

# **TB 9-2320-279-13&P-4**

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## **TECHNICAL BULLETIN OPERATOR AND FIELD LEVEL TECHNICAL BULLETIN FOR**

### **TRUCK, TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET), 8X8 M983A2 LET NSN 2320-01-528-6636**



Distribution A - Approved for public release; distribution is unlimited.

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**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**APRIL 2008**





## WARNING SUMMARY

### GENERAL SAFETY CAUTION/WARNING SUMMARY

- This list summarizes critical warnings. They are repeated here to let you know how important they are.
- Study these warnings carefully.
- They can save your life and the lives of personnel you work with.
- If there is any doubt about handling tools, materials, equipment, and procedures, see TB 43-0216, Safety and Hazard Warnings for Operation and Maintenance of TACOM Equipment.

### FOR INFORMATION ON FIRST AID:

Reference FM 4-25.11.

### WARNING



### MODIFICATION HAZARD

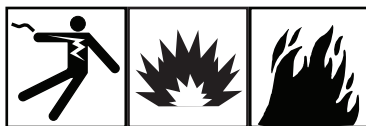
- Unauthorized modifications to, alterations to, or installations on this equipment are prohibited and are in violation of AR 750-10.
- Failure to comply may result in injury or death to personnel or damage to equipment.

### WARNING



### HIGH-PRESSURE HYDRAULIC SYSTEM

- Hydraulic systems can cause serious injuries if high-pressure lines or equipment fails.
- Never work on hydraulic systems or equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and can give first aid.
- Never disconnect any hydraulic hose or part while the engine is running. Allow several minutes to elapse after shutting off engine, to allow pressure to relieve itself, before attempting to remove hoses. Failure to comply may result in injury to personnel.
- The HEMTT vehicles contain hydraulic systems operating at oil pressures up to 3,000 psi (20,685 kPa) and 3,200 psi (22,064 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****ELECTRICAL SYSTEM**

- Remove all jewelry, such as rings, ID tags, bracelets, etc. If jewelry or tools contact electrical circuits, a direct short may result. Failure to comply may result in serious injury or death to personnel.
- Do not smoke, use open flame, make sparks or other ignition sources around batteries. A battery giving off gas could explode. Failure to comply may result in serious injury or death to personnel.
- Be careful when working on or with electrical equipment. Do not be misled by the term "low voltage". Voltages as low as 50 volts can cause death. For artificial respiration, refer to FM 4-25.11.
- When working inside the vehicle with power off, be sure to ground every capacitor likely to hold a dangerous voltage potential.
- Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment.

**WARNING****SOLVENT CLEANING COMPOUND**

- Solvent cleaning compound MIL-PRF-680 Type II and III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in a well-ventilated area. Use respirator as needed. Accidental ingestion can cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage. Can be fatal if swallowed. Inhalation of high/massive concentrations can cause coma or be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid of skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition. Failure to follow this warning may result in injury or death to personnel.
- The flashpoint for Type II solvent cleaning compound is 141-198°F (61-92°C), and Type III is 200-241°F (93-116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound. Failure to follow this warning may result in injury or death.

- Cloths or rags saturated with solvent cleaning compound must be disposed of IAW authorized facilities' procedures. Failure to follow this warning may result in injury.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

### WARNING



### POLYURETHANE COATING (CARC)

- Eye and hearing protection must be worn at all times when using power tools for grinding, cutting, sawing, and drilling. Failure to do so may result in injury to personnel. Chemical Agent Resistant Coating (CARC) paint contains isocyanate which is highly irritating to skin and respiratory system. High concentrations of isocyanate can produce symptoms of itching and reddening of skin, a burning sensation in the throat and nose, and watering of the eyes. In extreme concentrations, isocyanate can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention.
- The following precautions must be taken whenever using CARC paint:
- Protective equipment (gloves, goggles, ventilation mask) must be worn when using CARC paint.
- NEVER cut CARC-coated materials without high-efficiency, air-purifying respirators in use.
- 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.
- Use only in well-ventilated area. Check with local environmental office for methods and locations approved for painting in accordance with local and state environmental regulations.
- 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.

## WARNING



### ADHESIVE

- Adhesive, solvents and sealing compounds can burn easily and are harmful causing immediate bonding on contact with eyes, skin, or clothing and gives off harmful vapors.
- If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- If adhesive gets in your eyes, try to keep them open; flush them with water for 15 minutes and get immediate medical attention.
- Wear protective goggles and use in a well-ventilated area.
- Keep away from open fire and use in well-ventilated area to avoid injury or death.

## WARNING

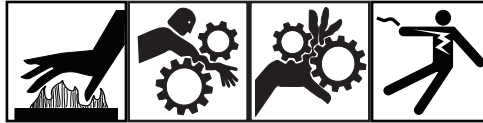


### FLAMMABLE LIQUID AND COMBUSTIBLE VAPOR

- Gasoline, fuel oil, lubricating oil, grease, paint, paint thinner, cleaning solvents, and other combustible liquids present a serious fire hazard.
- Combustible liquids must ALWAYS be stored in their approved containers and designated compartments or deck storage locations.
- Ensure exhaust and ventilation fans are operating while using cleaning solvents or paint products.
- Never store or charge batteries in a confined space without ventilation or near electrical equipment.
- 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.
- When working with fuel, post signs that read "NO SMOKING WITHIN 50 FEET OF VEHICLE".

- Starting fluid is toxic and flammable. Do not store in cab and do not breathe fumes. Do not puncture or burn containers. Dispose of container following manufacturer's recommendations on the container.

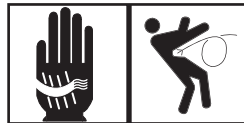
### WARNING



### MOVING MACHINERY

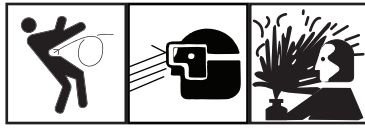
- Use extreme care when operating or working near moving machinery including running engine, rotating shafts, and other moving parts. Failure to comply may result in injury or death to personnel.
- Use extreme care when measuring voltage while engine is running around rotating fan blade and hot engine parts. Failure to comply may result in injury or death to personnel.

### WARNING



### HEAVY-DUTY WINCH OPERATION

- All personnel must stand clear during winching operations from possible snapping cable or shifting load. Failure to comply may result in injury or death to personnel.
- When hooking up for winching operations, position throat (open part) of hook upward in case overloading straightens out hook. Failure to comply may result in injury or death to personnel.
- The cable drum requires a minimum of three or four wraps of wire rope (cable) for safety. Failure to comply may result in injury or death to personnel.
- Be careful when handling the winch cable. Ensure cut ends are taped. Ensure cut ends of cable on winch assembly are securely fastened down. Failure to comply may result in injury or death to personnel.
- Always wear leather gloves when handling winch cable. Failure to comply may result in injury or death to personnel.

**WARNING****PARTS UNDER PRESSURE**

- Wear safety goggles and use caution when removing or installing springs, snap rings, retaining rings, and other parts under spring tension. These parts can act as projectiles. Failure to comply may result in injury or death to personnel.
- The radiator is very hot and pressurized during vehicle operation. Let radiator cool before removing cap. Failure to do so can result in serious burns.
- During pressure tests, ensure air pressure is drained to 0 psi (0 kPa) before taking off any components. If pressure is not released, plates or line could blow off and harm personnel. Do not drain air from tank with any part of body in air spray path. Skin embolisms and/or debris in eyes can occur from released pressure.
- High air pressure may 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.
- Stand clear of trajectory area during deflation or personal injury or death may result.
- Lock-ring is under tension. If lock-ring breaks loose it could cause injury to personnel. Keep hands and fingers away from lock-ring when removing.
- Use extreme care when removing or installing spring retainers. Spring retainers are under tension and can act as projectiles when released suddenly. Ensure proper eye protection is worn to prevent injury to personnel.
- Use extreme care when removing or installing springs. Springs are under tension and can act as projectiles when released. Ensure proper eye protection is worn to prevent injury to personnel. Eye protection is required during all grinding operations. Failure to comply may result in serious injury to personnel.
- Failure to relieve tank pressure may result in sudden, unexpected loss of pressure. Failure to comply may result in personal injury or death.
- Do not remove the radiator cap when the engine is hot, as steam and hot coolant can escape. Failure to comply may result in personal injury or death.

**WARNING****HEAVY PARTS**

Any part or component that weighs between 50 lbs (23 kg) and 75 lbs (34 kg) must be removed with the aid of an assistant. Any part or component that weighs over 75 lbs (34 kg) must be removed with the aid of an assistant and a lifting device. Failure to comply may cause injury or death to personnel.

**WARNING****CARBON MONOXIDE (EXHAUST GAS) CAN CAUSE DEATH**

- Carbon monoxide does not have color or smell and can cause death.
- Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling and coma. Brain damage or death can result from heavy exposure.
- Carbon monoxide is in exhaust fumes of fuel-burning heaters and internal combustion engines.
- Carbon monoxide can become dangerously concentrated under conditions of no ventilation.
- Precautions must be followed to ensure crew safety when the personnel heater or engine of any vehicle is operated for any purpose. Failure to comply may result in injury or death to personnel.
- DO NOT operate vehicle engine in a closed place unless the place has proper ventilation. Failure to comply may result in injury or death to personnel.
- DO NOT drive any vehicle with inspection plates, cover plates, or engine compartment covers removed unless necessary for maintenance purposes. Failure to comply may result in injury or death to personnel.
- BE ALERT at all times during vehicle operation for exhaust odors and exposure symptoms. If either odor or exposure symptoms are present, IMMEDIATELY VENTILATE personnel compartments. If symptoms continue, remove affected crew to fresh air and keep warm. DO NOT PERMIT PHYSICAL EXERCISE. If necessary, give artificial respiration and get immediate medical attention. For artificial respiration, refer to FM 4-25.11. Failure to comply may result in injury or death to personnel.
- BE AWARE that the gas particulate filter unit or the field protection mask for nuclear-biological-chemical protection WILL NOT offer safety from carbon monoxide poisoning.

## WARNING



### EXTREME HEAT

If required to remain inside the vehicle during extreme heat, occupants should follow the water intake, work/rest cycle, and other heat stress preventive medicine measures contained in FM 21-10, Field Hygiene and Sanitation.

## WARNING



### CABLES

- Always wear heavy gloves when handling winch cables; never let cable run through hands. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

## WARNING



### BATTERY

- Battery acid is harmful to skin and eyes. Be careful not to short out battery terminals. Failure to comply may result in injury or death to personnel.
- Do not smoke or use open flame near batteries. Batteries may explode from a spark. Failure to comply may result in injury or death to personnel.



## WARNING



### NBC

- NBC-contaminated air filters must be handled and disposed of only by authorized and trained personnel.
- The unit commander or senior officer in charge of maintenance personnel must ensure that prescribed protective clothing (refer to FM 3-11.4) is used, and prescribed safety measures and decontamination procedures are followed (refer to FM 3-11.5) .
- The local unit SOP is responsible for final disposal of contaminated air filters. Failure to comply may cause severe injury or death to personnel.

## WARNING



### TIRE OPERATION

- Operating a vehicle with a tire in an overinflated or underinflated condition, or with a questionable defect, may lead to premature tire failure. Ensure tire has proper tire pressure. Failure to comply may result in injury or death to personnel.
- When inflating tires mounted on the vehicle, all personnel must remain out of trajectory area. Failure to follow proper procedures may result in serious injury or death to personnel.
- Cracked, broken, bent or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated or damage or personal injury or death may result.
- No heat shall be applied to a multi-piece wheel or wheel component or damage or injury or death may result.
- Failure to place wheel/tire assembly in safety cage prior to initial inflation could result in serious injury or death to personnel.
- When a wheel/tire is in a restraining device, do not rest or lean any part of body or equipment on or against the restraining device, or injury or death could result.
- While changing tires or while performing tire maintenance, stay out of the trajectory path. Failure to comply may result in injury or death to personnel.
- Always use an inflation hose with an in-line gauge and a clip-on chuck when inflating tires. The gauge and valve must be mounted a minimum of 10 ft. (3.10 m) away from air chuck.

- High air pressure may 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.
- Tire is heavy. Brace tire to ensure tire will not fall over on you or on others.

### **WARNING**



### **VEHICLE OPERATION**

- Speed limits posted on curves reflect speeds that are considered safe for automobiles. Heavy trucks with a high center of gravity can roll over at these speed limits. Use caution and reduce your speed below the posted limit before entering a curve. Failure to comply may result in vehicle crash and injury to personnel.
- Use caution and reduce your speed below the posted limit before entering a curve. Failure to comply may result in vehicle crash and injury to personnel.
- Always use seatbelts when operating vehicle. Failure to use seatbelt can result in serious injury or death in case of accident.

### **WARNING**



### **BRAKES**

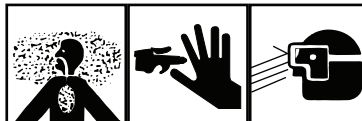
- Ensure all personnel are clear from front of truck before performing brake stall check. Be ready to apply service brake. Operator must remain in cab while performing this check. Failure to comply could result in personnel injury.
- Never use parking brake for normal braking or wheels will lock up causing severe skid. Skidding vehicle may result in serious personal injury or death.
- Do not use trailer brakes as a parking brake. Trailer brakes may not hold loaded vehicle and trailer on a grade. A runaway vehicle may cause severe personal injury or death.
- Engine must be shut OFF and parking brake set before performing PMCS walkaround. Failure to comply may result in injury or death to personnel.

**WARNING****BURNS**

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

**WARNING****HEARING PROTECTION**

- Excessive noise levels are present any time the heavy-duty winch is operating.
- Wear single hearing protection (earplugs or equivalent) while working around equipment while it is running. Failure to do so could result in damage to your hearing.
- Seek medical aid should you suspect a hearing problem.

**WARNING****COMPRESSED AIR**

- Brake shoes may be coated 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.
- 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, and gloves.



## LIST OF EFFECTIVE PAGES/WORK PACKAGES

### NOTE:

Zero in the "Change No." column indicates an original page or work package.

Date of issue for the original manual is:

Original 01 APRIL 2008

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TOTAL NUMBER OF WORK PACKAGES IS 87, CONSISTING OF THE  
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**HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 01 April 2008**

**TECHNICAL BULLETIN**

**OPERATOR AND FIELD LEVEL TECHNICAL BULLETIN  
TRUCK, TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET), 8X8  
M983A2 LET  
NSN 2320-01-528-6636**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is <https://aeps.ria.army.mil>. The DA Form 2028 is located under the Public Applications section in the AEPS Public Home Page. 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 E-mail your letter or DA Form 2028 direct to: U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LC-LMPP/TECH PUBS, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The email address is [ROCK-TACOM-TECH-PUBS@conus.army.mil](mailto:ROCK-TACOM-TECH-PUBS@conus.army.mil). The fax number is DSN 793-0726 or commercial (309)782-0726.

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## HOW TO USE THIS TECHNICAL BULLETIN

### INTRODUCTION

#### NOTE

If at any time you are unsure how to use this technical bulletin or you cannot locate the information you need, notify your supervisor.

This technical bulletin is designed to work together with TM 2320-279-10 and TM 2320-315-14&P (EM 0232) to help you operate and maintain the HEMTT M983A2 LET Tractor Vehicle. It also includes the Repair Parts and Special Tools List (RPSTL).

This technical bulletin is written in work package format:

Chapters divide the technical bulletin into major categories of information (e.g., General Information, Equipment Description and Data, and Theory of Operation; Operator Instruction; Operator Maintenance Instructions; Field Maintenance Instructions; and Supporting Information).

Each chapter is divided into work packages, which are identified by a 4-digit number (e.g., 0001, 0002, etc.) located on the upper right-hand corner of each page. The work package page number (e.g., 0001-1, 0001-2, etc.) is located center at the bottom of each page.

If a Change Package is issued to this technical bulletin, added work packages use the 5th and 6th digits of their number to indicate new material. For instance, work packages inserted between WP 0001 and WP 0002 are numbered WP 0001 01, WP 0001 02, etc.

Read through this technical bulletin to become familiar with its organization and contents before attempting to operate or maintain the HEMTT M983A2 LET Tractor Vehicle.

When this technical bulletin refers to TM 9-2320-315-14&P (EM 0232), use the M983A2 model information unless otherwise directed.

### CONTENTS OF THIS TECHNICAL BULLETIN

A Warning Summary is located at the beginning of this technical bulletin. Become familiar with these warnings before operating or performing maintenance on the HEMTT M983A2 LET Tractor Vehicle.

A Table of Contents, located in the front of the technical bulletin, lists all chapters and work packages in the publication.

The Table of Contents also provides Reporting Errors and Recommending Improvements information and DA Form 2028 addresses, for the submittal of corrections to this technical bulletin.

If you cannot find what you are looking for in the Table of Contents, refer to the alphabetical Index at the back of the technical bulletin.

Chapter 1, General Information, Equipment Description, and Theory of Operation, provides general information on the technical bulletin and the HEMTT M983A2 LET Tractor Vehicle.

Chapter 2, Operator Instructions, explains and illustrates all operator procedures for the HEMTT M983A2 LET Tractor Vehicle: Operation Under Usual Conditions and Operation Under Unusual Conditions.

Chapter 3, Troubleshooting, provides troubleshooting procedures for the HEMTT M983A2 LET Tractor Vehicle.

Chapter 4, Operator Maintenance Instructions, includes Preventive Maintenance Checks and Services (PMCS) Introduction and Preventive Maintenance Checks and Services (PMCS).

Chapter 5, Field Maintenance Instructions includes all field maintenance tasks.

Chapter 6, Parts Information includes Repair Parts and Special Tools List (RPSTL) Introduction; and Repair Parts and Special Tools List (RPSTL).

Chapter 7, Supporting Information includes References; Maintenance Allocation Chart (MAC) Introduction; Maintenance Allocation Chart (MAC); Expendable and Durable Items List, Mandatory Replacement Parts List and Schematic drawings.

## **FEATURES OF THIS TECHNICAL BULLETIN**

Read all **WARNINGS**, **CAUTIONS**, AND **NOTES** before performing any procedure.

Warnings, cautions, notes, subject headings, and other essential information are printed in **BOLD** type, making them easier for the user to see.

### **WARNING**

A **WARNING** indicates a hazard which may cause injury or death to personnel.

### **CAUTION**

A **CAUTION** is a reminder of safety practices or directs attention to usage practices that may cause damage to equipment.

### **NOTE**

A **NOTE** is a statement containing information that will make the procedures easier to perform.

Statements and words of particular interest may be printed in **CAPITAL LETTERS** to create emphasis.

Within a procedural step, reference may be made to another work package in this technical bulletin or to a technical manual. These references indicate where you should look for more complete information.

If you are told; "refer to TM 9-2320-279-10," go to References in this Technical Bulletin for complete information on the cited reference.

Illustrations are placed after, and as close to, the procedural steps to which they apply. Callouts placed on the art are text or numbers.

Technical instructions include metric units as well as standard units. For your reference, a Metric Conversion Chart is located on the inside back cover of the technical bulletin.



## **GENERAL TROUBLESHOOTING INSTRUCTIONS**

### **GENERAL**

The troubleshooting included in this bulletin provides the information needed to isolate, diagnose, and correct malfunctions incurred to the M982A2 LET model truck. Each malfunction symptom given for an individual component or system is followed by step(s) leading to the cause of the malfunction and the actions needed to correct it. This manual cannot list all malfunctions that may occur, nor all test, inspections, or corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify the supervisor.

### **BEFORE TROUBLESHOOTING**

Before taking any action to correct a possible malfunction, follow these rules:

1. Ensure Operator Troubleshooting has been performed on the vehicle since the malfunction has occurred.
2. Ensure Operator PMCS was performed prior to, during, and after the mission that incurred the malfunction.
3. Obtain as much information from the operator as possible about the malfunction.
4. Check the repair history of the vehicle.
5. Never overlook the possibility that the problem may be of simple origin and may be repairable with a simple adjustment.
6. Use all of your senses to observe and locate problems.
7. Whenever possible, isolate the system first and then the component causing the malfunction.
8. Remember, for every failed part there is a cause. Whenever possible, determine the cause of the failure before assuming the malfunction is fully repaired.
9. Use standard automotive theories and principles when troubleshooting the vehicle.

### **TROUBLESHOOTING AIR SYSTEMS GENERAL**

The air system consists of an engine driven air compressor and four air reservoirs. The system includes the necessary valves and air lines to control the vehicle's air operated devices. Pressurized air from the air compressor is passed through an air dryer to the quick buildup reservoir. The air dryer removes dirt and moisture from the pressurized air.

Once air pressure in reservoir No. 1 rises above 75 psi (517 kPa), a valve opens and allows the other reservoirs to be pressurized up to 120 psi (827 kPa). Air from reservoir No. 2 and No. 4 goes to the brake treadle valve. This air controls the rear axle service brakes. Air pressure in this system is shown by the red needle on the AIR PRESSURE gauge. Air from reservoir No. 3 goes to the brake treadle valve. This air controls the front axle service brakes. Air pressure in this system is shown by the green needle on the AIR PRESSURE gauge. The PARKING BRAKE valve controls air from reservoir No. 3 and No. 4 and applies or releases the rear axle service (parking) brakes. Reservoirs No. 3 and No. 4 are interconnected in such a way that if one reservoir fails, air would be supplied to release the rear axle service (parking) brakes from whichever reservoir is functioning. If air pressure falls below 60 to 70 psi (414 to 483 kPa), the system buzzer sounds and the AIR indicator will light. On models with the new type parking brake valve installed (yellow knob), parking brakes automatically apply when air pressure drops below 30 psi (207 kPa).

### **WHEN TROUBLESHOOTING AIR SYSTEMS**

Look for the following:

1. Inspect air lines for leaks, crimps, and loose fittings.
2. Tag and mark all air lines and hoses prior to removal.
3. When applicable, remove and replace cable ties.
4. When applicable, use adapter lines to aid in troubleshooting malfunctions.
5. Note all internal meter or gauge readings prior to selecting Take Reading button.

## **TROUBLESHOOTING ELECTRICAL SYSTEMS GENERAL**

The voltage and current for the electrical system are indicated by a battery gauge located on the instrument panel inside the driver's compartment. Circuit breakers located in the cab protect the main circuits. Electrical power is provided by four 12-volt series-parallel connected batteries. Power is distributed throughout the vehicle by wiring harnesses. The harnesses are interconnected by pin connectors. Connectors are provided at the rear of the vehicle to supply power for towed loads. A heavy-duty starting motor is mounted on the engine flywheel housing and provides the cranking power necessary for starting the engine. The voltage regulator is mounted on the belt driven alternator and maintains a 24-volt level for battery charging.

Use jumperwires when applicable to aid in isolating malfunctions during troubleshooting. When using the Maintainers Support Device (MSD), use jumperwires with red or black leads to access all locations on vehicles. Use a standard multimeter to troubleshoot circuits when battery power must be disconnected.

### **WHEN TROUBLESHOOTING ELECTRICAL SYSTEMS**

Look for the following:

1. Ensure battery disconnect switch is ON before performing a troubleshooting task.
2. Inspect wires for loose electrical connections.
3. Inspect connectors for loose, bent, or corroded terminals.
4. Tag and mark wires and connectors prior to removal.
5. When applicable, remove and replace cable ties.
6. Note all internal meter or multimeter readings prior to selecting Take Reading button.

## **TROUBLESHOOTING HYDRAULIC SYSTEMS GENERAL**

A pump mounted on the rear of engine provides the fluid power to operate the power steering only. Fluid power for the heavy-duty winch is provided by a hydraulic pump driven by the power take-off (PTO) mounted on the transmission. A manually-operated selector valve directs hydraulic power to the heavy-duty winch. Both hydraulic pumps share the same reservoir.

### **WHEN TROUBLESHOOTING HYDRAULIC SYSTEMS**

Look for the following:

1. Inspect quick disconnect couplings for proper seating and operation.
2. Tag and mark hydraulic lines prior to removal.
3. When applicable, remove and replace cable ties.
4. When applicable, use adapter lines to aid in troubleshooting malfunctions.
5. Note all gauge and/or flowmeter readings prior to selecting Take Reading button.

## **TROUBLESHOOTING RULES**

When performing troubleshooting, follow these rules:

1. Caution must be used when working around the alternator, starter, battery disconnect switch, NATO slave receptacle, or circuit breakers when the battery is connected. These components have 24 VDC terminals that will still be live.
2. Observe warnings, cautions, and notes.
3. When a work package reference is encountered in the text of a troubleshooting track, the troubleshooting mechanic must proceed to the referenced information. The information "referenced to" must be reviewed for information as it pertains to the troubleshooting procedures (i.e.: procedures, safety and caution information, component locations, and other necessary information). If this referenced information is not reviewed, dangerous situations and/or inaccurate test results may occur.

4. When the information “referenced to” is a maintenance task, and you are removing a component, the equipment conditions of the maintenance task must be performed. If the equipment conditions are not performed, dangerous situations and/or inaccurate test results may occur.
5. When the information “referenced to” is a maintenance task, and you are installing a component, the follow-on conditions of the maintenance task must be performed. If follow-on conditions are not performed, dangerous situations and/or inaccurate test results may occur.



## CHAPTER 1

### GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION

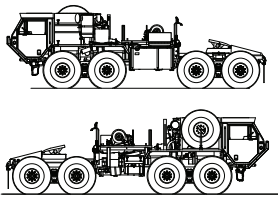


# **OPERATOR MAINTENANCE INTRODUCTION**

## **SCOPE**

This technical bulletin is used for operation, and both operator-performed and field level maintenance of HEMTT M983A2 LET series vehicles.

*Table 1. Overview.*

M983A2 LET TRACTOR	DESCRIPTION
 <p><i>Figure 1.</i></p>	<p>Tractor vehicle with 82,000 lbs (37 228 kg) GVWR, and 135,000 lbs (61 290 kg) GCWR (primary and secondary roads) or 117,000 lbs (53 118 kg) GCWR (cross country). Vehicle is equipped with fifth wheel, 3.5 in. (8.9 cm) kingpin, and 45,000 lbs (20 430 kg) recovery winch.</p>

## **MAINTENANCE FORMS AND RECORDS**

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8 The Army Maintenance Management System (TAMMS) Users Manual.

## **EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD) AND QUALITY DEFICIENCY REPORTING (QDR)**

The quarterly TB 43-0001-62 (series) Equipment Improvement Report and Maintenance Digest contains valuable field information on equipment covered in this technical bulletin. Information in the TB 43-0001-62 (series) Equipment Improvement Report and Maintenance Digest is compiled from some of the Equipment Improvement Reports (EIR) that have been prepared on vehicles covered in this technical bulletin. Many of these articles result from comments, suggestions, and improvement recommendations that were submitted to the EIR program. TB 43-0001-62 (series) Equipment Improvement Report and Maintenance Digest contains information on equipment improvements, minor alterations, proposed Modification Work Orders (MWOs), warranties (if applicable), actions taken on some of the DA Form 2028's (Recommended Changes to Publications), and advance information on proposed changes that may affect this technical bulletin. Refer to the TB 43-0001-62 (series) Equipment Improvement Report and Maintenance Digest periodically for the most current and authoritative information on the equipment. The information will help you to do a better job and will advise of the latest changes to this technical bulletin. Also refer to DA PAM 25-30, Consolidated Index of Army Publications and Blank Forms at <http://www.army.mil/usapa/2530.html>, and reference section of this technical bulletin. If you have a change recommendation to this technical bulletin, submit a DA Form 2028 (Recommended Changes to Publications) via e-mail to: ROCK-TACOM-TECH-PUBS@conus.army.mil.

If your vehicle needs improvement, let us know. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Report all defects in material or workmanship on a product via Quality Deficiency Report (QDR) utilizing the Army Electronic Product Support (AEPS) web site: <http://aeps.ria.army.mil>. If assistance is needed in submitting the QDR in AEPS, contact via email at:

tacomdrs@tacom.army.mil. QDRs may be recorded on a Standard Form 368 Product Quality Deficiency Report (Please include your e-mail address), and mailed to: USA TACOM, ATTN: AMSRD-TAR-E/PQDR, Warren, MI 48397-5000, or emailed to: tacomdrs@tacom.army.mil.

## **HAND RECEIPT (HR) INFORMATION**

Refer to TM 9-2320-279-10 for hand receipt information.

## **CORROSION PREVENTION AND CONTROL**

Corrosion prevention and control (CPC) of Army material is a continuing concern. It is important that any corrosion problems be reported so they can be corrected and improvements can be made to prevent problems in the future. While corrosion is typically associated with the rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using Standard Form 368. The use of key words, such as "corrosion", "rust", "deterioration", and "cracking" will ensure that the information is identified as a CPC problem.

## **DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE**

Procedures for the destruction of Army materiel to prevent enemy use are contained in TM 750-244-6.

## **PREPARATION FOR STORAGE OR SHIPMENT**

Refer to TM 9-2320-315-14&P for preparation for storage or shipment.

## **WARRANTY INFORMATION**

The HEMTT series vehicles are warranted by Oshkosh Truck Corporation for 12 months or 12,000 miles (19 308 km), whichever comes first. The warranty starts on the date found in block 23 of DA Form 2408-9 in the vehicle logbook. Report all defects in material or workmanship to the supervisor, who will take appropriate action through the field level maintenance shop.

## **NOMENCLATURE CROSS-REFERENCE LIST**

*Table 2. Common Nomenclature.*

<b>COMMON NAME</b>	<b>OFFICIAL NOMENCLATURE</b>
Brake Pedal	Service Brake Pedal
Cable/Hoist Cable	Wire Rope
Cold Start System	Ether Quick-Start System
Electrical Control Box	Junction Box
Engine Coolant	Antifreeze, Ethylene Glycol Mixture
Gladhand	Quick Disconnect Coupling
High Idle Switch	Engine Speed Control Switch



**Table 2. Common Nomenclature. - Continued**

<b>COMMON NAME</b>	<b>OFFICIAL NOMENCLATURE</b>
Jake Brake, Jacobs® Brake	Engine Retarder, Engine Brake
Manual Controls	Directional Control Valves
O-Ring	Preformed Packing
Snap Ring	Retaining Ring

**LIST OF ABBREVIATIONS****Table 3. Common Abbreviations.**

<b>ABBREVIATION</b>	<b>OFFICIAL NOMENCLATURE</b>
AAL	Additional Authorization List
AMDF	Army Master Data File
amp	Ampere
bar	Barometric Pressure
BII	Basic Issue Items
BL	Bottom Load
BOI	Basis of Issue
C	Celsius
CAGE/C	Commercial And Government Entity/Code
CARC	Chemical Agent Resistant Coating
CBR	Chemical, Biological, Radiological
CBT	Common Bridge Transporter
CCA	Cold Cranking Amperes
CID	Cubic Inch Displacement
CKT	Circuit
cm	Centimeter
COEI	Components of End Item
CPC	Corrosion Prevention Control

**Table 3. Common Abbreviations. - Continued**

<b>ABBREVIATION</b>	<b>OFFICIAL NOMENCLATURE</b>
CTA	Common Table of Allowance
DA	Department of the Army
dia.	Diameter
DS	Direct Support
EIR	Equipment Improvement Recommendations
F	Fahrenheit
FHTV	Family of Heavy Tactical Vehicles
fl. oz.	Fluid Ounce
FRS	Forward Repair System
ft.	Foot
GAA	Grease, Automotive, and Artillery
gal	Gallon
GCWR	Gross Combination Weight Rating
GMT	Guided Missile Transport
GPFU	Gas Particulate Filter Unit
gpm	Gallons Per Minute
GS	General Support
GVWR	Gross Vehicle Weight Rating
HDI	Hexamethylene Diisocyanate
HEMTT	Heavy Expanded Mobility Tactical Truck
hp	Horsepower
HVAC	Heating, Ventilation, and Air Conditioning
I.D.	Inside Diameter
in.	Inch
ISO	International Standards Organization

**Table 3. Common Abbreviations. - Continued**

<b>ABBREVIATION</b>	<b>OFFICIAL NOMENCLATURE</b>
JTA	Joint Table of Allowances
kg	Kilogram
km	Kilometer
Kmh or km/h	Kilometer per hour
kPa	Kilopascals
kw	Kilowatt
L	Liter
lbs	Pounds
lb-ft	Pound-Foot
lb-in	Pound-Inch
LED	Light Emitting Diode
LH	Left-hand
M	Meter
MAC	Maintenance Allocation Chart
mi	Mile
ml	Milliliter
MLC	Military Load Class
mm	Millimeter
Mph	Miles Per Hour
MTOE	Modified Tables of Organization and Equipment
NBC	Nuclear, Biological, Chemical
NIIN	National Item Identification Number
N•m	Newton Meter
NOC	Not Usable-On Code
NSN	National Stock Number





**Table 3. Common Abbreviations. - Continued**

<b>ABBREVIATION</b>	<b>OFFICIAL NOMENCLATURE</b>
O.D.	Outside Diameter
OEA	Oil, Engine, Artic
OE/HDO	Oil, Engine/Hydraulic Oil
OTC	Oshkosh Truck Corporation
Oz	Ounce
PLS	Palletized Load System
PMCS	Preventive Maintenance Checks and Services
psi	Pounds per Square Inch
pt.	Pint
PTO	Power Take-Off
qt.	Quart
Qty. Recm.	Quantity Recommended
Qty. Rqr.	Quantity Required
RCU	Remote Control Unit
RFI	Radio-Frequency Interference
RH	Right-hand
rpm	Revolutions Per Minute
RPSTL	Repair Parts and Special Tools List
SAE	Society of Automotive Engineers
SMR	Source, Maintenance, and Recoverability
SRA	Specialized Repair Activity
SRW	Self-Recovery Winch
TAMMS	The Army Maintenance Management System
TDA	Tables of Distribution and Allowance
TM	Technical Manual




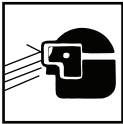



**Table 3. Common Abbreviations. - Continued**

ABBREVIATION	OFFICIAL NOMENCLATURE
TMDE	Test, Measuring, and Diagnostic Equipment
TOE	Tables of Organization and Equipment
u/m	Unit of Measure
UOC	Usable-On Code
VDC	Volts Direct Current
XHD	Extra heavy-duty








**Table 4. Warning Icons Used In This Technical Bulletin.**

WARNING ICON	DESCRIPTION
	<u>AIR PRESSURE</u> - human hand blocking air gun shows the need to reduce air pressure before use or debris may injure user, and/or damage equipment.
	<u>BIOLOGICAL</u> - abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.
	<u>CHEMICAL</u> - drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.
	<u>CRYOGENIC</u> - hand in block of ice shows that the material is extremely cold and can injure human skin and tissue.








**Table 4. Warning Icons Used In This Technical Bulletin. - Continued**

WARNING ICON	DESCRIPTION
	<p><u>ELECTRICAL</u> - electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.</p>
	<p><u>EXPLOSION</u> - rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure.</p>
	<p><u>EXTREMELY COLD SURFACE</u> - hand touching object with ice formed on both shows that surface is extremely cold and can damage human tissue.</p>
	<p><u>EYE PROTECTION</u> - person with goggles shows that the material will injure the eyes.</p>
	<p><u>FIRE</u> - flame shows that material may ignite and cause burns.</p>
	<p><u>FIRE EXTINGUISHER</u> - shows that material may ignite and a fire extinguisher should be within easy reach.</p>
	<p><u>HEAVY OBJECT</u> - human figure stooping over heavy object shows physical injury potential for improper lifting technique, and/or aid of assistant(s) and/or lifting device (as required).</p>

**Table 4. Warning Icons Used In This Technical Bulletin. - Continued**






WARNING ICON	DESCRIPTION
	<p><u>HEAVY PARTS</u> - hand with heavy object on top shows that heavy parts can crush and harm.</p>
	<p><u>HEAVY PARTS</u> - foot with heavy object on top shows that heavy parts can crush and harm.</p>
	<p><u>HEAVY PARTS</u> - moving heavy object pinning human figure against stationary object shows that heavy, moving parts/objects present a danger to life or limb.</p>
	<p><u>HEAVY PARTS</u> - heavy object on human figure shows that heavy parts present a danger to life or limb.</p>
	<p><u>HOT AREA</u> - hand over object radiating heat shows that part is hot and can burn.</p>
	<p><u>MOVING PARTS</u> - hand with fingers caught between gears shows that the moving parts of the equipment present a danger to life or limb.</p>
	<p><u>PRESSURE/TENSION HAZARD</u> - human body being impacted by rotating projectile shows that equipment is under pressure or tension presenting a danger to life or limb if pressure or tension is not carefully released.</p>

**Table 4. Warning Icons Used In This Technical Bulletin. - Continued**

WARNING ICON	DESCRIPTION
	<p><u>PROJECTILE HAZARD</u> - human body with object passing through it shows that a projectile hazard exists.</p>
	<p><u>RADIATION</u> - three circular wedges shows that the material emits radioactive energy and can injure human tissue.</p>
	<p><u>ROLLOVER HAZARD</u> - vehicle indicating direction of human figure shows that vehicle may roll over if conditions are not avoided, presenting a danger to life or limb.</p>
	<p><u>RUN OVER HAZARD</u> - vehicle running over human body shows hazard.</p>
	<p><u>SHARP OBJECT</u> - pointed object in hand shows that a sharp object presents a danger to life or limb.</p>
	<p><u>SKIN IRRITATION</u> - hand radiating shows that material can cause skin irritation.</p>
	<p><u>SLICK FLOOR</u> - wavy line on floor with legs prone shows that slick floor presents a danger for falling.</p>



**Table 4. Warning Icons Used In This Technical Bulletin. - Continued**

WARNING ICON	DESCRIPTION
	<u>STEAM HAZARD</u> - human engulfed in steam cloud shows steam hazard exists that could injure/burn human tissue.
	<u>TIRE BLOWOUT</u> - tire with hole shows that an over- or under-inflated tire may rupture, presenting a danger to life or limb.
	<u>VAPOR</u> - human figure in a cloud shows that material vapors present a danger to life or health.
	<u>WARNING/CAUTION</u> - triangle with exclamation point within shows that a WARNING or CAUTION is present that indicates a potential hazard which may cause injury or death to personnel (warning), or damage to equipment (caution).
	<u>WIRE CABLE/ROPE</u> - human hand with frayed wire cable/rope running across shows injury to unprotected (bare) hands may result.

**SAFETY, CARE, AND HANDLING**

Significant hazards and safety recommendations are listed in the table below.

**Table 5. Significant Hazard And Safety Recommendations.**

HAZARD	SAFETY RECOMMENDATION OR PRECAUTION	OPERATING CONDITION
Low air pressure for brakes.	Do not drive vehicle while low air pressure warning buzzer is sounding or red light is on.	Abnormal

**Table 5. Significant Hazard And Safety Recommendations. - Continued**

HAZARD	SAFETY RECOMMENDATION OR PRECAUTION	OPERATING CONDITION
Connecting towing devices.	Do not go between vehicles until vehicles are stopped and brakes are set.	Normal
Refueling vehicle.	Shut off engine and no smoking when filling tank.	Normal
<p style="text-align: center;"><b>NOTE</b></p> <p>Category of hazards as to whether or not they may be expected under normal or abnormal operating conditions.</p>		

**END OF WORK PACKAGE**

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## **OPERATOR MAINTENANCE EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

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### **EQUIPMENT CHARACTERISTICS**

The M983A2 LET tractor is used to transport construction equipment.

### **EQUIPMENT CAPABILITIES**

#### **NOTE**

Trailer/semitrailer may affect maximum fording depth. Refer to applicable trailer/semitrailer operator manual for further information on fording depth restrictions.

1. M983A2 LET is capable of operating in temperatures from -25 to 120°F (-32 to 49°C) and to -50 to 120°F (-46 to 49°C) with arctic kit installed.
2. M983A2 LET can ford water up to 48 in. (1 219 mm) deep for 5 minutes without damage or without requiring maintenance before operation can continue.
3. Normal operating range of M983A2 LET is 300 miles (483 km), based upon 154 gallons (583 L) of fuel and 100,000 lbs (45 400 kg) GCWR, traveling over mixed terrain. Varying loads, prolonged idle, use of power takeoff (PTO), off-road driving, and climatic conditions affect operating range.
4. M983A2 LET is provided with sufficient tiedown points located so it can be restrained in all directions during air transport in C-130, C-5A, and C-17 type aircraft.
5. M983A2 LET is also capable of being transported by highway, rail, and sea.

### **EQUIPMENT FEATURES**

1. DDEC IV electronically controlled, eight-cylinder, V-Type, two-cycle, fuel injected, turbocharged diesel engine.
2. Push button automatic transmission with one reverse speed and five forward speeds.
3. Operator controlled 4-wheel/8-wheel drive and high and low range transfer case for positive traction in areas of unimproved road surfaces.
4. Power steering system consists of basic manual steering system with hydraulic boost. Mechanical linkage also provides operator control in event of hydraulic oil pressure loss.
5. Fuel system includes one fuel tank, fuel lines, fuel/water separator, fuel pump, secondary filter, fuel pipes, and fuel injectors.
6. Two front and two rear towing eyes.
7. Manual-release-type rear pintle hook which will allow towing of a trailer.
8. Radio frequency interference suppression to permit voice radio communications during all phases of operation.

### **END OF WORK PACKAGE**



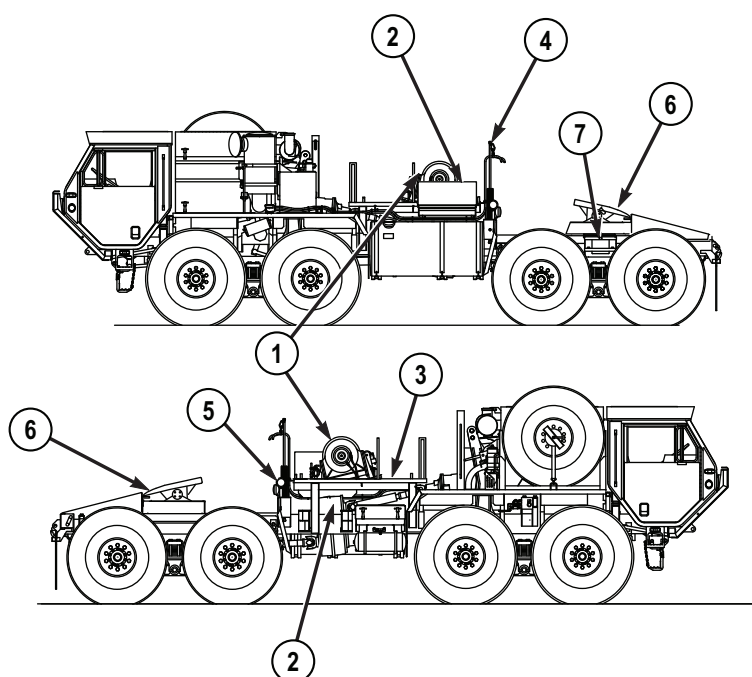
OPERATOR MAINTENANCE  
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

MAJOR COMPONENT LOCATION

NOTE

Refer to TM 9-2320-279-10 for common HEMTT series vehicle component location.

Table 1. M983A2 LET Vehicle Specific Component Location.

	
1	<b>Heavy-Duty Winch.</b> Powered by PTO to perform winching operations.
2	<b>Stowage Box.</b> Used to stow COEI, BII, AAL, and other mission essential items.
3	<b>Access Ladder.</b> Used by crew to clean window, check oil, or perform other tasks requiring access to parts of vehicle out of normal reach.
4	<b>Trailer Gladhands.</b> Provides air to trailer brake system through interconnecting air lines.
5	<b>Trailer Electrical Connector.</b> Supplies power to trailer electrical system through intervehicular cable.

**Table 1. M983A2 LET Vehicle Specific Component Location. - Continued**

6	<b>Fifth Wheel.</b> Couples trailer to tractor vehicle.
7	<b>Wheel Chock Stowage Box.</b> Used to stow two wooden wheel chocks.

END OF WORK PACKAGE

## OPERATOR MAINTENANCE DIFFERENCES BETWEEN MODELS

### DIFFERENCES BETWEEN MODELS

*Table 1. Differences Between HEMTT A2 Models.*

	M977 (Note 1)	M978 (Note 1)	M983 (Note 2)	M983 LET (Note 3)	M984 (Note 2)	M985 (Note 1)	M985 E1 (Note 2)	M1120 LHS (Note 1)	M1977 CBT (Note 1)
10 ft. (3.05 m) Equipment Body					.				
18 ft. (5.49 m) Cargo Body	.					.	.		
Cargo Cover Kit	.					.	.		
Heavy-Duty Winch				.	.				
Rear Beacon Lights (Note 4)					.				
Work Lights (Note 5)			.	.	.				.
MHC977 Grove Crane	.								
MHC985 Grove Crane						.			
MHC984 Grove Crane					.				
8108-2/2CD HIAB Crane (Note 6)							.		
Fifth Wheel			.	.					
3.5 inch (89 mm) Kingpin			.	.					

**Table 1. Differences Between HEMTT A2 Models. - Continued**

	<b>M977 (Note 1)</b>	<b>M978 (Note 1)</b>	<b>M983 (Note 2)</b>	<b>M983 LET (Note 3)</b>	<b>M984 (Note 2)</b>	<b>M985 (Note 1)</b>	<b>M985 E1 (Note 2)</b>	<b>M1120 LHS (Note 1)</b>	<b>M1977 CBT (Note 1)</b>
Semitrailer Spare Tire Carrier			•						
Load Handling System								•	•

**Table 2. Notes.****Note:**

1. Vehicle can be equipped in either of two configurations: with or without optional self-recovery winch.
2. Vehicle equipped with self-recovery winch.
3. Self-recovery winch not available for this model.
4. All HEMTT series vehicles are authorized to carry portable beacon light as an optional accessory.
5. All HEMTT series vehicles are authorized to carry portable work lamp as an optional accessory.
6. See data plate on base of crane loader body unit to determine model number.

**END OF WORK PACKAGE**



## OPERATOR MAINTENANCE EQUIPMENT DATA

### EQUIPMENT DATA

***Table 1. Vehicle Operation.***

<b>Operating Mode:</b> On and off-road
<b>Operating Temperature w/o Arctic Kit:</b> -25 to 120°F (-32 to 49°C)
<b>Operating Temperature w/Arctic Kit:</b> -50 to 120°F (-46 to 49°C)

***Table 2. Vehicle Dimensions.***

<b>Width (overall):</b> 96 in. (2 440 mm)
<b>Height (overall):</b> 112 in. (2 845 mm)
<b>Height (reduced for shipping):</b> 101 in. (2 565 mm)
<b>Length Overall:</b> 351 in. (8 920 mm)
<b>Wheelbase:</b> 181 in. (4 600 mm)
<b>Turn Circle (wall-to-wall):</b> 95 ft. (29 m)
<b>Ground Clearance:</b> 24 in. (609.6 mm)
<b>Center of Gravity:</b> See shipping data plate on outside of driver side rear of cab or inside of driver side door.

***Table 3. Vehicle Weight.***

<b>Curb Weight:</b> 34,520 lbs (15 672 kg)
<b>Gross Vehicle Weight Rating (GVWR):</b> 82,000 lbs (37 228 kg)
<b>Gross Combination Weight Rating (GCWR):</b> 135,000 lbs (61 290 kg)

***Table 4. Vehicle Weight Distribution.***

<b>Fifth Wheel Maximum Capacity:</b> 40,000 lbs (18 160 kg)
<b>Front Tandem Axles-Curb:</b> 22,520 lbs (10 224 kg)
<b>Front Tandem Axles-Loaded:</b> 30,000 lbs (13 620 kg)

**Table 4. Vehicle Weight Distribution. - Continued**

<b>Rear Tandem Axles-Curb:</b> 12,000 lbs (5 448 kg)
<b>Rear Tandem Axles-Loaded (maximum):</b> 52,000 lbs (23 608 kg)

**Table 5. Vehicle Performance.**

<b>Cruising Range at GCWR:</b> 300 mi. (483 km)
<b>Maximum Sustained Forward Speed (at 1696 rpm) - 5th Gear:</b> 63 mph (101 km/h)
<b>Maximum Sustained Forward Speed (at 2100 rpm) - 4th Gear:</b> 60 mph (97 km/h)
<b>Maximum Sustained Forward Speed (at 2100 rpm) - 3rd Gear:</b> 39 mph (63 km/h)
<b>Maximum Sustained Forward Speed (at 2100 rpm) - 2nd Gear:</b> 27 mph (43 km/h)
<b>Maximum Sustained Forward Speed (at 2100 rpm) - 1st Gear:</b> 12.7 mph (20 km/h)
<b>Speed on 3% Grade at GCWR:</b> 25 mph (40 km/h)
<b>Speed on 3% Grade at GVWR:</b> 40 mph (64 km/h)
<b>Speed on 30% Grade at GCWR:</b> 3 mph (5 km/h)
<b>Speed on 30% Grade at GVWR:</b> 5 mph (8 km/h)
<b>Maximum Grade at GCWR (Primary and Secondary Roads):</b> 12 percent
<b>Maximum Grade at GCWR (Cross Country):</b> 20 percent
<b>Maximum Grade at GVW:</b> 60 percent
<b>Maximum Side Slope w/Adequate Traction Surface:</b> 30 percent
<b>Maximum Towed Speed (Refer to FM 4-30.31):</b> 15 mph (24 km/h)
<b>Maximum Ford Depth:</b> 48 in. (1 219 mm)
<b>Approach Angle:</b> 41 degrees
<b>Departure Angle:</b> 45 degrees
<b>Limp Home Speed:</b> 10 mph (16 km/h) for up to 30 miles (48 km)

**Table 6. Fluid Capacities.**

Refer to lube table in operator's PMCS for vehicle fluid capacities.

**Table 7. Engine.**

<b>Make:</b> Detroit Diesel Corporation
<b>Model:</b> 8V92TA DDEC IV
<b>Type:</b> 2-Stroke, V-Type Diesel
<b>Cylinders:</b> 8
<b>Bore:</b> 4.84 in. (123 mm)
<b>Stroke:</b> 5 in. (127 mm)
<b>Displacement:</b> 736 cid (12 L)
<b>Maximum Brake Horsepower (at 2100 rpm):</b> 445 BHP (332 kW)
<b>Maximum Governed Engine Speed - Loaded:</b> 2050 - 2150 rpm
<b>Maximum Governed Engine Speed - No Load:</b> 2225 - 2275 rpm
<b>Oil Filter Type:</b> Full flow, replaceable element
<b>Oil Filter Quantity:</b> 1

**Table 8. Fuel System.**

<b>Type:</b> Diesel Injection
<b>Tank Quantity:</b> 1
<b>Air Cleaner Type:</b> Dry element
<b>Element Quantity:</b> (1 primary, 1 secondary)

**Table 9. Electrical System.**

<b>Voltage:</b> 24
<b>Alternator (amps):</b> 130
<b>RFI Suppression Ability:</b> Yes
<b>Number of Batteries:</b> 4
<b>Battery Voltage (each):</b> 12 volts
<b>Battery Connection:</b> Series - parallel
<b>Battery Capacity (at 20 hour rate):</b> 900 amp
<b>Battery Reserve Capacity (each, at 80°F/27°C):</b> 180 minutes

**Table 9. Electrical System. - Continued**

<b>Battery Cold Cranking Amps (each, at 80°F/27°C):</b> 575 CCA
---

<b>Battery Amp Hours (each, at 20 hour rate):</b> 100 amp
---

**Table 10. Cooling System.**

<b>Radiator Working Pressure:</b> 7 psi (48 kPa)
--

**Table 11. Transmission.**

<b>Make:</b> Allison
----------------------

<b>Model:</b> 4500 SP
-----------------------

<b>Type:</b> Automatic
------------------------

<b>Number of Forward Speeds:</b> 5
------------------------------------

<b>Number of Reverse Speeds:</b> 1
------------------------------------

**Table 12. Transfer Case.**

<b>Make:</b> Oshkosh
----------------------

<b>Model:</b> 55000
---------------------

<b>Type:</b> Air-operated front tandem disconnect
---

<b>Ratios:</b> 0.98:1 and 2.66:1
----------------------------------

**Table 13. Front Tandem Axles.**

<b>Front Tandem</b>
---------------------

<b>Make:</b> Oshkosh/Dana Heavy Axle
--------------------------------------

<b>Differential Carrier Model Nos.:</b> No. 1 axle: RS480, No. 2 axle: DS480-P
--

<b>Maximum Steering Angle:</b> 32 degrees
---

**Table 14. Rear Tandem Axles.**

<b>Make:</b> Dana Heavy Axle
------------------------------

<b>Differential Carrier Model Nos.:</b> No. 3 axle: DS520-P, No. 4 axle: RS520
--

**Table 15. Brake System.**

<b>Actuation:</b> Air
-----------------------

**Table 15. Brake System. - Continued**

<b>Number of Brake Chambers:</b> 8
<b>Pressure Range:</b> 60 - 120 psi (414 - 827 kPa)

**Table 16. Wheels.**

<b>Type:</b> Two-piece bolt-together wheel
<b>Quantity:</b> 8
<b>Spare Quantity:</b> 1
<b>Rim Size:</b> 20 x 10
<b>Stud Quantity Per Wheel:</b> 10

**Table 17. Tires.**

<b>Type:</b> Radial without tube
<b>Quantity:</b> 8
<b>Spare Quantity:</b> 1
<b>Tread Type:</b> Radial traction, non-directional
<b>Size:</b> 16.00R x 20 in.
<b>Load Range:</b> M

**Table 18. Steering System.**

<b>Type:</b> Dual gear with integrated hydraulic power assist
---

**Table 19. Towing Eyes.**

<b>Quantity:</b> 4 (2 front, 2 rear)
<b>Maximum Load Capacity Each:</b> 60,000 lbs (27 216 kg)

**Table 20. Pintle Hook.**

<b>Type:</b> Manual Release
<b>Maximum Load Capacity - Pulling:</b> 30,000 lbs (13 608 kg) in off-road application
<b>Maximum Load Capacity - Vertical:</b> 1,700 lbs (771 kg)

**Table 21. Fifth Wheel.**

<b>Type:</b> Full (4-way) oscillating with kingpin lock
<b>Kingpin Size:</b> 3.5 in. (89 mm)
<b>Side Articulation of Top Plate:</b> 5 degrees
<b>Front and Rear Articulation of Top Plate:</b> 27-28 degrees

**Table 22. Cab.**

<b>Windshield:</b> Tinted, two-piece, safety glass
<b>Personnel Capacity:</b> 2

**Table 23. Heavy-Duty Winch.**

<b>Make:</b> DP Manufacturing
<b>Model:</b> 45K
<b>Type:</b> Two-Speed Variable Displacement
<b>Cable Diameter:</b> 7/8 in. (22 mm)
<b>Cable Length:</b> 150 ft. (45.75 m)
<b>Line Pull - First Layer:</b> Low Speed: 45,000 lbs (20 430 kg), High Speed: 16,600 lbs (7 536kg)
<b>Line Pull - Second Layer:</b> Low Speed: 37,200 lbs (16 889 kg), High Speed: 13,700 lbs (6 220 kg)
<b>Line Pull - Third Layer:</b> Low Speed: 31,700 lbs (14 392 kg), High Speed: 11,700 lbs (5 312 kg)
<b>Line Pull - Fourth Layer:</b> Low Speed: 27,700 lbs (12 576 kg), High Speed: 10,200 lbs (4 631 kg)

**Table 24. Auxiliary Equipment.**

Arctic Engine Heater Kit
Chemical Alarm
Decontamination Unit
Gas Particulate Filter Unit
Machine Gun Ring
Radio Installation Kit
Rifle Mounting Kit

**Table 24. Auxiliary Equipment. - Continued**

**Note:** Vehicle may or may not be equipped with any of these items depending on mission, climate, or other factors.

**Table 25. Vehicle Load Classification.**

UNLOADED (TONS)	FULL LOAD (TONS)	WITH TRAILER LOADED (TONS)
15	N/A	Varies upon trailer and payload.

**TIRE PRESSURES****Table 26. M983A2 LET Tractor Vehicle Tire Pressures.**

TIRE	HIGHWAY	CROSS- COUNTRY (DRY)	CROSS- COUNTRY (WET)	SANDY TERRAIN
<b>Front Tire Pressure</b>				
<b>STANDARD (XZL) TIRE</b>	60 psi (414 kPa)	35 psi (241 kPa)	20 psi (138 kPa)	20 psi (138 kPa)
<p style="text-align: center;"><b>NOTE</b></p> <p>To improve ride comfort and tire life, operator has the choice of three rear tire pressures which depend on semitrailer load configuration.</p>				
<b>Rear Tire Pressure (No Semitrailer or Semitrailer Empty)</b>				
<b>STANDARD (XZL) TIRE</b>	45 psi (310 kPa)	45 psi (517 kPa)	45 psi (310 kPa)	45 psi (310 kPa)
<b>Rear Tire Pressure (Semitrailer Load Resulting in Fifth Wheel Load of 29,500 lbs or LESS)</b>				
<b>STANDARD (XZL) TIRE</b>	75 psi (517 kPa)	75 psi (517 kPa)	45 psi (310 kPa)	45 psi (310 kPa)
<b>Rear Tire Pressure (Semitrailer Load Resulting in Fifth Wheel Load of 29,501 lbs or MORE)</b>				
<b>STANDARD (XZL) TIRE</b>	100 psi (690 kPa)	75 psi (517 kPa)	45 psi (310 kPa)	45 psi (310 kPa)
<b>Spare Tire Pressure</b>				
<b>STANDARD (XZL) TIRE</b>	100 psi (690 kPa)	100 psi (690 kPa)	100 psi (690 kPa)	100 psi (690 kPa)

**OPERATING SPEEDS***Table 27. Operating Speeds.*

	<b>HIGHWAY</b>	<b>CROSS- COUNTRY (DRY)</b>	<b>CROSS- COUNTRY (WET)</b>	<b>SANDY TERRAIN</b>
<b>STANDARD (XZL) TIRE</b> (maximum Speed)	55 mph (88 km/h)	40 mph (64 km/h)	20 mph (32 km/h)	20 mph (32 km/ h)

**END OF WORK PACKAGE**



**OPERATOR MAINTENANCE  
AIR SYSTEM**

---

**NOTE**

On the M983A2 LET tractor vehicle, air from reservoir number four is controlled by the winch tensioner and winch declutch manual valves, which in turn operate the heavy-duty winch kickout and cable hold down systems.

Refer to TM 9-2320-315-14&P, Principles of Operation.

**END OF WORK PACKAGE**



## OPERATOR MAINTENANCE MAIN HYDRAULIC SYSTEM

### MAIN HYDRAULIC SYSTEM

The main hydraulic system consists of a power take-off (PTO) driven hydraulic pump (1) and a hydraulic fluid reservoir (2) shared with the power steering hydraulic system.

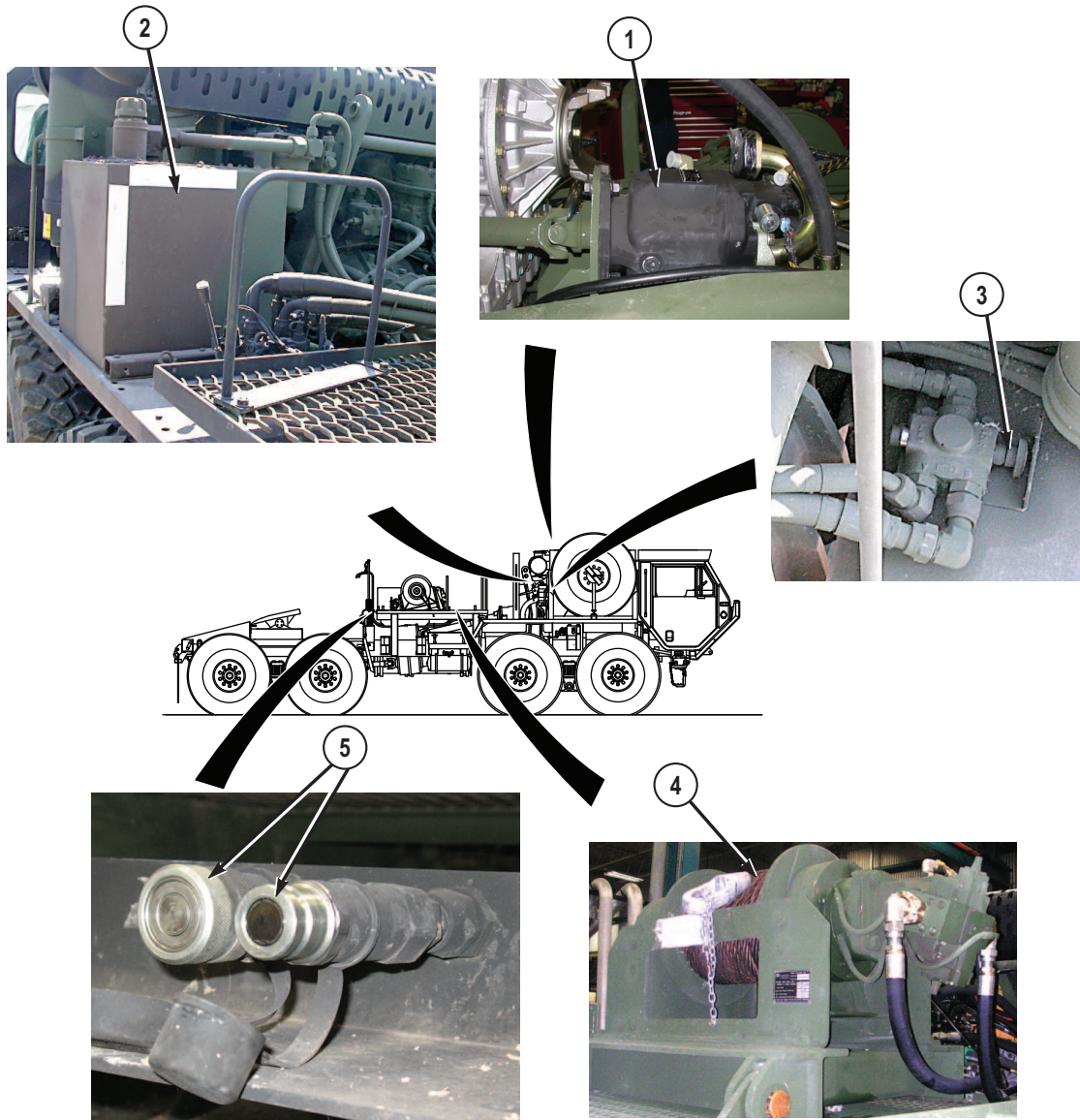


Figure 1.

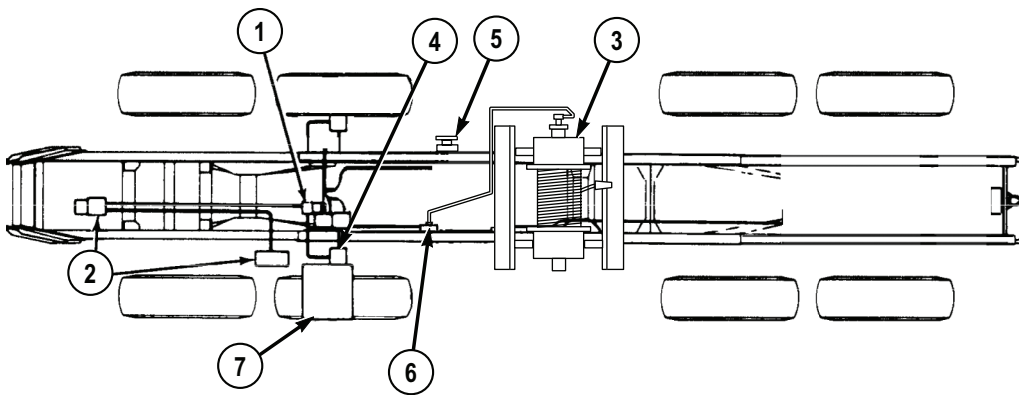
**NOTE**

- Pushing the manually-operated hydraulic selector valve in enables hydraulic power to auxiliary hydraulic quick disconnects.
- Pulling the manually-operated hydraulic selector valve out enables hydraulic power to heavy-duty winch.

The M983A2 LET is not equipped with a self-recovery winch, but is equipped with a manually-operated hydraulic selector valve (3) to supply hydraulic power to the heavy-duty winch (4) or auxiliary hydraulic quick disconnects (5).

**FLUID SYSTEM**

Hydraulic pump (1) mounted on the rear of engine provides the fluid power to operate the power steering (2).



*Figure 2.*

Fluid power for operating the heavy-duty winch (3) is provided by a hydraulic pump (4) driven by the power take-off (PTO) mounted on the transmission.

A manually-operated selector valve (5) is used to activate the heavy-duty winch (3).

Operation of the heavy-duty winch (3) is controlled from the control panel (6) on the driver side of the vehicle.

Both hydraulic pumps (1 and 4) share the same hydraulic fluid reservoir (7).

**END OF WORK PACKAGE**

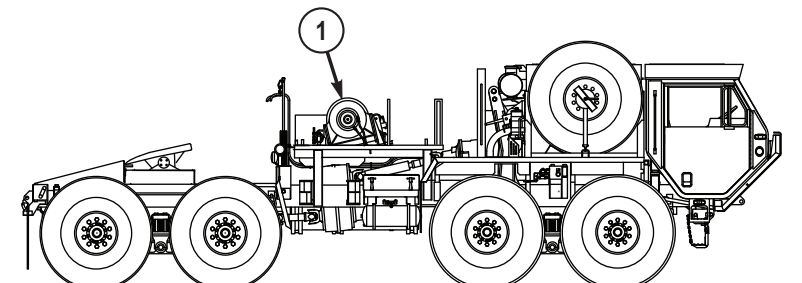
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## OPERATOR MAINTENANCE HEAVY-DUTY WINCH

---

### HEAVY-DUTY WINCH

The heavy-duty winch assembly (1) is mounted onto chassis frame. It is powered by an automatic two-speed hydraulic motor which drives the winch drum through a planetary gearbox.



*Figure 1.*

**END OF WORK PACKAGE**



## CHAPTER 2

### OPERATOR INSTRUCTIONS





**OPERATOR MAINTENANCE  
HYDRAULIC SELECTOR VALVE CONTROL**

**CONTROLS AND INDICATORS INTRODUCTION**

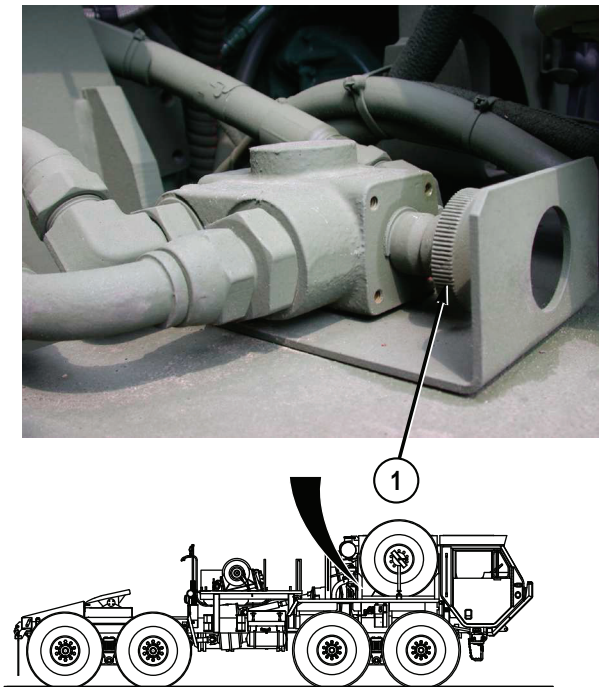
This section displays the location and describes the use of Hydraulic Selector Valve Control which is used in the operation of HEMTT series vehicles (refer to TM 9-2320-279-10-1). Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

**LOCATION AND USE OF CONTROLS AND INDICATORS**

Know the location and proper use of every control and indicator before operating HEMTT series vehicles. Separate illustrations with keys are provided for learning about Hydraulic Selector Valve Control.

*Table 1. Hydraulic Selector Valve Control.*

Key	Control/Indicator	Function
-----	-------------------	----------



*Figure 1.*

1	Hydraulic Selector Valve Control	Diverts main hydraulic power to/from Heavy-Duty Winch:
---	----------------------------------	--

Heavy-Duty Winch operation - PULL OUT.

**Table 1. Hydraulic Selector Valve Control. - Continued**

Key	Control/Indicator	Function
All other operations - PUSH IN (shown).		

**END OF WORK PACKAGE**

**OPERATOR MAINTENANCE  
HEAVY-DUTY WINCH CONTROLS**

**CONTROLS AND INDICATORS INTRODUCTION**

This section displays the location and describes the use of Heavy-Duty Winch Controls which are used in the operation of HEMTT series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

**LOCATION AND USE OF CONTROLS AND INDICATORS**

Know the location and proper use of every control and indicator before operating HEMTT series vehicles (refer to TM 9-2320-279-10-1). Separate illustrations with keys are provided for learning about Heavy-Duty Winch Controls.

*Table 1. Heavy-Duty Winch Controls.*

Key	Control/Indicator	Function

Figure 1.

**Table 1. Heavy-Duty Winch Controls. - Continued**

<b>Key</b>	<b>Control/Indicator</b>	<b>Function</b>
1	Winch Control Lever	Reels in/pays out heavy-duty winch cable.
2	Winch KickOut Control	<p>Engage/disengage heavy-duty winch KickOut.</p> <p>Engage (push in) - This will engage heavy-duty winch KickOut which disengages winch gears, allowing cable drum to spin freely. Cable drum will not move via input to winch control lever (manual or remote-control).</p> <p>Disengage (pull out) - This will disengage heavy-duty winch KickOut which engages winch gears. Cable drum will only move via input to winch control lever (manual or remote-control) under power.</p>
3	Cable Hold Down Control	Engage/disengage heavy-duty winch cable hold down assembly.
4	HIGH IDLE Switch	Turns engine high idle circuit ON/OFF.
5	Remote-Control Unit Receptacle	Allows operator to hook remote-control unit into heavy-duty winch system.
6	Remote-Control Unit	Allows operator to control heavy-duty winch away from vehicle.
7	High Idle Switch (Remote-Control Unit)	Turns engine high idle circuit ON/OFF.
8	Winch Control Lever (Remote-Control Unit)	Reels in/pays out heavy-duty winch cable.

**END OF WORK PACKAGE**

**OPERATOR MAINTENANCE  
FIFTH WHEEL CONTROLS**

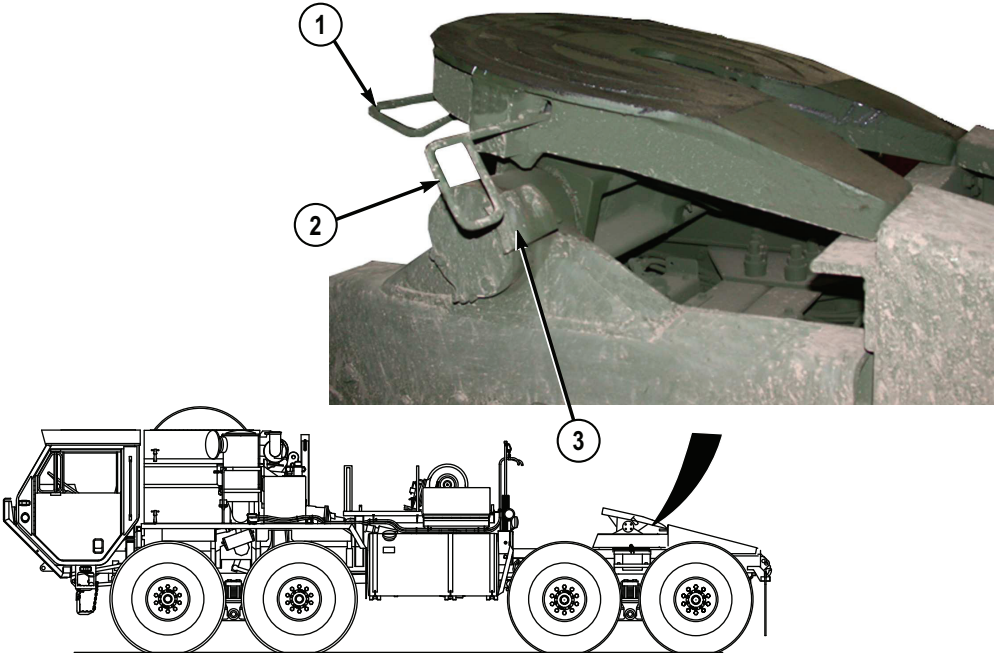
**CONTROLS AND INDICATORS INTRODUCTION**

This section displays the location and describes the use of Fifth Wheel Controls which are used in the operation of HEMTT series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

**LOCATION AND USE OF CONTROLS AND INDICATORS**

Know the location and proper use of every control and indicator before operating HEMTT series vehicles (refer to TM 9-2320-279-10-1). Separate illustrations with keys are provided for learning about Fifth Wheel Controls.

*Table 1. Fifth Wheel Controls.*

Key	Control/Indicator	Function
		

*Figure 1.*

- |   |                        |  |
|---|------------------------|--|
| 1 | Primary Lock Release   | Pull out (push up and hook tab to lock) to open fifth wheel coupler jaws. Push in to close fifth wheel coupler jaws. Primary lock release will not function when secondary lock release is locked. |
| 2 | Secondary Lock Release | Pull out to unlock fifth wheel coupler jaws. Allows primary lock release to open/close fifth wheel coupler jaws.   |

**Table 1. Fifth Wheel Controls. - Continued**

<b>Key</b>	<b>Control/Indicator</b>	<b>Function</b>
3	Lockout	Lockouts (one each on driver side and passenger side of fifth wheel) have three settings: FULL LOCK - inhibits the fifth wheel from pivoting (rolling) side to side. HALF LOCK - Fifth wheel is able to pivot (roll) three degrees side to side. NO LOCK - Fifth wheel is able to pivot (roll) its full range of six degrees side to side.

**END OF WORK PACKAGE**

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## OPERATOR MAINTENANCE CONNECT/DISCONNECT M870/M870A1 SEMITRAILER

---

### INITIAL SETUP:

Not Applicable

---

### CONNECT M870/M870A1 SEMITRAILER

#### WARNING



- This procedure should be performed on level ground. Failure to comply may result in injury or death to personnel.
- Operator must always be stationed in driver's seat any time the tractor vehicle is in N (neutral) with wheel chocks removed. Failure to comply may result in injury or death to personnel.

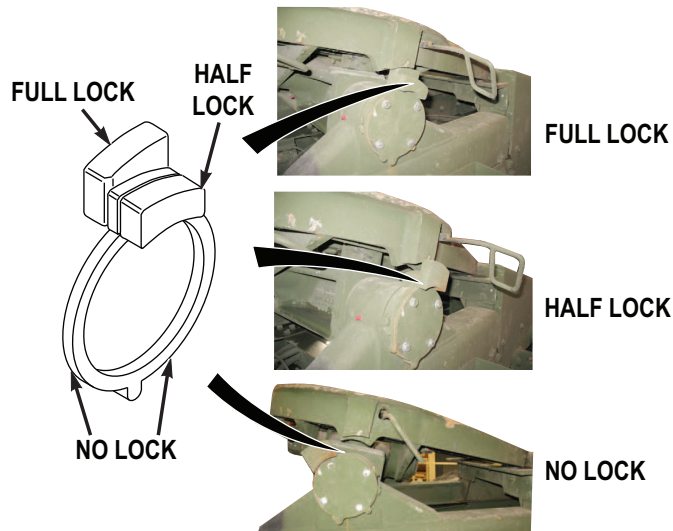
#### CAUTION

- Lockouts must be positioned as identified in Table 1. Failure to comply may result in damage to equipment.
- Always refer to semitrailer specific operator's manual (TM 5-2330-378-14&P) prior to coupling. Failure to comply may result in damage to equipment.

#### NOTE

- This procedure is a two soldier task.
- Leave tractor vehicle running during procedure for heavy-duty winch operation.
- Tractor vehicle is equipped with fifth wheel to accept 3.5 in. (89 mm) kingpin.
- If fifth wheel lockout assemblies are not positioned correctly, complete Steps (1) through (3).
- If fifth wheel lockout assemblies are positioned correctly, skip to Step (4).

1. Refer to Table 1. to determine whether lockout assembly lockrings are in correct position.

**Table 1. Lockout Requirements.****Figure 1.**

SEMITRAILER CENTER OF GRAVITY (CG)	ON-ROAD	OFF-ROAD
BELOW 65 in. (165 cm)	HALF LOCK (3° Oscillation)	NO LOCK (6° Oscillation)
ABOVE 65 in. (165 cm)	FULL LOCK (No Oscillation)	NO LOCK (6° Oscillation)

**NOTE**

- Remove lockout assembly only if desired locking position (HALF LOCK or FULL LOCK) is not located to the inside (against the fifth wheel).
- Loosen and rotate locking if NO LOCK position is desired, or if desired locking position (HALF LOCK or FULL LOCK) is located to the inside (against the fifth wheel).
- To remove lockout assembly, complete Step (2).
- To loosen and rotate lockout assembly, skip to Step (3).
- Both fifth wheel lockout assemblies are removed the same way (driver side shown).

2. Remove four screws (1), lockwashers (2), cover plate (3), and locking (4) from fifth wheel (5).



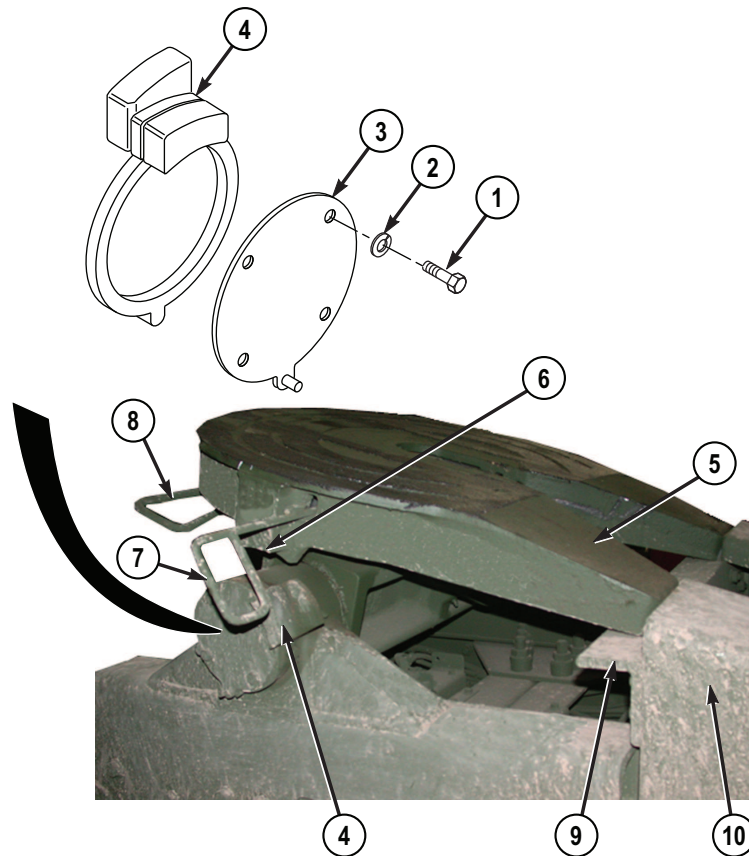


Figure 2.

- a. Install locking (4) so desired surface area (see Table 1 above) is oriented directly under engagement area (6) of fifth wheel (5) with cover plate (3), four lockwashers (2) and screws (1).
- b. Repeat Step (2) for opposite side of fifth wheel (5).

**NOTE**

Both fifth wheel lockout assemblies are rotated the same way (driver side shown).

3. Loosen four screws (1):

**NOTE**

- Driver side locking rotates toward the rear of vehicle.
- Passenger side locking rotates toward the front of vehicle.

- a. Rotate locking (4) so desired surface area (see table 1 above) is oriented directly under engagement area (6) of fifth wheel (5).
- b. Tighten four screws (1).

- c. Repeat Step (3) for opposite side of fifth wheel (5).

### NOTE

Fifth wheel has two lock release handles.

4. Pull fifth wheel secondary lock release handle (7) completely out as far as it will go.
5. Pull out fifth wheel primary lock release handle (8) and hook it in out position.
6. Push down rear of fifth wheel (5) until it rests on stop (9) below guide ramps (10).

### CAUTION

- Ensure there is a generous amount of grease on fifth wheel, ramps, kingpin, and steering wedge. Failure to comply may result in damage to equipment.
  - Tractor vehicle and semitrailer coupling should be performed with the tractor vehicle and semitrailer in a straight line. If wedge of trailer is not aligned with tractor vehicle fifth wheel, adjust either tractor vehicle, trailer, or both to align them. Failure to comply may result in damage to equipment.
7. Prepare semitrailer for coupling (refer to TM 5-2330-378-14&P).

### WARNING



Ensure that no one is standing between vehicle and semitrailer during coupling procedure. Failure to comply may result in injury or death to personnel.

8. Slowly back tractor vehicle to within 3 ft. (.92 m) of semitrailer. Stop tractor vehicle.
9. Set transmission range selector (11) to N (neutral).

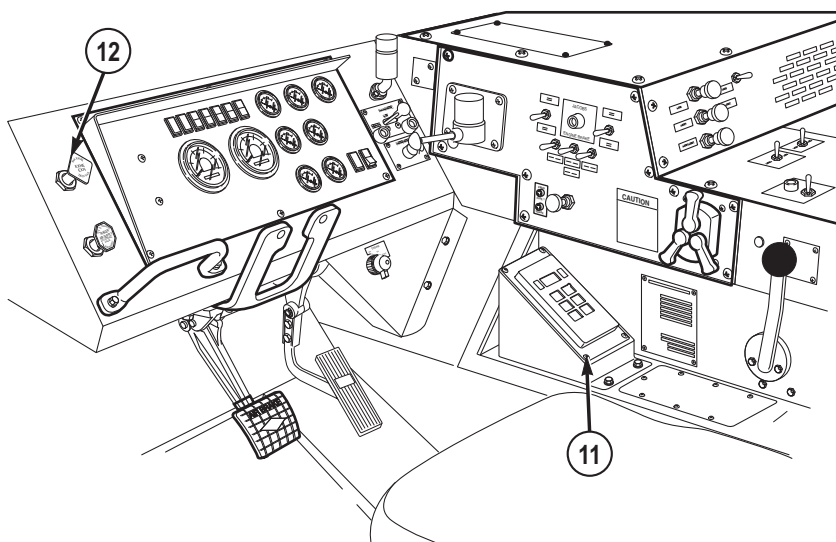


Figure 3.

### NOTE

Dashboard parking brake indicator will illuminate when PARKING BRAKE control is applied.

10. Pull out PARKING BRAKE control (12).

11. Prepare heavy-duty winch (13) for operation. (WP 0015)

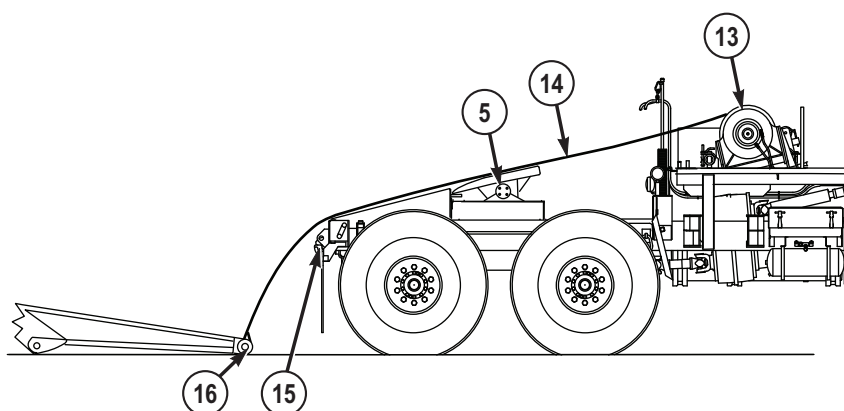


Figure 4.

**WARNING**

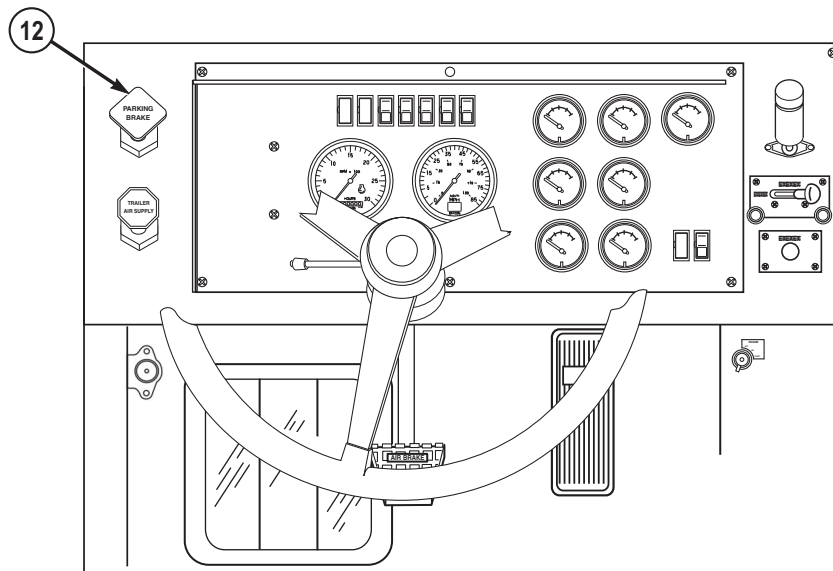
- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.
- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

12. With aid of an assistant, pay out heavy-duty winch cable (14) over fifth wheel (5) and guide roller (15), and connect heavy-duty winch cable (14) to lifting eye (16) of semitrailer.

**NOTE**

Dashboard parking brake indicator will go out when PARKING BRAKE control is released.

13. Push in PARKING BRAKE control (12).



*Figure 5.*

**WARNING**

Ensure that no one is standing between vehicle and semitrailer during coupling procedure. Failure to comply may result in injury or death to personnel.

**CAUTION**

Ensure tractor vehicle does not have parking brake or service brakes engaged while assistant reels in heavy-duty winch cable and lifts semitrailer off ground. Failure to comply may result in damage to equipment.

14. Reel in heavy-duty winch cable (14) until semitrailer gooseneck (17) is in maximum upright position. Operator allows semitrailer and tractor vehicle to roll together.

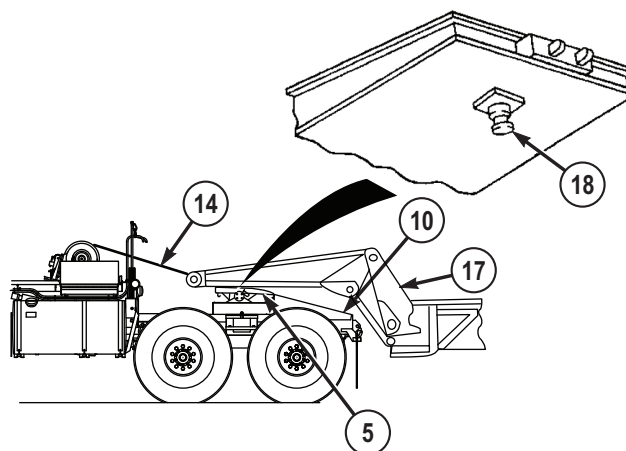


Figure 6.

**CAUTION**

Do not run kingpin up guide ramps to prevent damage to kingpin, guide ramps, or fifth wheel.

**NOTE**

- As semitrailer contacts tractor vehicle, second assistant should visually check that front of semitrailer is on guide ramps.
- Tractor vehicle is equipped with fifth wheel to accept 3.5 in. (89 mm) kingpin.

15. Continue to reel in heavy-duty winch cable (14) as semitrailer moves up guide ramps (10), and semitrailer kingpin (18) locks in fifth wheel (5).
16. Verify semitrailer kingpin (18) is fully engaged and locked within fifth wheel (5).

### NOTE

Dashboard parking brake indicator will illuminate when PARKING BRAKE control is applied.

17. Pull out PARKING BRAKE control (12).

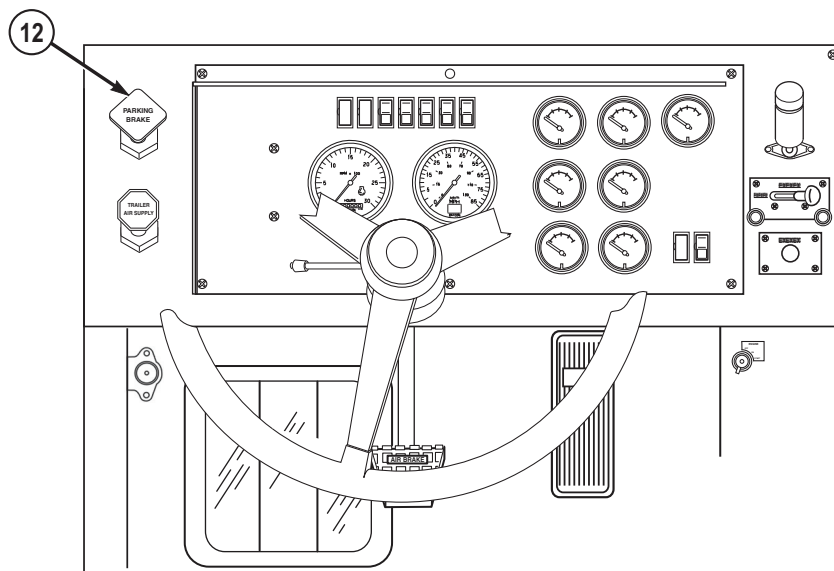


Figure 7.

18. Ensure primary lock release handle (8) is completely in.

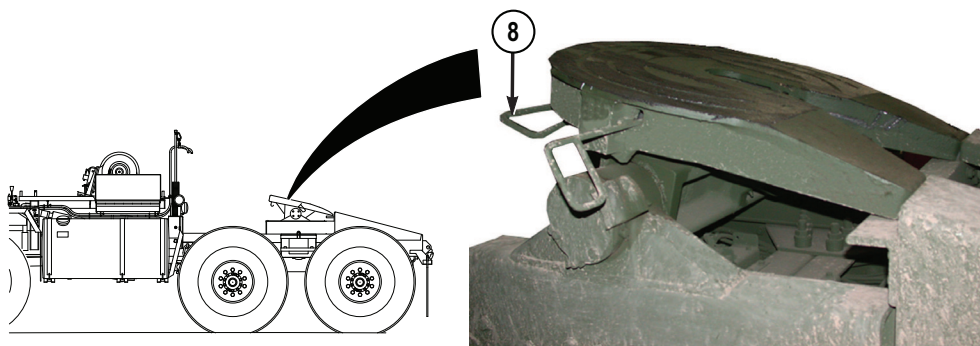


Figure 8.

### NOTE

- If semitrailer is M870, continue with Step (19).

- If semitrailer is M870A1, skip to Step (20).

19. Perform the following for a M870 semitrailer:

- Install two lockpins (19), one on each side of semitrailer gooseneck (17).

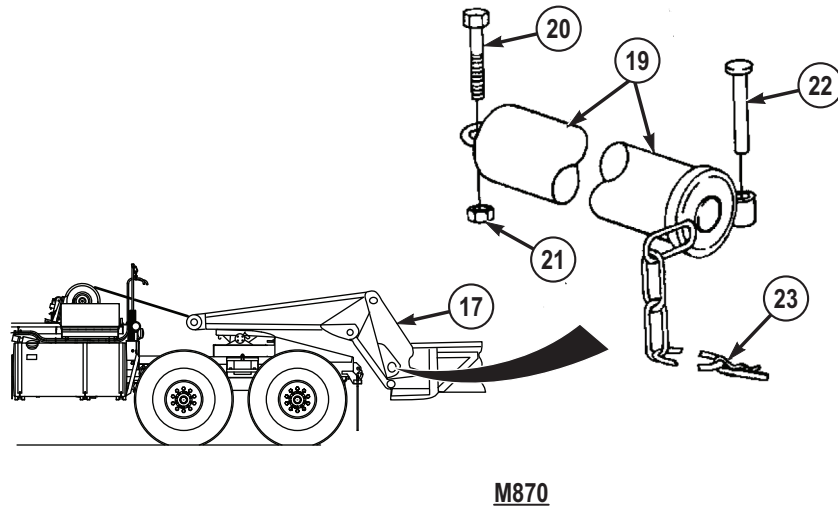


Figure 9.

- Install two safety screws (20), nuts (21), safety locking pins (22), and safety clips (23) in lockpins (19).

### NOTE

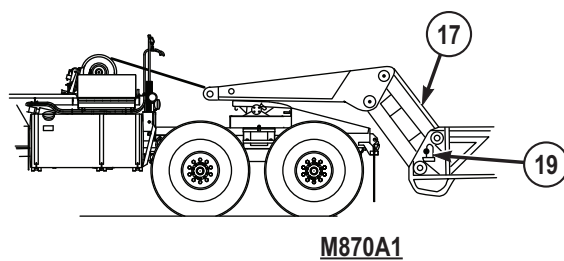
If semitrailer is M870A1, continue with Step (20).

20. Perform the following for a M870A1 semitrailer:

### CAUTION

Ensure safety latches on locking pins lay flat against the frame of semitrailer and in holder.  
Failure to comply may result in damage to equipment.

- Install two lockpins (19), one on each side of semitrailer gooseneck (17).



*Figure 10.*

21. Disconnect tractor vehicle air lines (24) from tree (25).



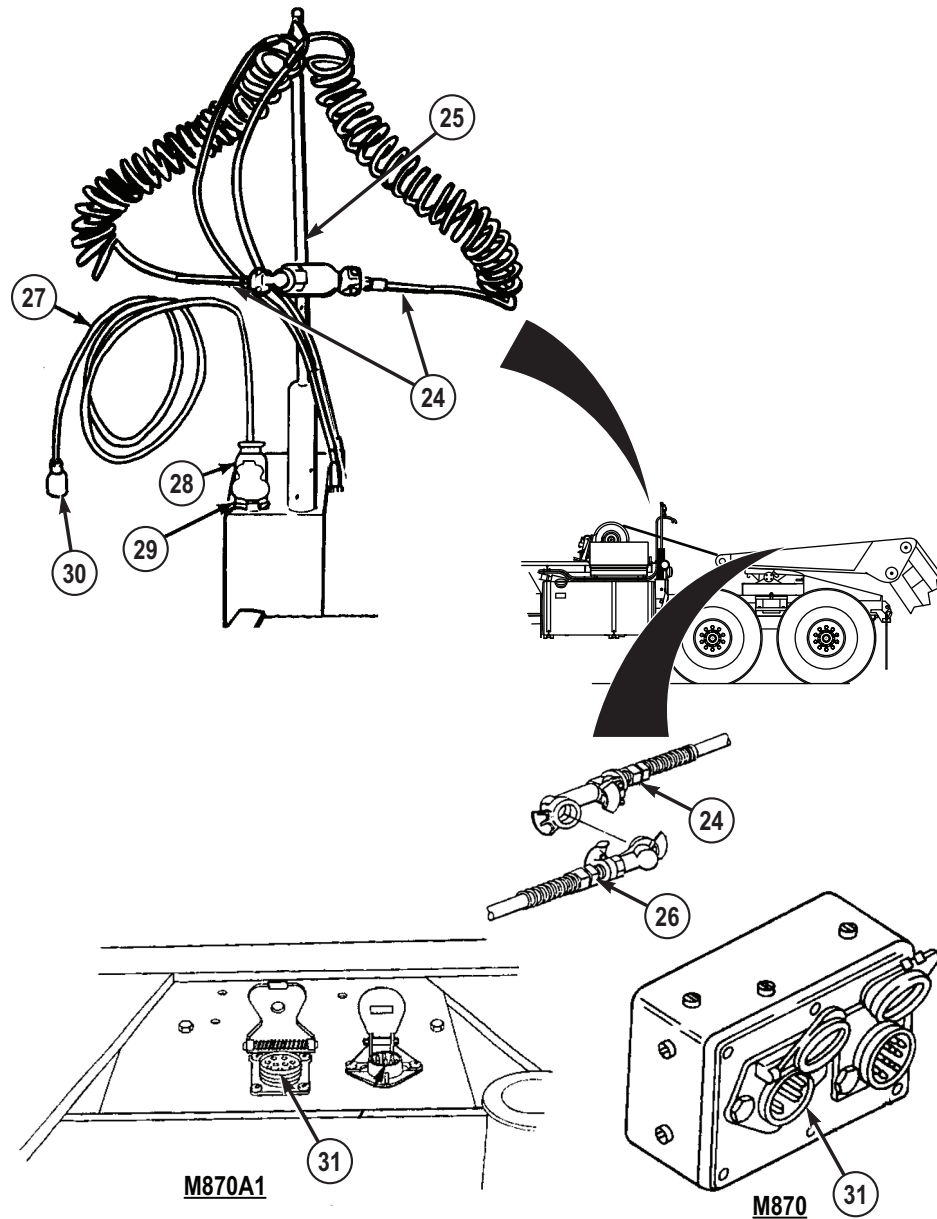


Figure 11.

**NOTE**

- Connect tractor vehicle emergency (red) air line to semitrailer emergency (red) air line.
- Connect tractor vehicle service (blue) air line to semitrailer service (blue) air line.

22. Connect tractor vehicle air lines (24) to semitrailer air lines (26).

23. Remove inter-vehicular wiring harness (27) from stowage box and connect cable plug (28) to receptacle on tractor vehicle (29).

**NOTE**

M870/M870A1 semitrailers have both 12-volt and 24-volt receptacles, use the 24-volt receptacle.

24. Connect free end of inter-vehicular harness cable plug (30) to receptacle (31) on semitrailer.

**NOTE**

The M870 and M870A1 semitrailers have different air reservoir configurations (refer to figure below).

25. Ensure semitrailer air reservoirs (32) have drain cocks (33) in closed position.

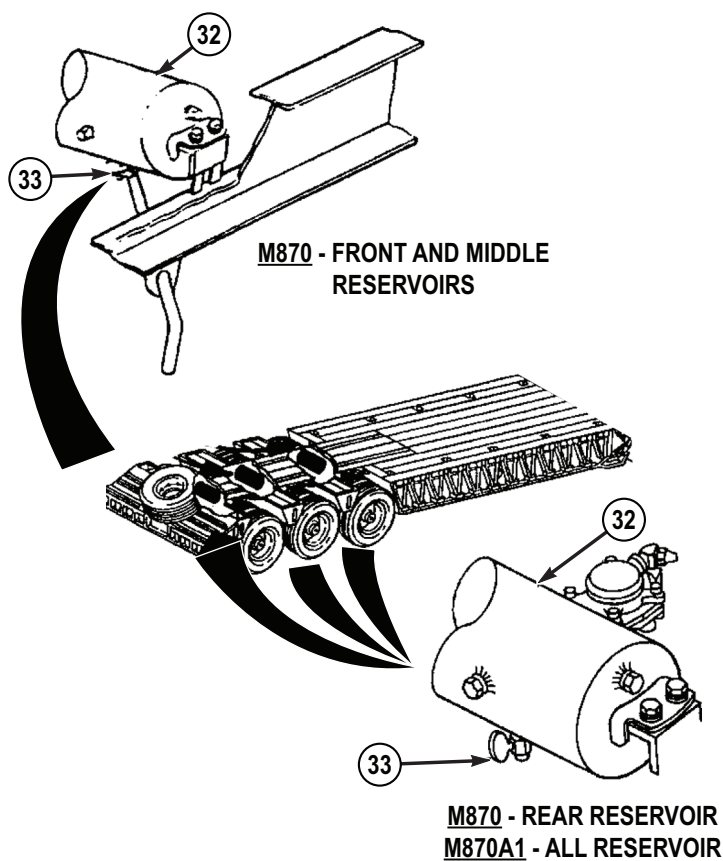


Figure 12.

26. With aid of an assistant, disconnect heavy-duty winch cable (14) from semitrailer lifting eye (16) and stow heavy-duty winch cable (14).

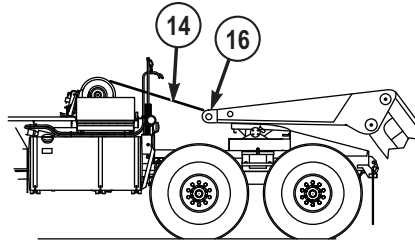


Figure 13.

27. With aid of an assistant, prepare semitrailer for transport (refer to TM 5-2330-378-14&P).

28. Push in TRAILER AIR SUPPLY control (34).

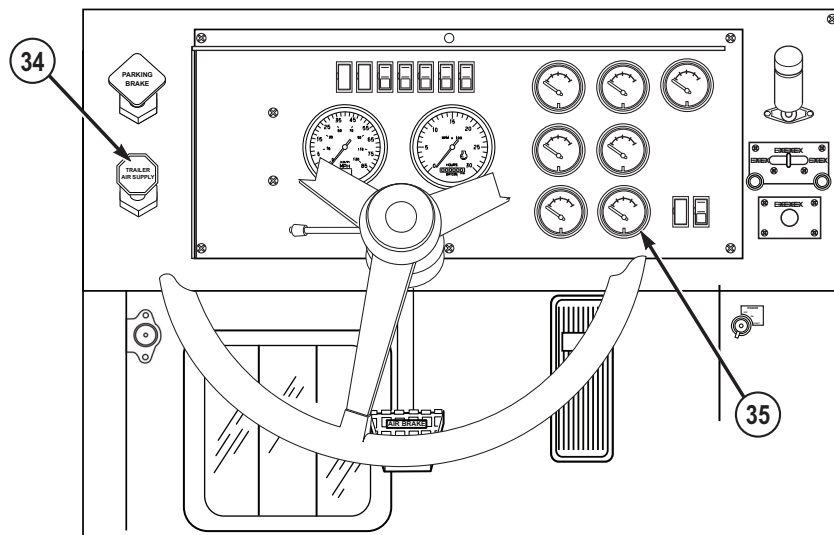


Figure 14.

29. Red and green needles of AIR PRESS gauge (35) must indicate at least 100 psi (690 kPa) before starting out.

30. Transport semitrailer (refer to TM 5-2330-378-14&P for semitrailer specific operating procedures).

### DISCONNECT M870/M870A1 SEMITRAILER

#### WARNING



- This procedure should be performed on level ground. Failure to comply may result in injury or death to personnel.

- Operator must always be stationed in driver's seat any time the tractor vehicle is in N (neutral) with wheel chocks removed. Failure to comply may result in injury or death to personnel.

### CAUTION

- Operator should not leave cab of tractor vehicle during these procedures. Tractor vehicle will have engine running, wheel chocks removed, and PARKING BRAKE control released (disengaged) for extended periods of time. Failure to comply may result in damage to equipment.
- Always refer to semitrailer specific operator's manual (TM 5-2330-378-14&P) prior to uncoupling. Failure to comply may result in damage to equipment.

### NOTE

- This procedure is a two soldier task.
- Leave tractor vehicle running during procedure for heavy-duty winch operation.

1. Position tractor vehicle and semitrailer.
2. Set transmission range selector (1) to N (neutral).

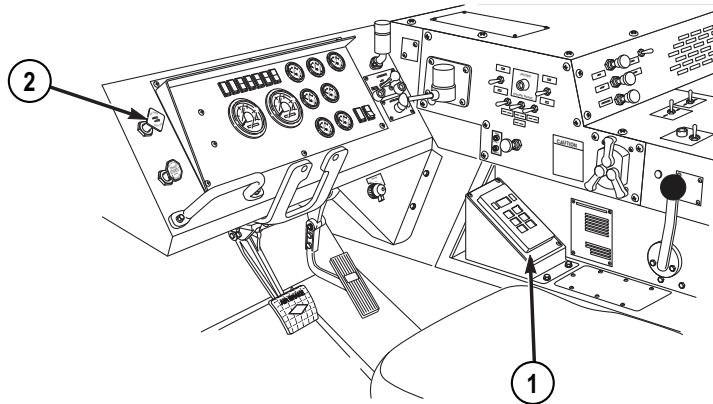


Figure 15.

### NOTE

Dashboard parking brake indicator will illuminate when PARKING BRAKE control is applied.

3. Pull out PARKING BRAKE control (2).

### CAUTION

Payload must be positioned over rear axles before starting uncoupling procedures. Failure to comply may result in damage to equipment.

4. With aid of an assistant, prepare semitrailer load for uncoupling (refer to TM 5-2330-378-14&P).
5. Ensure handbrake control (3) is off.

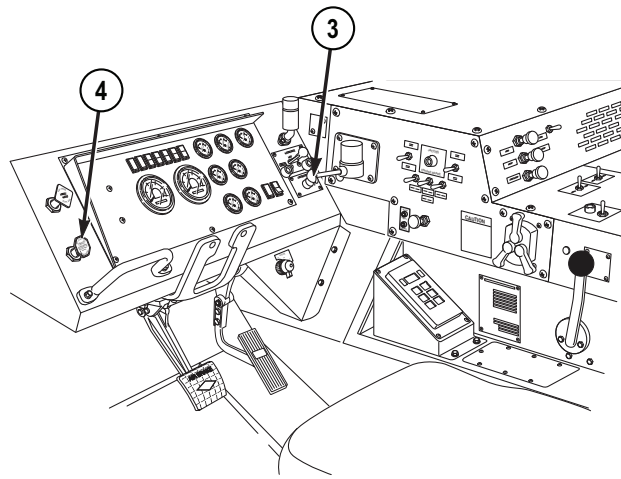


Figure 16.

6. Pull out TRAILER AIR SUPPLY control (4).
7. Disconnect air lines (5) from semitrailer and stow air lines on tree (6).

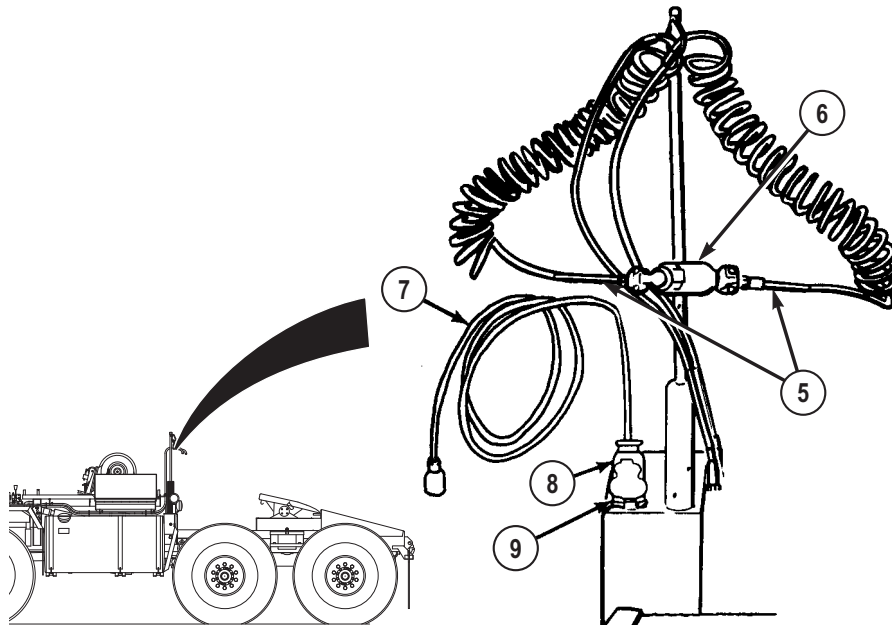


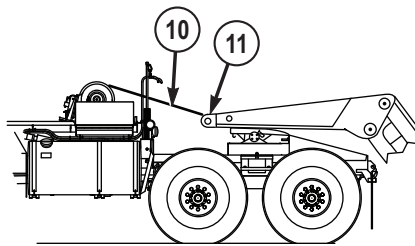
Figure 17.

8. Disconnect inter-vehicular wiring harness (7) from semitrailer, remove cable plug (8) from tractor vehicle receptacle (9), and stow inter-vehicular wiring harness (7) in stowage box.

**WARNING**

- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.
- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

9. With aid of an assistant, pay out heavy-duty winch cable (10) and connect to lifting eye (11) of semitrailer.



*Figure 18.*

**NOTE**

- If semitrailer is M870, continue with Step (10).
- If semitrailer is M870A1, skip to Step (11).

10. Perform the following for a M870 semitrailer:

- a. Remove two safety clips (12), safety locking pins (13), nuts (14), and screws (15) from lockpins (16).

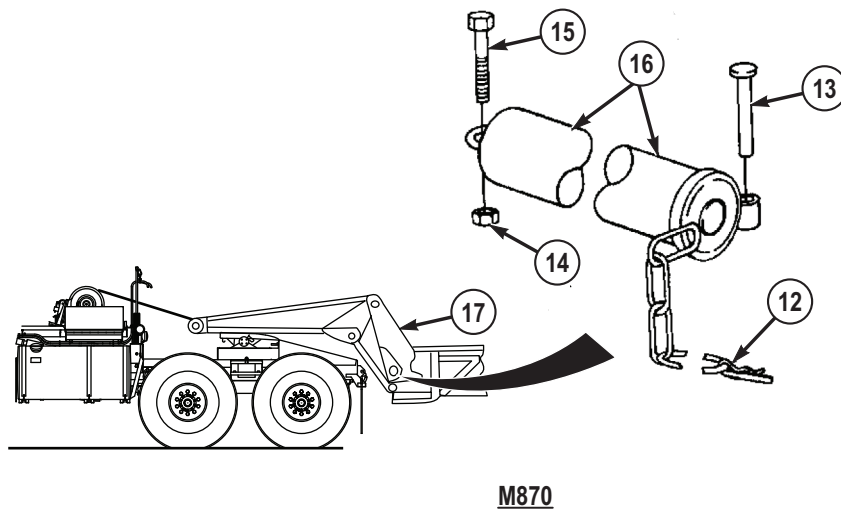


Figure 19.

- b. Remove two lockpins (16), one from each side of semitrailer gooseneck (17).
- c. Install two safety screws (15), nuts (14), safety locking pins (13), and safety clips (12) in lockpins (16) to prevent loss.

**NOTE**

- If semitrailer is M870, skip to Step (12).
- If semitrailer is M870A1, continue with Step (11).

11. Remove two lockpins (16), one from each side of semitrailer gooseneck (17).

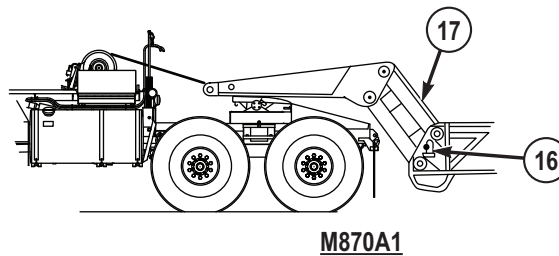


Figure 20.

**NOTE**

Fifth wheel has two lock release handles.

12. Pull fifth wheel secondary lock release handle (18) completely out as far as it will go.

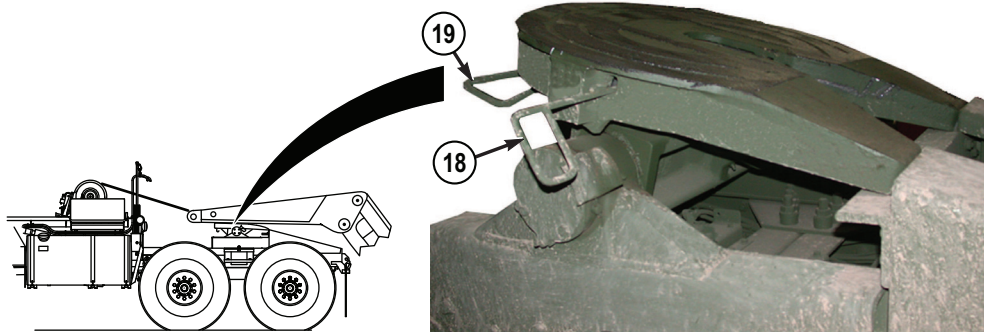


Figure 21.

13. Pull out fifth wheel primary lock release handle (19) and hook it in out position.

### NOTE

Dashboard parking brake indicator will go out when PARKING BRAKE control is released.

14. Push in PARKING BRAKE control (2).

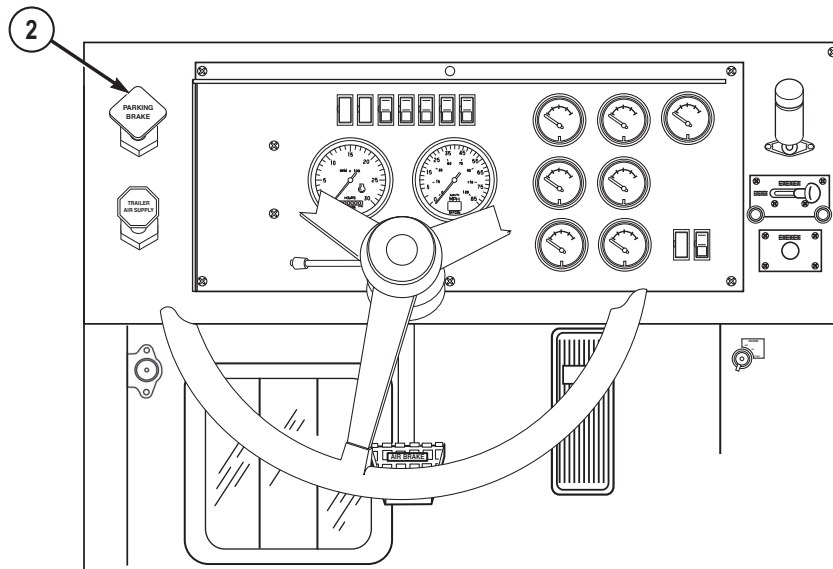


Figure 22.

### WARNING



- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.



- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

### CAUTION

- When uncoupling on soft or rough terrain, tractor vehicle may not roll forward as heavy-duty winch cable is payed out. It will be necessary to move tractor vehicle forward as assistant pays out heavy-duty winch cable. Failure to comply may result in damage to equipment.
- Do not pay out too much heavy-duty winch cable before tractor vehicle is moved forward or semitrailer gooseneck may contact tractor vehicle. Failure to comply may result in damage to equipment.

15. Ensure proper tractor vehicle position while slowly paying out heavy-duty winch cable (10). Assistant checks clearance between tractor vehicle (20) and semitrailer (21).

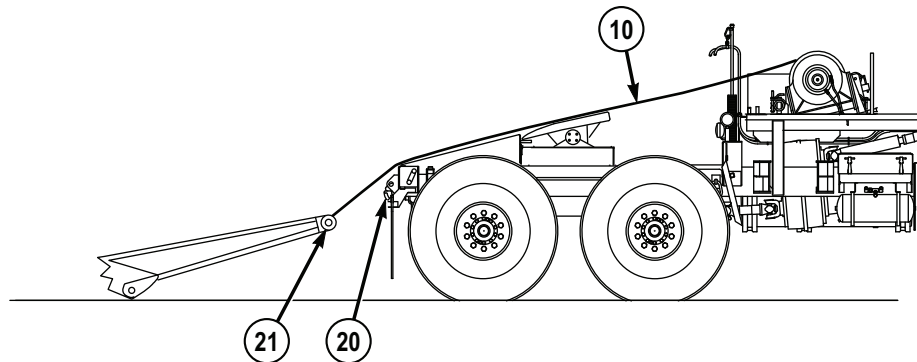


Figure 23.

### NOTE

Continue Step (15) as semitrailer landing pads touch ground, and until semitrailer gooseneck fully extends and rests on ground.

16. Verify semitrailer (21) is in full contact with ground.

### NOTE

Dashboard parking brake indicator will illuminate when PARKING BRAKE control is applied.

17. Pull out PARKING BRAKE control (2).

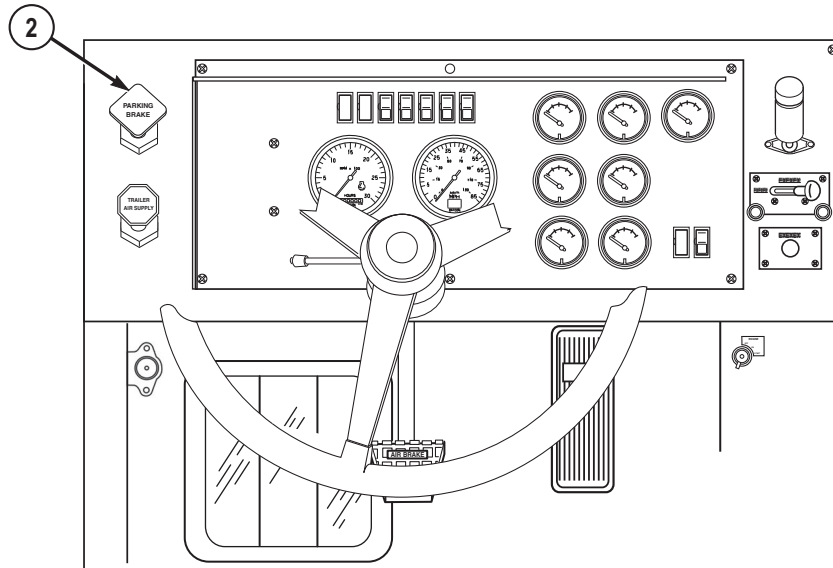


Figure 24.

### CAUTION

Use wheel chocks when uncoupling tractor vehicle from semitrailer. Failure to comply may result in damage to equipment.

### NOTE

- If semitrailer is parked on level ground; put one wheel chock in front of tire on one side and one wheel chock in back of tire on other side of tractor vehicle.
- If semitrailer is parked uphill; place one wheel chock on each side of semitrailer in back of tire.
- If semitrailer is parked downhill; place one wheel chock on each side of semitrailer in front of tire.

18. Chock semitrailer wheels (refer to TM 5-2330-378-14&P).

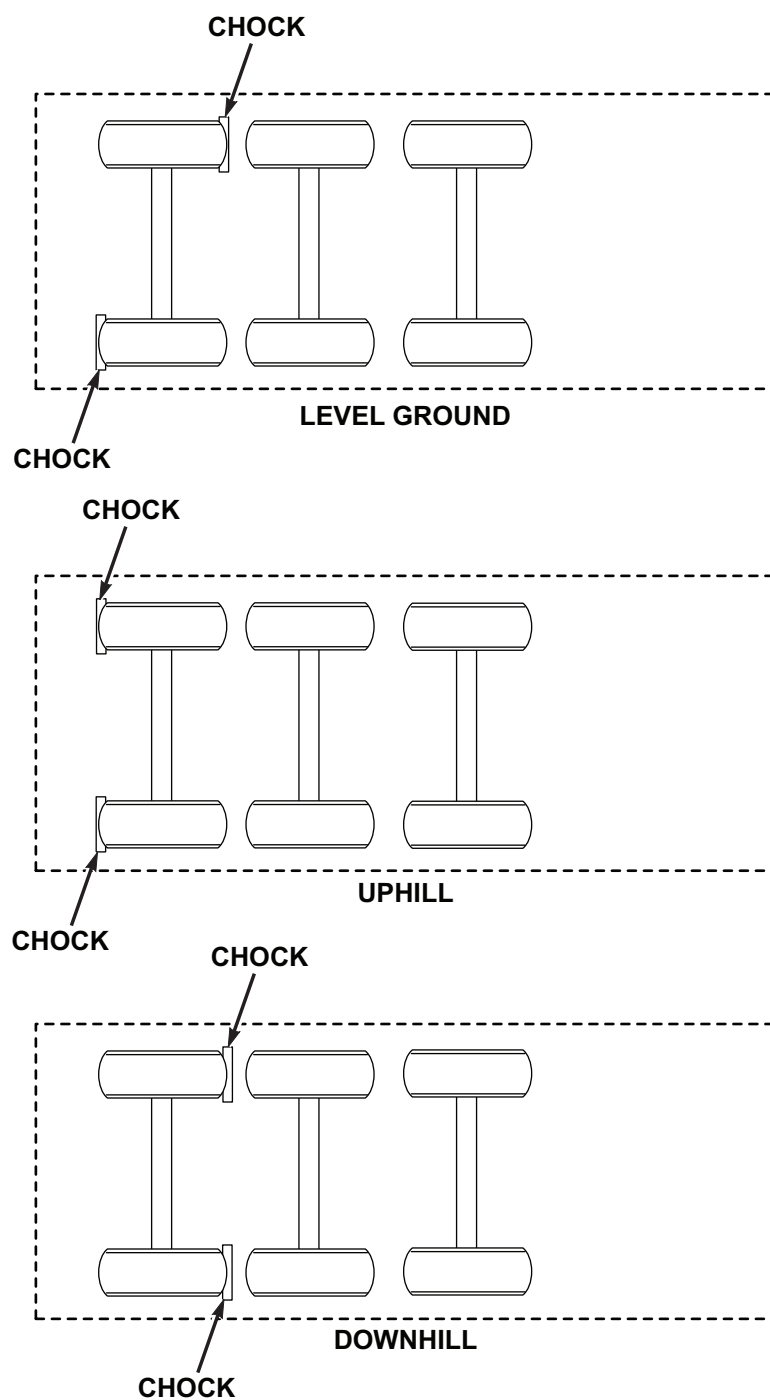


Figure 25.

### NOTE

- If semitrailer is M870, continue with Step (19).
- If semitrailer is M870A1, skip to Step (20).

19. Perform the following for a M870 semitrailer:

- a. Install two lockpins (16), one on each side of semitrailer gooseneck (17).
- b. Install two safety screws (15), nuts (14), safety locking pins (13), and safety clips (12) in lockpins (16).

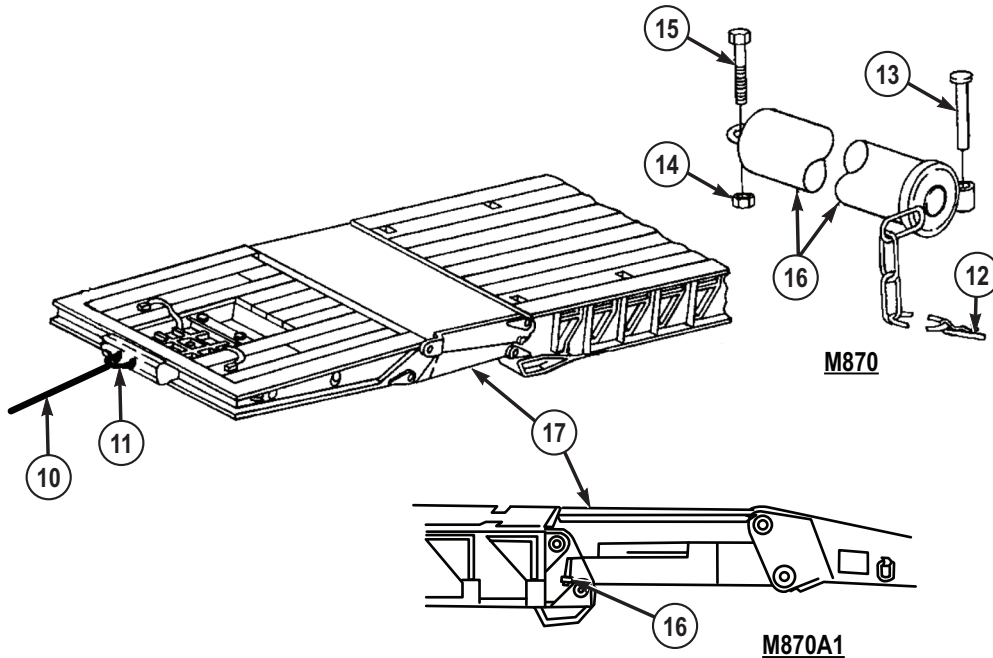


Figure 26.

### NOTE

- If semitrailer is M870, skip to Step (21).
- If semitrailer is M870A1, continue with Step (20).

20. Install two lockpins (16), one on each side of semitrailer gooseneck (17).

### WARNING



- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.
- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.

- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

21. With aid of an assistant, disconnect heavy-duty winch cable (10) from semitrailer lifting eye (11) and stow. (WP 0015)

22. Refer to TM 5-2330-378-14&P for further instructions regarding M870/M870A1 semitrailer.

**END OF TASK**

**END OF WORK PACKAGE**



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**OPERATOR MAINTENANCE  
CONNECT/DISCONNECT M870A3 SEMITRAILER**

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**INITIAL SETUP:**

Not Applicable

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**CONNECT M870A3 SEMITRAILER**

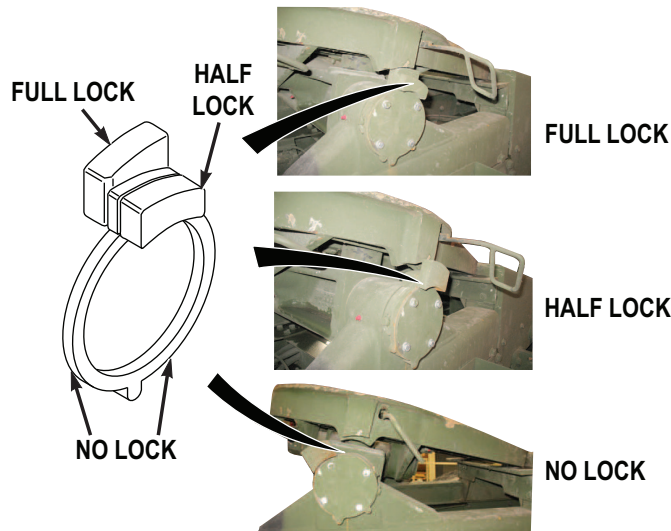
**CAUTION**

- The following are general procedures for connecting the M870A3 semitrailer to a tractor vehicle. Always refer to TM 5-2330-325-14&P for specific instructions with regard to operating the semitrailer. Failure to comply may result in damage to equipment.
- Lockouts must be positioned as identified in Table 1. Failure to comply may result in damage to equipment.

**NOTE**

- This procedure is a two soldier task.
- Tractor vehicle is equipped with fifth wheel to accept 3.5 in. (89 mm) kingpin.
- If fifth wheel lockouts are NOT positioned correctly, complete Steps (1) and (2).
- If fifth wheel lockouts are positioned in the correct mode, skip to Step (3).

1. Refer to Table 1 to determine whether lockout assembly lockrings are in correct position.

**Table 1. Lockout Requirements.****Figure 1.**

SEMITRAILER CENTER OF GRAVITY (CG)	ON-ROAD	OFF-ROAD
BELOW 65 in. (165 cm)	HALF LOCK (3° Oscillation)	NO LOCK (6° Oscillation)
ABOVE 65 in. (165 cm)	FULL LOCK (No Oscillation)	NO LOCK (6° Oscillation)

**NOTE**

- Remove lockout assembly only if desired locking position (HALF LOCK or FULL LOCK) is not located to the inside (against the fifth wheel).
- Loosen and rotate locking if NO LOCK position is desired, or if desired locking position (HALF LOCK or FULL LOCK) is located to the inside (against the fifth wheel).
- To remove lockout assembly, complete Step (2).
- To loosen and rotate lockout assembly, skip to Step (3).
- Both fifth wheel lockout assemblies are removed the same way (driver side shown).

2. Remove four screws (1), lockwashers (2), cover plate (3), and locking (4) from fifth wheel (5).



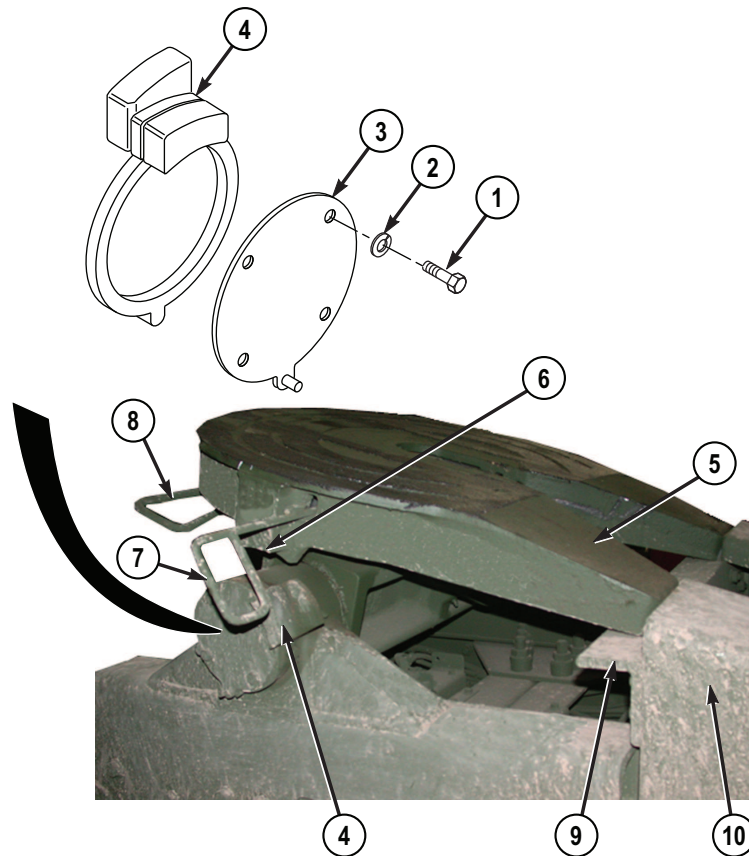


Figure 2.

- a. Install lockring (4) so desired surface area (see table 1 above) is oriented directly under engagement area (6) of fifth wheel (5) with cover plate (3), four lockwashers (2) and screws (1).
- b. Repeat Step (2) for opposite side of fifth wheel (5).

**NOTE**

Both fifth wheel lockout assemblies are rotated the same way (driver side shown).

3. Loosen four screws (1):

**NOTE**

- Driver side lockring rotates toward the rear of vehicle.
- Passenger side lockring rotates toward the front of vehicle.

- a. Rotate lockring (4) so desired surface area (see Table 1 above) is oriented directly under engagement area (6) of fifth wheel (5).
- b. Tighten four screws (1).

- c. Repeat Step (3) for opposite side of fifth wheel (5).

### NOTE

Fifth wheel has two lock release handles.

4. Pull out fifth wheel secondary lock release handle (7) completely.
5. Pull out fifth wheel primary lock release handle (8). Hook in out position.
6. Push down rear of fifth wheel (5) until it rests on stop (9) below guide ramps (10).
7. Set transmission range selector (11) to N (neutral).

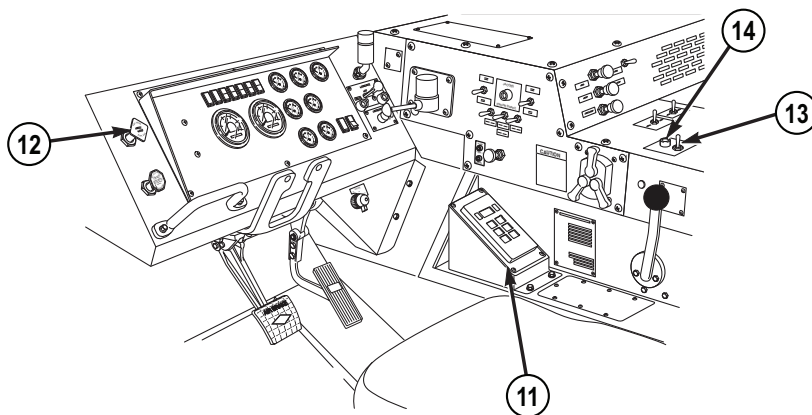


Figure 3.

### NOTE

Dashboard parking brake indicator will illuminate when PARKING BRAKE control is applied.

8. Pull out PARKING BRAKE control (12).
9. Set PTO ENGAGE switch (13) to OFF position, indicator light (14) will go out.

### CAUTION

Do not move hydraulic selector valve control while PTO ENGAGE switch is set to ON position. Failure to comply may result in damage to hydraulic equipment.

10. Push in hydraulic selector valve control (15) for M870A3 semitrailer coupling operations.

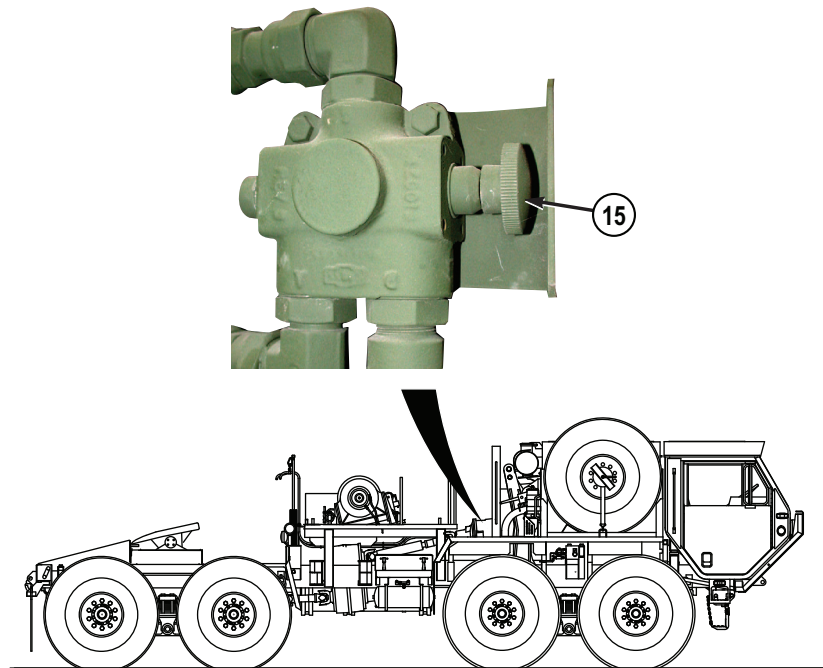


Figure 4.

11. Set PTO ENGAGE switch (13) to ON position, indicator light (14) will illuminate.

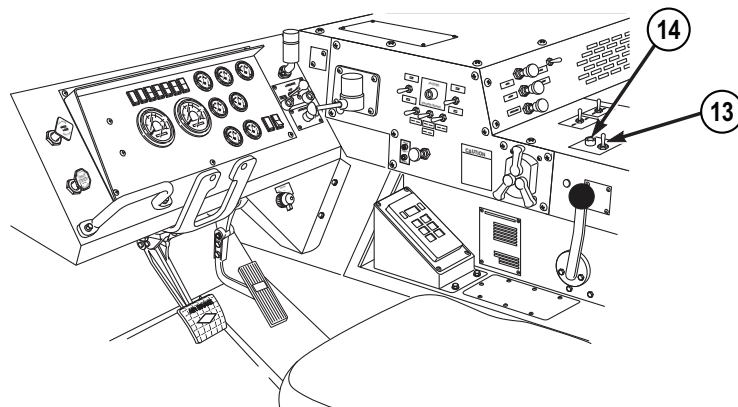


Figure 5.

### NOTE

- If trailer gooseneck is not high enough to couple to tractor vehicle fifth wheel, position tractor vehicle on left side of semitrailer (preferred) aligning tractor vehicle auxiliary hydraulic connections with trailer hydraulic connections (shown).
- Always wipe down all hydraulic connection points on tractor vehicle, trailer, and hydraulic hoses with a clean rag prior to coupling.

12. Prepare M870A3 semitrailer for coupling (refer to TM 5-2330-325-14&P). Ensure hydraulic hoses (16) are not kinked or otherwise impeded.



Figure 6.

13. Set PTO ENGAGE switch (13) to OFF position, indicator light (14) will go out.

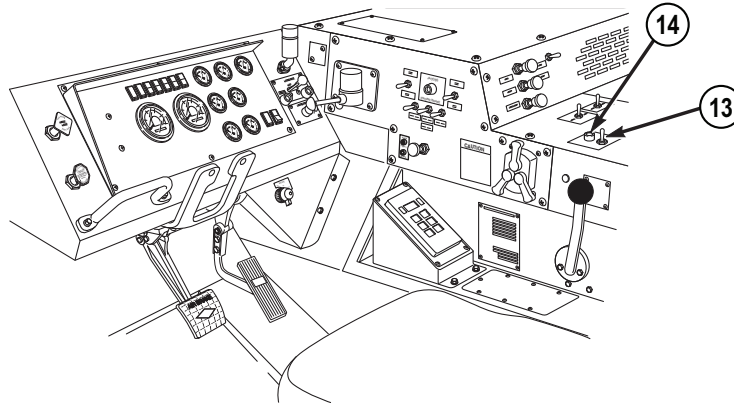


Figure 7.

14. Disconnect hydraulic hoses (16) from semitrailer and stow on tractor vehicle work platform (17).

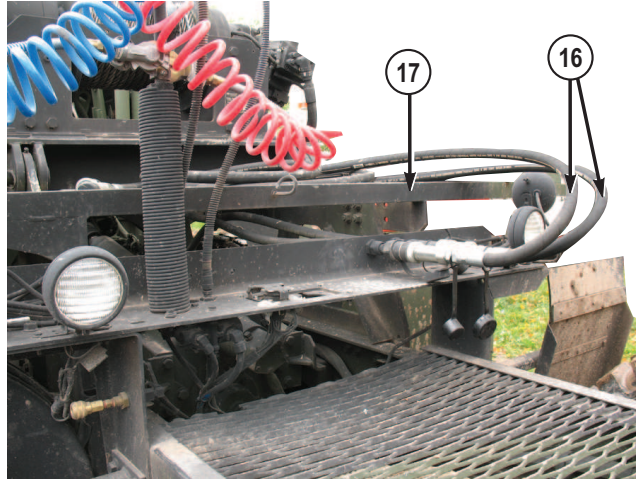


Figure 8.

### WARNING



Ensure that no one is standing directly behind vehicle or semitrailer during coupling procedure. Failure to comply may result in injury or death to personnel.

### CAUTION

- Ensure there is a generous amount of grease on fifth wheel, ramps, kingpin, and steering wedge. Failure to comply may result in damage to equipment.
  - Tractor vehicle and semitrailer coupling should be performed with the tractor vehicle and semitrailer in a straight line. If wedge of trailer is not aligned with tractor vehicle fifth wheel, adjust either tractor vehicle, trailer, or both to align them. Failure to comply may result in damage to equipment.
  - Do not run kingpin up guide ramps to prevent damage to kingpin, guide ramps, or fifth wheel.
15. Move tractor vehicle forward into position in front of semitrailer. Slowly back tractor vehicle under semitrailer while assistant stands beside front of semitrailer and gives hand signals to aid alignment of semitrailer kingpin with throat of fifth wheel.
  16. Assistant visually checks that front of semitrailer is on guide ramps (10).

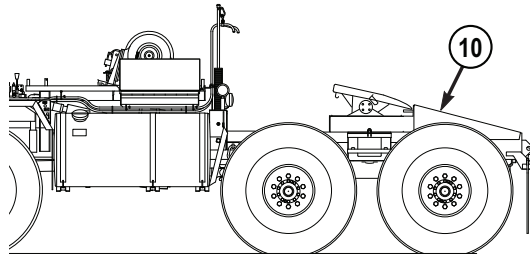


Figure 9.

17. Slowly back tractor vehicle until fifth wheel jaws lock around kingpin. Stop tractor vehicle.

### NOTE

Daylight should not show between top of fifth wheel plate and bottom of semitrailer.

18. Assistant visually checks that kingpin is in fifth wheel throat.  
19. Ensure primary lock release handle (8) is completely in.

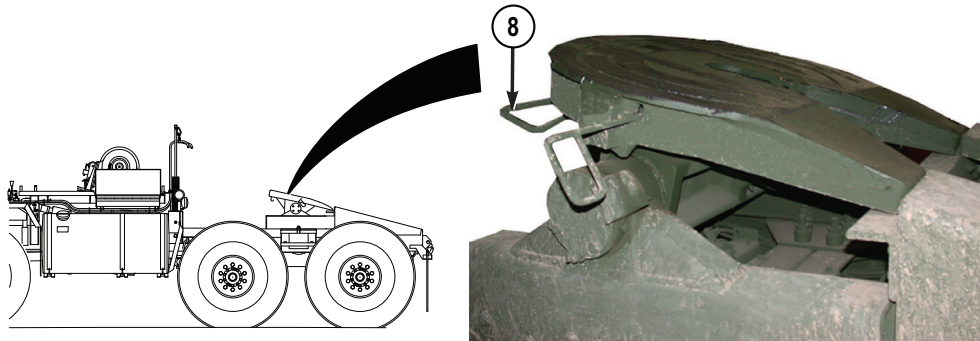


Figure 10.

### NOTE

If coupling is not secure, rock tractor vehicle back and forth slowly until kingpin is locked in fifth wheel.

20. Inch tractor vehicle forward to check coupling.  
21. Set transmission range selector (11) to N (neutral).

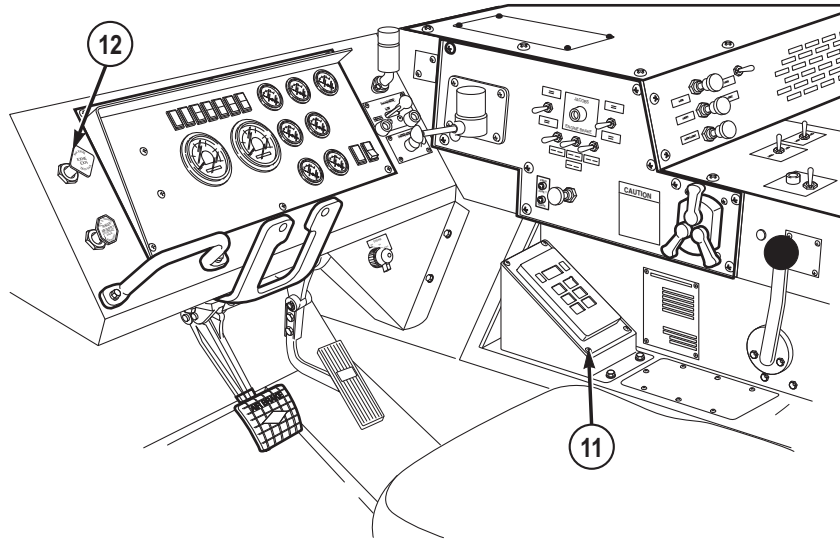


Figure 11.

### NOTE

Dashboard parking brake indicator will illuminate when PARKING BRAKE control is applied.

22. Pull out PARKING BRAKE control (12).

### NOTE

Always wipe down all hydraulic connection points on trailer and hydraulic hoses with a clean rag prior to coupling.

23. Reconnect hydraulic hoses (16) to M870A3 semitrailer.





Figure 12.

24. Set PTO ENGAGE switch (13) to ON position, indicator light (14) will illuminate.

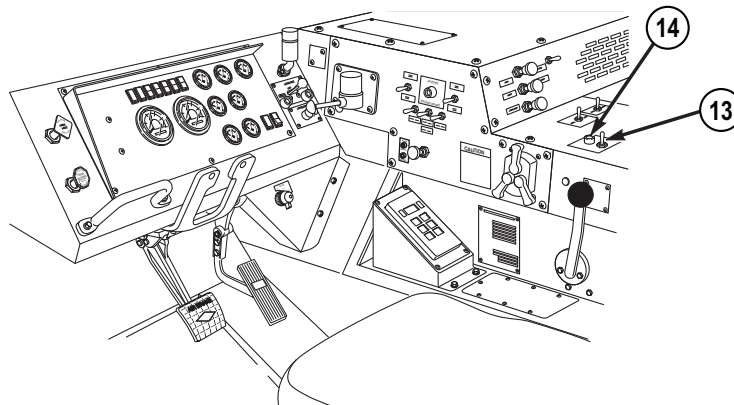


Figure 13.

25. Position semitrailer gooseneck as required (refer to TM 5-2330-325-14&P).

26. Set PTO ENGAGE switch (13) to OFF position, indicator light (14) will go out.

27. Disconnect two hydraulic hoses (16) from semitrailer and tractor vehicle. Stow two hydraulic hoses in semitrailer tool box (18).



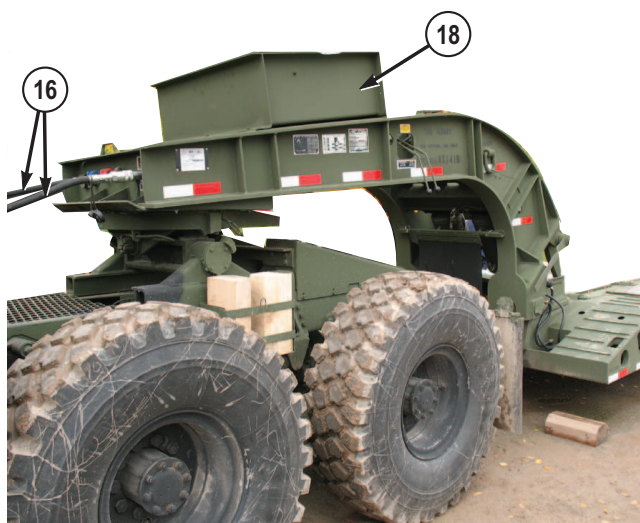


Figure 14.

### NOTE

- Connect blue (service) tractor vehicle air brake line gladhand to blue (service) semitrailer gladhand.
- Connect red (emergency) tractor vehicle air brake line gladhand to red (emergency) semitrailer gladhand.

28. Connect tractor vehicle air brake lines (19) to semitrailer gladhands (20).

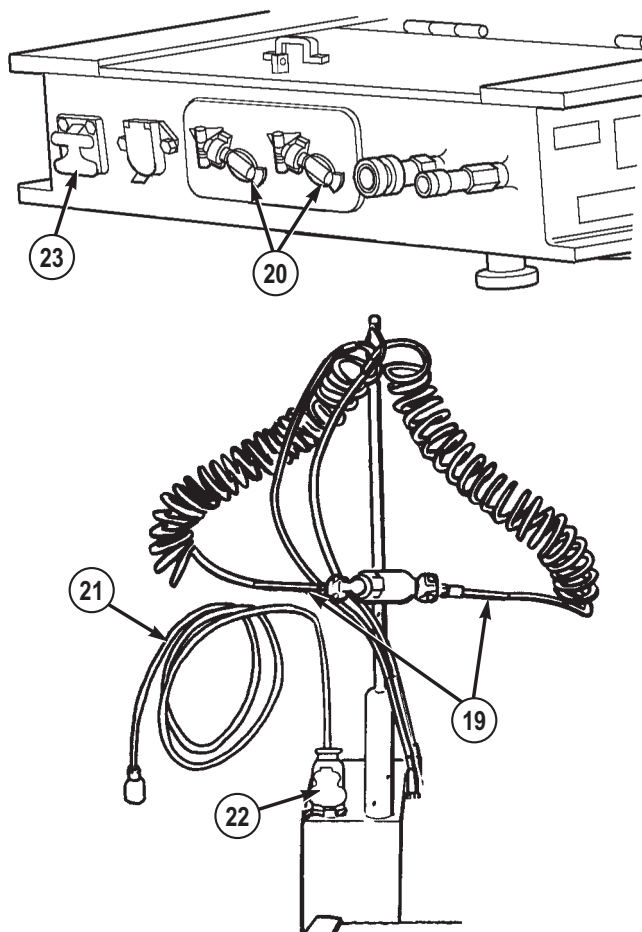


Figure 15.

29. Connect inter-vehicular wiring harness (21) to tractor vehicle 24V electrical connector (22) and semitrailer 24V electrical connector (23).
30. Prepare M870A3 semitrailer for transport (refer to TM 5-2330-325-14&P).
31. Push in TRAILER AIR SUPPLY control (24).

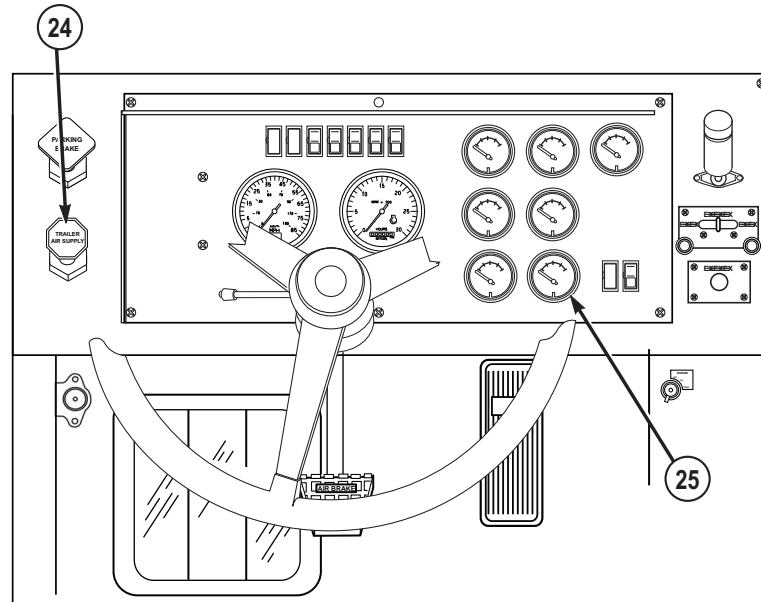


Figure 16.

32. Red and green needles of AIR PRESS gauge (25) must indicate at least 100 psi (690 kPa) before transporting semitrailer.
33. Transport M870A3 semitrailer (refer to TM 5-2330-325-14&P for semitrailer specific operating procedures).

#### DISCONNECT M870A3 SEMITRAILER

#### CAUTION

The following are general procedures for disconnecting the M870A3 semitrailer from a tractor vehicle. Always refer to TM 5-2330-325-14&P for specific instructions with regard to operating the semitrailer. Failure to comply may result in damage to equipment.

#### NOTE

This procedure is a two soldier task.

1. Position tractor vehicle and semitrailer.
2. Set transmission range selector (1) to N (neutral).

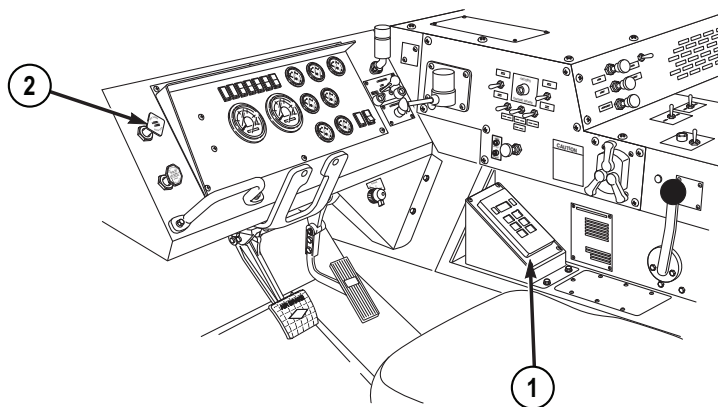


Figure 17.

### NOTE

Dashboard parking brake indicator will illuminate when PARKING BRAKE control is applied.

3. Pull out PARKING BRAKE control (2).

### CAUTION

Use wheel chocks when uncoupling tractor vehicle from semitrailer. Failure to comply may result in damage to equipment.

### NOTE

- If semitrailer is parked on level ground; put one wheel chock in front of tire on one side and one wheel chock in back of tire on other side of tractor vehicle.
- If semitrailer is parked uphill; place one wheel chock on each side of semitrailer in back of tire.
- If semitrailer is parked downhill; place one wheel chock on each side of semitrailer in front of tire.

4. Chock semitrailer wheels.

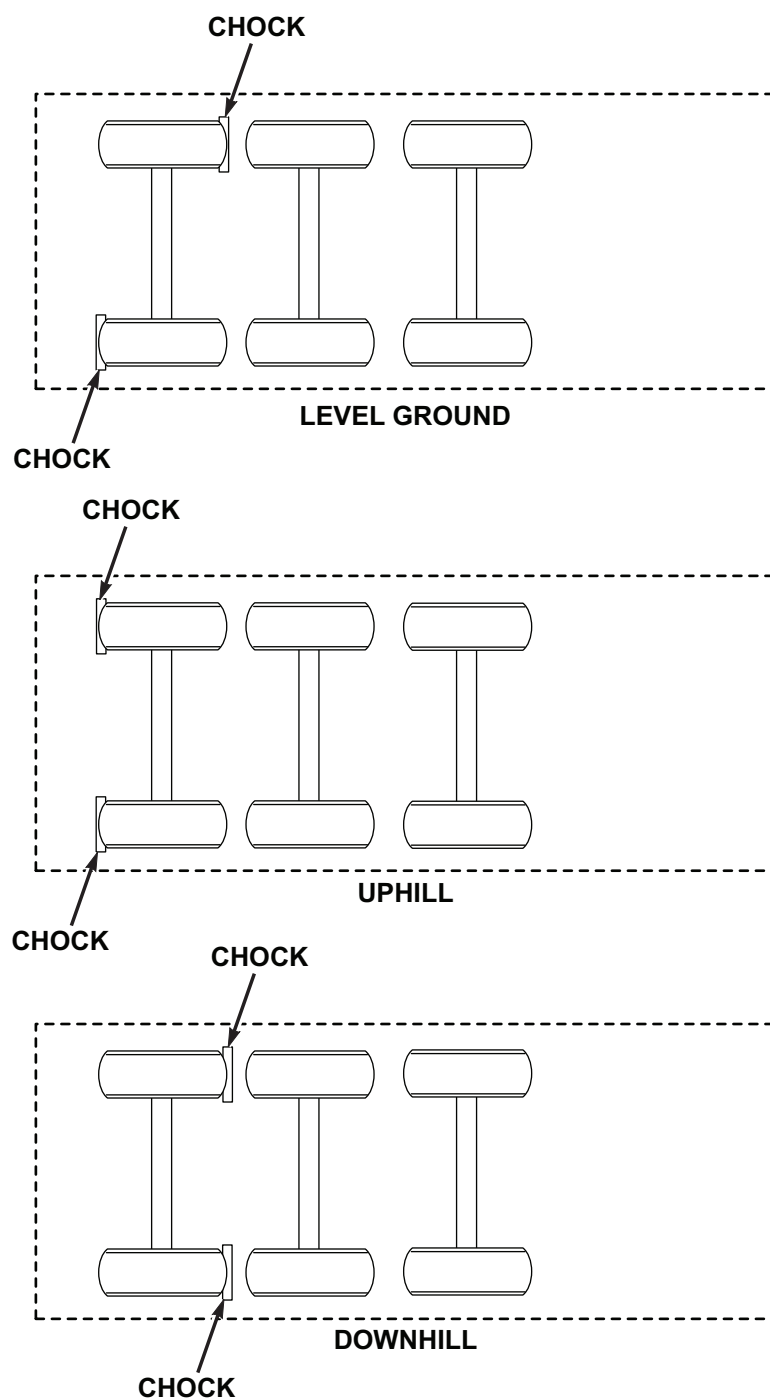


Figure 18.

5. Set PTO ENGAGE switch (3) to ON position, indicator light (4) will illuminate.

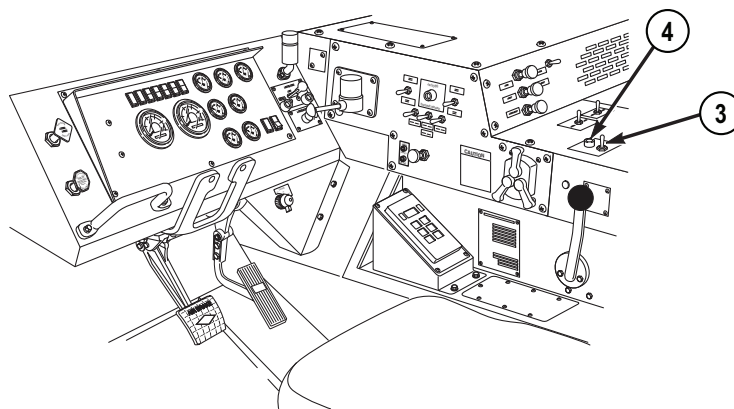


Figure 19.

6. Prepare M870A3 semitrailer for uncoupling (refer to TM 5-2330-325-14&P).
7. Set PTO ENGAGE switch (3) to OFF position, indicator light (4) will go out.
8. Ensure two hydraulic hoses (5) are disconnected from tractor vehicle and semitrailer. Stow two hydraulic hoses in semitrailer toolbox (6).

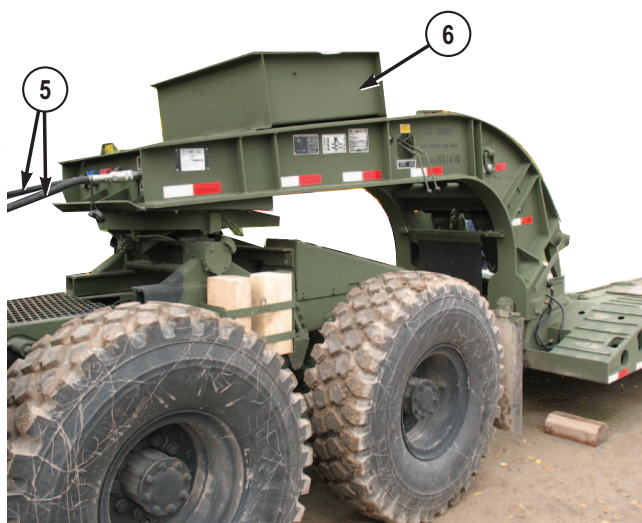


Figure 20.

9. Ensure handbrake control (7) off.

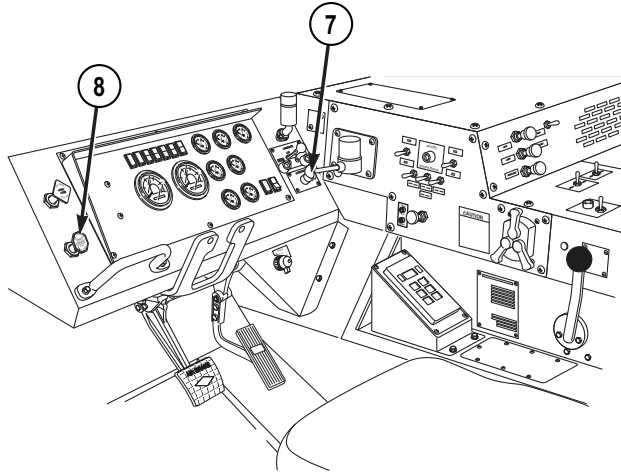


Figure 21.

10. Pull out TRAILER AIR SUPPLY control (8).

#### NOTE

- Disconnect blue (service) tractor vehicle air brake line gladhand from blue (service) semitrailer gladhand.
- Disconnect red (emergency) tractor vehicle air brake line gladhand from red (emergency) semitrailer gladhand.

11. Disconnect tractor vehicle air brake lines (9) from semitrailer gladhands (10) and stow on tree (11).

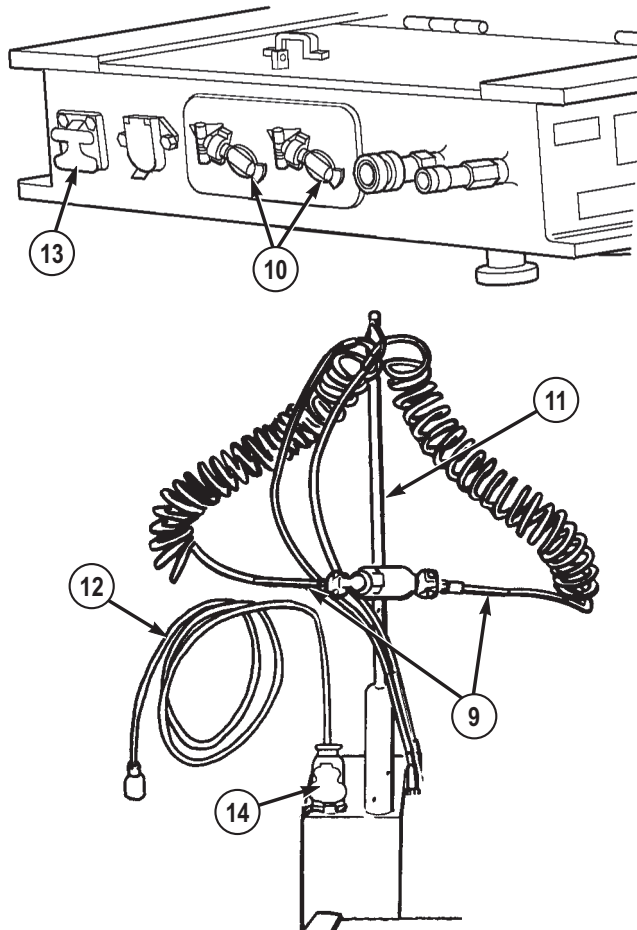


Figure 22.

12. Disconnect inter-vehicular wiring harness (12) from semitrailer 24V electrical connector (13) and tractor vehicle 24V electrical connector (14). Return inter-vehicular wiring harness (12) to tractor vehicle stowage.

### NOTE

Fifth wheel has two lock release handles.

13. Pull fifth wheel secondary lock release handle (15) completely out as far as it will go.





*Figure 23.*

14. Pull out fifth wheel primary lock release handle (16) and hook it in out position.
15. Drive tractor vehicle slowly forward for approximately 4 ft. (1.2 m), or until semitrailer kingpin is clear of fifth wheel, and semitrailer is on ground. Stop tractor vehicle.

**END OF TASK**

**END OF WORK PACKAGE**



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## OPERATOR MAINTENANCE OPERATE HEAVY-DUTY WINCH USING REMOTE-CONTROL UNIT

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### INITIAL SETUP:

Not Applicable

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### PREPARE TO OPERATE HEAVY-DUTY WINCH

#### WARNING



- Using remote-control unit and operating heavy-duty winch away from vehicle will lessen the possibility of injury or death to personnel if winch cable separates under tension.
- Excessive noise levels are present any time the heavy-duty winch is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

#### NOTE

This procedure is a two soldier task.

1. Start engine.
2. Position tractor vehicle for straight pull and on solid ground so tires have good traction.
3. Set transmission range selector (1) to N (neutral).

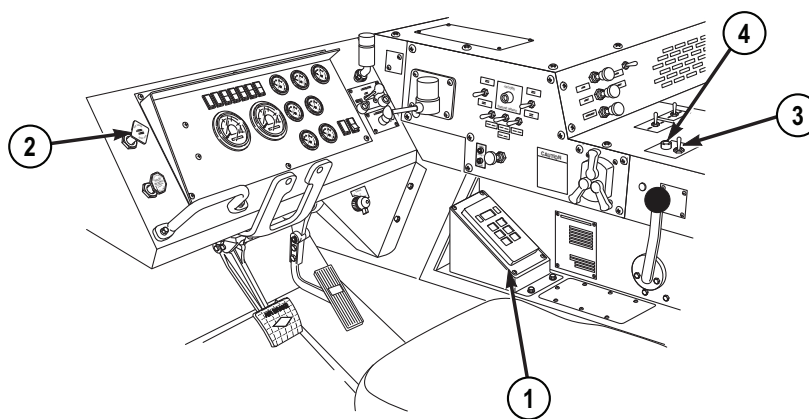


Figure 1.

#### NOTE

Dashboard parking brake indicator will illuminate when PARKING BRAKE control is applied.

4. Pull out PARKING BRAKE control (2).
5. Set PTO ENGAGE switch (3) to OFF position, indicator light (4) will go out.

### CAUTION

Do not move hydraulic selector valve control while PTO ENGAGE switch is set to ON position. Failure to comply may result in damage to hydraulic equipment.

6. Pull out hydraulic selector valve control (5) for winching operations.

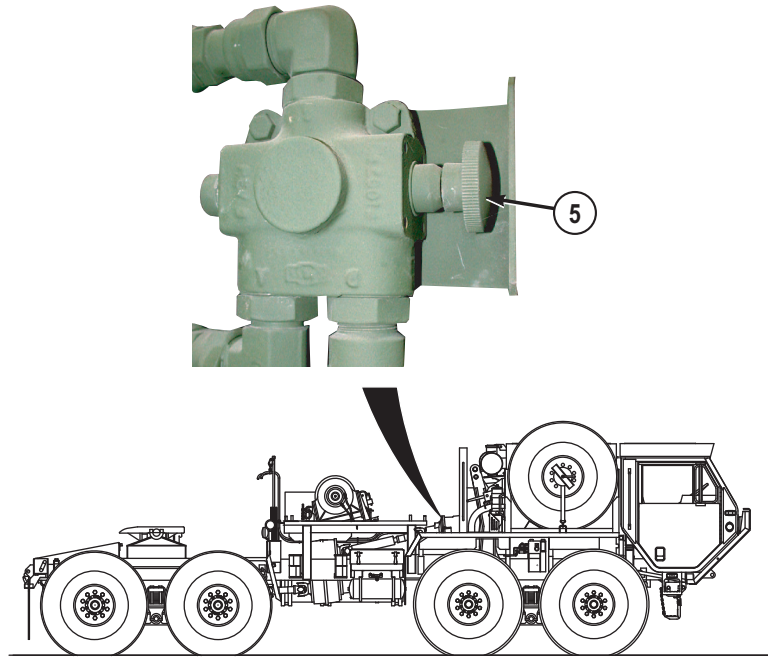


Figure 2.

7. Set PTO ENGAGE switch (3) to ON position, indicator light (4) will illuminate.

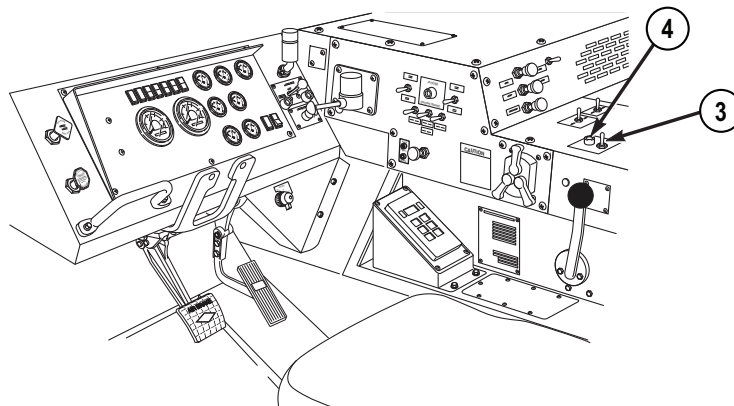


Figure 3.

8. Remove remote-control unit (6) and remote-control unit cable (7) from stowage.

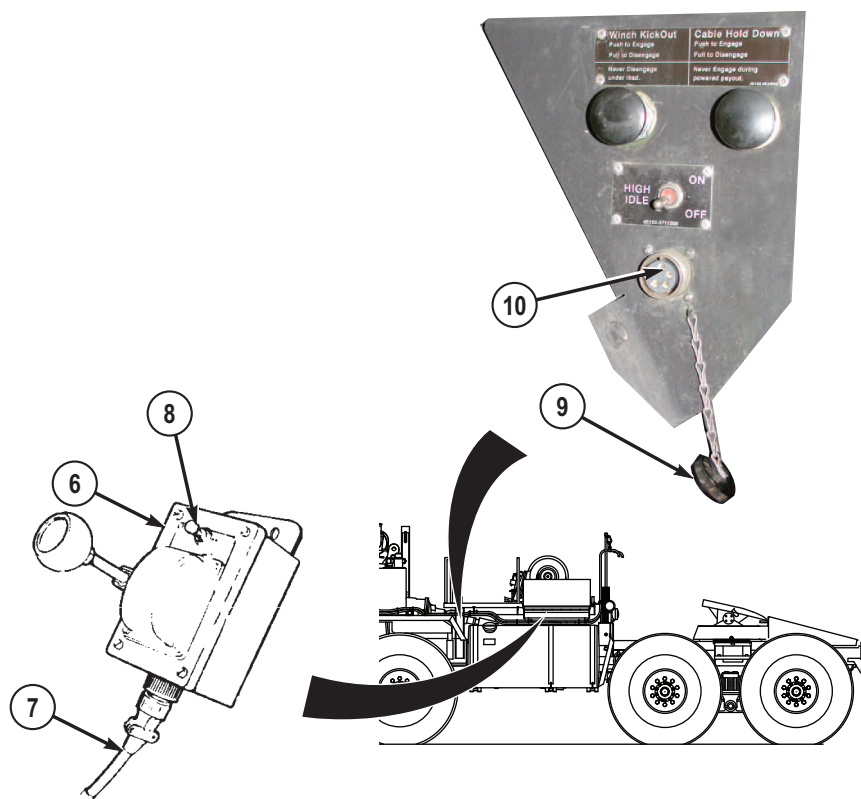


Figure 4.

9. Ensure remote-control unit HIGH IDLE switch (8) is set to OFF position.
10. Remove cap (9) from remote-control unit hookup receptacle (10).
11. Clean any dirt and debris from both remote-control unit hookup receptacle (10) and remote-control unit cable plug (11).

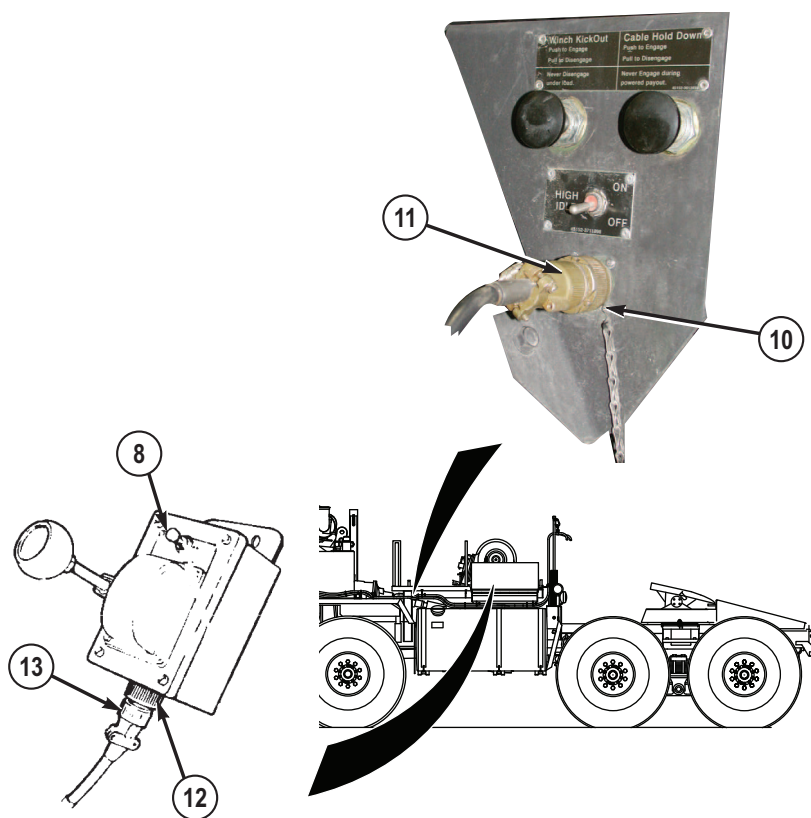


Figure 5.

12. Connect remote-control unit cable plug (11) to remote-control unit hookup receptacle (10).
13. Clean any dirt and debris from both remote-control unit receptacle (12) and remote-control unit cable plug (13).
14. Connect remote-control unit cable plug (13) to remote-control unit receptacle (12).

#### PAY OUT CABLE AND CONNECT TO EQUIPMENT

##### CAUTION

- Do not allow other vehicles to run over winch cable. Winch cable may be damaged. Failure to comply may result in damage to equipment.
- Cable Hold Down control should never be engaged (pushed in) during winch cable pay out under power. Failure to comply may result in damage to equipment.

1. Disengage (pull out) Cable Hold Down control (1).

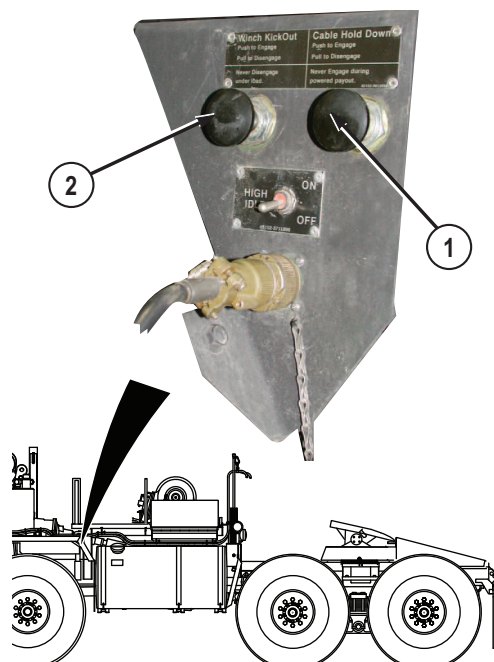


Figure 6.

2. Disengage (pull out) Winch KickOut control (2).
3. Unhook clevis retention chain (3) from clevis (4).

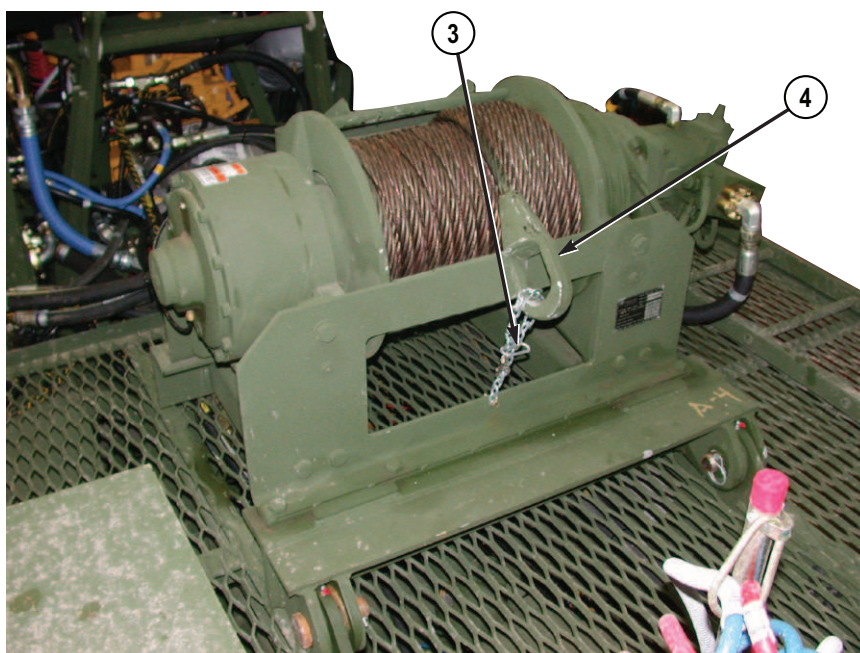


Figure 7.

**NOTE**

- Setting the HIGH IDLE switch to ON position enables fast speed in heavy-duty winch. HIGH IDLE should only be used when normal speed operation is too slow while loading mired equipment or a semitrailer laden with heavy equipment.
- Due to the increased speed of winch cable payout, it is not recommended that HIGH IDLE be used to pay out winch cable.

4. Use of remote-control unit HIGH IDLE switch (5) is at the discretion of the operator.

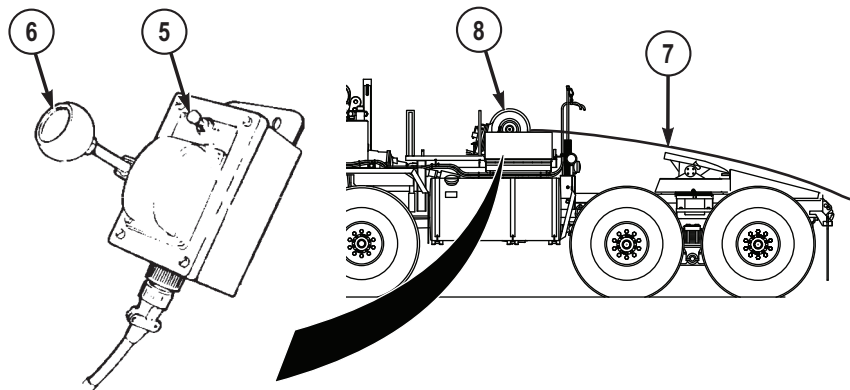


Figure 8.

**WARNING**

- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.
- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

**CAUTION**

Ensure assistant routes winch cable to avoid snag hazards on tractor vehicle and semitrailer. Failure to comply may result in damage to equipment.

**NOTE**

The operator may notice the vehicle mounted (manual) winch control lever mimicking the inputs applied to remote-control unit winch control lever. This is a normal condition.

5. Pull remote-control unit winch control lever (6) to pay out winch cable (7) while assistant routes winch cable to equipment. Release remote-control unit winch control lever (6) when it is determined ample winch cable (7) is available for connection to equipment.



**CAUTION**

Always be sure there are at least five wraps of winch cable on winch drum. If there are less than five wraps of winch cable on winch drum, winch cable may come loose and damage equipment.

**NOTE**

Ensure weight of equipment and amount of winch cable left on winch does not go over pull capacity (refer to FM 4-30.31 and Heavy-Duty Winch Pull Capacity Table below).

6. Check that there are at least five wraps of winch cable (7) on winch (8). If there are not at least five wraps of winch cable (7) on winch (8), move tractor vehicle closer to equipment and continue loading, or shut down winch (8).

**Table 1. Heavy-Duty Winch Pull Capacity.**

CABLE LAYER	CABLE ON DRUM (ft.)	CAPACITY (lbs)
1	37	45,000
2	81	37,200
3	133	31,700
4	150	27,700

**NOTE**

If HIGH IDLE was not utilized during winch cable pay out, skip to Step (8).

7. Set remote-control unit HIGH IDLE switch (5) to OFF position (as applicable).
8. Connect winch cable (7) to equipment.

**LOAD EQUIPMENT**

1. Engage (push in) Cable Hold Down control (1).

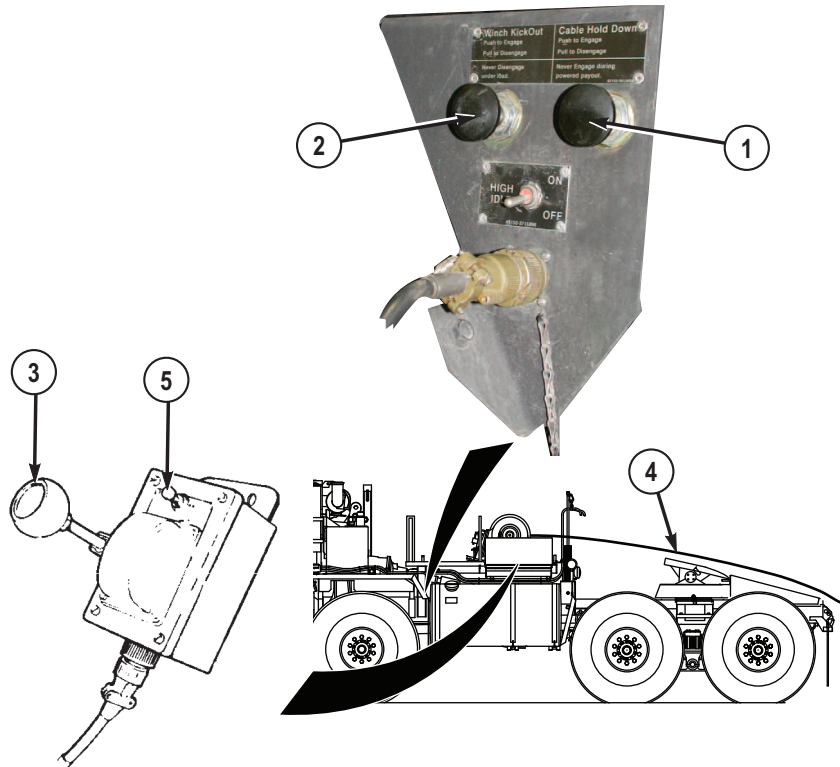


Figure 9.

**CAUTION**

Winch KickOut control should never be engaged (pushed in) under load. Failure to comply may result in damage to equipment.

2. Disengage (pull out) Winch KickOut control (2).
3. Ensure loading area is clear of personnel.

**WARNING**

- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.
- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

**CAUTION**

Gradually apply power to avoid high impact loading of winch cable.

**NOTE**

Maintaining a safe distance, visually recheck your rigging once light tension (slack taken out of winch cable) is applied to winch cable.

4. Push in remote-control unit winch control lever (3) slightly to slowly tighten winch cable (4).

**NOTE**

- Setting the HIGH IDLE switch to ON position enables fast speed in heavy-duty winch. HIGH IDLE should only be used when normal speed operation is too slow while loading mired equipment or a semitrailer laden with heavy equipment.
- Due to the increased speed of winch cable payout, it is not recommended that HIGH IDLE be used for loading an empty or lightly laden semitrailer.

5. Use of remote-control unit HIGH IDLE switch (5) is at the discretion of the operator.

**NOTE**

- Assistant should be in a position to safely monitor the loading operation and advise the operator of progress.
- The operator may notice the vehicle mounted (manual) control winch control lever mimicking the inputs applied to remote-control unit winch control lever. This is a normal condition.

6. Push in remote-control unit winch control lever (3) and load equipment.

**NOTE**

Pull remote-control unit winch control lever just enough to allow adequate slack in winch cable to disconnect from equipment.

7. When equipment is fully loaded, pull remote-control unit winch control lever (3).

**NOTE**

If high idle was not utilized during winch cable pay out, skip Step (8).

8. Set remote-control unit HIGH IDLE switch (4) to OFF position (as applicable).

**DISCONNECT WINCH CABLE AND STOW**

1. Ensure Cable Hold Down control (1) is engaged (pushed in).
2. Disconnect winch cable (2) from equipment.

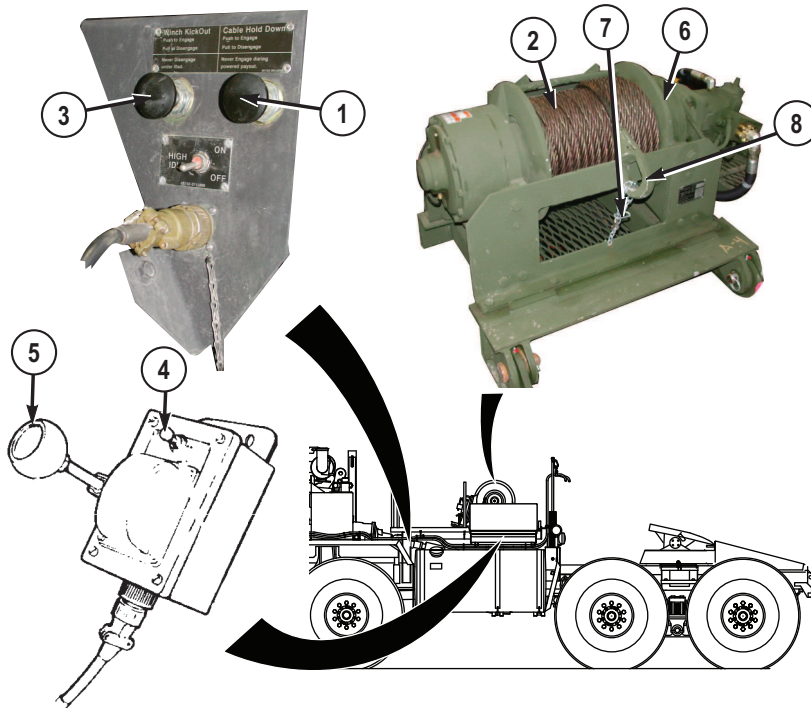


Figure 10.

3. Disengage (pull out) Winch KickOut control (3).

### NOTE

- Setting the HIGH IDLE switch to ON position enables fast speed in heavy-duty winch. HIGH IDLE should only be used when normal speed operation is too slow while loading mired equipment or a semitrailer laden with heavy equipment.
- Due to the increased speed of winch cable payout, it is not recommended that HIGH IDLE be used to reel in and stow winch cable.

4. Use of remote-control unit HIGH IDLE switch (4) is at the discretion of the operator.

### WARNING



- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.
- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

**CAUTION**

- Ensure assistant routes winch cable to avoid snag hazards on tractor vehicle and semitrailer. Failure to comply may result in damage to equipment.
- Both operator and assistant should ensure that winch cable wraps properly and evenly onto winch drum. Failure to comply may result in damage to equipment.

**NOTE**

- The operator may notice the vehicle mounted (manual) control winch control lever mimicking the inputs applied to remote-control unit winch control lever. This is a normal condition.
  - Ensure tension is kept on winch cable at all times during winch cable retrieval. This accompanied with guidance from the assistant will ensure the winch cable gets evenly wrapped onto winch drum.
5. Push in winch control lever (5) as assistant routes winch cable (2) onto winch drum (6).
  6. Once winch cable (2) is completely and evenly wrapped onto winch drum (6), release remote-control unit winch control lever (5).

**NOTE**

If high idle was not utilized during winch cable pay out, skip to Step (8).

7. Set remote-control unit HIGH IDLE switch (4) to OFF position (as applicable).
8. Assistant connects clevis retention chain (7) to clevis (8).
9. Set PTO ENGAGE switch (9) to OFF position, indicator light (10) will go out.

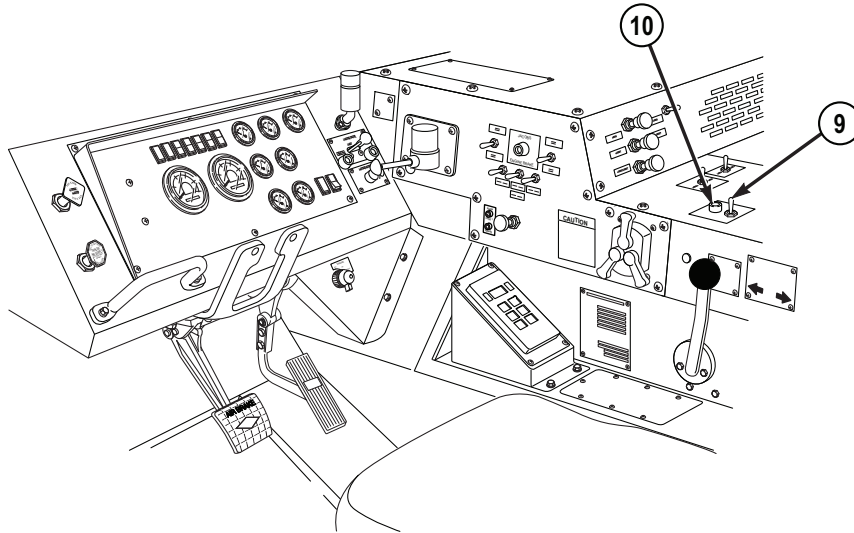


Figure 11.

10. Disconnect remote-control unit cable plug (11) from remote-control unit hookup receptacle (12).

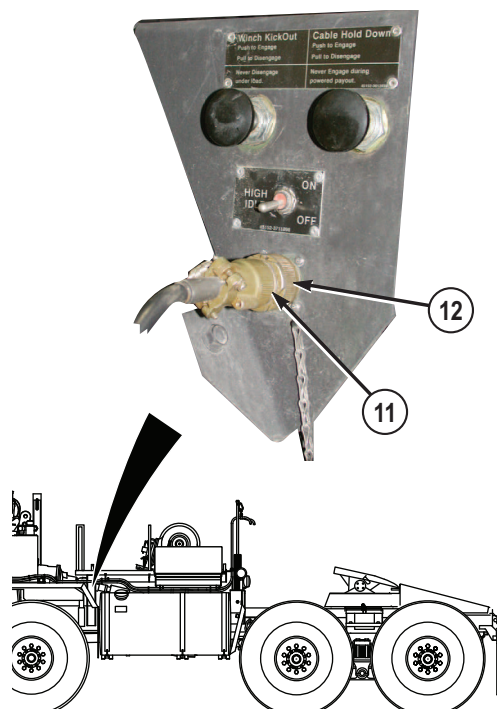


Figure 12.

11. Install cap (13) on remote-control unit hookup receptacle (12).

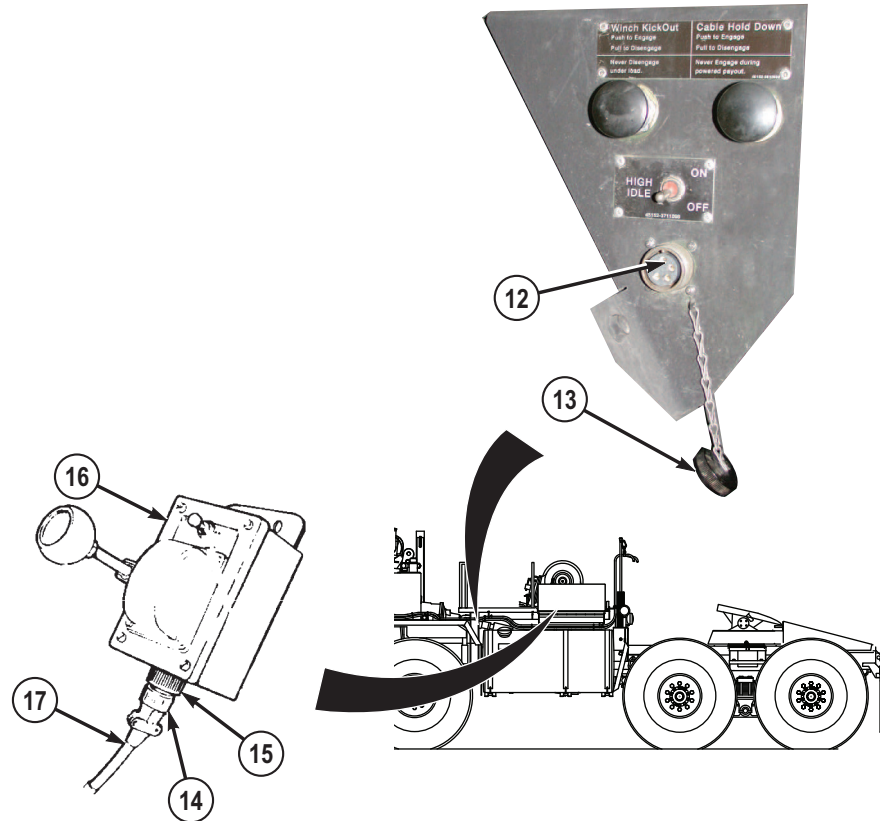
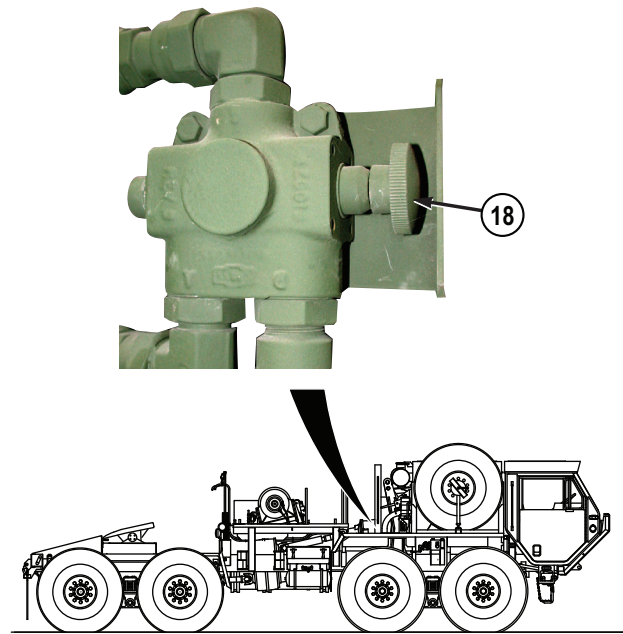


Figure 13.

12. Disconnect remote-control unit cable plug (14) from remote-control unit hookup receptacle (15).
13. Return remote-control unit (16) and remote-control unit cable (17) to stowage.

### CAUTION

- The operator should always push in hydraulic selector valve control when use of the heavy-duty winch is no longer required to ensure the heavy-duty winch will not be accidentally engaged during other tractor vehicle operations. Failure to comply may result in damage to equipment.
  - Do not move hydraulic selector valve control while PTO ENGAGE switch is set to ON position. Failure to comply may result in damage to hydraulic equipment.
14. Push in hydraulic selector valve control (18) for all tractor vehicle operations that do not require use of heavy-duty winch.



*Figure 14.*

**END OF TASK**

**END OF WORK PACKAGE**



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**OPERATOR MAINTENANCE**  
**OPERATE HEAVY-DUTY WINCH USING VEHICLE MOUNTED (MANUAL) CONTROLS**

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**INITIAL SETUP:**

Not Applicable

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**PREPARE TO OPERATE HEAVY-DUTY WINCH**

**WARNING**



- Due to reduced field of vision when using the vehicle mounted (manual) controls, the remote-control unit should always be used when operating the heavy-duty winch. The vehicle mounted (manual controls) should only be used as a last resort (remote-control lost or inoperable). Failure to comply may result in injury or death to personnel.
- Use of vehicle mounted (manual) controls requires an additional safety observer whenever the heavy-duty winch is being operated. Failure to comply may result in injury or death to personnel.
- Excessive noise levels are present any time the heavy-duty winch is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

**NOTE**

This procedure is a two soldier task.

1. Start engine.
2. Position tractor vehicle for straight pull and on solid ground so tires have good traction.
3. Set transmission range selector (1) to N (neutral).

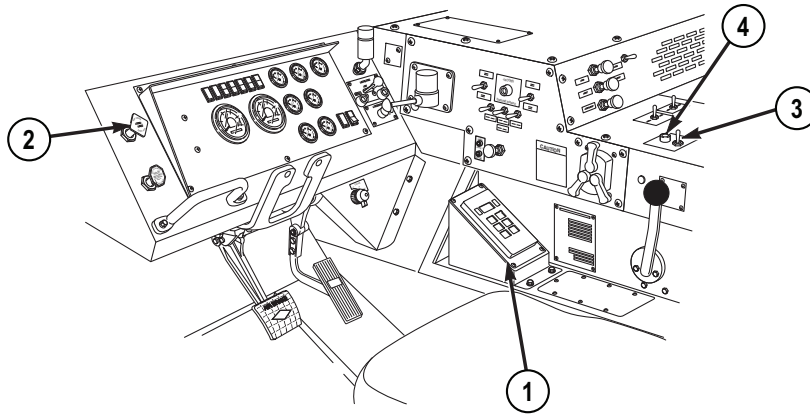


Figure 1.

**NOTE**

Dashboard parking brake indicator will illuminate when PARKING BRAKE control is applied.

4. Pull out PARKING BRAKE control (2).
5. Set PTO ENGAGE switch (3) to OFF position, indicator light (4) will go out.

**CAUTION**

Do not move hydraulic selector valve control while PTO ENGAGE switch is set to ON position.  
Failure to comply may result in damage to hydraulic equipment.

6. Pull out hydraulic selector valve control (5) for winching operations.

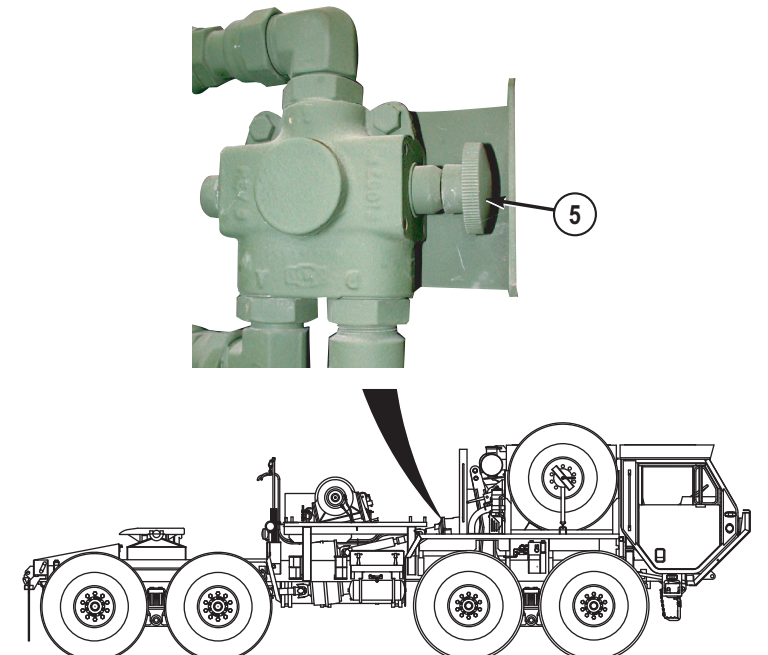


Figure 2.

7. Set PTO ENGAGE switch (3) to ON position; indicator light (4) will illuminate.

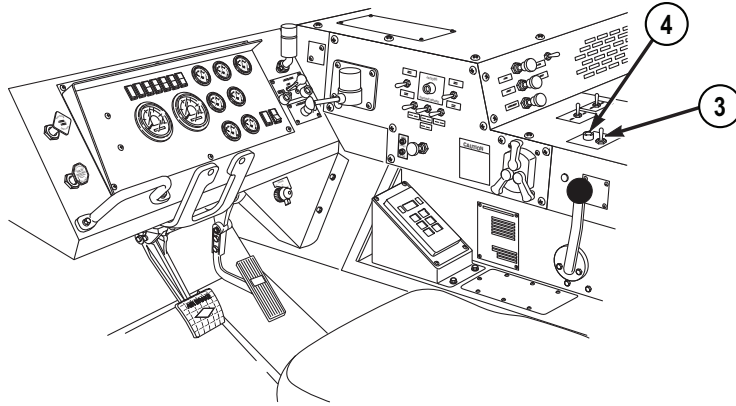


Figure 3.

## PAY OUT CABLE AND CONNECT TO EQUIPMENT

### WARNING



Using remote-control unit and operating heavy-duty winch away from vehicle will lessen the possibility of injury or death to personnel if winch cable separates under tension.

### CAUTION

- Do not allow other vehicles to run over winch cable. Winch cable may be damaged. Failure to comply may result in damage to equipment.
- Cable Hold Down control should never be engaged (pushed in) during winch cable pay out under power. Failure to comply may result in damage to equipment.

1. Disengage (pull out) Cable Hold Down control (1).

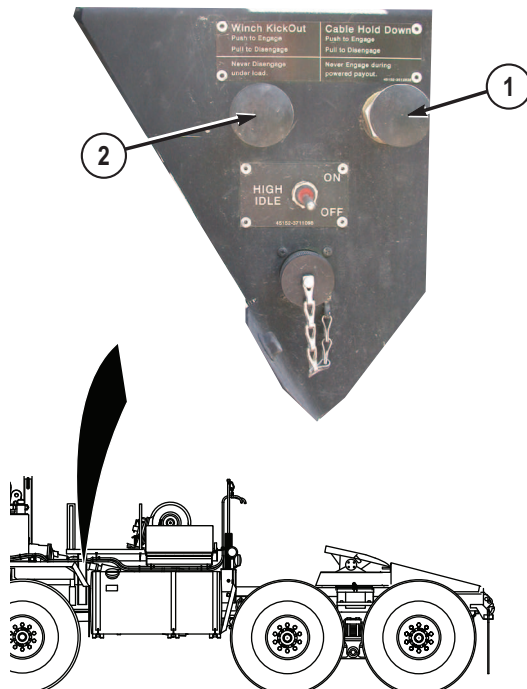


Figure 4.

2. Disengage (pull out) Winch KickOut control (2).
3. Unhook clevis retention chain (3) from clevis (4).

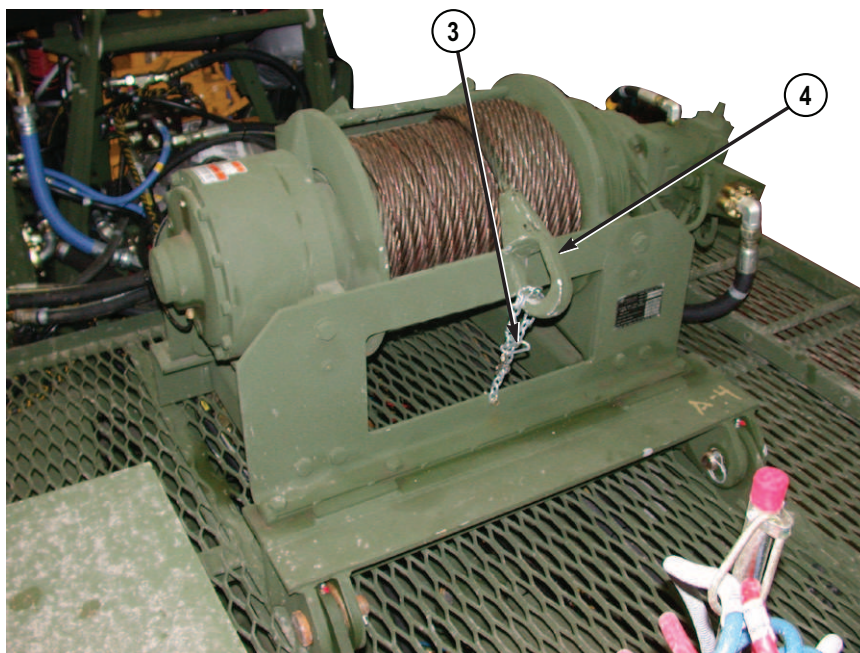


Figure 5.

**NOTE**

- Setting the HIGH IDLE switch to ON position enables fast speed in heavy-duty winch. HIGH IDLE should only be used when normal speed operation is too slow while loading mired equipment or a semitrailer laden with heavy equipment.
- Due to the increased speed of winch cable payout, it is not recommended that HIGH IDLE be used to pay out winch cable.

4. Use of HIGH IDLE switch (5) is at the discretion of the operator.

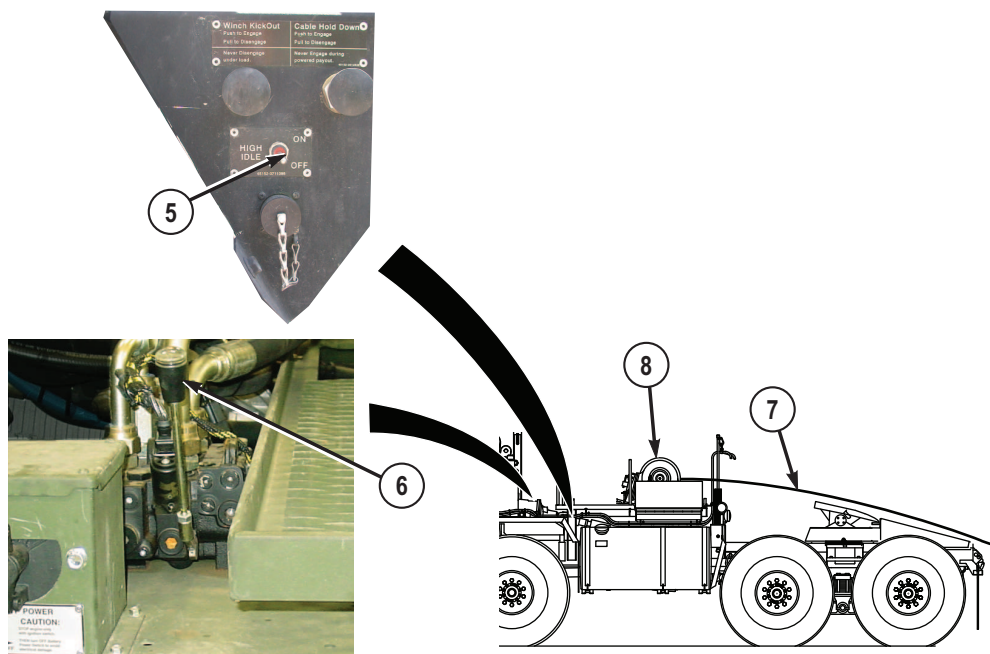


Figure 6.

**WARNING**

- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.
- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

**CAUTION**

Ensure assistant routes winch cable to avoid snag hazards on tractor vehicle. Failure to comply may result in damage to equipment.

5. Pull winch control lever (6) to pay out winch cable (7) while assistant routes winch cable (7) to equipment. Release winch control lever (6) when it is determined ample winch cable (7) is available for connection to equipment.

### CAUTION

Always be sure there are at least five wraps of winch cable on winch drum. If there are less than five wraps of winch cable on winch drum, winch cable may come loose and damage equipment.

### NOTE

Ensure weight of equipment and amount of winch cable left on winch does not go over pull capacity (refer to FM 4-30.31 and Heavy-Duty Winch Pull Capacity Table below).

6. Check that there are at least five wraps of winch cable (7) on winch (8). If there are not at least five wraps of winch cable (7) on winch (8), move tractor vehicle closer to equipment and continue loading, or shut down winch (8).

**Table 1. Heavy-Duty Winch Pull Capacity.**

CABLE LAYER	CABLE ON DRUM (ft.)	CAPACITY (lbs)
1	37	45,000
2	81	37,200
3	133	31,700
4	150	27,700

### NOTE

If HIGH IDLE was not used, skip to Step (8).

7. Set HIGH IDLE switch (5) to OFF.
8. Connect winch cable (7) to equipment.

### LOAD EQUIPMENT

### WARNING



Using remote-control unit and operating heavy-duty winch away from vehicle will lessen the possibility of injury or death to personnel if winch cable separates under tension.

1. Engage (push in) Cable Hold Down control (1).

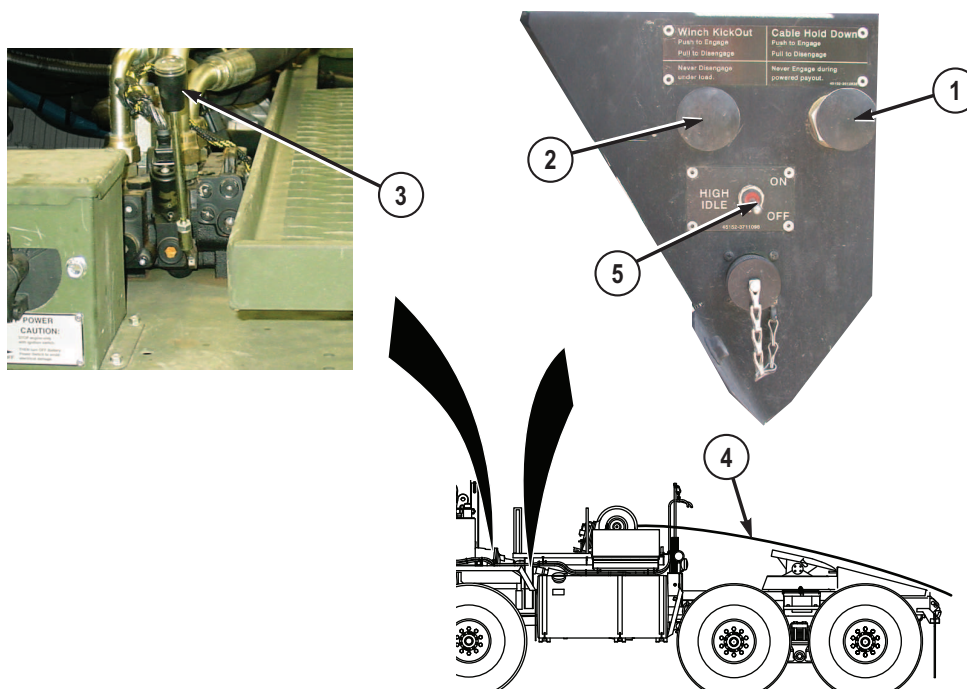


Figure 7.

**CAUTION**

Winch KickOut control should never be engaged (pushed in) under load. Failure to comply may result in damage to equipment.

2. Disengage (pull out) Winch KickOut control (2).
3. Ensure loading area is clear of personnel.

**WARNING**

- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.
- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

**CAUTION**

Gradually apply power to avoid high impact loading of winch cable.



**NOTE**

Maintaining a safe distance, visually recheck your rigging once light tension (slack taken out of winch cable) is applied to winch cable.

4. Push winch control lever (3) slightly to slowly tighten winch cable (4).

**NOTE**

- Setting the HIGH IDLE switch to ON position enables fast speed in heavy-duty winch. HIGH IDLE should only be used when normal speed operation is too slow while loading mired equipment or a semitrailer laden with heavy equipment.
- Due to the increased speed of winch cable payout, it is not recommended that HIGH IDLE be used for loading an empty or lightly laden semitrailer.

5. Use of HIGH IDLE switch (5) is at the discretion of the operator.

**NOTE**

Assistant should be in a position to safely monitor the loading operation and advise the operator of progress.

6. Push winch control lever (3) and load equipment.

**NOTE**

Pull winch control lever just enough to allow adequate slack in winch cable to disconnect from equipment.

7. When equipment is fully loaded, pull winch control lever (3).

**NOTE**

If high idle was not utilized during winch cable pay out, skip Step (8).

8. Set HIGH IDLE switch (5) to OFF (as applicable).

**DISCONNECT WINCH CABLE AND STOW**

1. Ensure Cable Hold Down control (1) is engaged (pushed in).
2. Disconnect winch cable (2) from equipment.



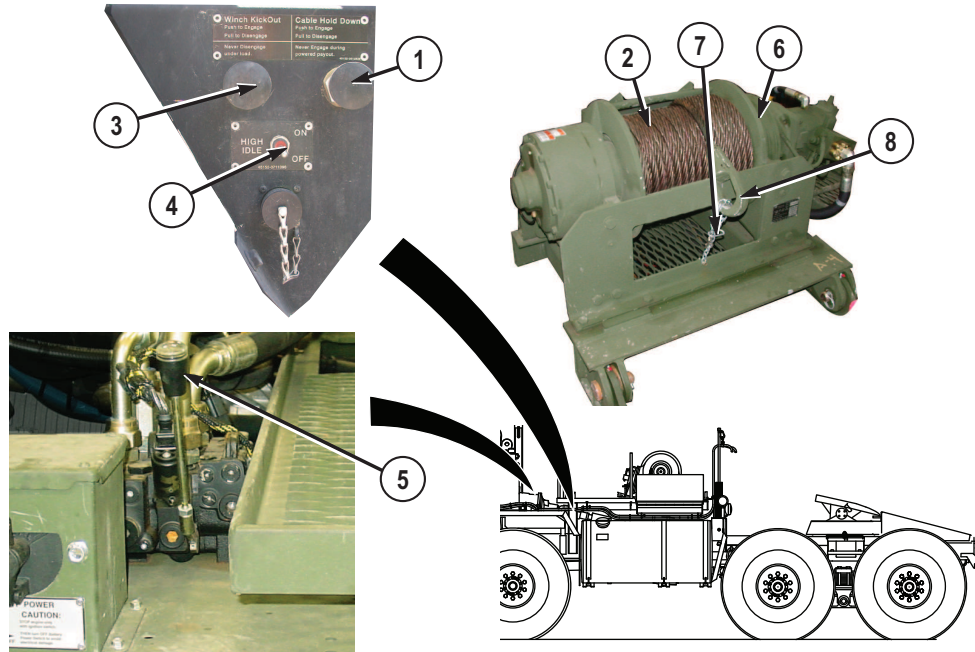


Figure 8.

3. Disengage (pull out) Winch KickOut control (3).

### NOTE

- Setting the HIGH IDLE switch to ON position enables fast speed in heavy-duty winch. HIGH IDLE should only be used when normal speed operation is too slow while loading mired equipment or a semitrailer laden with heavy equipment.
- Due to the increased speed of winch cable payout, it is not recommended that HIGH IDLE be used to reel in and stow winch cable.

4. Use of HIGH IDLE switch (4) is at the discretion of the operator.

### WARNING



- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.
- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

**CAUTION**

- Ensure assistant routes winch cable to avoid snag hazards on tractor vehicle and semitrailer. Failure to comply may result in damage to equipment.
- Ensure tension is kept on winch cable at all times during winch cable retrieval. This accompanied with guidance from the assistant will ensure the winch cable gets evenly wrapped onto winch drum.
- Both operator and assistant should ensure that winch cable wraps properly and evenly onto winch drum. Failure to comply may result in damage to equipment.

5. Push in winch control lever (5) as assistant routes winch cable (2) onto winch drum (6).
6. Once winch cable (2) is completely and evenly wrapped onto winch drum (6), release winch control lever (5).

**NOTE**

If high idle was not utilized during winch cable pay out, skip to Step (8).

7. Set HIGH IDLE switch (4) to OFF (as applicable).
8. Assistant connects clevis retention chain (7) to clevis (8).
9. Set PTO ENGAGE switch (9) to OFF position; indicator light (10) will go out.

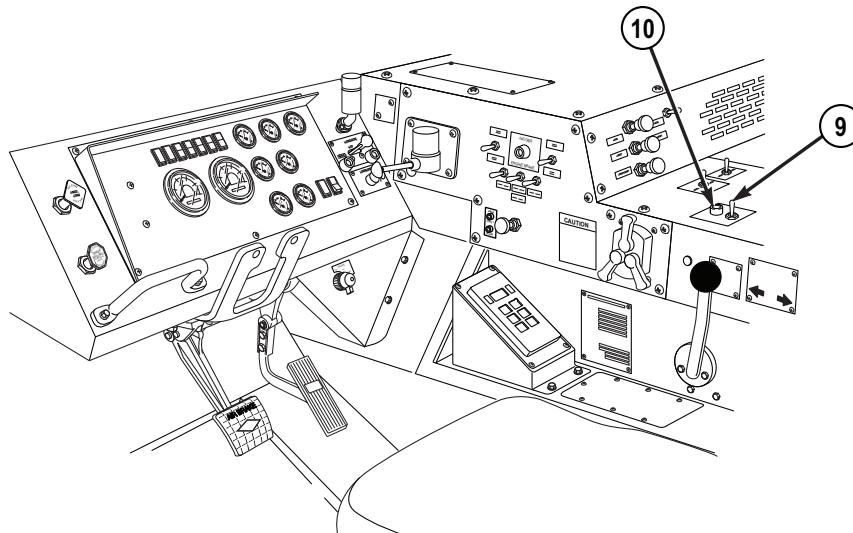
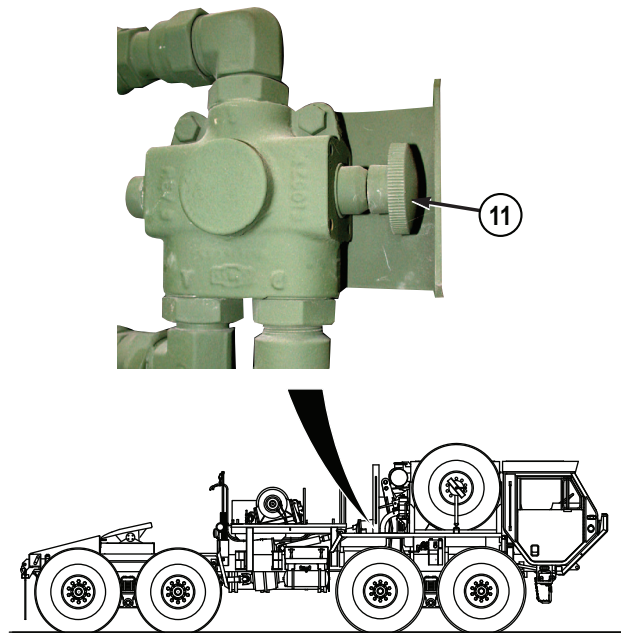


Figure 9.

**CAUTION**

- The operator should always push in hydraulic selector valve control when use of the heavy-duty winch is no longer required to ensure the heavy-duty winch won't accidentally moved during other operations.
- Do not move hydraulic selector valve control while PTO ENGAGE switch is set to ON position. Failure to comply may result in damage to hydraulic equipment.

10. Push in hydraulic selector valve control (11) for all tractor vehicle operations that do not require use of heavy-duty winch.



*Figure 10.*

**END OF TASK**

**END OF WORK PACKAGE**



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**OPERATOR MAINTENANCE  
OPERATION UNDER UNUSUAL CONDITIONS**

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**INITIAL SETUP:**

Not Applicable

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**CAUTION**

Special care should be taken when operating the M983A2 LET in unusual weather/environment, while fording a water obstacle, in off-road conditions, etc. as it is NOT equipped with either a self-recovery winch or snatch block. Operator may not be able to self-recover mired vehicle. Failure to comply may result in damage to equipment.

**NOTE**

Read and follow the procedures in Operation Under Unusual Conditions in TM 9-2320-279-10-1 before operating the M983A2 LET in any unusual or off-road environment.

1. There are no additional M983A2 LET specific instructions for operation under unusual conditions.

**END OF TASK**

**END OF WORK PACKAGE**



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## OPERATOR MAINTENANCE LIMP HOME/TRANSMISSION FAULT

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### INITIAL SETUP:

Not Applicable

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**ALLISON 4500SP TRANSMISSION WILL NOT SHIFT INTO OR OUT OF GEAR (CHECK TRANSMISSION INDICATOR ILLUMINATED)**

### CAUTION

If transmission range selector flashes current range selection while operating vehicle (shift selection is inhibited), **DO NOT SHUT OFF ENGINE** or attempt to change range selection. Shutting off engine may result in the inability to select a drive range at startup, and diagnostic data may be lost. Move vehicle to safe place and notify field level maintenance as soon as possible.

### NOTE

When transmission oil is below 19°F (-7 C), the only gears available are R (reverse), N (Neutral), and 3 (third gear range) when D (drive) is selected. The remaining gears in D (drive) will not be available until transmission oil in sump warms above 19°F (-7 C).

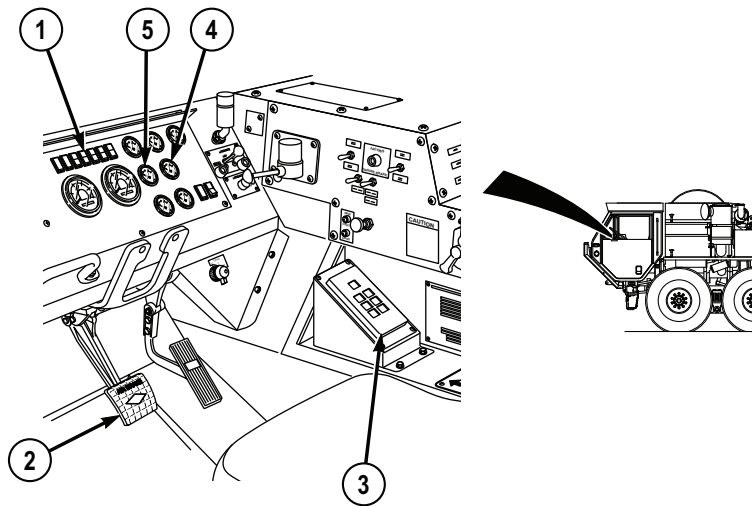


Figure 1.

1. If check transmission indicator (1) illuminates when operating vehicle, apply service brake pedal (2) and stop vehicle.

**NOTE**

**DO NOT shift transmission to N (neutral).**

2. Set transmission range selector (3) to R (reverse):
  - a. If vehicle DOES shift into R (reverse):
    - (1) Set transmission range selector (3) to appropriate position.
    - (2) Continue with mission, and notify field level maintenance when mission is completed.
  - b. If vehicle DOES NOT shift into R (reverse):
    - (1) The transmission may be locked into specific gear, and may not come out of that gear until the engine is turned off.
    - (2) **The operator must be aware that once the engine is turned off, the vehicle will not be operable until the problem is corrected.**

**WARNING**

When operating the vehicle in the transmission limp home mode, the operator must not rely on the parking brake to hold the vehicle in place. The service brakes must also be applied. Failure to comply may result in injury or death to personnel.

**NOTE**

The operator should consider the following guidelines carefully with regard to type of mission, environment, terrain, etc., when deciding on whether to continue the mission, deadline, or return vehicle to field level maintenance.

- (3) No additional damage to the transmission will occur. The operator can continue to operate vehicle in the limp home mode and complete mission. However, the operator must be aware of the following guidelines:
  - (a) DO NOT shut off engine until the decision is made to deadline vehicle. Once the engine is shut off, the vehicle will not be operable until the problem is corrected.
  - (b) As the engine cannot be turned off and the transmission is locked into gear, the operator will not be able to leave the cab until vehicle is deadlined.
  - (c) The vehicle will not be able to operate in R (reverse).
  - (d) Depending on gear range the transmission is locked into, the operator may not be able to drive vehicle up steep grades.



- (e) The service brake pedal (2) may need to be applied slightly earlier than normal when stopping the vehicle.
- (f) Depending upon gear range the transmission is locked into and the terrain the vehicle is operating in, the engine and/or transmission may overheat. The operator must closely monitor the engine WATER TEMP gauge (4) and the TRANS TEMP gauge (5).

### **CAUTION**

If overheating occurs when operating in the transmission limp home mode, the operator should stop the vehicle (do not shut off engine), and allow the transmission and engine to cool down to normal operating levels. If the engine and transmission do not cool down, or overheating reoccurs, the operator should shut off engine and notify field level maintenance. Failure to comply may result in damage to equipment.

- (g) Notify field level maintenance as soon as possible.

**END OF TASK**

**END OF WORK PACKAGE**



OPERATOR MAINTENANCE  
STOWAGE AND SIGN GUIDE

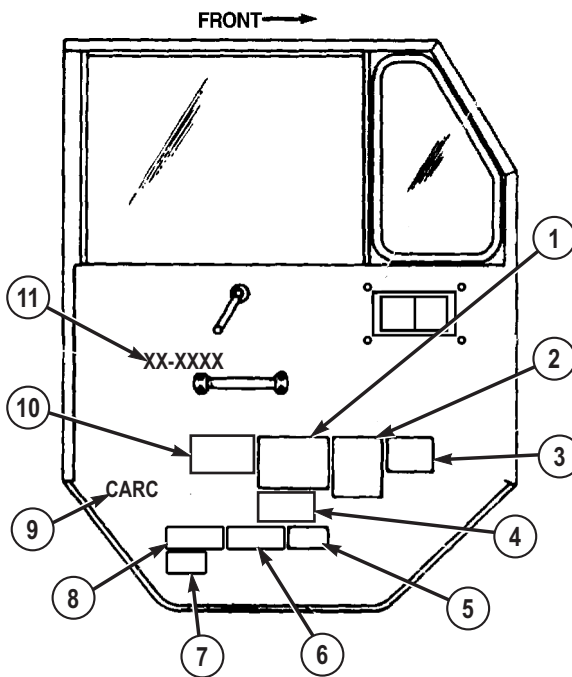
SCOPE

This work package shows locations for data plates, decals, and stencils that are required to be in place on the HEMTT series vehicles.

GENERAL

The following figures show the location of metal signs, decals, and stencils used on the vehicle. Most of these signs and stencils contain cautions or information needed to operate the vehicle safely. For stowage locations of Components Of End Item (COEI) and Basic Issue Items (BII), refer to Components of End Item and Basic Issue Items tables.

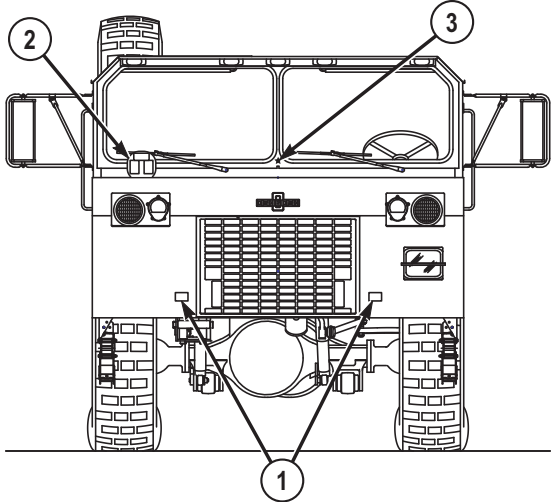
Table 1. M983A2 LET Tractor Inside Driver Side Door.

	
INDEX	DECAL/PLATE/STENCIL
1	Manufacturer's Certification Information
2	Parts Data
3	Name Plate
4	Overhaul Data (not included on all vehicles)

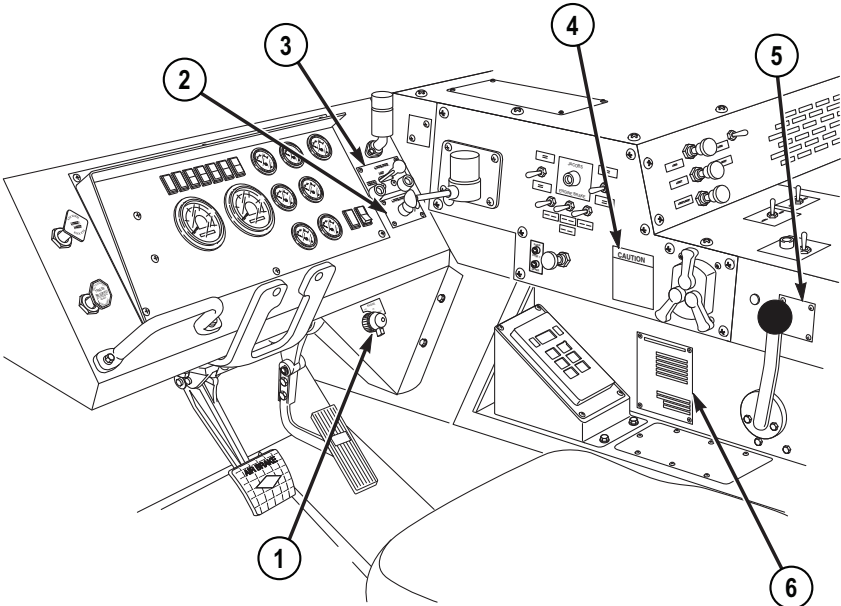
**Table 1. M983A2 LET Tractor Inside Driver Side Door. - Continued**

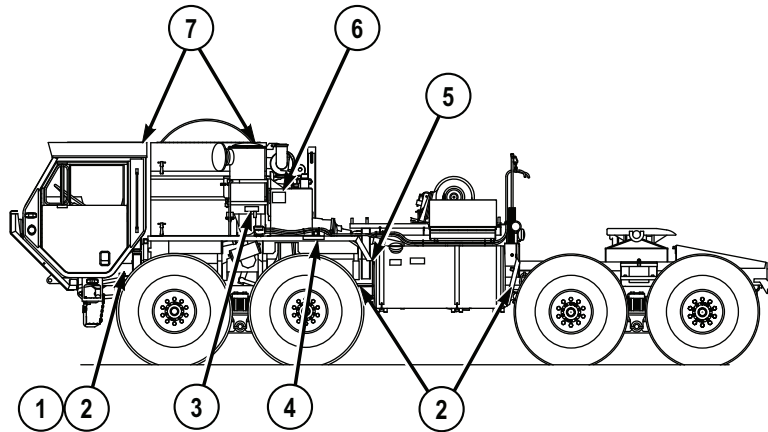
5	Tire Inflation Data
6	Warranty Information
7	Rustproofing Data/Rustproofing CAUTION
8	Noise Exemption Decal
9	"CARC" Stencil
10	Shipping Data
11	Registration Number (inside both driver and passenger side doors)

**Table 2. M983A2 LET Tractor Front Exterior.**

	
INDEX	PLACARD/STENCIL
1	"TIEDOWN" Stencil
2	Sign Kit/Weight Indicator
3	US Army Star Stencil

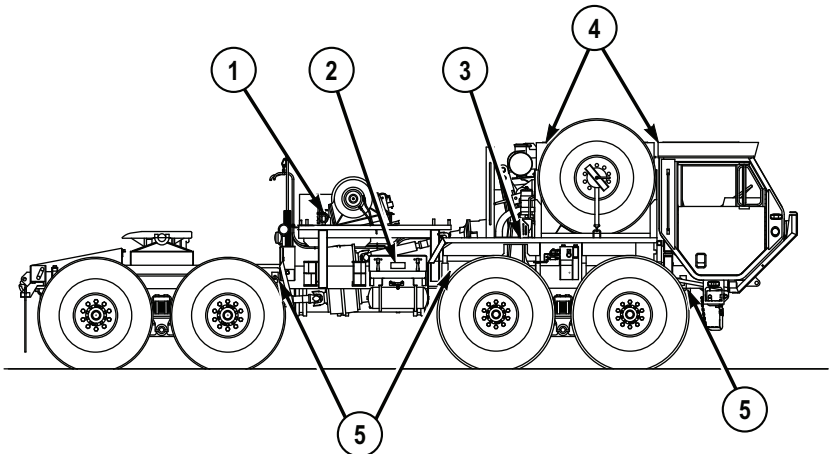
**Table 3. M983A2 LET Tractor Cabin.**

	
INDEX	DECAL/PLATE
1	Engine ON/OFF Decal
2	Ether Start Data Plate
3	Traction Control Data Plate
4	CAUTION (Transmission) Decal
5	Transfer Case Data Plate
6	Vehicle Data Plate

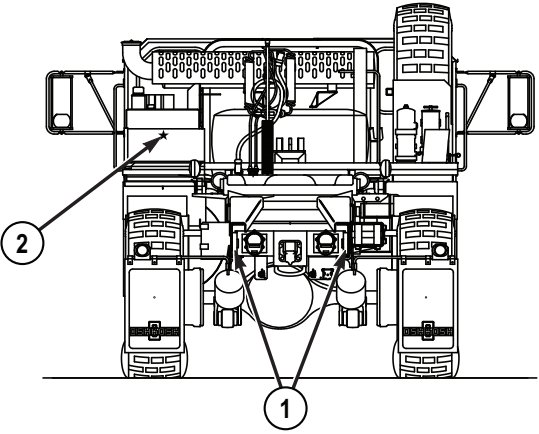
**Table 4. M983A2 LET Tractor Driver Side Exterior.**

INDEX	PLATE/PLACARD/STENCIL
1	Vehicle Identification Number (VIN) Placard
2	"TIEDOWN" Stencil
3	CAUTION Decal (hearing protection required)
4	"24V" Stencil
5	Heavy-Duty Winch Controls Placard
6	"FULL COLD" Stencil
7	"NO STEP" Stencil (multiple on exhaust and engine access panels)

**Table 5. M983A2 LET Tractor Passenger Side Exterior.**

	
INDEX	PLACARD/PLATE/STENCIL
1	Heavy-Duty Winch Data Plate
2	CAUTION Decal (hearing protection required)
3	CAUTION (hydraulic selector valve)
4	"NO STEP" Stencil (multiple on exhaust and engine access panels)
5	"TIEDOWN" Stencil

**Table 6. M983A2 LET Tractor Rear Exterior.**

	
INDEX	STENCIL

**Table 6. M983A2 LET Tractor Rear Exterior. - Continued**

1	"SLING POINT" and "TIEDOWN" Stencils (one each per side)
2	US Army Star Stencil

<sup>1</sup> M983A2 Tractor shown. Differences between M983A2 tractor and M983A2 LET Tractor have no effect on stencil locations.

**Table 7. M983A2 LET Tractor Miscellaneous Decals/Placards/Stencils.**

LOCATION	QUANTITY
Axle Housing	4
Carrier	4
Transfer Case	1
Engine	1
Transmission	1
Total	11

**END OF WORK PACKAGE**



## CHAPTER 3

### TROUBLESHOOTING PROCEDURES



---

**OPERATOR MAINTENANCE**  
**WINCH CABLE WILL NOT REEL OUT OR IN, OR OPERATES SLOWLY IN REMOTE CONTROL**

---

**INITIAL SETUP:**

**Equipment Condition**

Engine shut down. (TM 9-2320-279-10)

Parking brakes applied. (TM 9-2320-279-10)

Wheels chocked. (TM 9-2320-279-10)

---

**TROUBLESHOOTING PROCEDURE**

**WINCH CABLE WILL NOT REEL OUT OR IN, OR OPERATES SLOWLY IN REMOTE CONTROL**

**TEST 1 - Does winch operate normally IN and OUT with manual control?**

**NOTE**

- Common problems with heavy-duty winch that may be found are:
  - a. Slow or abnormal operation.
  - b. Winch will not pull required load.
- Common causes of problems are:
  - a. Cold hydraulic fluid (slow operation).
  - b. Low engine speed (slow or abnormal operation).
  - c. Controls malfunction (remote and manual).
- Report all problems to field maintenance.

1. Set PTO ENGAGE switch to ON. (WP 0015)

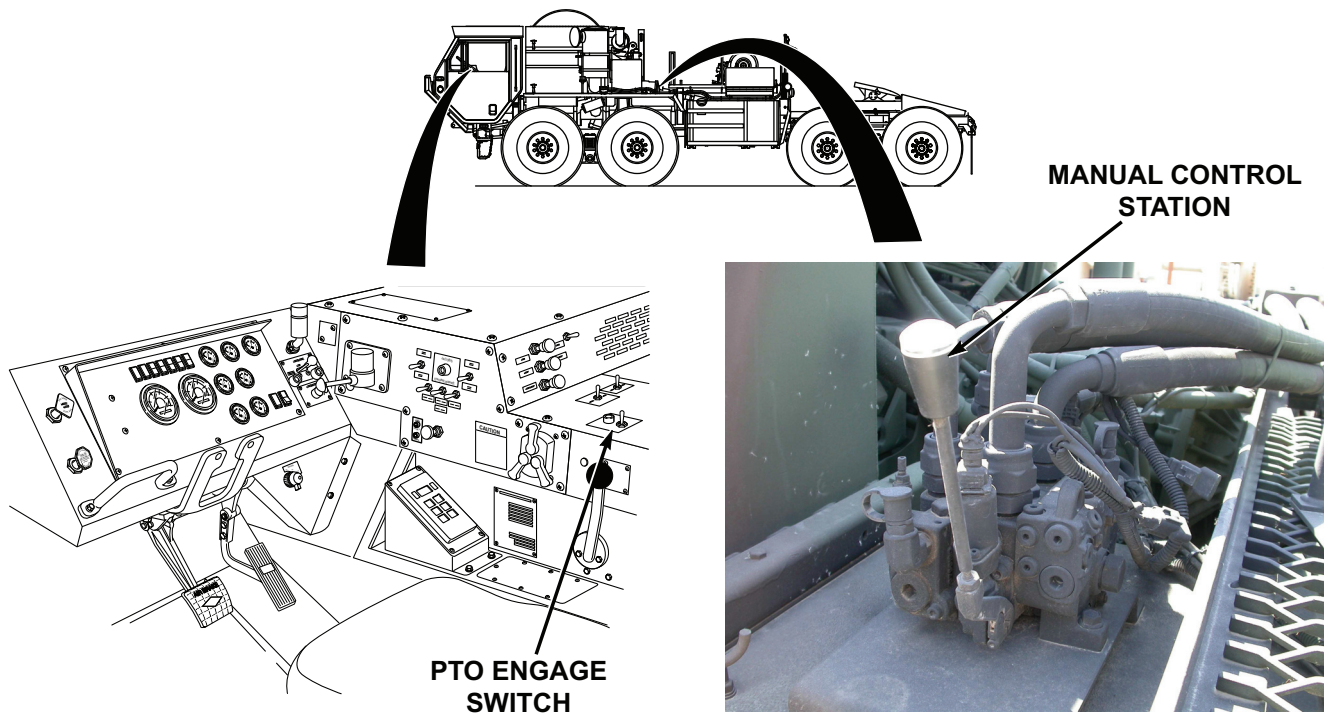


Figure 1.

2. Operate winch OUT and IN (WP 0015) from manual control station.

#### CONDITION/INDICATION

Does winch operate normally IN and OUT with manual control?

#### DECISION

No - Test 2 - Does winch operate normally after warming hydraulic fluid for 20 minutes?  
 Yes - Notify Supervisor.

**TEST 2 - Does winch operate normally after warming hydraulic fluid for 20 minutes?**

#### NOTE

If outside temperature is 0°F (-17°C) or lower, hydraulic fluid may not flow easily.

1. Operate engine (WP 0015) for 20 minutes with PTO ENGAGE switch set to ON to bring hydraulic fluid up to operating temperature.

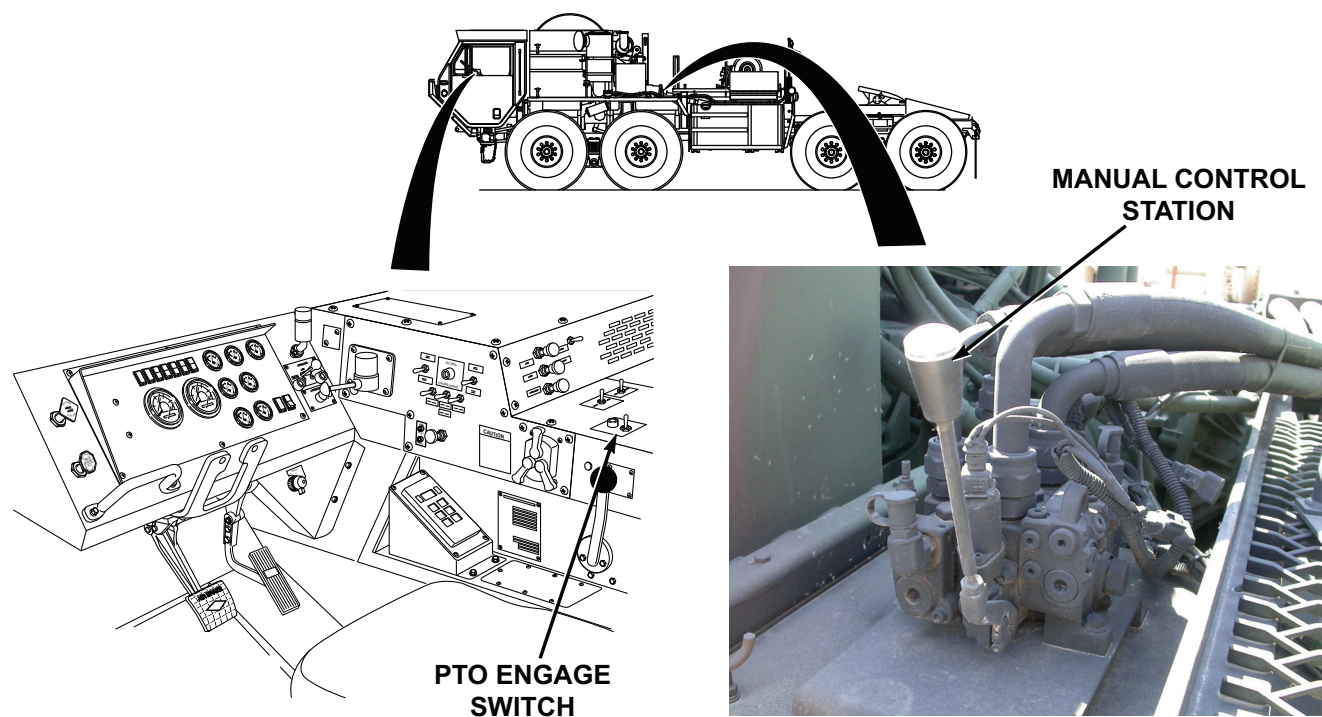


Figure 2.

**CONDITION/INDICATION**

Does winch operate normally after warming hydraulic fluid for 20 minutes?

**DECISION**

No - Notify Supervisor.

Yes - Problem corrected.

**END OF WORK PACKAGE**



---

## OPERATOR MAINTENANCE CONTROLS (REMOTE OR MANUAL) STICKING IN ENGAGED POSITION

---

### INITIAL SETUP:

#### Equipment Condition

Engine shut down. (TM 9-2320-279-10)

Parking brakes applied. (TM 9-2320-279-10)

Wheels chocked. (TM 9-2320-279-10)

---

### TROUBLESHOOTING PROCEDURE

#### CONTROLS (REMOTE OR MANUAL) STICKING IN ENGAGED POSITION

##### TEST 1 - Is hydraulic fluid below normal operating temperature?

### WARNING



Reservoir may be very hot. Use care when placing hand near reservoir. Reservoir can become hot enough to cause serious burns. Failure to comply may result in injury or death to personnel.

### NOTE

- Common problems with heavy-duty winch that may be found are:
  - a. Slow or abnormal operation.
  - b. Winch will not pull required load.
- Common causes of problems are:
  - a. Cold hydraulic fluid (slow operation).
  - b. Low engine speed (slow or abnormal operation).
  - c. Controls malfunction (remote and manual).
- Report all problems to field maintenance.
- If outside temperature is 0°F (-17°C) or lower, hydraulic fluid may be below operating temperature.

1. Check if outside temperature is 0°F (-17°C) or lower.

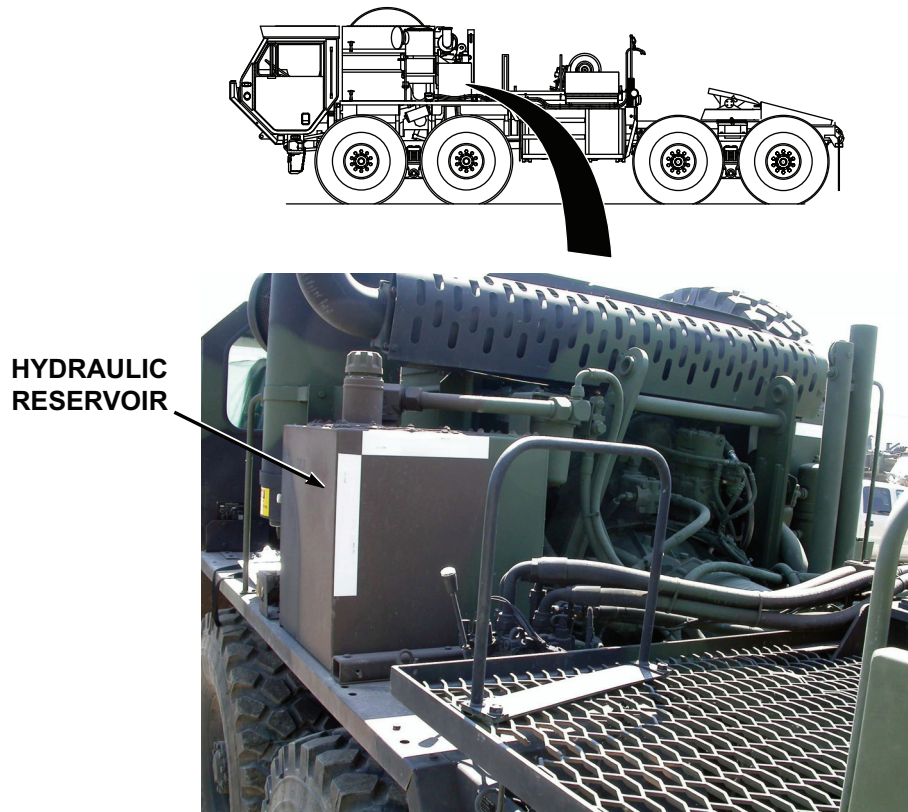


Figure 1.

#### CONDITION/INDICATION

Is hydraulic fluid below normal operating temperature?

#### DECISION

No - Test 3 - Is hydraulic fluid overheated?

Yes - Test 2 - Do controls stick in engaged position after running engine for 20 minutes?

**TEST 2 - Do controls stick in engaged position after running engine for 20 minutes?**

#### WARNING



Reservoir may be very hot. Use care when placing hand near reservoir. Reservoir can become hot enough to cause serious burns. Failure to comply may result in injury or death to personnel.



## NOTE

If outside temperature is 0°F (-17°C) or lower, hydraulic fluid may be below operating temperature. Operating system with PTO end hydraulic pump engaged should warm hydraulic fluid to an operating temperature.

1. Pull selector valve out. (WP 0015)
2. Start engine (refer to TM 9-2320-279-10).
3. Set PTO ENGAGE switch to ON. (WP 0015)
4. Operate engine for 20 minutes.
5. Check hydraulic fluid temperature at reservoir. Reservoir should be warm.

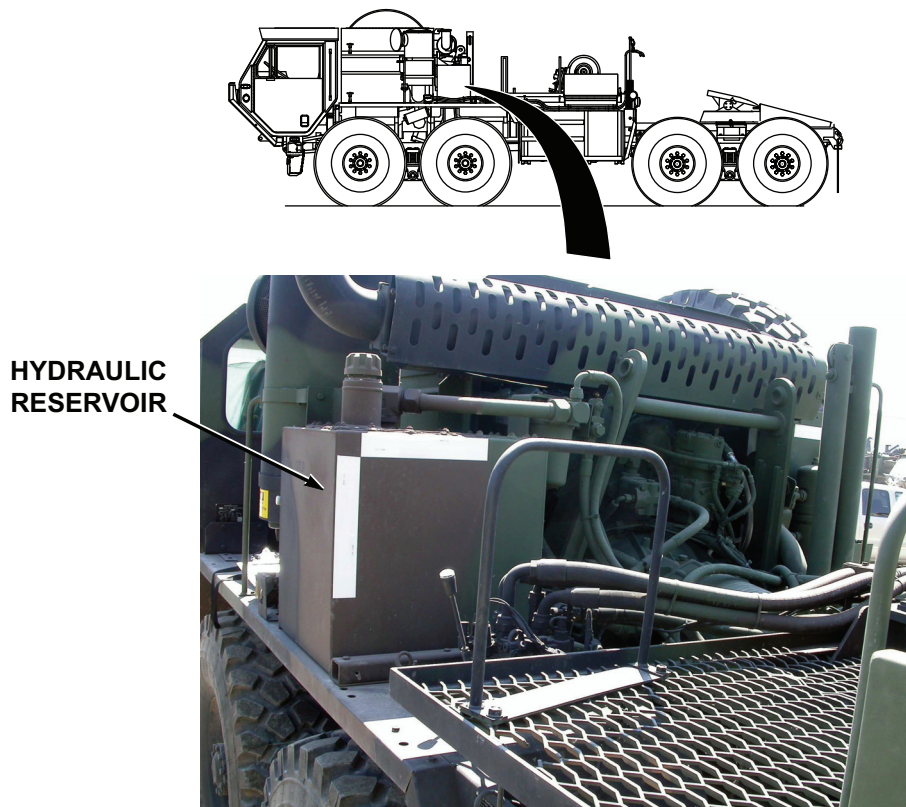


Figure 2.

6. Push WINCH KICKOUT control valve in to ENGAGE position. (WP 0015)
7. Prepare vehicle for heavy-duty winch operation. (WP 0015)
8. Operates heavy-duty winch manual controls, observe heavy-duty winch control operation. (WP 0015)

## CONDITION/INDICATION

Do controls stick in engaged position after running engine for 20 minutes?

## DECISION

No - Test 3 - Is hydraulic fluid overheated?

Yes - Test 4 - Do winch controls operate normally?

## TEST 3 - Is hydraulic fluid overheated?

1. If PTO is engaged, set PTO ENGAGE switch to OFF. (WP 0015)

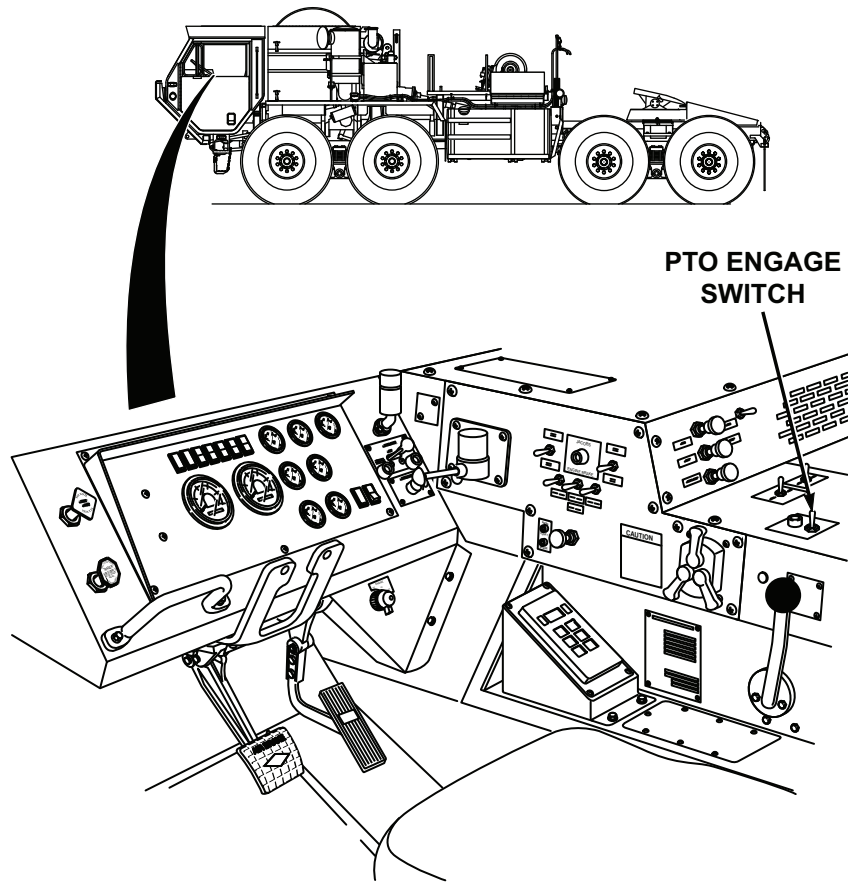


Figure 3.

### WARNING



Reservoir may be very hot. Use care when placing hand near reservoir. Reservoir can become hot enough to cause serious burns. Failure to comply may result in injury or death to personnel.

2. If engine is running, shut off engine (refer to TM 9-2320-279-10).

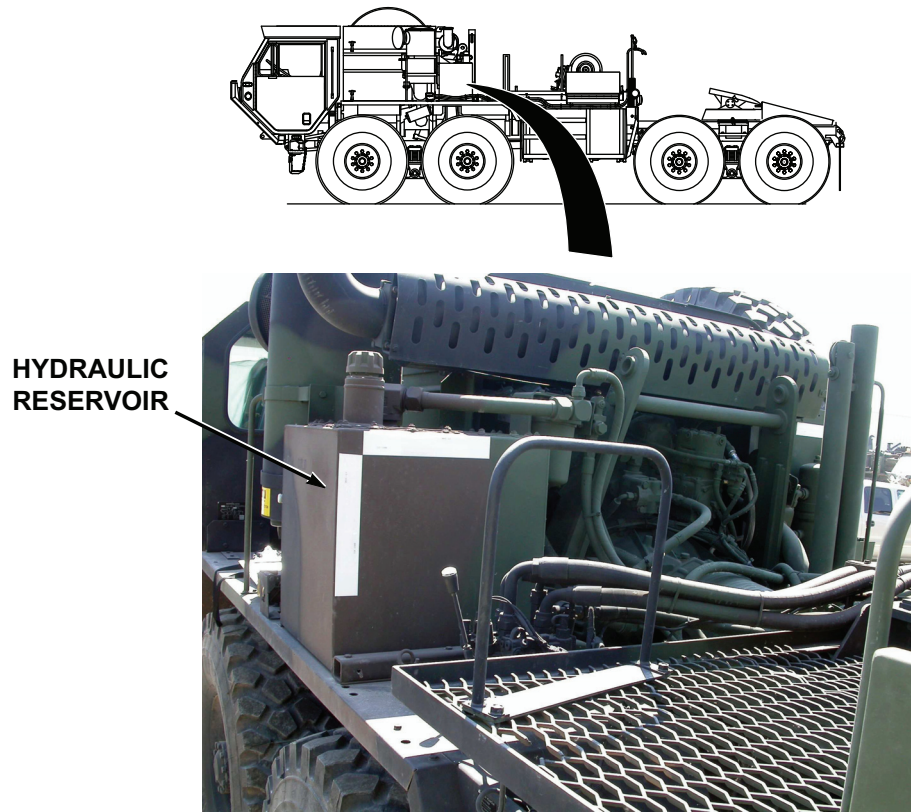


Figure 4.

3. Allow hydraulic oil to cool.

#### CONDITION/INDICATION

Is hydraulic fluid overheated?

#### DECISION

-

Continue - Test 4 - Do winch controls operate normally?

#### TEST 4 - Do winch controls operate normally?

1. Pull selector valve out. (WP 0015)
2. Push WINCH KICKOUT control valve in to ENGAGE position. (WP 0015)

#### WARNING



Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

3. Start engine (refer to TM 9-2320-279-10).

4. Set PTO ENGAGE switch to ON position. (WP 0015)
5. Prepare vehicle for heavy-duty winch operation. (WP 0015)
6. Operate heavy-duty winch controls. (WP 0010)

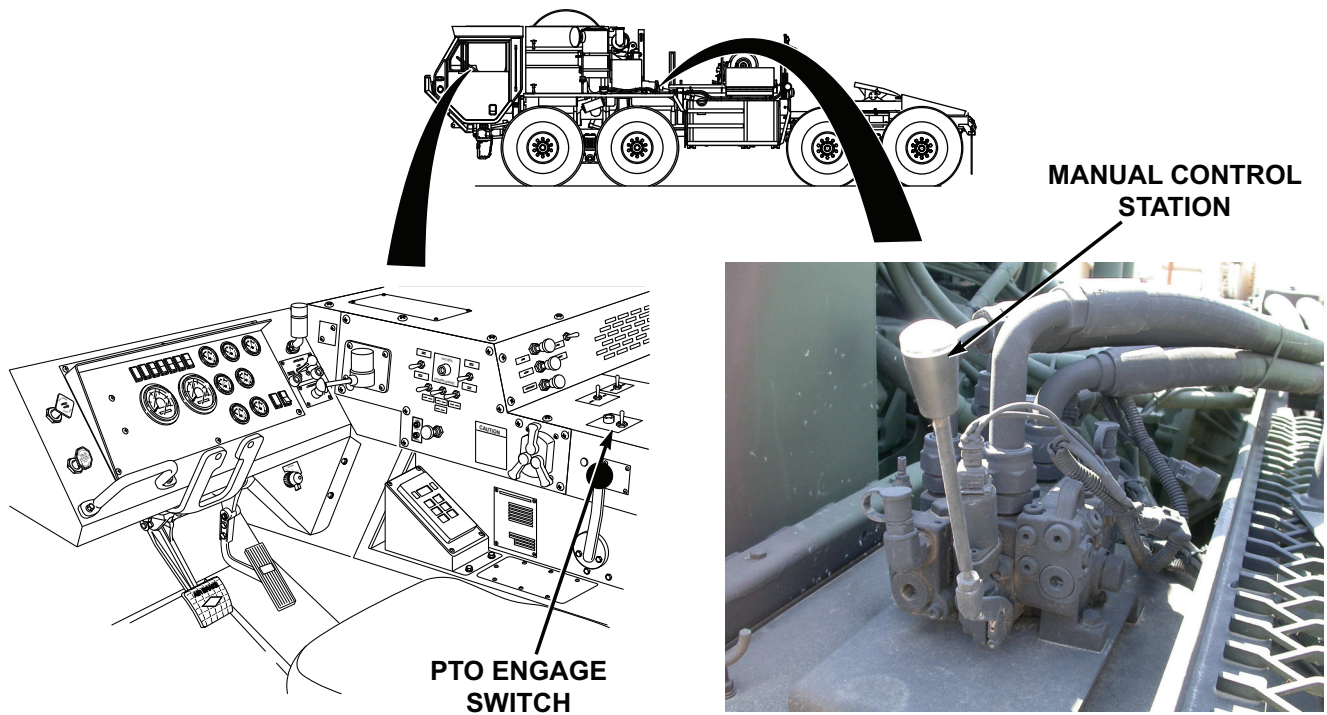


Figure 5.

**CONDITION/INDICATION**

Do winch controls operate normally?

**DECISION**

No - Notify Supervisor.  
Yes - Problem corrected.

**END OF WORK PACKAGE**

---

**OPERATOR MAINTENANCE**  
**HEAVY-DUTY WINCH WILL NOT OPERATE IN REMOTE CONTROL**

---

**INITIAL SETUP:**

**Equipment Condition**

Engine shut down. (TM 9-2320-279-10)

Parking brakes applied. (TM 9-2320-279-10)

Wheels chocked. (TM 9-2320-279-10)

---

**TROUBLESHOOTING PROCEDURE**

**HEAVY-DUTY WINCH WILL NOT OPERATE IN REMOTE CONTROL**

**TEST 1 - Does winch operate in and out with manual control?**

1. Pull selector valve out. (WP 0015)
2. Push WINCH KICKOUT control valve in to ENGAGE position. (WP 0015)

**WARNING**



Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

3. Start engine (refer to TM 9-2320-279-10).
4. Set PTO ENGAGE switch to ON. (WP 0015)



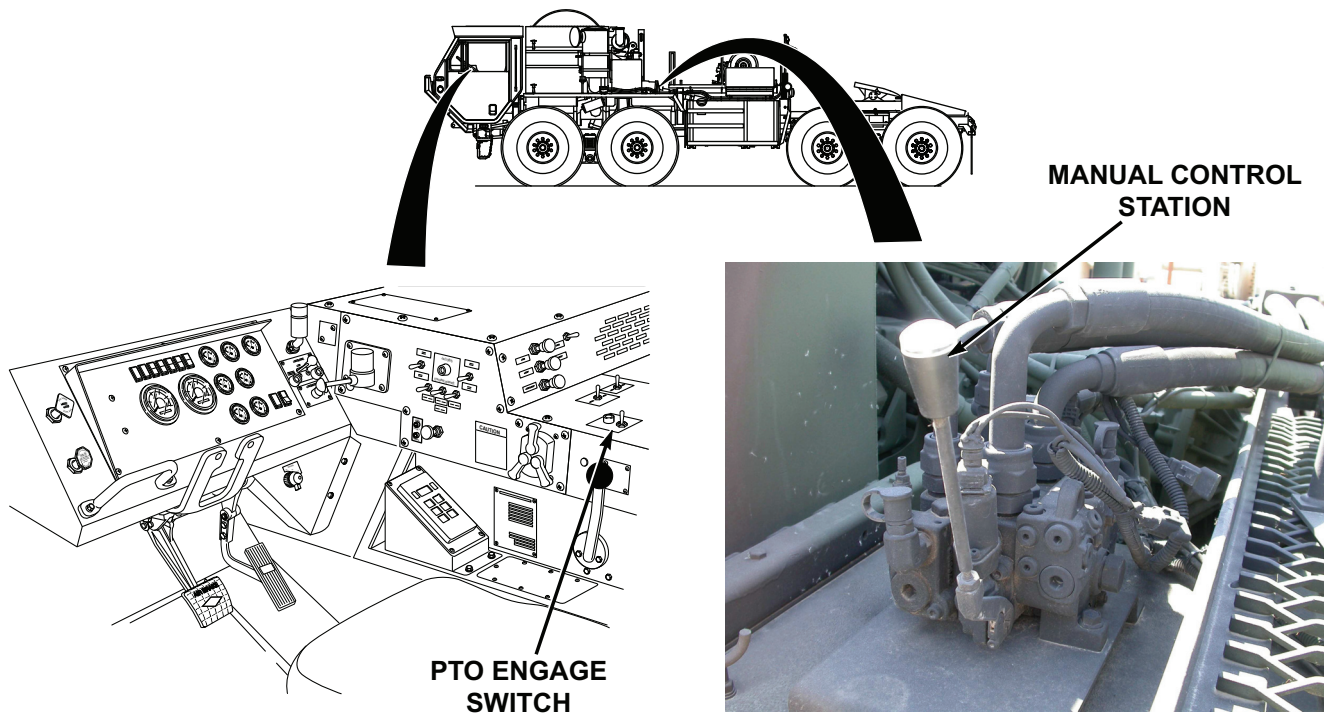


Figure 1.

5. Prepare vehicle for heavy-duty winch operation. (WP 0015)
6. While assistant operates heavy-duty winch OUT and IN from manual control station, (WP 0015) observe heavy-duty winch operation.

#### CONDITION/INDICATION

Does winch operate in and out with manual control?

#### DECISION

No - Problem not corrected. Notify Supervisor.  
 Yes - Test 2 - Does heavy-duty winch operate in remote control?

#### TEST 2 - Does heavy-duty winch operate in remote control?

1. While assistant operates heavy-duty winch OUT and IN from remote control station, (WP 0014) observe heavy-duty winch operation.

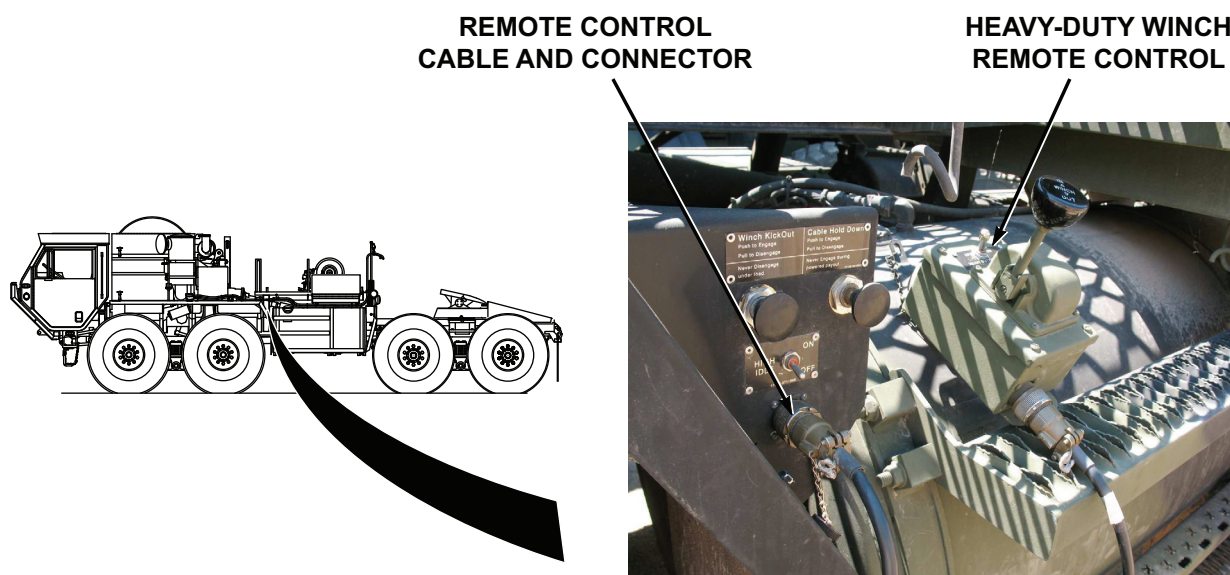


Figure 2.

**CONDITION/INDICATION**

Does heavy-duty winch operate in remote control?

**DECISION**

No - Problem not corrected. Notify Supervisor.

Yes - Problem corrected.

**END OF WORK PACKAGE**





**OPERATOR MAINTENANCE**  
**WINCH CABLE WILL NOT REEL OUT OR IN, OR OPERATES SLOWLY IN MANUAL CONTROL**

**INITIAL SETUP:**

**Equipment Condition**

Engine shut down. (TM 9-2320-279-10)

Parking brakes applied. (TM 9-2320-279-10)

Wheels chocked. (TM 9-2320-279-10)

**TROUBLESHOOTING PROCEDURE**

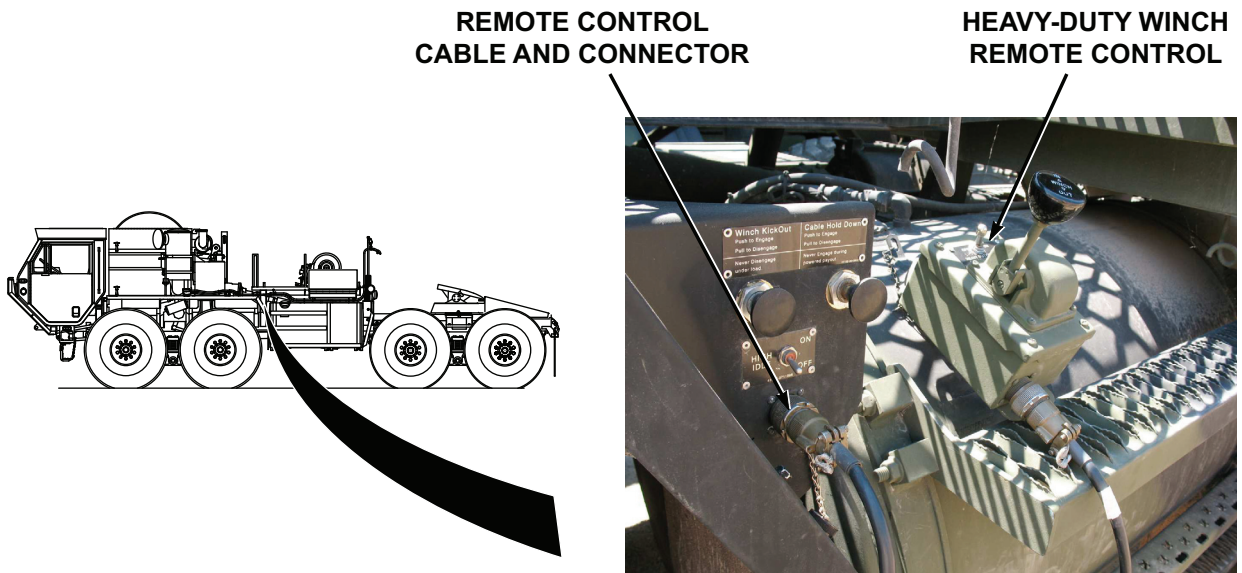
**WINCH CABLE WILL NOT REEL OUT OR IN, OR OPERATES SLOWLY IN MANUAL CONTROL**

**TEST 1 - Does winch operate normally IN and OUT with remote control?**

**NOTE**

- Common problems with heavy-duty winch that may be found are:
  - a. Slow or abnormal operation.
  - b. Winch will not pull required load.
- Common causes of problems are:
  - a. Cold hydraulic fluid (slow operation).
  - b. Low engine speed (slow or abnormal operation).
  - c. Controls malfunction (remote and manual).
- Report all problems to field maintenance.

1. Connect H.D. WINCH REMOTE CONTROL.



*Figure 1.*

2. Operate winch OUT and IN (WP 0014) from remote control station.

**CONDITION/INDICATION**

Does winch operate normally IN and OUT with remote control?

**DECISION**

No - Test 2 - Does winch operate normally after warming hydraulic fluid for 20 minutes?

Yes - Notify Supervisor.

**TEST 2 - Does winch operate normally after warming hydraulic fluid for 20 minutes?****NOTE**

If outside temperature is 0°F (-17°C) or lower, hydraulic fluid may not flow easily.

1. Operate engine (Refer to TM9-2320-279-10) for 20 minutes with PTO ENGAGE switch set to ON to bring hydraulic fluid up to operating temperature.

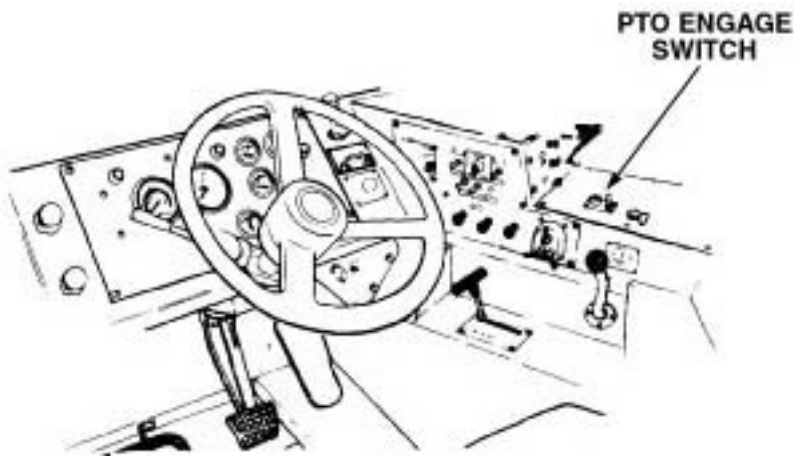


Figure 2.

**CONDITION/INDICATION**

Does winch operate normally after warming hydraulic fluid for 20 minutes?

**DECISION**

No - Problem not corrected. Notify Supervisor.

Yes - Problem corrected.

**END OF WORK PACKAGE**

**OPERATOR MAINTENANCE**  
**HYDRAULIC SYSTEM OPERATES TOO SLOW, TOO FAST, WITH JERKY MOVEMENTS; OR ONE OR MORE**  
**HYDRAULICS CIRCUITS WILL NOT OPERATE**

**INITIAL SETUP:**

**Equipment Condition**

Engine shut down. (TM 9-2320-279-10)

Parking brakes applied. (TM 9-2320-279-10)

Wheels chocked. (TM 9-2320-279-10)

**TROUBLESHOOTING PROCEDURE**

**HYDRAULIC SYSTEM OPERATES TOO SLOW, TOO FAST, WITH JERKY MOVEMENTS; OR ONE OR MORE**  
**HYDRAULICS CIRCUITS WILL NOT OPERATE**

**TEST 1 - Is hydraulic fluid level within normal operating range?**

1. Check hydraulic fluid level. If low, add hydraulic fluid. (TM 9-2320-315-14&P)

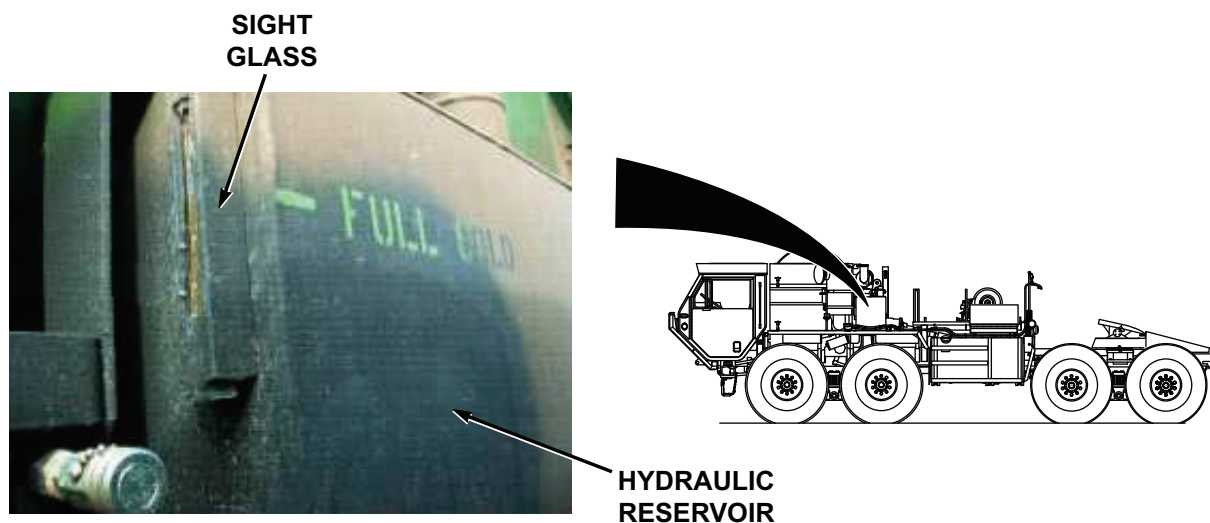


Figure 1.

**CONDITION/INDICATION**

Is hydraulic fluid level within normal operating range?

**DECISION**

No - Test 3 - Do all hydraulic systems operate properly?

Yes - Test 2 - Are hydraulic hoses and connections free from leaks and/or damage?

**TEST 2 - Are hydraulic hoses and connections free from leaks and/or damage?**

1. Check hydraulic hoses and connections for leaks and/or damage.

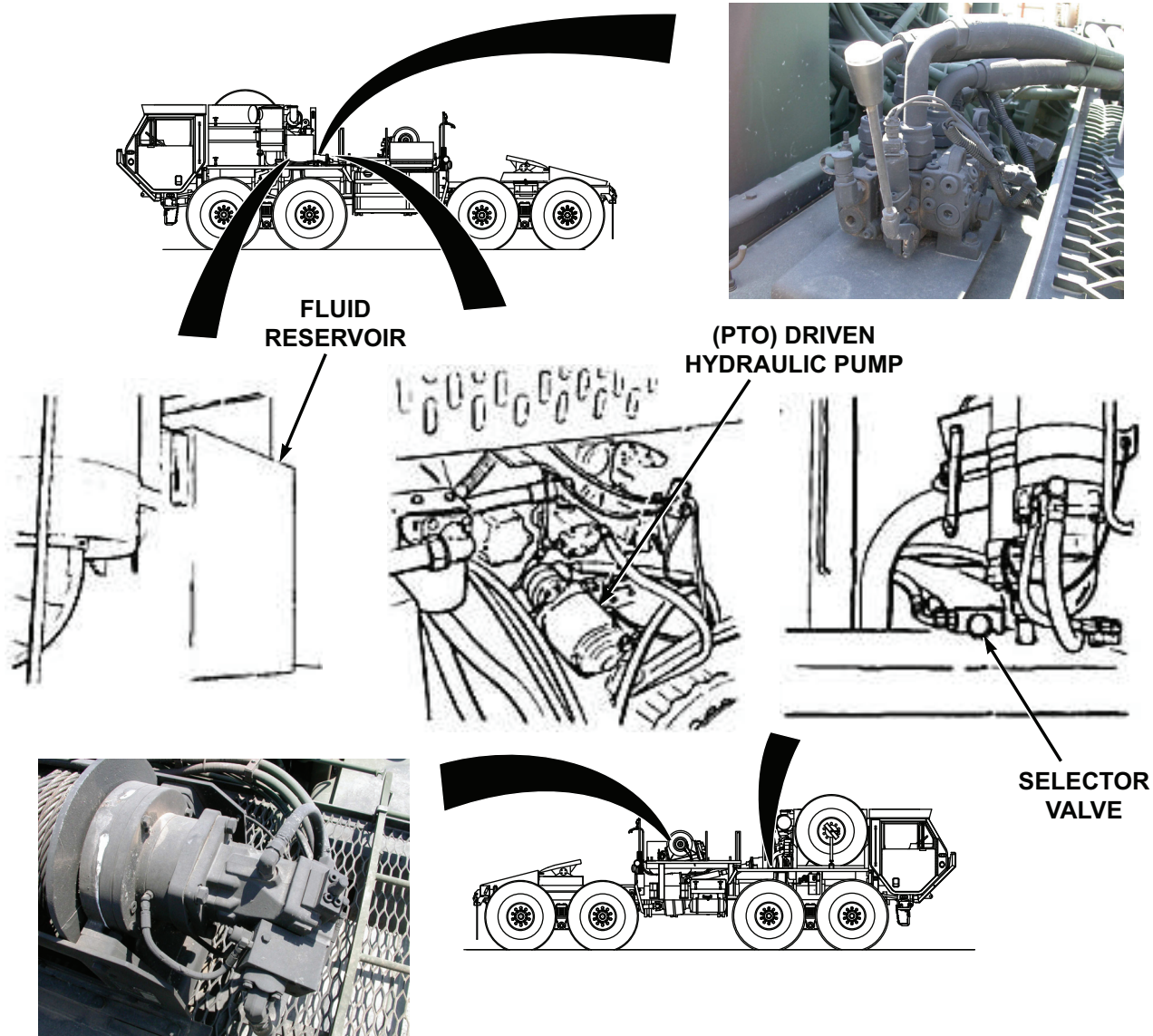


Figure 2.

2. Attempt to tighten loose hose(s) and/or connection(s).

**CONDITION/INDICATION**

Are hydraulic hoses and connections free from leaks and/or damage?

**DECISION**

Hydraulic hose or connection damaged. - Notify Supervisor. Test 3 - Do all hydraulic systems operate properly?  
 Notify Supervisor.  
 Hydraulic hoses and connections OK. - Notify Supervisor.

**TEST 3 - Do all hydraulic systems operate properly?**

1. Operate hydraulic systems to check for proper operation.

**CONDITION/INDICATION**

Do all hydraulic systems operate properly?

**DECISION**

No - Notify Supervisor.

Yes - Problem corrected.

**END OF WORK PACKAGE**



---

**FIELD MAINTENANCE**  
**ENGINE HIGH IDLE DOES NOT OPERATE (4500SP TRANSMISSION)**

---

**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

Parking brake applied (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

**Personnel Required**

Wheeled Vehicle Mechanic 63B (2)

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).

---

**TROUBLESHOOTING PROCEDURE**  
**ENGINE HIGH IDLE DOES NOT OPERATE (4500SP TRANSMISSION)**

**TEST 1 - Does PTO engage when selected?**

1. Start engine (refer to TM 9-2320-279-10).
2. Set PTO ENGAGE switch to ON position. (WP 0015)

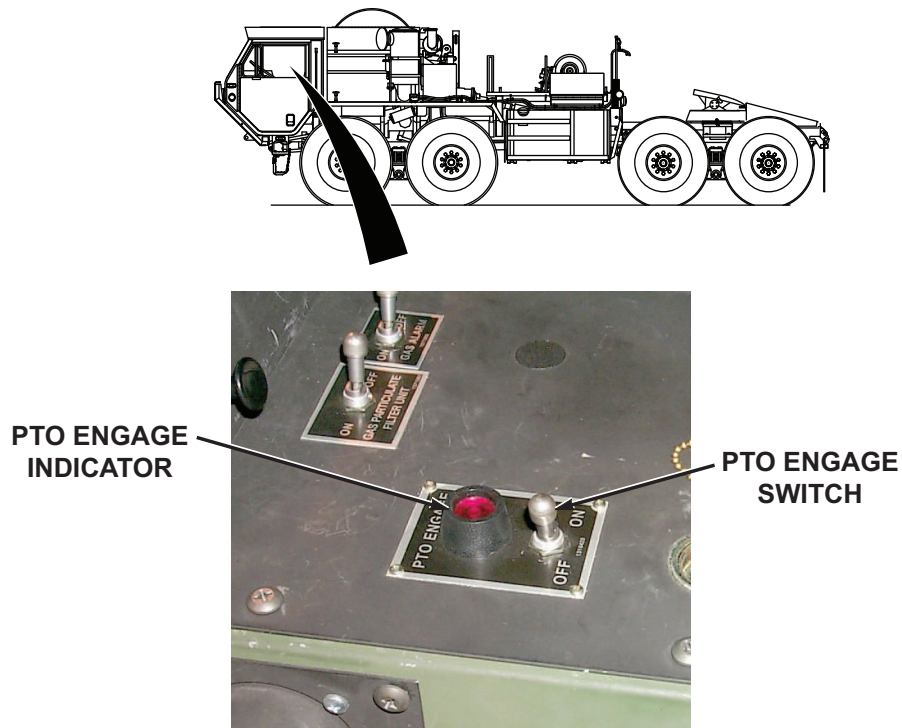


Figure 1.

3. Check if PTO ENGAGE indicator illuminates (refer to TM 9-2320-279-10).



4. If PTO ENGAGE indicator does not illuminate, set PTO ENGAGE switch to OFF position. (WP 0015)
5. If PTO ENGAGE indicator does not illuminate, shut OFF engine (refer to TM 9-2320-279-10).

#### CONDITION/INDICATION

Does PTO engage when selected?

#### DECISION

No - Troubleshoot: PTO Does Not Engage for M983A2 (refer to TM 9-2320-315-14&P).

Yes - Test 2 - Does high idle operate when selected at heavy-duty winch control station?

#### TEST 2 - Does high idle operate when selected at heavy-duty winch control station?

1. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)

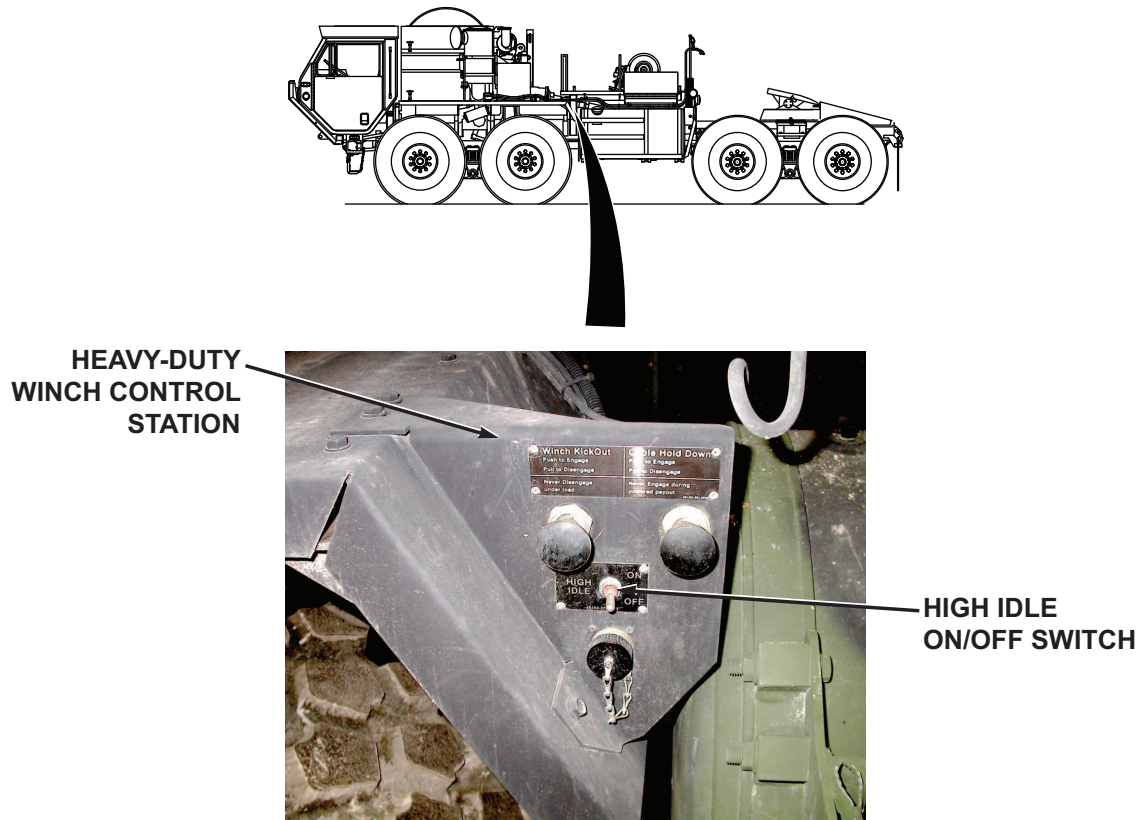


Figure 2.

#### NOTE

Engine high idle speed is 1,500 RPM.

2. Observe engine operation. Inspect tachometer for increase in engine speed.
3. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)

#### CONDITION/INDICATION

Does high idle operate when selected at heavy-duty winch control station?



**DECISION**

No - Test 9 - Are 22 to 28 vdc measured on wire 1854 at heavy-duty winch control station remote control connector, terminal C?

Yes - Test 3 - Are 22 to 28 vdc measured on wire 1854 at heavy-duty winch control station remote control connector, terminal C?

**TEST 3 - Are 22 to 28 vdc measured on wire 1854 at heavy-duty winch control station remote control connector, terminal C?**

**WARNING**

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Connect positive (+) probe of multimeter to wire 1854 at heavy-duty winch control station remote control connector, terminal C. Refer to schematics.

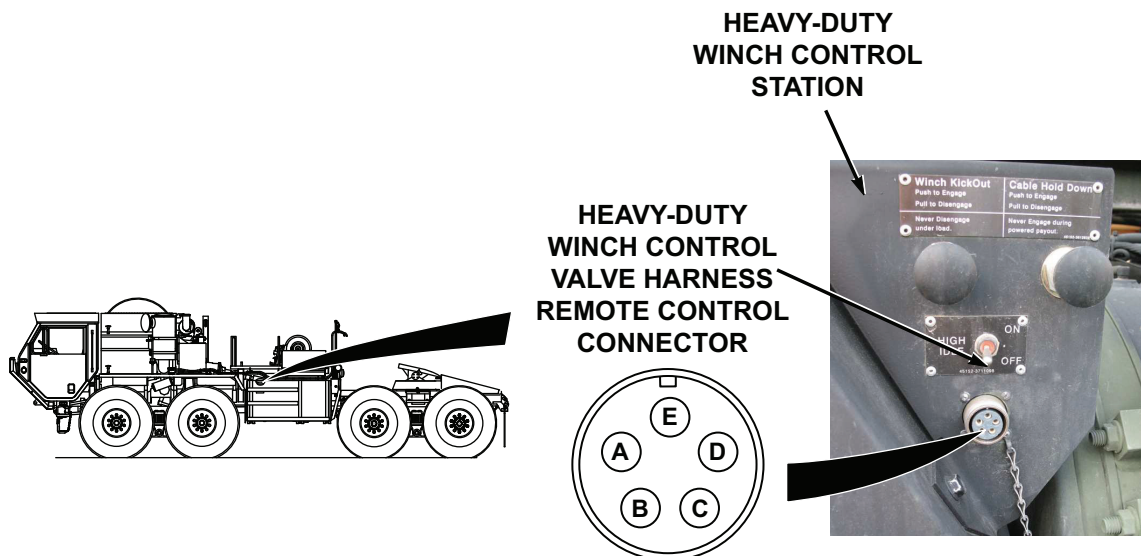


Figure 3.

2. Connect negative (-) probe of multimeter to known good ground.
3. Multimeter should display a reading between 22 and 28 vdc. Note reading.
4. Set PTO ENGAGE switch to OFF position. (WP 0015)
5. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Are 22 to 28 vdc measured on wire 1854 at heavy-duty winch control station remote control connector, terminal C?

**DECISION**

No - Test 4 - Can heavy-duty winch control valve harness wire 1854 be repaired?

Yes - Test 5 - Is continuity measured on remote control cable wires 1849 and 1854?

**TEST 4 - Can heavy-duty winch control valve harness wire 1854 be repaired?****WARNING**

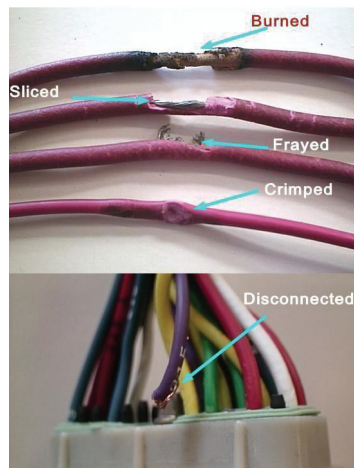
Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if prior wire repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Visually inspect wire 1854 from wire 1843/1854 splice to remote control connector, terminal C for repairability. Refer to schematics.



*Figure 4.*

**CONDITION/INDICATION**

Can heavy-duty winch control valve harness wire 1854 be repaired?

**DECISION**

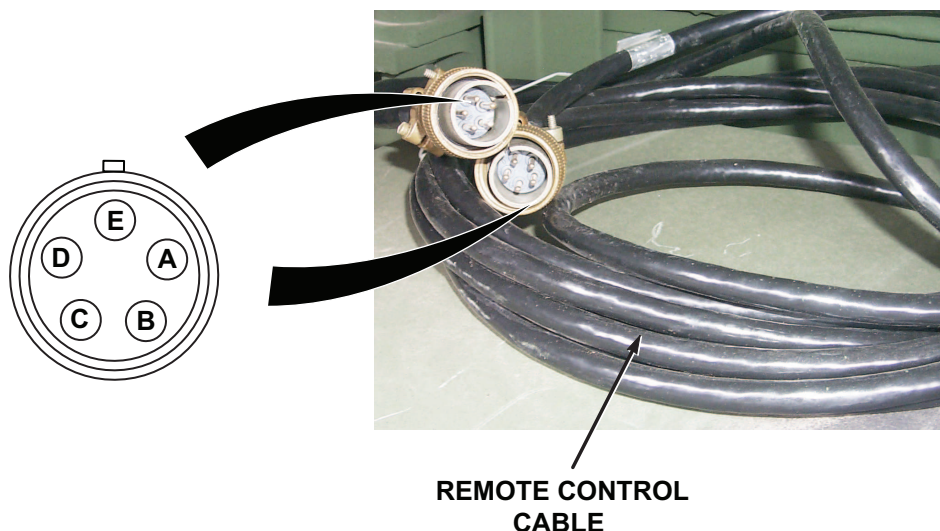
No - Replace heavy-duty winch control valve harness. (WP 0049) Test 42 - Does high idle operate?  
Yes - Repair wire 1854 (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 5 - Is continuity measured on remote control cable wires 1849 and 1854?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Set multimeter switch to ohms.
2. Connect positive (+) probe of multimeter to remote control cable, terminal D. Refer to schematics.



*Figure 5.*

3. Connect negative (-) probe of multimeter to opposite remote control cable end, terminal D.
4. Multimeter should display a reading less than 200 ohms. Note reading.
5. Connect positive (+) probe of multimeter to remote control cable, terminal C.
6. Connect negative (-) probe of multimeter to opposite remote control cable end, terminal C.
7. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on remote control cable wires 1849 and 1854?

**DECISION**

No - Repair damaged wire(s) or replace remote control cable. (WP 0048) Test 42 - Does high idle operate?

Yes - Test 6 - Is continuity measured between heavy-duty winch remote control unit wires 1849 and 1854 at remote control cable connector, terminals D and C when the HIGH IDLE ON/OFF switch is in the ON position?

**TEST 6 - Is continuity measured between heavy-duty winch remote control unit wires 1849 and 1854 at remote control cable connector, terminals D and C when the HIGH IDLE ON/OFF switch is in the ON position?**

**WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Position heavy-duty winch remote control unit HIGH IDLE ON/OFF switch to ON position. (WP 0010)
2. Set multimeter switch to ohms.
3. Connect positive (+) probe of multimeter to wire 1849 at remote control cable connector, terminal D. Refer to schematics.

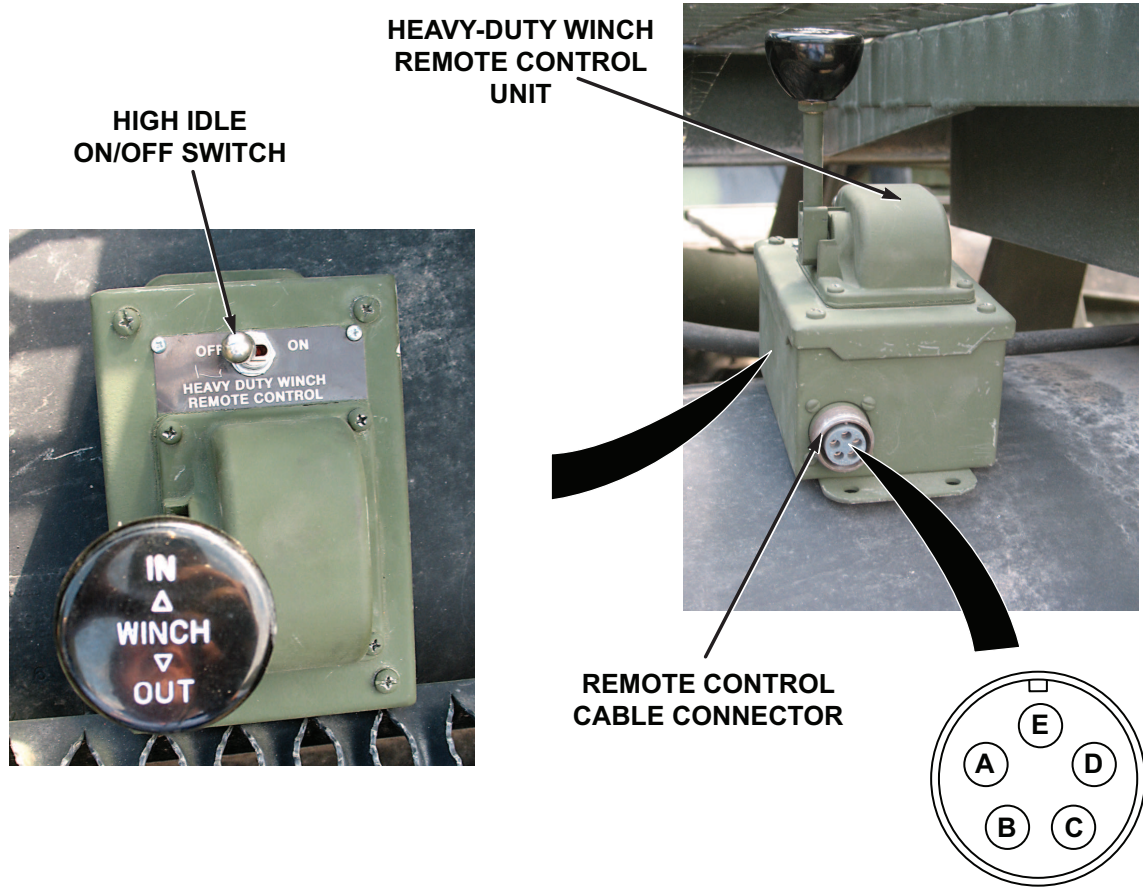


Figure 6.

4. Connect negative (-) probe of multimeter to wire 1854 at remote control cable connector, terminal C.
5. Multimeter should display a reading less than 200 ohms. Note reading.

#### CONDITION/INDICATION

Is continuity measured between heavy-duty winch remote control unit wires 1849 and 1854 at remote control cable connector, terminals D and C when the HIGH IDLE ON/OFF switch is in the ON position?

#### DECISION

No - Test 8 - Is continuity measured on heavy-duty winch remote control unit harness wires 1849, 1854, and 1854B?

Yes - Test 7 - Can heavy-duty winch control valve harness wire 1849 be repaired?

**TEST 7 - Can heavy-duty winch control valve harness wire 1849 be repaired?****WARNING**

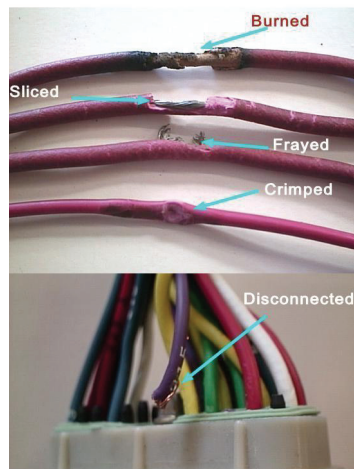
Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if prior wire repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Visually inspect wire 1849 from wire 1516/1849 splice to remote control connector, terminal D for reparability. Refer to schematics.



*Figure 7.*

**CONDITION/INDICATION**

Can heavy-duty winch control valve harness wire 1849 be repaired?

**DECISION**

No - Replace heavy-duty winch control valve harness. (WP 0049)Test 42 - Does high idle operate?  
Yes - Repair wire 1849 (refer to TM 9-2320-315-14&P).Test 42 - Does high idle operate?

**TEST 8 - Is continuity measured on heavy-duty winch remote control unit harness wires 1849, 1854, and 1854B?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Loosen four screws and lift cover from heavy-duty remote control unit. (WP 0047)
2. Set multimeter switch to ohms.
3. Connect positive (+) probe of multimeter to wire 1849 at remote control cable connector, terminal D. Refer to schematics.



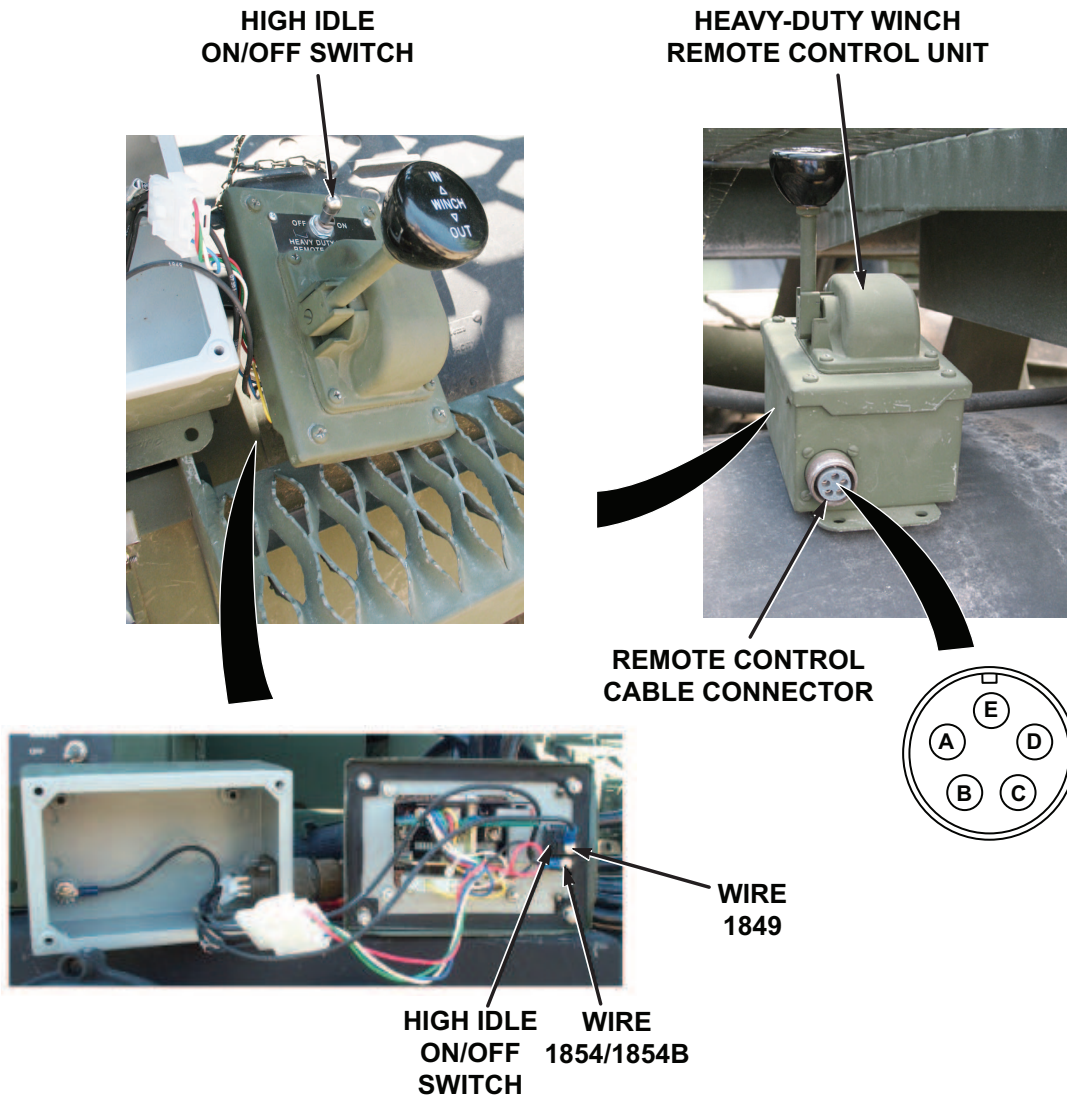


Figure 8.

4. Connect negative (-) probe of multimeter to wire 1849 at HIGH IDLE ON/OFF switch terminal.
5. Multimeter should display a reading less than 200 ohms. Note reading.
6. Connect positive (+) probe of multimeter to wire 1854 at remote control cable connector, terminal C.
7. Connect negative (-) probe of multimeter to wire 1854/1854B at HIGH IDLE ON/OFF switch other terminal.
8. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on heavy-duty winch remote control unit harness wires 1849, 1854, and 1854B?

**DECISION**

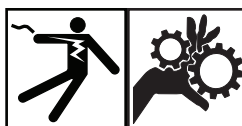
No - Repair damaged wire(s) or replace heavy-duty winch remote control unit harness. (WP 0047)Test 42 - Does high idle operate?

Yes - Replace heavy-duty winch remote control unit HIGH IDLE ON/OFF switch. (WP 0047)Test 42 - Does high idle operate?



**TEST 9 - Are 22 to 28 vdc measured on wire 1854 at heavy-duty winch control station remote control connector, terminal C?**

**WARNING**



Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Connect positive (+) probe of multimeter to wire 1854 at heavy-duty winch control station remote control connector, terminal C. Refer to schematics.

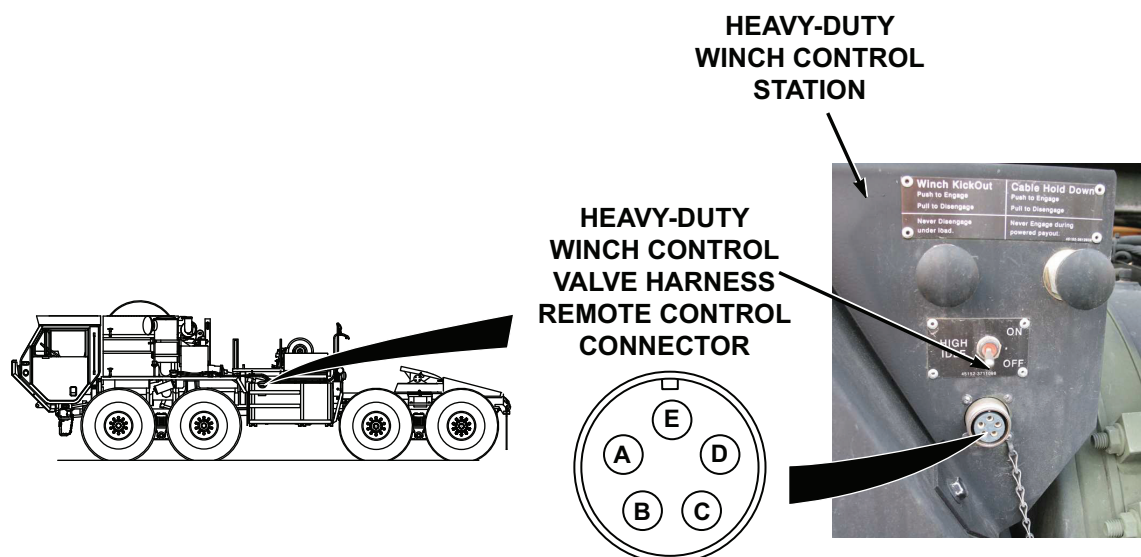


Figure 9.

2. Connect negative (-) probe of multimeter to known good ground.
3. Multimeter should display a reading between 22 and 28 vdc. Note reading.
4. Set PTO ENGAGE switch to OFF position. (WP 0015)
5. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Are 22 to 28 vdc measured on wire 1854 at heavy-duty winch control station remote control connector, terminal C?

**DECISION**

No - Test 10 - Are 22 to 28 vdc measured on wire 1843 at chassis harness connector MC41, terminal 1?  
 Yes - Test 15 - Are 22 to 28 vdc measured on wire 1516 at cab harness connector MC66, terminal 1?

**TEST 10 - Are 22 to 28 vdc measured on wire 1843 at chassis harness connector MC41, terminal 1?****WARNING**

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Disconnect chassis harness connector MC41 from heavy-duty winch control valve harness. (WP 0049)
2. Start engine (refer to TM 9-2320-279-10).
3. Set PTO ENGAGE switch to ON position. (WP 0015)
4. Connect positive (+) probe of multimeter to wire 1843 at chassis harness connector MC41, terminal 1. Refer to schematics.

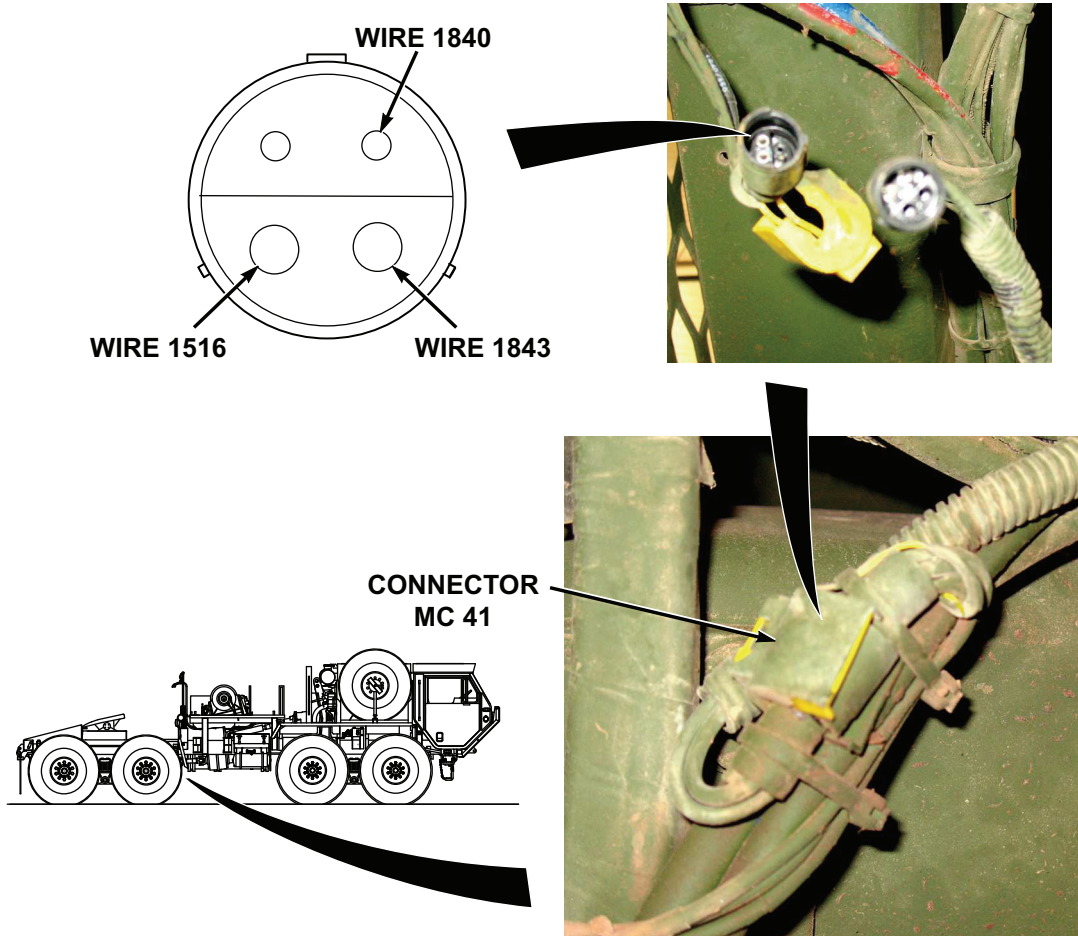


Figure 10.

5. Connect negative (-) probe of multimeter to a known good ground.
6. Multimeter should display a reading between 22 and 28 vdc. Note reading.

7. Set PTO ENGAGE switch to OFF position. (WP 0015)
8. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Are 22 to 28 vdc measured on wire 1843 at chassis harness connector MC41, terminal 1?

**DECISION**

No - Test 12 - Are 22 to 28 vdc measured on wire 1843 at cab harness connector MC1, terminal D?

Yes - Test 11 - Can heavy-duty winch control valve harness wire 1843 be repaired?

**TEST 11 - Can heavy-duty winch control valve harness wire 1843 be repaired?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if prior wire repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Visually inspect wire 1843 from connector MC41, terminal 1 to wire 1843/1854 splice for repairability. Refer to schematics.

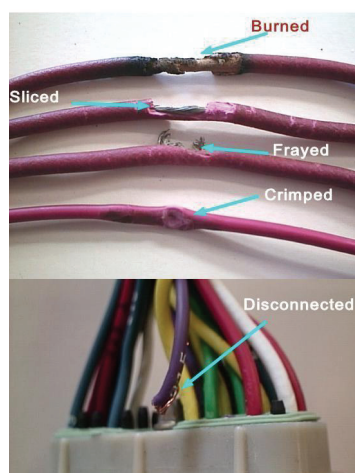


Figure 11.

#### CONDITION/INDICATION

Can heavy-duty winch control valve harness wire 1843 be repaired?

#### DECISION

No - Replace heavy-duty winch control valve harness. (WP 0049) Test 42 - Does high idle operate?  
 Yes - Repair wire 1843 (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 12 - Are 22 to 28 vdc measured on wire 1843 at cab harness connector MC1, terminal D?**

#### WARNING



Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Remove skid plate grille (refer to TM 9-2320-315-14&P).
2. Disconnect chassis harness connector MC1.
3. Start engine (refer to TM 9-2320-279-10).
4. Set PTO ENGAGE switch to ON position. (WP 0015)
5. Connect positive (+) probe of multimeter to wire 1843 at cab harness connector MC1, terminal D. Refer to schematics.

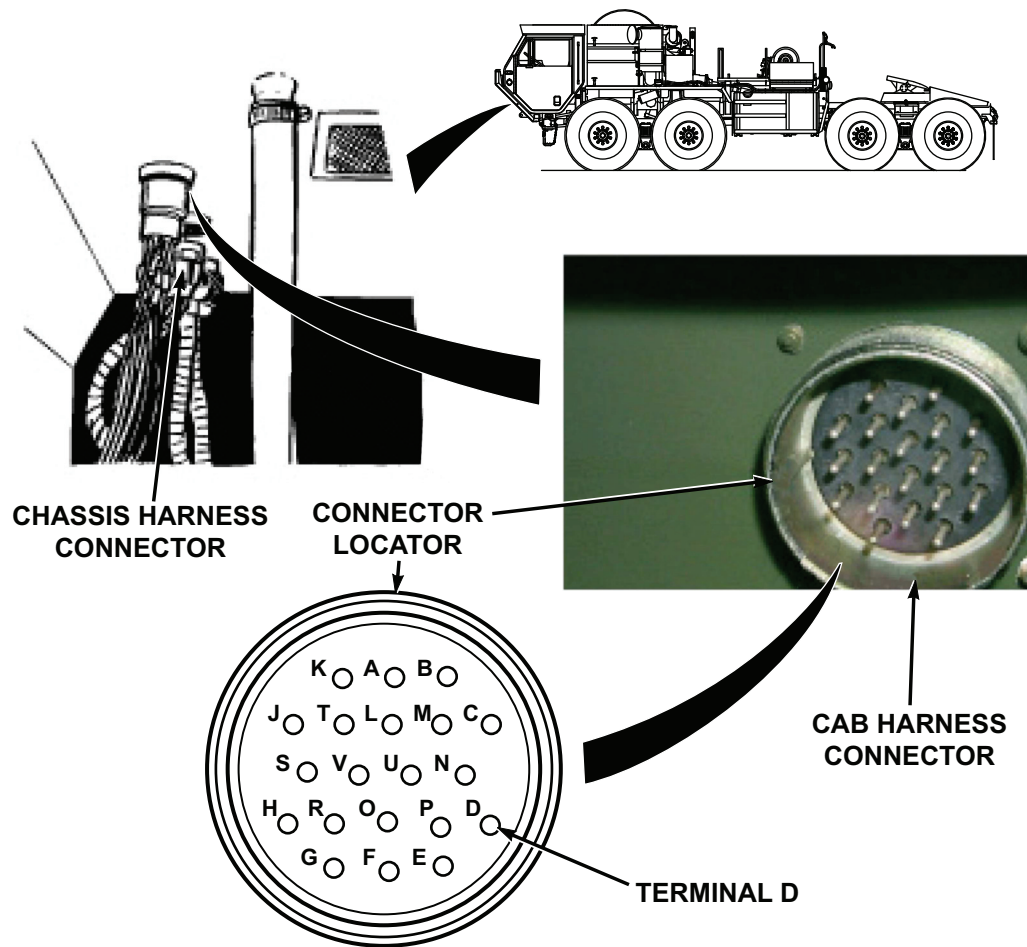


Figure 12.

6. Connect negative (-) probe of multimeter to a known good ground.
7. Multimeter should display a reading between 22 and 28 vdc. Note reading.
8. Set PTO ENGAGE switch to OFF position. (WP 0015)
9. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Are 22 to 28 vdc measured on wire 1843 at cab harness connector MC1, terminal D?

**DECISION**

- No - Test 13 - Can cab harness wire 1843 be repaired?
- Yes - Test 14 - Can chassis harness wire 1843 be repaired?

**TEST 13 - Can cab harness wire 1843 be repaired?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**

Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

1. Remove left heater compartment cover (refer to TM 9-2320-315-14&P).

**NOTE**

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

2. Inspect wire 1843 from splice on harness side near MC8 to connector MC1, terminal D (splice may be inside harness loom). Refer to schematics.

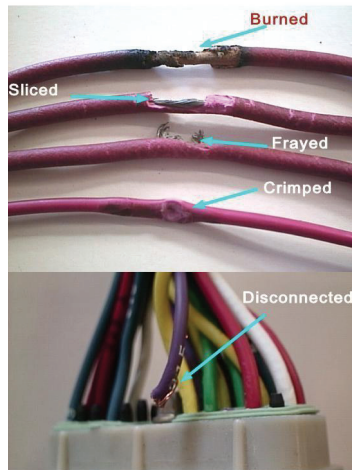


Figure 13.

#### CONDITION/INDICATION

Can cab harness wire 1843 be repaired?

#### DECISION

No - Replace cab harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 1843 (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

#### TEST 14 - Can chassis harness wire 1843 be repaired?

#### WARNING



Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

#### NOTE

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire 1843 from connector MC1, terminal D to connector MC41, terminal 1 for repairability. Refer to schematics.

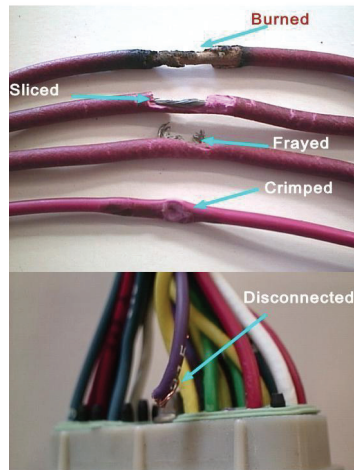


Figure 14.

#### CONDITION/INDICATION

Can chassis harness wire 1843 be repaired?

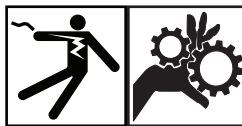
#### DECISION

No - Replace chassis harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 1843 (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 15 - Are 22 to 28 vdc measured on wire 1516 at cab harness connector MC66, terminal 1?**

#### WARNING



Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

#### WARNING



Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

1. Remove right and left heater compartment covers (refer to TM 9-2320-315-14&P).



2. Disconnect cab harness connector MC66.
3. Start engine (refer to TM 9-2320-279-10).
4. Set PTO ENGAGE switch to ON position. (WP 0015)
5. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
6. Connect positive (+) probe of multimeter to wire 1516 at cab harness connector MC66, terminal 1. Refer to schematics.

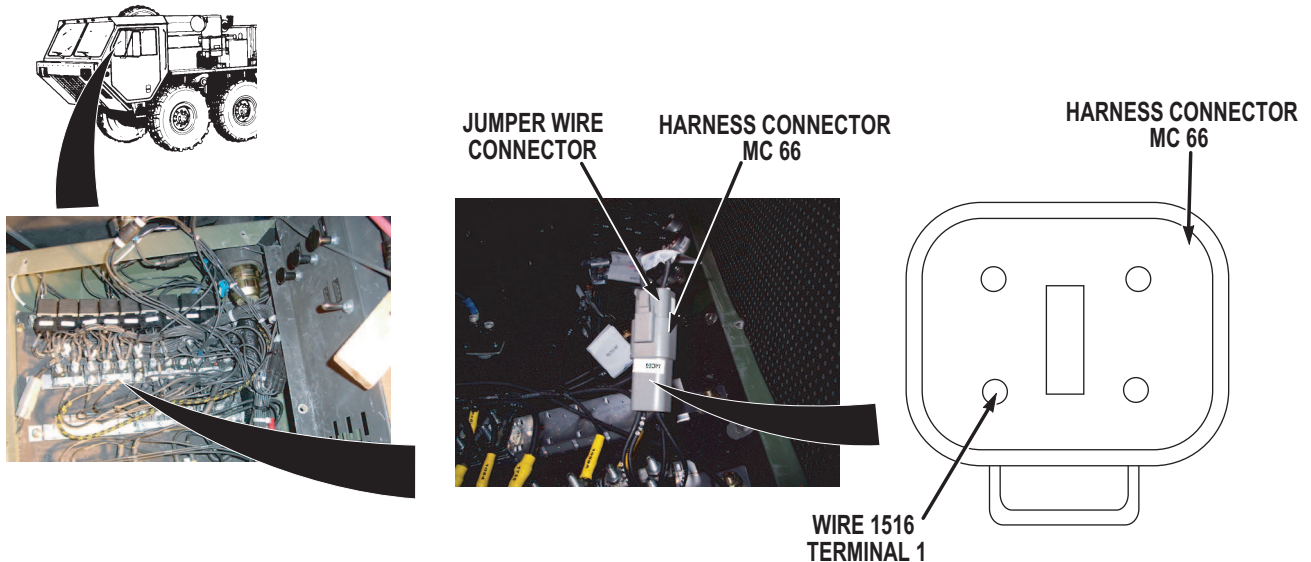


Figure 15.

7. Connect negative (-) probe of multimeter to a known good ground.
8. Multimeter should display a reading between 22 and 28 vdc. Note reading.
9. Set PTO ENGAGE switch to OFF position. (WP 0015)
10. Shut OFF engine (refer to TM 9-2320-279-10).

#### CONDITION/INDICATION

Are 22 to 28 vdc measured on wire 1516 at cab harness connector MC66, terminal 1?

#### DECISION

No - Test 16 - Is continuity measured between heavy-duty winch valve control harness wires 1516/1849 and 1843/1854, when HIGH IDLE ON/OFF switch is in the ON position?

Yes - Test 26 - Are 22 to 28 vdc measured on wire 1516A at high idle active relay R10, terminal 86?

**TEST 16 - Is continuity measured between heavy-duty winch valve control harness wires 1516/1849 and 1843/1854, when HIGH IDLE ON/OFF switch is in the ON position?**

#### WARNING



Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

### NOTE

Continuity measurements taken at heavy-duty winch control station remote control connector will check continuity across HIGH IDLE ON/OFF switch and wire 1516 and 1843.

1. Disconnect chassis harness connector MC41 from heavy-duty winch control valve harness. (WP 0049)
2. Position heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0010)
3. Set multimeter switch to ohms.
4. Connect positive (+) probe of multimeter to wire 1516/1849 at heavy-duty winch control station remote control connector, terminal D. Refer to schematics.

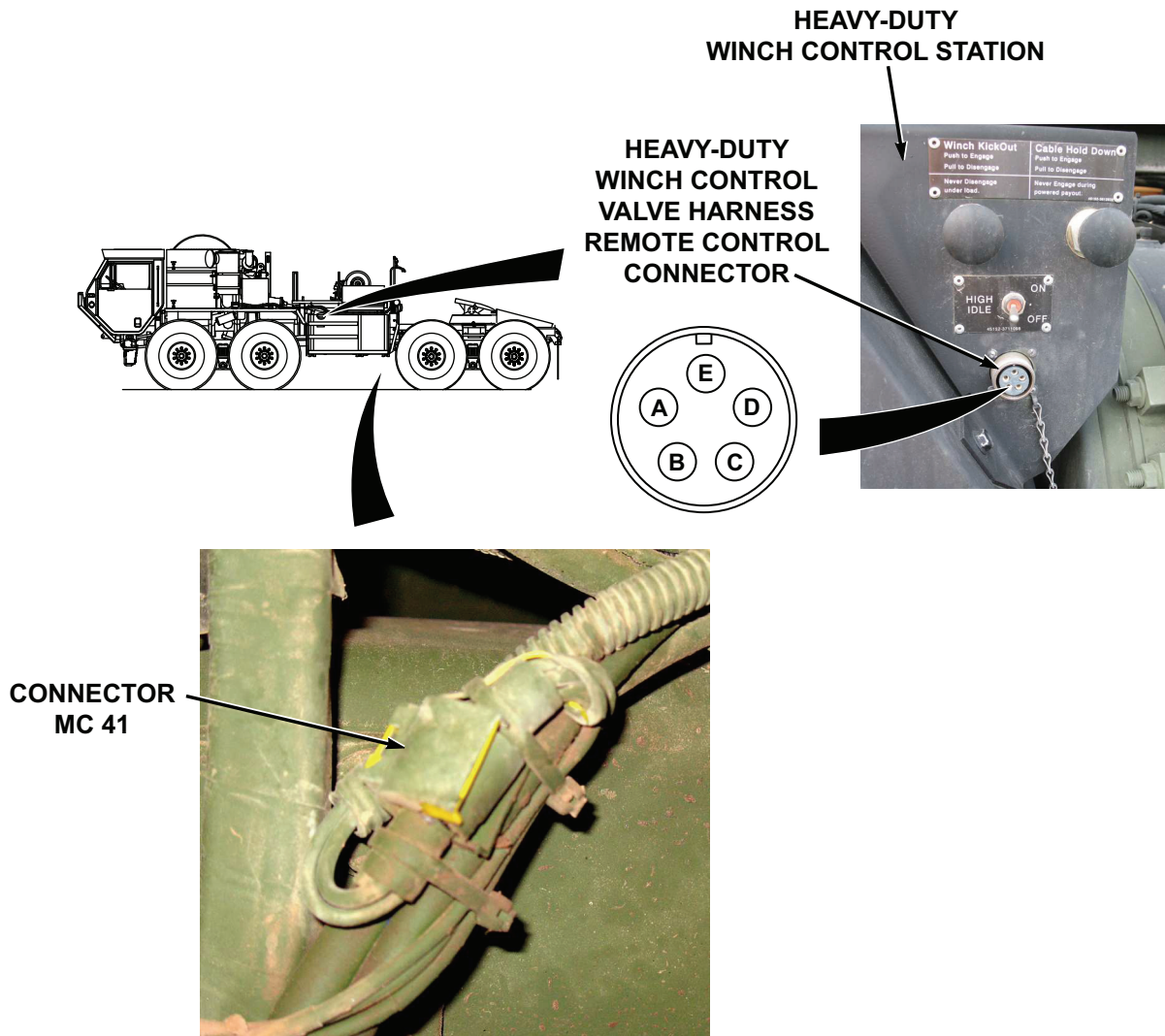


Figure 16.

5. Connect negative (-) probe of multimeter to wire 1843/1854 at heavy-duty winch control station remote control connector, terminal C.
6. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured between heavy-duty winch valve control harness wires 1516/1849 and 1843/1854, when HIGH IDLE ON/OFF switch is in the ON position?

**DECISION**

No - Test 17 - Is continuity measured across heavy-duty winch control station HIGH IDLE ON/OFF switch when switch is in the ON position?

Yes - Test 21 - Are 22 to 28 vdc measured on wire 1516 at chassis harness connector MC25, terminal 2?

**TEST 17 - Is continuity measured across heavy-duty winch control station HIGH IDLE ON/OFF switch when switch is in the ON position?**

**WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Ensure heavy-duty winch control station HIGH IDLE ON/OFF switch is in the ON position. (WP 0010)
2. Set multimeter switch to ohms.
3. Connect positive (+) probe of multimeter to heavy-duty winch control station HIGH IDLE ON/OFF switch terminal. Refer to schematics.

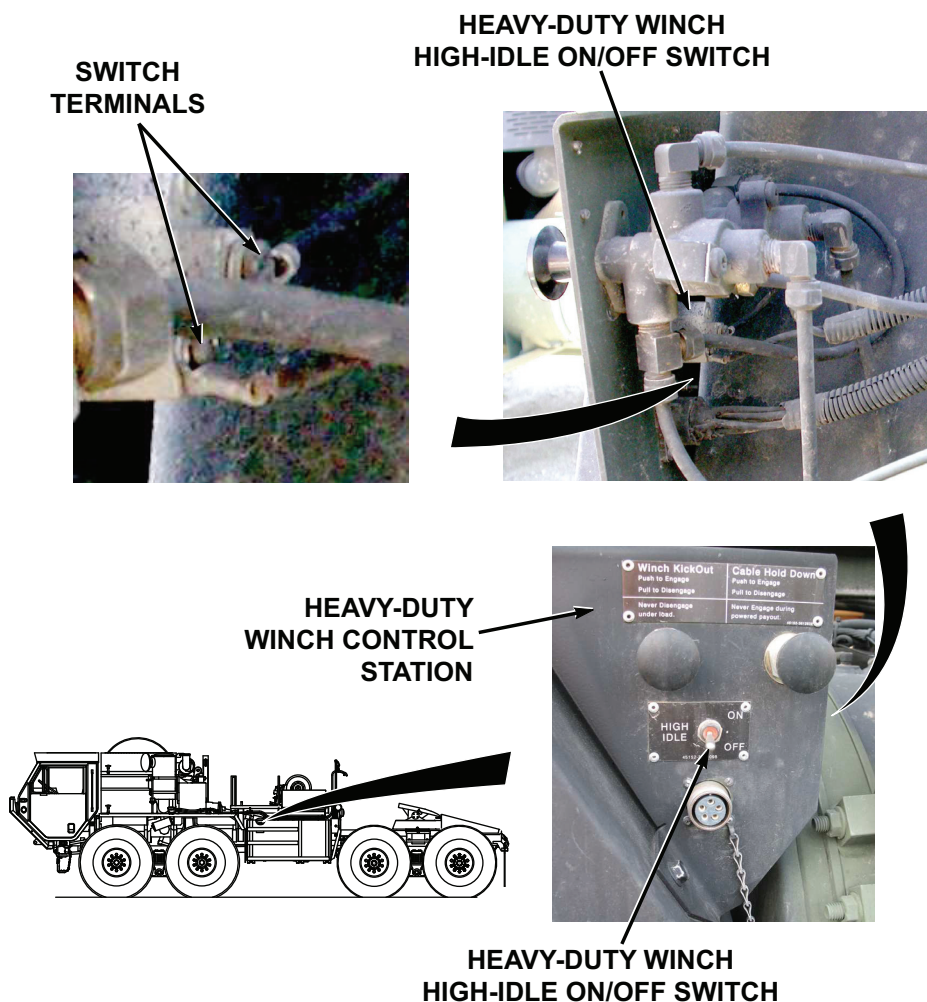


Figure 17.

4. Connect negative (-) probe of multimeter to heavy-duty winch control station HIGH IDLE ON/OFF switch terminal opposite side.
5. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured across heavy-duty winch control station HIGH IDLE ON/OFF switch when switch is in the ON position?

**DECISION**

No - Replace HIGH IDLE ON/OFF switch. (WP 0063) Test 42 - Does high idle operate?

Yes - Test 18 - Is continuity measured on heavy-duty winch valve control harness wire 1843?

**TEST 18 - Is continuity measured on heavy-duty winch valve control harness wire 1843?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

- Continuity measurements taken at heavy-duty winch control station remote control connector will check continuity across wire 1843.
  - HIGH IDLE ON/OFF switch is turned on, so wire 1843 does not have to be identified at HIGH IDLE ON/OFF switch for continuity measurement.
1. Ensure heavy-duty winch control station HIGH IDLE ON/OFF switch is in the ON position. (WP 0010)
  2. Set multimeter switch to ohms.
  3. Connect positive (+) probe of multimeter to 1843/1854 at heavy-duty winch control station remote control connector MC54, terminal C. Refer to schematics.

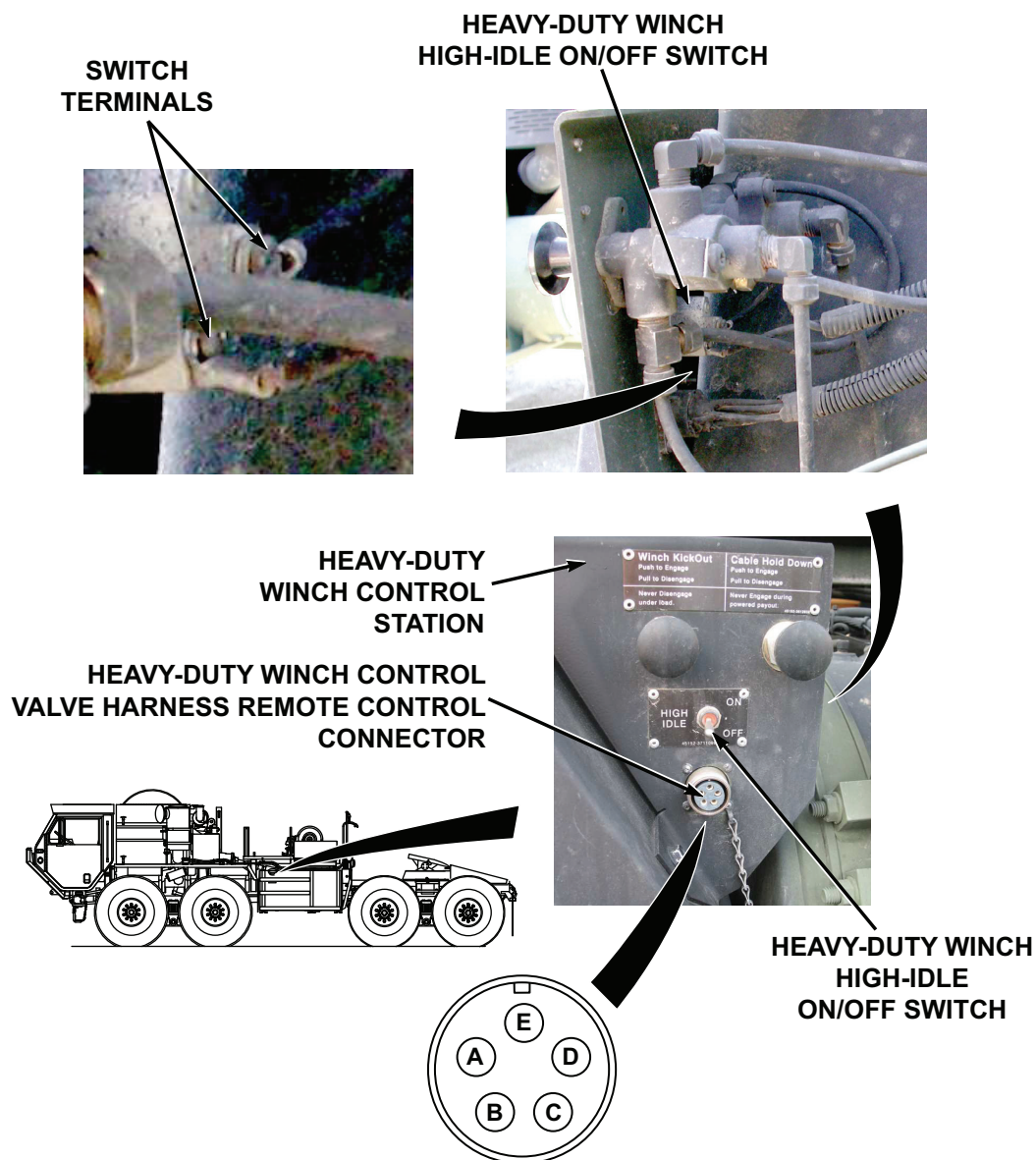


Figure 18.

4. Connect negative (-) probe of multimeter to wire 1843/1854 at heavy-duty winch control station HIGH IDLE ON/OFF switch either terminal.
5. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on heavy-duty winch valve control harness wire 1843?

**DECISION**

No - Test 19 - Can heavy-duty winch control valve harness wire 1843 be repaired?

Yes - Test 20 - Can heavy-duty winch control valve harness wire 1516 be repaired?



**TEST 19 - Can heavy-duty winch control valve harness wire 1843 be repaired?****WARNING**

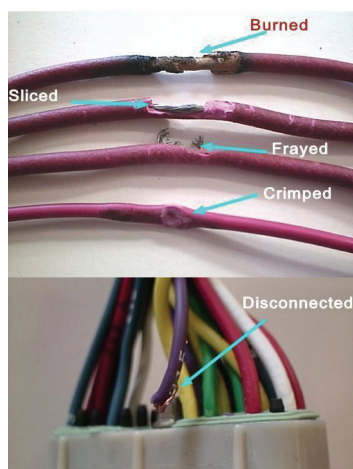
Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if prior wire repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Visually inspect wire 1843 from wire 1843/1854 splice to HIGH IDLE ON/OFF switch for repairability. Refer to schematics.



*Figure 19.*

**CONDITION/INDICATION**

Can heavy-duty winch control valve harness wire 1843 be repaired?

**DECISION**

No - Replace heavy-duty winch control valve harness. (WP 0049)Test 42 - Does high idle operate?  
Yes - Repair wire 1843 (refer to TM 9-2320-315-14&P).Test 42 - Does high idle operate?

**TEST 20 - Can heavy-duty winch control valve harness wire 1516 be repaired?****WARNING**

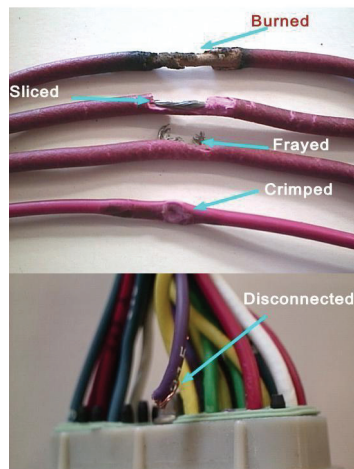
Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if prior wire repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Visually inspect wire 1516 from HIGH IDLE ON/OFF switch to connector MC41, terminal 2 for repairability. Refer to schematics.



*Figure 20.*

**CONDITION/INDICATION**

Can heavy-duty winch control valve harness wire 1516 be repaired?

**DECISION**

No - Replace heavy-duty winch control valve harness. (WP 0049)Test 42 - Does high idle operate?  
Yes - Repair wire 1516 (refer to TM 9-2320-315-14&P).Test 42 - Does high idle operate?



**TEST 21 - Are 22 to 28 vdc measured on wire 1516 at chassis harness connector MC25, terminal 2?****WARNING**

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Connect chassis harness connector MC41 to heavy-duty winch valve control harness.
2. Disconnect chassis harness connector MC25.
3. Start engine (refer to TM 9-2320-279-10).
4. Set PTO ENGAGE switch to ON position. (WP 0015)
5. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
6. Connect positive (+) probe of multimeter to wire 1516 at chassis harness side of connector MC25, terminal 2. Refer to schematics.

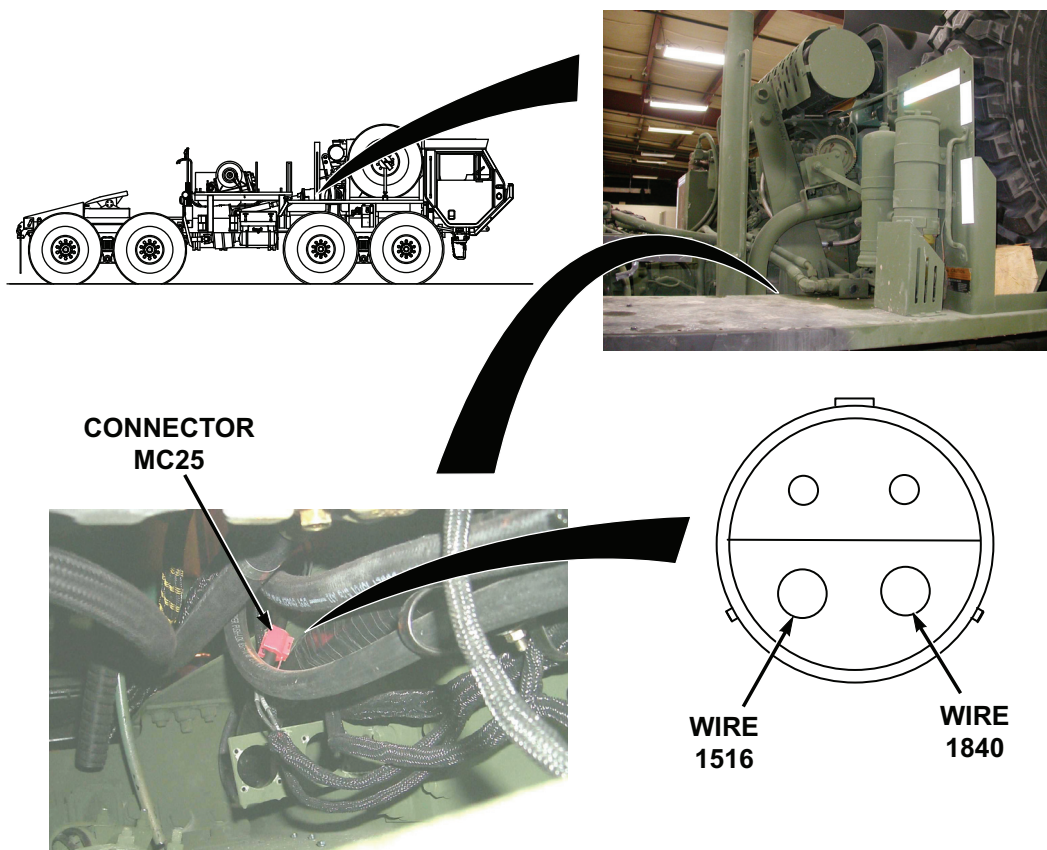


Figure 21.

7. Connect negative (-) probe of multimeter to a known good ground.
8. Multimeter should display a reading between 22 and 28 vdc. Note reading.
9. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)

10. Set PTO ENGAGE switch to OFF position. (WP 0015)
11. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Are 22 to 28 vdc measured on wire 1516 at chassis harness connector MC25, terminal 2?

**DECISION**

No - Test 22 - Can chassis harness wire 1516 be repaired?

Yes - Test 23 - Are 22 to 28 vdc measured on wire 1516 at engine harness connector MC4, terminal H?

**TEST 22 - Can chassis harness wire 1516 be repaired?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire 1516 between chassis harness connectors MC41, terminal 2 and MC25, terminal 2 for repairability. Refer to schematics.

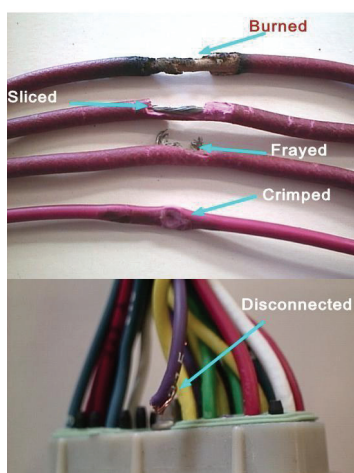


Figure 22.

### CONDITION/INDICATION

Can chassis harness wire 1516 be repaired?

### DECISION

No - Replace chassis harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 1516 (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 23 - Are 22 to 28 vdc measured on wire 1516 at engine harness connector MC4, terminal H?**

### WARNING



Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Connect chassis harness connector MC25.
2. Remove skid plate grille (refer to TM 9-2320-315-14&P).
3. Disconnect engine harness connector MC4.
4. Start engine (refer to TM 9-2320-279-10).
5. Set PTO ENGAGE switch to ON position. (WP 0015)
6. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
7. Connect positive (+) probe of multimeter to wire 1516 at engine harness side of connector MC4, terminal H. Refer to schematics.



Figure 23.

8. Connect negative (-) probe of multimeter to a known good ground.
9. Multimeter should display a reading between 22 and 28 vdc. Note reading.
10. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
11. Set PTO ENGAGE switch to OFF position. (WP 0015)
12. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Are 22 to 28 vdc measured on wire 1516 at engine harness connector MC4, terminal H?

**DECISION**

- No - Test 24 - Can engine harness wire 1516 be repaired?  
 Yes - Test 25 - Can cab harness wire 1516 be repaired?

**TEST 24 - Can engine harness wire 1516 be repaired?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire 1516 between connector MC4, terminal H and connector MC25, terminal 2 for repairability. Refer to schematics.

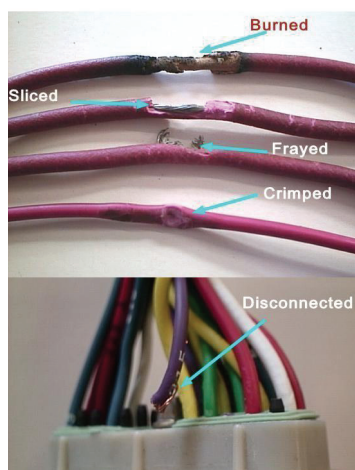


Figure 24.

#### CONDITION/INDICATION

Can engine harness wire 1516 be repaired?

#### DECISION

No - Replace engine harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 1516 (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

#### TEST 25 - Can cab harness wire 1516 be repaired?

#### WARNING



Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**

Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire 1516 between connector MC4, terminal H and connector MC66, terminal 1 for repairability. Refer to schematics.

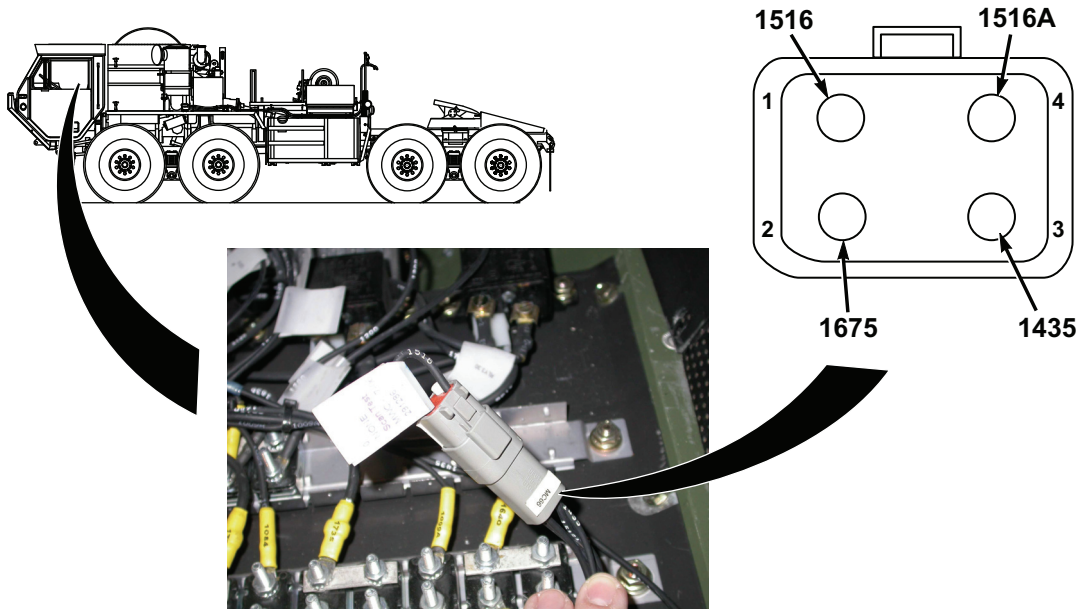


Figure 25.

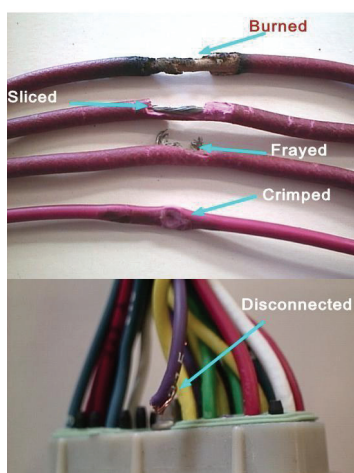


Figure 26.

#### CONDITION/INDICATION

Can cab harness wire 1516 be repaired?

#### DECISION

No - Replace cab harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 1516 (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 26 - Are 22 to 28 vdc measured on wire 1516A at high idle active relay R10, terminal 86?**

#### WARNING



Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

#### WARNING



Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

1. Connect cab harness connector MC66.



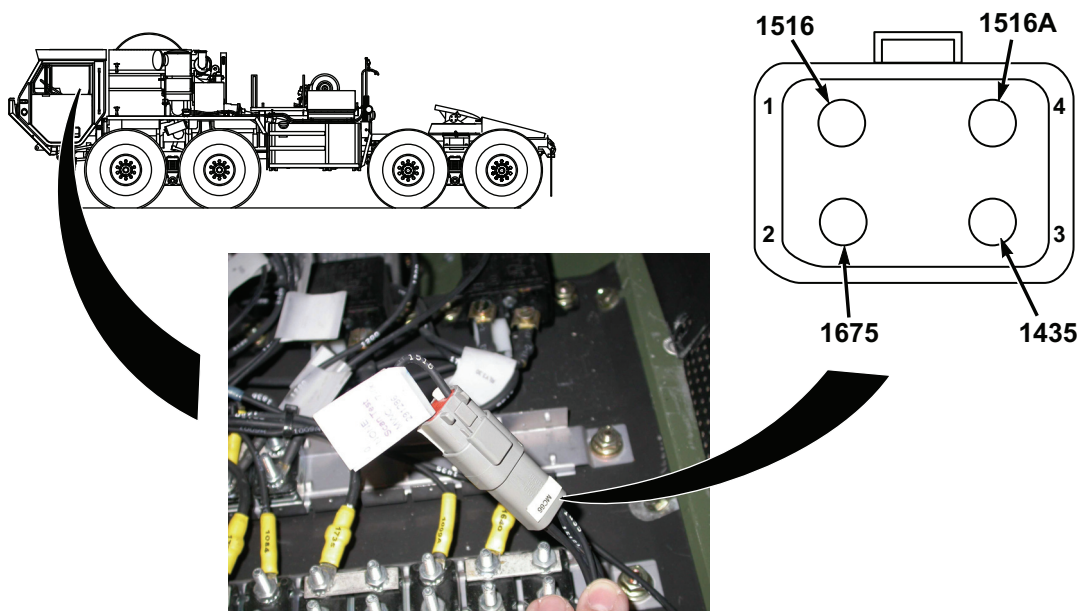


Figure 27.

2. Remove high idle active relay R10 (refer to TM 9-2320-315-14&P).
3. Start engine (refer to TM 9-2320-279-10).
4. Set PTO ENGAGE switch to ON position. (WP 0015)
5. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
6. Connect positive (+) probe of multimeter to wire 1516A at high idle active relay R10 socket, terminal 86. Refer to schematics.

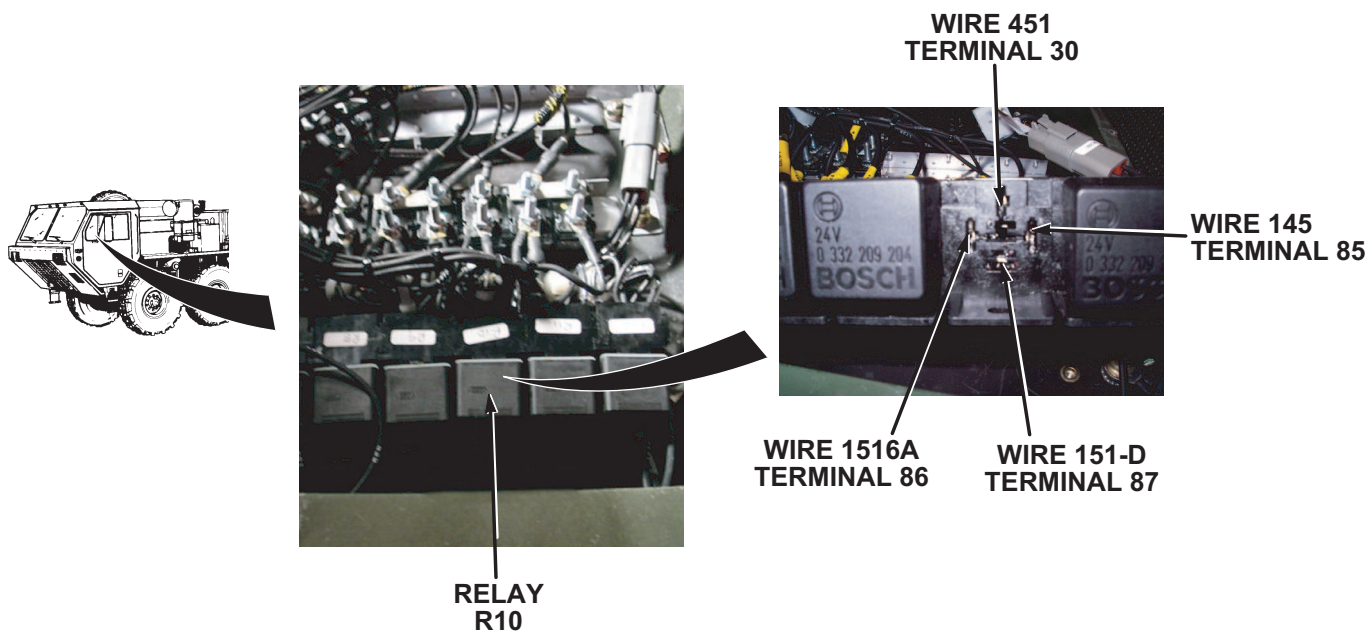


Figure 28.

7. Connect negative (-) probe of multimeter to a known good ground.



8. Multimeter should display a reading between 22 and 28 vdc. Note reading.
9. If voltage reading is not between 22 and 28 vdc, set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
10. If voltage reading is not between 22 and 28 vdc, set PTO ENGAGE switch to OFF position. (WP 0015)
11. If voltage reading is not between 22 and 28 vdc, shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Are 22 to 28 vdc measured on wire 1516A at high idle active relay R10, terminal 86?

**DECISION**

No - Test 27 - Can cab harness wire 1516A be repaired?

Yes - Test 28 - Are 22 to 28 vdc measured between wires 1516A and 145 at high idle active relay R10 connector, terminals 86 and 85?

**TEST 27 - Can cab harness wire 1516A be repaired?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**

Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire loop at connector MC66 between wire 1516 at terminal 1 and wire 1516A at terminal 4 for repairability. Refer to schematics.

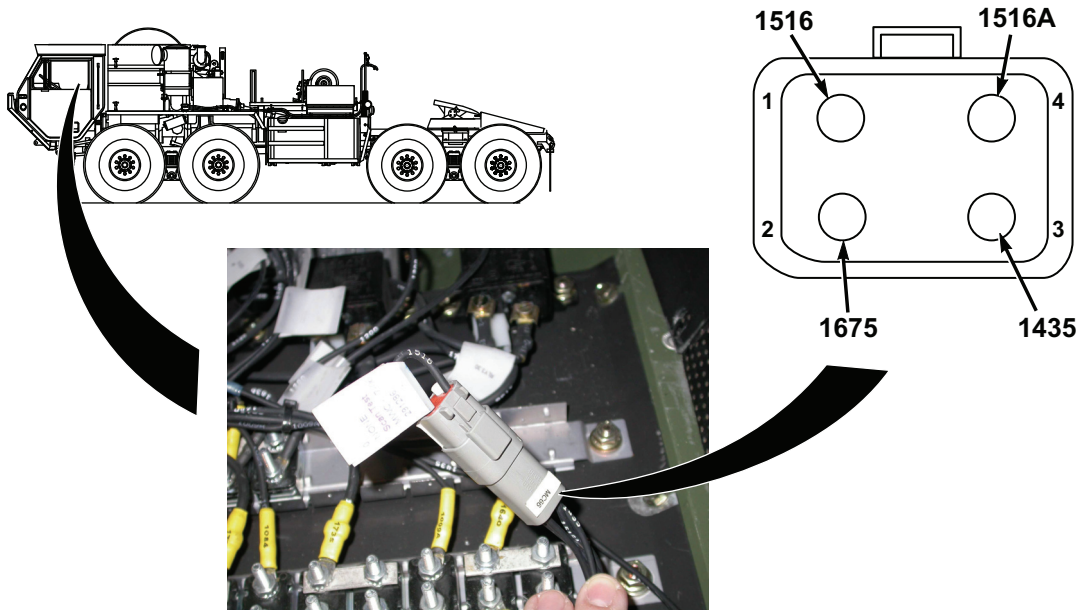


Figure 29.

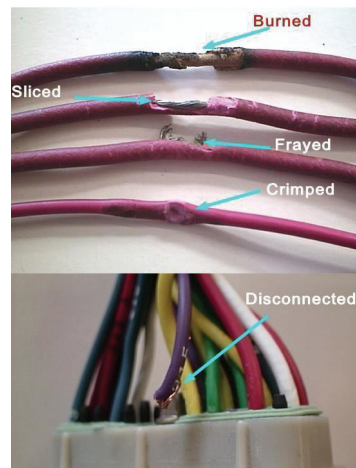


Figure 30.

2. Inspect wire 1516A between connector MC66, terminal 4 and high idle active relay R10, terminal 86 for repairability.

#### CONDITION/INDICATION

Can cab harness wire 1516A be repaired?

#### DECISION

No - Replace cab harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?  
 Yes - Repair wire 1516 (refer to TM 9-2320-279-10). Test 42 - Does high idle operate?

**TEST 28 - Are 22 to 28 vdc measured between wires 1516A and 145 at high idle active relay R10 connector, terminals 86 and 85?**

### WARNING



Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

### WARNING



Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

1. Connect positive (+) probe of multimeter to wire 1516A at high idle active relay R10 socket, terminal 86. Refer to schematics.

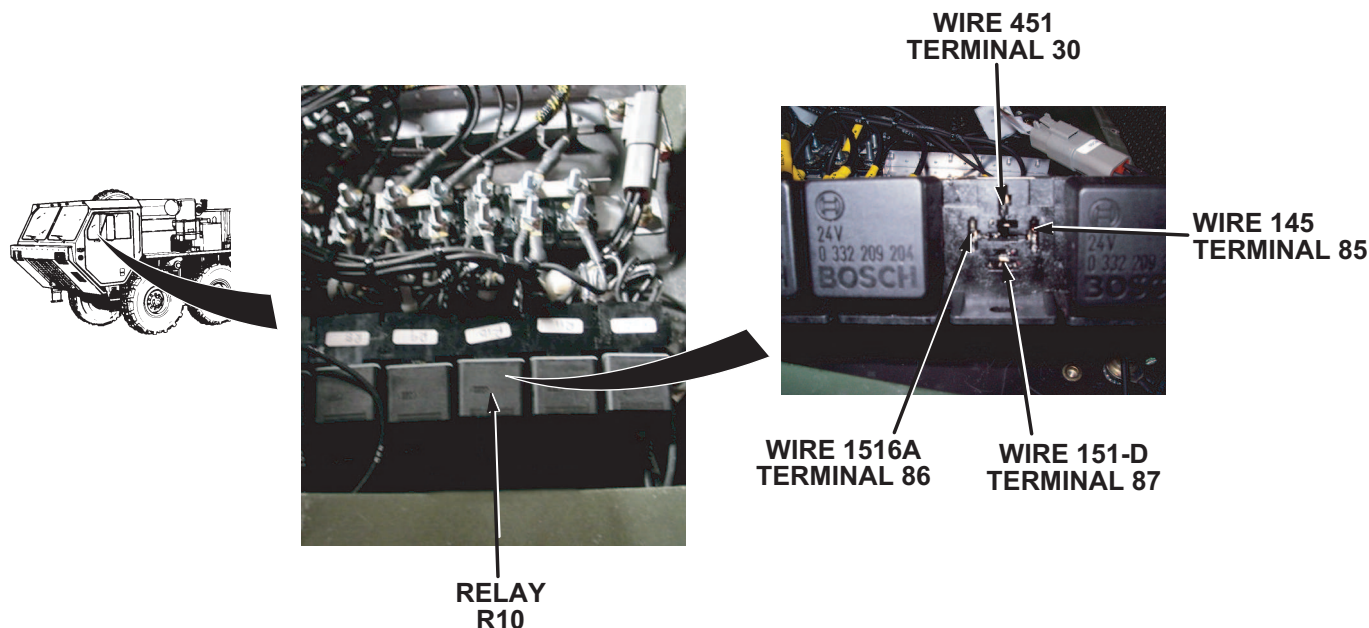


Figure 31.

2. Connect negative (-) probe of multimeter to wire 145 at high idle active relay R10 socket, terminal 85.
3. Multimeter should display a reading between 22 and 28 vdc. Note reading.
4. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)

5. Set PTO ENGAGE switch to OFF position. (WP 0015)
6. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Are 22 to 28 vdc measured between wires 1516A and 145 at high idle active relay R10 connector, terminals 86 and 85?

**DECISION**

No - Test 29 - Is continuity measured on wire 145 between high idle active relay R10 connector, terminal 85 and TCM connector MC150, terminal 45?

Yes - Test 31 - Is continuity measured on wire 451 between high idle active relay R10, terminal 30 and engine harness connector MC20, terminal E1?

**TEST 29 - Is continuity measured on wire 145 between high idle active relay R10 connector, terminal 85 and TCM connector MC150, terminal 45?**

**WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**

Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

1. Disconnect cab harness connector MC150.
2. Connect positive (+) probe of multimeter to wire 145 at high idle active relay R10 connector, terminal 85. Refer to schematics.
3. Connect negative (-) probe of multimeter to wire 145 at transmission control module harness connector MC150, terminal 45.

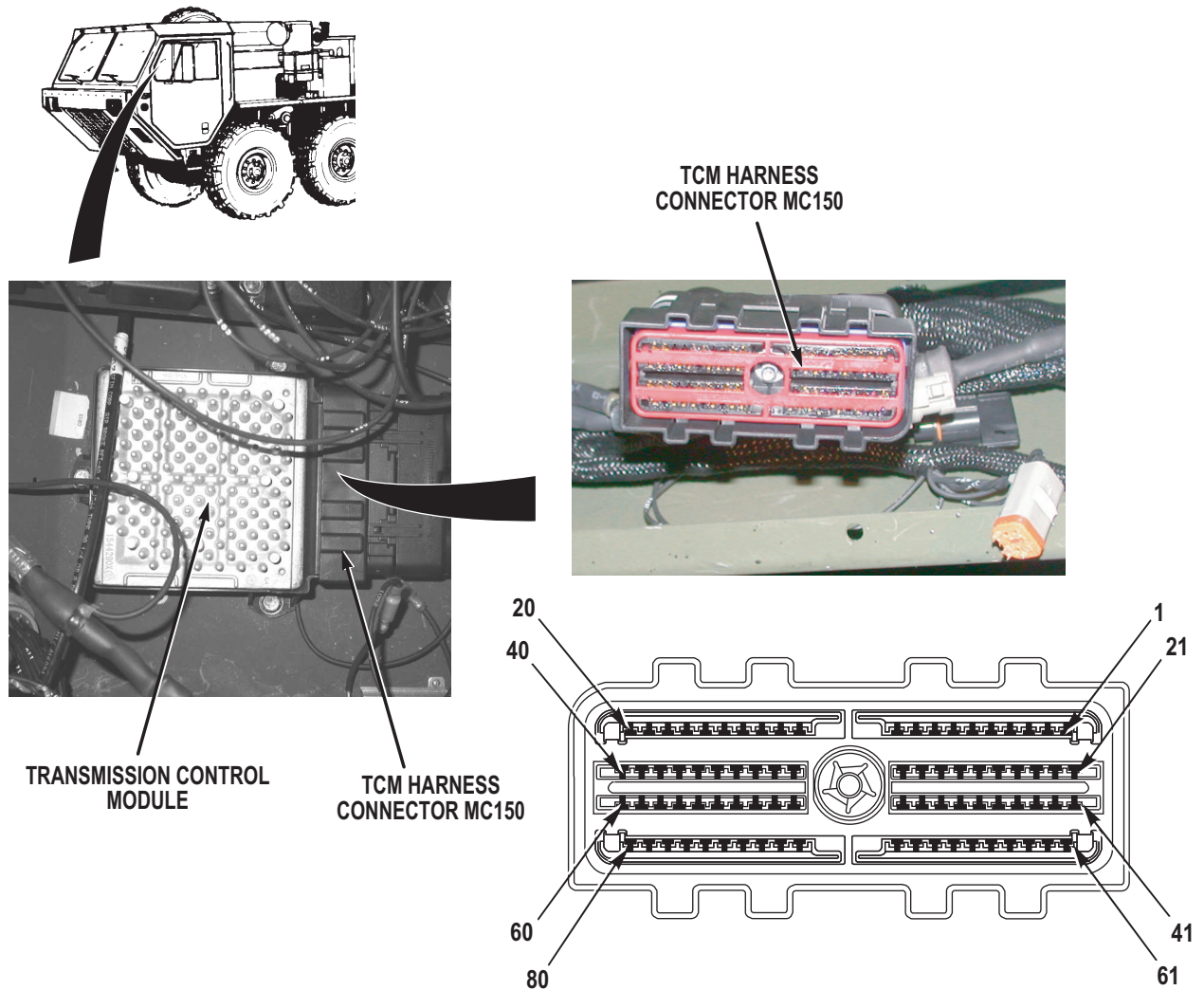


Figure 32.

4. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on wire 145 between high idle active relay R10 connector, terminal 85 and TCM connector MC150, terminal 45?

**DECISION**

No - Test 30 - Can cab harness wire 145 be repaired?

Yes - Replace TCM (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 30 - Can cab harness wire 145 be repaired?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**

Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire 145 from transmission harness connector MC150, terminal 45 to high idle active relay R10 connector, terminal 85 for repairability. Refer to schematics.

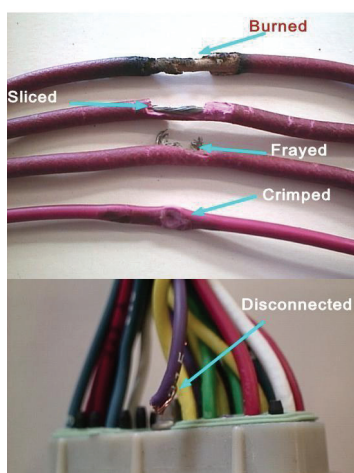


Figure 33.

#### CONDITION/INDICATION

Can cab harness wire 145 be repaired?

#### DECISION

No - Replace cab harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 145 (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 31 - Is continuity measured on wire 451 between high idle active relay R10, terminal 30 and engine harness connector MC20, terminal E1?**

#### WARNING



Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**

Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

1. Remove engine cover and side panels (refer to TM 9-2320-279-10).
2. Disconnect engine harness connector MC20.
3. Connect positive (+) probe of multimeter to wire 451 at high idle active relay R10 connector, terminal 30. Refer to schematics.



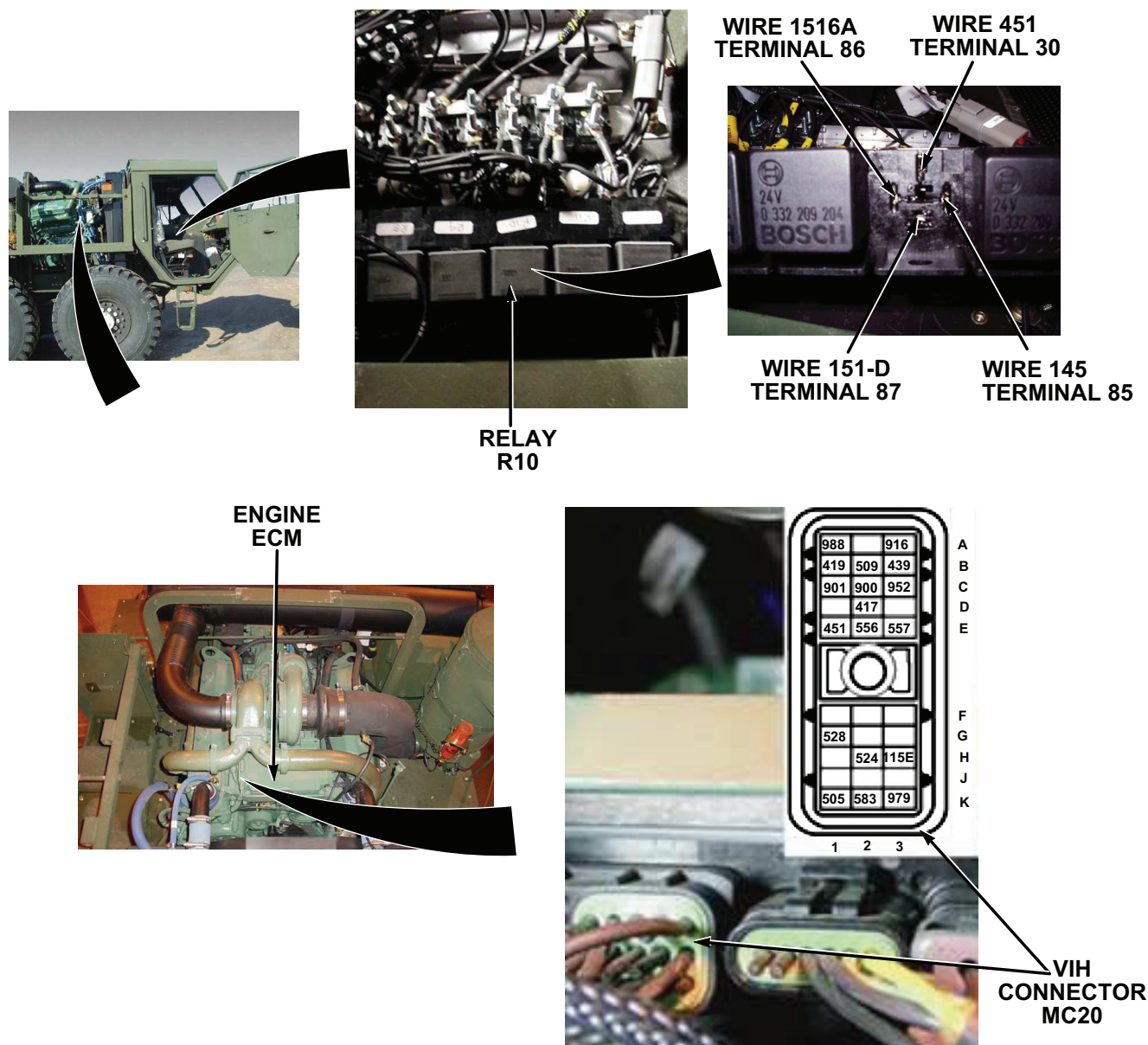


Figure 34.

4. Connect negative (-) probe of multimeter to wire 451 at engine harness connector MC20, terminal E1.
5. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on wire 451 between high idle active relay R10, terminal 30 and engine harness connector MC20, terminal E1?

**DECISION**

No - Test 32 - Is continuity measured on wire 451 between engine harness connector MC20 and cab harness connector MC4?

Yes - Test 35 - Is continuity measured between wire 151-D at high idle active relay R10 connector, terminal 87 and engine harness connector MC21, terminal B?

**TEST 32 - Is continuity measured on wire 451 between engine harness connector MC20 and cab harness connector MC4?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Remove skid plate grille (refer to TM 9-2320-315-14&P).
2. Disconnect engine harness connector MC4.
3. Connect positive (+) probe of multimeter to wire 451 at engine harness side of connector MC4, terminal J. Refer to schematics.

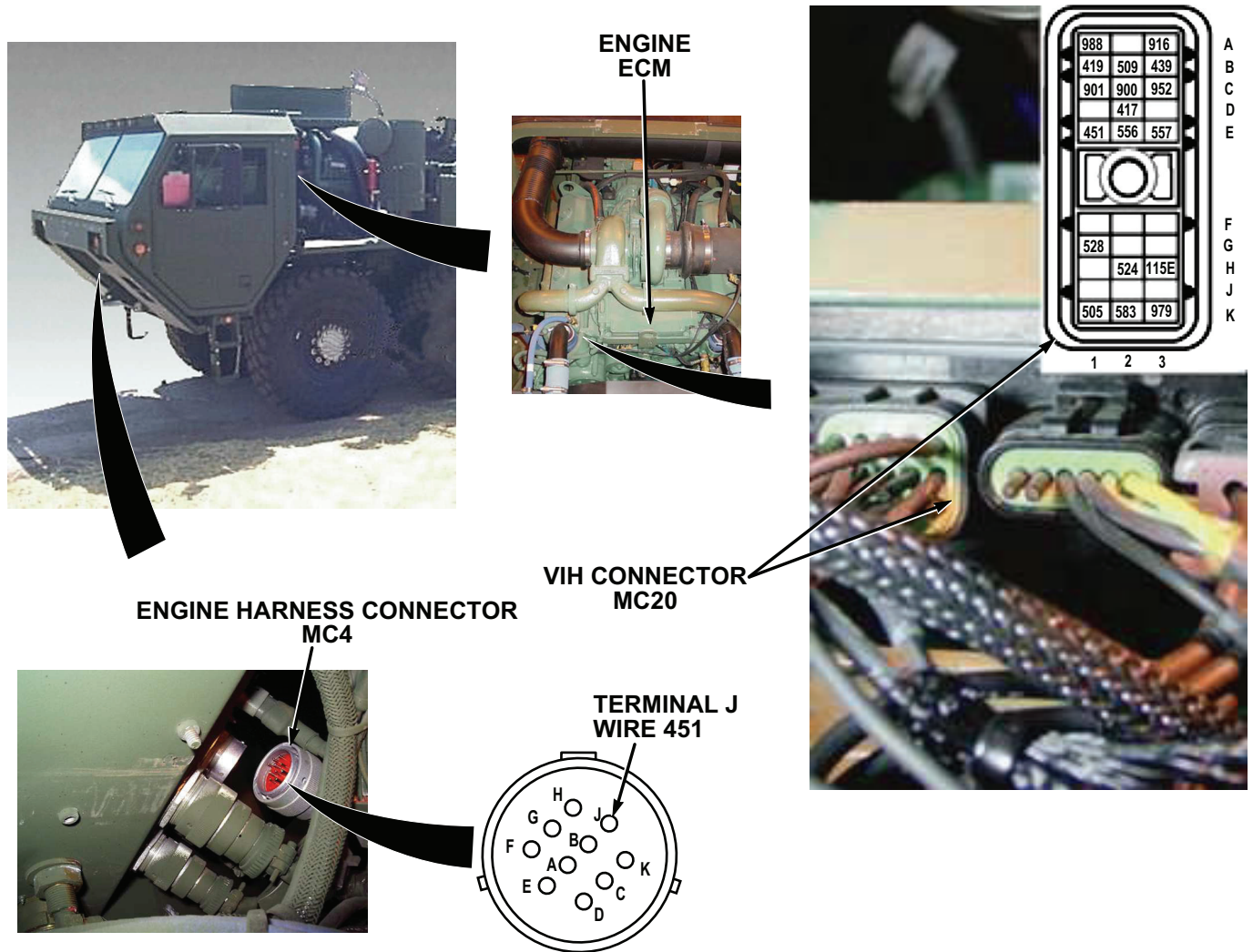


Figure 35.

4. Connect negative (-) probe of multimeter to wire 451 at engine harness connector MC20, terminal E1.
5. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on wire 451 between engine harness connector MC20 and cab harness connector MC4?

**DECISION**

No - Test 33 - Can engine harness wire 451 be repaired?

Yes - Test 34 - Can cab harness wire 451 be repaired?

**TEST 33 - Can engine harness wire 451 be repaired?****WARNING**

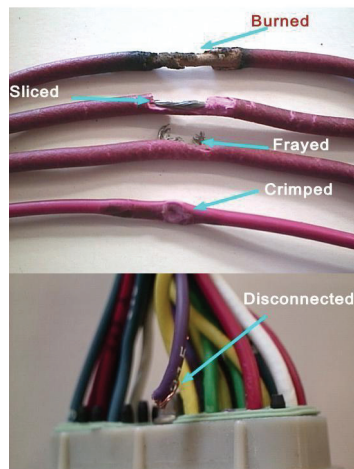
Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire 451 between engine harness connectors MC4, terminal J and MC20, terminal E1 for repairability. Refer to schematics.



*Figure 36.*

**CONDITION/INDICATION**

Can engine harness wire 451 be repaired?

**DECISION**

No - Replace engine harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 451 (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 34 - Can cab harness wire 451 be repaired?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**

Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire 451 between cab harness connector MC4, terminal J and high idle active relay R10 connector, terminal 30 for repairability. Refer to schematics.

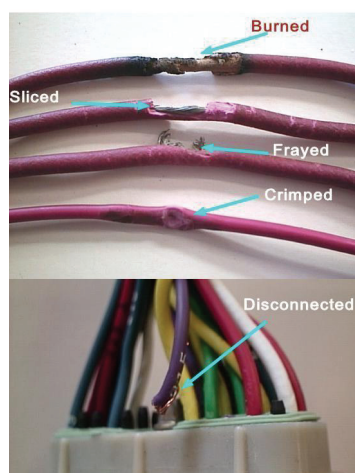


Figure 37.

#### CONDITION/INDICATION

Can cab harness wire 451 be repaired?

#### DECISION

No - Replace cab harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 451 (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 35 - Is continuity measured between wire 151-D at high idle active relay R10 connector, terminal 87 and engine harness connector MC21, terminal B?**

#### WARNING



Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**

Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

1. Disconnect engine harness connector MC21.
2. Connect positive (+) probe of multimeter to wire 151-D at high idle active relay R10 connector, terminal 87. Refer to schematics.



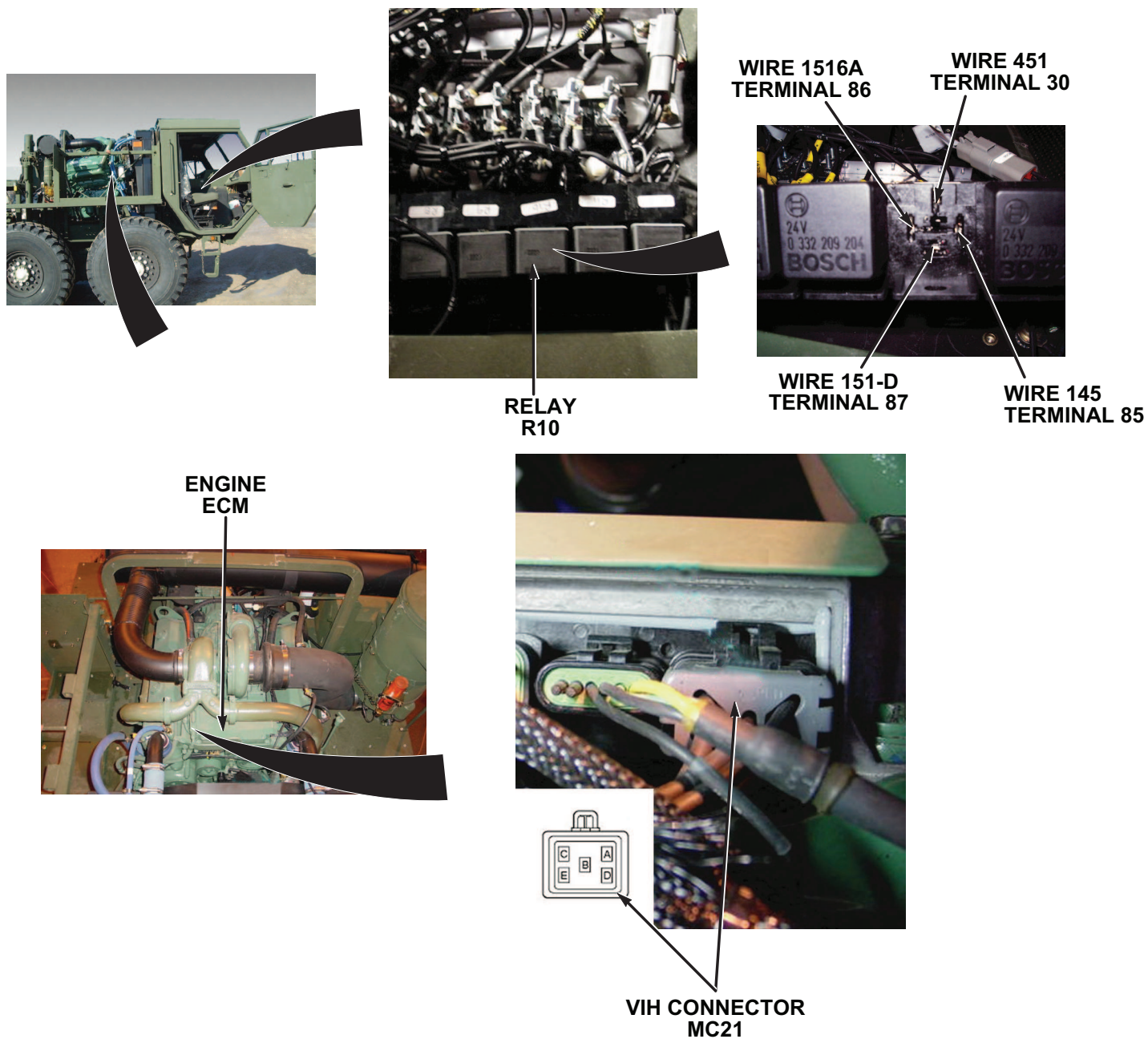


Figure 38.

3. Connect negative (-) probe of multimeter to engine harness connector MC21, terminal B.
4. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured between wire 151-D at high idle active relay R10 connector, terminal 87 and engine harness connector MC21, terminal B?



**DECISION**

No - Test 36 - Is continuity measured between wire 151-D at engine harness side of connector MC5, terminal R and engine harness connector MC21, terminal B?

Yes - Test 39 - Is continuity measured between wire 151-D at engine harness connector MC21, terminal B and a known good ground?

**TEST 36 - Is continuity measured between wire 151-D at engine harness side of connector MC5, terminal R and engine harness connector MC21, terminal B?**

**WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Remove skid plate grille (refer to TM 9-2320-315-14&P).
2. Disconnect engine harness connector MC5.
3. Connect positive (+) probe of multimeter to wire 151-D at engine harness connector MC21, terminal B. Refer to schematics.

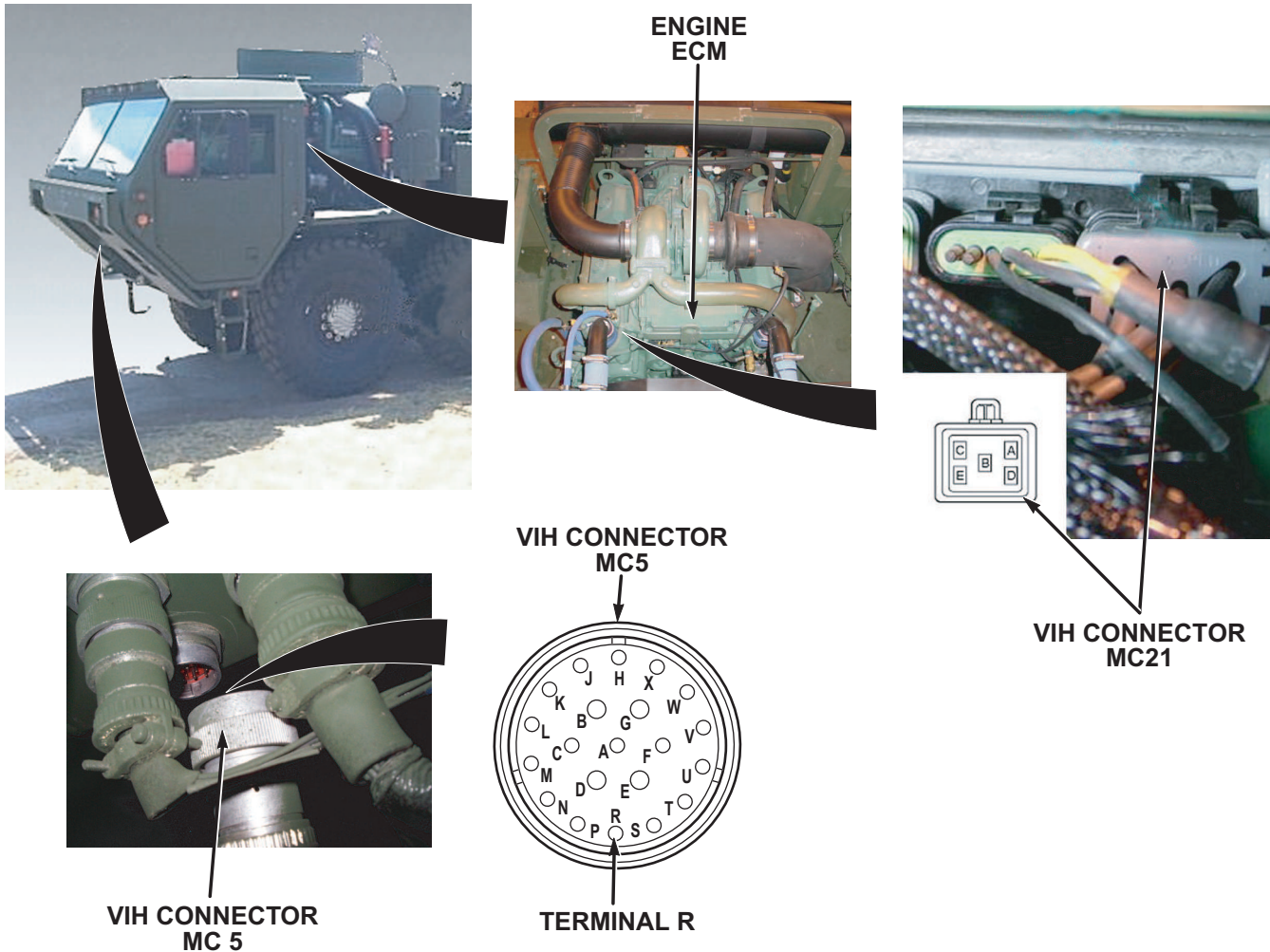


Figure 39.

4. Connect negative (-) probe of multimeter to wire 151-D at engine harness side of connector MC5, terminal R.
5. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured between wire 151-D at engine harness side of connector MC5, terminal R and engine harness connector MC21, terminal B?

**DECISION**

- No - Test 37 - Can engine harness wire 151-D be repaired?
- Yes - Test 38 - Can cab harness wire 151-D be repaired?

**TEST 37 - Can engine harness wire 151-D be repaired?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire 151-D between engine harness connectors MC5, terminal R and MC21, terminal B for repairability. Refer to schematics.

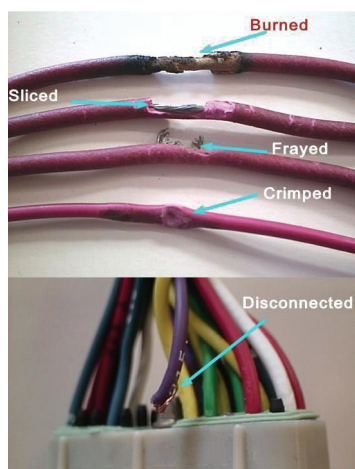


Figure 40.

**CONDITION/INDICATION**

Can engine harness wire 151-D be repaired?

**DECISION**

No - Replace engine harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 151-D in engine harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 38 - Can cab harness wire 151-D be repaired?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**

Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire 151-D between cab harness connector MC5, terminal R and high idle active relay R10, terminal 87 for repairability. Refer to schematics.

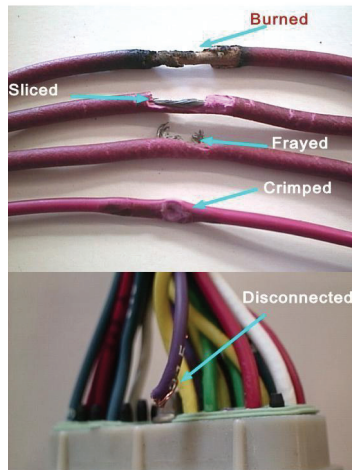


Figure 41.

#### CONDITION/INDICATION

Can cab harness wire 151-D be repaired?

#### DECISION

No - Replace cab harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 151-D (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 39 - Is continuity measured between wire 151-D at engine harness connector MC21, terminal B and a known good ground?**

#### WARNING



Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Connect positive (+) probe of multimeter to wire 151-D at engine harness connector MC21, terminal B. Refer to schematics.

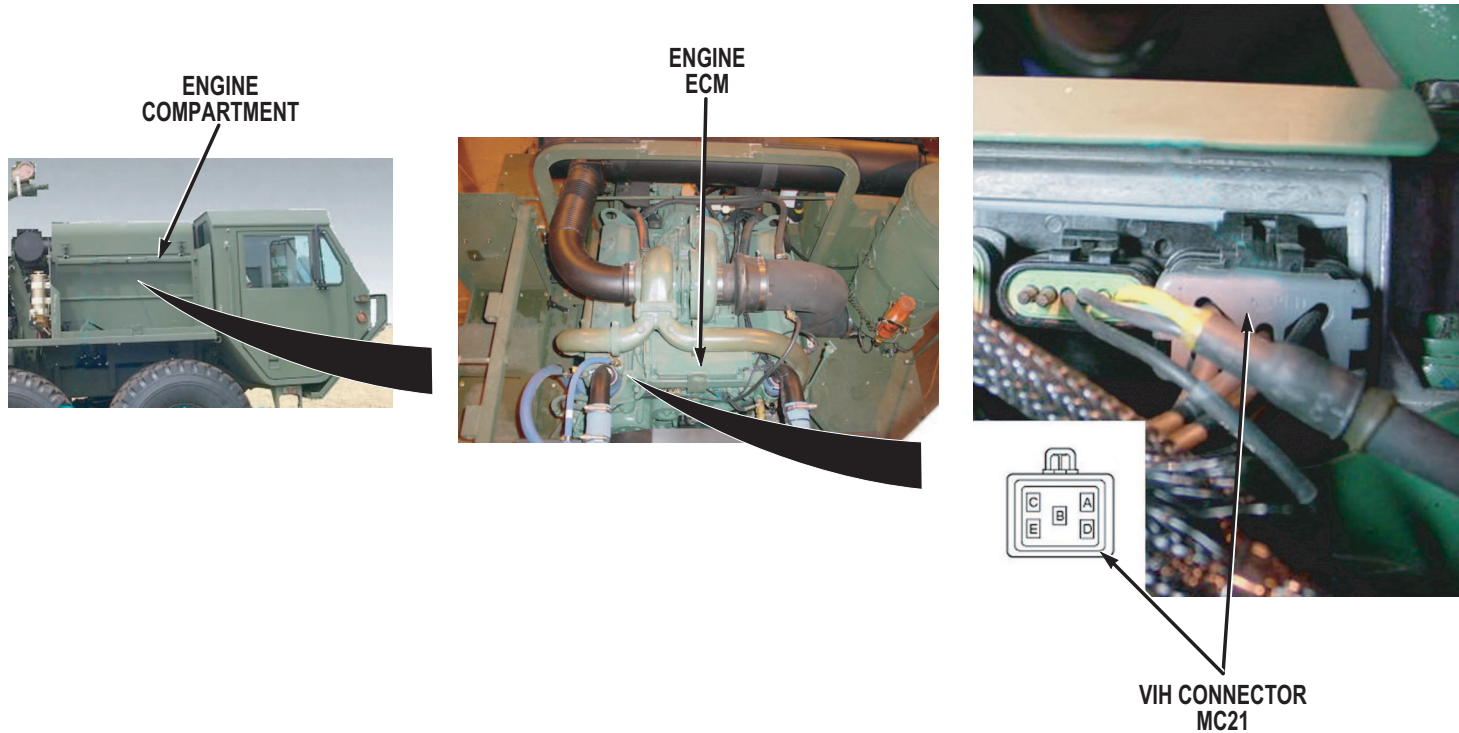


Figure 42.

2. Connect negative (-) probe of multimeter to a known good ground.
3. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured between wire 151-D at engine harness connector MC21, terminal B and a known good ground?

**DECISION**

No - Test 40 - Can engine harness wire 150/151-D be repaired?

Yes - Test 41 - Does high idle operate after swapping high idle active relay R10 with a known good relay?

**TEST 40 - Can engine harness wire 150/151-D be repaired?****WARNING**

- Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.
- Do not smoke or have open flame near batteries. Batteries may explode from a spark. Battery acid is harmful to eyes and skin. Failure to comply may result in injury or death to personnel.

## NOTE

Wire is not repairable if damage cannot be visually located or if a prior repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Inspect wire 150/151–D between battery A1 negative and engine harness connector MC21, terminal B for reparability. Refer to schematics.

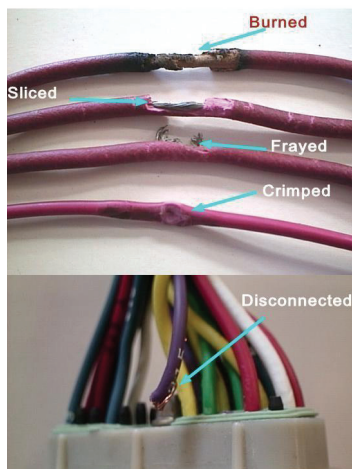


Figure 43.

## CONDITION/INDICATION

Can engine harness wire 150/151–D be repaired?

## DECISION

No - Replace engine harness (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

Yes - Repair wire 150/151–D (refer to TM 9-2320-315-14&P). Test 42 - Does high idle operate?

**TEST 41 - Does high idle operate after swapping high idle active relay R10 with a known good relay?**

## WARNING



Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.



**WARNING**

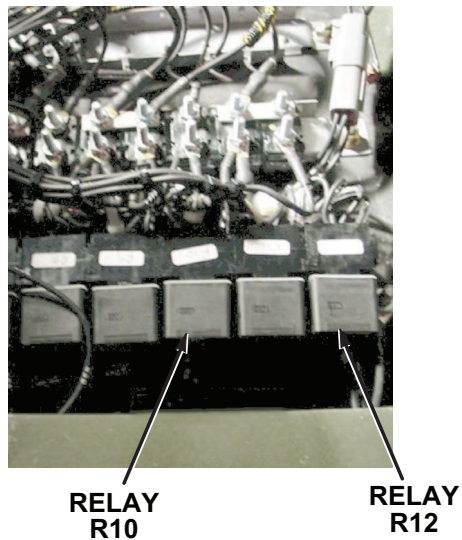
Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

1. Connect engine harness connector MC20. Refer to schematics.
2. Connect engine harness connector MC21.
3. Connect chassis harness connector MC25.
4. Connect chassis harness connector MC4.
5. Connect cab harness connector MC5.
6. Install skid plate grille (refer to TM-9-2320-315-14&P).
7. Connect cab harness connector MC150.
8. Connect cab harness connector MC66.

**NOTE**

Mark relays before swapping.

9. Swap high idle active relay R10 with backup alarm relay R12 (refer to TM 9-2320-314-15&P).
10. Start engine (refer to TM 9-2320-279-10).



*Figure 44.*

11. Set PTO ENGAGE switch to ON position. (WP 0015)
12. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)

**NOTE**

Engine high idle speed is 1,500 RPM.

13. Observe engine operation. Inspect tachometer for increase in engine speed.
14. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)



15. Set PTO ENGAGE switch to OFF position. (WP 0015)
16. Shut OFF engine (refer to TM 9-2320-279-10).
17. Swap relays R10 and R12 back to their original positions (refer to TM 9-2320-315-14&P).

### CONDITION/INDICATION

Does high idle operate after swapping high idle active relay R10 with a known good relay?

### DECISION

No - Replace engine ECM (refer to TM 9-2320-315-14&P).Test 42 - Does high idle operate?

Yes - Replace high idle active relay R10 (refer to TM 9-2320-315-14&P).Test 42 - Does high idle operate?

### TEST 42 - Does high idle operate?

### WARNING



Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

### WARNING



Circuit breakers No. 4, 5, 6, and 10 are always electrically live. Use care when working around these circuit breakers. Failure to comply may result in injury or death to personnel.

1. If disconnected, connect engine harness connector MC20.
2. If disconnected, connect engine harness connector MC21.
3. If removed, install engine cover and side panels (refer to TM 9-2320-315-14&P).
4. If disconnected, connect chassis harness connector MC25.
5. If disconnected, connect chassis harness connector MC41.
6. If disconnected, connect chassis to cab harness connector MC1.
7. If disconnected, connect chassis harness connector MC4.
8. If disconnected, connect cab harness connector MC5.
9. If removed, install skid plate grille (refer to TM 9-2320-315-14&P).
10. If disconnected, connect cab harness connector MC150.
11. If disconnected, connect cab harness connector MC66.
12. If removed, install high idle active relay R10 (refer to TM 9-2320-315-14&P).
13. If removed, install right and left heater compartment covers (refer to TM 9-2320-315-14&P).
14. Ensure vehicle is returned to normal operating condition.
15. Start engine (refer to TM 9-2320-279-10).
16. Set PTO ENGAGE switch to ON position. (WP 0015)
17. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)

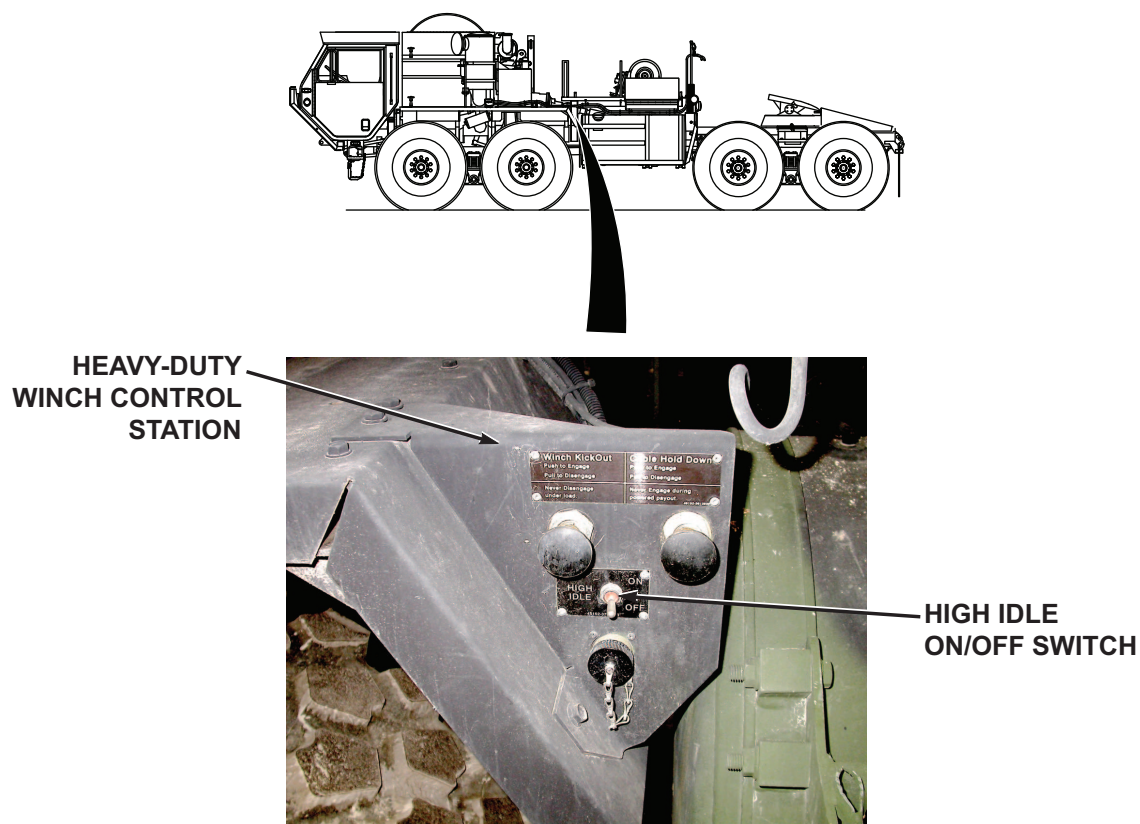


Figure 45.

### NOTE

Engine high idle speed is 1,500 RPM.

18. Observe engine operation. Inspect tachometer for increase in engine speed.
19. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
20. Connect remote control cable to remote control connector. (WP 0015)
21. Connect heavy-duty winch remote control unit to remote control cable. (WP 0015)
22. Set heavy-duty winch remote control unit HIGH IDLE ON/OFF switch to ON position. (WP 0015)

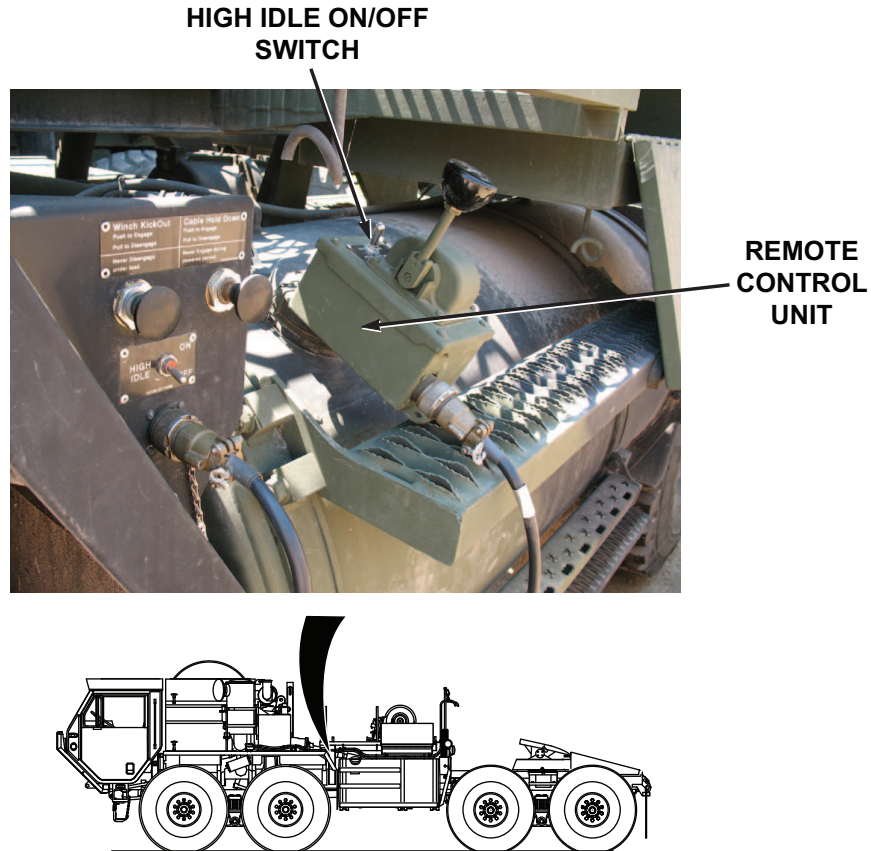


Figure 46.

**NOTE**

Engine high idle speed is 1,500 RPM.

23. Observe engine operation. Inspect tachometer for increase in engine speed.
24. Set heavy-duty winch remote control unit HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
25. Set PTO ENGAGE switch to OFF position. (WP 0015)
26. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Does high idle operate?

**DECISION**

No - Problem not corrected. Notify Supervisor.  
Yes - Problem corrected.

**END OF WORK PACKAGE**



---

**FIELD MAINTENANCE  
EXCESSIVE MOVEMENT OF TRAILER KINGPIN IN FIFTH WHEEL**

---

**INITIAL SETUP:****Tools and Special Tools**

None

Parking brake applied (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).

---

**TROUBLESHOOTING PROCEDURE  
EXCESSIVE MOVEMENT OF TRAILER KINGPIN IN FIFTH WHEEL**

1. Perform troubleshooting for M983 A2 "Excessive Movement Of Trailer Kingpin in Fifth Wheel" (refer to TM 9-2320-315-14&P).

**END OF WORK PACKAGE**



---

**FIELD MAINTENANCE**  
**FIFTH WHEEL WILL NOT LOCK WHEN COUPLING TRAILER**

---

**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's: Automotive (WP  
0081, Table 2, Item 5)

Parking brake applied (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

**Personnel Required**

Wheeled Vehicle Mechanic 63B (2)

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).

---

**TROUBLESHOOTING PROCEDURE**  
**FIFTH WHEEL WILL NOT LOCK WHEN COUPLING TRAILER**

**TEST 1 - Is fifth wheel properly lubricated and free from debris?**

1. Check if fifth wheel is free from debris.

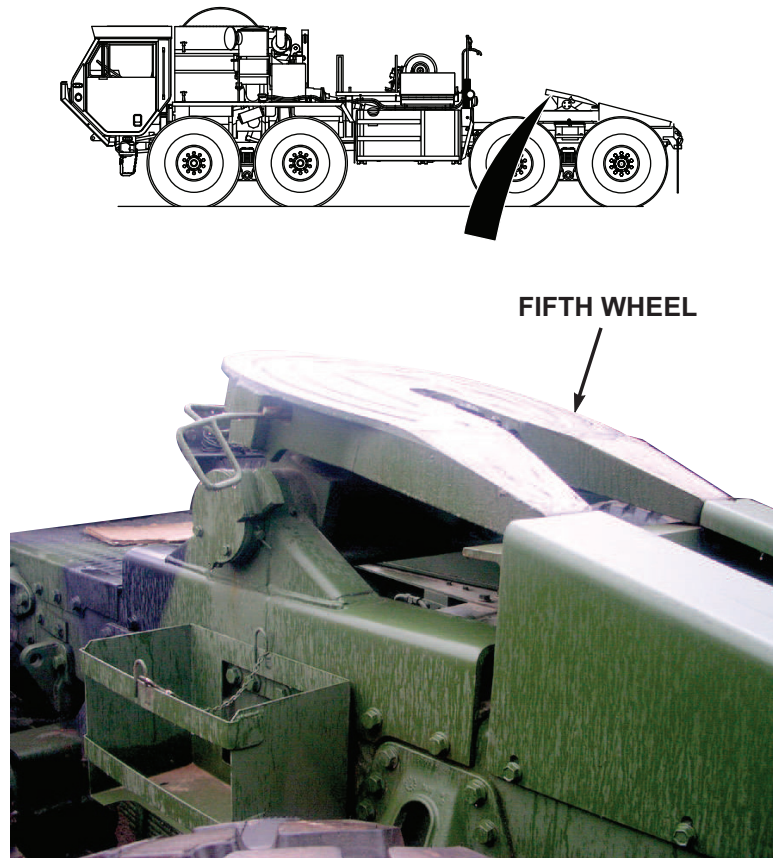


Figure 1.

2. If fifth wheel is not free from debris, clear debris from fifth wheel.
3. Check if fifth wheel is properly lubricated.
4. If fifth wheel is not properly lubricated, lubricate fifth wheel with GAA. (WP 0038)

#### CONDITION/INDICATION

Is fifth wheel properly lubricated and free from debris?

#### DECISION

No - Test 4 - Does fifth wheel lock when coupling trailer?

Yes - Test 2 - Are fifth wheel kingpin jaws secure and free of wear and damage?

#### TEST 2 - Are fifth wheel kingpin jaws secure and free of wear and damage?

#### CAUTION

Ensure kingpin jaws stay open when primary lock release handle is in locked position.  
Failure to comply may result in damage to fifth wheel.

1. Inspect fifth wheel for loose, worn, or broken kingpin jaws.



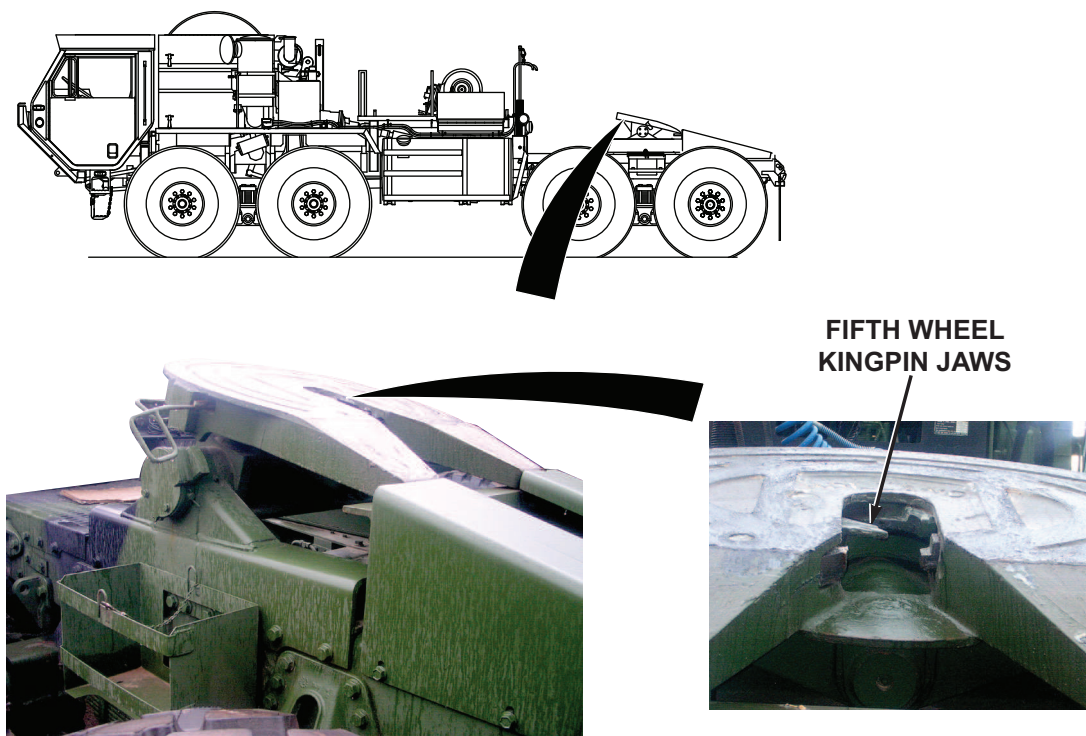


Figure 2.

**CONDITION/INDICATION**

Are fifth wheel kingpin jaws secure and free of wear and damage?

**DECISION**

No - Replace fifth wheel. (WP 0052)Test 4 - Does fifth wheel lock when coupling trailer?

Yes - Test 3 - Can fifth wheel be properly adjusted?

**TEST 3 - Can fifth wheel be properly adjusted?**

1. Perform fifth wheel adjustment procedure (refer to TM 9-2320-315-14&P).

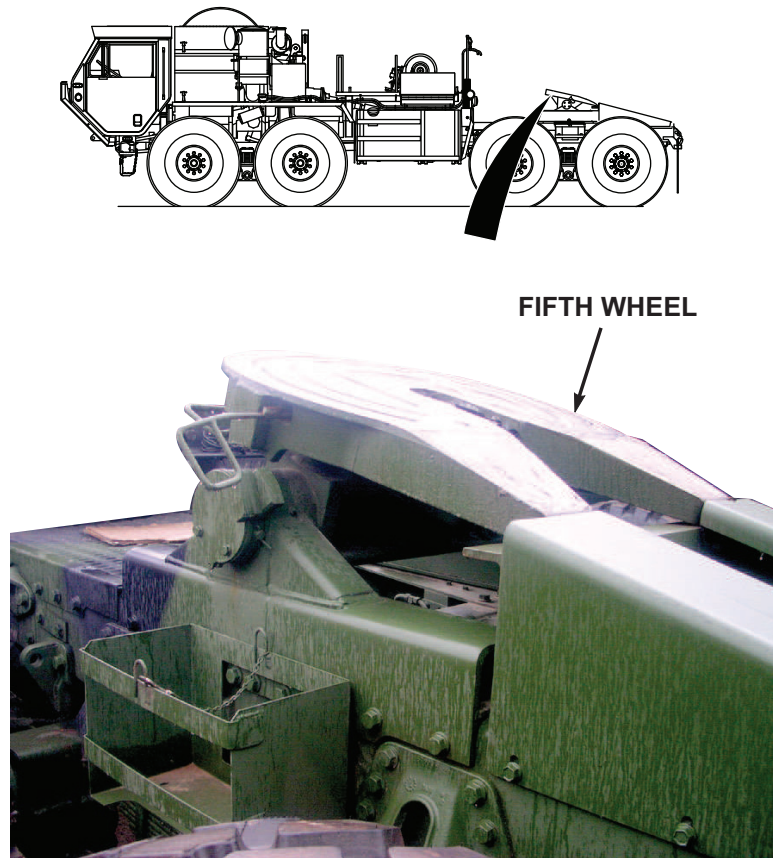


Figure 3.

**CONDITION/INDICATION**

Can fifth wheel be properly adjusted?

**DECISION**

No - Replace fifth wheel. (WP 0052) Test 4 - Does fifth wheel lock when coupling trailer?

Yes - Test 4 - Does fifth wheel lock when coupling trailer?

**TEST 4 - Does fifth wheel lock when coupling trailer?**

1. Ensure vehicle is returned to normal operating condition.
2. Connect semitrailer to vehicle. (WP 0013)
3. Apply trailer handbrake. (refer to TM 9-2320-279-10)

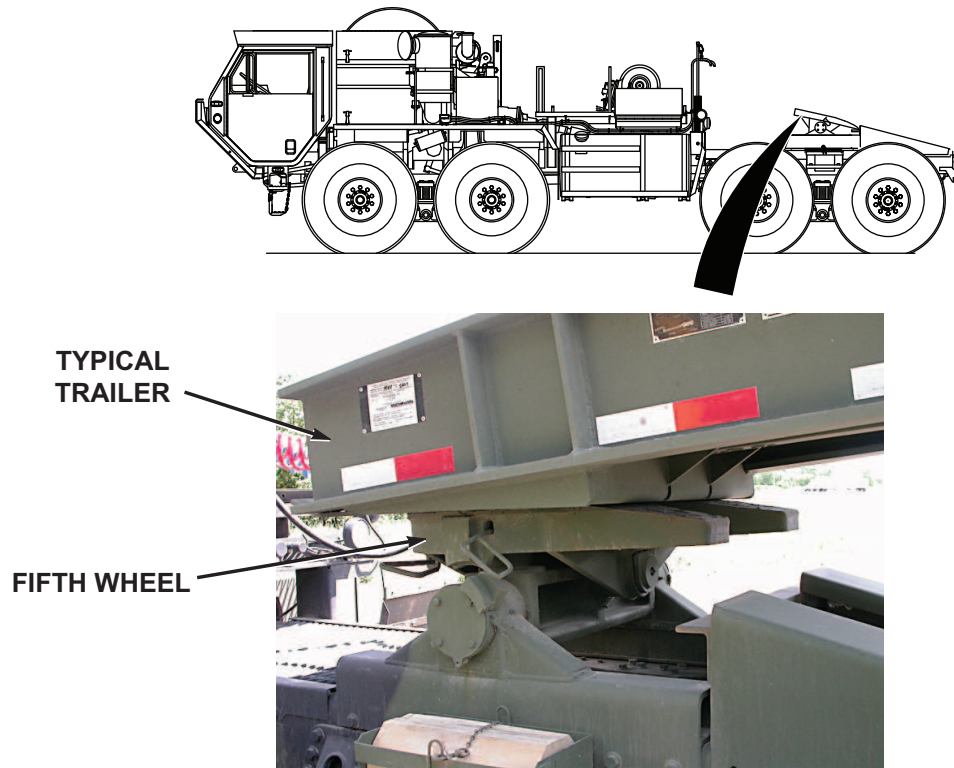


Figure 4.

4. With the aid of an assistant, shift truck into drive and reverse, and visually inspect fifth wheel to ensure it's securely locked.

**CONDITION/INDICATION**

Does fifth wheel lock when coupling trailer?

**DECISION**

No - Problem not corrected. Notify Supervisor.  
Yes - Problem corrected.

**END OF WORK PACKAGE**



---

**FIELD MAINTENANCE**  
**FIFTH WHEEL WILL NOT UNLOCK WHEN DISCONNECTING TRAILER**

---

**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's: Automotive (WP  
0081, Table 2, Item 5)

Parking brake applied (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

**Personnel Required**

Wheeled Vehicle Mechanic 63B (2)

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).

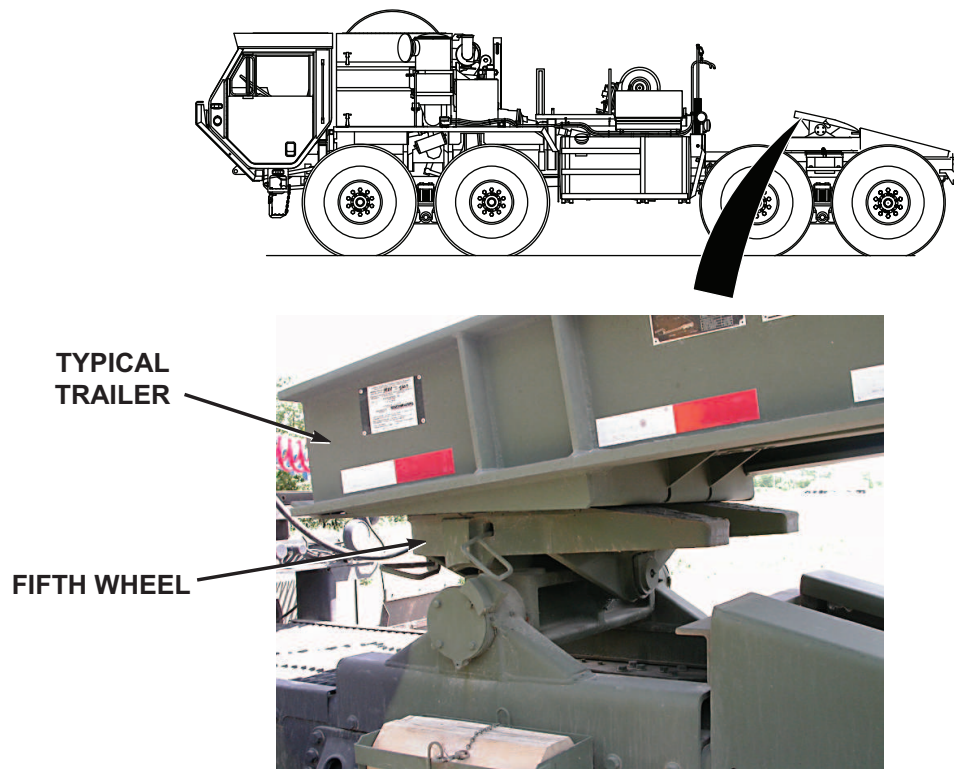
---

**TROUBLESHOOTING PROCEDURE**

**FIFTH WHEEL WILL NOT UNLOCK WHEN DISCONNECTING TRAILER**

**TEST 1 - Is fifth wheel properly lubricated and free from debris?**

1. Check if fifth wheel is free from debris.



*Figure 1.*

2. If fifth wheel is not free from debris, clear debris from fifth wheel.

3. Check if fifth wheel is properly lubricated.
4. If fifth wheel is not properly lubricated, lubricate fifth wheel with GAA. (WP 0038)

### CONDITION/INDICATION

Is fifth wheel properly lubricated and free from debris?

### DECISION

No - Test 4 - Does fifth wheel unlock when disconnecting trailer?

Yes - Test 2 - Do fifth wheel primary and secondary release handles operate without binding?

### TEST 2 - Do fifth wheel primary and secondary release handles operate without binding?

### CAUTION

Ensure kingpin jaws stay open when primary lock release handle is in locked position.  
Failure to comply may result in damage to fifth wheel.

1. Operate fifth wheel primary and secondary release handles. Check if release handles operate over their full range of motion without binding. (WP 0013)

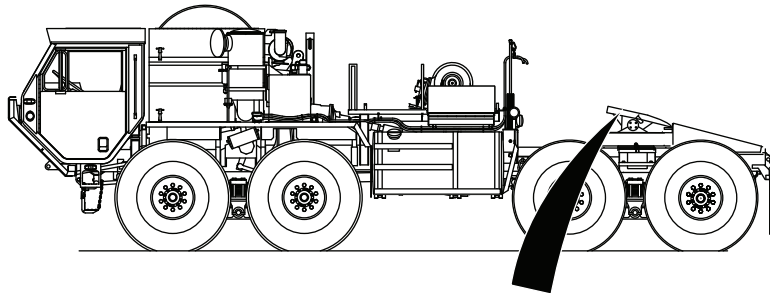


Figure 2.

### CONDITION/INDICATION

Do fifth wheel primary and secondary release handles operate without binding?

### DECISION

No - Replace fifth wheel. (WP 0052)Test 4 - Does fifth wheel unlock when disconnecting trailer?

Yes - Test 3 - Does fifth wheel unlock when disconnecting trailer?

**TEST 3 - Does fifth wheel unlock when disconnecting trailer?**

1. Ensure vehicle is returned to normal operating condition.
2. Connect semitrailer to vehicle. (WP 0013)

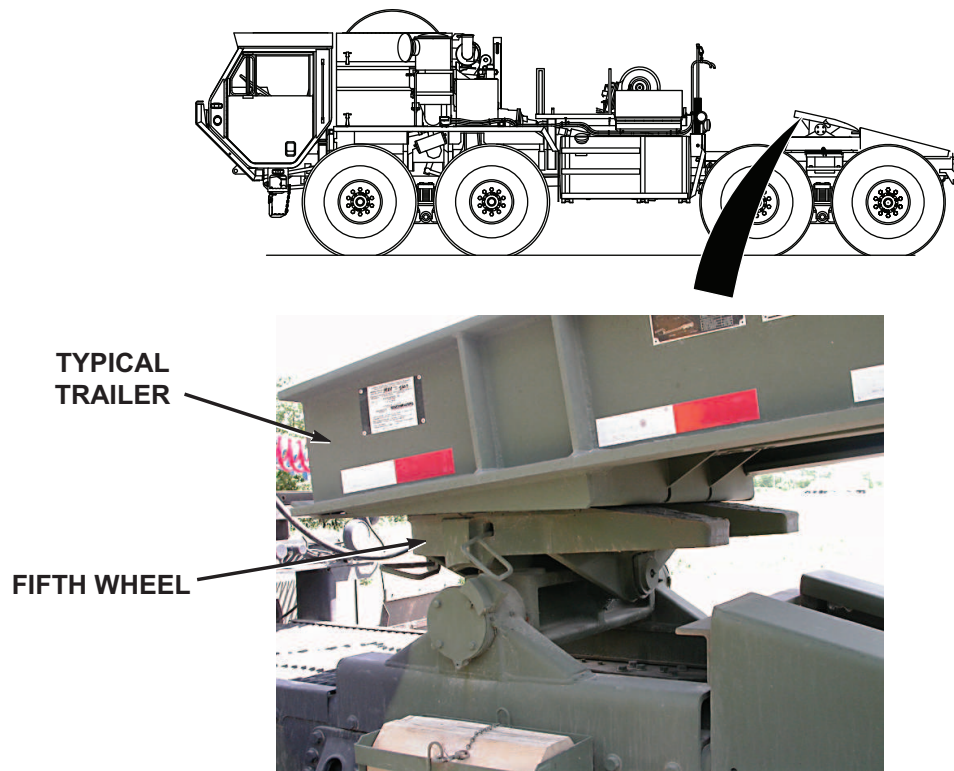


Figure 3.

3. Attempt to disconnect semitrailer from vehicle. (WP 0013)

**CONDITION/INDICATION**

Does fifth wheel unlock when disconnecting trailer?

**DECISION**

No - Replace fifth wheel. (WP 0052) Test 4 - Does fifth wheel unlock when disconnecting trailer?  
Yes - Problem corrected.

**TEST 4 - Does fifth wheel unlock when disconnecting trailer?**

1. Ensure vehicle is returned to normal operating condition.
2. Connect semitrailer to vehicle. (WP 0013)



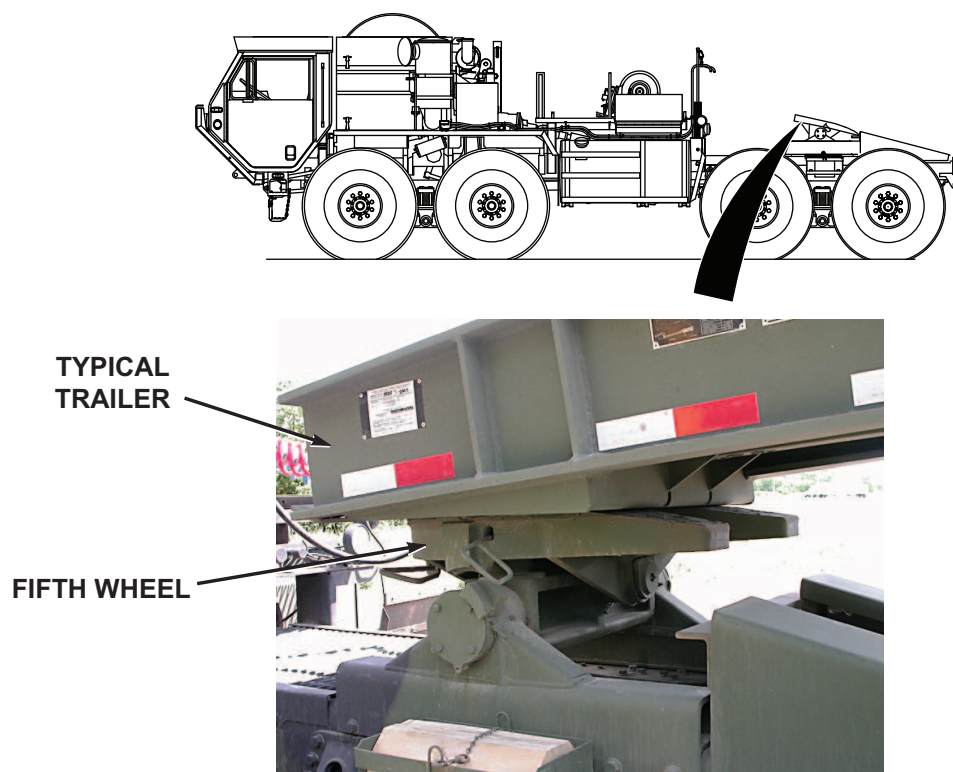


Figure 4.

3. Disconnect semitrailer from vehicle. (WP 0013)

**CONDITION/INDICATION**

Does fifth wheel unlock when disconnecting trailer?

**DECISION**

No - Problem not corrected. Notify Supervisor.

Yes - Problem corrected.

**END OF WORK PACKAGE**



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## FIELD MAINTENANCE

### CABLE HOLD DOWN DOES NOT OPERATE

---

#### INITIAL SETUP:

##### Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Gloves, Welders (WP 0081, Table 2, Item 7)  
Goggles, Industrial (WP 0081, Table 2, Item 7)

Parking brake applied (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

##### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

##### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).

---

#### TROUBLESHOOTING PROCEDURE

### CABLE HOLD DOWN DOES NOT OPERATE

#### TEST 1 - Is air pressure present on air line 2338 at winch hold down control valve?

##### WARNING



If air lines are under pressure when they are disconnected, they can whip around. Use care when loosening or disconnecting air line fittings. Failure to comply may result in injury or death to personnel.

##### WARNING



Wear proper eye protection when performing leakage tests or disconnecting air lines that may be under pressure. Failure to comply may result in injury or death to personnel.

1. Pull heavy-duty winch control station CABLE HOLD DOWN control valve out to DISENGAGE position. (WP 0010)
2. Pull heavy-duty winch control station WINCH KICKOUT control valve out to DISENGAGE position. (WP 0010)

**NOTE**

Perform Steps (3) through (5) only if system air pressure is not between 100 and 120 psi (690 and 827 kPa).

3. Start engine (refer to TM 9-2320-279-10).
4. Allow air pressure build to around 100 to 120 psi (690 to 827 kPa).
5. Shut off engine (refer to TM 9-2320-279-10).

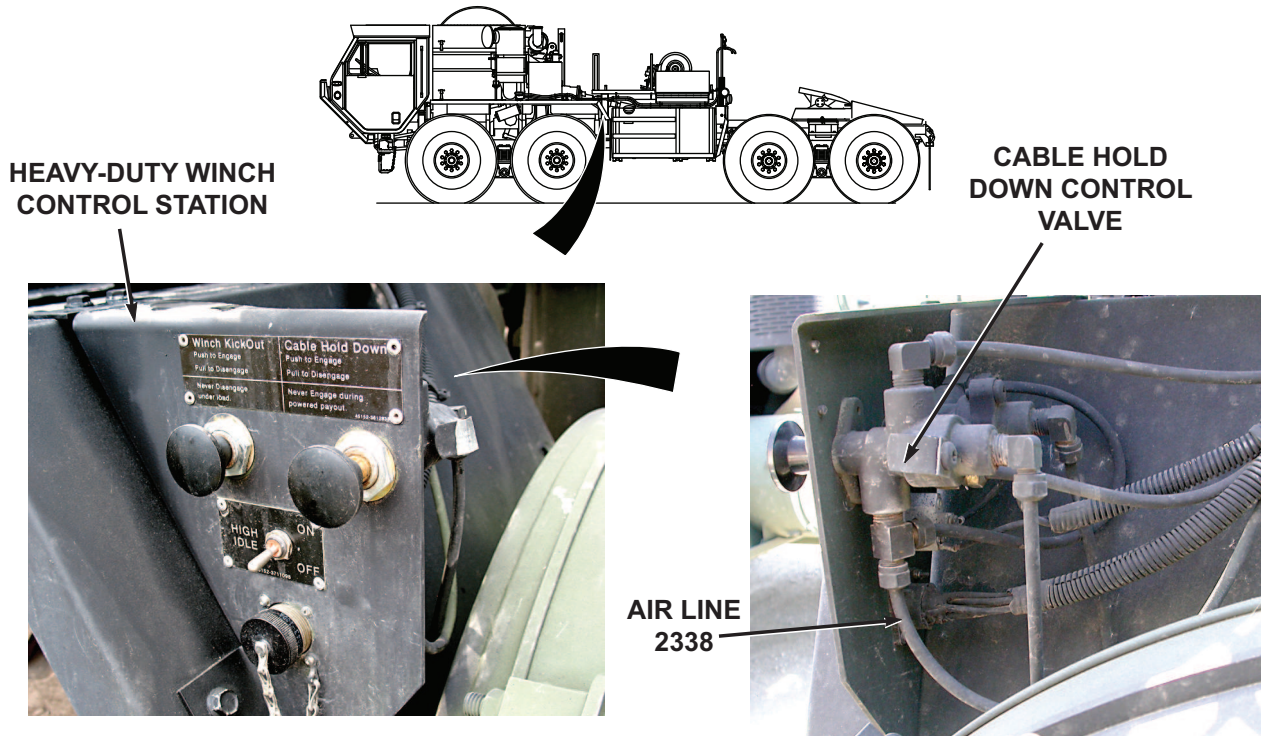


Figure 1.

6. Loosen fitting on air line 2338 fitting at winch hold down control valve.
7. Check for air flow from air line 2338.
8. Tighten air line 2338 to winch hold down control valve.

**CONDITION/INDICATION**

Is air pressure present on air line 2338 at winch hold down control valve?

**DECISION**

No - Test 2 - Is air line 2338 and fittings free of leaks, crimps, and damage?

Yes - Test 4 - Is air pressure present on air line 2706 at heavy-duty winch clutch connector, when CABLE HOLD DOWN control valve is in the DISENGAGED position?

**TEST 2 - Is air line 2338 and fittings free of leaks, crimps, and damage?****NOTE**

Perform Steps (1) through (3) only if vehicle air pressure is not above 85 psi (586 kPa).

1. Start engine (refer to TM 9-2320-279-10).

2. Allow vehicle air pressure to build to 100 psi (690 kPa).
3. Shut off engine (refer to TM 9-2320-279-10).

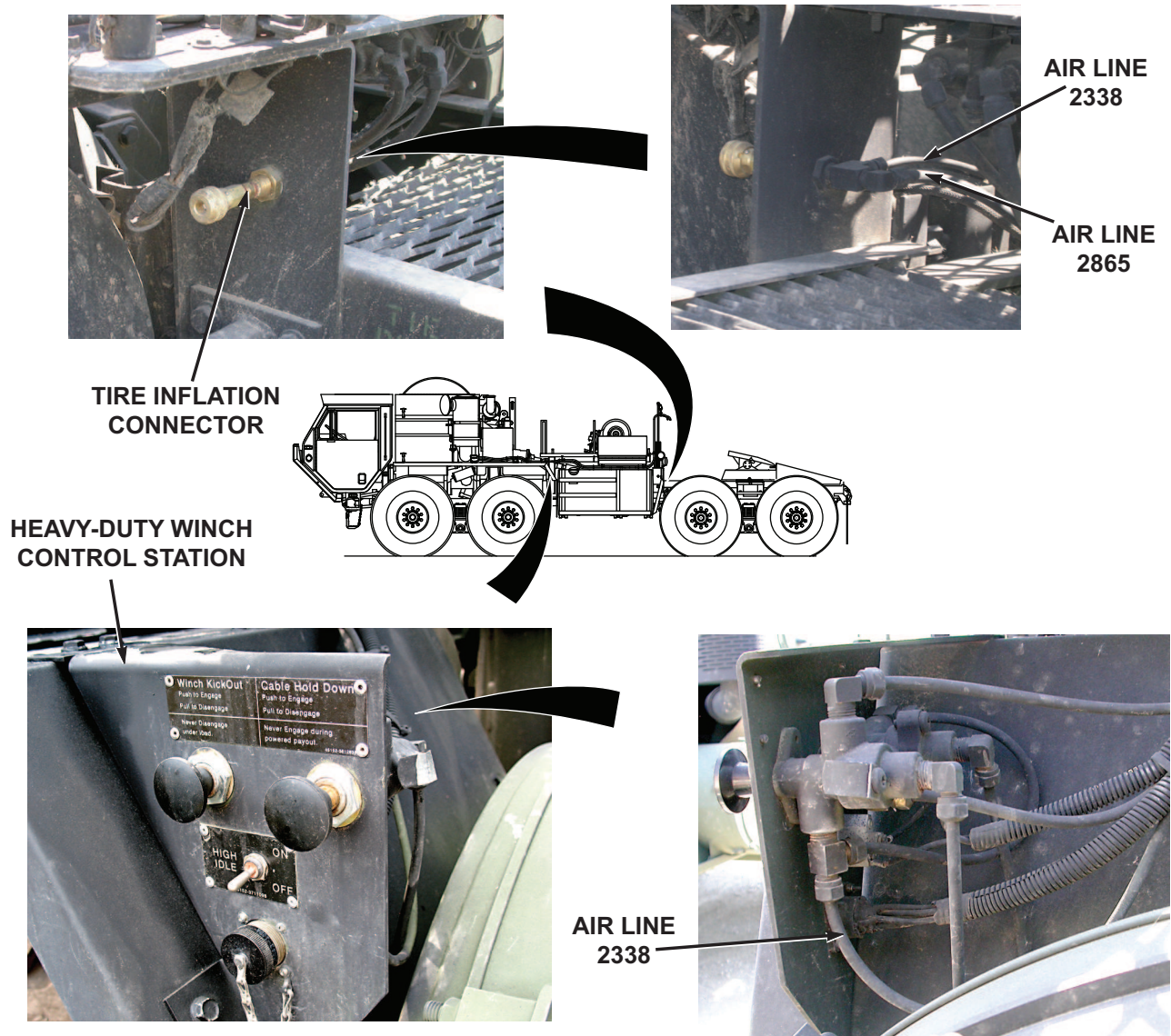


Figure 2.

4. Inspect air line 2338 for leaks, crimps, and damage. Refer to schematics.

### NOTE

Perform Steps (5) and (6) only if air line 2338 leaks, or are crimped or damage.

5. Drain air system (refer to TM 9-2320-279-10).
6. Disconnect pressure gauge and adapter.

### CONDITION/INDICATION

Is air line 2338 and fittings free of leaks, crimps, and damage?

**DECISION**

No - Replace damaged air line 2338 and fittings. (WP 0043) Test 7 - Does heavy-duty winch cable hold down operate?

Yes - Test 3 - Is air line 2865 and fittings free of leaks, crimps, and damage?

**TEST 3 - Is air line 2865 and fittings free of leaks, crimps, and damage?****NOTE**

Perform Steps (1) through (3) only if vehicle air pressure is not above 85 psi (586 kPa).

1. Start engine (refer to TM 9-2320-279-10).
2. Allow vehicle air pressure to build to 100 psi (690 kPa).
3. Shut off engine (refer to TM 9-2320-279-10).

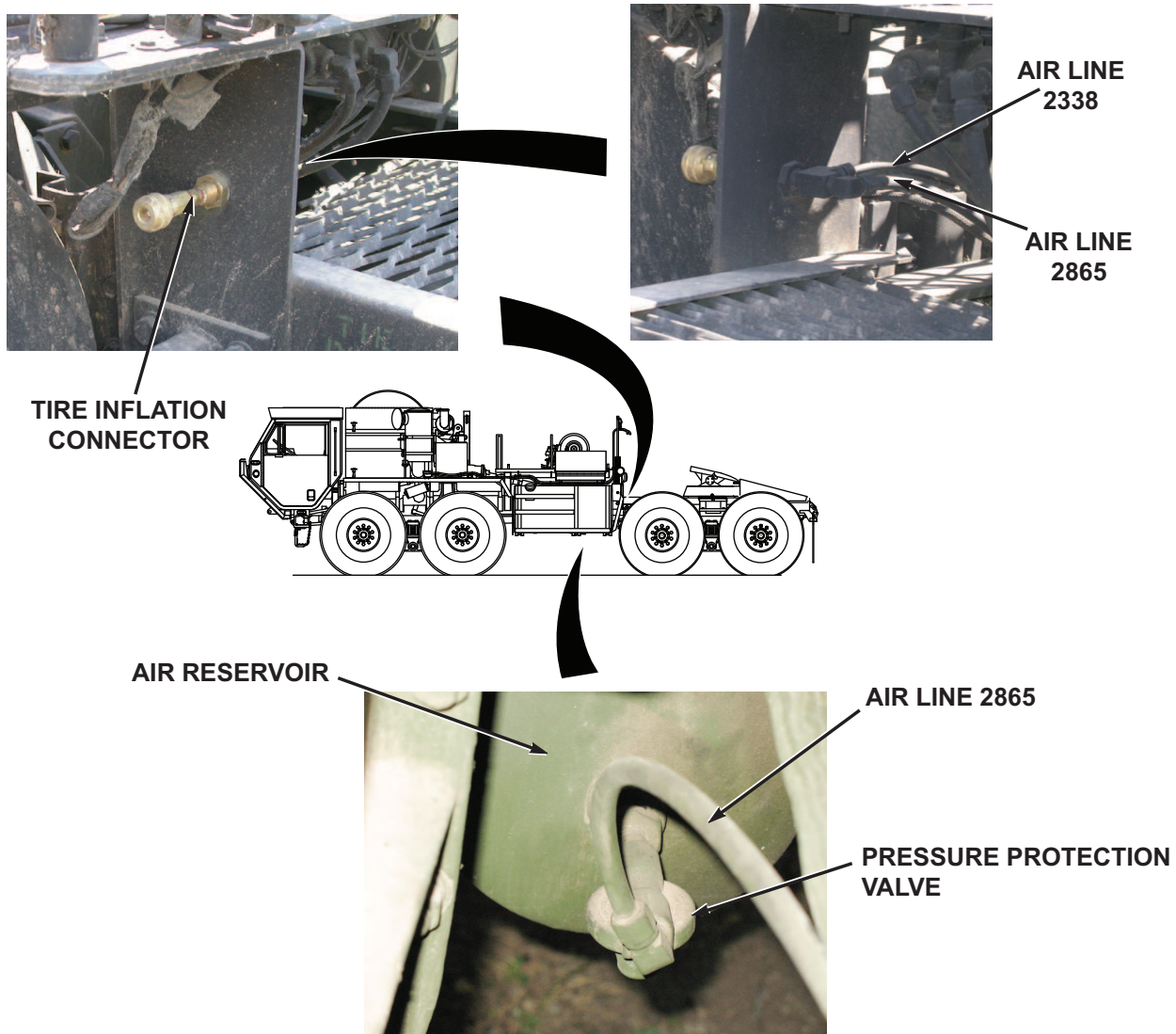


Figure 3.

4. Inspect air line 2865 and fittings for leaks, crimps, and damage. Refer to schematics.



5. Drain air system (refer to TM 9-2320-279-10).
6. Disconnect pressure gauge and adapter.
7. Connect air line 2338 to winch hold down control valve.

**CONDITION/INDICATION**

Is air line 2865 and fittings free of leaks, crimps, and damage?

**DECISION**

No - Replace damaged air line 2865 and fittings (refer to TM 9-2320-315-14&P). Test 7 - Does heavy-duty winch cable hold down operate?

Yes - Replace pressure protection valve. (refer to TM 9-2320-315-14&P). Test 7 - Does heavy-duty winch cable hold down operate?

**TEST 4 - Is air pressure present on air line 2706 at heavy-duty winch clutch connector, when CABLE HOLD DOWN control valve is in the DISENGAGED position?****WARNING**

If air lines are under pressure when they are disconnected, they can whip around. Use care when loosening or disconnecting air line fittings. Failure to comply may result in injury or death to personnel.

**WARNING**

Wear proper eye protection when performing leakage tests or disconnecting air lines that may be under pressure. Failure to comply may result in injury or death to personnel.

**NOTE**

Perform Steps (1) through (3) only if system air pressure is not between 100 and 120 psi (690 and 827 kPa).

1. Start engine (refer to TM 9-2320-279-10).
2. Allow vehicle air pressure to build to 100 psi (690 kPa).

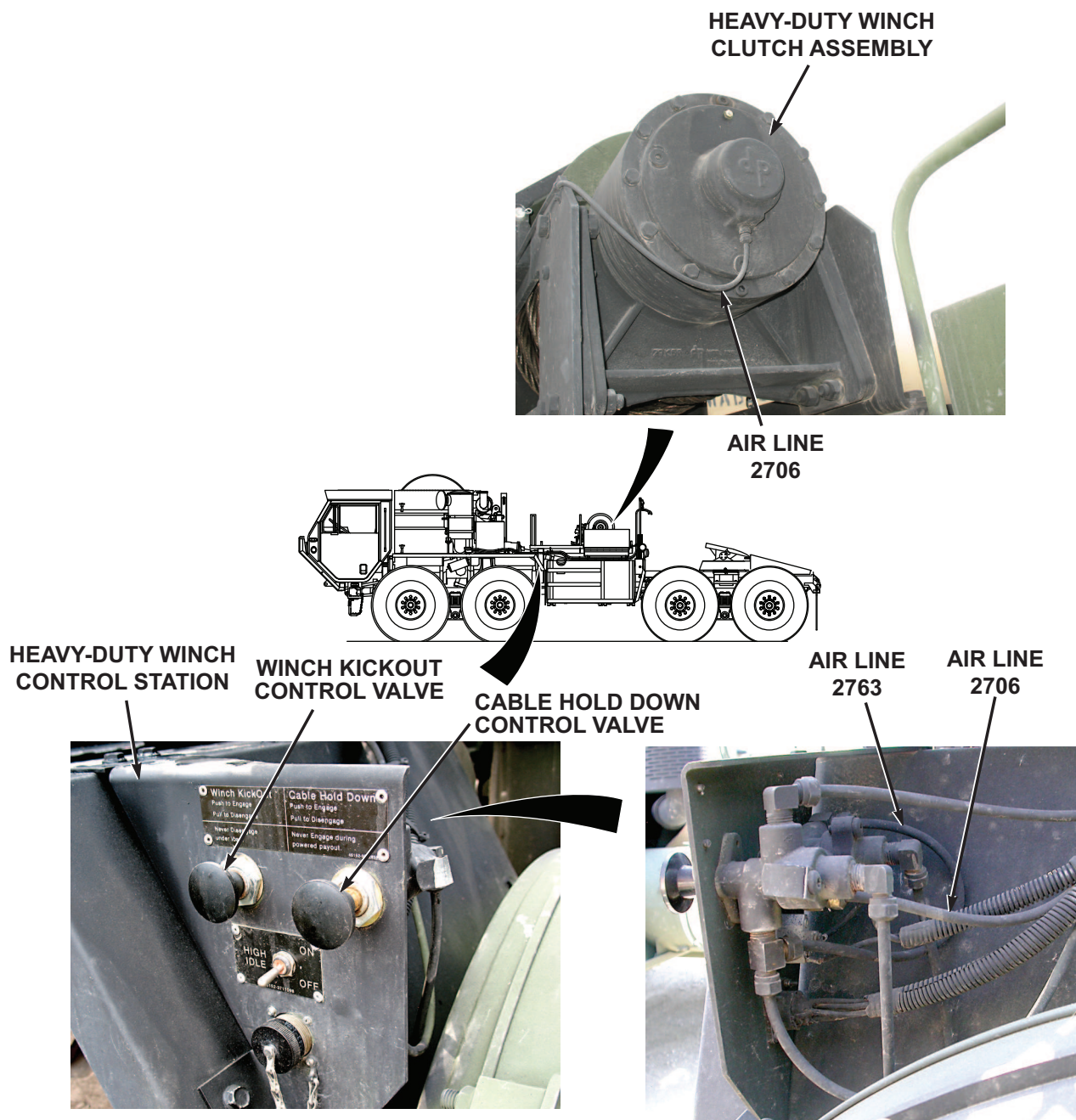


Figure 4.

3. Shut off engine (refer to TM 9-2320-279-10).
4. Disconnect air line 2706 from heavy-duty winch clutch assembly. Refer to schematics.
5. While assistant pushes heavy-duty winch control station **WINCH KICKOUT** control valve in to **ENGAGE** position, check for airflow at air line 2706. (WP 0010)
6. Pull heavy-duty winch control station **WINCH KICKOUT** control valve out to **DISENGAGE** position. (WP 0010)
7. Connect air line 2706 to heavy-duty winch clutch assembly.

#### CONDITION/INDICATION

Is air pressure present on air line 2706 at heavy-duty winch clutch connector, when **CABLE HOLD DOWN** control valve is in the **DISENGAGED** position?

**DECISION**

No - Replace damaged air line 2763 and fittings. (WP 0043) Test 7 - Does heavy-duty winch cable hold down operate?

Yes - Test 5 - Are air line 2231 and fittings free of leaks, crimps, and damage?

**TEST 5 - Are air line 2231 and fittings free of leaks, crimps, and damage?**

1. Push heavy-duty winch control station CABLE HOLD DOWN control valve in to ENGAGE position. (WP 0010)

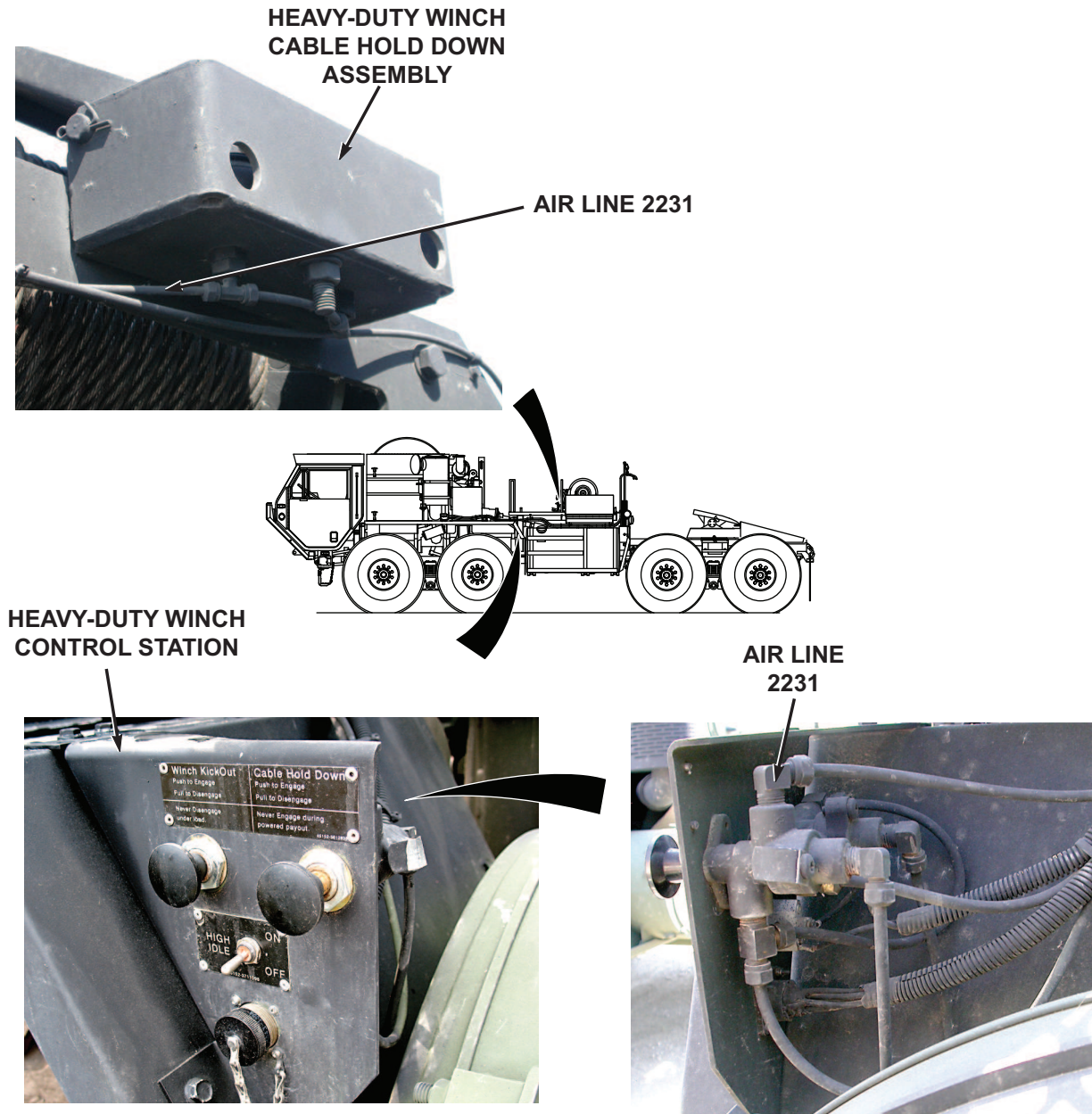


Figure 5.

2. Inspect air line 2231 and fittings for leaks, crimps, and damage. Refer to schematics.

**CONDITION/INDICATION**

Are air line 2231 and fittings free of leaks, crimps, and damage?

**DECISION**

No - Replace damaged air lines and fittings. (WP 0043) Test 7 - Does heavy-duty winch cable hold down operate?  
Yes - Test 6 - Is air pressure present on air line 2231 at heavy-duty winch cable hold down connector?

**TEST 6 - Is air pressure present on air line 2231 at heavy-duty winch cable hold down connector?****WARNING**

If air lines are under pressure when they are disconnected, they can whip around. Use care when loosening or disconnecting air line fittings. Failure to comply may result in injury or death to personnel.

**WARNING**

Wear proper eye protection when performing leakage tests or disconnecting air lines that may be under pressure. Failure to comply may result in injury or death to personnel.

1. Pull heavy-duty winch control station CABLE HOLD DOWN control valve out to DISENGAGE position. (WP 0010)

**NOTE**

Perform Steps (2) through (4) only if vehicle air pressure is not above 85 psi (586 kPa).

2. Start engine (refer to TM 9-2320-279-10).
3. Allow vehicle air pressure to build to 100 psi (690 kPa).
4. Shut off engine (refer to TM 9-2320-279-10).
5. Disconnect air line 2231 from heavy-duty winch cable hold down assembly. Refer to schematics.



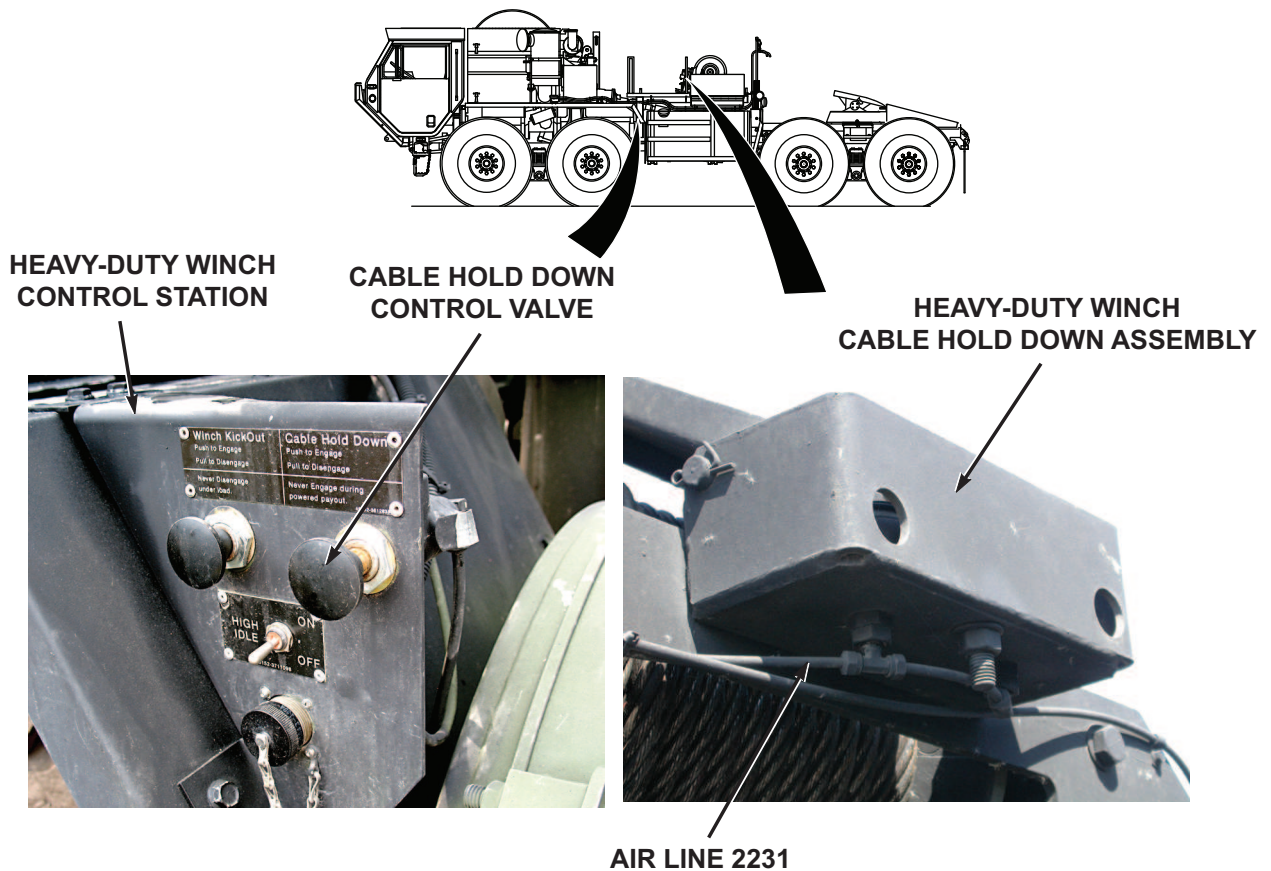


Figure 6.

6. While assistant pushes heavy-duty winch control station CABLE HOLD DOWN control valve in to ENGAGE position, check for airflow at air line 2231. (WP 0010)
7. Pull heavy-duty winch control station CABLE HOLD DOWN control valve out to DISENGAGE position. (WP 0010)
8. If air is not present, connect air line 2231 to heavy-duty winch hold down assembly.

**CONDITION/INDICATION**

Is air pressure present on air line 2231 at heavy-duty winch cable hold down connector?

**DECISION**

No - Replace heavy-duty winch cable hold down control valve. (WP 0056) Test 7 - Does heavy-duty winch cable hold down operate?

Yes - Replace heavy-duty winch cable hold down assembly. (WP 0067) Test 7 - Does heavy-duty winch cable hold down operate?

**TEST 7 - Does heavy-duty winch cable hold down operate?****WARNING**

- Heavy-duty winch operator shall ensure all personnel keep hands and feet clear of heavy-duty winch during operation. Failure to comply may result in injury or death to personnel.
- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

**NOTE**

Perform Steps (1) and (3) only if vehicle air pressure is not above 85 psi (586 kPa).

1. Start engine (refer to TM 9-2320-279-10).
2. Allow vehicle air pressure to build to 100 psi (690 kPa).
3. Shut off engine (refer to TM 9-2320-279-10).
4. While assistant operates heavy-duty winch CABLE HOLD DOWN control valve, check if heavy-duty winch cable hold down operates. (WP 0015)

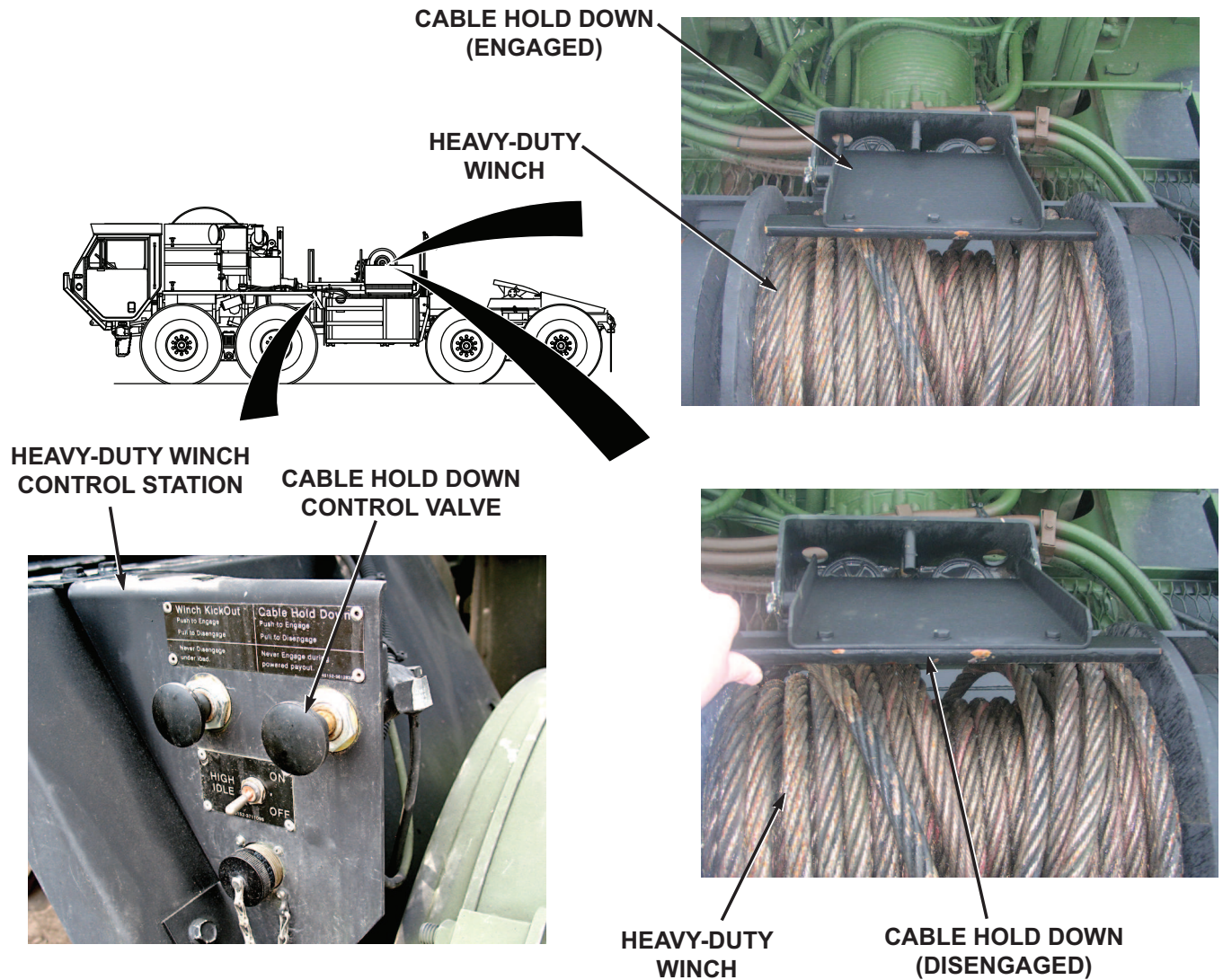


Figure 7.

**CONDITION/INDICATION**

Does heavy-duty winch cable hold down operate?

**DECISION**

No - Problem not corrected. Notify Supervisor.  
 Yes - Problem corrected.

**END OF WORK PACKAGE**



---

**FIELD MAINTENANCE  
WINCH WILL NOT PULL LOAD**

---

**INITIAL SETUP:****Tools and Special Tools**

Cap and Plug Set (WP 0081, Table 2, Item 1)  
Kit, Hydraulic Test (WP 0081, Table 2, Item 2)  
Pan, Drain, 4 Gallon (WP 0081, Table 2, Item 3)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Wrench, 18 in. Adjustable (WP 0081, Table 2, Item 6)  
Goggles, Industrial (WP 0081, Table 2, Item 7)

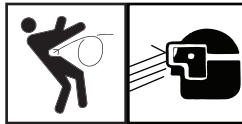
**Personnel Required**

Wheeled Vehicle Mechanic 63B (2)

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).  
Parking brake applied (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

---

**TROUBLESHOOTING PROCEDURE  
WINCH WILL NOT PULL LOAD****TEST 1 - Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?****WARNING**

- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

1. Place suitable drain pan under heavy-duty winch assembly prior to removing hoses.

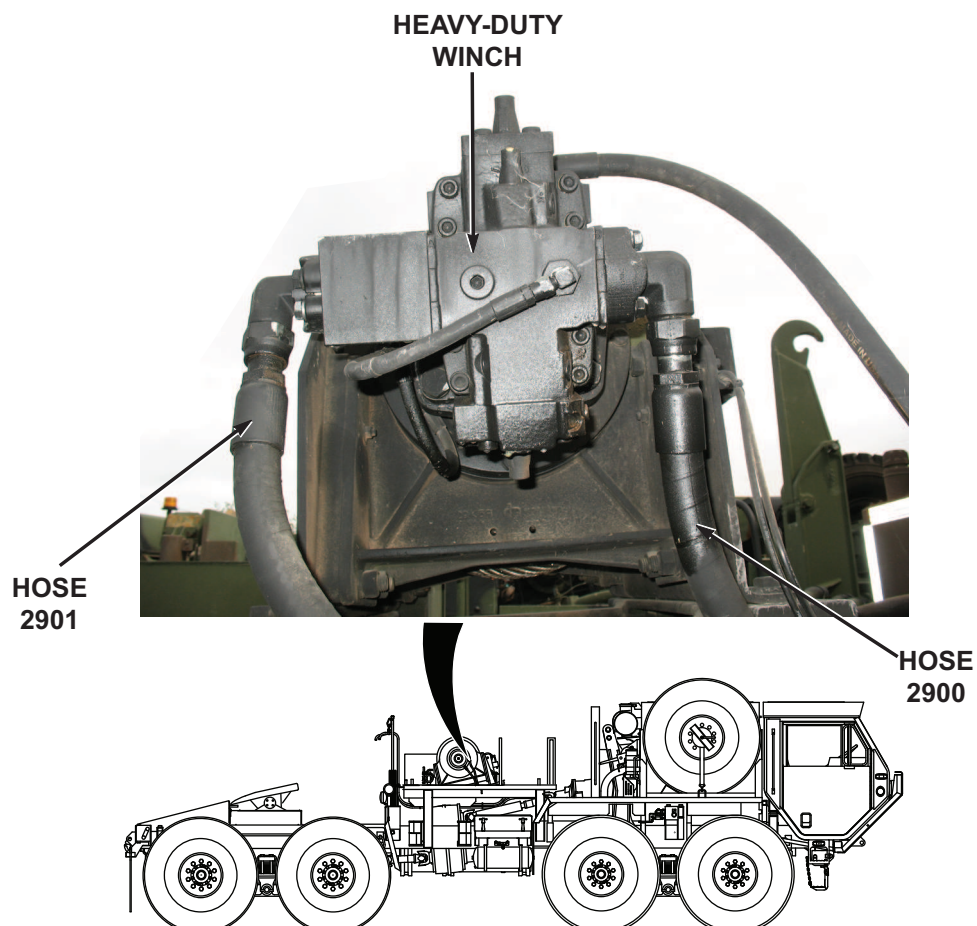


Figure 1.

2. Disconnect hydraulic hoses 2900 and 2901 from heavy-duty winch. Refer to schematics. (WP 0069)
3. Install hydraulic flow tester inlet hose to hydraulic hose 2901.



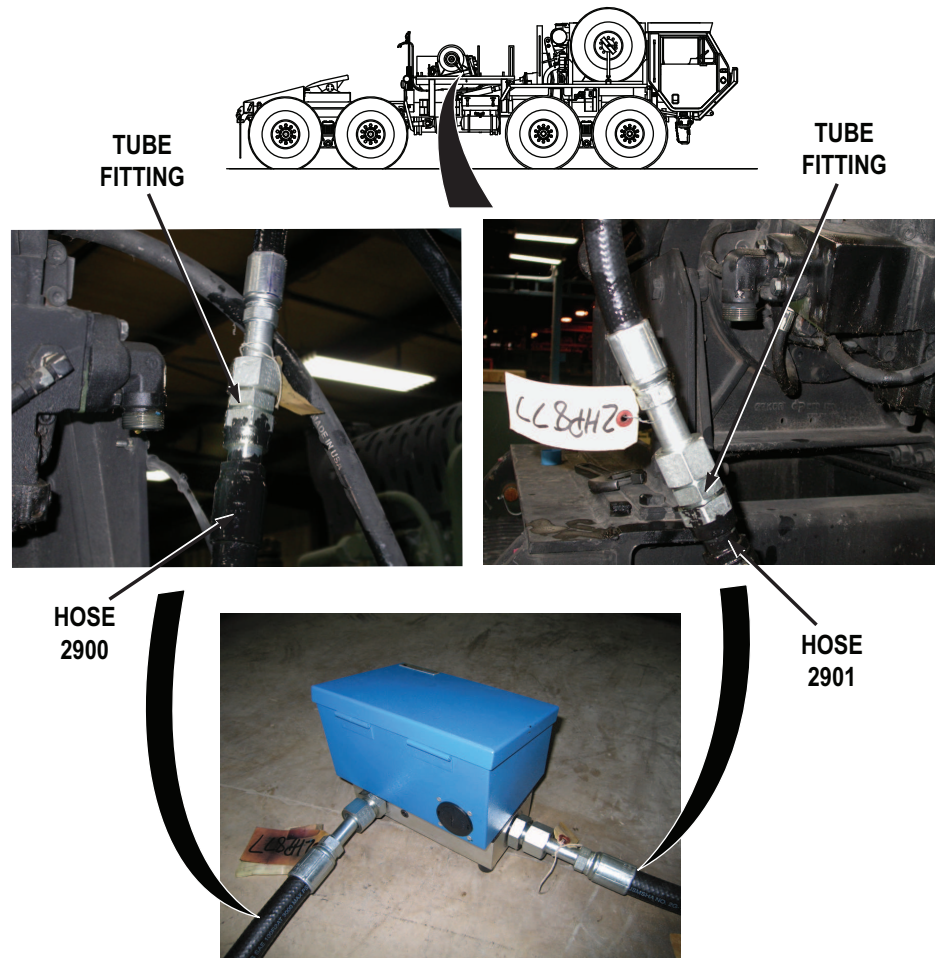


Figure 2.

4. Install hydraulic flow tester output hose to hydraulic hose 2900.
5. Pull selector valve out. (WP 0015)

**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

6. Start engine (refer to TM 9-2320-279-10).
7. Set PTO ENGAGE switch to ON position. (WP 0015)

**NOTE**

- All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch and at high idle.

- Winch is bypassed for this test, and cable will not pay out or reel in.
  - When performing test, winch control valve must be fully engaged or test readings will be faulty.
  - Relief pressure is obtained when flow reading drops off and pressure reading on gauge does not increase further.
8. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
  9. Have assistant operate winch IN manual control, while closing off load valve on hydraulic flow tester until relief pressure is obtained. (WP 0015)
  10. Note reading on pressure gauge when pressure relief is obtained.
  11. Have assistant release winch control.
  12. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
  13. Set PTO ENGAGE switch to OFF position. (WP 0015)
  14. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?

**DECISION**

No - Replace heavy-duty winch control valve (relief valve faulty). (WP 0072) Test 2 - Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?

Yes - Replace heavy-duty winch motor. (WP 0068) Test 3 - Does winch pull load?

**TEST 2 - Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?****WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

**NOTE**

- This procedure checks hydraulic pump output pressure after replacing heavy-duty winch relief valve.
- If hydraulic flow tester was disconnected, reconnect tester on hydraulic hoses 2900 and 2901 per previous test.



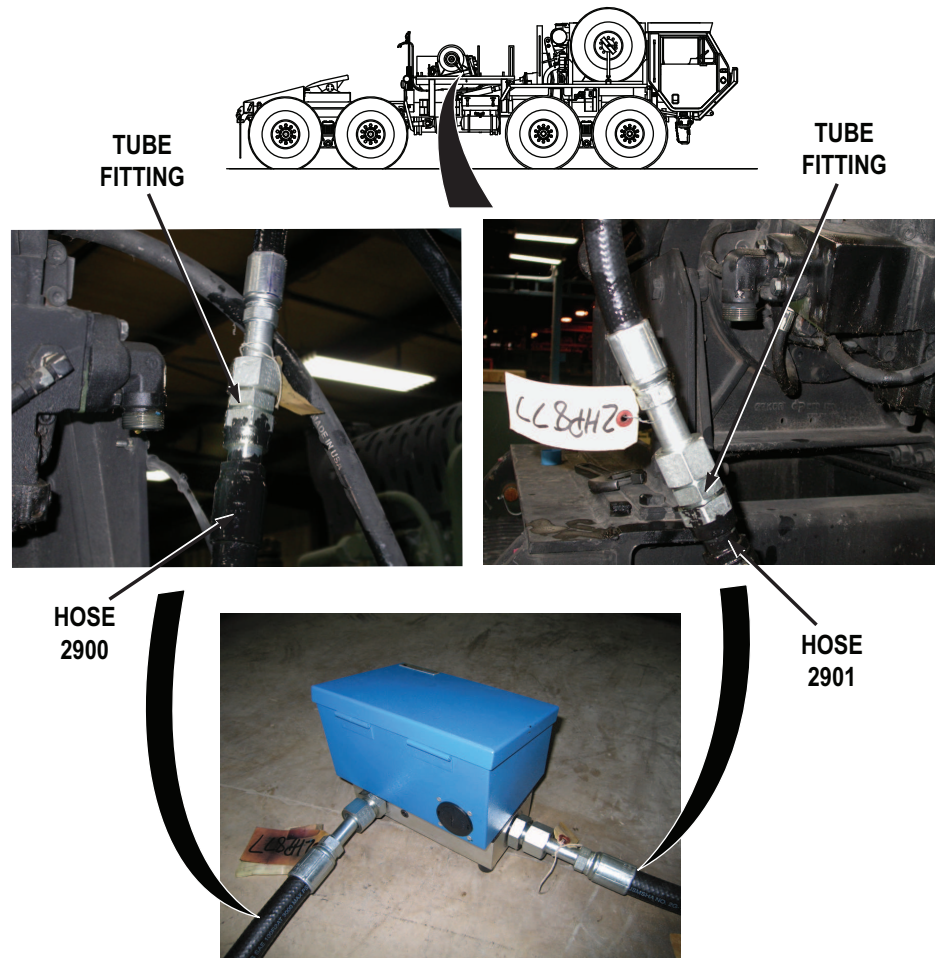


Figure 3.

1. Start engine (refer to TM 9-2320-279-10).
2. Set PTO ENGAGE switch to ON position. (WP 0015)

### NOTE

- All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch and at high idle.
  - Winch is bypassed for this test, and cable will not pay out or reel in.
  - When performing test, winch control valve must be fully engaged or test readings will be faulty.
  - Relief pressure is obtained when flow reading drops off and pressure reading on gauge does not increase further.
3. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
  4. Have assistant operate heavy-duty winch IN manual control, while closing off load valve on hydraulic flow tester until relief pressure is obtained. (WP 0015)
  5. Note reading on pressure gauge.
  6. Have assistant release winch control.
  7. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)

8. Set PTO ENGAGE switch to OFF position. (WP 0015)
9. Shut OFF engine (refer to TM 9-2320-279-10).

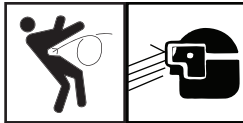
**CONDITION/INDICATION**

Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?

**DECISION**

No - Replace hydraulic pump. (refer to TM 9-2320-315-14&P)Test 3 - Does winch pull load?

Yes - Test 3 - Does winch pull load?

**TEST 3 - Does winch pull load?****WARNING**

- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

**CAUTION**

Do not let cable end run into heavy-duty winch while reeling IN, or damage to equipment will result.

1. Remove hydraulic flow tester inlet hose from hydraulic hose 2901.

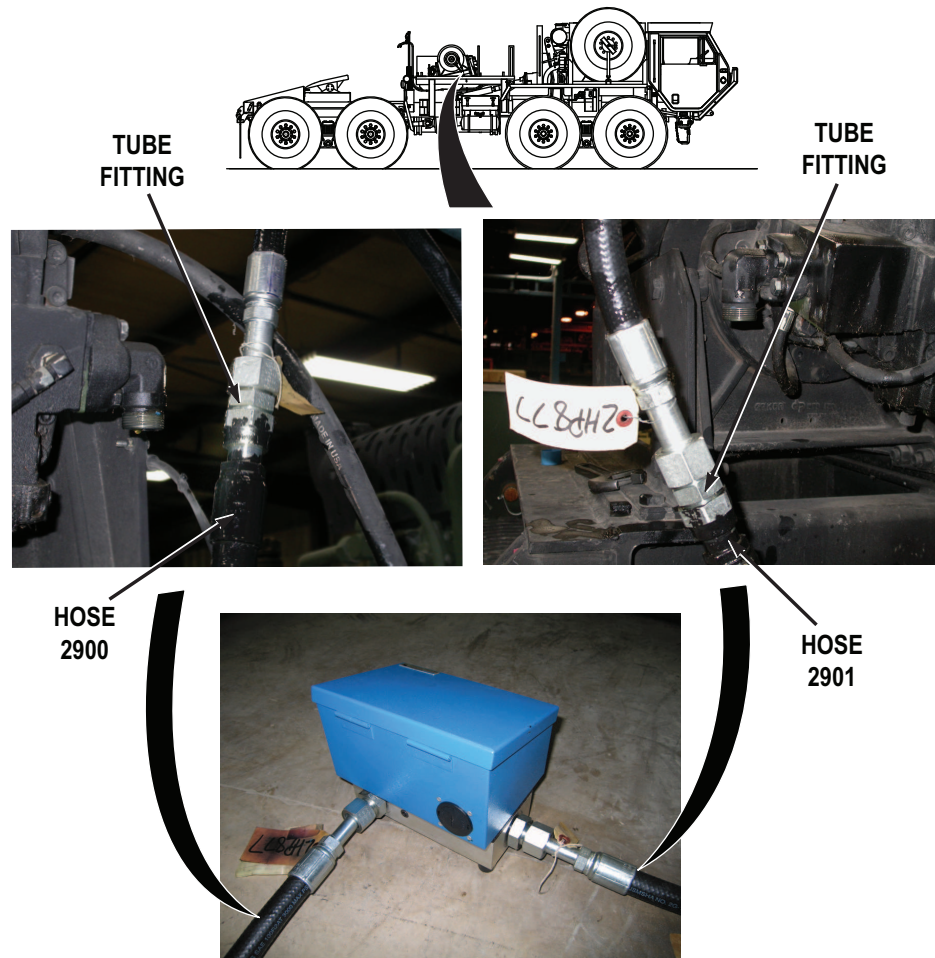


Figure 4.

2. Remove hydraulic flow tester output hose from hydraulic hose 2900.
3. Connect hydraulic hoses 2900 and 2901 to heavy-duty winch. (WP 0069)

**WARNING**

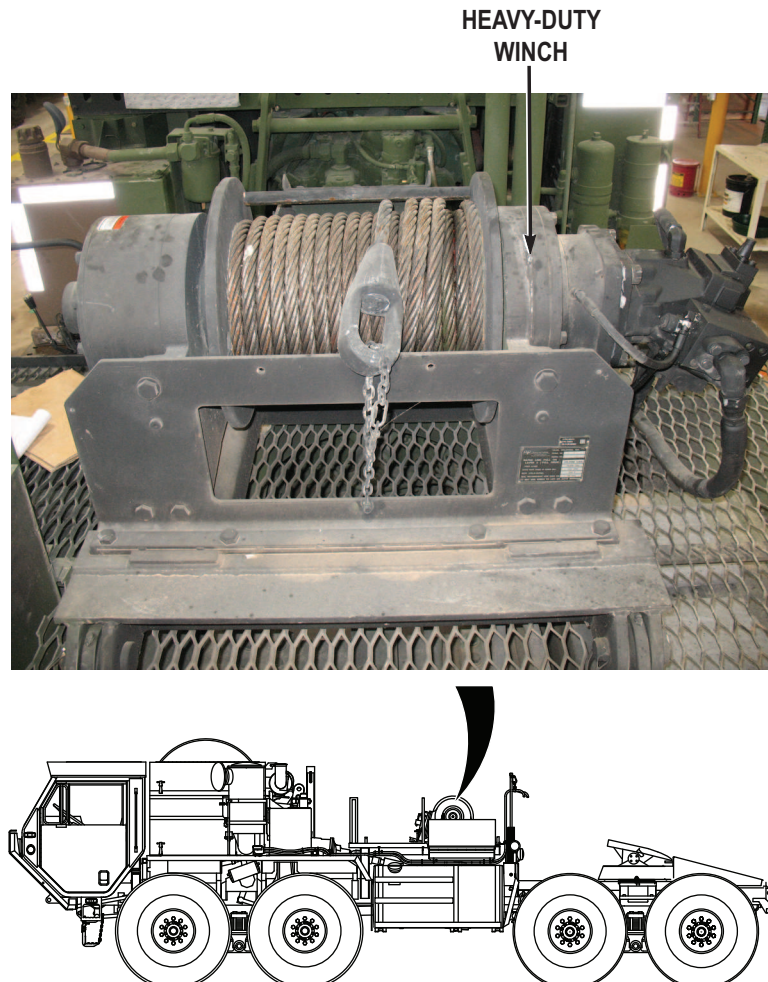
Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

4. Start engine (refer to TM 9-2320-279-10).
5. Set PTO ENGAGE switch to ON position. (WP 0015)

**NOTE**

All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch and at high idle.

6. Prepare vehicle for heavy-duty winch operation. (WP 0015)



*Figure 5.*

7. Perform load test in accordance with unit SOP. (WP 0015)
8. Observe operation of winch.
9. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
10. Disconnect and stow heavy-duty winch. (WP 0015)
11. Set PTO ENGAGE switch to OFF position. (WP 0015)
12. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Does winch pull load?

**DECISION**

No - Problem not corrected. Notify Supervisor.

Yes - Problem corrected.

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**WINCH HIGH SPEED DOES NOT OPERATE OR WINCH DOES NOT SHIFT TO LOWER SPEED UNDER HEAVY LOAD**

---

**INITIAL SETUP:**

**Tools and Special Tools**

Cap and Plug Set (WP 0081, Table 2, Item 1)  
Kit, Hydraulic Test (WP 0081, Table 2, Item 2)  
Pan, Drain, 4 Gallon (WP 0081, Table 2, Item 3)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Wrench, 18 in. Adjustable (WP 0081, Table 2, Item 6)  
Goggles, Industrial (WP 0081, Table 2, Item 7)

**Personnel Required**

Wheeled Vehicle Mechanic 63B (2)

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).  
Parking brake applied (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

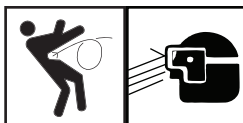
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**TROUBLESHOOTING PROCEDURE**

**WINCH HIGH SPEED DOES NOT OPERATE OR WINCH DOES NOT SHIFT TO LOWER SPEED UNDER HEAVY LOAD**

**TEST 1 - Are 20 gpm (76 lpm) flow and 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?**

**WARNING**



- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

1. Place suitable drain pan under heavy-duty winch assembly prior to removing hoses.



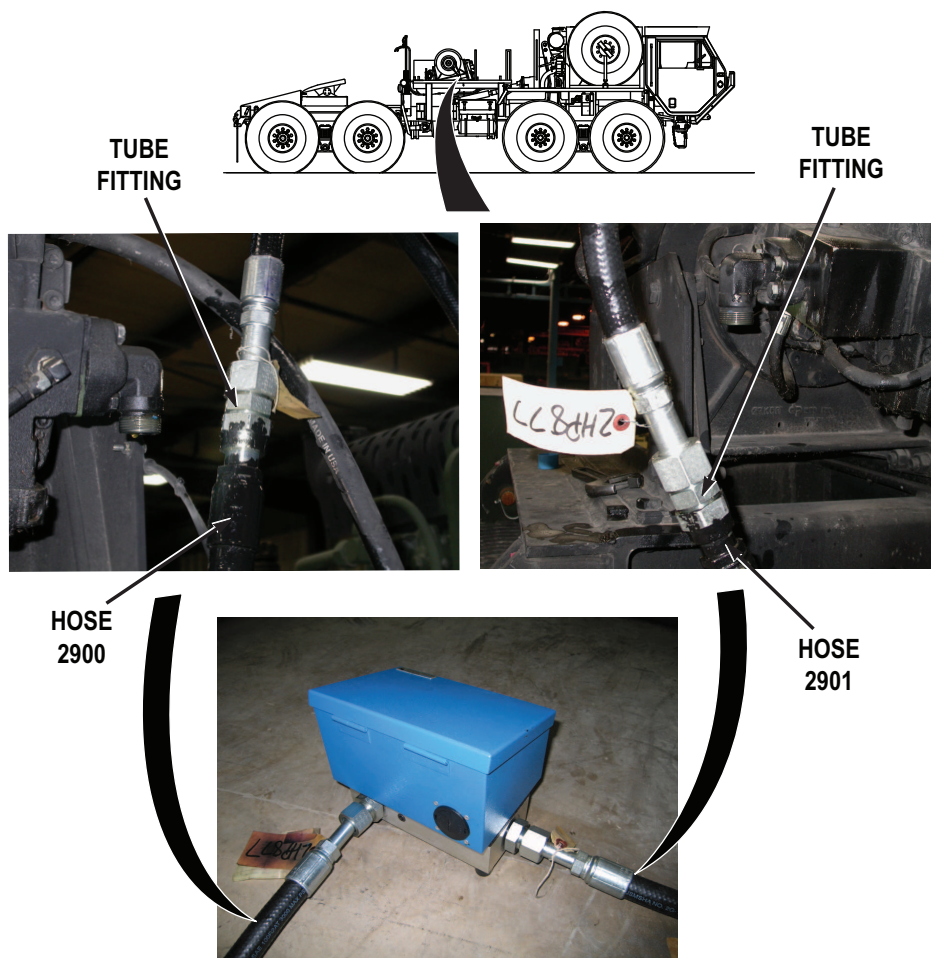


Figure 1.

2. Disconnect hydraulic hoses 2900 and 2901 from heavy-duty winch. Refer to schematics. (WP 0069)
3. Install hydraulic flow tester inlet hose to hydraulic hose 2901.
4. Install hydraulic flow tester output hose to hydraulic hose 2900.
5. Pull selector valve out. (WP 0015)

**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

6. Start engine (refer to TM 9-2320-279-10).
7. Set PTO ENGAGE switch to ON position. (WP 0015)



**NOTE**

- All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch and at high idle.
  - Winch is bypassed for this test, and cable will not pay out or reel in.
  - When performing test, winch control valve must be fully engaged or test readings will be faulty.
  - Relief pressure is obtained when flow reading drops off and pressure reading on gauge does not increase further.
8. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
  9. Have assistant operate heavy-duty winch IN manual control, while closing off load valve on hydraulic flow tester until relief pressure is obtained. (WP 0015)
  10. Note reading on flow and pressure gauges when pressure relief is obtained.
  11. Have assistant release winch control.
  12. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
  13. Set PTO ENGAGE switch to OFF position. (WP 0015)
  14. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Are 20 gpm (76 lpm) flow and 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?

**DECISION**

No - Replace heavy-duty winch control valve (relief valve faulty). (WP 0072) Test 2 - Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?  
Yes - Replace heavy-duty winch motor. (WP 0068) Test 3 - Does winch operate and shift to lower speed under load?

**TEST 2 - Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?****WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

**NOTE**

- This procedure checks hydraulic pump output pressure after replacing heavy-duty winch relief valve.
- If hydraulic flow tester was disconnected, reconnect tester on hydraulic hoses 2900 and 2901 per previous test.

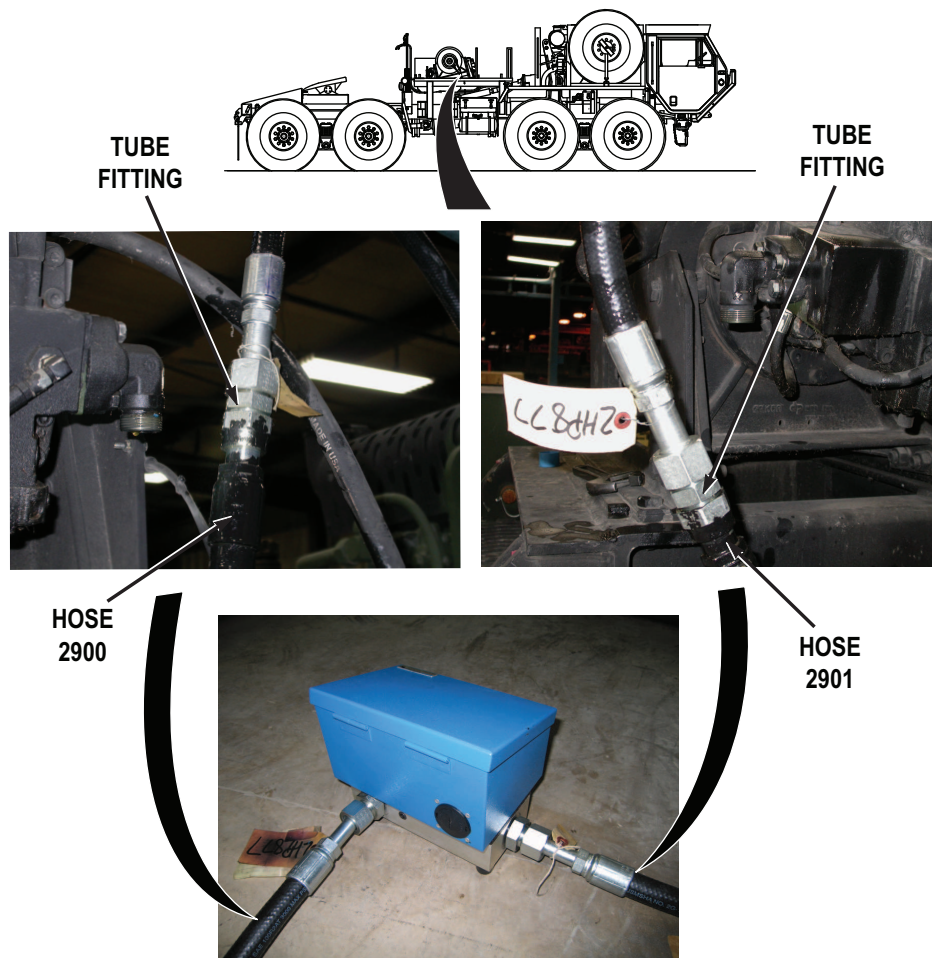


Figure 2.

1. Start engine (refer to TM 9-2320-279-10).
2. Set PTO ENGAGE switch to ON position. (WP 0015)

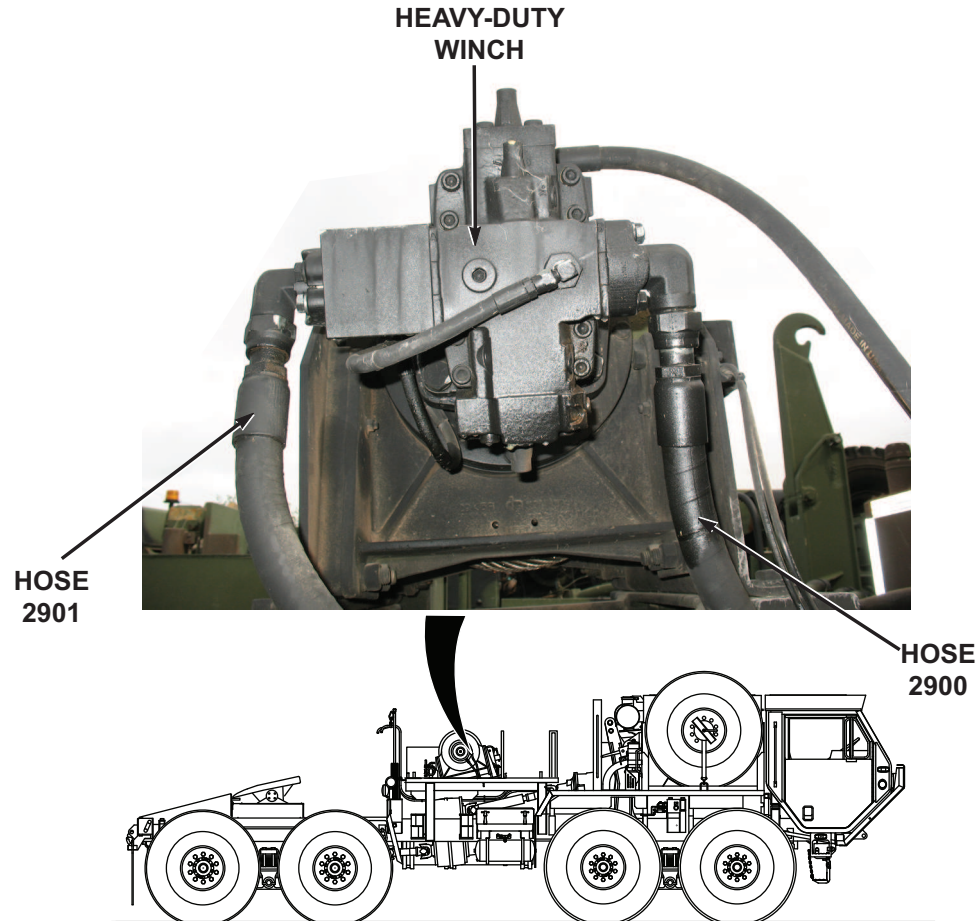


Figure 3.

**NOTE**

- All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch and at high idle.
  - Winch is bypassed for this test, and cable will not pay out or reel in.
  - When performing test, winch control valve must be fully engaged or test readings will be faulty.
  - Relief pressure is obtained when flow reading drops off and pressure reading on gauge does not increase further.
3. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
  4. Have assistant operate heavy-duty winch IN manual control, while closing off load valve on hydraulic flow tester until relief pressure is obtained. (WP 0015)
  5. Note reading on pressure gauge.
  6. Have assistant release winch control.
  7. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
  8. Set PTO ENGAGE switch to OFF position. (WP 0015)
  9. Shut OFF engine (refer to TM 9-2320-279-10).

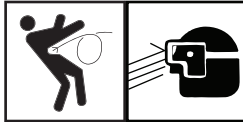
**CONDITION/INDICATION**

Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?

**DECISION**

No - Replace hydraulic pump. (WP 0068) Test 3 - Does winch operate and shift to lower speed under load?

Yes - Test 3 - Does winch operate and shift to lower speed under load?

**TEST 3 - Does winch operate and shift to lower speed under load?****WARNING**

- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

**CAUTION**

Do not let cable end run into heavy-duty winch while reeling IN, or damage to equipment will result.

1. Remove hydraulic flow tester inlet hose from hydraulic hose 2901.

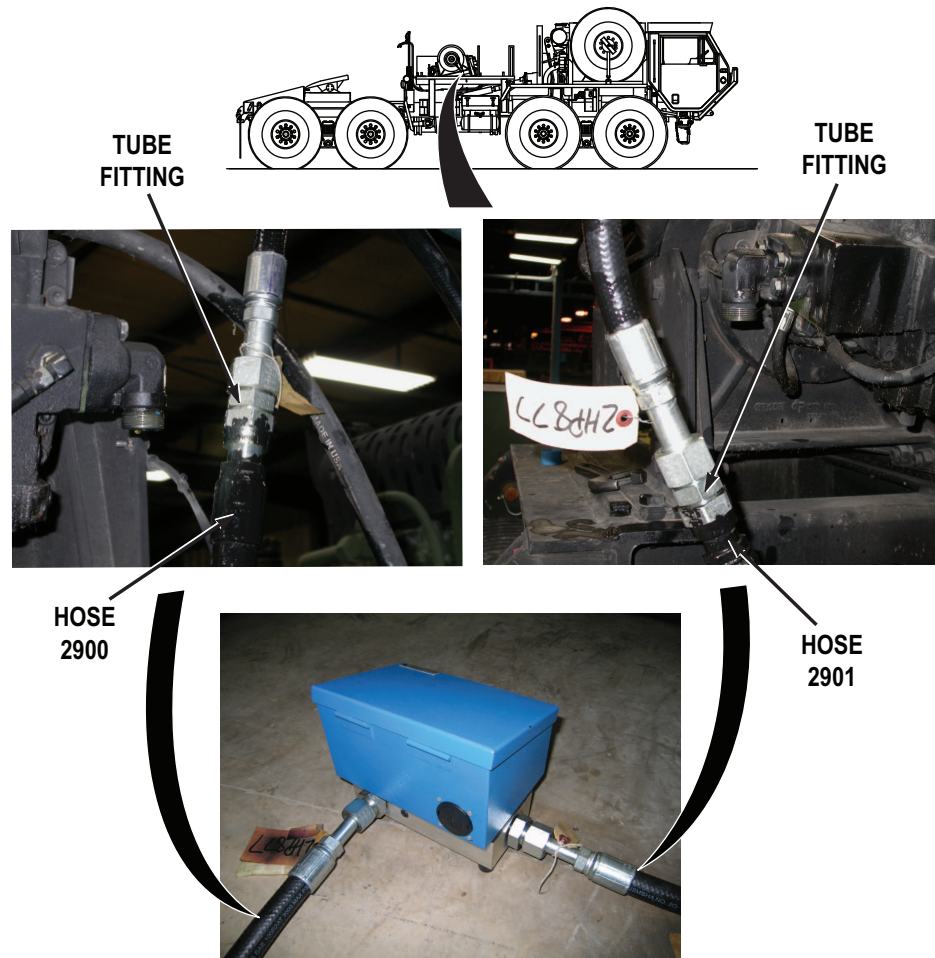


Figure 4.

2. Remove hydraulic flow tester output hose from hydraulic hose 2900.
3. Connect hydraulic hoses 2900 and 2901 to heavy-duty winch. (WP 0069)

### WARNING



Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

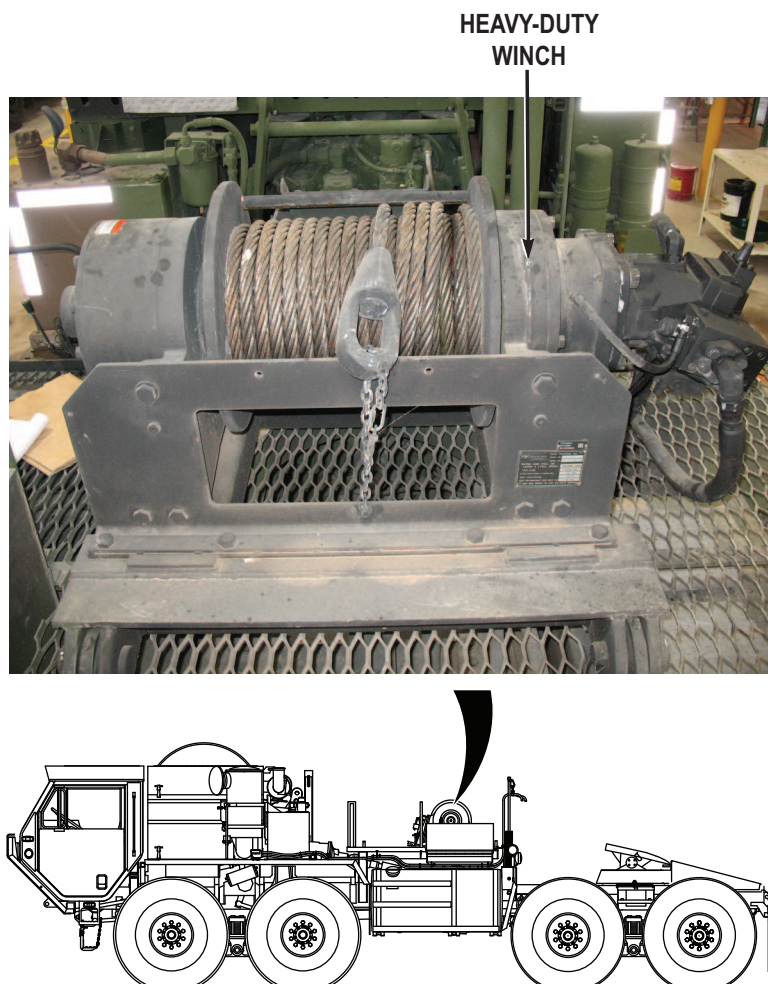
4. Start engine (refer to TM 9-2320-279-10).
5. Set PTO ENGAGE switch to ON position. (WP 0015)



**NOTE**

All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch and at high idle.

6. Prepare vehicle for heavy-duty winch operation. (WP 0015)



*Figure 5.*

7. Perform load test in accordance with unit SOP. (WP 0015)
8. Observe winch operation.
9. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
10. Disconnect and stow heavy-duty winch. (WP 0015)
11. Set PTO ENGAGE switch to OFF position. (WP 0015)
12. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Does winch operate and shift to lower speed under load?

**DECISION**

No - Problem not corrected. Notify Supervisor.

Yes - Problem corrected.

**END OF WORK PACKAGE**





## FIELD MAINTENANCE

### WINCH MAKES EXCESSIVE OR UNUSUAL NOISE, OPERATES SLOWLY, OR JERKS

#### INITIAL SETUP:

##### Tools and Special Tools

Cap and Plug Set (WP 0081, Table 2, Item 1)  
 Kit, Hydraulic Test (WP 0081, Table 2, Item 2)  
 Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
 Wrench, 18 in. Adjustable (WP 0081, Table 2, Item 6)  
 Goggles, Industrial (WP 0081, Table 2, Item 7)

##### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

##### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).  
 Parking brake applied (refer to TM 9-2320-279-10).  
 Wheels chocked (refer to TM 9-2320-279-10).

#### TROUBLESHOOTING PROCEDURE

##### WINCH MAKES EXCESSIVE OR UNUSUAL NOISE, OPERATES SLOWLY, OR JERKS

##### TEST 1 - Is fluid at proper level in hydraulic reservoir?

1. Check that hydraulic fluid in sight glass is at FULL COLD mark (refer to TM 9-2320-279-10).
2. If hydraulic fluid is below FULL COLD mark, add hydraulic fluid as required (refer to TM 9-2320-279-10).

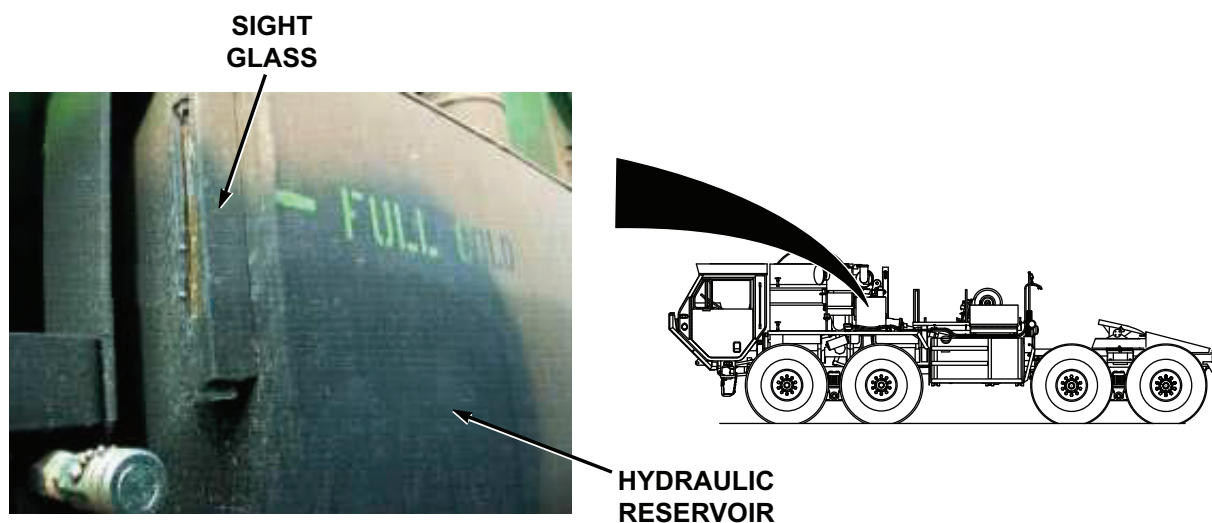


Figure 1.

#### CONDITION/INDICATION

Is fluid at proper level in hydraulic reservoir?

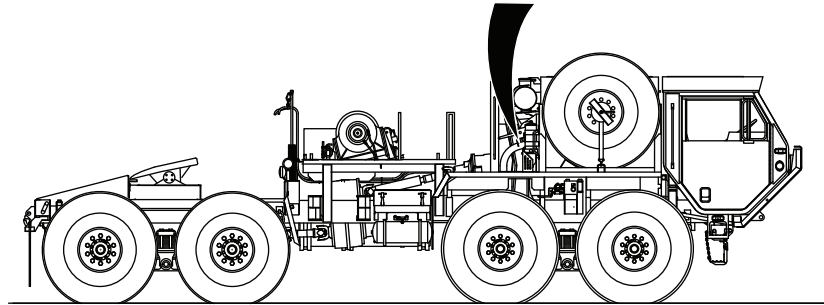
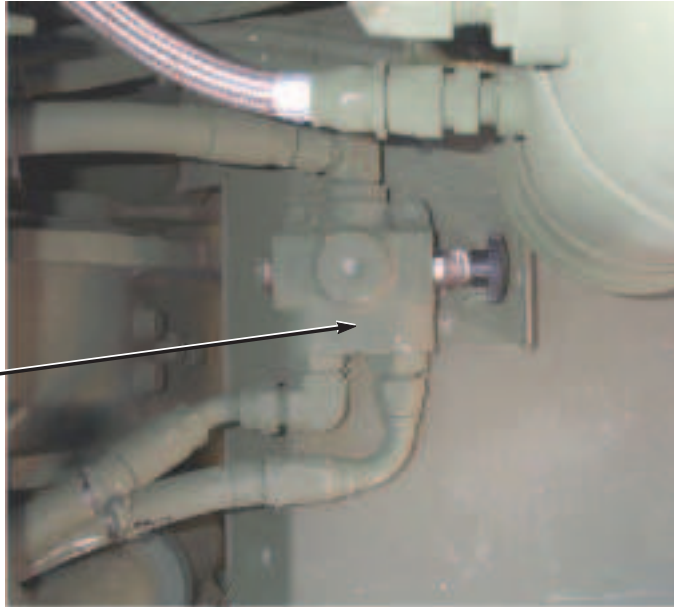
#### DECISION

No - Test 8 - Does heavy-duty winch operate normally?  
 Yes - Test 2 - Is selector valve in OUT position?

**TEST 2 - Is selector valve in OUT position?**

1. Check position of selector valve.
2. If selector valve is not completely pulled out, clear any obstructions present and pull selector valve completely out. (WP 0015)

**SELECTOR VALVE  
(OUT POSITION SHOWN)**



*Figure 2.*

**CONDITION/INDICATION**

Is selector valve in OUT position?

**DECISION**

No - Test 8 - Does heavy-duty winch operate normally?

Yes - Test 3 - Are heavy-duty winch brake control hoses and fittings free of leaks, crimps, or damage?

**TEST 3 - Are heavy-duty winch brake control hoses and fittings free of leaks, crimps, or damage?**

1. Inspect heavy-duty winch brake control hoses and fittings for leaks, crimps, and damage.

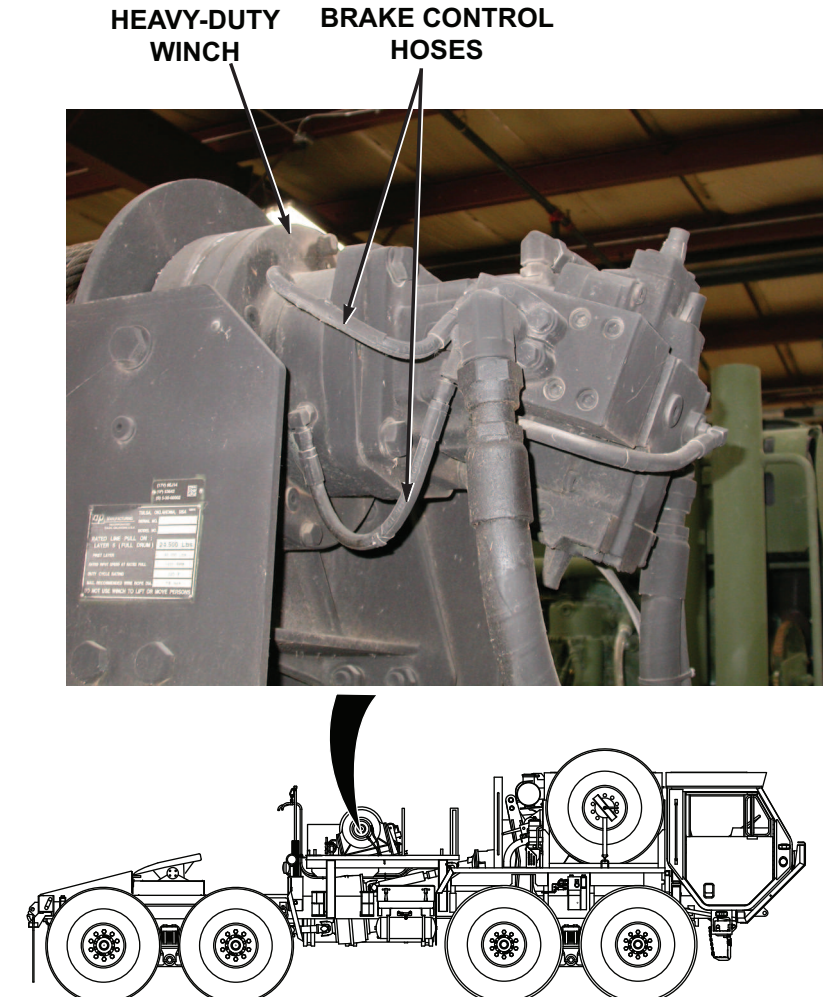


Figure 3.

#### CONDITION/INDICATION

Are heavy-duty winch brake control hoses and fittings free of leaks, crimps, or damage?

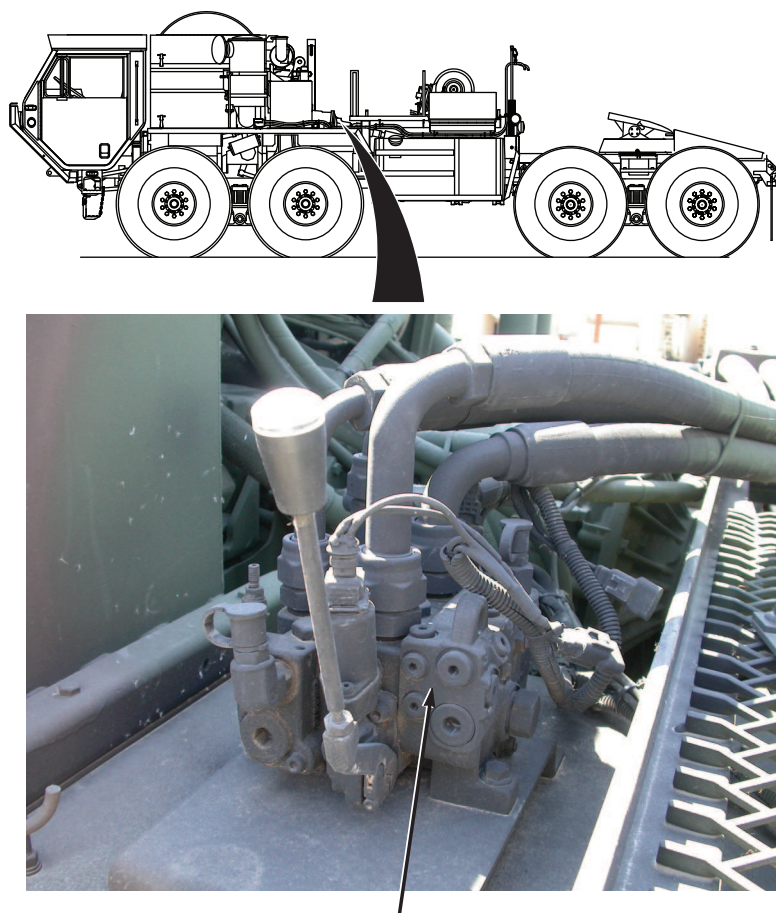
#### DECISION

No - Tighten or replace damaged heavy-duty winch brake control hoses and fittings. (WP 0068) Test 8 - Does heavy-duty winch operate normally?

Yes - Test 4 - Is heavy-duty winch control valve free of leaks or damage?

#### TEST 4 - Is heavy-duty winch control valve free of leaks or damage?

1. Inspect heavy-duty winch control valve for leaks or damage.



**HEAVY-DUTY  
WINCH CONTROL**

*Figure 4.*

#### **CONDITION/INDICATION**

Is heavy-duty winch control valve free of leaks or damage?

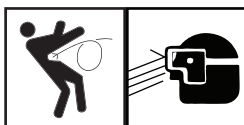
#### **DECISION**

No - Replace heavy-duty winch control valve. (WP 0072) Test 8 - Does heavy-duty winch operate normally?

Yes - Test 5 - Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?

**TEST 5 - Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?**

#### **WARNING**



- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.

- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

1. Place suitable drain pan under heavy-duty winch assembly prior to removing hoses.

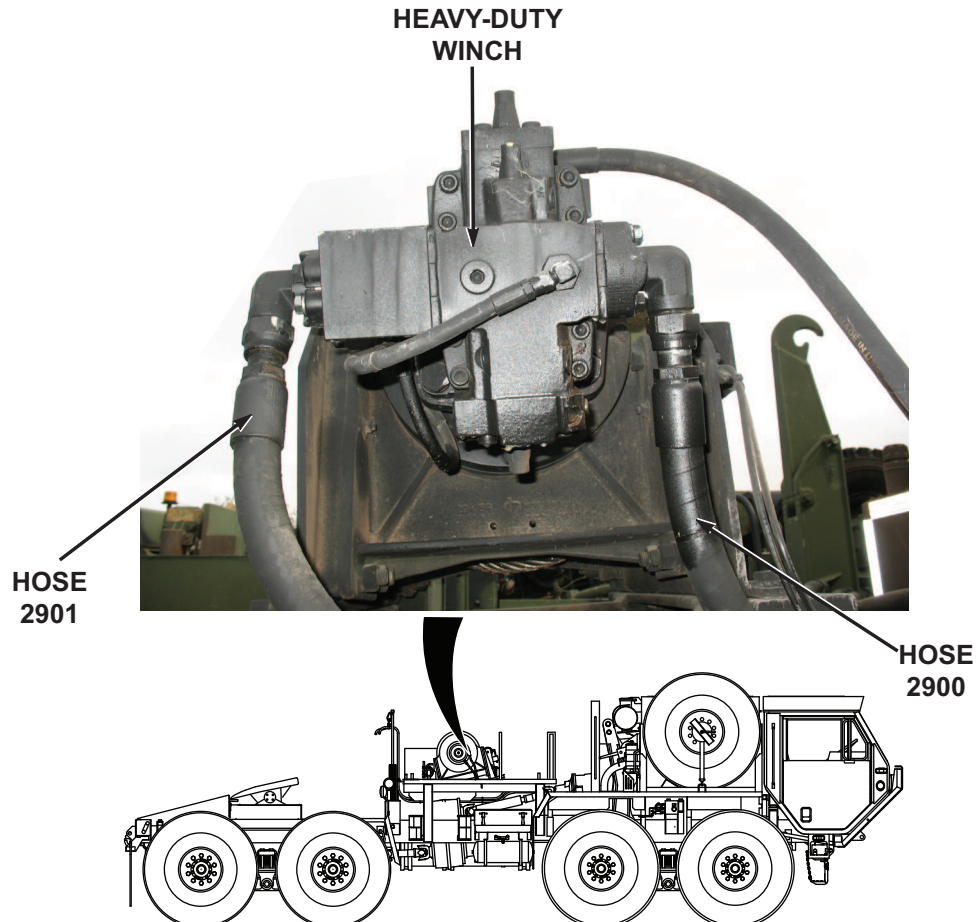


Figure 5.

2. Disconnect hydraulic hoses 2900 and 2901 from heavy-duty winch. Cap fittings on winch assembly. Refer to schematics. (WP 0069)
3. Install hydraulic flow tester inlet hose to hydraulic hose 2901.



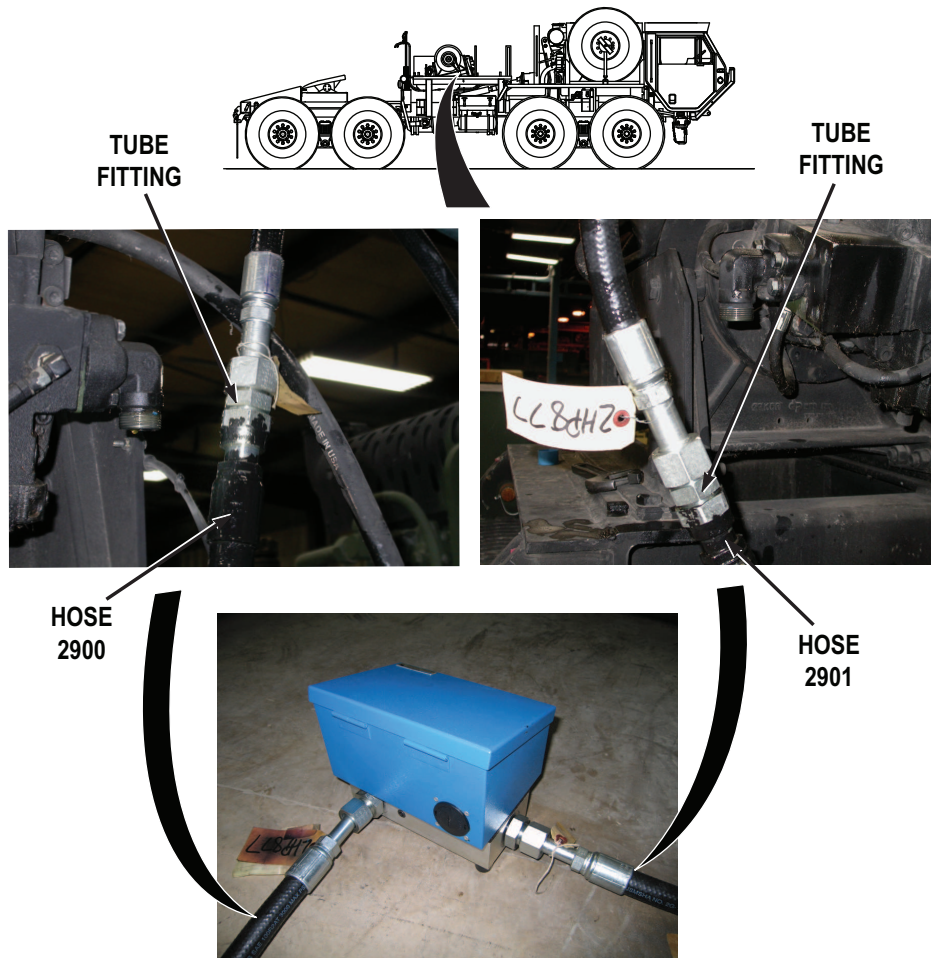


Figure 6.

4. Install hydraulic flow tester output hose to hydraulic hose 2900.

**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

5. Start engine (refer to TM 9-2320-279-10).
6. Set PTO ENGAGE switch to ON position. (WP 0015)

**NOTE**

- All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch and at high idle.

- Winch is bypassed for this test, and cable will not pay out or reel in.
  - When performing test, winch control valve must be fully engaged or test readings will be faulty.
  - Relief pressure is obtained when flow reading drops off and pressure reading on gauge does not increase further.
7. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
  8. Have assistant operate heavy-duty winch IN manual control, while closing off load valve on hydraulic flow tester until relief pressure is obtained. (WP 0015)
  9. Note reading on pressure gauge when pressure relief is obtained.
  10. Have assistant release winch control.
  11. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
  12. Set PTO ENGAGE switch to OFF position. (WP 0015)
  13. Shut OFF engine (refer to TM 9-2320-279-10).
  14. Remove hydraulic flow tester inlet hose from hydraulic hose 2901.

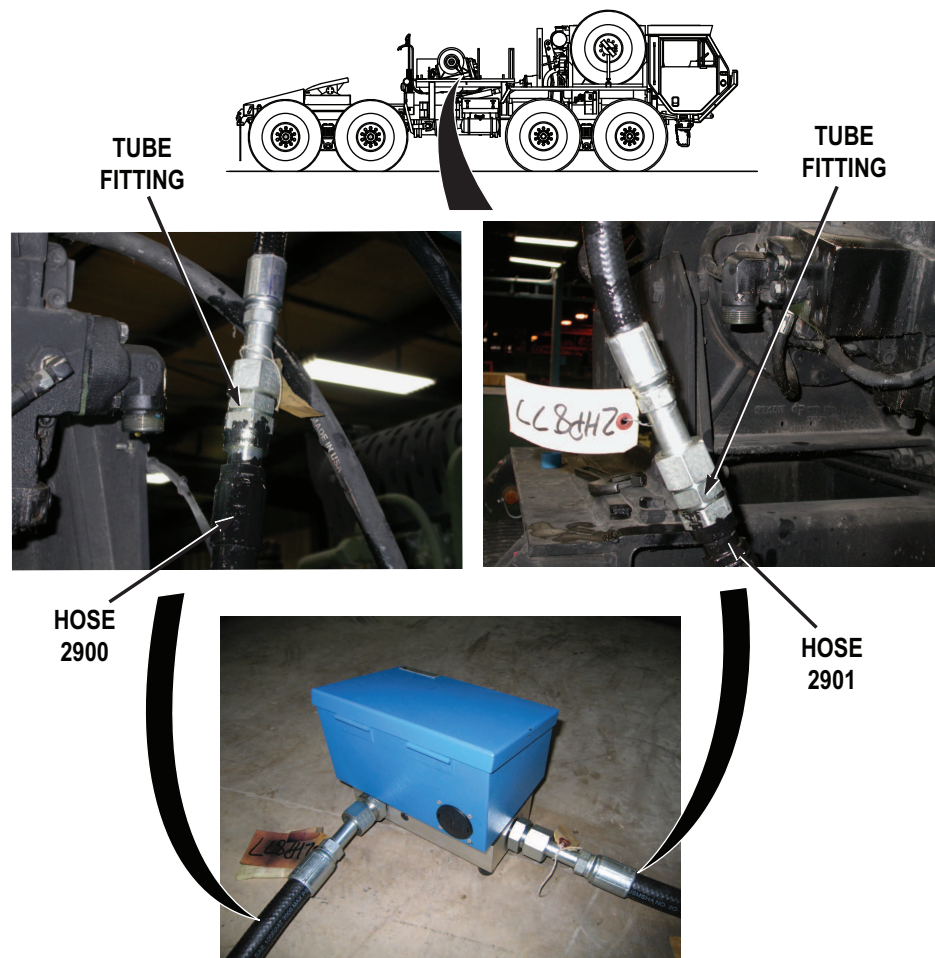


Figure 7.

15. Remove hydraulic flow tester output hose from hydraulic hose 2900.
16. Connect hydraulic hoses 2900 and 2901 to heavy-duty winch. (WP 0069)

**CONDITION/INDICATION**

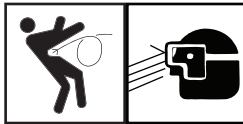
Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?

**DECISION**

No - Troubleshoot: Winch Will Not Operate in Either Direction. (WP 0032)

Yes - Test 6 - Is more than 270 psi (1 861 kPa) measured on winch hydraulic brake release hose?

**TEST 6 - Is more than 270 psi (1 861 kPa) measured on winch hydraulic brake release hose?**

**WARNING**

- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
  - Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
  - Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.
1. Place suitable drain pan under heavy-duty winch assembly prior to removing hose.
  2. Disconnect winch brake release hose at winch brake. Cap fitting on winch brake assembly. Refer to schematics.
  3. Connect 0 to 6000 psi (0 to 41 370 kPa) pressure gauge to winch brake release hose.

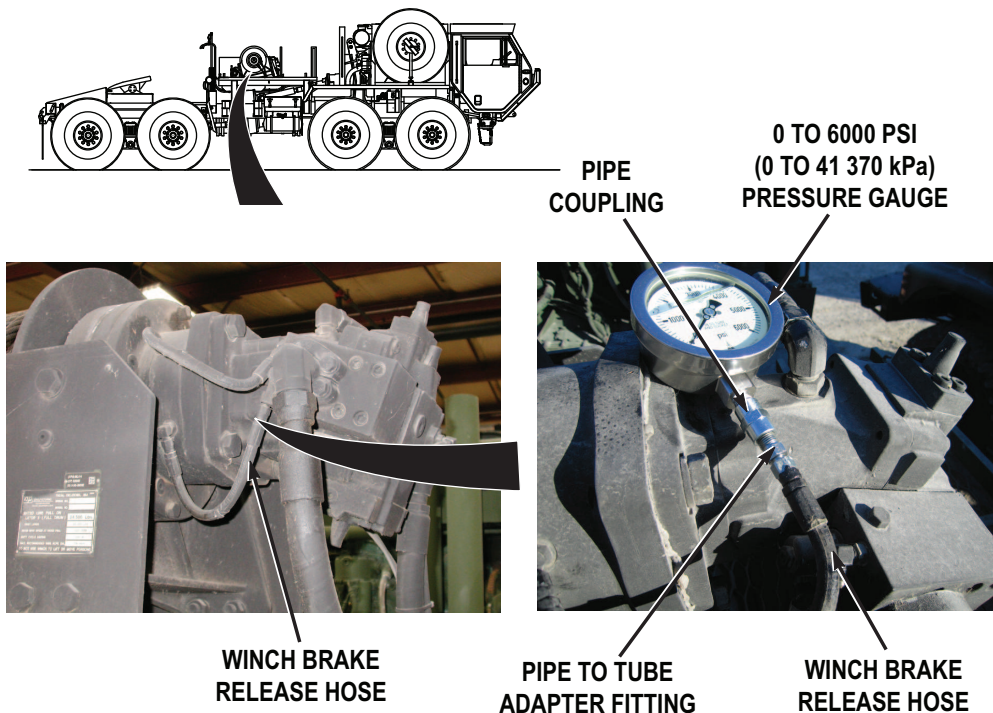


Figure 8.



**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

4. Start engine. (refer to TM 9-2320-279-10).
5. Set PTO ENGAGE switch to ON position. (WP 0015)
6. Have assistant operate heavy-duty winch IN and OUT manual controls, while noting reading on pressure gauge. (WP 0015)
7. Set PTO ENGAGE switch to OFF position. (WP 0015)
8. Shut OFF engine (refer to TM 9-2320-279-10).
9. Disconnect pressure gauge and reconnect hydraulic hose to winch brake fitting.

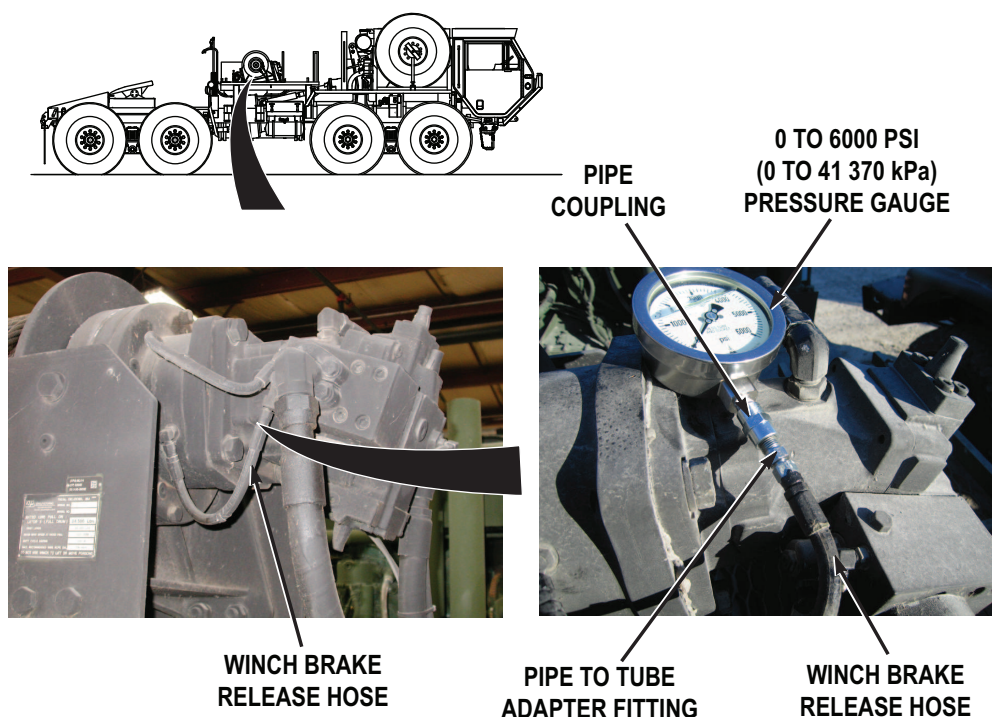


Figure 9.

**CONDITION/INDICATION**

Is more than 270 psi (1 861 kPa) measured on winch hydraulic brake release hose?

**DECISION**

No - Replace heavy-duty winch counterbalance valve. (WP 0071) Test 8 - Does heavy-duty winch operate normally?

Yes - Test 7 - Is winch motor free from excessive noise, jerking, or slow operation when removed from winch assembly?

**TEST 7 - Is winch motor free from excessive noise, jerking, or slow operation when removed from winch assembly?****WARNING**

When testing winch motor, keep hands and loose clothing away from rotating shaft and other winch components. Failure to comply may result in injury or death to personnel.

**NOTE**

- In the following test procedure, do not remove hydraulic hoses or counterbalance valve from winch motor.
- All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch.

1. Remove and secure winch motor from winch assembly. Do not disconnect hoses. (WP 0068)

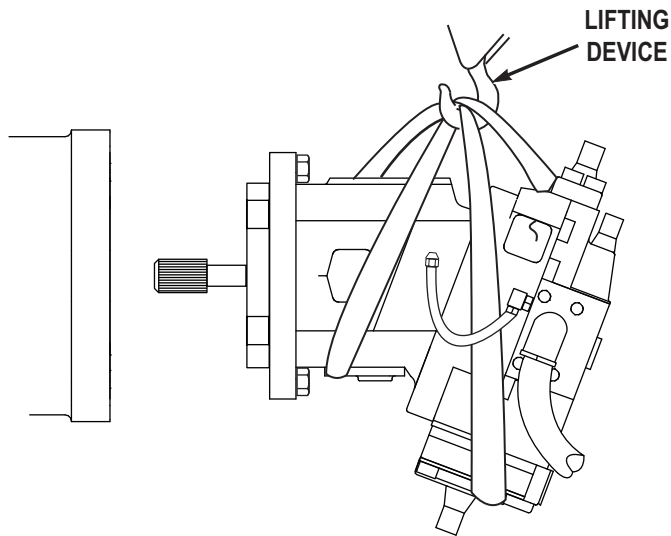


Figure 10.

**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

2. Start engine (refer to TM 9-2320-279-10).
3. Set PTO ENGAGE switch to ON position. (WP 0015)

### NOTE

Winch drum will not move during this test.

4. Have assistant operate heavy-duty winch controls while observing winch motor operation. (WP 0015)
5. Set PTO ENGAGE switch to OFF position. (WP 0015)
6. Shut OFF engine (refer to TM 9-2320-279-10).

### CONDITION/INDICATION

Is winch motor free from excessive noise, jerking, or slow operation when removed from winch assembly?

### DECISION

No - Replace winch motor. (WP 0068) Test 8 - Does heavy-duty winch operate normally?  
Yes - Replace winch assembly. (WP 0076) Test 8 - Does heavy-duty winch operate normally?

### TEST 8 - Does heavy-duty winch operate normally?

### CAUTION

Do not let cable end run into heavy-duty winch while reeling IN. Failure to comply may result in damage to equipment.

1. If removed, install winch motor on winch assembly. (WP 0068)

### WARNING

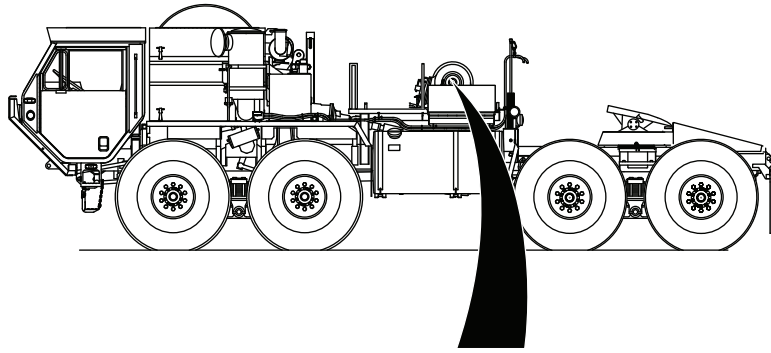


Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

2. Start engine (refer to TM 9-2320-279-10).
3. Set PTO ENGAGE switch to ON position. (WP 0015)

### NOTE

- All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch.
  - Pay out approximately 75 ft. (23 m) of cable to perform test.
4. Prepare vehicle for heavy-duty winch operation. (WP 0015)



**HEAVY-DUTY  
WINCH**

*Figure 11.*

5. While assistant operates heavy-duty winch manual controls, observe heavy-duty winch operation. (WP 0015)
6. Stow heavy-duty winch. (WP 0015)
7. Set PTO ENGAGE switch to OFF position. (WP 0015)
8. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Does heavy-duty winch operate normally?

**DECISION**

No - Problem not corrected. Notify Supervisor.  
Yes - Problem corrected.

**END OF WORK PACKAGE**

## FIELD MAINTENANCE WINCH WILL NOT OPERATE IN EITHER DIRECTION

### INITIAL SETUP:

#### Tools and Special Tools

Cap and Plug Set (WP 0081, Table 2, Item 1)  
 Kit, Hydraulic Test (WP 0081, Table 2, Item 2)  
 Pan, Drain, 4 Gallon (WP 0081, Table 2, Item 3)  
 Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
 Wrench, 18 in. Adjustable (WP 0081, Table 2, Item 6)  
 Goggles, Industrial (WP 0081, Table 2, Item 7)

#### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

#### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).  
 Parking brake applied (refer to TM 9-2320-279-10).  
 Wheels chocked (refer to TM 9-2320-279-10).

### TROUBLESHOOTING PROCEDURE WINCH WILL NOT OPERATE IN EITHER DIRECTION

#### TEST 1 - Is fluid at proper level in hydraulic reservoir?

1. Check that hydraulic fluid in sight glass is at FULL COLD mark (refer to TM 9-2320-279-10).
2. If hydraulic fluid is below FULL COLD mark, add hydraulic fluid as required (refer to TM 9-2320-279-10).

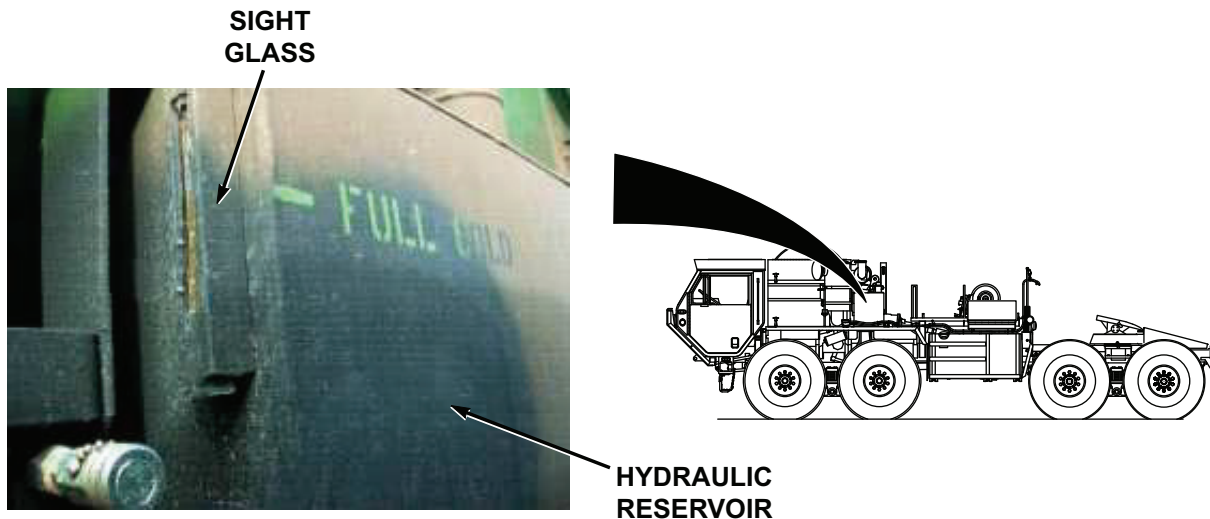


Figure 1.

#### CONDITION/INDICATION

Is fluid at proper level in hydraulic reservoir?

**DECISION**

No - Test 13 - Does heavy-duty winch operate in both directions?

Yes - Test 2 - Is air pressure present in air line 2706 at heavy-duty winch clutch connector, when WINCH KICKOUT control valve is in the ENGAGED position?

**TEST 2 - Is air pressure present in air line 2706 at heavy-duty winch clutch connector, when WINCH KICKOUT control valve is in the ENGAGED position?**

**WARNING**

If air lines are under pressure when they are disconnected, they can whip around. Use care when loosening or disconnecting air line fittings. Failure to comply may result in injury or death to personnel.

**WARNING**

Wear proper eye protection when performing leakage tests or disconnecting air lines that may be under pressure. Failure to comply may result in injury or death to personnel.

1. Pull heavy-duty winch control station WINCH KICKOUT control valve out to DISENGAGE position. (WP 0010)

**NOTE**

Perform Steps (2) through (4) only if vehicle air pressure is not above 85 psi (586 kPa).

2. Start engine (refer to TM 9-2320-279-10).
3. Allow vehicle air pressure to build to 100 psi (690 kPa).
4. Shut off engine (refer to TM 9-2320-279-10).
5. Disconnect air line 2706 from heavy-duty winch clutch assembly. Refer to schematics.



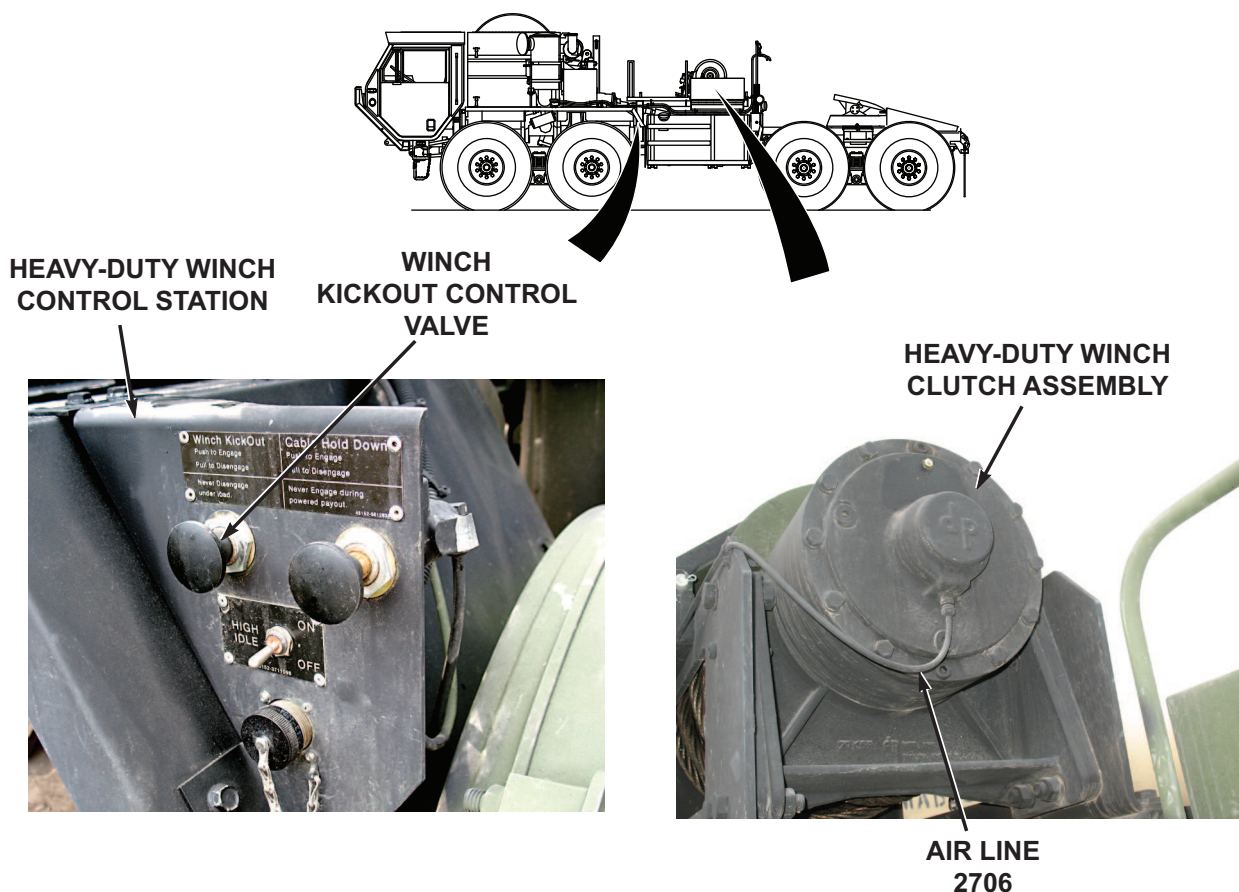


Figure 2.

6. While assistant pushes heavy-duty winch control station WINCH KICKOUT control valve in to ENGAGE position, check for airflow at air line 2706. (WP 0010)
7. Pull heavy-duty winch control station WINCH KICKOUT control valve out to DISENGAGE position. (WP 0010)
8. Connect air line 2706 to heavy-duty winch clutch assembly.

**CONDITION/INDICATION**

Is air pressure present in air line 2706 at heavy-duty winch clutch connector, when WINCH KICKOUT control valve is in the ENGAGED position?

**DECISION**

No - Test 3 - Does heavy-duty winch cable hold down operate, when CABLE HOLD DOWN control valve is in the ENGAGED position?  
 Yes - Test 5 - Are heavy-duty winch hydraulic hoses 2899, 2496, 2883, 2900, and 2901 and fittings free of leaks, crimps, or damage?

**TEST 3 - Does heavy-duty winch cable hold down operate, when CABLE HOLD DOWN control valve is in the ENGAGED position?**

**NOTE**

Perform Steps (1) through (3) only if vehicle air pressure is not above 85 psi (586 kPa).

1. Start engine (refer to TM 9-2320-279-10).

2. Allow vehicle air pressure to build to 100 psi (690 kPa).
3. Shut off engine (refer to TM 9-2320-279-10).
4. While assistant pushes the heavy-duty winch CABLE HOLD DOWN control valve in to ENGAGED position, check if heavy-duty winch cable hold down operates. (WP 0015)

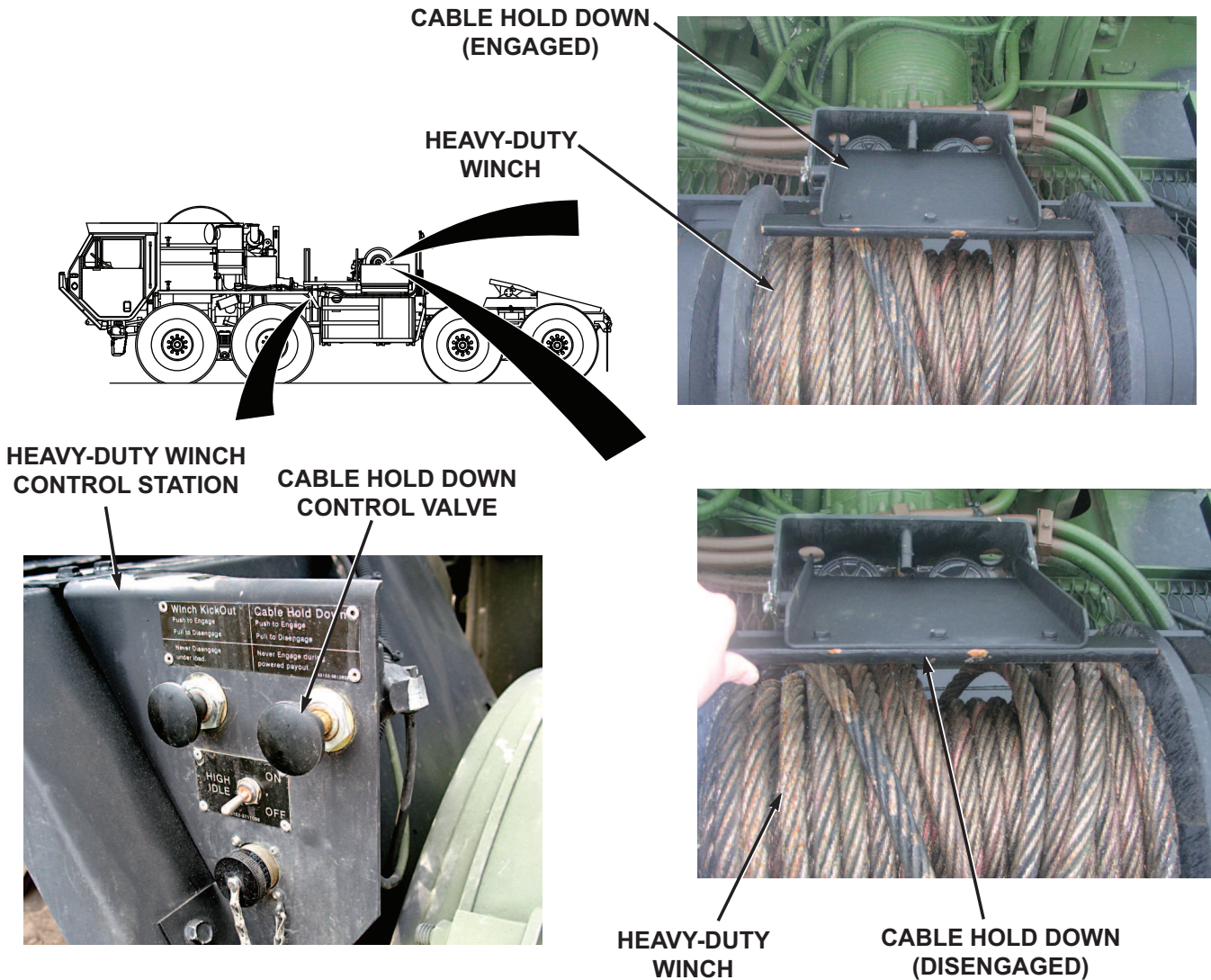


Figure 3.

5. Pull heavy-duty winch control station CABLE HOLD DOWN control valve out to DISENGAGE position. (WP 0010)

#### CONDITION/INDICATION

Does heavy-duty winch cable hold down operate, when CABLE HOLD DOWN control valve is in the ENGAGED position?

#### DECISION

No - Troubleshoot: Cable Hold Down Does Not Operate. (WP 0028)

Yes - Test 4 - Are air lines 2706 and 2763 and fittings free of leaks, crimps, or damage?



**TEST 4 - Are air lines 2706 and 2763 and fittings free of leaks, crimps, or damage?**

1. Push heavy-duty winch control station WINCH KICKOUT control valve in to ENGAGE position. (WP 0010)
2. Inspect air lines 2706 and 2763 and fittings for leaks, crimps, and damage. Refer to schematics.

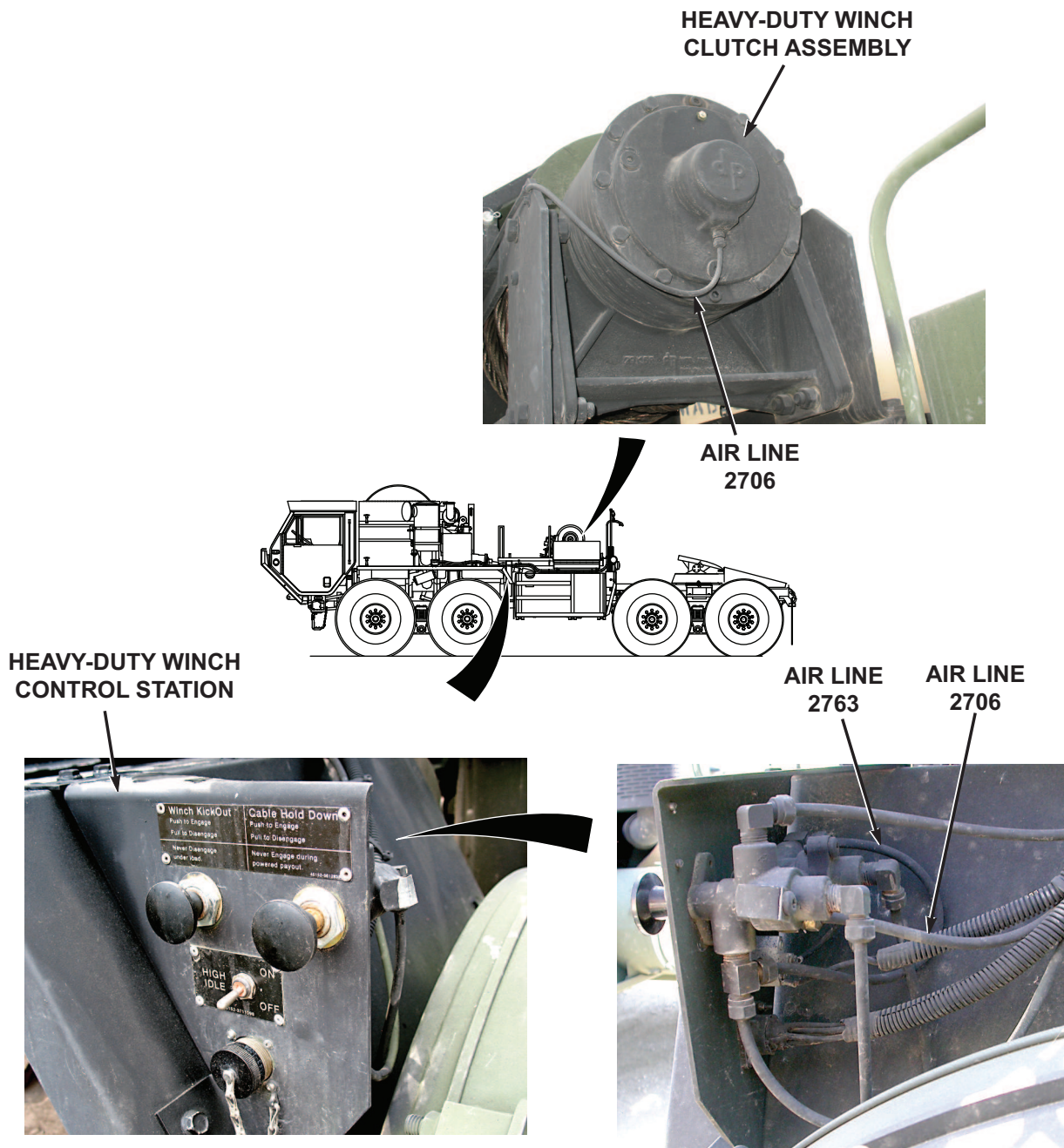


Figure 4.

**CONDITION/INDICATION**

Are air lines 2706 and 2763 and fittings free of leaks, crimps, or damage?

**DECISION**

No - Replace damaged air lines and fittings. (WP 0043)Test 13 - Does heavy-duty winch operate in both directions?

Yes - Replace heavy-duty winch control station WINCH KICKOUT control valve. (WP 0055)Test 13 - Does heavy-duty winch operate in both directions?

**TEST 5 - Are heavy-duty winch hydraulic hoses 2899, 2496, 2883, 2900, and 2901 and fittings free of leaks, crimps, or damage?**

1. Inspect heavy-duty winch hydraulic hoses 2899, 2496, 2883, 2900, and 2901 and fittings for leaks, crimps, and damage. Refer to schematics.

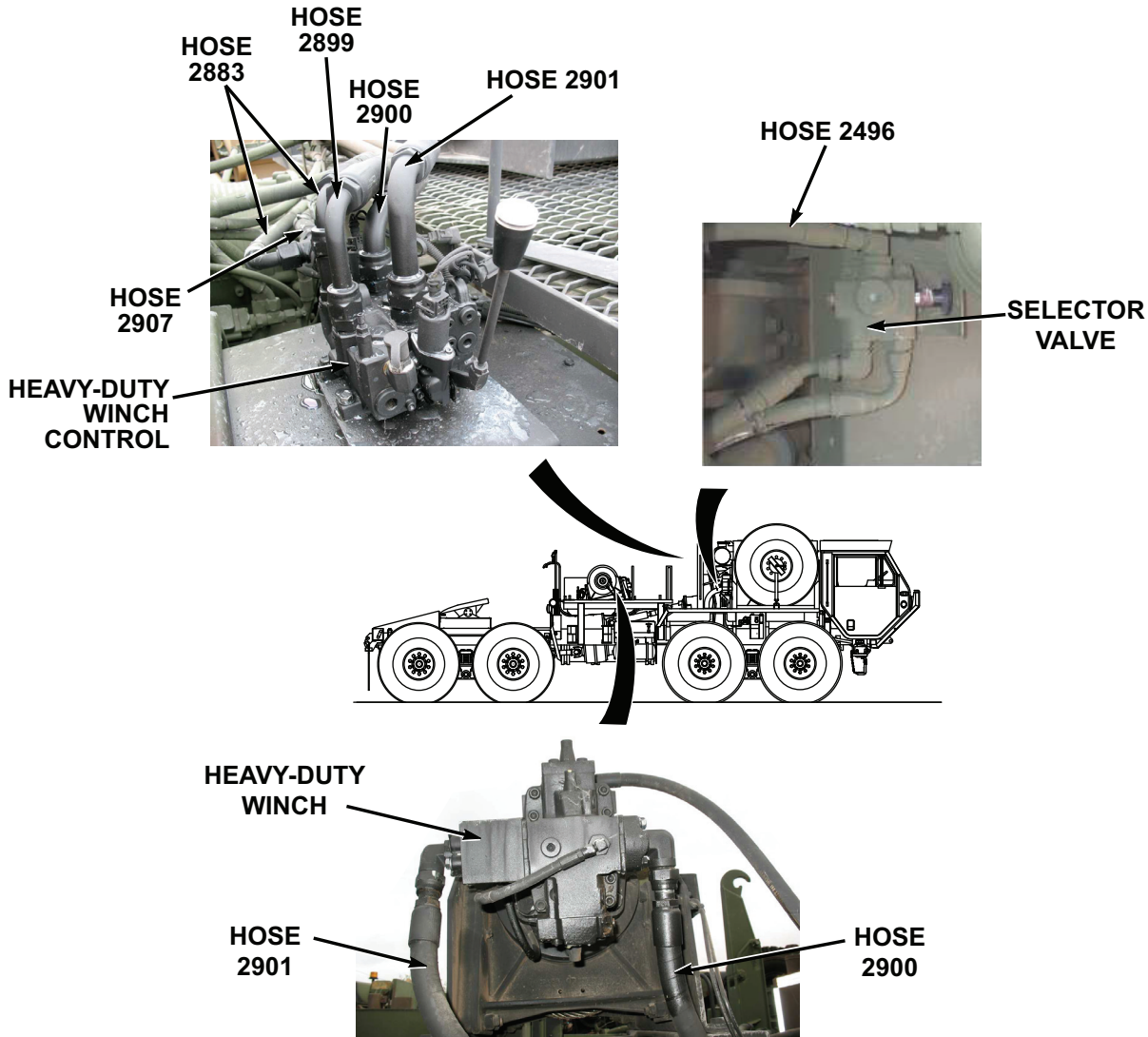


Figure 5.

**CONDITION/INDICATION**

Are heavy-duty winch hydraulic hoses 2899, 2496, 2883, 2900, and 2901 and fittings free of leaks, crimps, or damage?

**DECISION**

No - Tighten or replace damaged hoses and fittings. (WP 0069) Test 13 - Does heavy-duty winch operate in both directions?

Yes - Test 6 - Are heavy-duty winch brake control hoses and fittings free of leaks, crimps, or damage?

**TEST 6 - Are heavy-duty winch brake control hoses and fittings free of leaks, crimps, or damage?**

1. Inspect heavy-duty winch brake control hoses and fittings for leaks, crimps, and damage.

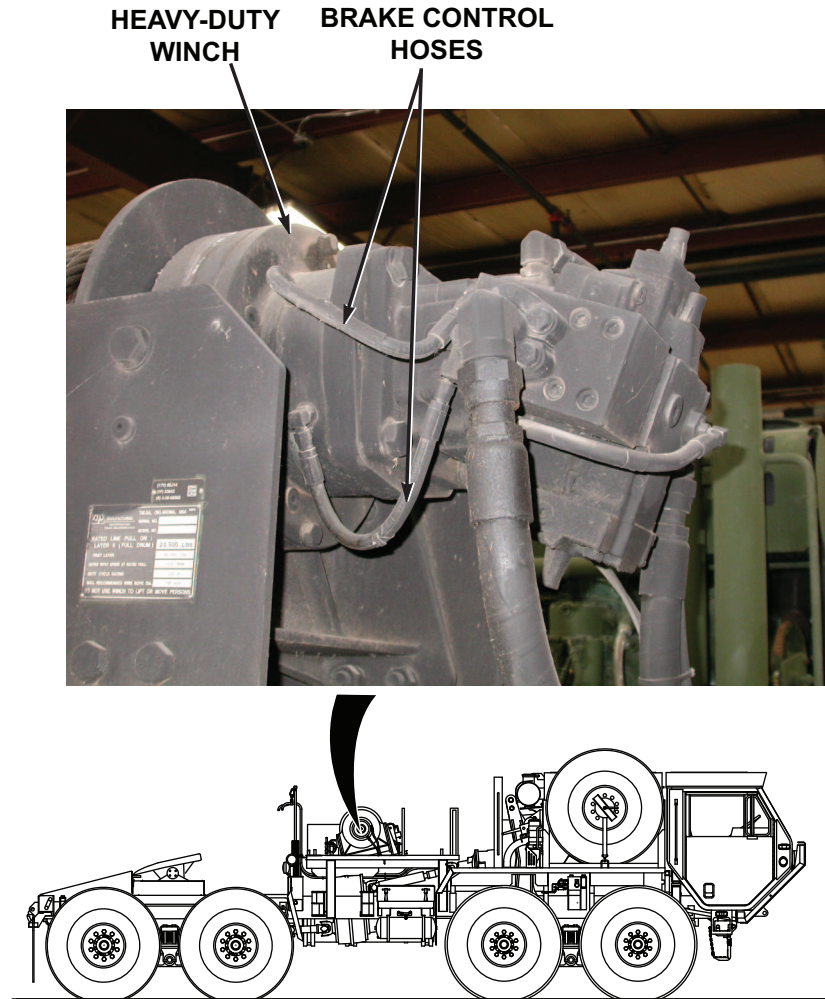


Figure 6.

**CONDITION/INDICATION**

Are heavy-duty winch brake control hoses and fittings free of leaks, crimps, or damage?

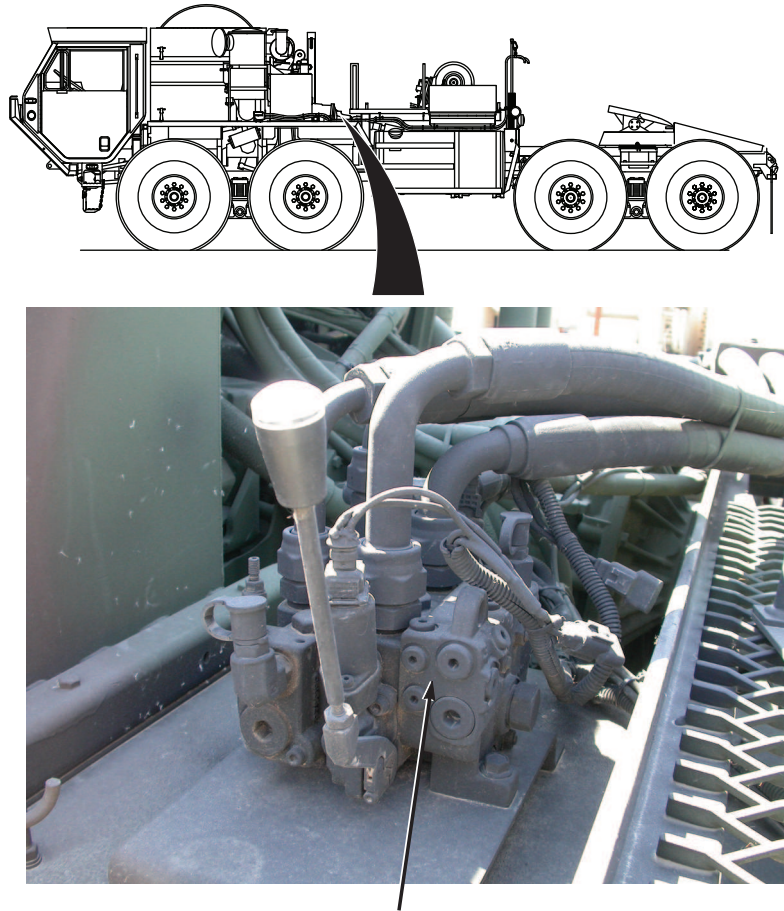
**DECISION**

No - Tighten or replace damaged heavy-duty winch brake control hoses and fittings. (WP 0068) Test 13 - Does heavy-duty winch operate in both directions?

Yes - Test 7 - Is heavy-duty winch control valve free of leaks or damage?

**TEST 7 - Is heavy-duty winch control valve free of leaks or damage?**

1. Inspect heavy-duty winch control valve for leaks or damage.



**HEAVY-DUTY  
WINCH CONTROL**

*Figure 7.*

**CONDITION/INDICATION**

Is heavy-duty winch control valve free of leaks or damage?

**DECISION**

No - Replace heavy-duty winch control valve. (WP 0072) Test 13 - Does heavy-duty winch operate in both directions?

Yes - Test 8 - Is hydraulic power available to system?

**TEST 8 - Is hydraulic power available to system?**

1. Install hydraulic flow tester inlet hose to hydraulic hose 2906 at auxiliary hydraulics supply (male) quick disconnect. Refer to schematics.



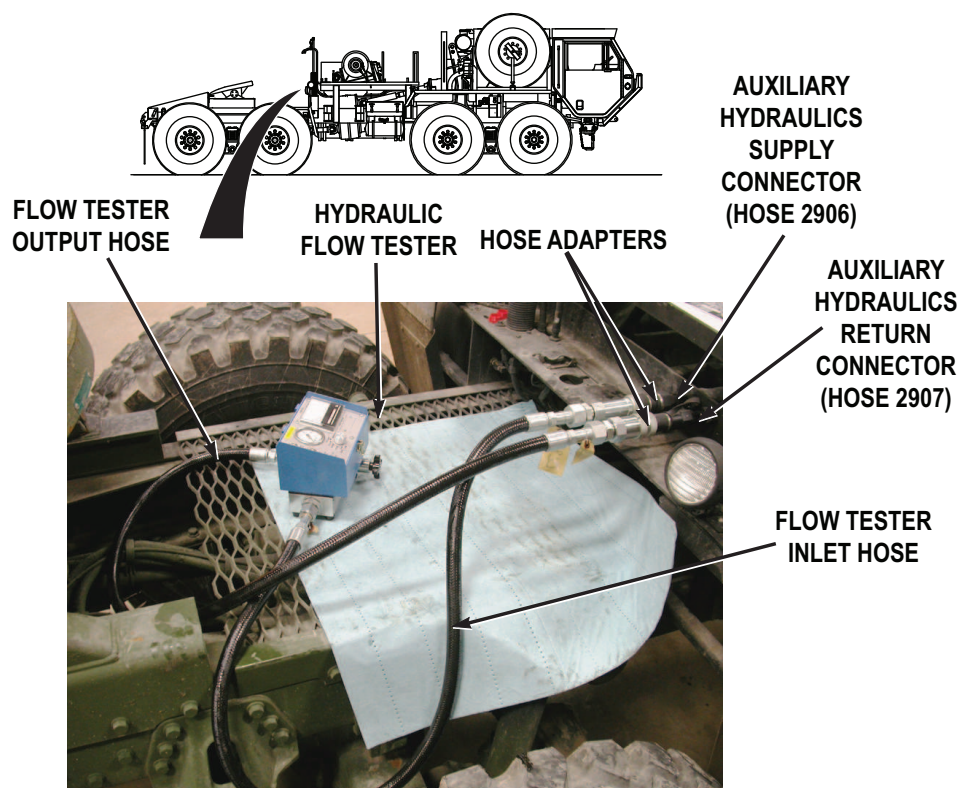


Figure 8.

2. Install hydraulic flow tester output hose to hydraulic hose 2907 at auxiliary hydraulics return (female) quick disconnect.
3. Push selector valve in (refer to TM 9-2320-279-10).
4. Start engine (refer to TM 9-2320-279-10).
5. Set PTO ENGAGE switch to ON position. (WP 0015)

### NOTE

- All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch and at high idle.
  - Relief pressure is obtained when flow reading drops off and pressure reading on gauge does not increase further.
6. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
  7. Close off load valve on hydraulic flow tester until relief pressure is obtained.
  8. Pressure gauge should read at least 2,850 psi (19 650 kPa). Note reading on flow meter and pressure gauge.
  9. Open load valve on hydraulic flow tester.
  10. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
  11. Set PTO ENGAGE switch to OFF position. (WP 0015)
  12. Shut OFF engine (refer to TM 9-2320-279-10).
  13. Remove hydraulic flow tester inlet hose from hydraulic hose 2906 at auxiliary hydraulics supply (male) quick disconnect.

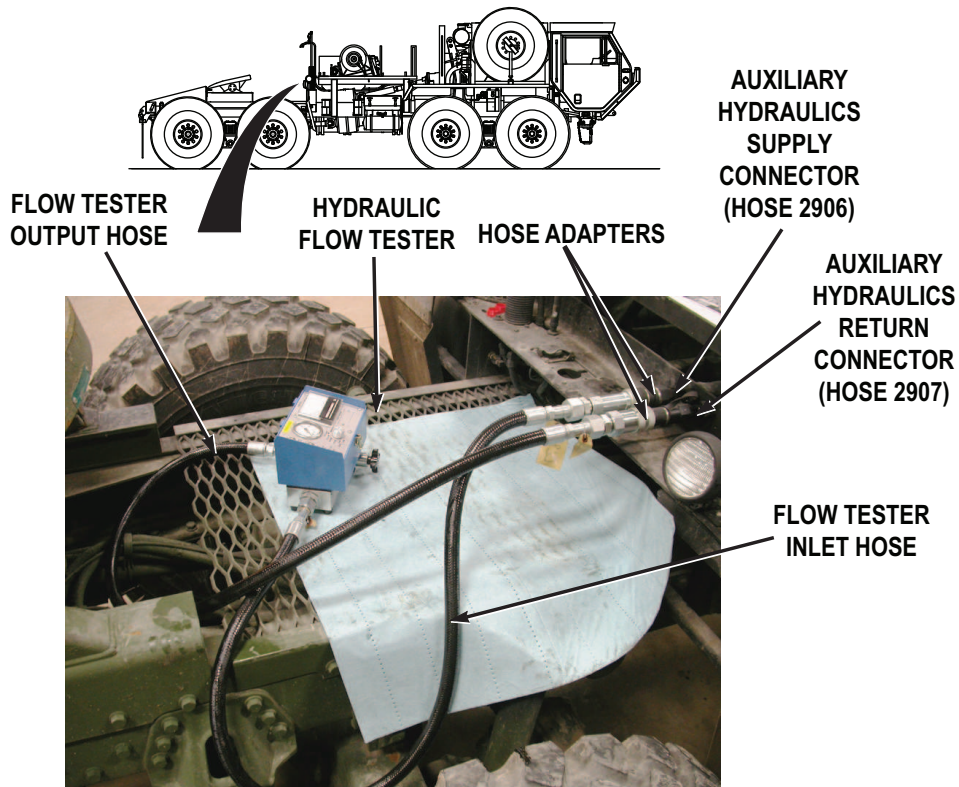


Figure 9.

14. Remove hydraulic flow tester output hose from hydraulic hose 2907 at auxiliary hydraulics return (female) quick disconnect.

#### CONDITION/INDICATION

Is hydraulic power available to system?

#### DECISION

No - Troubleshoot: One or More Hydraulic Circuit(s) Not Working for M983A2 (refer to TM 9-2320-315-14&P).  
 Yes - Test 9 - Does winch operate with manual controls?

#### TEST 9 - Does winch operate with manual controls?

#### CAUTION

Do not let cable end run into heavy-duty winch while reeling IN, or damage to equipment will result.

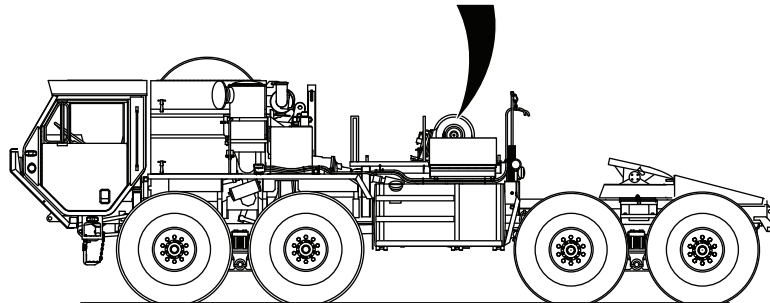
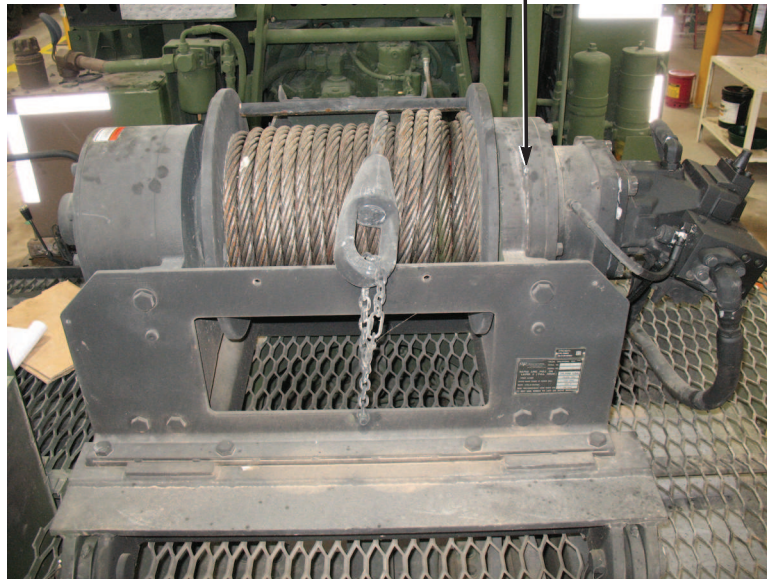
1. Pull selector valve out. (WP 0015)
2. Push heavy-duty winch control station WINCH KICKOUT control valve in to ENGAGE position. (WP 0015)

**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

3. Start engine (refer to TM 9-2320-279-10).
4. Set PTO ENGAGE switch to ON position. (WP 0015)
5. Prepare vehicle for heavy-duty winch operation. (WP 0015)

**HEAVY-DUTY  
WINCH**



*Figure 10.*

6. While assistant operates heavy-duty winch manual IN and OUT controls, observe operation of heavy-duty winch. (WP 0015)
7. Set PTO ENGAGE switch to OFF position. (WP 0015)
8. Shut OFF engine (refer to TM 9-2320-279-10).

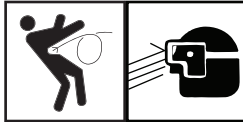
**CONDITION/INDICATION**

Does winch operate with manual controls?

**DECISION**

No - Test 10 - Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?

Yes - Test 13 - Does heavy-duty winch operate in both directions?

**TEST 10 - Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?****WARNING**

- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

1. Place suitable drain pan under heavy-duty winch assembly prior to removing hoses.



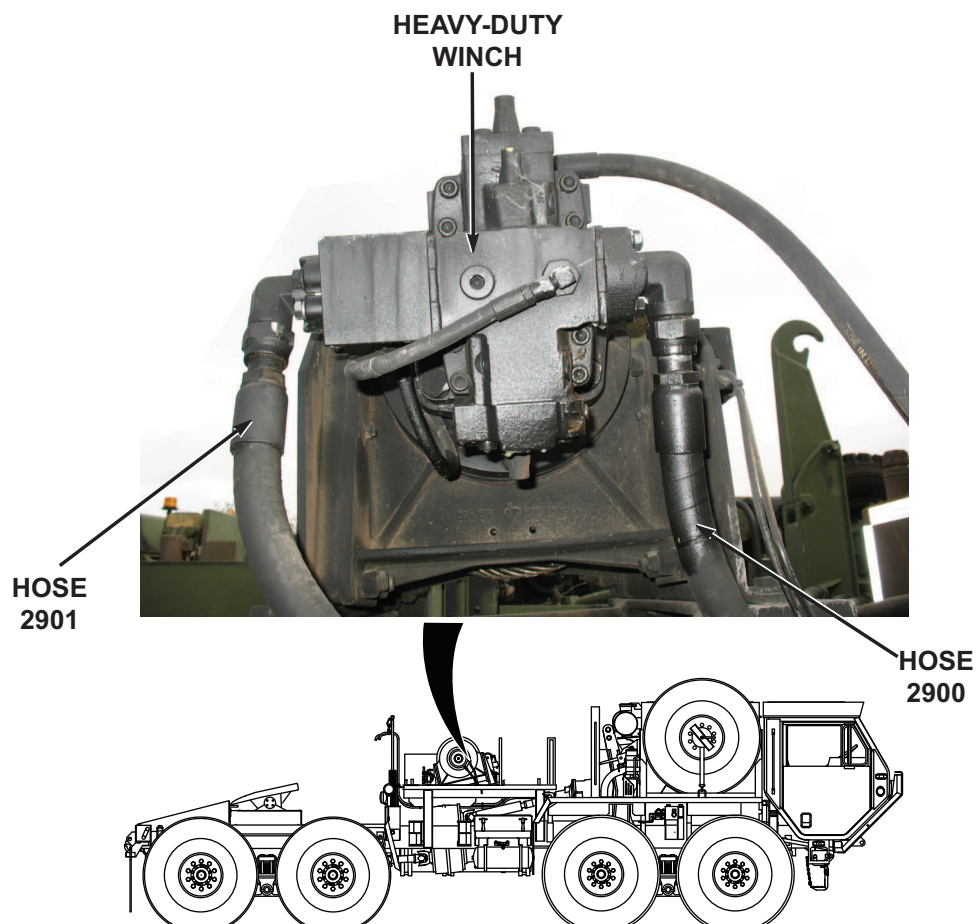


Figure 11.

2. Disconnect hydraulic hoses 2900 and 2901 from heavy-duty winch. Cap fittings on winch assembly. Refer to schematics. (WP 0069)
3. Install hydraulic flow tester input hose to hydraulic hose 2901.

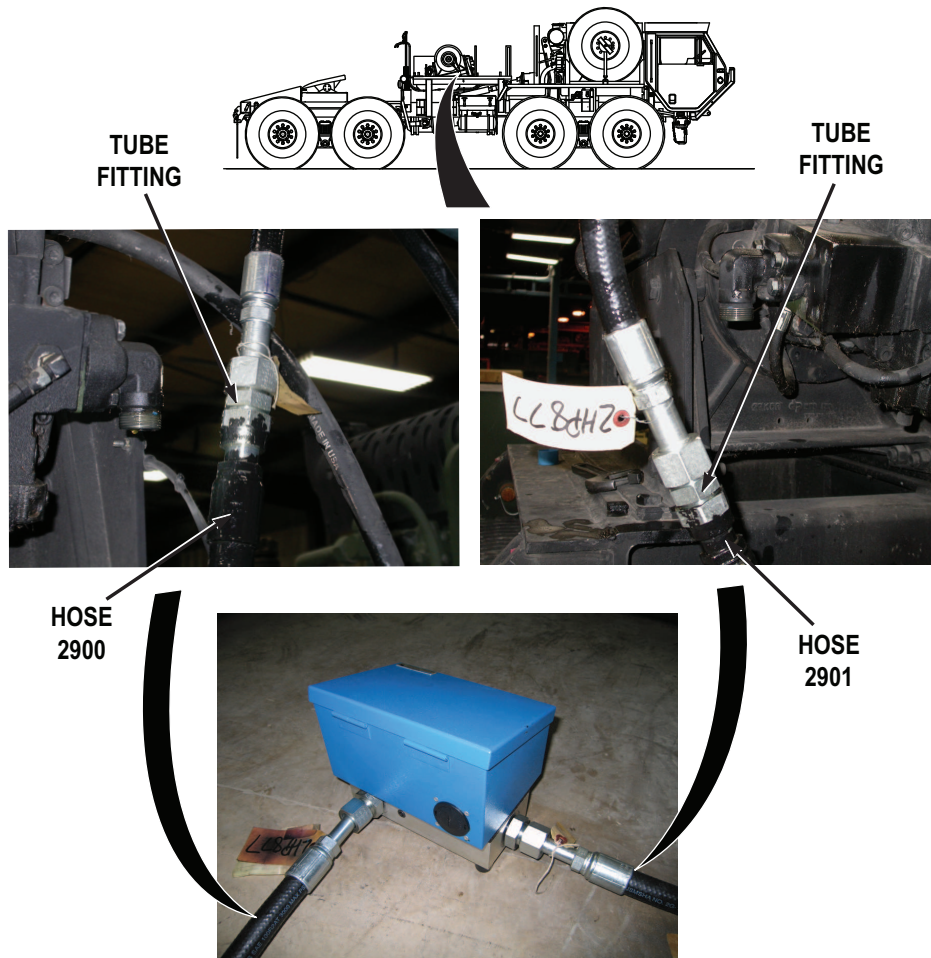


Figure 12.

4. Install hydraulic flow tester output hose to hydraulic hose 2900.

**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

5. Start engine (refer to TM 9-2320-279-10).
6. Set PTO ENGAGE switch to ON position. (WP 0015)

**NOTE**

- All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch and at high idle.

- Winch is bypassed for this test, and cable will not pay out or reel in.
  - When performing test, winch control valve must be fully engaged or test readings will be faulty.
  - Relief pressure is obtained when flow reading drops off and pressure reading on gauge does not increase further.
7. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to ON position. (WP 0015)
  8. Have assistant operate heavy-duty winch IN manual control, while closing off load valve on hydraulic flow tester until relief pressure is obtained. (WP 0015)
  9. Note reading on pressure gauge when pressure relief is obtained.
  10. Have assistant release winch control.
  11. Set heavy-duty winch control station HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
  12. Set PTO ENGAGE switch to OFF position. (WP 0015)
  13. Shut OFF engine (refer to TM 9-2320-279-10).
  14. Remove hydraulic flow tester inlet hose from hydraulic hose 2901.

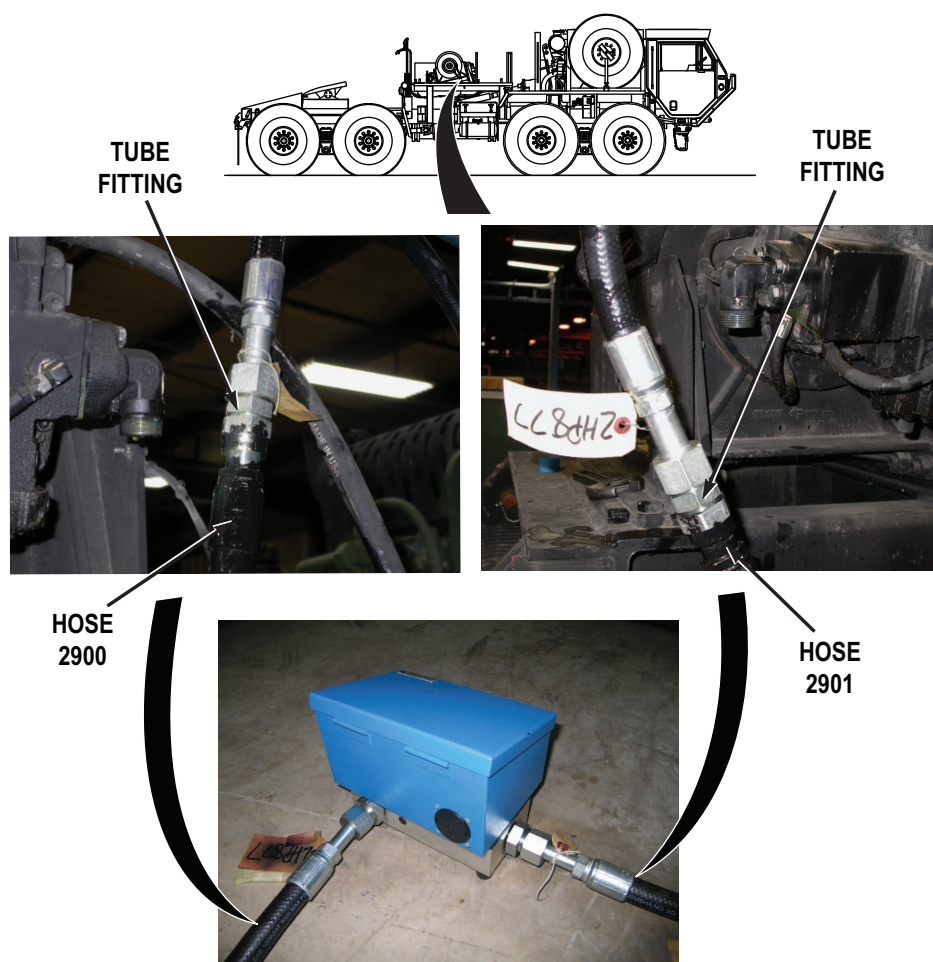


Figure 13.

15. Remove hydraulic flow tester output hose from hydraulic hose 2900.
16. Connect hydraulic hoses 2900 and 2901 to heavy-duty winch. (WP 0069)

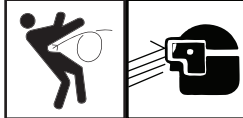
**CONDITION/INDICATION**

Is 2,850 psi (19 650 kPa) measured at heavy-duty winch motor?

**DECISION**

No - Replace heavy-duty winch control valve (relief valve faulty). (WP 0072) Test 13 - Does heavy-duty winch operate in both directions?

Yes - Test 11 - Is more than 270 psi (1 861 kPa) measured on winch hydraulic brake release hose?

**TEST 11 - Is more than 270 psi (1 861 kPa) measured on winch hydraulic brake release hose?****WARNING**

- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
  - Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
  - Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.
1. Place suitable drain pan under heavy-duty winch assembly prior to removing hose.
  2. Disconnect winch brake release hose at winch brake. Cap fitting on winch brake assembly. Refer to schematics.
  3. Connect 0 to 6000 psi (0 to 41 370 kPa) pressure gauge to winch brake release hose.

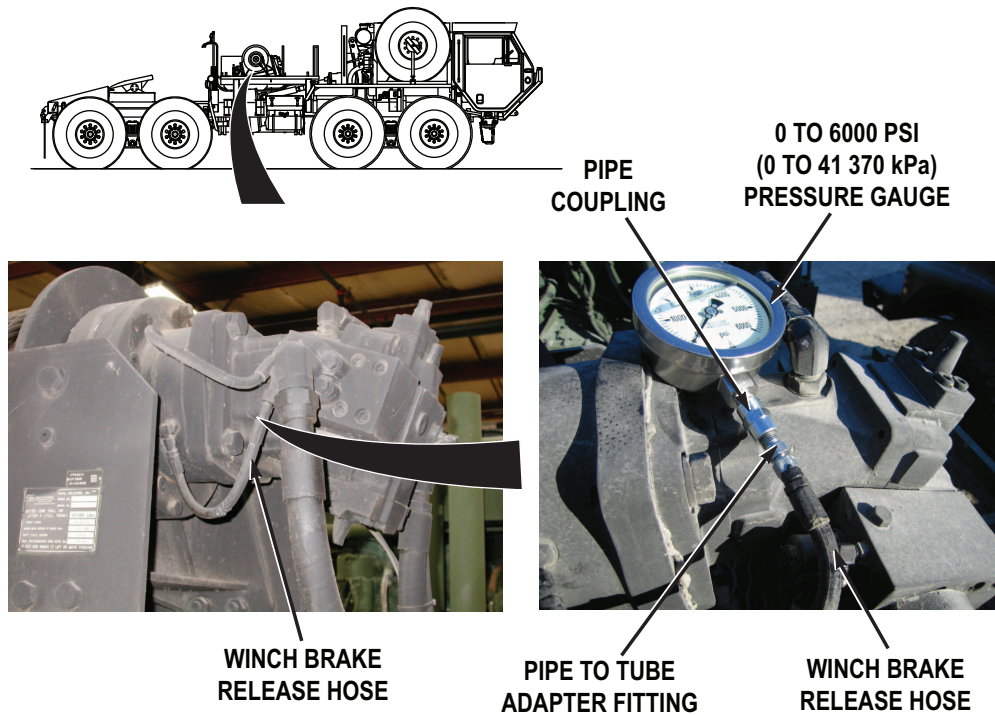


Figure 14.

**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

4. Start engine (refer to TM 9-2320-279-10).
5. Set PTO ENGAGE switch to ON position. (WP 0015)

**NOTE**

Winch drum should not move during this test.

6. Have assistant operate heavy-duty winch IN and OUT manual controls, while noting reading on pressure gauge. (WP 0015)
7. Set PTO ENGAGE switch to OFF position. (WP 0015)
8. Shut OFF engine (refer to TM 9-2320-279-10).
9. Disconnect pressure gauge and reconnect hydraulic hose to winch brake fitting.



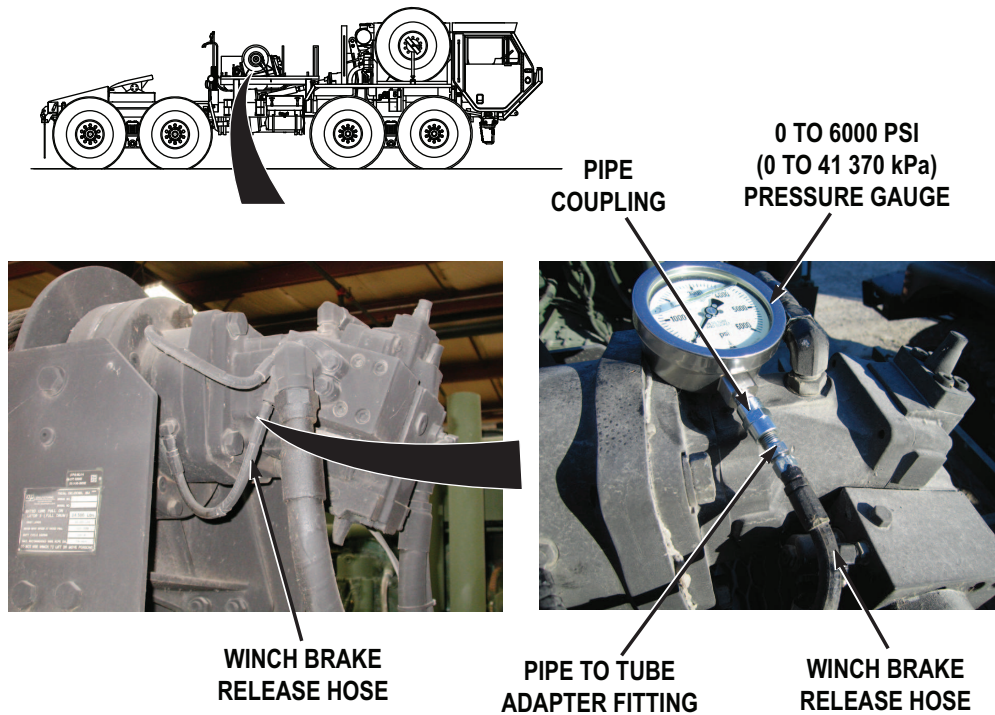


Figure 15.

**CONDITION/INDICATION**

Is more than 270 psi (1 861 kPa) measured on winch hydraulic brake release hose?

**DECISION**

No - Replace heavy-duty winch counterbalance valve. (WP 0071) Test 13 - Does heavy-duty winch operate in both directions?

Yes - Test 12 - Does heavy-duty winch hydraulic motor operate when removed from winch?

**TEST 12 - Does heavy-duty winch hydraulic motor operate when removed from winch?****WARNING**

When testing winch motor, keep hands and loose clothing away from rotating shaft and other winch components. Failure to comply may result in injury or death to personnel.

**NOTE**

- In the following test procedure, do not remove hydraulic hoses or counterbalance valve from winch motor.
- All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch.

1. Remove and secure winch motor from winch assembly. Do not disconnect hoses. (WP 0068)

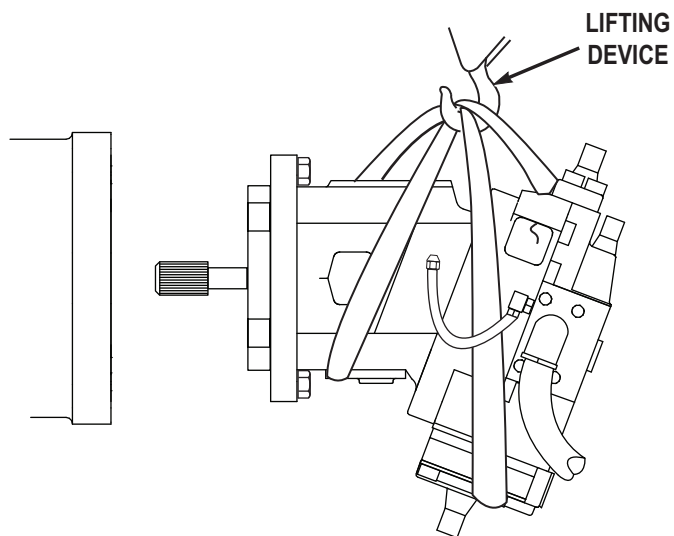


Figure 16.

### WARNING



Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

2. Start engine (refer to TM 9-2320-279-10).
3. Set PTO ENGAGE switch to ON position. (WP 0015)

### NOTE

Winch drum will not move during this test.

4. Have assistant operate heavy-duty winch controls while observing winch motor operation. (WP 0015)
5. Set PTO ENGAGE switch to OFF position. (WP 0015)
6. Shut OFF engine (refer to TM 9-2320-279-10).

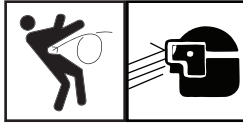
### CONDITION/INDICATION

Does heavy-duty winch hydraulic motor operate when removed from winch?

### DECISION

No - Replace heavy-duty winch hydraulic motor. (WP 0068)Test 13 - Does heavy-duty winch operate in both directions?

Yes - Replace heavy-duty winch assembly. (WP 0076)Test 13 - Does heavy-duty winch operate in both directions?

**TEST 13 - Does heavy-duty winch operate in both directions?****WARNING**

- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

**CAUTION**

Do not let cable end run into heavy-duty winch while reeling IN, or damage to equipment will result.

1. If removed, install heavy-duty winch hydraulic motor. (WP 0068)

**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

2. Start engine (refer to TM 9-2320-279-10).
3. Set PTO ENGAGE switch to ON position. (WP 0015)

**NOTE**

All hydraulic tests must be performed with hydraulic oil reservoir at least warm to the touch and at high idle.

4. Prepare vehicle for heavy-duty winch operation. (WP 0015)



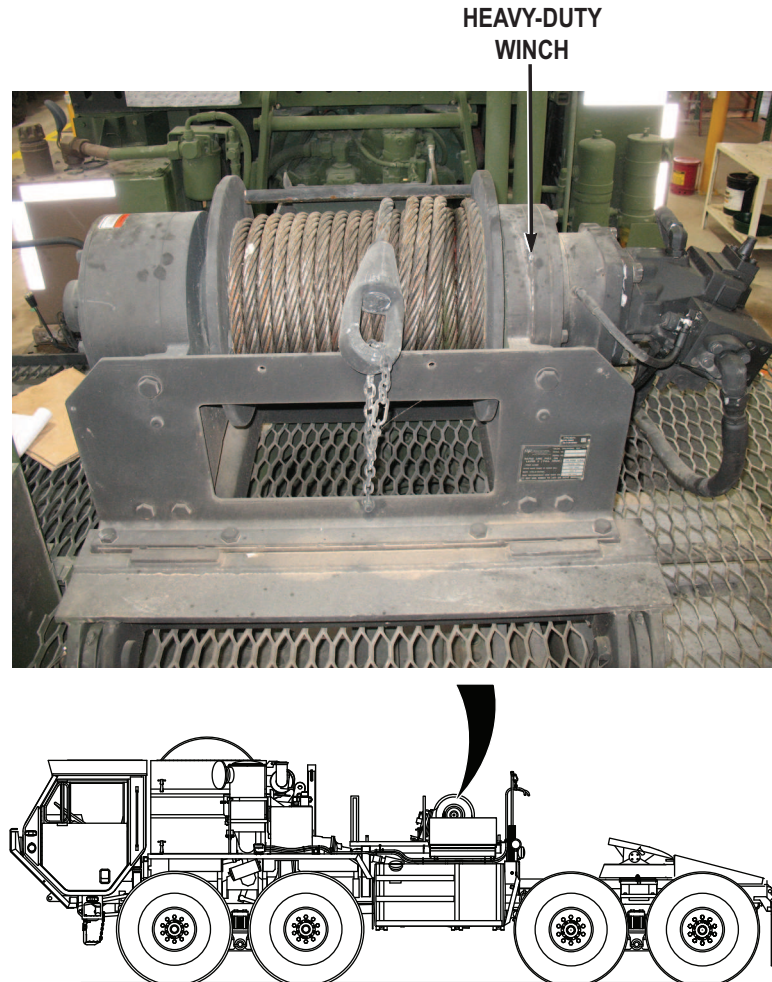


Figure 17.

5. While assistant operates heavy-duty winch manual controls, observe heavy-duty winch operation. (WP 0015)
6. Stow heavy-duty winch. (WP 0015)
7. Set PTO ENGAGE switch to OFF position. (WP 0015)
8. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Does heavy-duty winch operate in both directions?

**DECISION**

No - Problem not corrected. Notify Supervisor.  
Yes - Problem corrected.

**END OF WORK PACKAGE**



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## FIELD MAINTENANCE

### WINCH REMOTE DOES NOT OPERATE PROPERLY

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#### INITIAL SETUP:

##### Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Wrench, 18 in. Adjustable (WP 0081, Table 2, Item 6)

Parking brake applied (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

##### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

##### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).

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#### TROUBLESHOOTING PROCEDURE

##### WINCH REMOTE DOES NOT OPERATE PROPERLY

#### TEST 1 - Does winch operate with manual controls?

#### CAUTION

Do not let cable end run into heavy-duty winch while reeling IN, or damage to equipment will result.

1. Pull selector valve out. (WP 0015)
2. Push WINCH KICKOUT control valve in to ENGAGE position. (WP 0015)

#### WARNING



Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

3. Start engine (refer to TM 9-2320-279-10).
4. Set PTO ENGAGE switch to ON position. (WP 0015)
5. Prepare vehicle for heavy-duty winch operation. (WP 0015)

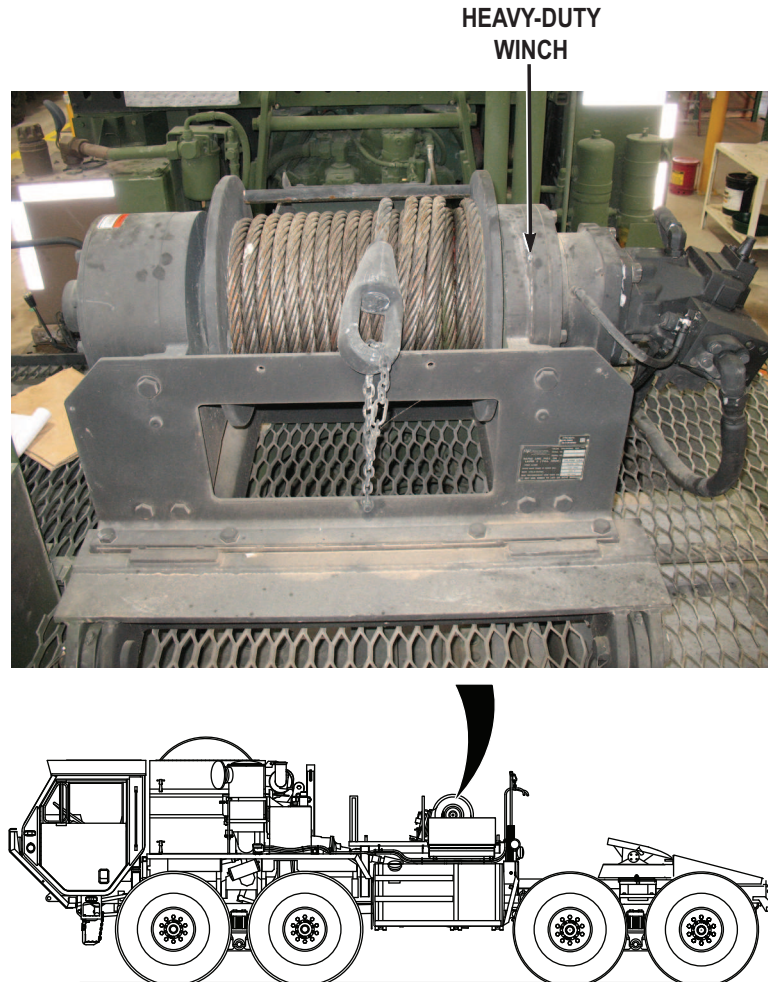


Figure 1.

6. While assistant operates heavy-duty winch manual controls, observe heavy-duty winch operation. (WP 0015)
7. Set PTO ENGAGE switch to OFF position. (WP 0015)
8. If winch does not operate, shut OFF engine (refer to TM 9-2320-279-10).

#### CONDITION/INDICATION

Does winch operate with manual controls?

#### DECISION

No - Troubleshoot: Winch Will Not Operate in Either Direction (WP 0032)

Yes - Test 2 - Does high idle operate when selected at heavy-duty winch remote control unit?

#### TEST 2 - Does high idle operate when selected at heavy-duty winch remote control unit?

1. Connect remote control cable to remote control connector. (WP 0015)
2. Connect heavy-duty winch remote control unit to remote control cable. (WP 0015)
3. Set PTO ENGAGE switch to ON position. (WP 0015)
4. Set heavy-duty winch remote control unit HIGH IDLE ON/OFF switch to ON position. (WP 0015)

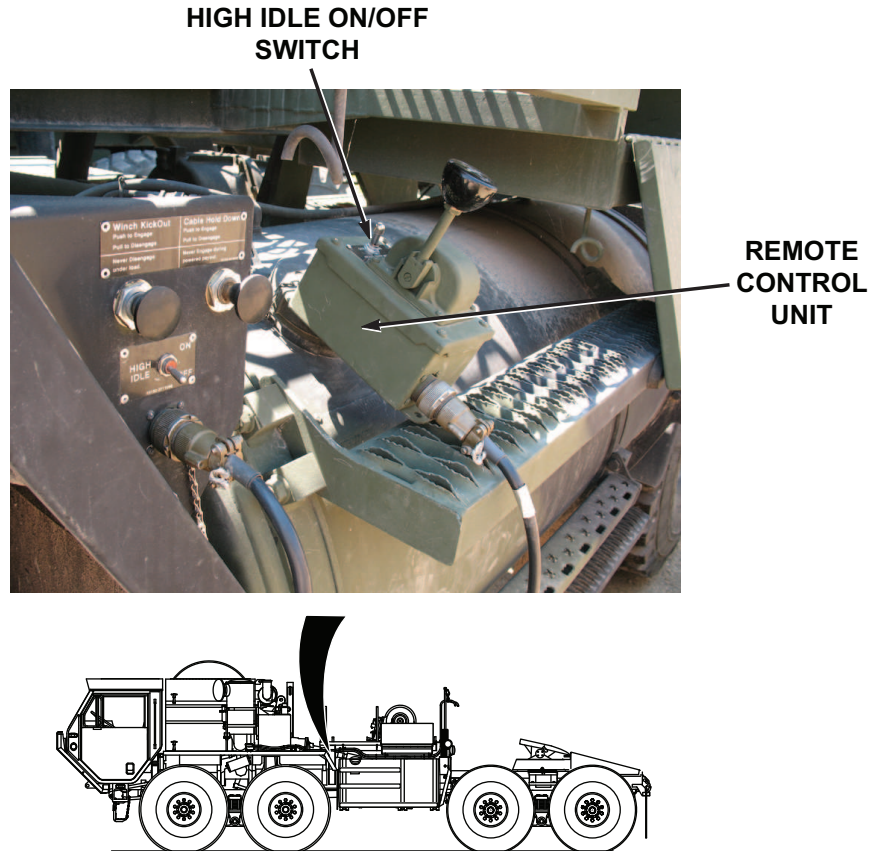


Figure 2.

5. Observe engine operation. Check if engine speed increases to 1,500 RPM.
6. Set heavy-duty winch remote control unit HIGH IDLE ON/OFF switch to OFF position. (WP 0015)
7. Set PTO ENGAGE switch to OFF position. (WP 0015)
8. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Does high idle operate when selected at heavy-duty winch remote control unit?

**DECISION**

No - Troubleshoot: High Idle Does Not Operate. (WP 0024)

Yes - Test 3 - Is continuity measured on remote control cable wire 1681, 1682, and 1435?

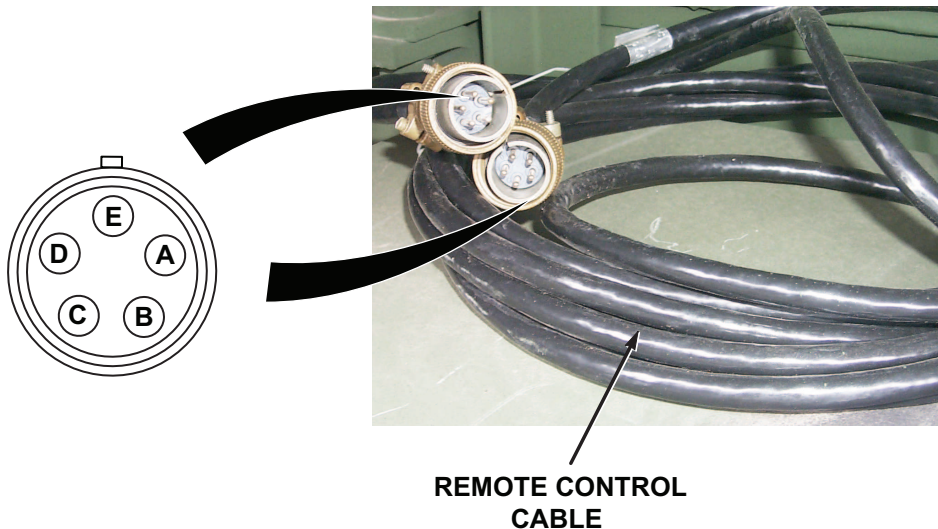
**TEST 3 - Is continuity measured on remote control cable wire 1681, 1682, and 1435?**

**WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Disconnect remote control cable from remote control connector.
2. Disconnect remote control cable from heavy-duty winch remote control unit connector.
3. Set multimeter switch to ohms.
4. Connect positive (+) probe of multimeter to remote control cable end, terminal A. Refer to schematics.



*Figure 3.*

5. Connect negative (-) probe of multimeter to opposite remote control cable end, terminal A.
6. Multimeter should display a reading less than 200 ohms. Note reading.
7. Connect positive (+) probe of multimeter to remote control cable end, terminal B.
8. Connect negative (-) probe of multimeter to opposite remote control cable end, terminal B.
9. Multimeter should display a reading less than 200 ohms. Note reading.
10. Connect positive (+) probe of multimeter to remote control cable end, terminal E.
11. Connect negative (-) probe of multimeter to opposite remote control cable end, terminal E.
12. Multimeter should display a reading less than 200 ohms. Note reading.

#### **CONDITION/INDICATION**

Is continuity measured on remote control cable wire 1681, 1682, and 1435?

#### **DECISION**

No - Repair damaged wire(s) or replace remote cable. (WP 0048) Test 20 - Does winch operate with remote control?

Yes - Test 4 - Is continuity measured on heavy-duty winch control valve harness wire 1681?



**TEST 4 - Is continuity measured on heavy-duty winch control valve harness wire 1681?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Disconnect heavy-duty winch control valve harness IN solenoid connector. (WP 0049)
2. Set multimeter switch to ohms.
3. Connect positive (+) probe of multimeter to wire 1681 at heavy-duty winch control valve harness connector remote control connector, terminal A. Refer to schematics.

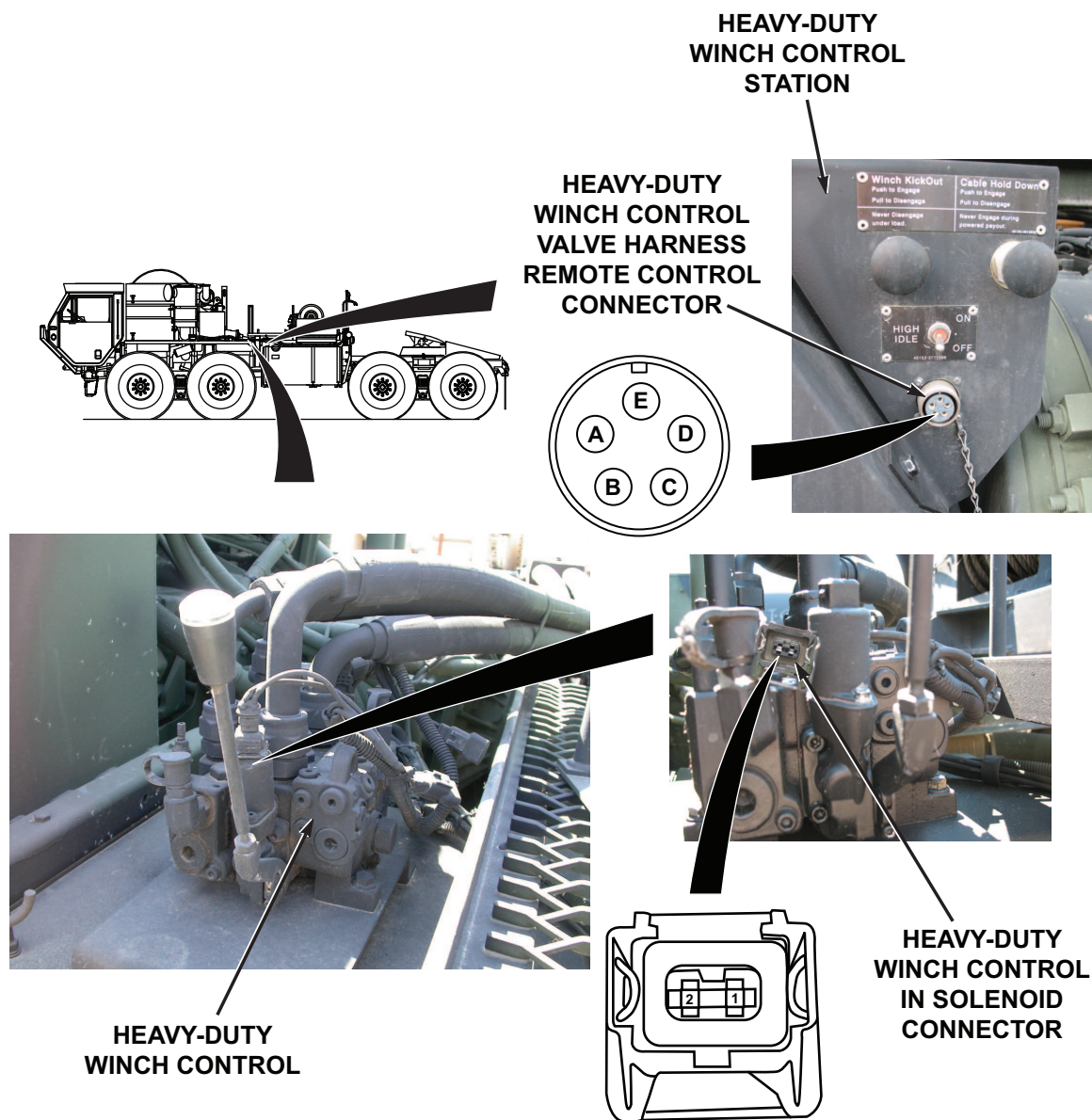


Figure 4.

4. Connect negative (-) probe of multimeter to wire 1681 at heavy-duty winch control valve harness heavy-duty winch control IN solenoid connector, terminal 1.
5. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on heavy-duty winch control valve harness wire 1681?

**DECISION**

No - Test 5 - Can heavy-duty winch control valve harness wire 1681 be repaired?

Yes - Test 6 - Is continuity measured on heavy-duty winch control valve harness IN solenoid wire 1435?



**TEST 5 - Can heavy-duty winch control valve harness wire 1681 be repaired?****WARNING**

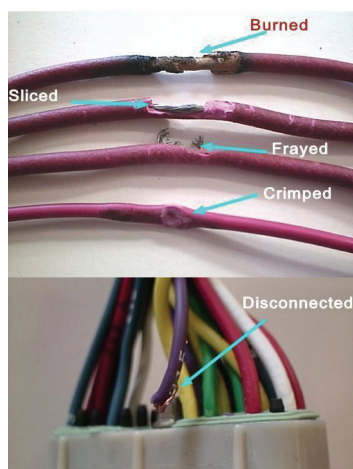
Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if prior wire repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Visually inspect wire 1681 from remote control connector, terminal A to heavy-duty winch control IN solenoid connector, terminal 1 for repairability. Refer to schematics.



*Figure 5.*

**CONDITION/INDICATION**

Can heavy-duty winch control valve harness wire 1681 be repaired?

**DECISION**

No - Replace heavy-duty winch control valve harness. (WP 0049) Test 20 - Does winch operate with remote control?

Yes - Repair wire 1681 (refer to TM 9-2320-315-14&P).

**TEST 6 - Is continuity measured on heavy-duty winch control valve harness IN solenoid wire 1435?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Set multimeter switch to ohms.
2. Connect positive (+) probe of multimeter to wire 1435 at heavy-duty winch control valve harness connector remote control connector, terminal E. Refer to schematics.

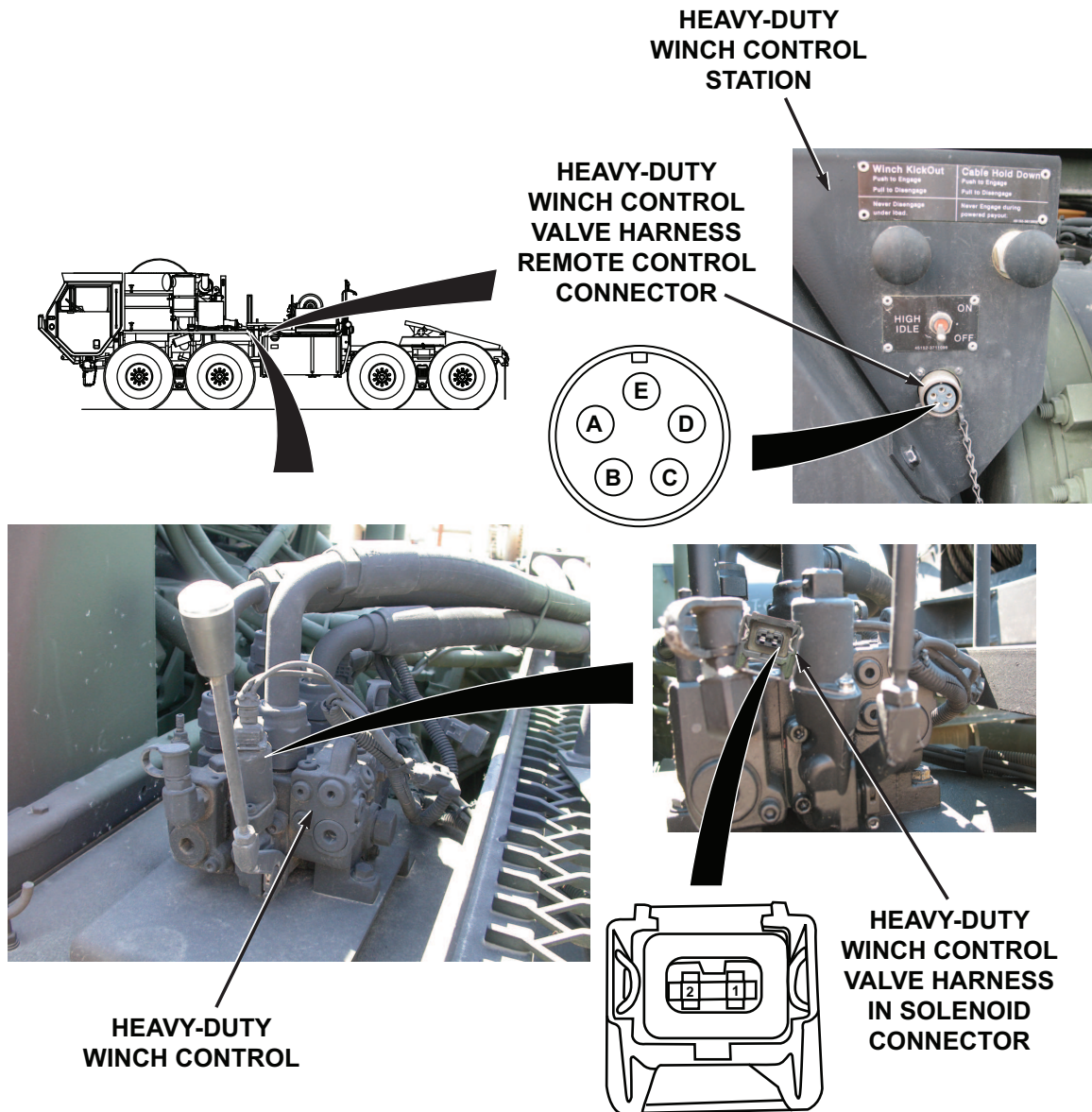


Figure 6.

3. Connect negative (-) probe of multimeter to wire 1435 at heavy-duty winch control valve harness heavy-duty winch control IN solenoid connector, terminal 2.
4. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on heavy-duty winch control valve harness IN solenoid wire 1435?

**DECISION**

No - Test 7 - Can heavy-duty winch control valve harness wire 1435 be repaired?

Yes - Test 8 - Is continuity measured on heavy-duty winch control valve harness wire 1682?

**TEST 7 - Can heavy-duty winch control valve harness wire 1435 be repaired?****WARNING**

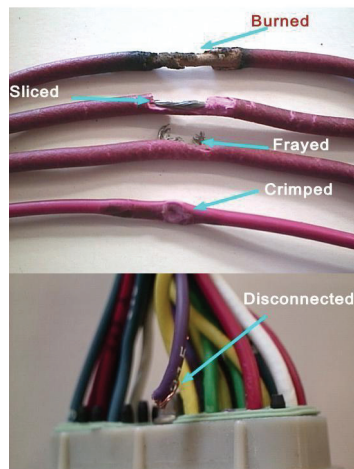
Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if prior wire repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Visually inspect wire 1435 from remote control connector, terminal E to heavy-duty winch control IN solenoid connector, terminal 2 for repairability. Refer to schematics.



*Figure 7.*

**CONDITION/INDICATION**

Can heavy-duty winch control valve harness wire 1435 be repaired?

**DECISION**

No - Replace heavy-duty winch control valve harness. (WP 0049) Test 20 - Does winch operate with remote control?

Yes - Repair wire 1435 (refer to TM 9-2320-315-14&P). Test 20 - Does winch operate with remote control?

**TEST 8 - Is continuity measured on heavy-duty winch control valve harness wire 1682?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Disconnect heavy-duty winch control valve harness OUT solenoid connector. (WP 0049)
2. Set multimeter switch to ohms.
3. Connect positive (+) probe of multimeter to wire 1682 at heavy-duty winch control valve harness connector remote control connector, terminal B. Refer to schematics.

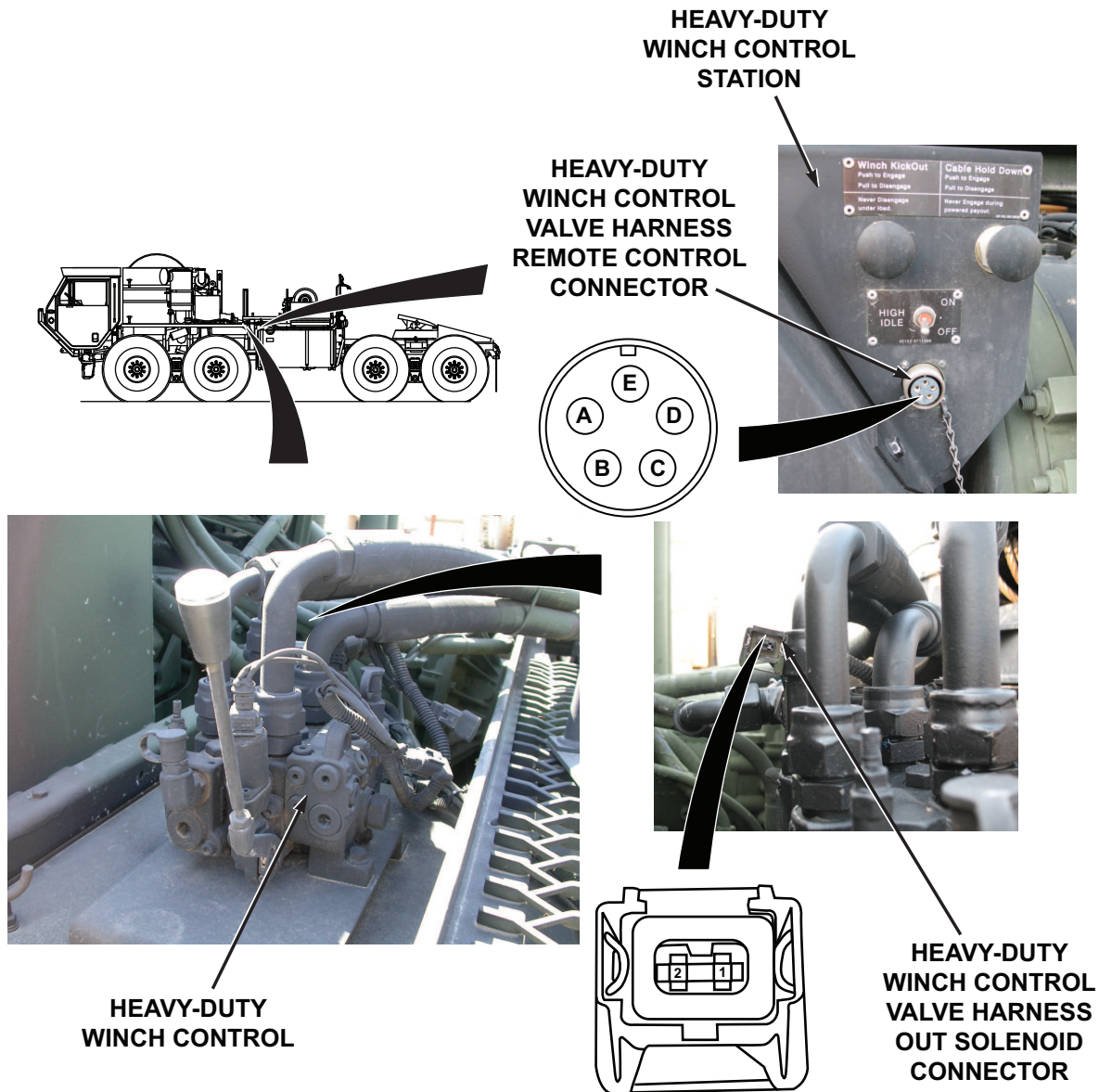


Figure 8.

4. Connect negative (-) probe of multimeter to wire 1682 at heavy-duty winch control valve harness heavy-duty winch control OUT solenoid connector, terminal 1.
5. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on heavy-duty winch control valve harness wire 1682?

**DECISION**

No - Test 9 - Can heavy-duty winch control valve harness wire 1682 be repaired?

Yes - Test 10 - Is continuity measured on heavy-duty winch control valve harness OUT solenoid wire 1435?

**TEST 9 - Can heavy-duty winch control valve harness wire 1682 be repaired?****WARNING**

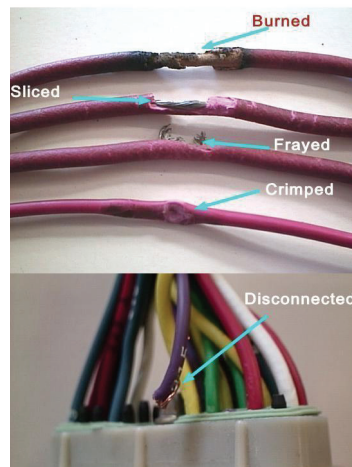
Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if prior wire repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Visually inspect wire 1682 from remote control connector, terminal B to heavy-duty winch control OUT solenoid connector, terminal 1 for repairability. Refer to schematics.



*Figure 9.*

**CONDITION/INDICATION**

Can heavy-duty winch control valve harness wire 1682 be repaired?



**DECISION**

No - Replace heavy-duty winch control valve harness. (WP 0049)Test 20 - Does winch operate with remote control?

Yes - Repair wire 1682 (refer to TM 9-2320-315-14&P).Test 20 - Does winch operate with remote control?

**TEST 10 - Is continuity measured on heavy-duty winch control valve harness OUT solenoid wire 1435?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Set multimeter switch to ohms.
2. Connect positive (+) probe of multimeter to wire 1435 at heavy-duty winch control valve harness connector remote control connector, terminal E. Refer to schematics.



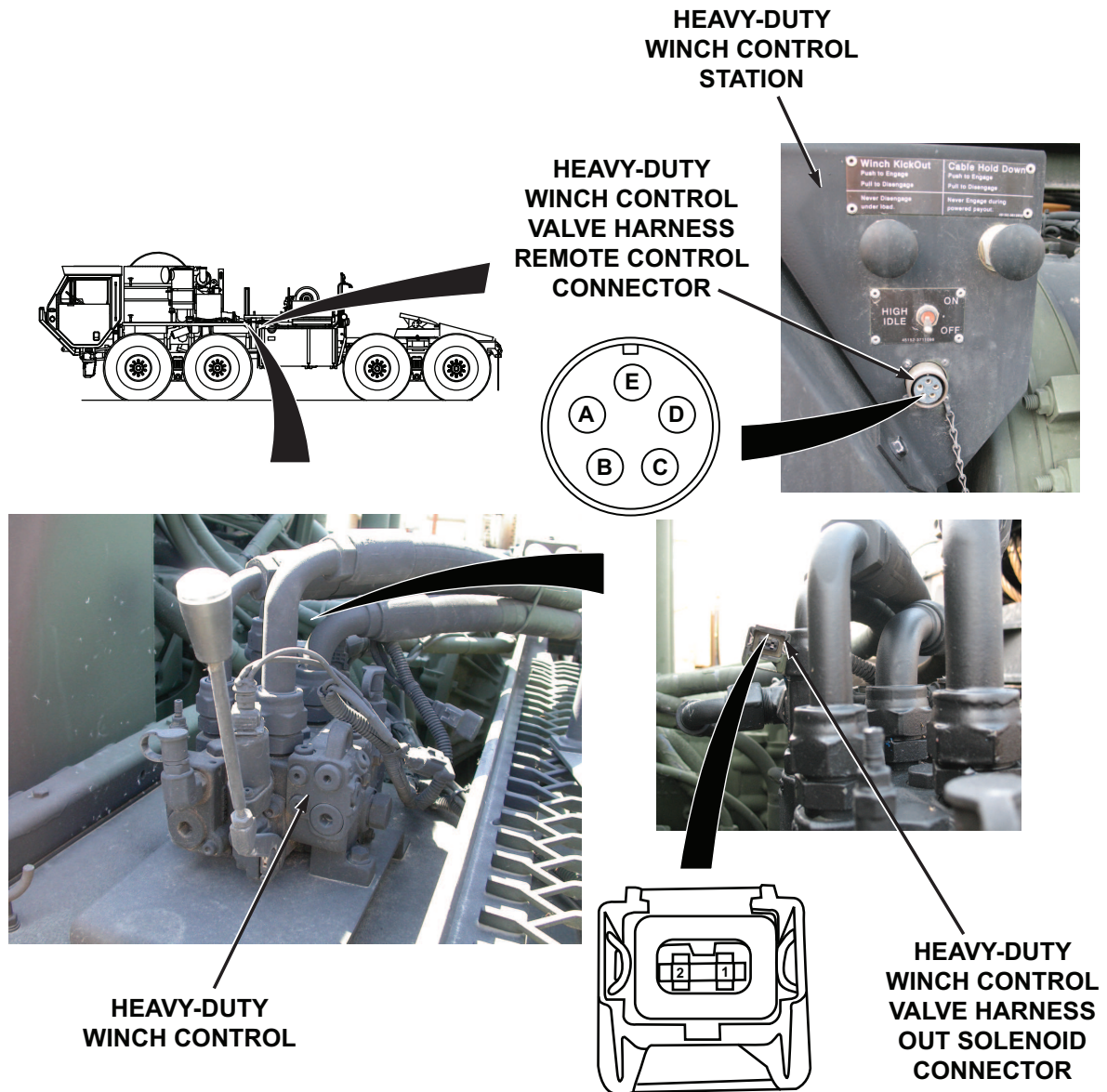


Figure 10.

3. Connect negative (-) probe of multimeter to wire 1435 at heavy-duty winch control valve harness heavy-duty winch control OUT solenoid connector, terminal 2.
4. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on heavy-duty winch control valve harness OUT solenoid wire 1435?

**DECISION**

No - Test 11 - Can heavy-duty winch control valve harness wire 1435 be repaired?

Yes - Test 12 - Is continuity measured on heavy-duty winch remote control unit harness wires 1854, 1861, 1862, and 1435?

**TEST 11 - Can heavy-duty winch control valve harness wire 1435 be repaired?****WARNING**

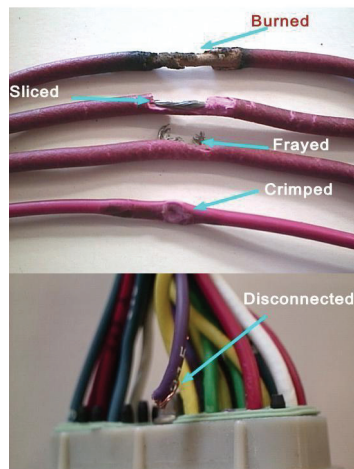
Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**NOTE**

Wire is not repairable if damage cannot be visually located or if prior wire repair has already reduced length of wire. Wire is not repairable if after repair, wire is too short to reach its connection point.

1. Visually inspect wire 1435 from remote control connector, terminal E to heavy-duty winch control OUT solenoid connector, terminal 2 for repairability. Refer to schematics.



*Figure 11.*

**CONDITION/INDICATION**

Can heavy-duty winch control valve harness wire 1435 be repaired?

**DECISION**

No - Replace heavy-duty winch control valve harness. (WP 0049) Test 20 - Does winch operate with remote control?

Yes - Repair wire 1435 (refer to TM 9-2320-315-14&P). Test 20 - Does winch operate with remote control?

**TEST 12 - Is continuity measured on heavy-duty winch remote control unit harness wires 1854, 1861, 1862, and 1435?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Loosen four screws and lift cover from heavy-duty remote control unit. (WP 0047)
2. Disconnect heavy-duty winch remote control unit harness internal four terminal connector. (WP 0047)
3. Set multimeter switch to ohms.
4. Connect positive (+) probe of multimeter to wire 1854 at remote control cable connector, terminal C. Refer to schematics.

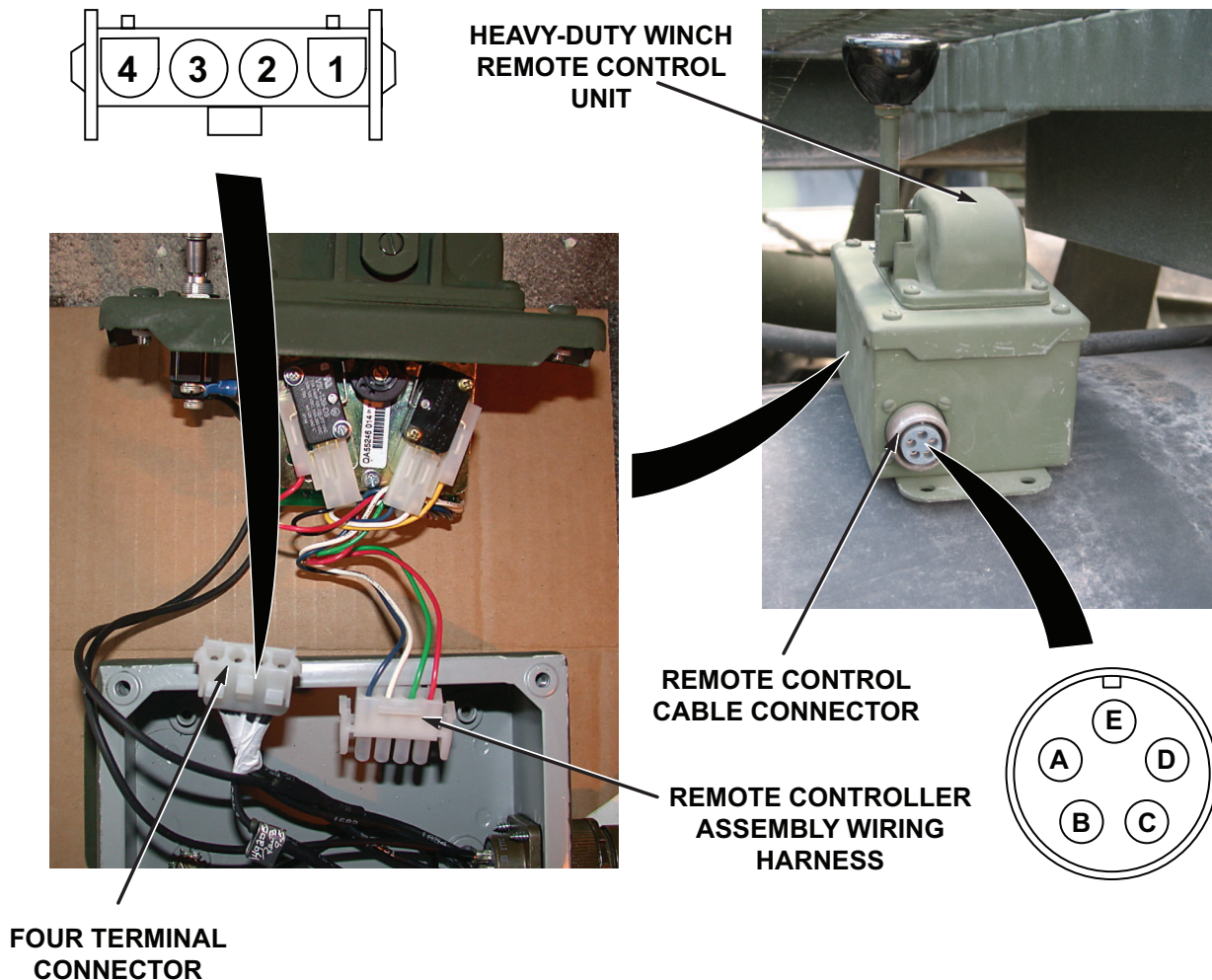


Figure 12.

5. Connect negative (-) probe of multimeter to wire 1854 at four terminal connector, terminal 1.
6. Multimeter should display a reading less than 200 ohms. Note reading.
7. Connect positive (+) probe of multimeter to wire 1681 at remote control cable connector, terminal A.
8. Connect negative (-) probe of multimeter to wire 1681 at four terminal connector, terminal 4.
9. Multimeter should display a reading less than 200 ohms. Note reading.
10. Connect positive (+) probe of multimeter to wire 1682 at remote control cable connector, terminal B.
11. Connect negative (-) probe of multimeter to wire 1682 at four terminal connector, terminal 3.
12. Multimeter should display a reading less than 200 ohms. Note reading.
13. Connect positive (+) probe of multimeter to wire 1435 at remote control cable connector, terminal E.
14. Connect negative (-) probe of multimeter to wire 1435 at four terminal connector, terminal 2.
15. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on heavy-duty winch remote control unit harness wires 1854, 1861, 1862, and 1435?

**DECISION**

No - Repair damaged wire(s) or replace heavy-duty winch remote control unit harness. (WP 0047) Test 20 - Does winch operate with remote control?

Yes - Test 13 - Is continuity measured on heavy-duty winch remote control unit blue wire?



**TEST 13 - Is continuity measured on heavy-duty winch remote control unit blue wire?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Set multimeter switch to ohms.
2. Connect positive (+) probe of multimeter to blue wire at four terminal connector, terminal 4. Refer to schematics.

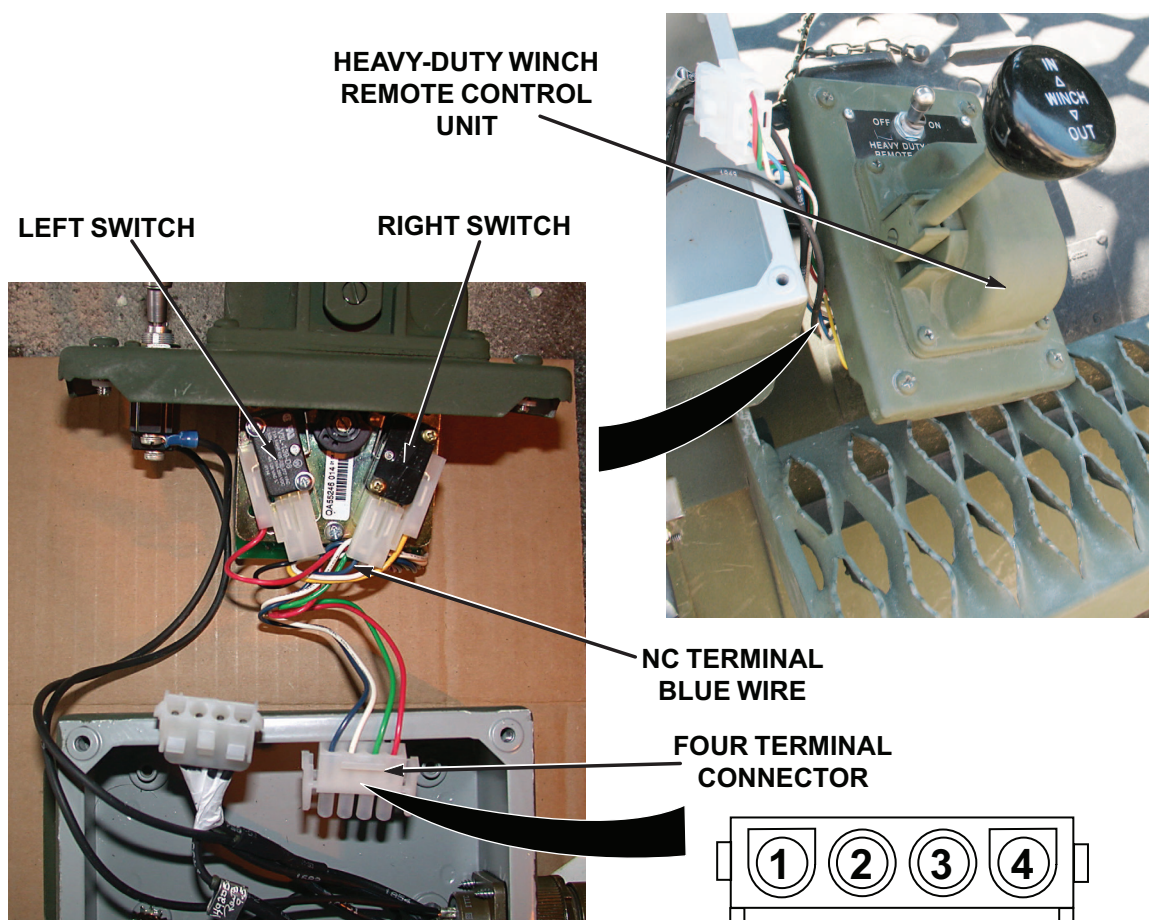


Figure 13.

3. Connect negative (-) probe of multimeter to blue wire at heavy-duty winch remote control unit right switch, NC terminal.
4. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on heavy-duty winch remote control unit blue wire?

**DECISION**

No - Repair blue wire or replace heavy-duty winch remote control unit. (WP 0047) Test 20 - Does winch operate with remote control?

Yes - Test 14 - Is continuity measured on heavy-duty winch remote control unit white wire?

**TEST 14 - Is continuity measured on heavy-duty winch remote control unit white wire?****WARNING**

Ensure electrical power is off prior to working on all electrical connections. Failure to comply may result in injury or death to personnel.

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Set multimeter switch to ohms.
2. Connect positive (+) probe of multimeter to white wire at four terminal connector, terminal 3. Refer to schematics.

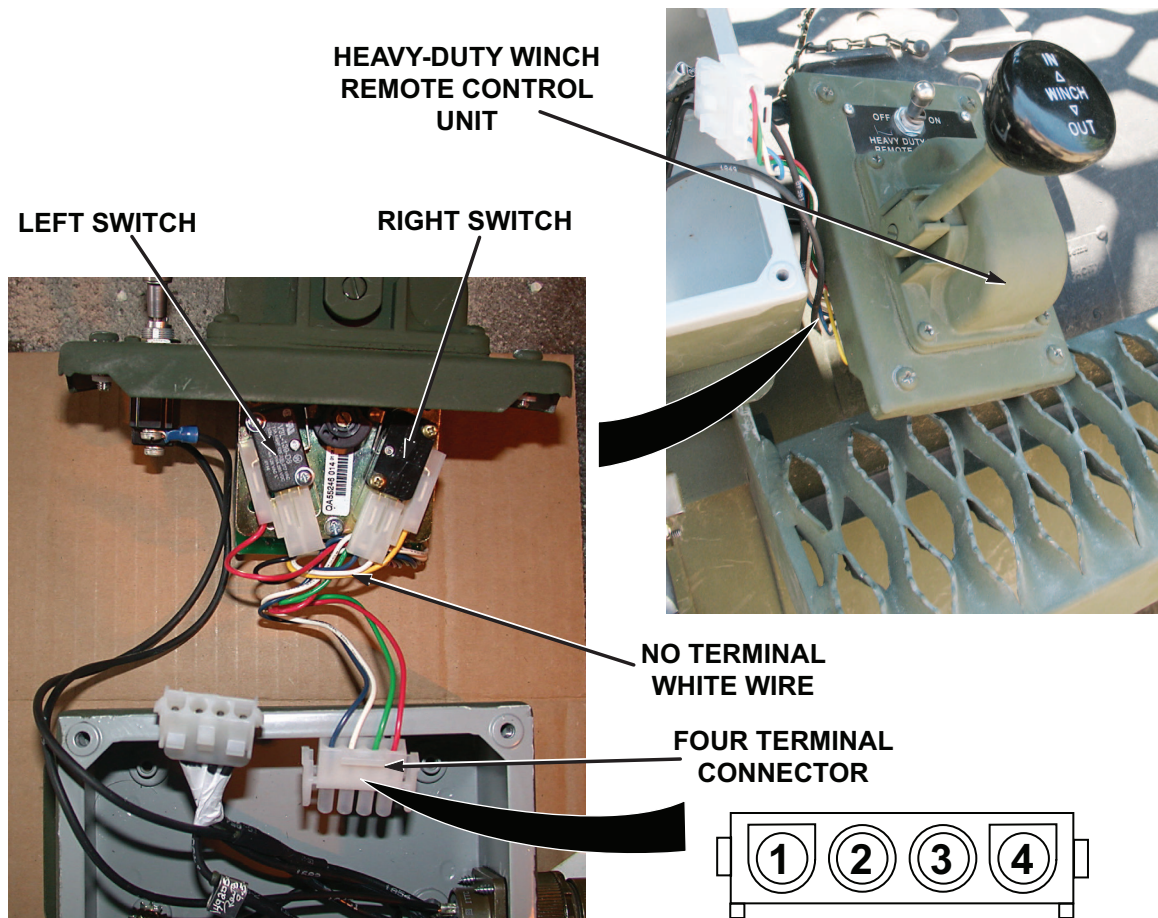


Figure 14.

3. Connect negative (-) probe of multimeter to white wire at heavy-duty winch remote control unit right switch, NO terminal.
4. Multimeter should display a reading less than 200 ohms. Note reading.

**CONDITION/INDICATION**

Is continuity measured on heavy-duty winch remote control unit white wire?

**DECISION**

No - Repair white wire or replace heavy-duty winch remote control unit. (WP 0047) Test 20 - Does winch operate with remote control?

Yes - Test 15 - Are 22 to 28 vdc measured on red wire at heavy-duty winch remote control unit left switch, COM terminal?

**TEST 15 - Are 22 to 28 vdc measured on red wire at heavy-duty winch remote control unit left switch, COM terminal?**

**WARNING**



Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

1. Connect heavy-duty winch remote control unit wiring harness internal four terminal connector. (WP 0047)
2. Connect remote control cable to remote control connector. (WP 0015)
3. Connect remote control cable to heavy-duty winch remote control unit connector. (WP 0015)

**NOTE**

Heavy-duty winch control valve IN and OUT solenoid connectors are disconnected to prevent unexpected operation of heavy-duty winch.

4. If connected, disconnect heavy-duty winch control valve harness IN solenoid connector. (WP 0049)
5. If connected, disconnect heavy-duty winch control valve harness OUT solenoid connector. (WP 0049)

**WARNING**



Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

6. Start engine (refer to TM 9-2320-279-10).
7. Set PTO ENGAGE switch to ON position. (WP 0015)
8. Connect positive (+) probe of multimeter to red wire at heavy-duty winch remote control unit left switch, COM terminal. Refer to schematics.



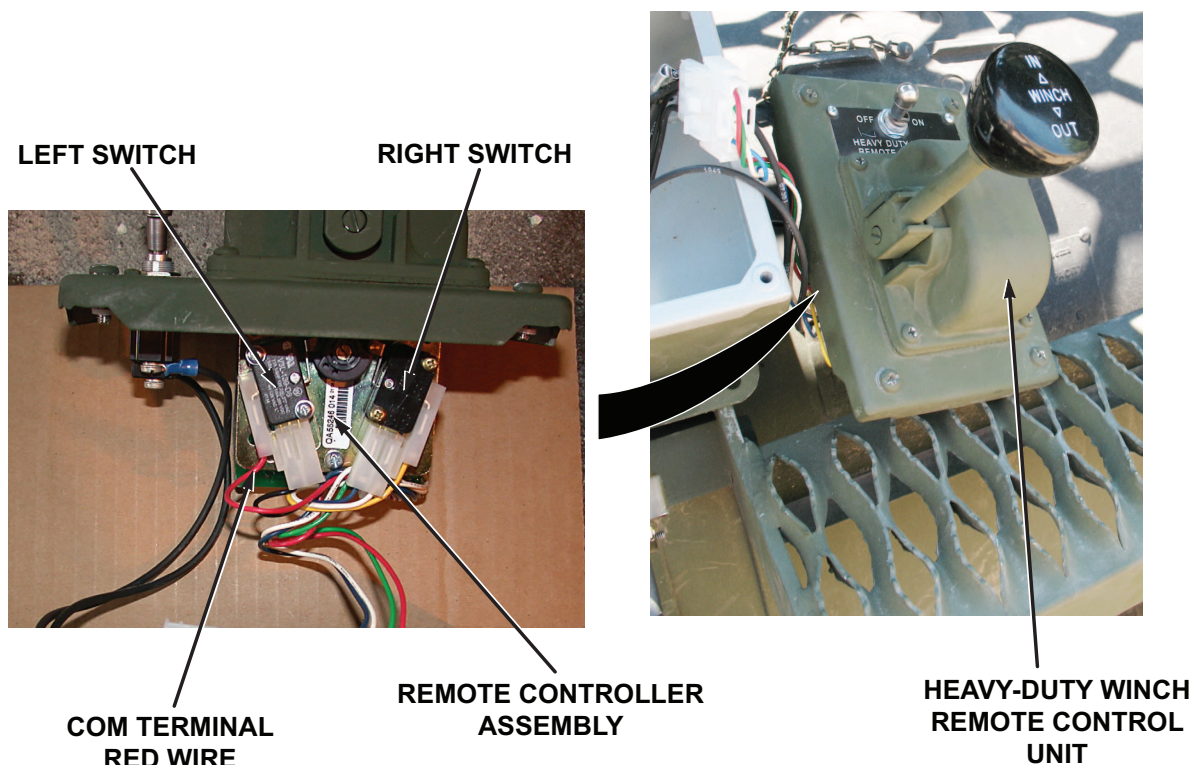


Figure 15.

9. Connect negative (-) probe of multimeter to known good ground.
10. Multimeter should display a reading between 22 and 28 vdc. Note reading.
11. If voltage reading is not between 22 and 28 vdc, set PTO ENGAGE switch to OFF position. (WP 0015)
12. If voltage reading is not between 22 and 28 vdc, shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

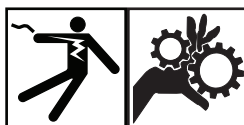
Are 22 to 28 vdc measured on red wire at heavy-duty winch remote control unit left switch, COM terminal?

**DECISION**

No - Repair red wire or replace heavy-duty winch remote control unit. (WP 0047) Test 20 - Does winch operate with remote control?

Yes - Test 16 - Are 22 to 28 vdc measured on black wire at heavy-duty winch remote control unit left switch, NO terminal when heavy-duty winch remote control lever is operated to the IN and OUT position?

**TEST 16 - Are 22 to 28 vdc measured on black wire at heavy-duty winch remote control unit left switch, NO terminal when heavy-duty winch remote control lever is operated to the IN and OUT position?**

**WARNING**

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and

cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

### WARNING



Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

1. Connect positive (+) probe of multimeter to black wire at heavy-duty winch remote control unit left switch, NO terminal. Refer to schematics.

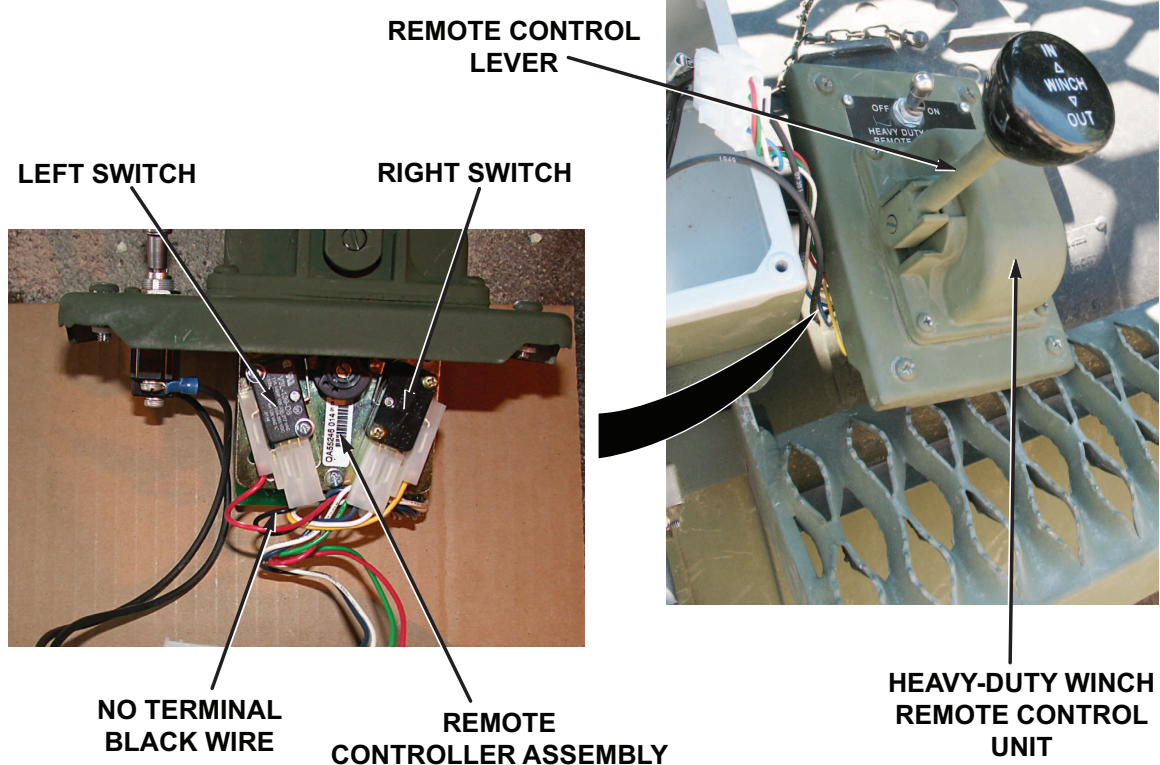


Figure 16.

2. Connect negative (-) probe of multimeter to known good ground.

### NOTE

Heavy-duty winch control valve IN and OUT solenoid connectors are disconnected to prevent unexpected operation of heavy-duty winch.

3. Operate remote control lever to the IN and OUT positions. (WP 0010)
4. Multimeter should display a reading between 22 and 28 vdc when remote control lever is in the IN and OUT positions. Note reading.
5. Release remote control lever.
6. If voltage reading is not between 22 and 28 vdc, set PTO ENGAGE switch to OFF position. (WP 0015)
7. If voltage reading is not between 22 and 28 vdc, shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Are 22 to 28 vdc measured on black wire at heavy-duty winch remote control unit left switch, NO terminal when heavy-duty winch remote control lever is operated to the IN and OUT position?

**DECISION**

No - Replace remote control left switch. (WP 0047) Test 20 - Does winch operate with remote control?

Yes - Test 17 - Are 22 to 28 vdc measured on yellow wire at heavy-duty winch remote control unit right switch, COM terminal when heavy-duty winch remote control lever is operated to the IN or OUT position?

**TEST 17 - Are 22 to 28 vdc measured on yellow wire at heavy-duty winch remote control unit right switch, COM terminal when heavy-duty winch remote control lever is operated to the IN or OUT position?**

**WARNING**

Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

1. Connect positive (+) probe of multimeter to yellow wire at heavy-duty winch remote control unit right switch, COM terminal. Refer to schematics.

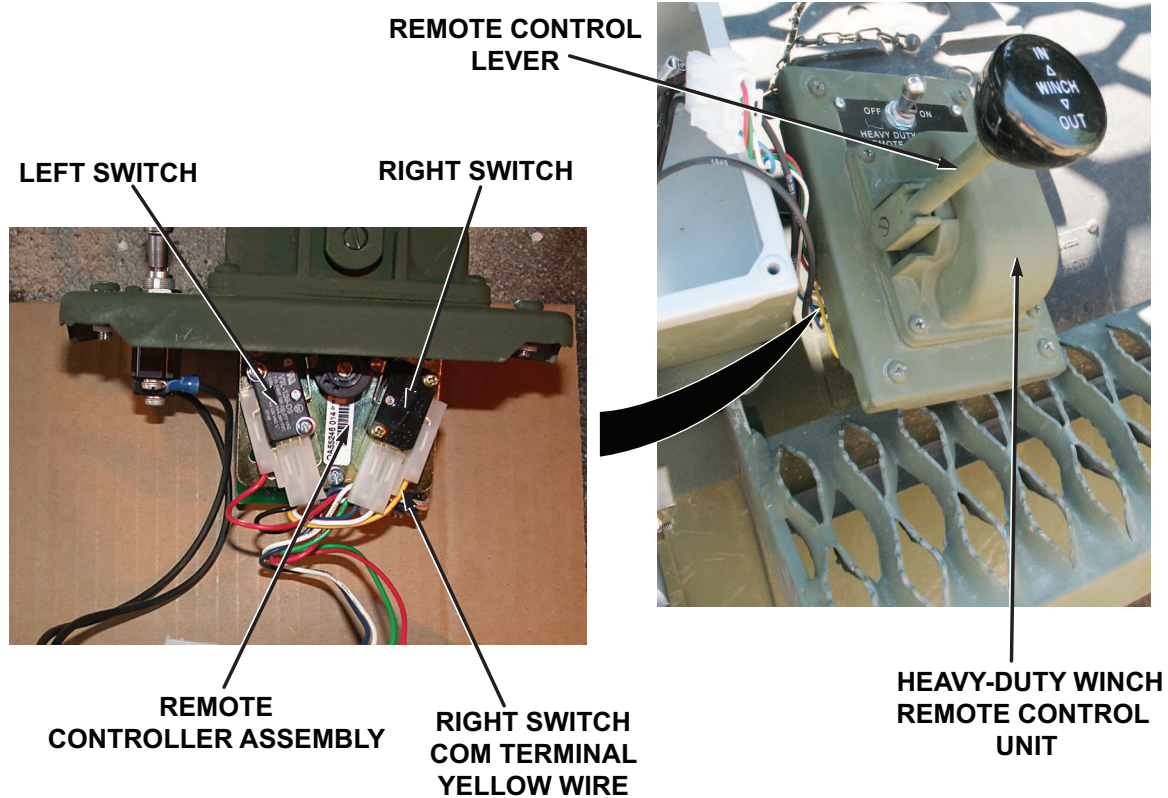


Figure 17.

2. Connect negative (-) probe of multimeter to known good ground.

### NOTE

Heavy-duty winch control valve IN and OUT solenoid connectors are disconnected to prevent unexpected operation of heavy-duty winch.

3. Operate remote control lever to the IN or OUT position. (WP 0010)
4. Multimeter should display a reading between 22 and 28 vdc, when remote control lever is in the IN and OUT positions. Note reading.
5. Release remote control lever.
6. If voltage reading is not between 22 and 28 vdc, set PTO ENGAGE switch to OFF position. (WP 0015)
7. If voltage reading is not between 22 and 28 vdc, shut OFF engine. (refer to TM 9-2320-279-10).

### CONDITION/INDICATION

Are 22 to 28 vdc measured on yellow wire at heavy-duty winch remote control unit right switch, COM terminal when heavy-duty winch remote control lever is operated to the IN or OUT position?

### DECISION

No - Replace heavy-duty winch remote control unit. (WP 0047) Test 20 - Does winch operate with remote control?  
 Yes - Test 18 - Are 22 to 28 vdc measured on blue wire at heavy-duty winch remote control unit right switch, NC terminal when heavy-duty winch remote control lever is operated to the IN position?

**TEST 18 - Are 22 to 28 vdc measured on blue wire at heavy-duty winch remote control unit right switch, NC terminal when heavy-duty winch remote control lever is operated to the IN position?**

**WARNING**



Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**



Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

1. Connect positive (+) probe of multimeter to blue wire at heavy-duty winch remote control unit right switch, NC terminal. Refer to schematics.



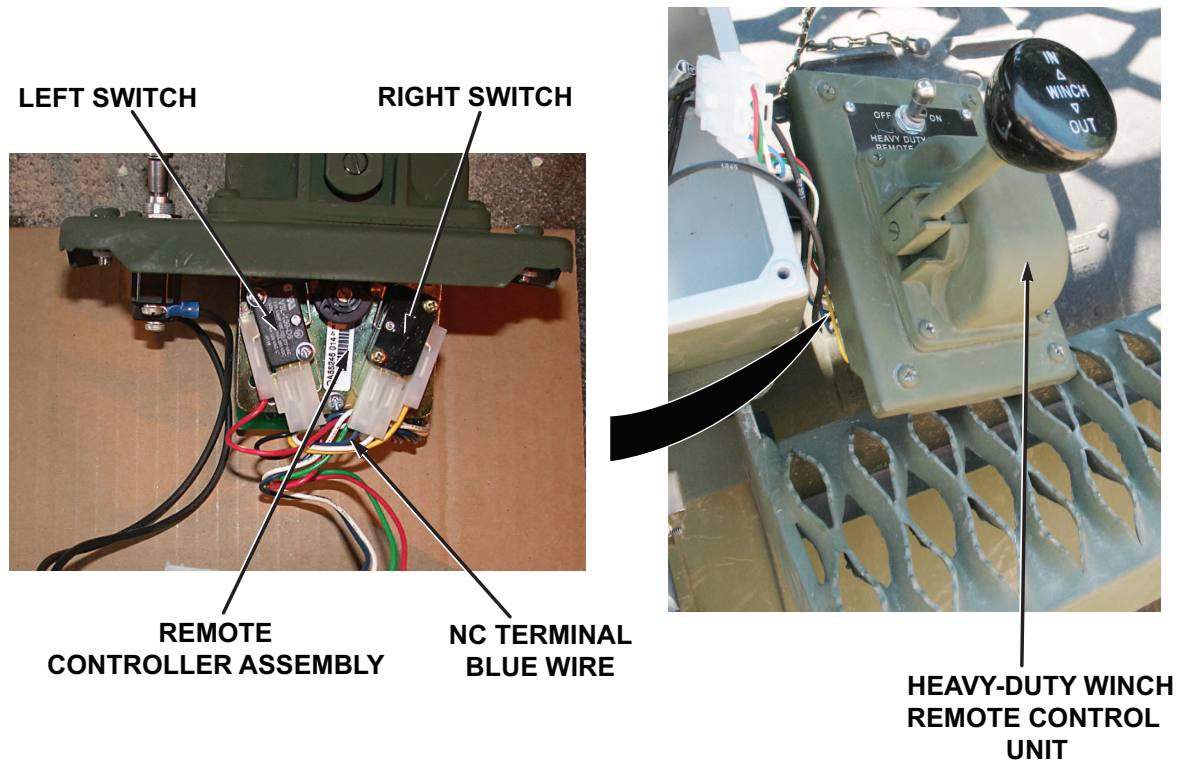


Figure 18.

2. Connect negative (-) probe of multimeter to a known good ground.

### NOTE

Heavy-duty winch control valve IN and OUT solenoid connectors are disconnected to prevent unexpected operation of heavy-duty winch.

3. Operate remote control lever to the IN position. (WP 0010)
4. Multimeter should display a reading between 22 and 28 vdc. Note reading.
5. Release remote control lever.
6. If voltage reading is not between 22 and 28 vdc, set PTO ENGAGE switch to OFF position. (WP 0015)
7. If voltage reading is not between 22 and 28 vdc, shut OFF engine (refer to TM 9-2320-279-10).

### CONDITION/INDICATION

Are 22 to 28 vdc measured on blue wire at heavy-duty winch remote control unit right switch, NC terminal when heavy-duty winch remote control lever is operated to the IN position?

### DECISION

No - Replace heavy-duty winch remote control unit right switch. (WP 0047) Test 20 - Does winch operate with remote control?  
 Yes - Test 19 - Are 22 to 28 vdc measured on white wire at heavy-duty winch remote control unit right switch, NO terminal when heavy-duty winch remote control lever is operated to the OUT position?

**TEST 19 - Are 22 to 28 vdc measured on white wire at heavy-duty winch remote control unit right switch, NO terminal when heavy-duty winch remote control lever is operated to the OUT position?**

**WARNING**



Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

**WARNING**



Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

1. Connect positive (+) probe of multimeter to white wire at heavy-duty winch remote control unit right switch, NO terminal. Refer to schematics.

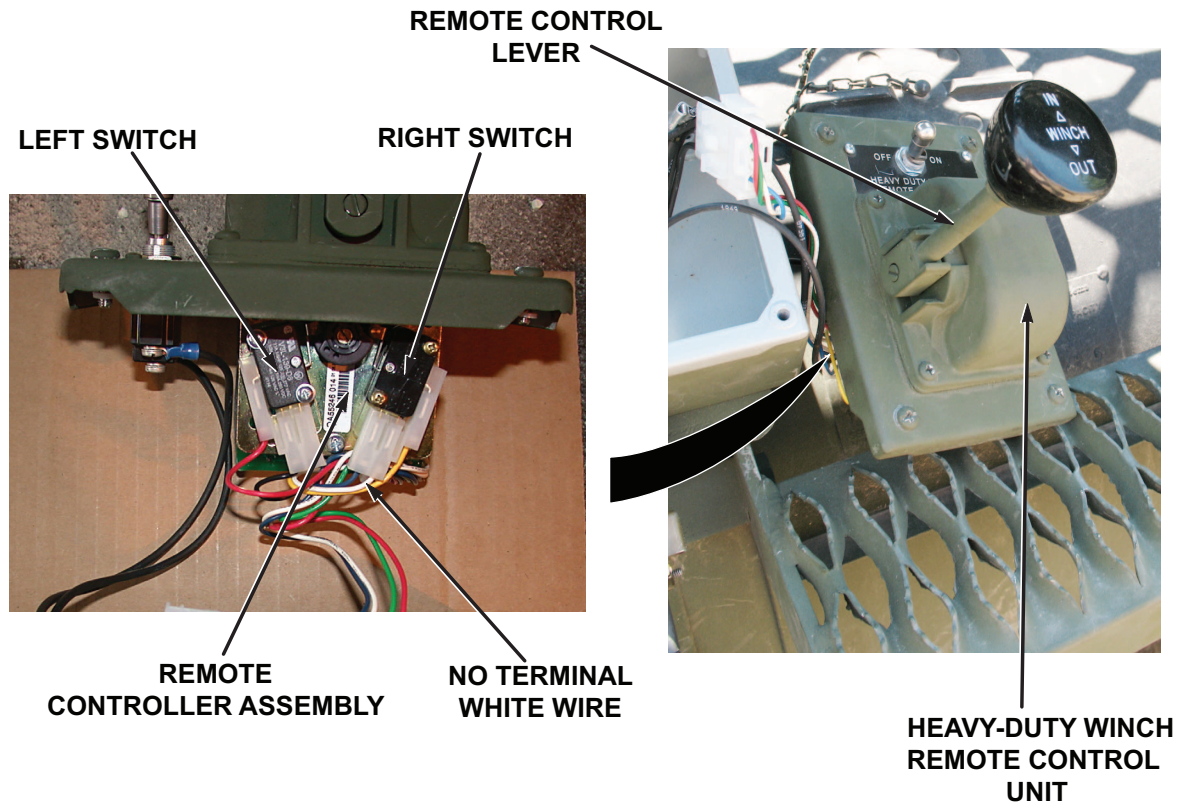


Figure 19.

2. Connect negative (-) probe of multimeter to a known good ground.

### NOTE

Heavy-duty winch control valve IN and OUT solenoid connectors are disconnected to prevent unexpected operation of heavy-duty winch.

3. Operate remote control lever to the OUT position. (WP 0010)
4. Multimeter should display a reading between 22 and 28 vdc. Note reading.
5. Release remote control lever.
6. Set PTO ENGAGE switch to OFF position. (WP 0015)
7. Shut off engine (refer to TM 9-2320-279-10).

### CONDITION/INDICATION

Are 22 to 28 vdc measured on white wire at heavy-duty winch remote control unit right switch, NO terminal when heavy-duty winch remote control lever is operated to the OUT position?

### DECISION

No - Replace heavy-duty winch remote control unit right switch. (WP 0047)Test 20 - Does winch operate with remote control?

Yes - Replace heavy-duty winch control valve. (WP 0072)Test 20 - Does winch operate with remote control?



**TEST 20 - Does winch operate with remote control?****CAUTION**

Do not let cable end run into heavy-duty winch while reeling IN, or damage to equipment will result.

1. If disconnected, connect heavy-duty winch remote control unit harness internal four terminal connector. (WP 0047)
2. If removed, install cover on heavy-duty winch remote control unit and tighten four screws. (WP 0047)
3. If disconnected, connect heavy-duty winch control valve harness IN solenoid connector. (WP 0049)
4. If disconnected, connect heavy-duty winch control valve harness OUT solenoid connector. (WP 0049)
5. If disconnected, connect remote control cable to remote control connector. (WP 0015)
6. If disconnected, connect heavy-duty winch remote control unit to remote control cable. (WP 0015)

**WARNING**

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

7. Start engine (refer to TM 9-2320-279-10).
8. Set PTO ENGAGE switch to ON position. (WP 0015)
9. Prepare vehicle for heavy-duty winch operation. (WP 0015)

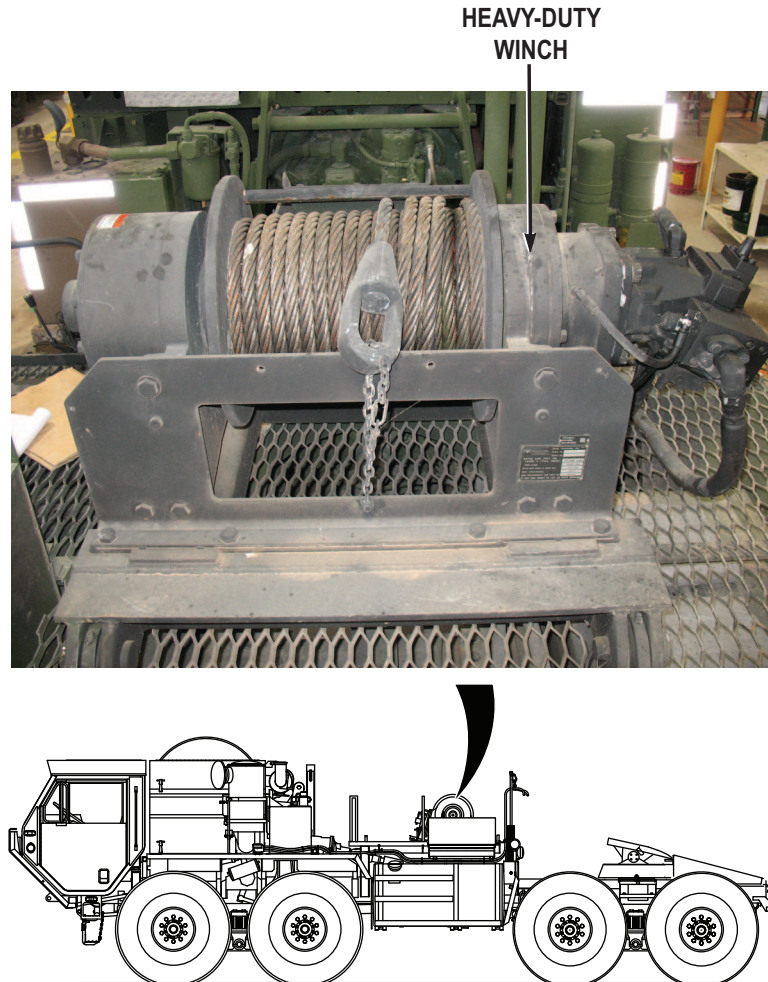


Figure 20.

10. While assistant operates heavy-duty winch remote controls, observe heavy-duty winch operation. (WP 0015)
11. Check if winch cable pays out and reels in using remote control.
12. Stow heavy-duty winch. (WP 0015)
13. Set PTO ENGAGE switch to OFF position. (WP 0015)
14. Shut OFF engine (refer to TM 9-2320-279-10).

**CONDITION/INDICATION**

Does winch operate with remote control?

**DECISION**

No - Problem not corrected. Notify Supervisor.  
Yes - Problem corrected.

**END OF WORK PACKAGE**

## CHAPTER 4

### PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)



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## FIELD MAINTENANCE

### INTRODUCTION - PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

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#### PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION

This section contains PMCS requirements for HEMTT series vehicles. The PMCS tables contain checks and services necessary to ensure that the vehicle is ready for operation. Using PMCS tables, perform maintenance at specified intervals. Operator Preventive Checks and Services must be completed before doing Field Level Preventive Checks and Services.

#### MAINTENANCE FORMS AND RECORDS

Every mission begins and ends with paperwork. There is not much of it, but it must be kept up. The filled out forms and records have several uses; they are a permanent record of services, repairs, and modifications made on the vehicle, they are reports to unit maintenance and to your Commander; and they serve as a checklist to find out what is wrong with the vehicle after its last use, and whether those faults have been fixed. For more information on forms and records, refer to DA PAM 750-8. (WP 0079)

#### GENERAL MAINTENANCE PROCEDURE

- **Cleanliness:** Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Use solvent cleaning compound (WP 0083) on all metal surfaces and soapy water on rubber.
- **Bolts, Nuts, and Screws:** Check bolts, nuts, and screws for obvious looseness, missing, bent, or broken condition and tighten or replace as necessary. They cannot all be checked with a tool, of course, but look for chipped paint, bare metal, or rust around bolt heads.
- **Welds:** Look for loose or chipped paint, rust, or gaps where parts are welded together. If a bad weld is found, have it repaired.
- **Electric Wires and Connectors:** Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure wires are in good shape.
- **Hydraulic Hoses and Fittings:** Look for wear, damage, and leaks, and make sure clamps and fittings are tight. Wet spots show leaks, of course, but a stain around a fitting or connector can indicate a leak. If a connector or fitting is loose, tighten it. If something is broken or worn out, repair or replace per applicable procedure.
- **Damage is defined as:** Any conditions that affect safety or would render the vehicle unserviceable for mission requirements.

#### FLUID LEAKAGE

##### NOTE

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

Fluid leakage affects the operational status of fuel, oil, coolant, and the hydraulic systems. The following are definitions of types/classes of leakage necessary to know in order to determine the status of the vehicle:

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

**Class II:** Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.

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

**PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**

Prior to performing your PMCS, check with your PLL clerk to verify that the latest publications are being used by the operator and organizational unit.

- Complete the before (B) PREVENTIVE MAINTENANCE just before operating vehicle. Pay attention to the CAUTIONS and WARNINGS.
- Complete the during (D) PREVENTIVE MAINTENANCE while vehicle and/or its component systems are in operation. Pay attention to the CAUTIONS and WARNINGS.
- Complete the after (A) PREVENTIVE MAINTENANCE right after operating vehicle. Pay attention to the CAUTIONS and WARNINGS.
- Complete the (W) PREVENTIVE MAINTENANCE weekly. Pay attention to the CAUTIONS and WARNINGS.
- Complete the (M) PREVENTIVE MAINTENANCE once a month. Pay attention to the CAUTIONS and WARNINGS.
- Complete SEMIANNUAL PREVENTIVE MAINTENANCE once every six months and/or every 3,000 miles (4,827 km), whichever comes first.
- Complete ANNUAL PREVENTIVE MAINTENANCE once each year and/or every 6,000 miles (9,654 km), whichever comes first.
- Complete BIENNIAL PREVENTIVE MAINTENANCE once every 2 years and/or every 12,000 miles (19,308 km), whichever comes first.
- Always complete PREVENTIVE MAINTENANCE in the same order, until it becomes habit. Once PREVENTIVE MAINTENANCE is mastered, it should allow you to spot any discrepancies, even in a rushed situation.
- If something does not work, troubleshoot per instructions in the Troubleshooting section of this publication.
- If anything looks wrong and is not fixed immediately upon discovery, complete a DA FORM 5988-E. (WP 0079)
- When completing PREVENTIVE MAINTENANCE, always take along the tools needed to make all the required checks (including one or two clean rags).

**END OF WORK PACKAGE**

**OPERATOR MAINTENANCE  
BEFORE - PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**

**INITIAL SETUP:**

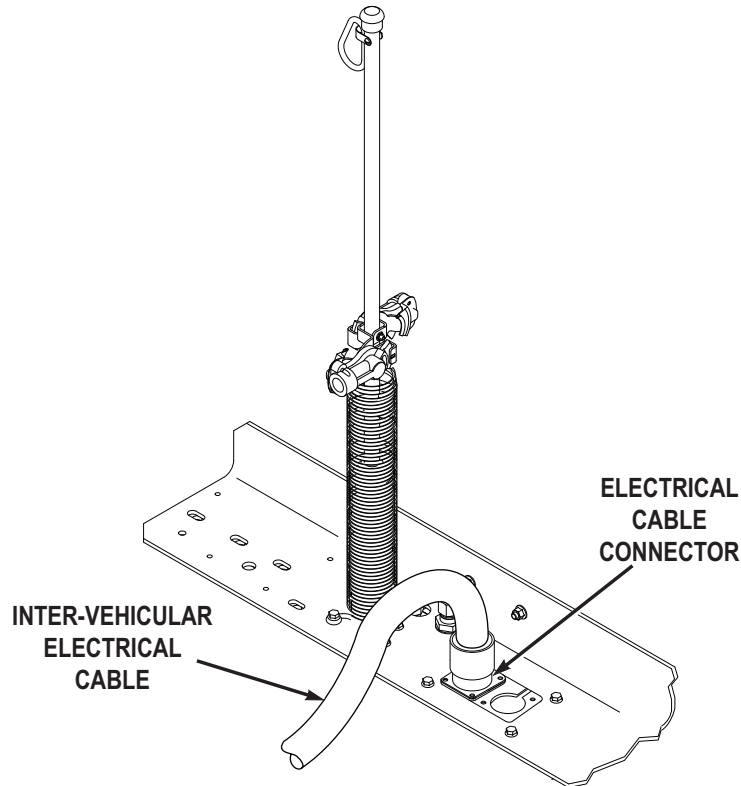
Not Applicable

***Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - Before.***

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
1	Before	Air Lines, Electrical Connector, and Inter-vehicular Wiring Harness	<p style="text-align: center;"><b>NOTE</b></p> <p>Use "Operator Before-Preventive Maintenance" found in TM 9-2320-315-14&amp;P. When performing PMCS on the M983A2 LET, add the following checks.</p> <ol style="list-style-type: none"> <li>1. Check semitrailer air brake lines for obvious damage.</li> </ol>	Air line is missing or unserviceable.

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - Before. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
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*Figure 1.*

2	Before	Fifth Wheel	2. Check inter-vehicular wiring harness, electrical cables and 24 Vdc connector for obvious damage.	Electrical cables and connectors have damage that would prevent normal operation. Inter-vehicular wiring harness is missing or unserviceable.
			1. Check primary release handle, linkage, and locking plunger for damage and proper operation.	Mechanism is damaged or will not operate properly.



Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - Before. - Continued

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:

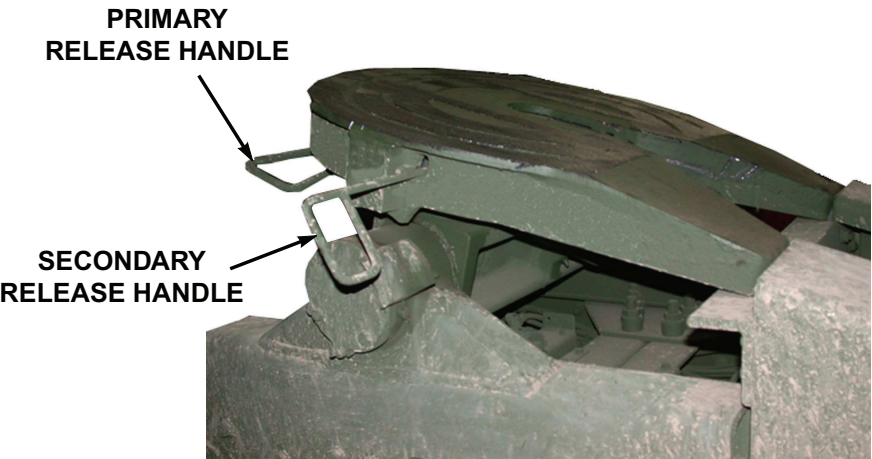


Figure 2.

			<div>2. Check secondary release handle linkage and locking plunger for damage and proper operation.</div> <div>3. Check that both release handles are pushed completely in.</div>	Mechanism is damaged or will not operate properly.
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END OF WORK PACKAGE





**OPERATOR MAINTENANCE  
DURING - PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**

**INITIAL SETUP:**

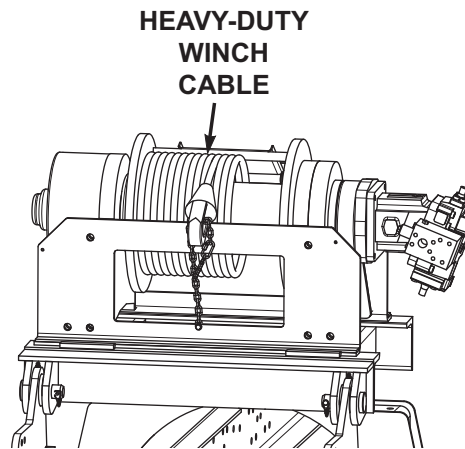
Not Applicable

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - DURING.**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
			<p style="text-align: center;"><b>WARNING</b></p>  <p>Keep hands clear of heavy-duty winch cable. Failure to comply may result in injury or death to personnel.</p> <p style="text-align: center;"><b>WARNING</b></p>  <p>Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.</p> <p style="text-align: center;"><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• Never operate winch with less than five wraps of cable on winch drum.</li> <li>• Use "Operator During-Preventive Maintenance" found in TM 9-2320-315-14&amp;P. When performing PMCS on the M983A2 LET, add the following checks.</li> </ul>	

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - DURING. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
1	During	Heavy-Duty Winch	Check winch cable for kinks, frays, and breaks.	Evidence of kinks, frays, or breaks.

*Figure 1.***WARNING**

Keep hands clear of heavy-duty winch cable. Failure to comply may result in injury or death to personnel.

**WARNING**

Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.

Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - DURING. - Continued

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
			<p><b>NOTE</b></p> <ul style="list-style-type: none"><li>• Never operate winch with less than five wraps of cable on winch drum.</li><li>• PMCS for heavy-duty winch should only be performed when heavy-duty winch is required for mission.</li></ul>	
2	During	Heavy-Duty Winch	1. Check heavy-duty winch remote control and cable for proper operation (WP 0010) obvious damage, missing parts, binding, and excessive looseness.	Controls malfunction, bind, or do not respond.

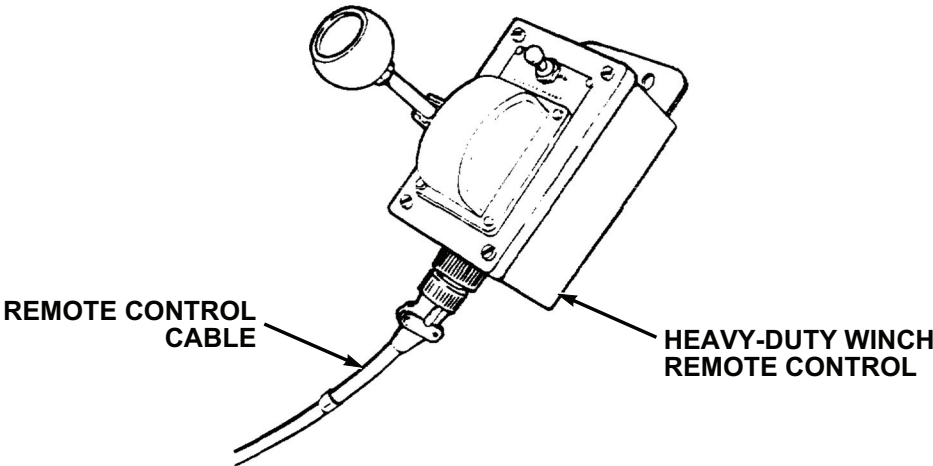
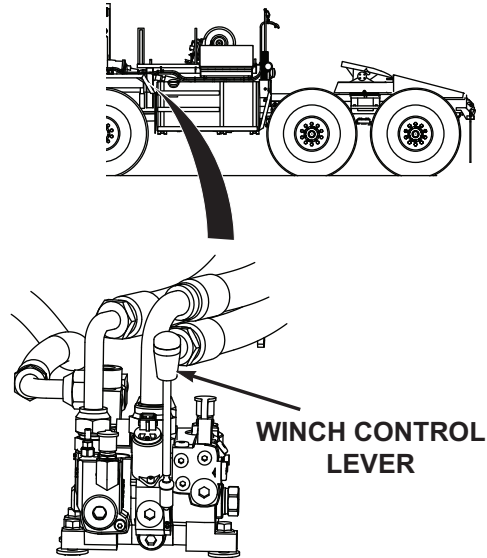


Figure 2.

			2. Check manual winch control for proper operation (WP 0010) obvious damage, missing parts, binding, and excessive looseness.	Controls malfunction, bind, or do not respond.
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**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - DURING. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:



*Figure 3.***END OF WORK PACKAGE**

**OPERATOR MAINTENANCE  
WEEKLY - PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**

**INITIAL SETUP:**

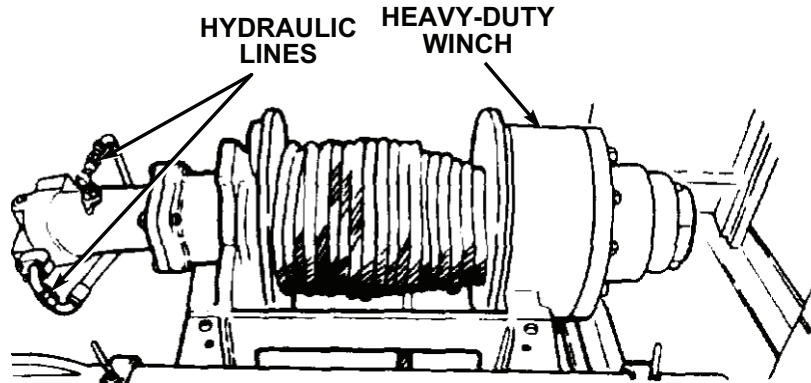
Not Applicable

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - WEEKLY.**

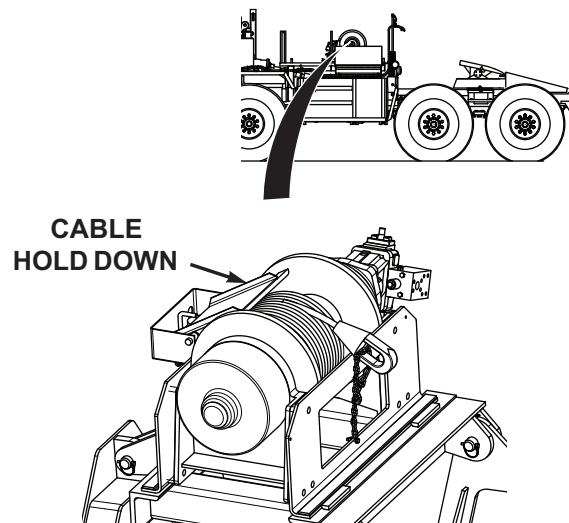
Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
			<p style="text-align: center;"><b>WARNING</b></p>  <p>Keep hands clear of heavy-duty winch cable. Failure to comply may result in injury or death to personnel.</p> <p style="text-align: center;"><b>WARNING</b></p>  <p>Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.</p> <p style="text-align: center;"><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• Never operate winch with less than five wraps of cable on winch drum.</li> <li>• Use Operator Weekly-Preventive Maintenance found in TM 9-2320-315-14&amp;P. When performing PMCS on the M983A2 LET, add the following checks.</li> </ul>	

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - WEEKLY. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
1	Weekly	Heavy-Duty Winch	1. Check for evidence of bent or crushed hydraulic hoses or leakage at any threaded coupling or quick disconnect.	Hoses or fittings are damaged. Class III leakage is evident.

*Figure 1.*

		2. Check cable hold down for obvious damage.
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*Figure 2.*

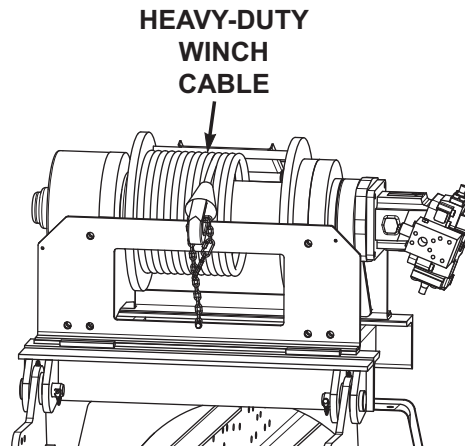


**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - WEEKLY. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
2	Weekly	Heavy-Duty Winch	<p style="text-align: center;"><b>WARNING</b></p> <div> </div> <p>Keep hands clear of heavy-duty winch cable. Failure to comply may result in injury or death to personnel.</p> <p style="text-align: center;"><b>WARNING</b></p> <div> </div> <p>Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.</p> <p style="text-align: center;"><b>NOTE</b></p> <p>Never operate winch with less than five wraps of cable on winch drum.</p> <p>1. Pay out heavy-duty winch cable (WP 0015) and check cable for kinks, frays, or breaks.</p>	Evidence of kinks, frays, or breaks.

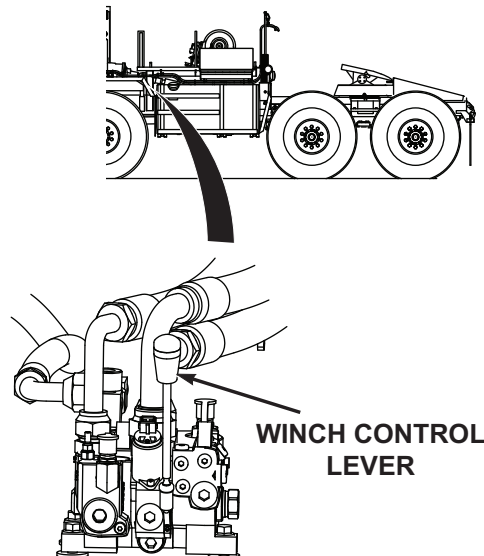
**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - WEEKLY. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:

*Figure 3.*

2. Check heavy-duty winch control lever for proper operation (WP 0010) in both directions.

Controls malfunction, bind, or do not respond.

*Figure 4.*

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - WEEKLY. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
			3. Check heavy-duty winch remote control and cable for proper operation (WP 0010) obvious damage, missing parts, binding, and excessive looseness.	Controls malfunction, bind, or do not respond.

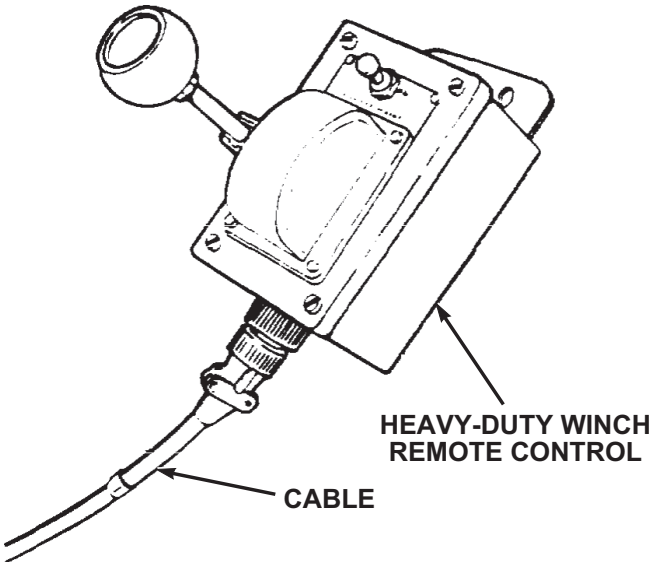


Figure 5.

END OF WORK PACKAGE



**OPERATOR MAINTENANCE  
SEMIANNUAL - PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**

**INITIAL SETUP:**

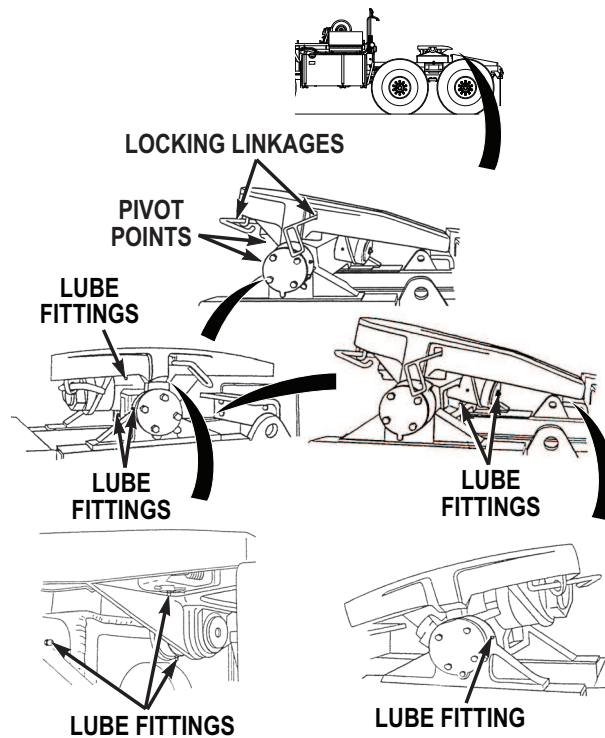
Not Applicable

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - SEMIANNUAL.**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
1	Semiannual	Fifth Wheel	<p style="text-align: center;"><b>NOTE</b></p> <p>Use "Operator Semiannual Preventive Maintenance" found in TM 9-2320-315-14&amp;P. When performing PMCS on the M983A2 LET, add the following check.</p> <ol style="list-style-type: none"> <li>1. Lubricate locking linkage, springs, and pivot points with OE/HDO (WP 0041) as required.</li> </ol>	

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - SEMIANNUAL. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:

*Figure 1.*

2	Semiannual	Heavy-Duty Winch	<ol style="list-style-type: none"> <li>2. Lubricate fifth wheel lube fittings with GAA (WP 0041) (nine fittings).</li> <li>1. Lubricate winch mounts with GAA (WP 0041) as required.</li> </ol>	Fittings will not purge old lubricant out of component.
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**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - SEMIANNUAL. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:

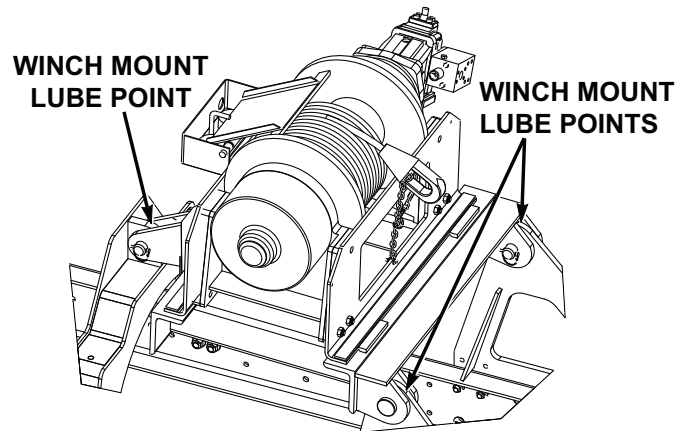


Figure 2.

3	Semiannual	Roller Assembly	1. Lubricate roller assembly lube fittings with GAA (WP 0041) (two fittings).	Fittings will not purge old lubricant out of component.
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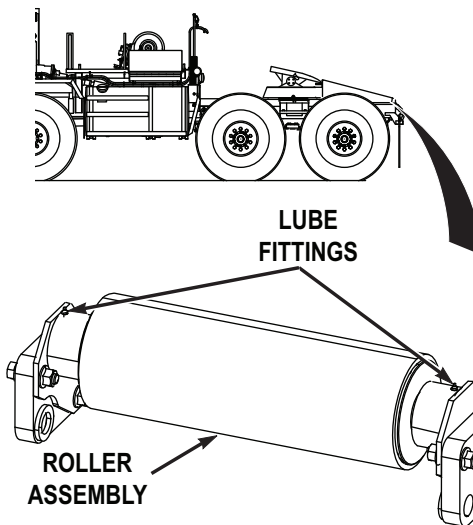


Figure 3.

**END OF WORK PACKAGE**





**FIELD MAINTENANCE**  
**SEMIANNUAL - PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**

**INITIAL SETUP:**

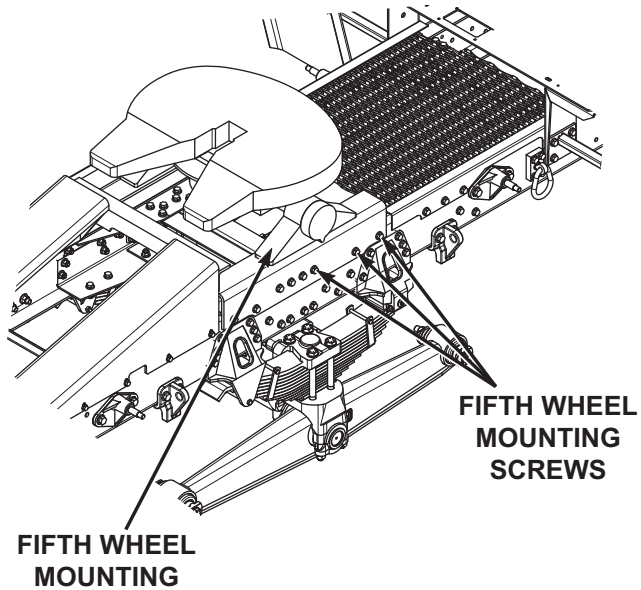
Not Applicable

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - SEMIANNUAL.**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
			<b>NOTE</b>  Use Field Level Semiannual-Preventive Maintenance found in TM 9-2320-315-14&P. When performing PMCS on the M983A2 LET, substitute the following checks for fifth wheel and winch checks.	
1	Semiannual	Fifth Wheel	1. Check fifth wheel mounting screws for looseness. Tighten screws to 210 lb-ft (285 N·m).	Screws cannot be torqued to 210 lb-ft (285 N·m).

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - SEMIANNUAL. - Continued**

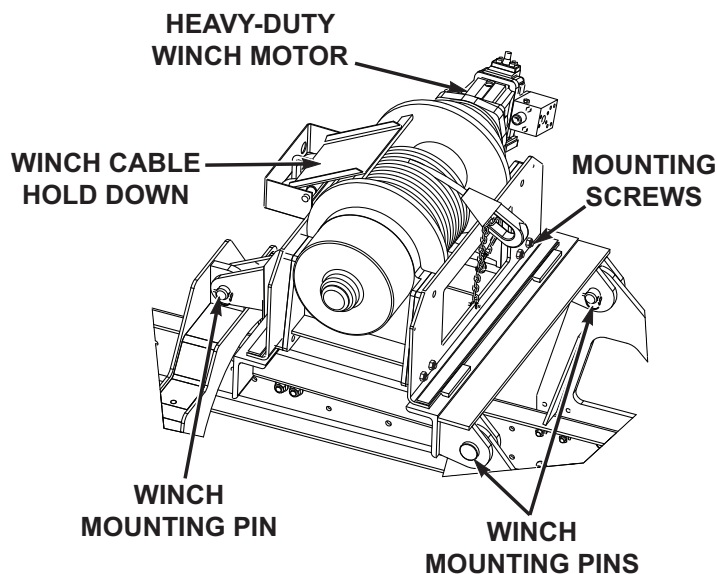
Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:

*Figure 1.*

2	Semiannual	Heavy-Duty Winch	<ol style="list-style-type: none"> <li>1. Inspect winch mounting screws for looseness.</li> <li>2. Inspect fifth wheel mounting for bent, worn, or broken parts.</li> </ol>	<p>Bent, worn, or broken parts evident.</p> <p>Screws cannot be torqued to 260 lb-ft (353 N·m).</p>
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**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - SEMIANNUAL. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:

*Figure 2.*

			<ol style="list-style-type: none"> <li>2. Pay out winch cable completely and check for kinks, broken strands, and wear.</li> <li>3. While operating winch (WP 0015), check that engine governor maintains 1,500 rpm (<math>\pm</math> 25 rpm).</li> <li>4. Inspect winch mounting pins for presence and damage.</li> <li>5. Inspect hydraulic hoses for splits, cracks, leaks, or other signs of damage.</li> <li>6. Inspect cable hold down for missing or damaged parts.</li> </ol>	<p>Kinks, broken strands or wear evident.</p> <p>Engine surges erratically or does not maintain 1,500 rpm (<math>\pm</math> 25 rpm).</p> <p>Mounting pins missing or damaged.</p> <p>Splits, cracks or Class III leaks evident.</p> <p>Missing or damaged parts evident.</p>
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**END OF WORK PACKAGE**



FIELD MAINTENANCE

ANNUAL - PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

INITIAL SETUP:

Not Applicable

Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - ANNUAL.

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
			<div>NOTE</div> <div>Use Field Level Annual-Preventive Maintenance found in TM 9-2320-315-14&amp;P. When performing PMCS on the M983A2 LET, substitute the following check for fifth wheel inspection.</div>	
1	Annual	Fifth Wheel	Inspect fifth wheel top plate and oscillating assembly for bent, worn, cracked, or broken parts.	Bent, worn, or broken parts evident.

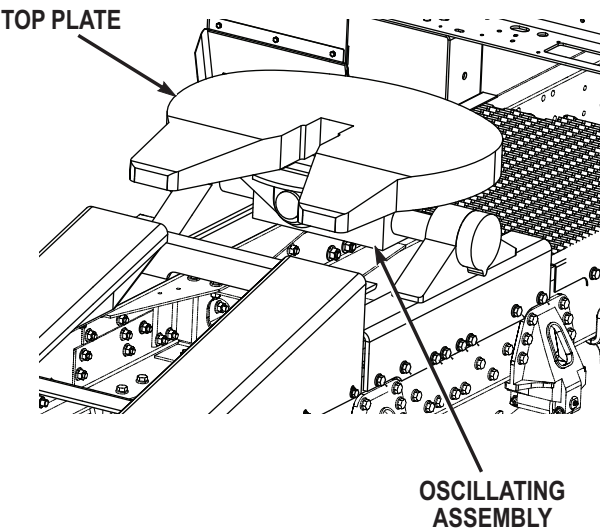
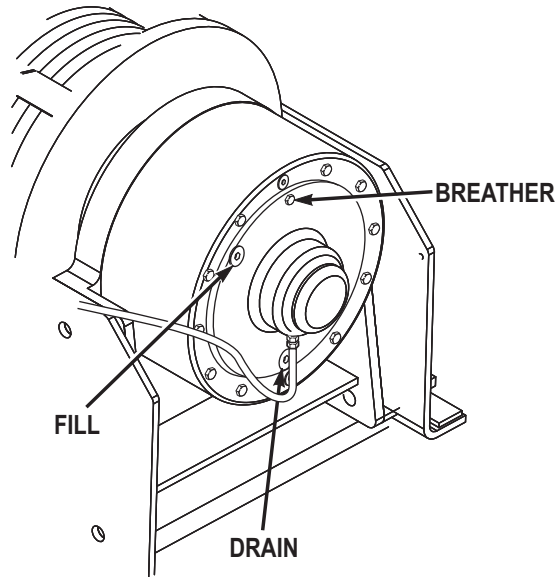


Figure 1.

**Table 1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - ANNUAL. - Continued**

Item No.	Interval	Item to be Checked or Serviced	Procedure	Equipment Not Ready/Available If:
2	Annual	Heavy-Duty Winch	<p style="text-align: center;"><b>NOTE</b></p> <p>Use Field Level Annual-Preventive Maintenance found in TM 9-2320-315-14&amp;P. When performing PMCS on the M983A2 LET, add the following check.</p>	
			1. Change GO (WP 0041) in heavy-duty winch drum gearbox.	

*Figure 2.*

			2. Remove, clean, and install winch breather.	Breather missing or cannot be cleaned.
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**END OF WORK PACKAGE**

## CHAPTER 5

### MAINTENANCE INSTRUCTIONS





## FIELD MAINTENANCE LUBE TABLE

**INITIAL SETUP:**

Not Applicable

**NOTE**

Information for the M983A2 LET is listed below.

**Table 1. M983A2 LET Specific Lubrication Points.**

ITEM	CAPACITIES	EXPECTED TEMPERATURES			INTERVALS
		ABOVE 15°F (-9°C)	40 to -15°F (4 to -26°C )	40 to -50°F (4 to -46°C )	
Winch Gearbox (Motor End)	2 qt. (1.89 L)	GO-85W/140 MIL-PRF-2105	GO-75 MIL-PRF-2105 or GO-80W/90 MIL-PRF-2105 (Note1)	GO-75 MIL-PRF-2105 (Note1)	A-Annual (1 Year)
Winch Gearbox (Gear End)	3.5 qt. (3.31 L)	GO-85W/140 MIL-PRF-2105	GO-75 MIL-PRF-2105 or GO-80W/90 MIL-PRF-2105 (Note1)	GO-75 MIL-PRF-2105 (Note1)	A-Annual (1 Year)
All Other Winch Lubrication Points (Note 2)	As Required	GAA MIL-PRF-10924	GAA MIL-PRF-10924 (Note 1)	GAA MIL-PRF-10924 (Note 1)	As Required
Roller Assembly Lubrication Points (Note 2)	As Required	GAA MIL-PRF-10924	GAA MIL-PRF-10924 (Note 1)	GAA MIL-PRF-10924 (Note 1)	As Required

**NOTE**

1. Refer to FM 9-207 (WP 0079) for arctic operation.
2. Refer to Operator's Semi-Annual PMCS (WP 0038) for specific lubrication points.

1. Refer to TM 9-2320-315-14&P for specific lubrication points and instructions.

**Table 2. Hydraulic Reservoir Servicing.**

ITEM	CAPACITIES	EXPECTED TEMPERATURES				INTERVAL
		ABOVE 60°F (-9°C)	ABOVE 15°F (-9°C)	40 to -15°F (4 to -26°C )	40 to -50°F (4 to -46°C )	
Hydraulic Reservoir	135 qt. (127.71 L)	OE/HDO-30 MIL- PRF-2104 (Note 1)	OE/HDO-10 MIL- PRF-2104 (Note 1)	OE/HDO-10 MIL- PRF-2104 (Note 2)	OEA MIL- PRF-46167 (Notes 2 and 3)	A-Annual (1 year)
<p style="text-align: center;"><b>NOTE</b></p> <ol style="list-style-type: none"> <li>1. OE/HDO-30 must be used only when temperatures are consistently above 60°F (16° C).</li> <li>2. Refer to FM 9-207 (WP 0079) for arctic operation.</li> <li>3. OEA must be used when temperatures are consistently below 0°F (-18°C).</li> </ol>						

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**MIRROR EXTENSION ASSEMBLY REMOVAL/INSTALLATION**

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**INITIAL SETUP:**

**References**

Parts Manual (Fig. 25)

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1. The M983A2 LET Mirror Extension Assembly is removed and installed the same way as the M984A2 Wrecker Mirror Extension Assembly. Refer to TM 9-2320-315-14&P for Mirror Extension Assembly Removal/Installation instructions.

**END OF TASK**

**END OF WORK PACKAGE**



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## FIELD MAINTENANCE WINCH AIR LINES REPLACEMENT

---

### INITIAL SETUP:

#### Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Gloves, Welders (WP 0081, Table 2, Item 7)  
Goggles, Industrial (WP 0081, Table 2, Item 7)

Compound, Anti-Corrosion Spray (WP 0083, Table 1, Item 8)  
Tags, Identification (WP 0083, Table 1, Item 30)

#### References

Parts Manual (Fig. 8)

#### Materials/Parts

Cable Ties, Plastic (WP 0083, Table 1, Item 1)

#### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).  
Air system drained (refer to TM 9-2320-315-14&P).

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### WARNING



### POLYURETHANE COATING (CARC)

- Eye and hearing protection must be worn at all times when using power tools for grinding, cutting, sawing, and drilling. Failure to do so may result in injury to personnel. Chemical Agent Resistant Coating (CARC) paint contains isocyanate which is highly irritating to skin and respiratory system. High concentrations of isocyanate can produce symptoms of itching and reddening of skin, a burning sensation in the throat and nose, and watering of the eyes. In extreme concentrations, isocyanate can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention.
- The following precautions must be taken whenever using CARC paint:
- Protective equipment (gloves, goggles, ventilation mask) must be worn when using CARC paint.
- NEVER cut CARC-coated materials without high-efficiency, air-purifying respirators in use.
- 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.
- Use only in well-ventilated area. Check with local environmental office for methods and locations approved for painting in accordance with local and state environmental regulations.
- 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.

### WARNING



If air lines are under pressure when they are disconnected, they can whip around. Use care when loosening or disconnecting air line fittings. Failure to comply may result in injury or death to personnel.

### WARNING



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

### NOTE

- Tag and mark air lines prior to removal to ensure proper installation.
- Note location and position of fittings prior to removal to ensure proper installation.
- Note position and remove cushion clips and cable ties as required.

**Table 1. Air Line Locations.**

Item No.	Line No.	Color	Size	From	To
1	2338	Black	0.38	Tee on Driver Side Tire Inflation Connector	Heavy-Duty Winch Tensioner Valve
2	2231	Black	0.25	Heavy-Duty Winch Tensioner Valve	Heavy-Duty Winch Tensioner

**Table 1. Air Line Locations. - Continued**

<b>Item No.</b>	<b>Line No.</b>	<b>Color</b>	<b>Size</b>	<b>From</b>	<b>To</b>
3	2763	Black	0.25	Tee Fitting on Heavy-Duty Winch Tensioner Valve	Heavy-Duty Winch De-clutch Valve
4	2706	Black	0.25	Heavy-Duty Winch De-clutch Valve	Heavy-Duty Winch Gearbox
5	2921	Black	0.25	Heavy-Duty Winch De-clutch Valve	Exhaust
6	2921	Black	0.25	Heavy-Duty Winch Tensioner Valve	Exhaust

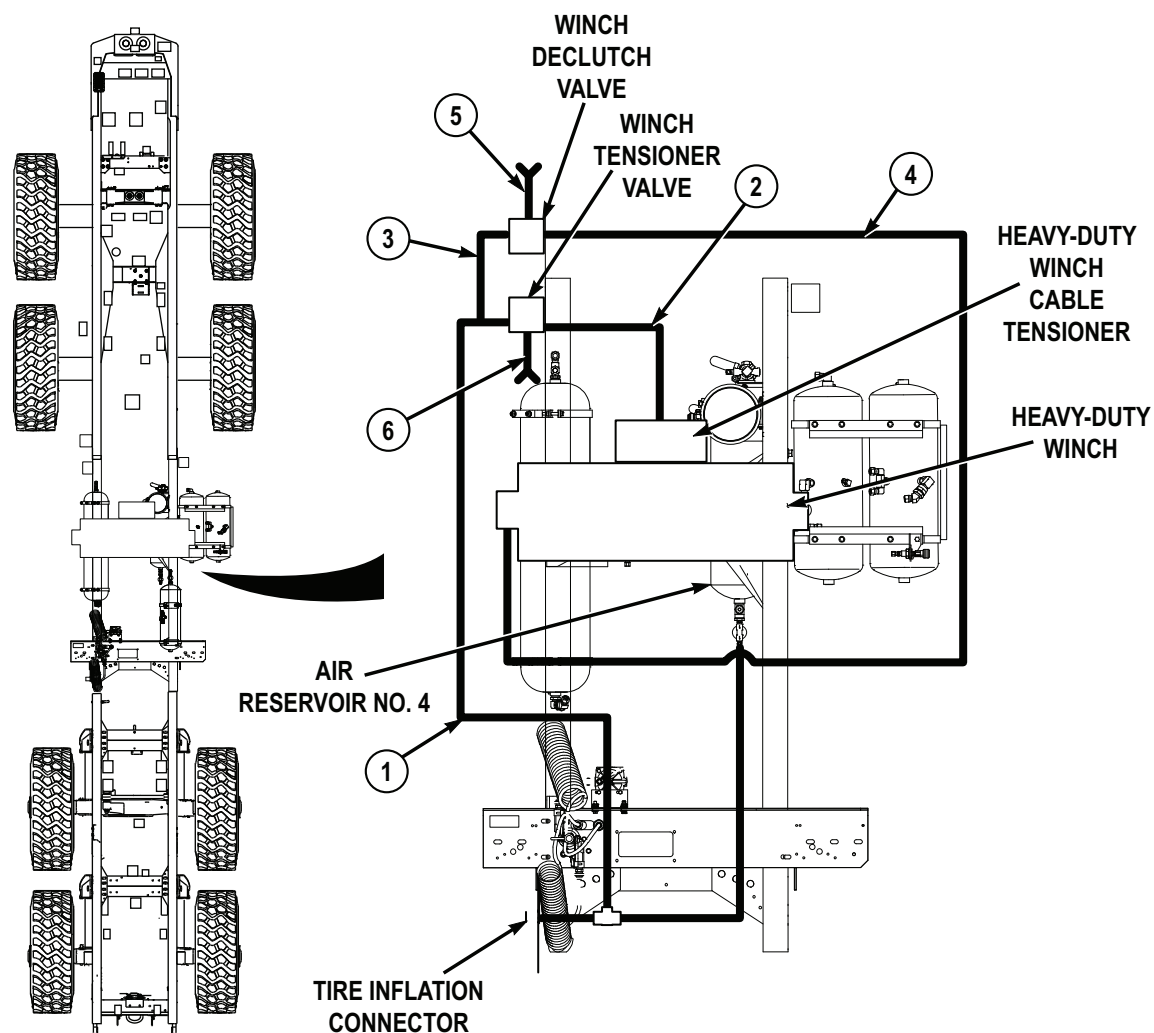


Figure 1.

**END OF TASK**

## FOLLOW-ON MAINTENANCE

1. Start engine and build air pressure to 120 to 125 psi (827 to 862 kPa) (refer to TM 9-2320-279-10).
2. Check air system for leaks. (refer to TM 9-2320-315-14&P).
3. Shut OFF engine (refer to TM 9-2320-279-10).
4. Remove wheel chocks (refer to TM 9-2320-279-10).

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AIR RESERVOIR #4 AND DRIVER SIDE TIRE INFLATION CONNECTOR, AND VALVE REMOVAL/  
INSTALLATION**

---

**INITIAL SETUP:**

**Materials/Parts**

Compound, Sealing (WP 0083, Table 1, Item 12,  
13, 14, 15)  
Tape, Antiseize (WP 0083, Table 1, Item 31, 32,  
33)

**References**

Parts Manual (Fig. 8)

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**REMOVAL**

**NOTE**

Perform Steps (1) through (8) of "AIR RESERVOIR NO. 4 AND LEFT SIDE TIRE INFLATION CONNECTOR, AND VALVE REMOVAL" in TM 9-2320-315-14&P to remove air reservoir No. 4.

1. Remove air reservoir No. 4 (refer to TM 9-2320-315-14&P).
2. Remove air line 2865 (1) from fitting (2).

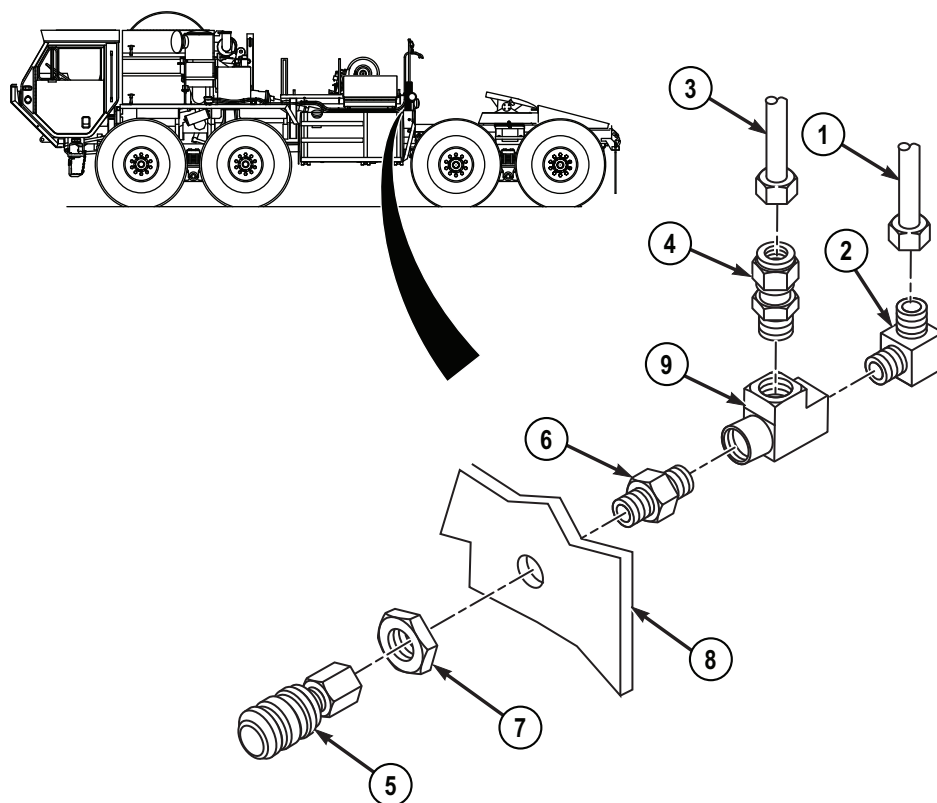


Figure 1.

3. Remove air line 2338 (3) from fitting (4).

### NOTE

Note position of fittings prior to removal.

4. Remove quick disconnect (5) from fitting (6).
5. Remove nut (7) and fitting (6) from center light mounting bracket (8).
6. Remove fitting (2) from fitting (9).
7. Remove fitting (4) from fitting (9).
8. Remove fitting (9) from fitting (6).

### END OF TASK

### INSTALLATION

### NOTE

Install fittings as noted prior to removal.

1. Install fitting (9) on fitting (6).

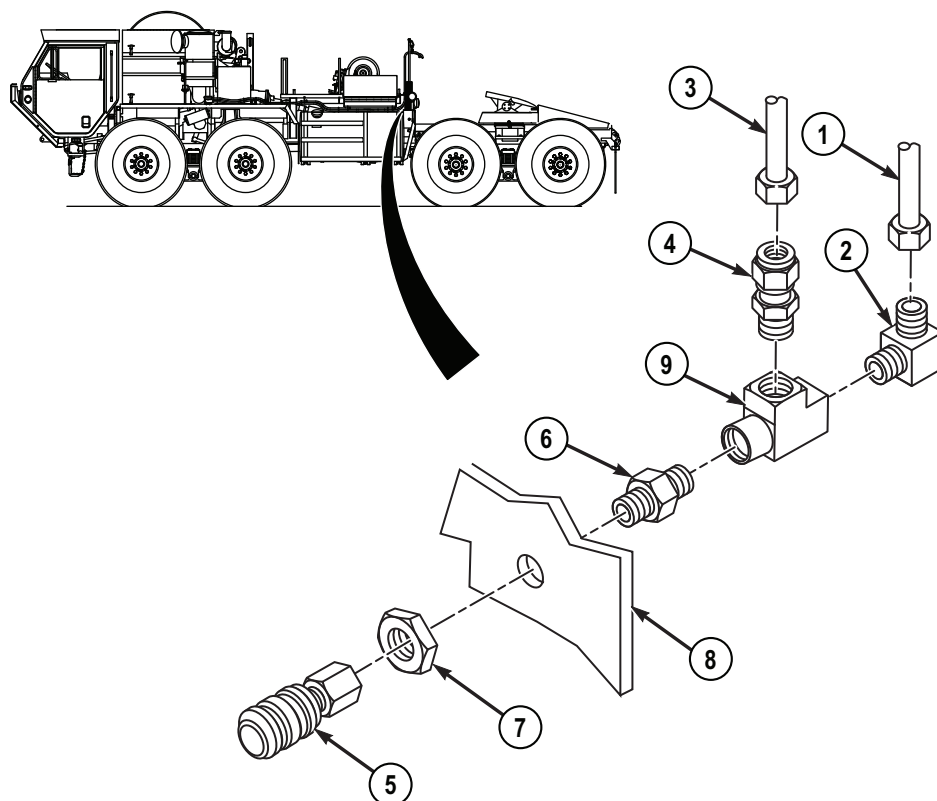


Figure 2.

### WARNING



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

2. Apply sealing compound or antiseize tape to threads of fitting (4) and install fitting (4) on fitting (9).
3. Apply sealing compound or antiseize tape to threads of fitting (2) and install fitting (2) on fitting (9).
4. Install fitting (6) on center light mounting bracket (8) with nut (7).
5. Apply sealing compound or antiseize tape to threads of fitting (6) and install quick disconnect (5) on fitting (6).
6. Install air line 2338 (3) on fitting (4).

7. Install air line 2865 (1) on fitting (2).

### **NOTE**

Perform Steps (5) through (11) of "AIR RESERVOIR NO. 4 AND LEFT SIDE TIRE INFLATION CONNECTOR, AND VALVE INSTALLATION" in TM 9-2320-315-14&P to install air reservoir No. 4.

8. Install air reservoir No. 4 (refer to TM 9-2320-315-14&P).

### **END OF TASK**

### **FOLLOW-ON MAINTENANCE**

1. None.

### **END OF WORK PACKAGE**

## FIELD MAINTENANCE WINCH DECKING REMOVAL/INSTALLATION

### INITIAL SETUP:

## Tools and Special Tools

Lifting Device, Minimum Capacity 1,000 lbs (454 kg)

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

## Materials/Parts

Locknut (WP 0084, Table 1, Item 11) Qty: 2

Locknut (WP 0084, Table 1, Item 4) Qty: 20

Lockwasher (WP 0084, Table 1, Item 16) Qty: 3

## Personnel Required

## Wheeled Vehicle Mechanic 63B (2)

## References

## Parts Manual (Fig. 11)

Parts Manual (Fig. 27)

### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).

Wheels chocked (refer to TM 9-2320-279-10).

Grab handles removed. (WP 0066)

Driver side stowage box removed (refer to TM 9-2320-315-14&P).

Heavy-duty winch removed. (WP 0076)

Access ladder removed (refer to TM 9-2320-279-10).

## REMOVAL

1. Remove locknut (1), screw (2), and standoff bracket (3) from winch decking (4). Discard locknut.

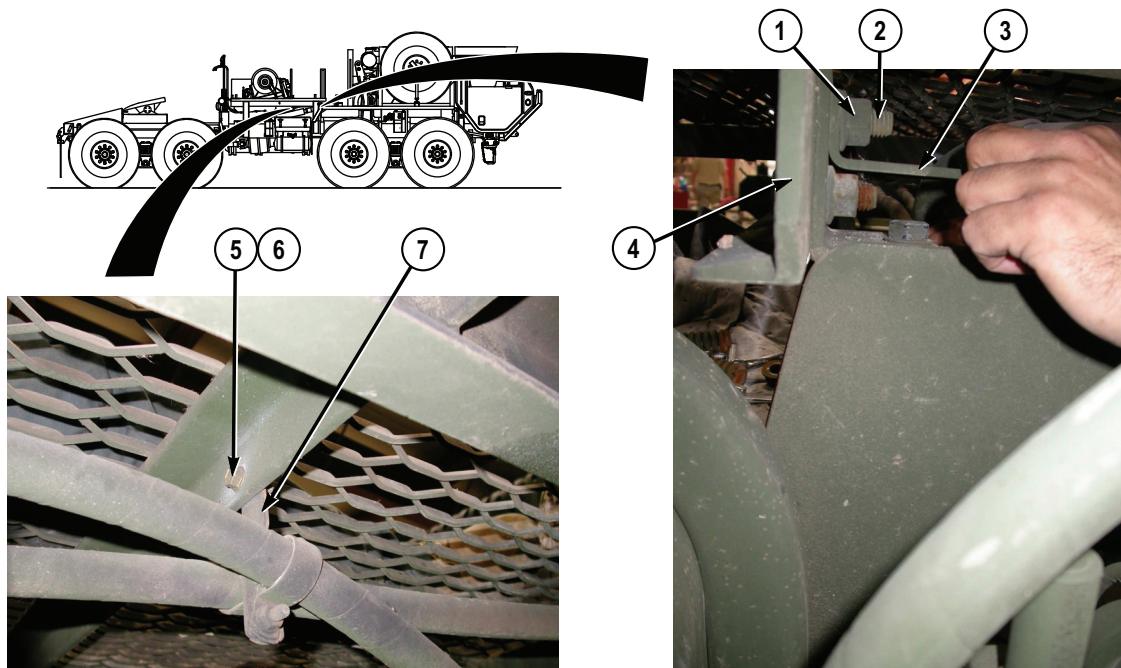


Figure 1.

2. Remove locknut (5), screw (6), and standoff bracket (7) from winch decking (4). Discard locknut.
3. Remove two locknuts (8), screws (9), and standoff brackets (10) from front of winch decking (4). Discard locknuts.

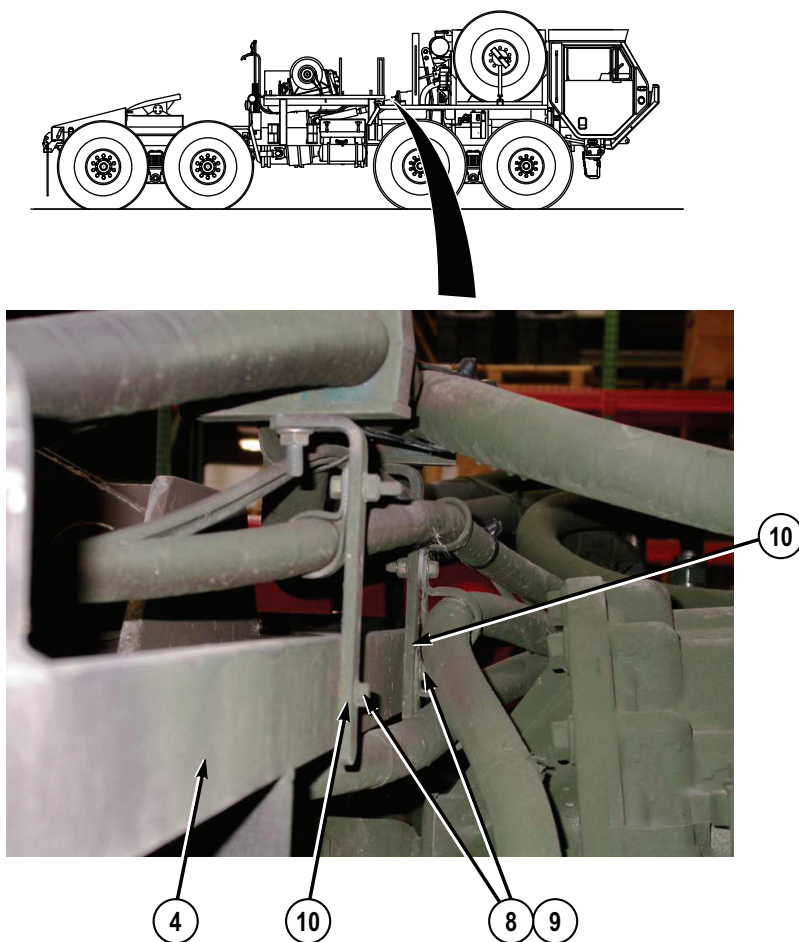


Figure 2.

4. Remove two locknuts (11), springs (12), and screws (13) from brackets (14) and front winch mount (15). Discard locknuts.

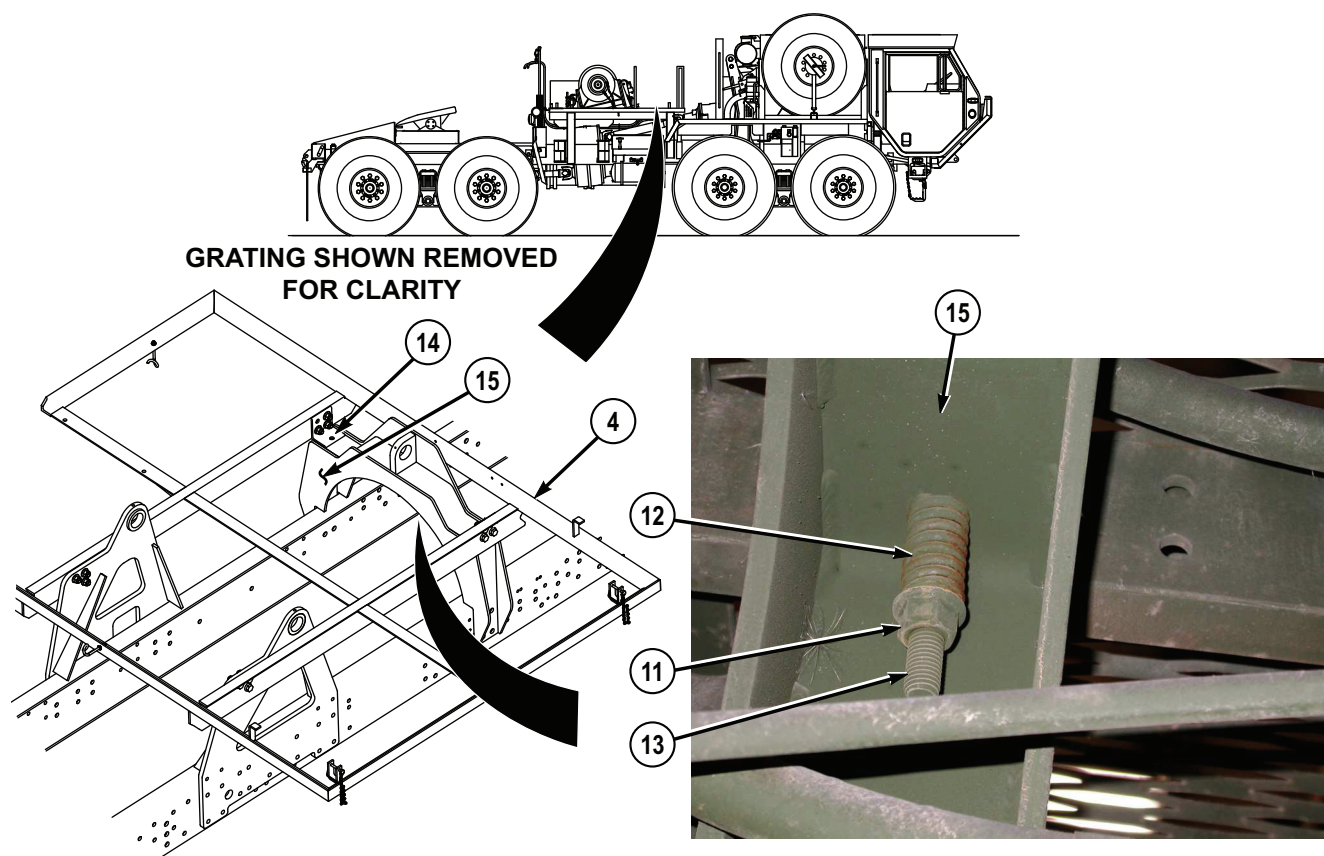
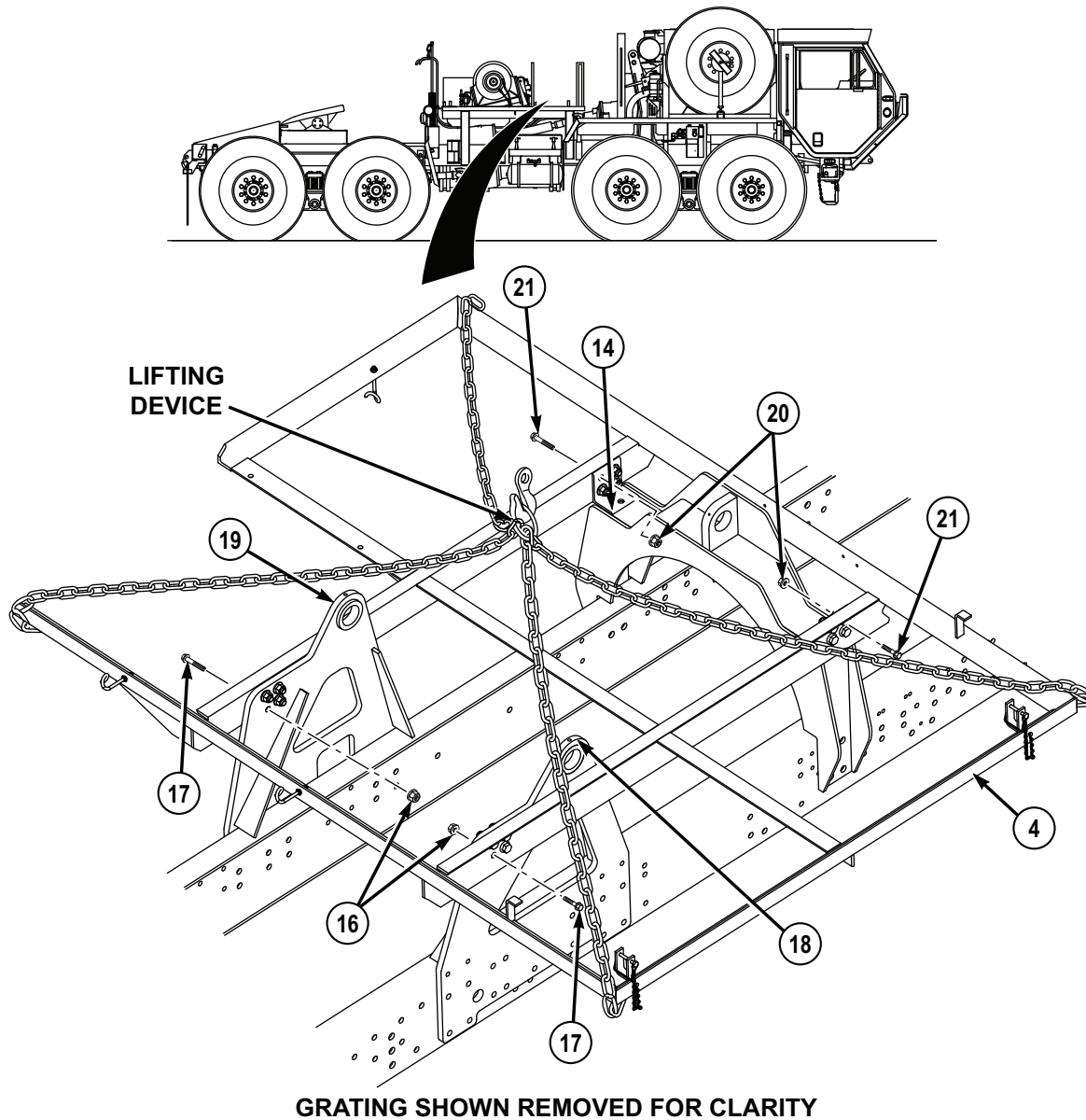


Figure 3.

### NOTE

Temporarily secure heavy-duty winch hydraulic hoses clear of winch decking.

5. With the aid of an assistant, attach lifting device to winch decking (4).

*Figure 4.***WARNING**

Winch decking weighs 260 lbs (118 kg). Do not attempt to lift or move winch decking without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.



6. Remove eight locknuts (16) and screws (17) from winch decking (4) and rear winch mounts (18) and (19). Discard locknuts.
7. With the aid of an assistant and a lifting device, remove winch decking (4) from vehicle.
8. Remove eight locknuts (20), screws (21), and two brackets (14) from winch decking (4). Discard locknuts.
9. With the aid of an assistant, remove lifting device from winch decking (4).

### NOTE

Note position of nuts, washers, and cable support hooks prior to removal.

10. Remove three nuts (22), lockwashers (23), washers (24), and cable support hooks (25) from winch decking (4). Discard lockwashers.

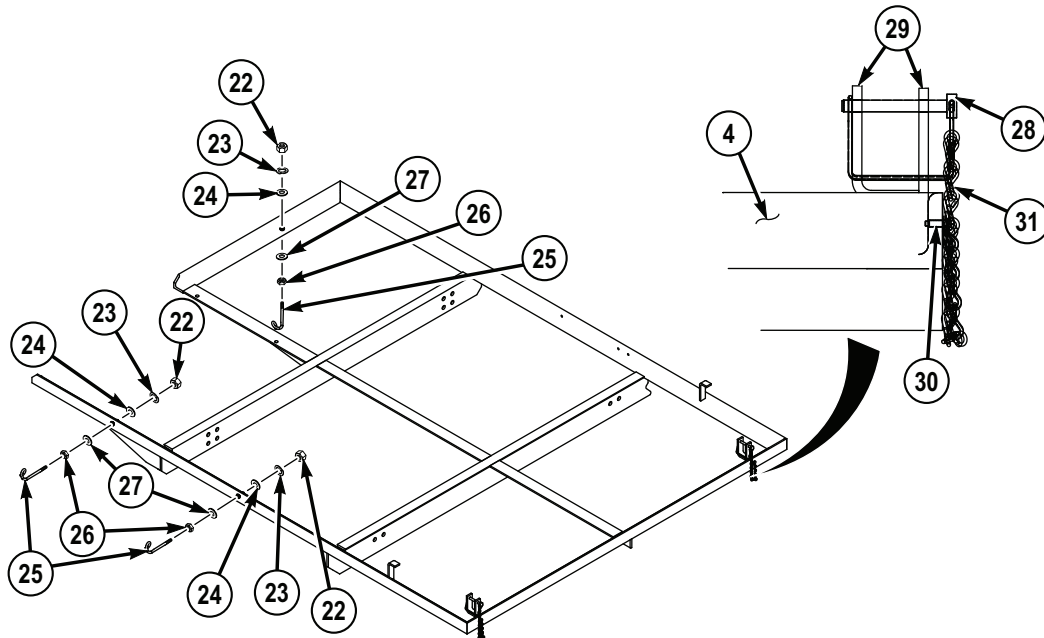


Figure 5.

11. Remove three washers (27) and nuts (26) from cable support hooks (25).
12. Remove two lockpins (28) from ladder support brackets (29).
13. Remove two screws (30), chains (31), and lockpins (28) from winch decking (4).
14. Remove two chains (31) from lockpins (28).

### END OF TASK

### INSTALLATION

1. Install two chains (31) on lockpins (28).

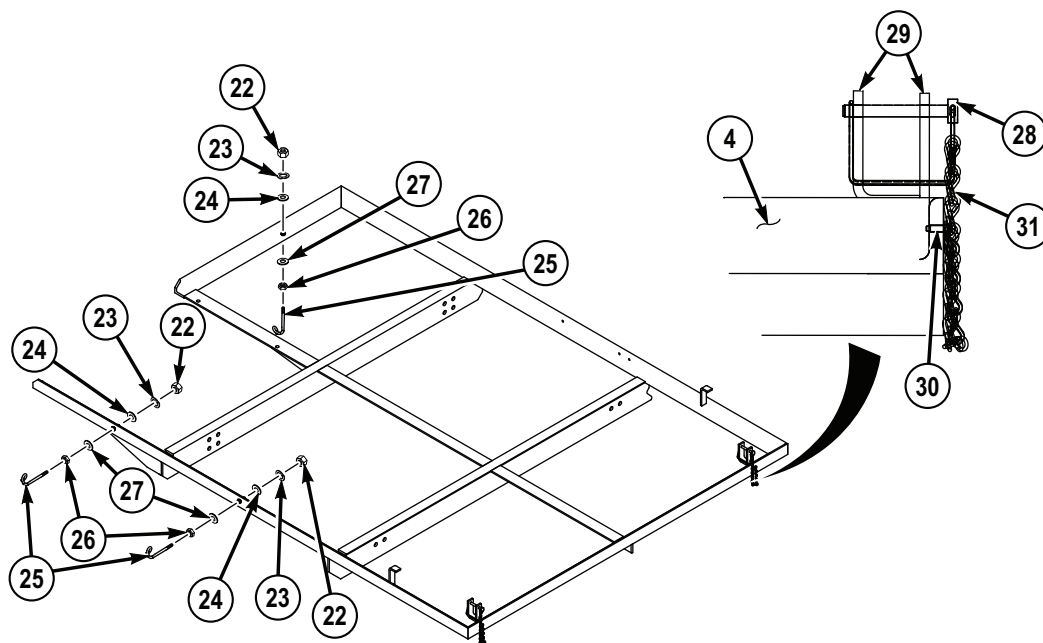


Figure 6.

2. Install two chains (31) and lockpins (28) on winch decking (4) with two screws (30).
3. Install two lockpins (28) on ladder support brackets (29).

**NOTE**

Install nuts and washers as noted prior to removal.

4. Install three nuts (26) and washers (27) on three cable support hooks (25).

**NOTE**

Install cable support hooks as noted prior to removal.

5. Install three cable support hooks (25) on winch decking (4) with three washers (24), lockwashers (23), and nuts (22).
6. With the aid of an assistant, attach lifting device to winch decking (4).

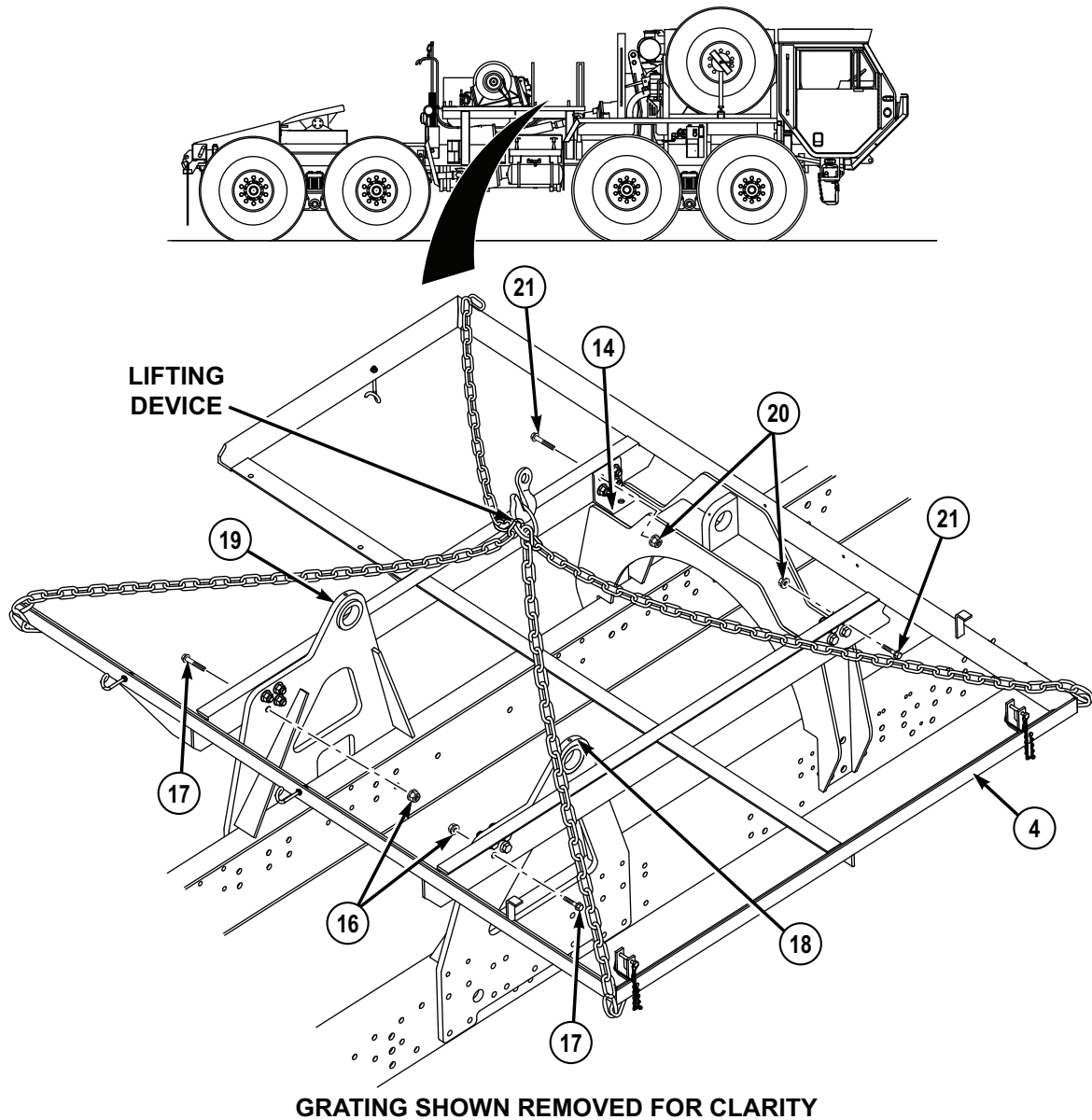


Figure 7.

**WARNING**

Winch decking weighs 260 lbs (118 kg). Do not attempt to lift or move winch decking without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

7. Install two brackets (14) on winch decking (4) with eight screws (21), and locknuts (20).
8. With the aid of an assistant and a lifting device, install winch decking (4) on rear winch mounts (18) and (19) with eight screws (17) and locknuts (16).
9. With the aid of an assistant, remove lifting device from winch decking (4).
10. Secure brackets (14) to front winch mount (15) with two springs (12), screws (13), and locknuts (11). Tighten locknuts until spring height is 2 7/8 in. (73 mm).

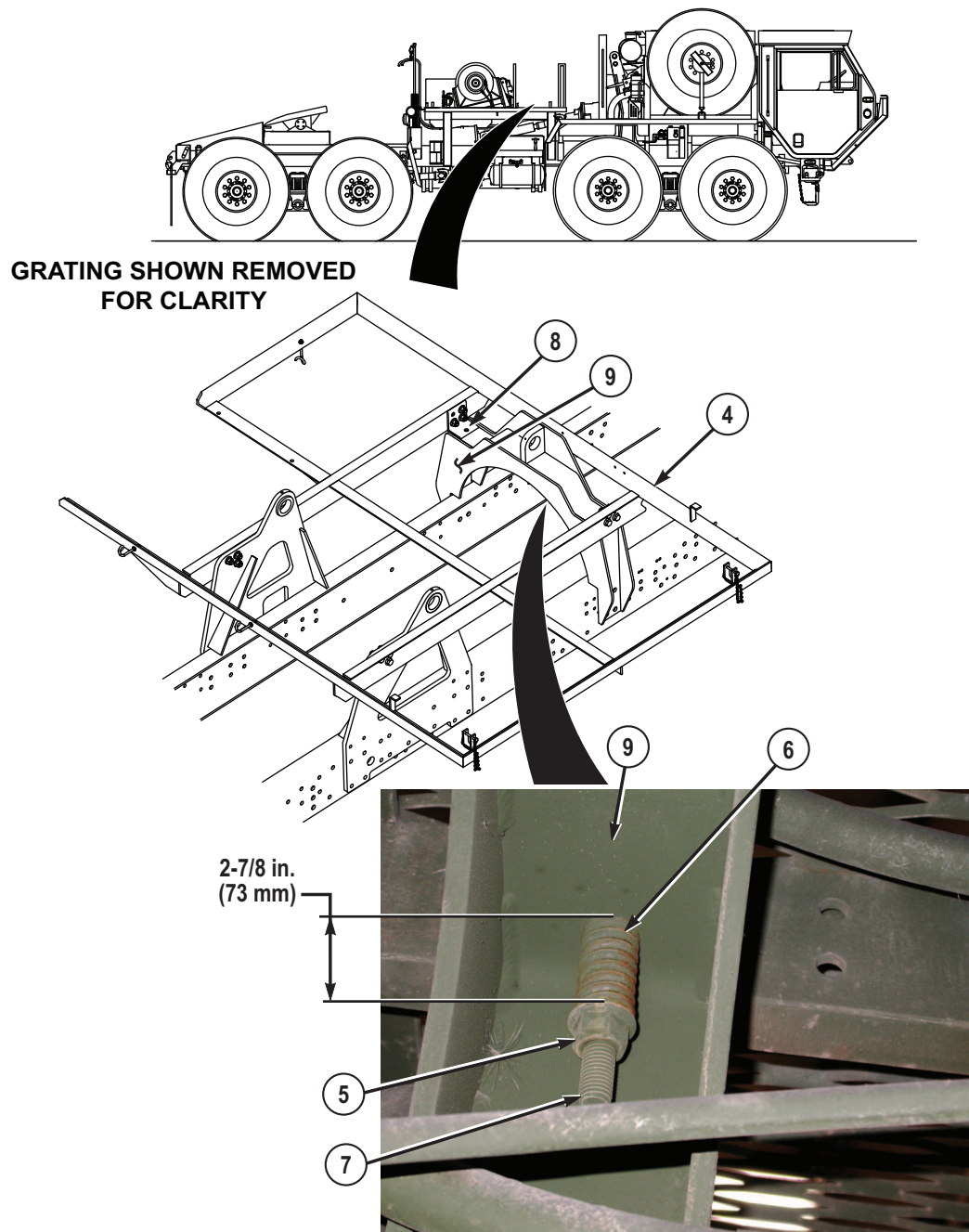


Figure 8.

**NOTE**

Release heavy-duty winch hydraulic hoses from temporary restraint away from winch decking.

11. Install two standoff brackets (10) on front of winch decking (4) with two screws (9) and locknuts (8). Remove locknut (5), screw (6), and standoff bracket (7) from winch decking (4).

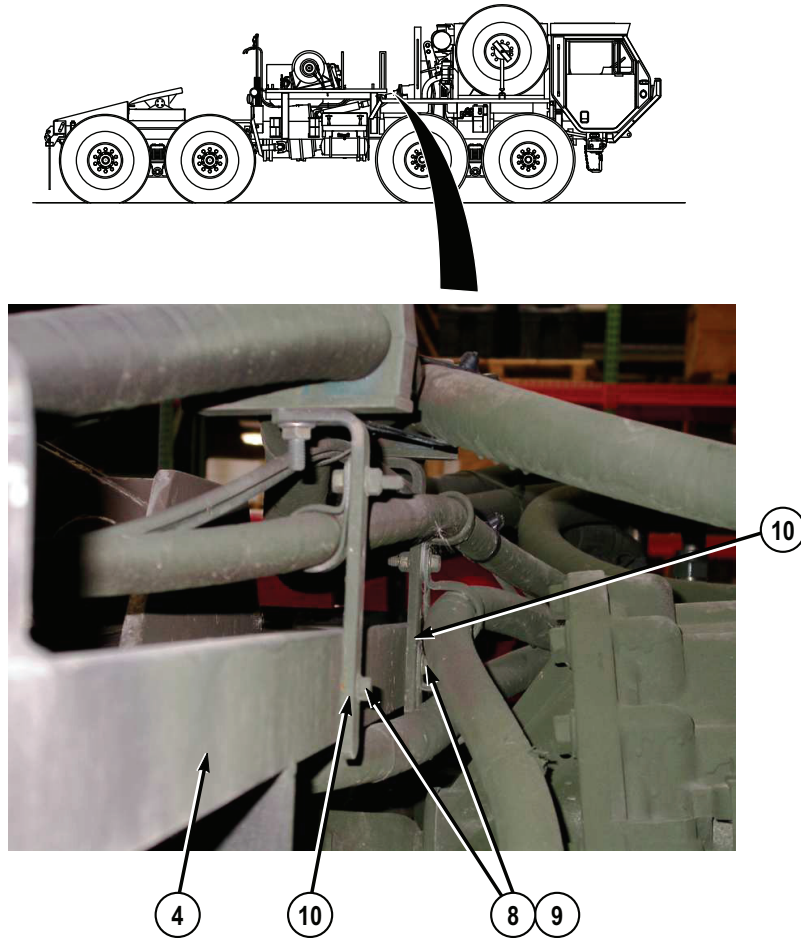


Figure 9.

12. Install standoff bracket (7) on winch decking (4) with screw (6) and locknut (5).

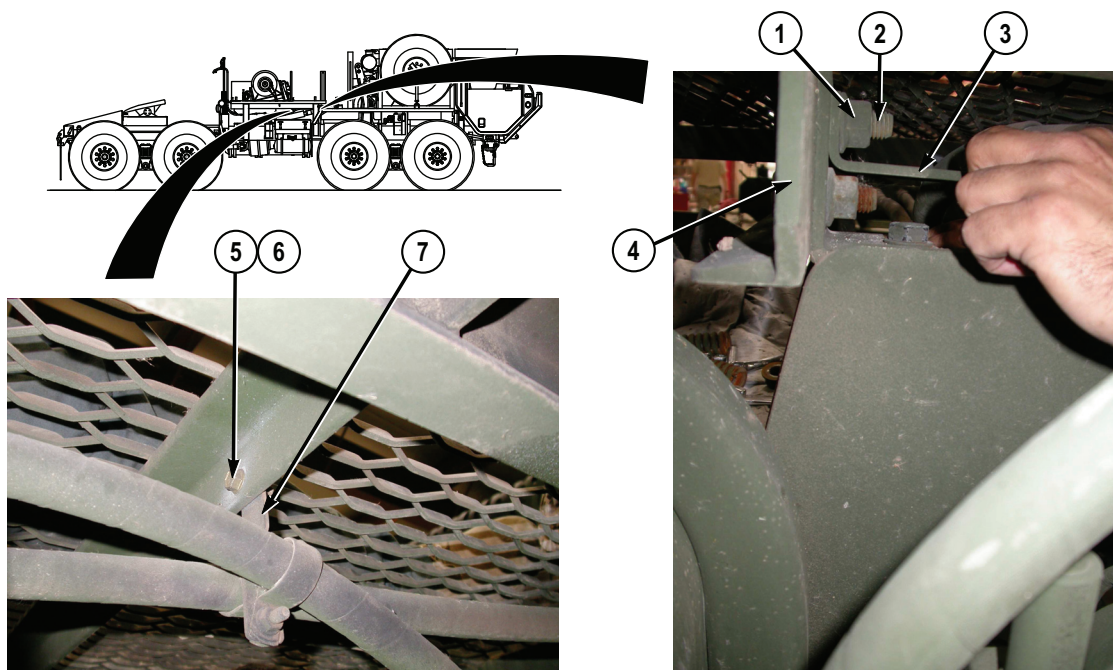


Figure 10.

13. Install standoff bracket (3) on winch decking (4) with screw (2) and locknut (1).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Install access ladder (refer to TM 9-2320-279-10).
2. Install heavy-duty winch. (WP 0076)
3. Install driver side stowage box (refer to TM 9-2320-315-14&P).
4. Install grab handles. (WP 0066)
5. Remove wheel chocks (refer to TM 9-2320-279-10).

#### END OF WORK PACKAGE





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## FIELD MAINTENANCE HEAVY-DUTY WINCH MOUNTS REMOVAL/INSTALLATION

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### INITIAL SETUP:

#### Tools and Special Tools

Lifting Device, Minimum Capacity 300 lbs (136 kg)  
Lift, Transmission and Differential (WP 0081, Table 2, Item 6)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

#### Materials/Parts

Locknut (WP 0084, Table 1, Item 4) Qty: 32  
Locknut (WP 0084, Table 1, Item 5) Qty: 8

#### References

Parts Manual (Fig. 21)  
Parts Manual (Fig. 10)

#### Equipment Condition

Heavy-duty winch removed. (WP 0076)  
Winch decking removed. (WP 0045)  
Stowage box removed. (WP 0054)  
Fuel tank removed. (WP 0065)

#### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

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### REMOVAL

#### WARNING



Passenger side heavy-duty winch mount weighs 127 lbs (58 kg). Do not attempt to lift or move heavy-duty winch mount without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

1. Attach lifting device to passenger side heavy-duty winch mount (1).

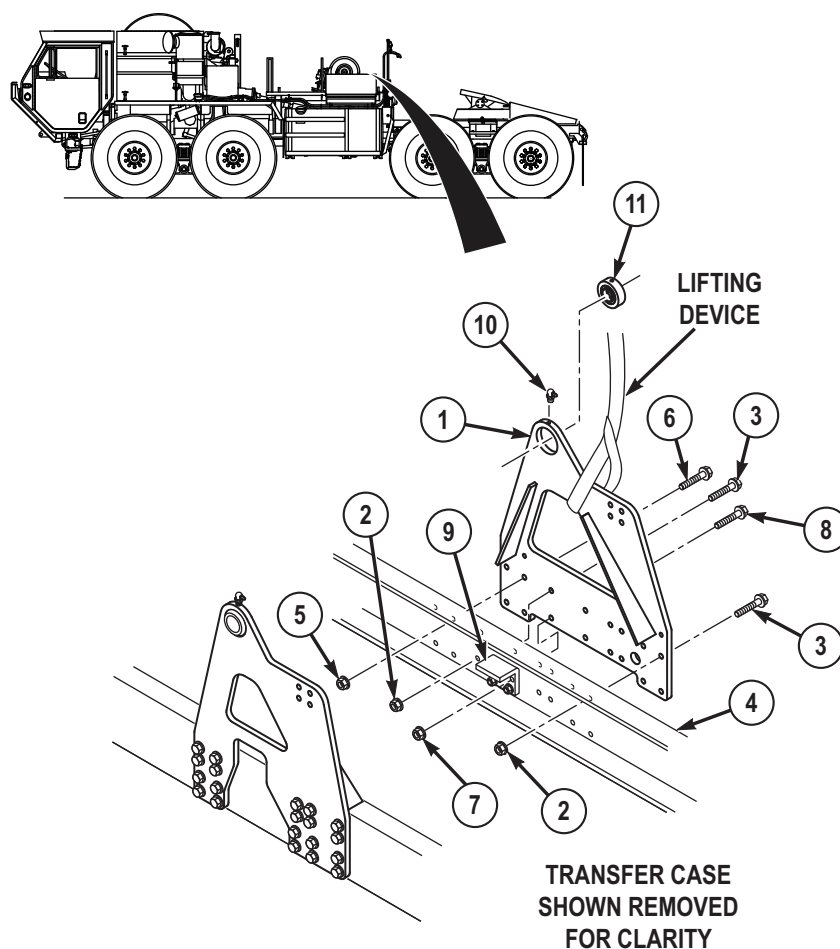


Figure 1.

2. With the aid of an assistant, remove nine locknuts (2) and screws (3) from passenger side heavy-duty winch mount (1) and passenger side frame (4). Discard locknuts.
3. With the aid of an assistant, remove two locknuts (5) and screws (6) from passenger side heavy-duty winch mount (1) and passenger side frame (4). Discard locknuts.

**WARNING**

Transfer case weighs 850 lbs (386 kg) and must be adequately supported before hardware is removed from transfer case mounts. Failure to comply may result in injury or death to personnel.

4. Support transfer case with transmission lift.

5. With the aid of an assistant, remove locknut (7) and screw (8) from passenger side heavy-duty winch mount (1), passenger side frame (4) and passenger side transfer case mount (9). Discard locknut.
6. With the aid of an assistant and lifting device, remove passenger side heavy-duty winch mount (1) from vehicle.
7. Remove lifting device from passenger side heavy-duty winch mount (1).
8. Remove grease fitting (10) from passenger side heavy-duty winch mount (1).
9. Remove bearing (11) from passenger side heavy-duty winch mount (1).

**WARNING**

Driver side heavy-duty winch mount weighs 116 lbs (53 kg). Do not attempt to lift or move heavy-duty winch mount without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

10. Attach lifting device to driver side heavy-duty winch mount (12).

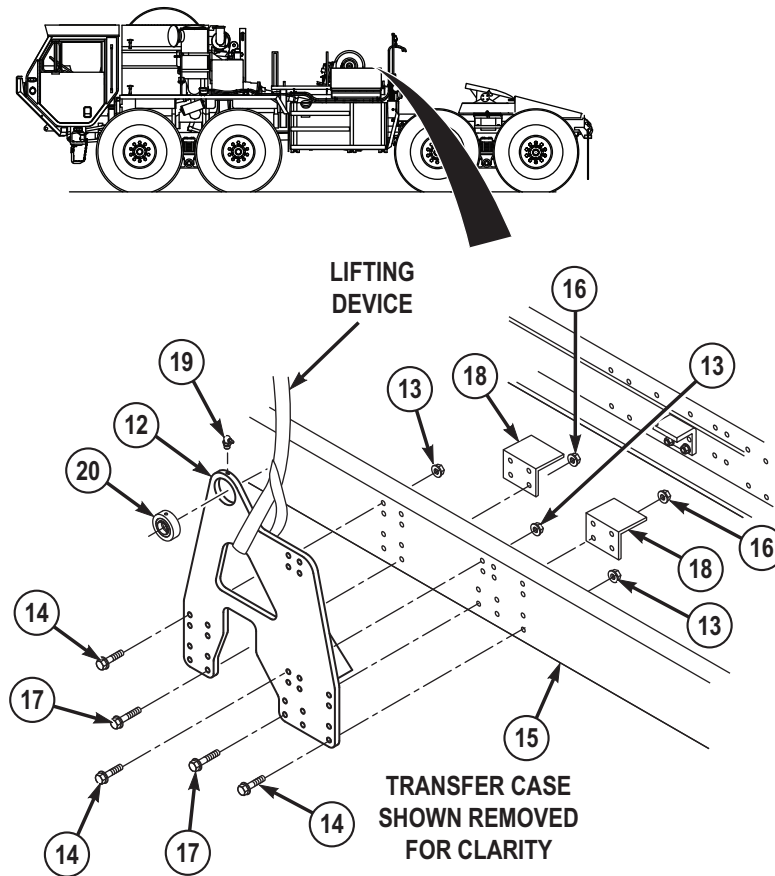


Figure 2.

11. With the aid of an assistant, remove 12 locknuts (13) and screws (14) from driver side heavy-duty winch mount (12) and driver side frame (15). Discard locknuts.

**WARNING**

Transfer case weighs 850 lbs (386 kg) and must be adequately supported before hardware is removed from transfer case mounts. Failure to comply may result in injury or death to personnel.

12. With the aid of an assistant, remove eight locknuts (16) and screws (17) from driver side heavy-duty winch mount (12), driver side frame (15), and two driver side transfer case mounts (18). Discard locknuts.
13. With the aid of an assistant and lifting device, remove driver side heavy-duty winch mount (12) from vehicle.
14. Remove lifting device from driver side heavy-duty winch mount (12).
15. Remove grease fitting (19) from driver side heavy-duty winch mount (12).

16. Remove bearing (20) from driver side heavy-duty winch mount (12).

**WARNING**

Front side heavy-duty winch mount weighs 104 lbs (47 kg). Do not attempt to lift or move heavy-duty winch mount without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

17. Attach lifting device to front heavy-duty winch mount (21).

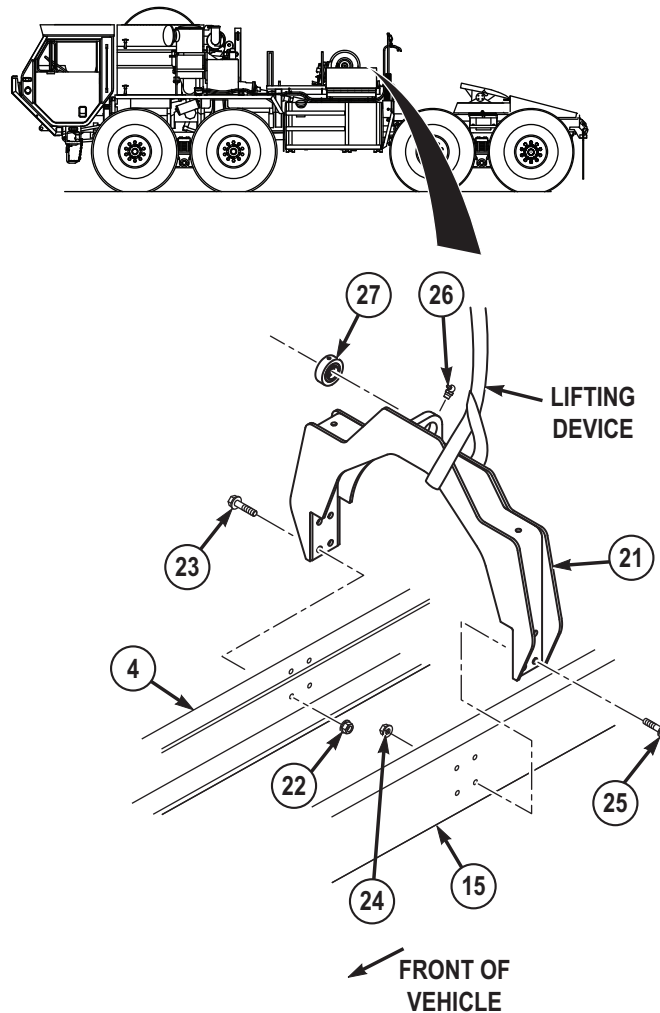


Figure 3.

18. With the aid of an assistant, remove four locknuts (22) and screws (23) from front heavy-duty winch mount (21) and passenger side frame (4). Discard locknuts.

19. With the aid of an assistant, remove four locknuts (24) and screws (25) from front heavy-duty winch mount (21) and driver side frame (15). Discard locknuts.
20. With the aid of an assistant and lifting device, remove front heavy-duty winch mount (21) from vehicle.
21. Remove lifting device from front heavy-duty winch mount (21).
22. Remove grease fitting (26) from front heavy-duty winch mount (21).
23. Remove bearing (27) from front heavy-duty winch mount (21).

## END OF TASK

## INSTALLATION

1. Install bearing (27) on front heavy-duty winch mount (21).

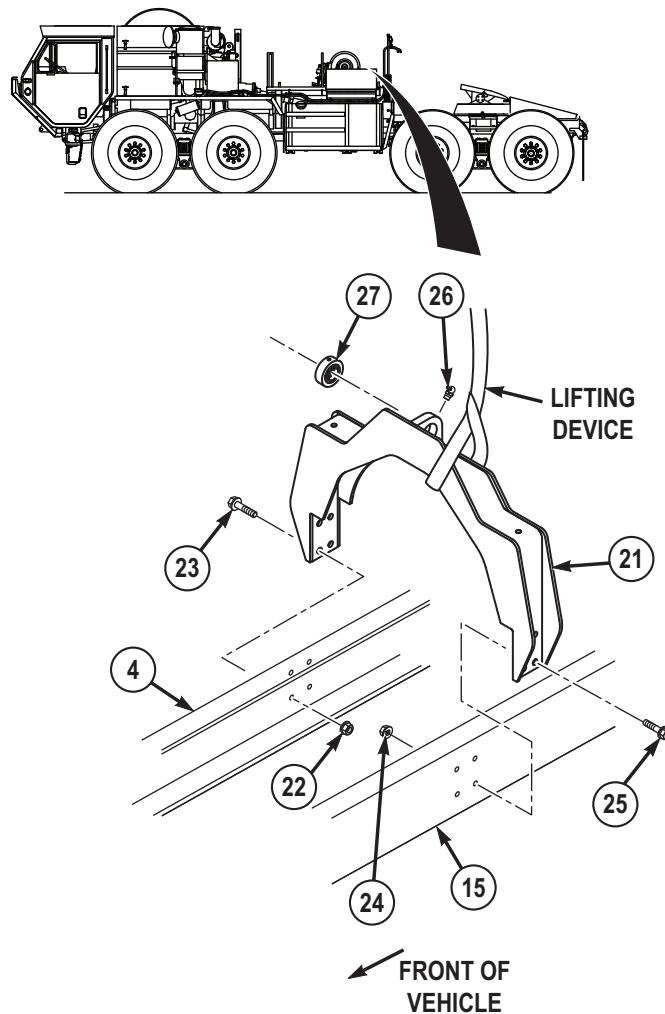


Figure 4.

2. Install grease fitting (26) on front heavy-duty winch mount (21).

**WARNING**

Front side heavy-duty winch mount weighs 104 lbs (47 kg). Do not attempt to lift or move heavy-duty winch mount without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

3. Attach lifting device to front heavy-duty winch mount (21).
4. With the aid of an assistant and lifting device, position front heavy-duty winch mount (21) on vehicle.
5. With the aid of an assistant, install four screws (25) and locknuts (24) on driver side frame (15) and front heavy-duty winch mount (21).
6. With the aid of an assistant, install four screws (23) and locknuts (22) on passenger side frame (4) and front heavy-duty winch mount (21).
7. Remove lifting device from front heavy-duty winch mount (21).
8. Install bearing (20) on driver side heavy-duty winch mount (12).

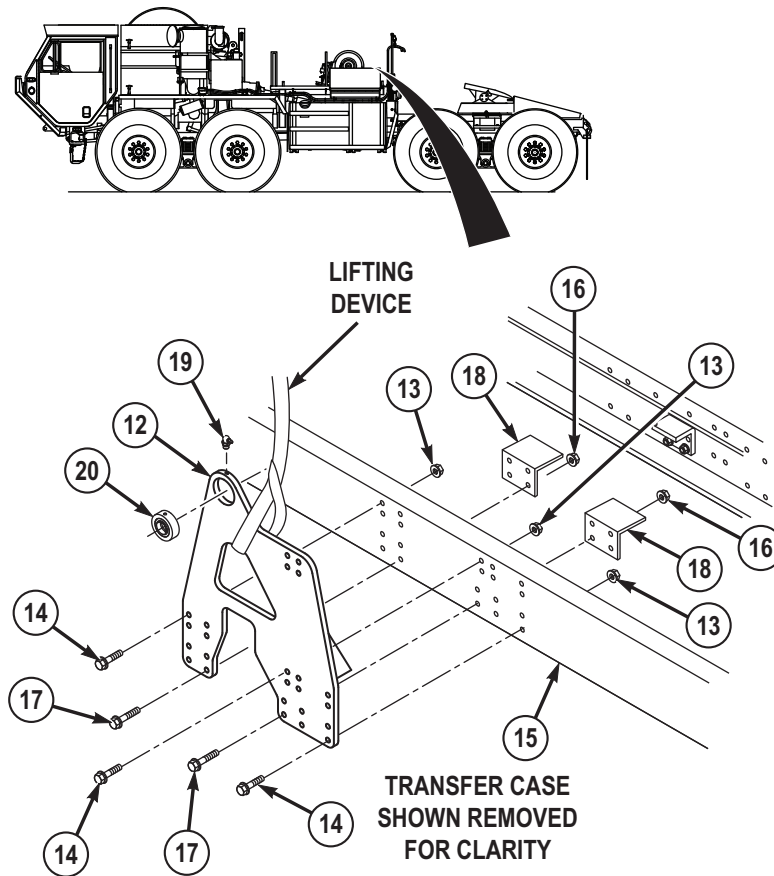


Figure 5.

9. Install grease fitting (19) on driver side heavy-duty winch mount (12).

**WARNING**

Driver side heavy-duty winch mount weighs 116 lbs (53 kg). Do not attempt to lift or move heavy-duty winch mount without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

10. Attach lifting device to driver side heavy-duty winch mount (12).
11. With the aid of an assistant and lifting device, position driver side heavy-duty winch mount (12) on vehicle.
12. With the aid of an assistant, install eight screws (17) and locknuts (16) on driver side frame (15), two driver side transfer case mounts (18), and driver side heavy-duty winch mount (12).
13. With the aid of an assistant, install 12 screws (14) and locknuts (13) on driver side frame (15) and driver side heavy-duty winch mount (12).



14. Remove lifting device from driver side heavy-duty winch mount (12).
15. Install bearing (11) on passenger side heavy-duty winch mount (1).

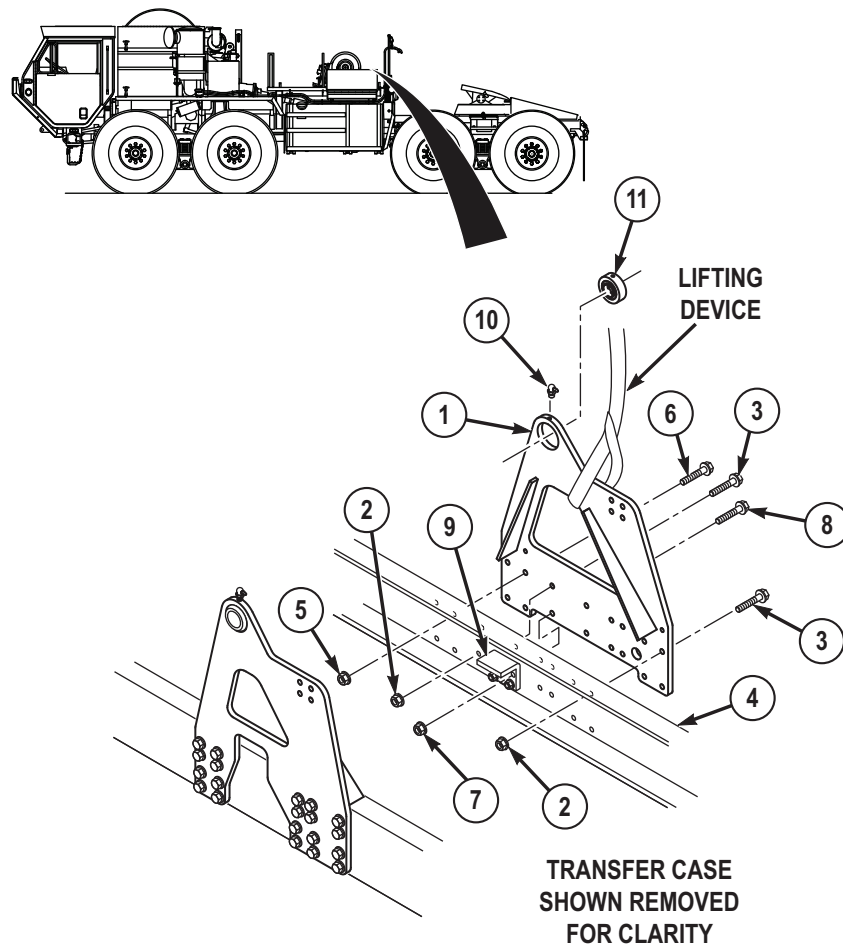


Figure 6.

16. Install grease fitting (10) on passenger side heavy-duty winch mount (1).

### WARNING



Passenger side heavy-duty winch mount weighs 127 lbs (58 kg). Do not attempt to lift or move heavy-duty winch mount without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

17. Attach lifting device to passenger side heavy-duty winch mount (1).
18. With the aid of an assistant and lifting device, position passenger side heavy-duty winch mount (1) on vehicle.

19. With the aid of an assistant, install screw (8) and locknut (7) on passenger side frame (4), passenger side transfer case mount (9) and passenger side heavy-duty winch mount (1).
20. With the aid of an assistant, install two screws (6) and locknuts (5) on passenger side frame (4) and passenger side heavy-duty winch mount (1).
21. With the aid of an assistant, install nine screws (3) and locknuts (2) on passenger side frame (4) and passenger side heavy-duty winch mount (1).
22. Remove transmission lift from transfer case.
23. Remove lifting device from passenger side heavy-duty winch mount (1).

**END OF TASK****FOLLOW-ON MAINTENANCE**

1. Install fuel tank. (WP 0065)
2. Install stowage box. (WP 0054)
3. Install winch decking. (WP 0045)
4. Install heavy-duty winch. (WP 0076)

**END OF WORK PACKAGE**

---

**FIELD MAINTENANCE  
WINCH REMOTE CONTROL REPAIR**

---

**INITIAL SETUP:**

Not Applicable

---

1. The heavy-duty winch remote control unit is repaired the same way as the M984A2 Wrecker remote control unit. Refer to "Heavy-Duty Winch Remote Control Unit Repair" in TM 9-2320-315-14&P.

**END OF TASK**

**END OF WORK PACKAGE**



---

**FIELD MAINTENANCE  
WINCH REMOTE CONTROL CABLE REPAIR**

---

**INITIAL SETUP:**

Not Applicable

---

1. The heavy-duty winch remote control cable is repaired the same way as the M984A2 Wrecker winch remote control cable. Refer to "Heavy-Duty Winch Remote Control Cable Repair" in TM 9-2320-315-14&P.

**END OF TASK**

**END OF WORK PACKAGE**



---

**FIELD MAINTENANCE  
WINCH CONTROL VALVE WIRE HARNESS REMOVAL/INSTALLATION**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

Locknut (WP 0084, Table 1, Item 10) Qty: 4  
Lockwasher (WP 0084, Table 1, Item 12) Qty: 1

**Materials/Parts**

Cable Ties, Plastic (WP 0083, Table 1, Item 1)  
Sealant, RTV200 Electrical (WP 0083, Table 1, Item 29)  
Tags, Identification (WP 0083, Table 1, Item 30)

**References**

Parts Manual (Fig. 1)

**Equipment Condition**

Batteries disconnected (refer to TM 9-2320-315-14&P).

---

**REMOVAL****NOTE**

- Tag and mark wires and connectors prior to removal to ensure proper installation.
- Note position and remove cushion clips and cable ties as required.

1. Disconnect connector SV10 (1) from reel in coil (2).

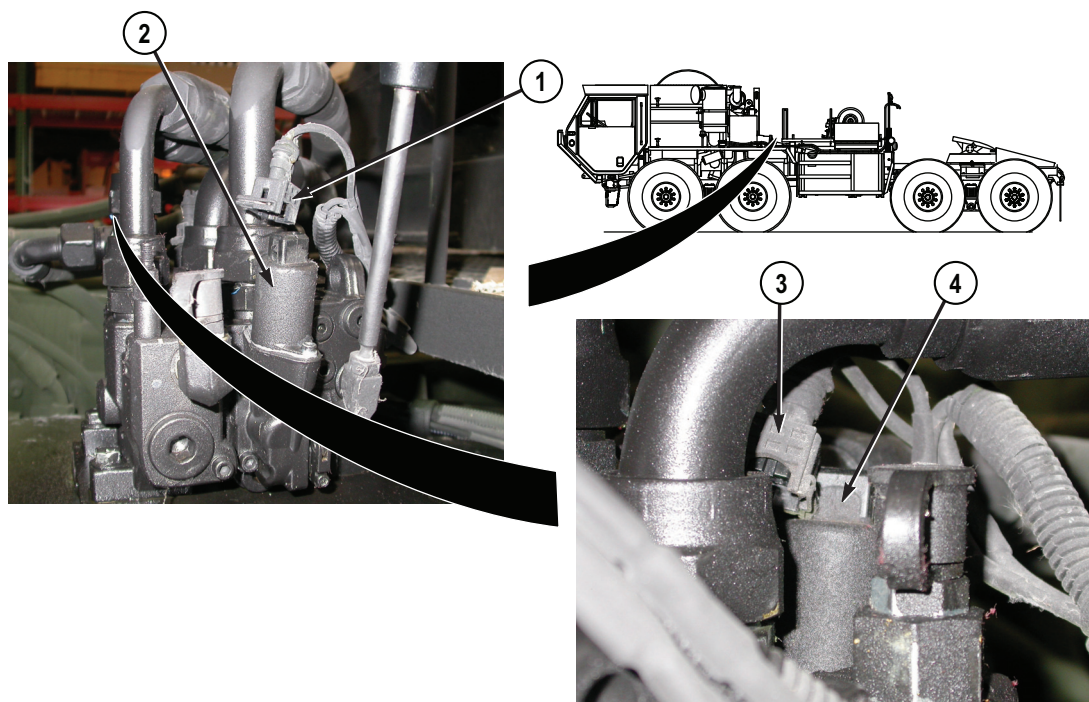


Figure 1.

2. Disconnect connector SV11 (3) from pay out coil (4).
3. Remove screw (5) and wire 1843 (6) from high idle switch (7).



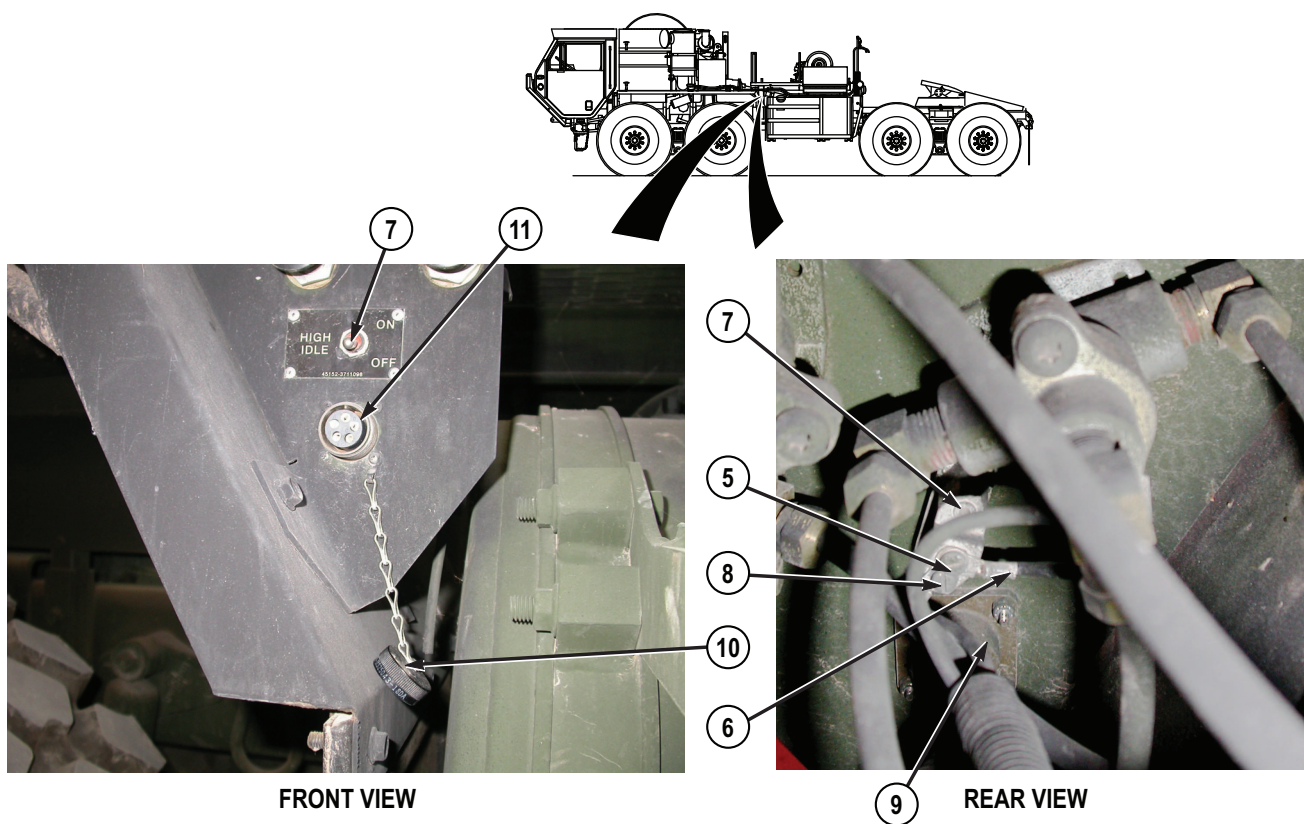


Figure 2.

4. Remove screw (8) and wire 1516 (9) from high idle switch (7).
5. Remove cap and chain assembly (10) from connector MC54 (11).
6. Remove four locknuts (12), screws (13), cap and chain assembly (10), and connector MC54 (11) from mounting bracket (14). Discard locknuts.

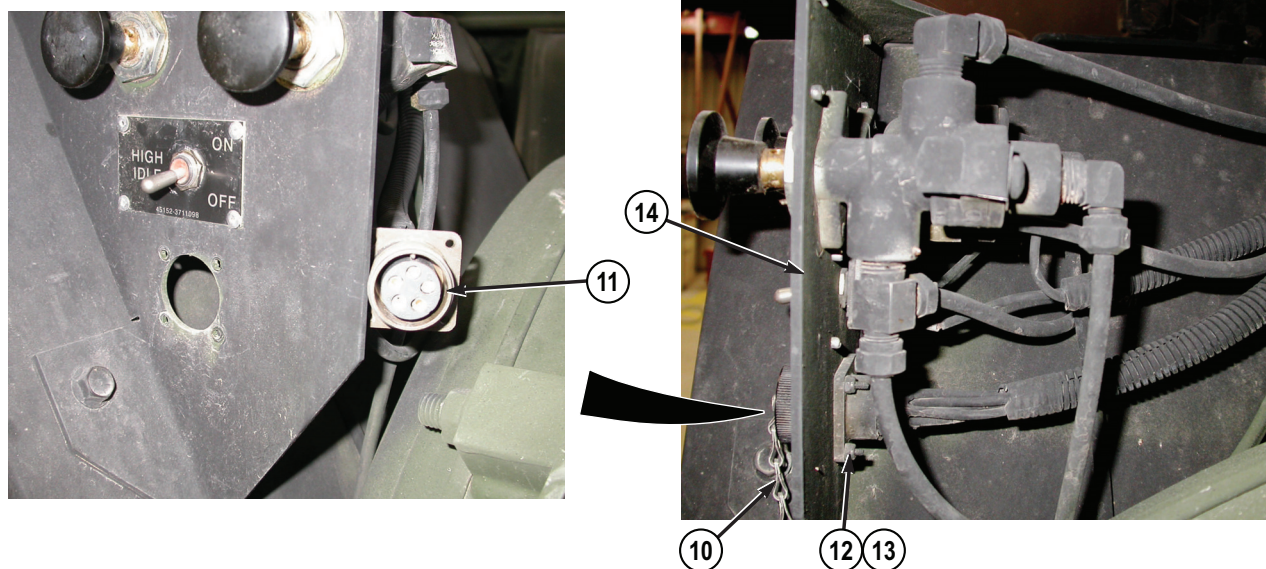


Figure 3.

7. Remove safety latch lock (15) from connector MC41 (16).

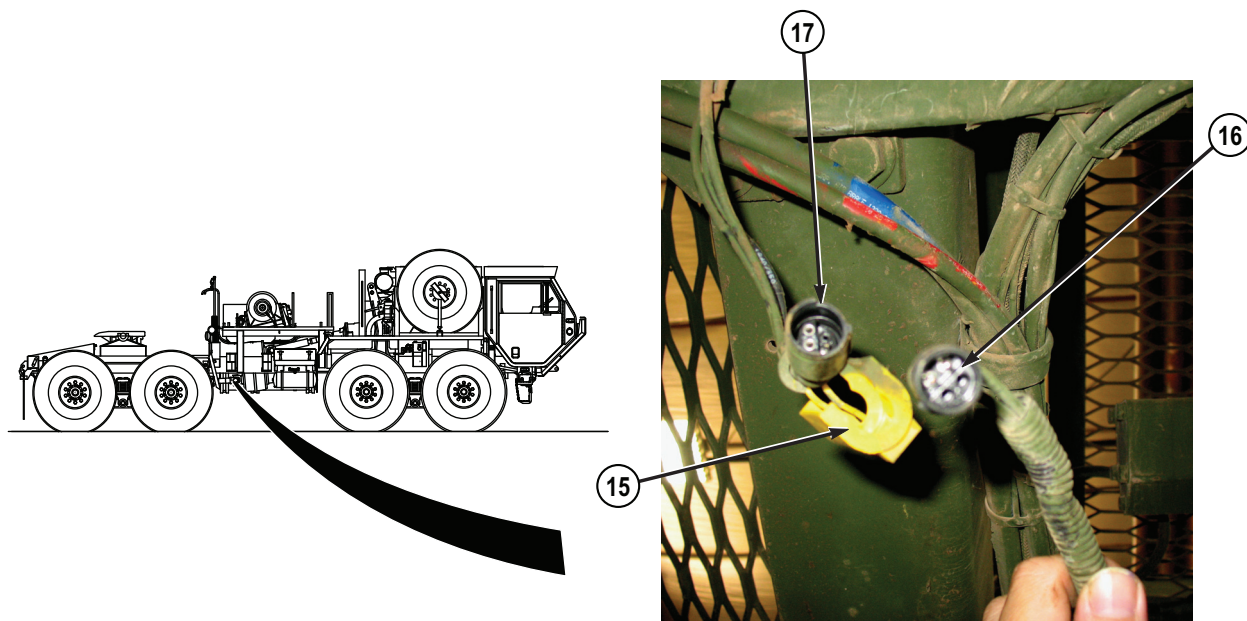


Figure 4.

8. Disconnect connector MC41 (16) from connector MC41 (17).
9. Remove nut (18), lockwasher (19), and wire 1435 (20) from mounting screw (21). Discard lockwasher.

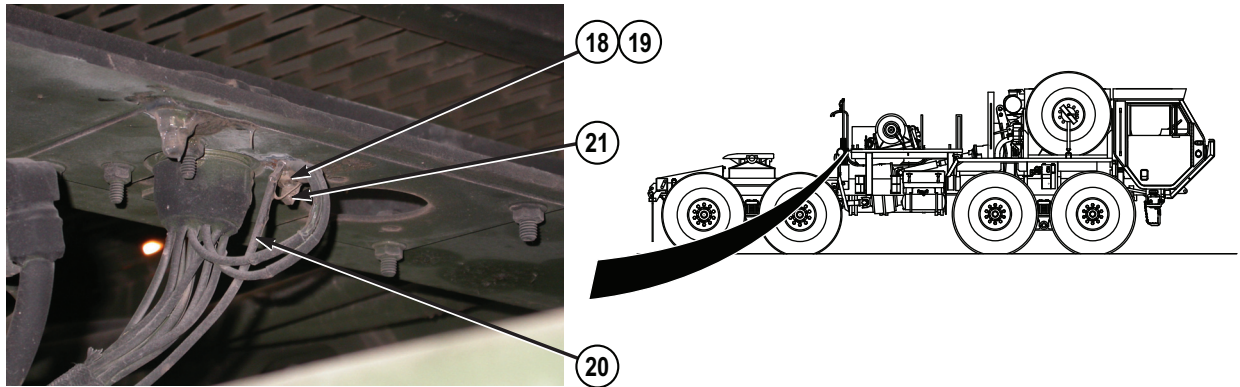


Figure 5.

**END OF TASK****INSTALLATION**

1. Install wire 1435 (20) on mounting screw (21) with lockwasher (19) and nut (18).

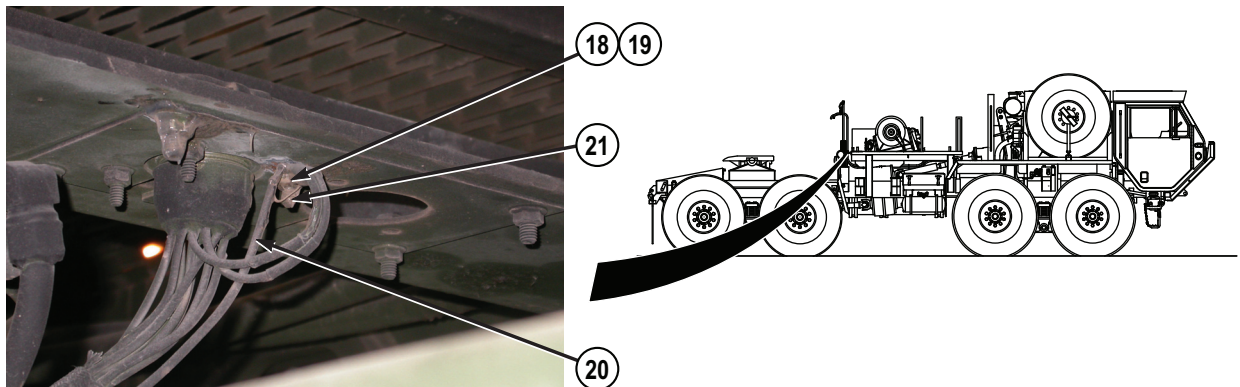


Figure 6.

**WARNING**

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

2. Apply sealant on wire 1435 (20), mounting screw (21), lockwasher (19), and nut (18).
3. Connect connector MC41 (17) to connector MC41 (16).



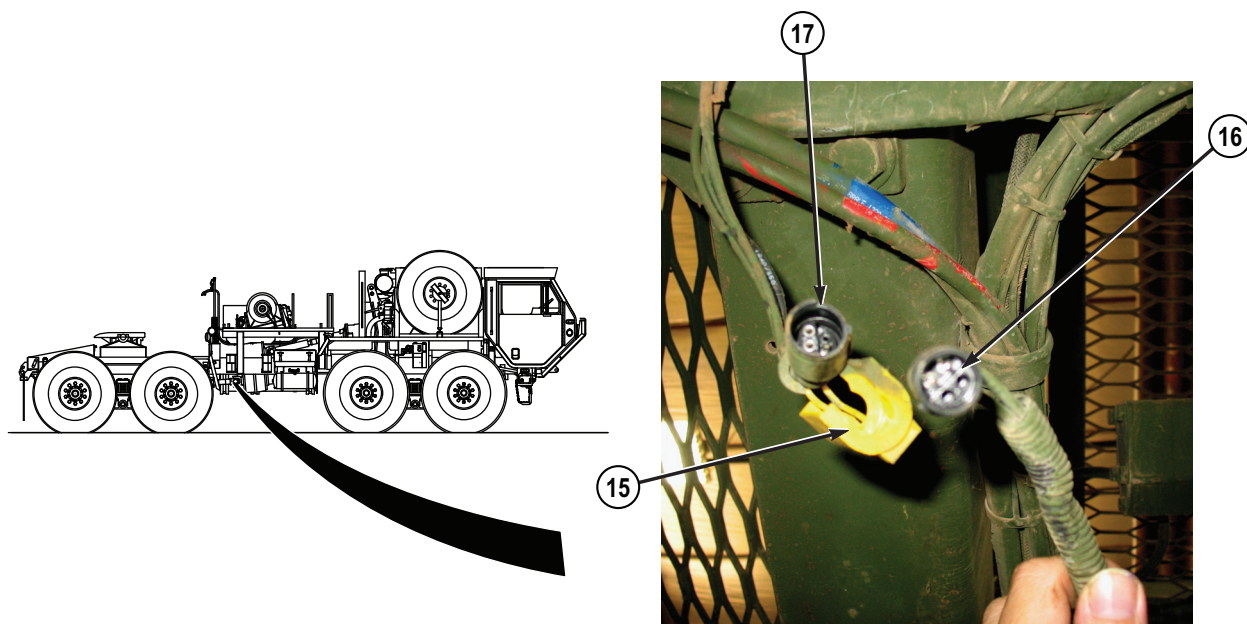


Figure 7.

4. Install safety latch lock (15) on connector MC41 (16).
5. Install connector MC54 (11) and cap and chain assembly (10) on mounting bracket (14) with four screws (13) and locknuts (12).

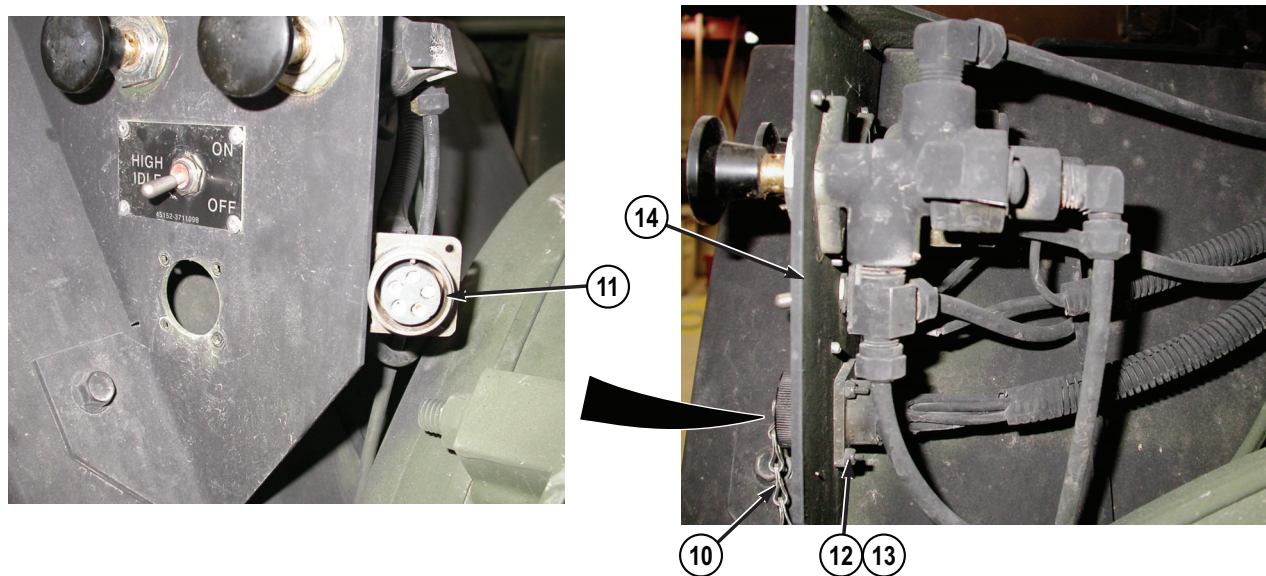


Figure 8.

6. Install cap and chain assembly (10) on connector MC54 (11).

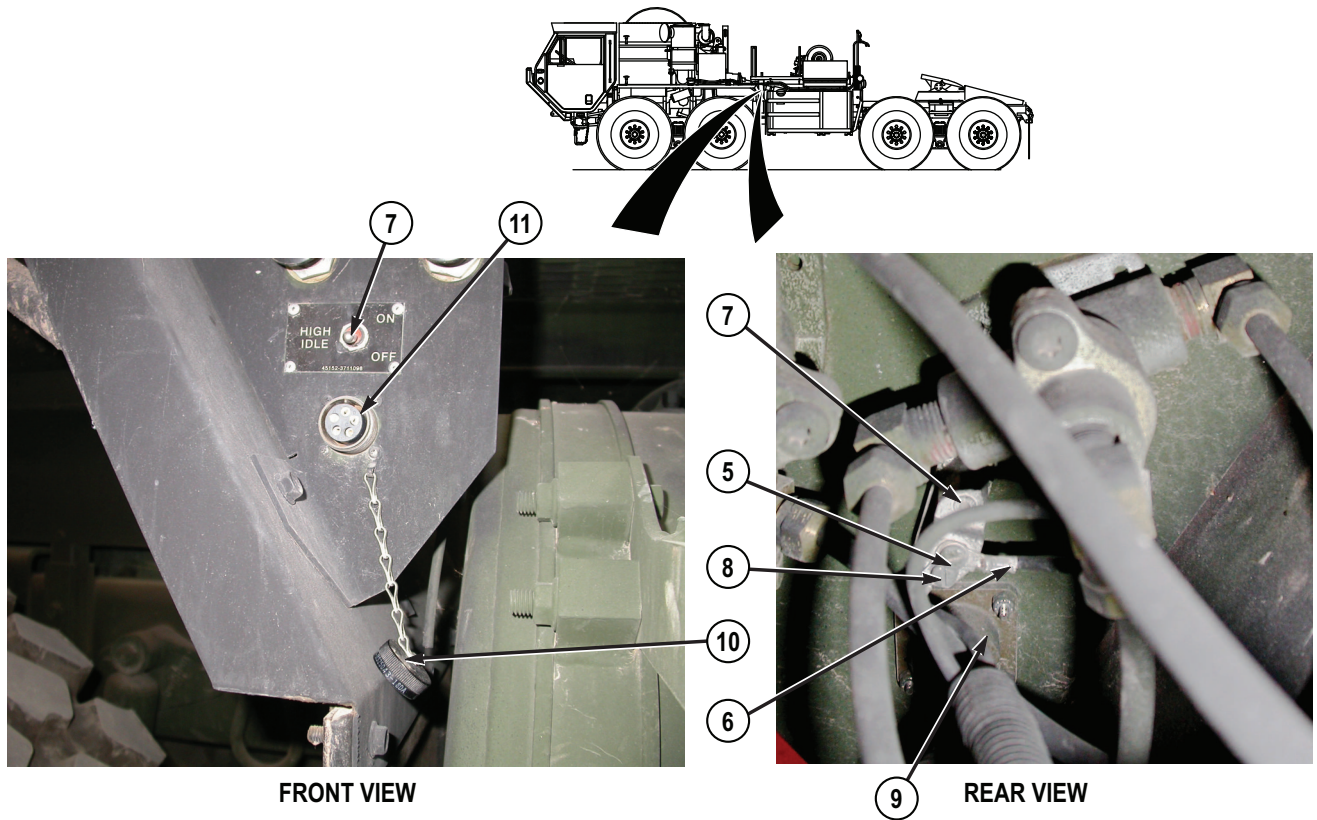


Figure 9.

**NOTE**

To simplify wire installation, you may wish to remove high idle switch from mounting bracket before installing wires. Re-install high idle switch after installing wires.

7. Install wire 1516 (9) on high idle switch (7) with screw (8).
8. Install wire 1843 (6) on high idle switch (7) with screw (5).

**WARNING**

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

9. Apply sealant on wire 1516 (9), screw (8), wire 1843 (6), and screw (5).

10. Connect connector SV11 (3) to pay out coil (4).

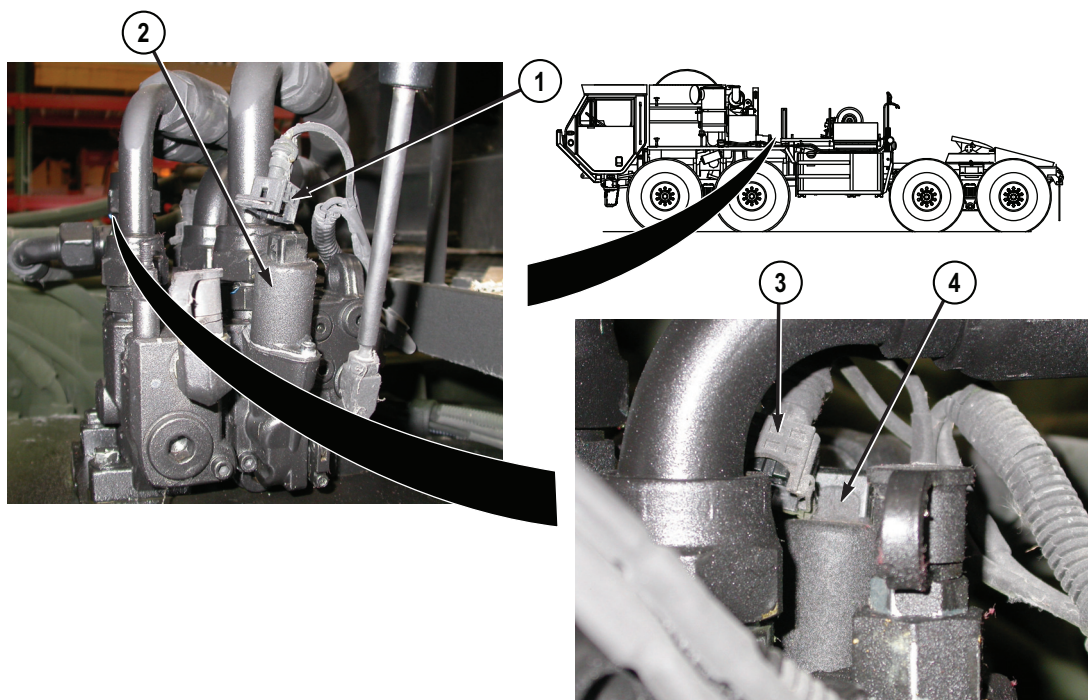


Figure 10.

11. Connect connector SV10 (1) to reel in coil (2).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Connect batteries (refer to TM 9-2320-315-14&P).
2. Start engine (refer to TM 9-2320-279-10).
3. Check operation of heavy-duty winch. (WP 0015)
4. Shut OFF engine (refer to TM 9-2320-279-10).
5. Remove wheel chocks (refer to TM 9-2320-279-10).

#### END OF WORK PACKAGE

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## FIELD MAINTENANCE

### WINCH CONTROL STATION BRACKET REMOVAL/INSTALLATION

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#### INITIAL SETUP:

##### Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

Winch KickOut control valve removed. (WP 0055)  
Winch cable hold down control valve removed. (WP 0056)  
Winch remote control connector removed. (WP 0062)

##### Materials/Parts

Locknut (WP 0084, Table 1, Item 3) Qty: 1  
Locknut (WP 0084, Table 1, Item 11) Qty: 2

##### References

Parts Manual (Fig. 8)

##### Equipment Condition

High idle switch removed. (WP 0063)

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#### REMOVAL

1. Remove locknut (1) and screw (2) from mounting bracket (3), fender (4), and fender brace (5). Discard locknut.

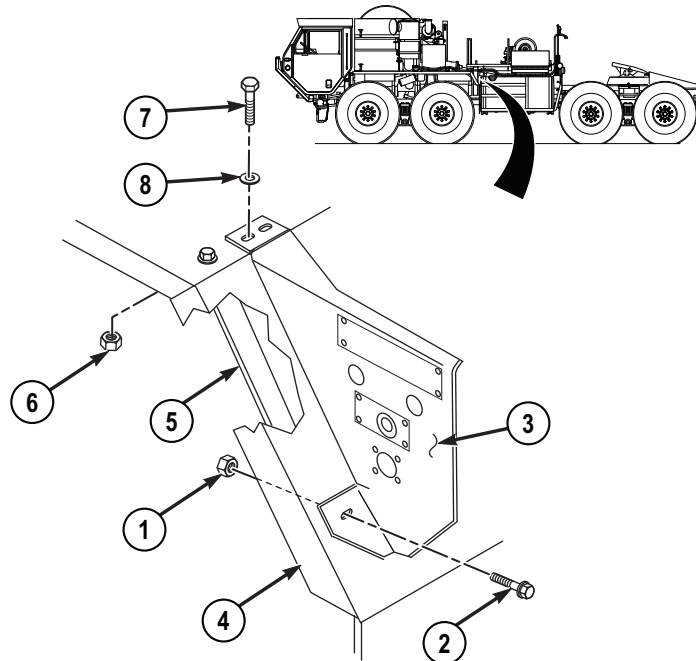


Figure 1.



2. Remove two locknuts (6), screws (7), washers (8), and mounting bracket (3) from fender (4). Discard locknuts.

#### END OF TASK

#### INSTALLATION

1. Install mounting bracket (3) on fender (4) with two washers (8), screws (7), and locknuts (6).

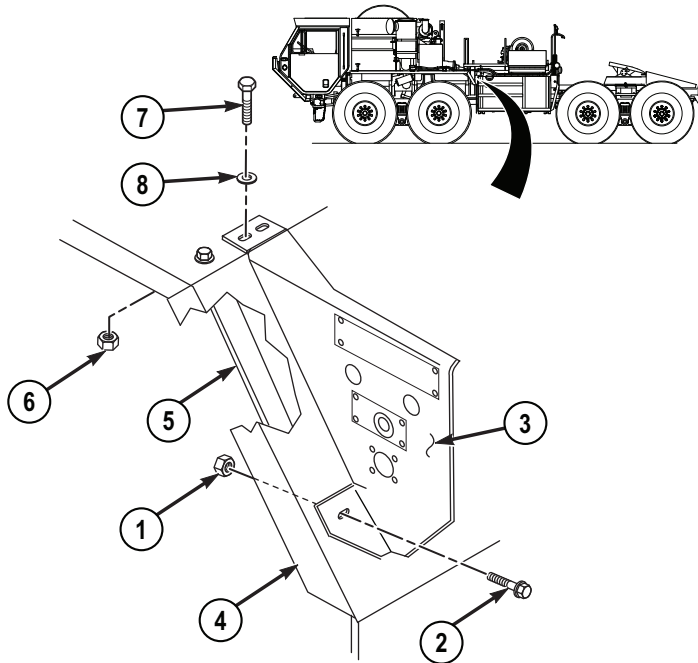


Figure 2.

2. Install screw (2) and locknut (1) on fender brace (5), fender (4), and mounting bracket (3).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Install winch cable hold down control valve. (WP 0056)
2. Install Winch KickOut control valve. (WP 0055)
3. Install high idle switch. (WP 0063)
4. Install winch remote control connector. (WP 0062)

#### END OF WORK PACKAGE



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**FIELD MAINTENANCE  
FIFTH WHEEL RAMP REMOVAL/INSTALLATION**

---

**INITIAL SETUP:****Tools and Special Tools**

Lifting Device, Minimum Capacity 300 lbs (136 kg).  
Tool Kit, General Mechanic's: Automotive (WP  
0081, Table 2, Item 5)

**References**

Parts Manual (Fig. 16)

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

**Materials/Parts**

Locknut (WP 0084, Table 1, Item 6) Qty: 20

**Personnel Required**

Wheeled Vehicle Mechanic 63B (2)

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**REMOVAL**

1. Attach lifting device to ramp assembly (1).

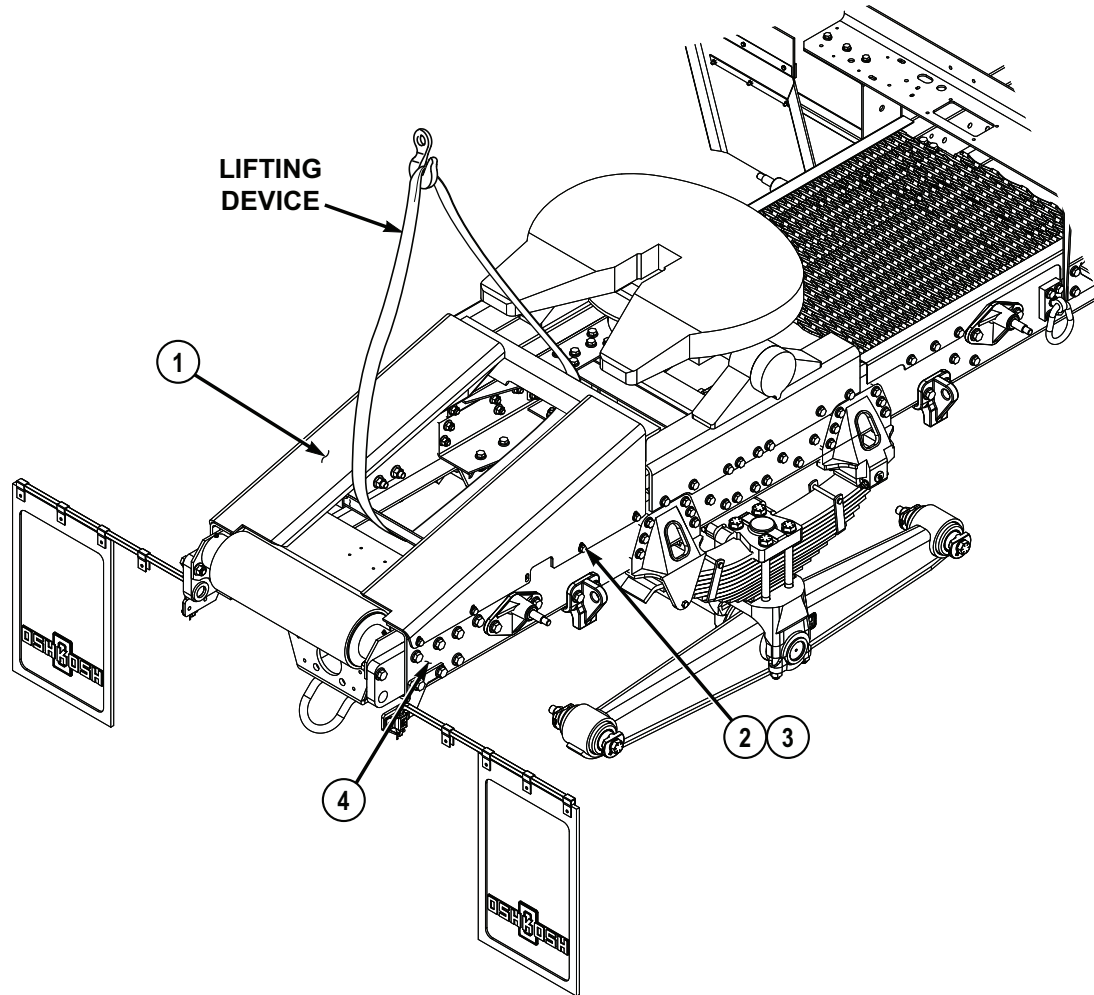


Figure 1.

### WARNING



Ramp assembly weighs 222 lbs (101 kg). Do not attempt to lift or move ramp without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

### NOTE

When removing ramp assembly, tilt fifth wheel fully forward to clear ramp assembly front support angle.

2. With the aid of an assistant and lifting device, remove ten locknuts (2), screws (3), and ramp assembly (1) from frame (4). Discard locknuts.
3. Set ramp assembly (1) down with ramp flats down, and remove lifting device from ramp assembly (1).
4. Remove four locknuts (5), screws (6), and rear ramp support bracket (7) from ramp assembly (1). Discard locknuts.

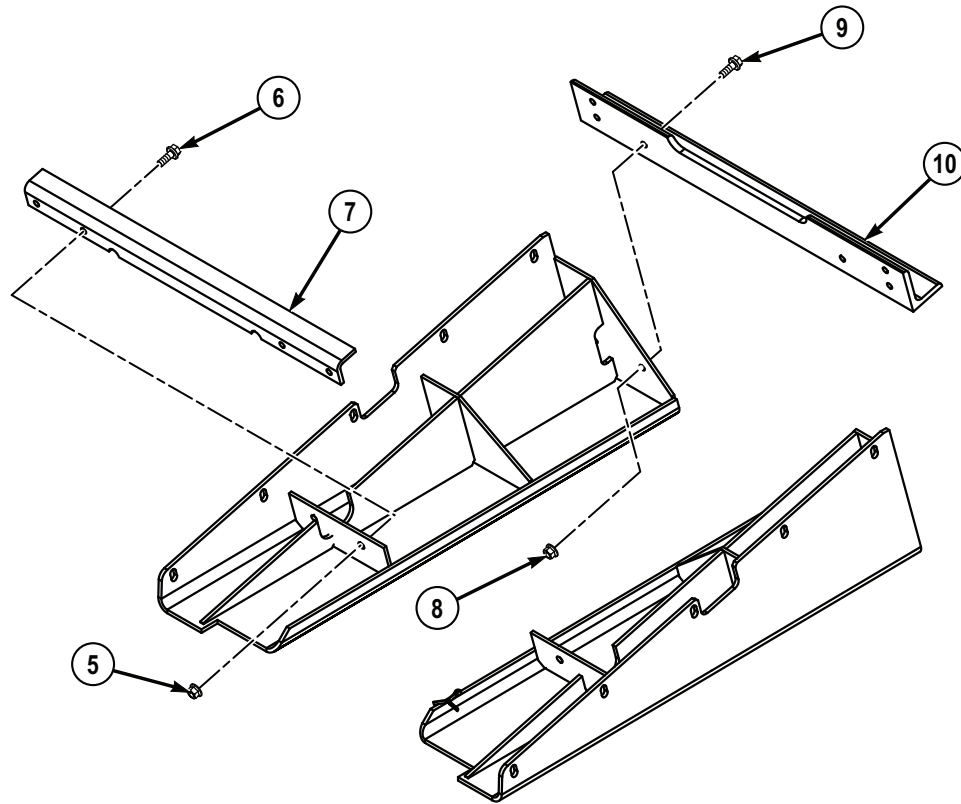


Figure 2.

5. Remove six locknuts (8), screws (9), and front support angle (10) from ramp assembly (1). Discard locknuts.

## END OF TASK

## INSTALLATION

1. Install front support angle (10) on ramp assembly (1) with six screws (9) and locknuts (8).

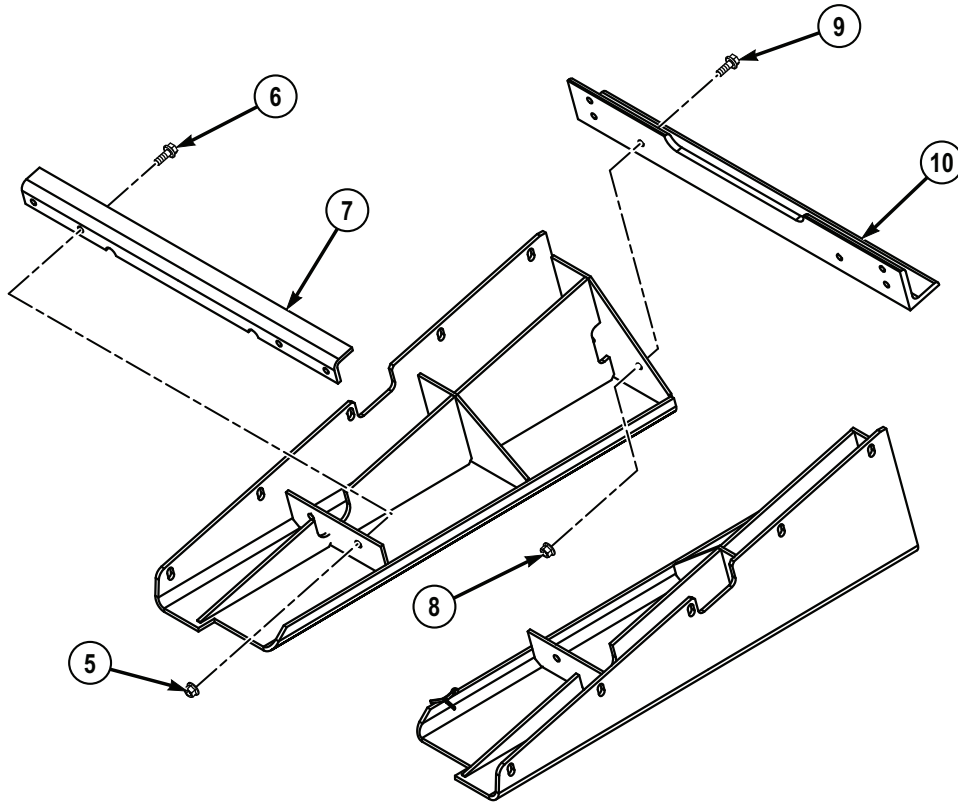


Figure 3.

2. Install rear ramp support bracket (7) on ramp assembly (1) with four screws (6) and locknuts (5).

### WARNING



Ramp assembly weighs 222 lbs (101 kg). Do not attempt to lift or move ramp without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

### NOTE

When installing ramp assembly, tilt fifth wheel fully forward to clear ramp assembly front support angle.

3. Attach lifting device to ramp assembly (1).

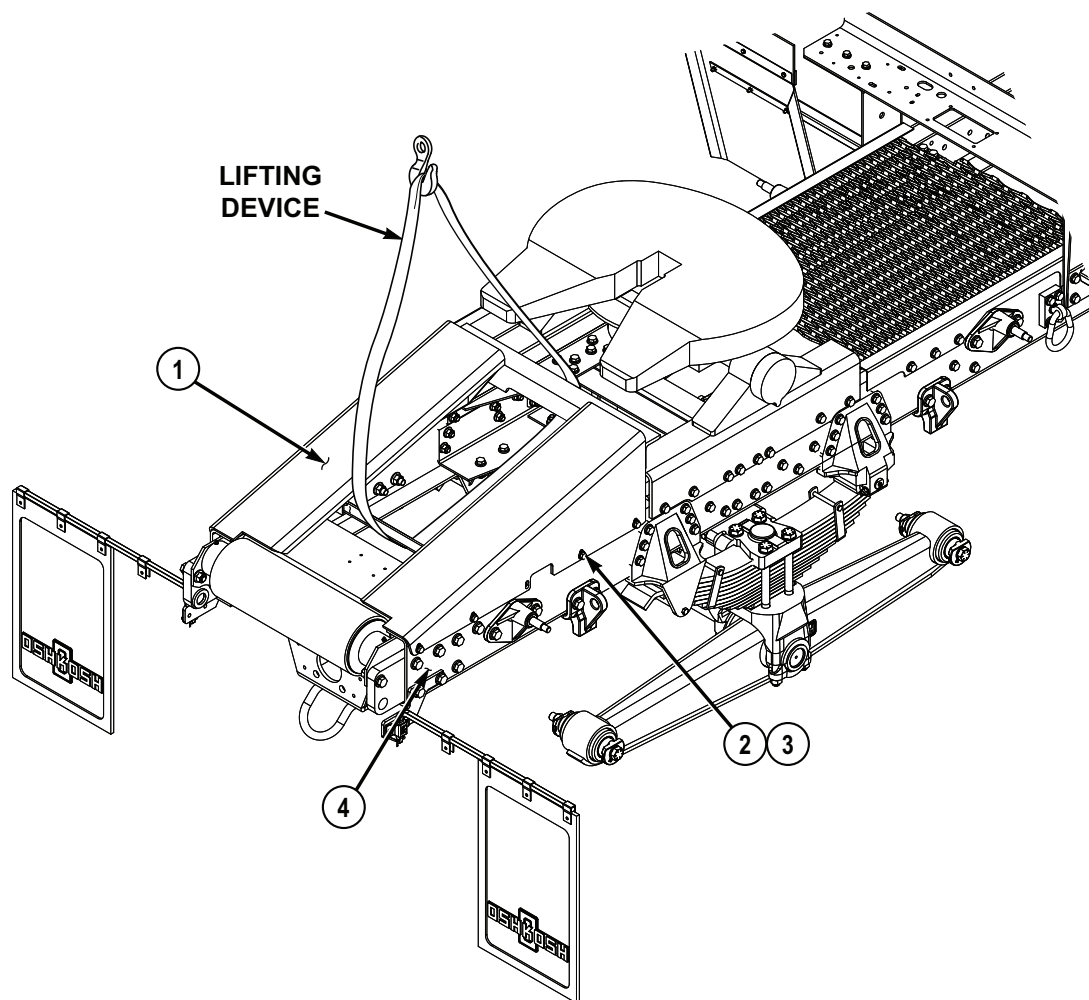


Figure 4.

4. With the aid of an assistant and lifting device, install ramp assembly (1) on frame (4) with ten screws (3) and locknuts (2).
5. Remove lifting device from ramp assembly (1).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Remove wheel chocks (refer to TM 9-2320-279-10).

#### END OF WORK PACKAGE



## FIELD MAINTENANCE FIFTH WHEEL REMOVAL/INSTALLATION

### INITIAL SETUP:

#### Tools and Special Tools

Lifting Device, Minimum Capacity 2,000 lbs (908 kg)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

#### References

Parts Manual (Fig. 15)  
Parts Manual (Fig. 16)

#### Equipment Condition

Chock block stowage box removed (refer to TM 9-2320-315-14&P)  
Front support angle removed. (WP 0051)

#### Materials/Parts

Locknut (WP 0084, Table 1, Item 4) Qty: 16

### REMOVAL

1. Remove eight locknuts (1) and screws (2) from fifth wheel assembly (3) and vehicle frame (4). Discard locknuts.

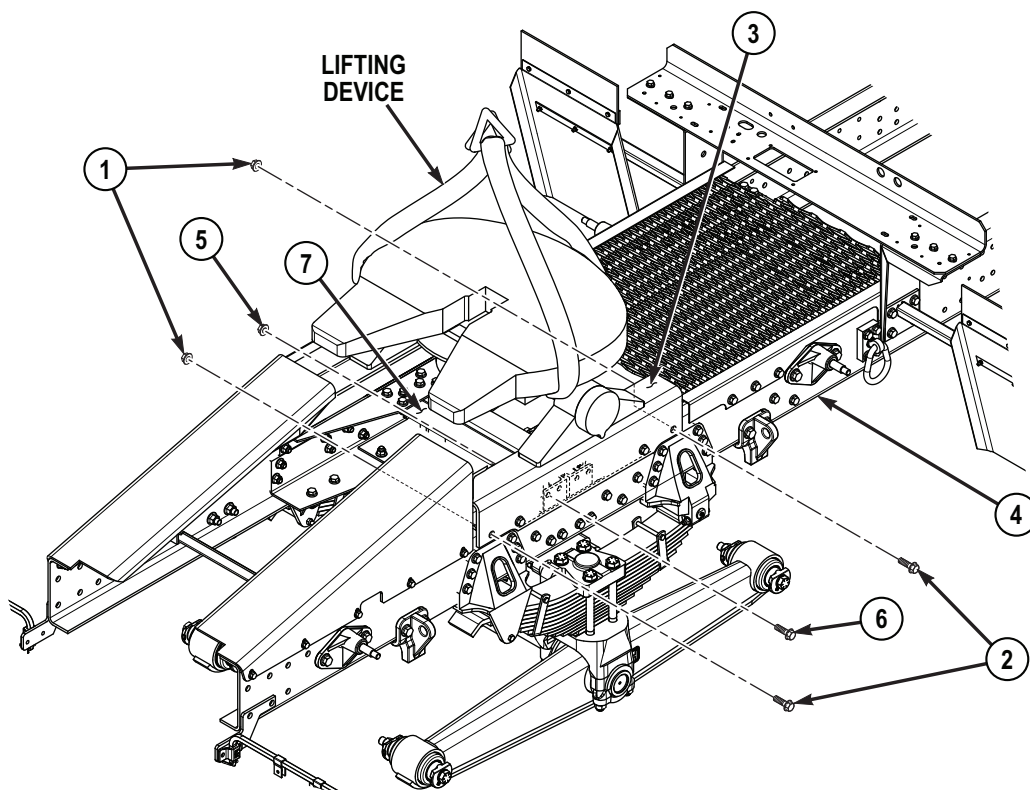


Figure 1.

**WARNING**

Fifth wheel assembly weighs 1,010 lbs (458 kg). Do not attempt to lift or move fifth wheel assembly without the aid of an assistant and lifting device. Failure to comply may result in injury or death to personnel.

2. Attach lifting device to fifth wheel assembly (3).
3. Remove eight locknuts (5) and screws (6) from fifth wheel assembly (3), frame (4), and crossmember (7). Discard locknuts.
4. With the aid of an assistant and lifting device, remove fifth wheel assembly (3) from vehicle.
5. Remove lifting device from fifth wheel assembly (3).

**END OF TASK****INSTALLATION****WARNING**

Fifth wheel assembly weighs 1,010 lbs (458 kg). Do not attempt to lift or move fifth wheel assembly without the aid of an assistant and lifting device. Failure to comply may result in injury or death to personnel.

1. Attach lifting device to fifth wheel assembly (3).



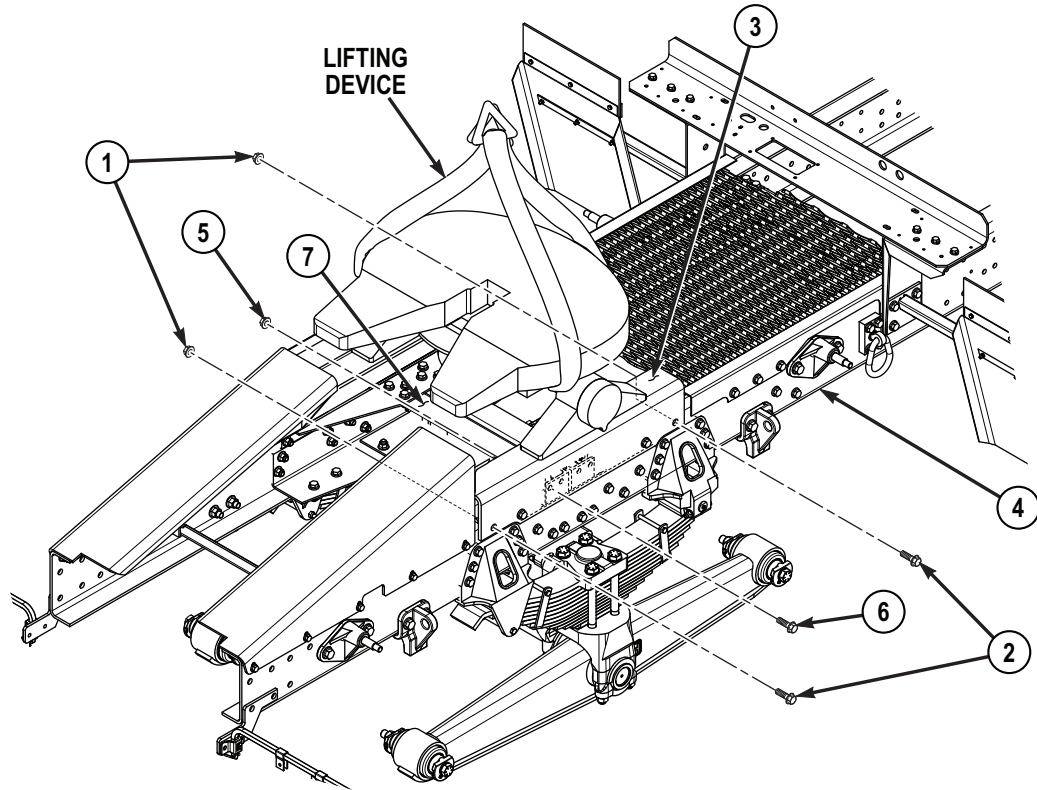


Figure 2.

2. With the aid of an assistant and lifting device, position fifth wheel assembly (3) on vehicle.
3. Install fifth wheel assembly (3) on frame (4) and crossmember (7) with eight screws (6) and locknuts (5). Do not tighten locknuts.
4. Secure fifth wheel assembly (3) on vehicle frame (4) with eight screws (2) and locknuts (1).
5. Tighten locknuts (5).
6. Remove lifting device from fifth wheel assembly (3).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Install front support angle. (WP 0051)
2. Install chock block stowage box (refer to TM 9-2320-315-14&P).

#### END OF WORK PACKAGE



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## FIELD MAINTENANCE

### REAR CROSSMEMBER ROLLER ASSEMBLY REMOVAL/INSTALLATION

---

#### INITIAL SETUP:

##### Tools and Special Tools

Lifting Device, Minimum Capacity 300 lbs (136 kg)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Wrench, Combination, 1 1/8 in. (WP 0081, Table 2, Item 6)  
Socket, 1 1/8 in. (WP 0081, Table 2, Item 6)

##### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

##### References

Parts Manual (Fig. 14)

##### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

##### Materials/Parts

Grease, Automotive and Artillery (WP 0083, Table 1, Item 17, 18, 19, 20, 21, 22)  
Locknut (WP 0084, Table 1, Item 5) Qty: 6

---

#### REMOVAL

#### WARNING



Crossmember roller assembly weighs 146 lbs (66 kg). Do not attempt to lift or move crossmember roller assembly without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

1. Attach lifting device to roller assembly (1).

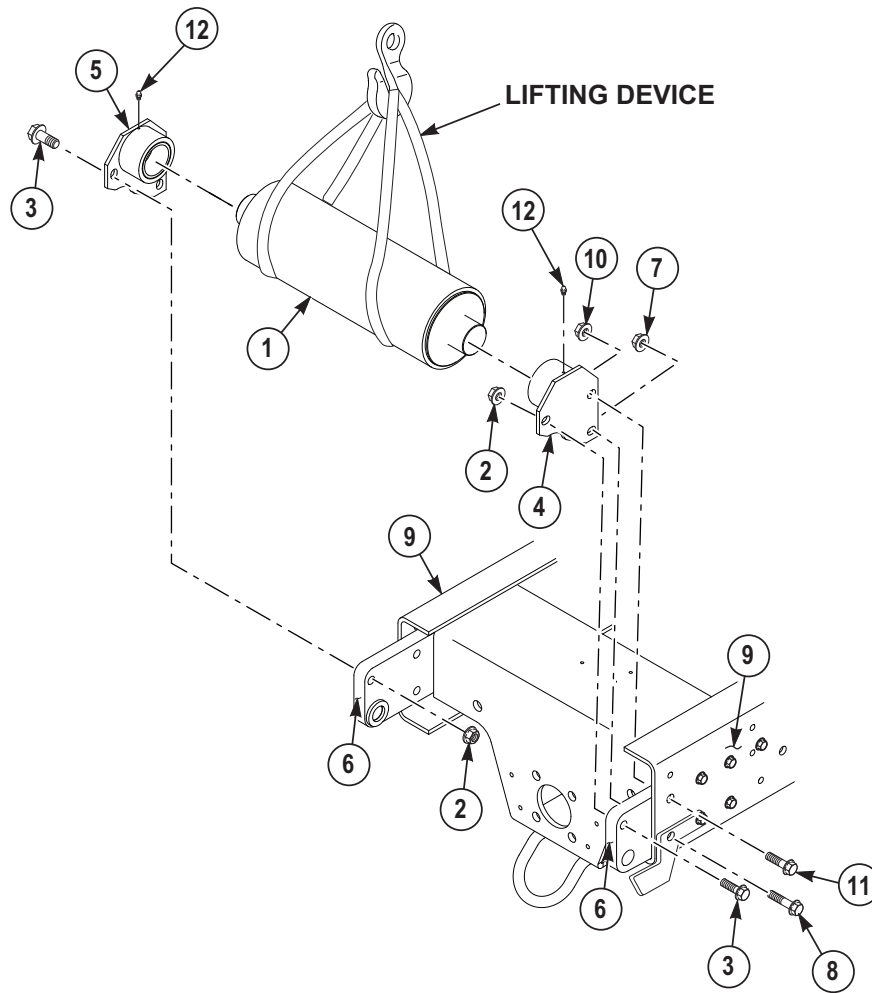


Figure 1.

2. Remove two locknuts (2) and screws (3) from two roller supports (4) and (5) and rear crossmember (6). Discard locknuts.
3. Remove two locknuts (7) and screws (8) from two roller supports (4) and (5), rear crossmember (6), and frame (9). Discard locknuts.

### WARNING



Roller supports can come free of roller when assembly is removed from vehicle. Secure roller supports during roller assembly removal. Failure to comply may result in injury to personnel.

4. With the aid of an assistant and lifting device, remove two locknuts (10), screws (11), roller supports (4) and (5), and roller assembly (1) from rear crossmember (6), and frame (9). Discard locknuts.
5. Remove two grease fittings (12) from two roller supports (4) and (5).
6. Remove lifting device from roller assembly (1).

## END OF TASK

## INSTALLATION

1. Install two grease fittings (12) on two roller supports (4) and (5).

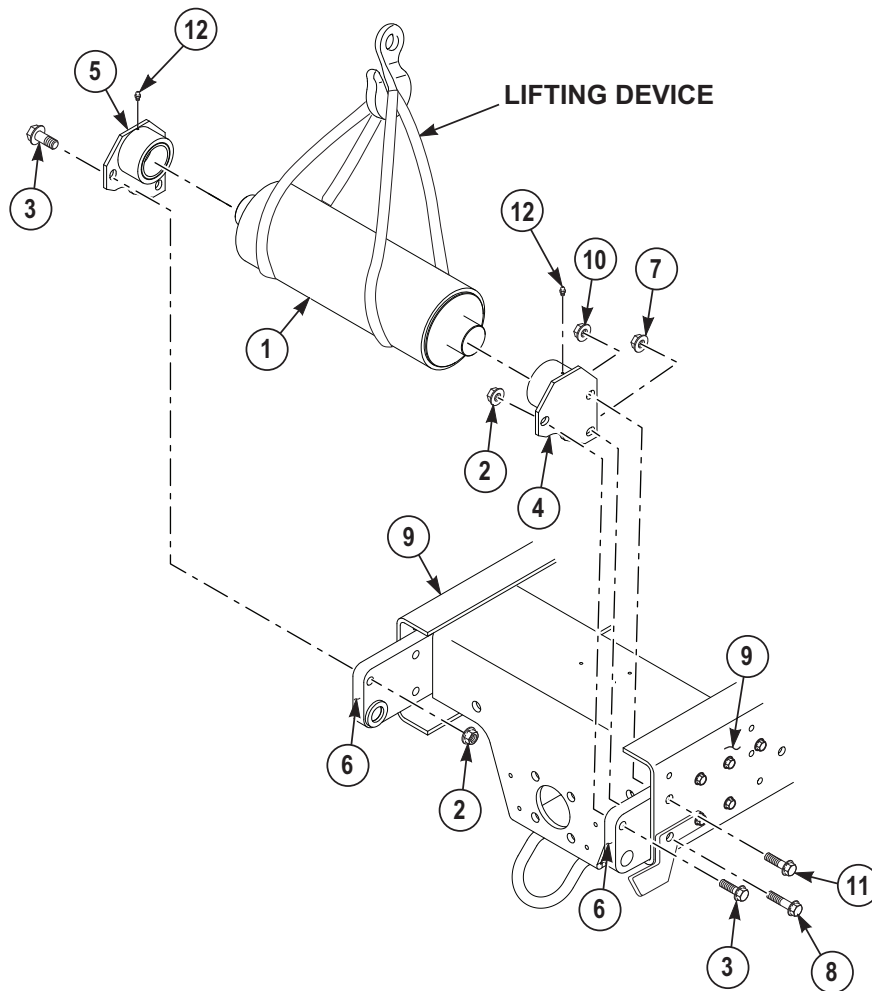


Figure 2.

2. Lubricate inside surface of two roller supports (4) and (5) with GAA. (WP 0041)
3. Install lifting device on roller assembly (1).

**WARNING**

Crossmember roller assembly weighs 146 lbs (66 kg). Do not attempt to lift or move crossmember roller assembly without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

4. With the aid of an assistant and lifting device, install roller assembly (1) and two roller supports (4) and (5) on rear crossmember (6) and frame (9) with two screws (11) and locknuts (10). Do not tighten locknuts.
5. Install two screws (8) and locknuts (7) on two roller supports (4) and (5), rear crossmember (6), and frame (9). Do not tighten locknuts.
6. Install two screws (3) and locknuts (2) on two roller supports (4) and (5) and rear crossmember (6).
7. Tighten locknuts (10) and (7).
8. Remove lifting device from roller assembly (1).

**END OF TASK****FOLLOW-ON MAINTENANCE**

1. Lubricate roller support bushings (refer to TM 9-2320-315-14&P).
2. Remove wheel chocks (refer to TM 9-2320-279-10).

**END OF WORK PACKAGE**

---

## FIELD MAINTENANCE STOWAGE BOX REMOVAL/INSTALLATION

---

### INITIAL SETUP:

#### Tools and Special Tools

Lifting Device, Minimum Capacity 300 lbs (136 kg)  
Tool Kit, General Mechanic's: Automotive (WP  
0081, Table 2, Item 5)

#### References

Parts Manual (Fig. 20)  
Parts Manual (Fig. 21)

#### Materials/Parts

Locknut (WP 0084, Table 1, Item 4) Qty: 4

#### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

#### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

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### REMOVAL

#### WARNING



Stowage box weighs 120 lbs (55 kg). Do not attempt to lift or move stowage box without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

1. Attach lifting device to stowage box (1).

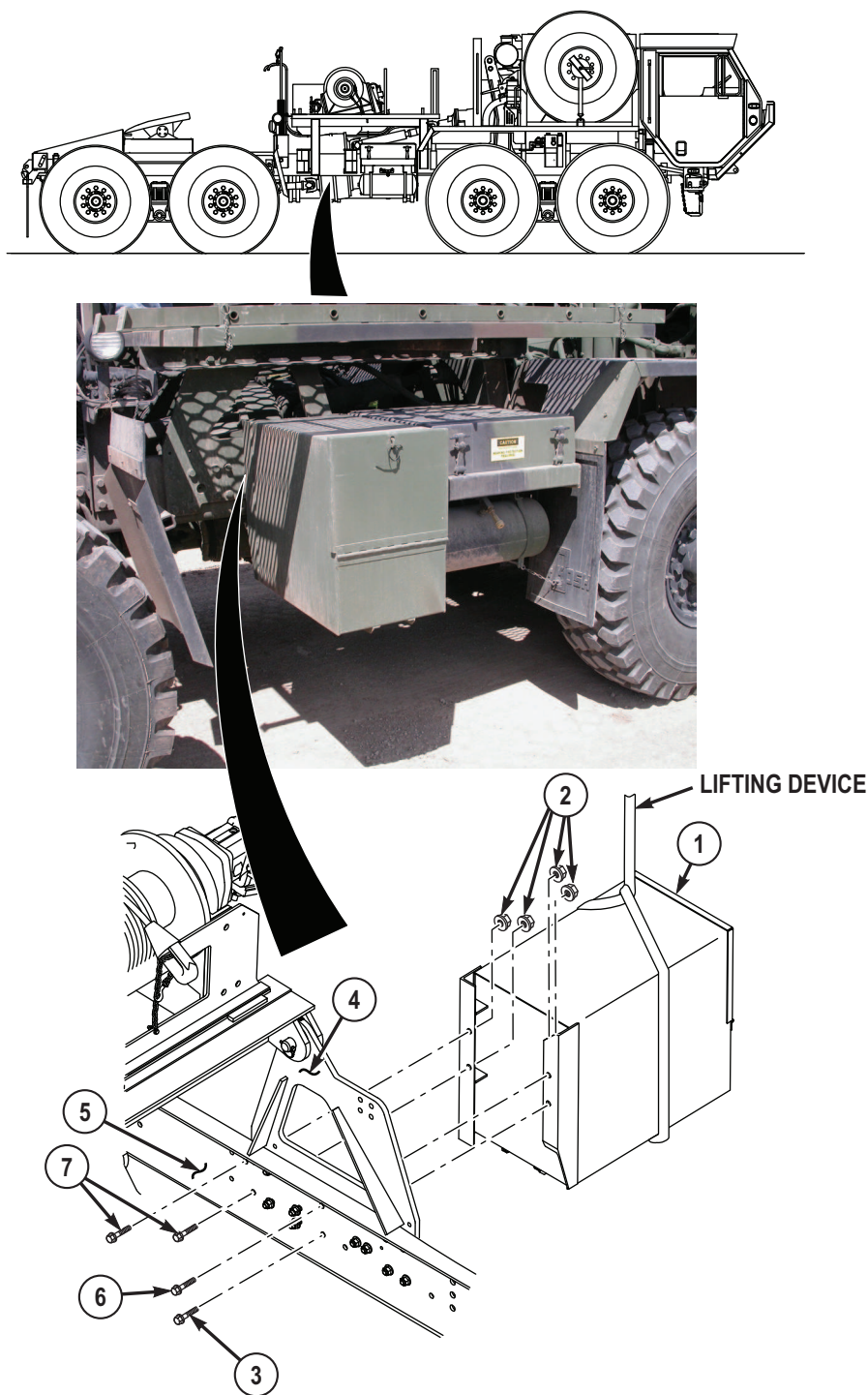


Figure 1.

2. With the aid of an assistant, remove locknut (2) and screw (3) from stowage box (1), winch mount (4), and vehicle frame rail (5). Discard locknut.
3. With the aid of an assistant, remove locknut (2) and screw (6) from stowage box (1), winch mount (4), and vehicle frame rail (5). Discard locknut.



4. With the aid of an assistant and lifting device, remove two locknuts (2), screws (7), and stowage box (1), from winch mount (4) and vehicle frame rail (5). Discard locknuts.

**END OF TASK****INSTALLATION****WARNING**

Stowage box weighs 120 lbs (55 kg). Do not attempt to lift or move stowage box without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

1. With the aid of an assistant and lifting device, install stowage box (1) on vehicle frame rail (5) and winch mount (4) with two screws (7) and two locknuts (2).

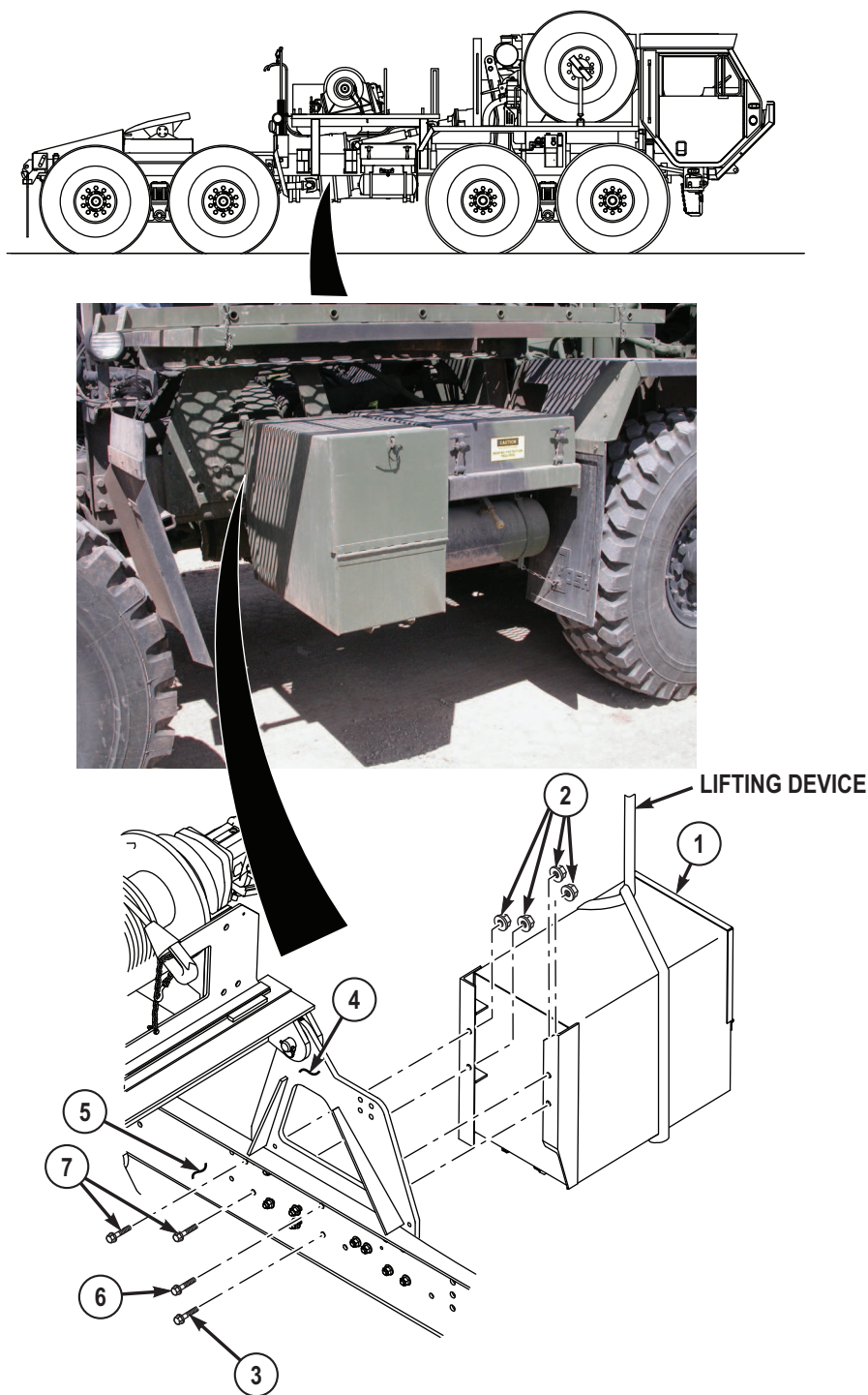


Figure 2.

2. With the aid of an assistant, secure storage box (1) on vehicle frame rail (5) and winch mount (4) with screw (6) and locknut (2).
3. With the aid of an assistant, secure storage box (1) on vehicle frame rail (5) and winch mount (4) with screw (3) and locknut (2).

4. Remove lifting device from stowage box (1).

**END OF TASK****FOLLOW-ON MAINTENANCE**

1. Remove wheel chocks (refer to TM 9-2320-279-10).

**END OF WORK PACKAGE**



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## FIELD MAINTENANCE WINCH KICKOUT CONTROL VALVE REMOVAL/INSTALLATION

---

### INITIAL SETUP:

#### Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

#### References

Parts Manual (Fig. 8)

#### Materials/Parts

Compound, Sealing (WP 0083, Table 1, Item 16)  
Tags, Identification (WP 0083, Table 1, Item 30)

#### Equipment Condition

Engine OFF (TM 9-2320-279-10).  
Wheels chocked (TM 9-2320-279-10).  
Air system drained (TM 9-2320-315-14&P).

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### REMOVAL

#### NOTE

Tag and mark air lines prior to removal to ensure proper installation.

1. Remove air line 2921 (1) from fitting (2).

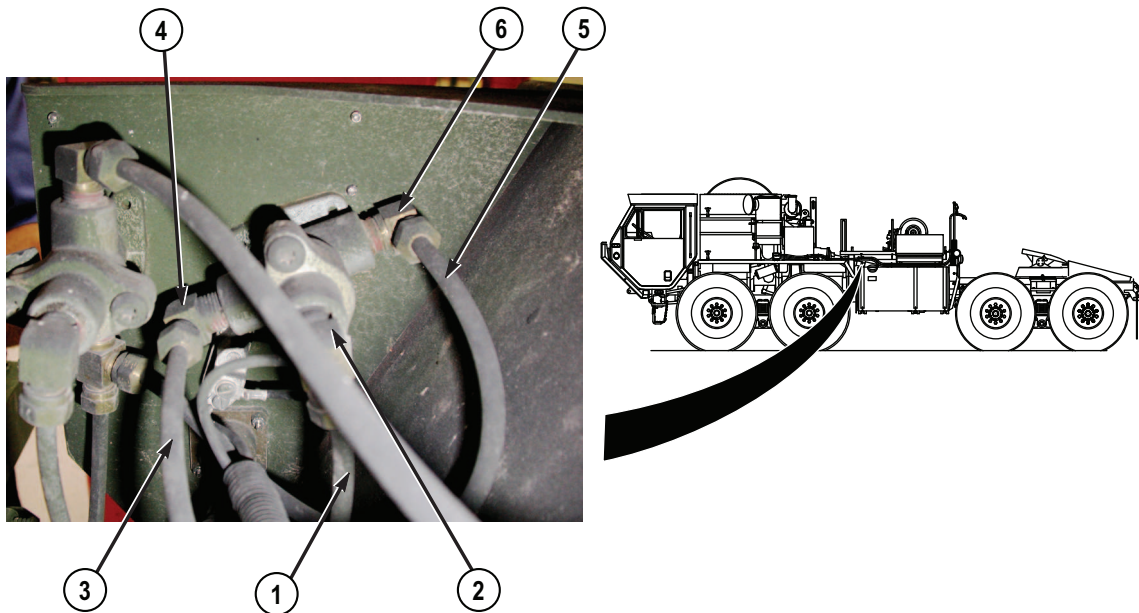


Figure 1.

2. Remove air line 2706 (3) from fitting (4).
3. Remove air line 2763 (5) from fitting (6).

4. Remove knob (7) from Winch KickOut control valve (8).

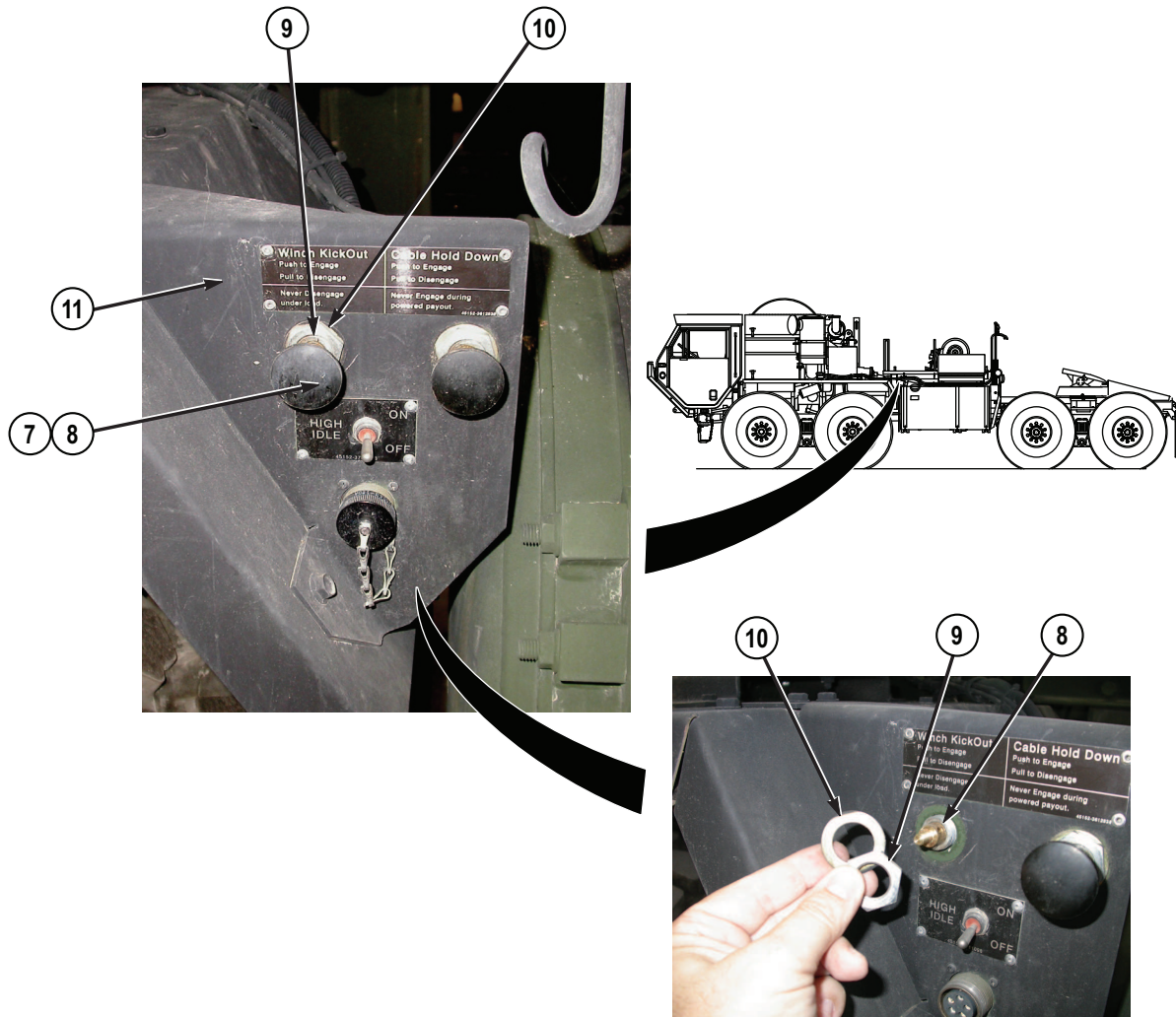


Figure 2.

5. Remove nut (9), washer (10), and Winch KickOut control valve (8) from mounting bracket (11).

### NOTE

Note location and position of fittings prior to removal to ensure proper installation.

6. Remove three fittings (2), (4), and (6) from Winch KickOut control valve (8).

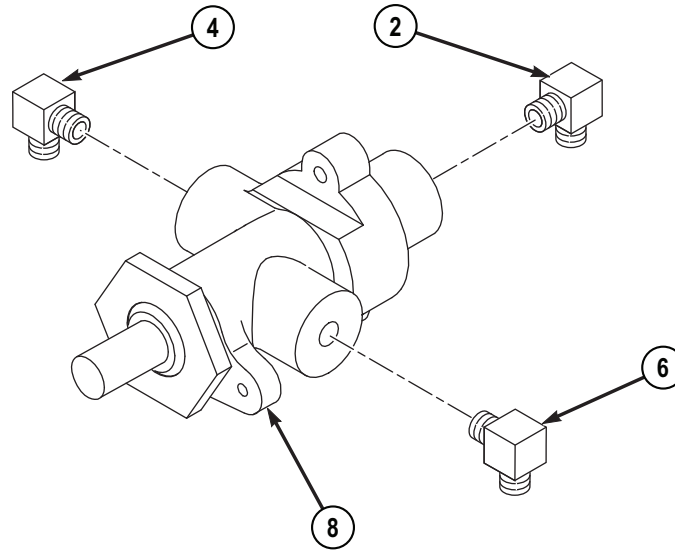


Figure 3.

## END OF TASK

## INSTALLATION

### WARNING



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

### NOTE

Install fittings as noted prior to removal.

1. Apply sealing compound to threads of three fittings (2), (4), and (6) and install three fittings (2), (4), and (6) on Winch KickOut control valve (8).

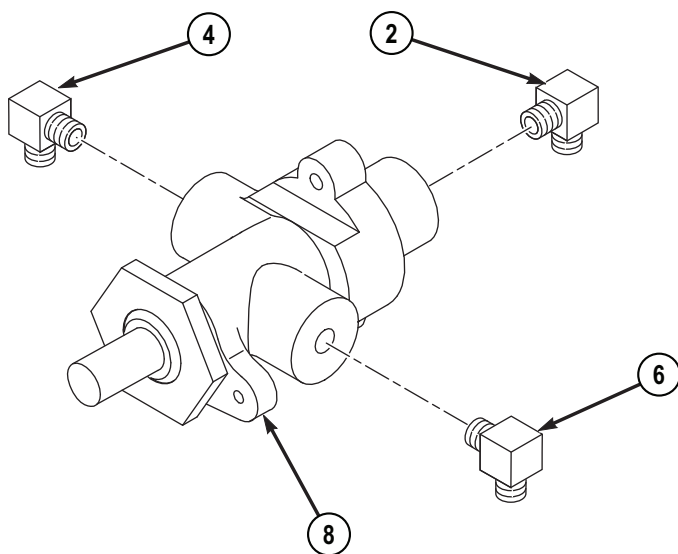


Figure 4.

2. Install Winch KickOut control valve (8) on mounting bracket (11) with washer (10) and nut (9).



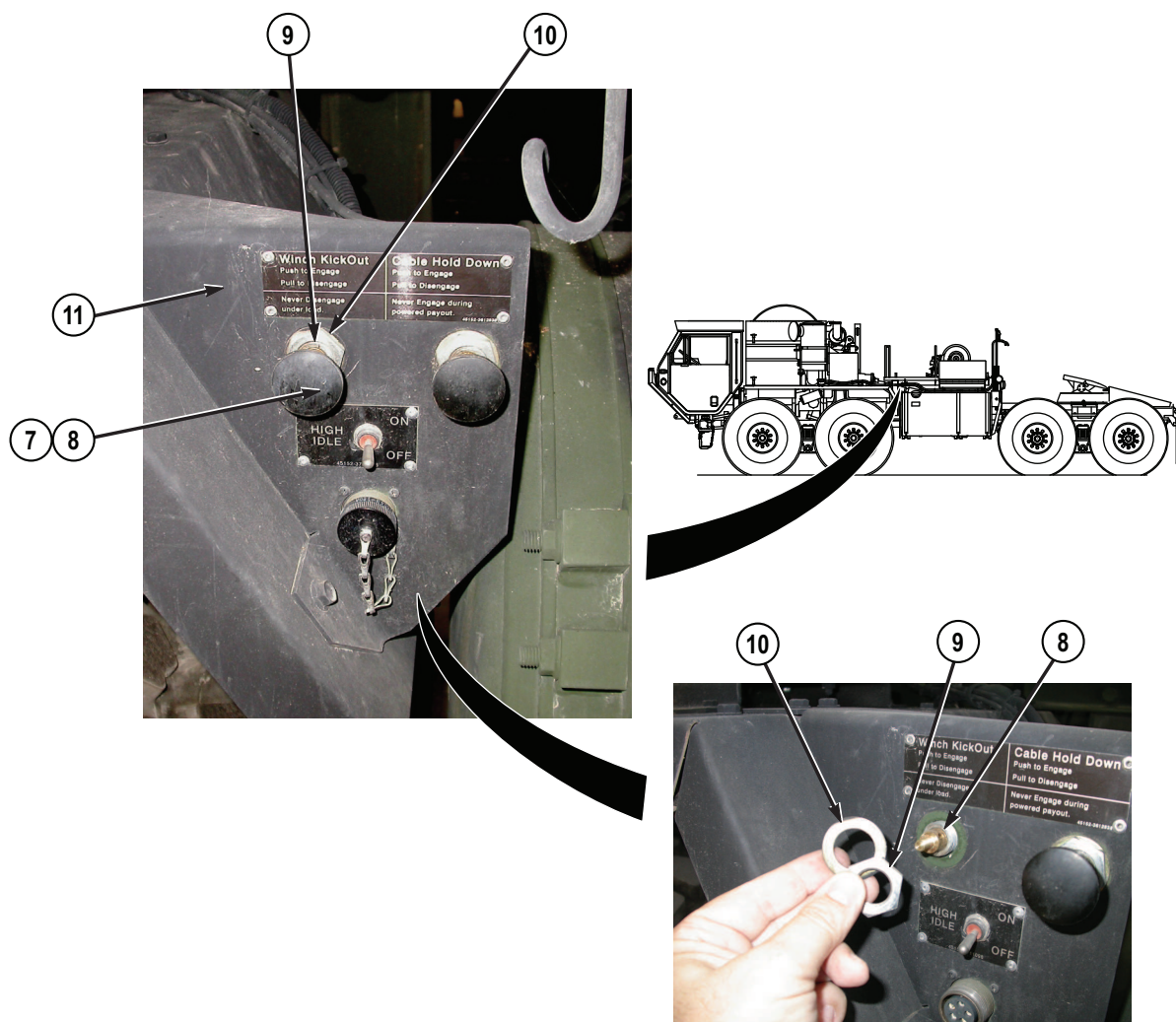


Figure 5.

3. Install knob (7) on Winch KickOut control valve (8).
4. Install air line 2763 (5) on fitting (6).

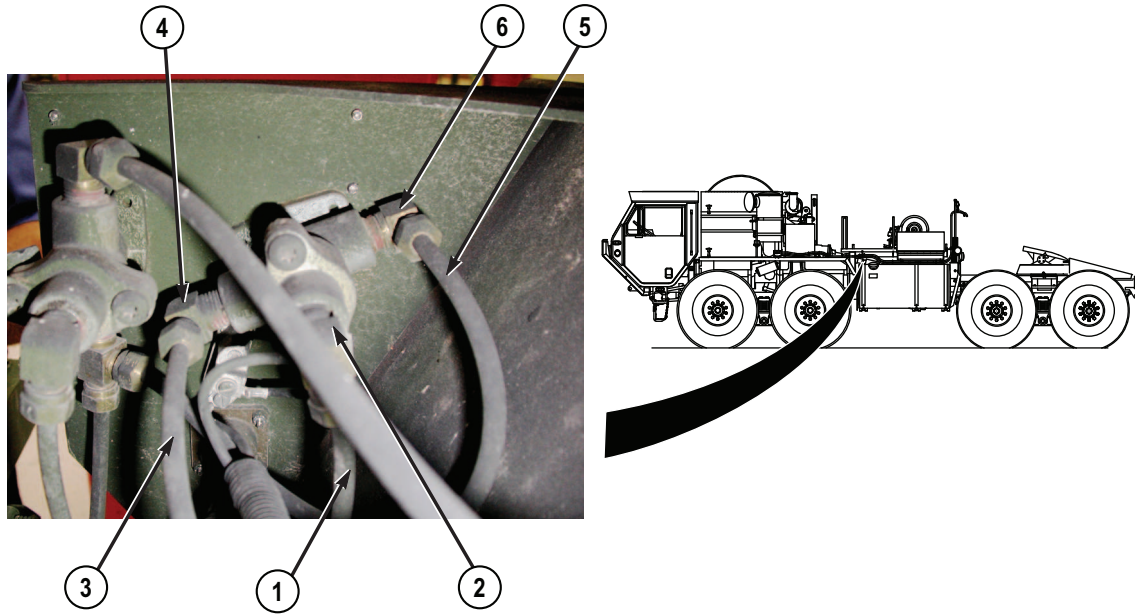


Figure 6.

5. Install air line 2706 (3) on fitting (4).
6. Install air line 2921 (1) on fitting (2).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Start engine and build air pressure to 120 to 125 psi (827 to 862 kPa) (refer to TM 9-2320-279-10).
2. Check air system for leaks (refer to TM 9-2320-315-14&P).
3. Check operation of heavy-duty winch. (WP 0015)
4. Shut OFF engine (refer to TM 9-2320-279-10).
5. Remove wheel chocks (refer to TM 9-2320-279-10).

#### END OF WORK PACKAGE

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**FIELD MAINTENANCE**  
**WINCH CABLE HOLD DOWN CONTROL VALVE REMOVAL/INSTALLATION**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

**References**

Parts Manual (Fig. 8)

**Materials/Parts**

Compound, Sealing (WP 0083, Table 1, Item 16)  
Tags, Identification (WP 0083, Table 1, Item 30)

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).  
Air system drained (refer to TM 9-2320-315-14&P).

---

**REMOVAL****NOTE**

Tag and mark air lines prior to removal to ensure proper installation.

1. Remove air line 2231 (1) from fitting (2).

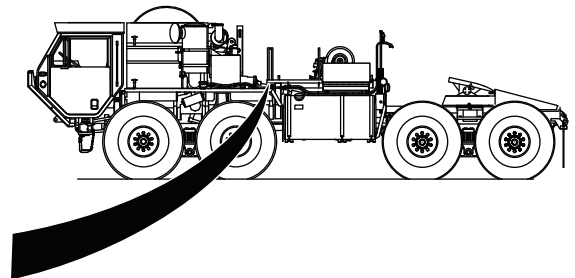
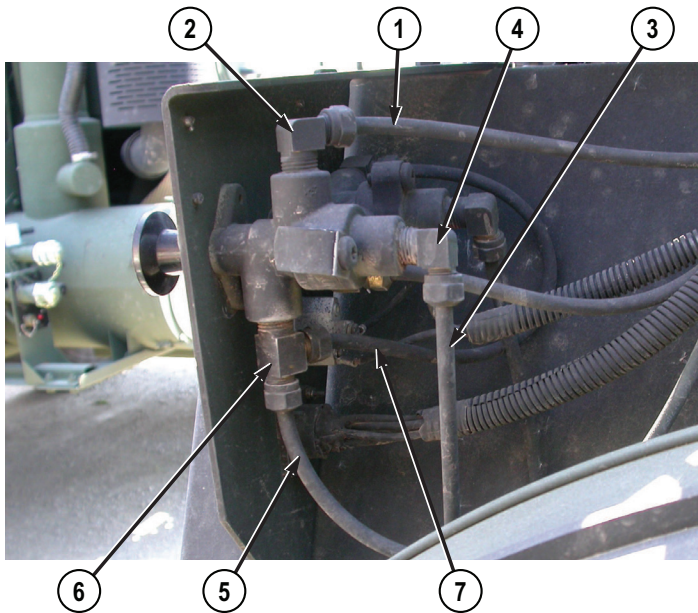


Figure 1.

2. Remove air line 2921 (3) from fitting (4).
3. Remove air line 2338 (5) from fitting (6).

4. Remove air line 2763 (7) from fitting (6).
5. Remove knob (8) from cable hold down control valve (9).

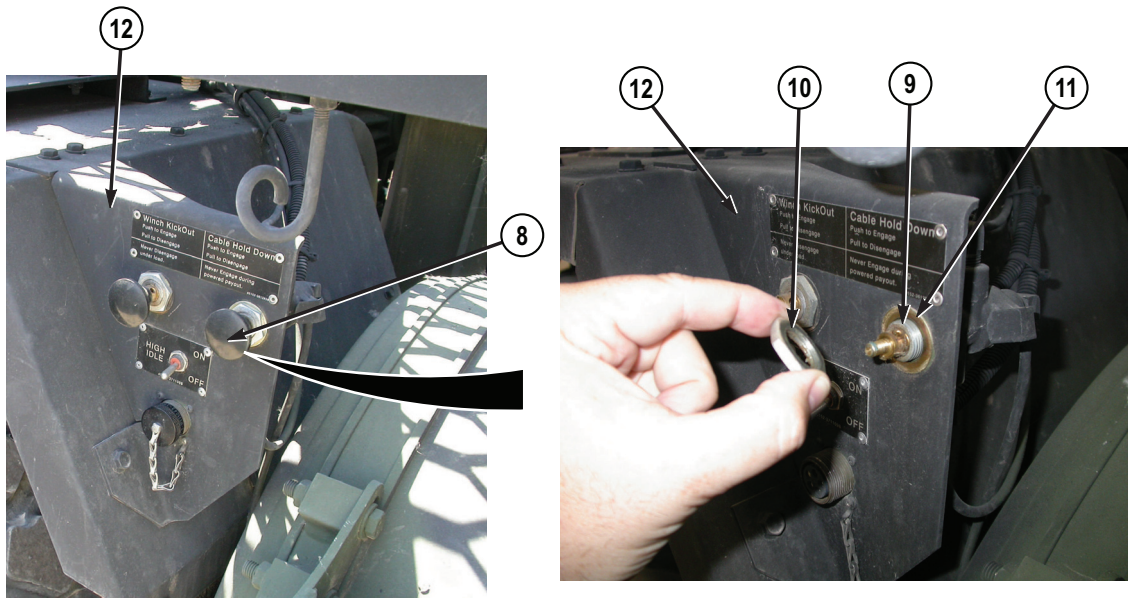


Figure 2.

6. Remove nut (10), washer (11), and cable hold down control valve (9) from mounting bracket (12).

### NOTE

Note location and position of fittings prior to removal to ensure proper installation.

7. Remove three fittings (2), (4), and (6) from cable hold down control valve (9).

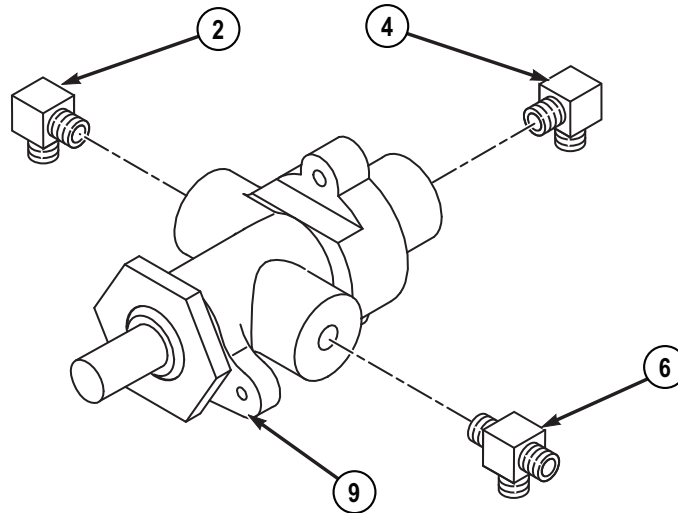


Figure 3.

## END OF TASK

## INSTALLATION

### WARNING



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

### NOTE

Install fittings as noted prior to removal.

1. Apply sealing compound to threads of three fittings (2), (4), and (6) and install three fittings (2), (4), and (6) on cable hold down control valve (9).



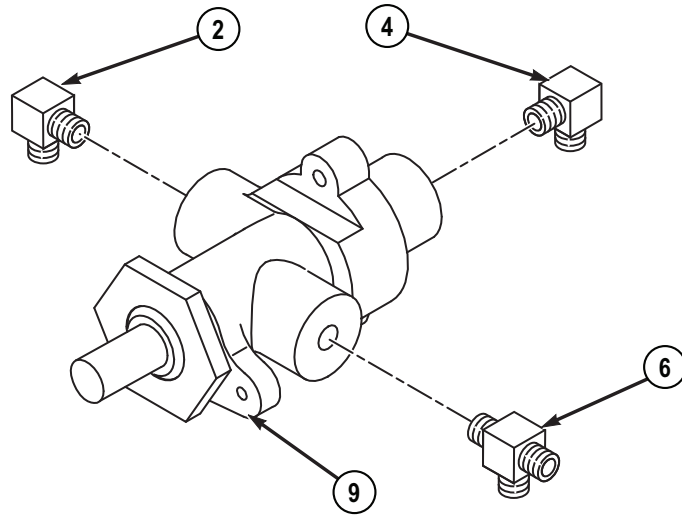


Figure 4.

2. Install cable hold down control valve (9) on mounting bracket (12) with washer (11) and nut (10).

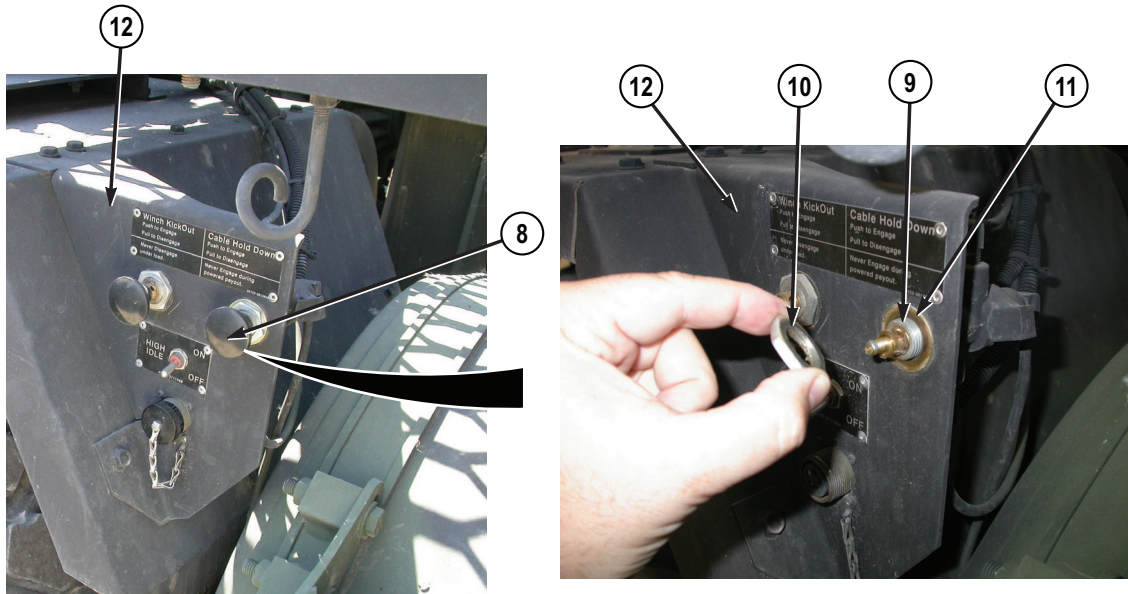


Figure 5.

3. Install knob (8) on cable hold down control valve (9).
4. Install air line 2763 (7) on fitting (6).

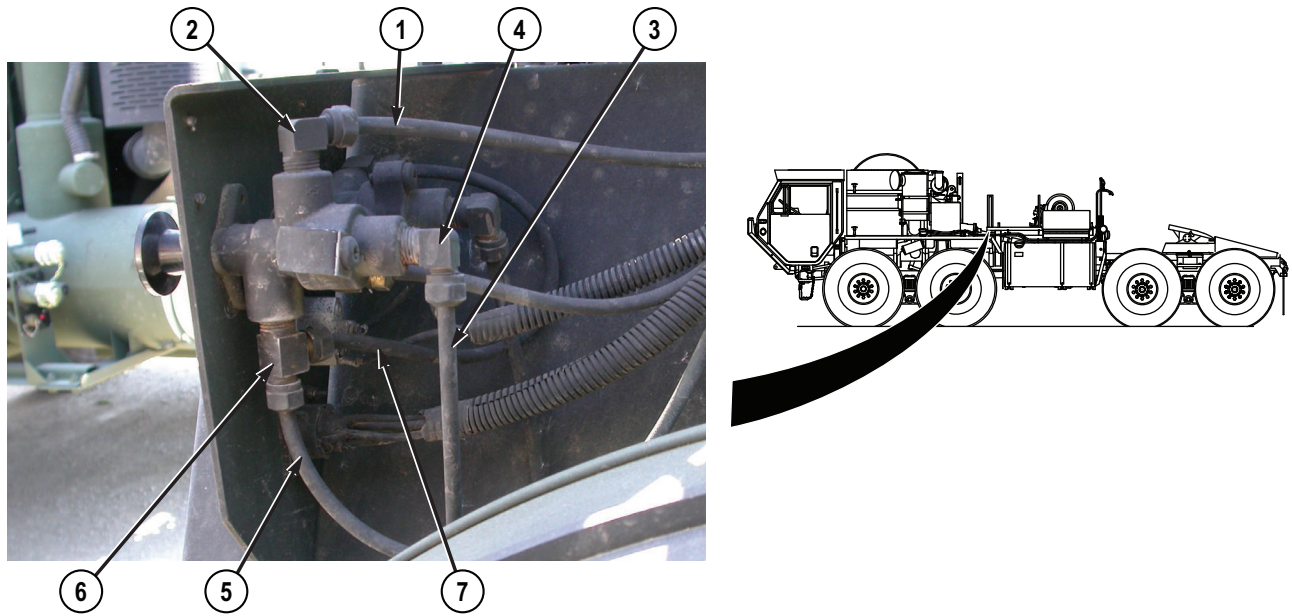


Figure 6.

5. Install air line 2338 (5) on fitting (6).
6. Install air line 2921 (3) on fitting (4).
7. Install air line 2231 (1) on fitting (2).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Start engine and build air pressure to 120 to 125 psi (827 to 862 kPa) (refer to TM 9-2320-279-10).
2. Check air system for leaks (refer to TM 9-2320-315-14&P).
3. Check operation of heavy-duty winch. (WP 0015)
4. Shut OFF engine (refer to TM 9-2320-279-10).
5. Remove wheel chocks (refer to TM 9-2320-279-10).

#### END OF WORK PACKAGE





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## FIELD MAINTENANCE

### REAR CROSSMEMBER REMOVAL/INSTALLATION

---

#### INITIAL SETUP:

##### Tools and Special Tools

Lifting Device, Minimum Capacity 500 lbs (227 kg)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Wrench, Combination, 1 1/8 in. (WP 0081, Table 2, Item 6)  
Socket, 1 1/8 in. (WP 0081, Table 2, Item 6)

##### References

Parts Manual (Fig. 14)

##### Equipment Condition

Rear crossmember roller removed. (WP 0053)  
Taillight brackets removed. (WP 0061)  
Mounting bar and mud flap assembly removed (refer to TM 9-2320-315-14&P).

##### Materials/Parts

Locknut (WP 0084, Table 1, Item 5) Qty: 10

---

#### REMOVAL

#### WARNING



Crossmember weighs 270 lbs (123 kg). Do not attempt to lift or move crossmember without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

1. Attach lifting device to crossmember (1).

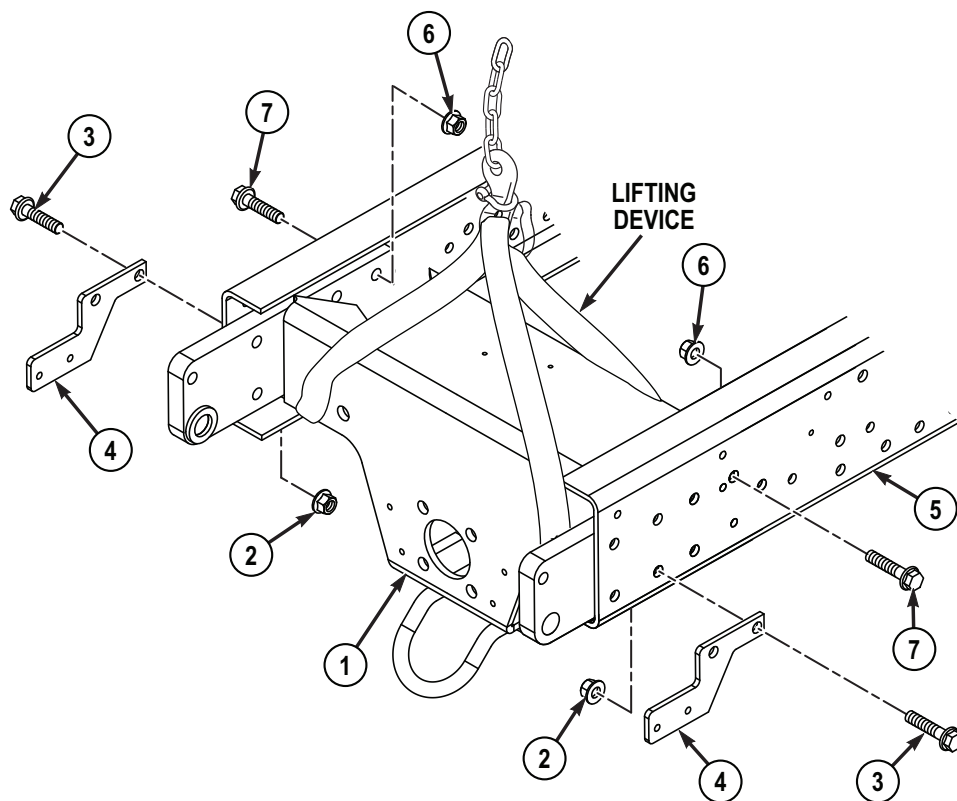


Figure 1.

2. Remove two locknuts (2), screws (3), and brackets (4) from crossmember (1) and frame (5). Discard locknuts.
3. Remove eight locknuts (6) and screws (7) from crossmember (1) and frame (5). Discard locknuts (6).
4. With the aid of an assistant and lifting device, slide crossmember (1) rearward and remove from vehicle.
5. Remove lifting device from crossmember (1).

#### END OF TASK

#### INSTALLATION

#### WARNING



Crossmember weighs 270 lbs (123 kg). Do not attempt to lift or move crossmember without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

1. Attach lifting device to crossmember (1).

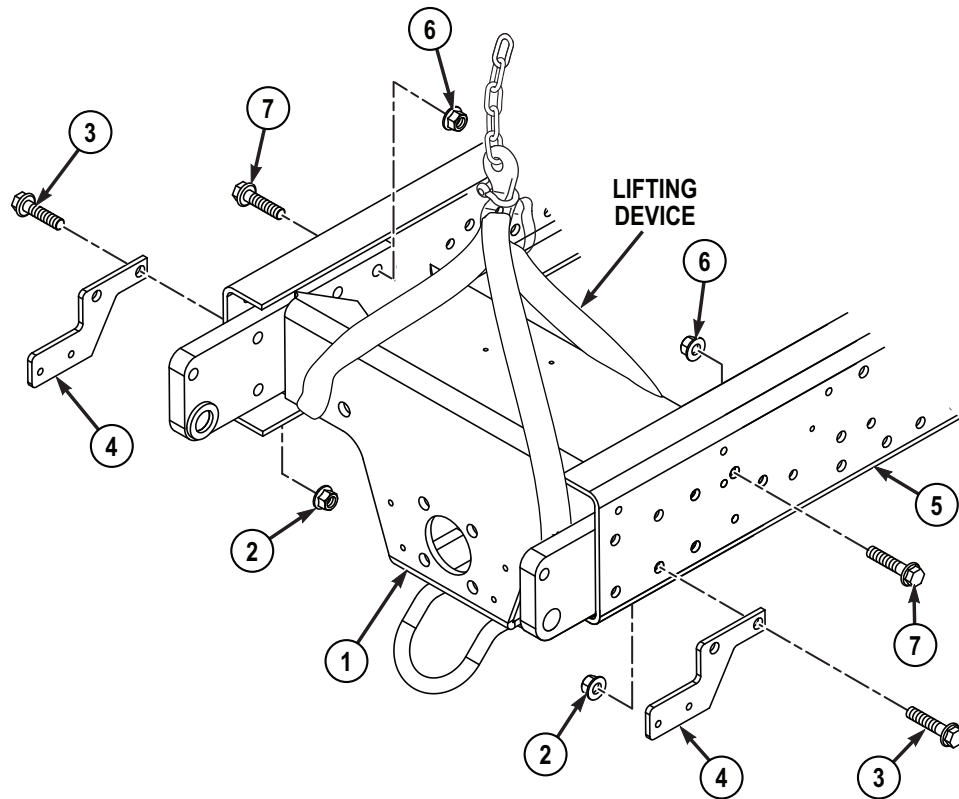


Figure 2.

2. With the aid of an assistant and lifting device, slide crossmember (1) forward between frame rails (5) and position on vehicle.
3. Install crossmember (1) on frame (5) with eight screws (7) and locknuts (6).
4. Install two brackets (4) on crossmember (1) and frame (5) with two screws (3) and locknuts (2).
5. Remove lifting device from crossmember (1).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Install mounting bar and mud flap assembly (refer to TM 9-2320-315-14&P).
2. Install taillight brackets. (WP 0061)
3. Install rear crossmember roller. (WP 0053)

#### END OF WORK PACKAGE



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**FIELD MAINTENANCE**  
**FIFTH WHEEL PLATE ASSEMBLY REMOVAL/INSTALLATION**

---

**INITIAL SETUP:****Tools and Special Tools**

Lifting Device, Minimum Capacity 1,000 lbs (454 kg)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Wrench, F (WP 0081, Table 2, Item 6)

Grease, Automotive and Artillery (GAA) (WP 0083, Table 1, Item 17, 18, 19, 20, 21, 22)  
Pin, Cotter (WP 0084, Table 1, Item 34) Qty: 1

**Personnel Required**

Wheeled Vehicle Mechanic 63B (2)

**Materials/Parts**

Compound, Antiseize (WP 0083, Table 1, Item 9, 10)

**References**

Parts Manual (Fig. 15)

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

---

**REMOVAL****WARNING**

Fifth wheel plate weighs 525 lbs (238 kg). Do not attempt to lift or move fifth wheel plate without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

1. Attach lifting device to fifth wheel plate (1).

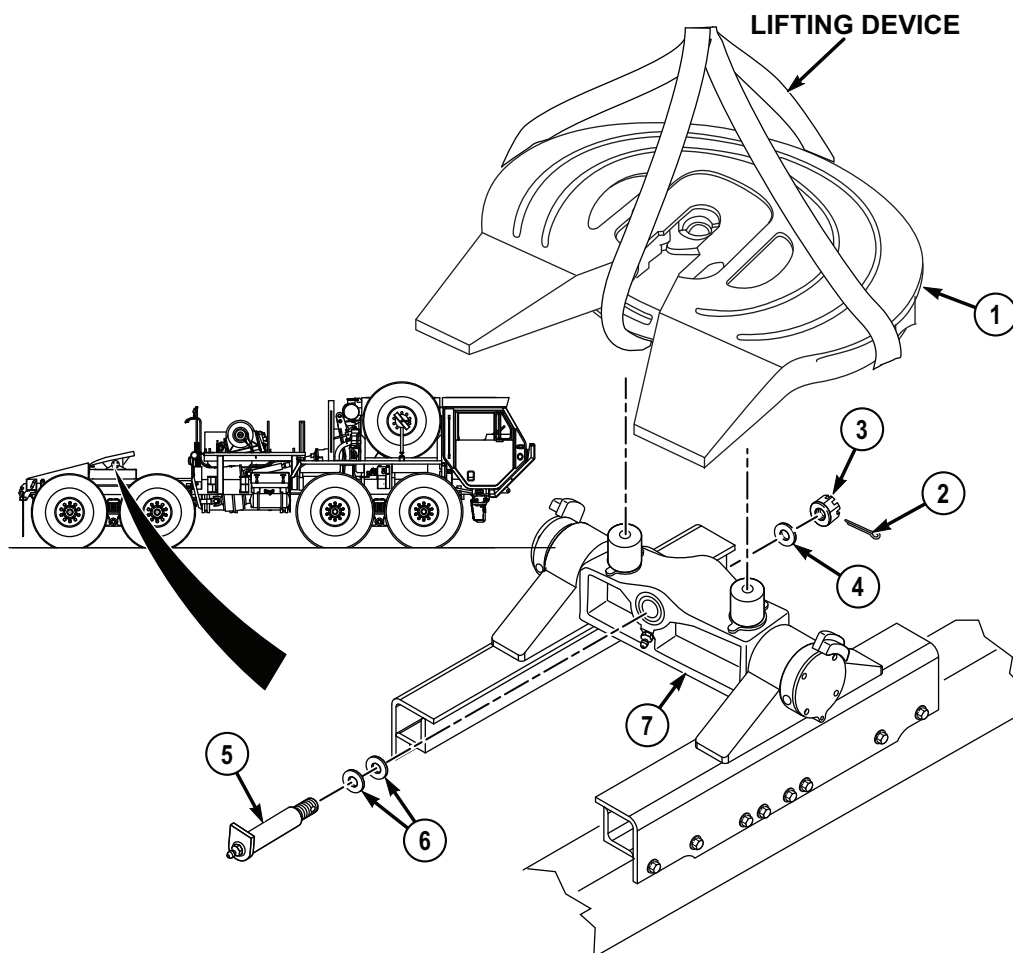


Figure 1.

### NOTE

Note number and size of shims (if any) on flange head end of bolt.

2. Remove cotter pin (2), nut (3), and washer (4) from bolt (5). Discard cotter pin.
3. Using a rubber mallet, remove bolt (5) and any shims (6) from fifth wheel plate (1).
4. With the aid of an assistant and lifting device, remove fifth wheel plate (1) from rocker arm (7).
5. Remove lifting device from fifth wheel plate (1).

### END OF TASK

**INSTALLATION****WARNING**

Fifth wheel plate weighs 525 lbs (238 kg). Do not attempt to lift or move fifth wheel plate without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

1. Attach lifting device to fifth wheel plate (1).

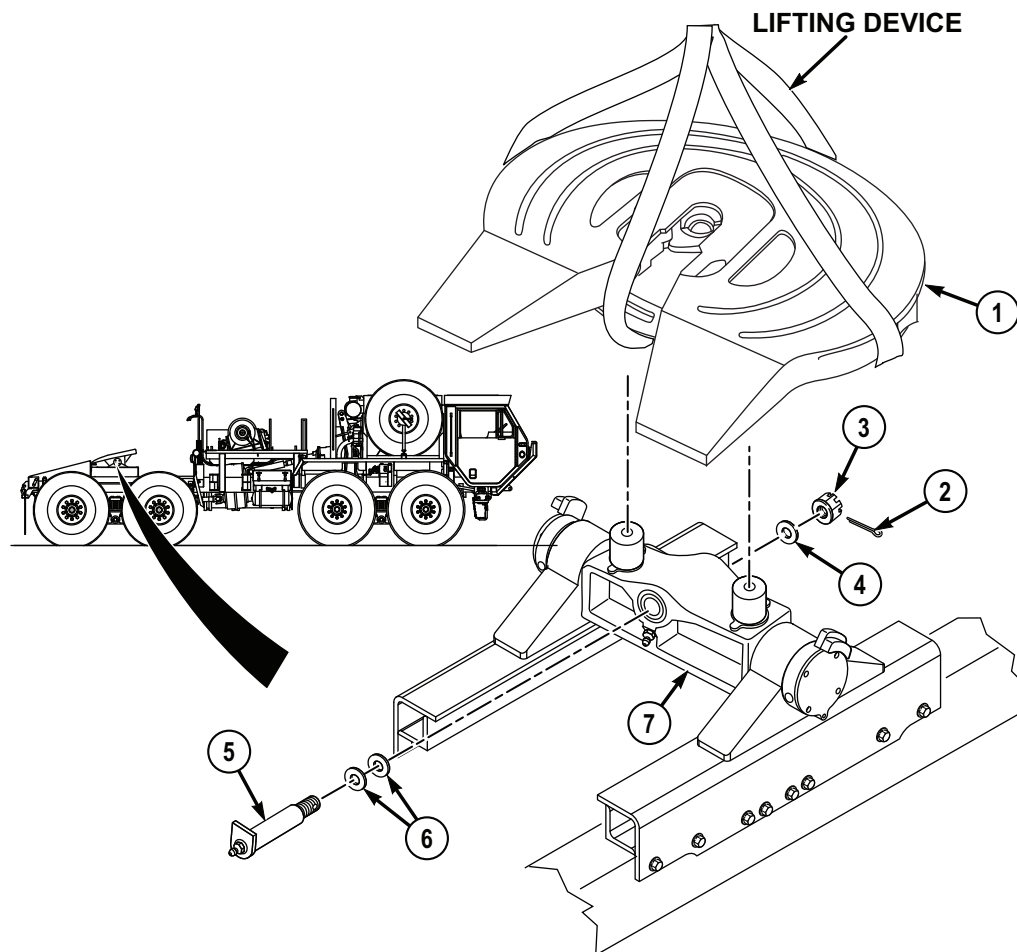


Figure 2.

2. With the aid of an assistant and a lifting device, align holes on fifth wheel plate (1) and rocker arm (7).

**NOTE**

- Ensure bolt flange head faces up towards fifth wheel plate.

- Install shim(s) on flange head end of bolt as noted prior to removal.

3. Apply grease to shank of bolt (5), and install bolt (5) with shims (6) (if needed) through holes in fifth wheel plate (1) and rocker arm (7).

### WARNING



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

4. Apply antiseize compound to threads of bolt (5) and install washer (4), nut (3), and cotter pin (2) on bolt (5).
5. Remove lifting device from fifth wheel plate (1).

### END OF TASK

### FOLLOW-ON MAINTENANCE

1. Lubricate fifth wheel plate attach bolt. (WP 0038)
2. Remove wheel chocks (refer to TM 9-2320-279-10).

### END OF WORK PACKAGE



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## FIELD MAINTENANCE FIFTH WHEEL ROCKER ARM REMOVAL/INSTALLATION

---

### INITIAL SETUP:

#### Tools and Special Tools

Lifting Device, Minimum Capacity 1,000 lbs (454 kg)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

#### References

Parts Manual (Fig. 15)

#### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).  
Fifth wheel removed. (WP 0052)  
Fifth wheel plate assembly removed. (WP 0058)

#### Materials/Parts

Grease, Automotive and Artillery (GAA) (WP 0083, Table 1, Item 17, 18, 19, 20, 21, 22)  
Pin, Cotter (WP 0084, Table 1, Item 35) Qty: 4  
Pin, Spring (WP 0084, Table 1, Item 36) Qty: 2

#### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

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### DISASSEMBLY

1. Remove rubber bumpers (1) from rocker arm pins (2).

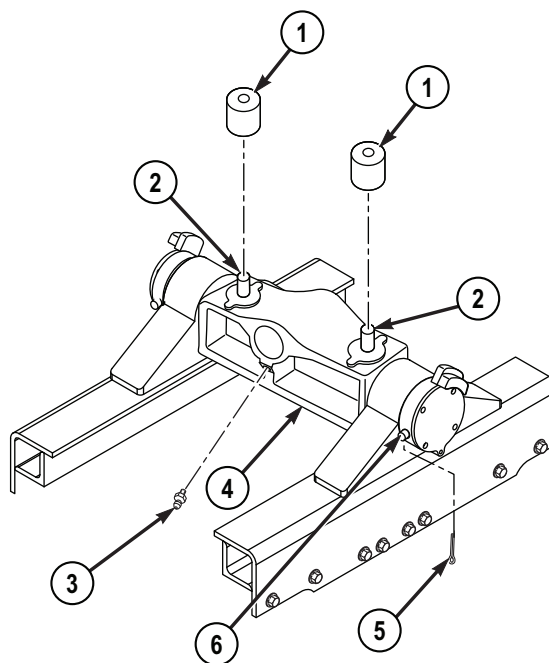


Figure 1.

2. Remove grease fitting (3) from rocker arm (4).

### NOTE

Driver side and passenger side hubs and bushings are removed the same way. Passenger side shown.

3. Remove two cotter pins (5) from pin (6). Discard cotter pins.

### NOTE

Note position of hub prior to removal to ensure proper installation.

4. Remove pin (6) from hub (7).

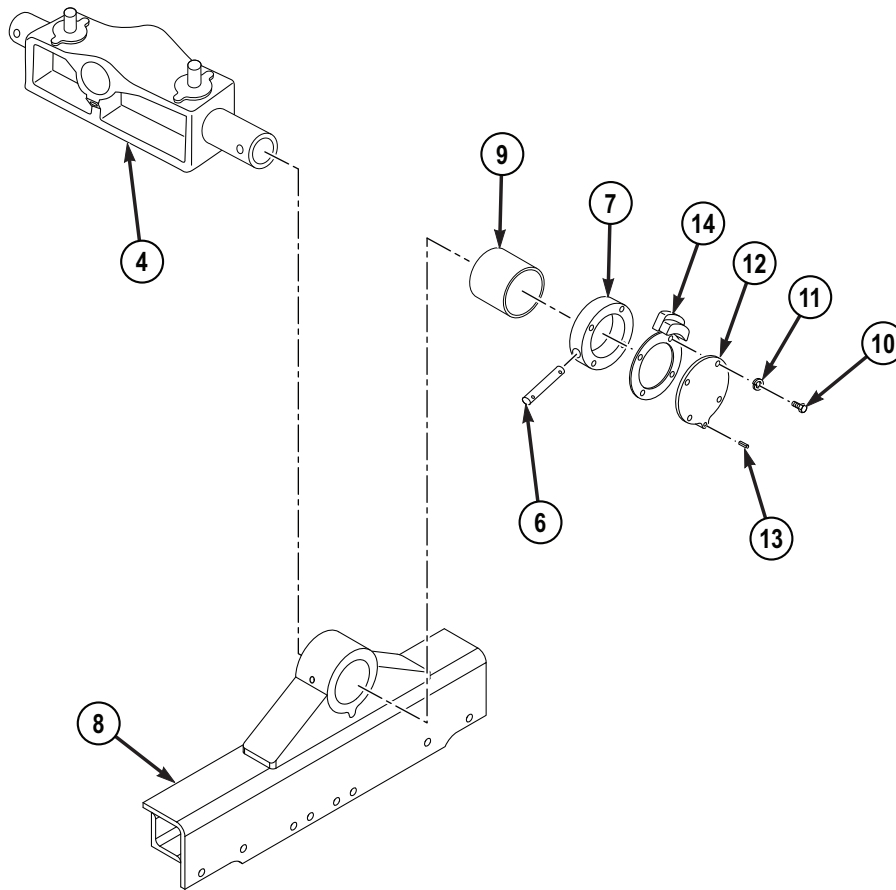


Figure 2.

5. Remove hub (7) from rocker arm (4).
6. With the aid of an assistant, remove side mount (8) from rocker arm (4).
7. Remove bushing (9) from side mount (8).

**NOTE**

Note position of lockout ring and cover prior to removal to ensure proper installation.

8. Remove four screws (10), washers (11), cover (12), spring pin (13), and lockout ring (14) from hub (7). Discard spring pin.

**END OF TASK****ASSEMBLY****NOTE**

Install lockout ring and cover as noted prior to removal.

1. Install cover (12) and lockout ring (14) on hub (7) with four washers (11), screws (10), and spring pin (13).

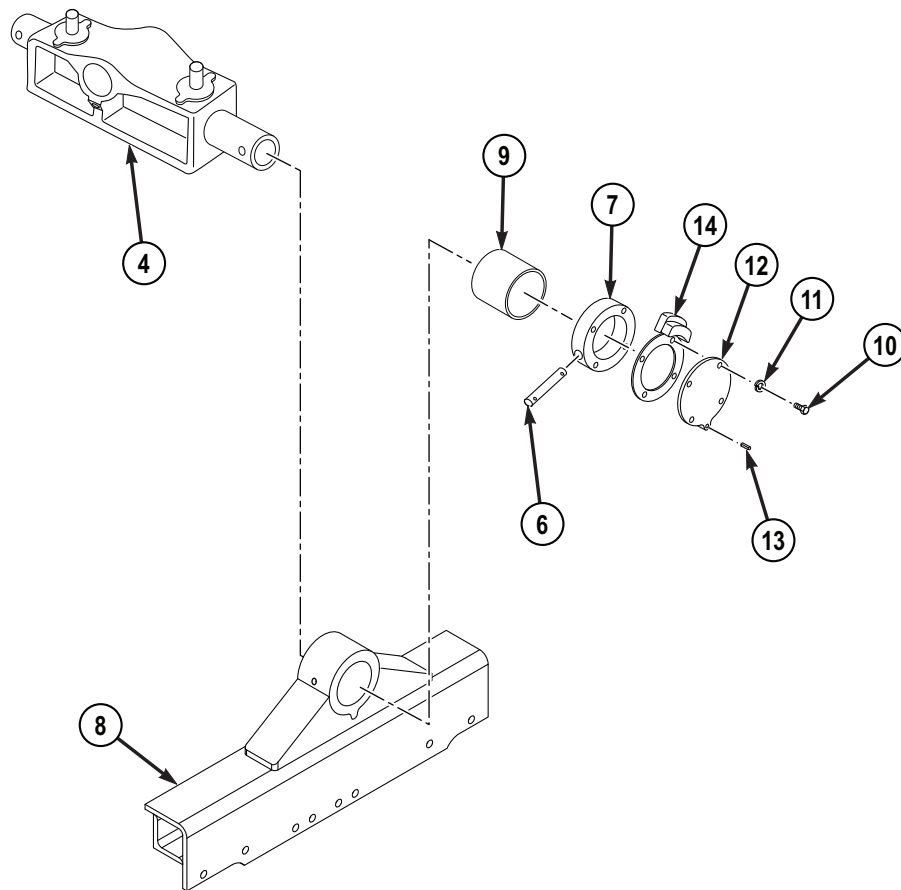


Figure 3.

2. Install bushing (9) on side mount (8). Apply grease to inside surface of bushing (9).
3. With the aid of an assistant, install side mount (8) on rocker arm (4).

**NOTE**

Install hub as noted prior to removal.

4. Install hub (7) on rocker arm (4) with pin (6).
5. Install two cotter pins (5) on pin (6).

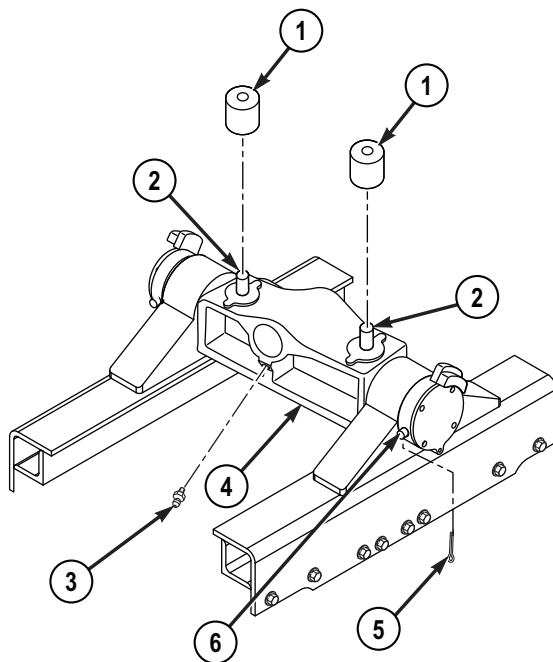


Figure 4.

6. Install grease fitting (3) on rocker arm (4).
7. Install rubber bumpers (1) on rocker arm pins (2).

**END OF TASK****FOLLOW-ON MAINTENANCE**

1. Install fifth wheel plate assembly. (WP 0058)
2. Install fifth wheel. (WP 0052)
3. Remove wheel chocks (refer to TM 9-2320-279-10).

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE  
COMPOSITE TAILLIGHT ASSEMBLY REMOVAL/INSTALLATION**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

Tags, Identification (WP 0083, Table 1, Item 30)  
Lockwasher (WP 0084, Table 1, Item 17) Qty: 2

**Materials/Parts**

Cable Ties, Plastic (WP 0083, Table 1, Item 1)  
Sealant, RTV200 Electrical (WP 0083, Table 1, Item 29)

**References**

Parts Manual (Fig. 1)

**Equipment Condition**

Batteries disconnected (refer to TM 9-2320-279-10).

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**REMOVAL****NOTE**

- Tag and mark wires and connectors prior to removal to ensure proper installation.
- Remove cable ties as required.
- Driver side and passenger side composite taillights are removed the same way. Passenger side shown.

1. Disconnect wire 1678 (1) from connector (2).

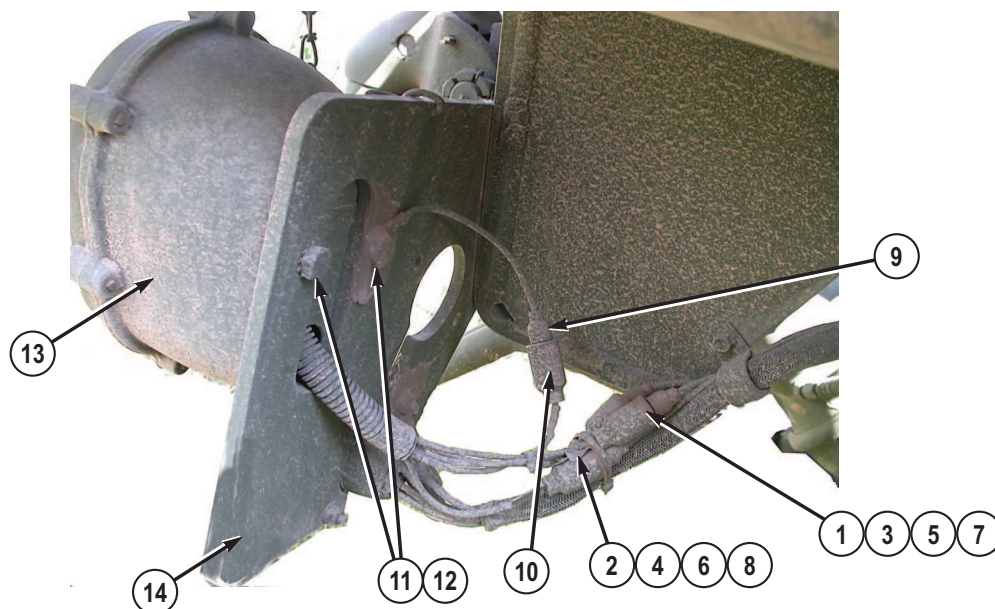


Figure 1.

2. Disconnect wire 1004 (3) from connector (4).
3. Disconnect wire 1008 (5) from connector (6).
4. Disconnect wire 1024 (7) from connector (8).
5. Disconnect wire 1435 (9) from connector (10).
6. Remove two screws (11), lockwashers (12), composite taillight (13), and wire 1435 (9) from bracket (14). Discard lockwashers.

## END OF TASK

## INSTALLATION

### NOTE

- Connect wires and connectors, as noted prior to removal.
- Driver side and passenger side composite taillights are installed the same way. Passenger side shown.
- Install cable ties as required.

1. Install composite taillight (13) and wire 1435 (9) on bracket (14) with two lockwashers (12) and screws (11).

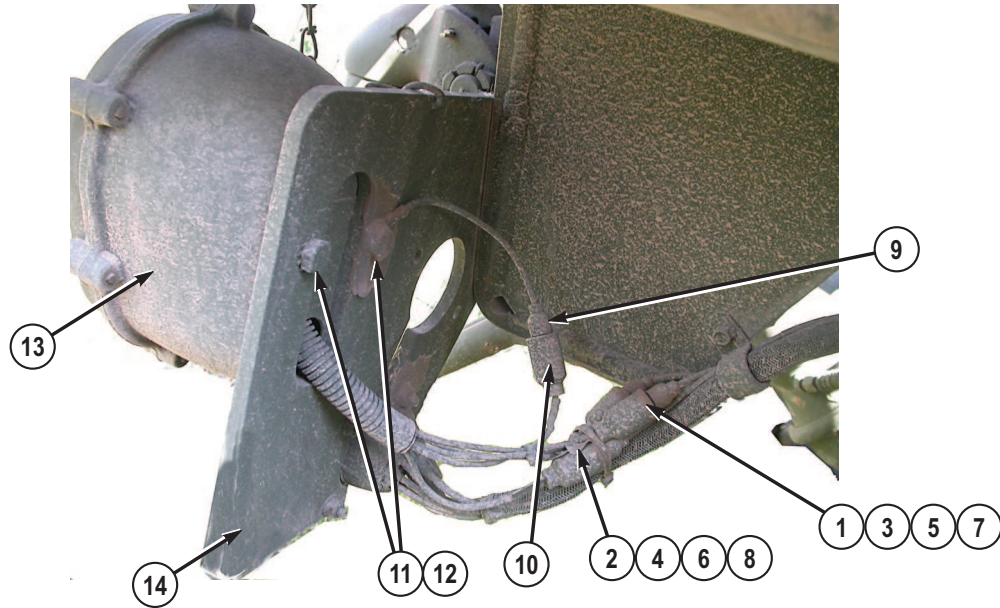


Figure 2.

### WARNING



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

2. Apply sealant on wire 1435 (9), screw (11), and lockwasher (12).
3. Connect wire 1435 (9) to connector (10).
4. Connect wire 1024 (7) to connector (8).
5. Connect wire 1008 (5) to connector (6).
6. Connect wire 1004 (3) to connector (4).
7. Connect wire 1678 (1) to connector (2).

### END OF TASK

### FOLLOW-ON MAINTENANCE

1. Connect batteries (refer to TM 9-2320-279-10).

2. Check operation of composite taillights (refer to TM 9-2320-279-10).
3. Remove wheel chocks (refer to TM 9-2320-279-10).

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE  
TAILLIGHT BRACKET REMOVAL/INSTALLATION**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

**References**

Parts Manual (Fig. 1)

**Materials/Parts**

Sealant, RTV200 Electrical (WP 0083, Table 1, Item 29)  
Locknut (WP 0084, Table 1, Item 7) Qty: 4

**Equipment Condition**

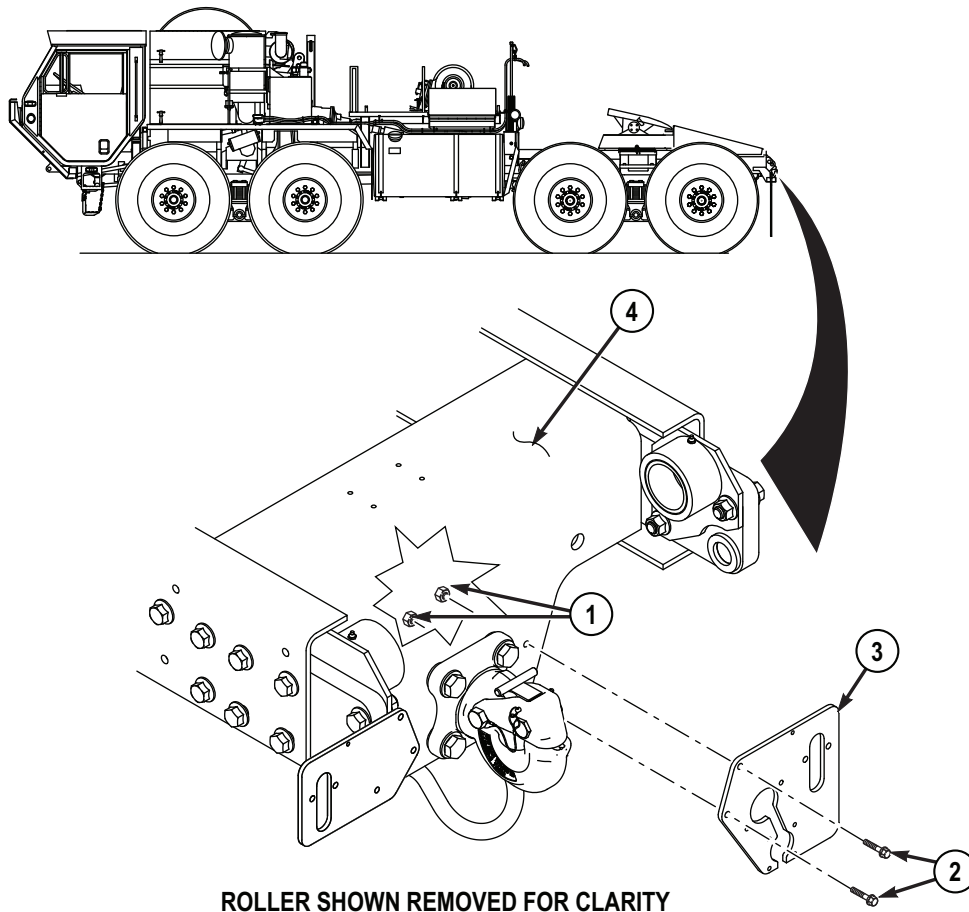
Trailer electrical connector removed (refer to TM 9-2320-315-14&P).  
Composite taillight removed. (WP 0060)

---

**REMOVAL****NOTE**

Driver side and passenger side taillight brackets are removed the same way. Passenger side shown.

1. Remove two locknuts (1), screws (2), and passenger side taillight bracket (3) from crossmember (4). Discard locknuts.

*Figure 1.***END OF TASK****INSTALLATION****NOTE**

- To ensure good electrical grounding, remove paint in a 1 in. (2.54 cm) diameter area around mounting holes on rear side of taillight bracket and front side of crossmember.
- Driver side and passenger side taillight brackets are installed the same way. Passenger side shown.

1. Install passenger side taillight bracket (3) on crossmember (4) with two screws (2) and locknuts (1).

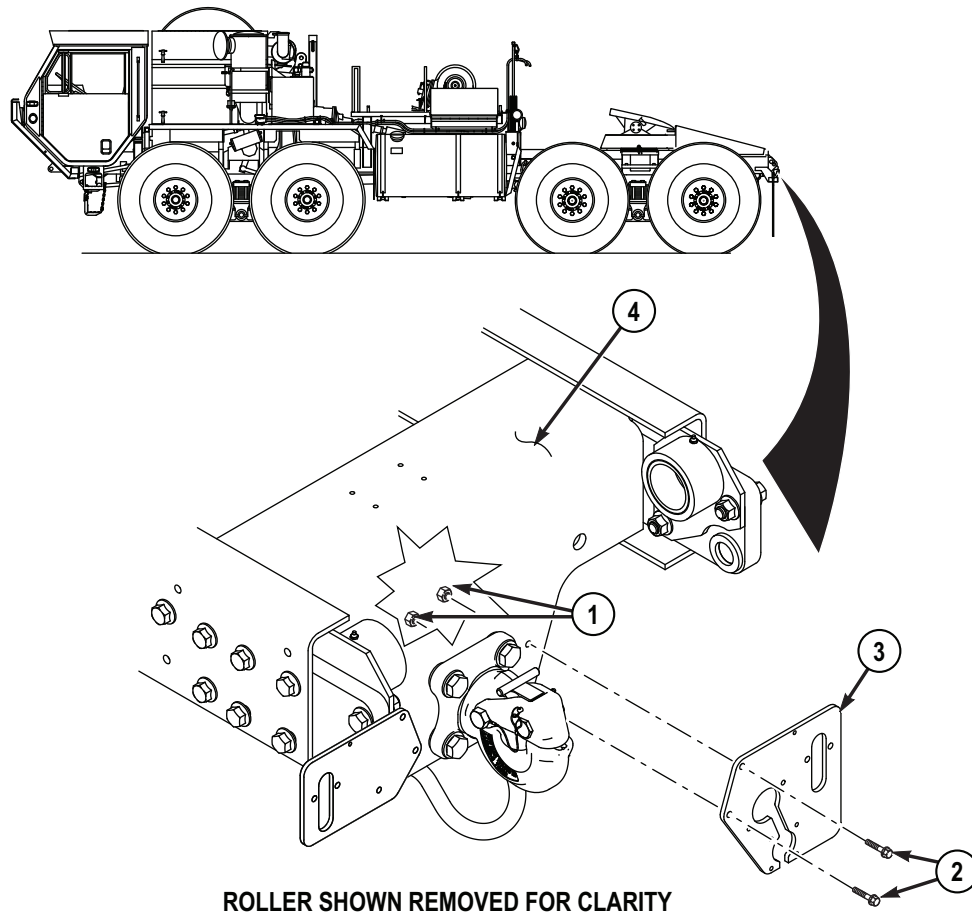


Figure 2.

**WARNING**

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

2. Apply sealant to heads of two screws (2) and locknuts (1).

**END OF TASK****FOLLOW-ON MAINTENANCE**

1. Install composite taillights. (WP 0060)

2. Install trailer electrical connector (refer to TM 9-2320-315-14&P).

**END OF WORK PACKAGE**

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## FIELD MAINTENANCE

### WINCH REMOTE CONTROL CONNECTOR REMOVAL/INSTALLATION

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#### INITIAL SETUP:

##### Tools and Special Tools

Tool Kit, Electrical (WP 0081, Table 2, Item 4)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

##### References

Parts Manual (Fig. 1)

##### Equipment Condition

Batteries disconnected (refer to TM 9-2320-315-14&P).

##### Materials/Parts

Cable Ties, Plastic (WP 0083, Table 1, Item 1)  
Locknut (WP 0084, Table 1, Item 10) Qty: 4

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#### REMOVAL

1. Remove cap and chain assembly (1) from connector MC54 (2).

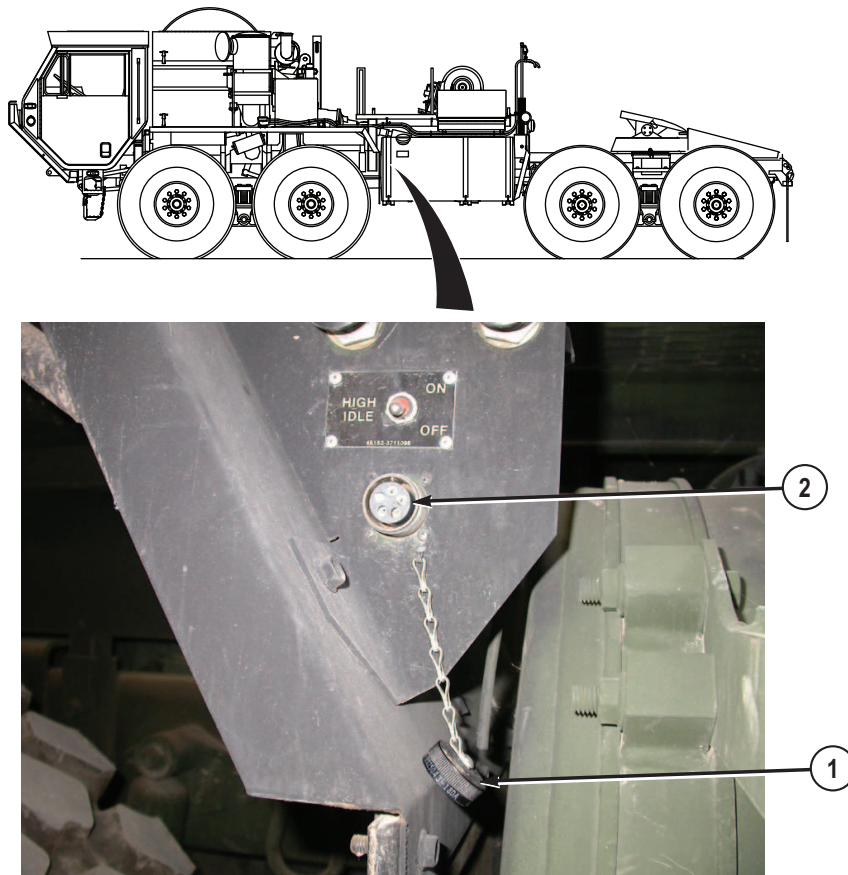


Figure 1.

**NOTE**

- Remove cable ties as required.
- Note position of polarizing key prior to removal to ensure proper installation.

2. Remove four locknuts (3), screws (4), cap and chain assembly (1) and connector MC54 (2) from mounting bracket (5). Discard locknuts.

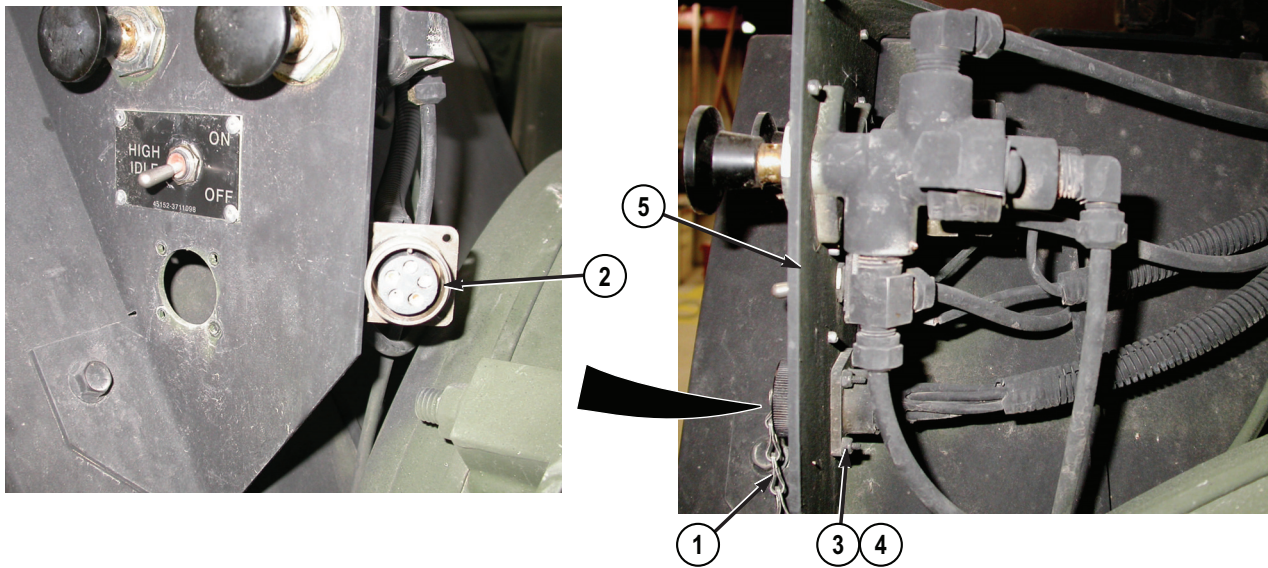


Figure 2.

**END OF TASK****INSTALLATION****NOTE**

Install connector as noted prior to removal.

1. Install connector MC54 (2) and cap and chain assembly (1) on mounting bracket (5) with four screws (4) and locknuts (3).

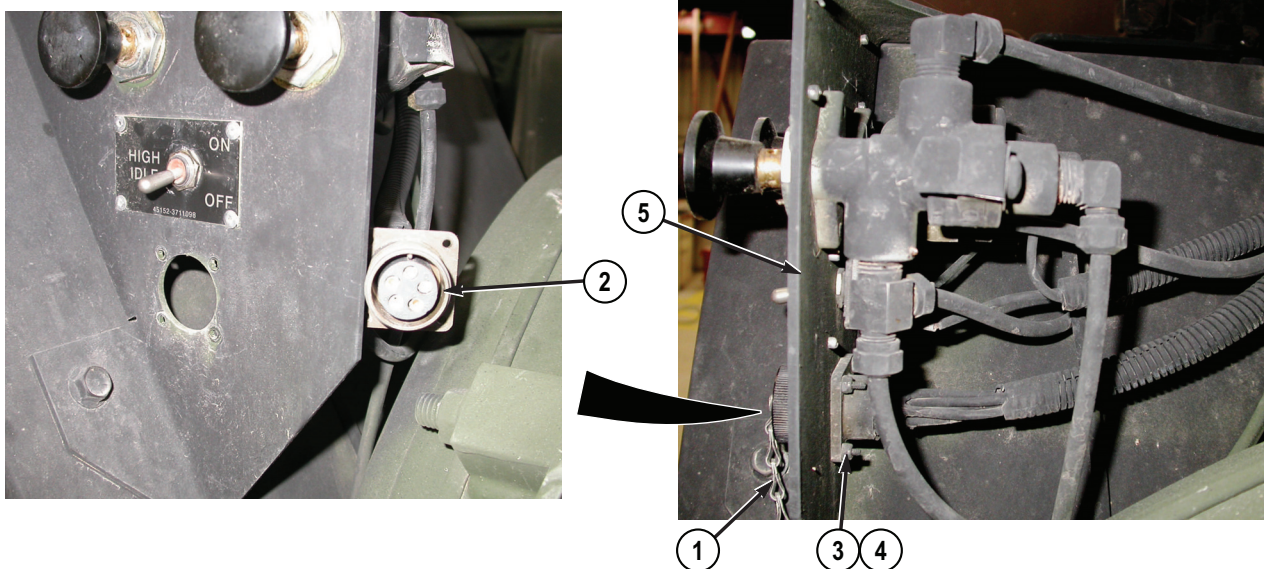


Figure 3.

### NOTE

Install cable ties as required.

2. Install cap and chain assembly (1) on connector MC54 (2).



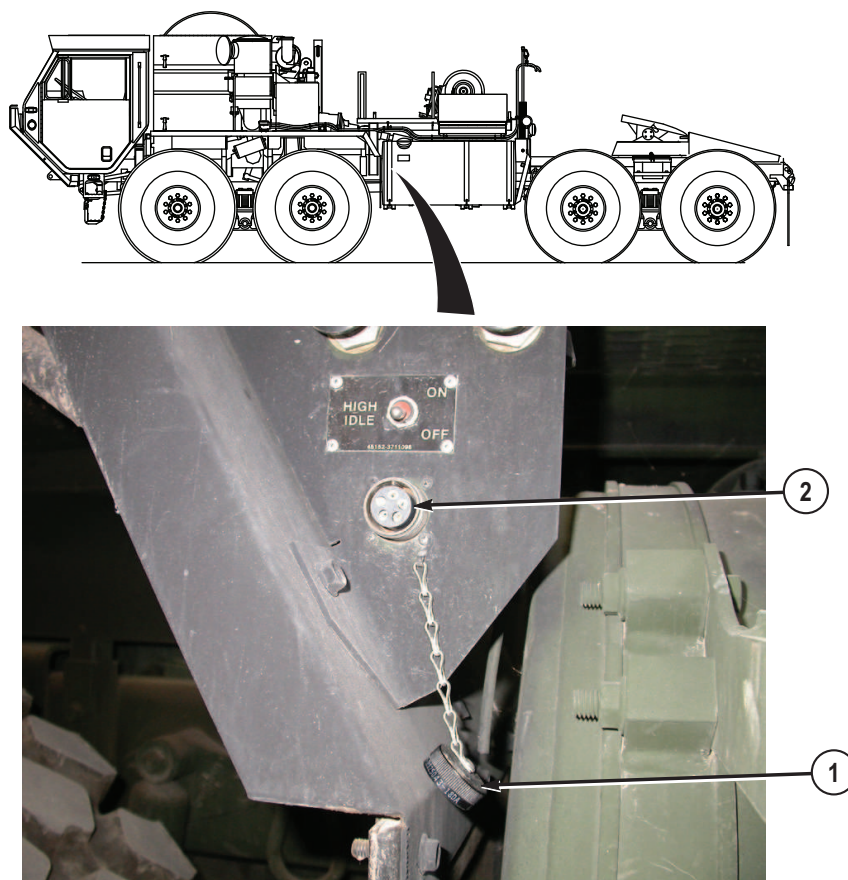


Figure 4.

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Connect batteries (refer to TM 9-2320-315-14&P).
2. Start engine (refer to TM 9-2320-279-10).
3. Check operation of heavy-duty winch. (WP 0015)
4. Shut OFF engine (refer to TM 9-2320-279-10).
5. Remove wheel chocks (refer to TM 9-2320-279-10).

#### END OF WORK PACKAGE



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## FIELD MAINTENANCE HIGH IDLE SWITCH REMOVAL/INSTALLATION

---

### INITIAL SETUP:

#### Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

Tags, Identification (WP 0083, Table 1, Item 30)  
Lockwasher Qty: 1

#### Materials/Parts

Cable Ties, Plastic (WP 0083, Table 1, Item 1)

#### References

Parts Manual (Fig. 1)

#### Equipment Condition

Batteries disconnected (refer to TM 9-2320-315-14&P).

---

### REMOVAL

#### NOTE

- Tag and mark wires prior to removal to ensure proper installation.
- Remove cable ties as required.

1. Remove screw (1) and wire 1843 (2) from high idle switch (3).

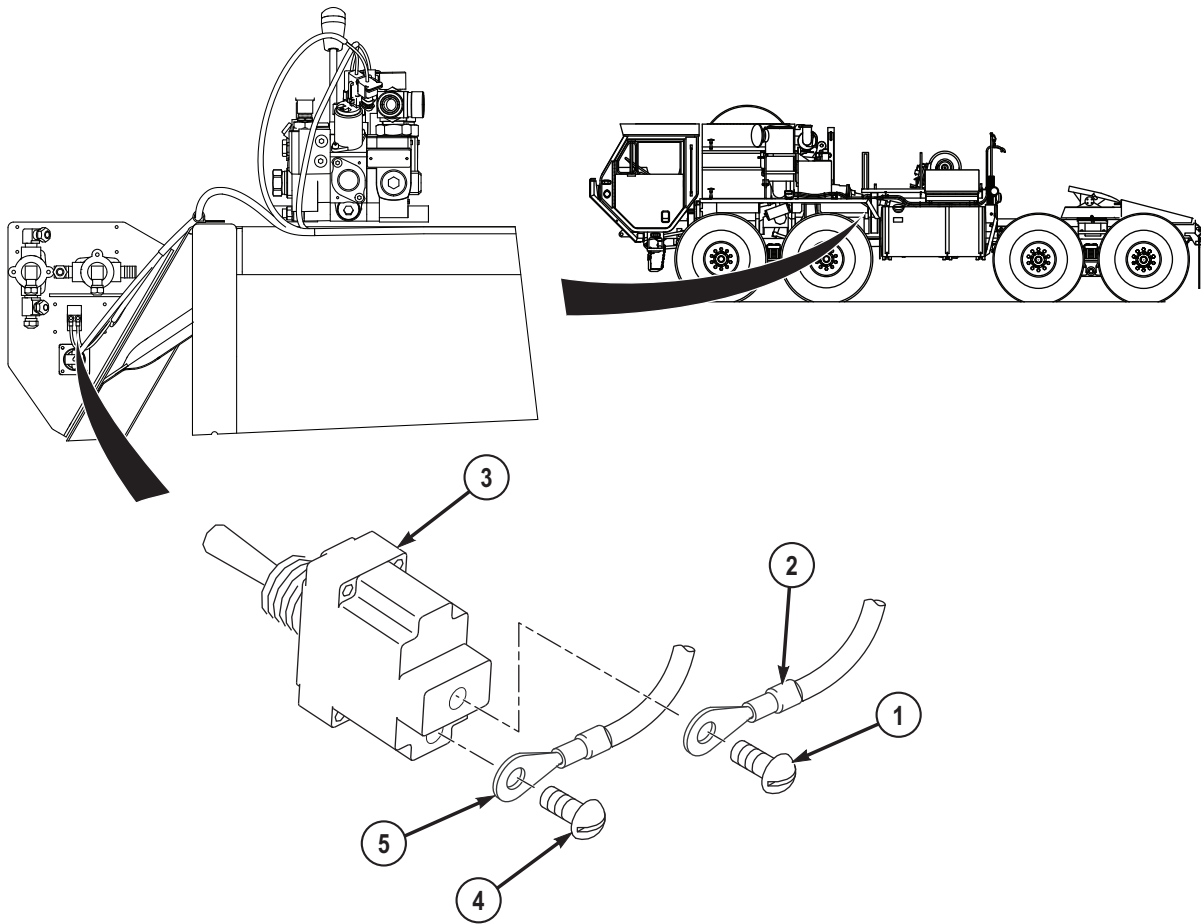


Figure 1.

2. Remove screw (4) and wire 1516 (5) from high idle switch (3).

### NOTE

Note switch position prior to removal to ensure proper installation.

3. Remove nut (6), lockwasher (7), and high idle switch (3) from mounting bracket (8). Discard lockwasher.

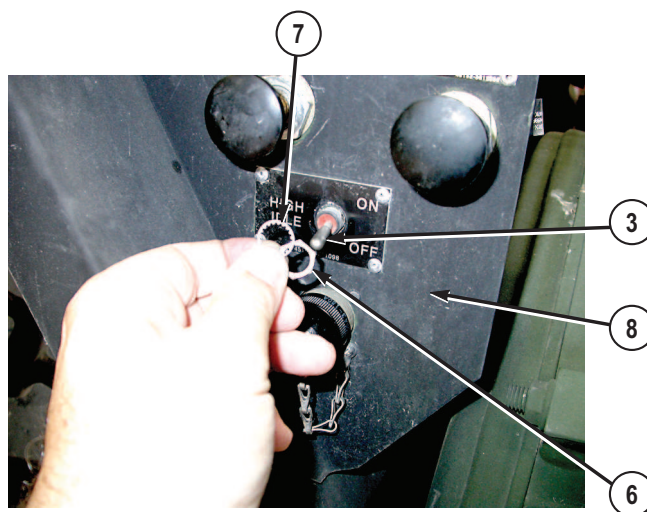
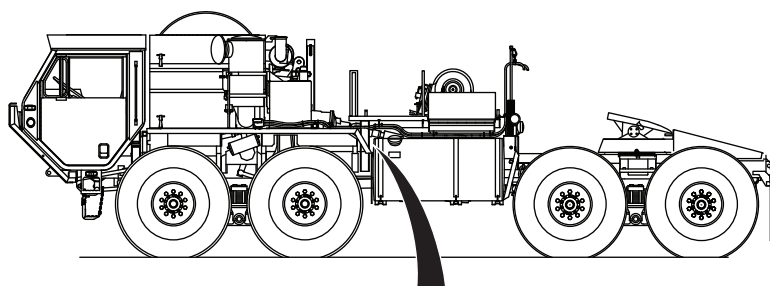


Figure 2.

## END OF TASK

## INSTALLATION

### NOTE

- Install switch as noted prior to removal.
- Install cable ties as required.

1. Install high idle switch (3) on mounting bracket (8) with lockwasher (7) and nut (6).

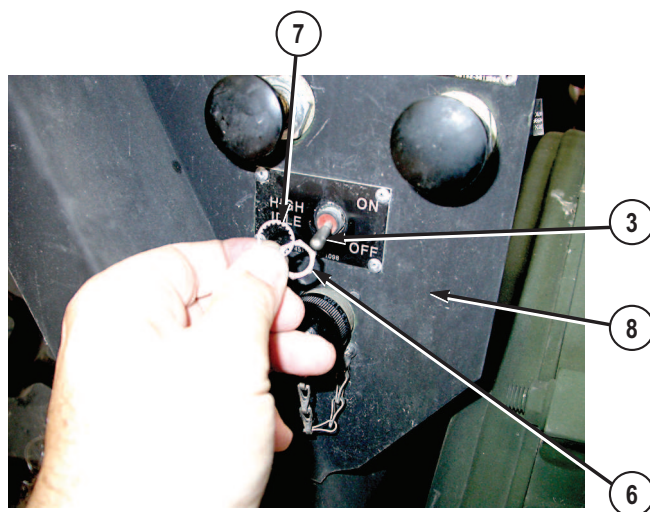
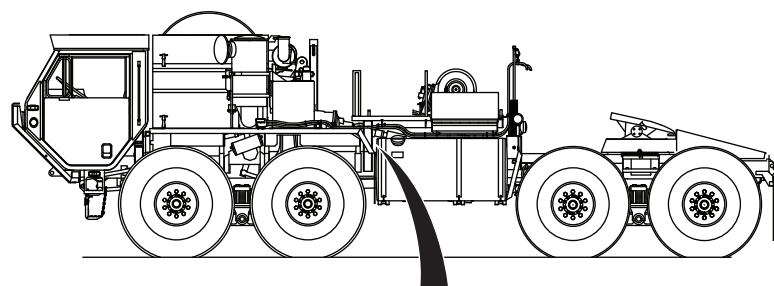


Figure 3.

2. Install wire 1516 (5) on high idle switch (3) with screw (4).

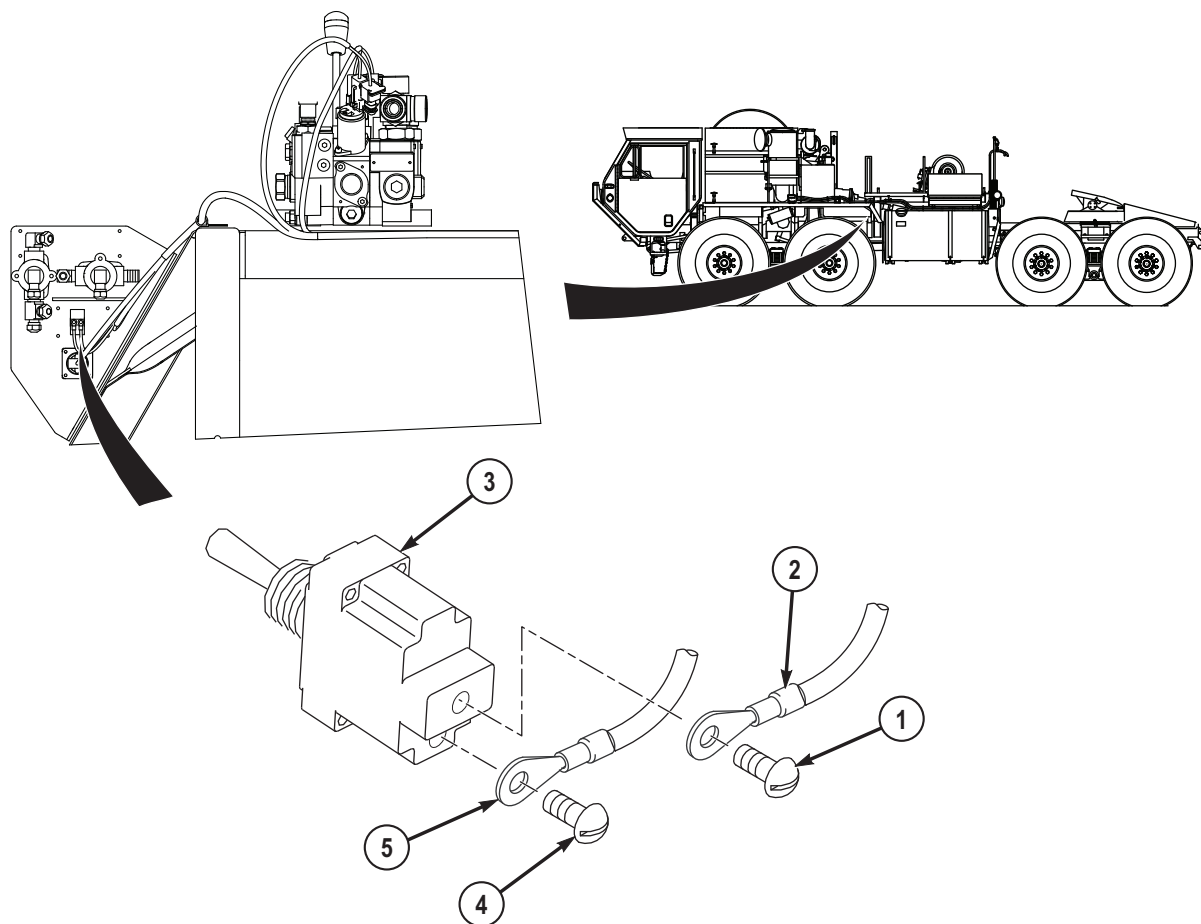


Figure 4.

3. Install wire 1843 (2) on high idle switch (3) with screw (1).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Connect batteries (TM 9-2320-315-14&P).
2. Start engine (refer to TM 9-2320-279-10).
3. Check operation of high idle switch. (WP 0010)
4. Shut OFF engine (refer to TM 9-2320-279-10).
5. Remove wheel chocks (refer to TM 9-2320-279-10).

#### END OF WORK PACKAGE



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## FIELD MAINTENANCE

### TRAILER ELECTRICAL CONNECTOR PLATE REMOVAL/INSTALLATION

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#### INITIAL SETUP:

##### Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

Locknut (WP 0084, Table 1, Item 11) Qty: 4

Lockwasher (WP 0084, Table 1, Item 12) Qty: 4

##### Materials/Parts

Cable Ties, Plastic (WP 0083, Table 1, Item 1)

Sealant, RTV200 Electrical (WP 0083, Table 1, Item 29)

Tags, Identification (WP 0083, Table 1, Item 30)

##### References

Parts Manual (Fig. 1)

##### Equipment Condition

Batteries disconnected (refer to TM 9-2320-315-14&P).

#### REMOVAL

1. Remove four locknuts (1), screws (2), and trailer connector plate (3) from center light mounting bracket (4). Discard locknuts.

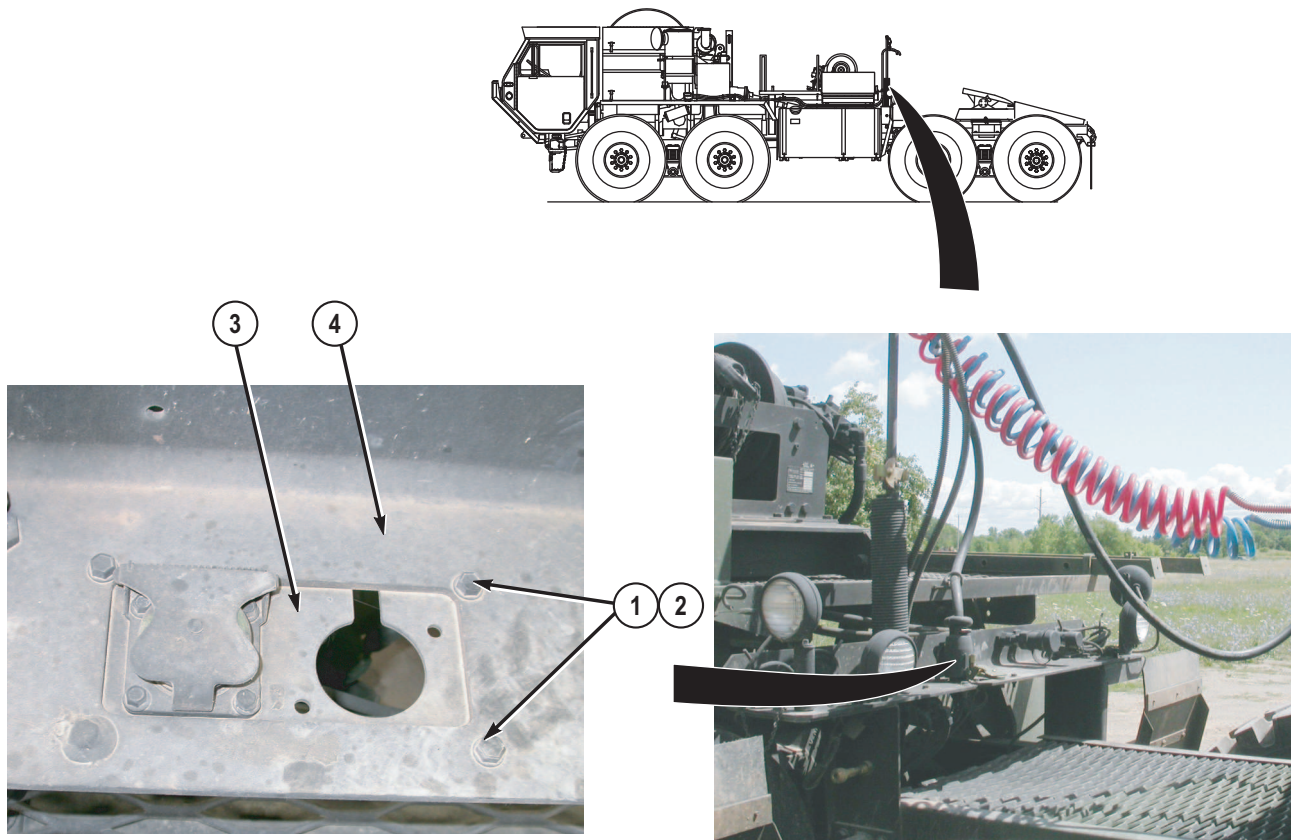
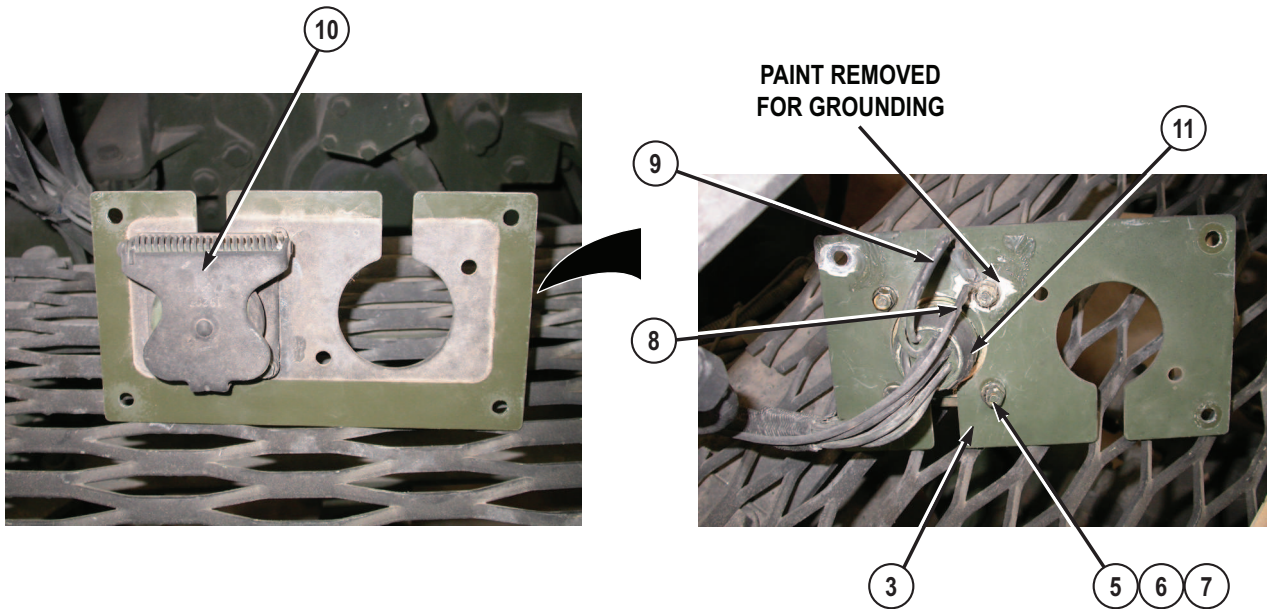


Figure 1.

**NOTE**

- Tag and mark wires prior to removal to ensure proper installation.
- Remove cable ties as required.

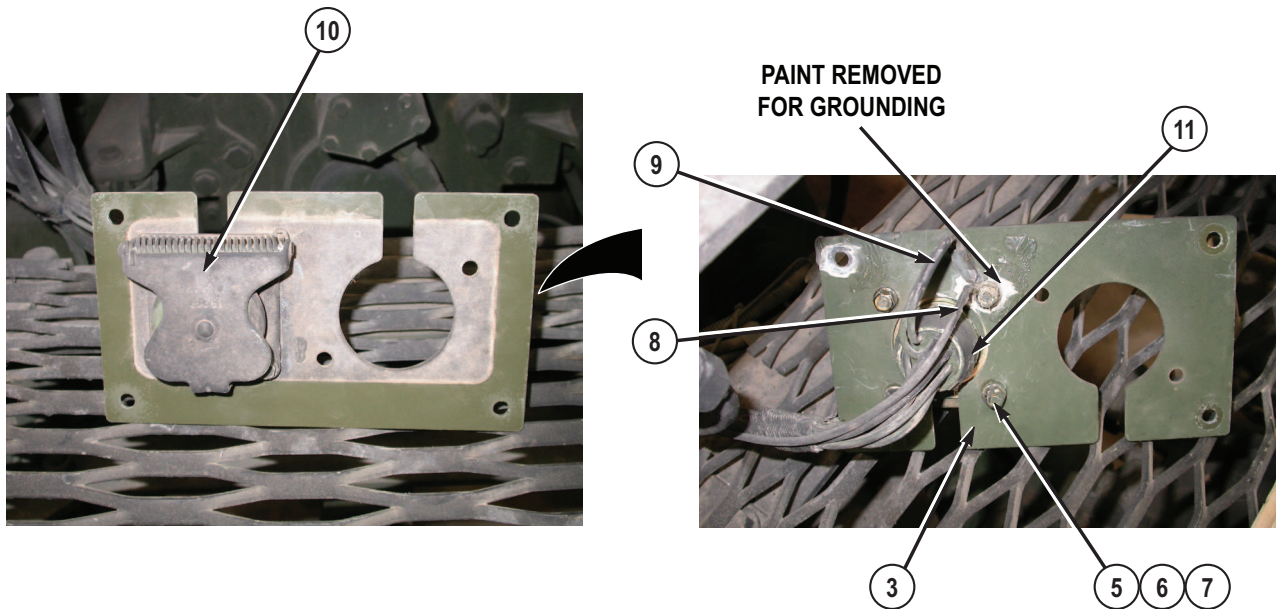
2. Remove four nuts (5), lockwashers (6), screws (7), wire 1435 (8), two wires 1435 (9), receptacle cover (10), and connector MC43 (11) from trailer connector plate (3). Discard lockwashers.

*Figure 2.***END OF TASK****INSTALLATION****NOTE**

- To ensure good electrical grounding, remove paint in a 1 in. (2.5 cm) diameter area around one connector mounting hole.
- Install cable ties as required.

1. Install connector MC43 (11), receptacle cover (10), two wires 1435 (9), wire 1435 (8) on trailer connector plate (3) with four lockwashers (6), screws (7), and nuts (5).



*Figure 3.***WARNING**

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

2. Apply sealant on two wires 1435 (9), wire 1435 (8), lockwasher (6), screw (7), and nut (5).
3. Install trailer connector plate (3) on center light mounting bracket (4) with four screws (2) and locknuts (1).

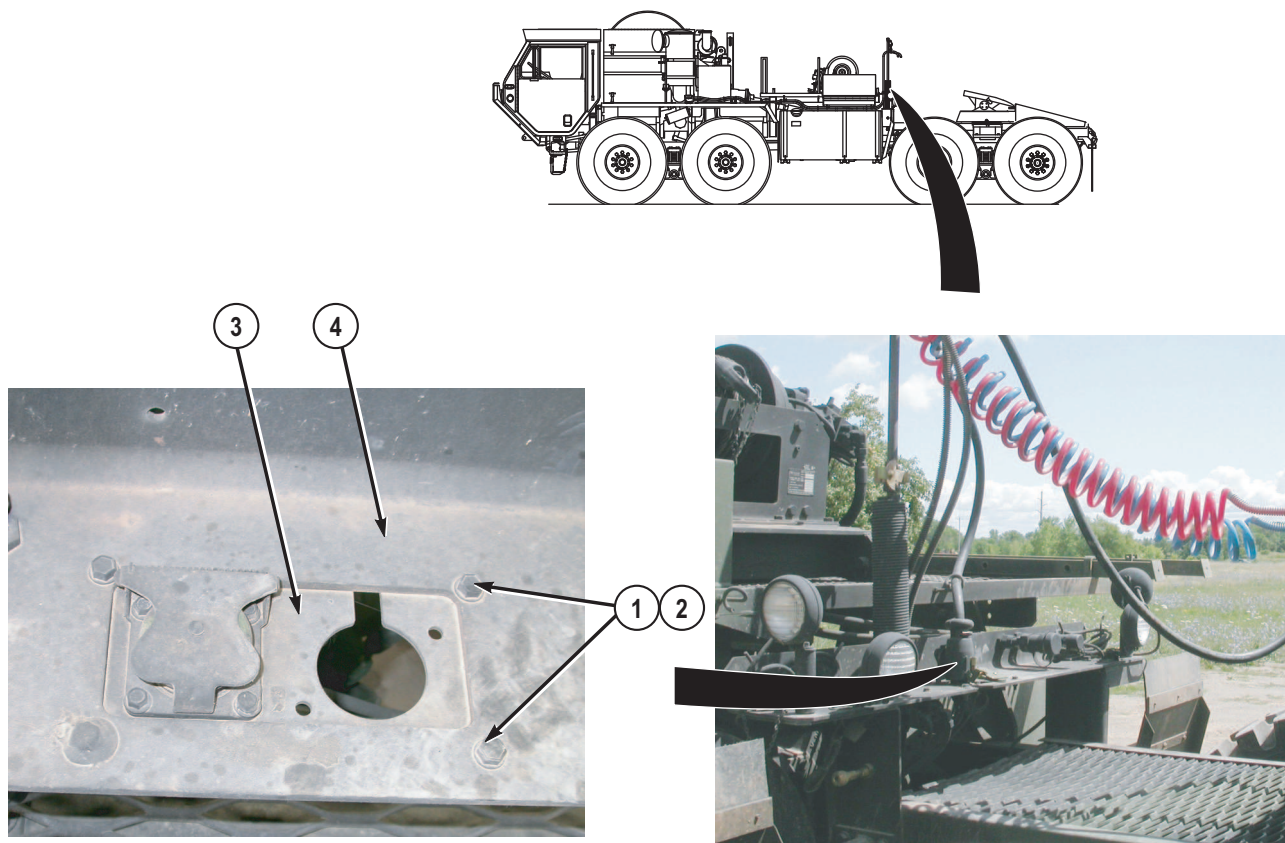


Figure 4.

**END OF TASK**

**FOLLOW-ON MAINTENANCE**

1. Connect batteries (refer to TM 9-2320-315-14&P).

**END OF WORK PACKAGE**

---

**FIELD MAINTENANCE  
FUEL TANK AND BRACKETS REMOVAL/INSTALLATION**

---

**INITIAL SETUP:**

**Equipment Condition**

Fuel tank steps removed. (WP 0066)

---

1. M983A2 LET Fuel Tank and Brackets Removal and Installation is performed as indicated in TM 9-2320-315-14&P, with the addition of this Equipment Condition and Follow-On Maintenance.

**END OF TASK**

**FOLLOW-ON MAINTENANCE**

1. Install fuel tank steps. (WP 0066)

**END OF WORK PACKAGE**



---

## FIELD MAINTENANCE FUEL TANK STEPS REMOVAL/INSTALLATION

---

### INITIAL SETUP:

#### Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

Locknut (WP 0084, Table 1, Item 8) Qty: 12

Lockwasher (WP 0084, Table 1, Item 16) Qty: 2

#### Materials/Parts

Locknut (WP 0084, Table 1, Item 6) Qty: 4

#### References

Parts Manual (Fig. 19)

#### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).

Wheels chocked (refer to TM 9-2320-279-10).

---

### REMOVAL

1. Remove two locknuts (1), six washers (2), two screws (3), and grab handle (4) from stowage box (5) and winch deck (6). Discard locknuts.

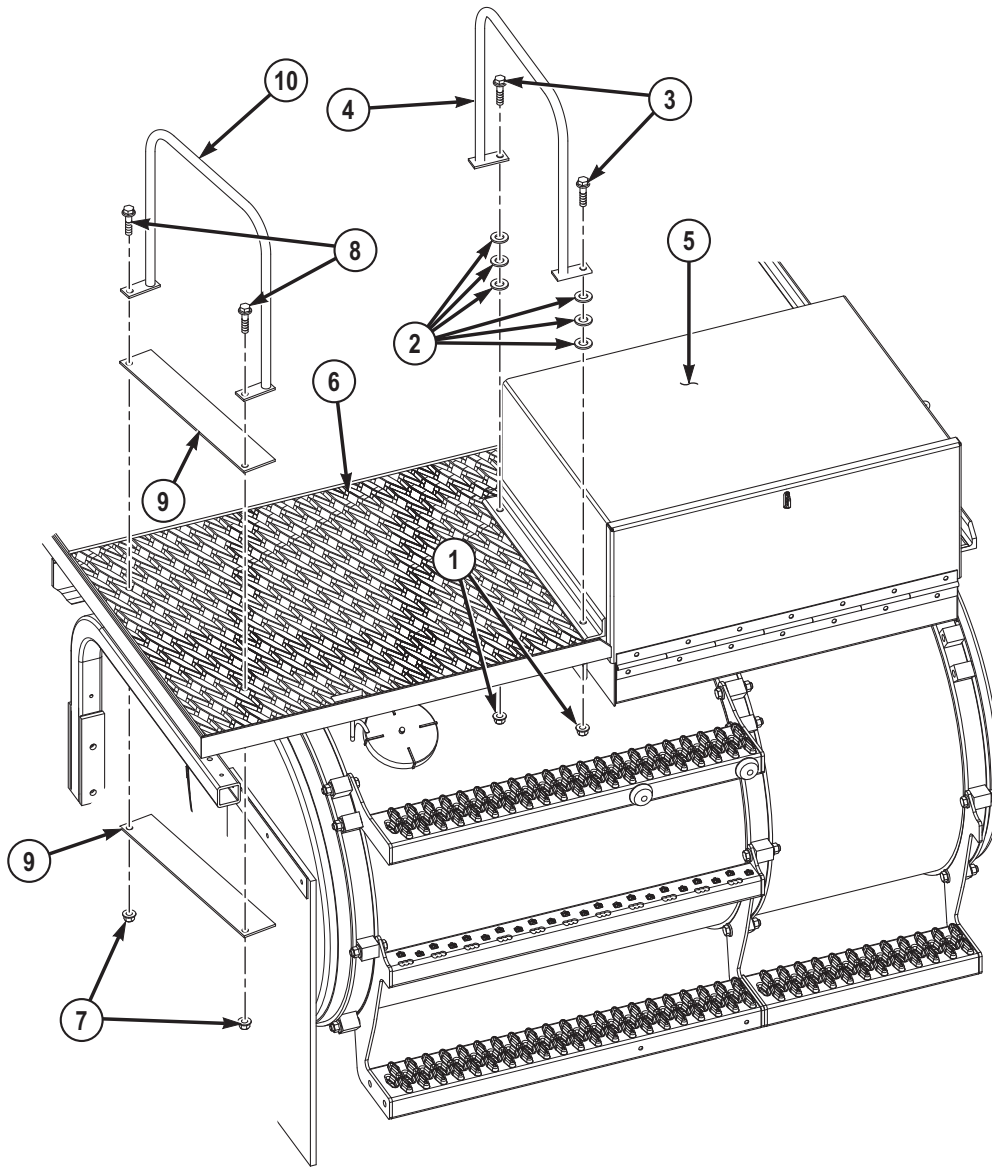


Figure 1.

2. Remove two locknuts (7), screws (8), plates (9), and grab handle (10) from winch deck (6). Discard locknuts.
3. Remove four locknuts (11), washers (12), screws (13), and top step (14) from forward fuel tank mounting strap (15) and middle fuel tank mounting strap (16). Discard locknuts.

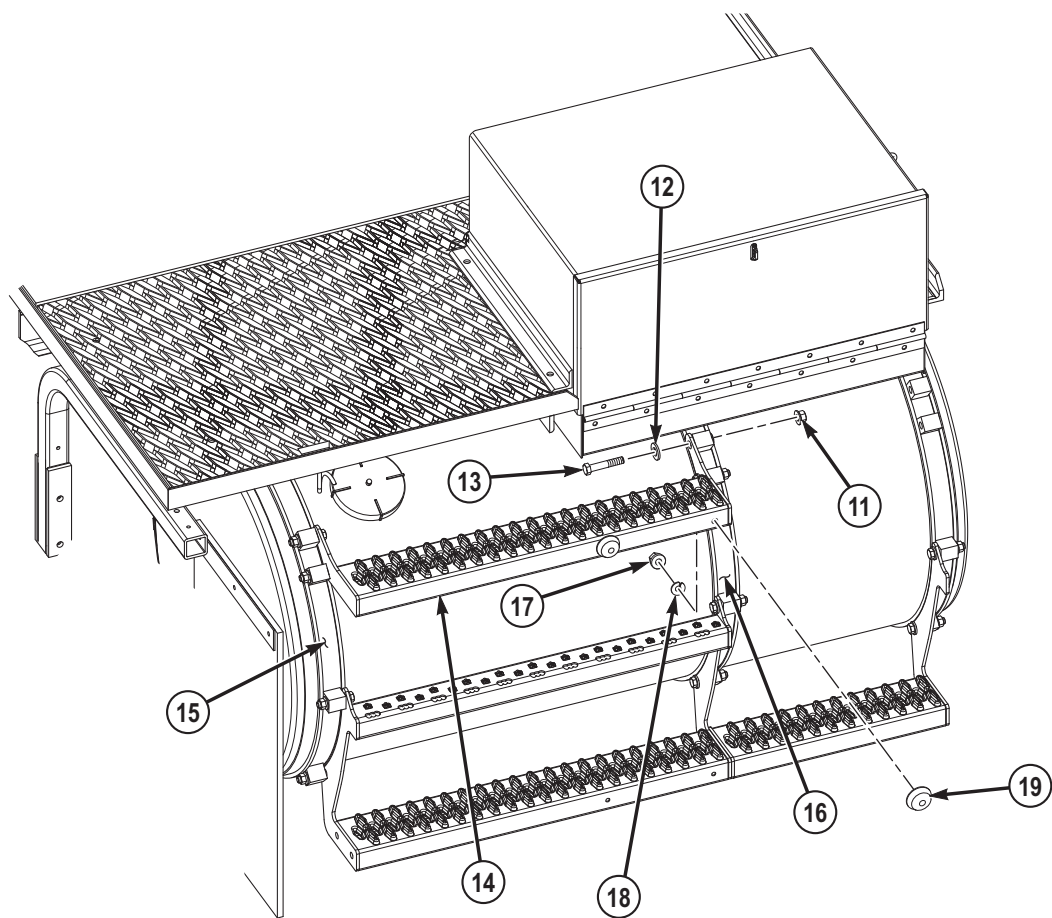


Figure 2.

4. Remove two nuts (17), lockwashers (18), and bumpers (19) from top step (14). Discard lockwashers.
5. Remove two locknuts (20), washers (21), and screws (22) from lower step (23) and rear step (24). Discard locknuts.

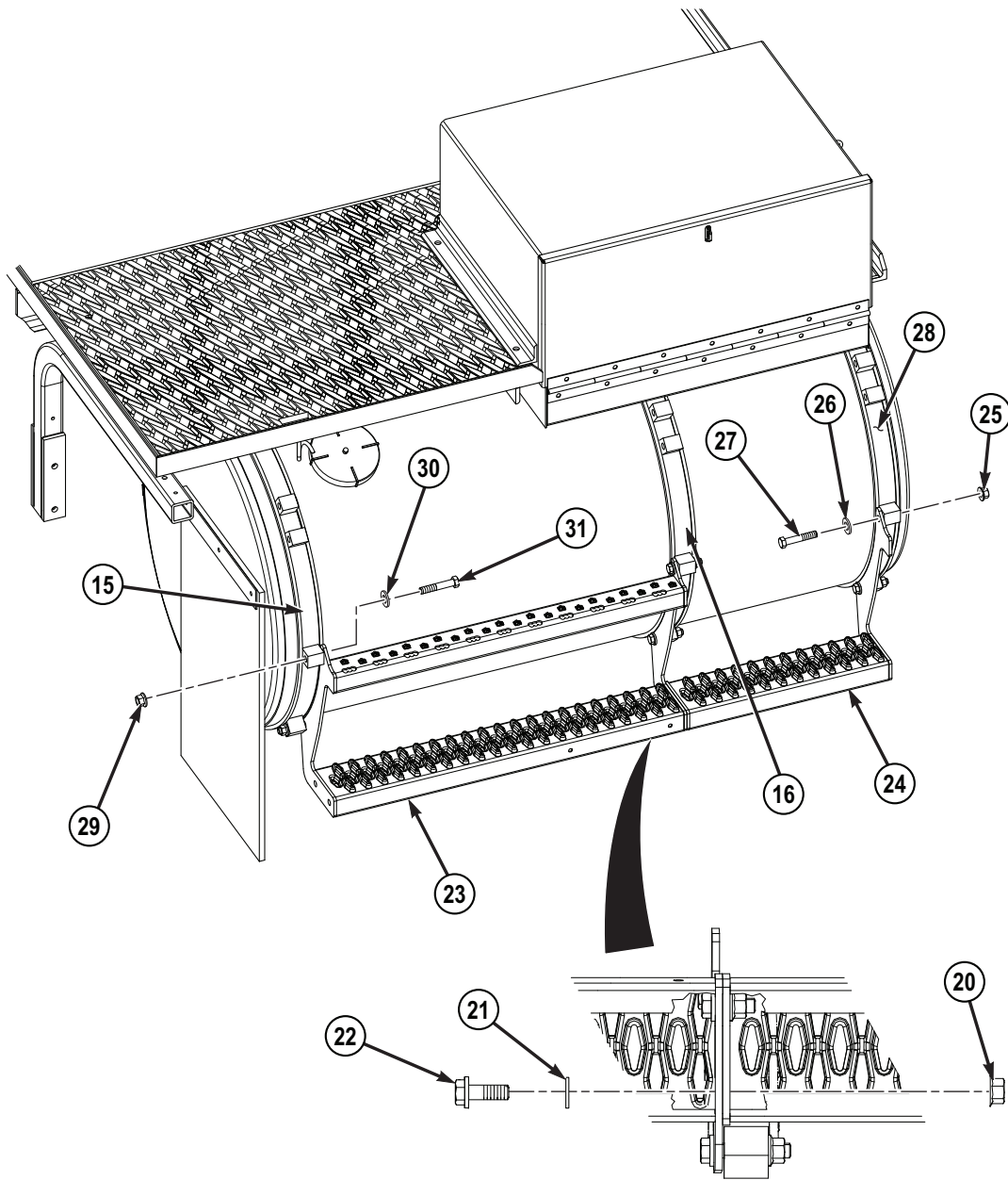


Figure 3.

6. Remove two locknuts (25), washers (26), screws (27), and rear step (24) from rear fuel tank mounting strap (28). Discard locknuts.
7. Remove four locknuts (29), washers (30), screws (31), and lower step (23) from forward fuel tank mounting strap (15) and middle fuel tank mounting strap (16). Discard locknuts.

**END OF TASK**



**INSTALLATION**

1. Install lower step (23) on forward fuel tank mounting strap (15) and middle fuel tank mounting strap (16) with four washers (30), screws (31), and locknuts (29).

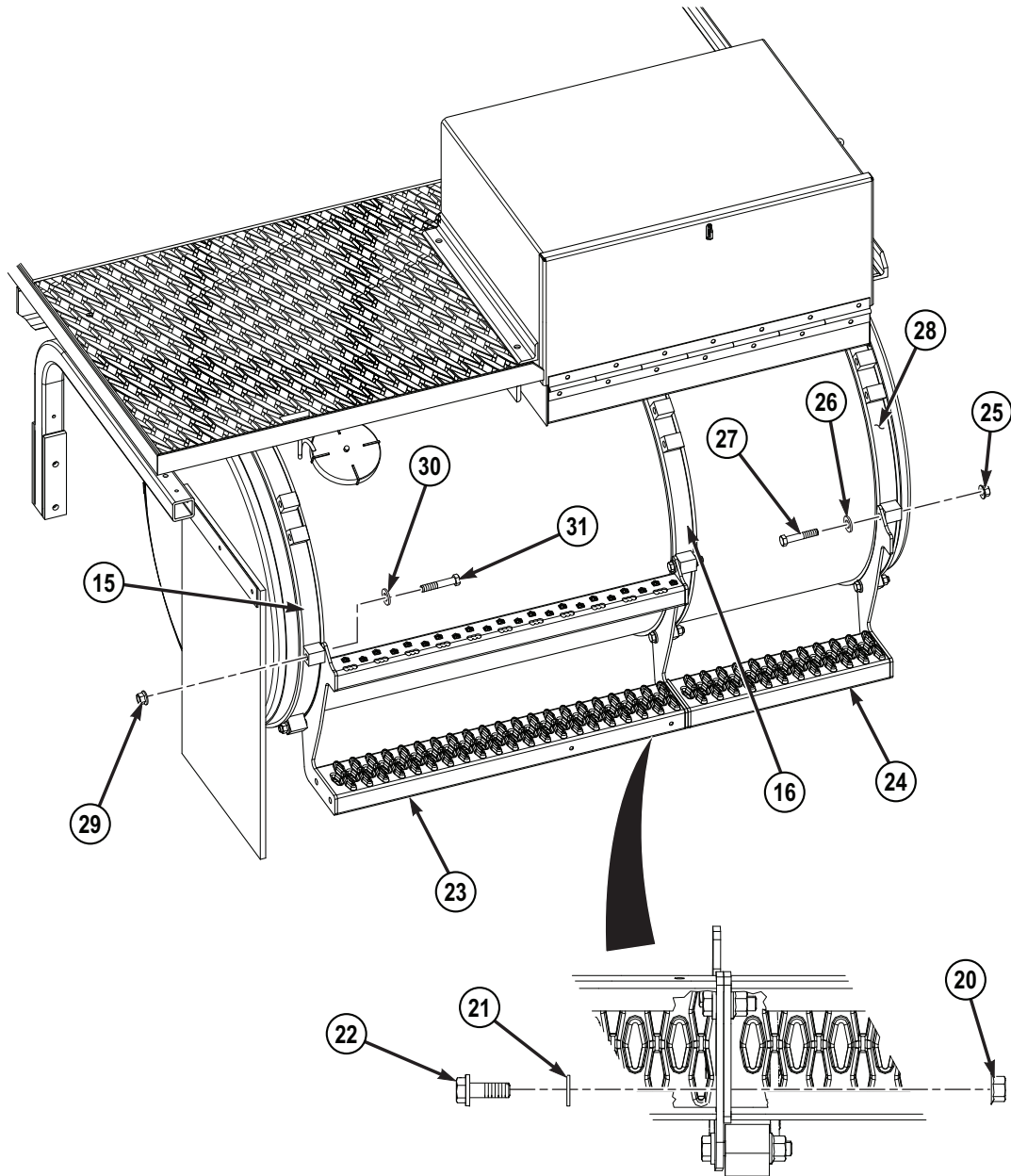


Figure 4.

2. Install rear step (24) on rear fuel tank mounting strap (28) with two washers (26), screws (27), and locknuts (25).
3. Secure rear step (24) to lower step (23) with two washers (21), screws (22), and locknuts (20).

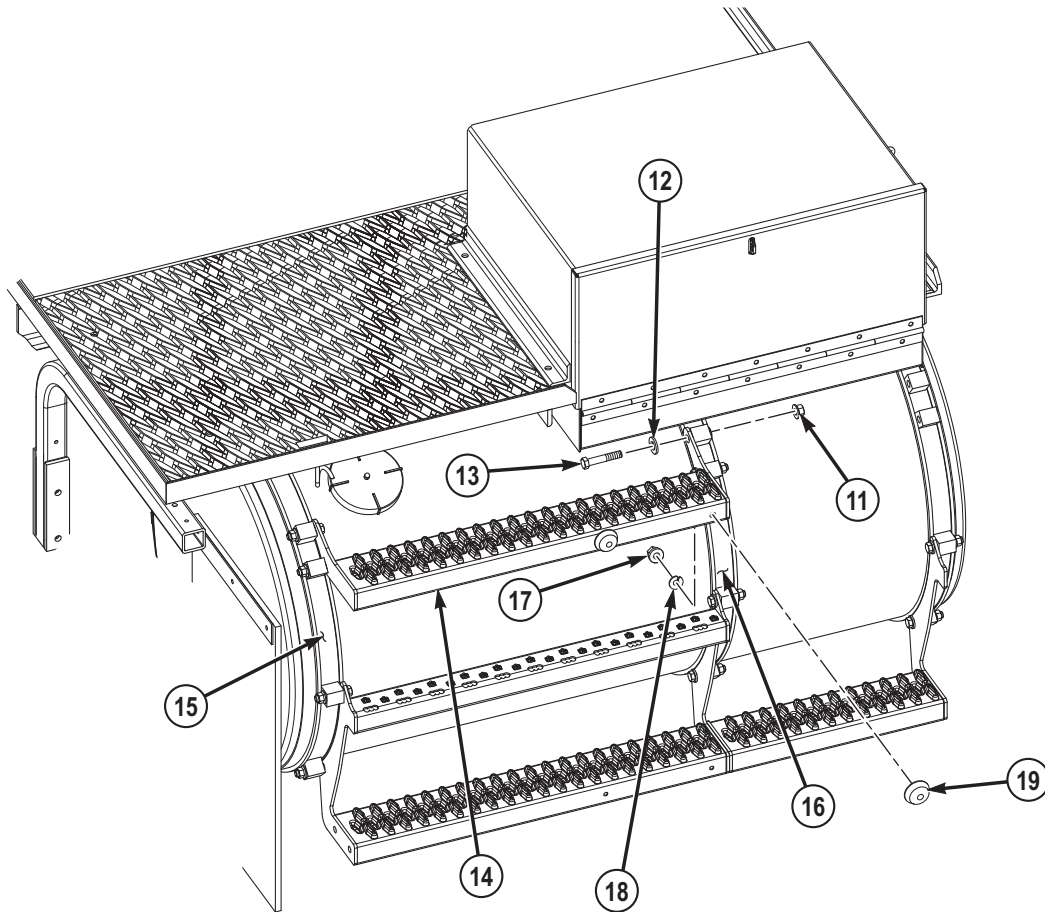


Figure 5.

4. Install two bumpers (19) on top step (14) with two lockwashers (18), and nuts (17).
5. Install top step (14) on forward fuel tank mounting strap (15) and middle fuel tank mounting strap (16) with four washers (12), screws (13), and locknuts (11).
6. Install grab handle (10) and two plates (9) on winch deck (6) with two screws (8), and locknuts (7).

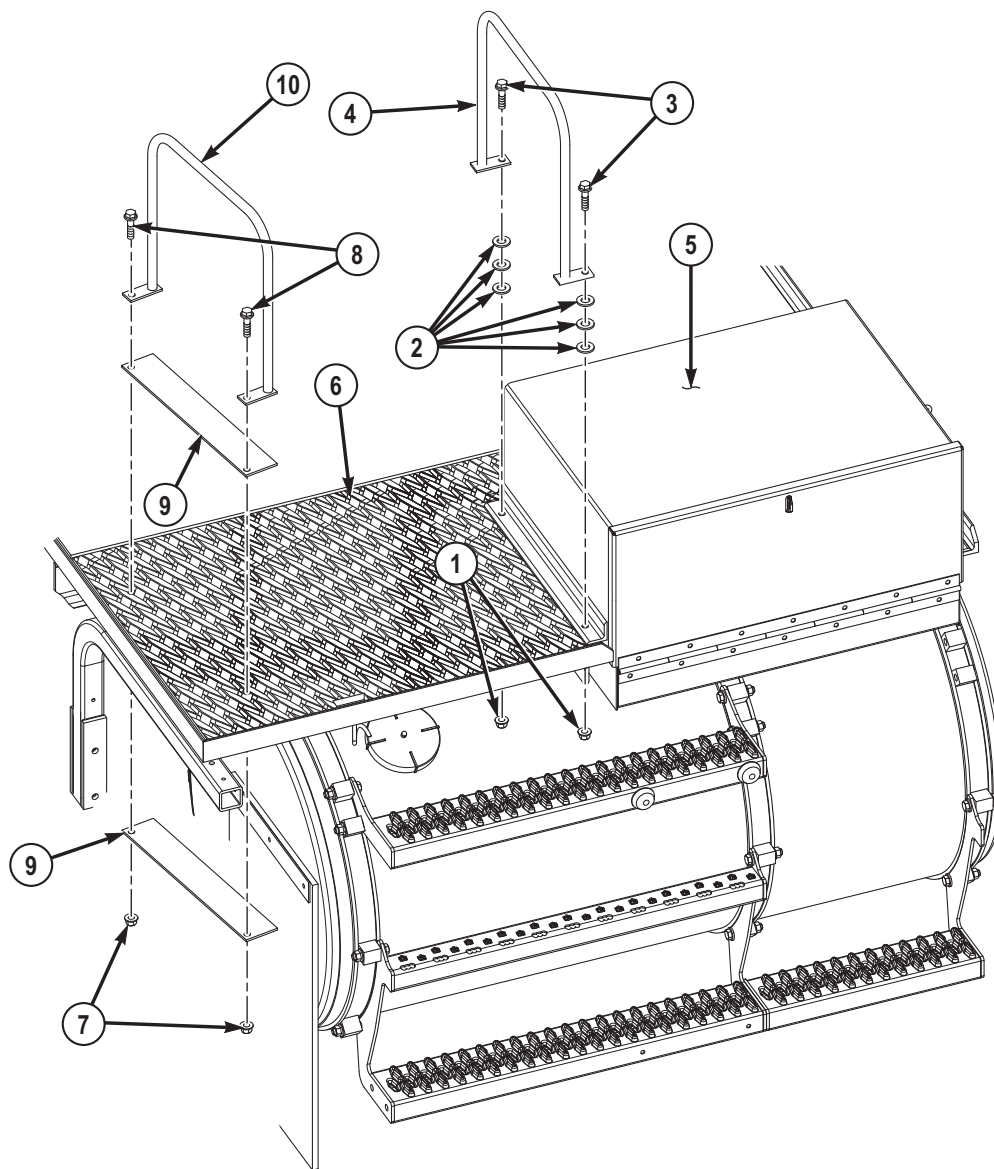


Figure 6.

7. Install grab handle (4) on stowage box (5) and winch deck (6) with six washers (2), two screws (3), and two locknuts (1).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Remove wheel chocks (TM 9-2320-279-10).

#### END OF WORK PACKAGE



---

**FIELD MAINTENANCE**  
**HEAVY-DUTY WINCH CABLE HOLD DOWN REMOVAL/INSTALLATION**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

Lockwasher (WP 0084, Table 1, Item 18) Qty: 3  
Compound, Sealing (WP 0083, Table 1, Item 11)

**Materials/Parts**

Cable Ties, Plastic (WP 0083, Table 1, Item 1)  
Tags, Identification (WP 0083, Table 1, Item 30)  
Pin, Cotter (WP 0084, Table 1, Item 33) Qty: 2  
Lockwasher (WP 0084, Table 1, Item 13) Qty: 2

**References**

Parts Manual (Fig. 22)

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).  
Air system drained (refer to TM 9-2320-315-14&P).

---

**REMOVAL****NOTE**

- Tag and mark air lines and fittings prior to removal to ensure proper installation.
- Remove cable ties as required.

1. Remove two sections of air line 2231 (1) from two fittings (2) and (3).

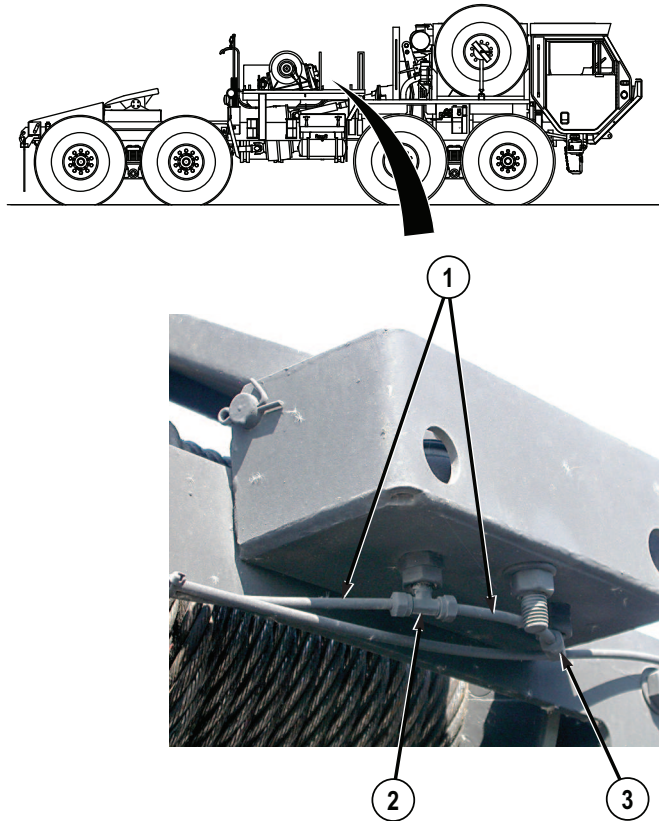


Figure 1.

2. Remove two cotter pins (4), pivot pin (5), two washers (6), bushing (7), and pivot arm (8) from mounting bracket (9). Discard cotter pins.

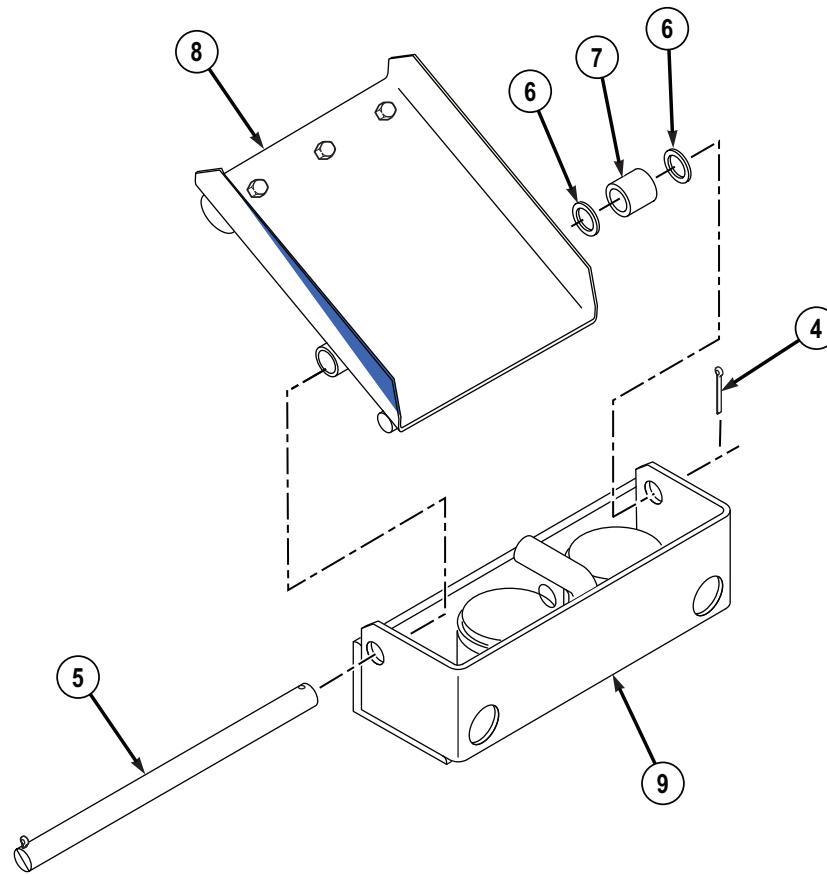


Figure 2.

3. Remove two screws (10), lockwashers (11), and mounting bracket (9) from winch (12). Discard lockwashers.

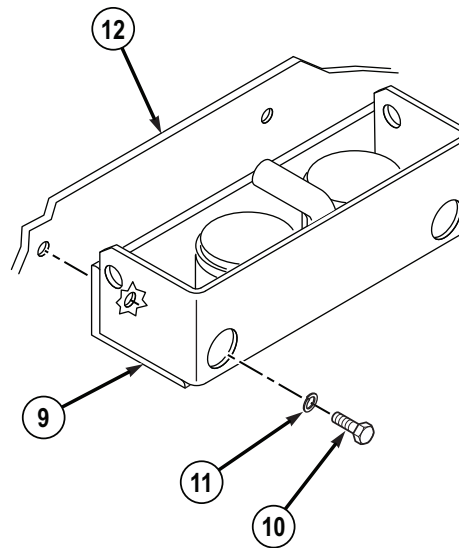


Figure 3.

## END OF TASK

## DISASSEMBLY

1. Remove nut (1), two washers (2), and anchor bolt (3) from mounting bracket (4).



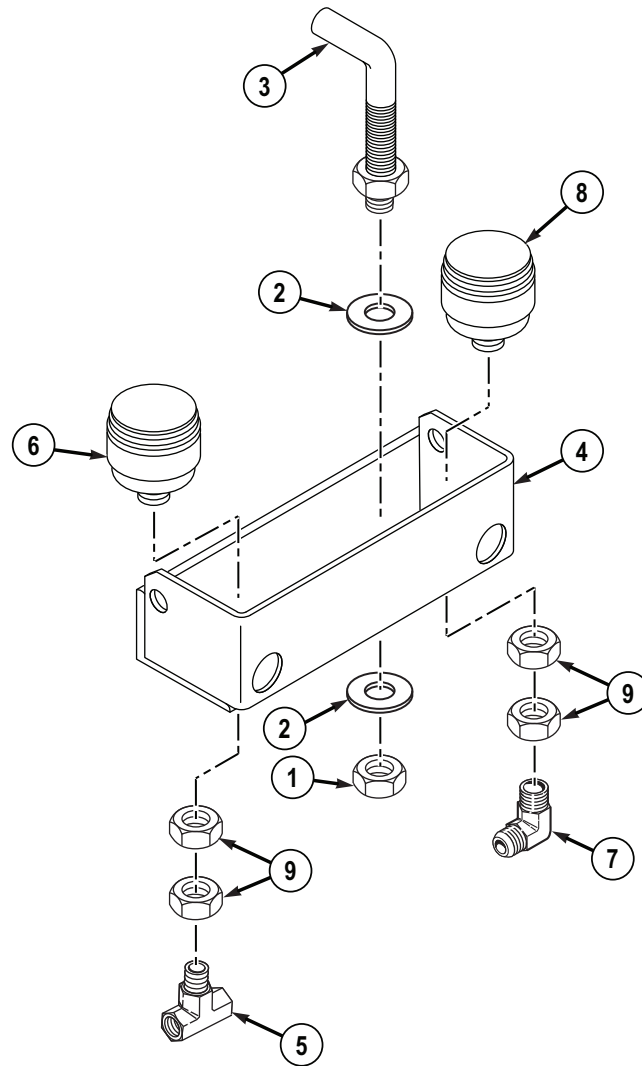
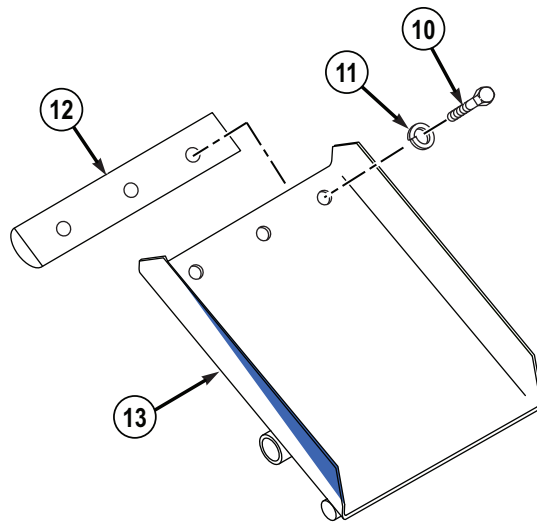


Figure 4.

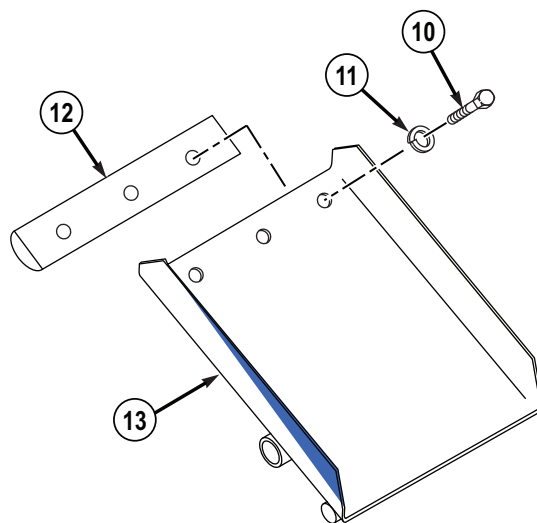
### NOTE

Note location and position of fittings prior to removal to ensure proper installation.

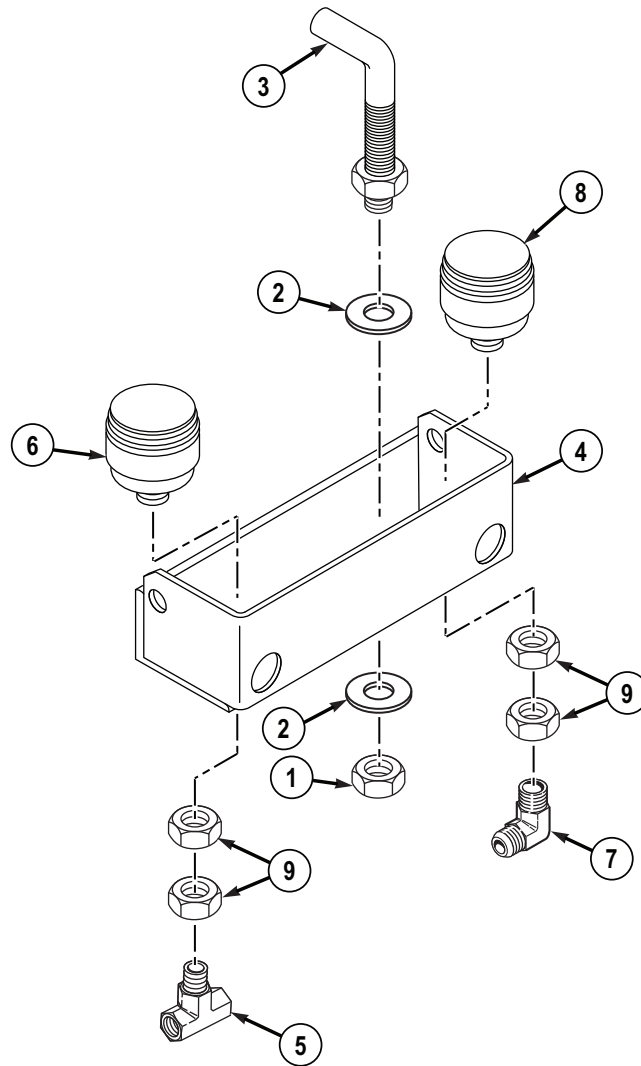
2. Remove fitting (5) from air spring (6).
3. Remove fitting (7) from air spring (8).
4. Remove four nuts (9) and two air springs (6) and (8) from mounting bracket (4).
5. Remove three screws (10), lockwashers (11), and rub bar (12) from pivot arm (13). Discard lockwashers.

*Figure 5.***END OF TASK****ASSEMBLY**

1. Install rub bar (12) on pivot arm (13) with three lockwashers (11) and screws (10).

*Figure 6.*

2. Install two air springs (6) and (8) on mounting bracket (4) with four nuts (9).

*Figure 7.***WARNING**

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

**NOTE**

Install fittings as noted prior to removal.

3. Apply sealing compound to threads of fitting (7) and install fitting (7) on air spring (8).
4. Apply sealing compound to threads of fitting (5) and install fitting (5) on air spring (6).
5. Install anchor bolt (3) on mounting bracket (4) with two washers (2) and nut (1).

#### END OF TASK

#### INSTALLATION

1. Install mounting bracket (9) on winch (12) with two lockwashers (11) and screws (10).

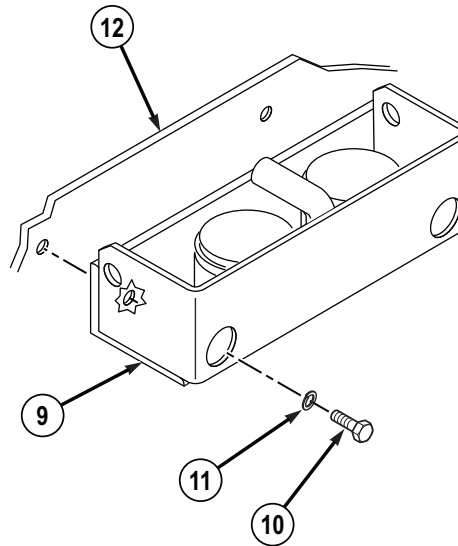


Figure 8.

2. Install pivot arm (8) on mounting bracket (9) with pivot pin (5), bushing (7), two washers (6), and cotter pins (4).

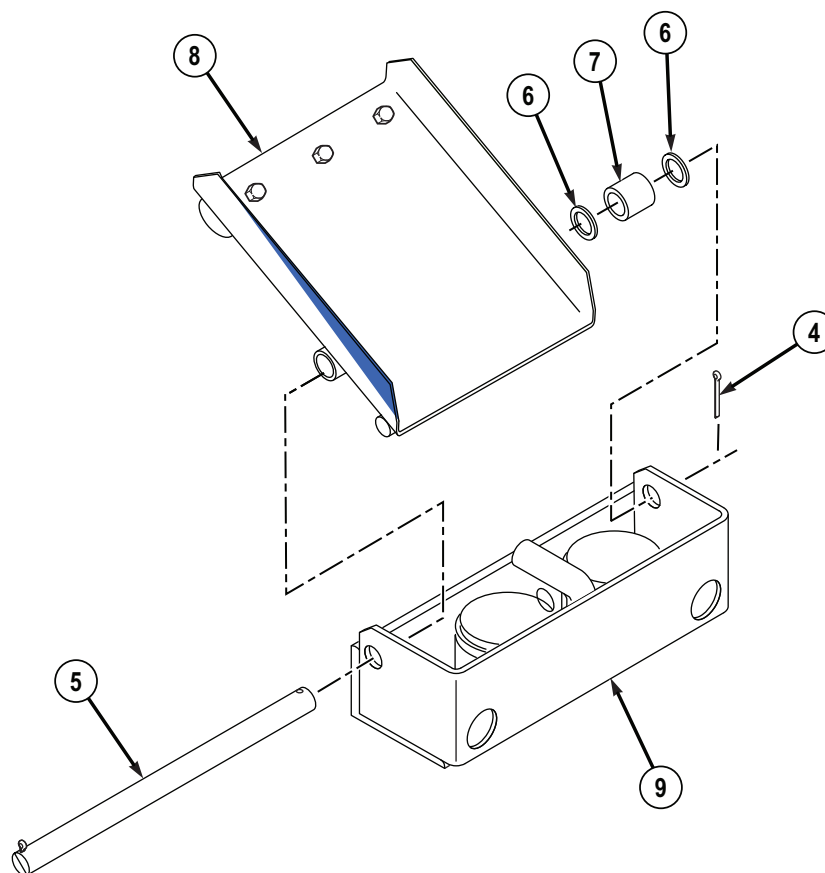


Figure 9.

### NOTE

Install cable ties as required.

3. Install two sections of air line 2231 (1) on two fittings (2) and (3).

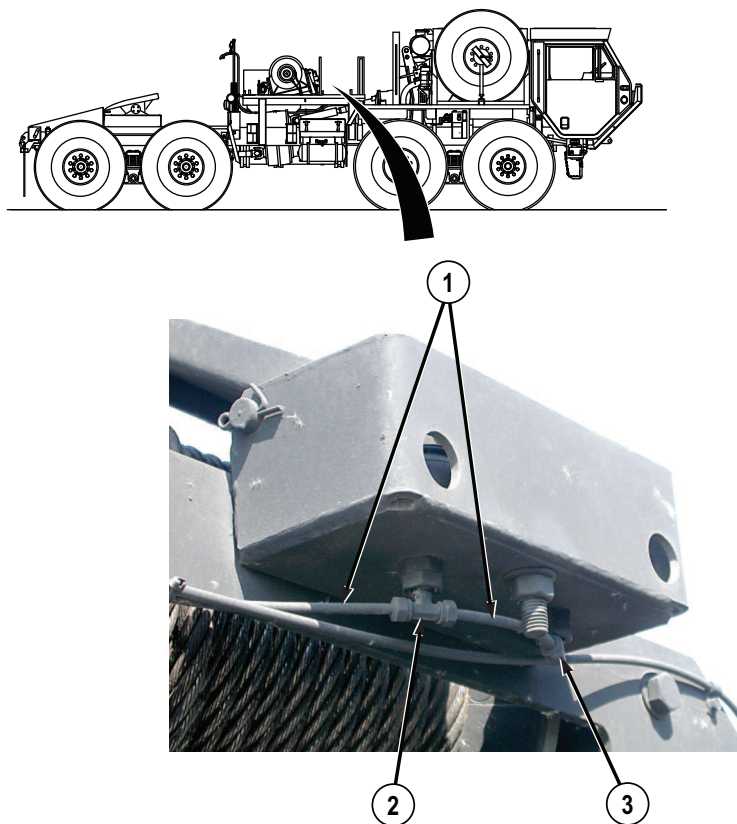


Figure 10.

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Start engine and build air pressure to 120 to 125 psi (827 to 862 kPa) (refer to TM 9-2320-279-10).
2. Check air system for leaks (refer to TM 9-2320-315-14&P).
3. Check operation of cable hold down. (WP 0015)
4. Shut OFF engine (refer to TM 9-2320-279-10).
5. Remove wheel chocks (refer to TM 9-2320-315-14&P).

#### END OF WORK PACKAGE

## FIELD MAINTENANCE

### HEAVY-DUTY WINCH DRIVE MOTOR REMOVAL/INSTALLATION

#### INITIAL SETUP:

##### Tools and Special Tools

Bit, Hex, 3/8", 3/8" DR (WP 0081, Table 2, Item 7)  
 Cap and Plug Set (WP 0081, Table 2, Item 1)  
 Lifting Device, Minimum Capacity 300 lbs (136 kg)  
 Pan, Drain, 4 Gallon (WP 0081, Table 2, Item 3)  
 Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
 Wrench, Adjustable, 18 inch (WP 0081, Table 2, Item 6)  
 Wrench, Torque, Click, Ratcheting, 3/8 inch Drive, 250 ft-lb (WP 0081, Table 2, Item 6)  
 Goggles, Industrial (WP 0081, Table 2, Item 7)

Lockwasher (WP 0084, Table 1, Item 14) Qty: 8  
 Packing, Preformed (WP 0084, Table 1, Item 22) Qty: 2  
 Packing, Preformed (WP 0084, Table 1, Item 23) Qty: 1  
 Lockwasher (WP 0084) Qty: 4  
 Gasket (WP 0084, Table 1, Item 1) Qty: 1  
 Packing, Preformed (WP 0084, Table 1, Item 24) Qty: 1  
 Packing, Preformed (WP 0084, Table 1, Item 25) Qty: 1

##### Materials/Parts

Cable Ties, Plastic (WP 0083, Table 1, Item 1)  
 Oil, Lubricating (WP 0083, Table 1, Item 25, 26, 27, 28)  
 Tags, Identification (WP 0083, Table 1, Item 30)  
 Packing, Preformed (WP 0084, Table 1, Item 28) Qty: 1  
 Packing, Preformed (WP 0084, Table 1, Item 20) Qty: 1

##### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

##### References

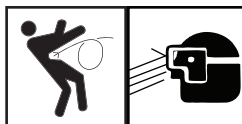
Parts Manual (Fig. 22)  
 Parts Manual (Fig. 27)

##### Equipment Condition

Engine OFF (TM 9-2320-279-10).  
 Wheels chocked (TM 9-2320-279-10).

#### REMOVAL

#### WARNING



- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

**WARNING**

Allow hydraulic fluid to cool prior to performing this task. Failure to comply may result in injury or death to personnel.

**WARNING**

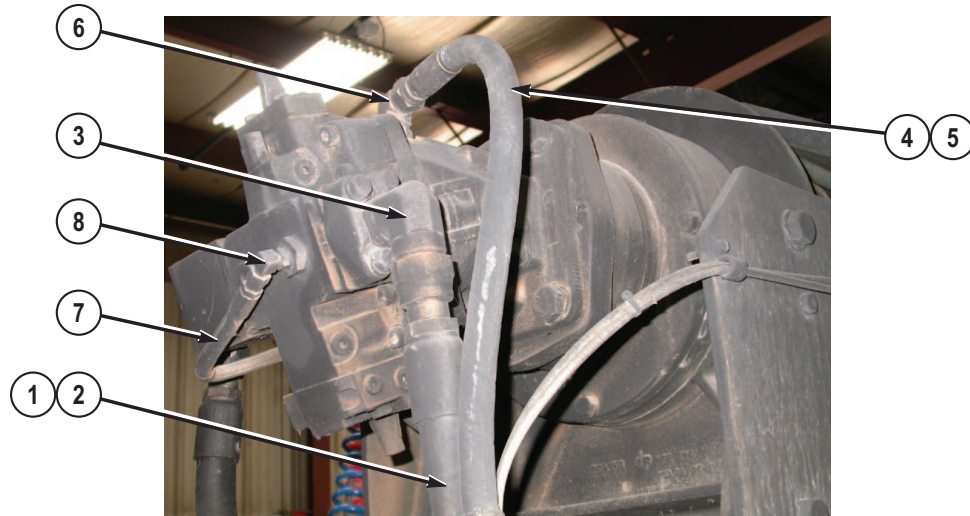
Prolonged contact with lubricating oil may cause skin rash. Immediately wash skin and clothing that come in contact with lubricating oil thoroughly and remove saturated clothing. Keep area well-ventilated to keep fumes at a minimum. Failure to comply may result in injury or death to personnel.

**NOTE**

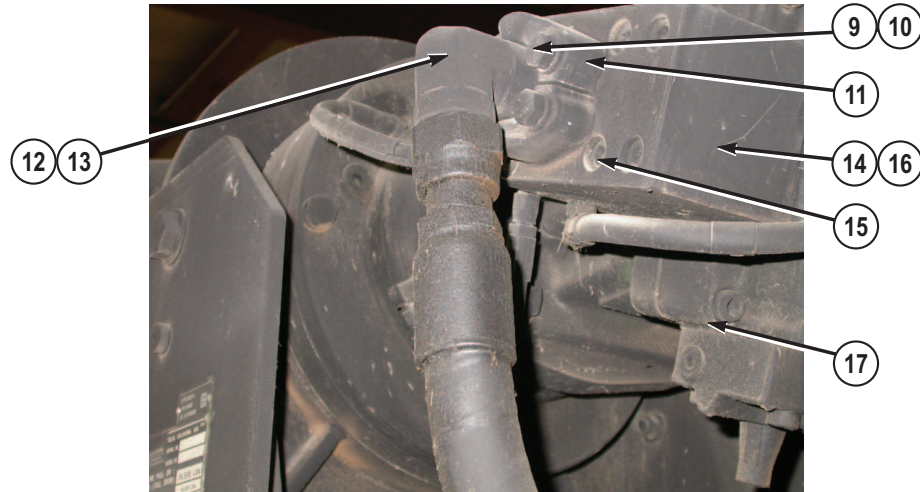
- Position drain pan under hoses being removed.
- Tag and mark hoses prior to removal to ensure proper installation.
- Cap and plug hoses and fittings upon removal.
- Remove cable ties as required.

1. Remove hose 2900 (1) and preformed packing (2) from fitting (3). Discard preformed packing.



*Figure 1.*

2. Remove hose 2918 (4) and preformed packing (5) from fitting (6). Discard preformed packing.
3. Remove hose (7) from fitting (8).
4. Remove four screws (9), lockwashers (10), two clamp halves (11), fitting (12), and preformed packing (13) from counterbalance valve block (14). Discard lockwashers and preformed packing.

*Figure 2.*

5. Remove four screws (15), counterbalance valve block (14), and preformed packing (16) from winch motor (17). Discard preformed packing.

**WARNING**

Winch drive motor weighs 105 lbs (48 kg). Do not attempt to lift or move winch drive motor without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

6. With the aid of an assistant and lifting device, remove four screws (18), lockwashers (19), winch motor (17), and gasket (20) from gearbox (21). Discard gasket.

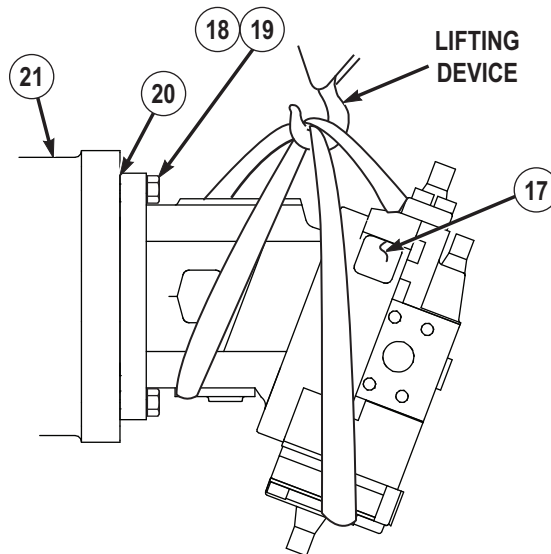


Figure 3.

**NOTE**

Note location and position of fittings prior to removal to ensure proper installation.

7. Remove four screws (22), lockwashers (23), two clamp halves (24), fitting (3), and preformed packing (25) from winch motor (17). Discard lockwashers and preformed packing.

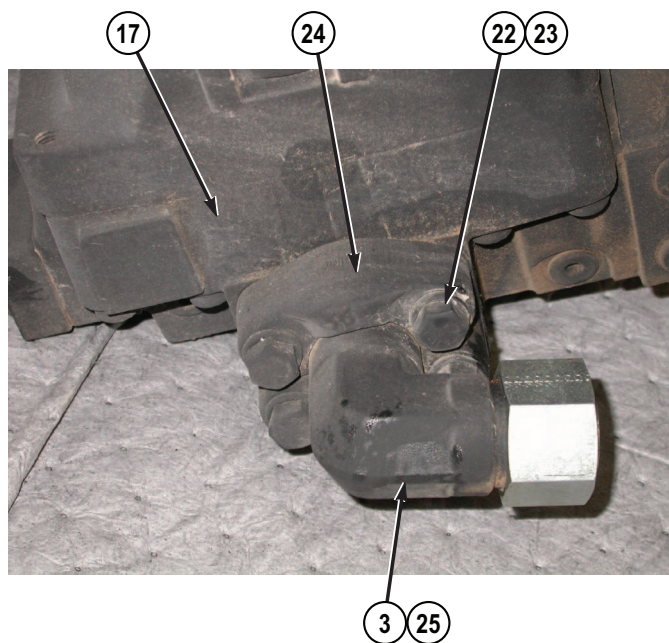


Figure 4.

8. Remove fitting (6) and preformed packing (26) from winch motor (17). Discard preformed packing.

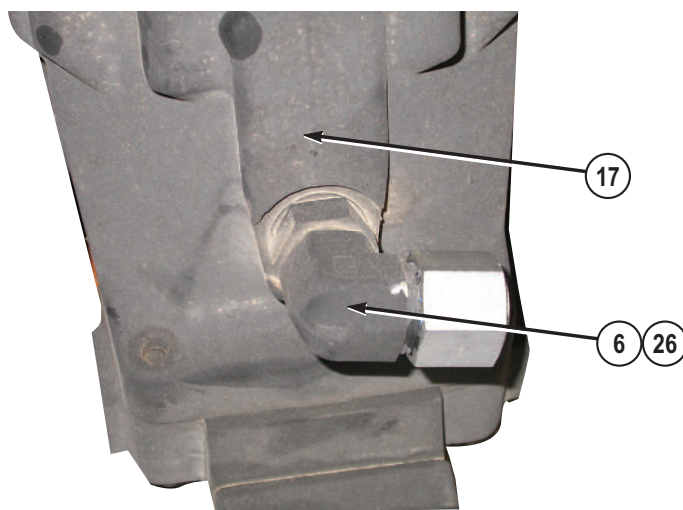


Figure 5.

9. Remove fitting (8) and preformed packing (27) from fitting (28). Discard preformed packing.

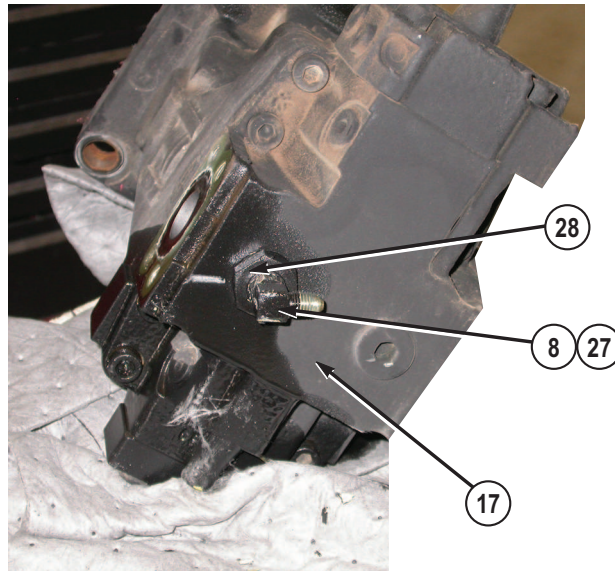


Figure 6.

10. Remove fitting (28) from winch motor (17).

#### END OF TASK

#### INSTALLATION

#### NOTE

Install fittings as noted prior to removal.

1. Install fitting (28) on winch motor (17).

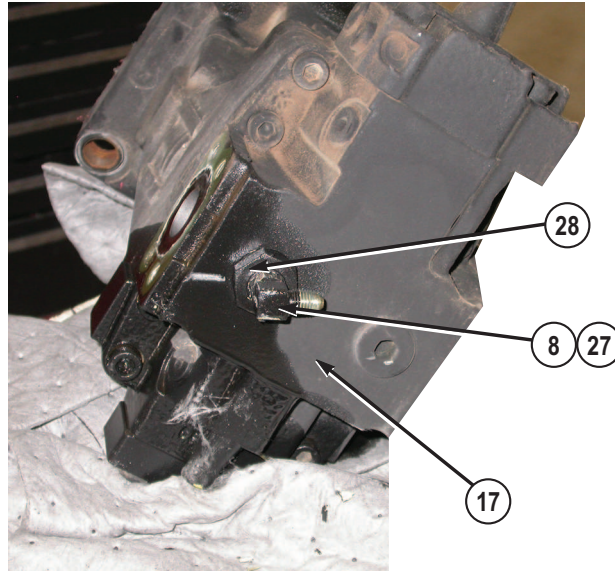


Figure 7.

2. Lightly lubricate preformed packing (27) with clean oil and install preformed packing (27) and fitting (8) on fitting (28).
3. Lightly lubricate preformed packing (26) with clean oil and install preformed packing (26) and fitting (6) on winch motor (17).

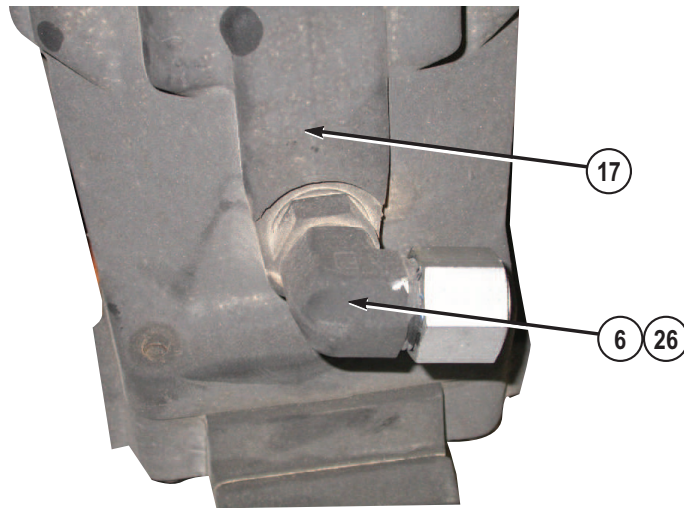


Figure 8.

4. Lightly lubricate preformed packing (25) with clean oil and install preformed packing (25) and fitting (3) on winch motor (17) with two clamp halves (24), four lockwashers (23), and screws (22).



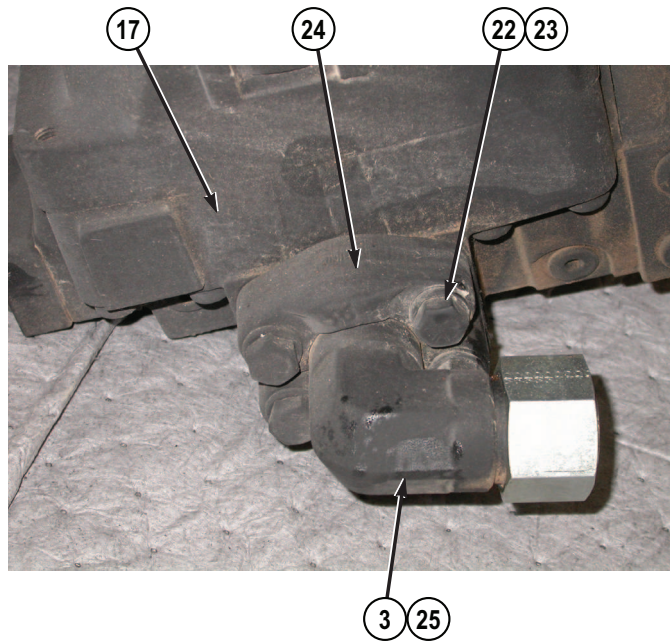


Figure 9.

### WARNING



Winch drive motor weighs 105 lbs (48 kg). Do not attempt to lift or move winch drive motor without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

5. With the aid of an assistant and lifting device, install gasket (20) and winch motor (17) on gearbox (21) with four lockwashers (19) and screws (18). Tighten screws to 200 lb-ft (271 N·m).

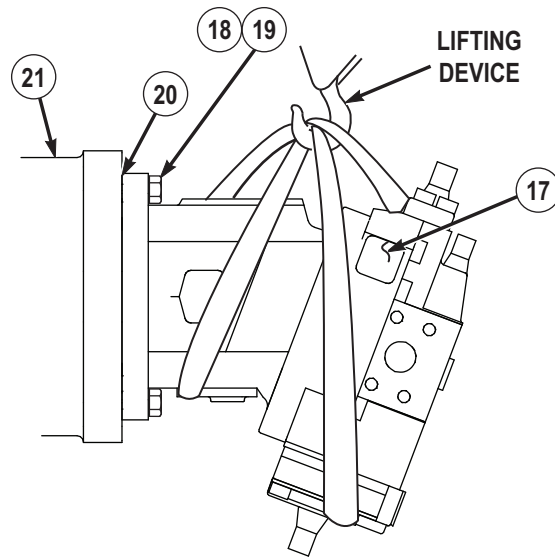


Figure 10.

6. Lightly lubricate preformed packing (16) with clean oil and install preformed packing (16) and counterbalance valve block (14) on winch motor (17) with four screws (15). Tighten screws to 53 lb-ft (72 N·m).

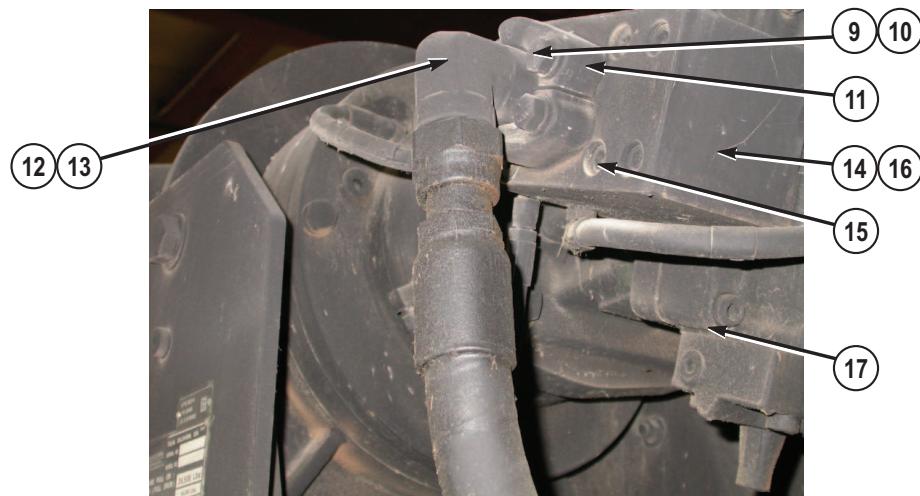


Figure 11.

7. Lightly lubricate preformed packing (13) with clean oil and install preformed packing (13) and fitting (12) on counterbalance valve block (14) with two clamp halves (11), four lockwashers (10), and screws (9).

### NOTE

Install cable ties as required.

8. Install hose (7) on fitting (8).

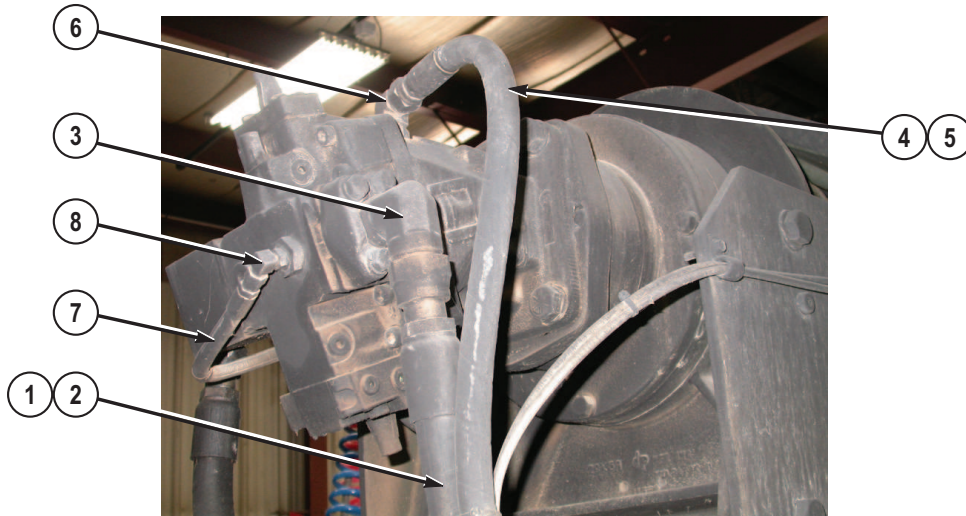


Figure 12.

9. Lightly lubricate preformed packing (5) with clean oil and install preformed packing (5) and hose 2918 (4) on fitting (6).
10. Lightly lubricate preformed packing (2) with clean oil and install preformed packing (2) and hose 2900 (1) on fitting (3).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Check hydraulic fluid level (refer to TM 9-2320-315-14&P).
2. Start engine (refer to TM 9-2320-279-10).
3. Check hydraulic system for leaks (refer to TM 9-2320-315-14&P).
4. Check operation of heavy-duty winch. (WP 0015)
5. Shut OFF engine (refer to TM 9-2320-279-10).
6. Remove wheel chocks (refer to TM 9-2320-279-10).

#### END OF WORK PACKAGE



---

## FIELD MAINTENANCE HYDRAULIC HOSE REPLACEMENT

---

### INITIAL SETUP:

#### Tools and Special Tools

Cap and Plug Set (WP 0081, Table 2, Item 1)  
Pan, Drain, 4 Gallon (WP 0081, Table 2, Item 3)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Wrench, Adjustable, 18 inch (WP 0081, Table 2, Item 6)  
Wrench, Combination, 2-1/4" (WP 0081, Table 2, Item 8)  
Wrench, Combination, 1-1/4" (WP 0081, Table 2, Item 6)  
Wrench, Combination, 1-3/8" (WP 0081, Table 2, Item 6)  
Wrench, Combination, 1-1/2" (WP 0081, Table 2, Item 6)  
Goggles, Industrial (WP 0081, Table 2, Item 7)

Oil, Lubricating (WP 0083, Table 1, Item 25, 26, 27, 28)  
Tags, Identification (WP 0083, Table 1, Item 30)

#### References

Parts Manual (Fig. 27)

#### Equipment Condition

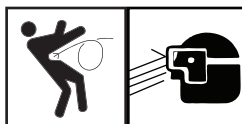
Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).  
Hydraulic reservoir drained (refer to TM 9-2320-315-14&P).

#### Materials/Parts

Cable Ties, Plastic (WP 0083, Table 1, Item 1)

---

### WARNING



- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

**WARNING**

Allow hydraulic fluid to cool prior to performing this task. Failure to comply may result in injury or death to personnel.

**WARNING**

Prolonged contact with lubricating oil may cause skin rash. Immediately wash skin and clothing that come in contact with lubricating oil thoroughly and remove saturated clothing. Keep area well-ventilated to keep fumes at a minimum. Failure to comply may result in injury or death to personnel.

**NOTE**

- This procedure shows the location of hydraulic hoses on vehicle. It will never be necessary to removal all hydraulic hoses at one time.
- Position drain pan under hoses being removed.
- Tag and mark hoses prior to removal to ensure proper installation.
- Cap and plug hoses and fittings upon removal.
- Note location and position of fittings prior to removal to ensure proper installation.
- Note position and remove cushion clips and cable ties as required.

1. Lightly lubricate preformed packings with clean oil prior to installation.

***Table 1. Heavy-Duty Winch Hydraulic System Hose Replacement.***

Item No.	Line No.	Hose Size	From	To
1	2278	24	Hydraulic Reservoir	P.T.O. Pump
2	2496	12	P.T.O. Pump (Output)	Hydraulic Selector Valve (C)
3	2928	12	P.T.O. Pump (Output)	Return Line Filter Relief Valve
4	2899	16	Hydraulic Selector Valve (B)	Winch Control Valve (P2)
5	2902	12	Hydraulic Selector Valve (A)	Relief Valve

**Table 1. Heavy-Duty Winch Hydraulic System Hose Replacement. - Continued**

<b>Item No.</b>	<b>Line No.</b>	<b>Hose Size</b>	<b>From</b>	<b>To</b>
6	2906	12	Relief Valve	Auxiliary Hydraulics Supply Fitting
7	2907	12	Auxiliary Hydraulics Return Fitting	Tee with Line 2883 at Winch Control Valve (T2B)
8	2883	12	Relief Valve	Tee with Line 2907 at Winch Control Valve (T2B)
9	2883	16	Manifold Block	Tee with Line 2907 at Winch Control Valve (T2B)
10	2900	16	Winch Control Valve (B)	Winch Motor (Pay Out Connector)
11	2901	16	Winch Control Valve (A)	Winch Motor (Reel In Connector)
12	2918	10	Winch Motor (Drain)	Hydraulic Reservoir

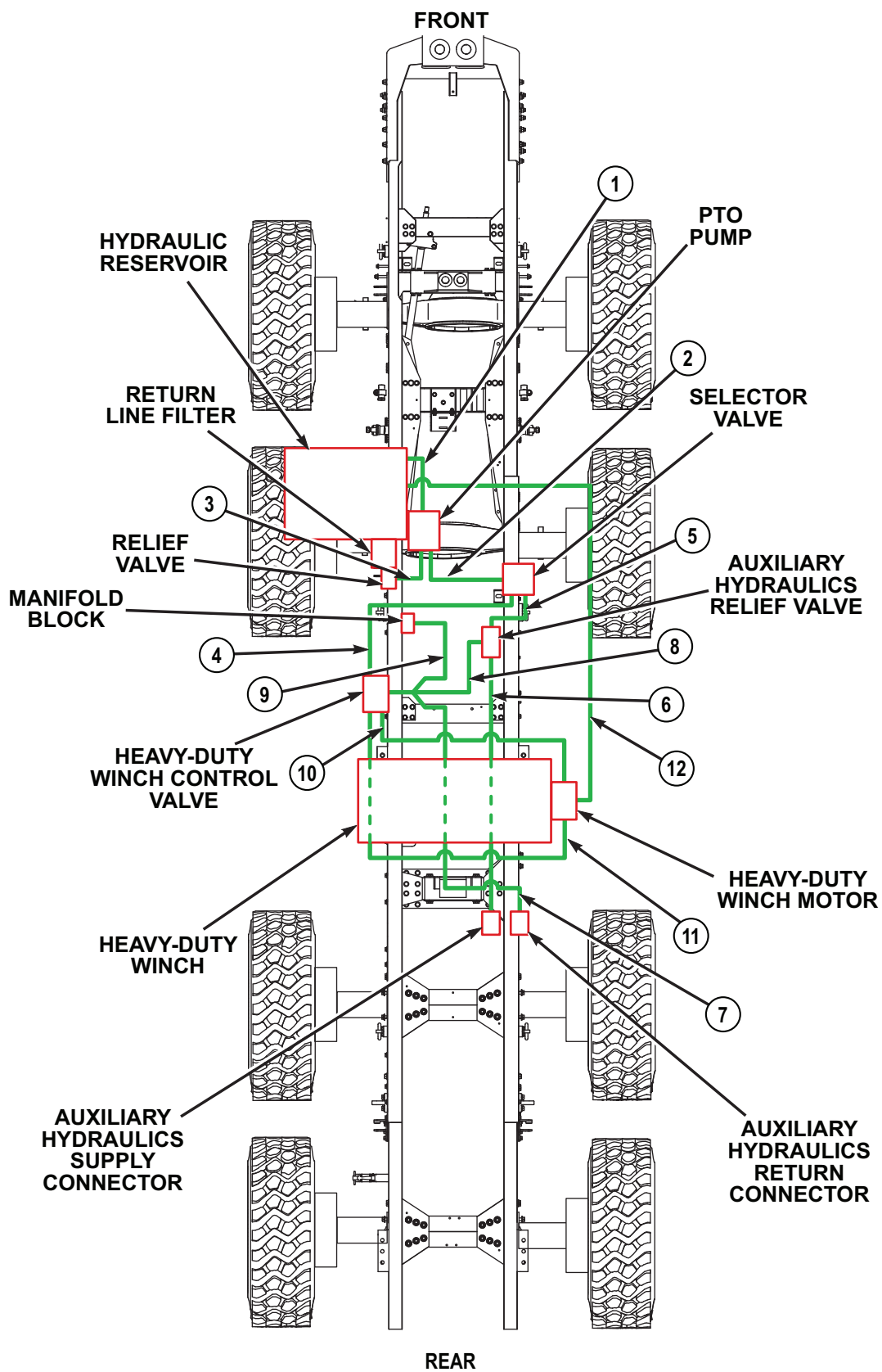


Figure 1.

**FOLLOW-ON MAINTENANCE**

1. Fill hydraulic reservoir (refer to TM 9-2320-315-14&P).
2. Start engine (refer to TM 9-2320-279-10).
3. Check hydraulic system for leaks (refer to TM 9-2320-315-14&P).
4. Shut OFF engine (refer to TM 9-2320-279-10).
5. Check hydraulic fluid level (refer to TM 9-2320-315-14&P).
6. Remove wheel chocks (refer to TM 9-2320-279-10).

**END OF WORK PACKAGE**



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## FIELD MAINTENANCE

### HYDRAULIC RETURN MANIFOLD REMOVAL/INSTALLATION

---

#### INITIAL SETUP:

##### Tools and Special Tools

Cap and Plug Set (WP 0081, Table 2, Item 1)  
Pan, Drain, 4 Gallon (WP 0081, Table 2, Item 3)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Wrench, Adjustable, 18 inch (WP 0081, Table 2, Item 6)  
Goggles, Industrial (WP 0081, Table 2, Item 7)

Compound, Sealing (WP 0083, Table 1, Item 11)  
Tags, Identification (WP 0083, Table 1, Item 30)  
Packing, Preformed (WP 0084, Table 1, Item 28)  
Qty: 1  
Lockwasher (WP 0084, Table 1, Item 19) Qty: 2

##### References

Parts Manual (Fig. 27)

##### Materials/Parts

Cable Ties, Plastic (WP 0083, Table 1, Item 1)  
Oil, Lubricating (WP 0083, Table 1, Item 25, 26, 27, 28)

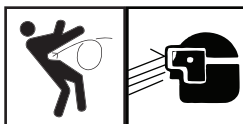
##### Equipment Condition

Engine OFF (TM 9-2320-279-10).  
Wheels chocked (TM 9-2320-279-10).

---

#### REMOVAL

##### WARNING



- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

##### WARNING



Allow hydraulic fluid to cool prior to performing this task. Failure to comply may result in injury or death to personnel.

**WARNING**

Prolonged contact with lubricating oil may cause skin rash. Immediately wash skin and clothing that come in contact with lubricating oil thoroughly and remove saturated clothing. Keep area well-ventilated to keep fumes at a minimum. Failure to comply may result in injury or death to personnel.

**NOTE**

- Position drain pan under hoses being removed.
- Tag and mark hoses prior to removal to ensure proper installation.
- Cap and plug hoses and fittings upon removal.
- Remove cable ties as required.

1. Remove hose 2277 (1) from fitting (2).



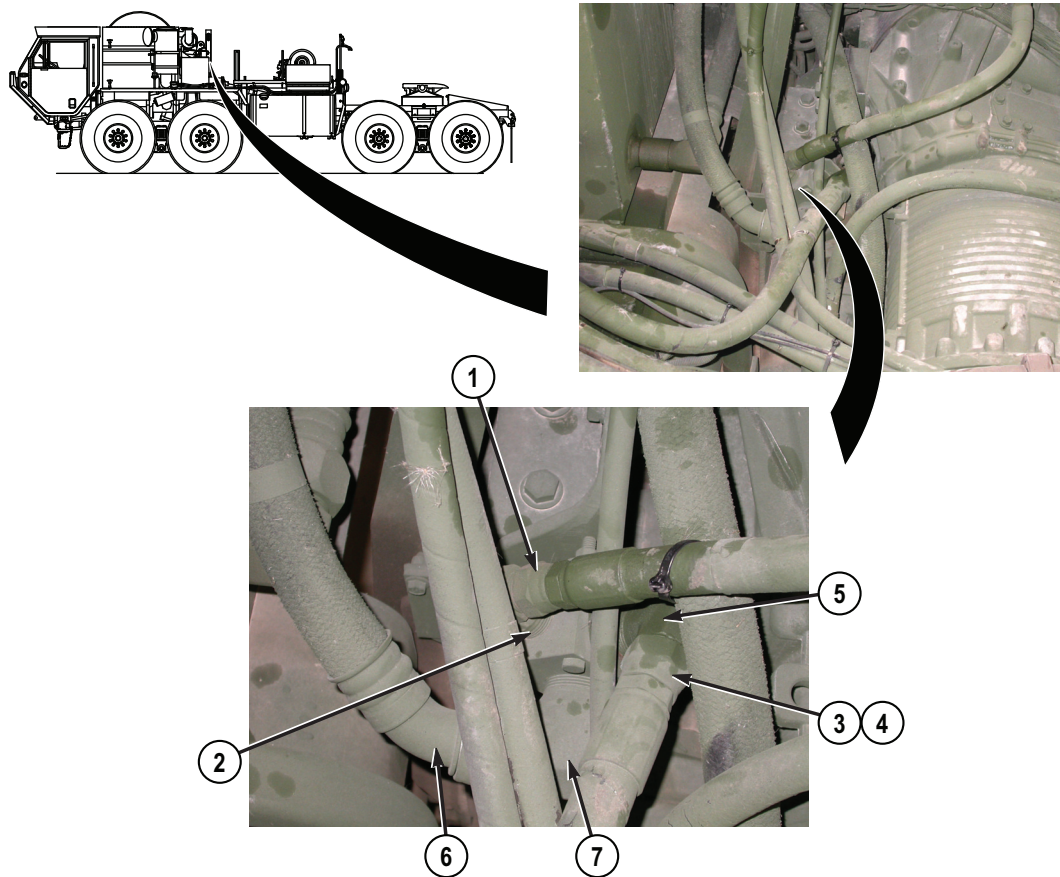


Figure 1.

2. Remove hose 2883 (3) and preformed packing (4) from fitting (5). Discard preformed packing.
3. Remove hose 2883 (6) from fitting (7).
4. Remove hose 2302 (8) from fitting (9).

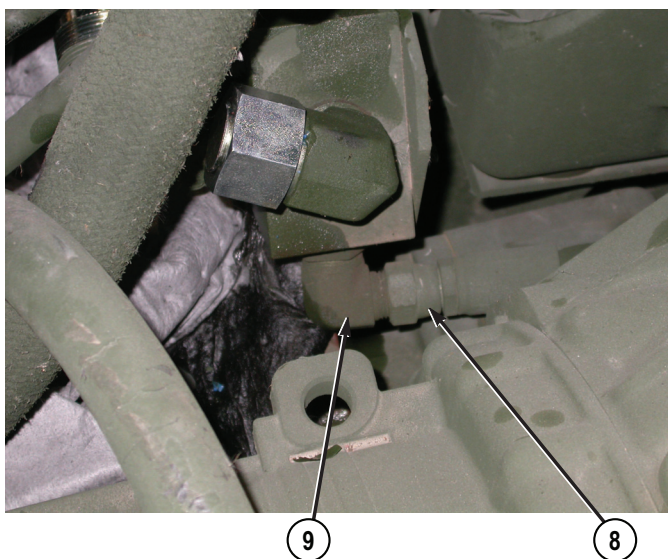


Figure 2.

5. Remove two nuts (10), lockwashers (11), screws (12), and manifold (13) from mounting bracket (14). Discard lockwashers.

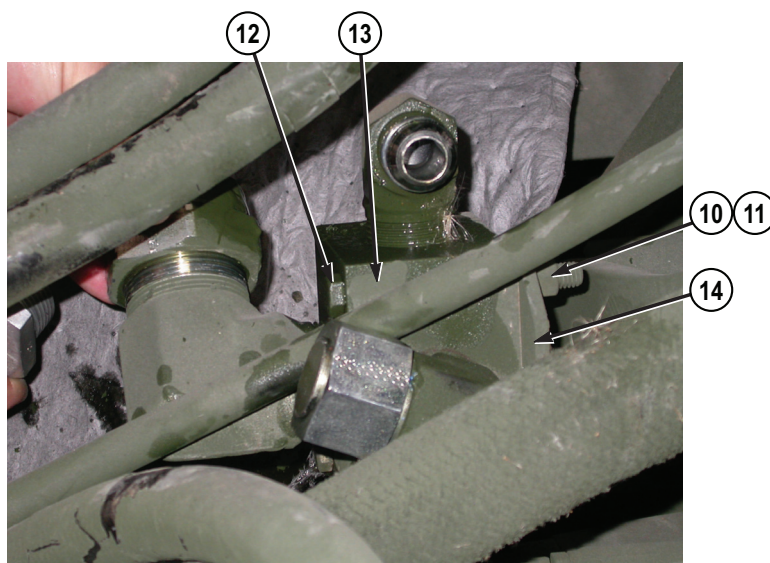


Figure 3.

### NOTE

Note location and position of fittings prior to removal to ensure proper installation.

6. Remove fitting (2) from manifold (13).

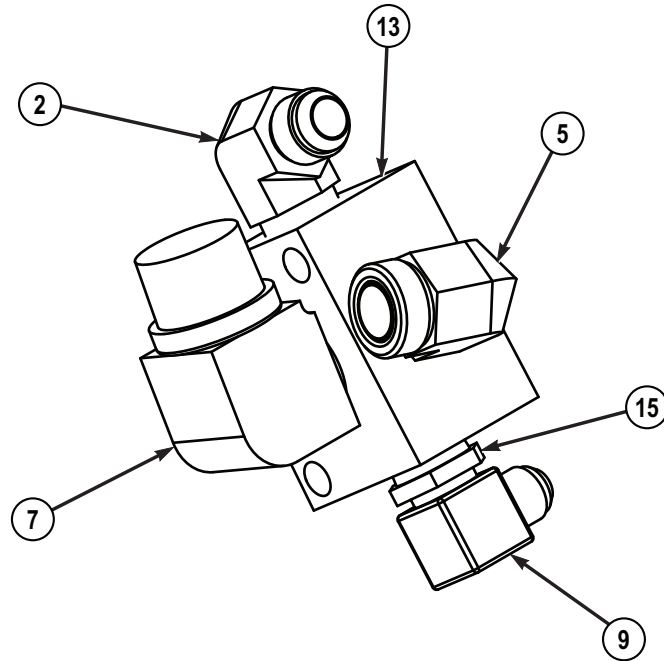


Figure 4.

7. Remove fitting (5) from manifold (13).
8. Remove fitting (7) from manifold (13).
9. Remove fitting (9) from fitting (15).
10. Remove fitting (15) from manifold (13).

#### END OF TASK

#### INSTALLATION

#### WARNING



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

#### NOTE

Install fittings as noted prior to removal.

1. Apply sealing compound to threads of fitting (15) and install fitting (15) on manifold (13).

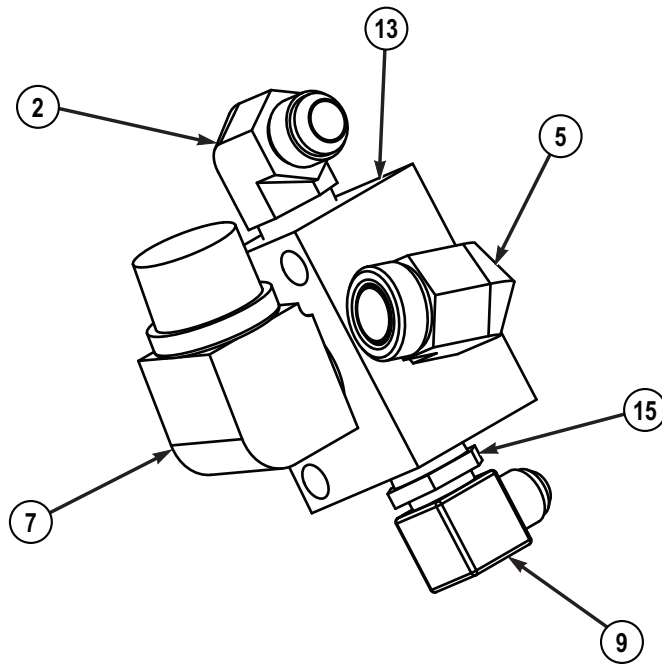


Figure 5.

2. Apply sealing compound to threads of fitting (9) and install fitting (9) on fitting (15).
3. Apply sealing compound to threads of fitting (7) and install fitting (7) on manifold (13).
4. Apply sealing compound to threads of fitting (5) and install fitting (5) on manifold (13).
5. Apply sealing compound to threads of fitting (2) and install fitting (2) on manifold (13).
6. Install manifold (13) on mounting bracket (14) with two lockwashers (11), screws (12), and nuts (10).

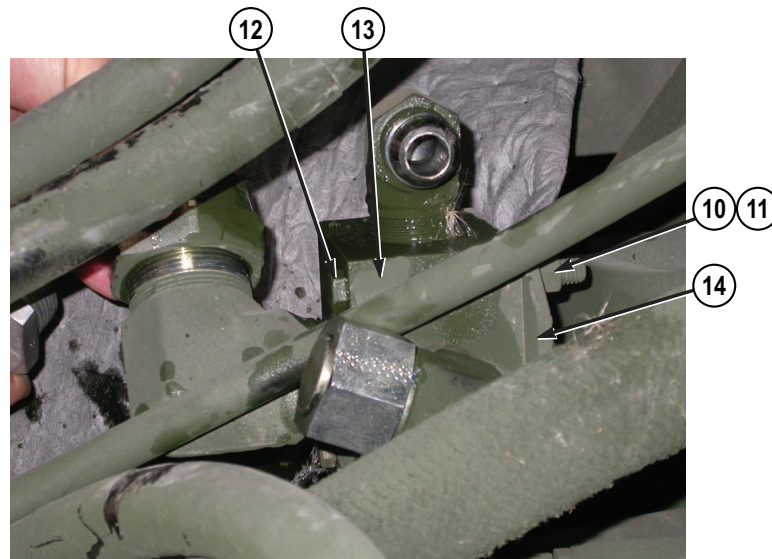


Figure 6.

### NOTE

Install cable ties as required.

7. Install hose 2302 (8) on fitting (9).



Figure 7.

8. Install hose 2883 (6) on fitting (7).



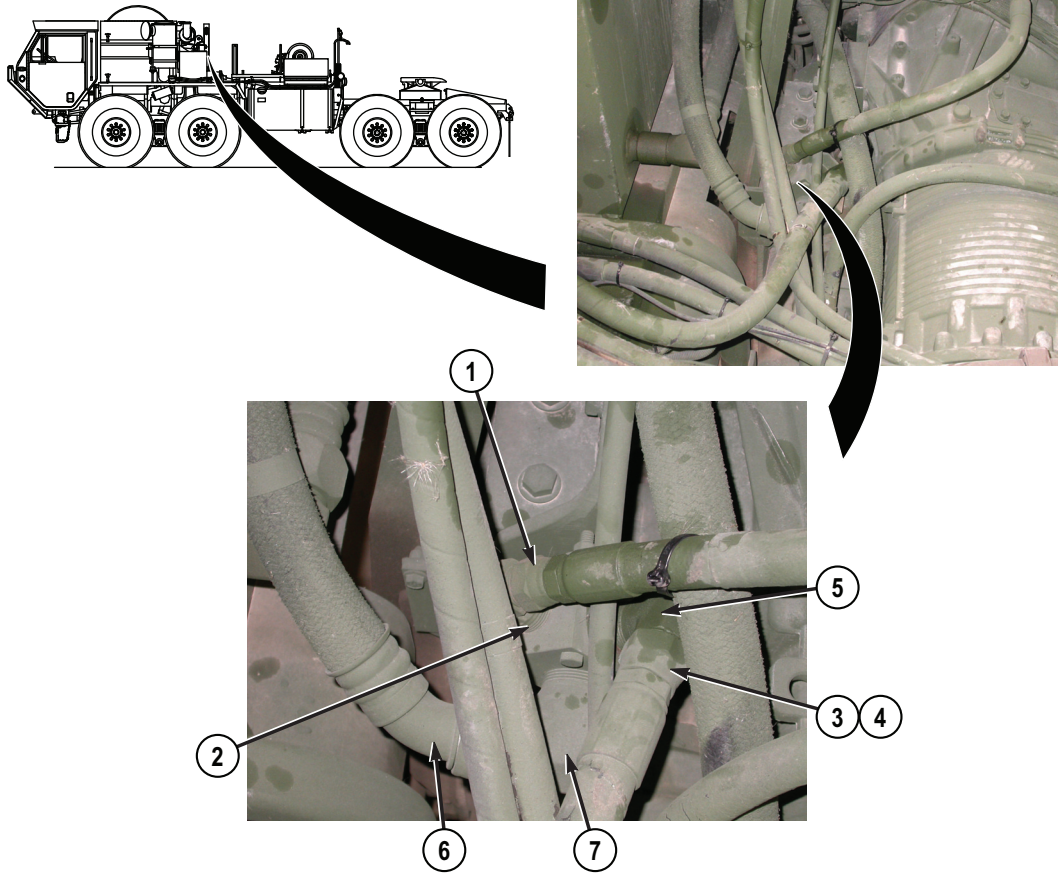


Figure 8.

9. Lightly lubricate preformed packing (4) with clean oil and install preformed packing (4) and hose 2883 (3) on fitting (5).
10. Install hose 2277 (1) on fitting (2).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Start engine (refer to TM 9-2320-279-10).
2. Check hydraulic system for leaks (refer to TM 9-2320-315-14&P).
3. Shut OFF engine (refer to TM 9-2320-279-10).
4. Check hydraulic fluid level (refer to TM 9-2320-315-14&P).
5. Remove wheel chocks (refer to TM 9-2320-279-10).

#### END OF WORK PACKAGE

## FIELD MAINTENANCE

### HEAVY-DUTY WINCH COUNTERBALANCE VALVE REMOVAL/INSTALLATION

#### INITIAL SETUP:

##### Tools and Special Tools

Bit, Hex, 3/8", 3/8" DR (WP 0081, Table 2, Item 7)  
 Cap and Plug Set (WP 0081, Table 2, Item 1)  
 Pan, Drain, 4 Gallon (WP 0081, Table 2, Item 3)  
 Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
 Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 ft-lb (WP 0081, Table 2, Item 6)  
 Goggles, Industrial (WP 0081, Table 2, Item 7)

##### Materials/Parts

Cable Ties, Plastic (WP 0083, Table 1, Item 1)  
 Oil, Lubrication (WP 0083, Table 1, Item 25, 26, 27, 28)  
 Tags, Identification (WP 0083, Table 1, Item 30)  
 Lockwasher (WP 0084, Table 1, Item 14) Qty: 4  
 Packing, Preformed (WP 0084, Table 1, Item 22) Qty: 1  
 Packing, Preformed (WP 0084, Table 1, Item 23) Qty: 1  
 Packing, Preformed (WP 0084, Table 1, Item 29) Qty: 1

Retainer, Packing (WP 0084, Table 1, Item 37) Qty: 2  
 Packing, Preformed (WP 0084, Table 1, Item 30) Qty: 1  
 Retainer, Packing (WP 0084, Table 1, Item 38) Qty: 1  
 Packing, Preformed (WP 0084, Table 1, Item 31) Qty: 1  
 Retainer, Packing (WP 0084, Table 1, Item 39) Qty: 1  
 Packing, Preformed (WP 0084, Table 1, Item 25) Qty: 3

##### References

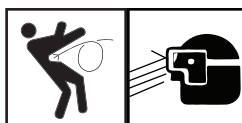
Parts Manual (Fig. 22)  
 Parts Manual (Fig. 27)

##### Equipment Condition

Engine OFF (TM 9-2320-279-10).  
 Wheels chocked (TM 9-2320-279-10).

#### REMOVAL

#### WARNING



- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

**WARNING**

Allow hydraulic fluid to cool prior to performing this task. Failure to comply may result in injury or death to personnel.

**WARNING**

Prolonged contact with lubricating oil may cause skin rash. Immediately wash skin and clothing that come in contact with lubricating oil thoroughly and remove saturated clothing. Keep area well-ventilated to keep fumes at a minimum. Failure to comply may result in injury or death to personnel.

**NOTE**

- Position drain pan under hoses being removed.
  - Tag and mark hoses prior to removal to ensure proper installation.
  - Cap and plug hoses and fittings upon removal.
  - Remove cable ties as required.
  - Note location and position of fittings prior to removal to ensure proper installation.
1. Remove four screws (1), lockwashers (2), two clamp halves (3), fitting (4), and preformed packing (5) from counterbalance valve block (6). Discard lockwashers and preformed packing.



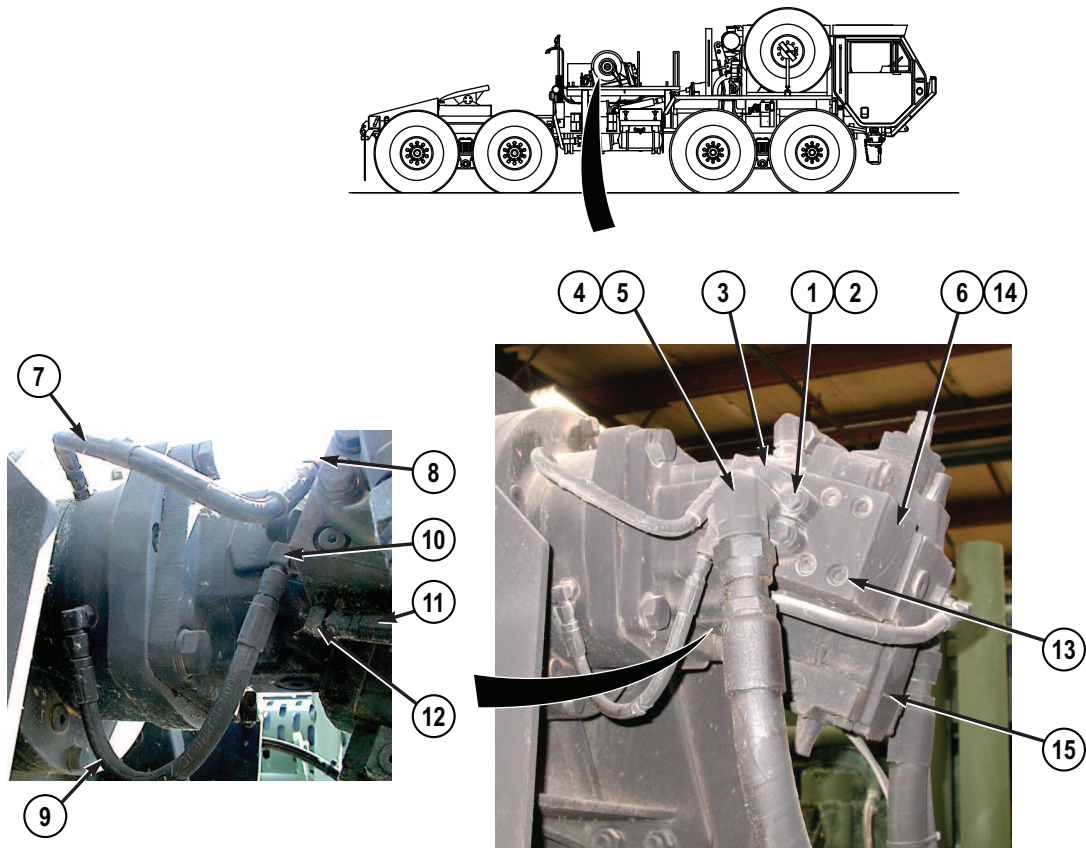


Figure 1.

2. Remove hose (7) from fitting (8).
3. Remove hose (9) from fitting (10).
4. Remove hose (11) from fitting (12).
5. Remove four screws (13), counterbalance valve block (6), and preformed packing (14) from winch motor (15). Discard preformed packing.
6. Remove counterbalance valve (16) from counterbalance valve block (6).

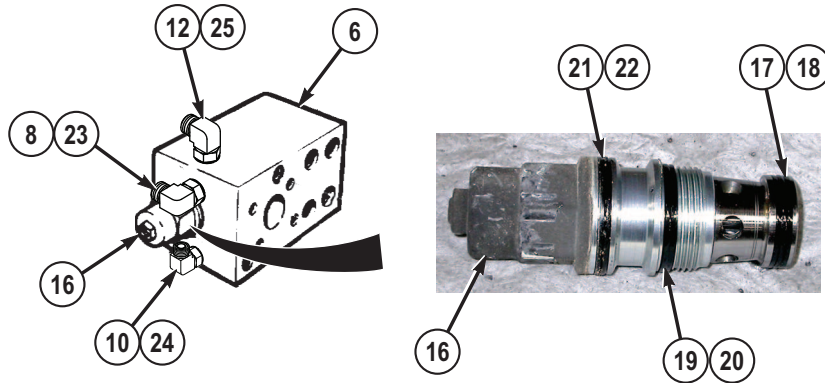


Figure 2.

7. Remove preformed packing (17), two packing retainers (18), preformed packing (19), packing retainer (20), preformed packing (21), and packing retainer (22) from counterbalance valve (16). Discard preformed packings and packing retainers.
8. Remove fitting (8) and preformed packing (23) from counterbalance valve block (6). Discard preformed packing.
9. Remove fitting (10) and preformed packing (24) from counterbalance valve block (6). Discard preformed packing.
10. Remove fitting (12) and preformed packing (25) from counterbalance valve block (6). Discard preformed packing.

## END OF TASK

## INSTALLATION

### NOTE

Install fittings as noted prior to removal.

1. Lightly lubricate preformed packing (25) with clean oil and install preformed packing (25) and fitting (12) on counterbalance valve block (6).

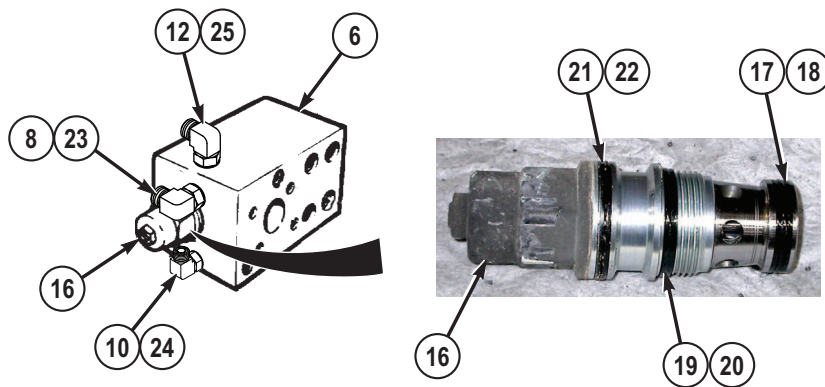


Figure 3.

2. Lightly lubricate preformed packing (24) with clean oil and install preformed packing (24) and fitting (10) on counterbalance valve block (6).
3. Lightly lubricate preformed packing (23) with clean oil and install preformed packing (23) and fitting (8) on counterbalance valve block (6).
4. Lightly lubricate packing retainer (22), preformed packing (21), packing retainer (20), preformed packing (19), two packing retainers (18), and preformed packing (17) with clean oil and install packing retainer (22), preformed packing (21), packing retainer (20), preformed packing (19), two packing retainers (18), and preformed packing (17) on counterbalance valve (16).
5. Install counterbalance valve (16) on counterbalance valve block (6).
6. Lightly lubricate preformed packing (14) with clean oil and install preformed packing (14) and counterbalance valve block (6) on winch motor (15) with four screws (13). Tighten screws to 53 lb-ft (72 N·m).

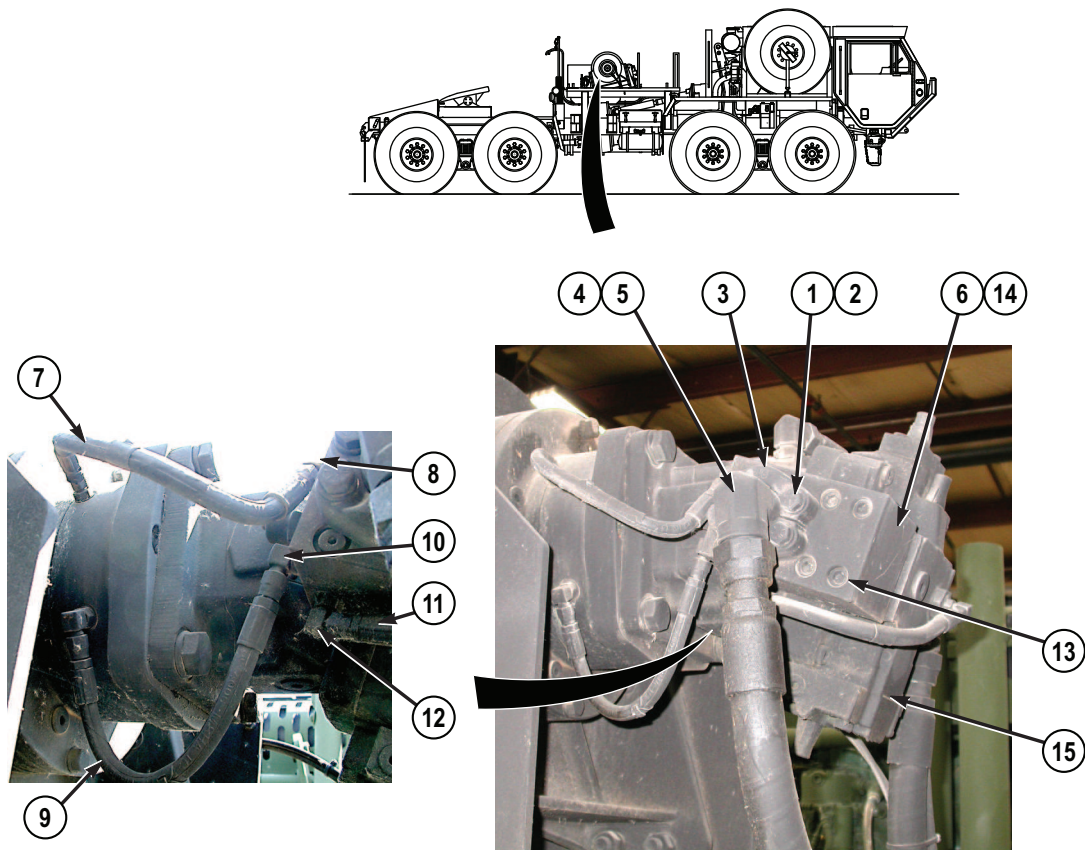


Figure 4.

7. Install hose (11) on fitting (12).
8. Install hose (9) on fitting (10).
9. Install hose (7) on fitting (8).

10. Lightly lubricate preformed packing (5) with clean oil and install preformed packing (5) and fitting (4) on counterbalance valve block (6) with two clamp halves (3), lockwashers (2), and screws (1).

**END OF TASK****FOLLOW-ON MAINTENANCE**

1. Check hydraulic fluid level (refer to TM 9-2320-315-14&P).
2. Start engine (refer to TM 9-2320-279-10).
3. Check hydraulic system for leaks (refer to TM 9-2320-315-14&P).
4. Check operation of heavy-duty winch. (WP 0015)
5. Shut OFF engine (refer to TM 9-2320-279-10).
6. Remove wheel chocks (refer to TM 9-2320-279-10).

**END OF WORK PACKAGE**

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## FIELD MAINTENANCE HEAVY-DUTY WINCH CONTROL VALVE REMOVAL/INSTALLATION

---

### INITIAL SETUP:

#### Tools and Special Tools

Cap and Plug Set (WP 0081, Table 2, Item 1)  
Pan, Drain, 4 Gallon (WP 0081, Table 2, Item 3)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Wrench, Adjustable, 18 inch (WP 0081, Table 2, Item 6)  
Socket, 1 1/2 inch, 1/2 inch Drive (WP 0081, Table 2, Item 6)  
Goggles, Industrial (WP 0081, Table 2, Item 7)

Packing, Preformed (WP 0084, Table 1, Item 26)  
Qty: 3  
Locknut (WP 0084, Table 1, Item 3) Qty: 4  
Packing, Preformed (WP 0084, Table 1, Item 24)  
Qty: 3  
Locknut (WP 0084, Table 1, Item 7) Qty: 3  
Packing, Preformed (WP 0084, Table 1, Item 27)  
Qty: 1

#### Materials/Parts

Cable Ties, Plastic (WP 0083, Table 1, Item 1)  
Oil, Lubricating (WP 0083, Table 1, Item 25, 26, 27, 28)  
Tags, Identification (WP 0083, Table 1, Item 30)  
Packing, Preformed (WP 0084, Table 1, Item 28)  
Qty: 2

#### References

Parts Manual (Fig. 27)  
Parts Manual (Fig. 1)

#### Equipment Condition

Batteries disconnected (TM 9-2320-315-14&P).

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### REMOVAL

#### NOTE

- Tag and mark connectors prior to removal to ensure proper installation.
- Remove cable ties as required.

1. Disconnect connector SV10 (1) from reel in coil (2).



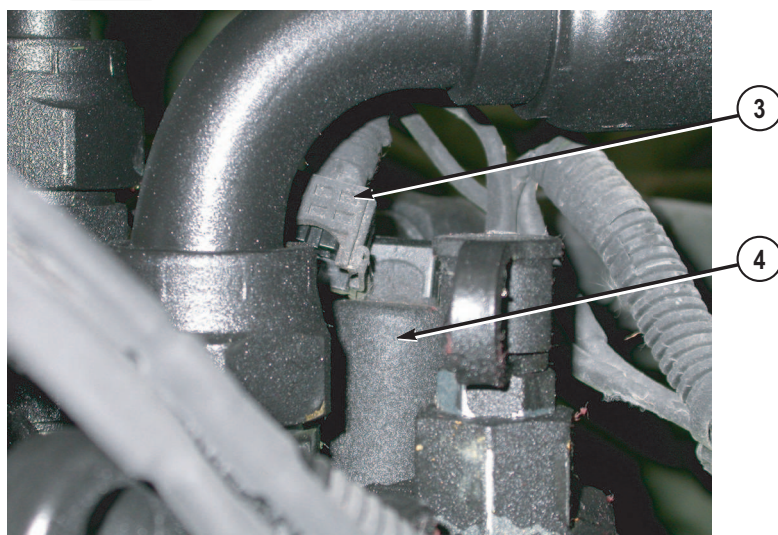
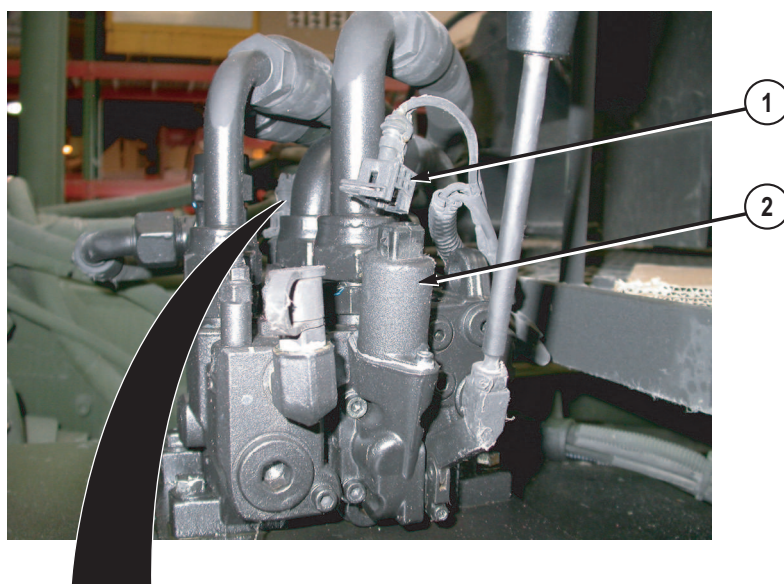
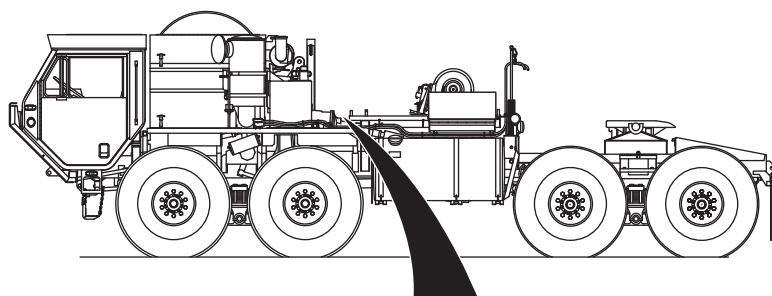
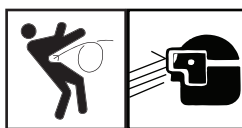


Figure 1.

2. Disconnect connector SV11 (3) from pay out coil (4).

**WARNING**

- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

**WARNING**

Allow hydraulic fluid to cool prior to performing this task. Failure to comply may result in injury or death to personnel.

**WARNING**

Prolonged contact with lubricating oil may cause skin rash. Immediately wash skin and clothing that come in contact with lubricating oil thoroughly and remove saturated clothing. Keep area well-ventilated to keep fumes at a minimum. Failure to comply may result in injury or death to personnel.

**NOTE**

- Position drain pan under hoses being removed.
- Tag and mark hoses prior to removal to ensure proper installation.
- Cap and plug hoses and fittings upon removal.

3. Remove hose 2901 (5) and preformed packing (6) from fitting (7). Discard preformed packing.

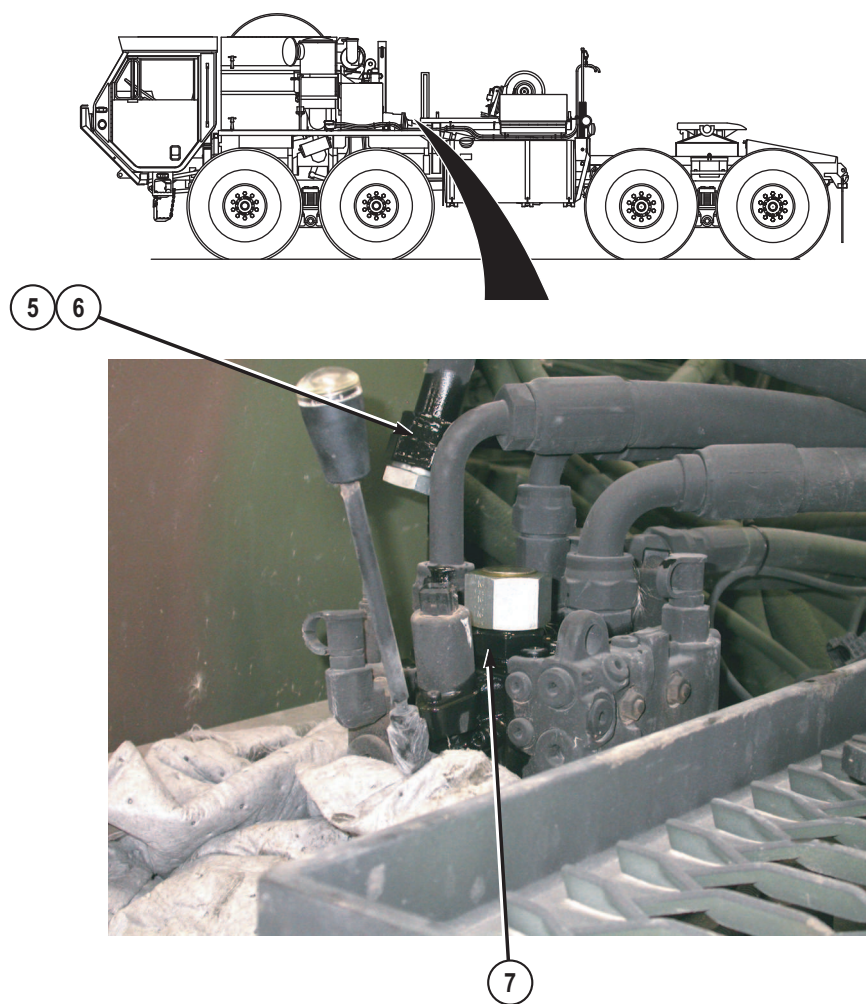


Figure 2.

4. Remove hose 2900 (8) and preformed packing (9) from fitting (10). Discard preformed packing.



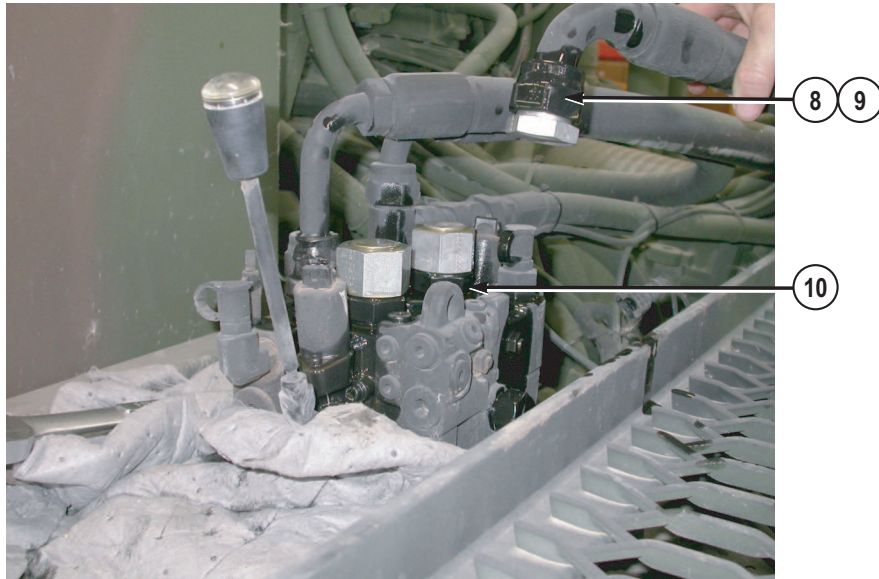


Figure 3.

5. Remove hose 2899 (11) and preformed packing (12) from fitting (13). Discard preformed packing.



Figure 4.

6. Remove hose 2883 (14) and preformed packing (15) from fitting (16). Discard preformed packing.



Figure 5.

7. Remove fitting (17) and preformed packing (18) from fitting (16). Discard preformed packing.



Figure 6.

### NOTE

Remove bracket (23) from vehicle only if necessary. Note position of bracket prior to removal.

8. Remove three locknuts (19), screws (20), washers (21), and control valve (22) from bracket (23). Discard locknuts.

### NOTE

Note location and position of fittings prior to removal to ensure proper installation.

9. Remove fitting (13) and preformed packing (24) from control valve (22). Discard preformed packing.

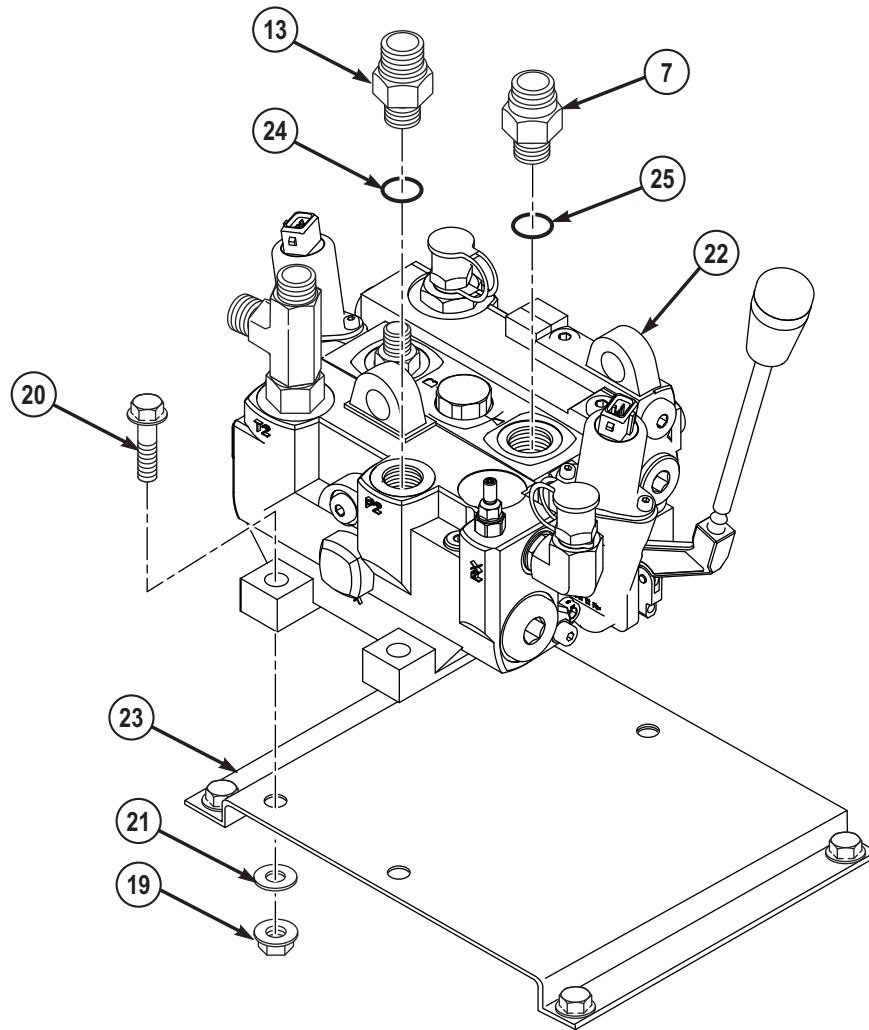


Figure 7.

10. Remove fitting (7) and preformed packing (25) from control valve (22). Discard preformed packing.
11. Remove fitting (10) and preformed packing (26) from control valve (22). Discard preformed packing.

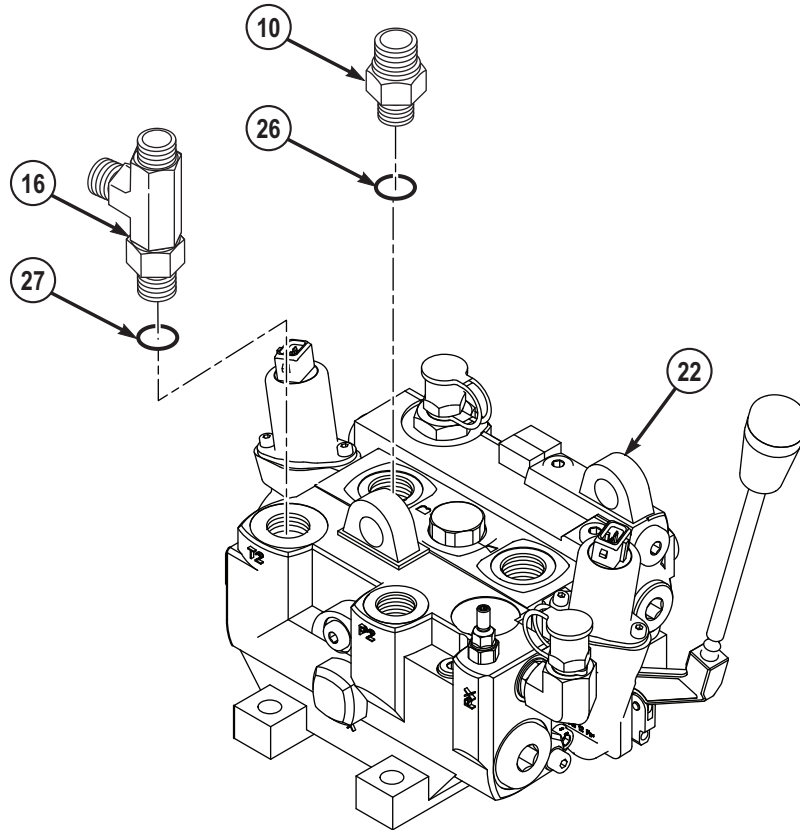


Figure 8.

12. Remove fitting (16) and preformed packing (27) from control valve (22). Discard preformed packing.

#### END OF TASK

#### INSTALLATION

#### NOTE

- If bracket (23) was removed from vehicle. Install bracket as noted prior to removal.
- Install fittings as noted prior to removal.

1. Lightly lubricate preformed packing (27) with clean oil and install preformed packing (27) and fitting (16) on control valve (22).

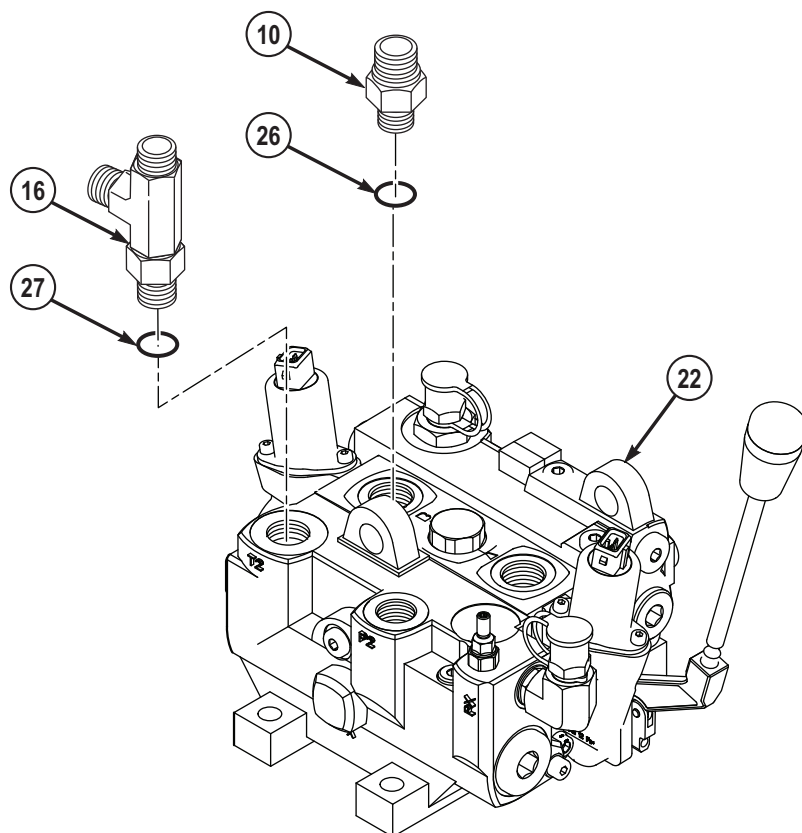


Figure 9.

2. Lightly lubricate preformed packing (26) with clean oil and install preformed packing (26) and fitting (10) on control valve (22).

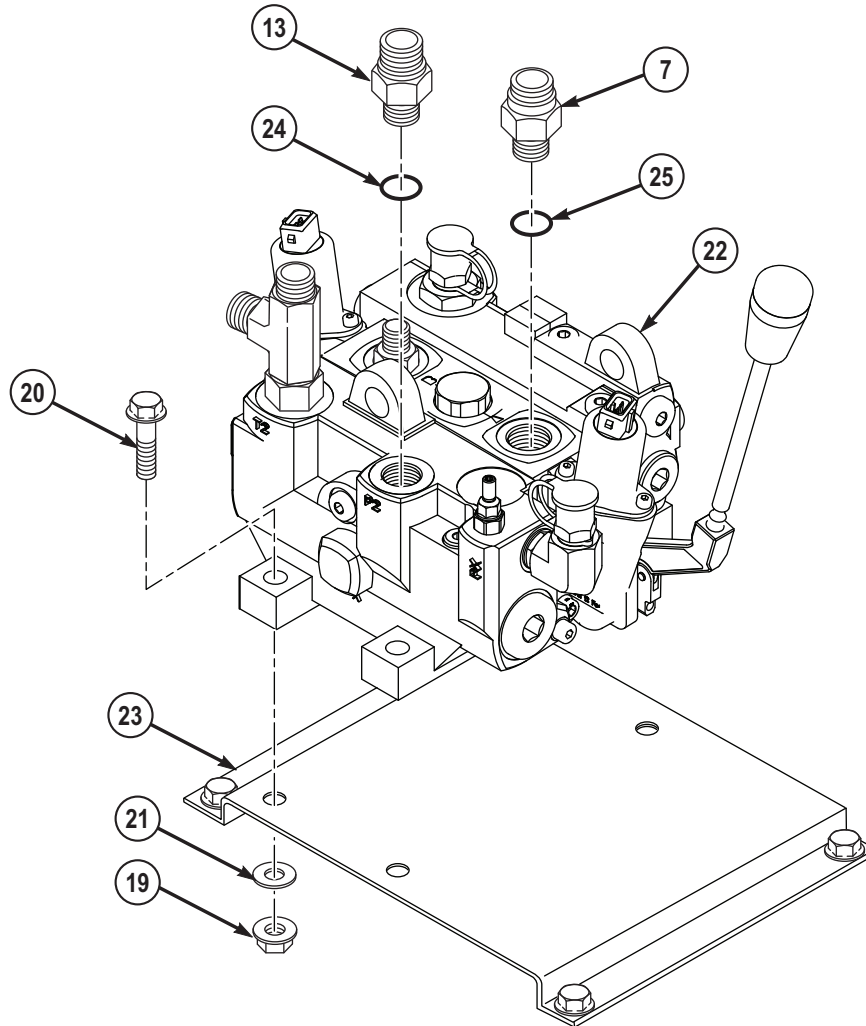


Figure 10.

3. Lightly lubricate preformed packing (25) with clean oil and install preformed packing (25) and fitting (7) on control valve (22).
4. Lightly lubricate preformed packing (24) with clean oil and install preformed packing (24) and fitting (13) on control valve (22).
5. Install control valve (22) on bracket (23) with three screws (20), washers (21) and locknuts (19).
6. Lightly lubricate preformed packing (18) with clean oil and install preformed packing (18) and fitting (17) on fitting (16).





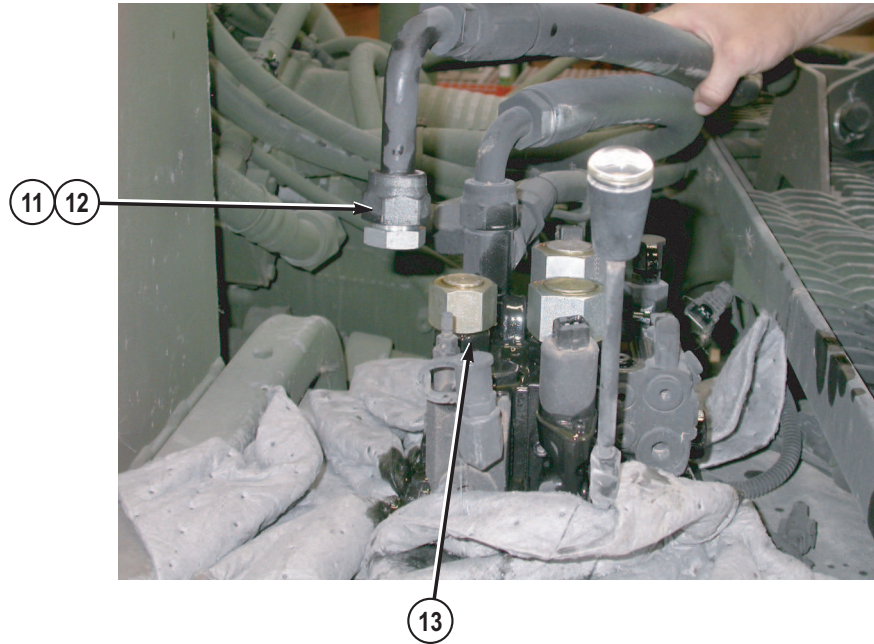
Figure 11.

7. Lightly lubricate preformed packing (15) with clean oil and install preformed packing (15) and hose 2883 (14) on fitting (16).



Figure 12.

8. Lightly lubricate preformed packing (12) with clean oil and install preformed packing (12) and hose 2899 (11) on fitting (13).

*Figure 13.*

9. Lightly lubricate preformed packing (9) with clean oil and install preformed packing (9) and hose 2900 (8) on fitting (10).

*Figure 14.*

10. Lightly lubricate preformed packing (6) with clean oil and install preformed packing (6) and hose 2901 (5) on fitting (7).



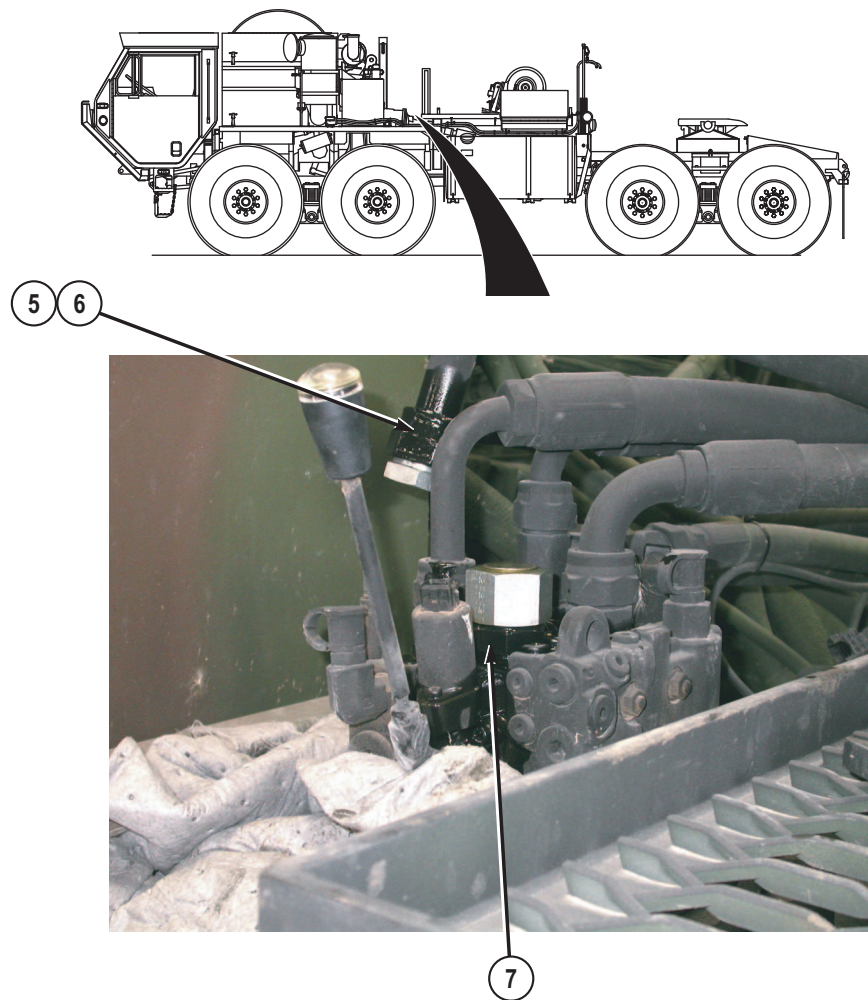


Figure 15.

### NOTE

Install cable ties as required.

11. Connect connector SV11 (3) to pay out coil (4).

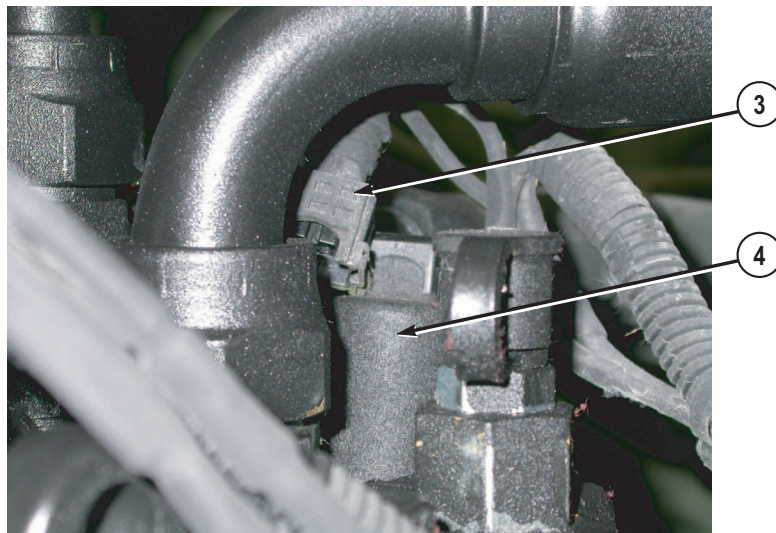
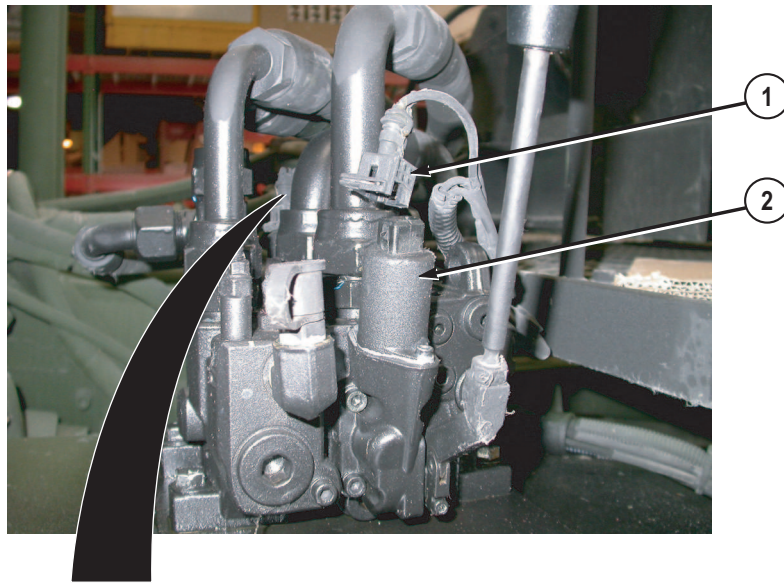
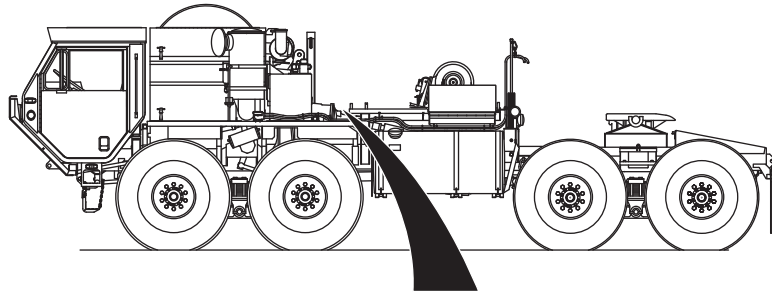


Figure 16.

12. Connect connector SV10 (1) to reel in coil (2).

**END OF TASK**

**FOLLOW-ON MAINTENANCE**

1. Connect batteries (refer to TM 9-2320-315-14&P).
2. Check hydraulic fluid level (refer to TM 9-2320-315-14&P).
3. Start engine (refer to TM 9-2320-279-10).
4. Check hydraulic system for leaks (refer to TM 9-2320-315-14&P).
5. Check operation of heavy-duty winch. (WP 0015)
6. Shut OFF engine (refer to TM 9-2320-279-10).
7. Remove wheel chocks (refer to TM 9-2320-279-10).

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**EQUALIZER BEAM ASSEMBLY (REAR TANDEM) REMOVAL/REPAIR/INSTALLATION**

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**INITIAL SETUP:**

Not Applicable

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**NOTE**

For removal/repair/installation of the equalizer beam assembly, refer to "Equalizer Beam Assembly (Rear Tandem) Removal/Repair/Installation" in TM 9-2320-315-14&P. Substitute the following Step for Step (6) in the "Installation" section.

1. Lubricate threads of two screws (7) with oil and install four washers (8), two beam end adapters (6), screws, and nuts (9) in each equalizer beam (1). Tighten nuts to 445 to 495 lb-ft (603 to 671 N·m).

**END OF TASK**

**END OF WORK PACKAGE**



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## FIELD MAINTENANCE HEAVY-DUTY WINCH CABLE REMOVAL/INSTALLATION

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### INITIAL SETUP:

#### Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

Wheels chocked (refer to TM 9-2320-279-10).  
Heavy-duty winch cable payed out. (WP 0015)

#### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

#### References

Parts Manual (Fig. 21)  
Parts Manual (Fig. 22)

#### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).

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### REMOVAL

#### WARNING



- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

1. Remove two screws (1) and clamp block (2) from winch drum hub (3).

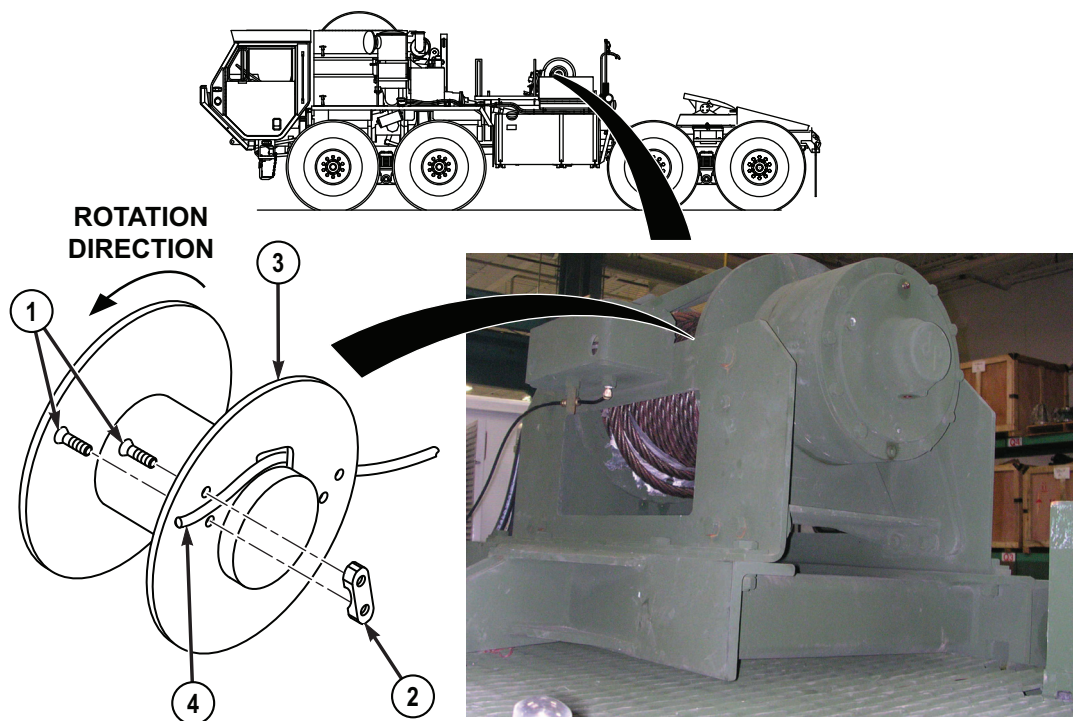


Figure 1.

2. Remove cable (4) from winch drum hub (3).

#### END OF TASK

#### INSTALLATION

1. With the aid of an assistant, pull cable (4) through hole in winch drum hub (3).



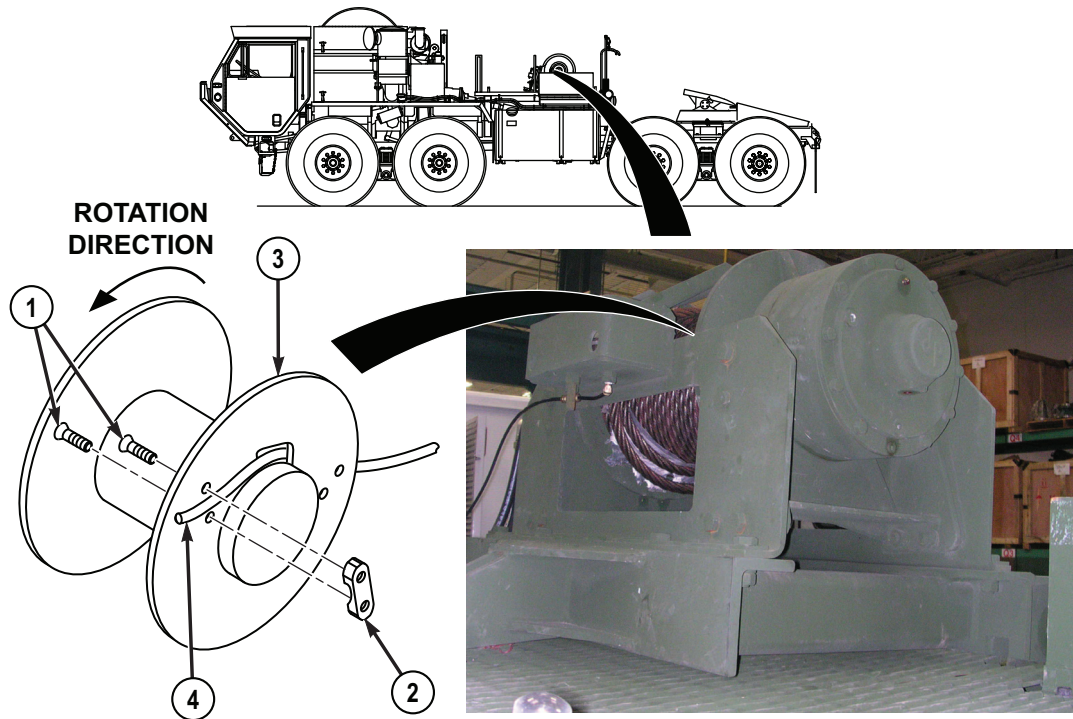


Figure 2.

### CAUTION

Do not allow cable end to extend past edge of winch drum. Failure to comply may result in damage to equipment.

### NOTE

As one screw is tightened, the other will loosen slightly until clamp block is seated around cable.

2. Place clamp block (2) over cable (4) and install two screws (1). Tighten screws alternately until both are tight.

### NOTE

If new cable was installed, proceed to Step (3) and New cable Break-In section, otherwise proceed to Follow-On Maintenance.

3. Break-in new cable.

### END OF TASK

**NEW CABLE BREAK-IN****NOTE**

If a new cable was installed, it must be wrapped on the drum under tension using another vehicle as a load source. The load source vehicle must have a driver at the controls, who is in full control of the vehicle (brakes and steering) at all times. The winching vehicle and the load source vehicle must be on level ground. The load source vehicle must be directly behind the winching vehicle.

1. Position the load source vehicle.
2. Connect heavy-duty winch cable to load source vehicle.

**CAUTION**

All winching performed in this procedure must be with the engine of the winching vehicle at low idle. Failure to do so could result in damage to equipment.

3. With the aid of an assistant, reel in heavy-duty winch cable (WP 0015), and keep cable suspended slightly above the ground.
4. Disconnect heavy-duty winch cable from the load source vehicle.
5. Repeat Steps (1) through (4) three times or until cable is tight to drum.

**END OF TASK****FOLLOW-ON MAINTENANCE**

1. Reel in heavy-duty winch cable. (WP 0015)
2. Remove wheel chocks (refer to TM 9-2320-279-10).

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE  
HEAVY-DUTY WINCH GEARCASE DRAIN/FILL**

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**INITIAL SETUP:****Tools and Special Tools**

Pan, Drain, 4 Gallon (WP 0081, Table 2, Item 3)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)

**References**

Parts Manual (Fig. 22)

**Equipment Condition**

Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).

**Materials/Parts**

Oil, Lubricating, Gear GO 85W/140 (MIL-L-2105)  
(WP 0083, Table 1, Item 23, 24)  
Packing, Preformed (WP 0084, Table 1, Item 21)  
Qty: 4

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**DRAIN****NOTE**

Position drain pan under winch gearcase drain.

1. Remove fitting (1) and preformed packing (2) from check/fill port (3) of brake-end gearcase (4). Discard preformed packing.

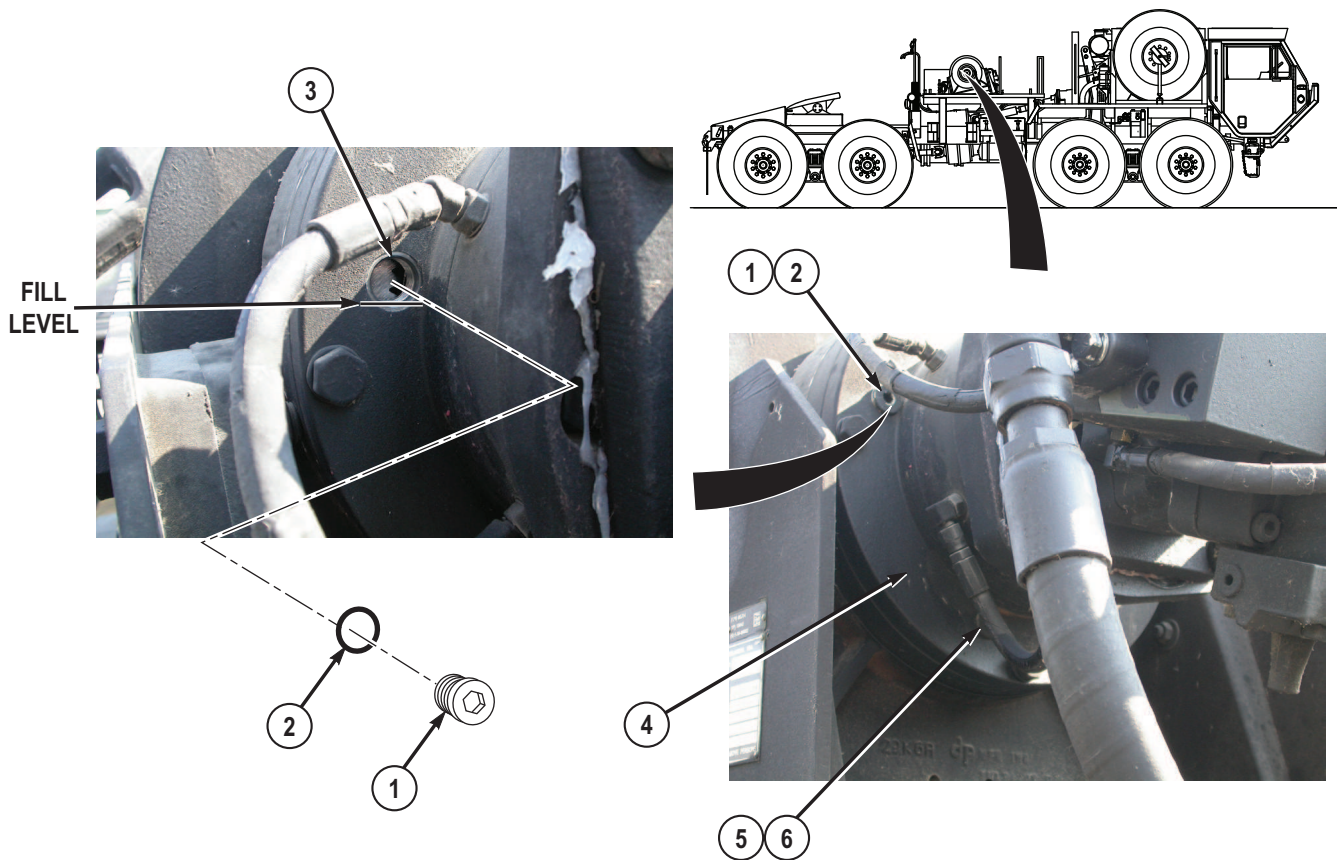


Figure 1.

2. Remove fitting (5) and preformed packing (6) from brake-end gearcase (4) and allow gear oil to drain into pan. Discard preformed packing.
3. Remove fitting (7) and preformed packing (8) from check/fill port (9) of clutch-end gearcase (10). Discard preformed packing.

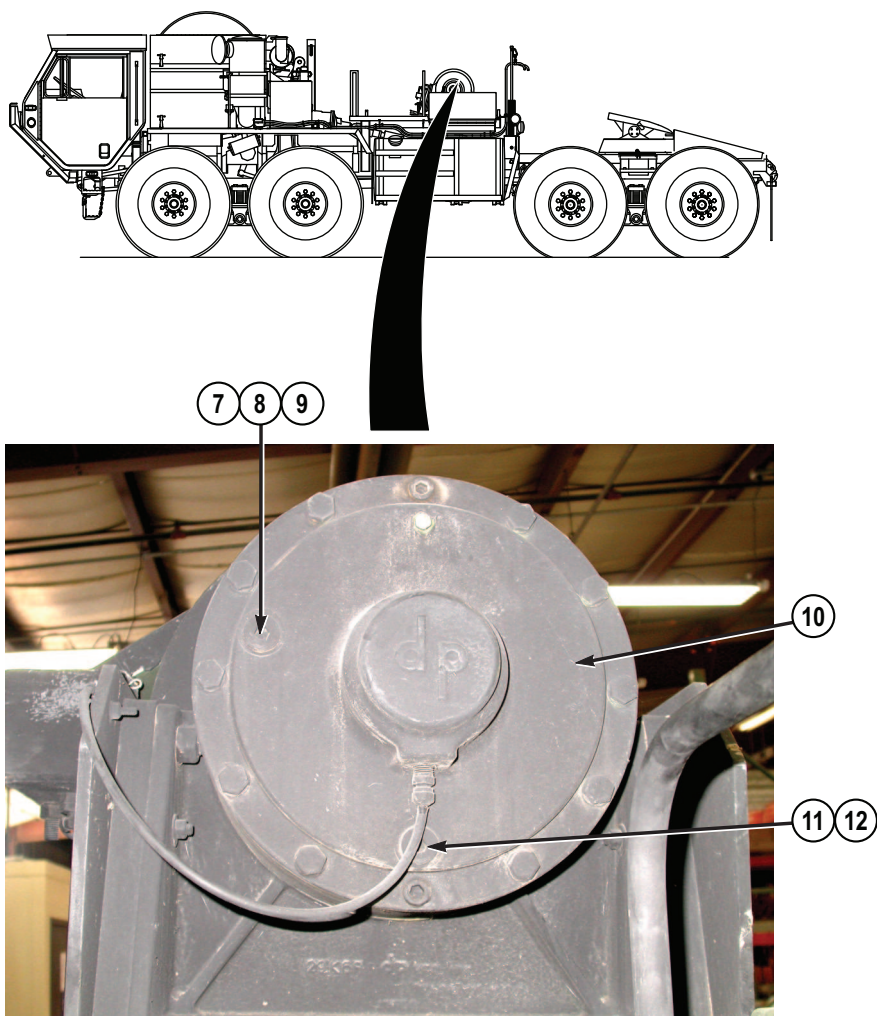


Figure 2.

4. Remove fitting (11) and preformed packing (12) from clutch-end gearcase (10) and allow gear oil to drain into pan. Discard preformed packing.

#### END OF TASK

#### FILL

1. Lightly lubricate preformed packing (12) with clean oil and install preformed packing (12) and fitting (11) on clutch-end gearcase (10).

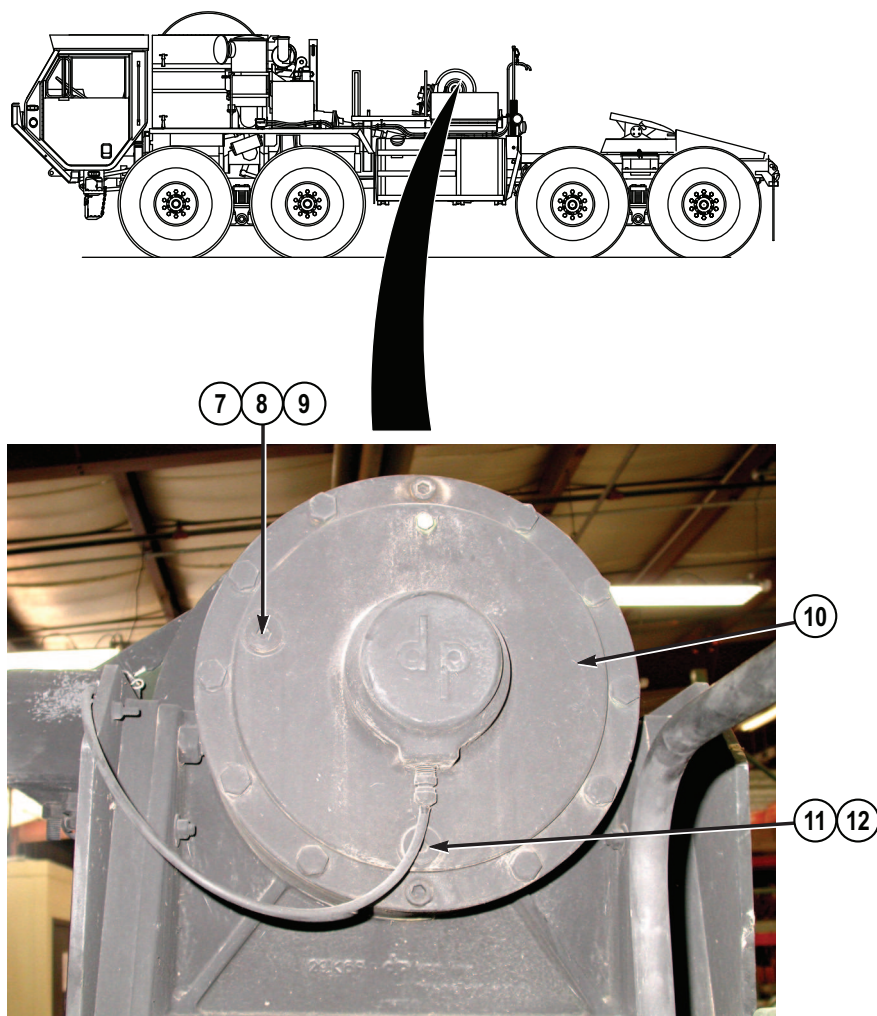


Figure 3.

2. Fill gearcase with gear oil to level of check/fill port (9). (WP 0041)
3. Lightly lubricate preformed packing (8) with clean oil and install preformed packing (8) and fitting (7) in check/fill port (9) of clutch-end gearcase (10).
4. Lightly lubricate preformed packing (6) with clean oil and install preformed packing (6) and fitting (5) on brake-end gearcase (4).



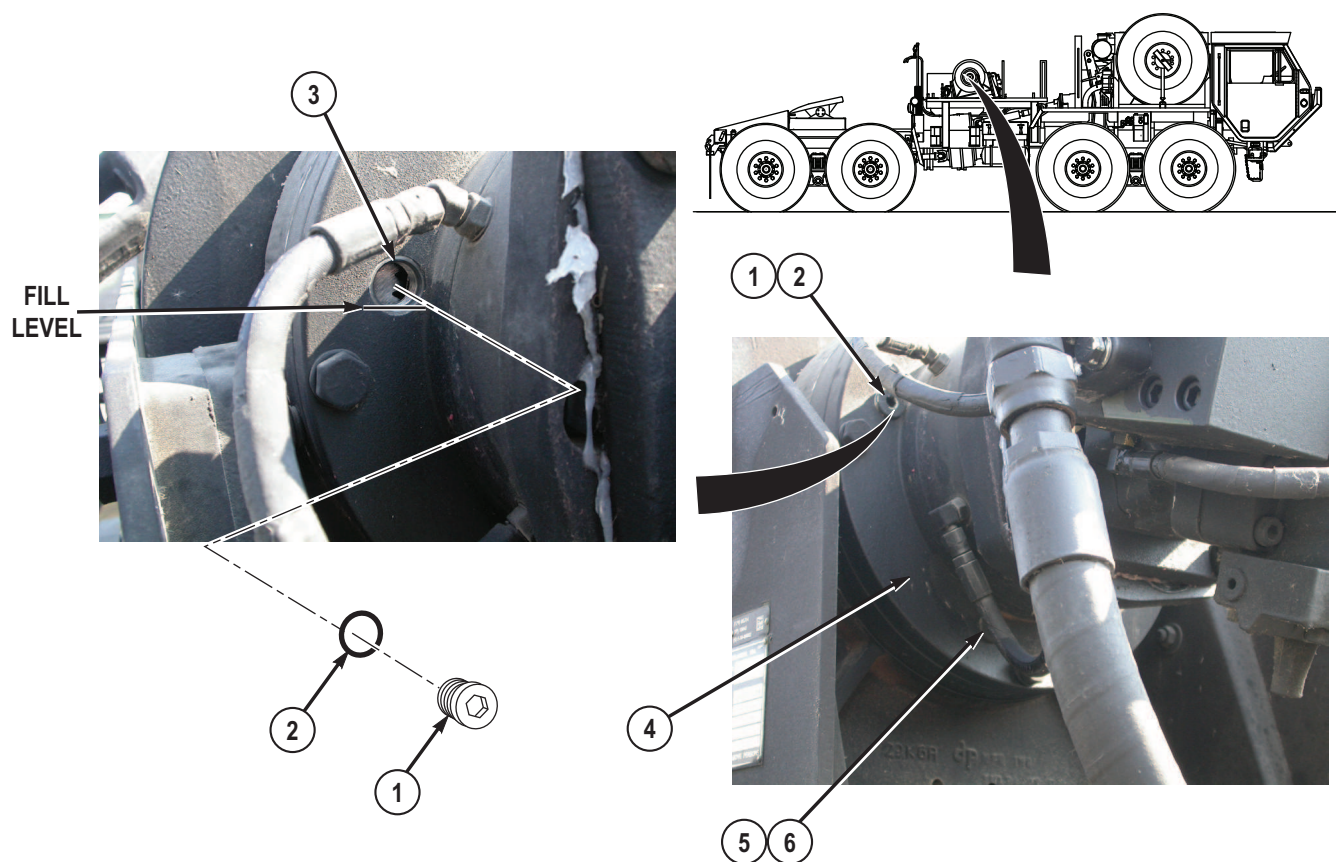


Figure 4.

5. Fill gearcase with gear oil to level of check/fill port (3). (WP 0041)
6. Lightly lubricate preformed packing (2) with clean oil and install preformed packing (2) and fitting (1) in check/fill port (3) of brake-end gearcase (4).

#### END OF TASK

#### FOLLOW-ON MAINTENANCE

1. Remove wheel chocks (refer to TM 9-2320-279-10).

#### END OF WORK PACKAGE





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## FIELD MAINTENANCE HEAVY-DUTY WINCH REMOVAL/INSTALLATION

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### INITIAL SETUP:

#### Tools and Special Tools

Cap and Plug Set (WP 0081, Table 2, Item 1)  
Lifting Device, Minimum Capacity 2000 lbs (908 kg)  
Pan, Drain, 4 Gallon (WP 0081, Table 2, Item 3)  
Tool Kit, General Mechanic's: Automotive (WP 0081, Table 2, Item 5)  
Wrench, Adjustable, 18 inch (WP 0081, Table 2, Item 6)  
Goggles, Industrial (WP 0081, Table 2, Item 7)

Packing, Preformed (WP 0084, Table 1, Item 20)  
Qty: 1  
Packing, Preformed (WP 0084, Table 1, Item 28)  
Qty: 2

#### Personnel Required

Wheeled Vehicle Mechanic 63B (2)

#### References

Parts Manual (Fig. 8)  
Parts Manual (Fig. 21)  
Parts Manual (Fig. 27)

#### Materials/Parts

Cable Ties, Plastic (WP 0083, Table 1, Item 1)  
Oil, Lubricating (WP 0083, Table 1, Item 25, 26, 27, 28)  
Tags, Identification (WP 0083, Table 1, Item 30)  
Locknut (WP 0084, Table 1, Item 9) Qty: 2

#### Equipment Condition

Engine OFF (refer to TM 9-2320-279-10).  
Wheels chocked (refer to TM 9-2320-279-10).  
Air system drained (refer to TM 9-2320-315-14&P).

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### REMOVAL

#### NOTE

- Tag and mark air lines prior to removal to ensure proper installation.
- Note position and remove cushion clips and cable ties as required.

1. Remove air line 2706 (1) from fitting (2).

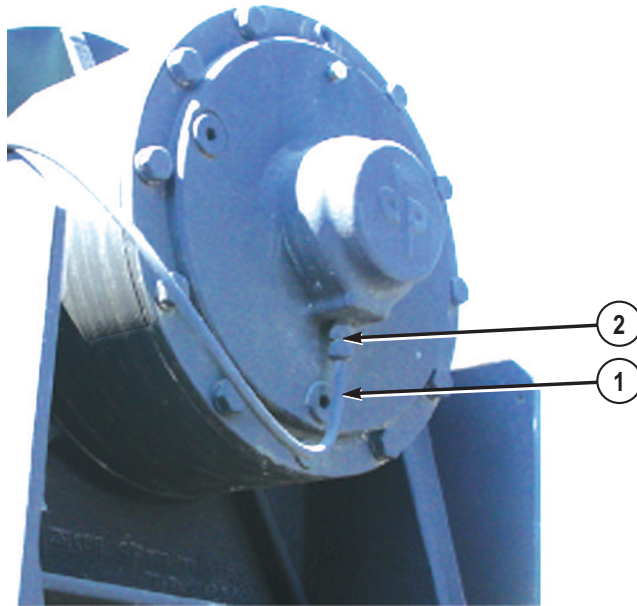
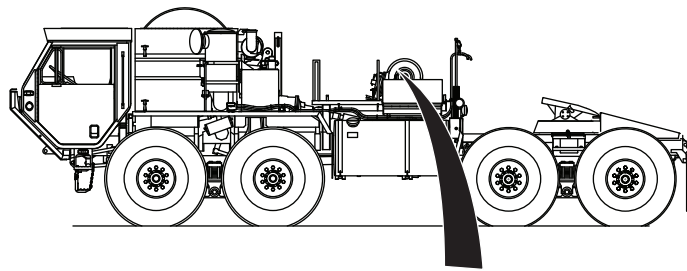


Figure 1.

2. Remove locknut (3), screw (4), cushion clip (5), and air line 2706 (1) from winch frame (6). Discard locknut.

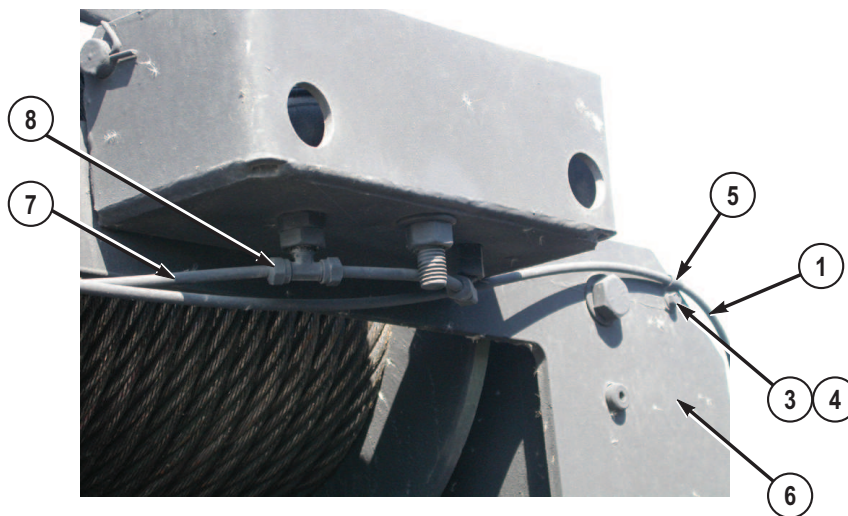


Figure 2.

3. Remove air line 2231 (7) from fitting (8).
4. Remove locknut (9), screw (10), cushion clip (11), and air lines 2706 (1) and 2231 (7) from winch frame (6). Discard locknut.

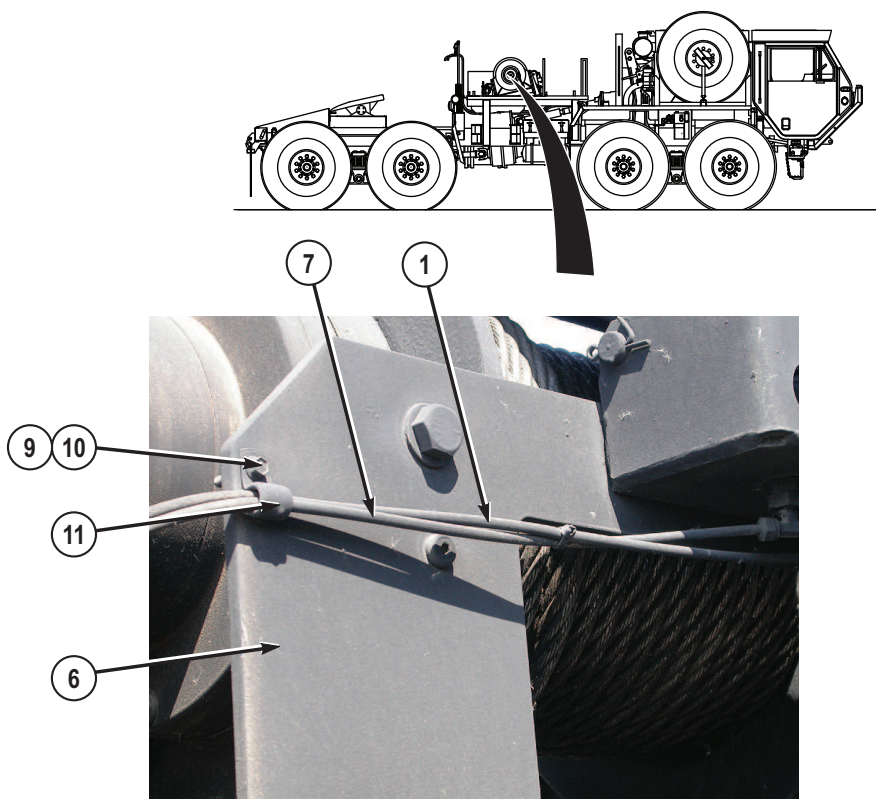
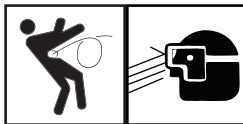


Figure 3.

### WARNING



- Hydraulic system pressure can exceed 3,000 psi (20 684 kPa). A high-pressure hydraulic system can pierce a body. Ensure engine is OFF prior to disconnecting hydraulic hoses. Failure to comply may result in injury or death to personnel.
- Never disconnect any high-pressure hydraulic hose, line or component without first dropping pressure to zero. Failure to comply may result in injury or death to personnel.
- Wear proper eye protection when working with or performing checks on high-pressure hydraulic systems. Failure to comply may result in injury or death to personnel.

**WARNING**

Allow hydraulic fluid to cool prior to performing this task. Failure to comply may result in injury or death to personnel.

**WARNING**

Prolonged contact with lubricating oil may cause skin rash. Immediately wash skin and clothing that come in contact with lubricating oil thoroughly and remove saturated clothing. Keep area well-ventilated to keep fumes at a minimum. Failure to comply may result in injury or death to personnel.

**NOTE**

- Position drain pan under hoses being removed.
- Tag and mark hoses prior to removal to ensure proper installation.
- Cap and plug hoses and fittings upon removal.

5. Remove hose 2918 (12) and preformed packing (13) from fitting (14). Discard preformed packing.

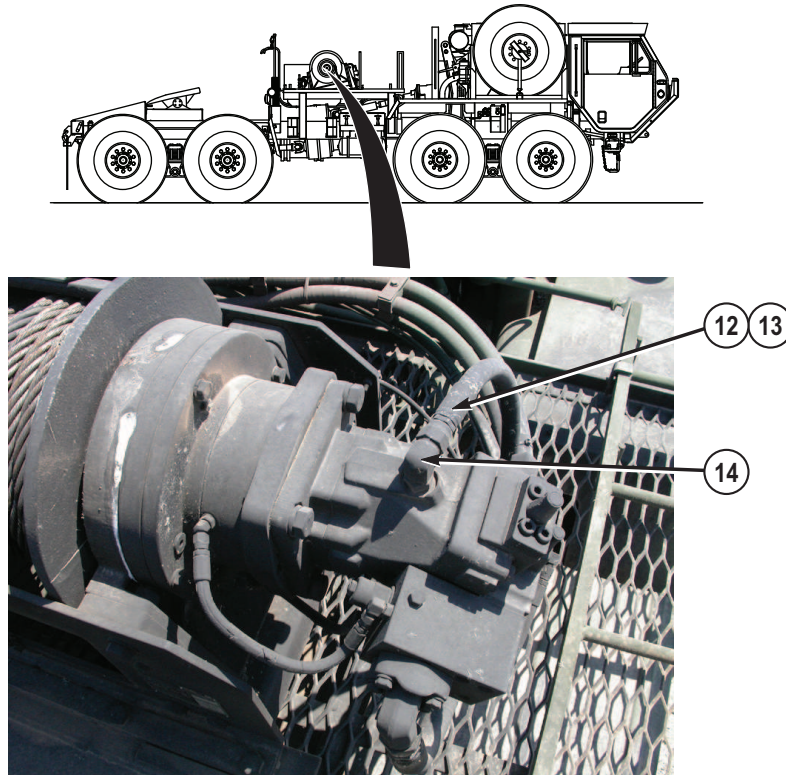


Figure 4.

6. Remove hose 2900 (15) and preformed packing (16) from fitting (17). Discard preformed packing.



Figure 5.

7. Remove hose 2901 (18) and preformed packing (19) from fitting (20). Discard preformed packing.





Figure 6.

### WARNING



Winch assembly without cable installed weighs 1,552 lbs (705 kg). Do not attempt to lift or move winch assembly, or remove and install mounting hardware, without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel and damage to equipment.

### WARNING



Keep out from under heavy parts. Ensure lifting device is around center of balance of part being moved. Failure to comply may result in injury or death to personnel.

### CAUTION

Ensure all hoses and air lines are positioned clear of heavy-duty winch before removal. Failure to comply may result in damage to equipment.

8. With the aid of an assistant, attach lifting device to winch assembly (21).

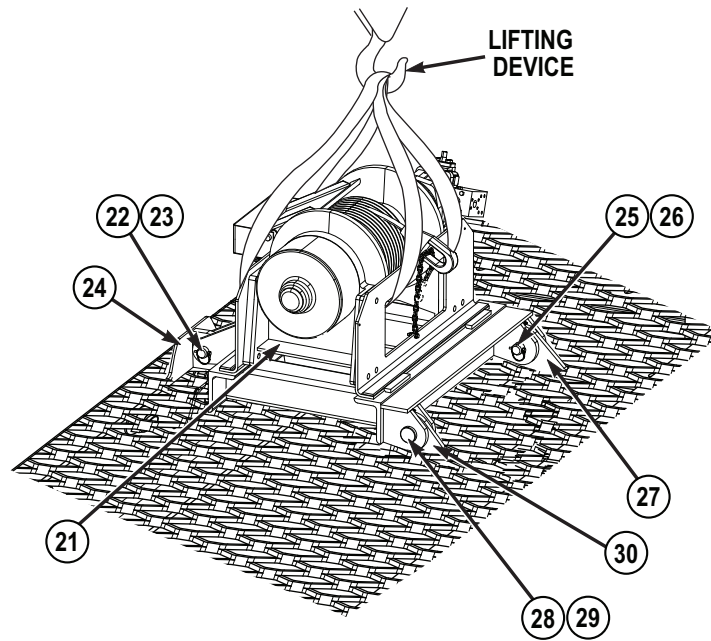


Figure 7.

9. With the aid of an assistant and lifting device, remove quick release pin (22) and pin (23) from front winch mount (24).
10. With the aid of an assistant and lifting device, remove quick release pin (25) and pin (26) from rear winch mount (27).
11. With the aid of an assistant and lifting device, remove quick release pin (28) and pin (29) from rear winch mount (30).
12. With the aid of an assistant and lifting device, remove winch assembly (21) from vehicle.
13. With the aid of an assistant, remove lifting device from winch assembly (21).

## END OF TASK

## INSTALLATION

### WARNING



Winch assembly without cable installed weighs 1,552 lbs (705 kg). Do not attempt to lift or move winch assembly, or remove and install mounting hardware, without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel and damage to equipment.

**WARNING**

Keep out from under heavy parts. Ensure lifting device is around center of balance of part being moved. Failure to comply may result in injury or death to personnel.

**CAUTION**

Ensure all hoses and air lines are positioned clear of heavy-duty winch before installation. Failure to comply may result in damage to equipment.

1. With the aid of an assistant, attach lifting device to winch assembly (21).

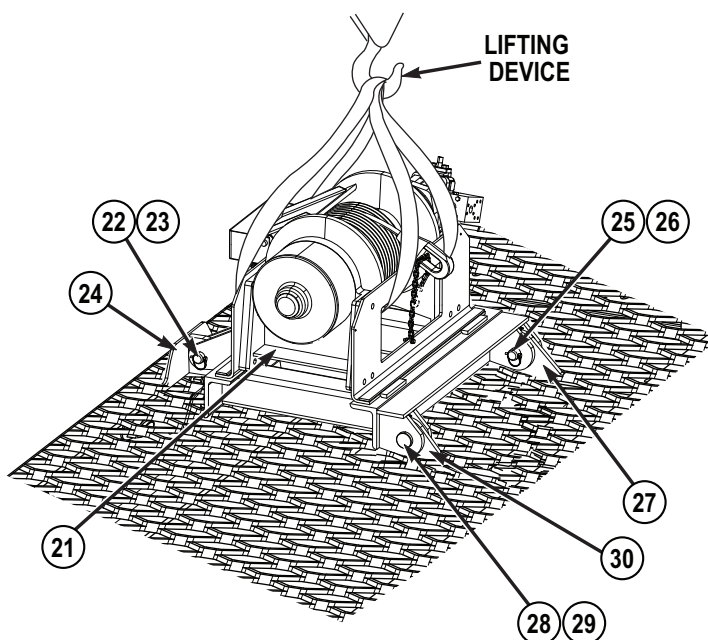


Figure 8.

2. With the aid of an assistant and lifting device, position winch assembly (21) on vehicle.

**NOTE**

Position pins so quick release pins can be easily installed and removed.

3. With the aid of an assistant and lifting device, install pin (29) and quick release pin (28) on rear winch mount (30).
4. With the aid of an assistant and lifting device, install pin (26) and quick release pins (25) on rear winch mount (27).



5. With the aid of an assistant and lifting device, install pin (23), and quick release pin (22) on front winch mount (24).
6. With the aid of an assistant, remove lifting device from winch assembly (21).

### NOTE

- Install cushion clips as noted prior to removal.
- Install cable ties as required.

7. Lightly lubricate preformed packing (19) with clean oil and install preformed packing (19) and hose 2901 (18) on fitting (20).



Figure 9.

8. Lightly lubricate preformed packing (16) with clean oil and install preformed packing (16) and hose 2900 (15) on fitting (17).

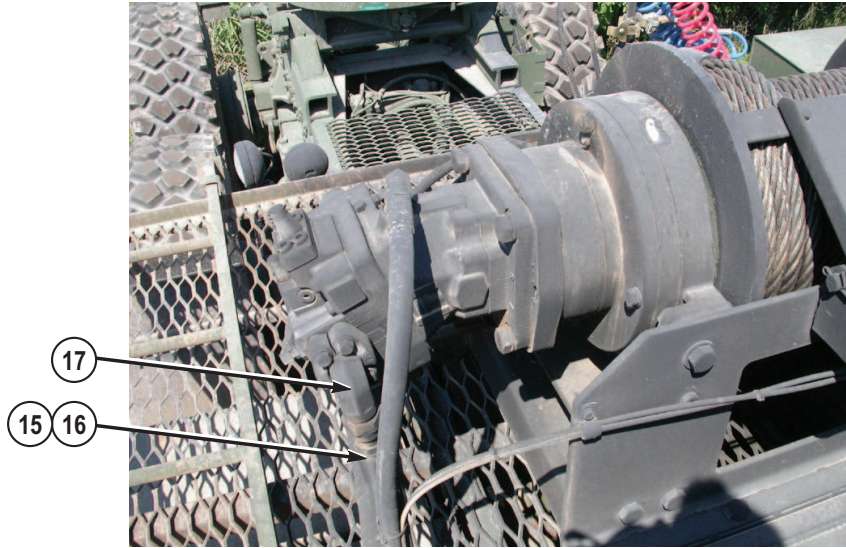


Figure 10.

9. Lightly lubricate preformed packing (13) with clean oil and install preformed packing (13) and hose 2918 (12) on fitting (14).

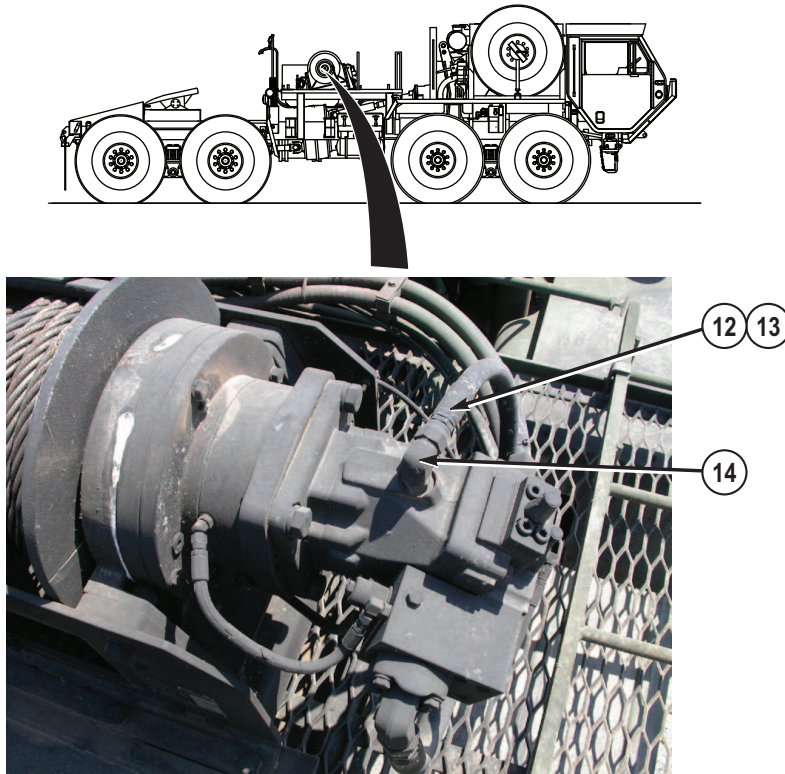


Figure 11.

10. Install air lines 2706 (1), 2231 (7), and cushion clip (11) on winch frame (6) with screw (10) and locknut (9).

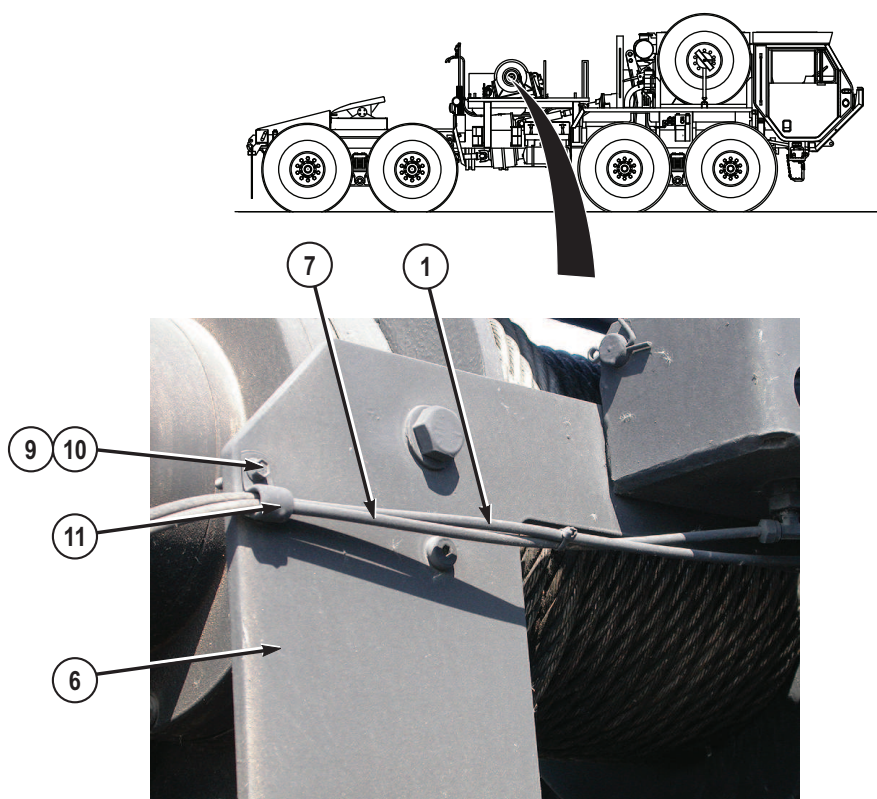


Figure 12.

11. Install air line 2231 (7) on fitting (8).

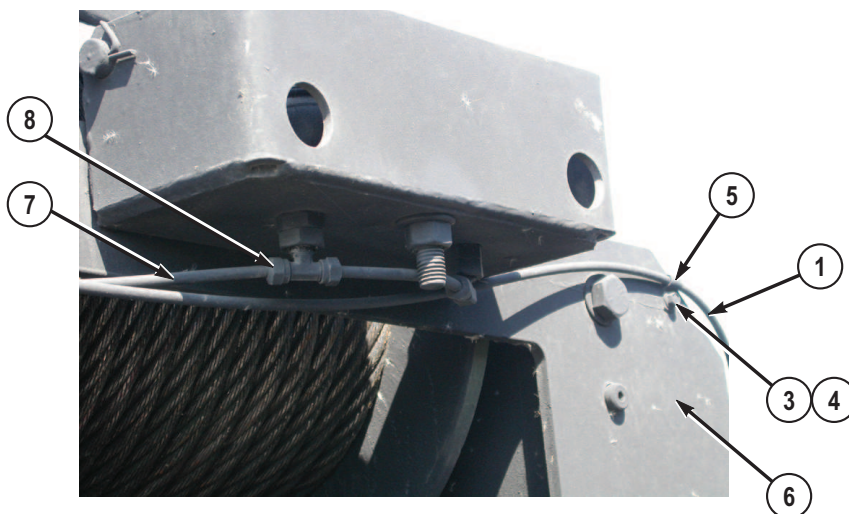


Figure 13.

12. Install air line 2706 (1) and cushion clip (5) on winch frame (6) with screw (4) and locknut (3).

13. Install air line 2706 (1) on fitting (2).



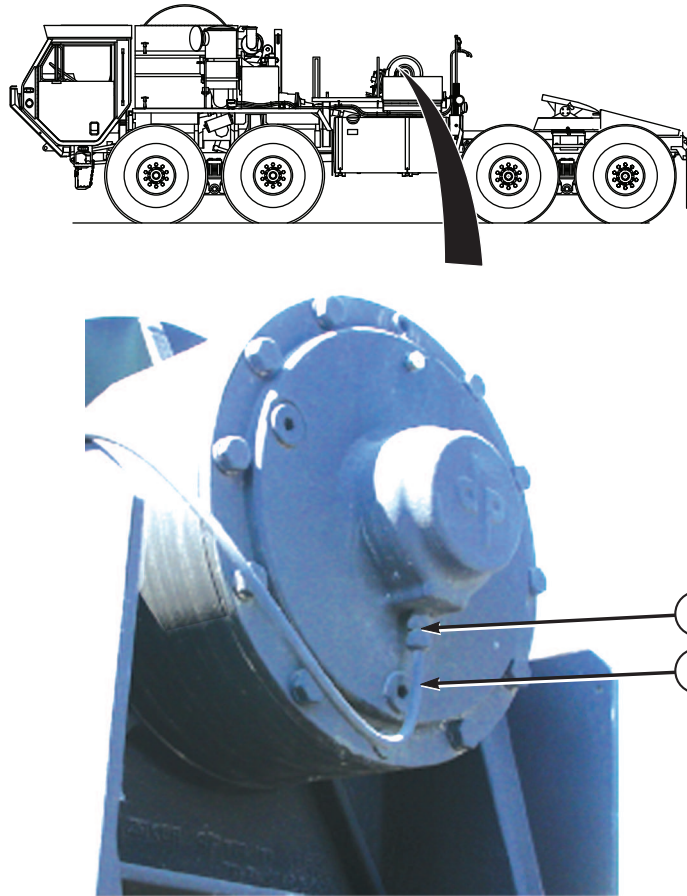


Figure 14.

## END OF TASK

### FOLLOW-ON MAINTENANCE

1. Check hydraulic fluid level (refer to TM 9-2320-315-14&P).
2. Start engine and build air pressure to 120 to 125 psi (827 to 862 kPa) (refer to TM 9-2320-279-10).
3. Check hydraulic system for leaks (refer to TM 9-2320-315-14&P).
4. Check air system for leaks (refer to TM 9-2320-315-14&P).
5. Check operation of heavy-duty winch. (WP 0015)
6. Shut OFF engine (refer to TM 9-2320-279-10).
7. Remove wheel chocks (refer to TM 9-2320-279-10).

## END OF WORK PACKAGE

## CHAPTER 6

### PARTS INFORMATION



## FIELD MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST INTRODUCTION

### SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of field and sustainment maintenance of the HEMTT vehicle. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

### GENERAL

In addition to Introduction work package, this RPSTL is divided into the following work packages.

1. **Repair Parts List Work Packages.** Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed separately in their own functional group and work package. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.
2. **Special Tools List Work Packages.** Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue [BOI] information in the DESCRIPTION column). Tools that are components of common tool sets and/or Class VII are not listed.

### EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGES

ITEM NO. (Column 1). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column 2). The (SMR) code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout:

**Table 1. SMR Code Explanation.**

Source Code	Maintenance Code		Recoverability Code
XX	XX		XX
1st two positions: How to get an item.	3rd position: Who can install, replace, or use the item.	4th position: Who can do complete repair* on the item.	5th position: Who determines disposition action on unserviceable items.
*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.			

Source Code. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanation of source codes follow:

**Table 2. Source Code 1st and 2nd Positions.**

Source Code	Application/Explanation
PA PB PC PD PE PF PG PH PR PZ	<p>Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the third position of the SMR code.</p> <p style="text-align: center;"><b>NOTE</b></p> <p style="text-align: center;">Items coded PC are subject to deterioration.</p>
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.
MO-Made at field (service)/AMC level MF-Made at field/ABS level MH-Made at below depot sustainment level ML-Made at SRA/TASMG MD-Made at depot level MG-Navy only	Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material which is identified by the P/N in the DESCRIPTION column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the third position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.
AO-Assembled by field (service)/AMC level AF-Assembled by field/ASB level AH-Assembled by below depot sustainment level AL-Assembled by SRA/TASMG AD-Assembled by depot AG-Navy only	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the third position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
XA	Do not requisition an "XA" coded item. Order its next higher assembly (refer to NOTE below).
XB	If an item is not available from salvage, order it using the CAGEC and P/N.
XC	Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's P/N.
XD	Item is not stocked. Order an XD-coded item through local purchase or normal supply chan-



**Table 2. Source Code 1st and 2nd Positions. - Continued**

Source Code	Application/Explanation
	nels using the CAGEC and P/N given, if no NSN is available.
<p style="text-align: center;"><b>NOTE</b></p> <p>Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.</p>	

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance:

**Table 3. Maintenance Code Third Position.**

Maintenance Code	Application/Explanation
O*	Field (Service) level/AMC maintenance can remove, replace, and use the item.
F	Field/ASB maintenance can remove, replace, and use the item.
H	Below Depot Sustainment maintenance can remove, replace, and use the items.
L	Specialized repair activity/TASMG can remove, replace, and use the item.
G	Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only).
K	Contractor facility can remove, replace, and use the item.
Z	Item is not authorized to be removed, replaced, or used at any maintenance level.
D	Depot can remove, replace, and use the item.

**Table 3. Maintenance Code Third Position. - Continued**

Maintenance Code	Application/Explanation
<p style="text-align: center;"><b>NOTE</b></p> <p>Army may use C in the third position. However, for joint service publications, Army will use O.</p>	

Fourth Position. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

**NOTE**

Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

**Table 4. Maintenance Code Fourth Position.**

Maintenance Code	Application/Explanation
O	Field (Service) level/AMC is the lowest level that can do complete repair of the item.
F	Field/ASB is the lowest level that can do complete repair of the item.
H	Below Depot Sustainment is the lowest level that can do complete repair of the item.
L	Specialized repair activity/TASMG is the lowest level that can do complete repair of the item.
D	Depot is the lowest level that can do complete repair of the item.
G	Both afloat and ashore intermediate levels are capable of complete repair of item (Navy only).
K	Complete repair is done at contractor facility.
Z	Nonrepairable. No repair is authorized.
B	No repair is authorized. No parts or special tools are authorized for the maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

**Table 5. Recoverability Code Fifth Position.**

<b>Recoverability Code</b>	<b>Application/Explanation</b>
Z	Nonrepairable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of SMR Code.
O	Reparable item. When uneconomically repairable, condemn and dispose of the item at service level.
F	Reparable item. When uneconomically repairable, condemn and dispose of the item at field level.
H	Reparable item. When uneconomically repairable, condemn and dispose of the item at the below depot sustainment level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA)/TASMG.
A	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
G	Field level repairable item. Condemn and dispose at either afloat or ashore intermediate levels (Navy only).
K	Reparable item. Condemnation and disposal to be performed at contractor facility.

NSN (Column 3). The NSN for the item is listed in this column.

CAGEC (Column 4). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column 5). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

**NOTE**

When you use an NSN to requisition an item, the item you receive may have a different P/N from the number listed.

DESCRIPTION (Column 6). This column includes the following information:

1. The Federal item name, and when required, a minimum description to identify the item.
2. P/Ns of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.
3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.
4. The statement END OF FIGURE appears just below the last item description in Column 6 for a given figure in both the repair parts list and special tools list work packages.

USABLE ON CODE (UOC) (Column 7). When applicable (see paragraph 1, Special Information, below).

UPA (Column 8). The UPA (units per assembly) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

**SPECIAL INFORMATION**

UOC. The (UOC) appears in Column 7. Usable on codes are shown as "UOC:..." in Column 7 (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Identification of the UOCs used in this RPSTL are:

**Table 6. Usable On Codes.**

Code	Used On
LET	M983A2LET Tractor

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded as manufactured or fabricated are found in TM 9-2320-315-14&P.

Associated Publications. The publication(s) listed below pertains to the Light Equipment Transporter:

**Table 7. Associated Publications.**

Publication	Short Title
TM 9-2320-279-Series	Heavy Expanded Mobility Tactical Trucks Manual
TM 9-2320-315-14&P	Heavy Expanded Mobility Tactical Trucks Interactive Electronic Technical Manual

**HOW TO LOCATE REPAIR PARTS**

1. When NSNs or P/Ns Are Not Known.

First. Using the table of contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number(s).

Fourth. Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE  
REPAIR PARTS AND SPECIAL TOOLS LIST**

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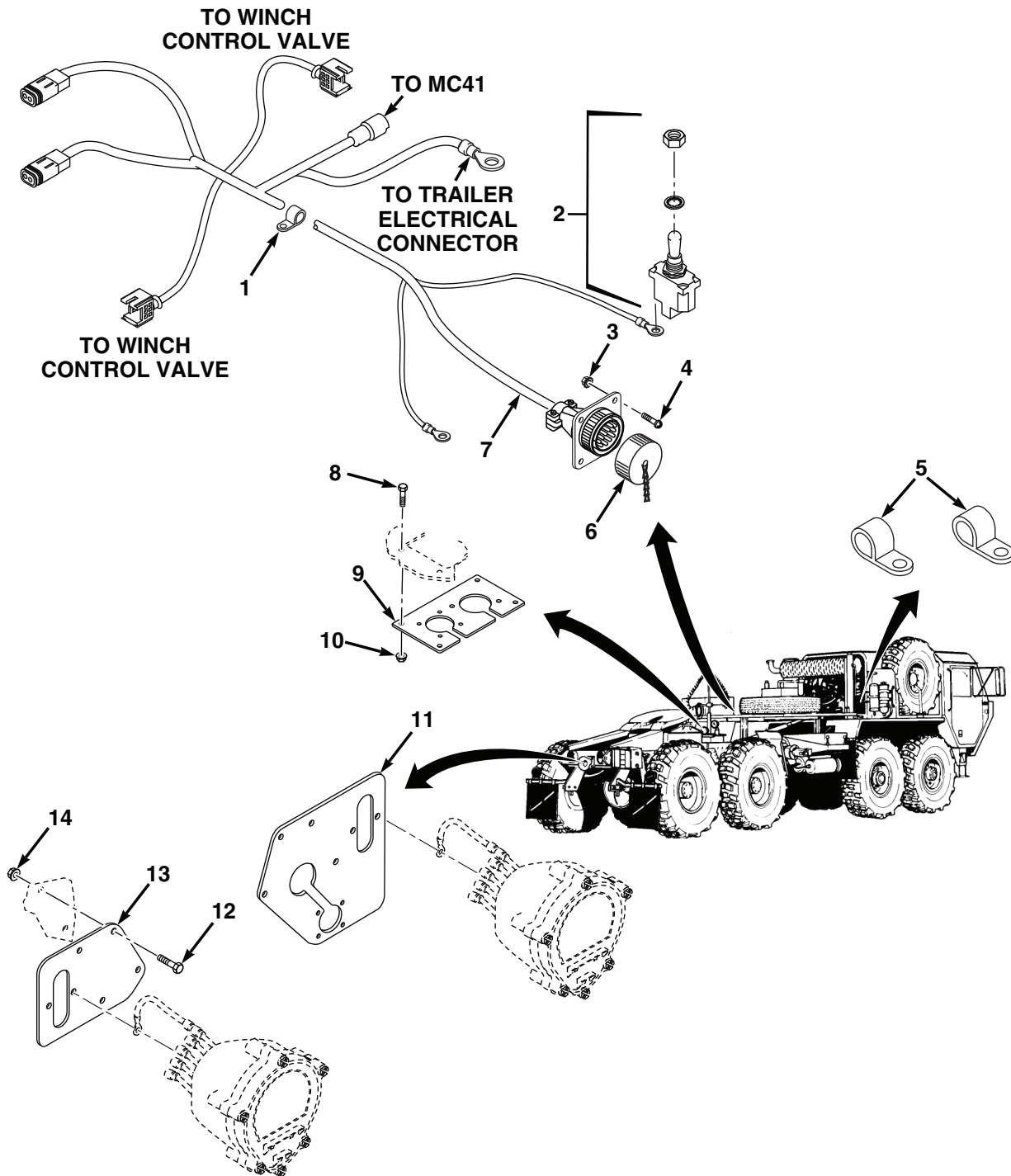


Figure 1. CHASSIS ELECTRIC



(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 0613 HULL OR CHASSIS WIRING HARNESS</b>						
<b>FIG. 1 CHASSIS ELECTRIC</b>						
1	PAFZZ	5340-00-404-4098	75272	COV-1713	CLAMP,LOOP	3
2	PAFZZ	5930-00-683-1628	96906	MS24523-22	SWITCH,TOGGLE	1
3	PAFZZ	5310-01-352-7732	45152	1571870	NUT,SELF-LOCKING,AS, 6-32 G2 ZC	4
4	PAFZZ	5305-01-194-8469	45152	60697AX	SCREW,MACHINE, 6-32X.50 NS ZC	4
5	PAFZZ	5340-00-224-1204	45152	2288HX	CLAMP,LOOP	2
6	PAFZZ	0000-00-000-0000	02660	9760-918	CAP AND CHAIN ASSEM	1
7	PAFZZ	0000-00-000-0000	45152	3690466	WIRE HARNESS,WINCH	1
8	PAFZZ	5305-01-344-5532	45152	1846HX1	SCREW,CAP,HEXAGON H, . 31-18X1.00 G5 ZY	4
9	PAFZZ	2590-01-507-4607	45152	3379739	BRACKET,MOUNTING	1
10	PAFZZ	5310-01-340-5671	45152	1333510	NUT,SELF-LOCKING,EX, .31-18 G5 ZY	4
11	PAFZZ	0000-00-000-0000	45152	3595870	BRACKET,TAILLIGHT, RIGHT HAND	1
12	PAFZZ	5305-01-304-9375	45152	177FX1	SCREW,CAP,HEXAGON H	4
13	PAFZZ	0000-00-000-0000	45152	3595869	BRACKET,TAILLIGHT, LEFT HAND	1
14	PAFZZ	5310-01-288-1116	45152	1437220	NUT,SELF-LOCKING,EX, .38-16 G5 ZY	4

**END OF FIGURE**

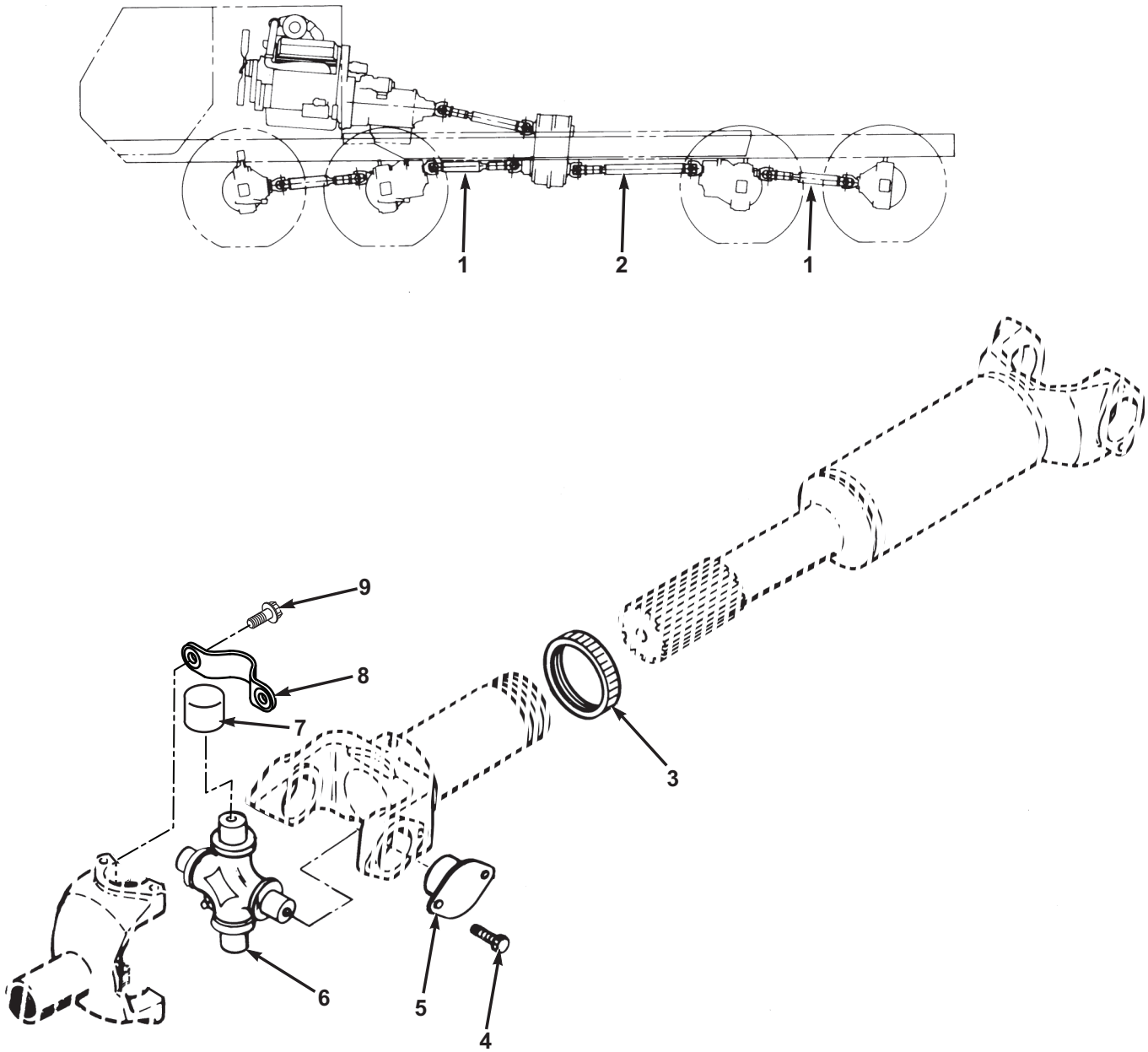


Figure 2. PROPSHAFT INSTALLATION

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 0900 PROPELLER SHAFTS</b>						
<b>FIG. 2 PROPSHAFT INSTALLATION</b>						
1	PAFZZ	2520-01-460-3308	72447	906354-1123	PROPELLER SHAFT WIT	2
2	PAFZZ	0000-00-000-0000	95019	907408-1	DRIVE SHAFT, TRANSFER CASE TO #3 AXLE	1
3	PAFZZ	5330-01-292-9536	72447	6.5-86-38	. SEAL,PLAIN	1
4	KFFZZ	0000-00-000-0000	72447	6.5-73-209	. BOLT	4
5	PAFZZ	2520-01-541-1539	6B170	6.5-6-158X	. UNIVERSAL JOINT,CAP	1
6	KFFZZ	0000-00-000-0000	72447	6.5-5-138X	. UNIVERSAL JOINT	1
7	KFFZZ	0000-00-000-0000	6B170	6.5-6-208X	. UNIVERSAL JOINT,CAP	1
8	PAFZZ	5340-01-292-3904	72447	6.5-70-89	STRAP,RETAINING	4
9	PAFZZ	5305-01-421-4218	95019	5-73-709	SCREW,CAP,HEXAGON H, T-CASE TO # 3 AXLE	8
9	PAFZZ	5305-01-421-4222	95019	6-73-209	SCREW,CAP,HEX HD, #2 AXLE TO T-CASE AND #3 TO #4 AXLE	16

**END OF FIGURE**

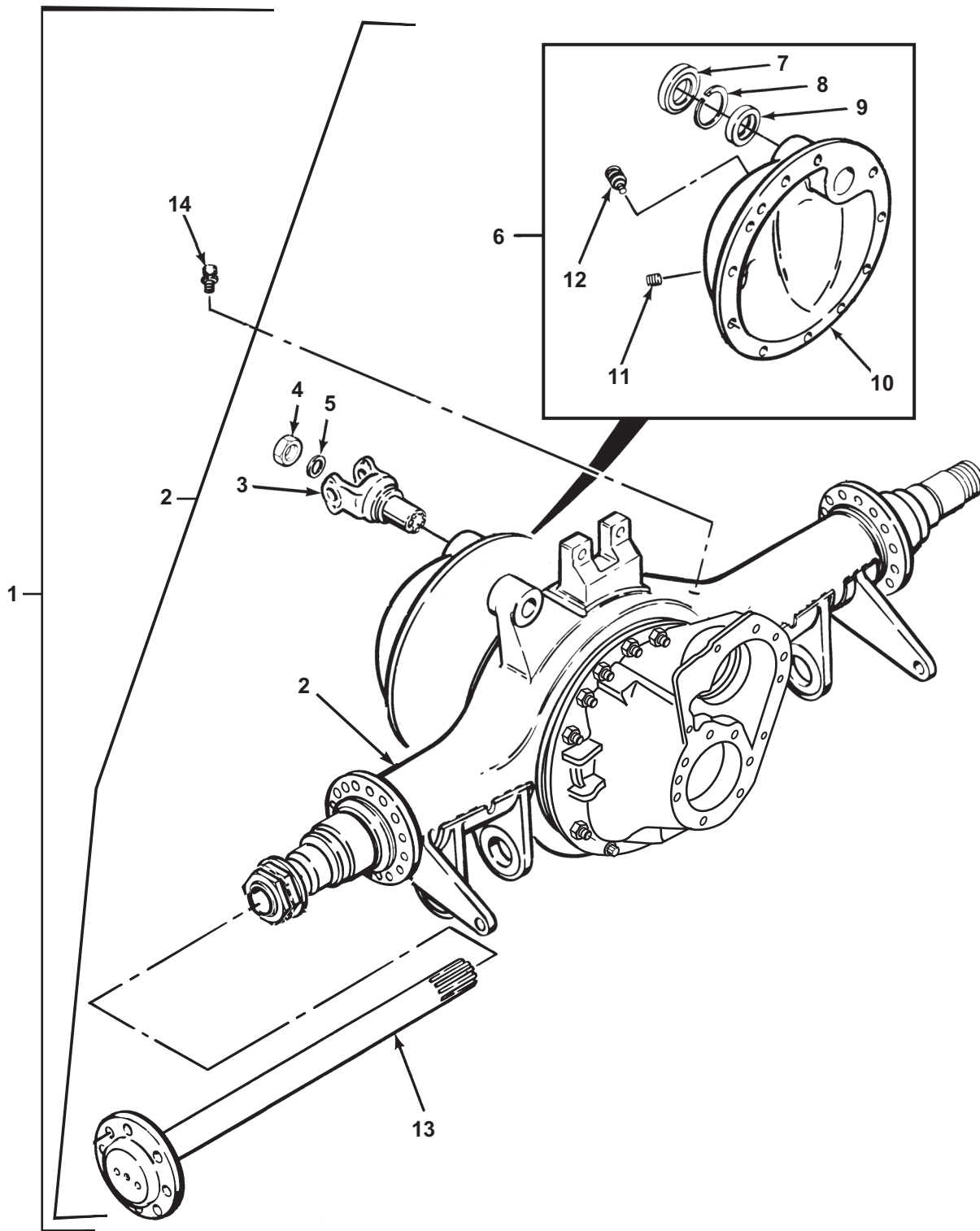


Figure 3. NO. 3 AXLE INSTALLATION

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1100 REAR AXLE ASSEMBLY</b>						
<b>FIG. 3 NO. 3 AXLE INSTALLATION</b>						
1	PBHHH	0000-00-000-0000	45152	3677826	AXLE,DS521,5.43, WELDMENT	1
2	XAHHH	0000-00-000-0000	9R200	0924291	AXLE,DS521,5.43 ASS	1
3	PAFZZ	2520-01-243-1480	72447	6.5-4-2361X	. YOKE,UNIVERSAL JOIN	1
4	PAFZZ	5310-01-551-8525	52304	210508	. NUT,PLAIN,EXTENDED	1
5	PAFZZ	0000-00-000-0000	52304	210509	. WASHER,OUTPUT SHAFT	1
6	PAHZZ	5340-01-214-9352	52304	217647	. COVER,ACCESS, #3 AXLE HOUSING	1
7	PAHZZ	5330-01-050-5022	01212	475012N	. . SEAL,PLAIN ENCASED	1
8	PAHZZ	5325-01-156-5280	52304	78937	. . RING,RETAINING	1
9	PAHZZ	3110-00-155-6518	0LTL1	MA1211EL	. . BEARING ASSEMBLY, OUTPUT SEAL	1
10	XAHHZ	0000-00-000-0000	52304	107863	. . COVER,# 3 AXLE	1
11	PAFZZ	2520-00-140-3653	23040	C8TZ-4A309-A	. . TRAP ASSY,MAGNETIC	1
12	PAFZZ	4730-01-062-4102	52304	90898	. . PLUG,HOUSING COVER	1
13	PAFZZ	0000-00-000-0000	9R200	126965	. SHAFT,AXLE	2
14	PAFZZ	4850-01-151-3692	45152	125836A	. VALVE,VENT	1

**END OF FIGURE**

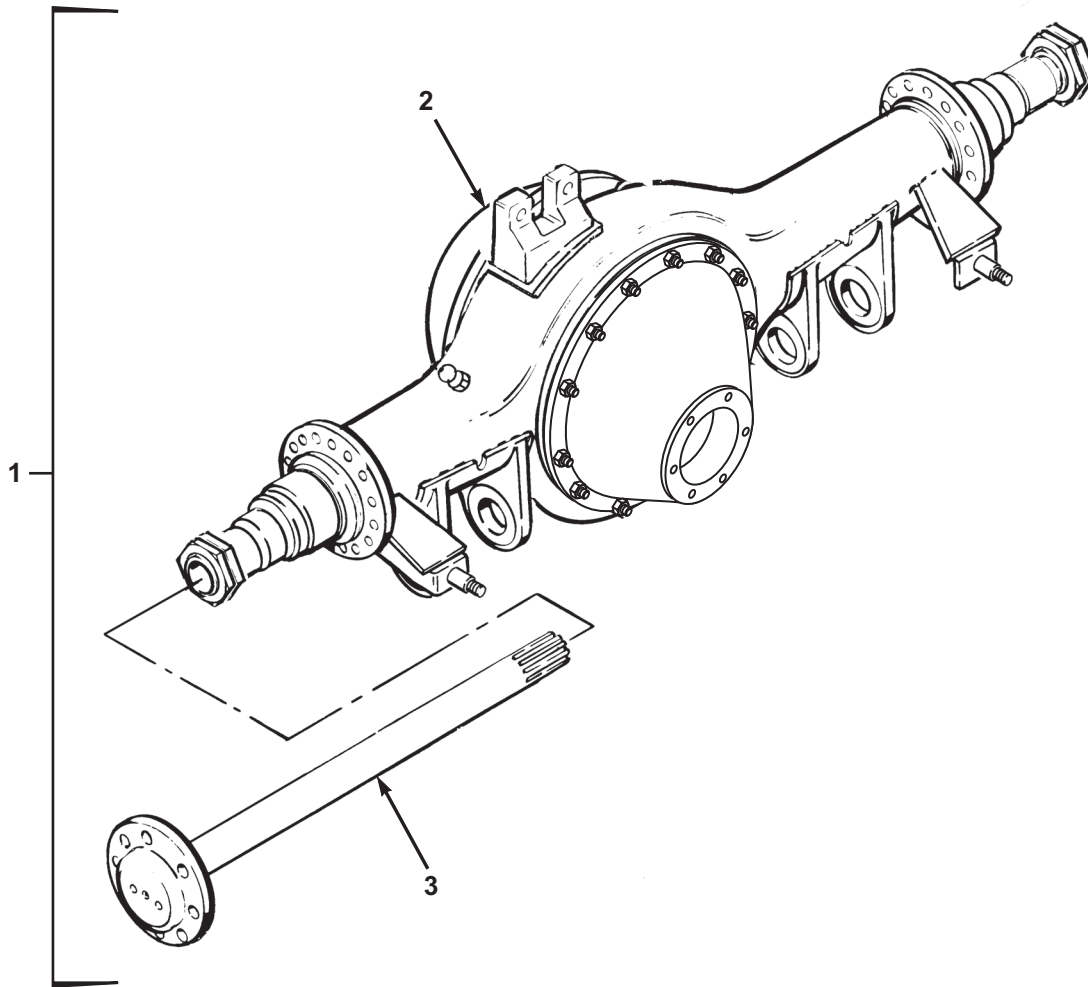


Figure 4. NO. 4 AXLE INSTALLATION

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY

**GROUP 1100 REAR AXLE ASSEMBLY****FIG. 4 NO. 4 AXLE INSTALLATION**

1	PBHHH	0000-00-000-0000	45152	3677827	AXLE ASSEMBLY, WELDMENT	1
2	XAHHH	0000-00-000-0000	9R200	0924301	. AXLE #4 RS521	1
3	PAFZZ	0000-00-000-0000	9R200	126965	. . SHAFT,AXLE	2

**END OF FIGURE**

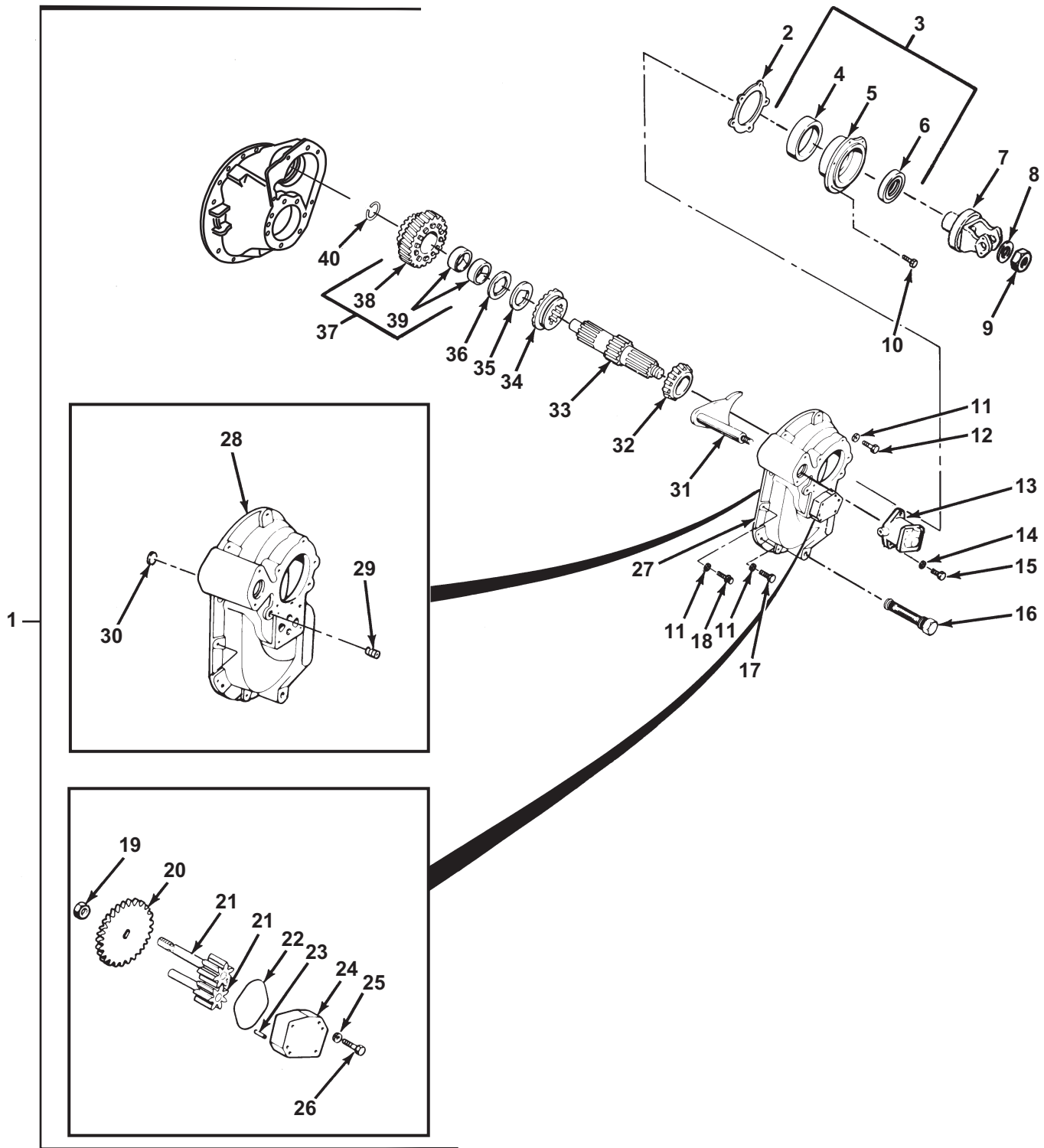


Figure 5. NO. 3 AXLE CARRIER (Sheet 1 of 3)



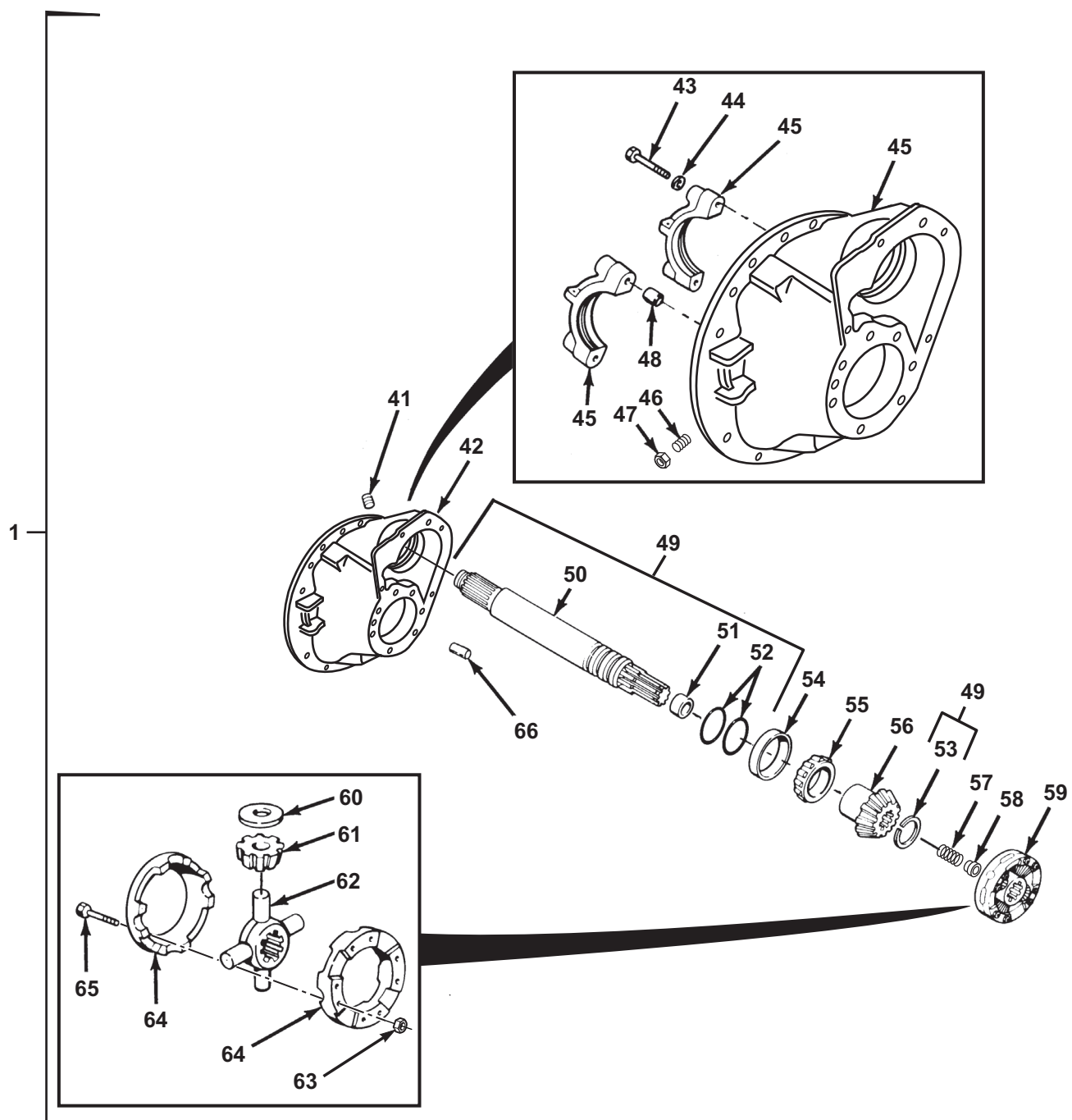


Figure 5. NO. 3 AXLE CARRIER (Sheet 2 of 3)

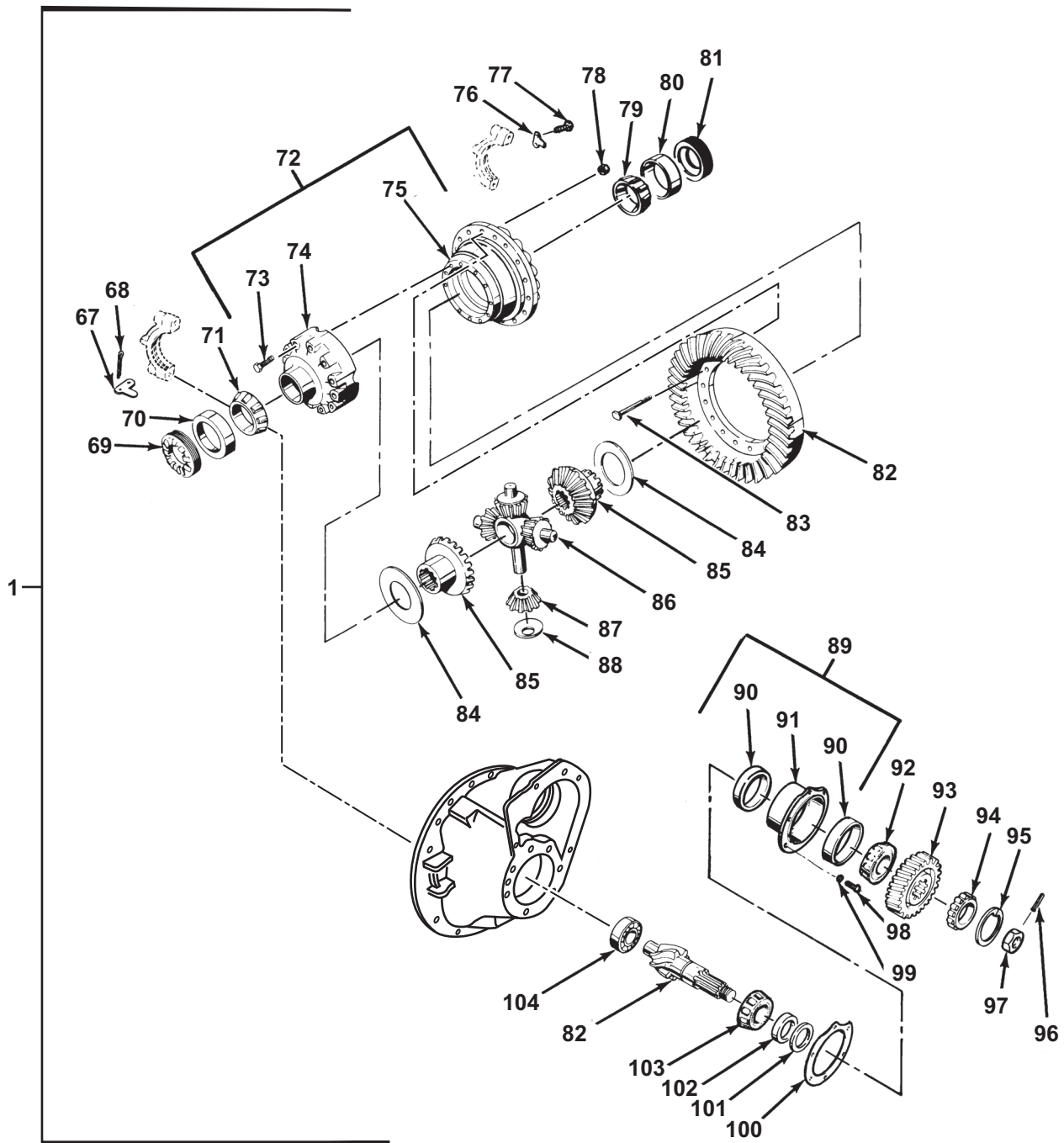


Figure 5. NO. 3 AXLE CARRIER (Sheet 3 of 3)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1102 DIFFERENTIAL</b>						
<b>FIG. 5 NO. 3 AXLE CARRIER</b>						
1	PAHZZ	0000-00-000-0000	9R200	DS-521-P	AXLE,TANDEM,FORWARD, #3 AXLE SINGLE REDUCTION	1
2	PAHZZ	5365-01-058-4588	52304	5EX108	. SHIM, .005 IN	1
2	PAHZZ	5365-01-059-2641	52304	5EX109	. SHIM, .010 IN	1
2	PAHZZ	0000-00-000-0000	52304	113130	. SHIM, .020 IN	1
2	PAHZZ	5365-01-058-4587	52304	78918	. SHIM, .003 IN	1
3	PAFZZ	3130-01-203-6486	1MVZ1	509643	. COVER,BEARING	1
4	PAHZZ	3110-01-023-1842	11083	2P8986	. . BEARING,INPUT SHAFT	1
5	PAFZZ	3130-01-203-6486	1MVZ1	509643	. . COVER,BEARING	1
6	PAHZZ	5330-00-824-6260	97907	9021835	. . SEAL,PLAIN ENCASED	1
7	PAFZZ	3010-01-278-8724	45152	1581970	. YOKE,UNIVERSAL	1
8	PAFZZ	0000-00-000-0000	52304	126242	. WASHER,FLAT	1
9	PAFZZ	0000-00-000-0000	52304	126155	. NUT,INPUT SHAFT	1
10	PAFZZ	0000-00-000-0000	52304	126243	. SCREW,CAP,HEXAGON H	6
11	PAFZZ	5310-01-147-4863	52304	90417	. WASHER,LOCK	10
12	PAFZZ	5305-01-146-1654	52304	90069	. SCREW	8
13	PAFZZ	0000-00-000-0000	52304	123218	. LOCKOUT ASSEMBLY	1
14	PAFZZ	5310-00-209-0965	80205	MS35338-47	. WASHER,LOCK	2
15	PAFZZ	5305-01-153-7465	52304	90031	. SCREW,CAP,HEXAGON H	2
16	PAFZZ	2520-01-147-1099	52304	102611	. SCREEN FILTER ASSEM	1
17	PAFZZ	5305-01-160-7507	52304	9309	. SCREW,CAP,HEXAGON H	1
18	PAFZZ	5305-01-150-1524	52304	81855	. SCREW,CAP,SOCKET HE	1
19	PAHZZ	5310-01-145-8917	52304	111451	. NUT	1
20	KFHZZ	0000-00-000-0000	52304	119946	. GEAR,PUMP DRIVE	1
21	PAHZZ	3040-01-159-2960	52304	102625	. GEARSHAFT,SPUR	1
22	PAHZZ	5330-01-159-2800	52304	102620	. PACKING,PREFORMED	1
23	PAHZZ	5315-01-147-3992	45152	144EX593	. PIN,STRAIGHT,HEADLE	2
24	PAHZZ	5340-01-159-7633	52304	102607	. COVER,ACCESS	1
25	PAFZZ	5310-01-145-9115	52304	90419	. WASHER,LOCK	4
26	PAFZZ	5305-01-146-1714	52304	102618	. SCREW,CAP,HEXAGON H	4
27	PAHZZ	3040-01-164-9284	52304	103536	. DIFFERENTIAL CARRIE, DIFFERENTIAL CARRIER	1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
28	XAHZZ	0000-00-000-0000	52304	103526	. . COVER,ACCESS	1
29	PAFZZ	4730-01-151-8965	52304	12 1301O9L	. . PLUG,FILLER	1
30	PAHZZ	5340-00-098-6350	52304	9797	. . PLUG,EXPANSION	1
31	PAHZZ	2520-01-152-8507	52304	103529	. SHIFTER FORK,VEHICU	1
32	PAFZZ	3110-01-021-1919	52304	2P8987	. BEARING,CONE, INPUT SHAFT	1
33	XAHZZ	0000-00-000-0000	52304	119990	. SHAFT,INPUT	1
34	PAHZZ	0000-00-000-0000	52304	119948	. CLUTCH,LOCKOUT	1
35	PAHZZ	3120-01-163-9374	52304	56360	. BEARING,WASHER,THRU	1
36	PAHZZ	0000-00-000-0000	52304	79304	. WASHER,THRUST	1
37	PAHZZ	3020-01-230-0291	52304	113331	. GEAR,HELICAL, GEAR AND BUSHING ASSEMBLY	1
38	XAHZZ	0000-00-000-0000	52304	113328	. . GEAR CLUSTER	1
39	PAHZZ	3120-01-169-9436	52304	75063	. . BEARING,SLEEVE	2
40	PAHZZ	5325-01-156-0018	52304	78909	. RING,RETAINING	1
41	PAFZZ	4730-01-151-8965	52304	12 1301O9L	. PLUG,FILLER	1
42	PAHHH	0000-00-000-0000	52304	122474	. CARRIER, BEARING CA	1
43	PAHZZ	5305-01-156-7675	52304	32732	. . SCREW,CAP,HEXAGON H	4
44	PAHZZ	5310-01-160-3971	52304	32912	. . WASHER,FLAT	4
45	XAHZZ	0000-00-000-0000	52304	126070	. . CASTING,CARRIER	1
46	PAFZZ	5305-01-551-7880	52304	126193	. . SETSCREW, RING GEAR	1
47	PAFZZ	5310-01-551-8139	52304	210184	. NUT,PLAIN,HEXAGON	1
48	PAHZZ	0000-00-000-0000	52304	32730	. . PIN,STRAIGHT,HEADLE	2
49	PAHHH	0000-00-000-0000	52304	122419	. SHAFT ASSEMBLY, OUTPUT	1
50	XAHZZ	0000-00-000-0000	52304	119991	. . SHAFT,OUTPUT	1
51	PAHZZ	3120-01-058-3212	52304	48922	. . BEARING,SLEEVE	1
52	PAHZZ	5330-01-058-3784	52304	78931	. . PACKING,PREFORMED	2
53	PAHZZ	5325-01-154-8560	52304	85994	. . RING,RETAINING	1
54	PAHZZ	3110-00-100-0573	60038	33472	. CUP,TAPERED ROLLER	1
55	PAHZZ	3110-00-100-3575	60038	33275	. CONE AND ROLLERS,TA	1
56	PAHZZ	3020-01-161-5894	52304	78911	. GEAR,BEVEL	1
57	PAHZZ	0000-00-000-0000	52304	127095	. SPRING,COMPRESSION	1
58	PAHZZ	0000-00-000-0000	52304	51228	. BEARING,THRUST	1
59	PAHHH	0000-00-000-0000	52304	121681	. DIFFERENTIAL ASSEMB, INTER-AXLE	1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
60	PAHZZ	0000-00-000-0000	52304	126180	. . WASHER,THRUST	4
61	PAHZZ	3020-01-153-9529	52304	95218	. . GEAR,BEVEL	4
62	PAHZZ	0000-00-000-0000	52304	126152	. . SPIDER	1
63	PAHZZ	5310-01-146-1658	52304	57637	. . NUT,SELF-LOCKING,CO	8
64	XAHZZ	0000-00-000-0000	52304	126151	. . CASE HALF	2
65	PAHZZ	5306-01-160-7432	52304	57636	. . BOLT,MACHINE	8
66	PAHZZ	5315-01-147-1132	52304	7641	. PIN,STRAIGHT,HEADLE	2
67	PAHZZ	2520-00-535-0502	81118	14275	. LOCK,ADJUSTER	1
68	PAHZZ	5315-01-147-3991	52304	90876	. PIN,COTTER	1
69	PAHZZ	2520-00-759-4741	89346	ETN0021637	. DIFFERENTIAL BEARIN, LEFT HAND	1
70	PAHZZ	3110-00-100-0583	60764	643280	. CUP,TAPERED ROLLER, LEFT HAND	1
71	PAHZZ	3110-00-159-9391	60038	42381	. CONE AND ROLLERS,TA, LEFT HAND	1
72	PAHHH	0000-00-000-0000	52304	121845	. CASE,DIFFERENTIAL	1
73	PAHZZ	0000-00-000-0000	52304	85503	. . SCREW,CAP,HEXAGON H	12
74	XAHZZ	0000-00-000-0000	52304	126234	. . CASE,DIFFERENTIAL, LEFT HAND	1
75	XAHZZ	0000-00-000-0000	52304	86777	. . CASE,PLAIN HALF, RIGHT HAND	1
76	PAHZZ	2520-01-153-2740	52304	45448	. LOCK,BEARING,DIFFER	1
77	PAHZZ	0000-00-000-0000	52304	210601	. SCREW,CAP,HEXAGON H	2
78	PAHZZ	5310-00-198-6691	24617	274639	. NUT,SELF-LOCKING,HE	16
79	PAHZZ	3110-00-100-0672	60038	665	. CONE AND ROLLERS,TA, RIGHT HAND	1
80	PAHZZ	3110-00-100-0335	70485	653	. GROMMET,NONMETALLIC, RIGHT HAND	1
81	XAHZZ	0000-00-000-0000	52304	79898	. BEARING UNIT,ROLLER, RIGHT HAND	1
82	PAHZZ	0000-00-000-0000	52304	122339	. GEAR SET,MATCHED, DRIVE PINION AND RING GEAR SET	1
83	PAHZZ	5306-01-006-9427	52304	67586	. BOLT	16
84	KFHZZ	0000-00-000-0000	52304	27247	. WASHER,THRUST	2
85	PAHZZ	3020-01-167-8033	52304	93401	. GEAR,BEVEL	2
86	PAHZZ	2520-01-108-4160	52304	86778	. SPIDER,DIFFERENTIAL	1
87	PAHZZ	3020-01-108-6548	52304	86780	. GEAR,BEVEL	4
88	PAHZZ	3120-01-118-2524	1MVZ1	86781	. BEARING,WASHER,THRU	4
89	PAHZZ	2520-01-155-3581	52304	78914	. CAGE ASSEMBLY,PINIO, PINION	1
90	XAHZZ	3110-00-100-0615	60038	72487	. . CUP,TAPERED ROLLER	2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
91	XAHHZ	0000-00-000-0000	52304	78932	. . HOUSING,BEARING UNI	1
93	PAHHZ	0000-00-000-0000	52304	119995	. GEAR,HELICAL, PINION	1
94	PAHHZ	0000-00-000-0000	52304	MU1309CV	. BEARING,OUTER	1
95	PAHHZ	5325-01-156-5280	52304	78937	. RING,RETAINING	1
96	PAHHZ	5315-01-211-1295	52304	118807	. PIN,SPRING	1
97	PAHHZ	0000-00-000-0000	52304	126182	. NUT,PINION SHAFT	1
98	PAFZZ	5305-01-146-1715	52304	62158	. SCREW,CAP,HEXAGON H	6
99	PAFZZ	5310-01-148-0231	52304	37207	. WASHER,LOCK	6
100	PAHHZ	5365-01-058-4586	52304	62830	. SHIM, .020 IN	1
100	PAHHZ	5365-01-137-8851	52304	045461	. SHIM, .003 IN	1
100	PAHHZ	5365-01-136-1702	52304	062829	. SHIM, .005 IN	1
100	PAHHZ	5365-01-137-6997	52304	45462	. SHIM, .010 IN	1
101	PAHHZ	5365-01-058-4593	52304	91679	. SPACER,RING, .167 IN	1
101	PAHHZ	5365-01-155-4598	52304	91680	. SPACER,RING, .168 IN	1
101	PAHHZ	5365-01-058-8208	52304	91689	. SPACER,SPECIAL, .177 IN	1
101	PAHHZ	5365-01-155-4604	52304	91690	. SPACER,RING, .178 IN	1
101	PAHHZ	5365-01-155-4605	52304	91691	. SPACER,RING, .179 IN	1
101	PAHHZ	5365-01-155-4606	52304	91692	. SPACER,RING, .180 IN	1
101	PAHHZ	5365-01-155-4607	52304	91694	. SPACER,RING, .181 IN	1
101	PAHHZ	5365-01-058-8209	52304	91696	. SPACER,RING, .182 IN	1
101	PAHHZ	5365-01-159-5975	52304	91698	. SPACER,RING, .183 IN	1
101	PAHHZ	5365-01-155-4609	52304	91702	. SPACER,RING, .185 IN	1
101	PAHHZ	5365-01-155-4610	52304	91704	. SPACER,RING, .186 IN	1
101	PAHHZ	5365-01-058-8210	52304	91706	. SPACER,RING, .187 IN	1
101	PAHHZ	5365-01-155-4611	52304	91708	. SPACER,RING, .188 IN	1
101	PAHHZ	5365-01-155-4612	52304	91710	. SPACER,RING, .189 IN	1
101	PAHHZ	5365-01-155-4613	52304	91712	. SPACER,RING, .190 IN	1
101	PAHHZ	5365-01-160-2495	52304	91714	. SPACER,RING, .191 IN	1
101	PAHHZ	5365-01-059-0042	52304	91716	. SPACER,SPECIAL, .192 IN	1
101	PAHHZ	5365-01-155-4614	52304	91720	. SPACER,RING, .195 IN	1
101	PAHHZ	5365-01-159-6917	52304	91721	. SPACER,RING, .196 IN	1
101	PAHHZ	5365-01-155-4615	52304	91723	. SPACER,RING, .198 IN	1
101	PAHHZ	5365-01-155-4617	52304	91726	. SPACER,RING, .201 IN	1
101	PAHHZ	5365-01-059-0043	52304	91727	. SPACER,SPECIAL, .202 IN	1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
101	PAHZZ	5365-01-155-4593	1MVZ1	91681	. SPACER,RING, .169 IN	1
101	PAHZZ	5365-01-155-4600	1MVZ1	91685	. SPACER,RING, .173 IN	1
101	PAHZZ	5365-01-155-4601	1MVZ1	91686	. SPACER,RING, .174 IN	1
101	PAHZZ	5365-01-155-4602	1MVZ1	91687	. SPACER,RING, .175 IN	1
101	PAHZZ	5365-01-155-4608	1MVZ1	91700	. SPACER,RING, .184 IN	1
101	PAHZZ	5365-01-155-4616	1MVZ1	91724	. SPACER,RING, .199 IN	1
101	PAHZZ	5365-01-174-2783	1MVZ1	91725	. SPACER,RING, .200 IN	1
101	PAHZZ	5365-01-161-2791	26512	19093-1	. SPACER,RING, .193 IN	1
101	PAHZZ	5365-01-173-3485	45152	144EX821	. SPACER,RING, .170 IN	1
101	PAHZZ	5365-01-157-6894	45152	2AT637	. SPACER,RING, .194 IN	1
101	PAHZZ	5365-01-155-4599	52304	091683	. SPACER,RING, .171 IN	1
101	PAHZZ	5365-01-155-4603	0MVZ1	91688	. SPACER,RING, .176 IN	1
102	PAHZZ	5310-01-213-9873	52304	78904	. WASHER,FLAT	1
103	PAHZZ	3110-00-980-5621	81348	FF-B-187/03-06	. BEARING CONE,PINION	2
104	PAHZZ	0000-00-000-0000	52304	MUS1308UM	. BEARING,PINION PILO	1

END OF FIGURE





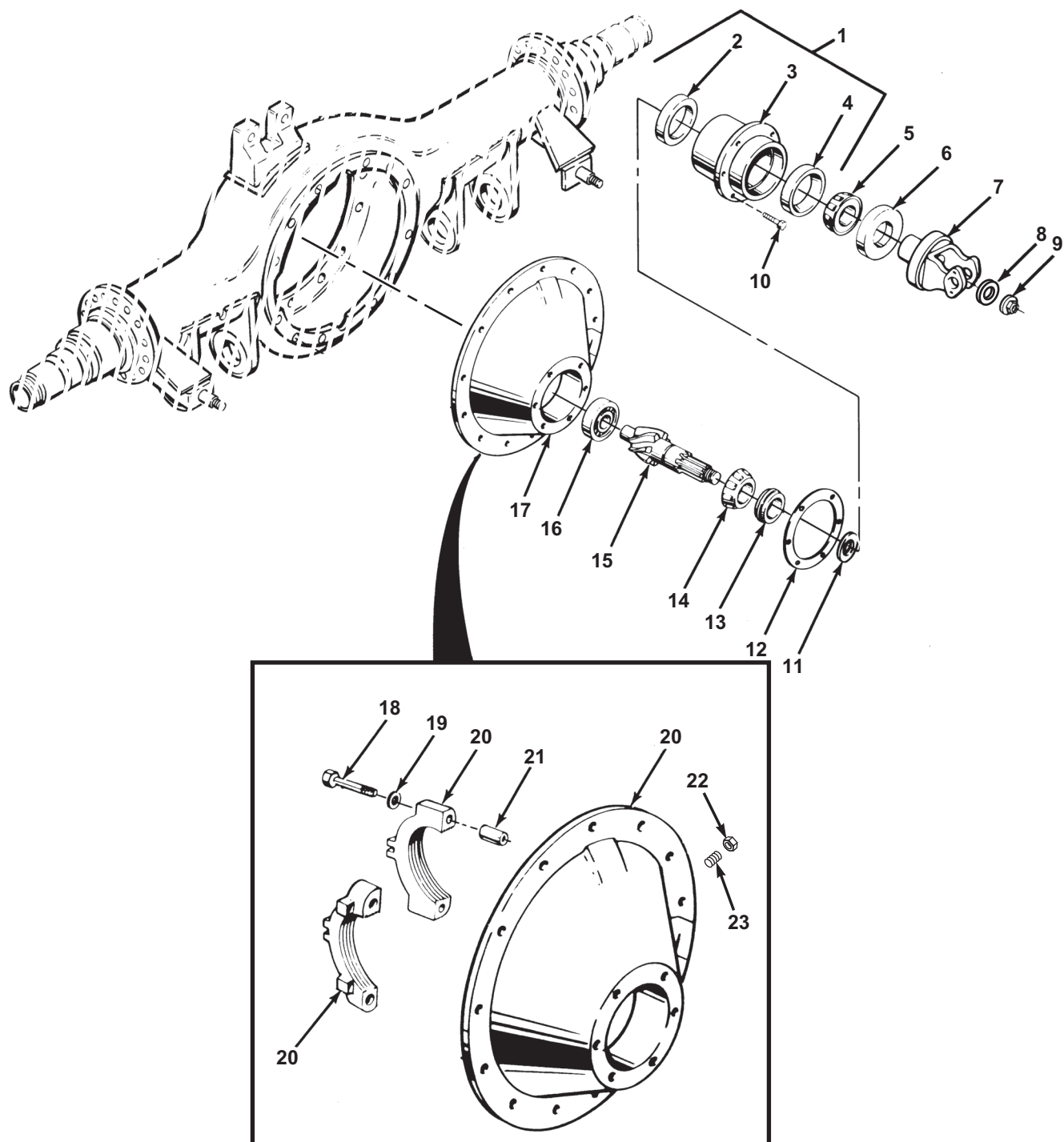


Figure 6. NO. 4 AXLE CARRIER (Sheet 1 of 2)

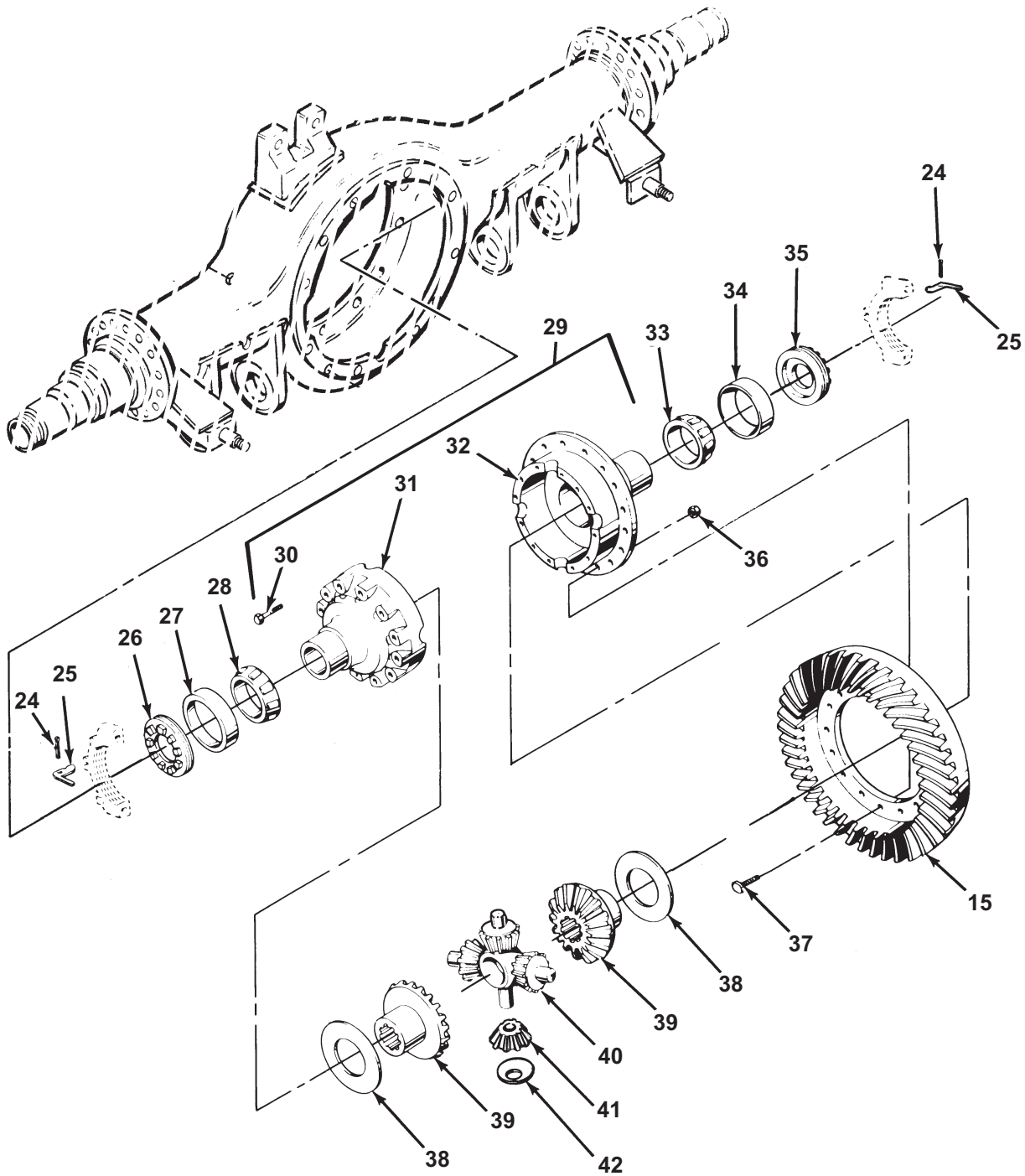


Figure 6. NO. 4 AXLE CARRIER (Sheet 2 of 2)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1102 DIFFERENTIAL</b>						
<b>FIG. 6 NO. 4 AXLE CARRIER</b>						
1	PAHZZ	3130-01-551-8132	52304	210592	HOUSING,BEARING UNI, PINION BEARING	1
2	PAHZZ	3110-00-100-0619	60038	78551	. CUP,TAPERED ROLLER, INNER	1
3	XAHZZ	0000-00-000-0000	52304	210591	. HOUSING,BEARING UNI	1
4	PAHZZ	3110-00-100-0615	60038	72487	. CUP,TAPERED ROLLER, OUTER	1
5	PAHZZ	3110-00-980-5621	81348	FF-B-187/03-46	CONE AND ROLLERS, PINION,OUTER	1
6	KFHZZ	0000-00-000-0000	9R200	712937	SEAL,PLAIN	1
7	PAFZZ	2520-01-192-1790	9R200	083801	YOKE,UNIVERSAL JOIN	1
8	PAFZZ	0000-00-000-0000	52304	210509	WASHER,OUTPUT SHAFT	1
9	PAFZZ	5310-01-551-8525	52304	210508	NUT,PLAIN,EXTENDED	1
10	PAHZZ	5305-01-215-0067	52304	113327	SCREW,CAP,HEXAGON H	6
11	PAHZZ	5365-01-155-4603	0MVZ1	91688	SPACER,RING, .176 THK	1
11	PAHZZ	5365-01-155-4593	1MVZ1	91681	SPACER,RING, .169 THK	1
11	PAHZZ	5365-01-155-4599	1MVZ1	91683	SPACER,RING, .171 THK	1
11	PAHZZ	5365-01-155-4600	1MVZ1	91685	SPACER,RING, .173 THK	1
11	PAHZZ	5365-01-155-4601	1MVZ1	91686	SPACER,RING, .174 THK	1
11	PAHZZ	5365-01-155-4602	1MVZ1	91687	SPACER,RING, .175 THK	1
11	PAHZZ	5365-01-155-4608	1MVZ1	91700	SPACER,RING, .184 THK	1
11	PAHZZ	5365-01-155-4616	1MVZ1	91724	SPACER,RING, .199 THK	1
11	PAHZZ	5365-01-174-2783	1MVZ1	91725	SPACER,RING, .200 THK	1
11	PAHZZ	5365-01-161-2791	26512	19093-1	SPACER,RING, .193 THK	1
11	PAHZZ	5365-01-173-3485	45152	144EX821	SPACER,RING, .170 THK	1
11	PAHZZ	5365-01-157-6894	45152	2AT637	SPACER,RING, .194 THK	1
11	PAHZZ	5365-01-058-4593	45152	5EX64	SPACER,RING, .167 THK	1
11	PAHZZ	5365-01-059-7385	45152	5EX65	SPACER,RING, .172 THK	1
11	PAHZZ	5365-01-059-1894	45152	5EX70	SPACER,RING, .197 THK	1
11	PAHZZ	5365-01-155-4598	52304	91680	SPACER,RING, .168 THK	1
11	PAHZZ	5365-01-058-8208	52304	91689	SPACER,SPECIAL, .177 THK	1
11	PAHZZ	5365-01-155-4604	52304	91690	SPACER,RING, .178 THK	1
11	PAHZZ	5365-01-155-4605	52304	91691	SPACER,RING, .179 THK	1
11	PAHZZ	5365-01-155-4606	52304	91692	SPACER,RING, .180 THK	1
11	PAHZZ	5365-01-155-4607	52304	91694	SPACER,RING, .181 THK	1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
11	PAHZZ	5365-01-058-8209	52304	91696	SPACER,RING, .182 THK	1
11	PAHZZ	5365-01-159-5975	52304	91698	SPACER,RING, .183 THK	1
11	PAHZZ	5365-01-155-4609	52304	91702	SPACER,RING, .185 THK	1
11	PAHZZ	5365-01-155-4610	52304	91704	SPACER,RING, .186 THK	1
11	PAHZZ	5365-01-058-8210	52304	91706	SPACER,RING, .187 THK	1
11	PAHZZ	5365-01-155-4611	52304	91708	SPACER,RING, .188 THK	1
11	PAHZZ	5365-01-155-4612	52304	91710	SPACER,RING, .189 THK	1
11	PAHZZ	5365-01-155-4613	52304	91712	SPACER,RING, .190 THK	1
11	PAHZZ	5365-01-160-2495	52304	91714	SPACER,RING, .191 THK	1
11	PAHZZ	5365-01-059-0042	52304	91716	SPACER,SPECIAL, .192 THK	1
11	PAHZZ	5365-01-155-4614	52304	91720	SPACER,RING, .195 THK	1
11	PAHZZ	5365-01-159-6917	52304	91721	SPACER,RING, .196 THK	1
11	PAHZZ	5365-01-155-4615	52304	91723	SPACER,RING, .198 THK	1
11	PAHZZ	5365-01-155-4617	52304	91726	SPACER,RING, .201 THK	1
11	PAHZZ	5365-01-059-0043	52304	91727	SPACER,SPECIAL, .202 THK	1
12	PAHZZ	5365-01-058-6963	45152	5EX135	SHIM, .003 KIT 4	1
12	PAHZZ	5365-01-058-6964	45152	5EX136	SHIM, .005 KIT 4	1
12	PAHZZ	5365-01-058-6965	45152	5EX137	SHIM, .010 KIT 4	1
12	PAHZZ	5365-01-058-6967	45152	5EX139	SHIM, .030 KIT 4	1
12	PAHZZ	5365-01-058-6966	52304	67923	SHIM, .020 KIT 4	1
13	PAHZZ	5365-00-653-9008	20417	LL313-66	SPACER,SLEEVE	1
14	PAHZZ	3110-01-119-4439	60038	78215C	CONE AND ROLLERS,TA, PINON,INNER	1
15	PAHZZ	0000-00-000-0000	9R200	121892	DRIVE GEAR AND PINI, MATCHED SET KIT 2	1
16	PAHZZ	0000-00-000-0000	9R200	MUSB1308UM	BEARING,PILOT	1
17	PAHHH	0000-00-000-0000	9R200	122432	DIFFERENTIAL ASSEMB, NO. 4 INCLUDES BEARING CAPS	1
18	PAHZZ	5305-01-156-7675	52304	32732	. SCREW,CAP,HEXAGON H	4
19	PAHZZ	5310-01-160-3971	52304	32912	. WASHER,FLAT	4
20	XAHZZ	0000-00-000-0000	52304	98493	. CARRIER	1
21	PAHZZ	3120-00-930-5415	97907	2257962	. BUSHING,SLEEVE	2
22	PAHZZ	5310-01-551-8139	52304	210184	. NUT,PLAIN,HEXAGON	1
23	PAHZZ	5305-01-551-7880	52304	126193	. SETSCREW	1
24	PAHZZ	5315-01-147-3991	52304	90876	PIN,COTTER	2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
25	PAHZZ	2520-00-535-0502	29510	65045H	LOCK,BEARING ADJUST	2
26	PAHZZ	2520-00-759-4741	89346	ETN0021637	DIFFERENTIAL BEARIN, BEARING RIGHT HAND	1
27	PAHZZ	0000-00-000-0000	9R200	42384	CUP,DIFFERENTIAL BE, RIGHT HAND	1
28	PAHZZ	3110-00-159-9391	60038	42381	CONE AND ROLLERS,TA, RIGHT HAND	1
29	PAHZZ	0000-00-000-0000	52304	121845	CASE,DIFFERENTIAL, WHEEL DIFFERENTIAL	1
30	PAHZZ	5306-01-159-6564	52304	88503	. BOLT,MACHINE, DIFFERENTIAL CASE	12
31	XAHZZ	0000-00-000-0000	52304	86777	. CASE,PLAIN HALF, RIGHT HAND	1
32	XAHZZ	0000-00-000-0000	52304	126234	. CASE,DIFFERENTIAL, FLANGED HALF	1
33	PAHZZ	0000-00-000-0000	9R200	42652	CONE AND ROLLERS, LEFT HAND	1
34	PAHZZ	0000-00-000-0000	9R200	42653	CUP,DIFFERENTIAL BE, LEFT HAND	1
35	PAHZZ	2520-00-759-4746	81118	39448	DIFFERENTIAL BEARIN, BEARING LEFT HAND	1
36	PAHZZ	5310-00-198-6691	81142	60600	NUT,SELF-LOCKING, KIT 1	15
37	PAHZZ	5306-01-006-9427	52304	67586	BOLT, KIT 1	16
38	PAHZZ	3120-00-248-5948	81142	27274	BEARING,WASHER,THRU, KIT 3	2
39	PAHZZ	3020-01-167-8033	52304	93401	GEAR,BEVEL, KIT 3	2
40	PAHZZ	2520-01-108-4160	52304	86778	SPIDER,DIFFERENTIAL, KIT 3	1
41	PAHZZ	3020-01-108-6548	52304	86780	GEAR,BEVEL, KIT 3	4
42	PAHZZ	5310-00-198-6691	24617	274639	NUT,SELF-LOCKING,HE, SIDE PINION KIT 3	4

END OF FIGURE

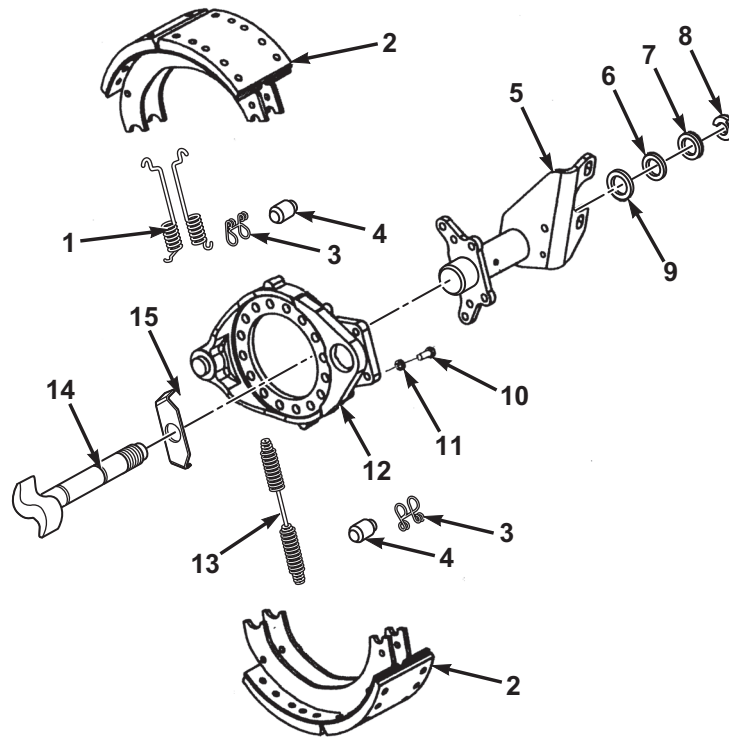


Figure 7. REAR BRAKE

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1202 SERVICE BRAKES</b>						
<b>FIG. 7 REAR BRAKE</b>						
1	PAFZZ	5360-01-024-7898	1MVZ1	819725	SPRING,HELICAL,EXTE	2
2	PAFZZ	2530-01-474-5772	45152	3113352	BRAKE SHOE	2
3	PAFZZ	5340-01-512-6328	52304	808058	SPRING,ROLLER RETAI	2
4	PAFZZ	2530-01-510-3165	52304	806234	ROLLER CAM,BRAKE	2
5	PAFZZ	0000-00-000-0000	52304	816876	BRACKET ASSEMBLY, #4 LEFT AXLE	1
5	PAFZZ	0000-00-000-0000	52304	816877	BRACKET ASSEMBLY, #4 RIGHT AXLE	1
5	PAFZZ	0000-00-000-0000	52304	978763	BRACKET ASSEMBLY, #3 RIGHT AXLE	1
5	PAFZZ	0000-00-000-0000	52304	978762	BRACKET ASSEMBLY, #3 LEFT AXLE	1
6	PAFZZ	5310-01-058-4589	52304	23570	WASHER,FLAT, .030	1
7	PAFZZ	5365-01-059-0126	52304	35428	SHIM, .060	1
8	PAFZZ	5325-01-152-4536	79136	5304-125	RING,RETAINING	1
9	PAFZZ	5310-01-110-7815	52304	43943	WASHER,FLAT, INNER SLACK ADJUSTER	1
10	PAFZZ	5305-01-033-2659	80205	MS90725-302	SCREW,CAP,HEXAGON H	4
11	PAFZZ	5310-01-110-7816	52304	90414	WASHER,FLAT	4
12	PAFZZ	2530-01-161-6566	81142	79935	SPIDER,BRAKE	1
13	PAFZZ	5360-01-503-3209	52304	818278	SPRING,HELICAL,EXTE	1
14	PAFZZ	2530-01-503-6764	1MVZ1	806526	CAMSHAFT,ACTUATING, LEFT SIDE	1
14	PAFZZ	2530-01-511-0241	52304	806527	CAMSHAFT,ACTUATING, RIGHT SIDE	1
15	PAFZZ	5310-01-478-7311	45152	3HS163	WASHER,CAM HEAD	1

**END OF FIGURE**

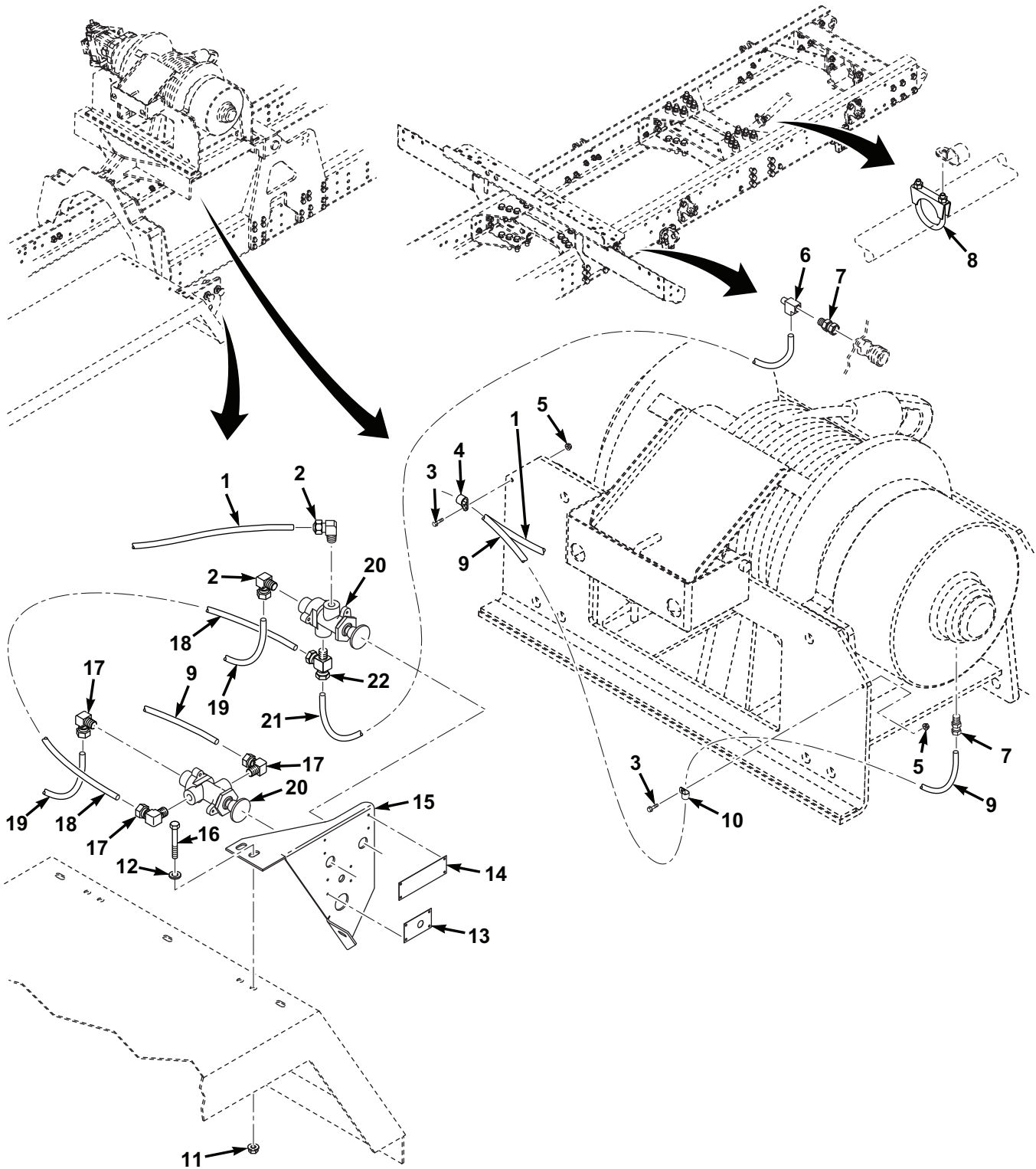


Figure 8. CHASSIS AIR



(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1208 AIR BRAKE SYSTEM</b>						
<b>FIG. 8 CHASSIS AIR</b>						
1	MFFZZ	0000-00-000-0000	45152	3636386-175	TUBING,NYLON 2231, MAKE FROM P/ N J844 TYPE A 1/4 OD (81343) 1 75 IN	1
2	PAFZZ	4730-01-086-4064	81343	SAE J246 4-4 100202BA	ELBOW,PIPE TO TUBE, 4TBG-4NPT FM BR	2
3	PAFZZ	5305-01-346-3692	45152	1764650	SCREW,CAP,HEXAGON H, . 25-20X1.25 G5 Z	2
4	PAFZZ	5340-01-204-4888	84971	TA720-S8	CLAMP,LOOP, .50ID	1
5	PAFZZ	5310-01-346-9445	45152	1600460	NUT,SELF-LOCKING, .25-20 G5 ZY	2
6	PAFZZ	4730-00-277-9615	93061	2225P-4	TEE,PIPE, 4NPT MFF BR	1
7	PAFZZ	4730-01-091-9212	81343	4-4-100102BA	ADAPTER,STRAIGHT,PI, 4TBG-4NPT FM BR	2
8	PAFZZ	5340-01-496-5306	45152	51689AX	CLAMP,MUFFLER	4
9	MFFZZ	0000-00-000-0000	45152	3631075-142	TUBING,NYLON 2706, MAKE FROM P/ N J844 TYPE A 1/4 OD (81343) 1 42 IN	1
10	PAFZZ	5340-01-038-9481	75272	COV0509Z1	CLAMP,LOOP, .25ID	1
11	PAFZZ	5310-01-340-5671	45152	1333510	NUT,SELF-LOCKING,EX, .31-18 G5 ZY	2
12	PAFZZ	5310-01-061-7452	45152	1804HX	WASHER,FLAT, .31X.69X.07 ZY	2
13	PAFZZ	0000-00-000-0000	45152	3711098	LABEL,HIGH IDLE,ALE	1
14	PAFZZ	0000-00-000-0000	45152	3612838	LABEL,WINCH KICKOUT	1
15	PAFZZ	0000-00-000-0000	45152	3706875	BRACKET,WINCH AIR V	1
16	PAFZZ	5305-01-146-4538	24617	9423808	SCREW,CAP,HEXAGON H, . 31-18X2.75 G5 Z	2
17	PAFZZ	4730-01-086-4064	81343	SAE J246 4-4 100202BA	ELBOW,PIPE TO TUBE, 4TBG-4NPT FM BR	3
18	MFFZZ	0000-00-000-0000	45152	3636361-7	TUBING,NYLON 2763, MAKE FROM P/ N J844 TYPE A 1/4 OD (81343) 7 IN	1
19	MFFZZ	0000-00-000-0000	45152	3631153-6	TUBING,NYLON 2921, MAKE FROM P/ N J844 TYPE A 1/4 OD (81343) 6 IN	2
20	PAFZZ	2530-01-360-4332	06721	N-14488-AM	VALVE,AIR SUPPLY	2
21	MFFZZ	0000-00-000-0000	45152	3710048-150	TUBING,NYLON 2338, MAKE FROM P/ N J844 TYPE A 1/4 OD (81343) 1 50 IN	1
22	PAFZZ	4730-01-081-5546	81343	J246 040404 100424B	TEE,PIPE TO TUBE, 4TBG-4NPT-4TBG FMF BR	1

**END OF FIGURE**

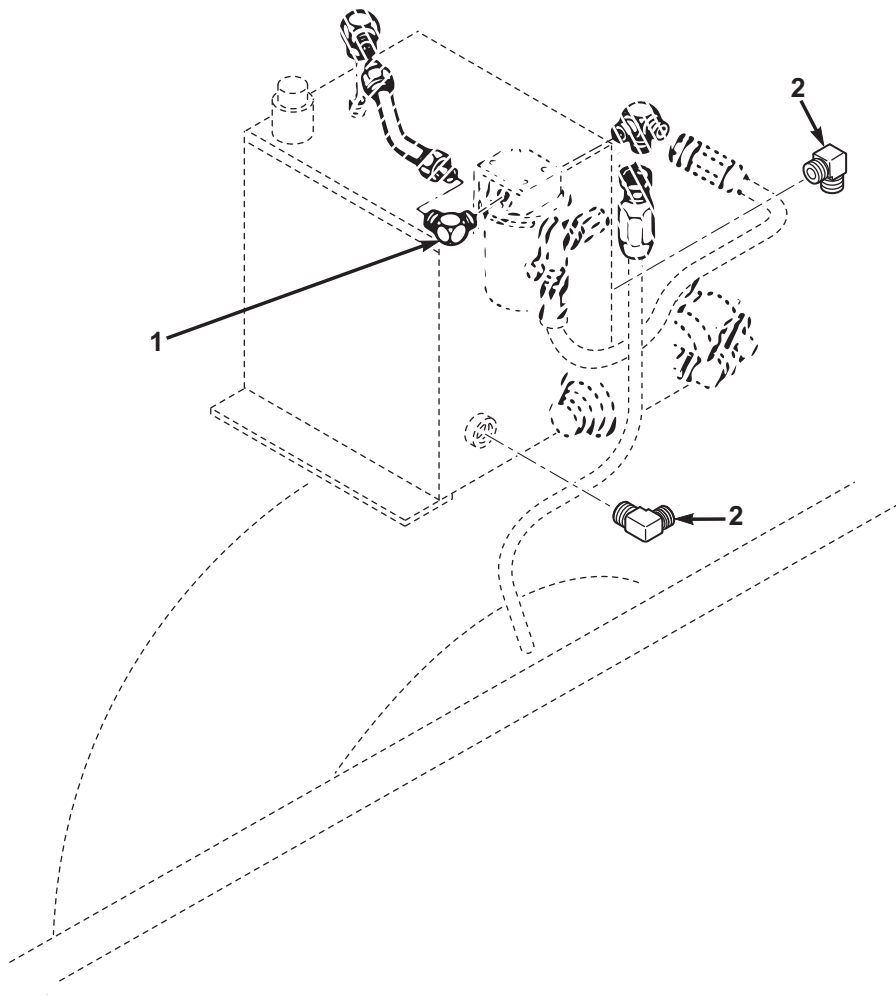


Figure 9. STEERING HYDRAULIC

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY

**GROUP 1411 HOSES, LINES, AND FITTINGS**

**FIG. 9 STEERING HYDRAULIC**

1	PAFZZ	4730-01-166-1074	99103	29309	ELBOW, PIPE TO TUBE	1
2	PAFZZ	4730-01-066-9486	96906	MS51504A24	ELBOW, PIPE TO TUBE	2

**END OF FIGURE**

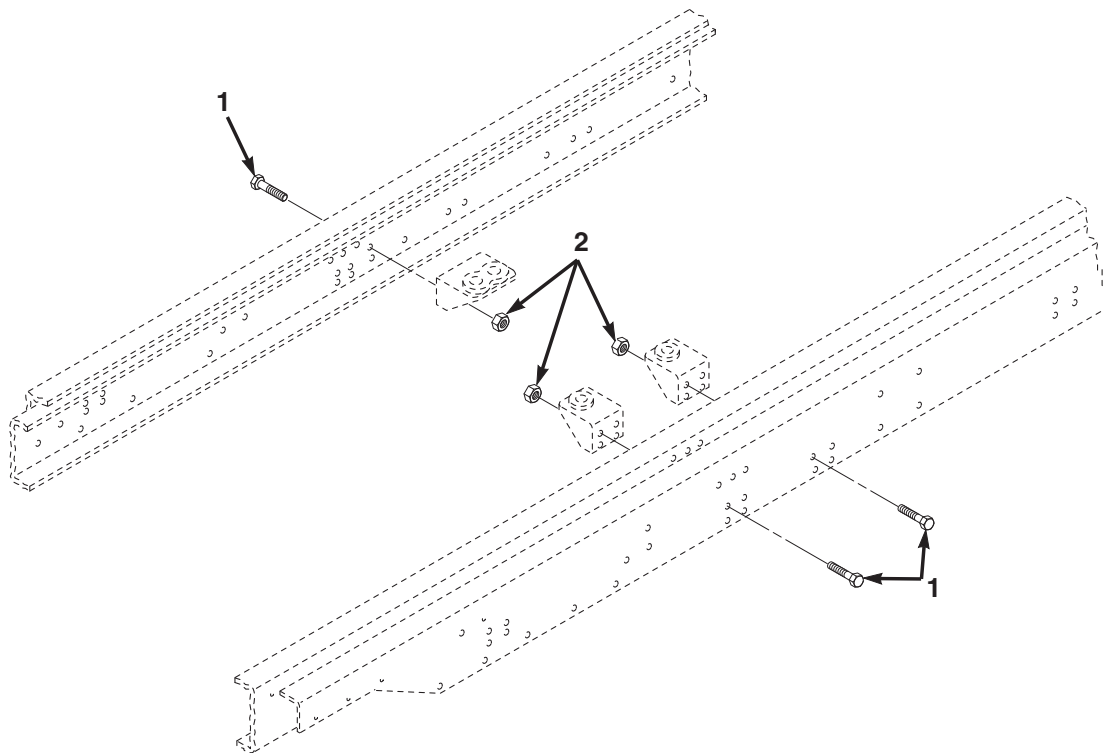


Figure 10. TRANSFER CASE MOUNTING

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY

**GROUP 1501 FRAME ASSEMBLY****FIG. 10 TRANSFER CASE MOUNTING**

1	PAFZZ	5305-00-724-7225	80204	B1821BH063C275 N	SCREW,CAP,HEXAGON	12
2	PAFZZ	5310-01-111-0645	45152	110311A	NUT,SELF-LOCKING,EX, .62-11 G8 PO	12

**END OF FIGURE**

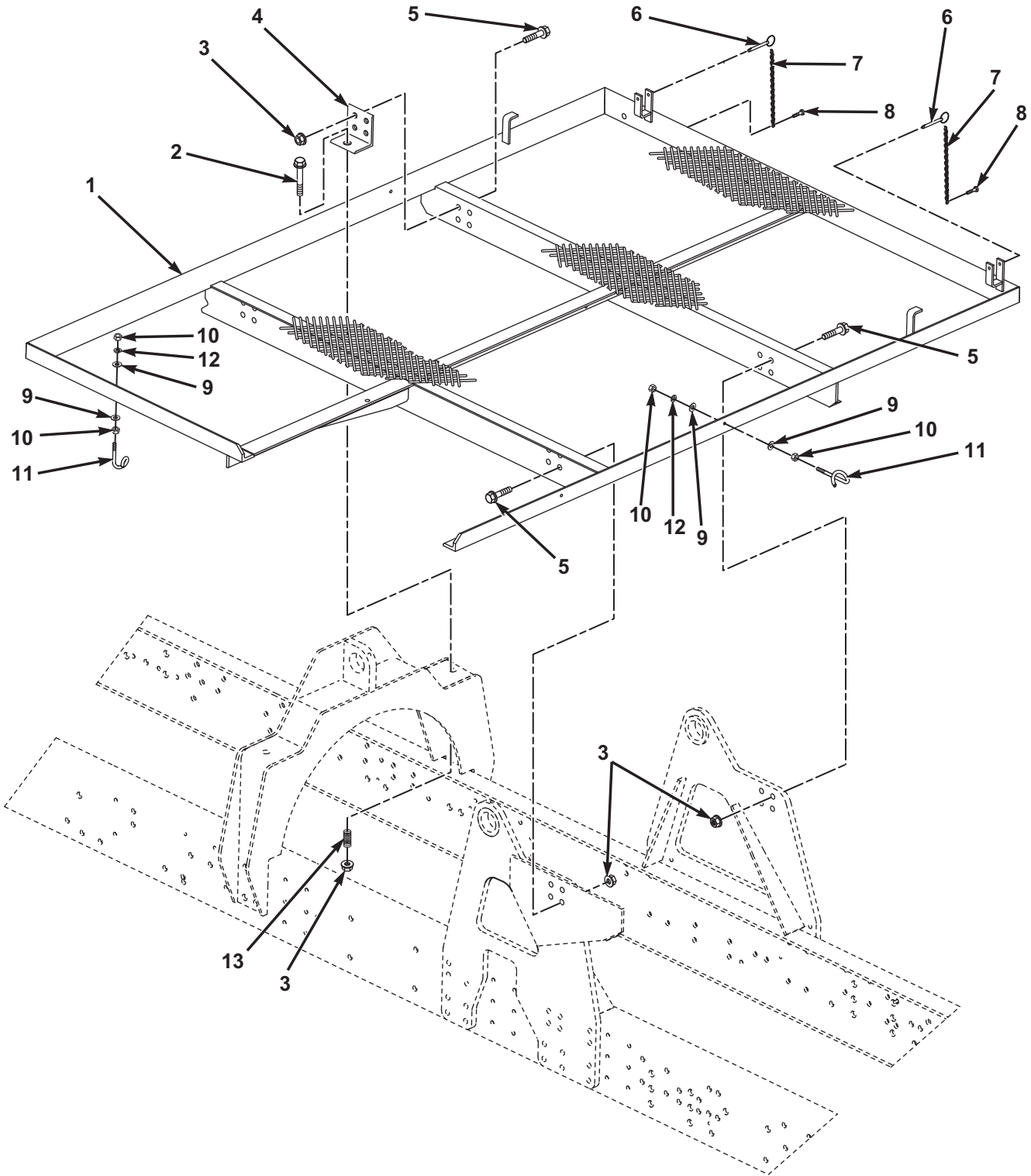


Figure 11. WINCH PLATFORM

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1501 FRAME ASSEMBLY</b>						
<b>FIG. 11 WINCH PLATFORM</b>						
1	PFFZZ	0000-00-000-0000	45152	3590193	DECK ASSEMBLY	1
2	PAFZZ	5306-01-211-1435	45152	1399980	BOLT,MACHINE	2
3	PAFZZ	5310-01-111-0645	45152	110311A	NUT,SELF-LOCKING,EX, .62-11 G8 PO	18
4	PFFZZ	0000-00-000-0000	45152	3589413	ANGLE,WINCH MOUNT	2
5	PAFZZ	5306-01-156-5429	45152	115217A	BOLT,MACHINE	16
6	PAFZZ	5315-01-164-1782	7V765	30-19	. PIN,QUICK RELEASE	2
7	MFFZZ	0000-00-000-0000	45152	1342FX-10	. CHAIN,WELDLESS, MAKE FROM P/N 75014-32 (46156) 10 IN	2
8	PAFZZ	5305-01-518-7600	45152	1345610	. SCREW,DRIVE	2
9	PAFZZ	5310-01-061-7452	45152	1804HX	WASHER,FLAT, .31X.69X.07 ZY	6
10	PAFZZ	5310-01-105-7229	06853	244095	NUT,PLAIN,HEXAGON	6
11	PAFZZ	5975-01-314-4747	45152	1718830	HANGER,CABLE	3
12	PAFZZ	5310-01-068-8446	45152	354AX	WASHER,LOCK	3
13	PAFZZ	5360-01-167-6410	45152	1401740	SPRING,HELICAL,COMP	2

**END OF FIGURE**

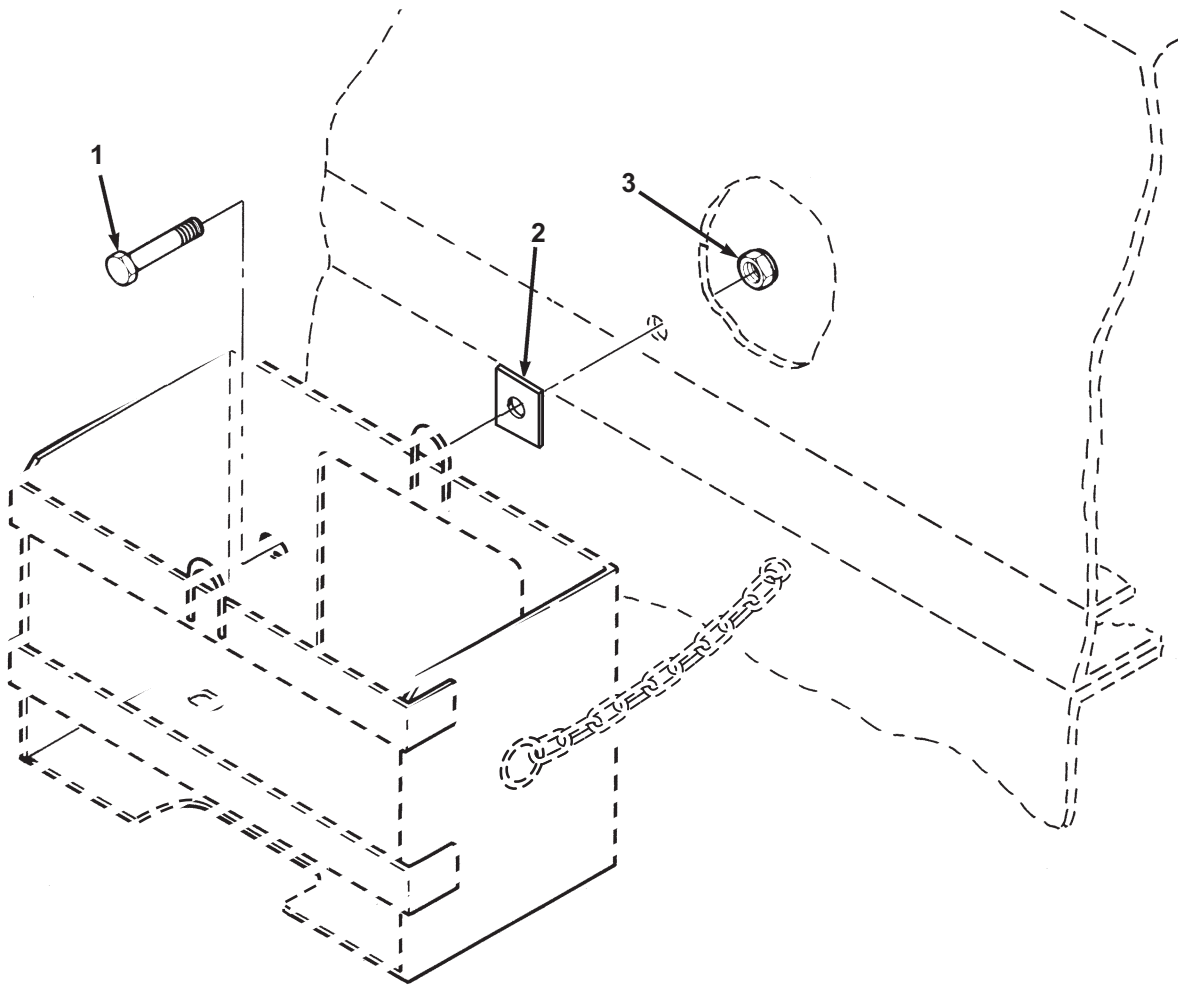


Figure 12. CHOCK BOX INSTALLATION - M983A2 LET



(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY

**GROUP 1501 FRAME ASSEMBLY****FIG. 12 CHOCK BOX INSTALLATION - M983A2 LET**

1	PAFZZ	5306-01-159-6549	45152	111452A	BOLT,MACHINE, .62-11X2.75 G8 P	2
2	PAFZZ	0000-00-000-0000	45152	3689312	PLATE,SPACER,CHOCK	2
3	PAFZZ	5310-01-111-0645	45152	110311A	NUT,SELF-LOCKING,EX, .62-11 G8 PO	2

**END OF FIGURE**

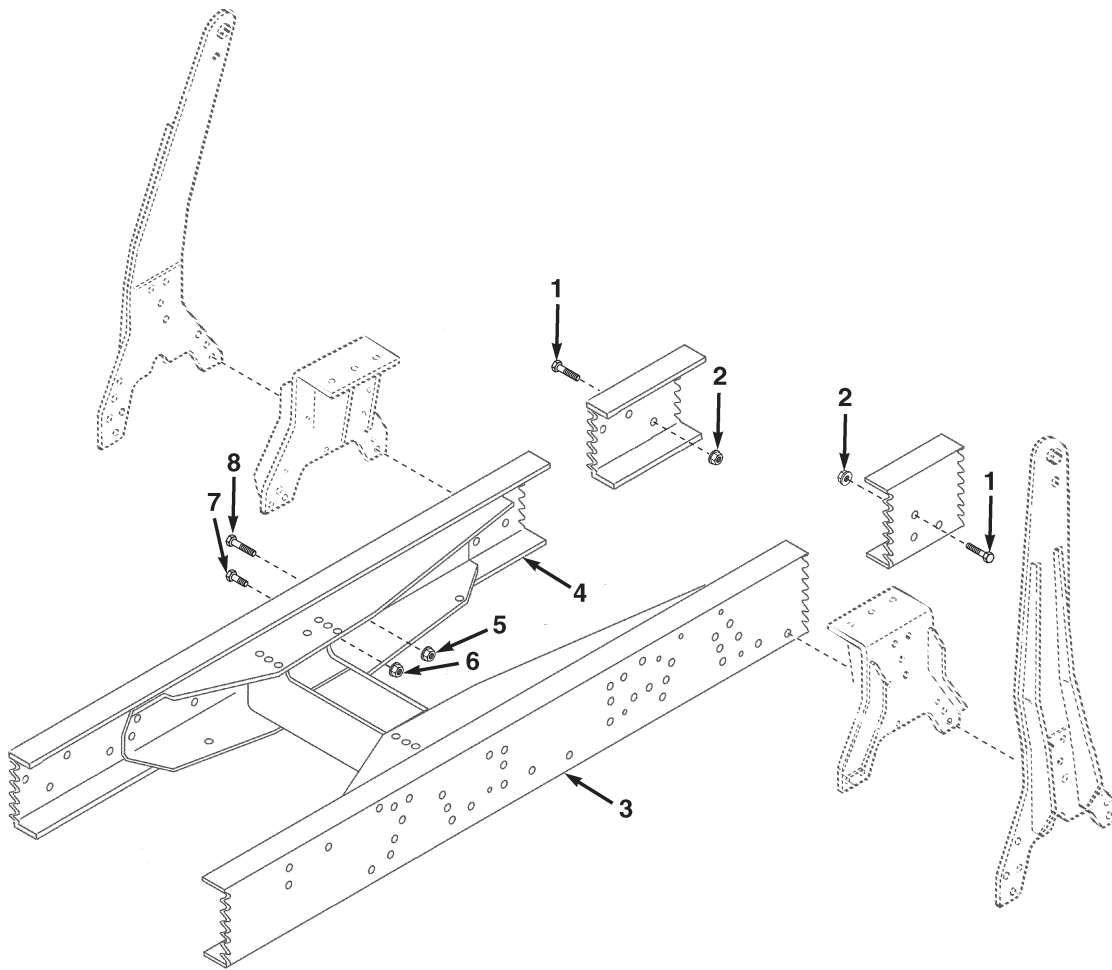


Figure 13. FRAME ASSEMBLY

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY

**GROUP 1501 FRAME ASSEMBLY****FIG. 13 FRAME ASSEMBLY**

1	PAFZZ	5306-01-287-5715	45152	1680530	BOLT,MACHINE, .38-16X1.25 G5 Z	4
2	PAFZZ	5310-01-288-1116	45152	1437220	NUT,SELF-LOCKING,EX, .38-16 G5 ZY	4
3	PGHZZ	0000-00-000-0000	45152	3684258	FRAME DRILLING,LEFT	1
4	PGHZZ	0000-00-000-0000	45152	3684257	FRAME DRILLING,RIGH	1
5	PAFZZ	5310-01-159-8178	45152	110310A	NUT,SELF-LOCKING,EX, .50-13 G8 PO	4
6	PAFZZ	5310-01-111-0645	45152	110311A	NUT,SELF-LOCKING,EX, .62-11 G8 PO	2
7	PAFZZ	5306-01-150-5884	45152	115289A	BOLT,MACHINE, .62-11X1.50 G8 P	2
8	PAFZZ	5305-01-156-5442	45152	111314A	SCREW,CAP,HEXAGON H, .50-13X1.75 G8 P	4

**END OF FIGURE**

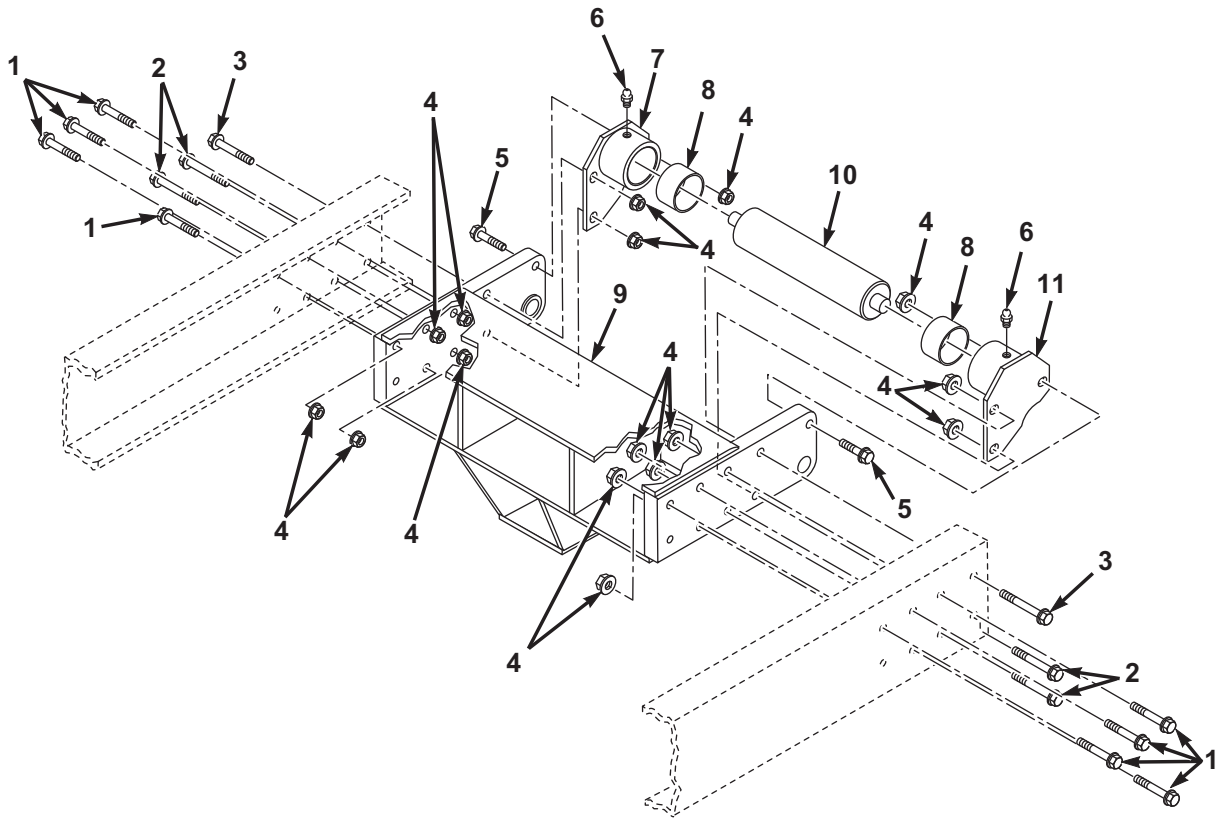


Figure 14. REAR CROSSMEMBER

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1503 PINTLES AND TOWING ATTACHMENTS</b>						
<b>FIG. 14 REAR CROSSMEMBER</b>						
1	PAFZZ	5305-01-185-8668	45152	126536A	SCREW,CAP,HEXAGON H, . 75-10X3.00 G8	8
2	PAFZZ	5305-01-154-4323	45152	1317120	CAPSCREW,FLANGED HE, . 75-10X3.50 G8	4
3	PAFZZ	5305-01-196-8088	45152	111319A	SCREW,CAP,HEXAGON H, . 75-10X3.25 G8	2
4	PAFZZ	5310-01-150-5918	45152	110312A	NUT,SELF-LOCKING,EX, .75-10 G8	16
5	PAFZZ	5305-01-155-3478	45152	1324980	SCREW,CAP,HEXAGON H, . 75-10X2.75 G8	2
6	PAFZZ	4730-01-217-1115	45152	615FX	. FITTING,LUBE	2
7	PAFZZ	0000-00-000-0000	45152	3115495	SUPPORT,HORZ ROLLER, RH	1
8	PAFZZ	3120-01-232-4299	45152	1437270	. BEARING,SLEEVE	2
9	XDFZZ	0000-00-000-0000	45152	3594793	CROSSMEMBER,REAR	1
10	PAFZZ	0000-00-000-0000	45152	3115479	ROLLER ASSY,HORIZON	1
11	PAFZZ	0000-00-000-0000	45152	3115496	SUPPORT,HORZ ROLLER, LH	1

**END OF FIGURE**



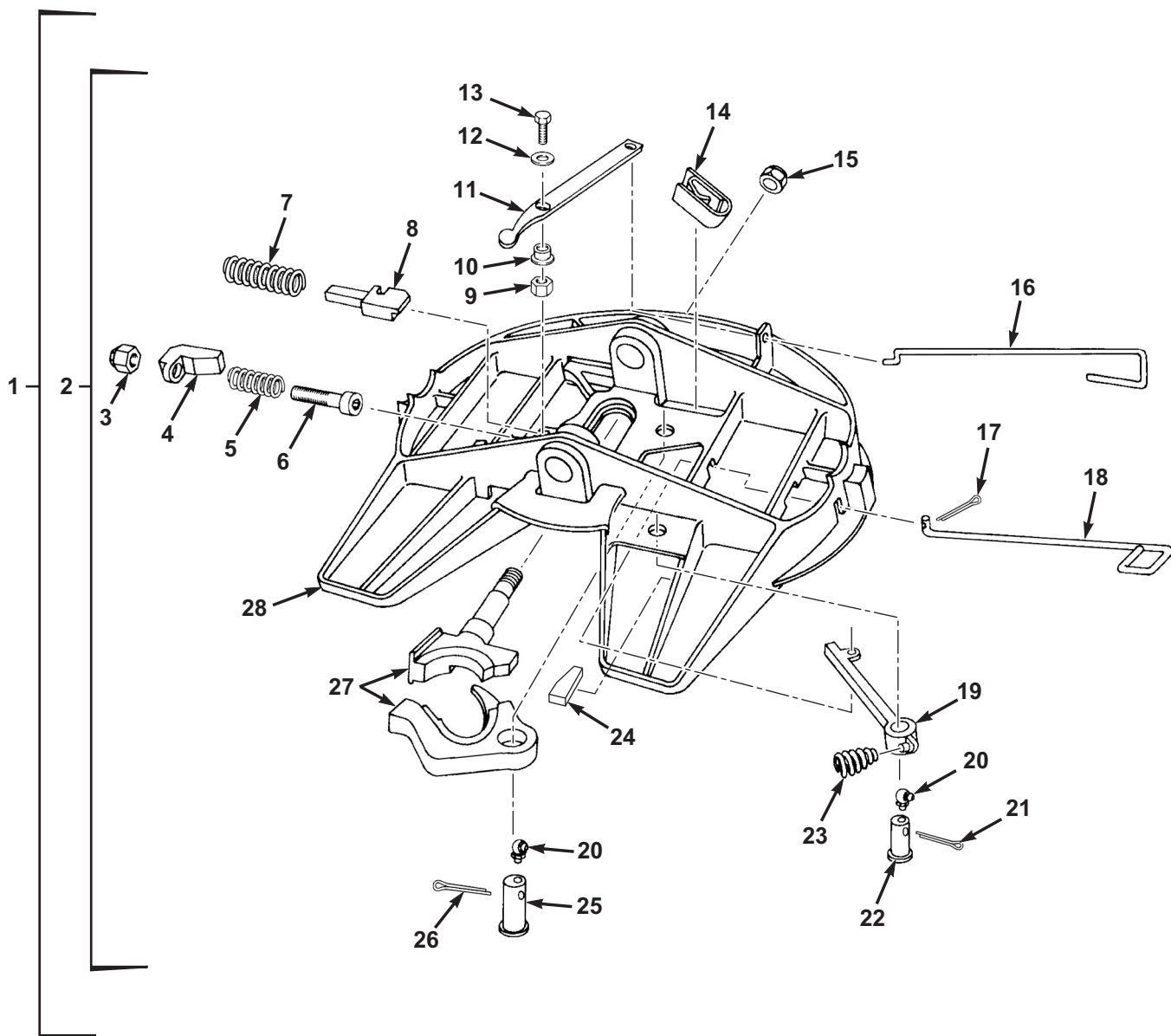


Figure 15. FIFTH WHEEL - 3.5 INCH KING PIN - M983A2 LET (Sheet 1 of 2)

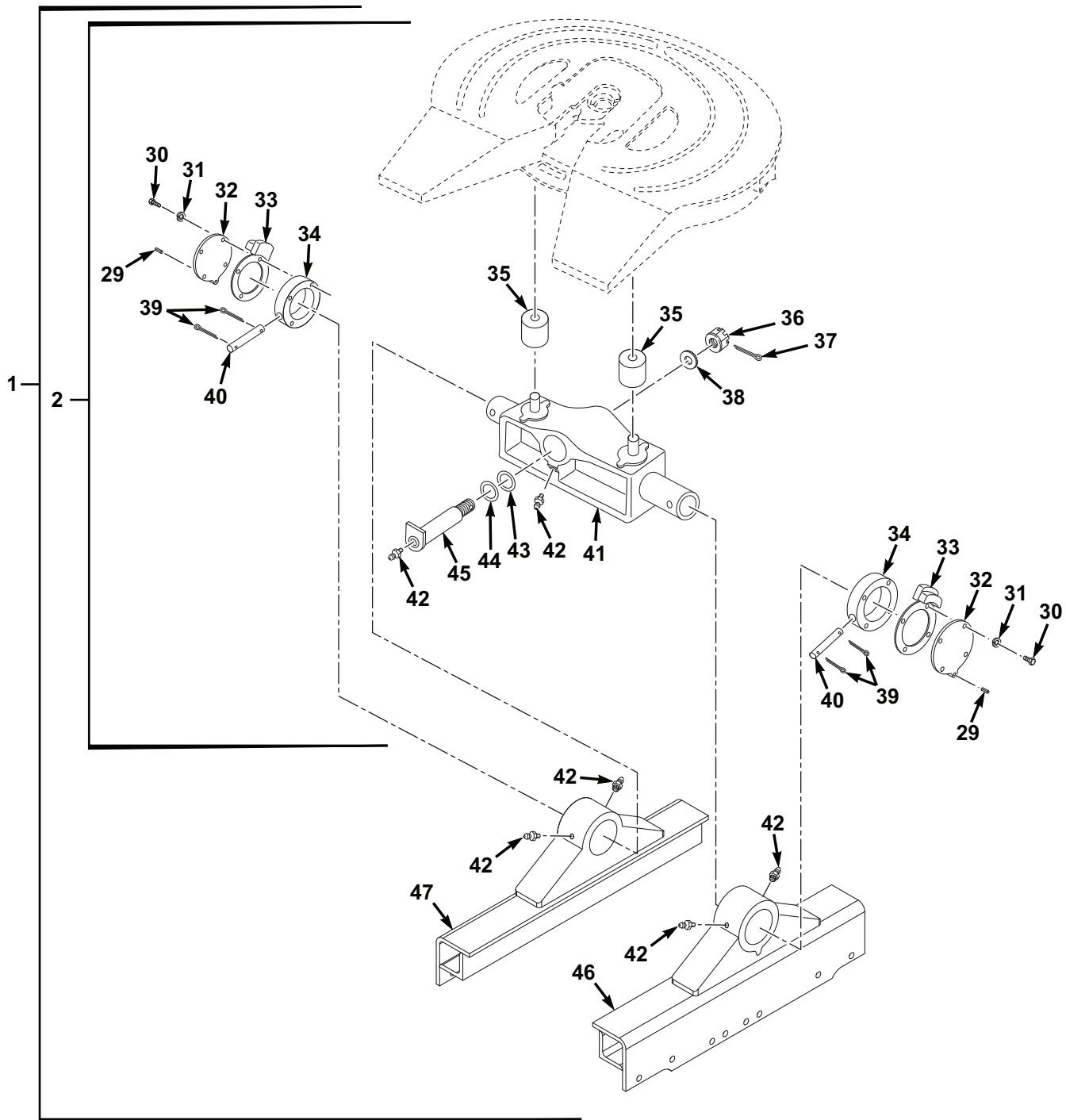


Figure 15. FIFTH WHEEL - 3.5 INCH KING PIN - M983A2 LET (Sheet 2 of 2)



(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1506 FIFTH WHEEL</b>						
<b>FIG. 15 FIFTH WHEEL - 3.5 INCH KING PIN - M983A2 LET</b>						
1	PBHZZ	0000-00-000-0000	45152	3685365	FIFTH WHEEL,WELDMEN	1
2	PAHFZ	2510-01-366-5284	74410	XA-2081-0A	. PLATE,FIFTH WHEEL A, 3-1/2 KINGPIN TOP ASSY	1
3	PAFZZ	5310-01-199-9463	74410	XB-HNH-58-C	. . NUT,SELF-LOCKING,CO, 5/8-11	1
4	PAFZZ	2510-01-198-0858	74410	XD-3123-1	. . WEDGE,LOCK,ADJUSTING	1
5	PAFZZ	5360-01-198-8081	74410	XB-403	. . SPRING,HELICAL,COMP	1
6	PAFZZ	5305-01-210-2173	74410	XB-2001	. . SCREW,CAP,SOCKET HE, 5/8-11X3-3/4	1
7	PAFZZ	5360-00-427-0762	74410	XB-1007	. . SPRING,HELICAL,COMP, 1-5/8X5 (RED)	1
8	PAFZZ	5340-01-199-9598	74410	XA-1104	. . PLUNGER,DETENT	1
9	PAFZZ	5310-01-165-2274	74410	XB-T-69-A	. . NUT,SELF-LOCKING,HE, 1/2-20	1
10	PAFZZ	3120-01-338-6710	74410	XB-02949	. . BUSHING,SLEEVE, RELEASE LEVER	1
11	PAFZZ	5340-01-244-7965	74410	XA-1005-FDS	. . LEVER,LOCK-RELEASE	1
12	PAFZZ	5310-01-199-9467	74410	XB-T-49	. . WASHER,FLAT, .50	1
13	PAFZZ	5305-01-161-0019	74410	XB-2083	. . SCREW,CAP,HEXAGON H, LOCK PATCH 1/2-20X1-3/4	1
14	PAFZZ	5360-01-198-8242	74410	XA-FW-128	. . SPRING,FLAT, LOCK	1
15	PAFZZ	5310-01-339-0747	74410	XB-04473	. . NUT,SELF-LOCKING,HE, 1-14	1
16	PAFZZ	5340-01-244-7968	74410	XA-1117-13	. . HANDLE,MANUAL CON	1
17	PAFZZ	5315-01-199-2088	74410	XB-16	. . PIN,COTTER, 1/8X1	1
18	PAFZZ	5340-01-251-6446	74410	XA-FW-138	. . HANDLE,MANUAL CON, SECONDARY LOCK	1
19	PAFZZ	2510-01-198-9655	74410	XA-FW-137-2	. . LEVER,REMOTE CONTRO, SECONDARY LOCK	1
20	PAFZZ	4730-01-329-2170	74410	XB-0769	. . FITTING,LUBRICATION	2
21	PAFZZ	5315-00-849-9854	80205	MS24665-498	. . PIN,COTTER, 1/4X2	1
22	PAFZZ	5315-01-199-2095	74410	XA-1016-C	. . PIN,GROOVED,HEADED, LOCK,HINGED	1
23	PAFZZ	5360-01-328-0864	74410	XB-1028-2	. . SPRING,HELICAL COM, SECONDARY LOCK	1
24	PAFZZ	5340-01-517-8408	74410	XA-05768	. . STOP,MECHANICAL, SECONDARY ADJUSTING LOCK BLOCK	1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
25	PAFZZ	5315-01-200-1520	74410	XA-FW-108-D	. . PIN,STRAIGHT,HEADED, LOCK	1
26	PAFZZ	5315-01-204-4893	74410	XB-T-60	. . PIN,COTTER, 1/4X2-1/2	1
27	PAFZZ	2510-01-182-6876	74410	XA-FW-104-03	. . LOCK SET,FIFTH WHEE, 3-1/2 KINGPIN	1
28	PAFZZ	0000-00-000-0000	74410	XA-2081-03	. . TOP PLATE, 3-1/2 KINGPIN	1
29	PAFZZ	0000-00-000-0000	74410	XB-21-5-250-1250	. PIN,ROLLED	2
30	PAFZZ	0000-00-000-0000	74410	XB-C-375-C-150	. SCREW,CAP,HEX HEAD, 3/8-16X1.5	8
31	PAFZZ	5310-00-261-7340	74410	XB-T-61	. WASHER,LOCK, 3/8	8
32	PAFZZ	5340-01-338-4319	74410	RK-0778	. COVER,ACCESS	2
33	PAFZZ	3110-01-338-3945	74410	XA-0786	. COLLAR,BEARING, LOCKOUT,SA	2
34	PAFZZ	3110-01-338-3944	74410	XA-0784	. COLLAR,BEARING, ROCKER ARM	2
35	XAFZZ	0000-00-000-0000	74410	XA-05814-A	. BRACKET,TRUCK MOUN, ROCKER ARM	2
35	PAFZZ	5365-01-242-3133	74410	XB-70	. BUSHING,NONMETALLI, CUSHION, RUBBER	2
36	PAFZZ	5310-01-242-5734	74410	XB-780-1	. NUT,HEXAGON SLOTTED, 2-1/4	1
37	PAFZZ	5315-01-369-1346	74410	XB-781-1	. PIN,COTTER, 5/16X3-1/2	1
38	PAFZZ	5310-01-242-5851	74410	XA-782	. WASHER,FLAT, 2-1/4	1
39	PAFZZ	5315-01-509-6850	74410	XB-382	. PIN,COTTER, 3-16X1-1/4	4
40	PAFZZ	5315-01-242-2909	74410	XA-1584-2	. PIN,STRAIGHT,HEADED, COLLAR ROCKER ARM	2
41	PAFZZ	2510-01-466-1187	74410	XA-05952-A	. ARM,FIFTH WHEEL, ROCKER ARM	1
42	PAFZZ	4730-01-509-4952	74410	XB-H-38	. FITTING,LUBRICATION	7
43	PAFZZ	5365-01-465-8717	74410	XB-07548	. SHIM,.030 THK, .030 THK,QUANTITY AS REQUIRED	1
44	PAFZZ	0000-00-000-0000	74410	XB-07548-1	. SHIM,.015 THK, .015 THK,QUANTITY AS REQUIRED	1
45	PAFZZ	4730-01-246-6006	74410	XA-1589-1	. BOLT,FLUID PASSAGE	1
46	XAFZZ	0000-00-000-0000	45152	3598723XA2	BRACKET,FIFTH WHEEL	1
47	XAFZZ	0000-00-000-0000	45152	3598723AX1	BRACKET,FIFTH WHEEL	1

END OF FIGURE



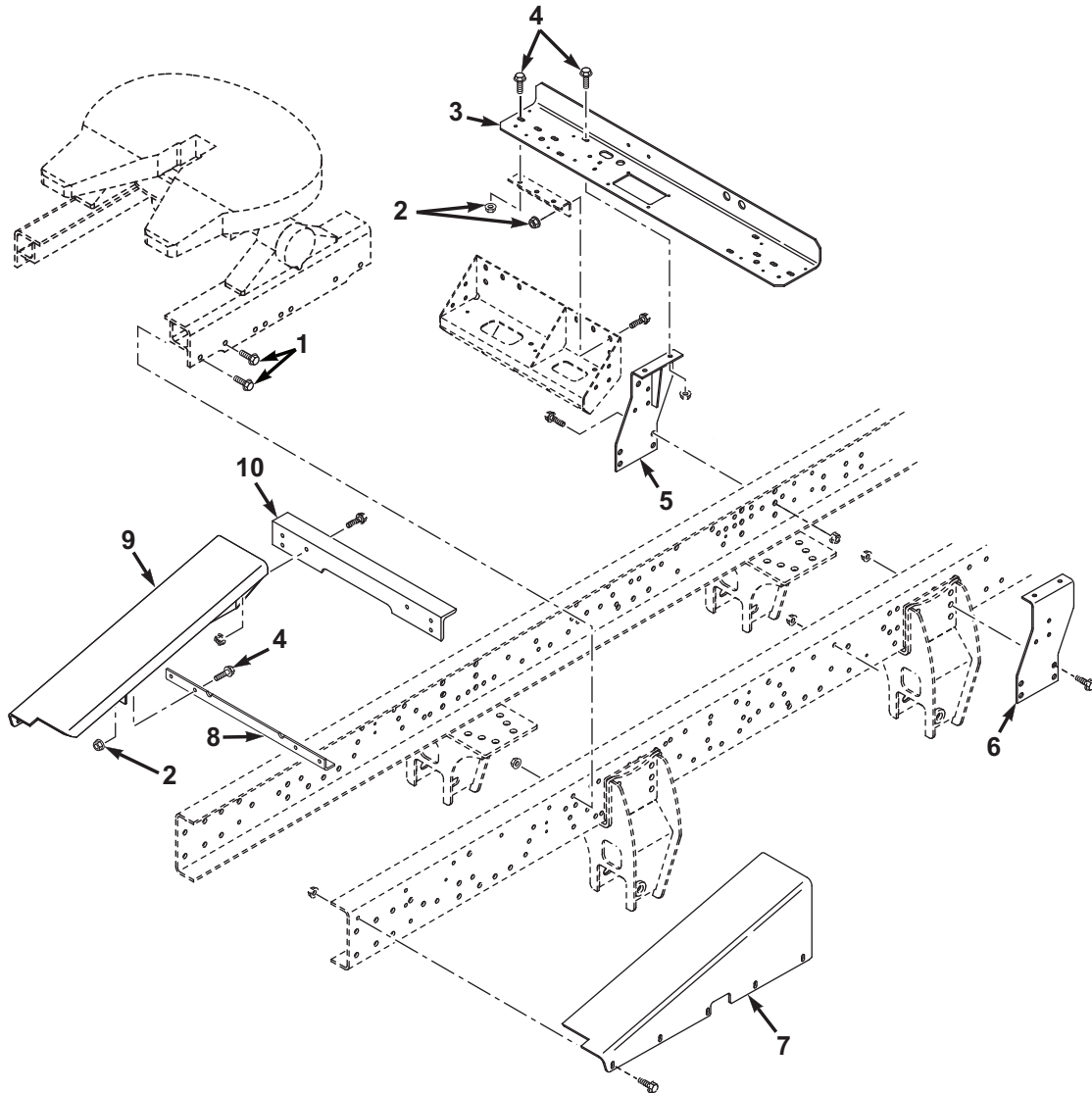


Figure 16. FIFTH WHEEL RAMP M983A2 LET

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1506 FIFTH WHEEL</b>						
<b>FIG. 16 FIFTH WHEEL RAMP M983A2 LET</b>						
1	PAFZZ	5306-01-150-7726	19207	12370195	BOLT,MACHINE, .62-11X2.50 G8 P	8
2	PAFZZ	5310-01-159-8178	45152	110310A	NUT,SELF-LOCKING,EX, .50-13 G8 PO	10
3	PAFZZ	0000-00-000-0000	45152	3591231	BRACKET,LIGHT MOUNT	1
4	PAFZZ	5306-01-155-9765	45152	115304A	BOLT,MACHINE, .50-13X1.25 G8 P	10
5	PAFZZ	0000-00-000-0000	45152	3689064	BRACKET,MOUNT,WORKL	1
6	PAFZZ	0000-00-000-0000	45152	3689063	BRACKET,MOUNT,WORKL	1
7	PBFZZ	0000-00-000-0000	45152	3117240	RAMP ASSEMBLY,RH	1
8	PAFZZ	0000-00-000-0000	45152	3594513	BRACKET,SUPPORT,RAM, REAR	1
9	PBFZZ	0000-00-000-0000	45152	3117241	RAMP ASSEMBLYY,LH	1
10	PAFZZ	0000-00-000-0000	45152	3536588	ANGLE,SUPPORT,FIFTH, FRONT	1

**END OF FIGURE**



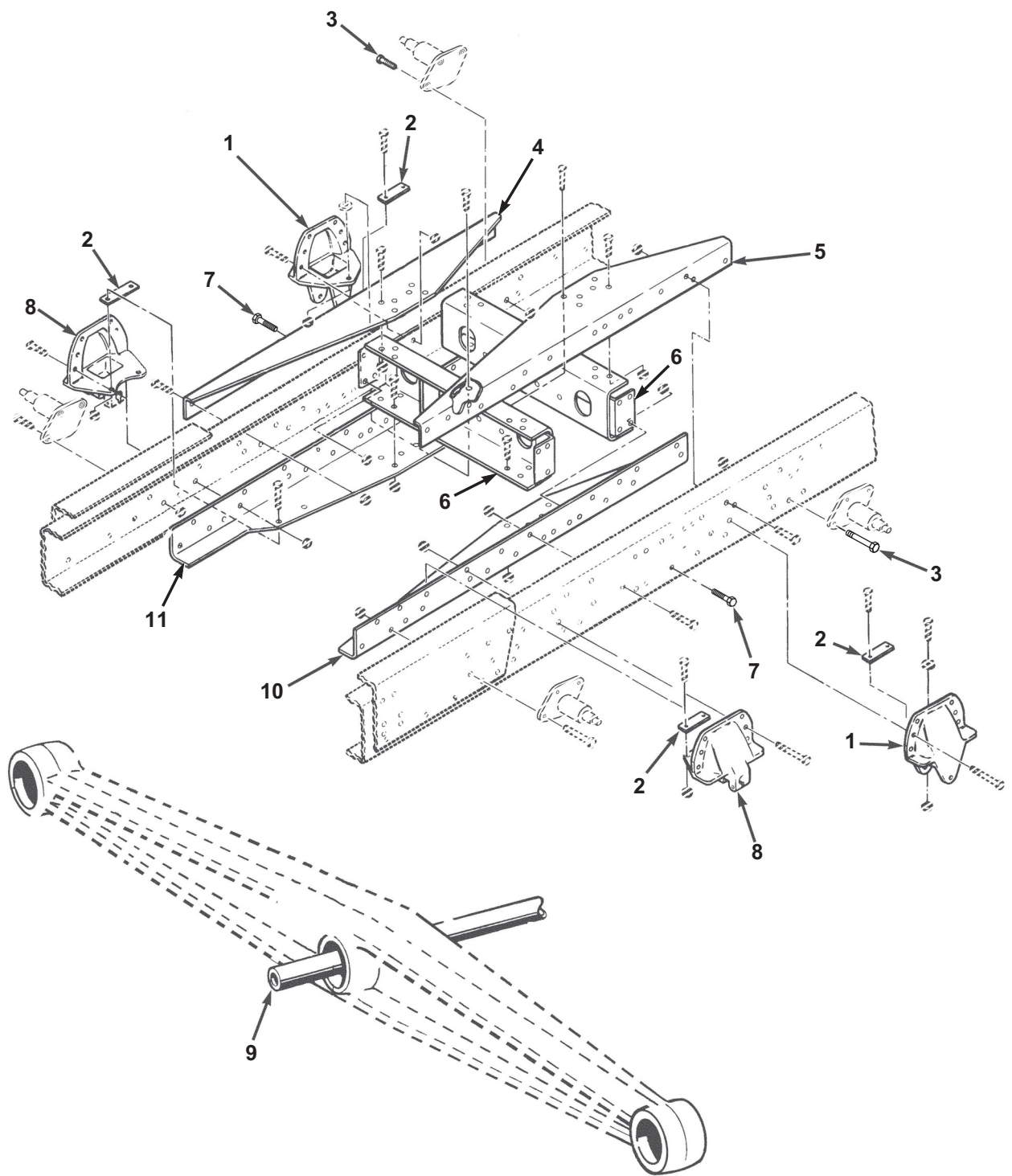


Figure 17. REAR SUSPENSION (Sheet 1 of 2)

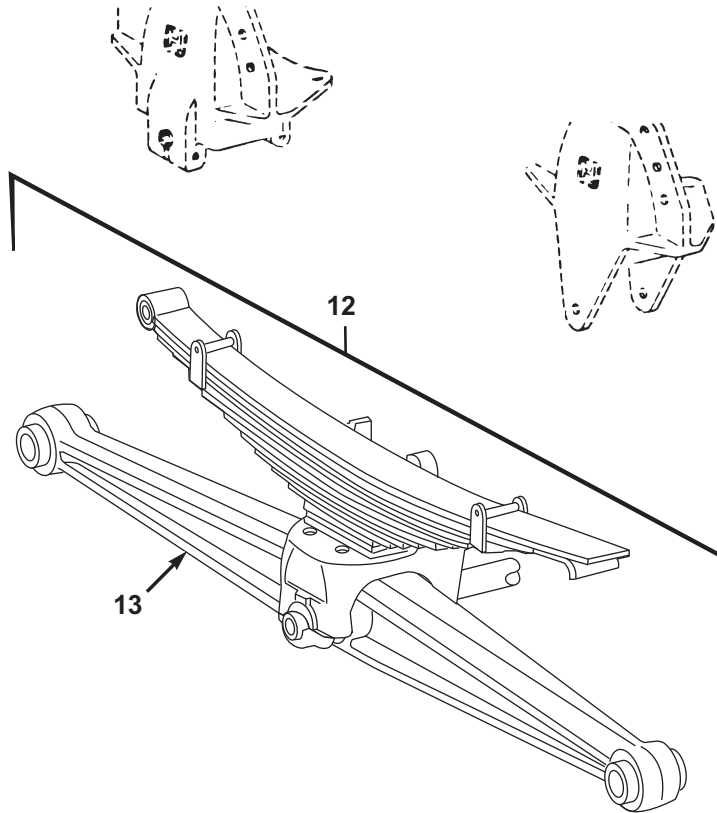


Figure 17. REAR SUSPENSION (Sheet 2 of 2)



(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1601 SPRINGS</b>						
<b>FIG. 17 REAR SUSPENSION</b>						
1	PBFZZ	2510-01-159-1003	71388	57594-2	ALIGNMENT CLIP,LEAF	2
2	PAFZZ	5365-01-235-7601	45152	47556AX	SPACER,SPRING HANGE	4
3	PAFZZ	5305-01-149-1934	45152	111320A	SCREW,CAP,HEXAGON H	4
4	XDFZZ	0000-00-000-0000	45152	3685266	BRACKET,CROSSMEMBER, TOP RIGHT	1
5	XDFZZ	0000-00-000-0000	45152	3685264	BRACKET,CROSSMEMBER, TOP LEFT	1
6	XDFZZ	0000-00-000-0000	45152	3684130	CROSSMEMBER	2
7	PAFZZ	5306-01-156-5429	45152	115217A	BOLT,MACHINE	8
8	PBFZZ	2510-01-159-1002	28158	46841-2	ALIGNMENT CLIP,LEAF	2
9	PAFZZ	2510-01-146-4158	45152	19AS60	CROSS TUBE	1
10	XDFZZ	0000-00-000-0000	45152	3685263	BRACKET,CROSSMEMBER, BOTTOM LEFT	1
11	XDFZZ	0000-00-000-0000	45152	3685265	BRACKET,CROSSMEMBER, BOTTOM RIGHT	1
12	PFFHH	0000-00-000-0000	6N039	57818-011	SUSPENSION,REAR, RT480-520	1
13	PFFZZ	0000-00-000-0000	6N039	57100-18	. BEAM,SPRING AND SAD, RIGHT HAND	1
13	PFFZZ	0000-00-000-0000	6N039	57100-17	. BEAM,SPRING AND SAD, LEFT HAND	1
<b>END OF FIGURE</b>						

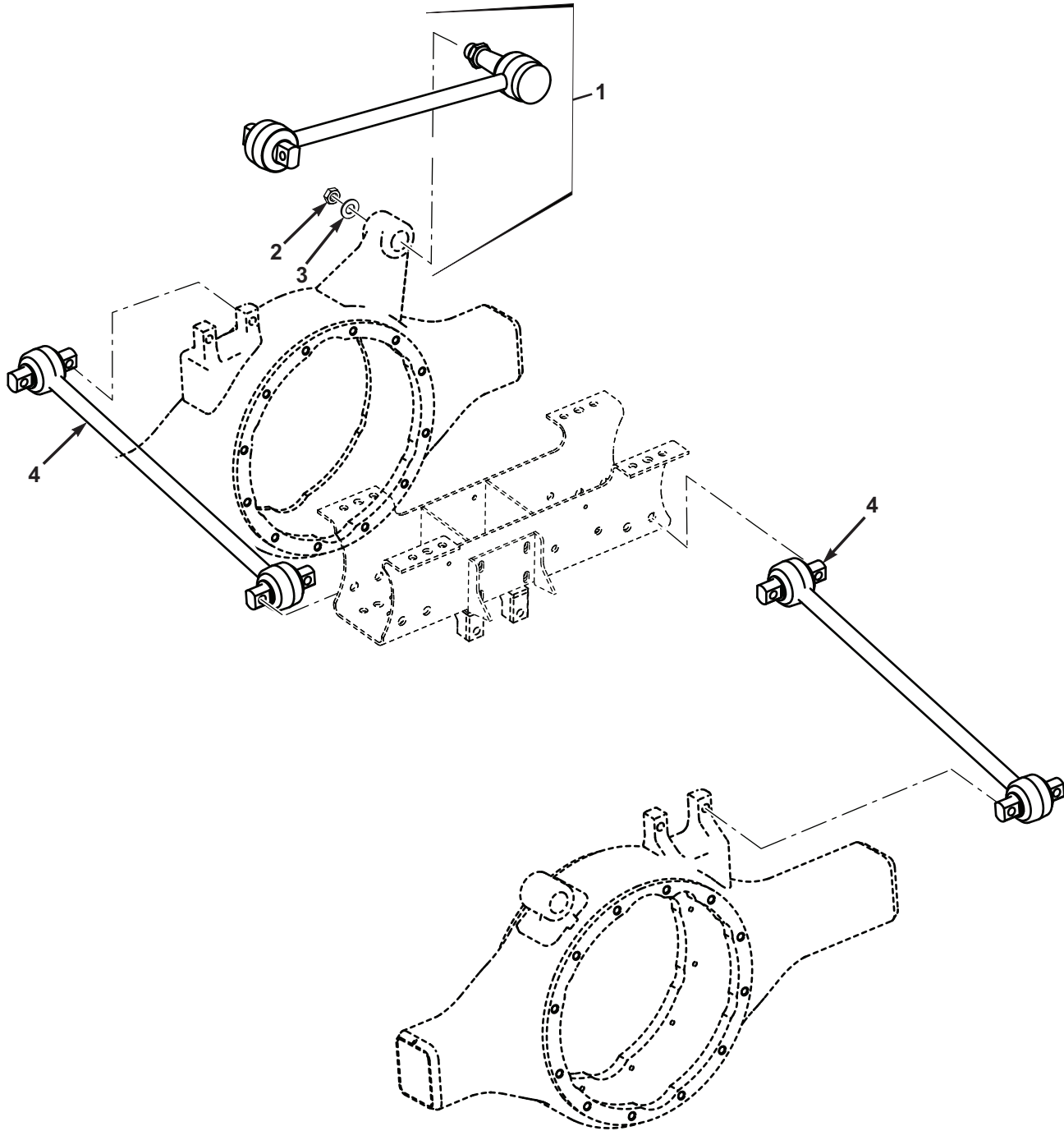


Figure 18. REAR SUSPENSION CONTROL RODS

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
GROUP 1605 TORQUE, RADIUS AND STABILIZER RODS						
FIG. 18 REAR SUSPENSION CONTROL RODS						
1	PAFZZ	0000-00-000-0000	27387	976590	ROD,TORQUE	1
2	PAFZZ	0000-00-000-0000	27387	060460	. NUT,SELF-LOCKING	1
3	PAFZZ	0000-00-000-0000	27387	060450	. WASHER,FLAT	1
4	PAFZZ	0000-00-000-0000	27387	976570	ROD,TORQUE	2
END OF FIGURE						

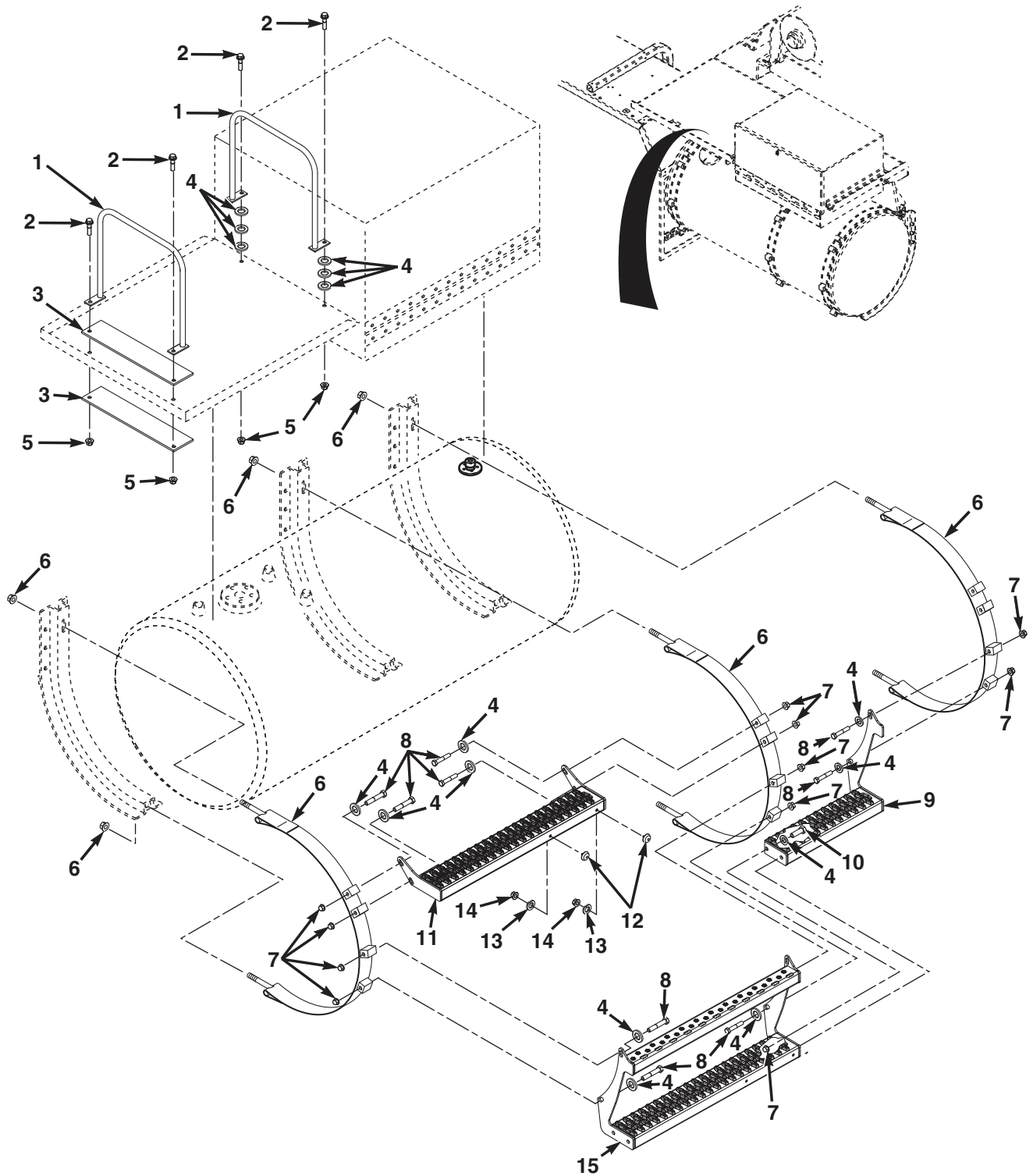


Figure 19. TANK STEPS

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 1801 BODY, CAB HOOD AND HULL ASSEMBLIES</b>						
<b>FIG. 19 TANK STEPS</b>						
1	PAFZZ	0000-00-000-0000	45152	3708734	HANDLE,GRAB	2
2	PAFZZ	5305-01-167-9408	45152	128131A	SCREW,CAP,HEXAGON H	4
3	PAFZZ	0000-00-000-0000	45152	3708704	PLATE,SPACER	1
4	PAFZZ	5310-01-457-8573	45152	720HX	WASHER,FLAT	18
5	PAFZZ	5310-01-159-8178	45152	110310A	NUT,SELF-LOCKING,EX, .50-13 G8 PO	4
6	PAFZZ	0000-00-000-0000	45152	3690569	STRAP,FUEL TANK MOU	3
7	PAFZZ	5310-01-342-8595	45152	1598030	NUT,SELF-LOCKING,EX	12
8	PAFZZ	5305-00-685-3193	96906	MS35297-117	SCREW,CAP,HEXAGON H	10
9	PFFZZ	0000-00-000-0000	45152	3691896	STEP,LOWER AFT	1
10	PAFZZ	5305-01-483-1144	45152	463BO1	SCREW,CAP,HEXAGON H	2
11	PFFZZ	0000-00-000-0000	45152	3690597	STEP,UPPER	1
12	PAFZZ	5340-01-486-2406	45152	3258335	BUMPER,NONMETALLIC	2
13	PAFZZ	5310-01-068-8446	11939	1263-3304-0	WASHER,LOCK	2
14	PAFZZ	5310-01-105-7229	06853	244095	NUT,PLAIN,HEXAGON	2
15	PFFZZ	0000-00-000-0000	45152	3690702	STEP,LOWER	1

**END OF FIGURE**

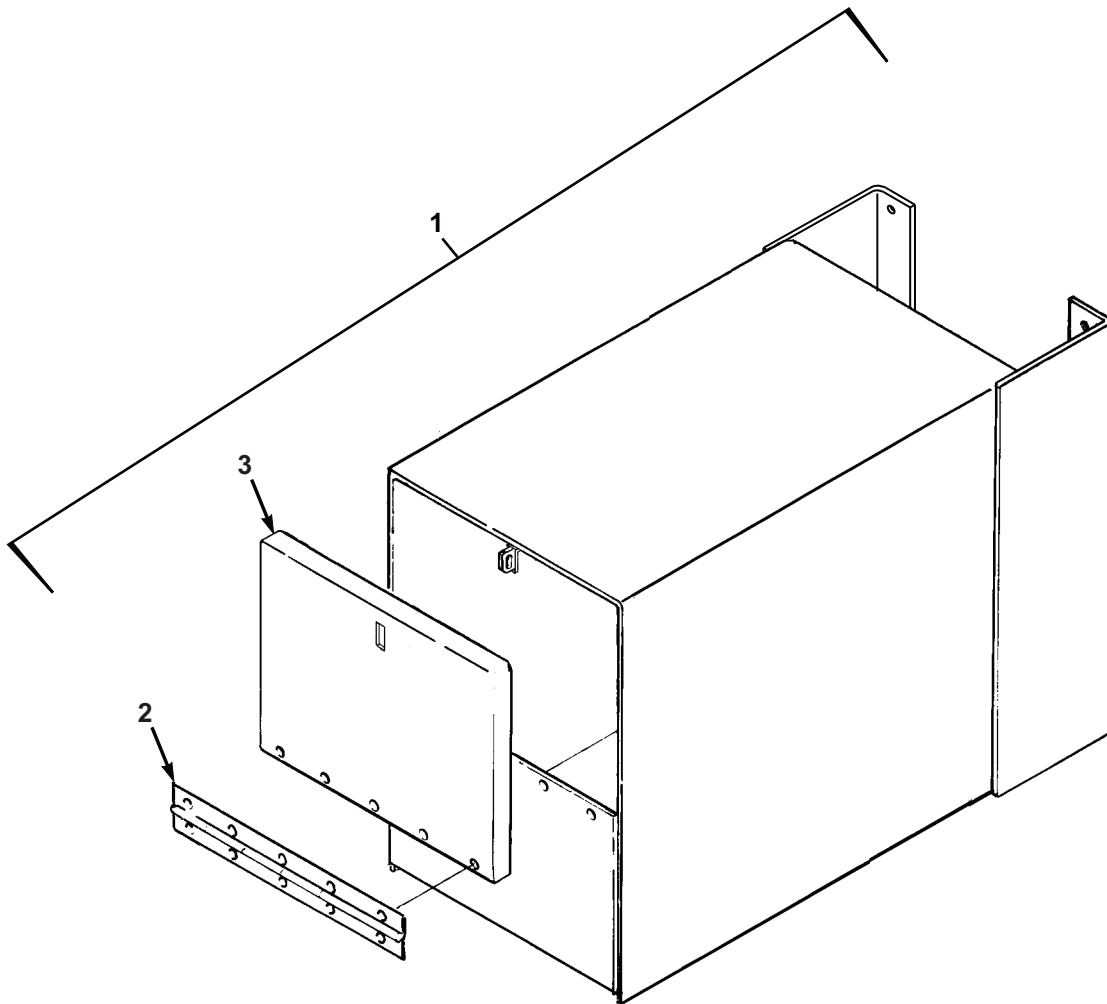


Figure 20. STOWAGE BOX

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
GROUP 1808 STOWAGE RACKS,BOXES,STRAPS,CARRYING CASES,CABLE REE						
FIG. 20 STOWAGE BOX						
1	PAFFF	0000-00-000-0000	45152	3601149	BOX,STOWAGE	1
2	PAFZZ	5340-01-153-9527	45152	1318180	. HINGE,BUTT	1
3	PAFZZ	5340-01-152-7708	45152	1318190	. DOOR,ACCESS,GENERAL	1
END OF FIGURE						

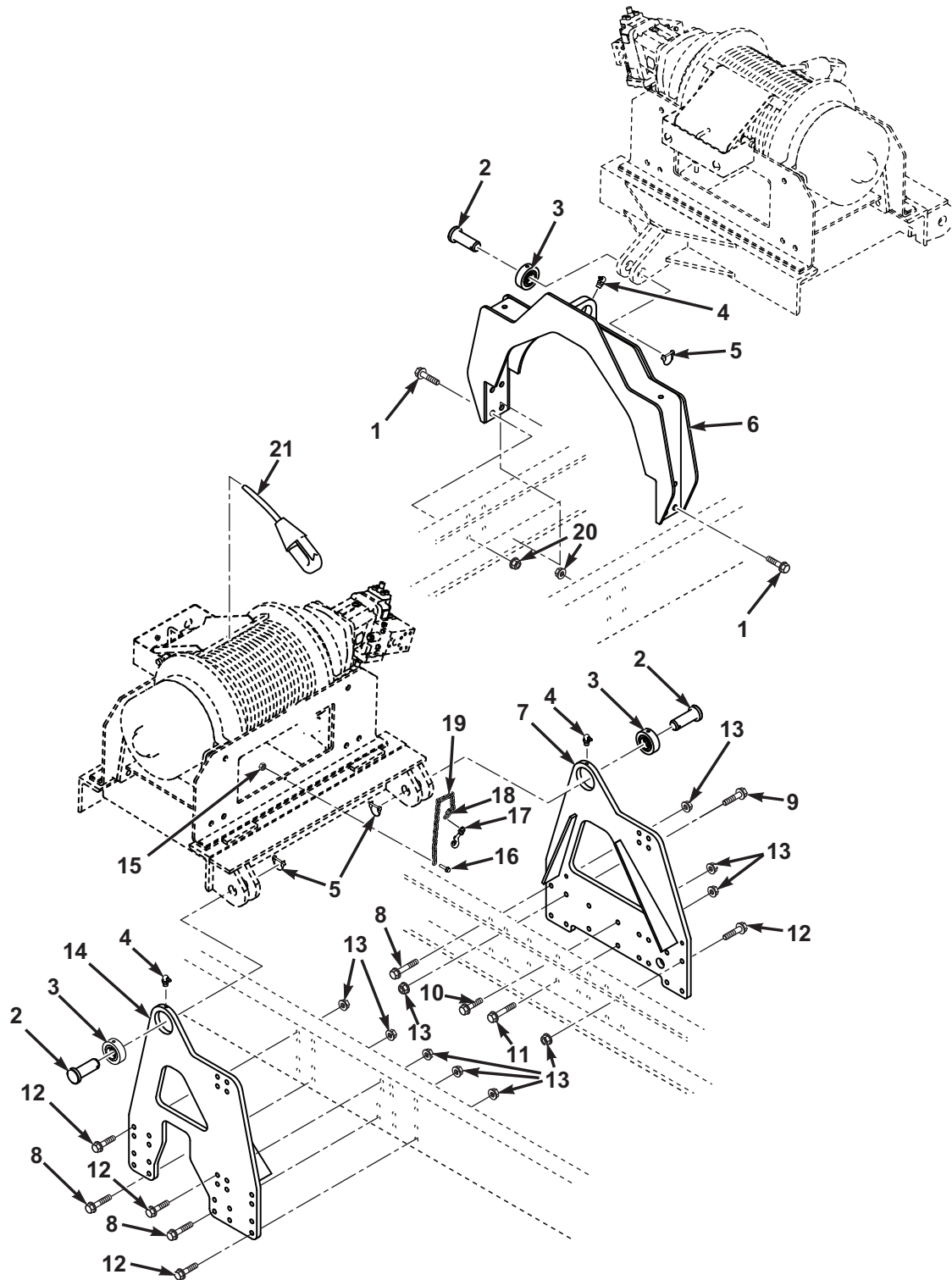


Figure 21. WINCH INSTALLATION



(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 2001 HOIST, WINCH,CAPSTAN,WINDLASS,CRANE OR WINCH ASSEMBLY</b>						
<b>FIG. 21 WINCH INSTALLATION</b>						
1	PAFZZ	5306-01-236-1585	45152	1336700	BOLT,MACHINE	8
2	PAFZZ	5315-01-167-5583	45152	1377810	PIN,STRAIGHT,HEADED	3
3	PAFZZ	3120-00-120-4825	51588	B24-LSS	BEARING,PLAIN,SELF-	3
4	PAFZZ	4730-00-172-0034	81343	AS15003-6-P	FITTING,LUBRICATION	3
5	PAFZZ	5315-01-136-1860	96652	28-01	PIN,STRAIGHT,HEADED	3
6	PFFZZ	0000-00-000-0000	45152	3589391	WINCH MOUNT,FRONT	1
7	PFFZZ	0000-00-000-0000	45152	3589389	WINCH MOUNT,RH	1
8	PAFZZ	5306-01-159-6549	45152	111452A	BOLT,MACHINE, .62-11X2.75 G8	11
9	PAFZZ	5306-01-150-7726	19207	12370195	BOLT,MACHINE, .62-11X2.50 G8	2
10	PAFZZ	5305-01-147-9723	45152	111317A	SCREW,CAP,HEXAGON H	1
11	PAFZZ	5305-01-151-1031	45152	111318A	SCREW,CAP,HEXAGON H	1
12	PAFZZ	5306-01-156-5429	45152	115217A	BOLT,MACHINE	23
13	PAFZZ	5310-01-111-0645	45152	110311A	NUT,SELF-LOCKING,EX, .62-11 G8 PO	38
14	PFFZZ	0000-00-000-0000	45152	3589390	WINCH MOUNT,LH	1
15	PAFZZ	5310-01-340-5671	45152	1333510	NUT,SELF-LOCKING,EX, .31-18 G5 ZY	1
16	PAFZZ	5306-01-341-0712	45152	1756870	BOLT,MACHINE	1
17	PAFZZ	5340-01-121-8769	39428	3913T11	SNAP HOOK	1
18	PAFZZ	0000-00-000-0000	39428	3711T22	CHAIN CONNECTOR	1
19	PAFZZ	0000-00-000-0000	45152	3594541	CHAIN,2/0	1
20	PAFZZ	5310-01-150-5918	45152	110312A	NUT,SELF-LOCKING,EX, .75-10 G8	8
21	PAFZZ	0000-00-000-0000	58864	81557	ROPE,WIRE,150 FT	1

**END OF FIGURE**

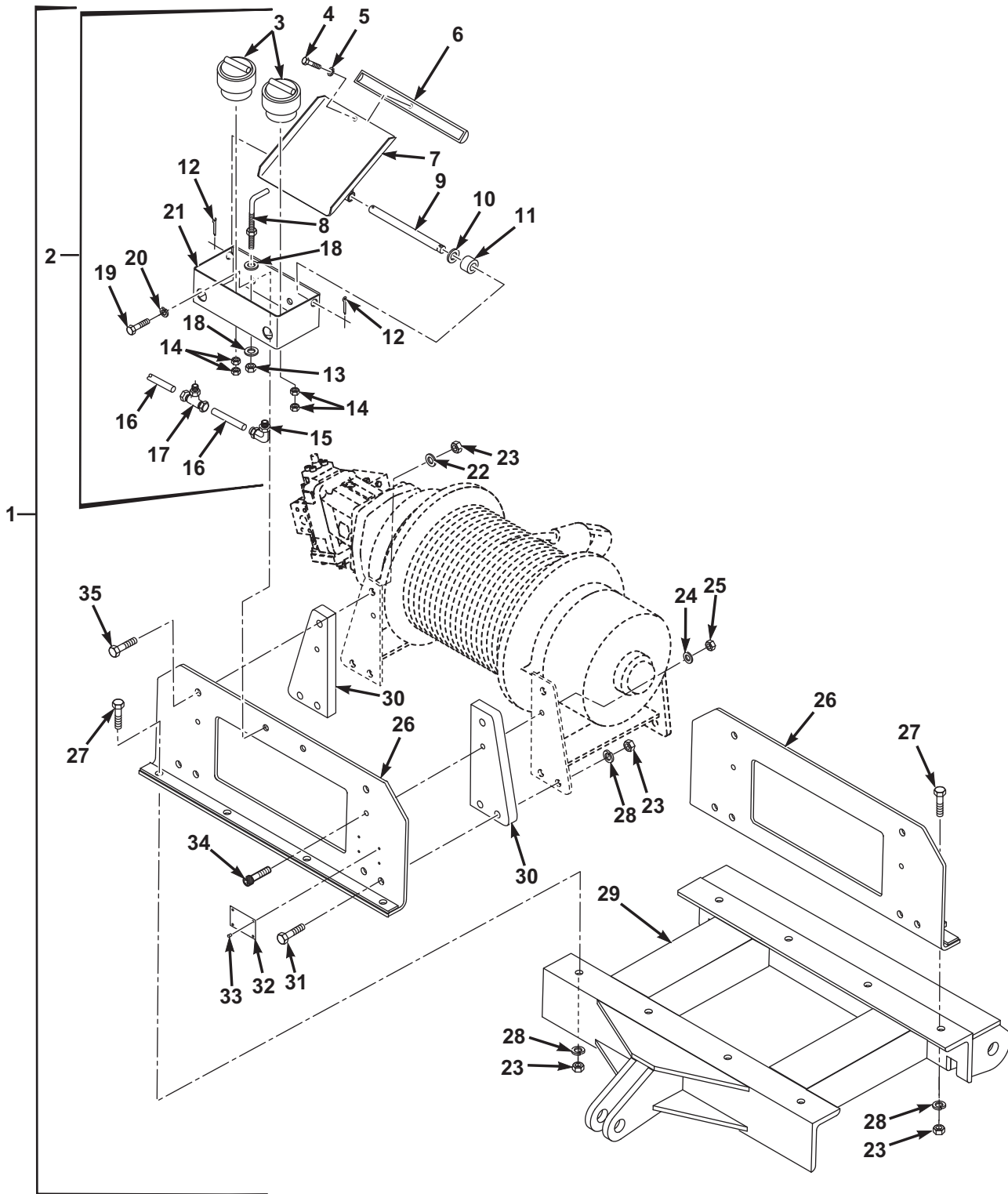


Figure 22. WINCH ASSEMBLY (Sheet 1 of 5)

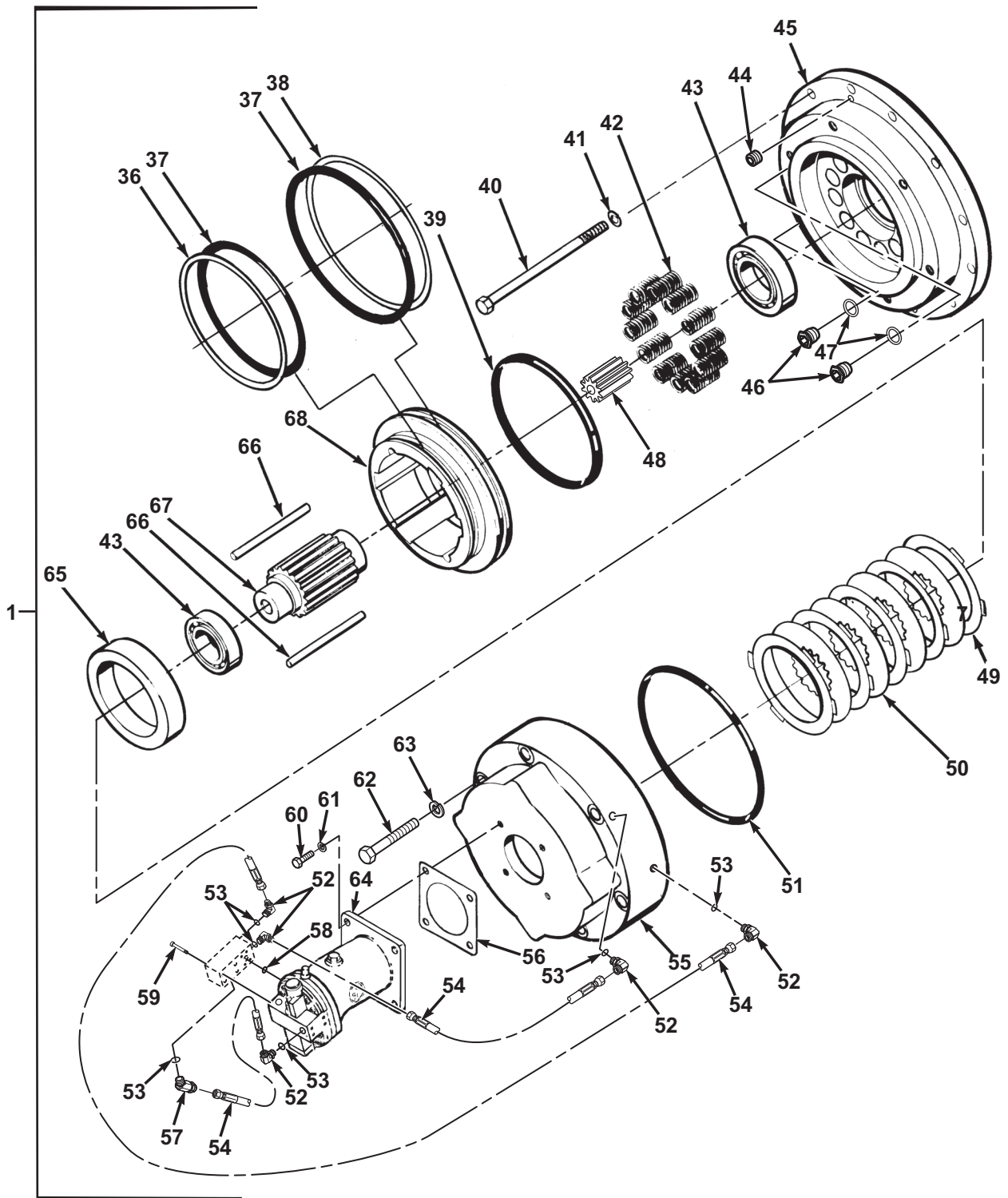


Figure 22. WINCH ASSEMBLY (Sheet 2 of 5)

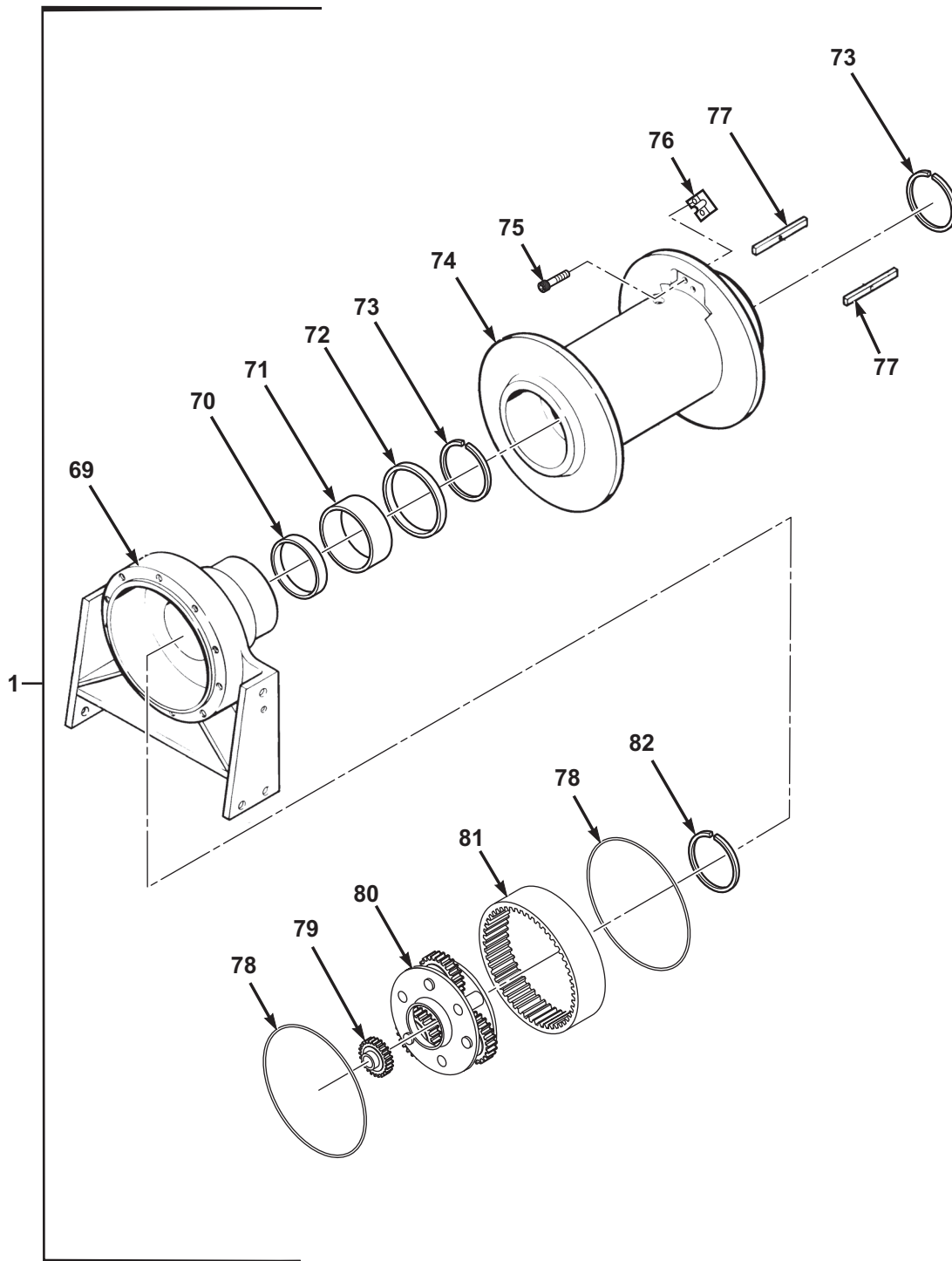


Figure 22. WINCH ASSEMBLY (Sheet 3 of 5)

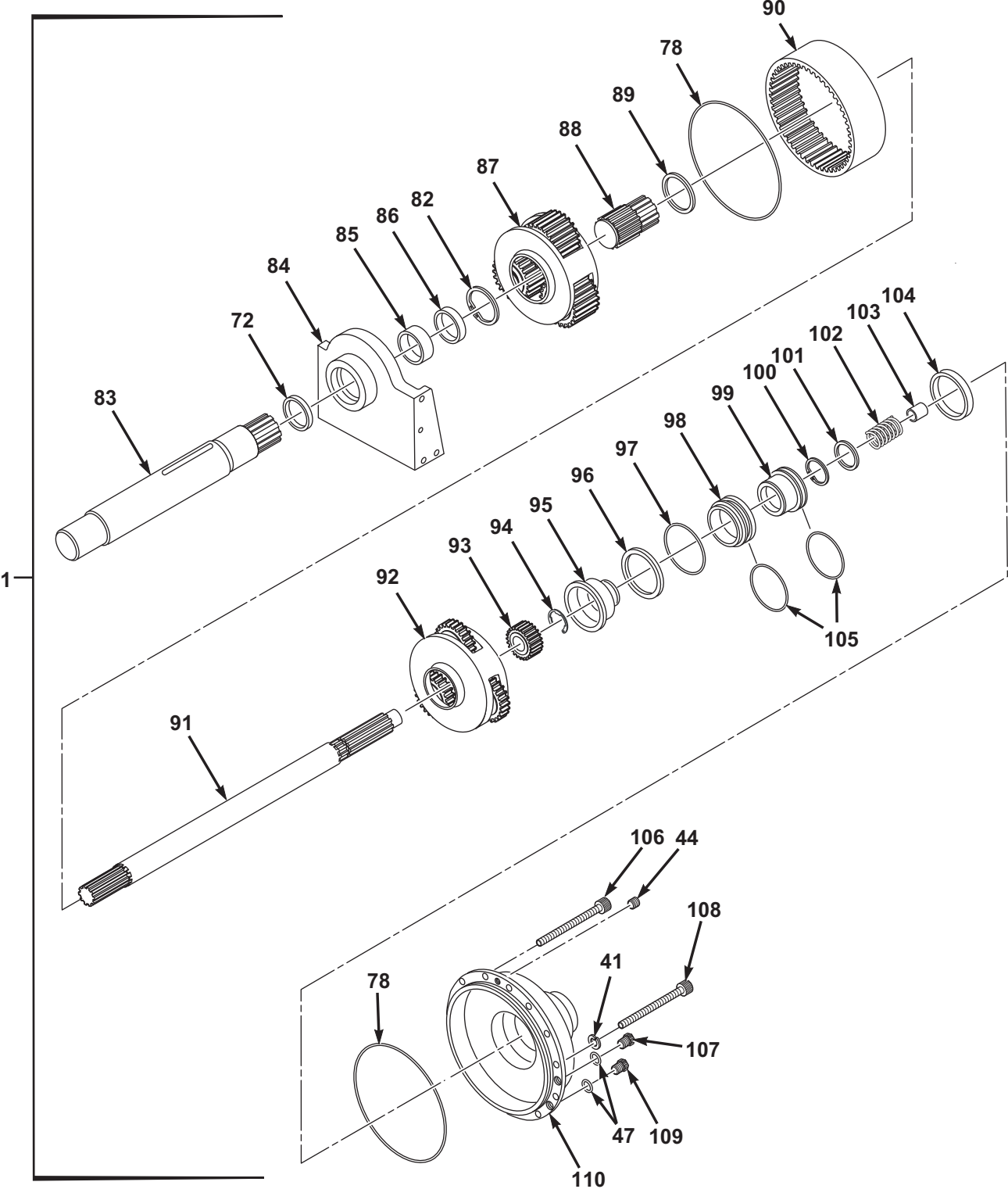


Figure 22. WINCH ASSEMBLY (Sheet 4 of 5)

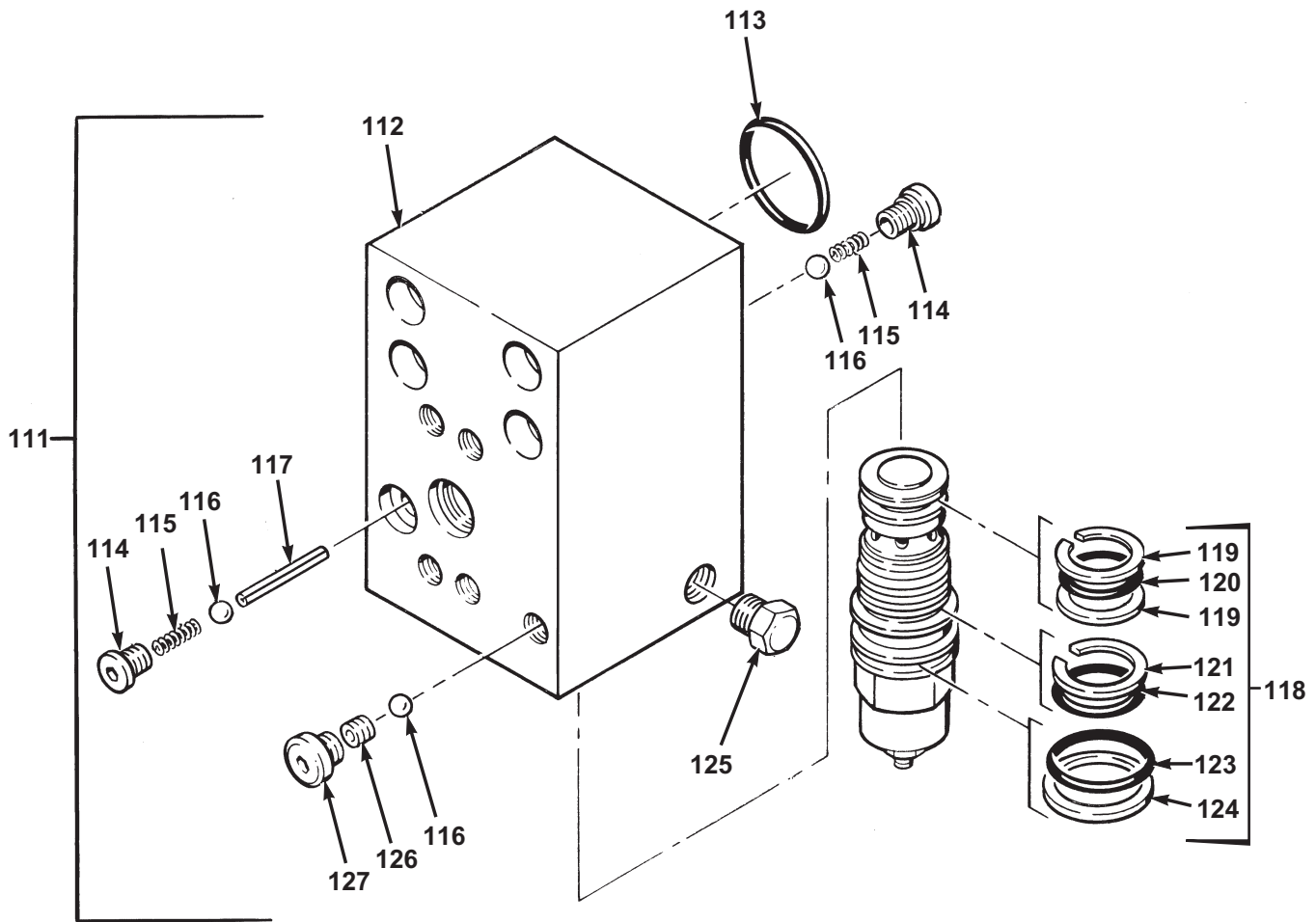


Figure 22. WINCH ASSEMBLY (Sheet 5 of 5)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
GROUP 2001 HOIST, WINCH,CAPSTAN,WINDLASS,CRANE OR WINCH ASSEMBLY						
FIG. 22 WINCH ASSEMBLY						
1	PBFHH	0000-00-000-0000	0EJ14	53642	WINCH ASSY,45K	1
2	PAFFF	0000-00-000-0000	0EJ14	55168	HOLD DOWN ASSY,CBL	1
3	PAFZZ	2510-01-369-3747	0EJ14	3445	AIR SPRING,VEHICULA	2
4	PAFZZ	5306-01-161-2566	0EJ14	1166	BOLT,MACHINE, 5/16-18NC X 1	3
5	PAFZZ	5310-01-254-2575	0EJ14	1168	WASHER,LOCK	3
6	PAFZZ	0000-00-000-0000	0EJ14	14014	BAR,RUB	1
7	PAFZZ	0000-00-000-0000	0EJ14	13969	ARM,PIVOT	1
8	PAFZZ	5306-01-519-2749	45152	2KK863	BOLT,ANCHOR,THREADE, 5/8 X 6 W/2" 90-W/NUT	1
9	PAFZZ	5315-01-519-2746	45152	2KK864	PIN,SHOULDER,HEADLE	1
10	PAFZZ	5310-01-513-5916	45152	2HA681	WASHER,FLAT	2
11	PAFZZ	0000-00-000-0000	0EJ14	13973	PIN,SPACER	1
12	PAFZZ	5315-01-513-5902	45152	2HA680	PIN,COTTER	2
13	PAFZZ	5310-01-513-5891	45152	2HA505	NUT,PLAIN,HEXAGON	1
14	PAFZZ	5310-01-513-5909	45152	2GL546	NUT,PLAIN,HEXAGON	4
15	PAFZZ	4730-01-367-7431	0EJ14	78403	ELBOW,PIPE TO TUBE	1
16	PAFZZ	4720-01-356-9815	0EJ14	69095	TUBING,NONMETALLIC	1
17	PAFZZ	4730-01-367-7430	0EJ14	78402	FITTING,TEE	1
18	PAFZZ	0000-00-000-0000	0EJ14	1598	WASHER,FLAT, 5/8 SAE	2
19	PAFZZ	5305-01-543-1017	45152	3KK181	SCREW,CAP,HEX HEAD, 1/2-13NC X 1	2
20	PAFZZ	5310-01-161-2527	0EJ14	1495	WASHER,LOCK	2
21	PAFZZ	0000-00-000-0000	0EJ14	62859	BRACKET,MOUNTING	1
22	PAFZZ	5310-01-522-7292	0EJ14	1698	WASHER,FLAT	4
23	PAFZZ	5310-00-763-8921	96906	MS51967-23	NUT,PLAIN,HEXAGON	20
24	PAFZZ	5310-01-197-3359	0EJ14	1394	WASHER,FLAT	4
25	PAFZZ	5310-01-197-4370	45152	2BD393	NUT,PLAIN HEXAGON, 3/8-16NC GRADE 2	4
26	PFFZZ	0000-00-000-0000	0EJ14	14055	BASE MOUNT,MOD 50-B	2
27	PAFZZ	5305-01-161-7299	0EJ14	1605	SCREW,CAP,HEXAGON H, 3/4-10NC X 2.25 GRADE 5	8
28	PAFZZ	5310-01-163-2481	0EJ14	1695	WASHER,LOCK, 3/4	16

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
29	XAFZZ	0000-00-000-0000	0EJ14	15076	PLATE,CROWD	1
30	PFFZZ	0000-00-000-0000	0EJ14	14058	SPACER,BASE ANGLE, 1" THICK	4
31	PAFZZ	0000-00-000-0000	0EJ14	1609	SCREW,CAP,HEX HD, 3/4-10NC X 3.25 GRADE 5	8
32	PFFZZ	0000-00-000-0000	0EJ14	12616	PLATE,ID,WINCH	1
33	PFFZZ	5320-01-161-2265	45152	2AN500	RIVET, #2 X 1/4L RD.HD	4
34	PAFZZ	0000-00-000-0000	0EJ14	1479	BOLT,SHOULDER, 1/2 X 2" W/3/8-16 THD	4
35	PAFZZ	0000-00-000-0000	0EJ14	1608	CAP SCREW,HH, 3/4-10NC X 3 GRADE 5	4
36	KFHZZ	5365-01-224-2304	0EJ14	9852	. RING	1
37	KFHZZ	5330-01-268-0914	0EJ14	9851	. PACKING,PREFORMED	2
38	KFHZZ	5365-01-224-2305	0EJ14	9854	. RING	1
39	KFHZZ	5330-01-267-9017	0EJ14	9853	. PACKING,PREFORMED, 6.5 ID X . 1875W,#2-36 BUNA N-70D	1
40	PAHZZ	5305-01-544-7436	0EJ14	1408	SCREW,CAP,HEX HD, 1/2-13NC X 2.75 GRADE 5	4
41	PAHZZ	5310-01-161-2527	0EJ14	1495	WASHER,LOCK	14
42	KFHZZ	5360-01-225-9676	0EJ14	2319	. SPRING,HELICAL,COMP	12
43	PAHZZ	3110-01-228-7663	0EJ14	81434	BEARING,BALL,ANNULA	2
44	PAFZZ	4820-00-637-2576	75477	903103-1	VALVE,SAFETY RELIEF	2
45	PFHZZ	3040-01-522-8068	0EJ14	14026	ADAPTER,BRAKE DRUM	1
46	PAFZZ	5365-01-515-0691	45152	2GL594	PLUG,MACHINE THREAD	2
47	PAFZZ	5331-01-244-2273	01276	22617-8	O-RING	2
48	PFHZZ	3040-01-326-9028	0EJ14	11724	EXTENSION SHAFT	1
49	KFHZZ	2530-01-251-5296	0EJ14	11603	. DISC,BRAKE	5
50	KFHZZ	0000-00-000-0000	0EJ14	3169	. PLATE,DRIVE,BRAKE	4
51	KFHZZ	5331-01-269-6079	0EJ14	9844	. O-RING, 6.75 ID X 7 OD X .125 BUNA N-70D	1
52	PAFZZ	4730-01-356-8647	0EJ14	76017	ELBOW,TUBE TO BOSS	5
53	PAFZZ	5331-01-049-1292	81346	ASTMD2000M6BG 910	O-RING	6
54	PAFZZ	0000-00-000-0000	0EJ14	75038	HOSE, 1/4-R1 X 12"-#4FJIC/#4FJIC	3
55	XAHZZ	0000-00-000-0000	0EJ14	14253	HOUSING,BRAKE,OUTER	1
56	KFFZZ	5330-01-225-0920	0EJ14	11522	. GASKET	1
57	PAFZZ	0000-00-000-0000	0EJ14	76029	ADAPTER, 45D-#4ORNG/#4 MJIC	1



(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
58	PAFZZ	5331-01-229-0726	0EJ14	9806	O-RING	1
59	PAFZZ	5305-01-225-0908	0EJ14	1375	SCREW,CAP,SOCKET HE, 7/16-14NC X 3.5	4
60	PAFZZ	5305-01-324-8391	0EJ14	1604	SCREW,CAP,HEXAGON, 3/4-10NC X 2 GRADE 8	4
60	PAFHH	0000-00-000-0000	0EJ14	73143	MOTOR-HYD-RR/VOLVO	1
61	PAFZZ	5310-01-163-2481	0EJ14	1695	WASHER,LOCK, 3/4	4
62	PAHZZ	0000-00-000-0000	0EJ14	1387	SCREW,CAP,HEX HD, 7/16-14NC X 3.25 GRADE 8	6
63	PAHZZ	5310-01-162-5737	58864	1388	WASHER,LOCK, 7/16	6
65	PFHZZ	0000-00-000-0000	0EJ14	11466	SPACER,DP BRAKE	1
66	PAHZZ	5315-01-223-1159	0EJ14	3263	PIN,STRAIGHT,HEADLE	2
67	PAHZZ	0000-00-000-0000	0EJ14	11888	SHAFT,BRAKE,C SPLIN	1
68	PAHZZ	5340-01-220-1293	0EJ14	11443	PLUNGER,DETENT	1
69	XAHZZ	0000-00-000-0000	0EJ14	13975	SUPPORT,END MOTOR	1
70	PAHZZ	4320-01-327-0479	58864	11725	PLATE,THRUST, ROTARY PUMP	1
71	PAHZZ	3110-01-527-6658	0EJ14	81438	ROLLER,BEARING	1
72	KFHZZ	5330-01-327-5498	0EJ14	9888	. SEAL,PLAIN ENCASED	2
73	KFHZZ	5325-01-522-7322	0EJ14	3714	. RING,RETAINING, 3.35 OD X .093T	2
74	PFHZZ	3950-01-530-9675	0EJ14	14360	DRUM,WINCH	1
75	PAFZZ	5305-01-341-9443	0EJ14	1586	SCREW,CAP,SOCKET H, 5/8-11NC X 2.25,GR 8	2
76	PAFZZ	5340-01-326-9472	0EJ14	12518	CLAMP,BLOCK	1
77	PBHZZ	5315-01-522-8202	0EJ14	14371	KEY,WOODRUFF	2
78	KFHZZ	5331-01-525-0160	0EJ14	9957	. O-RING, 10 1/2 ID X 1/8 SECTION	4
79	PAHZZ	3020-01-327-0482	0EJ14	11727	GEAR,HELICAL	1
80	PAHZZ	0000-00-000-0000	0EJ14	12437	CARRIER ASSY,PLANET	1
81	PAHZZ	3020-01-523-7208	0EJ14	14217	GEAR,INTERNAL	1
82	KFHZZ	5325-01-329-1947	0EJ14	3279	. RING,RETAINING	2
83	PAHZZ	3040-01-523-7200	0EJ14	14229	SHAFT,SHOULDERED, LGTH-DS/E	1
84	XAHZZ	0000-00-000-0000	0EJ14	14227	SUPPORT,GEAR END	1
85	PAHZZ	3110-01-527-6658	0EJ14	81438	ROLLER,BEARING	1
86	PAHZZ	5365-01-330-8461	58864	11555	SPACER,PLATE, 4.25 OD X .25T	1
87	PAHZZ	3010-01-095-5641	0EJ14	3034	CARRIER,GEAR REDUCT	1
88	PAHZZ	3020-01-525-0648	0EJ14	13985	GEAR,HELICAL	1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
89	PAHZZ	5310-01-522-9555	0EJ14	13929	WASHER,FLAT, 4 1/4 OD X 1/4T	1
90	PAHZZ	3020-01-523-7212	00736	14132	GEAR,INTERNAL	1
91	PAHZZ	0000-00-000-0000	0EJ14	14365	SHAFT,INPUT,MOD46-B, LGTH-AKO-DS/E	1
92	PAHZZ	3040-01-523-7215	0EJ14	13977	GEAR,SUM	1
93	PAHZZ	0000-00-000-0000	0EJ14	14036	GEAR,SUN 20 TEETH	1
94	KFHZZ	5325-01-522-7638	0EJ14	12037	. RING,RETAINING, 1.15 ID X .14 ROUND SECTION	1
95	PAHZZ	0000-00-000-0000	0EJ14	14039	COUPLING, KICKOUT	1
96	KFHZZ	5325-01-375-0501	0EJ14	3632	. RING,RETAINING, 3 OD X 34 GAGE	1
97	KFHZZ	0000-00-000-0000	0EJ14	9678	. O-RING, 2 1/2 ID X 1/8 SECTION	1
98	PAHZZ	4820-01-527-5935	0EJ14	14038	PISTON,VALVE	1
99	PAHZZ	4320-01-527-5916	0EJ14	14040	PISTON-KICKOUT	1
100	KFHZZ	5325-01-527-5922	0EJ14	3267	. RING,RETAINING, 1-9/16 X .062 THICK	1
101	PAHZZ	3120-01-527-6976	0EJ14	14037	BEARING,WASHER,THR, 2.16 OD X 1.59 ID X .075 THICK	1
102	PAHZZ	5360-01-527-5910	0EJ14	2323	SPRING,HELICAL,COMP, .192 X 1-15/16 OD	1
103	PAHZZ	3120-01-527-5909	0EJ14	81620	BUSHING,SLEEVE, 3/4 ID X 1 OD X 3/4	1
104	PAHZZ	5365-01-527-5953	0EJ14	14354	SPACER,RING, 4.25 OD X 3.5610 ID X .78	1
105	KFHZZ	5331-01-375-3086	0EJ14	9602	. O-RING, 2 3/4 ID X 3 OD X 1/8 SECTION	2
106	PAHZZ	5305-01-522-8093	64678	1451	SCREW,CAP,SOCKET HE, 1/2-13NC X 6	2
107	PAHZZ	5365-01-236-1955	27005	801294	PLUG,MACHINE THREAD, ORING BOSS,#10 SOCKET HEAD 7/8-14	1
108	PAHZZ	5305-01-522-7422	0EJ14	1418	SCREW,CAP,HEXAGON H, 1/2-13NC X 6-1/2 GRADE 5	10
109	PAHZZ	5365-01-375-6440	0EJ14	76343	PLUG,MACHINE THREAD, BOSS,ORING #10	1
110	PAHZZ	5340-01-527-5871	0EJ14	14041	COVER,ACCESS	1
111	PAFZZ	4820-01-221-5655	0EJ14	11520	VALVE,COUNTERBALANC	1
112	XAFZZ	0000-00-000-0000	58864	11519	. BODY,VALVE	1
113	PAFZZ	5331-01-229-0726	0EJ14	9806	. O-RING	1
114	PAFZZ	5365-01-225-0916	0EJ14	76045	. PLUG,MACHINE THREAD	2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
115	PAFZZ	5360-01-222-3996	58864	11453	. SPRING,HELICAL,COMP	2
116	PAFZZ	3110-01-418-1972	58864	3116	. BEARING,BALL,ANNULA	3
117	PAFZZ	5315-01-226-0968	0EJ14	3273	. PIN,SPRING	1
118	PAFFF	4820-01-221-5656	0EJ14	70034	. CARTRIDGE,VALVE	1
119	PAFZZ	0000-00-000-0000	58864	9858	. . RETAINER,PACKING	2
120	PAFZZ	0000-00-000-0000	58864	9857	. . PACKING,PREFORMED	1
121	PAFZZ	0000-00-000-0000	58864	9860	. . RETAINER,PACKING	1
122	PAFZZ	0000-00-000-0000	58864	9859	. . PACKING,PREFORMED	1
123	PAFZZ	5331-01-485-5991	58864	9861	. . PACKING,PREFORMED	1
124	PAFZZ	0000-00-000-0000	58864	9862	. . RETAINER,PACKING	1
125	PCFZZ	5331-01-164-6309	58864	76044	. PLUG,O-RING	1
126	PAFZZ	5365-01-224-8011	0EJ14	11462	. PLUG	1
127	PCFZZ	5331-01-225-0917	58864	76047	. PLUG,O-RING	1

END OF FIGURE

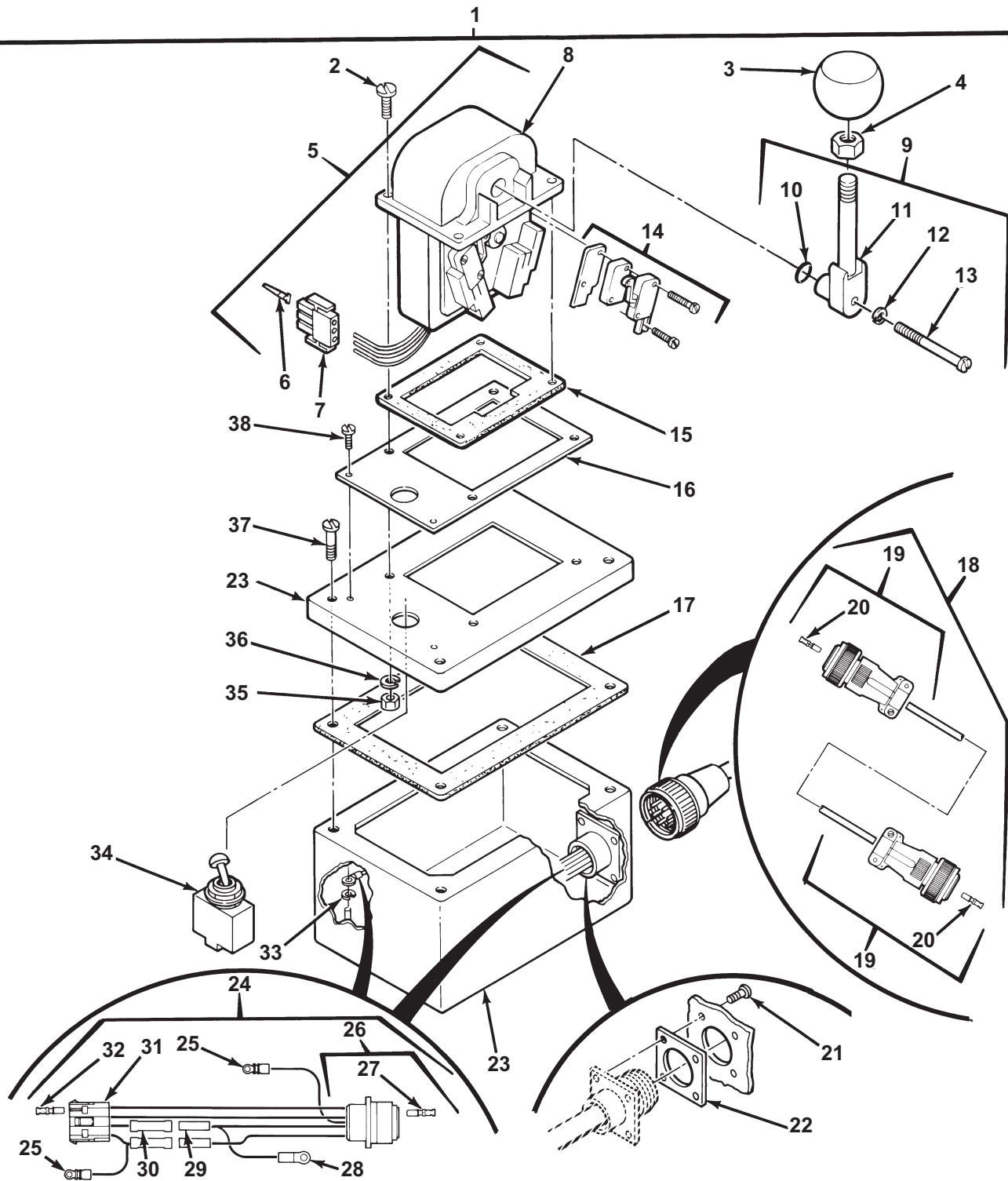


Figure 23. WINCH REMOTE CONTROL (COEI)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
GROUP 2001 HOIST, WINCH,CAPSTAN,WINDLASS,CRANE OR WINCH ASSEMBLY						
FIG. 23 WINCH REMOTE CONTROL (COEI)						
1	PDFFF	2590-01-217-8317	45152	1437940U	STATION,WINCH CONT	1
2	PAFZZ	5305-00-984-6195	80205	MS35206-247	. SCREW,MACHINE, .164-32 X .75	4
3	PAFZZ	5355-01-229-2052	45152	1492790	. KNOB	1
4	PAFZZ	5310-00-851-2674	96906	MS35691-1	. NUT,PLAIN,HEXAGON, .25-20	1
5	PAFFF	6110-01-212-4332	50064	EMS5M3412	. CONTROLLER,MOTOR	1
6	PAFZZ	5999-01-135-7369	34830	2129-0003	. . CONTACT,ELECTRICAL	1
7	PAFZZ	5935-01-324-0564	037Z3	87097-005	. . CONNECTOR BODY,PLUG	1
8	PAFZZ	5998-01-201-6416	50064	EA3412	. . CIRCUIT CARD ASSEMB	1
9	PAFZZ	5340-01-203-4959	50064	2279AM	. . LEVER ASSY,WINCH CO	1
10	PAFZZ	5331-01-214-1912	50064	A/103	. . . O-RING	1
11	PAFZZ	5340-01-213-9929	50064	A/278	. . . HANDLE,MANUAL CONTR	1
12	PAFZZ	5310-01-213-9891	50064	T/70	. . . WASHER,LOCK	1
13	PAFZZ	5305-01-213-9851	50064	A/107	. . . SCREW,MACHINE	1
14	PAFZZ	5340-01-234-7933	50064	2546AM	. . HARDWARE KIT,ELECTR	1
15	PAFZZ	5330-01-204-8871	50064	2273AM	. GASKET	1
16	PAFZZ	9905-01-223-8898	45152	1492030	. PLATE,IDENTIFICATIO	1
17	PAFZZ	5330-01-228-4238	45152	1494010	. GASKET	1
18	PDFFF	6150-01-231-6662	45152	1491030	CABLE ASSEMBLY,POWE	1
19	PAFZZ	5935-01-127-2089	96906	MS3456W18-11P	. CONNECTOR,PLUG,ELEC	2
20	PAFZZ	5999-00-752-7655	77820	10-40561	. . CONTACT,ELECTRICAL	1
21	PAFZZ	5305-01-235-7492	80205	MS51863-23	. SCREW,TAPPING	4
22	PAFZZ	5330-01-180-5618	56161	10513169	. GASKET	1
23	XAFZZ	0000-00-000-0000	45152	1492020	. BOX,ELECTRICAL	1
24	PAFFF	5995-01-222-5498	45152	1492050W	. WIRING HARNESS,BRAN	1
25	PAFZZ	5940-00-283-5280	81343	MS25036-106	. . TERMINAL,LUG	2
26	PAFZZ	5935-01-071-0331	96906	MS3452W18-11S	. . CONNECTOR,RECEPTAC	1
27	PAFZZ	5999-00-190-1887	81349	MIL-C-39029/30	. . . CONTACT,ELECTRICAL	1
28	PAFZZ	5940-00-143-4780	81343	MS25036-108	. . TERMINAL,LUG	1
29	PAFZZ	5940-00-801-3535	00779	34072	. . SPLICE,CONDUCTOR	2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
30	MFFZZ	0000-00-000-0000	45152	1343990-3	. . TUBING,HEAT SHRINK, MAKE FROM SLEEVING, P/N 603314-4 (00779) 3 IN LG	2
31	PAFZZ	5935-01-323-6819	037Z3	87096-005	. . CONNECTOR BODY,RECE	1
32	PAFZZ	5999-01-108-9214	29436	821-2115009-401	. . CONTACT,ELECTRICAL	4
33	PAFZZ	5310-00-080-9786	96906	MS45904-60	. WASHER,LOCK, .204	1
34	PAFZZ	5930-00-781-7101	96906	MS24658-22G	. SWITCH,TOGGLE	1
35	PAFZZ	5310-00-934-9757	80205	MS35649-282	. NUT,PLAIN,HEXAGON, .164-32	4
36	PAFZZ	5310-00-045-3299	80205	MS35338-42	. WASHER,LOCK, .16	4
37	PAFZZ	5305-00-059-3660	80205	MS51958-64	. SCREW,MACHINE	4
38	PAFZZ	5305-01-134-2052	45152	1381HX1	. SCREW,TAPPING, #4-24X.25 NS Z	2

END OF FIGURE



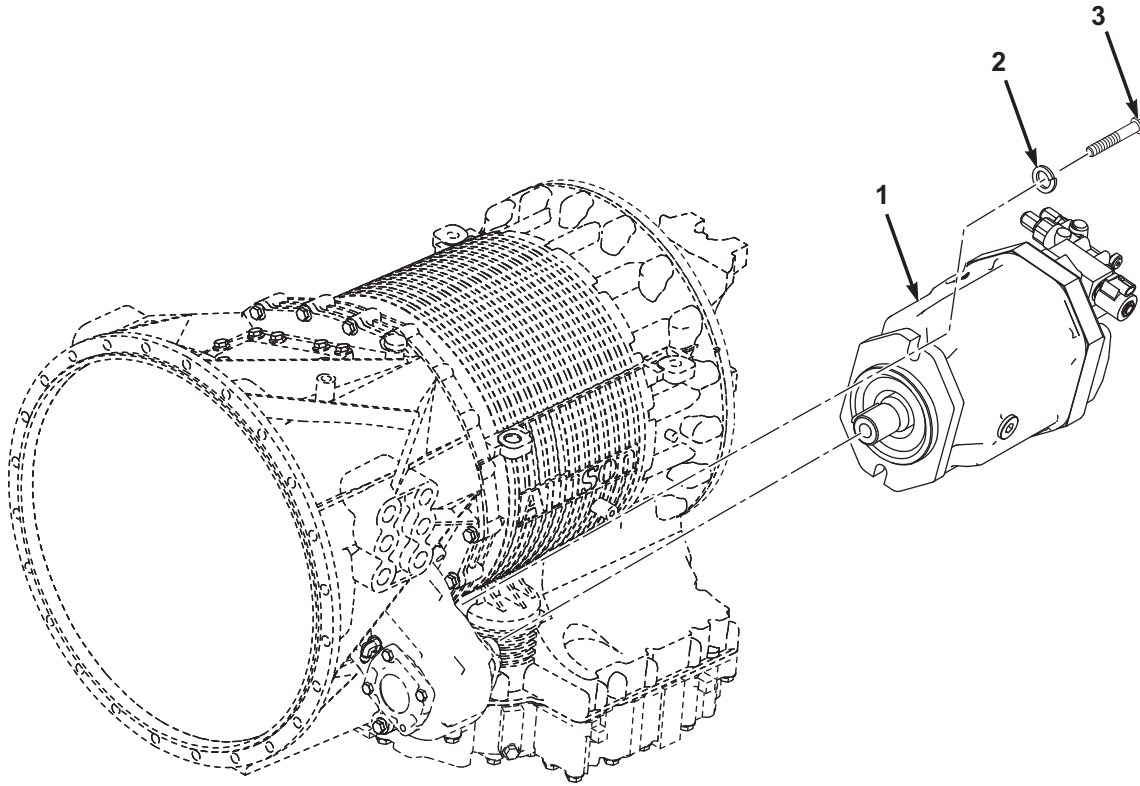


Figure 24. PTO PUMP INSTALLATION



(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY

**GROUP 2004 POWER TAKE-OFF  
ASSEMBLY**

**FIG. 24 PTO PUMP INSTALLATION**

1	PAFZZ	4320-01-545-4707	45152	3395836	PUMP,PTO	1
2	PAFZZ	5310-01-133-2130	45152	355AX	WASHER,LOCK	2
3	PAFZZ	5305-01-164-8510	24617	9423196	SCREW,CAP,HEXAGON H	2

**END OF FIGURE**

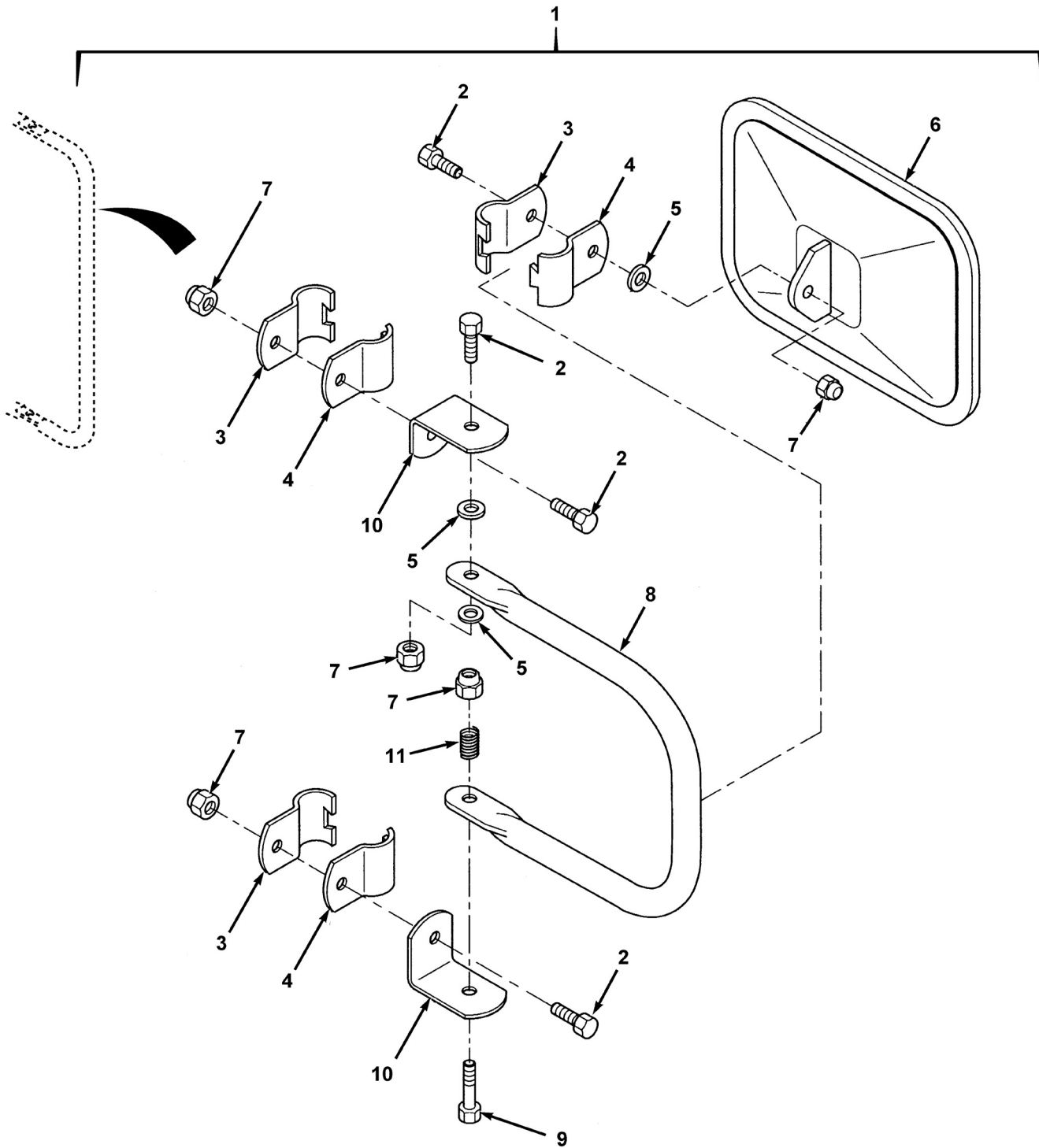


Figure 25. EXTENDED MIRROR

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY

**GROUP 2202 ACCESSORY ITEMS****FIG. 25 EXTENDED MIRROR**

1	PAFFF	2540-01-354-5614	30226	603560	MIRROR ASSEMBLY, REA	1
2	PAFZZ	5305-01-412-4849	30226	102360	. SCREW, CAP, HEXAGON H	4
3	PAFZZ	5340-01-428-3633	30226	602063	. RETAINER, NUT AND BO	3
4	PAFZZ	5340-01-428-3627	30226	602064	. RETAINER, NUT AND BO	3
5	PAFZZ	5310-01-354-7680	30226	101955	. WASHER, FLAT	2
6	PAFZZ	2540-01-354-5617	30226	602241	. MIRROR HEAD, VEHICUL	1
7	PAFZZ	5310-01-354-2509	30226	102382	. NUT, SELF-LOCKING, HE	5
8	PAFZZ	2540-01-429-8347	30226	604387	. ARM, REARVIEW MIRROR	1
9	PAFZZ	5305-01-446-3795	30226	101395	. SCREW, CAP, HEXAGON H	1
10	PAFZZ	5340-01-428-3632	30226	604508	. BRACKET, ANGLE	2
11	PAFZZ	5360-01-425-8483	30226	600166	SPRING, HELICAL, TORS	4

**END OF FIGURE**

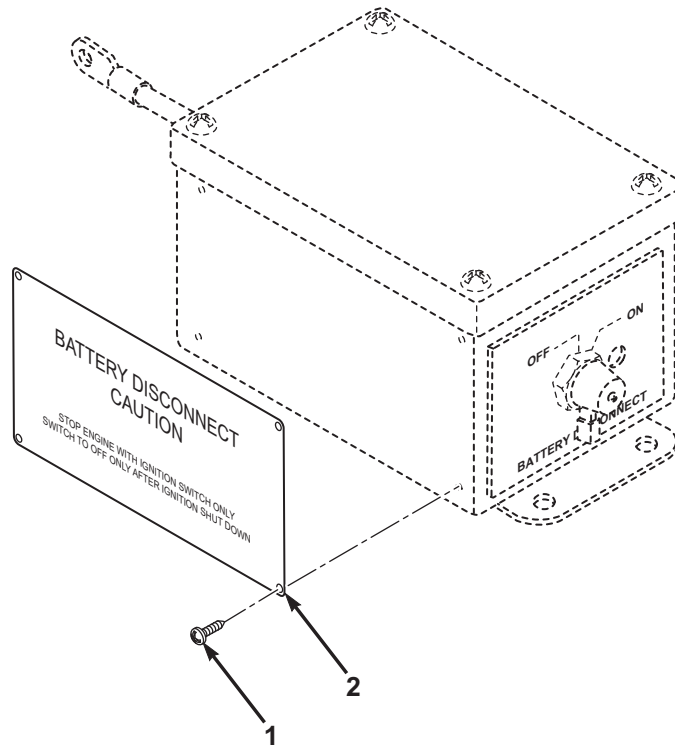


Figure 26. BATTERY DISCONNECT LABEL

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY

**GROUP 2210 DATA PLATES AND  
INSTRUCTION HOLDERS**

**FIG. 26 BATTERY DISCONNECT  
LABEL**

1	PAFZZ	5305-01-134-2052	45152	1381HX1	SCREW,TAPPING, #4-24X.25 NS Z	4
2	KFFZZ	0000-00-000-0000	45152	3665584	LABEL,CAUTION,BATT	1

**END OF FIGURE**



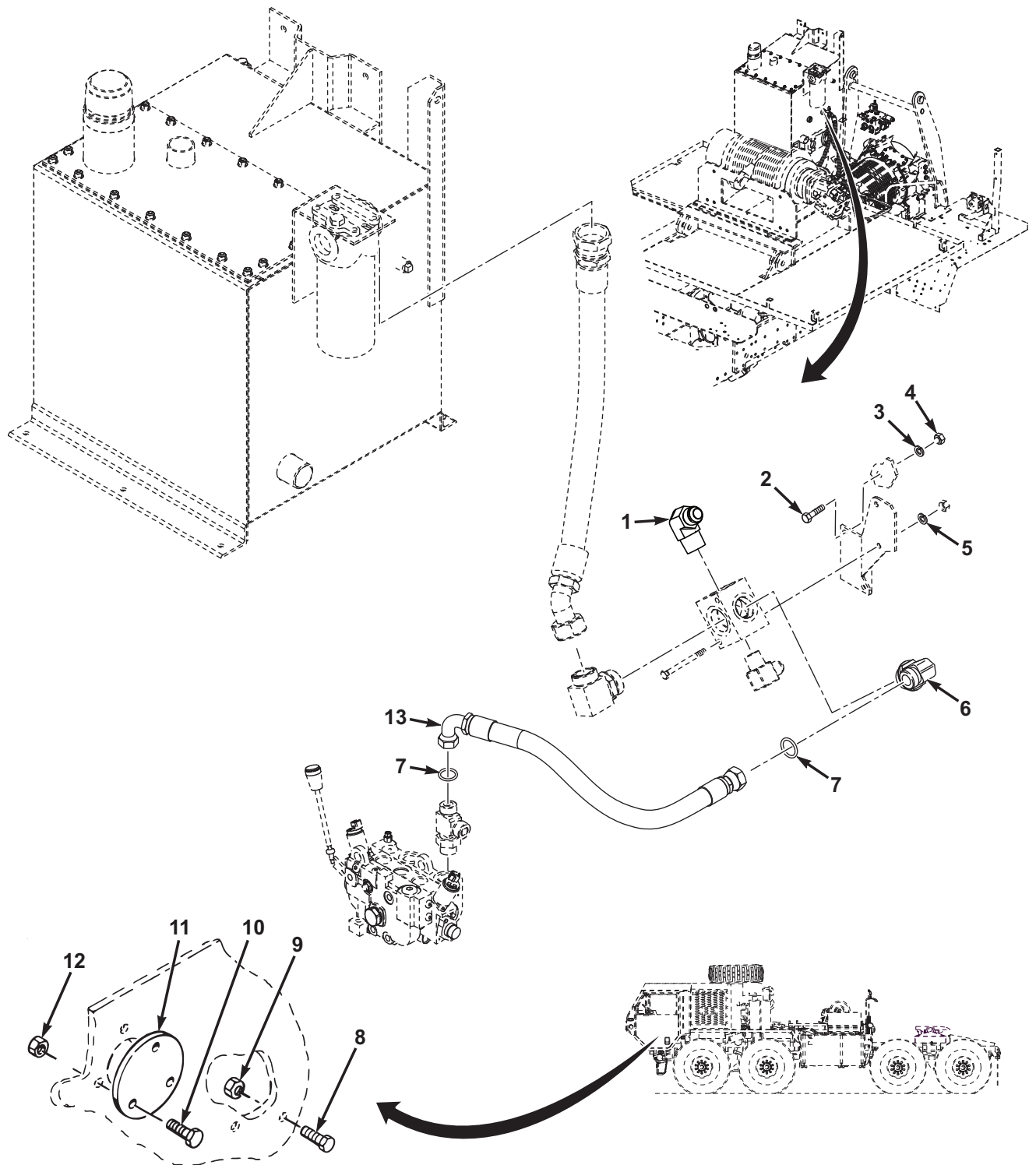


Figure 27. MAIN HYDRAULICS (Sheet 1 of 4)

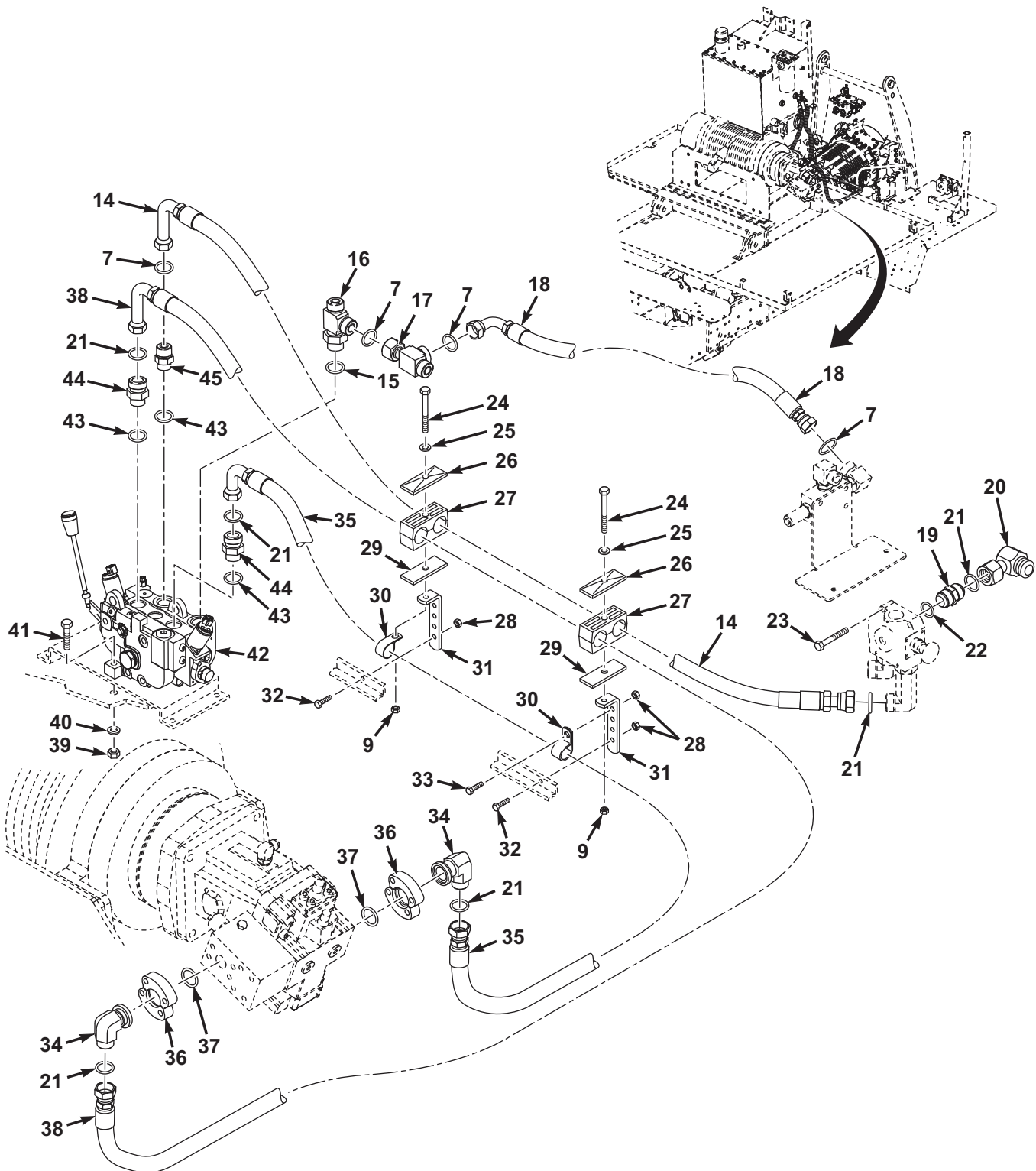


Figure 27. MAIN HYDRAULICS (Sheet 2 of 4)



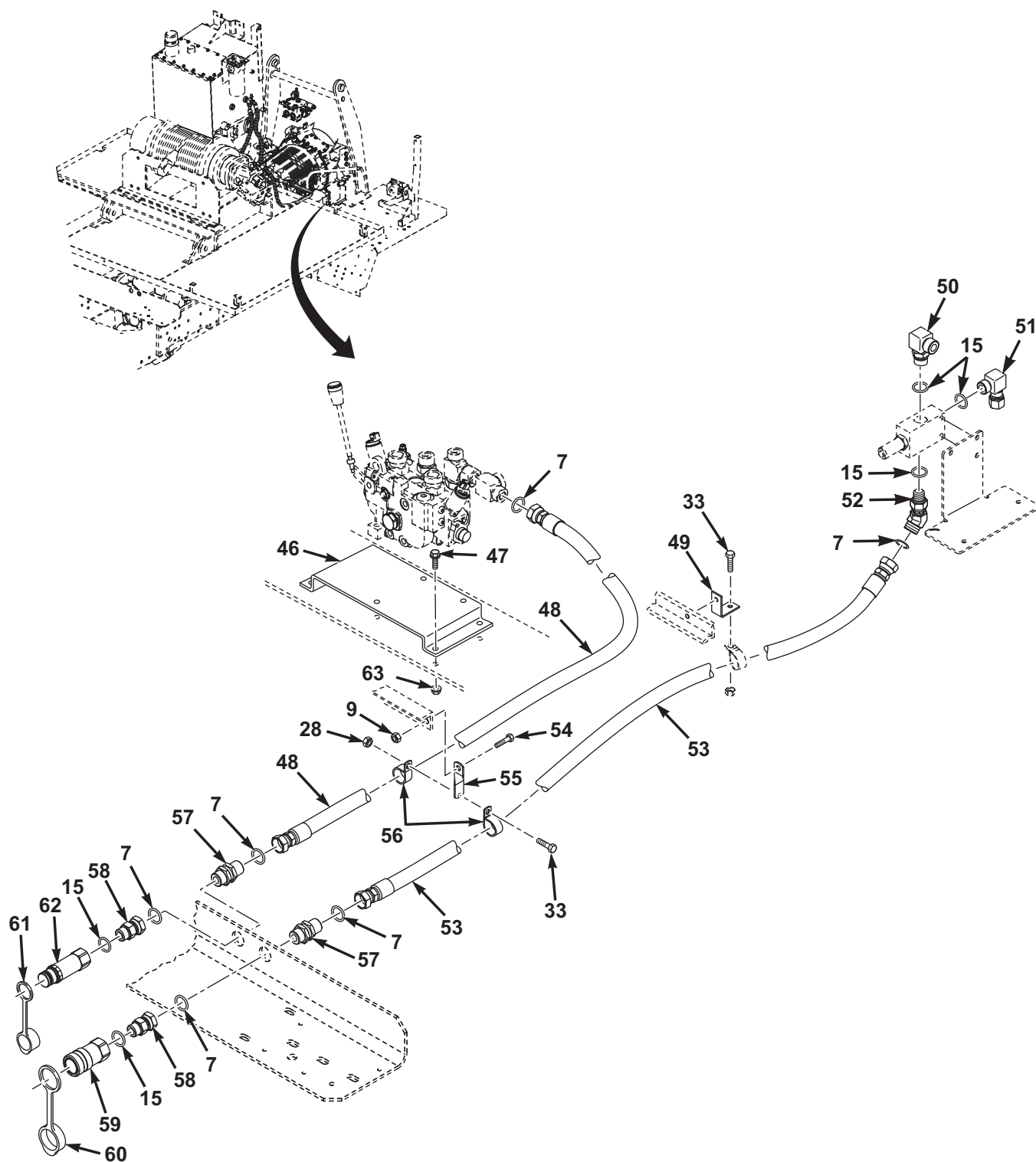


Figure 27. MAIN HYDRAULICS (Sheet 3 of 4)

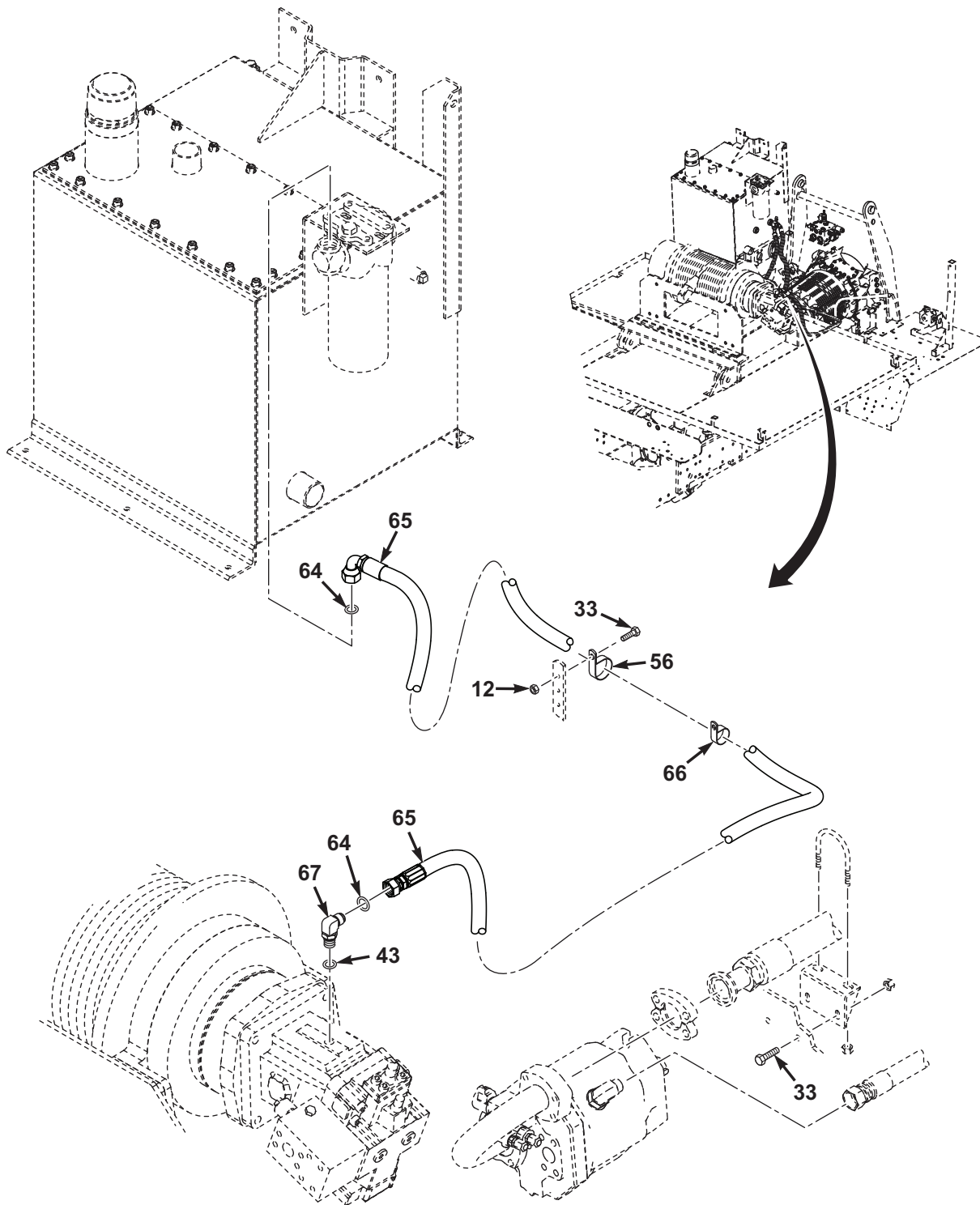


Figure 27. MAIN HYDRAULICS (Sheet 4 of 4)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 2406 HYDRAULIC LINES AND FITTINGS</b>						
<b>FIG. 27 MAIN HYDRAULICS</b>						
1	PAFZZ	4730-00-314-7706	01276	2024-16-12S	ELBOW,PIPE TO TUBE	1
2	PAFZZ	5305-01-156-9457	45152	1333170	SCREW,CAP,HEXAGON H	3
3	PAFZZ	5310-01-068-8446	11939	1263-3304-0	WASHER,LOCK	2
4	PAFZZ	5310-01-105-7229	06853	244095	NUT,PLAIN,HEXAGON	2
5	PAFZZ	5310-01-129-0450	45152	351AX	WASHER,LOCK	8
6	PAFZZ	0000-00-000-0000	01276	FF2032T1616S	ELBOW,TUBE TO BOSS, 16ORS-16NPT MM ST	1
7	PAFZZ	5331-01-092-5503	81343	AS568-018	O-RING	10
8	PAFZZ	5305-01-062-1017	45152	1367HX1	SCREW,CAP,HEXAGON H	1
9	PAFZZ	5310-01-340-5671	45152	1333510	NUT,SELF-LOCKING,EX, .31-18 G5 ZY	4
10	PAFZZ	5305-00-068-0508	80204	B1821BH025C075 N	SCREW,CAP,HEXAGON H, .25-20X.62 G5 ZY	3
11	PAFZZ	5340-01-164-4545	45152	1326050	COVER,ACCESS	1
11	PAFZZ	5310-01-346-9445	45152	1600460	NUT,SELF-LOCKING, .25-20 G5 ZY	7
13	PAFZZ	0000-00-000-0000	87373	F482STJCJ916121 6-33.5	HOSE ASSEMBLY NON M, #16 CR 33.5 2883	1
14	PAFZZ	0000-00-000-0000	87373	F721TCJSJ116121 6-87.0	HOSE ASSEMBLY NON M, #16 CR 81.0 2899	1
15	PAFZZ	5331-00-167-5175	81343	MS83248/2-912	O-RING	6
16	PAFZZ	0000-00-000-0000	93061	12R5OLO-S	TUBE,TEE, 12ORS-12ORS-12ORG	1
17	PAFZZ	4730-01-281-5881	81343	12-12-12 520432CA	TUBE,TEE, 12ORS-12ORS-12ORS MFM ST	1
18	PAFZZ	0000-00-000-0000	87373	F482STJCJ912121 2-56.0	HOSE ASSEMBLY NON M, #12 CR 56.0 2883	1
19	PAFZZ	4730-01-284-6101	81343	16-16 520120C	ADAPTER,STRAIGHT,TU, 16ORS-16ORG MM ST	1
20	PAFZZ	4730-01-459-9926	01276	FF2098T-1616S	ELBOW,TUBE	1
21	PAFZZ	5331-01-479-0599	02697	2-021 N0552	O-RING	5
22	PAFZZ	5331-00-404-4619	62983	263500	O-RING	1
23	PAFZZ	5305-01-485-6310	45152	1882HX1	SCREW,CAP,HEXAGON H	2
24	PAFZZ	5305-00-252-5070	80205	MS35307-346	SCREW,CAP,HEXAGON, .31-18X3.50 G5 Z	2
25	PAFZZ	5310-01-061-7452	45152	1804HX	WASHER,FLAT, .31X.69X.07 ZY	2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
26	PAFZZ	5340-01-235-7621	53790	GDDS 5	COVER,ACCESS	2
27	PAFZZ	0000-00-000-0000	53790	5381/381D-PP	CLAMP,TWIN, 1.50 ID	2
28	PAFZZ	5310-01-288-1116	45152	1437220	NUT,SELF-LOCKING,EX, .38-16 G5 ZY	3
29	PAFZZ	0000-00-000-0000	45152	3636577	PLATE,SPACER	2
30	PAFZZ	5340-00-224-1204	45152	2288HX	CLAMP,LOOP, 1.50 ID	2
31	PAFZZ	5340-01-341-3202	45152	1761380	BRACKET,ANGLE	2
32	PAFZZ	5305-01-346-3692	45152	1764650	SCREW,CAP,HEXAGON H, .25-20X1.25 G5 ZY	2
33	PAFZZ	5305-01-337-9120	45152	1754140	SCREW,CAP,HEXAGON H, .25-20X1.11 G5 ZY	5
34	PAFZZ	0000-00-000-0000	87373	16 LOEO2-S	ELBOW,TUBE FLANGE, 16FLG62-ORS MM ST	2
35	PAFZZ	0000-00-000-0000	87373	F721TCJCJ9161616-86.0	HOSE ASSEMBLY NON M, #16 CR 80.0 2900	1
36	PAFZZ	4730-01-221-0022	01276	FF595-16	PARTS KIT,SPLIT FLA	2
37	PAFZZ	5331-01-173-8779	02697	B0612 2-219	O-RING	2
38	PAFZZ	0000-00-000-0000	87373	F721TCJCJ161616-104.0	HOSE ASSEMBLY NON M, #16 CR 92.0 2901	1
39	PAFZZ	5310-01-288-1116	45152	1437220	NUT,SELF-LOCKING,EX, .38-16 G5 ZY	3
40	PAFZZ	5310-00-880-0626	19207	10892331	WASHER,FLAT, .38X1.25X.12 ZY	3
41	PAFZZ	5305-01-340-5061	45152	1754280	SCREW,CAP,HEXAGON H, .38-16X1.50 G5 ZY	3
42	PAFZZ	0000-00-000-0000	1CC11	K-00148	VALVE,HYDRAULIC CON	1
43	PAFZZ	5330-00-485-3586	02697	3-910	PACKING,PREFORMED	4
44	PAFZZ	0000-00-000-0000	01276	FF1852T1616OS	ADAPTER,STRAIGHT,TU	2
45	PAFZZ	4730-01-330-6555	81343	12-10 520120C	ADAPTER,STRAIGHT,TU, 12ORS-100ORG MM ST	1
46	XDFZZ	0000-00-000-0000	45152	3706874	BRACKET,MOUNTING	1
47	PAFZZ	5305-01-456-9449	45152	1955110	SCREW,CAP,HEXAGON H	4
48	PAFZZ	0000-00-000-0000	87373	F482STJCJC121212-106.5	HOSE ASSEMBLY NON M, #12 CR 106.5 2907	1
49	PAFZZ	5340-01-515-0215	45152	3063867	BRACKET,ANGLE	1
50	PAFZZ	4730-01-283-8195	81343	12-12 520220CA	ELBOW,TUBE TO BOSS, 12ORS-12ORG MM ST	3
51	PAFZZ	4730-01-281-0964	81343	12-12 520221CA	ELBOW,TUBE	1
52	PAFZZ	4730-01-351-1581	01276	FF2068T-1212S	ELBOW,TUBE TO BOSS	1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
53	PAFZZ	0000-00-000-0000	87373	F721TCJCJ712121 2-70.0	HOSE ASSEMBLY NON M, #12 CR 87.0 2906	1
54	PAFZZ	5305-01-340-0225	45152	1754210	SCREW,CAP,HEXAGON H, . 31-18X1.00 G5 ZY	1
55	PAFZZ	5340-01-154-5247	45152	3737FX4	BRACKET,ANGLE	1
56	PAFZZ	5340-00-404-4100	75272	COV2113	CLAMP,LOOP, 1.25 ID	2
57	PAFZZ	4730-01-351-8097	81343	12 520601CA	NIPPLE,TUBE	2
58	PAFZZ	4730-01-512-8588	45152	3367298	SWIVEL JOINT,HYDRAU	2
59	PAFZZ	4730-01-519-2285	97111	FF-751-12FO	COUPLING HALF,QUICK, 12QDC-12ORG FF ST	1
60	PAFZZ	5340-01-519-2425	97111	FR-751	PLUG,PROTECTIVE,DUS	1
61	PAFZZ	5340-01-519-2426	97111	FR-752	PLUG,PROTECTIVE,DUS	1
62	PAFZZ	4730-01-519-2280	97111	FC-752-12FO	COUPLING HALF,QUICK, 12QDC-12ORG MF ST	1
63	PAFZZ	5310-01-155-1905	45152	115303A	NUT,SELF-LOCKING,EX	4
64	PAFZZ	5331-01-115-8225	02697	2-016N552-90	O-RING	2
65	PAFZZ	0000-00-000-0000	87373	F422JC39101219-1 16.0	HOSE ASSEMBLY NON M, #10 CR 105.0 2918	1
66	PAFZZ	5340-00-404-4098	75272	COV-1713	CLAMP,LOOP, 1.00 ID	1
67	PAFZZ	4730-01-338-2124	81343	10-10 520220CA	ELBOW,TUBE TO BOSS	1

END OF FIGURE

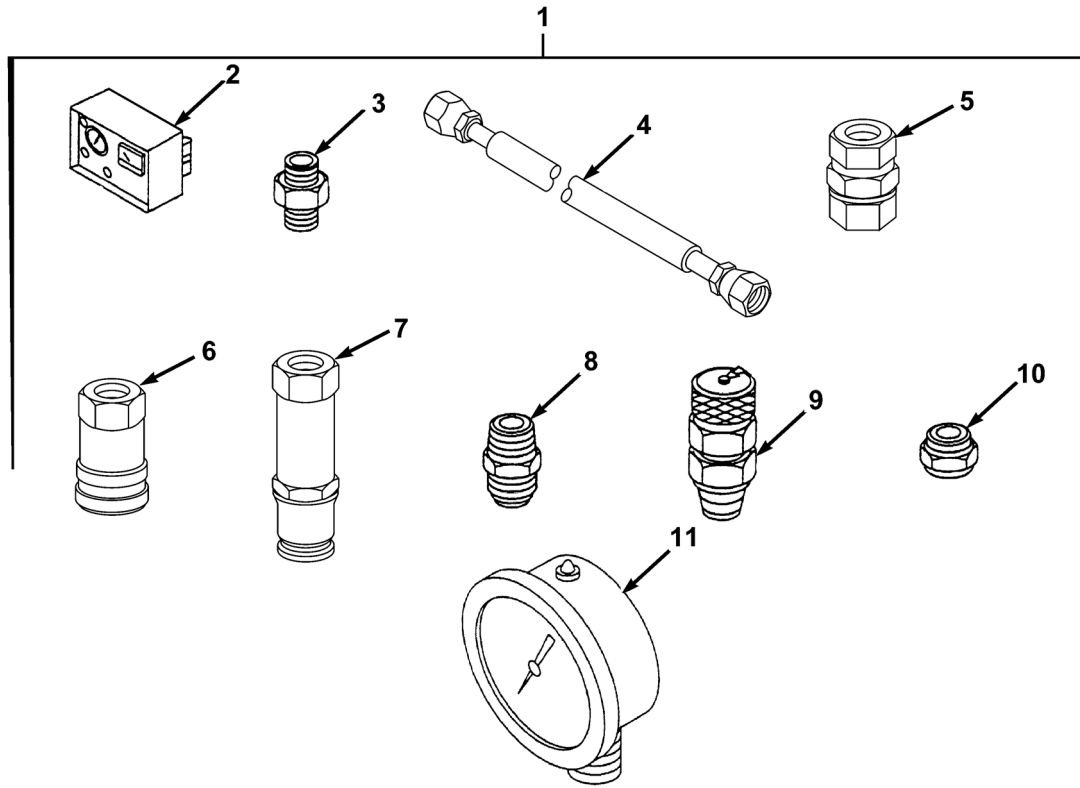


Figure 28. SPECIAL TOOLS-LHS HYDRAULICS

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY

**GROUP 2604 SPECIAL TOOLS****FIG. 28 SPECIAL TOOLS-LHS  
HYDRAULICS**

1	PAFFF	5180-01-559-2526	19207	57K4770	TOOL KIT,HYDR TEST	1
2	PAFZZ	6680-01-383-0784	0LB04	FT6370	. METER,FLOW RATE IND	1
3	PAFZZ	4730-01-280-8348	30780	16-12F5OLO-S	. ADAPTER,STRAIGHT,TU	2
4	PAFZZ	4720-01-466-3925	45152	2HP877	. HOSE ASSEMBLY,NONME	2
5	PAFZZ	4730-01-282-1704	30780	12-16F5OLO-S	. ADAPTER,STRAIGHT,TU	2
6	PAFZZ	4730-01-519-2285	97111	FF-751-12FO	. COUPLING HALF,QUICK	1
7	PAFZZ	4730-01-519-2280	97111	FC-752-12FO	. COUPLING HALF,QUICK	1
8	PAFZZ	4730-01-399-0879	01276	FF2000T1616S	. COUPLING,PIPE	2
9	PAFZZ	4730-00-837-7073	96906	MS51500A4-4S	. ADAPTER,STRAIGHT,PI	3
10	PAFZZ	4730-00-580-7408	04164	272M0075P004	. COUPLING,PIPE	4
11	PAFZZ	6685-01-373-7976	61349	356021	. GAGE,PRESSURE,DIAL	1

**END OF FIGURE**

# **FIGURE ILLUSTRATION NOT REQUIRED**

*Figure 29. KITS*



(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
<b>GROUP 9401 REPAIR KITS</b>						
<b>FIG. 29 KITS</b>						
1	PAHZZ	0000-00-000-0000	52304	114472	DIFFERENTIAL KIT, SIDE GEAR AND PINION	1
2	PAHZZ	0000-00-000-0000	52304	114472	DIFFERENTIAL KIT	1
3	PAHZZ	0000-00-000-0000	52304	118111	KIT,OIL SEAL AND SH	1
4	PAHZZ	0000-00-000-0000	52304	121302	KIT,LUBE PUMP	1
5	PAHZZ	0000-00-000-0000	52304	122418	SHAFT,INPUT ASSEMBL, INCLUDES NUT	1
6	PAHZZ	0000-00-000-0000	9R200	122436	KIT,SEAL AND SHIM	1
7	PAHZZ	0000-00-000-0000	52304	211252	DIFFERENTIAL CASE K, INTER-AXLE	1
8	PAFZZ	0000-00-000-0000	9R200	331224	. BRAKE ASSEMBLY, #3 AXLE LEFT HAND	1
9	PAFZZ	0000-00-000-0000	9R200	331225	. BRAKE ASSEMBLY, #3 AXLE RIGHT HAND	1
10	PAFZZ	0000-00-000-0000	9R200	331946	. BRAKE ASSEMBLY, #4 AXLE LEFT HAND	1
11	PAFZZ	0000-00-000-0000	9R200	331947	. BRAKE ASSEMBLY, #4 AXLE RIGHT HAND	1
12	PAFZZ	0000-00-000-0000	45152	3683054	KIT,BATTERY LABEL	1
13	PAFZZ	2520-01-467-1073	72447	5-676X	UNIVERSAL JOINT,VEH	1
14	PAHZZ	2520-01-147-1102	52304	70745	KIT,RING GEAR BOLT	1
15	PAFZZ	2530-01-456-9895	0EJ14	9401	PARTS KIT,DISK BRAK	1
16	PAFZZ	5330-31-344-2572	0EJ14	9403	PARTS KIT,SEAL	1
17	PAFZZ	0000-00-000-0000	0EJ14	9471	WINCH SERVICE KIT	1

**END OF FIGURE**

# **FIGURE ILLUSTRATION NOT REQUIRED**

*Figure 30. BULK*

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
GROUP 9501 HARDWARE SUPPLIES AND BULK MATERIAL						
FIG. 30 BULK						
1	PAFZZ	4720-00-443-4746	81343	J844 TYPE A 1/4 OD	TUBING,NYLON BLACK	1
2	PAFZZ	4010-01-067-1700	46156	75014-32	CHAIN,WELDLESS	1
3	PAFZZ	5970-01-342-1742	00779	603314-4	INSULATION SLEEVING	1
END OF FIGURE						



## CHAPTER 7

### SUPPORTING INFORMATION



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## FIELD MAINTENANCE REFERENCES

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### SCOPE

This work package lists all pamphlets, forms, field manuals, technical manuals, and other publications referenced in this bulletin. Also, those publications that should be consulted for additional information about vehicle operations are listed.

### DEPARTMENT OF ARMY PAMPHLETS

The following indexes should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical bulletin.

DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms
DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual

### FORMS

DA FORM 2028	Recommended Changes to Publications and Blank Forms
DA FORM 2408-9	Equipment Control Record
STANDARD FORM 368	Product Quality Deficiency Report
DA FORM 5988-E	Equipment Inspection Maintenance Worksheet (EGA)

### FIELD MANUALS

FM 3-11.4	Multiservice Tactics, Techniques, and Procedures For Nuclear, Biological, and Chemical (NBC) Protection {MCWP 3-37.2; NTTP 3-11.27; AFTTP (I) 3-2.46} (This Item is included on EM 0205)
FM 3-11.5	Multiservice Tactics, Techniques, and Procedures For Chemical, Biological, Radiological, and Nuclear Decontamination {MCWP 3-37.3; NTTP 3-11.26; AFTTP(I) 3-2.60}
FM 4-25.11	First Aid
FM 4-30.31	Recovery and Battle Damage Assessment and Repair
FM 9-207	Operation and Maintenance of Ordnance Materiel in Cold Weather
FM 21-10	Field Hygiene and Sanitation

### TECHNICAL BULLETINS

TB 43-0001-62-SERIES	Equipment Improvement Report and Maintenance Digest for Tank, Automotive, and Armament Equipment
TB 43-0216	Safety and Hazard Warnings for Operation and Maintenance of TACOM Equipment

### TECHNICAL MANUALS

TM 5-2330-378-14&P	Operator's, Unit, Direct Support, and General Support Maintenance Manual (Including Repair Parts and Special Tools List) for Semitrailer, Lowbed: 40-Ton Construction Equipment Transporter, M870 (CCE) (CMI/Load King Model 403LF) (NSN 2330-00-133-1731) [and] Semitrailer, Lowbed: 40-Ton Construction Equipment Transporter, M870A1 (NSN 2330-01-224-9245)
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**TECHNICAL MANUALS - Continued**

TM 5-2330-325-14&P	Operator's, Unit, And Direct Support Maintenance Manual With Repair Parts and Special Tools List (RPSTL) for Trailer, Medium Heavy Equipment Transporter (MHET), 40 ton, M870A3 (NSN 2330-01-458-2061)
TM 9-2320-279-Series	Operator's, Unit, Direct Support, and General Support Maintenance Manual for M977 Series, 8x8 Heavy Expanded Mobility Tactical Trucks
TM 9-2320-315-14&P	Maintenance Instructions for Organizational Maintenance, M977 Series, 8x8 Heavy Expanded Mobility Tactical Trucks
TM 750-244-6	Procedures for Destruction of Tank Automotive Equipment to Prevent Enemy Use (U.S. Army Tank-Automotive Command)

**MISCELLANEOUS PUBLICATIONS**

AR 750-1	Army Materiel Maintenance Policy
AR 750-10	Army Modification Program
CTA 8-100	Army Medical Department Expendable/Durable Items
CTA50-909	Field and Garrison Furnishings and Equipment
CTA 50-970	Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)

**END OF WORK PACKAGE**



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## FIELD MAINTENANCE MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

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### THE ARMY MAINTENANCE SYSTEM MAC

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.

This 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 three subcolumns, Crew maintenance (C), Service maintenance (O), and Field maintenance (F).
- Sustainment – includes two subcolumns, Below Depot (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:

**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). This includes scheduled inspection and gagings and evaluation of cannon tubes.

**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.

**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. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:

**UNPACK** To remove from packing box for service or when required for the performance of maintenance operations.

**REPACK** To return item to packing box after service and other maintenance operations.

**CLEAN** To rid the item of contamination.

**TOUCH UP** To spot paint scratched or blistered surfaces.

**MARK** To restore obliterated identification.

**ADJUST** To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

**ALIGN** To adjust specified variable elements of an item to bring about optimum or desired performance.

**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.

**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.

**PAINT (ammunition only)** To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.

**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.

**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.

**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.

**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 materiel 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 Functional Group Code (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.)

**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:** L Specialized Repair Activity

H General Support maintenance

D Depot maintenance

**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 entry 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.

#### **END OF WORK PACKAGE**



**FIELD MAINTENANCE  
MAINTENANCE ALLOCATION CHART (MAC)**

**Table 1. MAINTENANCE ALLOCATION CHART (MAC).**

(1)	(2)	(3)	(4)					(5)	(6)
			Maintenance Level						
			Field			Sustainment			
			Crew	Service	Field	Below Depot	Depot		
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref Code	Remarks Code
06	ELECTRICAL	none							
0609	Taillights	inspect replace	0.1		0.4			5	
0613	Trailer Electrical Connector Plate	replace			0.6			5	
15	FRAME AND TOWING ATTACHMENTS	none							
1501	Taillight Bracket	replace			1.0			5	
	Rear Roller Assembly	inspect service replace	0.1 0.1		3.0			5	
	Rear Crossmember	replace			1.2			5	
	Fifth Wheel Ramp Assembly	inspect service replace	0.1 0.1		4.0			5	
1506	Fifth Wheel Assembly	inspect service replace	0.1 0.3		4.0			5	
	Fifth Wheel Plate	replace			1.2			5	
	Fifth Wheel Rocker Arm	repair			5.0			5	

**Table 1. MAINTENANCE ALLOCATION CHART (MAC). - Continued**

(1)	(2)	(3)	(4)					(5)	(6)
			Maintenance Level						
			Field			Sustainment			
			Crew	Service	Field	Below Depot	Depot		
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref Code	Remarks Code
18	BODY, CAB, AND HOOD	none							
1801	Fuel Tank Step Assembly	replace			1.2			5	
1808	Stowage Box	replace			3.0			5	
20	WINCH, CRANE AND PTO	none							
2001	Heavy-Duty Winch	inspect	0.1						
		service		0.3					
		replace			1.8			1, 3, 5	B
	Heavy-Duty Winch Drive Motor	replace			2.4			1, 3, 5, 6, 7	B
	Heavy-Duty Winch Counterbalance Valve	replace			0.6			1, 3, 5, 6, 7	B
	Heavy-Duty Winch Cable	inspect	0.1						
		service	0.3						
		replace		0.8				5	B
	Winch Gearbox	service		0.6				3, 5	
	Cable Hold Down Valve	replace			0.4			5	
	Winch Hydraulic Hoses	replace		*				1, 3, 5, 6, 8	A, B
	Winch Control Valve Harness	replace			1.5			5	B
	Winch Remote Control Connector	replace			0.3			4, 5	B
	Air Lines and Fittings	replace		*				5	A

**Table 1. MAINTENANCE ALLOCATION CHART (MAC). - Continued**

(1)	(2)	(3)	(4)					(5)	(6)
			Maintenance Level						
			Field			Sustainment			
			Crew	Service	Field	Below Depot	Depot		
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref Code	Remarks Code
42	Winch Control Station Bracket	replace			1.0			5	
	Winch Decking	replace			4.8			5	
	KickOut Control Valve	replace			0.4			5	
	Cable Hold Down Assembly	replace		1.2				5	
	ELECTRICAL EQUIPMENT	none							
	4203	High Idle Switch	replace			0.2		5	
	43	HYDRAULIC, FLUID, AIR, AND VACUUM SYSTEMS	none						
4305	Heavy-Duty Winch Control Valve	replace			2.0			1, 3, 5	
	Winch Hydraulic Return Manifold	replace		0.9				1, 3, 5, 6	
	Winch Mounts	replace			8.7			5, 6	

**Table 2. TOOLS AND TEST EQUIPMENT.**

Tool or Test Equipment Ref Code	Maintenance Category	Nomenclature	National/NATO Stock Number	Tool Number
1	F	Cap and Plug Set	5340-00-450-5718	10935405
2	F	Hydraulic Test Kit	5180-01-559-2526	57K4770
3	F	Pan, Drain, 4 Gallon	4910-00-387-9592	17942
4	F	Tool Kit, Electric	5180-00-876-9336	7550526

**Table 2. TOOLS AND TEST EQUIPMENT. - Continued**

Tool or Test Equipment Ref Code	Maintenance Category	Nomenclature	National/NATO Stock Number	Tool Number
5	F	Tool Kit, General Mechanic's: Automotive	5180-01-483-0249	5180-95-B47
6	F	Standard Automotive Tool Set (SATS)	4910-01-490-6453	SC 4910-95-A81
7	F	Forward Repair System (FRS)	4940-01-463-7940	RIA149000
8	F	Wrench, Combination, 2-1/4 in.	5120-01-429-7302	8HE922

**Table 3. REMARKS.**

Remark Code	Remarks
A	No specific times established. Times required for replacement or repair will depend on extent of work required.
B	Replacement of winch components is performed at Field Support.

**END OF WORK PACKAGE**



**FIELD MAINTENANCE  
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS**

## INTRODUCTION


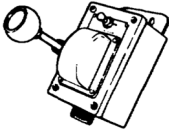
### Scope

For Basic Issue Items, refer to TM 9-2320-315-14&P.


### NOTE

The M983A2LET does not include "BLOCK, TACKLE: 20 Ton" as part of its BII.

**Table 1. COMPONENTS OF END ITEM**

(1)  Illus Number	(2)  National Stock Number (NSN)	(3)  Description, Part Number/ (CAGEC)	(4)  Usable On Code	(5)  U/I	(6)  Qty Rqr
1	6150-01-231-6662  	CABLE, REMOTE CONTROL, WINCH (right side equipment body, in bottom rear stowage box) 1491030 (45152)	LET	EA	1
2	2590-01-217-8317  	CONTROL, REMOTE, WINCH (right side equipment body, in bottom rear stowage box) 1437940U (45152)	LET	EA	1

**Table 1. COMPONENTS OF END ITEM - Continued**

(1)	(2)	(3)	(4)	(5)	(6)
Illus Number	National Stock Number (NSN)	Description, Part Number/ (CAGEC)	Usable On Code	U/I	Qty Rqr
3	2540-01-166-1384 	LADDER, (vehicle (on right side over batteries) (on walkway grating) 1766590W(45152)	LET	EA	1

**END OF WORK PACKAGE**

## FIELD MAINTENANCE EXPENDABLE SUPPLIES AND MATERIALS LIST

### INTRODUCTION

#### Scope

This work package lists expendable and supplies and materials that you will need to operate and maintain the HEMTT Series Vehicles. This list is for information only and is not authority to requisition the listed items. These items are authorized by CTA 50-970, Expendable Supplies and Materials (except Medical, Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment or CTA 8-100, Army Medical Department Expendable Supplies and Materials List.

#### Explanation of Columns in the Expendable Supplies and Materials List

**Column (1) - Item No.** This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use brake fluid [WP 0098, item 5]).

**Column (2) Level.** This column identifies the lowest level of maintenance that requires the listed item.

- C = Operator/Crew
- O = Unit/AMC
- F = Direct Support/ASB
- H = General Support
- D = Depot

**Column (3) National Stock Number (NSN).** This is the NSN assigned to the item which you can use to requisition it.

**Column (4) Item Name, Description, Part Number/(CAGEC).** This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

**Column (5) (U/I).** Unit of Issue (U/I) code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

**Table 1. Expendable Supplies and Materials List.**

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
			<b>Cable Ties, Plastic</b>	
1	F	5975-01-034-5871	Cable Ties, Plastic MS3367-7-0 (81343)	HD
			<b>Cleaning Compound, Solvent</b>	
2	O	6850-01-474-2319	Cleaning Compound, Solvent 1-gallon can MIL-PRF-680 (81349)	GL

**Table 1. Expendable Supplies and Materials List. - Continued**

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
3	O	6850-01-474-2317	Cleaning Compound, Solvent 5-gallon can MIL-PRF-680 (81349)	CO
4	O	6850-01-474-2316	Cleaning Compound, Solvent 55-gallon drum MIL-PRF-680 (81349)	DR
5	O	6850-01-474-2318	Cleaning Compound, Solvent 1-gallon can MIL-PRF-680 (81349)	GL
6	O	6850-01-474-2320	Cleaning Compound, Solvent 5-gallon can MIL-PRF-680 (81349)	BX
7	O	6850-01-474-2321	Cleaning Compound, Solvent 5-gallon can MIL-PRF-680 (81349)	DR
			<b>Compound, Anti-Corrosion Spray</b>	
8	F	8010-01-521-8653	Compound, Anti-Corrosion Spray 11-oz Spray Can 2233850 (45152)	
			<b>Compound, Antiseize (MIL-A-907)</b>	
9	F	8030-01-087-8254	Compound, Antiseize (MIL-A-907) 8-ounce can, brush applicator NSBT-8 (70707)	CN
10	F	8030-00-155-6444	Compound, Antiseize (MIL-A-907) 12-ounce aerosol can NSA16 (15145)	CN
			<b>Compound, Sealing, Pipe Thread</b>	
11	F	8030-01-026-1538	Compound, Sealing, Pipe Thread 250-cubic centimeter bottle 56941 (05972)	BT
			<b>Compound, Sealing, Pipe Thread, Loctite 567</b>	
12	F	8030-01-431-3582	Compound, Sealing, Pipe Thread, Loctite 567 6-milliliter tube (05972)	TU
13	F	8030-01-166-0675	Compound, Sealing, Pipe Thread, Loctite 567 50-milliliter tube 56747 (05972)	TU
14	F	8030-01-517-1616	Compound, Sealing, Pipe Thread, Loctite 567 250-milliliter tube 56765 (05972)	TU

**Table 1. Expendable Supplies and Materials List. - Continued**

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
15	F	8030-01-054-0740	Compound, Sealing, Pipe Thread, Loctite 567 Six 50-cubic centimeter bottles 59231 (05972)	BX
			<b>Compound, Sealing, Pipe Thread, Loctite 592</b>	
16	F	8030-01-218-0321	Compound, Sealing, Pipe Thread, Loctite 592 Six 50-cubic centimeter bottles MS-PTS-50 (02570)	TU
			<b>Grease, Automotive and Artillery (GAA) (MIL-G-10924)</b>	
17	O	9150-01-197-7688	Grease, Automotive and Artillery (GAA) (MIL-G-10924) 2 ¼-ounce tube M-10924-A (81349)	TU
18	O	9150-01-197-7693	Grease, Automotive and Artillery (GAA) (MIL-G-10924) 14-ounce cartridge M-10924-B (81349)	CA
19	O	9150-01-197-7690	Grease, Automotive and Artillery (GAA) (MIL-G-10924) 1 ¾-ounce can M-10924-C (81349)	CN
20	O	9150-01-197-7689	Grease, Automotive and Artillery (GAA) (MIL-G-10924) 6 ½-pound can M-10924-D (81349)	CN
21	O	9150-01-197-7692	Grease, Automotive and Artillery (GAA) (MIL-G-10924) 35-pound can M-10924-E (81349)	CN
22	O	9150-01-197-7691	Grease, Automotive and Artillery (GAA) (MIL-G-10924) 120-pound drum M-10924-F (81349)	DR
			<b>Oil, Lubricating, Gear GO 85W/140 (MIL-L-2105)</b>	
23	O	9150-01-035-5395	Oil, Lubricating, Gear GO 85/140 (MIL-L-2105) 5-gallon drum MIL-L-2105-3-85W140 (81349)	CN
24	O	9150-01-035-5396	Oil, Lubricating, Gear GO 85/140 (MIL-L-2105) 55-gallon drum MIL-PRF-2105 (81349)	DR

**Table 1. Expendable Supplies and Materials List. - Continued**

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
			<b>Oil, Lubricating, OE/HDO 10 (MIL-L-2104)</b>	
25	O	9150-00-189-6727	Oil, Lubricating, OE/HDO 10 (MIL-L-2104) 1-quart can M-2104-1-10W (81349)	QT
26	O	9150-00-186-6668	Oil, Lubricating, OE/HDO 10 (MIL-L-2104) 5-gallon can MIL-PRF-2104 (81349)	CN
27	O	9150-00-191-2772	Oil, Lubricating, OE/HDO 10 (MIL-L-2104) 55-gallon drum BRAYC0421C (98308)	DR
28	O	9450-00-183-7807	Oil, Lubricating, OE/HDO 10 (MIL-L-2104) Bulk MIL-PRF-2104G (81349)	GL
			<b>Sealant, RTV200 Electrical</b>	
29	F	9160-01-515-2484	Sealant, RTV200 Electrical 3119525 (45152)	EA
			<b>Tags, Identification, White</b>	
30	F	8135-00-178-9200	Tags, Identification, White 1000 per carton A-A-1916 (58536)	BX
			<b>Tape, Antiseize, Polytetrafluoroethylene</b>	
31	F	8030-00-889-3534	Tape, Antiseize, Polytetrafluoroethylene ¼ inch wide AA58092-2-1 (58536)	RO
32	F	8030-00-398-4130	Tape, Antiseize, Polytetrafluoroethylene 1 inch wide AA-58092 (58536)	RO
33	F	8030-00-889-3535	Tape, Antiseize, Polytetrafluoroethylene ½ inch wide AA-58902-2-2 (58536)	EA

**END OF WORK PACKAGE**

## FIELD MAINTENANCE MANDATORY REPLACEMENT PARTS

### GENERAL

This work package is a cross-reference of item numbers to part numbers and is included for that purpose only.

### EXPLANATION OF COLUMNS

The five table columns have the following headings:

**Column (1) - Item No.** This number is assigned to the entry in Table 1 for cross-referencing to the part number. The item number appears in the "Materials/Parts" listing of each maintenance procedure.

**Column (2) - Part Number/CAGEC.** This is the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements, to identify an item or range of items.

**Column (3) - National Stock Number.** When available, the national stock number is listed.

**Column (4) - Nomenclature.** This is the name given to the item in the "Materials/Parts" listing and in the text of the maintenance procedure.

**Column (5) - Qty.** Refer to the Materials/Parts section in the Initial Setup of the Maintenance Task for required quantities of item needed.

**Table 1. Mandatory Replacement Parts List.**

ITEM NO.	PART NUMBER/ (CAGEC)	NATIONAL STOCK NUMBER (NSN)	NOMENCLATURE	QTY
1	11522	5330-01-225-0920	GASKET	
2	2HB200	5330-01-539-1502	GASKET	
3	115303A	5310-01-155-1905	LOCKNUT	
4	110311A	5310-01-111-0645	LOCKNUT	
5	110312A	5310-01-150-5918	LOCKNUT	
6	110310A	5310-01-159-8178	LOCKNUT	
7	1437220	5310-01-288-1116	LOCKNUT	
8	1598030	5310-01-342-8595	LOCKNUT	
9	1600460	5310-01-346-9445	LOCKNUT	
10	1571870	5310-01-352-7732	LOCKNUT	
11	1333510	5310-01-340-5671	LOCKNUT	

**Table 1. Mandatory Replacement Parts List. - Continued**

ITEM NO.	PART NUMBER/ (CAGEC)	NATIONAL STOCK NUMBER (NSN)	NOMENCLATURE	QTY
12	353AX	5310-00-582-5965	LOCKWASHER	
13	1495	5310-01-161-2527	LOCKWASHER	
14	MS35338-47	5310-00-209-0965	LOCKWASHER	
15	360AX	5315-01-186-8506	PIN, COTTER	
16	354AX	5310-01-068-8446	LOCKWASHER	
17	Z0930-78423	5310-01-251-9277	LOCKWASHER	
18	1168	5310-01-254-2575	LOCKWASHER	
19	351AX	5310-01-129-0450	LOCKWASHER	
20	2-016N552-90	5331-01-115-8225	PACKING, PREFORMED	
21	22617-8	5331-01-244-2273	PACKING, PREFORMED	
22	B0612 2-219 ((02697))	5331-01-173-8779	PACKING, PREFORMED	
23	9806	5331-01-229-0726	PACKING, PREFORMED	
24	3-910	5330-00-485-3586	PACKING, PREFORMED	
25	ASTM D2000M6BG91 0	5331-01-049-1292	PACKING, PREFORMED	
26	AS568-018	5331-01-092-5503	PACKING, PREFORMED	
27	3-912	5331-00-167-5175	PACKING, PREFORMED	
28	2-021 N0552	5331-01-479-0599	PACKING, PREFORMED	
29	9857	5331-01-234-7614	PACKING, PREFORMED	
30	9859	5330-01-235-4617	PACKING, PREFORMED	
31	9861	5331-01-485-5991	PACKING, PREFORMED	
32	360AX	5315-01-186-8506	PIN, COTTER	
33	2HA680	5315-01-513-5902	PIN, COTTER	
34	MS24665-683	5315-00-234-1673	PIN, COTTER	
35	MS24665-493	5315-00-018-7988	PIN, COTTER	



**Table 1. Mandatory Replacement Parts List. - Continued**

ITEM NO.	PART NUMBER/ (CAGEC)	NATIONAL STOCK NUMBER (NSN)	NOMENCLATURE	QTY
36	XB-21- S-250-1250	5315-01-249-1050	PIN, SPRING	
37	9858	-	RETAINER, PACKING	
38	9860	5330-01-225-0921	RETAINER, PACKING	
39	9862	5330-01-225-0923	RETAINER, PACKING	

**END OF WORK PACKAGE**



**FIELD MAINTENANCE  
ELECTRICAL SCHEMATIC**

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**ELECTRICAL SCHEMATIC**

**NOTE**

This schematic shows the M983A2 LET specific section only. Refer to TM 9-2320-315-14&P for the complete HEMTT schematic.

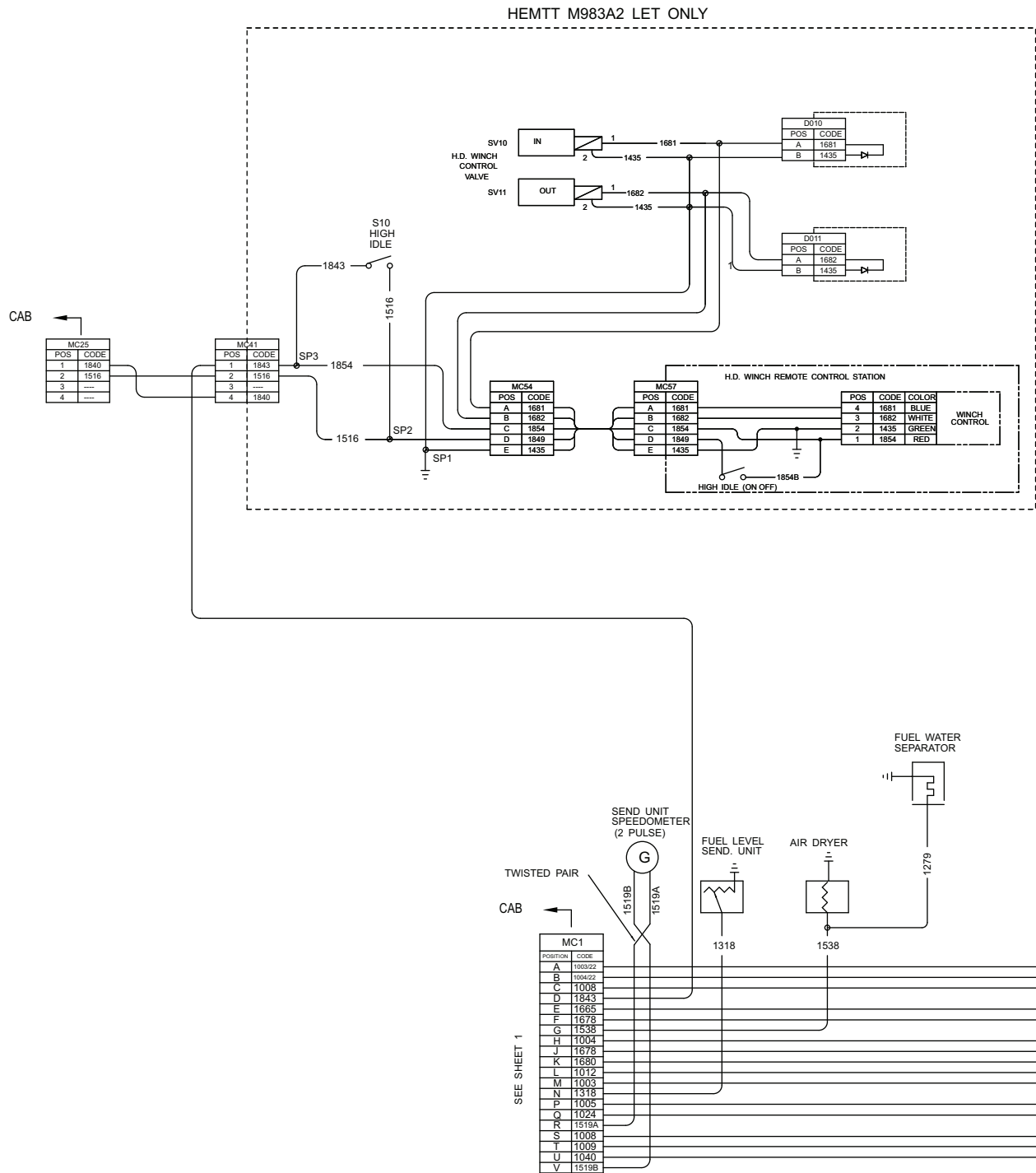


Figure 1.

END OF WORK PACKAGE

**FIELD MAINTENANCE  
HYDRAULIC SCHEMATIC**

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**HYDRAULIC SCHEMATIC**

**NOTE**

This schematic shows the M983A2 LET specific section only. Refer to TM 9-2320-315-14&P for the complete HEMTT schematic.

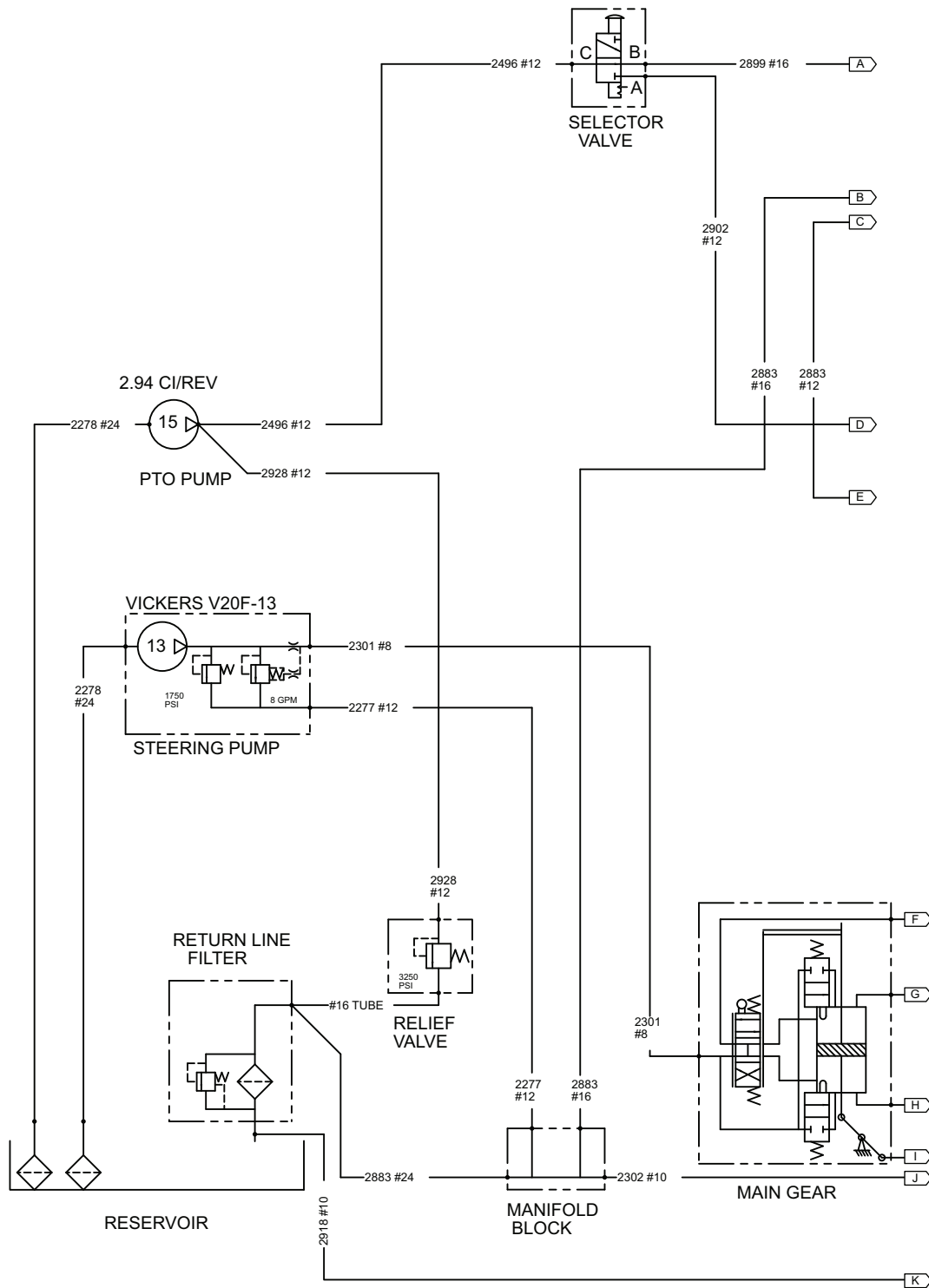


Figure 1.

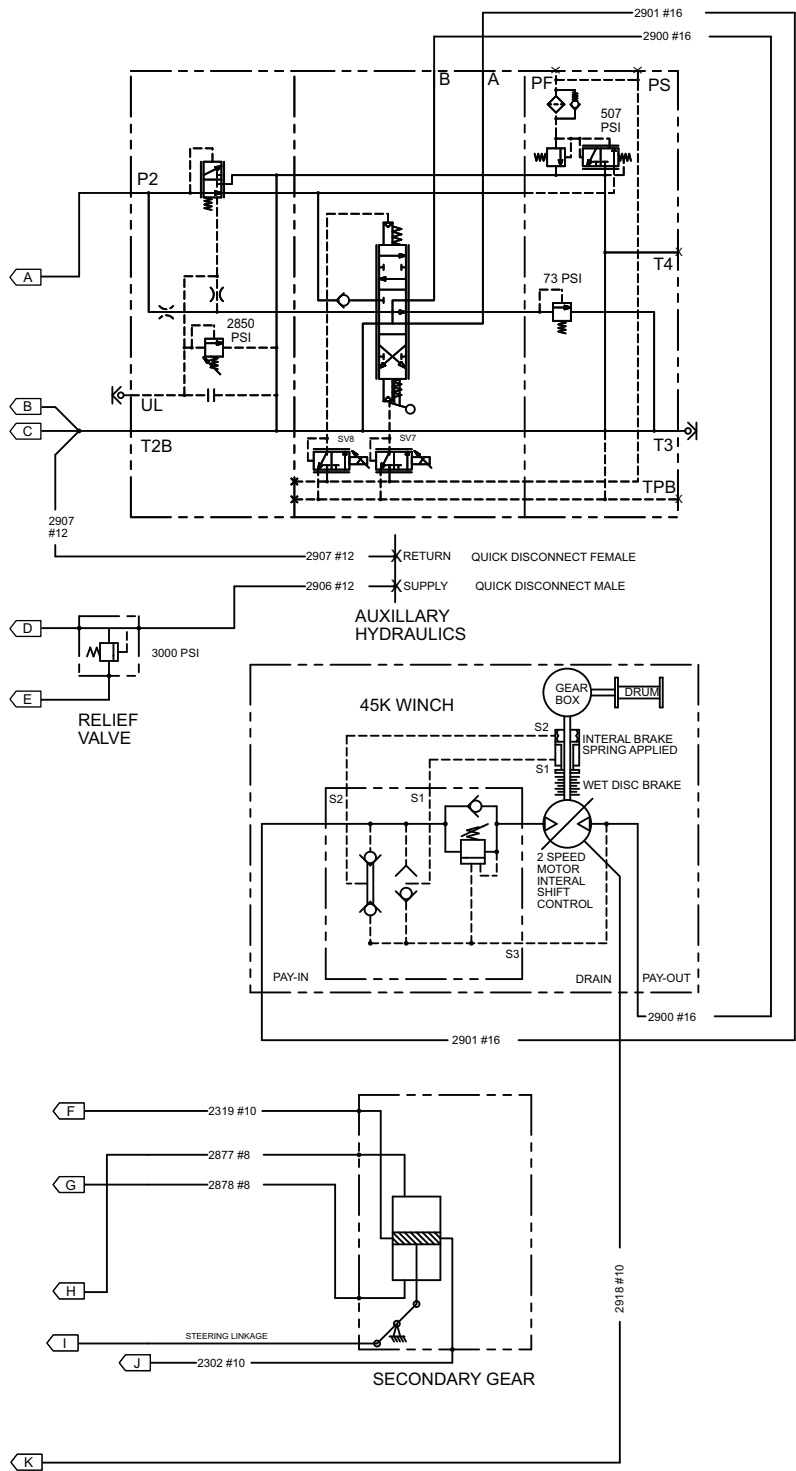


Figure 2.

END OF WORK PACKAGE





## FIELD MAINTENANCE PNEUMATIC SCHEMATIC

### PNEUMATIC SCHEMATIC

### NOTE

This schematic shows the M983A2 LET specific section only. Refer to TM 9-2320-315-14&P for the complete HEMTT schematic.

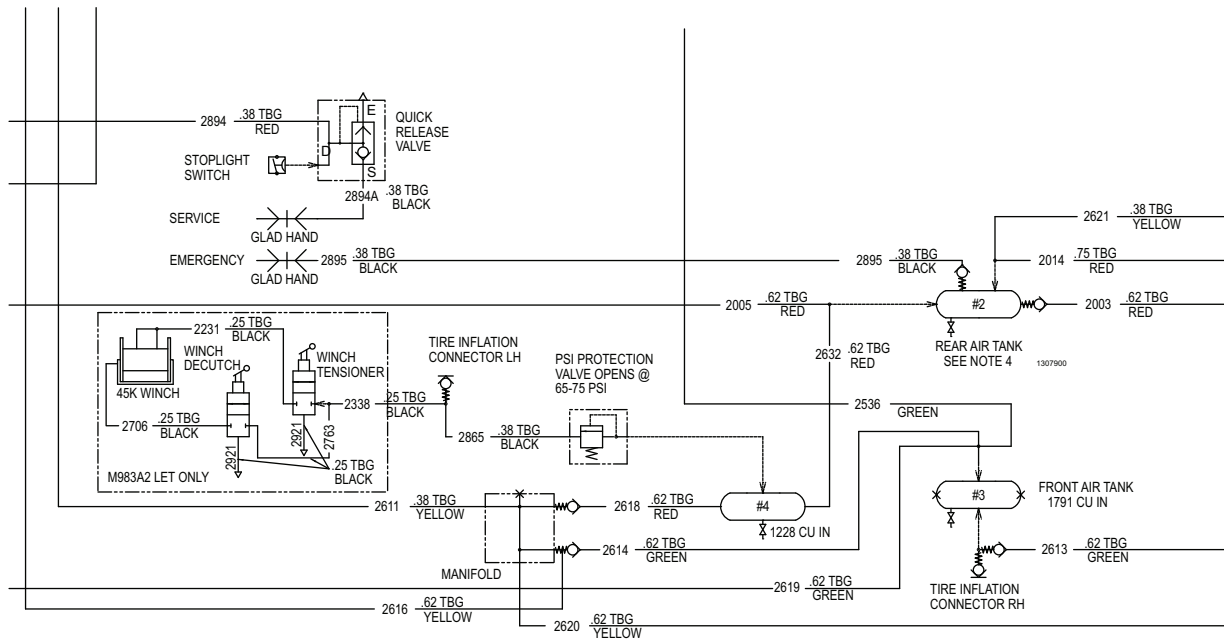


Figure 1.

**END OF WORK PACKAGE**



<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b> For use of this form, see AR 25-30; the proponent agency is ODISC4.						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).		DATE Date you filled out this form.	
TO: (Forward to proponent of publication or form) (Include ZIP Code) AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630						FROM: (Activity and location) (Include ZIP Code) Your mailing address			
<b>PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS</b>									
PUBLICATION/FORM NUMBER TB 9-2320-279-13&P-4 New						DATE 01 Apr 08		Title Truck, Tractor, Light Equip Transporter, (LET), 8x8 M983A2 LET	
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).			
									
<i>*Reference to line numbers within the paragraph or subparagraph.</i>									
TYPED NAME, GRADE OR TITLE Your Name					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		Signature Your Signature		

<b>TO: (Forward direct to addressee listed in publication)</b> AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630				<b>FROM: (Activity and location) (Include ZIP Code)</b> Your address				<b>DATE</b> Date you filled out this form	
<b>PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS</b>									
PUBLICATION NUMBER TB 9-2320-279-13&P-4 New				DATE 01 Apr 08			TITLE Truck, Tractor, Light Equipment Transporter (LET), 8x8 M983A2 LET		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION	
<div style="font-size: 100px; opacity: 0.5; position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);"> SAMPLE </div>									
<b>PART III – REMARKS</b> (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)									
TYPED NAME, GRADE OR TITLE  Your Name			TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION				SIGNATURE  Your Signature		

<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b> For use of this form, see AR 25-30; the proponent agency is ODISC4.						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
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<b>PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS</b>							
PUBLICATION/FORM NUMBER TB 9-2320-279-13&P-4 New						DATE 01 Apr 08	TITLE Truck, Tractor, Light Equipment Transporter, (LET), 8x8, M983A2 LET
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).	
TYPED NAME, GRADE OR TITLE				<i>*Reference to line numbers within the paragraph or subparagraph.</i> TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	



<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b> For use of this form, see AR 25-30; the proponent agency is ODISC4.						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	<b>DATE</b>
<b>TO: (Forward to proponent of publication or form) (Include ZIP Code)</b> AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630						<b>FROM: (Activity and location) (Include ZIP Code)</b>	
PUBLICATION/FORM NUMBER TB 9-2320-279-13&P-4 New						DATE 01 Apr 08	TITLE Truck, Tractor, Light Equipment Transporter, (LET), 8x8, M983A2 LET
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE

<b>TO: (Forward direct to addressee listed in publication)</b> AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630					<b>FROM: (Activity and location) (Include ZIP Code)</b>			<b>DATE</b>	
<b>PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS</b>									
<b>PUBLICATION NUMBER</b> TB 9-2320-279-13&P-4 New					<b>DATE</b> 01 Apr 08			<b>TITLE</b> Truck, Tractor, Light Equipment Transporter, (LET), 8x8, M983A2 LET	
<b>PAGE NO.</b>	<b>COLM NO.</b>	<b>LINE NO.</b>	<b>NATIONAL STOCK NUMBER</b>	<b>REFERENCE NO.</b>	<b>FIGURE NO.</b>	<b>ITEM NO.</b>	<b>TOTAL NO. OF MAJOR ITEMS SUPPORTED</b>	<b>RECOMMENDED ACTION</b>	
<b>PART III – REMARKS</b> <i>(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)</i>									
<b>TYPED NAME, GRADE OR TITLE</b>				<b>TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION</b>			<b>SIGNATURE</b>		



<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b> For use of this form, see AR 25-30; the proponent agency is ODISC4.						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	<b>DATE</b>
<b>TO: (Forward to proponent of publication or form) (Include ZIP Code)</b> AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630						<b>FROM: (Activity and location) (Include ZIP Code)</b>	
PUBLICATION/FORM NUMBER TB 9-2320-279-13&P-4 New						DATE 01 Apr 08	TITLE Truck, Tractor, Light Equipment Transporter, (LET), 8x8, M983A2 LET
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE

<b>TO: (Forward direct to addressee listed in publication)</b> AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630					<b>FROM: (Activity and location) (Include ZIP Code)</b>			<b>DATE</b>	
<b>PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS</b>									
PUBLICATION NUMBER TB 9-2320-279-13&P-4 New					DATE 01 Apr 08			TITLE Truck, Tractor, Light Equipment Transporter, (LET), 8x8, M983A2 LET	
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION	
<b>PART III – REMARKS</b> <i>(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)</i>									
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION			SIGNATURE		

By order of the Secretary of the Army:

GEORGE W. CASEY, JR.  
*General, United States Army*  
*Chief of Staff*

Official:

A handwritten signature in black ink, reading "Joyce E. Morrow". The signature is fluid and cursive, with the first letters of each name being capitalized and prominent.

JOYCE E. MORROW  
*Administrative Assistant to the*  
*Secretary of the Army*  
0801106

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 344896, requirements for TB 9-2320-279-13&P-4.



THE METRIC SYSTEM AND EQUIVALENTSLINEAR 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
Metrication .....	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



