754-0705	SC 4910-95-A31
7	F	SHOP EQUIPMENT, Automotive Maintenance and Repair: Field Maintenance	4910-00-754-0706	SC 4910-95-A62
8	F	SHOP EQUIPMENT, Fuel and Electrical System, Engine: Field Maintenance, Basic	4940-00-754-0714	SC 4940-95-B20-HR
9	F	SHOP WELDING SET	3433-00-357-6311	SC 3433-90-N01-HR
10	H	SHOP EQUIPMENT, Automotive Maintenance and Repair: Field Maintenance, Supp. 2	4910-00-754-0707	SC 4910-95-A63
11	F	SHOP EQUIPMENT, Machine Shop	3470-00-754-0708	SC 3470-95-A02
12	H	ADAPTER, Engine Stand	4910-00-146-9624	J33850
13	H	ADAPTER, Maintenance Stand, Differential	4910-01-384-6264	J-39929-A
14	F	ADAPTER, Mechanical Puller	5120-00-733-8890	J7932
15	F	ADAPTER, Quick Disconnect	5935-01-297-2481	J33765
16	O	ADAPTER, Radiator	4910-01-170-4929	J29003-A
17	F	ADAPTER, Socket (3/4 in. Female to 1/2 in. Male)	5120-00-227-8088	97-3725
18	F	ADAPTER, Socket (3/4 in. Female to 1 in. Male)	5120-00-227-8104	A-A-2172
19	H	ADAPTER KIT, Transfer Case	4910-01-385-6779	J-39911
20	F	ALIGNMENT TOOL, Blower	5120-01-158-3991	J33001

Table B-1. Tool and Test Equipment Requirements (Cont).

Tool or Test Equipment Ref Code	Maintenance Category	Nomenclature	National/ NATO Stock Number	Tool Number
21	H	ALIGNMENT TOOL, Clutch	5120-01-115-1156	J24221
22	H	ALIGNMENT TOOL, Pin	5120-01-232-0007	J24285
23	O	ANALYZER SET, STE/ICE-R	1910-01-222-6589	12259266
24	H	ATTMENT, BALL, MICRO	5120-00-221-1921	J4757
25	H	BRACKET, Lifting	5306-01-338-6292	J24408-A
26	F	BOX, Chalk, Reel and Line	5210-00-273-9793	GGG-C-291
27	H	BRACKET, Lifting	5120-01-115-1157	J24196
28	H	BRACKET, Mounting, Cylinder Liner	5340-01-158-3984	J24565-02
29	H	BRUSH, Wire, Valve Cylinder	5120-00-766-2141	J5437
30	O	CAP AND PLUG SET	5340-00-450-5718	10935405
31	O	CARTRIDGE, DDEC	7030-01-354-6174	J38500-750
32	O	CARTRIDGE, ATEC	4940-01-367-6194	J38500-300
33	F	CHARGING KIT, Pressure	4910-01-046-7109	12252157
34	F	COMPRESSOR, Air Unit	4130-00-752-9633	MIL-C-13874
35	H	COMPRESSOR SET, Snap Ring	5120-01-116-5016	J24208-D
36	H	COMPRESSOR, Ring	5120-01-048-3129	J24204-1
37	H	COMPRESSOR, Ring	4910-01-158-3974	J24227
38	F	COMPRESSOR, Ring, Piston	5120-00-250-6055	RC40C
39	H	COMPRESSOR, Seal	5120-01-048-2159	J24204-3
40	F	COMPRESSOR, Spring Valve	5120-01-297-2397	J7455-A
41	H	COMPRESSOR, Spring	5120-01-048-2160	J24219
42	O	CONNECTOR REMOVER	5120-01-355-3012	J38384
43	O	CONNECTOR REMOVER Electrical Contact	5120-01-158-4707	114010
44	O	CRIMPING TOOL	5120-01-355-0844	J35123
45	O	CRIMPING TOOL (CANNON)		995-0001-904
46	H	DETECTOR, Leak, Vacuum Gage	6685-01-061-4253	J23987-B
47	F	DRILL MACHINE, Upright	3413-00-165-4117	MIL-D-80038
48	F	DRIVER	5120-01-374-6200	2HE496
49	H	DRIVER BEARING, Gear	5120-01-033-8902	J25257
50	F	DRIVER, CTIS Seal	5120-01-355-0857	J41112
51	F	DRIVER, CTIS Seal	5120-01-355-0858	J41113
52	O	DRUM, Storage 57 gal	8110-00-082-2626	MIL-D-6054
53	F	EXPANDER, Seal, Oil	5120-00-336-0445	J4239
54	F	EXTRACTOR, Inertial		2HE226

Table B-1. Tool and Test Equipment Requirements (Cont).

Tool or Test Equipment Ref Code	Maintenance Category	Nomenclature	National/ NATO Stock Number	Tool Number
55	F	EXTRACTOR, Inertial	5120-01-354-9543	2HE227
56	O	EXTRACTOR TOOL, Elect	5120-01-015-2154	91019-3
57	O	EXTRACTOR TOOL, Elect	5120-00-020-5926	305183R
58	F	EYES, Lifting	5306-01-197-6569	3016T39
59	F	EYES, Lifting	5306-01-333-5486	8891T82
60	F	EYES, Lifting	5306-01-239-5053	3016T65
60.1	O	FAULT CODE RETRIEVAL DEVICE (FCRD)		CA1 05 020
61	H	FIXTURE, Holding	5120-01-115-1165	J24310
62	F	FIXTURE, Lifting, Cylinder Head	4910-00-456-7620	J22062-01
63	H	FIXTURE, PTO, Gear	4910-01-158-3969	J26899
64	H	FIXTURE, Test, Head	4910-01-158-3985	J28454
65	O	GAGE, Belt Tension	4935-01-254-9808	BT-33-73-BF
66	H	GAGE, Center and Front	5210-01-133-6888	J29198-3
67	H	GAGE, Cylinder, Bore	5210-01-070-4543	J5347-B
68	H	GAGE, Depth Cylinder, Liner	5210-01-174-4498	J24898
69	F	GAGE, Depth	5210-00-023-4798	J22273-01
70	F	GAGE, Dial	5120-00-494-1846	J-8165-2
71	O	GAGE, Feeler, Jacobs Brake	5210-01-214-2138	007958
72	F	GAGE, Feeler	5120-00-671-2275	J3174-02
73	H	GAGE, Groove	5220-01-028-1109	J24599
74	O	GAGE, Inflation	4910-00-204-2644	100708
75	F	GAGE Set, Feeler	5210-01-119-7601	FB310B
76	F	GAGE Set, Feeler	5210-01-245-9564	J1698-02
77	F	GAGE Set, Feeler, Piston	5210-00-416-1631	J5438-01
78	F	GAGE, Timing, Injector	5220-01-348-1638	J25502
79	F	GAGE, Valve, Adjustable	5220-00-176-0638	J9708-15
80	F	HAMMER, Slide	5120-01-112-2165	J6125-16
81	F	HANDLE, Driver	5120-00-677-2259	J8092
82	H	HANDLE, Driver	5120-00-808-5082	J3154-1
83	H	HANDLE, Driver	5120-01-054-4048	J24202-4
84	O	HANDLE, Installer	5120-00-977-5578	J7079-2
85	O	HARNESS, Breakout	6150-01-373-7771	J34517
86	F	HOLDER, Stator, Roller	5120-01-115-1158	J24218-2
87	H	HONING UNIT	5130-00-629-9782	J5902-01
88	F	INDICATOR, Dial, Timing Tool	2815-01-355-6628	J34930-A

Table B-1. Tool and Test Equipment Requirements (Cont).

Tool or Test Equipment Ref Code	Maintenance Category	Nomenclature	National/ NATO Stock Number	Tool Number
89	F	INDICATOR, Dial	5120-00-402-9619	J7872
90	H	INDICATOR, Dial, Set	5120-00-794-9178	J5959-01
91	F	RECONDITIONING SET Injector, Tube	5180-00-146-9619	J22525-B
92	F	INSERTER AND REMOVER	5120-01-166-0572	J33080
93	H	INSERTER, Bearing and Bushing	5120-01-158-3946	J25562
94	H	INSERTER, PLUG, Cylinder Block	5120-01-166-5419	J21850
95	H	INSERTER, SEAL	5120-01-340-1820	J35373
96	O	INSERTION TOOL (CANNON)	5120-01-374-8968	CIT-SS-10
97	H	INSTALLER AND REMOVER	5120-01-048-2180	J25275
98	H	INSTALLATION TOOL, Cup Plug	5120-01-297-2457	J33420
99	H	INSTALLER, Bearing	5120-01-115-1160	J24197
100	F	INSTALLER, Guide, Valve	5120-00-999-8617	J21520
101	H	INSTALLER, Lock Ring	5120-01-054-4050	J24453
102	F	INSTALLER, Oil Seal	5120-01-227-8483	J21983
103	H	INSTALLER, Output Shaft	5120-01-054-4042	J24202-1A
104	H	INSTALLER, Plug	5120-01-385-7288	J24411
105	H	INSTALLER, Plug	5120-01-054-4053	J24369
106	F	INSTALLER, Seal	5120-01-054-4049	J24198
107	F	INSTALLER, Seal, Crankshaft, Front	5120-00-936-4377	J9783
108	F	INSTALLER, Seal	5120-01-013-1678	J9791
109	O	INSTALLER, Seal	5120-00-977-5579	J8550
110	F	INSTALLER, Seal, Flywheel	4910-01-176-4230	J21112-B
111	H	INSTALLER, Seal, Oil	5120-00-937-7267	J8501
112	H	INSTALLER, Seal, Transfer Case	5120-01-383-7878	TRS6227
113	H	INSTALLER, Valve Bridge	5120-00-999-8616	J7482
114	H	INSTALLER, Water Pump Seal	5120-01-365-4079	J-38858
115	H	INSTALLING TOOL, Piston	5120-00-127-7757	J23762-A
116	H	INSTALLING TOOL, Valve	5120-01-048-3118	J24357
117	H	INSTALLING/REMOVING Tool	5120-01-130-8864	J23019
118	F	JACK, Stabilizer	2590-00-23-7418	10876244
119	O	JACK KIT, Hydraulic, Hand	5120-00-587-4144	GGG-J-60
120	F	LEVEL	4920-00-064-8974	2579573-002
121	F	LIFTING BRACKET, Flywheel	5120-01-116-6049	J24365

Table B-1. Tool and Test Equipment Requirements (Cont).

Tool or Test Equipment Ref Code	Maintenance Category	Nomenclature	National/ NATO Stock Number	Tool Number
122	H	LIFTING Bracket, Center	5120-01-116-6048	J24195
123	H	LIFTING Fixture, Clutch	5120-01-115-1159	J24209
124	H	MAG INS. UNIT, Stat	6635-00-566-9772	MIL-M-6867C
125	F	OIL, Seal, Expander	5120-01-232-0005	J8682
126	O	PAN, DRAIN 6 Gal	4910-00-287-2944	MIL-P-45819
127	F	PIN, Guide Set	5120-01-115-1163	J24315
128	F	STUDS, Guide	5315-01-162-3630	J24748
129	H	PIN, GUIDE	5315-01-165-1469	J1126
130	H	PLATE KIT, Gear Bearing	5180-01-167-4285	2SK900
131	F	PLIERS, Channel Lock	5120-00-287-2512	GGG-W-649
132	O	PLIERS, Retaining Ring	5120-01-375-5699	2BH945
133	F	PLUG, Cylinder Block	5120-01-166-5421	J24597
134	F	PLUMB BOB	5210-00-007-8229	GGG-P-501
135	O	PRESSURE TEST KIT	4910-01-378-9068	3SK911
136	F	PRESSURE TEST KIT	4910-01-378-8863	3SK912
137	H	PROTECTOR, Piston	5120-01-048-2156	J24210
138	H	PROTECTOR, Seal	5120-01-048-2157	J24216-01
139	F	PROTECTOR, Spindle	3830-01-349-7390	2HE234
140	F	PROTRACTOR, Magnetic	5210-01-415-0075	2150A251
141	F	PROTRACTOR, Square	5210-00-273-1937	05-12INCH
142	F	PULLER, Bolts	5120-01-185-6811	J26901-A
143	H	PULLER, Mech	5120-00-219-8397	J1902-B
144	F	PULLEY REMOVER	5120-00-944-0363	J5356
145	F	PUMP, FORCE	4130-01-192-0496	466-46485
146	O	PULLEY KIT, Pump, Roof Mount	5120-01-375-5700	2HP645
147	F	PUNCH, DRIFT	5120-00-004-4921	PWA14920
148	O	READER, Diagnostic (DDEC)	4910-01-343-3508	J38500-1
149	H	REMOVER, Bearing, Front Support	5120-01-117-2523	J28557
150	H	REMOVER, Snap Ring	4910-01-158-3996	J26598-A
151	H	REMOVER, Valve Bridge	5120-00-999-8615	J7453
152	H	REMOVER, Valve Pin	5120-01-048-3128	J-24412-2
153	H	REMOVER, Valve Seat	5120-01-165-1935	J23479-E
154	F	REMOVER AND INSTALLER, Piston Ring	5120-00-494-1846	7950177

Table B-1. Tool and Test Equipment Requirements (Cont).

Tool or Test Equipment Ref Code	Maintenance Category	Nomenclature	National/ NATO Stock Number	Tool Number
155	F	REMOVER ASSEMBLY	4910-01-158-3982	J24563-A
156	H	REMOVER SET, Valve Bridge	5120-00-999-8614	J7091-01
157	H	REMOVER, Guide Valve	5120-00-733-8880	J6569
158	H	REMOVER, Seal, Waterpump	4910-01-158-3979	J22150-B
159	H	COLLECTOR RING, Installer/Stalking SET	5120-01-048-3126	J24200
160	F	RIVET GUN	5130-00-982-8078	352
161	F	RULE, STEEL, Machinist	5120-00-204-1283	GGG-R-791
162	F	SCALE, TENSION	4910-00-779-6832	J-8129
163	F	SCREW, Guide	5120-01-144-4483	J1927-01
164	H	SLEEVE, Puller	4910-01-162-3633	J25007-4
165	H	SOCKET, 1-11/16 in.	5120-01-024-0168	GGG-W-641
166	H	SOCKET WRENCH Attachment, Screwdriver	5120-01-297-2374	J34650
167	H	SOCKET, 55mm	5120-01-386-5999	J39938
168	H	SOCKET, 63mm	5120-01-386-5988	J39939
169	F	SOCKET, Spindle Nut	5120-01-354-9451	J41111
170	H	SOCKET, Socket Head Screw	4470-01-350-0895	LAW124A
171	H	SOCKET, 12mm Hex Head	5120-00-240-6148	849550-3-8AF
172	F	SOCKET, Swivel 13/16 in.	5120-00-236-7619	A-A-1396
173	H	SPANNER	5120-01-354-9452	12379639
174	H	SPANNER	5120-01-354-9450	12379638
175	H	SPANNER	5120-01-354-9449	12379637
176	H	STAND, Maintenance, Axle	4910-00-241-3329	150-AX
177	H	STAND, Maintenance, Engine	4910-00-808-3372	J29109
178	H	STEAM CLEANER	7910-01-157-8272	PRO 12-5
179	H	STONE, Abrasive Cylinder	5130-00-937-7280	J5902-14
180	H	STONE, Sharpening	5345-00-584-4607	A6F0
181	H	STUD SET	5120-01-048-2155	J25002
182	F	TAP AND DIE SET	5136-01-119-0005	TDM99117
183	O	TERMINAL CRIMPER	5120-01-355-0845	J35688
184	O	TERMINAL REMOVER	5120-01-357-2937	J35689-A
185	O	TERMINAL REMOVER	5120-01-353-2534	J33095
186	O	TESTER, Pressure, Radiator	4910-01-170-4928	J24460-01
187	H	TESTING KIT, Cylinder	5180-01-252-9800	2SK737

Table B-1. Tool and Test Equipment Requirements (Cont).

Tool or Test Equipment Ref Code	Maintenance Category	Nomenclature	National/ NATO Stock Number	Tool Number
188	F	OSS TESTER	4910-01-370-4908	13189
189	H	TOOL SET, Blower	4940-00-611-7945	J6270-G
190	F	TOOL SET, Equalizer Beam	4940-01-386-6108	1764
191	F	TOOL, Knuckle, Adjusting	5120-01-355-6571	J41115
192	H	TOOL, Lifting	5120-01-159-1736	J33079-1
193	H	TOOL, Staking	5120-01-359-2757	J24200-1
194	O	TOOL, SRS/TRS Alignment	5120-01-343-1001	J39815
195	F	TORCH, Propane	3433-01-161-4998	737-1-0000
196	F	WISE, Pipe, Chain	5120-00-078-6662	CV12
197	O	WEATHERPAC CRIMPER	5120-01-374-8936	J38852
198	O	WEATHER TERMINAL REMOVER	5120-01-374-8969	J36400-5
199	F	WINCH, Cable, Hand Operating	3950-00-079-1202	415526-1
200	F	WRENCH, Chain	5120-01-192-9403	CW24
201	O	WRENCH, Combination 1 5/8 in.	5120-01-016-7144	1180
202	O	WRENCH, Combination 1 11/16 in.	5120-00-184-8566	A-A-1351
203	O	WRENCH, Combination 1 3/4 in.	5120-00-020-8658	1256
204	F	WRENCH, Combination 1 13/16 in.	5120-00-081-9099	GGG-W-636
205	O	WRENCH, Combination 1 7/8 in.	5120-00-020-8632	1260
206	O	WRENCH, Combination 2 in.		
207	O	WRENCH, Combination 2 1/8 in.	5120-00-203-4795	1268
208	O	WRENCH, Fuel Line	5120-00-019-5232	J-8932-B
209	F	WRENCH SET, Pushrod	5120-00-132-2109	J21100-D
210	H	WRENCH, Spanner	5120-01-375-4502	J41108

Section IV. REMARKS

REFERENCE CODE	REMARK
A	No specific times established. Times required for inspection, service, or test will depend on extent of testing required.
B	This task covers the entire on-stand repair. Use tools listed in the individual tasks for those tasks.
C	No specific times established. Times required for replacement or repair will depend on extent of work required.
D	No specific times established. Times required for overhaul will depend on extent of work required.
E	In the "O" category repair is limited to splicing of wires, taping of the harness or wires, and the replacement of wire ends.
F	At the "F" level the entire wire harness is replaced.
G	Repair consists of replacing individual items.
H	High pressure hoses are non-repairable.
I	Repair of the gas particulate filter is covered in TM-(TBD).
J	Repair of the M-8 chemical alarm is covered in TM 3-6665-225-12.
K	Repair of the M-13 decontamination unit is covered in TM 3-4230-214-12&P.

APPENDIX C

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION.

C-1. SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain the PLS. These items are authorized to you by CTA50-970, Expendable Items (Except Medical, Class V, Repair parts and Heraldic Items) or CTA8-100, Army Medical Department Expendable/Durable Items.

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 task box to identify the material (e.g., “Compound, Cleaning, Item 5, Appendix C”).
- b. Column (2) - Level.** This is the maintenance level approved to use the item listed.
- c. Column (3) - National Stock Number.** This is the National Stock Number assigned to the item; use it to request or requisition the item.
- d. Column (4) - Description.** Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Commercial and Government Entity (CAGE) code in parentheses followed by the part number.
- e. Column (5) - Unit of Measure.** Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, or pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	O		Adhesive (45152) 1490170 Sikaflex 221 gray	gl
1.1	O	8040-01-388-8704	Adhesive No. 380 (05972) OTC P/N 3303334 3 gm tube	gm
		8040-01-406-8424	(05972), 38004 1 oz bottle	oz
		8040-01-284-3984	(05972), ITEM 3850 1 oz can (05972), 3850	
2	O	8040-01-321-1254	Adhesive (05972) Loctite #409 20 gram tube	gm
3	O		Deleted	
4	O	8040-01-046-5061	Adhesive (05972) Loctite #44581 4 gram kit	gm
5	O	8040-00-148-7182	Adhesive (04963) 1300 5 ounce tube	oz
6	O	8040-00-851-0211	Adhesive (71984) RTV 732 Black 5 oz kit	oz
		8040-00-865-8991	12 oz kit	oz
		8040-01-331-7470	(80244) MIL-A-46106 Group 1 Type 1 5 oz tube	oz
7	O	8040-00-701-9546	Adhesive (71984) RTV 732 Clear 5 oz kit	oz
		8040-01-010-8758	12 oz kit	oz
		8040-01-331-7469	(80244) MIL-A-46106 Group 1 Type 1 3 oz tube	oz
		8040-01-331-7475	12 oz cartridge	oz
8	O	8040-01-260-1939	Adhesive (71984) RTV 738 5 oz tube	oz
9	O	8040-00-118-2695	Adhesive (01139) RTV-162 (71984) Silastic 738 RTV (81349) MIL-A-46146 3 oz kit	oz

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
10	O	8040-00-843-0802 8040-01-173-9815	Adhesive (01139) RTV 108 3 ounce kit 12 ounce tube	oz oz
11	O	8040-00-390-7959	Adhesive (18876) 13086263 1 quart can	qt
12	O	8040-01-515-1050	Adhesive, Insulation (28112) 540 (OTC P/N 1372150) 10.3 oz (305 ml) cartridge	oz
13	O	8030-01-303-0502	Adhesive, Retaining (05972) 68035 50 ml bottle	bt
14	O		Adhesive Sealant (45152) 24758FX	oz
15	O		Adhesive, (OPMN0) Sika 255 FC Blk (45152) 3145938	oz
16	O		Adhesive Spray (45152) 1537350	oz
17	O	6810-01-075-5546	Alcohol, Isopropyl (53390) 7618-19-4 40 oz bottle	oz
18	O	6850-00-174-1806	Antifreeze (81349) MIL-A-11755 55 gallon drum	gl
19	O	6850-00-181-7929 6850-00-181-7940	Antifreeze (81349) MIL-A-46153 1 gallon bottle 55 gallon drum	gl gl
20	O	8030-00-155-6444	Antiseize Compound (81349) MIL-A-907 16 oz aerosol can	oz
21	O	8030-00-251-3980	Antiseize Compound (81349) MIL-A-907 1 lb can	lb
22	O	8030-00-597-5367	Antiseize Compound, High Temperature (81349) MIL-A-907 2-1/2 lb can	lb
23	O	8020-00-178-8305	Brush, Paint (96906) MS16866	ea
24	O	6840-00-300-6373 6840-01-173-6940	Biocide, Fuel Preservative (OU7J1) Biobar J.F. 1 quart 5 gallon	qt gl

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
25	O	5975-01-273-8133	Cable Ties (96906) MS3367-3 12 inches long, 100 per package	hd
26	O	5975-00-074-2072	Cable Ties (96906) MS3367-1 6 inches long, 100 per package	hd
27	O	4310-01-115-2297	Cable Ties (56501) TY525MX	ea
28	O	7510-00-537-6426	Chalk, Marking, White (83030) 1400	ea
29	O	9150-01-079-6124	Cleaner, Lubricant A (81349) MIL-L-63460 4 oz bottle, w/extender tube	oz
30	O	5350-00-221-0872	Cloth, Abrasive (Crocus) (58536) A-A-1206 50 sheet package	sh
31	O	7920-00-165-7195 7920-00-044-9281	Cloth, Cleaning (81349) MIL-C-85043 Type 1 - 10 lb box Type 2 - 10 lb box	lb lb
32	O	8030-00-546-8621	Coating Compound, Bituminous, Solvent Type (70842) 765-1505 21 ounce aerosol can	oz
33	O	8030-00-231-2349 8030-00-231-2344 8030-00-174-3242	Coating, Rust Arresting (81349) MIL-R-10036 1 gallon can 5 gallon can 55 gallon drum	gl gl gl
34	O	8030-00-062-6950 8030-01-149-1731 8030-00-837-6557 8030-00-903-0931	Corrosion Preventive Compound (81349) MIL-C-16173 Grade 1 - 1 quart can Grade 2 - 1 quart can Grade 3 - 1 pint can Grade 4 - 1 pint can	qt qt pt pt
35	O		Corrosion Preventive Compound (13548) 97940 8 ounce can	oz
36	O	8030-00-231-2353 8030-00-285-1570	Corrosion Preventive Compound (81349) MIL-C-11796 5 lb 35 lb	lb lb
37	O	8010-00-652-3626	Dye, Prussian Blue (81349) MIL-P-30501	oz

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
38	O	8040-00-092-2816	Epoxy (96900) 04001	ea
39	O	5330-01-325-6993	Gasket, Forming Compound (0597) Loctite #515 50 ml tube	ml
40	O		Gasket, Strip (45152) 2011160 50 ft. roll	in
41		9150-01-197-7688 9150-01-197-7690 9150-01-197-7689	Grease (45152) 1864450 2.25 oz tube 1.75 lb can 6.5 lb can	oz lb lb
42	O	9150-01-197-7688 9150-01-197-7690 9150-01-197-7689	Grease, Automotive And Artillery (70878) 5542P (81349) MIL-G-10924 2.25 oz tube 1.75 lb can 6.5 lb can	oz lb lb
43	O	9150-01-306-9202 9150-00-235-5555 9150-00-823-8047	Grease, General Purpose (81349) MIL-G-23549 1 pound can 6.5 pound can 35 pound can	lb lb lb
44	O	9150-01-154-1259	Grease, High Temperature (81349) DOD-G-85733	qt
45	O	9150-01-235-5057	Grease, Instrument (97343) SRI2 1 pint can	pt
46	O	9150-00-076-1887	Grease, Lubriplate (73219) 06706	oz
47	O	9150-01-091-9336 9150-00-754-2595 9150-00-223-4004 9150-00-965-2003	Grease, Molybdenum Disulfide (58372) 60G 1.5 lb can (81349) MIL-G-21164 1.75 lb can 6.5 lb can 35 lb can	lb lb lb lb
48	O	5970-00-815-1295	Heatshrink, Sealed (45152) 1704950	ea
48.1	O		Heatshrink, Sealed (45152) 1704940	ea
49	O		Hot Melt (04963) 3783	oz

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
50	O	9150-00-189-6727 9150-01-177-3988 9150-00-191-2772 9150-00-183-7807	Hydraulic Oil, OE/HDO 10 (81349) MIL-L-2104 1 quart can 12 quart box 55 gallon drum Bulk	qt qt gl gl
51	O	6850-00-779-6851	Injector Test Oil (33287) J-26400-5	oz
52	O		Insulation, Cab (40501) MC5150-1/2 blk	ft
53	O	2540-00-256-5529 2540-00-256-5526 2540-00-256-5527	Lubricant, Tire (96980) AA20 5 gallon can 1 quart can (96980) AA17 1 gallon can	gl qt gl
54	O	9250-00-186-6681 9150-00-188-9858 9150-00-189-6729	Lubricating Oil, Engine OE/HDO 30 (81349) MIL-L-2104 1 quart can 5 gallon can 55 gallon drum	qt gl gl
55	O	9150-00-189-6730 9150-00-188-9862 9150-00-405-2987	Lubricating Oil, Engine OE/HDO 40 (81349) MIL-L-2104 1 quart can 55 gallon drum Bulk	qt gl gl
56	O	9150-01-152-4117 9150-01-178-4725 9150-01-152-4118 9150-01-152-4119	Lubricating Oil, Engine OE/HDO 15W/40 (81349) MIL-L-2104 1 quart can 12 quart box 5 gallon can 55 gallon drum	qt qt gl gl
57	O	9150-00-402-4478 9150-00-402-2372 9150-00-491-7197	Lubricating Oil, Engine OEA (81349) MIL-L-46167 1 quart can 5 gallon can 55 gallon can	qt gl gl
58	O	9150-01-035-5390 9150-01-048-4593 9150-01-035-5391	Lubricating Oil, Gear GO 75W (81349) MIL-L-2105 1 quart can 1 gallon can 5 gallon can	qt gl gl

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
59	O	9150-01-035-5392 9150-01-313-2191 9150-00-001-9395	Lubricating Oil, Gear GO 80W/90 (81349) MIL-L-2105 1 quart can 1 gallon can 5 gallon can	qt gl gl
60	O	9150-01-293-7696 9150-01-293-2792	Lubricating Oil, Preservative (15W40) (Engine) (81349) MIL-L-21260C 5 gallon 55 gallon	gl gl
61	C	9140-00-286-5286	Oil, Fuel, Diesel Winter Bulk	gl
62	C	9140-00-286-5294	Oil, Fuel, Diesel Regular Bulk	gl
63	O	9150-00-250-0931 9150-00-250-0926 9150-00-250-0933	Petrolatum, Technical (81348) VV-P-236 8 ounce tube 1.75 pound can 7.5 pound can	oz lb lb
64	O		Primer, (OPMN0) Sika Cleaner 205 (45152) 3145939	oz
65	O	8030-01-388-5604	Primer, "T" 7471 (05972) 19267	oz
66	O		Protective Coating (45152) 1412020 1 quart can	qt
67	O	7920-00-205-1711	Rags, Wiping (58536) A-A-531 50 pound bale	lb
68	O		Sealant, Electrical (00CE9) RTV200-257	
69	O		Sealant, Metal (45152) 1317520	
70	O		Sealant, Rubber (45152) 1494320	
71	O	1015-01-255-4144	Sealant, Teflon Pipe (19207) 12297953 50 ml tube	ml

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
72	O	8030-01-054-0740 8030-00-204-9149 8030-01-166-0675	Sealing Compound (05972) Loctite #567 50 ml bottle 250 ml tube (05972) Loctite #567-47 50 ml tube	ml ml ml
73	O	8030-00-111-2763 8030-00-111-2762 8030-01-050-8288	Sealing Compound (05972) Loctite #290 (80244) MIL-S-46163 Type 3 Grade R 10 ml bottle 50 ml bottle 150 ml bottle	ml ml ml
74	O	8030-00-148-9833 8030-01-158-6070	Sealing Compound (05972) Loctite #271 (80244) MIL-S-46163 Type 1 Grade K 10 ml bottle 50 ml bottle	ml ml
75	O	8030-00-656-1426	Sealing Compound (77247) Permatex-3D (80244) MIL-S-45180 Type 3 1 pint can	pt
76	O	8030-01-159-4374 8030-01-142-9830 8030-01-142-3131	Sealing Compound (05972) Loctite #262 10 ml bottle 50 ml bottle 250 ml bottle	ml ml ml
77	O	8030-01-104-5392 8030-01-014-5869 8030-01-025-1692	Sealing Compound (05972) Loctite #242 (80244) MIL-S-46163A Type 2 Grade N 10 ml bottle 50 ml bottle 250 ml bottle	ml ml ml
78	O	8030-01-054-3968 8030-01-069-3046 8030-01-055-6126	Sealing Compound (05972) Loctite 222 (80244) MIL-S-46163A Type II Grade M 10 ml bottle 50 ml bottle 250 ml bottle	ml ml ml
79		8030-01-303-0502 8030-01-387-2007	Sealing Compound (05972) Loctite #680 50 ml bottle 250 ml bottle	ml ml
80	O	8030-01-023-4535	Sealing Compound (04963) 3M2084	oz

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
81	O	8030-00-954-9371	Sealing Compound (77247) 51D 1 pint can	pt
82	O	8030-01-104-5392 8030-01-014-5869 8030-01-025-1692	Sealing Compound (45152) 079-820400 10 ml bottle 50 ml bottle 250 ml bottle	ml ml ml
83	O	8030-01-104-5392 8030-01-014-5869 8030-01-025-1692	Sealing Compound (45152) 65270AX 10 ml bottle 50 ml bottle 250 ml bottle	ml ml ml
84	O	6850-00-294-0860	Silicone Compound (72984) DC 111 5 ounce Tube	oz
85	O	6850-00-177-5094	Silicone Compound, Anti-Corrosion (71984) DC4-2OZ 2 ounce tube	oz
86	O	6810-00-252-1345	Solution, Soap (81349) MIL-W-15000 Class C 1 quart bottle	qt
87	O	6850-00-664-5685 6850-00-264-9038 6850-01-378-0679	Solvent, Drycleaning (58536) A-A-711 (81348) P-D-680 1 quart can 5 gallon can (Environmentally Compliant Solvent) (0K209) Breakthrough 5 gallon can	qt gl gl
88	O	9905-00-720-3577	Tag, Identification (16956) 12-105 white	ea
89	O	9905-00-537-8957 9905-00-537-8955	Tags, Identification (81349) MIL-T-12755 white yellow	ea ea
90	O	7510-00-079-7604	Tape, Adhesive (26066) 4516 36 yard roll	yd
91	O		Tape, Foam 36 yard roll	yd

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
92	O	5330-01-084-5058	Tape, Foam (45152) 107685A	in
93	O	8030-00-889-3535	Tape, Antiseizing (81755) P5025-2R (81349) MIL-T-27730 260 inch spool	in
94	O	7510-01-358-8770	Tape, Pressure Sensitive (52152) 4950 36 yard roll	yd
95			Deleted	
96			Deleted	
97	O	8010-00-401-0421	Varnish (79819) FIXATIF 1 quart can	qt
98	C	6850-00-926-2275	Washer Fluid (81348) O-C-1901 1 gallon bottle	gl
99	O	6145-01-074-7535	Wire, 16 Gage (45152) 1927FX	ft
100	O	9505-00-331-3275	Wire, Safety (96906) MS20995C41	lb
101	O	5330-01-325-6993	Wrench, Loctite #515 (05972) 25824AX	ml

APPENDIX D

ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I. INTRODUCTION

D-1. SCOPE.

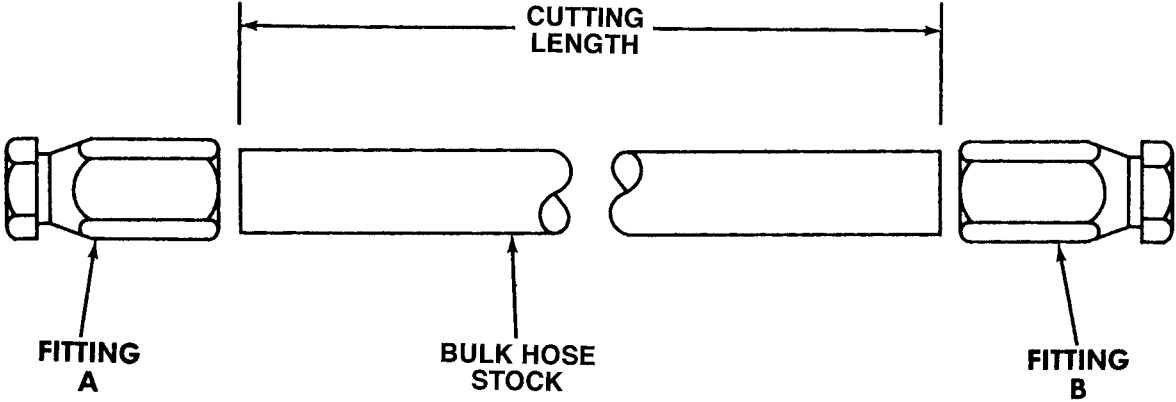
This appendix includes complete instructions for manufacturing or fabricating authorized items locally. All bulk materials needed to manufacture an item are listed by part number or specification number in a tabular list with an illustration, as needed.

Section II. MANUFACTURED ITEMS

D-2. FUEL HOSE FABRICATION.

The following hoses are cut from bulk hose using a fine toothed hacksaw or suitable cutting device. Locations and installation instructions for fuel hoses are found in Para 4-12. Table D-1 lists the fuel hoses.

Table D-1. Fuel System Hoses



Hose Assembly Part Number	Bulk Hose Part Number	Cutoff Length	
		Inches	cm
65068AX-024	2575-48RL	24	61
47371AXU-018	FC350-04	18	46
EU102958-025	FC350-06	25	64
EU102958-052	FC350-06	52	132
1924600U-034	FC350-10	34	86
56845AXU-005	FC350-10	5	13

D-3. AIR INTAKE HOSE FABRICATION.

There are two hoses in the air intake system that require fabrication. Both hoses can be cut from bulk stock using a fine-toothed hacksaw or suitable cutting device. Refer to Para 4-7 for locations and installation instructions.

Table D-2. Air Intake Hoses

Hose Assembly Part Number	Bulk Hose Part Number	Cutoff Length	
		Inches	cm
21033FXW-120	21020FX	120	305
1732400U-067	FC300-16	67	170

D-4. COOLING SYSTEM HOSES FABRICATION.

The following hoses for the cooling system are cut from bulk hose using a fine-toothed hacksaw or suitable cutting device. Locations and installation instructions are found in Para 6-8.

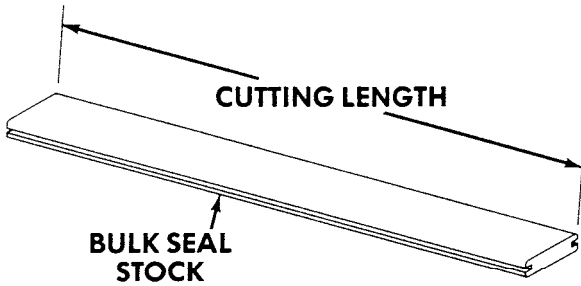
Table D-3. Cooling System Hoses

Hose Assembly Part Number	Bulk Hose Part Number	Cutoff Length	
		Inches	cm
69940AX-048	3230-0293	48	122
4811FX-100	4811FX	100	254
46754AX-U-020	FC350-06	20	51

D-5. SEAL FABRICATION.

Fabricate seals from bulk seal stock listed in Table D-4. Use a suitable cutting tool to cut seal to length required.

Table D-4. Seal, Nonmetallic



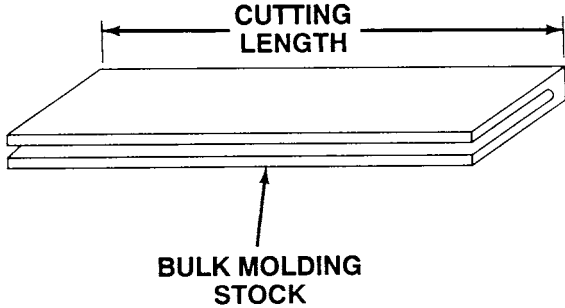
The diagram shows a perspective view of a long, thin, rectangular bulk seal stock. A double-headed arrow above the stock indicates the 'CUTTING LENGTH'. An arrow points to the stock with the label 'BULK SEAL STOCK'.

Seal Part Number	Seal Bulk Part Number	Cutoff Length	
		Inches	cm
59747AX-040	101-2203	40	102
59747AX-055	101-2203	55	140
59745AX-040	75000519	40	102
59745AX-055	75000519	55	140
125865A-047	75001366	47	119
125865A-116	75001366	116	295
125865A-160	75001366	160	409

D-6. EDGING AND MOLDING FABRICATION.

Edging and molding can be fabricated from bulk stock listed in Table D-5. Use suitable cutting tool to cut to length required.

Table D-5. Edging and Molding

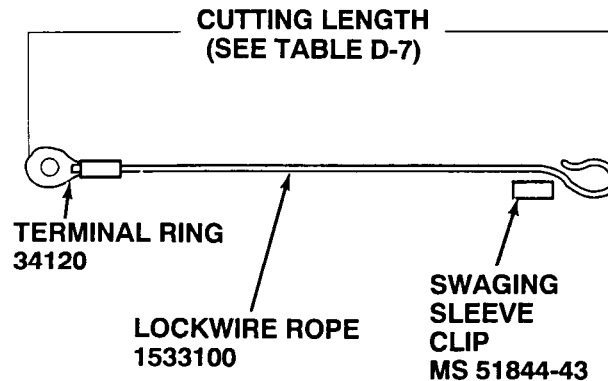


The diagram shows a perspective view of a rectangular block of material, labeled 'BULK MOLDING STOCK'. A horizontal double-headed arrow above the block is labeled 'CUTTING LENGTH', indicating the dimension to be cut.

Edging/Molding Part Number	Edging/Molding Part Number	Cutoff Length	
		Inches	cm
1339700-011	1339700	11	28
26927AX-026	26927AX	26	66
26947BX-002	75000317	2	5
26947BX-003	75000317	3	8
26947BX-004	75000317	4	10
26947BX-005	75000317	5	13
26947BX-006	75000317	6	15
26947BX-017	75000317	17	43
26947BX-018	75000317	18	46
1467160-012	75000317	12	31
42925AX-005	OR40	5	13
27022AX-002	R-422-N	2	5
27002AX-019	R-422-N	19	48
27022AX-024	R-422-N	24	61
27022AX-043	R-422-N	43	109
27022AX-093	R-422-N	93	236
27022AX-101	R-422-N	101	257
27022AX-130	R-422-N	130	330

D-7. LOCKWIRE ROPE FABRICATION.

The lockwire length is shown in Table D-6. Crimped button stop caps are used to attach the lockwire to other components. Each application requires two swaging sleeve clips.



NOTES:

1. OBTAIN ALL COMPONENTS REQUIRED TO FABRICATE LOCKWIRE.
2. USE A FINE TOOTHED HACKSAW OR SUITABLE CUTTING DEVICE, AND CUT LOCKWIRE TO LENGTH REQUIRED.
3. SLIDE WIRE THROUGH HOLE IN COMPONENT, UNTIL LOCKWIRE COMES THROUGH OTHER SIDE.
4. SLIDE CAP ONTO LOCKWIRE, UNTIL CAP BOTTOMS AGAINST COMPONENT AND WIRE COMES THROUGH CAP.
5. CRIMP CAP TO LOCKWIRE.
6. SLIDE OPPOSITE END OF WIRE THROUGH ASSEMBLY, AND SLIDE OTHER CAP OVER END OF WIRE.
7. SLIDE WIRE THROUGH HOLE IN COMPONENT, UNTIL LOCKWIRE COMES THROUGH OTHER SIDE.
8. SLIDE CAP ONTO LOCKWIRE, UNTIL CAP BOTTOMS AGAINST COMPONENT AND WIRE COMES THROUGH CAP.
9. CRIMP CAP TO LOCKWIRE.

The following wire rope is cut from bulk stock. Refer to Table D-6 for cutting lengths.

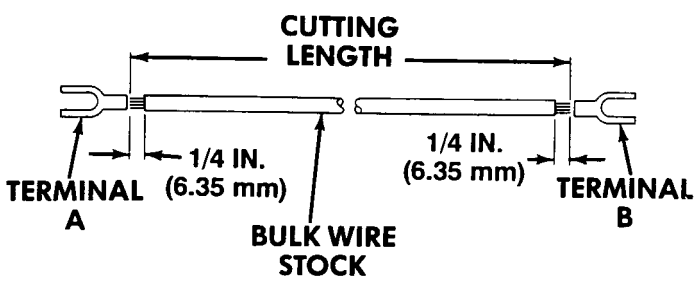
Table D-6. Lockwire Rope

Lockwire Rope Part Number	Lockwire Rope Part Number	Cutoff Length	
		Inches	cm
1533100-010	1533100	10	25
1533100-015	1533100	15	38
1533100-020	1533100	20	51
1533100-024	1533100	24	61

D-8. WIRE AND WIRE ASSEMBLIES FABRICATION.

Fabricate from bulk wire stock listed in Table D-7. Use wire cutters to cut wire to required length, then strip ends of wire 1/4 in. (6.35 mm). Crimp the required lugs or terminals onto wire ends.

Table D-7. Wire And Wire Assemblies



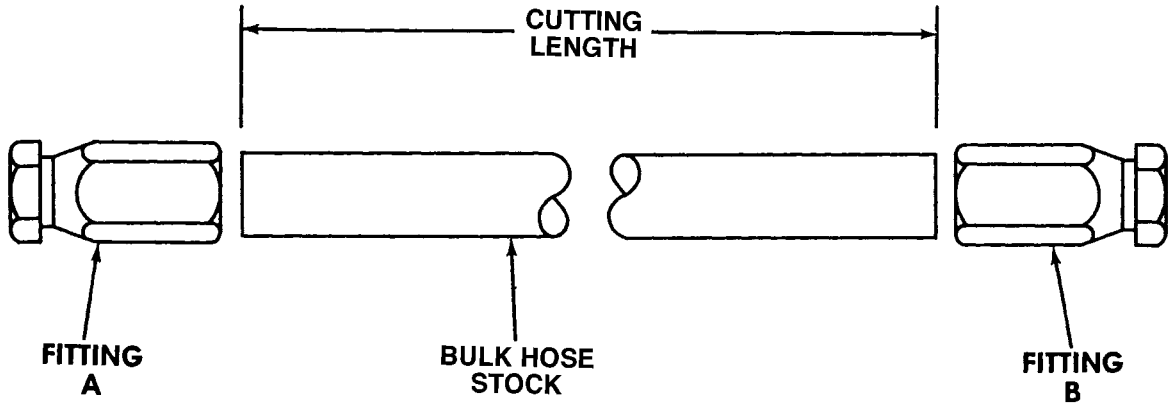
The diagram illustrates the fabrication of a wire assembly. It shows a central section of 'BULK WIRE STOCK' with a 'CUTTING LENGTH' indicated by a double-headed arrow. On both ends of the wire, there are 'TERMINAL A' and 'TERMINAL B' crimped onto the wire. The distance from the center of the bulk wire stock to the center of each terminal is marked as '1/4 IN. (6.35 mm)'.

Wire/Assembly Part Number	Bulk Wire Part Number	Cutoff Length	
		Inches	cm
1884540W-012	121782A	12	31
1947560W-012	121782A	12	31
1959390W-012	121782A	12	31
1969600W-012	121782A	12	31
1977300W-010	4127FX	10	25
1974580-013	R-64951	13	33
1974590-005	R-64951	5	13
1978470W-005	R-64951	5	13

D-9. HOSES AND TUBES.

Fabricate hoses and tubes from bulk hose or tube stock listed in Table D-8. Use a fine toothed hacksaw or suitable cutting device and cut hose/tube to desired length. Place fitting A in vise and screw hose/tube counterclockwise until hose/tube bottoms out in fitting. Back off ¼ turn. Repeat for fitting B.

Table D-8. Hoses and Tubes



Hose/Tube Part Number	Bulk Hose Part Number	Cutoff Length	
		Inches	cm
5113689-12	1525-6	12	31
21021FX-026	2102CFX	26	66
32850AX-014	22020	14	36
32850AX-016	22020	16	41
32850AX-030	22020	30	76
32850AX-036	22020	36	91
32850AX-51	22020	51	130
31270AX-029	31270AX	29	74
31270AX-082	31270AX	83	208
31270AX-096	31270AX	96	244
31270AX-140	31270AX	140	356
69940AX-006	3230-0293	6	15
69940AX-065	3230-0293	65	165
31271AX-040	3250-101	40	102
31271AX-047	3250-101	47	119
31271AX-053	3250-101	53	135
31271AX-092	3250-101	92	234
31271AX-150	3250-101	150	381
AAAC0085	51995757	85	216

Table D-8. Hoses and Tubes

Hose/Tube Part Number	Bulk Hose Part Number	Cutoff Length	
		Inches	cm
AAAC0105	5199575	105	267
AAAC0190	5199575	190	483
AAAC0260	5199575	260	660
AAAE0090	5199575	90	229
1944510	70-062		Variable
1944520	70-062		Variable
23319FX-012	C604-200 BLK	12	31
23319FX-023	C604-200 BLK	23	58
23319FX-029	C604-200 BLK	29	74
23319FX-244	C604-200 BLK	244	620
23319FX-257	C604-200 BLK	257	653
23323FX-008	C606 BLACK	8	20
23323FX-008	C606 BLACK	8	20
23323FX-010	C606 BLACK	10	25
23323FX-010	C606 BLACK	10	25
23323FX-012	C606 BLACK	12	31
23323FX-014	C606 BLACK	14	36
23323FX-019	C606 BLACK	19	48
23323FX-022	C606 BLACK	22	56
23323FX-026	C606 BLACK	26	66
23323FX-030	C606 BLACK	30	76
23323FX-033	C606 BLACK	33	84
23323FX-042	C606 BLACK	42	107
23323FX-042	C606 BLACK	42	107
23323FX-044	C606 BLACK	44	112
23323FX-046	C606 BLACK	46	117
23323FX-050	C606 BLACK	50	127
23323FX-052	C606 BLACK	52	132
23323FX-055	C606 BLACK	55	140
23323FX-057	C606 BLACK	57	145
23323FX-060	C606 BLACK	60	152
23323FX-060	C606 BLACK	60	152
23323FX-082	C606 BLACK	82	208
23323FX-087	C606 BLACK	87	221
23323FX-089	C606 BLACK	89	226
23323FX-148	C606 BLACK	148	376

Table D-8. Hoses and Tubes

Hose/Tube Part Number	Bulk Hose Part Number	Cutoff Length	
		Inches	cm
23323FX-159	C606 BLACK	159	404
23323FX-163	C606 BLACK	163	414
23323FX-200	C606 BLACK	200	508
23323FX-335	C606 BLACK	335	851
23323FX-377	C606 BLACK	377	958
198872A U-200	FC300-04	20	51
115134A W-004	FC300-04	4	10
1732400 U-067	FC300-16	67	170
1620950 U-099	FC350-04	99	252
47371AX U-055	FC350-04	5	13
47371AX U-006	FC350-04	6	15
47371AX U-012	FC350-04	12	31
47371AX U-017	FC350-04	17	43
47371AX U-018	FC350-04	18	46
47371AX U-120	FC350-04	120	305
60264AX U-031	FC350-04	31	79
60264AX U-034	FC350-04	34	86
60264AX U-054	FC350-04	54	137
60264AX U-057	FC350-04	57	145
60264AX U-063	FC350-04	63	160
60264AX U-082	FC350-04	82	208
60296AX U-029	FC350-04	29	74
60296AX U-036	FC350-04	36	91
60296AX U-061	FC350-04	61	155
1780700 U-032	FC350-06	32	81
1780700 U-035	FC350-06	35	89
1780700 U-039	FC350-06	39	99
1780700 U-041	FC350-06	41	104
1782400 U-022	FC350-06	22	56
1782410 U-021	FC350-06	21	53
1782450 U-025	FC350-06	25	64
47336AX-060	FC350-06	60	152
47554AX U-020	FC350-06	20	51
118971A U-022	FC350-06	22	56
118971A U-095	FC350-06	95	241
119784A U-010	FC350-06	10	25

Table D-8. Hoses and Tubes

Hose/Tube Part Number	Bulk Hose Part Number	Cutoff Length	
		Inches	cm
119784A U-021	FC350-08	21	53
119784A U-047	FC350-08	47	119
1782340 U-019	FC350-08	19	48
1782360 U-020	FC350-08	20	51
1921290 U-025	FC350-08	25	64
1936150 U-032	FC350-08	32	81
1936150 U-034	FC350-08	34	86
1936150 U-038	FC350-08	38	97
1936150 U-040	FC350-08	40	102
69390AX U-006	FC350-08	6	15
69390AX U-019	FC350-08	19	48
69390AX U-020	FC350-08	20	51
69390AX U-020	FC350-08	20	51
69390AX U-021	FC350-08	21	53
69390AX U-025	FC350-08	25	37
1780720 U-020	FC350-10	20	51
1780720 U-051	FC350-10	51	130
1782370 U-037	FC350-10	37	94
1782380 U-031	FC350-10	31	79
1782390 U-020	FC350-10	20	51
1782420 U-039	FC350-10	39	99
1782430 U-031	FC350-10	31	79
1782440 U-019	FC350-10	19	48
1924600 U-090	FC350-10	90	229
47750AX U-009	FC350-10	9	23
58989AX U-020	FC350-10	20	51
58989AX U-034	FC350-10	34	86
58989AX U-064	FC350-10	64	163
66798AX U-020	FC350-10	20	51
66798AX U-025	FC350-10	25	64
66798AX U-030	FC350-10	30	76
66798AX U-077	FC350-10	77	196
1780710 U-082	FC350-12	82	208
1780710 U-083	FC350-12	83	211
47369AX U-127	FC350-12	127	323
61608AX U-093	FC350-12	93	236

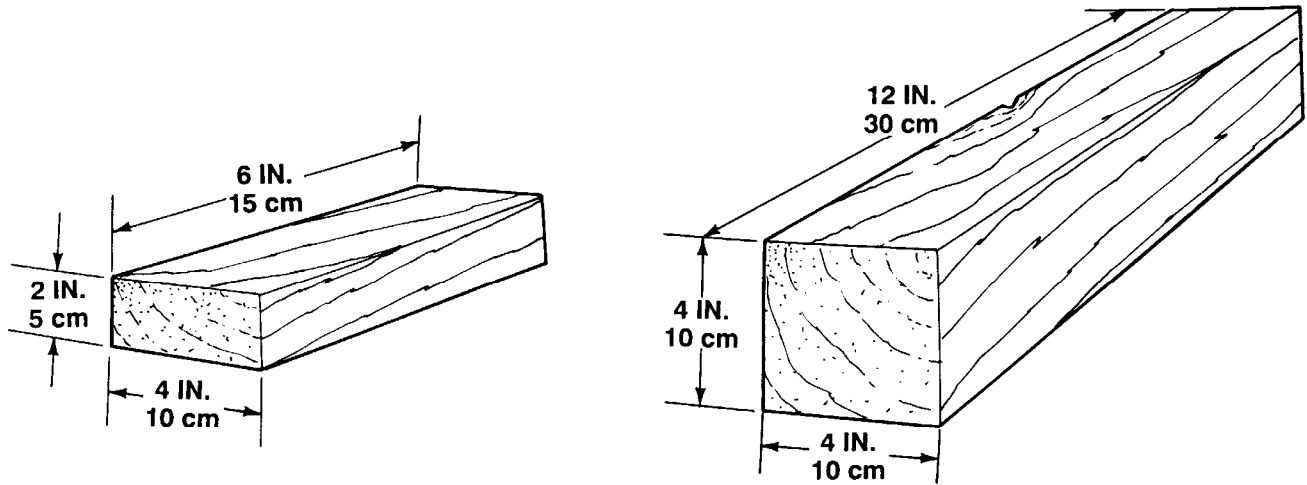
Table D-8. Hoses and Tubes

Hose/Tube Part Number	Bulk Hose Part Number	Cutoff Length	
		Inches	cm
61608AX U-142	FC350-12	142	361
47468AX U-011	FC350-16	11	28
47468AX U-022	FC350-16	22	56
47468AX U-045	FC350-16	45	114
47468AX U-046	FC350-16	46	117
47468AX U-089	FC350-16	89	226
47213AX-012	NT10012-50FT	12	31
47213AX-015	NT10012-50FT	16	41
47213AX-021	NT10012-50FT	21	53
47213AX-023	NT10012-50FT	23	58
47213AX-025	NT10012-50FT	25	64
47213AX-025	NT10012-50FT	25	64
47213AX-060	NT10012-50FT	60	152
47213AX-073	NT10012-50FT	73	185
47213AX-073	NT10012-50FT	73	185
47213AX-173	NT10012-50FT	173	439
47213AX-194	NT10012-50FT	194	493
1656500-128	PFT-10B-GRN	128	325
1656500-183	PFT-10B-GRN	183	465
1656490-102	PFT-10B-RED	102	259
1656490-202	PFT-10B-RED	202	513
1656490-257	PFT-10B-RED	257	653
1656470-030	PFT-4A-BLU	30	76
1656470-104	PFT-4A-BLU	104	264
1656470-115	PFT-4A-BLU	115	292
1656470-139	PFT-4A-BLU	139	353
1605260-008	PFT-4A-GRN	8	20
1605330-020	PFT-4A-ORG	20	51
1605330-040	PFT-4A-ORG	40	102
1605330-071	PFT-4A-ORG	71	180
1605330-112	PFT-4A-ORG	112	285
1605330-124	PFT-4A-ORG	124	315
1605170-007	PFT-4A-RED	7	18
1605270-023	PFT-6B-GRN	23	58
1605270-028	PFT-6B-GRN	28	71
1605270-056	PFT-6B-GRN	56	142

Table D-8. Hoses and Tubes

Hose/Tube Part Number	Bulk Hose Part Number	Cutoff Length	
		Inches	cm
1605270-057	PFT-6B-GRN	57	145
1605270-100	PFT-6B-GRN	100	254
1605270-108	PFT-6B-GRN	108	274
1605270-146	PFT-6B-GRN	146	371
1605320-205	PFT-6B-ORG	205	521
1605160-012	PFT-6B-RED	12	31
1605160-014	PFT-6B-RED	14	36
1605160-030	PFT-6B-RED	30	76
1605160-031	PFT-6B-RED	31	79
1605160-047	PFT-6B-RED	47	119
1605160-048	PFT-6B-RED	48	122
1605160-049	PFT-6B-RED	49	125
1605160-055	PFT-6B-RED	55	140
1605160-102	PFT-6B-RED	102	259
1605160-103	PFT-6B-RED	103	262
1605160-114	PFT-6B-RED	114	290
1605160-165	PFT-6B-RED	165	419
1605160-213	PFT-6B-RED	213	541
1605300-026	PFT-6B-YEL	26	66
1605300-066	PFT-6B-YEL	66	168
1605300-070	PFT-6B-YEL	70	179
1605300-129	PFT-6B-YEL	129	328
1605300-132	PFT-6B-YEL	132	335
1605300-150	PFT-6B-YEL	150	381
1605300-022	PFT-8B-BLU	22	56
1605300-316	PFT-8B-BLU	316	803
W-22-13	W-22	13	33
W-22-9	W-22	9	23
40AW168-010	W-22-L	10	25
40AW168-050	W-22-L	50	127
40AW168-19	W-22-L	19	48
40AW168-27	W-22-L	27	69
40AW168-45	W-22-L	45	114

D-10. WOODEN BLOCKS.

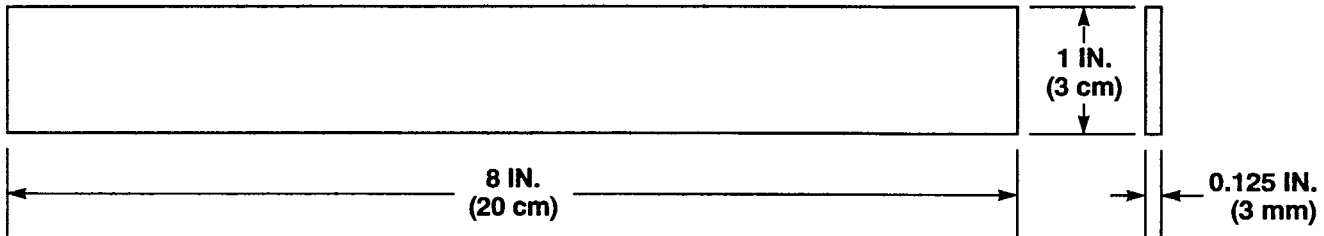


- a. Fabricate from MML751 lumber stock.
- b. Using saw and standard planing machine, cut stock to size required in Table D-9.

Table D-9. Wooden Blocks

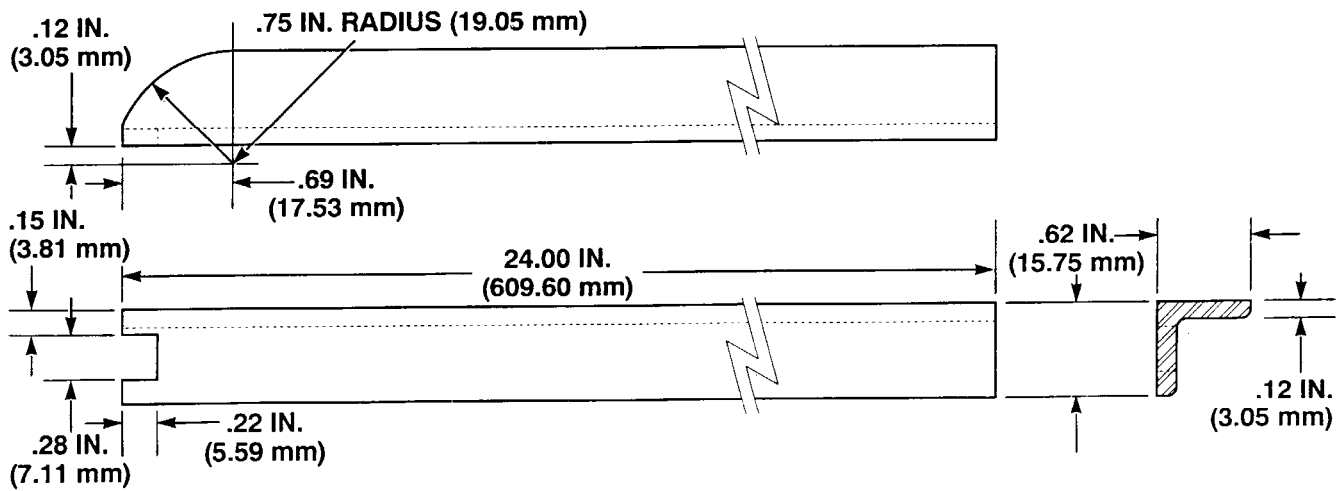
Para Number	Finished Dimensions of Block In. (cm)
2-28	4 by 4 by 12 in. (10 by 10 by 30 cm)
5-2	2 by 4 by 6 in. (5 by 10 by 15 cm)
13-2	4 by 4 by 12 in. (10 by 10 by 30 cm)

D-11. STEERING STOP PLATE.



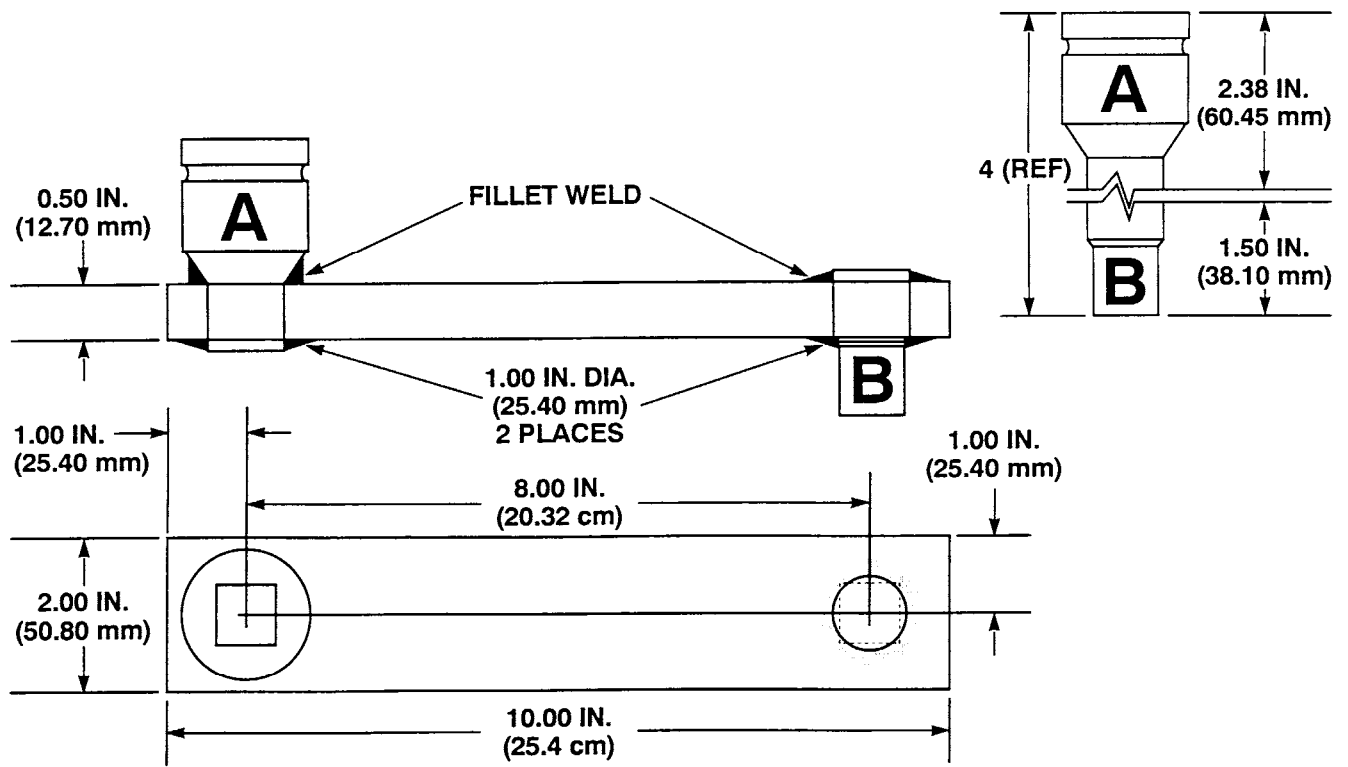
Fabricate steering stop plate from 1/8 in. (3mm) thick mild steel stock. Using a hacksaw, cut to dimension shown. File off rough edges.

D-12. BAR-BRAKE RETURN SPRING REMOVAL TOOL.



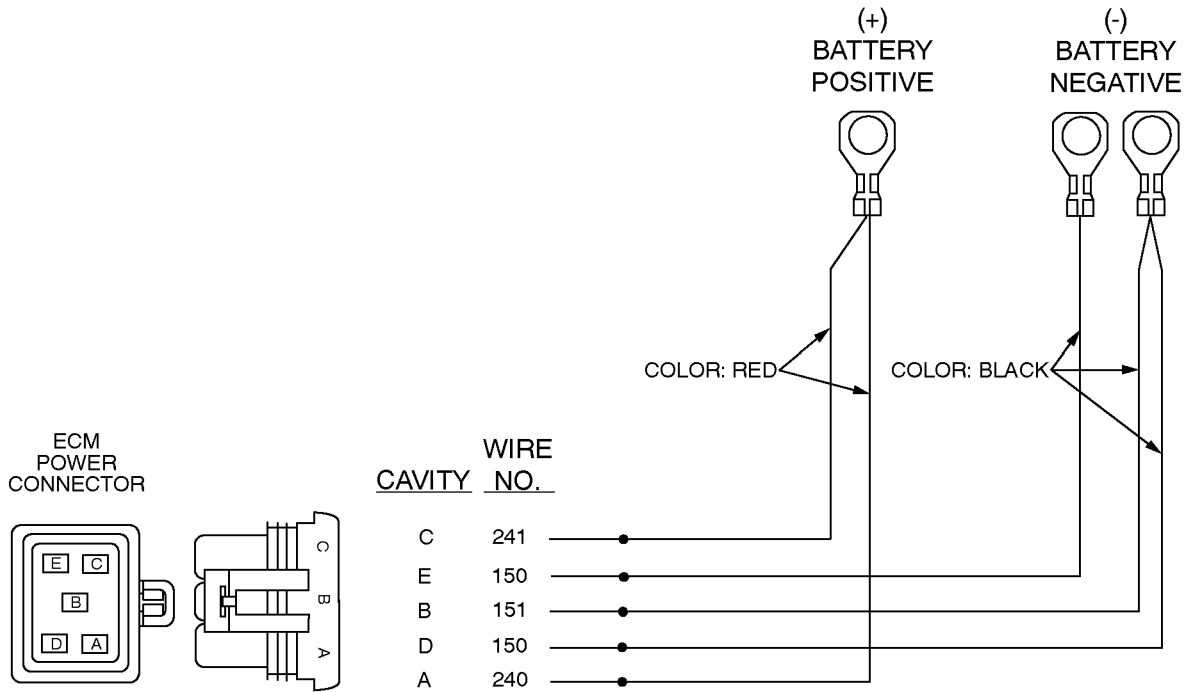
Fabricate bar-brake return spring removal tool from ASTM A36 angle aluminum. Using a hacksaw, cut to dimension shown. File off rough edges.

D-13. ADAPTER, TORQUE, 3/4 IN. DRIVE.



Fabricate torque adapter from Extension, P/N L32, NSN 5120-00-273-9208, and bar stock, Spec 23 or better. Cut part A and part B to dimensions shown.

D-14. JUMPER HARNESS (DDEC III/IV).



- (1) Fabricate from 16-gage wire.
- (2) Using wire cutters, cut five pieces of 16-gage wire to 180 in. (457 cm).
- (3) Strip both ends of each wire .25 inch (6.4 mm).
- (4) Crimp five terminals (PN 12077413) and five cable seals (PN 12015193) on wires.
- (5) Insert terminals and cable seals into connector body (PN 12124634) as illustrated.
- (6) Secure terminals and cable seals in connector body with secondary lock (PN 12052816).
- (7) Attach terminals (PN-D-351-38) to other end of wires 150, 150 & 151, and 240 & 241, as illustrated.

APPENDIX E

TORQUE LIMITS

E-1. SCOPE.

This section provides general torque limits for the screws, hoses and fittings used on the truck. Special torque limits are listed in the maintenance procedures for applicable components. The general torque limits given in this appendix shall be used when specific torque limits are not indicated in the maintenance procedure. These general torque limits cannot 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, tighten the screw or nut until it touches the metal bracket then tighten it one more turn.

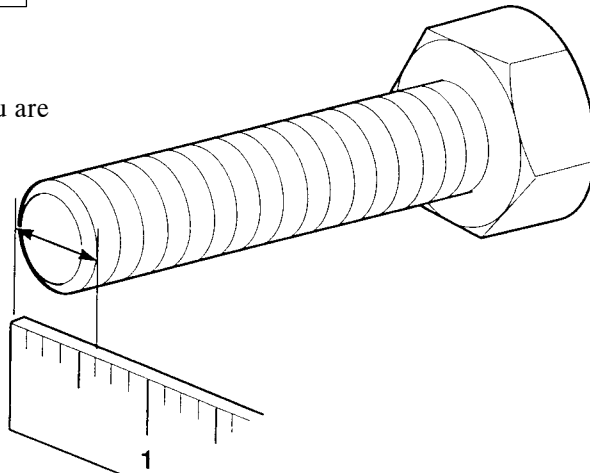
E-2. TORQUE LIMITS.

Table E-1 lists the torque limits for wet flange nuts. Table E-2 lists the torque limits for wet socket head capscrews. Table E-3 lists dry torque limits for capscrews. Dry torque limits are used on screws that do not have high pressure lubricants applied to the threads. Table E-4 lists wet torque limits for capscrews. Wet torque limits are used on screws that have high pressure lubricants applied to the threads. Table E-5 lists the torque limits for SAE 37 degree flare hose connections. Table E-6 lists the torque limits for SAE 45 degree flare hose connections. Table E-7 lists the torque limits for ORS preformed packing face seal hose connections. Table E-8 lists the torque limits for NPSM swivel connections.

E-3. HOW TO USE TORQUE TABLE.

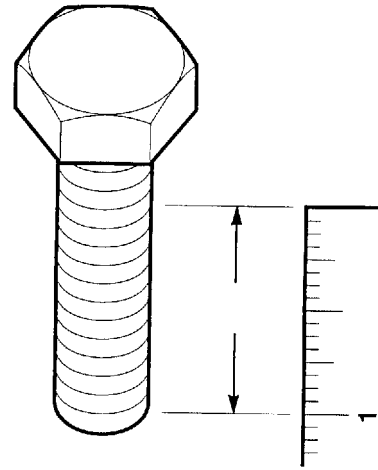
a. *Screws and Nuts.*

- (1) Measure the diameter of the screw you are installing with a ruler.



E-3. HOW TO USE TORQUE TABLE (CONT).

- (2) Measure out one inch with a ruler and count the number of threads per inch.
- (3) Under the heading **SIZE**, look down the left hand column until you find the diameter of the screw you are installing (there will usually be two lines beginning with the same size).
- (4) In the second column under **SIZE**, find the number of threads per inch that matches the number of threads per inch you counted in Step 2. (Not required for metric screws).
- (5) To find the grade screw you are installing, match the markings on the head to the correct picture of **CAPSCREW HEAD MARKINGS** on the torque table.
- (6) Look down the column under the picture you found in Step 5. until you find the torque limit (lb-ft or N·m) for the diameter and threads per inch of the screw you are installing.
- (7) Use wet torque values.



CAPSCREW HEAD MARKINGS

<p>Manufacturer's marks may vary. These are all SAE Grade 5 (3-line).</p> <p>STANDARD</p>	<p>Metric screws are of three grades: 8.8, 10.9, and 12.9. Grades & Manufacturer's marks appear on the screw head.</p> <p>METRIC</p>
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Table E-1. Torque Limits For Wet Flange Nuts

SPIRALOCK FLANGE NUT MARKINGS GRADE 8	DIAMETER		THREADS PER INCH	TORQUE	
	IN.	MM		LB-FT	N·m
	1/4	6.35	20	15	20
	5/16	7.94	18	25	34
	3/8	9.65	16	45	61
	1/2	12.70	13	110	149
	5/8	15.87	11	210	285
	3/4	19.05	10	375	508

Table E-2. Torque Limits For Wet Socket Head Cap Screws

SOC HEAD/12 PT. 	TORQUE IN FT. LBS. (CAP SCREWS) LUBED		
	SIZE	SOC HD OR 12 PT	SOC FLAT HD
SOC FLAT HEAD 	.10-24	5	2.5
	.25-20	12	6
	.31-18	25	12
	.38-16	44	22
	.50-13	70	36
SOC FLAT HEAD 	.56-12	106	53
	.62-11	212	106
	.75-10	375	187
	1.00-8	781	

b. *Hoses and Fittings.*

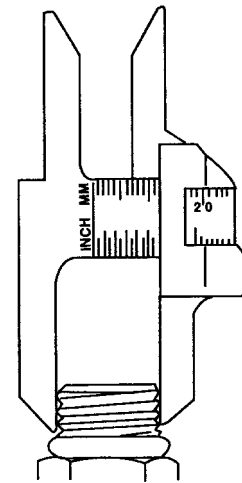
NOTE

Most fluid piping system sizes are measured by dash numbers. These are universally used abbreviations for the size of the component expressed as the numerator of the fraction with the denominator always being 16. For example, a -04 port is 4/16 or 1/4-inch. Dash numbers are usually nominal (in name only) and are abbreviations that make ordering of components easier.

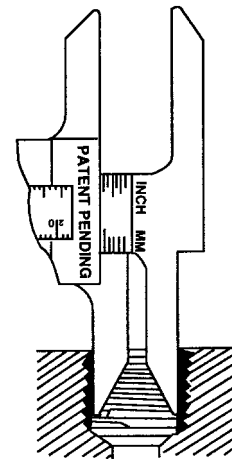
- (1) Measure the I.D./O.D. diameter with a caliper as shown.

- (2) Under the heading MALE THREAD O.D. and FEMALE THREAD I.D., match the measurements with the row in table to determine proper torque.

- (3) To find the sealing surface angle, use a protractor and measure the sealing surface parallel to the center line of the fitting.



**O.D.
(MALE THREADS)**



**I.D.
(FEMALE THREADS)**

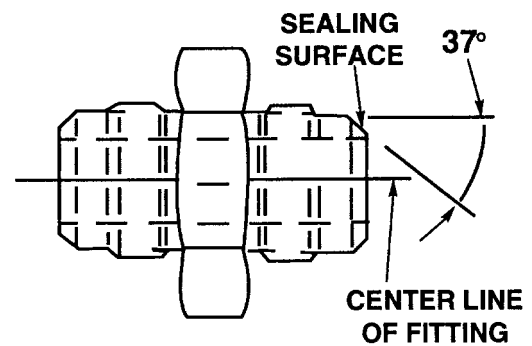


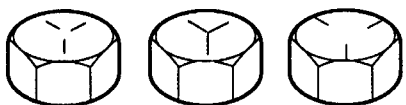
Table E-3. Torque Limits For Dry Fasteners

SIZE			TORQUE							
			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 or 7		SAE GRADE NO. 8	
DIA. INCHES	THREADS PER INCH	MILLIMETERS	POUNDS FEET	NEWTON METERS	POUNDS FEET	NEWTON METERS	POUNDS FEET	NEWTON METERS	POUNDS FEET	NEWTON METERS
1/4	20	6.35	5	7	8	11	10	14	12	16
1/4	28	6.35	6	9	10	14	12	16	14	19
5/16	18	7.94	11	15	17	23	21	28	25	34
5/16	24	7.94	12	16	19	26	24	33	25	34
3/8	16	9.53	20	27	30	41	40	54	45	61
3/8	24	9.53	23	31	35	47	45	61	50	68
7/16	14	11.11	30	41	50	68	60	81	70	95
7/16	20		35	47	55	75	70	95	80	108
1/2	13	12.70	50	68	75	102	95	129	110	149
1/2	20		55	75	90	122	100	136	120	163
9/16	12	14.29	65	88	110	149	135	183	150	203
9/16	18		75	102	120	163	150	203	170	231
5/8	11	15.88	90	122	150	203	190	258	220	298
5/8	18		100	136	180	244	210	285	240	325
3/4	10	19.05	160	217	260	353	320	434	380	515
3/4	16		180	244	300	407	360	488	420	569
7/8	9	22.23	140	190	400	542	520	705	600	814
7/8	14		155	210	440	597	580	786	660	895
1	8	25.40	220	298	580	786	800	1085	900	1220
1	12		240	325	640	868	860	1166	1000	1356
1-1/8	7	25.58	300	407	800	1085	1120	1519	1280	1736
1-1/8	12		340	461	880	1193	1260	1709	1440	1953
1-1/4	7	31.75	420	597	1120	1519	1580	2142	1820	2468
1-1/4	12		460	624	1240	1681	1760	2387	2000	2712
1-3/8	6	34.93	560	759	1460	1980	2080	2820	2380	3227
1-3/8	12		640	868	1680	2278	2380	3227	2720	3688
1-1/2	6	38.10	740	1003	1940	2631	2780	3770	3160	4285
1-1/2	12		840	1139	2200	2983	3100	4204	3560	4827

Table E-4. Torque Limits For Wet Fasteners

SIZE			TORQUE							
			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 or 7		SAE GRADE NO. 8	
DIA. INCHES	THREADS PER INCH	MILLIMETERS	POUNDS FEET	NEWTON METERS	POUNDS FEET	NEWTON METERS	POUNDS FEET	NEWTON METERS	POUNDS FEET	NEWTON METERS
1/4	20	6.35	4	6	6	8	8	11	9	12
1/4	28	6.35	5	7	7	9	9	12	10	14
5/16	18	7.94	8	11	13	18	16	22	18	24
5/16	24	7.94	9	12	14	19	18	24	20	27
3/8	16	9.53	15	20	23	31	30	41	35	47
3/8	24	9.53	17	23	25	34	30	41	35	47
7/16	14	11.11	24	33	35	47	45	61	55	75
7/16	20		25	34	40	54	50	68	60	81
1/2	13	12.70	35	47	55	75	70	95	80	108
1/2	20		40	54	65	88	80	108	90	122
9/16	12	14.29	50	68	80	108	100	136	110	149
9/16	18		55	75	90	122	110	149	130	176
5/8	11	15.88	70	95	110	149	140	190	170	231
5/8	18		80	108	130	176	160	217	180	244
3/4	10	19.05	120	163	200	271	240	325	280	380
3/4	16		140	190	220	298	280	380	320	434
7/8	9	22.23	110	149	300	407	400	542	460	624
7/8	14		120	163	320	434	440	597	500	678
1	8	25.40	160	217	440	597	600	814	680	922
1	12		170	231	480	651	660	895	740	1003
1-1/8	7	25.58	220	298	600	814	840	1139	960	1320
1-1/8	12		260	353	660	895	940	1275	1080	1464
1-1/4	7	31.75	320	434	840	1139	1100	1492	1360	1844
1-1/4	12		360	488	920	1248	1320	1790	1500	2034
1-3/8	6	34.93	420	570	1100	1492	1560	2115	1780	2414
1-3/8	12		460	624	1260	1709	1780	2414	2040	2776
1-1/2	6	38.10	560	760	1460	1980	2080	2820	2360	3200
1-1/2	12		620	841	1640	2224	2320	3146	2660	3607

CAPSCREW HEAD MARKINGS



Manufacturer's marks may vary.
These are all SAE Grade 5 (3-line).

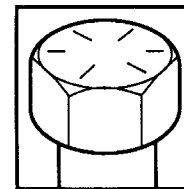
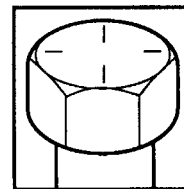
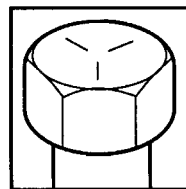
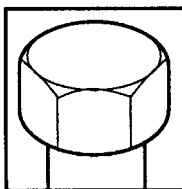


Table E-5. Torque Limits For 37 Degree Flare Hose Connections

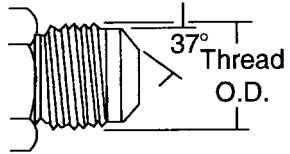
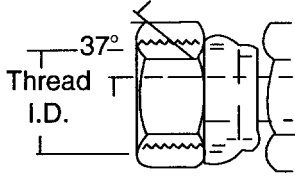
				
Male Half		Female Half		
INCH SIZE	DASH NO.	THREAD SIZE	TORQUE LB.FT.	TORQUE N·m
1/4	04	7/16-20	11-12	15-16
3/8	06	9/16-18	18-21	24-28
1/2	08	3/4-16	36-39	49-53
5/8	10	7/8-14	57-62	77-84
3/4	12	1 1/16-12	79-87	107-118
7/8	14	1 3/16-12	83-91	113-123
1	16	1 5/16-12	108-113	146-153
1 1/4	20	1 5/8-12	127-133	172-180
1 1/2	24	1 7/8-12	158-167	214-224
2	32	2 1/2-12	245-258	332-350

Table E-6. Torque Limits For 45 Degree Flare Hose Connections

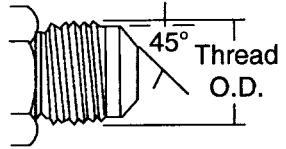
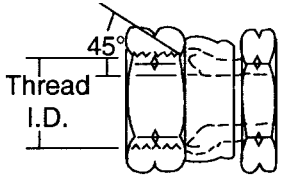
				
Male Half		Female Half		
INCH SIZE	DASH NO.	THREAD SIZE	TORQUE LB.FT.	TORQUE N·m
1/4	04	7/16-20	8-9	11-12
3/8	06	5/8-18	18-20	24-27
1/2	08	3/4-16	36-38	49-51
5/8	10	7/8-14	52-54	70-73
3/4	12	1 1/16-14	71-74	97-100

Table E-7. Torque Limits For ORS Preformed Packing Face Seal Hose Connections

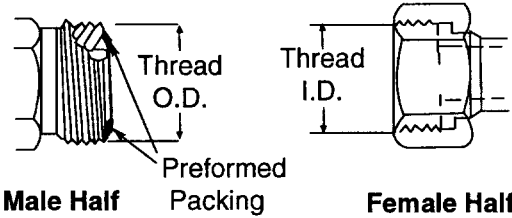
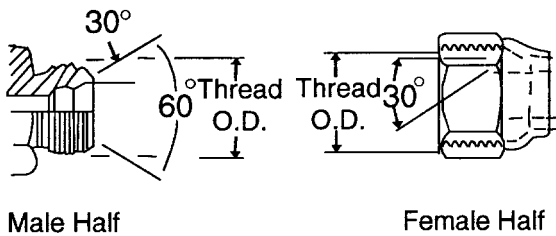
				
INCH SIZE	DASH NO.	THREAD SIZE	TORQUE LB.FT.	TORQUE N·m
1/4	04	9/16-18	10-12	14-16
3/8	06	11/16-16	18-20	24-27
1/2	08	13/16-16	32-35	43-47
5/8	10	1-14	46-50	62-68
3/4	12	1 3/16-12	65-70	88-95
1	16	1 7/16-12	108-113	146-153
1 1/4	20	1 11/16-12	127-133	172-180
1 1/2	24	2-12	158-167	214-226

Table E-8. Torque Limits For NPSM Swivel Connections

				
INCH SIZE	DASH NO.	THREAD SIZE	TORQUE LB.FT.	TORQUE N·m
1/8	02	1/8-27	3-4	4-5
1/4	04	1/4-18	10-11	14-15
3/8	06	3/8-18	16-18	22-24
1/2	08	1/2-14	25-27	34-37
3/4	12	3/4-14	46-48	62-65
1	16	1-1 1/2	80-83	108-113
1 1/4	20	1 1/4-11/2	130-134	176-182
1 1/2	24	1 1/2-11/2	160-164	217-222
2	32	2-11/2	170-174	231-240

APPENDIX F

MANDATORY REPLACEMENT PARTS

Section I. INTRODUCTION

F-1. SCOPE.

This appendix lists all mandatory replacement parts required for performance of Unit Support Maintenance of the PLS truck. It authorizes the requisitioning, issue, and disposition of consumable repair parts. All consumable repair parts listed in the maintenance tasks are listed here for ease of reference.

F-2. EXPLANATION OF COLUMNS (SECTION II).

- a. Column (1) - Replacement Part Reference Code.* This number is assigned to the entry in the listing and is referenced in the narrative task box to identify the part e.g., Clamp (Item 12, Appendix F).
- b. Column (2) - Nomenclature.* Indicates the federal item name and, if required, a description to identify the item.
- c. Column (3) - Part Number.* This is the vendor number assigned to the item.
- d. Column (4) - National Stock Number.* This is the National Stock Number assigned to the item; use it to request or requisition the item.

Section II. MANDATORY REPLACEMENT PARTS LIST

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
1	Belt Set, (3)	3113452	
2	Belt Set, Vee, (2)	1934800	3030-00-492-8106
3	Bushing	1X1/4PTR-B	4730-01-338-1459
4	Bushing	12406FX	5365-00-402-5376
5	Bypass Valve	A-DF-216	4820-01-359-1067
6	Cable, Drain Valve	SN-153	4010-01-348-6039
7	Cap, End Splice	7040700	
8	Capacitor	1972630	5910-01-364-9163
9	Channel	AS-1340	5330-01-111-2281
10	Channel, Rubber	101-2203	5330-01-267-7542
11	Channel, Rubber	126890	5330-01-155-1938
12	Clamp	24433	5340-01-131-8313
13	Clamp	32664AX	5340-01-131-8312
14	Clamp	5137620	5340-01-114-5623
15	Clamp	700-118	4730-01-212-8276
16	Clamp	700-120	4730-01-199-1458
17	Clamp	700-88	5340-01-355-7648
18	Clamp	90359-A	4730-01-353-9723
19	Clamp	B54-32780	4730-00-278-2523
20	Clamp	C0V-2515	5340-01-060-8686
21	Clamp	51689AX	5340-01-167-4146
22	Clamp, Loop	H360-4-2	5340-01-151-8391
23	Clip, Cable	57972	5340-01-193-9654
24	Clip, Push	H360-7-2	5340-01-224-8368
25	Contact, Electrical	12034051	5940-01-342-0712
26	Contact, Electrical	12084563	5999-01-321-1925
27	Contact, Electrical	12089305	5999-01-319-7394
28	Cross and Bearing	5-103X	2530-01-244-4949
29	Dust Boot	12010293	5975-01-226-8078
30	Dust Boot	12015323	5975-01-310-5011
31	Element, Filter	100696-E	2940-01-213-1135
32	Element, Filter	1317673	2940-01-347-7460

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
33	Element, Filter	2020-PMOR	2910-01-344-5791
34	Element, Strainer	5106910	4730-01-160-5668
35	Fastener And Seal Kit	50009501	5340-01-363-9215
36	Fastener And Seal Kit	50009503	5330-01-358-9309
37	Fastener And Seal Kit	50009504	5330-01-358-9308
38	Filter and Gasket	23518524	2940-01-314-1345
39	Filter Element Kit	MTP-95-551	4330-01-026-6371
40	Filter, Fuel	23518481	2910-01-423-2859
41	Filter, Hydraulic	1314130	4330-01-232-8305
42	Fitting, Lubrication	MS15002-3	4730-00-172-0015
43	Gasket	02343-02	5330-01-193-5315
44	Gasket	0-615C46XA	5330-01-348-8345
45	Gasket	11007B	5330-01-344-0539
46	Gasket	1198559	5330-01-358-8219
47	Gasket	1199479	5330-01-234-2618
48	Gasket	12357897	6220-01-319-5509
49	Gasket	14079550	5330-00-107-3925
50	Gasket	1728230	5330-01-347-9858
51	Gasket	1958330	5330-01-358-5561
52	Gasket	23016336	5330-01-328-7634
53	Gasket	5100860	5300-01-058-8267
54	Gasket	5104081	5330-01-078-7186
55	Gasket	5117786	5330-00-781-7117
56	Gasket	5130995	5330-00-980-1546
57	Gasket	5136678	5330-00-198-7953
58	Gasket	5766-1211-6	5330-01-242-2698
59	Gasket	731740-002	
60	Gasket	7716570	5330-00-771-6570
61	Gasket	8921312	5330-01-206-3263
62	Gasket	8924413	
63	Gasket	92-158	5330-01-058-7118
64	Gasket	A/281	5330-01-352-1997

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
65	Gasket	DIN7603A 14X18	
66	Gasket	EE100969	9330-01-185-4466
67	Gasket	M25988/1-246	5330-01-189-6351
68	Gasket	NE-71A	5330-01-277-5103
69	Gasket Strip	2050690	5330-01-394-8346
70	Gasket, Breather Filler	FB-7	5330-01-406-8221
71	Gasket, Headlight	1400940	5330-01-234-7640
72	Grommet	459-A	5330-01-049-0550
73	Guide Assy, Pawl	NA1779M195	3040-01-351-4061
74	Guide Assy, Pawl	NA22297U4597	3040-01-350-3980
75	Hardware, Mounting	GS-2655	5340-01-365-3144
76	Housing, Tach	5106771	6680-01-086-4470
77	Insulation	1949200	2540-01-370-6144
78	Insulation	1949220	2540-01-367-7392
79	Insulation	1949230	2540-01-368-9962
80	Insulation	C04610	2510-01-389-0708
81	Isolator	23512307	5340-01-414-2177
82	Journal And Bearing Kit	5-438X	2520-01-339-0533
83	Journal And Bearing Kit	5-510X	2520-01-339-0532
84	Journal And Bearing Kit	5-515X	2520-01-289-8307
85	Key	1363190	5315-01-165-2188
86	Kit, Mounting	893236	4810-01-400-6041
87	Kit, Packing	SK-10-4	
88	Lamp	E-013-001	6210-01-345-6315
89	Locknut	0-952A14	5310-00-725-9479
90	Locknut	10095	5310-01-063-1755
91	Locknut	110310A	5310-01-159-8178
92	Locknut	110311A	5310-01-111-0645
93	Locknut	110312A	5310-01-150-5918
94	Locknut	112556A	5310-01-372-6378
95	Locknut	114358AX	
96	Locknut	115307A	5310-01-151-1036

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
97	Locknut	1244954-2	5310-00-074-1387
98	Locknut	1333510	5310-01-340-5671
99	Locknut	1334320	5310-01-161-9123
100	Locknut	1408910	5310-01-111-0645
101	Locknut	1437220	
102	Locknut	1525130	5310-01-357-8840
103	Locknut	1571850	5310-01-288-5096
104	Locknut	1571870	5310-01-352-7732
105	Locknut	1598030	5310-01-342-8595
106	Locknut	1600460	5310-01-346-9445
107	Locknut	1605420	5310-00-542-0087
107.1	Locknut	1HT191	5310-01-383-6080
108	Locknut	203145	5310-00-012-0368
109	Locknut	21NE-040	5310-01-066-6759
110	Locknut	22NM04	5310-00-207-9341
111	Locknut	2-X-5731	5310-00-447-4251
112	Locknut	40X-1239	5310-01-377-1996
113	Locknut	41NE120	5310-00-530-0239
114	Locknut	434-A	5310-01-063-8970
115	Locknut	44NTE-1210	5310-01-346-3789
116	Locknut	5340910	5310-01-280-6538
117	Locknut	60860AX	
118	Locknut	60861A	5310-01-061-5678
119	Locknut	7-660-082504	5310-01-354-8734
120	Locknut	767HX1	5310-01-058-3183
121	Locknut	76985	5310-00-432-3959
122	Locknut	88881	5310-01-349-0759
123	Locknut	93604342	5310-01-081-5351
124	Locknut	AN365-1024A	5310-00-208-1918
125	Locknut	ATS2-518	5340-01-196-0380
126	Locknut	F41NE2076-1216	5310-01-357-4700
127	Locknut	L-10-MNS-500-X-1	5310-01-345-2350

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
128	Locknut	MS17828-7C	5310-01-117-5055
129	Locknut	MS21044C08	5310-00-982-6814
130	Locknut	MS51849-74	5305-00-470-3321
131	Locknut	MS51922-1	5310-00-088-1251
132	Locknut	MS51922-17	5310-00-087-4652
133	Locknut	MS51922-9	5310-00-984-3806
134	Locknut	MS51943-31	5310-00-061-4560
135	Locknut	MS51968-14	5310-00-732-0560
136	Locknut	N08	5310-00-185-6389
137	Locknut	N9406	5310-01-362-6171
138	Locknut	N9410	5310-01-348-8398
139	Locknut	SN104-NM-22	5310-01-355-0217
140	Locknut	T893R	5310-01-288-1116
141	Locknut	TLA-1213-GRC	5310-01-081-8244
142	Locknut	TLA-3410-GRC	5310-01-080-5747
143	Locknut	TLA-3816-GRC	5310-01-222-9097
144	Locknut	TLA-7809-GRC	5310-01-107-3586
145	Locknut	V75700689	5310-01-345-3757
146	Locknut	XB-769	5310-01-150-8599
147	Lockscrew	11504603	5305-01-336-6757
148	Lockscrew	31 WLFS 1420	5310-01-393-7077
149	Lockwasher	100-0000-051	5310-00-045-3299
150	Lockwasher	114021	5310-01-081-0798
151	Lockwasher	1244954-2	5310-00-074-1387
152	Lockwasher	1344950	5305-01-155-6107
153	Lockwasher	138526	5310-00-013-8526
154	Lockwasher	1459-254	5310-00-171-1734
155	Lockwasher	16FW008032	5310-00-988-8820
156	Lockwasher	1978HX	
157	Lockwasher	201506	5310-01-373-2539
158	Lockwasher	201946	5310-00-013-8572
159	Lockwasher	202210	5310-01-101-2490
160	Lockwasher	210104	5310-01-K49-2583

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
161	Lockwasher	2239HX	5310-00-209-1218
162	Lockwasher	2249HX	
162.1	Lockwasher	2250HX	
163	Lockwasher	2251HX	5310-01-354-3729
164	Lockwasher	2434	5310-00-775-5139
165	Lockwasher	318B	5310-01-061-5302
166	Lockwasher	318BX	
167	Lockwasher	3231	5310-00-032-1814
168	Lockwasher	351AX	5310-01-129-0450
169	Lockwasher	352A	5310-01-081-1283
170	Lockwasher	352AX	5310-01-081-1283
171	Lockwasher	353AX	5310-00-582-5965
172	Lockwasher	354AX	5310-01-068-8446
173	Lockwasher	355AX	5310-01-133-2130
174	Lockwasher	362AX	5310-01-062-3379
175	Lockwasher	371AX	5310-00-775-5139
176	Lockwasher	62ANBH-4	4730-01-349-7765
177	Lockwasher	777-A	5310-01-061-4481
178	Lockwasher	7-950-160050	5310-01-292-4150
179	Lockwasher	8104200064	5310-01-358-6624
180	Lockwasher	93613642	5310-01-068-8446
180.1	Lockwasher	CA300302	5310-01-478-2605
181	Lockwasher	C-972	5310-01-210-7427
182	Lockwasher	HLKW025EG	5310-01-105-2652
183	Lockwasher	L051275	5310-10-244-8747
184	Lockwasher	MS35333-37	5310-00-579-0079
185	Lockwasher	MS35333-40	5310-00-550-1130
186	Lockwasher	MS35333-51	5310-00-655-6927
187	Lockwasher	MS35335-30	5310-00-209-0788
188	Lockwasher	MS35335-31	5310-00-596-7693
189	Lockwasher	MS35335-49	5310-00-582-6714
190	Lockwasher	MS35338-100	5310-00-261-8278
191	Lockwasher	MS35338-103	5310-00-184-8971

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
192	Lockwasher	MS35338-15	5310-00-012-1326
193	Lockwasher	MS35338-42	5310-00-045-3299
194	Lockwasher	MS35338-43	5310-00-045-3296
195	Lockwasher	MS35338-44	5310-00-582-5965
196	Lockwasher	MS35338-45	5310-00-407-9566
197	Lockwasher	MS35338-46	5310-00-637-9541
198	Lockwasher	MS35338-48	5310-00-584-5272
199	Lockwasher	MS35338-50	5310-00-820-6653
200	Lockwasher	MS35338-51	5310-00-584-7888
201	Lockwasher	MS35338-6	5310-00-010-3319
202	Lockwasher	MS35338-8	5310-00-261-7340
203	Lockwasher	MS35649-204	5310-00-954-9760
204	Lockwasher	MS45904-60	5310-00-080-9786
205	Lockwasher	MS51413-8	
206	Lockwasher	MS51848-12	5310-00-688-2195
207	Lockwasher	N405P13C16	5310-01-044-2295
208	Lockwasher	N9015	5310-01-046-0186
209	Lockwasher	N9018	5310-01-032-4827
210	Lockwasher	N9461	5310-01-348-8392
211	Lockwasher	W08	5310-01-355-8794
212	Lockwasher (#10 Stud)	85020	5310-01-373-6180
213	Nut	MS35650-103	5310-00-988-2652
214	Nut	MS51967-32	5310-00-762-6242
215	Nut	MS51967-35	5310-00-762-6241
216	Nut	MS51967-38	5310-00-762-6247
217	Nut, Push On	C12044-017-4	5310-00-110-8742
218	Nut, Stop	A1300R	
219	Nut, Tenz	1244954-2	5310-00-074-1387
220	Packing, Preformed	0526453-00	5330-00-071-6651
221	Packing, Preformed	11-222	5330-00-198-6190
222	Packing, Preformed	11350	5330-01-147-6003
223	Packing, Preformed	11639519-1	5330-00-463-0200

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
224	Packing, Preformed	11639519-2	5330-00-462-0907
225	Packing, Preformed	2014N103-70	5330-00-213-8722
226	Packing, Preformed	2-016N552-90	5330-01-115-8225
227	Packing, Preformed	2-021N0552	4730-00-541-0938
228	Packing, Preformed	22012-6	5330-00-200-8125
229	Packing, Preformed	22012-8	5330-00-996-8627
230	Packing, Preformed	2-238N674-70	5330-00-172-7223
231	Packing, Preformed	22617-10	5330-01-040-4772
232	Packing, Preformed	22617-12	5330-00-228-7196
233	Packing, Preformed	22617-16	5330-01-168-0885
234	Packing, Preformed	22617-20	5330-01-168-1802
235	Packing, Preformed	22617-4	
236	Packing, Preformed	22617-6	5330-01-198-8439
237	Packing, Preformed	22617-8	5330-01-224-2273
238	Packing, Preformed	2282320	
239	Packing, Preformed	2282330	
240	Packing, Preformed	23017303	5330-01-334-9946
241	Packing, Preformed	23504641	5330-01-336-2997
242	Packing, Preformed	235063	5330-00-454-0370
243	Packing, Preformed	262332	5330-00-443-2045
244	Packing, Preformed	3-916N0552	
245	Packing, Preformed	3-924N552-90	5330-01-038-3074
246	Packing, Preformed	52-49529-00	5330-01-348-8331
247	Packing, Preformed	A-103	5330-00-115-6327
248	Packing, Preformed	A307777000-8	5330-00-920-4157
249	Packing, Preformed	ARP568-014	5330-01-213-6795
250	Packing, Preformed	FF9446-14	
251	Packing, Preformed	FF9446-18	5330-01-092-5503
252	Packing, Preformed	FF9446-21	5330-01-269-4323
253	Packing, Preformed	FF9446-219	5330-00-013-7784
254	Packing, Preformed	FF9446-222	5330-00-984-3808
255	Packing, Preformed	FF9446-25	5330-01-269-6152

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
256	Packing, Preformed	FF9855-12	5330-01-376-9629
257	Packing, Preformed	GG108-NP04-10	4730-01-346-4684
258	Packing, Preformed	MS28775-013	5331-00-684-3420
259	Packing, Preformed	MS28775-223	5330-00-171-6649
260	Packing, Preformed	MS29512-16	5330-00-263-8034
261	Packing, Preformed	V75500858	5330-01-350-6007
262	Packing, Preformed	VS-1087-4	5330-01-371-5119
263	Packing, Pump Piston	P4-4	5330-00-122-0624
264	Pad, Rubber	1946480	5330-01-363-7020
265	Pin, Cotter	0900806-1	5315-00-254-1657
266	Pin, Cotter	126761A	5315-01-157-0960
267	Pin, Cotter	1749HX	
268	Pin, Cotter	1840070	
269	Pin, Cotter	L6451-101	5315-00-187-9591
270	Pin, Cotter	MS24665-134	5315-00-839-5820
271	Pin, Cotter	MS24665-151	5315-00-815-1405
272	Pin, Cotter	MS24665-319	5315-01-267-7570
273	Pin, Cotter	MS24665-353	5315-00-839-5822
274	Pin, Cotter	MS24665-491	5315-00-059-0206
275	Pin, Cotter	MS24665-498	5315-00-849-9854
276	Pin, Cotter	MS24665-624	5315-00-059-0217
277	Pin, Cotter	MS24665-627	5315-00-013-7508
278	Pin, Cotter	XB-T-60	5315-01-204-4893
279	Pin, Roll	1840070	
280	Pin, Roll	XB-21-S-187-1250	5315-01-448-0604
281	Pin, Roll	XB-21-S-312-1250	
282	Pin, Roll	XB-21-S-312-2500	
283	Pin, Roll	XB-21-S-500-1000	5315-01-448-0599
284	Pin, Roll	XB-S05742	
285	Pin, Spring	3145955	
286	Plug	A-LF-2550	5330-01-276-7351
287	Preformed Packing Kit	RN-60-A	4440-01-337-7324

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
288	Preformed Packing Kit	RN-60-V	5330-01-377-2460
289	Quick Edge	75000317	2510-01-176-1177
290	Retainer, Packing	8-238N300-90	5330-01-065-5959
291	Rubber Liner	124660A	
292	Rubber Strip	70-17-30	9320-00-491-5351
293	Screw	118941A	5305-01-156-5099
294	Screw	1344950	5305-01-155-6107
295	Screw	1778HX	5305-01-133-2114
296	Screw	23512308	5306-01-411-6384
297	Screw	5103642	5305-01-078-1999
298	Screw	59030AX	5305-00-984-6210
299	Screw	B71-10015-002	5305-01-352-2066
300	Screw	MS35206-267	5305-00-984-6214
301	Screw	MS35207-267	5305-00-993-1851
302	Screw	MS90725-34	5306-00-225-8499
303	Screw	MS90725-60	5305-00-269-3211
304	Screw	MS90725-8	5305-00-225-3839
305	Screw	SPLE101D05	5306-01-156-8678
306	Screw (Sheet Metal)	1381HX1	5305-01-134-2052
307	Screw Washer Assembly	1756840	5305-01-354-5708
308	Screw Washer Assembly	2050700	5305-01-394-3551
309	Screw, Self-locking	02092	5305-00-696-5115
310	Screw, Self-locking	1367HX1	5305-01-062-1017
311	Screw, Self-locking	23015458	5306-01-363-4057
312	Screw, Self-locking	96-212	5305-01-205-0041
313	Screw, Self-tapping	1324510	5305-01-157-5624
314	Screw, Self-tapping	1345280	5305-01-159-8544
315	Screw, Self-tapping	1354490	5305-01-274-0028
316	Screw, Self-tapping	1723180	5305-01-145-4003
317	Screw, Self-tapping	54067AX	5305-01-150-8714
318	Screw, Tapping	2763HX	5305-01-353-6120
319	Screws, Self-locking	31 WLFS 51618-062	5306-01-350-8223

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
320	Seal	1862760	
321	Seal	1941570	5330-01-363-7019
322	Seal	2282340	
323	Seal	2282350	
324	Seal	23504641	5330-01-336-2997
325	Seal	3S9643-00	5330-00-246-6380
326	Seal	5104105	5330-01-163-8178
327	Seal	75001366	9390-01-179-4508
328	Seal	NE-71A	5330-01-277-5103
329	Seal, Door	75001366	9390-01-179-4508
330	Seal, Plain	5103646	5330-01-088-2740
331	Seal, Preformed	101-2203	5330-01-267-7542
332	Seal, Ring	N1205B1666	5330-01-351-7881
333	Seal, Ring	N1205C1667	5330-01-350-5385
334	Splice, Conductor	327025	5940-01-368-9579
335	Stem, Valve	N-1268	2640-01-354-9424
336	Strip, Nut	128757A	5310-01-157-0894
337	Strip, Rubber	350907	5330-01-156-5266
338	Strip, Rubber	352731	5330-00-114-2073
339	Stud	52-49523-00	5307-01-348-7046
340	Tape, Rubber Adhesive	SJ5816	9320-01-299-3332
341	U-joint Kit	5-471X	2520-01-359-8444
342	Valve Core	8500V	2640-00-004-8297
343	Washer	1605640	5310-01-383-7327
344	Washer	MS27183-10	5310-00-809-4058
345	Washer	MS27183-7	5310-00-809-8544
346	Washer	MS27183-8	5310-00-809-8546
347	Washer	MS37183-62	5310-01-380-3474
348	Washer	V75503675	5310-01-389-2364
349	Washer, Copper	31425BX	2520-01-041-3542
350	Washer, Key	TW107	5310-01-014-5136
351	Washer, Plastic	16FW008032	5310-00-988-8820

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) Index No.	(2) Nomenclature	(3) Part Number	(4) National Stock Number
352	Washer, Rubber	8-325N300-90	5330-00-156-3208
353	Washer, Sealing	1760040	5310-01-353-2062
353.1	Washer, Special	3264358	
354	Washer, Star	50001716	5310-01-372-6391

APPENDIX G

TOOL IDENTIFICATION LIST

Section I. INTRODUCTION

G-1. SCOPE.

This appendix lists all of the tools needed to repair the truck.

G-2. GENERAL.

This appendix is a list of tools, both common and special, test equipment and tool kits used at unit level to repair the truck. This list is arranged alphabetically and shows the nomenclature, part number (P/N), National Stock Number (NSN) and references when applicable. The index number corresponds to the index number found in the task box of maintenance procedures.

Section II. COMMON TOOLS, TEST EQUIPMENT AND TOOL KITS

Item No.	Description	Part No.	NSN	Reference
1	Adapter, Torque Wrench	J-8932-B	5120-00-019-5232	
2	Adapter, Radiator	J-29003-A	4910-01-170-4929	
3	Analyzer Set, STE/ICE-R	12259266	4910-01-222-6589	
4	Bar, Crow	10501985	5120-00-224-1390	SC 4910-95-A74
5	Bar, Wrecking	130	5120-00-293-0665	SC 4910-95-A72-HR
6	Bit, Set	38699-1	5120-01-170-4454	SC 4910-95-A72-HR
7	Caliper, Micrometer, Inside	124B	5120-00-221-1921	
8	Cap And Plug Set	10935405	5340-00-450-5718	
9	Caps, Vise Jaw	GGG-C-137	5120-00-221-1506	SC 4910-95-A74
10	Clamp, Machinist's	GGG-C-406	5120-00-222-1612	SC 4910-95-A72-HR
11	Compressor Unit, Air	MIL-C-13874	4130-00-752-9633	SC 4910-95-A72-HR
12	Connector Remover (DEUTSCH)	114010	5120-01-158-4707	
13	Crimping Tool	J35123	5120-01-355-0844	
14	Crimping Tool (Cannon)	995-0001-904	5120-01-374-8937	
15	DDEC Repair Kit	J-35888	2815-01-355-5993	
16	Dispensing Pump	FEDXXD370	4930-00-287-8293	SC 4910-95-A72-HR
17	Drill, Electric, Portable	WD00661	5130-00-293-1849	SC 4910-95-A74
18	Drill, Electric, Portable, 1/4 in.	1070	5130-00-889-8993	SC 4910-95-A31
19	Drill Set, Twist	GGG-D-751	5133-00-293-0983	SC 4910-95-A74
20	Drill Set, Twist	GGG-D-751	5133-00-449-6775	SC 3470-95-A02
21	Drum, Storage 57 Gal	MIL-D-6054	8110-00-082-2626	
22	Extractor Tool, Electrical	901019-3	5120-01-015-2154	
23	Extractor Tool, Electrical	305183	5120-01-020-5926	

Section II. COMMON TOOLS, TEST EQUIPMENT AND TOOL KITS (CONT)

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23.1	Fault Code Retrieval Device (FCRD)	CA1 05 020		
24	Funnel	L-F-1593	7240-00-404-9795	SC 4910-95-A74
25	Gage, Air Inflation	1506	4910-00-204-2644	
26	Gage, Belt Tension (Tensiometer)	BT-33-73BF	4935-01-254-9808	
27	Gage, Feeler	007958	5210-01-214-2138	
28	Gloves, Chemical Oil Protective	ZZ-G-381	8415-00-641-4601	SC 4910-95-A74
29	Gloves, Heavy Duty	A-A-50022	8415-00-268-7859	SC 4910-95-A72-HR
30	Goggles, Industrial	GGG-G-13	4140-00-269-7912	SC 4910-95-A74
31	Gun, Air Blow	GGG-G-770	4940-00-333-5541	SC 4910-95-A72-HR
32	Gun, Heat	500	4940-00-561-1002	
33	Hammer, Hand Soft Plastic	3-HD	5120-01-065-9037	SC 4910-95-A72-HR
34	Handle, Driver	J-3154-1	5120-00-808-5082	
35	Handler, Installer	J7079-2	5120-01-977-5578	
36	Harness, Breakout	J34517	6150-01-373-7771	
37	Hose, Drain	ZZ-H-461	4720-00-356-8557	SC 4910-95-A74
38	Insertion Tool, (Cannon)	CIT-SS-10	5120-01-374-8968	
39	Installer, Seal	J8550	5120-00-977-5579	
40	Jack, Hydraulic, Hand	5029209-111-101	5120-00-224-7330	SC 4910-95-A74
41	Jack, Kit, Hydraulic, Hand	GGG-J-60	5120-00-587-4144	
42	Jackstand, Trestle	306	4910-00-251-8013	SC 4910-95-A74
43	Measure, Liquid	MIL-M-43530	7240-00-138-7984	
44	Multimeter	ANURM105C	6625-00-999-6282	SC 4910-95-A72-HR
45	Multiplier, Torque	292	5120-00-574-9318	SC 4910-95-A72-HR
46	Pan, Drain (6 Gal)	MIL-P-45819	4940-00-795-3595	
47	Pan, Drain (4 Gal)	450	4940-00-387-9592	SC 4910-95-A74
48	Pliers, Brake Repair	131A	5120-00-690-8044	SC 4910-95-A74
49	Pliers, Retaining Ring	2BH945	5120-01-375-5699	
50	Pressure Test Kit	3SK911	4910-01-378-9068	
51	Puller Kit, Universal	1677	5180-00-423-1596	SC 4910-95-A73
52	Pulley Kit, Pump, Roof Mount	2HP645	5120-01-375-5700	
53	Reader, Diagnostic	J38500-1	4910-01-343-3508	
54	Removal Tool, Oil Filter	2304	5120-00-865-0933	SC 4910-95-A72-HR
55	Remover, Connector	J38384	5120-01-355-3012	
56	Repair Tool, Pneumatic Tire, Valve	7471	5120-00-308-3809	SC 4910-95-A74
57	Respirator, Air Filter	GGG-M-125/6	4240-00-022-2524	SC 4910-95-A72-HR
58	Rivet Gun	352	5130-00-982-8078	
59	Scriber, Machinist's, 8 To 9 In Long	68A	5120-00-221-7063	
60	Socket Set, Deepwell, 1/2 In.	GGG-W-641	5120-00-596-8622	SC 4910-95-A72-HR
61	Socket Set, 3/4 In.	GGG-W-641	5120-00-204-1999	SC 4910-95-A72-HR
62	Socket Set, 3/8 In.	221FSMY	5120-01-117-3876	SC 4910-95-A72-HR

Section II. COMMON TOOLS, TEST EQUIPMENT AND TOOL KITS (CONT)

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63	Socket, Wheel Bearing Adj. Nut 3 1/4 In. 6 Pt.	1908	5120-01-144-5331	SC 4910-95-A74
64	Soldering Kit, Torch	LP-999G	3439-00-542-0531	SC 4910-94-A74
65	Strainer Tool	FC 88A	5120-01-328-2504	
66	Tape, Measurer	GGG-T-106	5120-01-554-7085	SC 4910-95-A72-HR
67	Terminal Crimper	J35688	5120-01-355-0845	
68	Terminal Remover	J33095	5120-01-353-2534	
69	Terminal Remover	J35689-A	5120-01-357-2937	
70	Terminal Remover, Weatherpac	J36400-5	5120-01-374-8969	
71	Tester, Pressure, Radiator	J24460-01	4910-01-170-4928	
72	Tool Kit, Blind Rivet	D-100-MIL-1	5180-01-201-4978	SC 4910-95-A74
73	Tool Kit, Electric	7550526	5180-00-876-9336	SC 4910-95-A72-HR
74	Tool Kit, General Mechanic's: Automotive	SC-5180-90-N26	5180-00-177-7033	SC 5180-90-N26
75	Vise, Machinist's	504M2	5120-00-293-1439	SC 4910-95-A74
76	Weatherpac Crimper	J38852	5120-01-374-8936	
77	Wrench, Box 1/2 In.	J4242	5120-00-591-2685	
78	Wrench, Combination 1 1/16 In.	1234	5120-00-228-9515	SC 4910-95-A74
79	Wrench, Combination 1 1/8 In.	1172	5120-00-228-9516	SC 4910-95-A74
80	Wrench, Combination 1 1/4 In.	1173	5120-00-228-9517	SC 4910-95-A74
81	Wrench, Combination 1 5/16 In.	1174	5120-00-228-9518	SC 4910-95-A74
82	Wrench, Combination 1 3/8 In.	1176A	5120-00-228-9519	SC 4910-95-A74
83	Wrench, Combination 1 1/2 In.	1178	5120-00-277-8834	SC 4910-95-A74
84	Wrench, Combination 1 5/8 In.	1180	5120-01-016-7144	
85	Wrench, Combination 1 11/16 In.	A-A-1351	5120-00-184-8566	
86	Wrench, Combination 1 3/4 In.	1256	5120-00-020-8658	
87	Wrench, Combination 1 7/8 In.	1260	5120-00-020-8632	
88	Wrench, Combination 2 In.	1190	5120-00-957-3115	
89	Wrench, Combination 2 1/8 In.	1268	5120-00-203-4795	
90	Wrench, Crowfoot 1/2 In., 3/8 In Drive	FRH-1605	5120-01-114-4933	SC 4910-95-A74
91	Wrench, Pipe 3 1/2 In. Opening	GGG-W-651	5120-00-277-1485	
92	Wrench, Set, Combination	GGG-W-00645	5120-00-895-9566	SC 4910-95-CL-A74
93	Wrench Set, Socket 3/8 In. Drive	51200017510	5120-00-322-6231	SC 4910-95-A31
94	Wrench, Spanner	J41108	5120-01-375-4502	
95	Wrench, Torque (0 To 175 Lb-Ft [0-237 N·M])	1753LDF	5120-00-640-6364	SC 4910-95-A74
96	Wrench, Torque (0 To 300 Lb-Ft [0-407 N·M])	6134A	5120-00-555-1523	SC 4910-95-A72-HR
97	Wrench, Torque (0 To 600 Lb-Ft [0-814 N·M])	SW130-301	5120-00-221-7983	SC 4910-95-A31

Section II. COMMON TOOLS, TEST EQUIPMENT AND TOOL KITS (CONT)

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98	Wrench, Torque, 3/8 In. Drive (0 To 60 N·M)	TESI60	5120-01-112-9531	SC 4910-95-A72-HR
99	Zonal Separator, Oil And Water Spray Gun (Variable Air Supply)	MIL-S-12928CLASS1	4940-00-242-4100	SC 4910-95-A73

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SCHEMATICS

The following sections contain the schematics which are the same in all volumes of TM 9-2320-364-20 and TM 9-2320-364-34.

Section I contains the schematics for trucks equipped with the 145 amp alternator and the DDEC II engine.

Section II contains the schematics for trucks equipped with the 200 amp alternator and the DDEC III/IV engine.

SCHEMATICS

Section I. 145 AMP ALTERNATOR AND DDEC II ENGINE.

Section I contains the schematics for trucks equipped with the 145 amp alternator and the DDEC II engine.

MULTIPLE CONNECTORS			
NUMBER	ZONE	SH	DESCRIPTION
MC1	H3	3	CAB/ELECTRICAL BOX
MC1	C26	4	CAB/ELECTRICAL BOX
MC2	D3	3	CAB/ELECTRICAL BOX
MC2	D26	4	CAB/ELECTRICAL BOX
MC3	C3	3	CHASSIS
MC3	H17	6	CHASSIS
MC4	G10	3	SWITCHES
MC5	B12	3	WIPER MOTOR
MC6	D15	3	THROTTLE SENSOR
MC7	H8	3	TURN SIGNAL
MC8	F19	3	GAUGES
MC9	G4	4	ECU ATEC
MC10	G4	4	ECU ATEC
MC11	D3	4	DOEC
MC11	D26	5	DOEC
MC12	H26	4	SHIFT CONT ATEC
MC13	F6	3	DIGN CONN DOEC
MC15	B4	6	MILITARY CONNECTOR
MC16	D4	6	TRAILER
MC17	G11	5	DOEC
MC18	E11	5	DOEC
MC19	E13	5	TRANSMISSION
MC20	E12	5	TRANSMISSION
MC21	E2	3	ENGINE SENSOR
MC21	H26	5	ENGINE SENSOR
MC22	G21	5	REGULATOR
MC23	B23	5	ETHER START
MC24	G19	5	ALTERNATOR
MC25	C17	6	TRAILER 24VDC
MC27	F18	6	FRONT TOW
MC28	E6	3	BEACON LIGHT
MC29	F8	6	CRANE
MC30	C5	6	TRAILER
MC31	B21	3	CAB/CHASSIS
MC32	B23	3	CTI CHASSIS
MC33	F17	7	LHS CAB
MC34	C19	3	24V METERS
MC35	D24	3	CTI
MC36	A5	4	THROTTLE SENSOR
MC38	C15	3	VERNIER CONTROL
MC39	H7	5	STE/ICE
MC40	G5	5	STE/ICE MODULE
MC41	G2	5	PULSE TACH DRIVE
MC42	H4	5	DIFFERENTIAL PRESS
MC43	F2	5	FUEL PRESSURE
MC44	C5	3	CAB/TRANSMISSION
MC44	F26	4	CAB/TRANSMISSION
MC45	D5	4	ECU ATEC

MULTIPLE CONNECTORS			
NUMBER	ZONE	SH	DESCRIPTION
MC50	C7	4	RELAYS/ATEC
MC51	C6	4	ECU ATEC
MC52	B23	4	HEATER/DIMMER
MC53	F23	3	ENGINE BRAKE
MC54	F8	6	WORK LIGHT
MC55	B13	6	SELF RECOVERY WINCH
MC56	C23	5	ETHER THERMOSTAT
MC57	F6	6	DRIVE LINE LOCK
MC58	E7	3	GAS PART FILTER
MC59	G13	6	FAN CONTROL
MC60	G24	5	REVERSE PLRT PROTR
MC61	G10	6	FAN CONTL WTR TEMP
MC62	F13	5	DOEC ENGINE POWER
MC63	G11	6	FAN CONTROL
MC64	D15	6	AUXILIARY CTI MANF
MC65	E5	5	STE/ICE ENGINE
MC66	G2	5	TURBO OUTLET PSI
MC67	E2	5	AIR CLEANER
MC68	D2	5	AIR BOX PSI
MC69	D2	5	FUEL RETURN
MC70	C2	5	ENGINE OIL TEMP
MC71	B2	5	ENGINE WATER TEMP
MC73	F13	6	FAN CONTROL
MC76	F11	6	FAN CONTROL VALVE
MC77	E3	6	BACK UP LIGHT
MC78	F4	6	REAR LIGHT GROUP
MC79	G7	6	WORK LIGHT
MC80	G4	6	REAR LIGHT GROUP
MC81	E13	7	LHS
MC82	E12	7	LHS
MC83	E14	7	LHS
MC84	E15	7	LHS
MC85	E9	7	LHS
MC86	E7	7	LHS
MC87	D5	7	LHS
MC88	E6	7	LHS
MC90	C3	6	REAR LIGHT GP HARN
MC91	G8	3	STRN COL.-CAB HARN
MC92	F8	3	STRG COL.-CAB HARN
MC93	C17	7	LHS
MC94	B17	7	LHS
MC95	B15	5	DOEC BATTERY POWER
MC96	C2	3	LOW HYD OIL
MC97	B10	6	AIR DRYER
MC98	B9	6	AIR DRYER
MC99	B8	6	AFTER COOLER
MC102	A3	4	DOEC 6.8K RESISTOR
MC103	E5	3	CHEM DETECTOR
MC104	E5	3	CHEM ALARM

MULTIPLE CONNECTORS			
NUMBER	ZONE	SH	DESCRIPTION
MC105	E24	3	CTI ACCESS OUTPUT
MC106	H4	3	DOEC DIAGNOSTIC
MC107	D6	6	FUEL WATER SEP
MC108	C20	5	FUEL PUMP
MC109	C15	6	CTI POWER MANIFOLD
MC110	C24	3	CTI AUX MANF CAB
MC111	B24	3	CTI POWER MANF CAB
MC112	B19	3	LHS LIGHTS
MC113	F16	6	EMERGENCY STEER SW
MC114	G18	5	200 AMP OPTION
MC115	H16	5	200 AMP OPTION
MC116	B12	4	EMER ENG SHUT DOWN
MC118	A9	5	STE/ICE
MC119	B22	4	ARCTIC PUMP
MC120	B7	6	ARCTIC PUMP
MC121	C12	6	SELF RECOVERY WINCH
MC122	D12	6	SELF RECOVERY WINCH
MC123	D12	6	SELF RECOVERY WINCH
MC124	E3	6	BACK-UP LIGHT/ALARM
MC125	G18	3	AIR RESTRICTION LT
MC126	E11	3	STOP LIGHTS
MC127	B15	3	THROTTLE POSN SW
MC128	G10	6	AUX WATER TEMP SW

LIGHTS			
NUMBER	ZONE	SH	DESCRIPTION
L1	G16	3	PARKING BRAKE IND
L2	G17	3	LOW AIR INDICATOR
L3	G17	3	CHECK GAUGES IND
L4	G17	3	RH TURN INDICATOR
L5	G24	3	TRANS CHECK IND
L6	G18	3	CHECK ENGINE IND
L7	G17	3	DRIVE LINE LOCK IND
L8	G24	3	HI WATER TEMP IND
L9	G24	3	LOW OIL PSI IND
L10	G25	3	HI BEAM INDICATOR
L11	G28	3	LH TURN INDICATOR
L12	F27	3	RH HEADLIGHT
L13	G27	3	RH SIDE TURN SIGNAL
L14	F27	3	RH COMPOSITE
L15	E27	3	BLACKOUT DRIVE
L16	D27	3	LH COMPOSITE
L17	C27	3	LH HEADLIGHT
L18	C27	3	LH SIDE TURN SIGNAL
L19	B27	3	ID & CLEARANCE
L20	H10	3	DOME
L21	G7	6	RH WORK LIGHT
L22	G2	6	RH REAR COMPOSITE
L23	G2	6	BACK UP
L24	F2	6	LH REAR COMPOSITE
L25	C2	6	ID/CLEARANCE REAR
L26	E22	3	LHS INDICATOR
L27	E22	3	AUXILIARY HYDR IND
L28	E23	3	TRANSIT INDICATOR
L29	E23	3	LHS OVERLOAD IND
L31	D2	6	RH REAR S MKR (RED)
L32	H4	6	RH SIDE MKR (AMBER)
L33	B2	6	LH SIDE MKR (AMBER)
L34	H4	6	LH REAR S MKR (RED)
L35	G16	3	EMERGENCY STEERING
L36	G16	3	LOW HYD OIL
L37	D21	3	ENGINE BRAKE
L38	D21	3	FLAT RACK
L39	F7	6	LH WORK LIGHT
L40	F7	3	T.C. LOCKUP
L41	C2	6	L.H. B.O. CL LIGHT
L42	D2	6	R.H. B.O. CL LIGHT
L43	B5	3	POST LIGHT
L44	F5	3	HEATER PANEL LIGHT

SWITCHES			
NUMBER	ZONE	SH	DESCRIPTION
S1	H6	3	TURN SIGNAL/DIMMER
S2	E13	3	IGNITION
S3	F5	3	HEATER
S4	D8	3	SELF RECOVERY CRANE
S5	H12	3	BEACON LIGHT
S6	H13	3	WORK LIGHT
S7	H14	3	WINDSHIELD WASHER
S8	G15	3	WINDSHIELD WIPER
S9	F16	3	BLACK OUT SVCE SEL
S10	F54	3	BLACK OUT MARKER
S11	F14	3	BLACK OUT DRIVE
S12	F14	3	HEADLIGHTS
S13	F5	6	DRIVE LINE LOCK
S14	F12	3	RHEOSTAT
S15	F7	3	HORN
S16	F13	3	ENGINE BRAKE
S18	D7	3	SELF RECOVERY WINCH
S19	D6	3	GAS PARTICULATE FLTR
S20	D5	3	CHEMICAL ALARM
S21	H15	3	DOME LIGHT
S22	C8	5	STE/ICE ZEROING
S23	C22	7	PROX SW HOOK ARM UP
S24	C23	7	PROX SW MDL FR DOWN
S25	D13	3	ETHER START
S26	F7	3	TC LOCKUP
S27	E5	7	HOOK ARM DOWN
S28	G8	7	OVERLOAD PSI
S29	B19	4	ARCTIC PUMP
S30	E9	3	EMER ENG SHUT DOWN
S31	C16	3	THROTTLE POSITION
PRESSURE SWITCHES			
NUMBER	ZONE	SH	DESCRIPTION
PS1	G9	3	FRONT BRAKE
PS2	F9	3	REAR BRAKE
PS3	F9	3	HAND BRAKE
PS4	C14	3	PARKING BRAKE
PS5	B15	3	PARKING BRAKE SW
PS6	D17	3	LOW AIR PRESSURE
PS7	D17	3	LOW AIR PRESSURE
PS8	C22	5	ATEC OIL PRESSURE
PS9	D22	5	ENGINE OIL
PS10			GOVERNOR PRESSURE
PS11			GOVERNOR PRESSURE
PS13	F15	6	EMERGENCY STEER
PS15	F26	5	BOOST PRESSURE

TEMPERATURE SWITCHES			
NUMBER	ZONE	SH	DESCRIPTION
TS1	C23	5	ETHER START
TS2	D23	5	ENGINE WATER
TS3	F10	6	ENGINE WATER
TS4	G10	6	ENGINE WATER
RELAYS			
NUMBER	ZONE	SH	DESCRIPTION
R1	G24	4	HEADLIGHTS
R2	G23	4	ID/CLEARANCE LIGHTS
R3	G22	4	HORN
R4	G21	4	WORK LIGHTS
R5	G20	4	DIMMER
R6	G19	4	BEACON LIGHTS
R7	G18	4	TRANSMISSION
R8	G18	4	RATARDER
R9	G18	4	CK TRANSMISSION
R10	G17	4	REVERSE
R11	G16	4	NEUTRAL START
R12	G15	4	12 V MAG SWITCH
R13	G15	4	B.O. STOP
R14	G14	4	BO SERVICE TAIL LTS
R15	G13	4	LH TURN SIGNAL
R16	G12	4	RH TURN SIGNAL
R17	G12	4	BLACK OUT TAIL LTS
R18	G11	4	DOEC
R19	G10	4	TRANS DOEC
R20	G9	4	INTER AXLE
R21	G9	4	DIFFERENTIAL LOCK
R22	G8	4	CRANE HI IDLE
R23	G7	4	HIGH RANGE LOCKOUT
R24	G6	4	T.C. DUAL MODE
R25	B17	4	MAGNETIC SWITCH
R26	B18	4	MAGNETIC SWITCH
R27	D19	5	MAGNETIC SWITCH
R28	C21	4	MAGNETIC SWITCH
R29	C10	7	MIDDLE FR LOCKOUT
R32	B21	4	ARCTIC PUMP
R33	B20	4	ARCTIC PUMP
SENDING UNIT			
NUMBER	ZONE	SH	DESCRIPTION
SU1	E21	5	WATER TEMPERATURE
SU2	D21	5	TRANSMISSION TEMP
SU3	D21	5	ENGINE OIL PRESSURE
SU4	F6	6	SPEEDOMTER
SU5	D6	6	FUEL LEVEL

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 1 OF 35
ENGINEERING DWG 1878290 SHEET 1
FP-1/FP-2 BLANK

REVISION W
CN 24230
4-15-93

CIRCUIT BREAKERS			
NUMBER	ZONE	SH	DESCRIPTION
CB1	D22	4	15 AMP
CB2	D22	4	15 AMP
CB3	D21	4	15 AMP
CB4	D21	4	15 AMP
CB5	D20	4	20 AMP
CB6	D20	4	15 AMP
CB7	D19	4	10 AMP
CB8	D19	4	15 AMP
CB9	D18	4	10 AMP
CB10	D17	4	3 AMP
CB11	D16	4	8 AMP
CB12	D16	4	8 AMP
CB13	D15	4	8 AMP
CB14	D14	4	15 AMP
CB15	D13	4	15 AMP
CB16	D12	4	15 AMP
CB17	D12	4	3 AMP
CB18	D11	4	10 AMP
CB19	D10	4	15 AMP
CB20	D9	4	15 AMP
CB21	D9	4	30 AMP
CB22	D7	4	20 AMP
CB23	D7	4	20 AMP
CB24	C20	5	3 AMP

GAUGES			
NUMBER	ZONE	SH	DESCRIPTION
G1	G20	3	WATER TEMPERATURE
G2	G21	3	OIL PRESSURE
G3	G22	3	FUEL LEVEL
G4	G22	3	TACHOMETER
G5	G23	3	SPEEDOMTER
G6	G19	3	VOLTMETER 12V
G7	G19	3	VOLTMETER 24V
G10	G20	3	XMSN OIL TEMP
G11	G18	3	AIR PRESSURE
G12	H18	3	AIR RESTRICTION

MISCELLANEOUS			
NUMBER	ZONE	SH	DESCRIPTION
M1	B6	3	WINDSHIELD WSHR SOL
M2	B13	3	WIPER MOTOR
M3	E17	3	LOW OIL & AIR ALARM
M4	A5	4	THROTTLE POSN CONT
M5	C20	4	FLASHER
M6	C16	5	BATTERIES
M7	E17	5	STARTER
M8	B22	5	ETHER START
M9	D6	6	FUEL/WATER SEP
M10	C10	6	LHS SOLENOID VALVE
M11	C8	6	AFTERCOOLER
M12	C20	5	FUEL PUMP
M13	B10	6	AIR DRYER
M14	E6	3	CHEMICAL DETECTOR
M14	B9	6	AIR DRYER
M15	D1	3	HORN
M16	D16	3	VERNIER CONTROL
M17	F5	3	HEATER MOTOR
M18	F24	3	LOW OIL PRESS ALARM
M19	F21	5	REGULATOR/DVS
M20	G22	5	ALTERNATOR STD
M21	C25	5	RH SIDE ENG BK COIL
M22	C24	5	LH SIDE ENG BK COIL
M23	D18	5	SLAVE CONNECTER
M24	B15	6	CTI POWER MANIFOLD
M25	D15	6	CTI AUXILIARY MANF
M26	E13	7	LHS CAB CONTROLLER
M27	B13	6	SELF RECOVERY WINCH
M28	E25	3	CTI CONTROLLER
M29	G14	7	CHEMICAL ALARM
M30	D11	3	GAS PART FILTER
M31	D11	3	AIR HEATER DRIVER
M32	D12	3	AIR HEATER PASS
M33	D3	7	SRW SOLENOID VALVE
M35	E15	3	THROTTLE POSITIONER
M36	C9	4	DIODE
M39	F9	4	RECTIFIER
M40	G2	5	PULSE TACH DRIVE
M41	H5	5	DIFFERENTIAL PRESS
M42	F2	5	FUEL PRESSURE
M43	G5	5	STE/ICE MODULE
M45	F10	6	FAN CONTROL VALVE
M48	D16	5	SHUNT
M49	B9	3	XFR CASE LKUP SOL
M50	B8	3	INTER AXLE SOL V
M51	B8	3	DIFF SOLENOID VALVE
M51	C11	6	FAN
M52	A21	4	RECTIFIER
M53	G11	7	LHS HOOK ARM B
M54	G10	7	LHS HOOK ARM A
M55	G10	7	LHS MAIN CYLINDER B
M56	G10	7	LHS MAIN CYLINDER A

MISCELLANEOUS			
NUMBER	ZONE	SH	DESCRIPTION
M57	G9	7	LHS FREEFLOW
M58	G9	7	LHS TRANSIT
M59	F3	7	LHS LH HOOK ARM A
M60	F3	7	LHS LH HOOK ARM B
M61	F2	7	LHS RH HOOK ARM A
M62	F2	7	LHS RH HOOK ARM B
M64	H21	5	DUVAC CONTROLLER
M65	G17	5	ALTNTR 200 AMP OPT.
M66	G16	3	RECTIFIER
M67	C8	3	RECTIFIER
M68	G12	7	RECTIFIER
M70	F2	5	TURBO OUTLET PSI
M71	E2	5	AIR CLEANER
M72	D2	5	AIR BOX PSI
M73	C2	5	FUEL RETURN
M74	C2	5	ENGINE OIL TEMP
M75	B2	5	ENGINE WATER TEMP
M76	E10	4	RECTIFIER
M77	B17	5	ARCTIC BATTERIES
M78	E2	6	BACK-UP ALARM
M80	B7	6	ARCTIC PUMP
M81	F4	3	RECTIFIER
M82	E13	3	ISOLATOR

CODE SORT			
CODE	ROUTING	SH	DESCRIPTION
104	MC36-M4	4	THROTTLE SENSOR
104	MC10-MC36	4	THROTTLE SENSOR
105	MC10-MC19	4/5	ATEC
106A	MC10-MC36	4	THROTTLE SENSOR
106A	MC36-M4	4	THROTTLE SENSOR
106A	MC10-106B	4/5	ATEC
106B	106A-MC19	4/5	ATEC
107	MC10-MC19	4/5	ATEC
108	MC10-MC19	4/5	ATEC
109	MC10-MC19	4/5	ATEC
110	MC10-MC19	4/5	ATEC
111	MC10-MC19	4/5	ATEC
112	MC10-MC20	4/5	ATEC
113	MC10-MC20	4/5	ATEC
114	MC10-MC19	4/5	ATEC
115	MC11-MC18	5	ECM
115	MC11-MC102	4	6.8K RESISTOR
115	MC10-MC19	4/5	ATEC
116	MC10-MC19	4/5	ATEC
117	MC10-MC19	4/5	ATEC
118	MC10-MC19	4/5	ATEC
119	MC10-MC19	4/5	ATEC
120	MC10-MC19	4/5	ATEC
121	MC10-MC19	4/5	ATEC
122	MC10-MC19	4/5	ATEC
123	MC10-MC19	4/5	ATEC
124	MC36-M4	4	THROTTLE SENSOR
124	MC10-MC36	4	THROTTLE SENSOR
150	MC62-MC62	5/4	
150	MC17-MC62	5	
195	MC5-M2	3	
201	MC51-GROUND	4	
201	MC9-MC51	4	
202A	MC9-SPLICE	4	
203	MC9-MC51	4	
203	MC51-CB12	4	
204	MC9-MC12	4	ATEC
206	MC9-MC12	4	ATEC
207A	MC51-MC106	4	ATEC
207A	MC9-MC51	4	ATEC
207A	MC106-MC13	4	
208/209	MC11-SPLICE	4	
208/209	SPLICE-MC51	4	
208/209	M6-MC95	5	
208/209	MC95-MC11	5	
208/209	MC51-MC9	4	
210A	MC9-MC12	4	
211	R8-MC50	4	
211	MC50-R8	4	RETARDER
211	MC9-MC50	4	

CODE SORT			
CODE	ROUTING	SH	DESCRIPTION
212	MC9-MC12	4	
213	MC50-R8	4	RETARDER
213	MC9-MC50	4	
214	MC50-R10	4	REVERSE
214	MC9-MC50	4	
215	MC9-MC50	4	
215	MC50-R9	4	CHECK TRANSMISSION
216A	MC106-MC13	3	
216A	MC9-MC51	4	ATEC
216A	MC51-MC106	4	ATEC
218	MC9-MC12	4	ATEC
219	MC9-MC12	4	ATEC
220	MC9-MC12	4	ATEC
221	MC9-MC12	4	ATEC
222	MC9-GROUND	4	ATEC
223A	MC51-CB14	4	TRANSMISSION
223A	MC51-SPLICE	4	
223A	SPLC-SPLC	4	
223A	SPLC-SPLC	4	
223A	SPLC-SPLC	4	
223A	SPLICE-MC9	4	
223B	MC12-SPLICE	4	
225	CB11-MC12	4	
230	MC12-234	4	
231	MC50-MC12	4	
231	MC50-R22	4	CRANE HI IDLE
231	MC50-M36	4	
231	M36-R11	4	NEUTRAL START
233	MC50-MC12	4	
234	MC12-GROUND	4	
240	MC62-CB23	5/4	
240	CB23-M6	4/5	
240	MC17-MC62	5	
240	MC62-M6	5	
241	MC62-CB22	5/4	
241	MC62-M6	5	
241	MC17-MC62	5	
241	CB22-M6	4/5	
309	MC45-R24	4	TC DUAL MODE
313	MC45-R24	4	TC DUAL MODE
315	MC45-R24	4	TC DUAL MODE
417	MC6-M35	3	
417	MC11-MC44	4	
417	MC11-MC18	5	ECM
417	MC44-MC6	3	THROTTLE SENSOR
419	MC11-MC18	5	ECM
419	MC11-MC44	4	
419	MC44-MC8	3	
419	MC8-L6	3	CHECK ENGINE LIGHT

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 2 OF 35
ENGINEERING DWG 1878290 SHEET 1
FP-3/FP-4 BLANK

CODE SORT				CODE SORT				CODE SORT			
CODE	ROUTING	SH	DESCRIPTION	CODE	ROUTING	SH	DESCRIPTION	CODE	ROUTING	SH	DESCRIPTION
439	MC116-MC106	4	EMERGENCY ENG STOP	1001	S1-MC7	3	RH HEADLIGHT	1008	MC27-MC3	6	FRONT TOW
439	MC116-S30	3	EMERGENCY ENG STOP	1002	S1-MC7	3	LH HEADLIGHT	1008	MC3-SPLICE	3	
439	MC116-S30	3	EMERGENCY ENG STOP	1002	MC8-L11	3		1008	MC3-MC4	3	
439	MC116-CB13	4	DDEC	1002	MC7-SPLICE	3		1008	MC3-MC16	6	TRAILER CONN 12VDC
439	MC106-MC13	3		1002	SPLICE-MC8	3		1008	MC78-L22	6	RH TAIL LIGHT
439	SPLC-MC106	4		1002	SPLICE-L18	3		1008	MC78-L24	6	LH TAIL LIGHT
439	MC11-MC18	5	ECM	1002	SPLICE-L16	3		1008C	MC25-MC15	6	TRAILER CONN 24VDC
439	MC8-L6	3	CHECK ENGINE LIGHT	1003	MC7-MC3	3		1008C	MC25-R14	4	B.O. SERVICE
439	MC8-L3	3	ENGINE STOP LIGHT	1003	S1-MC7	3	LH RR TURN SIGNAL	1009	PS2-PS3	3	
439	MC44-MC8	3		1003	MC3-MC80	6		1009	PS1-PS2	3	
439	MC11-SPLICE	4		1003	MC3-MC16	6	TRAILER CONN 12VDC	1009	MC2-PS1	3	
439	SPLICE-MC44	4		1003	MC1-R15	4	LH TURN LIGHT	1009	MC2-CB6	4	STOP LIGHT
439	SPLC-MC116	4		1003	MC80-L24	6	LH STOP LIGHT	1012	MC3-SPLICE	3	
451	MC11-MC18	5	ECM	1003	MC27-MC3	6	FRONT TOW	1012	SPLC-SPLC	3	
451	MC106-MC13	3		1003	MC7-MC1	3		1012	MC2-SPLICE	3	
451	MC11-MC106	4		1003C	MC25-R17	4	LH TURN LIGHT	1012	SPLC-SPLC	3	
505	MC106-MC13	3		1003C	MC25-MC15	6	TRAILER CONN 12VDC	1012	SPLICE-L19	3	
505	MC11-MC106	4		1004	MC7-MC1	3		1012	MC2-R2	4	CLEARANCE LIGHTS
505	MC11-MC18	5	ECM	1004	MC7-MC3	3		1012	MC3-SPLICE	6	
508	MC11-R7	4	TRANSMISSION	1004	S1-MC7	3		1012	SPLICE-MC27	6	
508	MC11-MC18	5	ECM	1004	MC3-MC80	6		1012	SPLICE-MC80	6	
509	MC11-MC18	5	ECM	1004	MC80-L22	6	RH STOP LIGHT	1012	SPLICE-L32	6	RH SIDE MARKER
509	MC8-L3	3	ENGINE STOP LIGHT	1004	MC27-MC3	6		1012	SPLICE-L34	6	LH SIDE MARKER
509	MC44-MC8	3		1004	MC3-MC78	6		1012	MC90-L31	6	RR SIDE MARKER
509	MC11-MC44	4		1004	MC3-MC16	6		1012	MC90-L25	6	ID LIGHTS
510	MC11-MC18	5	ECM	1004	MC1-R16	4		1012	MC80-MC90	6	
510	MC44-PS4	3	PARKING BRAKE	1004C	MC25-R16	4	RH TURN LIGHT	1012	MC90-L33	6	RR SIDE MARKER
510	R22-MC44	4		1004C	MC25-MC15	6	TRAILER CONN 24VDC	1016	MC92-MC2	3	
510	MC11-R22	4		1005	MC126-S9	3		1016	S15-MC92	3	
900	MC11-MC106	4		1005	PS3-MC3	3		1016	MC2-R3	4	HORN
900	MC11-MC18	5	ECM	1005	MC3-MC16	6	TRAILER CONN 24VDC	1017	SPLICE-R5	4	
900	MC106-MC13	3		1005	MC126-PS1	3		1017	MC52-R14	4	
901	MC11-MC18	5	ECM	1005	PS2-PS3	3		1017	R2-MC52	4	
901	MC106-MC13	3		1005	MC27-MC3	6	FRONT TOW	1017	MC2-SPLICE	4	
901	MC11-MC106	4		1005	PS1-PS2	3		1017	SPLICE-R1	4	
908	MC11-MC18	5	ECM	1005A	MC7-MC126	3		1017	MC91-MC2	3	
908	MC11-M4	4	THROTTLE POSN CONT	1005A	MC126-S9	3		1017	S1-MC91	3	
916	MC44-MC6	3		1005A	S1-MC7	3	TURN SIGNAL/DIM SW	1017A	MC91-MC2	3	
916	MC11-MC44	4		1006	MC2-SPLICE	3		1017A	S1-MC91	3	
916	MC38-M16	3		1006	SPLICE-L12	3		1017A	MC2-R5	4	
916	MC6-MC38	3	VERNIER CONTROL	1006	SPLICE-L17	3		1018	MC8-L10	3	HIGH BEAM
916	MC6-M35	3	THROTTLE SENSOR	1006	MC2-R5	4	DIMMER	1018	MC8-1007	3	
916	MC11-MC18	5	ECM	1007	MC2-R5	4	DIMMER	1019	L15-1679	3	
952	MC38-M16	3		1007	MC2-SPLICE	3		1020	L14-L16	3	
952	MC11-MC44	4		1007	SPLICE-L12	3		1020	DUVAC IGN	5	FUEL PUMP
952	MC44-MC6	3	THROTTLE SENSOR	1007	SPLICE-L17	3		1020	S2-MC21	3	
952	MC11-MC18	5	ECM	1008	MC3-MC78	6		1020	R27-MC48	5	
952	MC6-MC38	3	VERNIER CONTROL	1008	MC4-S12	3	HEADLIGHTS	1020	MC60-IGN	5	DUVAC CONTROLLER
1001	MC8-L4	3						1020	MC21-MC60	5	
1001	MC7-SPLICE	3						1020	MC108-M81	5	
1001	MC8-SPLICE	3						1020	M81-MC60	5	
1001	SPLICE-L13	3						1021	MC2-S2	3	
1001	SPLICE-L14	3						1021	MC2-R11	4	
								1021	R11-M76	4	

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 3 OF 35
ENGINEERING DWG 1878290 SHEET 1
FP-5/FP-6 BLANK

CODE SORT			
CODE	ROUTING	SH	DESCRIPTION
1021	MC52-R11	4	FRONT TOW
1021A	R11-MC1	4	
1021A	MC1-MC21	3	
1021A	MC21-MC60	5	
1021A	MC60-R27	5	
1026	MC52-CB16	4	
1029	MC2-R6	4	BEACON
1029	MC2-MC28	3	
1031	R3-SPLICE	4	
1032	MC8-MC21	3	
1032	M39-L9	3	LOW OIL PSI
1032	MC8-M39	3	
1032	PS9-MC21	5	ENGINE OIL PSI SW
1033	M39-M18	3	OIL PSI/H WTR ALM
1036	MC23-M8	5	
1036	MC23-M7	5	
1036	MC21-MC56	5	ETHER START
1036	MC21-S25	3	
1040	CB4-R4	4	WORKLIGHT
1040A	S6-MC4	3	
1040A	MC2-R4	4	WORKLIGHT
1040A	MC4-MC2	3	
1040B	MC3-MC79	6	RH WORKLIGHT
1040B	MC2-MC3	3	
1040B	MC2-R4	4	WORKLIGHT
1040B	MC3-MC54	6	LH WORKLIGHT
1045	R27-M7	5	
1049	MC2-R1	4	HEADLIGHTS
1049	MC4-MC2	3	
1049	S12-MC4	3	
1052	S20-S19	3	CHEM ALM-GPF
1052	S19-S18	3	GAS PART FLTR-SRW
1052	S18-S4	3	SRW-SRW/MHC
1052	S4-S30	3	SRW/MHC-EMER ENG S D
1052	S30-SPLICE	3	EMER ENG SHUT DOWN
1052	SPLICE-G11	3	AIR PRESSURE GAUGE
1052	MC4-SPLICE	3	
1052	SPLICE-L44	3	HEATER PANEL LIGHT
1052	S5-S6	3	BEACON LT-WORK LT
1052	S6-S7	3	WORK LT-WSHLD WSHR
1052	S7-S8	3	WSHLD WASHER-WIPERS
1052	S8-S21	3	WIPERS-DOME LIGHT
1052	S21-S9	3	DOME LT-B.O.SERV SEL
1052	S9-S10	3	BO SERV SEL-BO MKR
1052	S10-S11	3	B.O. MARKER-B.O. DR
1052	S11-S12	3	B.O. DRIVE-HEADLTS
1052	S12-S16	3	HEADLIGHTS-ENG BK
1052	S16-S14	3	ENG BRAKE-RHEO/DOME
1052	S14-SPLICE	3	RHEOSTAT/DOME
1052	SPLICE-G6	3	VOLTMETER 12V
1052	SPLC-SPLC	3	
1052	SPLICE-G10	3	XMSN OIL TEMP GAUGE
1052	SPLICE-G1	3	WATER TEMP GAUGE
1052	SPLICE-G2	3	OIL PRESSURE GAUGE
1052	SPLICE-G4	3	TACHOMETER
1052	SPLICE-G5	3	SPEEDOMETER
1052	SPLICE-G3	3	FUEL GAUGE

CODE SORT			
CODE	ROUTING	SH	DESCRIPTION
1052	MC1-SPLICE	3	
1052	SPLICE-L43	3	POST LIGHT
1052	SPLC-MC125	3	
1052	MC125-G12	3	AIR RESTRICTION GA
1052	MC1-SPLICE	3	
1052	MC1-CB1	4	15 AMP HEADLIGHT
1052	MC50-MC1	4	
1055	MC115-M7	5	
1055	M7-1277	5	
1055	M7-1281	5	
1056	MC111-MC32	3	
1056	MC32-MC109	6	CTI POWER MANIFOLD
1057	M20-M20	5	
1057	MC111-MC32	3	
1057	MC32-MC109	6	CTI POWER MANIFOLD
1058	MC32-MC109	6	CTI POWER MANIFOLD
1058	MC111-MC32	3	
1059	MC32-MC109	6	CTI POWER MANIFOLD
1059	MC111-MC32	3	
1061	MC22-MC109	6	CTI POWER MANIFOLD
1061	MC111-MC32	3	
1062	MC32-MC109	6	CTI POWER MANIFOLD
1062	MC111-MC32	3	
1063	MC32-MC109	6	CTI POWER MANIFOLD
1064	MC32-MC109	6	CTI POWER MANIFOLD
1064	MC111-MC32	3	
1065	MC32-MC109	6	CTI POWER MANIFOLD
1065	MC111-MC32	3	
1066	MC32-MC64	6	CTI AUX MANIFOLD
1066	MC110-MC32	3	
1067	MC32-MC64	6	CTI AUX MANIFOLD
1068	MC32-MC64	6	CTI AUX MANIFOLD
1068	MC110-MC32	3	
1070	MC32-MC64	6	CTI AUX MANIFOLD
1070	MC110-MC32	3	
1071	MC110-MC32	3	
1071	MC32-MC64	6	CTI AUX MANIFOLD
1072	R26-R25	3	
1072	MC110-MC32	3	
1072	MC32-MC64	6	CTI AUX MANIFOLD
1073	MC32-MC64	6	CTI AUX MANIFOLD
1073	MC110-MC32	3	
1074	MC110-MC32	3	
1074	R25-CB10	4	
1074	MC32-MC64	6	CTI AUX MANIFOLD
1075	M6-R25	4/3	
1075B	R25-R18	4	
1076	MC110-MC32	3	
1076	MC32-MC64	6	CTI AUX MANIFOLD
1079	CB5-M6	4	HAZARD LIGHTS
1080	MC7-MC2	3	

CODE SORT			
CODE	ROUTING	SH	DESCRIPTION
1080	MC2-M5	4	TURN SIGNAL/FLASHER
1082	MC2-MC52	4	
1082	MC2-M81	3	
1082	M81-S3	3	
1082	MC52-CB15	4	HEATER
1084	MC1-CB5	4	B.O. LIGHTS
1084	MC4-MC1	3	
1084	MC4-S9	3	
1091	L17-GROUND	3	
1092	L7-MC8	3	
1092	MC8-M51	3	
1093	MC31-MC57	6	
1093	MC1-MC31	3	
1093	MC1-CB16	4	
1093	MC57-S13	6	DRIVE LINE LOCK-UP
1094	S5-S14	3	
1095	R23-R24	4	
1095	MC44-R23	4	
1095	MC31-MC44	3	
1095	MC57-S13	6	DRIVE LINE LOCK-UP
1095	MC31-MC57	6	
1108	MC44-MC8	3	
1108	505-MC44	4	
1108	MC8-G4	3	TACHOMETER
1113	MC8-MC21	3	
1113	G2-MC8	3	OIL PSI GAUGE
1113	SU3-MC21	5	ENG OIL PSI SNDG UN
1114	M66-MC8	3	
1114	MC96-MC8	3	LOW OIL LEVEL LIGHT
1114	MC8-L36	3	
1114	L36-M66	3	
1118	MC4-1919	3	
1118	S8-MC4	3	
1120	M66-MC8	3	
1120	M66-M3	3	
1120	PS6-PS7	3	
1120	PS6-MC8	3	
1120	L2-M66	3	
1137	M6(1)-M6(2)	5	
1137	M6(3)-M6(4)	5	
1138	M48-M7	5	SHUNT
1138	M7-M23	5	SLAVE
1138	M6-M48	5	SHUNT
1138	M77-M7	5	ARCTIC BATTERIES
1139	M7-M23	5	SLAVE
1139	M6-M7	5	
1139	M77-M7	5	ARCTIC BATTERIES
1147	TS2-MC21	5	ENG WTR TEMP SNDG UN
1147	M39-L8	3	HIGH WATER TEMP
1147	MC8-MC21	3	
1147	MC8-M39	3	
1149	MC1-R10	4	REVERSE
1149	MC3-MC78	6	
1149	MC1-MC124	3	
1149	MC78-MC77	6	REVERSE LIGHT
1149	MC124-MC77	6	

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 4 OF 35
ENGINEERING DWG 1878290 SHEET 2
FP-7/FP-8 BLANK

REVISION V
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CODE SORT			
CODE	ROUTING	SH	DESCRIPTION
1678	MC78-L22	6	RH B.O. STOP LIGHT
1678	SPLICE-MC3	3	
1678	MC1-R13	4	
1678	SPLICE-MC4	3	
1678	MC4-S9	3	
1678C	MC25-R13	4	B.O. STOP LIGHT
1678C	MC25-MC15	6	TRAILER CONN 24VDC
1679	L15-MC4	3	
1679	MC4-S11	3	
1680	MC3-SPLICE	3	
1680	SPLICE-MC1	3	
1680	SPLC-SPLC	3	
1680	SPLICE-MC4	3	
1680	SPLC-SPLC	3	
1680	SPLC-SPLC	3	
1680	SPLICE-L19	3	
1680	SPLICE-L19	3	
1680	MC3-MC78	6	
1680	MC4-S10	3	
1680	MC78-L24	6	LH B.O. TAIL LIGHT
1680	MC1-R17	4	B.O. LIGHTS
1680	MC78-L22	6	RH B.O. TAIL LIGHT
1680C	MC25-MC15	6	TRAILER CONN 24VDC
1680C	MC25-MC15	6	TRAILER CONN 24VDC
1680C	MC25-R17	4	B.O. TAIL LIGHTS
1680C	MC25-MC15	6	TRAILER CONN 24VDC
1702	MC44-MC34	3	
1702	MC34-G7	3	
1702	MC44-R26	4	
1708	M32-1709	3	PASSENGER AIR HTR
1709	MC58-S19	3	GAS PART FILTER SW
1709	MC58-M30	3	
1710	M31-1709	3	DRIVER AIR HEATER
1711	CB11-R7	4	
1712	MC1-CB7	4	ENGINE BRAKE
1712	MC4-MC1	3	
1713	MC53-L37	3	
1713	MC4-MC1	3	
1713	S16-MC4	3	ENGINE BRAKE
1713	MC1-R7	4	TRANSMISSION
1713	S16-MC53	3	
1714	MC1-1716	4	
1714	MC4-MC1	3	ENGINE BRAKE
1714	S16-MC4	3	ENGINE BRAKE
1715	MC4-MC1	3	ENGINE BRAKE
1715	S16-MC4	3	ENGINE BK RH COILS
1715	MC11-MC1	4	
1715	MC11-M21	5	LH ENGINE BRAKE
1716	MC11-R5	4	RETARDER
1716	MC11-M22	5	RH ENGINE BRAKE
1717	MC44-S20	3	CHEMICAL ALARM SW
1717	MC44-CB19	4	
1718	M76-M77	6	BACK-UP ALARM
1722	MC34-1734	3	

CODE SORT			
CODE	ROUTING	SH	DESCRIPTION
1722	L26-MC34	3	
1722	MC33-MC84	7	
1722	MC84-MC83	7	
1723	MC44-S18	3	SELF RECOVERY WN SW
1723	MC44-CB18	4	
1724	MC112-SPLC	3	
1724	SPLICE-MC33	3	
1724	MC33-MC93	7	
1724	L27-MC112	3	
1724	M67-SPLICE	3	
1724	SPLC-MC112	3	
1724	M67-MC33	3	
1725	L28-MC112	3	
1725	MC84-MC83	7	
1725	MC33-MC84	7	
1725	MC112-MC33	3	
1726	MC33-MC84	7	
1726	MC84-MC83	7	
1726	MC112-MC33	3	
1726	L29-MC112	3	
1729	MC31-S18	3	SELF RECOVERY WINCH
1729	MC31-MC55	6	
1729	MC55-MC121	6	SELF RECOVERY WINCH
1730	MC31-S18	3	SELF RECOVERY WINCH
1730	MC55-MC122	6	SELF RECOVERY WINCH
1730	MC31-MC55	6	
1731	MC3-S4	3	SELF RECOVERY WINCH
1731	MC3-S4	3	SELF RECOVERY WINCH
1731	MC3-MC29	6	CRANE
1732	MC55-MC123	6	SELF RECOVERY WINCH
1732	S4-MC31	3	SELF RECOVERY WINCH
1732	MC31-MC55	6	
1733	MC31-M67	3	
1733	MC31-M51	6	
1734	M67-SPLICE	3	
1734	SPLC-SPLC	3	
1734	SPLICE-MC31	3	
1734	MC31-M10	6	
1736	MC39-MC39	5	
1737	MC31-MC1	3	
1737	MC1-R22	4	CRANE HI IDLE
1737	MC31-MC29	6	CRANE
1738	MC44-1755	4	
1738	MC44-MC31	3	
1738	MC31-MC29	6	CRANE
1739	MC44-CB21	4	

CODE SORT			
CODE	ROUTING	SH	DESCRIPTION
1739	MC44-S19	3	GAS PARTICULATE SW
1744	S4-M67	3	
1745	MC103-S20	3	CHEMICAL ALARM
1746	MC103-M29	3	CHEMICAL ALARM
1747	MC103-M29	3	CHEMICAL ALARM
1755	MC84-MC83	7	
1755	MC44-CB18	4	
1755	MC33-MC84	7	
1755	MC33-MC44	3	
1765	MC3-MC113	6	
1765	L35-MC8	3	
1765	MC3-MC8	3	
1809	MC41-MC65	5	PULSE TACH DRIVE
1809	MC65-MC39	5	STE/ICE
1809	MC41-M40	5	PULSE TACH DRIVE
1810	MC65-MC39	5	STE/ICE
1810	MC41-M40	5	PULSE TACH DRIVE
1810	MC41-MC65	5	PULSE TACH DRIVE
1811	MC42-M41	5	DIFFERENTIAL PSI
1811	MC42-MC39	5	STE/ICE
1812	MC42-M41	5	DIFFERENTIAL PSI
1812	MC42-MC39	5	STE/ICE
1813	MC39-M6	5	
1814	MC39-M6	5	BATTERIES
1815	MC39-MC24	5	
1815	MC24-MC114	5	
1815	MC24-M20	5	
1816	MC39-MC65	5	STE/ICE
1816	MC39-M7	5	STARTER

CODE SORT			
CODE	ROUTING	SH	DESCRIPTION
1818	MC39-M7	5	STARTER
1818	MC39-MC65	5	STE/ICE
1819	MC39-M7	5	
1820	MC24-M20	5	
1820	MC24-M20	5	
1820	MC39-MC24	5	
1821	MC39-M6	5	
1822	MC39-M6	5	BATTERIES
1824	SPLICE-MC67	5	
1824	MC66-M70	5	
1824	MC68-M72	5	
1824	SPLICE-MC70	5	
1824	SPLICE-MC71	5	
1824	MC65-MC39	5	STE/ICE
1824	SPLICE-MC68	5	
1824	MC67-M71	5	
1824	MC43-M42	5	FUEL PSI
1824	MC69-M73	5	
1824	MC70-M74	5	
1824	MC71-M75	5	
1824	SPLICE-MC69	5	
1824	MC66-SPLICE	5	
1824	SPLICE-MC65	5	
1824	SPLICE-MC43	5	
1825	MC68-MC69	5	
1825	MC70-MC71	5	
1825	MC65-MC43	5	
1825	MC43-MC67	5	
1825	MC67-MC68	5	
1825	MC70-M74	5	
1825	MC69-MC70	5	
1825	MC41-MC65	5	
1825	MC68-M72	5	
1825	MC66-M70	5	TURBO OUTLET PSI
1825	MC65-MC39	5	STE/ICE
1825	MC69-M73	5	
1825	MC67-M71	5	
1825	MC39-MC40	5	STE/ICE MODULE
1825	MC43-M42	5	FUEL PSI
1825	MC71-M75	5	
1825A	MC39-MC40	5	STE/ICE MODULE
1826	MC40-MC39	5	
1827	MC40-MC39	5	
1828	MC39-M48	5	SHUNT
1829	MC39-M48	5	SHUNT
1835	R2-CB2	4	
1839	R7-R8	4	
1860	MC39-MC24	5	
1860	MC24-MC114	5	
1861	MC24-MC114	5	

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 6 OF 35
ENGINEERING DWG 1878290 SHEET 2
FP-11/FP-12 BLANK

REVISION P
CN 23873
5-14-92

28 27 26 25 24 23 22 21 20

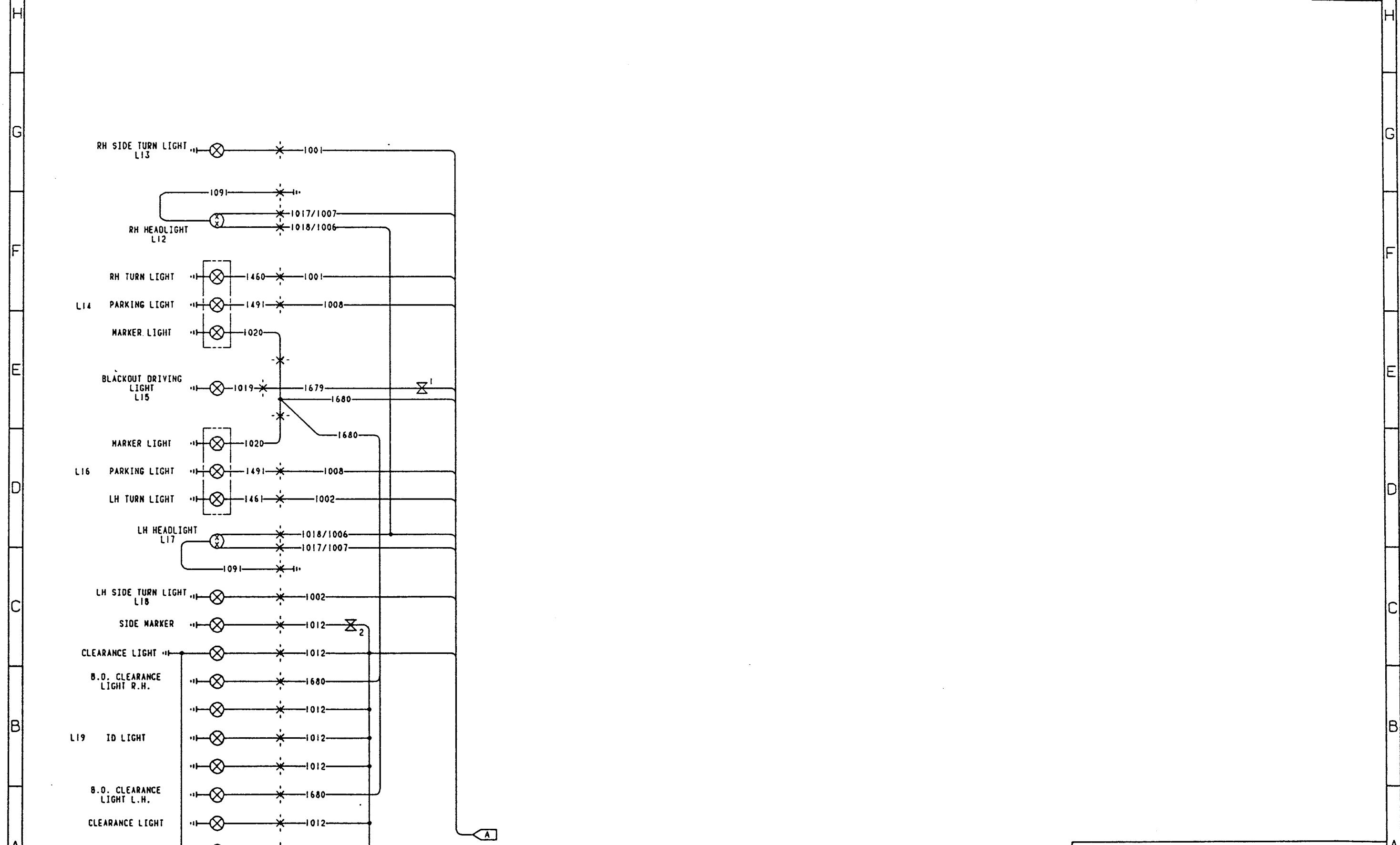
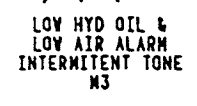
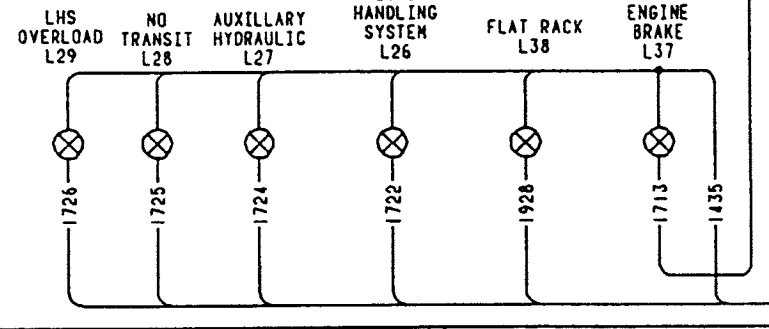
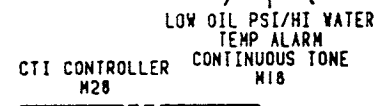
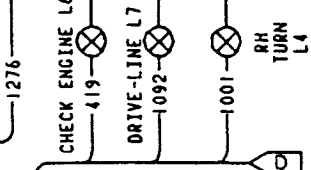
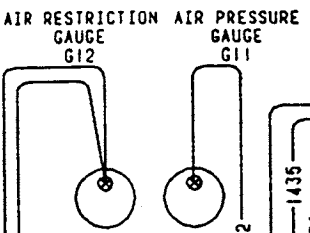
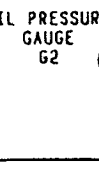
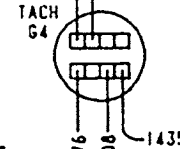
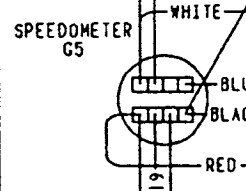
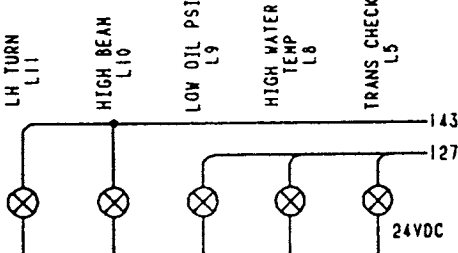
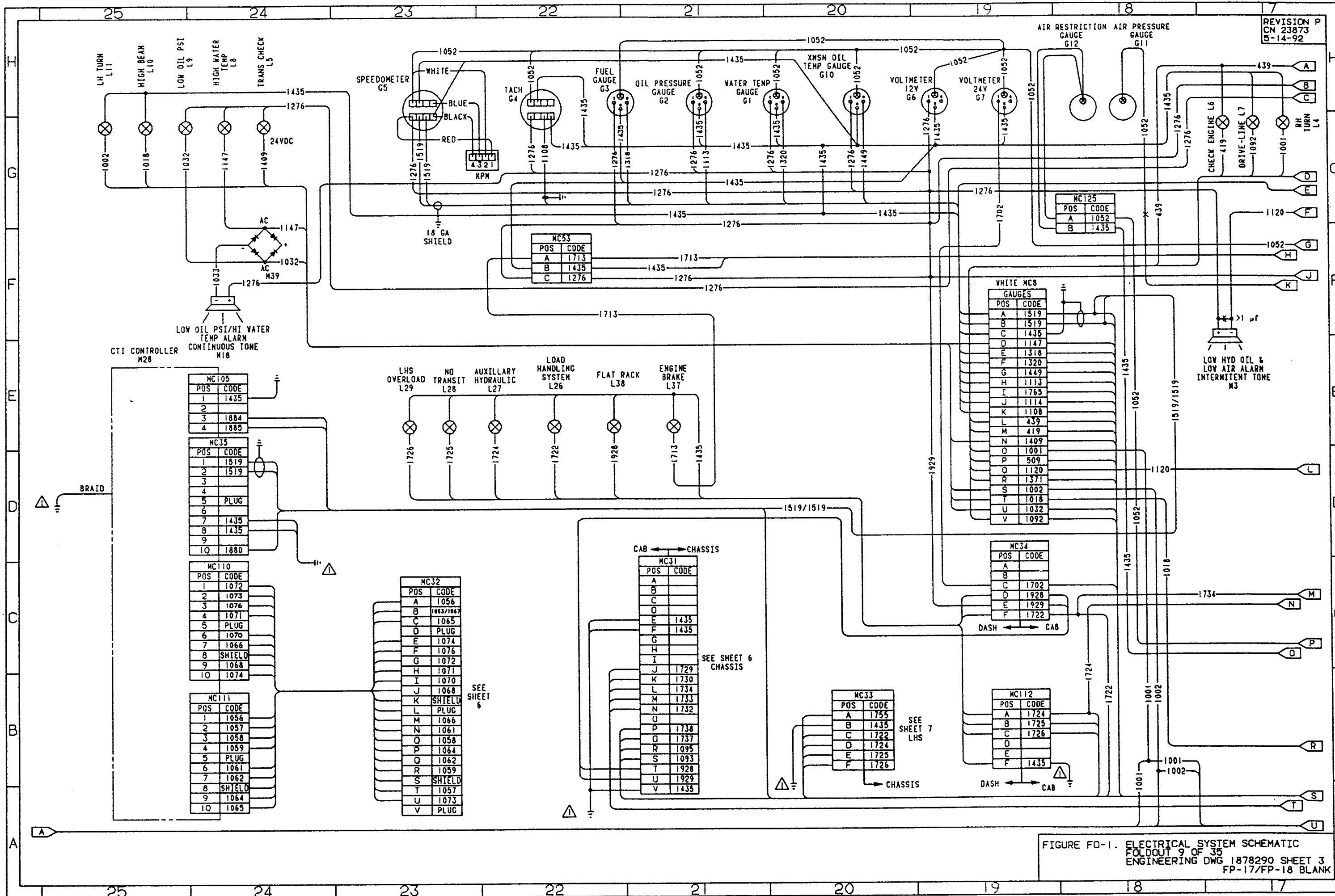


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 8 OF 35
ENGINEERING DWG 1878290 SHEET 3
FP-15/FP-16 BLANK

28 27 26 25 24 23 22 21 20

REVISION P
CN 23873
5-14-92



POS	CODE
1	1435
2	1884
3	1885
4	1885

POS	CODE
1	1519
2	1519
3	
4	
5	PLUG
6	
7	1435
8	1435
9	
10	1880

POS	CODE
1	1072
2	1073
3	1076
4	1071
5	PLUG
6	1070
7	1066
8	SHIELD
9	1068
10	1074

POS	CODE
1	1056
2	1057
3	1058
4	1059
5	PLUG
6	1061
7	1062
8	SHIELD
9	1064
10	1065

POS	CODE
A	1056
B	1063/1067
C	1065
D	PLUG
E	1074
F	1076
G	1072
H	1071
I	1070
J	1068
K	SHIELD
L	PLUG
M	1066
N	1061
O	1058
P	1064
Q	1062
R	1059
S	SHIELD
T	1057
U	1073
V	PLUG

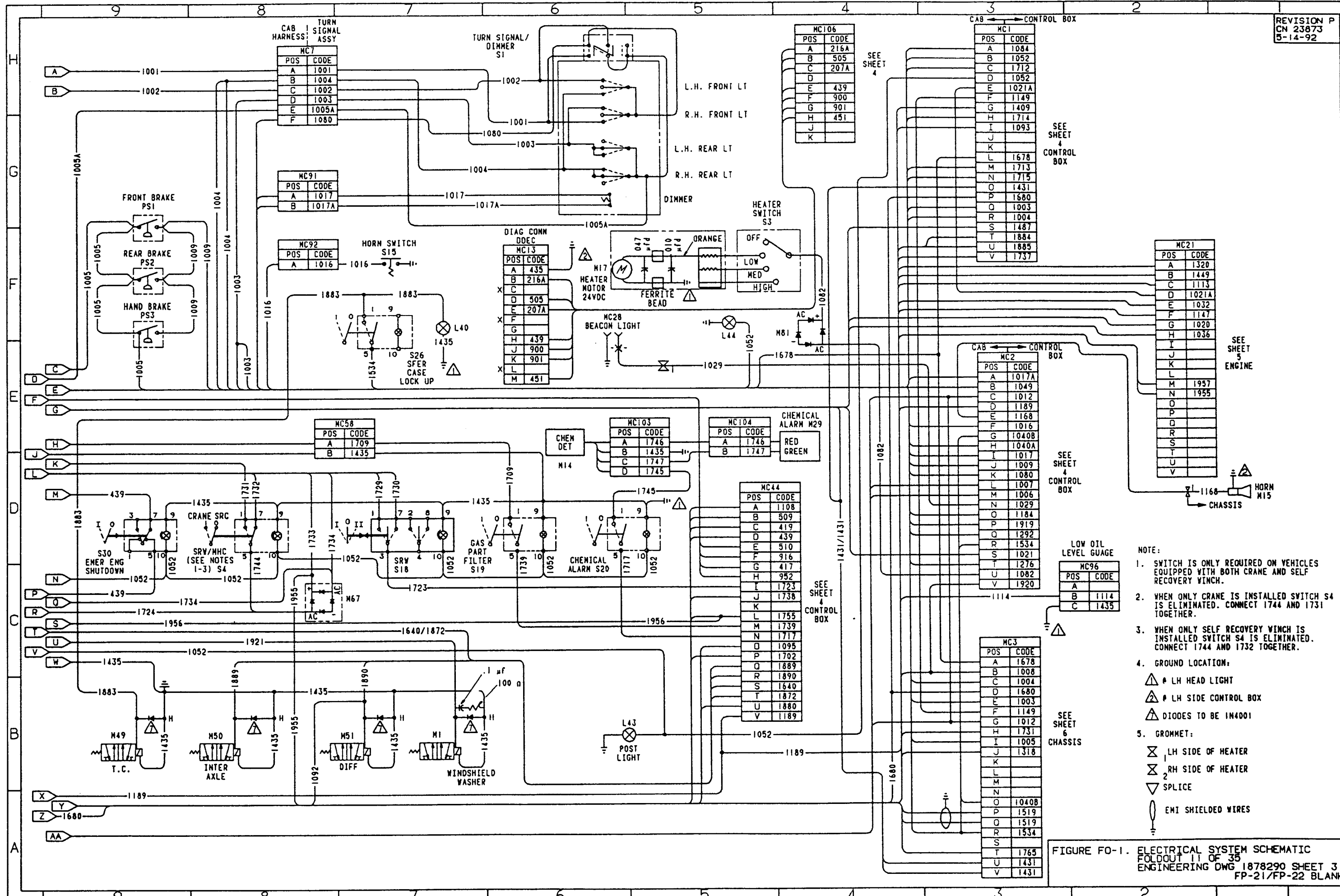
POS	CODE
A	
B	
C	
D	
E	1435
F	1435
G	
H	
I	
J	1729
K	1730
L	1734
M	1733
N	1732
O	
P	1738
Q	1737
R	1095
S	1093
T	1928
U	1929
V	1435

POS	CODE
A	1519
B	1519
C	1435
D	1147
E	1318
F	1320
G	1449
H	1113
I	1765
J	1114
K	1108
L	439
M	419
N	1409
O	1001
P	509
Q	1120
R	1371
S	1002
T	1018
U	1032
V	1092

POS	CODE
A	
B	
C	1702
D	1928
E	1929
F	1722

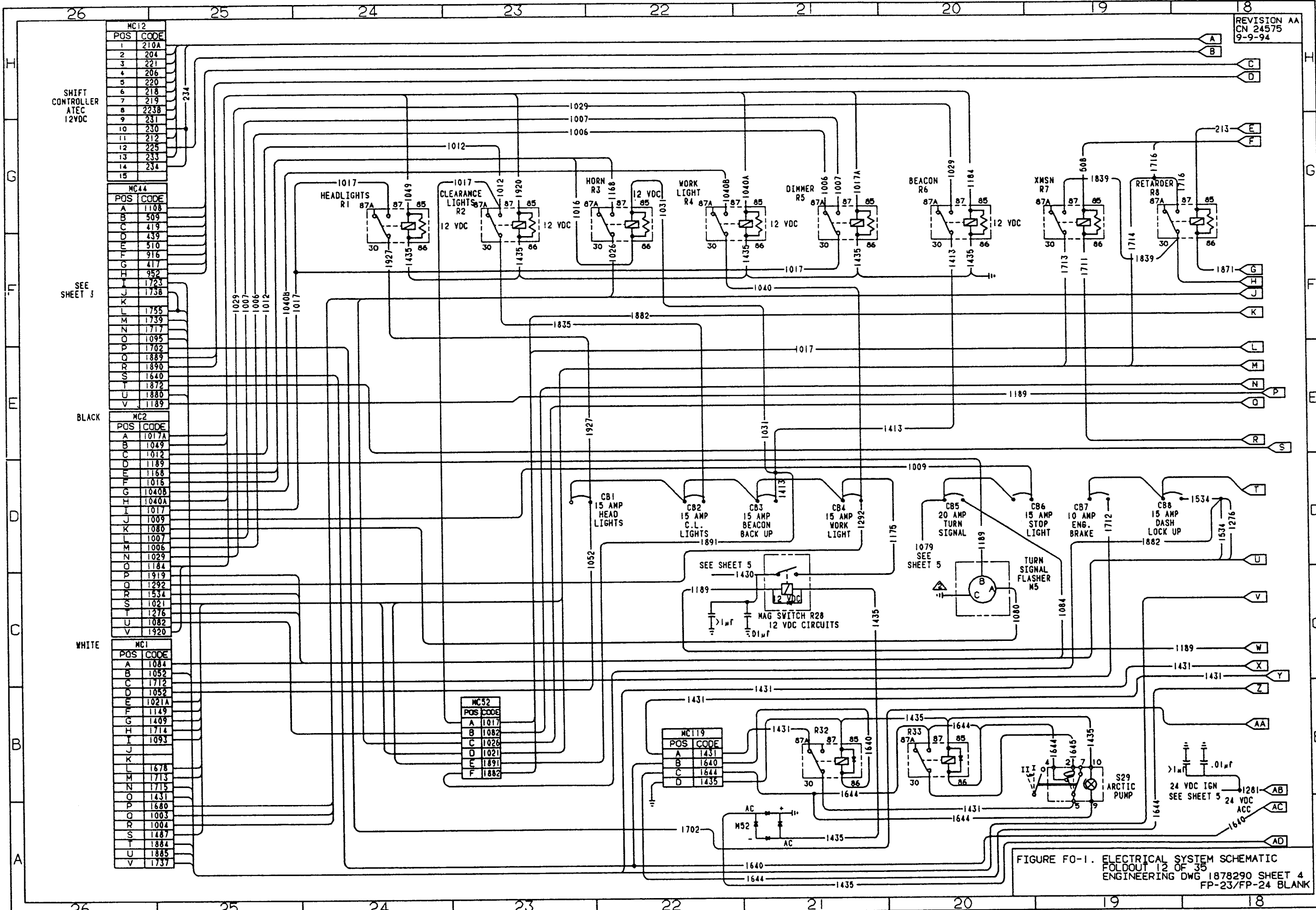
POS	CODE
A	1724
B	1725
C	1726
D	
E	
F	1435

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 9 OF 35
ENGINEERING DWG 1878290 SHEET 3
FP-17/FP-18 BLANK



- NOTE:
- SWITCH IS ONLY REQUIRED ON VEHICLES EQUIPPED WITH BOTH CRANE AND SELF RECOVERY WINCH.
 - WHEN ONLY CRANE IS INSTALLED SWITCH S4 IS ELIMINATED. CONNECT 1744 AND 1731 TOGETHER.
 - WHEN ONLY SELF RECOVERY WINCH IS INSTALLED SWITCH S4 IS ELIMINATED. CONNECT 1744 AND 1732 TOGETHER.
 - GROUND LOCATION:
 - △ # LH HEAD LIGHT
 - △ # LH SIDE CONTROL BOX
 - △ DIODES TO BE IN4001
 - GROMMET:
 - ⊗ LH SIDE OF HEATER
 - ⊗ RH SIDE OF HEATER
 - ▽ SPLICE
 - EMI SHIELDED WIRES

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 11 OF 35
ENGINEERING DWG 1878290 SHEET 3
FP-21/FP-22 BLANK



SHIFT CONTROLLER ATEC 12VDC

SEE SHEET J

BLACK

WHITE

POS	CODE
A	1017
B	1082
C	1026
D	1021
E	1891
F	1882

POS	CODE
A	1431
B	1640
C	1644
D	1435

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 12 OF 35
 ENGINEERING DWG 1878290 SHEET 4
 FP-23/FP-24 BLANK

REVISION AA
CN 24575
9-9-94

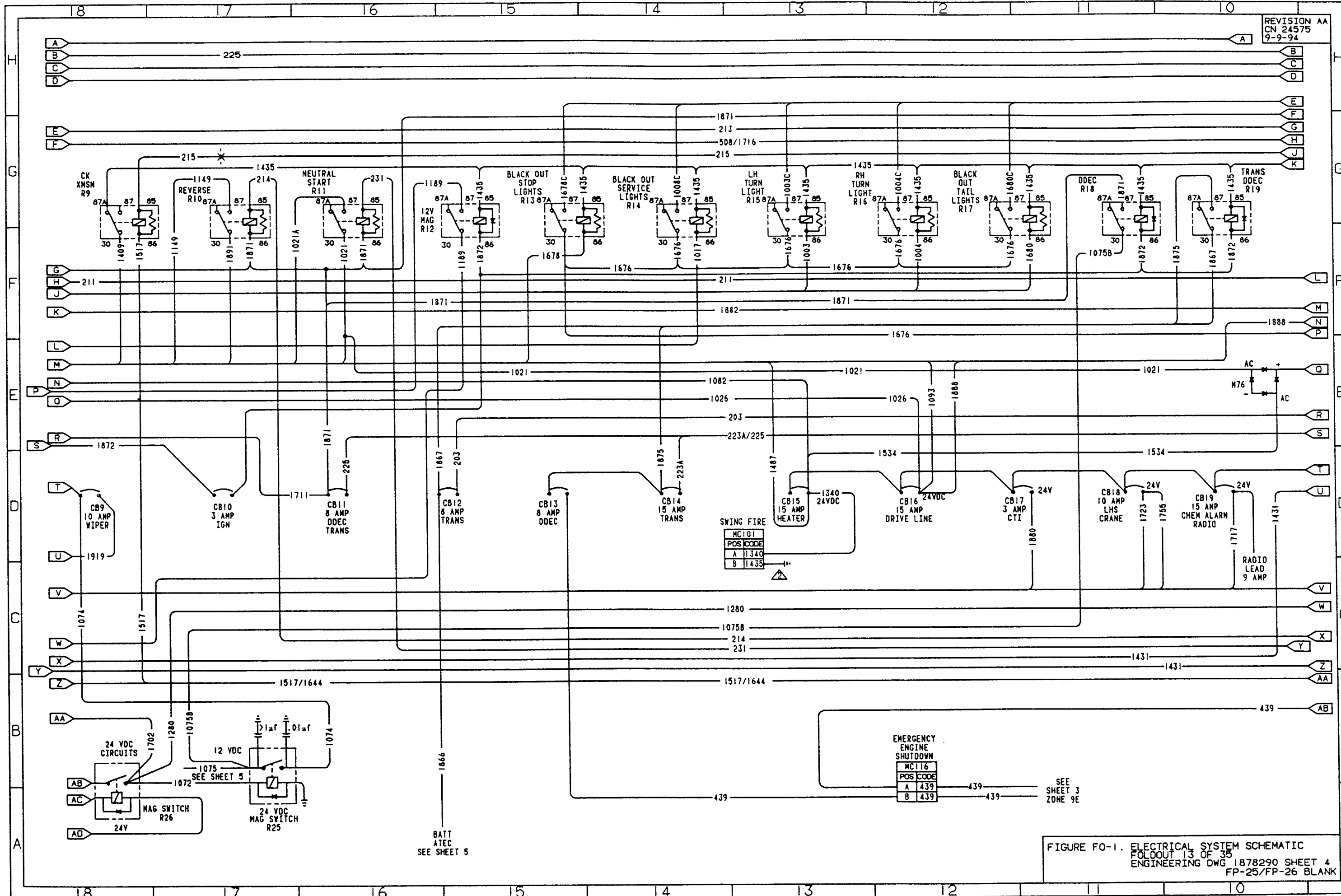
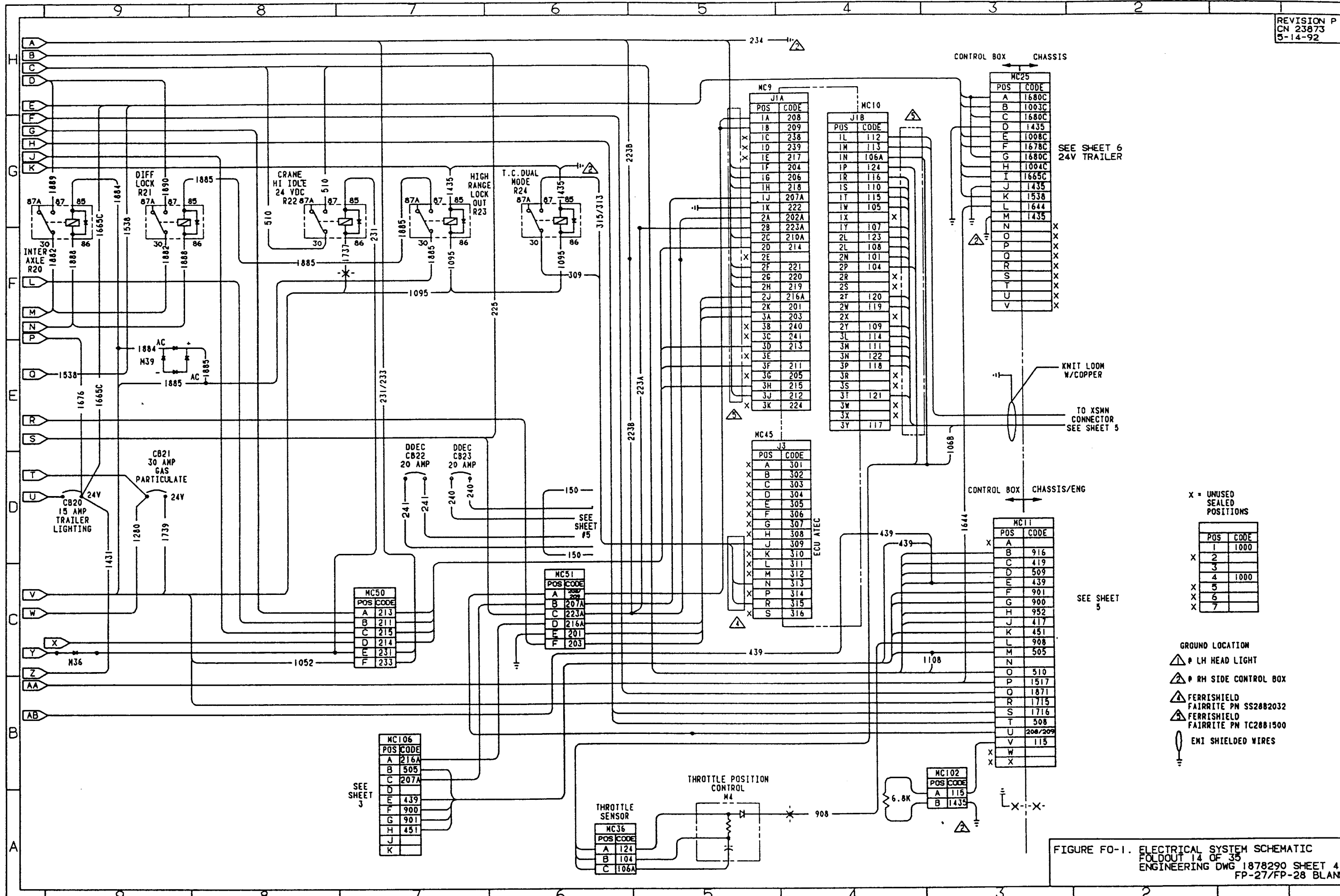


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 13 OF 35
ENGINEERING DWG 1878290 SHEET 4
FP-25/FP-26 BLANK



SEE SHEET 6
24V TRAILER

KNIT LOOM
W/COPPER
TO XSMN
CONNECTOR
SEE SHEET 5

x = UNUSED
SEALED
POSITIONS

POS	CODE
1	1000
2	
3	
4	1000
5	
6	
7	

- GROUND LOCATION
- △ LH HEAD LIGHT
 - ◻ RH SIDE CONTROL BOX
 - ◻ FERRISHIELD FAIRRITE PM SS2882032
 - ◻ FERRISHIELD FAIRRITE PM TC2881500
 - EMI SHIELDED WIRES

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 14 OF 35
ENGINEERING DWG 1878290 SHEET 4
FP-27/FP-28 BLANK

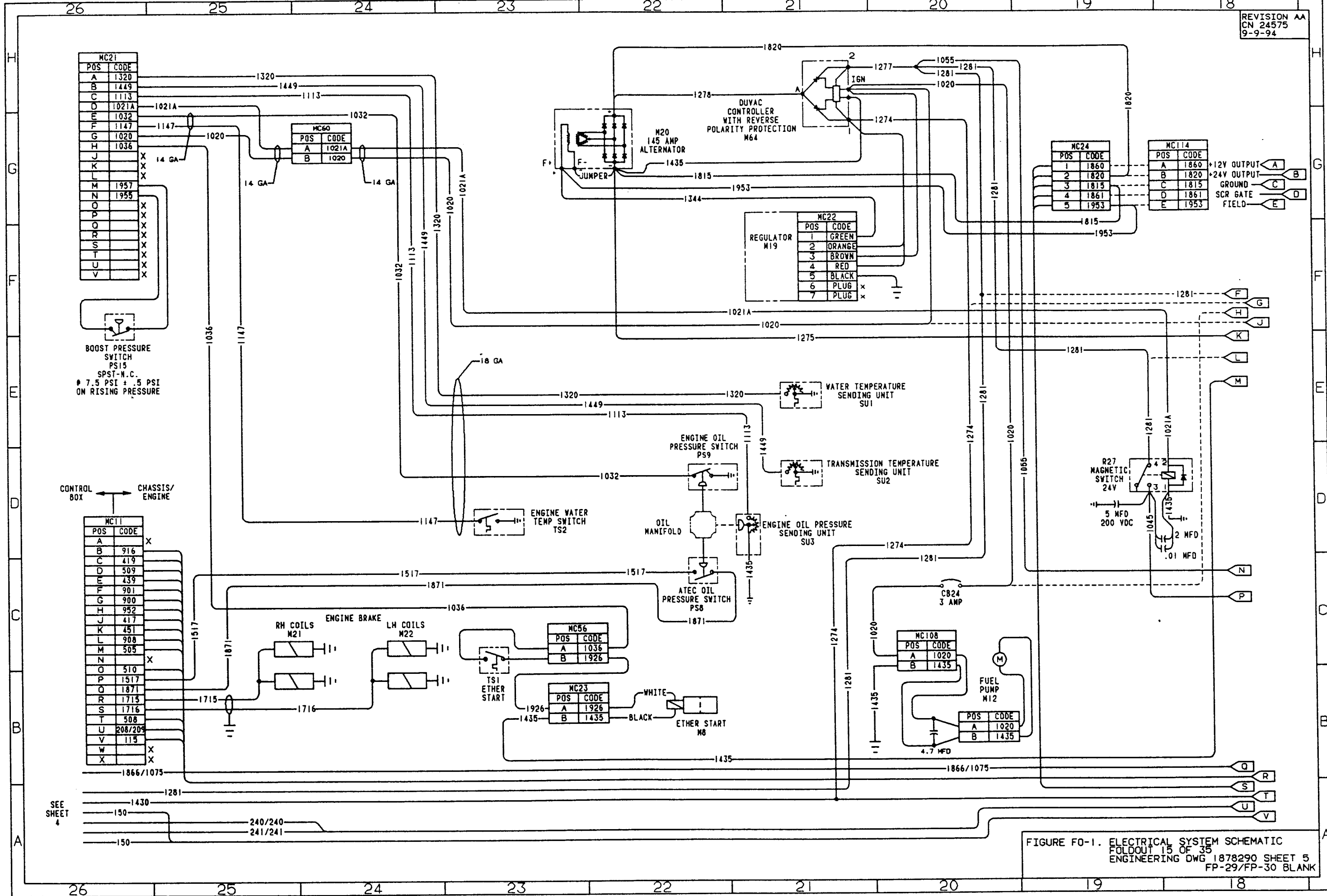


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 15 OF 35
ENGINEERING DWG 1878290 SHEET 5
FP-29/FP-30 BLANK

REVISION AA
CN 24575
9-9-94

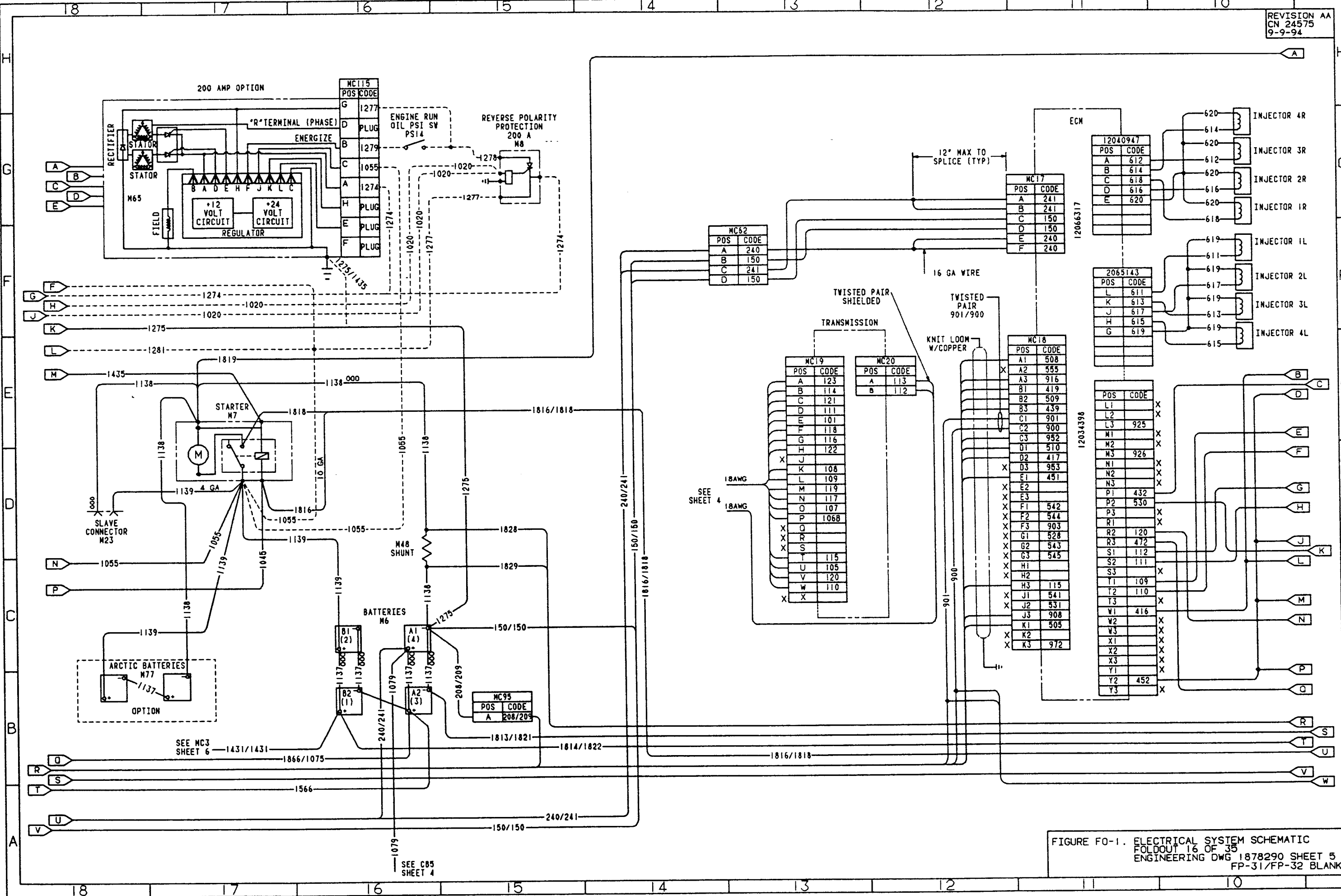


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 16 OF 35
ENGINEERING DWG 1878290 SHEET 5
FP-31/FP-32 BLANK

REVISION V
CN 24138
11-24-92

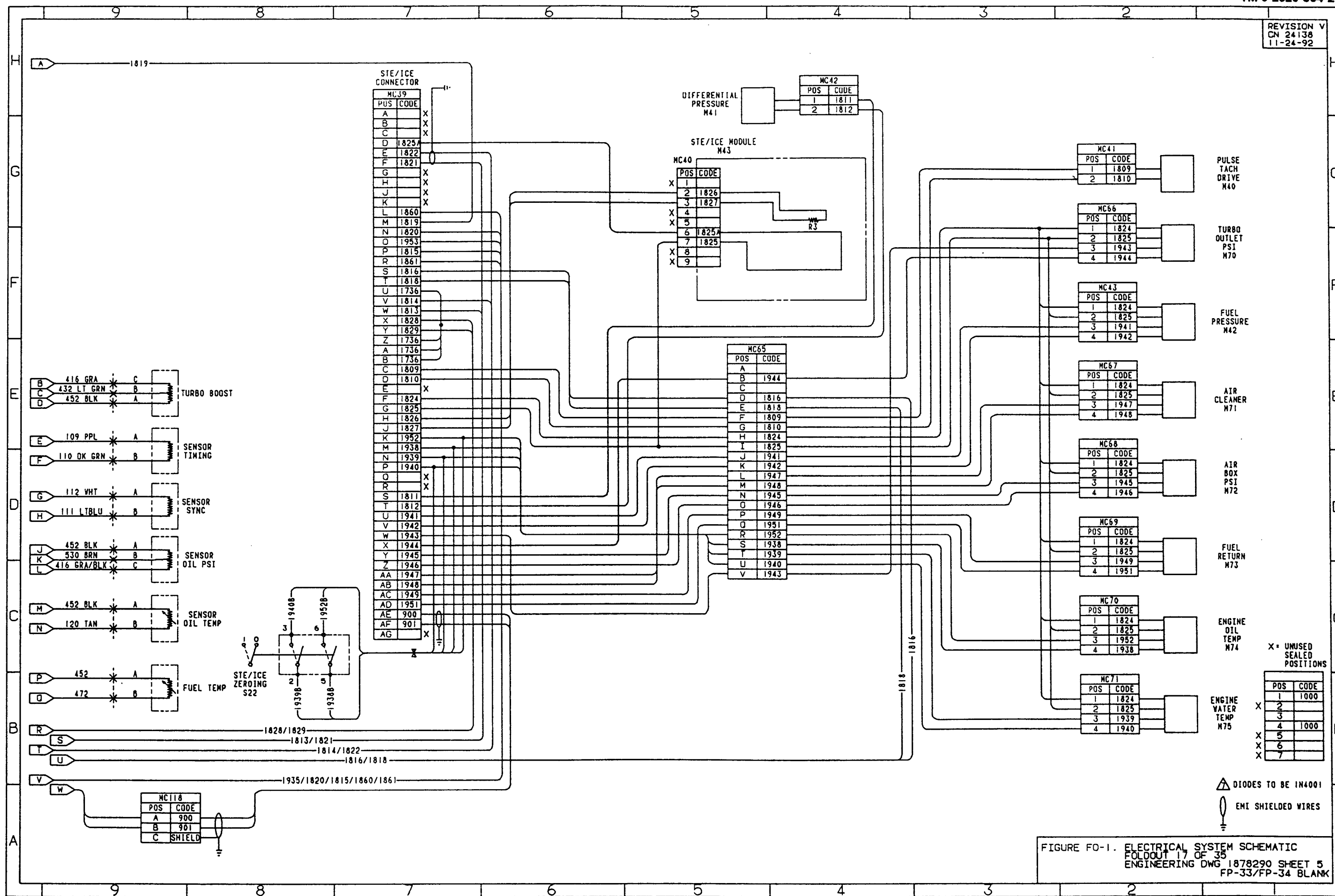


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 17 OF 35
ENGINEERING DWG 1878290 SHEET 5
FP-33/FP-34 BLANK

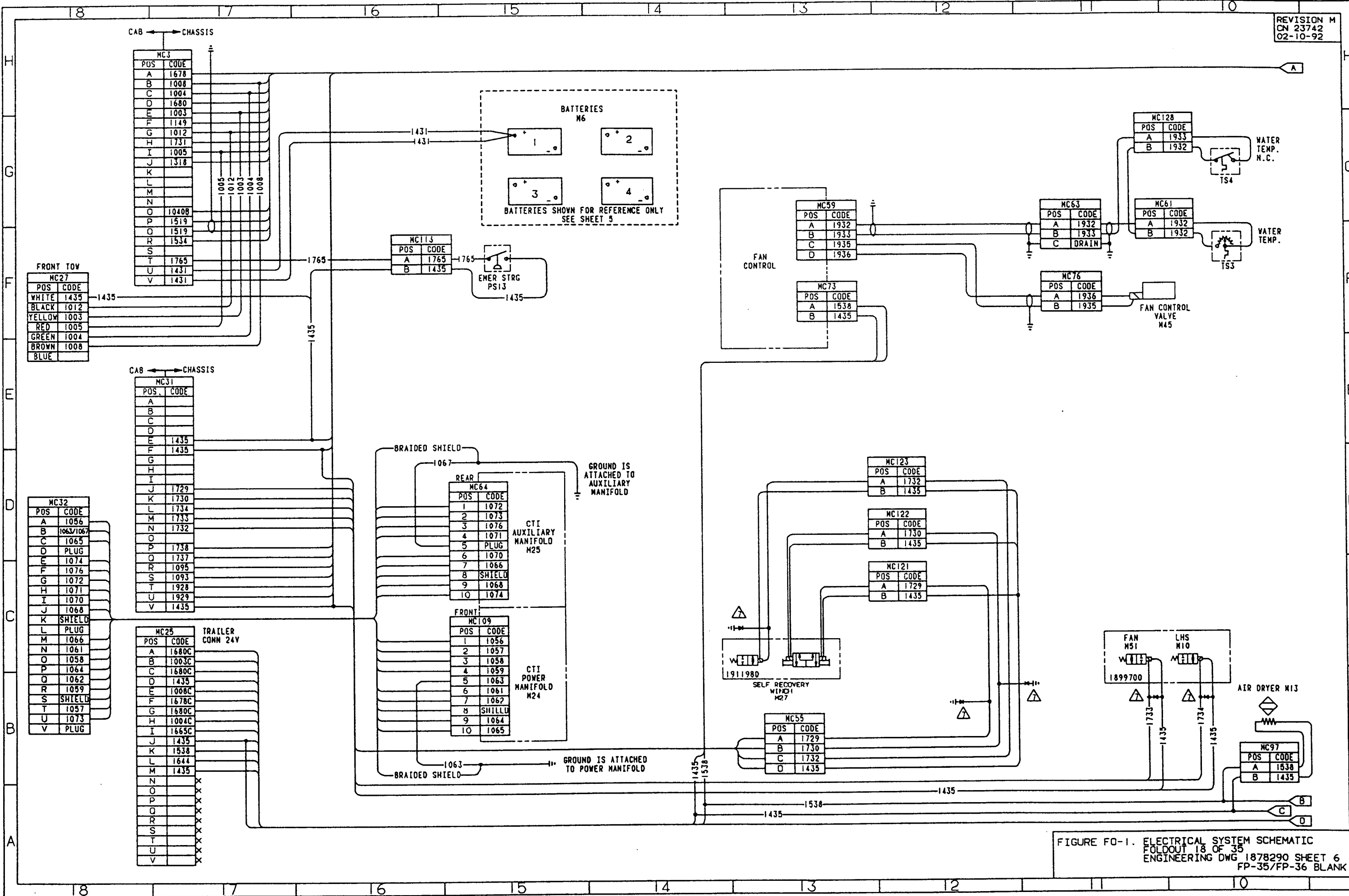


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 18 OF 35
ENGINEERING DWG 1878290 SHEET 6
FP-35/FP-36 BLANK

REVISION M
CN 23742
02-10-92

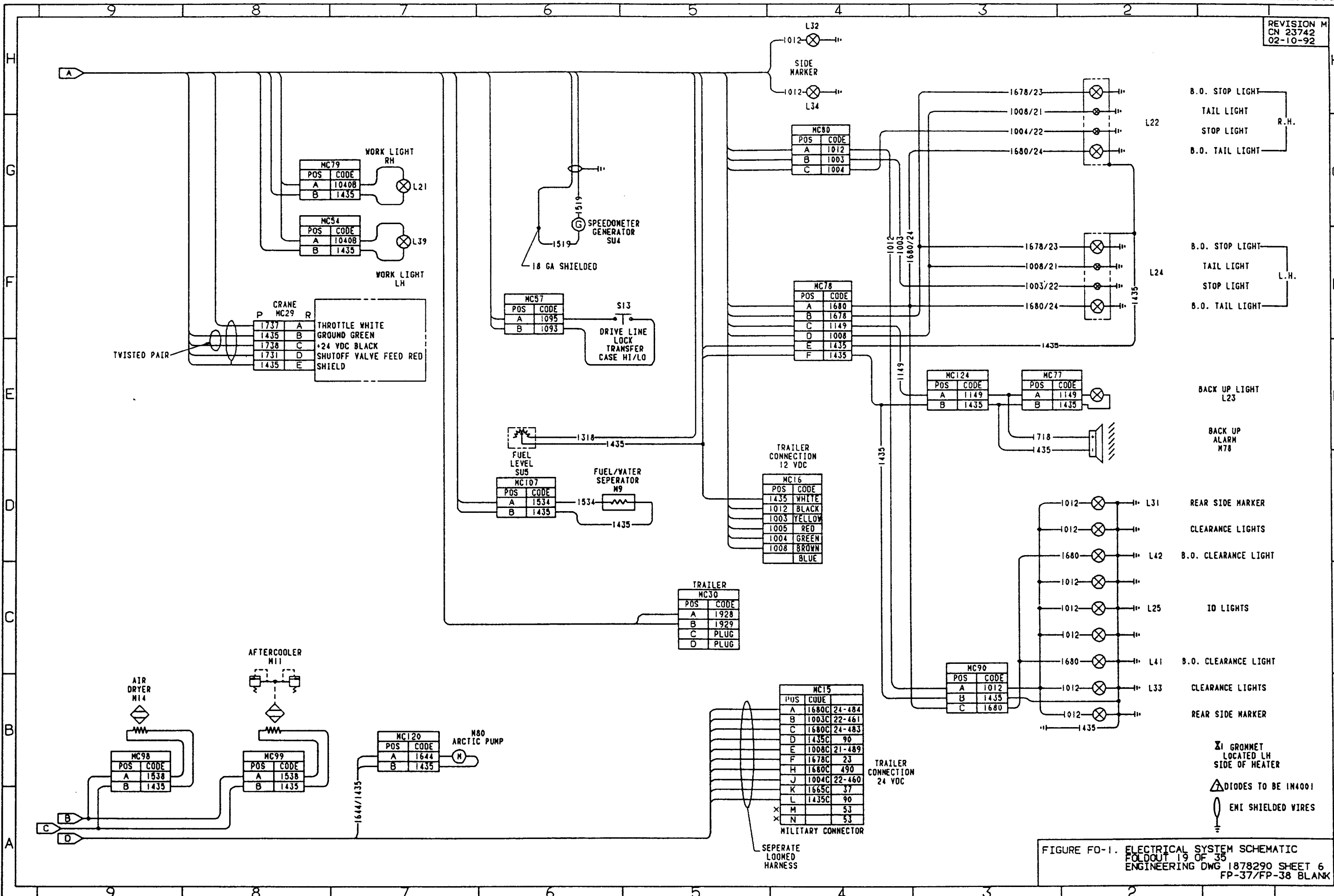


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 19 OF 35
ENGINEERING DWG 1878290 SHEET 6
FP-37/FP-38 BLANK

REVISION AA
CN 24575
9-9-94

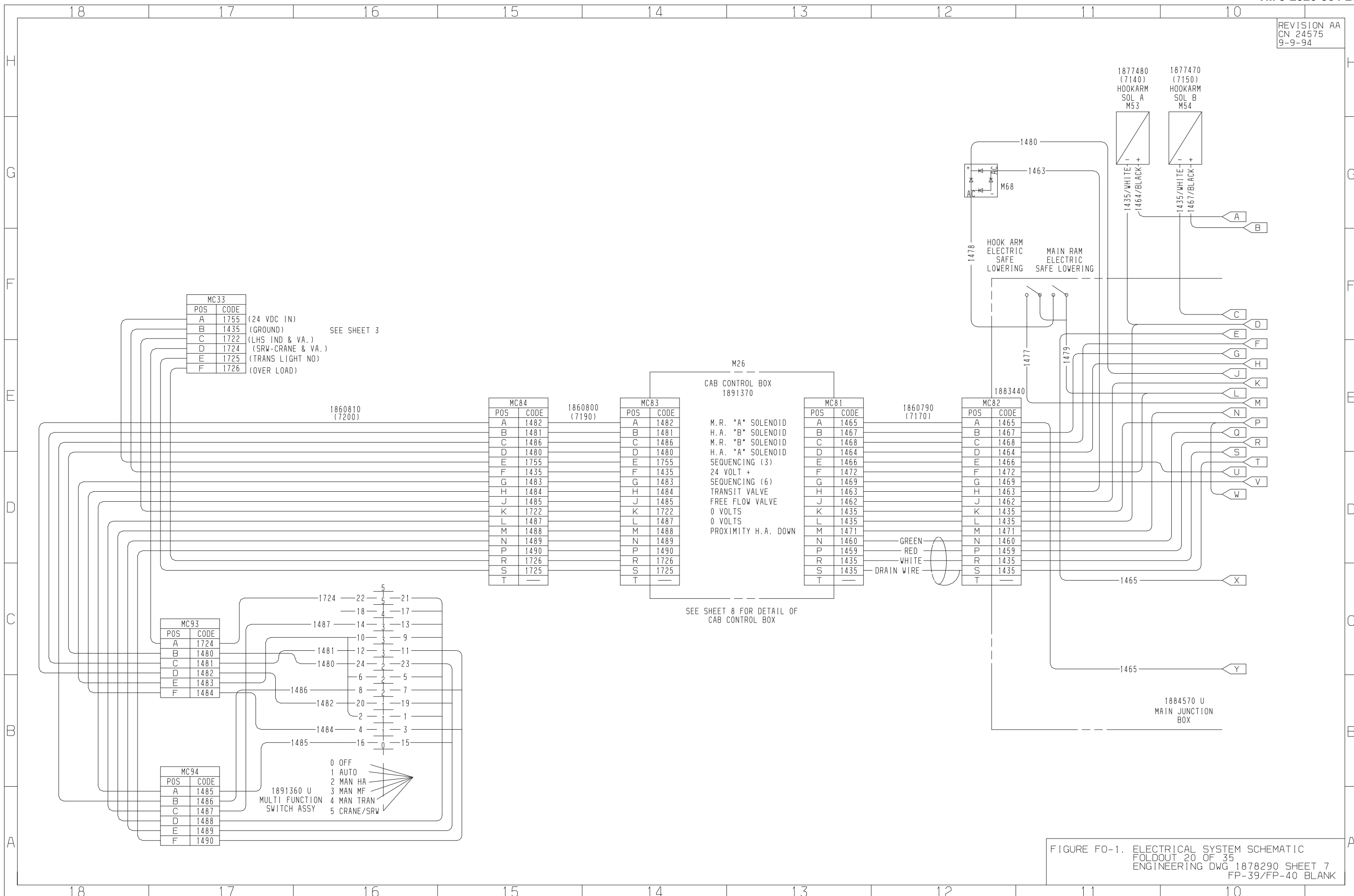


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 20 OF 35
ENGINEERING DWG 1878290 SHEET 7
FP-39/FP-40 BLANK

REVISION U
CN 23966
12-1-92

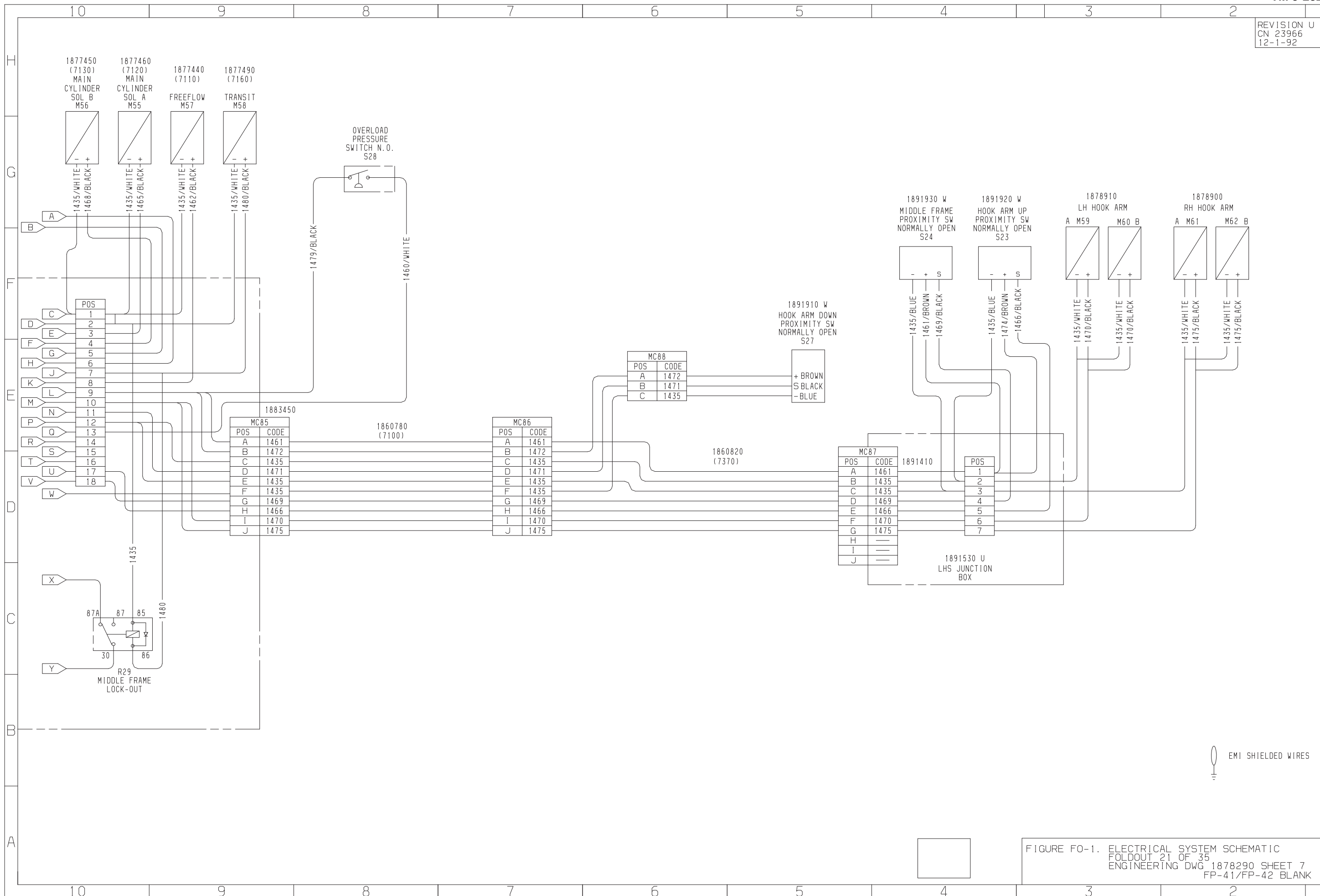


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 21 OF 35
ENGINEERING DWG 1878290 SHEET 7
FP-41/FP-42 BLANK

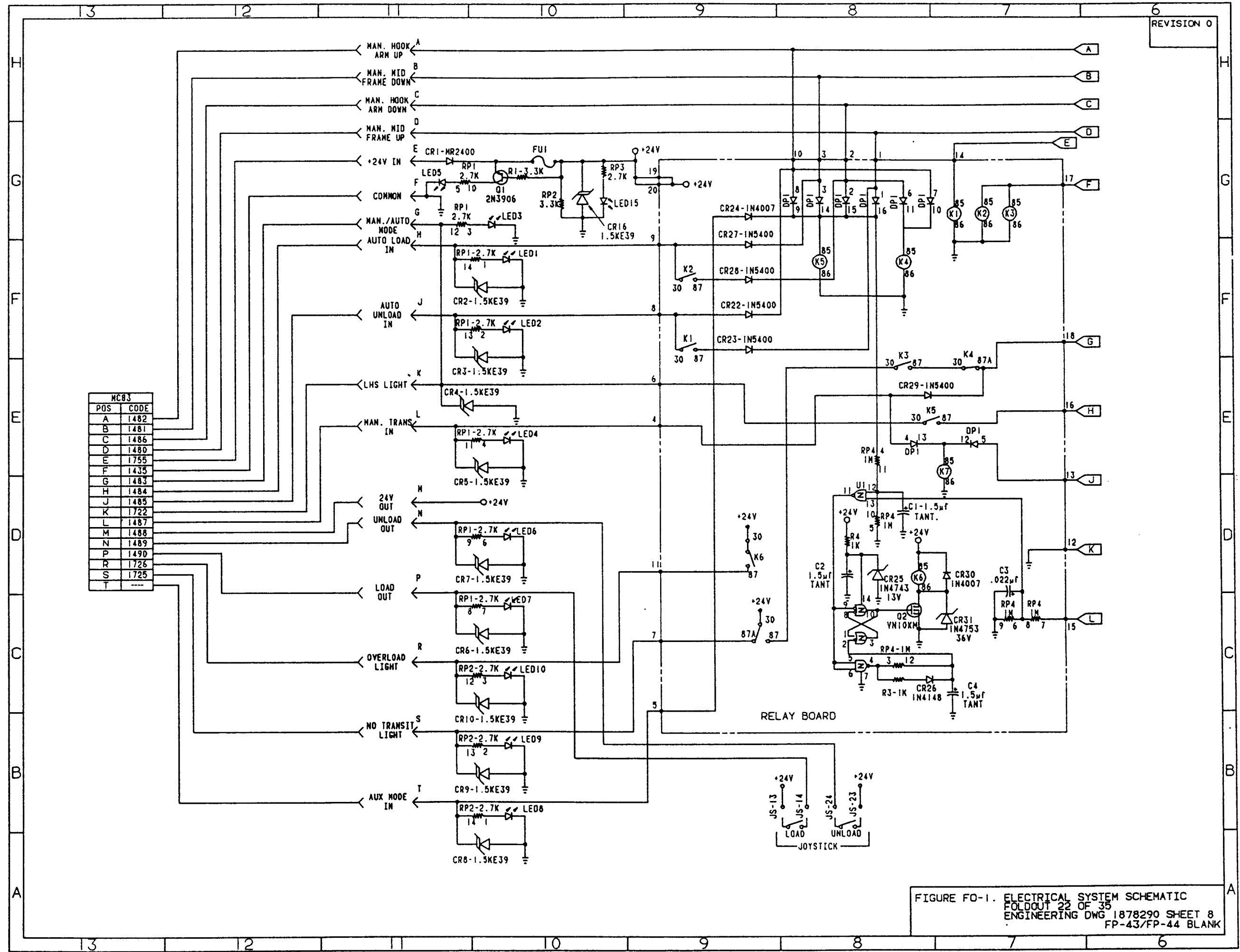


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 22 OF 35
 ENGINEERING DWG 1878290 SHEET 8
 FP-43/FP-44 BLANK

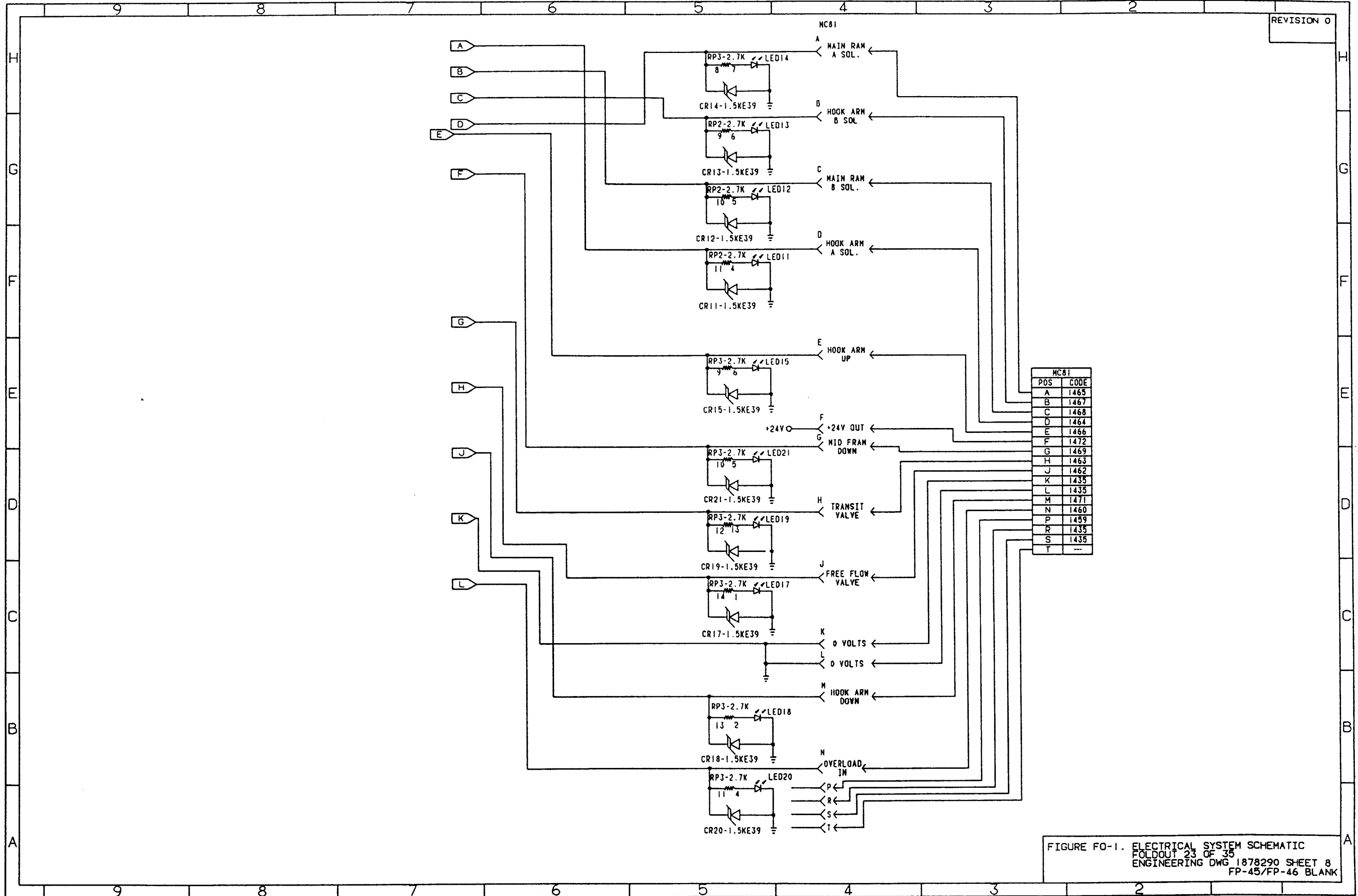
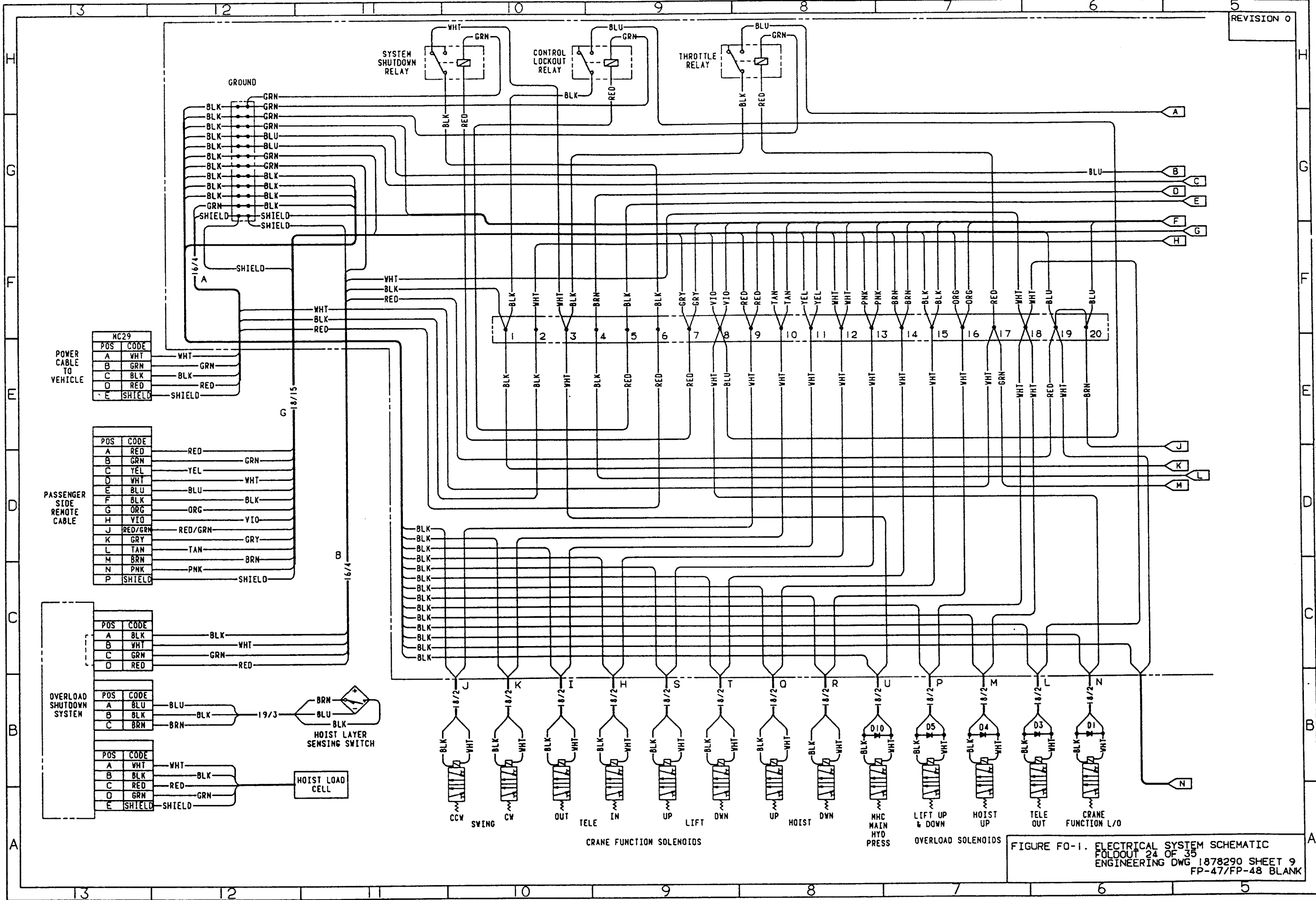


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 23 OF 35
 ENGINEERING DWG 1878290 SHEET 8
 FP-45/FP-46 BLANK



POS	CODE
A	WHT
B	GRN
C	BLK
D	RED
E	SHIELD

POS	CODE
A	RED
B	GRN
C	YEL
D	WHT
E	BLU
F	BLK
G	ORG
H	VIO
J	RED/GRN
K	GRY
L	TAN
M	BRN
N	PNK
P	SHIELD

POS	CODE
A	BLK
B	WHT
C	GRN
D	RED

POS	CODE
A	BLU
B	BLK
C	BRN

POS	CODE
A	WHT
B	BLK
C	RED
D	GRN
E	SHIELD

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 24 OF 35
 ENGINEERING DWG 1878290 SHEET 9
 FP-47/FP-48 BLANK

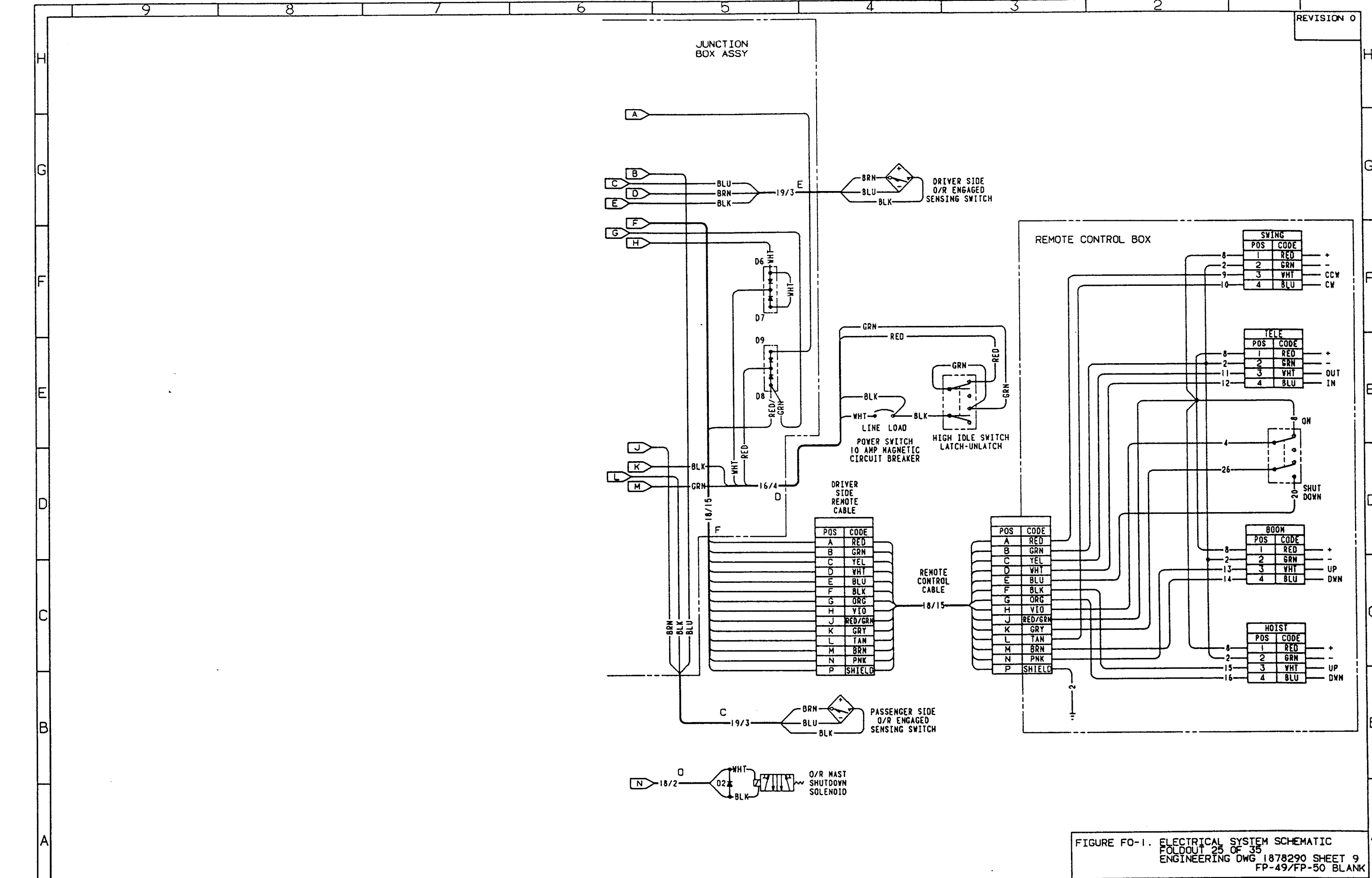
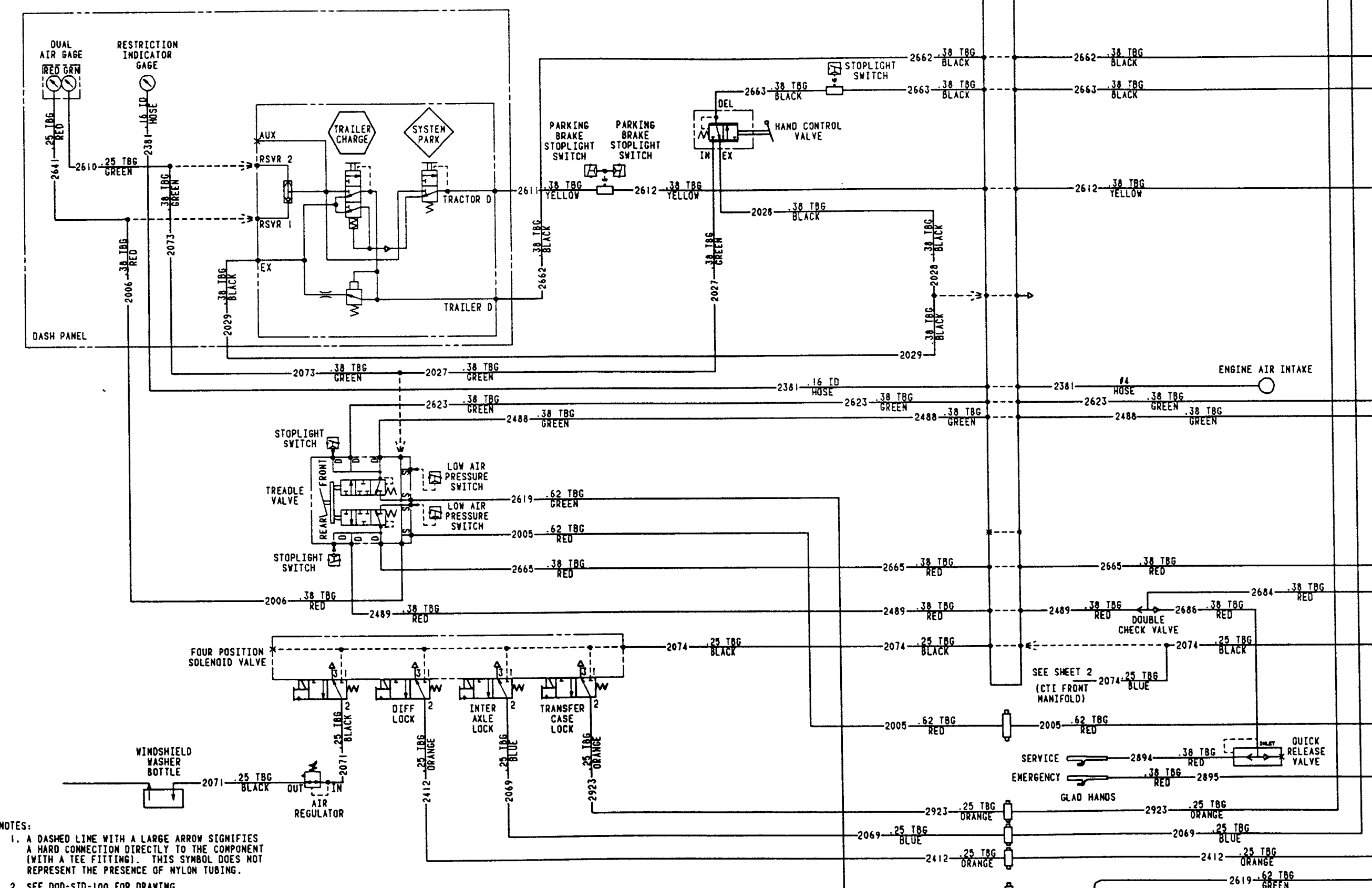


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 25 OF 35
 ENGINEERING DWG 1878290 SHEET 9
 FP-49/FP-50 BLANK

REVISION F
CN 24526
3-28-94



- NOTES:
1. A DASHED LINE WITH A LARGE ARROW SIGNIFIES A HARD CONNECTION DIRECTLY TO THE COMPONENT (WITH A TEE FITTING). THIS SYMBOL DOES NOT REPRESENT THE PRESENCE OF NYLON TUBING.
 2. SEE DOD-STD-100 FOR DRAWING INTERPRETATION STANDARDS
 3. PARENTHETICAL IDENTITIES ARE FOR REFERENCE ONLY

FIGURE FO-2. AIR SYSTEM SCHEMATIC
FOLDOUT 26 OF 35
ENGINEERING DWG 1878300 SHEET 1
FP-51/FP-52 BLANK

REVISION 0
CN 24303
6-25-93

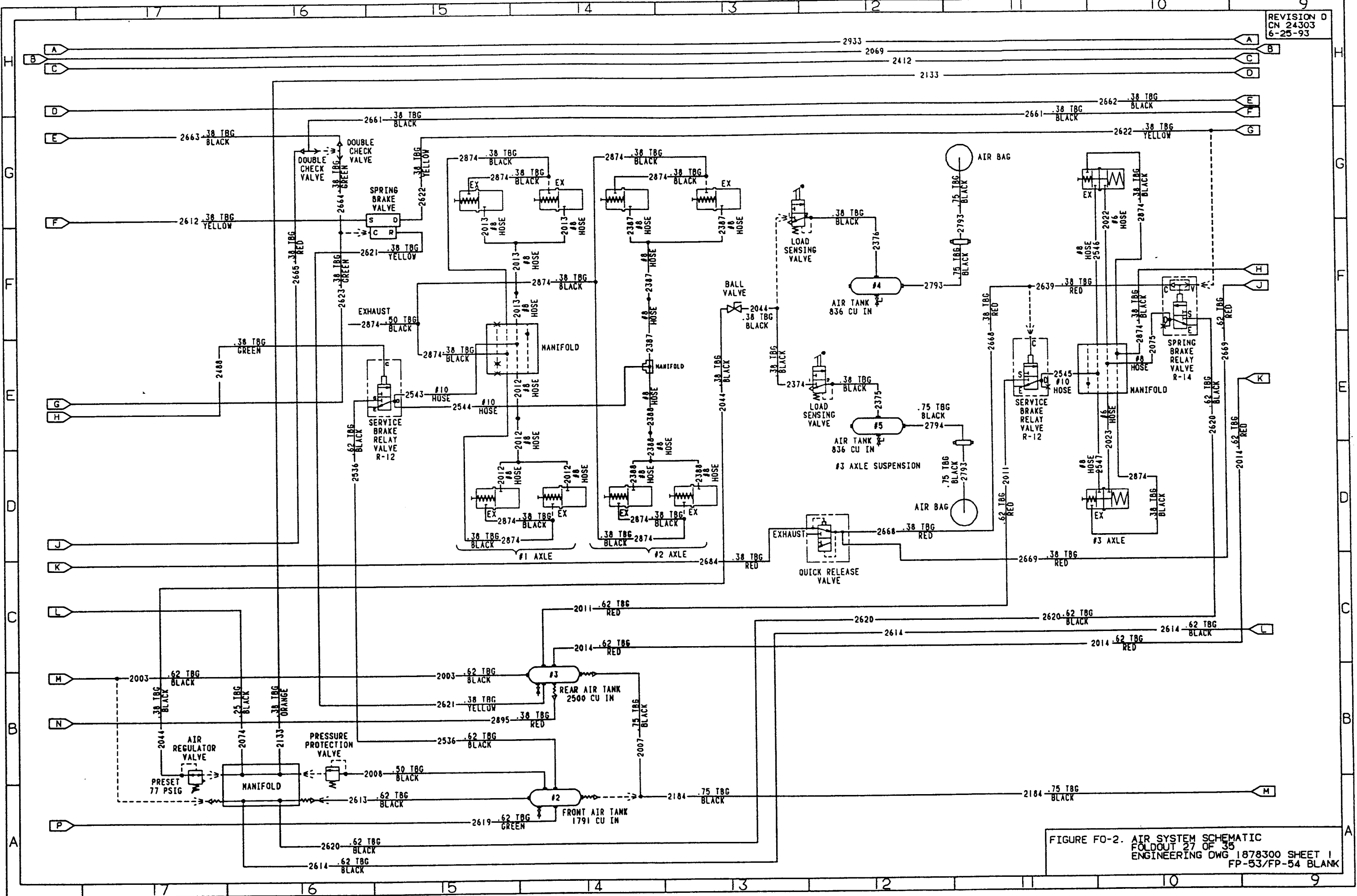


FIGURE FO-2. AIR SYSTEM SCHEMATIC
FOLDOUT 27 OF 35
ENGINEERING DWG 1878300 SHEET 1
FP-53/FP-54 BLANK

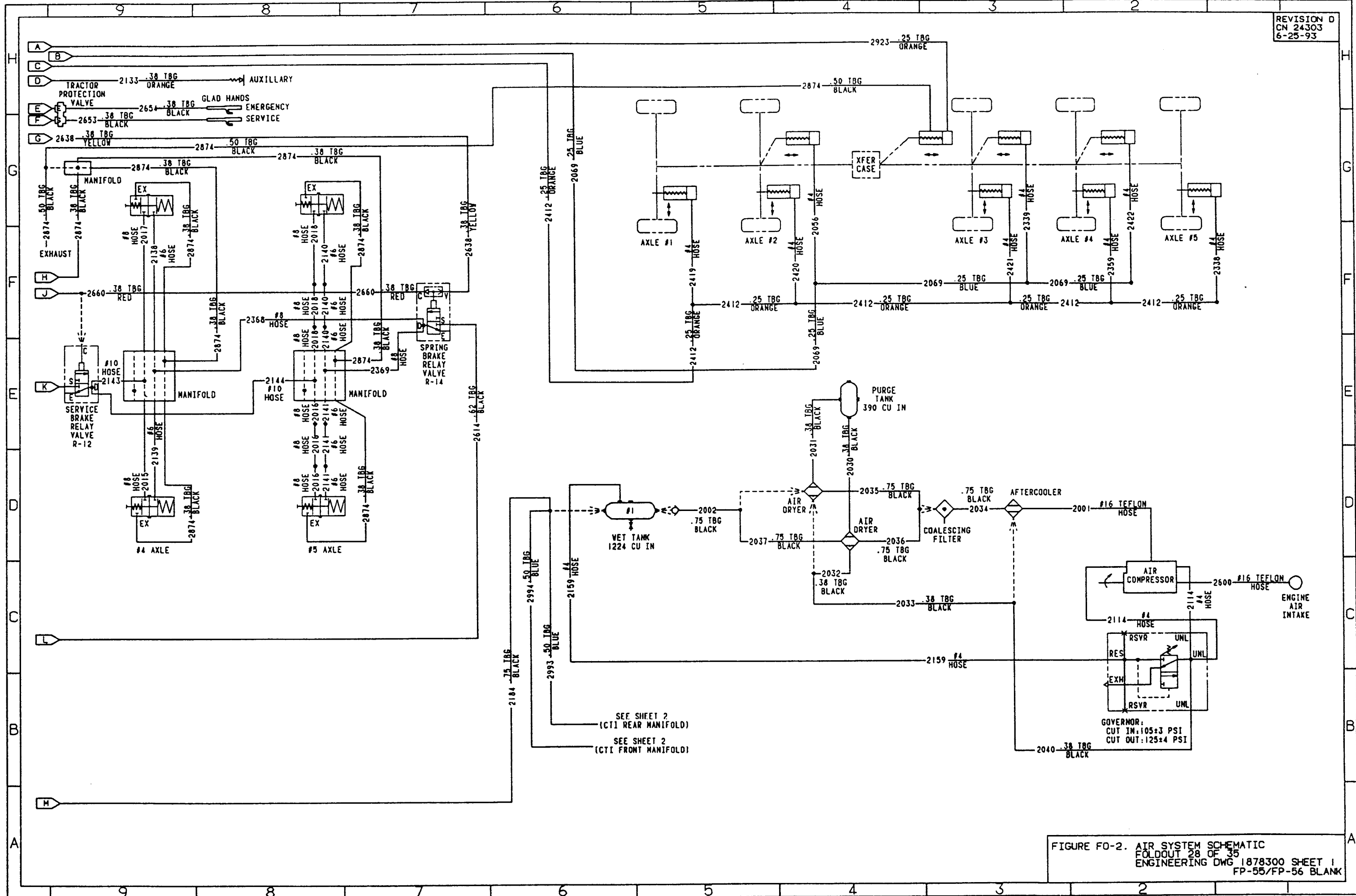


FIGURE FO-2. AIR SYSTEM SCHEMATIC
FOLDOUT 28 OF 35
ENGINEERING DWG 1878300 SHEET 1
FP-55/FP-56 BLANK

REVISION B
CN 23468
8-8-91

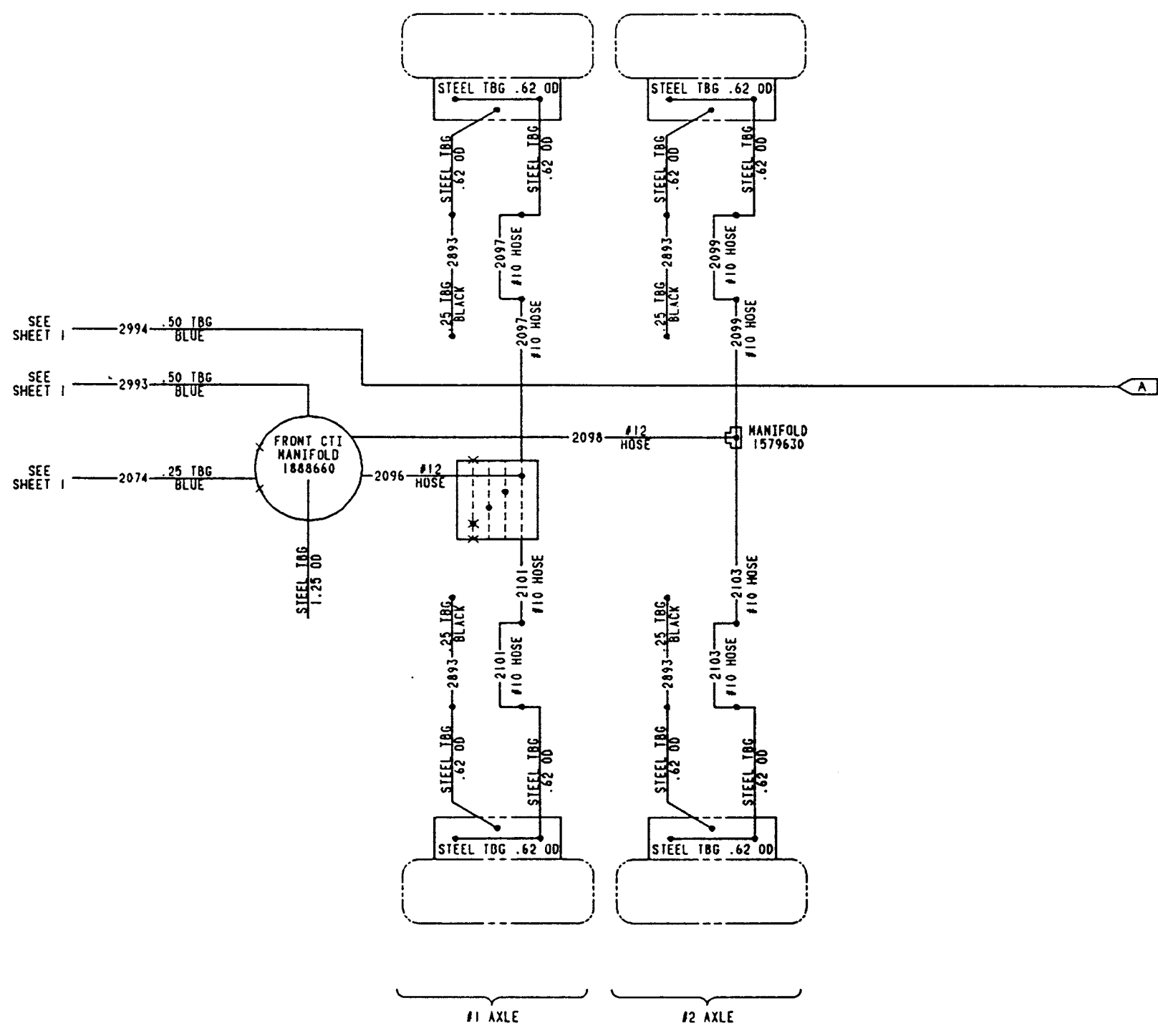


FIGURE FO-2. AIR SYSTEM SCHEMATIC
FOLDOUT 29 OF 35
ENGINEERING DWG 1878300 SHEET 2
FP-57/FP-58 BLANK

REVISION B
CN 23468
8-8-91

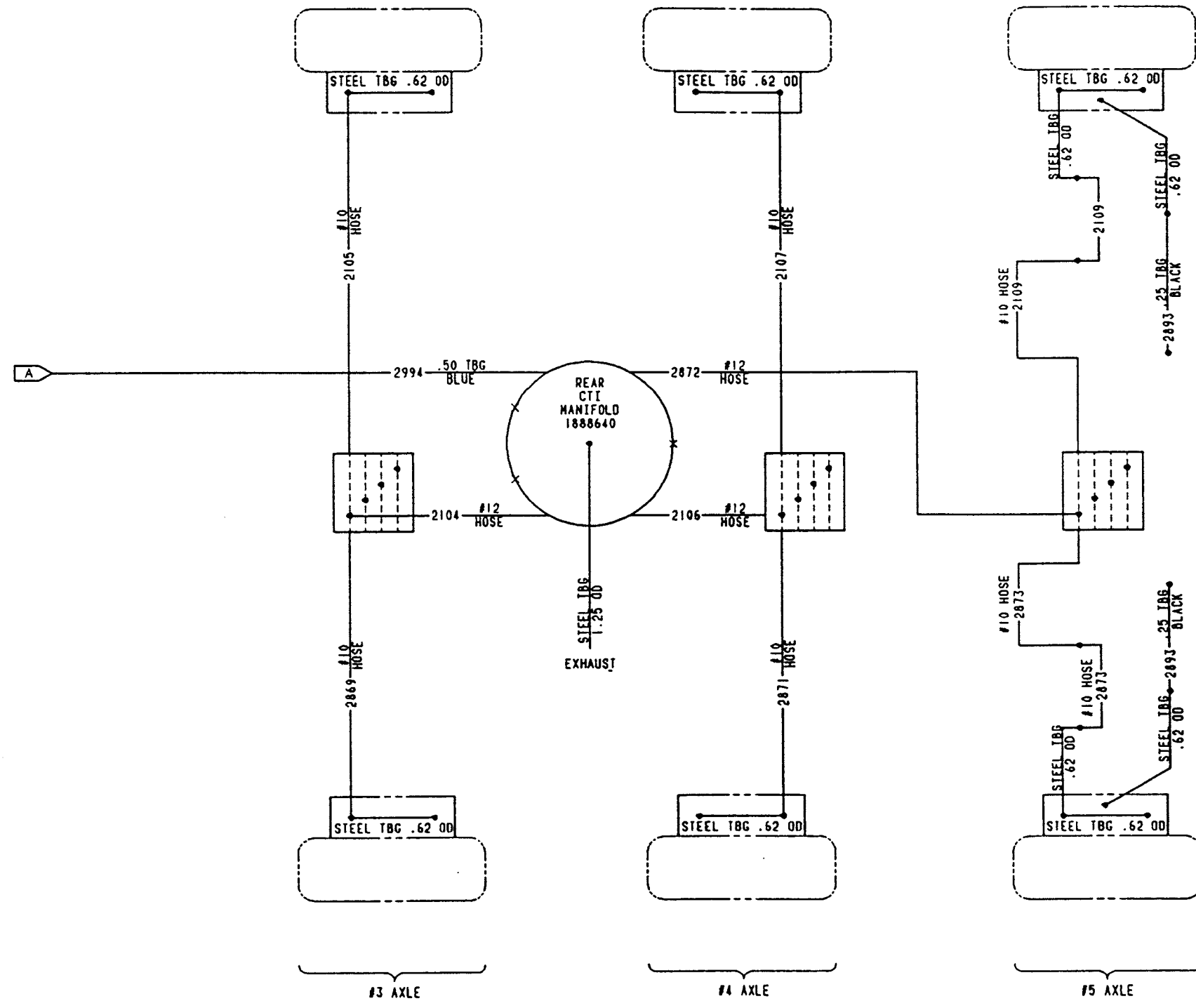


FIGURE FO-2. AIR SYSTEM SCHEMATIC
FOLDOUT 30 OF 35
ENGINEERING DWG 1878300 SHEET 2
FP-59/FP-60 BLANK

REVISION H
CN 24303
6-25-93

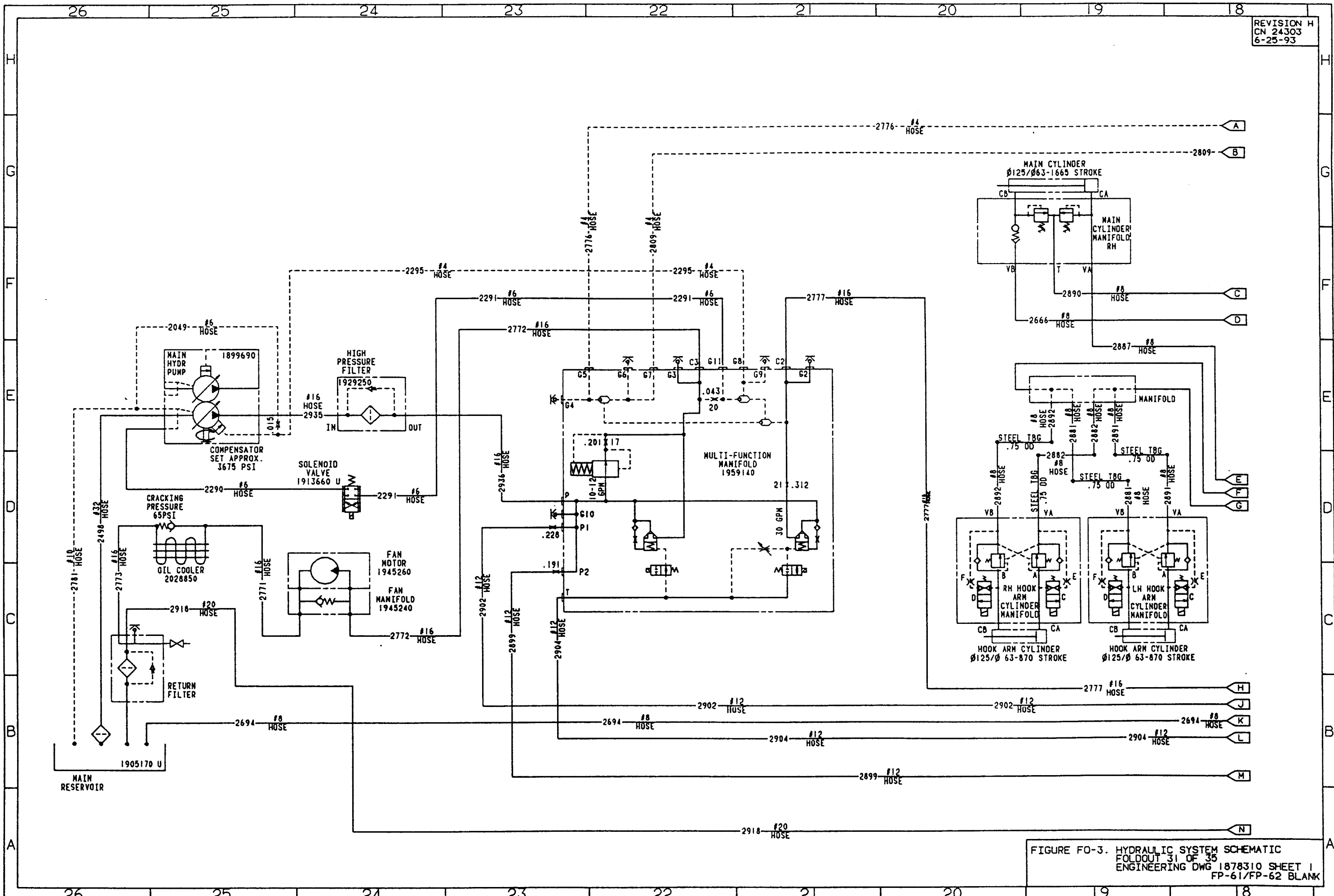


FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 31 OF 35
ENGINEERING DWG 1878310 SHEET 1
FP-61/FP-62 BLANK

REVISION H
CN 2225
4/14/00

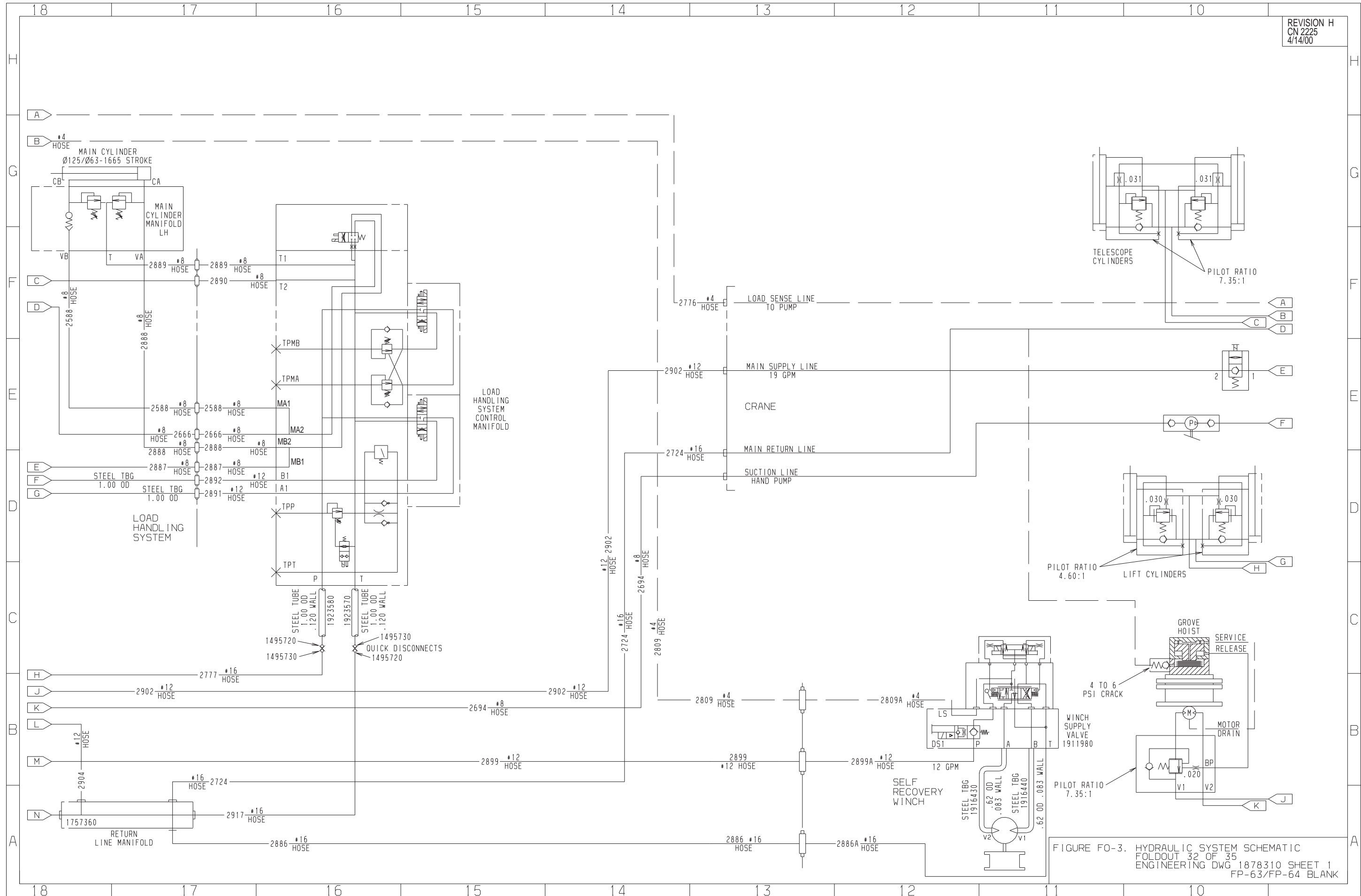


FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 32 OF 35
ENGINEERING DWG 1878310 SHEET 1
FP-63/FP-64 BLANK

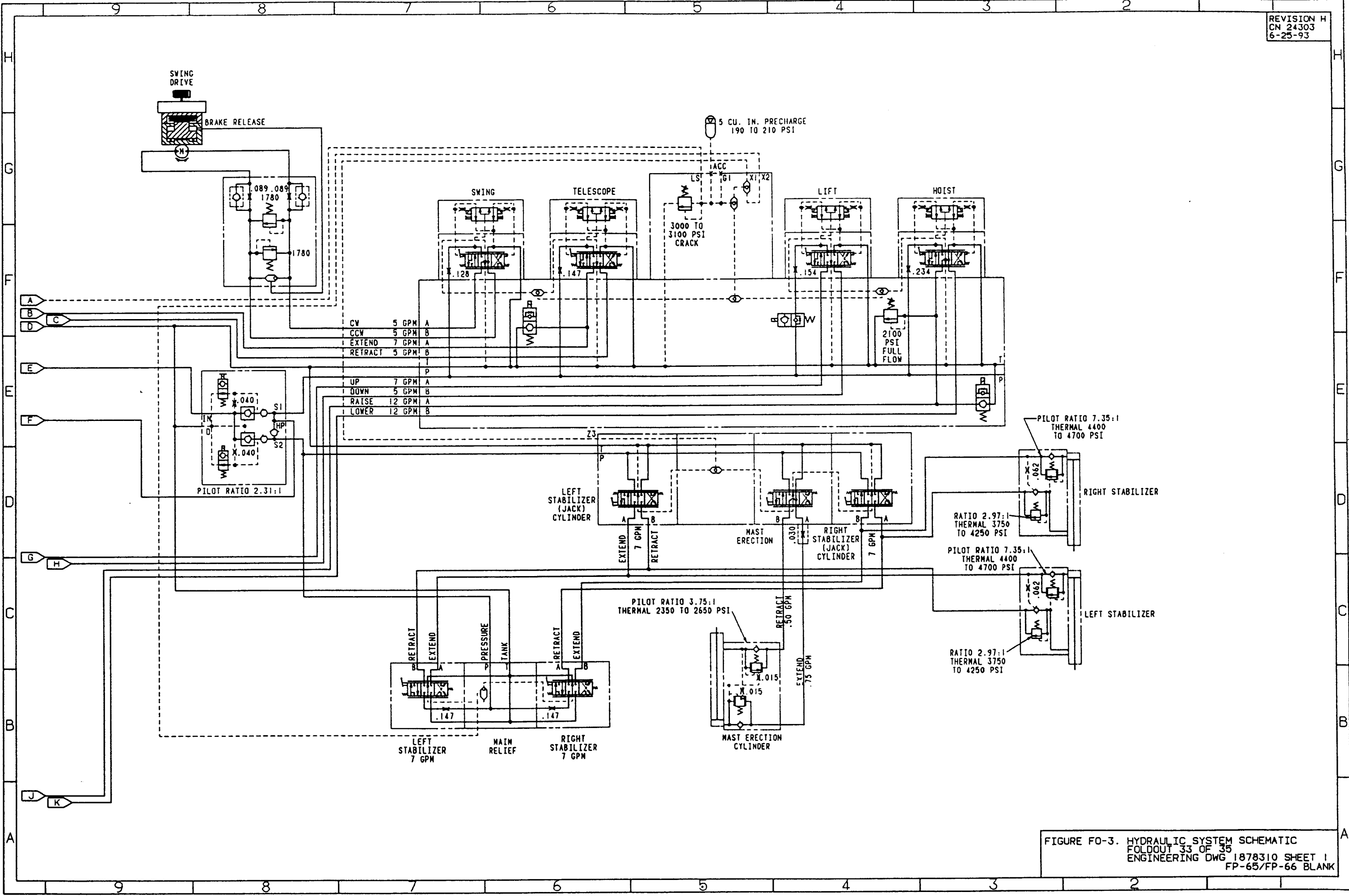


FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 33 OF 35
ENGINEERING DWG 1878310 SHEET 1
FP-65/FP-66 BLANK

REVISION E
CN 23777
2-14-92

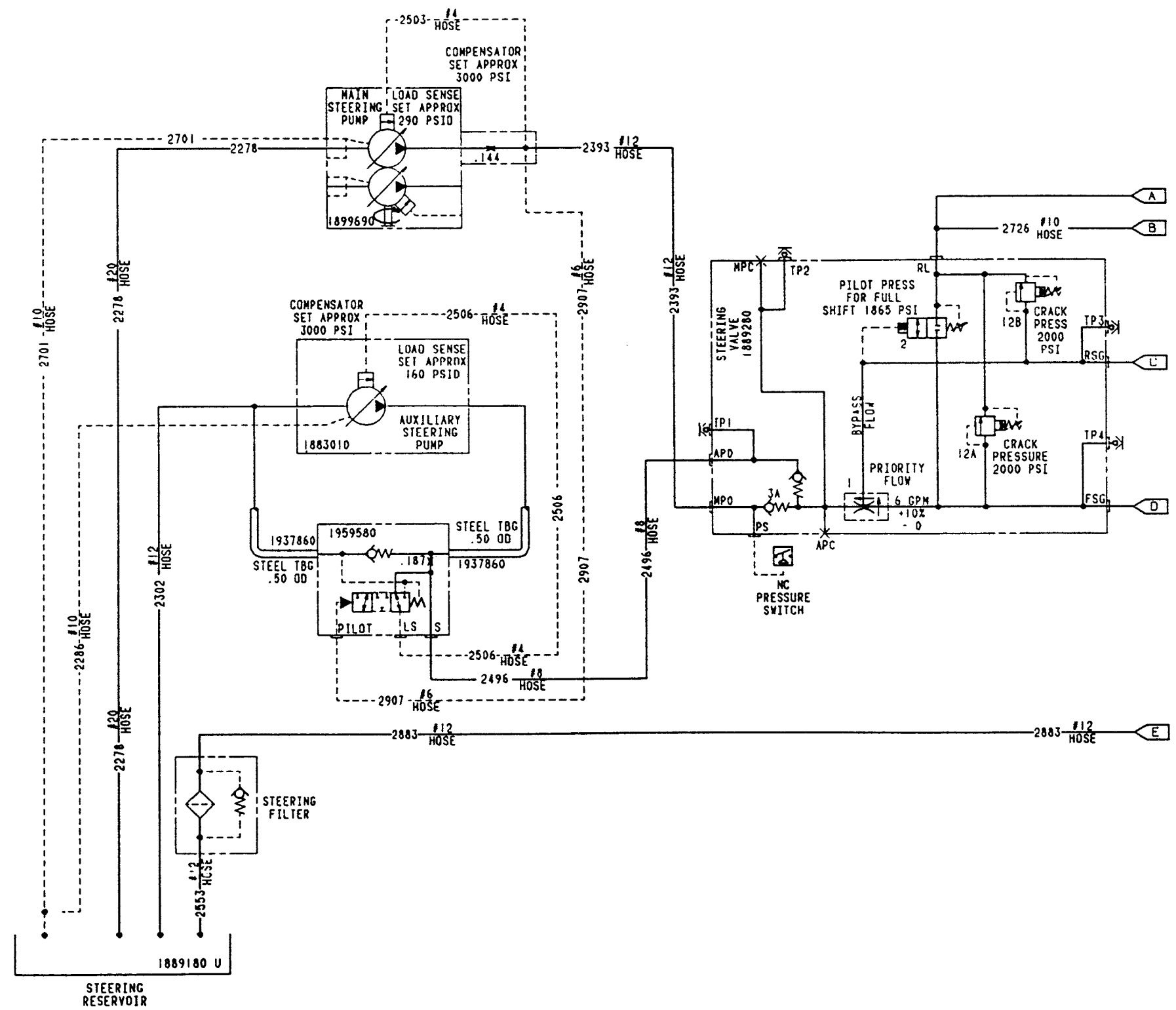


FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 34 OF 35
ENGINEERING DWG 1878310 SHEET 2
FP-67/FP-68 BLANK

REVISION E
CN 23777
2-14-92

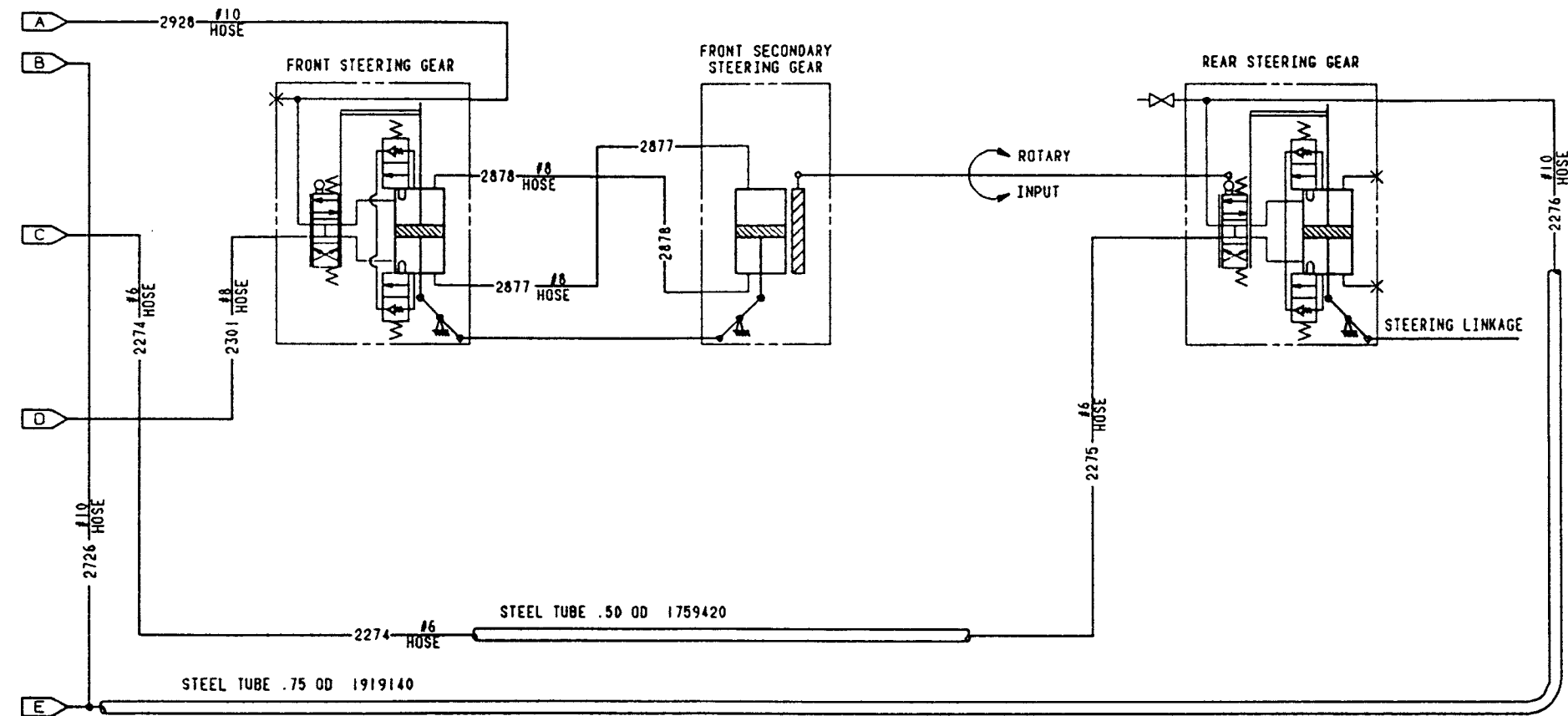


FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 35 OF 35
ENGINEERING DWG 1878310 SHEET 2
FP-69/FP-70 BLANK

SCHEMATICS

Section II. 200 AMP ALTERNATOR AND DDEC III/IV ENGINE.

Section II contains the schematics for trucks equipped with the 200 amp alternator and the DDEC III/IV engine.

REVISION D
CN 15194
12/23/97

CODE SORT				CODE SORT				CODE SORT			
CODE	ROUTING	SH	DESCRIPTION	CODE	ROUTING	SH	DESCRIPTION	CODE	ROUTING	SH	DESCRIPTION
439	MC116-MC106	4	EMERGENCY ENG STOP	1001	MC7-SPLICE	3		1008	MC27-MC3	6	FRONT TOW
439	MC116-S30	3	EMERGENCY ENG STOP	1001	MC8-SPLICE	3		1008	MC3-SPLICE	3	
439	MC116-S30	3	EMERGENCY ENG STOP	1001	SPLICE-L13	3		1008	MC3-MC4	3	
439	MC116-CB13	4	DDEC	1001	SPLICE-L14	3		1008	MC3-MC16	6	TRAILER CONN 12VDC
439	MC106-MC13	3		1001	S1-MC7	3	RH HEADLIGHT	1008	MC78-L22	6	RH TAIL LIGHT
439	SPLC-MC106	4		1002	S1-MC7	3	LH HEADLIGHT	1008	MC78-L24	6	LH TAIL LIGHT
439	MC11-MC18	5	ECM	1002	MC8-L11	3		1008C	MC25-MC15	6	TRAILER CONN 24VDC
439	MC8-L6	3	CHECK ENGINE LIGHT	1002	MC7-SPLICE	3		1008C	MC25-R14	4	B.O. SERVICE
439	MC8-L3	3	ENGINE STOP LIGHT	1002	SPLICE-MC8	3		1009	PS2-PS3	3	
439	MC44-MC8	3		1002	SPLICE-L18	3		1009	PS1-PS2	3	
439	MC11-SPLICE	4		1002	SPLICE-L16	3		1009	MC2-PS1	3	
439	SPLICE-MC44	4		1003	MC7-MC3	3		1009	MC2-CB6	4	STOP LIGHT
439	SPLC-MC116	4		1003	S1-MC7	3	LH RR TURN SIGNAL	1012	MC3-SPLICE	3	
505	MC44-MC8	3	TACHOMETER	1003	MC3-MC80	6		1012	SPLC-SPLC	3	
505	MC11-MC44	4		1003	MC3-MC16	6	TRAILER CONN 12VDC	1012	MC2-SPLICE	3	
505	MC8-G4	3		1003	MC1-R15	4	LH TURN LIGHT	1012	SPLC-SPLC	3	
505	MC11-MC18	5		1003	MC80-L24	6	LH STOP LIGHT	1012	SPLICE-L19	3	
509	MC11-MC18	5	ECM	1003	MC27-MC3	6	FRONT TOW	1012	MC2-R2	4	CLEARANCE LIGHTS
509	MC8-L3	3	ENGINE STOP LIGHT	1003	MC7-MC1	3		1012	MC3-SPLICE	6	
509	MC44-MC8	3		1003C	MC25-R17	4	LH TURN LIGHT	1012	SPLICE-MC27	6	
509	MC11-MC44	4		1003C	MC25-MC15	6	TRAILER CONN 12VDC	1012	SPLICE-MC80	6	
510	MC11-MC18	5	ECM	1004	MC7-MC1	3		1012	SPLICE-L32	6	RH SIDE MARKER
510	MC44-PS4	3	PARKING BRAKE	1004	MC7-MC3	3		1012	SPLICE-L34	6	LH SIDE MARKER
510	R22-MC44	4		1004	S1-MC7	3		1012	MC90-L31	6	RR SIDE MARKER
510	MC11-R22	4		1004	MC3-MC80	6		1012	MC90-L25	6	ID LIGHTS
528	MC11-MC18	5	DIAG. REQ.	1004	MC80-L22	6	RH STOP LIGHT	1012	MC80-MC90	6	
528	MC106-S17	3		1004	MC27-MC3	6		1012	MC90-L33	6	RR SIDE MARKER
528	MC11-MC106	4		1004	MC3-MC78	6		1016	MC92-MC2	3	
900	MC11-MC106	4		1004	MC3-MC16	6		1016	S15-MC92	3	
900	MC11-MC18	5	ECM	1004	MC1-R16	4		1016	MC2-R3	4	HORN
900	MC106-MC13	3		1004C	MC25-R16	4	RH TURN LIGHT	1017	SPLICE-R5	4	
901	MC11-MC18	5	ECM	1004C	MC25-MC15	6	TRAILER CONN 24VDC	1017	MC52-R14	4	
901	MC106-MC13	3		1005	MC126-S9	3		1017	R2-MC52	4	
901	MC11-MC106	4		1005	PS3-MC3	3		1017	MC2-SPLICE	4	
908	MC11-MC18	5	ECM	1005	MC3-MC16	6	TRAILER CONN 24VDC	1017	SPLICE-R1	4	
908	MC11-M4	4	THROTTLE POSN CONT	1005	MC126-PS1	3		1017	MC91-MC2	3	
916	MC44-MC6	3		1005	PS2-PS3	3		1017	S1-MC91	3	
916	MC11-MC44	4		1005	MC27-MC3	6	FRONT TOW	1017A	MC91-MC2	3	
916	MC38-M16	3		1005	PS1-PS2	3		1017A	S1-MC91	3	
916	MC6-MC38	3	VERNIER CONTROL	1005A	MC7-MC126	3		1017A	MC2-R5	4	
916	MC6-M35	3	THROTTLE SENSOR	1005A	MC126-S9	3		1018	MC8-L10	3	HIGH BEAM
916	MC11-MC18	5	ECM	1005A	S1-MC7	3	TURN SIGNAL/DIM SW	1018	MC8-1007	3	
952	MC38-M16	3		1006	MC2-SPLICE	3		1019	L15-1679	3	
952	MC11-MC44	4		1006	SPLICE-L12	3		1020	L14-L16	3	
952	MC44-MC6	3	THROTTLE SENSOR	1006	SPLICE-L17	3		1020	S2-MC21	3	
952	MC11-MC18	5	ECM	1006	MC2-R5	4	DIMMER	1020	MC60-CB24	5	
952	MC6-MC38	3	VERNIER CONTROL	1007	MC2-R5	4	DIMMER	1020	MC21-MC60	5	
953	M6-MC14	5	DDEC SIGNAL GROUND	1007	MC2-SPLICE	3		1020	M12-MC60	5	
953	MC14-SPLICE	4		1007	SPLICE-L12	3		1020A	CB24-PS12	5	
953	SPLICE-MC102	4		1007	SPLICE-L17	3		1020B	PS12-ENG	5	ALTERNATOR
953	SPLICE-R22	4		1008	MC3-MC78	6		1021	MC2-S2	3	
953	SPLICE-MC106	4		1008	MC4-S12	3	HEADLIGHTS	1021	MC2-R11	4	
953	MC106-S17	3						1021	R11-M76	4	
953	S17-MC13	3						1021A	R11-MC1	4	
988	MC11-R7	4	TRANSMISSION					1021A	MC1-MC21	3	
988	MC11-MC18	5	ECM					1021B	MC21-MC60	5	
1001	MC8-L4	3						1021B	MC60-R27	5	

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 3 OF 26
ENGINEERING DWG 3053493 SHEET 1
FP-5/FP-6 BLANK

		28	27	26	25	24	23	22	21	20		
		REVISION D										
H	CODE SORT				CODE SORT				CODE SORT			
	CODE	ROUTING	SH	DESCRIPTION	CODE	ROUTING	SH	DESCRIPTION	CODE	ROUTING	SH	DESCRIPTION
	1021	MC52-R11	4	FRONT TOW	1052	MC1-SPLICE	3		1080	MC2-M5	4	TURN SIGNAL/FLASHER
	1021A	R11-MC1	4		1052	SPLICE-L43	3	POST LIGHT	1082	MC2-MC52	4	
	1021A	MC1-MC21	3		1052	SPLC-MC125	3		1082	MC2-M81	3	
	1021A	MC21-MC60	5		1052	MC125-G12	3	AIR RESTRICTION GA	1082	M81-S3	3	
	1021A	MC60-R27	5		1052	MC1-SPLICE	3		1082	MC52-CB15	4	HEATER
	1026	MC52-CB16	4		1052	MC1-CB1	4	15 AMP HEADLIGHT	1084	MC1-CB5	4	B.O. LIGHTS
	1029	MC2-R6	4	BEACON	1052	MC50-MC1	4		1084	MC4-MC1	3	
	1029	MC2-MC28	3						1084	MC4-S9	3	
	1031	R3-SPLICE	4		1055	M7-R27	5		1091	L17-GROUND	3	
	1032	MC8-MC21	3						1092	L7-MC8	3	
	1032	M39-L9	3	LOW OIL PSI	1056	MC111-MC32	3		1092	MC8-M51	3	
	1032	MC8-M39	3		1056	MC32-MC109	6	CTI POWER MANIFOLD	1093	MC31-MC57	6	
	1032	PS9-MC21	5	ENGINE OIL PSI SW					1093	MC1-MC31	3	
	1033	M39-M18	3	OIL PSI/H WTR ALM	1057	MC111-MC32	3		1093	MC1-CB16	4	
	1036	MC23-M8	5		1057	MC32-MC109	6	CTI POWER MANIFOLD	1093	MC57-S13	6	DRIVE LINE LOCK-UP
	1036	MC23-M7	5		1058	MC32-MC109	6	CTI POWER MANIFOLD	1094	S5-S14	3	
	1036	MC21-MC56	5	ETHER START	1058	MC111-MC32	3		1095	R23-R24	4	
	1036	MC21-S25	3		1059	MC32-MC109	6	CTI POWER MANIFOLD	1095	MC44-R23	4	
	1040	CB4-R4	4	WORKLIGHT	1059	MC111-MC32	3		1095	MC31-MC44	3	
	1040A	S6-MC4	3		1061	MC22-MC109	6	CTI POWER MANIFOLD	1095	MC57-S13	6	DRIVE LINE LOCK-UP
	1040A	MC2-R4	4	WORKLIGHT	1061	MC111-MC32	3		1095	MC31-MC57	6	
	1040A	MC4-MC2	3		1062	MC32-MC109	6	CTI POWER MANIFOLD				
	1040B	MC3-MC79	6	RH WORKLIGHT	1062	MC111-MC32	3					
	1040B	MC2-MC3	3		1063	MC32-MC109	6	CTI POWER MANIFOLD				
	1040B	MC2-R4	4	WORKLIGHT	1064	MC32-MC109	6	CTI POWER MANIFOLD	1113	MC8-MC21	3	
	1040B	MC3-MC54	6	LH WORKLIGHT	1064	MC111-MC32	3		1113	G2-MC8	3	OIL PSI GAUGE
1045	R27-M7	5		1065	MC32-MC109	6	CTI POWER MANIFOLD	1113	SU3-MC21	5	ENG OIL PSI SNDG UN	
1049	MC2-R1	4	HEADLIGHTS	1065	MC111-MC32	3		1114	M66-MC8	3		
1049	MC4-MC2	3		1066	MC32-MC64	6	CTI AUX MANIFOLD	1114	MC96-MC8	3	LOW OIL LEVEL LIGHT	
1049	S12-MC4	3		1066	MC110-MC32	3		1114	MC8-L36	3		
1052	S20-S19	3	CHEM ALM-GPF	1067	MC32-MC64	6	CTI AUX MANIFOLD	1114	L36-M66	3		
1052	S19-S18	3	GAS PART FLTR-SRW	1068	MC32-MC64	6	CTI AUX MANIFOLD	1118	MC4-1919	3		
1052	S18-S4	3	SRW-SRW/MHC	1068	MC110-MC32	3		1118	S8-MC4	3		
1052	S4-S30	3	SRW/MHC-EMER ENG S D	1070	MC32-MC64	6	CTI AUX MANIFOLD	1120	M66-MC8	3		
1052	S30-SPLICE	3	EMER ENG SHUT DOWN	1070	MC110-MC32	3		1120	M66-M3	3		
1052	SPLICE-G11	3	AIR PRESSURE GAUGE	1071	MC110-MC32	3		1120	PS6-PS7	3		
1052	MC4-SPLICE	3		1071	MC32-MC64	6	CTI AUX MANIFOLD	1120	PS6-MC8	3		
1052	SPLICE-L44	3	HEATER PANEL LIGHT	1072	R26-R25	3		1120	L2-M66	3		
1052	S5-S6	3	BEACON LT-WORK LT	1072	MC110-MC32	3		1137	M6(1)-M6(2)	5		
1052	S6-S7	3	WORK LT-WSHLD WSHR	1072	MC32-MC64	6	CTI AUX MANIFOLD	1137	M6(3)-M6(4)	5		
1052	S7-S8	3	WSHLD WASHER-WIPERS	1073	MC32-MC64	6	CTI AUX MANIFOLD	1138	M48-M7	5	SHUNT	
1052	S8-S21	3	WIPERS-DOME LIGHT	1073	MC110-MC32	3		1138	M7-M23	5	SLAVE	
1052	S21-S9	3	DOME LT-B.O.SERV SEL	1074	MC110-MC32	3		1138	M6-M48	5	SHUNT	
1052	S9-S10	3	BO SERV SEL-BO MKR	1074	R25-CB10	4		1138	M77-M7	5	ARCTIC BATTERIES	
1052	S10-S11	3	B.O. MARKER-B.O. DR	1074	MC32-MC64	6	CTI AUX MANIFOLD	1139	M7-M23	5	SLAVE	
1052	S11-S12	3	B.O. DRIVE-HEADLTS	1075	M6-R25	4/3		1139	M6-M7	5		
1052	S12-S16	3	HEADLIGHTS-ENG BK	1075B	R25-R18	4		1139	M77-M7	5	ARCTIC BATTERIES	
1052	S16-S14	3	ENG BRAKE-RHEO/DOME	1076	MC110-MC32	3		1147	TS2-MC21	5	ENG WTR TEMP SNDG UN	
1052	S14-SPLICE	3	RHEOSTAT/DOME	1076	MC32-MC64	6	CTI AUX MANIFOLD	1147	M39-L8	3	HIGH WATER TEMP	
1052	SPLICE-G6	3	VOLTMETER 12V	1079	CB5-M6	4	HAZARD LIGHTS	1147	MC8-MC21	3		
1052	SPLC-SPLC	3		1080	MC7-MC2	3		1147	MC8-M39	3		
1052	SPLICE-G10	3	XMSN OIL TEMP GAUGE					1149	MC1-R10	4	REVERSE	
1052	SPLICE-G1	3	WATER TEMP GAUGE					1149	MC3-MC78	6		
1052	SPLICE-G2	3	OIL PRESSURE GAUGE					1149	MC1-MC124	3		
1052	SPLICE-G4	3	TACHOMETER					1149	MC7B-MC77	6	REVERSE LIGHT	
1052	SPLICE-G5	3	SPEEDOMETER					1149	MC124-MC77	6		
1052	SPLICE-G3	3	FUEL GAUGE									

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 4 OF 26
 ENGINEERING DWG 3053493 SHEET 2
 FP-7/FP-8 BLANK

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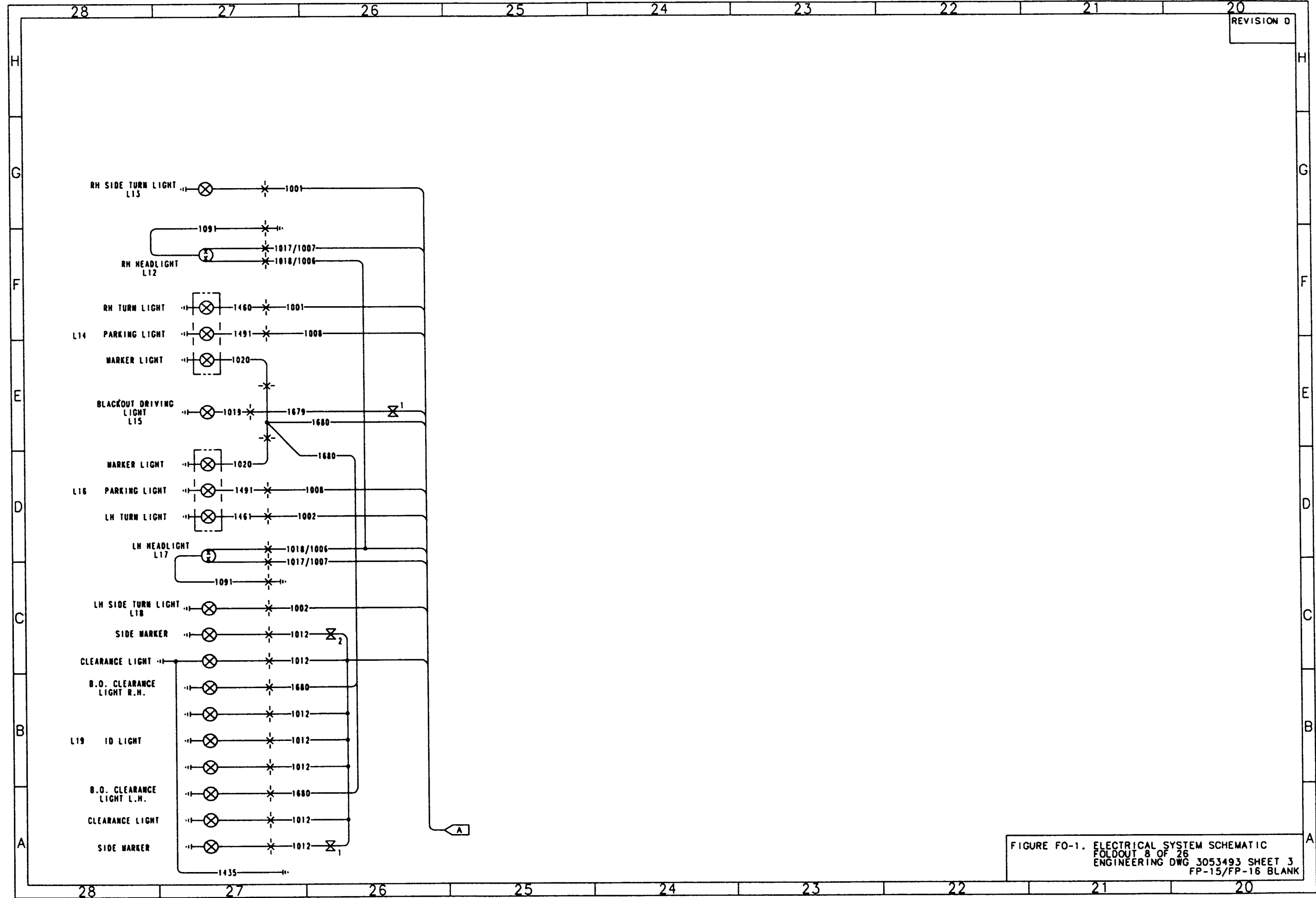


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 8 OF 26
 ENGINEERING DWG 3053493 SHEET 3
 FP-15/FP-16 BLANK

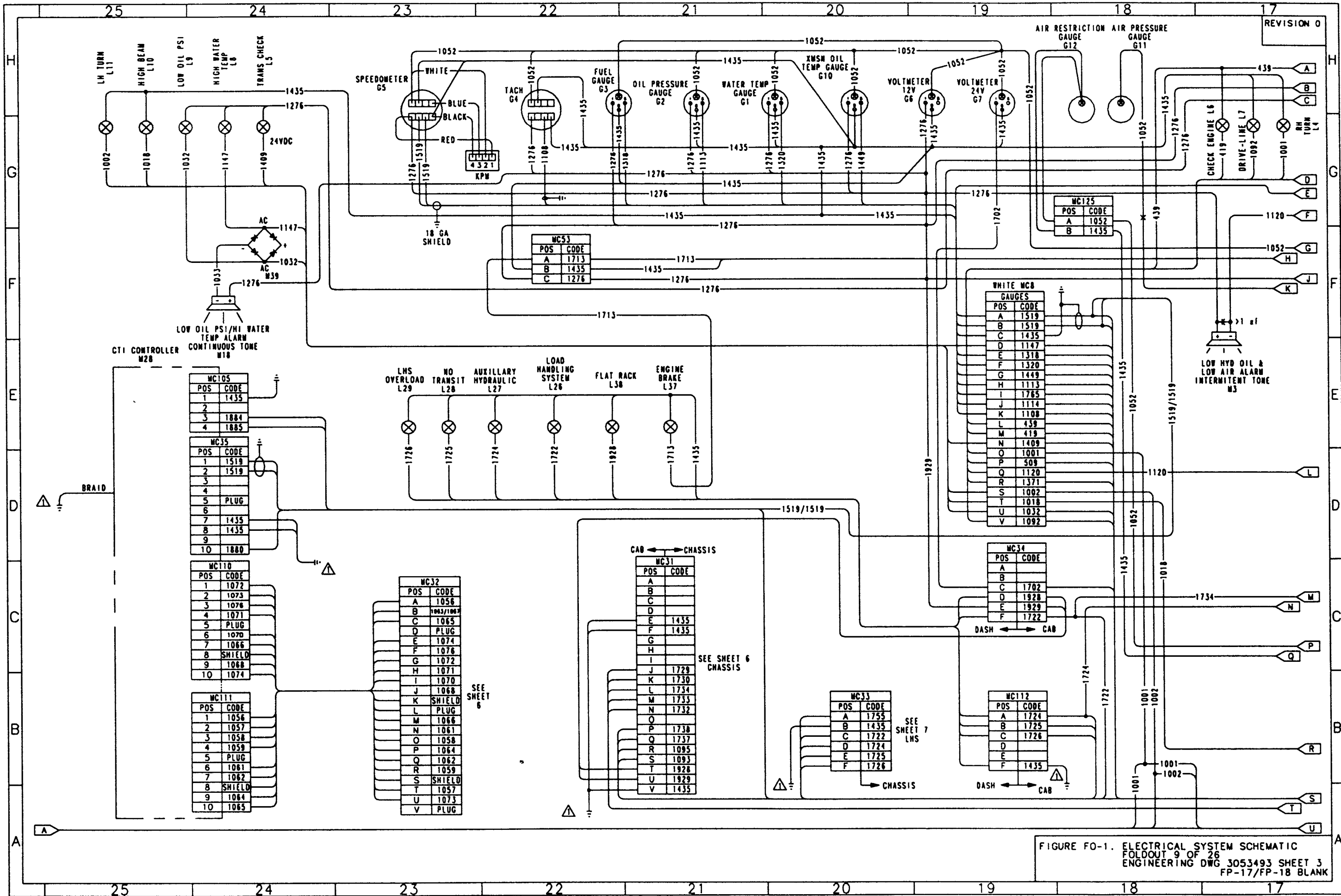


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 9 OF 26 ENGINEERING DWG 3053493 SHEET 3 FP-17/FP-18 BLANK

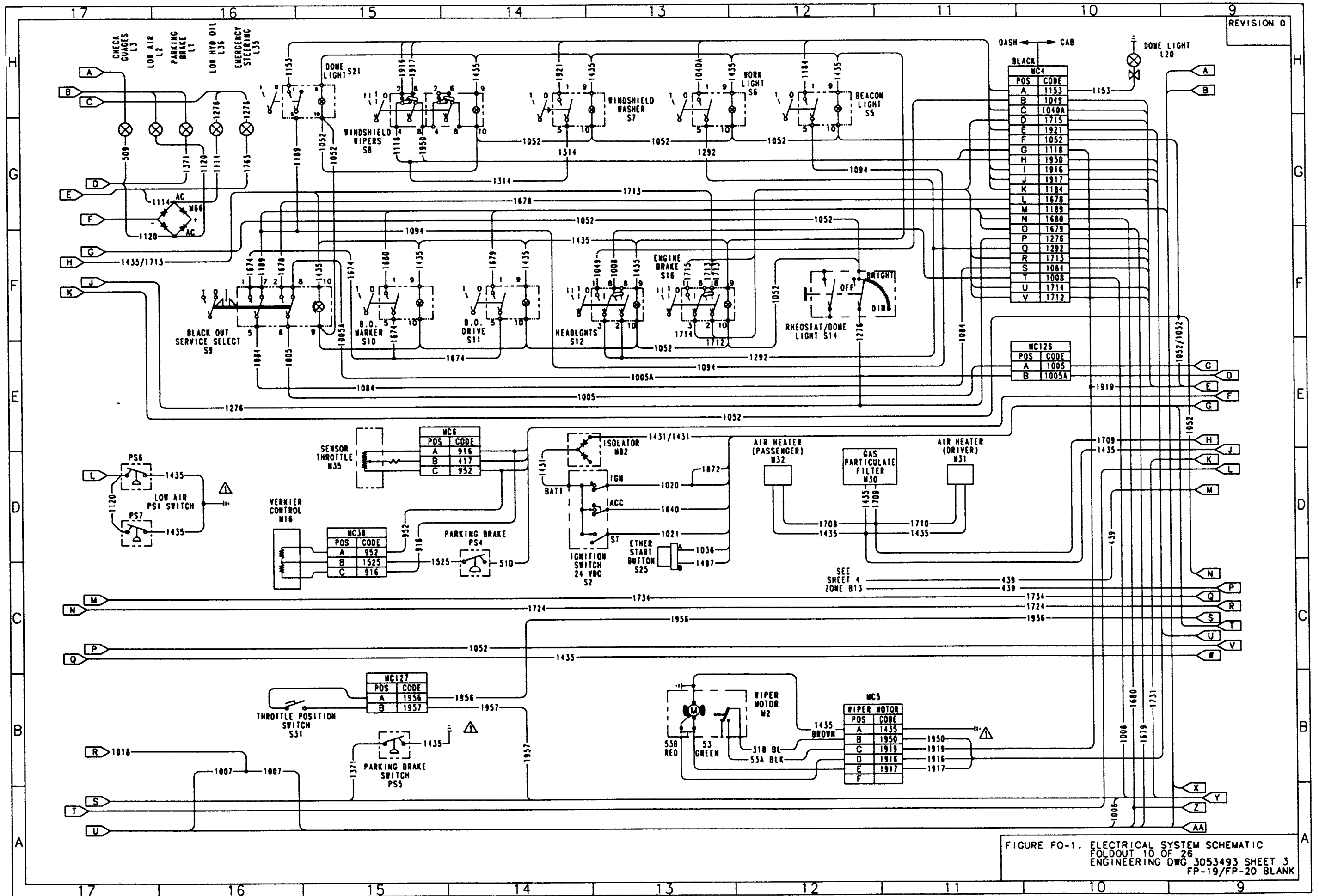


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 10 OF 26 ENGINEERING DWG 3053493 SHEET 3 FP-19/FP-20 BLANK

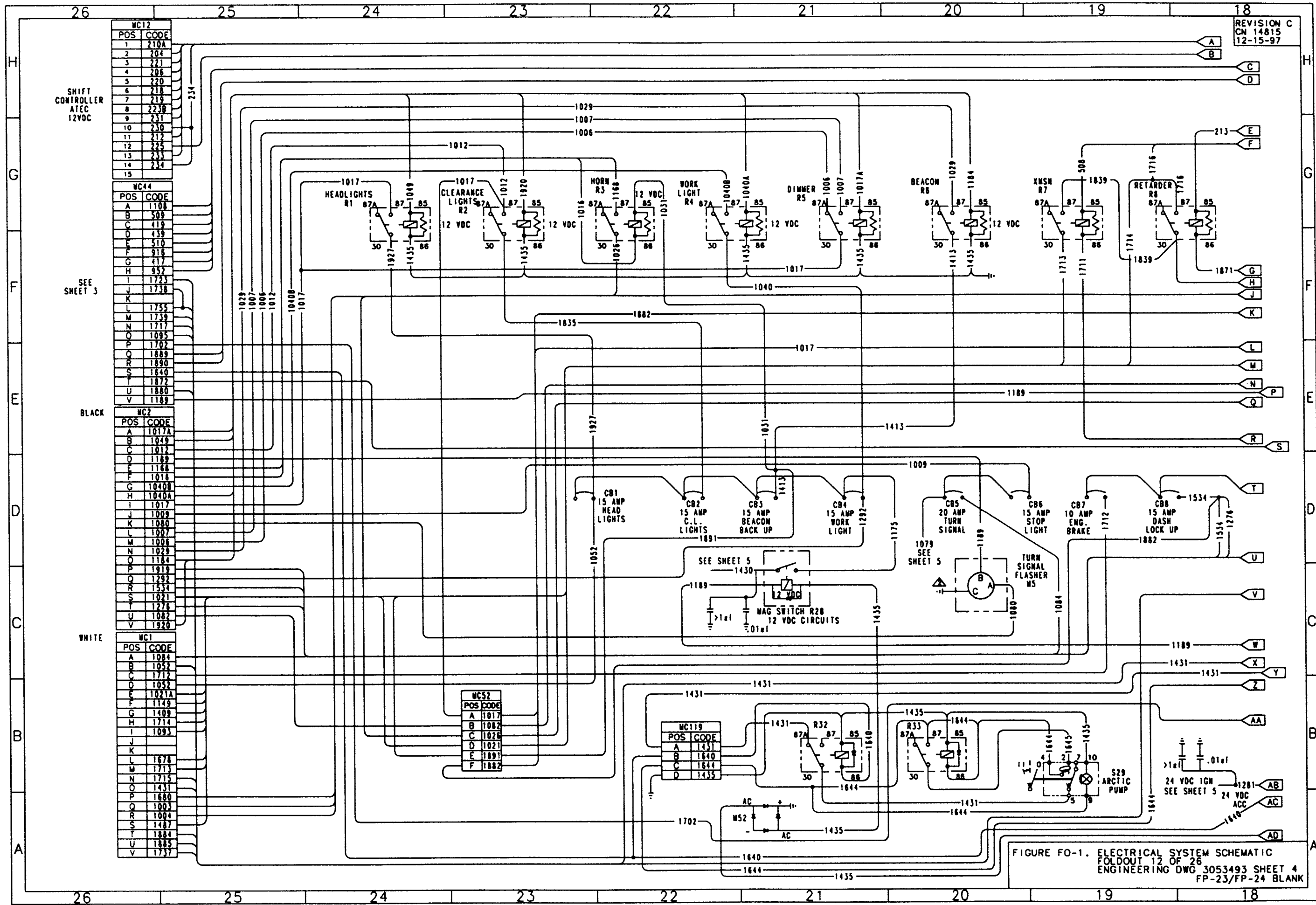


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 12 OF 26
ENGINEERING DWG 3053493 SHEET 4
FP-23/FP-24 BLANK

REVISION C
CN 14815
12-15-97

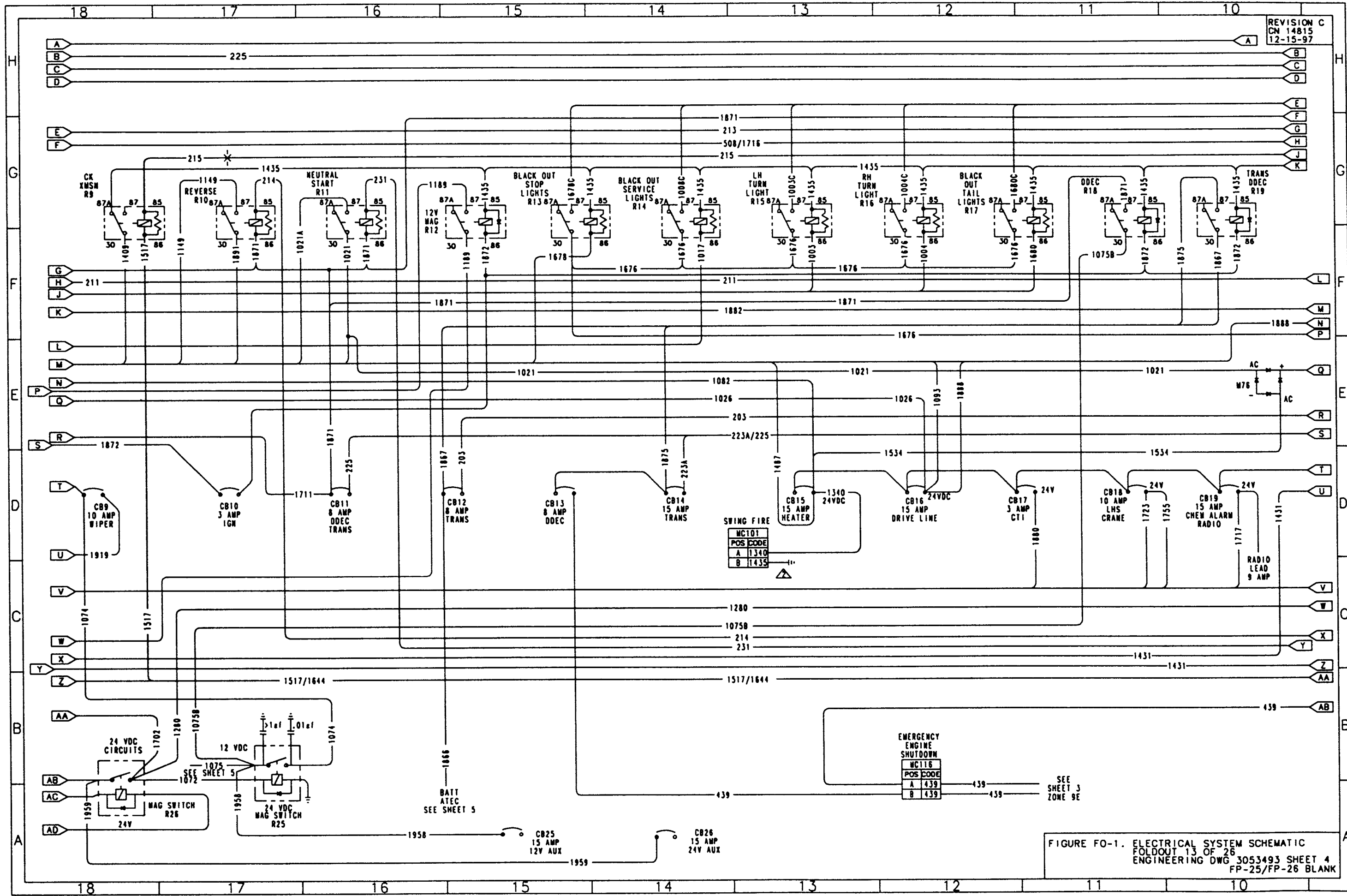


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 13 OF 26
ENGINEERING DWG 3053493 SHEET 4
FP-25/FP-26 BLANK

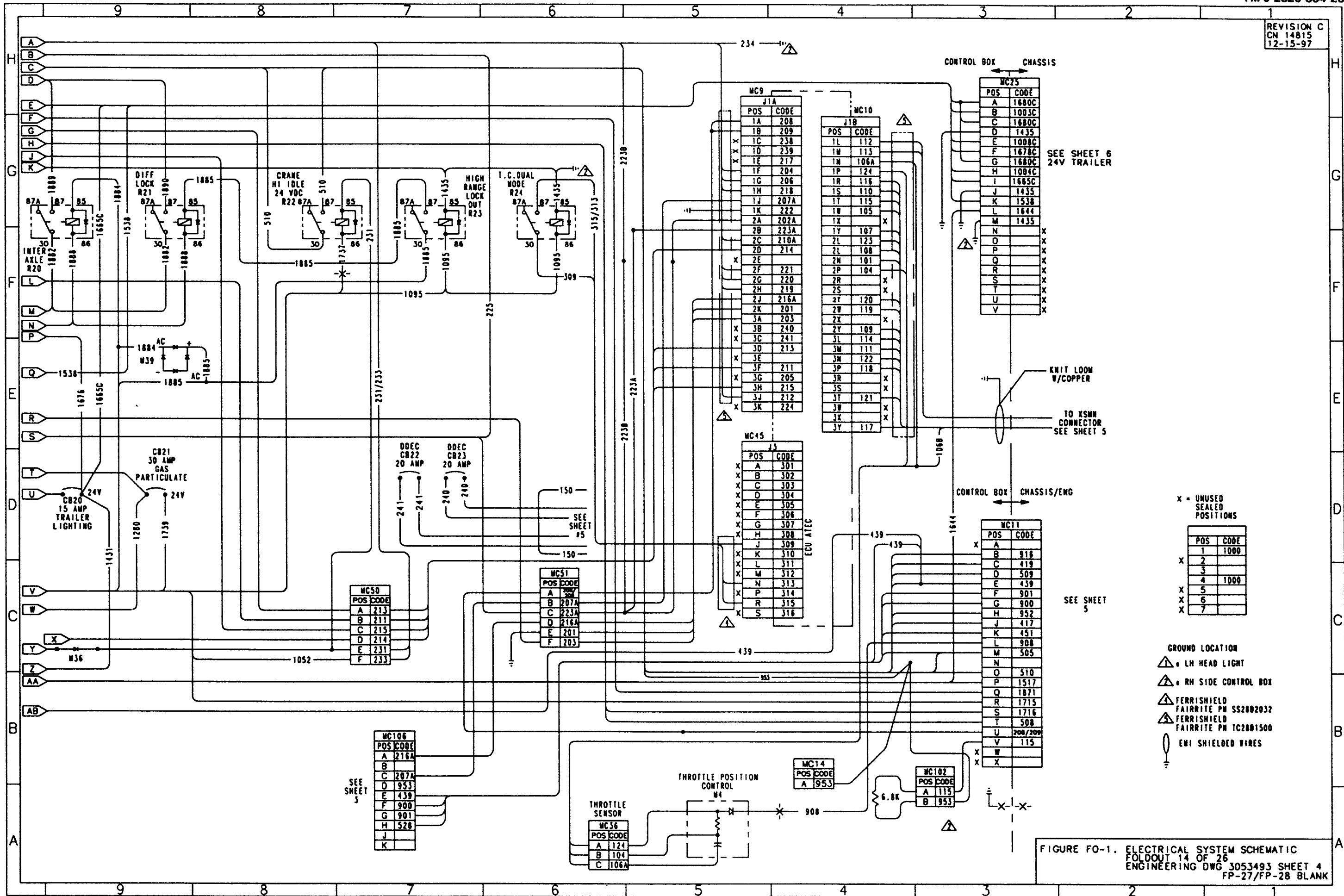


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 14 OF 26
ENGINEERING DWG 3053493 SHEET 4
FP-27/FP-28 BLANK

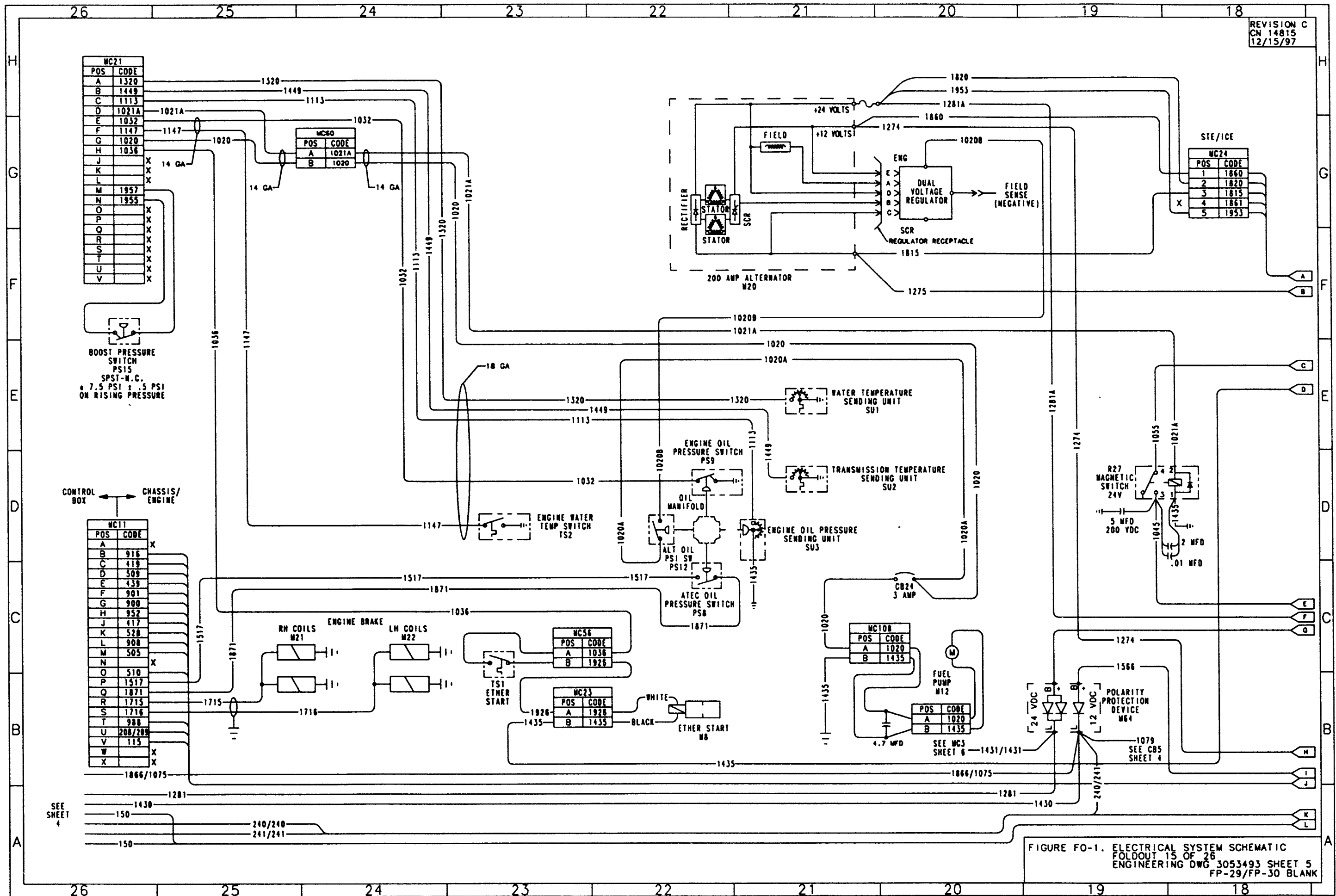


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 15 OF 26
ENGINEERING DWG 3053493 SHEET 5
FP-29/FP-30 BLANK

REVISION G6
CN 20233
10/12/99

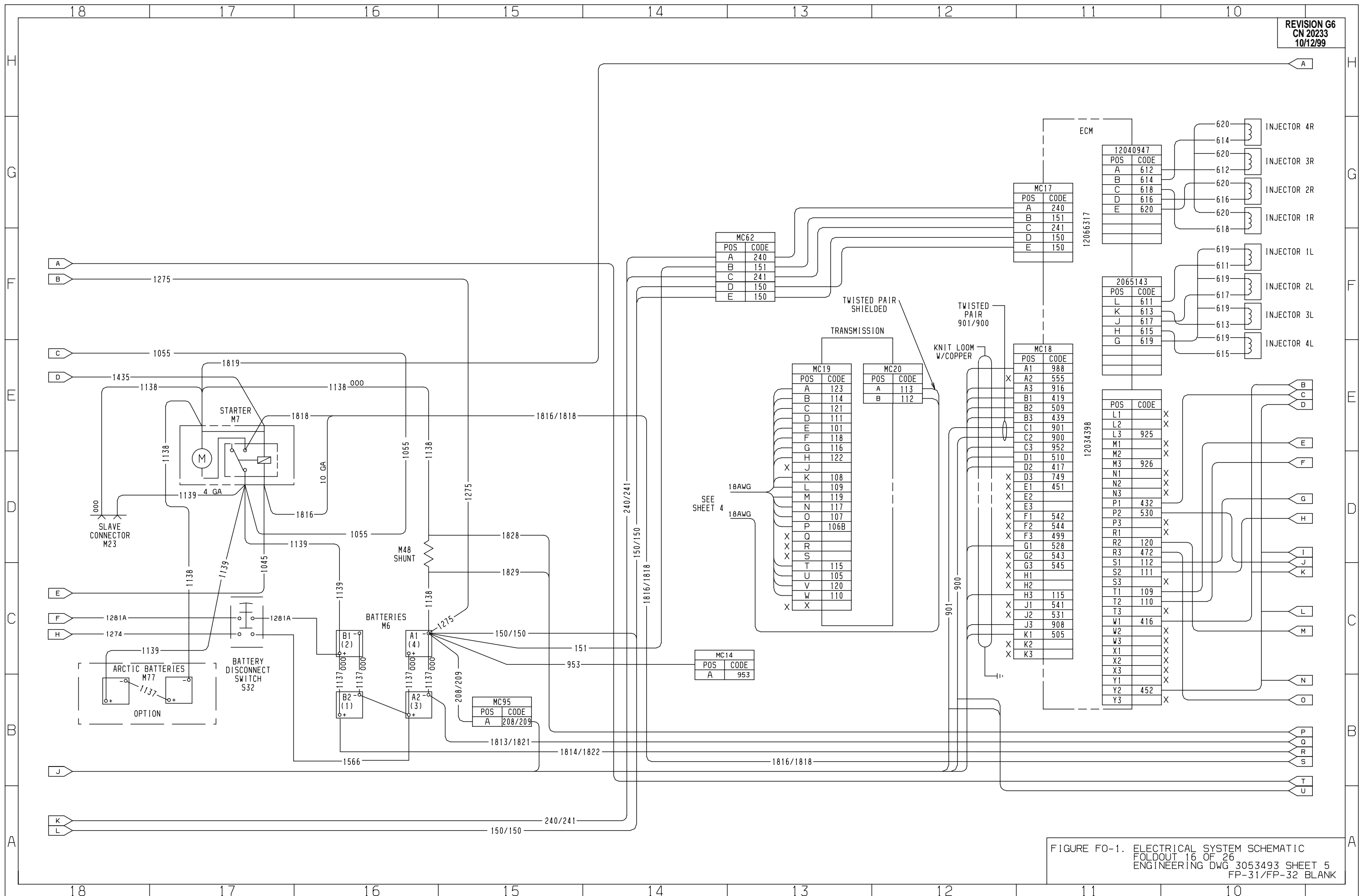
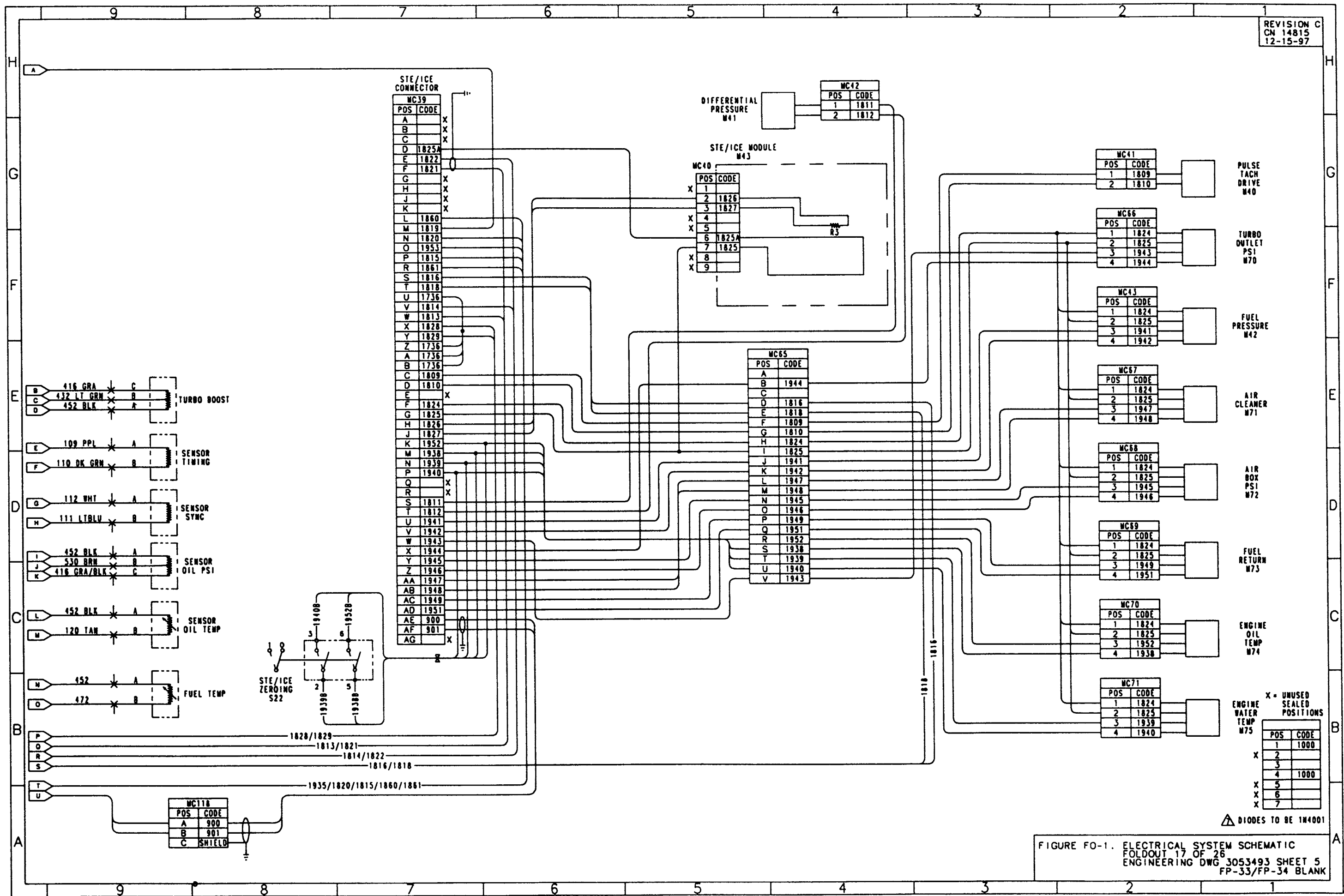


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 16 OF 26
ENGINEERING DWG 3053493 SHEET 5
FP-31/FP-32 BLANK

REVISION C
CN 14815
12-15-97



X = UNUSED SEALED POSITIONS

POS	CODE
1	1000
X	2
X	3
X	4
X	1000
X	5
X	6
X	7

▲ DIODES TO BE 1N4001

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 17 OF 26
ENGINEERING DWG 3053493 SHEET 5
FP-33/FP-34 BLANK

REVISION 0

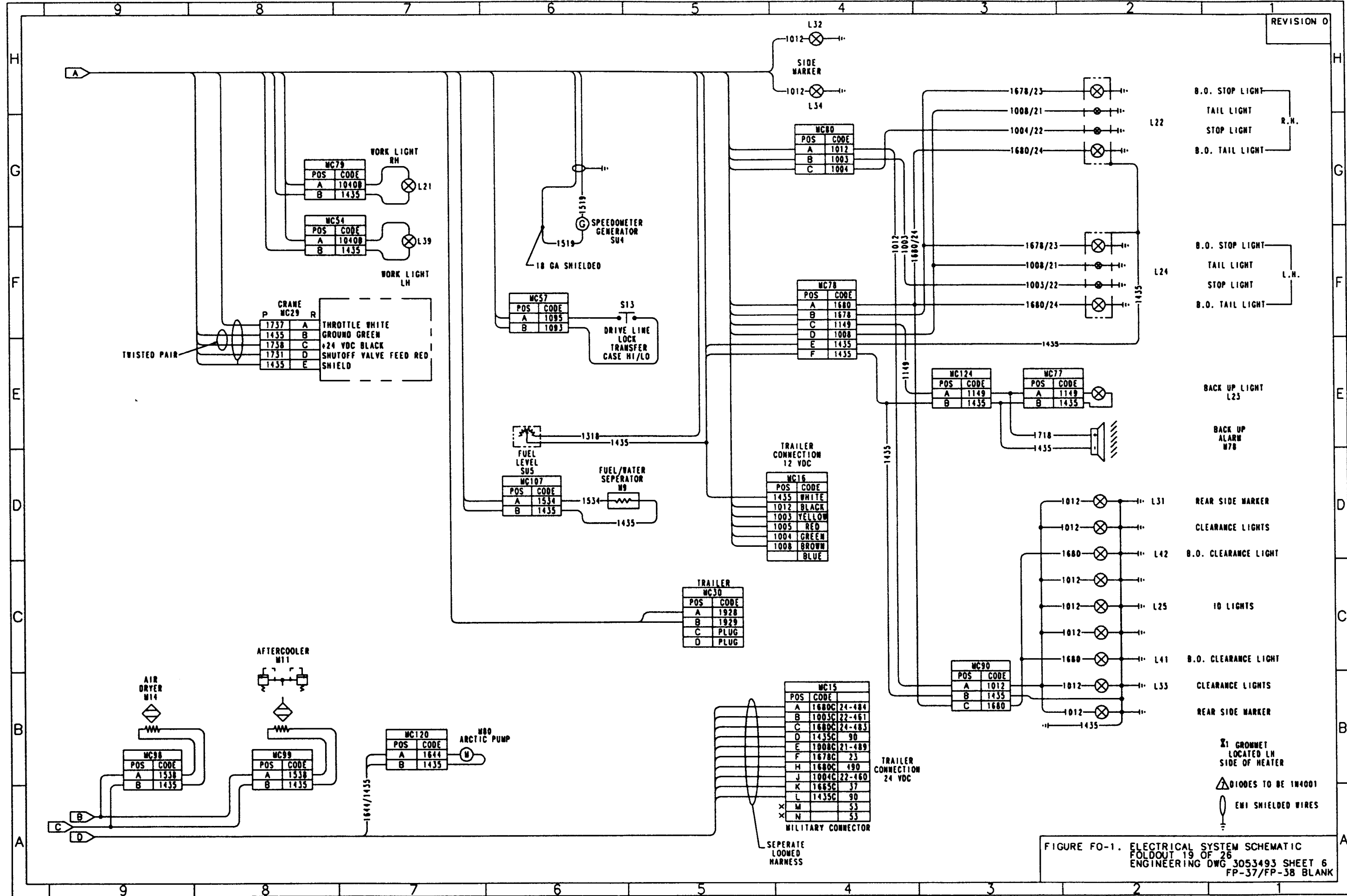


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 19 OF 26 ENGINEERING DWG 3053493 SHEET 6 FP-37/FP-38 BLANK

X1 GROMMET LOCATED LN SIDE OF HEATER
 Δ DIODES TO BE 1N4001
 ⊗ EMI SHIELDED WIRES

REVISION 0

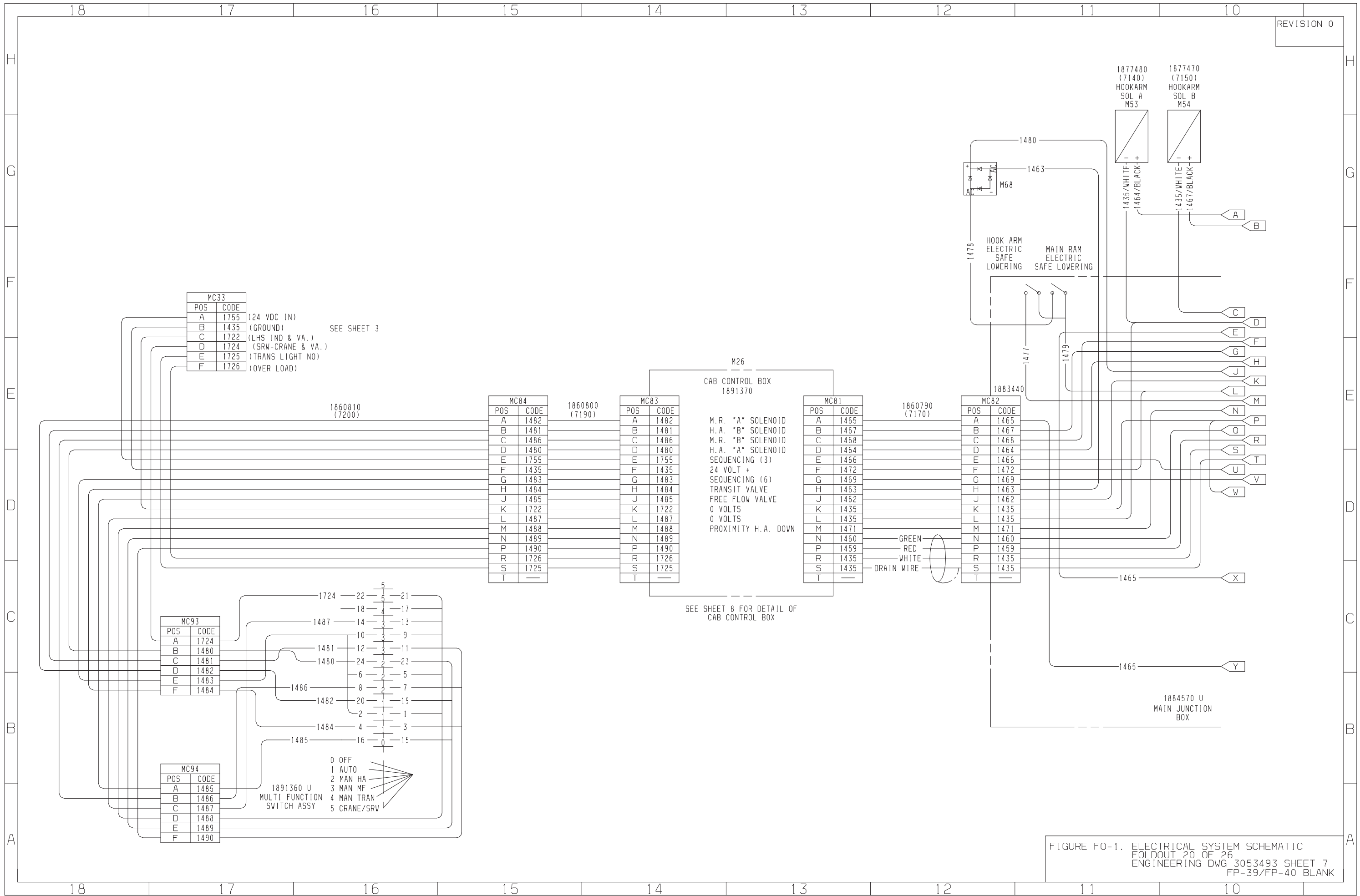


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 20 OF 26
 ENGINEERING DWG 3053493 SHEET 7
 FP-39/FP-40 BLANK

REVISION 0

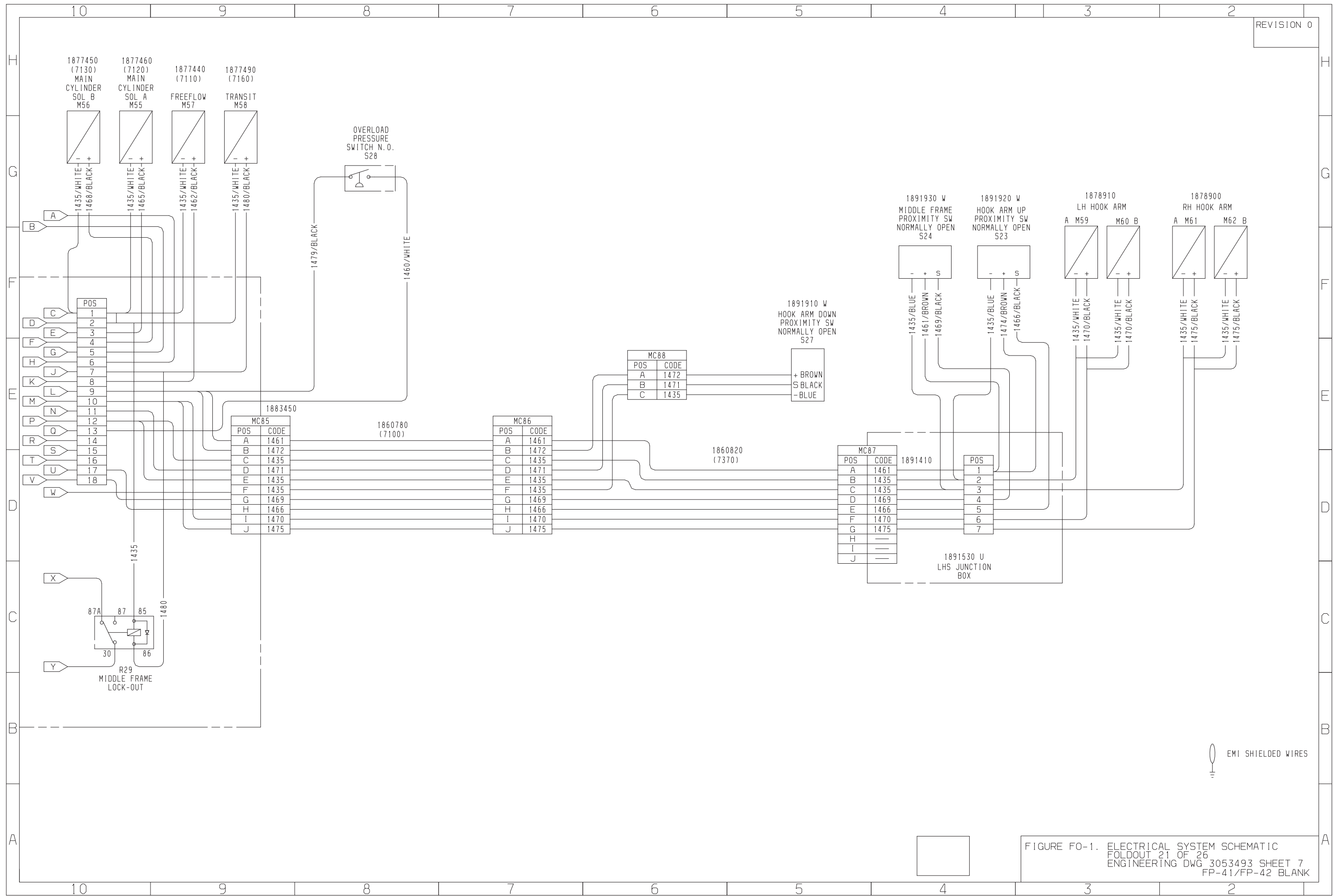
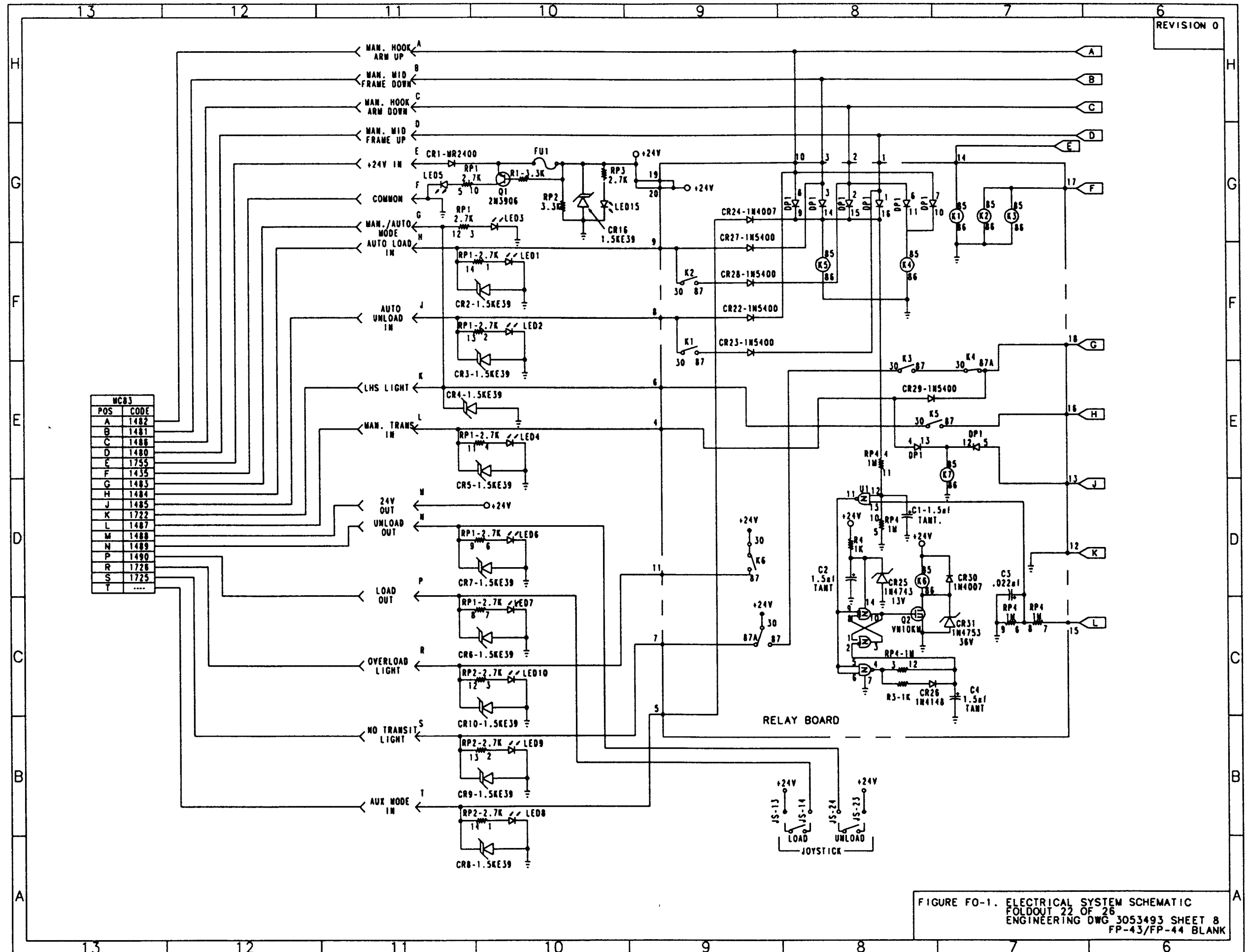
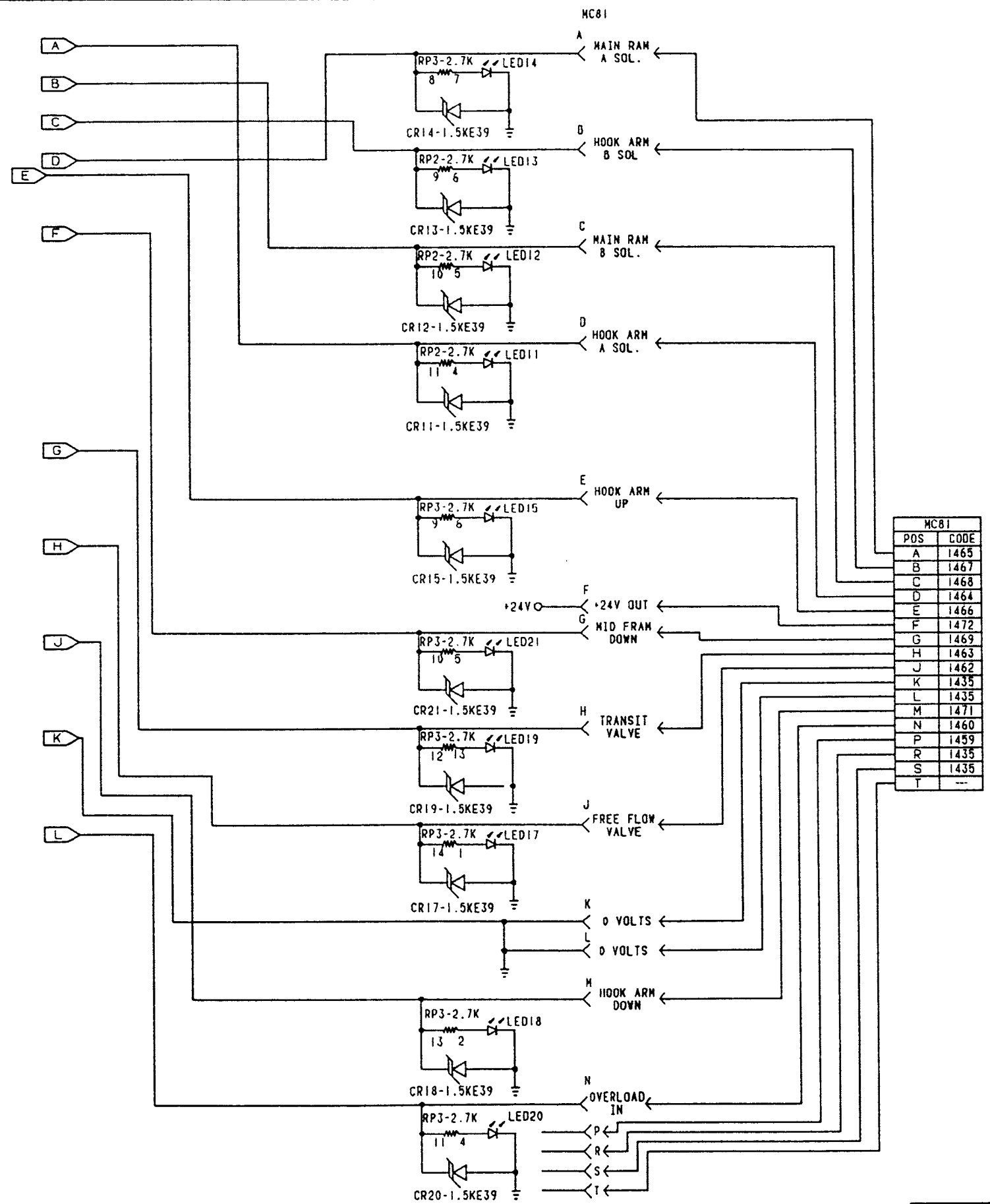


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 21 OF 26
 ENGINEERING DWG 3053493 SHEET 7
 FP-41/FP-42 BLANK



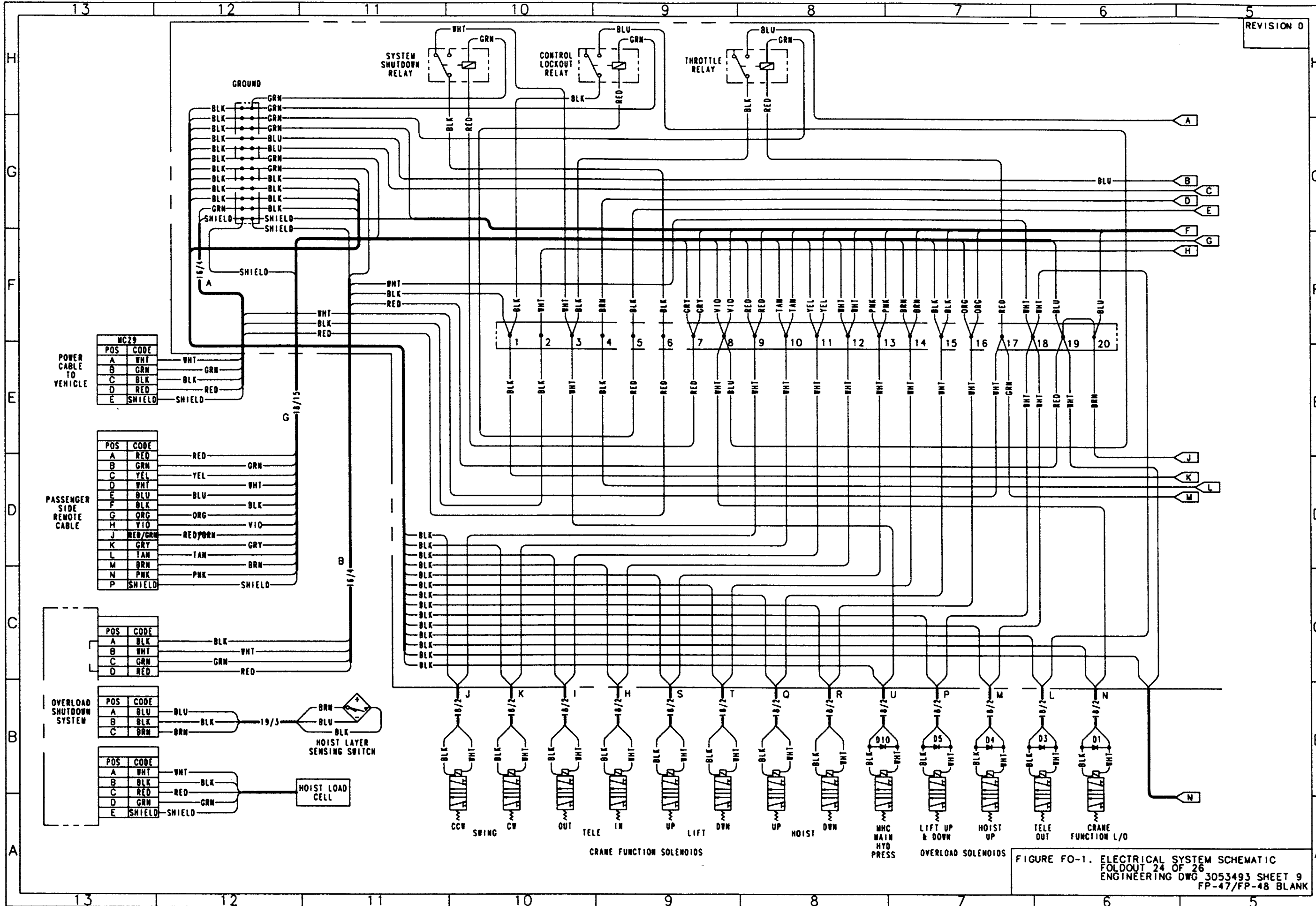
MC83	
POS	CODE
A	1482
B	1481
C	1486
D	1480
E	1755
F	1435
G	1483
H	1484
J	1485
K	1722
L	1487
M	1488
N	1489
P	1490
R	1728
S	1725
T

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 22 OF 26
 ENGINEERING DWG 3053493 SHEET 8
 FP-43/FP-44 BLANK



MC81	
POS	CODE
A	1465
B	1467
C	1468
D	1464
E	1466
F	1472
G	1469
H	1463
J	1462
K	1435
L	1435
M	1471
N	1460
P	1459
R	1435
S	1435
T	---

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 23 OF 35
 ENGINEERING DWG 1878290 SHEET 8
 FP-45/FP-46 BLANK



POS	CODE	WHT	GRN	BLK	RED	SHIELD
A	WHT					
B	GRN					
C	BLK					
D	RED					
E	SHIELD					

POS	CODE	RED	GRN	YEL	WHI	BLU	BLK	ORG	VIO	RED/GRN	RED/BRN	GRY	TAN	BRN	PNK	SHIELD
A	RED															
B	GRN															
C	YEL															
D	WHI															
E	BLU															
F	BLK															
G	ORG															
H	VIO															
J	RED/GRN															
K	GRY															
L	TAN															
M	BRN															
N	PNK															
P	SHIELD															

POS	CODE	BLK	WHI	GRN	RED
A	BLK				
B	WHI				
C	GRN				
D	RED				

POS	CODE	BLU	BLK	BRN
A	BLU			
B	BLK			
C	BRN			

POS	CODE	WHI	BLK	RED	GRN	SHIELD
A	WHI					
B	BLK					
C	RED					
D	GRN					
E	SHIELD					

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 24 OF 26 ENGINEERING DWG 3053493 SHEET 9 FP-47/FP-48 BLANK

REVISION 0

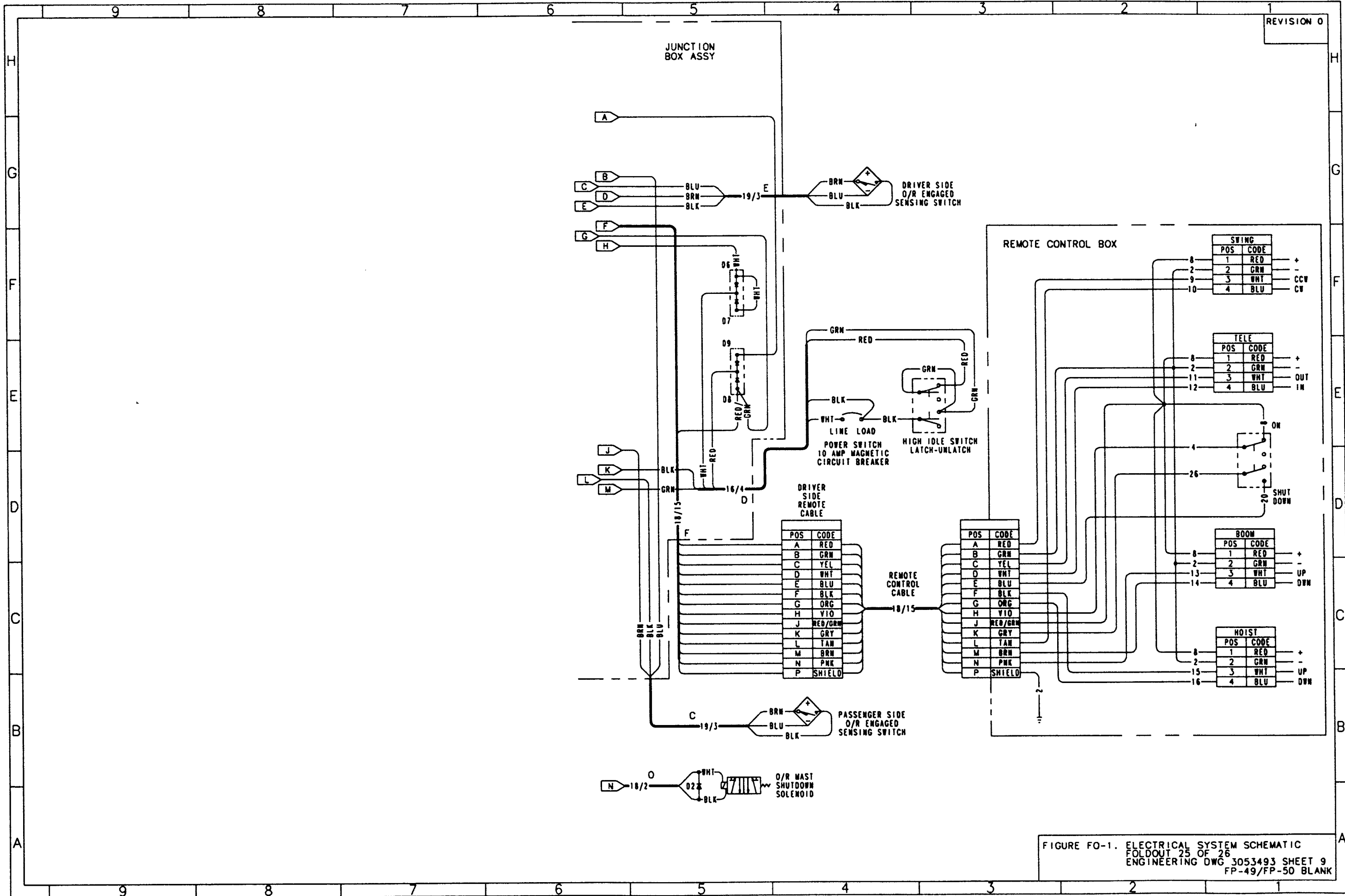
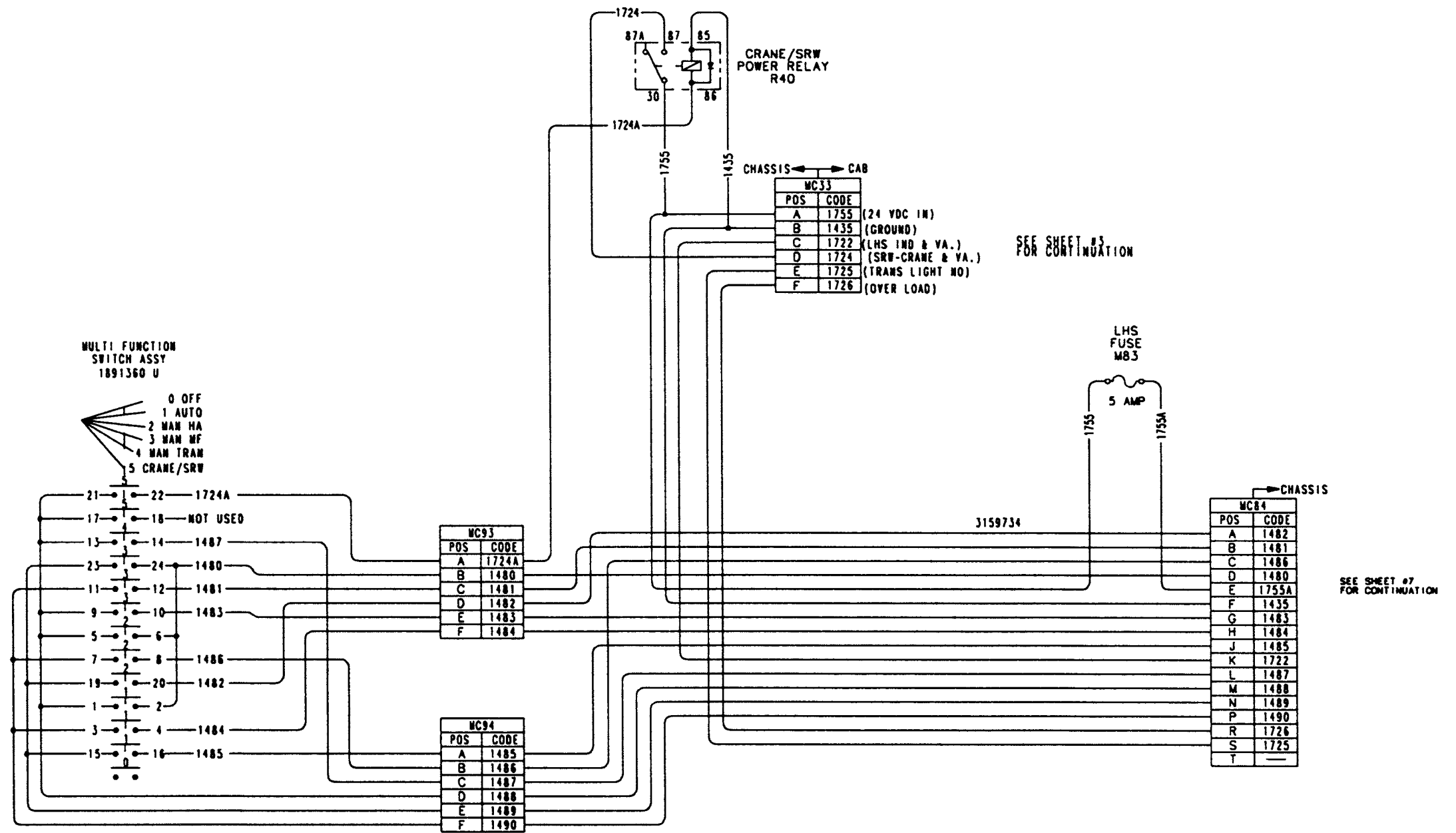


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 25 OF 26
 ENGINEERING DWG 3053493 SHEET 9
 FP-49/FP-50 BLANK



FOR LHS CIRCUIT PROTECTION CONFIGURATION

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 25 OF 26
 ENGINEERING DWG 3053493 SHEET 10
 FP-51/FP-52 BLANK

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

Official:




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109		51		

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TEAR ALONG PERFORATION LINE

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Rock Island, IL 61299-7630

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER TM 9-2320-364-20	PUBLICATION DATE	PUBLICATION TITLE Palletized Load System Unit Maintenance Manual
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BE EXACT... PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO	PARA-GRAPH	FIGURE NO.	TABLE NO	

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TEAR ALONG PERFORATION LINE

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter=10 Millimeters=0.01 Meters=0.3937 Inches
 1 Meter=100 Centimeters=1000 Millimeters=39.37 Inches
 1 Kilometer=1000 Meters=0.621 Miles

SQUARE MEASURE

1 Sq Centimeter=100 Sq Millimeters=0.155 Sq Inches
 1 Sq Meter=10,000 Sq Centimeters=10.76 Sq Feet
 1 Sq Kilometer=1,000,000 Sq Meters=0.386 Sq Miles

WEIGHTS

1 Gram=0.001 Kilograms=1000 Milligrams=0.035 Ounces
 1 Kilogram=1000 Grams=2.2 Lb
 1 Metric Ton=1000 Kilograms=1 Megagram=1.1 Short Tons

CUBIC MEASURE

1 Cu Centimeter=1000 Cu Millimeters=0.06 Cu Inches
 1 Cu Meter=1,000,000 Cu Centimeters=35.31 Cu Feet

LIQUID MEASURE

1 Milliliter=0.001 Liters=0.0338 Fluid Ounces
 1 Liter=1000 Milliliters=33.82 Fluid Ounces

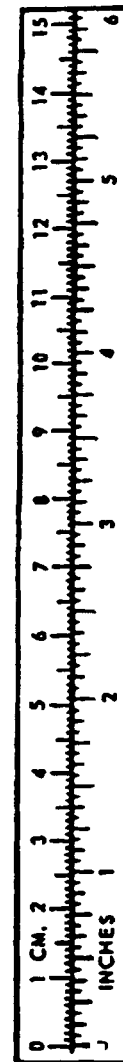
TEMPERATURE

$5/9 (°F - 32) = °C$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 C + 32 = F$

APPROXIMATE CONVERSION FACTORS

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Inches.....	Centimeters.....	2.540
Feet.....	Meters.....	0.305
Yards.....	Meters.....	0.914
Miles.....	Kilometers.....	1.609
Square Inches.....	Square Centimeters.....	6.451
Square Feet.....	Square Meters.....	0.093
Square Yards.....	Square Meters.....	0.836
Square Miles.....	Square Kilometers.....	2.590
Acres.....	Square Hectometers.....	0.405
Cubic Feet.....	Cubic Meters.....	0.028
Cubic Yards.....	Cubic Meters.....	0.765
Fluid Ounces.....	Milliliters.....	29.573
Pints.....	Liters.....	0.473
Quarts.....	Liters.....	0.946
Gallons.....	Liters.....	3.785
Ounces.....	Grams.....	28.349
Pounds.....	Kilograms.....	0.454
Short Tons.....	Metric Tons.....	0.907
Pound-Feet.....	Newton-Meters.....	1.356
Pounds/Sq Inch.....	Kilopascals.....	6.895
Miles per Gallon.....	Kilometers per Liter.....	0.425
Miles per Hour.....	Kilometers per Hour.....	1.609

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Centimeters.....	Inches.....	0.394
Meters.....	Feet.....	3.280
Meters.....	Yards.....	1.094
Kilometers.....	Miles.....	0.621
Sq Centimeters.....	Square Inches.....	0.155
Square Meters.....	Square Feet.....	10.764
Square Meters.....	Square Yards.....	1.196
Square Kilometers.....	Square Miles.....	0.386
Sq Hectometers.....	Acres.....	2.471
Cubic Meters.....	Cubic Feet.....	35.315
Cubic Meters.....	Cubic Yards.....	1.308
Milliliters.....	Fluid Ounces.....	0.034
Liters.....	Pints.....	2.113
Liters.....	Quarts.....	1.057
Liters.....	Gallons.....	0.264
Grams.....	Ounces.....	0.035
Kilograms.....	Pounds.....	2.205
Metric Tons.....	Short Tons.....	1.102
Newton-Meters.....	Pound-Feet.....	0.738
Kilopascals.....	Pounds per Sq Inch.....	0.145
Km per Liter.....	Miles per Gallon.....	2.354
Km per Hour.....	Miles per Hour.....	0.621



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