

# \*TM 10629A-OR/A

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## SYSTEM OPERATION MANUAL WITH COMPONENTS LIST FOR

**TRUCK, CARGO, 7-TON W/O WINCH, MK23**

**TRUCK, CARGO, 7-TON W/WINCH, MK25**

**TRUCK, XLWB CARGO, 7-TON W/O WINCH, MK27**

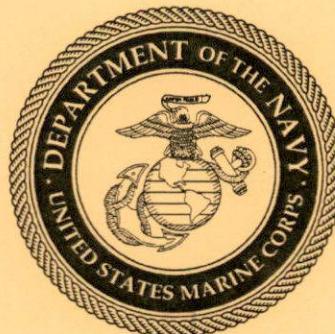
**TRUCK, XLWB CARGO, 7-TON W/WINCH, MK28**

**MK23: (NSN 2320-01-465-2174)**

**MK25: (NSN 2320-01-465-2176)**

**MK27: (NSN 2320-01-465-2180)**

**MK28: (NSN 2320-01-465-2182)**



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DEPARTMENT OF THE NAVY  
Headquarters, U.S. Marine Corps  
Washington, DC 20380-0001

30 September 2014

1. This Technical Manual (TM), TM 10629A-OR/A, authenticated for Marine Corps use and effective upon receipt, provides system operations and components list information for the 7-Ton Truck, Cargo MK23: (NSN 2320-01-465-2174), MK25: (NSN 2320-01-465-2176), MK27: (NSN 2320-01-465-2180), and the MK28: (NSN 2320-01-465-2182).
2. Submit notice of discrepancies or suggested changes on a NAVMC 10772. For instructions on how to submit a NAVMC 10772 go to <http://www.marcorsyscom.marines.mil/ProfessionalStaff/ACALPS.aspx> and click on "NAVMC 10772 submittal". Problems or questions regarding the NAVMC 10772 program should be reported by calling DSN 567-7628, DSN 567-6439, or DSN 567-5017 (Commercial numbers are (229) 639-7628, (229) 639-6439, or (229) 639-5017).
3. TM 10629A-OR, dated September 2012, is superseded for Marine Corps use.
4. This TM is applicable to the Marine Corps Reserve.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

OFFICIAL



G. B. Prosser  
Program Manager  
Medium and Heavy Tactical Vehicles  
Program Executive Officer Land Systems  
Marine Corps Systems Command

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## WARNING SUMMARY - Continued

### WARNING

#### HIGH INTENSITY NOISE

- Hearing protection is required for all personnel working in and around this vehicle while engine is running.
- Failure to comply may result in injury to personnel.

### WARNING

#### MODIFICATION HAZARD

- Unauthorized modifications to, alterations to, or installations of 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

#### 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 SUMMARY

### 1. 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.

#### FOR INFORMATION ON FIRST AID:

Reference FM 4-25.11.

### WARNING

#### CARBON MONOXIDE (EXHAUST GASES) CAN KILL

- DO NOT operate/idle vehicle in an enclosed area or with windows closed.
- BE ALERT at all times for exhaust odors and poisoning symptoms; i.e., headache, dizziness, sleepiness, and loss of muscular control.
- IF YOU SEE another person with exhaust poisoning symptoms, remove person from area, expose to open air, keep person warm, do not permit person to move, and if necessary, administer artificial respiration or CPR (Reference MCRP 3-02G/FM 21-11).
- BE AWARE, the field protective mask for Nuclear-Biological-Chemical (NBC) protection will NOT protect you from carbon monoxide poisoning.

### WARNING

#### PARKING BRAKE

ANY TIME THE OPERATOR leaves the vehicle and the engine is running, the following must be done:

- TRANSMISSION must be in N (neutral).
- PARKING BRAKE must be engaged.
- TIRES must be chocked.
- Unexpected vehicle movement may occur causing injury or death to personnel.

### WARNING

#### LOW AIR PRESSURE

- PRIOR TO operating vehicle, ensure both air pressure gauge needles read at least 100 psi (690 kPa).
- BOTH low air indicators and the low air audible alarm MUST turn OFF.
- Failure to comply may result in injury or death to personnel.

## WARNING SUMMARY - Continued

### 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.
- Never adjust relief valve so that personnel must stand on strongback to operate latch.
- If there is any residual pressure in tank when relief valve is open, personnel may lose their balance and fall. Failure to comply may result in injury or death to personnel.
- 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 for 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 SUMMARY - Continued**

### **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 SUMMARY - Continued**

### **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

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Original   September 2014

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MARINE CORPS SYSTEMS COMMAND  
QUANTICO, VA, SEPTEMBER 2014 PCN 184 106290 00

U.S. MARINE CORPS TECHNICAL MANUAL  
SYSTEM OPERATION MANUAL WITH COMPONENTS LIST  
FOR

Truck, Cargo, 7-Ton W/O Winch, MK23  
Truck, Cargo, 7-Ton W/Winch, MK25  
Truck, XLWB Cargo, 7-Ton W/O Winch, MK27  
Truck, XLWB Cargo, 7-Ton W/Winch, MK28  
MK23: (NSN 2320-01-465-2174)  
MK25: (NSN 2320-01-465-2176)  
MK27: (NSN 2320-01-465-2180)  
MK28: (NSN 2320-01-465-2182)

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit by NAVMC form 10772 directly to Marine Corps Logistics Command, Logistics Capabilities Center, Business Performance Management Division, Logistics Support Branch, 814 Radford Blvd Ste 20330, Albany, GA 31404-0330. You may also send in your recommended changes via electronic mail or by fax. Our fax number is DSN 567-5455 or Commercial (229) 639-5455. Our e-mail address is [smblogcompqdrstracking@usmc.mil](mailto:smblogcompqdrstracking@usmc.mil). A reply will be furnished to you.

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## HOW TO USE THIS MANUAL

### USABLE ON CODE (UOC) INFORMATION

#### NOTE

Unless otherwise noted in this manual, the MK models shall represent the MK, MKA1, AMK, and AMKA1 models.

The following table contains a list of Usable On Codes (UOCs) you may see in this manual.

AAA	Truck, Cargo, 7-Ton, W/O Winch, MK23
AAB	Truck, Cargo, 7-Ton, W/Winch, MK25
AAC	Truck, Cargo, 7-Ton, XLWB, W/O Winch, MK27
AAD	Truck, Cargo, 7-Ton, XLWB, W/Winch, MK28
BBA	Truck, Cargo, 7-Ton, W/O Winch, MK23A1
BBB	Truck, Cargo, 7-Ton, W/Winch, MK25A1
BBC	Truck, Cargo, 7-Ton, XLWB, W/O Winch, MK27A1
BBD	Truck, Cargo, 7-Ton, XLWB, W/Winch, MK28A1
CCA	Truck, Cargo, 7-Ton, W/O Winch, AMK23
CCB	Truck, Cargo, 7-Ton, W/Winch, AMK25
CCC	Truck, Cargo, 7-Ton, XLWB, W/O Winch, AMK27
CCD	Truck, Cargo, 7-Ton, XLWB, W/Winch, AMK28
DDA	Truck, Cargo, 7-Ton, W/O Winch, AMK23A1
DDB	Truck, Cargo, 7-Ton, W/Winch, AMK25A1
DDC	Truck, Cargo, 7-Ton, XLWB, W/O Winch, AMK27A1
DDD	Truck, Cargo, 7-Ton, XLWB, W/Winch, AMK28A1

### WARNINGS, CAUTIONS, AND NOTES

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.

Prior to operating any part of the 7-Ton Truck, **ALWAYS** do the following:

## HOW TO USE THIS MANUAL - Continued

- Read and follow all **WARNINGS** inside the front cover.
- Read the Safety Summary.
- Read the Physical and Functional Description located in Chapter 1.
- Read completely through the Location and Function of Controls and Instruments in Chapter 2.
- Read completely through the Operating Procedures to familiarize yourself with the equipment before using it.

### GENERAL INFORMATION

This single volume manual is divided into **CHAPTERS**, **SECTIONS**, and **PARAGRAPHS**. For a specific Chapter, Section, or Paragraph, refer to the **TABLE OF CONTENTS**.

1.
  - CHAPTER 1 introduces and describes the 7-Ton Truck, giving General Information, Safety Precautions, Preparation for Use, and Demolition to Prevent Enemy Use.
  - CHAPTER 2 provides Operation Instructions for the 7-Ton Truck in the following sections:
    - Theory of Operation
    - Service Requirements of Operator
    - Controls and Instruments
    - Operation under Specific Conditions
    - Operating Procedures
    - Operation of Equipment Used in Conjunction with Major Items
  - CHAPTER 3 provides Operator Maintenance Instructions for the 7-Ton Truck in the following sections:
    - Introduction
    - Tools and Equipment
    - Troubleshooting
    - Maintenance Procedures
    - Maintenance of Auxiliary Equipment

### SYMPTOM INDEX

A feature of the Troubleshooting Procedures Section is the **SYMPTOM INDEX**. This index provides an easy way to find the troubleshooting procedure needed by looking up the symptom.

### SUPPORTING INFORMATION

Supporting information is located at the back of this manual to provide information on equipment, tools, and supplies needed to keep the 7-Ton Truck fully operational.

## **CHAPTER 1**

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

## 1ST ECHELON MAINTENANCE INTRODUCTION

### General Description and Specification Data

#### Purpose

This manual is provided to maximize use of the 7-Ton Truck by presenting clear operating and maintenance instructions. Read these instructions thoroughly before operating vehicle.

#### Scope

This manual contains instructions for operation and operator-performed maintenance of the 7-Ton Truck, and associated equipment. Your manual also includes operator instructions for special purpose kits that may be installed on your vehicle.

#### Maintenance Forms and Records

Instructions contained in TM 4700-15/1, Ground Equipment Records Procedures, will be used for preparation, use, and disposition of required forms and records associated with the operation and maintenance of Marine Corps equipment.

#### Reporting Equipment Improvement Recommendations (EIR)

If your equipment needs improvement, let us know. Send an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design or performance. Document it on a Standard Form (SF) 368, Product Quality Deficiency Report. Mail your completed SF 368 to:

Marine Corps Logistics Command

Logistics Capabilities Center

Business Performance Management Division

814 Radford Blvd, Ste 20330

Albany, GA 31704-0330

PQDR Mailbox is: [smblogcompqdrstracking@usmc.mil](mailto:smblogcompqdrstracking@usmc.mil)

<http://www.logcom.usmc.mil/pqdr/>

#### Corrosion Prevention and Control (CPC)

1. Corrosion prevention and control is a continuing concern. It is important that any corrosion problems be reported so that the problem can be corrected and improvements made to prevent the problem in the future.
2. While corrosion is typically associated with 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 corrosive problem.
3. If a corrosive problem is identified, it shall be reported using a SF 368, Product Quality Deficiency Report. Use of the key words such as "corrosion", "rust", "deterioration", or "cracking" will ensure that information is identified as a CPC problem. Mail your completed SF 368 to:

Marine Corps Logistics Command

Logistics Capabilities Center

## Corrosion Prevention and Control (CPC) - Continued

Business Performance Management Division

814 Radford Blvd, Ste 20330

Albany, GA 31704-0330

PQDR Mailbox is: [smblogcompqdrstracking@usmc.mil](mailto:smblogcompqdrstracking@usmc.mil)

<http://www.logcom.usmc.mil/pqdr/>

### Warranty Information

- Failure-Free Vehicle Warranty. The 7-Ton Trucks are warranted for 90 days after vehicle handoff, or 15 months after vehicle acceptance, whichever comes first.
- Systemic Defect Warranty. The 7-Ton Trucks are warranted for 24 months from vehicle handoff to the gaining unit or 36 months from the date of vehicle acceptance, whichever comes first.
- Reporting Claims. Report all defects in material or workmanship to your NCOIC. Contact Second Echelon Maintenance for warranty procedures and service.

### Abbreviations/Acronyms

Abbreviations and acronyms used in this manual are as follows:

AAL	Additional Authorized List
AAR	Association of American Railroads
ABS	Anti-Locking Braking System
amp	Amphere
ATC	Automatic Traction Control
AUX	Auxiliary
BII	Basic Issue Items
BOM	Bill of Materials
C	Celsius
CAGE	Commercial and Government Entity
CARC	Chemical Agent Resistance Coating
CB	Circuit Breaker
CC	Cross-Country
CCA	Cold Cranking Amps
CCGVW	Cross-Country Gross Vehicle Weight
CCW	Counterclockwise
CLS	Contractor Logistics Support
cm	Centimeter
COEI	Components of End Item
CPC	Corrosion Prevention Control
CPR	Cardiopulmonary Resuscitation
CTIS	Central Tire Inflation
CW	Counterclockwise
DLHV	Double-Load-Holding-Valve
e.g.	For Example
ea	Each
ECM	Electronic Control Module (pertains to engine)
ECU	Electronic Control Unit (pertains to transmission)
EIR	Equipment Improvement Recommendation
EMC	Electromagnetic Container
Emer	Emergency

**Abbreviations/Acronyms - Continued**

EMI	Electromagnetic Interference
F	Fahrenheit
FM	Field Manual
FMIS	Failure Mode Identifiers
FSCM	Federal Supply Code For Manufacturer
ft.	Feet
GAA	General Automotive Artillery
Gal	Gallon
gl	Gallons
GPM	Gallons Per Minute
GVWR	Gross Vehicle Weight Rating
HMMWV	High Mobility Multipurpose Wheeled Vehicle
hp	Horsepower
Hwy	Highway
IAW	In Accordance With
IFAV	Interim Fast Attack Vehicle
i.e.	That is
in.	Inch
ISO	International Organization for Standardization
ITV	Internally Transportable Vehicle
kg	Kilograms
Km	Kilometers
km/h	Kilometers Per Hour
kPa	Kilopascals
kph	Kilometers Per Hour
kW	Kilowatt
L	Liter
lb-ft	Foot Pounds
lbs	Pounds
LCAC	Landing Craft Air Cushion (Landing Craft)
LCU	Landing Craft Utility (Landing Craft)
LED	Light Emitting Diode
LHA	Landing Helicopter Assault (Ship)
LHD	Landing Helicopter Dock (Ship)
LI	Lubrication Instructions
LOLO	Lift-On/Lift-Off
LPD	Landing Platform Dock (Ship)
LSD	Landing Ship Dock (Ship)
M	Meters
MAC	Maintenance Allocation Chart
Max	Maximum
MCO	Marine Corps Order
MCWP	Marine Corps Warfare Publication
MFOM	MLRS Family of Munitions
MHC	Material Handling Crane
MIC	Message Information Center
ml	Milliliter
MLRS	Multiple Launch Rocket System
mm	millimeter
mph	Miles Per Hour
MSS	Mud/Sand/Snow
MTMCTEA	Military Traffic Management Command Transportation
NATO	North Atlantic Treaty Organization
NAVMC	Navy and Marine Corps

**Abbreviations/Acronyms - Continued**

NBC	Nuclear-Biological-Chemical
NCOIC	Non Commissioned Officer In Charge
Nm	Newton-Meters
No.	Number
NSN	National Stock Number
OE/HDO	Oil Engine/Hydraulic Oil
OLP	Overload Protection
OMIS	Oshkosh Module Independent Suspension
OTC	Oshkosh Truck Corporation
oz	Ounce
PDB	Power Display Box
PIDS	Parameter Identifications
PMCS	Preventive Maintenance Checks and Services
POL	Petroleums, Oils, and Lubricants
Psi	Pounds Per Square Inch
PTO	Power Takeoff
Qt	Quart
Qty	Quantity
Quad-Con	Four (4) Containers
RSS	Re-Supply System
RST	Re-Supply Trailer
RSV	Re-Supply Vehicle
RIM	Reaction Injection Molding
RORO	Roll-On/Roll-Off
RPM	Revolutions Per Minute
Rqr	Required
SF	Standard Form
SINCGARS	Single Channel Ground and Airborne Radio System
Six-Con	Six (6) Containers
SOP	Standard Operating Procedure
SPV	Special Purpose Vehicle
SRW	Self-Recovery Winch
STDWB	Standard Wheel Base
STE/ICE	Simplified Test Equipment for Internal Combustion Engine
T/E	Table of Equipment
TC	Transfer Case
TCM	Transmission Control Module
TIM	Test Interface Module
TM	Technical Manual
U/I	Unit of Issue
U/M	Unit of Measure
VCW	Vehicle Curb Weight
XLWB	Extra Long Wheel Base

**END OF WORK PACKAGE**

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## 1ST ECHELON MAINTENANCE GENERAL DESCRIPTION AND SPECIFICATION DATA

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### DESCRIPTION, PHYSICAL AND FUNCTIONAL

#### Physical Description

The 7-Ton, 6 x 6, Truck is designed for use on all types of roads, highways, and cross-country terrain. These vehicles also operate in extreme conditions and temperatures such as arctic conditions. Major subsystems of the vehicles are; cab, engine, transmission, drive train, suspension, electrical system, pneumatic (air) system, and CTIS.

#### Functional Description

1. The 7-Ton Truck is capable of operating in temperatures from -25 to 125°F (-32 to 52°C) and to -50°F (-46°C) with arctic kit installed while carrying a 7.1 ton (6,447 kg) payload cross country or up to 15 tons (13,620 kg) on primary or secondary roads.
2. The 7-Ton Truck is capable of traversing a 60% grade, a 30% side slope up to 15 mph (24 km/h), and a 40% side slope up to 5 mph (8 km/h) with its maximum cross country load. The 7-Ton Truck is capable of fording 60 in. (1.5 m) of water. It can also travel at 65 mph (105 km/h) on paved surfaces, and has an on-road cruising range of 300 miles (483 km).

#### NOTE

The 7-Ton Truck is capable of traveling 65 mph (105 km/h). However, the operator MUST adhere to the speed limits set by USMC directives and Unit SOP.

3. The 7-Ton Truck is provided with sufficient tiedown points located so that the vehicle can be restrained in all directions during air transport. All models are capable of transport by highway, rail, and sea.

### Location and Description of Major Components

Major components and accessories found on the 7-Ton Truck are illustrated in the figures below and described as follows:

1. ENGINE COMPARTMENT. Engine supplies power to move vehicle and operate equipment and accessories.
2. CAB. Provides protection from weather for crew, vehicle controls, gauges, and indicators.
3. GLADHANDS. Couples air supply to towed vehicle or trailer.
4. PINTLE HOOK. Allows connection to a towed vehicle.
5. AXLES NO. 2 AND 3. Transmits power to hubs to turn wheels.
6. FUEL TANK. Stores fuel to operate vehicle.
7. BATTERY BOX. Stores up to four batteries for normal operating temperatures and for operation in cold environment.
8. SELF RECOVERY WINCH (SRW). Used to free vehicle from mired conditions. On the MK25 and MK28, the winch is located to the rear of the vehicle on the right-hand side.
9. MUFFLER AND EXHAUST PIPING. Used to direct exhaust fumes from engine at safe distance to not affect personnel in cab.

**Location and Description of Major Components - Continued**

10. MACHINE GUN MOUNT (when equipped). Used to mount machine gun. Machine gun mount is a kit and will not be installed on all vehicles. Machine gun allowance planning was one mount for every five vehicles.
11. TOWING EYES. Attachment points for safety chains, towing shackles, and vehicle towing.
12. AXLE NO. 1. Controls direction of vehicle when in motion. Transmits power to hubs to turn wheels.
13. AIR CLEANER. Filters out dust and debris which prevents dust and debris from entering air induction system.
14. TIEDOWN EYES. Attaching points for securing the vehicle during operation.
15. CHEMICAL ALARM (when equipped). This kit monitors the air and notifies the operator if it becomes contaminated with a toxic chemical. The chemical alarm kit is installed by using units as required.
16. FUEL/WATER CAN BRACKET. This bracket secures a 5-gallon storage can to the vehicle. On the MK27 and MK28, the bracket is mounted to the frame between the battery box and axle no. 2.
17. DECONTAMINATION CAN BRACKET (when equipped). This bracket secures a 5-gallon decontamination can to the vehicle. On the MK27 and MK28, the bracket is mounted to the frame between the air filter housing and axle no. 2. The decontamination bracket is a kit and is installed on using unit vehicles as required.

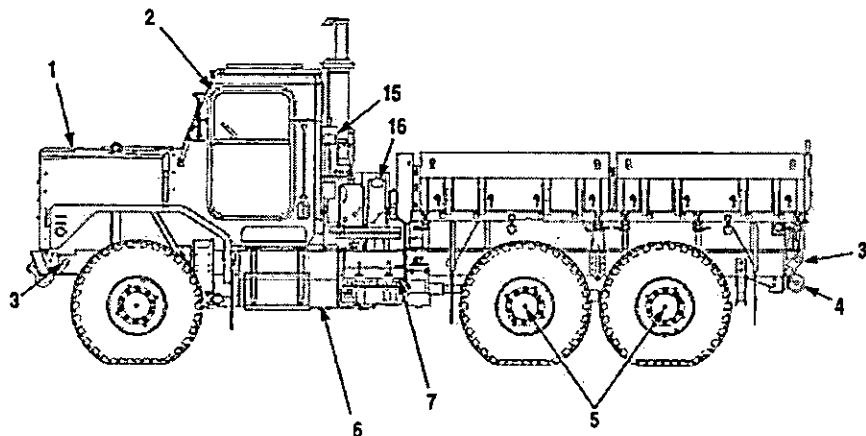


Figure 1. Location and Description of Major Components (1 of 2).

## Location and Description of Major Components - Continued

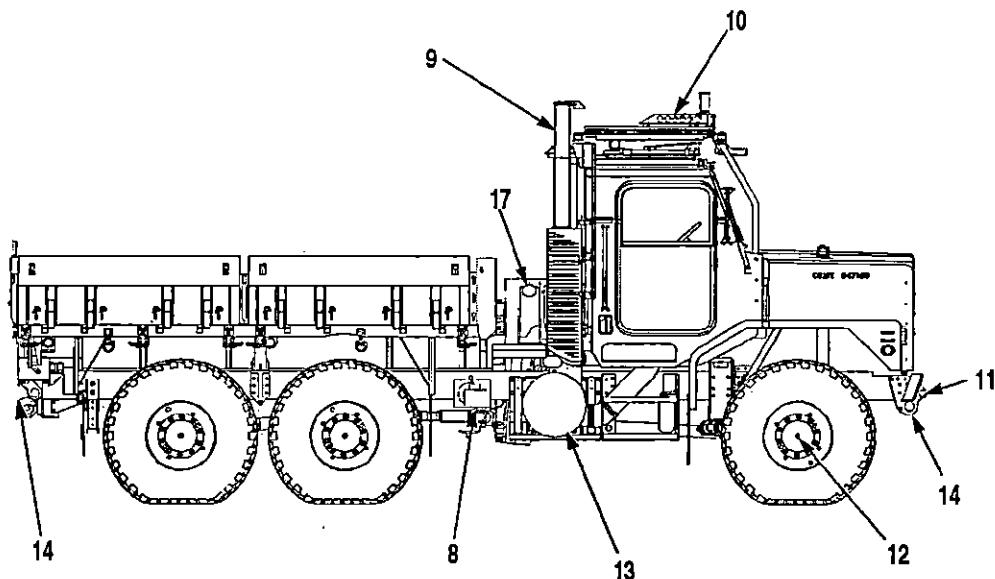


Figure 2. Location and Description of Major Components (2 of 2).

## Reference Data Tables

Refer to the following tables for specific equipment data:

## Dimensions

Table 1. Dimensions.

Item	Specification
Width	98 in. (249 cm)
Operational Height	141.2 in. (358.7 cm)
Reducible Height	98 in. (249 cm)
Length	314.9 in. (799.8 cm)
Length	386.5 in. (981.7 cm)
Ground Clearance	
Cross-Country Highway	16.2 in. (41.2 cm) 16.7 in. (42.4 cm)

**Reference Data Tables - Continued****Vehicle Weights***Table 2. Vehicle Weights.*

Item	Specification
Vehicle Curb Weight (VCW)	
MK23	27,753 lbs (12,600 kg)
MK23A1	27,900 lbs (12,667 kg)
AMK23	33,800 lbs (15,345 kg)
AMK23A1	33,800 lbs (15,345 kg)
AMK23 with Cab and Troop Carrier Armor	42,000 lbs (19,068 kg)
Gross Vehicle Weight Rating (GVWR)	
MK23	62,200 lbs (28,239 kg)

**Vehicle Weights***Table 3. Vehicle Weights.*

Item	Specification
Vehicle Curb Weight (VCW)	
MK25	28,642 lbs (13,003 kg)
MK25A1	29,100 lbs (13,211 kg)
AMK25	35,000 lbs (15,890 kg)
AMK25A1	35,000 lbs (15,890 kg)
AMK25 with Cab and Troop Carrier Armor	43,200 lbs (19,613 kg)
Gross Vehicle Weight Rating (GVWR)	
MK25	62,200 lbs (28,239 kg)

**Vehicle Weights***Table 4. Vehicle Weights.*

Item	Specification
Vehicle Curb Weight (VCW)	

## Reference Data Tables - Continued

Table 4. Vehicle Weights - Continued.

Item	Specification
MK27	30,067 lbs (13,650 kg)
MK27A1	30,600 lbs (13,892 kg)
AMK27	36,400 lbs (16,526 kg)
AMK27A1	36,400 lbs (16,526 kg)
AMK27 with Cab and Troop Carrier Armor	44,700 lbs (20,294 kg)
Gross Vehicle Weight Rating (GVWR)	
MK27	62,200 lbs (28,239 kg)

## Vehicle Weights

Table 5. Vehicle Weights.

Item	Specification
Vehicle Curb Weight (VCW)	
MK28	30,995 lbs (14,054 kg)
MK28A1	31,700 lbs (14,392 kg)
AMK28	37,500 lbs (17,025 kg)
AMK28A1	37,500 lbs (17,025 kg)
AMK28 with Cab and Troop Carrier Armor	45,800 lbs (20,793 kg)
Gross Vehicle Weight Rating (GVWR)	
MK28	62,200 lbs (28,239 kg)

## Performance

Table 6. Performance.

Item	Specification
Gradient (Grade)	
Longitudinal (Up Slope)	60% at CCGVW 30% at CCGVW up to 15 mph (24 km/h)

## Reference Data Tables - Continued

Table 6. Performance - Continued.

Item	Specification
Side Slope	40% side slope up to 5 mph (8 km/h)
Environmental Operation	-50°F to 125°F (150°F storage) (-46°C to 52°C [66°C storage]) -25°F to -50°F with kits (-32°C to -46°C with kits)
Speed, Maximum	
GVW Road	65 mph (105 km/h)
Fording	60 in. (152.4 cm)
Cruising Range	300 mi. (483 km) CCGVW, road
Turning Radius - MK23 and MK25	42.7 ft. (13.0 m) wall to wall 41.6 ft. (12.7 m) curb to curb
Turning Radius - MK27 and MK28	47.7 ft. (14.6 m) wall to wall 46.5 ft. (14.2 m) curb to curb

## Axles

Table 7. Axles.

Item	Specification
Axles Configuration	6 x 6 - Three axles
Make and Model	Oshkosh 7-Ton Truck axle
Rated Capacity	
Front Axle	17,800 lbs (8,081 kg) with armor 21,600 lbs (9,806 kg) with front axle upgrade 16,000 lbs (7,264 kg) without armor
Intermediate Axle	23,500 lbs (10,669 kg)

## Reference Data Tables - Continued

Table 7. Axles - Continued.

Item	Specification
Rear Axle	25,500 lbs (11,577 kg)
Type	Full-time all wheel drive Fixed-center differential and planetary hub reduction
Inter-Axle Differential Lock	CTIS-controlled terrain selection with manual override
Intra-Axle Differential Lock	Controlled by CTIS terrain selection on all axles, with manual override
Gear Ratios	
Final	6.00:1
Differential	1.687:1
Wheel Drive	3.556:1

## Parking and Emergency Brakes

Table 8. Parking and Emergency Brakes.

Item	Specification
Type	Spring brakes on axles No. 2 and No. 3 Modulated emergency system
Make	
Intermediate and Rear Axle	Eaton extended service S-Cam

## Service Brakes

Table 9. Service Brakes.

Item	Specification
Type	Drum with internal shoe Dual system, air operated
Make	
Front Axle	Meritor RDA type-9 wedge

## Reference Data Tables - Continued

*Table 9. Service Brakes - Continued.*

Item	Specification
Intermediate and Rear Axle	Eaton extended service S-Cam
Size	
Front Axle	16.1 x 7.1 in. (40.9 x 18 cm)
Intermediate and Rear Axle	16.5 x 7 in. (41.9 x 17.8 cm)

## Cab

*Table 10. Cab.*

Item	Specification
Construction and Accessories	Welded aluminum extrusion construction with adhesively bonded corrosion resistant skins
	Three-person 82.3 in. (209 cm) cab width
	Hinged windshield, roof, side walls, door frames, and rear wall for reducible height to 98 in. (248.9 cm)
	One-piece front wind shield (standard configuration)
	Three-piece armored wind shield (w/cab armor)
Instrumentation	Modular dash panels
	Multiplex gauge control
	J1708 and J1939 data bus communications
	US/metric color band gauges

**Reference Data Tables - Continued****Central Tire Inflation System (CTIS)***Table 11. Central Tire Inflation System (CTIS).*

Item	Specification
Type	Eaton, electronic controlled, terrain and payload biased, automatic upon operator selection
Control	Transfer case, interaxle, and all axles side-to-side lockup control, with manual override
Features	Preset tire pressures for highway, cross-country, mud-sand-snow, and emergency
	Overspeed function with warning and automatic tire pressure and driveline lock corrections
	Run flat function provides continuous air to punctured tire
	Utilizes SAE J1708 and 1939 data bus for external control functions
Tire Pressure Settings	Refer to Central Tire Inflation System, Tire Pressure Table (WP 0043, General) for correct tire pressure settings

**Air System***Table 12. Air System.*

Item	Specification
Air Governor	Bendix #275491
Aftercooler	Midland Brake, Inc. #N-50023-B
Air Dryer	Midland Brake, Inc. #N-4250-A 24 VDC

## Reference Data Tables - Continued

## Cooling System

Table 13. Cooling System.

Item	Specification
Type	Cross flow fin and tube type radiator, includes internal transmission cooler and external charge air cooler
Frontal Area	1,241 in <sup>2</sup> (8006 cm <sup>2</sup> )
Construction	Fabricated end tanks and side members bolted together to form a rigid frame surrounding radiator core, built in deaeration system
Fan	32 in. (81 cm), nine blade, serpentine belt driven
Fan Clutch	Temperature controlled

## Cargo Body

Table 14. Cargo Body (MK23 and MK25).

Item	Specification
Type	ISO and non-ISO payload compatible
Payload Capability (without Armor)	15 ton (13,620 kg) non-ISO payload on primary and secondary roads
	10 ton (9,080 kg) ISO payload on primary and secondary roads
	7.1 ton (6,447 kg) ISO and non-ISO payload on all terrain
Payload Capability (with Armor)	10.5 ton (9,534 kg) non-ISO payload on primary and secondary roads
	6 ton (5,448 kg) ISO and non-ISO payload on all terrain
ISO Compatible Payloads	10 ft. EMI/EMC shelters (1 ea.)
	Quad-cons (2 ea.)
	Six-cons (2 ea.)
Recommended Personnel Capacity	16

## Reference Data Tables - Continued

*Table 14. Cargo Body (MK23 and MK25) - Continued.*

Item	Specification
	Also refer to Preparation for Operation (WP 0028) for warning information.

## Cargo Body

*Table 15. Cargo Body (MK27 and MK28).*

Item	Specification
Type	ISO and non-ISO payload compatible
Payload Capability (without Armor)	10 and 15 ton (9,080 and 13,620 kg) ISO and non-ISO payload on primary and secondary roads
	7.1 ton (6,447 kg) ISO and non-ISO payload on all terrain
Payload Capability (with Armor)	10.5 ton (9,534 kg) ISO and non-ISO payload on primary and secondary roads
	6 ton (5,448 kg) ISO and non-ISO payload on all terrain
ISO Compatible Payloads	20 ft ISO container and shelter (1 ea.)
	10 ft. EMI/EMC shelters (2 ea.)
	Quad-cons (4 ea.)
	Six-cons (3 ea.)
Recommended Personnel Capacity	20 Also refer to Preparation for Operation (WP 0028) for warning information.

## Electrical System

*Table 16. Electrical System.*

Item	Specification
Alternator	150 amp or 300 amp
Voltage	24 volts with 12-volt accessory provision in cab
Battery	Two 12-volt (625 CCA ea. @ -18°F [-28°C])

## Reference Data Tables - Continued

*Table 16. Electrical System - Continued.*

Item	Specification
	Battery box has provisions for four batteries for 32°F to -50°F operation (0°C to -46°C)

## Steering System

*Table 17. Steering System.*

Item	Specification
Type	R.H. Sheppard integral power steering with booster and separate fluid reservoir
Steering Gear Ratio	18.1
Turning Circle	
MK23 and MK25	82 ft. wall to wall (25 m)
MK27 and MK28	94 ft. wall to wall (29 m)

## Engine

*Table 18. Engine.*

Item	Specification
Make and Model	Caterpillar C-12 electronic control, Adam III
Type	4-stroke, in-line, six cylinder, electronic
Bore	5.12 in. (13 cm)
Stroke	5.91 in. (15 cm)
Displacement	729 in <sup>3</sup> (11.9 L)
Maximum Horsepower	425 hp (317 kW) at 1800 rpm
Peak Torque	1,550 ft-lb (2,102 N·m) at 1200 rpm
Engine Brake/Retarder	Jacob's engine brake with three settings: High, Medium, and Low

**Reference Data Tables - Continued****Suspension***Table 19. Suspension.*

Item	Specification
Type	Oshkosh Modular Independent Suspension, coil spring, A-arm
Wheel Travel	
Front Axle	16.0 in. (41 cm)
Intermediate Axle	12.8 in. (32.5 cm)
Rear Axle	12.8 in. (32.5 cm)
Roll Stability	Anti-roll bar on axles #2 and #3

**Tires***Table 20. Tires.*

Item	Specification
Type	16.00R20 XZL
Quantity	Six
Additional Capability	Limp Home capability in case of flat tire where CTIS cannot maintain pressure

**CTIS Tire Pressure Settings (Cold)***Table 21. CTIS Tire Pressure Settings (Cold).*

CTIS LOAD SETTINGS		HWY	CC	MSS	EMER
0-2 Tons	Front	43	28	15	12
	Rear	35	22	12	10
2-7.1 Tons	Front	42	27	14	11
	Rear	55	34	19	14
7.1-15 Tons	Front	42	27		
	Rear	96	70		
	MAXIMUM	MAX.	40	15	5

## Reference Data Tables - Continued

Table 21. CTIS Tire Pressure Settings (Cold) - Continued.

CTIS LOAD SETTINGS		HWY	CC	MSS	EMER
	SPEED (MPH)	SPD.			

## NOTE

All tire pressures are  $\pm$  3 psi.

## Reference Data Tables - Continued

## CTIS Tire Pressure Settings (Cold): (MK23, MK25, MK27, and MK28) w/CabArmor

Table 22. CTIS Tire Pressure Settings (Cold): (MK23, MK25, MK27, and MK28) w/Cab Armor.

CTIS LOAD SETTINGS		HWY	CC	MSS	EMER
0-2 Tons	Front	80 PSI	55 PSI	29 PSI	22 PSI
	Rear	41 PSI	26 PSI	14 PSI	12 PSI
2-6 Tons	Front	80 PSI	55 PSI	29 PSI	22 PSI
	Rear	58 PSI	39 PSI	21 PSI	17 PSI
6-10.5 Tons	Front	80 PSI	55 PSI		
	Rear	96 PSI	70 PSI		
	Maximum Speed (MPH)	Max. Spd.	40	15	5
<b>NOTE</b>					
All tire pressures are $\pm$ 3 psi.					

## Transfer Case

Table 23. Transfer Case.

Item	Specification
Make and Model	Oshkosh 30000 Series
Type	Three shaft, single speed with torque proportioning differential with manual differential lock
Ratio	1.271:1
Torque Split	32% Front, 68% Rear

**Reference Data Tables - Continued****Transmission***Table 24. Transmission.*

Item	Specification
Make and Model	Allison HD4070P, Automatic electronic control, WTECIII or
	Allison 4700SP, Automatic electronic control, GEN IV
Type	Seven speed automatic with TC-541 torque converter, second-gear start
Ratios	
Seventh	0.64:1
Sixth	0.74:1
Fifth	1.00:1
Fourth	1.43:1
Third	1.91:1
Second	3.51:1
First	7.63:1
Reverse	4.80:1

**Wheels***Table 25. Wheels.*

Item	Specification
Type	Two-piece bolt together, steel disc
Size	20 x 10 in. (51 x 25 cm)

**Self Recovery Winch***Table 26. Self Recovery Winch.*

Item	Specification
Make and Model	DP Manufacturing, S 20 K

## Reference Data Tables - Continued

*Table 26. Self Recovery Winch - Continued.*

Item	Specification
Wire Rope	Wire Rope Corp.
Diameter	0.625 in. (15.9 mm)
Length	200 ft. (61 m)
Deployment	Rear only

## Self Recovery Winch Performance Data - with Engine at 1500 RPM

*Table 27. Self Recovery Winch Performance Data - with Engine at 1500 RPM.*

Layers On Drum	Pull Pounds/kg	Line Speed Ft/M Per Minute	Drum Capacity Feet/Meters
5th Layer	13,800 / 6265	47 / 14.3	181 / 55.2
4th Layer	15,000 / 6810	43 / 13.1	139 / 42.4
3rd Layer	16,400 / 7446	40 / 12.2	99 / 30.2
2nd Layer	18,000 / 8172	36 / 11	63 / 19.2
1st Layer (five wraps minimum)	20,000 / 9080	32 / 9.8	30 / 9.2

## Petroleums, Oils, and Lubricant (POL) Capacities

*Table 28. Petroleums, Oils, and Lubricant (POL) Capacities.*

Description	Capacity
Engine	33 Qt. (31.2 L) With Filter 27 Qt. (25.5 L) Without Filter
Transmission	48 Qt. (45 L) With Filter 38 Qt. (36 L) Drain and Refill
Transfer Case	6 Qt. (5.7 L)
Hydraulic Reservoir	15 Gal. (57 L) With Filter
Power Steering Reservoir	9 Qt. (8.5 L)
Radiator	40.5 Qt. (38.3 L)
Axles No. 1 and 3	10.5 Qt. (9.9 L)

## Reference Data Tables - Continued

Table 28. *Petroleums, Oils, and Lubricant (POL) Capacities - Continued.*

Description	Capacity
Axles No. 2	12.7 Qt. (12 L)
Wheel Ends	1.6 Qt. (1.5 L)
Winch Gearbox	2 Qt. (2 L)
Fuel Tank	80 Gal. (303 L) Total 76 Gal. (288 L) Useable

## Recommended Modes of CTIS Operation

Table 29. *Recommended Modes of CTIS Operation.*

CTIS SETTING				
Road Condition	HWY	CC	MSS	Emer
Highway/Paved & Smooth	X			
Gravel/Smooth	1	2		
Gravel/Dirt W/ Potholes or Washboard		X		
Cobblestone/ Belgium Block	X			
Mud/Sand/Snow		1	2	
Fording-Hard Bottom		X		
Fording-Soft Bottom		1	2	
Grade-Slight (<10%)	X			
Grade-Moderate 10%-25%		X		
Grade-Steep (>25%)		1	2	

Where more than one CTIS terrain setting is identified above, first try choice 1. If wheel spin occurs, remove power to stop the spin and try choice 2.

**Reference Data Tables - Continued**

Where conditions are a combination of the above classifications (such as a moderate grade with mud/sand/snow), it is likely that choice 2 will be needed to complete the required task.

This table cannot cover all possible terrain and considerations. If you do not see a table choice that addresses your particular situation, choose a terrain/road condition CTIS setting that suggests a worse environment than the one you will encounter.

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
GENERAL**

---

**General**

This section explains the electrical and mechanical theory of operation for the 7-Ton Truck. Figures Mechanical Theory Block Diagram (WP 0005, Figure 1) and Electrical Theory Block Diagram (WP 0006, Figure 1) are illustrated block diagrams of each system.

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE HYDRAULIC THEORY

### Hydraulic Theory

#### Hydraulic System.

The hydraulic system is powered by a shaft-driven Power Takeoff (PTO), which supplies power to a hydraulic pump. The hydraulic pump supplies power to the Self Recovery Winch (SRW).

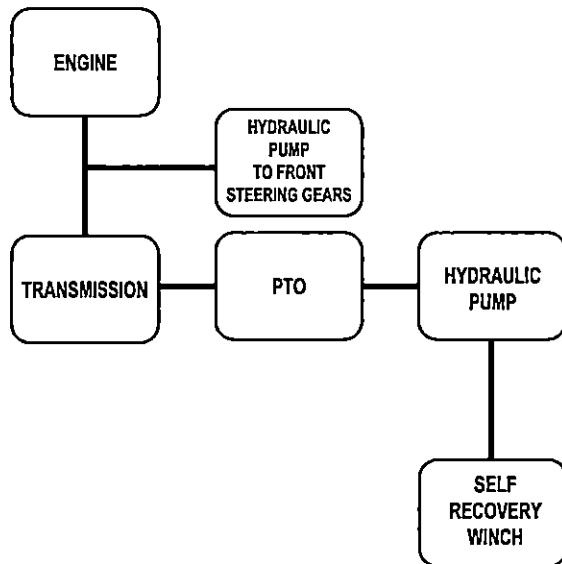


Figure 1.

**END OF WORK PACKAGE**

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**1ST ECHELON MAINTENANCE  
MECHANICAL THEORY**

---

**Mechanical Theory (Block Diagrams)**

The engine generates power to move the vehicle. This power is transferred to the transmission which converts the power into a controllable speed. The transmission transfers this controlled speed to the transfer case which transfers this speed to the axles. The axles then transfer this speed to the right and left wheels of the vehicle.

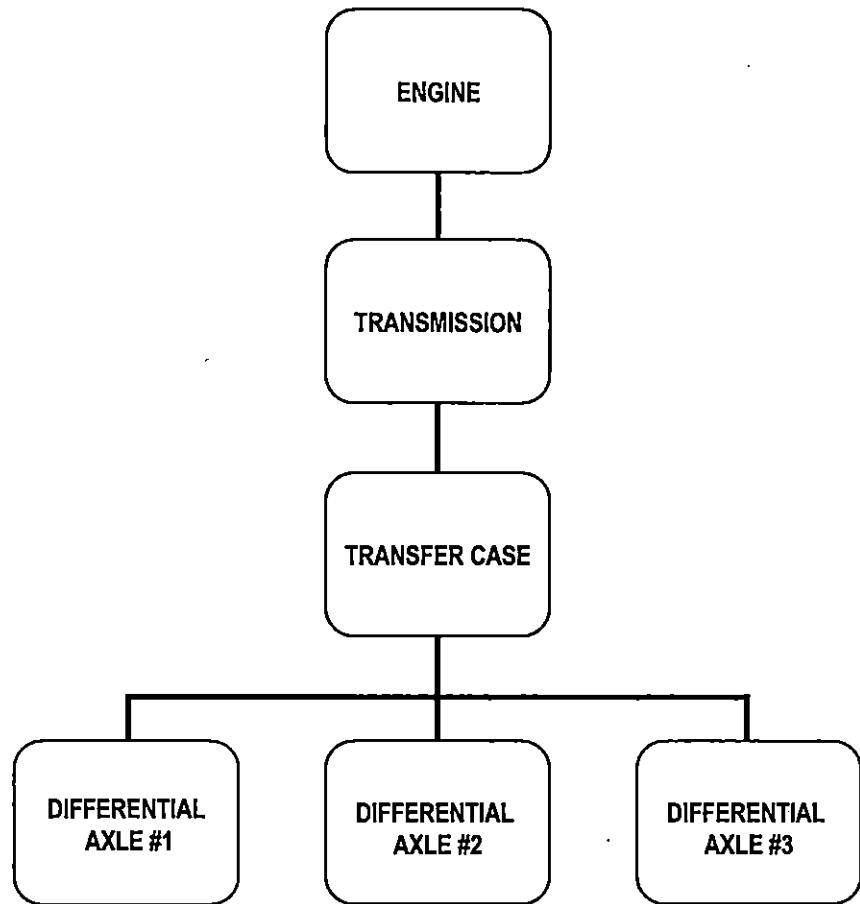


Figure 1. Mechanical Theory.

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE ELECTRICAL THEORY

### Electrical Theory (Block Diagrams)

The alternator generates electricity and distributes the load as necessary (i.e. to batteries, lights, winch, etc.). The batteries store generated electricity, which is used to start the vehicle. The electricity then transfers to the circuit breakers which safeguard the electrical components from power surges. From there, the electricity is distributed throughout the vehicle. The main electrical components are comprised of six components:

The ancillary circuits operate all the lights, the winch controls, heater controls, etc. The engine Electronic Control Module (ECM) primarily controls the fuel injection by monitoring temperature, oil pressure, rpms, etc. The CTIS system operates tire inflation, deflation, and driveline lockups. The Antilock Brake System (ABS) prevents wheels from locking up during braking and aids in traction control. The transmission Electronic Control Unit (ECU) controls the transmission shifting for the WTEC III transmission. Transmission Control Module (TCM) controls the transmission shifting for the GEN IV transmission. The J1708/J1939 data bus is used for diagnostic purposes.

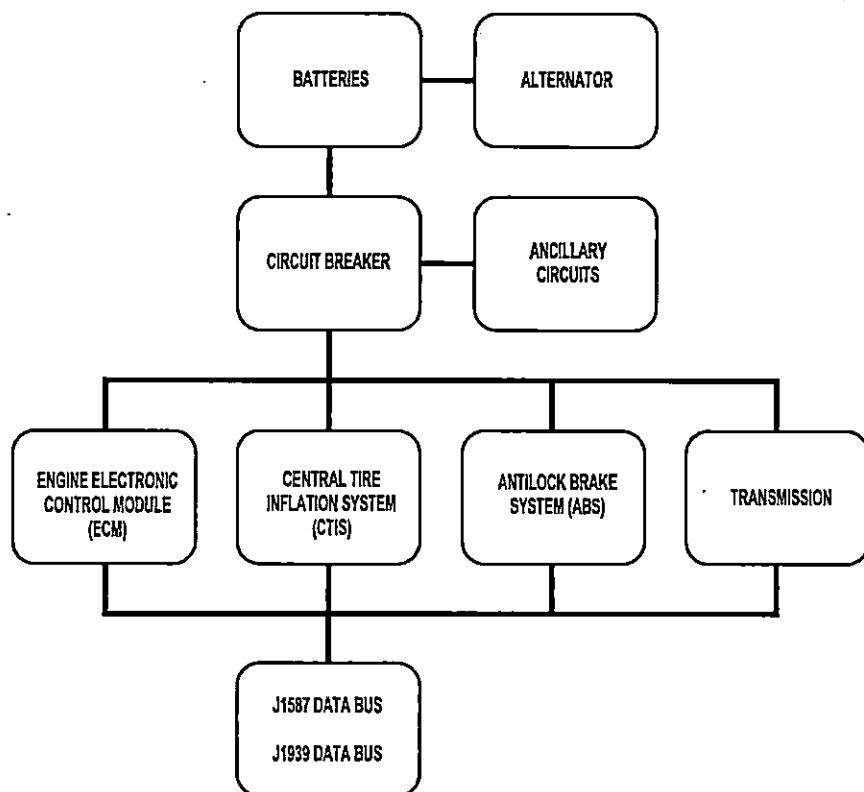


Figure 1. Electrical Theory

## **Antilock Brake System (ABS) Theory of Operation**

### **NOTE**

When operating vehicle in CC, MSS, or EMER CTIS settings (refer to Central Tire Inflation System (WP 0043)), ABS is off road mode, and Automatic Traction Control (ATC) system is disabled.

The brake system for the 7-Ton Truck incorporates an Antilock Brake System (ABS) into its design. ABS controlled braking ensures optimum vehicle stability while minimizing stopping distance.

When applying the service brakes, the ABS monitors all wheels on the vehicle for a wheel lock condition. If wheel lock occurs, the ABS makes a new assessment of the conditions and will adjust the air pressure to the service brakes to eliminate wheel lock. The ABS will, in effect, pulse the brakes to eliminate wheel lock. Once the ABS detects that the wheel lock condition is eliminated, it will stop adjusting the air pressure to the service brakes.

## **Antilock Brake System (ABS) Light Theory of Operation**

The ABS light (refer to (WP 0011)) on the dash will illuminate steadily for a two second bulb check whenever the ignition switch is turned ON. The ABS light turns OFF after the two second bulb check if there are not any ABS malfunctions. If the light remains ON after the two second bulb check, or if the light comes ON and illuminates steadily while operating the vehicle, there is a malfunction with the ABS. Notify Second Echelon Maintenance if ABS light indicates a malfunction in the ABS.

### **NOTE**

If the ABS light indicates a malfunction, the ABS and possibly the ATC system may be disabled. If the ABS and/or ATC is disabled, the emergency and service brake systems remain functional.

The ABS light will flash slowly when CTIS is set to CC, MSS, or EMER terrain settings (refer to Central Tire Inflation System (WP 0043)) to indicate that the ABS is in off road mode. This indication is normal and does not indicate a malfunction in the ABS.

## **Automatic Traction Control (ATC) Theory of Operation**

### **NOTE**

When operating vehicle in CC, MSS, or EMER CTIS settings (refer to Central Tire Inflation System (WP 0043)), ABS is in off road mode, and ATC system is disabled.

The 7-Ton Truck incorporates an Automatic Traction Control (ATC) system. The ATC system helps improve traction on slippery or unstable driving surfaces by reducing drive wheel slippage.

The ATC system constantly monitors the wheel for a wheel slip condition. If a wheel slip condition occurs, the ATC system activates and throttles back the engine to help reduce wheel slip. If the vehicle is traveling at a speed of less than 25 mph (40 km/h), the ATC will also pulse the service brake system to aid in reducing wheel slip. Once the ATC system detects that the wheel slip condition is no longer present, it will return the engine and service brake system to normal operating condition.

## **Automatic Traction Control (ATC) Light Theory of Operation**

The ATC light (refer to (WP 0011)) will illuminate steadily when the ignition switch is turned ON. The light will remain ON until the service brake pedal is engaged for the first time. The light will then turn OFF.

When operating the vehicle with CTIS set to HWY terrain setting (refer to Central Tire Inflation System (WP 0043)), the ATC light will remain OFF unless the ATC system detects a wheel slip condition and is activated. The light will then flash rapidly until the wheel slip condition is no longer present.

**Automatic Traction Control (ATC) Light Theory of Operation - Continued**

If the ATC light illuminates steadily when operating the vehicle in the HWY CTIS setting (refer to Central Tire Inflation System (WP 0043)), the ATC is malfunctioning.

**NOTE**

If the ATC light indicates a malfunction, the ATC and possibly the ABS system may be disabled. If the ATC and/or ABS is disabled, the emergency and service brake systems remain functional.

The ATC light will illuminate steadily when CTIS is sent to CC, MSS, or EMER terrain settings (refer to Central Tire Inflation System (WP 0043)) to indicate that the ATC system is disabled. This indication is normal and does not indicate a malfunction in the ATC.

**END OF WORK PACKAGE**

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## 1ST ECHELON MAINTENANCE PRINCIPLES OF OPERATION

---

### DRIVETRAIN

#### General

Power for the 7-Ton Series is provided by a diesel engine, which is coupled directly to an automatic transmission. Power from the transmission is transferred to the transfer case and onto the drive and drive/steering axles through a series of prop shafts and universal joints. The 7-Ton Series' drivetrain is enhanced through the use of electronic control modules for both the Caterpillar engine and Allison transmission.

## DRIVETRAIN

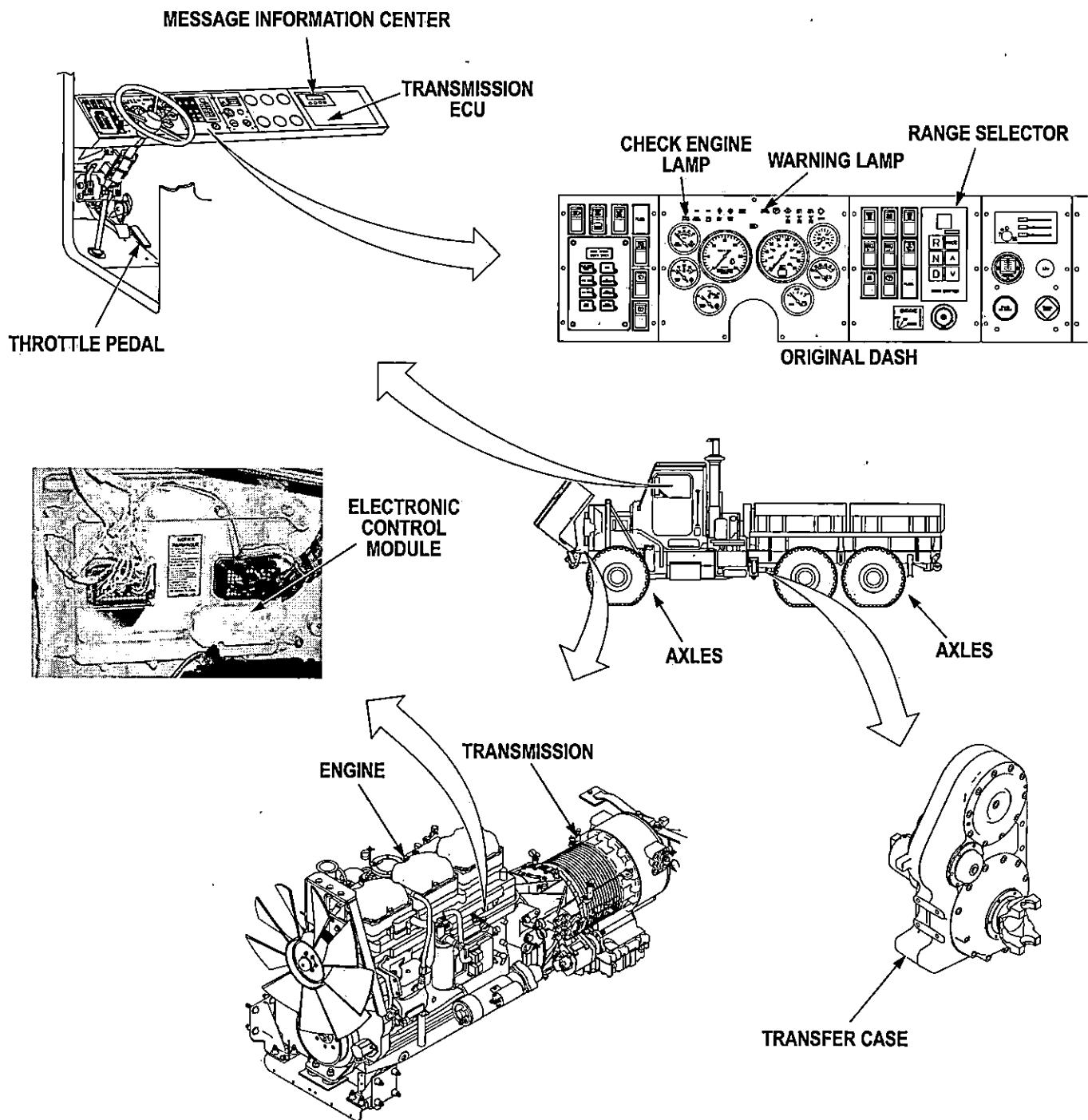


Figure 1.

## DRIVETRAIN - Continued

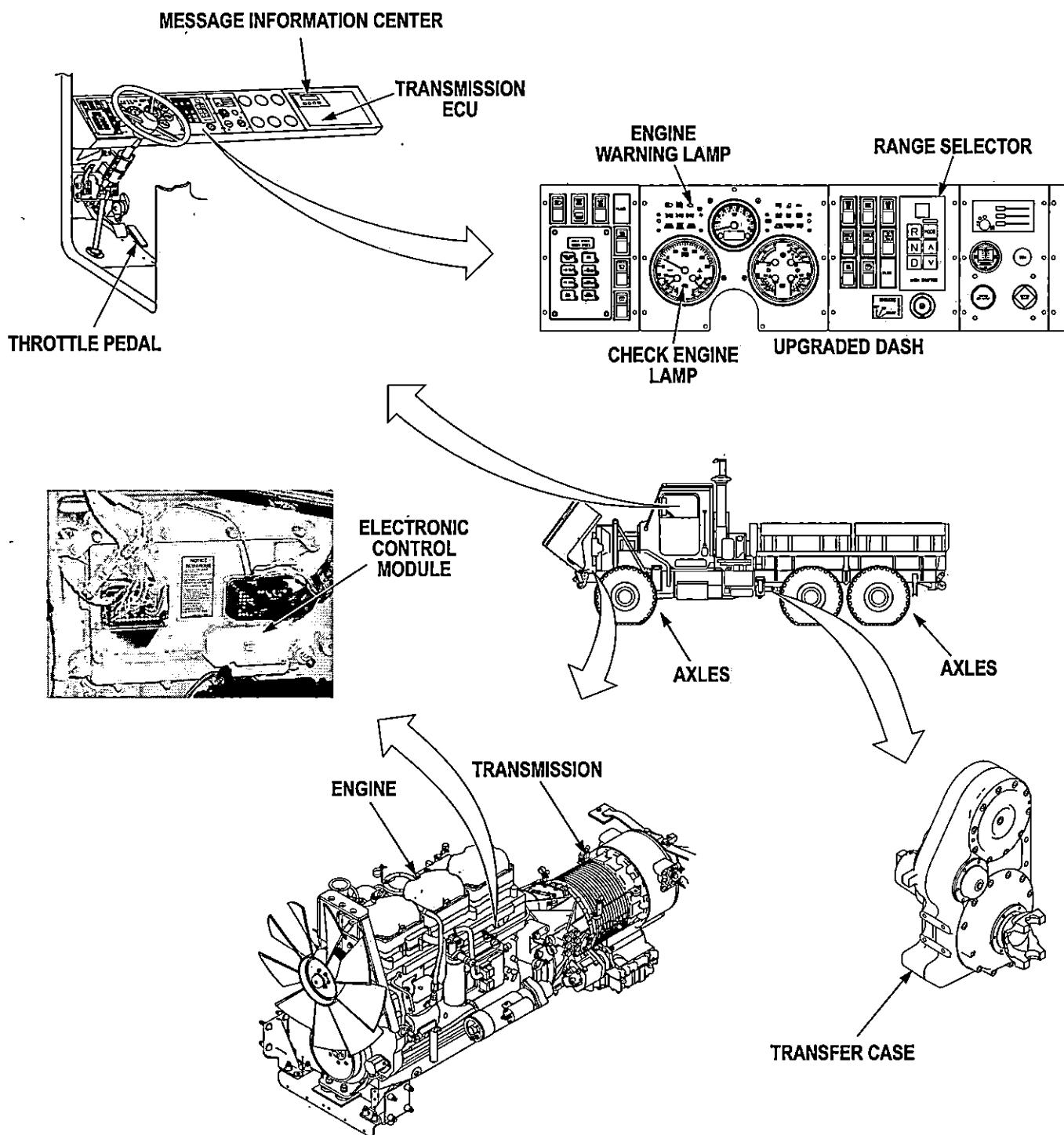


Figure 2.

## Engine

**DRIVETRAIN - Continued**

The 7-Ton Series is equipped with a Caterpillar diesel engine, Model C-12, rated at 430 HP. The Caterpillar engine incorporates an electronic control system.

The main components of the electronic control system are the Engine Control Module (ECM) and multiple engine sensors. The ECM is the computer that controls the engine.

The electronic controls on the engine serve as the engine governor. The electronic controls determine when and how much fuel to deliver to the cylinders, based on the actual and desired conditions at any given time.

The governor uses a sensor on the throttle pedal to determine the desired engine speed and compares this to the actual engine speed as determined by the engine crankshaft position sensor. If the desired engine speed is greater than the actual engine speed, the governor injects more fuel to increase engine speed. If desired engine speed is less than the actual engine speed, the governor injects less fuel to decrease engine speed.

Once the governor has determined how much fuel is required, it must next determine when to inject the fuel. Injection timing is determined by the ECM after considering input from the coolant temperature sensor, intake manifold air temperature sensor, atmospheric pressure sensor, and boost pressure sensor.

The ECM determines where top dead center on cylinder number one is located from the engine camshaft position sensor signal. The ECM decides when injection should occur relative to top center and provides the signal to the injector at the desired time. The ECM adjusts timing for best engine performance, fuel economy, and white smoke control.

The ECM controls the amount of fuel injected by varying high voltage signals to the injectors. The injectors will pump fuel only when the injector solenoid is energized. By controlling the timing and duration of the high voltage signal, the ECM can control injection timing and the amount of fuel injected.

Included with the ECM is an engine monitoring system. The Caterpillar engine monitoring system monitors engine oil pressure, coolant temperature, and intake manifold air temperature. If the engine monitoring system detects a sensor reading outside of the normal operating parameters, the ECM causes the Warning Lamp to turn ON and the Check Engine lamp to flash to indicate a problem has been detected.

The electronic system also helps diagnose problems. When a problem is detected, a diagnostic code is generated, the Check Engine lamp may be turned ON, and the diagnostic code is stored in the ECM.

When diagnostic codes occur, they are called active codes. These codes indicate a problem of some kind currently exists. Diagnostic codes stored in memory are considered historical codes. Since the problem may have been temporary or may have been repaired since it was logged, historical codes do not necessarily mean something needs to be repaired. They are instead meant to be an indicator or probable causes for intermittent problems.

The diagnostic codes are accessed by using the Message Information Console (MIC) or a computer.

**DRIVETRAIN - Continued****Transmission**

The 7-Ton Series uses an Allison WT-series, seven speed, automatic transmission, model HD4070. The transmission is directly coupled to the Caterpillar C-12 engine. The main components of the transmission are the transmission assembly, transmission Electronic Control Unit (ECU), and Transmission Range Selector.

The ECU, which contains the microprocessor based electronics, is located in the dash near the circuit breaker/relay panel. The ECU receives information, in the form of signals from switches and sensors, processes the information, and sends electrical signals to the appropriate solenoids inside the transmission. These solenoids control the operation of the transmission. The ECU features diagnostics which can sense electronic system malfunctions and identify them. The diagnostic information is accessed using the Message Information Console (MIC) or a computer. The ECU also protects the transmission from cold weather start-ups by inhibiting normal shifting functions until a minimum sump oil temperature of 19° F (-7° C) is attained. If the ECU detects a problem in the transmission system, a buzzer will sound and the CHECK TRANS light will come on.

The Transmission Range Selector is totally electronic. When the 7-Ton Series is started, the Range Selector automatically defaults to N (neutral). Range selection is achieved by means of six buttons located on the face of the transmission range selector. When D (drive) is selected, the truck will start in first gear and will automatically upshift to a higher gear as output speed increases. As the truck slows down, output speed decreases and the transmission automatically downshifts to the appropriate gear. When R (reverse) is selected, the transmission will shift to reverse and the range selector will also activate the reverse light and reverse alarm.

By using the up arrow button or down arrow button on the Transmission Range Selector, the operator can adjust the range of gears they wish to operate in. The MODE button on the Transmission Range Selector is used to activate the PTO to provide power to the self recovery winch (when equipped).

**Transfer Case**

The transfer case incorporates a 32/68 differential. The transfer case 32/68 differential provides full time, all wheel drive, and proportions approximately 32 percent of the torque to the front axle and 68 percent of the torque to the two rear axles. The differential has an operator controlled, air actuated, drive line lock mechanism, which consists of a sliding lockout collar that locks the differential housing to the output shaft. The differential drive line lock mechanism provides increased mobility in adverse operating conditions.

**Suspension**

The 7-Ton Series incorporates half-shafts, springs, shock absorbers, jounce bumpers, rebound bumpers, anti-sway bars, and upper and lower control arms in the vehicle's independent suspension design. This suspension system design maintains tire/ground contact under adverse terrain profiles and conditions. This design equalizes loads between axles and provides the necessary roll stability to operate on a 30 percent side slope.

The six half-shafts incorporated into this design move up and down independently of each other. This independent motion allows for a smoother ride than a standard walking beam suspension design.

**Axles**

The 7-Ton Series incorporates six half-shafts in the vehicle's independent suspension design. The two half-shafts of the front axle work in conjunction with the wheel ends and hub assemblies to drive and steer the vehicle. The four half-shafts of the two rear axles work in conjunction with the hub assemblies to drive the vehicle.

**DRIVETRAIN - Continued**

The six half-shafts incorporated into this design move up and down independently of each other. This allows the half-shafts to maintain tire/ground contact under adverse terrain profiles and conditions.

**ENGINE SYSTEMS****Cooling System**

The pressure type cooling system protects the engine by removing heat generated by the engine during the combustion process. Pressure within the cooling system is regulated by a pressure release in the surge tank filler cap. The hot coolant flows from the engine to the radiator and through the radiator core where a stream of air removes heat from the coolant. This stream of air is drawn through the radiator core by the engine fan. The water pump on the engine draws the coolant from the radiator, pushes it through the engine, pass the thermostats, and back into the radiator. This process is repeated continuously.

## ENGINE SYSTEMS - Continued

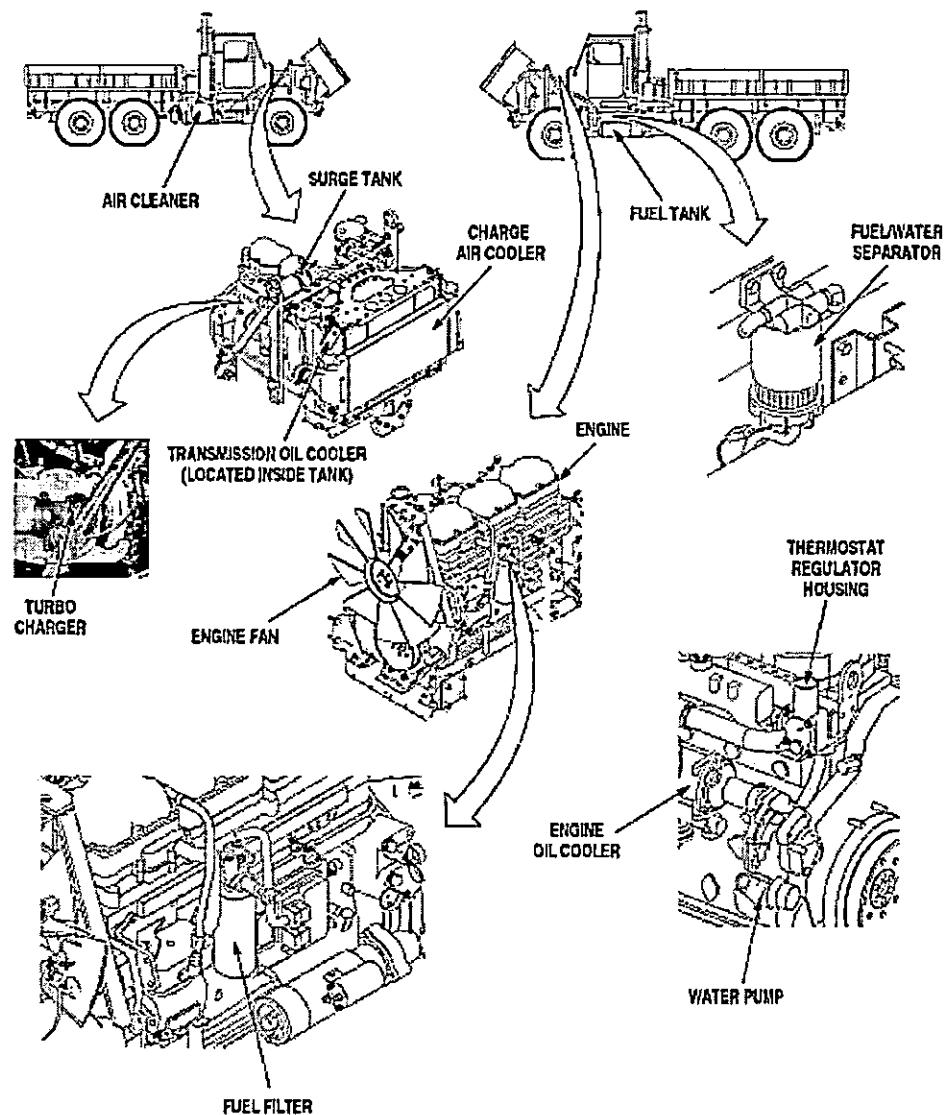


Figure 3.

Thermostats mounted in the Regulator Housing, remain closed until the coolant approaches a predetermined temperature at which time the thermostats open. When the coolant temperature drops below the thermostat rating, the thermostats close, allowing the engine to reach normal operating temperature quicker.

An oil cooler for the transmission oil is located in the right hand radiator tank. An oil cooler for the engine oil is incorporated into the engine on the right side. Both oil coolers have coolant passing through them to absorb heat from the oil.

#### Air Intake System

The air intake system consists of a dry-type air cleaner, ducting, turbocharger, and charge air cooler. Engine exhaust gases flow through the turbocharger driving a turbine wheel. A compressor wheel on the opposite end of

**ENGINE SYSTEMS - Continued**

the turbine shaft rotates and draws in fresh air through the air cleaner. The air is then compressed by the turbocharger and pushed into the charge air cooler to cool the compressed air. The air then flows into the intake manifold of the engine to be used for combustion.

If the air pressure inside the turbocharger reaches a predetermined pressure, the waste gate on the turbocharger will open to relieve excess pressure. When the pressure returns to the safe operating range, the waste gate will close.

**Fuel System**

In the fuel system, fuel is drawn from the fuel tank, through the fuel/water separator, and into the fuel pump. The fuel pump then pushes the fuel through a fuel filter and into the engine. Surplus fuel from the electronic injectors is returned to the fuel tank through a return line.

The fuel pump is a gear driven mechanical pump mounted on the engine and driven by the engine's flywheel. The fuel/water separator removes water and large solid particles from the fuel. The finer particles are removed by the fuel filter before they can enter the fuel injectors.

**ELECTRICAL SYSTEM****General**

The 7-Ton Series has a 24 VDC electrical system that is waterproof and includes a 12 VDC auxiliary receptacle located on the dash, inside the cab. Manual and automatic resetting circuit breakers are used throughout the system. The voltage of the electrical system is indicated by a voltmeter located on the dash, inside the cab.

## ELECTRICAL SYSTEM - Continued

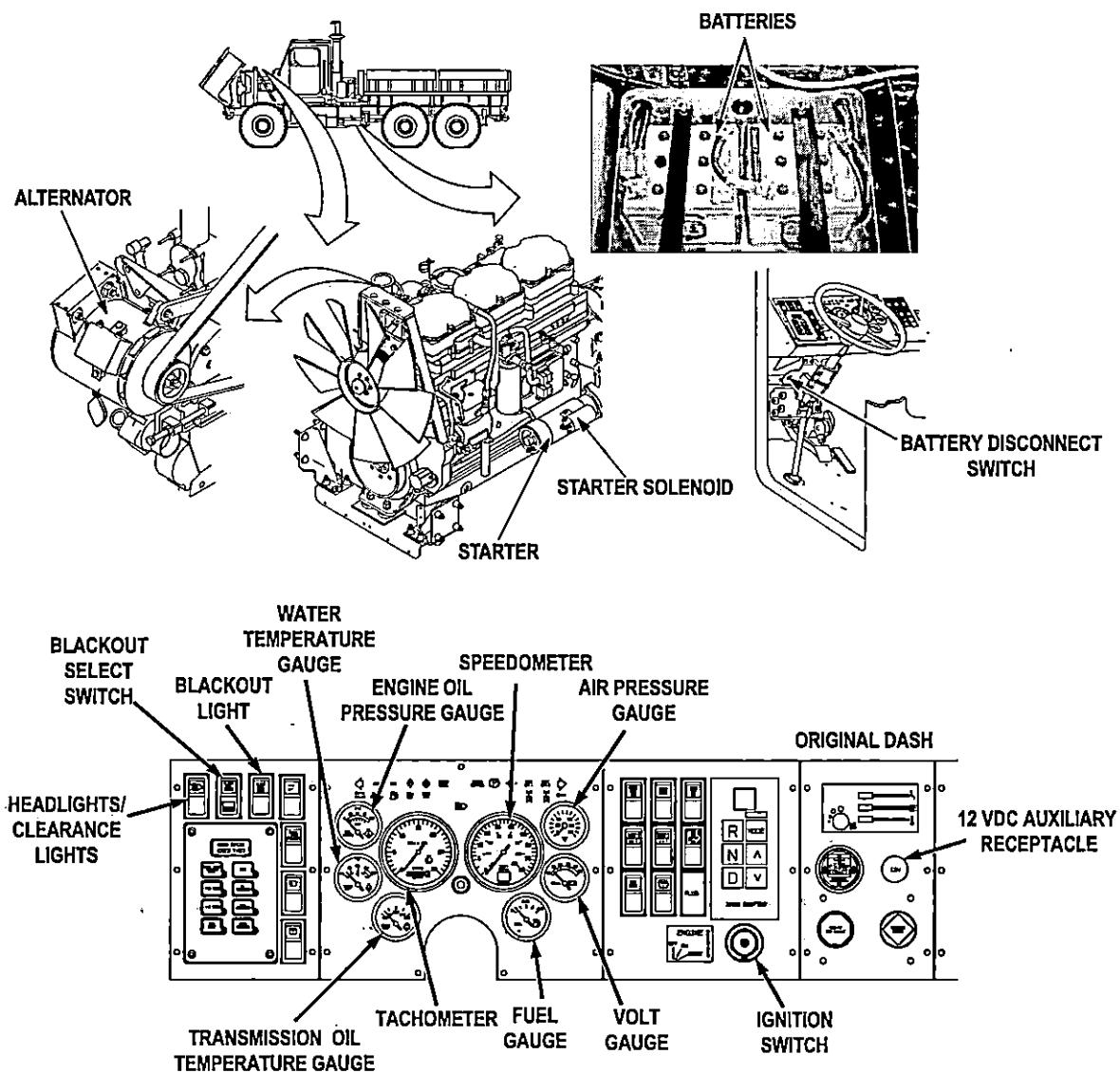


Figure 4.

## ELECTRICAL SYSTEM - Continued

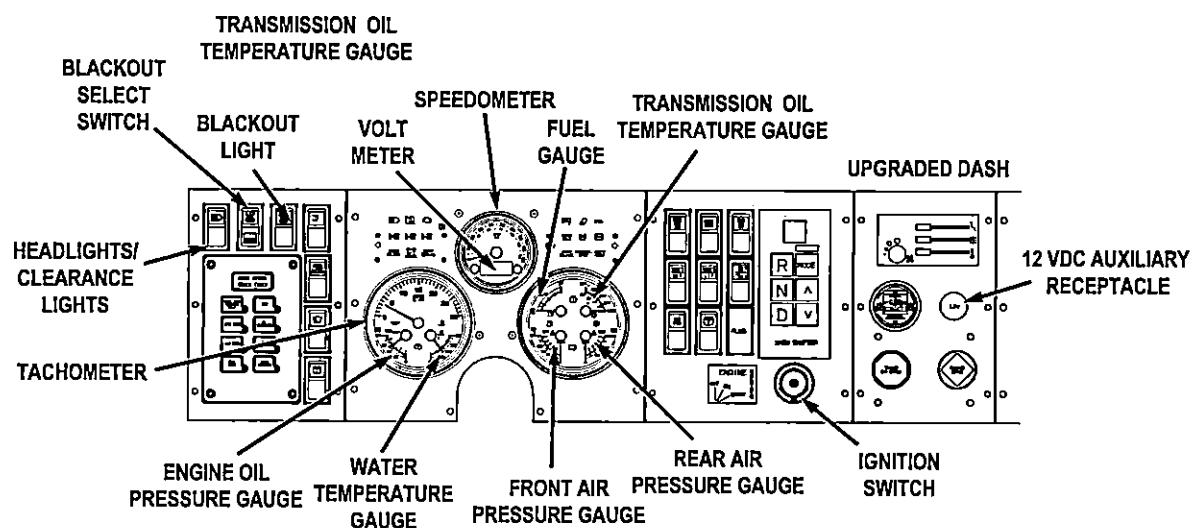
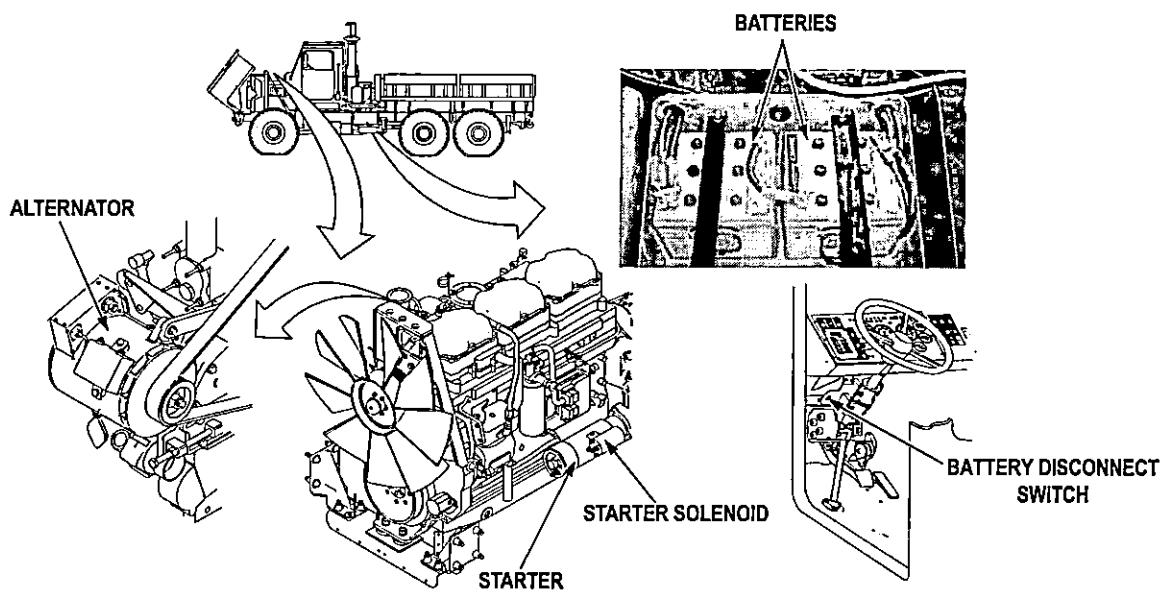


Figure 5.

The electrical system is powered by two 12 volt series connected batteries. Under adverse climatic conditions, two additional batteries may be added in a series-parallel configuration to provide additional starting and operating power. The 150 amp alternator delivers up to full alternator output on demand to any single or combined 24 VDC load requirement.

The battery box is located on the left side of the vehicle in front of axle #2. This location provides ready access for service and protection when operating the vehicle. The battery box is made of a non-conductive material to help

## ELECTRICAL SYSTEM - Continued

prevent short circuits during maintenance and operation. Power is distributed throughout the vehicle by wiring harnesses. The harnesses are interconnected by pin connectors.

A battery disconnect switch is located outside the cab behind the drivers seat. The battery disconnect switch provides power to operating and control circuits throughout the vehicle.

A connector is provided at the rear of the truck to supply power to towed loads. Another connector is located at the front of the truck to provide access for incoming auxiliary power when vehicle is being towed.

Part of the electrical system includes a heavy duty starting motor mounted on the engine flywheel housing. The starting motor provides the cranking power necessary for starting the engine. The electrical system maintains the voltage level necessary for proper battery charging. The alternator provides sufficient amperage to operate all electrical components and charge the batteries during engine idling. Truck exterior lights are mounted in protective locations and/or are protected by component design. Polycarbonate lenses are provided for all lights except the sealed beam headlights. The electrical system provides all of the electrical power needed to operate the truck. The complete electrical system is made up of the following subsystems:

Power Storage and Generating	Accessory Lighting
Engine Starting and Stopping	Instruments
Service Lighting	Warning Lights and Buzzers
Blackout Lighting	Diagnostic System

### **Power Storage and Generating**

Power storage for the truck consists of two or four 12 VDC batteries connected in a series or series parallel configuration to provide 24 VDC. While the batteries can power all of the systems for a limited time, their primary purpose is to supply power to the engines starting system. Once the engine is running, the generating system provides the electrical power to operate the electrical components/systems on the vehicle.

The engine driven alternator generates alternating current (AC) which passes through a set of rectifiers that change it into direct current (DC). This direct current is used to charge the batteries and is distributed to the other systems on the vehicle.

### **Engine Starting and Stopping**

The engine starting system uses the stored electrical energy of the batteries to turn the starter motor. When the ignition switch is turned to the START position, electrical power is passed through the neutral safety switch to the starter solenoid. When the starter solenoid is energized, the starter motor draws electrical power from the batteries and turns the engine. To stop the engine, turn off the ignition switch.

The ignition switch, when positioned in the ON position, will provide power to all electrical circuits that are not directly connected to the battery disconnect switch.

### **Service Lighting**

The service lighting system includes the headlights, taillights, parking lights, and clearance/marker lights. They are energized by positioning the Blackout Select switch in the down position and the Headlights/Clearance/Marker Lights switch in the center or up position. The stoplights, panel lights, turn signals, and emergency flashers are controlled by separate switches located inside the cab.

## ELECTRICAL SYSTEM - Continued

### Blackout Lighting

The blackout lighting system includes the front blackout headlight, front and rear blackout marker lights, and blackout stoplights. To energize the blackout lighting system, position the Blackout Select switch in the up position and the Blackout Light switch in the center or up position. The blackout headlight and marker lights will then illuminate. The blackout brake lights are then controlled by the treadle valve located inside the cab.

### Instruments

The instrument system includes all gauges that give the operator information. These gauges include:

Engine Oil Pressure Gauge	Water Temperature Gauge
Transmission Oil Temperature Gauge	Fuel Gauge
Volt Gauge	Tachometer
Speedometer	Odometer
Air Pressure Gauge	Air Filter Restriction Indicator

All of the gauges, except the Air Pressure Gauge, Volt Gauge, and Air Filter Restriction Indicator, receive electrical signals from sensors/sending units located in various places throughout the vehicle.

The Volt Gauge directly measures the electrical system's current operating voltage. The Air Pressure Gauge measures and displays the pressures of each of the two primary reservoirs located above the two rear axles of the vehicle. The Air Filter Restriction Indicator measures the vacuum inside the air intake pipe between the air cleaner and the turbocharger.

### Warning Lights and Buzzers

The warning lights, buzzers, and indicators in the cab are activated by various sensors/sending units and switches located throughout the vehicle. These lights, buzzers, and indicators include:

ATC Indicator	ABS Indicator
Water Temperature Light	Transmission Oil Temperature Light
Check Trans Light	Engine Warning Light
Park Brake Indicator	Oil PSI Warning Light
Low Air 1 Warning Light	Low Air 2 Warning Light
Check Engine Light	Lube Filter Light
Low Fuel Light	Fan Off Indicator
High Idle Light	Winch Indicator Light
High Beam Indicator	Right and Left Turn Signal Indicators
Drive Line Lock Lights	CTIS Controller (fault lights and buzzer)
Low Coolant	

When one or more of the sensors/sending units or switches are activated, they energize the appropriate light/indicator.

### Diagnostic System

The Message Information Console (MIC) and Test Interface Module (TIM) work together in conjunction with the following components to interpret and display operating and diagnostic information.

## ELECTRICAL SYSTEM - Continued

Antilock Brake System (ABS)

Electronic Control Unit (ECU)

Engine Electronic Control

    Module (ECM)

Transmission ECU

CTIS Controller

SAE J1587 Data Bus Cable

SAE J1587 Data Bus

Multiple Sensors

The Diagnostic System is used to help prevent and diagnose problems on the 7-Ton Series. The diagnostic system can display information through the MIC or through an auxiliary computer designed to interface with the system.

## AIR SYSTEM

### General

The air system consists of an engine driven air compressor and five air reservoirs. The system includes valves and airlines to control the vehicle's air operated devices. Pressurized air from the air compressor is passed through the aftercooler and air dryer to the reservoirs. The aftercooler cools the heated air from the air compressor. The air dryer removes moisture and dirt from the compressed air.

## AIR SYSTEM - Continued

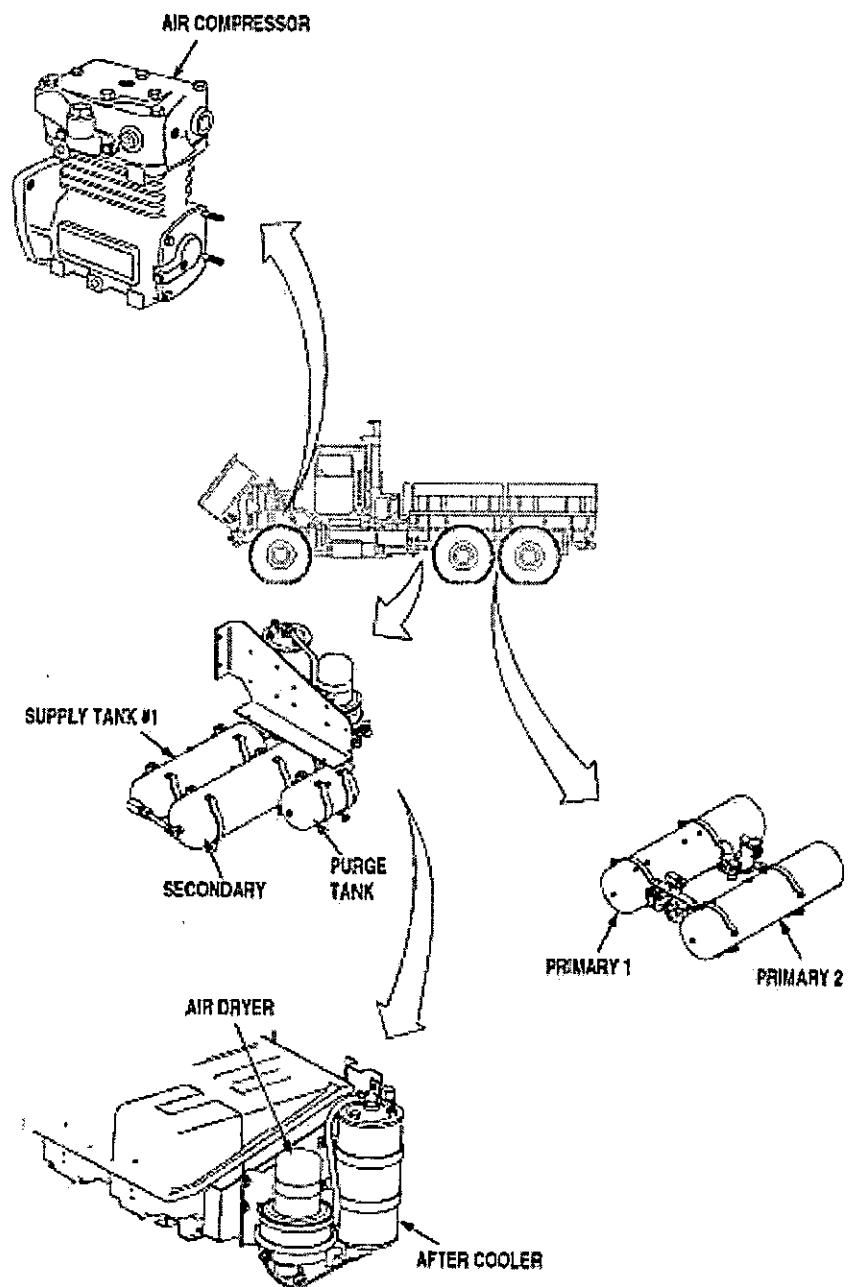


Figure 6.

The Primary #1 and Primary #2 reservoirs are located above the two rear axles. Air from these two reservoirs control the service brakes and parking brakes on the rear axle of the vehicle. The air pressure in this system is shown by the red needle of the air pressure gauge.

**AIR SYSTEM - Continued**

The remaining three reservoirs are the Purge Tank, Supply Tank #1, and Secondary reservoirs. These three reservoirs are located beneath the battery box on the left side of the vehicle. The Secondary Reservoir provides air to operate the service brakes to the front axle. Supply Tank #1 provides air to operate the CTIS, Drive Line Locks, and auxiliary air outlet. The Secondary reservoir also provides backup air to the rear brake system if the primary reservoirs fail. The green needle on the air pressure gauge shows the air pressure in this system.

If air pressure drops below 64 to 76 psi (441 to 524 kPa) in the Primary Reservoirs, a buzzer will sound and the Low Air 2 indicator will illuminate.

If air pressure drops below 64 to 76 psi (441 to 524 kPa) in the Supply and Secondary Reservoirs, a buzzer will sound and the Low Air 1 indicator will illuminate.

**STEERING SYSTEM****General**

Steering system power is supplied to the steering gears by an engine driven pump. The steering reservoir is independent from the main hydraulic system. The steering wheel, which is mechanically linked to the primary steering gear, manipulates, and controls the hydraulic pressures in the steering gear. The primary steering gear is hydraulically connected to the secondary steering gear. The secondary steering gear mirrors the movements of the primary steering gear. The steering gears pivot pitman arms, which in turn move a tie rod and two toe control links. This action causes the tires to move left or right causing the vehicle to steer left or right.

## STEERING SYSTEM - Continued

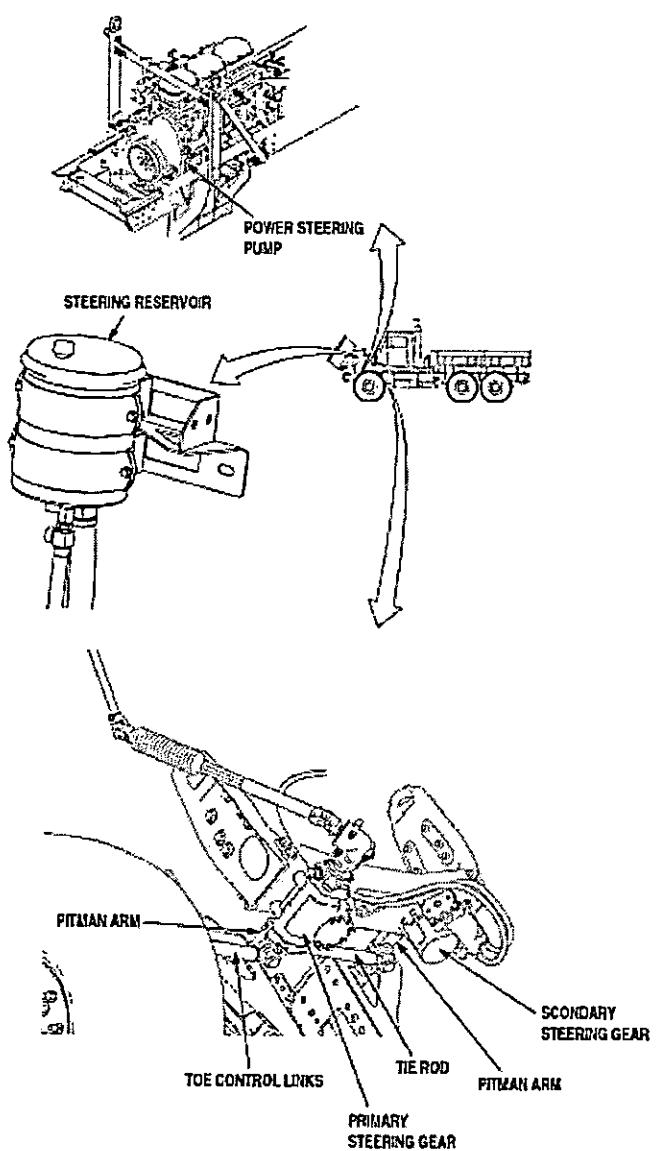


Figure 7.

## SELF RECOVERY WINCH

## General

When specified, the 7-Ton Series is equipped with a winch for self recovery. The self recovery winch is only capable of rearward deployment. The winch is equipped with a holding brake and hydraulic counterbalance valve to safely deploy and hold the full rated load of the winch. The winch brake is automatic and is fully engaged anytime the winch is stopped or not in use and is fully released during operation. The winch cable is equipped with a clevis end. Roller assemblies (rear cable guides) are provided to guide the cable. The winch is controllable from the driver's position and at the winch itself. All controls revert to neutral when released.

**SELF RECOVERY WINCH - Continued**

The winch is powered by an independent hydraulic system. The hydraulic system is powered by an electrically controlled, transmission driven, PTO located on the transmission. The PTO is directly coupled to a hydraulic pump, which generates the hydraulic pressure used to operate the winch.

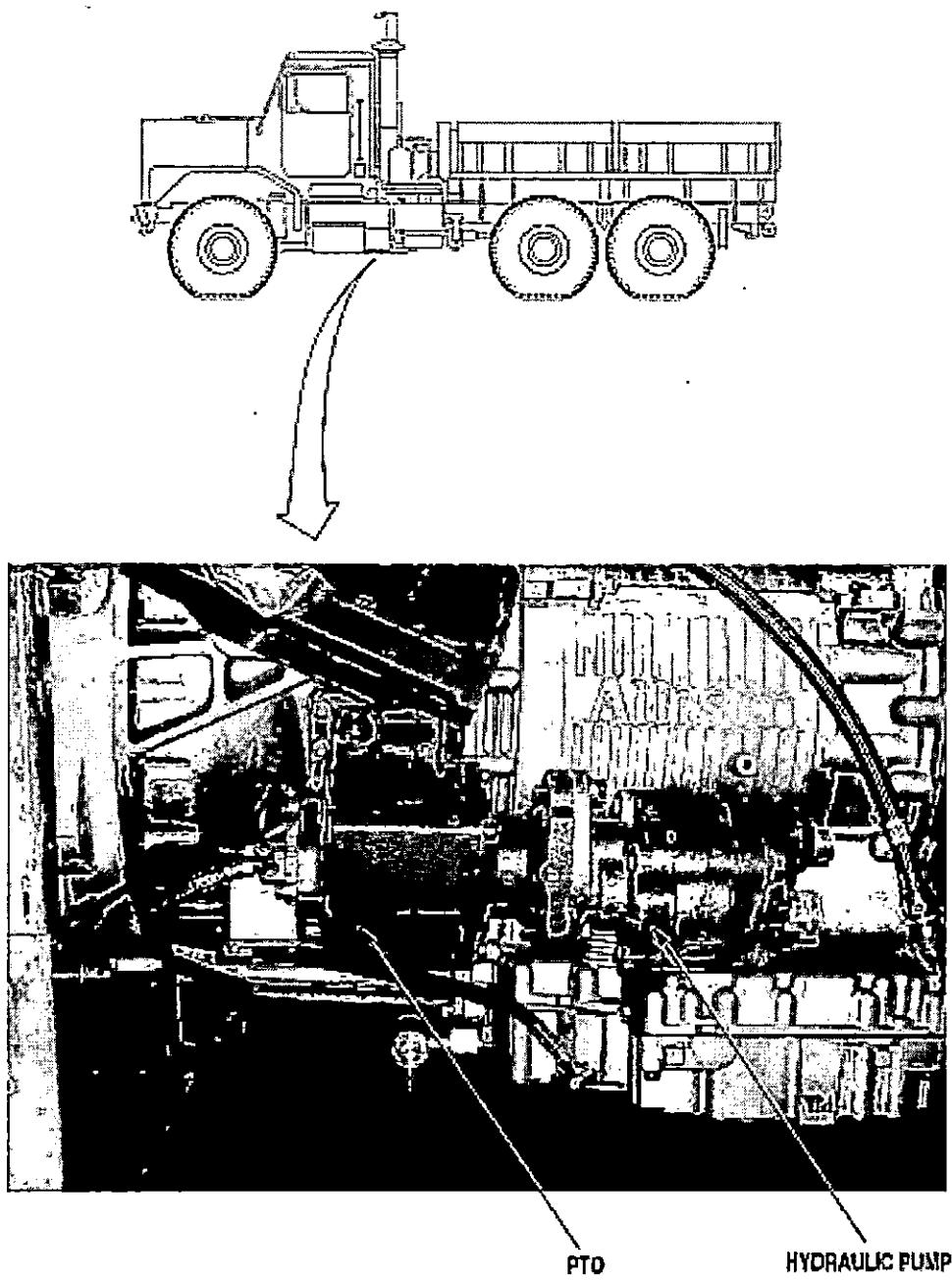


Figure 8.

## WHEELS AND TIRES

### General

Each truck has six wheel/tire assemblies. The components of each wheel/tire assembly are the wheel, tire, valve stem, Central Tire Inflation System (CTIS) wheel valve, bead lock, and wheel cover.

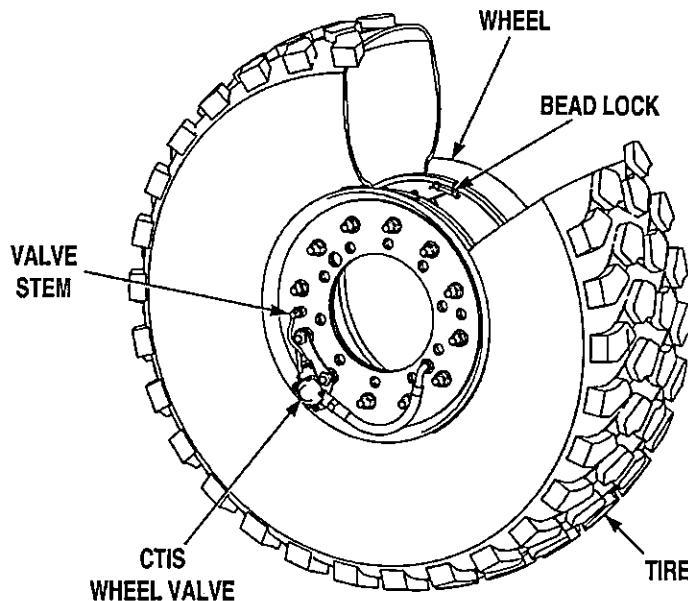


Figure 9.

### Wheel

The 20 x 10 inch wheel is manufactured in two pieces. Twelve studs that protrude from the rear wheel half are used to bolt the two halves together. These studs are also used to mount the CTIS wheel valve bracket and secure the wheel cover.

### Tire

The 16.00R20 tires are tubeless.

### Bead Lock

The bead lock is installed inside the assembled wheel and tire. It assures that the tire stays pressurized when tire pressure is low.

### CTIS Wheel Valve

The CTIS wheel valve assembly allows airflow in and out of the tire during CTIS inflation/deflation cycles. It is mounted to the wheel and secured by a bracket assembly. The input and output ports are fitted with flexible and steel tubes.

**WHEELS AND TIRES - Continued****Valve Stem**

The valve stem connects inside the wheel and is routed to the CTIS wheel valve.

**Wheel Cover**

The wheel end contains a wheel cover to protect the CTIS wheel valve and attached airlines from physical damage. This cover must always be in place whenever the vehicle is in operation. It is secured to the wheel end via four of the wheel studs.

**CENTRAL TIRE INFLATION SYSTEM (CTIS)****General**

The CTIS is designed to adjust the pressure of all tires on the truck for different terrain conditions. The CTIS controller has four terrain settings, three load settings, and a run flat setting which the operator selects and activates in the cab. The main components of the CTIS consist of control valves for air supply and distribution, a dash mounted electrical controller that adjusts tire pressure, associated air tubing, and electrical cables.

## CENTRAL TIRE INFLATION SYSTEM (CTIS) - Continued

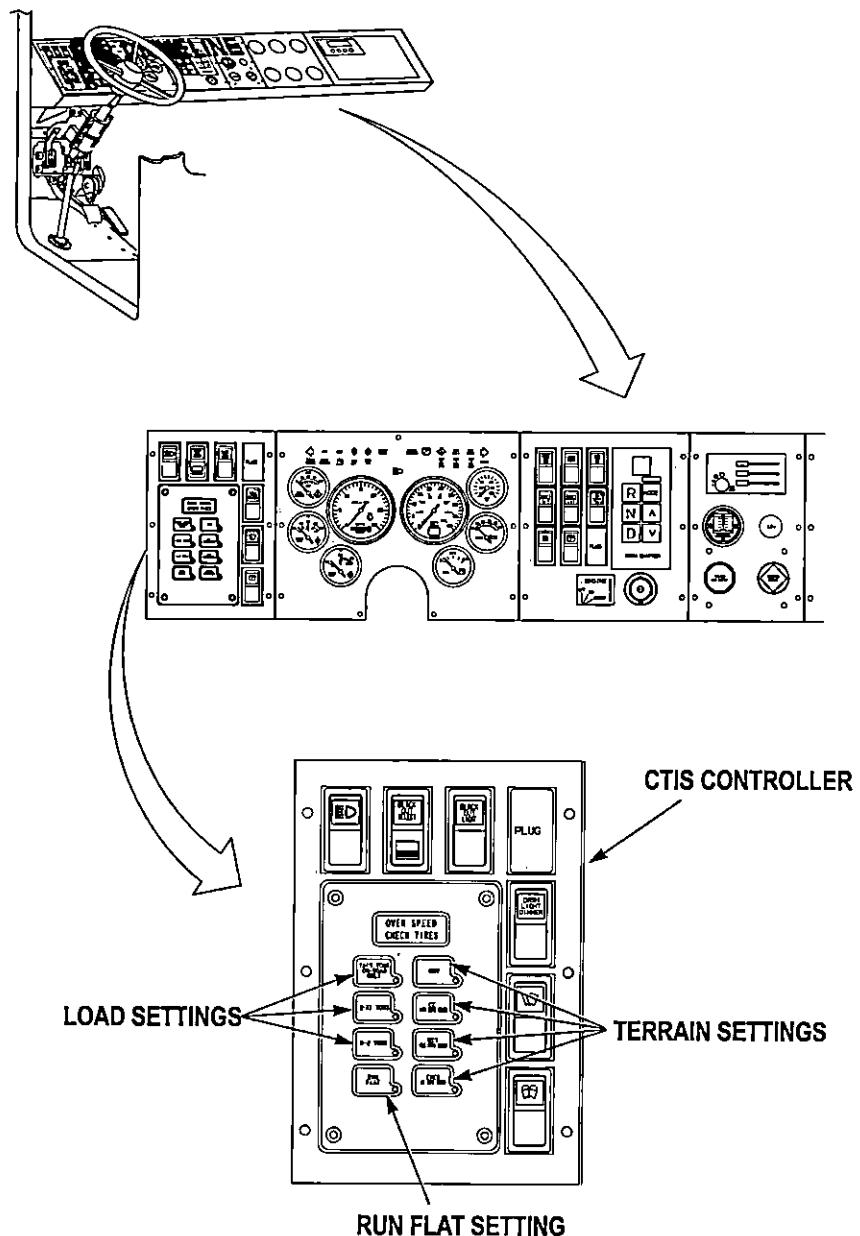


Figure 10.

The drive line lock controls are integrated with the CTIS to simplify operation of the 7-Ton Series. The CTIS will engage a specific drive line lock configuration based on the terrain and load settings chosen by the operator.

## ANTILOCK BRAKE SYSTEM (ABS)

### General

The brake system for the 7-Ton Series incorporates an Antilock Brake System (ABS) into its design. ABS controlled braking ensures optimum vehicle stability while minimizing stopping distance.

When applying the service brakes, the ABS monitors all wheels on the vehicle for a wheel lock condition. If wheel lock occurs, the ABS makes a new assessment of the conditions and will adjust the air pressure to the service brakes to eliminate wheel lock. The ABS will in effect, pulse the brakes, through four ABS valves, to eliminate wheel lock. Once the ABS detects that the wheel lock condition is eliminated, it will stop adjusting the air pressure to the service brakes.

## AUTOMATIC TRACTION CONTROL (ATC)

### General

The 7-Ton Series incorporates an Automatic Traction Control (ATC) system. The ATC system helps improve traction on slippery or unstable driving surfaces by reducing drive wheel slippage.

The ATC system constantly monitors the wheel for a wheel slip condition. If a wheel slip condition occurs, the ATC system activates and throttles back the engine to help reduce wheel slip. If the vehicle is traveling at a speed of less than 25 mph (40 km/h), the ATC will also pulse the service brake system, through the Traction Control Valve, to aid in reducing wheel slip. Once the ATC system detects that the wheel slip condition is no longer present, it will return the engine and service brake system to normal operating condition.

## CAB

### General

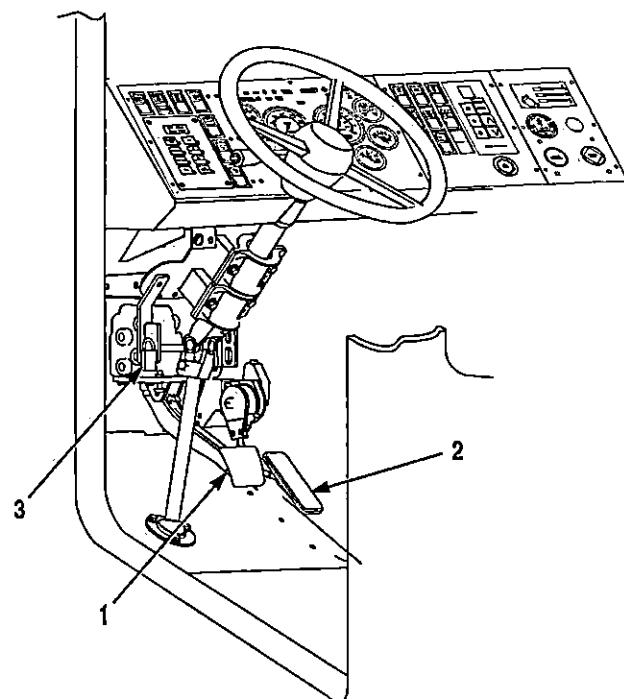
The truck cab features a full width configuration and is positioned rearward of axle #1. The cab controls and operating mechanisms are designed to accommodate a crew of up to three. Heating, ventilation, noise control, and vibration and shock control are provided to the occupants. The cab contains all of the driving controls, gauges, warning lights and indicators, and operating controls for the self recovery winch.

## END OF WORK PACKAGE

**CHAPTER 2**

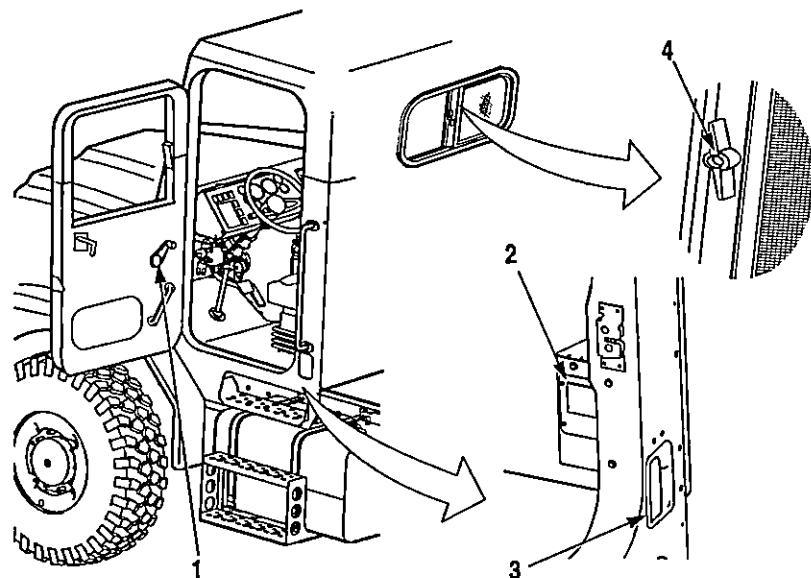
**OPERATOR INSTRUCTIONS**

**CONTROLS AND INSTRUMENTS**

**1ST ECHELON MAINTENANCE  
CAB MOUNTED CONTROLS****Table 1. Cab Mounted Foot Controls.****Figure 1. Cab Mounted Foot Controls.**

Key	Control/Indicator	Function
1	Service Brake Pedal	Applies service brakes. When vehicle is coupled to trailer, trailer service brakes will operate when vehicle service brakes are applied.
2	Throttle Control	Controls engine speed.
3	Steering Wheel Lock	Allows operator to lock the steering wheel. (Not accessible in armored cab).

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
CAB MOUNTED CONTROLS****Table 1. Cab Mounted Hand Controls.****Figure 1. Cab Mounted Hand Controls.**

Key	Control/Indicator	Function
1	Cab Door Window Glass Crank	Rotate left crank CCW to raise left window glass; CW to lower left window glass. Rotate right crank CW to raise glass; CCW to lower window glass. (Not available on armored cab).
2	Cab Door Inside Handle (one on each side)	Pull lever up to open cab door from inside of cab.
3	Cab Door Outside Handle (one on each side)	Pull to open cab door from outside of cab.

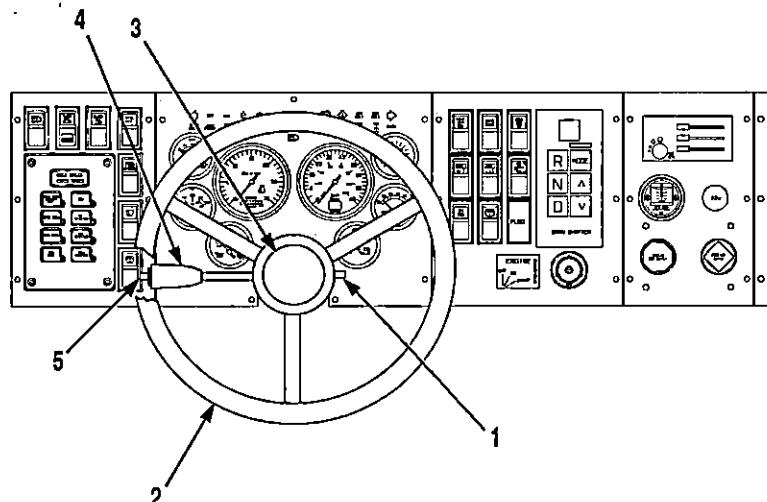
*Table 1. Cab Mounted Hand Controls - Continued.*

Key	Control/Indicator	Function
4	Cab Rear Sliding Window Latch (optional)	Turn latch CCW to unlock rear sliding window. Turn latch CW to lock rear sliding window.

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
STEERING COLUMN MOUNTED CONTROLS**

**Table 1. Steering Column Mounted Controls.**



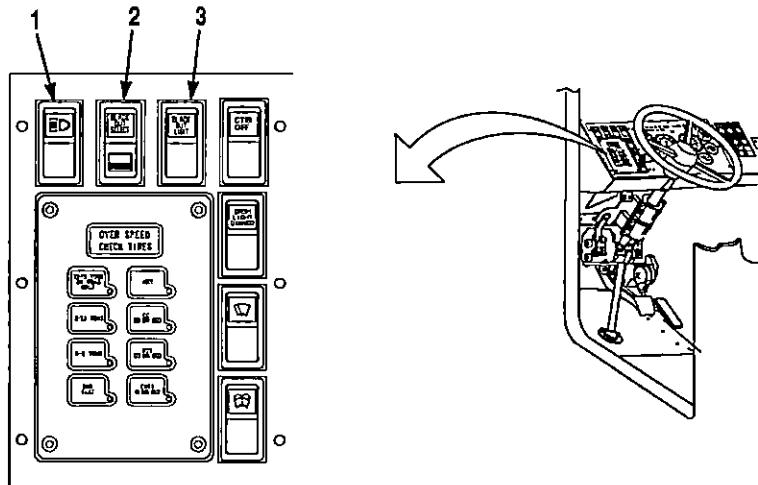
**Figure 1. Steering Column Mounted Controls.**

Key	Control/Indicator	Function
1	Emergency Flasher Control	To turn on hazard warning flashers, push red switch inward; to turn off warning flashers, pull out.
2	Steering Wheel	Controls direction of vehicle.
3	Horn	Button sounds horn when pressed.
4	Turn Signal Lever	Push up to signal right turn. Pull down to signal left turn. When turn is completed, lever will automatically return to center position.
5	Dimmer Switch	Push button to raise or lower headlight beams. High beam indicator (item 44, Instrument Panel Controls and Indicators (WP 0011), sheet 9) will light (blue) when high beams are on.

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE**  
**INSTRUMENT PANEL CONTROLS AND INDICATORS**

**Table 1. Instrument Panel Controls and Indicators.**



**Figure 1. Instrument Panel Controls and Indicators.**

Key	Control/Indicator	Function
1	Headlights/ Clearance/Marker Lights (3-way rocker switch)	Turn headlights and clearance/marker lights ON/OFF. CENTER position operates clearance/marker lights and parking lights. UP position adds headlights. DOWN position turns headlights and clearance/marker lights off.
2	Blackout Select (2- way rocker switch)	Selects between normal and blackout mode. Press smaller bottom switch up and hold while pressing main switch up (blackout light mode) or down (normal mode). Releasing small switch locks main switch in selected position. In blackout mode, backup alarm will not operate.
3	Blackout Light (3- way rocker switch)	Turns blackout drive lights on and off. CENTER position turns blackout composite lights on. UP position adds blackout headlights. Press switch DOWN to turn blackout composite lights and headlights off.

Table 1. Instrument Panel Controls and Indicators - Continued.

Key	Control/Indicator	Function
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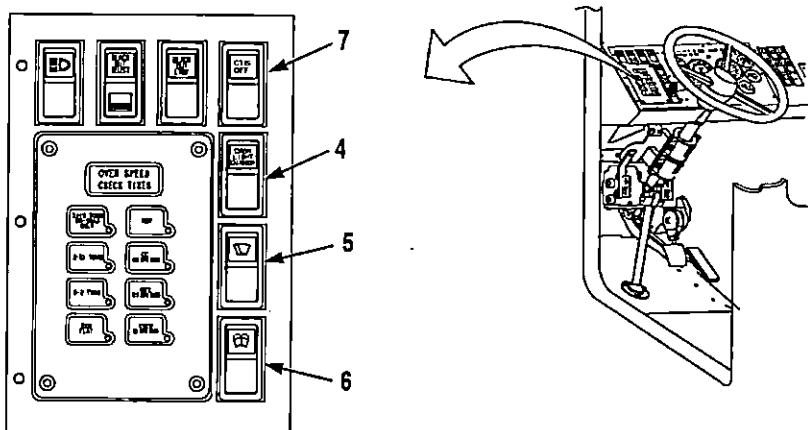


Figure 2. Instrument Panel Control and Indicators.

4	Panel Dimmer (3-way rocker switch)	When switch is in DOWN position, instrument panel lights are OFF. CENTER position is for LOW illumination and UP position is for HIGH illumination.
5	Windshield Wiper (3-position switch)	Controls operation of windshield wipers. DOWN position is OFF, CENTER position is used for LOW speed, and UP position is used for HIGH speed.
6	Windshield Washer (1-way momentary switch)	Applies windshield washer fluid on windshield.
7	CTIS OFF Switch	This switch is used to partially disable the CTIS when operating in temperatures below 0°F (-18°C). Refer to Operate Vehicle in Cold Environment (WP 0076). The switch should normally be in the DOWN or OFF position.

Table 1. Instrument Panel Controls and Indicators - Continued.

Key	Control/Indicator	Function
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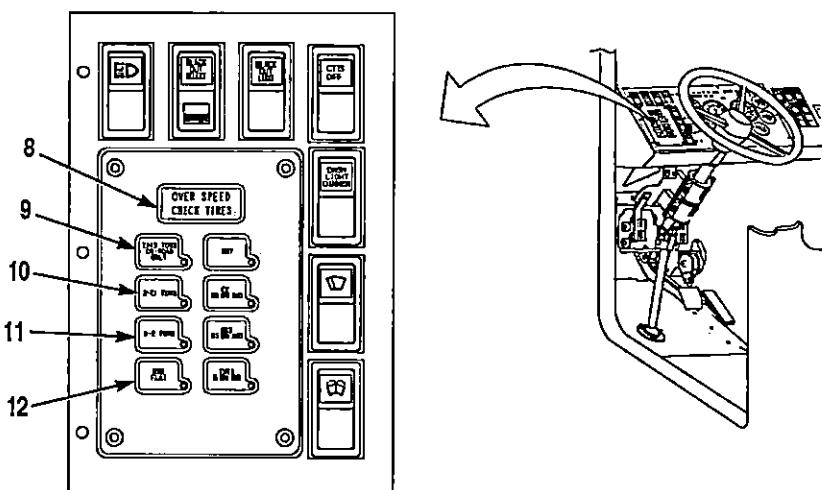
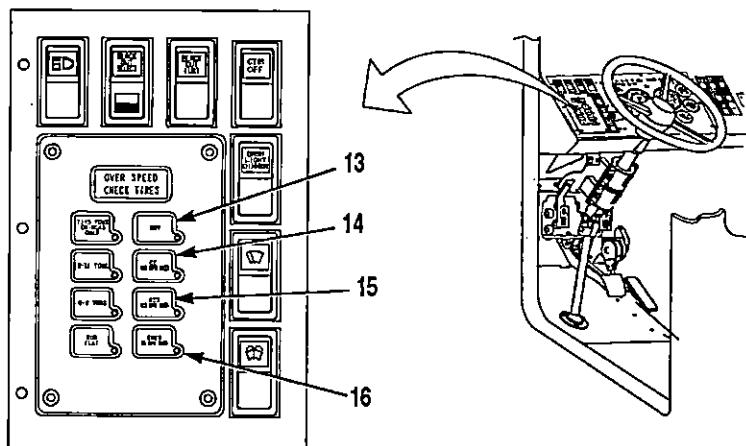


Figure 3. Instrument Panel Control and Indicators.

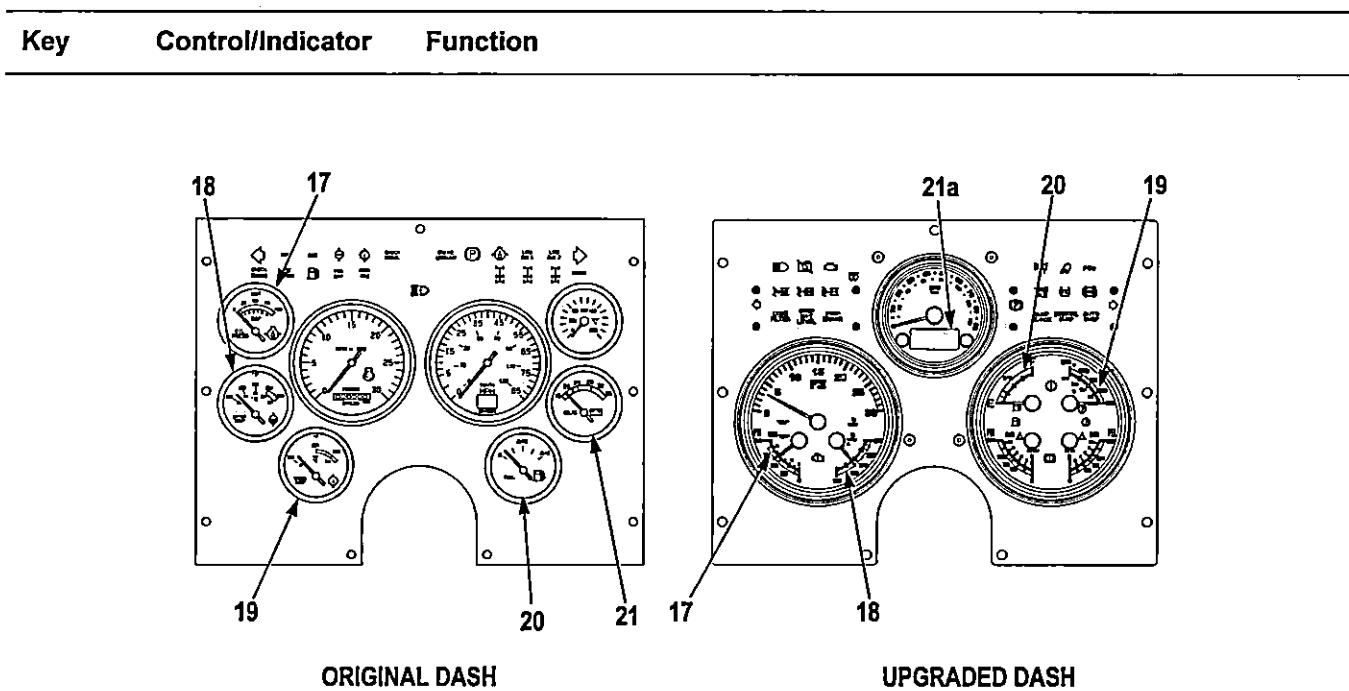
8	OVERSPEED CHECK TIRES Light (Amber)	When OVERSPEED indicator is lit, indicator alerts driver that vehicle speed exceeds maximum allowable speed as determined by CTIS. An audible alarm will also come on with OVERSPEED indicator. When CHECK TIRES indicator is lit, indicator alerts operator that substantial damage may have occurred to one or more tires.
9	7.1-15 TONS ON-ROAD ONLY BUTTON	Selects preset system tire pressure for full load conditions. Switching load setting results in pressure check.
10	2-7.1 TONS BUTTON	Selects preset system tire pressure for partial load.
11	0-2 TONS BUTTON	Selects preset system tire pressure for empty conditions.
12	RUN FLAT BUTTON	Driver uses this mode when vehicle has sustained minor tire damage.

**Table 1. Instrument Panel Controls and Indicators - Continued.**

Key	Control/Indicator	Function
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**Figure 4. Instrument Panel Control and Indicators.**

13	HWY BUTTON	Key selects tire pressure for travel over improved paved roads.
14	CC (40 MPH MAX) BUTTON	When activated, button adjusts tire pressure for travel over non-paved, secondary roads, and hard-packed surfaces.
15	MSS (15 MPH MAX) BUTTON	Button selects automatic tire pressure for travel on soft surface trails and other unimproved surfaces.
16	EMER (5 MPH MAX) BUTTON	Button selects adjustment for extremely low tire pressure to help free a stuck vehicle or to travel short distance over terrain known to require very low tire pressure.

Table 1. *Instrument Panel Controls and Indicators - Continued.*Figure 5. *Instrument Panel Control and Indicators.*

17 Engine Oil Pressure Gauge Indicates engine oil pressure.

18 Water Temperature Gauge Indicates engine coolant temperature.

19 Transmission Oil Temperature Gauge Indicates transmission oil temperature.

20 Fuel Gauge Indicates amount of fuel in fuel tank.

21 Volt Gauge (24V) Indicates state of charge of batteries and voltage level in 24-volt system.

21a Volt Gauge (24V) For updated dash, volt gauge is a function of the LCD Message Center. Refer to Instrument Panel Operation (WP 0053).

Table 1. Instrument Panel Controls and Indicators - Continued.

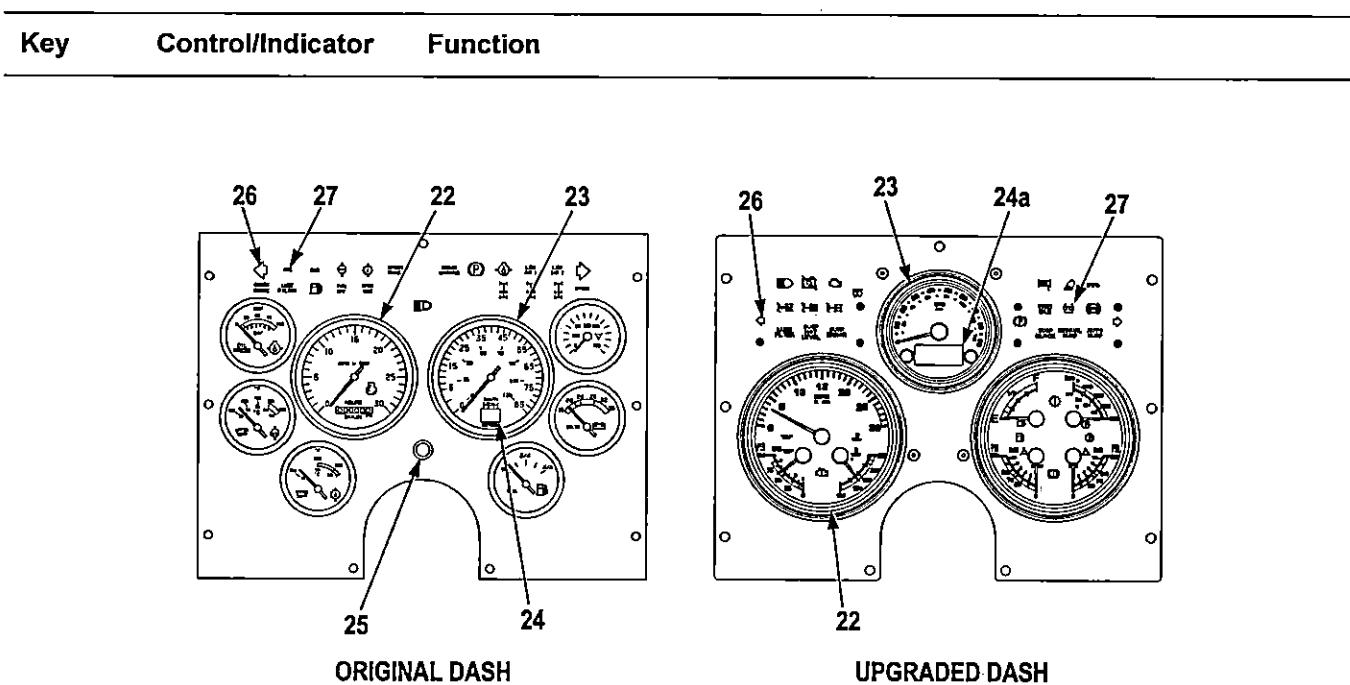
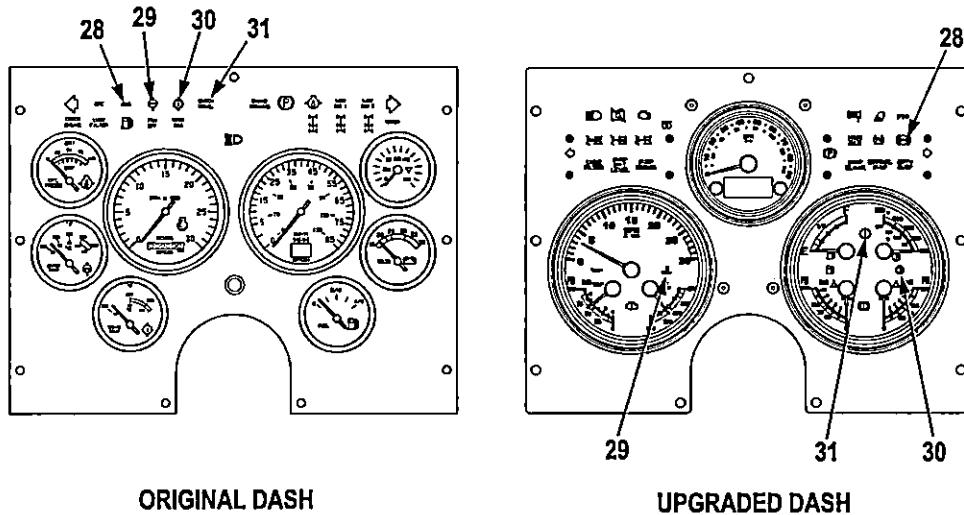


Figure 6. Instrument Panel Control and Indicators.

Key	Control/Indicator	Function
22	Tachometer/Hourmeter	Indicates engine operating speed (rpm x 100) and total operating time (Hours). Hourmeter is only present on original dash. For updated dash, hourmeter is a function of the LCD Message Center. Refer to Instrument Panel Operation (WP 0053).
23	Speedometer	Indicates vehicle traveling speed.
24	Odometer/Trip Odometer	Odometer indicates total miles traveled on vehicle. Trip odometer indicates miles traveled on vehicle since last time trip odometer reset button was pushed. The odometer displays will blackout when the cab average air temperature drops below approximately -4°F (-20°C). The odometer will continue to record information.
24a	Odometer/Trip Odometer	For updated dash, odometer and trip odometer are functions of the LCD Message Center. Refer to Instrument Panel Operation (WP 0053).
25	Trip Odometer Reset Button	Resets trip odometer to 0. Not applicable to updated dash.
26	Left Turn Indicator (green)	Flashes when left turn signal is on.

Table 1. *Instrument Panel Controls and Indicators - Continued.*

Key	Control/Indicator	Function
27	Automatic Traction Control (ATC) Light (amber)	Illuminates at Key-On and remains lit until operator presses brake pedal when system is configured for ATC. The ATC light flashes/blinks while changing to CC or EMER mode. Once cycle is complete, light stays illuminated. Refer to ATC Theory of Operation (WP 0006).

Figure 7. *Instrument Panel Control and Indicators.*

28	Antilock Brake System (ABS) Light (red)	Under normal conditions, ABS indicator lights steadily for a two-second bulb check whenever ignition switch is ON. Light turns OFF after bulb check if no ABS malfunctions are present. Illuminates steadily when ABS is malfunctioning. Blinks fault codes when diagnostic codes are activated. (Refer to Electrical Theory (Block Diagrams) (WP 0006))
29	Water Temperature Light (red)	Lights when coolant temperature reaches 235°F (113°C). Audible buzzer also sounds. Cooling system fan turns ON when coolant temperature reaches 205°F (96°C).
30	High Transmission Temperature Light (red)	Lights when transmission fluid temperature is approximately 300°F (149°C). Audible alarm will also sound.
31	CHECK TRANS Light (yellow)	Lights when transmission fluid temperature reaches 250°F (121°C).

Table 1. Instrument Panel Controls and Indicators - Continued.

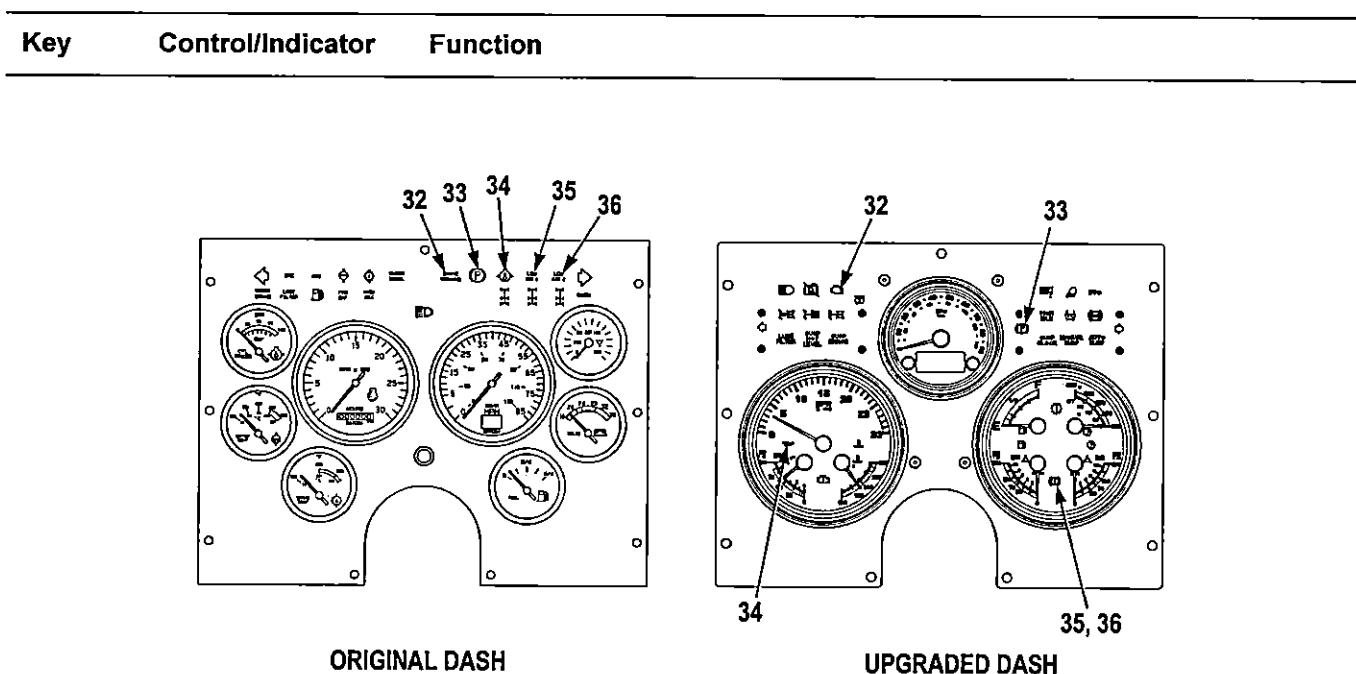


Figure 8. Instrument Panel Control and Indicators.

32	ENGINE WARNING Indicator Light (red)	Alerts driver of engine problem detected by ECM.
33	PARK BRAKE Indicator Light (red)	Lights when parking brake is activated.
34	OIL PSI Warning Light (red)	Illuminates when engine oil pressure is below 5 psi (34 kPa).
35	LOW AIR 1 Warning Light (red)	Illuminates when front air system pressure drops between 64 and 76 psi (441 and 524 kPa) (audible alarm). Updated dash has only one warning light to cover both front and rear air pressure systems (audible alarm will sound).
36	LOW AIR 2 Warning Light (red)	Illuminates when rear air system pressure drops between 64 and 76 psi (441 and 524 kPa) (audible alarm). Updated dash has only one warning light to cover both front and rear air pressure systems (audible alarm will sound).

Table 1. Instrument Panel Controls and Indicators - Continued.

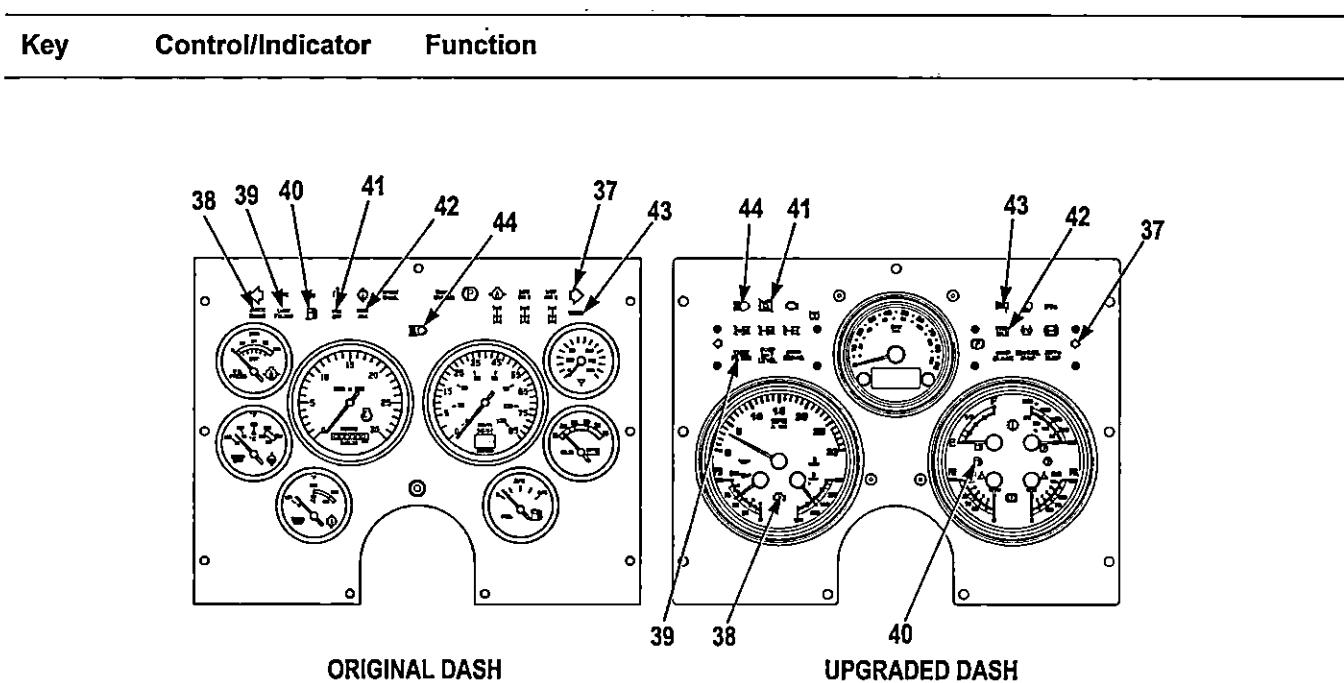


Figure 9. Instrument Panel Control and Indicators.

37	Right Turn Indicator (green)	Flashes when right turn signal is on.
38	CHECK ENGINE Light (yellow)	Illuminates when coolant temperature reaches 217°F (103°C) or when oil pressure is low (dependent on engine rpm).
39	LUBE FILTER Light	Not Functional
40	LOW FUEL Light (yellow)	Illuminates when fuel in tank is low.
41	FAN OFF Warning Light	Illuminates when engine fan lockout circuit is activated during fording operations.
42	HIGH IDLE Light	Illuminates when engine is in HIGH IDLE mode.
43	WINCH Indicator Light (red)	Illuminates when winch is activated (MK25 and MK28 only). Illuminates when PTO is activated for winch and dump body operations.
44	High Beam Indicator (blue)	Illuminates when vehicle lights are on high beam.

Table 1. Instrument Panel Controls and Indicators - Continued.

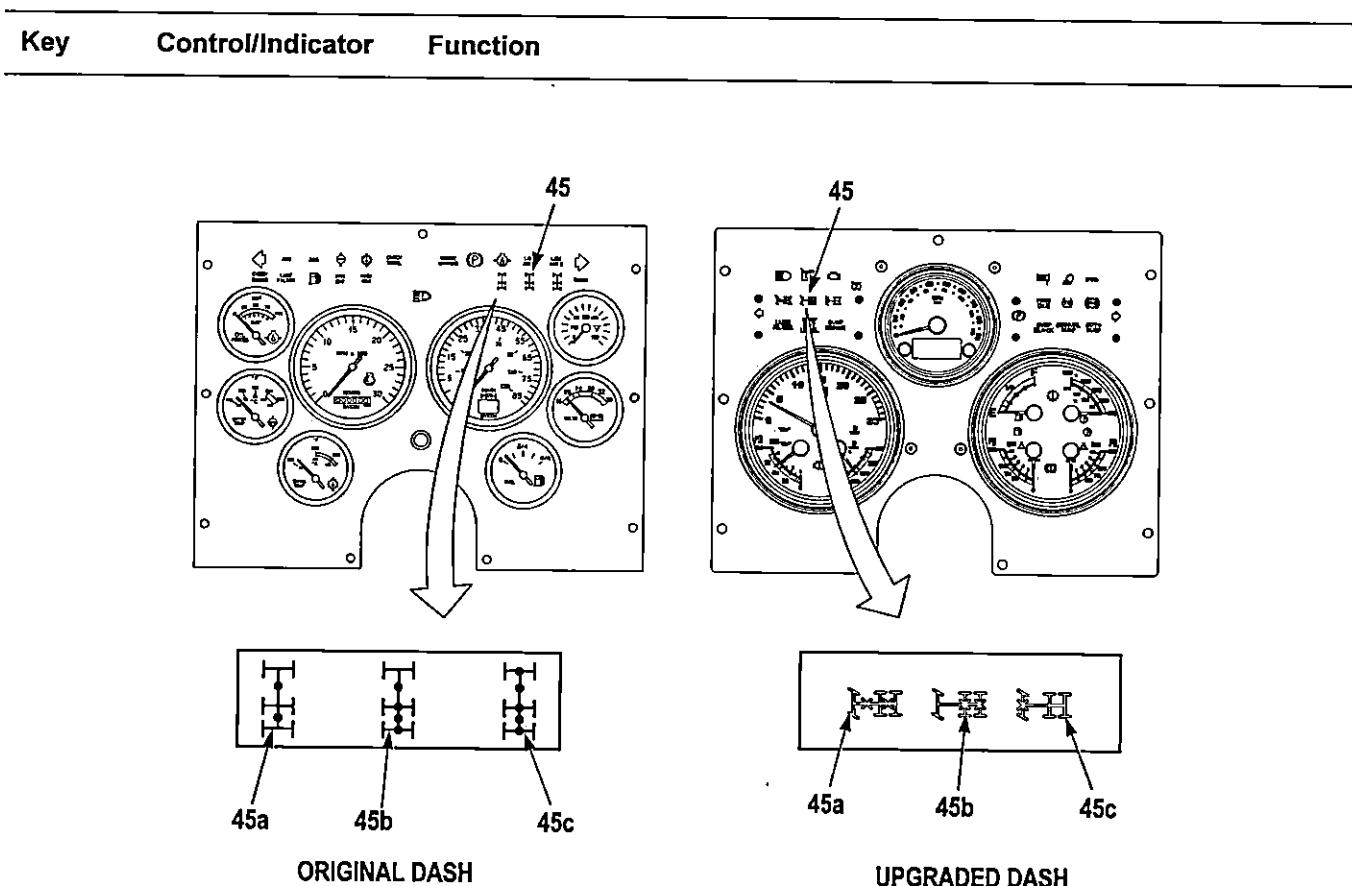


Figure 10. Instrument Panel Control and Indicators.

45 Driveline Lock Lights Indicates three-step locking sequence, as shown by each light from left to right.

45a a. The first icon (left) indicates transfer case and inter-axle locks are engaged.

45b b. The second icon (center) indicates transfer case, inter-axle, and rear intra-axle locks are engaged.

45c c. The third icon (right) indicates transfer case and inter-axle as well as front and rear intra-axle locks are engaged (full locked condition).

Table 1. Instrument Panel Controls and Indicators - Continued.

Key	Control/Indicator	Function
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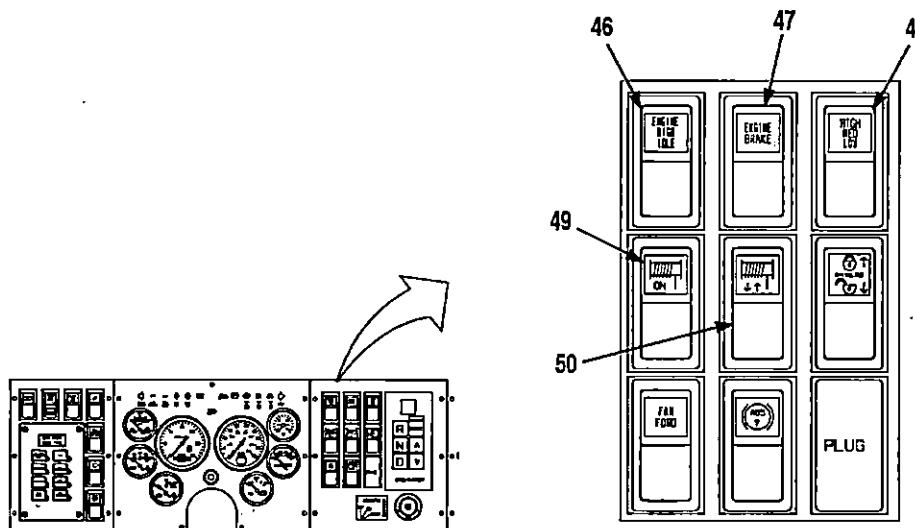


Figure 11. Instrument Panel Control and Indicators.

46	HIGH IDLE (2-position switch)	Raises engine idle speed to 1500 rpm when switch is in UP position.
47	ENGINE BRAKE (2-position switch)	Turns engine brake/retarder ON when switch is in UP position.
48	HIGH/MED/LOW (3-position switch)	Selects high, medium, or low range for engine brake/retarder.
49	WINCH ON/OFF (2-position switch)	Activates power to winch when switch is in UP position. Activates power to PTO for operation of winch and dump body when switch is in UP position.
50	WINCH OUT/IN (2-way momentary switch)	Controls winch operation from inside cab. UP position pulls cable in; DOWN position feeds cable out. Operator must hold switch in at desired position to affect winch operation (MK25 and MK28 only).

Table 1. Instrument Panel Controls and Indicators - Continued.

Key	Control/Indicator	Function

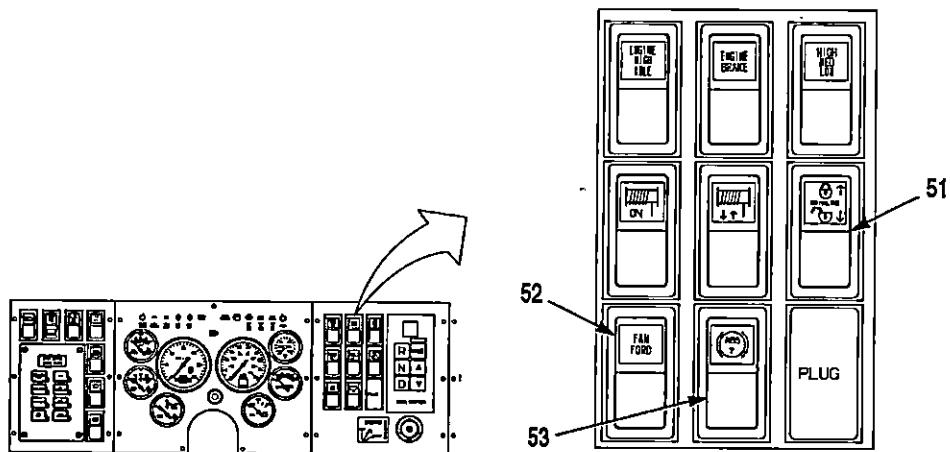


Figure 12. Instrument Panel Control and Indicators.

51	DRIVELINE LOCK (2-way momentary) switch	Switch allows operator to manually override CTIS by sequentially engaging locks for transfer case and all axles.
52	FAN FORD (2-position) switch	Turns engine fan ON/OFF. Fan OFF light will illuminate when switch is turned ON.
53	ABS DIAG. (2-way momentary switch)	Turns ON Antilock Brake System (ABS) diagnostics. ABS light will illuminate.

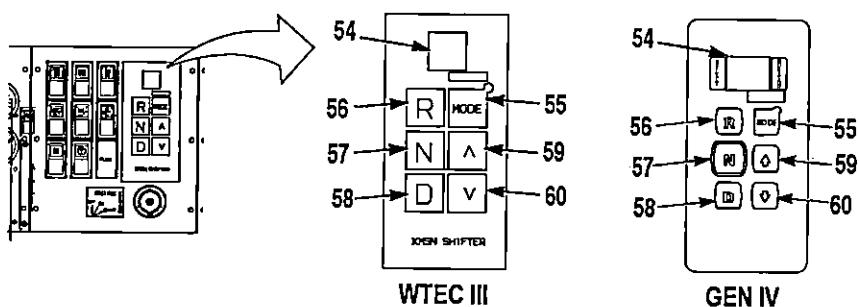


Figure 13. Instrument Panel Control and Indicators.

**Table 1. Instrument Panel Controls and Indicators - Continued.**

Key	Control/Indicator	Function
54	SELECTION DISPLAY Indicator	Displays transmission setting operator has selected. Display will show R for reverse and N for neutral. When D is selected on WTEC III transmission vehicles, the top forward gear of range is displayed. On GEN IV transmission vehicles, the top forward gear of range selected is displayed on the left, and gear the vehicle is currently in is displayed on the right. No. 3 is displayed when engine brake/retarder system is active (WP 0032).
55	MODE Button	Pushing of MODE button will allow operator to activate Power Take Off (PTO) if equipped with winch. Button displays red light when MODE is selected. For vehicles without a winch, button serves no purpose.
56	R (Reverse) Button	Use for backing of vehicle.
57	N (Neutral) Button	Use when starting engine or if vehicle is left unattended while engine is running.
58	D (Drive) Button	Use for all normal driving conditions. Transmission will upshift and downshift automatically.
59	(Increase) Button	When in drive, the button allows operator to increase gear range being used by transmission. Gear 7 is highest available setting and is also the default setting when drive (D) is first pushed upon startup.
60	(Decrease) Button	When in drive, this button allows operator to decrease gear range being used by transmission.

Table 1. Instrument Panel Controls and Indicators - Continued.

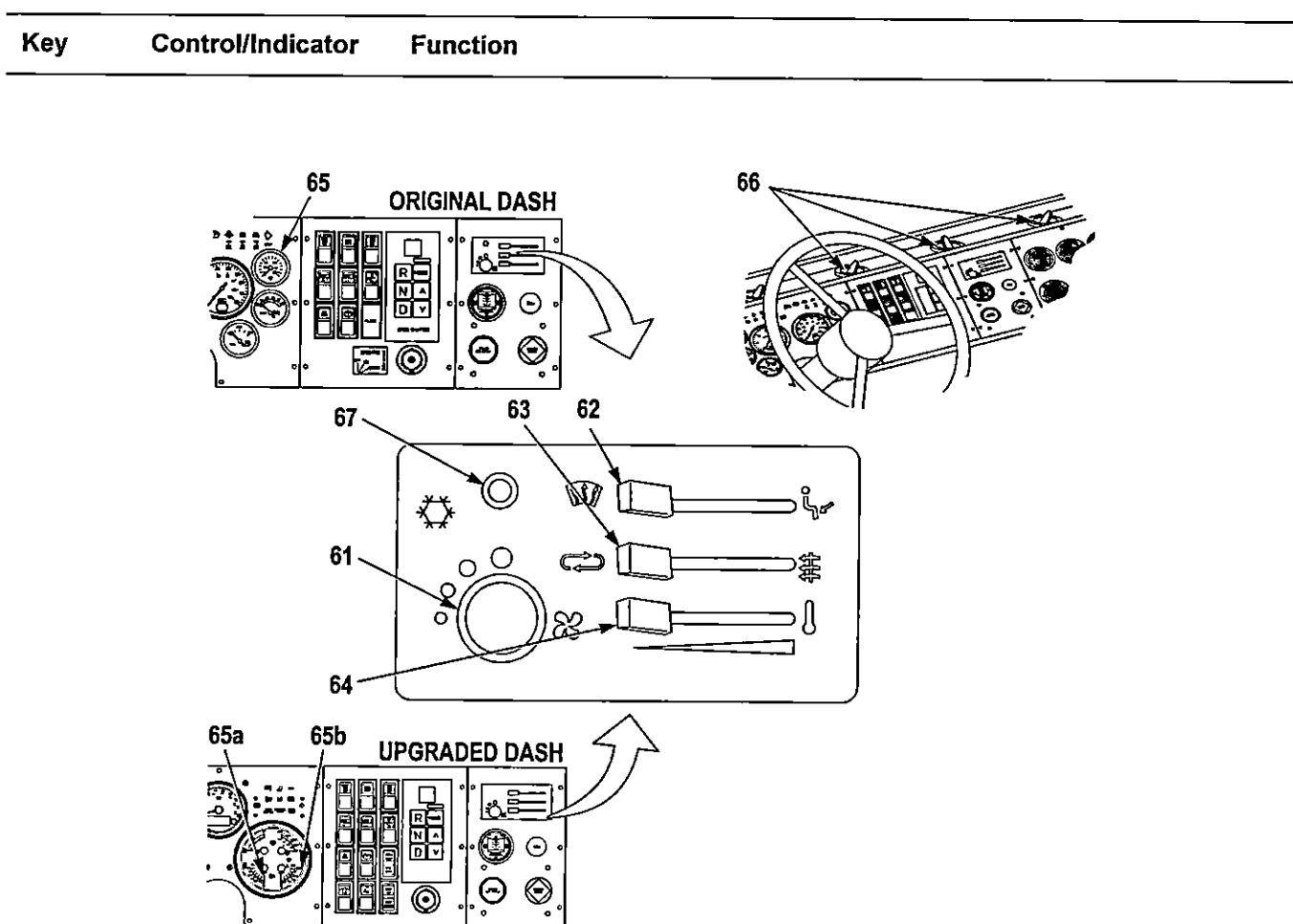


Figure 14. Instrument Panel Control and Indicators.

61	Fan Control	Controls speed of fan (LOW/MED/HIGH). Lowest setting turns fan OFF.
62	Cab Air Directional Control Lever	Controls direction of air. Push lever to left to direct air to defroster louvers. Push lever to right to direct air to floor.
63	Vent Control Lever	Recirculates air throughout cab. Controls amount of outside air entering cab through fresh air vent. The farther left the lever is, the less outside air enters cab.
64	Heater Control Lever	Controls temperature level or amount of heat entering cab.
65	Air Pressure Gauge	Red needle (emergency) indicates rear brake air pressure. Green needle indicates front brake air pressure.

Table 1. Instrument Panel Controls and Indicators - Continued.

Key	Control/Indicator	Function
65a	Front Air Pressure Gauge	Indicates front brake air pressure.
65b	Rear Air Pressure Gauge	Indicates rear brake air pressure.
66	Defroster Louver	Direct air against windshield for defrosting. Can be opened, closed, and rotated to control direction and flow of air.
67	Air Conditioning (A/C) Switch	Turns A/C ON or OFF. Fan ford switch must be in normal operating mode and FAN OFF warning light must not be illuminated to enable A/C.

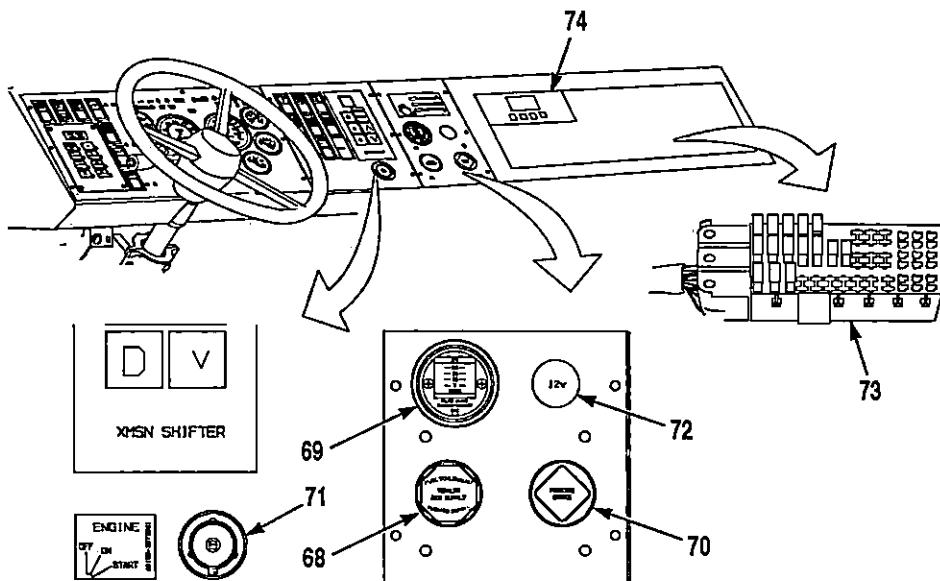


Figure 15. Instrument Panel Control and Indicators.

68	TRAILER AIR SUPPLY	Push to supply air to trailer air system. Pull to shut off trailer air.
69	Air Filter Restriction Indicator	Shows condition of air filter. Push the button to reset.
70	PARKING BRAKE Control	Push to release vehicle brakes. Pull to apply vehicle and trailer brakes.

**Table 1. Instrument Panel Controls and Indicators - Continued.**

Key	Control/Indicator	Function
71	Ignition Switch (3-position rotary)	Turns engine ON/OFF.
72	12 VDC AUX Receptacle	Use for powering 12 VDC auxiliary equipment.
73	Circuit Breaker Block	Contains the circuit breakers that help to protect the vehicle's electric circuits from overload.
74	Message Information Center (MIC)	This module shows current system operating readings and fault codes. For more information, refer to Operation of MIC (WP 0095).

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
OPERATOR AND CREW SEAT ADJUSTMENT CONTROLS**

*Table 1. Operator and Crew Seat Adjustment Controls.*

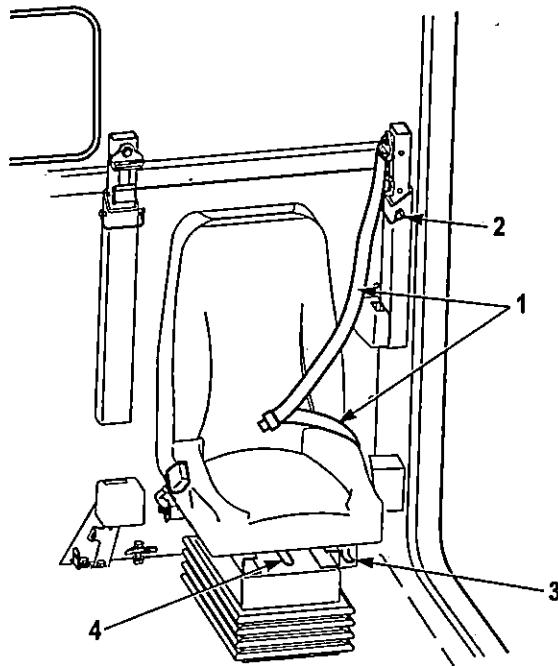


Figure 1. Operator and Crew Seat Adjustment Controls.

Key	Control/Indicator	Function
1	Seat belt/Shoulder Harness	Secures operator in seat.
2	Seat belt Column Clip	Adjusts height of seat belt column.
3	Height Adjustment Control	Use to adjust seat height.
4	Forward/Backward Adjustment Control	Use to move seat forward or backward on slides.

**END OF WORK PACKAGE**

1ST ECHELON MAINTENANCE  
BATTERY BOX AND BATTERY DISCONNECT SWITCH

Table 1. *Battery Box and Battery Disconnect Switch.*

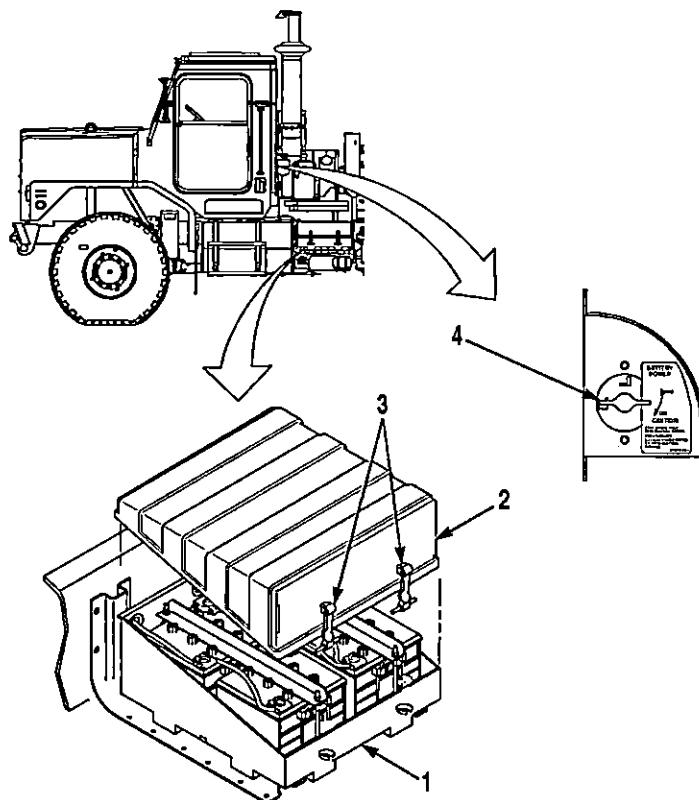


Figure 1. *Battery Box and Battery Disconnect Switch.*

Key	Control/Indicator	Function
1	Battery Box	Used to store up to four batteries.
2	Battery Box Cover	Covers and protects batteries from weather.
3	Rubber Latches	Secures battery box cover to battery box.

**Table 1. Battery Box and Battery Disconnect Switch - Continued.**

Key	Control/Indicator	Function
4	Battery Disconnect Switch	Turns vehicle battery power ON and OFF.

**END OF WORK PACKAGE**

1ST ECHELON MAINTENANCE  
EXTERIOR MOUNTED CONTROLS AND INDICATORS

*Table 1. Exterior Mounted Controls and Indicators.*

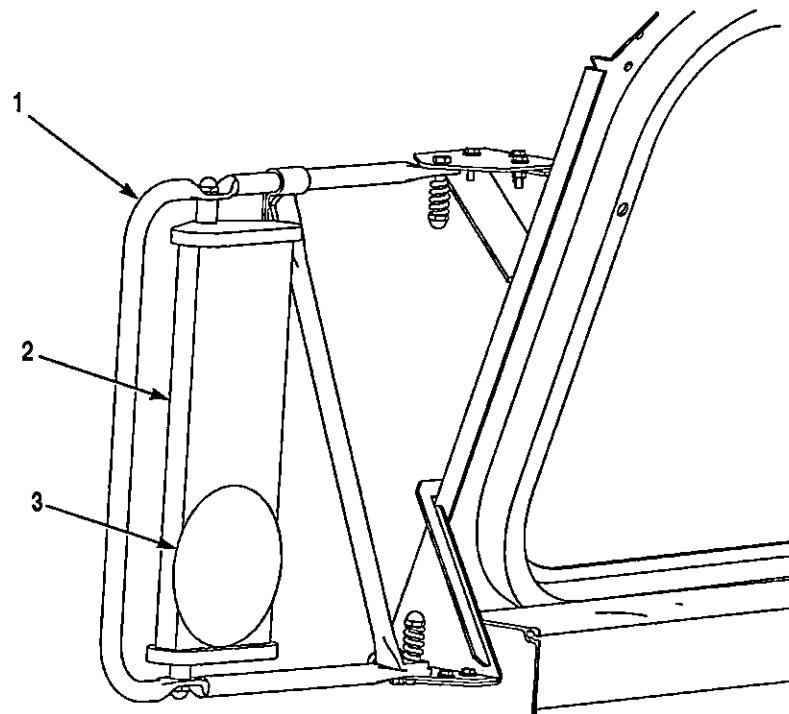


Figure 1. Exterior Mounted Controls and Indicators.

Key	Control/Indicator	Function
1	Mirror Mount (Both Sides)	Adjustable to six positions allowing operator full range of views.
2	Rear View Mirror (Both Sides)	Permits viewing of side of vehicle, traffic, and terrain to rear of vehicle.
3	Spotter Mirror (Both Sides)	Allows viewing of blind spots along side and lower section of vehicle.

Table 1. Exterior Mounted Controls and Indicators - Continued.

Key	Control/Indicator	Function
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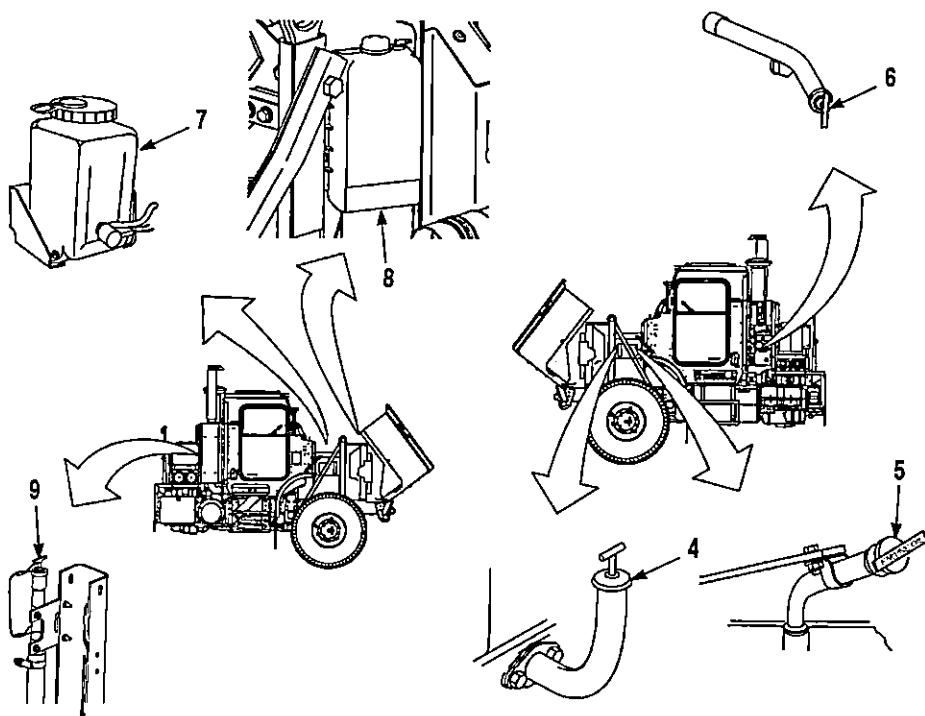


Figure 2. Exterior Mounted Controls and Indicators.

4	Engine Oil Filler Cap	Provides opening to add engine oil to engine. Turn T-handle CCW to loosen and CW to tighten.
5	Engine Oil Dipstick	Indicates engine oil level. Turn T-handle CCW to loosen and CW to tighten.
6	Transmission Oil Dipstick	Indicates transmission oil level.
7	Windshield Washer Reservoir	Stores windshield washer fluid.
8	Coolant Overflow Reservoir	Stores excess coolant from cooling system.

Table 1. Exterior Mounted Controls and Indicators - Continued.

Key	Control/Indicator	Function
9	Transmission Fill Tube	Used to add fluid to transmission.

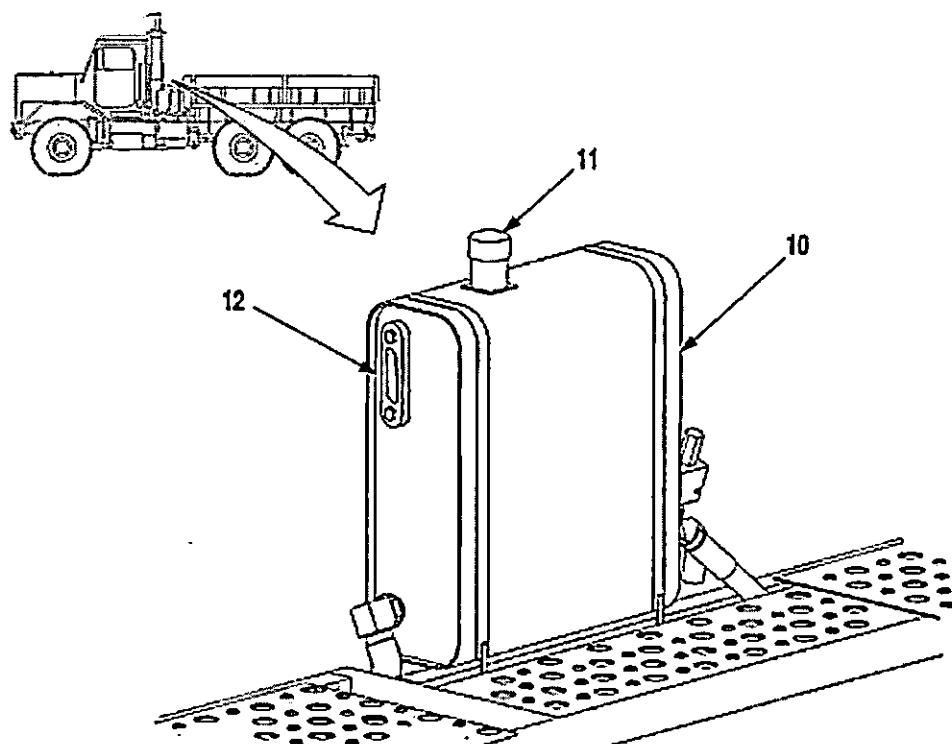


Figure 3. Exterior Mounted Controls and Indicators.

10 Hydraulic Reservoir Stores and supplies hydraulic fluid for suspension.

11 Hydraulic Reservoir Filler Cap Provides cover for hydraulic reservoir filler opening. Turn CCW to remove and CW to install (MK25 and MK28 only).

12 Hydraulic Reservoir Sight Glass Provides visual inspection of hydraulic level in reservoir.

Table 1. Exterior Mounted Controls and Indicators - Continued.

Key	Control/Indicator	Function
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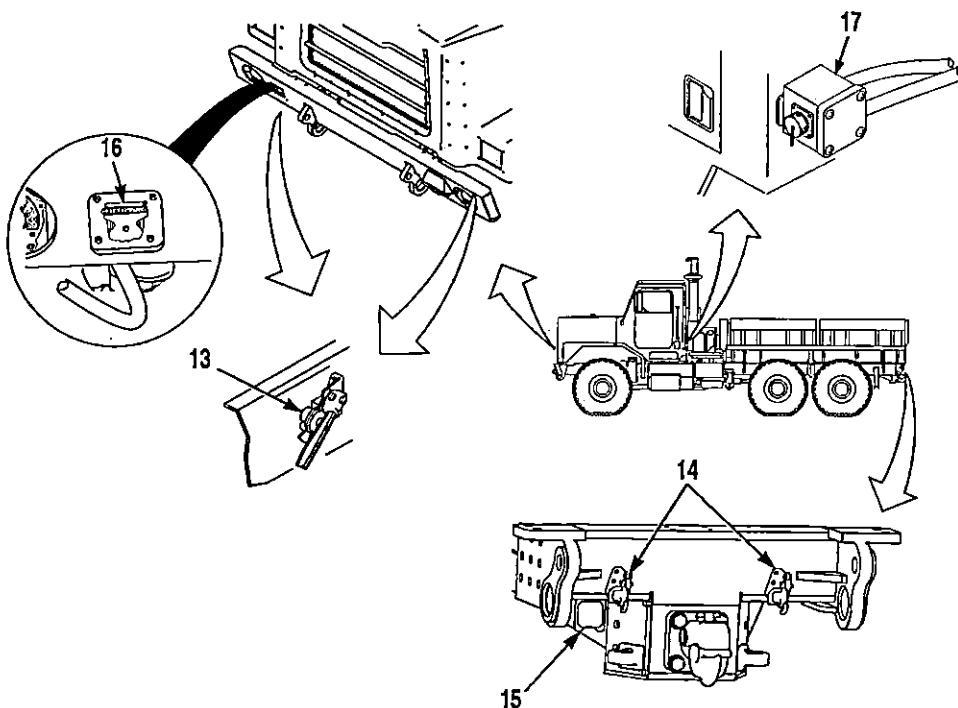


Figure 4. Exterior Mounted Controls and Indicators.

13	Front Gladhands	Allows towing vehicle to feed air into air system of Truck when connected. Blue is for service and red is for emergency.
14	Rear Gladhands	Allows vehicle to supply air to towed vehicle or trailer. Red is for emergency and blue is for service.
15	Rear Inter-vehicle Electrical Connector	Connects Truck electrical system to electrical system of towed vehicle or trailer.
16	Front Inter-vehicle Electrical Connector	Connects Truck electrical system to electrical system of towing vehicle.
17	NATO Slave Receptacle	Used with NATO slave cable to help start vehicles with dead batteries.

Table 1. Exterior Mounted Controls and Indicators - Continued.

Key	Control/Indicator	Function
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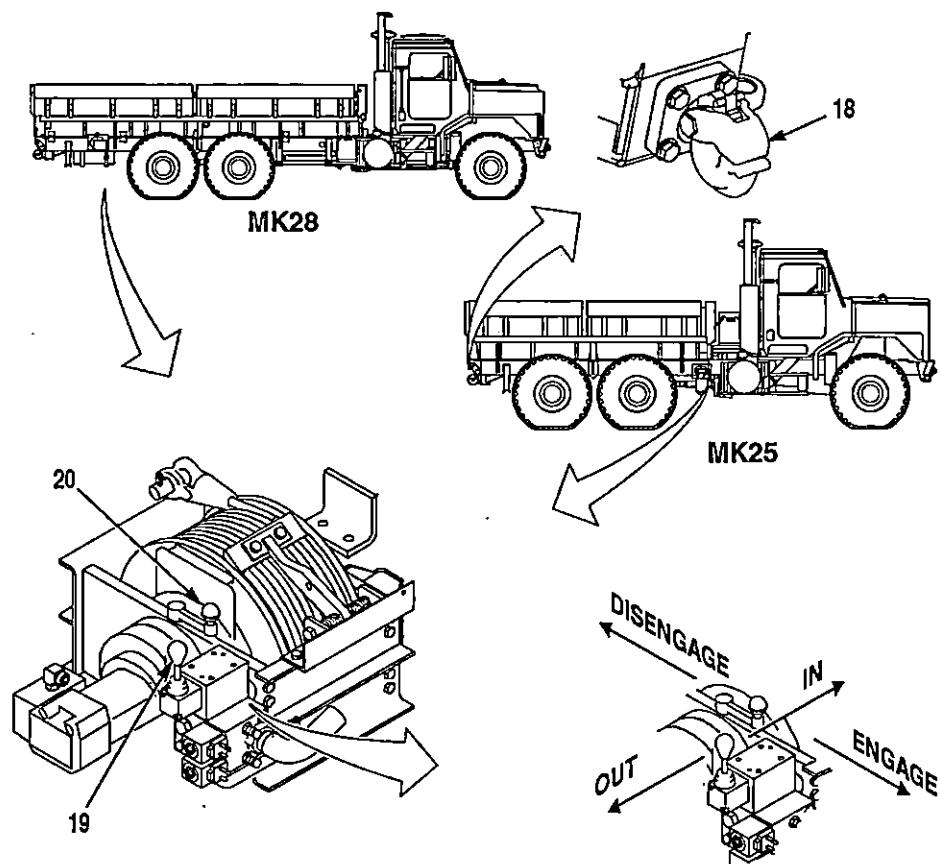


Figure 5. Exterior Mounted Controls and Indicators.

18	Pindle Hook	Used for attaching trailers and tow bars.
19	Self-Recovery Winch Control Lever	Pays the cable in or out (MK25 and MK28 only).
20	Self-Recovery Winch Shift Lever	Engages and disengages winch clutch control to allow free spooling of winch (MK25 and MK28 only).

Table 1. Exterior Mounted Controls and Indicators - Continued.

Key	Control/Indicator	Function
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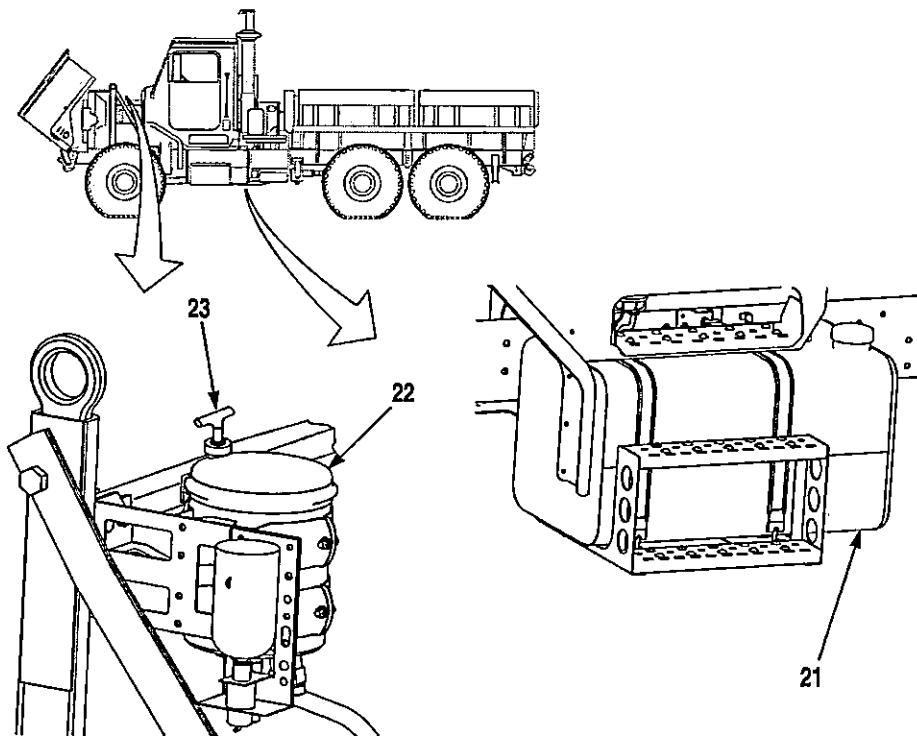


Figure 6. Exterior Mounted Controls and Indicators.

21	Fuel Tank	Stores fuel for engine operation.
22	Steering Reservoir	Storage tank for power steering fluid.
23	Steering Reservoir Dipstick	Indicates power steering fluid level in tank.

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**END OF WORK PACKAGE**

1ST ECHELON MAINTENANCE  
FUEL/WATER/DECONTAMINATION (DECON) CAN BRACKET

Table 1. Fuel/Water/Decontamination (DECON) Can Bracket.

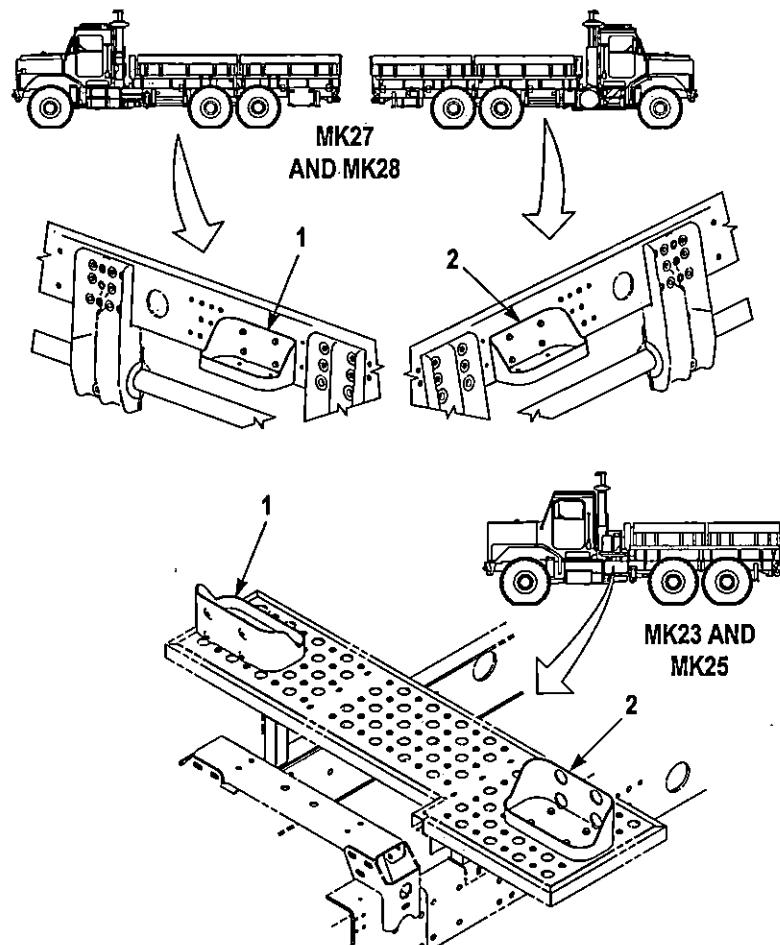


Figure 1. Fuel/Water/DECON Can Bracket.

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Key	Control/Indicator	Function
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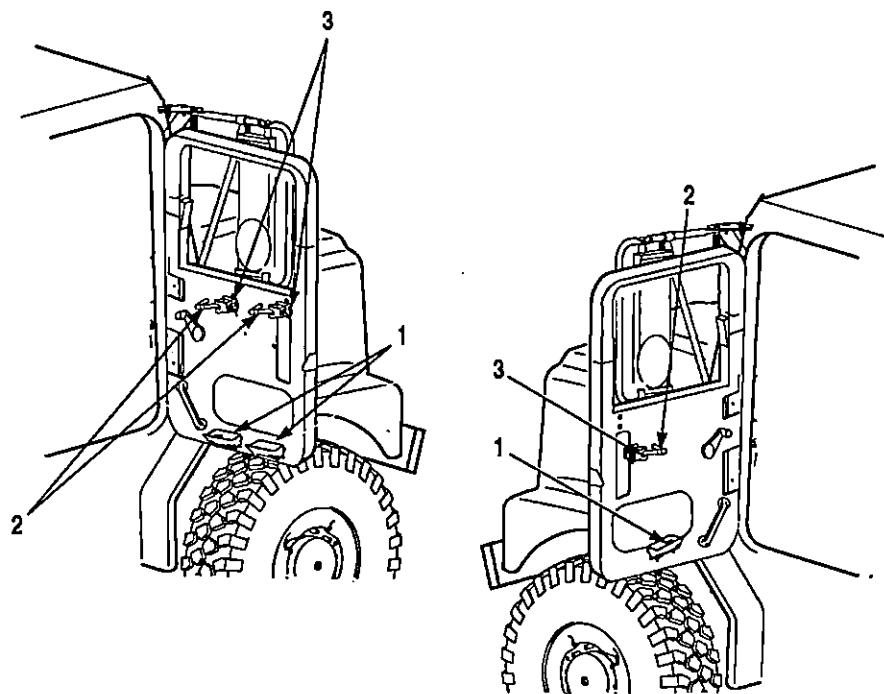
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1 Fuel/Water/DECON Can Bracket Holds fuel/water/decontamination can.

**Table 1. Fuel/Water/Decontamination (DECON) Can Bracket - Continued.**

Key	Control/Indicator	Function
2	Decontamination Bracket	Holds decontamination unit.

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
RIFLE STOWAGE MOUNT****Table 1. Rifle Stowage Mount.****Figure 1. Rifle Stowage Mount.**

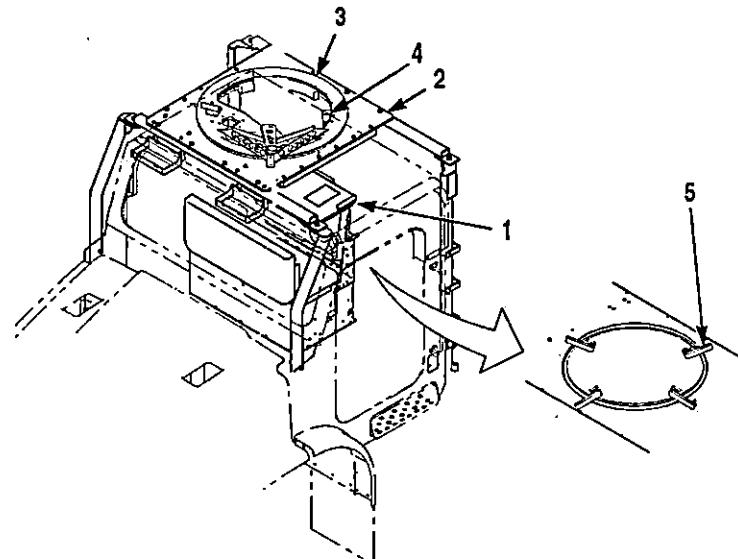
Key	Control/Indicator	Function
1	Lower Rifle Mount	Holds butt of rifle.
2	Rifle Mount Handle	Secures hand guard of rifle against top rifle mount.
3	Top Rifle Mount	Holds hand guard of rifle.

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
MACHINE GUN MOUNT**

---

**Table 1. Machine Gun Mount.****Figure 1. Machine Gun Mount.**

---

Key	Control/Indicator	Function
1	Machine Gun Platform	Supports machine gun operator.
2	Machine Gun Mount	Secures machine gun to machine gun ring.
3	Machine Gun Ring	Allows machine gun to turn 360°.
4	Machine Gun Ring Locking Lever	Locks machine gun ring into selected position.
5	Hatch Turnlocks	Used to secure cover in closed position.

---

**END OF WORK PACKAGE**

---

 1ST ECHELON MAINTENANCE  
 ARCTIC ENGINE HEATER
 

---

Table 1. Arctic Engine Heater.

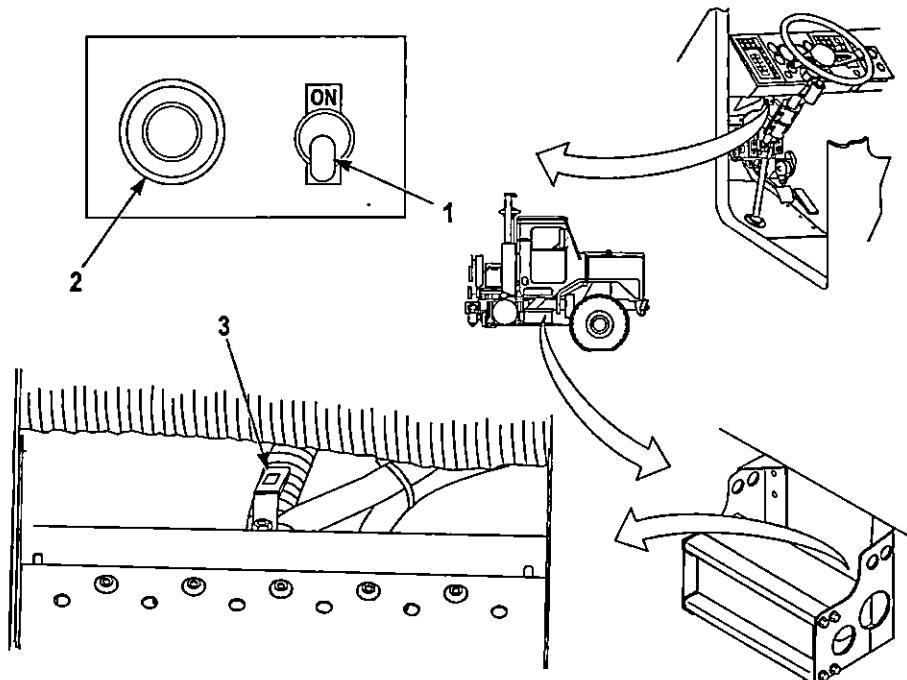


Figure 1. Arctic Engine Heater.

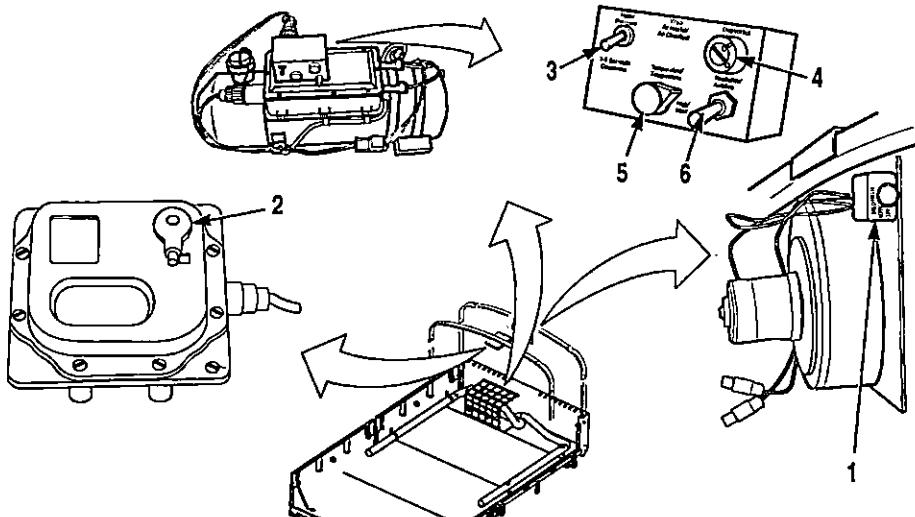
Key	Control/Indicator	Function
1	Arctic Engine Heater On/Off Switch	Turns the arctic engine heater ON and OFF.
2	Pilot Lamp	During startup of arctic engine heater, this pilot lamp will illuminate. This indicates arctic engine heater has been started.
3	Ball Valve	Ball valve allows operator to control the coolant flow through the arctic engine heater.

---

END OF WORK PACKAGE

**1ST ECHELON MAINTENANCE  
ARCTIC CARGO KIT**

**Table 1. Arctic Cargo Kit.**



**Figure 1. Arctic Cargo Kit.**

Key	Control/Indicator	Function
1	Fan Control Switch	Controls the speed of the fan.
2	Arctic Cargo Dome Light Switch	Rotating this switch away from the tab turns on the normal interior light. Rotating this switch past the tab turns on the blackout interior light.
3	Diagnostic Switch	Used in conjunction with diagnostic light to diagnose arctic cargo kit personnel heater problems.
4	Diagnostic Light	Used in conjunction with diagnostic switch to diagnose arctic cargo kit personnel heater problems.
5	Heat Control Switch	This switch varies the temperature of the heated air being generated by the arctic cargo kit personnel heater.

*Table 1. Arctic Cargo Kit - Continued.*

Key	Control/Indicator	Function
6	Personnel Heater Vent/Off/Heat Switch	Turns the arctic cargo kit personnel heater ON and OFF.

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
HANDLING**

---

**INITIAL SETUP:**

Not Applicable

---

**WARNING**

Shipping containers are heavy. Do not lift or move shipping containers without the aid of an assistant and a suitable lifting device. Failure to comply may result in serious injury or death to personnel.

1. The 7-Ton Truck is shipped with two shipping containers that are secured to the 7-Ton Truck cargo bed. One shipping container contains BII equipment. The other shipping container contains the cargo cover, bows, and staves. Open the shipping containers and remove any protective wrapping. Inventory contents of shipping containers (WP 0113). Stow contents of shipping containers (WP 0116).
2. The BII shipping containers are labeled according to model:
  - MK23 BII shipping container is labeled 3709738
  - MK25 BII shipping container is labeled 3709739
  - MK27 BII shipping container is labeled 3709740
  - MK28 BII shipping container is labeled 3709741
3. The containers containing the cargo cover, bows, and staves are also labeled according to model:
  - MK23 and MK25 cargo cover kits are labeled 3165501
  - MK27 and MK28 cargo cover kits are labeled 3214499

**END OF TASK****END OF WORK PACKAGE**

---

## 1ST ECHELON MAINTENANCE SERVICING

---

### INITIAL SETUP:

Not Applicable

---

Refer to, Preparation for Operation (WP 0028), for all service adjustments to be done prior to operation.

### Removal of Protective Components

Upon receipt of the 7-Ton Truck, inspect vehicle for obvious damage. Upon receipt of the 7-Ton Truck, undo any tiedowns, shackles, or banding securing the 7-Ton Truck and shipping containers.

### Cleaning

#### CAUTION

- Do not wipe dirt off vehicle when vehicle is dry. Dirt, stones, or debris can scratch paint off the vehicle. Failure to comply may result in damage to equipment.
- Do not use an abrasive brush to wash vehicle. Failure to comply may result in damage to equipment.

1. Using clean cloth (WP 0115, Table 1, Item 4, 5), wash vehicle with cool or warm water. Do not use strong detergent or abrasives.
2. While cleaning vehicle, look closely for rust or corrosion, bare metal, or other damage. Report damage to Second Echelon Maintenance.

#### CAUTION

- When using a pressure washer to clean vehicle, do not allow water stream to contact dash, dash components, or other electrical components. Failure to comply may result in damage to equipment.
- When using a pressure washer to clean cab interior, keep nozzle of pressure washer away from vehicle or components a distance of five ft. (1.5 m) or more. Failure to comply may result in damage to equipment.

3. Using clean cloth (WP 0115, Table 1, Item 4, 5), wipe loose dust and dirt from cab interior.
4. Clean seats and seat belts using a mild solution of warm water and soap solution (WP 0115, Table 1, Item 35). Never use solvents or abrasives.
5. Using clean, dry cloth (WP 0115, Table 1, Item 4, 5), wipe seats and seat belts dry.

**Lubrication**

Refer to the Lubrication Instruction (WP 0111) for all lubrication requirements for the 7-Ton Truck.

**END OF TASK**

**END OF WORK PACKAGE**

---

## 1ST ECHELON MAINTENANCE INITIAL CHECKOUT AND ADJUSTMENT

---

### INITIAL SETUP:

Not Applicable

---

This paragraph includes instructions for initial checkout and adjustment values for the 7-Ton Truck. Complete inspection of vehicle must be performed to ensure there are no loose wires or bent pin contacts that would cause a short circuit when power is applied.

1. Make complete visual inspection to ensure that required tools, publications, accessories, and attachments are with vehicle.
2. Perform all "B" (before) PMCS listed in PMCS Table (WP 0092).
3. Visually inspect entire vehicle for loss of parts or damage which may have occurred during loading, removal, or shipment.
4. Check tires for proper inflation (refer to Table - CTIS Tire Pressure Settings (WP 0043, General)).
5. Check radiator shroud to ensure shroud is free of dents or other damage from shipment.
6. Inspect muffler, air cleaner, oil filters, and fan for visible damage.
7. Inspect starter and alternator for loose connections and insecure mounting.
8. Examine winch pump and connections (MK23 and MK25 only) for visible signs of damage.
9. Visually inspect all piping, lines, hoses, and wiring for cracks or damage, loose connections, or missing parts. Ensure all drain plugs are securely tightened.
10. Inspect tanks and gauges for signs of damage.
11. Inspect tail lights, headlights, clearance lights, and blackout lights for proper operation.
12. Check fan belt for proper tension. Belt has proper tension when belt can be depressed approximately 0.5 inch (1.3 cm) by normal pressure (10 to 15 pounds [4.5 to 6.8 kg]).

This paragraph includes instructions for initial checkout and adjustment values for the 7-Ton Truck. Complete inspection of vehicle must be performed to ensure there are no loose wires or bent pin contacts that would cause a short circuit when power is applied.

1. Make complete visual inspection to ensure that required tools, publications, accessories, and attachments are with vehicle.
2. Perform all "B" (before) PMCS listed in PMCS Table (WP 0093).
3. Visually inspect entire vehicle for loss of parts or damage which may have occurred during loading, removal, or shipment.
4. Check tires for proper inflation (refer to Table - CTIS Tire Pressure Settings (WP 0043, General)).
5. Check radiator shroud to ensure shroud is free of dents or other damage from shipment.
6. Inspect muffler, air cleaner, oil filters, and fan for visible damage.
7. Inspect starter and alternator for loose connections and insecure mounting.
8. Examine winch pump and connections (MK27 and MK28 only) for visible signs of damage.
9. Visually inspect all piping, lines, hoses, and wiring for cracks or damage, loose connections, or missing parts. Ensure all drain plugs are securely tightened.
10. Inspect tanks and gauges for signs of damage.

11. Inspect tail lights, headlights, clearance lights, and blackout lights for proper operation.
12. Check fan belt for proper tension. Belt has proper tension when belt can be depressed approximately 0.5 inch (1.3 cm) by normal pressure (10 to 15 pounds [4.5 to 6.8 kg]).

After performing the above initial checkouts and adjustments, refer to Service Upon Receipt of Equipment (WP 0094).

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
PREPARATION FOR STORAGE**

---

**INITIAL SETUP:**

Not Applicable

---

Contact Second Echelon Maintenance for long term storage information.

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
GENERAL**

---

**INITIAL SETUP:**

Not Applicable

---

**General**

When capture or abandonment of the 7-Ton Truck to any enemy is imminent, the responsible unit commander must make the decision to either destroy the equipment or to render it inoperative. Based on this decision, orders are issued which cover the desired extent of destruction.

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
DEMOLITION TO PREVENT ENEMY USE**

---

**INITIAL SETUP:**

Not Applicable

---

**Demolition to Render 7-TON TRUCK Inoperative**

**Demolition by Mechanical Means**

Use hammers, crowbars, picks, or other tools which may be available to destroy the engine block, manifold, Electronic Control Module (ECM), and water pump.

**Demolition by Misuse**

Perform the following steps to render the 7-Ton Truck inoperative.

1. Drain radiator and crankcase. Place sand, nuts, bolts, or broken glass into radiator opening, oil filler tube, and fuel tank.
2. Puncture radiator in several places.
3. Disconnect radiator fan and run engine at full throttle.

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
DEMOLITION BY EXPLOSIVES OR WEAPONS FIRE**

---

**INITIAL SETUP:**

Not Applicable

---

**Demolition by Explosives or Weapons Fire**

Refer to FM 5-25, Explosives and Demolition, for instructions for demolition by explosives or weapons fire.

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
OTHER DEMOLITION METHODS**

---

**INITIAL SETUP:**

Not Applicable

---

**Other Demolition Methods**

The following are other demolition methods which may be used if capture or abandonment of the 7-Ton Truck to any enemy is imminent:

1. Scattering of Parts
2. Concealing of Equipment or Parts
3. Burning of Equipment or Parts
4. Submersion of Equipment or Parts

**END OF TASK****END OF WORK PACKAGE**

## **CHAPTER 3**

### **OPERATOR INSTRUCTIONS OPERATION UNDER NORMAL CONDITIONS**

---

## 1ST ECHELON MAINTENANCE PREPARATION FOR OPERATION

---

### INITIAL SETUP:

Not Applicable

---

### **WARNING**

The driver is responsible for the safety of the personnel riding on their vehicle. Drivers will refuse to move a vehicle if anyone is in an unsafe position or the vehicle has too many passengers. Refer to TB 9-639 for passenger-carrying capacities. Failure to comply may result in serious injury or death to personnel.

### **WARNING**

Operating vehicle with items on dashboard is dangerous and may result in injury to personnel.

### **WARNING**

When adjusting the shoulder restraint columns, always adjust shoulder restraint columns in the intermediate or upper positions such that the harness crosses shoulder and not across the face or under the shoulder. The fully lowered position is only used when the cab is lowered for transport with driver's seat fully lowered and shall never be used during vehicle operation. Using the shoulder restraint column in the fully lowered position during operation is unsafe and places the driver at increased risk due to improper positioning of the seat belt across the occupant. Failure to comply may result in injury or death to personnel.

### **WARNING**

- No cargo other than the cargo cover and stowage bag is authorized to be stored behind the cab of the vehicle. When stowing the cargo cover and stowage bag behind cab of the MK23 and MK25, ensure straps or other items do not hang below top of frame.
- Items may engage prop shafts, air lines, and other components that may render the vehicle inoperable. Failure to comply may result in injury or death to personnel.
- No cargo is authorized to be stored behind the cab of the MK27 and MK28.
- For storage locations for the cargo cover and stowage bag (WP 0116) on the MK27 and MK28.

1. Wheel Chocks Removal and Stowage.

Remove and stow wheel chocks in BII box prior to operation.

2. Turn Battery Disconnect Switch On.

Turn battery disconnect switch (1) to ON position.

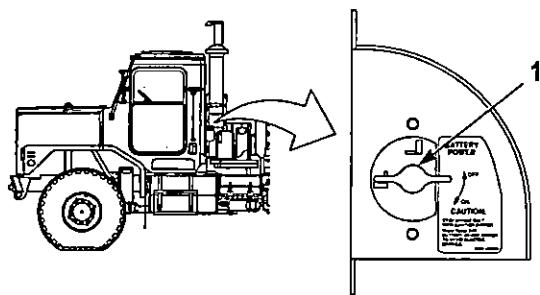


Figure 1.

3. Entering Cab and Operator Seat Adjustment.

**WARNING**



Do not use steering wheel for hand grip to enter 7-Ton Truck cab. Use of steering wheel for hand grip may cause sudden violent jerking of vehicle. This may result in severe injury to operator.

**WARNING**

When entering or exiting cab, use three-point contact system. Failure to comply may result in injury to personnel.

**NOTE**

Operator should be able to easily reach brake pedal, throttle pedal, and dash controls with seat adjusted and seat belt and shoulder harness on.

a. Enter cab using steps (1) and grab handles (2).

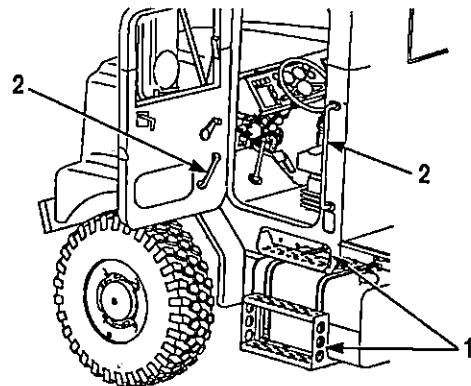


Figure 2.

b. Adjust seat height as required with height adjustment switch (3).

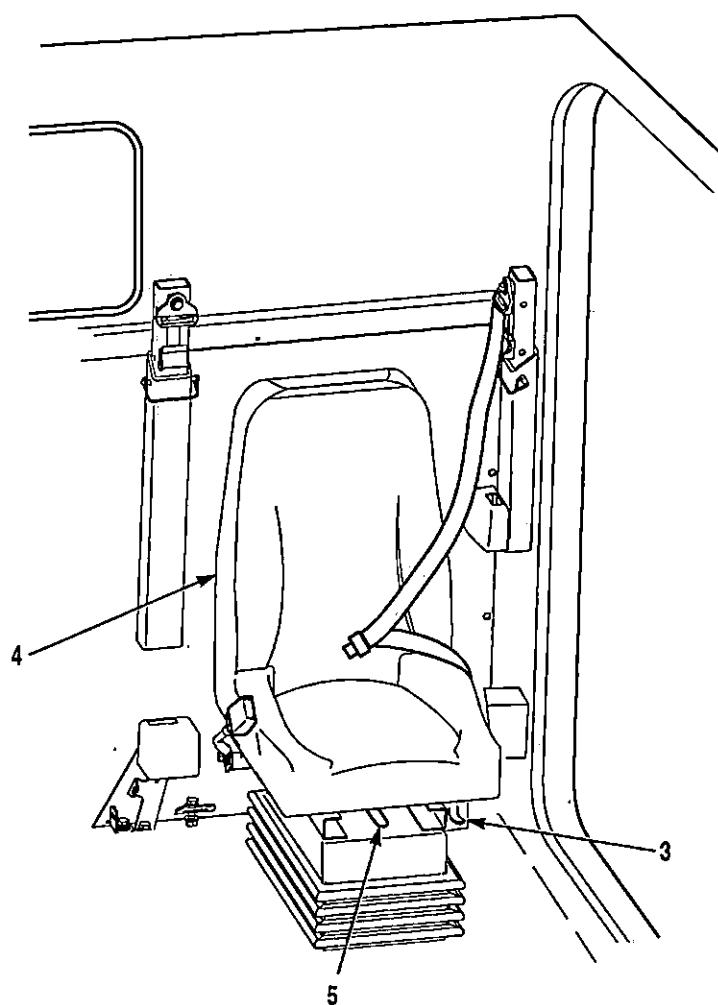


Figure 3.

- c. Adjust seat (4) forward or backward as required using adjustment lever (5).
4. Crew Seat belt Adjustment.

**NOTE**

Seat belt/shoulder harness is two belts combined together. The belt below the buckle is the seat belt, the belt above the buckle is the shoulder harness.

- a. Buckle seat belt (1) and shoulder harness (2) by pushing buckle (3) into latch (4) until click is heard.

**WARNING**

When adjusting the shoulder restraint columns, always adjust shoulder restraint columns in the intermediate or upper positions such that the harness crosses shoulder and not across the face or under the shoulder. The fully lowered position is only used when the cab is lowered for transport with driver's seat fully lowered and shall never be used during vehicle operation. Using the shoulder restraint column in the fully lowered position during operation is unsafe and places the driver at increased risk due to improper positioning of the seat belt across the occupant. Failure to comply may result in injury or death to personnel.

- b. Adjust column (5) by removing clip (6) and raising or lower column (5) until desired height is obtained. Install clip (6).

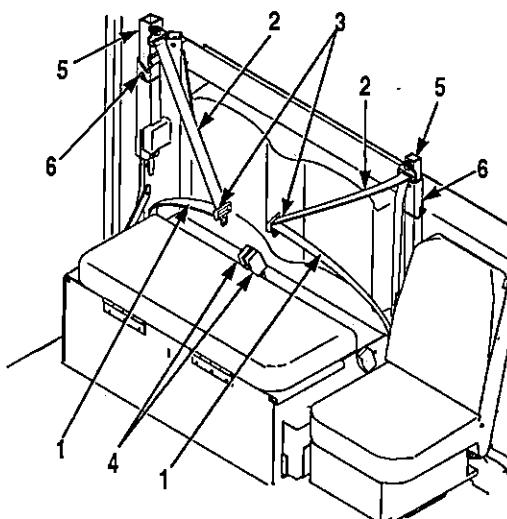


Figure 4.

- c. Position seat belt on hips as low as possible.

**NOTE**

Seat belt does not have self adjusting lock. Remove slack from seat belt by pulling on shoulder harness end. Adjust shoulder harness until snug against chest (no more than one inch [2.5 cm] away).

- d. Pull shoulder harness (2) until seat belt (1) fits snug at hips.

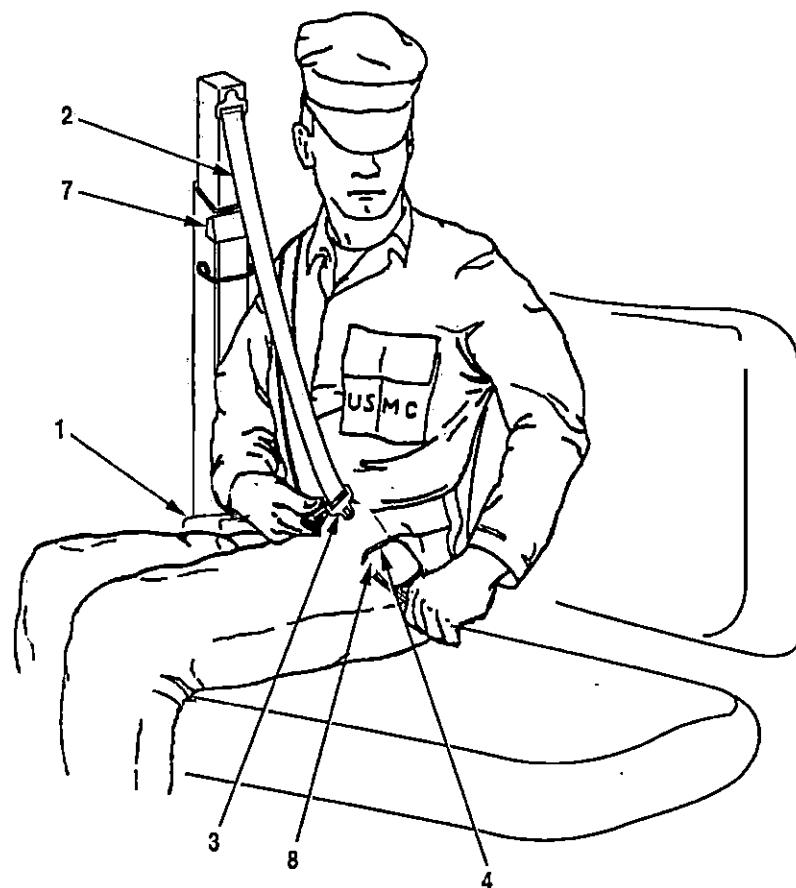


Figure 5.

- e. Adjust shoulder harness (2) length by releasing latch (7) and adjusting shoulder harness (2) no more than one inch away from chest. Engage latch (7) to hold adjustment.
- f. To release seat belt/shoulder harness (2), push in release button (8) and pull buckle (3) from latch (4).

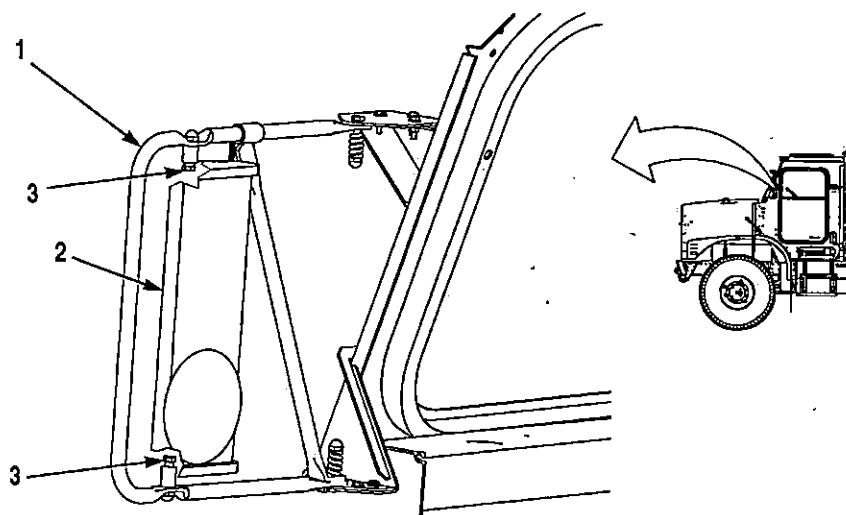


Figure 6.

## 5. Mirror Adjustment.

- a. Adjust side mirror frames (1).

**WARNING**

Ensure side mirrors are adjusted to allow for full range of view prior to operating vehicle. Failure to comply may result in injury or death to personnel.

- b. Adjust mirrors (2) by pivoting them until back of vehicle and road can be seen.
- c. Loosen two nuts (3), and tilt mirror if additional adjustment is required.

## 6. Driver's Seat belt Adjustment.

**NOTE**

Seat belt/shoulder harness is two belts combined together. The belt below the buckle is the seat belt, the belt above the buckle is the shoulder harness.

- a. Buckle seat belt (1) and shoulder harness (2) by pushing buckle (3) into latch (4) until a click is heard.

**WARNING**

When adjusting the shoulder restraint columns, always adjust shoulder restraint columns in the intermediate or upper positions such that the harness crosses shoulder and not across the face or under the shoulder. The fully lowered position is only used when the cab is lowered for transport with driver's seat fully lowered and shall never be used during vehicle operation. Using the shoulder restraint column in the fully lowered position during operation is unsafe and places the driver at increased risk due to improper positioning of the seat belt across the occupant. Failure to comply may result in injury or death to personnel.

**NOTE**

If required, adjust height of columns until shoulder harness positions across shoulder and NOT across face or under shoulder.

b. Adjust column (5) by removing clip (6) and raising or lowering column (5) until desired height is obtained. Install clip (6).

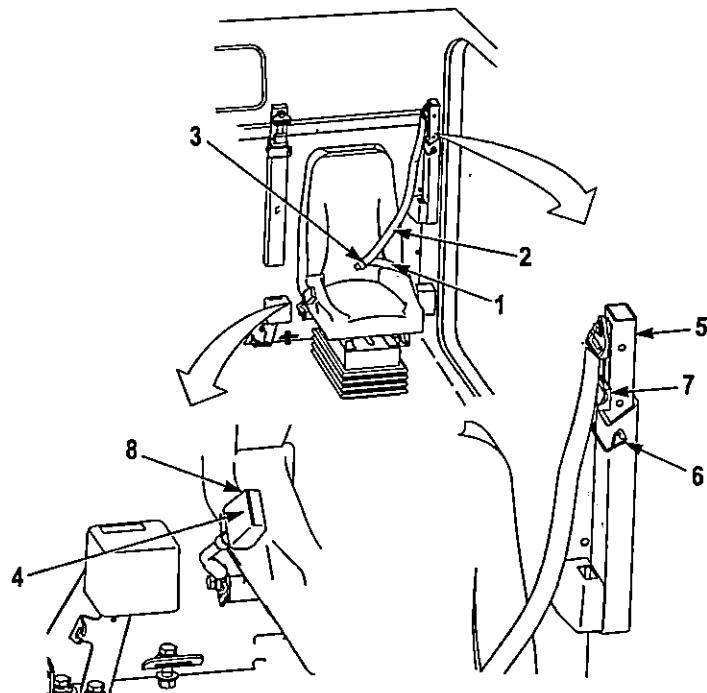


Figure 7.

c. Position seat belt on hips as low as possible.

#### NOTE

Seat belt does not have self adjusting lock. Remove slack from seat belt by pulling on shoulder harness end. Adjust shoulder harness until snug against chest (no more than one inch [2.5 cm] away).

d. Pull shoulder harness (2) until seat belt (1) fits snug at driver's hips.

e. Adjust shoulder harness (2) length by releasing latch (7) and adjust shoulder harness (2) no more than one inch away from chest. Engage latch (4) to hold adjustment.

f. To release seat belt/shoulder harness (2), push in release button (8) and pull buckle (3) from latch (4).

7. Operate Service Lights/Blackout Lights.

#### NOTE

- Use rocker switches on instrument panel to check operation of the following lights.
- The headlight/clearance light switch has three positions; OFF (down), CLEARANCE/MARKER LIGHTS and PARKING LIGHTS (middle), and HEADLIGHTS WITH CLEARANCE/MARKER LIGHTS and PARKING LIGHTS (up).

a. Turn headlight/clearance light switch (1) to UP position.

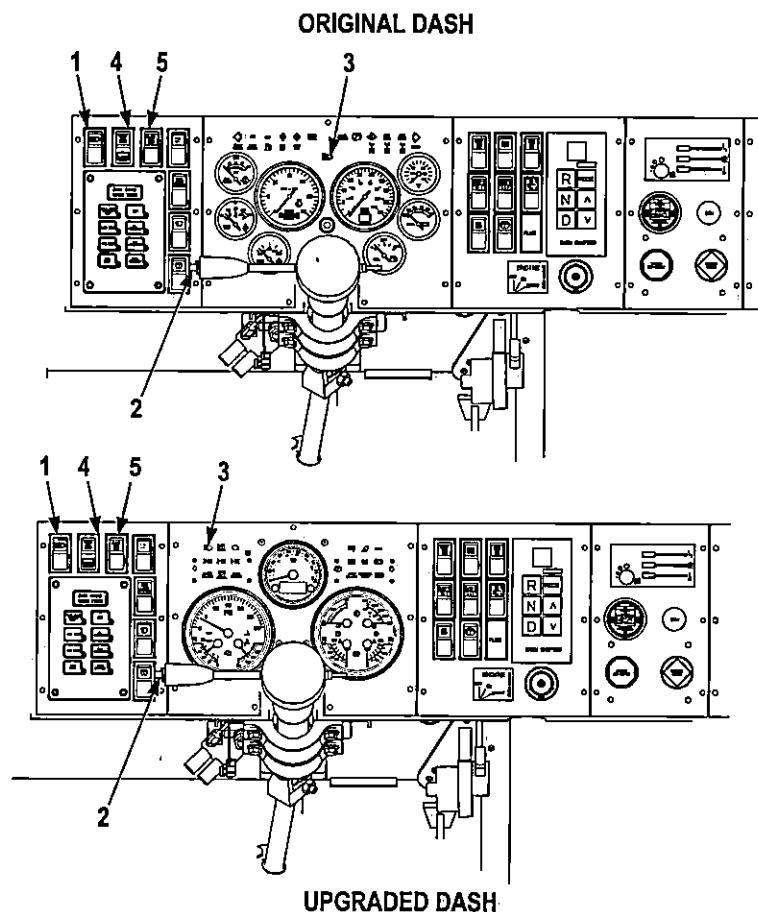


Figure 8.

b. With headlights on, press dimmer switch (2) to select HIGH or LOW beam. High beam indicator (3) will light when HIGH beam is on.

#### NOTE

- Push switch lock on lower part of switch up to operate blackout select switch.
- Panel dimmer switch is a three position switch. Down position is OFF, center position is LOW, and up position is HIGH.
- In blackout mode, panel dimmer switch should be turned OFF.

c. Push blackout selector switch (4) up to position lighting system in BLACKOUT mode.

#### NOTE

Blackout light switch has three positions; OFF (down), COMPOSITE LIGHTS (middle), and COMPOSITE LIGHTS and HEADLIGHT (up).

d. Turn blackout drive lights (5) to UP position.

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
NORMAL START - ABOVE 32°F (0°C)**

---

**INITIAL SETUP:**

Not Applicable

---

**WARNING**



Ensure all personnel are clear of vehicle before engine start is attempted. Operator must visually check to see that all areas of vehicle are clear of personnel prior to attempting to start engine. Failure to comply may result in serious injury or death to personnel.

**NOTE**

- When starting engine below 32°F (0°C), refer to Operate Vehicle in Cold Environment (WP 0076). For starting engine in extremely cold weather, refer to Operate Vehicle in Extreme Cold Environment (WP 0077).
- Before attempting to operate vehicle, be sure to perform PMCS (WP 0092). Also, be familiar with all controls and indicators.

**WARNING**



Ensure all personnel are clear of vehicle before engine start is attempted. Operator must visually check to see that all areas of vehicle are clear of personnel prior to attempting to start engine. Failure to comply may result in serious injury or death to personnel.

**NOTE**

- When starting engine below 32°F (0°C), refer to Operate Vehicle in Cold Environment (WP 0076). For starting engine in extremely cold weather, refer to Operate Vehicle in Extreme Cold Environment (WP 0077).
- Before attempting to operate vehicle, be sure to perform PMCS (WP 0093). Also, be familiar with all controls and indicators.

1. Apply parking brake by pulling out on PARKING BRAKE valve (1).

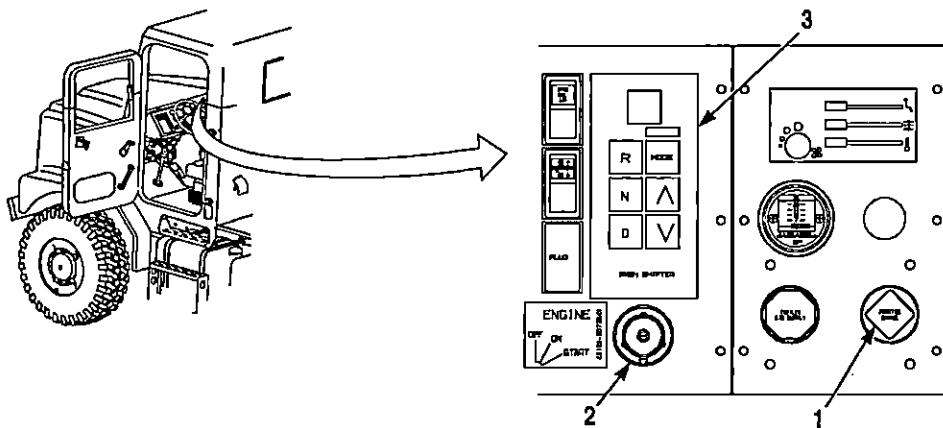


Figure 1.

2. Turn ignition switch (2) to ON position and ensure transmission range selector (3) is in N (neutral).

#### CAUTION

- If engine fails to start after five start attempts, refer to Troubleshooting. Failure to comply may result in damage to equipment.
- Do not turn ignition switch to START position while engine is rotating or damage to equipment may result.
- If engine fails to start, wait 15 seconds prior to next start attempt to allow starter to cool. Failure to comply may result in damage to equipment.

#### NOTE

- If air pressure in the brake system is low, a warning buzzer and low air warning lights in cab will activate. This is normal for initial starts. Buzzer and lights will shut off once air pressure builds up to 64 to 76 psi (441 to 524 kPa).
- If engine fails to start, ignition switch must be returned to OFF position prior to next start attempt.
- Low air 1 warning light and low air 2 warning light may light.

3. Turn ignition switch (2) to START for approximately 10 seconds or until engine starts. Release ignition switch (2). Ignition switch will spring back to ON position. Low oil pressure light (4), low air 1 warning light (5), and low air 2 warning light (6), may light. ATC light (7) will illuminate (refer to Instrument Panel Controls and Indicators (WP 0011)).

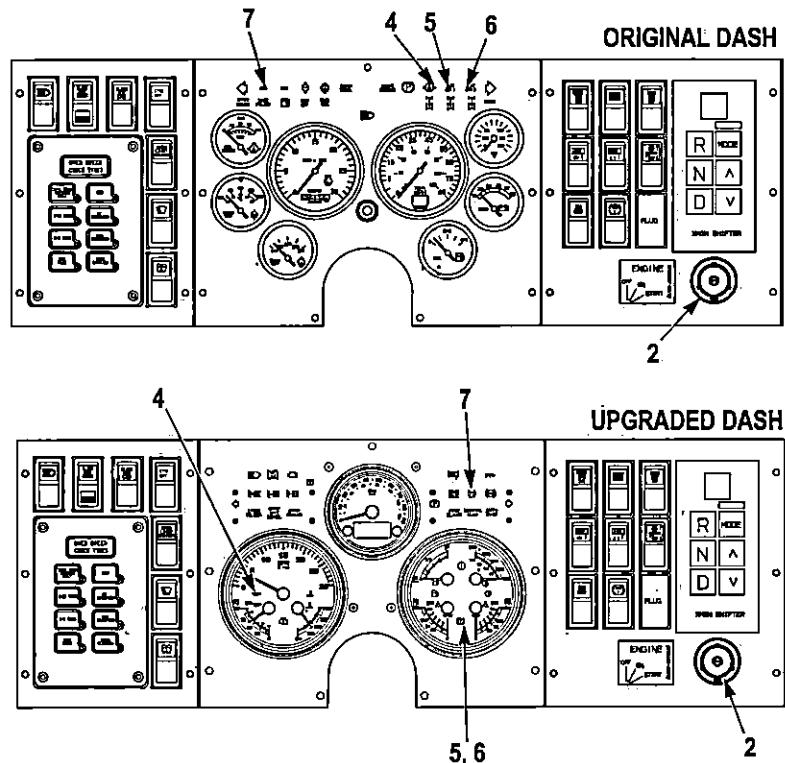


Figure 2.

4. Run engine at 800 to 1000 rpm for three minutes.

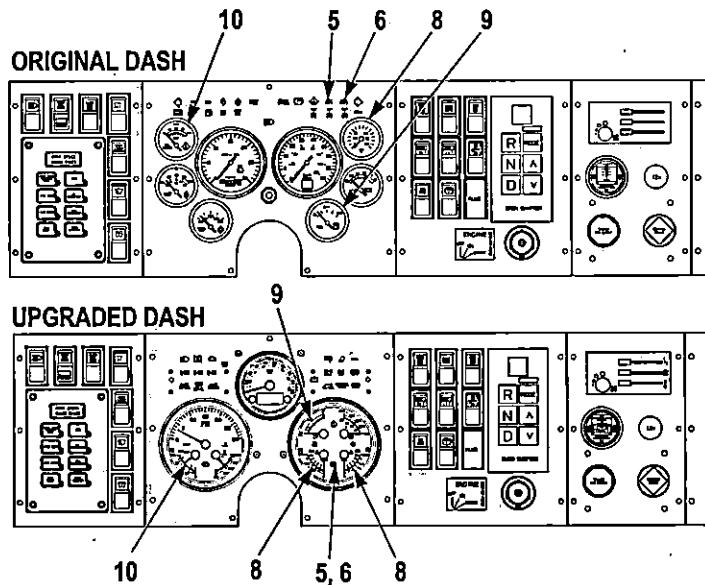


Figure 3.

5. Check that both needles on AIR PRESS gauge (8) read 100 to 125 psi (690 to 862 kPa) (ORIGINAL DASH).

6. Check that needle on FRONT AIR PRESS gauge (8) and REAR AIR PRESS gauge (8) read 100 to 125 psi (690 to 862 kPa) (UPGRADED DASH).
7. Check that LOW AIR 1 warning light (5) and LOW AIR 2 warning light (6) remain illuminated until red and green needles on AIR PRESS gauge (8) reach 64 to 76 psi (441 to 524 kPa) (ORIGINAL DASH).
8. Check that LOW AIR 1 warning light (5) and LOW AIR 2 warning light (6) remain illuminated until needle on FRONT AIR PRESS gauge (8) and REAR AIR PRESS gauge (8) reach 64 to 76 psi (441 to 524 kPa) (UPGRADED DASH).
9. Check that FUEL gauge (9) shows sufficient fuel to complete mission.
10. Check that OIL PRESS gauge (10) reads in safe operating range.

#### NOTE

WATER TEMP gauge may not show reading at engine idle.

11. Check that WATER TEMP gauge (11) does not read over 220°F (104°C).

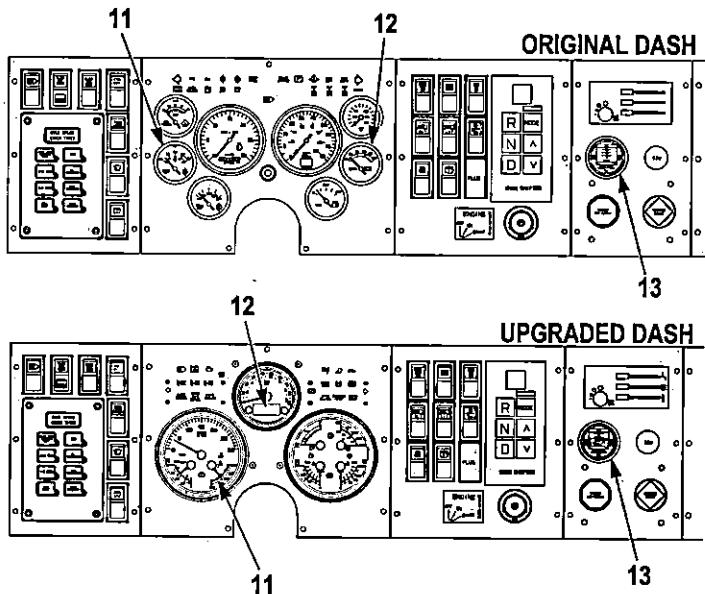


Figure 4.

12. Check that 24V VOLT gauge (12) reads between 24 and 30 volts.
13. Check that air filter restriction indicator (13) shows green and less than 15 inches.

#### NOTE

Vehicle may be operated until air filter restriction indicator reads up to a maximum of 20 inches.

14. If air filter restriction indicator (13) reads 15 inches or more, notify Second Echelon Maintenance.

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE**  
**OPERATE SERVICE BRAKES**

---

**INITIAL SETUP:**

Not Applicable

---

**WARNING**

Rapid operation of service brakes will consume compressed-air supply and cause automatic spring brake application. Always observe air pressure gauge. Failure to comply may result in damage to equipment or injury to personnel.

**WARNING**

Maximum braking requires 100 psi (690 kPa) or more air pressure for service brakes, as indicated by air pressure gauge. If air pressure drops below 100 psi (690 kPa), braking ability will be reduced. If air pressure continues to drop, air system is malfunctioning. Operating vehicle with reduced air pressure may result in serious injury or death to personnel.

**WARNING**

If air pressure gauge(s) reads approximately 45 psi (310 kPa) or less, spring brakes will be applied automatically, causing vehicle to stop rapidly, resulting in serious injury or death to personnel.

1. Prior to operating vehicle, ensure AIR PRESS gauge(s) (1) read at least 100 psi (690 kPa).

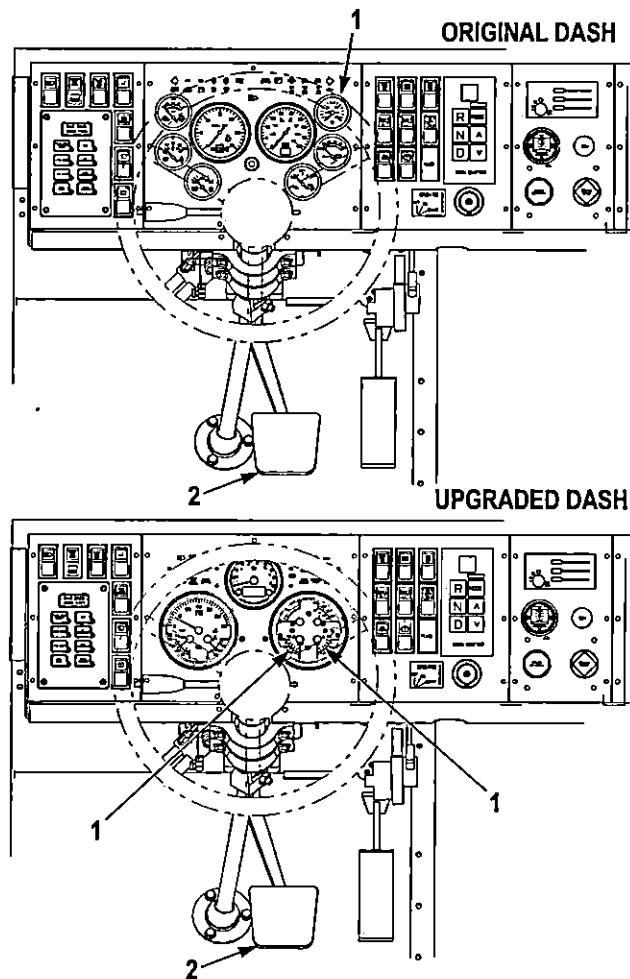


Figure 1.

2. Push down and hold service brake pedal (2) as required to slow or stop vehicle.

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
OPERATE TRANSMISSION****INITIAL SETUP:**

Not Applicable

1. Start engine (WP 0029).

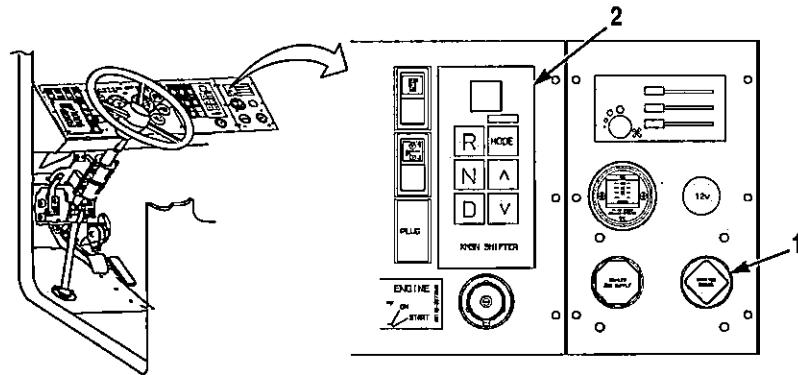


Figure 1.

2. Push in PARKING BRAKE control (1) to release parking brake.

**NOTE**

- Located on transmission range selector is a MODE button. In the upper right-hand corner of the MODE button is a red indicator that lights only when MODE button is turned on. The MODE button is only activated for 7-Ton Trucks equipped with self-recovery winch. For 7-Ton Trucks without a self-recovery winch, MODE button serves no purpose.
- Transmission range selector has six buttons and a digital display. The six buttons are; R (reverse), N (neutral), D (drive), (up), (down), and MODE. The vehicle has seven forward gears. Maximum forward gear available is gear seven.
- When vehicle is positioned in (D), gear seven is automatically chosen and displayed in digital display window. The transmission automatically upshifts and downshifts within the selected range during vehicle operation.
- On WTEC III transmission vehicles the top forward gear of gear range is displayed in single digital display on the top of the transmission range selector and can be changed by using (up) and (down) buttons.
- On GEN IV transmission vehicles the digital display at the top left of the transmission range selector displays the top forward gear of gear range selected and can be changed by using (up) and (down) buttons. The digital display at the top of the transmission range selector displays what gear the vehicle is currently in.
- When engine brake/retarder switch is activated and vehicle is decelerating, the No. 3 will be displayed in the display window of the transmission selector.

3. Ensure transmission range selector (2) is set to N (neutral).

**CAUTION**

Service brake pedal must be applied and vehicle stopped when shifting among D-N-R shift selections. Failure to comply may result in damage to equipment.

4. Apply service brake pedal (3) and push appropriate buttons on transmission range selector (2) to set transmission range to desired position.

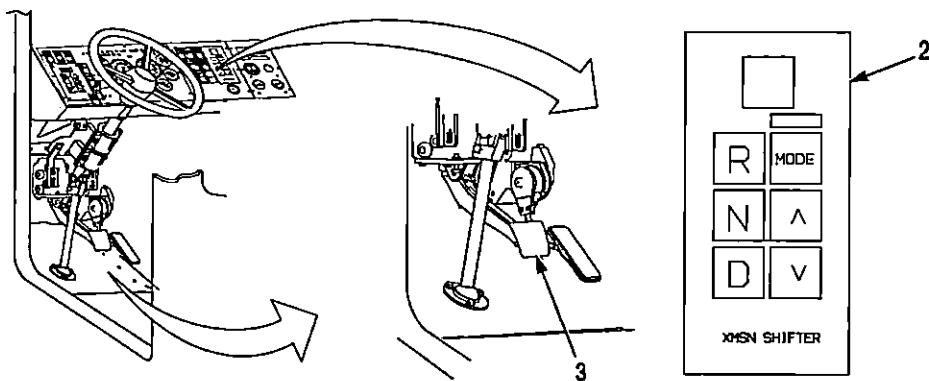


Figure 2.

5. To move vehicle backwards, select R (reverse).

**WARNING**

If the operator leaves the vehicle, even momentarily, when engine is running, the transmission MUST be in N (neutral), PARKING BRAKE must be set and engaged, and wheel MUST be chocked. Unexpected and sudden vehicle movement may occur causing injury or death to personnel.

6. To start or park vehicle; select N (neutral).
7. To drive in normal conditions or move forward from a stopped position, select D (drive).

**END OF TASK**

**END OF WORK PACKAGE**

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**1ST ECHELON MAINTENANCE**  
**OPERATE ENGINE BRAKE/RETARDER**

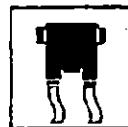
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**INITIAL SETUP:**

Not Applicable

---

**WARNING**



Use engine brake/retarder only when vehicle tires have good traction. Use of engine brake/retarder on slick or loose surfaces can cause vehicle to skid and cause injury or death to personnel.

**CAUTION**

Do not apply engine brake/retarder if engine speed is over 2100 rpm. Damage to engine may occur.

**NOTE**

- Service brakes may be used in addition to engine brake/retarder to obtain maximum braking.
- Use engine brake/retarder when long application of service brakes is not desired (i.e., long downgrades).
- Engine brake/retarder will not engage when transmission is in first gear.
- Engine brake/retarder disengages when engine speed drops below 1000 rpm in third gear or 800 rpm in second gear or when accelerator is re-engaged.

1. Set engine brake/retarder ON/OFF switch (1) to ON (up).
2. Set engine brake/retarder HIGH, MED, LOW switch (2) to LOW.

**NOTE**

When engine brake/retarder switch is activated and vehicle is decelerating, the No. 3 will be displayed in the display window of the transmission selector on WTEC III transmission vehicles. On GEN IV transmission vehicles the No. 3 will be displayed in the left window while the right window will continue to display the gear the vehicle is currently in.

3. Lift foot off throttle pedal (3). Engine brake/retarder will automatically slow vehicle.

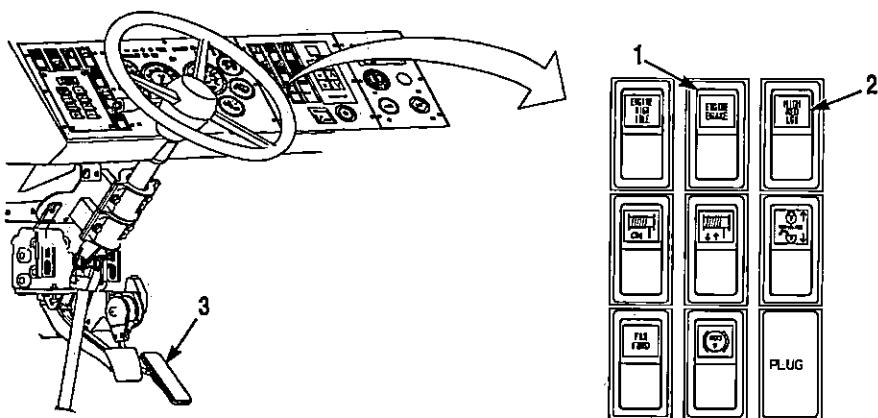


Figure 1.

4. Optimum braking occurs with engine between 1650 and 2100 rpm. Select appropriate transmission range and engine brake/retarder HIGH, MED, LOW switch (2) setting to maintain desired effect.
5. If more braking is required, set engine brake/retarder HIGH, MED, LOW switch (2) to MED or HIGH.
6. When no engine braking is required, turn HIGH, MED, LOW switch (2) to LOW and turn engine brake/retarder ON/OFF switch (1) to OFF.

**END OF TASK**

**END OF WORK PACKAGE**

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## 1ST ECHELON MAINTENANCE NORMAL DRIVING PROCEDURES

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### INITIAL SETUP:

Not Applicable

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### WARNING

- Fluid slosh can produce a vehicle rollover. Transportation of bulk liquids create fluid motions that can disturb and destabilize vehicle movements. Major slosh motions develop during vehicle cornering and braking. Always do the following to minimize fluid slosh:
  - Transport containers that are either filled to their capacity or practically emptied.
  - Avoid quick braking. Keep safe distance between you and the vehicle in front of you and brake early.
  - Avoid abrupt lane changes. Make lane changes gradually.
  - Make turns slowly and cautiously.
  - Operate vehicle at safe, prudent speeds to keep vehicle in control.
  - Failure to comply may result in injury or death to personnel.

### WARNING



If the operator leaves the vehicle, even momentarily, when engine is running, the transmission MUST be in N (neutral), PARKING BRAKE must be set and engaged, and wheel MUST be chocked. Unexpected and sudden vehicle movement may occur causing injury or death to personnel.

### WARNING



Increased effort will be required to turn steering wheel if there is a failure of hydraulic steering system or engine stops running. Stop vehicle as soon as road conditions permit. Operating vehicle with impaired steering could result in serious injury or death to personnel.

**WARNING**

Be alert at all time for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately and notify Second Echelon Maintenance. Failure to comply may result in injury or death to personnel and/or damage to equipment.

1. Remove and stow wheel chocks.

**WARNING**

If the operator leaves the vehicle, even momentarily, when engine is running, the transmission MUST be in N (neutral), PARKING BRAKE must be set and engaged, and wheel MUST be chocked. Unexpected and sudden vehicle movement may occur causing injury or death to personnel.

**WARNING**

Increased effort will be required to turn steering wheel if there is a failure of hydraulic steering system or engine stops running. Stop vehicle as soon as road conditions permit. Operating vehicle with impaired steering could result in serious injury or death to personnel.

**WARNING**

Be alert at all time for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately and notify Second Echelon Maintenance. Failure to comply may result in injury or death to personnel and/or damage to equipment.

2. Remove and stow wheel chocks.
3. Unlock steering wheel (WP 0040).
4. Adjust seat (1) as required (WP 0028).

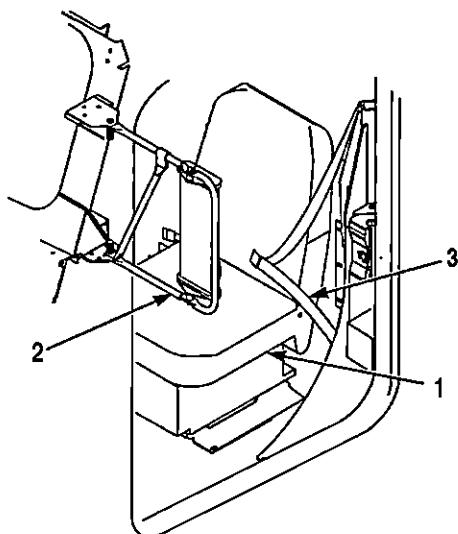


Figure 1.

5. Adjust each rearview mirror (WP 0028) (2) until rear of vehicle and view of road can be seen.
6. Adjust and fasten seat belt (WP 0028) (3).
7. Start engine (WP 0029).
8. Turn on lights as required (WP 0028).
9. Make sure both AIR PRESS gauge needles (4) read at least 100 psi (690 kPa) before driving vehicle.

**WARNING**

Rapid operation of service brakes will consume compressed-air supply and cause automatic spring brake application. Always observe air pressure gauge. Failure to comply may result in damage to equipment or injury to personnel.

**WARNING**

Make sure both AIR PRESS gauge needles read at least 100 psi (690 kPa) and that LOW AIR indicator lights have gone out and warning alarm has quit sounding before pushing in PARKING BRAKE control valve and driving vehicle. If LOW AIR indicator lights come back on and warning alarm sounds when PARKING BRAKE control valve is pushed in, pull PARKING BRAKE control valve out and allow more air to build up in system. Do NOT drive vehicle until PARKING BRAKE control valve can be pushed in without LOW AIR indicator lights coming on and warning alarm sounding. Failure to comply may result in damage to equipment or injury to personnel.

**CAUTION**

Do not change CTIS controller or driveline lock settings while vehicle is turning or wheels are slipping. Damage to equipment may occur.

**NOTE**

For a detailed explanation, refer to CTIS (WP 0043).

10. Set CTIS controller (5) to appropriate settings.

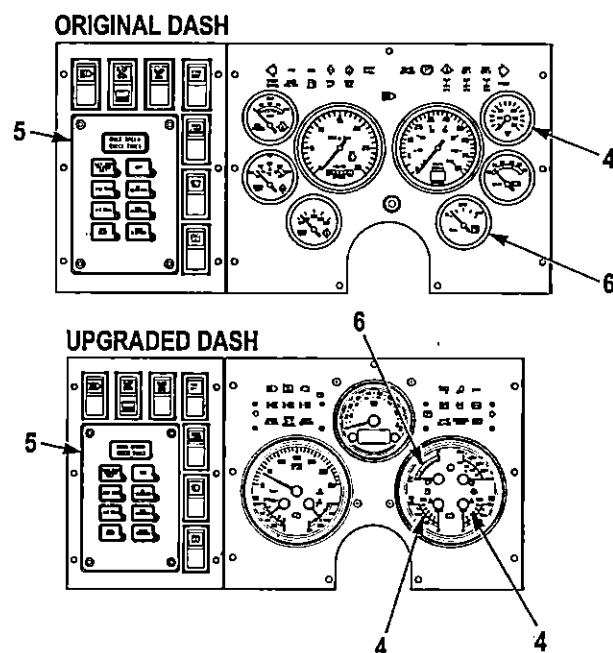


Figure 2.

11. Check that fuel gauge (6) indicates enough fuel to complete mission.

12. Check that oil pressure gauge (7) indicates safe range at idle and increases as engine speed increases.
13. After transmission warms up, check that transmission oil temperature gauge (8) reads below 250°F (121°C).
14. Check that volt gauge (9) reads 24 to 30 volts.
15. Check that water temperature gauge (10) reads below 220°F (104°C).

## WARNING



Do not back up without a ground guide. Failure to comply may result in damage to vehicle or injury or death to personnel.

16. Apply service brake pedal (11) and set transmission range selector (12) to appropriate range.

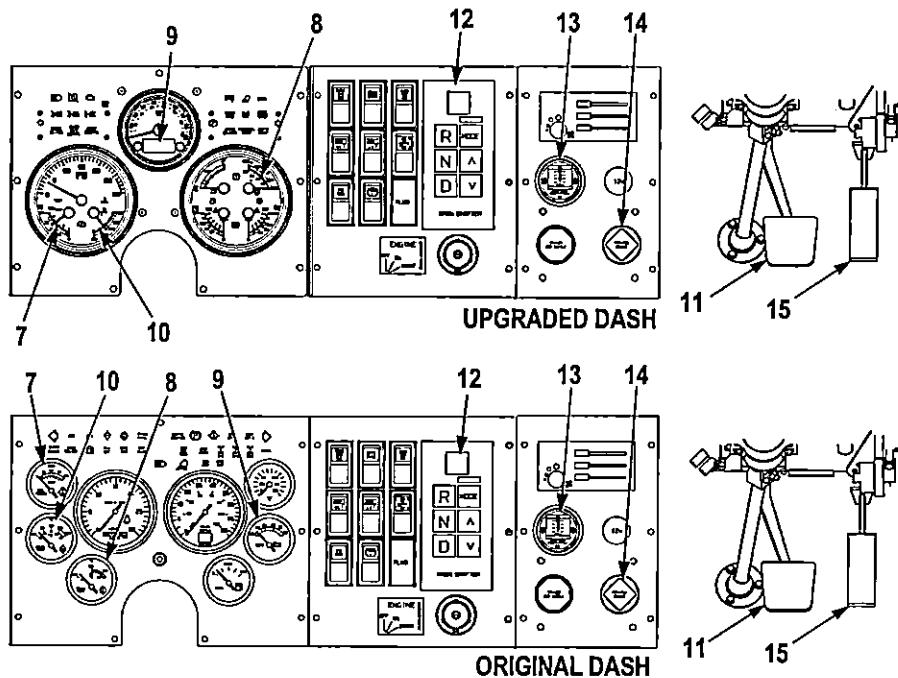


Figure 3.

17. Check that air filter restriction indicator (13) shows green and less than 15 inches.

## NOTE

Vehicle may be operated until air filter restriction indicator reads up to a maximum of 20 inches.

18. If air filter restriction indicator (13) reads 15 inches or more, notify Second Echelon Maintenance.
19. Push in PARKING BRAKE control valve (14).
20. Release service brake pedal (11) and slowly press down on throttle pedal (15).

**CAUTION**

- Do not hold steering wheel at full left or full right for longer than 10 seconds. Oil overheating and pump damage can result.
- CTIS increases tire pressure when vehicle speed exceeds the allowable speed for each setting. When an increase in speed is required, maintain the lower speed until tires are inflated to correct pressure (refer to CTIS (WP 0043)). Failure to comply may result in damage to equipment.
- Do not allow vehicle to coast in N (neutral). This can result in severe transmission damage and unsafe operation.
- Maximum governed engine speed with transmission in N (neutral) is approximately 2125 rpm. Never allow engine speed to exceed this figure. Under load, governed speed is approximately 2100 rpm. If engine is allowed to go over governed speeds, serious engine damage can result.

21. Accelerate, brake, and steer as required.

22. Check system gauges often.

**NOTE**

Engine oil pressure has three monitoring systems, (low oil pressure light, check engine light, and oil pressure gauge). If two of the three systems indicate a problem, park vehicle, shut down engine and notify Second Echelon Maintenance. If only one system indicates a problem, and the other two indicate normal, proceed with mission and then notify Second Echelon Maintenance.

23. Check engine oil pressure by monitoring oil pressure gauge (7), oil pressure light (16), and check engine light (17).

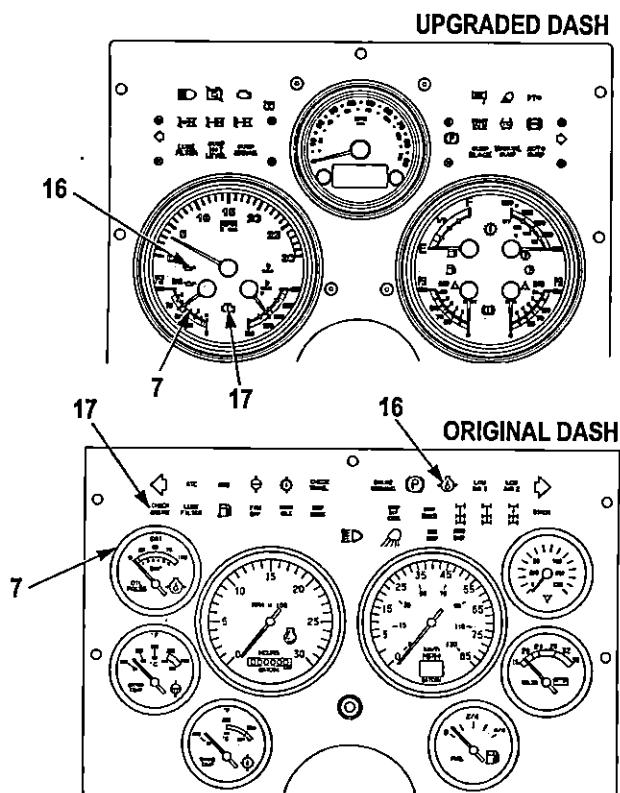


Figure 4.

24. Check engine coolant temperature by monitoring water temperature gauge (10), check engine light (17), and water temperature light (18).

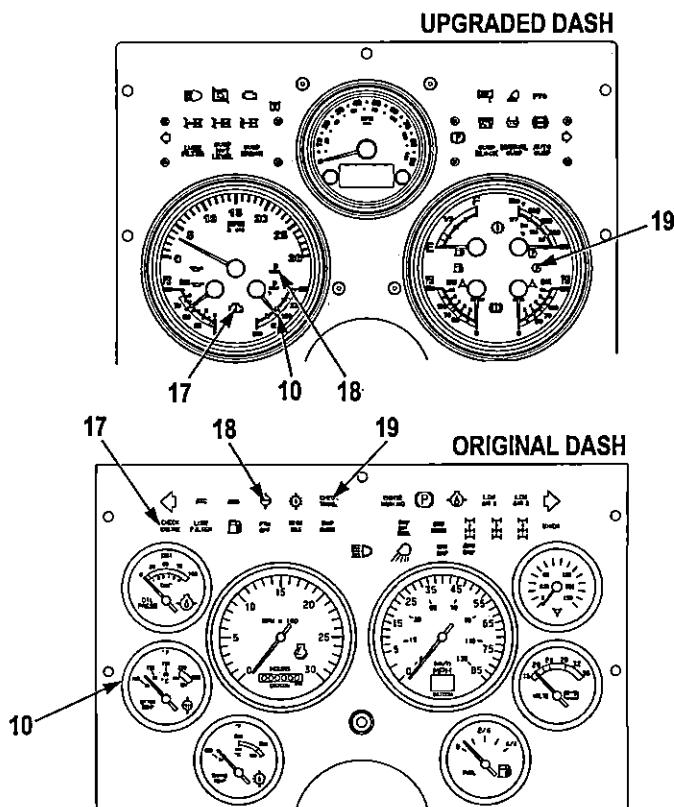


Figure 5.

25. If the check engine light (17) illuminates other than at startup, there is a problem in the engine that could cause damage to the engine. Check for low oil pressure or high water temperature. If indications are normal, continue the mission. Notify Second Echelon Maintenance at completion of mission.

#### NOTE

If transmission check light illuminates at any time other than startup, do NOT turn off engine or shift transmission to N (neutral). Refer to Transmission Limp Home Procedure (WP 0090).

26. If the transmission check light (19) illuminates other than at startup, there is a potential problem in the transmission and transmission may need to be serviced. Check for correct oil level and high transmission oil temperature. If indications are normal, continue the mission. Notify Second Echelon Maintenance at completion of mission.

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
PARK VEHICLE****INITIAL SETUP:**

Not Applicable

1. Lift foot off of throttle pedal (1). Allow automatic downshifting of transmission to slow vehicle.

**WARNING**

Rapid operation of service brakes will consume compressed-air supply and cause automatic spring brake application. Always observe air pressure gauge. Failure to comply may result in damage to equipment or injury to personnel.

2. Push down on service brake pedal (2) until vehicle comes to complete stop.

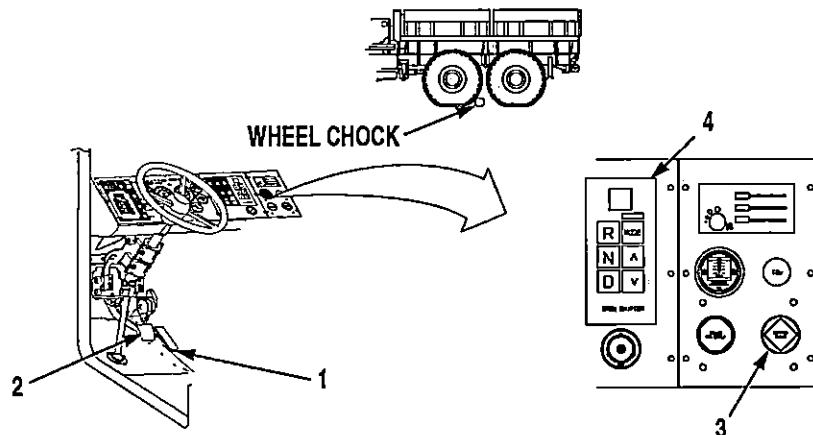


Figure 1.

3. Pull out PARKING BRAKE control valve (3).
4. Position transmission range selector (4) to N (neutral) mode.
5. Align front tires in straight-ahead position.

**WARNING**

When exiting cab, first step is blind step. Be sure of sound footing before proceeding to next step. Failure to comply may result in injury to personnel.

**WARNING**

When parking on steep grades, the CTIS must be in Cross-Country (CC), Mud/Sand/Snow (MSS), or Emergency (EMER) setting, and drivelock must be in full lock condition prior to shutting off engine (WP 0037). Failure to comply may result in injury or death to personnel.

6. Chock wheels.

**END OF TASK****END OF WORK PACKAGE**

## **1ST ECHELON MAINTENANCE SHUT OFF ENGINE**

## INITIAL SETUP:

Not Applicable

1. Park vehicle (WP 0034).
2. Shut down engine brake (1) (if activated).
3. Shut off all lights and switches.

**CAUTION**

Prior to shutting down engine, run engine at 800 to 1000 rpm with transmission in N (neutral) for three minutes to allow turbocharger to slow down and cool off. Engine components may be damaged if not allowed to cool off.

4. Run engine at 800 to 1000 rpm for three minutes.

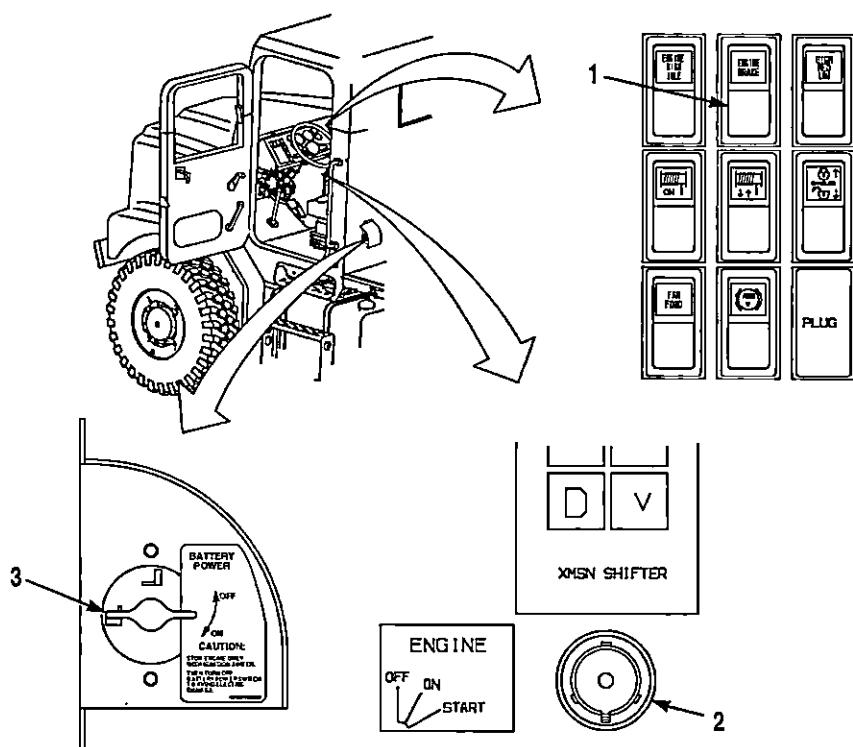


Figure 1.

5. Turn engine IGNITION switch (2) to OFF.
6. Turn battery disconnect switch (3) to OFF.

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
OFF-ROAD CONDITIONS**

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**INITIAL SETUP:**

Not Applicable

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**WARNING**

If the operator leaves the vehicle, even momentarily, when engine is running, the transmission MUST be in N (neutral), PARKING BRAKE must be set and engaged, and wheel MUST be chocked. Unexpected and sudden vehicle movement may occur causing injury or death to personnel.

**CAUTION**

- Before attempting to negotiate terrain conditions such as deep ditches, where axles are likely to be suspended, set CTIS controller and transmission range selector to appropriate settings (refer to CTIS (WP 0043)). Failure to comply may result in damage to equipment.
- Before operating off-road, rear mud flaps need to be pinned on storage hooks located on mud flap brackets. If steep slope is encountered and rear mud flaps are not pinned, damage may result.
- Before operating off-road or up steep grades, ensure underride bar is adjusted to upper position to allow maximum road clearance. Failure to comply may result in damage to vehicle.

1. Adjust underride bar (WP 0105) (1) and rear mudflaps (WP 0106) to raised position.

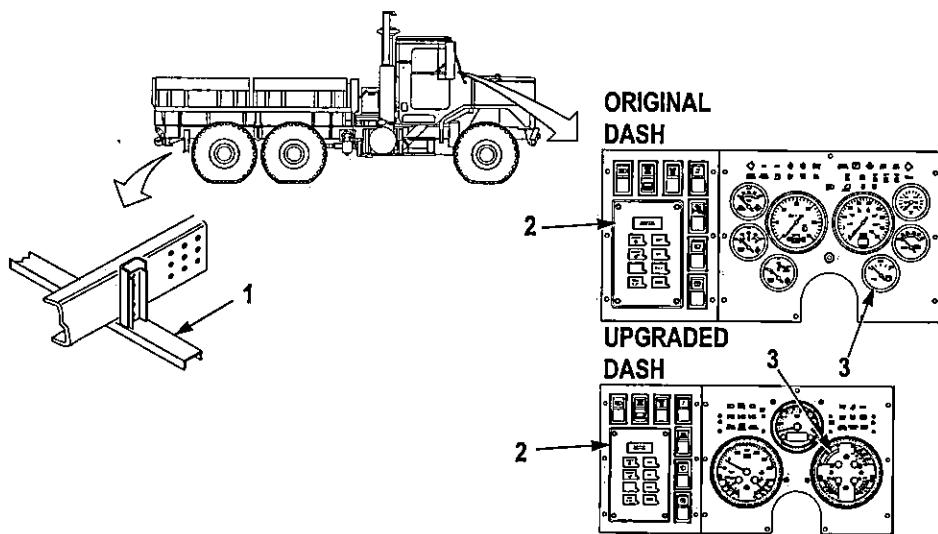


Figure 1.

2. Set CTIS controller (2) to CROSS COUNTRY position and select appropriate weight setting.
3. Check that fuel gauge (3) shows enough fuel to complete mission.

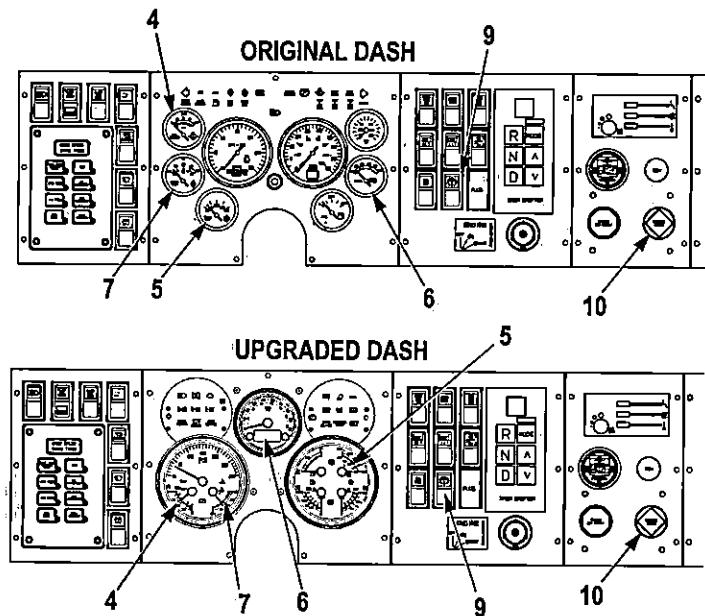


Figure 2.

4. Check that oil pressure gauge (4) reads in safe operating range and increases as engine speed increases.
5. Check that transmission oil temperature gauge (5) reads below 250°F (121°C) after transmission warms up.
6. Check that volt gauge (6) reads 24 to 30 volts.
7. Check that water temperature gauge (7) reads below 220°F (104°C).

8. Apply service brake pedal (8) and position transmission range selector (9) in D (drive) mode and use arrow buttons to select 3, 2, or 1, depending on ground conditions.

**CAUTION**

Ensure both AIR PRESS gauge needles read at least 100 psi (690 kPa) prior to performing Step (9). Failure to comply may result in damage to equipment.

9. Push in PARKING BRAKE control valve (10).

**CAUTION**

Maximum governed engine speed with transmission in N (neutral) is approximately 2125 rpm. Never allow engine speed to exceed this figure. Under load, governed speed is approximately 2100 rpm. If engine is allowed to go over governed speeds, serious engine damage can result.

10. Release service brake pedal (8) and slowly press down throttle pedal (11) until vehicle reaches desired speed.

**CAUTION**

- Do not hold steering wheel at full left or full right for longer than 10 seconds. Oil overheating and pump damage can result. Failure to comply may result in damage to equipment.
- CTIS increases tire pressure when vehicle speed exceeds the allowable speed for each setting. When an increase in speed is required, maintain the lower speed until tires are inflated to correct pressure. Failure to comply may result in damage to equipment.

11. Accelerate, brake, and steer as required.

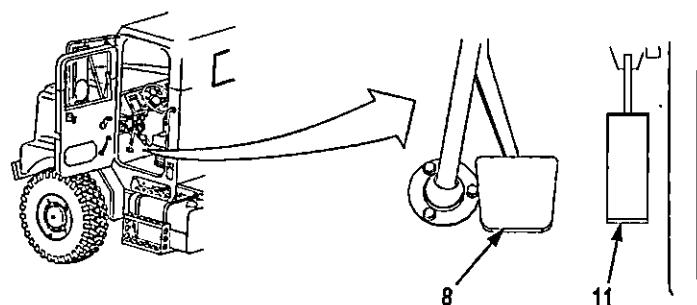


Figure 3.

12. Check system gauges often during vehicle operation as noted in Normal Driving Procedures (WP 0033).
13. When returning to on-road conditions, return transmission range selector and CTIS controller to appropriate settings.
14. Lower underride bar (WP 0105) and rear mudflaps (WP 0106) to normal operating position.

**END OF TASK**

**END OF WORK PACKAGE**

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## 1ST ECHELON MAINTENANCE STEEP GRADES

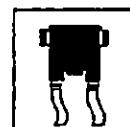
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**INITIAL SETUP:**

Not Applicable

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### WARNING



Use engine brake/retarder only when vehicle tires have good traction. Use of engine brake/retarder on slick or loose surfaces can cause vehicle to skid and cause injury or death to personnel.

### WARNING

Prior to operating a 7-Ton Truck on a steep grade, perform steps (1) and (2). Failure to comply may result in injury or death to personnel.

### CAUTION

- Do not change CTIS controller or drive line lock settings while vehicle is turning or wheels are slipping. Damage to equipment may occur.
- Before operation off-road or up steep grades, rear mud flaps need to be pinned on storage hooks located on mud flap brackets. If steep slope is encountered and rear mud flaps are not pinned, damage to equipment can result.
- Before operating off-road or up steep grades, ensure underride bar is adjusted to upper most position to allow maximum road clearance. Failure to comply may result in damage to vehicle.
- Do not operate vehicle at more than 10 mph (16 km/h) when all differential and transfer case driveline locks are engaged. Failure to comply may cause damage to equipment.
- Do not allow engine speed to go above 2100 rpm when driving downhill or damage to engine can result.
- Engine brake operates best when engine speed is between 1000 and 2100 rpm. Engine brake will disengage when engine speed drops below 1000 rpm in third gear or 800 rpm in second gear. Failure to comply may result in damage to equipment.

**NOTE**

- Engine works hardest when carrying loads uphill. Proper use of gear ranges will minimize stress on engine.
- Use engine brake/retarder when long application of service brakes is not desired (i.e., long downgrades).
- Engine brake/retarder will not engage when transmission is in first gear.

1. Set CTIS (WP 0043) controller (1) and engine brake/retarder (WP 0032) switches (2) to appropriate settings.

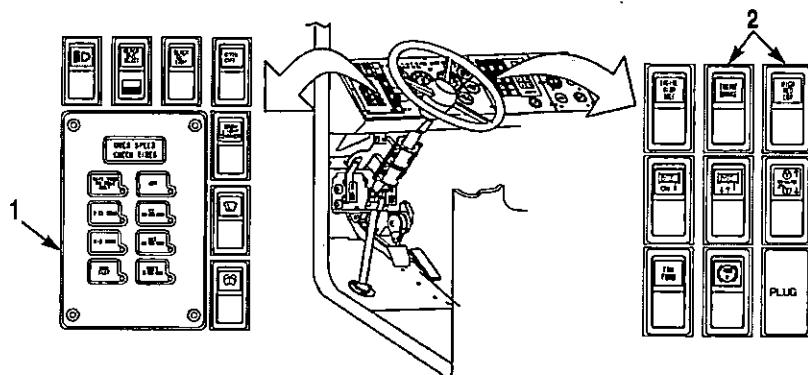


Figure 1.

2. Engage all differential and transfer case driveline locks (WP 0043).

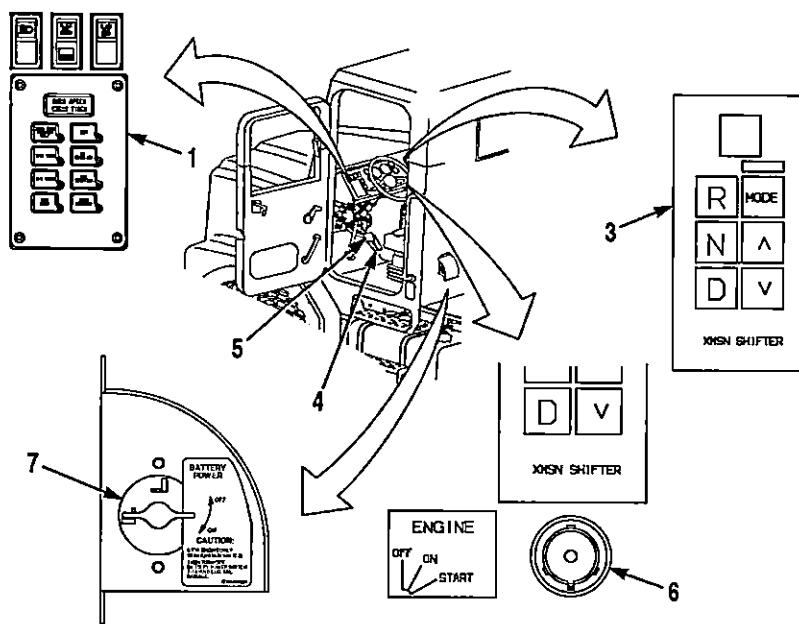


Figure 2.

3. Unless uphill grade is extreme, begin with transmission range selector (3) in gear range D (drive). If there is enough power for safe and satisfactory road speed, remain in D range and allow transmission to shift automatically.
4. If uphill grade causes steady decrease in road speed and engine rpm, perform the following Steps:
  - a. Position transmission range selector (3) to D (drive) mode and use arrow buttons to select 3, 2, or 1, depending on ground conditions.

### CAUTION

Excessive wheel slippage while traveling up steep grade could cause driveline damage. When wheel slippage is detected, stop vehicle immediately.

- b. If wheels start to slip, stop vehicle and adjust CTIS controller (1) to EMERGENCY setting. Gradually apply throttle pedal (4) and release service brake pedal (5) as traction allows (refer to CTIS (WP 0043)).
5. Check system gauges often during vehicle operation (refer to Normal Driving Procedures (WP 0033)).

### WARNING

When parking on steep grades, the CTIS must be in Cross-Country (CC), Mud/Sand/Snow (MSS), or Emergency (EMER) setting, and drivelock must be in full lock condition prior to shutting off engine (WP 0037). Failure to comply may result in injury or death to personnel.

### NOTE

If parking 7-ton truck on a steep grade, perform Steps (6) through (13).

6. Lift foot off throttle pedal (4).

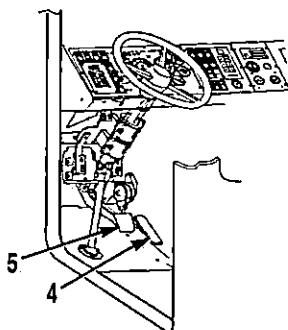


Figure 3.

7. Push down on service brake pedal (5).
8. When vehicle comes to a complete stop, keep applying service brake (WP 0008) and apply parking brake (WP 0011).

#### **WARNING**

Release service brakes slowly. Fast release of service brakes may allow truck to roll before parking brakes engage. Failure to comply may result in injury to personnel.

9. Slowly release service brake pedal (5).
10. Note transmission setting and then position transmission range selector (3) to N (neutral).
11. Turn engine ignition switch (6) to OFF (WP 0035).
12. Turn battery disconnect switch (7) to OFF.
13. Chock wheels (WP 0034).

#### **NOTE**

When starting a vehicle that is parked on a steep grade, perform Steps (14) through (20).

14. Remove and stow wheel chocks.
15. Start engine (WP 0029).
16. Engage all differential and transfer case driveline locks (WP 0043).
17. Set transmission range selector (3) to setting that was noted prior to parking vehicle.
18. Push down on service brake pedal (5).
19. Push in parking brake control valve (8).
20. Release service brake pedal (5), accelerate and drive as required.

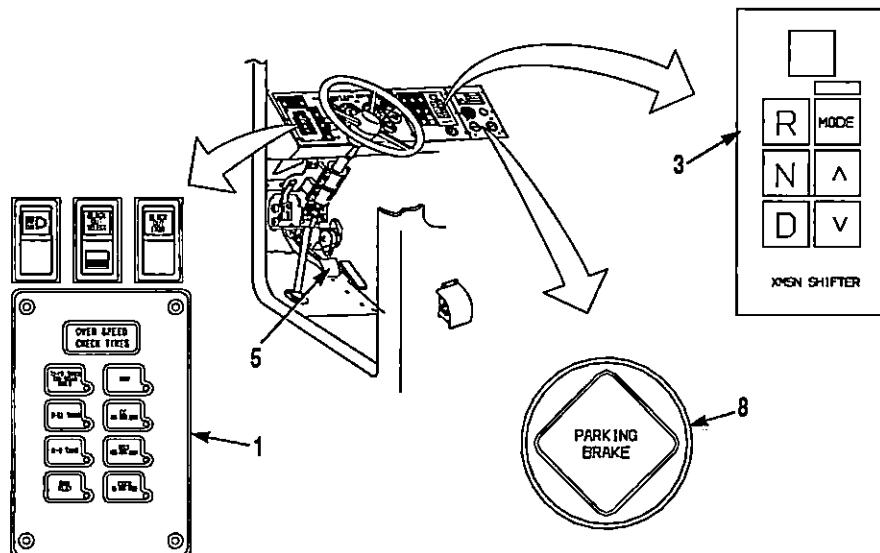


Figure 4.

21. Once grade is crested, adjust transmission range selector (3) and CTIS controller (1) to appropriate settings (refer to CTIS (WP 0043)).
22. When driving down steep grades, perform the following Steps:

#### CAUTION

- Do not allow engine speed to go above 2100 rpm when driving downhill or damage to engine can result.
- Engine brake operates best when engine speed is between 1000 and 2100 rpm. Engine brake will disengage when engine speed drops below 1000 rpm in third gear or 800 rpm in second gear. Failure to comply may result in damage to equipment.

- a. Position transmission range selector (3), as required, to keep engine speed on tachometer between 1000 and 2100 rpm. (refer to Instrument Panel Controls and Indicators (WP 0011)).

#### WARNING



Rapid operation of service brakes will consume compressed-air supply and cause automatic spring brake application. Always observe air pressure gauge. Failure to comply may result in damage to equipment or injury to personnel.

- b. Apply service brake pedal (5) as required to control vehicle speed.

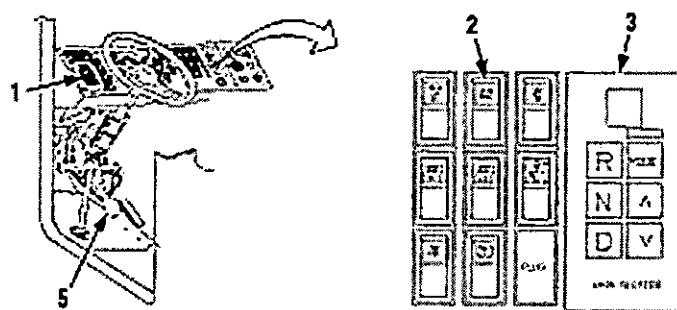


Figure 5.

- c. Use engine brake/retarder (WP 0032) (2) as required.
- d. Accelerate, brake, and steer as required.
- e. Check system gauges often during vehicle operation as noted in Normal Driving Procedures (WP 0033).

23. When conditions improve, return transmission range selector (3) and adjust CTIS controller (1) to appropriate settings. (refer to CTIS (WP 0043)).

**END OF TASK**

**END OF WORK PACKAGE**

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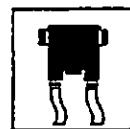
**1ST ECHELON MAINTENANCE  
SLIPPERY CONDITIONS**

---

**INITIAL SETUP:**

Not Applicable

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**WARNING**

Use engine brake/retarder only when vehicle tires have good traction. Use of engine brake/retarder on slick or loose surfaces can cause vehicle to skid and cause injury or death to personnel.

**CAUTION**

- Do not change CTIS controller or drive line lock settings while vehicle is turning or wheels are slipping. Damage to equipment may occur.
- When using EMERGENCY mode on CTIS, top speed should not exceed 5 MPH (8 km/h). Use extreme care as steering response is limited due to drive line lock configuration. Failure to comply may result in damage to equipment.

**NOTE**

Tire chains may be required to aid in traction during slippery conditions (refer to Tire Chain Installation/Removal (WP 0060)).

1. For maximum traction under adverse conditions, set CTIS controller switch (1) to MUD, SAND, SNOW position, or if conditions warrant, to EMERGENCY position. Set cargo load setting to appropriate setting. (refer to CTIS (WP 0043)).

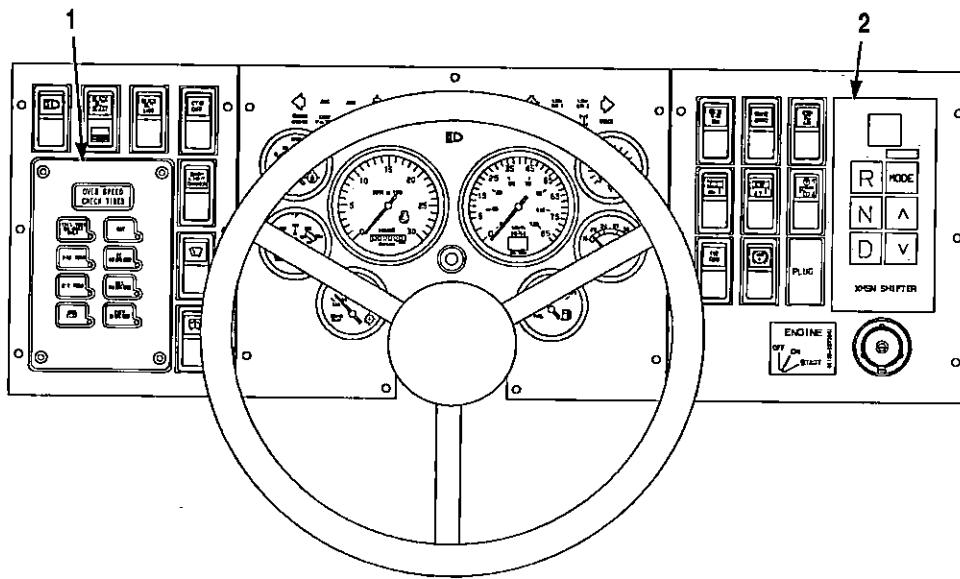


Figure 1.

2. Position transmission range selector (2) to D (drive) mode and use arrow buttons to select 3, 2, or 1, depending on ground conditions. A lower range will give better control on slick or icy roads as well as on steep downgrades.
3. Accelerate, brake, and steer as required.
4. Check system gauges often during vehicle operation as noted in Normal Driving Procedures (WP 0033).
5. When conditions improve, return transmission range selector (2) and CTIS (WP 0043) controller (1) to appropriate settings.

**END OF TASK**

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE RAISE/LOWER HOOD

### INITIAL SETUP:

Not Applicable

#### 1. Raise Hood.

##### **WARNING**



Hood retaining bar must be used and installed properly whenever hood is in upright position. Wind or sudden shifting of vehicle may cause hood to fall. Failure to comply may result in injury or death to personnel.

- a. Unhook rubber latch (1) on each side of cab (2).

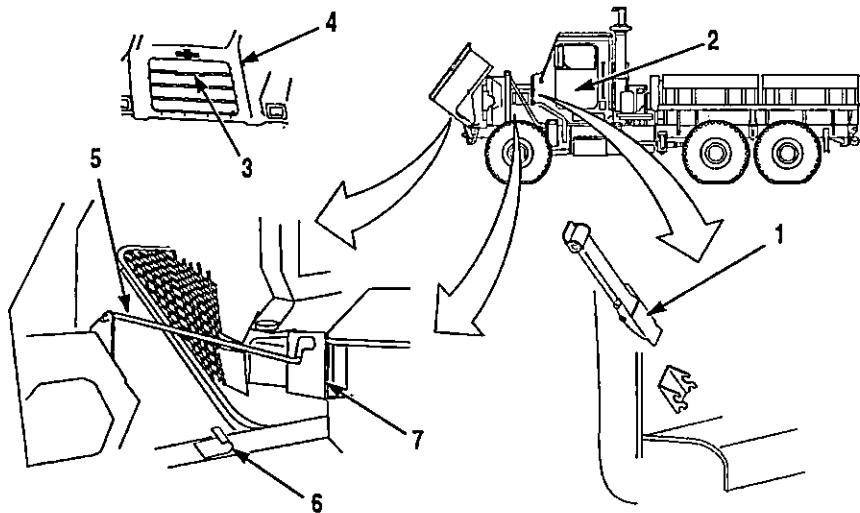


Figure 1.

- b. Pull on handle (3) and raise hood (4) until hood is in fully upright position.
- c. Remove retaining bar (5) from retaining bar clip (6).
- d. Install retaining bar (5) in retaining bar bracket (7).

2. Lower Hood.
- a. Remove retaining bar (5) from retaining bar bracket (7).
- b. Secure retaining bar (5) in retaining bar clip (6).

- c. Slowly lower hood (4).
- d. Secure hood (4) with rubber latch (1) on each side of cab (2).

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
STEERING WHEEL LOCK/UNLOCK****INITIAL SETUP:**

Not Applicable

**1. Steering Wheel Lock.**

- Remove locking pin (1) from bracket (2).

**NOTE**

- Steering column may have to be turned so locking pin can be positioned through brackets and universal joint.
- Steering wheel lock is not accessible on vehicles equipped with cab armor.

- Insert locking pin (1) through two brackets (3) and steering column universal joint (4).

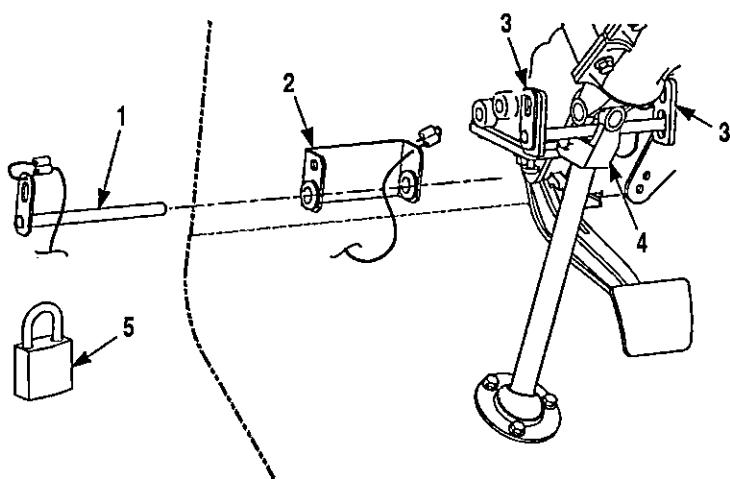


Figure 1.

- Apply lock (5) to locking pin (1) and bracket (3).

- Steering Wheel Unlock.
  - Remove lock (5) from locking pin (1) and bracket (3).
  - Remove locking pin (1) from two brackets (3) and steering column universal joint (4).

- c. Install locking pin (1) in bracket (2).

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
WINDSHIELD WIPERS/WASHER****INITIAL SETUP:**

Not Applicable

1. Turn BATTERY DISCONNECT switch (1) to ON position.

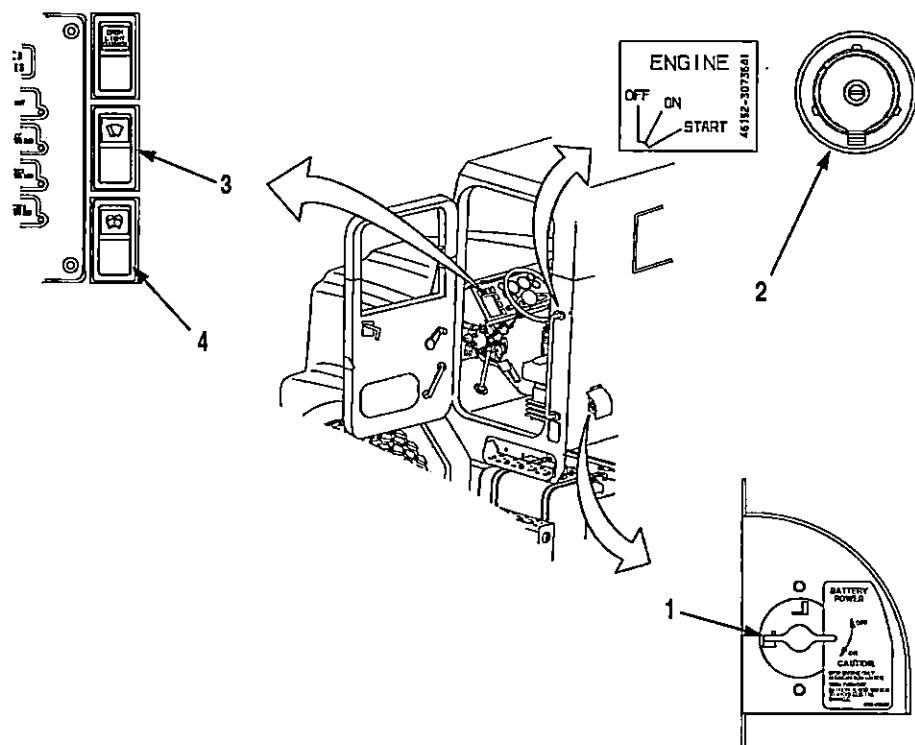


Figure 1.

2. Turn engine IGNITION switch (2) to ON position.
3. To operate windshield wipers, perform Steps (a) and (b).
  - a. Press WIPER switch (3) to center position for low speed and upper position for high speed.
  - b. Press WIPER switch (3) to lower position to stop windshield wipers.
4. To operate windshield washer, perform Steps (a) and (b).
  - a. Press and hold WASHER switch (4) up to spray washer fluid on windshield.

- b. Release WASHER switch (4) to stop washer fluid spray.

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
FIRE EXTINGUISHERS**

---

**INITIAL SETUP:**

Not Applicable

---

**WARNING**

Do not incinerate. Failure to comply may result in injury or death to personnel.

**WARNING**

Do not discharge at a person's face. Failure to comply may result in injury or death to personnel.

**WARNING**

Do not inhale the dry chemical agent. Failure to comply may result in injury or death to personnel.

**WARNING**

Avoid exposure to contents if wearing contact lenses, have respiratory illnesses, or have skin allergies. In case of contact with agent, flush the affected area with clean, cool water. Failure to comply may result in injury to personnel.

**NOTE**

Become familiar with operating instructions, warnings, and cautions listed on fire extinguishers.

1. Remove Fire Extinguisher from bracket.

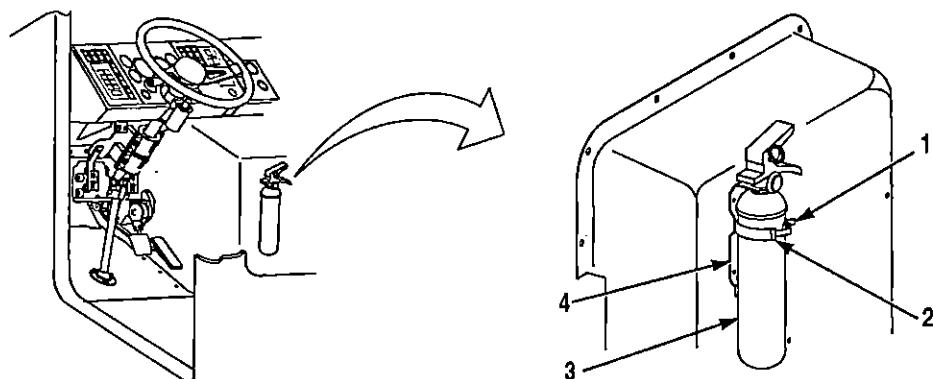


Figure 1.

- a. Pull out on latch (1) and open strap (2).
- b. Pull fire extinguisher (3) straight out and remove from bracket (4).

2. Extinguish fire in accordance with operating instructions listed on fire extinguisher (3).

3. Install Fire Extinguisher in bracket.

- a. Position fire extinguisher (3) in bracket (4).
- b. Position latch (1) on strap (2).
- c. Push down latch (1) and secure strap (2).
- d. Replace used fire extinguisher (3) as soon as possible with a properly charged fire extinguisher.

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
CENTRAL TIRE INFLATION SYSTEM****INITIAL SETUP:**

Not Applicable

**General**

1. The 7-Ton CTIS is designed to maximize traction, mobility, and ride quality. It will adjust the air pressure in all tires to correspond to the cargo setting and the terrain setting selected by the operator.
2. The CTIS controller (1) has four terrain settings (2) and three cargo settings (3). These settings will affect the tire inflation pressure on both the front and rear tires. Refer to the following tire pressures listed in Tire Pressures Table below:

*Table 1. Tire Pressures.*

CARGO	TERRAIN				
		HWY	CC	MSS	EMER
0-2 Tons	Front	43 PSI	28 PSI	15 PSI	12 PSI
	Rear	35 PSI	22 PSI	12 PSI	10 PSI
2-7.1 Tons	Front	42 PSI	27 PSI	14 PSI	11 PSI
	Rear	55 PSI	34 PSI	19 PSI	14 PSI
7.1-15 Tons	Front	42 PSI	27 PSI		
	Rear	96 PSI	70 PSI		
	Maximum Speed (MPH)	Max. Spd.	40	15	5

NOTE: All tire pressures are  $\pm$  3 psi.

## General - Continued

Table 2. Tire Pressures with Cab Armor.

CARGO	TERRAIN	HWY	CC	MSS	EMER
0-2 Tons	Front	80 PSI	55 PSI	29 PSI	22 PSI
	Rear	41 PSI	26 PSI	14 PSI	12 PSI
2-6 Tons	Front	80 PSI	55 PSI	29 PSI	22 PSI
	Rear	58 PSI	39 PSI	21 PSI	17 PSI
6-10.5 Tons	Front	80 PSI	55 PSI		
	Rear	96 PSI	70 PSI		
	Maximum Speed (MPH)	Max. Spd.	40	15	5

NOTE: All tire pressures are  $\pm$  3 psi.

3. Tire pressure is immediately checked and adjusted, if necessary, upon pushing one of the terrain or cargo setting buttons (2) or (3). The CTIS automatically checks tire pressure every 15 minutes and adjusts the pressure if needed.
4. The CTIS is operational whenever the vehicle is running.

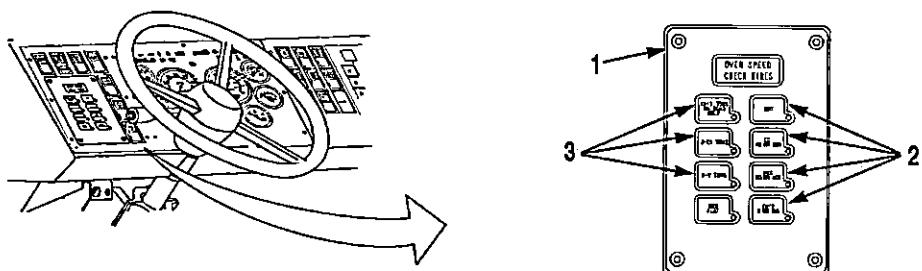
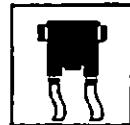


Figure 1.

5. If air system pressure drops below 85 psi (586 kPa), the CTIS will automatically stop tire pressure increase adjustments. The CTIS will automatically resume operation when air system pressure rises above 115 psi (793 kPa).

## Operating Procedures

### **WARNING**



Operator MUST fully understand the operation of the CTIS. Read the entire contents of this paragraph (CTIS) prior to operating the CTIS. Failure to comply may result in damage to equipment or injury to personnel.

### **CAUTION**

- When operating vehicle, there are two speed limitations imposed. One limitation comes from the CTIS terrain setting. The other comes from the driveline lock setting. The lower speed limitation of the two must be adhered to. Failure to comply may result in damage to vehicle.
- Do not change the CTIS Controller terrain settings while turning a corner or wheels are slipping. Damage to driveline may result.
- The EMER (Emergency) button is for extreme conditions only and should not be used for normal driving. Damage to driveline may result.
- Select the appropriate CTIS Controller settings before entering an area where poor traction conditions are likely to occur. Failure to comply may result in damage to equipment.
- Adequate air pressure is required to begin, or continue any pressure changing sequence. Failure to comply may result in damage to equipment.
- If the OVERSPEED indicator blinks, and the operator has not selected the EMER (Emergency) setting, the operator should reduce vehicle speed and/or shift the CTIS Controller to an appropriate terrain setting for the vehicle speed. Failure to comply may result in damage to equipment.
- If the operator has selected the EMER (Emergency) setting and the audible overspeed alarm comes on, the operator should reduce vehicle speed and/or shift the CTIS Controller to an appropriate terrain setting for the vehicle speed. Failure to comply may result in damage to equipment.
- If the OVERSPEED indicator comes on solid without audible alarm, the operator must assume that the automatic Overspeed Protection feature is no longer operable, and caution must be used to not exceed speed parameters. Continue with mission and notify Second Echelon Maintenance when mission is completed. Failure to comply may result in damage to vehicle.
- If the RUN FLAT indicator light comes on, the operator should be aware that tire damage may be present and that the CTIS is attempting to compensate for this damage. Perform troubleshooting. Failure to comply may result in damage to equipment.
- If the CHECK TIRE indicator comes on, the operator should stop the vehicle and refer to section Run Flat Feature (Run Flat Feature) and Check Tire Light (Check Tire Light) of this paragraph. Failure to comply may result in damage to equipment.
- If two terrain setting indicators turn on solid, the operator should stop the vehicle and refer to CTIS Controller Displays (CTIS Controller Displays) of this paragraph. Failure to comply may result in damage to equipment.

## Operating Procedures - Continued

### CAUTION

- If the CTIS controller flashes the four terrain setting indicators as well as the run flat indicator, the operator should stop the vehicle and refer to CTIS Controller Displays (CTIS Controller Displays) of this paragraph. Failure to comply may result in damage to equipment.
- Prior to operating the CTIS in temperatures below 0°F (-18°C), the CTIS will need to be disabled. (Refer to Operate Vehicle in Cold Environment (WP 0076)). Failure to comply may result in damage to equipment.

1. With vehicle running, select appropriate terrain setting on CTIS controller (1).

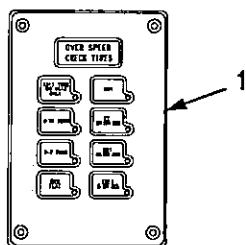


Figure 2.

2. Select appropriate cargo load setting on CTIS controller (1).

### Terrain Settings

1. The CTIS controller (1) has four terrain settings: Highway (2), Cross-Country (3), Mud/Sand/Snow (4), and Emergency (5). The terrain setting needed for the conditions the vehicle is operating in can be determined by using Recommended Modes of Operation Table (WP 0002, Table 29) or CTIS Settings and Terrain Conditions Table below. The terrain settings can be changed while the vehicle is moving.

*Table 3. CTIS Settings and Terrain Conditions.*

CTIS Setting	Terrain Conditions
Highway (HWY) (2)	For operation on improved paved surfaces.
Cross-Country (CC) (3)	For operation on non-paved secondary roads and hard-packed trails.
Mud/Sand/Snow (MSS) (4)	For operation on soft-surface trails and other unimproved surfaces.
Emergency (EMER) (5)	For selection of extremely low tire pressure to help free a mired vehicle or to traverse a short distance over a terrain known to require very low tire pressure.

**Terrain Settings - Continued****CAUTION**

The Emergency mode is for extreme conditions only and should not be used for normal driving conditions. Failure to comply may result in damage to equipment.

**NOTE**

Prior to selecting EMER (Emergency) setting, the vehicle must be traveling below the 5 MPH (8 km/h), maximum allowable speed for that setting.

2. During normal operation, when a terrain setting button is pushed, the indicator light (6) next to the selected button will blink to indicate that the specific terrain button has been pushed. The indicator (6) will continue to blink until the tire pressure has been adjusted to this setting, it will then stop blinking and will stay on steady. The indicator will then blink briefly every 15 minutes when the CTIS checks and adjusts tire pressure.

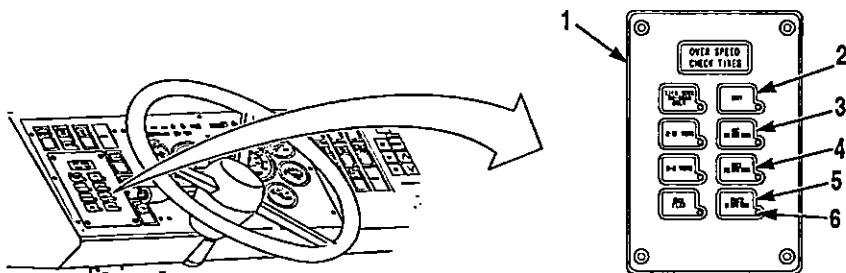


Figure 3.

3. Each terrain setting has a maximum allowable speed (refer to Maximum Allowable Speed Table (Table 4) below). Each setting also dictates a default driveline lock configuration which will be displayed via icons (7) on the instrument panel.

## Terrain Settings - Continued

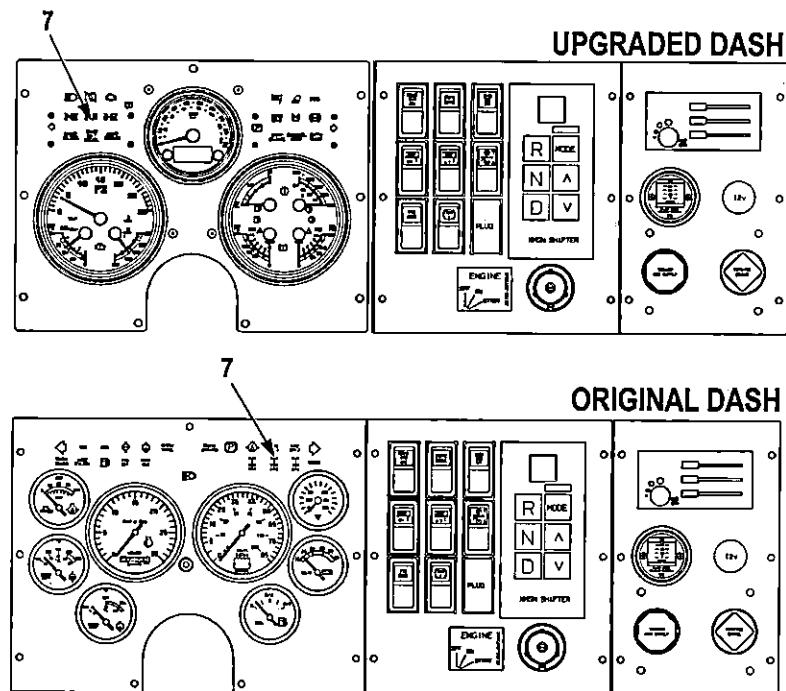


Figure 4.

Table 4. Maximum Allowable Speed.

Terrain Setting	Max. Allowable Speed	Driveline Lock Configuration
Highway (HWY)	65 MPH (105 km/h)	No Driveline Lock
Cross-Country (CC)	40 MPH (64 km/h)	No Driveline Lock
Mud/Sand/Snow (MSS)	15 MPH (24 km/h)	T-Case and Inter-axle
Emergency (EMER)	5 MPH (8 km/h)	T-Case, Inter-axle, and Rear Intra-axle

## CAUTION

- If OVERSPEED indicator comes on solid without audible alarm, the operator must assume that the automatic Overspeed Protection feature is no longer operable and caution must be used to not exceed speed parameters. Continue with mission and notify Second Echelon Maintenance when mission is completed. Failure to comply may result in damage to vehicle.
- If the audible alarm comes on when operating the vehicle in the EMER (Emergency) position, the operator should reduce vehicle speed and/or shift the CTIS Controller to an appropriate terrain setting for the vehicle speed. Failure to comply may result in damage to vehicle.

## Terrain Settings - Continued

### NOTE

When EMER (Emergency) position is selected by the operator, the OVERSPEED indicator will blink when tire pressure has reached the pressure setting appropriate for the EMER (Emergency) position.

4. Tire Overspeed Protection. The CTIS includes an automatic feature called Overspeed Protection used to prevent damage to tires. If the maximum allowable speed for a specific terrain setting is exceeded, the CTIS will monitor the overspeed situation for a predetermined time (15 to 90 seconds, depending on terrain setting). If vehicle speed does not decrease to an allowable level during this predetermined time, an alarm will sound and the OVER SPEED indicator (8) will blink. Once the alarm sounds, the operator has 30 seconds to adjust vehicle speed or upshift to a new CTIS terrain setting. If the operator does not adjust vehicle speed or terrain setting, the CTIS will automatically upshift the terrain setting to the next setting appropriate for the speed of the vehicle.

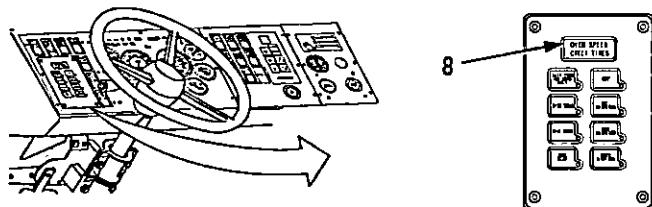


Figure 5.

## Cargo Load Settings

1. The CTIS controller (1) has three cargo load settings, 0-2 TONS (0-1 TONS with cab armor) (2), 2-7.1 TONS (1-6 TONS with cab armor) (3), and 7.1-15 TONS ON-ROAD ONLY (6-12.2 TONS with cab armor) (4).

Table 5. CTIS Cargo Load/Setting.

CTIS Load Setting	Weight Range
0-2 TONS (2) 0-1 TONS (with cab armor)	0 to 2 Tons (0 to 1,816 kg) 0 to 1 Tons (0 to 908 kg) with cab armor
2-7.1 TONS (3) 1-6 TONS (with cab armor)	2 to 7.1 Tons (1,816 to 6,447 kg) 1 to 6 Tons (908 to 5,448 kg) with cab armor
7.1-15 TONS ON-ROAD ONLY (4) 6-12.2 TONS (with cab armor)	7.1 to 15 Tons (6,447 to 13,620 kg) 6 to 12.2 Tons (5,448 to 11,078 kg) with cab armor

### CAUTION

The CTIS controller cargo load setting must be changed as required immediately upon adding or removing cargo from the vehicle. Damage to vehicle may result.

## Cargo Load Settings - Continued

### NOTE

- When the cargo load setting is at FULL LOAD, only Highway and Cross-Country terrain settings are allowed.
- When the cargo load setting is at FULL LOAD, the transmission will not allow selection of 1st gear.

2. Switching the cargo load setting will result in a tire pressure check and a possible adjustment in tire pressure, as determined by the CTIS.

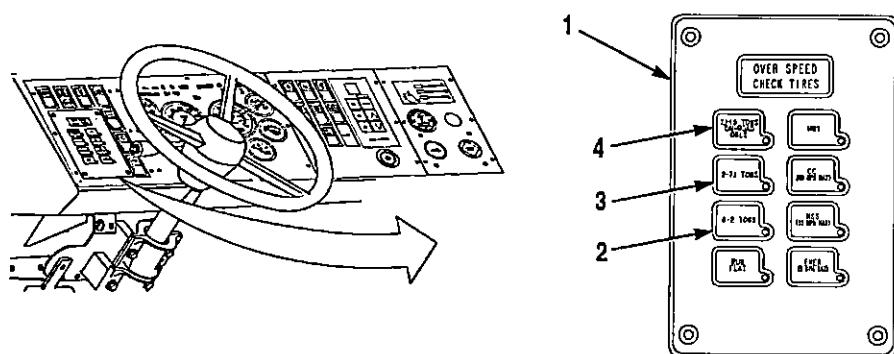


Figure 6.

## Run Flat Feature

### CAUTION

The Run Flat feature should not be used in an attempt to inflate tires with substantial damage. Using the Run Flat feature in these circumstances may result in other tires losing pressure. Failure to comply may result in damage to equipment.

1. The RUN FLAT button (1) on the CTIS Controller (2) should be engaged whenever the operator knows the vehicle has sustained minor tire damage so the operator can continue his mission, or as a preventative measure when operator is traveling in conditions where tire damage is likely.

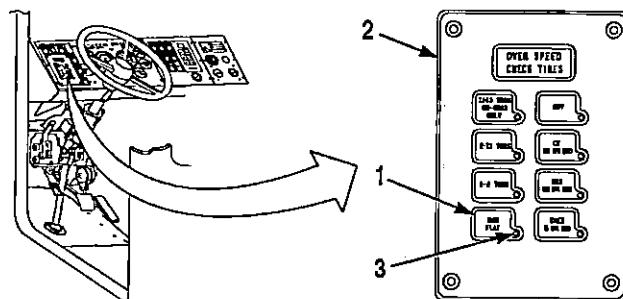


Figure 7.

### Run Flat Feature - Continued

2. By pushing the RUN FLAT button (1) the intervals between tire pressure checks and adjustments is reduced from 15 minutes to 15 seconds. The indicator (3) next to the RUN FLAT button will blink to indicate that it is engaged. The Run Flat feature will then stay engaged until the CTIS has inflated the low tire to appropriate pressure or for 10 minutes. If needed the Run Flat Mode can be reactivated by pushing the RUN FLAT button again.

#### NOTE

The CTIS in the 7-Ton Truck operates two channels. One channel monitors and adjusts the two tires on the front axle. The other channel monitors and adjusts the tires on the back two axles.

3. The Run Flat feature will be automatically engaged by the CTIS if, during a normal tire pressure check/adjust cycle, the CTIS notices a substantial tire pressure imbalance between tires on a specific channel. The Run Flat feature will then stay engaged until the CTIS has inflated the low tire to appropriate pressure.
4. If the Run Flat feature was automatically engaged by the CTIS the operator should be aware that tire damage may be present and that the CTIS is attempting to compensate for this damage. The operator should inspect for tire damage at their earliest convenience.

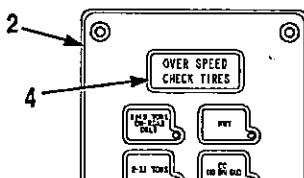


Figure 8.

5. If the damage becomes too great for the Run Flat feature to compensate for, the CHECK TIRE indicator (4) will illuminate.

### Check Tire Light

1. The CHECK TIRE indicator (4) on the CTIS Controller (2) automatically illuminates when a consistent and/or substantial leak develops in a tire or airline.

#### NOTE

- If the RUN FLAT button is pushed to allow the CTIS to compensate for minor tire damage, the CHECK TIRE indicator may go out, depending on the severity and type of damage. The CHECK TIRE indicator may come on again once the Run Flat system disengages.
- Excessive air seal leakage on cold weather start up may result in the CHECK TIRE indicator coming on. If upon inspection, no tire damage exists, the operator may continue to operate the vehicle. This condition should correct itself as the seals warm up with use. If the condition continues to exist contact Second Echelon Maintenance.

2. When the CHECK TIRE indicator (4) comes on the operator should stop the vehicle and assess the situation. If minor tire damage is found the operator should push the RUN FLAT button and re-assess the situation. If no tire damage is found or the CTIS is able to compensate for the damage, the operator should continue with the mission and contact Second Echelon Maintenance when mission is completed. If major

### Check Tire Light - Continued

tire damage is found or the CTIS is not able to compensate for the damage the operator should return the vehicle to base using the Flat Tire Limp Home Procedure, (WP 0083) as required.

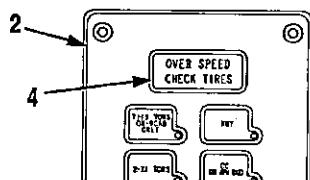


Figure 9.

### Driveline Lock

- When a terrain setting (1) is selected on the CTIS Controller (2), a specific driveline lock configuration is engaged by the CTIS according to CTIS Settings and Terrain Conditions Table (Table 3).

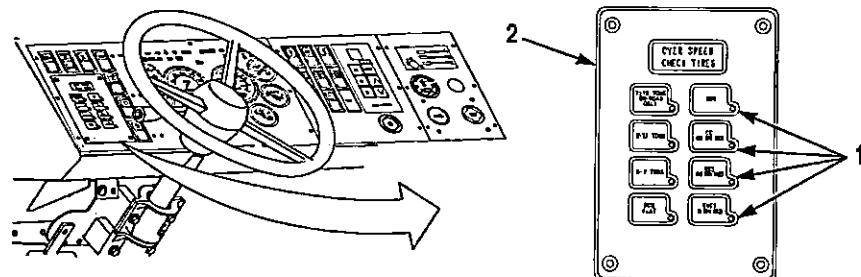


Figure 10.

- Driveline Lock Overspeed Protection. The CTIS has a driveline lock overspeed protection system similar to the terrain overspeed protection feature (refer to Driveline Overspeed Protection Table below). If the vehicle exceeds the maximum allowable speed for the driveline lock setting it is in for more than 30 seconds, the CTIS automatically shifts the driveline lock configuration to the next setting appropriate for the speed of the vehicle. When an automatic shift in driveline lock setting occurs the icons on the instrument panel will change to show new setting.

*Table 6. Driveline Overspeed Protection.*

Driveline Lock Setting	Maximum Allowable Speed	Icons Lit
T-Case and Inter-Axle	30 MPH (48 km/h)	(3)
T-Case, Inter-Axle, and Rear Intra-Axle	10 MPH (16 km/h)	(3), (4)
T-Case, Inter-Axle, and Front and Rear Intra-Axle (Full Lock)	10 MPH (16 km/h)	(3), (4), and (5)

**Driveline Lock - Continued**

1. T-Case — Transfer Case
1. Inter-Axle — Driveline connection between axle No. 2 and axle No. 3
1. Intra-Axle - Driveline connection from left side of axle to right side of axle

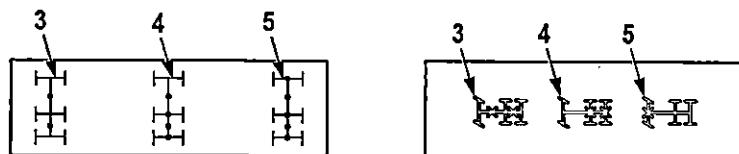


Figure 11.

3. In the vast majority of conditions encountered by the vehicle, the default driveline lock setting selected by the CTIS is the setting most appropriate for the situation. The driveline lock setting can be overridden when unusual conditions are encountered (refer to Recommended Modes of Operation Table (WP 0002, Table 29)), by using the driveline lock switch (WP 0011) on the instrument panel. The operator can use this switch to add more locks to the configuration but the CTIS will not allow the operator to select fewer locks than the default setting selected by the terrain settings of the CTIS Controller. To return to default CTIS selection, select original CTIS terrain settings.

**CTIS Controller Displays****NOTE**

CTIS will automatically shut off when it cannot function properly. Indicator lights will continue to illuminate until problem is corrected.

1. Single Terrain Light
  - a. Flashing - System working to achieve new pressure.
  - b. Steady - Pressure achieved. Wheel valves closed. System stable.
2. Two Terrain Lights On (Solid)
  - a. System has shutoff with tire pressure between two settings.
  - b. Vehicle is still operational.
  - c. CTIS is still operational, desired terrain setting can be re-selected to re-attempt pressure change.
  - d. If encountered frequently, notify Second Echelon Maintenance.
3. Check Tires Light (Flashing)
  - a. System has shutoff, due to an air leak or possible tire damage.
  - b. Selecting RUN FLAT may allow CTIS operation if tire damage is minimal.
  - c. CTIS should not be operated if major tire damage is found.
  - d. Vehicle is still operational (depending on tire damage).
  - e. Notify Second Echelon Maintenance as soon as possible.
4. Five Lights Flashing (Four Terrain Lights and Run Flat Light)
  - a. System has shutoff at least one channel (front or rear) due to fault detection of CTIS component.

**CTIS Controller Displays - Continued**

- b. Vehicle is still operational without CTIS. Operator should verify tire pressures are adequate for desired load and speed.

5. No Terrain Lights

- a. Inadequate vehicle power.
- b. Electrical solenoid fault.
- c. CTIS is not operational. Vehicle may be operated after operator has verified tire pressures are correct.

6. Run Flat Light Flashing (With a Terrain Light)

System has detected a low tire or line leak and is working to correct problem.

**END OF TASK****END OF WORK PACKAGE**

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**1ST ECHELON MAINTENANCE  
SELF RECOVERY WINCH**

---

**INITIAL SETUP:**

Not Applicable

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**General**

The self recovery winch (SRW) is designed to allow 7-Ton Truck to recover itself or another vehicle from mired conditions. The 7-Ton Truck can only winch from the rear. An assistant is required for operations of SRW.

**WARNING**

Never pull load from the manual winch IN/OUT lever. Winch cable may snap and hit operator during winch operations. Failure to comply may result in injury or death to personnel.

**WARNING**

All personnel must stand clear of winch cable during winch operation. Snapped winch cable may cause injury or death to personnel.

**WARNING**

Do not disengage winch under load. Failure to comply may result in injury or death to personnel.

**WARNING**

Winch is NOT to be used for lifting or moving of persons. Failure to comply may result in injury or death to personnel.

**WARNING**

Always wear heavy leather gloves when handling winch cable. Never let cable run through hands. Broken cable wires will cause injury to personnel.

**General - Continued****WARNING**

Winch components become hot during normal operation. Use care when operating winch. Failure to comply may result in injury to personnel.

**CAUTION**

When using the SRW, do not allow the cable to deviate more than 30° from straight behind the vehicle. The winch efficiency will degrade. Winch rollers are located so the winch cable, when properly used, will not contact vehicle components. Do not winch vehicle if 30° behind vehicle cannot be maintained. Failure to comply may result in damage to equipment.

**NOTE**

- A snatch block is provided to give mechanical and indirect pull help when needed.
- Self-recovery winch IN/OUT switch (in cab) is used for winching when vehicle or another vehicle is mired.
- Manual IN/OUT lever (right side of vehicle) is used to pay out or reel in cable before and after winching operations. Amount of pressure applied to manual IN/OUT lever will affect speed of winch operation.
- Free spooling feature is for unwinding cable without hydraulic power.
- Two (2) personnel are required to operate winch.
- Engine rpm in excess of 1550 will de-activate winch PTO.
- Application of brake pedal will de-activate winch PTO and high idle (1500 rpm) setting.
- For more information, refer to FM 9-43-2/FMFRP 4-34, Recovery and Battlefield Damage Assessment and Repair.
- High idle (1500 rpm) may be used only when vehicle is in N (neutral) with no load.
- To allow even winding of winch cable, tension must be maintained on winch cable during operation. Tension may be maintained by either of the following two methods.
  1. Winched vehicle method. By leaving vehicle being winched attached to cable until winched vehicle is 15 to 20 ft. (4.6 - 6.1m) from winch. Disconnect winched vehicle and, with the aid of an assistant, use manual winch IN/OUT lever to stow cable.
  2. Loose cable method. By hooking cable to an immovable object, (i.e. tree, rock, forklift, etc.), winch cable while backing up vehicle until clevis is approximately 15 to 20 ft. (4.6 to 6.1m) from winch. Disconnect cable from object and, with the aid of an assistant, use manual winch IN/OUT lever to stow cable.

**Preparation for Use**

1. Start engine (WP 0029).

## Preparation for Use - Continued

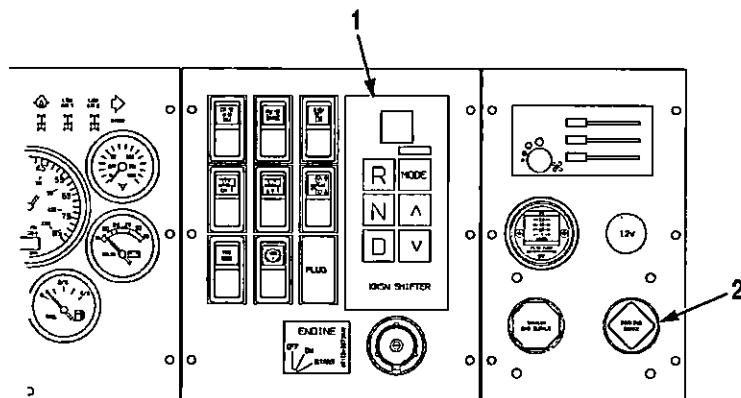


Figure 1.

2. Park vehicle (WP 0034) directly facing away from object to be winched, if possible. If vehicle cannot be parked in direct line with object to be winched, refer to paragraph Procedure for Indirect Recovery of Second Vehicle.
3. Position transmission selector (1) in N (neutral).
4. Apply parking brake (2).

### Unwinding Winch Cable

1. Adjust right side mirror until assistant can be seen at rear of vehicle.

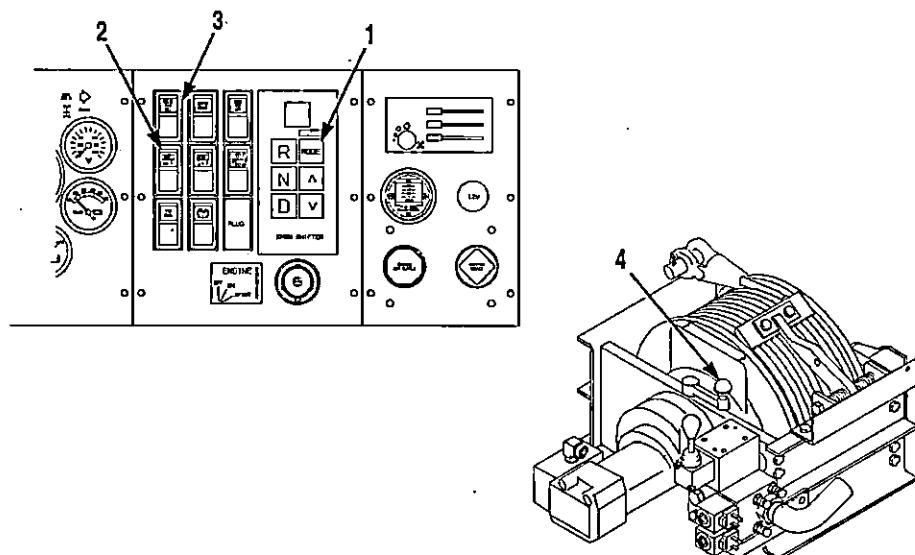


Figure 2.

**Unwinding Winch Cable - Continued**

2. Push MODE button (1) on transmission range selector.
3. Push WINCH ON/OFF switch (2) (in cab) to ON position.
4. Push high idle switch (3) (in cab) to ON position.

**CAUTION**

Do not force shift lever into position. If shift lever does not engage/disengage, rock winch drum as required until shift lever engages. Failure to comply may result in damage to equipment.

5. Ensure shift lever (4) is in ENGAGE position.

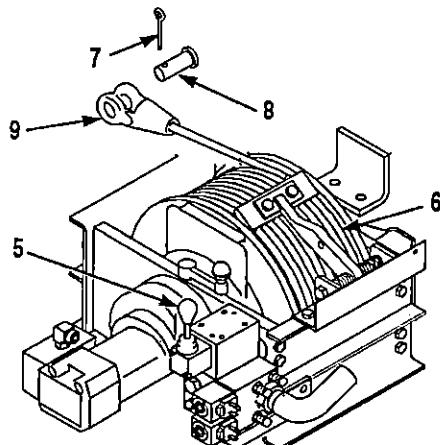


Figure 3.

**CAUTION**

Never pay out more cable than your assistant can handle at one time. Failure to comply may result in damage to equipment.

6. Move manual WINCH IN/OUT lever (5) to pay out small amount of cable (6).
7. Release manual WINCH IN/OUT lever (5).

**WARNING**

Always wear heavy leather gloves when handling winch cable. Never let cable run through hands. Broken cable wires will cause injury to personnel.

**Unwinding Winch Cable - Continued****WARNING**

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

**WARNING**

Avoid quick, jerking winch operation. Keep all personnel well away from vehicle involved in winching operation. Snapped cable or shifting load may cause serious injury or death to personnel.

8. Remove cotter pin (7) and clevis pin (8) from clevis (9).

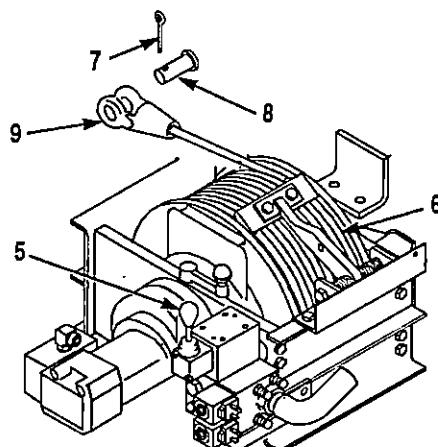


Figure 4.

**NOTE**

Shift lever may be positioned in DISENGAGE position to pull cable by hand (free spool). Once enough cable has been payed out, position shift lever in ENGAGE position.

9. Use manual WINCH IN/OUT lever (5) or free spooling of winch to pay out required amount of cable (6) required to reach rear of vehicle.
10. Release WINCH IN/OUT lever (5).

**NOTE**

- Do not position cable between tensioning pulleys until cable is routed completely through rear roller guide.
- Perform Step (11) for MK28 only. Perform Steps (12) through (14) for MK25.
- Cable tensioner and forward vertical roller are not present on MK28.

**Unwinding Winch Cable - Continued**

11. Thread winch cable (6) through rear roller guide (10) between two horizontal rollers (11) and two vertical rollers (12).

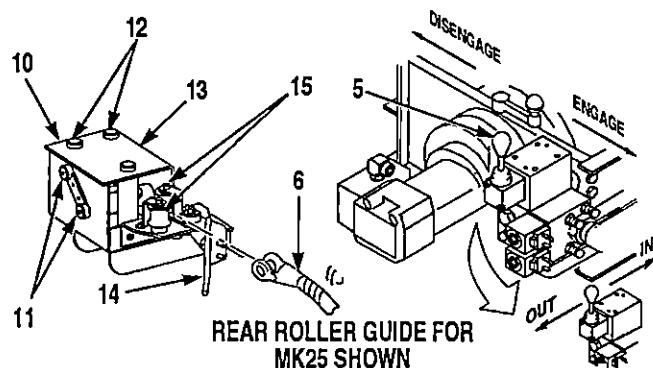


Figure 5.

12. Thread winch cable (6) through rear roller guide (10), past first vertical roller (13) and then between two horizontal rollers (11) and two vertical rollers (12).
13. Pull lever (14) on rear roller guide (10) and position winch cable (6) through two vertical tensioner rollers (15).

**WARNING**

When returning lever to operating position, release tension slowly. Failure to comply may result in injury to personnel.

14. Release lever (14).
15. Use WINCH IN/OUT lever (5) or use free spooling of winch to pay out cable (6) until cable reaches vehicle to be pulled or anchor point.
16. Release WINCH IN/OUT lever (5).

**WARNING**

Cable is not fully mission capable if: Cable has more than three broken wires per inch on same strand, or cable has more than six broken wires on all strands in one inch of cable. Maximum number of broken wires shall not occur in any two consecutive inches of cable. For example, if six wires are broken in one inch of cable, none would be allowed in next consecutive inch. Failure to comply may result in damage to equipment or injury to personnel.

17. Check cable (6) for broken wires and kinks. If in doubt, notify Second Echelon Maintenance.

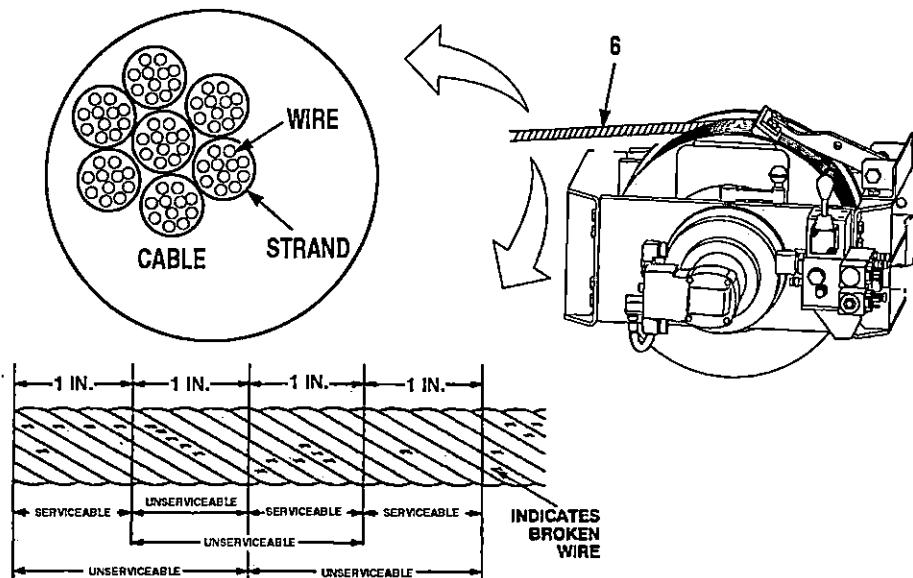
**Unwinding Winch Cable - Continued**

Figure 6.

18. Check for at least five wraps of cable (6) left on winch. If at least five wraps of cable (6) are not left on winch, stop using winch.

**Procedure for Self Recovery****WARNING**

Ensure anchor point is strong enough to withstand pull of winch. Failure to comply may result in injury or death to personnel.

**CAUTION**

- Winch cable must never be looped around an anchor point and secured to itself. Failure to comply may result in damage to winch cable.
- Cable must be positioned and attached to an anchor point as straight as possible behind the vehicle. Failure to comply may result in damage to equipment.

**Procedure for Self Recovery - Continued****NOTE**

- A single hook winch chain is used to assist in recovery operations where applicable. The chain is stored inside vehicle stowage box.
- If anchor point is another vehicle, attach cable directly to shackles, tow rings, or pintle hook of anchor vehicle.
- If anchor point is a tree, rock, or other stationary or heavy object, attached winch chain to anchor point to facilitate cable attachment.
- Attach winch cable to upper hole (towing eye) of vehicle only. Bottom hole is tiedown hole.

1. Attach cable (1) to anchor point.

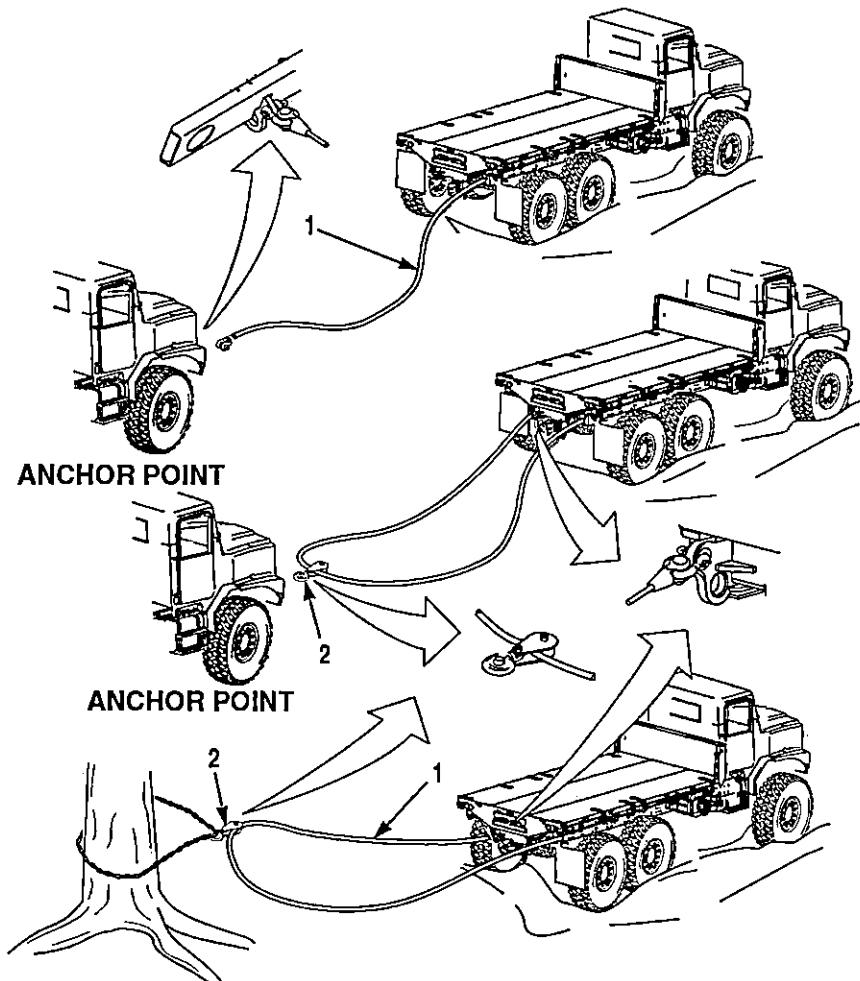


Figure 7.

2. If vehicle is very heavy or deeply mired, install snatch block (2) to increase winch pulling power. To install snatch block, perform Step (a) through (d) below:
  - a. Pay out enough cable (1) to reach anchor point and back to vehicle.

**Procedure for Self Recovery - Continued**

- b. Attach winch cable (1) to vehicle.
- c. Attach snatch block (Installation of 35-Ton Snatch Block) (2) to cable.
- d. Attach snatch block (2) to anchor point.

**WARNING**

During winch operation, the operator should direct all personnel to stand clear of the winch cable a distance greater than the payed out length of cable. Snapped winch cable could cause serious injury or death to personnel.

**WARNING**

When pulling a load, operate winch from cab only. Do not operate winch from manual WINCH IN/OUT lever when pulling a load. Snapped cable can result in serious injury or death to personnel.

**WARNING**

Do not operate winch erratically. Erratic winding may result in snapped cable that can cause serious injury or death to personnel.

**CAUTION**

- Tension must be maintained on winch cable during winch operation. Tension can be maintained by winching vehicle until vehicle is 15 to 20 ft. (4.6 to 6.1m) from anchor point before disconnecting and stowing cable. Failure to comply may result in damage to equipment.
- If wheels start to slip when CTIS controller is in EMERGENCY position, stop vehicle and set CTIS controller to MUD, SAND, SNOW position. Failure to comply may result in damage to equipment.

**NOTE**

Two personnel are required to operate winch.

3. Turn off high idle switch (3).
4. Set CTIS controller (4) to EMERGENCY position and transmission range selector (5) to R (reverse).

### Procedure for Self Recovery - Continued

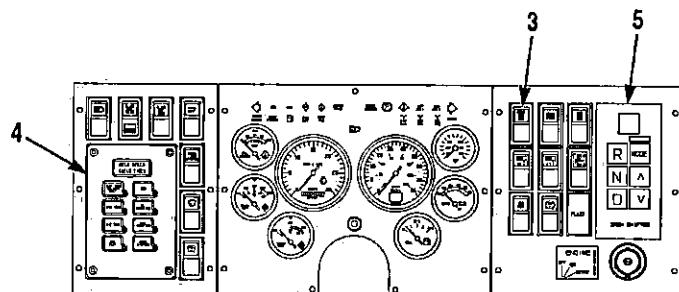


Figure 8.

5. Release parking brake (6).
6. Release service brake pedal (7).

#### NOTE

Engine rpm in excess of 1550 rpm will disable winch (PTO).

7. Push and hold WINCH IN/OUT switch (8) to IN position and apply slight pressure to throttle pedal (9).

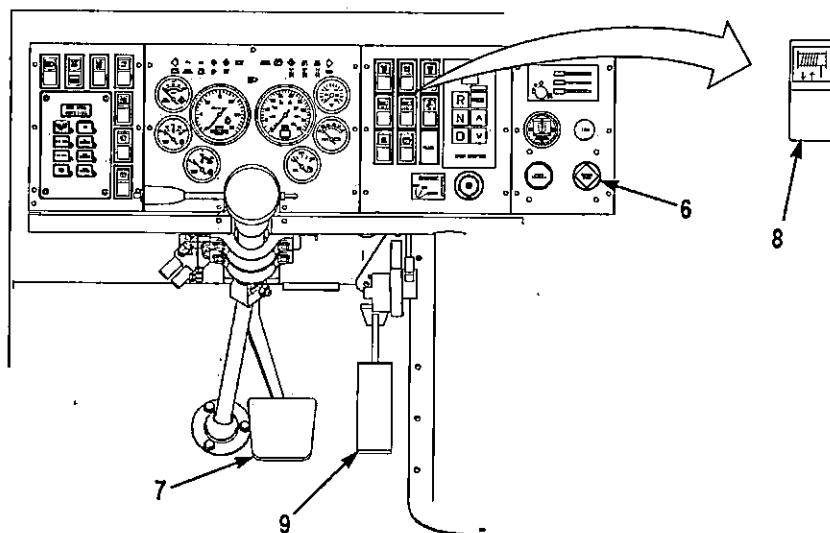


Figure 9.

#### CAUTION

- Keep cable tight at all times to ensure cable does not get tangled with vehicle.
- If winch does not move vehicle, stop using winch. Failure to comply may result in damage to equipment.

### Procedure for Self Recovery - Continued

- When anchor point object is 15 to 20 ft. (4.6 to 6.1m) from rear of vehicle, release WINCH IN/OUT switch (8) to stop winding.

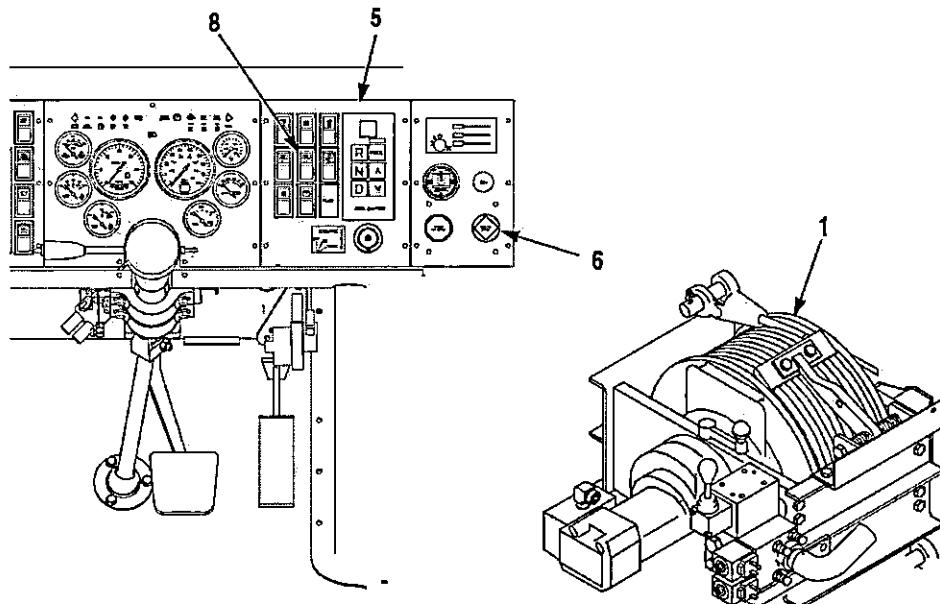


Figure 10.

- Apply parking brake (6).
- Set transmission range selector (5) to N (neutral).
- Push and hold WINCH IN/OUT switch (8) to OUT position and pay out cable until all tension is off cable.
- When all tension is off of cable, release WINCH IN/OUT switch (8).
- Disconnect and stow cable (Procedure for Disconnecting and Stowing Winch Cable) (1).

### Procedure for Direct Recovery of Second Vehicle

#### CAUTION

Cable must be positioned behind winching vehicle, as straight as possible. Failure to comply may result in damage to equipment.

#### NOTE

- If cable cannot be positioned behind winching vehicle, use indirect recovery method (Procedure for Indirect Recovery of Second Vehicle).
- Single hook winch chain is used to assist in recovery operations where applicable. The chain is stored inside vehicle stowage box.

- If mired vehicle is very heavy or deeply mired, install snatch block to increase winch pulling power. If vehicle is not very heavy or deeply mired, proceed to Step (2). To use snatch block, perform Steps (a) through (d) below.

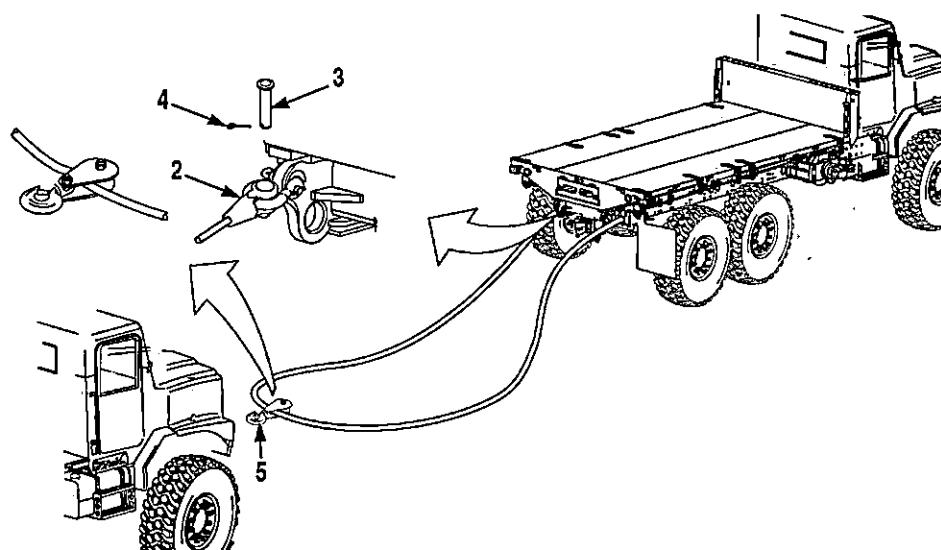
**Procedure for Direct Recovery of Second Vehicle - Continued**

Figure 11.

- a. Pay out enough cable (1) to reach mired vehicle and back to winching vehicle.
- b. Attach clevis (2) to shackle, tow ring, or pintle hook of winching vehicle with clevis pin (3) and cotter pin (4).
- c. Attach snatch block (Installation of 35-Ton Snatch Block) (5) to cable (1).
- d. Attach snatch block (5) to shackle, tow ring, or pintle hook of mired vehicle.

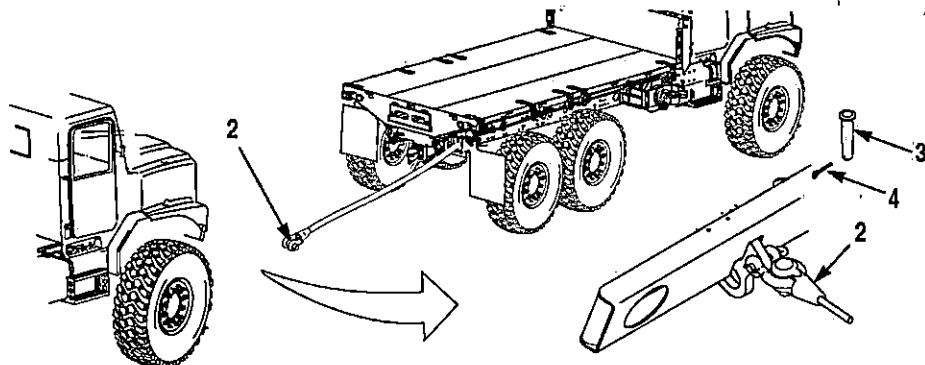


Figure 12.

2. Attach clevis (2) to shackle, tow rings, or pintle hook of mired vehicle with clevis pin (3) and cotter pin (4).

## Procedure for Direct Recovery of Second Vehicle - Continued

### WARNING



During winch operation, the operator should direct all personnel to stand clear of the winch cable a distance greater than the payed out length of cable. Snapped winch cable could cause serious injury or death to personnel.

### WARNING

When pulling a load, operate winch from cab only. Do not operate winch from manual WINCH IN/OUT lever when pulling a load. Snapped cable can result in serious injury or death to personnel.

### WARNING



Do not operate winch erratically. Erratic winding may result in snapped cable that can cause serious injury or death to personnel.

### CAUTION

- Tension must be maintained on winch cable during winch operation. Tension can be maintained by winching vehicle until vehicle is 15 to 20 ft. (4.6 to 6.1m) from anchor point before disconnecting and stowing cable. Failure to comply may result in damage to equipment.
- If wheels start to slip when CTIS controller is in EMERGENCY position, stop vehicle and set CTIS controller to MUD, SAND, SNOW position. Failure to comply could result in damage to equipment.
- Winching vehicle must remain stationary during winching operation. Failure to comply may result in damage to equipment.

### NOTE

Two personnel are required to operate winch.

3. If mired vehicle has driveline power, perform Steps (a) through (c).

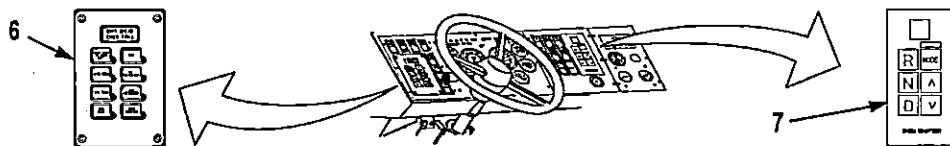


Figure 13.

- a. Set CTIS controller of mired vehicle to EMERGENCY position.

**Procedure for Direct Recovery of Second Vehicle - Continued**

- b. If winch cable is connected to front of mired vehicle, set transmission range selector (7) of mired vehicle to D (drive).
- c. If winch cable is connected to rear of mired vehicle, set transmission range selector (7) of mired vehicle to R (reverse).
4. If mired vehicle does not have driveline power, disengage brakes, transmission, and driveline of mired vehicle.

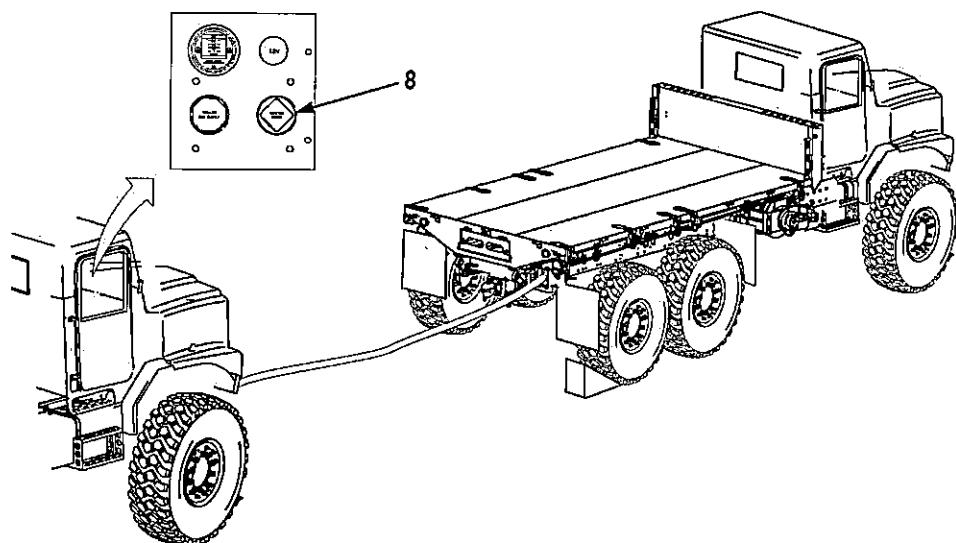


Figure 14.

5. Release parking brake (8) of mired vehicle.
6. Chock wheels of winching vehicle.

**NOTE**

Winch speed is controlled by the speed of the engine.

7. If more control of winch speed is desired, turn off high idle switch (9) of winching vehicle.

**Procedure for Direct Recovery of Second Vehicle - Continued**

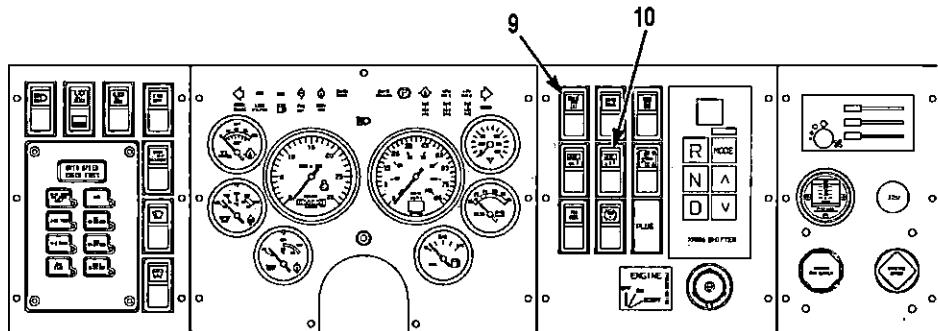


Figure 15.

- Push and hold WINCH IN/OUT switch (10) of winching vehicle to IN position.

**NOTE**

Engine rpm in excess of 1550 rpm will disable winch (PTO).

- If high idle switch (9) is turned OFF, apply slight pressure to throttle pedal (11).

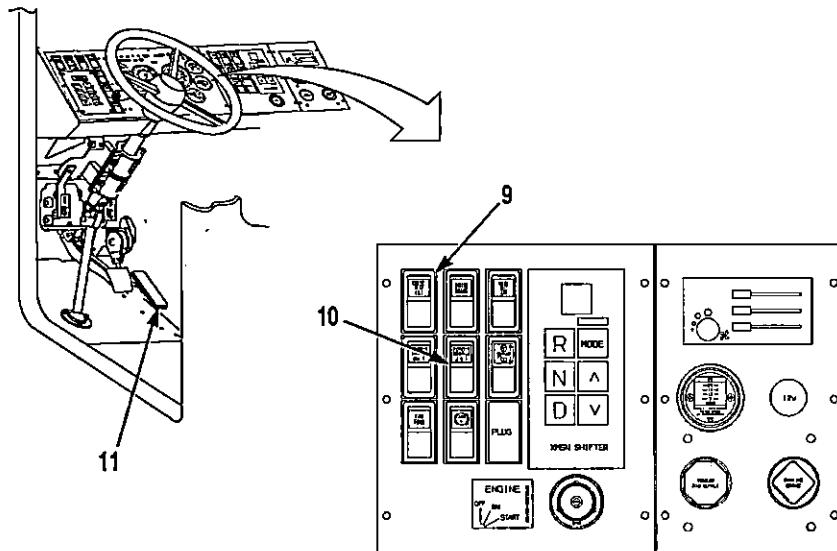


Figure 16.

- If mired vehicle has driveline power, apply slight pressure to throttle pedal (9) of mired vehicle.

## Procedure for Direct Recovery of Second Vehicle - Continued

### CAUTION

- Keep cable tight at all times so cable does not get tangled with vehicle. Failure to comply may result in damage to equipment.
- If winch does not move vehicle, stop using winch. Failure to comply may result in damage to equipment.

11. When mired vehicle is 15 to 20 ft. (4.6 to 6.1m) from rear of winching vehicle, release WINCH IN/OUT switch (10) to stop winding.

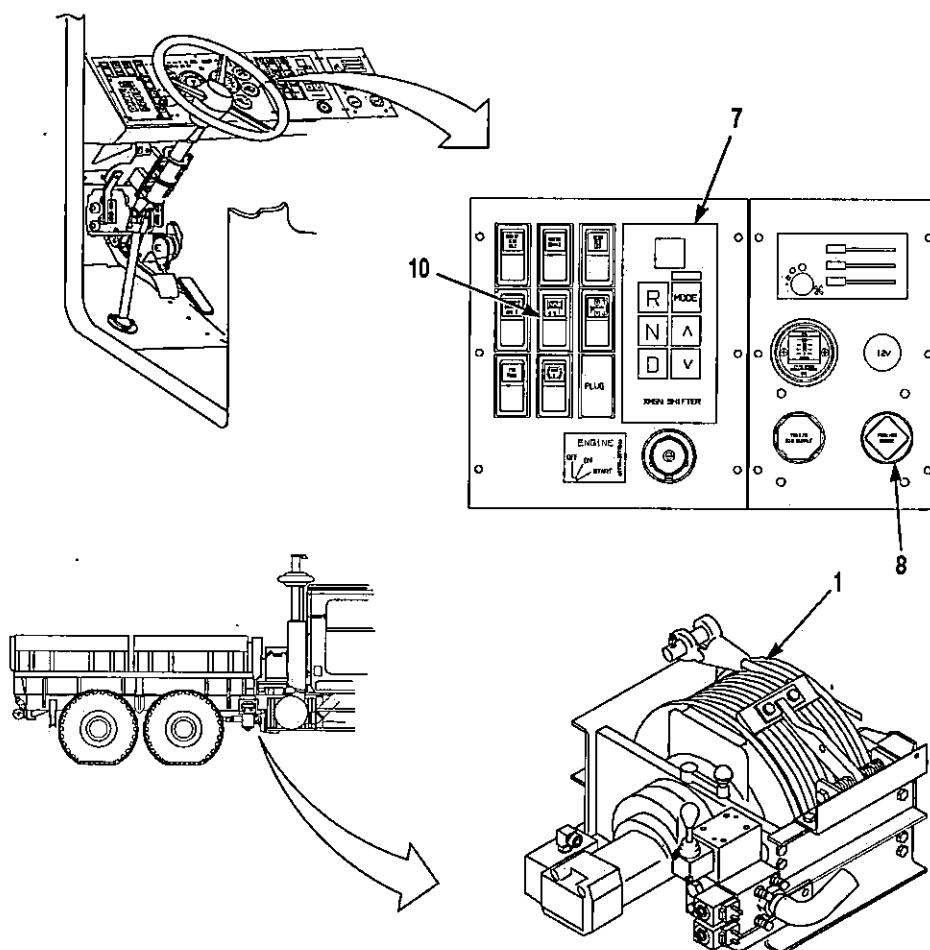


Figure 17.

12. Set transmission range selector (7) of mired vehicle to N (neutral).
13. Apply parking brake (8) and chock wheels of mired vehicle.
14. Push and hold WINCH IN/OUT switch (10) of winching vehicle to OUT position and pay out cable until all tension is off cable.

**Procedure for Direct Recovery of Second Vehicle - Continued**

15. When all tension is off cable, release WINCH IN/OUT switch (10).
16. Disconnect and stow cable (Procedure for Disconnecting and Stowing Winch Cable) (1).

**Procedure for Indirect Recovery of Second Vehicle****WARNING**

Ensure anchor point is strong enough to withstand pull of winch. Failure to comply may result in injury or death to personnel.

**NOTE**

A single hook winch chain is used to assist in recovery operations where applicable. Chain is stored inside vehicle stowage box.

1. Attach winch chain (1) to anchor point.

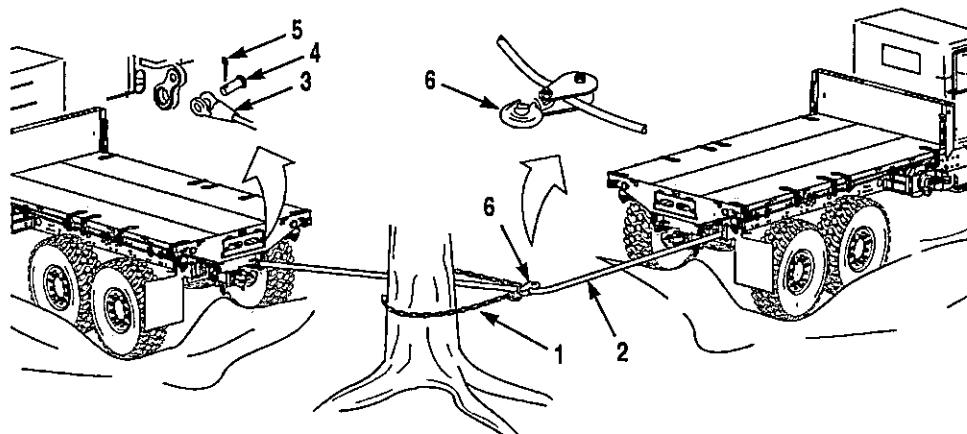


Figure 18.

2. Pay out enough cable (2) to reach anchor point and back to mired vehicle.
3. Attach clevis (3) to shackles, tow rings, or pintle hook of mired vehicle with clevis pin (4) and cotter pin (5).
4. Attach snatch block (Installation of 35-Ton Snatch Block) (6) to cable (2).
5. Attach snatch block (6) to winch chain (1).

**Procedure for Indirect Recovery of Second Vehicle - Continued****WARNING**

During winch operation, the operator should direct all personnel to stand clear of the winch cable a distance greater than the payed out length of cable. Snapped winch cable could cause serious injury or death to personnel.

**WARNING**

When pulling a load, operate winch from cab only. Do not operate winch from manual WINCH IN/OUT lever when pulling a load. Snapped cable can result in serious injury or death to personnel.

**WARNING**

Do not operate winch erratically. Erratic winding may result in snapped cable that can cause serious injury or death to personnel.

**CAUTION**

- Tension must be maintained on winch cable during winch operation. Tension can be maintained by pulling winching until vehicle is 15 to 20 ft. (4.6 to 6.1m) from anchor point object before disconnecting and stowing cable. Failure to comply may result in damage to equipment.
- If wheels start to slip when CTIS controller is in EMERGENCY position, stop vehicle and set CTIS controller to MUD, SAND, SNOW position. Failure to comply could result in damage to equipment.
- Winching vehicle must remain stationary during winching operation. Failure to comply may result in damage to equipment.

**NOTE**

Two personnel are required to operate winch.

6. If mired vehicle has driveline power, perform Steps (a) through (c).

### Procedure for Indirect Recovery of Second Vehicle - Continued

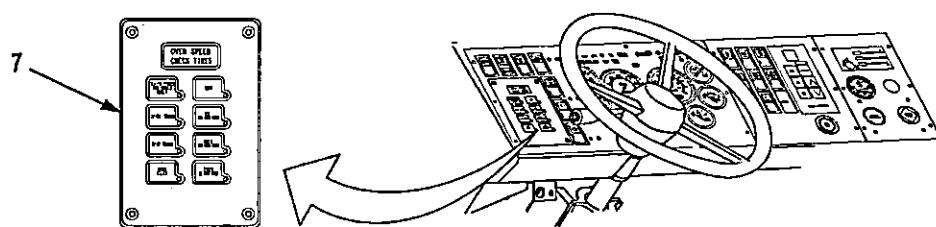


Figure 19.

- a. Set CTIS controller (7) of mired vehicle to EMERGENCY position.
- b. If winch cable is connected to front of mired vehicle, set transmission range selector (8) of mired vehicle to D (drive).
- c. If winch cable is connected to rear of mired vehicle, set transmission range selector (8) of mired vehicle to R (reverse).
7. If mired vehicle does not have driveline power, disengage brakes, transmission, and driveline of mired vehicle.

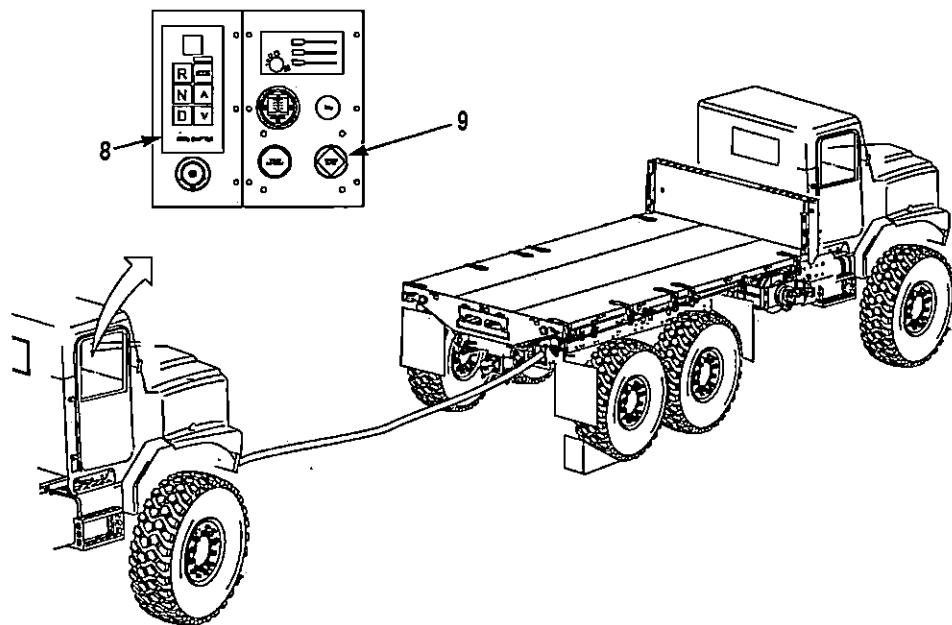


Figure 20.

8. Release parking brake (9) of mired vehicle.
9. Chock wheels of winching vehicle.

#### NOTE

Winch speed is controlled by the speed of the engine.

## **Procedure for Indirect Recovery of Second Vehicle - Continued**

10. If more control of winch speed is desired, turn off high idle switch (10) of winching vehicle.

## NOTE

Engine rpm in excess of 1550 rpms will disable winch (PTO).

11. Push and hold WINCH IN/OUT switch (11) of winching vehicle to IN position.

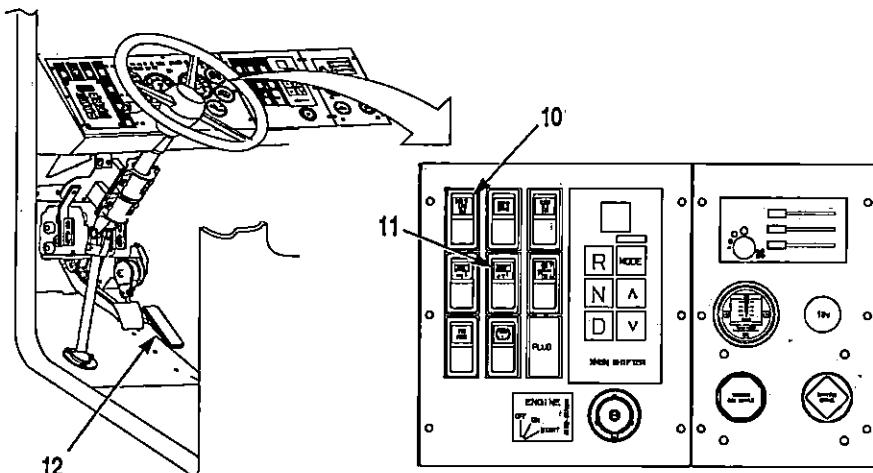


Figure 21.

12. If high idle switch (10) is turned OFF, apply slight pressure to throttle pedal (12).
13. If mired vehicle has driveline power, apply slight pressure to throttle pedal (12) of mired vehicle.

## CAUTION

- Keep cable tight at all times so cable does not get tangled with vehicle. Failure to comply may result in damage to equipment.
- If winch does not move vehicle, stop using winch. Failure to comply may result in damage to equipment.

14. When clevis is 15 to 20 ft. (4.6 to 6.1m) from anchor point, release WINCH IN/OUT switch (11) to stop winding.

### Procedure for Indirect Recovery of Second Vehicle - Continued

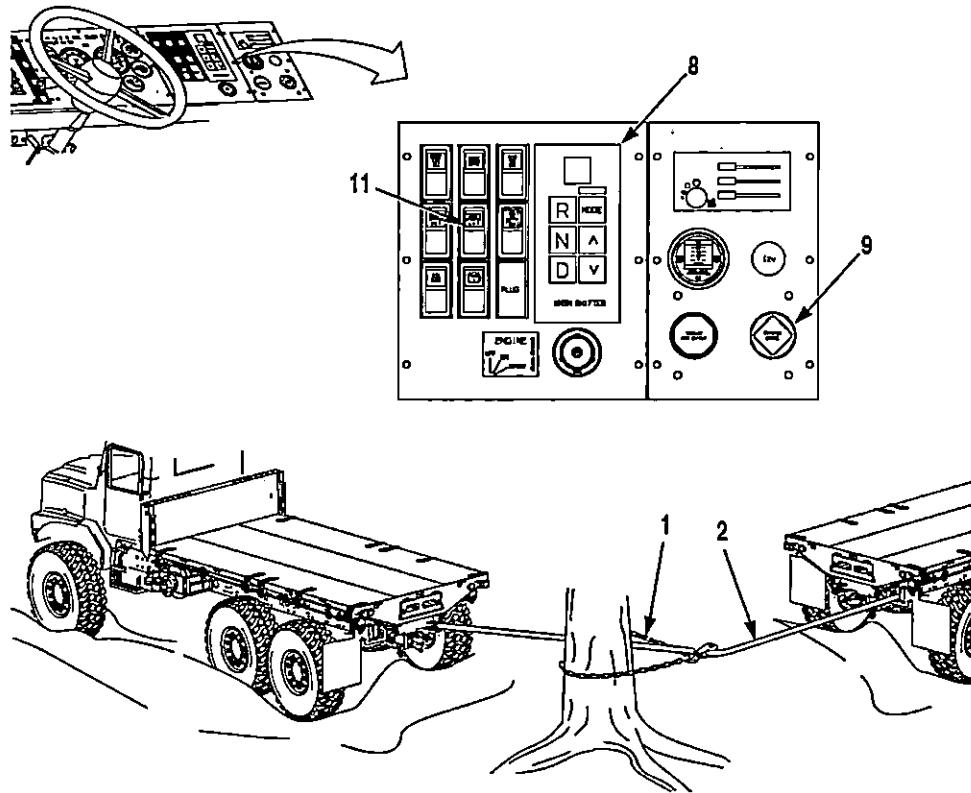


Figure 22.

15. Set transmission range selector (8) of mired vehicle to N (neutral).
16. Apply parking brake (9) and chock wheels of mired vehicle.
17. Push and hold WINCH IN/OUT switch (11) of winching vehicle to OUT position and pay out cable until all tension is off cable.
18. When all tension is off cable, release WINCH IN/OUT switch (11).
19. Disconnect and stow cable (Procedure for Disconnecting and Stowing Winch Cable) (2).
20. Remove winch chain (1) from anchor point.

#### Procedure for Disconnecting and Stowing Winch Cable

##### NOTE

If snatch block and/or winch chain were used, remove and stow them at this time.

1. Remove cotter pin (1), clevis pin (2), and clevis (3) from mired vehicle or anchor point.

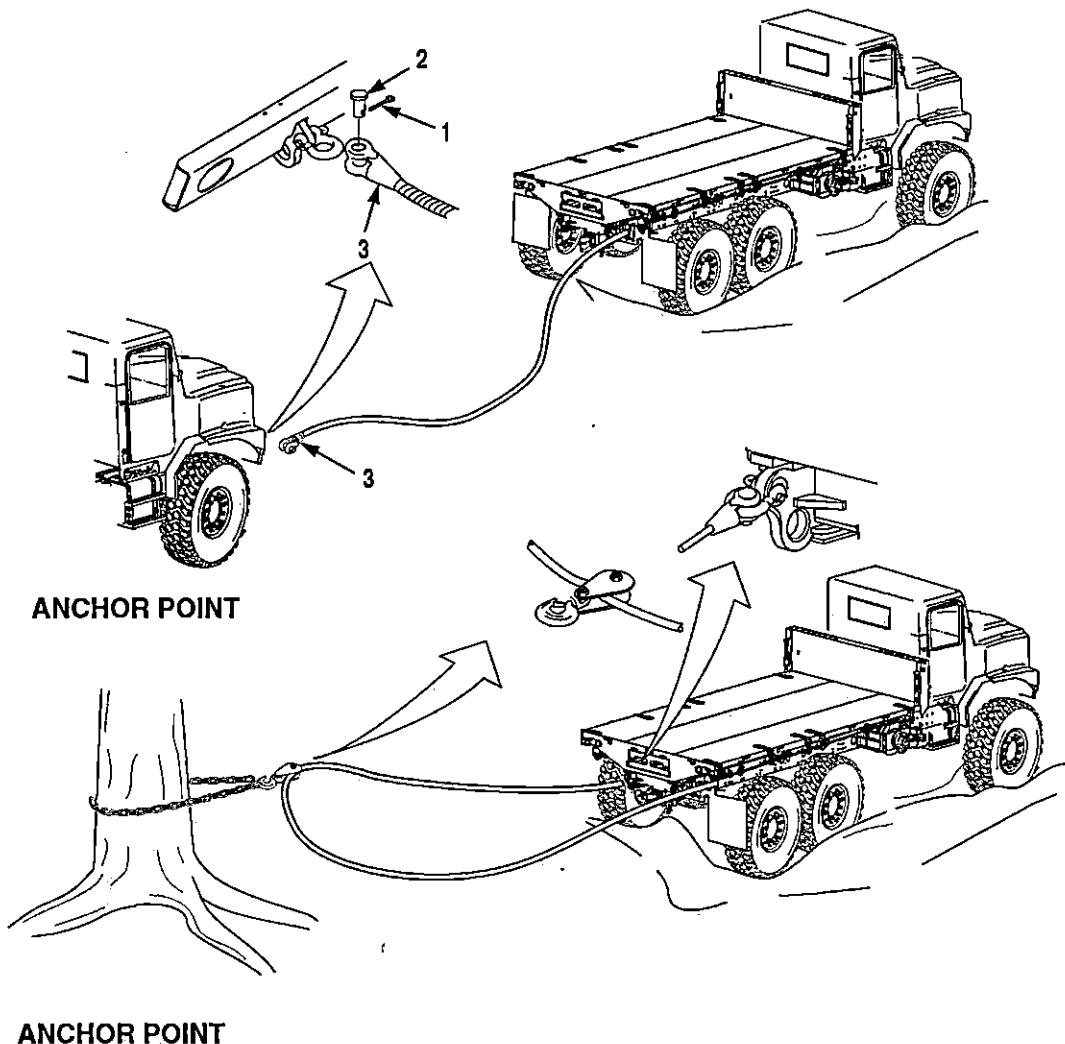
**Procedure for Disconnecting and Stowing Winch Cable - Continued**

Figure 23.

**WARNING**

Do not use winch to reel clevis end of cable through roller guides. Clevis may catch on roller guide and cause cable or roller guide to break. Broken cables or roller guides can cause serious injury or death to personnel.

### Procedure for Disconnecting and Stowing Winch Cable - Continued

#### **WARNING**



Keep hands clear of winch area when winch is reeling in cable. If hands are caught in winch or cable, severe injury or death may result.

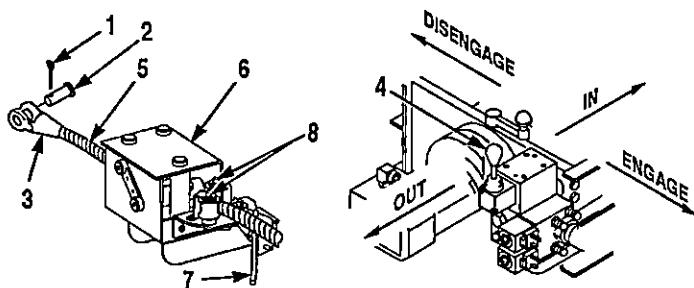
#### **WARNING**

Always use an assistant and the manual control lever to stow cable. Failure to comply may result in injury to personnel or damage to equipment.

#### **CAUTION**

An assistant is required to keep tension on cable until clevis is one ft. (0.31 m) from rear cable guide. Failure to comply may result in damage to equipment.

2. With the aid of an assistant and using manual control lever (4), wind cable (5) until cable is approximately one ft. (0.31 m) from rear roller guide (6).



REAR ROLLER GUIDE  
FOR MK25 SHOWN

Figure 24.

3. Release manual control lever (4).

#### **NOTE**

If cotter pin and clevis pin are attached to cable, perform Step (4).

4. Remove cotter pin (1) and clevis pin (2) from clevis (3).

#### **NOTE**

- Cable tensioner and forward vertical cable are not present on MK28.
- Perform Steps (5) and (6) for MK25.

5. Pull lever (7) and remove cable (5) from two tension rollers (8).

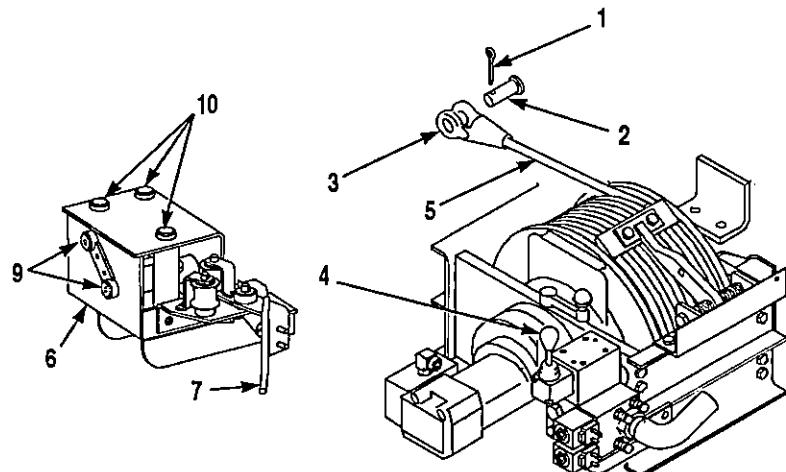
**Procedure for Disconnecting and Stowing Winch Cable - Continued**

Figure 25.

**WARNING**

When returning lever to operating position, release tension slowly. Failure to comply may result in injury to personnel.

6. Release lever (7).
7. Remove cable (5) from rear roller guide (6) by manually pulling cable through horizontal rollers (9) and vertical rollers (10).

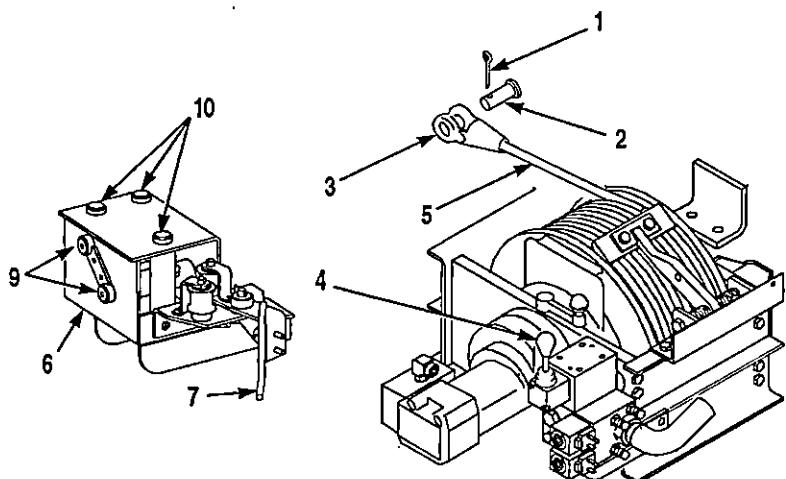


Figure 26.

**Procedure for Disconnecting and Stowing Winch Cable - Continued****WARNING**

Keep hands clear of winch area when winch is reeling in cable. If hands are caught in winch or cable, severe injury or death may result.

**NOTE**

When winding cable, ensure cable is being spooled evenly.

8. Install clevis pin (2) and cotter pin (1) on clevis (3).
9. With the aid of an assistant, using manual control lever (4), continue winding cable (5) until clevis pin (2) is approximately 10 in. (25.4 cm) from cable hold down (12), and release manual control lever (4).

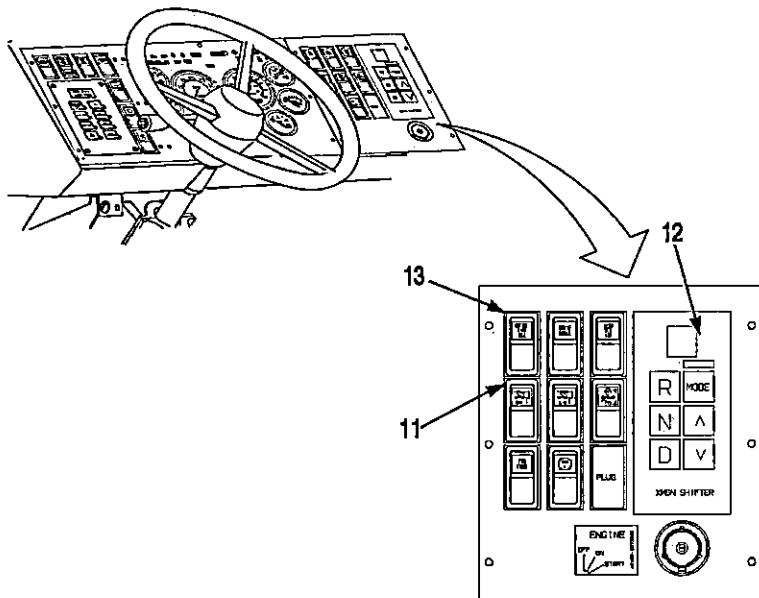


Figure 27.

10. Turn WINCH ON/OFF switch (11) (in cab) to OFF position.
11. Turn MODE switch (12) (in cab) to OFF position.
12. Turn high idle switch (13) (in cab) to OFF position.
13. Shut off engine (WP 0035).

**Installation of 35-Ton Snatch Block****WARNING**

When attaching snatch block to a truck, anchor point, or winch chain, ensure open side of hook faces up. Failure to comply may result in severe injury or death to personnel.

**NOTE**

Snatch block is used as a mechanical advantage when the load resistance exceeds capacity of self recovery winch.

1. Remove snatch block (1) from stowage.

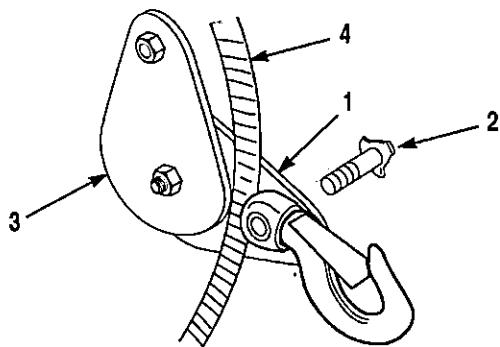


Figure 28.

2. Unscrew pin (2) and partially pull away from snatch block (1).
3. Move plate (3) to side to open snatch block (1).

**WARNING**

Always wear heavy leather gloves when handling winch cable. Never let cable run through hands. Broken cable wires will cause injury to personnel.

4. Position cable (4) in snatch block (1).
5. Close plate (3) and align holes on snatch block (1).
6. Tighten pin (2) in snatch block (1).
7. Ensure screw (2) is tight and cable (4) can move freely through snatch block.
8. Continue with self recovery winch operation.

**Removal of Snatch Block**

1. Ensure there is slack in cable (4).

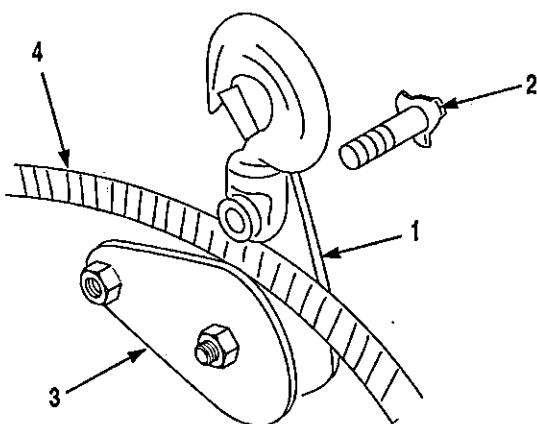
**Removal of Snatch Block - Continued**

Figure 29.

2. Unscrew pin (2) and partially pull away from snatch block (1).
3. Move plate (3) to side to open snatch block (1).

**WARNING**

Always wear heavy leather gloves when handling winch cable. Never let cable run through hands. Broken cable wires will cause injury to personnel.

4. Remove cable (4) from snatch block (1).
5. Close plate (3) and align holes in snatch block (1).
6. Tighten pin (2) in snatch block (1).
7. Return snatch block (1) to stowage.
8. Continue with mission.

**END OF TASK****END OF WORK PACKAGE**

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## 1ST ECHELON MAINTENANCE GENERAL

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**INITIAL SETUP:**

Not Applicable

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**General**

This section provides procedures that should be followed when operating the vehicle under specific conditions. This section also includes operating procedures that should be followed after certain systems and components of the vehicle have failed or have been damaged.

**END OF TASK****END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE STANDARD ISO LOCK / UNLOCK

### INITIAL SETUP:

Not Applicable

### Lock

1. Pull back pin (1) and loosen nut (2) completely.

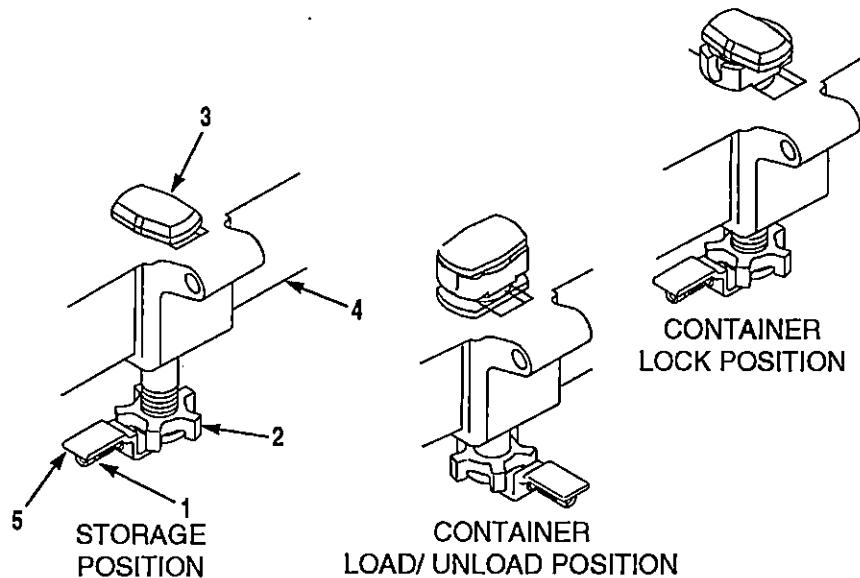


Figure 1.

2. Push ISO lock (3) up through ISO bed (4).
3. Turn ISO lock (3) 1/4 turn so handle (5) points away from ISO bed (4).
4. Allow ISO lock (3) to drop down into seated position in ISO bed (4).
5. Load containers on ISO bed (4) ensuring proper alignment with ISO locks (3).
6. Turn ISO lock (3) 1/4 turn to locked position until handle (5) is pointed in same direction as in Step (1).

### CAUTION

To prevent nut from turning when pin is released, ensure pin rests in notch of nut. Failure to comply could result in damage to equipment.

7. Pull back pin (1) and tighten nut (2) securely.

### Unlock

1. Pull back pin (1) and loosen nut (2).

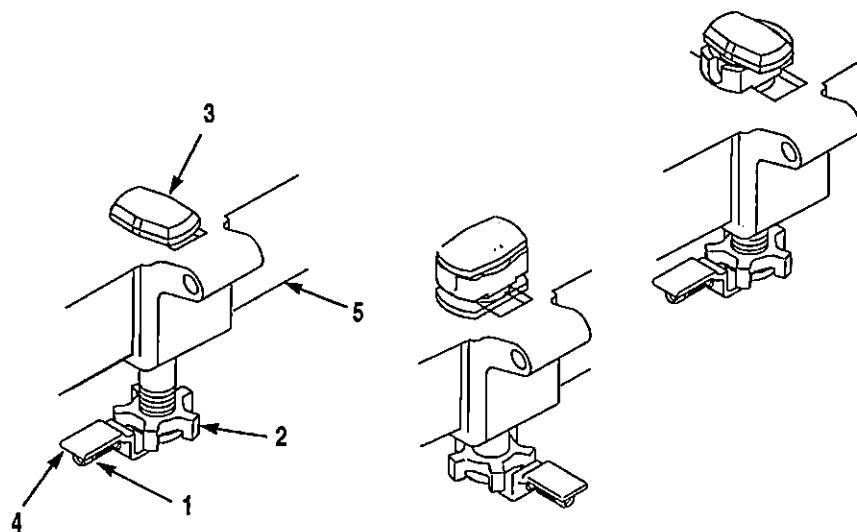
**Unlock - Continued**

Figure 2.

2. Turn ISO lock (3) 1/4 turn so handle (4) points away from ISO bed (5).
3. Unload containers.
4. Push up on ISO lock (3) and turn 1/4 turn so handle (4) is pointing in same direction as in Step (1).
5. Lower ISO lock (3) and allow ISO lock to recess into ISO bed (5).

**CAUTION**

To prevent nut from turning when pin is released, ensure pin rests in notch of nut. Failure to comply could result in damage to equipment.

6. Pull back pin (1) and tighten nut (2) securely.

**END OF TASK**

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE SHALLOW ISO LOCK/UNLOCK

### INITIAL SETUP:

Not Applicable

### Lock

#### NOTE

- The ISO lock spanner wrench may need to be used to loosen ISO lock knob.
- The shallow ISO lock is used on MK27 and MK28 models only.

1. Loosen ISO lock knob (1) and turn counterclockwise (when view is from below ISO lock), until end of travel is reached (position 1).

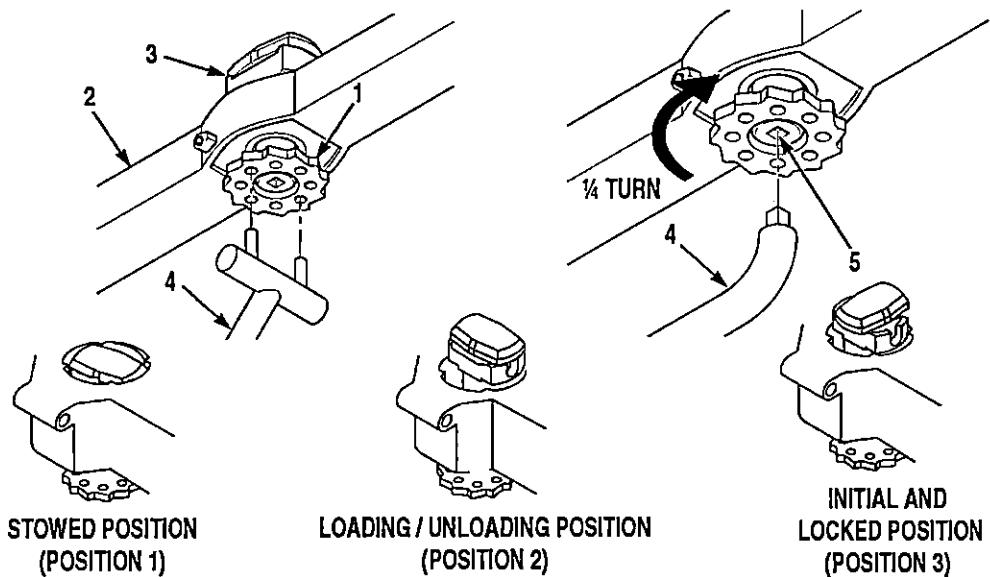


Figure 1.

2. Push ISO lock knob (1) up through ISO bed (2), turn 1/4 turn, and position ISO lock (3) parallel to side of ISO bed (position 3).
3. With square end of ISO lock spanner wrench (4) inserted in shaft (5), turn shaft 1/4 turn (position 2).
4. Load containers on ISO bed (2) and ensure proper alignment is made with ISO locks (3).
5. Insert square end of ISO lock spanner wrench (4) in shaft (5) and turn shaft 1/4 turn (position 3).
6. Turn ISO lock knob (1) clockwise until seated and tighten with ISO lock spanner wrench (4).

**Unlock**

1. Pull and turn lock pin (1) 1/4 turn counterclockwise.

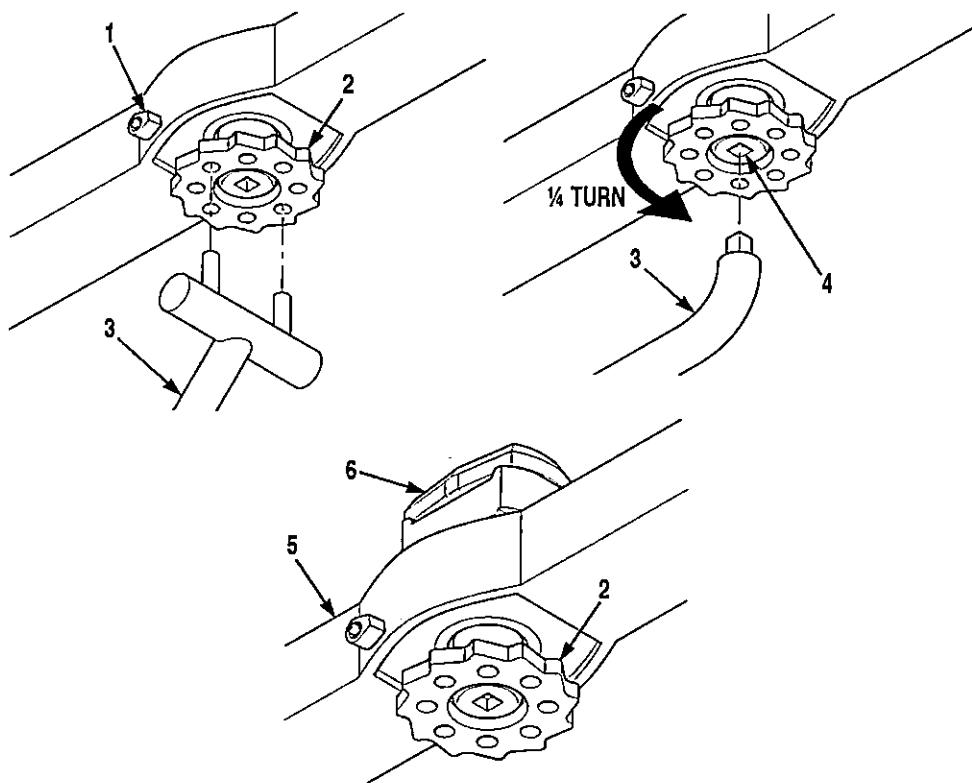


Figure 2.

2. Loosen ISO lock knob (2) with ISO lock spanner wrench (3) and turn knob counterclockwise (when view is from below ISO lock) until end of travel is reached (position 3).
3. Insert square end of ISO lock spanner wrench (3) in shaft (4) and turn 1/4 turn (position 2).
4. Remove containers from ISO bed (5).
5. Push ISO lock knob (2) up and turn ISO lock (6) 1/4 turn.
6. Lower ISO lock (6) and allow ISO lock to recess into ISO bed (5).
7. Insert square end of ISO lock spanner wrench (3) in shaft (4), turn 1/4 turn, and allow ISO lock to fully recess into ISO bed (5) (position 1).
8. Turn ISO lock knob (2) clockwise until seated and tighten.
9. Pull and turn lock pin (1) clockwise 1/4 turn.

**END OF TASK**

**END OF WORK PACKAGE**

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## 1ST ECHELON MAINTENANCE CONTAINER LOAD

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**INITIAL SETUP:**

Not Applicable

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**Container Load****WARNING**

- Fluid slosh can produce a vehicle rollover. Transportation of bulk liquids create fluid motions that can disturb and destabilize vehicle movements. Major slosh motions develop during vehicle cornering and braking. Always do the following to minimize fluid slosh:
- Transport containers that are either filled to their capacity or practically emptied.
- Avoid quick braking. Keep safe distance between you and the vehicle in front of you and brake early.
- Avoid abrupt lane changes. Make lane changes gradually.
- Make turns slowly and cautiously.
- Operate vehicle at safe, prudent speeds to keep vehicle in control.
- Failure to comply may result in injury or death to personnel.

**NOTE**

- Refer to Cargo Body (WP 0002, Table 14) for MK23 and MK25 and Cargo Body (WP 0002, Table 15) for MK27 and MK28 to determine payloads for vehicles equipped with armor.
- Prior to loading cargo, operator must determine the type of payload from the Types of Payloads Table below, the weights of different containers listed in the Payload Weight Variations Table below, and the use and possible changes in the containers. Operator must also be familiar with load limiting factors listed in the Load Limiting Factors Table.

**NOTE**

Operator must adhere to the following guidelines when loading the vehicle.

*Table 1. Types of Payloads.*

14 ft. (4m) Body	20 ft. (6m) Body
Distributed Palletized	Distributed Palletized
6-Con, Water or Fuel (Total of 2)	6-Con, Water or Fuel (Total of 3)
10 ft. (3m) Shelter (Total of 1)	10 ft. (3m) Shelter (Total of 2)

**Container Load - Continued****Table 1. Types of Payloads - Continued.**

14 ft. (4m) Body	20 ft. (6m) Body
Quad Cons (Total of 2, paired)	Quad Cons (Total of 4, paired)
	20 ft. (6m) Container (Total of 1)
	20 ft. (6m) Shelter (Total of 1)

**Table 2. Payload Weight Variations.**

Type of Load	Weight Range Each lbs/(kg)
Distributed Palletized	30 lbs to 15 Tons (14 to 13,620 kg)
6-Con, General	2,530 lbs to 5 Tons (1,149 to 4,540 kg)
6-Con, Water Tank	2,530 lbs to 9,730 lbs (1,149 to 4,417 kg)
6-Con, Water Pump	3,000 lbs (1,362 kg)
6-Con, Fuel Tank	2,530 lbs to 8,830 lbs (1,149 to 4,009 kg)
6-Con, Fuel Pump	4,000 lbs (1,816 kg)
10 ft. (3m) Shelter	2,950 lbs to 7,500 lbs (1,339 to 3,405 kg)
Quad Cons	1,800 lbs to 10,000 lbs (817 to 4,540 kg)
20 ft. (6m) Container	4,700 lbs to 30,000 lbs (2,134 to 13,620 kg)
20 ft. (6m) Shelter	4,650 lbs to 15,000 lbs (2,111 to 6,810 kg)

**Table 3. Load Limiting Factors.**

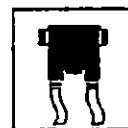
Type	Limiting Factors
Axle Loading	Front axle load range is 11,000 lbs to 16,000 lbs (4,994 to 7,264 kg) for optimum ride quality and steering and handling. Too much weight on front axle will cause excessive stress on front suspension, too little weight on front axle will cause possible loss of steering control.

## Container Load - Continued

Table 3. Load Limiting Factors - Continued.

Type	Limiting Factors
	Front axle load range is 14,500 lbs to 21,600 lbs (6,583 to 9,806 kg) for optimum ride quality and steering and handling. Too much weight on front axle will cause excessive stress on front suspension, too little weight on front axle will cause possible loss of steering control.
Terrain Requirements	Payload limited to 7.1 tons (6,447 kg) off road terrain.
	Payload limited to 15 tons (13,620 kg) on highway and secondary roads.
Shipping Requirements	Payload limited to 7.1 tons (6,447 kg) for rail shipping and crane loading.
Federal Highway Regulations	Payload limited to 17,736 lbs (8,052 kg) for MK23 and MK25. Payload limited to 15,920 lbs (7,228 kg) for MK27 and MK28.

## Standard Wheel Base Cargo Variant (MK23 and MK25)

**WARNING**

When loading or unloading any of the container combinations listed below, the payload may require the operator to rearrange the cargo in order to meet the loading restrictions specified. The payload configuration must fall within the guidelines listed below prior to movement of the 7-Ton Truck. Failure to comply may result in damage to equipment or loss of steering control which may result in injury or death to personnel.

## Standard Wheel Base Cargo Variant (MK23 and MK25) - Continued

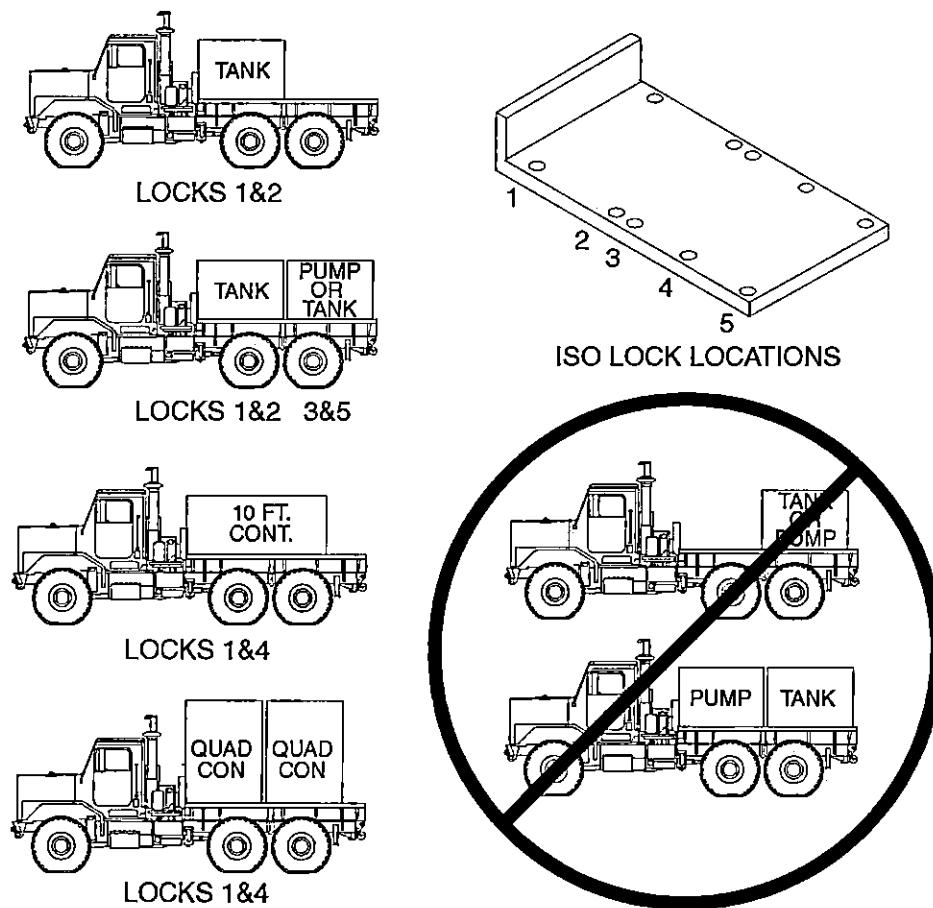


Figure 1. Standard Wheel Base Cargo (MK23 and MK25).

1. Distributed Payload. The vehicle is capable of carrying 7.1 tons (6,447 kg) off road and 15 tons (13,620 kg) on road. Payload center of gravity shall be placed at the approximate center of the useable cargo area. (Refer to Figure 1).

### WARNING

The MTVR is designed to carry only ISO containers with a maximum size of 8 ft x 8 ft x 14 ft (2.4 m x 2.4 m x 4.3 m) for the standard wheel base cargo variant and 8 ft x 8 ft x 20 ft (2.4 m x 2.4 m x 6.1 m) for extended wheel base cargo variant. Do not use any containers exceeding these measurements. Failure to comply may result in serious injury or death to personnel and/or damage to equipment.

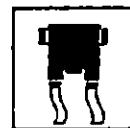
2. Ten Foot (3m) EMI/EMC Shelter/Container. The vehicle is capable of carrying one container with a gross weight (GW) of 3.75 tons (3,405 kg). A 10 ft. (3m) container is secured using ISO locks #1 and #4.
3. Six-Cons. The vehicle is capable of carrying one or two six-con units with total combination weight of 7.1 tons (6,447 kg) off road and 10 tons (9,080 kg) on road. The six-con units include six-con water tank, six-con water pump, six-con fuel tank, and six-con fuel pump. One six-con is secured using ISO locks #1 and #2 and the second six-con is secured using ISO locks #3 and #5.
  - a. If carrying one six-con, the container must be placed in the forward position (ISO locks #1 and #2).

**Standard Wheel Base Cargo Variant (MK23 and MK25) - Continued**

- b. If carrying two six-cons, the heavier container must be placed in the forward position (ISO locks #1 and #2).
- c. If the vehicle is loaded with two water or fuel tank six-cons, liquid should be dispensed from the rear container first until empty (or near empty) and then from the forward container. When replenishing empty tanks, the forward tank should be filled first and the rear filled second.

4. Quad-Cons. The vehicle is capable of carrying two quad-con units with a total combination weight of 7.1 tons (6,447 kg) off road and 10 tons (9,080 kg) on road. Quad-con units shall be coupled together after loading. Two quad-cons are secured using ISO locks #1 and #4.

- a. If carrying two quad-cons on road, the heaviest of the two must be positioned in the forward position.
- b. If carrying two quad-cons off road, the container pair must be equally loaded.

**Extended Wheel Base Cargo Variant (MK27 and MK28)****WARNING**

When loading or unloading any of the container combinations listed below, the payload may require the operator to rearrange the cargo in order to meet the loading restrictions specified. The payload configuration must fall within the guidelines listed below prior to movement of the 7-Ton Truck. Failure to comply may result in damage to equipment or loss of steering control which may result in injury or death to personnel.

## Extended Wheel Base Cargo Variant (MK27 and MK28) - Continued

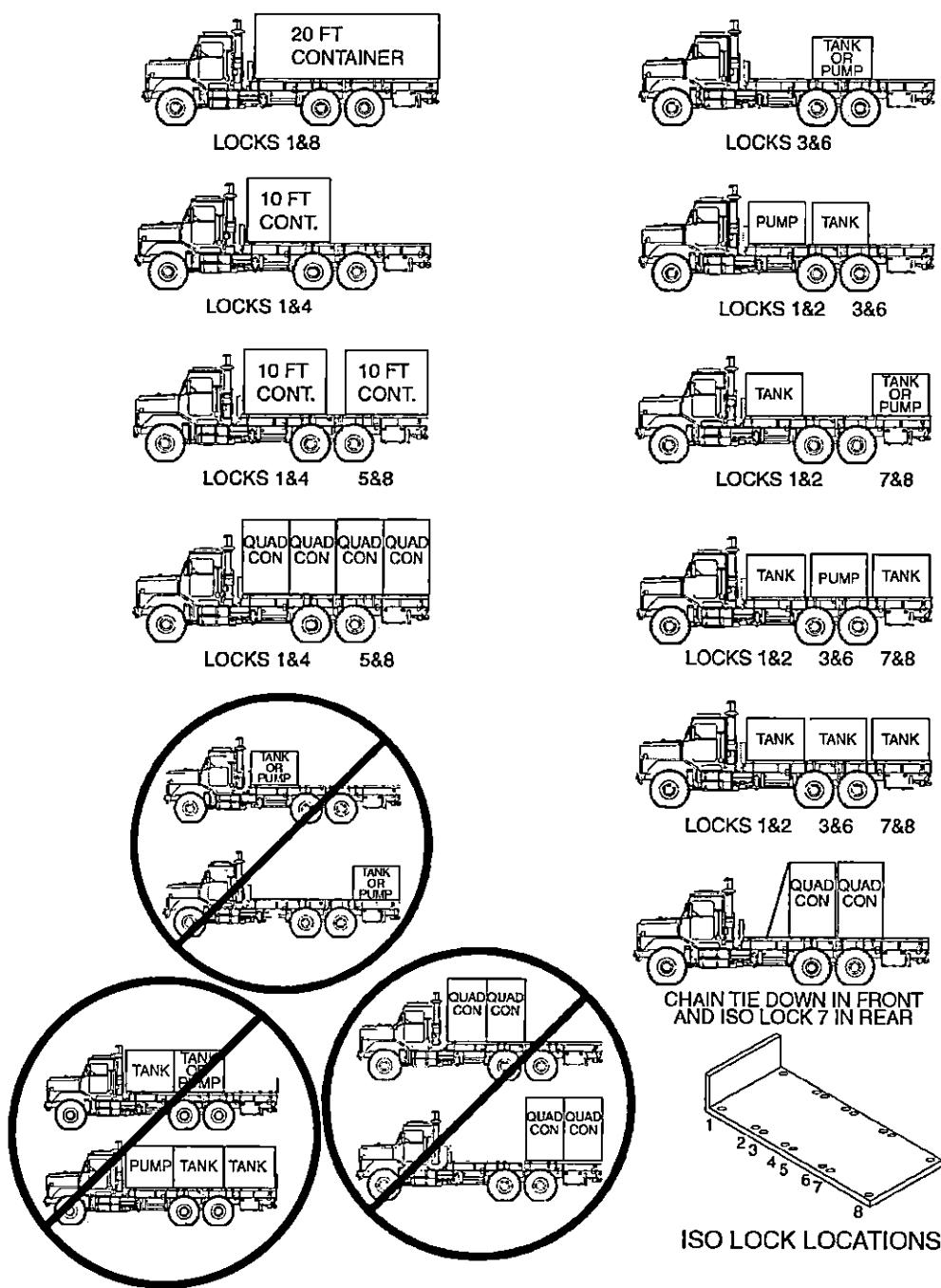


Figure 2. Extended Wheel Base Cargo (MK27 And MK28).

1. Distributed Payload. The vehicle is capable of carrying 7.1 tons (6,447 kg) off road and 15 tons (13,620 kg) on road. Payload center of gravity shall be placed at the approximate center of cargo area. (Refer to Figure 2).

**Extended Wheel Base Cargo Variant (MK27 and MK28) - Continued****WARNING**

The MTVR is designed to carry only ISO containers with a maximum size of 8 ft x 8 ft x 14 ft (2.4 m x 2.4 m x 4.3 m) for the standard wheel base cargo variant and 8 ft x 8 ft x 20 ft (2.4 m x 2.4 m x 6.1 m) for extended wheel base cargo variant. Do not use any containers exceeding these measurements. Failure to comply may result in serious injury or death to personnel and/or damage to equipment.

2. Twenty foot (6m) Shelter/Container. The vehicle is capable of carrying one 20 ft. container with a weight of 7.1 tons (6,447 kg) off road and 15 tons (13,608 kg) on road. Prior to loading the shelter/container, adjust the interior materials/components so that the center of gravity is close to the center of the shelter/container. Secure the shelter/container using ISO locks #1 and #8.

**WARNING**

The MTVR is designed to carry only ISO containers with a maximum size of 8 ft x 8 ft x 14 ft (2.4 m x 2.4 m x 4.3 m) for the standard wheel base cargo variant and 8 ft x 8 ft x 20 ft (2.4 m x 2.4 m x 6.1 m) for extended wheel base cargo variant. Do not use any containers exceeding these measurements. Failure to comply may result in serious injury or death to personnel and/or damage to equipment.

3. Ten foot (3m) Electro Magnetic Interference/Electro Magnetic Container (EMI/EMC) Shelter/Container. The vehicle is capable of carrying one or two containers with a total combination weight of 7.1 tons (6,447 kg) off road and 7.5 tons (6,810 kg) on road. One 10 ft. (3m) container is secured using ISO locks #1 and #4 and the other 10 ft. (3m) container is secured using ISO locks #5 and #8.
  - a. If carrying one 10 ft. (3m) container, the container must be placed in the forward position (ISO locks #1 and #4).
  - b. If carrying two 10 ft. (3m) containers, the heavier container must be placed in the forward position (ISO locks #1 and #4), and the lighter in the rear position (ISO locks #5 and #8).
4. Six-Cons. The vehicle is capable of carrying one, two, or three six-con units with the total combination weight of 7.1 tons (6,447 kg) off road and 15 tons (13,620 kg) on road. The six-con units include six-con water tank, six-con water pump, six-con fuel tank, and six-con fuel pump. One six-con is secured using ISO locks #1 and #2, another six-con is secured using ISO locks #3 and #6, and the other six-con is secured using ISO locks #7 and #8.
  - a. If carrying one six-con, the container must be placed in the middle position (ISO locks #3 and #6).
  - b. If carrying two six-cons, the heavier container must be placed in the forward position (ISO locks #1 and #2) and the other must be placed in the rear position (ISO locks #7 and #8), payloads separated.
  - c. If carrying three six-cons, the heavier containers must be placed in the forward (ISO locks #1 and #2) and middle position (ISO locks #3 and #6) and the third must be placed in the rear position (ISO locks #7 and #8).
  - d. If the vehicle is loaded with two water or fuel tank six-cons, liquid should be dispensed from the rear container first until empty (or near empty) and then from the forward container. When replenishing the empty tanks, the forward tank should be filled first and then the rear tank.
  - e. If the vehicle is loaded with three water or fuel tank six-cons, liquid should be dispensed from the rear container first until empty (or near empty) and then from the front container, and finally from the middle container. When replenishing the empty tanks, the middle tank should be filled first, then the forward tank and finally the rear tank.
  - f. If carrying one six-con water or fuel tank and one six-con water or fuel pump, the units may be carried in pairs under the following restriction: the pump unit shall be placed in the front position (ISO locks #1 and #2) and the tank unit shall be placed in the middle position (ISO locks #3 and #6).

**Extended Wheel Base Cargo Variant (MK27 and MK28) - Continued**

- g. If carrying two six-con water or fuel tanks and one six-con water or fuel pump, the pump unit shall be placed in the middle position (ISO locks #3 and #6), the tank units shall be placed in the forward position (ISO locks #1 and #2) and rear positions (ISO locks #7 and #8). When dispensing liquid, liquid should be dispensed from the rear container first until empty (or near empty) and then from the front container. When replenishing the empty tanks, the forward tank should be filled first.
- 5. Quad-Cons. The vehicle is capable of carrying two or four quad-con units with the total combination weight of 5 tons (4,540 kg) off road and 15 tons (13,620 kg) on road. The quad-con units shall be coupled together in pairs after loading. One pair of quad-cons are secured using ISO locks #1 and #4 and the other pair of quad-cons are secured using ISO locks #5 and #8.
  - a. If carrying two pairs of quad-cons, the heavier container pair must be placed in the forward position (ISO locks #1 and #4) and the lighter pair must be placed in the rear position (ISO locks #5 and #8).
  - b. If carrying one quad-con off road, the pair must be equally loaded.
  - c. If carrying one quad-con pair, the pair must be secured in the following manner:

**CAUTION**

One Quad-Con pair cannot be secured using four ISO locks. The front end of the quad-con pair must be tied down using two tiedowns. Failure to comply may result in damage to equipment.

- (1) Place container pair so that the rear ISO lock pockets on the pair are positioned over ISO locks #7. The front ISO lock pockets of the pair will be just forward of ISO locks #2.
- (2) Secure the #7 ISO locks to the ISO lock casting of the rear container (refer to Shallow ISO Lock/Unlock (WP 0047)).
- (3) Connect the two quad-cons together.
- (4) Tie the front of the container pair to the cargo body with chain/cable tiedowns.

**END OF TASK****END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE LADDER

### INITIAL SETUP:

Not Applicable

### Move Ladder From Tailgate To Side Mount Position

#### NOTE

To use ladder for access to rear of cargo bed, position tailgate down.

1. Remove two clips (1) from ladder (2) and tailgate (3).

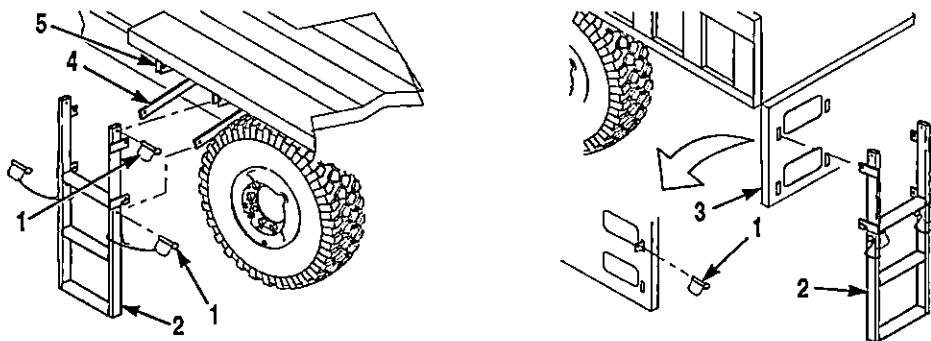


Figure 1.

2. Remove ladder (2) from tailgate (3).

#### NOTE

Extra clips may be stowed on tailgate when not being used. If ladder struts are not installed, refer to Service Upon Receipt of Equipment: Inspection (WP 0094).

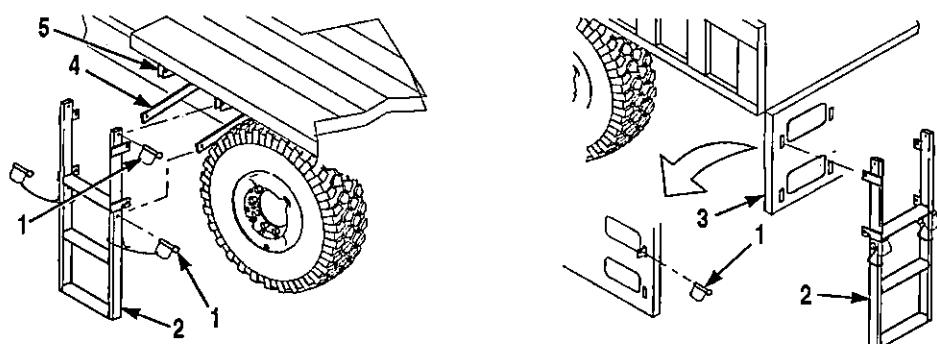
3. Remove two clips (1) from ladder struts (4) and U-brackets (5) and allow struts to drop down.
4. Using two clips (1), attach ladder (2) to U-brackets (5).
5. Attach ladder (2) to struts (4) with two clips (1).

### Move Ladder From Side Mount Position to Tailgate

#### WARNING

Ensure cargo bed stowage door is installed prior to using ladder. Failure to comply may result in severe injury to personnel.

1. Remove four clips (1) and ladder (2) from two struts (4) and U-brackets (5).

**Move Ladder From Side Mount Position to Tailgate - Continued****Figure 2.**

2. Attach struts (4) to U-brackets (5) with two clips (1).
3. Install ladder (2) on tailgate (3) with two clips (1).

**END OF TASK****END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
TAILGATE AND DROPSIDES****INITIAL SETUP:**

Not Applicable

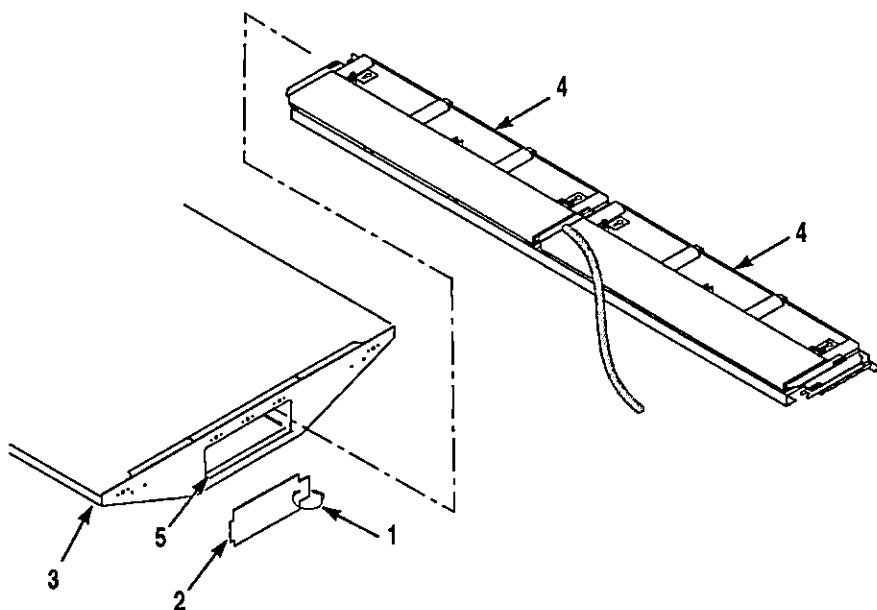
**Unstow Dropside**

Figure 1.

1. Remove pin (1) from stowage door (2).
2. Remove stowage door (2) from cargo body (3).

**WARNING**

Two personnel are required to unstow dropsides. Failure to comply may result in damage to equipment or injury to personnel.

3. With the aid of an assistant, remove four dropsides (4) from stowage compartment (5).
4. Remove rope from dropside and stow in BII.

**NOTE**

If troop seats will not be installed, secure and stow remaining portion of rope on top of stowed troop seats.

5. Install stowage door (2) on cargo body (3).

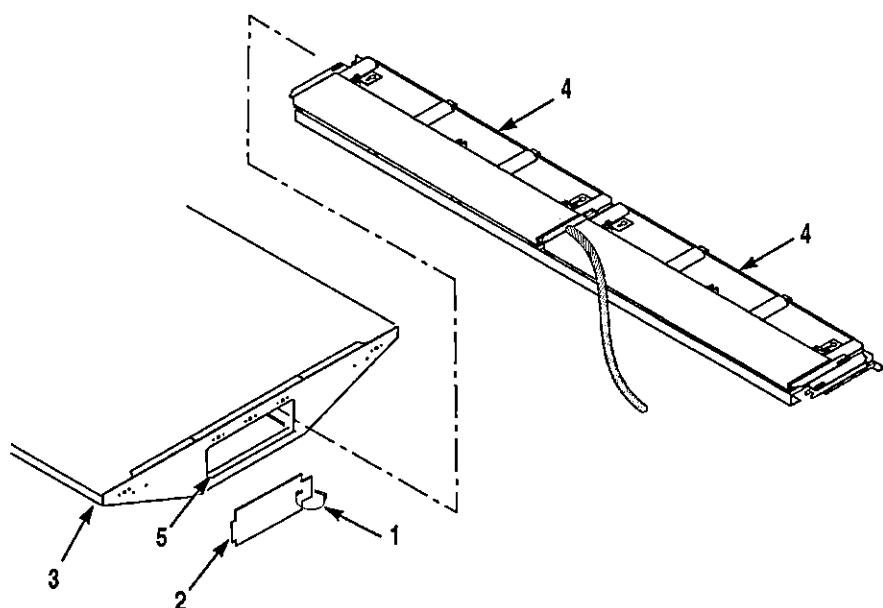
**Unstow Dropside - Continued**

Figure 2.

6. Install pin (1) in stowage door (2).

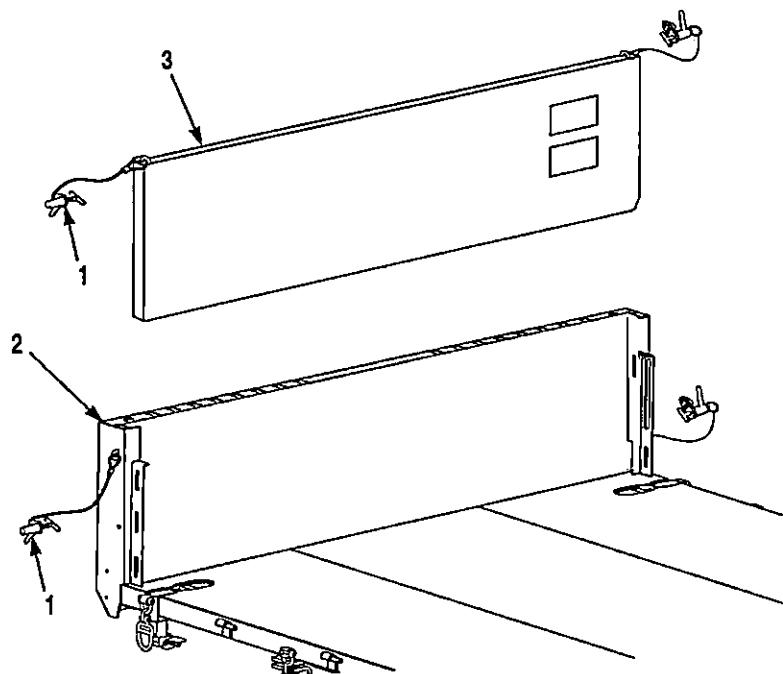
**Unstow Tailgate**

Figure 3.

1. Loosen and remove four T-bolt locking handle assemblies (1) from headboard (2).

**WARNING**

Two personnel are required to unstow tailgate. Failure to comply may result in damage to equipment or injury to personnel.

2. With the aid of an assistant, lift and remove tailgate (3) from headboard (2).

**Dropside Installation****WARNING**

Two personnel are required to install dropsides. Failure to comply may result in damage to equipment or injury to personnel.

**NOTE**

- There are two hinge pins and two hinge barrels for each dropside on the MK23 and MK25. There are three hinge pins and three hinge barrels for each dropside on the MK27 and MK28.
- Dropsides are the same and are interchangeable within each vehicle.
- Prior to installing dropsides, ensure that all top tie down rings and ISO locks are recessed in cargo bed.

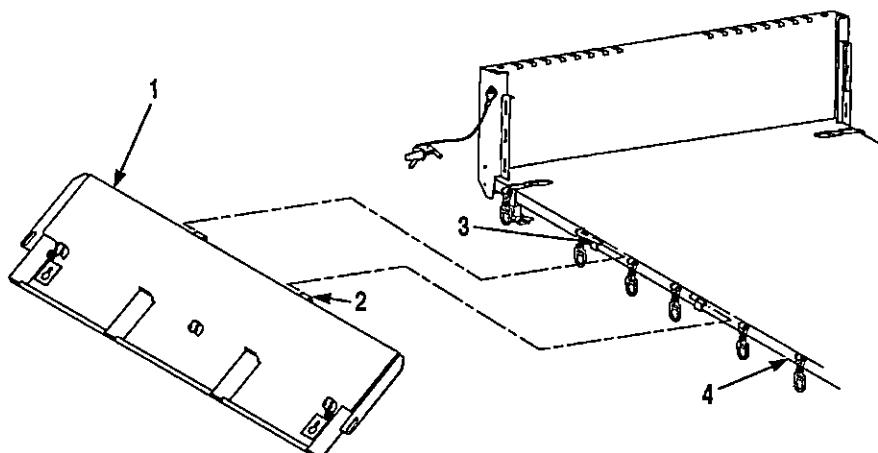
**Dropside Installation - Continued**

Figure 4.

1. With the aid of an assistant, position dropside (1) in an almost full down position and align hinge barrels (2) with front two (MK23 and MK25) or three (MK27 and MK28) hinge pins (3) on cargo body (4).
2. Slide hinge barrels (2) onto hinge pins (3).

## Dropside Installation - Continued

### WARNING

When installing T-bolt locking handle assemblies, ensure T-bolt of locking handle assembly is perpendicular to slot in headboard. Tighten T-bolt locking handle as tight as possible by hand, and then tighten an additional 1/4 turn using handle extension from BII. Failure to comply may result in serious injury or death to personnel.

3. With the aid of an assistant, rotate dropside (1) to up position and secure to headboard (5) with T-bolt locking handle assembly (6).
4. Repeat Steps (1) through (3) for remaining front dropside.

### CAUTION

Ensure center T-bolt locking handle is installed so handle is on inside of cargo bed. Failure to comply may result in damage to cargo cover.

5. With the aid of an assistant, position dropside (1) in an almost full down position and align hinge barrels (2) with rear two (MK23 and MK25) or three (MK27 and MK28) hinge pins (3) on cargo body (4).

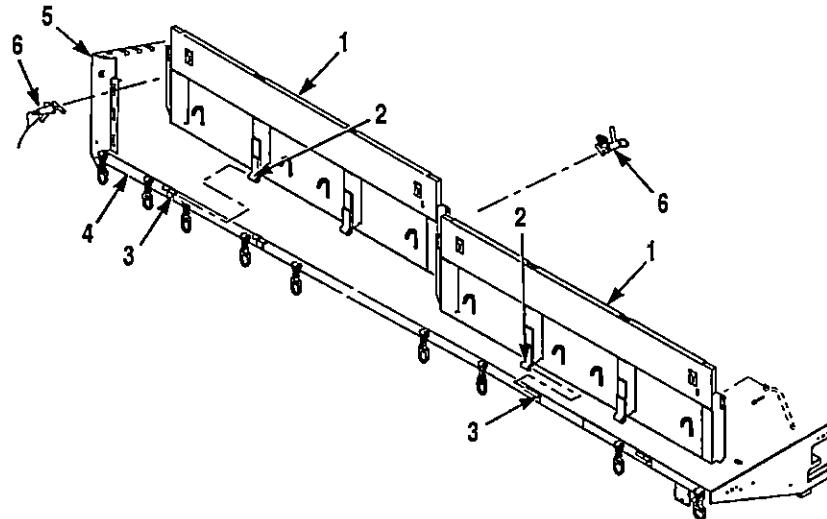


Figure 5.

6. Slide hinge barrels (2) onto hinge pins (3) until hinge barrels are completely on hinge pins.
7. With the aid of an assistant, rotate dropside (1) to up position and secure to front dropside (1) with T-bolt locking handle assembly (6).
8. Repeat Steps (5) through (7) for remaining dropside (1).

### NOTE

Prior to installing locking rods, ensure they are adjusted to appropriate length.

9. Secure two locking rods (8) to cargo body (4) and rear dropsides (1) with washer (9) and cotter pin (10).

**Tailgate Installation****WARNING**

Two personnel are required to install tailgate. Failure to comply may result in damage to equipment or injury to personnel.

**NOTE**

- Dopsides must be installed before installing tailgate.
- Early models of 7-Ton Truck use a screw and washer in place of cotter pin and washer.

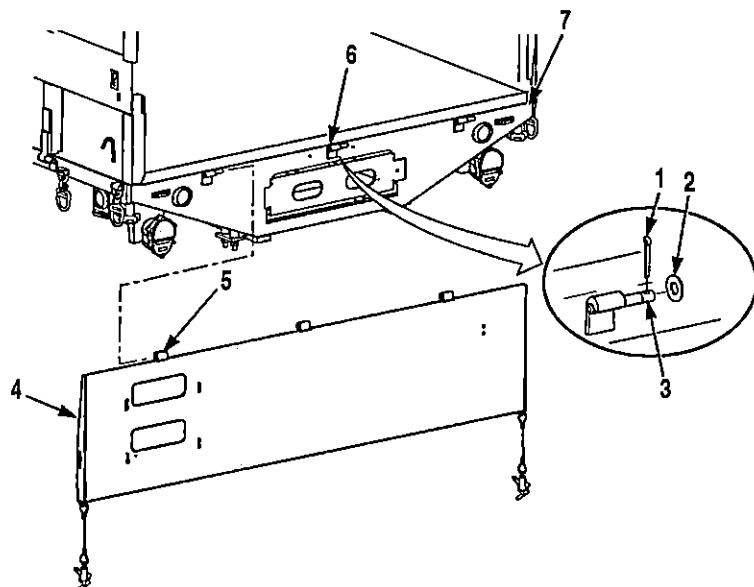


Figure 6.

1. Remove cotter pin (1) and washer (2) from pin extension (3).
2. With the aid of an assistant, position tailgate (4) in an almost full down position and align hinge barrels (5) with hinge pins (6) on cargo body (7).
3. Slide hinge barrels (5) onto hinge pins (6) until hinge barrels are completely on hinge pins.

**Tailgate Installation - Continued****WARNING**

T-bolt locking handles are tethered to tailgate and can swing freely when not secured in tailgate. Use care when opening or closing tailgate. Failure to comply may result in injury to personnel.

**WARNING**

When installing T-bolt locking handle assemblies, ensure T-bolt of locking handle assembly is perpendicular to slot in headboard. Tighten T-bolt locking handle as tight as possible by hand, and then tighten an additional 1/4 turn using handle extension from BII. Failure to comply may result in serious injury or death to personnel.

4. With the aid of an assistant, rotate tailgate (4) to up position and secure to dropsides (8) with two T-bolt locking handle assemblies (9).

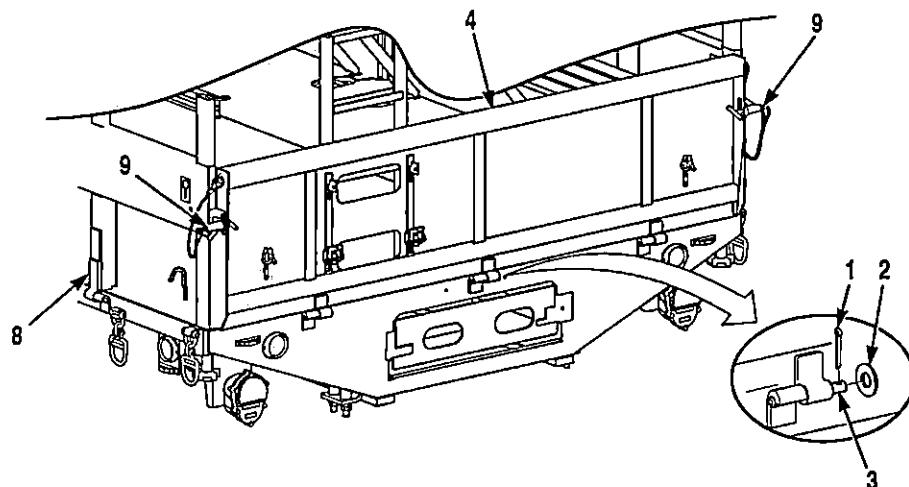


Figure 7.

5. Install washer (2) and cotter pin (1) on pin extension (3).

**Tailgate Removal****NOTE**

Early models of 7-Ton Truck use a screw and washer in place of cotter pin and washer.

1. Remove cotter pin (1) and washer (2) from pin extension (3).

**WARNING**

Two personnel are required to remove tailgate. Failure to comply may result in damage to equipment or injury to personnel.

## Tailgate Removal - Continued

### WARNING

T-bolt locking handles are tethered to tailgate and can swing freely when not secured in tailgate. Use care when opening or closing tailgate. Failure to comply may result in injury to personnel.

- With the aid of an assistant, loosen and remove two T-bolt locking handle assemblies (4) from tailgate (5) and rotate tailgate (5) to full down position.

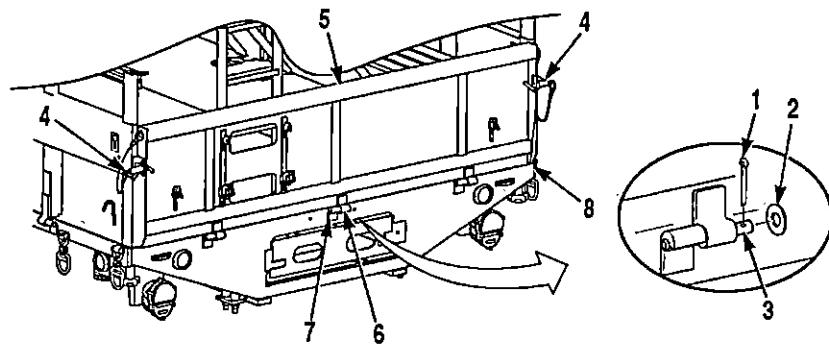


Figure 8.

- With the aid of an assistant, slide hinge barrels (6) off hinge pins (7) and remove tailgate (5) from cargo body (8).
- Install washer (2) and cotter pin (1) on pin extension (3).

## Dropside Removal

### NOTE

Tailgate must be removed prior to removing dropsides.

- Remove cotter pin (1), washer (2), and locking rod (3) from cargo body (4) and rear dropside (5).

### WARNING

Two personnel are required to remove dropsides. Failure to comply may result in damage to equipment or injury to personnel.

- With the aid of an assistant, loosen and remove T-bolt locking handle assembly (6) from rear dropside (5) and rotate dropside to full down position.

## Dropside Removal - Continued

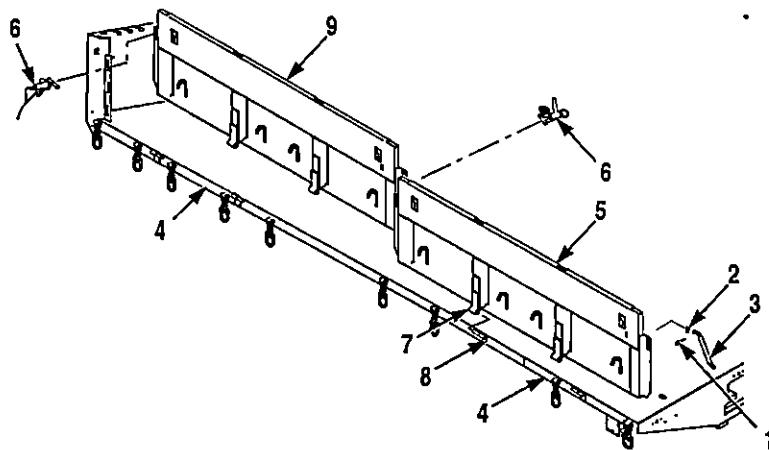


Figure 9.

3. With the aid of an assistant, slide hinge barrels (7) off hinge pins (8) and remove rear dropside (5) from cargo body (4).
4. Repeat Steps (2) and (3) for remaining rear dropside.
5. With the aid of an assistant, loosen and remove T-bolt locking handle assembly (6) from front dropside (9) and rotate dropside to full down position.
6. With the aid of an assistant, slide hinge barrels (7) off hinge pins (8) and remove front dropside (9) from cargo body (4).
7. Repeat Steps (5) and (6) for remaining front dropside.

## Stow Tailgate

**WARNING**

Two personnel are required to stow tailgate. Failure to comply may result in damage to equipment or injury to personnel.

**NOTE**

Tailgate must be stowed with hinge barrels down and inside of tailgate facing towards rear of truck.

1. With the aid of an assistant, lift and place tailgate (1) in tailgate stowage area located next to headboard (2).

**WARNING**

When installing T-bolt locking handle assemblies, ensure T-bolt of locking handle assembly is perpendicular to slot in headboard. Tighten T-bolt locking handle as tight as possible by hand, and then tighten an additional 1/4 turn using handle extension from BII. Failure to comply may result in serious injury or death to personnel.

2. Attach two tailgate T-bolt locking handle assemblies (3) and two headboard T-bolt locking handle assemblies (3) to headboard (2).

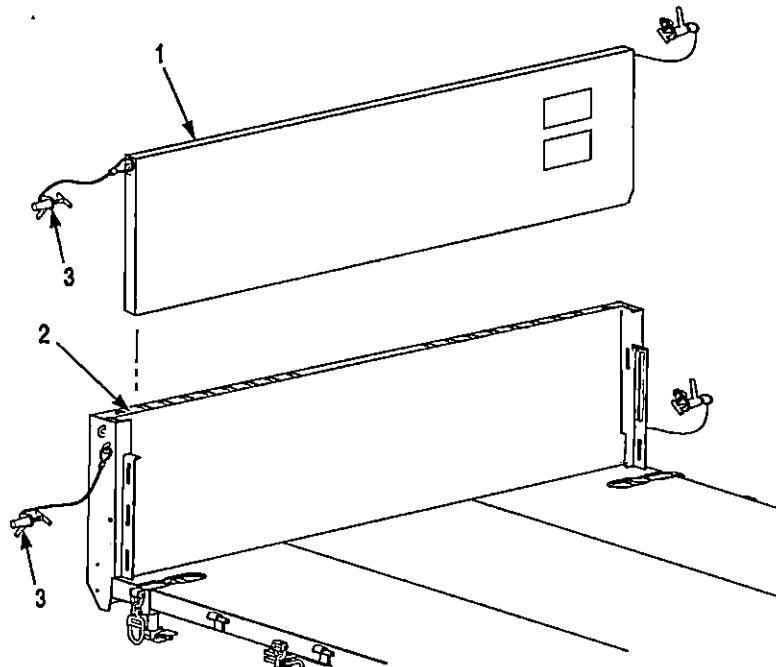
**Stow Tailgate - Continued**

Figure 10.

**Stow Dropside**

1. Remove pin (1) from stowage door (2).
2. Remove stowage door (2) from cargo body (3).

**WARNING**

Two personnel are required to stow dropsides. Failure to comply may result in damage to equipment or injury to personnel.

**NOTE**

- When stacking dropsides for stowage, dropsides must be stowed in two sets of two. The bottom dropside must be positioned so outside of dropside is pointing up and the hinge barrels must point up and to the right of the vehicle. The top dropside must be positioned on top of the first with the outside of the dropside facing down and the hinge barrels pointing down and to the left of the vehicle.
- When stowing dropsides in cargo bed, the hinge barrels of bottom dropside must point to right of vehicle.

3. With the aid of an assistant, stack two dropsides (4) together.

## Stow Dropside - Continued

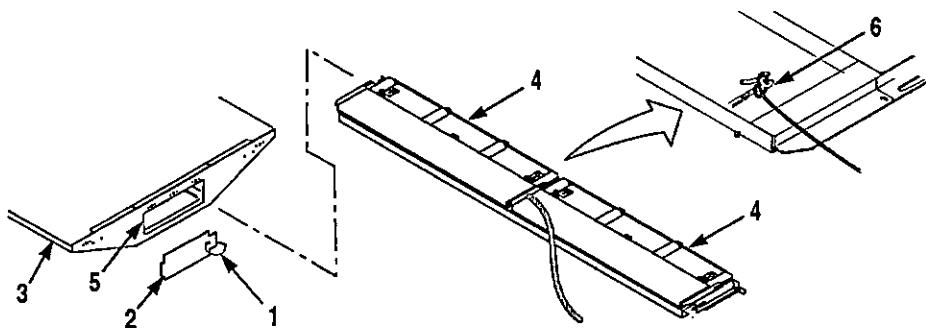


Figure 11.

4. With the aid of an assistant, stow first set of dropsides (4) in top of stowage compartment (5) allowing two ft. (.6 m) of dropsides (4) to extend beyond rear of vehicle.
5. Secure a rope to the bottom dropside (4) by tying the rope to the cargo cover hook (6) that is to the rear of the vehicle.
6. Push first set of dropsides (4) into stowage compartment (5).

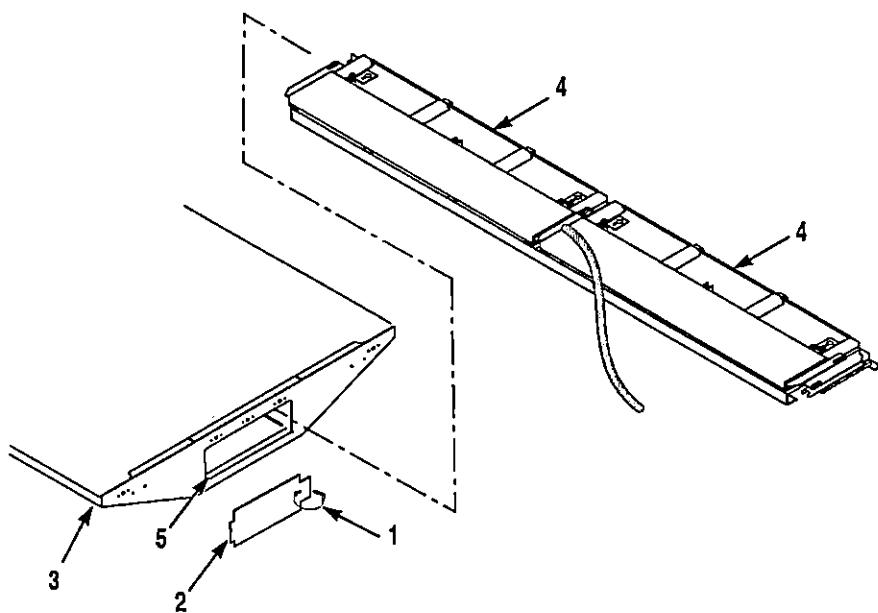


Figure 12.

7. With the aid of an assistant, stack remaining two dropsides (4) together.
8. Stow second set of dropsides (4) in top of stowage compartment (5) using care not to pinch or cut rope.
9. Install stowage door (2) on cargo body (3).

**Stow Dropside - Continued**

10. Install pin (1) in stowage door (2).

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
TROOP SEATS / BACKRESTS / STAVES / BOWS**

**INITIAL SETUP:**

Not Applicable

**Unstow Troop Seats and Backrests**

1. Remove pin (1) from storage door (2).

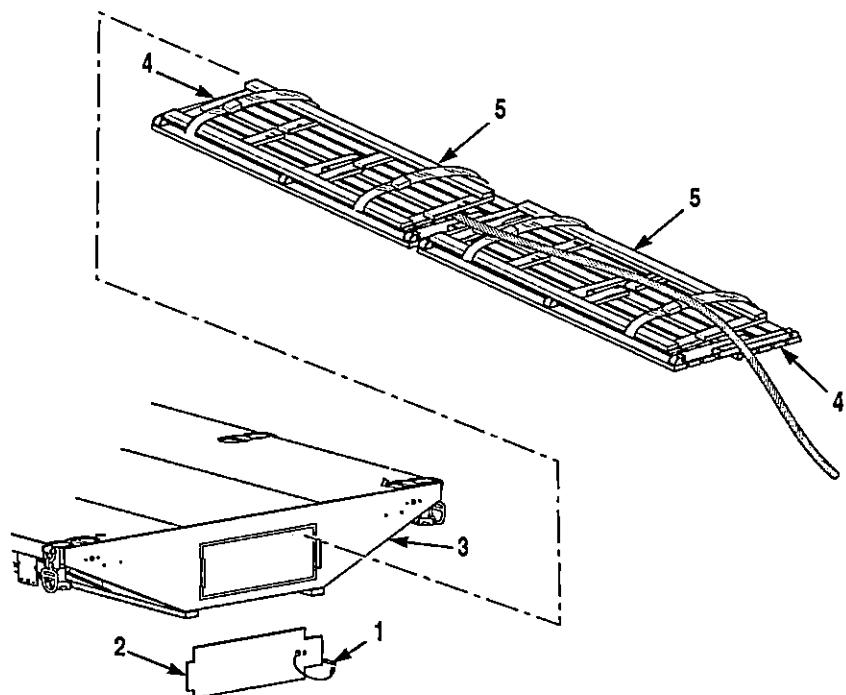


Figure 1.

2. Remove stowage door (2) from cargo body (3).

**WARNING**

Two personnel are required to unstow troop seats and backrests. Failure to comply may result in damage to equipment or injury to personnel.

3. With the aid of an assistant, remove four troop seats (4) and backrests (5) from stowage compartment.
4. Remove rope (6) and four straps (7) from troop seats and stow in BII box.
5. Install stowage door (2) on cargo body (3).

## Unstow Troop Seats and Backrests - Continued

6. Install pin (1) in stowage door (2).

### Backrests, Staves, and Bows Installation

#### NOTE

- Front backrests have a wooden support on both ends. Rear supports do not have wooden supports.
- Front backrests must be installed with wooden supports inserted into front and rear stave pockets of front dropside.

1. Install both front backrests (1) on dropsides (2).

#### NOTE

- The MK23 and MK25 have two center stave pockets. The MK27 and MK28 have three center stave pockets.
- Staves are stowed in slots in headboard.

2. Install center staves (3) through stave pockets of each front backrest (1) and into stave pockets of dropsides (2).

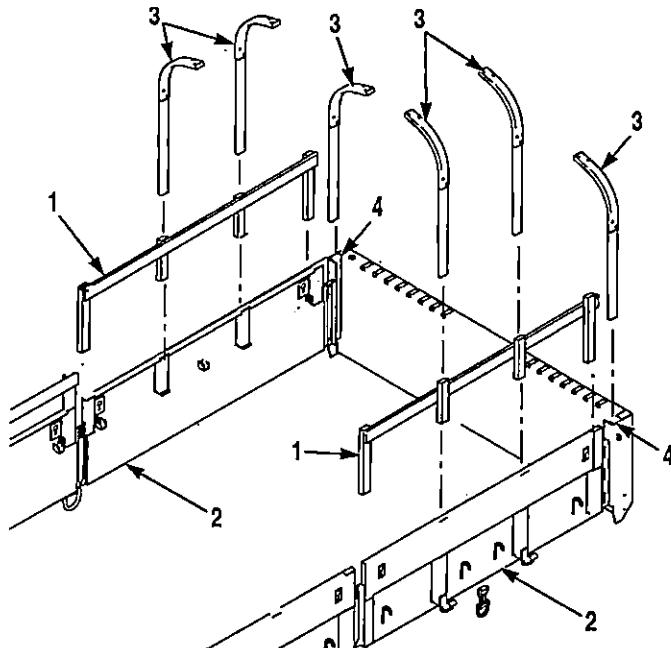


Figure 2.

3. Install two staves (3) into headboard stave pockets (4).

#### NOTE

- Rear backrests are installed by inserting staves through stave pockets of backrests and into stave pockets of dropsides.
- When installing rear backrests, an assistant is required to support the backrest while installing staves.

### Backrests, Staves, and Bows Installation - Continued

- With the aid of an assistant, install remaining staves (3) and rear backrests (5).

#### NOTE

Bows are stowed on front of headboard.

- Remove strap (6) and bows (7) from headboard (8).
- Install bows (7) into staves (3) and secure with clasps (9).
- Place strap (6) in BII box.

### Troop Seat Installation

#### NOTE

Early models of 7-Ton Truck use a push button hinge pin that does not use a cotter pin.

- Remove cotter pins (1) and hinge pins (2) from hinge brackets (3) on dropsides (4).

#### WARNING

Two personnel are required to install troop seats. Failure to comply may result in damage to equipment or injury to personnel.

- With the aid of an assistant, align hinge barrels (5) of troop seats (6) with hinge brackets (3) of dropsides (4).

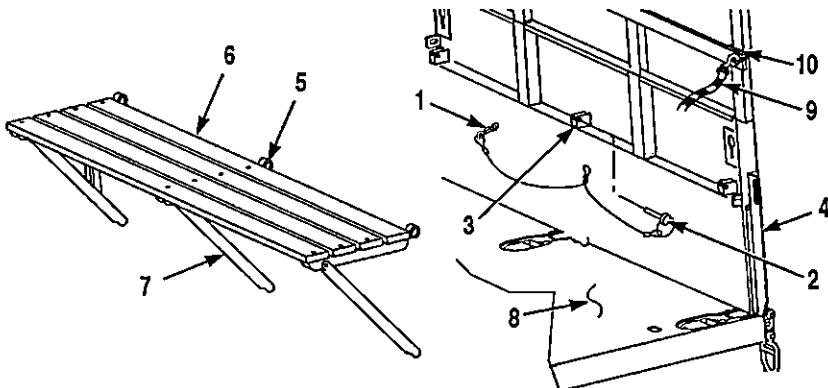


Figure 3.

- Install hinge pins (2) through hinge brackets (3) and hinge barrels (5) and secure with cotter pin (1).
- Position legs (7) or troop seats (6) so bottom end of legs fit into corner formed by dropside (4) and cargo bed (8).

#### WARNING

Step (5) must be performed whenever personnel are being transported in cargo bed.  
Failure to comply may result in damage to equipment or injury to personnel.

- Install safety strap (9) by attaching each end of strap to rings of rear backrests (10).
- Install remaining troop seats (6) using same procedure.

**Troop Seat Removal****NOTE**

Perform Step (1) only if safety strap is installed.

1. Remove safety strap (1) from rings of rear backrests (2).

**WARNING**

Two personnel are required to remove troop seats. Failure to comply may result in damage to equipment or injury to personnel.

**NOTE**

Early models of 7-Ton Truck use a push button hinge pin that does not use a cotter pin.

2. With the aid of an assistant, remove cotter pins (3), hinge pins (4), and troop seats (5) from hinge brackets (6).

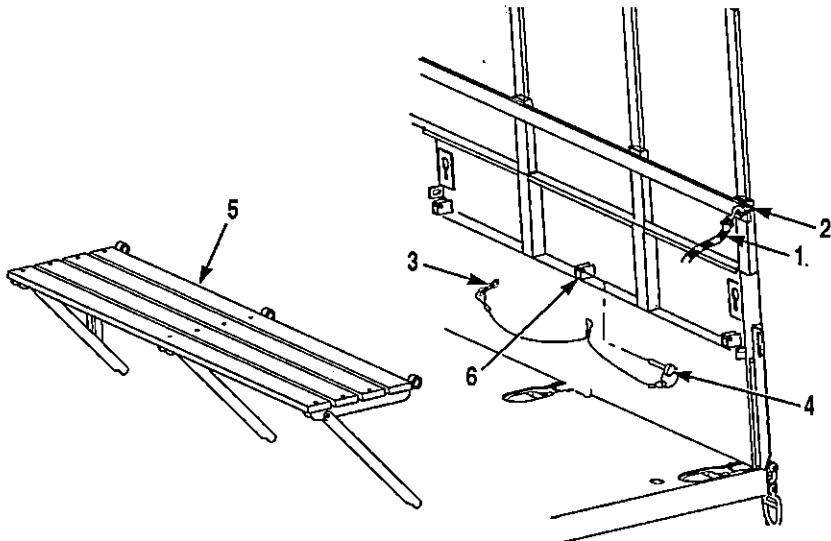


Figure 4.

3. Install hinge pins (4) in hinge brackets (6) and secure with cotter pins (3).
4. Remove remaining troop seats (5) using same procedure.

**Bows, Staves, and Backrest Removal**

1. Unlatch clasps (1) on both ends of bows (2).

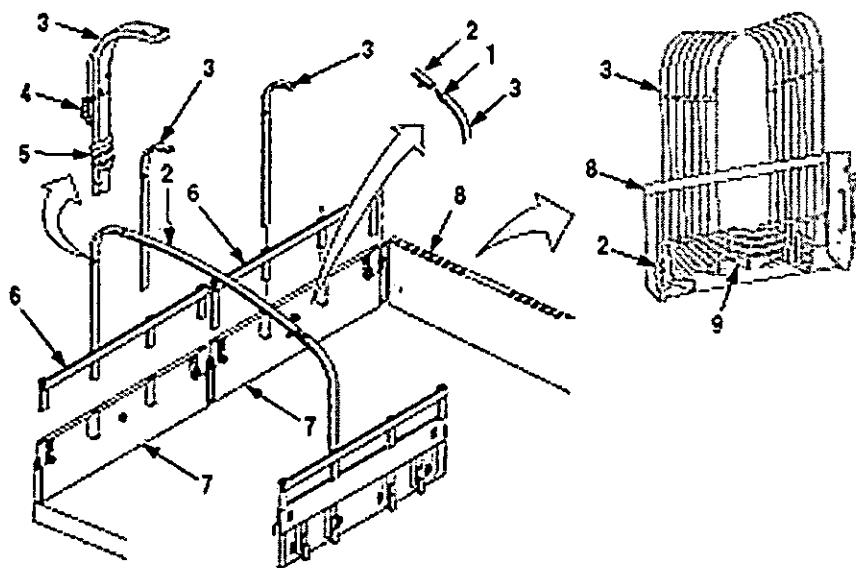
**Bows, Staves, and Backrest Removal - Continued**

Figure 5.

2. Remove bows (2) from staves (3) and place them in storage area located on the front of the tailgate stowage support.

**CAUTION**

Ensure cargo cover straps are wrapped and tied around staves. Failure to comply may result in damage to equipment.

**NOTE**

When removing rear backrest, an assistant is required to support backrest while staves are being installed.

3. Slide roll-up latches (4) on cargo cover straps (5) to approximately 12 in. (30 cm) from fixed end of cargo cover straps (5).
4. Wrap cargo cover strap (5) around staves (3) until approximately 12 in. (30 cm) of cargo cover straps (5) remain loose.
5. Tie free ends of cargo cover straps (5) around staves (3).
6. With the aid of an assistant, remove staves (3) and backrests (6) from dropsides (7).
7. Install staves (3) in headboard (8).

**NOTE**

Strap is located in BII box.

8. Install bows (2) in headboard (8) with strap (9).

**Stow Troop Seats and Backrests**

1. Remove pin (1) from stowage door (2).

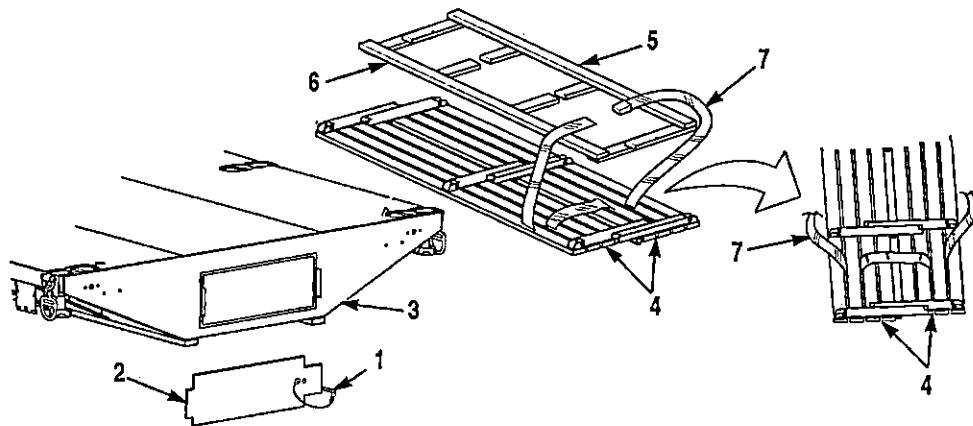
**Stow Troop Seats and Backrests - Continued**

Figure 6.

2. Remove stowage door (2) from cargo body (3).

**WARNING**

Two personnel are required to stow troop seats and backrests. Failure to comply may result in damage to equipment or injury to personnel.

3. With the aid of an assistant, place two troop seats (4) face down with hinge barrels of troop seats facing one another.

**NOTE**

When placing a front backrest and a rear backrest on troop seats for stowage, they must face down with the bottom of the stave pockets of the backrests pointing towards one another. The wooden legs of the front backrest must be inserted into the outside stave pockets of the rear backrest.

4. Position one front backrest (5) and one rear backrest (6) on troop seats (4).

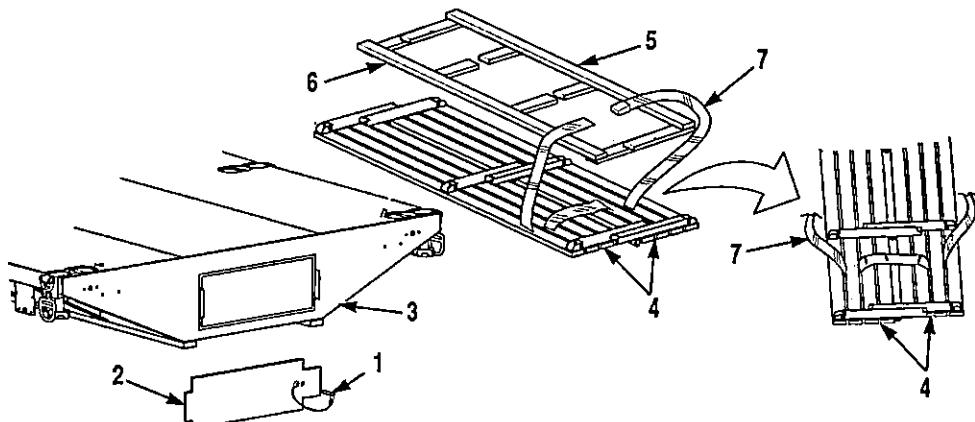


Figure 7.

**Stow Troop Seats and Backrests - Continued**

5. Install one strap (7) around each end of the troop seats (4) and backrests (5 and 6) as shown.
6. Repeat Steps (3) through (5) for remaining troop seats and backrests.

**NOTE**

When attaching rope to first set of troop seats and backrests, the rope must be attached to the troop seat legs that will be nearest to rear of cargo bed.

7. Attach rope to first set of troop seats (4) and backrests (5 and 6).

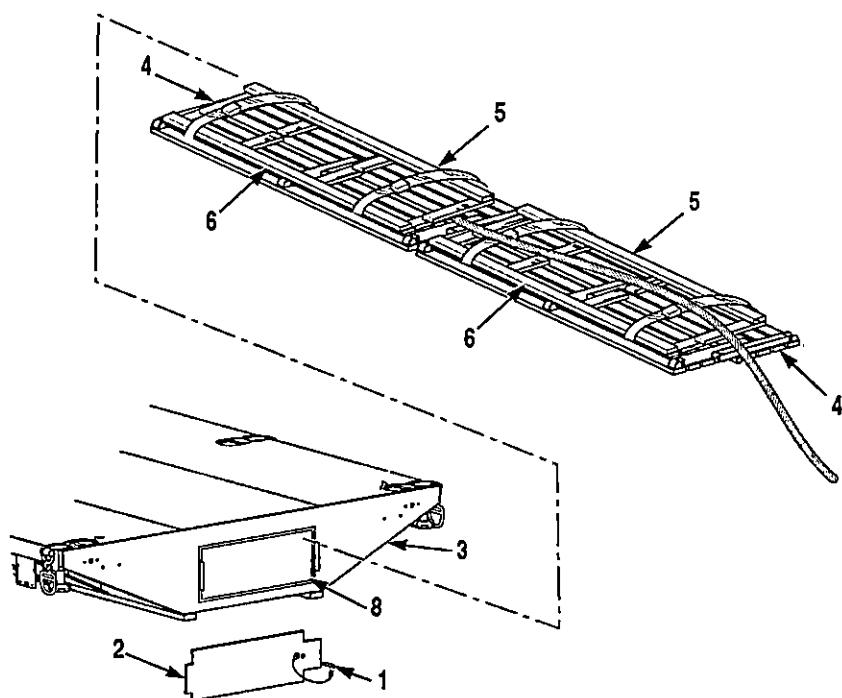


Figure 8.

8. With the aid of an assistant, install first set of troop seats (4) and backrests (5 and 6) in bottom of stowage compartment (8).
9. With the aid of an assistant, install second set of troop seats (4) and backrests (5 and 6) in bottom of stowage compartment (8) using care not to pinch or cut rope.
10. Install stowage door (2) on cargo body (3).
11. Install pin (1) in stowage door (2).

**END OF TASK**

**END OF WORK PACKAGE**

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## 1ST ECHELON MAINTENANCE CARGO COVER

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### INITIAL SETUP:

Not Applicable

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### Unstow Cargo Cover

For the MK23 and MK25, the cargo cover is stowed in a storage bag located on the platform between the cab and the cargo bed. For the MK27 and MK28, the cargo cover is stowed in the stowage box mounted on the left side of the vehicle.

### Cargo Cover Installation

#### **WARNING**

Two personnel are required to install the cargo cover. Failure to comply may result in damage to equipment or injury to personnel.

#### **CAUTION**

Prior to installing cargo cover, ensure center T-bolt locking handles are installed so handles are on inside of cargo bed (refer to paragraph 2-7c). Failure to comply may result in damage to equipment.

#### **NOTE**

- When installing cargo cover on MK27 and MK28, ensure FORWARD mark on folded cover points to front of vehicle and the UP marked on folded cover points up.
- Perform Steps (1) and (2) when installing cargo cover on MK27 and MK28.
- Perform Steps (3) and (4) when installing cargo cover on MK23 and MK25.

1. With the aid of an assistant, position folded cargo cover (1) across center bow (2) of cargo bed.

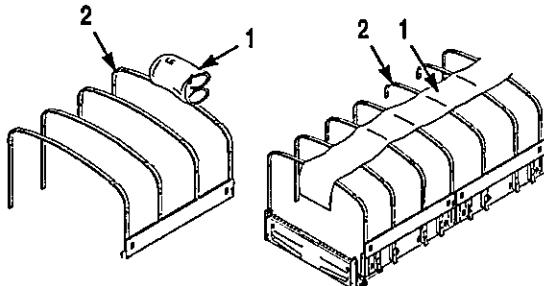


Figure 1.

**Cargo Cover Installation - Continued****NOTE**

- When unfolding cargo cover, ensure cover hangs evenly on all sides.
- Ensure cargo cover eyelets are facing outward.

2. Unfold cargo cover (1) over bows (2) towards front and rear of vehicle.

**NOTE**

When positioning cargo cover on bow, ensure left mark on cover is on left side of vehicle.

3. Position cargo cover (1) on top of bow (2) closest to cab.
4. With the aid of an assistant, unroll cargo cover (1) over top of seven bows (2) until cargo cover (1) is completely rolled out.

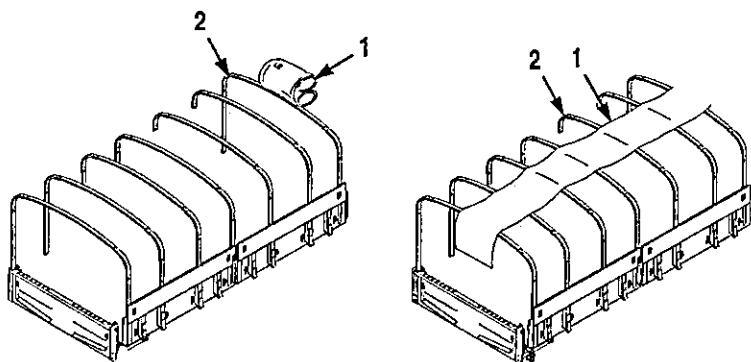


Figure 2.

5. Unfold cargo cover (1) over bows (2) to sides of vehicle.

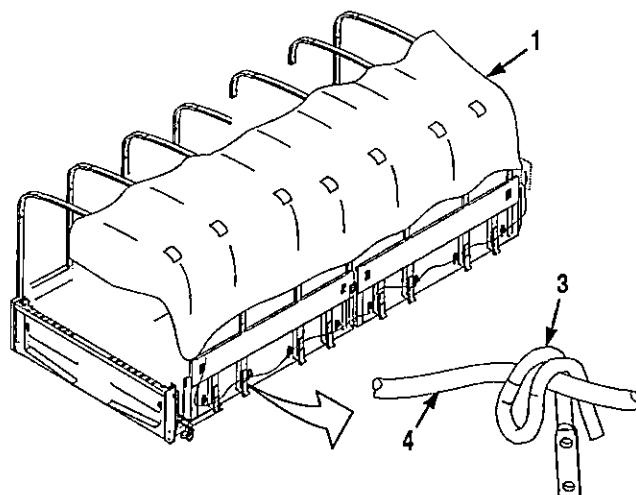


Figure 3.

6. Secure cargo cover (1) to cargo cover hooks (3) with bungee cords (4).

**Cargo Cover Installation - Continued**

7. For proper ventilation of cargo cover, refer to Cargo Cover Ventilation (Cargo Cover Ventilation) of this paragraph.

**Cargo Cover Removal****CAUTION**

Do not fold or stow cargo cover when cargo cover is wet. Failure to comply may result in damage to equipment.

**NOTE**

Ensure front and rear windows are closed and zipped prior to removal. Note front and back of cargo cover so cargo cover can be marked once folding is completed.

1. Unhook bungee cords (1) from cargo cover hooks (2).

**WARNING**

Two personnel are required to remove the cargo cover. Failure to comply may result in injury to personnel.

2. With the aid of an assistant, remove cargo cover (3) from vehicle and position cargo cover on ground with cargo cover top facing up.

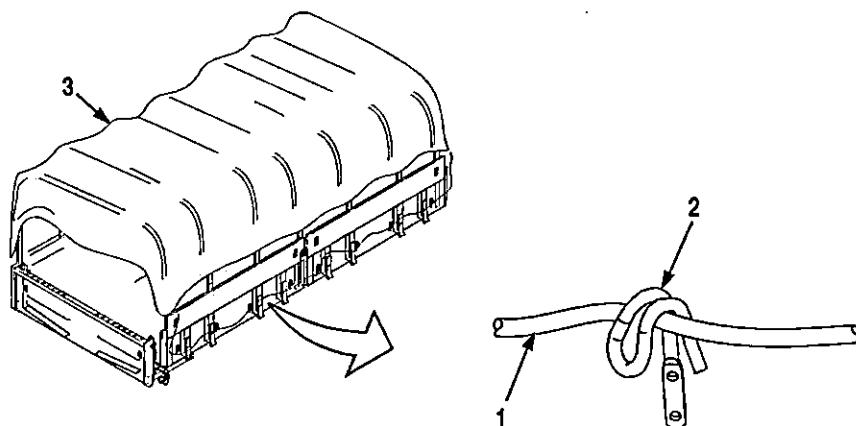


Figure 4.

3. Fold front and rear cargo cover flaps in over cargo cover (3).

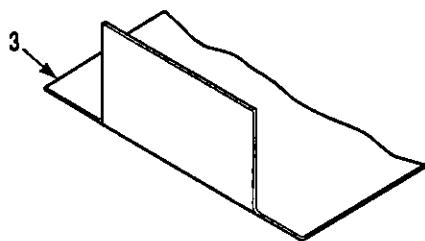
**Cargo Cover Removal - Continued**

Figure 5.

4. Fold each side of cargo cover in approximately one ft. (0.3 m).

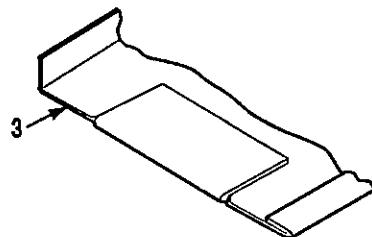


Figure 6.

5. Fold each new side of cargo cover (3) in to center of cargo cover.

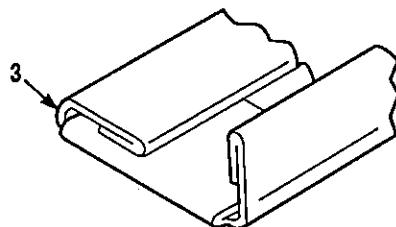


Figure 7.

6. Pick up each new side and fold to center of cargo cover (3).

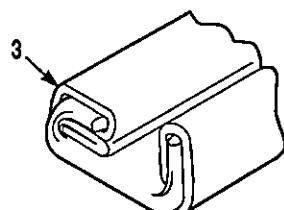


Figure 8.

**Cargo Cover Removal - Continued****NOTE**

Perform Steps (7) through (12) for MK27 and MK28. Perform Steps (13) through (17) for MK23 and MK25.

7. Fold left side of cargo cover (3) on top of right side.

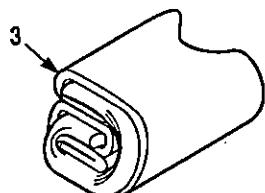


Figure 9.

8. Fold each end of cargo cover (3) to center of cover.

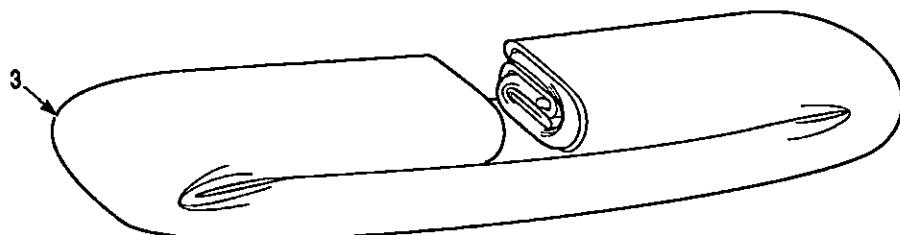


Figure 10.

9. Pick up each new end of the cargo cover (3) and fold to center of cargo cover.

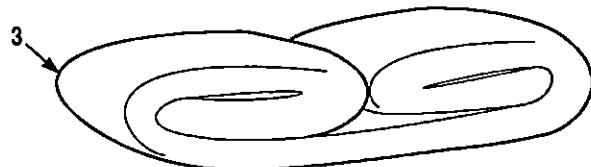


Figure 11.

10. Fold front end of cargo cover (3) on top of rear end of cargo cover.

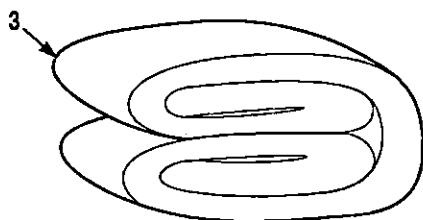
**Cargo Cover Removal - Continued**

Figure 12.

11. Mark FORWARD and UP in appropriate positions on top of folded cargo cover (3).
12. Place folded cargo cover (3) in stowage box (refer to Stowage Guide).

**NOTE**

When rolling cover, cover must be rolled as tight as possible for cover to fit in stowage bag.

13. Roll up cargo cover (3) from rear to front.
14. Mark LEFT in appropriate position on rolled up cargo cover (3).

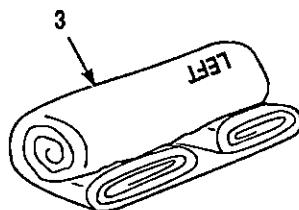


Figure 13.

15. Position cargo cover (3) in stowage bag (4).

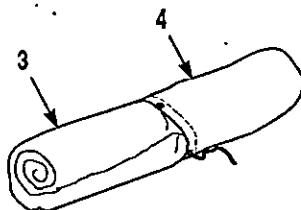


Figure 14.

16. Cinch open end of stowage bag (4).

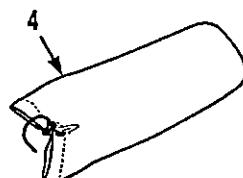
**Cargo Cover Removal - Continued**

Figure 15.

17. Secure cargo cover and stowage bag (4) to platform (5) with strap (6).

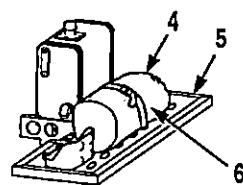


Figure 16.

**Stow Cargo Cover**

For the MK23 and MK25, the cargo cover is stowed in a storage bag located on the platform between the cab and the cargo bed. For the MK27 and MK28, the cargo cover is stowed in the stowage box mounted on the left side of the vehicle.

**Cargo Cover Ventilation**

1. Unzip front and/or rear windows (1) of cargo cover (2).

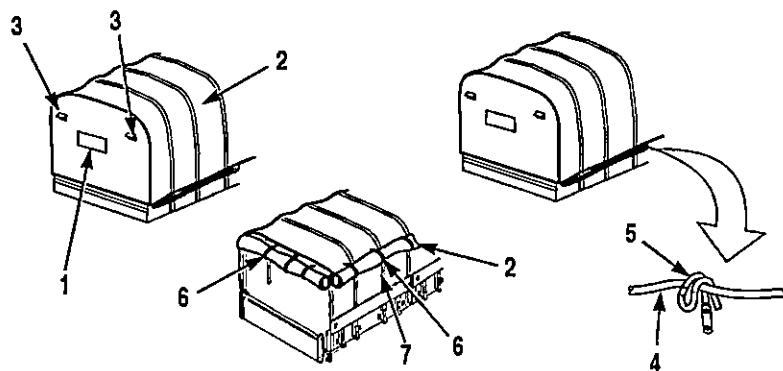


Figure 17.

2. Open two ventilation pockets (3) in front and two ventilation pockets in rear of cargo cover (2).
3. Unhook bungee cords (4) from cargo cover hooks (5).

**Cargo Cover Ventilation - Continued****NOTE**

- The MK23 and MK25 have seven staves and attached cargo cover straps on each side of cargo cover as well as three cargo cover straps attached to each end of cover. The MK27 and MK28 have nine staves and attached cargo cover straps on each side of cargo cover as well as three cargo cover straps attached to each end of cover.
- Perform Step (4) only if cargo cover straps are wrapped and tied around staves.

4. Untie and unwrap cargo cover straps (6) from staves (7).
5. Roll up cargo cover (2) on each side of cargo bed and secure cargo cover (2) by adjusting length of cargo cover straps (6) and attaching to eyelets of cargo cover (2).
6. Roll up ends of cargo cover (2) and secure by adjusting length of cargo cover straps (6) and attaching to eyelets of cargo cover (2).

**END OF TASK****END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE INSTRUMENT PANEL OPERATION

### INITIAL SETUP:

Not Applicable

### General

The Instrument Panel on the MTVR incorporates electronic gauges, indicator lights, and an LCD to communicate information to the operator. The LCD has multiple modes and functions.

The LCD can display the odometer reading as well as testing gauges and indicator lights. The LCD can also be set to display measured units in English or Metric.

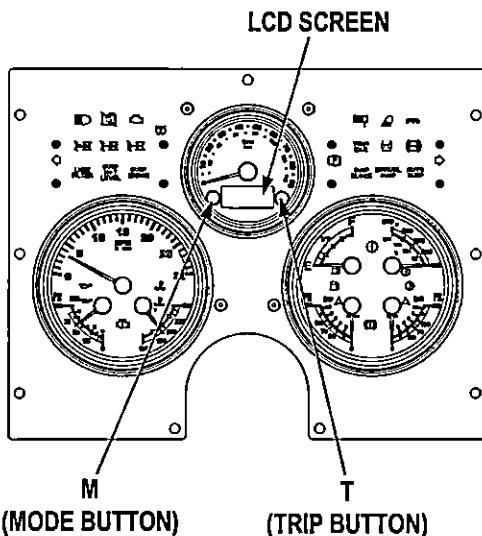


Figure 1. Main Gauge Panel.

### Instrument Panel Modes.

**Sleep Mode:** The Instrument Panel is normally in Sleep Mode when the ignition switch is turned off. None of the gauges, indicator lights, or the LCD screen will operate in this mode.

**Start-Up Mode:** The Instrument Panel enters Start-Up Mode when the ignition switch is switched on. After key-on, a gauge start-up self test is performed.

#### During start-up mode:

- The LCD will display any warning messages and will then display the Odometer, Trip Odometer, and Battery Voltage. The LCD will then revert to normal drive mode screen.
- The warning lights will turn on and off followed by the active warning lights (if any) coming back on.

**Ignition Mode:** The Instrument Panel will be in ignition mode whenever the ignition switch is on. The Instrument Panel is fully active in this mode.

## General - Continued

**Diagnostic Mode:** From Ignition Mode with the vehicle speed at zero, pressing the M button for more than two seconds allows the Instrument Panel to enter Diagnostics Mode. This mode provides the following functions:

- Set units - Selecting the Set Units menu brings up the set units screen which is used to select whether values are to be displayed in Metric units or English units. To select the units, simply let the screen time out after scrolling to the desired units.
- Adjust contrast - Selecting the Contrast menu brings up a screen to allow the user to adjust the LCD contrast. Pressing the M pushbutton will decrease contrast and pressing the T pushbutton will increase contrast.
- Instrument diagnostics - Selecting the Instrument Diag menu brings up the instrument diagnostic menu.
- Press the T pushbutton to scroll through the available menu options. Once the desired menu item is selected press both the T and M pushbutton to select and enter the menu.
- Press the M pushbutton to exit this screen.
- If no selection is made, the display will time out and return to the previous screen. The screen time out will occur in roughly 5 seconds.
- There are six menu options on the Settings and Diagnostics (DIAG) menu.

**Drive Mode Screen:** This is the normal display screen when operating the vehicle. In the drive mode, the LCD will display the odometer reading, system voltage reading, and the trip odometer reading. To toggle back and forth between these two options, the operator must press and release the M button in less than two seconds.

## LCD Message Center

### NOTE

- The LCD will display warnings as dictated by the various control systems on the vehicle. The warning will remain on the screen until the warnings are no longer valid or, until the operator pushes the T button.
- When operating in extremely hot or cold temperatures, the extreme temperatures may affect the visibility of the LCD.

## Settings and Diagnostics

The operator can enter the settings and diagnostics menu from the Drive Mode Screen when the engine is running and vehicle speed is zero. To enter the settings and diagnostics menu, the operator must push the M button for more than two seconds. The item highlighted will be the item selected when both the M and T buttons are pressed together. Pressing the M or T button separately will scroll through the various selections.

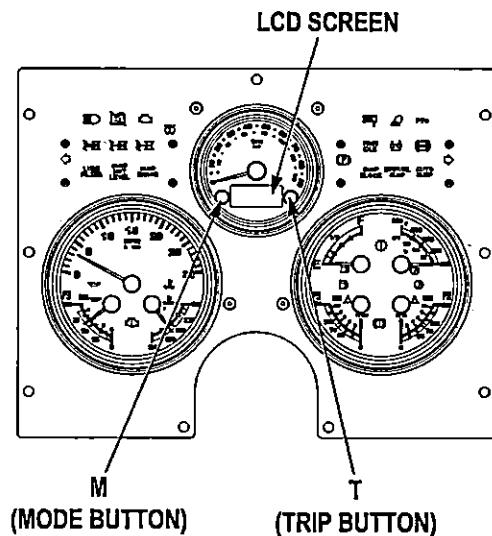
**Settings and Diagnostics - Continued**

Figure 2. Main Gauge Panel.

1. To change measurement units.
  - a. Enter the LCD Settings and Diagnostics (DIAG) screen.
  - b. Select '0-Set Units' by scrolling up and down using the M button and T button.

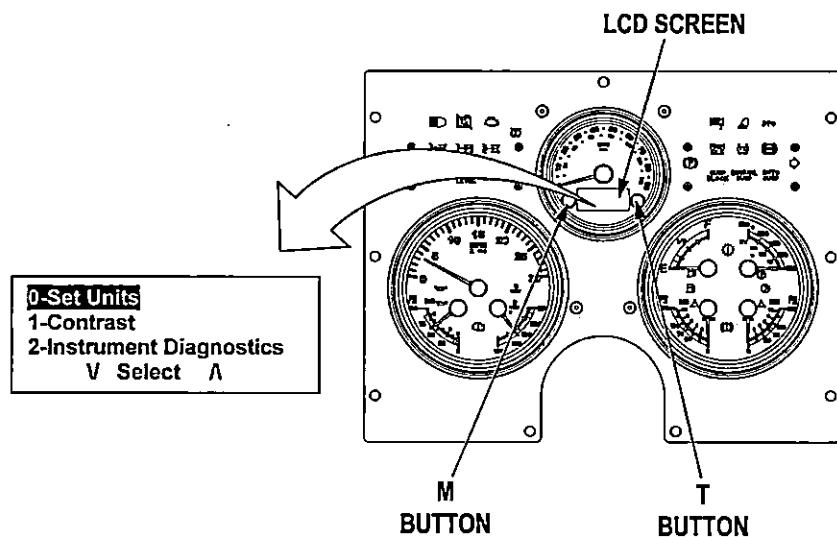


Figure 3. Change Measurement Units.

- c. Press the M button and T button at the same time.
- d. Press the T button to change the measurement units to English or Metric.
- e. Press the M button to return to Drive Mode Screen.

## Settings and Diagnostics - Continued

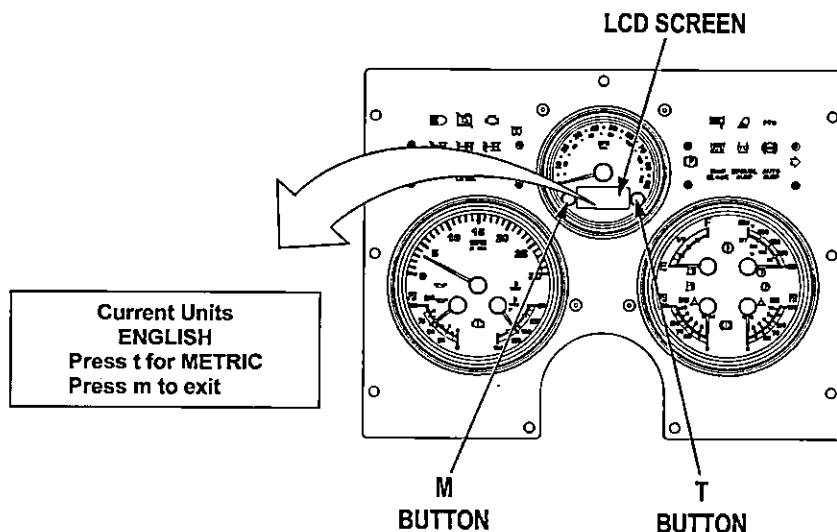


Figure 4. Change Measurement Units.

2. To change the LCD screen contrast setting.
  - a. Enter the LCD Settings and Diagnostics (DIAG) screen.
  - b. Select '1-Contrast' by scrolling up and down using the M and T buttons.

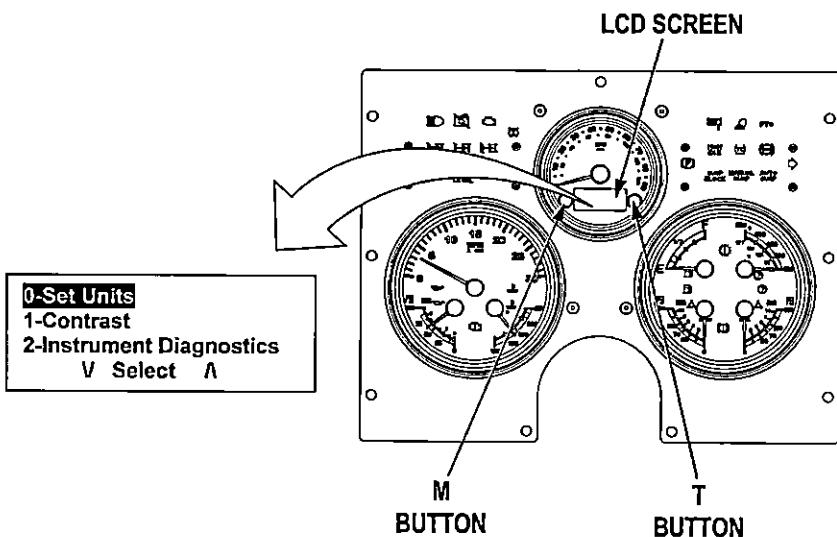


Figure 5. Change LCD Screen Contrast.

- c. Press the M button and T button at the same time.
- d. Press the M button to increase the contrast or press the T button to decrease the contrast.
- e. LCD will automatically return to Drive Mode Screen.

## Settings and Diagnostics - Continued

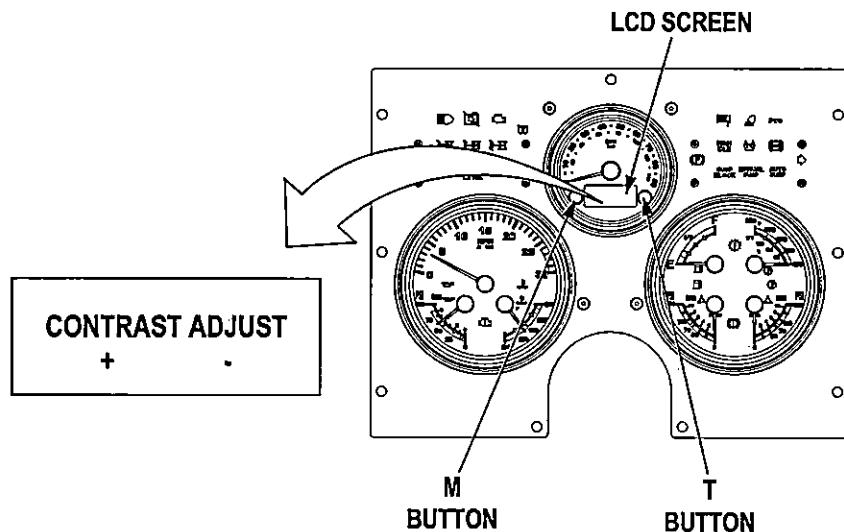


Figure 6. Contrast Adjustment.

3. Instrument Panel Gauges Testing.
  - a. Enter the Settings and Diagnostics (DIAG) screen.
  - b. Select '2-Instrument Diagnostics' by scrolling up and down using the M and T buttons.

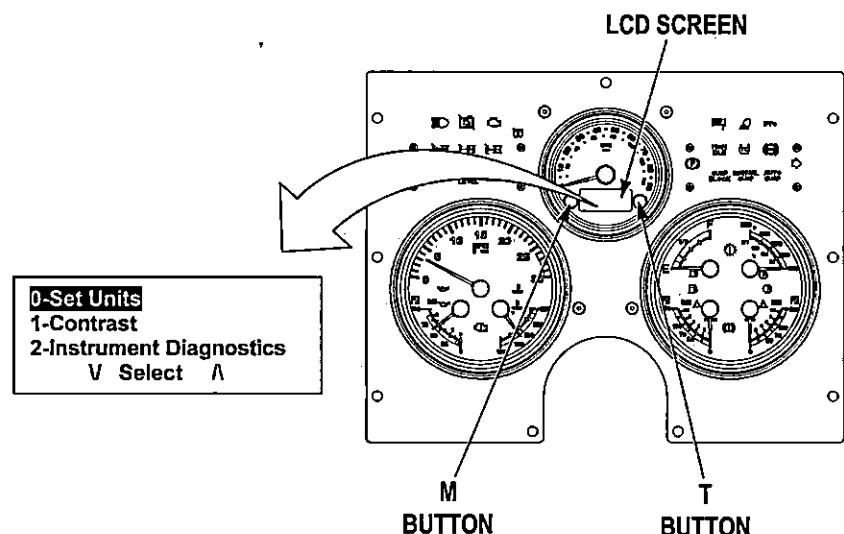


Figure 7. Instrument Panel Gauges Testing.

- c. Press the M button and T button together to display instrument diagnostics menu.
- d. Select '0-Gauge Test' by scrolling up and down using the M and T buttons.

## Settings and Diagnostics - Continued

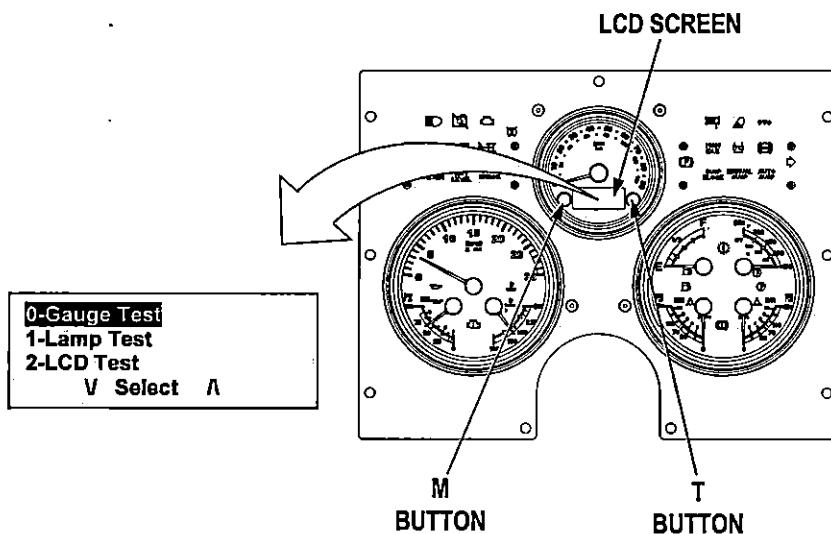


Figure 8. Gauge Testing.

- e. Press the M button and T button together to begin testing gauges (fuel gauge test shown). Each gauge is tested in turn at 0%, 50%, and 100%. The LCD displays the corresponding percentage.
- f. Press the M button to end test and return to Drive Mode Screen.
- g. Contact Field Maintenance to replace main gauge/instrument panel if corresponding gauge does not reflect LCD indication.

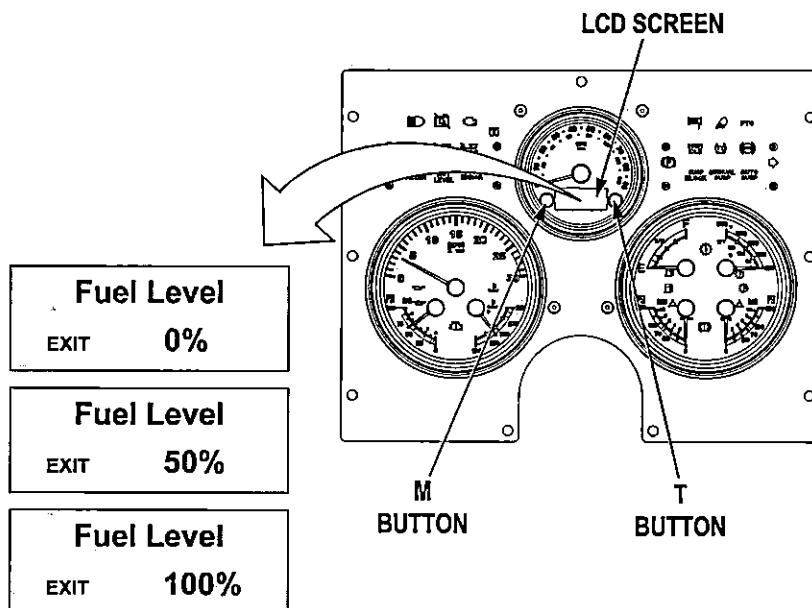


Figure 9. Gauge Testing.

## 4. Instrument Panel Indicator Lamps Testing.

### Settings and Diagnostics - Continued

- a. Enter the Settings and Diagnostics (DIAG) screen.
- b. Select '2-Instrument Diag' by scrolling up and down using the M and T buttons.

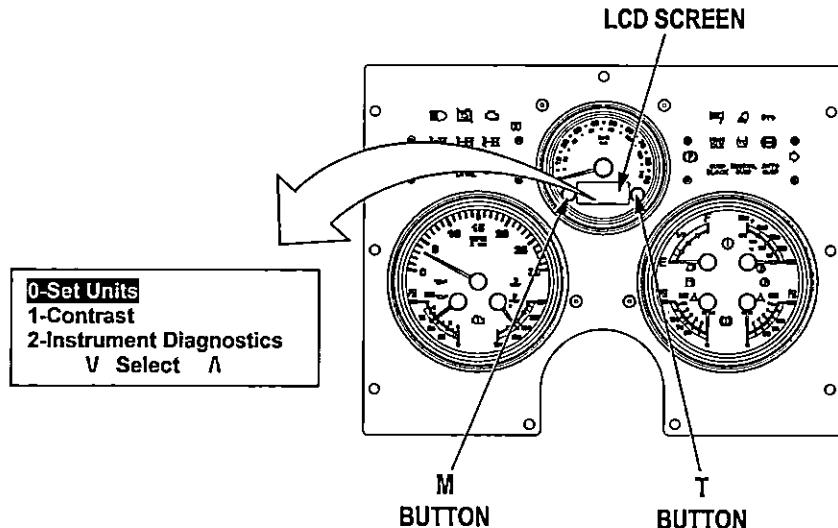


Figure 10. Instrument Panel Indicator Lamp Testing.

- c. Press the M button and T button together to display instrument diagnostics menu.
- d. Select '1-Lamp Test' by scrolling up and down using the M and T buttons.

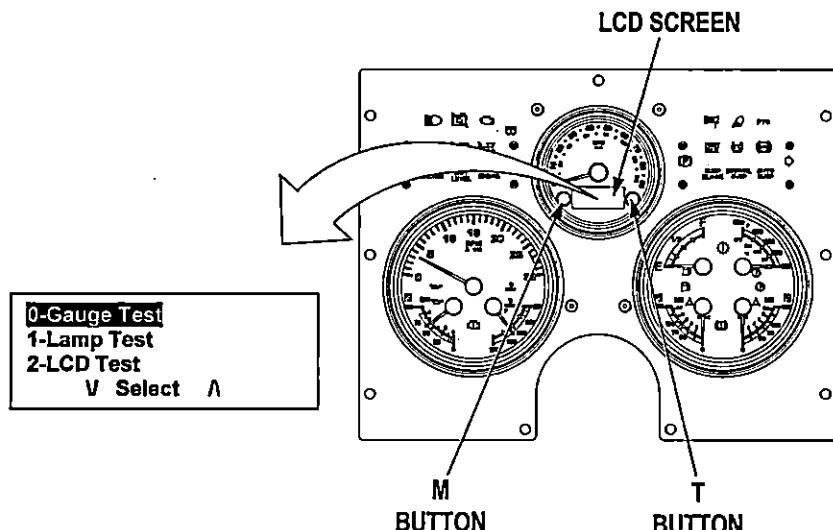


Figure 11. Lamp Testing.

- e. Press the M button and T button together to begin testing warning lamps. Each indicator lamp on main gauge/instrument panel is turned on and off in turn. The LCD displays the corresponding warning lamp under test (high beam indicator test shown).
- f. Press the M button to end test and return to Drive Mode Screen.

**Settings and Diagnostics - Continued**

g. Contact Field Maintenance to replace main gauge/instrument panel if an indicator fails to illuminate as indicated by the LCD.

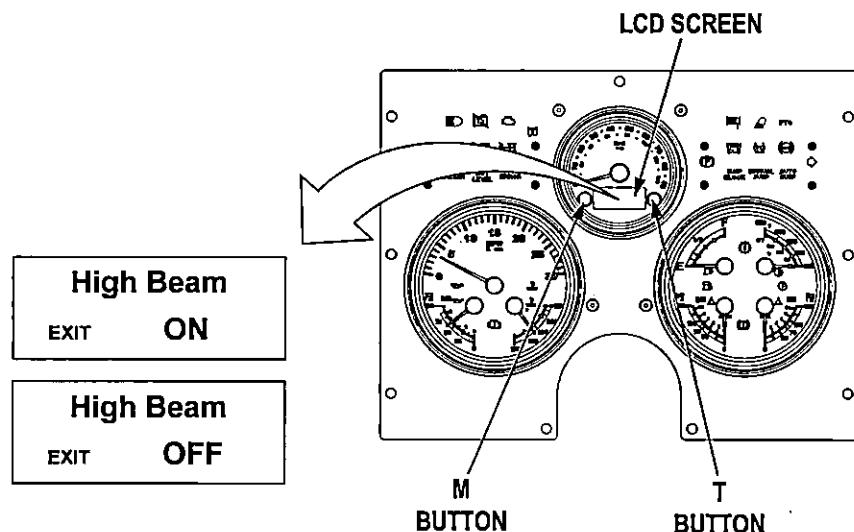


Figure 12. Lamp Testing.

**Instrument Panel LCD Screen Testing****NOTE**

The instrument panel LCD screen is used as part of the test procedure if the LCD is unreadable during any part of the test, it should be considered defective and replaced.

1. Enter the Settings and Diagnostics (DIAG) screen.
2. Select '2-Instrument Diagnostics' by scrolling up and down using the M and T buttons.

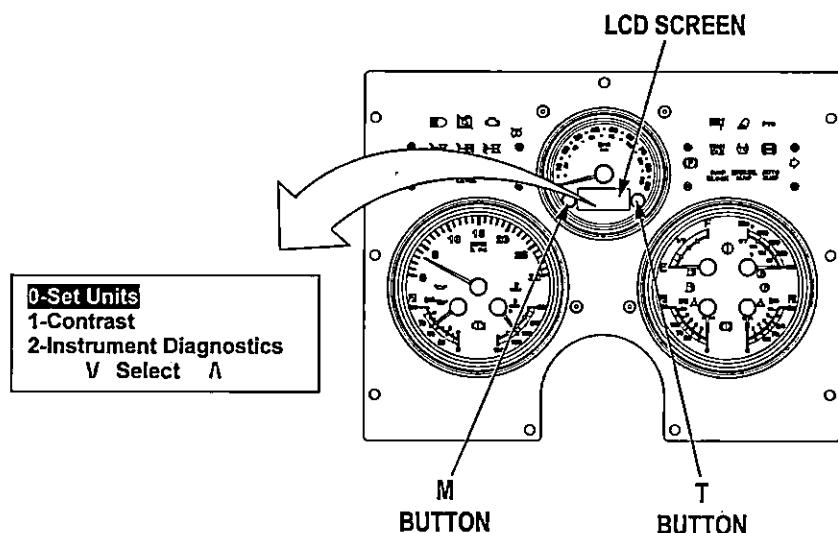
**Instrument Panel LCD Screen Testing - Continued**

Figure 13. Instrument Panel LCD Screen Testing.

3. Press the M button and T button together to display instrument diagnostics menu.
4. Select '2-LCD Test' by scrolling up and down using the M and T buttons.
5. Press the M button and T button together to begin testing LCD. The display should appear in normal and reverse mode three times before returning to the Drive Mode Screen.
6. Contact Field Maintenance to replace main gauge/instrument panel if it fails to illuminate.

## Instrument Panel LCD Screen Testing - Continued

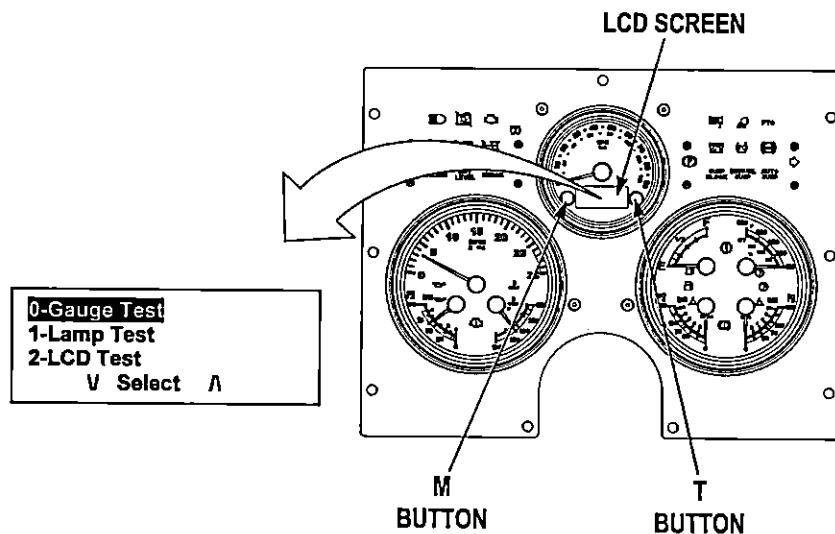


Figure 14. LCD Screen Testing.

END OF TASK

END OF WORK PACKAGE

**1ST ECHELON MAINTENANCE**  
**BUNGEE CORD INSTALL / TIGHTEN / REMOVE**

**INITIAL SETUP:**

Not Applicable

**Bungee Cord Installation**

**NOTE**

- Bungee cord should make a criss-cross pattern on the outside of cargo cover.
- There are 8 cargo cover eyelets that have 8 holes and 12 cargo cover eyelets that have 4-holes.

1. Push end of bungee cord (1) through hole (2) on cargo cover eyelet (3).

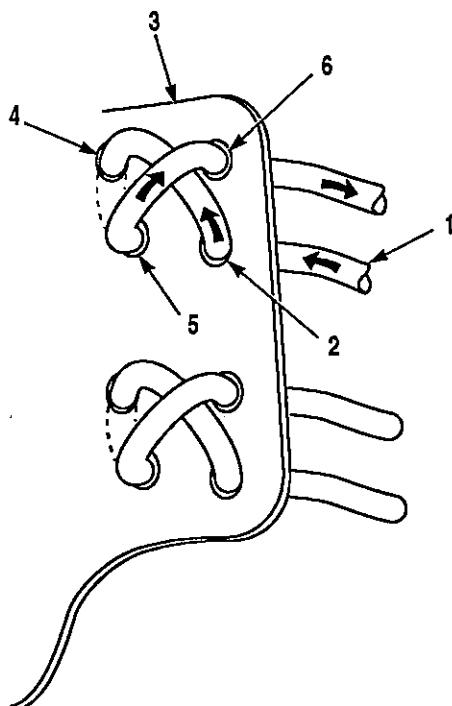


Figure 1.

2. Slide approximately 12 in. (30 cm) through hole (2) and push end of bungee cord (1) through hole (4) until snug.
3. Push end of bungee cord (1) through hole (5) until snug.
4. Push end of bungee cord (1) through hole (6) until snug.

**Bungee Cord Tightening**

1. Push bungee cord (1) through hole (2) on cargo cover eyelet (3).

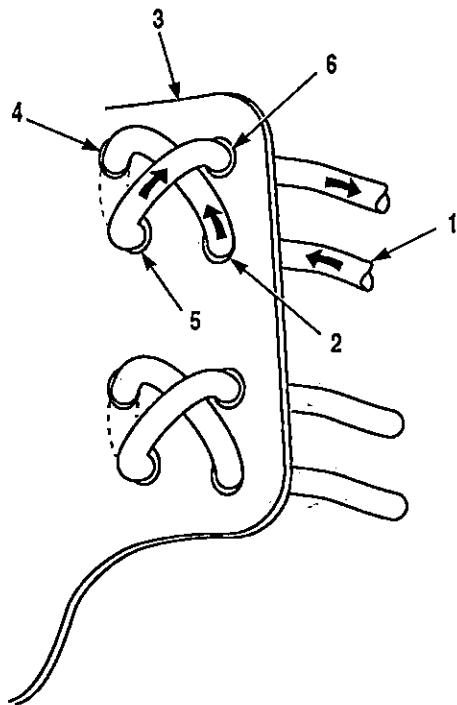


Figure 2.

2. Slide several inches through hole (2) and push bungee cord (1) through hole (4) until snug.
3. Push bungee cord (1) through hole (5) until snug.
4. Push bungee cord (1) through hole (6) until snug.
5. Repeat Steps (1) thru (4) as necessary.

**Bungee Cord Removal**

1. Push end of bungee cord (1) through hole (6).

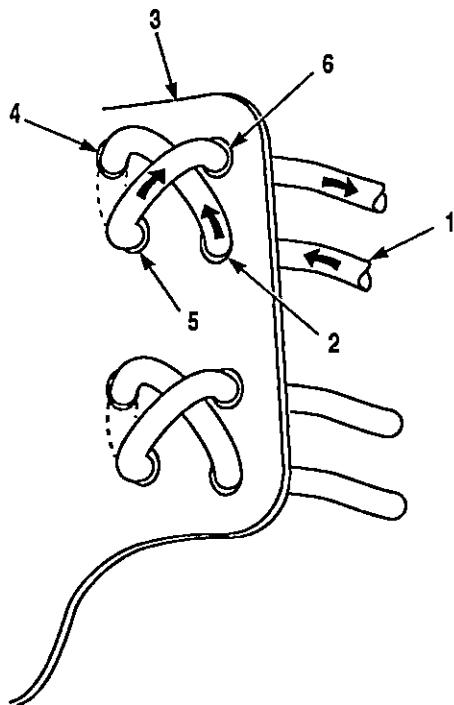
**Bungee Cord Removal - Continued**

Figure 3.

2. Push end of bungee cord (1) through hole (5).
3. Push end of bungee cord (1) through hole (4).
4. Push end of bungee cord (1) through hole (2) and remove bungee cord (1) from cargo cover eyelet (3).

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
COMMUNICATIONS EQUIPMENT**

---

**INITIAL SETUP:**

Not Applicable

---

**Communications Equipment**

Refer to technical manual of communications equipment for operation of all communications equipment.

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
CHEMICAL EQUIPMENT**

---

**INITIAL SETUP:**

Not Applicable

---

**Chemical Equipment**

Refer to TM 10434A-12-P for operation of all chemical equipment.

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
MACHINE GUN MOUNT**

---

**INITIAL SETUP:**

Not Applicable

---

**Machine Gun Mount****WARNING**

Use Catch Bag and Catch Bag Retainer when firing a weapon from the machine gun mount. This is to prevent links and spent hot brass cartridge casings from entering the cab and engine compartment during firing. Failure to do so may cause injury to personnel or damage to equipment.

**CAUTION**

Upon completion of firing weapons from truck mount, check engine and remove any links and spent cartridge cases. Failure to do so could result in damage to equipment.

**NOTE**

Refer to TM 1005-13&P/TM 9-1005-245-13&P for operation of machine gun mount equipment. To mount machine gun to mount requires a MK175 pintle adapter and a MK64 gun mount. Refer to TI 2320-14/70 and TM 08686A-13&P for more information.

**Adjusting Crew Seat for Machine Gun Use**

1. Remove two cotter pins (1) from adjusting pins (2) on backrest sliders (3).

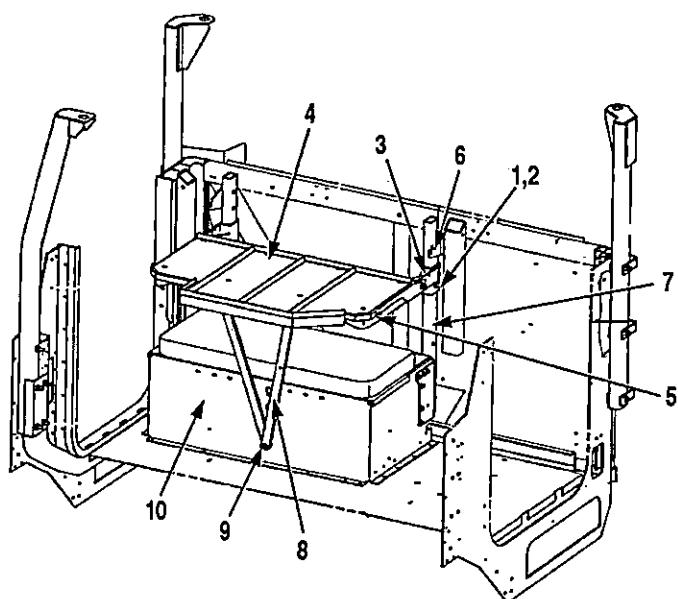
**Adjusting Crew Seat for Machine Gun Use - Continued**

Figure 1.

2. Remove two adjusting pins (2) from platform (4) and move platform (4) up until shoulder bolts (5) clear cab brackets (6).
3. Tilt platform (4) forward until cushion side of platform (4) faces down.

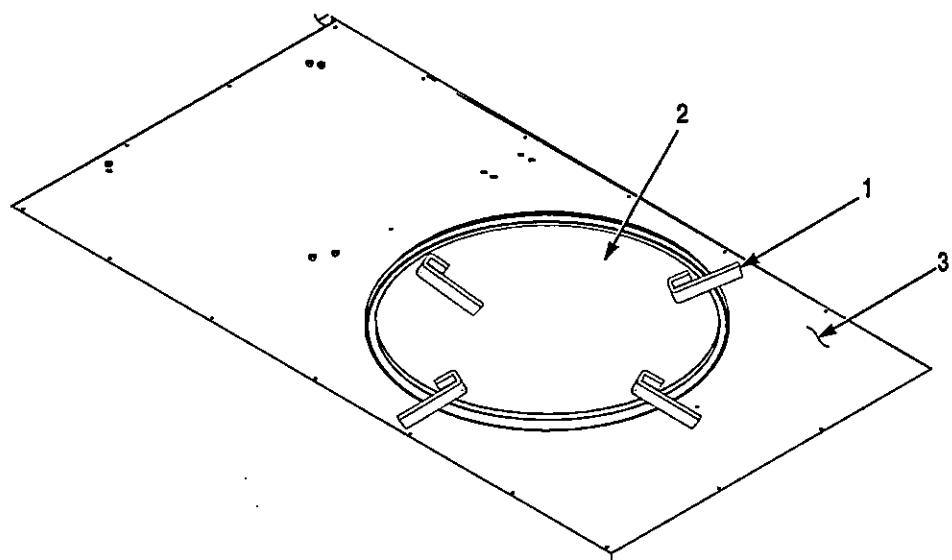
**NOTE**

There are four different height settings on the rear support brackets.

4. Slide backrest sliders (3) up along slider supports (7) to desired height interval, and install two adjusting pins (2) in backrest sliders (3).
5. Install two cotter pins (1) in adjusting pins (2).
6. Install support strut (8) on platform (4) and place shoulder bolt (9) in companion seat (10) keyhole that keeps backrest in most level position.

**Open Roof Cover**

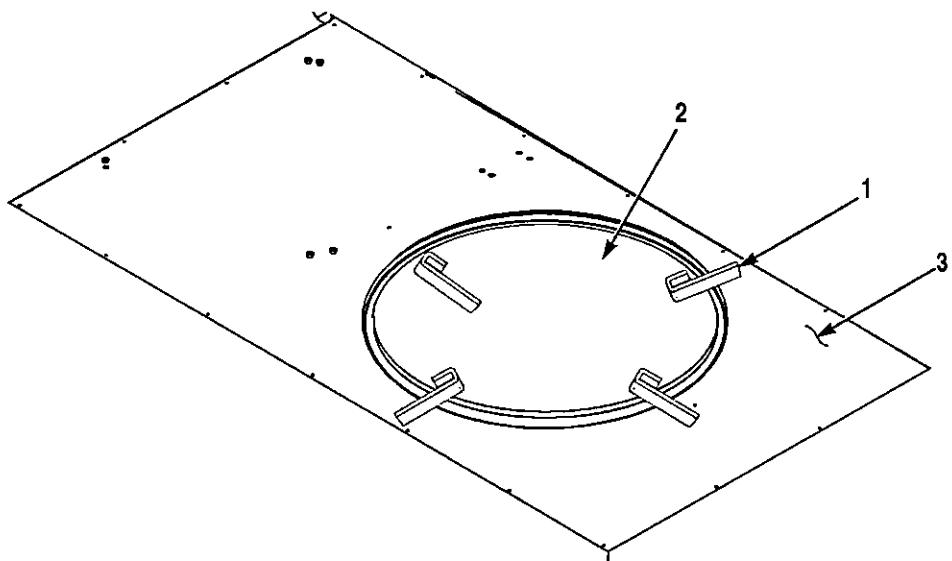
1. Turn four latches (1) on roof cover (2) to unlock position.

**Open Roof Cover - Continued****Figure 2.**

2. Remove roof cover (2) from cab (3).

**Close Roof Cover**

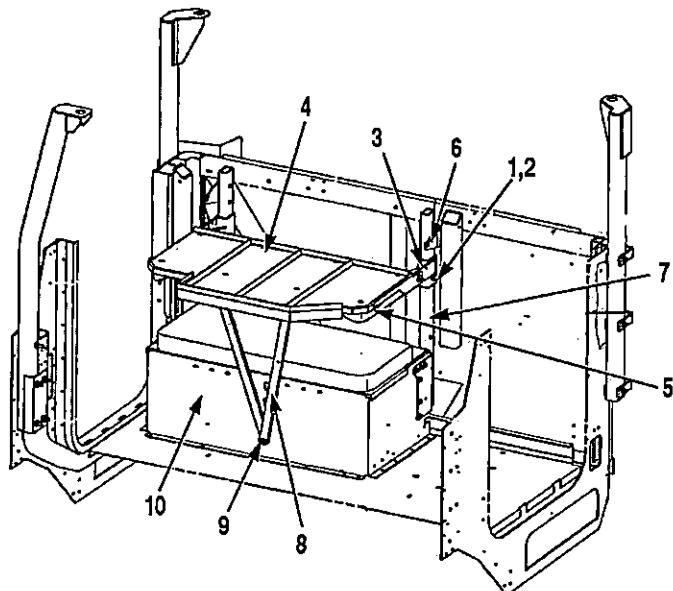
1. With latches (1) down, install roof cover (2) on cab (3).

**Close Roof Cover - Continued****Figure 3.**

2. Turn four latches (1) on roof cover (2) to lock position.

**Adjusting Crew Seat Back to Original Configuration**

1. Remove shoulder bolt (9) and support strut assembly (8) from companion seat (10) and platform (4).

**Adjusting Crew Seat Back to Original Configuration - Continued****Figure 4.**

2. Stow support strut assembly (8) inside companion seat (10).
3. Remove two cotter pins (1) from adjusting pins (2) on backrest sliders (3).
4. Remove two adjusting pins (2) and position backrest sliders (3) to bottom hole of slider supports (7).
5. Move platform (4) to vertical position with shoulder bolts (5) resting in cab brackets (6).
6. Install two adjusting pins (2) in backrest sliders (3).
7. Install two cotter pins (1) in adjusting pins (2).

**Open Armor Roof Cover**

1. Loosen four handles (1) on cover (2) and rotate four retainers (3) away from cab roof (4).

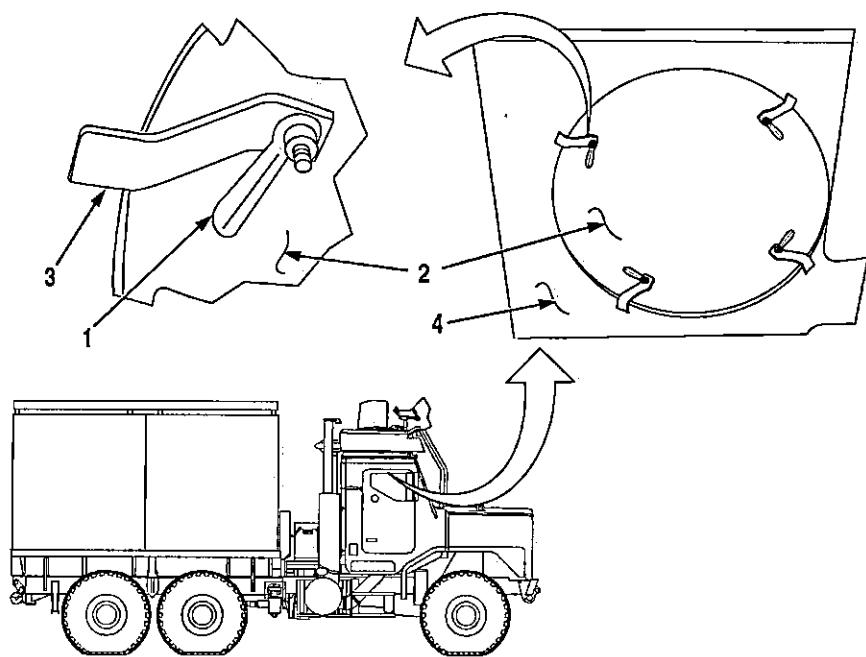
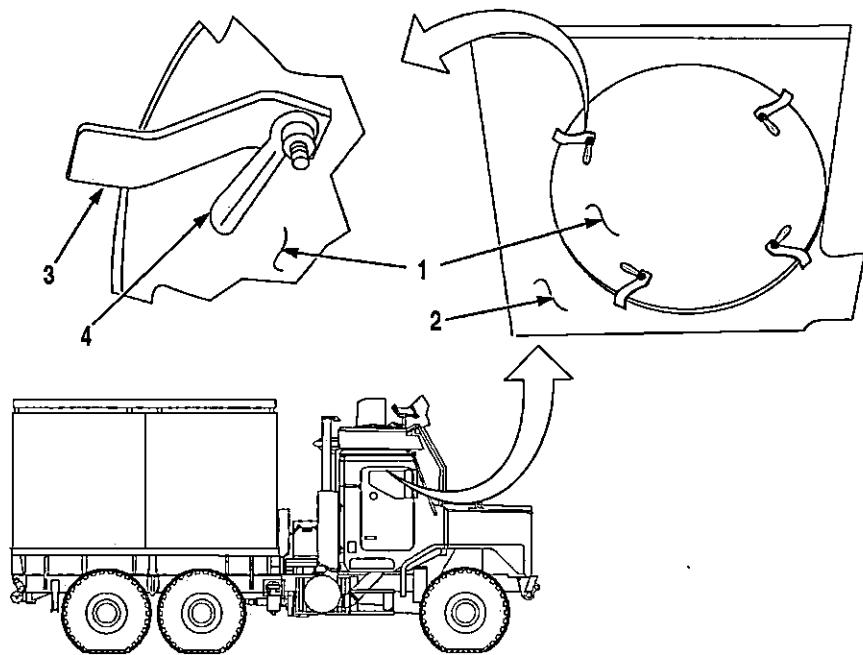
**Open Armor Roof Cover - Continued**

Figure 5.

2. Remove cover (2) from cab roof (4).

**Close Armor Roof Cover**

1. Position cover (1) over opening in cab roof (2).

**Close Armor Roof Cover - Continued****Figure 6.**

2. Rotate four retainers (3) toward cab roof (2) and tighten four handles (4).

**END OF TASK****END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE**  
**RIFLE STOW / UNSTOW IN RIFLE MOUNT**

**INITIAL SETUP:**

Not Applicable

**Stow Rifle**

1. Position butt (1) of rifle (2) in lower mount (3) with trigger guard (4) toward rear of vehicle.

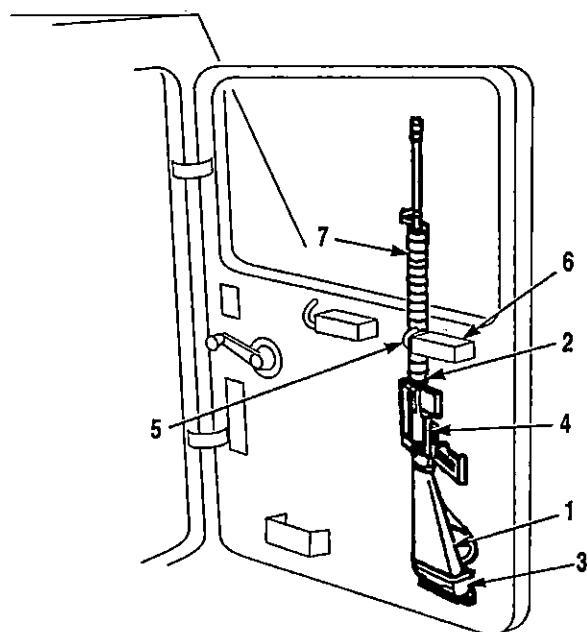
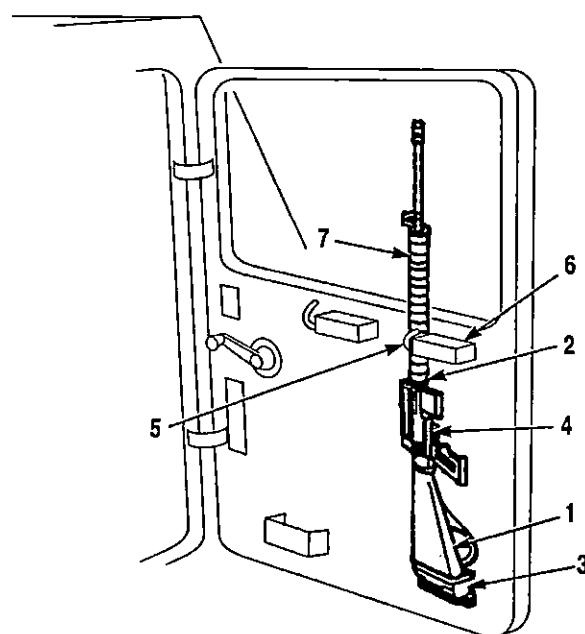


Figure 1.

2. Pull handle (5) of top mount (6) toward middle of cab.
3. Position heat guard (7) of rifle (2) in top mount (6).
4. Push handle (5) across heat guard (7).
5. Check that rifle (2) is tightly secured.

**Unstow Rifle**

1. Pull handle (5) of top mount (6) down and toward middle of cab.

**Unstow Rifle - Continued****Figure 2.**

2. Remove heat guard (7) of rifle (2) from top mount (6).
3. Remove butt (1) of rifle (2) from lower mount (3).

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
ARCTIC ENGINE HEATER**

---

**INITIAL SETUP:**

Not Applicable

---

**Arctic Engine Heater****WARNING**

The surrounding area around the coolant heater exhaust pipe must be kept clear of any flammable material. Fire could result causing serious injury or death to personnel and/or damage to equipment.

**WARNING**

Due to the danger of poisoning and asphyxiation, the heater must not be operated in enclosed space such as garage or work bays without adequate exhaust ventilation. Failure to comply may result in serious injury or death to personnel.

**WARNING**

Turn heat switch "OFF" while refueling and at fueling operations. Failure to comply may result in serious injury or death to personnel.

**WARNING**

Do not operate coolant heater in an area where toxic or explosive materials or fumes may be present. Failure to comply may result in serious injury or death to personnel.

**CAUTION**

Do not use arctic engine heater when operating conditions are above -25° F (-32°C). Failure to comply may result in damage to equipment.

## Arctic Engine Heater - Continued

### NOTE

- When the engine is not running the arctic engine heater may be operated for extended periods of time to keep the engine, transmission, and batteries warm. However, the arctic engine heater will use power from the battery and fuel from the fuel tank. If used for extended periods of time, when the engine is not running, there may not be sufficient power to properly operate the starter and/or there may not be a sufficient amount of fuel to start the engine.
- Ensure ignition switch is in the OFF position while performing this procedure.
- Heater will continue to operate until battery voltage drops below 20.0 volts or runs out of fuel.
- Coolant heater may be left "ON" during vehicle operation to aid in cab heat and enhance engine performance during cold weather.
- Consider closing ball valve if heater is not being used frequently. The engine will reach operating temperature quicker with ball valve closed.
- After heater shut down, the heater fan will continue to operate for several minutes to expel exhaust/gas fumes. After this, the system will shut off automatically.

- Turn off all accessories such as radios, lights, heater fan, wipers, etc. prior to operating the arctic engine heater.

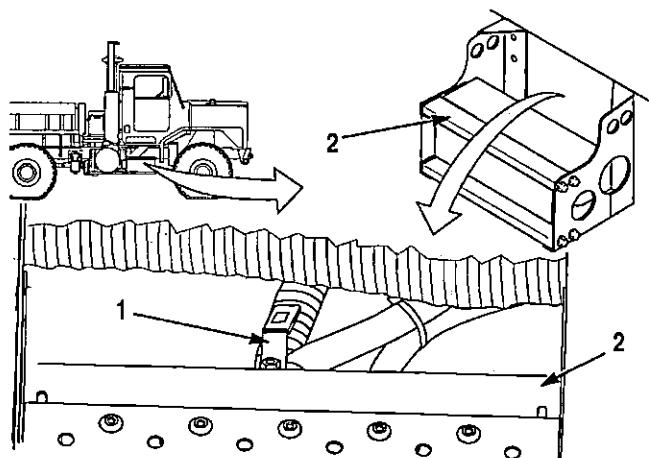


Figure 1.

- Open ball valve (1) of arctic engine heater (2).

### NOTE

When arctic engine heater switch is turned ON, the pilot lamp will light for approximately 3 minutes. The pilot lamp will then go out and the arctic engine heater switch will light. The switch should then remain lit solidly. If the switch blinks, a fault is indicated. Shut OFF arctic engine heater switch, and notify Second Echelon Maintenance.

- Turn arctic engine heater switch (3) to ON position.

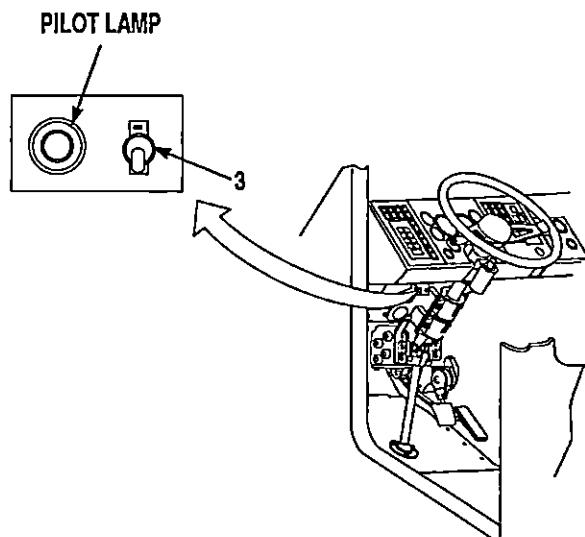
**Arctic Engine Heater - Continued**

Figure 2.

4. Turn arctic engine heater switch (3) to OFF position after engine is shut down.

**NOTE**

Perform Step (5) only if ambient air temperature rises above 0°F (-18°C).

5. Close ball valve (1) of arctic engine heater (2).

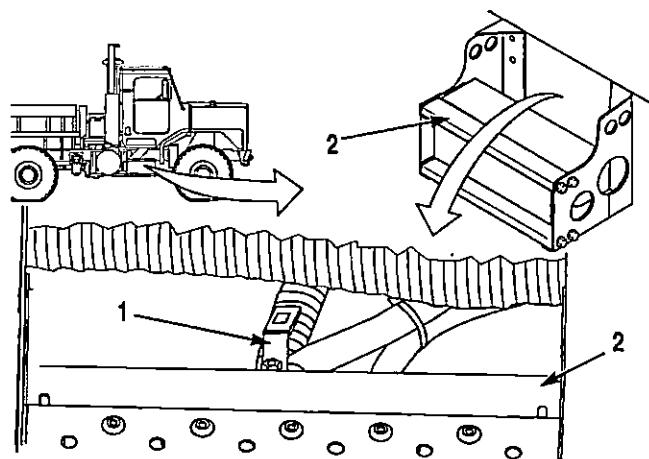


Figure 3.

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
TIRE CHAIN INSTALLATION / REMOVAL**

---

**INITIAL SETUP:**

Not Applicable

---

**Installation of Tire Chains**

**WARNING**



Do not back up without a ground guide. Failure to comply may result in damage to vehicle or injury or death to personnel.

**CAUTION**

- Tire chains must not be used when driving on hard surfaces where there is no wheel slippage. Failure to comply may result in damage to equipment.
- CTIS must NOT be set below CROSS COUNTRY setting. Failure to comply may result in damage to equipment.
- CTIS settings must NOT be changed once tire chains are installed. Failure to comply may result in damage to equipment.
- Maximum speed for vehicles equipped with tire chains is 10 mph (16 km/h) on the highway and 15 mph (24 km/h) off road. Failure to comply may result in damage to equipment.

**NOTE**

- Two personnel are required to install tire chains.
- Tire chains can only be installed on axle No. 2 of the MK23 and MK25 and axle No. 3 of the MK27 and MK28.
- Tire chain installation requires installation of jounce limiter service kit listed in AAL (WP 0114).

1. Remove locknut (1), screw (2), and jounce bumper (3) from vehicle.

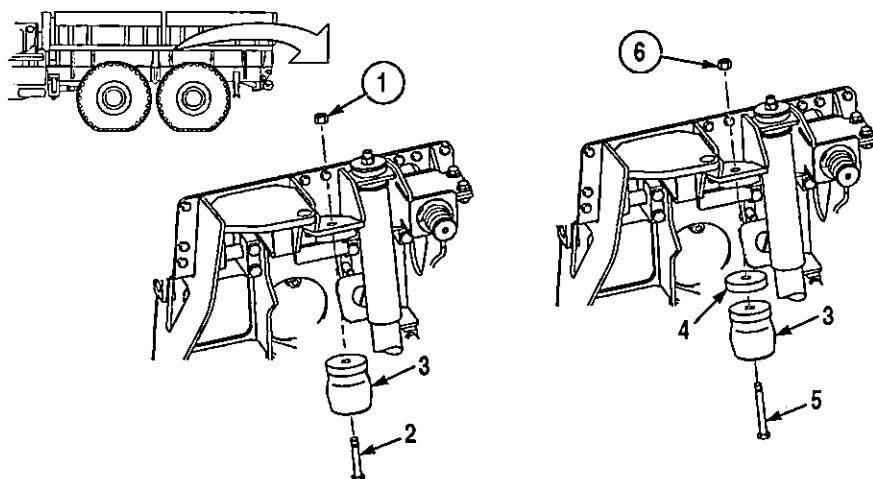
**Installation of Tire Chains - Continued**

Figure 1.

2. Install jounce bumper (3) and jounce limiter (4) on vehicle with screw (5) and locknut (6).
3. Repeat Steps (1) and (2) for jounce bumper and jounce limiter on opposite side of vehicle.

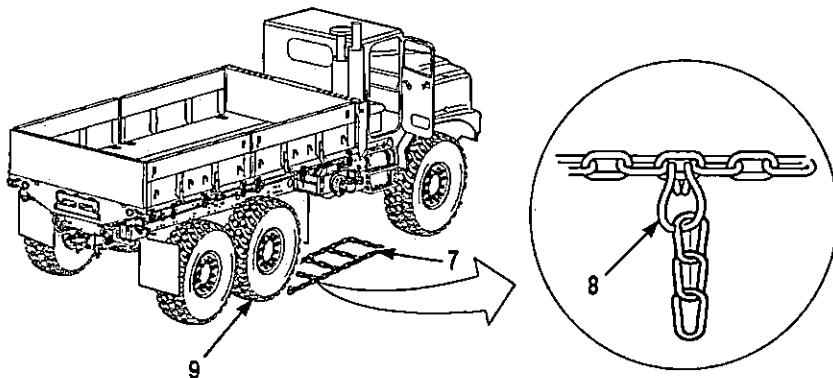


Figure 2.

4. Position tire chain (7) on ground with cross chain connecting links (8) facing down in front of tire (9) on MK23 and MK25 or to rear of tire on MK27 and MK28.
5. Park vehicle (WP 0034).

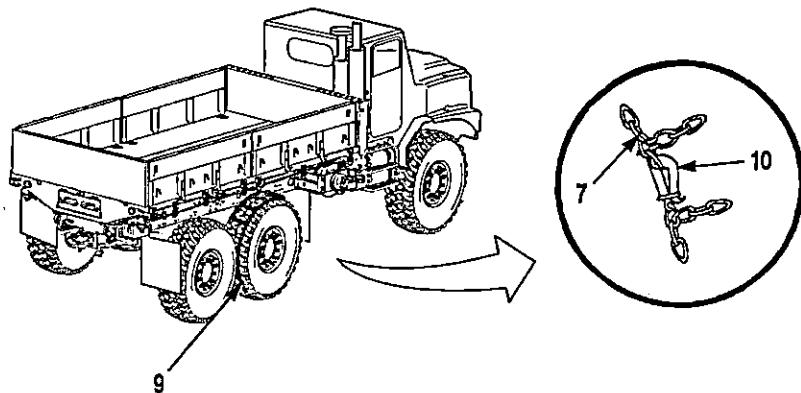
**Installation of Tire Chains - Continued**

Figure 3.

6. Ensure tire (9) is not resting on end of tire chain (7).
7. Shut engine OFF (WP 0035).
8. Wrap tire chain (7) around tire (9) as evenly as possible.
9. Connect and secure inside and outside tire chain clamps (10) until tire chain is as tight as possible on tire.
10. Repeat Steps (4) through (9) to install tire chain on other tire.
11. Drive vehicle ahead 300 ft. (91.5 m), park vehicle, check and adjust tire chains as required until a tight fit is obtained.
12. Inspect tire chains after every hour of operation and tighten as required so tire chains remain as tight as possible.

**Removal of Tire Chains****WARNING**

Do not back up without a ground guide. Failure to comply may result in damage to vehicle or injury or death to personnel.

**NOTE**

Two personnel are required to remove tire chains.

1. Start vehicle (WP 0029) and position tire (1) so tire chain clamps (2) are at 4 o'clock position.

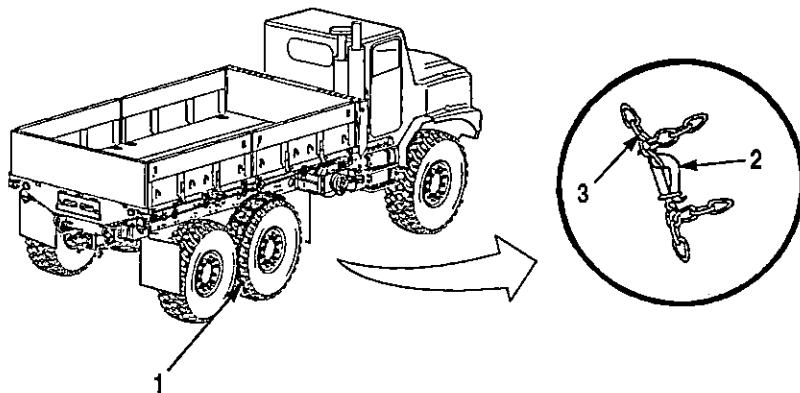
**Removal of Tire Chains - Continued**

Figure 4.

2. Park vehicle (WP 0034).
3. Disconnect inside and outside tire chain clamps (2).
4. Unwrap tire chain (3) from tire (1).
5. Drive vehicle off tire chain.
6. Repeat Steps (2) through (5) to remove tire chain from other tire.
7. Park vehicle (WP 0034) and shut engine OFF (WP 0035).

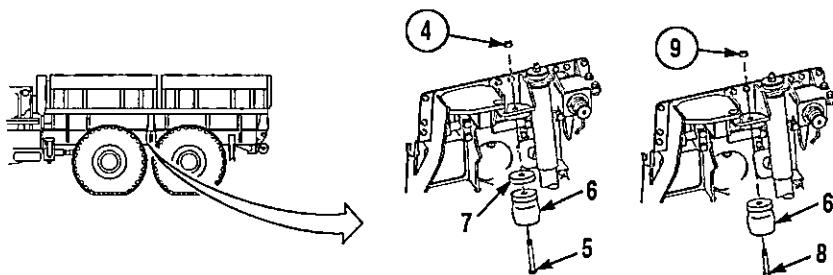


Figure 5.

8. Remove locknut (4), screw (5), jounce bumper (6), and jounce limiter (7) from vehicle.
9. Install jounce bumper (6) on vehicle with screw (8) and locknut (9).
10. Repeat Steps (8) and (9) for jounce bumper on opposite side of vehicle.

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
ARCTIC CARGO KIT**

---

**INITIAL SETUP:**

Not Applicable

---

**Arctic Cargo Kit Dome Light Operation****NOTE**

- Battery disconnect switch must be turned ON for dome lights to work.
- To turn normal light to ON, perform Step (1). To turn blackout light to ON, perform Step (2).

1. Push button (1) in and turn knob (2) counterclockwise.

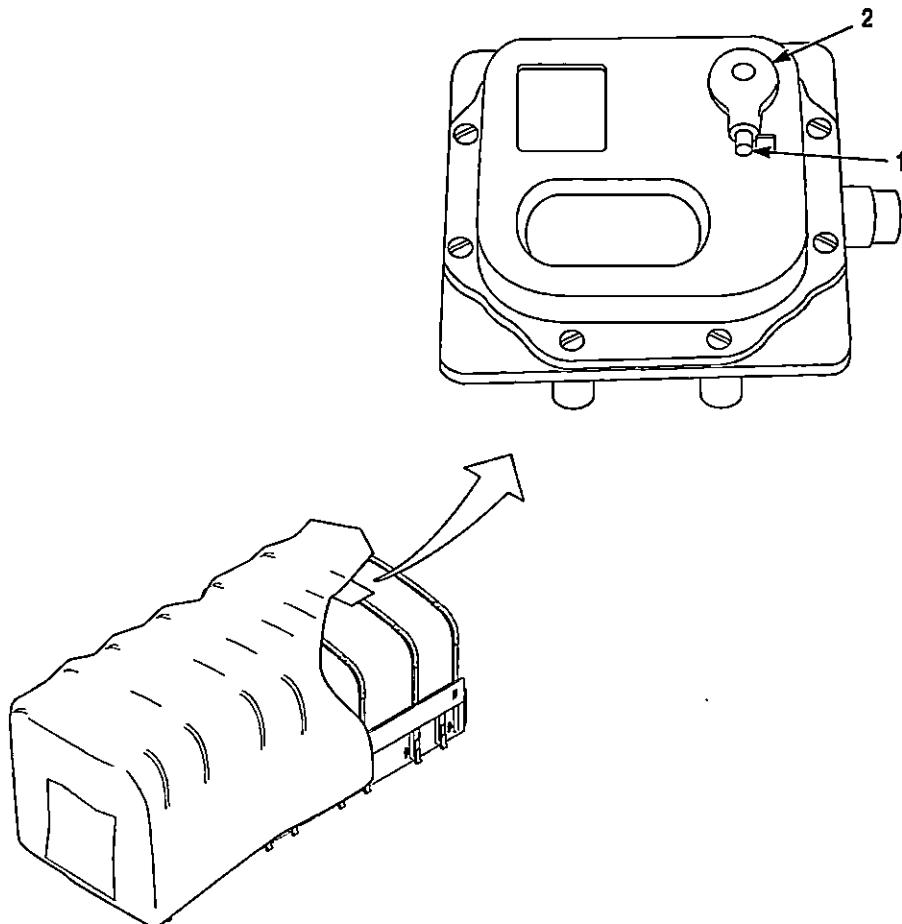


Figure 1.

**Arctic Cargo Kit Dome Light Operation - Continued**

2. Turn knob (2) clockwise.
3. To turn light OFF, turn knob (2) back to center position.

**Arctic Cargo Kit Personnel Heater****WARNING**

Carbon Monoxide (exhaust gases) can kill.

**WARNING**

Be alert at all times for exhaust odors and poisoning symptoms; i.e., headache, dizziness, sleepiness, and loss of muscular control. If you notice these symptoms, leave the area and go to open air. Failure to comply may result in serious injury or death to personnel.

**WARNING**

If you see another person with exhaust poisoning symptoms, remove person from area, expose to open air, keep person warm, do not permit person to move, and if necessary, administer artificial respiration or CPR. (Reference MCRP 3-02G/FM 21-11). Failure to comply may result in serious injury or death to personnel.

**WARNING**

Do not operate personnel heater if a fuel or exhaust leak is present. Failure to comply may result in injury or death to personnel.

**WARNING**

Do not operate personnel heater near combustible or flammable vapors, liquids, or materials. Failure to comply may result in injury or death to personnel.

**WARNING**

Do not operate the personnel heater if it is damaged. Failure to comply may result in injury or death to personnel.

**NOTE**

- To use personnel heater for ventilation only, perform Step (1). In this position the personnel heater will only circulate the air in the cargo area.
- To use personnel heater to heat cargo area, proceed to Step (2).

1. Put main control switch (1) in the UP or "Venting" position.

### Arctic Cargo Kit Personnel Heater - Continued

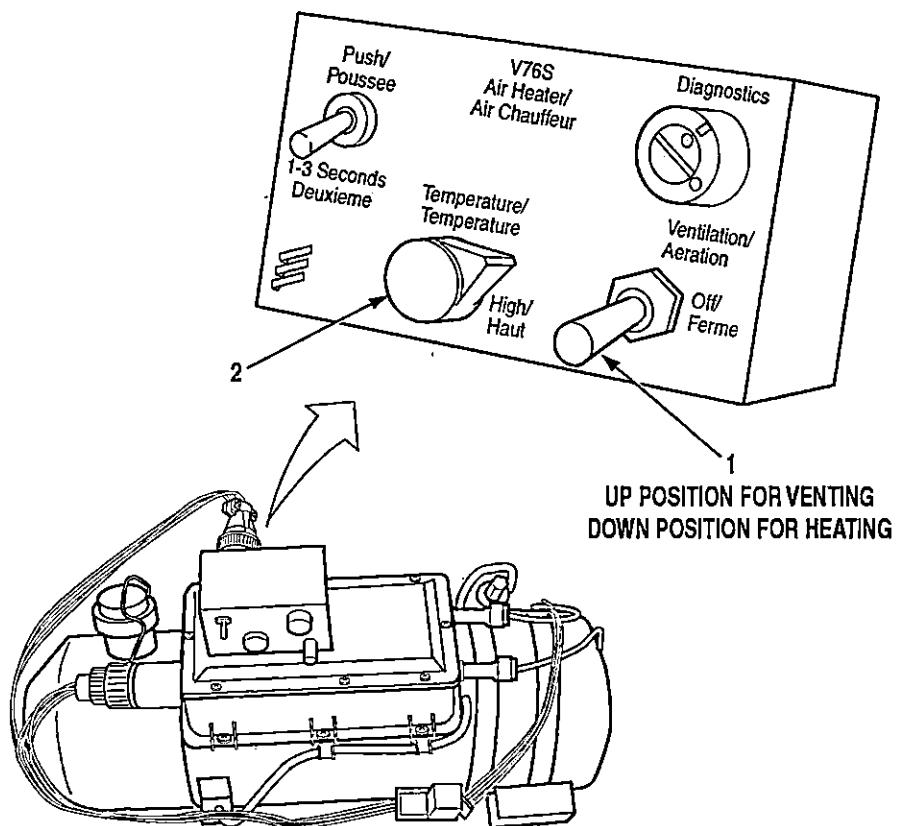


Figure 2.

2. Put the main control switch (1) in the DOWN or "Heating" position.
3. After 5 minutes the heat output can be adjusted by turning the heat control knob (3).

#### NOTE

If the personnel heater was used in the heating position, the fan will run for another three minutes to cool the motor off once the main control switch is turned off.

4. To turn the personnel heater off, put the main control switch (1) in the "Off" position.

### Arctic Cargo Kit Ventilation Fan

#### CAUTION

Prior to operating ventilation fan, ensure outside cargo cover flap is open. Failure to comply may result in damage to equipment.

#### NOTE

The ventilation fan on the cargo cover should be operated whenever conditions inside the cargo cover area are such that cooler/fresh air is needed. (i.e. too hot, stale air, chemical vapors, etc. . . .)

**Arctic Cargo Kit Ventilation Fan - Continued**

1. Secure flap (1) in open position.

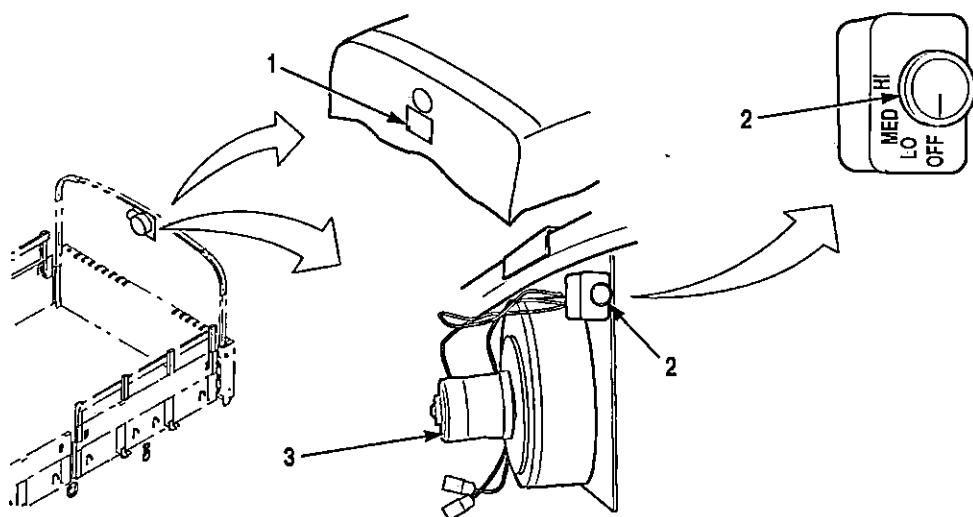


Figure 3.

2. Turn knob (2) on fan (3) to desired setting.
3. To turn fan off, turn knob (2) to "Off" position.
4. Secure flap (1) in closed position.

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
TIRE RAMP UNSTOW / STOW****INITIAL SETUP:**

Not Applicable

**Unstow Tire Ramps**

1. Remove handle (1) and T-bolt (2) from tire ramps (3) and step (4) on right side of vehicle.

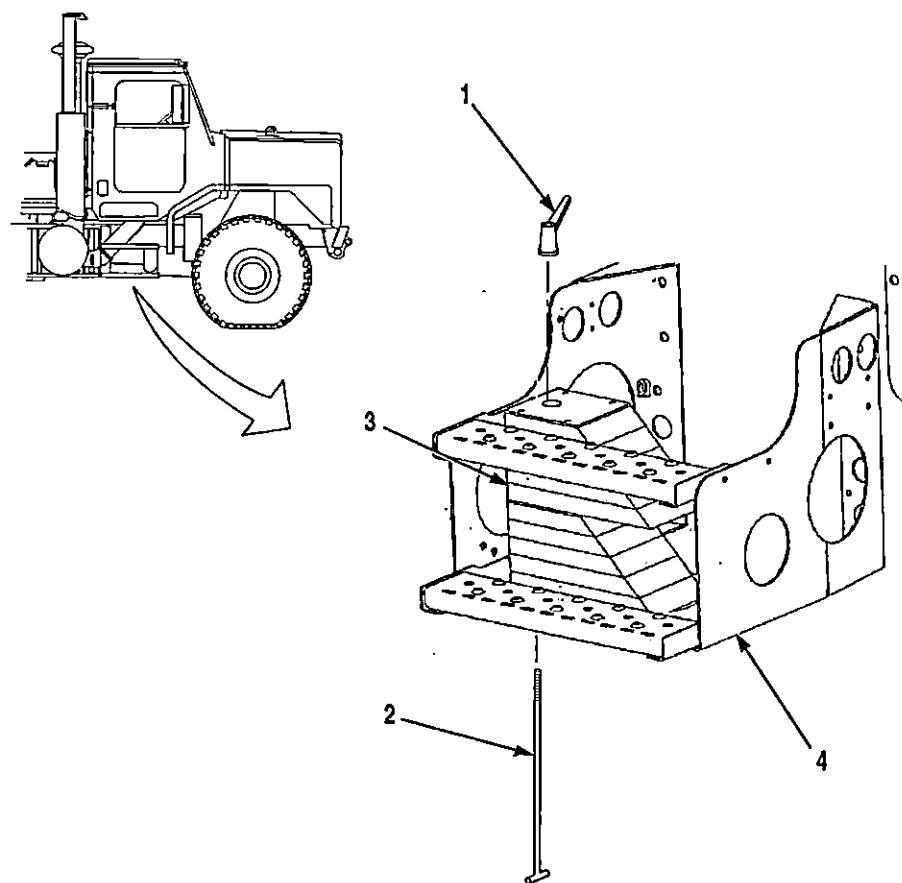


Figure 1.

2. Remove tire ramps (3) from step (4).

**Stow Tire Ramps**

1. Position tire ramps (3) on step (4).

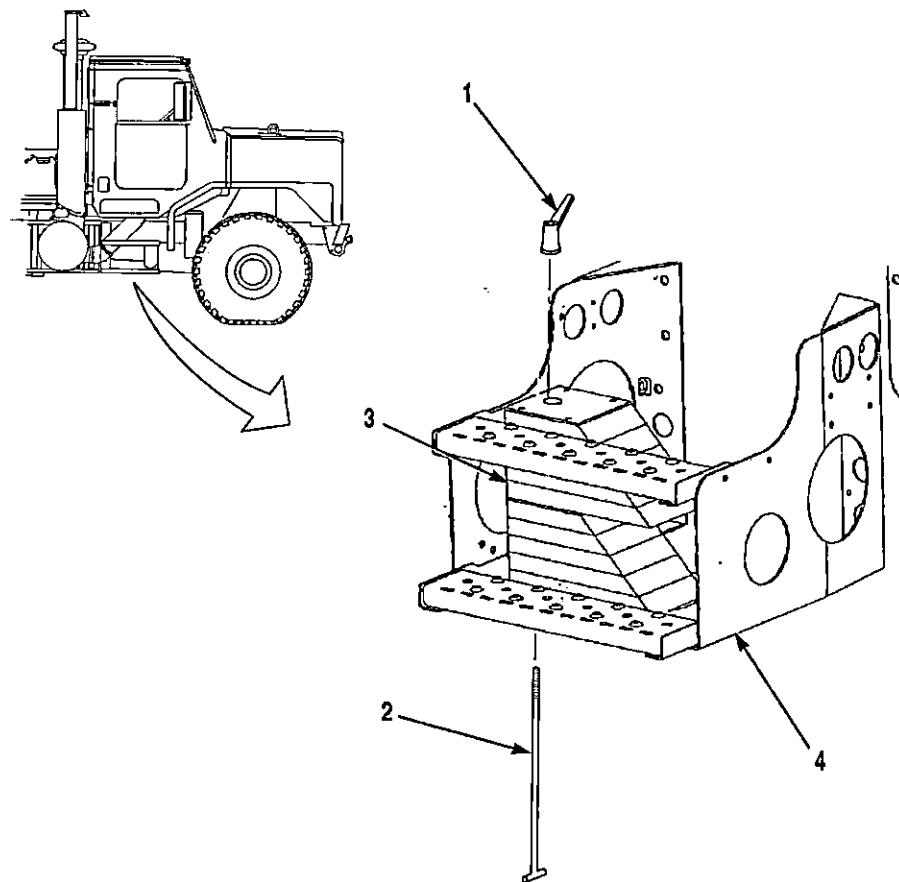


Figure 2.

2. Align holes in step (4) and tire ramps (3).
3. Install T-bolt (2) through step (4) and tire ramps (3) and secure with handle (1).

**END OF TASK**

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE LADDER

### INITIAL SETUP:

Not Applicable

### Positioning Ladder for Use (Single)

#### **WARNING**

- Ladder assembly is hinged and swings down when being positioned for use. Do not stand directly beneath ladder when deploying ladder assembly. Failure to comply may result in serious injury or death to personnel.
- Keep hands away from hinges when positioning ladder for use. Failure to comply may result in serious injury to personnel.
- When entering or exiting troop carrier, use three-point contact system. Failure to comply may result in injury to personnel.

1. Pull on wire rope (1) to release ladder assembly (2) and rotate ladder assembly (2) down until bumpers (3) contact vehicle frame.

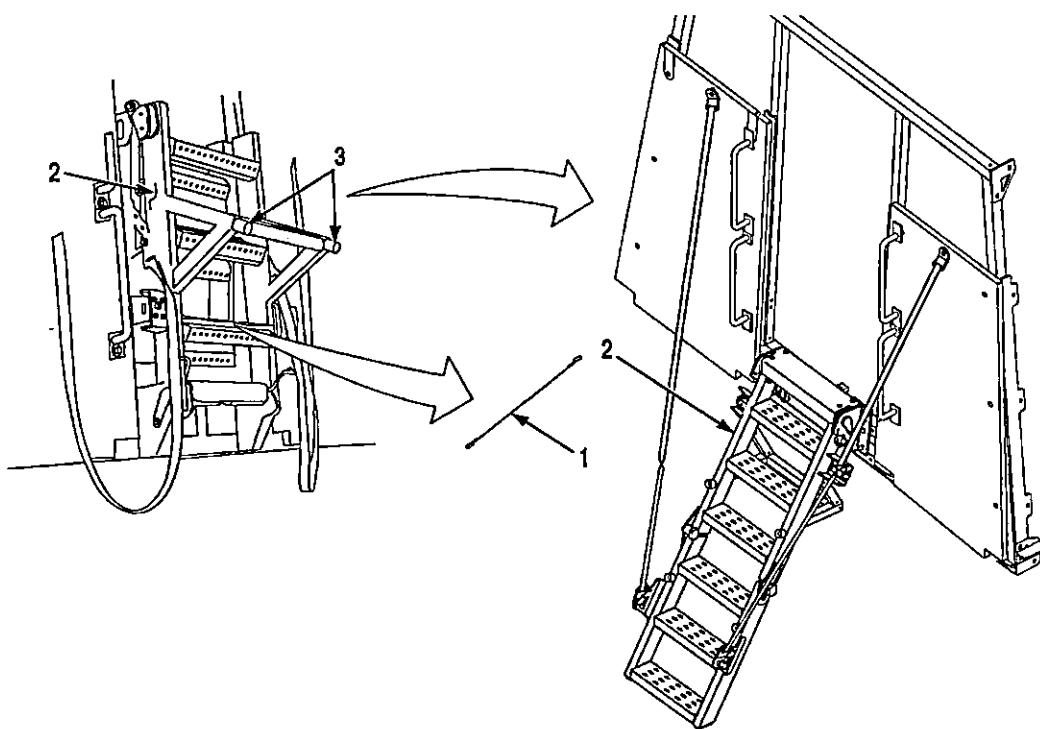


Figure 1.

2. Rotate lower section of ladder assembly (2) down until aligned with upper section of ladder assembly (2).

**Positioning Ladder for Use (Single) - Continued****WARNING**

Locking pin must be installed prior to using ladder. Failure to comply may result in serious injury to personnel.

3. Insert locking pin (4) through hole on bracket (5) and into hole on ladder assembly (2).

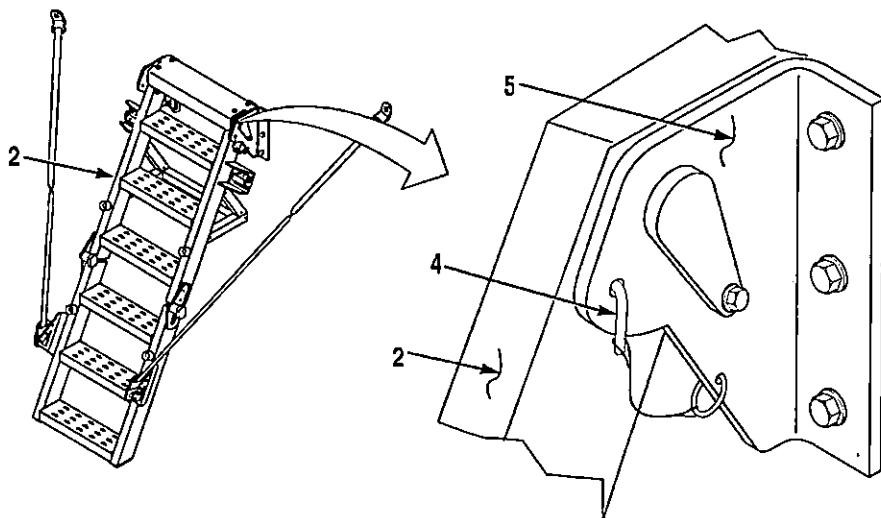


Figure 2.

**Stowing Ladder (Single)****WARNING**

- Ladder assembly is hinged and can pinch hands or fingers when being stowed. Keep hands away from pivot points. Failure to comply may result in serious injury to personnel.
- When entering or exiting troop carrier, use three-point contact system. Failure to comply may result in serious injury to personnel.

1. Remove locking pin (1) from ladder assembly (2) and bracket (3).

## Stowing Ladder (Single) - Continued

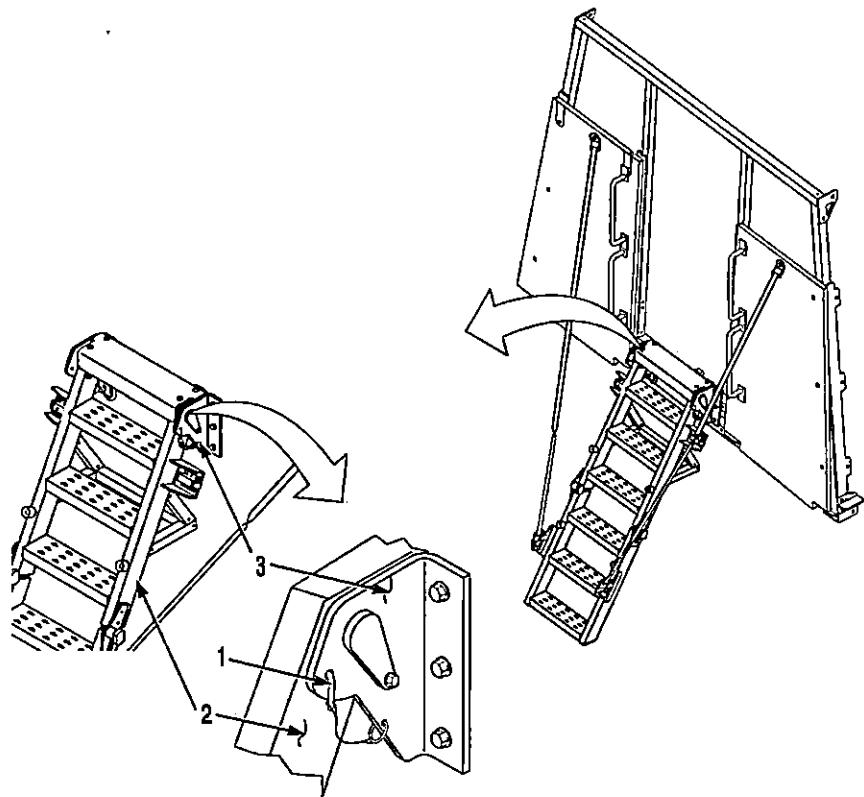


Figure 3.

2. Rotate lower section of ladder assembly (2) up until lower section contacts upper section of ladder assembly (2).
3. Rotate ladder assembly (2) up until two latch assemblies (4) engage in two latch brackets (5).

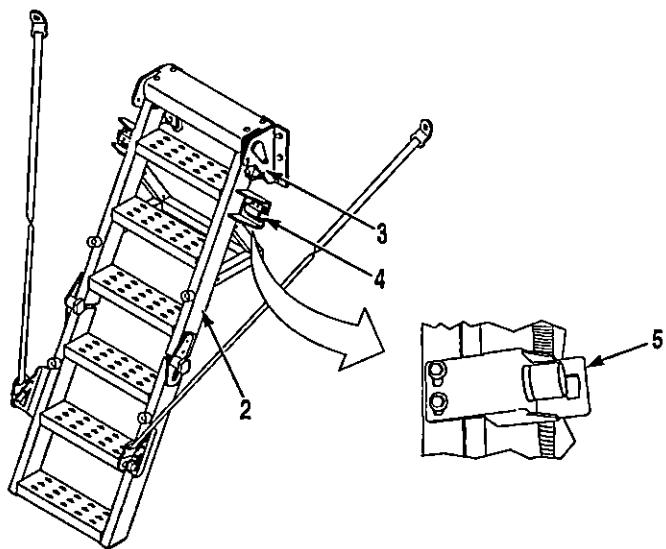
**Stowing Ladder (Single) - Continued**

Figure 4.

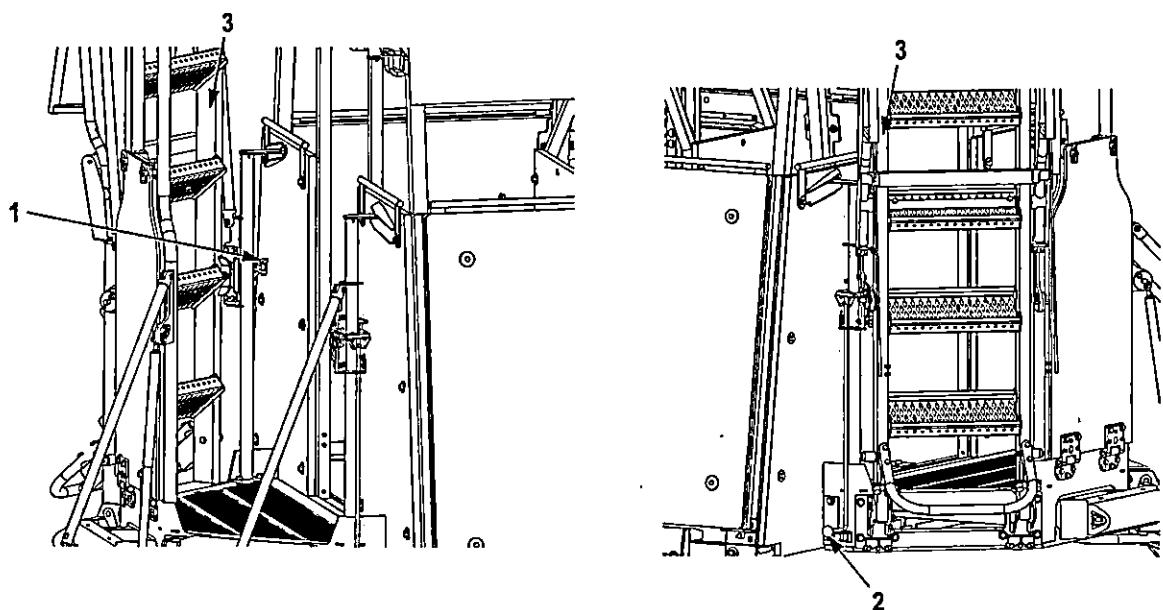
**Positioning Ladder for Use (Dual)****WARNING**

- There is a potential crush hazard with this ladder caused by a failed hydraulic strut. Be alert and stand clear of ladder path. Failure to comply may result in serious injury or death to personnel.
- Keep hands away from hinges when positioning ladder for use. Failure to comply may result in serious injury to personnel.
- When entering or exiting troop carrier, use three-point contact system. Failure to comply may result in injury to personnel.

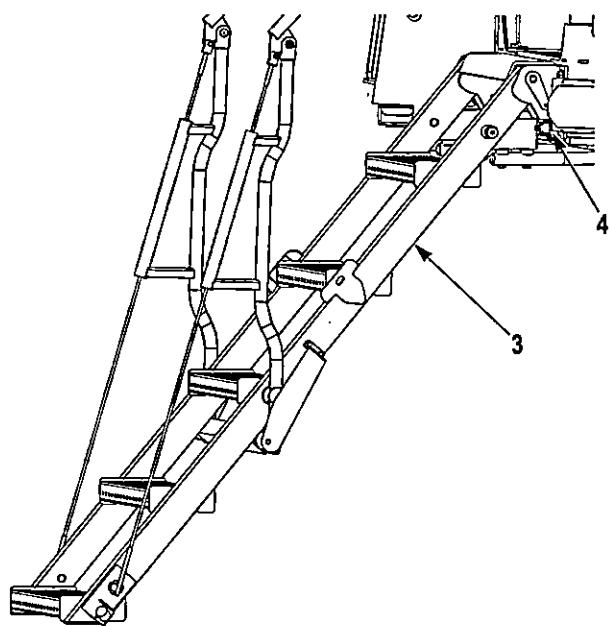
**NOTE**

Left and right side ladders are operated the same way. Left side ladder shown.

1. Lift handle (1) or handle (2) to release ladder (3).

**Positioning Ladder for Use (Dual) - Continued****Figure 5.**

2. Rotate ladder (3) down until friction locks on two ball bracket assemblies (4) are engaged.

**Figure 6.**

**Stowing Ladder (Dual)****WARNING**

Keep hands away from hinges when stowing ladder. Failure to comply may result in serious injury to personnel.

Rotate ladder (3) up until latch assembly (5) is engaged.

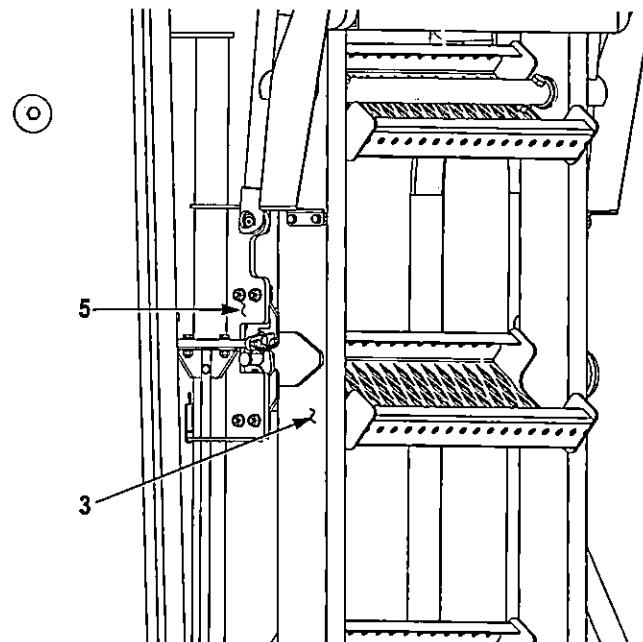


Figure 7.

**END OF TASK**

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE ARMOR TROOP CARRIER COVER

### INITIAL SETUP:

Not Applicable

### Installation

1. Remove folded cover (1) from stowage.

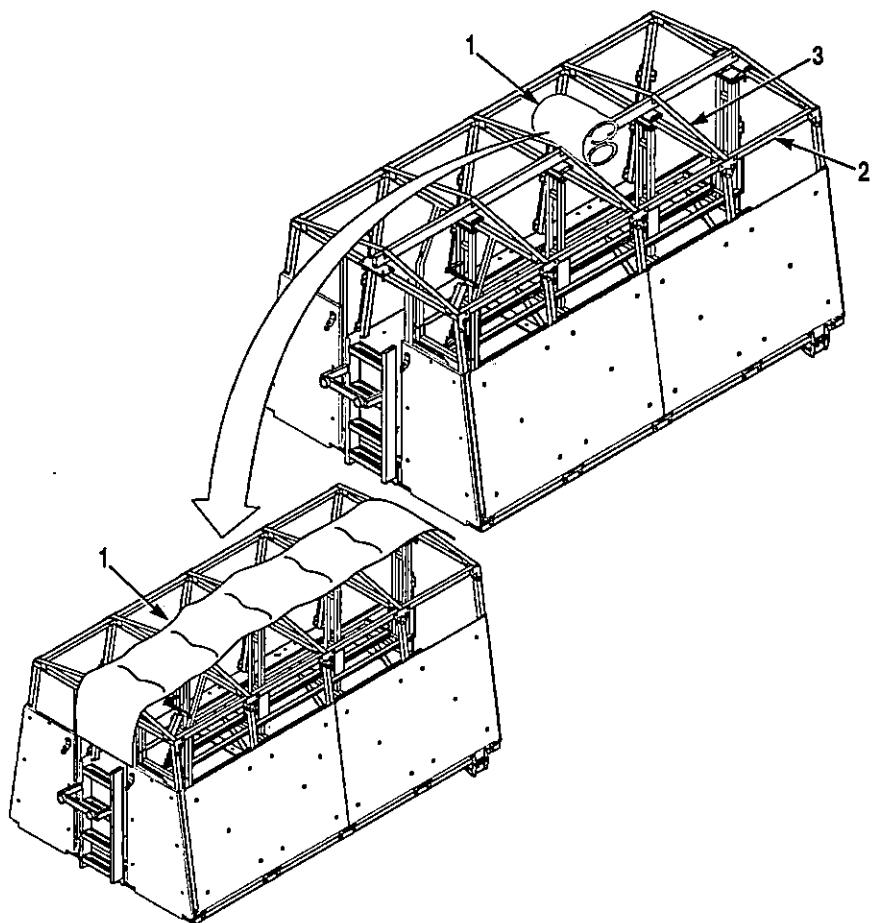


Figure 1.

2. With the aid of an assistant, position folded cover (1) across center armor frame (2) of troop carrier armor assembly.
3. Unfold cover (1) over tops of armor frames (2) until cover (1) is completely rolled out from front to back.
4. Unfold cover (1) over roof bows (3) to sides of outer armor frames (2).

**Installation - Continued**

5. Loosely attach troop carrier cover securing straps (4) on front, side, and rear armor top rails (5) and fasten cover corners (6).

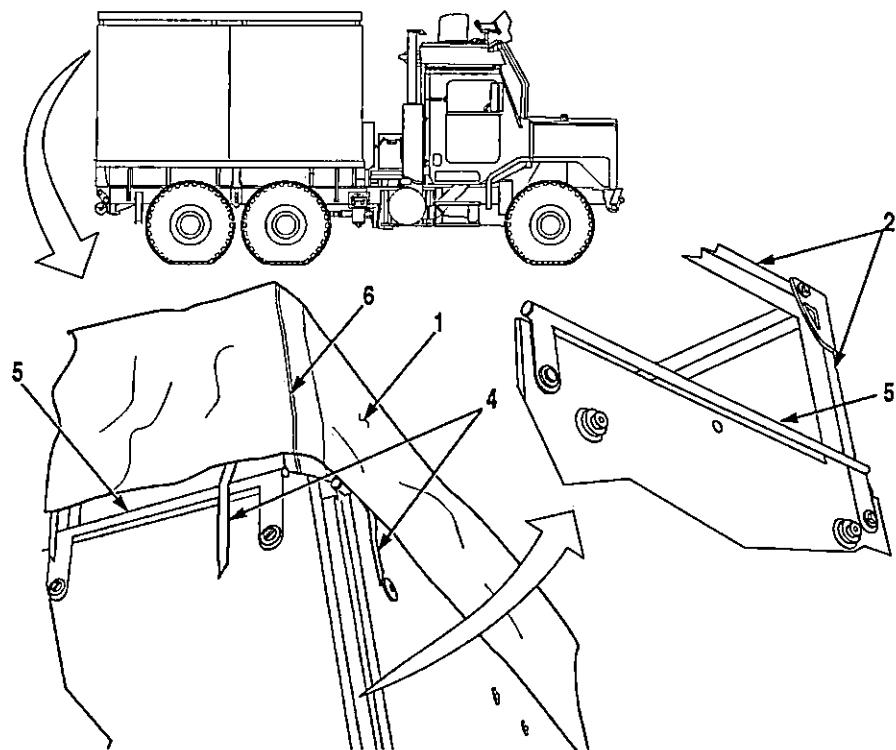


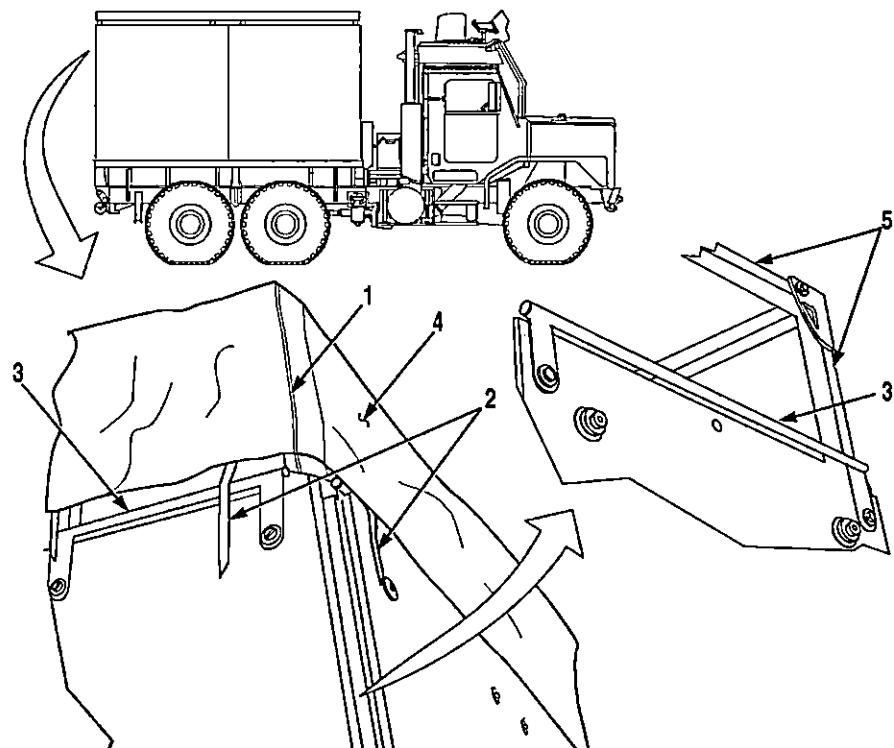
Figure 2.

6. From rear of vehicle, pull cover (1) rearward until taut and rear corners are in place at corners of armor frames (2).
7. Adjust cover (1) so all four corners fit evenly and roof is taut. Tie off corner troop carrier cover securing straps (4) to top rails (5) first, then tie off side troop carrier cover securing straps (4) moving from front to back and alternating from driver side to passenger side until all troop carrier cover securing straps (4) and cover (1) are secure and taut.

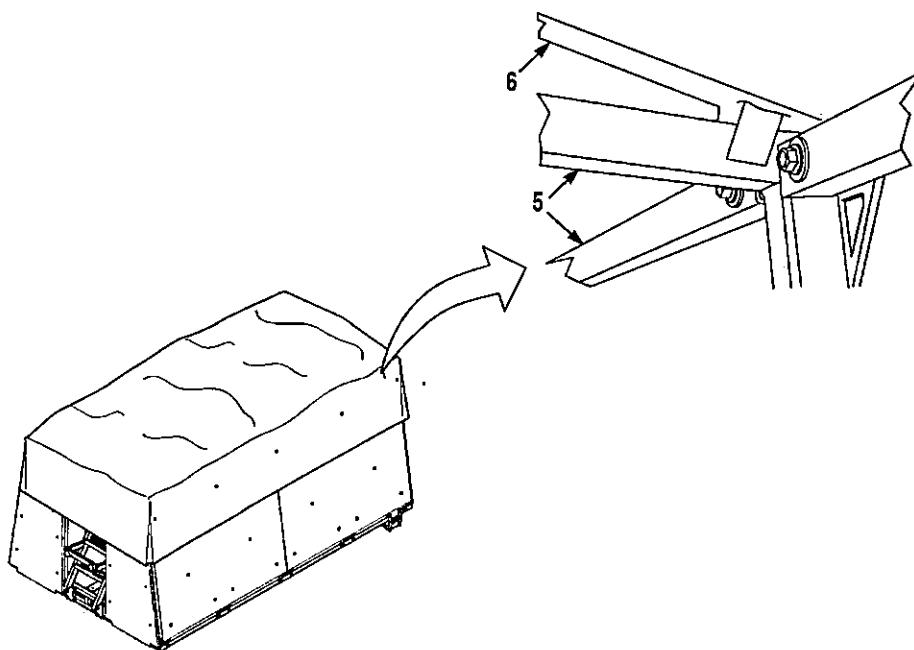
**Removal****CAUTION**

Do not fold or stow cover when cover is wet. Failure to comply may result in damage to equipment.

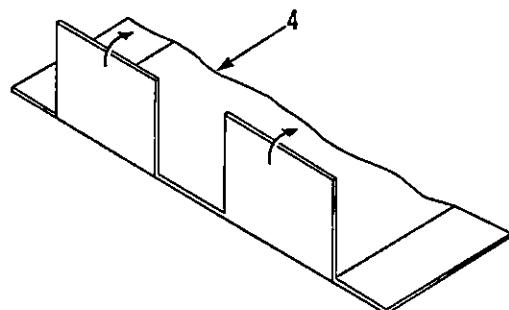
1. Open cover corners (1) and release troop carrier cover securing straps (2) from front, side, and rear armor top rails (3).

**Removal - Continued****Figure 3.**

2. With the aid of an assistant, lift cover (4) off armor frames (5) and roof bows (6), and place cover (4) on ground with top facing up.

**Removal - Continued****Figure 4.**

3. Fold front and rear flaps inward over cover (4).

**Figure 5.**

4. Fold passenger side/driver side panels inward over cover (4).

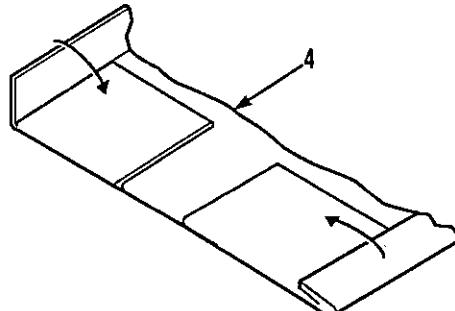
**Removal - Continued**

Figure 6.

5. Continue folding each side in to center of cover (4).

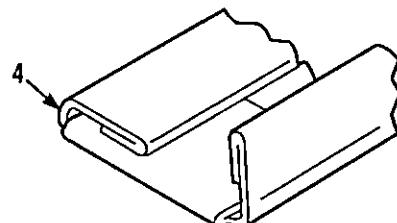


Figure 7.

6. Fold passenger side of cover (4) on top of driver side of cover (4).

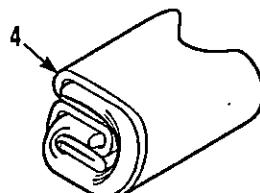


Figure 8.

7. Fold each end of cover (4) to center of cover (4).

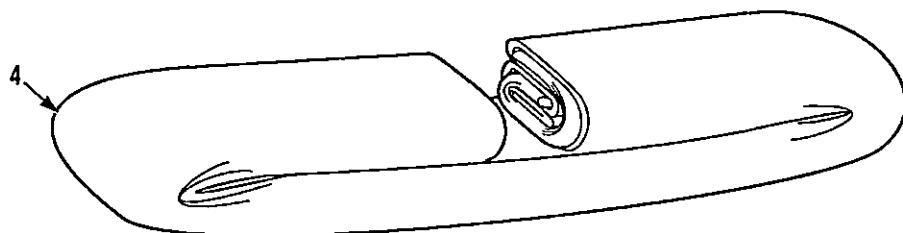
**Removal - Continued**

Figure 9.

8. Pick up each new end of cover (4) and fold to center of cover (4).

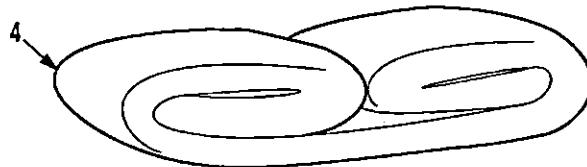


Figure 10.

9. Fold front end of cover (4) on top of rear end of cover (4).

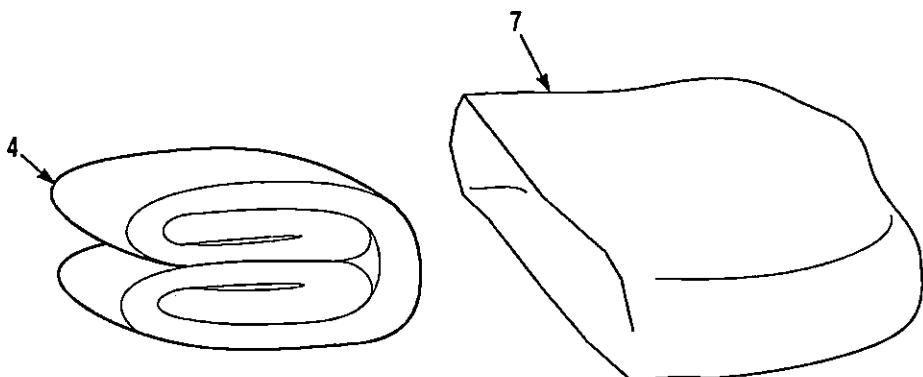


Figure 11.

10. Place folded cover (4) in stowage bag (7).

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
FOUR-POINT SEAT BELT**

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**INITIAL SETUP:**

Not Applicable

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**Operation****WARNING**

Always use seat belts when vehicle is in operation. Failure to comply may result in serious injury or death to personnel.

1. Insert latches on two shoulder belts (1) and latch on lap strap (2) into buckle (3) on buckle strap (4) until a click is heard.

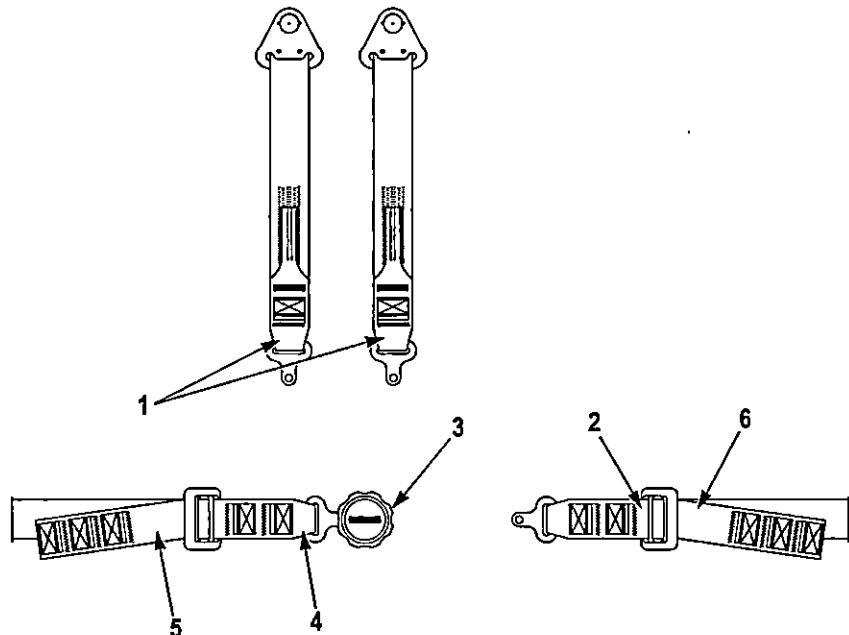


Figure 1.

2. Adjust buckle strap (4) by pulling strap (5).
3. Adjust lap strap (2) by pulling strap (6).
4. To release four-point seat belt, rotate buckle (3) on buckle strap (4).

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
CENTER SEAT****INITIAL SETUP:**

Not Applicable

**Adjusting for Machine Gun Use**

1. Release two latches (1) and fold platform (2) down.

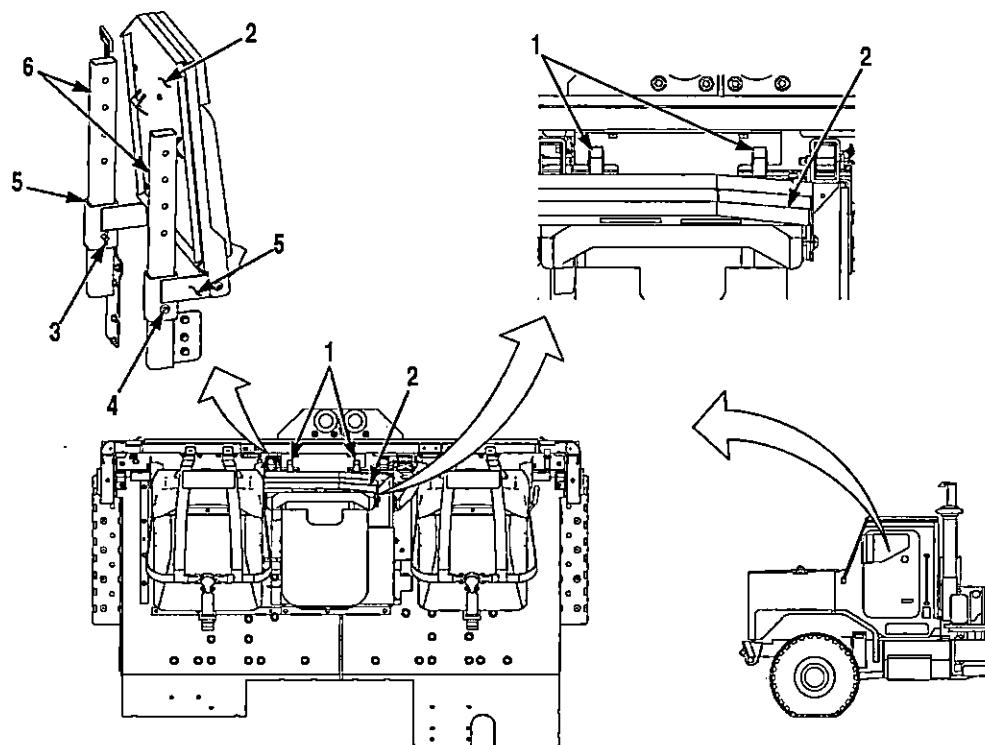


Figure 1.

2. Remove two hairpins (3) from pins (4).
3. Remove two pins (4) from sliders (5).

**NOTE**

There are four different gunner height settings on supports.

4. Move sliders (5) up supports (6) to desired height.
5. Install two pins (4) in sliders (5).
6. Install two hairpins (3) in pins (4).

**Adjusting for Machine Gun Use - Continued****NOTE**

There are four different support strut height settings on seat base.

7. Install support strut (7) on platform (2) and position shoulder bolt (8) in keyhole of seat base (9) to hold platform (2) level.

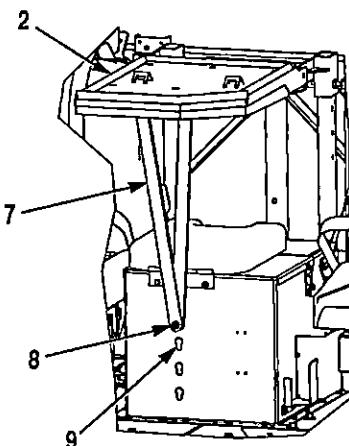


Figure 2.

**Adjusting Back to Seat Configuration**

1. Remove support strut (7) from platform (2) and shoulder bolt (8) from keyhole of seat base (9).

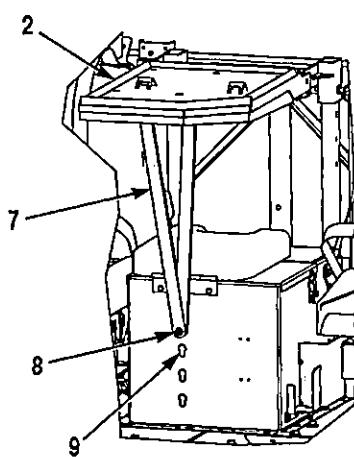


Figure 3.

2. Remove two hairpins (3) from pins (4).

**Adjusting Back to Seat Configuration - Continued**

3. Remove two pins (4) from sliders (5).

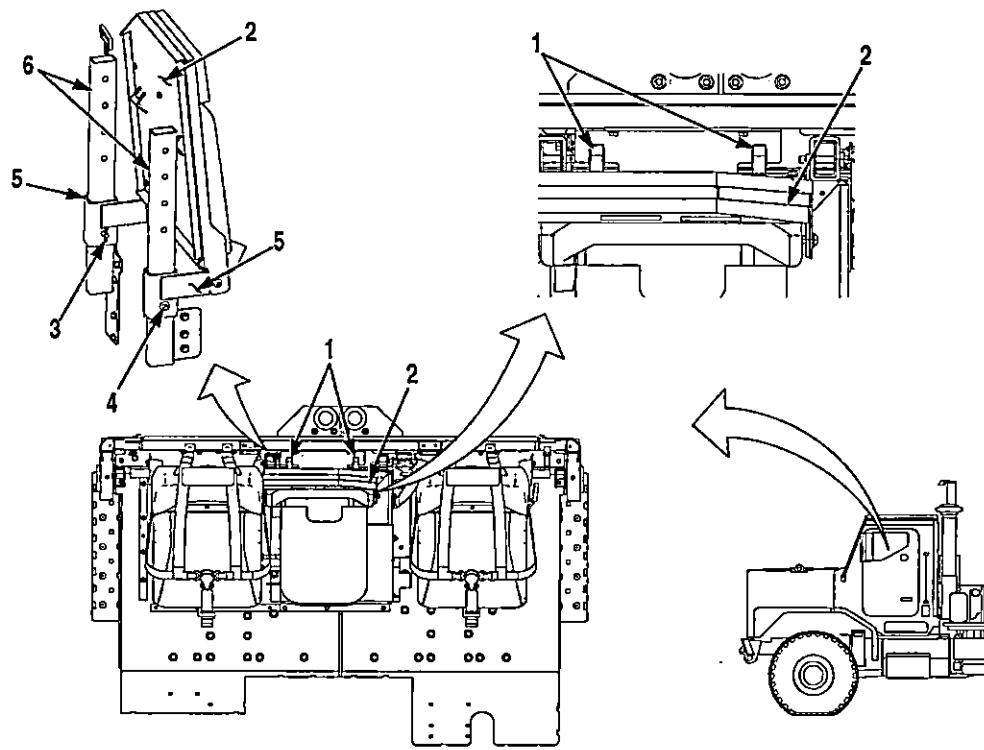


Figure 4.

4. Move two sliders (5) down supports (6) to seat height.
5. Install two pins (4) in sliders (5).
6. Install two hairpins (3) in pins (4).
7. Fold platform (2) up, and secure with two latches (1).

**Adjusting for Machine Gun Use (With TGRS)**

1. Release two latches (1) and fold gunner platform (2) down.

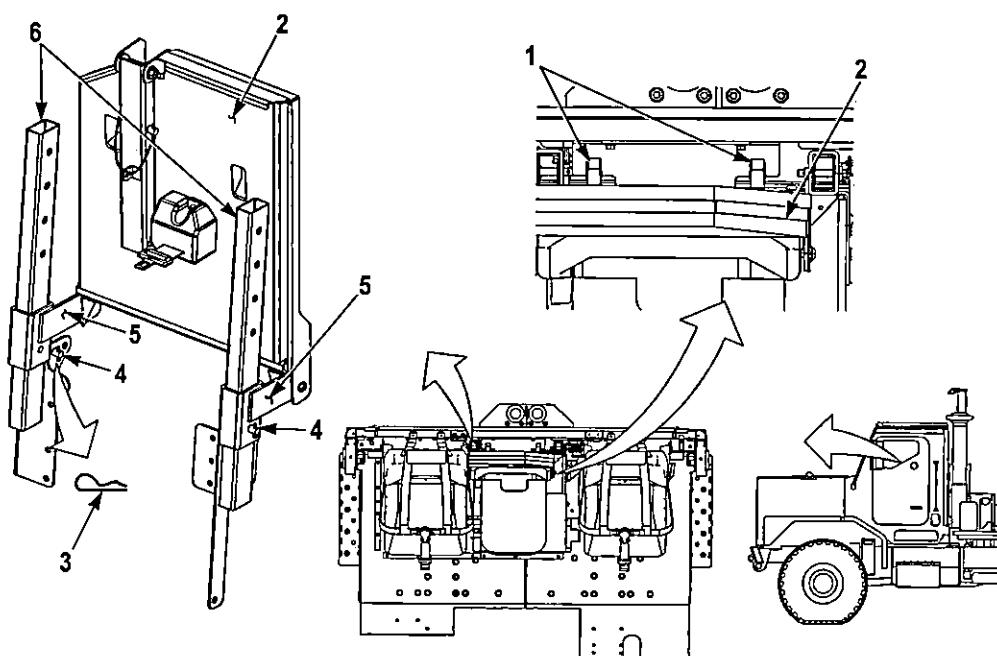
**Adjusting for Machine Gun Use (With TGRS) - Continued**

Figure 5.

2. Remove two hairpins (3) from height adjustment pins (4).
3. Remove two height adjustment pins (4) from sliders (5).

**NOTE**

There are four different gunner height settings on supports.

4. Move sliders (5) up supports (6) to desired height.
5. Install two height adjustment pins (4) in sliders (5).
6. Install two hairpins (3) in height adjustment pins (4).
7. Move platform support (7) to unstowed position.

### Adjusting for Machine Gun Use (With TGRS) - Continued

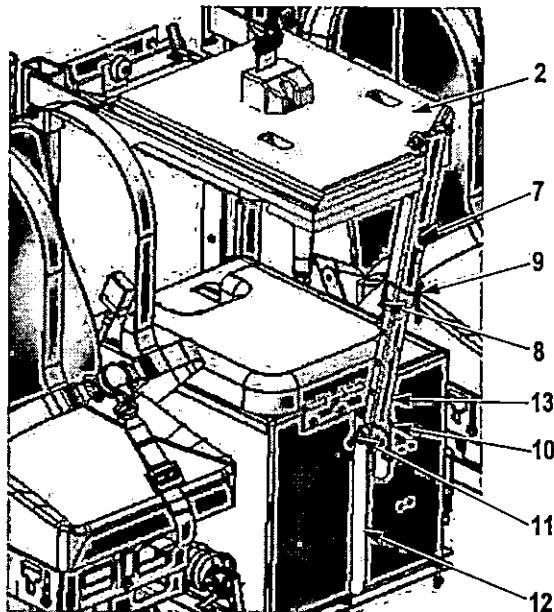


Figure 6.

8. Remove hairpin (8) from height adjustment pin (9).
9. Remove hairpin (10) from pin (11) and remove pin (11) from platform support bracket (12).

#### **WARNING**

When height adjustment pin is removed, platform support tube can fall out of platform support weldment. Support bottom of support tube and platform support weldment when removing height adjustment pin. Failure to comply may result in serious injury or death to personnel.

#### **NOTE**

There are four different platform support tube height settings.

10. Remove height adjustment pin (9) and install platform support tube (13) on platform support bracket (12) with pin (11) in bottom hole of support tube (13).
11. Install hairpin (10) on pin (11).
12. Raise gunner platform (2) to desired height, line up closest hole in platform support tube (13) with hole in platform support (7) and insert height adjustment pin (9).
13. Install hairpin (8) on height adjustment pin (9).

### Adjusting back to Seat Configuration (With TGRS)

1. Remove hairpin (10) from pin (11).

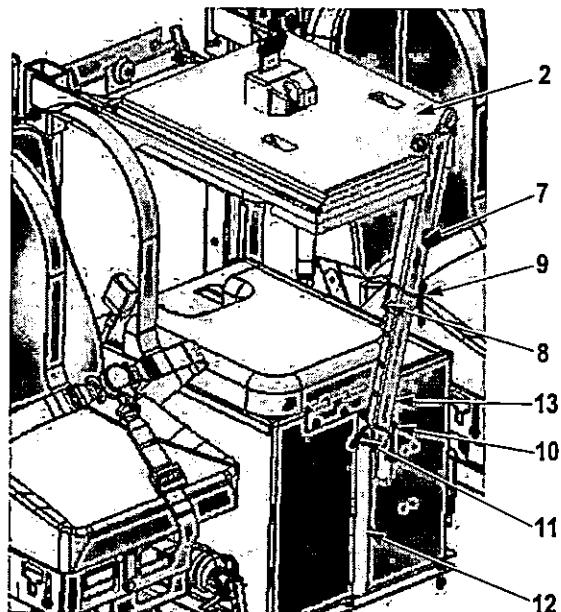
**Adjusting back to Seat Configuration (With TGRS) - Continued**

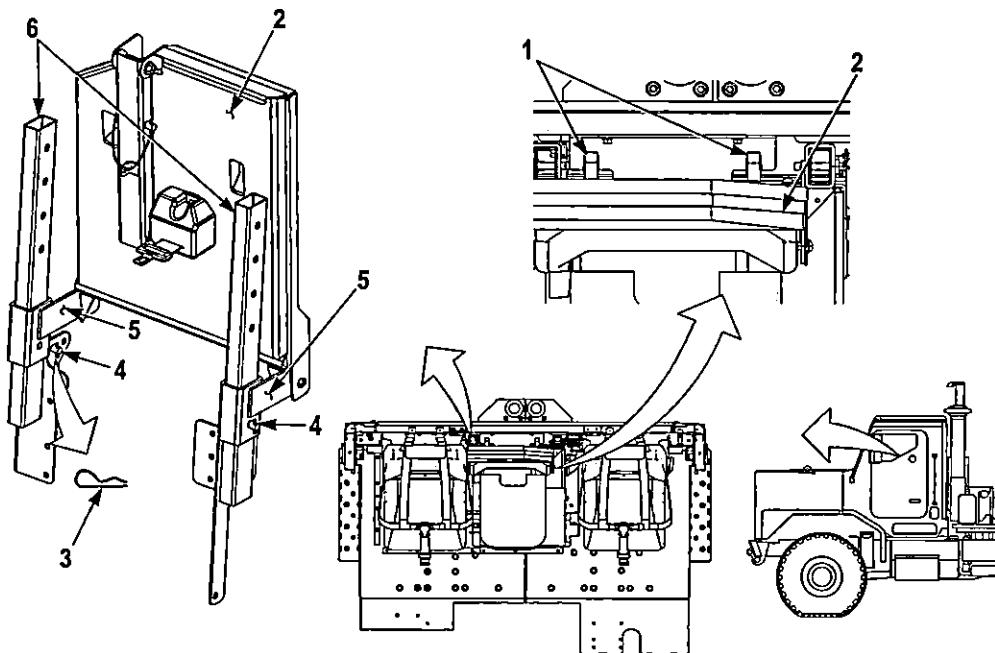
Figure 7.

2. Support weight of gunner platform (2) and remove pin (11) from platform support bracket (12) and platform support tube (13).
3. Remove hairpin (8) from height adjustment pin (9).

**WARNING**

When height adjustment pin is removed, platform support tube can fall out of platform support weldment. Support bottom of support tube and platform support weldment when removing height adjustment pin. Failure to comply may result in serious injury or death to personnel.

4. Remove height adjustment pin (9) and push platform support tube (13) up into platform support (7).
5. Install height adjustment pin (9) in platform support (7) and platform support tube (13).
6. Install hairpin (8) on height adjustment pin (9).
7. Move platform support (7) to stowed position.
8. Install pin (11) on platform support bracket (12) and install hairpin (10) on pin (11).
9. Remove two hairpins (3) from height adjustment pins (4).

**Adjusting back to Seat Configuration (With TGRS) - Continued****Figure 8.**

10. Remove two height adjustment pins (4) from sliders (5).
11. Move two sliders (5) down supports (6) to seat height.
12. Install two height adjustment pins (4) in sliders (5).
13. Install two hairpins (3) on height adjustment pins (4).
14. Fold gunner support platform (2) up and secure with two latches (1).

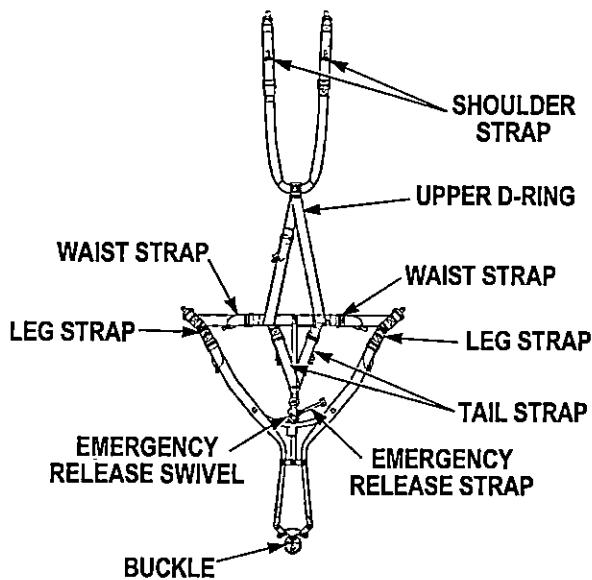
**Parts of Harness (With TGRS)**

Figure 9.

**Donning and Removing Gunner Restraint Harness (With TGRS)****WARNING**

Always use turret gunner restraint system when vehicle is in operation. Failure to comply may result in serious injury or death to personnel.

**NOTE**

- Turret gunner restraint system is only to be used when personnel are in machine gunner position.
- The gunner restraint system is only designed to prevent gunner from being ejected from vehicle, it will not pull the gunner back into vehicle.

1. Locate upper D-ring (1) and place at base of neck with shoulder straps (2) over shoulder.

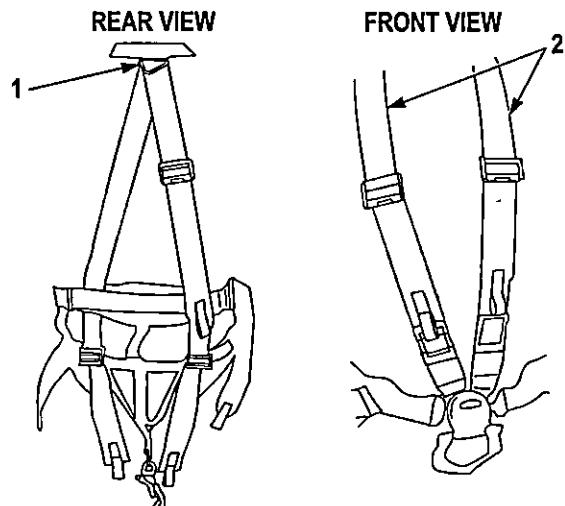
**Donning and Removing Gunner Restraint Harness (With TGRS) - Continued**

Figure 10.

2. Insert shoulder strap latches (3) and waist belt latches (4) into buckle (5).

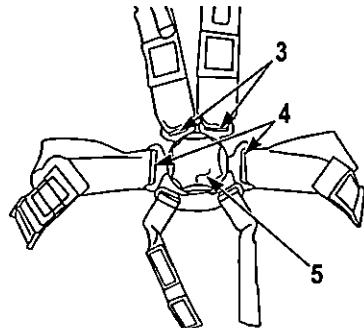


Figure 11.

**NOTE**

Rear shoulder strap adjustment is used to adjust height of waist strap.

3. Adjust rear shoulder straps (6) by pulling down on strap (7).

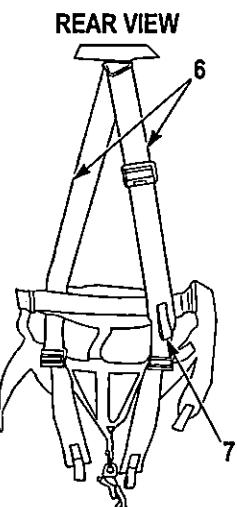
**Donning and Removing Gunner Restraint Harness (With TGRS) - Continued**

Figure 12.

**NOTE**

Both sides of waist belt and leg straps are adjusted the same way. Adjust both sides of waist belt evenly.

4. Adjust waist belt (8) by pulling straps (9) until waist belt (8) fits snug around waist.

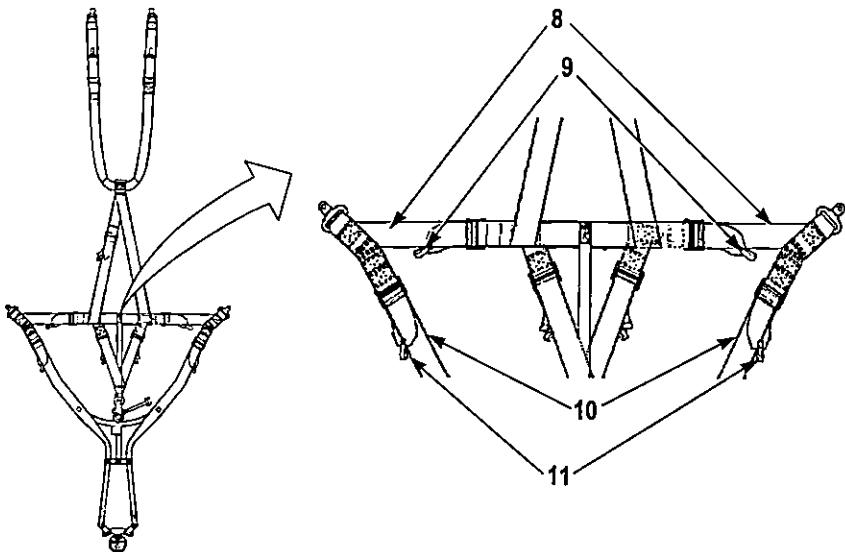


Figure 13.

5. Adjust leg straps (10) by pulling straps (11) until leg straps (10) fit snug around legs.
6. Adjust shoulder straps (2) by pulling on straps (12) until shoulder harness fits snug against chest.

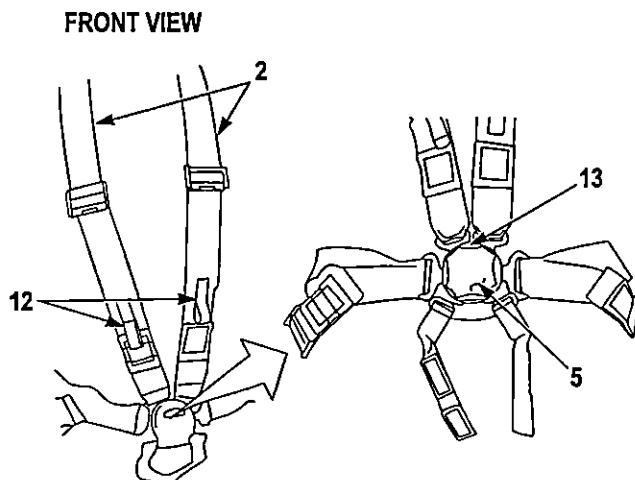
**Donning and Removing Gunner Restraint Harness (With TGRS) - Continued**

Figure 14.

7. To remove gunner restraint harness, push yellow button (13) and turn buckle (5) clockwise or counterclockwise.

**Operation of Gunner Restraint System (With TGRS)**

1. Attach vertical anchor strap (1) to buckle (2).

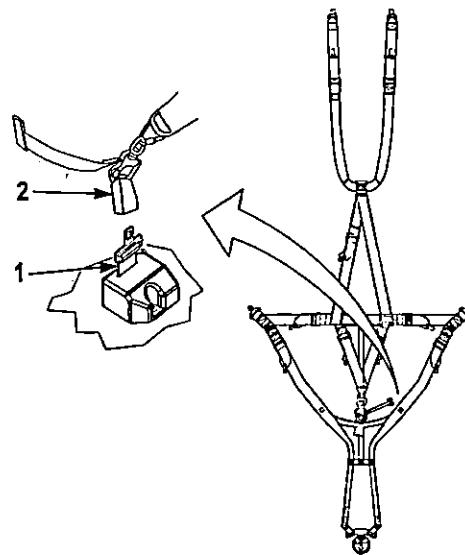


Figure 15.

**WARNING**

Any slack in the harness anchor straps will reduce the effectiveness of the restraint. Remove all slack from harness anchor straps. Failure to comply may result in serious injury or death to personnel.

**Operation of Gunner Restraint System (With TGRS) - Continued**

2. Adjust harness anchor straps (3) by pulling down on straps (4).

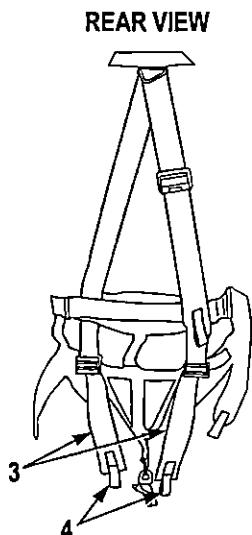
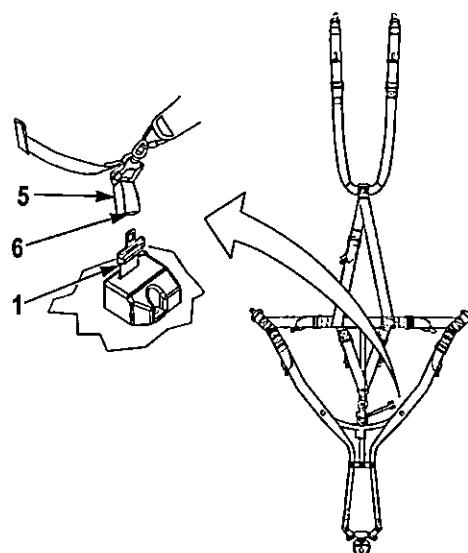


Figure 16.

**NOTE**

- There are two ways to release gunner restraint harness from vertical anchor strap.
- For operation under normal conditions, use the anchor strap buckle, perform step (3).
- For emergencies that require a quick exit of vehicle, use the emergency release, perform step (4).

3. To release buckle (5), press red button (6) and remove vertical anchor strap (1) from buckle (5).

**Operation of Gunner Restraint System (With TGRS) - Continued****Figure 17.****NOTE**

Use emergency release only in the event of an emergency that requires a quick exit of vehicle.

4. To release emergency release swivel (7), pull emergency release strap (8) and pull anchor strap (3) from buckle (5).

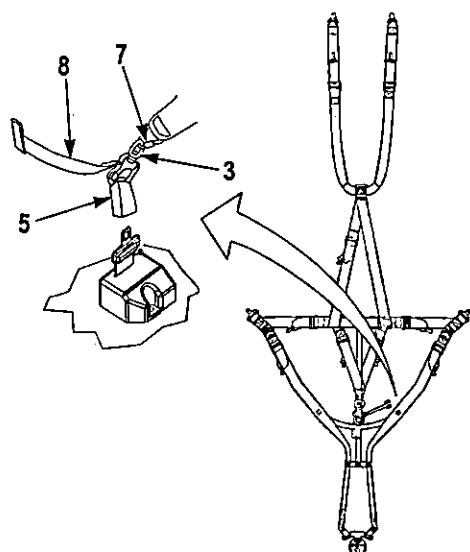
**Operation of Gunner Restraint System (With TGRS) - Continued**

Figure 18.

**END OF TASK****END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE DRIVER/PASSENGER SEAT

### INITIAL SETUP:

Not Applicable

### Adjustment

#### NOTE

Both seats are adjusted the same way.

1. Adjust seat (1) forward or backward, as required, using adjustment lever (2).

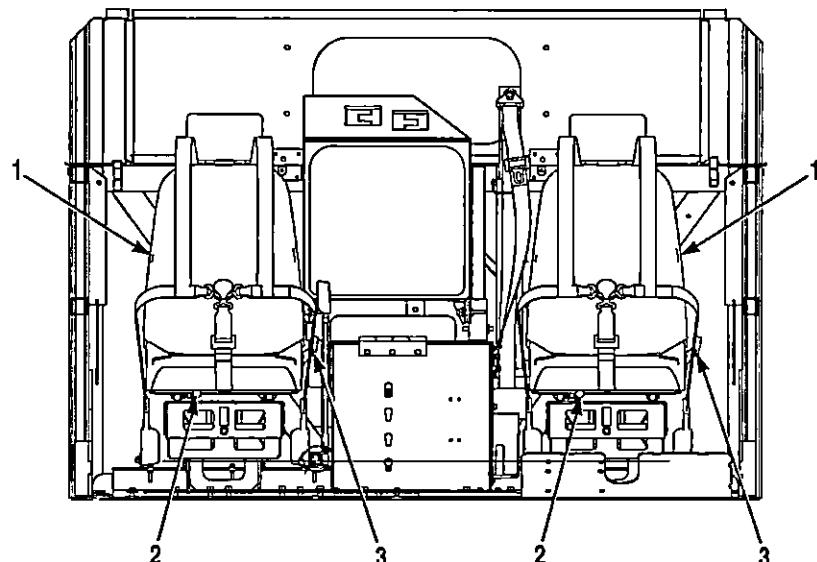


Figure 1.

2. Push lever (3) to adjust back support of seat (1).

END OF TASK

END OF WORK PACKAGE

**1ST ECHELON MAINTENANCE  
FIVE-POINT SEAT BELT****INITIAL SETUP:**

Not Applicable

**Operation****WARNING**

Always use seat belts when vehicle is in operation. Failure to comply may result in serious injury or death to personnel.

**NOTE**

- Seat belt/shoulder harness is two belts combined together. The belt below latch is the seat belt. The belt above latch is the shoulder harness.
- Belt on front center of seat prevents occupants from sliding forward.

1. Insert two latches (1 and 2) into buckle (3) on center belt (4) until a click is heard.

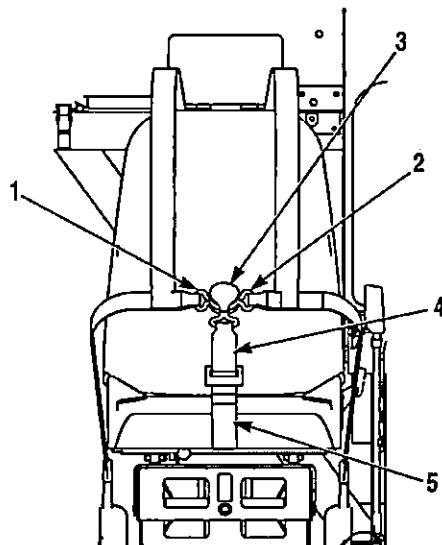


Figure 1.

2. Adjust center belt (4) by pulling strap (5).

**NOTE**

Adjust shoulder harness until snug against chest, no more than 1 in. (2.5 cm) away.

3. Pull seat belt/shoulder harness (6) until seat belt/shoulder harness (6) fits snug at driver's hips.

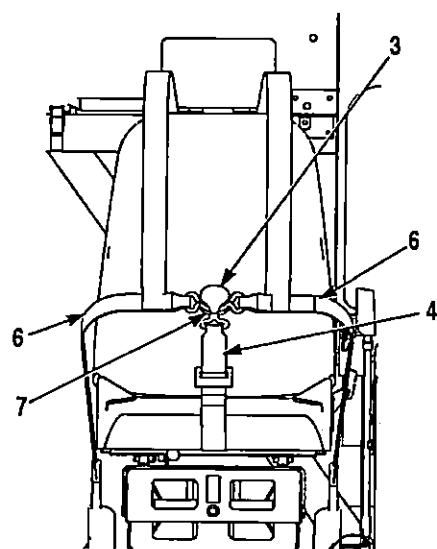
**Operation - Continued**

Figure 2.

4. To release seat belt/shoulder harness (6), rotate lever (7) on buckle (3) on center belt (4).

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
COMBAT LOCK**

---

**INITIAL SETUP:**

Not Applicable

---

**Unlock Combat Lock****NOTE**

Combat locks on driver side and passenger side doors are unlocked the same way.  
Passenger side combat lock shown.

1. Combat lock (1) is unlocked from the inside by pulling combat lock lever (2) down.

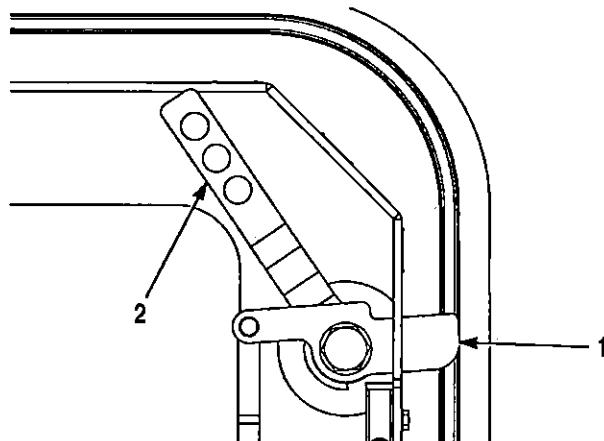


Figure 1.

2. Combat lock (1) is unlocked from the outside by inserting screwdriver or other device in hole of combat lock shaft (3) and turning clockwise.

- Continued

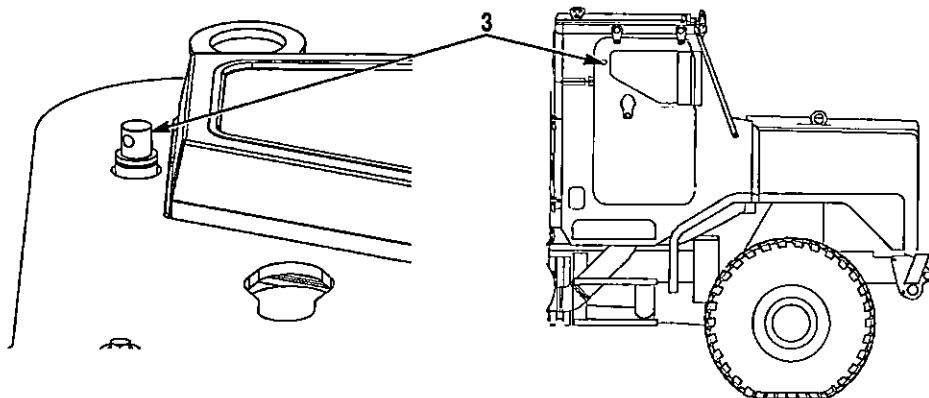


Figure 2.

### Lock Combat Lock

#### NOTE

Combat locks on driver side and passenger side doors are locked the same way.  
Passenger side combat lock shown.

1. Combat lock (1) is locked from the inside by pushing combat lock lever (2) up.

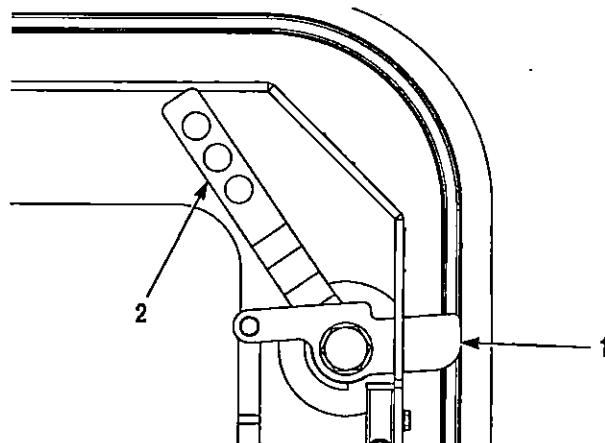


Figure 3.

2. Combat lock (1) is locked from the outside by inserting screwdriver or other device in hole of combat lock shaft (3) and turning counterclockwise.

- Continued

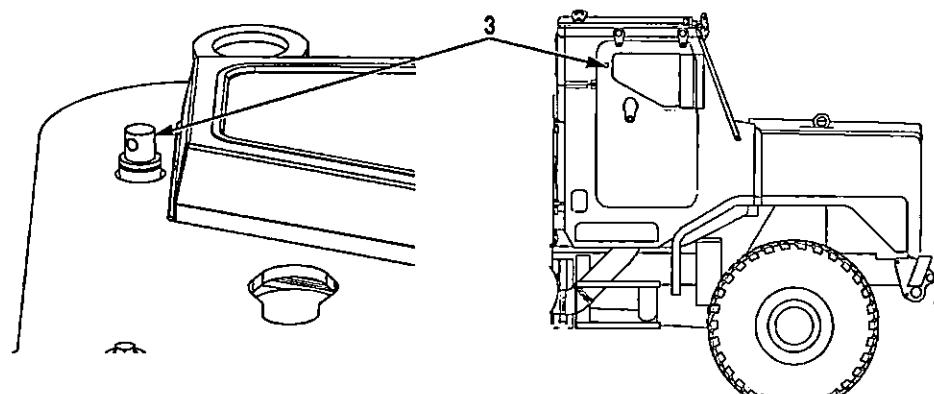


Figure 4.

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
WEAPONS PORTS****INITIAL SETUP:**

Not Applicable

**Opening Weapons Ports****NOTE**

Weapons ports are located on driver side door and passenger side door. Both weapons ports are opened the same way. Driver side weapons port shown.

Push handle (1) on weapons port (2) and rotate handle (1) clockwise or counterclockwise 180 degrees to open weapons port (2).

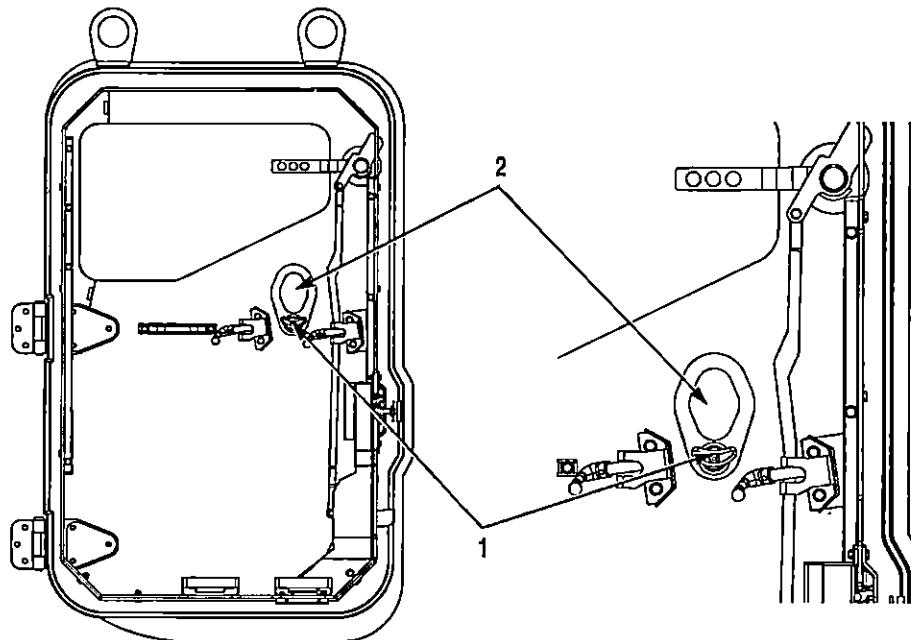
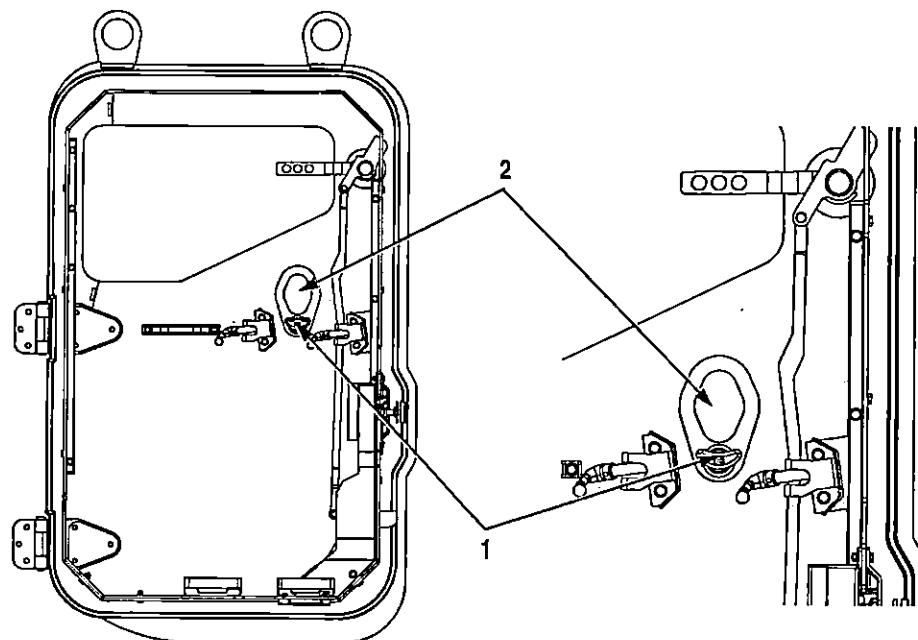


Figure 1.

**Closing Weapons Ports****NOTE**

Weapons ports are located on driver side door and passenger side door. Both weapons ports are closed the same way. Driver side weapons port shown.

Rotate handle (1) on weapons port (2) clockwise or counterclockwise 180 degrees and pull handle (1) to close weapons port (2).

**Closing Weapons Ports - Continued****Figure 2.****END OF TASK****END OF WORK PACKAGE**

## **CHAPTER 4**

### **OPERATOR INSTRUCTIONS OPERATION UNDER UNUSUAL CONDITIONS**

**1ST ECHELON MAINTENANCE**  
**OPERATE VEHICLE IN EXTREME HEAT**

**INITIAL SETUP:**

Not Applicable

**CAUTION**

- When operating vehicle in temperatures above 100°F (38°C), extra care must be taken to prevent overheating engine (temperature over 220°F [104°C]) and transmission. Observe water and transmission oil temperature gauges closely. Failure to comply may result in damage to equipment.
- Check oil levels often and keep operating strain as low as possible. Vehicle cooling and lubrication systems support each other. Failure to comply will rapidly cause failure of other systems.

**NOTE**

- Overheating of engine or transmission is occurring if:
- Engine coolant temperature exceeds 220°F (104°C) as indicated by water temperature gauge.
- Engine oil pressure drops below normal operating range.
- Transmission oil temperature exceeds 250°F (121°C) as indicated by transmission oil temperature gauge.
- Engine oil pressure has three monitoring systems, (low oil pressure light, check engine light, and oil pressure gauge). If two of the three systems indicate a problem, park vehicle, shut down engine, and notify Second Echelon Maintenance. If only one system indicates a problem, and the other two indicate normal, proceed with mission and then notify Second Echelon Maintenance.
- Engine coolant temperature has three monitoring systems (water temperature light, check engine light, and water temperature gauge). If two of the three systems indicate a problem, park vehicle and idle engine at 800 to 1000 rpm until water temperature cools down. If water temperature does not cool down, shut off engine and notify Second Echelon maintenance.

1. Keep operating temperatures as low as possible.

**NOTE**

Allow engine to idle for approximately three minutes prior to shutdown. Idling will cool the engine faster than a quick shutdown and may prevent damage from remaining engine heat.

2. Position transmission range selector (1) in neutral (N) while engine is running.

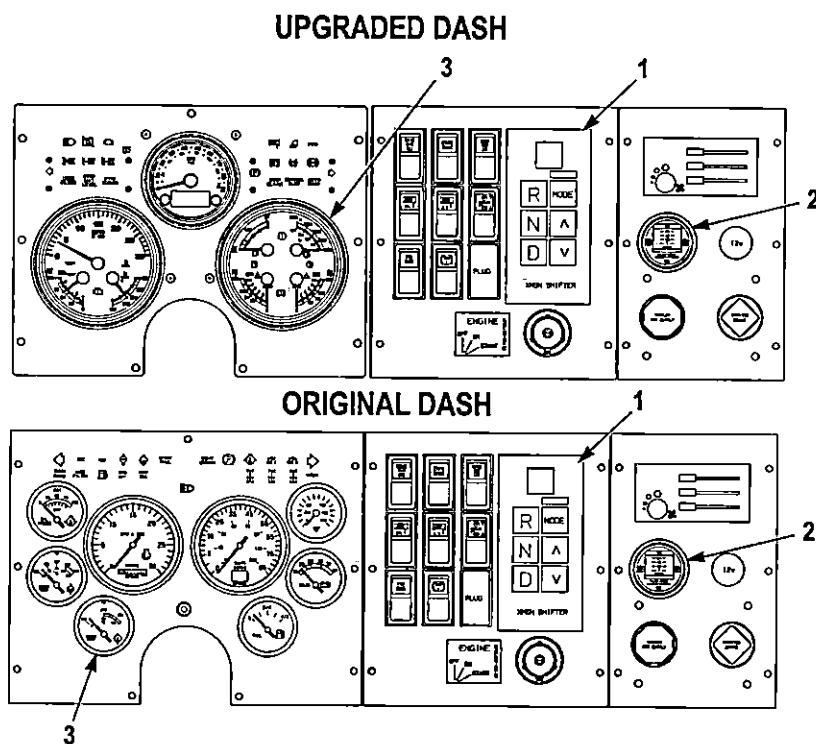


Figure 1.

3. Stop vehicle for cooling down periods. Idle engine as often as possible.
4. Check oil levels often. Oil seals are more likely to leak in extreme hot weather.
5. Check air filter restriction indicator (2) frequently. If indicator shows red, park vehicle, shut off engine, and notify Second Echelon Maintenance.
6. If transmission oil temperature gauge (3) reads in the yellow range, perform the following Steps:
  - a. Downshift to next lower gear range (refer to Operate Transmission (WP 0031)), slow vehicle, and continue operation.
  - b. When transmission oil temperature gauge (3) reads normal range, upshift to normal gear range (refer to Operate Transmission (WP 0031)) and continue operation.
  - c. If transmission oil temperature gauge (3) does not return to normal range, stop vehicle and allow transmission to cool by running engine at high idle (1500 rpm).
  - d. When transmission oil temperature gauge (3) reads normal range, shift to normal gear range (refer to Operate Transmission (WP 0031)) and continue operation.
7. If water temperature gauge (4) indicates coolant temperature is extremely close to overheating, perform the following Steps:

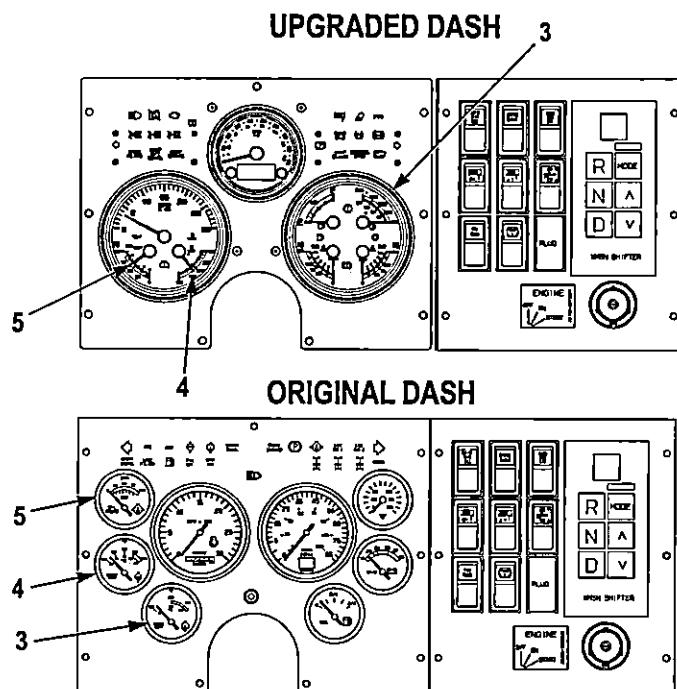


Figure 2.

8. If continued overheating occurs, shut off engine (WP 0035) and refer to Troubleshooting (WP 0090).
9. Observe water temperature gauge (4), transmission oil temperature gauge (3), and engine oil pressure gauge (5) for indications that engine is steadily cooling.

#### NOTE

Batteries do not hold charge well in extreme heat. Battery specific gravity must be adjusted in accordance with (TM 9-6140-200-14).

10. Check batteries daily and service as required.
11. In hot, damp climates, check body and chassis often, and notify Second Echelon Maintenance if any of the following conditions are found:
  - a. Signs of pitting or paint blistering on metal surfaces.
  - b. Signs of mildew, mold, fungus, or dry rot on fabrics and rubber.

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
OPERATE VEHICLE IN EXTREME DUST**

**INITIAL SETUP:**

Not Applicable

**CAUTION**

When operating in extreme dust environments, all fluids, lubricants, and filters should be inspected more frequently and changed as required. Failure to comply may result in damage to equipment.

1. Closely monitor air filter restriction indicator (1), gauges, and indicator lights on dash panel (2) to ensure they are operating properly.

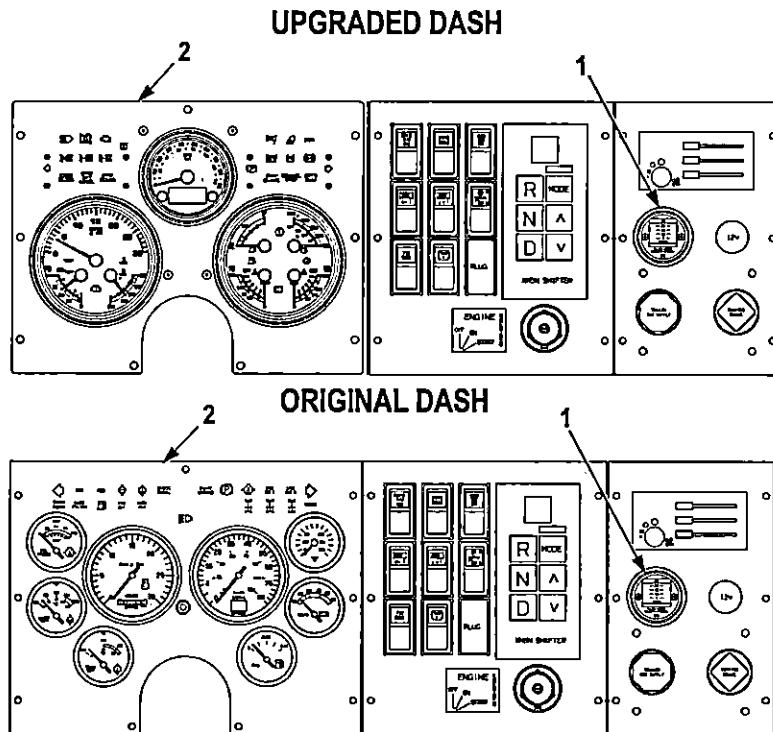


Figure 1.

2. Allow appropriate distance between vehicles, and operate at speeds relative to visibility.
3. At stops, check and drain fuel/water separator (3) as required.

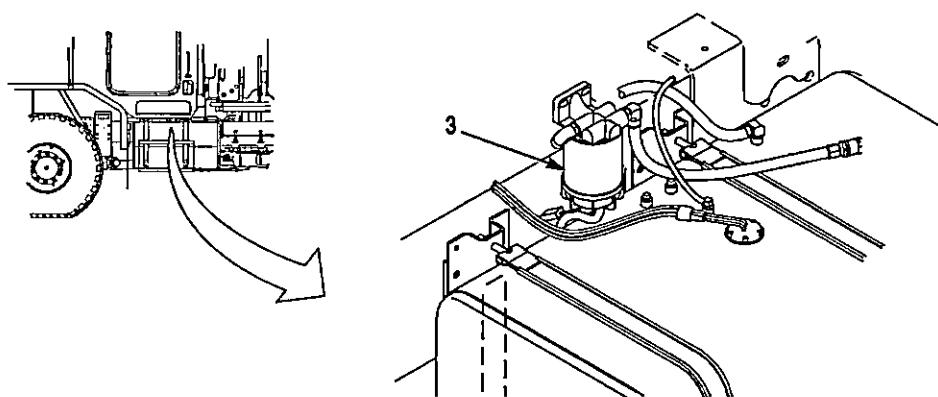


Figure 2.

4. When possible, park so vehicle does not face into wind.

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE**  
**OPERATE VEHICLE IN MUD, SAND, OR SNOW**

**INITIAL SETUP:**

Not Applicable

**CAUTION**

- Before backing vehicle in mud, sand, or snow, mud flaps must be pinned on stowage hook located on mud flap bracket. If mud flaps are not pinned, damage to mud flaps may result.
- Prior to operating off-road, ensure underride bar is adjusted to upper position to allow maximum road clearance. Failure to comply may result in damage to vehicle.

1. Check air filter restriction indicator (1) often.
2. Set CTIS controller (2) to MUD/SAND/SNOW position.

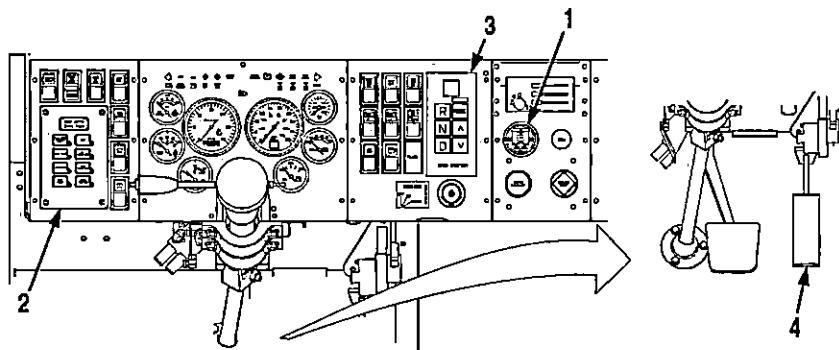


Figure 1.

3. Install tire chains as required (WP 0060, Installation of Tire Chains).

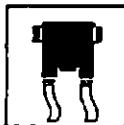
**NOTE**

For better traction, the operator should select gear 1 or 2 on transmission range selector, depending on CTIS load setting.

4. Set transmission range selector (3) to appropriate position.
5. Begin driving vehicle. Do not spin wheels when beginning to move vehicle.
6. Keep throttle control pedal (4) steady after vehicle reaches desired speed.
7. Turn vehicle slowly when on loose or slippery surfaces.
8. When traveling over hills, steer vehicle straight up and down hills whenever possible.
9. Drive at slower speeds and keep twice the normal distance from vehicle ahead.

10. Activate turn signals sooner, as required, to give early warning to following vehicles.

### **WARNING**



Use engine brake/retarder only when vehicle tires have good traction. Use of engine brake/retarder on slick or loose surfaces can cause vehicle to skid and cause injury or death to personnel.

11. Apply service brakes sooner by pressing service brake pedal (5) lightly to give early warning to following vehicles that vehicle will slow or stop thus, allowing for additional stopping distance.

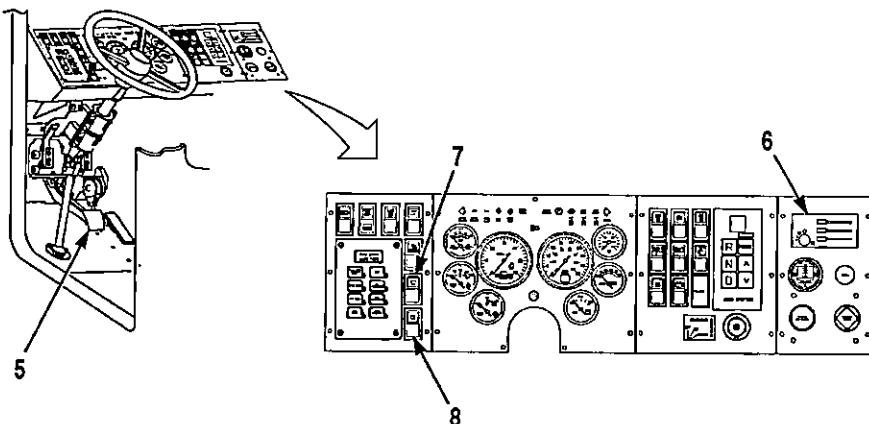


Figure 2.

12. Keep windshield, windows, mirrors, headlights, stoplights, and marker lights clean and free of mud, snow, and ice. Use defroster (6), windshield wiper (7), and washer (8) to keep windshield free of mud, snow, and ice.
13. After driving through slush or water, drive slowly and test service brakes. If brakes start slipping, perform the following:
  - a. Continue to drive slowly.
  - b. Apply moderate pressure on service brake pedal (5) to cause slight brake drag.
  - c. When service brakes are dry and no longer slip, let up on service brake pedal (5).
  - d. Resume appropriate driving speed.

### **NOTE**

Refer to FM 21-305 for additional information on driving in dangerous conditions.

14. If vehicle skids or vehicle starts to slide, perform the following:

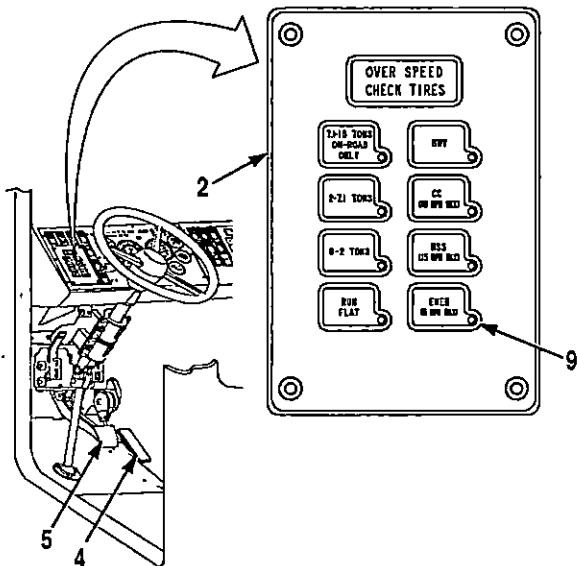


Figure 3.

15. If absolutely necessary for better traction, set CTIS controller (2) to EMERGENCY position by pushing EMER button (9). Drive at low speed (5 mph [8 km/h]) when tire pressure is reduced.

#### NOTE

Refer to FM 9-43-2/FMRP 4-34 for detailed information for vehicle recovery.

16. If vehicle becomes stuck, perform the following:

- a. When possible, shovel a clear path ahead of and behind each wheel. Position boards, brush, or similar material in cleared paths to obtain better traction.

#### CAUTION

Do not change CTIS controller or driveline lock settings while vehicle is turning or wheels are slipping. Damage to vehicle may occur.

- b. Set CTIS controller (2) to EMERGENCY position.

#### NOTE

When driveline lock is set to full lock position, all driveline lock icons will be lit.

- c. Adjust driveline lock (WP 0043, Driveline Lock) to full lock position.

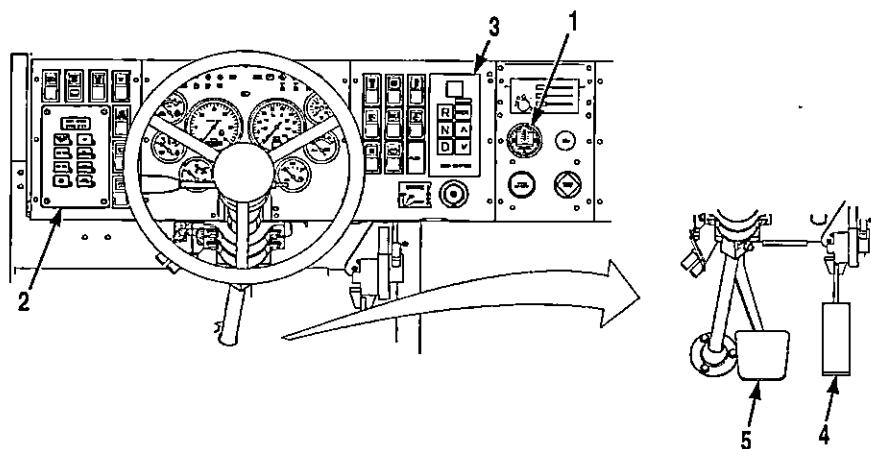


Figure 4.

- d. Set transmission range selector (3) to reverse (R).
- e. Press throttle control pedal (4) and attempt to move vehicle straight back approximately 20 ft. (6.1 m).
- f. Apply service brake pedal (5) to stop vehicle.
- g. Set transmission range selector (3) to lowest forward gear available, depending on CTIS load setting.
- h. Release service brake pedal (5) and press throttle control pedal (4) to attempt to move vehicle forward.
- i. Repeat Steps (d) through (h) until vehicle is no longer stuck.

17. If vehicle cannot be freed, use another vehicle to winch or tow stuck vehicle.

18. If vehicle cannot be freed and another vehicle is not available, use SRW (WP 0044) (if equipped) to free vehicle.

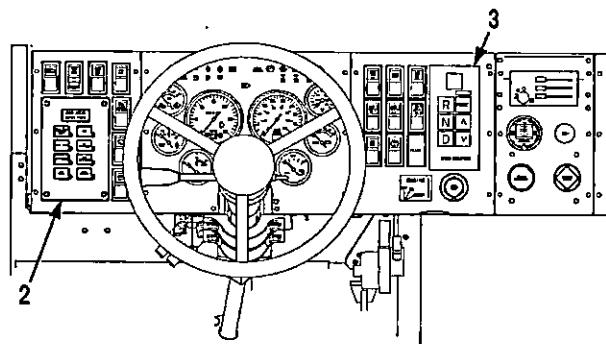


Figure 5.

19. Once vehicle is freed, set transmission range selector (3) and CTIS controller (2) to appropriate settings and continue with mission.

## 20. Park vehicle as follows:

- a. Park vehicle (WP 0034) so vehicle does not face into wind, if possible.
- b. Shut off engine (WP 0035) and clean mud off vehicle as soon as possible.

**CAUTION**

Do not direct high-pressure water stream at seals, air intake, exhaust outlet, or any other component of vehicle that could be easily damaged by high pressure water stream. Failure to comply may result in damage to equipment.

- c. Clean mud from wheels, brakes, axles, universal joints, steering mechanism, hoses, and radiator as soon as possible.

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
OPERATE VEHICLE IN DESERT ENVIRONMENT**

---

**INITIAL SETUP:**

Not Applicable

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**CAUTION**

Temperatures may change as much as 70°F (21°C) between day and night. Due to expansion and contraction of all fluids, care should be taken when filling fuel tank and fluid reservoirs to prevent overflow when temperatures change, (e.g. filling tank full of cold fuel may cause fuel tank to overflow when fuel expands as fuel heats up).

**NOTE**

MCWP 3-35.6/FM 90-3, Desert Operations, contains detailed instructions for living and working in desert environments.

1. Principles for operating in extreme heat (WP 0071), extreme dust (WP 0072), and mud, sand, or snow (WP 0073) apply to desert conditions.
2. Precision instruments can be affected by temperature changes and may need adjustment more often.

**END OF TASK**

**END OF WORK PACKAGE**

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**1ST ECHELON MAINTENANCE  
SPECIAL INSTRUCTIONS**

---

**INITIAL SETUP:**

Not Applicable

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1. General. Special instructions for operating and maintaining the vehicle under unusual conditions are included in this section. Unusual conditions are extreme high and low temperatures, humidity, and/or terrain. Special care in cleaning and lubrication must be taken to keep vehicles operational when operating under unusual conditions.
2. Lubrication.
  - a. Refer to the Lubrication Instruction (WP 0111) for proper lubricating instructions.
  - b. Service intervals in the Lubrication Instruction (WP 0111) are for normal operating conditions. Intervals should be adjusted to more frequent servicing when operating under unusual conditions.
3. Driving Instructions.
  - a. FM 21-305 contains special driving instructions for operating wheeled vehicles.
  - b. FM 9-207 contains instructions on vehicle operation in extreme cold of 0° to -50°F (-18° to -46°C) or below. Other documents with information on cold weather vehicle operation are:
    - (1) MCWP 3-35.1/FM 90-11 Cold Weather Operations.
    - (2) FM 31-71 Northern Operations.
    - (3) MCWP 3-35.2/FM 90-6 (HTF) Mountain Operations.
4. Reporting Material Failure. Report failure of vehicle, body equipment, or kits on SF368 (Product Quality Deficiency Report) as prescribed by TM 4700-15/1.

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE**  
**OPERATE VEHICLE IN COLD ENVIRONMENT 32°F TO -25°F (0°C TO -32°C)**

**INITIAL SETUP:**

Not Applicable

**NOTE**

The 7-Ton Truck is capable of starting at temperatures down to 10°F (-12°C) with two batteries. If temperatures are expected to be consistently at or below 10°F (-12°C), it is recommended that two additional batteries be installed. Each vehicle's starting capacity may vary depending on vehicle age and condition. When ambient temperature is expected to be below 32°F (0°C), two additional batteries may be installed. Battery cables and mounting hardware are provided in the 7-Ton Truck Bill.

1. Turn battery disconnect switch (1) to ON position.

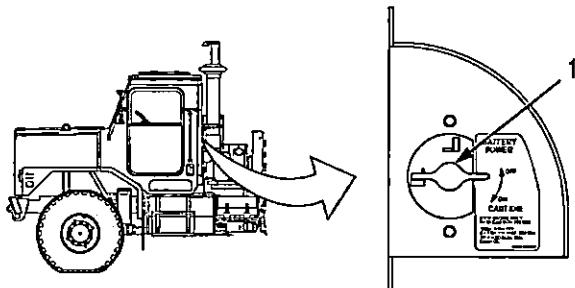


Figure 1.

2. Ensure PARKING BRAKE (2) is engaged.

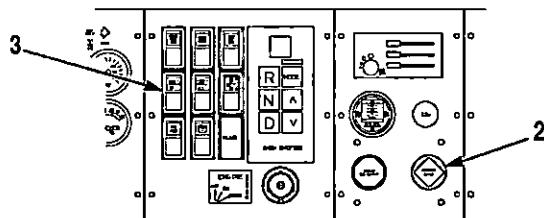


Figure 2.

3. Adjust operator's seat (WP 0028).
4. Adjust left and right side mirrors (WP 0028).
5. Adjust and fasten driver's seat belt (WP 0028).
6. Ensure vehicle front and side windows are clean. If not, clean windows prior to attempting to start vehicle.

7. For MK25 and MK28 vehicles only, ensure winch ON/OFF switch (3) is in OFF position.
8. Turn off all accessories prior to starting engine.

#### NOTE

Ignition switch must be turned to ON position for a minimum of 20 seconds before starting engine. This allows ether start system to cycle and provide ether to engine air intake manifold.

9. Turn ignition switch (4) to ON position for a minimum of 20 seconds.

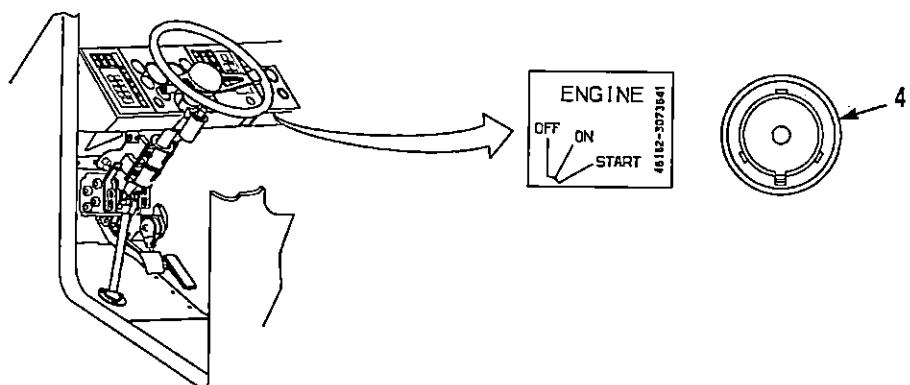


Figure 3.

#### WARNING



Ensure all personnel are clear of vehicle before engine start is attempted. Operator must visually check to see that all areas of vehicle are clear of personnel prior to attempting to start engine. Failure to comply may result in serious injury or death to personnel.

**CAUTION**

- If engine fails to start in two minutes, turn ignition switch to OFF position. Allow starter to cool at least two minutes before trying again. Failure to comply may result in damage to starter.
- If engine fails to start after five start attempts, refer to Troubleshooting. Failure to comply may result in damage to equipment.
- Do not turn ignition switch to START position while engine is rotating, damage to equipment may result.
- Observe instrument panel closely. If there are any unusual readings, stop vehicle and shut off engine. Check immediately to prevent damage to equipment.
- All snow and ice should be removed from vehicle as soon as possible. Snow and ice may slow or stop movement of crucial parts if allowed to pile up. Failure to comply may result in damage to equipment.
- Fuel/water separator should be drained of water before topping off fuel tank. Keep fuel tank as full as possible during cold operations. Water forms in empty fuel tank as it cools. Water in fuel system could freeze and block fuel system. Failure to comply may result in damage to equipment.

**NOTE**

- Before operating vehicle in cold environment, make sure vehicle has been prepared as described in FM 9-207. Refer to FM 31-70, FM 31-71, and FM 21-305 for additional information on operation in cold environment.
- If engine fails to start, ignition switch must be turned to OFF position, prior to next start attempt. This will disengage engine restart interlock which prevents starter engagement from ON position.
- Ether is automatically injected into engine whenever ignition is turned to start position and temperature is below +32°F (0°C).
- In severe cold, engine coolant and windshield washer fluid can freeze, batteries can freeze and crack, oil and grease may get thick and stiff, and rubber may crack or break easily.

10. Turn ignition switch (4) to START position for not more than two minutes or until engine starts. Release switch as soon as engine starts.

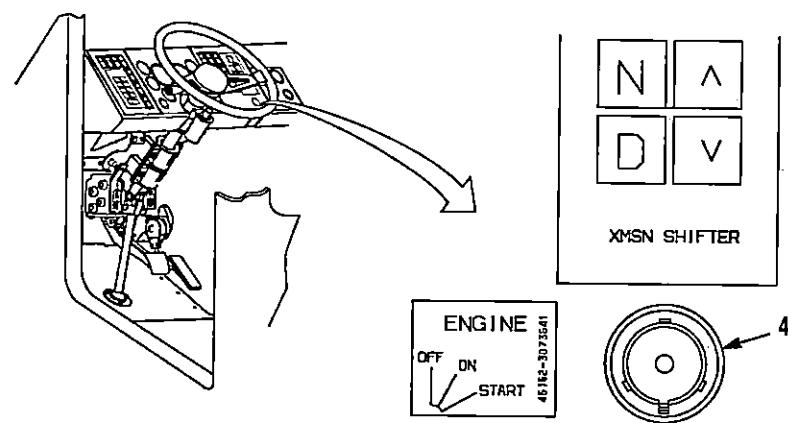


Figure 4.

11. Check that OIL PRESS gauge (5) reads in safe range during idle and increases as engine speed increases.

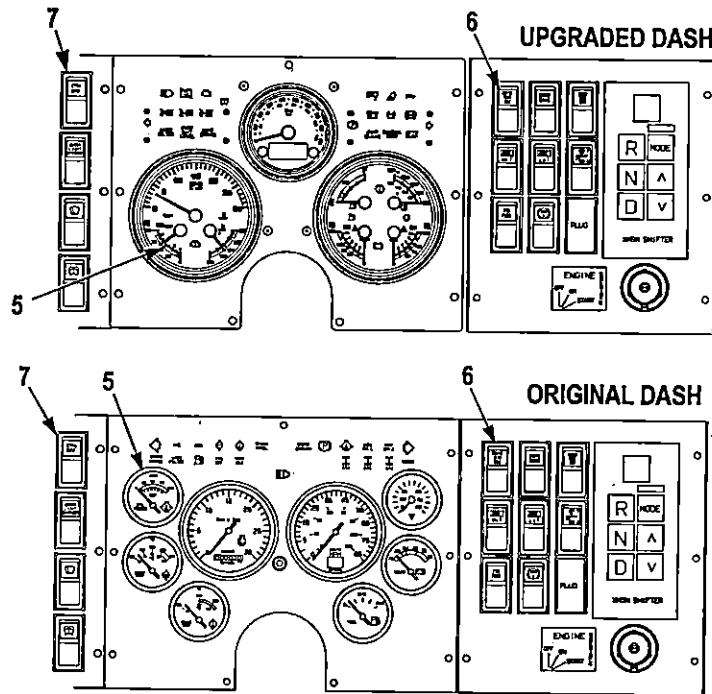


Figure 5.

12. Run engine until engine idles smoothly, then increase engine speed to 1200 to 1500 rpm or engage high idle switch (6) for another 25 minutes.

**NOTE**

- When operating in temperatures below 0°F (-18°C), the CTIS OFF switch must be positioned in the ON position during the first five miles of operation. This allows the tires to warm up and ensures a tight seal between the tire and wheel.
- When the CTIS OFF switch is ON, the CTIS controller will display a FIVE LIGHTS FLASHING fault code (refer to (WP 0043)) four minutes after turning the CTIS OFF switch ON.
- When operating in cold environments, operate heater and defroster controls as needed (refer to Instrument Panel Controls and Indicators (WP 0011)).

13. When operating in temperatures below 0°F (-18°C), position the CTIS OFF switch (7) in the UP or ON position.

**CAUTION**

- During first five miles of driving operation, all cornering should be performed slowly and carefully. Failure to comply may result in damage to driveline components.
- Do not use first gear to move vehicle if tires are frozen to ground or brakes are frozen to drums. Failure to comply may result in damage to driveline.

**NOTE**

- If transmission fluid temperature is below 19°F (-7°C), the following will occur:
  - Transmission will operate in neutral (N), reverse (R), and third (3) gear only.
  - Above 19°F (-7°C) transmission will operate in all ranges.

14. Set transmission range selector (8) to third gear, release parking brake (2), and slowly drive vehicle three to five miles to warm up driveline components and tires.

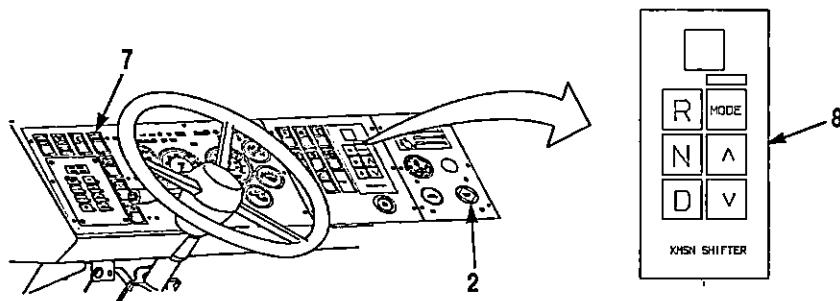


Figure 6.

15. Position the CTIS OFF switch (7) in the DOWN or OFF position.

16. When operating in Mud/Sand/Snow conditions, refer to (WP 0073).

17. When operating in Slippery Conditions, refer to (WP 0038).

18. Park vehicle as follows:
 

- Park vehicle (WP 0034) in sheltered area out of wind if possible. If no shelter is available, park so vehicle does not face wind.

- b. Park vehicle on high, dry ground if possible. If high, dry ground is not available, spread out planks or brush to make raised and dry area so tires will not freeze in snow, water, ice, or mud.
- c. Park vehicle on level ground so body does not twist.

19. Shut off engine as follows:

### CAUTION

Engine must run for at least 10 minutes with minimum coolant temperature of 160°F (71°C) prior to shutting engine OFF. Failure to comply may result in damage to engine.

- a. Set transmission range selector (8) to neutral (N).

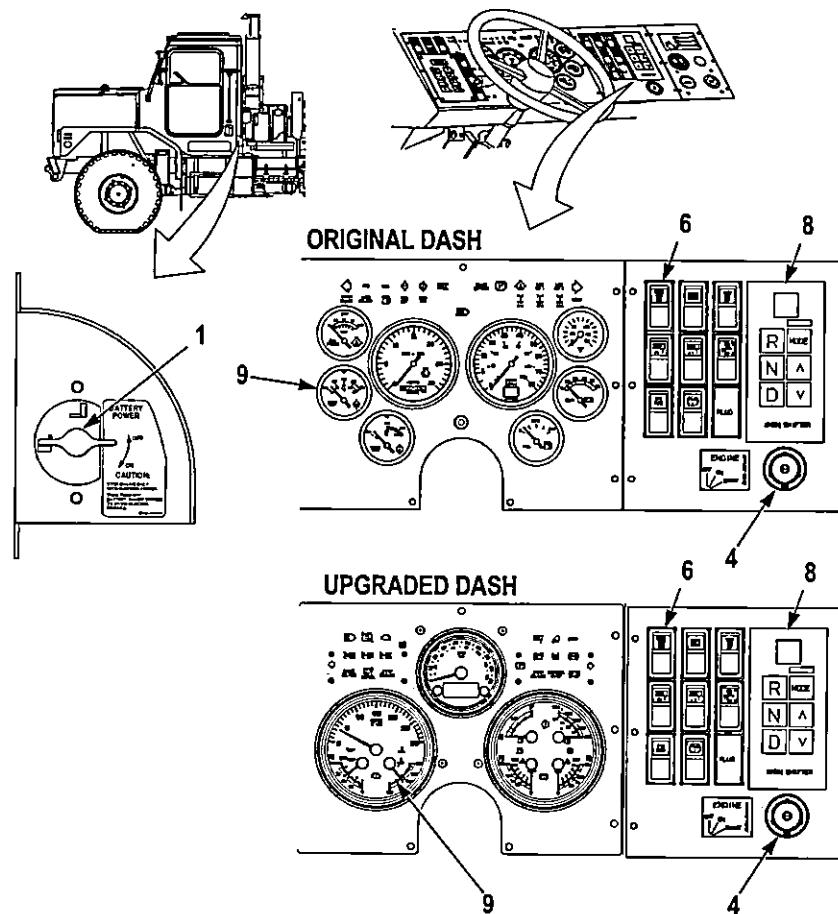


Figure 7.

- b. Idle engine at 1200 to 1500 rpm or engage high idle switch (6) until coolant temperature reaches 160°F (71°C). Depending on environmental conditions, it may take as long as 45 minutes for coolant temperature to reach 160°F (71°C).

### NOTE

Depending on environmental conditions, it may take as long as 45 minutes for coolant temperature to reach 160°F (71°C).

- c. Once coolant temperature gauge (9) reads above 160°F (71°C), continue to idle engine between 1200 and 1500 rpm for minimum of 10 minutes.
- d. Turn ignition switch (4) to OFF position.
- e. Turn battery disconnect switch (1) to OFF position.

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE**  
**OPERATE VEHICLE IN EXTREME COLD ENVIRONMENT -26°F TO -50°F (-32°C TO -46°C)**

**INITIAL SETUP:**

Not Applicable

**WARNING**

Do not touch extremely cold metal (below -26°F [-32°C]). Bare skin may freeze on cold metal. Failure to comply may result in serious injury to personnel.

**CAUTION**

Operator must always be alert to changes in weather. Operator must take care of assigned vehicle in order to prevent damage to vehicle due to sudden changes in weather. Operator should be cautious when starting or driving a vehicle that has not been operated for a long period of time. Lubricants may thicken and cause parts failure. Tires may freeze to ground or may freeze flat on bottom if underinflated. Operator should be alert to such possibilities to prevent severe damage to vehicle.

**NOTE**

- Principles for operating in cold environment apply to operating in extreme cold environment, with the addition of arctic engine heater kit.
- Before operating vehicle in extreme cold environment, ensure engine arctic kit is installed and vehicle has been properly prepared as described in FM 9-207 and Operate Vehicle in Cold Environment (WP 0076).
- Special care must be used during operations in extreme cold environments. In extreme cold, engine coolant and windshield washer fluid can freeze. Batteries can freeze and crack. Oil and grease may get thick and stiff. Rubber may crack and break easily.

1. Operate engine arctic heater (WP 0059).

**NOTE**

Do not attempt to start engine until arctic heater has operated for 60 minutes.

2. Perform starting procedures as described in, Operate Vehicle in Cold Environment (WP 0076) 32°F to -25°F(0°C to -32°C).

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
FORD WATER OBSTACLE**

---

**INITIAL SETUP:**

Not Applicable

---

**WARNING**

Do not ford water unless depth is known. Water deeper than 60 in. (152 cm) (including wave height) may cause personal injury or damage to equipment.

**CAUTION**

- Prior to fording water obstacle, arctic heater kit (when equipped), must be removed and connection ports on vehicle plugged. Failure to comply may result in damage to equipment.
- Prior to fording a water obstacle, ensure engine and transmission dipsticks, and fill caps are properly installed (WP 0107). Failure to comply may result in damage to equipment.

1. Ensure depth of fording site is not more than 60 in. (152 cm).
2. Ensure bottom of fording site is firm enough that 60 in. (152 cm) maximum fording depth will not be exceeded and vehicle will not become mired.
3. Stop vehicle at edge of water.

**CAUTION**

FAN FORD switch must be activated prior to entering water. Failure to comply may result in damage to equipment.

**NOTE**

Fan off indicator will illuminate when fan ford switch is activated.

4. Activate FAN FORD switch (1) to turn fan OFF.

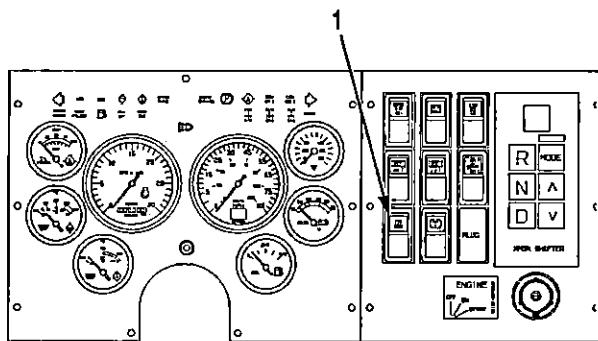


Figure 1.

5. If brakes have been heavily used or are hot, allow drums and shoes to cool before entering water if possible.

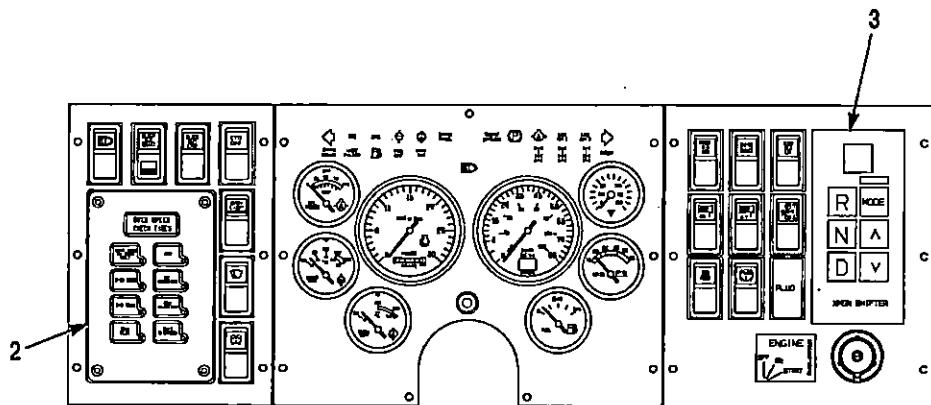


Figure 2.

6. Set CTIS controller (2) to appropriate position (refer to Recommended Modes Of Operation Table (WP 0002, Table 29)).

### CAUTION

Do not enter water until tires are adjusted to appropriate CTIS setting. Failure to comply may result in damage to equipment.

7. Set transmission range selector (3) to first gear.

**CAUTION**

If engine stops, immediately attempt to restart engine. If engine will not start, tow or winch vehicle from water with another vehicle as soon as possible. Failure to comply may result in damage to equipment.

8. Drive vehicle slowly through water.

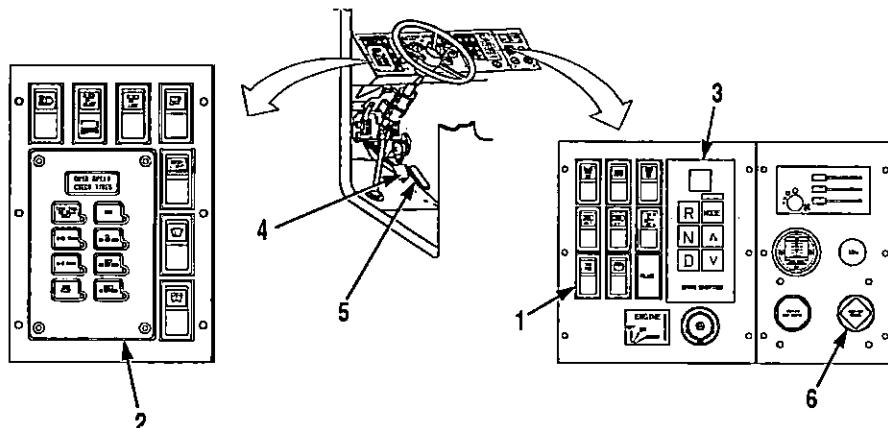


Figure 3.

9. Unless absolutely necessary, do not stop in water.
10. If vehicle accidentally enters water deeper than 60 in. (152 cm), perform the following:
  - a. Press service brake pedal (4) and hold to stop vehicle.
  - b. Set transmission range selector (3) to reverse (R).
  - c. Let up on service brake pedal (4).
  - d. Press down on throttle pedal (5) and slowly back vehicle out of water.

**CAUTION**

FAN FORD switch must be turned OFF immediately after leaving water. Failure to comply may result in damage to vehicle.

11. After leaving water, turn FAN FORD switch (1) to OFF position.

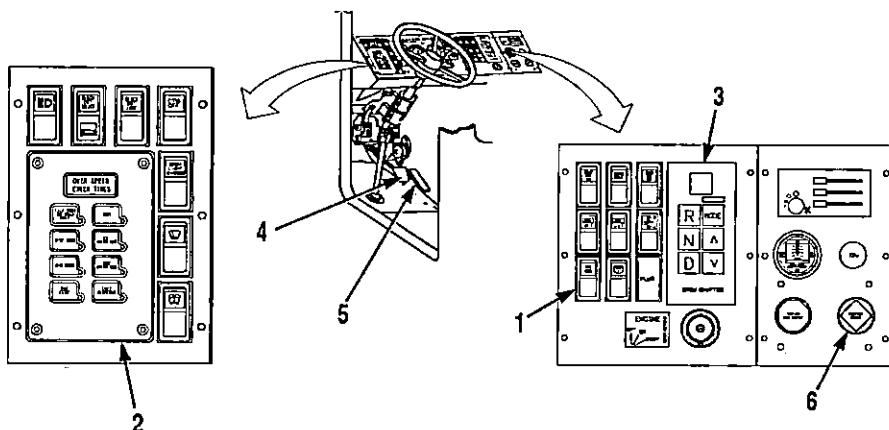


Figure 4.

12. Press service brake pedal (4) lightly and hold while driving slowly to dry out brake linings.
13. When clear of fording area, stop vehicle.
14. Apply and release parking brake (6) several times to remove water from brake components.
15. Set CTIS controller (2) and transmission range selector (3) to appropriate settings and continue with mission.
16. Remove water and clean deposits from all areas of vehicle as soon as possible.

#### NOTE

Drain holes and plugs are located on floor of cab under crew seat and between driver and crew seat.

17. If water has collected in cab, remove two drain plugs (7) from drain holes (8) and allow water to drain. Install two drain plugs (7) in drain holes (8).

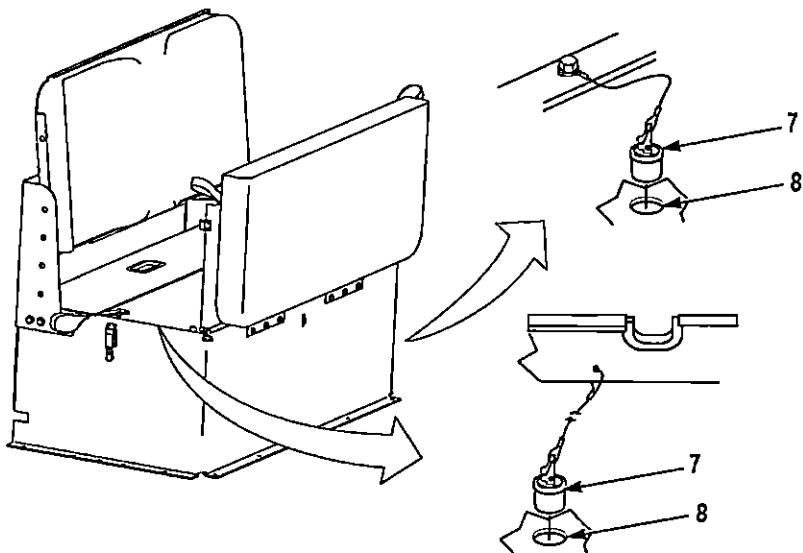


Figure 5.

18. If vehicle came into contact with salt water, wash with fresh water as soon as possible to minimize corrosion.

**CAUTION**

Vehicle must be serviced by Second Echelon Maintenance as soon as possible in accordance with Lubrication Instruction. Failure to comply may result in damage to equipment.

19. Vehicle must be serviced by Second Echelon Maintenance as soon as possible in accordance with Lubrication Instruction (WP 0111).

**NOTE**

- If back-up alarm does not operate after fording, report failure to Second Echelon Maintenance for removal, draining of water, or replacement of back-up alarm.
- If the water level was high enough to submerge stowed dropsides, perform step (20) to minimize corrosion.

20. Unstow troop seats, dropsides, and backrests (refer to (WP 0051, Unstow Troop Seats and Backrests) and (WP 0050, Unstow Dropside)), rinse with fresh water, allow to air dry, and stow back in original position (refer to (WP 0051, Stow Troop Seats and Backrests) and (WP 0050, Stow Dropside)).

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE**  
**OPERATE AUXILIARY EQUIPMENT IN COLD OR EXTREME COLD WEATHER**

**INITIAL SETUP:**

Not Applicable

**WARNING**

- Cold oil may prevent the control manifold valves from returning to the neutral position under its own power. Cold oil may also allow hydraulic components to slowly continue to operate even after the control is returned to the neutral or reversed position. This condition is called OVER RUNNING. When operating the hydraulic systems in cold or extreme cold weather, stand by the control manifold valves so that the levers can be manually returned to the neutral position, or operated in the opposite direction, if OVER RUNNING occurs. Failure to comply may result in injury or death to personnel.
- Do not use remote controls until warm-up procedure is complete and vehicle hydraulic systems operate normally. Failure to comply may result in injury or death to personnel.

**CAUTION**

- Warm-up procedures must be followed to flush cold oil from the MTVR auxiliary hydraulic equipment systems prior to use. To prevent over running hydraulic functions, perform the following steps until the cold oil has been flushed from the system and the vehicle system operates normally. Failure to comply may result in damage to equipment.
- Do not use remote controls until warm-up procedure is complete and vehicle systems are operating normally. Failure to comply may result in damage to equipment.

**NOTE**

- After 25 minutes at high idle, the main hydraulic reservoir temperature should be approximately 70°F (21°C).
- Do not bring hydraulic functions immediately to full stroke.
- Operate all functions at low speed until cold oil has been flushed from the hydraulic systems.

**Operate Self Recovery Winch**

1. Operate self recovery winch (SRW) controls from manual control valve bank. (WP 0044)

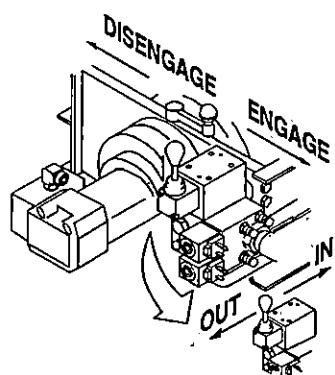
**Operate Self Recovery Winch - Continued**

Figure 1. SRW Controls

2. Pay out winch cable 30 ft (9 m) and wind cable back onto drum.
3. Repeat step (2) until SRW winch operates normally.

**END OF TASK**

**END OF WORK PACKAGE**

## **CHAPTER 5**

### **OPERATOR INSTRUCTIONS OPERATION UNDER EMERGENCY CONDITIONS**

**1ST ECHELON MAINTENANCE  
SLAVE START VEHICLE****INITIAL SETUP:**

Not Applicable

**CAUTION**

After slave starting vehicle, allow vehicle to idle at least 3 to 5 minutes. Operating vehicle before batteries are partially charged may result in alternator overcharging batteries. Failure to comply may result in damage to batteries.

**NOTE**

This procedure requires an operator and an assistant.

1. Start engine of slaving vehicle.

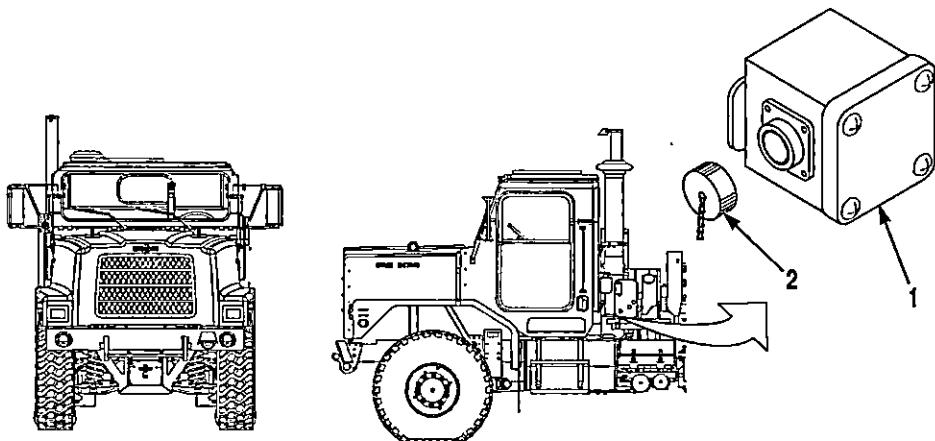


Figure 1.

2. Position slaving vehicle beside disabled vehicle until slave receptacles (1) on both vehicles can be connected by slave cable.
3. Park slaving vehicle (WP 0034).
4. Shut off engine of slaving vehicle (WP 0035).
5. Ensure all electrical switches on both vehicles are OFF.
6. Remove caps (2) from slave receptacles (1) on slaving vehicle and disabled vehicle.

**WARNING**

Ensure battery disconnect switches in both vehicles are OFF prior to connecting NATO slave cables. Ensure vehicles are not touching one another. Failure to comply may result in electrical shock.

**CAUTION**

- Ensure connectors and receptacles are free of dirt, sand, and debris. Failure to comply could result in damage to equipment.
- Always connect NATO slave cable to disabled vehicle prior to connecting to slaving vehicle. Damage to batteries or cable may result from improperly connecting NATO slave cable.

7. Plug NATO slave cable connector (3) into slave receptacles on disabled vehicle first and then slaving vehicle.

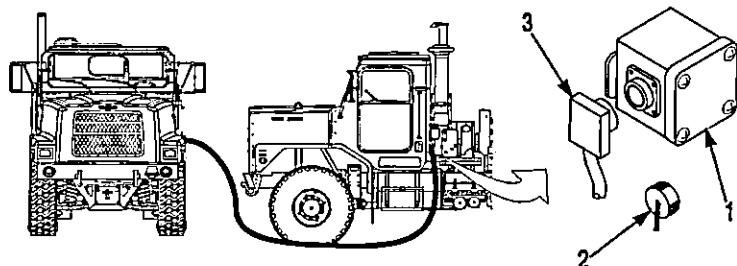


Figure 2.

8. Start engine of slaving vehicle (WP 0029).

**NOTE**

Operator must operate slaving vehicle at more than 1000 rpm while assistant starts engine of disabled vehicle.

9. While operator remains in slaving vehicle, assistant attempts to start disabled vehicle.
10. As soon as engine of disabled vehicle is started and running smoothly, remove NATO slave cable connectors (3) from slave receptacles on both vehicles.
11. Install caps (2) on slave receptacles (1) of both vehicles.

**END OF TASK**

**END OF WORK PACKAGE**

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## 1ST ECHELON MAINTENANCE LOSS OF AIR SYSTEM PRESSURE

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**INITIAL SETUP:**

Not Applicable

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### **WARNING**



Operating vehicle with air pressure system loss is extremely dangerous. Vehicle has reduced braking capability. Operating vehicle with loss of air pressure may cause serious injury or death to personnel.

### **WARNING**

If air pressure gauge(s) reads approximately 45 psi (310 kPa) or less, spring brakes will be applied automatically, causing vehicle to stop rapidly, resulting in serious injury or death to personnel.

### **WARNING**

Maximum braking requires 100 psi (690 kPa) or more air pressure for service brakes, as indicated by air pressure gauge. If air pressure drops below 100 psi (690 kPa), braking ability will be reduced. If air pressure continues to drop, air system is malfunctioning. Operating vehicle with reduced air pressure may result in serious injury or death to personnel.

1. If low air light 1 (1) or low air light 2 (2) illuminates and warning buzzer sounds while driving vehicle, check air pressure gauge (3).

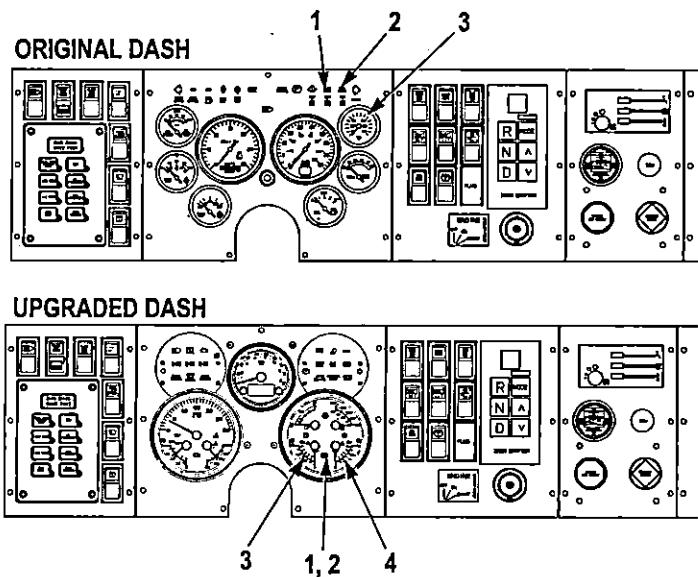


Figure 1.

2. If green needle of air pressure gauge (3) is at 70 psi (483 kPa) or less, there is loss of air for front brakes to operate normally (ORIGINAL DASH).

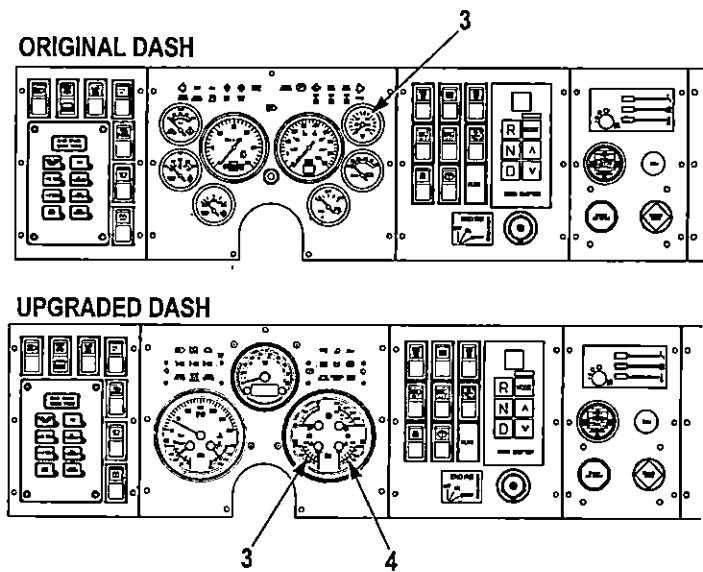


Figure 2.

3. If needle of front air pressure gauge (3) is at 70 psi (483 kPa) or less, there is a loss of air for front brakes to operate normally (UPGRADED DASH). In this situation, perform the following steps:

- Leave additional distance between vehicles and decrease speed.
- Apply brake pedal (5) earlier than usual when slowing vehicle.

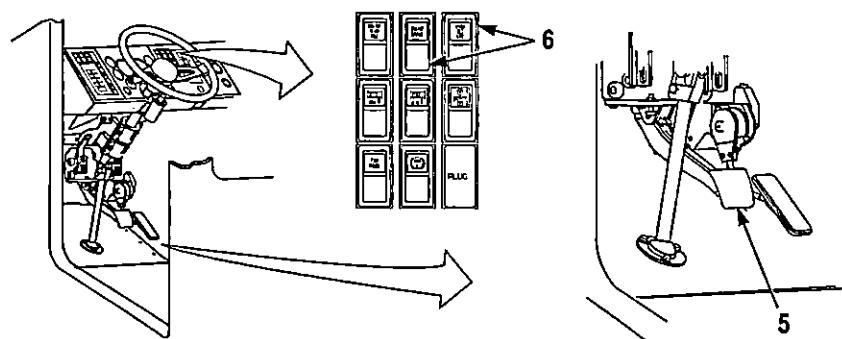
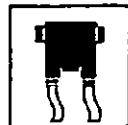


Figure 3.

**WARNING**

Use engine brake/retarder only when vehicle tires have good traction. Use of engine brake/retarder on slick or loose surfaces can cause vehicle to skid and cause injury or death to personnel.

- c. Downshift and use engine brake/retarder (WP 0032) switches (6) on HIGH setting as required when slowing vehicle.
- d. Refer to Troubleshooting (WP 0090) as soon as possible.

**WARNING**

Operating vehicle with air pressure system loss is extremely dangerous. Vehicle has reduced braking capability. Operating vehicle with loss of air pressure may cause serious injury or death to personnel.

**WARNING**

If air pressure gauge(s) reads approximately 45 psi (310 kPa) or less, spring brakes will be applied automatically, causing vehicle to stop rapidly, resulting in serious injury or death to personnel.

**WARNING**

Maximum braking requires 100 psi (690 kPa) or more air pressure for service brakes, as indicated by air pressure gauge. If air pressure drops below 100 psi (690 kPa), braking ability will be reduced. If air pressure continues to drop, air system is malfunctioning. Operating vehicle with reduced air pressure may result in serious injury or death to personnel.

- 4. If red needle on air pressure gauge (3 ORIGINAL DASH) is at 70 psi (483 kPa) or less, there is a loss of air for rear brakes to operate normally. If needle of rear pressure gauge (4 UPGRADED DASH) is at 70 psi

(483 kPa) or less, there is a loss of air for rear brakes to operate normally. In this situation, perform the following Steps:

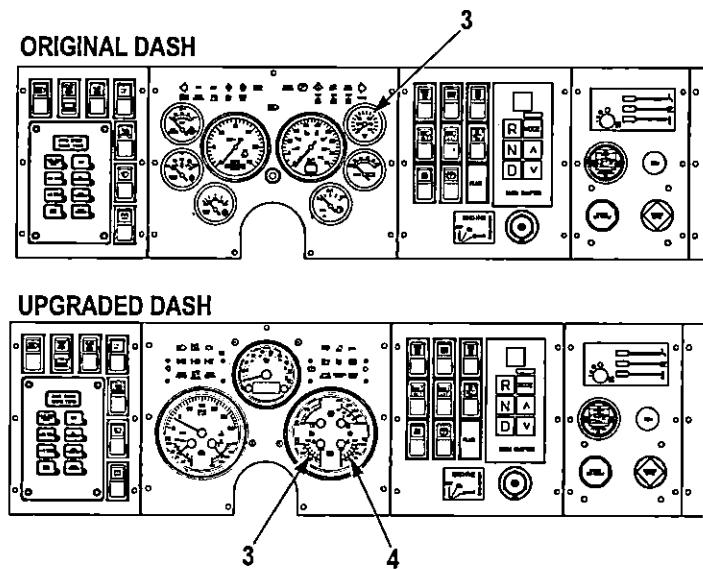
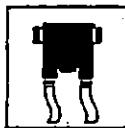


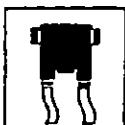
Figure 4.

### WARNING



Vehicle cannot be driven again until malfunction is repaired and there is enough air supply for operation of service brakes. Failure to comply may result in injury to personnel or damage to equipment.

### WARNING



Use engine brake/retarder only when vehicle tires have good traction. Use of engine brake/retarder on slick or loose surfaces can cause vehicle to skid and cause injury or death to personnel.

- a. Downshift, apply engine brake/retarder switches (6) on HIGH setting to control vehicle speed until suitable location is found, and stop vehicle immediately. Spring brakes on vehicle and trailer will automatically apply at approximately 45 psi (310 kPa), bringing vehicle to sudden stop.

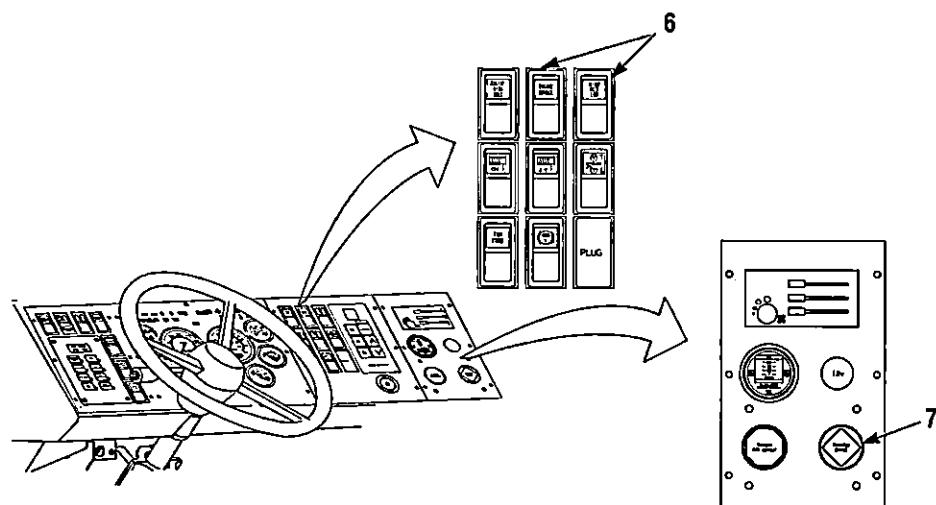


Figure 5.

- b. If possible, for a more controlled stop, pull out parking brake control valve (7) to apply spring brakes on axles No. 2 and 3 before pressure drops below 45 psi (310 kPa).
- c. Refer to Troubleshooting (WP 0090) as soon as possible.

**END OF TASK**

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE MANUAL DRIVELINE LOCK

### INITIAL SETUP:

Not Applicable

### CAUTION

When manual driveline lock is used, the automatic speed protection features of the CTIS are no longer operational. There are two speed limitations imposed when operating the vehicle. One limitation comes from the CTIS terrain setting, the other from the driveline lock setting. The lower of the two speed limitations must be adhered to. Failure to comply may result in damage to vehicle.

### NOTE

This procedure must ONLY BE USED IN EMERGENCY SITUATIONS when the CTIS has failed and driveline lock is required to operate vehicle.

1. Shut engine OFF (WP 0035).

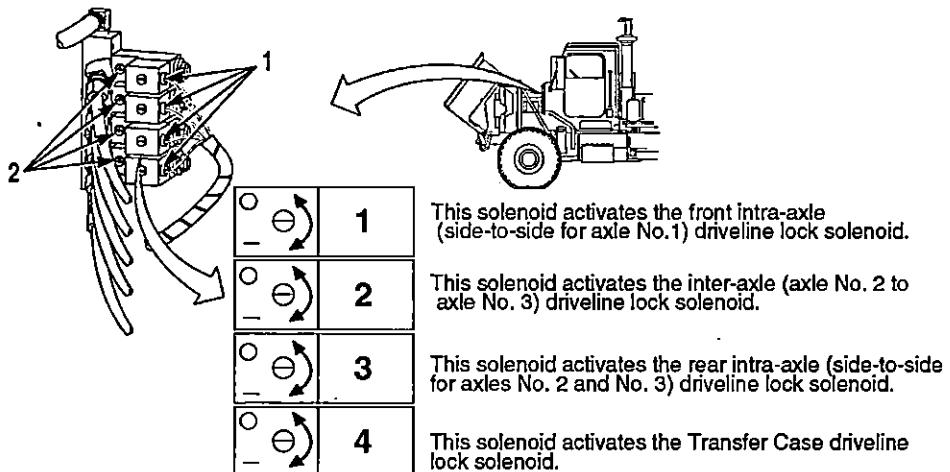


Figure 1.

2. Open hood (WP 0039).
3. Using the following charts, determine which solenoids (1) need to be engaged.

### NOTE

To manually engage solenoid, turn associated valve switch (2) 1/2 turn clockwise.

4. Manually engage appropriate solenoids (1).

**Table 1. Axle Lock Maximum Speed.**

Driveline Lock Configuration	Maximum Allowable Speed	Solenoids Needed To Be Turned On
T-Case and Inter-Axle	30 MPH (48 km/h)	2 and 4
T-Case, Inter-Axle, and Intra-Axle	10 MPH (16 km/h)	2, 3 and 4
T-Case, Inter-Axle, and Front and Rear Intra-Axle	10 MPH (16 km/h)	1, 2, 3, and 4

5. Close hood (WP 0039).

### **CAUTION**

- When manual driveline lock is used, the automatic speed protection features of the CTIS are no longer operational. There are two speed limitations imposed when operating the vehicle. One limitation comes from the CTIS terrain setting, the other from the driveline lock setting. The lower of the two speed limitations must be adhered to. Failure to comply may result in damage to vehicle.
- When manual driveline lock is no longer needed, the manual driveline lock solenoid switches must be returned to the normal operating position as soon as possible. Failure to comply may result in damage to vehicle.

### **NOTE**

When manual driveline lock is used, there will be no indication of driveline lock on the dash.

6. Operate vehicle using care not to exceed the speed limitations dictated by the lower of either the driveline lock configuration (refer to Axle Lock Maximum Speed Table (Table 1)) the operator has chosen or the last CTIS terrain setting (refer to CTIS Maximum Speed Table below) the vehicle was operating at.

**Table 2. CTIS Maximum Speed.**

CTIS Terrain Setting	Max. Allowable Speed	Default CTIS Configuration
Highway	65 MPH (105 km/h)	No Driveline Lock
Cross-Country	40 MPH (64 km/h)	No Driveline Lock
Mud/Sand/Snow	15 MPH (24 km/h)	T-Case and Inter-Axle
Emergency	5 MPH (8 km/h)	T-Case, Inter-Axle, and Rear Intra-Axle

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
LIMP HOME FOR FLAT TIRE ON NO. 2 AXLE**

**INITIAL SETUP:**

Not Applicable

1. Position tire ramp (1) directly in front or behind flat tire (2).

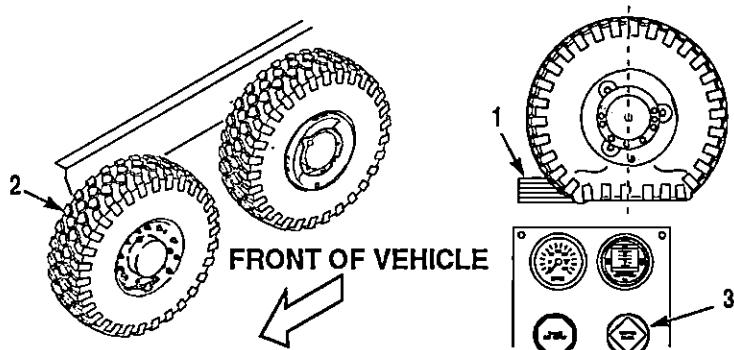


Figure 1.

**WARNING**



Tire needs to be properly centered over tire ramp. This includes both centered side-to-side and front-to-rear directions (refer to the following illustration). This will keep tire from sliding off during jacking procedures. Failure to comply may result in injury or death to personnel.

2. Drive vehicle forward or backward to position and center flat tire (2) on tire ramp (1).
3. Apply PARKING BRAKE (3) and shut off engine (WP 0035).
4. Chock tire on opposite side of axle.
5. Remove three nuts (4) and wheel cover (5) from studs (6).

**CAUTION**

Keep CTIS air lines and fittings clean and dry when removing CTIS air line from CTIS fitting. Failure to comply may result in damage to equipment.

6. Remove CTIS air line (7) from CTIS fitting (8).

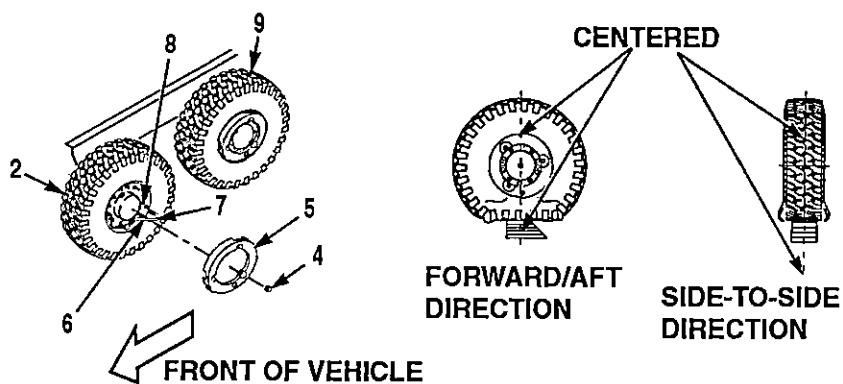


Figure 2.

7. Cap and plug CTIS air line (7) and CTIS fitting (8).
8. Start vehicle, set CTIS controller to Highway setting, and allow tire pressures to adjust. (refer to CTIS (WP 0043)).
9. Shut off engine (WP 0035).
10. Deflate tire (WP 0101) (9) on No. 3 axle on same side as flat tire (2).

#### CAUTION

When installing limp home strut, bend of strut must be at bottom and point away from spring. Failure to comply may result in damage to equipment.

11. Install limp home strut (10), two washers (11), and nuts (12) on control arm (13) and spring bracket (14). Hand-tighten nuts.

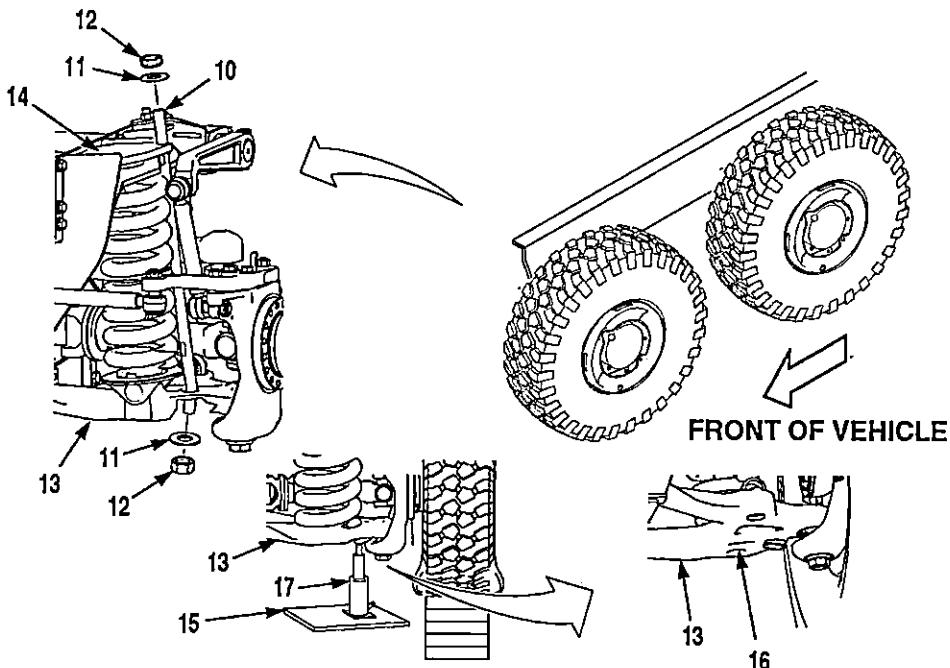


Figure 3.

12. Position jack plate (15) under rear locating indent (16) in control arm (13).

**NOTE**

Prior to using jack, ensure valve on jack is turned clockwise until seated.

13. Position jack (17) on jack plate (15) under rear locating indent (16) of axle No. 2.

**CAUTION**

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

14. Unscrew jack extension of jack (17) until jack extension touches rear locating indent (16).

**WARNING**

Hydraulic jacks are intended only for lifting the vehicle and not for supporting the vehicle while performing maintenance. Do not get under vehicle after vehicle is raised unless it is properly supported with blocks or jackstands. Failure to comply may result in injury or death to personnel.

15. Close valve (18) on jack (17).
16. Raise jack (17) up until flat tire (2) lifts off of tire ramp (1).

**CAUTION**

Use care when tightening nuts on limp home strut. At a minimum, the threads of the limp home strut must protrude through the nuts. Failure to comply may result in damage to equipment.

17. Snug two nuts (12) on limp home strut (10) with wrench.

**NOTE**

This procedure is not intended to lift the tire completely off the ground. This procedure is intended to minimize ground pressure on tire by compressing wheel end suspension. The tire will still be in contact with ground.

18. Lower jack (17) by slowly turning valve (18) counterclockwise.

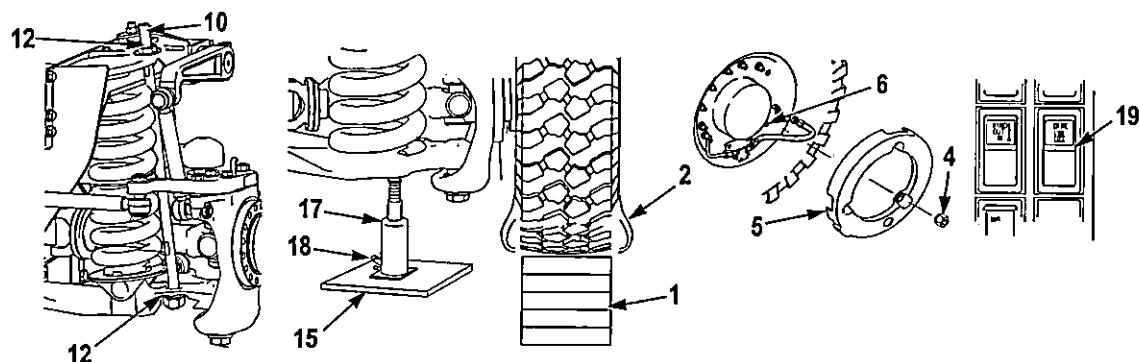


Figure 4.

19. Remove and stow jack (17), jack plate (15), and wheel chocks.
20. Install wheel cover (5) on studs (6) with three nuts (4).
21. Start engine and allow remaining tires to inflate to appropriate operating pressure.
22. Engage transfer case and inter-axle lock (1st position) using driveline lock switch (WP 0043, Driveline Lock) (19) and slowly drive off tire ramp (1). Park vehicle (WP 0034) and stow tire ramp (1).
23. Operate vehicle using caution not to exceed speeds listed in Maximum Speed Table below.

*Table 1. Maximum Speed During Limp Home.*

Mode	Speed Not to Exceed
Cross-Country/Trails	5 mph (8 kph)
Secondary Roads	10 mph (16 kph)
Highway	15 mph (24 kph)

END OF TASK

END OF WORK PACKAGE

**1ST ECHELON MAINTENANCE**  
**LIMP HOME FOR FLAT TIRE ON NO. 1 AXLE**

**INITIAL SETUP:**

Not Applicable

**CAUTION**

Limp home strut must only be installed on No. 2 axle. Failure to comply may result in damage to equipment.

**CAUTION**

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

1. Turn engine off (WP 0035) and apply PARKING BRAKE.

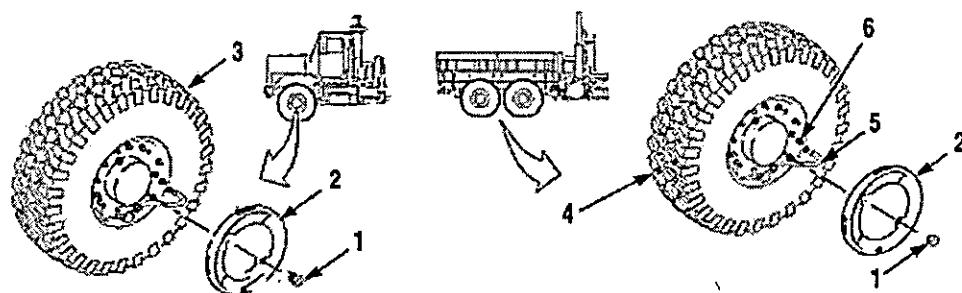


Figure 1.

2. Chock tire on axle No. 2 on same side of vehicle that flat tire is on.
3. Remove three nuts (1) and wheel cover (2) from flat tire (3) on No. 1 axle.
4. Remove three nuts (1) and wheel cover (2) from tire (4) on axle No. 2 on opposite side of vehicle from flat tire.

**CAUTION**

Keep CTIS air lines and fittings clean and dry when removing CTIS air line from CTIS fitting. Failure to comply may result in damage to equipment.

5. Remove CTIS air line (5) from CTIS fitting (6) on tire (4) on axle No. 2.
6. Cap and plug CTIS air line (5) and CTIS fitting (6).
7. Position tire ramp (7) under rear locating indent (8) in lower control arm (9) of axle No. 2.

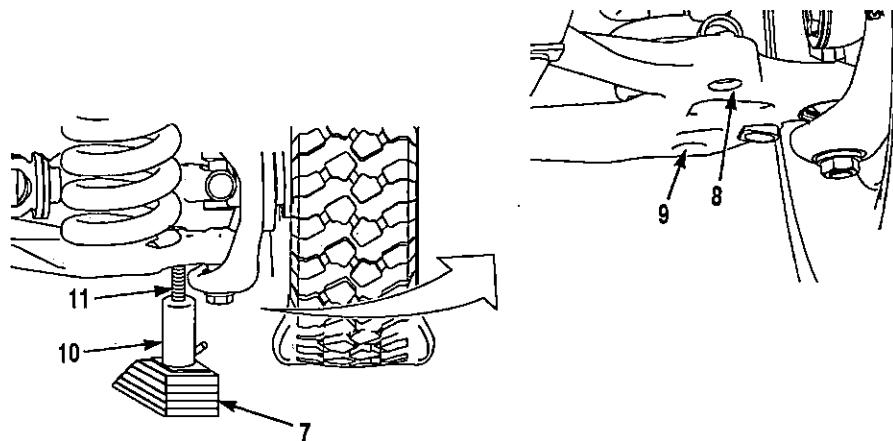


Figure 2.

**NOTE**

Second jack positioned on jack plate may be required to raise lower control arm to enable jack and jack platform to be positioned.

8. Position jack (10) on tire ramp (7) under rear locating indent (8).

**WARNING**

Hydraulic jacks are intended only for lifting the vehicle and not for supporting the vehicle while performing maintenance. Do not get under vehicle after vehicle is raised unless it is properly supported with blocks or jackstands. Failure to comply may result in injury or death to personnel.

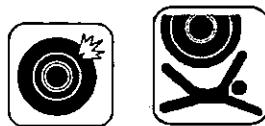
**CAUTION**

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

**NOTE**

Ensure valve on jack is turned clockwise until seated prior to using jack.

9. Unscrew jack extension (11) of jack (10) and raise jack, using jack handle, until jack extension touches rear locating indent (8).

**WARNING**

Do not loosen or remove outer nuts on wheel. Outer nuts hold wheel assembly together. Tire is under pressure and loosening these nuts can cause tire to blow apart. Failure to comply may result in serious injury or death to personnel.

10. Loosen ten lugnuts (12) on tire (4). Do not remove lugnuts at this time.

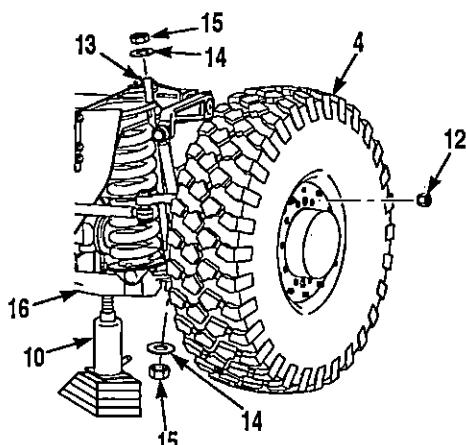


Figure 3.

11. Raise jack (10) until limp home strut (13) can be installed.

**CAUTION**

- When installing limp home strut, bend of strut must be at bottom and point away from spring. Failure to comply may result in damage to equipment.
- Use care when tightening nuts on limp home strut. At a minimum, the threads of the limp home strut must protrude through the nuts. Failure to comply may result in damage to equipment.

12. Install limp home strut (13), two washers (14), and nuts (15) on lower control arm (9) and spring bracket (16). Tighten both nuts finger-tight.
13. Raise jack (10) until tire (4) is just off the ground. Retighten two nuts (15) finger-tight and snug with wrench.

**WARNING**

Wheel/tire assembly weighs 500 lbs (227 kg). Do not attempt to lift or catch wheel/tire assembly without the aid of an assistant and a suitable lifting device. Failure to comply may result in injury or death to personnel.

**CAUTION**

Use care when removing tire from wheel end assembly. Dragging tire across studs may result in damage to studs.

**NOTE**

To remove tire, jack may need to be lowered until tire is just off ground.

14. Remove ten lugnuts (12) and tire (4) from wheel end assembly (17) on axle No. 2.

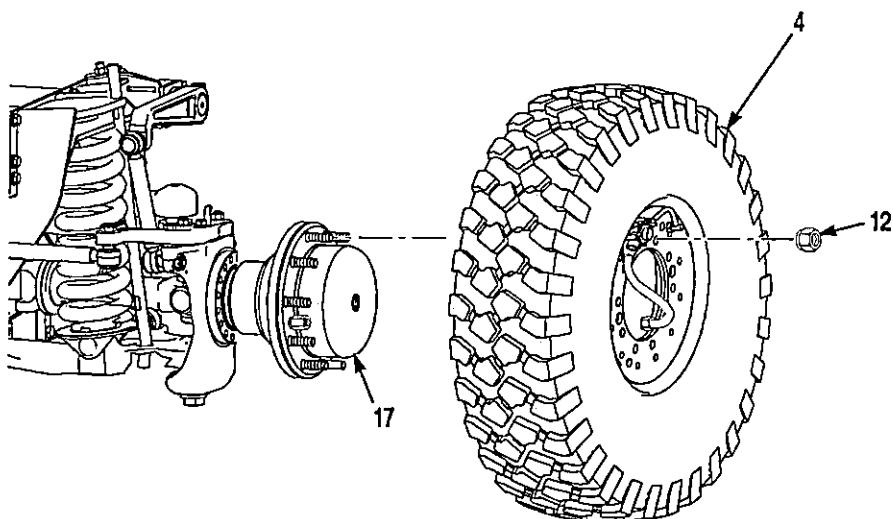


Figure 4.

15. Position second jack (18) on jack plate (19) under lower control arm (9) and align jack with forward locating indent (20).

**CAUTION**

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

16. Unscrew jack extension (21) of second jack (18) approximately 2 to 4 in. (5 to 10 cm) and raise jack up until end of travel is reached.
17. Turn valve (22) of jack (10) counterclockwise and lower jack (10) completely.
18. Remove jack (10) and tire ramp (7) from under vehicle.
19. Turn valve (23) counterclockwise and lower jack (18) completely.
20. Remove jack (18) and jack plate (19) from under vehicle.
21. Remove wheel chocks.

**NOTE**

Prior to moving vehicle, if no driveline lock icons are lit, engage transfer case and inter-axle lock (1st position). (refer to Driveline Lock (WP 0043))

22. Exchange flat tire on No. 1 axle with tire removed from No. 2 axle (refer to Changing Wheel/Tire Assembly (WP 0100)).

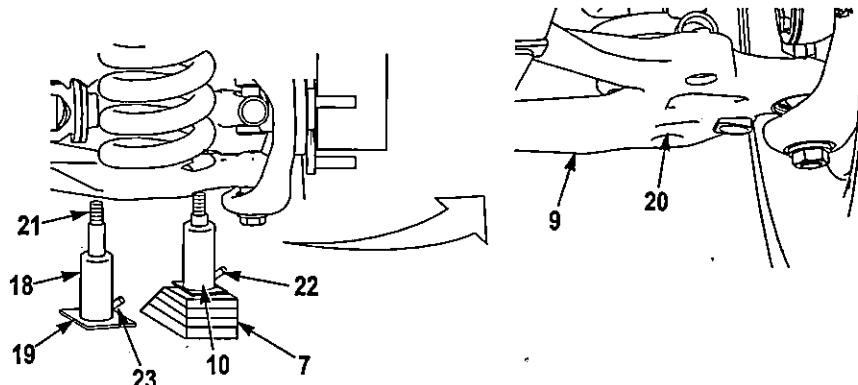


Figure 5.

23. Position jack (18) on jack plate (19) under vehicle and align jack (18) with forward locating indent (20) on axle No. 2.

#### CAUTION

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

24. Unscrew jack extension (21) of jack (18) approximately 2 to 4 in. (5 to 10 cm) and raise jack (18) until jack (10) located on tire ramp (7) can be positioned under lower control arm (9).

25. Position tire ramp (7) under rear locating indent (8) in lower control arm (9) on axle No. 2.

26. Position jack (10) on tire ramp (7) and align with rear locating indent (8).

#### WARNING



Hydraulic jacks are intended only for lifting the vehicle and not for supporting the vehicle while performing maintenance. Do not get under vehicle after vehicle is raised unless it is properly supported with blocks or jackstands. Failure to comply may result in injury or death to personnel.

#### CAUTION

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

#### NOTE

Ensure valve on jack is turned clockwise until seated prior to using jack.

27. Unscrew jack extension (11) of jack (10) and raise jack, using jack handle, until extension touches rear locating indent (8).

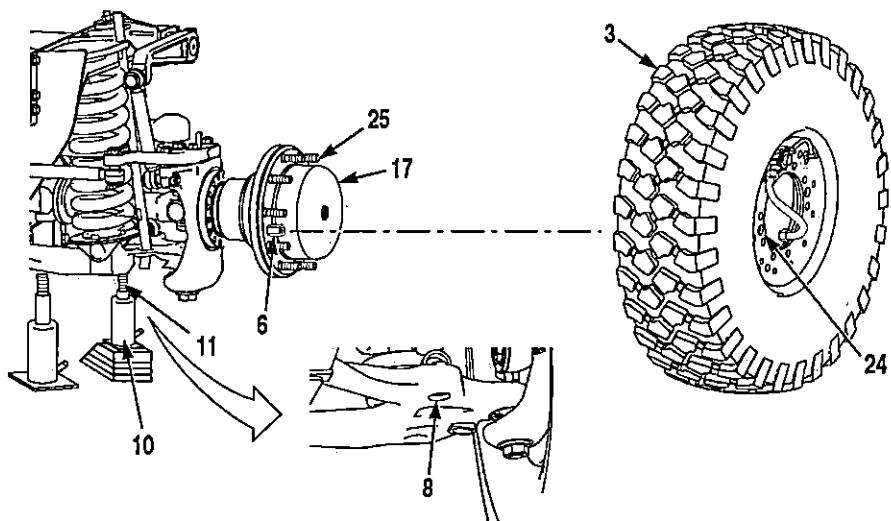


Figure 6.

28. Raise wheel end assembly (17) with jack (10) until flat tire (3) can be installed.

**NOTE**

Flat tire should have CTIS valve facing outward.

29. With the aid of an assistant, line up CTIS hole (24) in flat tire (3) with CTIS fitting (6) in wheel end assembly (17).
30. With the aid of an assistant, line up ten holes in flat tire (3) with studs (25) on wheel end assembly (17).

**CAUTION**

Use care when installing tire on wheel end assembly. Dragging tire across studs may result in damage to studs.

31. Mount flat tire (3) on wheel end assembly (17) and install ten lugnuts (12) on studs. Run lugnuts up until snug but do not completely tighten.

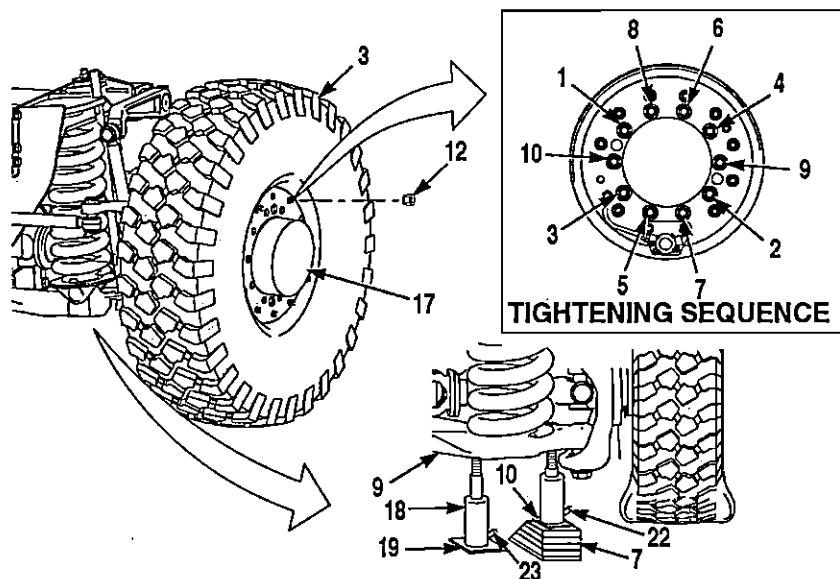


Figure 7.

32. Turn valve (22) of jack (10) counterclockwise and lower jack (10) completely, allowing lower control arm (9) to rest on jack (18).
33. Remove jack (10) and tire ramp (7) from under vehicle.
34. Turn valve (23) slowly counterclockwise and lower jack (18) until flat tire (3) touches ground. Turn valve (23) clockwise until seated.
35. Alternately tighten ten lugnuts (12) on studs in sequence shown.
36. Lower jack (18) completely and remove jack and jack plate (19) from under vehicle.
37. Remove wheel chocks.
38. Perform Limp Home (WP 0083) for Flat Tire on No. 2 Axle (Steps 1-10 and 12-22).

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE**  
**LIMP HOME FOR FLAT TIRE ON NO. 3 AXLE**

**INITIAL SETUP:**

Not Applicable

**CAUTION**

Limp home strut must only be installed on No. 2 axle. Failure to comply may result in damage to equipment.

**CAUTION**

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

1. Turn engine off (WP 0035) and apply PARKING BRAKE.

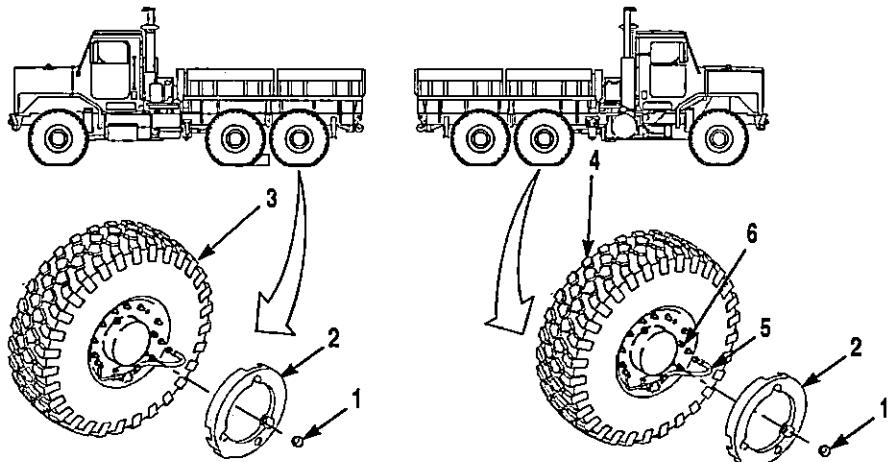


Figure 1.

2. Chock tire on axle No. 2 on same side of vehicle that flat tire is on.
3. Remove three nuts (1) and wheel cover (2) from flat tire (3) on No. 3 axle.
4. Remove three nuts (1) and wheel cover (2) from tire (4) on axle No. 2 on opposite side of vehicle from flat tire.

**CAUTION**

Keep CTIS air lines and fittings clean and dry when removing CTIS air line from CTIS fitting. Failure to comply may result in damage to equipment.

5. Remove CTIS air line (5) from CTIS fitting (6) on tire (4) on axle No. 2.
6. Cap and plug CTIS air line (5) and CTIS fitting (6).
7. Position tire ramp (7) under rear locating indent (8) in lower control arm (9) of axle No. 2.

**NOTE**

Second jack positioned on jack plate may be required to raise/lower control arm to enable jack and tire ramp to be positioned.

8. Position jack (10) on tire ramp (7) under rear locating indent (8).

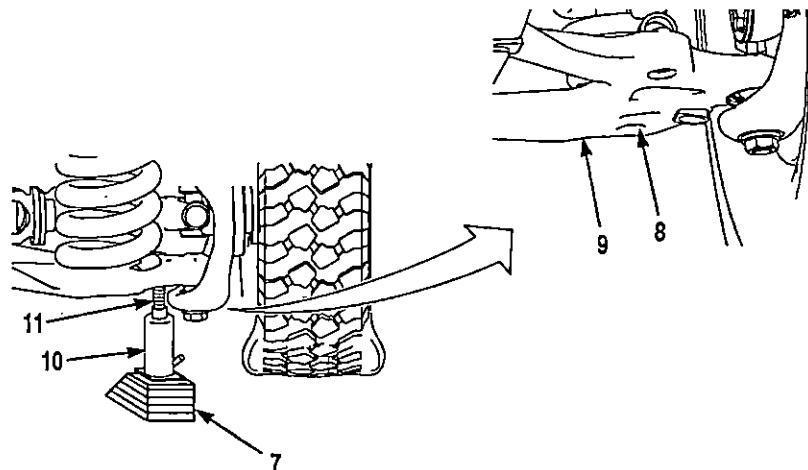


Figure 2.

**WARNING**

Hydraulic jacks are intended only for lifting the vehicle and not for supporting the vehicle while performing maintenance. Do not get under vehicle after vehicle is raised unless it is properly supported with blocks or jackstands. Failure to comply may result in injury or death to personnel.

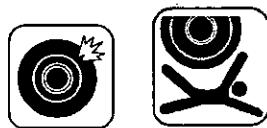
**CAUTION**

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

**NOTE**

Ensure valve on jack is turned clockwise until seated prior to using jack.

9. Unscrew jack extension (11) of jack (10) and raise jack, using jack handle, until jack extension touches rear locating indent (8).

**WARNING**

Do not loosen or remove outer nuts on wheel. Outer nuts hold wheel assembly together. Tire is under pressure and loosening these nuts can cause tire to blow apart. Failure to comply may result in serious injury or death to personnel.

10. Loosen ten lugnuts (12) on tire (4). Do not remove lugnuts at this time.

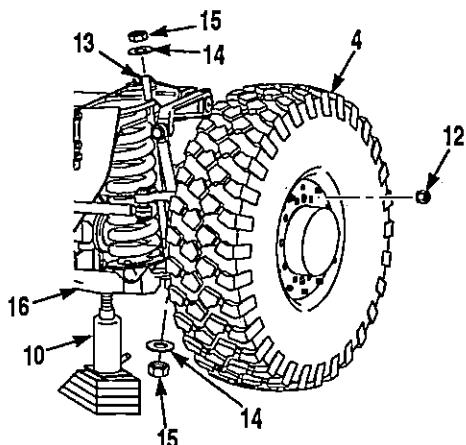


Figure 3.

11. Raise jack (10) until limp home strut (13) can be installed.

**CAUTION**

- When installing limp home strut, bend of strut must beat bottom and point away from spring. Failure to comply may result in damage to equipment.
- Use care when tightening nuts on limp home strut. At a minimum, the threads of the limp home strut must protrude through the nuts. Failure to comply may result in damage to equipment.

12. Install limp home strut (13), two washers (14), and nuts (15) on lower control arm (9) and spring bracket (16). Tighten both nuts finger-tight.
13. Raise jack (10) until tire (4) is just off the ground. Retighten two nuts (15) finger-tight and snug with wrench.

**WARNING**

Wheel/tire assembly weighs 500 lbs (227 kg). Do not attempt to lift or catch wheel/tire assembly without the aid of an assistant and a suitable lifting device. Failure to comply may result in injury or death to personnel.

**CAUTION**

Use care when removing tire from wheel end assembly. Dragging tire across studs may result in damage to studs.

**NOTE**

To remove tire, jack may need to be lowered until tire is just off ground.

14. Remove ten lugnuts (12) and tire (4) from wheel end assembly (17) on axle No. 2.

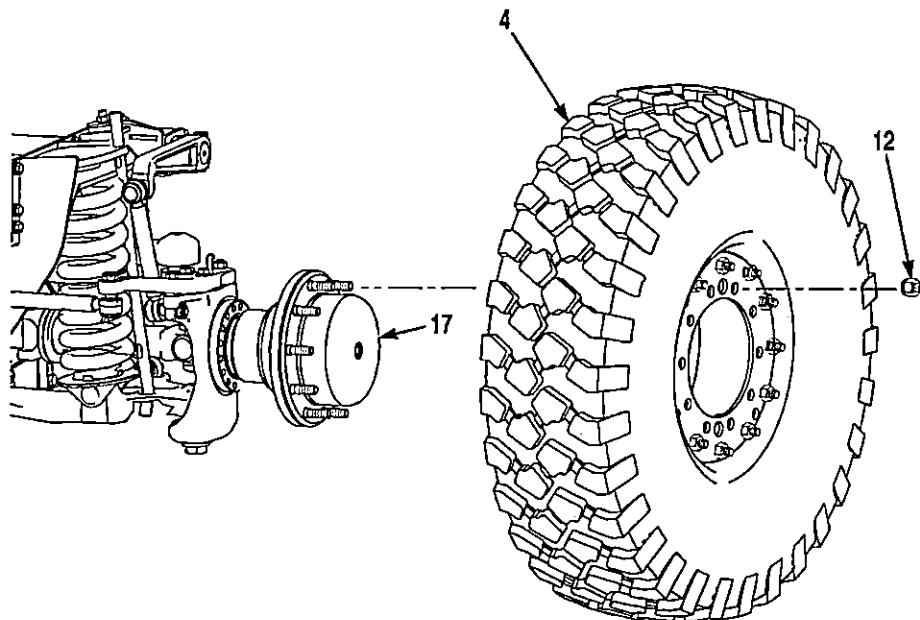


Figure 4.

15. Position second jack (18) on jack plate (19) under lower control arm (9) and align jack with forward locating indent (20).

**CAUTION**

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

16. Unscrew jack extension (21) of second jack (18) approximately 2 to 4 in. (5 to 10 cm) and raise jack up until end of travel is reached.

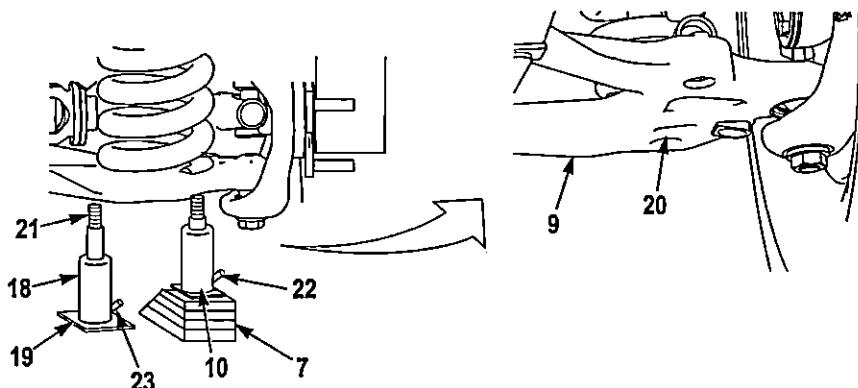


Figure 5.

17. Turn valve (22) of jack (10) counterclockwise and lower jack (10) completely.
18. Remove jack (10), and tire ramp (7) from under vehicle.
19. Turn valve (23) counterclockwise and lower jack (18) completely.
20. Remove jack (18) and jack plate (19) from under vehicle.
21. Remove wheel chocks.

#### NOTE

Prior to moving vehicle, if no driveline lock icons are lit, engage transfer case and inter-axle lock (1st position). (refer to Driveline Lock (WP 0043))

22. Exchange flat tire (WP 0100) on No. 3 axle with tire removed from No. 2 axle.

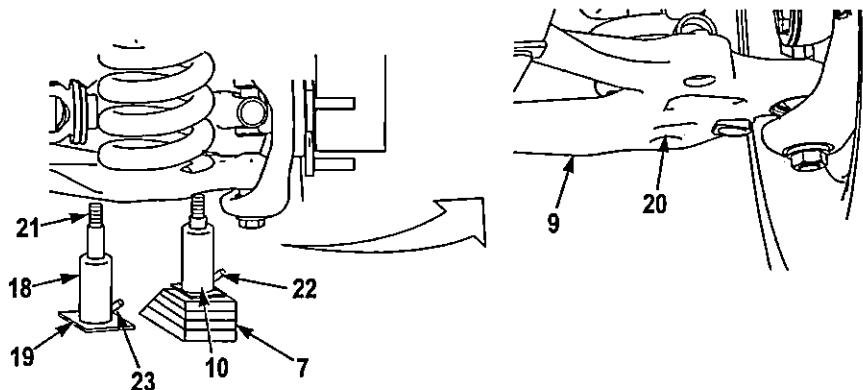


Figure 6.

23. Position second jack (18) on jack plate (19) under vehicle and align second jack (18) with forward locating indent (20) on axle No. 2.

#### CAUTION

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

24. Unscrew jack extension (21) of second jack (18) approximately 2 to 4 in. (5 to 10 cm) and raise jack (18) until jack (10) located on tire ramp (7) can be positioned under lower control arm (9).
25. Position tire ramp (7) under rear locating indent (8) in lower control arm (9) on axle No. 2.
26. Position jack (10) on tire ramp (7) and align with rear locating indent (8).

### WARNING



Hydraulic jacks are intended only for lifting the vehicle and not for supporting the vehicle while performing maintenance. Do not get under vehicle after vehicle is raised unless it is properly supported with blocks or jackstands. Failure to comply may result in injury or death to personnel.

### CAUTION

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

### NOTE

Ensure valve on jack is turned clockwise until seated prior to using jack.

27. Unscrew jack extension (11) of jack (10) and raise jack, using jack handle, until extension touches rear locating indent (8).

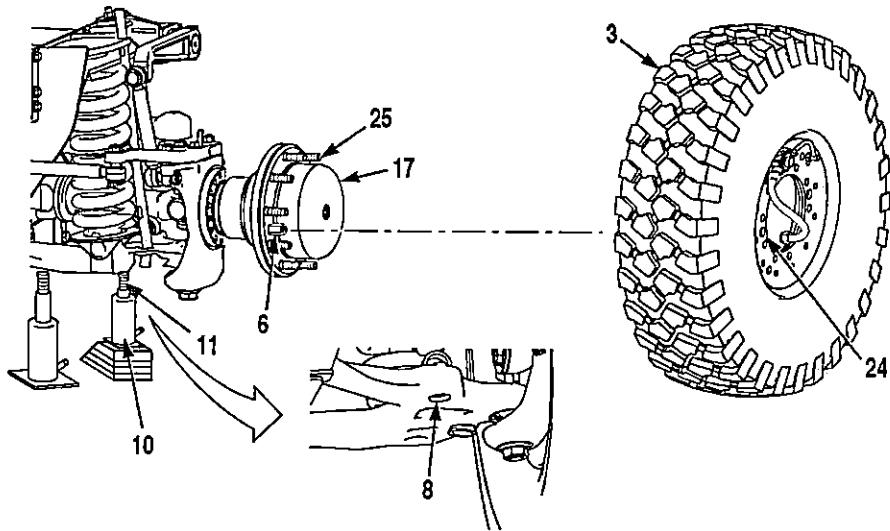


Figure 7.

28. Raise wheel end assembly (17) with jack (10) until flat tire (3) can be installed.

### NOTE

Flat tire should have CTIS valve facing outward.

29. With the aid of an assistant, line up CTIS hole (24) in flat tire (3) with CTIS fitting (6) in wheel end assembly (17).
30. With the aid of an assistant, line up ten holes in flat tire (3) with studs (25) on wheel end assembly (17).

### CAUTION

Use care when installing tire on wheel end assembly. Dragging tire across studs may result in damage to studs.

31. Mount flat tire (3) on wheel end assembly (17) and install ten lugnuts (12) on studs. Run lugnuts up until snug but do not completely tighten.

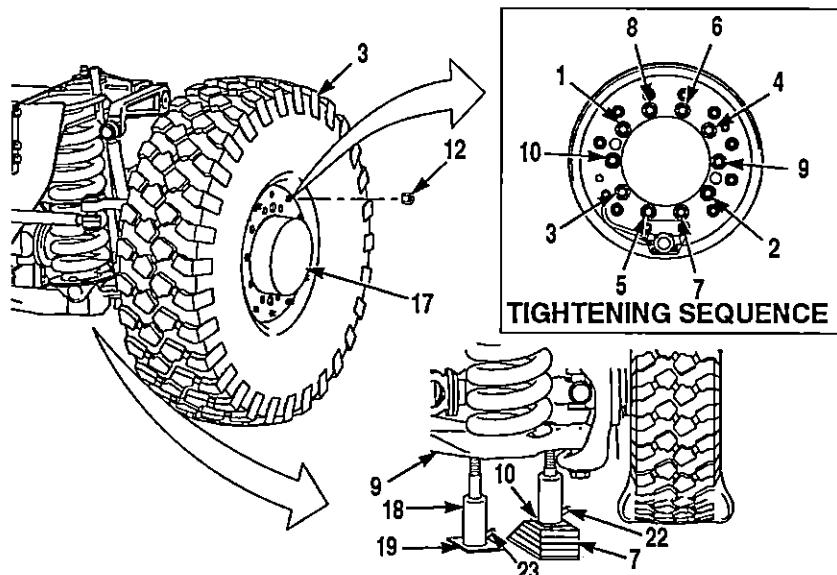


Figure 8.

32. Turn valve (22) of jack (10) counterclockwise and lower jack (10) completely, allowing lower control arm (9) to rest on second jack (18).
33. Remove jack (10) and tire ramp (7) from under vehicle.
34. Turn valve (23) slowly counterclockwise and lower second jack (18) until flat tire (3) touches ground. Turn valve (23) clockwise until seated.
35. Alternately tighten ten lugnuts (12) on studs in sequence shown.
36. Lower second jack (18) completely and remove jack and jack plate (19) from under vehicle.
37. Remove wheel chocks.
38. Perform Limp Home (WP 0083) for Flat Tire on No. 2 Axle (Steps 1-10 and 12-22).

**END OF TASK**

**END OF WORK PACKAGE**

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**1ST ECHELON MAINTENANCE**  
**LIMP HOME STRUT REMOVAL**

---

**INITIAL SETUP:**

Not Applicable

---

**NOTE**

Perform Step (1) only if tire is damaged and needs to be replaced.

1. Remove flat tire (1) (WP 0100).

**WARNING**

Hydraulic jacks are intended only for lifting the vehicle and not for supporting the vehicle while performing maintenance. Do not get under vehicle after vehicle is raised unless vehicle is properly supported with blocks or jackstands. Failure to comply may result in serious injury or death to personnel.

**WARNING**

Tension must be removed prior to removal of limp home strut. Failure to comply may result in serious injury to personnel.

**CAUTION**

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

**NOTE**

- Wheel/tire end assembly may need to be raised to compress wheel end suspension and minimize pressure on limp home strut.
- Ensure valve on jack is turned clockwise until seated prior to using jack.
- Tension is released when control arm is raised.

2. If needed, raise jack (2) until tension is removed from limp home strut (3).

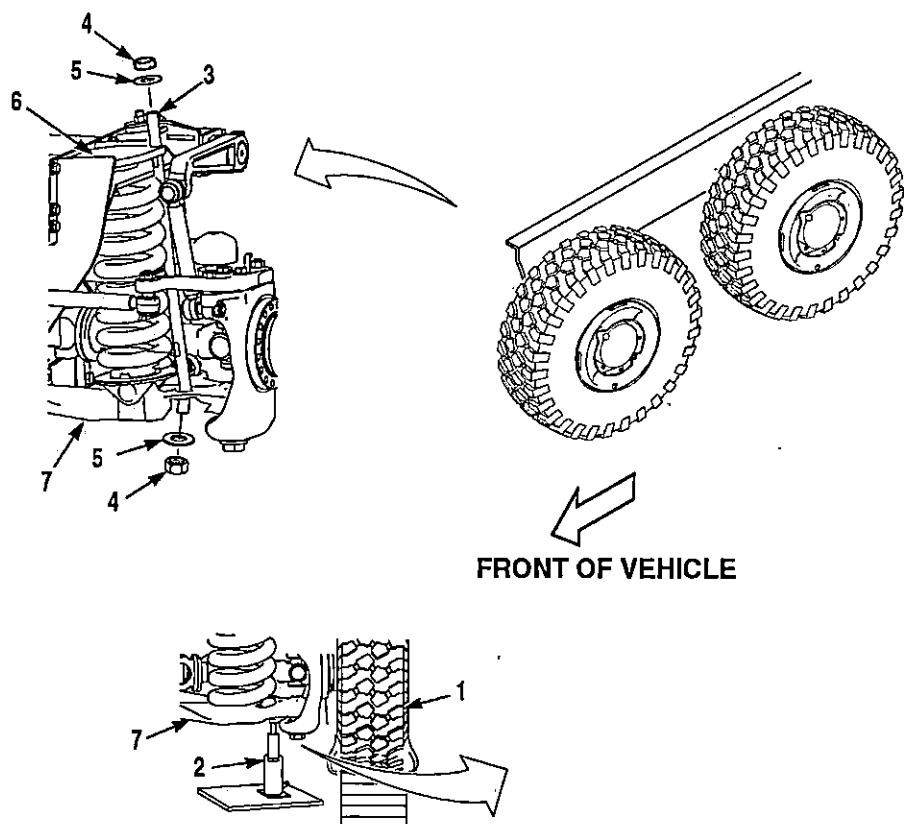


Figure 1.

3. Remove two nuts (4), washers (5), and limp home strut (3) from spring bracket (6) and control arm (7).

**NOTE**

Perform Step (4) only if tire was removed.

4. Install replacement tire (WP 0100).

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
OPENING CAB DOOR WITH LUG DOOR PLATE**

**INITIAL SETUP:**

Not Applicable

**NOTE**

- Perform Steps (1) through (5) to attach self-recovery winch cable to lug door plate.
- Perform Steps (6) through (8) to attach anchor shackle to lug door plate.
- Perform Step (8) to use crowbar/Halligan tool on lug door plate.

1. Remove cotter pin (1) from clevis pin (2).

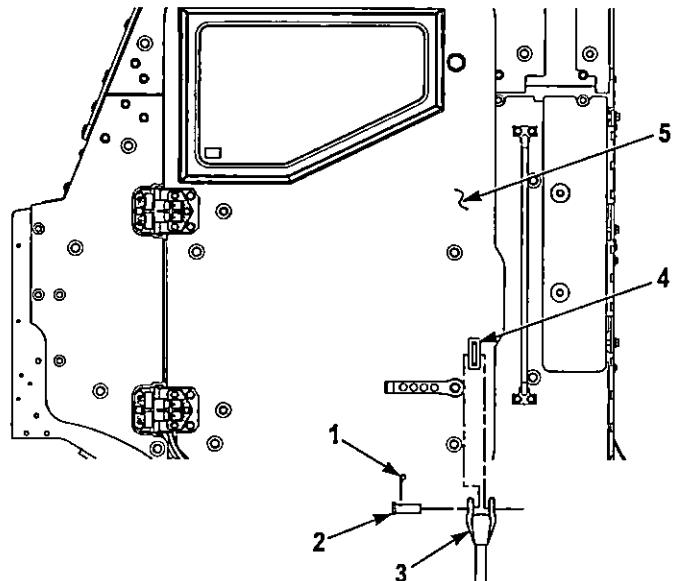


Figure 1.

2. Remove clevis pin (2) from clevis (3).
3. Install clevis (3) on lug door plate (4) with clevis pin (2).
4. Install cotter pin (1) on clevis pin (2).
5. Operate self-recovery winch to remove door (5).

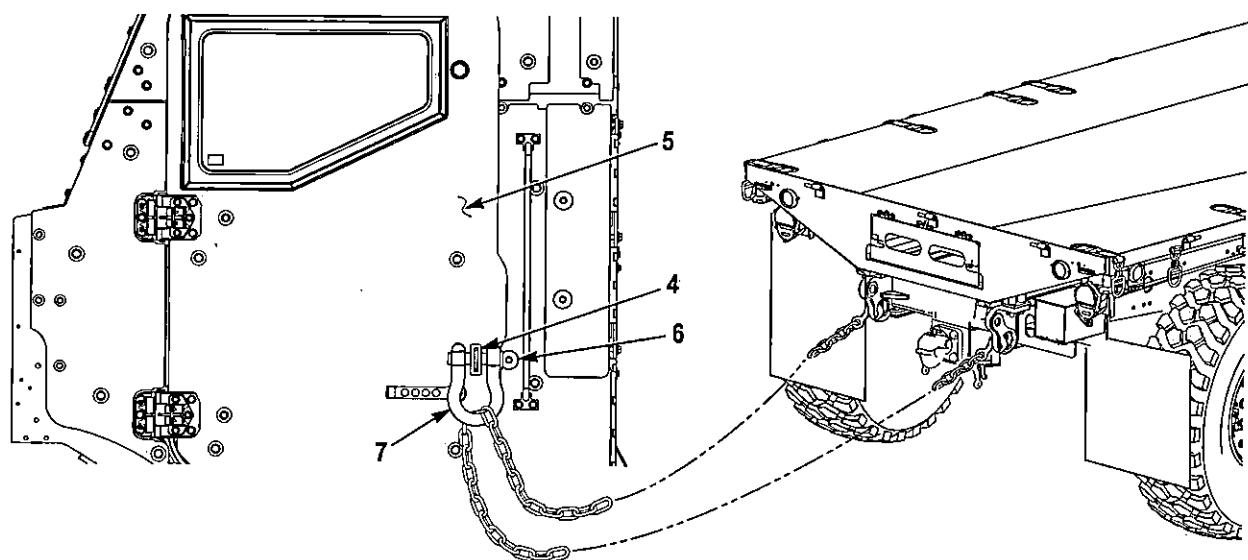


Figure 2.

6. Remove pin (6) from anchor shackle (7).
7. Install anchor shackle (7) on lug door plate (4) with pin (6).
8. Position crowbar/Halligan tool (8) on lug door plate (4) and remove door (5).

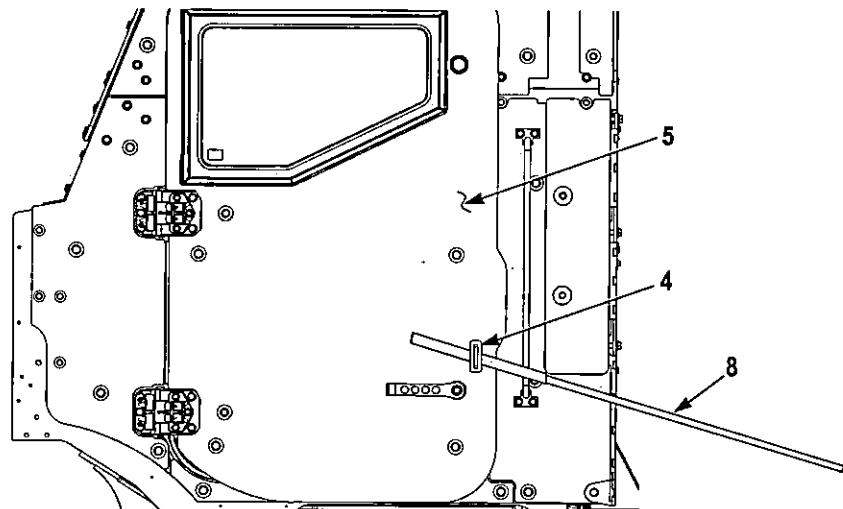


Figure 3.

**END OF TASK**

**END OF WORK PACKAGE**

---

1ST ECHELON MAINTENANCE  
EMERGENCY EGRESS WINDOW OPERATION

---

**INITIAL SETUP:**

Not Applicable

---

1. Remove two beaded security ties (1) and T-handle retaining pins (2) from handles (3) and armored glass (4).

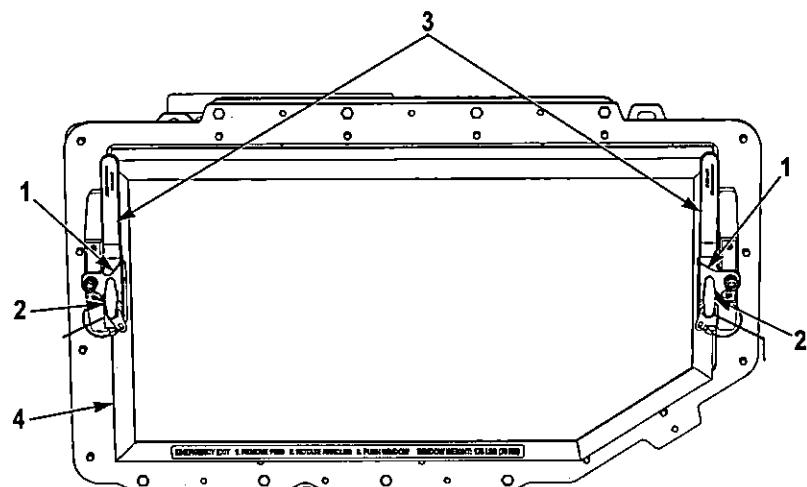


Figure 1. Reducible.

- Continued

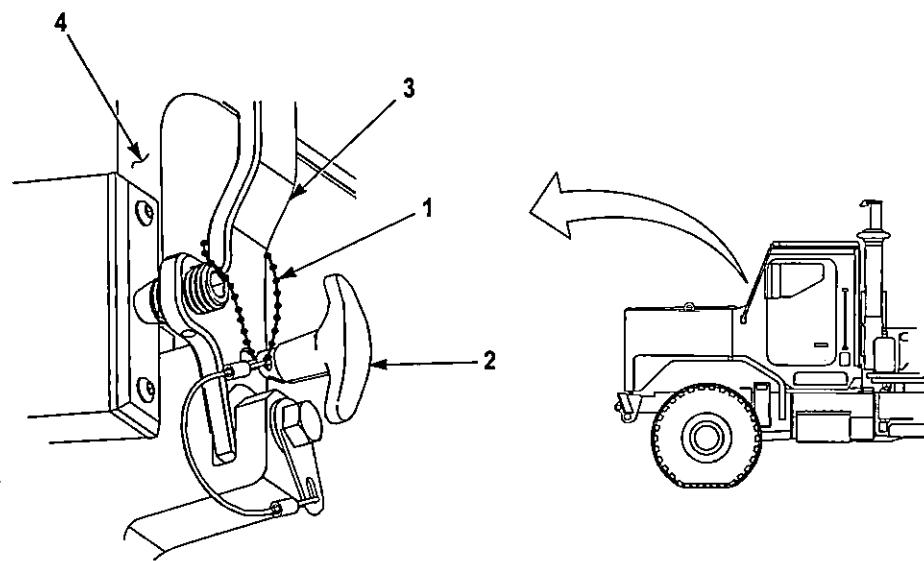


Figure 2. Non-Reducible.

2. Rotate two handles (3) inward and push armored glass (4) outward.

- Continued

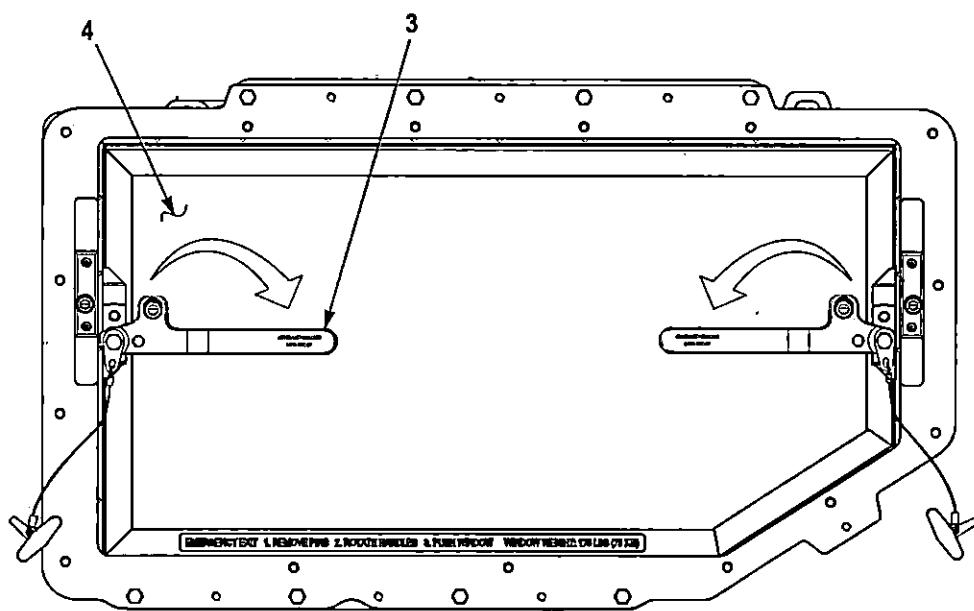


Figure 3. Reducible.

- Continued

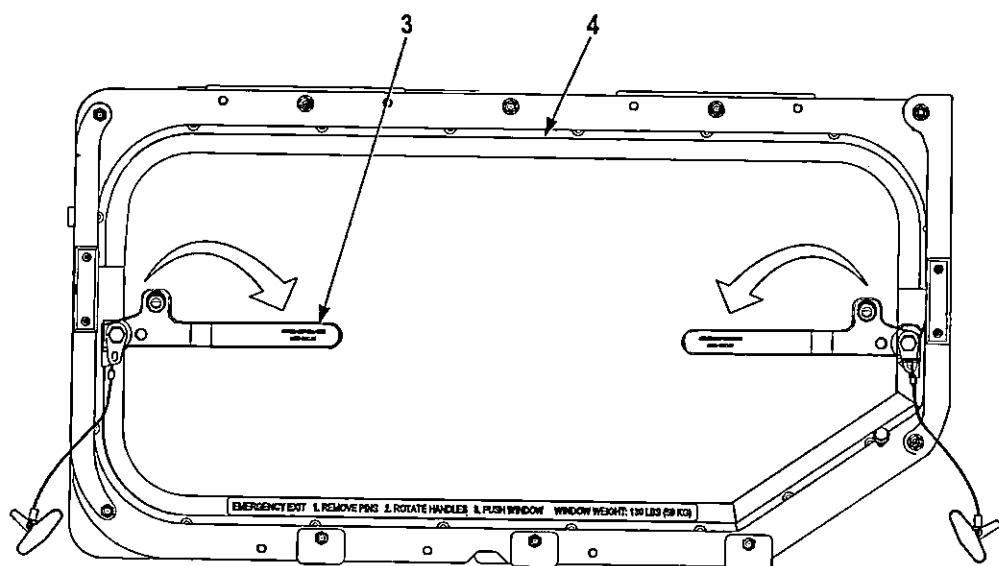


Figure 4. Non-Reducible.

**END OF TASK**

**END OF WORK PACKAGE**

## **CHAPTER 6**

### **TROUBLESHOOTING PROCEDURES**

## 1ST ECHELON MAINTENANCE TROUBLESHOOTING INTRODUCTION

### Introduction

This section contains operator troubleshooting procedures. Troubleshooting Table (WP 0090) lists most common malfunctions found during operation of the 7-Ton Truck and its components. Tests or inspections and corrective actions should be performed in the order listed. If a malfunction is not listed on the table, refer to Second Echelon Maintenance.

To quickly find the troubleshooting procedure you need, use the Fault Symptom Index Table below. Components and symptoms are listed first; common malfunctions are listed under those components or system headings.

This manual cannot list all malfunctions that may occur. Nor can it list all tests, inspections, and corrective actions. If a malfunction is not listed, or if listed corrective actions are not adequate, notify the Noncommissioned Officer in Charge (NCOIC).

**Table 1. Symptom Index.**

Troubleshooting Procedure	Item No.
<b>A. Engine</b>	
Engine fails to crank when ignition switch is turned to start position	1
Engine cranks but fails to start	2
Engine shuts down while running	3
Engine runs roughly after proper warm-up but does not develop full power or makes excessive exhaust smoke	4
Engine overheats	5
Low engine oil pressure gauge indication	6
Excessive engine oil consumption	7
<b>B. Transmission</b>	
Noisy when operating	1
Transmission temperature gauge or high transmission temp light indicates overheating during normal operation	2
Transmission will not shift into gear or shift out of gear (check trans light on)	3
<b>C. Wheels</b>	
Wheel wobbles	1
<b>D. Steering</b>	

*Table 1. Symptom Index - Continued.*

Troubleshooting Procedure	Item No.
Vehicle shimmies, wanders, or pulls to one side	1
Vehicle is hard to steer or steering is slow to respond or intermittent	2
<b>E. Air System</b>	
Low air buzzer sounds and low air indicator lights are on	1
Trailer brakes do not apply when service brake pedal or parking brake is used	2
<b>F. Electrical</b>	
No electrical circuits operate	1
Voltmeter reads less than 26 volts	2
Windshield washer will not operate	3
One or more lighting circuits not operating	4
<b>G. Self Recovery Winch</b>	
Self recovery winch does not operate	1
Self recovery winch unusually noisy when operating	2
<b>H. CTIS</b>	
CTIS controller has failed and driveline lock is necessary to continue operation of vehicle	1
CTIS shutdown and tires need to be inflated/deflated	2

END OF WORK PACKAGE

**1ST ECHELON MAINTENANCE  
TROUBLESHOOTING TABLE****TROUBLESHOOTING TABLE**

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
<b>ENGINE</b>	
1. ENGINE FAILS TO CRANK WHEN IGNITION SWITCH IS TURNED TO START POSITION .....	<ol style="list-style-type: none"><li>1. Check that instrument panel lights illuminate with ignition switch on. If instrument panel lights do not illuminate, check battery disconnect switch.</li><li>2. Check for tripped circuit breakers (refer to Resetting Circuit Breakers (WP 0104)). If tripped, reset. If circuit breakers trip again, notify Second Echelon Maintenance.</li><li>3. Check that transmission range selector is switched to N (neutral). If transmission range selector is not in N (neutral), position transmission range selector to N (neutral). Attempt to restart engine.</li></ol>

**WARNING**

Do not wear watches, rings, or other jewelry when servicing batteries which could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes.

## TROUBLESHOOTING TABLE - Continued

Malfunction/SymptomTroubleshooting Procedure**WARNING**

Do not smoke, have open flame, or make sparks near batteries. Batteries can explode causing severe injury or death to personnel.

**WARNING**

Battery acid is harmful to skin and eyes. Wear protective equipment to prevent personal injury or death.

**WARNING**

Avoid electrolyte contact with skin and eyes. Failure to comply may result in injury or death to personnel.

**WARNING**

Wear safety goggles, acid proof gloves, and a rubber apron when performing battery maintenance. Failure to comply may result in injury or death to personnel.

4. Check for dirty battery connectors, and loose or broken battery cables.
  - a. If connections are loose; tighten them.

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
2. ENGINE RUNS ROUGHLY AFTER PROPER WARM-UP, DOES NOT DEVELOP FULL POWER, OR MAKES EXCESSIVE EXHAUST SMOKE .....	<ol style="list-style-type: none"><li>1. Check air filter restriction indicator.<ol style="list-style-type: none"><li>a. If indicator reads below 20, go to Step 2.</li><li>b. If indicator reads 20 or above, reset indicator.</li><li>c. If indicator still reads 20 or above after resetting, notify Second Echelon Maintenance.</li></ol></li><li>b. If battery connections are corroded, clean them (refer to Battery Maintenance (WP 0103)).</li><li>c. If cables are damaged, notify Second Echelon Maintenance.</li></ol>

**WARNING**

Fuel is flammable and can explode. Keep fuel away from open flame 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. Smoking is prohibited while working with fuel.

2. Check fuel/water separator for contamination or water.

If water or contamination is present, drain fuel from sediment bowl until clean fuel flows out.
3. With engine OFF and hood open, check fuel filter and fuel/water separator for damage or leaks.

If fuel filter or fuel/water separator is loose, leaking or damaged, notify Second Echelon Maintenance.
4. Check fuel lines and connections for leaks or damage.

## TROUBLESHOOTING TABLE - Continued

Malfunction/SymptomTroubleshooting Procedure

If hoses are leaking or damaged, notify Second Echelon Maintenance.

5. Engine has air in fuel line.

Prime fuel system (WP 0102). If air cannot be purged from system, notify Second Echelon Maintenance.

3. ENGINE CRANKS BUT FAILS TO START ..... 1. Check for tripped circuit breaker (refer to Resetting Circuit Breakers (WP 0104)). If tripped, reset. If circuit breaker trips again, notify Second Echelon Maintenance.

**WARNING**

Fuel is flammable and can explode. Keep fuel away from open flame 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. Smoking is prohibited while working with fuel.

2. Check indication on FUEL gauge.

If fuel gauge indicates fuel tank is empty, fill fuel tank, prime engine (refer to Priming Fuel System (WP 0102)), and attempt to restart engine.

3. Visually check fuel level in fuel tank.

If level of fuel does not equal level indicated by fuel gauge, notify Second Echelon Maintenance.

4. Reset and check air filter restriction indicator.

If indicator shows red after resetting, notify Second Echelon Maintenance.

5. Check fuel/water separator for contamination or water.

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
	<p>If water or contamination is present, drain fuel from sediment bowl until clean fuel flows out. Attempt to restart engine.</p> <p>6. With hood open, check fuel filter and fuel/water separator for damage or leaks.</p>
	<p><b>WARNING</b></p>  <p>Fuel is flammable and can explode. Keep fuel away from open flame 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. Smoking is prohibited while working with fuel.</p>
	<p>a. If fuel filter or fuel/water separator is loose and leaking, notify Second Echelon Maintenance.</p> <p>b. If fuel filter or fuel/water separator is damaged, notify Second Echelon Maintenance.</p> <p>7. Check fuel lines and connections for leaks or damage.</p> <p>If hoses are leaking or damaged, notify Second Echelon Maintenance.</p> <p>8. Engine has air in fuel line.</p> <p>Prime fuel system (WP 0102). If air cannot be purged from system, notify Second Echelon Maintenance.</p> <p>9. If problem still exists, notify Second Echelon Maintenance.</p>
4. ENGINE OVERHEATS .....	<p>1. Check that FAN FORD switch is in the OFF position (down).</p>

## TROUBLESHOOTING TABLE - Continued

Malfunction/SymptomTroubleshooting Procedure**WARNING**

Cooling system components are very hot and pressurized during vehicle operation. Let cooling system cool before checking hoses. Failure to comply may result in serious burns.

2. With engine OFF and hood open, check coolant level in coolant overflow reservoir.
  - a. If coolant level is low, add coolant (refer to Expendable/Durable Supplies List) to overflow reservoir until level is at COLD mark.
  - b. If coolant overflow reservoir is empty, notify Second Echelon Maintenance.
3. Check if radiator cooling fins, charge air cooler fins, and hood grill are obstructed (leaves, paper, etc.).  
If obstructed, clear obstruction.
4. Check surge tank, radiator hoses, clamps, and radiator for leaks.  
If surge tank, radiator, or hoses leak, notify Second Echelon Maintenance.
5. If problem still exists, notify Second Echelon Maintenance.

5. ENGINE SHUTS DOWN WHILE RUNNING .....1. Check indication on FUEL gauge.  
If fuel gauge indicates fuel tank is empty, fill fuel tank, prime engine (refer to Priming Engine (WP 0102)), and attempt to restart engine.

2. Visually check fuel level in tank.  
If level of fuel does not equal level indicated by fuel gauge, notify Second Echelon Maintenance.

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
	<p>3. Reset and check air filter restriction indicator.</p> <p>If indicator shows red after resetting, notify Second Echelon Maintenance.</p>
	<p>4. Check fuel/water separator for contamination or water.</p> <p>If water or contamination is present, drain fuel from sediment bowl until clean fuel flows out. Attempt to restart engine. If engine fails to restart, notify Second Echelon Maintenance.</p>
6. EXCESSIVE ENGINE OIL CONSUMPTION .....	<p>1. Check underneath vehicle for Class III leaks.</p> <p>If Class III leaks are found, notify Second Echelon Maintenance.</p>
	<p>2. If problem still exists, notify Second Echelon Maintenance.</p>
7. LOW ENGINE OIL PRESSURE GAUGE INDICATION ...	<p>1. With engine OFF and hood open, check engine oil level (refer to PMCS Table (WP 0092)).</p> <p>If engine oil level is low, add oil as required.</p>
	<p>2. With engine OFF and hood open, check engine oil level (refer to PMCS Table (WP 0093)).</p> <p>If engine oil level is low, add oil as required.</p>
	<p>3. Check under vehicle for Class III leaks.</p> <p>If Class III leaks are found, notify Second Echelon Maintenance.</p>
	<p>4. If problem still exists, notify Second Echelon Maintenance.</p>
<b>TRANSMISSION</b>	
8. TRANSMISSION TEMPERATURE GAUGE OR HIGH TRANSMISSION TEMP LIGHT INDICATES OVERHEATING DURING NORMAL OPERATION .....	<p>1. Check transmission fluid level (refer to PMCS Table (WP 0092)).</p> <p>a. If transmission fluid level is low add necessary amount of oil.</p>

## TROUBLESHOOTING TABLE - Continued

Malfunction/SymptomTroubleshooting Procedure

- b. If fluid level is high, notify Second Echelon Maintenance.
- 2. Check transmission fluid level (refer to PMCS Table (WP 0093)).
  - a. If transmission fluid level is low add necessary amount of oil.
  - b. If fluid level is high, notify Second Echelon Maintenance.
- 3. Check that FAN FORD switch is in OFF position (down).

**WARNING**

Cooling system components are very hot and pressurized during vehicle operation. Let cooling system cool before checking hoses. Failure to comply may result in serious burns.

- 4. With engine OFF and hood open, check coolant level in coolant overflow reservoir.
  - a. If coolant level is low, add coolant (refer to Expendable/Durable Supplies List) to overflow reservoir until level is at COLD mark.
  - b. If coolant overflow reservoir is empty, notify Second Echelon Maintenance.
- 5. Check if radiator cooling fins, charge air cooler fins, and hood grill are obstructed (leaves, paper, etc.).
 

If obstructed, clear obstruction.
- 6. Check radiator hoses, clamps, and radiator for leaks.
  - a. Tighten loose hose clamps.
  - b. If radiator or hoses leak, notify Second Echelon Maintenance.
- 7. If problem still exists, notify Second Echelon Maintenance.

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
9. TRANSMISSION WILL NOT SHIFT INTO GEAR OR SHIFT OUT OF GEAR (CHECK TRANS LIGHT ON) .....	<p><b>NOTE</b></p> <p>When transmission oil is below 19°F (-7°C), the only gears available are reverse (R), neutral (N), and 3rd gear when drive (D) is selected. Remaining gears in drive (D) will not be available until oil in sump warms above 19°F (-7°C).</p> <ol style="list-style-type: none"><li>1. If CHECK TRANS light comes on when operating vehicle, apply service brakes, stop vehicle, do NOT shift into N (neutral), and perform the following Transmission Limp Home procedure.<ol style="list-style-type: none"><li>a. Select R (reverse) on the transmission range selector and note if the vehicle does shift.</li><li>b. If vehicle does shift into R (reverse), set transmission range selector to appropriate position, continue with mission, and notify Second Echelon Maintenance when mission is completed.</li><li>c. If vehicle does not shift into R (reverse), the transmission may be locked into a specific gear and may not come out of that gear until the engine is turned OFF. The operator must be aware that once the engine is turned OFF, the vehicle will not be operable until the problem is corrected.</li></ol></li><li>d. No additional damage to the transmission will occur, so the operator can continue to operate the vehicle in the limp home mode and complete the mission.</li></ol>

**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.

## TROUBLESHOOTING TABLE - Continued

Malfunction/SymptomTroubleshooting Procedure

However, the operator must be aware of a few guidelines.

- (1) The engine must not be turned OFF until the operator deadlines the vehicle. Once the engine is turned OFF the vehicle will not be operable until the problem is corrected.
- (2) 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 the vehicle is deadlined.
- (3) The vehicle will not be able to operate in reverse.
- (4) Depending on the gear the transmission is locked into, the vehicle may not be able to drive up steep grades.
- (5) The brakes may need to be applied slightly earlier than normal when stopping the vehicle.
- (6) Depending upon the gear the transmission is locked into and the terrain the vehicle is operating in, the engine or transmission may overheat. The operator must closely monitor the Water Temperature Gauge and the Transmission Oil Temperature Gauge.

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
	<b>CAUTION</b> If overheating occurs when operating in the transmission limp home mode, the operator should stop the vehicle (do not turn off the engine), 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 turn off the engine and notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.
	(7) Once vehicle is deadlined, the operator must notify Second Echelon Maintenance.
	2. If CHECK TRANS light remains on after startup, prior to operating vehicle, stop engine, wait 15 seconds, and restart engine. a. If CHECK TRANS light does not stay on, the fault has cleared and the vehicle can be operated normally. Notify Second Echelon Maintenance at earliest opportunity. b. If CHECK TRANS light comes on and remains on after second startup, turn off engine, do not operate vehicle, and notify Second Echelon Maintenance.
	3. If problem still exists, notify Second Echelon Maintenance.
10. NOISY WHEN OPERATING .....	1. Check transmission fluid level (refer to PMCS Table (WP 0092)). a. If transmission fluid level is low add necessary amount of oil. b. If fluid level is high, notify Second Echelon Maintenance.

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
	<ol style="list-style-type: none"> <li>2. Check transmission fluid level (refer to PMCS Table (WP 0093)).             <ol style="list-style-type: none"> <li>a. If transmission fluid level is low add necessary amount of oil.</li> <li>b. If fluid level is high, notify Second Echelon Maintenance.</li> </ol> </li> <li>3. If problem still exists, notify Second Echelon Maintenance.</li> </ol>
<b>WHEELS</b>	
11. WHEEL WOBBLES .....	<ol style="list-style-type: none"> <li>1. Check wheels for loose, missing, or broken lugnuts.             <p style="margin-left: 20px;">Tighten loose lugnuts and notify Second Echelon Maintenance to have lugnuts tightened to proper torque requirements.</p> </li> <li>2. Check tires for bulges and visually inspect for bent wheel.             <p style="margin-left: 20px;">If wheel is bent or tire has bulges, notify Second Echelon Maintenance.</p> </li> <li>3. If problem still exists, notify Second Echelon Maintenance.</li> </ol>
<b>STEERING</b>	
12. VEHICLE SHIMMIES, WANDERS, OR PULLS TO ONE SIDE .....	<ol style="list-style-type: none"> <li>1. Check wheels for loose, missing, or broken lugnuts.             <p style="margin-left: 20px;">Tighten loose lugnuts and notify Second Echelon Maintenance to have lugnuts tightened to proper torque requirements.</p> </li> <li>2. Check for obvious damage to steering components.             <p style="margin-left: 20px;">If steering components are damaged, notify Second Echelon Maintenance.</p> </li> <li>3. Check tires for proper pressure.             <p style="margin-left: 20px;">If tire pressure is not correct, adjust tire to proper pressure (refer to Tire Pressures (WP</p> </li> </ol>

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
	0043, General) and Tire Inflate/Deflate (WP 0101)).
13. VEHICLE IS HARD TO STEER OR STEERING IS SLOW TO RESPOND OR INTERMITTENT .....	<ol style="list-style-type: none"> <li>4. Check CTIS for proper operation. If CTIS is not operating properly, notify Second Echelon Maintenance.</li> <li>5. If problem still exists, notify Second Echelon Maintenance.</li> </ol> <p>1. Check steering hydraulic reservoir fluid level. If fluid level is low, notify Second Echelon Maintenance.</p> <p>2. Check for loose or leaking steering hydraulic connections and damaged steering hydraulic lines. If lines are loose or damaged, notify Second Echelon Maintenance.</p> <p>3. Check tires for proper pressure. If tire pressure is not correct, adjust tire to proper pressure (refer to Tire Pressures (WP 0043, General) and Tire Inflate/Deflate (WP 0101)).</p> <p>4. If problem still exists, notify Second Echelon Maintenance.</p>
14. LOW AIR BUZZER SOUNDS AND LOW AIR INDICATOR LIGHTS ARE ON .....	<ol style="list-style-type: none"> <li>1. Check air pressure gauges.             <ol style="list-style-type: none"> <li>a. If red and green needles show 75 psi (517 kPa) or more, but buzzer and lights are still on, notify Second Echelon Maintenance.</li> <li>b. If red and green needles show below 75 psi (517 kPa) and does not build up after several minutes, go to Step 2.</li> </ol> </li> <li>2. Check that TRAILER AIR SUPPLY control is pulled out (OFF position). Pull out TRAILER AIR SUPPLY control.</li> </ol>

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
	<p>3. Check that all air reservoir drain valves are closed. Close all drain valves.</p>
15. TRAILER BRAKES DO NOT APPLY WHEN SERVICE BRAKE PEDAL OR PARKING BRAKE IS USED ....	<p>4. Check for leaks at hoses, lines, fittings, and connectors. If leaks are found, tighten connections and fittings and notify Second Echelon Maintenance.</p> <p>5. If problem still exists, notify Second Echelon Maintenance. Check to make sure that service and emergency air hoses are securely and correctly connected.</p> <p>a. Connect air hoses. b. If problem continues, notify Second Echelon Maintenance.</p>
16. NO ELECTRICAL CIRCUITS OPERATE .....	<p>1. Make sure that battery disconnect switch is in the ON position.</p>

## ELECTRICAL

16. NO ELECTRICAL CIRCUITS OPERATE ..... 1. Make sure that battery disconnect switch is in the ON position.

## WARNING



Do not wear watches, rings, or other jewelry when servicing batteries which could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes.

## TROUBLESHOOTING TABLE - Continued

Malfunction/SymptomTroubleshooting Procedure**WARNING**

Do not smoke, have open flame, or make sparks near batteries. Batteries can explode causing severe injury or death to personnel.

**WARNING**

Avoid electrolyte contact with skin and eyes. Failure to comply may result in injury or death to personnel.

**WARNING**

Wear safety goggles, acid proof gloves, and a rubber apron when performing battery maintenance. Failure to comply may result in injury or death to personnel.

2. With battery box cover removed, check batteries for dirty connections and loose or broken battery cables.
  - a. If battery connections are corroded, clean them (refer to Battery Maintenance (WP 0103)).
  - b. If battery cables are loose, tighten them.
  - c. If battery cables are damaged, notify Second Echelon Maintenance.
3. Check for tripped circuit breakers (refer to Resetting Circuit Breakers)

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
17. ONE OR MORE LIGHTING CIRCUITS NOT OPERATING .....	<p>(WP 0104)). If tripped, reset. If circuit breakers trip again, notify Second Echelon Maintenance.</p> <p>4. If problem still exists, notify Second Echelon Maintenance.</p>
18. VOLTMETER READS LESS THAN 26 VOLTS .....	<p><b>NOTE</b></p> <p>Blackout select switch must be in OFF position. When operating service lights, refer to (WP 0028).</p> <p>1. Check to make sure lighting system controls are in ON or operating position.</p> <p>If lighting system controls are OFF, turn to ON position.</p> <p>2. Check for tripped lighting circuit breakers 5 and 22.</p> <p>If tripped, reset (refer to Resetting Circuit Breakers) (WP 0104). If circuit breaker trips again, notify Second Echelon Maintenance.</p> <p>3. If trailer is attached and trailer lighting system is not working, check intervehicular connection.</p> <p>If cable connector is loose, reconnect cable connector.</p> <p>4. If problem still exists, notify Second Echelon Maintenance.</p> <p>1. Check for tripped ALTERNATOR circuit breaker 11 (refer to Resetting Circuit Breakers (WP 0104)). If tripped, reset. If circuit breaker trips again, notify Second Echelon Maintenance.</p>

## TROUBLESHOOTING TABLE - Continued

Malfunction/SymptomTroubleshooting Procedure**WARNING**

Do not wear watches, rings, or other jewelry when servicing batteries which could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes.

**WARNING**

Do not smoke, have open flame, or make sparks near batteries. Batteries can explode causing severe injury or death to personnel.

**WARNING**

Avoid electrolyte contact with skin and eyes. Failure to comply may result in injury or death to personnel.

**WARNING**

Wear safety goggles, acid proof gloves, and a rubber apron when performing battery maintenance. Failure to comply may result in injury or death to personnel.

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
	<ol style="list-style-type: none"> <li>2. With battery box cover removed, check batteries for dirty connections and loose or broken battery cables.             <ol style="list-style-type: none"> <li>a. If battery connections are corroded, clean them (refer to Battery Maintenance (WP 0103)).</li> <li>b. If battery cables are loose, tighten them.</li> <li>c. If battery cables are damaged, notify Second Echelon Maintenance.</li> </ol> </li> <li>3. Check for tripped circuit breakers (refer to Resetting Circuit Breakers (WP 0104)).              If tripped, rest. If circuit breaker trips again, notify Second Echelon Maintenance.         </li> <li>4. If problem still exists, notify Second Echelon Maintenance.</li> </ol>
19. WINDSHIELD WASHER WILL NOT OPERATE .....	<ol style="list-style-type: none"> <li>1. Check washer fluid level in reservoir.</li> </ol>

**WARNING**

Engine components become extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in serious injury to personnel.

- If fluid is low, fill reservoir with fluid (refer to Expendable/Durable Supplies List).
2. If washers do not operate, or if only one washer operates, check that hoses are securely connected.
   
Tighten any loose connections.
3. If problem still exists, notify Second Echelon Maintenance.

## TROUBLESHOOTING TABLE - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
<b>SELF RECOVERY WINCH</b>	
20. SELF RECOVERY WINCH DOES NOT OPERATE .....	<p><b>NOTE</b></p> <p>For more information on the self recovery winch, refer to Self Recover Winch (WP 0044).</p> <ol style="list-style-type: none"><li>1. Check to make sure WINCH ON/OFF switch is ON and MODE button is activated/illuminated.<ol style="list-style-type: none"><li>a. If winch ON/OFF switch is in OFF position, turn ON.</li><li>b. If MODE button indicator is not illuminated, push to activate it.</li></ol></li><li>2. Check for tripped circuit breaker 1. If tripped, reset (refer to Resetting Circuit Breakers) (WP 0104). If circuit breaker trips again, notify Second Echelon Maintenance.</li><li>3. Check for low hydraulic oil level. If oil level is low, add oil until level is acceptable.</li><li>4. Make sure winch shift lever is placed in engaged position. If lever is not engaged, engage it. If SRW winch still does not operate, notify Second Echelon Maintenance.</li></ol>
21. SELF RECOVERY WINCH UNUSUALLY NOISY WHEN OPERATING .....	<p><b>WARNING</b></p> <p>Keep all personnel away from self recovery winch cable during self recovery winch operation. Failure to comply may result in injury or death to personnel.</p>

## TROUBLESHOOTING TABLE - Continued

Malfunction/SymptomTroubleshooting Procedure**WARNING**

Cable is under tension when wrapped around self-recovery winch drum. Keep hands away from drum when operating winch. Failure to comply may result in injury or death to personnel.

1. Check to make sure cable is not twisted, tangled, or causing drum to bind.  
Pay out or take up cable as necessary to straighten cable.
2. Check for low hydraulic fluid level.
  - a. If fluid level is low, add oil until level is between upper and lower marks in sight gauge (refer to PMCS Table (WP 0092)).
  - b. If fluid level is low, add oil until level is between upper and lower marks in sight gauge (refer to PMCS Table (WP 0093)).
3. If problem still exists, notify Second Echelon Maintenance.

**CTIS**

22. CTIS CONTROLLER HAS FAILED AND  
DRIVELINE LOCK IS NECESSARY TO CONTINUE  
OPERATION OF VEHICLE .....

**NOTE**

For more information on the CTIS operation/troubleshooting, refer to Central Tire Inflation (WP 0043).

Refer to MANUAL DRIVELINE LOCK (WP 0082).

23. CTIS SHUTDOWN AND TIRES NEED TO BE  
INFLATED/DEFLATED .....

Refer to TIRE INFLATE/DEFLATE (WP 0101).

**END OF WORK PACKAGE**

## CHAPTER 7

### PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

## 1ST ECHELON MAINTENANCE INTRODUCTION

### General

This paragraph contains the operator PMCS requirements for the 7-Ton Truck. The PMCS table contains checks and services necessary to ensure that the 7-Ton Truck is ready for operation. Using the PMCS table and Lubrication Instruction (WP 0111), perform the maintenance at the specified intervals.

### Use of the PMCS Table

**Interval Column.** This column describes when and how often the checks are to be made. Pay close attention to all CAUTIONS and WARNINGS. Checks and services given in PMCS Table (WP 0093) are for normal operation. Extreme weather conditions, periods of high use, or combat conditions may dictate that the PMCS is performed more often than is mentioned in the PMCS table.

**Interval Column.** This column describes when and how often the checks are to be made. Pay close attention to all CAUTIONS and WARNINGS. Checks and services given in PMCS Table (WP 0092) are for normal operation. Extreme weather conditions, periods of high use, or combat conditions may dictate that the PMCS is performed more often than is mentioned in the PMCS table.

**B (Before):** Perform your BEFORE (B) PMCS just before you operate the vehicle and/or its components.

**D (During):** Perform your DURING (D) PMCS while the vehicle and/or its components are in operation.

**A (After):** Perform your AFTER (A) PMCS right after operating the vehicle and/or its components.

**M (Monthly):** Perform your MONTHLY (M) PMCS on a monthly basis. Perform all B and A PMCS tasks when performing monthly checks.

**Equipment Not Ready/Available if: Column.** This column contains the criteria that causes the equipment to be classified as not ready/not available because of the inability to perform its primary mission. If severity of the problem is such that the operator thinks the vehicle cannot be operated, the operator should contact their NCOIC.

**Item to be Checked or Serviced Column.** This column lists specific items to be checked and a brief description of the procedure by which the check is to be performed.

If a component does not pass PMCS inspection, troubleshoot it with the instructions in this manual (refer to Troubleshooting (WP 0090)), and notify your NCOIC.

Always perform your PMCS in the same order.

If you find a problem that is beyond your echelon of repair, report the problem to Second Echelon Maintenance.

### General Maintenance Procedures

**Cleanliness.** Dirt, grease, oil, and debris get in the way and may cover up a serious problem. Always perform PMCS on a clean vehicle.

**Nuts and Screws.** Check for obvious looseness or missing, bent, or broken condition. You cannot check them all with a tool, but look for chipped paint, bare metal, or rust around screwheads. If you find one you think is loose, tighten it or report it to Second Echelon Maintenance or your NCOIC.

### General Maintenance Procedures - Continued

**Welds.** Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to Second Echelon Maintenance or your NCOIC.

**Electric Wires and Connectors.** Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors, and make sure the wires are in good shape. If you find a bad wire or connector, report it to Second Echelon Maintenance or your NCOIC.

**Fluid Lines and Fittings.** Look for wear, damage, or leaks and make sure clamps and fittings are tight. Wet spots show leaks but a stain around a fitting or connector can also mean a leak. If a leak comes from a loose fitting or connector, tighten it. If any part is broken or worn out, report it to Second Echelon Maintenance or your NCOIC. To classify leaks, refer to Fluid Leakage section (Fluid Leakage).

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

Inspect BII IAW MCO P4400.150\_. More frequent BII inspections may be required depending on usage and unit SOP.

**Corrosion Control.** Corrosion control maintenance is a requirement of the 7-Ton Truck. WHILE PERFORMING YOUR PMCS, look for and always be aware of rust, paint peeling, blistering, and damage that can cause corrosion, or other signs of corrosion. Inspect the entire vehicle as well as the specific areas mentioned in PMCS Table (WP 0093). Also look for and be aware of missing or damaged corrosion preventive compounds. Report problem areas as soon as possible to Second Echelon Maintenance or your NCOIC. Having problem areas corrected as soon as possible will maximize the life of the 7-Ton Truck.

**Corrosion Control.** Corrosion control maintenance is a requirement of the 7-Ton Truck. WHILE PERFORMING YOUR PMCS, look for and always be aware of rust, paint peeling, blistering, and damage that can cause corrosion, or other signs of corrosion. Inspect the entire vehicle as well as the specific areas mentioned in PMCS Table (WP 0092). Also look for and be aware of missing or damaged corrosion preventive compounds. Report problem areas as soon as possible to Second Echelon Maintenance or your NCOIC. Having problem areas corrected as soon as possible will maximize the life of the 7-Ton Truck.

Appearance and color of corrosion is dependent on the metal/components involved. The following information will aid in the visual detection of corrosion.

**Table 1. Visual Detection of Corrosion.**

Metal/Component	Corrosion Appearance
Steel	Powdery Reddish Brown Film
Aluminum	Powdery White Film
Brass	Green Film
Electrical Connection	Green Film

### Fluid Leakage

The following are definitions of the types/classes of leakage for determining the status of fluid systems. Become familiar with them, and remember – **WHEN IN DOUBT, NOTIFY YOUR NCOIC.**

## Fluid Leakage - Continued

### Class I

Seepage of fluid 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 fall from item being checked/inspected.

### Class III

Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

## PMCS Preparation and PMCS Table

### NOTE

Prior to performing PMCS tasks, clean components as required.

Ensure vehicle is on a hard level surface, park vehicle (WP 0034) and shut engine OFF (WP 0035).

Open hood on vehicle (WP 0039).

### NOTE

Vehicles equipped with cab armor do not have fender splash guard installed.

Remove fender splash guard (1) by lifting splash guard out of mounting brackets (2). Inspect splash guard for damage and serviceability.

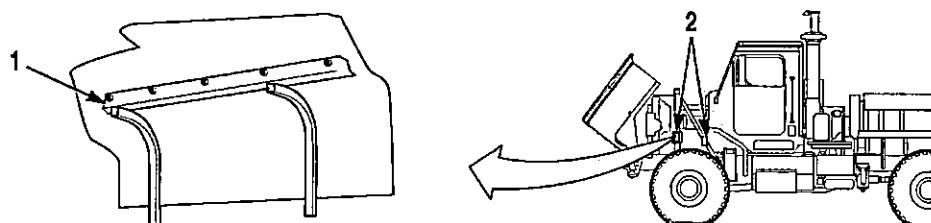


Figure 1.

Proceed to Preventive Maintenance Checks and Services (WP 0092).

Proceed to Preventive Maintenance Checks and Services (WP 0093).

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
PMCS TABLE**

**INITIAL SETUP:**

Not Applicable

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25).**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:		
			<b>NOTE</b>			
			<p>These checks are to be made in the order listed, within designated interval.</p>			
1	Before Operation	CAB AND HOOD EXTERIOR	<p>1. Inspect for broken, cracked, or loose mirrors (1).</p> <p>2. Check under vehicle for fuel, oil, transmission fluid, or coolant leakage.</p>	<p>Any mirror is missing or unusable.</p> <p>Any fuel leak or class III oil or coolant leak.</p>		
			Figure 1.			
2	Before Operation	FUEL TANK	<p style="text-align: center;"><b>WARNING</b></p> <p>Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.</p>			

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>CAUTION</b></p> <p>Do not fill fuel tank above full-level line on outside tank, or fuel spillage will occur. Failure to comply may cause damage to equipment.</p> <p>1. Check that strainer (1) is in place and clean. Ensure fuel cap (2) is securely tightened.</p>	Fuel cap is missing.
3	Before Operation	FUEL/WATER SEPARATOR	<p><b>WARNING</b></p> <p>Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.</p> <p><b>NOTE</b></p> <p>A flashlight may be required to perform the following check.</p> <p>Check sediment bowl (1) for water. If water is present, drain fuel from bowl into suitable container until clean fuel flows out. To drain fuel from sediment bowl, open drain valve (2) until water and contaminated fuel are allowed to drain from sediment bowl. Close drain valve (2) once all water and contaminated fuel is drained from sediment bowl.</p>	

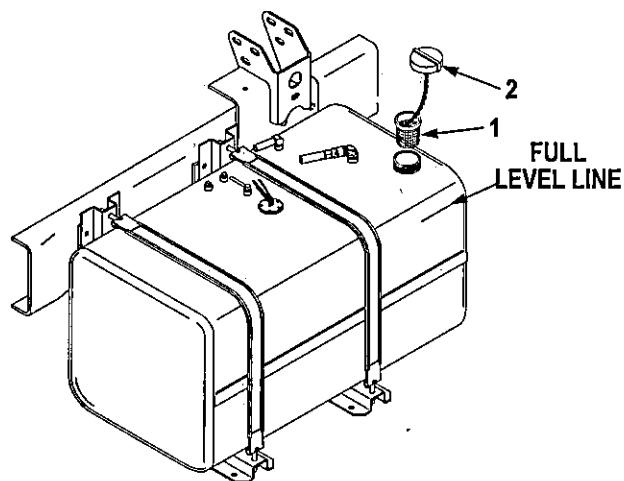
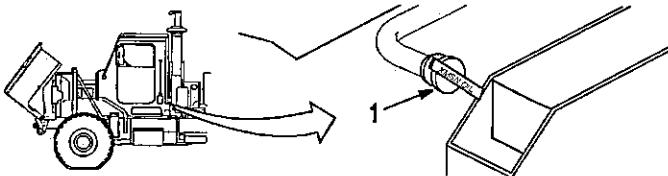


Figure 2.

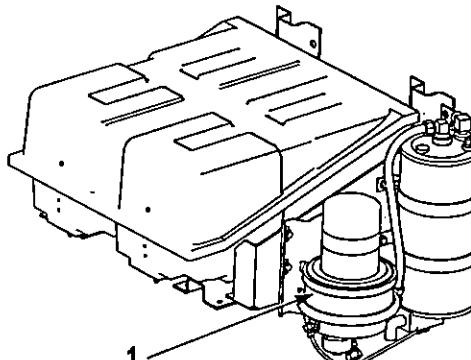
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
4	Before Operation	TRANSMISSION FLUID	<p><b>WARNING</b></p>  <p>Failure to take the following precautions will lead to sudden, unexpected vehicle movement. Whenever checking fluid level, the transmission range selector must be in N (neutral), the parking brake must be set, and the wheels must be chocked. Failure to comply may result in serious injury or death to personnel.</p> <p><b>CAUTION</b></p> <p>Do not permit dirt, dust, or grit to enter transmission filler tube. Thoroughly clean dipstick handle and end of filler tube. Serious internal transmission damage can result if transmission is contaminated.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>If the transmission oil temperature is between 160° and 250°F (71° and 121°C), go directly to the HOT CHECK procedure. If there is evidence of transmission oil leakage, contact Second Echelon Maintenance. If the transmission oil temperature is less than 160°F (71°C), go to the next step, COLD CHECK procedure.</li> </ul>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<ul style="list-style-type: none"> <li>The Cold Check determines if the transmission has enough fluid to be operated safely until a HOT CHECK can be made.</li> </ul> <ol style="list-style-type: none"> <li>If the engine has been shutdown for an extended time, park the vehicle on a level surface and apply the parking brake.</li> <li>Start engine (WP 0029) and idle at (500 to 800 rpm) in N (neutral) for about one minute. Shift to D (drive) and then to R (reverse) to clear the hydraulic circuits of air. Shift to N (neutral) and leave engine at idle.</li> <li>Remove transmission dipstick (1) (WP 0107).</li> </ol> <p><b>CAUTION</b></p> <p>If transmission fluid is too high and needs to be drained, notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <ol style="list-style-type: none"> <li>After wiping the transmission dipstick (1) clean, check the fluid level. If the fluid on the dipstick is within the COLD RUN band, the level is satisfactory. If the fluid level is not within this band, add fluid as necessary to bring the level within the COLD RUN band. (Refer to Lubrication Instruction) (WP 0111)</li> </ol>	Transmission fluid level is too high.
				Figure 4.
5	Before Operation	AIR DRYER AND AFTERCOOLER	<ol style="list-style-type: none"> <li>Install transmission dipstick (WP 0107) (1).</li> <li>Perform a Hot Check at the first opportunity after normal operating temperature (160° to 200°F [71° to 93°C]) is reached.</li> </ol>	Air dryer does not purge.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
6	Before Operation	AIR SYSTEM	<p><b>NOTE</b></p> <p>Low air lights must go out prior to performing air reservoir checks.</p> <ol style="list-style-type: none"> <li>1. Shut engine OFF (WP 0035).</li> <li>2. With engine off, listen for leaks at all reservoirs and air reservoir lines.</li> </ol>	Any air reservoir leakage present.
7	Before Operation	TIRES	<ol style="list-style-type: none"> <li>1. Check tires (1) for cuts, gouges, cracks, or other damage.</li> <li>2. Check torque seal (2) on lugnuts (3) and axle studs (4) for cracked, missing, or loose torque seal.</li> </ol>	<p>Any tire that has wear or damage that allows ply or belt material to be exposed through the tread or sidewall. Any tire that has tread or sidewall separation. Any tire that is flat or has an audible leak.</p> <p>Two or more nuts or studs on the same wheel are missing, broken, or bent. Torque seal on nuts or studs cracked, missing or loose.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
8	Before Operation	CARGO BODY AND ISO LOCKS	<p>1. Check ladder (1) for damage and ensure ladder is properly secured.</p> <p>2. Check tailgate (2), hinges (3), and T-bolt locking handles (4) for damage and proper operation (WP 0050, Dropside Installation).</p> <p>3. Check tailgate rubber stops (5) for cracks, damage, and serviceability.</p> <p>4. Check storage cover (6) and pin (7) for damage and proper installation.</p>	

Figure 6.

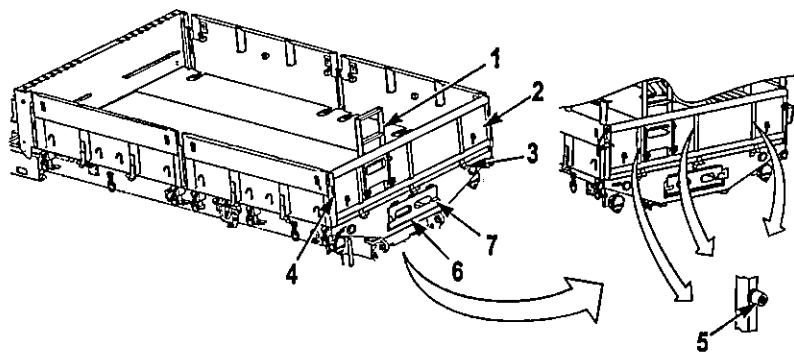
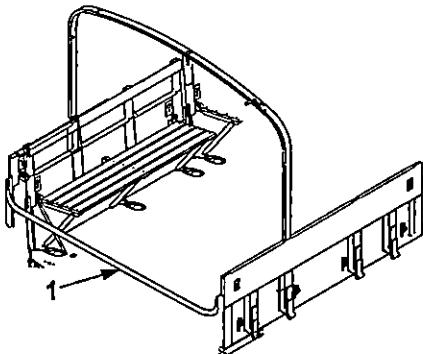
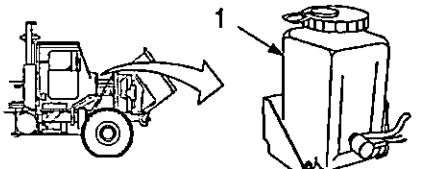


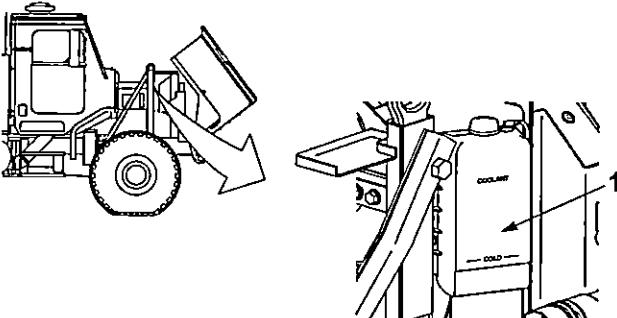
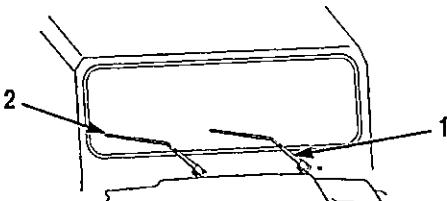
Figure 7.

9	Before Operation	CARGO BODY COVER, TROOP SEATS, BOWS, STAVES, AND BACKRESTS	<p><b>NOTE</b></p> <p>Perform Step (1) only if troop carrying components are installed.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>1. Inspect troop strap (1) for serviceability.</p> 	
10	Before Operation	WINDSHIELD WASHER FLUID BOTTLE	<p>1. Check to ensure there is fluid in windshield washer bottle (1) and that there is no damage to bottle or hoses. Add windshield washer fluid as necessary.</p> 	
11	Before Operation	COOLANT OVERFLOW TANK AND COOLANT LEVEL	<p><b>WARNING</b></p>  <p>Cooling system components become pressurized and extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in injury or death to personnel.</p> <p>1. Check coolant level in coolant overflow tank (1) to ensure it is above the COLD mark. If coolant is below COLD mark, add coolant to bring it up to COLD level (WP 0111).</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
12	Before Operation	WINDSHIELD WIPER ARMS AND BLADES	<p>1. Check windshield wiper arms (1) and blades (2) for damage or wear.</p> 	
13	Before Operation	LIGHTS AND REFLECTORS	<p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>To determine location of switches needed to operate lights for the following checks, refer to Instrument Panel Controls and Indicators (WP 0011).</li> <li>Prior to turning on lights, battery disconnect switch (WP 0013) must be turned on.</li> <li>An assistant is needed to perform the light checks.</li> <li>When light checks are completed, ensure all lights are turned OFF.</li> </ul> <p>1. Position blackout select switch in down position and headlight switch in full up position. Ensure headlights (1) and parking light function (2) of front composite lights (3) illuminate. Ensure marker/clearance lights (4)</p>	Headlights are inoperable.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>illuminate. Operate dimmer switch and ensure headlights (1) change from high beam to low beam and ensure high beam indicator (5) on dash operates properly.</p> <p>2. With headlight switch ON, ensure dash light dimmer (6) switch operates properly in all three positions.</p> <p>3. Operate turn signal lever and ensure turn signal (7) of front composite lights (3) function, and check that top marker light (8) on hood blinks.</p> <p>4. Check front reflectors (9) for damage and serviceability.</p> <p>5. Push in emergency flasher control switch and ensure turn signal (7) of front composite lights (3) blink.</p> <p>6. Position blackout select switch to up position and blackout light switch in full up position, and ensure blackout drive headlights (10) and blackout marker lights (11) of front composite lights (3) illuminate.</p>	

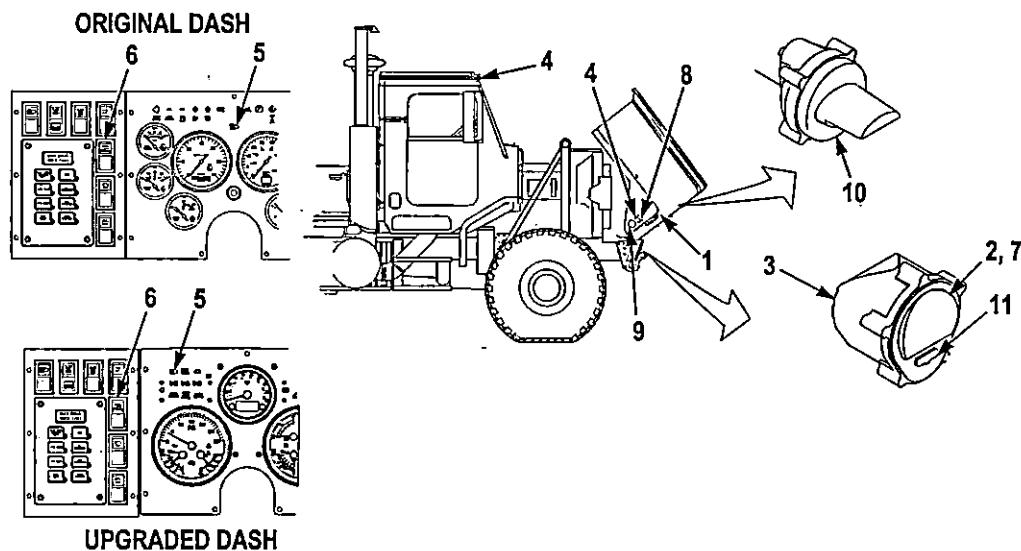


Figure 12.

7. Position blackout select switch in down position and headlight switch in full up position. Ensure parking light function (12) of rear composite lights (13) illuminate. Ensure marker/clearance lights (14) illuminate. Operate service brake pedal and ensure brake light function (15) of rear composite lights (13) illuminate.

Brake lights are inoperable.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>8. Operate turn signal lever and ensure turn signal function (16) of rear composite lights (13) blink.</p> <p>9. Push in emergency flasher control switch and ensure parking light function (12) of rear composite lights (13) blink.</p> <p>10. Position blackout select switch in up position and blackout light switch in full up position, and ensure blackout parking light function (17) of rear composite lights (13) illuminate. Operate service brake pedal and ensure blackout marker brake light function (18) of rear composite lights (13) illuminate.</p> <p>11. Check side and rear reflectors (19) for damage and serviceability.</p>	

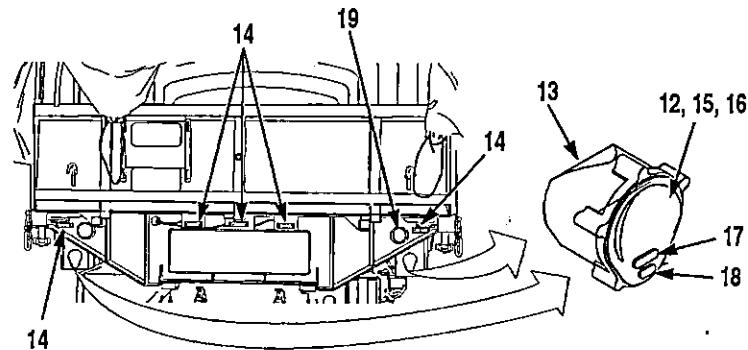


Figure 13.

14	Before Operation	WINDSHIELD AND GLASS	<p><b>CAUTION</b></p> <p>Vehicles equipped with ballistic glass must not have ballistic glass cleaned with solvent or other strong cleaning compounds. Ballistic glass must only be cleaned with a lint-free cloth and a mild solution of warm water and soap. Do not clean ballistic glass in hot temperatures. Avoid contacting ballistic glass with hands or skin. Failure to comply may result in damage to equipment.</p> <p>1. Check for broken or cracked windshield, driver and passenger side windows, and rear window.</p>	Windshield is cracked or broken.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
15	Before Operation	ENGINE OIL	<p><b>CAUTION</b></p> <p>If engine oil needs to be drained, contact Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <p><b>NOTE</b></p> <p>If engine has been running, wait approximately five minutes after engine shutdown before checking engine oil.</p> <ol style="list-style-type: none"> <li>1. Remove engine oil dipstick (WP 0107) (1).</li> <li>2. Check engine oil on dipstick (1). Oil should be between the ADD and FULL mark. Add oil as required (WP 0111).</li> <li>3. Ensure dipstick (1) and fill cap (2) are properly installed (WP 0107).</li> </ol>	Oil level is too high.

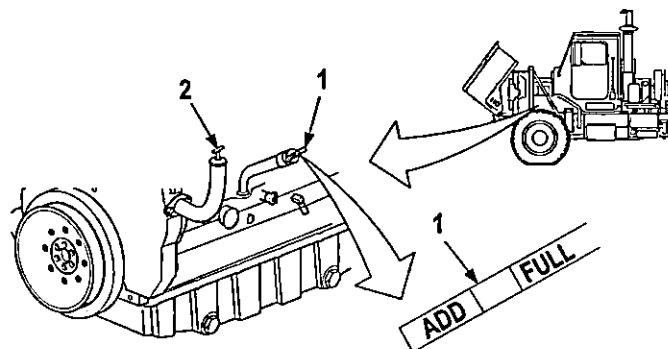


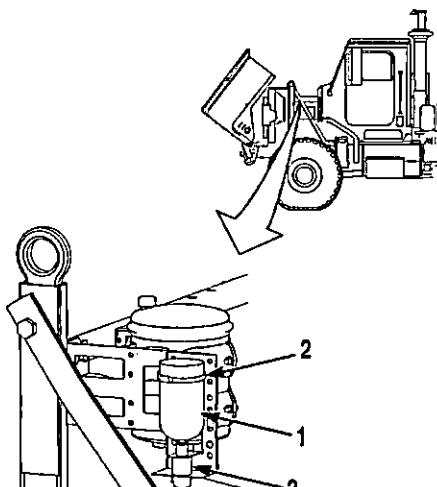
Figure 14.

16	Before Operation	ETHER START SYSTEM	<p><b>WARNING</b></p>  <p>Use care when working around ether canister, ether canister is pressurized and is flammable. Failure to comply may result in injury or death to personnel.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>WARNING</b></p>  <p>Ether canisters are considered hazardous material and must be handled with care and disposed of in accordance with current directives. Failure to comply may result in injury or death to personnel.</p> <p><b>WARNING</b></p>     <p>Ether canister contains diethyl ether with carbon dioxide as a propellant. Keep away from heat and flame. NEVER smoke near contents. Do not incinerate or puncture container. Do not store at temperatures above 120°F (49°C). Avoid contact with skin and eyes. Avoid breathing fumes. Do not store spare containers in driver's compartment. If swallowed, do not induce vomiting. Contact physician immediately. Failure to comply may result in injury or death to personnel.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>When re-installing ether canister, ensure gasket is properly seated in valve.</li> <li>When installing a new ether canister, replace old gasket with new gasket supplied with new canister.</li> </ul> <p>1. When temperature is below 45°F (7°C), check for presence of ether fluid by shaking canister (1). If fluid is present, canister is serviceable. To remove canister, loosen clamp (2) and unscrew canister (1) counterclockwise out of valve (3). Install canister in reverse order.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
17	Before Operation	HYDRAULIC STEERING SYSTEM	<p>1. Check hydraulic steering reservoir (1) for damage or leaks.</p> <p>2. Check hydraulic steering hoses and fittings for damage, leakage, or looseness.</p>	Any Class III hydraulic leak. Any Class III hydraulic leak.

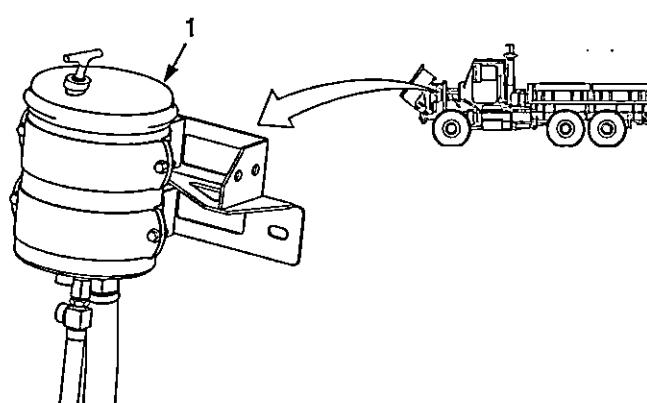


Figure 16.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

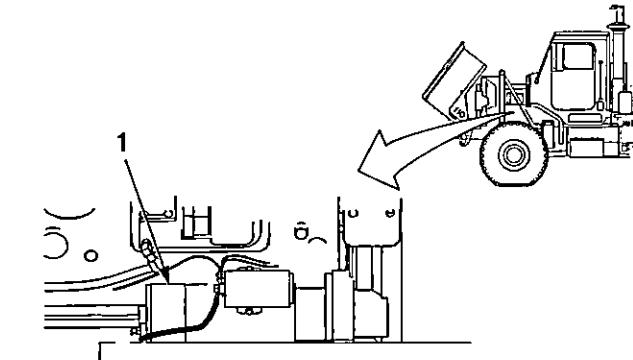
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
18	Before Operation	UNDERCARRIAGE AND FRAME	<p><b>CAUTION</b></p> <p>All guidelines set forth for maintaining corrosion preventive compounds must be adhered to (refer to General Maintenance Procedures (WP 0091)). Failure to follow these guidelines will negatively impact the corrosion control integrity of the vehicle and result in damage to equipment.</p> <p>1. Inspect underside of vehicle for loose or damaged wires.</p>	
19	Before Operation	ENGINE OPERATION	1. Start engine (WP 0029) and check starter (1) for slow operation or unusual noises when cranking.	Starter is noisy or cranks slowly.
				

Figure 17.

20	Before Operation	EXHAUST SYSTEM	<p><b>WARNING</b></p>  <p>During vehicle operation, exhaust system can become very hot. Do not touch exhaust system components with bare hands, or allow your body to come in contact with exhaust system components. Failure to comply may result in serious burns to personnel.</p> <p>1. Check raincap (1) to ensure it is in place and functioning on top of exhaust stack (2).</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

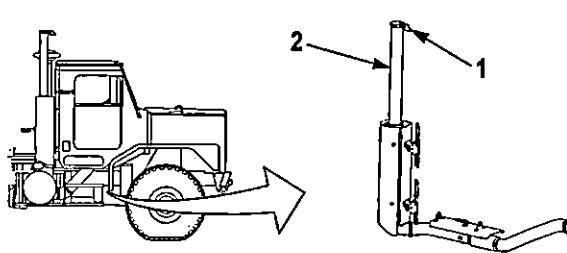
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
21	Before Operation	CAB INTERIOR	<p>1. Check that LOW AIR 1 warning light (1) and LOW AIR 2 warning light (2) indicator lights remain illuminated and warning buzzer sounds until red and green needles on AIR PRESS gauge (3) reach 64 to 76 psi (441 to 524 kPa). (ORIGINAL DASH).</p> <p>2. Check that LOW AIR 1 warning light (5) and LOW AIR 2 warning light (6) remain illuminated until needle on FRONT AIR PRESS gauge (3) and REAR AIR PRESS gauge (3a) reach 64 to 76 psi (441 to 524 kPa) (UPGRADED DASH).</p> <p>3. Check that both needles on AIR PRESS gauge (3) read 100 to 125 psi (690 to 862 kPa) (ORIGINAL DASH).</p> <p>4. Check that the needle on FRONT AIR PRESS gauge (3) and REAR AIR PRESS gauge (3a) read 100 to 125 psi (690 to 862 kPa) (UPGRADED DASH).</p> <p>5. Check to ensure oil pressure gauge (4) indicates safe operating pressure at idle and increases as engine speed does.</p> <p>6. Check to ensure water temperature gauge (5) reads below 220°F (104°C).</p> <p>7. Check to ensure transmission oil temperature gauge (6) reads below 250°F (121°C).</p> <p>8. Check to ensure volt gauge (7) reads between 24 and 30 volts.</p>	<p>Low oil pressure.</p> <p>Water temperature exceeds 220°F (104°C).</p> <p>Transmission oil temperature exceeds 250°F (121°C).</p> <p>Voltage is below 24 volts or above 30 volts.</p>

Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.

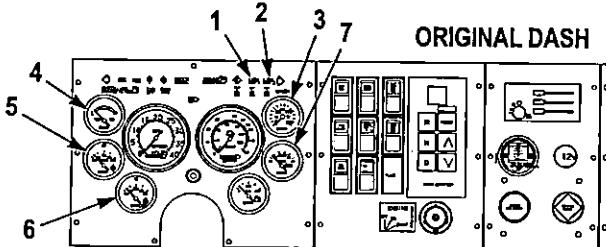
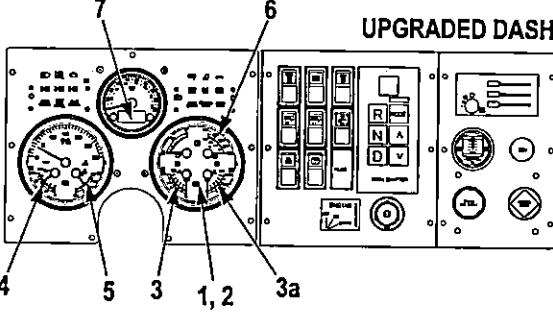
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
				

Figure 19.

9. Check seat belts (8) and buckles (9) for serviceability and proper operation.	Damaged, missing, or inoperable seat belts.
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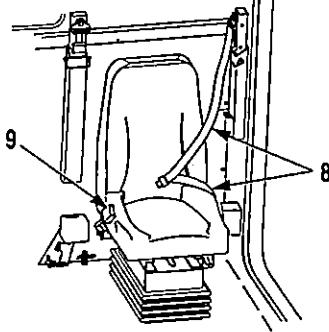


Figure 20.

10. Ensure fuel gauge (10) operates. 11. Check horn button (11) for proper operation. 12. Check to ensure steering wheel (12) controls direction of vehicle.	Steering wheel does not control direction of vehicle.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>NOTE</b></p> <p>With ignition switch off, tachometer will not return to zero. Tachometer will "zero out" and indicate correct rpm when ignition switch is ON and engine is operating.</p> <p>13. Ensure tachometer (13) indicates 600 to 800 rpm with engine idling.</p>	

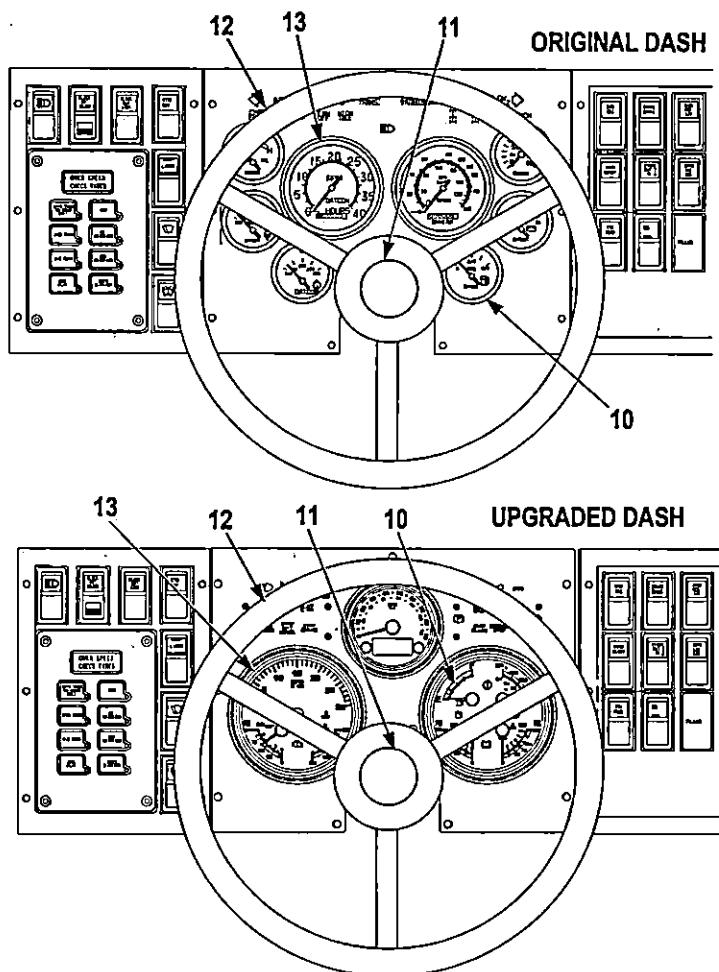


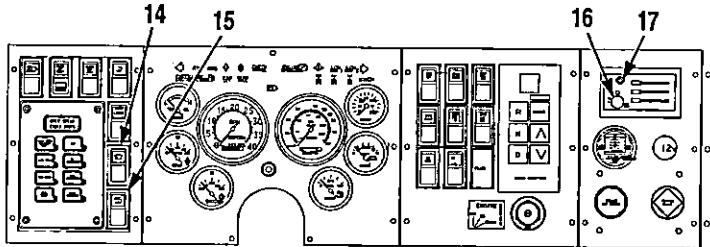
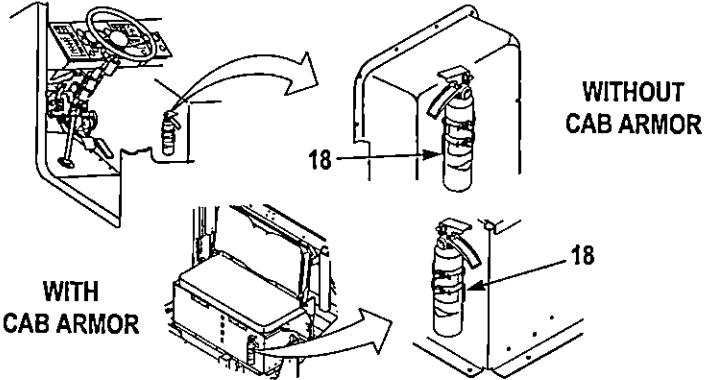
Figure 21.

14. Check windshield wiper control (14) and washer control (15) for proper operation.

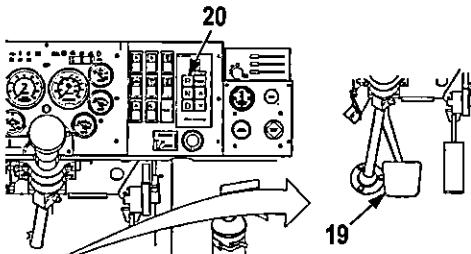
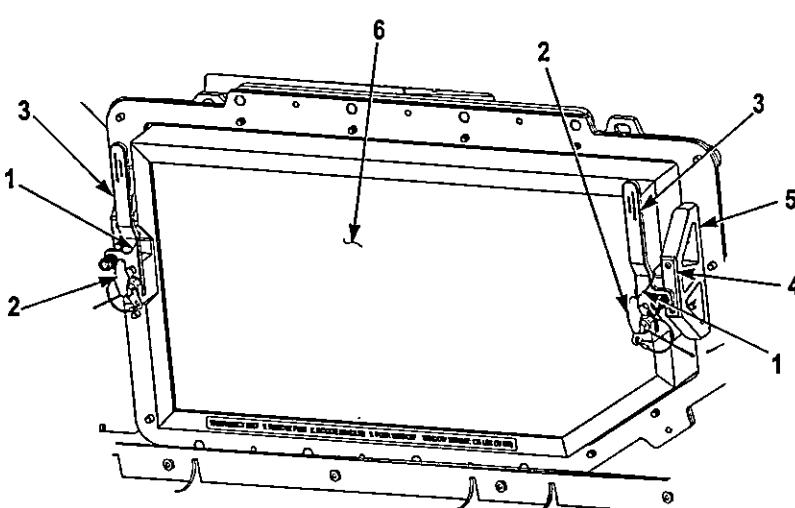
Windshield wipers do not operate.

15. Check fan control (16) for proper fan operation in all settings.

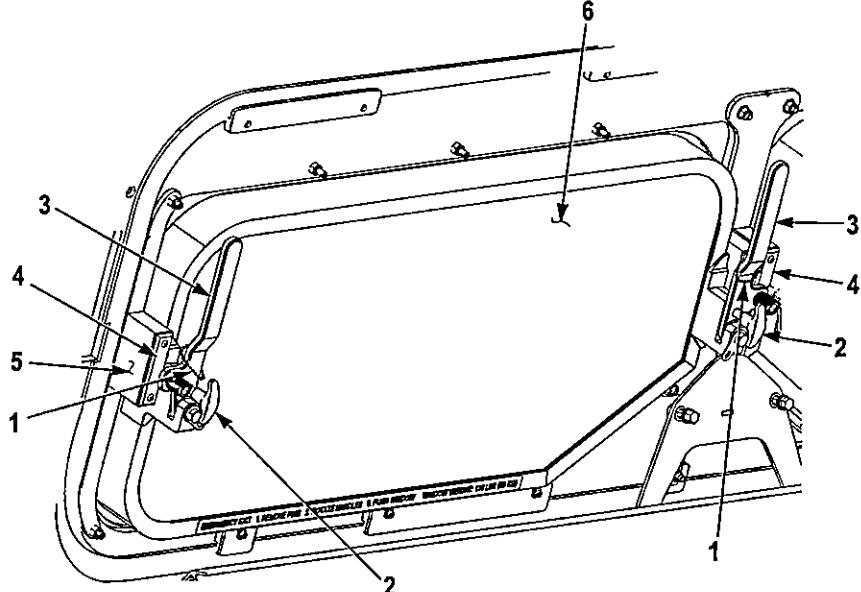
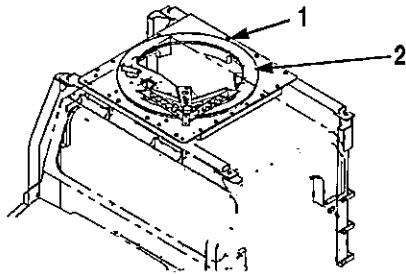
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>16. Check air conditioning control (17) (if equipped) for proper operation. Check for cooler airflow after one minute of operation.</p> 	
			<p>17. Check fire extinguisher (18) for broken or missing seal.</p> <p>18. Check fire extinguisher (18) for proper charge and damage.</p> 	Fire extinguisher not present or properly charged.
			<p>19. Ensure that service brakes engage when brake pedal (19) is pushed.</p> <p>20. Check to ensure back-up alarm and back-up light works when transmission range selector is in R (reverse) (20).</p>	Service brakes do not engage when brake pedal is pushed.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
			Figure 24.	
22	Before Operation	EMERGENCY EGRESS WINDOW (EEW)	<p>21. Shut engine OFF (WP 0035).</p> <p>1. Check for broken beaded security ties (1) and broken, loose, or damaged T-handle pins (2) and handles (3).</p> <p>2. Inspect strike plates (4) and standoff blocks (5) for damage.</p> <p>3. Check armored glass (6) for cracks and degradation.</p> 	
			Figure 25. Reducible.	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
<p>Figure 26. Non-Reducible.</p>				
23	Before Operation	MACHINE GUN MOUNTING KIT (IF EQUIPPED)	<p><b>SPECIAL PURPOSE KITS</b></p> <p>1. Check machine gun mount screws (1) for damage and serviceability.</p> <p>2. Check machine gun mount (2) for damage and serviceability.</p> <p>3. Ensure machine gun mount (2) rotates and locks into position.</p>	Machine gun mount screws are damaged.
				
<p>Figure 27.</p>				

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
24	Before Operation	ARCTIC CARGO KIT (IF EQUIPPED)	1. Ensure guard (1) is free of debris and obstructions.	

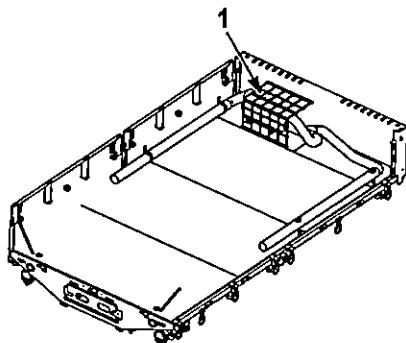


Figure 28.

25	Before Operation	HYDRAULIC RESERVOIR (MK25)	1. Check that hydraulic fluid level is visible in sight glass (1) and is between two black range marks.  2. Inspect hydraulic fluid in sight glass (1) for milky, foamy, or dirty appearance.	
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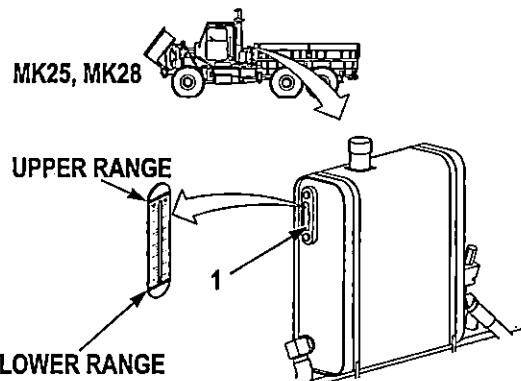


Figure 29.

26	Before Operation	SELF RECOVERY WINCH (SRW) (WHEN EQUIPPED)	<p><b>WARNING</b></p> <p>Use heavy leather gloves when checking winch cable. Injury to hands can result if gloves are not worn.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

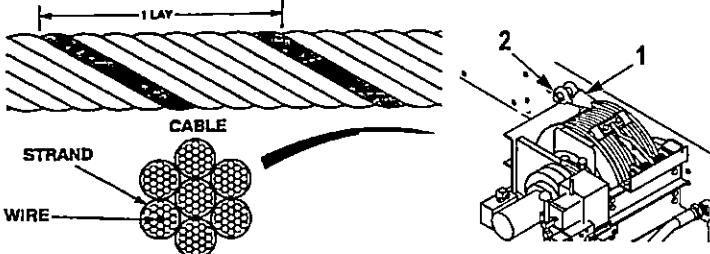
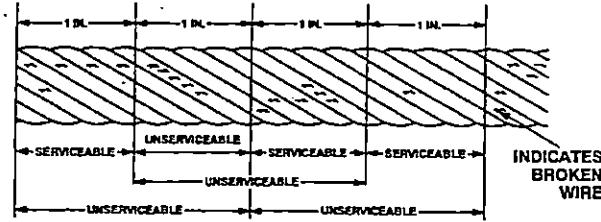
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>NOTE</b></p> <p>Refer to Winch Operation (WP 0044) for more detailed information on operation of SRW.</p> <p>1. Check that winch cable clevis (1) is not broken and pin (2) is not missing.</p>  	Clevis is loose on cable or is broken, pin is missing.

Figure 30.

27	Before Operation	FUEL TANK FIRE PROTECTION KIT (IF EQUIPPED)	<p><b>CAUTION</b></p> <p>If panel is cracked, notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <p>1. Check panel assemblies (1) for damage, cracks, or leaking powder.</p>	Panel is cracked or powder is present.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

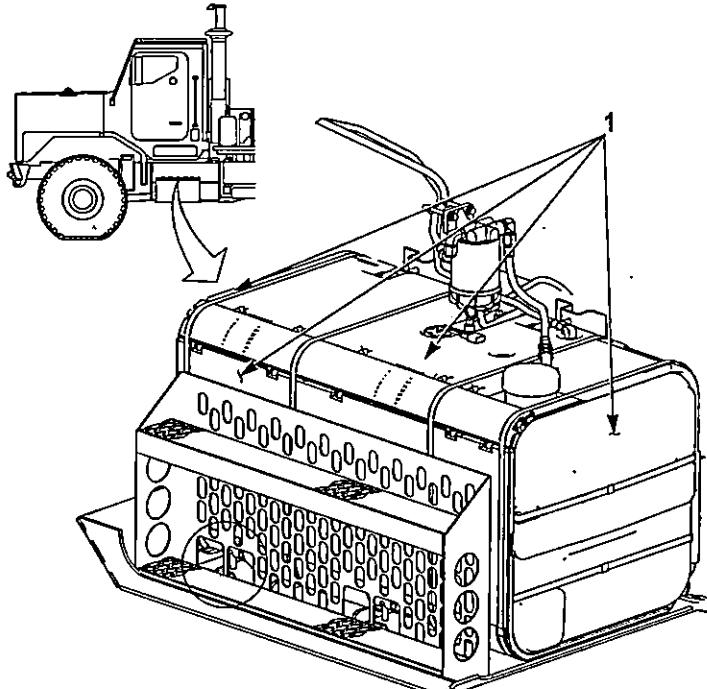
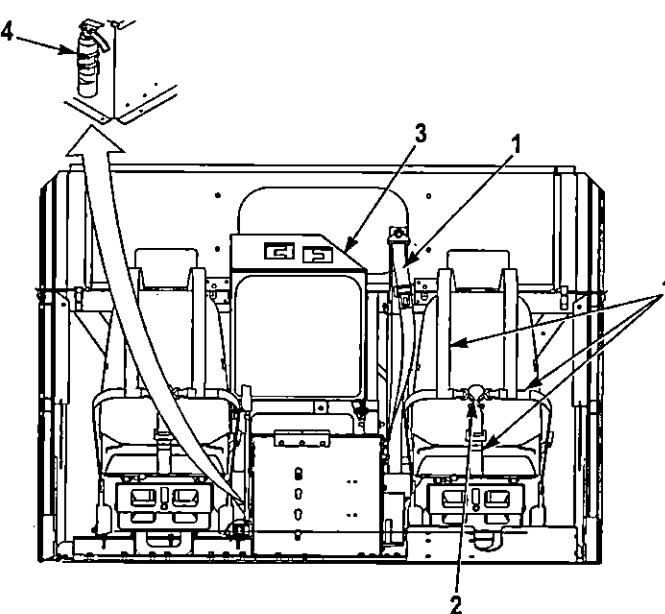
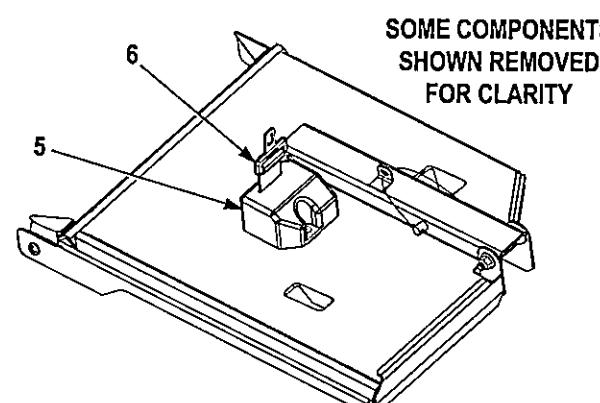
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 31.

28	Before Operation	INCREASED MINE PROTECTION KIT (IF EQUIPPED)	<p><b>NOTE</b></p> <p>Both passenger and driver seats and seat belts are the same.</p> <ol style="list-style-type: none"> <li>1. Check seat belts (1) and buckles (2) for serviceability and proper operation.</li> <li>2. Inspect platform (3) for damage and proper operation (WP 0066).</li> <li>3. Check fire extinguisher (4) for proper charge and damage.</li> </ol>	Damaged, missing, or inoperable seat belts.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
			<p>4. Check gunner's restraint retractor (5) for proper operation.</p> <p>5. Check gunner's restraint strap (6) for damage.</p>	<p>Retractor does not operate</p> <p>Strap is damaged.</p>
				
29	Before Operation	AIR CONDITIONING	<p>1. Check A/C compressor belt (1) for cracking, fraying, or other damage.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
		(A/C) KIT (IF EQUIPPED)	<p>2. Check A/C compressor (2) and hoses (3) for damage.</p>	
30	Before Operation	ARMORED GLASS WINDSHIELD AND DOOR (ARMOR KIT)	<p>1. Check armored glass (1) for cracks and degradation.</p>	Cracks are present, or clarity of glass is degraded to the point that operator's vision is impaired.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

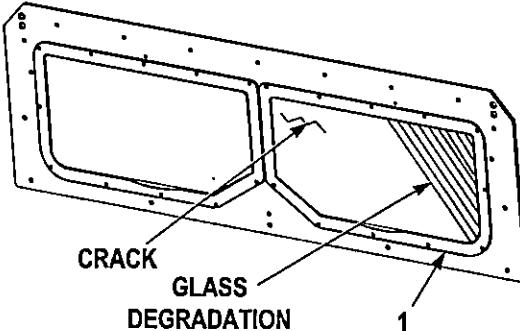
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 35.

31	Before Operation	PINTLE HOOK	<ol style="list-style-type: none"> <li>1. Check pintle hook (1) for secure mounting and proper operation. Ensure safety latch (2) engages hook lock (3).</li> <li>2. Ensure safety pin (4) is secure and functional.</li> <li>3. Check pivot pin (5) for free movement.</li> <li>4. Check latch pin (6) for looseness.</li> </ol>	Pintle hook is damaged or missing.  Pin is loose.
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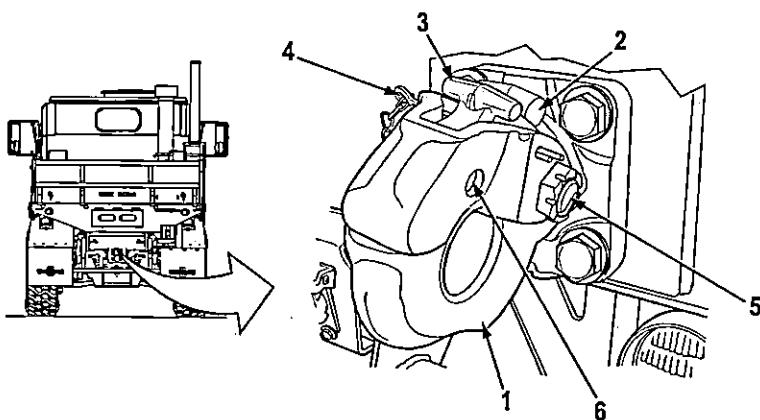


Figure 36.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
32	During Operation	TRANSMISSION FLUID	<p><b>WARNING</b></p>  <p>Failure to take the following precautions will lead to sudden, unexpected vehicle movement. Whenever checking fluid level, the transmission range selector must be in N (neutral), the parking brake must be set, and the wheels must be chocked. Failure to comply may result in serious injury or death to personnel.</p> <p><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>Do not permit dirt, dust, or grit to enter transmission filler tube. Thoroughly clean dipstick handle and end of filler tube. Serious internal transmission damage can result if transmission is contaminated.</li> <li>The transmission must not be operated for extended periods of time, until a Hot Check has verified proper fluid level. Transmission damage can result from extended operation at improper fluid level conditions.</li> <li>An accurate fluid level check cannot be made unless the engine is idling (500 to 800 rpm) in N (neutral), the transmission fluid is at the proper temperature, and the vehicle is on a level surface. Failure to comply may result in damage to equipment.</li> </ul>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - 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>If the transmission oil temperature is between 160° and 250°F (71° and 121°C), go directly to the HOT CHECK procedure. If there is evidence of transmission oil leakage, contact Second Echelon Maintenance. If the transmission oil temperature is less than 160°F (71°C), go to the next step, COLD CHECK procedure.</li> <li>Because the fluid level rises as the temperature increases, the fluid must be hot to ensure an accurate check.</li> </ul> <ol style="list-style-type: none"> <li>Be sure fluid has reached normal operating temperature (160° to 250°F; 71° to 121°C).</li> <li>Park the vehicle on a level surface and shift to N (neutral). Apply the parking brake and allow the engine to idle (500 to 800 rpm).</li> </ol> <p><b>CAUTION</b></p> <p>If transmission fluid is too high and needs to be drained, notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <ol style="list-style-type: none"> <li>Remove transmission dipstick (WP 0107) (1).</li> <li>After wiping the transmission dipstick (1) clean, check the fluid level. The safe operating level is anywhere within the HOT RUN band on the dipstick. If the fluid level is not within this band, add fluid as necessary to bring the level within the HOT RUN band. (Refer to Lubrication Instruction) (WP 0111)</li> </ol>	Transmission fluid level is too high.

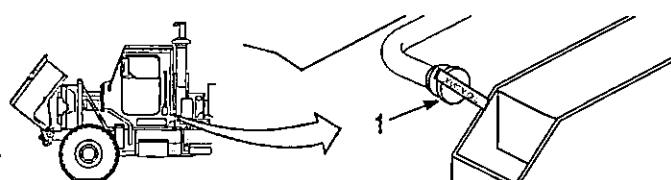
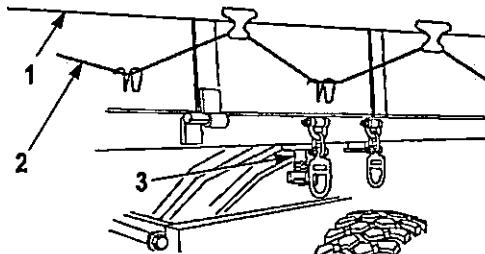


Figure 37.

5. Install transmission dipstick (WP 0107) (1).

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			6. Be sure that fluid level checks are consistent. Check level more than once, and if readings are not consistent, notify your supervisor or Second Echelon maintenance.	
33	During Operation	CARGO BODY COVER, TROOP SEATS, BOWS, STAVES, AND BACKRESTS	1. Shortly after starting a mission and at all stops, get out and ensure cargo cover (1) and bungee cords (2) are not damaged. Ensure cargo has not shifted. Tighten tie down straps if required. Check ISO locks (3) for tightness - tighten ISO locks if required.	
				
34	During Operation	ENGINE OPERATION	1. While running, check engine for excessive smoke, unusual noise, rough running, or misfiring. 2. Ensure engine brake operates (WP 0032).	Any of these conditions are found.
35	During Operation	PARKING BRAKE	<p><b>WARNING</b></p>  <p>Prior to performing test, ensure area 30 ft. (9 m) to front of vehicle is clear of objects and personnel. Failure to comply may result in injury or death to personnel.</p> <p>1. Apply parking brake (1). Select D (drive) on transmission range selector (2) and run engine at 1000 rpm. Vehicle should not move.</p>	Vehicle moves when parking brake is applied.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

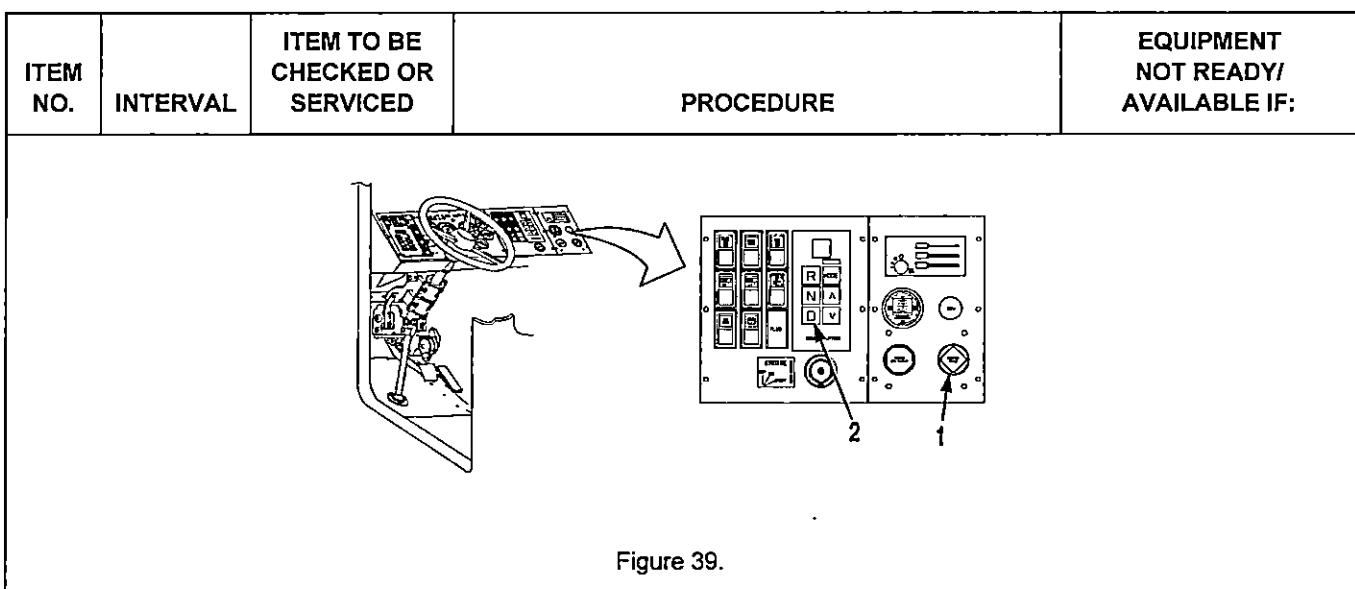


Figure 39.

36	During Operation	SERVICE BRAKE STALL TEST	<p><b>WARNING</b></p>  <p>Prior to performing test, ensure area 30 ft. (9 m) to front of vehicle is clear of objects and personnel. Failure to comply may result in injury or death to personnel.</p> <p>1. Apply service brake (1). Select D (drive) on transmission range selector (2) and run engine at 1000 rpm. Vehicle should not move.</p>	Vehicle moves when service brake is applied.
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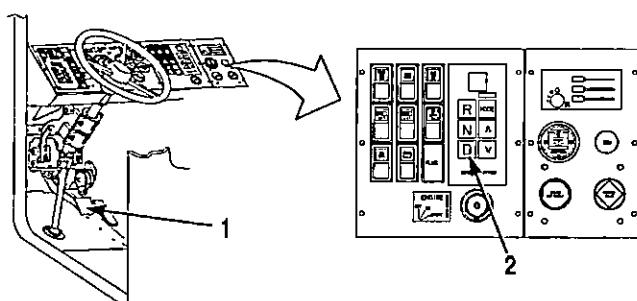
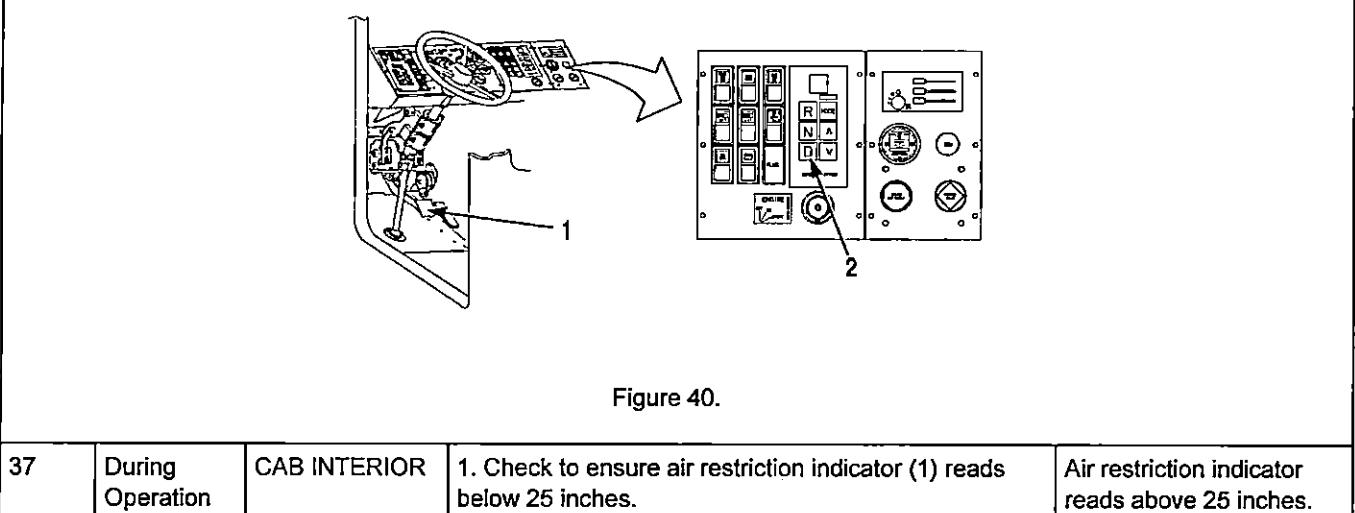


Figure 40.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>NOTE</b></p> <p>With ignition switch off, speedometer will not return to zero. Speedometer will "zero out" and indicate correct MPH when ignition switch is ON and vehicle is in motion.</p> <p>2. Ensure speedometer (2) operates properly.</p> <p>3. Check to ensure steering wheel (3) controls direction of vehicle.</p>	Steering wheel does not control direction of vehicle.

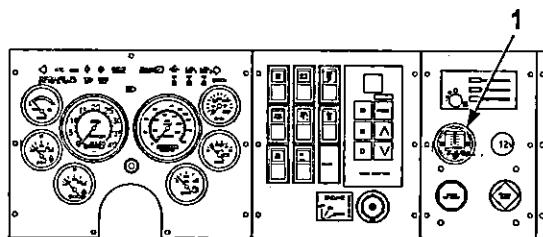
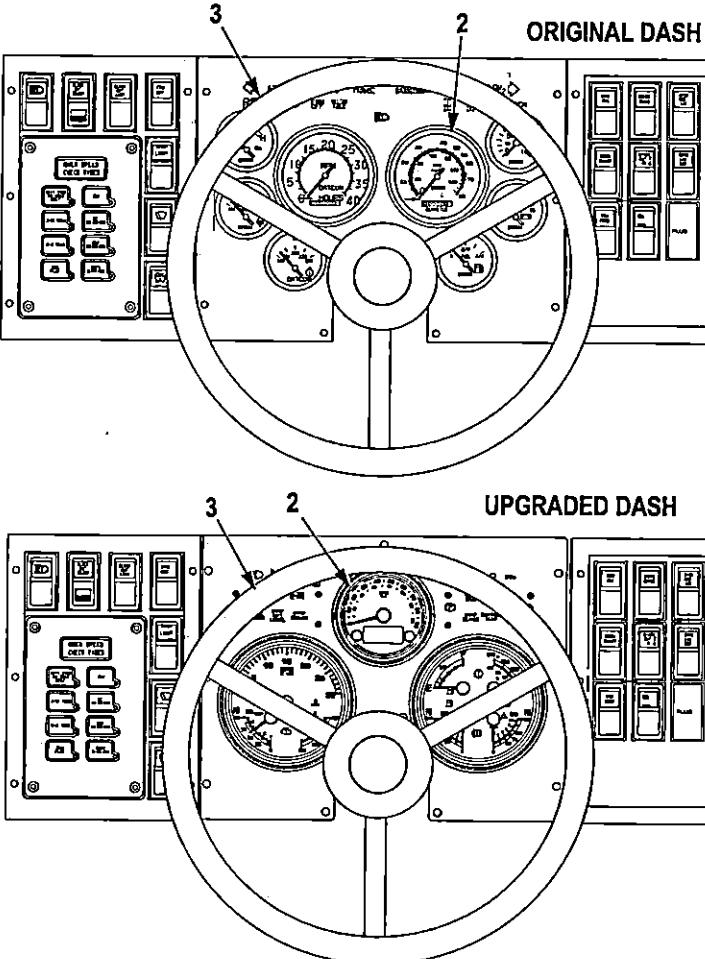
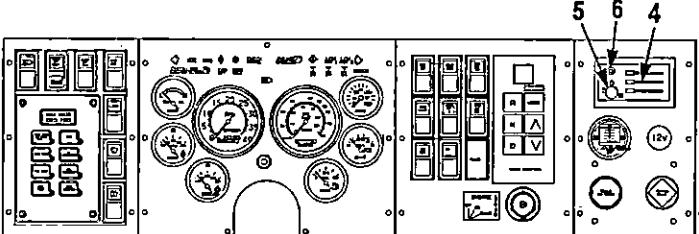
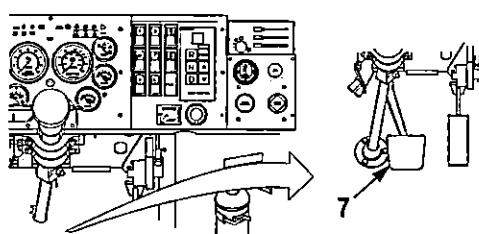


Figure 41.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				<p>4. Check heat and defrost controls (4) for proper operation. Check for warm airflow.</p> <p>5. Check fan control (5) for proper fan operation in all settings.</p> <p>6. Check air conditioning control (6) (if equipped) for proper operation. Check for cooler airflow after one minute of operation.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
			<p>7. Ensure that service brakes engage when brake pedal (7) is pushed.</p>	<p>Service brakes do not engage when brake pedal is pushed.</p>
				
			<p>Figure 43.</p> <p>Figure 44.</p>	
38	During Operation	TRANSMISSION	<p>1. Check transmission for proper shifting (WP 0031).</p> <p><b>NOTE</b></p> <p>At idle speed, the automatic transmission may not reach 160°F (71°C) oil temperature.</p> <p>2. Check transmission temperature gauge for normal operating temperature of 160° to 250°F (71° to 121°C). If the transmission temperature exceeds 250°F (121°C), downshift to a lower gear to avoid overheating.</p>	<p>Transmission does not operate in all ranges.</p> <p>Transmission fluid temperature is above 250°F (121°C).</p>
			<p><b>SPECIAL PURPOSE KITS</b></p>	
39	During Operation	HYDRAULIC RESERVOIR (MK25)	<p>1. Check that hydraulic fluid level is visible in sight glass (1) and is between two black range marks.</p> <p>2. Inspect hydraulic fluid in sight glass (1) for milky, foamy, or dirty appearance.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
40	During Operation	SELF RECOVERY WINCH (SRW) (WHEN EQUIPPED)	<p><b>WARNING</b></p> <p>Use heavy leather gloves when checking winch cable. Injury to hands can result if gloves are not worn.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Refer to Winch Operation (WP 0044) for more detailed information on operation of SRW.</li> <li>Worn spots will show up as shiny flattened spots on the strands.</li> </ul> <ol style="list-style-type: none"> <li>Inspect winch cable (1) for kinks and broken strands while cable is being payed out for use.</li> <li>Inspect for worn spots while cable is being payed out for use.</li> <li>Inspect broken wires to determine if it is a single broken wire or several broken wires. Inspect while cable is being payed out for use.</li> <li>Wind cable onto winch (WP 0044).</li> </ol>	<p>Cable is frayed, kinked, worn, or corroded.</p> <p>Outer wires are reduced in diameter by one-fourth.</p> <p>Individual wires are broken next to one another; six randomly distributed broken wires in one lay (the distance in which the strands make one complete turn around the cable); or three broken wires in one lay.</p>

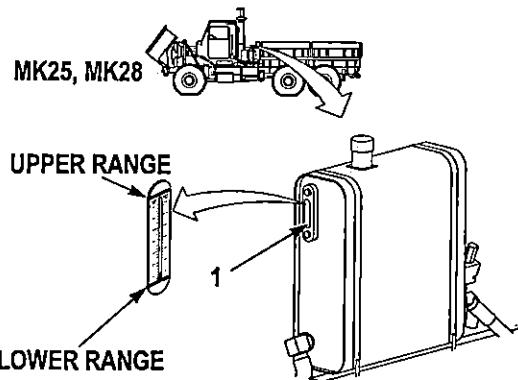


Figure 45.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

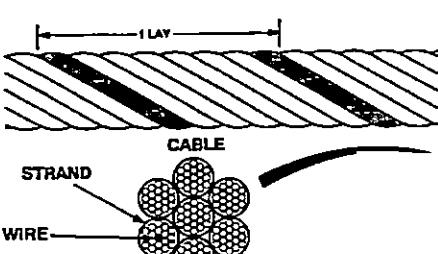
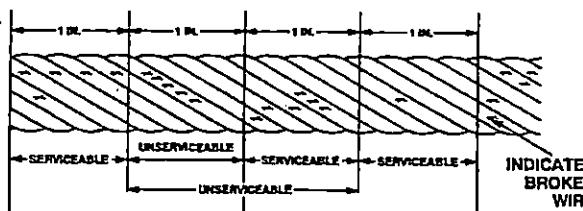
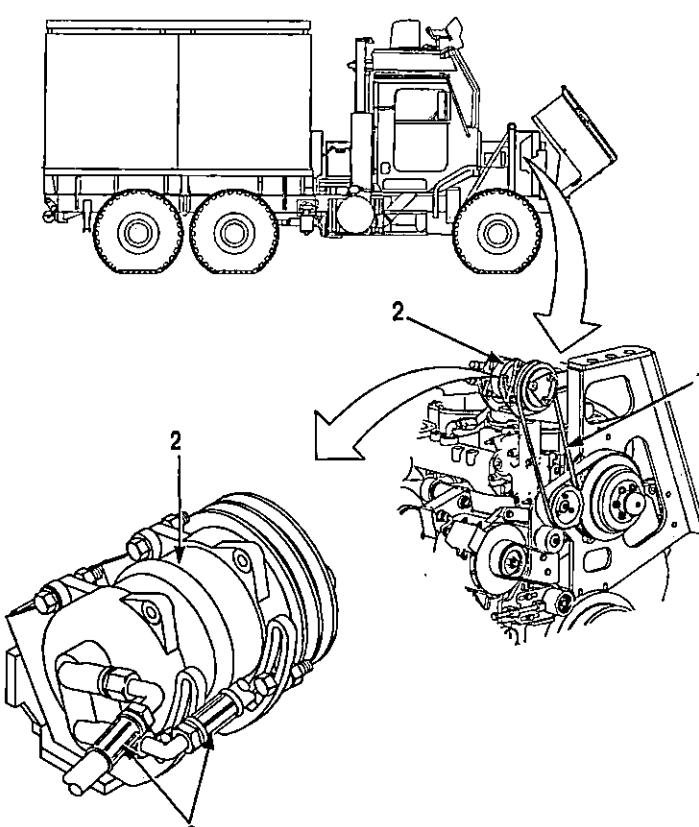
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
		 		

Figure 46.

41	During Operation	AIR CONDITIONING (A/C) KIT (IF EQUIPPED)	<p>1. Check A/C compressor belt (1) for cracking, fraying, or other damage.</p> <p>2. Check A/C compressor (2) and hoses (3) for damage.</p>	
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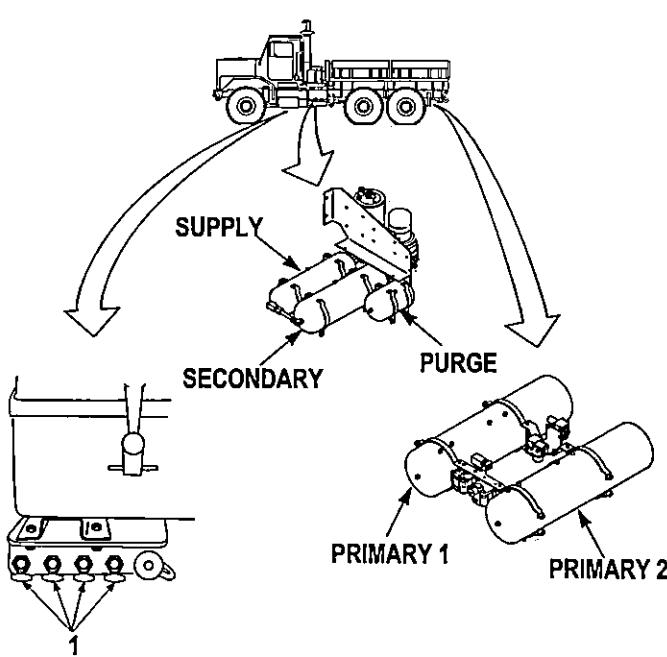
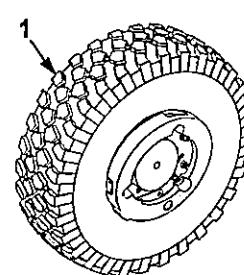
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
42	After Operation	CAB AND HOOD EXTERIOR	<p>1. Check under vehicle for fuel, oil, transmission fluid, or coolant leakage.</p>	Any fuel leak or Class III oil or coolant leak.
43	After Operation	FUEL/WATER SEPARATOR	<p><b>WARNING</b> Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.</p> <p><b>NOTE</b> A flashlight may be required to perform the following check.</p>	

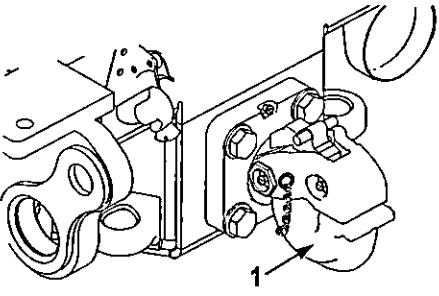
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>1. Check sediment bowl (1) for water. If water is present, drain fuel from bowl into suitable container until clean fuel flows out. To drain fuel from sediment bowl, open drain valve (2) until water and contaminated fuel are allowed to drain from sediment bowl. Close drain valve (2) once all water and contaminated fuel is drained from sediment bowl.</p>	
44	After Operation	AIR SYSTEM	<p><b>WARNING</b></p>  <p>Air drain valves may be under extreme pressure. Do not allow face to be in front of air drain valves while draining air reservoirs. Open air drain valves slowly to prevent sudden blast of air. Failure to comply may result in serious injury to personnel.</p> <p><b>NOTE</b></p> <p>Low air lights must go out prior to performing air reservoir checks.</p> <ol style="list-style-type: none"> <li>1. Open air drain valves (1) and drain reservoirs completely.</li> <li>2. Close air drain valves (1).</li> </ol>	

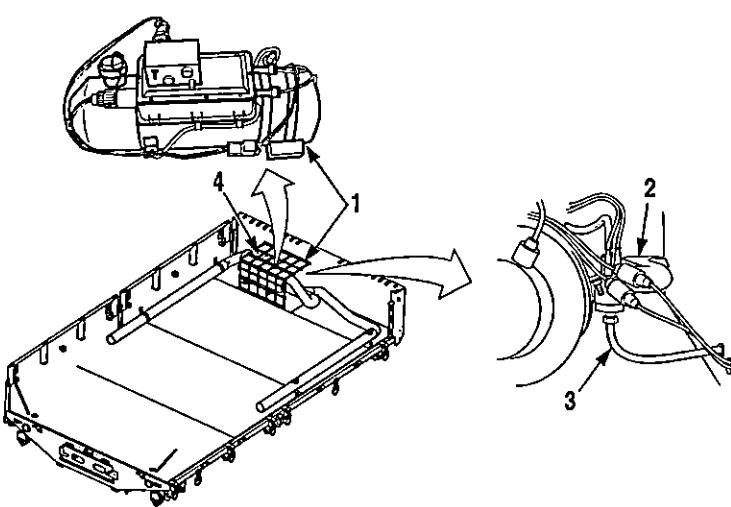
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
Figure 49.				
45	After Operation	TIRES	1. Check tires (1) for cuts, gouges, cracks, or other damage.	Any tire that has wear or damage that allows ply or belt material to be exposed through the tread or sidewall. Any tire that has tread or sidewall separation. Any tire that is flat or has an audible leak.
				
Figure 50.				

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
46	After Operation	PINTLE HOOK	1. Lubricate pintle hook (WP 0111) (1) after each use.	
				
			Figure 51.	
47	After Operation	UNDERCARRIAGE AND FRAME	<p><b>CAUTION</b></p> <p>All guidelines set forth for maintaining corrosion preventive compounds must be adhered to (refer to General Maintenance Procedures (WP 0091)). Failure to follow these guidelines will negatively impact the corrosion control integrity of the vehicle and result in damage to equipment.</p> <p>1. Inspect underside of vehicle for loose or damaged wires.</p>	
			<b>SPECIAL PURPOSE KITS</b>	
48	After Operation	ARCTIC CARGO KIT (IF EQUIPPED)	<p><b>WARNING</b></p> <p>Do not operate arctic cargo kit heater if fuel leaks or exhaust leaks are present. Failure to comply may result in injury or death to personnel.</p> <p>1. Operate arctic cargo kit heater (1) and check for exhaust leaks in exhaust line (2).</p> <p>2. With arctic cargo kit heater (1) operating, check for fuel leaks in fuel line (3).</p> <p>3. With arctic cargo kit heater (1) operating, ensure heater works properly in both heating and venting position. (Refer to Arctic Cargo Kit Personnel Heater (WP 0061)).</p> <p>4. Ensure guard (4) is free of debris and obstructions.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
49	After Operation	FUEL TANK FIRE PROTECTION KIT (IF EQUIPPED)	<p><b>CAUTION</b></p> <p>If panel is cracked, notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <p>1. Check panel assemblies (1) for damage, cracks, or leaking powder.</p>	Panel is cracked or powder is present.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
50	After Operation	AIR CONDITIONING (A/C) KIT (IF EQUIPPED)	<p>1. Check A/C compressor belt (1) for cracking, fraying, or other damage.</p> <p>2. Check A/C compressor (2) and hoses (3) for damage.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

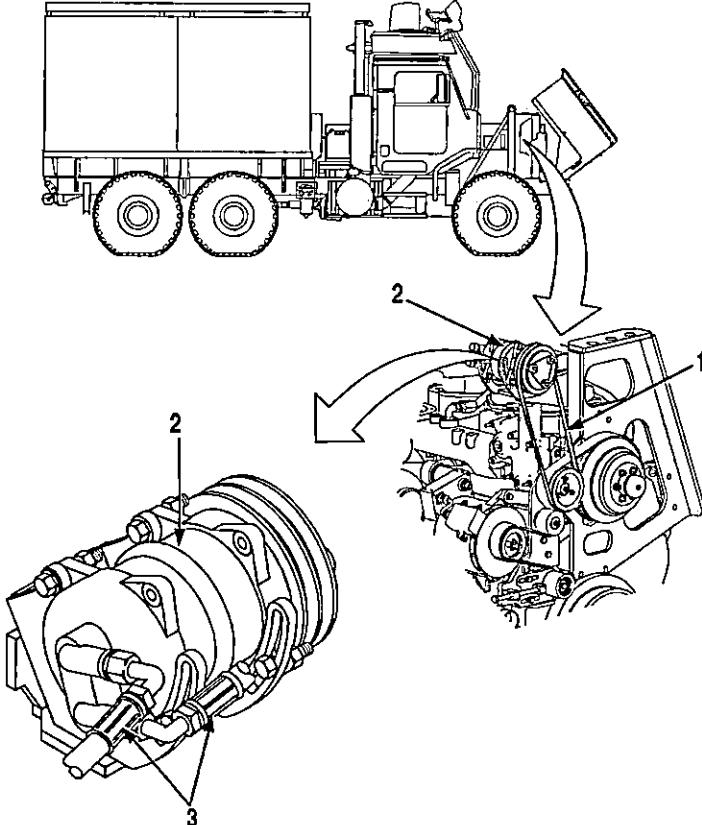
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 54.

51	Monthly	CAB AND HOOD EXTERIOR	<ol style="list-style-type: none"> <li>1. Inspect cab (1) and hood (2) for damage.</li> <li>2. Inspect cab doors (3) for damage or misalignment.</li> <li>3. Check cab mounts (4) and cab shocks (5) for damage.</li> <li>4. Inspect prop rod (6) and springs (7) for damage and serviceability.</li> </ol>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

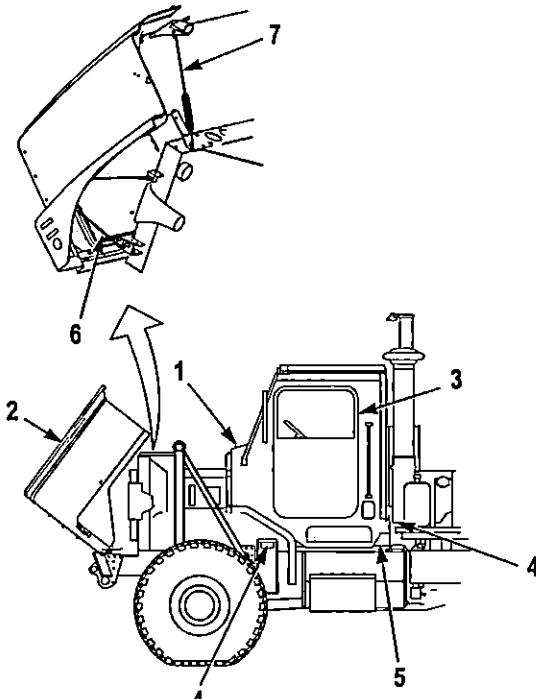
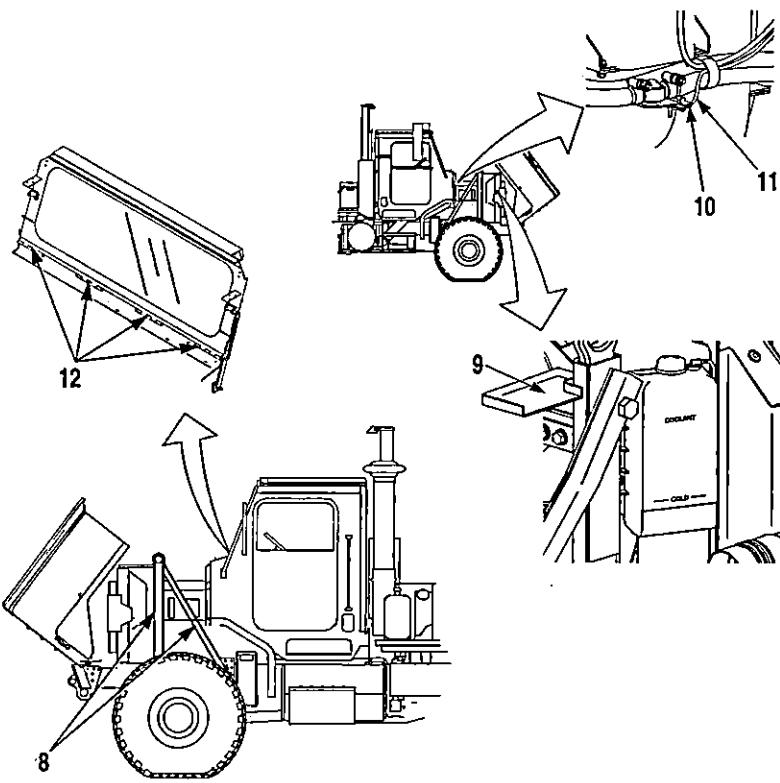
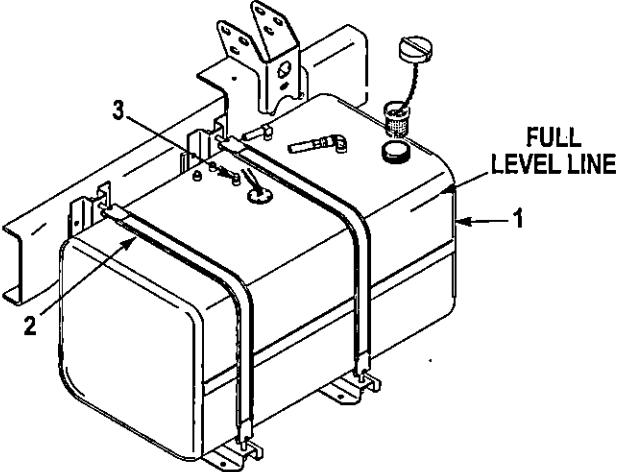
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			 <p>5. Inspect front hardlift (8) for broken welds and loose, broken, or missing screws.  6. Inspect right front hardlift drip pan (9) for damage.  7. Lubricate heater control valve (10) and cable (11) (WP 0111).  8. Lubricate windshield hinges (12) (WP 0111).</p>	

Figure 55.

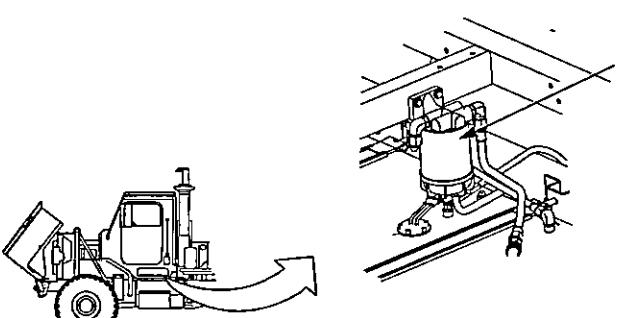
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
52	Monthly	FUEL TANK	 <p><b>WARNING</b> Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.</p> <p><b>CAUTION</b> Do not fill fuel tank above full-level line on outside tank, or fuel spillage will occur. Failure to comply may cause damage to equipment.</p> <ol style="list-style-type: none"> <li>1. Check fuel tank (1) for leaks or damage.</li> <li>2. Check fuel hoses and connections for leaks and damage.</li> <li>3. Check fuel tank mounting hardware and liners (2) for looseness or damage.</li> </ol>	<p>Any fuel leak.</p> <p>Any leakage or loose connections.</p> <p>Any fuel leak.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>4. Inspect fuel sending unit (3) for frayed or damaged wires or connectors.</p> 	
53	Monthly	FUEL/WATER SEPARATOR	<p><b>WARNING</b> Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.</p> <p><b>NOTE</b> A flashlight may be required to perform the following check.</p> <p>1. Check fuel water separator (1) for leaks, damage, or loose connections.</p>	Any fuel leak.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
54	Monthly	BATTERIES	<p><b>WARNING</b></p> <p>Do not wear watches, rings, or other jewelry when servicing batteries, they could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes. Failure to comply may result in serious injury to personnel.</p> <p><b>NOTE</b></p> <p>Prior to performing battery PMCS, ensure battery disconnect switch (WP 0014) is OFF. Turn battery disconnect switch to ON when battery PMCS is completed.</p> <ol style="list-style-type: none"> <li>1. Remove battery box cover (1) and check battery box cover (1) and battery box (2) for cracks and damage.</li> <li>2. Inspect for any missing or damaged batteries (3).</li> </ol> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• A flashlight may be required to perform the following checks.</li> <li>• If fluid level is repeatedly low, or fluid is boiling, notify Second Echelon Maintenance. When distilled water has been added and temperature is below +32°F (0°C), run engine 15 minutes to allow water to mix with electrolyte.</li> </ul> 	<p>Battery box has damage that could allow battery box to separate from vehicle.</p> <p>Battery is missing or damaged.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>3. c. Remove battery caps (4) and check fluid level of each cell. Fluid level should be up to split ring. Add distilled water up to split ring, as required, refer to Battery Maintenance (WP 0103).</p> <p>4. Inspect batteries (3) for cracked or leaking casing, or loose, broken, or burned terminal posts, cables, or connections.</p> <p>5. Check battery posts and terminals for corrosion. If needed, clean battery posts and terminals.</p> <p>6. Check battery box (2) and brackets (5) for corrosion. Install battery box cover (1).</p> <p>7. Inspect slave receptacle (6) for loose cables, damage, or missing cover (7) or cap (8).</p>	Battery is damaged or terminals or cables are broken or burned.

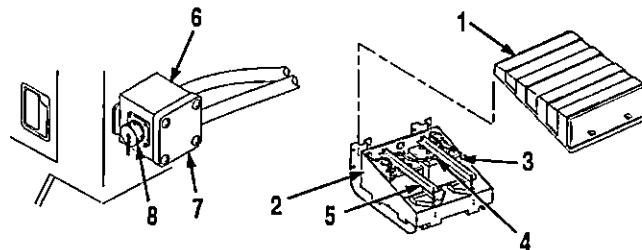
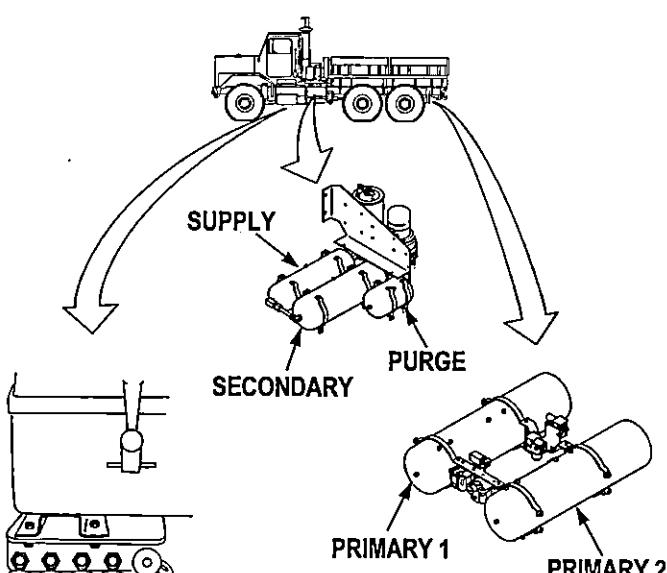


Figure 59.

55	Monthly	AIR SYSTEM	<p><b>NOTE</b></p> <p>Low air lights must go out prior to performing air reservoir checks.</p> <p>1. Inspect air lines, hoses, and fittings for bends, dents, and cracks that could cause leaks.</p> <p>2. Inspect primary #1, primary #2, secondary, supply, and purge reservoirs for dents, damage, or corrosion.</p>	Any air leakage present. Any air leakage present.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
56	Monthly	AIR DRYER AND AFTERCOOLER	<p>1. Inspect air dryer (1) and aftercooler (2) for punctures and obvious damage.</p> <p>2. Check air dryer (1) and aftercooler (2) for loose mounting screws and loose or damaged air lines and fittings.</p> <p>3. Check wires to air dryer (1) for proper connection and damage.</p>	<p>Air dryer or aftercooler is punctured.</p> <p>Air lines or fittings loose or damaged.</p> <p>Wires are damaged or disconnected.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
57	Monthly	TIRES	<p><b>NOTE</b></p> <p>Small cracks extending from mounting holes do not effect performance of wheel cover. If small cracks are present, wheel cover is still serviceable.</p> <ol style="list-style-type: none"> <li>1. Remove wheel covers (1) and inspect CTIS wheel valve components for damage and serviceability.</li> <li>2. Check wheels (2) for broken, cracked, or bent surfaces.</li> <li>3. Check wheel nuts (3) and wheel studs (4) for obvious looseness or damage.</li> <li>4. Check that valve caps (5) are securely tightened.</li> <li>5. Install wheel cover (1).</li> <li>6. Check six tire mudflaps (6) for damage and serviceability.</li> <li>7. Check hooks (7) and strap (8) on rear mudflaps (6) for damage and serviceability.</li> </ol>	<p>Wheel is broken, cracked, or bent.</p> <p>One or more wheel nuts and/or wheel studs are missing, loose, or damaged.</p>

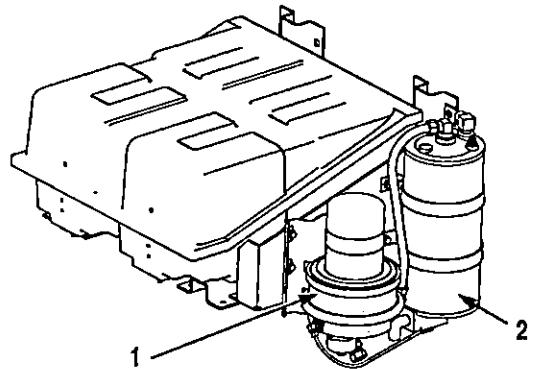


Figure 61.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
58	Monthly	SHOCK ABSORBERS	<p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Lower shock bearing wear is normal and does not impair truck operation.</li> <li>Shock absorbers may have a thin film of oil on the outer surface due to a normal condition known as "misting". Misting is not considered a leak and will not be evident as a stream of fluid.</li> </ul> <p>1. Check shock absorbers (1) for leaks and damage.</p>	Class III leak or damage to shock absorbers that impairs truck operation.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

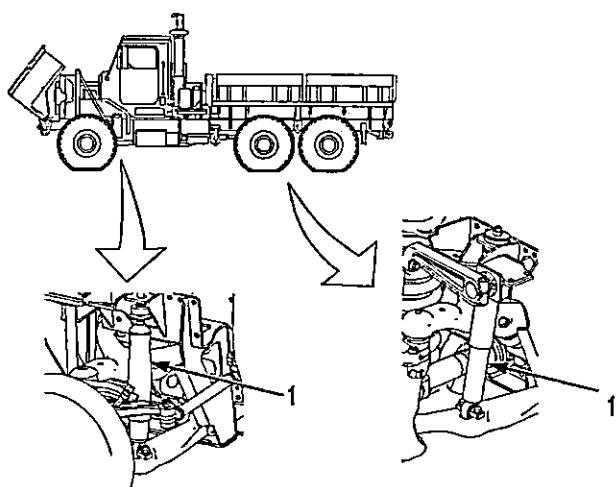
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
59	Monthly	MUD FLAPS	<p>1. Inspect radiator splashguards (1) and belt protection mud flap (2) for tears and missing or loose hardware.</p> 	

Figure 63.

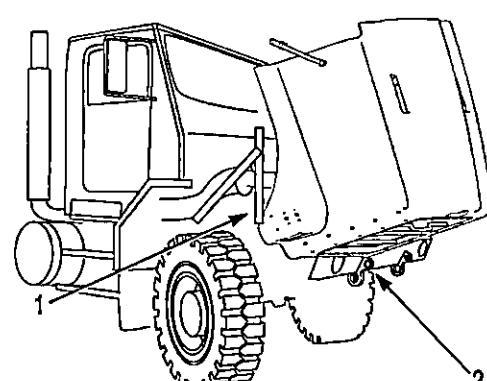
59	Monthly	MUD FLAPS	<p>1. Inspect radiator splashguards (1) and belt protection mud flap (2) for tears and missing or loose hardware.</p> 	
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Figure 64.

60	Monthly	FRONT AND REAR INTER-VEHICLE ELECTRICAL CONNECTOR	<p>1. Inspect electrical connectors (1) for damage.</p> <p>2. Inspect electrical connector cover seals (2) for tears or rot.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			3. Inspect electrical connector cables (3) for damage.	

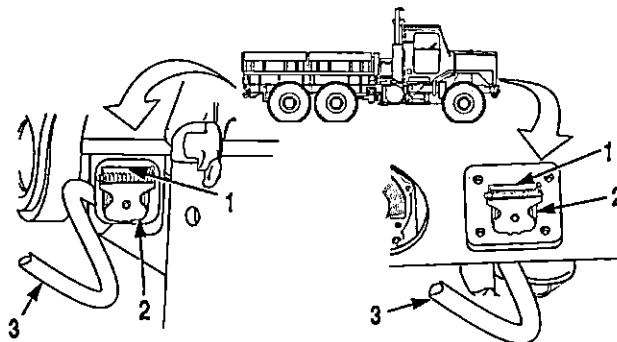


Figure 65.

61	Monthly	FRONT AND REAR GLADHANDS	<p><b>WARNING</b></p> <p>Ensure front gladhands are free of clogs. Clogged front gladhands may cause service brakes to lock up. Failure to comply may result in injury or death to personnel.</p> <p>1. Check front and rear gladhands (1) and air lines for damage or obstruction.</p> <p>2. Inspect front and rear gladhands (1) for missing or rotted seals.</p>	Air line is damaged or obstructed.
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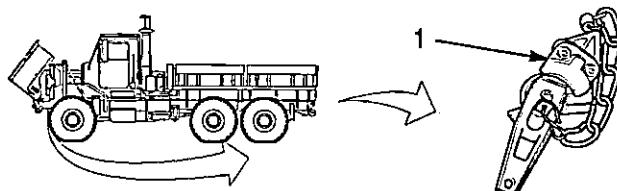


Figure 66.

62	Monthly	CARGO BODY AND ISO LOCKS	<p>1. Check for broken, bent, or damaged hinge pins (1).</p> <p>2. Check that front drop side (2) and rear drop side (3) are not bent or broken and have no broken welds.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

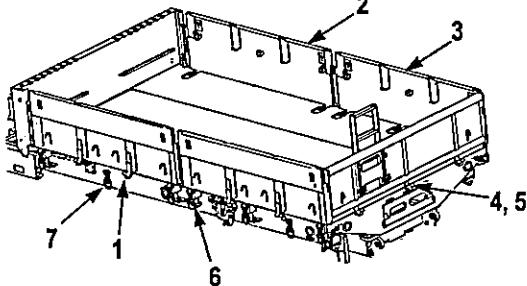
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>NOTE</b></p> <p>Early models of MTVR Cargo use a screw and a washer in place of cotter pin and washer.</p> <p>3. Ensure cotter pin (4) and washer (5) are secure and in place on center hinge.</p> <p>4. Check ISO locks (6) for damage and ensure that they operate freely.</p> <p>5. Check cargo hold downs (7) for damage and ensure they operate freely.</p> <p>6. Ensure tire ramp and jack platform are properly secured with two T-bolt locking handles.</p>	
			 <p>Figure 67 shows a side view of the rear cargo area of an MTVR vehicle. The diagram labels various parts: 1 points to a bolt on the left side; 2 points to a vertical support on the left; 3 points to a vertical support on the right; 4 and 5 point to a center hinge mechanism; 6 points to an ISO lock; 7 points to a cargo hold down; 8 points to a stave pocket; 9 points to the headboard; and 10 points to the tailgate.</p>	

Figure 67.

**CAUTION**

All guidelines set forth for maintaining corrosion preventive compounds must be adhered to (refer to General Maintenance Procedures (WP 0091)). Failure to follow these guidelines will negatively impact the corrosion control integrity of the vehicle and result in damage to equipment.

7. Inspect stave pockets (8) and underside of lips on headboard (9) and tailgate (10) for presence of corrosion.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

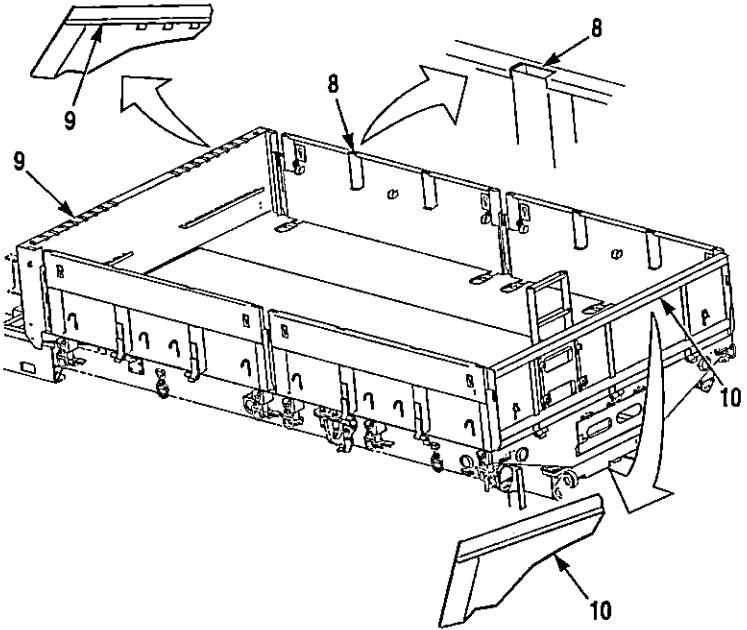
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 68.

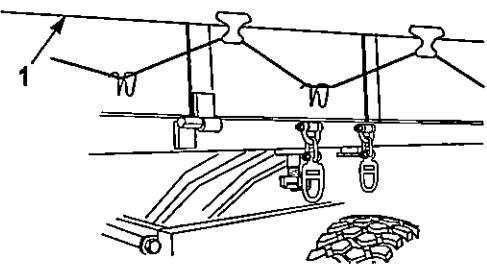
63	Monthly	CARGO BODY COVER, TROOP SEATS, BOWS, STAVES, AND BACKRESTS	<p>1. Inspect cargo body cover (1) for serviceability.</p> <p>2. If troop carrying components are not installed, ensure they are stowed properly.</p>	
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Figure 69.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>NOTE</b></p> <p>Perform Steps (3) through (7) only if troop carrying components are installed.</p> <p>3. Inspect troop seats (2) to ensure legs and pins are properly secured.</p> <p>4. Inspect bows (3) for damage and serviceability.</p> <p>5. Inspect staves (4) to ensure latches (5) are properly latched and connected to bows. Inspect staves (4) for damage and serviceability.</p> <p>6. Inspect backrest (6) for damage and proper installation.</p> <p>7. Inspect troop strap (7) for serviceability.</p>	

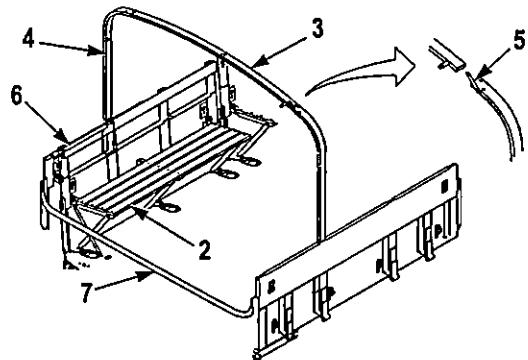


Figure 70.

64	Monthly	VENT HOSES AND TRANSMISSION BREATHER	<p>1. Check vent hoses (1) for damage, proper mounting, and obstruction.</p> <p>2. Check transmission breather (2) for damage and debris.</p>	<p>One or more plugged vent hoses.</p> <p>Breather is plugged.</p>
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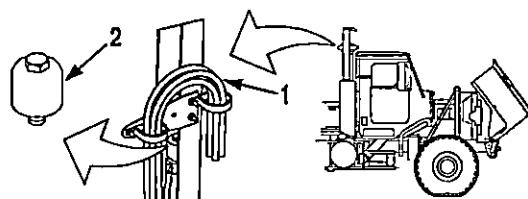


Figure 71.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
65	Monthly	OIL FILTER AND OIL SAMPLING VALVES	<ol style="list-style-type: none"> <li>1. Check engine oil filter (1) for leaks or damage.</li> <li>2. Check oil sampling valves (2) for damage and leakage.</li> <li>3. Ensure caps (3) are properly secured to oil sampling valves (2).</li> <li>4. Check oil filter (1) wires and connectors for looseness and damage.</li> </ol>	Any class III oil leaks.  Any class III oil leaks.

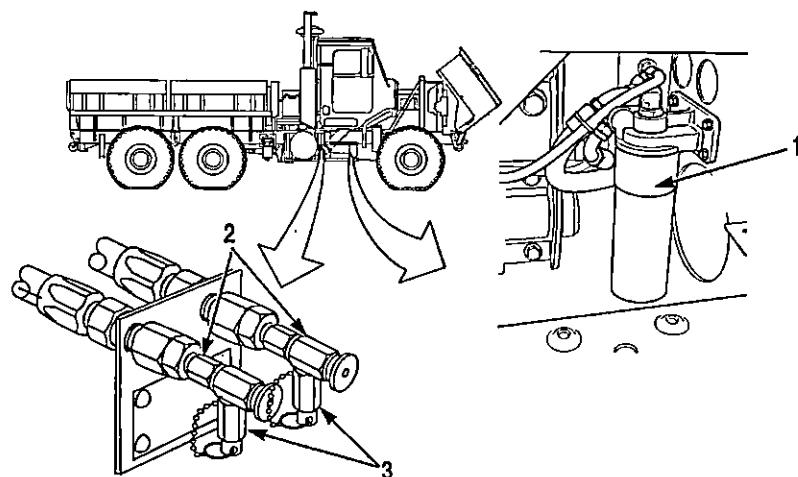


Figure 72.

66	Monthly	AIR INTAKE SYSTEM	<ol style="list-style-type: none"> <li>1. Check air intake system for loose clamps and punctured or damaged hoses or tubes.</li> <li>2. Check air cleaner housing (1) for loose clips (2) and damage. Secure clips as required.</li> </ol>	Any damage that would allow unfiltered air to enter engine.  Any damage that would allow unfiltered air to enter engine.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
67	Monthly	TURBOCHARGER	<p><b>WARNING</b></p>  <p>Engine components become extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in serious injury to personnel.</p> <p>1. Check turbocharger oil supply line (1) and drain line (2) for damage or signs of leakage.</p> <p>2. Inspect mounting screws and clamps on turbocharger (3) for looseness, damage, and exhaust leaks.</p>	Any leakage is evident.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

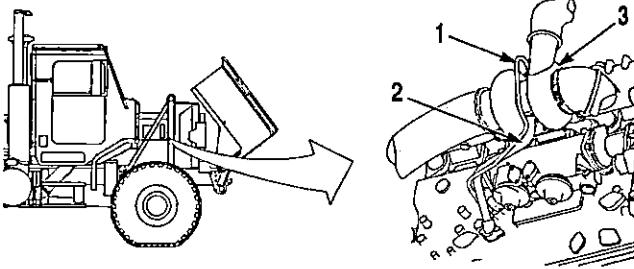
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 74.

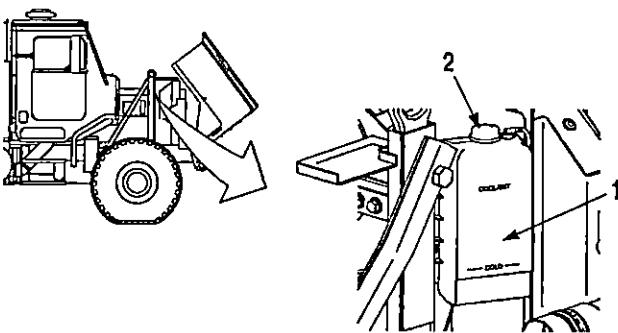
68	Monthly	COOLANT OVERFLOW TANK AND COOLANT LEVEL	<p>1. Check coolant overflow tank (1) and cap (2) for damage or leakage.</p> 	Class III coolant leak.
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Figure 75.

69	Monthly	RADIATOR AND COOLANT HOSES	<p><b>CAUTION</b></p> <p>Use extreme care when cleaning radiator fins and charged air cooler fins to prevent damage to equipment.</p> <p>1. Check radiator (1) for damage and leakage. Check radiator fins (2) and charged air cooler fins (3) for obstructions and clear obstructions as required.</p> <p>2. Check coolant hoses for rot, leaks, or loose clamps.</p>	<p>Class III coolant leak.</p> <p>Class III coolant leak.</p>
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
70	Monthly	COOLING FAN AND FAN BELT	<p>1. Check cooling fan (1) for looseness or damage.</p> <p>2. Check fan belt (2) for cracking, fraying, or other damage.</p> <p>3. Check fan belt for proper tension. Belt has proper tension when belt can be depressed approximately 1/2 in. (1.3 cm) by normal pressure (10 to 15 lbs [4.5 to 6.8 kg]).</p>	<p>Loose or damaged fan.</p> <p>Any damage that would prevent the fan belt from driving the cooling fan.</p> <p>Any fan belt that is broken or cracked to the belt fibre, has more than one crack (1/8 in. (3.2 mm) in depth or 50% of belt thickness) or has frays more than 2 in. (51 mm) long. Belt is loose.</p>

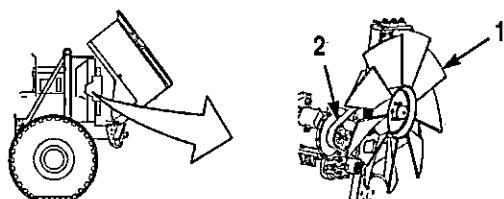


Figure 76.

71	Monthly	ENGINE OIL	<p><b>CAUTION</b></p> <p>If engine oil needs to be drained, contact Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <p><b>NOTE</b></p> <p>If engine has been running, wait approximately five minutes after engine shutdown before checking engine oil.</p> <p>1. Check dipstick tube assembly (1) and oil fill assembly (2) for damage or leakage.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

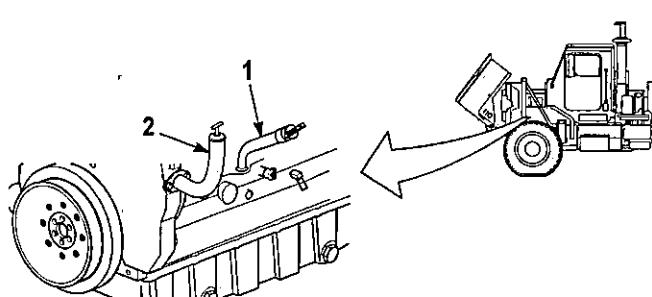
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
72	Monthly	FUEL FILTER AND FUEL PUMP	 <p>1. Check fuel filter (1) and fuel pump (2) for damage or leaks.</p>	Any fuel leak.

Figure 78.

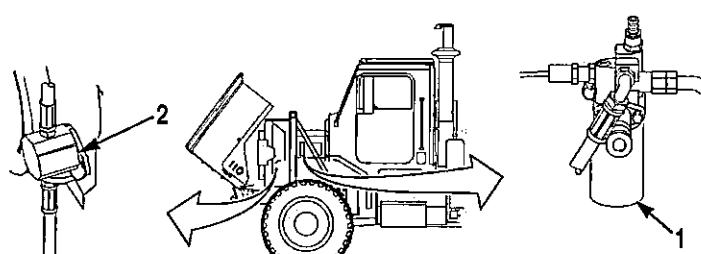
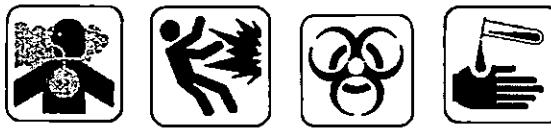
72	Monthly	FUEL FILTER AND FUEL PUMP	 <p>1. Check fuel filter (1) and fuel pump (2) for damage or leaks.</p>	Any fuel leak.
73	Monthly	ETHER START SYSTEM	<p><b>WARNING</b></p>  <p>Use care when working around ether canister, ether canister is pressurized and is flammable. Failure to comply may result in injury or death to personnel.</p>	

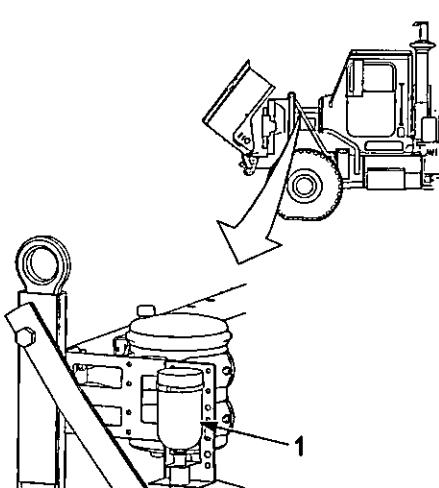
Figure 79.

73	Monthly	ETHER START SYSTEM	<p><b>WARNING</b></p>  <p>Use care when working around ether canister, ether canister is pressurized and is flammable. Failure to comply may result in injury or death to personnel.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>WARNING</b></p>  <p>Ether canisters are considered hazardous material and must be handled with care and disposed of in accordance with current directives. Failure to comply may result in injury or death to personnel.</p> <p><b>WARNING</b></p>  <p>Ether canister contains diethyl ether with carbon dioxide as a propellant. Keep away from heat and flame. NEVER smoke near contents. Do not incinerate or puncture container. Do not store at temperatures above 120°F (49° C). Avoid contact with skin and eyes. Avoid breathing fumes. Do not store spare containers in driver's compartment. If swallowed, do not induce vomiting. Contact physician immediately. Failure to comply may result in injury or death to personnel.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>When re-installing ether canister, ensure gasket is properly seated in valve.</li> <li>When installing a new ether canister, replace old gasket with new gasket supplied with new canister.</li> </ul> <p>1. Inspect ether canister (1) for punctures or obvious damage.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
74	Monthly	HYDRAULIC STEERING SYSTEM	 <p><b>CAUTION</b> If steering hydraulic oil needs to be drained, contact Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <p><b>NOTE</b> When checking steering hydraulic oil level, the oil temperature should be at outside air temperature.</p> <ol style="list-style-type: none"> <li>1. Check hydraulic steering reservoir (1) and ensure steering oil level is between the add and full marks on dipstick (2), add fluid as required (WP 0111).</li> <li>2. Check steering shafts (3), right steering gear (4), and left steering gear (5) for damage or leakage, and ensure they are securely mounted to vehicle.</li> </ol>	<p>Oil level not between add and full mark.</p> <p>Any class III hydraulic leak. Steering shafts or gears are not securely mounted.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

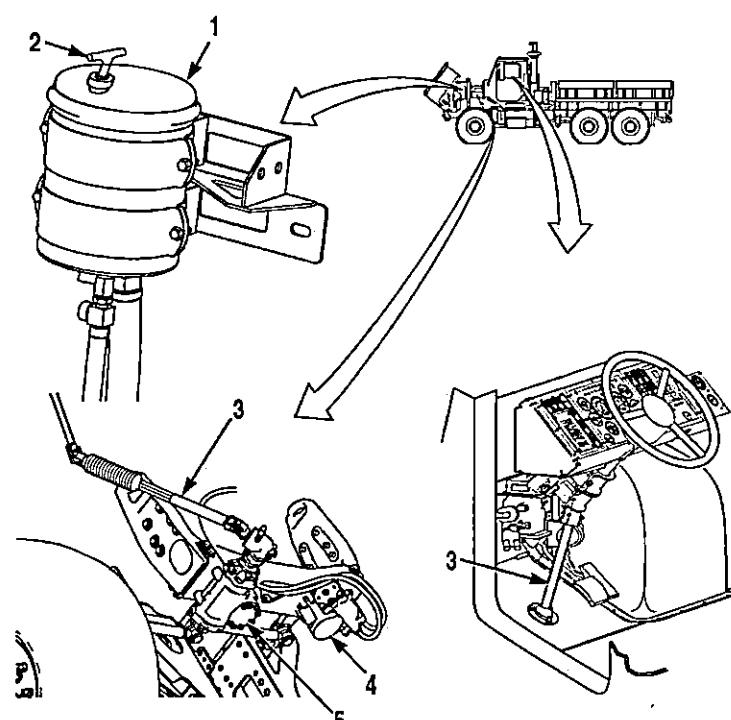
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 81.

75	Monthly	UNDERCARRIAGE AND FRAME	<p>1. Check for loose, broken, or missing cargo body mounting screws (1).</p> <p>2. Inspect frame rails and crossmembers for loose or broken screws, cracked or broken welds.</p> <p>3. Inspect jounce bumpers (2) and rebound bumpers (3) for damage.</p> <p>4. Inspect upper and lower control arm ball joint boots (4) for leaks and damage.</p> <p>5. Inspect upper and lower control arm pivot bushing bolts (5) and zerk fittings (6) for looseness or damage.</p> <p>6. Inspect axles no. 1, no. 2, and no. 3 for leaks or damage.</p> <p>7. Inspect rear hardlifts (7) for broken welds and loose, broken, or missing screws.</p>	<p>One or more screws are broken or missing.</p> <p>Any broken frame rails, crossmembers, broken welds, loose or broken screws.</p> <p>Loose, missing, or damaged pivot bushing bolts.</p> <p>Any damage that would impair vehicle operation.</p>
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>8. Inspect engine, transmission, and transfer case for leaks or damage.</p> <p>9. Inspect springs (8) for cracks, broken coils, or other damage.</p> <p>10. Inspect anti-sway bar (9) for looseness or damage.</p> <p style="text-align: center;"><b>CAUTION</b></p> <p>All guidelines set forth for maintaining corrosion preventive compounds must be adhered to (refer to General Maintenance Procedures (WP 0091)). Failure to follow these guidelines will negatively impact the corrosion control integrity of the vehicle and result in damage to equipment.</p> <p>11. Inspect underside of cargo body (10) between mud flaps (11) for presence of corrosion. Look and be aware for spots where paint has been damaged and white primer has been exposed.</p>	Any class III leaks.

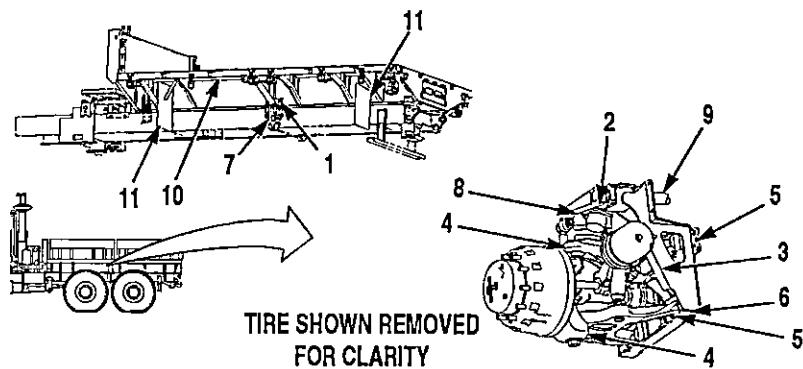


Figure 82.

76	Monthly	ANTI-SWAY BAR	<p style="text-align: center;"><b>NOTE</b></p> <p>There are four anti-sway bar arms on vehicle. All four anti-sway bar arms <b>MUST</b> be checked for movement.</p> <p>1. Move link end of anti-sway bar arm (1) inboard and outboard, and check spline connection for movement. If any movement is detected, notify Second Echelon Maintenance.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

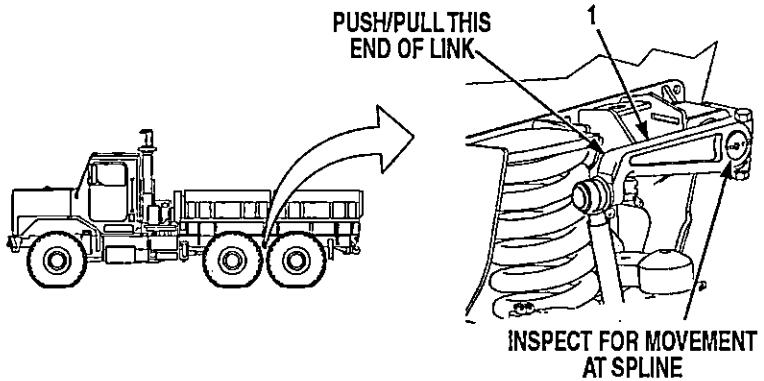
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
77	Monthly	ENGINE OPERATION	 <p>PUSH/PULL THIS END OF LINK.</p> <p>INSPECT FOR MOVEMENT AT SPLINE</p>	<p>1. Inspect starter (1) for secure mounting and loose or damaged wires (2).</p> <p>Starter is loose or has loose or damaged wires.</p>

Figure 83.

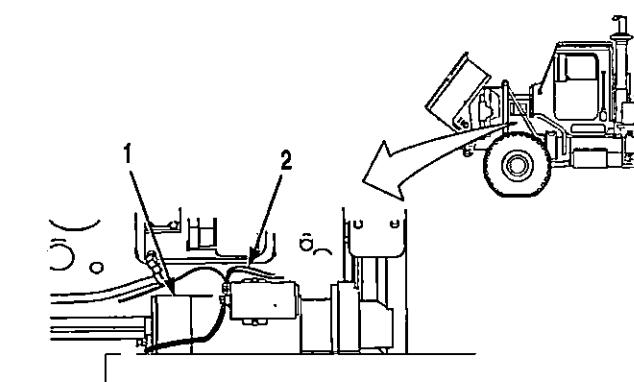
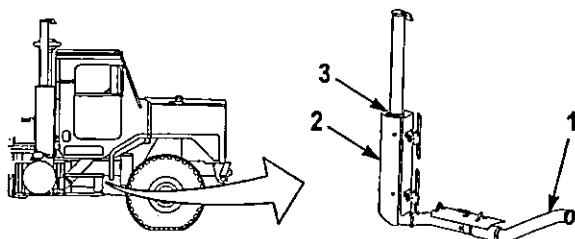
77	Monthly	ENGINE OPERATION	 <p>1. Inspect starter (1) for secure mounting and loose or damaged wires (2).</p>	<p>Starter is loose or has loose or damaged wires.</p>
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Figure 84.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
78	Monthly	EXHAUST SYSTEM	<p><b>WARNING</b></p>  <p>During vehicle operation, exhaust system can become very hot. Do not touch exhaust system components with bare hands, or allow your body to come in contact with exhaust system components. Failure to comply may result in serious burns to personnel.</p> <p>1. Check exhaust piping (1), shields (2), and muffler (3) for looseness or damage. While engine is running, listen for exhaust leaks.</p>	Any exhaust piping leak.
79	Monthly	CTIS	<p>1. Activate each button on CTIS controller (WP 0043) (1) and ensure corresponding indicator light illuminates.</p>	

Figure 85.



**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

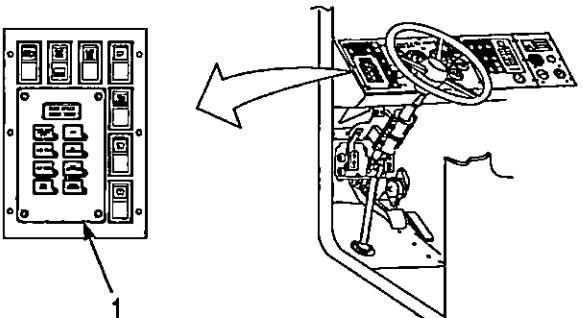
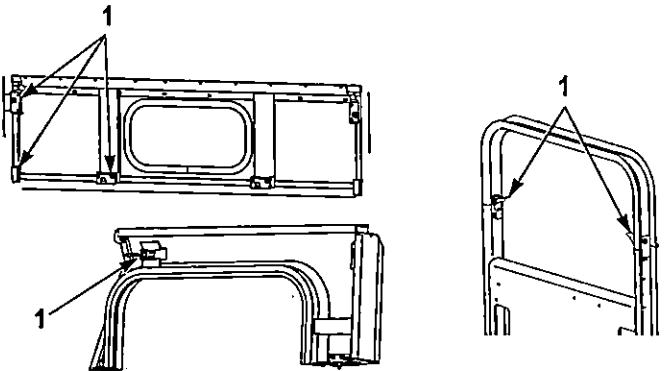
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 86.

80	Monthly	CAB INTERIOR	<p>1. Check all cab latches (1) for damage and ensure all latches are in lock position.</p> 	
			<p>2. Check upper and lower rifle mount brackets (2) for looseness or damage.</p> <p>3. Check catch assembly (3) on upper rifle mount brackets for excessive looseness, binding or damage.</p> <p>4. Inspect all seat cushions (4), backrest (5), frames (6), and BII box (7) for serviceability.</p> <p>5. Inspect driver's seat (8) and switch (9) for proper operation (WP 0028).</p> <p>6. Inspect two drain plugs (10) for proper operation and serviceability.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
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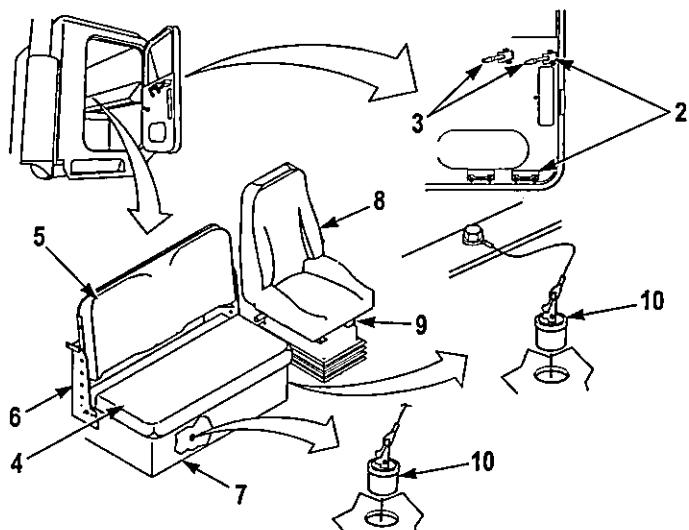


Figure 88.

7. Operate MIC and check for fault messages (WP 0095).  
 8. Check three weapons ports (11) for proper operation (WP 0070) (if equipped with non-reducible armor).

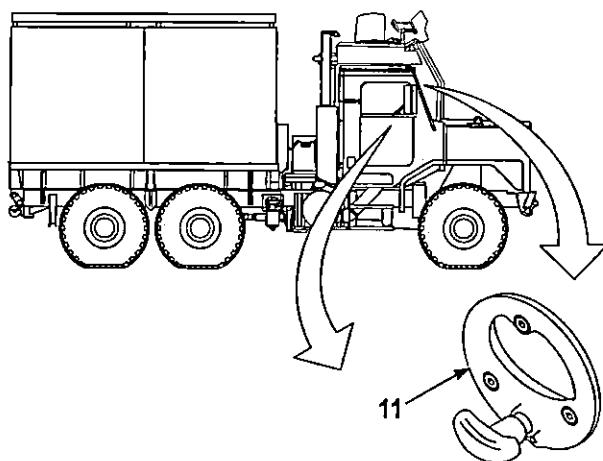
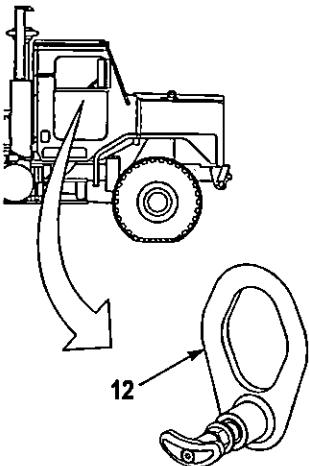


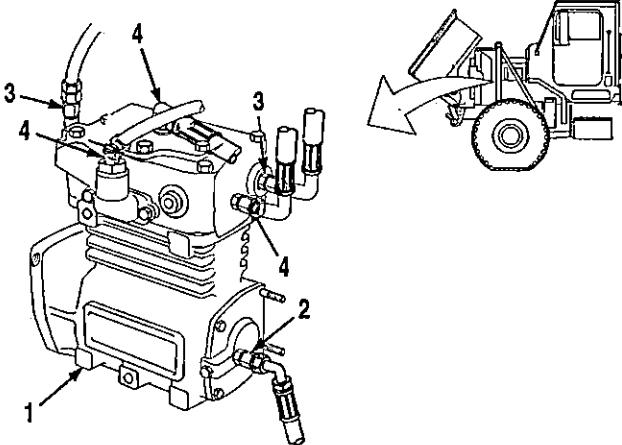
Figure 89.

9. Check two weapons ports (12) for proper operation (WP 0070) (if equipped with non-reducible armor).

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
81	Monthly	AIR COMPRESSOR	<p><b>WARNING</b></p>  <p>Engine components become extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in serious injury to personnel.</p> <p><b>NOTE</b></p> <p>To check for air leakage, the air system must be charged to a minimum of 100 psi (690 kPa).</p> <ol style="list-style-type: none"> <li>1. Check air compressor (1) for oil or coolant leaks.</li> <li>2. Check air compressor (1), oil fitting (2), coolant fittings (3), and air fittings (4) for looseness and leakage.</li> <li>3. Check that air compressor (1) is securely mounted.</li> </ol>	Class III oil or coolant leak. Class III oil or coolant leak or air leakage. Compressor is loose.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
82	Monthly	ARCTIC ENGINE KIT (IF EQUIPPED)	 <p>Figure 91.</p> <ol style="list-style-type: none"> <li>Inspect fuel lines for signs of leakage.</li> <li>Inspect coolant hoses and arctic engine heater (1) for signs of leakage.</li> <li>Inspect exhaust hose (2) for signs of exhaust leaks.</li> <li>Inspect transmission heater pan (3) for damage and secure mounting.</li> <li>Open battery box (4) and inspect for signs of coolant leakage.</li> <li>Check to ensure wire harness (5) is securely connected to arctic engine heater (1).</li> <li>Inspect arctic engine heater (1) to ensure secure mounting.</li> <li>Operate arctic engine heater (1) and ensure proper operation (WP 0059).</li> </ol>	Any leak.  Any Class III leak.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

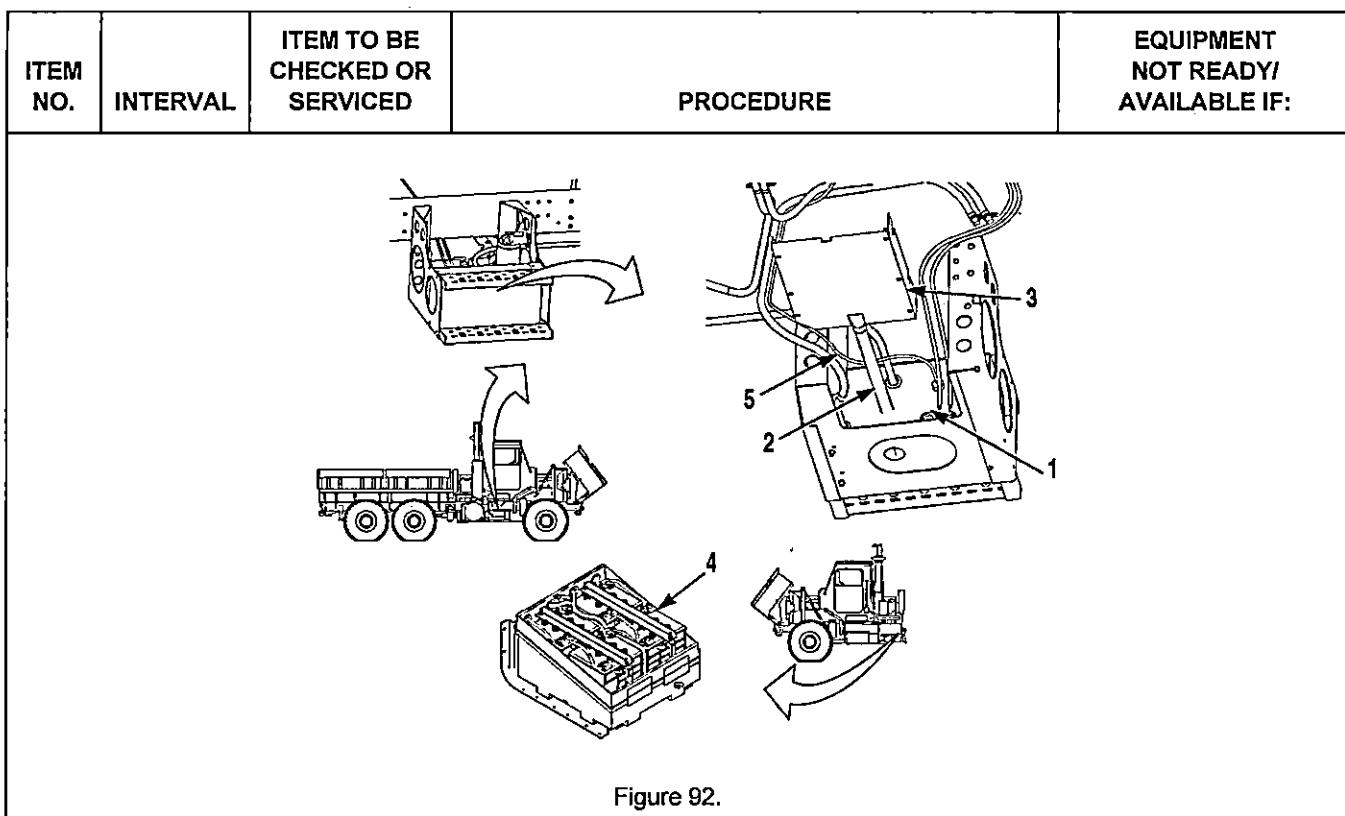


Figure 92.

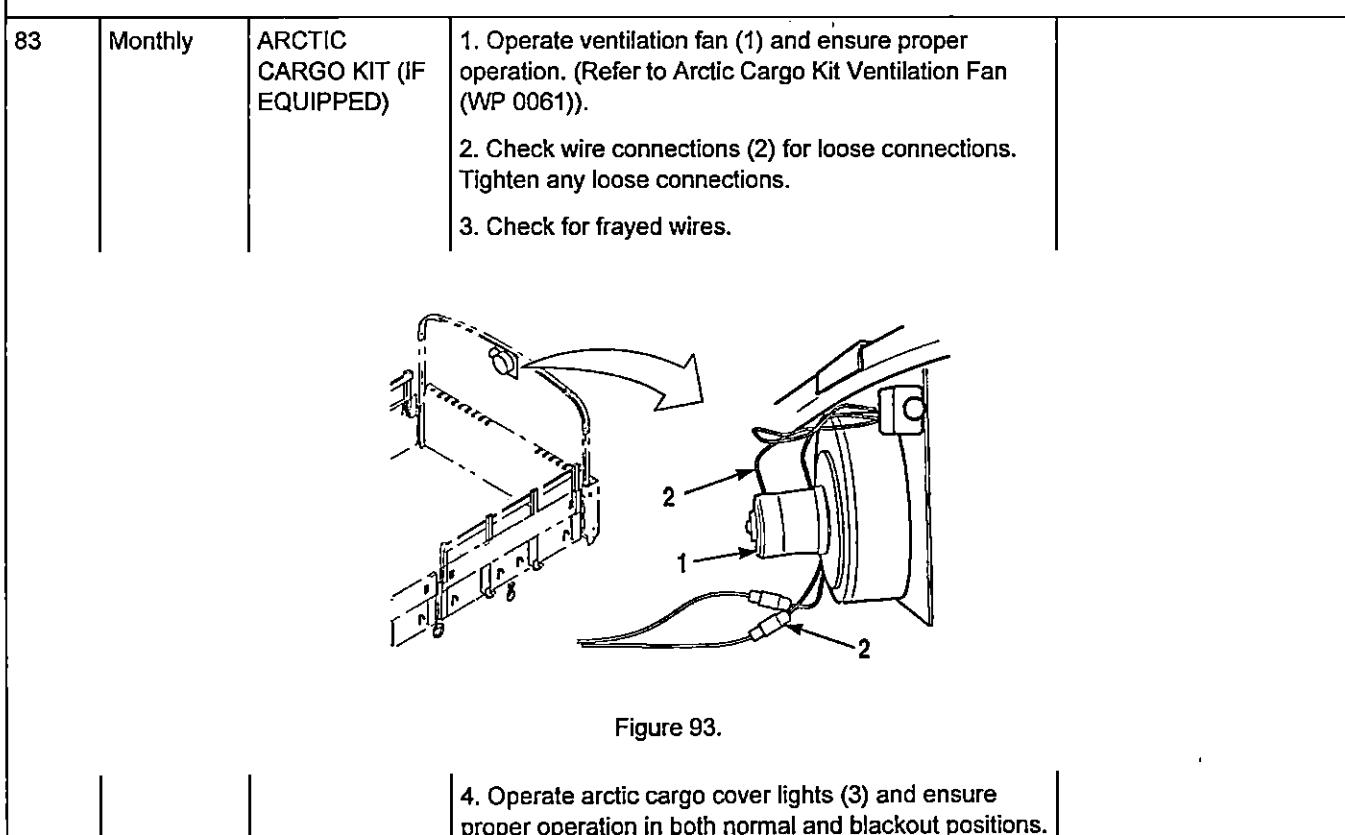


Figure 93.

4. Operate arctic cargo cover lights (3) and ensure proper operation in both normal and blackout positions.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

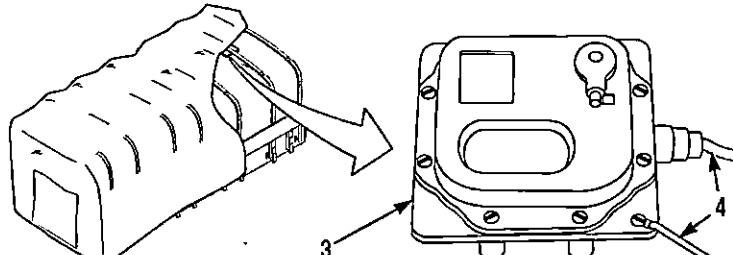
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>(Refer to Arctic Cargo Kit Dome Light Operation (WP 0061)).</p> <p>5. Check arctic cargo cover light wire connections (4) for loose connections. Tighten any loose connections.</p>	
				

Figure 94.

**WARNING**

Do not operate arctic cargo kit heater if fuel leaks or exhaust leaks are present. Failure to comply may result in injury or death to personnel.

6. Check for damage to fuel line (5) and connections.
7. Check for damage to exhaust line (6) and connections.
8. Inspect arctic cargo heater wire connections for tightness. Tighten any loose connections.
9. Ensure arctic cargo kit heater (7) is securely mounted to cargo bed (8).
10. Check heating tubes (9) and ensure vent holes (10) are clean and free of debris.
11. Push switch (11) up and hold for five seconds. Diagnostic light (12) should light solidly and should not blink.
12. Operate arctic cargo kit heater (7) and check for exhaust leaks in exhaust line (6).
13. With arctic cargo kit heater (7) operating, check for fuel leaks in fuel line (5).
14. With arctic cargo kit heater (7) operating, ensure heater works properly in both heating and venting position. (Refer to Arctic Cargo Kit Personnel Heater (WP 0061)).

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
84	Monthly	CHEMICAL ALARM KIT (IF EQUIPPED)	<p>Refer to Location and Description of Major Components (WP 0002).</p> <p>Refer to TM 3-10434A-12&amp;P for PMCS.</p>	
85	Monthly	DECONTAMINATION KIT (IF EQUIPPED)	<p>Refer to Fuel/Water Can Bracket (WP 0002).</p> <p>Refer to TM 3-4230-204-12&amp;P for PMCS.</p>	
86	Monthly	HYDRAULIC RESERVOIR (MK25)	<p>1. Check hydraulic tank (1) for leaks, damage, and secure mounting.</p> <p>2. Check hydraulic hoses, connections, cap (2), and filter (3) for leaks, damage, or looseness.</p>	<p>Any Class III hydraulic leak.</p> <p>Any class III hydraulic fluid leakage or loose connections.</p>

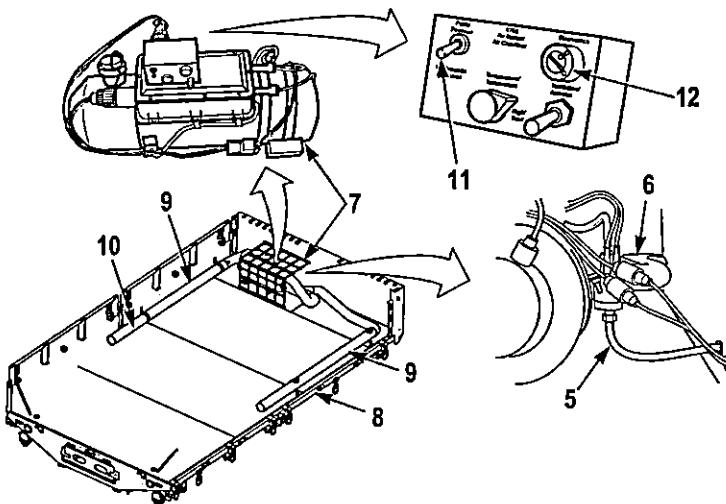


Figure 95.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

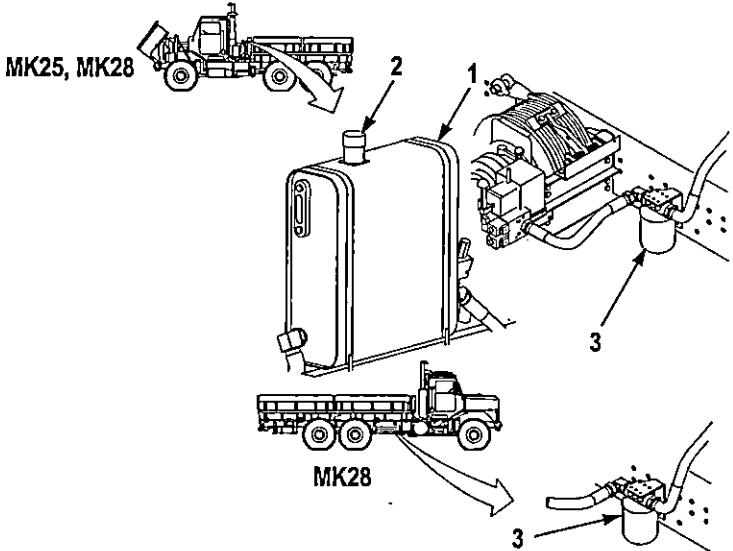
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
87	Monthly	SELF RECOVERY WINCH (SRW) (WHEN EQUIPPED)	 <p>1. Check for looseness and damage to SRW rear cable guide (3) and rollers (4). Check tensioning rollers (1) and spring (2) for damage. Check for obvious damage to SRW (5).</p> <p>2. Inspect cable holddown (6) for damage and serviceability.</p> <p>3. With the aid of an assistant, pay winch cable in and out while listening to winch motor (7) for unusual noises and proper operation.</p>	

Figure 96.

87	Monthly	SELF RECOVERY WINCH (SRW) (WHEN EQUIPPED)	<p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Refer to Winch Operation (WP 0044) for more detailed information on operation of SRW.</li> <li>Tensioning rollers (1) and spring (2) are not present on MK28.</li> </ul> <p>1. Check for looseness and damage to SRW rear cable guide (3) and rollers (4). Check tensioning rollers (1) and spring (2) for damage. Check for obvious damage to SRW (5).</p> <p>2. Inspect cable holddown (6) for damage and serviceability.</p> <p>3. With the aid of an assistant, pay winch cable in and out while listening to winch motor (7) for unusual noises and proper operation.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

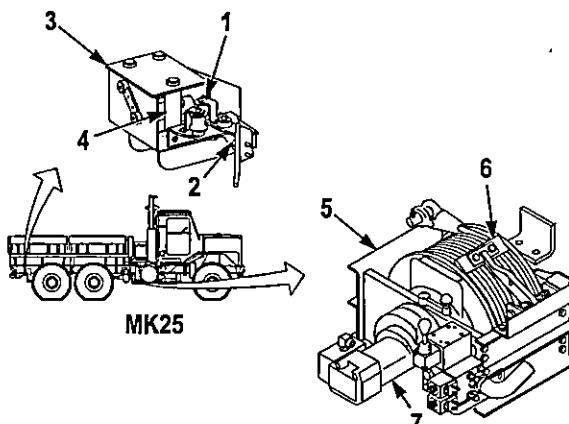
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 97.

#### **WARNING**

Use heavy leather gloves when checking winch cable. Injury to hands can result if gloves are not worn.

#### **NOTE**

Worn spots will show up as shiny flattened spots on the strands.

4. Inspect winch cable (8) for kinks and broken strands while cable is being payed out for use.

5. Inspect for worn spots while cable is being payed out for use.

6. Inspect broken wires to determine if it is a single broken wire or several broken wires. Inspect while cable is being payed out for use.

Cable is frayed, kinked, worn, or corroded.

Outer wires are reduced in diameter by one-fourth.

Individual wires are broken next to one another; six randomly distributed broken wires in one lay (the distance in which the strands make one complete turn around the cable); or three broken wires in one lay.

7. Lubricate winch cable (8) (WP 0111).

8. Wind cable onto winch (WP 0044).

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

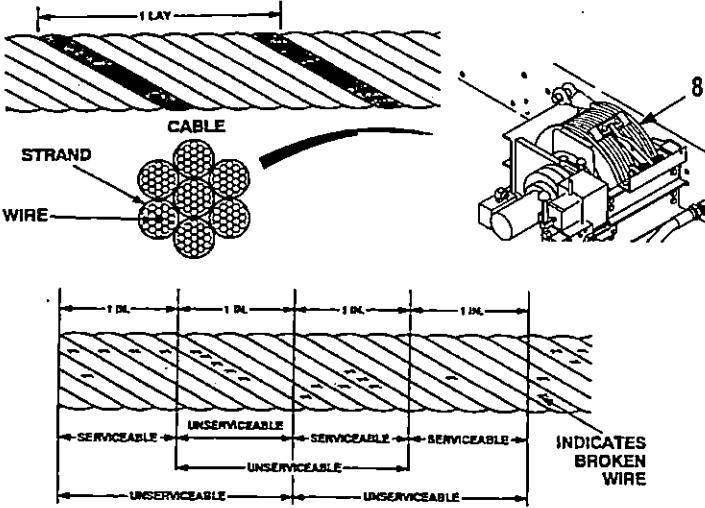
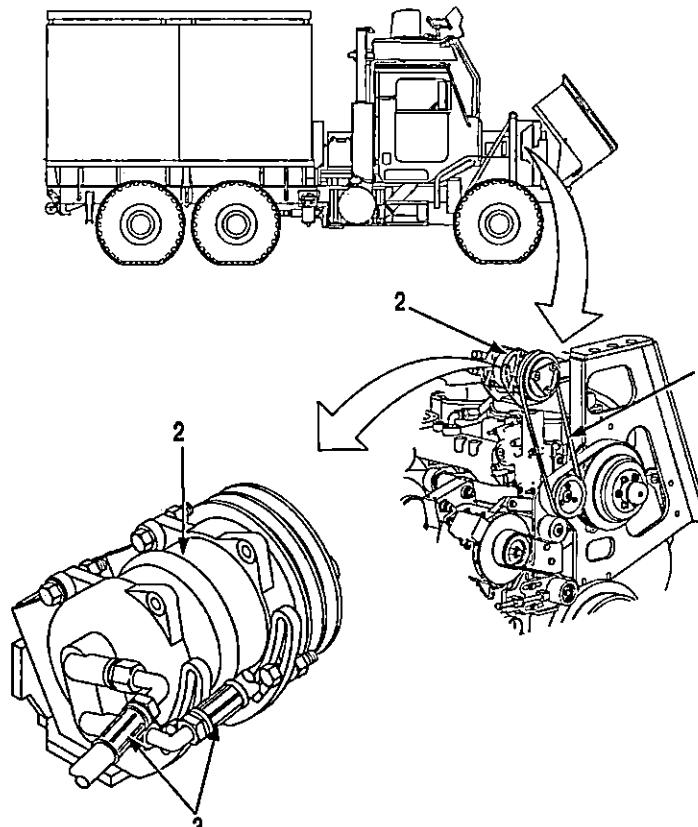
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 98.

88	Monthly	AIR CONDITIONING (A/C) KIT (IF EQUIPPED)	<p>1. Check A/C compressor belt (1) for cracking, fraying, or other damage.</p> <p>2. Check A/C compressor (2) and hoses (3) for damage.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
89	Monthly	FUEL TANK FIRE PROTECTION KIT (IF EQUIPPED)	<p><b>CAUTION</b></p> <p>If panel is cracked, notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <p>1. Check panel assemblies (1) for damage, cracks, or leaking powder.</p> <p>2. Check metal locking ties (2) for damage.</p>	<p>Panel is cracked or powder is present.</p> <p>Metal locking tie is broken or missing.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

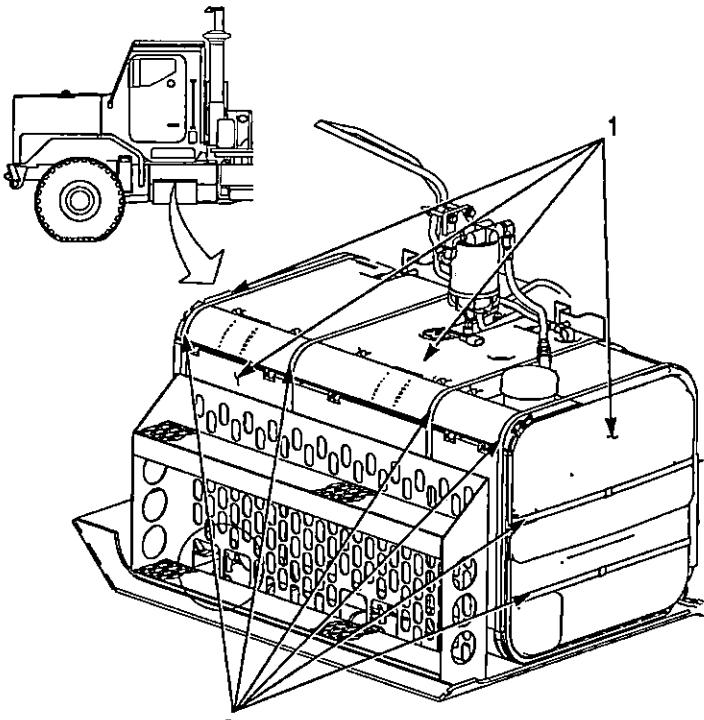
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 100.

90	Monthly	INCREASED MINE PROTECTION KIT (IF EQUIPPED)	<p><b>NOTE</b></p> <p>Both passenger and driver seats and seat belts are the same.</p> <p>1. Inspect all seat cushions (1), backrests (2), frames (3), and BII stowage box (4) for serviceability.</p> <p>2. Inspect cab map box (5) and BII stowage strap (6) for damage and serviceability.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

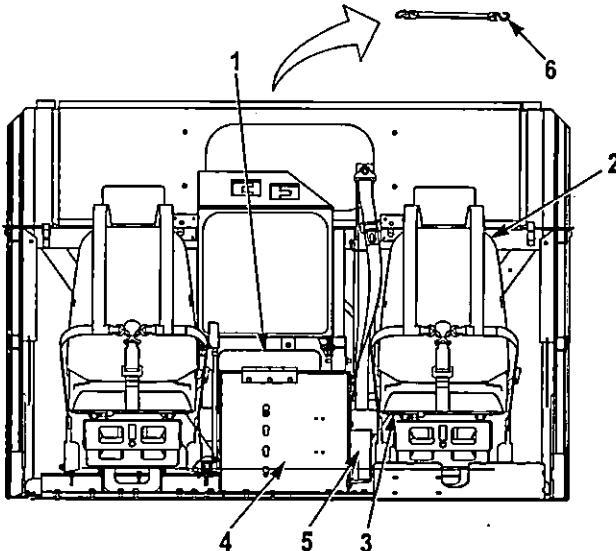
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
91	Monthly	BELLY DEFLECTOR (ARMOR KIT)	 <p>1. Inspect belly deflector (1) and two wheel zone deflectors (2) for loose, broken, or missing hardware.</p>	

Figure 101.

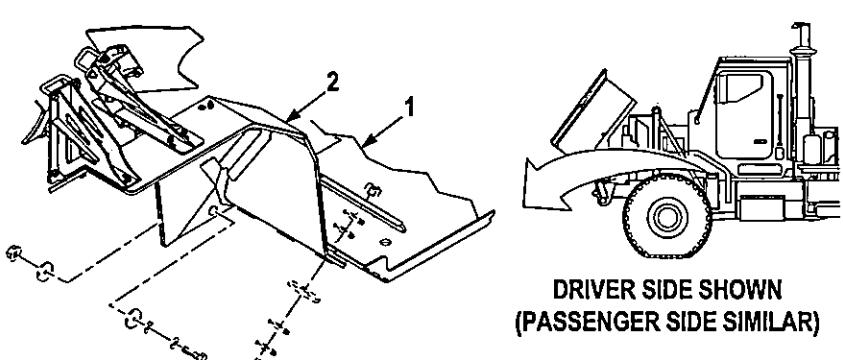
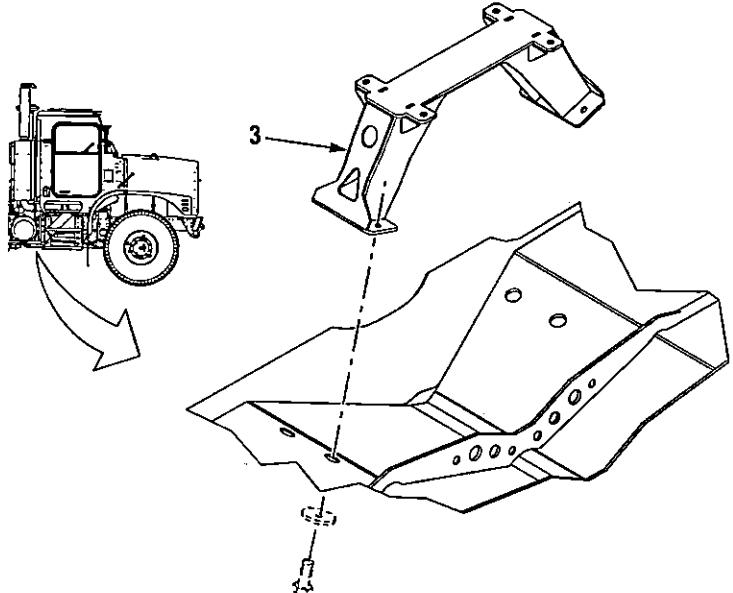
91	Monthly	BELLY DEFLECTOR (ARMOR KIT)	 <p>DRIVER SIDE SHOWN (PASSENGER SIDE SIMILAR)</p> <p>2. Inspect frame bridge (3) for loose, broken, or missing hardware.</p>	
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Figure 102.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
92	Monthly	CAB ARMOR (ARMOR KIT)	 <p>1. Check armored panels for stress cracks.</p>	<p>Stress crack over 2 in. (51 mm) long is present or more than two stress cracks are present on the armored panel.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

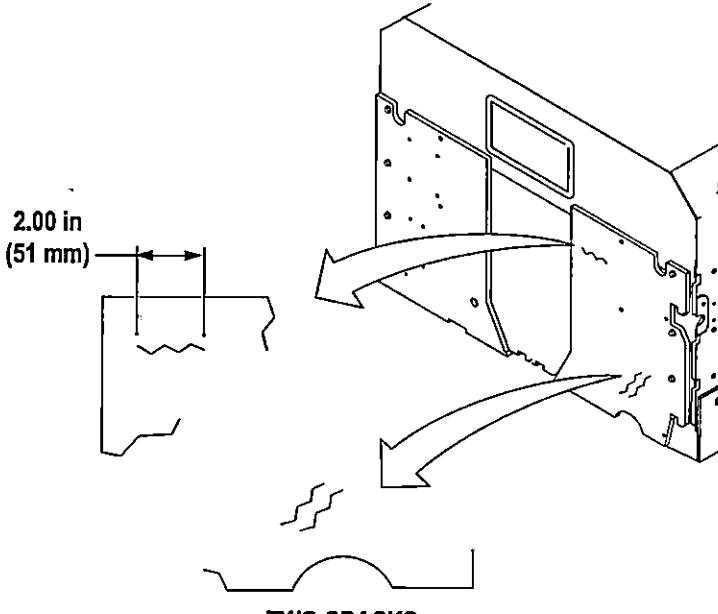
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
93	Monthly	FRONT AND REAR CAB MOUNTS (ARMOR KIT)	<p>1. Inspect front cab mounts (1) and rear cab mounts (2) for wear.</p>	

Figure 104.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

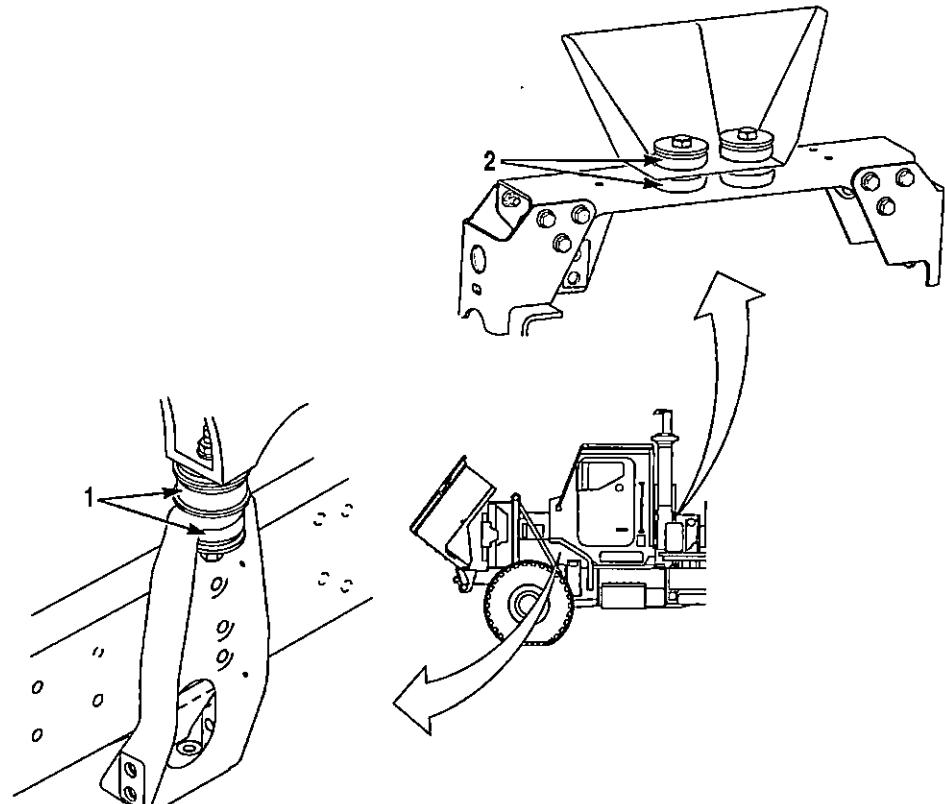
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
94	Monthly	CAB DOOR (ARMOR KIT)	 <p>1. Inspect lug door plate (1) for cracked or broken welds.</p>	Any cracked or broken welds.

Figure 105.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

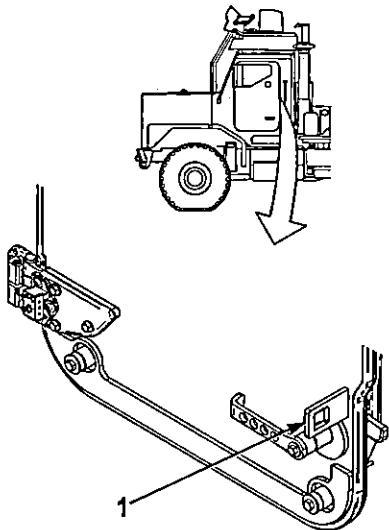
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
95	Monthly	EMERGENCY EGRESS WINDOW (EEW)		Check adjustment screw (1) for proper torque. Notify 2nd ECHELON Field Maintenance if not within torque specs.

Figure 106.

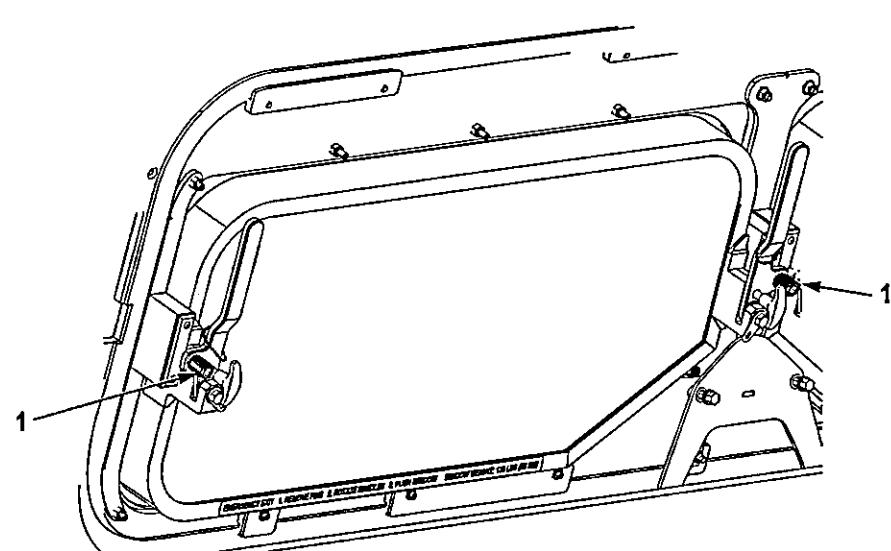
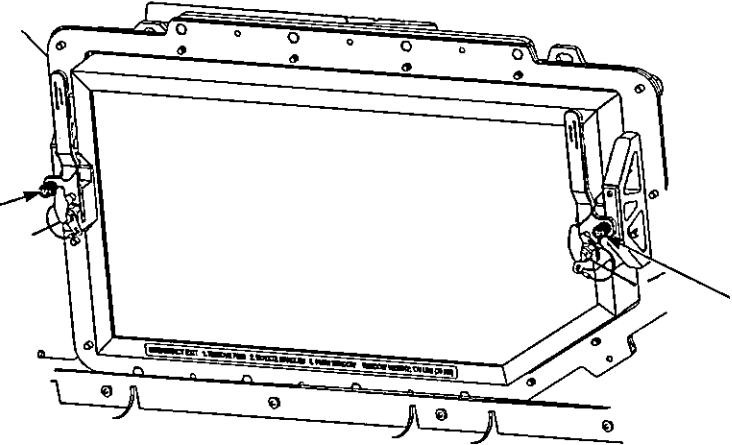
95	Monthly	EMERGENCY EGRESS WINDOW (EEW)		Loose hardware will cause hazardous driving conditions.
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Figure 107. Non-Reducible,

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK23 AND MK25) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
 <p>Figure 108. Reducible,</p>				

**END OF TASK**

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE PMCS TABLE

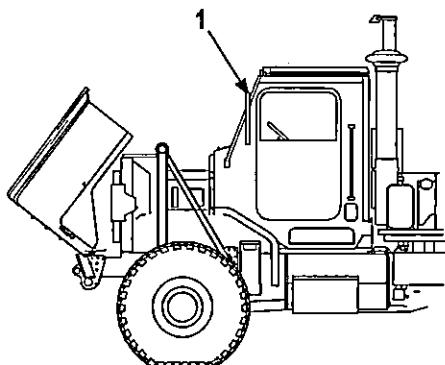
### INITIAL SETUP:

Not Applicable

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28).**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:		
			<b>NOTE</b> These checks are to be made in the order listed, within designated interval.			
1	Before Operation	CAB AND HOOD EXTERIOR	1. Inspect for broken, cracked, or loose mirrors (1).  2. Check under vehicle for fuel, oil, transmission fluid, or coolant leakage.	Any mirror is missing or unusable.  Any fuel leak or class III oil or coolant leak.		
2	Before Operation	FUEL TANK	<b>WARNING</b> Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.			

Figure 1.



**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>CAUTION</b></p> <p>Do not fill fuel tank above full-level line on outside tank, or fuel spillage will occur. Failure to comply may cause damage to equipment.</p> <p>1. Check that strainer (1) is in place and clean. Ensure fuel cap (2) is securely tightened.</p>	Fuel cap is missing.

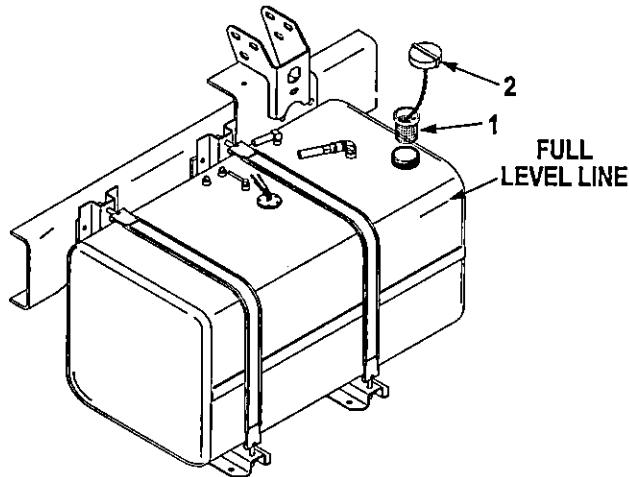


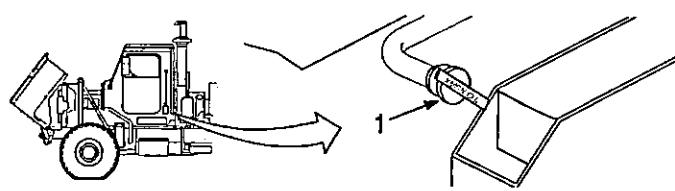
Figure 2.

3	Before Operation	FUEL/WATER SEPARATOR	<p><b>WARNING</b></p> <p>Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.</p> <p><b>NOTE</b></p> <p>A flashlight may be required to perform the following check.</p> <p>1. Check sediment bowl (1) for water. If water is present, drain fuel from bowl into suitable container until clean fuel flows out. To drain fuel from sediment bowl, open drain valve (2) until water and contaminated fuel are allowed to drain from sediment bowl. Close drain valve (2) once all water and contaminated fuel is drained from sediment bowl.</p>	
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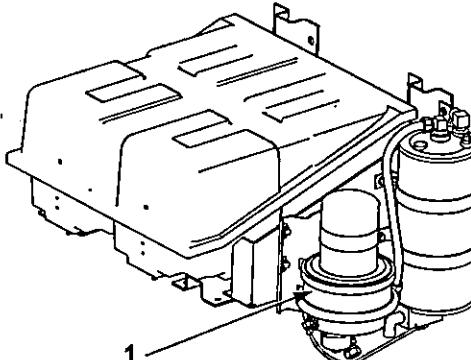
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
4	Before Operation	TRANSMISSION FLUID	<p><b>WARNING</b></p>  <p>Failure to take the following precautions will lead to sudden, unexpected vehicle movement. Whenever checking fluid level, the transmission range selector must be in N (neutral), the parking brake must be set, and the wheels must be chocked. Failure to comply may result in serious injury or death to personnel.</p> <p><b>CAUTION</b></p> <p>Do not permit dirt, dust, or grit to enter transmission filler tube. Thoroughly clean dipstick handle and end of filler tube. Serious internal transmission damage can result if transmission is contaminated.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• If the transmission oil temperature is between 160° and 250°F (71° and 121°C), go directly to the HOT CHECK procedure. If there is evidence of transmission oil leakage, contact Second Echelon Maintenance. If the transmission oil temperature is less than 160°F (71°C), go to the next step, COLD CHECK procedure.</li> </ul>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<ul style="list-style-type: none"> <li>The Cold Check determines if the transmission has enough fluid to be operated safely until a HOT CHECK can be made.</li> </ul> <ol style="list-style-type: none"> <li>If the engine has been shutdown for an extended time, park the vehicle on a level surface and apply the parking brake.</li> <li>Start engine (WP 0029) and idle at (500 to 800 rpm) in N (neutral) for about one minute. Shift to D (drive) and then to R (reverse) to clear the hydraulic circuits of air. Shift to N (neutral) and leave engine at idle.</li> <li>Remove transmission dipstick (1) (WP 0107).</li> </ol> <p><b>CAUTION</b></p> <p>If transmission fluid is too high and needs to be drained, notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <ol style="list-style-type: none"> <li>After wiping the transmission dipstick (1) clean, check the fluid level. If the fluid on the dipstick is within the COLD RUN band, the level is satisfactory. If the fluid level is not within this band, add fluid as necessary to bring the level within the COLD RUN band. (Refer to Lubrication Instruction) (WP 0111)</li> </ol>	Transmission fluid level is too high.
			 <p>Figure 4.</p> <ol style="list-style-type: none"> <li>Install transmission dipstick (WP 0107) (1).</li> <li>Perform a Hot Check at the first opportunity after normal operating temperature (160° to 200°F [71° to 93°C]) is reached.</li> </ol>	
5	Before Operation	AIR DRYER AND AFTERCOOLER	<ol style="list-style-type: none"> <li>Check that air dryer (1) purges when governor shuts off air compressor at 125 psi (862 kPa).</li> </ol>	Air dryer does not purge.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
6	Before Operation	AIR SYSTEM	<p><b>NOTE</b></p> <p>Low air lights must go out prior to performing air reservoir checks.</p> <ol style="list-style-type: none"> <li>1. Shut engine OFF (WP 0035).</li> <li>2. With engine off, listen for leaks at all reservoirs and air reservoir lines.</li> </ol>	Any air reservoir leakage present.
7	Before Operation	TIRES	<ol style="list-style-type: none"> <li>1. Check tires (1) for cuts, gouges, cracks, or other damage.</li> <li>2. Check torque seal (2) on lugnuts (3) and axle studs (4) for cracked, missing, or loose torque seal.</li> </ol>	<p>Any tire that has wear or damage that allows ply or belt material to be exposed through the tread or sidewall. Any tire that has tread or sidewall separation. Any tire that is flat or has an audible leak.</p> <p>Two or more nuts or studs on the same wheel are missing, broken, or bent. Torque seal on nuts or studs cracked, missing or loose.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

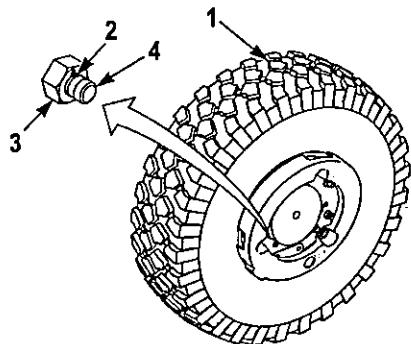
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 6.

8	Before Operation	CARGO BODY AND ISO LOCKS	<ol style="list-style-type: none"> <li>1. Check ladder (1) for damage and ensure ladder is properly secured.</li> <li>2. Check tailgate (2), hinges (3), and T-bolt locking handles (4) for damage and proper operation (WP 0050, Dropside Installation).</li> <li>3. Check tailgate rubber stops (5) for cracks, damage, and serviceability.</li> <li>4. Check storage cover (6) and pin (7) for damage and proper installation.</li> </ol>	
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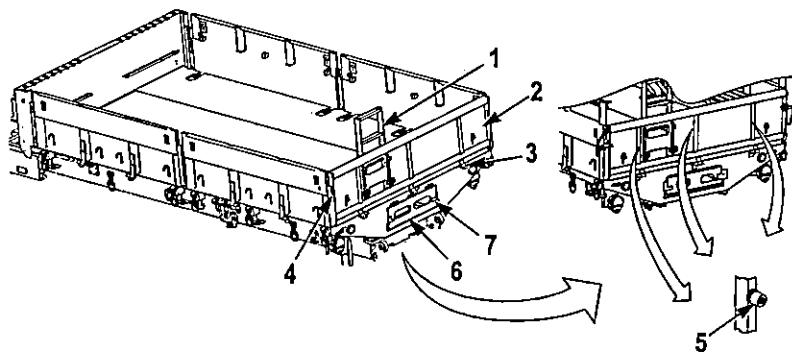
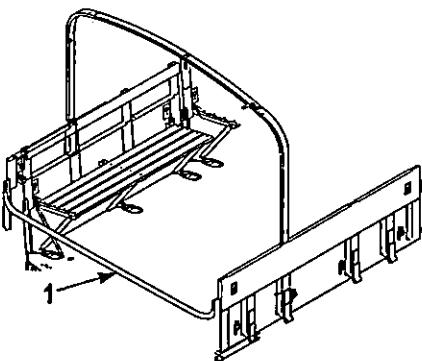
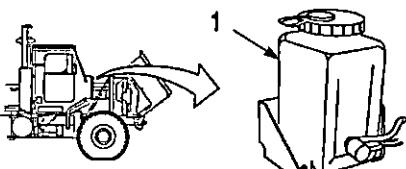


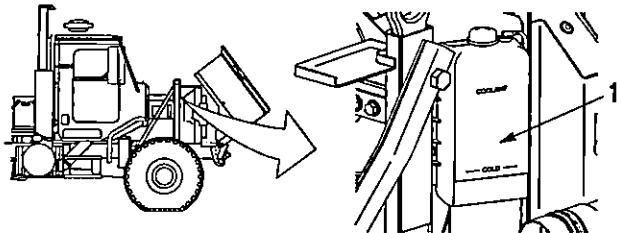
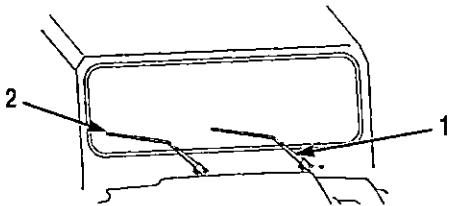
Figure 7.

9	Before Operation	CARGO BODY COVER, TROOP SEATS, BOWS, STAVES, AND BACKRESTS	<p><b>NOTE</b></p> <p>Perform Step (1) only if troop carrying components are installed.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>1. Inspect troop strap (1) for serviceability.</p> 	
10	Before Operation	WINDSHIELD WASHER FLUID BOTTLE	<p>1. Check to ensure there is fluid in windshield washer bottle (1) and that there is no damage to bottle or hoses. Add windshield washer fluid as necessary.</p> 	
11	Before Operation	COOLANT OVERFLOW TANK AND COOLANT LEVEL	<p><b>WARNING</b></p>  <p>Cooling system components become pressurized and extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in injury or death to personnel.</p> <p>1. Check coolant level in coolant overflow tank (1) to ensure it is above the COLD mark. If coolant is below COLD mark, add coolant to bring it up to COLD level (WP 0111).</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
12	Before Operation	WINDSHIELD WIPER ARMS AND BLADES	<p>1. Check windshield wiper arms (1) and blades (2) for damage or wear.</p> 	
13	Before Operation	LIGHTS AND REFLECTORS	<p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>To determine location of switches needed to operate lights for the following checks, refer to Instrument Panel Controls and Indicators (WP 0011).</li> <li>Prior to turning on lights, battery disconnect switch (WP 0013) must be turned on.</li> <li>An assistant is needed to perform the light checks.</li> <li>When light checks are completed, ensure all lights are turned OFF.</li> </ul> <p>1. Position blackout select switch in down position and headlight switch in full up position. Ensure headlights (1) and parking light function (2) of front composite lights (3) illuminate. Ensure marker/clearance lights (4) illuminate. Operate dimmer switch and ensure headlights (1) change from high beam to low beam</p>	Headlights are inoperable.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>and ensure high beam indicator (5) on dash operates properly.</p> <p>2. With headlight switch ON, ensure dash light dimmer (6) switch operates properly in all three positions.</p> <p>3. Operate turn signal lever and ensure turn signal (7) of front composite lights (3) function, and check that top marker light (8) on hood blinks.</p> <p>4. Check front reflectors (9) for damage and serviceability.</p> <p>5. Push in emergency flasher control switch and ensure turn signal (7) of front composite lights (3) blink.</p> <p>6. Position blackout select switch to up position and blackout light switch in full up position, and ensure blackout drive headlights (10) and blackout marker lights (11) of front composite lights (3) illuminate.</p>	

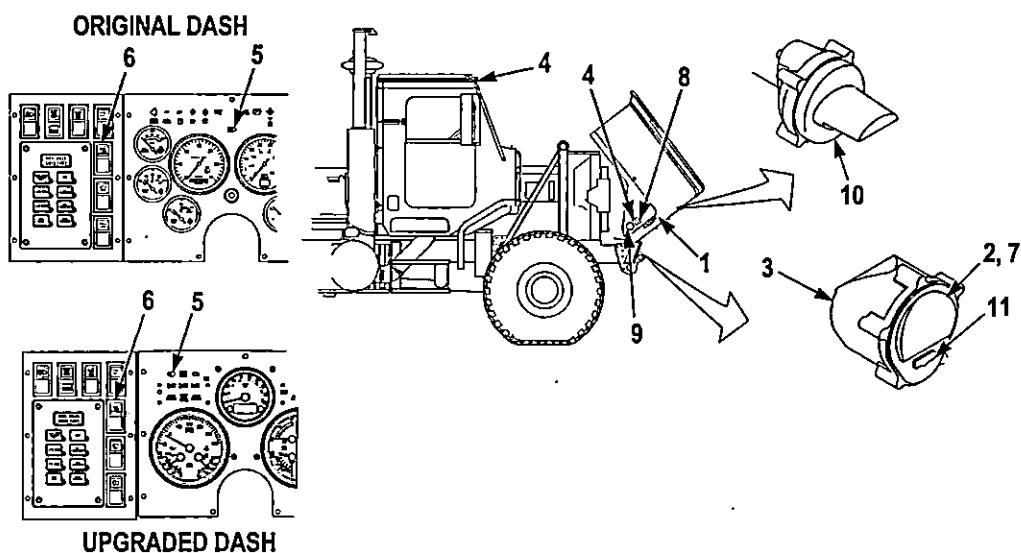


Figure 12.

		<p>7. Position blackout select switch in down position and headlight switch in full up position. Ensure parking light function (12) of rear composite lights (13) illuminate. Ensure marker/clearance lights (14) illuminate. Operate service brake pedal and ensure brake light function (15) of rear composite lights (13) illuminate.</p> <p>8. Operate turn signal lever and ensure turn signal function (16) of rear composite lights (13) blink.</p>	Brake lights are inoperable.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>9. Push in emergency flasher control switch and ensure parking light function (12) of rear composite lights (13) blink.</p> <p>10. Position blackout select switch in up position and blackout light switch in full up position, and ensure blackout parking light function (17) of rear composite lights (13) illuminate. Operate service brake pedal and ensure blackout marker brake light function (18) of rear composite lights (13) illuminate.</p> <p>11. Check side and rear reflectors (19) for damage and serviceability.</p>	
14	Before Operation	WINDSHIELD AND GLASS	<p><b>CAUTION</b></p> <p>Vehicles equipped with ballistic glass must not have ballistic glass cleaned with solvent or other strong cleaning compounds. Ballistic glass must only be cleaned with a lint-free cloth and a mild solution of warm water and soap. Do not clean ballistic glass in hot temperatures. Avoid contacting ballistic glass with hands or skin. Failure to comply may result in damage to equipment.</p> <p>1. Check for broken or cracked windshield, driver and passenger side windows, and rear window.</p>	Windshield is cracked or broken.
15	Before Operation	ENGINE OIL	<p><b>CAUTION</b></p> <p>If engine oil needs to be drained, contact Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>NOTE</b></p> <p>If engine has been running, wait approximately five minutes after engine shutdown before checking engine oil.</p> <ol style="list-style-type: none"> <li>1. Remove engine oil dipstick (WP 0107) (1).</li> <li>2. Check engine oil on dipstick (1). Oil should be between the ADD and FULL mark. Add oil as required (WP 0111).</li> <li>3. Ensure dipstick (1) and fill cap (2) are properly installed (WP 0107).</li> </ol>	<p>Oil level is too high</p> <p>Oil level is too high.</p>

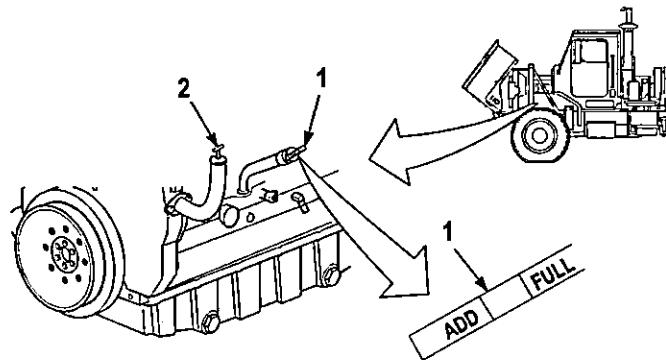


Figure 14.

16	Before Operation	ETHER START SYSTEM	<p><b>WARNING</b></p>  <p>Use care when working around ether canister, ether canister is pressurized and is flammable. Failure to comply may result in injury or death to personnel.</p>	
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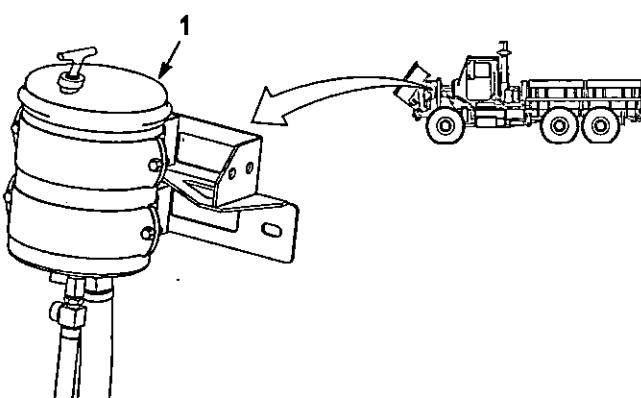
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>WARNING</b></p>  <p>Use care when working around ether canister, ether canister is pressurized and is flammable. Failure to comply may result in injury or death to personnel.</p> <p><b>WARNING</b></p>  <p>Ether canister contains diethyl ether with carbon dioxide as a propellant. Keep away from heat and flame. NEVER smoke near contents. Do not incinerate or puncture container. Do not store at temperatures above 120°F (49°C). Avoid contact with skin and eyes. Avoid breathing fumes. Do not store spare containers in driver's compartment. If swallowed, do not induce vomiting. Contact physician immediately. Failure to comply may result in injury or death to personnel.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>When re-installing ether canister, ensure gasket is properly seated in valve.</li> <li>When installing a new ether canister, replace old gasket with new gasket supplied with new canister.</li> </ul> <p>1. When temperature is below 45°F (7°C), check for presence of ether fluid by shaking canister (1). If fluid is present, canister is serviceable. To remove canister, loosen clamp (2) and unscrew canister (1) counterclockwise out of valve (3). Install canister in reverse order.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
17	Before Operation	HYDRAULIC STEERING SYSTEM	<p>1. Check hydraulic steering reservoir (1) for damage or leaks.</p> <p>2. Check hydraulic steering hoses and fittings for damage, leakage, or looseness.</p>	Any class III hydraulic leak.  Any class III hydraulic leak.

Figure 16.



**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
18	Before Operation	UNDERCARRIAGE AND FRAME	<p><b>CAUTION</b></p> <p>All guidelines set forth for maintaining corrosion preventive compounds must be adhered to (refer to General Maintenance Procedures) (WP 0091). Failure to follow these guidelines will negatively impact the corrosion control integrity of the vehicle and result in damage to equipment.</p> <p>1. Inspect underside of vehicle for loose or damaged wires.</p>	
19	Before Operation	ENGINE OPERATION	1. Start engine (WP 0029) and check starter (1) for slow operation or unusual noises when cranking.	Starter is noisy or cranks slowly.

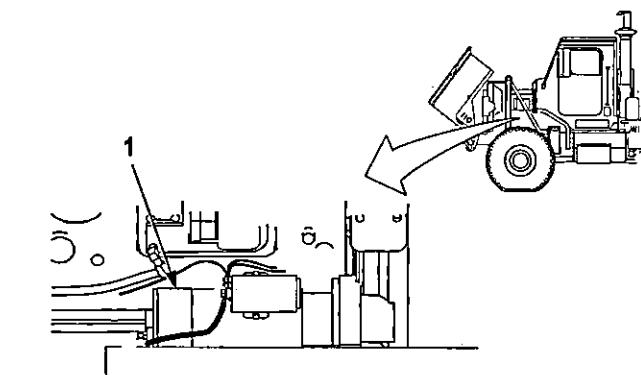


Figure 17.

20	Before Operation	EXHAUST SYSTEM	<p><b>WARNING</b></p>  <p>During vehicle operation, exhaust system can become very hot. Do not touch exhaust system components with bare hands, or allow your body to come in contact with exhaust system components. Failure to comply may result in serious burns to personnel.</p> <p>1. Check raincap (1) to ensure it is in place and functioning on top of exhaust stack (2).</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
21	Before Operation	CAB INTERIOR	<p>1. Check that LOW AIR 1 warning light (1) and LOW AIR 2 warning light (2) indicator lights remain illuminated and warning buzzer sounds until red and green needles on AIR PRESS gauge (3) reach 64 to 76 psi (441 to 524 kPa) (ORIGINAL DASH).</p> <p>2. Check that LOW AIR 1 warning light (1) and LOW AIR 2 warning light (2) remain illuminated until needle on FRONT AIR PRESS gauge (3) and REAR AIR PRESS gauge (3a) reach 64 to 76 psi (441 to 524 kPa) (UPGRADED DASH).</p> <p>3. Check that both needles on AIR PRESS gauge (3) read 100 to 125 psi (690 to 862 kPa) (ORIGINAL DASH).</p> <p>4. Check that the needle on FRONT AIR PRESS gauge (3) and REAR AIR PRESS gauge (3a) read 100 to 125 psi (690 to 862 kPa) (UPGRADED DASH).</p> <p>5. Check to ensure oil pressure gauge (4) indicates safe operating pressure at idle and increases as engine speed does.</p> <p>6. Check to ensure water temperature gauge (5) reads below 220°F (104°C).</p> <p>7. Check to ensure transmission oil temperature gauge (6) reads below 250°F (121°C).</p> <p>8. Check to ensure volt gauge (7) reads between 24 and 30 volts.</p>	<p>Low oil pressure.</p> <p>Water temperature exceeds 220°F (104°C).</p> <p>Transmission oil temperature exceeds 250°F (121°C).</p> <p>Voltage is below 24 volts or above 30 volts.</p>

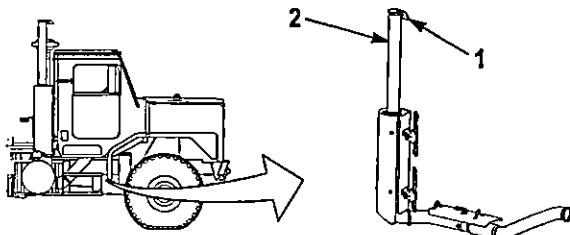


Figure 18.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

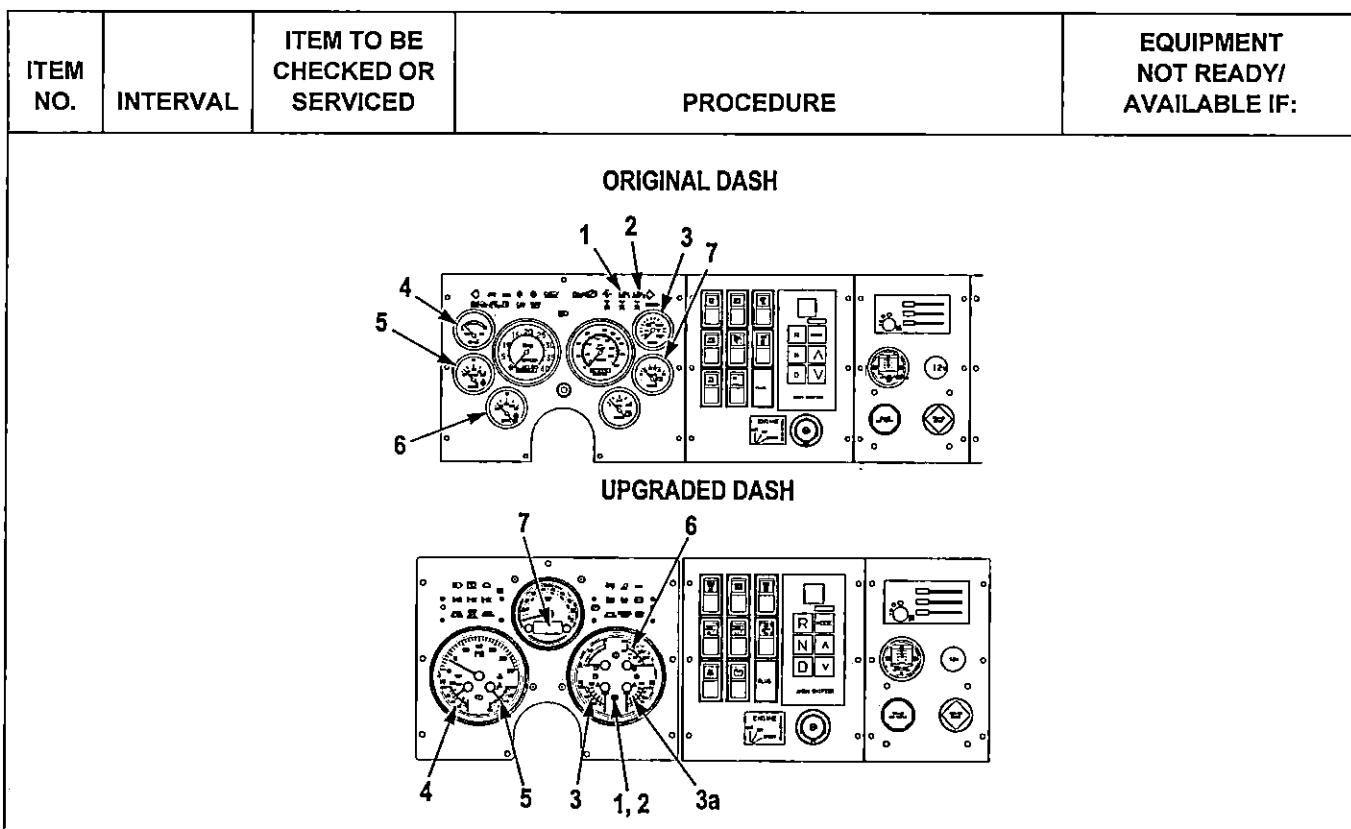


Figure 19.

9. Check seat belts (8) and buckles (9) for serviceability and proper operation.

Damaged, missing, or inoperable seat belts.

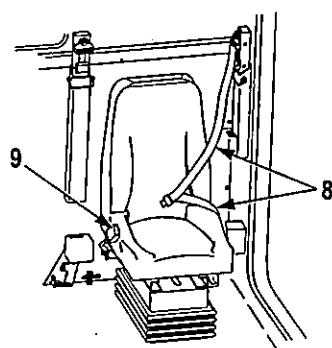


Figure 20.

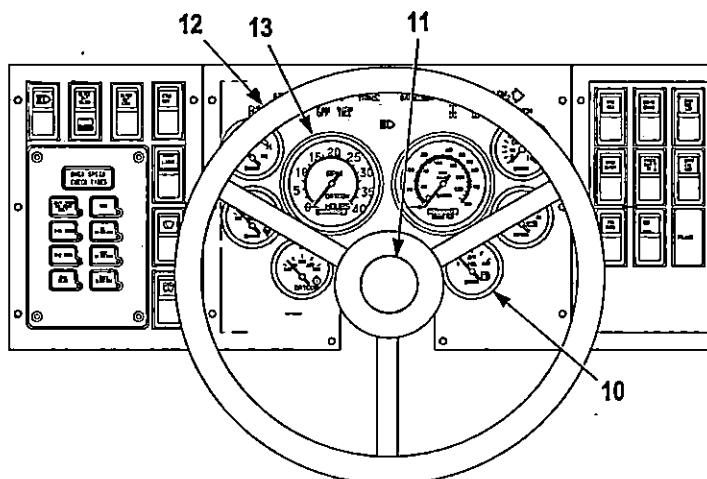
10. Ensure fuel gauge (10) operates.

11. Check horn button (11) for proper operation.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>12. Check to ensure steering wheel (12) controls direction of vehicle.</p> <p><b>NOTE</b></p> <p>With ignition switch off, tachometer will not return to zero. Tachometer will "zero out" and indicate correct rpm when ignition switch is ON and engine is operating.</p> <p>13. Ensure tachometer (13) indicates 600 to 800 rpm with engine idling.</p>	Steering wheel does not control direction of vehicle.

**ORIGINAL DASH**



**UPGRADED DASH**

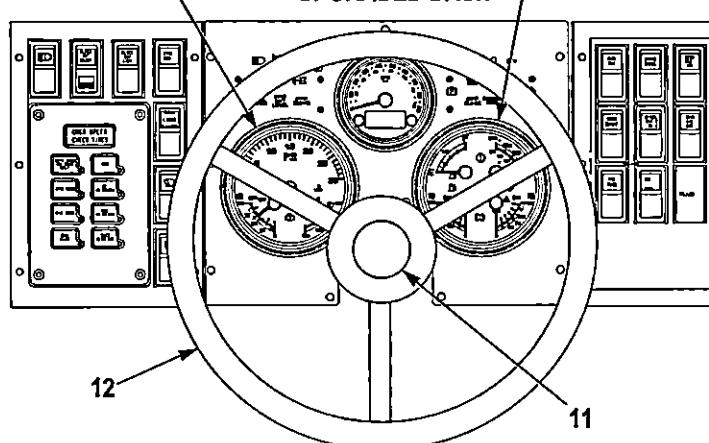


Figure 21.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>14. Check windshield wiper control (14) and washer control (15) for proper operation.</p> <p>15. Check fan control (16) for proper fan operation in all settings.</p> <p>16. Check air conditioning control (17) (if equipped) for proper operation. Check for cooler airflow after one minute of operation.</p>	Windshield wipers do not operate.

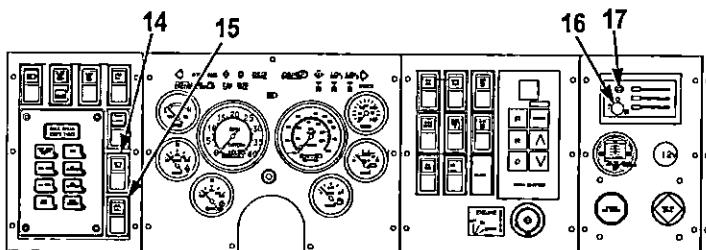


Figure 22.

17. Check fire extinguisher (18) for broken or missing seal.

Fire extinguisher not present or properly charged.

18. Check fire extinguisher (18) for proper charge and damage.

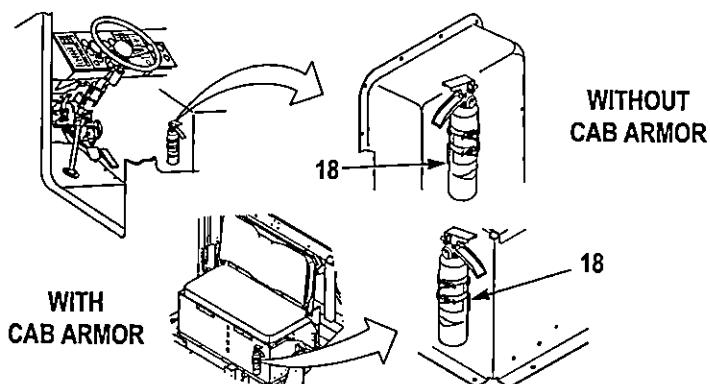


Figure 23.

19. Ensure that service brakes engage when brake pedal (19) is pushed.

Service brakes do not engage when brake pedal is pushed.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			20. Check to ensure back-up alarm and back-up light works when transmission range selector is in R (reverse) (20).	

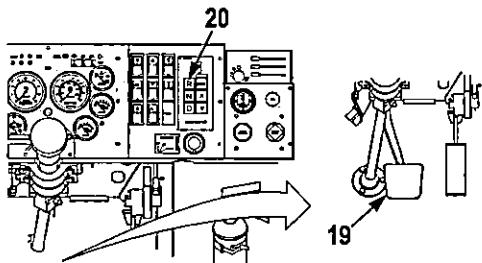


Figure 24.

			21. Shut engine OFF (WP 0035) .	
22	Before Operation	EMERGENCY EGRESS WINDOW (EEW)	<p>1. Check for broken beaded security ties (1) and broken, loose, or damaged T-handle pins (2) and handles (3).</p> <p>2. Inspect strike plates (4) and standoff blocks (5) for damage.</p> <p>3. Check armored glass (6) for cracks and degradation.</p>	

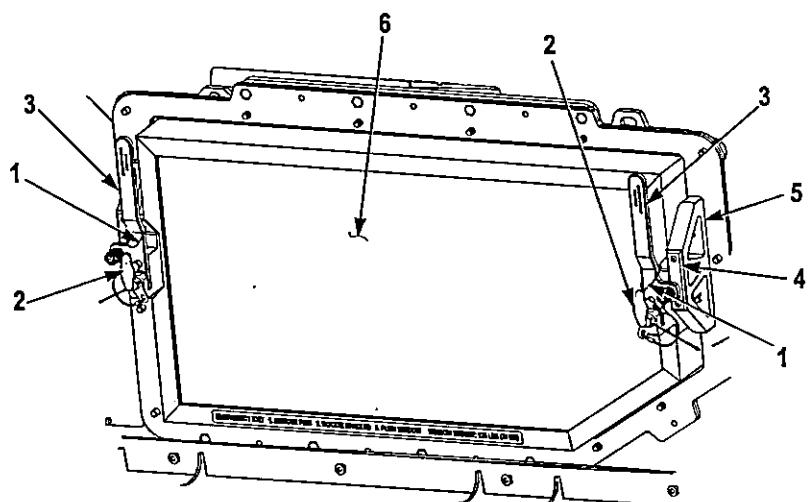
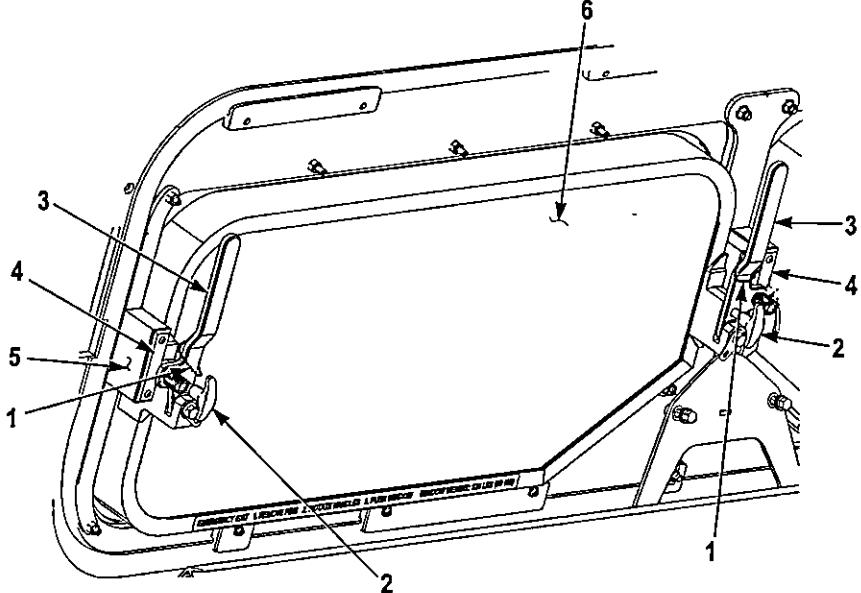
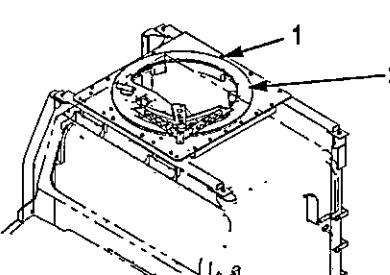


Figure 25. Reducible.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
Figure 26. Non-Reducible.				
23	Before Operation	MACHINE GUN MOUNTING KIT (IF EQUIPPED)	<p><b>SPECIAL PURPOSE KITS</b></p> <p>1. Check machine gun mount screws (1) for damage and serviceability.</p> <p>2. Check machine gun mount (2) for damage and serviceability.</p> <p>3. Ensure machine gun mount (2) rotates and locks into position.</p>	Machine gun mount screws are damaged.
				
Figure 27.				

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

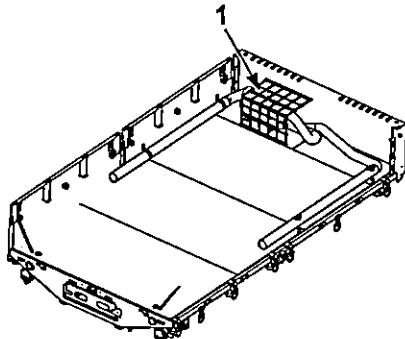
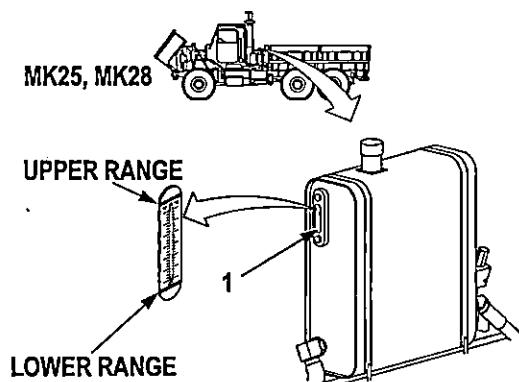
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
24	Before Operation	ARCTIC CARGO KIT (IF EQUIPPED)	<p><b>WARNING</b></p> <p>Do not operate arctic cargo kit heater if fuel leaks or exhaust leaks are present. Failure to comply may result in injury or death to personnel.</p> <p>1. Ensure guard (1) is free of debris and obstructions.</p> 	
25	Before Operation	HYDRAULIC RESERVOIR (MK28)	<p>1. Check that hydraulic fluid level is visible in sight glass (1) and is between two black range marks.</p> <p>2. Inspect hydraulic fluid in sight glass (1) for milky, foamy, or dirty appearance.</p> 	

Figure 28.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
26	Before Operation	SELF RECOVERY WINCH (SRW) (WHEN EQUIPPED)	<p><b>WARNING</b></p> <p>Use heavy leather gloves when checking winch cable. Injury to hands can result if gloves are not worn.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Refer to Winch Operation (WP 0044) for more detailed information on operation of SRW.</li> <li>Tensioning rollers and spring are not present on MK28.</li> </ul> <p>Check that winch cable clevis (1) is not broken and pin (2) is not missing.</p>	Clevis is loose on cable or is broken, pin is missing.

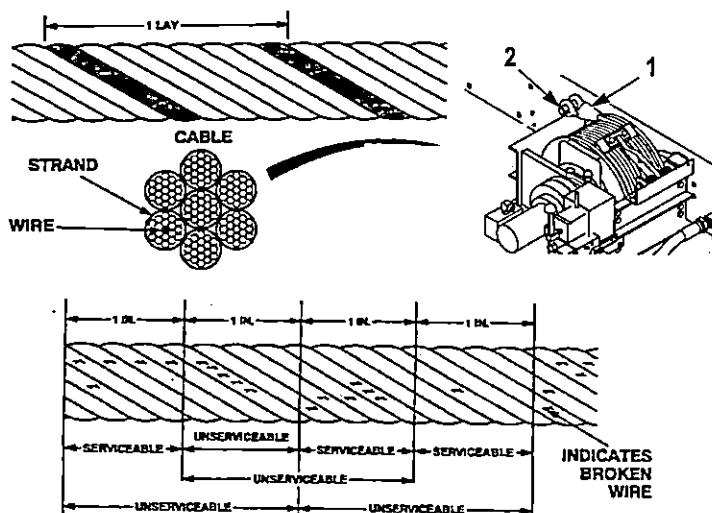


Figure 30.

27	Before Operation	FUEL TANK FIRE PROTECTION KIT (IF EQUIPPED)	<p><b>CAUTION</b></p> <p>If panel is cracked, notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <p>1. Check panel assemblies (1) for damage, cracks, or leaking powder.</p>	Panel is cracked or powder is present.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:

Figure 31.

28	Before Operation	INCREASED MINE PROTECTION KIT (IF EQUIPPED)	<p><b>NOTE</b></p> <p>Both passenger and driver seats and seat belts are the same.</p> <ol style="list-style-type: none"> <li>1. Check seat belts (1) and buckles (2) for serviceability and proper operation.</li> <li>2. Inspect platform (3) for damage and proper operation (WP 0066).</li> <li>3. Check fire extinguisher (4) for proper charge and damage.</li> </ol>	Damaged, missing, or inoperable seat belts.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

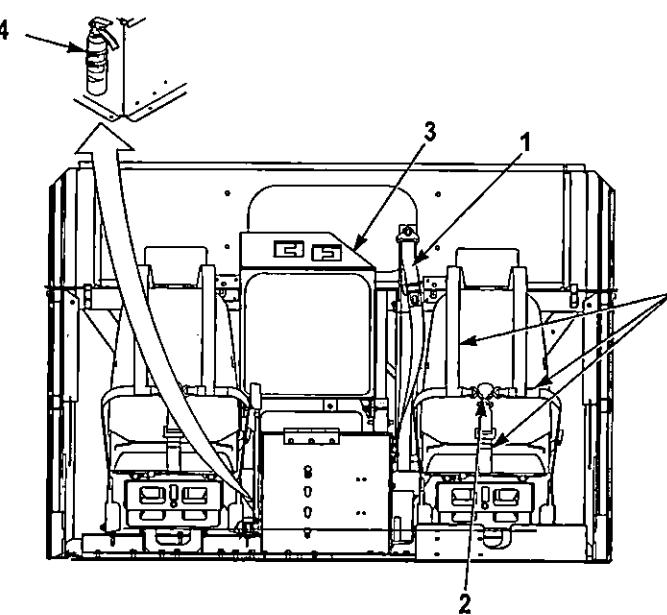
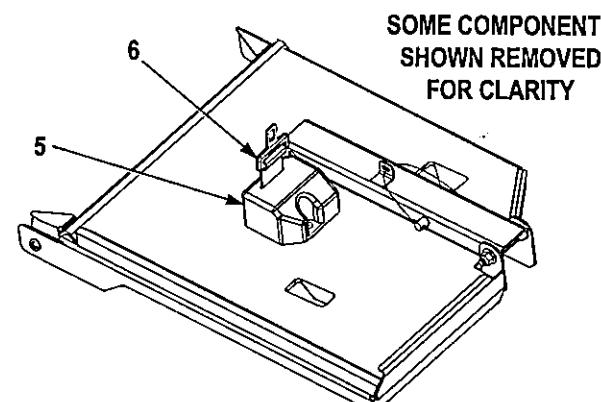
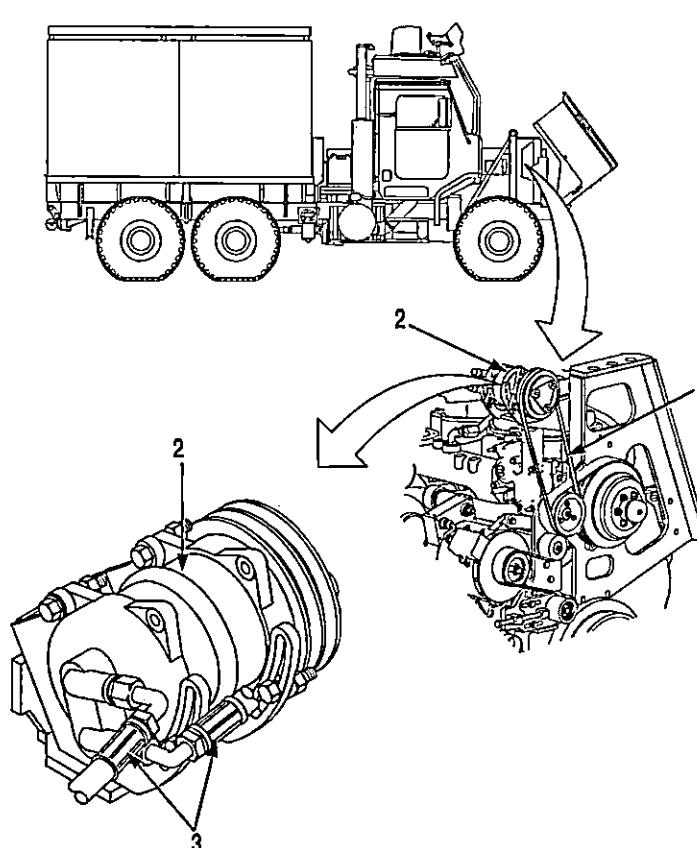
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
29	Before Operation	AIR CONDITIONING	<p>4. Check gunner's restraint retractor (5) for proper operation.</p> <p>5. Check gunner's restraint strap (6) for damage.</p> 	<p>Retractor does not operate</p> <p>Strap is damaged.</p>

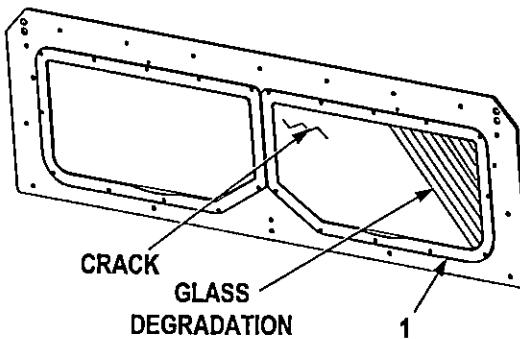
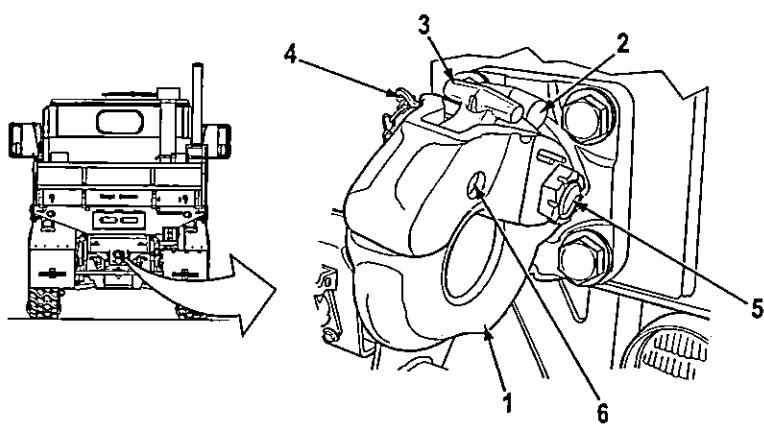
Figure 32.

Figure 33.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
		(A/C) KIT (IF EQUIPPED)	<p>2. Check A/C compressor (2) and hoses (3) for damage.</p> 	
<p>30      Before Operation      ARMORED GLASS WINDSHIELD AND DOOR (ARMOR KIT)      1. Check armored glass (1) for cracks and degradation.      Cracks are present, or clarity of glass is degraded to the point that operator's vision is impaired.</p>				

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
31	Before Operation	PINTLE HOOK	<p>1. Check pintle hook (1) for secure mounting and proper operation. Ensure safety latch (2) engages hook lock (3).</p> <p>2. Ensure safety pin (4) is secure and functional.</p> <p>3. Check pivot pin (5) for free movement.</p> <p>4. Check latch pin (6) for looseness.</p>	<p>Pintle hook is damaged or missing.</p> <p>Pin is loose.</p> 

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
32	During Operation	TRANSMISSION FLUID	<p><b>WARNING</b></p>  <p>Failure to take the following precautions will lead to sudden, unexpected vehicle movement. Whenever checking fluid level, the transmission range selector must be in N (neutral), the parking brake must be set, and the wheels must be chocked. Failure to comply may result in serious injury or death to personnel.</p> <p><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>Do not permit dirt, dust, or grit to enter transmission filler tube. Thoroughly clean dipstick handle and end of filler tube. Serious internal transmission damage can result if transmission is contaminated.</li> <li>The transmission must not be operated for extended periods of time, until a Hot Check has verified proper fluid level. Transmission damage can result from extended operation at improper fluid level conditions.</li> <li>An accurate fluid level check cannot be made unless the engine is idling (500 to 800 rpm) in N (neutral), the transmission fluid is at the proper temperature, and the vehicle is on a level surface. Failure to comply may result in damage to equipment.</li> </ul>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - 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>If the transmission oil temperature is between 160° and 250°F (71° and 121°C), go directly to the HOT CHECK procedure. If there is evidence of transmission oil leakage, contact Second Echelon Maintenance. If the transmission oil temperature is less than 160°F (71°C), go to the next step, COLD CHECK procedure.</li> <li>Because the fluid level rises as the temperature increases, the fluid must be hot to ensure an accurate check.</li> </ul> <ol style="list-style-type: none"> <li>Be sure fluid has reached normal operating temperature (160° to 250°F; 71° to 121°C).</li> <li>Park the vehicle on a level surface and shift to N (neutral). Apply the parking brake and allow the engine to idle (500 to 800 rpm).</li> </ol> <p><b>CAUTION</b></p> <p>If transmission fluid is too high and needs to be drained, notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <ol style="list-style-type: none"> <li>Remove transmission dipstick (WP 0107) (1).</li> <li>After wiping the transmission dipstick (1) clean, check the fluid level. The safe operating level is anywhere within the HOT RUN band on the dipstick. If the fluid level is not within this band, add fluid as necessary to bring the level within the HOT RUN band. (Refer to Lubrication Instruction) (WP 0111)</li> </ol>	Transmission fluid level is too high.

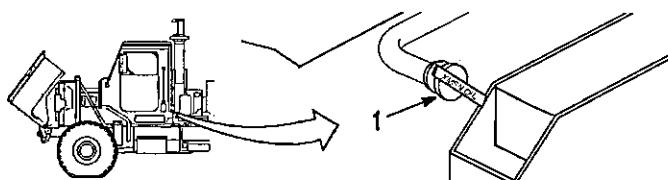


Figure 37.

5. Install transmission dipstick (WP 0107) (1).

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			6. Be sure that fluid level checks are consistent. Check level more than once, and if readings are not consistent, notify your supervisor or second echelon maintenance.	
33	During Operation	CARGO BODY COVER, TROOP SEATS, BOWS, STAVES, AND BACKRESTS	1. Shortly after starting a mission and at all stops, get out and ensure cargo cover (1) and bungee cords (2) are not damaged. Ensure cargo has not shifted. Tighten tie down straps if required. Check ISO locks (3) for tightness - tighten ISO locks if required.	
			Figure 38.	
34	During Operation	ENGINE OPERATION	1. While running, check engine for excessive smoke, unusual noise, rough running, or misfiring. 2. Ensure engine brake operates (WP 0032).	Any of these conditions are found.
35	During Operation	PARKING BRAKE	<p><b>WARNING</b></p>  <p>Prior to performing test, ensure area 30 ft. (9 m) to front of vehicle is clear of objects and personnel. Failure to comply may result in injury or death to personnel.</p> <p>1. Apply parking brake (1). Select D (drive) on transmission range selector (2) and run engine at 1000 rpm. Vehicle should not move.</p>	If vehicle moves when parking brake is applied.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

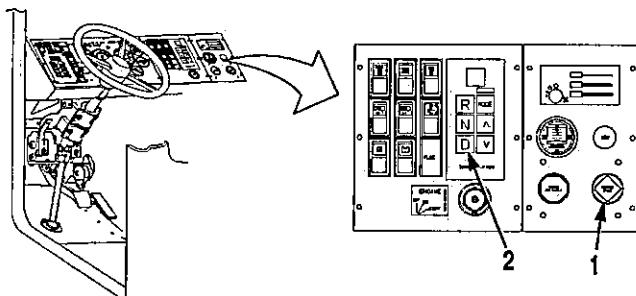
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 39.

36	During Operation	SERVICE BRAKE STALL TEST	<p><b>WARNING</b></p>  <p>Prior to performing test, ensure area 30 ft. (9 m) to front of vehicle is clear of objects and personnel. Failure to comply may result in injury or death to personnel.</p> <p>1. Apply service brake (1). Select D (drive) on transmission range selector (2) and run engine at 1000 rpm. Vehicle should not move.</p>	Vehicle moves when service brake is applied.
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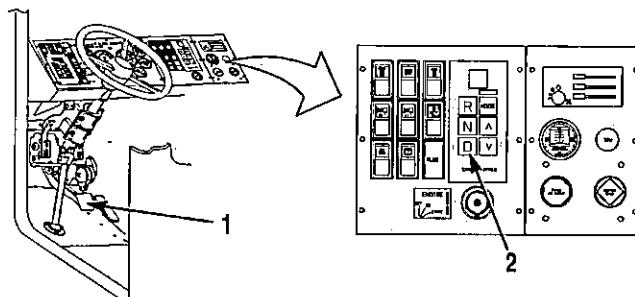
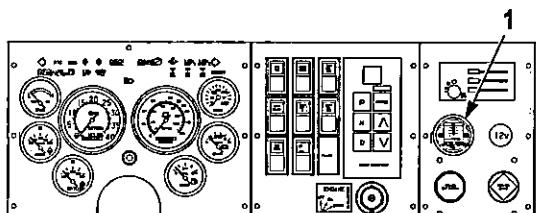


Figure 40.

37	During Operation	CAB INTERIOR	1. Check to ensure air restriction indicator (1) reads below 25 inches.	Air restriction indicator reads above 25 inches.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			 <p><b>NOTE</b></p> <p>With ignition switch off, speedometer will not return to zero. Speedometer will "zero out" and indicate correct MPH when ignition switch is ON and vehicle is in motion.</p> <p>2. Ensure speedometer (2) operates properly.</p> <p>3. Check to ensure steering wheel (3) controls direction of vehicle.</p>	Steering wheel does not control direction of vehicle.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
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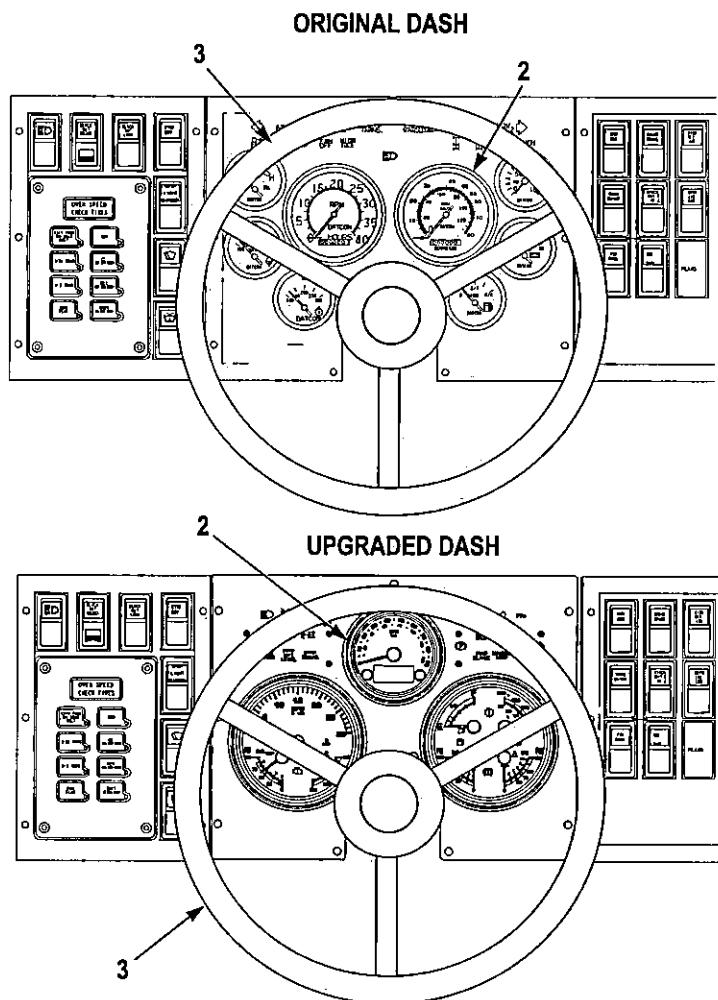
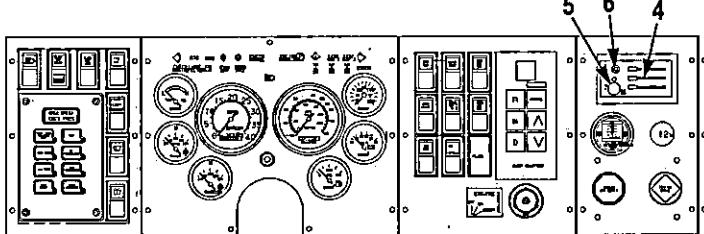
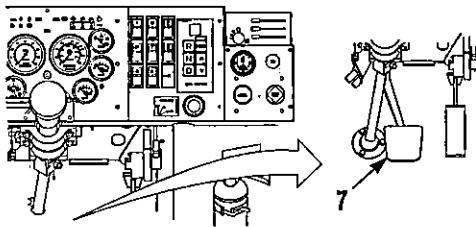


Figure 42.

- 4. Check heat and defrost controls (4) for proper operation. Check for warm airflow.
- 5. Check fan control (5) for proper fan operation in all settings.
- 6. Check air conditioning control (6) (if equipped) for proper operation. Check for cooler airflow after one minute of operation.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
			<p>7. Ensure that service brakes engage when brake pedal (7) is pushed.</p> 	<p>Service brakes do not engage when brake pedal is pushed.</p>
38	During Operation	TRANSMISSION	<p>1. Check transmission for proper shifting (WP 0031).</p> <p><b>NOTE</b></p> <p>At idle speed, the automatic transmission may not reach 160°F (71°C) oil temperature.</p> <p>2. Check transmission temperature gauge for normal operating temperature of 160° to 250°F (71° to 121°C). If the transmission temperature exceeds 250°F (121°C), downshift to a lower gear to avoid overheating.</p>	<p>Transmission does not operate in all ranges.</p> <p>Transmission fluid temperature is above 250°F (121°C).</p>
			<b>SPECIAL PURPOSE KITS</b>	
39	During Operation	HYDRAULIC RESERVOIR (MK28)	<p>1. Check that hydraulic fluid level is visible in sight glass (1) and is between two black range marks.</p> <p>2. Inspect hydraulic fluid in sight glass (1) for milky, foamy, or dirty appearance.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
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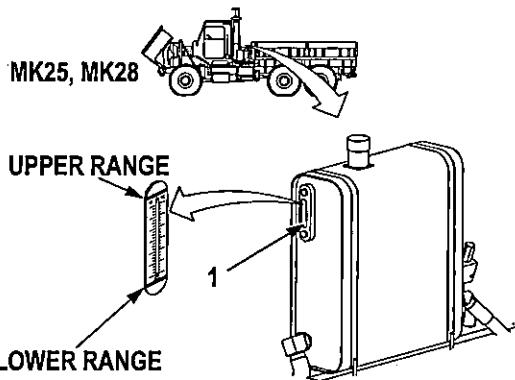


Figure 45.

40	During Operation	SELF RECOVERY WINCH (SRW) (WHEN EQUIPPED)	<p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Refer to Winch Operation (WP 0044) for more detailed information on operation of SRW.</li> <li>Tensioning rollers and spring are not present on MK28.</li> </ul> <p><b>WARNING</b></p> <p>Use heavy leather gloves when checking winch cable. Injury to hands can result if gloves are not worn.</p> <p><b>NOTE</b></p> <p>Worn spots will show up as shiny flattened spots on the strands.</p> <ol style="list-style-type: none"> <li>Inspect winch cable (1) for kinks and broken strands while cable is being payed out for use.</li> <li>Inspect for worn spots while cable is being payed out for use.</li> <li>Inspect broken wires to determine if it is a single broken wire or several broken wires. Inspect while cable is being payed out for use.</li> <li>Wind cable onto winch (WP 0044).</li> </ol>	<p>Cable is frayed, kinked, worn, or corroded.</p> <p>Outer wires are reduced in diameter by one-fourth.</p> <p>Individual wires are broken next to one another; six randomly distributed broken wires in one lay (the distance in which the strands make one complete turn around the cable); or three broken wires in one lay.</p>
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

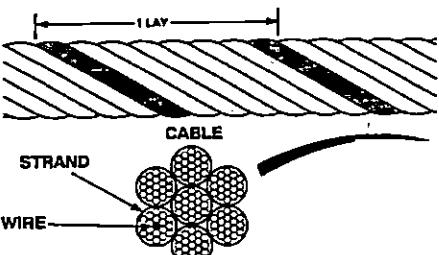
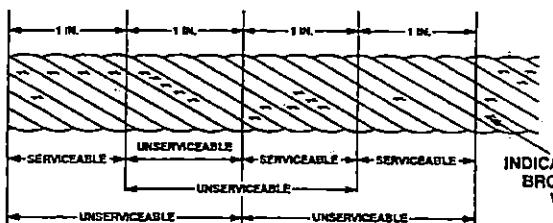
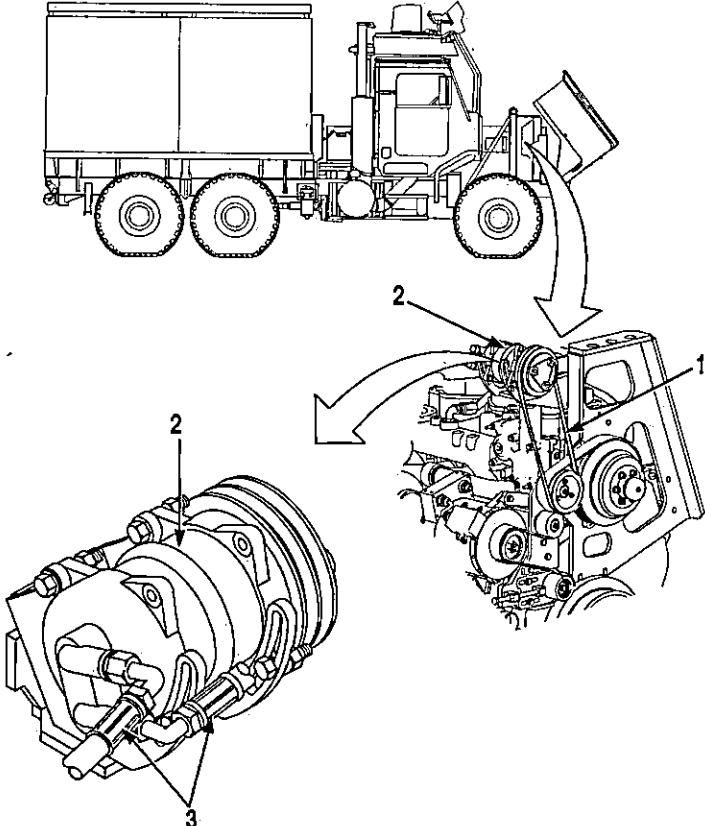
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
		 		

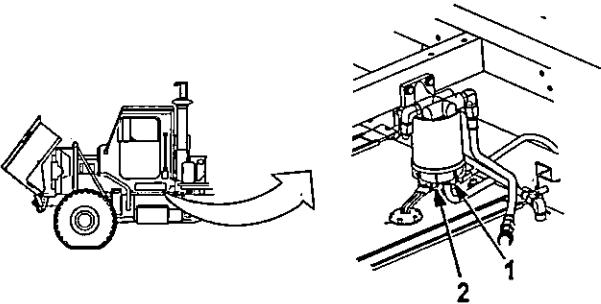
Figure 46.

41	During Operation	AIR CONDITIONING (A/C) KIT (IF EQUIPPED)	<p>1. Check A/C compressor belt (1) for cracking, fraying, or other damage.</p> <p>2. Check A/C compressor (2) and hoses (3) for damage.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
42	After Operation	CAB AND HOOD EXTERIOR	1. Check under vehicle for fuel, oil, transmission fluid, or coolant leakage.	Any fuel leak or class III oil or coolant leak.
43	After Operation	FUEL/WATER SEPARATOR	<p><b>WARNING</b></p> <p>Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.</p> <p><b>NOTE</b></p> <p>A flashlight may be required to perform the following check.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>1. Check sediment bowl (1) for water. If water is present, drain fuel from bowl into suitable container until clean fuel flows out. To drain fuel from sediment bowl, open drain valve (2) until water and contaminated fuel are allowed to drain from sediment bowl. Close drain valve (2) once all water and contaminated fuel is drained from sediment bowl.</p> 	
44	After Operation	AIR SYSTEM	<p><b>NOTE</b> Low air lights must go out prior to performing air reservoir checks. Open air drain valves (1) and drain reservoirs completely.</p> <p><b>WARNING</b></p>  <p>Air drain valves may be under extreme pressure. Do not allow face to be in front of air drain valves while draining air reservoirs. Open air drain valves slowly to prevent sudden blast of air. Failure to comply may result in serious injury to personnel.</p> <p>1. Close air drain valves (1).</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

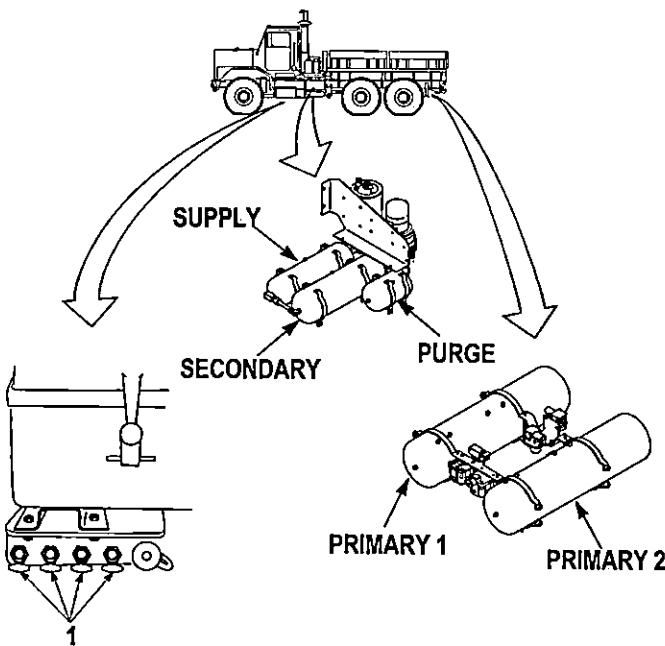
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 49.

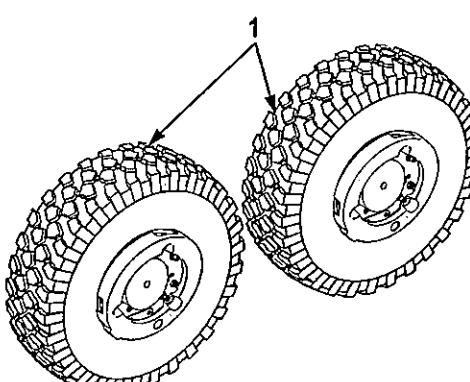
45	After Operation	TIRES	1. Check tires (1) for cuts, gouges, cracks, or other damage.	
				

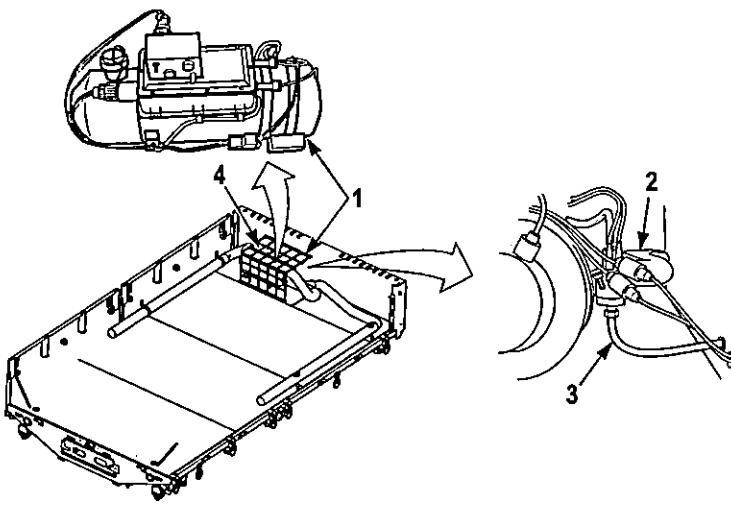
Figure 50.

46	After Operation	PINTLE HOOK	1. Lubricate pintle hook (WP 0111) (1) after each use.	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
47	After Operation	UNDERCARRIAGE AND FRAME	<p><b>CAUTION</b></p> <p>All guidelines set forth for maintaining corrosion preventive compounds must be adhered to (refer to General Maintenance Procedures) (WP 0091). Failure to follow these guidelines will negatively impact the corrosion control integrity of the vehicle and result in damage to equipment.</p> <p>1. Inspect underside of vehicle for loose or damaged wires.</p>	
48	After Operation	ARCTIC CARGO KIT (IF EQUIPPED)	<p><b>WARNING</b></p> <p>Do not operate arctic cargo kit heater if fuel leaks or exhaust leaks are present. Failure to comply may result in injury or death to personnel.</p> <p>1. Operate arctic cargo kit heater (1) and check for exhaust leaks in exhaust line (2).</p> <p>2. With arctic cargo kit heater (1) operating, check for fuel leaks in fuel line (3).</p> <p>3. With arctic cargo kit heater (1) operating, ensure heater works properly in both heating and venting position. (Refer to Arctic Cargo Kit Personnel Heater) (WP 0061).</p> <p>4. Ensure guard (4) is free of debris and obstructions.</p>	

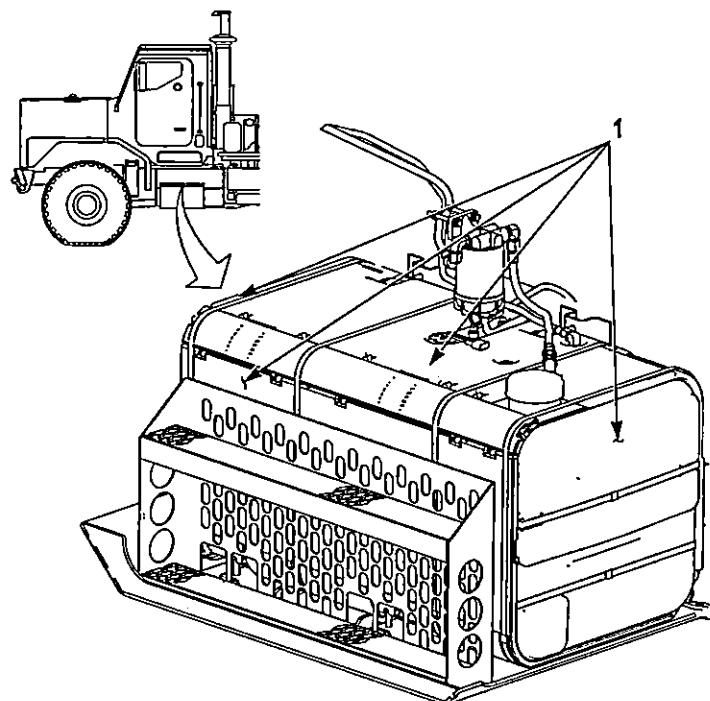
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
49	After Operation	FUEL TANK FIRE PROTECTION KIT (IF EQUIPPED)	<p><b>CAUTION</b></p> <p>If panel is cracked, notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <p>1. Check panel assemblies (1) for damage, cracks, or leaking powder.</p>	Panel is cracked or powder is present.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
50	AIR CONDITIONING (A/C) KIT (IF EQUIPPED)	<p>1. Check A/C compressor belt (1) for cracking, fraying, or other damage.</p> <p>2. Check A/C compressor (2) and hoses (3) for damage.</p>	

Figure 53.



**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

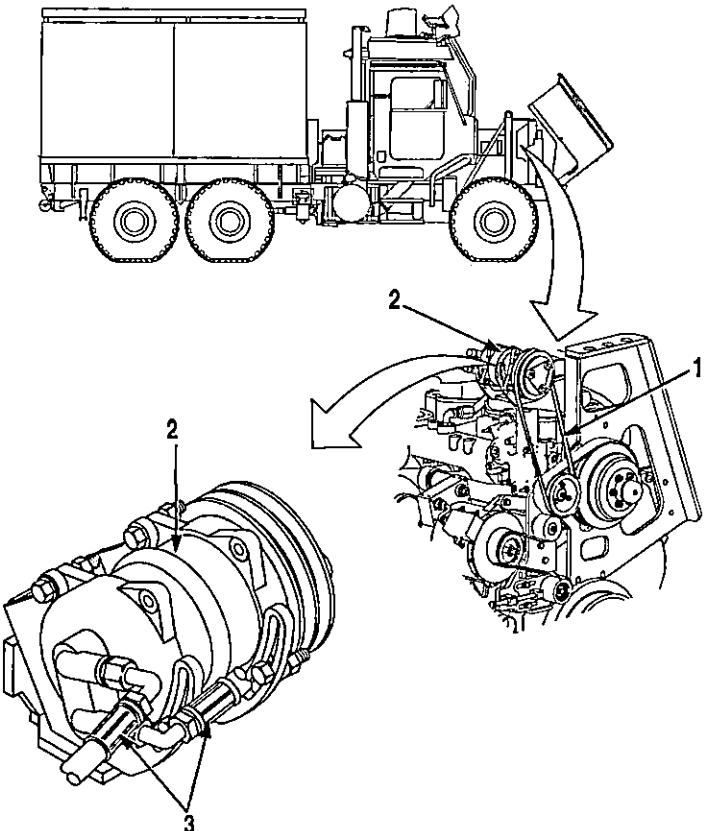
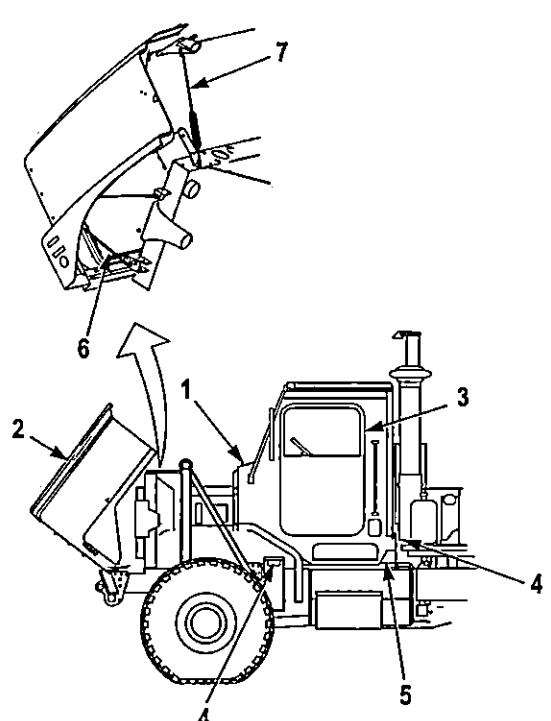
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 54.

51	Monthly	CAB AND HOOD EXTERIOR	<ol style="list-style-type: none"> <li>1. Inspect cab (1) and hood (2) for damage.</li> <li>2. Inspect cab doors (3) for damage or misalignment.</li> <li>3. Check cab mounts (4) and cab shocks (5) for damage.</li> <li>4. Inspect prop rod (6) and springs (7) for damage and serviceability.</li> </ol>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>5. Inspect front hardlift (8) for broken welds, and loose, broken or missing screws.</p> <p>6. Inspect right front hardlift drip pan (9) for damage.</p> <p>7. Lubricate heater control valve (10) and cable (11) (WP 0111).</p> <p>8. Lubricate windshield hinges (12) (WP 0111).</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

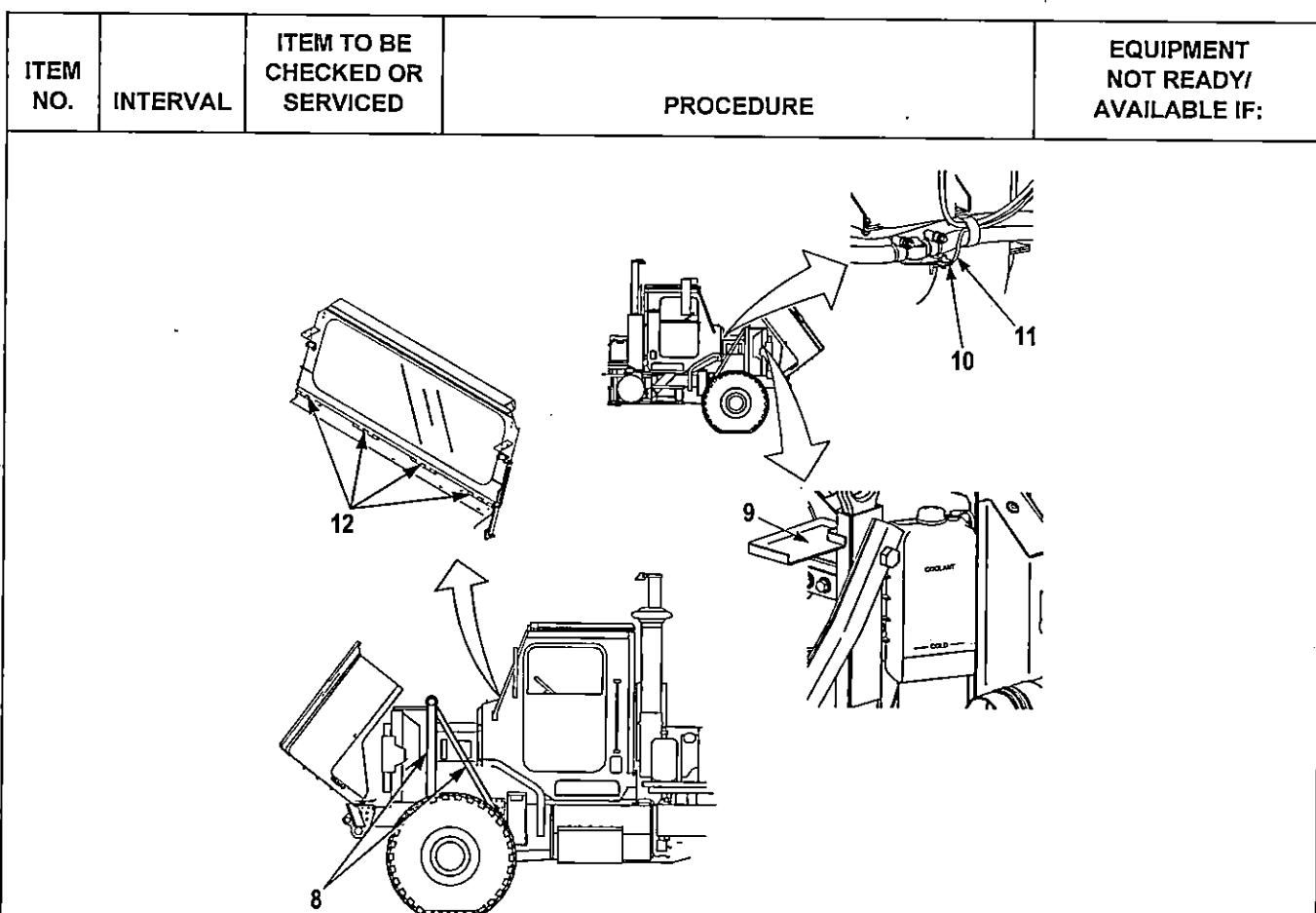


Figure 56.

52	Monthly	FUEL TANK	<p><b>WARNING</b> Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.</p> <p><b>CAUTION</b> Do not fill fuel tank above full-level line on outside tank, or fuel spillage will occur. Failure to comply may cause damage to equipment.</p> <ol style="list-style-type: none"> <li>1. Check fuel tank (1) for leaks or damage.</li> <li>2. Check fuel hoses and connections for leaks and damage.</li> <li>3. Check fuel tank mounting hardware and liners (2) for looseness or damage.</li> </ol>	Any fuel leak. Any leakage or loose connections. Any fuel leak.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

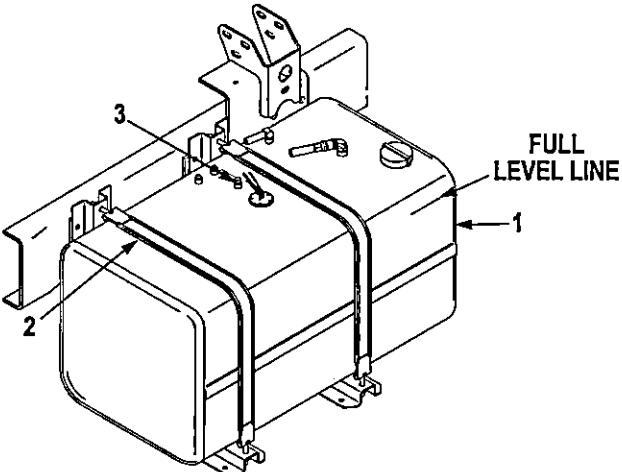
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>4. Inspect fuel sending unit (3) for frayed or damaged wires or connectors.</p> 	

Figure 57.

53	Monthly	FUEL/WATER SEPARATOR	<p><b>WARNING</b></p> <p>Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.</p> <p><b>NOTE</b></p> <p>A flashlight may be required to perform the following check.</p> <p>1. Check fuel/water separator (1) for leaks, damage, or loose connections.</p>	Any fuel leak.
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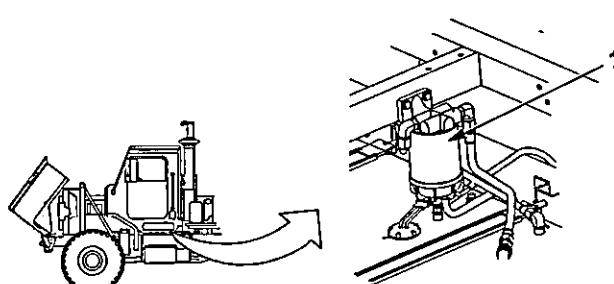


Figure 58.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
54	Monthly	BATTERIES	<p><b>WARNING</b></p> <p>Do not wear watches, rings, or other jewelry when servicing batteries, they could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes. Failure to comply may result in serious injury to personnel.</p> <p><b>NOTE</b></p> <p>Prior to performing battery PMCS, ensure battery disconnect switch (WP 0014) is OFF. Turn battery disconnect switch to ON when battery PMCS is completed.</p> <ol style="list-style-type: none"> <li>1. Remove battery box cover (1) and check battery box cover (1) and battery box (2) for cracks and damage.</li> <li>2. Inspect for any missing or damaged batteries (3).</li> </ol> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• A flashlight may be required to perform the following checks.</li> <li>• If fluid level is repeatedly low, or fluid is boiling, notify Second Echelon Maintenance. When distilled water has been added and temperature is below +32°F (0°C), run engine 15 minutes to allow water to mix with electrolyte.</li> </ul> <ol style="list-style-type: none"> <li>1. Remove battery caps (4) and check fluid level of each cell. Fluid level should be up to split ring. Add distilled water up to split ring, as required, refer to Battery Maintenance (WP 0103).</li> <li>2. Inspect batteries (3) for cracked or leaking casing, or loose, broken, or burned terminal posts, cables, or connections.</li> <li>3. Check battery posts and terminals for corrosion. If needed, clean battery posts and terminals.</li> <li>4. Check battery box (2) and brackets (5) for corrosion. Install battery box cover (1).</li> <li>5. Inspect slave receptacle (6) for loose cables, damage, or missing cover (7) or cap (8).</li> </ol>	<p>Battery box has damage that could allow battery box to separate from vehicle.</p> <p>Battery is missing or damaged.</p> <p>Battery is damaged or terminals or cables are broken or burned.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

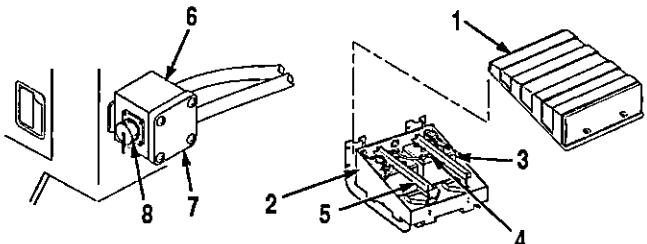
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 59.

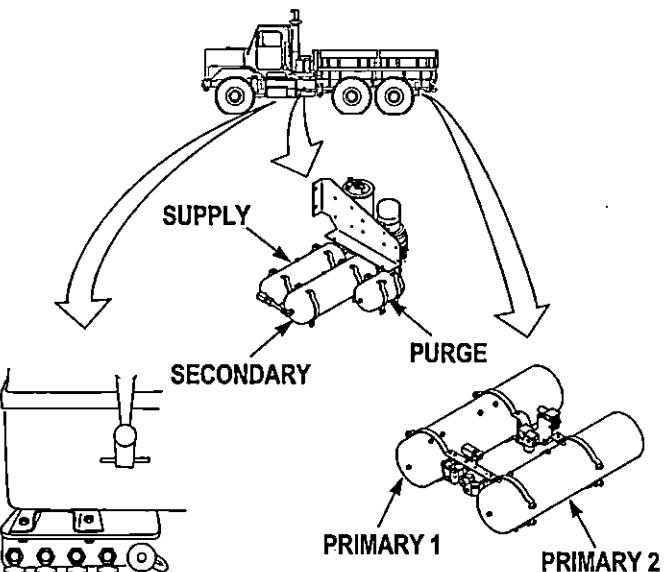
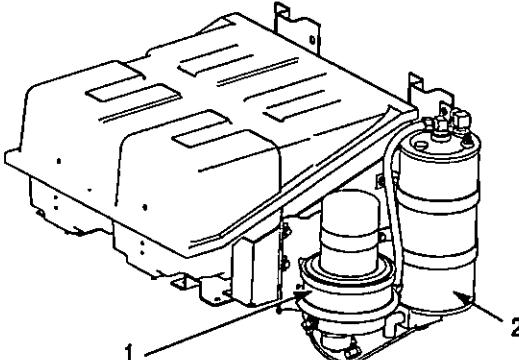
55	Monthly	AIR SYSTEM	<p><b>NOTE</b></p> <p>Low air lights must go out prior to performing air reservoir checks.</p> <ol style="list-style-type: none"> <li>1. Inspect air lines, hoses, and fittings for bends, dents, and cracks that could cause leaks.</li> <li>2. Inspect primary #1, primary #2, secondary, supply, and purge reservoirs for dents, damage, or corrosion.</li> </ol>	<p>Any air leakage present.</p> <p>Any air leakage present.</p>
				

Figure 60.

56	Monthly	AIR DRYER AND AFTERCOOLER	1. Inspect air dryer (1) and aftercooler (2) for punctures and obvious damage.	Air dryer or aftercooler is punctured.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>2. Check air dryer (1) and aftercooler (2) for loose mounting screws and loose or damaged air lines and fittings.</p> <p>3. Check wires to air dryer (1) for proper connection and damage.</p>	<p>Air lines or fittings loose or damaged.</p> <p>Wires are damaged or disconnected.</p>
				
Figure 61.				
57	Monthly	TIRES	<p><b>NOTE</b></p> <p>Small cracks extending from mounting holes do not effect performance of wheel cover. If small cracks are present, wheel cover is still serviceable.</p> <p>1. Any tire that has wear or damage that allows ply or belt material to be exposed through the tread or sidewall. Any tire that has tread or sidewall separation. Any tire that is flat or has an audible leak.</p> <p>2. Remove wheel covers (1) and inspect CTIS wheel valve components for damage and serviceability.</p> <p>3. Check wheels (2) for broken, cracked, or bent surfaces.</p> <p>4. Check wheel nuts (3) and wheel studs (4) for obvious looseness or damage.</p> <p>5. Check that valve caps (5) are securely tightened.</p> <p>6. Install wheel cover (1).</p>	<p>Wheel is broken, cracked, or bent.</p> <p>One or more wheel nuts and/or wheel studs are missing, loose, or damaged.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

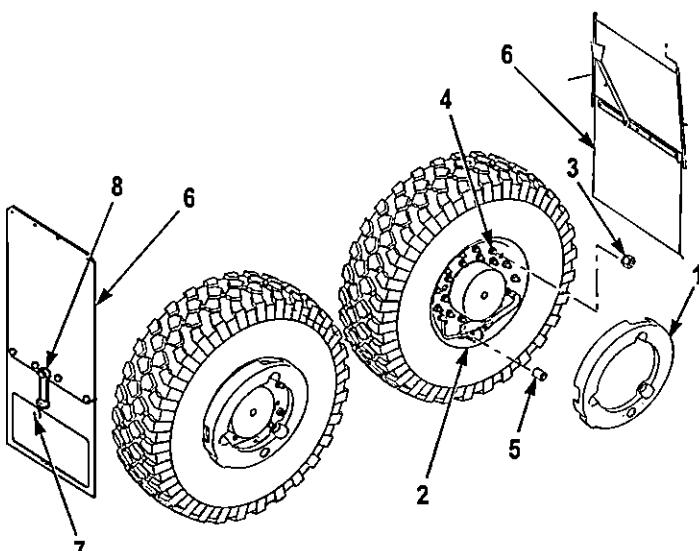
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>7. Check six tire mud flaps (6) for damage and serviceability.</p> <p>8. Check hooks (7) and strap (8) on rear mud flaps (6) for damage and serviceability.</p>	
				

Figure 62.

58	Monthly	SHOCK ABSORBERS	<p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Lower shock bearing wear is normal and does not impair truck operation.</li> <li>Shock absorbers may have a thin film of oil on the outer surface due to a normal condition known as "misting". Misting is not considered a leak and will not be evident as a stream of fluid.</li> </ul> <p>1. Check shock absorbers (1) for leaks and damage.</p>	Class III leak or damage to shock absorbers that impairs truck operation.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

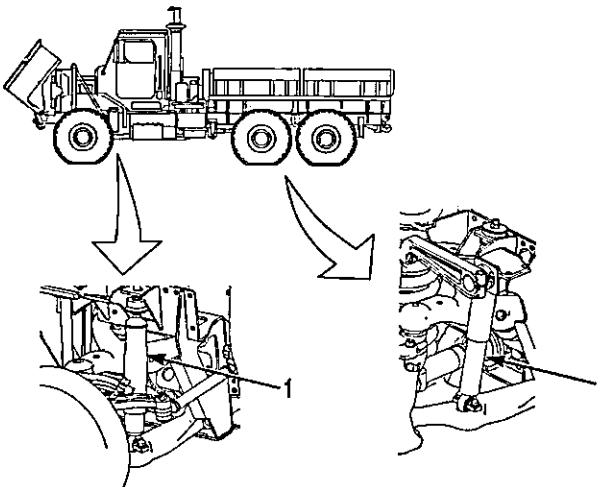
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 63.

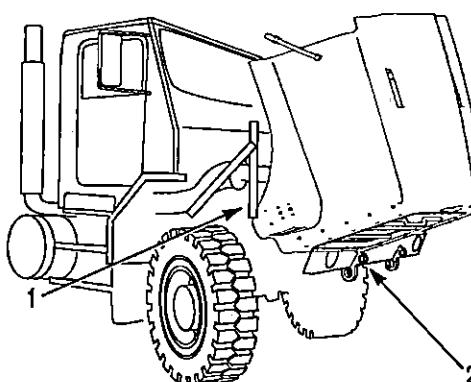
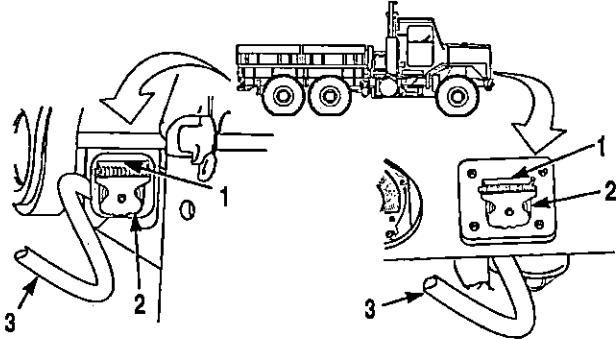
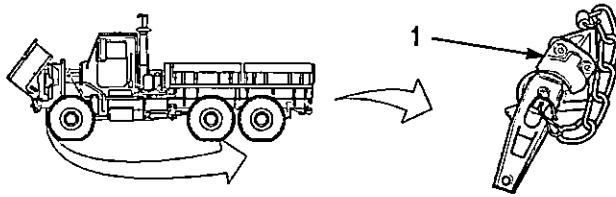
59	Monthly	MUD FLAPS	<p>1. Inspect radiator splashguards (1) and belt protection mud flap (2) for tears and missing or loose hardware.</p> 	
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Figure 64.

60	Monthly	FRONT AND REAR INTER-VEHICLE ELECTRICAL CONNECTOR	<p>1. Inspect electrical connectors (1) for damage.</p> <p>2. Inspect electrical connector cover seals (2) for tears or rot.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>3. Inspect electrical connector cables (3) for damage.</p> 	
61	Monthly	FRONT AND REAR GLADHANDS	<p><b>WARNING</b></p> <p>Ensure front gladhands are free of clogs. Clogged front gladhands may cause service brakes to lock up. Failure to comply may result in injury or death to personnel.</p> <p>1. Check front and rear gladhands (1) and air lines for damage or obstruction.</p> <p>2. Inspect front and rear gladhands (1) for missing or rotted seals.</p>	<p>Air line is damaged or obstructed.</p> 
62	Monthly	CARGO BODY AND ISO LOCKS	<p>1. Check for broken, bent, or damaged hinge pins (1).</p> <p>2. Check that front drop side (2) and rear drop side (3) are not bent or broken and have no broken welds.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>NOTE</b></p> <p>Early models of MTVR Cargo use a screw and a washer in place of cotter pin and washer.</p> <p>3. Ensure cotter pin (4) and washer (5) are secure and in place on center hinge.</p> <p>4. Check ISO locks (6) for damage and ensure that they operate freely.</p> <p>5. Check cargo hold downs (7) for damage and ensure they operate freely.</p> <p>6. Ensure tire ramp and jack platform are properly secured with two T-bolt locking handles.</p>	

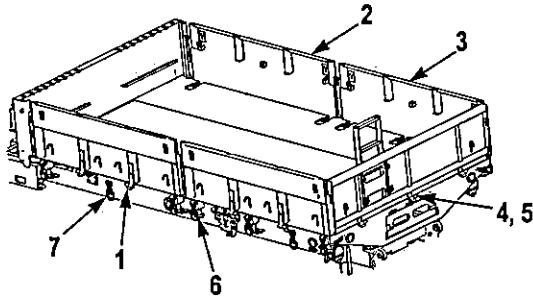


Figure 67.

**CAUTION**

All guidelines set forth for maintaining corrosion preventive compounds must be adhered to (refer to General Maintenance Procedures) (WP 0091). Failure to follow these guidelines will negatively impact the corrosion control integrity of the vehicle and result in damage to equipment.

7. Inspect stave pockets (8) and underside of lips on headboard (9) and tailgate (10) for presence of corrosion.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

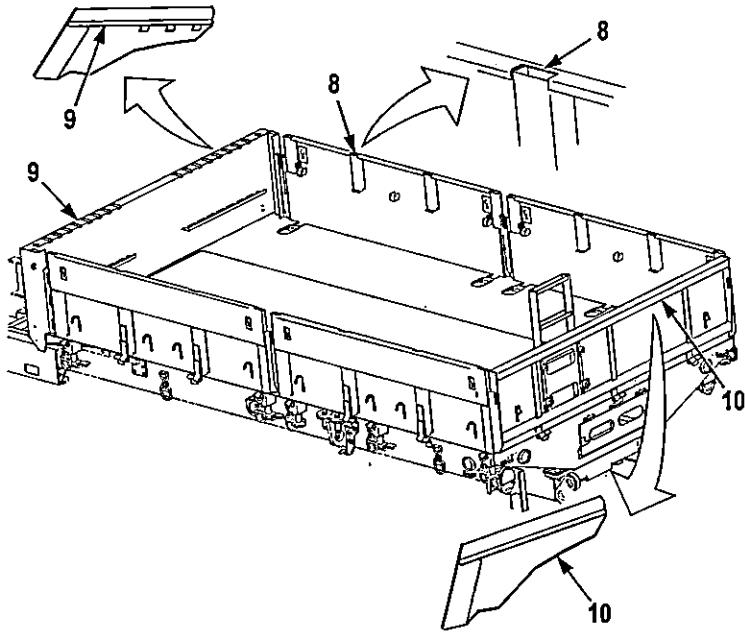
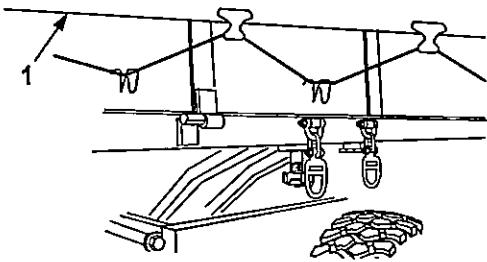
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
63	Monthly	CARGO BODY COVER, TROOP SEATS, BOWS, STAVES, AND BACKRESTS	<p>1. Inspect cargo body cover (1) for serviceability.</p> <p>2. If troop carrying components are not installed, ensure they are stowed properly.</p>	

Figure 68.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>NOTE</b></p> <p>Perform Steps (3) through (7) only if troop carrying components are installed.</p> <p>3. Inspect troop seats (2) to ensure legs and pins are properly secured.</p> <p>4. Inspect bows (3) for damage and serviceability.</p> <p>5. Inspect staves (4) to ensure latches (5) are properly latched and connected to bows. Inspect staves (4) for damage and serviceability.</p> <p>6. Inspect backrest (6) for damage and proper installation.</p> <p>7. Inspect troop strap (7) for serviceability.</p>	

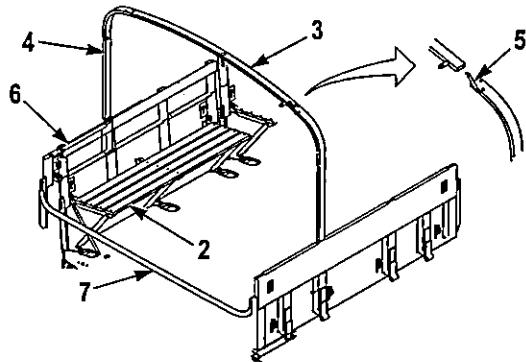


Figure 70.

64	Monthly	VENT HOSES AND TRANSMISSION BREATHER	<p>1. Check vent hoses (1) for damage, proper mounting, and obstruction.</p> <p>2. Check transmission breather (2) for damage and debris.</p>	<p>One or more plugged vent hoses.</p> <p>Breather is plugged.</p>
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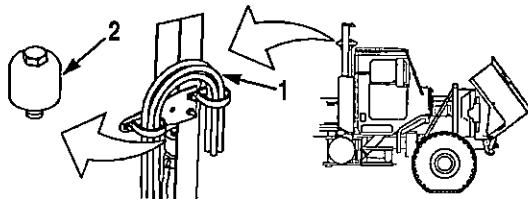


Figure 71.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
65	Monthly	OIL FILTER AND OIL SAMPLING VALVES	<ol style="list-style-type: none"> <li>1. Check engine oil filter (1) for leaks or damage.</li> <li>2. Check oil sampling valves (2) for damage and leakage.</li> <li>3. Ensure caps (3) are properly secured to oil sampling valves (2).</li> <li>4. Check oil filter (1) wires and connectors for looseness and damage.</li> </ol>	Any class III oil leaks.  Any class III oil leaks.

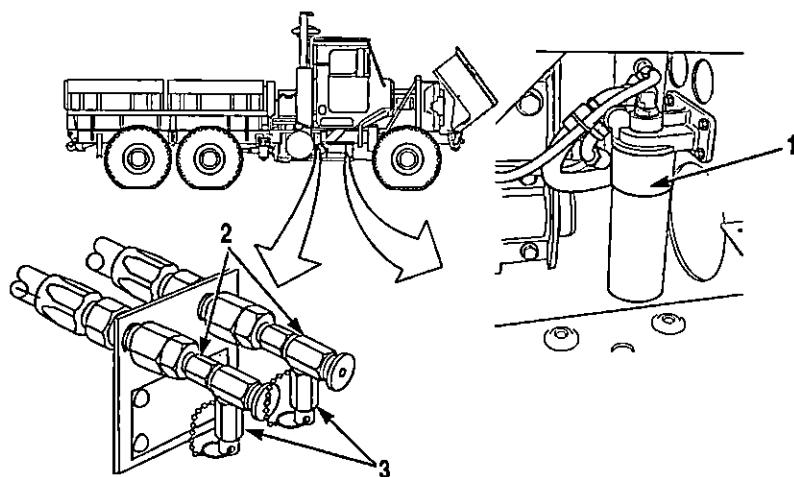


Figure 72.

66	Monthly	AIR INTAKE SYSTEM	<ol style="list-style-type: none"> <li>1. Check air intake system for loose clamps and punctured or damaged hoses or tubes.</li> <li>2. Check air cleaner housing (1) for loose clips (2) and damage. Secure clips as required.</li> </ol>	Any damage that would allow unfiltered air to enter engine.  Any damage that would allow unfiltered air to enter engine.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

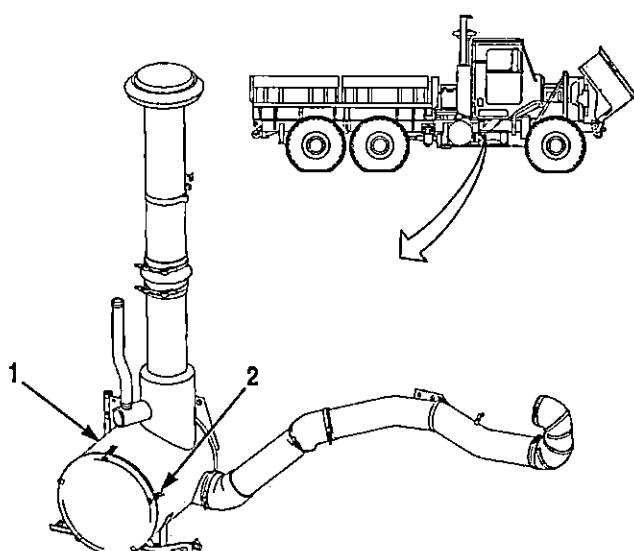
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 73.

67	Monthly	TURBOCHARGER	<b>WARNING</b>  <p>Engine components become extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in serious injury to personnel.</p> <p>1. Check turbocharger oil supply line (1) and drain line (2) for damage or signs of leakage.</p> <p>2. Inspect mounting screws and clamps on turbocharger (3) for looseness, damage, and exhaust leaks.</p>	Any leakage is evident.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

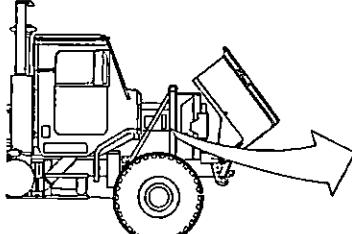
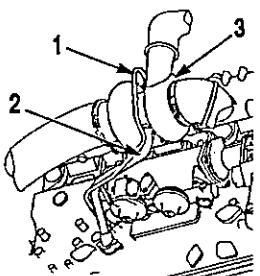
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			 	

Figure 74.

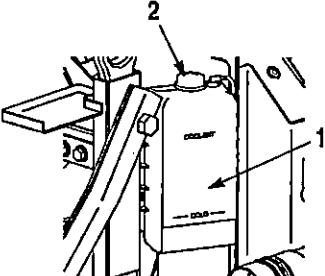
68	Monthly	COOLANT OVERFLOW TANK AND COOLANT LEVEL	<p>1. Check coolant overflow tank (1) and cap (2) for damage or leakage.</p>  	<p>Class III coolant leak.</p>
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Figure 75.

69	Monthly	RADIATOR AND COOLANT HOSES	<p><b>CAUTION</b></p> <p>Use extreme care when cleaning radiator fins and charged air cooler fins to prevent damage to equipment.</p> <p>1. Check radiator (1) for damage and leakage. Check radiator fins (2) and charged air cooler fins (3) for obstructions and clear obstructions as required.</p> <p>2. Check coolant hoses for rot, leaks, or loose clamps.</p>	<p>Class III coolant leak.</p> <p>Class III coolant leak.</p>
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

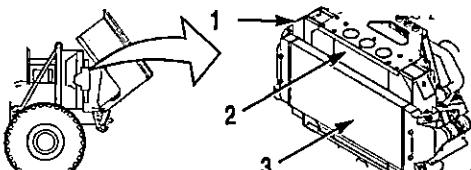
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 76.

70	Monthly	COOLING FAN AND FAN BELT	<p>1. Check cooling fan (1) for looseness or damage.</p> <p>2. Check fan belt (2) for cracking, fraying, or other damage.</p> <p>3. Check fan belt for proper tension. Belt has proper tension when belt can be depressed approximately 1/2 in. (1.3 cm) by normal pressure (10 to 15 lbs [4.5 to 6.8 kg]).</p>	<p>Loose or damaged fan.</p> <p>Any damage that would prevent the fan belt from driving the cooling fan.</p> <p>Any fan belt that is broken or cracked to the belt fibre, has more than one crack (1/8 in. (3.2 mm) in depth or 50% of belt thickness) or has frays more than 2 in. (51 mm) long. Belt is loose.</p>
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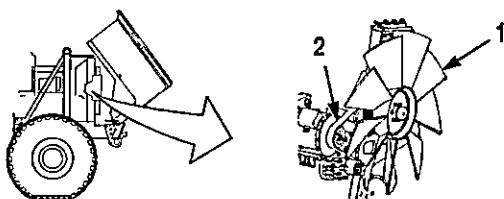
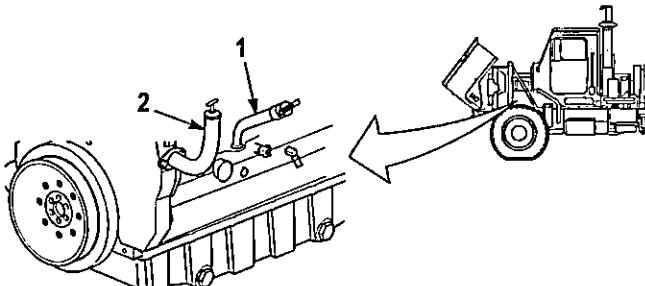
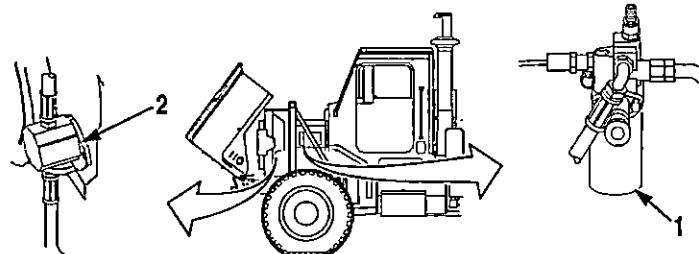


Figure 77.

71	Monthly	ENGINE OIL	<p><b>CAUTION</b></p> <p>If engine oil needs to be drained, contact Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <p><b>NOTE</b></p> <p>If engine has been running, wait approximately five minutes after engine shutdown before checking engine oil.</p> <p>1. Check dipstick tube assembly (1) and oil fill assembly (2) for damage or leakage.</p>	
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
72	Monthly	FUEL FILTER AND FUEL PUMP	<p>1. Check fuel filter (1) and fuel pump (2) for damage or leaks.</p> 	Any fuel leak.
73	Monthly	ETHER START SYSTEM	<p><b>WARNING</b></p>  <p>Use care when working around ether canister, ether canister is pressurized and is flammable. Failure to comply may result in injury or death to personnel.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>WARNING</b></p>  <p>Use care when working around ether canister, ether canister is pressurized and is flammable. Failure to comply may result in injury or death to personnel.</p> <p><b>WARNING</b></p>     <p>Ether canister contains diethyl ether with carbon dioxide as a propellant. Keep away from heat and flame. NEVER smoke near contents. Do not incinerate or puncture container. Do not store at temperatures above 120°F (49° C). Avoid contact with skin and eyes. Avoid breathing fumes. Do not store spare containers in driver's compartment. If swallowed, do not induce vomiting. Contact physician immediately. Failure to comply may result in injury or death to personnel.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>When re-installing ether canister, ensure gasket is properly seated in valve.</li> <li>When installing a new ether canister, replace old gasket with new gasket supplied with new canister.</li> </ul> <p>1. Inspect ether canister (1) for punctures or obvious damage.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

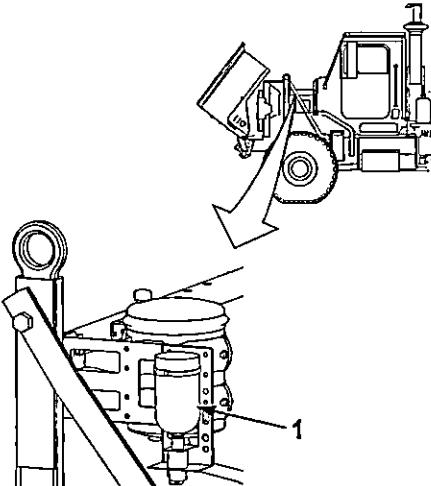
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
74	Monthly	HYDRAULIC STEERING SYSTEM	 <p>Check hydraulic steering reservoir (1) and ensure steering oil level is between the add and full marks on dipstick (2), add fluid as required (WP 0111).</p> <p>Check steering shafts (3), right steering gear (4), and left steering gear (5) for damage or leakage, and ensure they are securely mounted to vehicle.</p>	<p>Oil level not between add and full mark.</p> <p>Any class III hydraulic leak. Steering shafts or gears are not securely mounted.</p>

Figure 80.

74	Monthly	HYDRAULIC STEERING SYSTEM	<p><b>CAUTION</b></p> <p>If steering hydraulic oil needs to be drained, contact Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <p><b>NOTE</b></p> <p>When checking steering hydraulic oil level, the oil temperature should be at outside air temperature.</p> <ol style="list-style-type: none"> <li>1. Check hydraulic steering reservoir (1) and ensure steering oil level is between the add and full marks on dipstick (2), add fluid as required (WP 0111).</li> <li>2. Check steering shafts (3), right steering gear (4), and left steering gear (5) for damage or leakage, and ensure they are securely mounted to vehicle.</li> </ol>	<p>Oil level not between add and full mark.</p> <p>Any class III hydraulic leak. Steering shafts or gears are not securely mounted.</p>
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
75	Monthly	UNDERCARRIAGE AND FRAME	<p>1. Check for loose, broken, or missing cargo body mounting screws (1).</p> <p>2. Inspect frame rails and crossmembers for loose or broken screws, cracked or broken welds.</p> <p>3. Inspect jounce bumpers (2) and rebound bumpers (3) for damage.</p> <p>4. Inspect upper and lower control arm ball joint boots (4) for leaks and damage.</p> <p>5. Inspect upper and lower control arm pivot bushing bolts (5) and zerk fittings (6) for looseness or damage.</p> <p>6. Inspect axles no. 1, no. 2, and no. 3 for leaks or damage.</p> <p>7. Inspect rear hardlifts (7) for broken welds and loose, broken, or missing screws.</p>	<p>One or more screws are broken or missing.</p> <p>Any broken frame rails, crossmembers, broken welds, loose or broken screws.</p> <p>Loose, missing, or damaged pivot bushing bolts.</p> <p>Any damage that would impair vehicle operation.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>8. Inspect engine, transmission, and transfer case for leaks or damage.</p> <p>9. Inspect springs (8) for cracks, broken coils, or other damage.</p> <p>10. Inspect anti-sway bar (9) for looseness or damage.</p> <p><b>CAUTION</b></p> <p>All guidelines set forth for maintaining corrosion preventive compounds must be adhered to (refer to General Maintenance Procedures (WP 0091)). Failure to follow these guidelines will negatively impact the corrosion control integrity of the vehicle and result in damage to equipment.</p> <p>11. Inspect underside of cargo body (10) between mud flaps (11) for presence of corrosion. Look and be aware for spots where paint has been damaged and white primer has been exposed.</p>	Any class III leaks.
76	Monthly	ANTI-SWAY BAR	<p><b>NOTE</b></p> <p>There are four anti-sway bar arms on vehicle. All four anti-sway bar arms MUST be checked for movement.</p> <p>1. Move link end of anti-sway bar arm (1) inboard and outboard, and check spline connection for movement. If any movement is detected, notify Second Echelon Maintenance.</p>	

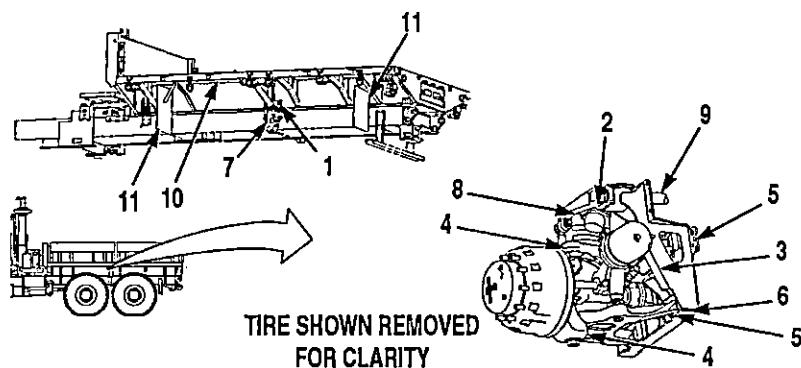


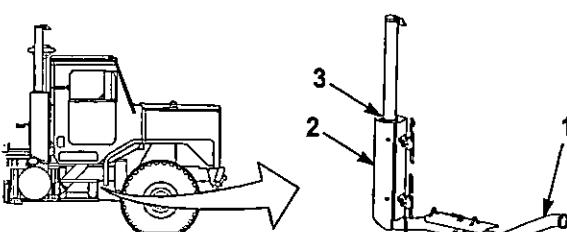
Figure 82.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

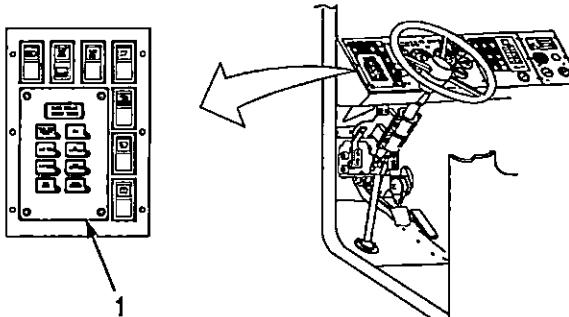
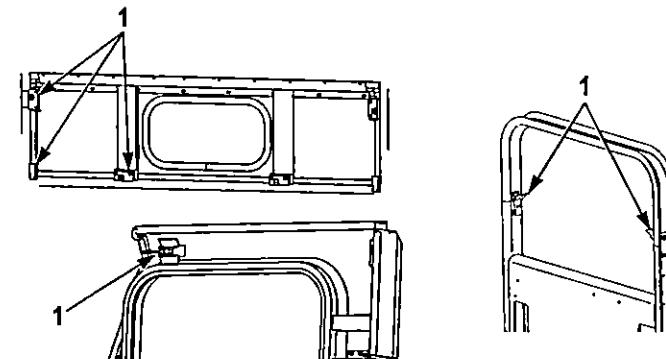
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
77	Monthly	ENGINE OPERATION	<p>1. Inspect starter (1) for secure mounting and loose or damaged wires (2).</p>	<p>Starter is loose or has loose or damaged wires.</p>

Figure 84.

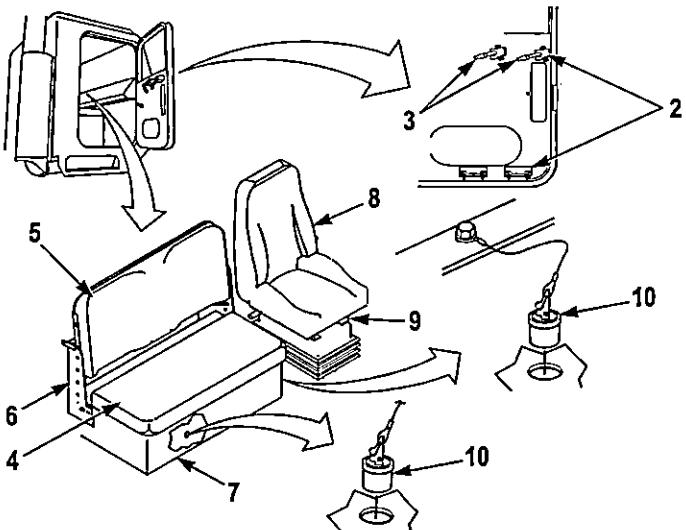
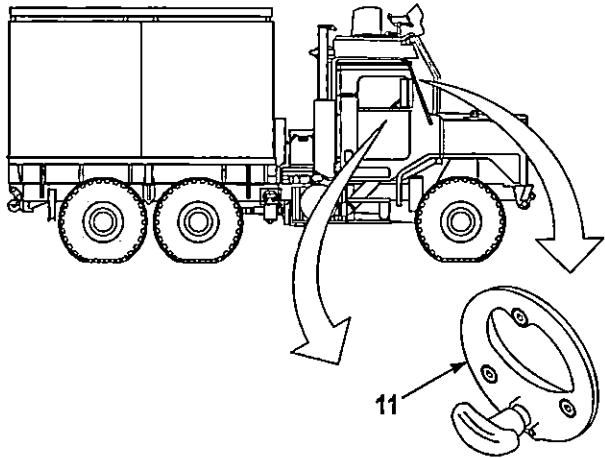
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
78	Monthly	EXHAUST SYSTEM	<p><b>WARNING</b></p>  <p>During vehicle operation, exhaust system can become very hot. Do not touch exhaust system components with bare hands, or allow your body to come in contact with exhaust system components. Failure to comply may result in serious burns to personnel.</p> <p>1. Check exhaust piping (1), shields (2), and muffler (3) for looseness or damage. While engine is running, listen for exhaust leaks.</p> 	Any exhaust piping leak.
79	Monthly	CTIS	1. Activate each button on CTIS controller (WP 0043) (1) and ensure corresponding indicator light illuminates.	

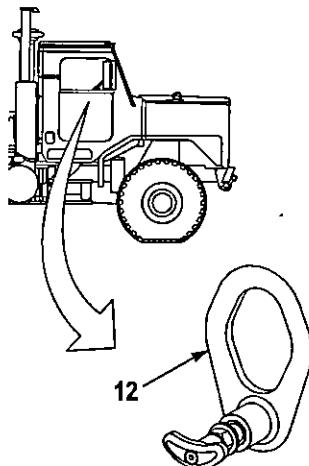
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
80	Monthly	CAB INTERIOR	<p>1. Check all cab latches (1) for damage and ensure all latches are in lock position.</p> 	<p>2. Check upper and lower rifle mount brackets (2) for looseness or damage.</p> <p>3. Check catch assemblies (3) on upper rifle mount brackets for excessive looseness, binding or damage.</p> <p>4. Inspect all seat cushions (4), backrest (5), frames (6), and BII box (7) for serviceability.</p> <p>5. Inspect driver's seat (8) and switch (9) for proper operation (WP 0028).</p> <p>6. Inspect two drain plugs (10) for proper operation and serviceability.</p>

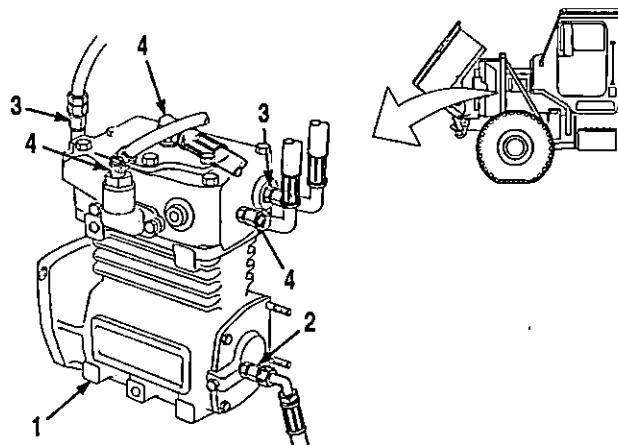
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
			<p>7. Operate MIC and check for fault messages (WP 0095).</p> <p>8. Check three weapons ports (11) for proper operation (WP 0070) (if equipped with non-reducible armor).</p>	
				<p>9. Check two weapons ports (12) for proper operation (WP 0070) (if equipped with reducible armor).</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
81	Monthly	AIR COMPRESSOR	<p><b>WARNING</b></p>  <p>Engine components become extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in serious injury to personnel.</p> <p><b>NOTE</b></p> <p>To check for air leakage, the air system must be charged to a minimum of 100 psi (690 kPa).</p> <ol style="list-style-type: none"> <li>1. Check air compressor (1) for oil or coolant leaks. Class III oil or coolant leak.</li> <li>2. Check air compressor (1), oil fitting (2), coolant fittings (3), and air fittings (4) for looseness and leakage. Class III oil or coolant leak or air leakage.</li> <li>3. Check that air compressor (1) is securely mounted. Compressor is loose.</li> </ol>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
82	Monthly	ARCTIC ENGINE KIT (IF EQUIPPED)	 <p>Figure 91.</p> <ol style="list-style-type: none"> <li>1. Inspect fuel lines for signs of leakage.</li> <li>2. Inspect coolant hoses and arctic engine heater (1) for signs of leakage.</li> <li>3. Inspect exhaust hose (2) for signs of exhaust leaks.</li> <li>4. Inspect transmission heater pan (3) for damage and secure mounting.</li> <li>5. Open battery box (4) and inspect for signs of coolant leakage.</li> <li>6. Check to ensure wire harness (5) is securely connected to arctic engine heater (1).</li> <li>7. Inspect arctic engine heater (1) to ensure secure mounting.</li> <li>8. Operate arctic engine heater (1) and ensure proper operation (WP 0059).</li> </ol>	Any leak.  Any Class III leak.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

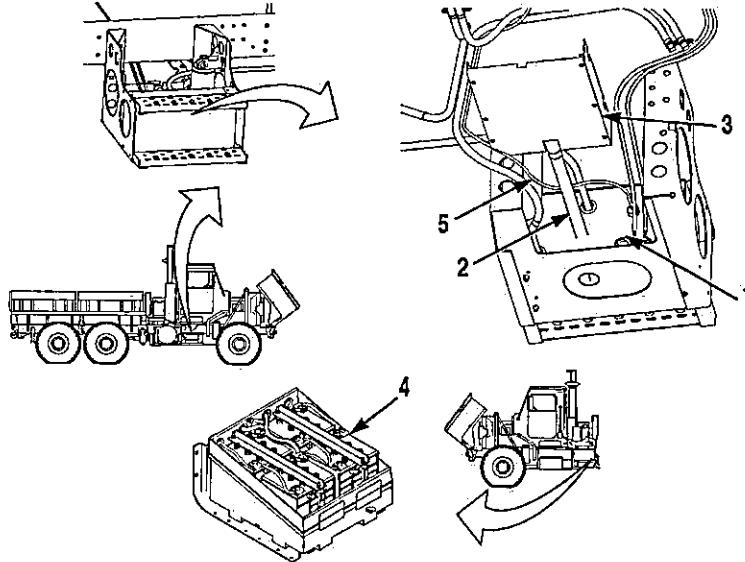
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 92.

83	Monthly	ARCTIC CARGO KIT (IF EQUIPPED)	<p>1. Operate ventilation fan (1) and ensure of proper operation. (Refer to Arctic Cargo Kit Ventilation Fan) (WP 0061).</p> <p>2. Check wire connections (2) for loose connections. Tighten any loose connections.</p> <p>3. Check for frayed wires.</p>	
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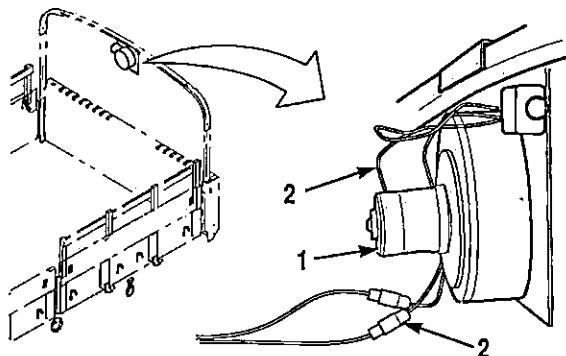


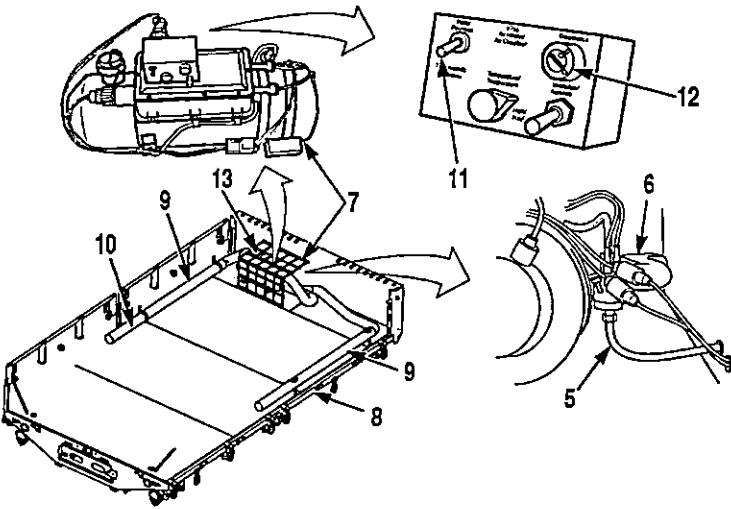
Figure 93.

4. Operate arctic cargo cover lights (3) and ensure of proper operation in both normal and blackout positions.

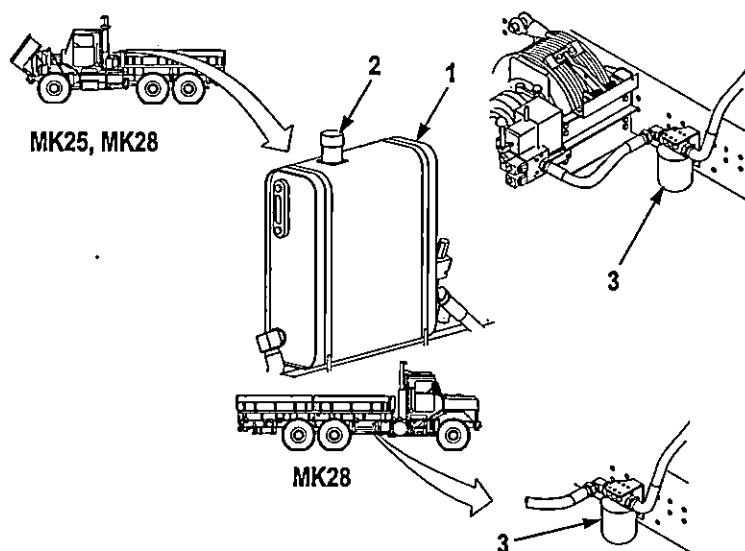
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>(Refer to Arctic Cargo Kit Dome Light Operation) (WP 0061).</p> <p>5. Check arctic cargo cover light wire connections (4) for loose connections. Tighten any loose connections.</p>	
			<p><b>WARNING</b></p> <p>Do not operate arctic cargo kit heater if fuel leaks or exhaust leaks are present. Failure to comply may result in injury or death to personnel.</p> <p>6. Check for damage to fuel line (5) and connections.</p> <p>7. Check for damage to exhaust line (6) and connections.</p> <p>8. Inspect arctic cargo heater wire connections for tightness. Tighten any loose connections.</p> <p>9. Ensure arctic cargo kit heater (7) is securely mounted to cargo bed (8).</p> <p>10. Check heating tubes (9) and ensure vent holes (10) are clean and free of debris.</p> <p>11. Push switch (11) up and hold for five seconds. Diagnostic light (12) should light solidly and should not blink.</p> <p>12. Operate arctic cargo kit heater (7) and check for exhaust leaks in exhaust line (6).</p> <p>13. With arctic cargo kit heater (7) operating, check for fuel leaks in fuel line (5).</p> <p>14. With arctic cargo kit heater (7) operating, ensure heater works properly in both heating and venting position. (Refer to Arctic Cargo Kit Personnel Heater) (WP 0061).</p>	

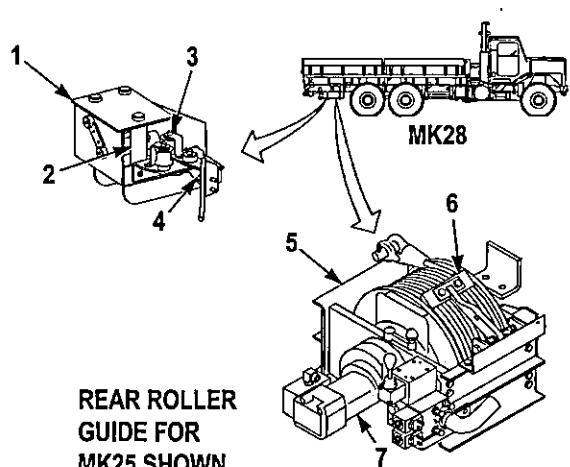
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p>15. With arctic cargo kit heater (7) operating, ensure heater works properly in both heating and venting position. (Refer to Arctic Cargo Kit Personnel Heater) (WP 0061).</p> 	
84	Monthly	CHEMICAL ALARM KIT (IF EQUIPPED)	<p>Refer to Location and Description of Major Components (WP 0002).</p> <p>Refer to TM 3-10434A-12&amp;P for PMCS.</p>	
85	Monthly	DECONTAMINATION KIT (if equipped) (refer to)	<p>Refer to Fuel/Water Can Bracket (WP 0002).</p> <p>Refer to TM 3-10434A-12&amp;P for PMCS.</p>	
86	Monthly	HYDRAULIC RESERVOIR (MK28)	<p>1. Check hydraulic tank (1) for leaks, damage, and secure mounting.</p> <p>2. Check hydraulic hoses, connections, cap (2), and filter (3) for leaks, damage, or looseness.</p>	<p>Any class III hydraulic leak.</p> <p>Any class III hydraulic fluid leakage or loose connections.</p>

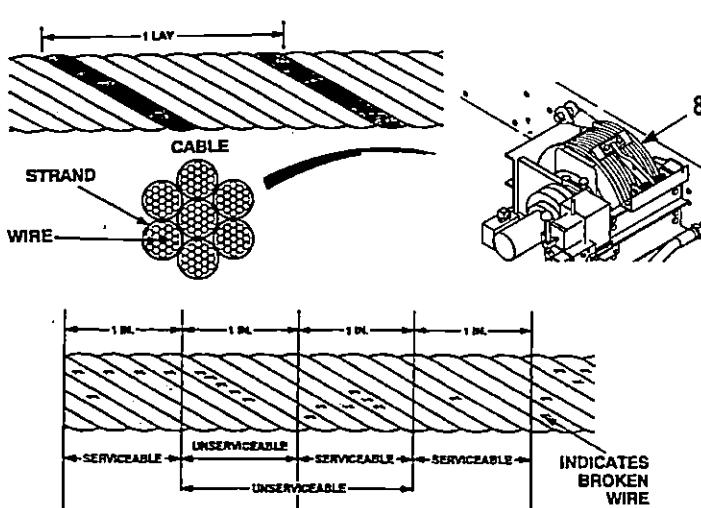
**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
87	Monthly	SELF RECOVERY WINCH (SRW) (WHEN EQUIPPED)	 <p>Figure 96.</p>	<p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Refer to Winch Operation (WP 0044) for more detailed information on operation of SRW.</li> <li>Tensioning rollers (3) and spring (4) are not present on MK28.</li> </ul> <ol style="list-style-type: none"> <li>Check for looseness and damage to SRW rear cable guide (1) and rollers (2). Check tensioning rollers (3) and spring (4) for damage. Check for obvious damage to SRW (5).</li> <li>Inspect cable holdown (6) for damage and serviceability.</li> <li>With the aid of an assistant, pay winch cable in and out while listening to winch motor (7) for unusual noises and proper operation.</li> </ol>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			<p><b>WARNING</b></p> <p>Use heavy leather gloves when checking winch cable. Injury to hands can result if gloves are not worn.</p> <p><b>NOTE</b></p> <p>Worn spots will show up as shiny flattened spots on the strands.</p> <ol style="list-style-type: none"> <li>4. Inspect winch cable (8) for kinks and broken strands while cable is being payed out for use.</li> <li>5. Inspect for worn spots while cable is being payed out for use.</li> <li>6. Inspect broken wires to determine if it is a single broken wire or several broken wires. Inspect while cable is being payed out for use.</li> <li>7. Lubricate winch cable (8) (WP 0111).</li> <li>8. Wind winch cable (8) onto winch (WP 0044).</li> </ol>	<p>Cable is frayed, kinked, worn, or corroded.</p> <p>Outer wires are reduced in diameter by one-fourth.</p> <p>Individual wires are broken next to one another; six randomly distributed broken wires in one lay (the distance in which the strands make one complete turn around the cable); or three broken wires in one lay.</p>

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
88	Monthly	AIR CONDITIONING (A/C) KIT (IF EQUIPPED)	 <p>1. Check A/C compressor belt (1) for cracking, fraying, or other damage.</p> <p>2. Check A/C compressor (2) and hoses (3) for damage.</p>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

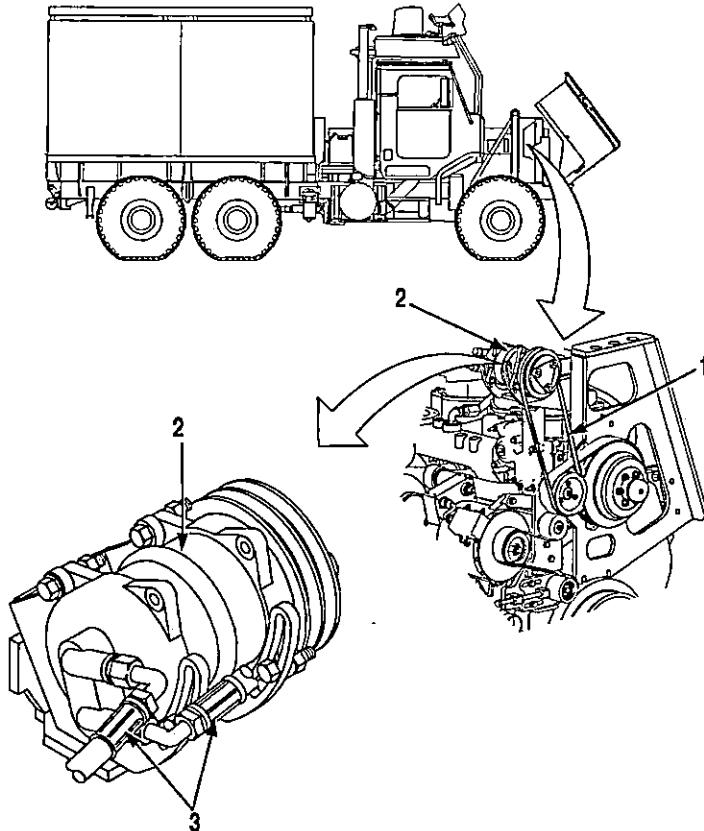
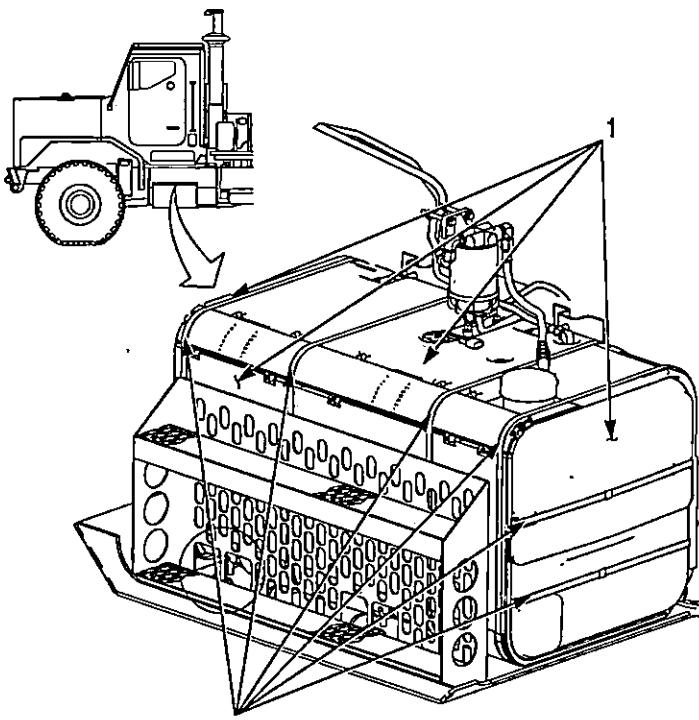
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 99.

89	Monthly	FUEL TANK FIRE PROTECTION KIT (IF EQUIPPED)	<p><b>CAUTION</b></p> <p>If panel is cracked, notify Second Echelon Maintenance. Failure to comply may result in damage to equipment.</p> <ol style="list-style-type: none"> <li>1. Check panel assemblies (1) for damage, cracks, or leaking powder.</li> <li>2. Check panel assemblies (1) for damage, cracks, or leaking powder.</li> <li>3. Check metal locking ties (2) for damage.</li> </ol>	<p>Panel is cracked or powder is present.</p> <p>Panel is cracked or powder is present.</p> <p>Metal locking tie is broken or missing.</p>
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
90	Monthly	INCREASED MINE PROTECTION KIT (IF EQUIPPED)	 <p>Figure 100.</p> <p><b>NOTE</b></p> <p>Both passenger and driver seats and seat belts are the same.</p> <ol style="list-style-type: none"> <li>1. Inspect all seat cushions (1), backrests (2), frames (3), and BII stowage box (4) for serviceability.</li> <li>2. Inspect cab map box (5) and BII stowage strap (6) for damage and serviceability.</li> </ol>	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

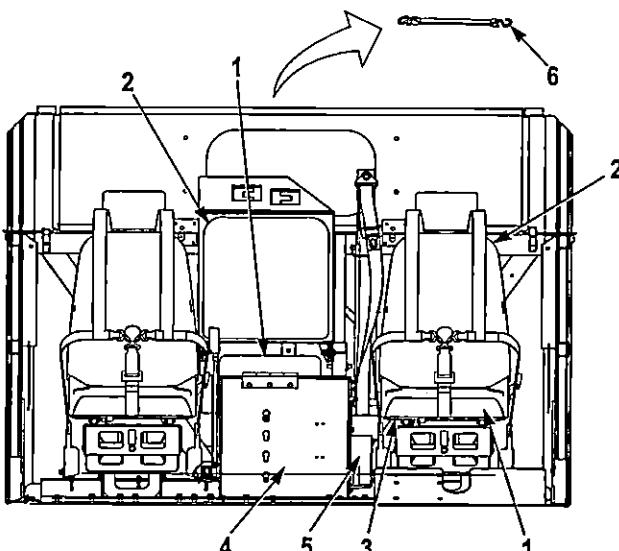
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
91	Monthly	BELLY DEFLECTOR (ARMOR KIT)	 <p>1. Inspect belly deflector (1) and two wheel zone deflectors (2) for loose, broken, or missing hardware.</p>	

Figure 101.

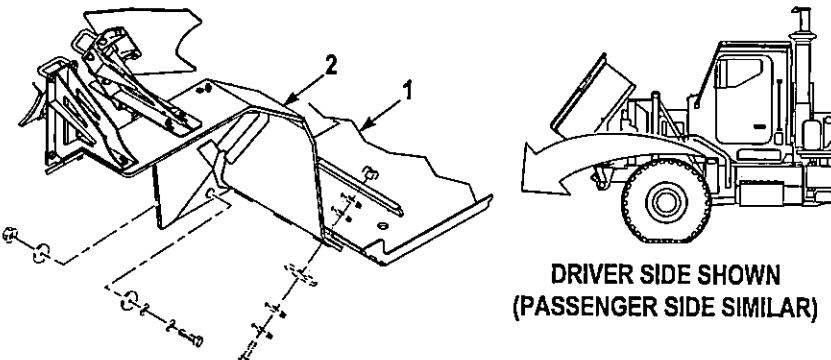
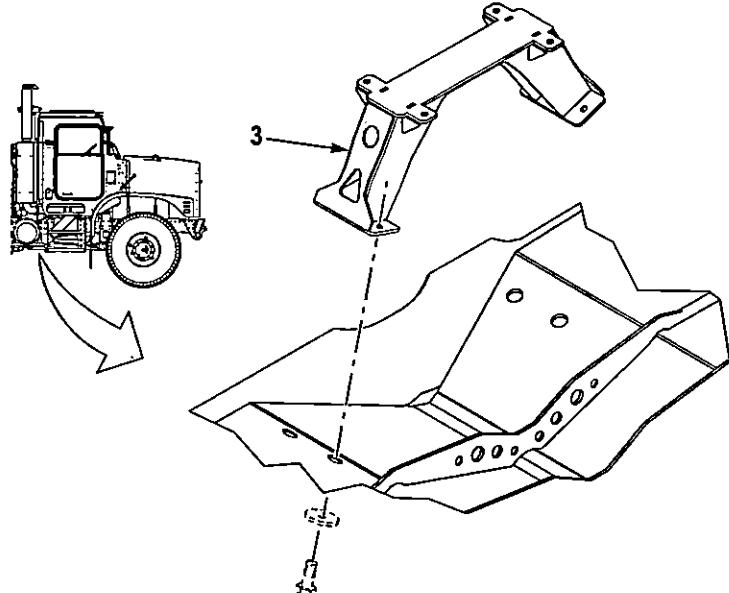
91	Monthly	BELLY DEFLECTOR (ARMOR KIT)	 <p>1. Inspect belly deflector (1) and two wheel zone deflectors (2) for loose, broken, or missing hardware.</p> <p>2. Inspect frame bridge (3) for loose, broken, or missing hardware.</p>	
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Figure 102.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
92	Monthly	FRONT AND REAR CAB MOUNTS (ARMOR KIT)	Inspect front cab mounts (1) and rear cab mounts (2) for wear.	

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

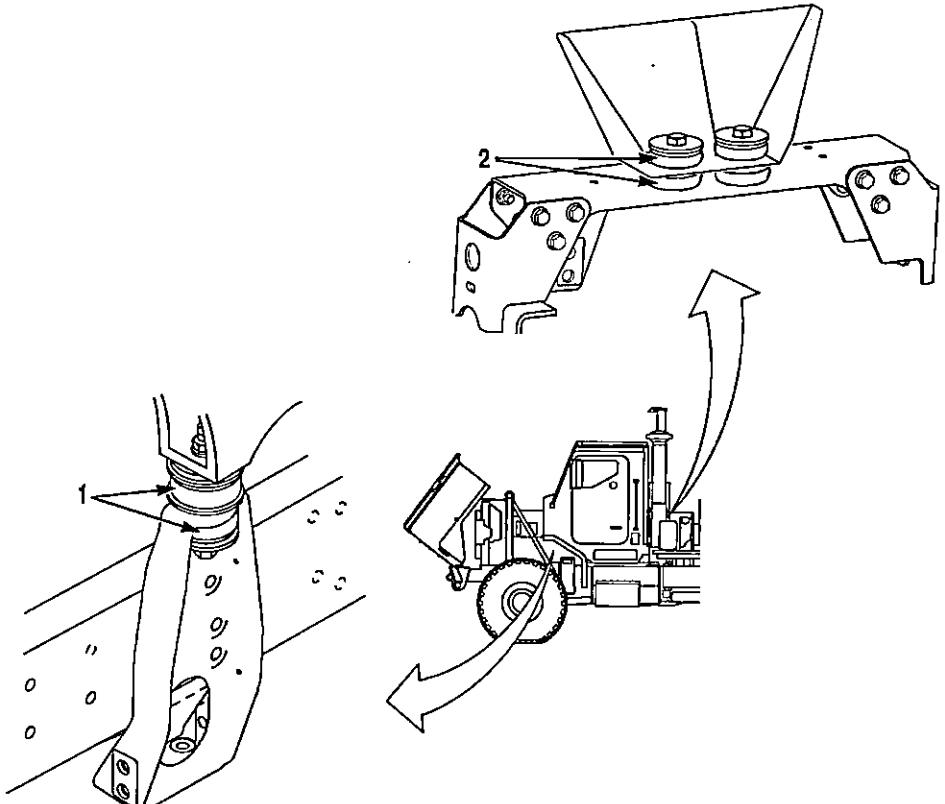
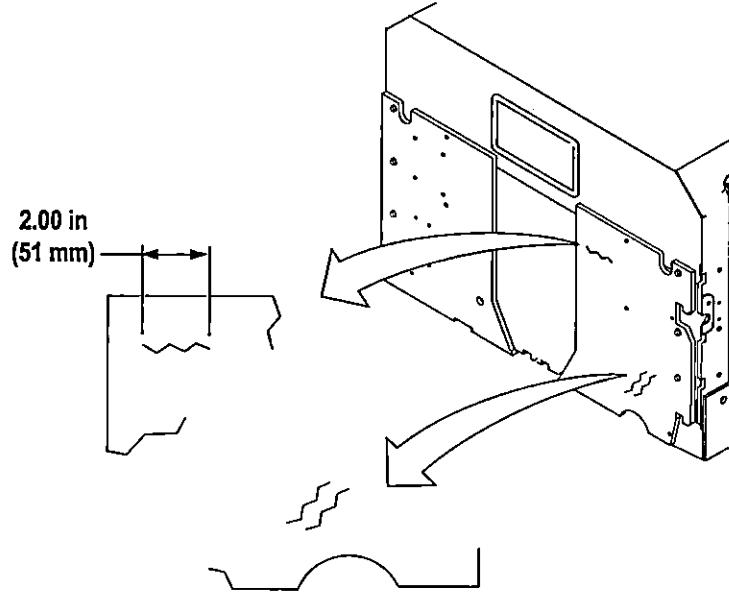
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 104.

93	Monthly	CAB ARMOR (ARMOR KIT)	1. Check armored panels for stress cracks.	Stress crack over 2 in. (51 mm) long is present or more than two stress cracks are present on the armored panel.
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**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				
94	Monthly	CAB DOOR (ARMOR KIT)	<p>1. Inspect lug door plate (1) for cracked or broken welds.</p>	Any cracked or broken welds.

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

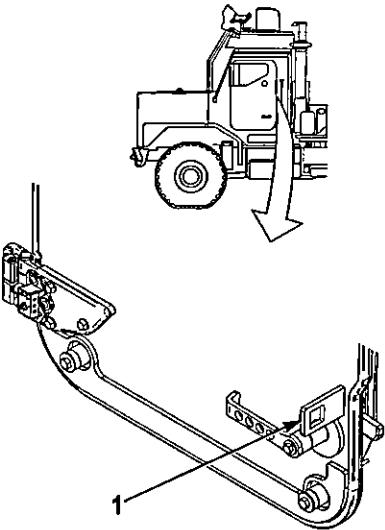
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 106.

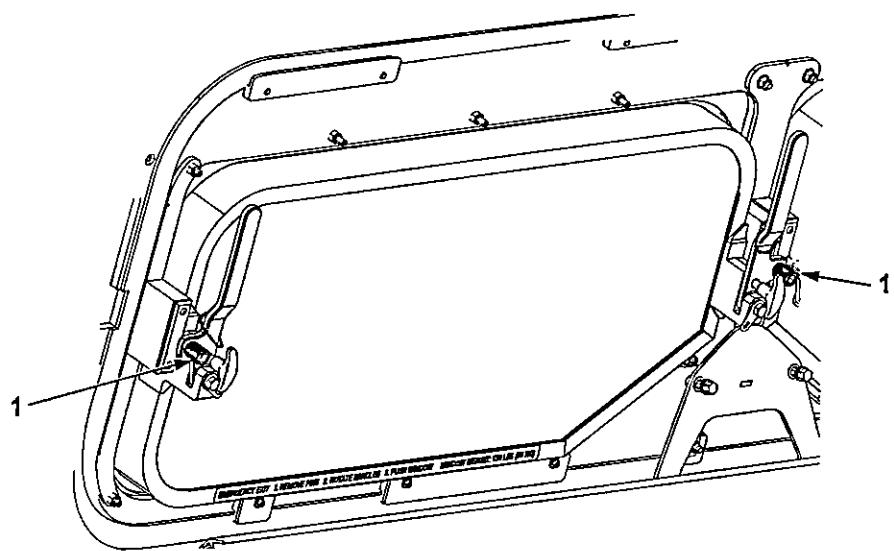
95	Monthly	EMERGENCY EGRESS WINDOW (EEW)	Check adjustment screw (1) for proper torque. Notify 2nd ECHELON Field Maintenance if not within torque specs.	Loose hardware will cause hazardous driving conditions.
				

Figure 107. Non-Reducible,

**Table 1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (MK27 AND MK28) - Continued.**

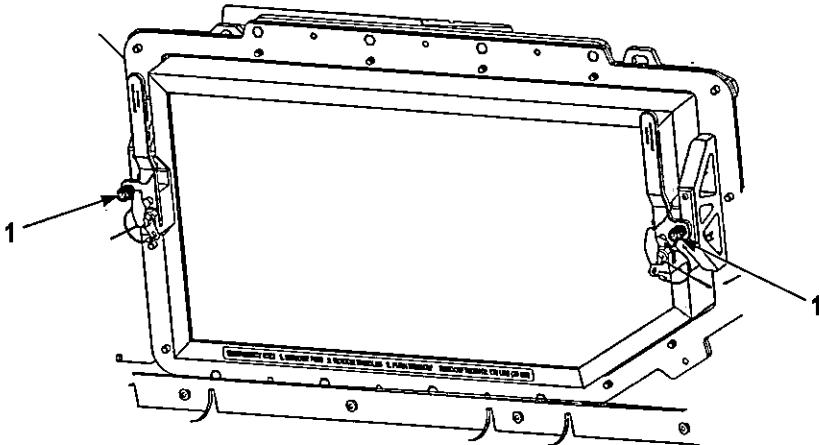
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
				

Figure 108. Reducible,

**END OF TASK**

**END OF WORK PACKAGE**

**CHAPTER 8**  
**MAINTENANCE INSTRUCTIONS**

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**1ST ECHELON MAINTENANCE  
SERVICE UPON RECEIPT OF EQUIPMENT**

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**INITIAL SETUP:**

Not Applicable

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The following steps are to be performed by operator upon receipt of the 7-Ton Truck.

**Inspection**

The following components and areas are to be inspected to ensure that no damage to equipment has occurred since the inspection required when equipment was initially prepared for use during Initial Checkout and Adjustment (WP 0022).

## Inspection - Continued

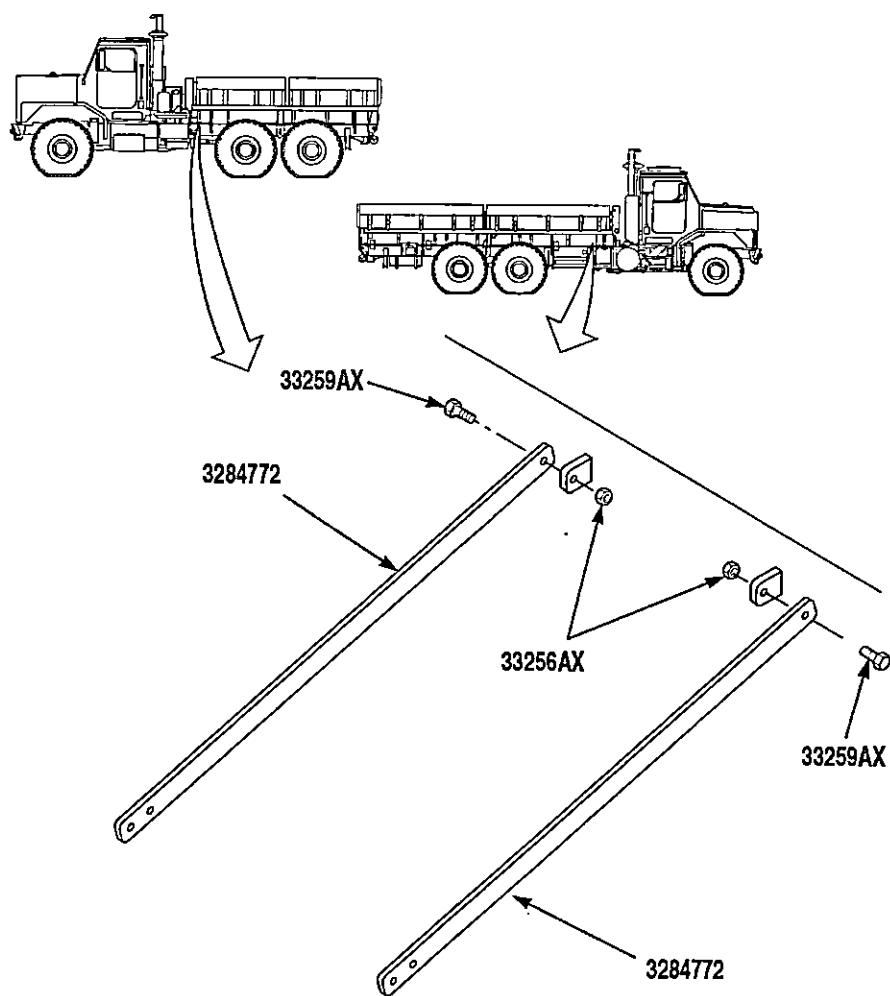


Figure 1. Installation of Ladder Struts.

1. Check all fuel, oil, and water levels in vehicle and fill as required.
2. Visually inspect entire vehicle for loss of parts or damage which may have occurred during loading, removal, or shipment.
3. Check tires for proper inflation (refer to Tire Pressures (WP 0043, General)).
4. Check radiator shroud to ensure shroud is free of dents or other damage from shipment.
5. Inspect muffler, air cleaner, oil filters, and fan for visible damage. Inspect all wire connectors for firm connections.
6. Inspect starter and alternator for loose connections and insecure mounting.
7. Examine hydraulic pump and pump connections (MK25 and MK28 only) for visible signs of damage.

**Inspection - Continued**

8. Visually inspect all piping, lines, hoses, and wiring for cracks or damage, loose connections, or missing parts. Ensure all drain plugs are securely tightened.
9. Inspect tanks and gauges for signs of damage.
10. Inspect taillights, headlights, clearance lights, and blackout lights for proper operation.
11. Inspect fan belt for proper tension. Belt has proper tension when belt can be depressed approximately 0.5 inch (1.3 cm) by normal pressure (10 to 15 pounds [4.5 to 6.8 kg]).
12. Inspect steering fluid reservoir cover to determine if the fill/dipstick port points towards engine. If the port is pointing towards the engine, notify second echelon.
13. Reference BII (WP 0113) and Stowage Guide (WP 0116) for proper mounting location of fire extinguisher.

**NOTE**

On the MK23/MK25, the ladder struts mount on the left side and to the front of the cargo body. On the MK27/MK28, the ladder struts mount to the right side and to the front of the cargo body. Part numbers are provided as an aid to identify parts.

14. Remove two ladder struts (3284772), screws (33259AX), and nuts (33256AX) from stowage in the crew seat (refer to BII (WP 0113)). Install ladder struts to the strut brackets on cargo bed using the screws and nuts.

**NOTE**

On the MK23/MK25, the ladder struts mount on the left side and to the front of the cargo body. On the MK27/MK28, the ladder struts mount to the right side and to the front of the cargo body. Part numbers are provided as an aid to identify parts.

15. Remove two ladder struts (3284772), screws (33259AX), and nuts (33256AX) from stowage in the crew seat (refer to (WP 0113)). Install ladder struts to the strut brackets on cargo bed using the screws and nuts.

**END OF TASK****Lubrication**

Refer to Lubrication Instruction (WP 0111) for all lubrication requirements.

**END OF TASK****Completeness of Equipment**

Refer to (WP 0113) for equipment required for operation of the 7-Ton Truck to ensure completeness of vehicle.

**END OF TASK****END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE OPERATION OF MESSAGE INFORMATION CENTER (MIC)

### INITIAL SETUP:

Not Applicable

### General

Incorporated into the design of the 7-Ton Truck is an on-board monitoring/diagnostic system. This system consists of a monitoring device, a display device, system control modules, and various sensors.

While operating the 7-Ton Truck, the Test Interface Module (TIM) monitors the various sensors as well as the engine, transmission, CTIS, and ABS control modules. The MIC, working with the TIM can display this information in the form of messages or specific readings. This information can be used to help troubleshoot problems as well as check systems for the purpose of preventive maintenance.

The monitoring/diagnostic system can also be interfaced with a lap top computer to obtain additional information.

To operate MIC, battery disconnect switch and ignition switch must be in the ON position.

### Accessing the Information

1. Turn six screws (1) 1/4 turn counterclockwise and remove Message Information Console (MIC) dash panel cover (2) from dash (3).

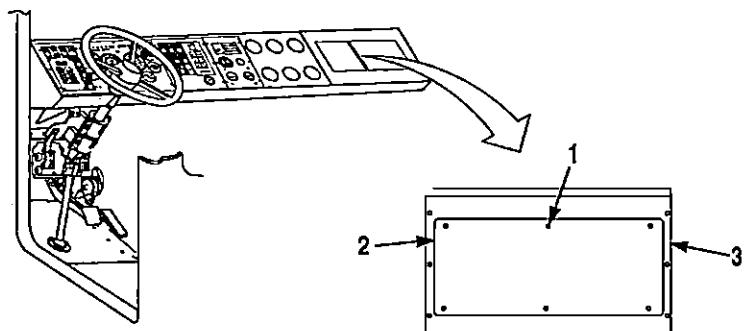


Figure 1.

### NOTE

Connector C14 is tucked underneath the MIC module.

2. Remove two dust covers (4 and 5) from ends of two connectors C14 (6 and 7).

## Accessing the Information - Continued

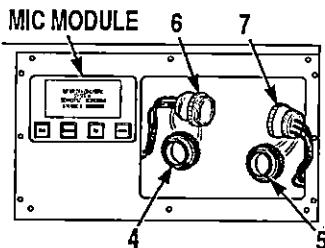


Figure 2.

### NOTE

- Once the MIC is connected, it will start to display information.
- The first information displayed is the 7-Ton Truck Diagnostic System screen. This screen will be displayed for 5 seconds.

3. Connect connector C14 (6) to connector C14 (7).

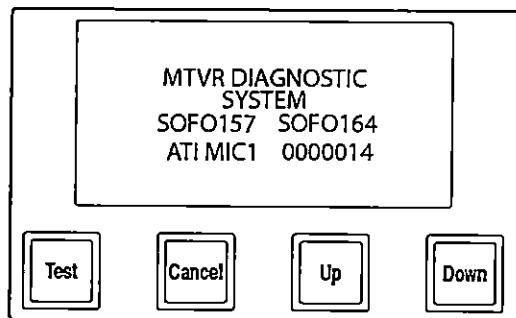


Figure 3.

### NOTE

- If an arrow shows in the upper right-hand corner of any display screen, it indicates that additional information is available. Use the "Up" and "Down" buttons to scroll the information.
- If the Test Interface Module (TIM) is working properly, the next message displayed will be a message stating "TIM IS OPERATING PROPERLY." This screen will be displayed for 5 seconds.

4. If the TIM is not working properly, the MIC (8) will display information stating what the problems are. Note the messages, push the "Cancel" button (9) to continue with the MIC operation. Notify Second Echelon Maintenance as soon as possible.

## Accessing the Information - Continued

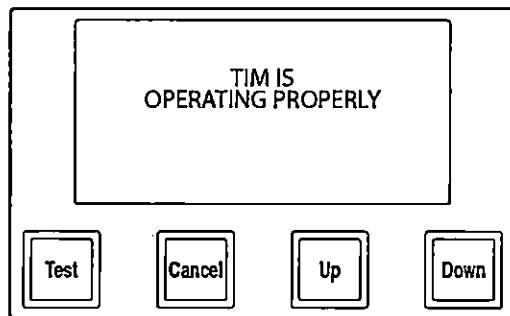


Figure 4.

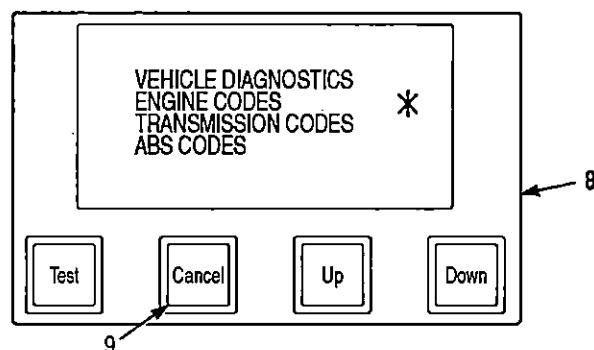


Figure 5.

**NOTE**

- After the TIM operating information, the next screen to be displayed is the main menu. To see the entire menu use the "Up" and "Down" buttons. The maintenance jacket and vehicle diagnostics menu items are to be used by second echelon maintenance and should not be accessed by the operator.
- Pushing the "Cancel" button will cause the MIC to back up to the previous screen. This button can be used to back up as far as the main menu.

5. Position the asterisk (10) next to the menu item specific to the desired testing area by using the "Up" button (11) and "Down" button (12).

### Accessing the Information - Continued

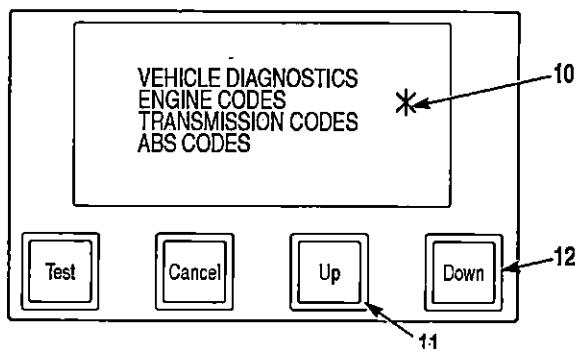


Figure 6.

- Push the "Test" button (13) to select this menu item.

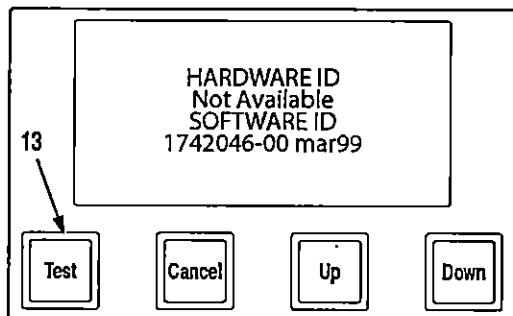


Figure 7.

#### NOTE

When the screen showing the "HARDWARE ID" and "SOFTWARE ID" titles display, it may take another 10 seconds before the ID information is displayed below the titles.

- When the screen displaying the complete hardware and software ID information is displayed, push the "Test" button (13) to proceed.

#### NOTE

When checking for FMIS (Failure Mode Identifiers) for the Engine, Transmission, or ABS, perform steps (8) through (10). When checking the CTIS for FMIS, perform steps (11) through (16).

- The next message displayed is "DISPLAY ACTIVE OR INACTIVE FMIS. PRESS TEST TO BEGIN." Push the "Test" button (13) to proceed with the testing.

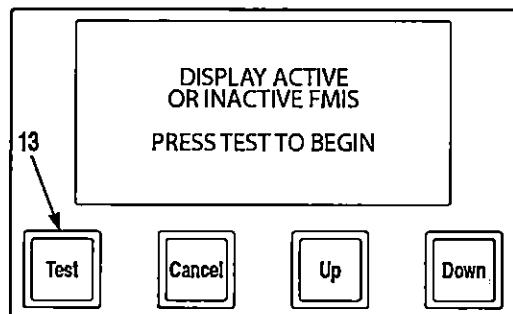
**Accessing the Information - Continued**

Figure 8.

9. If the message "THERE ARE NO FMIS" displays on the screen, push the "Cancel" button (9) repeatedly until the MIC returns to the main menu.

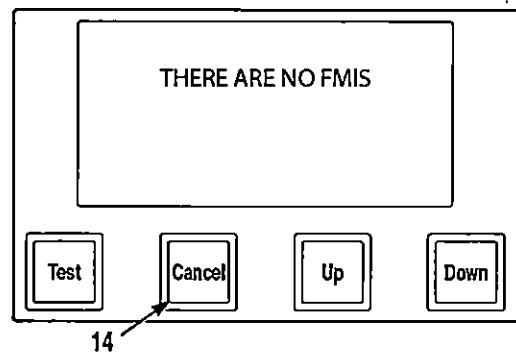


Figure 9.

10. If a message other than "THERE ARE NO FMIS" displays on the screen, note the message(s) and push the "Cancel" button (9) repeatedly until the MIC returns to the main menu. Report messages to Second Echelon Maintenance.

## Accessing the Information - Continued

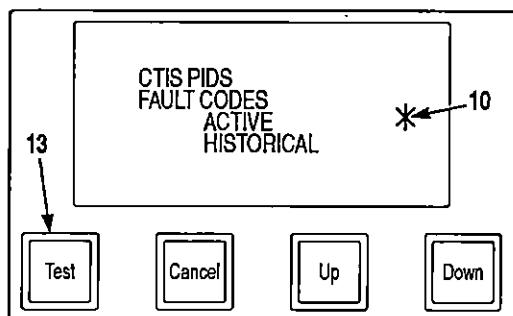


Figure 10.

**NOTE**

The CTIS Parameter Identifications (PIDS) menu item is to be used by Second Echelon Maintenance and should not be accessed by the operator.

11. Position the asterisk (10) next to the ACTIVE menu item and push the "Test" button (13).
12. If the message "THERE ARE NO FMIS" displays on the screen, push the "Cancel" button (9) and proceed to step (m).

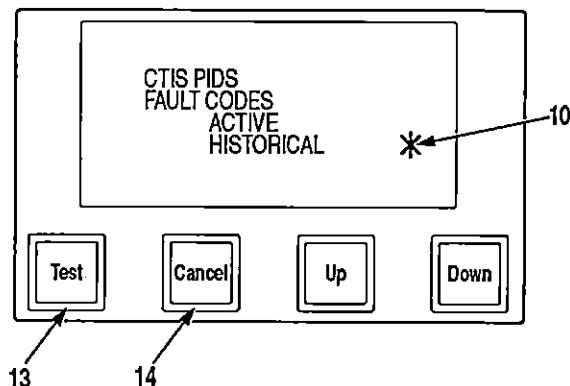


Figure 11.

13. If a message other than "THERE ARE NO FMIS" displays on the screen, note the message(s) and push the "Cancel" button (9). Report message(s) to Second Echelon Maintenance.
14. Position the asterisk (10) next to the HISTORICAL menu item and push the "Test" button (13).

## Accessing the Information - Continued

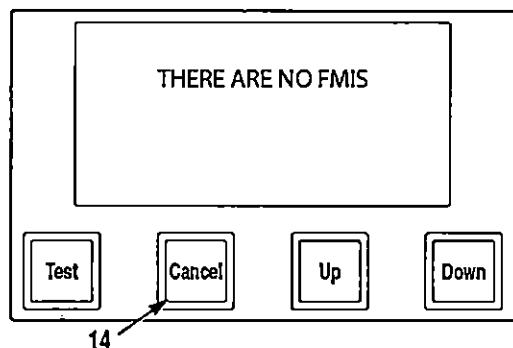


Figure 12.

15. If the message "THERE ARE NO FMIS" displays on the screen, push the "Cancel" button (9) repeatedly until MIC returns to main menu.
16. If a message other than "THERE ARE NO FMIS" displays on the screen, note the message(s) and push the "Cancel" button (9) repeatedly until MIC returns to main menu. Report message(s) to Second Echelon Maintenance.

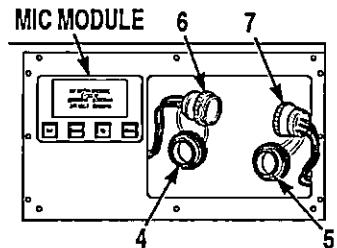


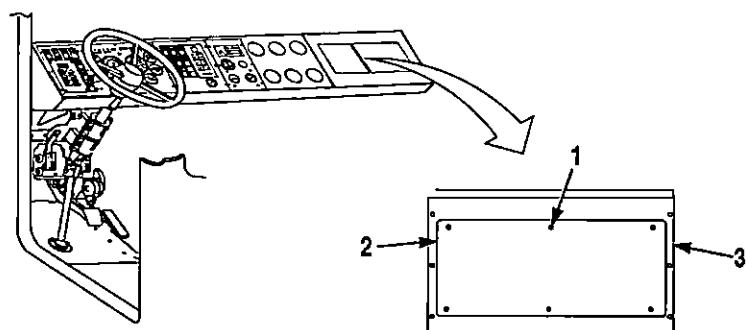
Figure 13.

17. Disconnect connector C14 (6) from connector C14 (7).
18. Install two dust covers (4 and 5) on ends of connectors (6 and 7).

**CAUTION**

Ensure that connector C14 is secured underneath MIC module. Failure to comply could result in damage to equipment.

19. Tuck connector C14 (6) underneath MIC module and secure with nylon tie.
20. Install MIC dash panel cover (2) on dash (3) and turn six screws (1) 1/4 turn clockwise.

**Accessing the Information - Continued****Figure 14.****END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
GENERAL**

---

**INITIAL SETUP:**

Not Applicable

---

**General**

This chapter contains operator maintenance to be performed on the 7-Ton Truck and operator troubleshooting symptoms. Also covered in this chapter are the tools and equipment carried with vehicle and the lubrication instructions.

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
TOOLS AND MATERIAL CARRIED WITH VEHICLE**

---

**INITIAL SETUP:**

Not Applicable

---

**Tools and Material Carried with Vehicle**

Refer to (WP 0113) for a listing of all the BII shipped with each model of the 7-Ton Truck. Components of End Item (COEI) and Basic Issue Items (BII) Work Package also contains the COEI.

**END OF TASK**

**END OF WORK PACKAGE**

---

## 1ST ECHELON MAINTENANCE INTRODUCTION

---

**INITIAL SETUP:**

Not Applicable

---

**Introduction**

1. The crew is responsible for the PMCS listed in PMCS Table (WP 0092) within this manual. Certain maintenance services the crew is responsible for are covered in this section.
2. The crew is responsible for the PMCS listed in PMCS Table (WP 0093) within this manual. Certain maintenance services the crew is responsible for are covered in this section.

**END OF TASK****END OF WORK PACKAGE**

---

## 1ST ECHELON MAINTENANCE DRAINING AIR SYSTEM

---

**INITIAL SETUP:**

Not Applicable

---

**Draining Air System**

1. Shut OFF engine (WP 0035).

**WARNING**

Air drain valves may be under extreme pressure. Do not allow face to be in front of air drain valves while draining air reservoirs. Open air drain valves slowly to prevent sudden blast of air. Failure to comply may result in serious injury to personnel.

2. Open four air valves (1).

## Draining Air System - Continued

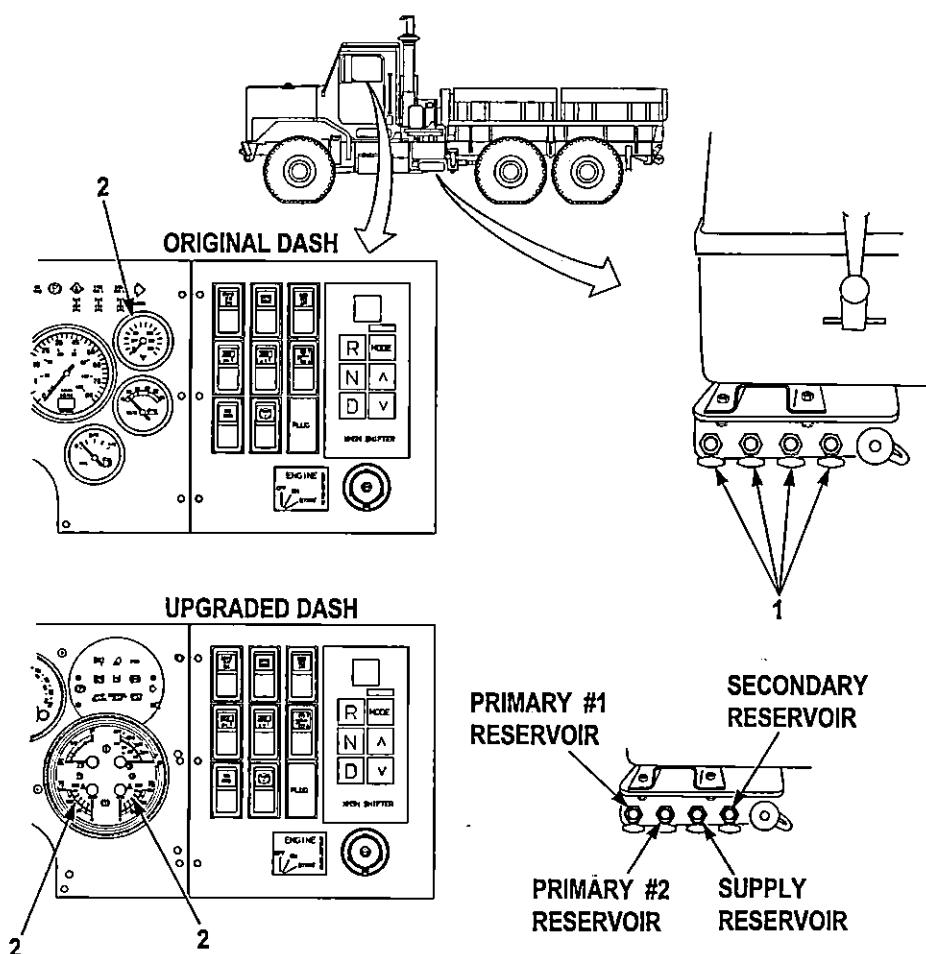


Figure 1.

3. Allow air to drain from system and check air pressure gauge (2). Green and red needles of air pressure gauge (2) should both read zero (ORIGINAL DASH).
4. Needles of both air pressure gauges (2) should read zero (UPGRADED DASH).
5. Close four air valves (1).

**END OF TASK**

**END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
CHANGING WHEEL/TIRE ASSEMBLY**

---

**INITIAL SETUP:**

Not Applicable

---

**Changing Wheel/Tire Assembly**

**WARNING**



Vehicle must be parked in safe area, out of traffic, where there is no danger to personnel changing wheel/tire assembly. Failure to comply may result in injury or death to personnel.

**WARNING**



Vehicle must be parked on hard, level surface where jacks will have stable surface. Attempting to change wheel/tire assembly on unlevel or soft surface may result in vehicle falling, causing serious injury or death to personnel.

**WARNING**



Wheel/tire assembly weighs 500 lbs (227 kg). Do not attempt to lift or catch wheel/tire assembly without the aid of an assistant and a suitable lifting device. Failure to comply may result in injury or death to personnel.

**WARNING**



Tire needs to be properly centered over tire ramp. This includes both centered side-to-side and front-to-rear directions (refer to the following illustration). This will keep tire from sliding off during jacking procedures. Failure to comply may result in injury or death to personnel.

## Changing Wheel/Tire Assembly - Continued

### CAUTION

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

### NOTE

- This procedure covers tire changing on right front wheel/tire assembly. Tire changing procedures for the rest of the vehicle's wheel/tire assemblies are the same.
- This task requires two personnel.

1. Position tire ramp (1) directly in front or behind flat tire (2).

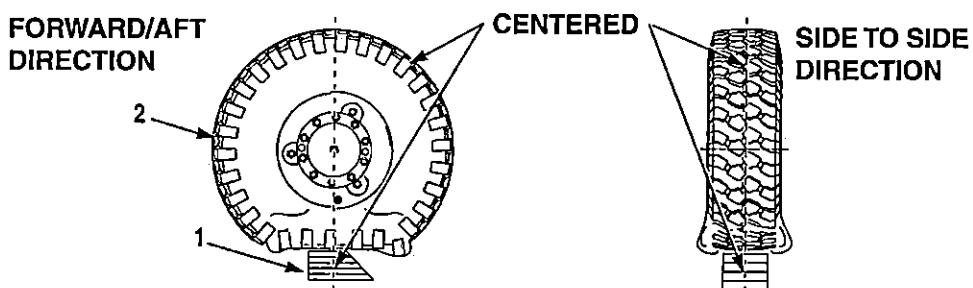


Figure 1.

2. With the aid of a ground guide, drive vehicle forward or aft to position flat tire (2) centered onto tire ramp (1).

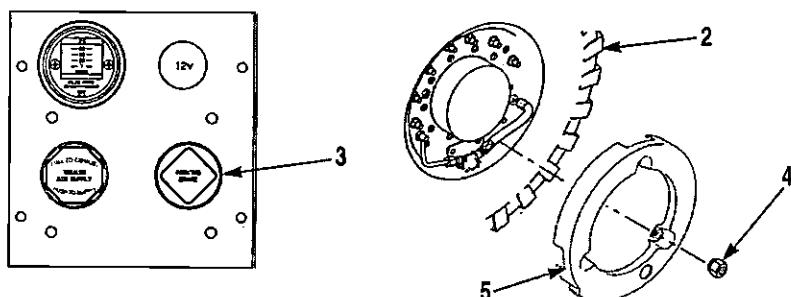


Figure 2.

3. Set PARKING BRAKE (3) and shut off vehicle.
4. Position wheel chocks opposite the tire to be changed.
5. Remove three nuts (4) and wheel cover (5) from flat tire assembly (2).

### CAUTION

Keep hoses clean and dry when removing CTIS wheel valve. Failure to comply may result in damage to CTIS wheel valve.

## Changing Wheel/Tire Assembly - Continued

### NOTE

If CTIS fitting turns while removing CTIS air line fitting, remove CTIS fitting with CTIS air line. Separate fitting from air line once fitting is loose from hub. CTIS fitting must be installed on hub once wheel/tire assembly is removed. Notify Second Echelon Maintenance when mission is completed.

6. Remove CTIS air line (6) from CTIS fitting (7).

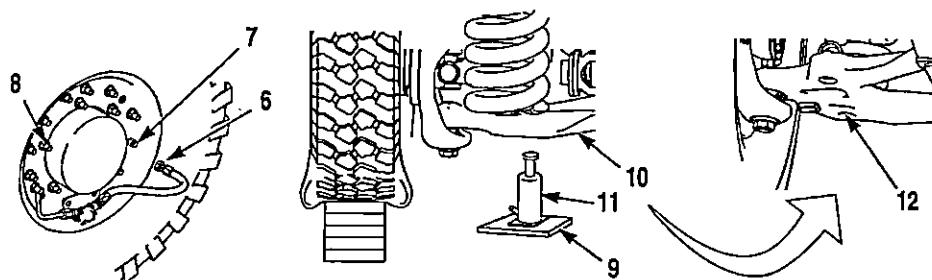


Figure 3.

### WARNING



Do not loosen or remove outer nuts on wheel. Outer nuts hold wheel assembly together. Tire is under pressure and loosening these nuts can cause tire to blow apart. Failure to comply may result in serious injury or death to personnel.

### WARNING



If wheel studs are damaged, wheel/tire assembly may explode. Ensure flat or damaged tire is completely deflated before proceeding with removal. Failure to comply may result in serious injury or death to personnel.

### NOTE

Perform Step (7) if wheel studs are damaged.

7. Completely deflate flat tire (2) (WP 0101).
8. Loosen 10 lugnuts (8) on flat tire (2). Do not remove lugnuts at this time.

### CAUTION

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

## Changing Wheel/Tire Assembly - Continued

### NOTE

When positioning jack plate, allow room for jack platform to be positioned next to jack plate under forward locating indent.

9. Position jack plate (9) under right front control arm (10) so jack (11) will contact rear locating indent (12) when raised.

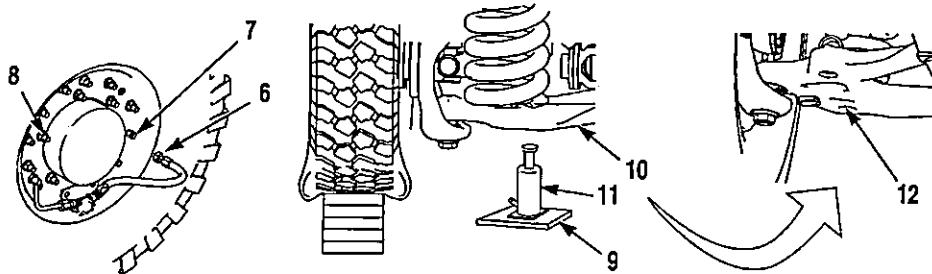


Figure 4.

10. Position jack (11) on jack plate (9) under rear locating indent (12).

### CAUTION

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

11. Unscrew jack extension of jack (11) until screw touches rear locating indent (12).

### WARNING



Hydraulic jacks are intended only for lifting the vehicle and not for supporting the vehicle while performing maintenance. Do not get under vehicle after vehicle is raised unless it is properly supported with blocks or jackstands. Failure to comply may result in injury or death to personnel.

### CAUTION

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

### NOTE

Ensure valve on jack is turned clockwise until seated prior to using jack.

12. Using jack handle, raise jack (11) up to maximum jack height (approximately 18 in. [46 cm]).

## Changing Wheel/Tire Assembly - Continued

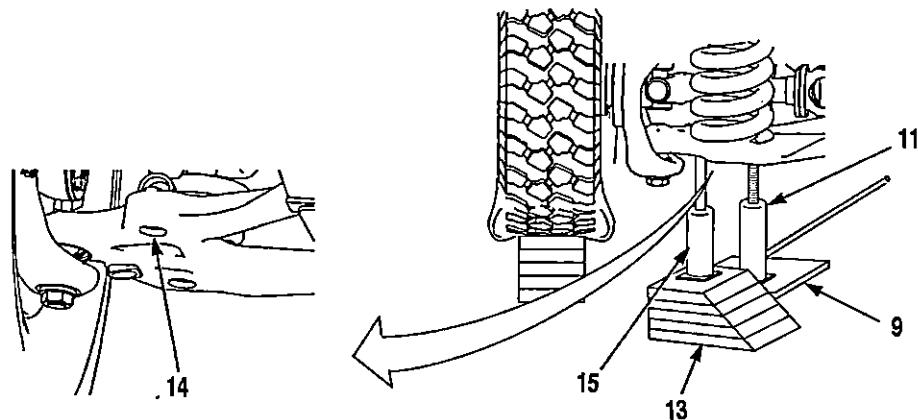


Figure 5.

**NOTE**

Tire ramp must be positioned under forward locating indent and next to jack plate.

13. Position tire ramp (13) under forward locating indent (14).

**NOTE**

Jack extension may have to be screwed in to allow jack to fit under locating indent.

14. Position second jack (15) on tire ramp (13) under forward locating indent (14).

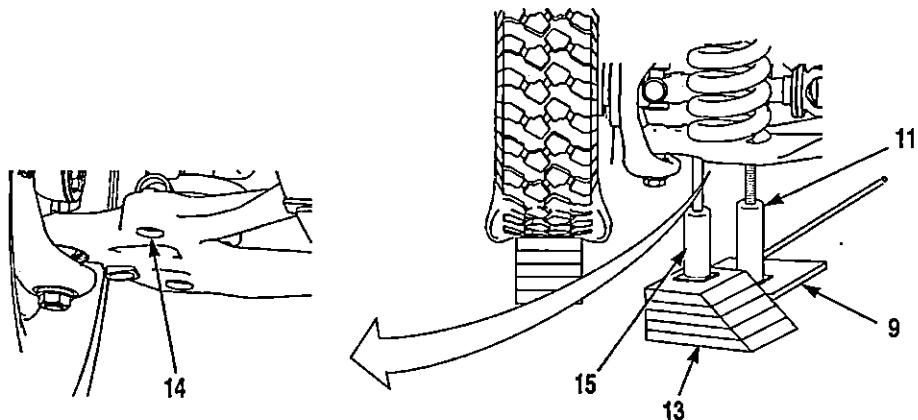


Figure 6.

15. Unscrew jack extension of second jack (15) until jack extension touches forward locating indent (14).

## Changing Wheel/Tire Assembly - Continued

### CAUTION

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

### NOTE

- Tire may have to be rotated to assist in removing tire ramp.
- Ensure valve on jack is turned clockwise until seated prior to using jack.

16. Using jack handle, raise second jack (15) to height needed to remove tire ramp (1) from under flat tire (2).

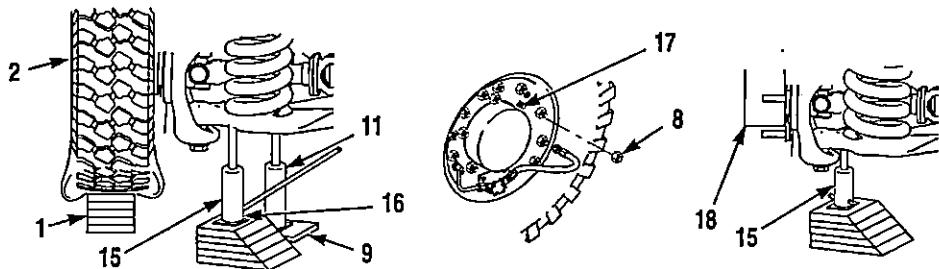


Figure 7.

17. Remove tire ramp (1), first jack (11), and jack plate (9) from under flat tire (2).

18. Turn valve (16) counterclockwise to slowly lower jack until flat tire can be removed. Close valve (16) once proper height has been reached.

### WARNING



Wheel/tire assembly weighs 500 lbs (227 kg). Do not attempt to lift or catch wheel/tire assembly without the aid of an assistant and a suitable lifting device. Failure to comply may result in injury or death to personnel.

### CAUTION

Use care when removing wheel/tire assembly. Dragging wheel/tire assembly across studs may result in damage to studs.

19. Remove ten lugnuts (8) from studs (17) and, with the aid of an assistant, remove flat tire from wheel end assembly (18).

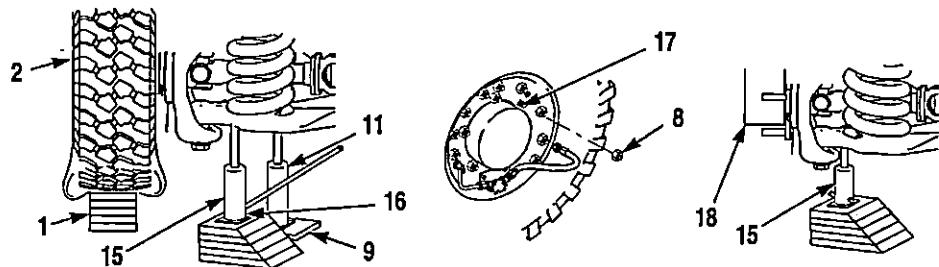
**Changing Wheel/Tire Assembly - Continued**

Figure 8.

**WARNING**

Hydraulic jacks are intended only for lifting the vehicle and not for supporting the vehicle while performing maintenance. Do not get under vehicle after vehicle is raised unless it is properly supported with blocks or jackstands. Failure to comply may result in injury or death to personnel.

**CAUTION**

Do not operate jack or lift load at maximum height. Always screw extension in five turns after maximum height is achieved. Failure to comply may result in damage to equipment.

20. Using second jack (15), raise wheel end assembly (18) enough so replacement tire can be installed.

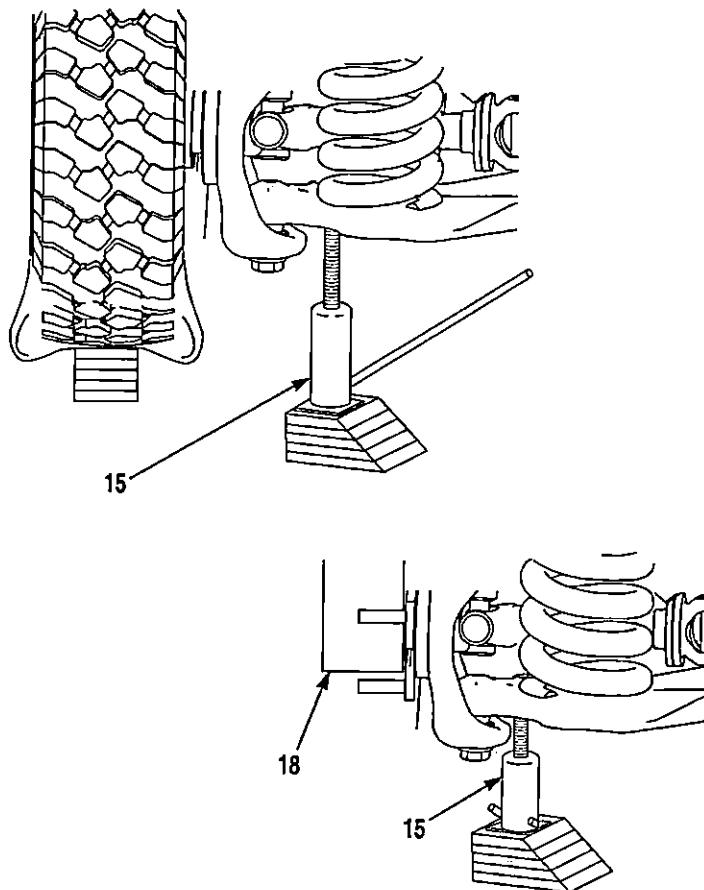
**Changing Wheel/Tire Assembly - Continued**

Figure 9.

21. With the aid of an assistant, roll replacement tire (19) up to axle.

**CAUTION**

Position replacement tire assembly so that CTIS hole in replacement tire assembly is aligned with CTIS fitting. Damage to CTIS fitting and wheel may result if replacement tire assembly is not correctly installed.

**NOTE**

Replacement tire assembly should have CTIS valve facing outward.

22. With the aid of an assistant, line up CTIS hole (20) in replacement tire (19) with CTIS fitting (7) in wheel end assembly (18).

## Changing Wheel/Tire Assembly - Continued

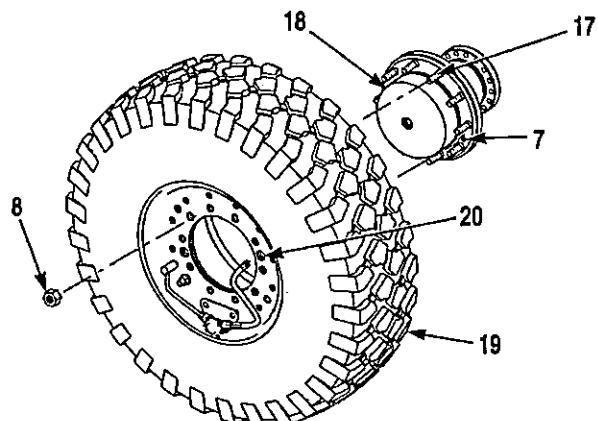


Figure 10.

- With the aid of an assistant, line up ten holes in replacement tire (19) with studs (17) on wheel end assembly (18).

**CAUTION**

Use care when installing replacement tire assembly. Dragging tire assembly across studs may result in damage to studs.

- With the aid of an assistant, mount replacement tire (19) on wheel end assembly (18) and install ten lugnuts (8). Tighten lugnuts (8) until snug, but do not completely tighten yet.
- Slowly open valve (16) on second jack (15) and lower vehicle until tire (19) just contacts ground, then close valve (16).

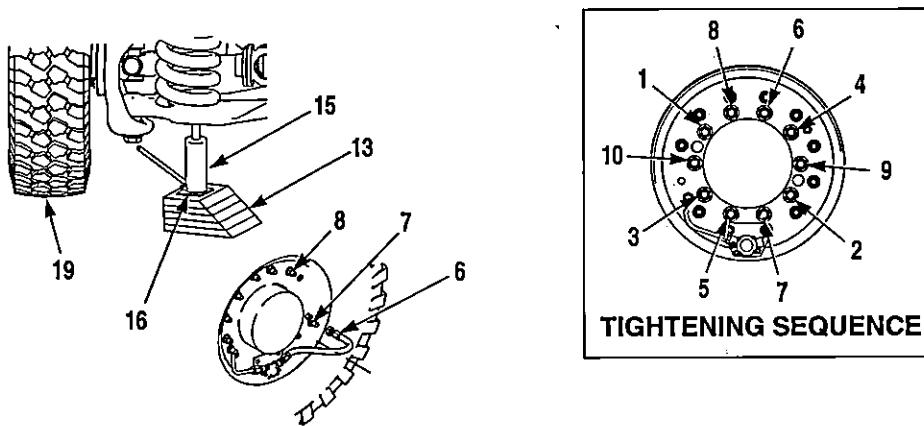


Figure 11.

- Alternately tighten lugnuts (8) in sequence shown. After tightening lugnuts, use valve (16) on second jack (15) to lower jack completely.

## Changing Wheel/Tire Assembly - Continued

### NOTE

If second jack cannot be lowered enough for easy removal, use first jack as described in Steps (9) thru (11) to raise wheel end enough to remove second jack and tire ramp. Then, lower and remove first jack.

27. Remove second jack (15) and tire ramp (13) from under vehicle.
28. Remove cap from CTIS air line (6) on replacement tire assembly (19).

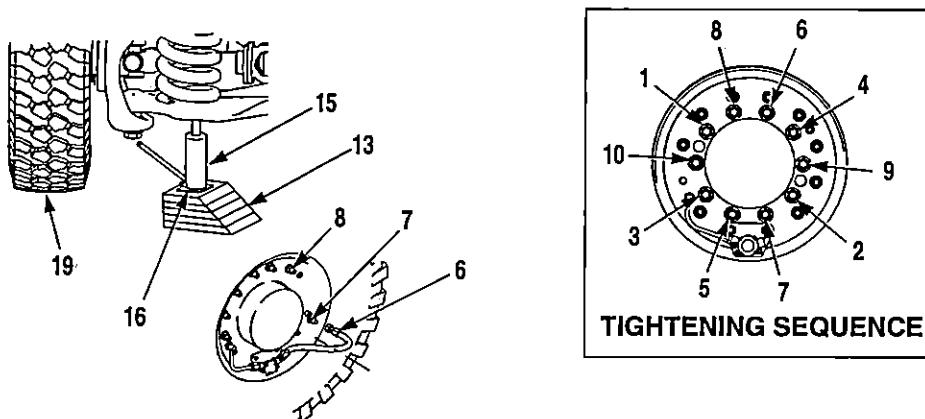


Figure 12.

29. Install CTIS air line (6) on CTIS fitting (7).
30. Start engine (WP 0029).
31. Operate CTIS (WP 0043).
32. Check hose for leaks.
33. Shut down engine (WP 0035).
34. Install wheel cover (5) on replacement tire assembly (19) with three nuts (4).

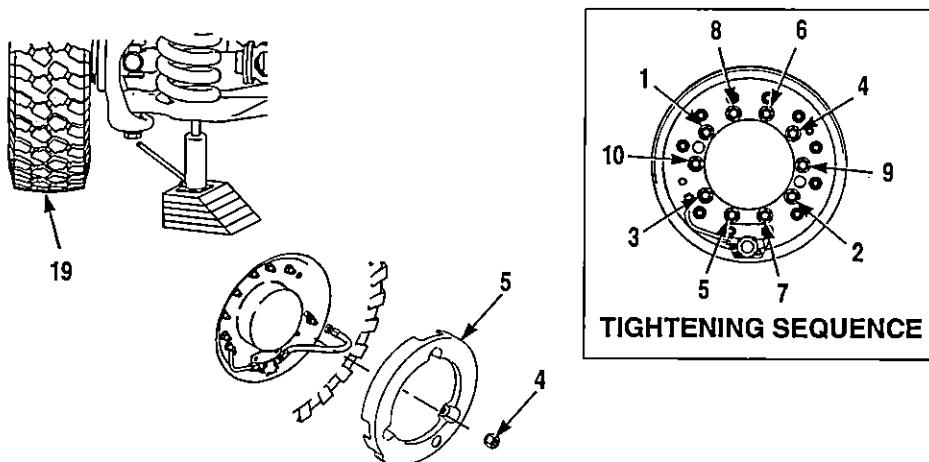


Figure 13.

**Changing Wheel/Tire Assembly - Continued**

35. Tighten three nuts (4).
36. As soon as possible, take vehicle to Second Echelon Maintenance and have wheel lugnuts tightened to 450 to 500 lb-ft (610 to 678 N•m) and wheel cover lugnuts tightened to 80 lb-ft (108 N•m).

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE**  
**TIRE INFLATE/DEFLATE**

---

**INITIAL SETUP:**

Not Applicable

---

**Tire Inflate**

1. Remove valve cap (1) from valve (2).

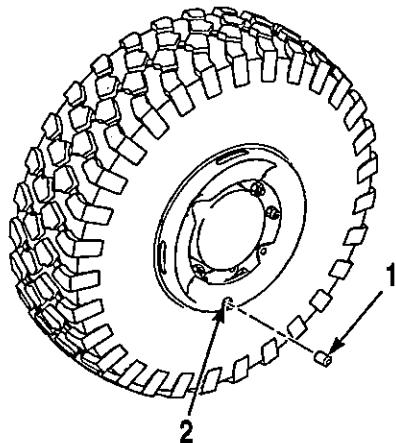


Figure 1.

**WARNING**

When connecting to a quick-disconnect coupling, hold the end of the air hose(s). Air hoses are under pressure and can fly out at a fast rate of speed causing injury to personnel.

2. Install air hose (3) on quick disconnect coupling (4) of vehicle.

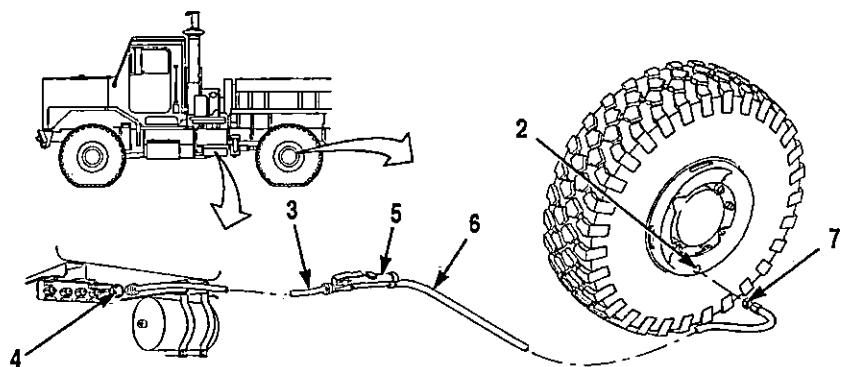
**Tire Inflate - Continued**

Figure 2.

3. Connect quick disconnect coupling of air hose (3) to inflator/gauge (5) of air hose assembly (6).

**NOTE**

- Tire pressure gauge in handle of hose assembly will only indicate tire pressure setting when lever of handle is released.
- Refer to Central Tire Inflation System, Tire Pressures Table (WP 0043, General) for correct tire pressure readings.
- Air chuck must clamp securely onto tire valve without air leaks or the air pressure reading may be inaccurate.

4. Install air chuck (7) of air hose assembly (6) on valve (2).

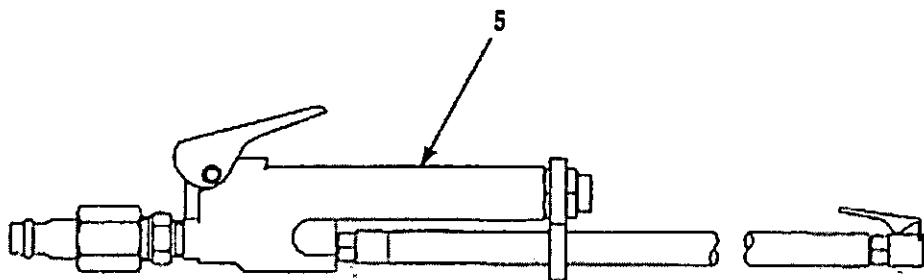


Figure 3.

5. Tire pressure setting is indicated on inflator/gauge (5).

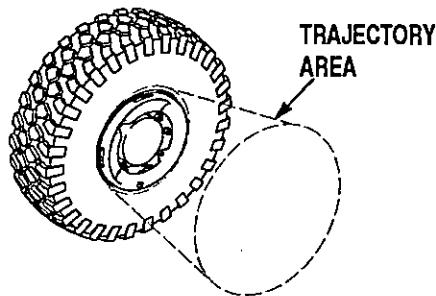
**Tire Inflate - Continued**

Figure 4.

**WARNING**

Trajectory area as shown applies to all wheel tire assemblies. Before inflating or deflating, stand out of the trajectory area or personal injury or death may occur.

**NOTE**

If tire pressure needs to be increased, vehicle must be started and air pressure of vehicle must be above 100 psi (690 kPa).

6. To increase tire pressure, press lever (8) on inflator/gauge (5) until desired tire pressure is indicated on inflator/gauge.

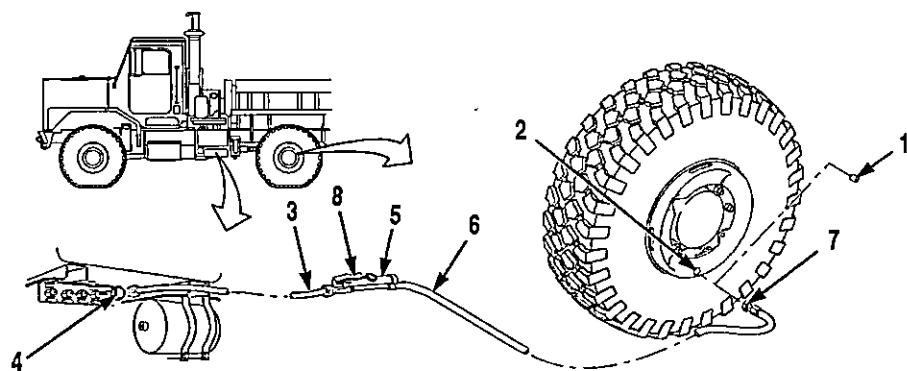


Figure 5.

7. Once desired pressure is achieved, release lever (8) on inflator/gauge (5) and disconnect air chuck (7) from valve (2).

**Tire Inflate - Continued**

8. Remove air hose (3) from quick disconnect coupling (4) of vehicle.
9. Disconnect quick disconnect coupling of air hose (3) from inflator/gauge (5).
10. Install valve cap (1) on valve (2).

**END OF TASK****Tire Deflate**

1. Remove valve cap (1) from valve (2).

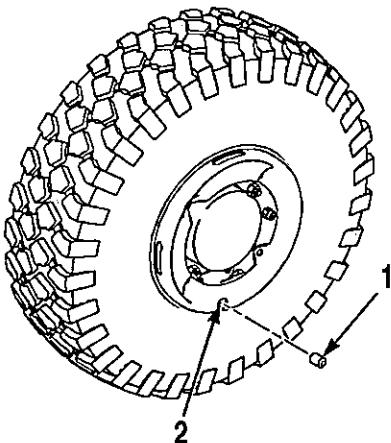


Figure 6.

2. Install air chuck (3) of air hose assembly (4) on valve (2).

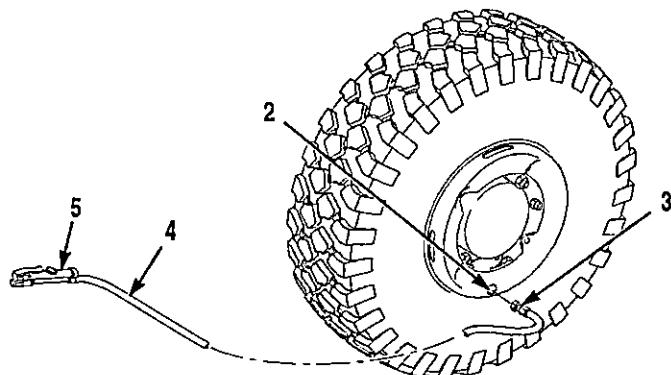


Figure 7.

**Tire Deflate - Continued****NOTE**

- Tire pressure gauge in handle of hose assembly will only indicate tire pressure setting when lever of handle is released.
- Refer to Tire Pressures Table (WP 0043, General) for correct tire pressure settings.
- Air chuck must clamp securely onto tire valve without air leaks or the air pressure reading will be inaccurate.

3. Tire pressure setting is indicated on inflator/gauge (5).

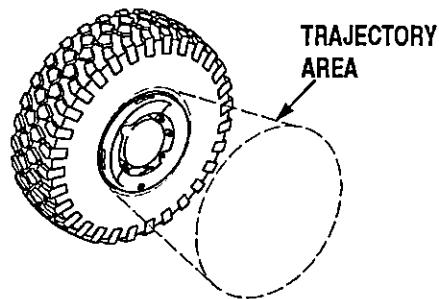


Figure 8.

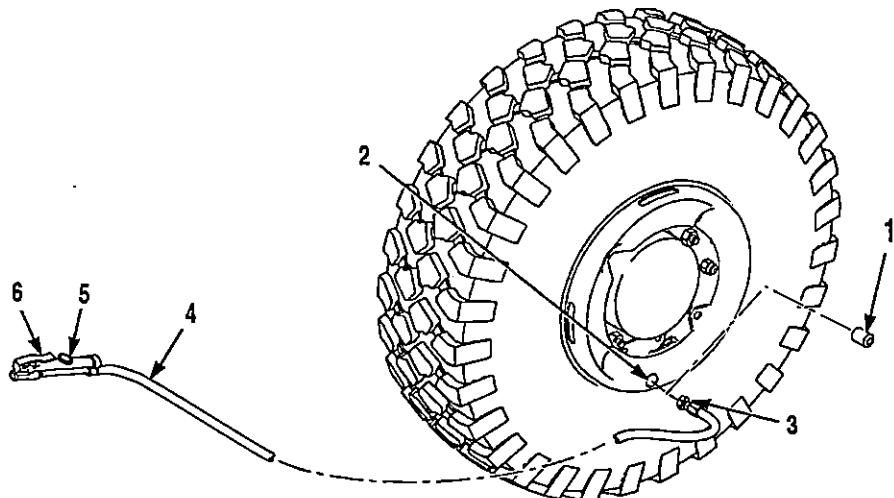


Figure 9.

**Tire Deflate - Continued****WARNING**

Trajectory area as shown applies to all wheel tire assemblies. Before inflating or deflating, stand out of the trajectory area or personal injury or death may occur.

4. To decrease tire pressure, press lever (6) on inflator/gauge (5) until desired tire pressure is indicated on inflator/gauge (5).
5. Once desired tire pressure is achieved, release lever (6) on inflator/gauge (5) and disconnect air chuck (3) from valve (2).
6. Install valve cap (1) on valve (2).

**END OF TASK****END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE PRIMING FUEL SYSTEM

### INITIAL SETUP:

Not Applicable

### Priming Fuel System

#### **WARNING**



Fuel is flammable and can explode. Keep fuel away from open flame 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. Smoking is prohibited while working with fuel.

#### **WARNING**

Ensure battery disconnect switch is in OFF position. Failure to comply may result in injury or death to personnel.

#### **CAUTION**

Do not loosen fuel lines at filter housing to bleed fuel system. Periodic loosening of fittings will result in increased wear of threads. Failure to comply may result in damage to equipment.

#### **NOTE**

- It may be necessary to prime fuel system if vehicle has run out of fuel.
- If fuel filter has been replaced, it may require more than 75 pumps to prime fuel system.

1. Raise hood (WP 0039).
2. Loosen air bleed plug (1) two full turns.

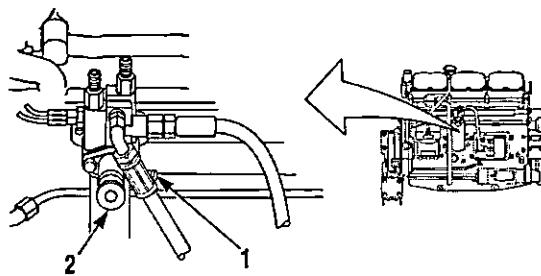
**Priming Fuel System - Continued**

Figure 1.

3. Turn knob (2) counterclockwise until knob (2) can be pulled out.

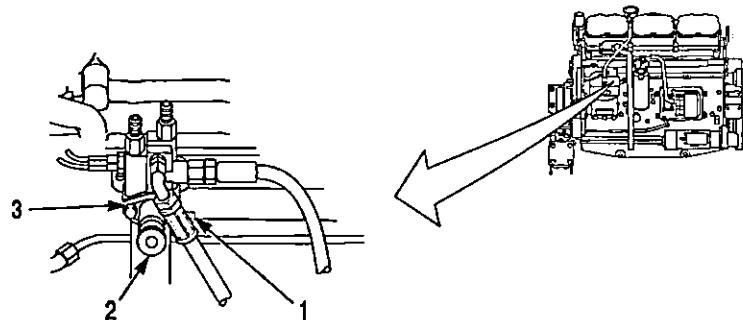


Figure 2.

4. Push and pull knob (2) on priming pump (3) until fuel appears at air bleed plug (1).
5. Tighten air bleed plug (1).
6. Push and pull knob (2) until strong resistance is felt.
7. Push knob (2) in and turn clockwise until locked.

**CAUTION**

If engine fails to start within 30 seconds, turn ignition switch to OFF and allow starter motor to cool at least two minutes before trying again. Failure to comply could result in damage to starter.

8. Attempt to start engine (WP 0029). If engine fails to start, repeat Steps (1) thru (6) as required.
9. If vehicle does not start after three attempts, contact Second Echelon Maintenance.

**END OF TASK****END OF WORK PACKAGE**

---

**1ST ECHELON MAINTENANCE  
BATTERY MAINTENANCE**

---

**INITIAL SETUP:**

Not Applicable

---

**Battery Maintenance****WARNING**

Do not wear watches, rings, or other jewelry when servicing batteries which could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes.

**WARNING**

Do not smoke, have open flame, or make sparks near batteries. Batteries can explode causing severe injury or death to personnel.

**WARNING**

Battery acid is harmful to skin and eyes. Wear protective equipment to prevent personal injury or death.

**WARNING**

Avoid electrolyte contact with skin and eyes. Failure to comply may result in injury or death to personnel.

**Battery Maintenance - Continued****WARNING**

Wear safety goggles, acid proof gloves, and a rubber apron when performing battery maintenance. Failure to comply may result in injury or death to personnel.

**CAUTION**

- When removing and installing battery terminals and cables from batteries, ensure they are removed and installed in proper sequence as described below. Failure to comply may result in damage to equipment.
- Ensure battery disconnect switch is turned OFF prior to performing battery maintenance. Failure to comply may result in damage to equipment.

**NOTE**

- The battery posts or battery cases may be marked with a (+) positive and/or a (-) negative to help identify battery polarity.
- In the arctic configuration, there may be four batteries installed on vehicle.
- When removing battery post terminals and cables, note connections prior to their removal to ensure proper installation.

1. Remove battery box cover (1) from battery box (2).
2. Remove main negative battery post terminal (3) and then remaining negative battery post terminals (4) from battery posts (5).

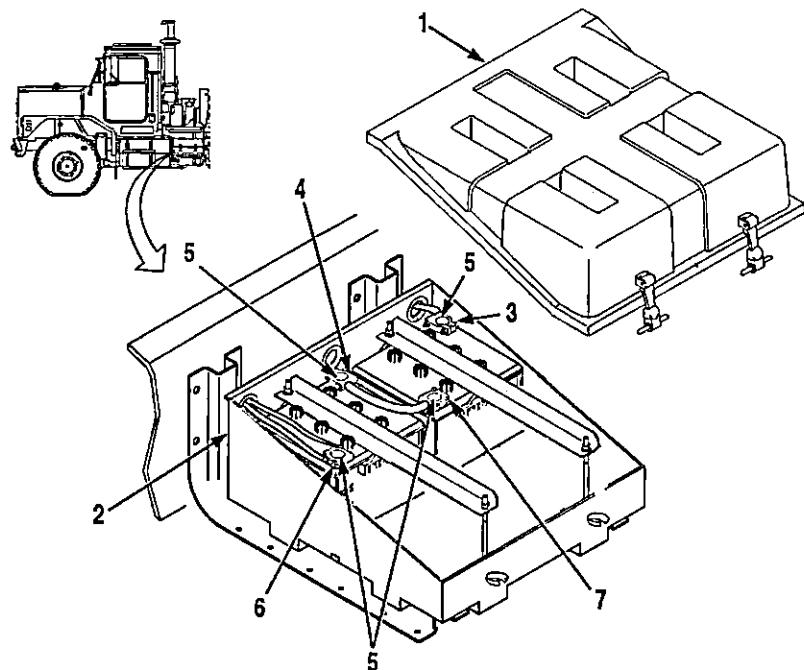
**Battery Maintenance - Continued**

Figure 1.

3. Remove main positive battery post terminal (6) and then remaining positive battery post terminals (7) from battery posts (5).
4. Clean battery posts and terminals as required in accordance with Unit SOP or TM 9-6140-200-14.

**WARNING**

Ensure battery cables and terminals are installed in same position as noted during removal. Failure to comply may result in injury or death to personnel.

5. Install main positive battery post terminal (6) and then remaining positive battery post terminals (7) on battery posts (5).

## Battery Maintenance - Continued

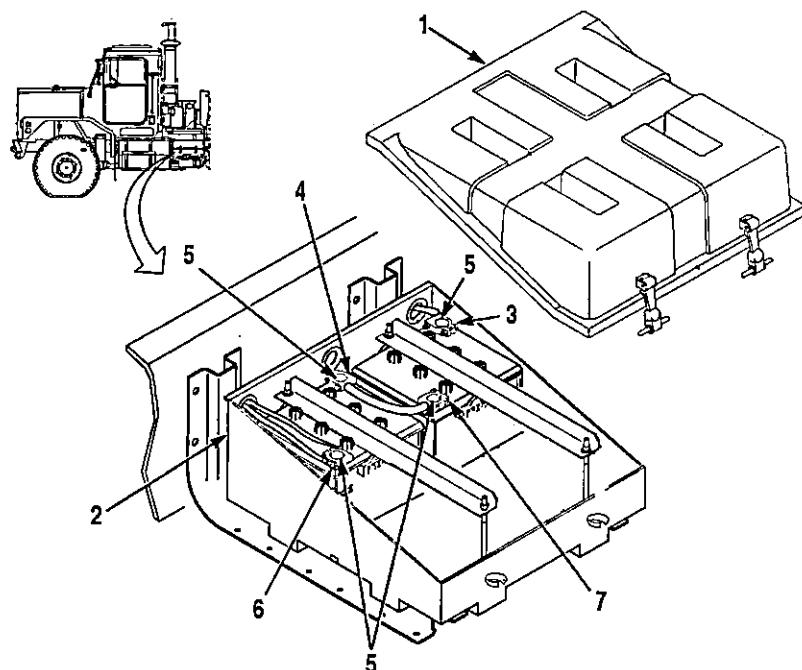


Figure 2.

6. Install main negative battery post terminal (3) and then remaining negative battery post terminals (4) on battery posts (5).
7. Ensure all battery post terminals are securely tightened.

### WARNING



Anti-corrosion compound is toxic. Use only in well-ventilated area. Use NIOSH/MSHA-approved respirator with dual organic vapor/mist and particulate cartridge. Do not get in eyes; wear chemical safety goggles and full face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If eyes are contacted, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in injury or death to personnel.

### CAUTION

The 7-Ton Truck has been designed with a 22-year corrosion control plan. All guidelines set forth in Corrosion Control Work Package for applying corrosion preventive compounds must be adhered to. Failure to follow guidelines will negatively impact the corrosion control integrity of the vehicle.

8. Apply connector lubricant (WP 0115, Table 1, Item 12) to battery posts and battery post terminals.

**Battery Maintenance - Continued****WARNING**

Ensure battery box cover is secured with both locking tabs at rear of cover before latching front of cover. Failure to comply may result in injury to personnel while stepping on battery box cover.

9. Install battery box cover (1) on battery box (2).

**END OF TASK****END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE RESETTING CIRCUIT BREAKERS

### INITIAL SETUP:

Not Applicable

### RESETTING CIRCUIT BREAKERS

#### CAUTION

If a circuit breaker trips again after being reset, report problem to Second Echelon Maintenance. Failure to comply may result in damage to equipment.

1. Turn six screws (1) 1/4 turn counterclockwise and remove cover (2) from dash (3).

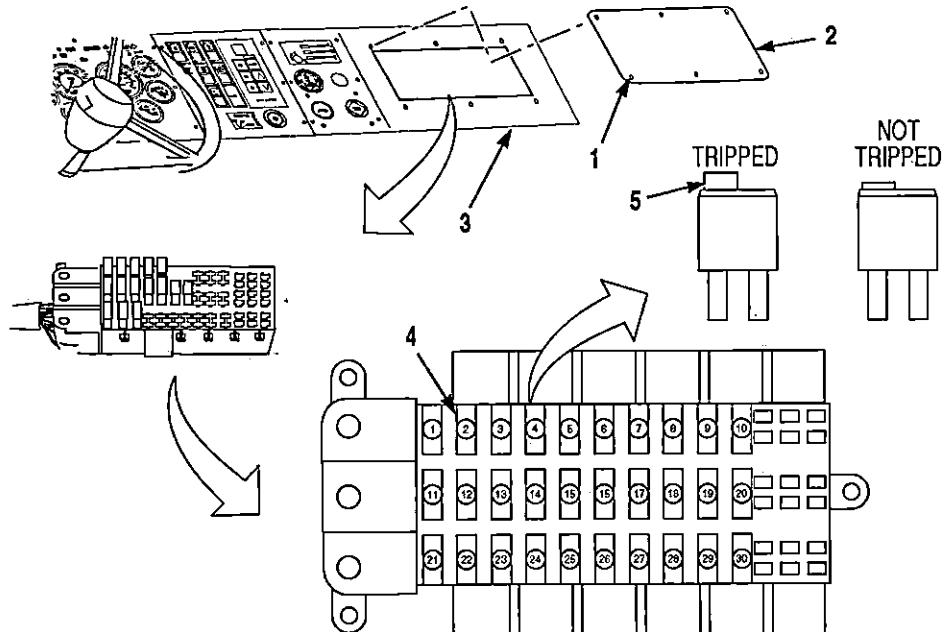


Figure 1.

2. Check for tripped circuit breakers (4).
3. Push down tab (5) on circuit breaker to reset.
4. Install cover (2) on dash (3) and turn four screws (1) 1/4 turn clockwise.

**END OF TASK**

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE UNDERRIDE BAR ADJUSTMENT

### INITIAL SETUP:

Not Applicable

### Underride Bar Adjustment

#### **WARNING**

When operating on road, the underride bar must be adjusted to the lower position. Failure to comply may result in injury or death to other vehicle operators that may rear end the 7-Ton Truck.

1. Remove four nuts (1), screws (2), and underride bar (3) from two brackets (4).

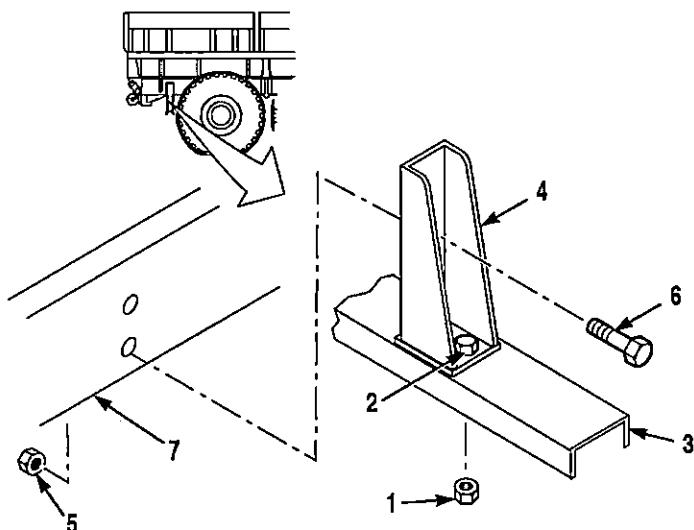


Figure 1.

2. Remove two nuts (5), screws (6), and bracket (4) from frame (7).
3. Position bracket (4) at desired height and secure with two screws (6) and nuts (5).
4. Repeat Steps (2) and (3) for remaining bracket on opposite side of vehicle.
5. Install underride bar (3) on two brackets (4) with four screws (2) and nuts (1).
6. As soon as possible, take vehicle to Second Echelon Maintenance to tighten eight nuts (1) and (5) to 175 lb-ft (237 N·m).

**END OF TASK**

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE RAISING AND LOWERING REAR MUDFLAPS

### INITIAL SETUP:

Not Applicable

### Raise Rear Mudflaps

Raise bottom of mudflap (1) and secure on retaining hook (2).

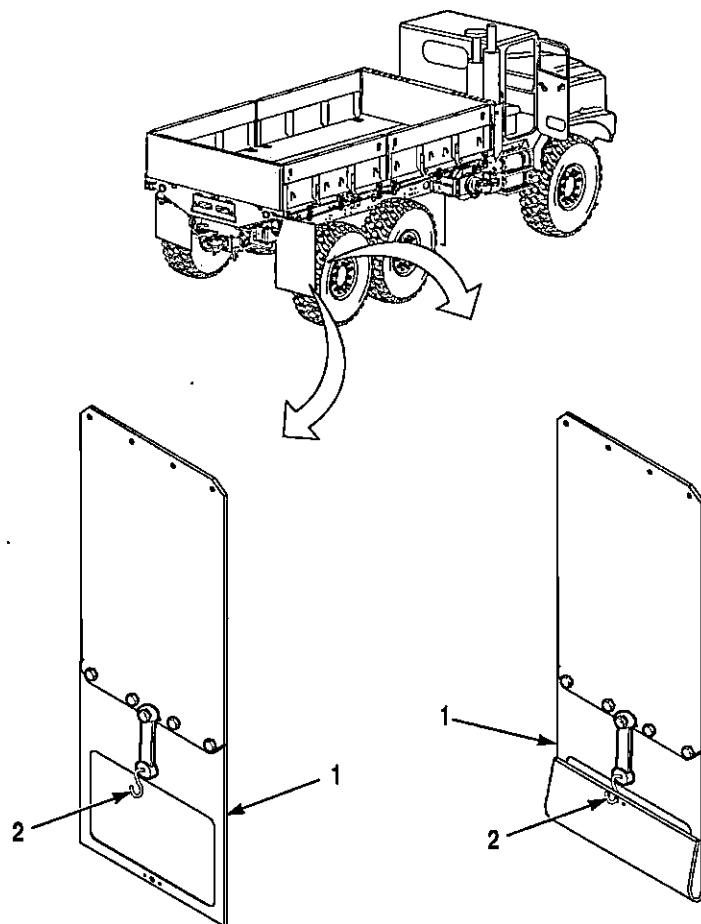


Figure 1.

END OF TASK

**Lower Rear Mudflaps**

Remove and lower mudflap (1) from retaining hook (2).

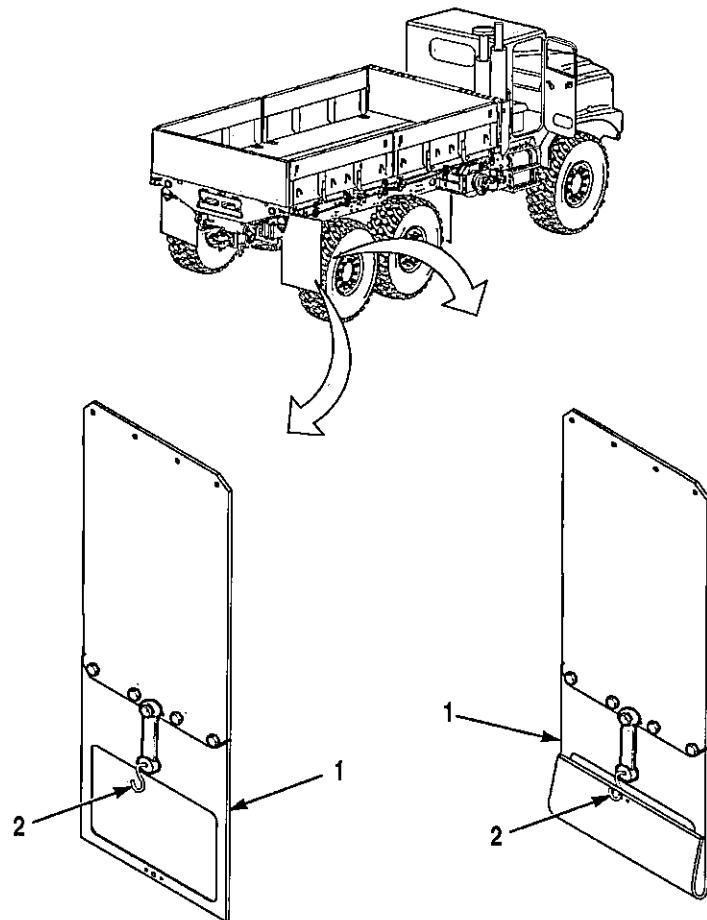


Figure 2.

**END OF TASK**

**END OF WORK PACKAGE**

**1ST ECHELON MAINTENANCE  
TRANSMISSION AND ENGINE DIPSTICK AND FILL CAPS**

**INITIAL SETUP:**

Not Applicable

**Transmission and Engine Fill Cap Removal**

1. Turn T-handle (1) counterclockwise until fill cap (2) is loose in tube (3).

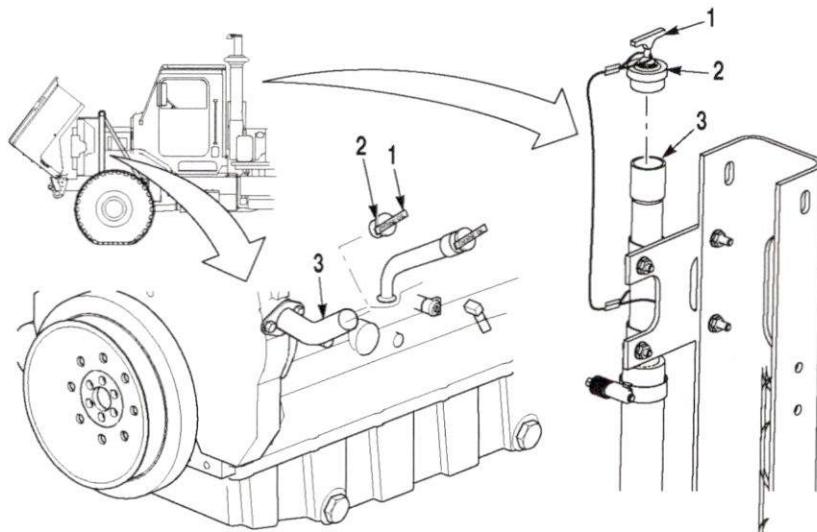


Figure 1.

2. Remove fill cap (2) from tube (3).

**END OF TASK**

**Transmission and Engine Fill Cap Installation**

**CAUTION**

When installing fill caps, ensure fill cap is inserted all the way into tube prior to tightening. Failure to comply may result in damage to equipment.

1. Install fill cap (2) in tube (3).

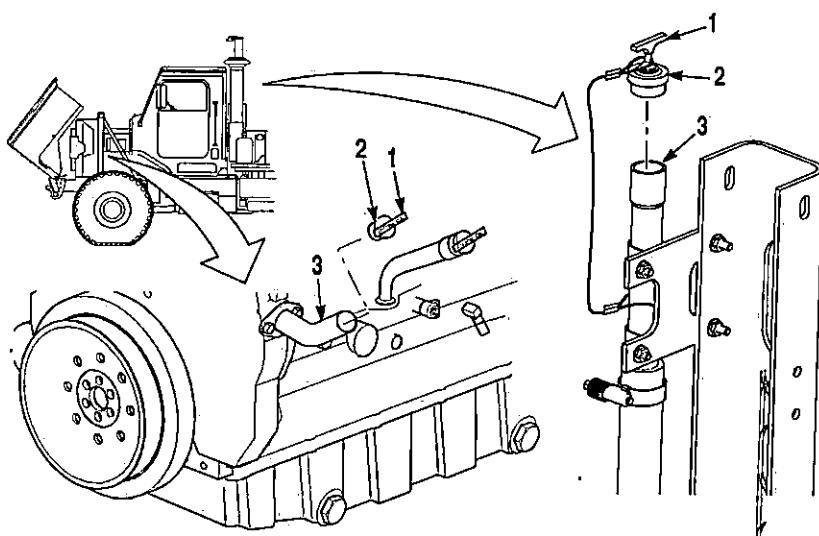
**Transmission and Engine Fill Cap Installation - Continued**

Figure 2.

2. Turn T-handle (1) clockwise until snug.

**END OF TASK****Engine Oil Dipstick Removal**

1. Turn T-handle (4) counterclockwise until dipstick (5) is loose in tube (6).

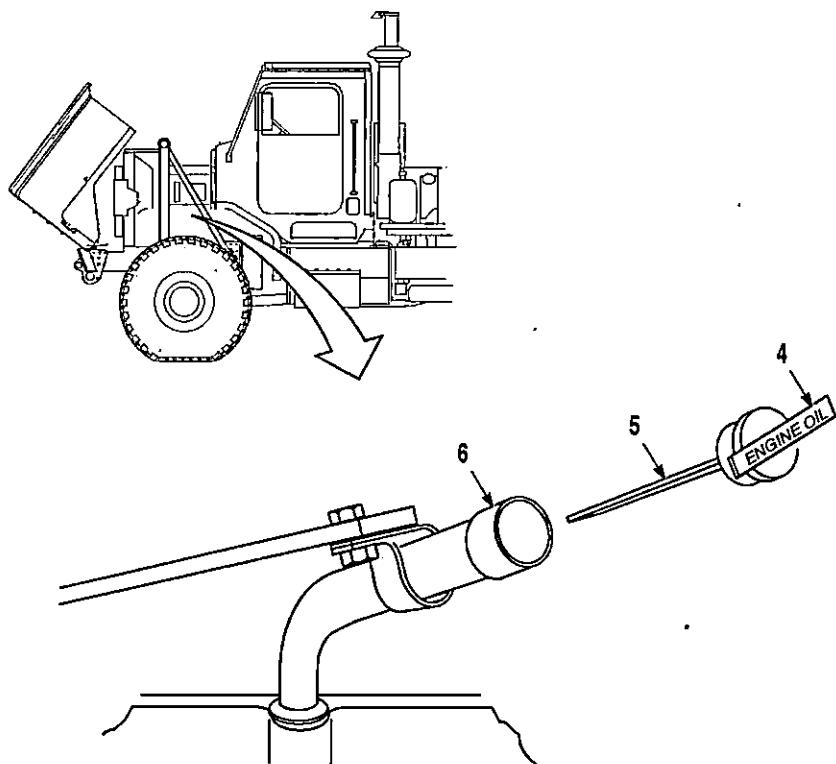
**Engine Oil Dipstick Removal - Continued**

Figure 3.

2. Remove dipstick (5) from tube (6).

**END OF TASK**

**Engine Oil Dipstick Installation****CAUTION**

When installing dipstick, ensure fill cap is inserted all the way into tube prior to tightening. Failure to comply may result in damage to equipment.

1. Install dipstick (5) in tube (6).

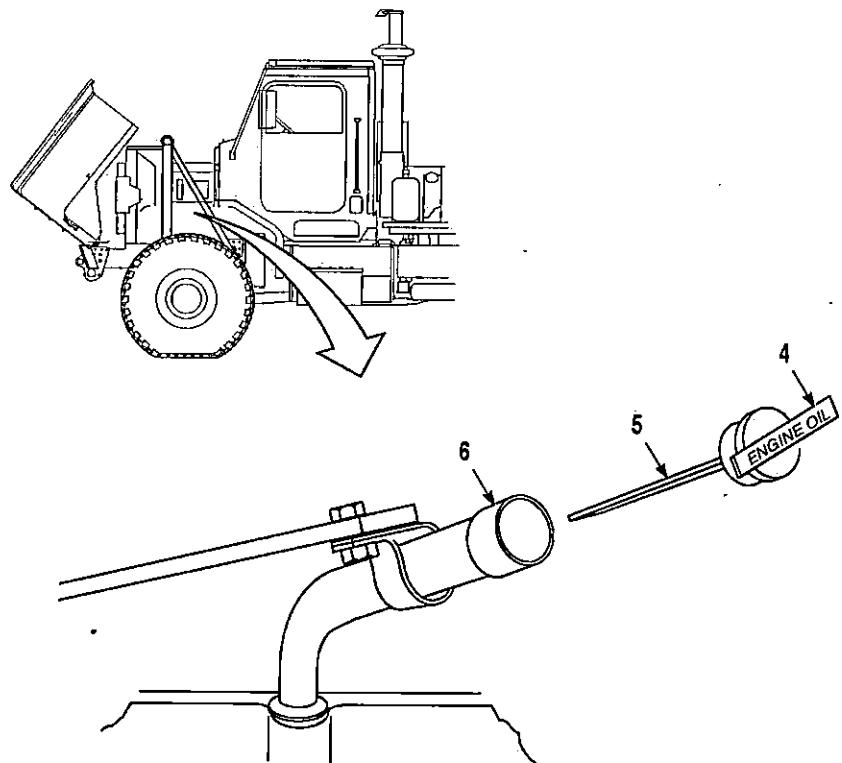
**Engine Oil Dipstick Installation - Continued**

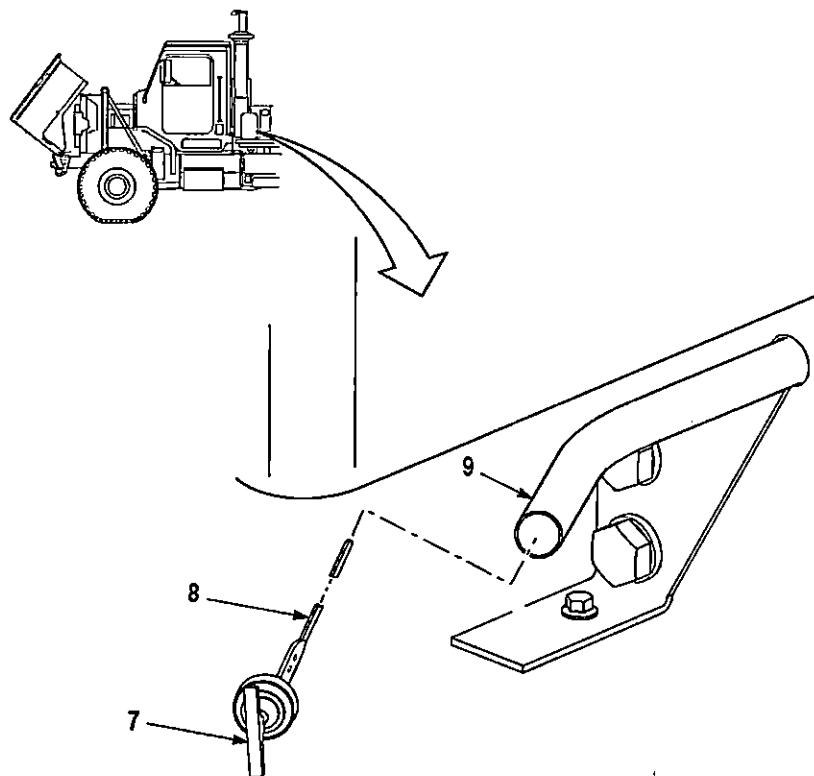
Figure 4.

2. Turn T-handle (4) clockwise until snug.

**END OF TASK****Transmission Dipstick Removal****CAUTION**

Improper removal or installation of dipsticks may damage the dipstick or fill cap and allow contaminants to enter the engine or transmission. Failure to comply may result in damage to equipment.

1. Turn T-handle (7) counterclockwise until dipstick (8) is loose in tube (9).

**Transmission Dipstick Removal - Continued****Figure 5.**

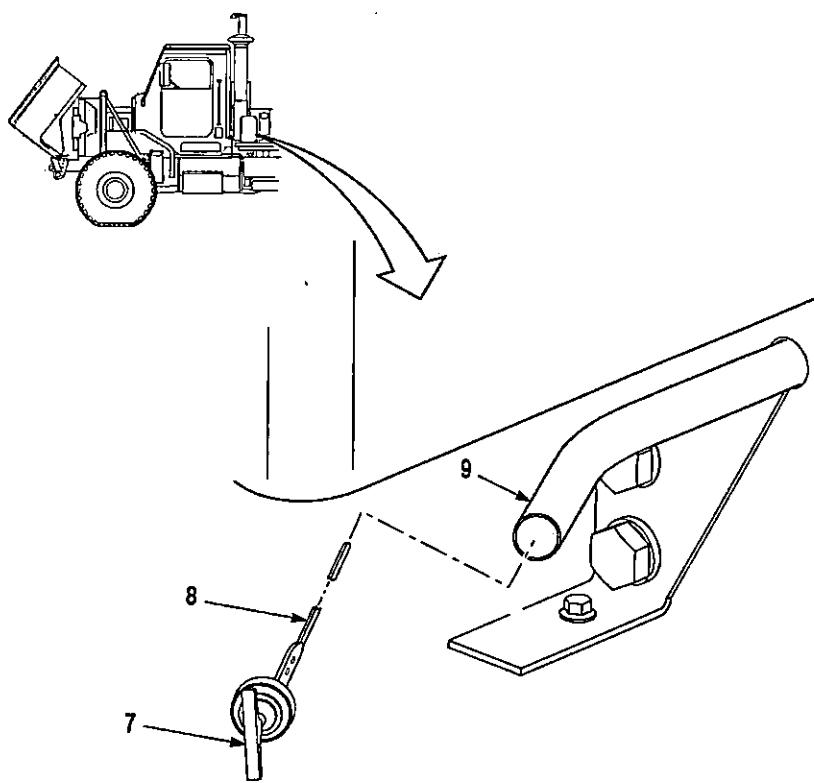
2. Remove dipstick (8) from tube (9).

**END OF TASK**

**Transmission Dipstick Installation****CAUTION**

When installing dipstick, ensure fill cap is inserted all the way into tube prior to tightening.  
Failure to comply may result in damage to equipment.

1. Install dipstick (8) in tube (9).

**Transmission Dipstick Installation - Continued****Figure 6.**

2. Turn T-handle (7) clockwise until snug.

**END OF TASK****END OF WORK PACKAGE**

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**1ST ECHELON MAINTENANCE  
MAINTENANCE OF WINCH ASSEMBLY**

---

**INITIAL SETUP:**

Not Applicable

---

**Maintenance of Winch Assembly**

1. Refer to Lubrication Instruction (WP 0111) for all lubrication instructions for the self recovery winch. Refer to PMCS (WP 0092). Refer to Self Recovery Winch (WP 0044) for all other operations and maintenance for the self recovery winch.
2. Refer to Lubrication Instruction (WP 0111) for all lubrication instructions for the self recovery winch. Refer to PMCS (WP 0093). Refer to Self Recovery Winch (WP 0044) for all other operations and maintenance for the self recovery winch.

**END OF TASK**

**END OF WORK PACKAGE**

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**1ST ECHELON MAINTENANCE  
MAINTENANCE OF MACHINE GUN MOUNT**

---

**INITIAL SETUP:**

Not Applicable

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**Maintenance of Machine Gun Mount**

1. Refer to PMCS (WP 0092) for the machine gun mount.
2. Refer to PMCS (WP 0093) for the machine gun mount.

**END OF TASK**

**END OF WORK PACKAGE**

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**1ST ECHELON MAINTENANCE  
MAINTENANCE OF CARGO BODY**

---

**INITIAL SETUP:**

Not Applicable

---

**Maintenance of Cargo Body**

1. Refer to Lubrication Instruction (WP 0111) for all lubrication instructions for the cargo body. Refer to PMCS (WP 0092).
2. Refer to Lubrication Instruction (WP 0111) for all lubrication instructions for the cargo body. Refer to PMCS (WP 0093).

**END OF TASK**

**END OF WORK PACKAGE**

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## 1ST ECHELON MAINTENANCE LUBRICATION INSTRUCTION

---

**INITIAL SETUP:**

Not Applicable

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**Lubrication Instruction.**

Intervals are based on normal operation. Intervals may be more frequent if lubricants are contaminated or if vehicle is being operated in adverse operating conditions. Intervals may also be more frequent if vehicle is operating under longer-than-usual operating hours. The interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken.

Items with a daily interval must be lubricated on a daily basis but only prior to the first mission of the day.

**1. Intervals.**

- a. Intervals shown in this lubrication instruction are based on mileage and/or calendar times. An example of a mileage and calendar lubrication is 36/A, in which 36 stands for 3,600 miles and A stands for annually. The lubrication is to be performed at whichever interval occurs first for the vehicle.
- b. Dashed lines indicate lubrication on both sides of the vehicle or equipment.

**2. Cleaning.**

Clean fittings before lubricating. Clean parts and reusable filters with dry cleaning solvent (SD) type II or equivalent. Dry before lubricating.

**3. Lubricants.**

Lubricant types and operating temperature ranges are given within the key on Table 1. When changing or applying lubricants, be sure to follow the recommended temperature ranges for those lubricants.

**4. After Fording.**

Lubricate all fittings below fording depth and check submerged gearboxes, engine, and transmission for the presence of water. Remove crankcase breather hose and inspect crankcase breather tube for sand or dirt. Perform flywheel housing lubrication.

**5. After High-Pressure Washing.**

Lubricate all grease fittings and oil can points outside and underneath vehicle.

**6. View.**

A reference to the appropriate localized view is given after the lubrication entry in most cases. Localized views begin with diagram A.

**7. Level of Maintenance.**

The lowest level of maintenance authorized to lubricate a point is indicated by one of the following: Operator/Crew (O); and Organizations Maintenance (I).

**8. Coolant.**

Protection to the lowest temperature expected should be the goal of any program. A 50/50 mix which protects to -34° F (-37° C).

**9. Contents.**

This Work Package includes lubrication instructions and filter (lube and non-lube) maintenance information.

*Table 1. Key.*

LUBRICANTS		CAPACITIES	Above 32°F (Above 0°C)	32°F to 0°F (0° to -18°C)	0°F to -50°F (-18° to -46°C)
Lubricating Oil, Engine OE/HDO (MIL-L-2104) or OEA (MIL-L-46167)	Engine	37 Qt. (35 L) W/Filter	OE/HDO15W40	OE/HDO15W40	OEA
Lubricating Oil, Engine	Transmission (Dry)	45 Qt. (42.6 L) W/Filter	OE/HDO15W40	OE/HDO10	OEA
Lubricating Oil, Engine	Transmission Drain and Refill	38 Qt. (36 L) W/Filter	OE/HDO15W40	OE/HDO10	OEA
Lubricating Oil, Engine	Transfer Case	6 Qt. (5.5 L)	OE/HDO40	OE/HDO40	OEA
Lubricating Oil, Engine	Hydraulic Reservoir	15 Gal. (57 L) W/Filter	OE/HDO 15W40	OE/HDO10	OEA
Lubricating Oil, Engine	Power Steering Reservoir	9 Qt. (8.5 L)	OE/HDO15W40	OE/HDO10	OEA
Lubricating Oil, Carwell Lube	Oil Can Points	A/R	Carwell Lube	Carwell Lube	OEA
Anti-Freeze Coolant AFC	Radiator Surge Tank	40.5 Qt. (38.3 L) 7.1 Qt. (6.7 L)	AFC  Ethylene Glycol (MIL-A-46153) 50/50 Ratio Mixture		AFC Ethylene Glycol Arctic (MIL-A-11755) (Note 19)
Lubricating Oil, Chain, Wire, Rope	Exposed Wire Rope	A/R	Carwell Lube	Carwell Lube	
Intervals					
B/M - Before/Monthly, A-Annually, B - Biennially (2 years), 36 - 3,600 miles, 72 - 7,200 miles					

Table 2. Key.

LUBRICANTS		CAPACITIES	Above 10° F (Above -12° C)	30°F to -15°F (-1° to -26°C)	-15°F to -50°F (-26° to -46°C)
Gear Oil GO (MIL-L-2105)					
Gear Oil	Axes No. 1 and 3 Differential	10.5 Qt. (9.9 L)	GO 80W90	GO 80W90	GO 75W
Gear Oil	Axle No. 2 Differential	12.5 Qt. (11.8 L)	GO 80W90	GO 80W90	GO 75W
Gear Oil	Wheel Ends	1.6 Qt. (1.5 L)	GO 80W90	GO 80W90	GO 75W
Gear Oil	Winch Drum	2 Qt. (2 L)	GO 85W140	GO 85W140	GO 75W
Grease, Automotive and Artillery (MIL-G-10924F) GAA	Propeller Shafts and U-Joints		GAA MIL-G-10924F		
Grease, Automotive and Artillery	Brake Camshaft and Slack Adjusters		GAA MIL-G-10924F		
Grease, Automotive and Artillery	Pintle Hook		GAA MIL-G-10924F		
Grease, Automotive and Artillery	Winch Cable Guide		GAA MIL-G-10924F		
Grease, Automotive and Artillery	Steering Shaft and Universal Joints		GAA MIL-G-10924F		
Grease, Automotive and Artillery	#2 Output Flange		GAA MIL-G-10924F		
Grease, Automotive and Artillery	Hood Trunion		GAA MIL-G-10924F		
Grease, Automotive and Artillery	ISO Locks		GAA MIL-G-10924F		

Table 2. Key - Continued.

LUBRICANTS		CAPACITIES	Above 10° F (Above -12° C)	30°F to -15°F (-1° to -26°C)	-15°F to -50°F (-26° to -46°C)
Grease, Automotive and Artillery	Control Arms		GAA MIL-G-10924F		
Grease, Automotive and Artillery	Steering Mitre		GAA MIL-G-10924F		
Grease, Automotive and Artillery	Spring Seat		GAA MIL-G-10924F		
Grease, Automotive and Artillery	Machine Gun Mount (if equipped)		GAA MIL-G-10924F		
Grease, Molybdenum Disulfide NSN 9150-01-302-73 77	ISO Locks		Grease, Molybdenum Disulfide		
Inhibitor, Corrosion	Flywheel housing	3 oz (88.70 ml) VCI 325	Nalcool 2000 NSN 6850-01-515-2449		
Intervals B/M - Before/Monthly, A-Annually, B - Biennially (2 years), 36 - 3,600 miles, 72 - 7,200 miles					

Table 3. Key.

Vehicle	Oil Can Points	Before/Monthly	Annual	Biennially
MK23 MTVR Cargo Without Self- Recovery Winch	0.2	0.6	1.5	3.2
MK25 MTVR Cargo With Self-Recovery Winch	0.7	0.7	1.5	5.4
MK27 MTVR XLWB Without Self- Recovery Winch	0.2	0.2	1.5	3.2

Table 3. Key - *Continued.*

Vehicle	Oil Can Points	Before/Monthly	Annual	Biennially
MK28 MTVR XLWB Cargo With Self- Recovery Winch	0.7	0.7	1.5	5.4

Note: The times listed above are shown in 0.1 hour (six minute) increments, and have been established on an individual vehicle basis and therefore are not applicable at maintenance facilities where production line methods are used.

**Engine Crankcase**

Check at Dipstick and Fill as Necessary  
 Lubricant: OE/HDO  
 Interval: B/M (O)  
 View: A and C  
 Note: 2

**Drain and Refill**

Lubricant: OE/HDO  
 Interval: 36/A (I)  
 View: A, B, and C  
 Note: 2

**Crankcase Breather**

Check and Clean  
 Interval: 72/A (I)  
 View: G  
 Note: 7

**Fuel Filter**

Replace  
 Interval: 72/B (I)  
 View: F

**Steering Mitre**

Lubricate  
 Lubricant: GAA  
 Interval: 36/B (O)  
 View: AL

**Flywheel Housing**

Drain and Refill  
 Lubricant: VCI 325  
 Interval: 36 A (I)  
 View: A28 and A29

**Transmission**

Check at Dipstick and Fill as Necessary  
 Lubricant: OE/HDO  
 Interval: B/M (O)  
 View: D and Z  
 Note: 5 and 25

**Drain and Refill**

Lubricant: OE/HDO  
 Interval: 36/72/B (I)  
 View: E, Z, and D  
 Note: 3

**Fuel/Water Separator**

Check and Drain as Necessary  
 Interval: B/M (O)  
 View: H  
 Note: 9

**Change Filter Element**

Interval: 72/B (I)  
 View: H

**Transmission Filters**

Replace  
 Interval: 36/72/B (I)  
 View: I  
 Note: 3 and 6

**Radiator/Surge Tank**

Check at Over Flow Bottle and  
 Fill as Necessary  
 Lubricant: AFC  
 Interval: B/M (O)  
 View: J and K

**Drain and Refill**

Lubricant: AFC  
 Interval: 72/B (I)  
 View: J, K, and AD  
 Note: 8 and 19

**Engine Oil Filter**

Replace  
 Interval: 36/A (I)  
 View: L  
 Note: 4

**Transmission Oil Sampling Valve**

Sample  
 Interval: 36/A (I)  
 View: M  
 Note: 3

**Engine Oil Sampling Valve**

Sample  
 Interval: 36/A (I)  
 View: M  
 Note: 2

**Propeller Shaft Universal Joints**

Lubricate  
 Lubricant: GAA  
 Interval: B/M (O)  
 View: N  
 Note: 11, 12, and 13

**Transfer Case**

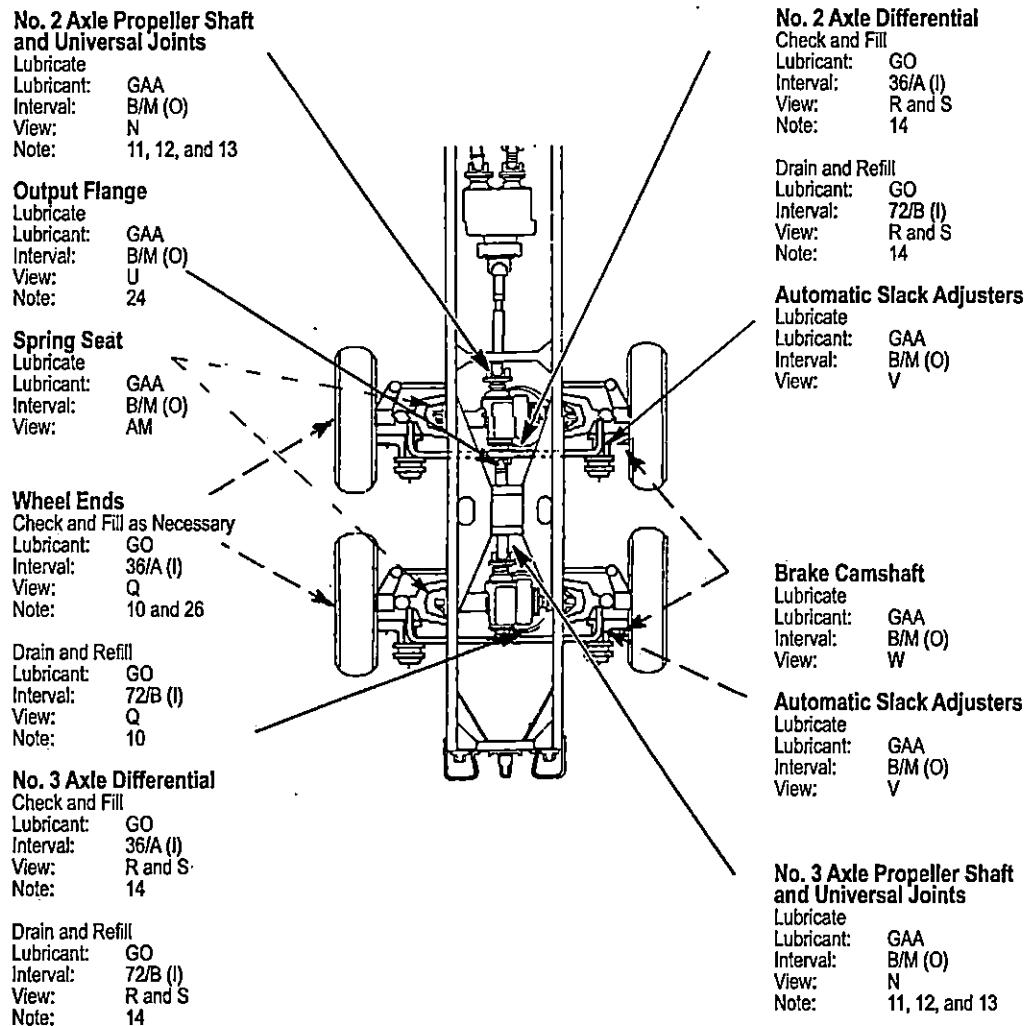
Check and Fill as Necessary  
 Lubricant: OE/HDO  
 Interval: 36/A (I)  
 View: O and P

**Drain and Refill**

Lubricant: OE/HDO  
 Interval: 72/B (I)  
 View: O and P

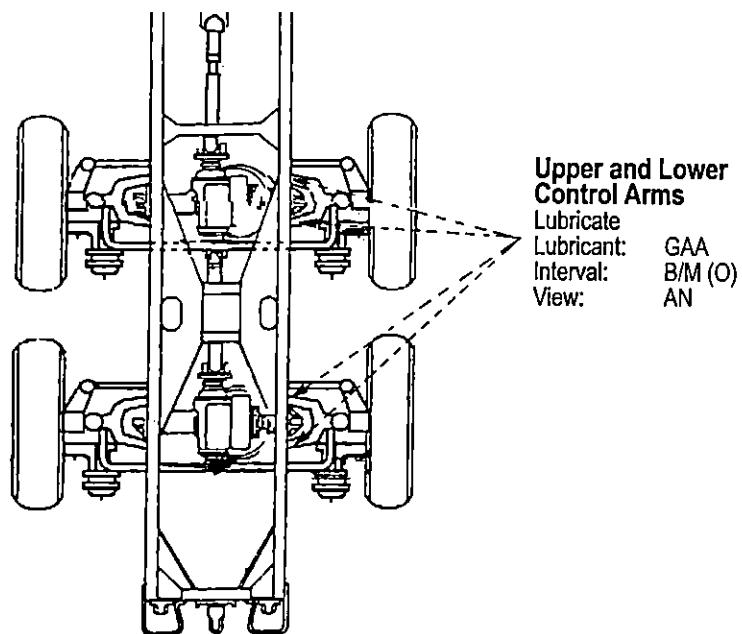
**Engine, Transmission, Transfer Case, Fuel System, and Coolant System**

Figure 1.



No. 2 and 3 Axle

Figure 2.



No. 2 and 3 Axle

Figure 3.

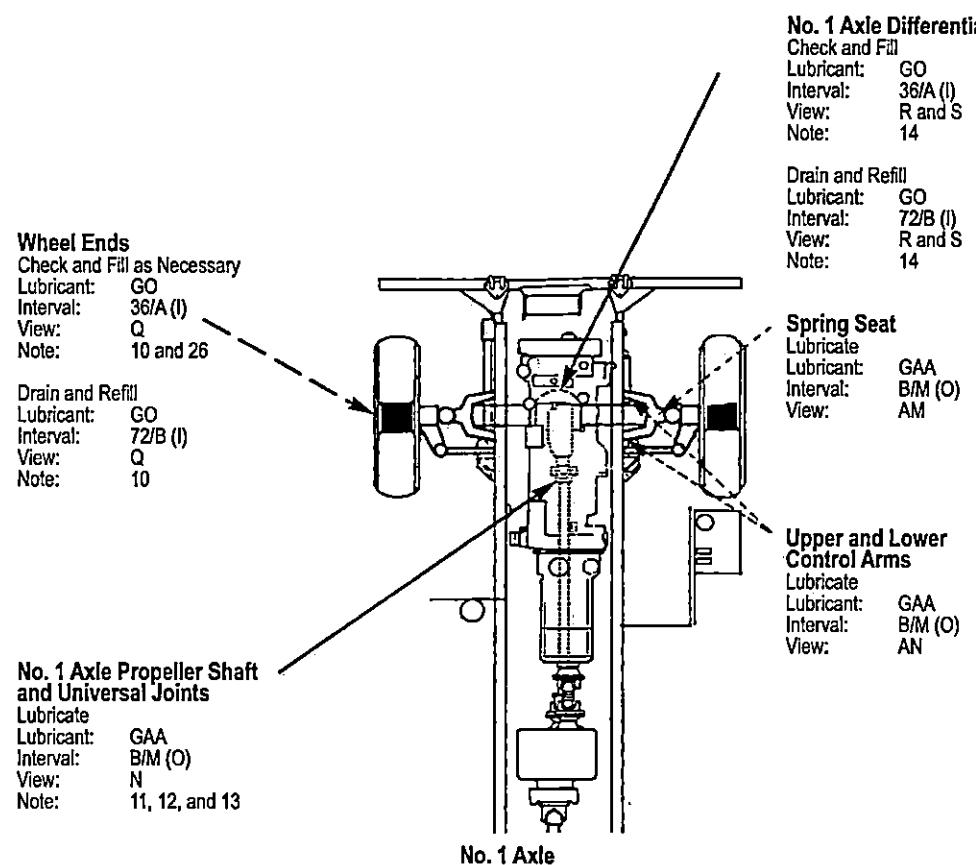
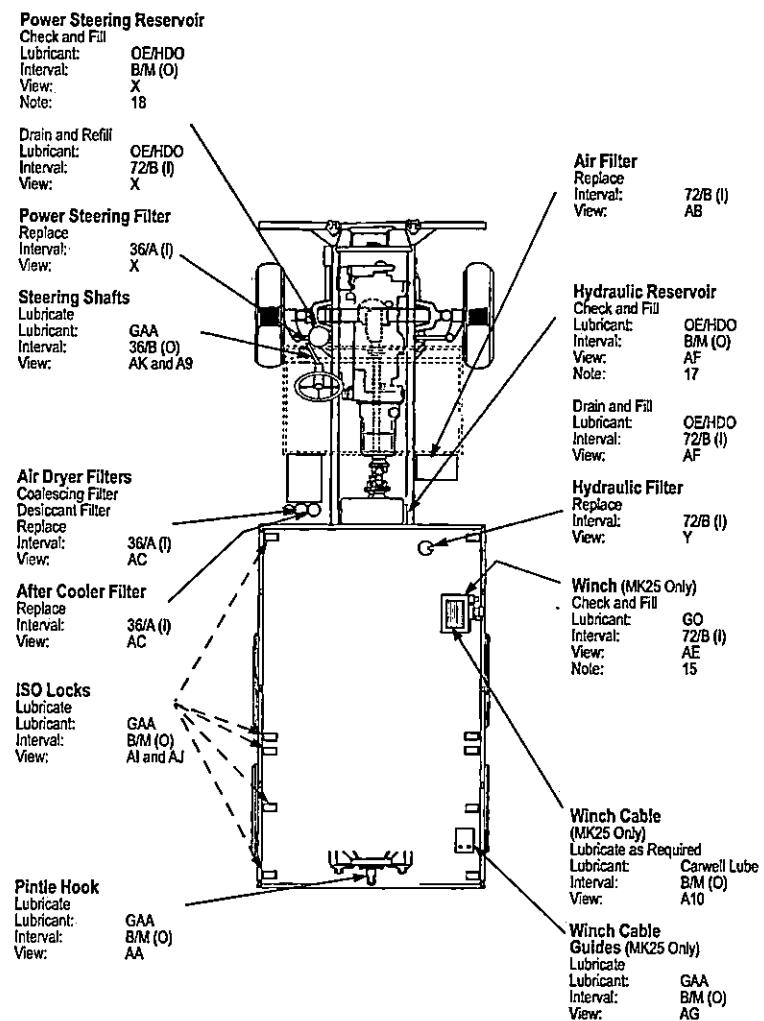
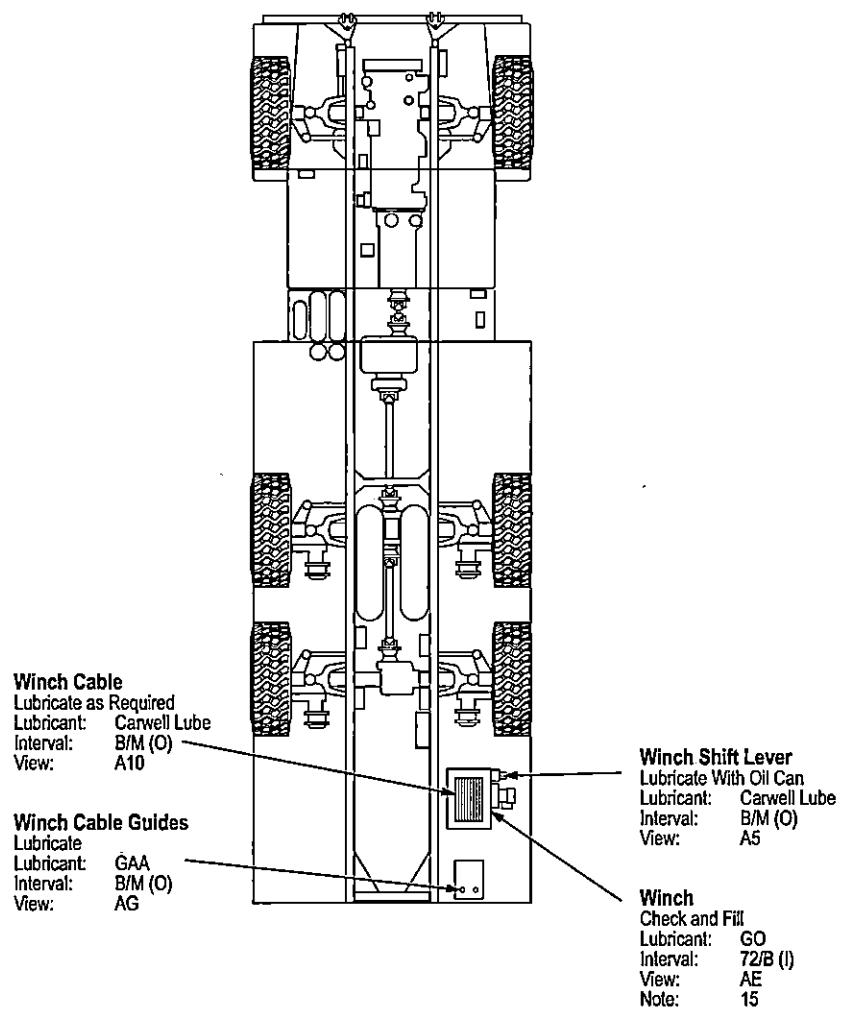


Figure 4.



Hydraulic System, Air System, Winch, and Vehicle Exterior

Figure 5.



Winch-MK28

Figure 6.

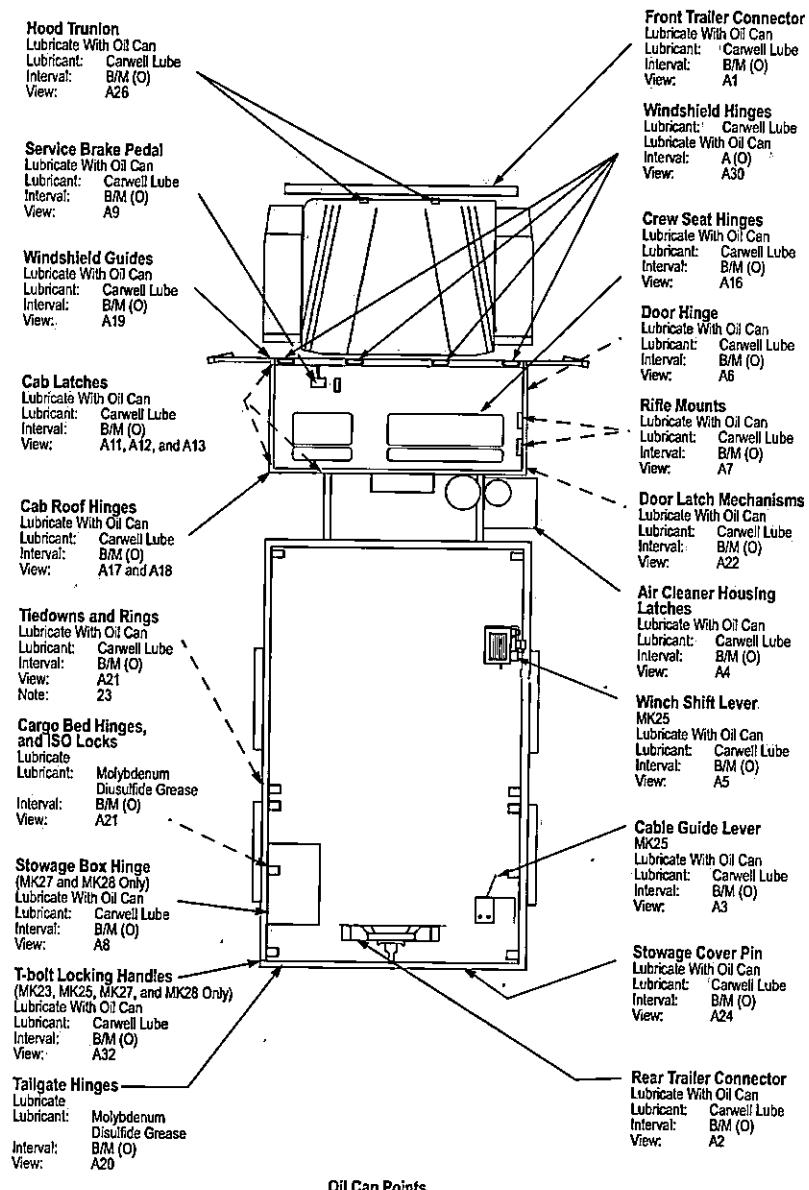


Figure 7.

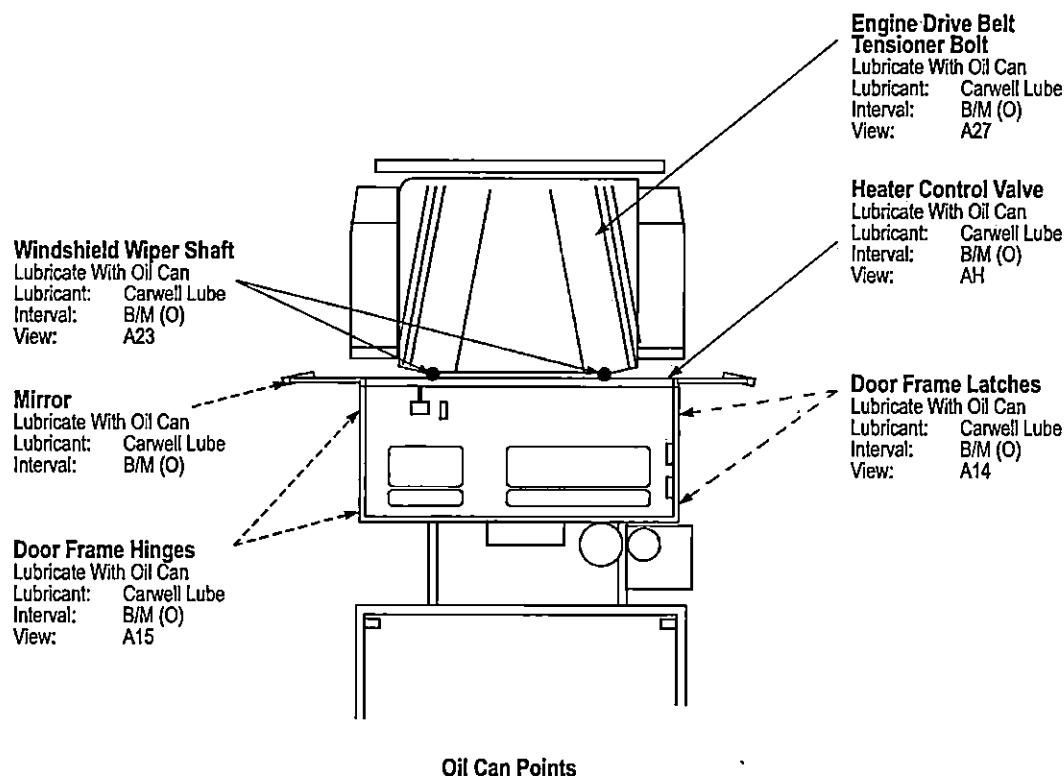


Figure 8.

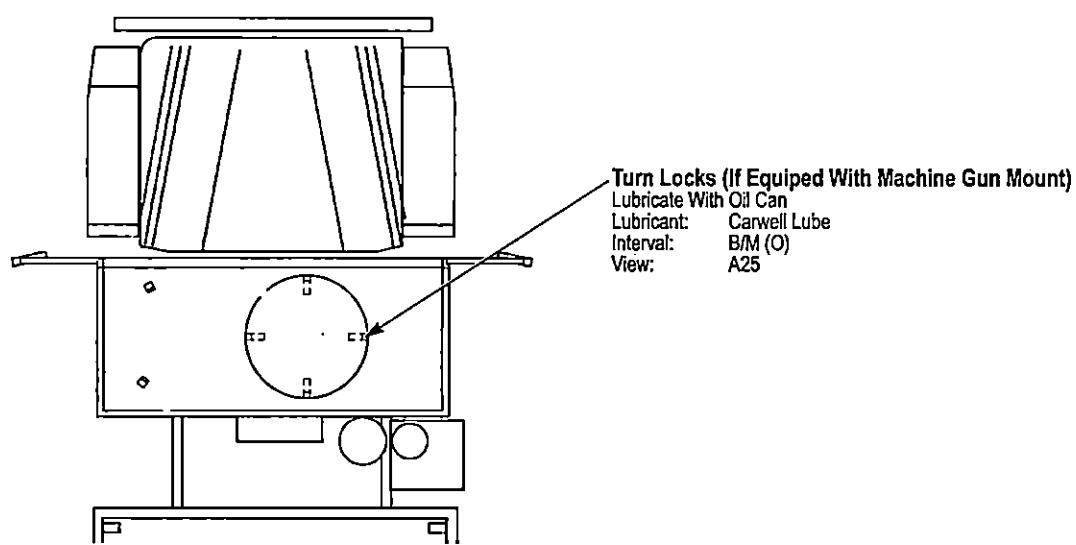


Figure 9.

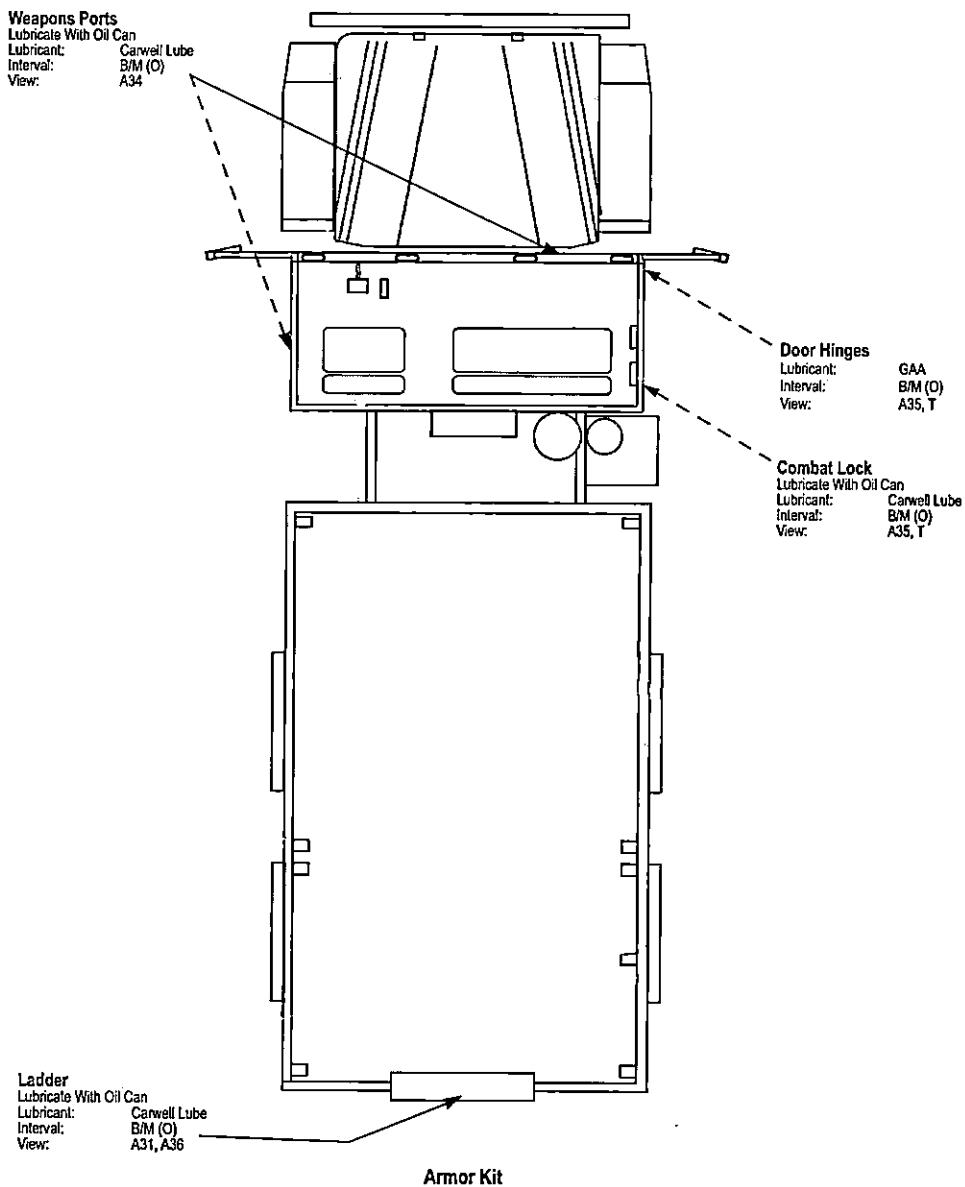


Figure 10.

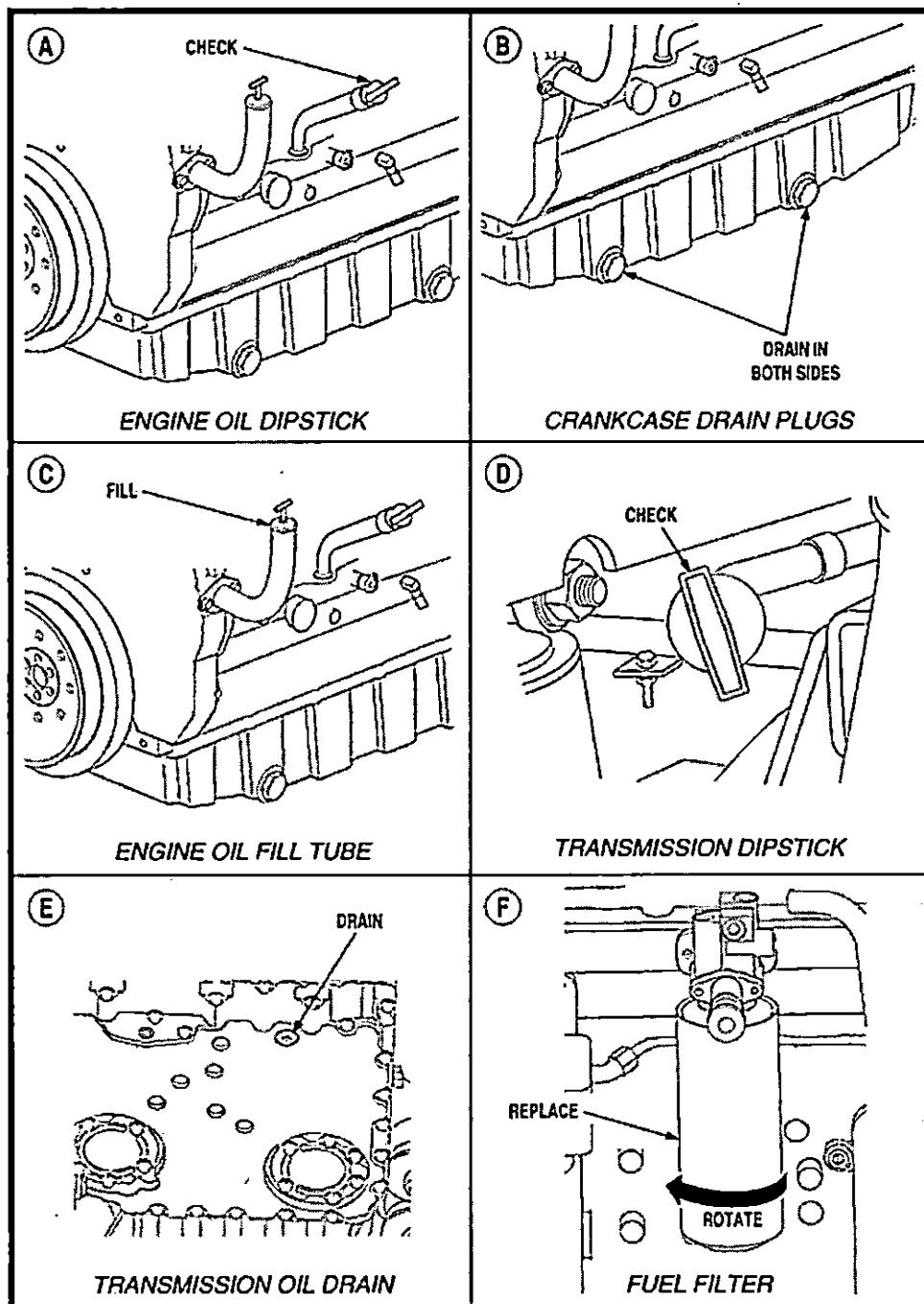


Figure 11.

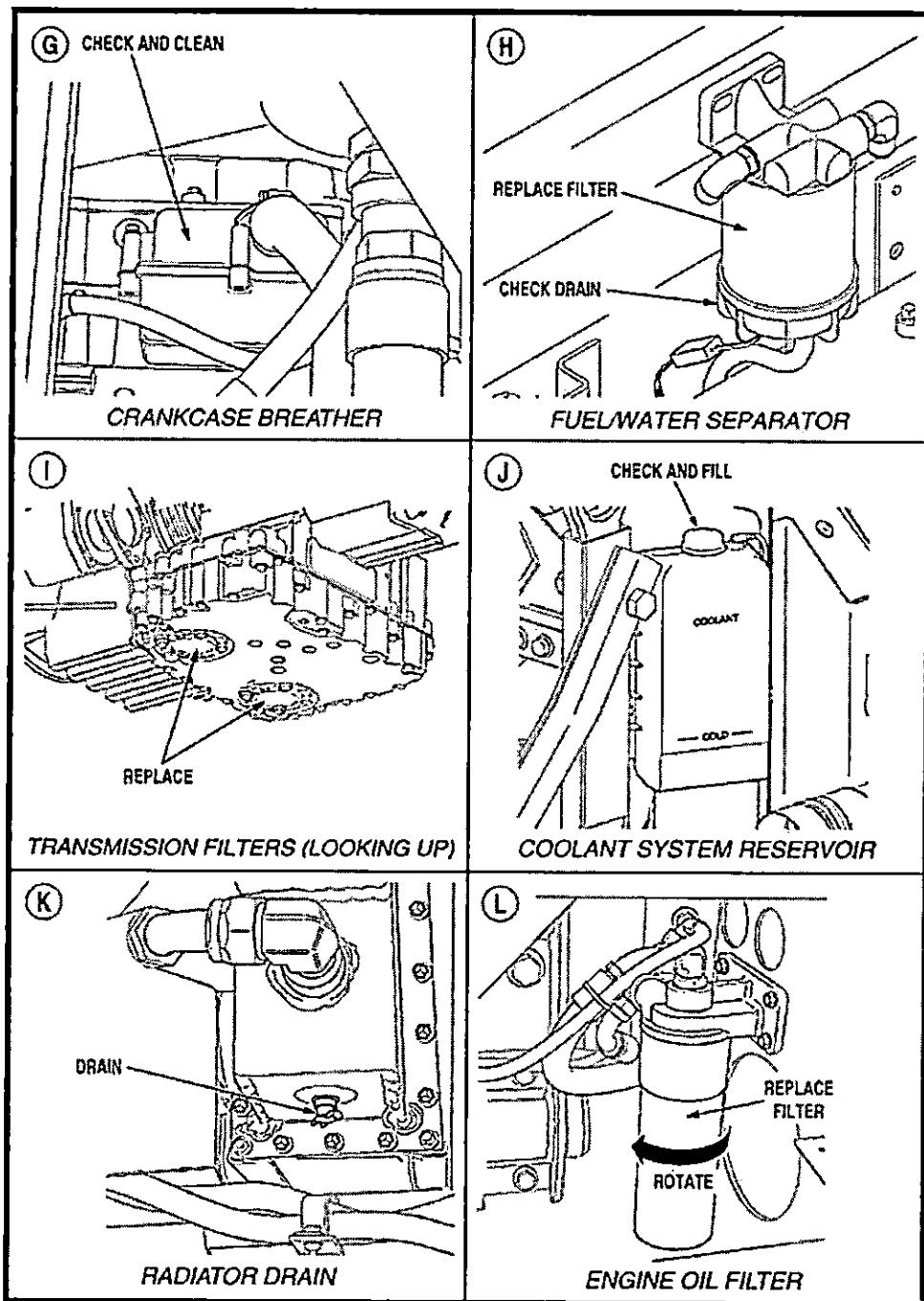


Figure 12.

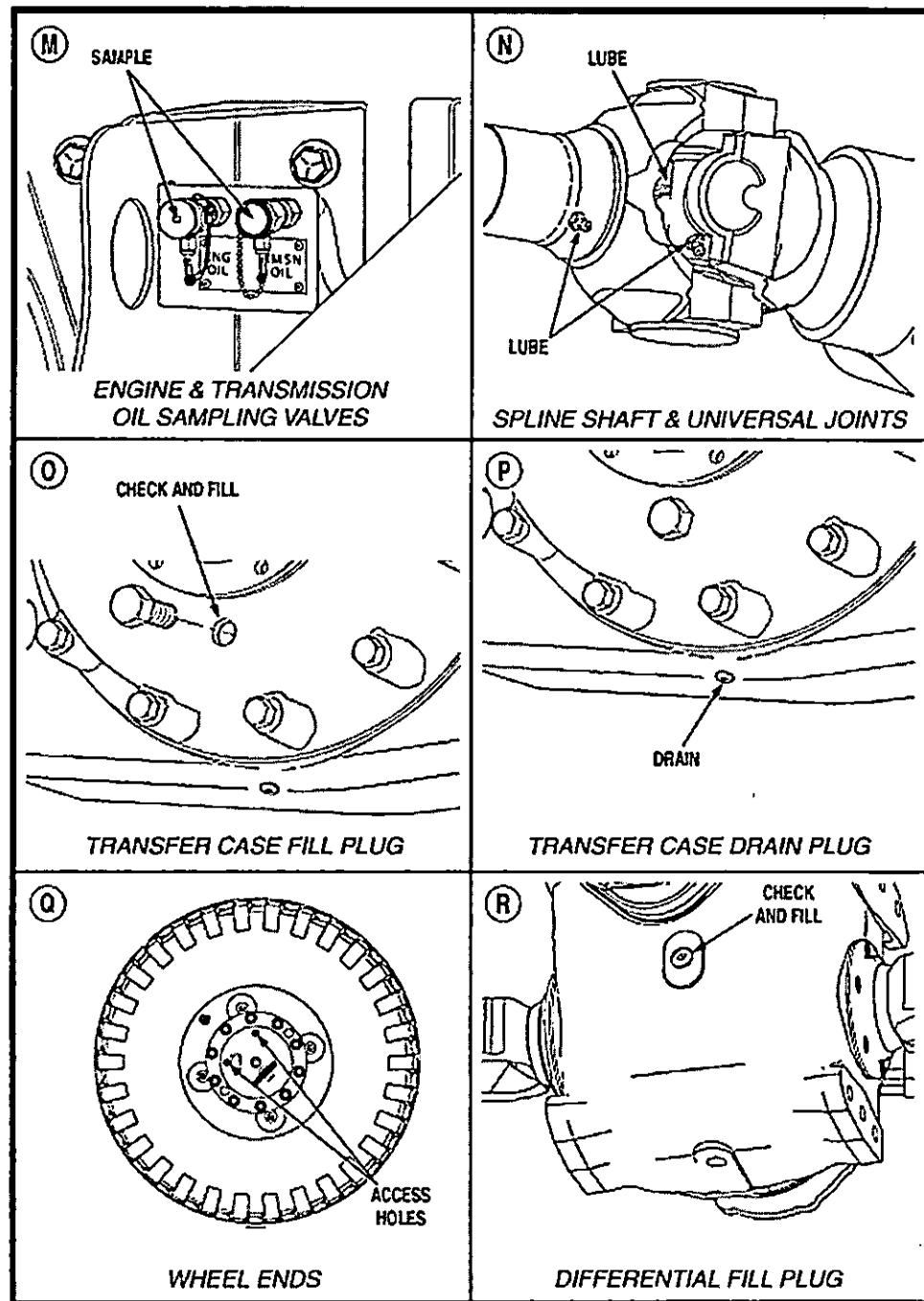


Figure 13.

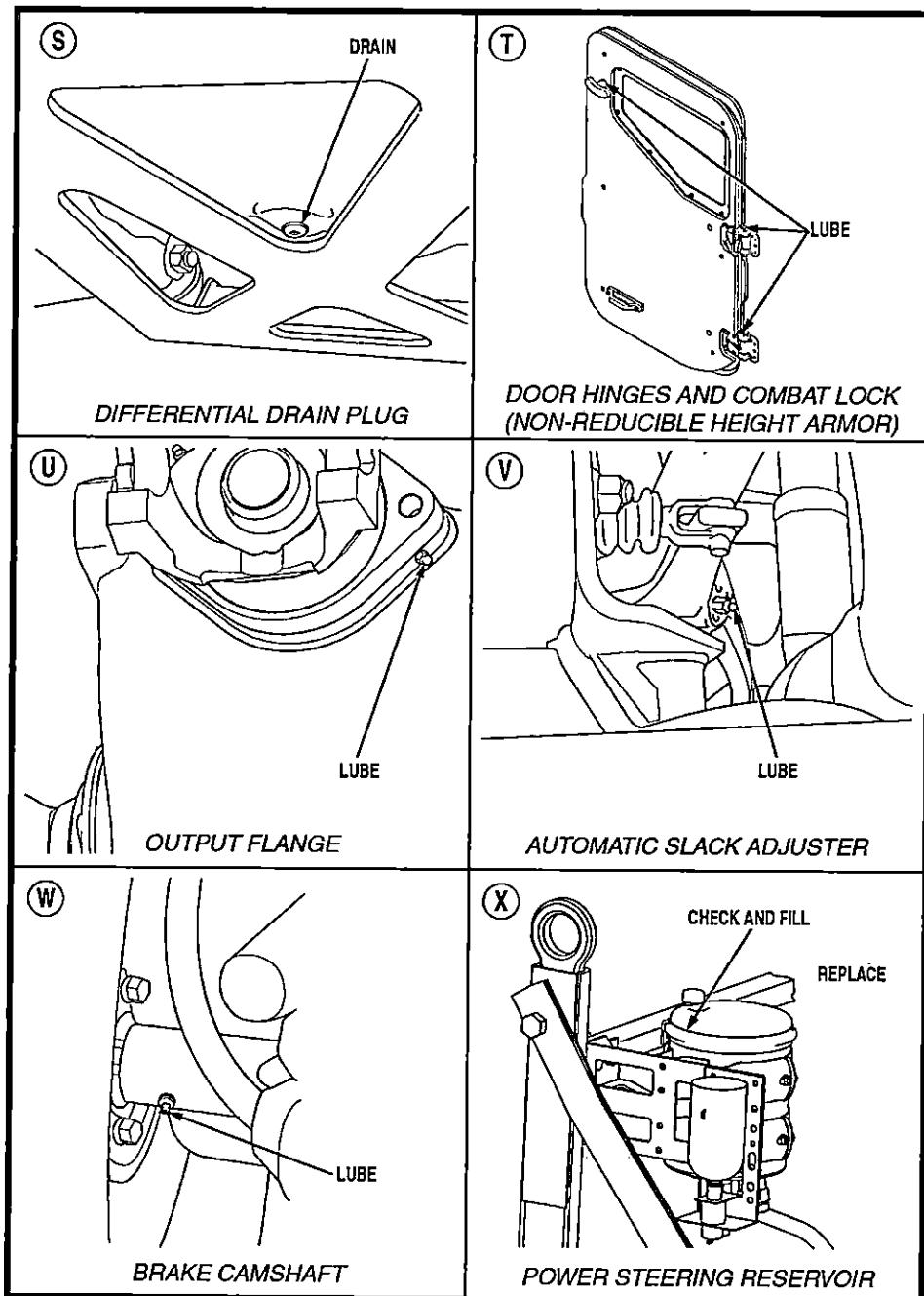


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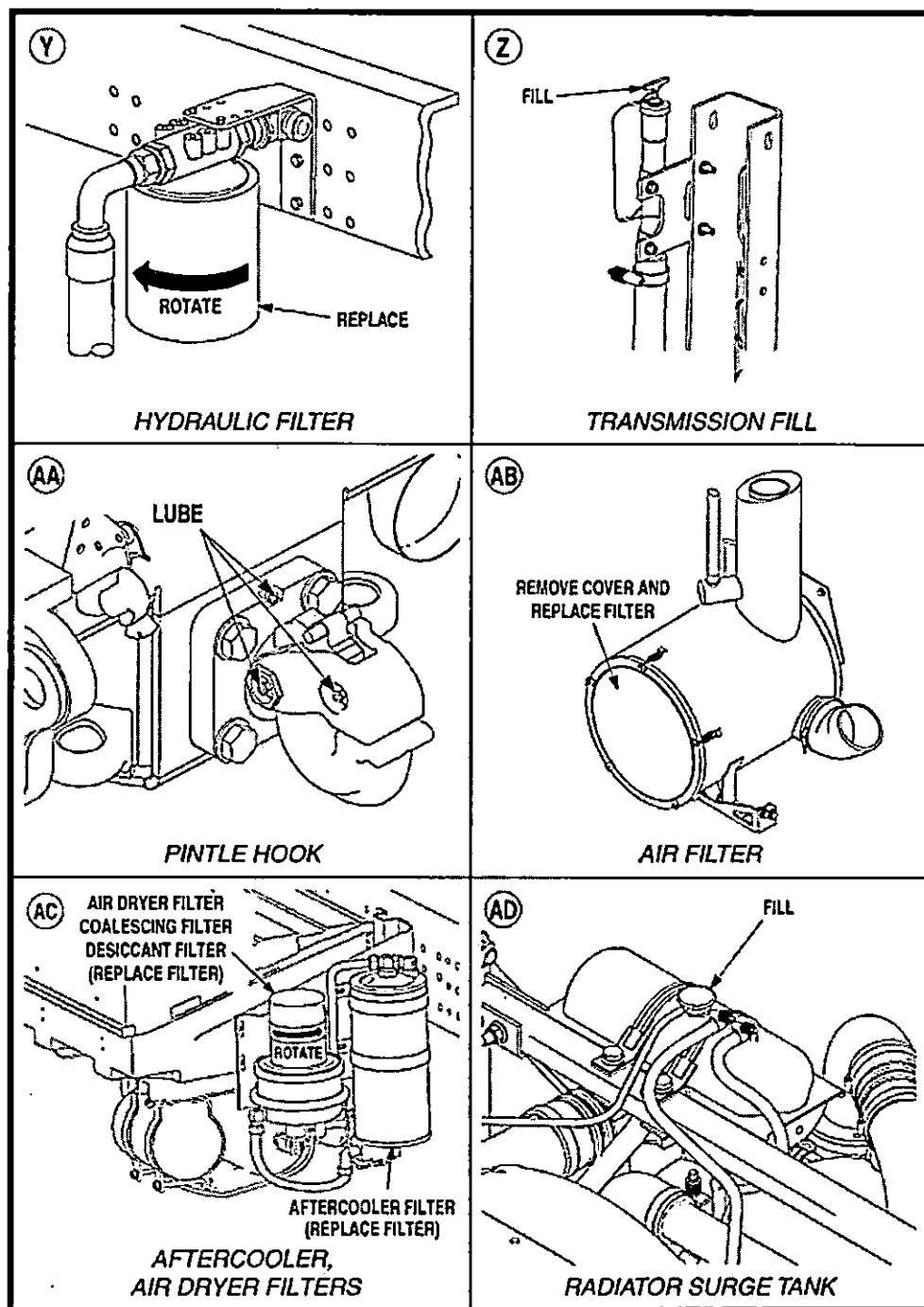


Figure 15.

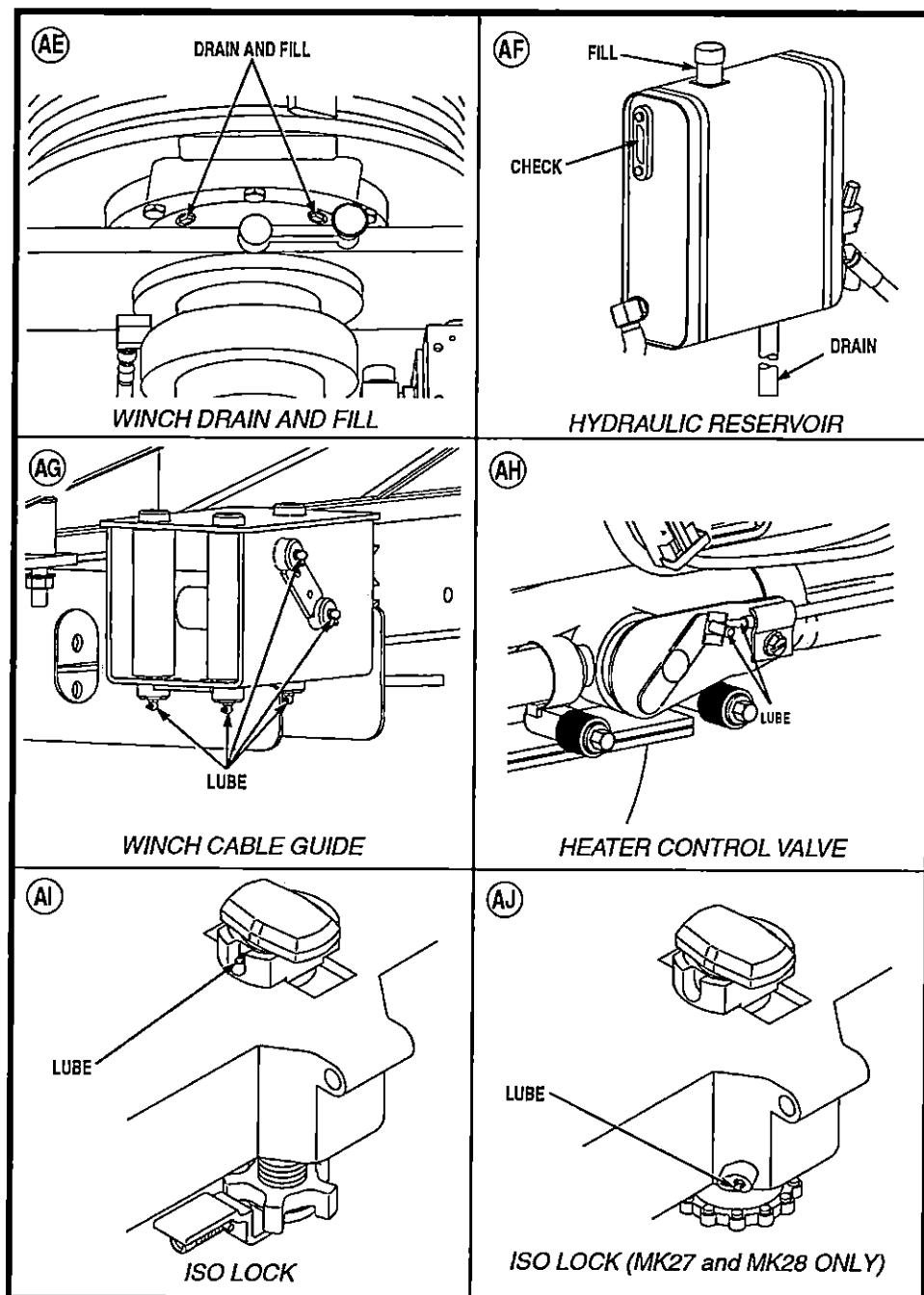


Figure 16.

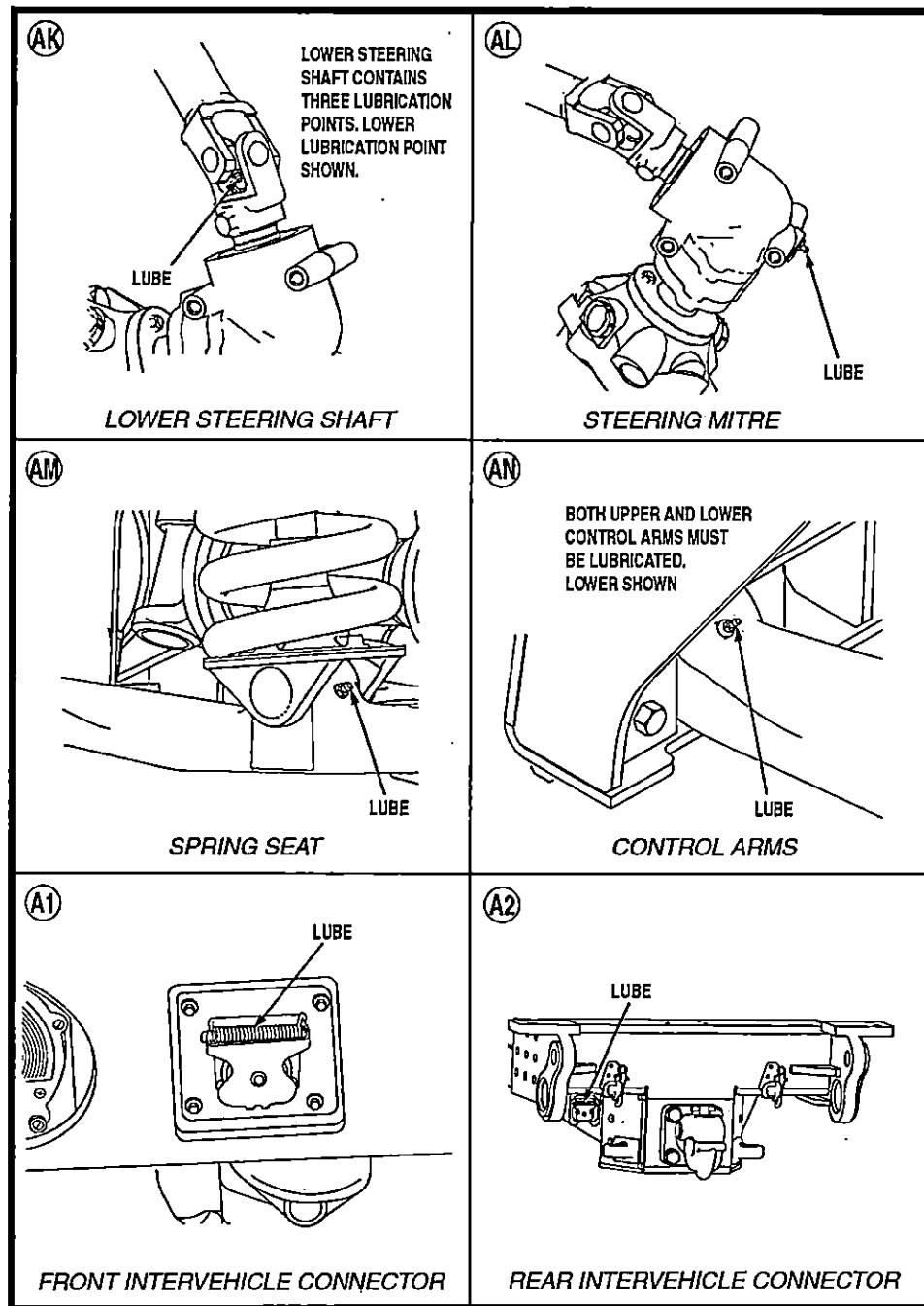


Figure 17.

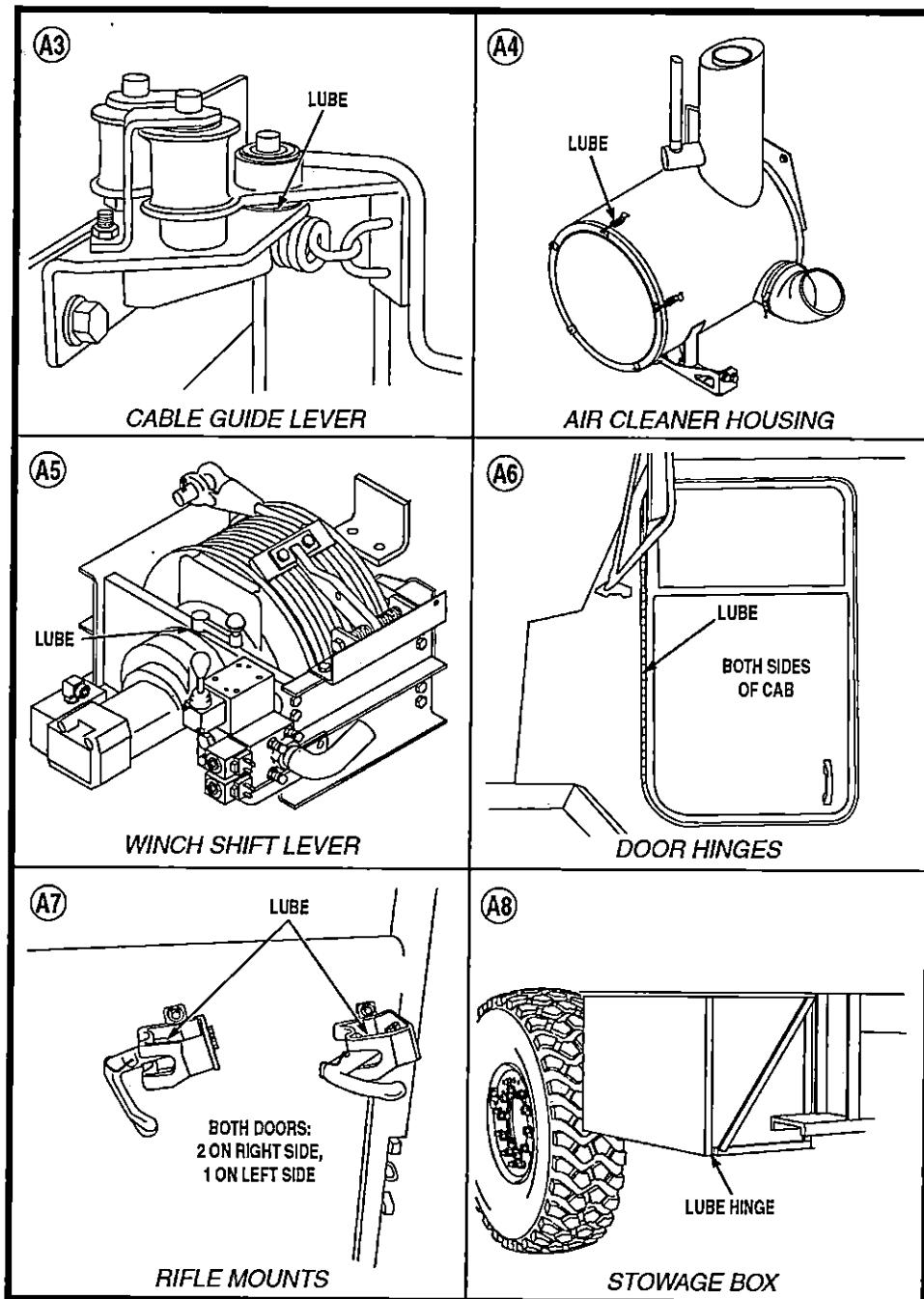


Figure 18.

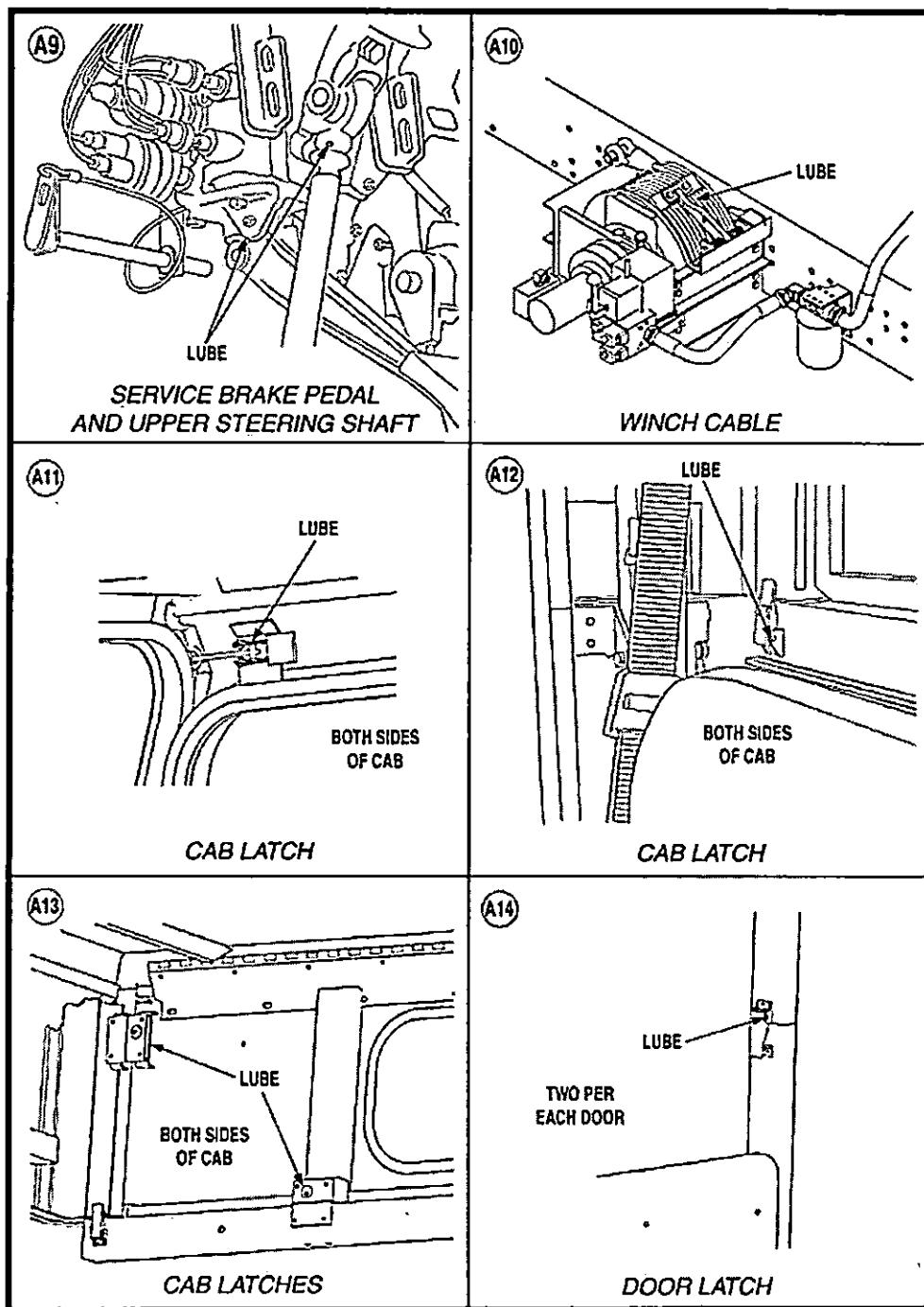


Figure 19.

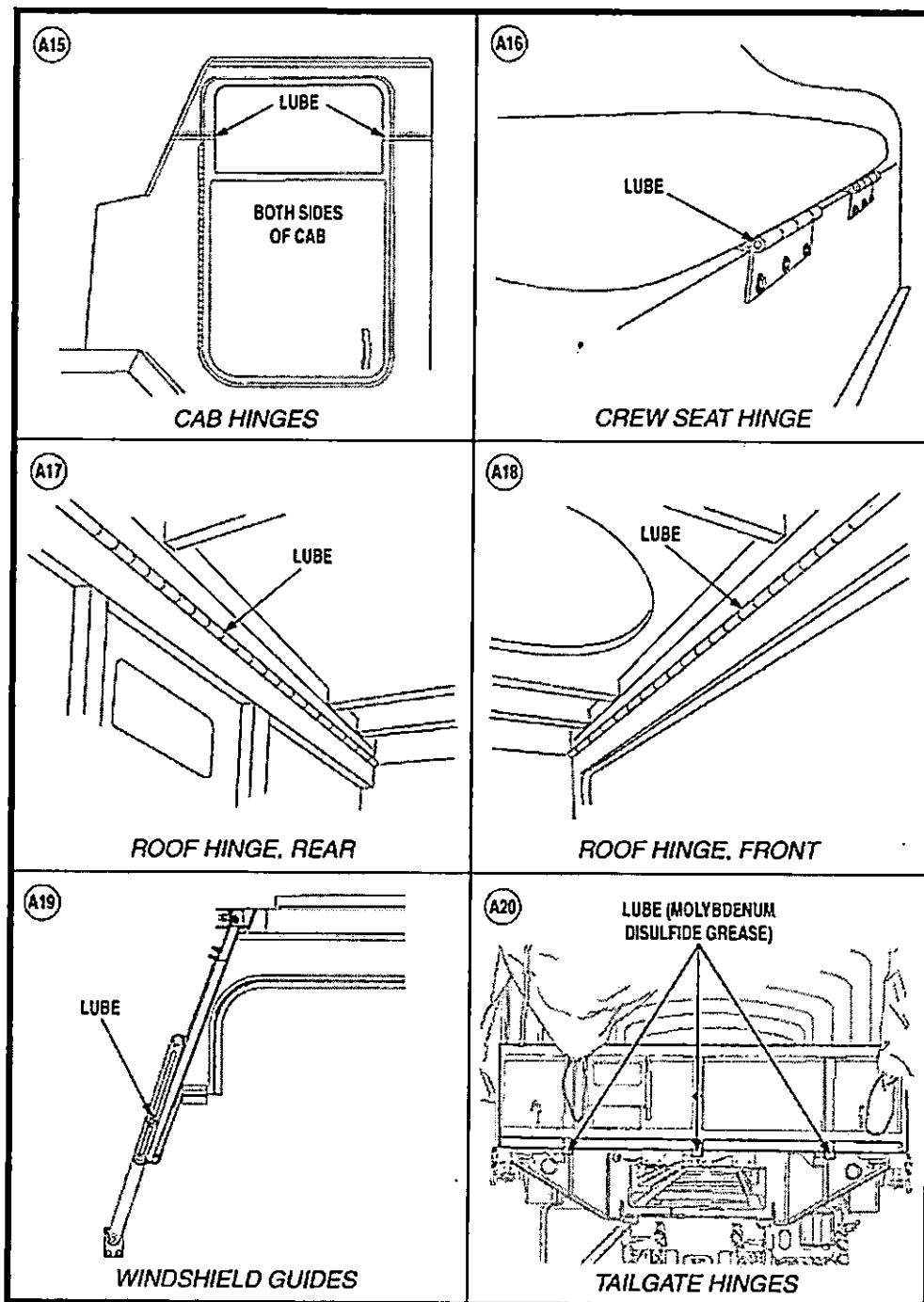


Figure 20.

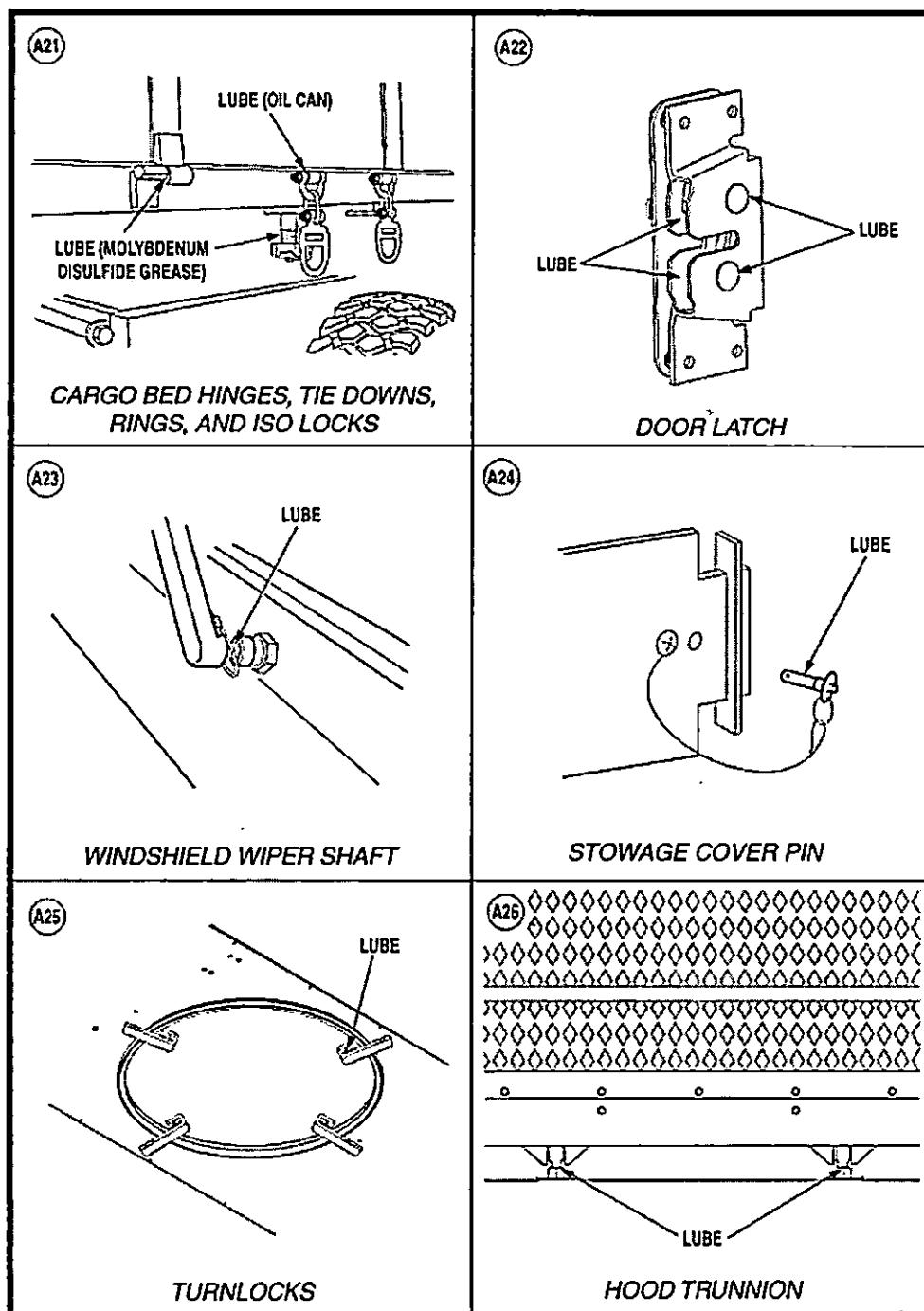


Figure 21.

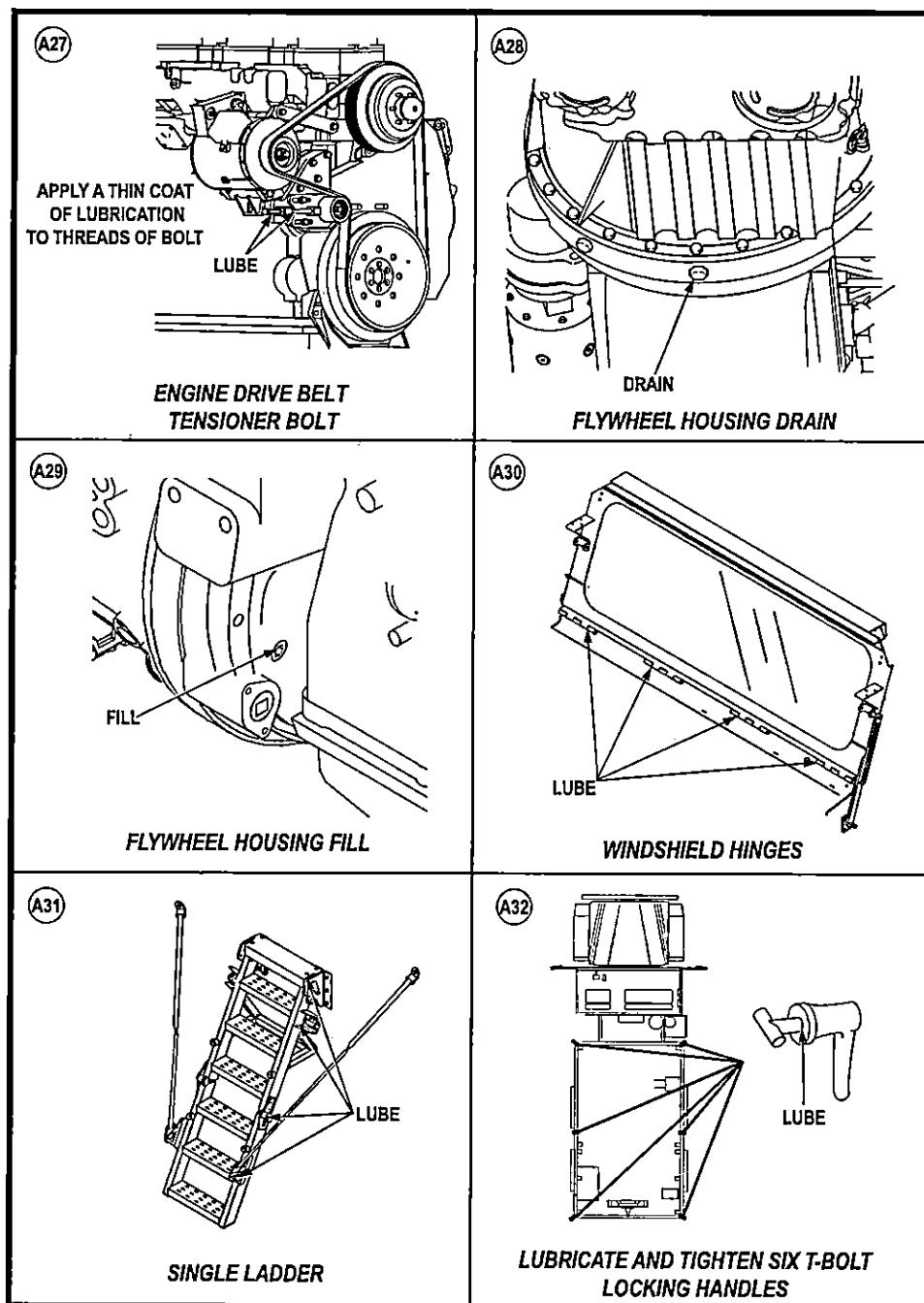


Figure 22.

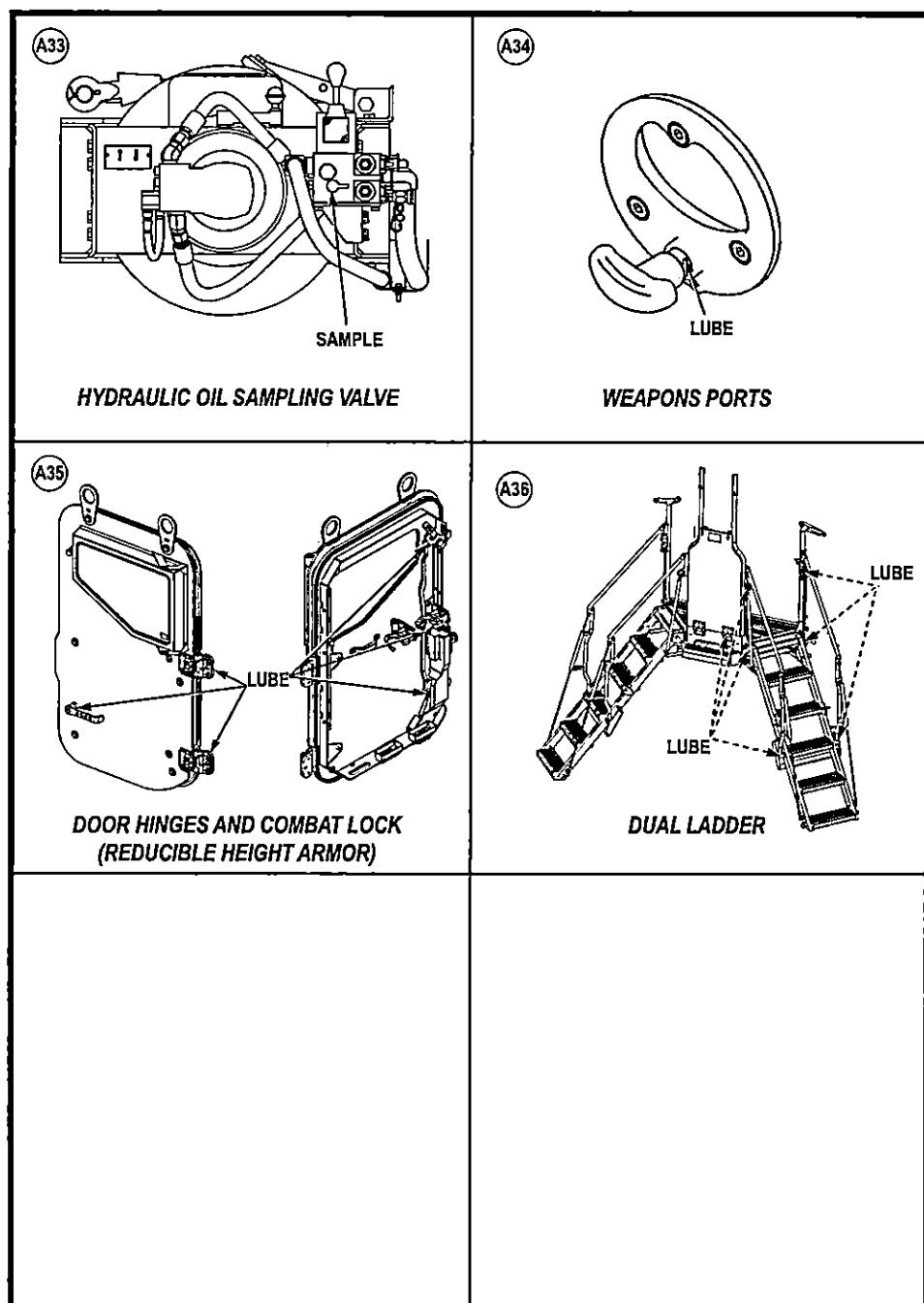


Figure 23.

**NOTES**

1. Cold Temperature Operation. When operating equipment in temperatures below 0°F (-18°C), remove lubricants prescribed for temperatures above 0°F (-18°C). Relubricate with lubricants specified for temperatures 0 to -50°F (-18 to -45°C). Refer to Key table for lubricant temperature ranges.
2. Crankcase. Check oil level with truck parked on level ground and the engine off and cool. Do not overfill.

**NOTES - Continued**

3. Transmission Fluid. Transmission fluid must be changed after first 3,600 miles (5,792 km) of vehicle operation. After initial fluid change, fluid must be changed every 7,200 miles (11,585 km). Whenever transmission fluid is changed, transmission filters must also be changed.
4. Engine Oil Filter. After installing new filter, fill crankcase, run engine five minutes, and check housing for leaks. Shut off engine, check crankcase oil level, and bring to full mark.
5. Transmission. Refer to PMCS (WP 0092) for instructions on check transmission fluid level.
6. Transmission. Refer to PMCS (WP 0093) for instructions on check transmission fluid level.
7. Transmission Internal Oil Filter. Change at overhaul.
8. Crankcase Breather. Loosen hose clamp and remove hose from crankcase breather assembly. Remove crankcase breather assembly from engine. Download ECM logged and active fault codes. Change oil and replace filter. Visually inspect turbocharger compressor for excessive endplay or compressor to wheel and housing contact. Wash the breather element in clean, nonflammable solvent. Allow the breather element to dry prior to reinstallation.
9. Coolant Level. After filling cooling system, run engine for five minutes. Shut off engine and check coolant level. Add coolant as required.
10. Fuel/Water Separator. Check fuel/water separator for leaks and/or damage. Visually check sediment bowl for water or contamination. If water or contamination is present, drain fuel from bowl into suitable container until fuel flows out.
11. Wheel Ends. Position one access hole in the 12 O'clock position and one access hole in the 9 O'clock or 3 O'clock position. The oil level should be level with the bottom of the access hole in the 9 O'clock or 3 O'clock position. If oil needs to be added it must be added through the top access hole.
12. Purging of Lubricant. When using a grease gun, apply lubricants to the fitting until clean lubricant squeezes out of the part being lubricated.

**CAUTION**

Rotate universal joint to obtain access to the fitting. Forcing the grease gun onto the fitting can result in broken or damaged fitting.

13. Universal Joints. Use the proper lubricant to purge all four bearing seals of each universal joint. Lubricate grease fitting until new grease is evident at seal. This flushes abrasive contaminants from each bearing and ensures that all four bearings are filled properly. More than one grease fitting may be installed in a universal joint. Apply grease to only one fitting.
14. If any seals fail to purge, move propeller shaft from side-to-side while applying gun pressure. This allows greater clearance on thrust end of the bearing that is not purging.
15. Differentials. Differential oil level is at the bottom of the check/fill plug. Fill through check/fill hole until oil starts to run out.
16. Winch. Winch oil level is centerline of drum. One of the drain and fill holes must be in the 12 o'clock position to check and fill the winch.
17. Gladhands. Coat gladhand seals with a light coating of grease.
18. Hydraulic Reservoir. Hydraulic fluid level must be between the two range marks on the sight gauge.
19. Power Steering Reservoir. Fluid level must be checked when fluid is in a cold condition.
20. Cooling System. Refer to TB 750-651 for use of antifreeze solutions, cleaning compounds, and testing.

**NOTES - Continued**

- a. Protection to the lowest temperature expected should be the goal of any program. A 50% mix of ethylene glycol to water protects to -34°F (-37°C) should be used in most cases.
- b. For protection from -34°F (-37°C) to -64°F (-53°C) use a 60% ethylene glycol to water mix.
- c. Do not use more than a 60% ethylene glycol to water mix.
21. Remove top nut, washer, and external shaft assembly from internal post. Apply lubricant to internal post. Re-install external shaft assembly, washer, and nut on internal post.
22. Remove nut, screw, and leaf spring from bracket. Apply lubricant to screw and bracket surfaces where leaf spring contacts bracket. Re-install leaf spring to bracket with screw and nut.
23. Remove nut from center screw and gently pull down on center plate until lubricant can be applied to screw between center plate and roof cover. Re-install center plate and nut.
24. The cargo bed tie down rings require oil can lubrication. The MK23 and MK25 have 14 tie down rings along outside of cargo bed and 10 tie down rings recessed in cargo bed. The MK27 and MK28 have 22 tie down rings along the outside of cargo bed and 16 tie down rings recessed in cargo bed.
25. When applying grease to output flange of differential on axle No. 2, only apply two pumps of grease to one of the two grease fittings.
26. When installing dipstick in tube, ensure dipstick is inserted all the way into tube and tighten snugly. Do not over tighten, over tightening will cause dipstick to push out of tube. After tightening dipstick in tube, ensure dipstick is properly seated by attempting to push dipstick into tube.
27. Oil in wheel ends may look milky due to bronze components of wheel ends. When doing wheel end inspections, check oil in all wheel ends. Oil color in all wheel ends should be consistent. If there is a significant difference in one wheel end, when compared to other five wheel ends, check inside wall of wheel for leaks. If a leak is present, replace wheel seals on affected wheel.

**END OF WORK PACKAGE**

**CHAPTER 9**  
**SUPPORTING INFORMATION**

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## 1ST ECHELON MAINTENANCE REFERENCES

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### Scope

This Work Package lists all forms, field manuals, technical manuals, and miscellaneous publications referenced in this manual.

### Forms

MANUAL NUMBER	TITLE
NAVMC 10772	Reporting Errors/Changes to Publications
SF 368	Product Quality Deficiency Report (PQDR)

### Technical Manuals

MANUAL NUMBER	TITLE
MCO P4790.2_	Marine Corps Integrated Maintenance Management System (MIMMS) Field Procedures Manual
TM 3-4230-214-12&P	Operator's and Unit Maintenance Manual for Decontamination Kit
TM 3-4241-280-10	Operator's Manual for Mask, Chemical - Biological
TM 9-6140-200-14	Maintenance Manual for Lead-Acid Storage Batteries
TM 1005-13&P	Machine Gun Mount Manual
TM 4700-15/1_	Ground Equipment Record Procedures
TM 4750-15/1_	Painting and Registration Markings For Marine Corps Combat and Tactical Equipment
TM 10434A-12-P	Operator's and Organizational Maintenance Manual for Chemical Alarm Kit
TM 10867A-12&P	Medium Duty Tow Bar Operation Manual
TM 11240-15/3	Motor Vehicle Licensing Official's Handbook
TM 11240-15/4	Motor Transport Technical Characteristics Manual

### Field Manuals

FM 3-5/MCWP 3-37.3	NBC Decontamination
FM 9-207	Operation and Maintenance of Ordnance Material in Cold Weather (0°F to -65°F)
FM 21-305	Manual for the Wheeled Vehicle Driver
FM 31-70	Basic Cold Weather Manual

**Field Manuals - Continued**

FM 31-71	Northern Operations
FM 55-21	Rail Operations and Safety Rules
FM 90-3/MCWP 3-35.6	Desert Operations
FM 90-5/MCWP 3-35.5	Jungle Operations
FM 90-6/MCWP 3-35.2	Mountain Operations
FMFRP 4-34	Recovery and Battlefield Damage Assessment and Repair
MANUAL NUMBER	TITLE
MCRP 3-02G	First Aid
MCWP 3-35.1/FM90-11	Cold Weather Operations
MCWP 4-11.3	Transportation Operations
SS/FM 5-250	Explosives and Demolition

**Miscellaneous Publications**

(PQDR) MCO 4855.10	Product Quality Deficiency Report
MANUAL NUMBER	TITLE
MCO P4400.150_	Consumer-Level Supply Policy Manual
MTMCTEA Pamphlet 55-19	Tiedown Handbook for Rail Movements
MTMCTEA Reference 55-20	Tiedown Handbook for Truck Movements
MTMCTEA Reference 55-21	Lifting and Tiedown for US Military Helicopters
MTMCTEA Reference 55-22	Marine Lifting and Lashing Handbook
MTMCTEA Reference 55-24	Vehicle Preparation Handbook for Fixed Wing Air Movements
TB 9-639	Passenger-Carrying Capacity of Tactical and Administrative Vehicles Commonly Used to Transport Personnel
ULSS 007392-15	User's Logistic Support Summary 7-Ton Truck

**END OF WORK PACKAGE**

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**1ST ECHELON MAINTENANCE  
COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS**

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## INTRODUCTION

### Scope

This Work Package lists COEI and BII for the 7-Ton Truck to help you inventory the items for safe and efficient operation of the equipment.

### General

The COEI and BII lists are divided into the following sections:

**Components Of End Item List:** This listing is for information purposes only, and is not authority to requisition replacements. These items are part of the 7-Ton Truck, but they are to be removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to help you find and identify the items.

**Basic Issue Items List:** These essential items are required to place the 7-Ton Truck in operation, operate it, and to do emergency repairs. BII must be with the 7-Ton Truck during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by Table of Equipment (T/E). Illustrations are furnished to help you find and identify the items.

## EXPLANATION OF COLUMNS

**Column (1) - Illus Number.** Gives you the number of the item illustrated.

**Column (2) - National Stock Number (NSN).** Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

**Column (3) - Description, Part Number/(CAGEC).** Indicates the Federal item name, part number and CAGEC and, if required, a minimum description to identify and locate the item.

**INTRODUCTION - Continued**

**Column (4) - Usable on Code.** When applicable, gives you a code if the item you need is not the same for different models of equipment. If no code is entered in this column, item is used on all models. Unless otherwise noted, the usable on code for the MK models shall represent the MK, MKA1, AMK, and AMKA1. These codes are identified as:

*Table 1. Code Used On.*

CODE	USED ON
AAA	MK23
BBA	MK23A1
CCA	AMK23
DDA	AMK23A1
AAB	MK25
BBB	MK25A1
CCB	AMK25
DDB	AMK25A1
AAC	MK27
BBC	MK27A1
CCC	AMK27
DDC	AMK27A1
AAD	MK28
BBD	MK28A1
CCD	AMK28
DDD	AMK28A1

**Column (5) - Unit of Issue (U/I).** Indicates the quantity issued when ordering the component. This measure is expressed by a two character alphabetical abbreviation (e.g., ea., in., pr.).

**Column (6) - Quantity Required (Qty Rqr.).** Indicates the quantity of the item authorized to be used with/on the equipment.

Table 2. Components Of End Items 7-Ton Series Truck.

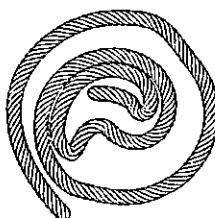
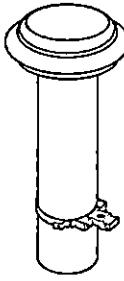
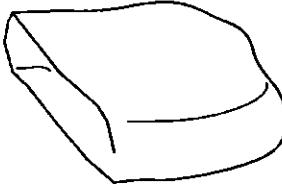
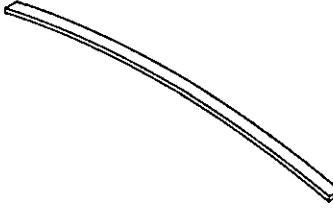
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1	2540-01-491-1504 	28 ft. Rope, for dropside and troop seat stowage 3282895		EA	1
2		Air intake stack assembly 4SK901		KT	1
3	8105-01-500-0175 	Bag, cargo cover storage 5HA373		EA	1
4	2540-01-435-8208 	Bow 12460216-1		EA	7

Table 2. Components Of End Items 7-Ton Series Truck - Continued.

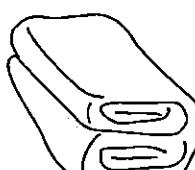
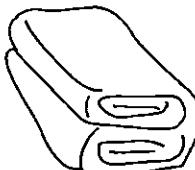
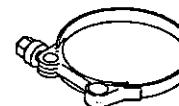
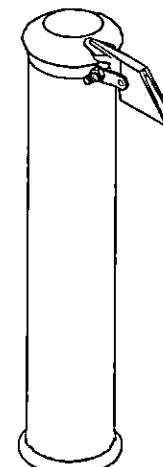
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5	2540-01-480-0371 	Cargo cover 3213613	AAA, AAB, BBA, BBB, CCA, CCB, DDA, DDB	EA	1
6	2540-01-479-2014 	Cargo cover 3214508	AAC, AAD, BBC, BBD, CCC, CCD, DDC, DDD	EA	1
7	2995-01-478-7173 	Clamp (air intake stack) 3052931		EA	1
8		Exhaust stack assembly 4SK902		KT	1

Table 2. Components Of End Items 7-Ton Series Truck - Continued.

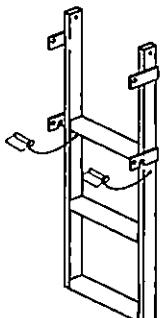
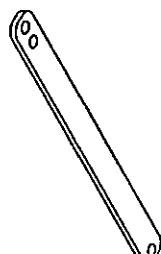
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9	2540-01-480-0450  	Ladder 3250817		EA	1
10	2510-01-485-3216  	Ladder strut 3284772		EA	1
11	5310-01-478-7218  	Locknut (secures air intake assembly to mast) 3266309		EA	2

Table 2. Components Of End Items 7-Ton Series Truck - Continued.

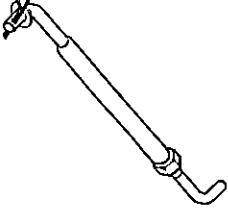
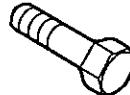
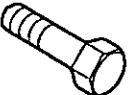
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12	5310-01-479-5890 	Nut (Ladder strut installation) 33256AX		EA	2
13	5340-01-479-4617 	Rod and Tube Assembly for dropsides (includes cotter pin and washer) 3266444		EA	2
14	5305-01-479-0912 	Screw (Ladder strut installation) 33259AX		EA	2
15	5305-01-479-0703 	Screw (secures air intake assembly to mast) 3266317		EA	2

Table 2. Components Of End Items 7-Ton Series Truck - Continued.

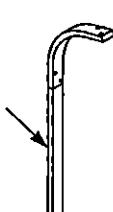
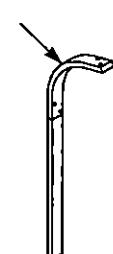
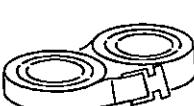
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16	2510-00-737-2781 	Stave 7372781		EA	14
17	2540-00-420-5036 	Stave Corner Bow 10937879		EA	14
18	5340-01-479-9215 	Strap, bow stowage 3351612		EA	1
19	5340-00-894-9542 	Strap, cargo cover stowage 3294638	AAA, AAB, BBA, BBB, CCA, CCB, DDA, DDB	EA	1

Table 2. Components Of End Items 7-Ton Series Truck - Continued.

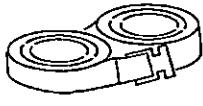
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20	2540-01-491-1503 	Strap, troop seat stowage 3282492		EA	4

Table 3. Basic Issue Items 7-Ton Series Truck.

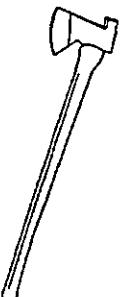
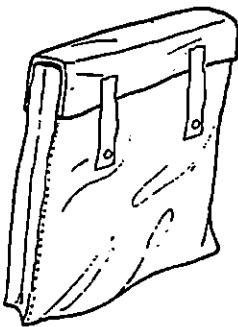
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1	5110-01-416-7827 	Ax 595-010		EA	1
2	5110-01-416-7830 	Ax sheath 595-020		EA	1
3	8105-01-353-2497 	Bag assembly, pamphlet 1362710		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

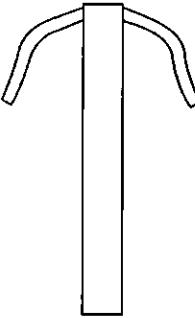
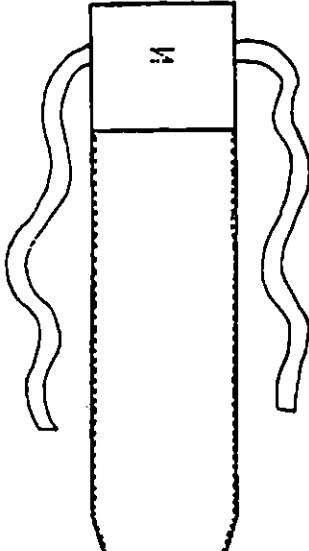
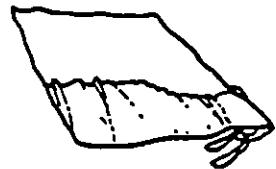
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4	8105-01-480-4004 	Bag, canvas, battery connection kit (cold weather starting kit) 3237979		EA	1
5	8105-01-394-5929 	Bag, tire changing tools 199-1290		EA	1
6	5140-01-480-0634 	Bag, tool, general 1898680		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

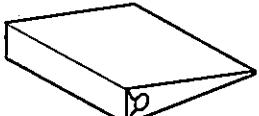
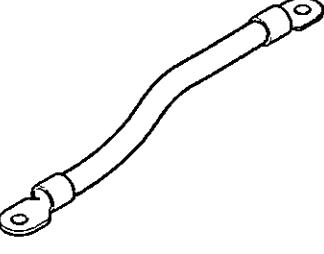
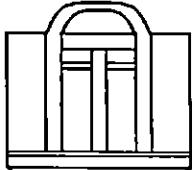
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7	7510-01-612-9700 	Binder 4002529		EA	1
8	5120-01-416-8572 	Broad pick attachment 595-070		EA	1
9	6150-01-480-4003 	Cable, battery, 4/0 ga (cold weather starting kit) 3238073		EA	3
10	5140-01-416-8569 	Carrying case 595-030		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

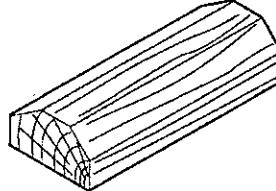
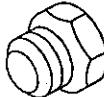
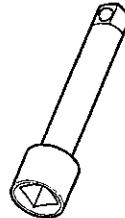
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
11	4030-01-479-9222 	Chain, winch single hook 3127743	AAB, AAD, BBB, BBD, CCB, CCD, DDB, DDD	EA	1
12	2540-01-165-6136 	Chock, wheel (GFE) 1350250		EA	2
13	4730-01-479-2000 	CTIS plug, (limp home) 3294634		EA	1
14	5120-01-479-9227 	Extension, 3 3/4" in. drive 3294624		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

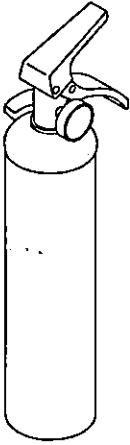
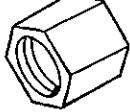
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
15	4210-01-133-9053 	Extinguisher, fire 1347000		EA	1
16	5340-01-480-2332 	Fitting, cap 3294630		EA	1
17	4930-01-498-9747 	Flexible adapter, grease gun 3318814		EA	1
18	8415-00-268-7870 	Gloves, leather, heavy A-A-55060		PR	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

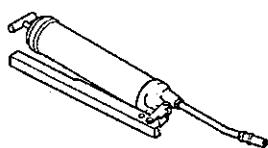
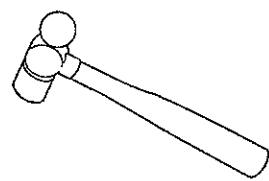
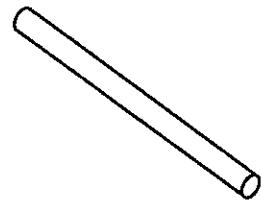
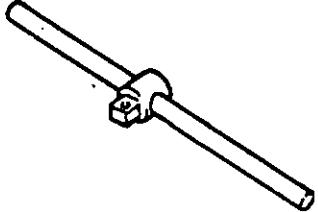
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
19	4930-01-480-9063 	Grease gun 1429580		EA	1
20	5120-01-480-0638 	Hammer 1916HX		EA	1
21	5340-01-209-7841 	Handle, extension 1347720		EA	1
22	5120-01-242-7218 	Handle, socket wrench 1505380		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

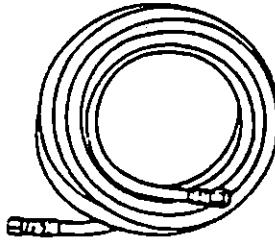
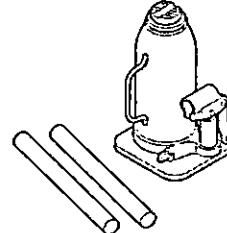
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
23	5310-01-479-5887 	Hex nut 1-1/8 in. G5 (limp home) 60142AX		EA	4
24	4720-01-341-4912 	Hose assy, air 1759750U		EA	1
25	5120-01-146-8096 	Hydraulic jack with handle 28961		EA	2
26	2990-01-498-9973 	Intake adapter, air 3353139		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

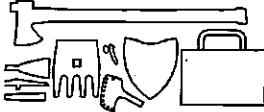
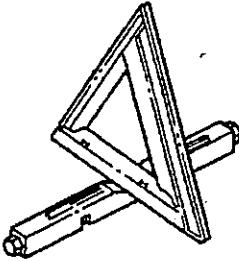
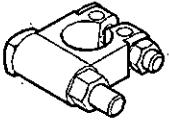
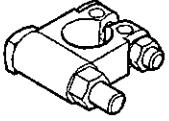
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
27	5120-01-416-8568 	Kit, combination tool, hand 595		KT	1
28	9905-01-480-0644 	Kit, hwy warning 64326BX		EA	1
29	5940-01-089-7066 	Lug, terminal neg.(cold weather starting kit) 117585A		EA	2
30	5940-00-549-6581 	Lug, terminal, pos.(cold weather starting kit) 117584A		EA	2
31		Manual, Operator's 184 106290 00 (10629A- OR)		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

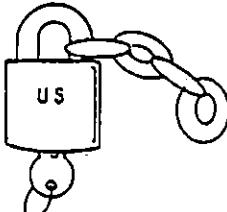
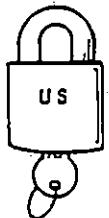
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
32	5120-01-416-8571 	Mattock attachment 595-050		EA	1
33	5340-00-158-3807 	Padlock set w/chain (BII box) 5200 GL w/chain		SE	2
34	5340-00-158-3805 	Padlock, w/o chain (steering wheel) AA59487-2S		EA	1
35	5120-01-416-8573 	Pick attachment 595-060		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

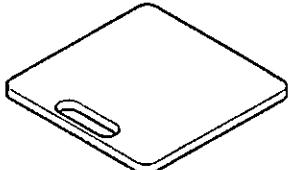
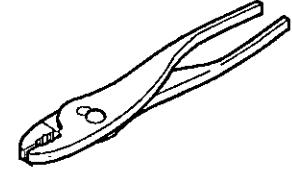
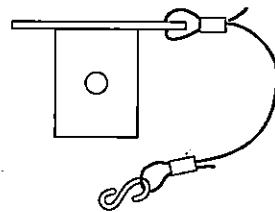
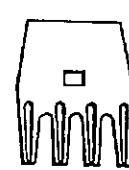
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
36	5340-01-350-0872 	Plate, jack base 1731070		EA	1
37	5120-01-480-0640 	Pliers, 10-in. 1350150		EA	1
38	2990-01-498-9975 	Rain cap assembly, exhaust 3353144		EA	1
39	5120-01-416-8577 	Rake-hoe attachment 595-080		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

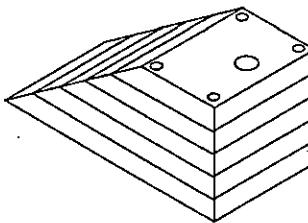
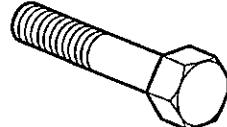
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
40	5120-01-416-8574 	Rake-hoe fastener 595-090		EA	1
41	2540-01-480-0453 	Ramp, tire 3361026		EA	2
42	5120-01-416-8575 	Safety locking pin 595-999		EA	1
43	5305-00-638-8920 	Screw, battery clamp (cold weather starting) B1821BH038C225N		EA	4
44	5120-01-367-3801 	Screwdriver, cross tip SGDP82BR		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

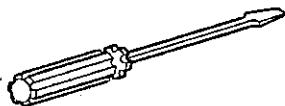
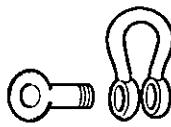
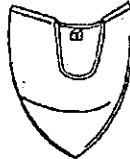
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
45	5120-01-367-3722 	Screwdriver, flat tip SDD48		EA	1
46	5120-00-227-7356 	Screwdriver, flat tip (for driveline lock solenoids) 1898660		EA	1
47	4030-01-504-7788 	Shackle 3442534	AAB, AAD, BBB, BBD, CCB, CCD, DDB, DDD	EA	1
48	5120-01-416-8570 	Shovel attachment 595-040		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

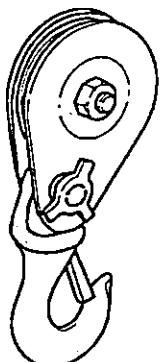
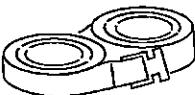
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
49	3950-01-347-9666 	Snatch block 193418	AAB, AAD, BBB, BBD, CCB, CCD, DDB, DDD	EA	1
50	5120-01-479-9225 	Socket, 1-1/8 in., 3/4 in. drive, standard (for underride) 3294625		EA	1
51	5120-01-491-2085 	Socket, 33 mm 3/4 in. SPL (wheel covers/lug nuts) 3357015		EA	1
52	2540-01-479-9219 	Strap (secures 5 gal. can) 3265037		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

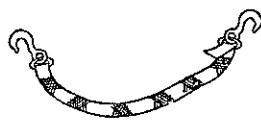
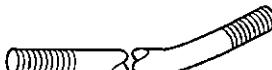
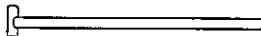
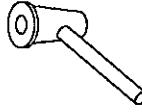
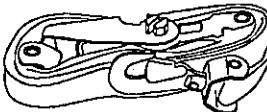
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
53	5340-01-114-7712 	Strap, safety, for backrests 3111796		EA	1
54	2510-01-479-9202 	Strut, limp home 3298810		EA	2
55	5340-01-479-9208 	T-Bolt (securing tire ramps) 3361032		EA	1
56	5340-01-485-4384 	T-Bolt, locking handle (securing tire ramps) 3296113		EA	1
57	5340-01-575-0854 	Tiedown strap 15' 3806108	DDA, DDB, DDC, DDD	EA	2

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

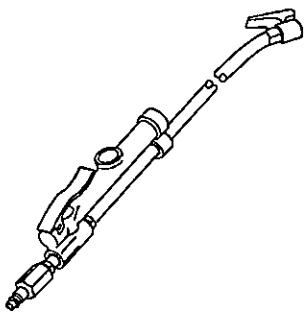
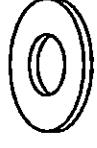
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
58	4910-01-386-4300 	Tire inflator/gauge (w/ 10-ft. air line) I-405M		EA	1
59	5120-01-493-6828 	Tool, valve core 3816949		EA	1
60	5310-01-098-7246 	Washers, flat (limp home) 1.25C 837-00		EA	4
61	5120-01-479-9223 	Wrench, 5/16 in. Allen 3213535		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

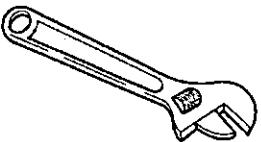
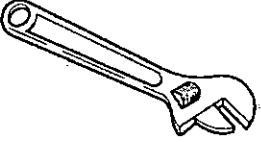
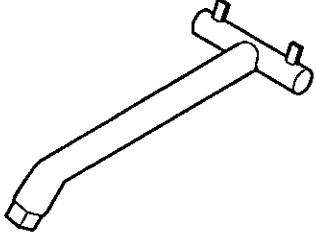
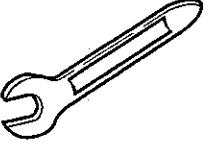
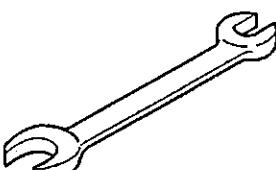
(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
62	5120-00-240-5328 	Wrench, adjustable, 8 in. 11655778-3		EA	1
63	5120-00-264-3796 	Wrench, adjustable, 12 in. 120405A		EA	1
64	5120-01-479-9220 	Wrench, ISO lock spanner 3266448	AAC, AAD, BBC, BBD, CCC, CCD, DDC, DDD	EA	1
65	5120-01-479-2034 	Wrench, open-end, 1-5/8 in. 3307342		EA	1

Table 3. Basic Issue Items 7-Ton Series Truck - Continued.

(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER (NSN) AND ILLUSTRATION	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
66	5120-01-373-8833 	Wrench, open-end, 3/4 in. and 7/8 in. (CTIS air lines) BW-731A		EA	1

END OF WORK PACKAGE

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**1ST ECHELON MAINTENANCE  
ADDITIONAL AUTHORIZED LIST (AAL)**

---

**Introduction****Scope**

This Work Package lists additional items authorized for support of the 7-Ton Truck. These items are a using unit responsibility to procure when unit commander determines there is a requirement for them.

**GENERAL**

This list identifies items that do not have to accompany the truck and do not have to be turned in with it.

**EXPLANATION OF LISTING**

Descriptions, national stock numbers, and part numbers are provided to help you identify and request additional items you require to support this equipment. If items required differs for different models, the model is shown under the "USABLE ON CODES" heading. Codes are the same as in Basic Issue Items.

**Column (1) – National Stock Number** Indicates the national stock number assigned to the item and will be used for requisitioning purposes.

**Column (2) – Description** Indicates the federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the Commercial and Government Entity (CAGE) Code (in parenthesis) followed by the part number. If item needed differs for different models of this equipment, the model number is shown under the "USABLE ON CODES" heading in this column. Refer to Basic Issue Items for listing of cage codes used on this vehicle.

**Column (3) – Usable On Code.** When applicable, gives you a code if the item you need is not the same for different models of equipment.

**Column (4) – Unit of Issue** Indicates how the item is issued for the national stock number or part number listed.

**Column (5) – Qty. Auth** Indicates the quantity of each item authorized.

Table 1. Additional Authorized List.

(1) NATIONAL STOCK NUMBER (NSN)	(2) DESCRIPTION, PART NUMBER/ (CAGEC)	(3) USABLE ON CODE	(4) U/I	(5) QTY RECM
2590-01-449-2385	NET, CARGO RETAINING: B9154-090-168-2R (098PO)	AAA, AAB, AAC	EA	1
3950-01-347-9666	BLOCK: snatch 1918000 (45152)	AAB, AAD, BBB, BBD	EA	1
5120-00-926-5175	BRUSH: wire, battery 1052SP (70550)		EA	1
5995-00-772-8813	CABLE ASSEMBLY: inter-vehicular 64297CX (45152)		EA	1
2590-00-148-7961	CABLE KIT: special power, Inter-vehicle power cable, NATO slave, 24-volt, 20- ft.long with 2 adapters 11682379-1 (19207)		EA	1
7240-01-337-5269	CAN: gasoline, military,5 gallon MIL-C-53109 (81349)		EA	1
7240-00-089-3827	CAN: water, military, 5 gallon MIL-C-43613 (81349)		EA	1
4010-00-473-6166	CHAIN ASSY: single leg 7077063 (19207)		EA	1
2540-01-152-7813	CHAIN: tire, emergency 2624-10-8 (46156)		PR	1
7022-01-477-9089	COMPUTER: rugged laptop 0001A0012 (01365)		EA	1
6545-00-922-1200	FIRST AID KIT: 11677011		KT	1
6230-00-264-8261	FLASHLIGHT: MX-991/U (1CSX9)		EA	1
4240-00-052-3776	GOGGLES: industrial GG-G-531 (81348)		PR	1
1005-01-387-8483	GUN MOUNT, ADAPTER: 6650486	AAA, AAB, AAC, AAD	EA	1
5120-00-243-2419	HANDLE, BAR		EA	1
4720-01-254-0189	HOSE ASSEMBLY: non-metallic (inter- vehicular air line) MS39325-9-140-8 (96906)		EA	2
2540-01-567-3236	KIT, ADAPTER: tow bar 3252181		KT	1

Table 1. Additional Authorized List - Continued.

(1) NATIONAL STOCK NUMBER (NSN)	(2) DESCRIPTION, PART NUMBER/ (CAGEC)	(3) USABLE ON CODE	(4) U/I	(5) QTY RECM
5340-00-682-1505	PADLOCK SET: keyed alike 1-3/4 in., w/ clevis and chain, composed of 5 padlocks and 7 keys MS21313-52 (96906)		SE	1
4730-01-479-2000	PLUG: CTI limp home 3294634 (45152)		EA	6
5120-00-944-4268	PULLER: battery terminal 54000 (36540)		EA	1
	S280 Tiedown Kit 3250984 (45152)		KT	1
5340-01-500-3227	SERVICE KIT: ether storage cap 3414924 (45152)		EA	1
2540-01-515-2158	SERVICE KIT: jounce limiter 3254396 (45152)		KT	1
	Sling 56" 4 Leg 3678833 (45152)		EA	1
2530-01-497-0440	SPARE TIRE KIT 3359477 (45152)		KT	1
7240-00-177-6154	SPOUT: can, flexible 11677020 (19207)		EA	1
5120-00-611-7525	TERMINAL, CLAMP, SPREADER: reamer, postcleaner 20-C (70786)		EA	1
1670-00-725-1437	TIEDOWN: cargo, aircraft 3114100C240 (01276)		EA	1
2530-01-496-8356	TOWBAR: medium duty 3428515 (45152)		EA	1
9905-00-148-9546	WARNING DEVICE KIT:highway 11669000 (19207)		SE	1
5340-01-494-0252	WEAPON MOUNT ASSEMBLY 3378368 (45152)	AAA, AAB, AAC, AAD	EA	1
5120-00-228-9507	WRENCH, 9/16"		EA	1
5120-00-316-9127	WRENCH, WHEEL		EA	1
5120-00-228-9506	WRENCH, 1/2"		EA	1

END OF WORK PACKAGE

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## 1ST ECHELON MAINTENANCE EXPENDABLE/DURABLE SUPPLIES LIST

---

### Introduction

### SCOPE

This Work Package lists expendable/durable supplies needed to operate and maintain the 7-Ton Truck vehicles.

### EXPLANATION OF COLUMNS

#### Column (1) - Item Number (Item No.).

This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, Expendable/Durable Supplies List").

#### Column (2) - Level.

This column identifies the lowest level of maintenance that requires the listed item.

#### Column (3) - National Stock Number.

This is the National stock number assigned to the item; use it to request or requisition the item.

#### C - Operator/Crew

#### Column (4) - Item Name, Description, Part Number/(CAGEC).

Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

#### Column (5) - Unit of Issue (U/I).

Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea., in., pr.). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Table 1. Expendable/Durable Supplies List.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/ (CAGEC)	(5) U/I
<b>Antifreeze, Coolant (Arctic)</b>				
1	C	6850-01-441-3248	Antifreeze, Coolant (Arctic) A-A-52624 (58536)	dr
<b>Antifreeze, Coolant</b>				
2	C	6850-01-464-9125	Antifreeze, Coolant 1-gal bottle A-A-52624 (58536)	gl
3	C	6850-01-464-9152	Antifreeze, Coolant 55-gal drum A-A-52624 (58536)	gl
<b>Cloth, Cleaning</b>				
4	C	7920-00-165-7195	Cloth, Cleaning 10-lb box, 15 X 15 in MIRACLEWIPE1003 Type 1 (51200)	bx
5	C	7920-00-044-9281	Cloth, Cleaning 10 lb box, 18 X 13 in MIRACLEWIPEL001 Type 2 (51200)	bx
<b>Grease, Automotive And Artillery (GAA)</b>				
6	C	9150-01-197-7688	Grease, Automotive And Artillery (GAA) 2.25-oz tube M-10924-A (81349)	oz
7	C	9150-01-197-7690	Grease, Automotive And Artillery (GAA) 1.75 pound can M-10924-C (81349)	lb
8	C	9150-01-197-7689	Grease, Automotive And Artillery (GAA) 6.5 pound can M-10924-D (81349)	lb
<b>Grease, General Purpose</b>				
9	C	9150-01-306-9202	Grease, General Purpose 1-lb can MIL-G-23549 (81349)	lb
10	C	9150-00-235-5555	Grease, General Purpose 6.5-lb can ROYCO 49 (07950)	lb
11	C	9150-00-823-8047	Grease, General Purpose 35-lb can ROYCO 49 (07950)	lb
<b>Lubricant, Connector, Nyogel 760G</b>				
12	C	5970-01-551-5155	Lubricant, Connector, Nyogel 760G 2200400 (45152)	ea
<b>Lubricating Oil, Engine OE/HDO 15W40</b>				
13	C	9150-01-518-9477	Lubricating Oil, Engine OE/HDO 15W40 1-qt can MIL-PRF-2104 (81349)	qt
14	C	9150-01-178-4725	Lubricating Oil, Engine OE/HDO 15W40 24-qt box MIL-PRF-2104 (81349)	qt
15	C	9150-01-152-4118	Lubricating Oil, Engine OE/HDO 15W40 5-gal can MIL-PRF-21041 (81349)	gl

Table 1. Expendable/Durable Supplies List - Continued.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/ (CAGEC)	(5) U/I
16	C	9150-01-152-4119	Lubricating Oil, Engine OE/HDO 15W40 55-gal drum M2104-5-15W/40 (81349)	dr
<b>Lubricating Oil, Gear GO 80W/90</b>				
17	C	9150-01-035-5392	Lubricating Oil, Gear GO 80W/90 1-qt can M2105-1-80W90 (81349)	qt
18	C	9150-01-313-2191	Lubricating Oil, Gear GO 80W/90 1-gal can MIL-PRF-2105 (81349)	gl
19	C	9150-00-001-9395	Lubricating Oil, Gear GO 80W/90 5-gal can MIL-PRF-2105 (81349)	cn
<b>Oil, Hydraulic OE/HDO 10</b>				
20	C	9150-00-189-6727	Oil, Hydraulic OE/HDO 10 1-qt can M2104-1-10W (81349)	qt
21	C	9150-01-177-3988	Oil, Hydraulic OE/HDO 10 12-qt box M2104-1-10W (81349)	qt
22	C	9150-00-191-2772	Oil, Hydraulic OE/HDO 10 55-gal drum BRAYC0421C (98308)	dr
23	C	9150-00-183-7807	Oil, Hydraulic OE/HDO 10 bulk BRAYC0421C (98308)	gl
<b>Oil, Lubricating, Gear GO 75W</b>				
24	C	9150-01-035-5390	Oil, Lubricating, Gear GO 75W 1-qt can M2105-1-75W (81349)	qt
25	C	9510-01-048-4593	Oil, Lubricating, Gear GO 75W 1-gal can MIL-L-2105 (81349)	gl
26	C	9510-01-035-5391	Oil, Lubricating, Gear GO 75W 5-gal can MIL_PRF-2105 (81349)	cn
<b>Paint, Black</b>				
27	O	8010-01-229-7540	Paint, Black 1 quart can M53039-1-001Q-37030 (81349)	QT
28	C	8010-01-229-7541	Paint, Black 1 gallon can M53039-1-001G-37030 (81349)	GL
29	C	8010-01-229-7542	Paint, Black 5 gallon can M53039-1-005G-37030 (81349)	GL
<b>Paint, 383 Green</b>				
30	C	8010-01-229-7546	Paint, 383 Green 1 quart can M53039-1-001Q-34094 (81349)	QT
31	C	8010-01-229-9561	Paint, 383 Green 1 gallon can M53039-1-001G-34094 (81349)	GL
32	C	8010-01-229-7547	Paint, 383 Green 5 gallon can M53039-1-005G-34094 (81349)	GL

Table 1. Expendable/Durable Supplies List - Continued.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/ (CAGEC)	(5) U/I
<b>Paint, 686A Tan</b>				
33	C	8010-01-276-3638	Paint, 686A Tan 1 quart can M53039-1-001Q-33446 (81349)	QT
34	C	8010-01-276-3640	Paint, 686A Tan 5 gallon can M53039-1-005G-33446 (81349)	GL
<b>Solution, Soap</b>				
35	C	6810-00-252-1345	Solution, Soap 1-qt bottle MIL-W-15000 Class C (81349)	qt
<b>Solvent, Dry cleaning</b>				
36	C	6850-00-664-5685	Solvent, Dry cleaning 1-qt can AA59601-1D (58536)	qt
37	C	6850-00-281-1985	Solvent, Dry cleaning 1-gal can PS661 (02978)	gl
38	C	6850-00-264-9038	Solvent, Dry cleaning 5-gal drum AA59601-1F (58536)	gl
<b>Washer Fluid</b>				
39	C	6850-00-926-2275	Washer Fluid 12 16-oz bottles 0854-000 (OFTT5)	bx
<b>Water, Distilled</b>				
40	C	6810-00-682-6867	Water, Distilled Six 1-gal bottles ASTM D 1193 type III (81346)	bx
41	C	6810-00-356-4936	Water, Distilled 5-gal bottle 629250 (81346)	bt
<b>Ether Cylinder</b>				
42	C	5430-01-292-1628	Ether Cylinder 2EH475 (45152)	ea
<b>Grease, Molybdenum Disulfide</b>				
43	C	9150-01-302-7377	Grease, Molybdenum Disulfide 1.5-lb can MOLYKOTE3402C (94499)	cn
44	C	9150-00-754-2595	Grease, Molybdenum Disulfide 1.75-lb can ROYCO 64 (07950)	cn
45	C	9150-00-223-4004	Grease, Molybdenum Disulfide 6.5-lb can MIL-G-21164 (81349)	cn
46	C	9150-00-965-2003	Grease, Molybdenum Disulfide 35-lb can ROYCO 64 (07950)	cn
<b>Corrosion Preventive Compound</b>				
47	C		Corrosion Preventive Compound 8-oz can 1388330 (45152)	oz

Table 1. Expendable/Durable Supplies List - Continued.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/ (CAGEC)	(5) U/I
<b>Carwell Lube</b>				
48	C	8030-01-414-8947	Carwell Lube 5-gal can T32P5 (03GK3)	cn
<b>Lubricating Oil, Transmission OE/HDO 30</b>				
49	C	9250-00-186-6681	Lubricating Oil, Transmission OE/HDO 30 1 qt can MIL2104-1-30W (81349)	qt
50	C	9250-00-188-9858	Lubricating Oil, Transmission OE/HDO 30 5 gallon can (81349) ALLIEDC030 (15958)	cn
51	C	9250-00-189-6729	Lubricating Oil, Transmission OE/HDO 30 55 gallon drum ALLIEDC030 (81349)	dr

END OF WORK PACKAGE

## 1ST ECHELON MAINTENANCE STOWAGE GUIDE

### SCOPE

This Work Package identifies stowage locations for the BII and COEI equipment of the 7-Ton Truck.

#### General.

The following tables and illustrations show the stowage locations for the BII and COEI equipment on the 7-Ton Truck.

**Table 1. Equipment Stowed In BII Box Under Companion Seat.**

Description	Part No.	Qty
Adapter, flexible, grease gun	NSN 4930-01-498-9747	1
Bag, pamphlet	NSN 2540-00-670-2459	1
Bag, canvas, battery connection kit	NSN 8105-01-480-4004	1
Bag, tire changing tools	NSN 8105-01-394-5929	1
Bag, tool, general	NSN 5140-01-480-0634	1
Binder	NSN 7510-01-612-9700	1
Cable*, 4/0 ga.	NSN 6150-01-480-4003	3
Chain, winch (MK25 and MK28)	NSN 4030-01-479-9222	1
Chock, wheel	NSN 2540-01-165-6136	2
CTIS cap	NSN 5340-01-480-2332	1
CTIS plug	NSN 4730-01-479-2000	1
Extension, wrench 3-3/4 in.	NSN 5120-01-479-9227	1
Extension**, handle	NSN 5340-01-209-7841	1
Gloves	NSN 8415-00-268-7870	1 pr
Grease gun	NSN 4930-01-480-9063	1
Hammer	NSN 5120-01-480-0638	1
Handle, sliding 'T'	NSN 5120-01-242-7218	1
Hex nut, 1-1/8 in.	NSN 5310-01-479-5887	4

## General - Continued.

Table 1. Equipment Stowed In BII Box Under Companion Seat

Description	Part No.	Qty
Hose assembly	NSN 4720-01-341-4912	1
Hydraulic jack	NSN 5120-01-146-8096	2
Intake adapter, air	NSN 2990-01-498-9973	1
Kit, highway warning	NSN 9905-01-480-0644	1
Kit**, max tool	NSN 5120-01-416-8568	1
Lug*, negative terminal	NSN 5940-01-089-7066	2
Lug*, positive terminal	NSN 5940-00-549-6581	2
Manual, Operator's	184 106290 00	1
Plate, jack base	NSN 5340-01-350-0872	1
Pliers	NSN 5120-01-480-0640	1
Rain cap assembly, exhaust	NSN 2990-01-498-9975	1
Rod and tube assembly* (supports dropside)	3266444	2
Screw*, for battery clamps	NSN 5305-00-638-8920	4
Screwdriver, flat tip, general	NSN 5120-01-367-3722	1
Screwdriver, cross tip, general	NSN 5120-01-110-3531	1
Screwdriver, flat tip, for driveline lock solenoids	NSN 5120-00-227-7356	1
Shackle (MK25 and MK28)	NSN 4030-01-504-7788	1
Snatch block (MK25 and MK28)	NSN 3950-01-347-9666	1
Socket, 33 mm 3/4" SPL	NSN 5120-01-491-2085	1
Socket, 1-1/8, 3/4 drive	NSN 5120-01-479-9225	1
Strap* (secures 5 gal. can)	NSN 5340-00-968-4060	1
Strap*, safety (for backrests)	NSN 5340-01-114-7712	1
Strut**, for limp home procedure	NSN 2510-01-479-9202	2
Support** strut assembly	NSN 2540-01-522-9749	1

## General - Continued.

**Table 1. Equipment Stowed In BII Box Under Companion Seat.**

Description	Part No.	Qty
Tiedown Strap 10' (Reducible Height Stowage)*	NSN 5340-01-341-2984	4
Tiedown Strap 15' (Reducible Height Stowage)*	NSN 5340-01-575-0854	2
Tire inflator/gauge with 10 ft hose	NSN 4910-01-386-4300	1
Tool, valve core	NSN 5120-01-493-6828	1
Washer, for limp home procedure	NSN 5310-01-098-7246	4
Wrench, adjustable, 12 in.	NSN 5120-00-264-3796	1
Wrench, 5/16 Allen	NSN 5120-01-479-9223	1
Wrench, adjustable, 8 in.	NSN 5120-01-436-2924	1
Wrench, ISO lock (MK27 and MK28)	NSN 5120-01-479-9220	1
Wrench, open end	NSN 5120-01-373-8833	1
Wrench, open end	NSN 5120-01-479-2034	1

\* These items may be stowed in the BII box or installed on the vehicle, depending on the configuration the vehicle is in.

\*\* These items are stowed behind center seat (if equipped with Increased Mine Protection Kit).

**Table 2. Equipment Stowed on Vehicle**

No.	Description	Part No.	Qty
1	Bag, cargo cover stowage (MK23 and MK25) Located: on platform	5HA373	1
2	Bow assembly (MK23 and MK25) Located: on cargo body headboard	12460216-1	7
3	Bow assembly (MK27 and MK28) Located: On cargo body headboard	12460216-1	9
4	Cargo cover (MK23 and MK25) Located: on platform in stowage bag	3213613	1
5	Cargo cover (MK27 and MK28) Located: in stowage bag in stowage box	3214508	1

## General - Continued.

Table 2. Equipment Stowed on Vehicle

No.	Description	Part No.	Qty
6	Door, stowage Located: on rear of cargo body	3214613	1
7	Dropside (MK23 and MK25) Located: in cargo body stowage compartment	9HB50	4
8	Dropside (MK27 and MK28) Located: in cargo body stowage compartment	9HB49	4
9	Fire Extinguisher Located: in cab, on engine cover	1347000	1
10	Ladder Located: on cargo body or tailgate	3250817	1
11	Padlock, for BII box Located: on BII box in cab	1362720	1
12	Padlock, for stowage box (MK27 and MK28) Located: on stowage box	1362720	1
13	Padlock, for steering wheel lock Located: in cab	1619180	1
14	Ramp, tire Located: on cargo body	3361026	2
15	Rope, for dropside / troop seat stowage Located: in cargo body stowage compartment	3282895	1
16	Screw, secures tailgate to cargo bed Located: on tailgate hinge of cargo body	9HB37	1
17	Strap, bow stowage Located: on cargo body headboard	3351612	1
18	Strap, cargo cover, stowage (MK23 and MK25) Located: on platform behind cab	3294638	1
19	Strap, troop seat stowage Located: in cargo body stowage compartment	3282492	4
20	T-bolt, locking handle Located: on cargo body	3266445	2
21	T-bolt Located: RH steps	3361032	1

**General - Continued.****Table 2. Equipment Stowed on Vehicle**

No.	Description	Part No.	Qty
22	T-bolt, locking handle Located: RH steps	3296113	1
23	Tailgate Located: on cargo body headboard	3268884	1
24	Troop seat assembly (MK23 and MK25) Located: in cargo body stowage compartment	3212044	4
25	Troop seat assembly (MK27 and MK28) Located: in cargo body stowage compartment	3214506	4
26	Troop seat backrest (right rear, MK23 and MK25) Located: in cargo body stowage compartment	3212041	1
27	Troop seat backrest (left rear, MK23 and MK25) Located: in cargo body stowage compartment	3212040	1
28	Troop seat backrest (front, MK23 and MK25) Located: in cargo body stowage compartment	3239212	2
29	Troop seat backrest (right rear, MK27 and MK28) Located: in cargo body stowage compartment	3214503	1
30	Troop seat backrest (left rear, MK27 and MK28) Located: in cargo body stowage compartment	3214502	1
31	Troop seat backrest (front, MK27 and MK28) Located: in cargo body stowage compartment	3262206	2
32	Washer, secures tailgate to cargo bed Located: on tailgate hinge of cargo body	9HA870	1

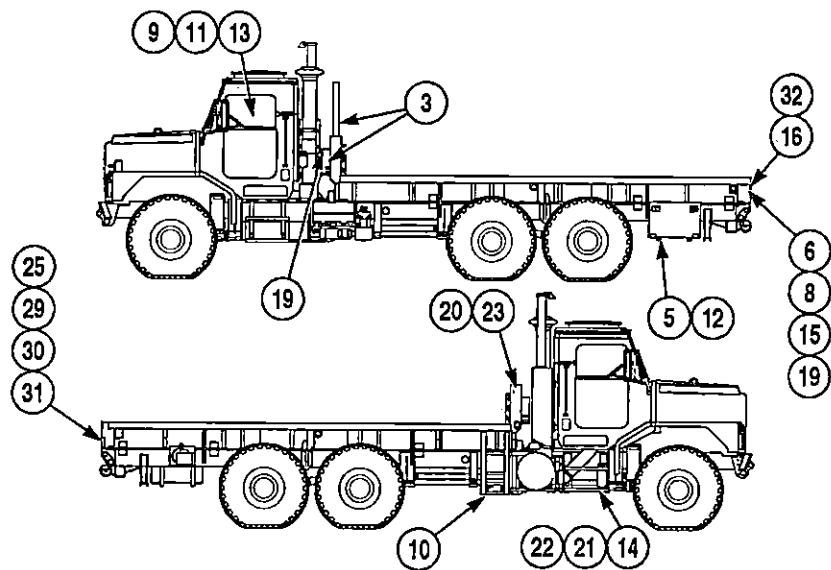
**General.**

Figure 1. Equipment Stowed On Vehicle (Mk27 And Mk28).

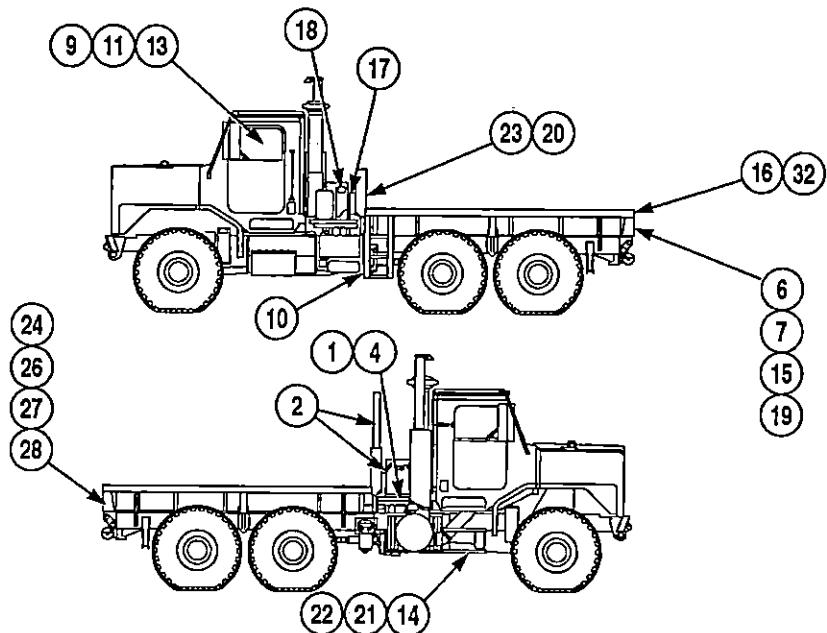


Figure 2. Equipment Stowed on Vehicle (MK23 and MK25).

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE TRANSPORTABILITY REQUIREMENTS

### Scope

This Work Package provides transportability guidance for the shipment of the 7-Ton Truck via the following modes of transportation: Marine, Rail, Air, and Truck. It covers the technical and physical characteristics, prescribes materials and guidance required to prepare, load, tie down, and unload the vehicle.

### Planning

#### References

The following documents should be used when planning movement of the 7-Ton Truck.

- a. MTMCTEA Pamphlet 55-19, Tiedown Handbook for Rail Movements
- b. MTMCTEA Reference 55-20, Tiedown Handbook for Truck Movements
- c. MTMCTEA Reference 55-21, Lifting and Tiedown for US Military Helicopters
- d. MTMCTEA Reference 55-22, Marine Lifting and Lashing Handbook
- e. MTMCTEA Reference 55-24, Vehicle Preparation Handbook for Fixed Wing Air Movements
- f. MTMCTEA Reference 70-1, Transportability & Deployability for Better Strategic Mobility
- g. MTMCTEA Reference 700-2, Logistics Handbook for Strategic Mobility Planning
- h. MTMCTEA Reference 700-5, Deployment Planning Guide

### Equipment and Materials

The following equipment and materials may be required to prepare the 7-Ton Truck for shipment and placing the vehicle back in operation. Prior to commencement of movement, inspect equipment for proper operation and current load tests if applicable.

- a. Tool Kit, Mechanic
- b. Refueler
- c. Shoring
- d. Hand Pump
- e. Empty 55 gallon drums or other suitable fuel container
- f. Crane
- g. Lifting Slings
- h. Spreader Bars (8 to 12 foot longitudinal spreader bar)
- i. Forklifts
- j. Banding materials and associated equipment
- k. Wire Rope (used to tiedown equipment)
- l. Wire Rope Clips (used with the wire rope)
- m. Rust Retardant Oil

## Planning - Continued

### Preparation Times

The time required to prepare, load, offload, and place the 7-Ton Truck back into operation will vary depending on existing conditions and personnel available. Time and personnel allotted to each transport mode are for planning purposes.

### Staging Areas

Ensure there are adequate equipment staging areas and traffic pattern to allow easy movement.

### VEHICLE RAMP CLEARANCE

The truck has an approach angle of 50°, departure angle of 36°, (20° for the XLWB), and under-body clearance (brake over angle) to permit negotiating ramps with inclination angles up to and exceeding 15° ramp. Standard 7-Ton Truck Ramp Crest Angle Figure and XLWB 7-Ton Truck Ramp Crest Angle Figure provide the ramp crest ramp angle for standard and extra long wheelbase (XLWB) 7-Ton Truck.

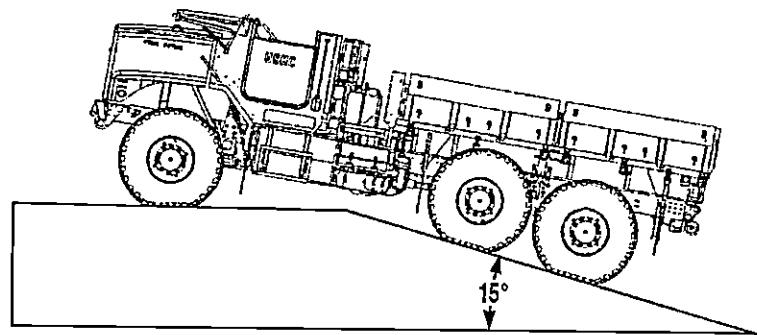


Figure 1. Standard 7-Ton Truck Ramp Crest Angle

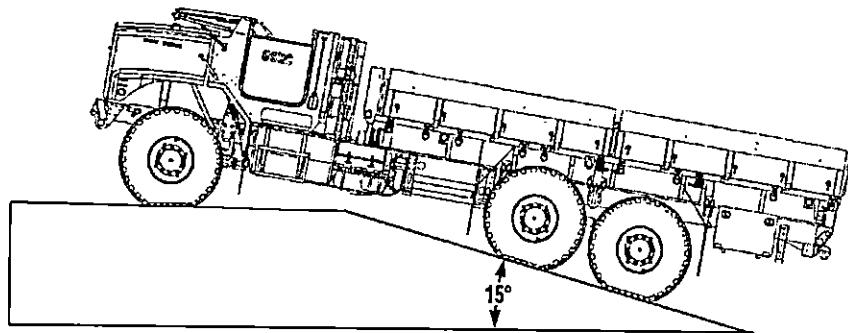


Figure 2. XLWB 7-Ton Truck Ramp Crest Angle

### VEHICLE TIEDOWN EYES

The 7-Ton Truck is equipped with four tiedown eyes. Two eyes are located in the front of the vehicle and two in the rear. Tiedown Eyes Figure shows location of tiedown eyes. The tiedown eyes are designed to support the weight of the vehicle loaded with a cross-country payload of 14,200 pounds. When securing the vehicle use only

### VEHICLE TIEDOWN EYES - Continued

the tiedown eyes. Do not use bumperettes, axles, towing pintles, or towing hooks as points of attachment. Each tiedown eye is designed to provide the strength listed in Tiedown Eye Strength Table.

*Table 1. Tiedown Eye Strength.*

	Yield	Ultimate
Fore and Aft	107,637 lbs (48,867 kg)	118,400 lbs (53754 kg)
Vertical	63,810 lbs (28,969 kg)	70,191 lbs (31,867 kg)
Lateral	48,229 lbs (21,896 kg)	53,052 lbs (24,085 kg)

Whenever possible, tie down the vehicles with chains. Chains to secure vehicle are normally provided by transporting organization. The size and number of tiedowns are determined by the gross weight of the vehicle. For specific instructions on the size and number of chains see the appropriate Handbook listed below:

- a. MTMCTEA Reference 55-22, Marine Lifting and Lashing
- b. MTMCTEA Pamphlet 55-19, Tiedown Handbook for Rail Movement
- c. MTMCTEA Reference 55-24, Vehicle Preparation Handbook for Fixed Wing Air Movements
- d. MTMCTEA Reference 55-20, Tiedown Handbook for Truck Movements

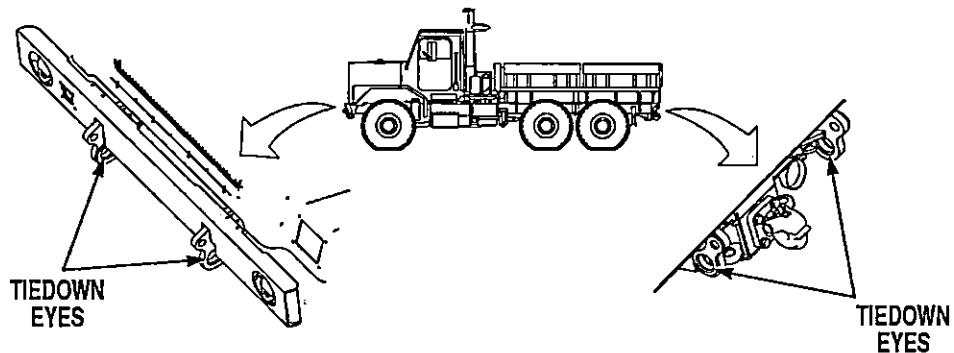


Figure 3. Tiedown Eyes

### VEHICLE LIFTING EYES

The vehicle has four lifting eyes, two at the engine cover on the front of the vehicle, and two between the rear-tandem axles, for lift-on/lift-off (LOLO) loading. Location of Lifting Eyes Figure shows location of lifting eyes. The lifting eyes are designed to support the weight of the vehicle loaded with a cross-country payload of 14,200 lbs (6,446 kg). LOLO loading can be accomplished using an 8 to 12 foot longitudinal spreader bar and slings at loads up to the full cross-country payload. 7-Ton Truck Rigged for Crane Lift Figure shows the 7-Ton Truck rigged for crane lift. Care must be taken to prevent the rear sling legs from contacting any cargo. Each lifting eye is designed to provide the strength listed in Lifting Eye Strength Table.

## VEHICLE LIFTING EYES - Continued

Table 2. *Lifting Eye Strength.*

Front Lifting Eyes		
	Static Load	Design Limit (2.3 Load Factor)
Vertical Force	8,062 lbs (3,660 kg)	18,542 lbs (8,418 kg)
Longitudinal Force	4,270 lbs (1,938 kg)	9,821 lbs (4,459 kg)
Lateral Force	1,500 lbs (681 kg)	3,450 lbs (1,566 kg)
Rear Lifting Eyes		
	Static Load	Design Limit (2.3 Load Factor)
Vertical Force	9,674 lbs (4,392 kg)	22,457 lbs (10,195 kg)
Longitudinal Force	2,190 lbs (994 kg)	5,038 lbs (2,287 kg)
Lateral Force	16,899 lbs (7,672 kg)	38,868 lbs (17,646 kg)

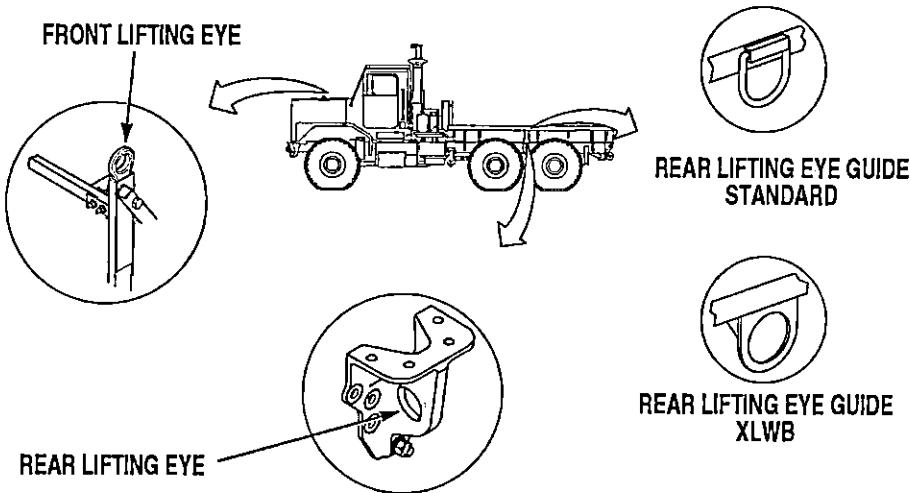


Figure 4. Location of Lifting Eyes

## VEHICLE LIFTING EYES - Continued

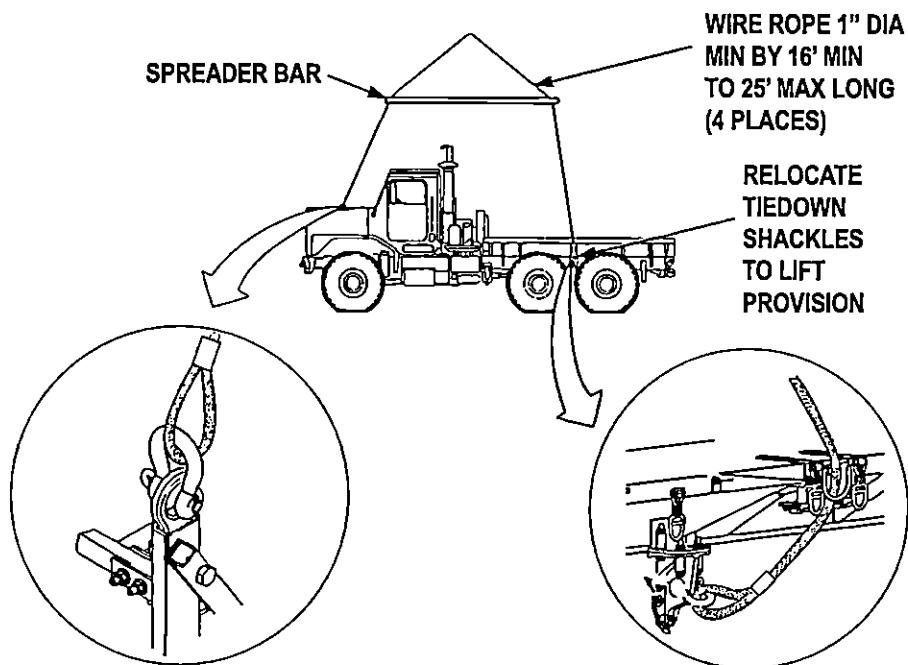


Figure 5. 7-Ton Truck Rigged for Crane Lift

## HAZARDOUS MATERIALS

Some modes of transportation require identification of hazardous material being shipped. Accordingly, the 7-Ton Truck in its operational and shipment configuration contains the following hazardous material:

1. Battery, wet, filled with acid, 8, UN2794, PGIII

**Hazard:** Battery acid and hydrogen gas from battery use. The vehicle uses two (2) batteries during normal operations. Four (4) batteries may be used for cold weather starting. Do not short out the battery terminals. Do not smoke or use open flames near batteries. Batteries may explode from a spark. Battery acid is harmful to skin and eyes.

2. Compressed gasses, Flammable, N.O.S., 2.1, UN1954, (ether)

**Hazard:** Ether starting fluid. The vehicle uses a single 21-ounce cylinder. Ether starting fluid is toxic and extremely flammable. Do not store containers in the cab and do not breathe the fumes. Do not puncture or burn the containers, even when empty.

3. Diesel Fuel, 3, NA1993, PGIII

**Hazard:** Vehicle fuel, diesel. The vehicle has a single 80-gallon fuel tank and fuel system lines. Diesel fuel is toxic and flammable.

4. Methyl alcohol, 3, UN1230, PGII

**Hazard:** Windshield washer fluid (40% methyl alcohol). The vehicle has a single, four-quart container. Methyl alcohol is poisonous if taken internally. High contact exposure or heavy inhalation should be avoided.

5. Ethylene glycol monobutyl ether, 6.1, UN2369, PGIII

## HAZARDOUS MATERIALS - Continued

**Hazard:** Antifreeze, engine coolant. The vehicle uses 40.5 quarts of ethylene glycol based antifreeze. Antifreeze is poisonous if taken internally. High contact exposure or heavy inhalation should be avoided.

### 6. Petroleum Oil, 3, NA1270, PG III

**Hazard:** Lubricating Oils: The engine uses various lubricating oils. Refer to Lubrication Instruction (WP 0111). Petroleum is toxic and flammable.

## PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT

### NOTE

- All the items removed to achieve the reduced height can be removed using onboard Basic Issue Items (BII) tools in approximately 30 minutes.
- The 7-Ton Truck may be operated with the vehicle in the reduced height configuration to facilitate loading the vehicle into transport platform.
- Contact Second Echelon Maintenance for armored cab height reduction procedures.

**1. Scope** This task covers the procedures to prepare the 7-Ton Truck for shipment. The 7-Ton Truck must be configured to a reduced height of 98 in. (249 cm) for marine transport, rail transport (in NATO countries and Korea only), air transport by a C-130 and C-141, and by tractors using the M870 semi-trailer. The 7-Ton Truck does not need to be reduced to 98 in. (249 cm) for air transport by helicopter and the C-5, or by rail within the continental United States.

### NOTE

- This procedure requires two personnel and the adjustable wrench, Allen wrench, and pliers from Basic Issue Items (BII) box.
- Prior to performing this task, the machine gun mount must be removed and stowed as required.
- Prior to performing this task, the cargo body cover, bows, staves, and backrests must be removed and stowed in cab, cargo body, or stowage box as required.

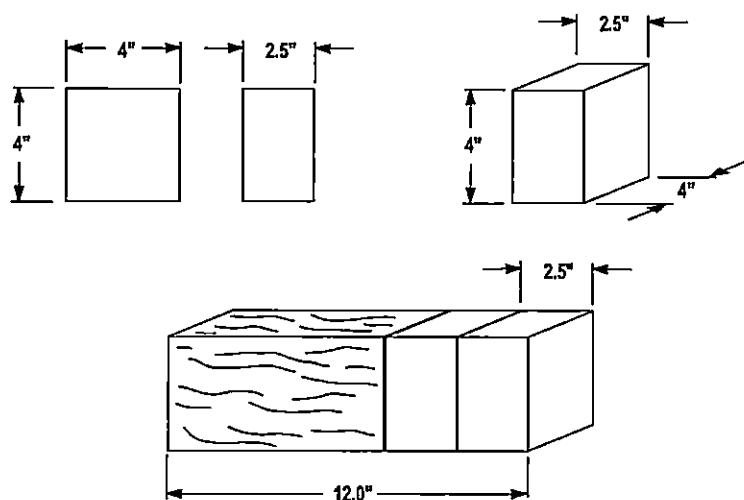
**2. Shipment Preparation** The following procedure must be performed when a reduced height is required for shipment.

**3. Bill of Material for Reducing Vehicle Height for Shipment** Cab height reduction blocks bill of material table lists the material required to construct two cab height reduction blocks to reduce the cab height on the 7-Ton Truck. Two cab height reduction blocks are required for each vehicle. Construct cab height reduction blocks as shown in cab height reduction blocks figure.

*Table 3. Cab Height Reduction Blocks Bill of Material.*

Shoring type	Description	Qty
Cab height reduction blocks	Lumber, 4 x 4 x 12 in. (10 x 10 x 30 cm)	1

## PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT - Continued



NOTE: A 7" ALLOWANCE IS PROVIDED FOR SAFETY WHILE CUTTING

Figure 6. Cab Height Reduction Blocks

**NOTE**

Prior to performing step (4), CTIS must be set and stabilized to Highway setting (WP 0043).

4. Lowering Vehicle for Transport

- Position one tire ramp (1) in front of each tire (2) on No. 2 axle.

**WARNING**

Both tires on No. 2 axle need to be properly centered over tire ramps. This includes both centered side-to-side and front-to-rear directions. This will keep tires from sliding off ramps while installing limp home struts. Failure to comply may result in injury or death to personnel.

- Start engine (WP 0029).

## PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT - Continued

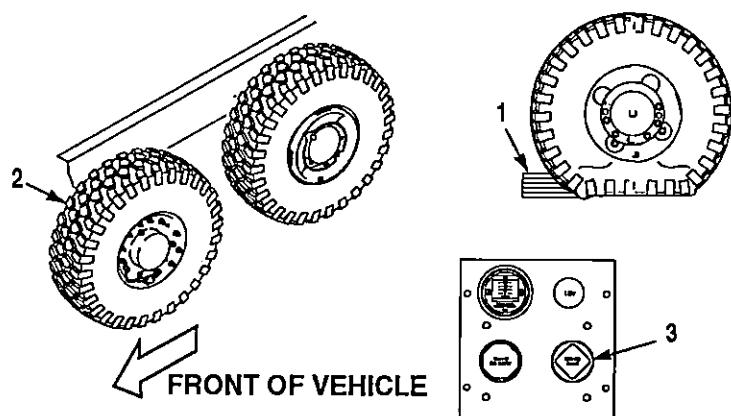


Figure 7.

- c. Drive vehicle forward to position and center two tires (2) on tire ramps (1).
- d. Apply parking brake (3) and shut off engine (WP 0035).

**CAUTION**

When installing limp home strut, bend of strut must be at bottom and point away from spring. Failure to comply may result in damage to equipment.

**NOTE**

Both limp home struts are installed the same way.

- e. Install limp home struts (4), two washers (5), and nuts (6) on control arm (7) and spring bracket (8) of No. 2 axle on right side of vehicle. Tighten nuts (6) securely.

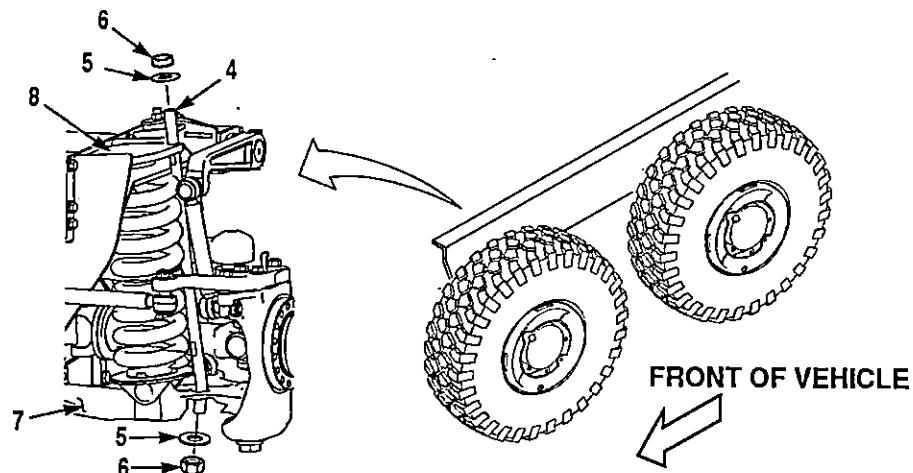


Figure 8.

- f. Repeat step (e) for left side of vehicle.

## PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT - Continued

g. Start engine (WP 0029) and release parking brake (3).

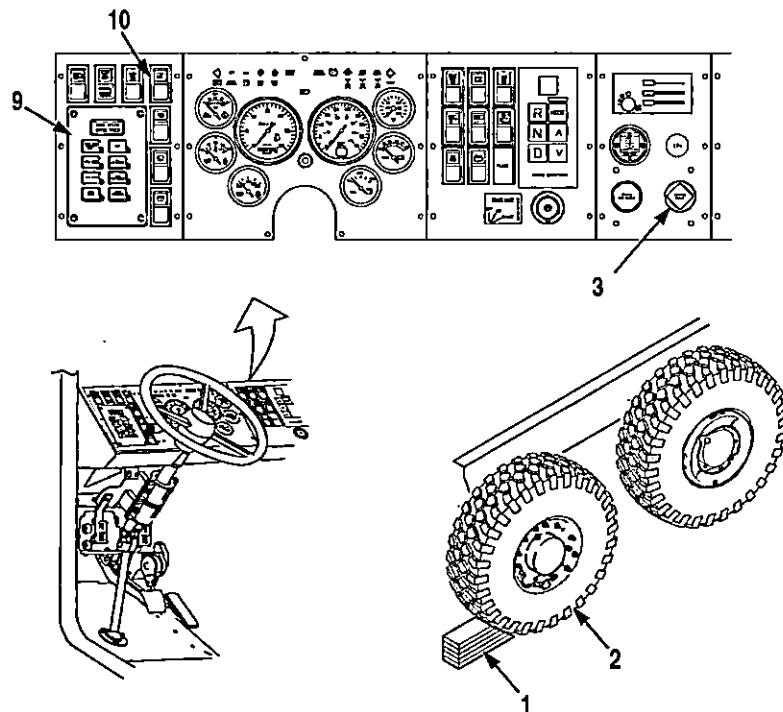


Figure 9.

h. Drive vehicle until tires (2) are off tire ramps (1) and apply parking brake (3).  
 i. Set CTIS controller (9) to EMER (emergency) position and 0-2 TONS position (WP 0043).

## NOTE

- CTIS must be stabilized at EMER (emergency) setting prior to performing step (i).
- When the CTIS OFF switch is ON, the CTIS controller will display a FIVE LIGHTS FLASHING fault code (WP 0043, CTIS Controller Displays) four minutes after turning the CTIS OFF switch ON.

j. Position CTIS OFF switch (10) in the UP or ON position.  
 k. Shut off engine (WP 0035).  
 l. Remove two valve caps (11) from valves (12) of tires (2) on No. 2 axle.

**PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT - Continued****WARNING**

Valve cores will be under pressure. Do not allow personnel to be in front of valves when removing valve cores. Remove valve cores slowly. Failure to comply may result in injury to personnel.

- m. Using valve core removal tool, remove two valve cores (13) from valves (12) of tires (2) on No. 2 axle.

**NOTE**

All air pressure must be depleted from tires prior to performing step (n).

- n. Using valve core removal tool, install two valve cores (13) in valves (12) of tires (2) on No. 2 axle.

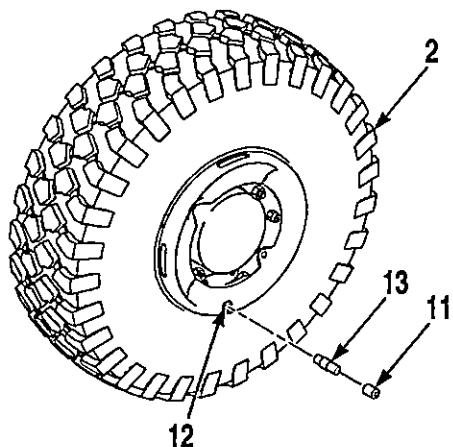


Figure 10.

- o. Install two valve caps (11) in valves (12) of tires (2) on No. 2 axle.

## PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT - Continued

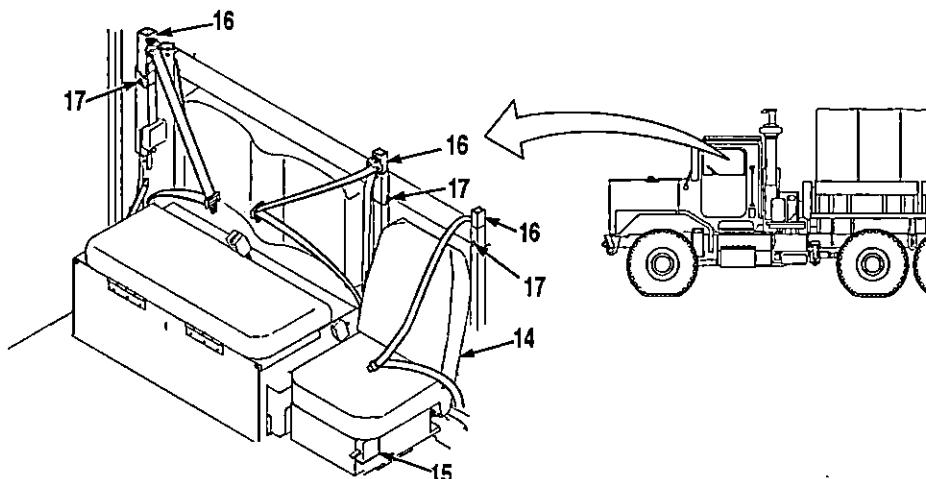


Figure 11.

- p. Position air seat (14)-to lowest position using height adjustment switch (15).
- q. Adjust three seat belt columns (16) to lowest position by removing clip (17). After seat belt columns are lowered, install clip (17).
- r. Loosen clamp (18) on air intake stack (19) and hump hose (20).

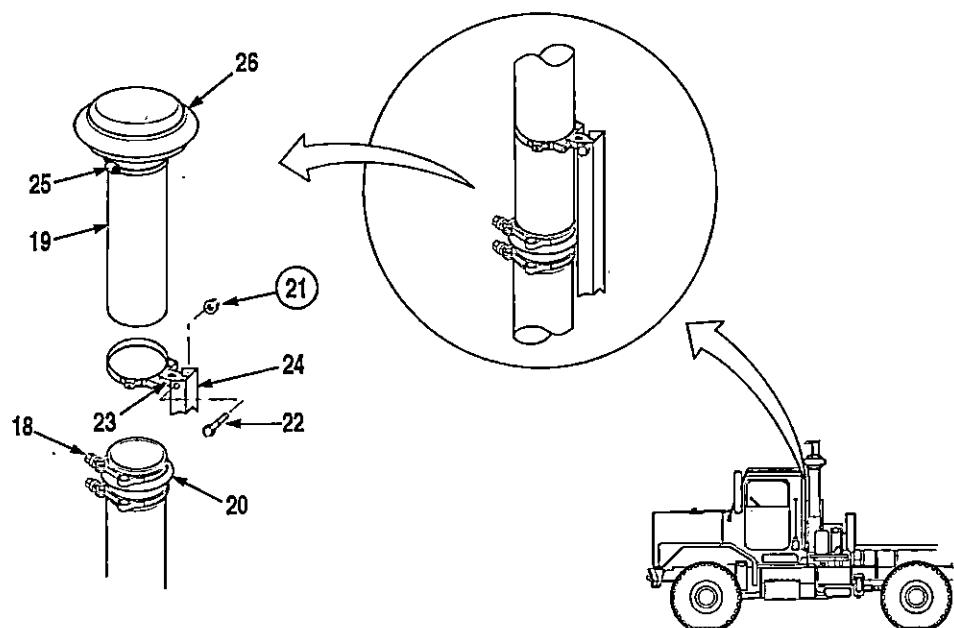


Figure 12.

- s. Remove two locknuts (21) and screws (22) from clamp (23) and bracket (24).
- t. Remove air intake stack (19), clamp (18), and clamp (23) from hump hose (20) and bracket (24).

## PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT - Continued

- u. Reinstall two screws (22) and locknuts (21) on clamp (23).
- v. Loosen clamp (25) on air intake stack (19) and air intake cap (26).
- w. Remove air intake cap (26) and clamp (25) from air intake stack (19). Store air intake stack (19) inside cargo body.
- x. Position clamp (18) on hump hose (20).

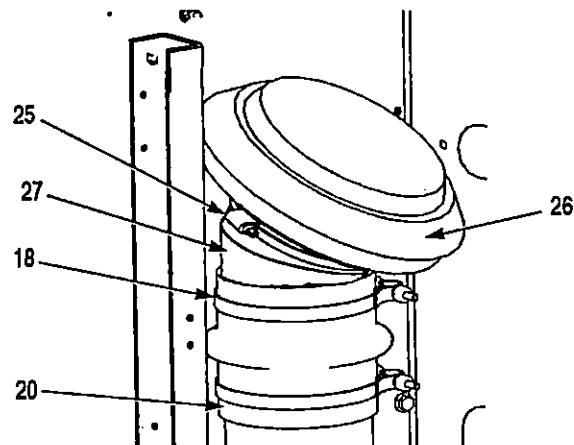


Figure 13.

- y. Install air intake adapter (27) in hump hose (20) and secure with clamp (18).
- z. Position clamp (25) on air intake adapter (27).
- aa. Install air intake cap (26) on air intake adapter (27) and secure with clamp (25).
- ab. Remove washer hose (28) from fitting (29).

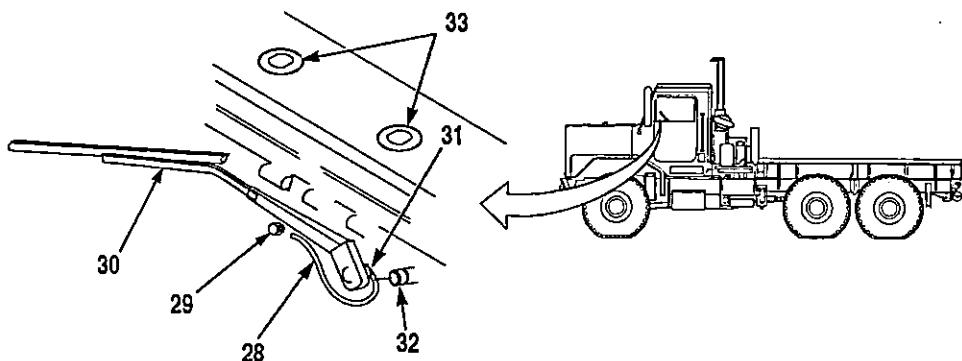


Figure 14.

- ac. Raise wiper arm (30).

## PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT - Continued

- ad. Press lever (31) and remove wiper arm (30) from shaft (32).
- ae. Repeat Steps (ab) thru (ad) for other wiper arm (30).
- af. Close defroster flaps (33).
- ag. Turn four allen screws (34) counterclockwise approximately 180° in four latches (35) to release rear wall (36).

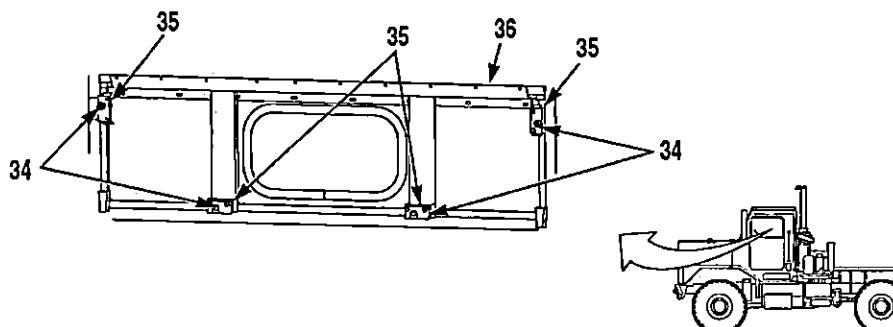


Figure 15.

### NOTE

Roof will need to be raised approximately 1 ft. (30 cm) to allow rear wall to be folded in.

- ah. Fold rear wall (36) inside cab and latch rear wall (36) to cab ceiling (37) with two latches (38).

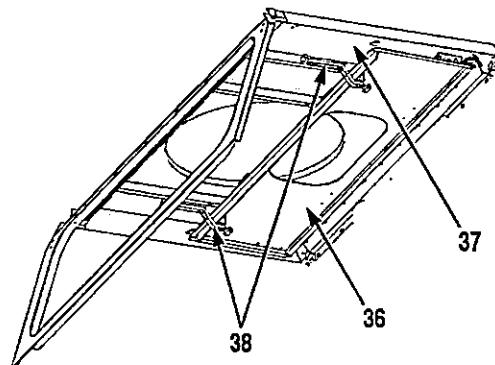


Figure 16.

### NOTE

If assistance is required for removal of cable ties, contact Second Echelon Maintenance.

- ai. Remove cable ties from latches (39).

## PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT - Continued

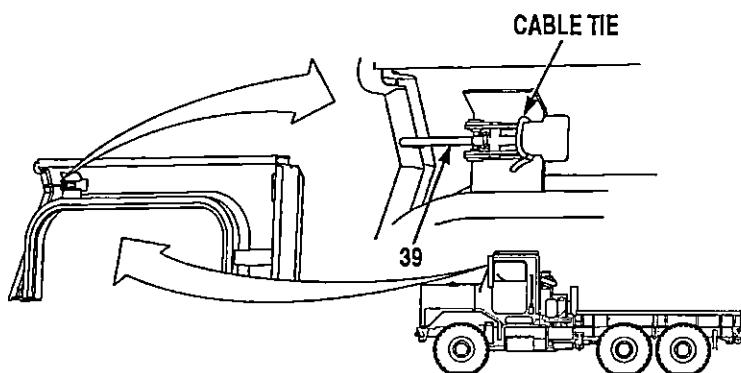


Figure 17.

- aj. Release two latches (39) in upper front corners of cab.

**CAUTION**

Do not lower cab roof completely until after cab height reduction blocks are inserted.  
Failure to comply may result in damage to equipment.

- ak. With the aid of an assistant, lift cab roof (40), slide forward until cab roof (40) is positioned over hood (41)

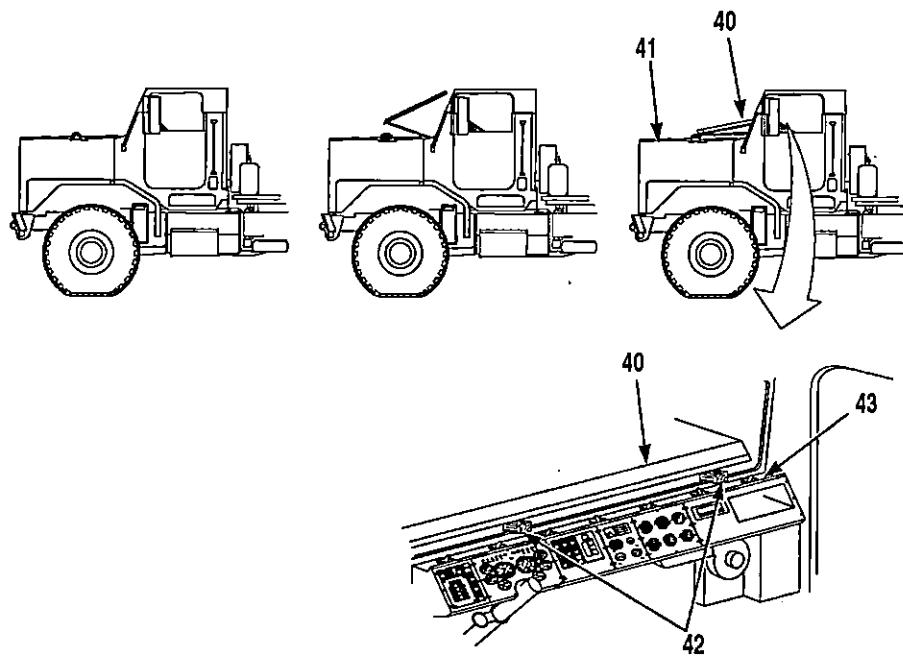


Figure 18.

## PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT - Continued

**CAUTION**

Ensure cab height reduction blocks are not resting on the defroster ducts or the rear window. Failure to comply may result in damage to equipment.

- al. Insert two cab height reduction blocks (42) under edge of cab roof (40) between defroster ducts (43).
- am. Roll down cab door windows (44).

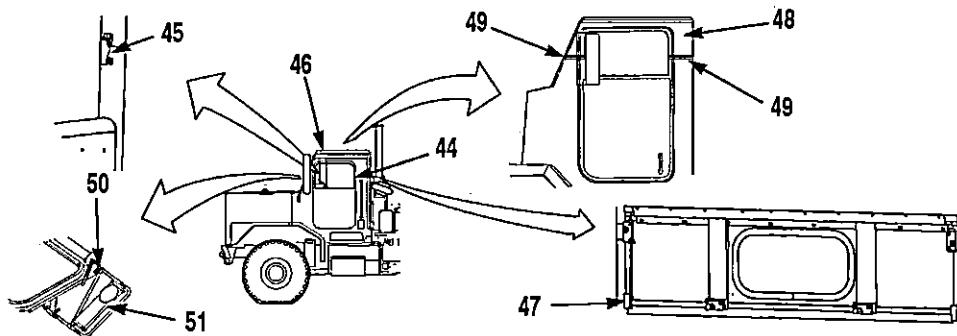


Figure 19.

- an. Release two latches (45) on cab doors (46) and fold top of doors (46) down.
- ao. Release two latches (47).

**WARNING**

When lowering cab side walls, walls will become detached from cab. Remove with care to prevent damage to equipment and possible injury to personnel.

- ap. Lower cab side walls (48) down 90° and remove from tracks (49). Store cab side walls (48) inside cargo body.
- aq. Pull mirror assemblies (50) downward. Rotate two mirrors (51) 180° until mirrors face inward.
- ar. If ladder is mounted on tailgate, remove and attach ladder to side of cargo bed (WP 0049).

**WARNING**

Muffler and exhaust stack may still be hot. Allow muffler and exhaust stack to cool. Failure to comply may result in serious injury to personnel.

## PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT - Continued

- as. Remove clamp (52) and exhaust stack (53) from muffler (54). Store exhaust stack (53) inside cargo body.

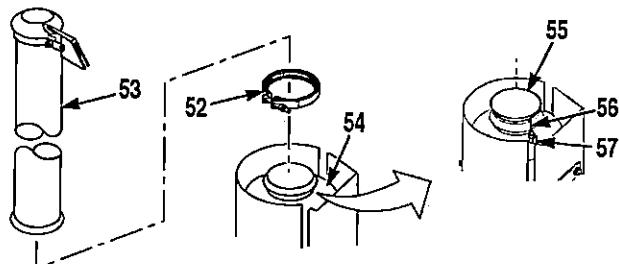


Figure 20.

- at. Install clamp (52) on muffler (54).
- au. Install rain cap (55) in exhaust part of muffler (54).
- av. Attach loose end of tether (56) to muffler tab (57).

### Raising Vehicle After Transport

1. Position cab side walls (48) in tracks (49) at 90° to sides of cab. Align and raise cab side walls (48) and secure with latches (47) located on rear of cab.

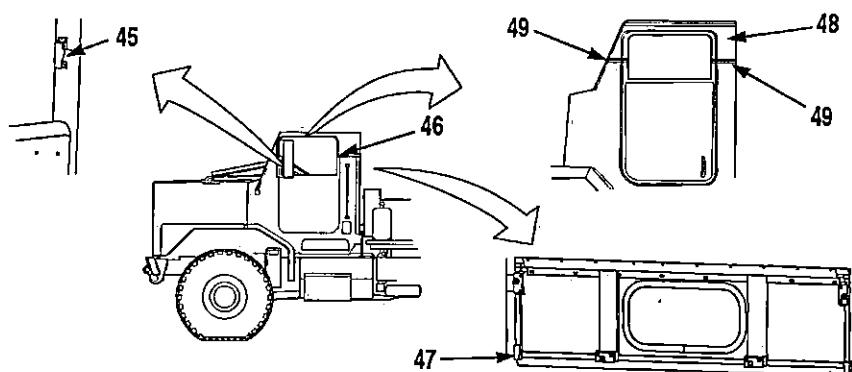


Figure 21.

2. Position top of doors (46) in upward position and secure with latches (45).

### CAUTION

Once cab height reduction blocks are removed, cab roof must be supported and not allowed to rest on the hood. Failure to comply may result in damage to equipment.

3. Remove two cab height reduction blocks (42) from between defroster ducts (43).

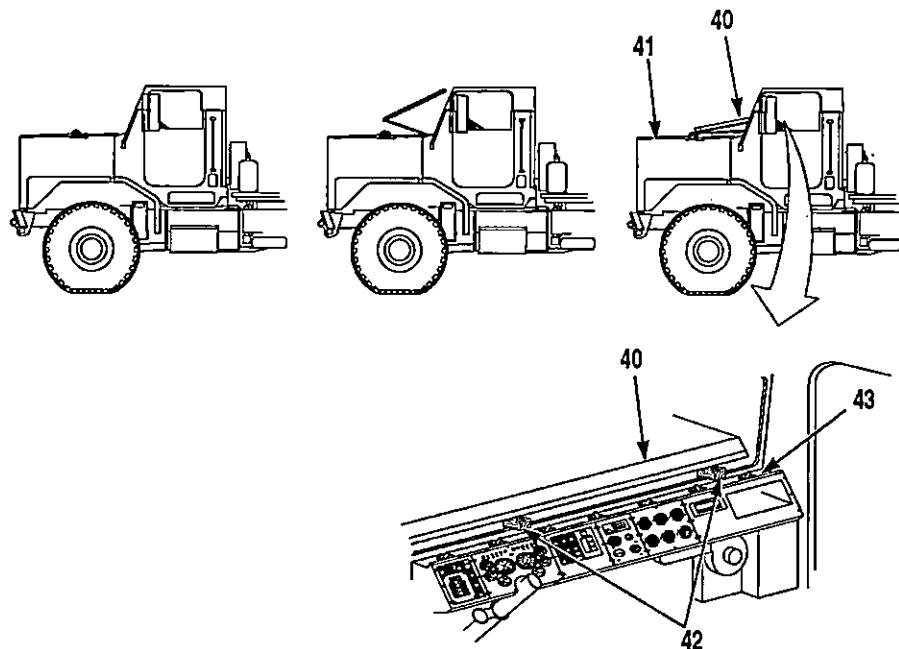
**Raising Vehicle After Transport - Continued**

Figure 22.

**CAUTION**

While raising cab roof, ensure wires do not bind or become pinched. Failure to comply may result in failure of equipment.

**NOTE**

While raising cab roof, ensure wires in front left corner of cab are fully positioned in corner between door frame and windshield frame.

4. With the aid of an assistant, lift cab roof (40), and slide toward rear until cab roof (40) is properly positioned over cab side walls.
5. Secure cab roof to cab side walls with latches (39) located in upper front corners of cab.

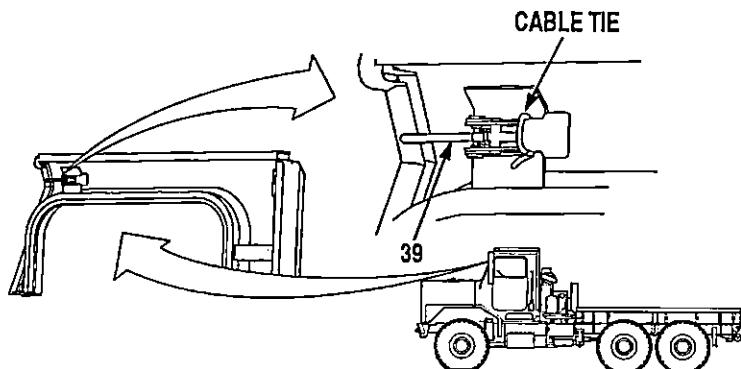
**Raising Vehicle After Transport - Continued**

Figure 23.

**NOTE**

Contact Second Echelon Maintenance for replacement cable tie.

6. Install cable ties on latches (39).

**WARNING**

Rear wall must be supported prior to releasing from latches. Failure to comply may result in injury to personnel.

7. Open latches and carefully lower rear wall (36).

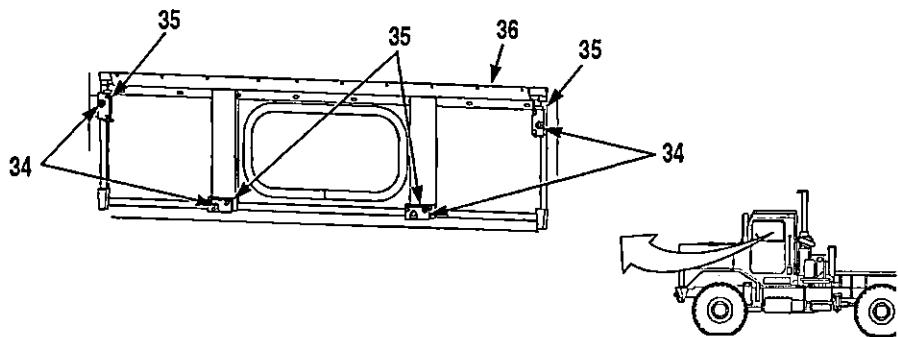


Figure 24.

**NOTE**

Roof will need to be raised approximately 1 ft. (30 cm) to allow rear wall to be positioned on rear of cab.

### Raising Vehicle After Transport - Continued

8. Position rear wall (36) against rear of cab.
9. Secure rear wall (36) by turning four allen screws (34) clockwise approximately 180° in latches (35).
10. Position mirrors in proper driving position (WP 0028).
11. Press lever (31) and install wiper arm (30) on shaft (32).

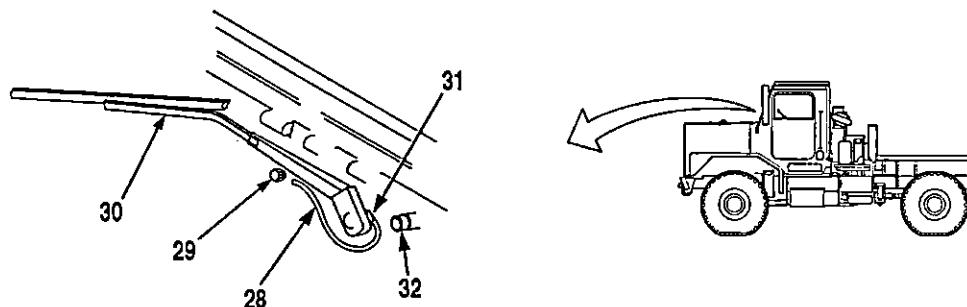


Figure 25.

12. Position wiper arm (30) against windshield.
13. Install hose (28) on fitting (29).
14. Repeat steps (11) through (13) for other wiper arm (30).
15. Remove air intake cap (26) and clamp (25) from air intake adapter (27).

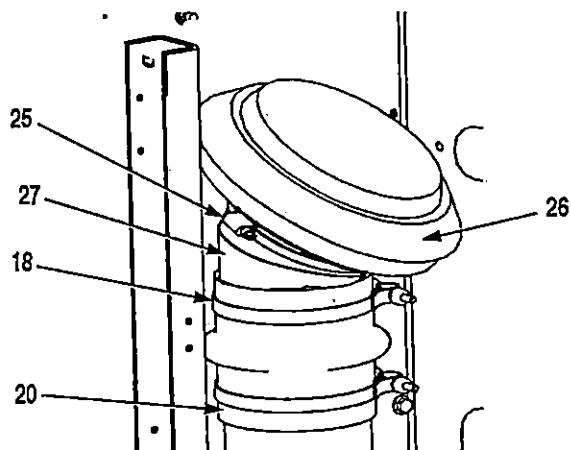


Figure 26.

16. Remove clamp (18) and air intake adapter (27) from hump hose (20).
17. Install air intake cap (26) on air intake stack (19) with clamp (25).
18. Remove two screws (22) and locknuts (21) from clamp (23).

## Raising Vehicle After Transport - Continued

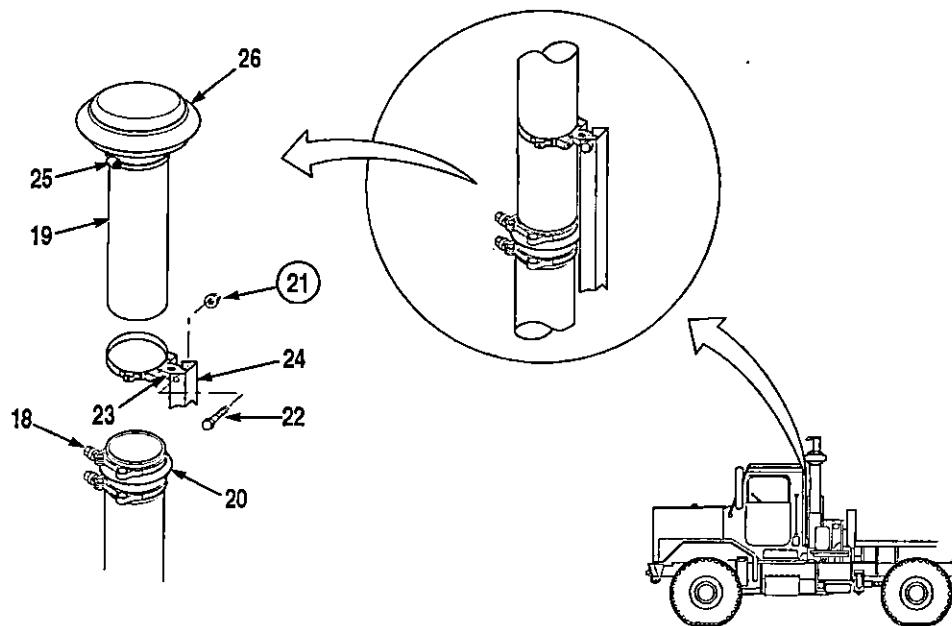


Figure 27.

19. Position clamp (18) on hump hose (20).
20. Position air intake stack (19) in hump hose (20).
21. Secure air intake stack (19) and clamp (23) to bracket (24) with two screws (22) and locknuts (21).
22. Secure air intake stack (19) in hump hose (20) with clamp (18).
23. Remove tether (56) from muffler tab (57).

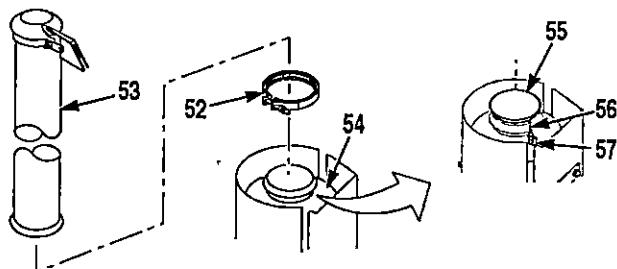


Figure 28.

24. Remove rain cap (55) from muffler (54).
25. Remove clamp (52) from muffler (54).
26. Install exhaust stack (53) on muffler (54) with clamp (52).
27. Adjust three seat belt columns (WP 0028) as required.

**Raising Vehicle After Transport - Continued****NOTE**

When the CTIS OFF switch is ON, the CTIS controller will display a FIVE LIGHTS FLASHING fault code (WP 0043, CTIS Controller Displays) four minutes after turning the CTIS OFF switch ON.

28. Start engine (WP 0029).
29. Position CTIS OFF switch (10) in the DOWN of OFF position.

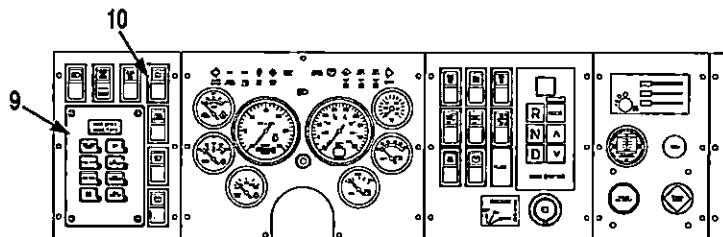


Figure 29.

30. Set CTIS controller (9) to HWY position (WP 0043).

**NOTE**

CTIS must be stabilized at HWY (highway) setting prior to performing step (33).

31. Position one tire ramp (1) in front of each tire (2) on No. 2 axle.

**WARNING**

Both tires on No. 2 axle need to be properly centered over tire ramps. This includes both centered side-to-side and front-to-rear directions. This will keep tires from sliding off ramps while installing limp home struts. Failure to comply may result in injury or death to personnel.

32. Start engine (WP 0029).

### Raising Vehicle After Transport - Continued

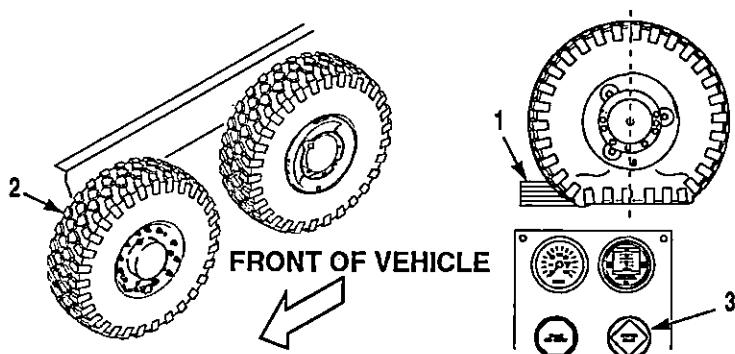


Figure 30.

33. Drive vehicle forward to position and center two tires (2) on tire ramps (1).
34. Apply parking brake (3) and shut off engine (WP 0035).

#### NOTE

Both limp home struts are removed the same way.

35. Remove two nuts (6), washers (5), and limp home strut (4) from control arm (7) and spring bracket (8) of No. 2 axle on right side of vehicle.

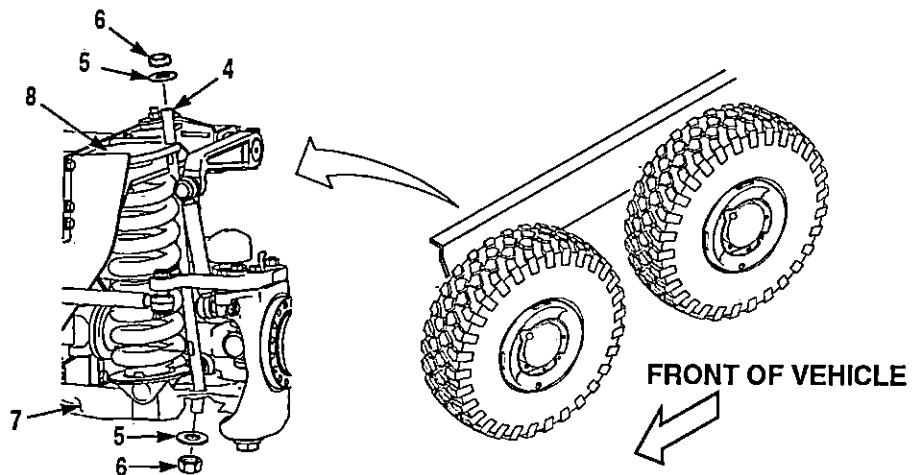


Figure 31.

36. Repeat step (35) for left side of vehicle.
37. Start engine (WP 0029) and release parking brake (3).
38. Adjust driver's seat as required (WP 0028).
39. Drive vehicle until two tires (2) are off tire ramps (1) and apply parking brake (3).

### Raising Vehicle After Transport - Continued

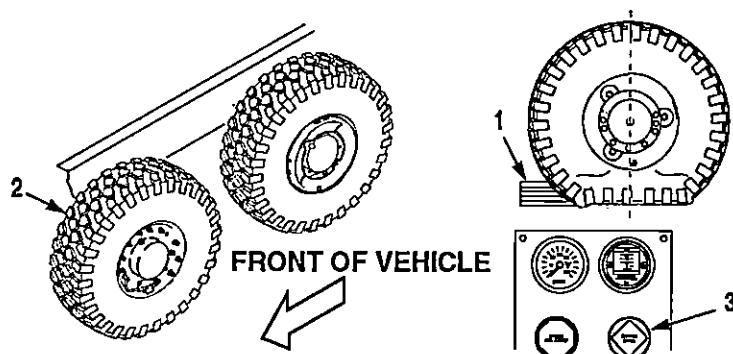


Figure 32.

40. If vehicle will not be immediately operated, shut off engine (WP 0035).

### SHIPPING DATA

Figures 33 through 48 provide Shipping Data Plate illustrations for the 7-Ton Cargo variations with and without SRW and with and without armor. The overall height of the vehicles can change as a result of the cargo weight and CTIS setting. The maximum shipping weight of the 7-Ton Cargo Truck is the same as its cross-country gross vehicle weight (CCGVW). The cross-country GVW of the standard bed cargo truck with Self-Recovery Winch (SRW) is 43,451 lbs (19,726 kg) and XLWB cargo truck with SRW is 45,556 lbs (20,682 kg).

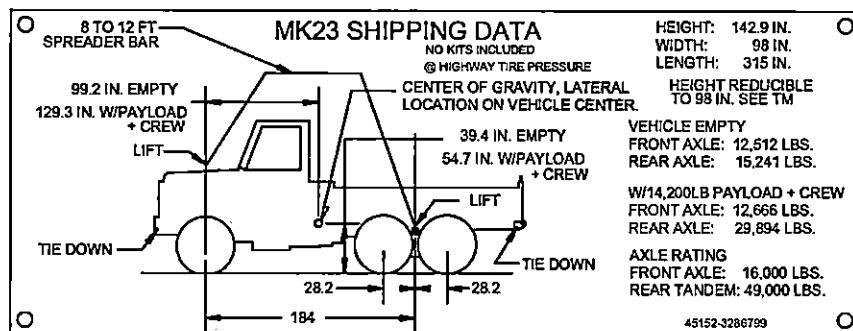


Figure 33. 7-Ton Truck Shipping Data Plate without SRW

## SHIPPING DATA - Continued

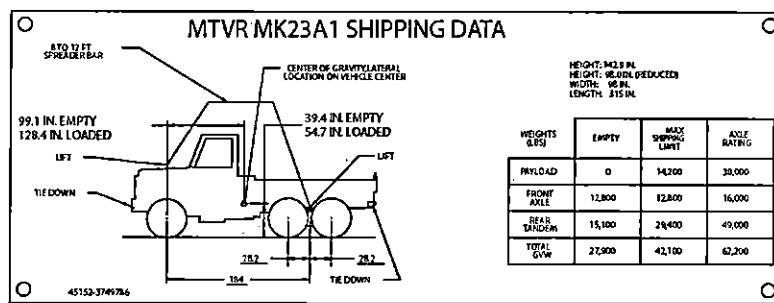


Figure 34. 7-Ton Truck (Armor Ready) Shipping Data Plate without SRW

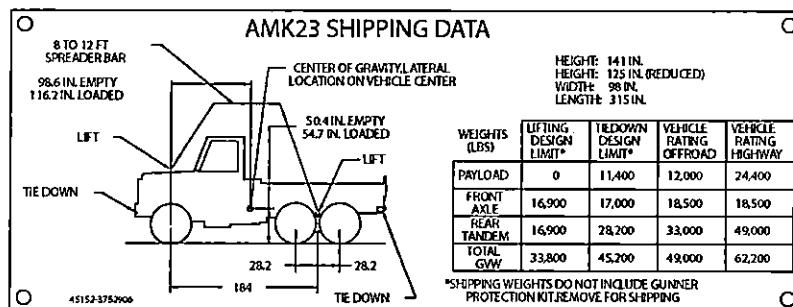


Figure 35. 7-Ton Truck (with Non-Reducible Armor) Shipping Data Plate without SRW

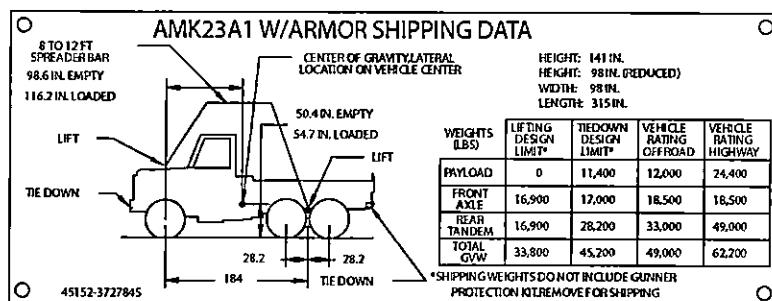


Figure 36. 7-Ton Truck (with Reducible Armor) Shipping Data Plate without SRW

**SHIPPING DATA - Continued**

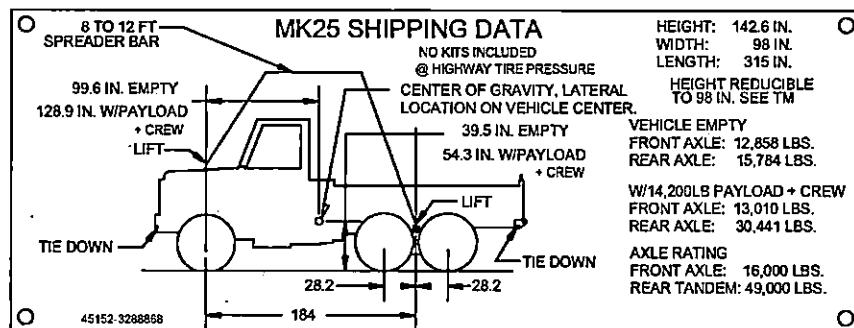


Figure 37. 7-Ton Truck Shipping Data Plate with SRW

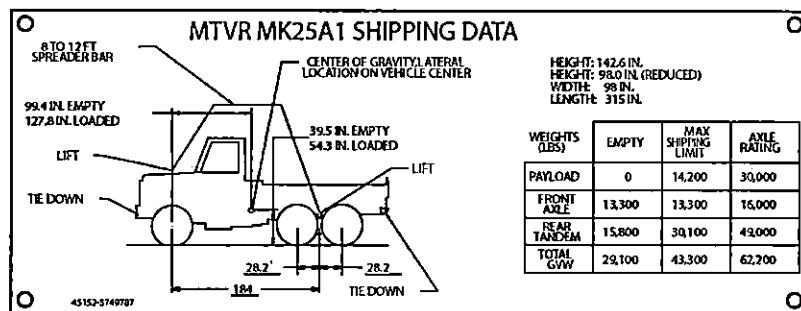


Figure 38. 7-Ton Truck (Armor Ready) Shipping Data Plate with SRW

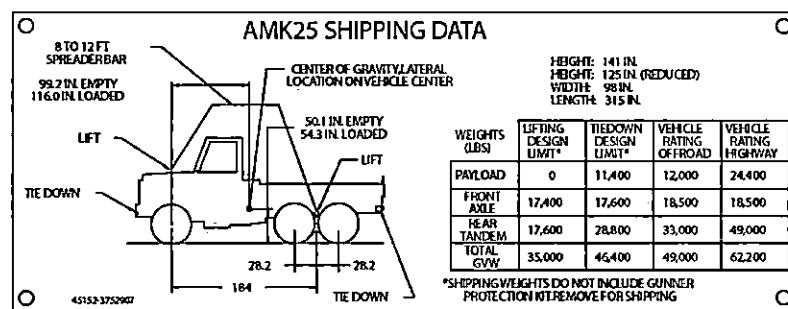


Figure 39. 7-Ton Truck (with Non-Reducible Armor) Shipping Data Plate with SRW

## SHIPPING DATA - Continued

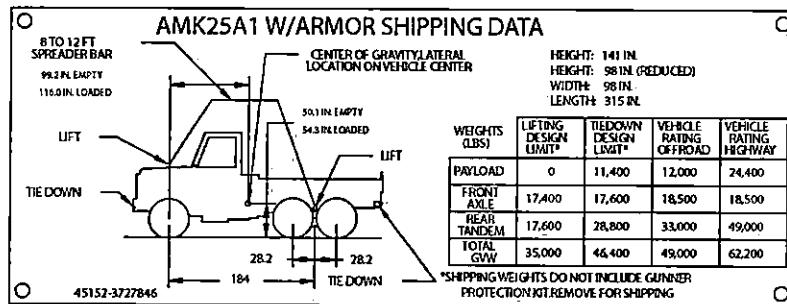


Figure 40. 7-Ton Truck (with Reducible Armor) Shipping Data Plate with SRW

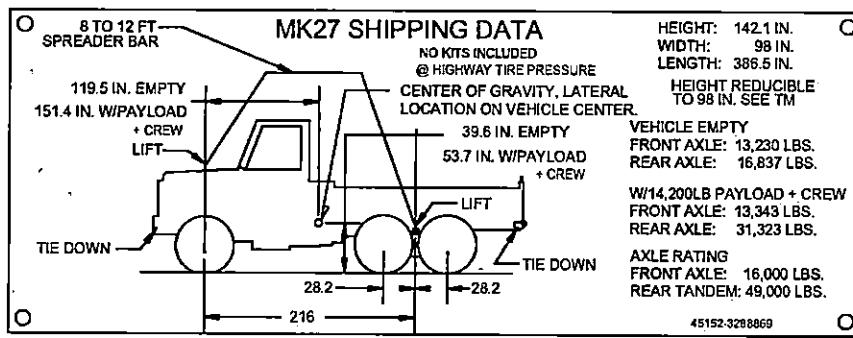


Figure 41. XLWB Truck Shipping Data Plate without SRW

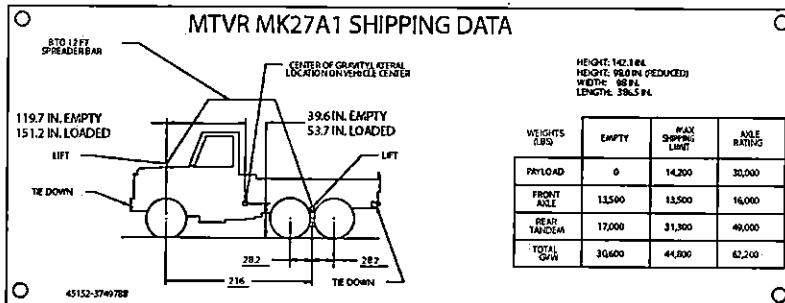


Figure 42. XLWB (Armor Ready) Shipping Data Plate without SRW

## SHIPPING DATA - Continued

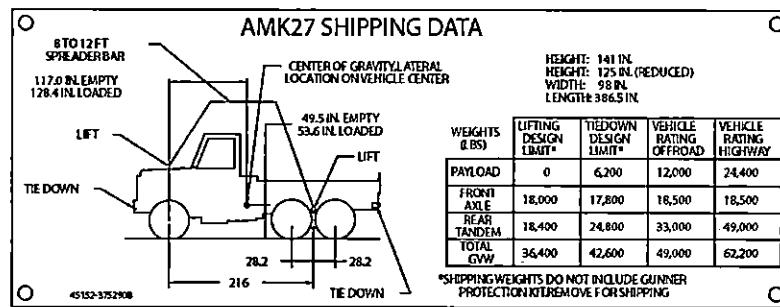


Figure 43. XLWB (with Non-Reducible Armor) Shipping Data Plate without SRW

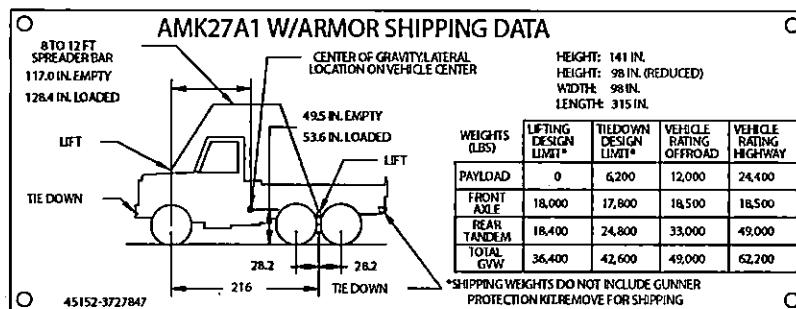


Figure 44. XLWB (with Reducible Armor) Shipping Data Plate without SRW

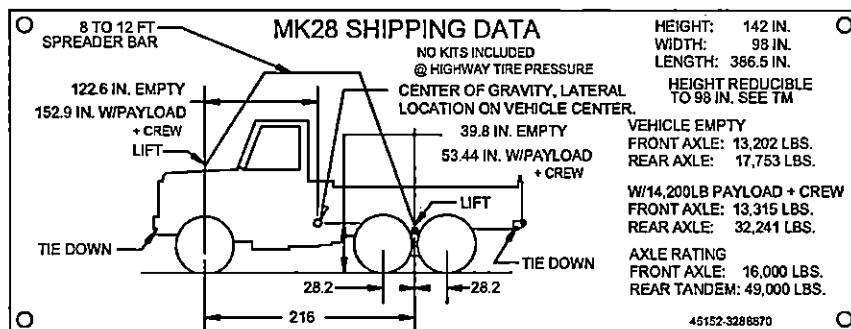


Figure 45. XLWB Truck Shipping Data Plate with SRW

## SHIPPING DATA - Continued

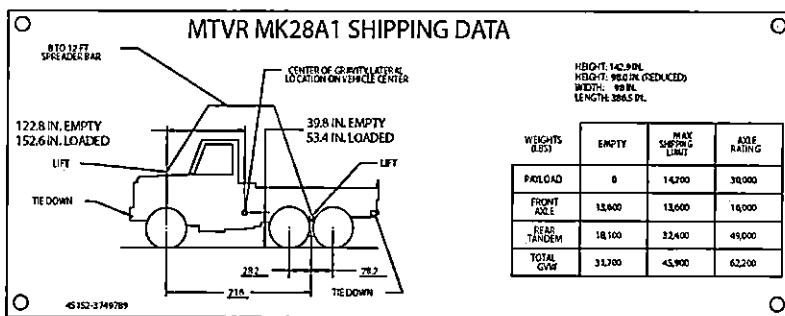


Figure 46. XLWB (Armor Ready) Shipping Data Plate with SRW

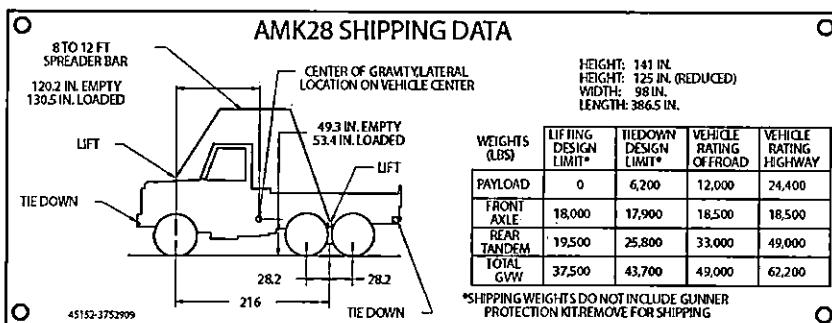


Figure 47. XLWB (with Non-Reducible Armor) Shipping Data Plate with SRW

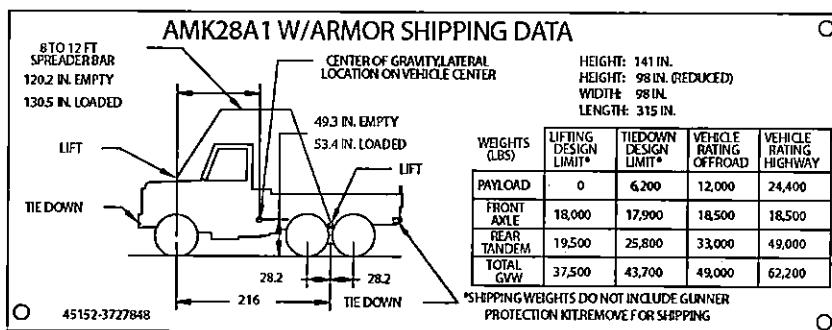


Figure 48. XLWB (with Reducible Armor) Shipping Data Plate with SRW

## MARINE TRANSPORT

## 1. General

The 7-Ton Truck may be shipped at full cross-country payload, reduced payload, or at curb weight by a variety of marine vessels. It can be loaded onto marine transportation assets by any of the following methods.

- Landing craft for beach onload and offload onto ships.

**MARINE TRANSPORT - Continued**

- b. Pier side via ramps or crane of adequate capacity.
- c. Loaded onto seagoing vessels by shore-side or floating cranes of adequate capacity.
- d. The vehicle can be loaded on roll-on/roll-off (RORO) vessels under its own power or be towed.

2. **Safety**

- a. All vessel equipment and gear should be inspected before use.
- b. All stevedore slings and other items used in loading and unloading operations should be checked for their condition and capacity.
- c. All other precautionary measures and safety regulations peculiar to loading/unloading site or terminal will be observed.
- d. Use guides when moving the vehicle aboard ship.
- e. The slope of ramp to flight deck ramp of LPD 4/7 is too steep and not suitable for XLWB variants transit.

3. **Preparation for Marine Transport**

The following preparation procedures are required:

- a. Inspect the vehicle for leaks, damage, and proper operation of the 7-Ton Truck; repair as required.
- b. Coordinate with ship to get any shoring requirements. Fabricate shoring as required.
- c. Ensure cargo in the bed is properly secured.
- d. Remove and stow cargo cover and bows, if required.

**NOTE**

When the 7-Ton Truck is loaded on vessels that are adequately ventilated by power blowers, such as those commonly found on Navy amphibious ships or roll-on/roll-off (RORO) ships, fuel tanks need not be drained.

- e. Check fuel level. Drain as necessary to meet requirements of transporting ship.
- f. Remove and stow Machine Gun Mount Kit, if equipped (contact Second Echelon Maintenance).
- g. If required, lubricate windshield hinges (WP 0111) and reduce vehicle height (PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT) to 98 in. (249 cm). Ensure cargo in the truck bed does not exceed 98 in. (249 cm) in height.
- h. Protect the windshield.
- i. Remove and stow ladder from tailgate if installed on tailgate (WP 0049).
- j. Make sure all BII items are properly stowed.

4. **Preparation Times**

Time/Personnel Requirements to Load 7-Ton Truck Aboard Various Marine Transports Table below lists the estimated preparation times and personnel required to load one 7-Ton Truck aboard various Marine Transports. Preparation personnel consists of the driver and an assistant to lower the cab. The loading and unloading personnel consists of a driver, guide, and two personnel to tiedown the equipment.

**MARINE TRANSPORT - Continued****Table 4. Time/Personnel Requirements to Load 7-Ton Truck Aboard Various Marine Transports.**

Type of Ship	Preparation Personnel/Minutes	Loading Personnel/Minutes	Unloading Personnel/Minutes
LCAC	2 / 40 minutes	4 / 20 minutes	4 / 10 minutes
LCU	2 / 40 minutes	4 / 20 minutes	4 / 10 minutes
LHA/LHD	2 / 40 minutes	4 / 20 minutes	4 / 15 minutes
LPD	2 / 40 minutes	4 / 20 minutes	4 / 15 minutes
LSD	2 / 40 minutes		4 / 15 minutes
RORO	2 / 40 minutes	4 / 20 minutes	4 / 15 minutes

**5. Loading Aboard Ship****a. General Rules for Stowage.**

- (1) Whenever possible, the 7-Ton Truck should be transported below-deck for protection. If needed, the vehicle can be configured to its reduced height of 98 in. (249 cm) for marine transport.
- (2) For on-deck transport, the vehicle should be in the operation configuration for maximum protection from the environment.
- (3) Vehicle components should be properly identified as to location or disposition during shipment if not shipped on the vehicle.

**b. Lifting the Vehicle.** The vehicle has four lifting eyes, two at the engine cover on the front of the vehicle, and two between the rear-tandem axles, for lift-on/lift-off (LOLO) loading. LOLO loading can be accomplished using an 8 to 12 ft. (2.4-3.6m) longitudinal spreader bar and slings at loads up to the full cross-country payload. Care must be taken to prevent the rear sling legs from contacting any cargo.**c. Loading.**

- (1) A check must be made to ensure that the hatch girder and hold overhead clearance of the specified vessel is at least 145 in. (368 cm) for the unreduced 7-Ton Truck or 100 in. (254 cm) for the reduced 7-Ton Truck.
- (2) Drive or lift vehicle onto vessel.
- (3) Avoid stowing the vehicle athwart ship.
- (4) When vehicle is in position, place transmission in neutral and engage parking brake.
- (5) If air intake and exhaust stack were removed, seal off the openings from environment.
- (6) Turn the battery disconnect switch to OFF position to cut off power to vehicle systems.

**d. Securing the Vehicle.****WARNING**

Use only front and rear tiedown eyes to secure the vehicle. Do not use bumperettes, axles, towing pintles, or tow eyes as points of attachment. Failure to comply may result in death or injury to personnel or damage to equipment.

**MARINE TRANSPORT - Continued**

- (1) Using the tiedown eyes on the 7-Ton Truck, secure the vehicle to the deck with chains. See shipping data plate on vehicle or Vehicle Tiedown Eyes (VEHICLE TIEDOWN EYES) of this Work Package for location of tiedown eyes.
- (2) Cross tiedown chains to optimize lateral restraints.

**RAIL TRANSPORT****1. General**

The 7-Ton Truck does not need to be reduced in height for rail shipment within the continental United States; however, to stay within the Association of American Railroads (AAR) clearance envelope for tunnels, the exhaust and air intake stacks have to be removed and sealed from the environment. The vehicle at its reduced height of 98 in. (249 cm) is capable of unrestricted rail transport in NATO countries and Korea. FM 55-21, Rail Operations and Safety Rules, and MTMCTEA pamphlet 55-19, Tiedown Handbook for Rail Movements, provides detailed guidance for movement of the vehicle by rail.

**2. Safety**

- a. Loading ramp, spanners, and crane should be inspected before use.
- b. If loading via crane, inspect crane, slings, spreader bars, and other items used in lifting operations for the condition and capacity.
- c. Railcar brake should be set and railcar wheels chocked to prevent railcar movement during loading.
- d. Use railcar ground guides when loading vehicle. Guides should keep one rail car distance between train and vehicle being loaded.
- e. Use spanners strong enough to support the heaviest vehicle. When loading behind rail cars of unequal deck height, place dunnage under the spanners to prevent slipping.

**3. Preparation of Vehicle for Rail Movement**

- a. Set CTIS to HIGHWAY setting.
- b. Fold mirrors inward.
- c. If required, reduce vehicle height to 98 in. (249 cm). Procedures for Reducing Vehicle Height for Shipment (PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT) contains the procedures for reducing vehicle height.
- d. Make sure fuel tanks are not more than 3/4 full and gas cans are empty.
- e. Remove bows and canvas to prevent wind damage.
- f. Secure any equipment loaded into the bed of the truck.
- g. Remove the engine exhaust and air inlet extensions.
- h. Remove and stow ladder if located on tailgate (WP 0049).

**4. Preparation for Railcar**

- a. Inspect railcars to verify deck suitability. On chain equipped cars, locking channels should not be bent, and all chains and tightening devices should be operative. Loading teams should have rust retardant oil available to free frozen locking devices.
- b. Set PARKING BRAKE and chock railcar wheels to prevent movement while loading.
- c. Store unused chains in the channels to prevent damage when loading vehicles.
- d. Clean debris from locking channels on chain-equipped railcars to allow locking devices to be moved the length of the channel.

## RAIL TRANSPORT - Continued

### 5. Preparation Times

Time/Personnel Requirements to Load 7-Ton Truck Aboard Railcars Table below is the estimated preparation time and personnel required to load one 7-Ton Truck aboard railcar. Preparation personnel consists of the driver and an assistant to lower the cab. The loading and unloading personnel consists of a driver, guide, and two personnel to tiedown the equipment. The preparation time does not include fabrication of shoring (chock blocks and side bracing blocks).

*Table 5. Time/Personnel Requirements to Load 7-Ton Truck Aboard Railcars.*

Preparation Personnel/Minutes	Loading Personnel/Minutes	Unloading Personnel/Minutes
2 / 40 minutes	4 / 30 minutes	4 / 15 minutes

### 6. Bill of Materials for Rail Shipment

Chock Blocks and Side Bracing Blocks Bill of Material Table lists the material required to construct one set of chock blocks and side bracing blocks to transport one 7-Ton Truck by railcar. Eight (8) chock blocks and six (6) side bracing block are required for each vehicle. Construct chock blocks as shown in Chock Blocks For Rail Movement Figure. Construct side bracing blocks as shown in Side Bracing for Rail Movement Figure.

*Table 6. Chock Blocks and Side Bracing Blocks Bill of Material.*

Shoring Type	Description	Qty
Chock Blocks	Lumber, 6 x 8 x 72 in. (15 x 20 x 183 cm)	2
	Nails, 40-D	40
Side Bracing Blocks	Lumber, 2 x 4 x 36 in. (5 x 10 x 91 cm)	18
	Lumber, 2 x 6 x 36 in. (5 x 15 x 91 cm)	6
	Nails, 12-D	1 lb. (.45 kg)
	Nails, 20-D	1 lb. (.45 kg)

## RAIL TRANSPORT - Continued

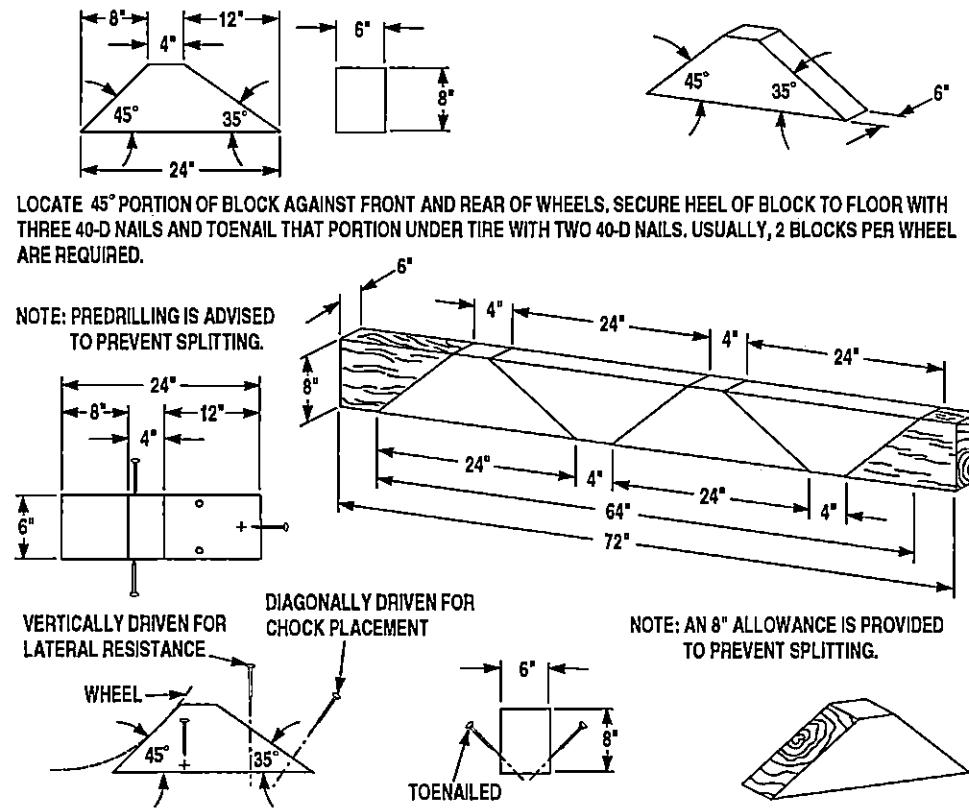


Figure 49. Chock Blocks for Rail Movement

## RAIL TRANSPORT - Continued

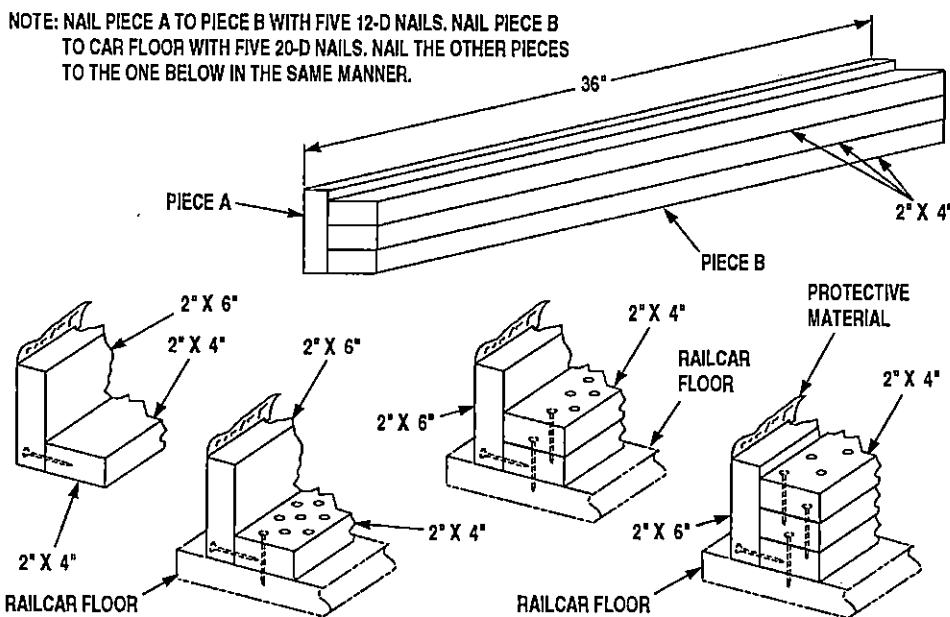


Figure 50. Side Bracing for Rail Movement

### 7. Loading Vehicle on Railcar

- The truck can be loaded on the railcar by use of a ramp and railcar spanners or crane. Procedures for crane lift are contained in Vehicle Lifting Eyes (VEHICLE LIFTING EYES).
- Use railcar ground guides when loading vehicles. Guides should keep one railcar distance between them and the vehicle being loaded. A guide should never walk backwards on a railcar onto which a second vehicle is being loaded. Before directing the loading of the second vehicle, the railcar guide should mount the loaded vehicle.
- When loading wheeled vehicles, use spanners strong enough to support the heaviest load anticipated and properly position them. When loading vehicles between railcars of unequal deck heights, be sure to place dunnage under the spanner to prevent it from slipping.
- Be sure to leave at least 10 in. (25 cm) between vehicles to avoid damage in transit and to obtain a proper angle of tiedown.
- Position transmission into neutral and set parking brake.

### 8. Securing Vehicle to Railcar

- Chock Blocks. One chock block per wheel placed in front and back of each single wheel and front and back of each tandem wheel assembly as shown in Side Bracing For Rail Movement Figure. Nail chock blocks into the deck of the railcar as indicated in Chock Blocks for Rail Movement Figure.
- Side Bracing Blocks. The outside of each tire requires side-bracing blocks as shown in Side Bracing for Rail Movement Figure. Nail side bracing blocks into the deck of the railcar as indicated in the Side Bracing Blocks for Rail Movement Figure.

## RAIL TRANSPORT - Continued

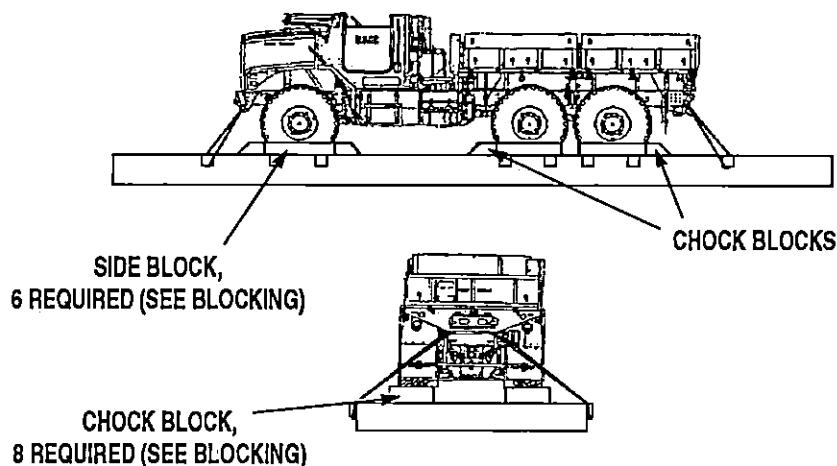


Figure 51. Side Bracing for Rail Movement

**WARNING**

Use only front and rear tiedown eyes to secure the vehicle. Do not use bumperettes, axles, towing pintles, or tow eyes as points of attachment. Failure to comply may result in death or injury to personnel or damage to equipment.

- c. The 7-Ton Truck is designed to allow rail transport with a 14,200 lb. (6,356 kg) payload when secured per MTMCTEA pamphlet 55-19, Tiedown Handbook for Rail Movements. The vehicle is equipped with tiedown eyes to secure it to the railcar. Two tiedown eyes at the front and two at the rear of the vehicle are provided. The cargo body deck is equipped with International Standards Organization (ISO) cargo container locks and 14 cargo tiedowns (22 for XLWB), each rated at 10,000 lbs. (4,540 kg); also, 10 tiedowns (14 for XLWB), each rated at 5,000 lbs. (2,270 kg) are provided to secure cargo to the vehicle body during rail transport. The 7-Ton Truck Tiedown for Rail Shipment Figure shows the 7-Ton Trucks tied down for rail transport.

## RAIL TRANSPORT - Continued

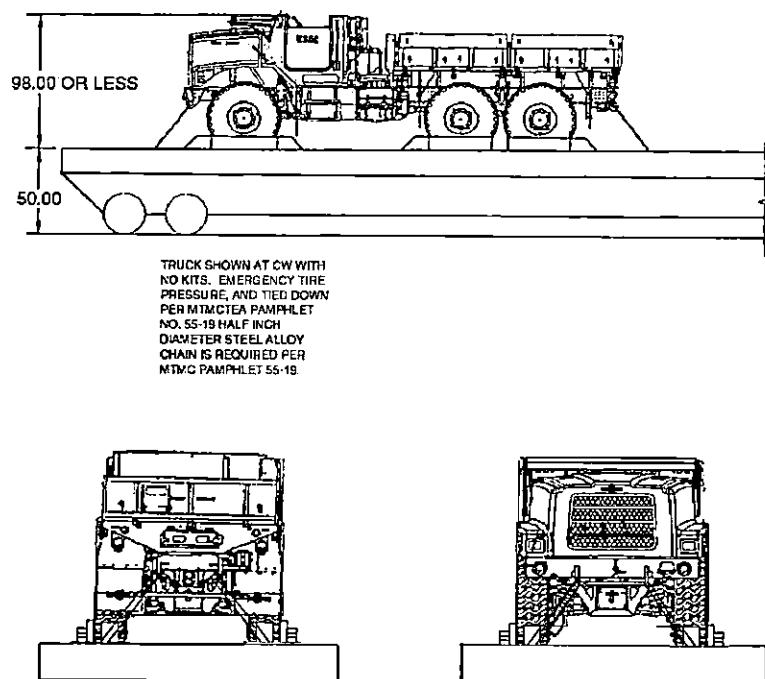


Figure 52. 7-Ton Truck Tiedown for Rail Shipment

- d. Both the STD, and the XLWB 7-Ton Trucks, with or without winches, can be reduced to 98 in. (249 cm) height at Cross Country Vehicle Weight (CCVW) with the tire pressure set at "Emergency". However the MTMCTEA Pamphlet No. 55-19, "Tiedown Handbook for Rail Movements", requires tires be set at "Highway" pressures for safety reasons, when being transported by rail. Tension wire rope to allow no more than 1 in. deflection when supporting the weight of a full-grown man. Tension chains to achieve a moderate deflection of the vehicle's suspension." Tying down either 7-Ton Truck variant at highway tire pressure by using a perpendicular force of a 175 lbs. (79 kg) man against the center of each of the tiedowns will allow the highest point of the trucks to below 98 in. (249 cm).
- e. When wire rope tiedowns are used to secure the truck, the diameter of the wire rope and number of complete loops required to secure the vehicle is determined by vehicle weight indicated in Wire Rope Requirements Table. MTMCTEA Pamphlet 55-19 provides additional information and complete tiedown instructions for wire rope.

Table 7. Wire Rope Requirements.

6 x 19 IWRC IPS Wire Rope		
Vehicle Weight Ranges (lb.)	Cable Size (Diameter, Inches)	Total No. of Cables (Complete Loop)
25,000 – 38,000	5/8	4
38,000 – 50,000	1/2	8

**RAIL TRANSPORT - Continued**

f. When tiedown chains are used to secure the truck, the diameter of the chain and the number of chains required are contained in Tiedown Chain Requirements Table. MTMCTEA Pamphlet 55-19 provides detailed instructions in the use of chains.

**Table 8. Tiedown Chain Requirements.**

Alloy Steel Chain			
Weight Range of Vehicles (lb.)	Dia. (In.)	Minimum Proof Test Value (lb.)	No. of Chains Required
25,000 - 40,000	1/2	27,500	4
40,000 - 55,000	1/2	27,500	8

**AIR TRANSPORT OF 7-TON TRUCK****1. General**

The C-130, C-141, C-17, and C-5 fixed wing cargo aircraft can transport the 7-Ton Truck. In addition, the standard wheelbase (STD WB) 7-Ton Truck without winch (MK23) can be transported externally by CH-53E helicopter.

**2. Safety**

- Do not drive vehicle under the wings of the aircraft.
- Do not drive a vehicle within 10 ft. (3.5 m) of the aircraft without a walking ground guide to observe clearance between vehicle and aircraft.
- Use ground guides when loading vehicle via ramps. Ensure ground guide keeps a safe distance from vehicle while loading.
- Warn personnel to stand clear of the aircraft during loading operations. Ensure personnel are in no danger during loading operations.
- Do not back vehicle towards or into aircraft without ground guides placed at the front and rear corners of the vehicle. Ground guides should not be directly in front or behind any moving vehicle. The aircraft loadmaster directs all backing.

**3. Preparation for Shipment by Aircraft**

The following preparation procedures are required for movement by cargo aircraft:

- Inspect the vehicle for leaks, damage, and proper operation of the 7-Ton Truck; repair as required.
- Fabricate shoring as required.
- Check fuel level. Drain as necessary to reduce fuel level to 1/4 full or less.
- Remove and stow Machine Gun Mount Kit if installed.
- Check height of vehicle against the cargo deck clearance for the type of aircraft being used. If required, lubricate windshield hinges (WP 0111) and reduce vehicle height (PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT) to 98 in. (249 cm). Ensure cargo in the truck bed does not exceed 98 in. (249 cm) in height.
- Ensure cargo in the truck bed is properly secured and does not exceed the height and weight limitations of aircraft type.
- Make sure all BII items are properly stowed.

**AIR TRANSPORT OF 7-TON TRUCK - Continued**

h. Hazardous materials such as the fuel, batteries, etc. must be identified and prepared for shipment aboard an aircraft in accordance with current Hazardous material movement regulations.

**4. Preparation Times**

Prep Time/Personnel Required to Load 7-Ton Truck on Aircraft Table lists estimated preparation times and personnel to load one 7-Ton Truck into an aircraft. Personnel consist of the aircraft loadmaster, truck driver, ground guide, and two personnel to secure vehicle in aircraft. The personnel for CH-53E external load are the hookup person, helicopter ground control signalman, radio operator, and vehicle operator. The preparation time does not include fabrication of shoring. Unit SOP determines personnel requirements.

*Table 9. Preparation Time/Personnel Required to Load 7-Ton Truck on Aircraft.*

Type of Aircraft	Preparation Personnel/Minutes	Loading Personnel/Minutes	Unloading Personnel/Minutes
C-130	2 / 60 minutes	4 / 30 minutes	4 / 20 minutes
C-141	2 / 60 minutes	4 / 30 minutes	4 / 20 minutes
C-17	2 / 60 minutes	4 / 30 minutes	4 / 20 minutes
C-5	2 / 60 minutes	4 / 30 minutes	4 / 20 minutes
CH-53E	2 / 60 minutes	4 / 30 minutes	2 / 10 minutes

**NOTE**

Truck can be operated in reduced configuration to assist loading operation.

**5. Loading**

Using the cargo aircraft ramp, drive the truck into the aircraft as directed by the aircraft loadmaster.

**6. Securing the Vehicle Aboard Aircraft**

The following procedures for securing the vehicle are used in all cargo aircraft.

- When vehicle is in position on the aircraft, place transmission in neutral and set parking brake.
- Ensure cargo in the bed is properly secured by banding, chains, cargo straps or ISO locks and does not exceed the height limitations of the cargo compartment of the cargo aircraft.
- Turn battery disconnect switch to OFF position.

**WARNING**

Use only front and rear tiedown eyes to secure the vehicle. Do not use bumperettes, axles, towing pintles, or tow eyes as points of attachment. Failure to comply may result in death or injury to personnel or damage to equipment.

- Using the two front and two rear tie down eyes on the 7-Ton Truck, secure the vehicle with chains to the aircraft cargo deck.
- MTMCTEA Reference 55-24, Vehicle Preparation Handbook for Fixed Wing Air Movements, provides detailed guidance on proper methods for preparing and securing vehicles in fixed wing aircraft.

**7. C-130 Cargo Aircraft Transport**

- General. One 7-Ton Truck at curb weight and prepared at reduced vehicle height as described in paragraph F-7. meets the size and weight limits of the C-130 aircraft. Prepare the truck as described.

**AIR TRANSPORT OF 7-TON TRUCK - Continued**

- b. Preparing the Truck. Prepare the truck as described in paragraph Preparation for Shipment by Aircraft. In addition, do the following:
  - (1) Remove and stow cargo cover and bows.
  - (2) Remove and stow cargo drop sides, seats, and seat backs.
  - (3) Remove and stow ladder from tailgate, if installed on tailgate.
  - (4) Remove and stow tailgate in bed of truck.
  - (5) Remove staves and stow in bed of truck.
  - (6) Set CTIS to mud/sand/snow (WP 0043).
- c. Aircraft Preparation. To insure the axle loads of the 7-Ton Truck do not exceed load design of ramp, approach shoring and ramp support shoring is required to keep the ramp angle at 7.25 degrees. Shoring is required to unload the aircraft once the aircraft arrives at its destination. Accordingly, the shoring must also be at aircraft destination or taken with the vehicle aboard the C-130 aircraft.
- d. Bill of materials for Air shipment. BOM for Approach and Ramp Shoring for C-130 Aircraft Table lists material that is required to construct a set of approach and ramp shoring for one C-130 aircraft. If shoring is not taken with equipment, an additional set will be required at aircraft destination.

## AIR TRANSPORT OF 7-TON TRUCK - Continued

Shoring Type	Description	Qty
Approach Ramp	Plywood, $\frac{1}{2} \times 11\frac{1}{2} \times 40$ in. (1.27 x 29 x 102 cm)	4
	Lumber, $2 \times 12 \times 44\frac{1}{4}$ in. (5 x 30 x 112 cm)	4
	Lumber, $2 \times 12 \times 48\frac{1}{2}$ in. (5 x 30 x 123 cm)	4
	Lumber, $2 \times 12 \times 52\frac{3}{4}$ in. (5 x 30 x 134 cm)	4
	Lumber, $2 \times 12 \times 57$ in. (5 x 30 x 145 cm)	4
	Lumber, $2 \times 12 \times 61\frac{1}{4}$ in. (5 x 30 x 156 cm)	4
	Lumber, $2 \times 12 \times 65\frac{1}{2}$ in. (5 x 30 x 166 cm)	4
	Lumber, $2 \times 12 \times 69\frac{3}{4}$ in. (5 x 30 x 177 cm)	4
	Lumber, $2 \times 12 \times 74$ in. (5 x 30 x 188 cm)	4
	Lumber, $2 \times 12 \times 78\frac{1}{4}$ in. (5 x 30 x 199 cm)	4
	Lumber, $2 \times 12 \times 82\frac{1}{2}$ in. (5 x 30 x 210 cm)	4
	Lumber, $2 \times 12 \times 86\frac{3}{4}$ in. (5 x 30 x 220 cm)	4
	Lumber, $2 \times 12 \times 91$ in. (5 x 30 x 231 cm)	4
	Lumber, $2 \times 12 \times 96$ in. (5 x 30 x 244 cm)	4
	Nails, 12-D	2028
Ramp Support	Lumber, $2 \times 10 \times 18$ in. (5 x 25 x 46 cm)	26
	Plywood, $\frac{1}{2} \times 9\frac{1}{2} \times 18$ in. (1.27 x 24 x 46 cm)	2
	Nails, 12-D	156

Figure 53. BOM for Approach and Ramp Shoring for C-130 Aircraft.

e. Ramp Support Shoring. Construct one ramp support by constructing two of the following shoring blocks.

Nail thirteen (13),  $2 \times 10 \times 18$  in. (5 x 25 x 46 cm) boards and one (1)  $\frac{1}{2} \times 9\frac{1}{2} \times 18$  in. (1.27 x 24 x 46 cm) plywood together using twelve (12) 12-D nails on each board and plywood (refer to Ramp Support Shoring).

## AIR TRANSPORT OF 7-TON TRUCK - Continued

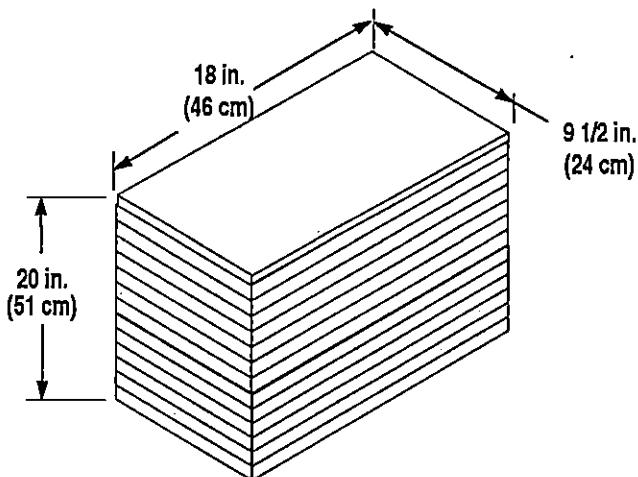


Figure 54. Ramp Support Shoring.

f. Approach Shoring. Construct two approach shorings by constructing four of the following approach shoring ramps.

- (1) Nail 2 x 12 x 91 in. (5 x 30 x 231 cm) board on top of 2 x 12 x 96 in. (5 x 30 x 244 cm) board with 57 nails.
- (2) Nail 2 x 12 x 86 3/4 in. (5 x 30 x 220 cm) board on top of 2 x 12 x 91 in. (5 x 30 x 231 cm) board with 54 nails.
- (3) Nail 2 x 12 x 82 1/2 in. (5 x 30 x 210 cm) board on top of 2 x 12 x 86 3/4 in. (5 x 30 x 220 cm) board with 51 nails.
- (4) Nail 2 x 12 x 78 1/4 in. (5 x 30 x 199 cm) board on top of 2 x 12 x 82 1/2 in. (5 x 30 x 210 cm) board with 48 nails.
- (5) Nail 2 x 12 x 74 in. (5 x 30 x 188 cm) board on top of 2 x 12 x 78 1/4 in. (5 x 30 x 199 cm) board with 45 nails.
- (6) Nail 2 x 12 x 69 3/4 in. (5 x 30 x 277 cm) board on top of 2 x 12 x 74 in. (5 x 30 x 188 cm) board with 42 nails.
- (7) Nail 2 x 12 x 65 1/2 in. (5 x 30 x 166 cm) board on top of 2 x 12 x 69 3/4 in. (5 x 30 x 177 cm) board with 39 nails.
- (8) Nail 2 x 12 x 61 1/4 in. (5 x 30 x 156 cm) board on top of 2 x 12 x 65 1/2 in. (5 x 30 x 166 cm) board with 36 nails.
- (9) Nail 2 x 12 x 57 in. (5 x 30 x 145 cm) board on top of 2 x 12 x 61 1/4 in. (5 x 30 x 156 cm) board with 33 nails.
- (10) Nail 2 x 12 x 52 3/4 in. (5 x 30 x 134 cm) board on top of 2 x 12 x 57 in. (5 x 30 x 145 cm) board with 30 nails.
- (11) Nail 2 x 12 x 48 1/2 in. (5 x 30 x 123 cm) board on top of 2 x 12 x 52 3/4 in. (5 x 30 x 134 cm) board with 27 nails.
- (12) Nail 2 x 12 x 44 1/4 in. (5 x 30 x 112 cm) board on top of 2 x 12 x 48 1/2 in. (5 x 30 x 123 cm) board with 24 nails.

## AIR TRANSPORT OF 7-TON TRUCK - Continued

(13) Nail  $1\frac{1}{2}$  x  $11\frac{1}{2}$  x 40 in. (1.27 x 29 x 102 cm) plywood on top of 2 x 12 x 44  $\frac{1}{4}$  in. (5 x 30 x 112 cm) board with 21 nails.

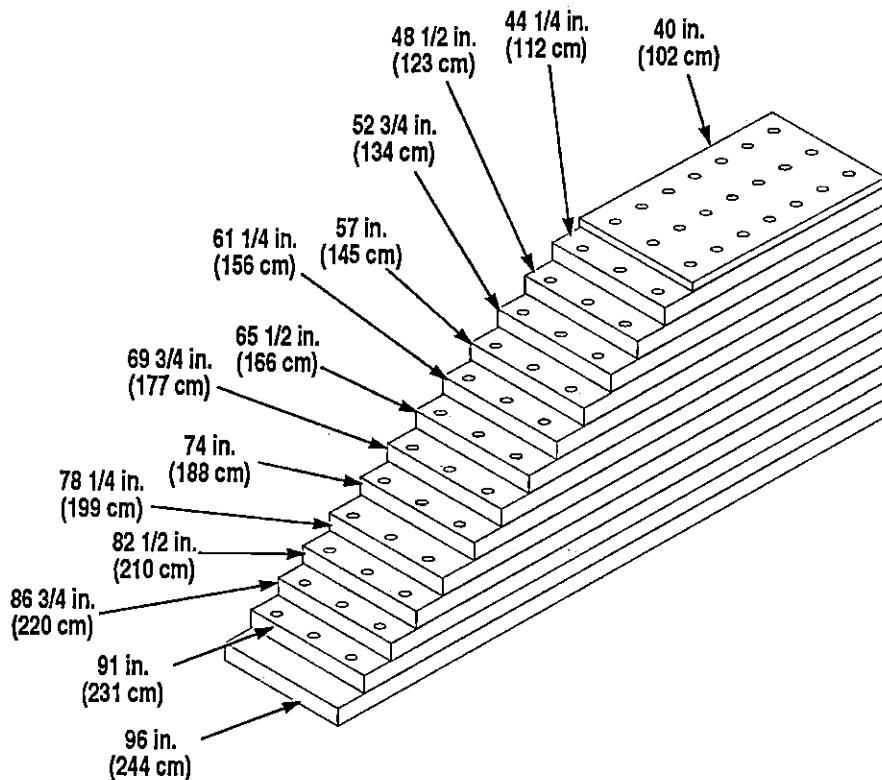


Figure 55. Approach Shoring.

g. Placement of Shoring. Place the support shoring at the end of the ramp. The approach shoring is to be tapered, and extended behind the auxiliary ground ramp as shown in the Placement of Shoring figure.

## AIR TRANSPORT OF 7-TON TRUCK - Continued

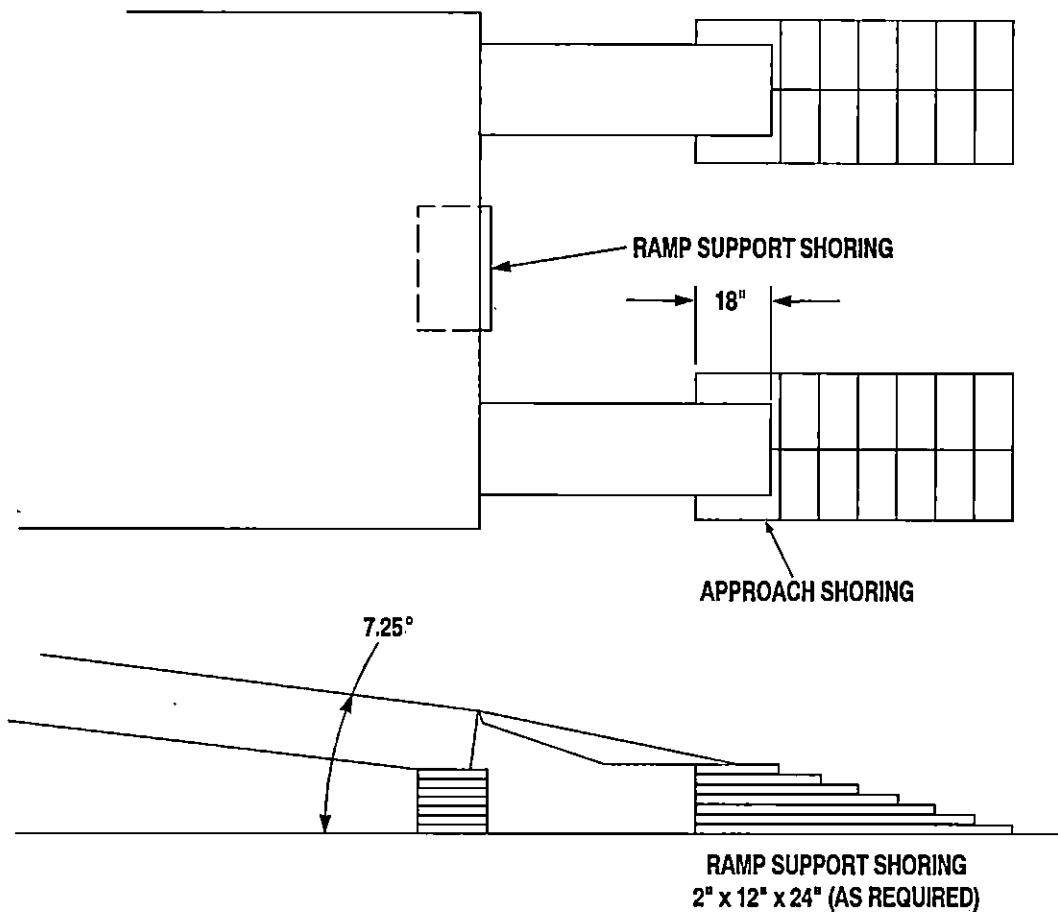


Figure 56. Placement of Shoring.

- h. Loading. To load the 7-Ton Truck in all configurations, it is necessary to back the truck into the fuselage cargo space to stay within the axle load limits of the aircraft ramp as shown in 7-Ton Truck Loading Figure. This ensures ceiling clearance with the 102 in. (259 cm) height limit of the cargo compartment opening as the vehicle crests the ramp. To provide a 14 in. (36 cm) wide aisle along the left side of the truck, the truck needs to be positioned 3.5 in. (8.9 cm) off center to the right.

## AIR TRANSPORT OF 7-TON TRUCK - Continued

## C130 AIR TRANSPORT

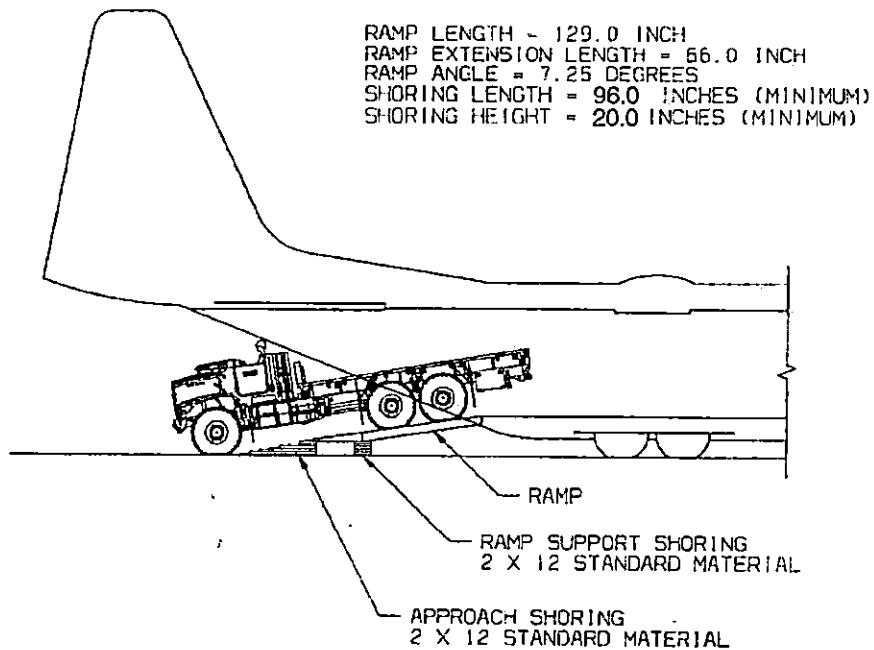


Figure 57. 7-Ton Truck Loading on C-130.

- i. Securing the vehicle aboard aircraft. Secure vehicle to aircraft deck as directed by aircraft Loadmaster (refer to paragraph Securing the Vehicle Aboard Aircraft).
- 8. **C-141 Cargo Aircraft Transport**
  - a. General. The 7-Ton Truck at curb weight and prepared at reduced vehicle height as described in paragraph F-7 meets the size and weight limits of the C-141 aircraft. Two 7-Ton Trucks at curb weight or one at cross-country bed payload of 14,200 lbs. (6,446 kg) can be transported on the aircraft.
  - b. Preparing the 7-Ton Truck. Prepare the 7-Ton Cargo Truck as described in paragraph Preparation for Shipment by Aircraft. In addition, do the following:
    - (1) Remove and stow cargo cover and bows.
    - (2) Remove and stow cargo drop sides, seats, and seat backs.
    - (3) Remove and stow ladder from tailgate, if installed on tailgate.
    - (4) Remove and stow tailgate in bed of 7-Ton Truck.
    - (5) Remove staves and stow in bed of 7-Ton Truck.
    - (6) Set CTIS to mud/sand/snow (WP 0043).
  - c. Loading
    - (1) To load all configurations of the 7-Ton Truck, it is necessary to back the first truck and to drive the second truck forward into the aircraft cargo compartment.

## AIR TRANSPORT OF 7-TON TRUCK - Continued

(2) To stay within the axle load limits of the aircraft floor, the front axles of each vehicle must be positioned between loading stations I through M which permit individual axle loads up to 20,000 lbs. (9,080 kg). The C-141 loading stations outside of I through M limit axle loads to 10,000 lbs. (4,540 kg) each during flight. Refer to Two 7-Ton Trucks Loading on C-141 Figure showing the placement of two STD WB trucks and Two 7-Ton XLWB Trucks Loading on C-141 Figure showing the placement of two XLWB trucks.

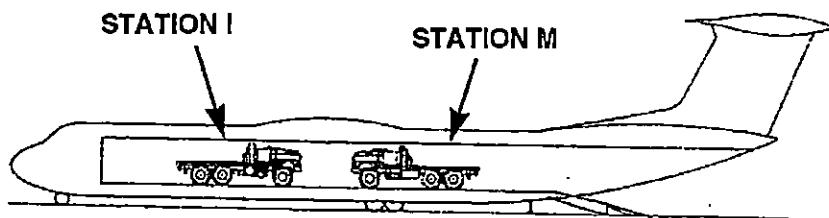


Figure 58. Two 7-Ton Trucks Loading on C-141.

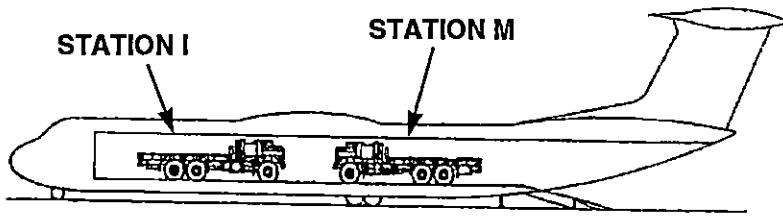


Figure 59. Two 7-Ton XLWB Trucks Loading on C-141.

### CAUTION

Do not use lifting rings for tiedowns. Failure to comply may result in damage to equipment.

d. Securing the vehicle aboard aircraft. Secure vehicle to aircraft deck as directed by aircraft Loadmaster (refer to paragraph Securing the Vehicle Aboard Aircraft).

9. **C-17 Cargo Aircraft Transport**

a. General. The C-17 can on-load and off-load all variants of the 7-Ton Truck in its operational configuration. The C-17 has the cargo space and cargo weight capacity to transport four (4) cargo trucks empty or three (3) cargo trucks with the cross-country bed payload of 14,200 lbs. (6,446 kg).

### NOTE

Recommend the truck be reduced in height to 98 in. (249 cm) for air shipment as outlined in Air Transport of 7-Ton Truck. Preparing vehicles in this configuration gives the transporting unit flexibility to use different aircraft types. Cargo aircraft availability can change with little notice.

b. Preparing the Truck. Prepare the truck as described in paragraph Preparation for Shipment by Aircraft. It is not necessary to reduce vehicle height, but the truck mirrors must be folded in against the cab.

c. Loading.

**AIR TRANSPORT OF 7-TON TRUCK - Continued**

- (1) The 7-Ton Truck is capable of being driven forward or backward into the C-17. All cargo truck variants can readily negotiate the ramp without interference.
- (2) The vehicle will not exceed allowable ramp or deck load limits.
- d. Securing Vehicle Aboard Aircraft. Secure vehicle to aircraft deck as directed by Aircraft Loadmaster (refer to paragraph Securing the Vehicle Aboard Aircraft).

**10. C-5 Cargo Aircraft Transporting****a. General.**

The C-5 can on-load and off-load all variants of the 7-Ton Truck in its operational configuration. The C-5 has the cargo space and cargo weight capacity to transport seven (7) MK23/MK25 trucks empty or six (6) MK27 trucks empty. Five (5) MK23/MK25 trucks or four (4) MK27/MK28 cargo trucks can be transported with the cross-country bed payload of 14,200 lbs. (6,446 kg). However, to provide adequate space between vehicles for tiedown, the practical number of empty trucks to be transported on a single C-5 is six (6).

**NOTE**

Recommend the Cargo truck be reduced in height to 98 in. (249 cm) for air shipment as outlined in Air Transport of 7-Ton Truck. Preparing vehicles in this configuration gives the transporting unit flexibility to use different aircraft types. Cargo aircraft availability can change with little notice.

- b. Preparing the Truck. Prepare the truck as described in paragraph Preparation for Shipment by Aircraft. It is not necessary to reduce vehicle height, but the truck mirrors must be folded in against the cab (MK23/MK25/MK27/MK28).
- c. Loading
  - (1) The 7-Ton Truck is capable of being driven forward or backward into the C-5. All cargo truck variants can readily negotiate the front or rear ramps without interference.
  - (2) The vehicle will not exceed allowable ramp or deck load limits for the aircraft.
- d. Securing Vehicle Aboard Aircraft. Secure vehicle to aircraft deck as directed by Aircraft Loadmaster (refer to paragraph Securing the Vehicle Aboard Aircraft).

**11. CH-53E External Helicopter Transport**

- a. General. The 7-ton standard wheelbase (STD WB) cargo truck without winch (MK 23) is the only truck that can be externally transported by CH-53E helicopter using a dual point sling lift without the use of spreader bars. Refer to MTMCTEA Reference 55-21, Lifting and Tiedown for US Military Helicopters, for specific guidance on helicopter lift of the vehicle.
- b. Safety
  - (1) Inspect cargo lifting slings for serviceability and lift weight certification.
  - (2) Helicopters in flight produce static electricity charges. A grounding wire and wand is required to dissipate the charge prior to vehicle hookup.
  - (3) Helicopter hookup crew must wear goggles and heavy leather gloves to protect eyes and hands from dust and debris of rotor wash.
- c. Vehicle Preparation.
  - (1) Remove and stow cargo cover, bows, and staves.
  - (2) Remove and stow drop sides, troop seats, backrests and tailgate.
  - (3) If installed on vehicle, remove machine gun mount kit.

## AIR TRANSPORT OF 7-TON TRUCK - Continued

- (4) Check fuel level. Drain as necessary to reduce fuel level to 1/4 full or less.
- (5) Fold mirrors inward.
- d. Helicopter Lift Point. The MK23 is equipped with four (4) lifting eyes. Two (2) lift eyes are located through the engine cover in the front of the vehicle and two (2) at the rear on the frame side rails between the rear tandem axles. Paragraph Vehicle Lifting Eyes of this Work Package and the vehicle data plate shows the location. When using the rear lift eye, the cable/chain should pass through the rear lifting eye guide. The truck is not to be lifted by the rear eye guide. CH-53E Helicopter Lift Figure shows the truck rigged for CH-53E helicopter lift.

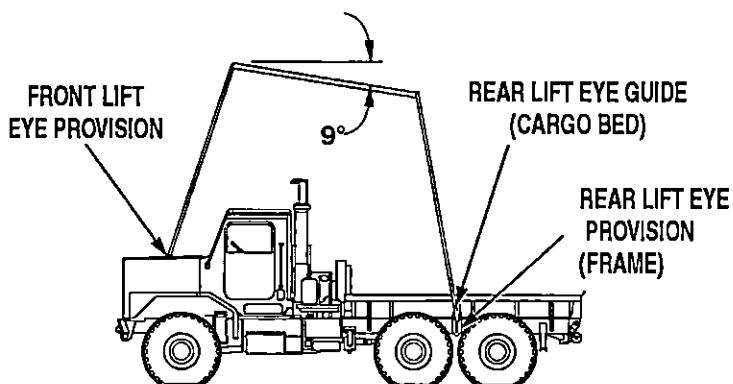


Figure 60. CH-53E Helicopter Lift.

## Truck Transport Of The 7-Ton Truck

### 1. General

The 7-Ton Truck can be transported on lowbed or highbed semi-trailers with deck height up to 58 in. (147 cm). MTMCTEA Reference 55-20, Tiedown Handbook for Truck Movements, provides detailed guidance on proper methods for preparing and securing vehicles to trucks.

### 2. Safety

- a. All facilities and equipment used to load and transport the 7-Ton Truck must be inspected for certification, serviceability and proper function prior to use.
- b. Use ground guides when loading vehicle via ramps. Ensure ground guide keeps a safe distance from vehicle while loading. Position guide in a prominent location to assure constant visual contact with payload vehicle driver.
- c. Ensure gross weight of 7-Ton Truck does not exceed capacity of vehicle hauling truck.
- d. Make sure tractor and semi-trailer brakes are set to assure maximum vehicle stability during drive on operations.
- e. Warn personnel to stand clear of the semi-trailer during loading operations.

### 3. Preparation for Shipment by Truck

The 7-Ton Truck can be transported on a lowbed trailer or highbed trailer and stay within the US height limits of 13.5 ft. (4.1 m). The following preparation procedures are required:

- a. Remove and stow Machine Gun Mount Kit, if installed.
- b. Reduce vehicle height to 98 in. (249 cm) in accordance with Procedures for Reducing Vehicle Height for Shipment (PROCEDURES FOR REDUCING VEHICLE HEIGHT FOR SHIPMENT) paragraph.

## Truck Transport Of The 7-Ton Truck - Continued

- c. Protect the windshield.
- d. Secure any material or equipment loaded in the cargo bed of the vehicle by banding, chains, cargo straps or ISO locks. Ensure cargo in the truck bed does not exceed the 98 inch reduced vehicle height.
- e. Set CTIS system to highway.
- f. Check fuel level. Drain as necessary to reduce fuel level to 3/4 full or less.
- g. Remove and stow cargo cover and bows to prevent wind and transit damage.
- h. Remove staves and stow in bed of truck.
- i. Remove engine exhaust and air intake extensions. Seal off exhaust/intake opening from the environment once vehicle is loaded aboard the truck.
- j. Remove and stow ladder from tailgate, if installed on tailgate.

### NOTE

Truck can be operated in reduced configuration to assist loading operation.

#### 4. Loading

The 7-Ton Truck can be driven on the trailer by use of a ramp or crane. Vehicle Lifting Eyes paragraph contains instructions on how to hook up vehicle for lift by crane.

#### 5. Securing the Vehicle

- a. When vehicle is in position on truck bed, place transmission in neutral and set parking brake.
- b. Make sure all BII items are properly stowed.
- c. Turn battery disconnect switch to OFF position.

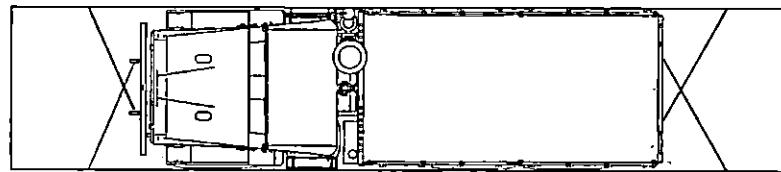
### WARNING

Use only front and rear tiedown eyes to secure the vehicle. Do not use bumperettes, axles, towing pintles, or tow eyes as points of attachment. Failure to comply may result in death or injury to personnel or damage to equipment.

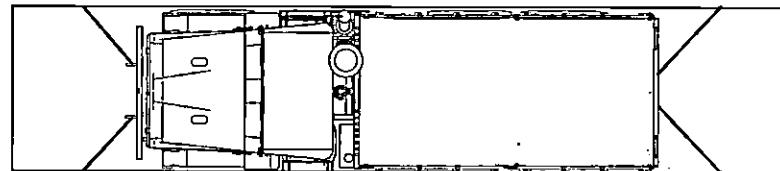
- d. Using the two front and two rear tiedown eyes on the 7-Ton Truck, secure the vehicle with chains. Chain and Tiedown Specifications Table provides the chain specifications and number of tie downs required. 7-Ton Truck Tiedown to Semi-Trailer shows two ways the vehicle can be tied-down to the semi-trailer.

*Table 10. Chain and Tiedown Specifications.*

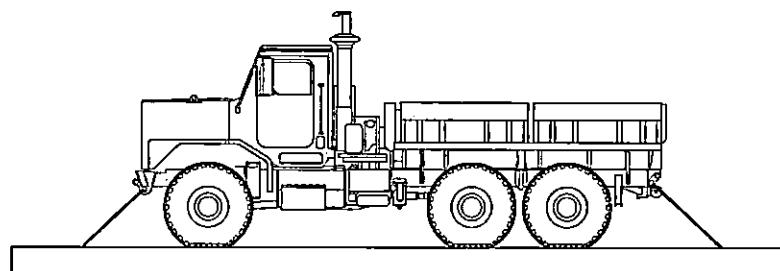
ALLOY STEEL CHAINS			
Weight Range of Vehicle (lbs.) (kg)	Dia. (In.) (cm)	Minimum Proof Test Value (lbs.) (kg)	Number of Chains Required
25,000 - 40,000 lbs. (11,350 - 18,160 kg)	1/2 in. (1.27 cm)	27,500 lbs. (12,485 kg)	4
40,000 - 55,000 lbs. (18,160 - 24,970 kg)	1/2 in. (1.27 cm)	27,500 lbs. (12,485 kg)	8

**Truck Transport Of The 7-Ton Truck - Continued**

TOP VIEW OF 7-TON TRUCK, TIEDOWNS CROSSED.



TOP VIEW OF 7-TON TRUCK, TIEDOWNS SAME-SIDE.



SIDE VIEW OF 7-TON TRUCK ON SEMITRAILER.

Figure 61. 7-Ton Truck Tiedown to Semi-Trailer

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE TOWING REQUIREMENTS

### Towing Trailers

1. Refer to Operator's Manual of trailer being towed to determine maximum speed limit, load capacity, and procedures for towing trailers.
2. For trailer Operator's Manuals that do not have a cross-country maximum speed limit recommended, cross-country speed limit should be no greater than 15 mph (24 km/h).

### 7-Ton Truck Towing a 7-Ton Truck

#### Initial Towing Setup

#### **WARNING**

- If brakes of disabled vehicle are inoperable, do not flat tow disabled vehicle. Call for wrecker service. Failure to comply may result in injury or death to personnel.
- To safely flat tow the disabled vehicle, the Gross Vehicle Weight (weight of vehicle plus cargo) of towing vehicle must be equal to or greater than the disabled vehicle. Failure to comply may result in injury or death to personnel.
- Never flat tow a 7-Ton Truck from the rear. Failure to comply may result in injury or death to personnel.

#### **WARNING**

TM 10867A-OR must be used in conjunction with this initial setup procedure for complete flat tow instructions. Failure to comply may result in serious injury or death to personnel.

#### **CAUTION**

Medium duty tow bar kit, NSN 2540-01-496-8356, is required for flat towing. Complete towing instructions and hook up procedures are included in the kit. Failure to comply with tow bar kit instructions may cause severe damage to equipment.

- a. Align the front tires of the disabled vehicle in the straight ahead position.
- b. Chock wheels of disabled vehicle.

#### **CAUTION**

Do not tow a 7-Ton Truck without removing prop shaft of disabled vehicle. Failure to comply may result in damage to equipment.

- c. Prop shaft between transfer case and transmission must be removed from the disabled vehicle before towing or vehicle may be damaged. Notify wrecker operator or Second Echelon maintenance to remove prop shaft.
- d. Ensure tire pressures of disabled vehicle are sufficient for the terrain the vehicle will be towed over. If tire pressures need to be increased, use the towing vehicle to adjust the tire pressures.
- e. Raise hood of disabled vehicle.

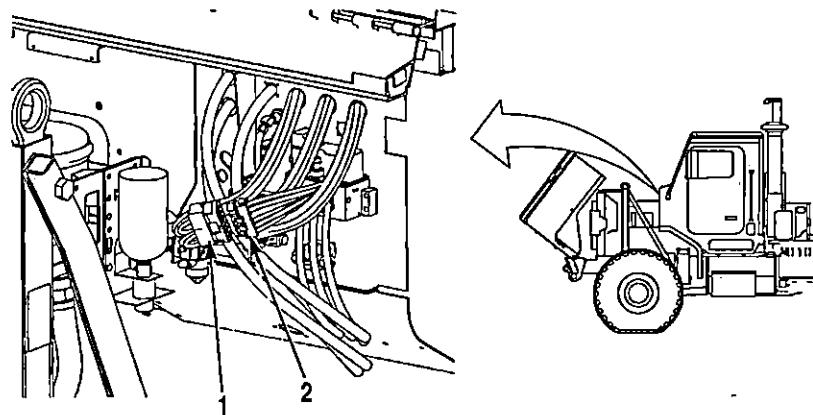
**7-Ton Truck Towing a 7-Ton Truck - Continued**

Figure 1.

- f. Disconnect connector C23 (1) from connector C23 (2).
- g. Close hood of disabled vehicle.

**NOTE**

Medium duty tow bar kit, NSN 2540-01-496-8356, is required for flat towing. Complete towing instructions and hook up procedures are included in the kit.

- h. Proceed to tow bar hookup and towing procedures.

**END OF WORK PACKAGE**

## 1ST ECHELON MAINTENANCE DATA PLATES, DECALS, AND STENCILS

### SCOPE

This Work Package shows locations for data plates, decals, and stencils that must be in place on the 7-Ton Truck.

### GENERAL

This Work Package shows the locations of the data plates, decals, and stencils required for the 7-Ton Truck. Data plates are attached to the vehicle with rivets and are outlined with solid boxes on the following illustrations. Decals are attached to the vehicle with adhesive only and are outlined with dashed line boxes in the following illustrations. Stencils are displayed in the following illustrations without any type of outline box.

*Table 1. MK23, MK25, MK27, and MK28 Data Plates and Decals.*

Data Plate Number	Data Plate Description	Figure Number
1	Engine Ignition Plate	Figure-1
2	Driver Safety Belt Caution	Figure-1
3	Noise Caution	Figure-1
4	Passenger Safety Belt Caution	Figure-1
5	Information, MIC Update Label	Figure-1
6	Information, Gen 6 ABS, Label	Figure-1
7	Vehicle Identification Plate, LH Door	Figure-2
8	Battery Disconnect Switch Caution, LH Door	Figure-2
9	No Rollover Protection Caution, LH Door	Figure-2
10	Cold Tire Pressure Caution, LH Door	Figure-2
11	Welding and Disconnect Caution, LH Door	Figure-2
12	Model and Serial Number, LH Door	Figure-2
13	Fan Warning, LH	Figure-3
14	Radiator Coolant Overflow Caution	Figure-3
15	Fan Warning, RH	Figure-3
16	Radiator Surge Tank Caution	Figure-3

## GENERAL - Continued

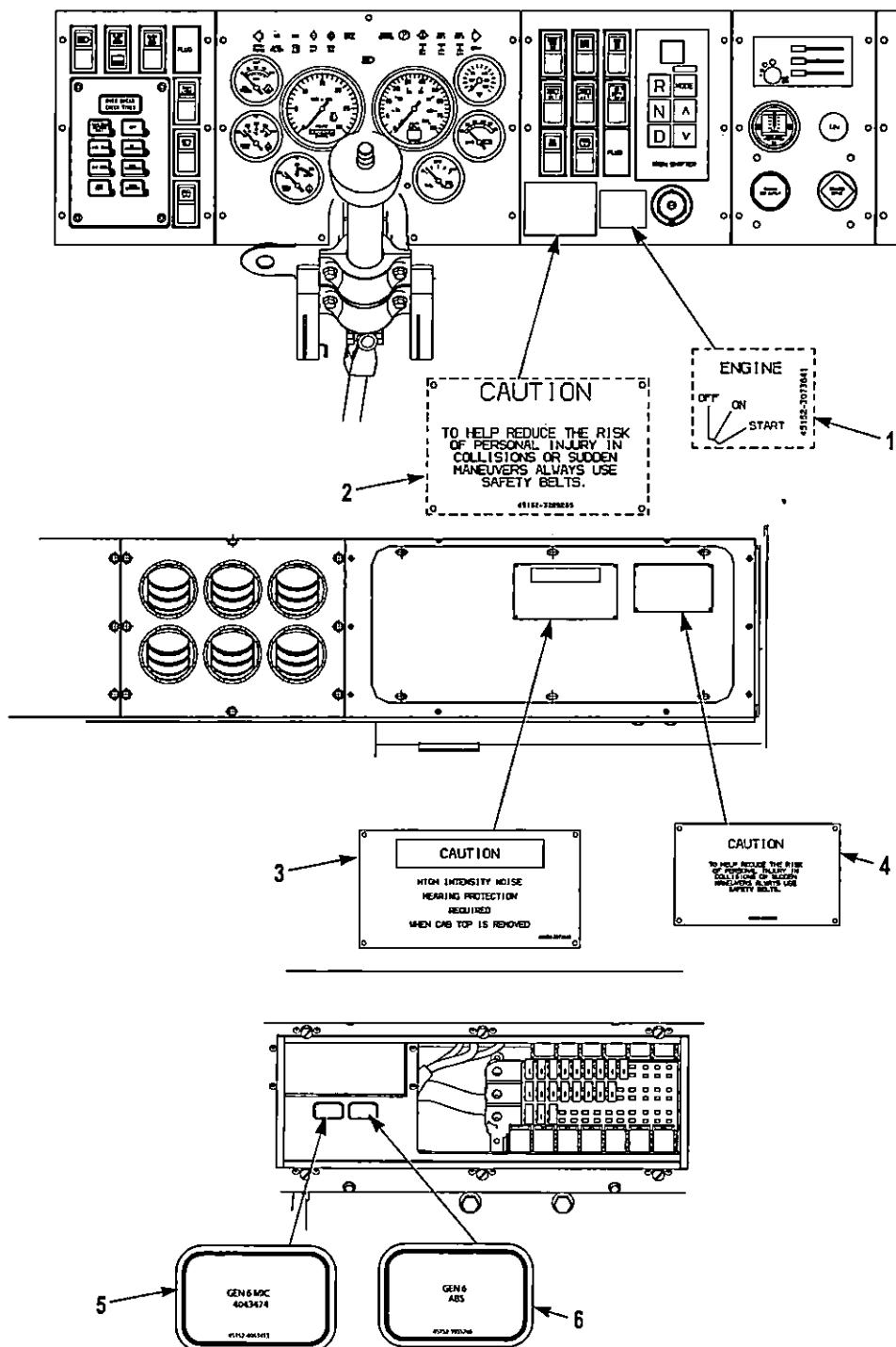


Figure 1. MK23, MK25, MK27, and MK28 Data Plates, Decals, and Stencils.

## GENERAL - Continued

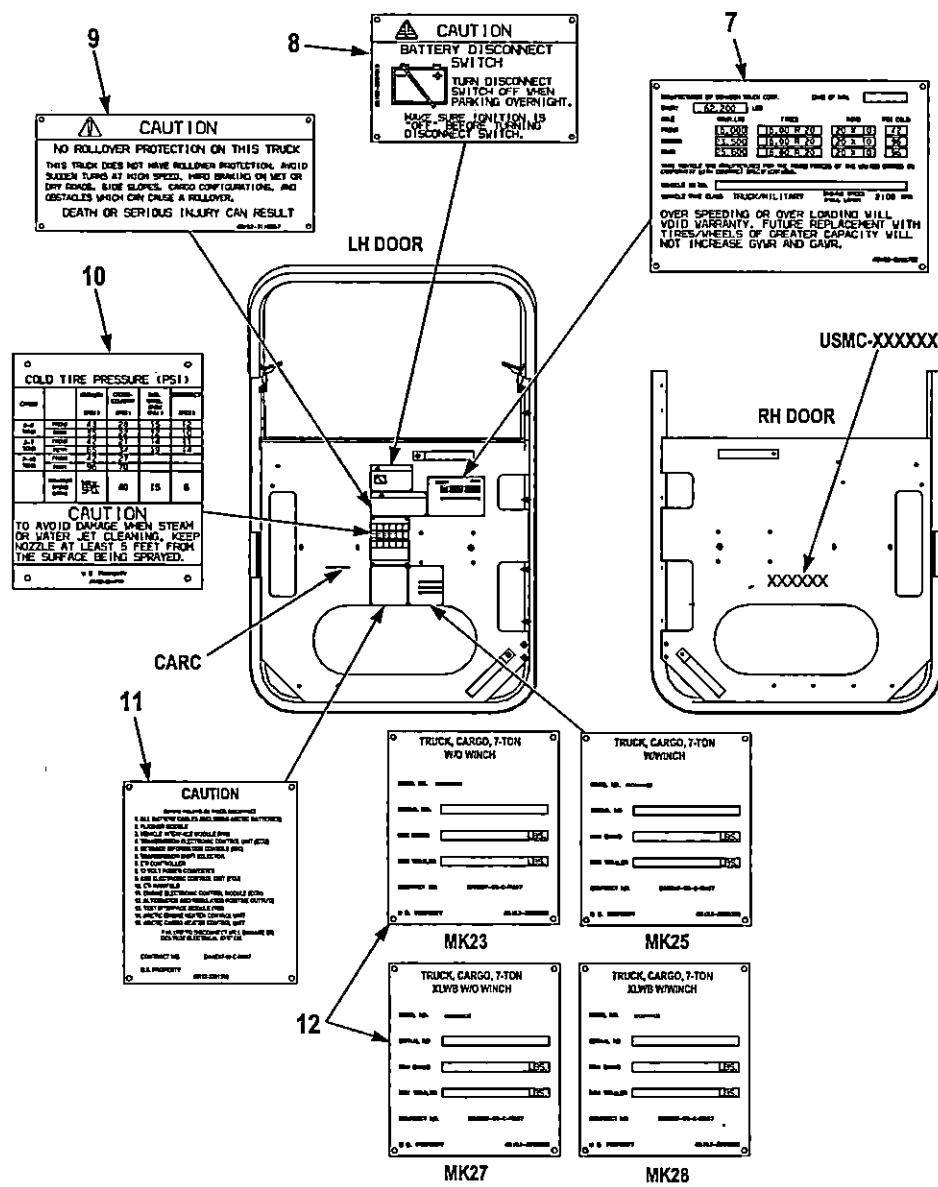


Figure 2. MK23, MK25, MK27, and MK28 Data Plates, Decals, and Stencils.

## GENERAL - Continued

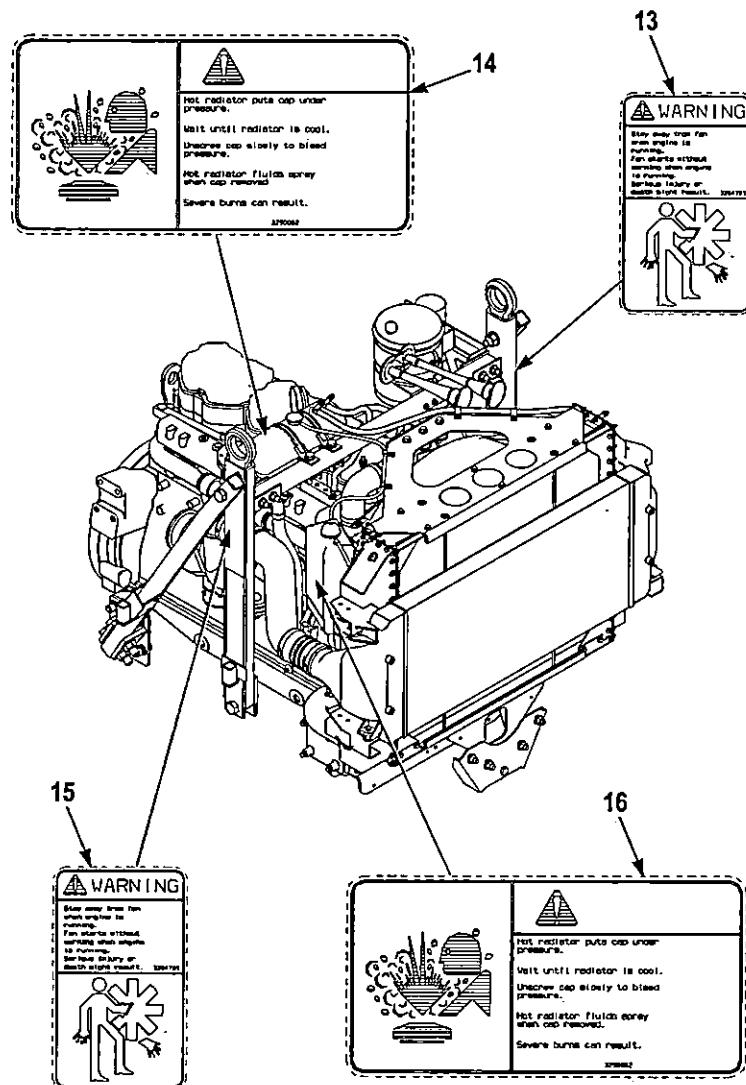


Figure 3. MK23, MK25, MK27, and MK28 Data Plates, Decals, and Stencils.

Table 2. MK23 and MK25 Data Plates and Decals.

Data Plate Number	Data Plate Description	Figure Number
1	Muffler and Exhaust Pipe Caution	Figure-4
2	Manual Winch Control Plate	Figure-4
3	Sampling Valve ID Plate	Figure-4
4	Hydraulic Reservoir Fill Level	Figure-5
5	Battery Power Plate and Caution	Figure-5

## GENERAL - Continued

Table 2. MK23 and MK25 Data Plates and Decals - Continued.

Data Plate Number	Data Plate Description	Figure Number
6	Vehicle Identification, Cab	Figure-5
7	Oshkosh Truck Nameplate	Figure-5
8	Shipping Data Plate	Figure-5
9	Battery Box Plate	Figure-5
10	Payload Data Plate	Figure-5

## GENERAL - Continued

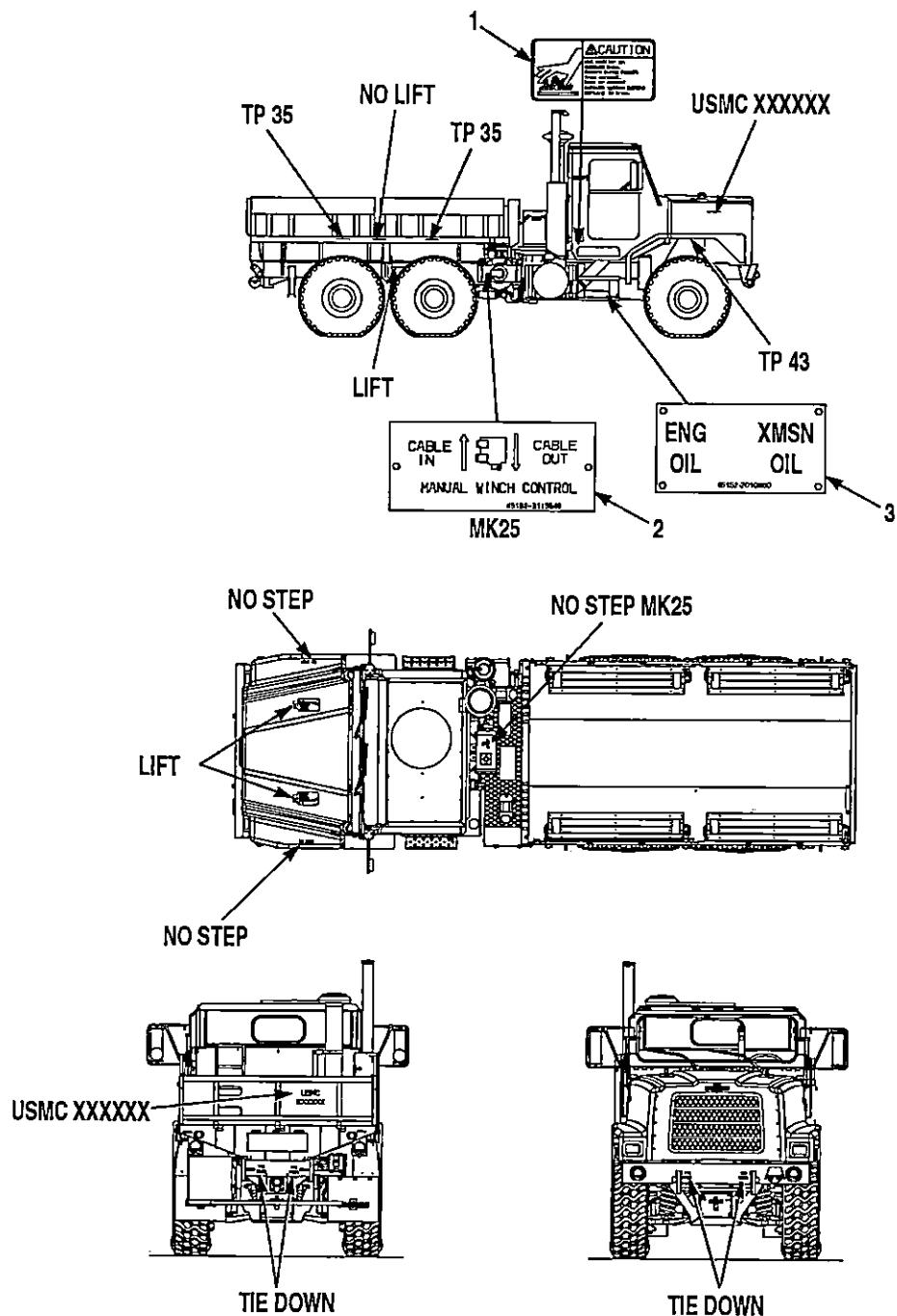


Figure 4. MK23 and MK25 Data Plates, Decals, and Stencils.

## GENERAL - Continued

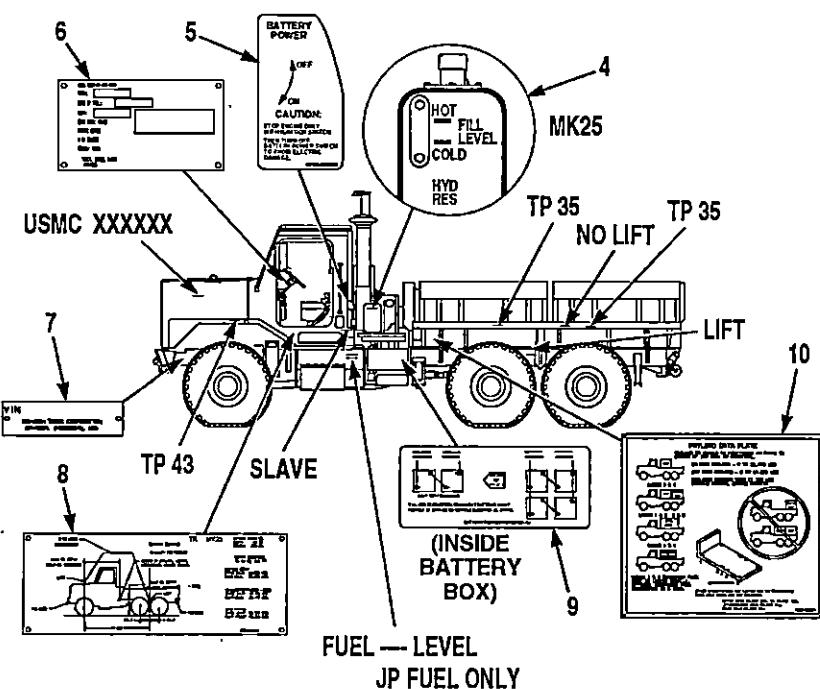


Figure 5. MK23 and MK25 Data Plates, Decals, and Stencils.

Table 3. MK27 and MK28 Data Plates and Decals.

Data Plate Number	Data Plate Description	Figure Number
1	Muffler and Exhaust Pipe Caution	Figure-6
2	Manual Winch Control Plate	Figure-6
3	Sampling Valve ID Plate	Figure-6
4	Hydraulic Reservoir Fill Level	Figure-7
5	Battery Power Plate and Caution	Figure-7
6	Vehicle Identification, Cab	Figure-7
7	Oshkosh Truck Nameplate	Figure-7
8	Shipping Data Plate	Figure-7
9	Battery Box Plate	Figure-7
10	Payload Data Plate	Figure-7

## GENERAL - Continued

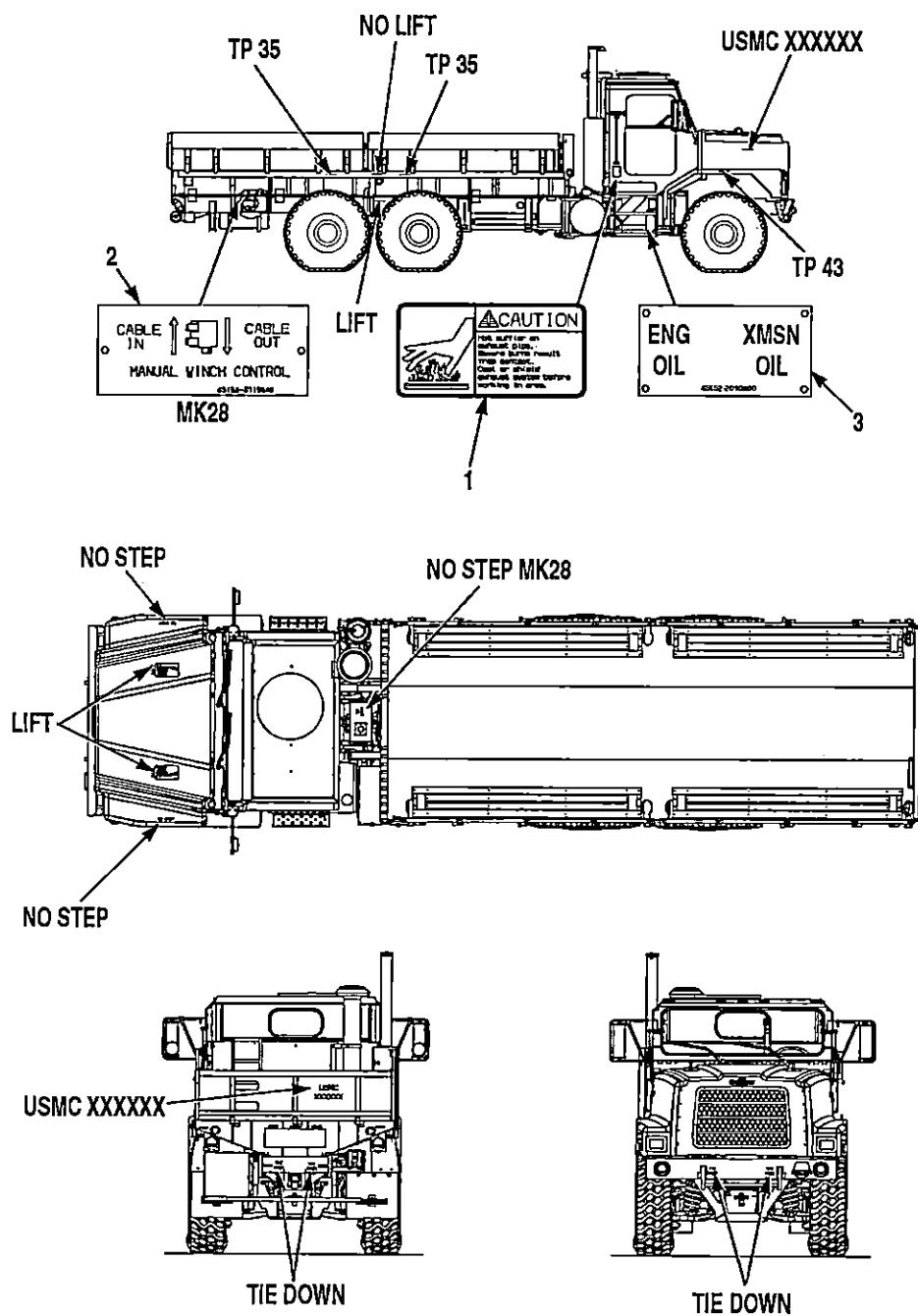


Figure 6. MK27 and MK28 Data Plates, Decals, and Stencils.

## GENERAL - Continued

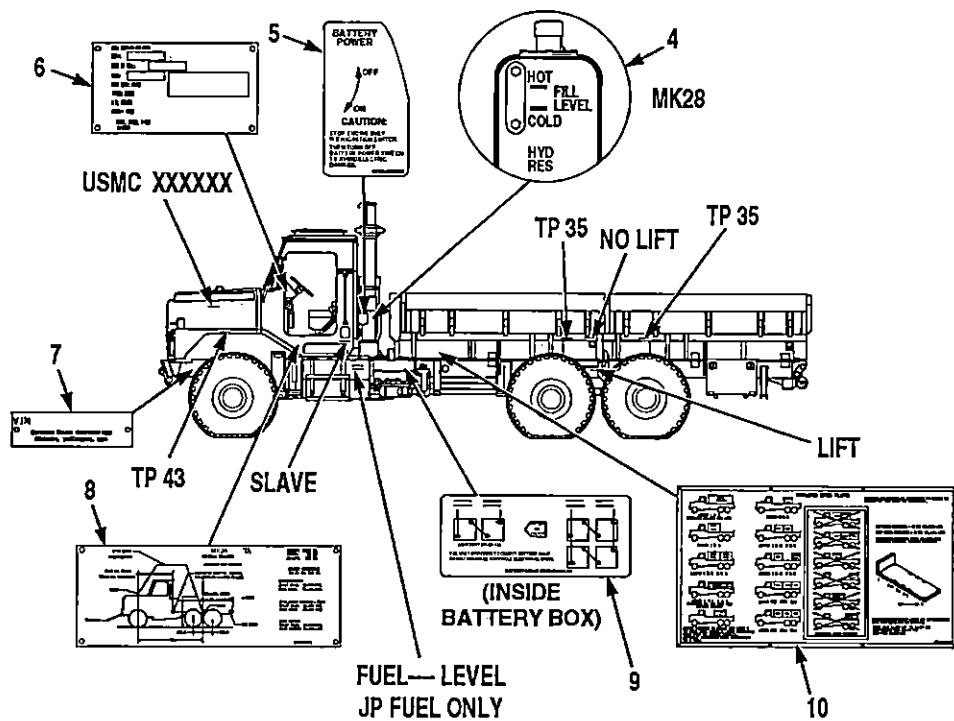


Figure 7. MK27 and MK28 Data Plates, Decals, and Stencils.

Table 4. Armor Kit Data Plates and Decals.

Data Plate Number	Data Plate Description	Figure Number
1	Caution Label	Figure-8
2	Shipping Data Label	Figure-8
3	Muffler and Exhaust Pipe Caution	Figure-8
4	Altered Vehicle Data Label	Figure-8
5	Payload Information Label	Figure-8

## GENERAL - Continued

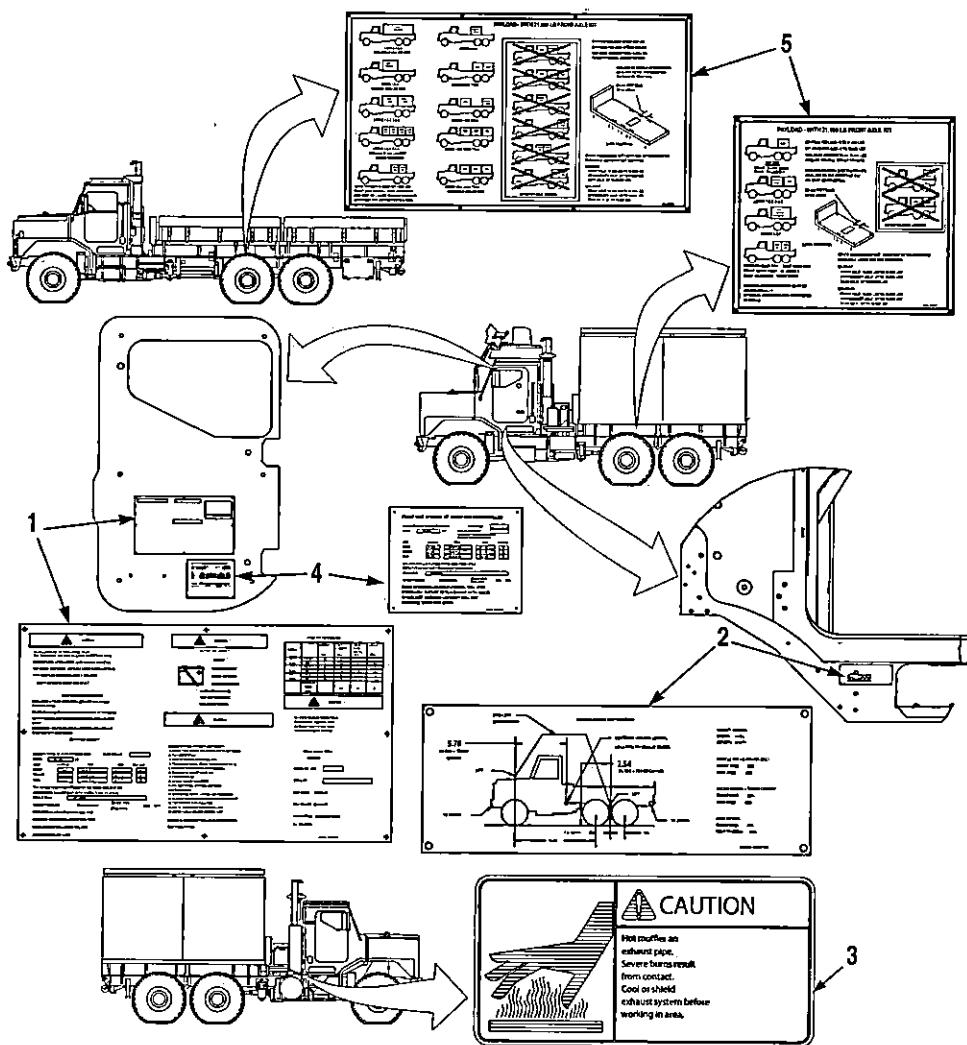


Figure 8. Armor Kit Data Plates and Decals, and Stencils.

Table 5. Reducible Height Armor Kit Data Plates and Decals.

Data Plate Number	Data Plate Description	Figure Number
1	Muffler and Exhaust Pipe Caution	Figure-10
2	Fan Warning, LH	Figure-10
3	Fan Warning, RH	Figure-10
4	Shipping Data Label	Figure-10
5	Combat Lock Caution	Figure-11
6	Combat Lock Caution	Figure-11

## GENERAL - Continued

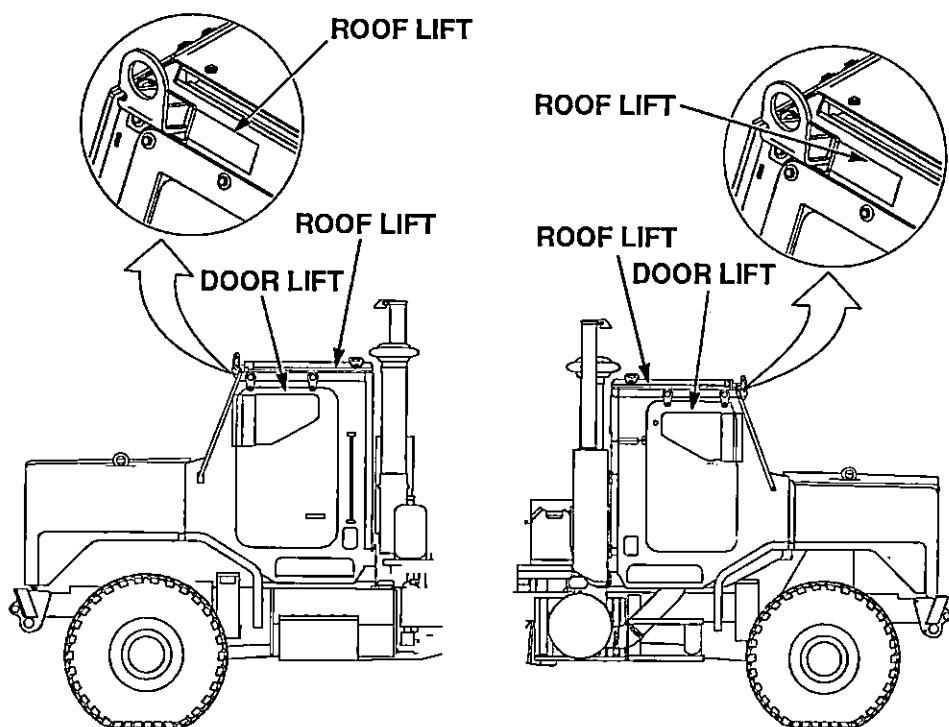


Figure 9. Reducible Height Armor Kit Stencils.

## GENERAL - Continued

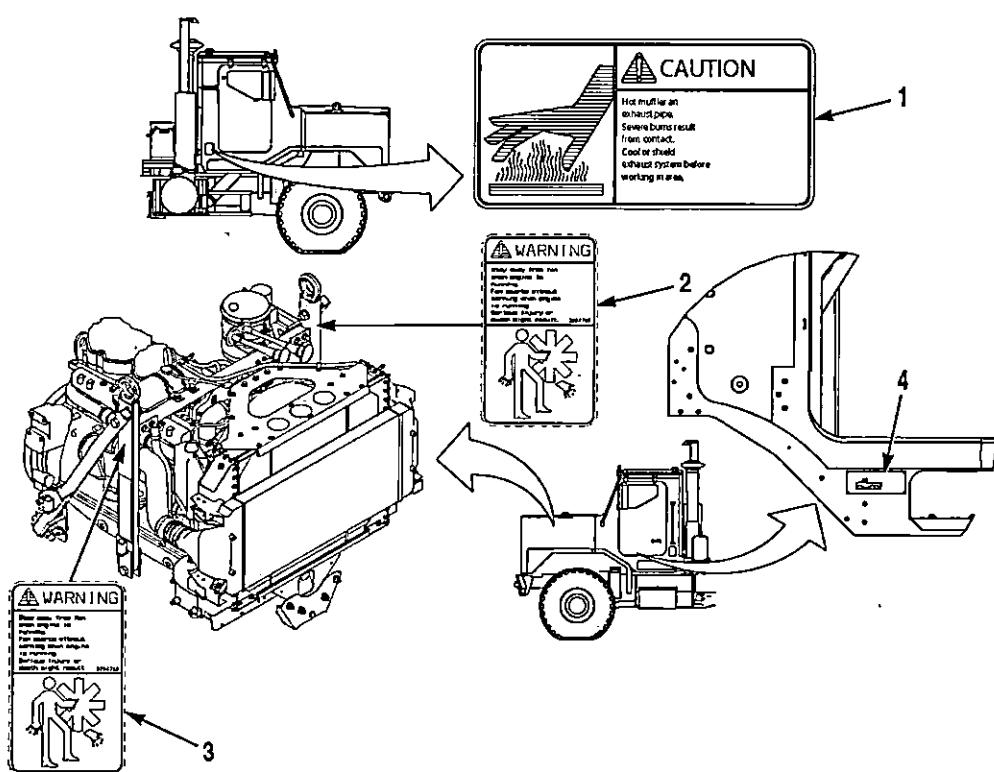


Figure 10. Reducible Height Armor Kit Data Plates and Decals.

## GENERAL - Continued

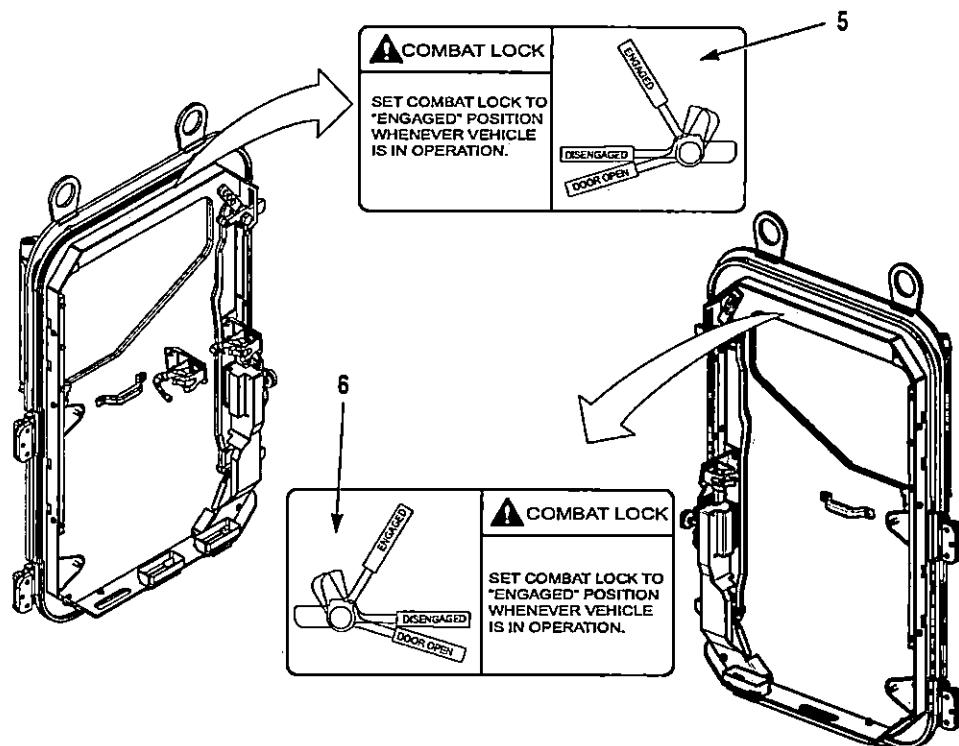


Figure 11. Reducible Height Armor Kit Data Plates and Decals.

Table 6. Dual Ladder Assembly and Troop Carrier Data Plates and Decals.

Data Plate Number	Data Plate Description	Figure Number
1	Dual Ladder Safety Label	Figure-12
2	Emergency Egress Safety Label	Figure-12
3	Troop Carrier Shipping Data Label	Figure-13
4	Troop Carrier UID Label	Figure-13

## GENERAL - Continued

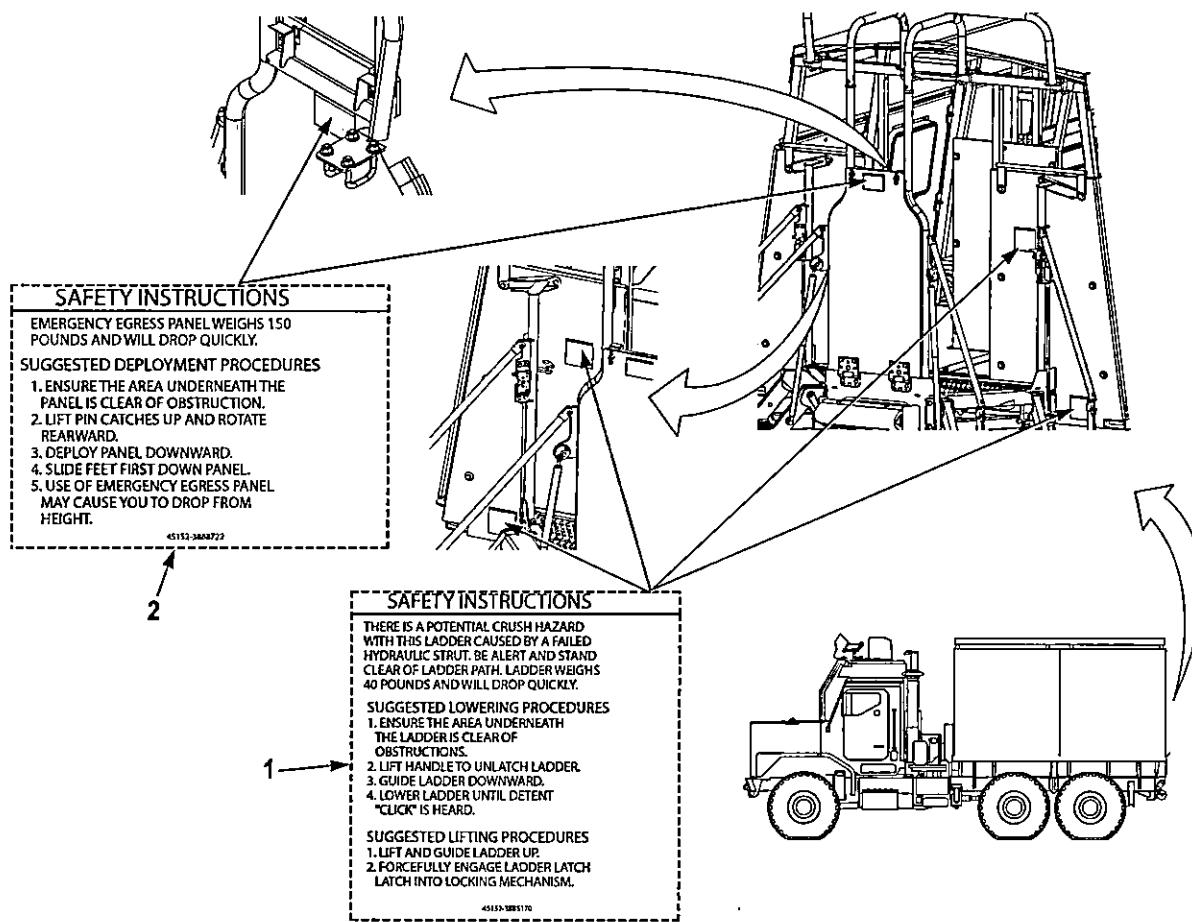


Figure 12. Dual Ladder Assembly and Troop Carrier Data Plates and Decals.

## GENERAL - Continued

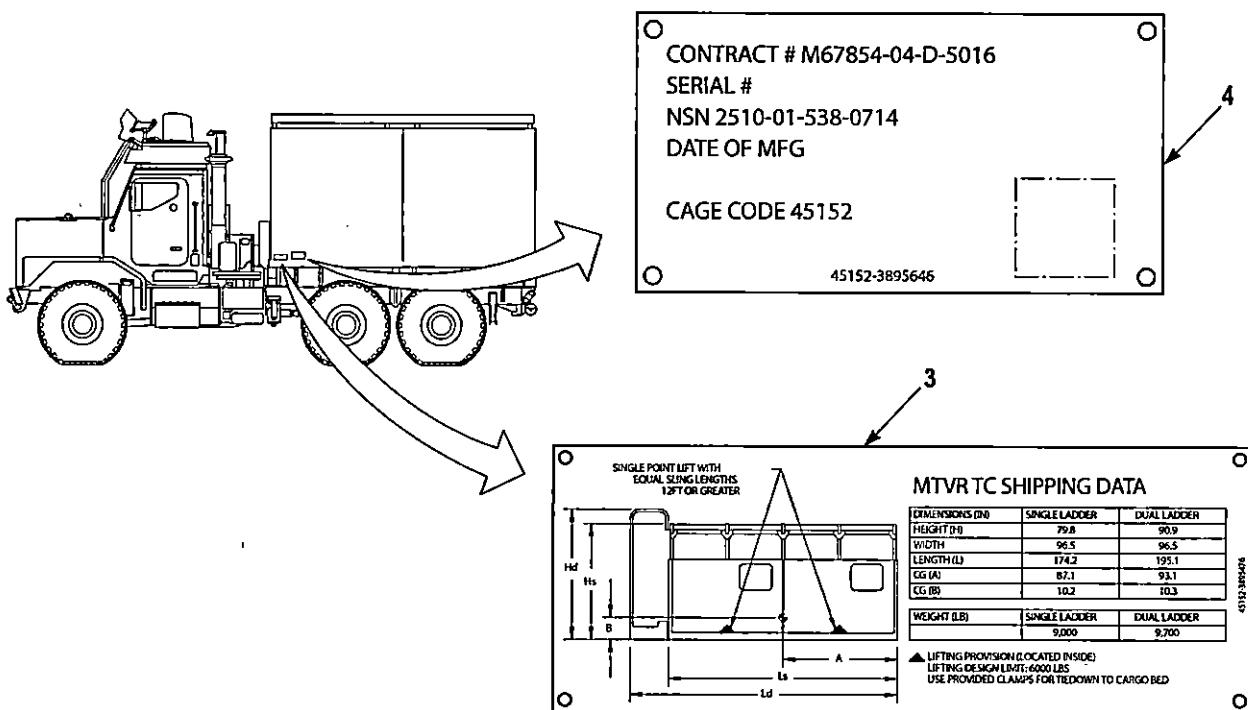


Figure 13. Troop Carrier Data Plates and Decals.

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### THE METRIC SYSTEM AND EQUIVALENTS

#### LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

#### SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches  
 1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet  
 1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

#### WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 Lb  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

#### CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches  
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

#### 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

TO CHANGE	TO	MULTIPLY BY
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

TO CHANGE	TO	MULTIPLY BY
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

