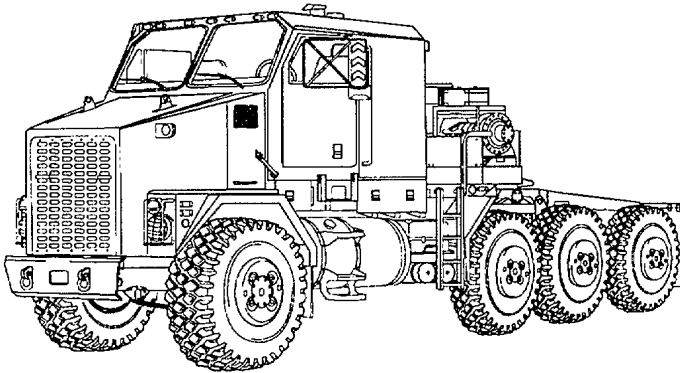


**TECHNICAL MANUAL
OPERATOR'S MANUAL**



HOW TO USE THIS MANUAL	iii
-----------------------------------	------------

EQUIPMENT DESCRIPTION	1-4
----------------------------------	------------

CONTROLS AND INDICATORS	2-2
------------------------------------	------------

PMCS	2-21
-------------	-------------

OPERATION UNDER USUAL CONDITIONS	2-105
---	--------------

OPERATION UNDER UNUSUAL CONDITIONS	2-180
---	--------------

TROUBLESHOOTING PROCEDURES	3-1
---------------------------------------	------------

MAINTENANCE PROCEDURES	3-44
-----------------------------------	-------------

INDEX	INDEX-1
--------------	----------------

**TRUCK, TRACTOR, M1070, 8 X 8,
HEAVY EQUIPMENT TRANSPORTER (HET)
NSN 2320-01-318-9902
EIC: B5C**

Approved for public release: distribution is unlimited.

**This copy is a reprint which includes current
pages from Changes 1 through 3.**

**HEADQUARTERS, DEPARTMENT OF THE ARMY
MARCH 1994**

WARNING

CARBON MONOXIDE (EXHAUST GAS) FROM ARCTIC HEATER EXHAUST CAN CAUSE DEATH.

Carbon monoxide does not have color or smell, but can cause death. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide is in exhaust fumes of fuel-burning heaters and internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no ventilation. Precautions must be followed to ensure crew safety when the engine of any vehicle is operated for any purpose.

- Allow for adequate ventilation when arctic heater is operating.
- DO NOT run engine of vehicle in a closed place without proper ventilation.
- BE AWARE that the gas particulate filter unit or the field protection mask for nuclear, biological, or chemical (NBC) protection WILL NOT offer safety from carbon monoxide poisoning.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. When working with fuel, post signs that read: NO SMOKING WITHIN 50 FEET OF VEHICLE.

WARNING

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

WARNING

Be careful not to short out battery terminals. Do not wear watches, rings, or other jewelry that could short out battery terminals while servicing batteries. Do not smoke or use open flame around batteries. Batteries may explode from a spark. Battery acid is harmful to skin and eyes. Gloves, eye protection, and proper clothing should be worn when working with batteries. For first aid procedures, refer to FM 21-11.

WARNING

Be careful when working on or with electrical equipment. Do not be misled by the term "low voltage." Voltages as low as 50 volts can cause death. For artificial respiration, refer to FM 21-11.

WARNING

Never use parking brake for normal braking. Wheels will lock up causing severe skid. Skidding vehicle may result in serious personal injury or death.

WARNING

Do not use trailer brakes as a parking brake. Trailer brakes may not hold loaded vehicle and trailer on a grade. A runaway vehicle may cause severe personal injury or death.

WARNING

Do not use engine brake retarder in wet, slick, or icy road conditions. Failure to comply may result in loss of vehicle control. Personnel injury or death may result.

WARNING

The radiator is very hot and pressurized during vehicle operation. Let radiator cool before removing cap. Failure to do so may result in serious burns.

WARNING

The exhaust pipe and muffler can become very hot during vehicle operation. Be careful not to touch these parts with bare hands, or allow body to come in contact with exhaust pipe or muffler. Exhaust system parts can become hot enough to cause serious burns.

WARNING

Always use seat belts when operating vehicle. Failure to use seatbelt may result in serious injury or death in case of accident.

WARNING

Avoid quick, jerking winch operation. Keep other personnel away from vehicles involved in winching operations. A snapped cable or shifting load may cause serious injury or death.

WARNING

Always wear heavy gloves when handling winch cables. Never let cable run through hands; frayed cables can cut. Never operate winch with less than five wraps of cable on drum.

WARNING

Remove rings, bracelets, wristwatches, neck chains, and any other jewelry before working around the vehicle. Jewelry can catch on equipment and cause injury, or may short across an electrical circuit and cause severe burns or electrical shock.

WARNING

Utility chains are heavy and difficult to handle. Two personnel are required when handling utility chains. Failure to comply may result in injury to personnel.

WARNING

After Nuclear, Biological, or Chemical (NBC) exposure of HET Tractor, contaminated filters must be handled using adequate precautions and must be disposed of by trained personnel. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. Wear protective mask, hood, protective overgarments, chemical protective gloves, and boots in NBC environments. (See FM 21-40.)

WARNING

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

For first aid procedures, refer to FM 21-11.

**CHANGE
NO. 3**

**HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 1 September 1997**

**OPERATOR'S MANUAL
TRUCK, TRACTOR, M1070, 8 X 8,
HEAVY EQUIPMENT TRANSPORTER (HET)
(NSN 2320-01-318-9902)
EIC:B5C**

TM 9-2320-360-10, 31 March 1994, changed as follows:

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Remove Pages	Insert Pages	Remove Pages	Insert Pages
i and ii	i and ii	2-183 thru 2-186	2-183 thru 2-186.1/(2-186.2 blank)
1-1 and 1-2	1-1 and 1-2		
1-11 and 1-12	1-11 and 1-12	2-187 thru 2-190.2	2-187 thru 2-190.3/(2-190.4 blank)
2-1 thru 2-6	2-1 thru 2-6		
2-25 and 2-26	2-25 and 2-26		
2-33 and 2-34	2-33 and 2-34	2-191 thru 2-196	2-191 thru 2-196
2-53 thru 2-56	2-53 thru 2-56		2-200.1 thru 2-200.3/(2-200.4 blank)
2-81 and 2-82	2-81 and 2-82		
2-85 and 2-86	285 and 2-86	2-217.2 and 2-218	2-217.2 and 2-218
2-105 and 2-106	2-105 and 2-106	3-23 and 3-24	3-23 and 3-24
2-113 and 2-114	2-113 and 2-114	3-59 and 3-60	3-59 thru 3-60.1/ (3-60.2 blank)
2-137 and 2-138	(2-136.1 blank) 2-136.2 thru 2-138.1/(2-13.2 blank)	3-61 and 3-62	3-61 thru 3-62.1/(3-62.2 blank)
2-139 and 2-140	2-139 and 2-140	B-4.1/(B-4.2 blank)	B-4.1/(B-4.2 blank)
2-143 and 2-144	2-143 and 2-144		

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B-5 thru B-8	B-5 thru B-8	E-3 and E-4	E-3 and E-4
B-11 and B-12	B-11 and B-12	Index-3 and Index-4	Index-3 and Index-4

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By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
03813

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NO. 2**

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WASHINGTON, DC, 1 June 1997**

**OPERATOR'S MANUAL
TRUCK, TRACTOR, M1070, 8 X 8,
HEAVY EQUIPMENT TRANSPORTER (HET)
(NSN 2320-01-318-9902)
EIC:B5C**

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1-0	1-0	3-59 thru 3-62	3-59 thru 3-62
1-19 and 1-20	1-19 and 1-20	B-3 and B-4	B-3 and B-4
2-1 and 2-2	2-1 and 2-2	B-11 thru B-14	B-11 thru B-14
2-9 and 2-10	2-9 and 2-10	D-3 and D-4	D-3 and D-4
2-111 thru 2-114	2-111 thru 2-114	E-1 and E-2	E-1 and E-2
2-143 thru 2-146 (blank)	2-143 thru 2-146 (blank)	F-1 thru F-4	F-1 thru F-4
		Index-1 and Index-2	Index-1 and Index-2

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WASHINGTON, D.C., 30 March 1995

OPERATOR'S MANUAL
TRUCK, TRACTOR, M1070, 8 X 8,
HEAVY EQUIPMENT TRANSPORTER (HET)
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1-0	1-0	2-145 thru 2-148	2-134.1/ (2-134.2 blank)
1-9 and 1-10	1-9 and 1-10		2-145 and 2-146 (blank) thru
1-19 thru 1-22	1-19 thru 1-22		2-146.2 thru
2-1 thru 2-16	2-1 thru 2-12 thru 2-12.2		2-148 thru
	(blank) thru 2-16	2-151 thru 2-154	2-148.2
2-39 thru 2-44	2-39 thru 2-44	2-157 thru 2-162	2-151 thru 2-154
2-71 thru 2-74	2-71 thru 2-74		2-157 thru
2-79 and 2-80	2-79 and 2-80 thru 2-80.2		2-160.2 (blank) thru 2-162
2-89 and 2-90	2-89 and 2-90	2-165 thru 2-168	2-165 thru 2-168
2-93 thru 2-98	2-93 and 2-94 thru 2-94.2	2-171 thru 2-178	2-171 thru 2-178
	(blank) thru 2-98	2-185 thru 2-190	2-185 thru 2-190
2-103 thru 2-110	2-103 thru 2-110	2-193 and 2-194	2-193 and 2-194
2-113 thru 2-122	2-113 thru	2-215 thru 2-222	2-215 thru
	2-114.2 thru		2-217.2 (blank) thru 2-222
	2-120 thru	2-227 thru 2-230	2-227 thru 2-230
	2-121.2 thru	3-1 and 3-2	3-1 and 3-2
	2-122	3-5 and 3-6	3-5 and 3-6
2-127 thru 2-134	2-127 thru 2-134	3-11 thru 3-16	3-11 thru 3-16
		3-33 and 3-34	3-33 and 3-34

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Remove Pages	Insert Pages	Remove Pages	Insert Pages
3-37 and 3-38	3-37 and 3-38	B-1 thru B-14	B-1 thru -4.2 (blank) thru B-14
3-41 and 3-42	3-41 and 3-42	C-1 and C-2	C-1 and C-2
3-45 thru 3-60	3-45 thru 3-52 thru 3-52.4 (blank) thru 3-60	E- thru E-6 (blank)	E-1 thru E-6 (blank)
3-61 and 3-62	3-61 thru 3-63	F-1 thru F-4 Index-1 thru Index-4	F-1 thru F-4 Index-1 thru Index-4

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By Order of the Secretary of the Army:

Official:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

JOEL B. HUDSON
Acting Administrative Assistant to the
Secretary of the Army
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OPERATOR'S MANUAL
TRUCK, TRACTOR, M1070, 8 X 8,
HEAVY EQUIPMENT TRANSPORTER (HET)
(NSN 2320-01-318-9902)
EIC:B5C

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. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual, direct to: Commander U.S. Army Tank-Automotive and Armaments Command, ATTN: AMSTA-IM-OPIT Warren, Michigan 48397-5000. A reply will be furnished to you.

TABLE OF CONTENTS

		Page
HOW TO USE THIS MANUAL		iii
CHAPTER 1	INTRODUCTION	1-1
Section I.	General Information	1-1
Section II.	Equipment Description	1-4
Section III.	Principles Of Operation	1-20
CHAPTER 2	OPERATING INSTRUCTIONS	2-1
Section I.	Description And Use Of Operator's Controls And Indicators	2-2
Section II.	Preventive Maintenance Checks And Services (PMCS)	2-21
Section III.	Operation Under Usual Conditions	2-105
Section IV	Operation Under Unusual Conditions	2-180

TABLE OF CONTENTS (CONT)

	Page
CHAPTER 3	MAINTENANCE INSTRUCTIONS 3-1
Section I	Lubrication Instructions 3-1
Section II	Troubleshooting Procedures 3-1
	Malfunction Index 3-2
Section III	Maintenance Procedures 3-44
APPENDIX A	REFERENCESA-1
APPENDIX B	COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTSB-1
APPENDIX C	ADDITIONAL AUTHORIZATION LIST (AAL)C-1
APPENDIX D	EXPENDABLE AND DURABLE ITEMS LISTD-1
APPENDIX E	SIGN GUIDEE-1
APPENDIX F	ON-VEHICLE EQUIPMENT LOADING PLANF-1
INDEX Index-1

HOW TO USE THIS MANUAL

OVERVIEW

This technical manual (TM) is provided to help you operate and maintain the HET Tractor. It is divided into the following major sections in order of appearance:

- **WARNING SUMMARY.** Provides a summary of the most important warnings that apply throughout the manual.
- **TABLE OF CONTENTS.** Lists the chapters, sections, appendixes, and index with page number in order of appearance.
- **CHAPTER 1, INTRODUCTION.** Describes the HET Tractor and provides equipment data.
- **CHAPTER 2, OPERATING INSTRUCTIONS.** Describes operator's controls and indicators, preventive maintenance, and operating instructions.
- **CHAPTER 3, MAINTENANCE INSTRUCTIONS.** Provides instructions for troubleshooting and unscheduled maintenance.
- **APPENDIX A, REFERENCES.** Lists publications used with the HET Tractor.
- **APPENDIX B, COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS.** Lists and illustrates components of end item (COEI) and basic issue items (BII) and their locations.
- **APPENDIX C, ADDITIONAL AUTHORIZATION LIST (AAL).** Lists additional authorized items.
- **APPENDIX D, EXPENDABLE AND DURABLE ITEMS LIST.** Lists expendable and durable items.
- **APPENDIX E, STOWAGE AND SIGN GUIDE.** Shows locations of stowage areas, signs, data plates, and stencils.
- **APPENDIX F, ON-VEHICLE EQUIPMENT LOADING PLAN.** Shows the location of personal and unit items of mission equipment.
- **ALPHABETICAL INDEX.** Lists important subjects in alphabetical order and gives the page numbers on which they are located.

FINDING INFORMATION

There are several ways to find the information you need in this manual. They are as follows:

- **TABLE OF CONTENTS.** Lists chapters, sections, appendixes, and index with page numbers in order of appearance.
- **CHAPTER INDEXES.** List paragraphs contained in the individual chapters with paragraph and page numbers in order of appearance.

FINDING INFORMATION (CONT)

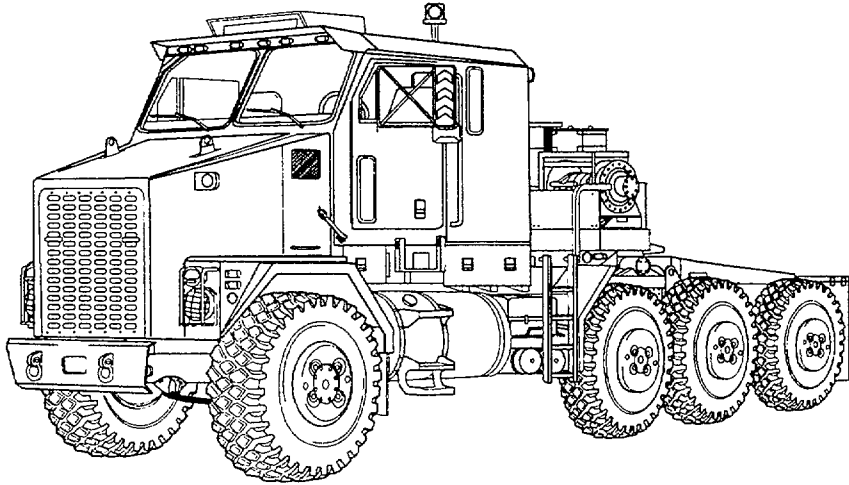
- **MALFUNCTION INDEX.** Lists malfunctions contained in the troubleshooting table with page numbers in order of appearance.
- **SUBJECT INDEX.** Lists all important topics with page numbers in alphabetical order.

TROUBLESHOOTING

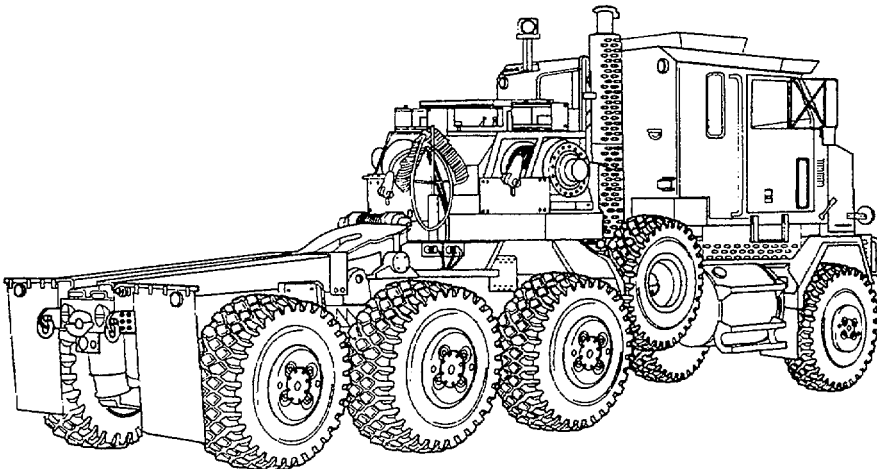
When you have a problem with the operation of your equipment, look at the Malfunction Index on page 3-2. Find the malfunction in the index. Turn to the page number listed for the malfunction in the troubleshooting table (table 3-1). Perform the steps required to correct the malfunction. If you can't find the malfunction, or the malfunction is not corrected, notify your supervisor.

OPERATION AND MAINTENANCE

- **OPERATION.** Before you operate the HET Tractor, familiarize yourself with the controls and indicators (chapter 2, section I). Perform your BEFORE preventive maintenance (chapter 2, section II). Read the operating instructions contained in chapter 2, sections III and IV. Always follow the WARNINGS and CAUTIONS. During operation, perform your DURING preventive maintenance, and after operation perform your AFTER preventive maintenance (chapter 2, section II).
- **MAINTENANCE.** When you perform maintenance, look over the entire procedure before starting. Make sure you have the necessary tools and materials at hand. Always follow the WARNINGS and CAUTIONS.



Left Front View



Right Rear View

**TRUCK, TRACTOR, M1070, 8 X 8,
HEAVY EQUIPMENT TRANSPORTER (HET)**

**CHAPTER 1
INTRODUCTION**

Contents	Para	Page
Scope	1-1	1-1
Maintenance Forms and Procedures	1-2	1-1
Corrosion Prevention and Control (CPC)	1-3	1-2
Destruction of Army Materiel to Prevent Enemy Use	1-4	1-2
Reporting Equipment Improvement Recommendations (EIR)	1-5	1-2
Warranty Information	1-6	1-2
Nomenclature Cross-Reference List	1-7	1-2
List of Abbreviations	1-8	1-3
Equipment Characteristics, Capabilities, and Features	1-9	1-4
Location and Description of Major Components	1-10	1-6
Equipment Data	1-11	1-10
Systems Introduction	1-12	1-20
Power Train	1-13	1-20
Electrical System	1-14	1-21
Air System	1-15	1-22
Winch System	1-16	1-24
Central Tire Inflation System (CTIS)	1-17	1-25

Section I. GENERAL INFORMATION

1-1. SCOPE

a. Type of Manual. This manual provides instructions for operation and operator maintenance of the HET Tractor.

b. Name and Model. Truck, Tractor, M1070, 8 x 8, Heavy Equipment Transporter (HET).

c. Purpose of Equipment. The HET Tractor and the M1000 Trailer form the Heavy Equipment Transport System (HETS). HETS will be used to load, unload, and transport the M1 Series Main Battle Tank (MBT) during administrative and tactical operations.

d. Special Inclusions. A Sign Guide is included as appendix E to this manual. An On-Vehicle Equipment Loading Plan is included as appendix F to this manual.

1-2. MAINTENANCE FORMS AND PROCEDURES

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 (The Army Maintenance Management System (TAMMS))(Maintenance Management UPDATE).

1-3. CORROSION PREVENTION AND CONTROL

The HET Tractor has a total service life of 20 years which allows for extended periods of operation in a corrosive environment. A corrosive environment includes exposure to high humidity, salt spray, road-deicing chemicals, gravel damage, and atmospheric contamination. No action beyond normal washing and repair of damaged areas is necessary to control corrosion. To prevent moisture accumulation, drain holes are provided on structural and sheet metal areas where necessary, and stowage boxes are provided with seals and baffled drains.

1-4. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

Command decision, according to the tactical situation, will determine when the using organization is to destroy a HET Tractor. A destruction plan will be prepared by the using organization, unless one has been prepared by a higher authority. For general HET Tractor destruction procedures, refer to TM 750-244-6, Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (U.S. Army Tank-Automotive and Armament Command).

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your HET Tractor needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail to us at: Commander, U.S. Army Tank-Automotive and Armament Command, ATTN: AMSTA-QRT, Warren, MI 48397-5000. We'll send you a reply.

1-6. WARRANTY INFORMATION

The HET Tractor is warranted by Oshkosh Truck Corporation for 12 months. For complete information covering this warranty, refer to TB 9-2320-360-14, Warranty Procedures for Truck, Tractor, M1070, 8 x 8, Heavy Equipment Transporter (HET).

1-7. NOMENCLATURE CROSS-REFERENCE LIST

<u>Common Name</u>	<u>Official Nomenclature</u>
Cable	Wire rope
Cold Start System	Ether quick-start system
Engine Coolant	Antifreeze, ethylene glycol mixture
Gladhand	Quick-disconnect coupling
HET Tractor	Truck, Tractor, M1070, 8 x 8, Heavy Equipment Transporter (HET)

1-8. LIST OF ABBREVIATIONS

AAL	Additional Authorization List
amp	Amperes
AOAP	Army Oil Analysis Program
BII	Basic Issue Item
°C	Degree Celsius
CBR	Chemical, Biological, and Radiological
CID	Cubic Inch Displacement
cm	Centimeter
COEI	Components of End Item
CTA	Common Table of Allowance
CTIS	Central Tire Inflation System
cu in.	Cubic Inch
DA	Department of the Army
DAP	Decontamination Apparatus Portable
EIR	Equipment Improvement Recommendation
°F	Degree Fahrenheit
ft	Foot
GCWR	Gross Combination Weight Rating
GPFU	Gas Particulate Filter Unit
GVWR	Gross Vehicle Weight Rating
HD	Heavy Duty
HET	Heavy Equipment Transporter
HETS	Heavy Equipment Transport System
hp	Horsepower
in.	Inch
JTA	Joint Tables of Allowances
kg	Kilogram
kPa	Kilopascal
km/h	Kilometer Per Hour
kW	Kilowatt
L	Liter
lb	Pound

1-8. LIST OF ABBREVIATIONS (CONT)

lb-ft	Pound-Foot
lb-in.	Pound-inch
m	Meter
MBT	Main Battle Tank
mi	Mile
mm	Millimeter
mph	Miles Per Hour
MTOE	Modification Table of Organization and Equipment
N•m	Newton Meter
NBC	Nuclear, Biological, Chemical
PMCS	Preventive Maintenance Checks and Services
psi	Pound-Force Per Square Inch
PTO	Power Takeoff
RFI	Radio-Frequency Interference
rpm	Revolutions Per Minute
SAE	Society of Automotive Engineers
STE/ICE-R	Simplified Test Equipment/Internal Combustion Engine Reprogrammable
TAMMS	The Army Maintenance Management System
TDA	Tables of Distribution and Allowance
TM	Technical Manual
Vdc	Volts Direct Current
XHD	Extra Heavy-Duty

Section II. EQUIPMENT DESCRIPTION**1-9. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

a. Characteristics. The HET Tractor is used in combination with the M1000 Trailer to form the Heavy Equipment Transporter System (HETS). The HETS is used to load, unload, and transport the M1Series Main Battle Tank (MBT) and other heavy tracked/wheeled vehicles weighing up to 140,000 lb (63,500 kg) during administrative and tactical operations.

b. Capabilities

(1) Operates in temperatures from -25 to 120°F (-32 to 49°C) and to -50°F (-46°C) with arctic kit installed.

(2) Fords water up to 28 in. (71 cm) deep for 5 minutes without damage or requiring maintenance before operation can continue.

(3) Normal operating range is 325 mi (523 km), based on 250 gal (946 L) of fuel and 231,400 lb (104,963 kg) gross combination weight rating (GCWR) when operated at an average speed of 30 mph (48 km/h). Varying loads, prolonged idle, use of Power Takeoff (PTO), off-road driving, and climatic conditions affect operating range.

(4) Tiedown points are located so HET Tractor can be restrained in all directions during air transport in C-5A and C-17 aircraft. Capable of being transported by highway, rail, and sea.

c. Features

(1) Eight-cylinder, 736 cu in. (12.1 L), V-type, 2-cycle, turbocharged diesel engine.

(2) Automatic transmission with one reverse speed and five forward speeds.

(3) Operator-controlled 6-wheel/8-wheel drive with high and low range transfer case for positive traction on unimproved road surfaces.

(4) Power steering system consists of basic manual steering system with hydraulic boost. An auxiliary steering pump provides hydraulic boost in the event of main pump failure. Mechanical linkage also provides operator control in event of hydraulic oil pressure loss.

(5) Fuel system includes two fuel tanks, injectors, pipes (inlet and outlet), manifolds (integral with the cylinder head), pump, fuel/water separator, secondary filter, and fuel lines.

(6) Two front and two rear towing eyes.

(7) Manual-release pintle hook which will allow towing of trailer.

(8) Two main winches each having 55,000 lb (24,947 kg) capacity used for recovering, loading, and unloading heavy tracked and wheeled vehicles. Auxiliary winch having 3000 lb (1361 kg) capacity used for pulling main winch cable back to payload.

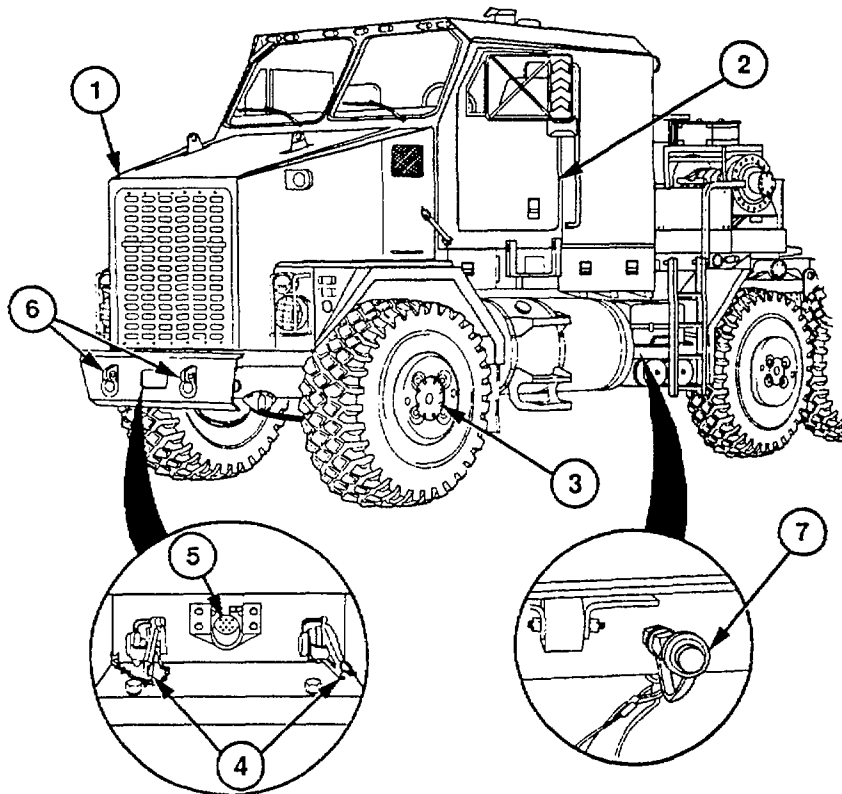
(9) Central Tire Inflation System (CTIS) allows operator to automatically adjust tire pressure to suit terrain conditions.

(10) Personnel cab has accommodations for two personnel in front seats and three personnel in rear seat. Rear seat converts into beds which sleep two personnel.

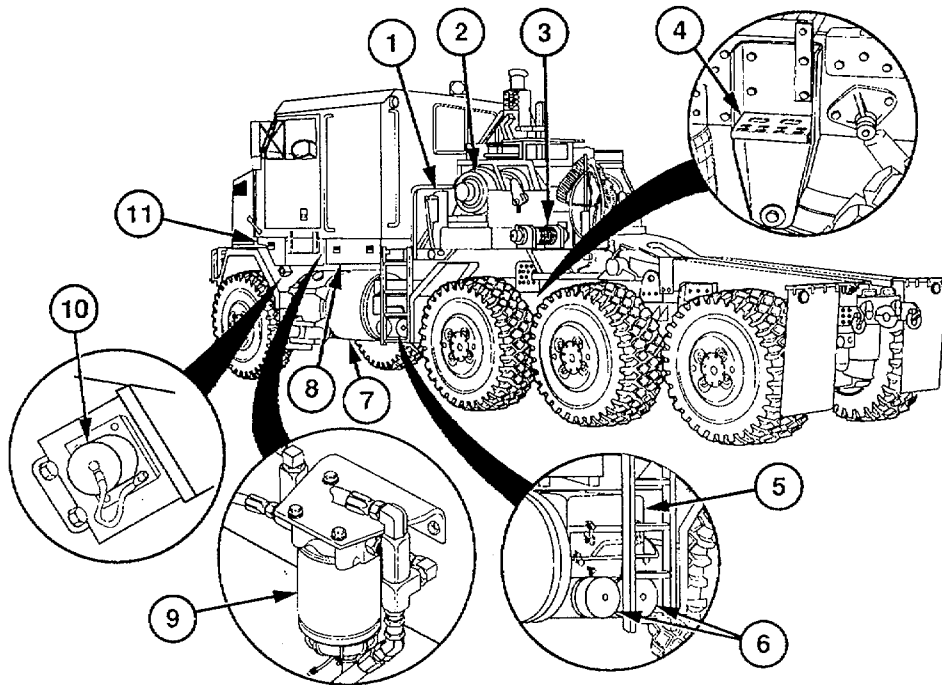
(11) Heavy duty, full oscillating fifth wheel accommodates M1000 trailer or any other trailer with 3-1/2 in. kingpin.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

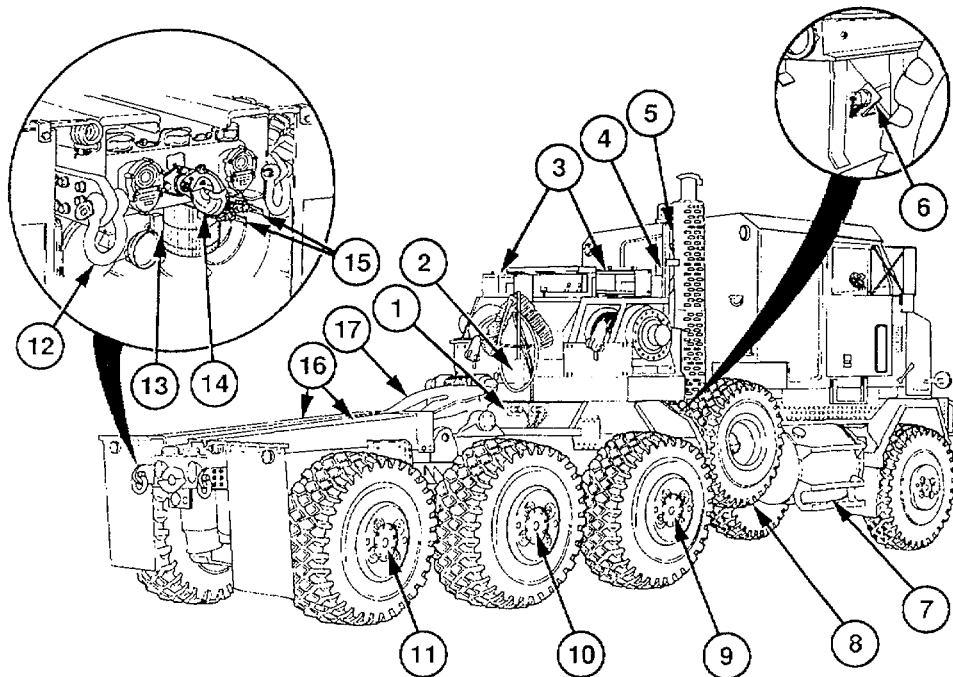
Major components and accessories found on the M1070 HET Tractor are illustrated and described below.



- 1 **HOOD.** Houses engine and components.
- 2 **PERSONNEL CAB.** Provides protection from weather for crew and contains controls, gages, and indicators. The cab has provisions to accommodate five fully-equipped personnel and sleeping provisions for two. It is equipped with a footrest, a sliding rear window, rifle mounts, and a stowage area under rear seat.
- 3 **NO. 1 DRIVING AXLE.** Controls direction of HET Tractor when in motion. When needed, transmits power to hubs to turn wheels.
- 4 **GLADHANDS.** Couples air supply from another vehicle during towing operations.
- 5 **ELECTRICAL CONNECTOR.** A 12-volt (7-pin) connector receives power from towing vehicle electrical system through intervehicular cable.
- 6 **TOW EYES.** Attachment points for towing operations.
- 7 **QUICK-DISCONNECT COUPLING.** Used to connect air hose from Bill to vehicle air system. Hose is used to manually inflate tires or power air wrench.



- 1 **HYDRAULIC OIL RESERVOIR.** Stores, cools, and filters oil used to operate main and auxiliary winches.
- 2 **MAIN WINCHES.** Two winches that operate independently of each other used to recover load, and unload heavy tracked and wheeled vehicles.
- 3 **AUXILIARY WINCH.** Pulls the main winch cables out to payload.
- 4 **FIFTH WHEEL ACCESS STEP.** Allows safe access to fifth wheel access platform.
- 5 **BATTERY BOX.** Contains four batteries and protects them from inclement weather. Pulls out for easier access to batteries.
- 6 **AIR RESERVOIRS.** Store compressed air for operation of brake, suspension, and central tire inflation systems.
- 7 **NO. 1 FUEL TANK.** A 150 gal (568 L) tank which stores fuel used to operate engine. Receives excess fuel not used by engine fuel injection system. Connects to fuel tank no. 2 with hose and shutoff valve.
- 8 **STORAGE BOX.** Used to stow basic issue items (BII), components of end item (COEI), and additional authorization list (AAL) items.
- 9 **DUEL/WATER SEPARATOR.** Removes water and contaminants from fuel before entering fuel pump. The unit incorporates a thermostatically activated electric heater to prevent gelling of fuel in cold weather operation.
- 10 **SLAVE RECEPTACLE.** A 24-volt receptacle used to slave start the HET Tractor.
- 11 **TOOL BOX.** Used to stow BII, COEI, and AAL items.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (CONT)

- 1 **TRAILER ELECTRICAL CONNECTORS.** Two connectors (24-volt/12-pin and 12-volt/7-pin) supply power to trailer electrical system through intervehicular cable.
- 2 **TRAILER GLADHANDS.** Couples air supply to trailer.
- 3 **CHOCK BLOCKS STORAGE BOXES.** Used to stow wheel chocks.
- 4 **PERSONNEL LADDER.** Provides access to engine compartment when servicing engine and accessories. Mounts in holes in right or left side fenders when in use. Folds and mounts on exhaust stack for storage.
- 5 **TIRE DAVIT.** Raises and lowers spare tire.
- 6 **QUICK-DISCONNECT COUPLING.** Used to connect air hose from BII to vehicle air system. Hose is used to manually inflate tires or power air wrench.
- 7 **NO. 2 FUEL TANK.** A 100 gal (379 L) tank stores diesel engine operating fuel.
- 8 **SPARE TIRE.** Used to replace a damaged tire.
- 9 **NO. 2 AXLE.** Supports weight of HET Tractor and transmits power to hubs to turn rear wheels.
- 10 **NO. 3 AXLE.** Supports weight of HET Tractor and transmits power to hubs to turn rear wheels.

- 11 **NO. 4 AXLE.** Supports weight of HET Tractor and assists no. 1 axle in steering when in motion. Transmits power to hubs to turn rear wheels.
- 12 **TOW EYES.** Attachment points for towing operations.
- 13 **ELECTRICAL CONNECTOR.** A 12-volt (7-pin) connector supplies power to trailer or to towed vehicle electrical system through intervehicular cable.
- 14 **PINTLE HOOK.** Hitch used for towing trailer.
- 15 **GLADHANDS.** Couples air supply to another vehicle or trailer during towing or trailering operations.
- 16 **APPROACH RAMPS.** Raise the front end of trailer to guide kingpin into fifth wheel.
- 17 **FIFTH WHEEL.** Couples trailer to HET Tractor.

1-11. EQUIPMENT DATA

Table 1-1. HET Tractor Equipment Data

DIMENSIONS

With

Vehicle	102 in. (259 cm)
Mirrors	144 in. (366 cm)
Height (Overall)	140.1 in. (356 cm)
Length(Overall)	361.6 in. (919 cm)
Wheelbase	215 in.(546 cm)
Track	82 in. (208 cm)
5th Wheel Height	64 in. (163 cm)
Kingpin Diameter	3.5 in. (8.9 cm)
Ground Clearance	15.9 in. (40.4 cm)

WEIGHTS AND PAYLOADS

HET Tractor Curb Weight	38,910 lb (17,665 kg)
Gross Vehicle Weight Rating (GVWR)	86,000 lb (39,009 kg)
Gross Combination Weight Rating (GCWR)	231,400 lb (104,963 kg)
Kingpin Load	46,000 lb (20,865 kg)

WEIGHT DISTRIBUTION

Axle Loads of HET Tractor (Cur Weight)

No. 1 Axle	17,620 lb (7999 kg)
No. 2 Axle	7210 lb (3273 kg)
No. 3 Axle	7050 lb (3200 kg)
No. 4 Axle	7030 lb (3191 kg)

Axle Loads of HET Tractor (Gross Vehicle Weight)

No. 1 Axle	20,122 lb (9127 kg)
No. 2 Axle	22,022 lb (9989 kg)
No. 3 Axle	21,982 lb (9971 kg)
No. 4 Axle	21,874 lb (9922 kg)

Table 1-1. HET Tractor Equipment Data (Con)t

PERFORMANCE

Cruising Range at GCWR	325 mi (523 km)
Maximum Sustained Forward Speed	
(at 2100 rpm)	
5 th Gear	45 mph (72 km/h)
4 th Gear	32 mph (51 km/h)
3 rd Gear	22 mph (35 km/h)
2 nd Gear	14 mph (23 km/h)
1 st Gear	9 mph (14 km/h)
Maximum Grade a GCWR	15%
Maximum Grade w/50,000 lb (22,680 kg) Payload	30%
Maximum Side Slope at GCWR.....	20%
Maximum Towed Speed (Reference FM 21-305)	5 mph (8 km/h)
Maximum Ford Depth.....	in. (71 cm)
Approach Angle	30°
Turning Radius	67.9 ft (20.4 m)

CAPACITIES

Engine Oil	
Without Filter	26 qt (24.6 L)
With Filter	28 qt (26.5 L)
Cooling System	
Radiator Only	61.9 qt (58.6 L)
Entire System.....	93.8 qt (88.8 L)
Transmission Oil	
Without Filter	31 qt (29 L)
With Filer	32 qt (30 L)
Transfer Case	6 qt (5.67 L)
Axles (Including Wheel End)	
No. 1, No. 4	19 qt (18 L)
No. 2, No. 3	20 qt (19 L)

1-11. EQUIPMENT DATA (CONT)

Table 1-1. HET Tractor Equipment Data (Cont)

System Oil	
Steering	16 qt (15 L)
Hydraulic	42 gal (159 L)
Fuel Tank	
No. 1	SO 150 gal (568 L)
No. 2	100 gal (379 L)
Windshield Washer Fluid.....	3 qt (2.8 L)

ENGINE

Make	Detroit Diesel
Model	8V92TA
Type	2-Stroke, V-Type Diesel. Turbocharged, Aftercooled
Cylinders	8
Bore.....	4.84 in. (12.3 cm)
Stroke.....	5.0 in. (12.7 cm)
Displacement.....	736 cu in. (12.1L)
Torque (at 1200 rpm)	1470 lb-ft (1993 Nm)
Maximum Brake Horsepower (at 2100 rpm)	500 hp SAE (373 kW)
Maximum Governed Engine Speed (Loaded).....	2050-2150 rpm
Oil Filter Type	Full Flow, Replaceable Element
Oil Filter	1

FUEL SYSTEM

Type	Electronic Fuel Injection
Tanks.....	2
Air Cleaner Type	Dry Element

COOLING SYSTEM

Radiator Working Pressure	7 psi (48 kPa)
---------------------------------	----------------

AIR COMPRESSOR

Make	Midland
Model.....	EL 3200
Type	Four Cylinder, Piston-Type

Table 1-1. HET Tractor Equipment Data (Cont)

ELECTRICAL SYSTEM

Alternators (2)

Make..... Prestolite
 Model 4805JX (14 Vdc), 4826JX (28 Vdc)
 Drive Type..... Belt
 Voltage Regulator..... Integral
 Dual Voltage System..... Separate Alternators Common at Batteries

Starter

Make..... Leece Neville
 Type24 Vdc per MIL-S-3785D, Type II, Grade A
 Rating 680 Amps, 50 lb-ft (68 N m) at 18.7 Vdc

Batteries

Make..... Exide
 Type 6TL
 Quantity 4 (Additional two batteries if arctic kit is installed)
 Battery Connection Series-Parallel
 Rating 600 Cold Cranking Amps at 0°F (-18°C) for 60 seconds

TRANSMISSION

MakeAlison
 Model CLT 754
 Type Automatic
 Forward Speeds 5
 Reverse Speeds 1
 Power Takeoff

Make..... Chelsea/Dana
 Model 270 Series

TRANSFER CASE

MakeOshkosh
 Model 55000Series
 Type 2-Speed, Helical Gear

1-11. EQUIPMENT DATA (CONT)

Table 1-1. HET Tractor Equipment Data (Cont)

AXLES

No. 1

Make.....Rockwell
 Model SVI 5 MRDIS-FC
 Type Planetary Hub Reduction
 Ratio7.36:1
 Maximum Load Capacity..... 21,500 lb (9752 kg)
 Steering Angles
 Right 36°
 Left 360
 Differential Carrier
 MakeRockwell
 Model.....SVI 5MR
 Type Spiral Bevel

No. 2

Make.....Rockwell
 Model..... SVI 5 MRTGS-FC
 Type Planetary Hub Reduction
 Ratio7.36:1
 Maximum Load Capacity..... 23,680 lb (10,741 kg)
 Differential Carrier
 Make.....Rockwell
 ModelSVI 5MR
 Type Spiral Bevel

No. 3

Make.....Rockwell
 Model..... SVI 5 MRTGS-FC
 Type Planetary Hub Reduction
 Ratio7.36:1
 Maximum Load Capacity..... 23,680 lb (10,741 kg)

Table 1-1. HET Tractor Equipment Data (Cont)

Differential Carrier

Make.....Rockwell
 ModelSVI 5MR
 Type Spiral Bevel

No. 4

Make.....Rockwell
 Model SVI5 MRDIS-FC
 Type Planetary Hub Reduction
 Ratio.....7.36:1
 Maximum Load Capacity..... 23,680 lb (10,741 kg)

Steering Angles

Right 190
 Left 19

Differential Carrier

MakeRockwell
 Model..... SVI 5VMR
 Type Spiral Bevel

PROPELLER SHAFTS

Make Spicer
 Model
 Transmission to Transfer Case 1810
 Transfer Case to Axle No. 1 1610
 Transfer Case to Axle No.2 1810
 No.2 Axle to No. 3 Axle 1710
 No. 3 Axle to No. 4 Axle 1610

11-11. EQUIPMENT DATA(CONT)

Table 1-1. HET Tractor Equipment Data (Cont)

SUSPENSION SYSTEM

Make

FrontHendrickson/Canada

Rear.....Hendrickson/Turner

Type

FrontTaper Leaf

Rear..... Air Ride

BRAKE SYSTEM

MakeRockwell

Model 16.5 in. Q-Series

Type S-Cam, Air Actuated

Drum Size 16.5 in. (42 cm) diameter X 7.9 in. (20 cm) wide

FMVSS Certification..... Yes

Brake Air Chambers 8

Pressure Range..... 60-120 psi (414-827 kPa)

HYDRAULIC SYSTEM

Operating Pressure..... 3000 psi (20,684 kPa)

Overload Protection Yes

CAB

Windshield..... Tinted, 2-Piece, Safety Glass

Personnel Capacity..... 5

Sleeping Capacity..... 2

TOWING EYES

Quantity 4(2 front, 2 rear)

Maximum Load Capacity (Each) 28,000 lb (12,701 kg)

PINTLE HOOK

Type Manual Release

Maximum Load Capacity

Pulling..... 49,000 lb (22,226 kg)

Vertical.....9,800 lb (4445 kg)

Table 1-1. HET Tractor Equipment Data (Cont)

WINCH SYSTEM

Recovery Winches

Make..... dp Manufacturing
 Model..... 55K
 Speeds 2
 Maximum Load (per winch) 55,000 lb (24,947 kg)
 Cable Dimensions..... 1 in. (2.5 cm) diameter X 170 ft (51.8 m)

Auxiliary Winch

Make..... dp Manufacturing
 Model 3GN
 Speeds
 Maximum Load 3000 lb (1361 kg)
 Cable Dimensions..... 0.25 in. (0.64 cm) diameter X 300 ft (91.4 m)

WHEELS

Make Titan
 Rim Size and Type20 X 10, Two-Piece, Bolt-Together
 Quantity 9 (including spare)
 Studs Per Wheel 10
 Maximum Wheel Load..... 11,500 lb (5216 kg)

CENTRAL TIRE INFLATION SYSTEM (CTIS)

Make CM Automotive

TIRES

Make Michelin
 Size 425/95 R20 (16.00 R20)
 Tread Design..... Non Directional On-Off Road
 Ply Rating..... 22 Ply
 Tube or Tubeless..... Tubeless
 Load Range..... M

1-11. EQUIPMENT DATA (CONT)

Table 1-1. HET Tractor Equipment Data (Cont)

Tire Loads (per tire)

HET Tractor Unloaded

Front 9184 lb (4166 kg)
 Rear..... 3772 lb (1711 kg)

HET Tractor at GVWR

Front 10,282 lb (4664 kg)
 Rear 11,073 lb (5023 kg)

TIRE PRESSURE (ALL TIRES)

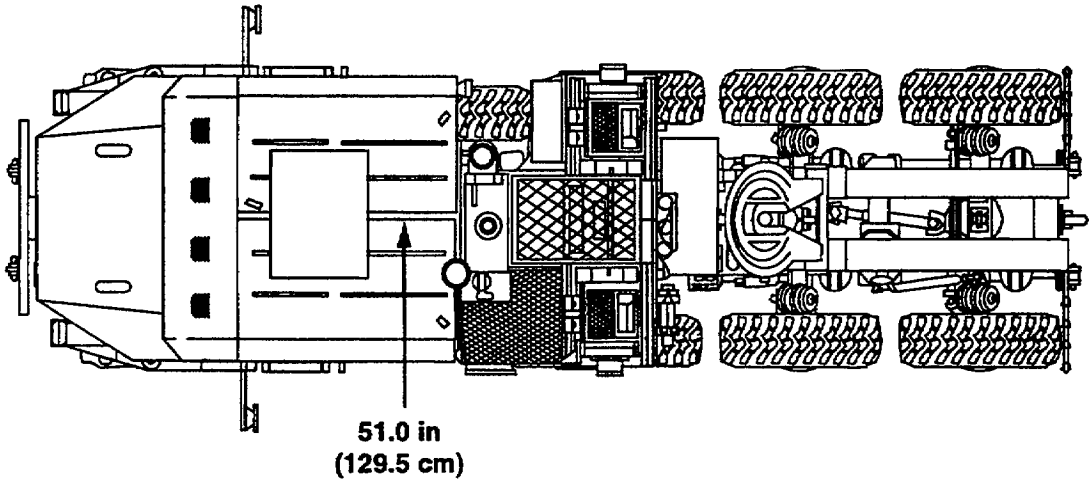
<u>Terrain Condition</u>	<u>Maximum Speed</u>	<u>Tire Pressure</u>
Highway	45 mph (72 km/h)	75 psi (517 kPa)
Cross Country	30 mph (48 km/h)	55 psi (379 kPa)
Mud, Sand, Snow	15 mph (24 km/h)	40 psi (276 kPa)
Emergency	5 mph (8 km/h)	30 psi (207 kPa)

AUXILIARY EQUIPMENT *

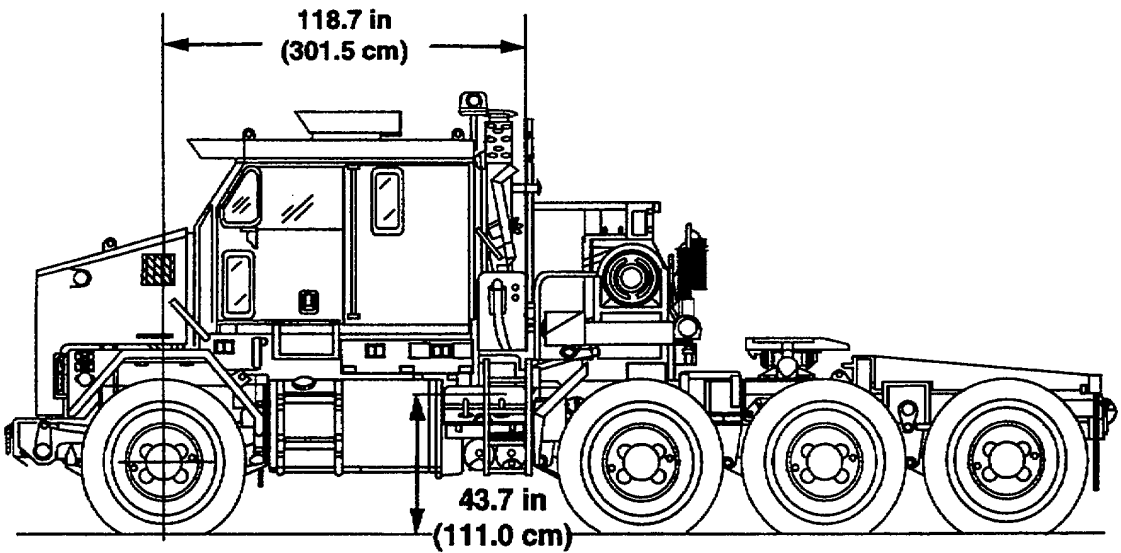
- Arctic Kit
- Gas Particulate Filter Unit
- Chemical Alarm Kit
- Decontamination Apparatus Portable (DAP) Kit
- Radio

*HET Tractor may not be equipped with any of these items depending on mission, climate, or other factors.

LOAD CLASSIFICATION CHART	
Vehicle Condition	Load Class Number
M1070 without trailer	19
M1070 with M1000 trailer	30
M1070 with M1000 trailer and M1 Tank	95



TOP VIEW



LEFT VIEW

CENTER OF GRAVITY

Section III. PRINCIPLES OF OPERATION

1-12. SYSTEMS INTRODUCTION

This section provides a basic explanation of major systems on the HET Tractor. The power train, electrical, air (pneumatic), winch, and central tire inflation systems are explained in this section.

1-13. POWERTRAIN

Power for the HET Tractor is generated by a two-stroke, V-type diesel engine coupled directly to an automatic transmission. The engine is capable of 500 horsepower of braking.

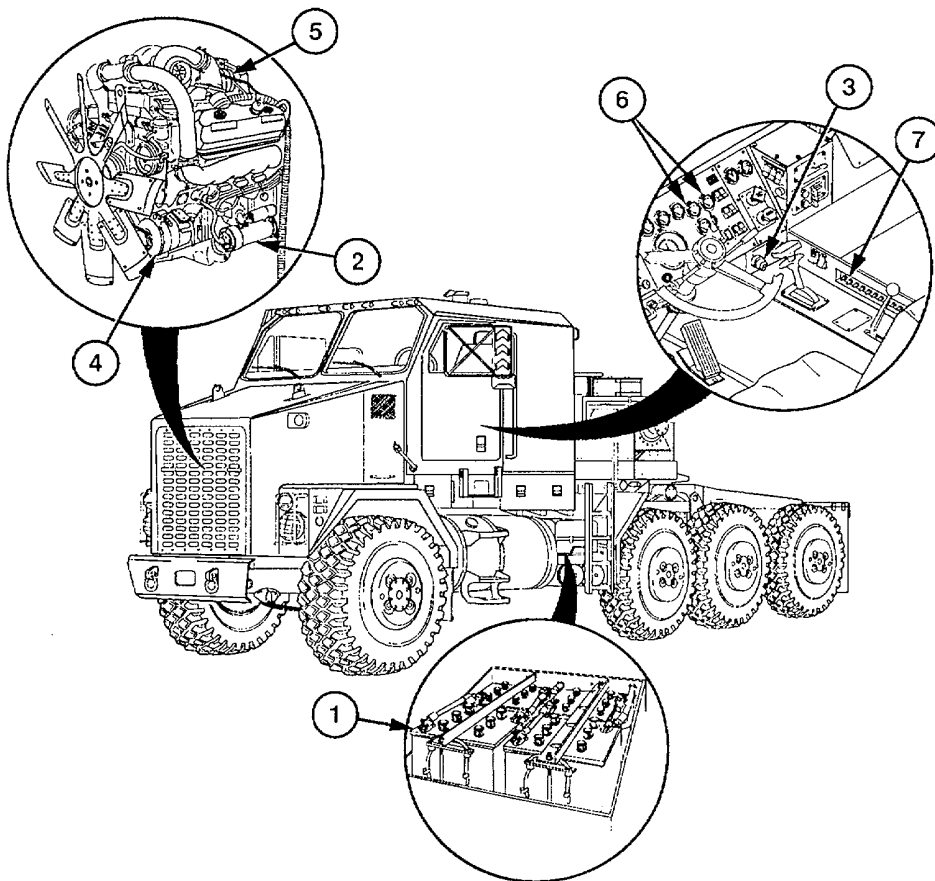
The engine is equipped with an electronic control system that regulates fuel delivery to each injector as well as governing engine speed for power takeoff operation. Engine sensors and engine performance can be checked using a plug-in diagnostic reader.

Five forward drive ranges can be manually selected, depending on the terrain and conditions. The transmission will automatically downshift as engine speed and throttle position change.

Power from the transmission is directed to the transfer case and propeller shafts forward and rear. The front axle and rear tridem axles are each equipped with planetary wheel ends. In low range, driver-controlled lockouts in the differentials provide positive drive to all four axles.

1-14. ELECTRICAL SYSTEM

The electrical system is a combined 12 Vdc/24 Vdc system. Four 12-volt storage batteries (1) are connected in series-parallel with the negative terminal grounded. The starting motor (2) operates directly from the 24 Vdc source through the engine start switch (3). A belt-driven alternator (4) having a capacity of 130 amps maintains the charge on the batteries for the 24 Vdc system. A second belt-driven alternator (5), having a capacity of 145 amps, maintains the charge on the batteries for the 12 Vdc system. The 24 Vdc source supplies electrical power to operate starter, Central Tire Inflation System (CTIS), fuel/water separator, air dryers, trailer lights, and ether injection system. The 12 Vdc source supplies electrical power to operate HET Tractor lights, trailer lights, warning lights and gages inside cab, and windshield wipers and washer. There are two BATTERY gages (6). One shows the voltage output for the 12 Vdc system, the other shows the voltage output for the 24 Vdc system. The HET Tractor electrical circuits are protected against overloads by automatic reset circuit breakers (7). Wiring harnesses are used to carry current to operate equipment and accessories.

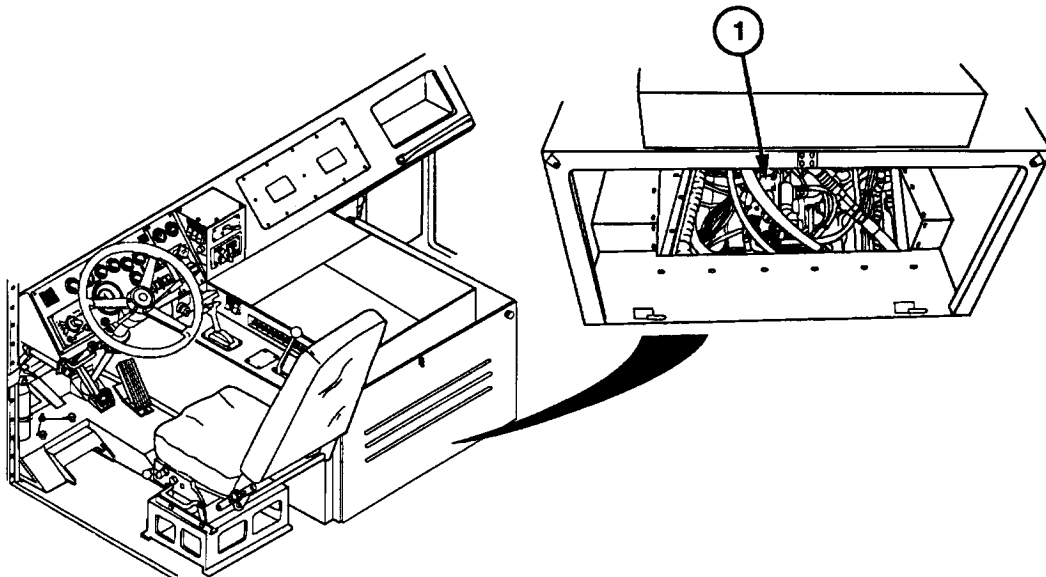


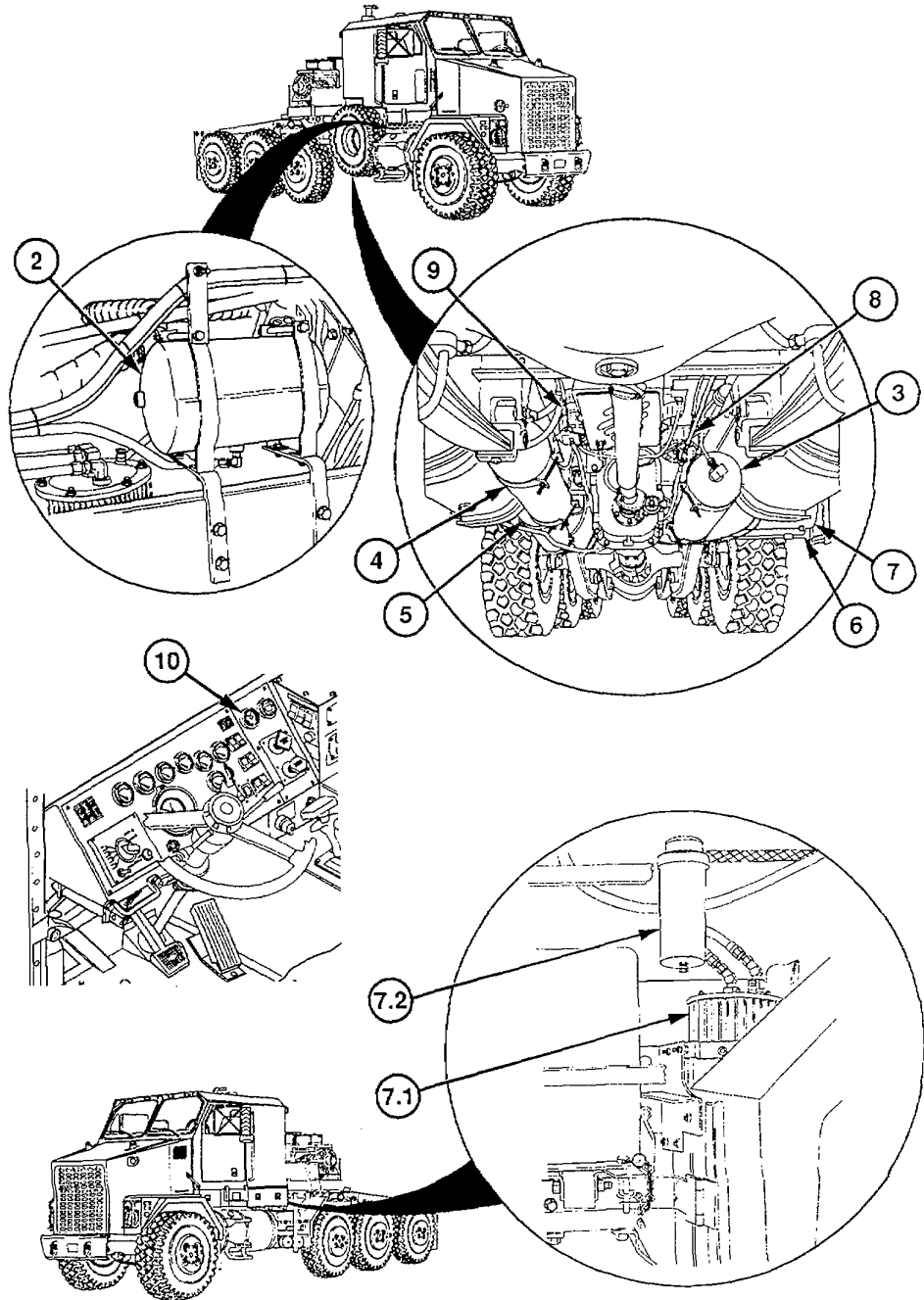
1-15. AIR SYSTEM

Major systems on HET Tractor which operate with air include service and parking brakes, rear suspension system, and Central Tire Inflation System (CTIS). Other vehicle components which operate with air include the transfer case and interaxle lockups, winch tensioners and kickouts, windshield washer, and horns. Vales are installed to isolate air-operated components so operation o one does not affect the operation of another.

The air system consists of an engine-driven air compressor (1), a purge reservoir (2), and five air reservoirs (3, 4, 5, 6, and 7). Air is drawn from the engine air intake and routed to the air compressor (1). Pressurized air flows from the air compressor (1) thru an aftercooler (7.1), a coalescing filter (7.2), and air dryers (8 and 9) where the air is cooled and the moisture/oil is removed. From the air dryers, air goes to the purge reservoir (2) and air reservoir (3). The purge reservoir (2) supplies the air to purge the air dryers (8 and 9) and aftercooler (7.1) when required. Moisture not removed by the air dryers will condense in air reservoir. System air pressure is 120-125 psi (827-862 kPa). The air pressure in reservoir (3) is sensed and controls air compressor operation.

Reservoir (3) supplies air to reservoirs (4, 5, 6, and 7) and CTIS. Reservoirs (5, 6, and 7) are interconnected and separated from reservoir (4) with check vales. Reservoirs (5, 6, and 7) supply air to operate the CTIS, service and parking brakes on rear tridem axles, and rear suspension system. Air pressure in reservoirs (5, 6, and 7) is indicted by the red needle on the AIR PRESS Gage (10). Reservoir (4) supplies air to operate service brakes on front axle, parking brakes on rear tridem axles, transfer case and interaxle lockups, winch tensioners and kickout, windshield washes, and horns. Air pressure in reservoir (4) is indicated by the green needle on the AIR PRESS Gage (10). If air pressure system falls below 60 psi (414 kPa), an audible alarm will sound and the LOW AIR Indicator will light.

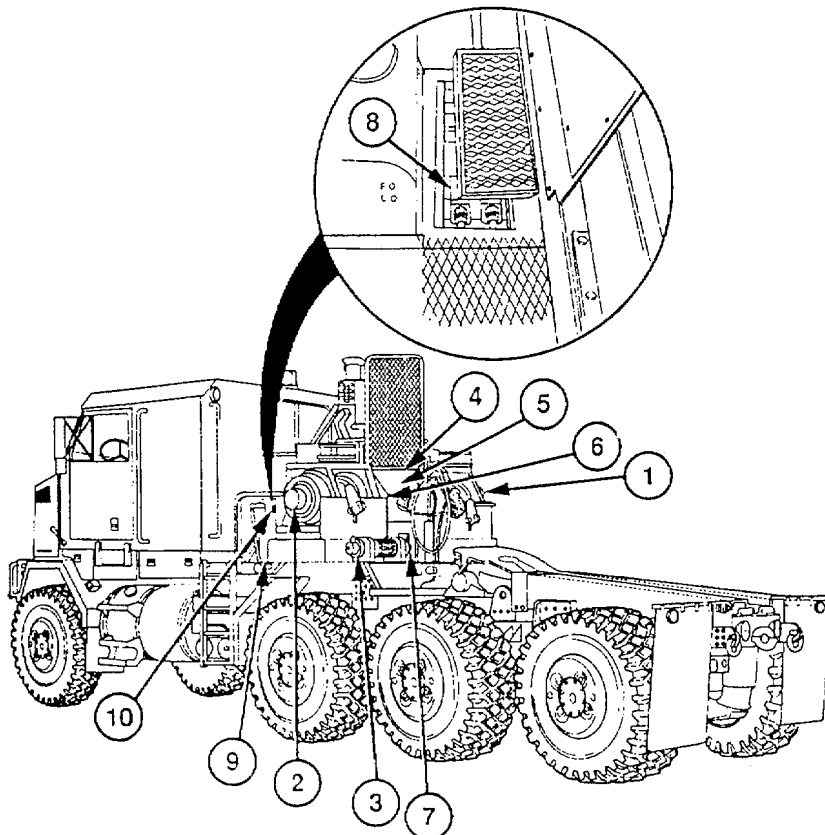




1-16. WINCH SYSTEM

The winch system operates hydraulically and consists of two main winches (1 and 2) and an auxiliary winch (3). The main winches operate independently and are used to recover, load, and unload heavy tracked and wheeled vehicles. The main winches are mounted side-by-side directly to the winch platform. Each main winch has a maximum capacity of 55,000 lb (24,947 kg). The auxiliary winch is used to pull the main winch cable back to the payload. The auxiliary winch is mounted to the winch platform just below the driver's side main winch. The auxiliary winch has a maximum capacity of 3000 lb (1361 kg). The winches are controlled from the operator's station (4). The operator is protected by a shield during winch operations.

Each main winch incorporates a two-speed hydraulic motor (5 and 6). A single-speed motor (7) is used by the auxiliary winch. A Power Takeoff (PTO) driven hydraulic pump (8) supplies winch system with hydraulic oil from a 45 gal (170 L) reservoir (9). A view gage (10) on the reservoir indicates the hydraulic oil level. All winches have a fail-safe, spring-loaded brake. The brake will automatically set when winch control is in neutral posit on or when hydraulic pressure is less than 270 psi (1862 kPa).

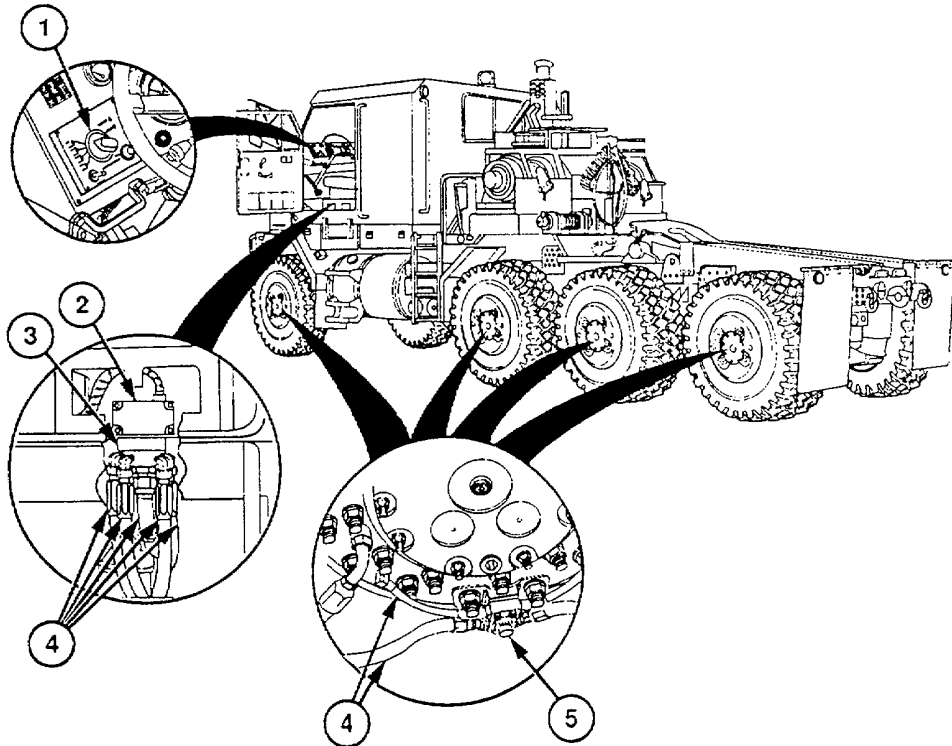


1-17. CENTRAL TIRE INFLATION SYSTEM (CTIS)

The Central Tire Inflation System (CTIS) allows the HET operator to adjust the vehicle tire pressure to one of four predetermined settings. Each tire pressure setting has a vehicle speed limitation. If the average vehicle speed exceeds this limit, the CTIS will activate an overspeed light.

The CTIS consists of five major components. A controller (1) mounted on the instrument panel contains the switches and indicator lights for system operation. The power manifold (2) located under the drivers seat contains operating valves, a low air pressure sensor, and a pressure sensor which monitors system pressure. Located directly under the power manifold is the porting block (3), to which the air lines (4) to the axles are connected. Air pressure passes through these lines and the axle assemblies to CTI wheel valves (5). These wheel valves are opened and closed by the CTIS depending on pressures at the porting block and individual tire pressures.

The air pressure to operate the CTIS comes from air reservoir no. 3. The CTIS will shut off its air supply from the air system if the pressure drops below 85 psi or when the electrical power is interrupted. Air pressure is present in the CTIS lines and hoses only when the system is monitoring (or adjusting) the tire pressures, approximately once every 15 minutes. At all other times, the system has no pressure and the wheel valves remain closed.



**CHAPTER 2
 OPERATING INSTRUCTIONS**

Contents	Para	Page
Introduction	2-1	2-2
Description and Use of Controls and Indicators	2-2	2-2
Preventive Maintenance Checks and Services (PMCS)		
Introduction	2-3	2-21
Use of PMCS Table	2-4	2-21
General Maintenance Procedures	2-5	2-22
Fluid Leakage	2-6	2-23
PMCS Table.....	2-7	2-23
Decals and Data Plates	2-8	2-105
General Tractor-Trailer Operating Instructions	2-9	2-114
Assembly and Preparation for Use	2-10	2-115
Lights Operation	2-11	2-122
Driving HET Tractor	2-12	2-126
Central Tire Inflation System (CTIS) Operation	2-13	2-141
Windshield Wipers/Washer Operation	2-14	2-143
Personnel Heater/Exhaust Fan Operation.....	2-15	2-144
Ventilator Operation	2-15.1	2-146.1
Personnel Ladder Operation.....	2-16	2-146.2
Fire Extinguisher Operation	2-17	2-147
Trailer Connection/Disconnection (Fifth Wheel)	2-18	2-148
Winch Operation	2-19	2-158
Auxiliary Equipment Operation.....	2-20	2-169
Operation in Extreme Heat	2-21	2-180
Operation in Extreme Dust	2-22	2-182
Operation in Sand or Mud.....	2-23	2-184
Operation in Desert Environment	2-24	2-187
Operation in Cold Environment, -25 to 32°F (-32 to 0°C)	2-25	2-188
Operation in Extremely Cold Environment, -50 to -26°F (-46 to -32°C)	2-26	2-192
Operation in Forest or Uneven Terrain.....	2-27	2-193
Fording Water Obstacles	2-28	2-194
Set Up/Securing of Highway Emergency Marking Kit	2-29	2-196
Tire Chain Installation/Removal	2-29.1	2-200.1
Tow Bar Connection/Disconnection	2-30	2-201
Towing Disabled M1070 Vehicle	2-31	2-216
Emergency Procedures	2-32	2-218
Opening/Closing Hood	2-33	2-226
Opening/Closing Battery Box	2-34	2-228

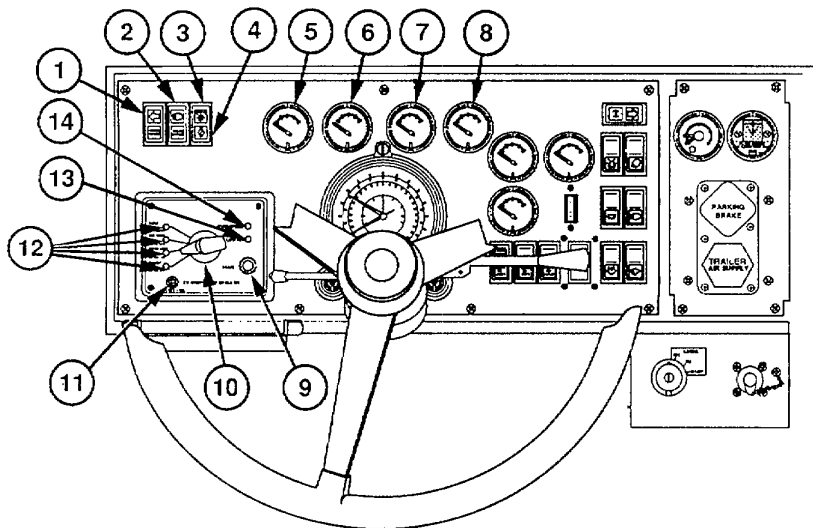
Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. INTRODUCTION

This section shows location and describes use of controls and indicators used to operate HET Tractor. Operator/crew must become thoroughly familiar with contents of this section before attempting to operate HET Tractor.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS

Know location and proper use of every control and indicator before operating HET Tractor. Use this section to learn about each control and indicator to be used.



MAIN INSTRUMENT PANEL CONTROLS AND INDICATORS

1 Left Turn Indicator

Flashes (green) when left turn signal is on.

2 High Beam Indicator

Lights (blue) when HET Tractor headlights are on high.

3 PTO Indicator

Lights (green) when PTO control switch is in on position.

4 LOW AIR Indicator

Lights (red) and remains lit until air system pressure is greater than 60 psi (414 kPa). Warning alarm sounds at the same time indicator is lit.

5 WATER TEMP Gage

Shows engine coolant temperature in °F and °C.

6 OIL PRESS Gage

Shows engine oil pressure in psi and kPa.

7 TRANS TEMP Gage

Shows transmission oil temperature in °F and °C.

8 T-CASE TEMP Gage

Shows transfer case oil temperature in °F and °C.

9 START (Central Tire Inflation System) Switch

Pushbutton switch starts CTIS when pressed.

10 Central Tire Inflation System Rotary Selector Switch

Four-position switch used to control tire inflation/deflation for different terrain conditions.

11 Central Tire Inflation System ON/OFF Switch

Two-position switch. When switch is in ON position, CTIS will operate. Positioning switch to OFF will shut down CTIS.

12 Tire Pressure Indicator Lights

Light indicates terrain condition selected by CTIS rotary switch. A maximum speed is associated with each terrain condition. Lights are labeled as follows:

HIGHWAY - Maximum speed is 45 mph (72 km/h). Tire pressure is 75 psi (517 kPa).

CROSS COUNTRY - Maximum speed is 30 mph (48 km/h). Tire pressure is 55 psi (379 kPa).

MUD, SAND & SNOW - Maximum speed is 15 mph (24 km/h). Tire pressure is 40 psi (276 kPa).

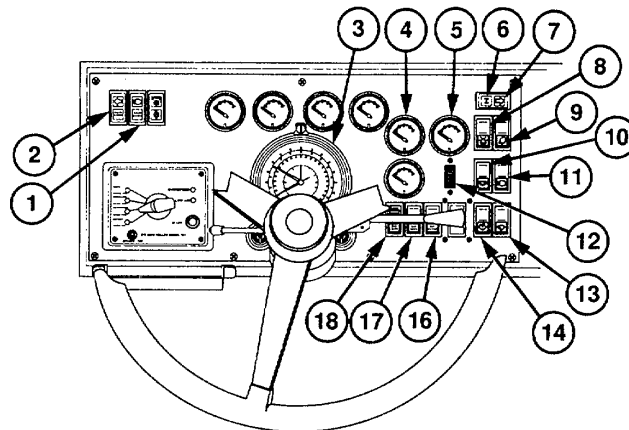
EMERGENCY - Maximum speed is 5 mph (8 km/h). Tire pressure is 30 psi (207 kPa).

13 LOW AIR (Central Tire Inflation System) Indicator

Lights (red) to warn of low pressure in HET Tractor air system. This condition causes CTIS to shut down, giving HET Tractor brake system priority for available air pressure. The CTIS automatically resumes operation when air pressure builds up to about 110 psi (758 kPa).

14 OVERSPEED Indicator

Flashes (amber) when speed of HET Tractor is too fast for existing tire pressure as selected by rotary selector switch.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS (CONT)**MAIN INSTRUMENT PANEL CONTROLS AND INDICATORS****1 CHECK GAUGES Indicator**

Lights when engine coolant levels is too low, engine (oil or coolant) temperature is too high, or oil pressure is too low Warning alarm sounds at the same time indicator is lit.

2 CHECK ENGINE Indicator

Lights (amber) when engine malfunction occurs.

3 Tachograph

Includes a speedometer, tachometer, odometer, and clock. Unit keeps a continuous record of HET Tractor traveling speeds and engine rpm versus time of day. Speedometer shows HET Tractor speed in mph and km/h. Tachometer shows engine rpm x 100. RPM warning indicator lights when engine exceeds 2250 rpm. Odometer records total distance HET Tractor has traveled in miles. A 12-hour clock gives current time of day.

4 BATTERY Gage (12-volt system)

Shows state of charge of batteries and alternator voltage output. During normal operations, range is 13-15 volts.

5 BATTERY Gage 4-volt system)

Shows state of charge of batteries and alternator voltage output. During normal operations, range is twice the 12-volt system voltage, +- 1 volt (26-30 volts).

6 All Wheel Drive Indicator

Lights (green) when DRIVELINE control is in LOCK position or when TRANSFER CASE shift lever is in LOW.

7 Right Turn Indicator

Flashes (green) when right turn signal is on.

8 Beacon Light Switch

Two-position switch used to control rotating beacon light. Push beacon light switch up to turn light off and down to turn light on.

9 Work Light Switch

Two-position switch used to control work light.

10 Dome Light Switch

Two-position switch used to control dome light.

11 Headlights Switch

Three-position switch used to control headlights, clearance lights, and parking lights. BLACK OUT LIGHTS switch must be in off position before these lights will operate.

12 Instrument Panel Lighting Control

Used to control brightness of instrument panel lights.

13 Windshield Wiper Switch

Three-position switch used to operate and control speed of windshield wipers.

14 Windshield Washer Switch

Momentary switch used to control windshield washer.

15 Deleted**16 BLACK OUT MARKER Switch**

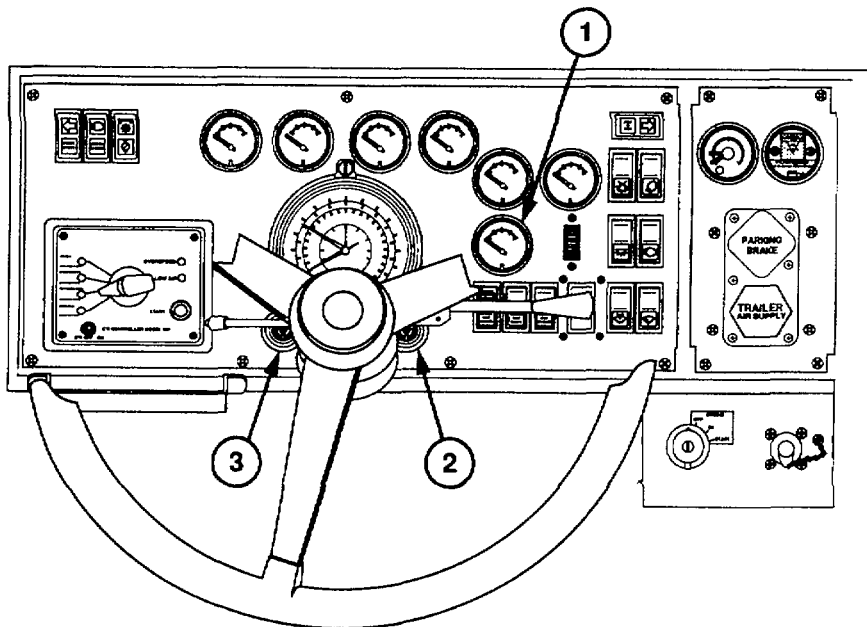
Two-position switch used to control blackout marker lights. BLACK OUT LIGHTS switch must be in on position before blackout marker lights will operate.

17 BLACK OUT DRIVE Switch

Two-position switch used to control blackout driving lights. BLACK OUT LIGHTS switch must be in on position before blackout driving lights will operate.

18 BLACK OUT LIGHTS Switch

Two-position switch used to control BLACK OUT DRIVE and BLACK OUT MARKER switches. When turned on, other lighting is inoperative.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS (CONT)**MAIN INSTRUMENT PANEL CONTROLS AND INDICATORS****1 FUEL Gage**

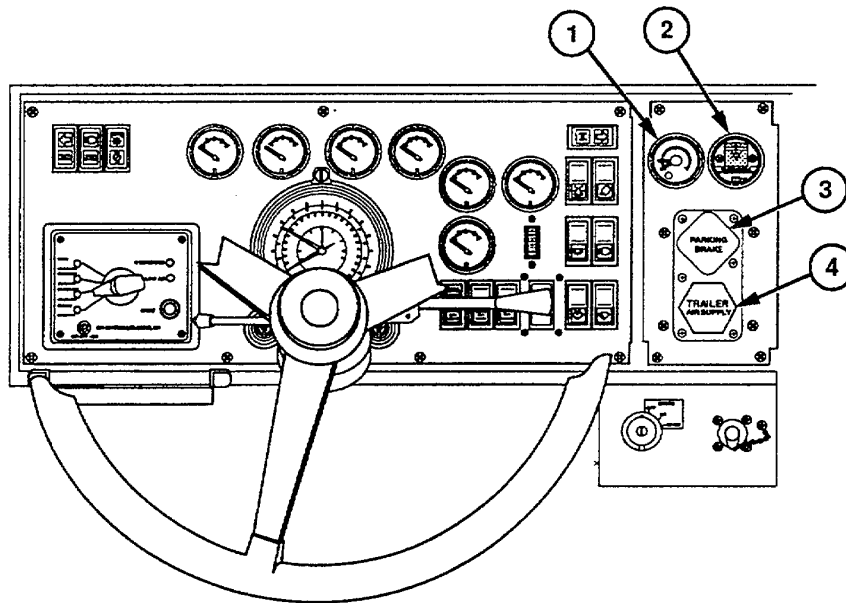
Shows amount of fuel in fuel tank.

2 Warning Alarm

Sounds when engine coolant level is too low, engine (oil or coolant temperature is too high, or oil pressure is too low indicator lights at the same time alarm sounds.

3 Warning Alarm

Sounds when air system pressure is below 60 psi (414 kPa).



AIR SYSTEM CONTROLS AND INDICATORS

1 AIR PRESSURE Gage

Shows air pressure (in psi and kPa) in reservoirs available to operate air system components. Green needle indicates r pressure to operate service brakes on front axle, parking brakes on rear tridem axles, transfer case and interaxle lockups, winch tensioners and kickouts, windshield washers, and horns. Red needle indicates air pressure to operate service and parking brakes on rear tridem axles, CTIS pressure transducer, and ear suspension system. Normal operating range for AIR PRESS gage 60-120 psi (414-827 kPa).

2 AIR CLEANER RESTRICTION Indicator

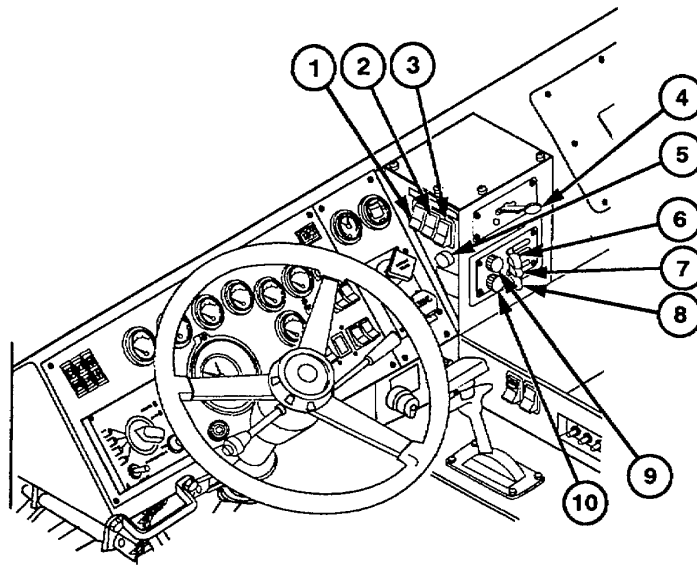
Indicates when air cleaner filter is restricted. Yellow diaphragm enters red zone when air cleaner is clogged and needs service. Yellow RESET button on face gage is used to reset gage after air cleaner has been serviced.

3 PARKING BRAKE Control

Used to apply and release HET Tractor parking brakes and trailer parking brakes equipped.

4 TRAILER AIR SUPPLY Control

Used to control air supply to trailer.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS (CONT)**CENTER PANEL CONTROLS****1 AS PART FILTER Switch**

Two-position switch used to operate and control gas particulate filter unit.

2 CHEMICAL ALARM Switch

Two-position used to control chemical alarm kit.

3 PTO Control Switch

Two-position switch used to control power takeoff. PTO indicator lights (green) when PTO is engaged.

4 DRIVELINE Control

Used to control drive train operation. DRIVELINE Control has two functions depending on the TRANSFER CASE Shift Lever position. The control either activates the front axle lock-up or the axle differential interaxle power dividers.

When the control is in the UNLOCK position, with the transfer case in HI range, the transfer case drives the rear axles only. When the control is in the LOCK position, with the transfer case in HI range, the transfer case also drives the front axle.

When the control is in the UNLOCK position, with the transfer case in LO range, the interaxle differentials are unlocked allowing them to turn at different speeds.

When the control is in the LOCK position, with the transfer case in LO range, the interaxle differentials lock causing all differentials to turn at the same rate, thus further increasing traction.

TRANSFER CASE SHIFT LEVER POSITION	DRIVELINE CONTROL POSITION	DRIVING FRONT AXLE	INTERAXLE LOCKUP ENGAGED
HI	UNLOCK	NO	NO
HI	LOCK	YES	NO
LO	UNLOCK	YES	NO
LO	LOCK	YES	YES

5 ETHER START Control

Used to inject ether into engine air intake adapter for cold weather starting. Use ether Mart only if outside temperature is below 45OF (70°C). Press ETHER START control to inject ether.

6 DEF/CAB Control

Used to control cab air. When control is in DEF position, air defrosts windshield. When control is in CAB position, air heats cab interior. When control is between CAB and DEF, air defrosts windshield and heats cab interior.

7 RECIRC/F/A

Used to control guide air flow to cab. When control is in RECIRC position, cab air recirculates. When control is in F/A position, fresh air is vented into cab.

8 OFF/HEAT Control

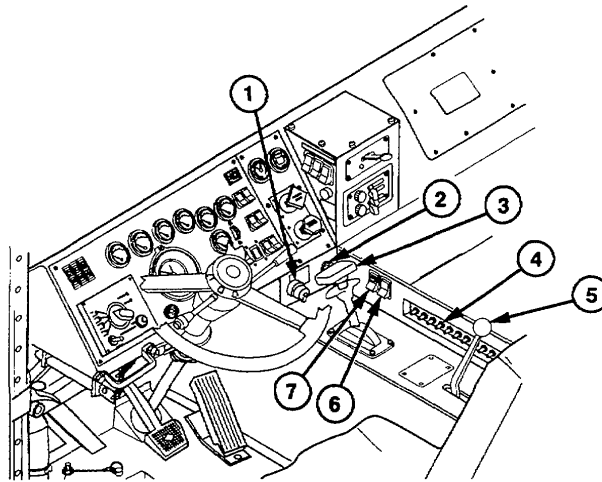
Used to control temperature of air that heats cab interior and defrosts windshield.

9 FRONT Fan Switch

Four-position switch used to control operation and speed of front heater fan.

10 REAR Fan Switch

Four-position switch used to control operation and speed of rear exhaust fan. Exhaust fan ventilates cab by blowing cab air to the outside thru louvers located in the rear cab wall.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS (CONT)**TUNNEL PANEL CONTROLS - DRIVER'S SIDE****1 ENGINE Switch**

Three-position switch (OFF, ON, START). When switch is in ON position, electrical system will operate. START position operates engine cranking circuit. When switch is released after engine starts, switch will return to ON position. Positioning switch to OFF will shut down engine and turn off electrical system.

2 Utility Outlet

Outlet used for connecting portable work light.

3 Transmission Range Selector

Used to select transmission range.

R (reverse): Permits operation in reverse.

N (neutral): Drive gears not engaged.

2-5: Normal driving over hard, smooth surfaces that provide high wheel traction and little or no wheel slippage.

2-4 and 2-3: Driving over soft, rough, slippery surfaces, or cross-country terrain.

2: Hill climbing and engine braking to slow HET Tractor when descending steep hills.

1: Maximum engine braking when descending very steep grades, climbing steep grades, or driving through deep mud, sand, or snow

4 **Circuit Breakers**

Breakers open automatically to protect HET Tractor from electrical overloads. Push in circuit breaker buttons to reset

5 **TRANSFER CASE Shift Lever**

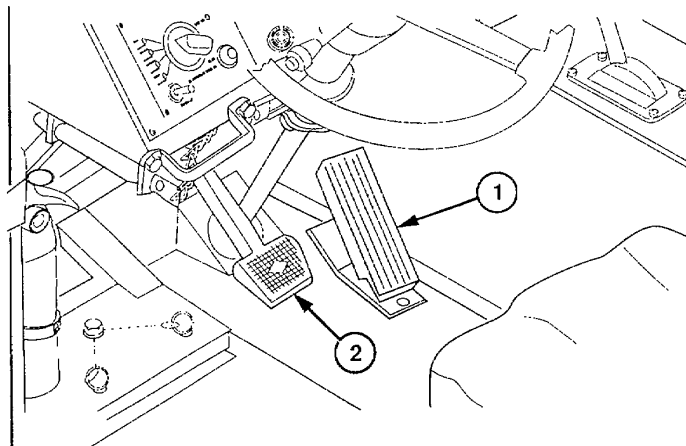
Used to select HIGH or LOW range or NEUTRAL. All wheel drive indicator lights (green) when DRIVELINE control is in LOCK position or when TRANSFER CASE shift lever is in LOW position.

6 **Engine Brake Retarder H/LO Switch**

Two-position switch used to control high or low mode of engine brake retarder Switch in up position is LO and switch in down position is HI. Engine brake retarder ON/OFF switch must be ON for HI/LO switch to function.

7 **Engine Brake Retarder ON/OFF Switch**

Two-position switch used to turn engine brake retarder on or off. Switch in up position is OFF and switch in down position is ON. Switch locks in the OFF position.



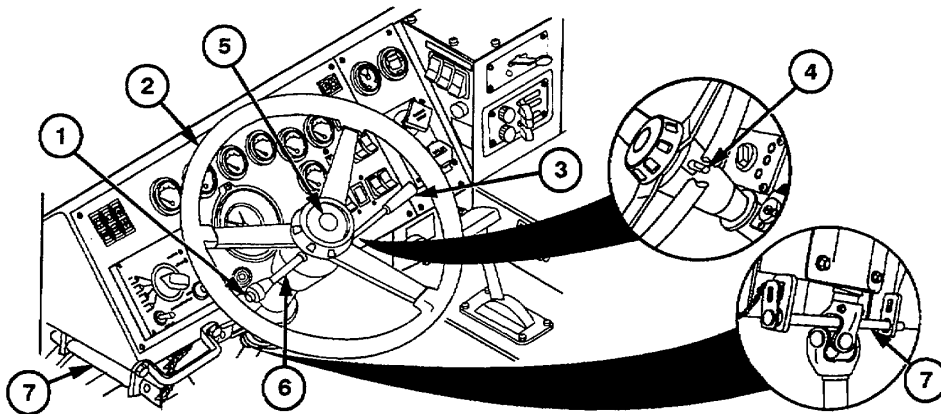
CAB-MOUNTED FOOT CONTROLS

1 **Accelerator Pedal**

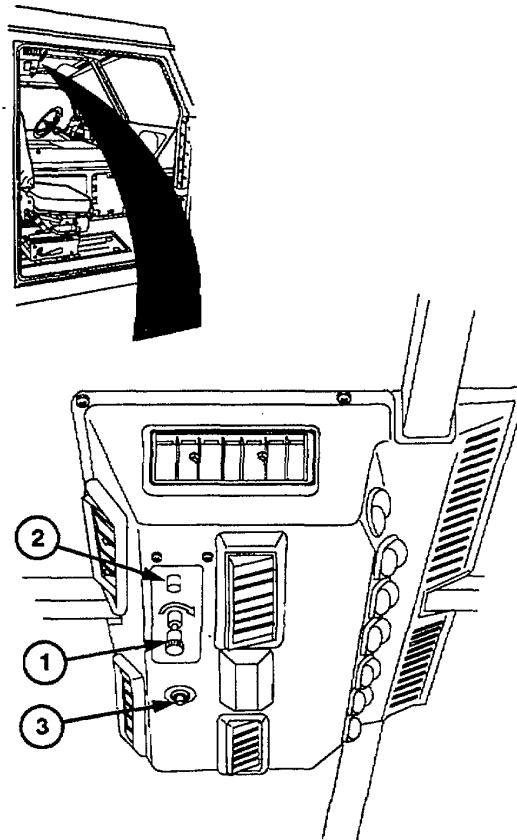
Used to control engine speed. Push pedal down to increase speed, release pedal to decrease speed.

2 **Brake Pedal**

Applies service brakes when pressed. Also applies trailer service brakes when HET Tractor is coupled to trailer.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS (CONT)**STEERING-COLUMN-MOUNTED CONTROLS**

- 1 Headlight Dimmer Switch**
 Pushbutton switch used to raise or lower headlight beams. High beam indicator lights (blue) when high beams are engaged.
- 2 Steering Wheel**
 Used to control direction of HET Tractor travel.
- 3 Trailer Handbrake Control**
 Used to apply and release trailer service brakes without engaging HET Tractor service brakes. Not used during normal operation. Can be used for coupling and uncoupling trailers without spring brake.
- 4 Emergency Flasher Control**
 Two-position, push/pull switch Used to control emergency flashers. BLACK OUT LIGHTS switch must be in off position before emergency flashers will operate. Push in switch to activate emergency flashers. Left and right turn indicators flash (green) when emergency flashers are engaged.
- 5 Horn Button**
 Sounds city horn when pressed. Horn is for use in populated areas.
- 6 Turn Signal Lever**
 Used to operate turn signals. Push lever up to signal right turn. Pull lever down to signal left turn. Automatically returns to off position when steering wheels is returned to straight position. Left or right turn indicator flashes when turn signal is engaged.
- 7 Steering Column Lock Pin**
 Prevents steering wheel from turning when installed in steering column.



VENTILATOR CONTROLS

1 Recirculate/Fresh Air Control

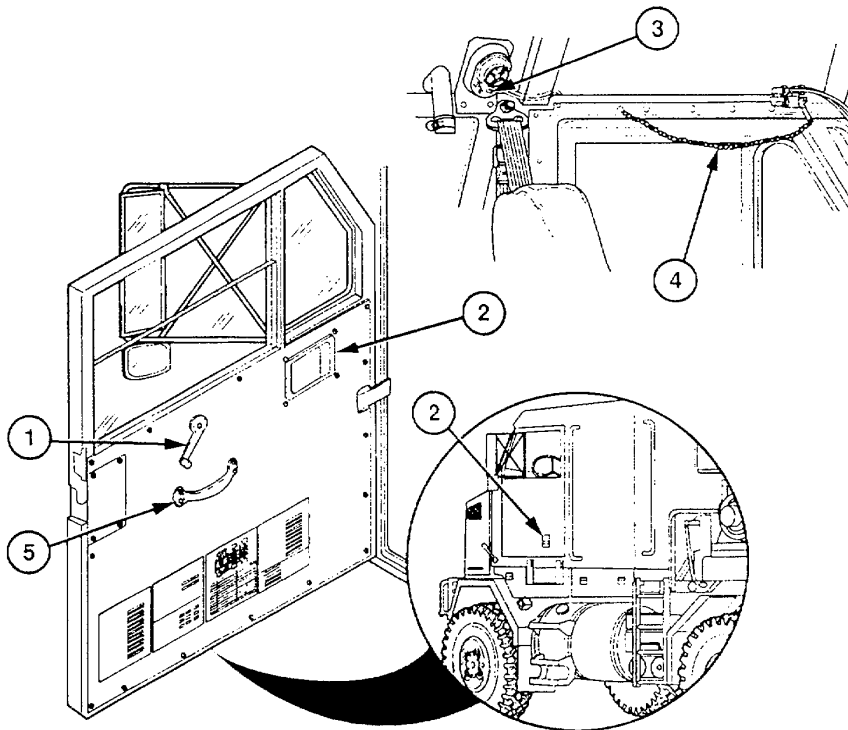
Used to control air flow to cab. When control is pulled out, fresh outside air is vented into cab. When control is pushed in, cab air recirculates. Turn control knob clockwise to lock in position; turn counterclockwise to unlock and adjust

2 Blower Fan Switch

Four-position switch used to control operation and speed of ventilator blower fan.

3 Circuit Breaker

Breaker opens automatically to protect ventilator from electrical overload. Push in circuit breaker button to reset.



CAB-MOUNTED HAND CONTROLS

1 Cab Door Window Glass Regulator

Located on each door. Raises or lowers window glass when handle is turned.

2 Cab Door Latch

Located on inside and outside of each door. Opens cab door from inside and outside HET Tractor when pulled.

3 Map Light Switches

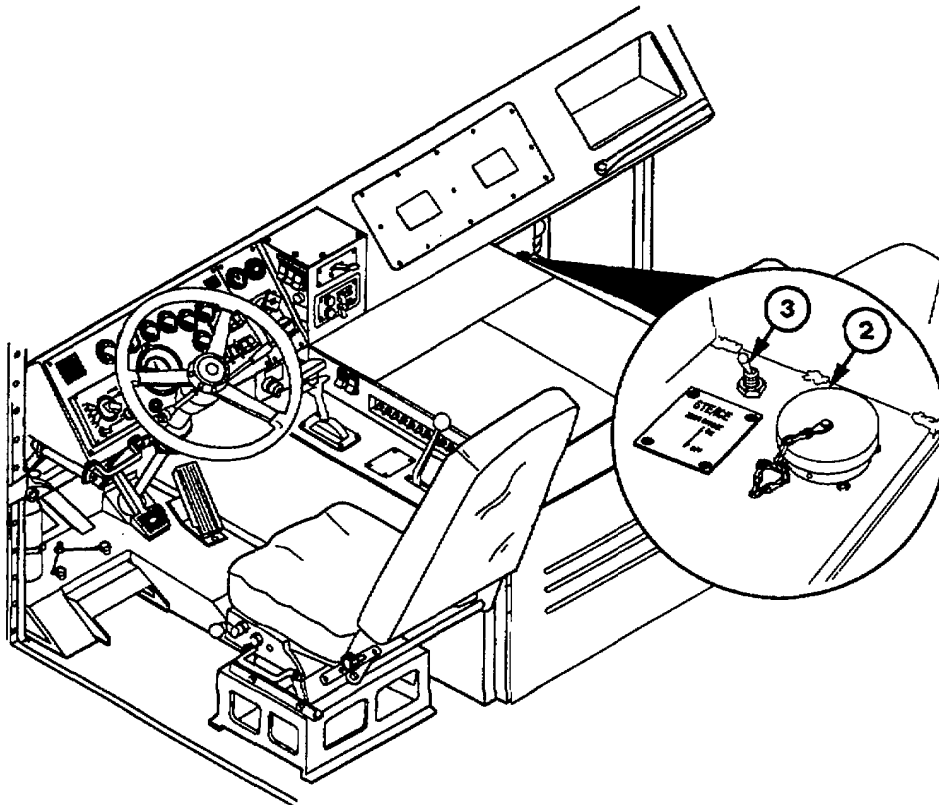
Located behind each door above seat belt mount. Two-position switches used to control map lights.

4 Air Horn Chain

Located above driver's door. Sounds country horn when pulled. Horn is for use in unpopulated areas.

5 Cab Door Handle

Located on each door. Closes cab door from inside HET Tractor when pulled.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS (CONT)**TUNNEL PANEL CONTROLS - PASSENGERS SIDE**

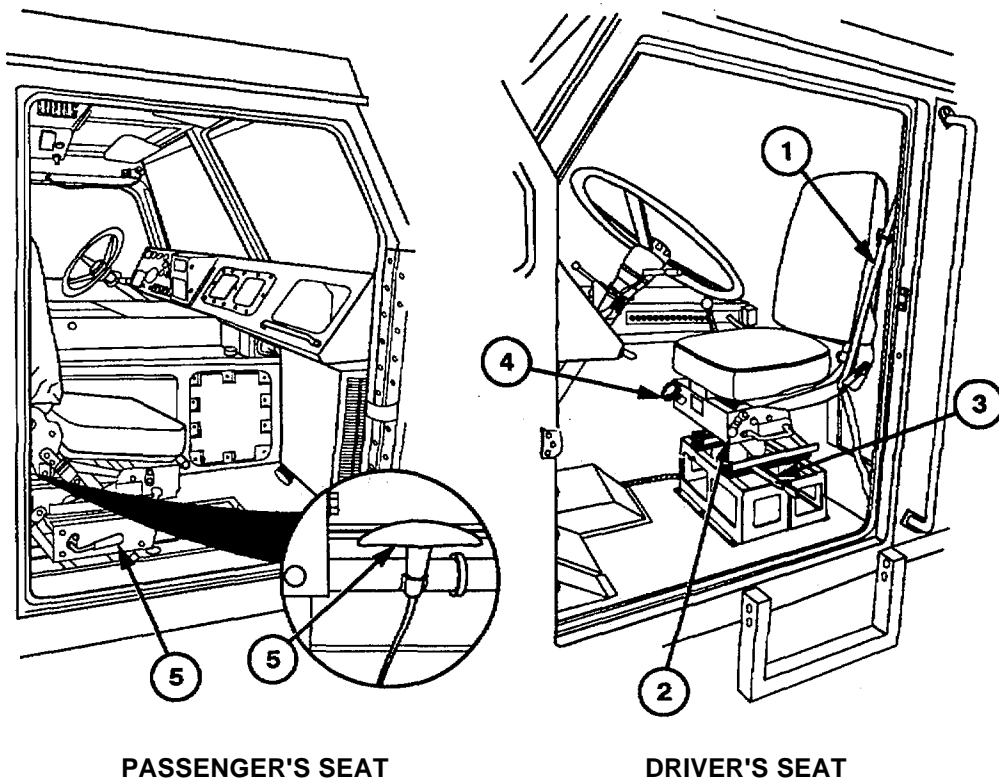
■ 1 Deleted.

2 **STE/ICE Receptacle**

Used to connect STE/ICE.

3 **STE/ICE ZERO OFFSET Switch**

Used to reset instrument connected to simplified test equipment/internal combustion engine (STE/ICE) receptacle to zero.



FRONT SEAT ADJUSTMENT CONTROLS

1 Seatbelt/Shoulder Harness

Used to secure personnel in seat.

2 Height Adjustment Control

Used to adjust seat height.

3 Forward/Backward Adjustment Control

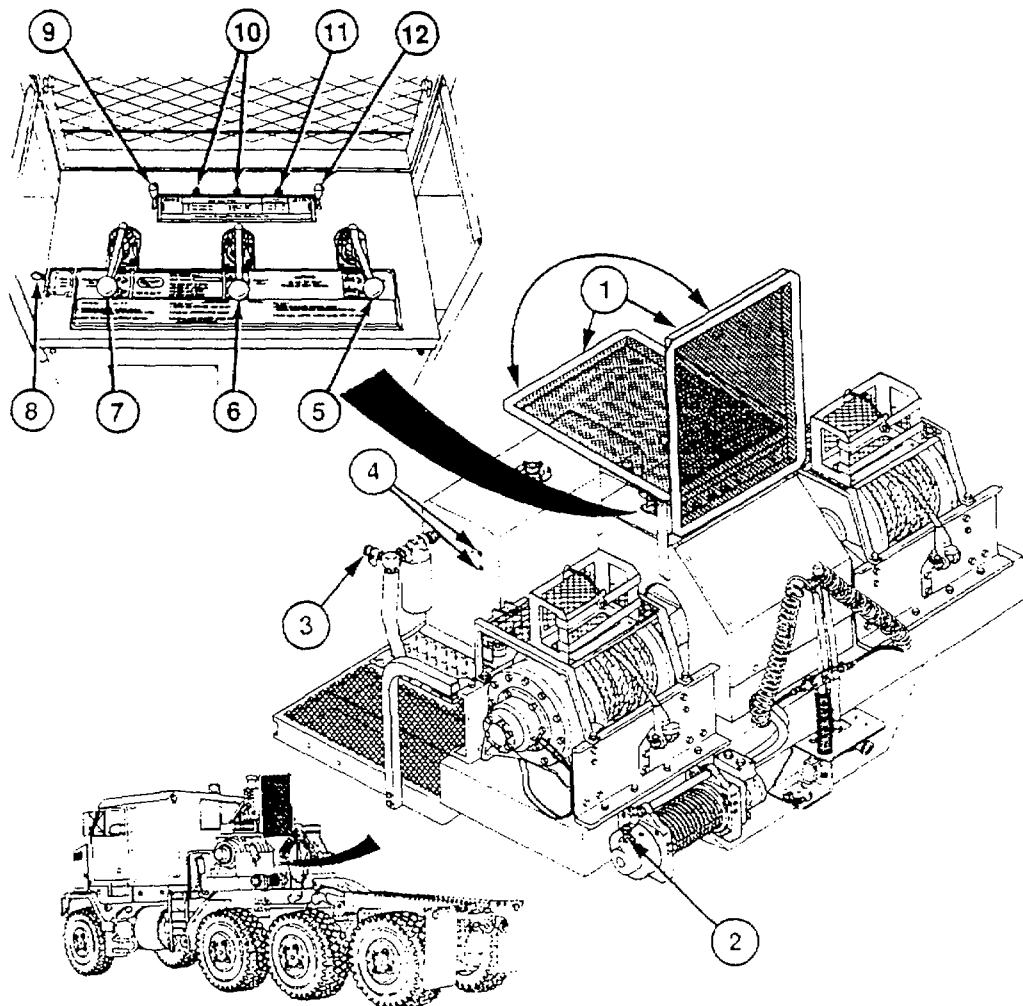
Used to move seat forward or backward.

4 Ride Adjustment Control

Used to adjust seat tension and ride firmness.

5 Seat Lift Controls (passenger seat only)

Used to lift and move seat forward to allow access to and from rear seat.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS (CONT)**WINCH STATION CONTROLS AND INDICATORS****1 Personnel Guard**

Two-position guard which protects operator during winch operation.

2 Auxiliary Winch Manual Kickout

Used to engage and disengage auxiliary winch kickout. Lift and rotate control 180 degrees to disengage kickout. When disengaged, winch drum will spool freely and cable can be payed out by hand. Return control to locked position to engage kickout. When engaged, winch operation is controlled from AUXILIARY WINCH control.

3 Hydraulic Oil Sampling Valve

Used to take sample of hydraulic oil for Army Oil Analysis Program (AOAP).

4 OIL LEVEL Sight Glass

Indicates full or low level of hydraulic oil in reservoir. Fluid level should be between top (FULL) and bottom (LOW) of two sight glasses.

5 DRIVER SIDE WINCH Control

Used to pay out and reel in driver's side winch cable when DRIVER SIDE WINCH KICKOUT is engaged.

6 AUXILIARY WINCH Control

Used to pay out and reel in auxiliary winch cable when auxiliary winch manual kickout is engaged.

7 PASSENGER SIDE WINCH Control

Used to pay out and reel in passenger's side winch cable when PASSENGER SIDE WINCH KICKOUT is engaged.

8 CABLE HOLD DOWN Control

Used to engage and disengage cable tensioner on main winches. Control is OFF when paying out winch cable with auxiliary winch. Control is ON when reeling in winch cable to ensure cable spools properly onto drum.

9 PASSENGER SIDE WINCH KICKOUT Control

Used to engage and disengage passenger side winch kickout. When disengaged, winch drum will spool freely and cable can be payed out using auxiliary winch. When engaged, winch operation is controlled from PASSENGER SIDE WINCH control.

10 ENGINE SPEED CONTROL Switches

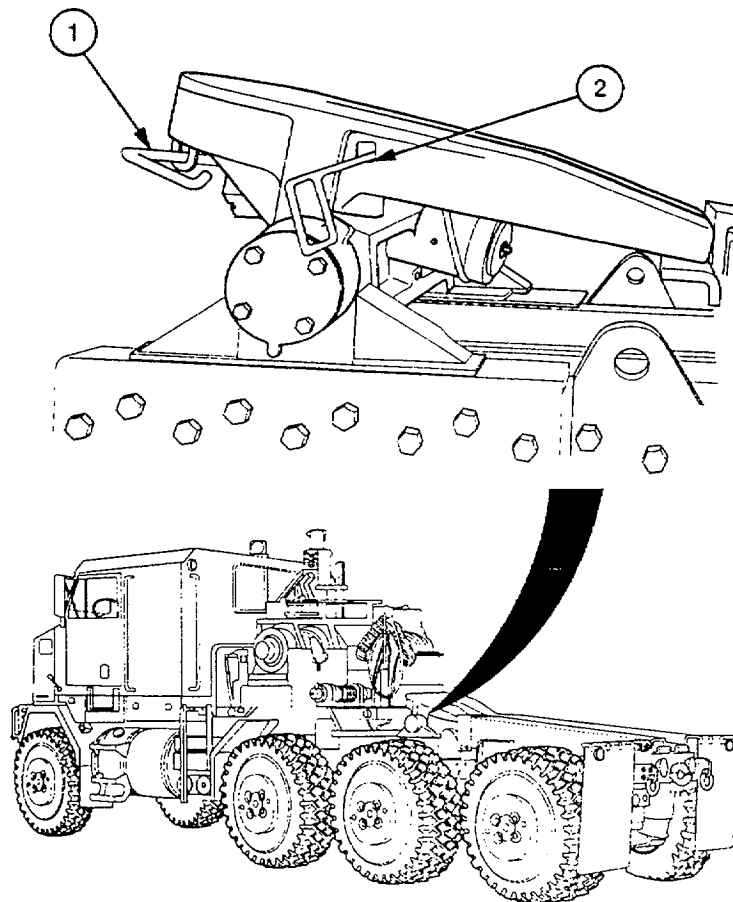
Two switches used to control speed of engine during winch operations. When left switch is at LOW ENGINE IDLE, engine operates at low rpm. When left switch is at HIGH ENGINE IDLE and PUSH TO LOCK ENGINE @ HIGH IDLE switch is pressed, engine operates at high rpm.

11 WINCH SPEED CONTROL Switches

Two-position (LOW/HIGH) switch used to control pay out/reel in speed of main winches.

12 DRIVER SIDE WINCH KICKOUT Control

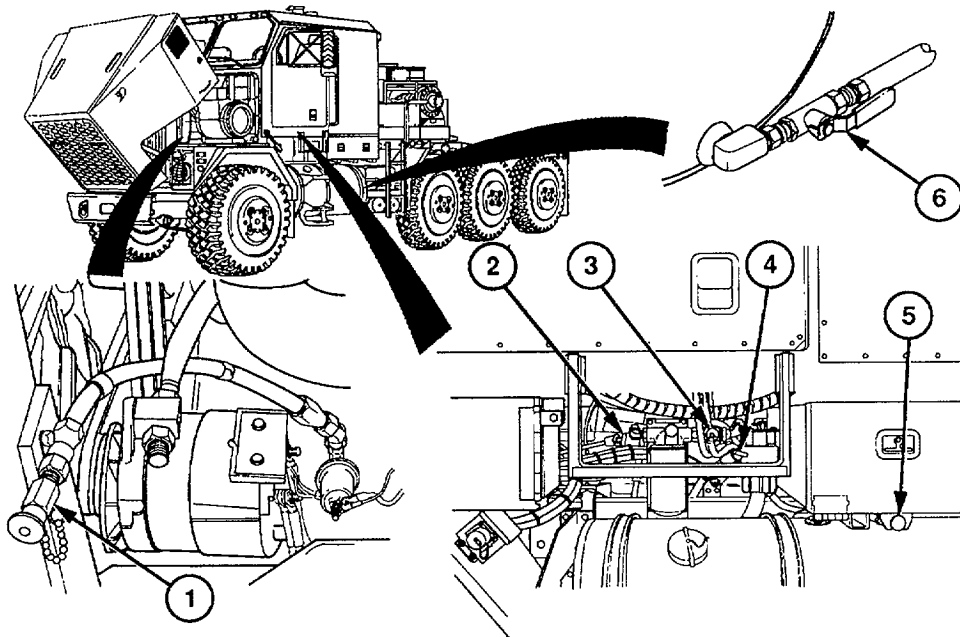
Used to engage and disengage driver side winch kickout. When disengaged, winch drum will spool freely and cable can be payed out using auxiliary winch. When engaged, winch operation is controlled from DRIVER SIDE WINCH control.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS (CONT)**FIFTH WHEEL CONTROLS****1 Primary Lock Release Handle**

Used to open fifth wheel coupler jaws. Jaws open when handle is pulled.

2 Secondary Lock Release Handle

Used to unlock fifth wheel coupler jaws and allows them to be opened with primary lock release handle. Coupler jaws unlock when handle is pulled.



EXTERIOR-MOUNTED CONTROLS AND INDICATORS (DRIVER'S SIDE)

1 Engine Oil Sampling Valve

Used to take sample of engine oil for Army Oil Analysis Program (AOAP).

2 Engine Oil Dipstick

Indicates engine oil level. Turn dipstick handle counterclockwise to release from tube and obtain measurement. Fully insert dipstick into tube and turn handle clockwise to secure.

3 Transmission Oil Sampling Valve

Used to take sample of transmission oil for AOAP.

4 Transmission Oil Dipstick

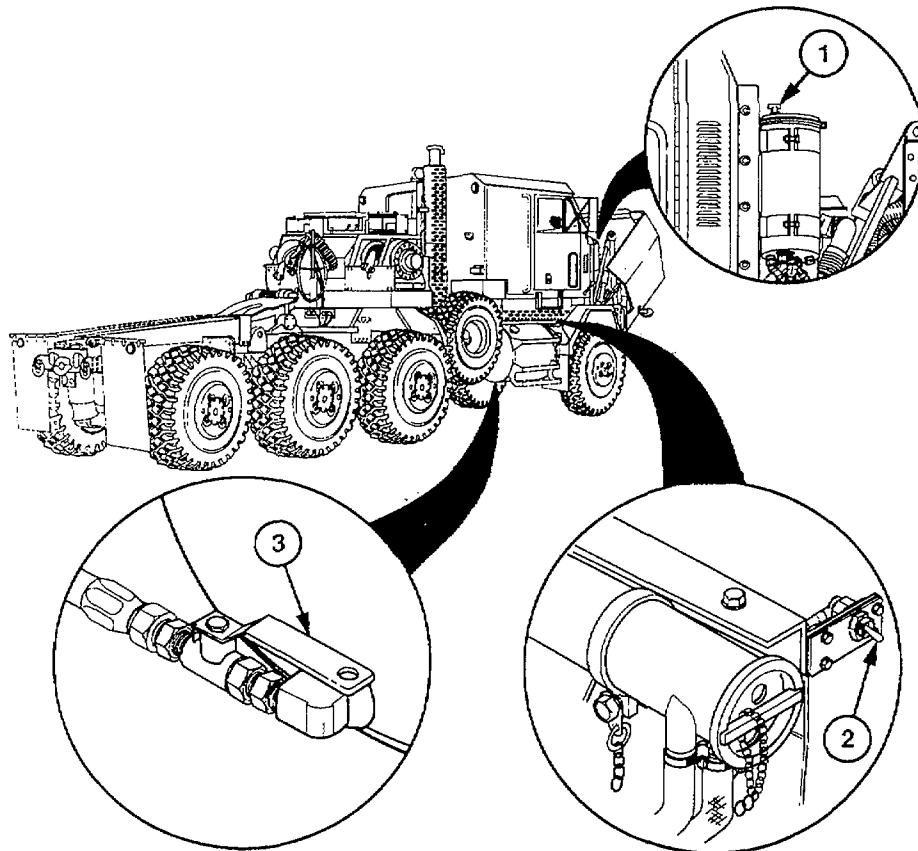
Indicates transmission oil level. Turn dipstick handle counterclockwise to release from tube and obtain measurement. Fully insert dipstick into tube and turn handle clockwise to secure.

5 Fuel Primer Pump

Supplies fuel to fuel lines. Hand pump is used after fuel system maintenance and to drain water from fuel/water separator.

6 Left Fuel Shutoff Valve

Isolates left and right fuel tanks. Should be closed during side slope operation when left side of truck is higher than right. Should be open all other times.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS (CONT)**EXTERIOR-MOUNTED CONTROLS AND INDICATORS (PASSENGER'S SIDE)****1 Power Steering Oil Dipstick**

Indicates power steering oil level. Turn dipstick handle counterclockwise to release from tube and obtain measurement. Fully insert dipstick into tube and turn handle clockwise to secure.

2 Arctic Kit Pump Switch

When installed, two-position switch used to control coolant pump operation.

3 Right Fuel Shutoff Valve

Isolate left and right fuel tanks. Should be dosed only when required by maintenance procedures. Should be open all other times.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-3. PMCS INTRODUCTION

This section provides information to guide the HET Tractor operator/crew in performing required PMCS functions. Table 2-1 lists and describes PMCS procedures and specifies maintenance intervals to follow to ensure the HET Tractor is ready to perform its intended mission.

2-4. USE OF PMCS TABLE

a. General. Table 2-1 (Operator/Crew PMCS) is provided so you can keep your HET Tractor in good operating condition and ready for its primary mission.

b. Warnings and Cautions. Always observe the WARNINGS and CAUTIONS appearing in your PMCS table. Warnings and cautions appear before applicable procedures. You must observe these WARNINGS and CAUTIONS to prevent serious injury to yourself and others or prevent your HET Tractor from being damaged.

c. Explanation of Table Entries

(1) Item number column. Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do checks and services for the intervals listed.

(2) Interval column. This column tells you when you must do the procedure in the procedure column. BEFORE procedures must be done before you operate or use the HET Tractor. DURING procedures must be done during operation of the HET Tractor. AFTER procedures must be done immediately after you have operated the HET Tractor.

(3) Location, item to check/service column. This column provides the location and the item to be checked or serviced.

(4) Procedure column. This column provides the procedure to check or service the item listed in the Check/Service column.

(5) Not fully mission capable if: column. This column tells you what faults will keep your HET Tractor from being capable of performing its primary mission. If you perform check and service procedures that show faults listed in this column, do not operate the HET Tractor. Follow standard operating procedures for maintaining the HET Tractor or reporting equipment failure.

d. Other Table Entries. Be sure to observe all special information and notes that appear in your table.

e. Shortened Intervals. When check/service intervals are shortened because of unusual conditions, an asterisk will precede the interval. A footnote will explain the asterisk and the reason for the shortened interval.

2-4. USE OF PMCS TABLE (CONT)

f. Weekly Intervals. When a check/service procedure is required for both WEEKLY and BEFORE intervals, you do not have to do the procedure twice if the HET Tractor is operated during the weekly period.

g. Leakage Criteria. Leakage criteria is included in the Not Fully Mission Capable If: column.

2-5. GENERAL MAINTENANCE PROCEDURES**WARNING**

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

a. Cleanliness. Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Use dry cleaning solvent (Item 14, Appendix D) on all metal surfaces.

b. Bolts, Nuts, and Screws. Check bolts, nuts, and screws for obvious looseness, and missing, bent, or broken conditions. Look for chipped paint, bare metal, or rust around bolt heads. If any part seems loose, tighten it or report it to unit maintenance.

CAUTION

The following conditions must be observed before welding on HET Tractor

- **All battery cables disconnected (including arctic batteries if installed).**
- **DDEC electronic control module disconnected.**
- **12-volt and 24-volt alternators disconnected.**
- **CTIS controller and power manifold disconnected.**

Failure to comply will result in damage to vehicle's electrical system.

c. Welds. Look for loose or chipped paint, rust, or gaps where parts are welded together. If a bad weld is found, report it to unit maintenance.

d. Electric Wires and Connectors. Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and ensure wires are in good shape. If a bad wire or connector is found, report it to unit maintenance.

2-5. GENERAL MAINTENANCE PROCEDURES (CONT)

e. Hydraulic Lines and Fittings. Look for wear, damage, and leaks; ensure clamps and fittings are tight. Wet spots show leaks. Stain around a fitting or connector can mean a leak. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, report it to unit maintenance.

f. Damage. Damage is defined as any condition that affects safety or would make the HET Tractor unserviceable for mission requirements.

2-6. FLUID LEAKAGE

It is necessary to know how fluid leakage affects the status of fuel, oil, coolant, and hydraulic systems. The following are definitions of the different types of leakage that can determine the status of the HET Tractor. Learn, then be familiar with them and REMEMBER - WHEN IN DOUBT NOTIFY YOUR SUPERVISOR!

CAUTION

- **Equipment operation is allowable with minor leakage (Class I or Class II). Consideration must be given to the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.**
- **Class III leaks should be reported to the supervisor or to unit maintenance.**

Fluid leakage is classified and defined as follows:

<u>Classification</u>	<u>Identification</u>
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 cause drops to fall from item being checked/inspected.

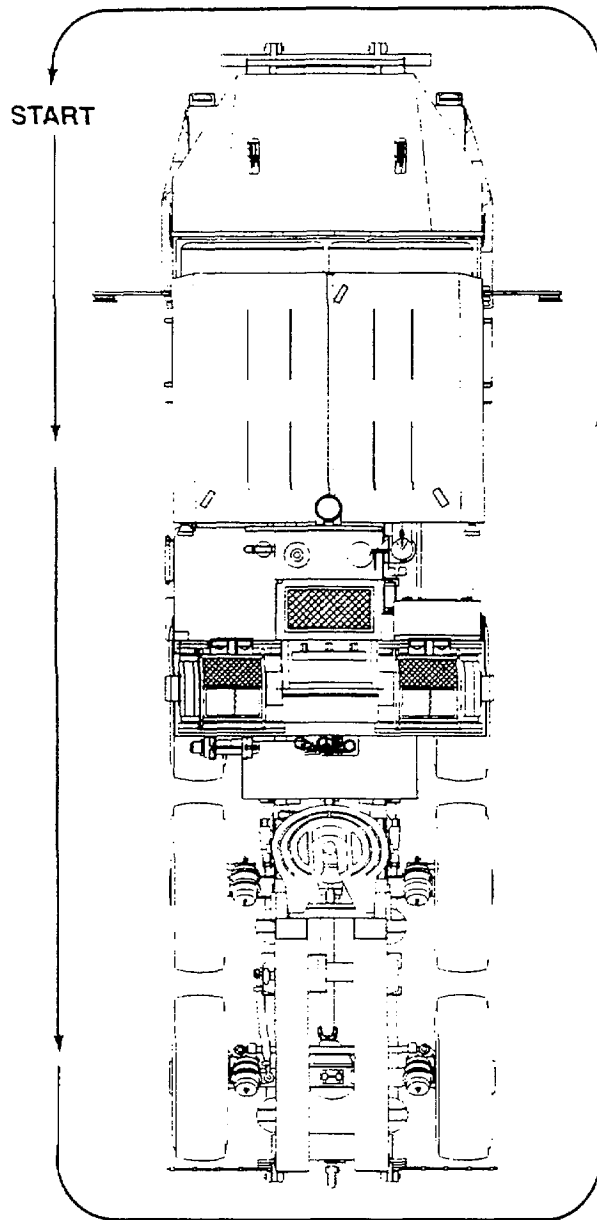
2-7. PMCS TABLE

Refer to table 2-1 for operator/crew PMCS procedures for the HET Tractor. Perform your PMCS (Before, During, After, or Weekly) starting with the left front of the HET Tractor and continuing counterclockwise around the NET Tractor.

NOTE

If leakage is detected, further investigation is needed to determine the location and cause. If there is any doubt, contact your supervisor or unit maintenance.

When operating with Class I or Class II leaks, continue to check fluid levels as required in the PMCS.



Daily Walk Around Diagram

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor

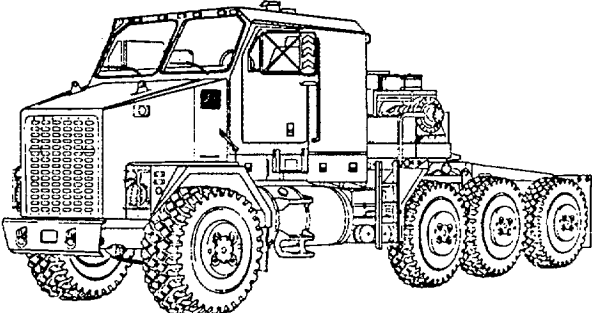
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
				
<p>NOTE</p> <ul style="list-style-type: none"> - Checking condition of windshield and windshield wipers, arms, and blades are safety tasks that would not be performed in a combat mission. See AR 385-55. - If leakage is detected, further investigation is needed to determine the location and cause. If there is any doubt, contact your supervisor or unit maintenance. 				
1	Before	LEFT FRONT EXTERIOR	<ul style="list-style-type: none"> a. Visually inspect cab and components for obvious damage that would impair operation. b. Check condition of windshield. c. Check condition of windshield wipers, arms, and blades. d. Check radiator sightglass. Add coolant if coolant is not visible in sightglass. 	<ul style="list-style-type: none"> a. Any component is damaged that would impair HET Tractor mission. c. Wiper arms or blades are missing or broken. d. Coolant is not visible in sightglass.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

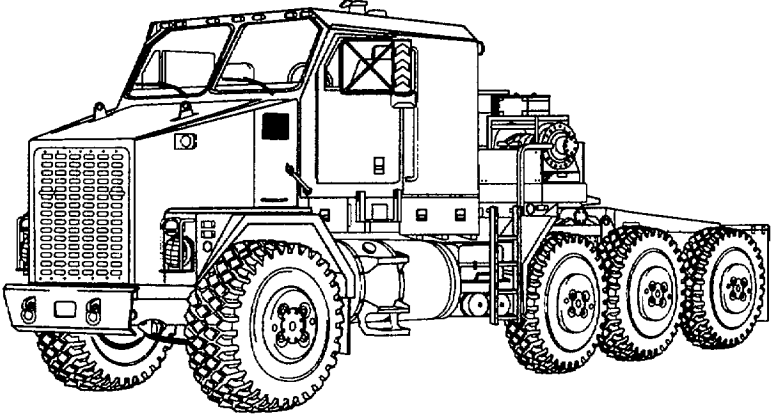
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
1 (cont)	Before	LEFT FRONT EXTERIOR (CONT)	e. Look under HET Tractor for evidence of fluid leakage.	
		 <p>WARNING Do not operate vehicle with a tire that is under-inflated, over-inflated, or has a questionable defect. Do not attempt to inflate a tire that is under-inflated, over-inflated or has a questionable defect. Failure to comply may result in injury or death to personnel.</p>		
2	Before	LEFT SIDE TIRES	Visually inspect tires for presence of under-inflation.	Any tire is missing, deflated, or unserviceable.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

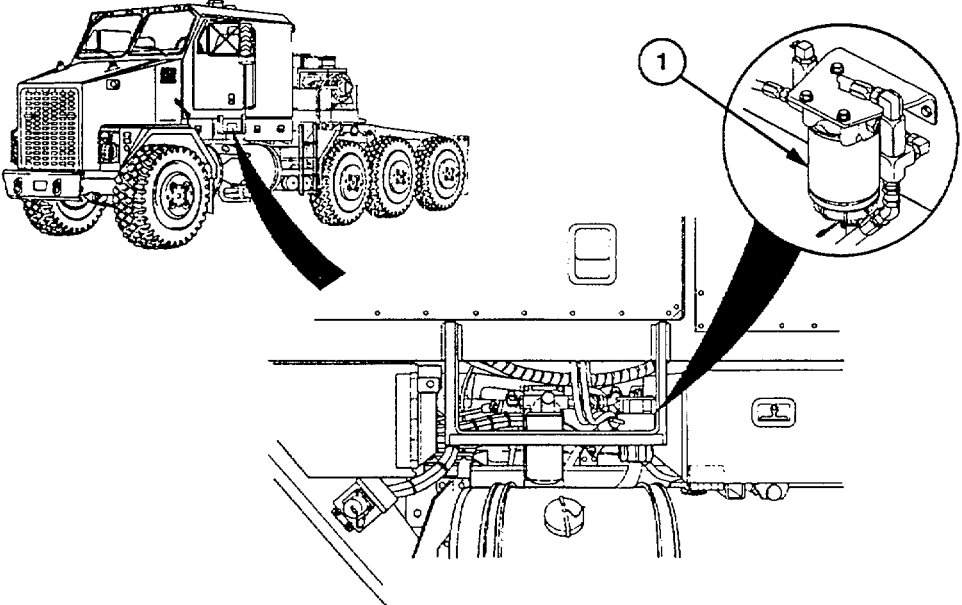
Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable If:
3	Before		<p style="text-align: center;">WARNING</p> <p>Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach 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.</p>	
		<p>FUEL/WATER SEPARATOR</p>	<p>Check fuel/water separator (1) for leaks or damage.</p>	<p>Class III leakage is evident</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

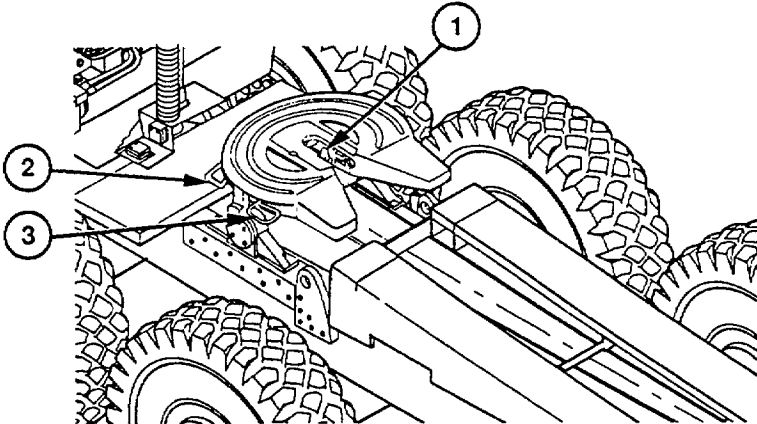
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
				
<p>NOTE If trailer is uncoupled, do item 4. If coupled, do item 5.</p>				
4	Before	FIFTH WHEEL WITHOUT TRAILER COUPLED	<p>a. Check coupler jaws (1), primary lock release handle (2), secondary lock release handle (3), linkage, and locking plunger (under fifth wheel) for damage and proper operation.</p>	Coupler jaws are broken or mechanism is damaged or will not operate properly.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

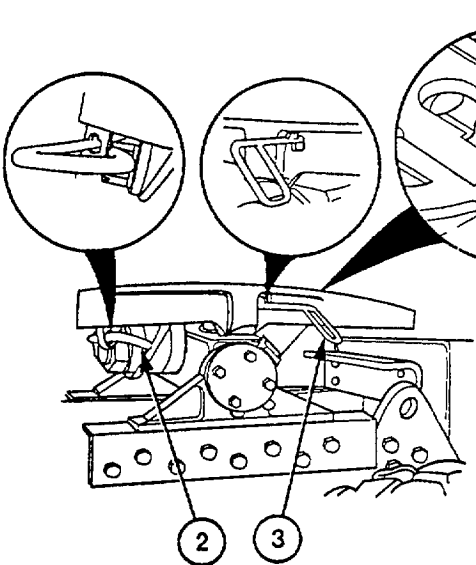
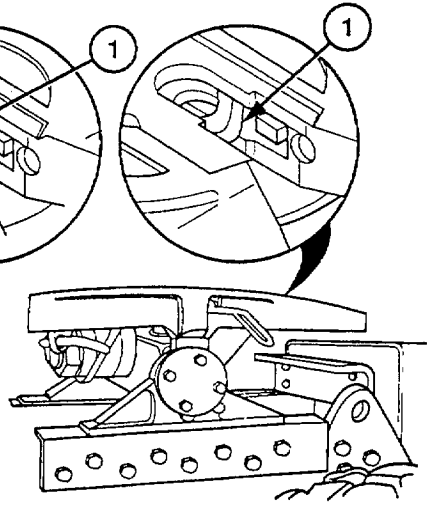
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:	
		Item to Check/Service			
4 (cont)	Before	FIFTH WHEEL WITHOUT TRAILER COUPLED (CONT)	 <p style="text-align: center;">UNLOCKED POSITION</p>	<p>b. Check that coupler jaws (1) lock in open position:</p> <p>(1) Pullout secondary lock release handle (3) and latch in position.</p> <p>(2) Pull out primary lock release handle (2) two times.</p>	
			 <p style="text-align: center;">LOCKED POSITION</p>		

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
4 (cont)	Before	FIFTH WHEEL WITHOUT TRAILER COUPLED (CONT)	<p>(3) Put primary lock release handle (2) in locked position.</p> <p>(4) Check that coupler jaws (1) stay open with primary lock release handle in locked position.</p> <p>c. Check that top surface of fifth wheel (4) and fifth wheel ramps (5) are properly and adequately lubricated.</p>	(4) Coupler jaws will not stay open.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

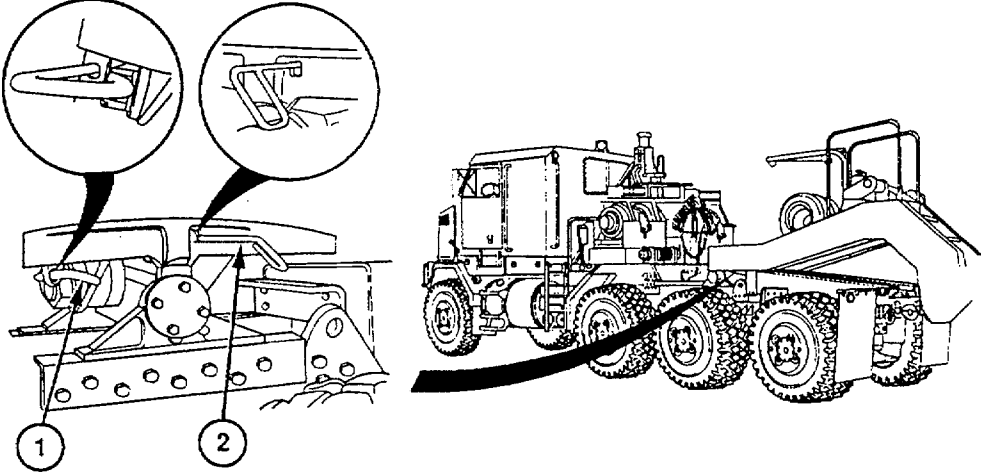
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
				
5	Before	FIFTH WHEEL WITH TRAILER COUPLED	Check that primary lock release handle (1) and secondary lock release handle (2) are completely in.	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
6	Before		<p>a. Check that service coupling (1), inter-vehicular electrical cable (2), and emergency coupling (3) are securely connected to trailer.</p>	<p>a. Either air brake hose or electrical cable cannot be connected to trailer.</p>
			<p>NOTE Perform this test with the trailer empty and with the trailer loaded.</p> <p>b. Check trailer air brake hoses, relay valve, and air reservoirs for leaks.</p>	<p>b. Any air leaks or damage is present</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
6 (cont)	Before	TRAILER AIR BRAKE HOSES AND ELECTRICAL CABLE WITH TRAILER COUPLED (CONT)	c. Check trailer intervehicular cable for obvious damage.	c. Both intervehicular and trailer electrical cables are missing or unserviceable.
7	Before	LEFT SIDE AND REAR EXTERIOR	a. Visually inspect components for obvious damage that would impair operation. b. Look under HET Tractor for evidence of fluid leakage. c. Check that mud flaps are in place and intact.	a. Any component is damaged that would prevent operation.
8	Before	RIGHT SIDE EXTERIOR	a. Visually inspect components for obvious damage that would impair operation. b. Look under HET Tractor for evidence of fluid leakage.	a. Any component is damaged that would prevent operation.

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
<p>WARNING</p> <p>Do not operate vehicle with a tire that is under-inflated, over-inflated, or has a questionable defect. Do not attempt to inflate a tire that is under-inflated, over-inflated or has a questionable defect. Failure to comply may result in injury or death to personnel.</p>				
9	Before	RIGHT SIDE TIRES	Visually inspect tires for presence of under-inflation.	Any tire is missing, deflated, or unserviceable.
<p>NOTE</p> <p>If leakage is detected, further investigation is needed to determine the location and cause. If there is any doubt, contact your supervisor or unit maintenance.</p>				
10	Before	FRONT	<ul style="list-style-type: none"> a. Visually inspect components for obvious damage that would impair operation. b. Look under HET Tractor for evidence of fluid leakage. 	<ul style="list-style-type: none"> a. Any component is damaged that would prevent operation.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
11	Before	CAB FIRE EXTINGUISHER	<p>Check for missing or damaged fire extinguisher (1) under dashboard on drivers side. Check gage (2) for proper pressure of about 150 psi (1034 kPa). Make sure mounting is secure. Check for damaged or missing seal (3).</p>	<p>Fire extinguisher is missing or damaged, pressure gage needle is in RECHARGE area, or seal is damaged or missing.</p>
<p>NOTE Vehicle operation with inoperative seat belts may violate AR 385-55.</p>				
12	Before	SEAT BELTS	<p>Check all seat belts for security, completeness, and proper operation.</p>	

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
13	Before	SEATS	<ul style="list-style-type: none"> a. Check operation of driver's seat adjustment mechanism. b. Check operation of passenger's seat adjustment mechanism. 	<ul style="list-style-type: none"> a. Seat adjustment lock mechanism is broken, missing, or inoperative. b. Seat adjustment lock mechanism is broken, missing, or inoperative.
14	Before	INSTRUMENT PANEL	<ul style="list-style-type: none"> a. Start engine (para 2-12) and check for: <ul style="list-style-type: none"> (1) CHECK GAUGES and CHECK ENGINE lights to go out in approximately 6 sec. (2) Correct idle of 600 to 700 rpm. 	<ul style="list-style-type: none"> (1) CHECK GAUGES or CHECK ENGINE light does not go out and gage(s) indicate abnormal reading. (2) Tachometer indicates less than 600 rpm or more than 800 rpm.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
14 (cont)	Before	INSTRUMENT PANEL (CONT)	<p>(3) Press engine brake retarder ON/OFF switch (1) to ON. Press engine brake retarder HI/LO switch (1.1) to HI position. Increase engine rpm to approximately 1800 rpm and release throttle pedal. Decompression of engine will be head in exhaust system.</p>	<p>(3) Engine brake retarder is inoperative.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

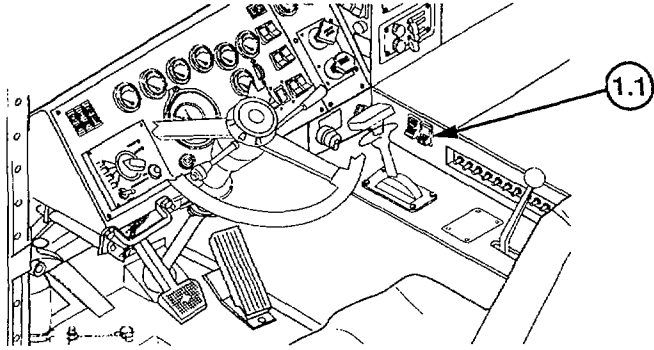
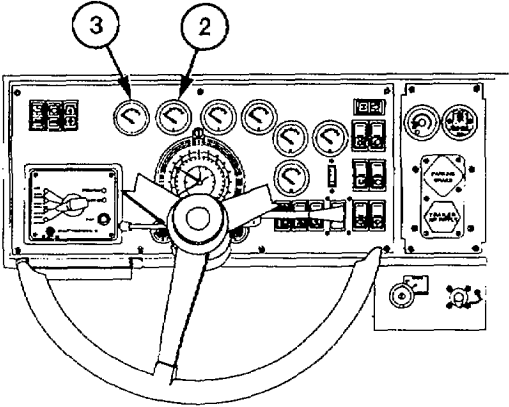
Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable If:
14 (cont)	Before	INSTRUMENT PANEL (CONT)	<p>Press engine brake retarder HI/LO switch (1.1) to LO position and check operation.</p> <p>b. Check operation of CTIS (para 2-13).</p>	
 				

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
14 (cont)	Before	INSTRUMENT PANEL (CONT)	c. Check engine OIL PRESS gage (2) for normal operating range of 50-70 psi (345-483 kPa) between engine speeds of 1800 to 2100 rpm. Minimum for safe operation is 30 psi (207 kPa). At idle, oil pressure can go as low as 5 psi (34 kPa).	c. Gage indicates less than 30 psi (207 kPa) during normal operation or less than 5 psi 34 kPa) idle and CHECK GAUGES indicator lights/alarm sounds.
			<p style="text-align: center;">NOTE</p> <p style="text-align: center;">At idle, engine water temperature may not reach 180°F (82°C).</p>	d. Gage reads in red area (approximately 230°F (110°C)) and CHECK GAUGES indicator lights/alarm sounds.
			d. Check engine WATER TEMP gage (3) for normal operating temperature of 180 to 200°F (93 to 97°C).	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
14 (cont)	Before	INSTRUMENT PANEL (CONT)	e. Check AIR CLEANER RESTRICTION indicator (4). Press RESET button if indicator reads greater than 15 (in yellow or red area). Notify unit maintenance to service air cleaner assembly if indicator still reads greater than 15 (in yellow or red area).	e. Indicator reads in red area and will not reset.

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
14 (cont)	Before	INSTRUMENT PANEL (CONT)	f. Check AIR PRESS gage (5) for system air pressure level above 60 psi (414 kPa). Repeatedly step on brake pedal until air pressure drops below 60 psi (414 kPa). Check that warning buzzer operates below 60 psi (414 kPa).	f. Gage indication for either section is less than 60 psi (414 kPa) or low air pressure indicator lights or warning alarm sounds.
			g. Check BATTERY gage (6) for 26 to 30 Vdc.	g. Gage indicates below 26 Vdc or above 30 Vdc.
			h. Check BATTERY gage (7) for 13 to 15 Vdc.	h. Gage indicates below 13 Vdc or above 15 Vdc.
<p>NOTE</p> <ul style="list-style-type: none"> - At idle, TRANS TEMP gage may indicate 0-160°F (0-71°C) oil temperature. - Remove chock blocks. 				
			i. Check TRANS TEMP gage (8) for normal operating temperature of less than 220°F (104°C).	i. Gage indicates in red area (approximately 300°F (149°C) or more).

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
14 (cont)	Before	INSTRUMENT PANEL (CONT)	j. Check "T"-CASE (transfer case) TEMP gage (9). or more).	j. Gage indicates in red area (approximately 300°F (149°C)
			k. Ensure FUEL gage (10) operates.	

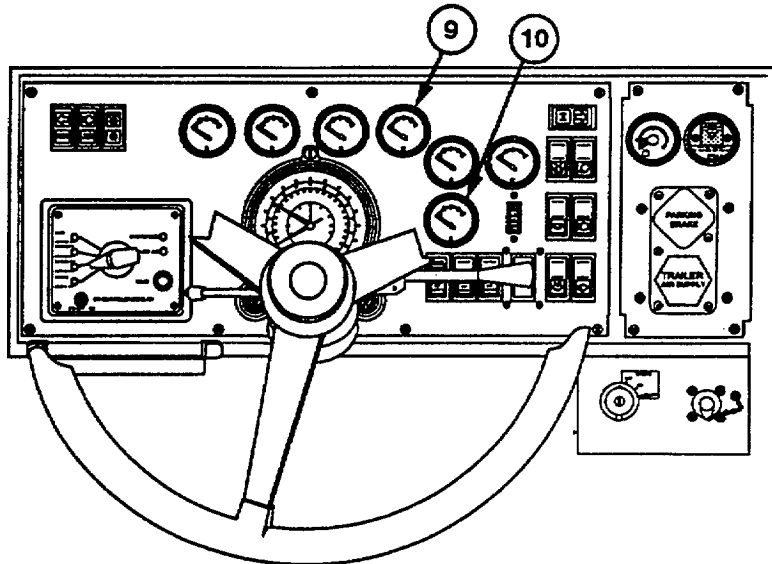


Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

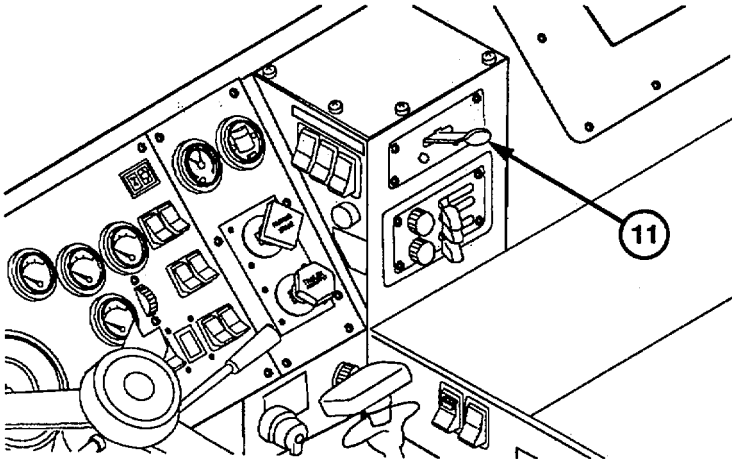
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
				
14 (cont)	Before	INSTRUMENT PANEL (CONT)	<p>NOTE</p> <p>Transfer case must be in HIGH range when making this check.</p>	<p>I. Does not function properly for required mission.</p>
			<p>I. Check DRIVELINE control (11) for proper operation. All wheel drive indicator should light in lock position.</p>	
<p>CAUTION</p> <p>HET Tractor must be parked when making this check. Transfer case will be damaged if shifted while HET Tractor is moving.</p>				
15	Before	SHIFTERS	<p>a. Check transfer case operation in HIGH and LOW ranges (para 2-12).</p>	<p>a. Does not operate in bath ranges.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
15 (cont)	Before	SHIFTERS (CONT)	<ul style="list-style-type: none"> b. Check transmission for proper operation in all ranges (para 2-12). 	<ul style="list-style-type: none"> b. Any gear range does not work.
16	Before	BRAKES AND PARKING BRAKES	<ul style="list-style-type: none"> a. Check brakes by moving HET Tractor approximately 60 ft (18.3 m) and steadily apply brake pedal. HET Tractor should stop smoothly without noticeable side pull or vibration. b. With HET Tractor stopped and range selector in gear, release brake pedal. Brakes should release immediately and allow HET Tractor to roll forward. 	<ul style="list-style-type: none"> a. Service brakes do not operate properly. b. Service brakes do not operate properly.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

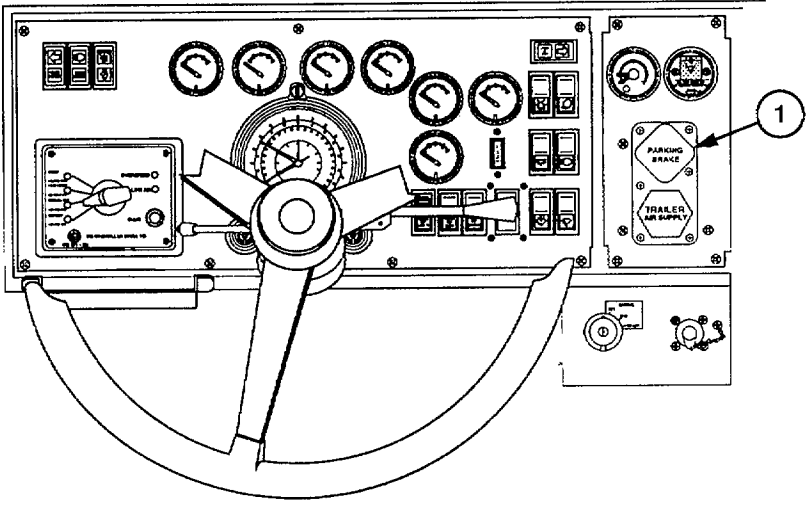
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:	
		Item to Check/Service			
16 (cont)	Before			<p>c. Check parking brake while HET Tractor is still stopped; apply PARKING BRAKE control (1) with transmission still in 2-5 and engine at idle. HET Tractor should not move.</p>	<p>c. HET Tractor moves with parking brake applied.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

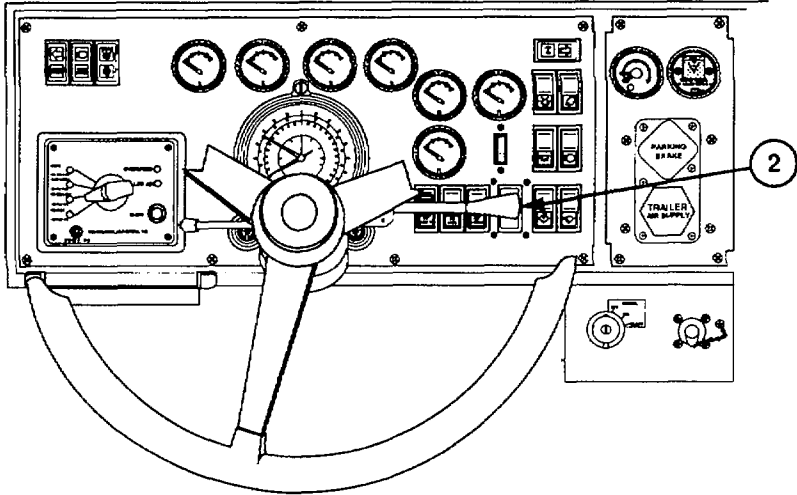
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
<p>NOTE</p> <p>Check trailer hand brake control only if trailer is connected to HET Tractor.</p>				
16 (cont)	Before	BRAKES AND PARKING BRAKES (CONT)	d. Check trailer brakes by applying trailer hand brake control (2) only, and attempt to move tractor/trailer combination. Do not apply brake pedal. HET Tractor and trailer should not move.	d. Brakes fail to hold tractor/trailer from moving.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

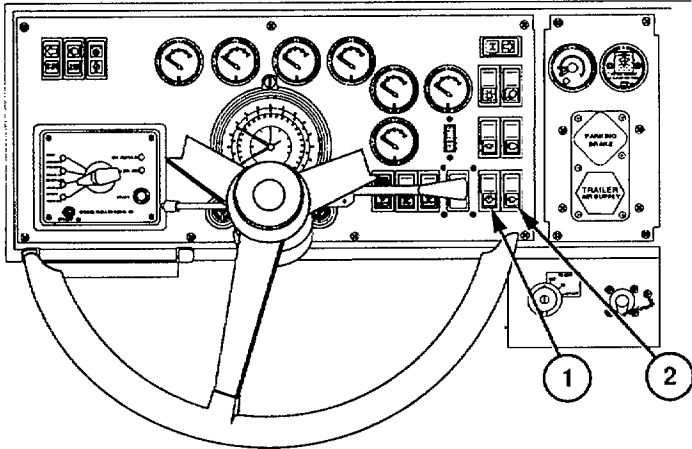
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
NOTE Not all HET Tractors will have radios.				
17	Before	RADIO	Refer to TM 11-5820-401-10-1 (AN/VRC-46) or TM 11-5820-890-10-1 (AN/VRC-90) for preventive maintenance checks and services.	
				
18	During	INSTRUMENT PANEL	<ul style="list-style-type: none"> a. Check windshield washer control (1) for proper operation. b. Check windshield wiper control (2) for proper operation. 	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

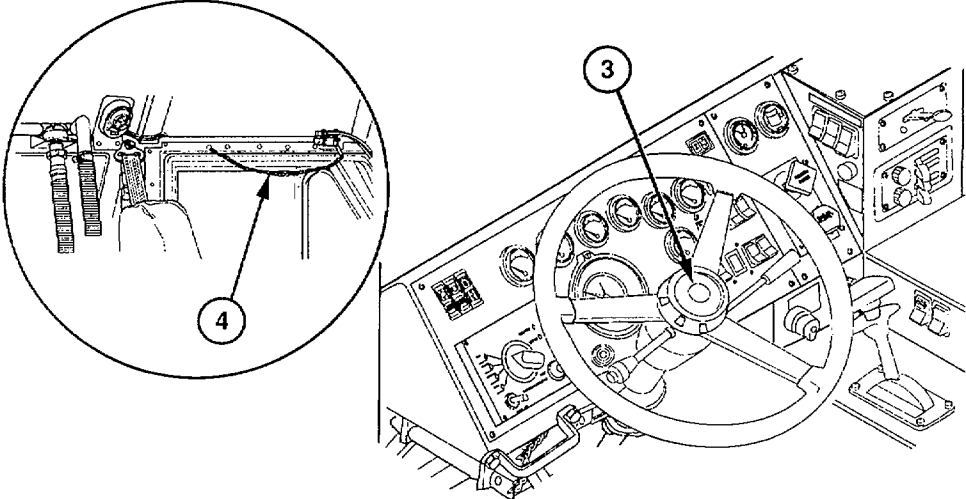
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
<p>NOTE</p> <p>Checking condition of horns is a safety task that would not be performed in a combat mission. See AR 385-55.</p>				
18 (cont)	During	INSTRUMENT PANEL (CONT)	<p>c. Check city horn (3) and country horn (4) for proper operation.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Sound of air dryer discharge is normal.</p> <p>d. Listen for air dryer discharge when system air pressure reaches about 120 psi (827 kPa).</p>	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

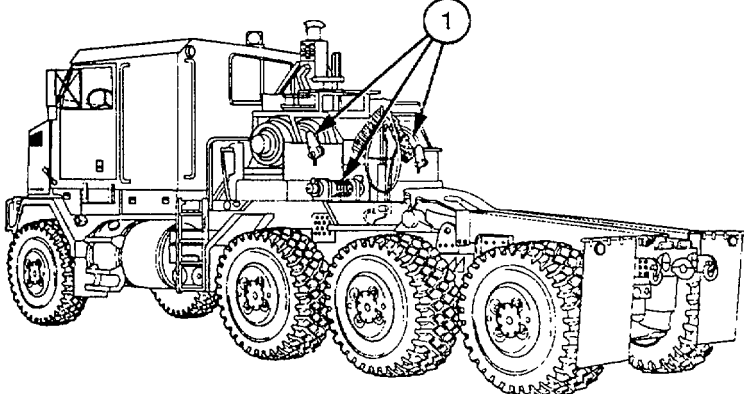
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
18 (cont)	During	INSTRUMENT PANEL (CONT)	<ul style="list-style-type: none"> e. Monitor all gages for proper operation. f. Listen for unusual noises, rough idle, or misfiring. 	<ul style="list-style-type: none"> f. Engine misfires or runs rough.
19	During	STEERING	Check for any unusual steering noise, binding, or difficulty in turning during operation.	Steering binds or is unresponsive.
				
<p>NOTE</p> <p>Winch checks are performed during recovery operations.</p>				
20	During	WINCHES	<ul style="list-style-type: none"> a. Inspect winches (1) for loose parts, hydraulic leaks, and obvious external damage. b. Check winch controls for proper operation. 	<ul style="list-style-type: none"> a. Any winch is inoperative, loose, leaking, or damaged.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
20 (cont)	During	WINCHES (CONT)	<ul style="list-style-type: none"> c. Check winch cables (2) for kinks, frays, and breaks. d. Check winches for missing or damaged clevis pins (3), snapper pins (4), and pin (5). 	

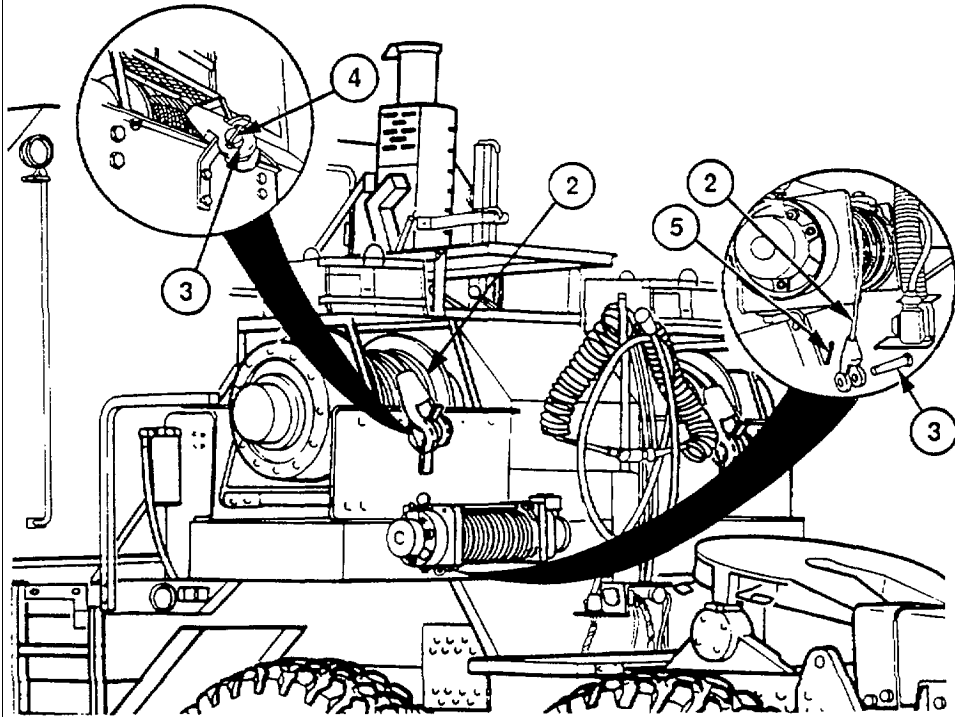


Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

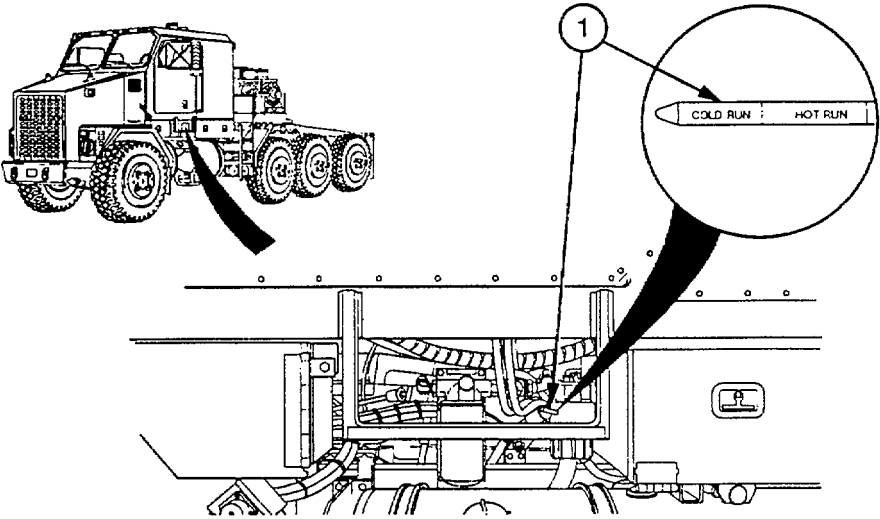
Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
			<p style="text-align: center;">WARNING</p> <p>Parking brake must be set before checking transmission fluid. Personal injury may result.</p> <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> - Perform the following check with engine running and transmission in N (neutral). - If transmission fluid temperature is below 160°F (71°C), fluid level should be within COLD RUN area. If transmission fluid temperature is above 160°F (71°C), fluid level should be within HOT RUN area. 	
21	After	TRANSMISSION FLUID LEVEL	<p>Check transmission fluid level on dipstick (1). Add transmission fluid if fluid level is too low. If fluid level is too high, notify unit maintenance.</p> <p style="text-align: center;">NOTE Shut off engine.</p>	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

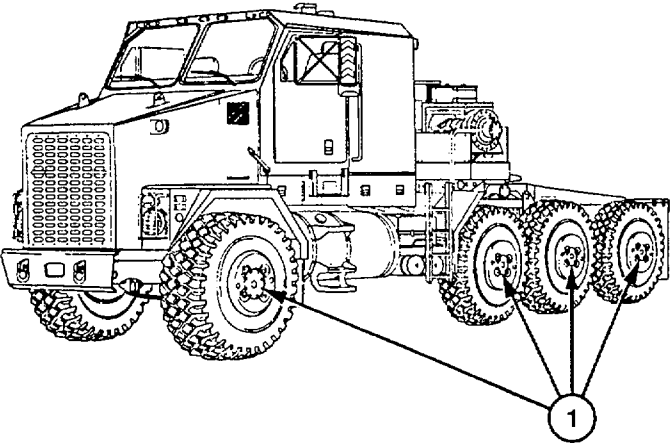
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
<p>WARNING Planetary hubs may get hot enough to burn. Use caution when checking hubs. Injury may result.</p>				
22	After	LEFT SIDE WHEEL HUBS	<ul style="list-style-type: none"> a. Check planetary hubs (1) by feeling for warmth. b. Check for obvious damage. 	<ul style="list-style-type: none"> a. One or more hubs are noticeably warmer than the others.
23	After	LEFT SIDE TIRES	Check tires for cuts, gouges, cracks, or scratches. Remove any sharp objects.	Tires have cuts, gouges, or cracks that would result in tire failure during operation. One or more tires are missing or unserviceable and no spare is available.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

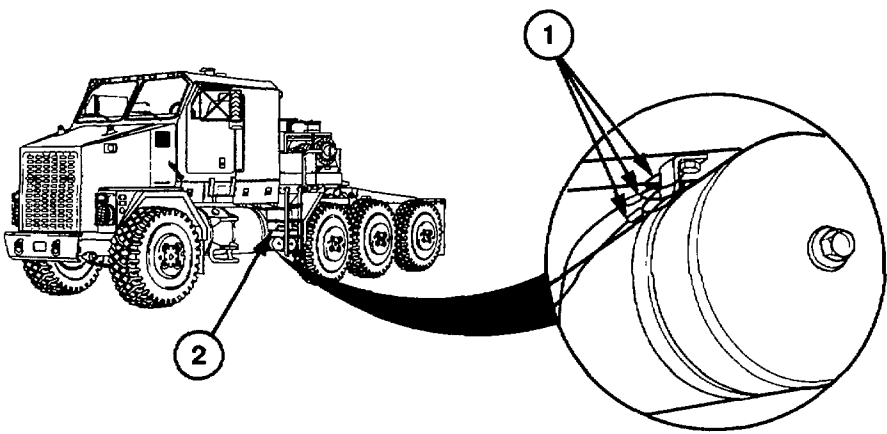
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
24	After	LEFT SIDE AIR RESERVOIRS	<ul style="list-style-type: none"> a. With HET Tractor parked and engine off, listen for sound of air system leaks around reservoirs. b. Pull three cables (1) by battery box (2) to drain reservoirs until no water comes out of system. 	<ul style="list-style-type: none"> a. Any air leakage is detected.
25	After	LEFT SIDE AND REAR EXTERIOR	Check left side and rear for obvious damage.	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

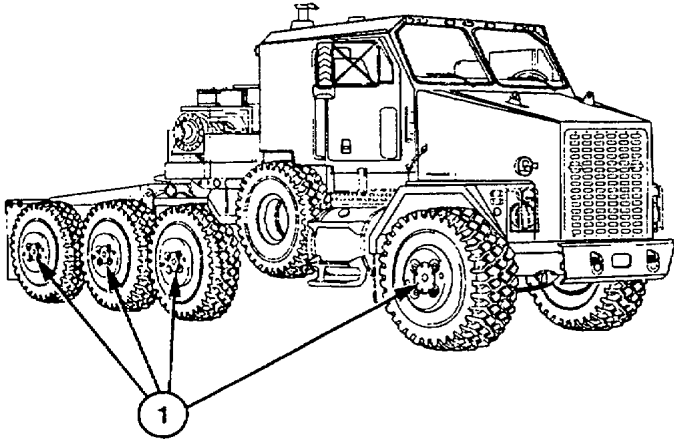
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
<p><u>WARNING</u> Planetary hubs may get hot enough to burn. Use caution when checking hubs. Injury may result.</p>				
26	After	RIGHT SIDE WHEEL HUBS	<ul style="list-style-type: none"> a. Check planetary hubs (1) by feeling for warmth. b. Check for obvious damage. 	<ul style="list-style-type: none"> a. One or more hubs are noticeably warmer than the others.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

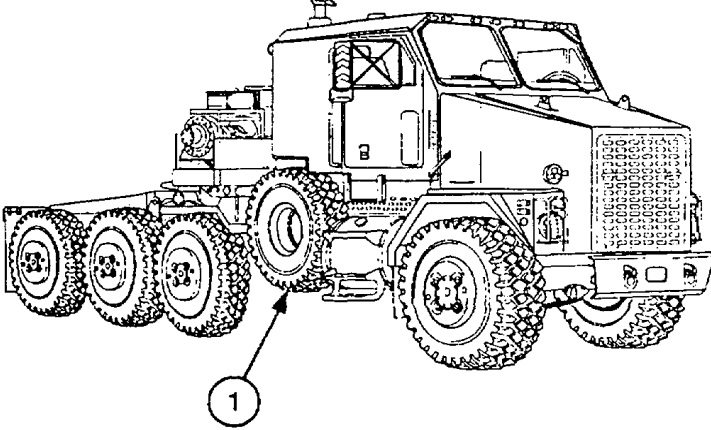
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
27	After	RIGHT SIDE TIRES	Check tires for cuts, gouges, cracks, or scratches. Remove any sharp objects.	Tires have cuts, gouges, or cracks that would result in tire failure during operation. One or more tires are missing or unserviceable and no spare is available.
				
28	After	SPARE TIRE	<ul style="list-style-type: none"> a. Check that spare tire (1) is securely mounted. b. Inspect condition of spare tire (1). 	<ul style="list-style-type: none"> b. Spare tire is missing, flat, or unserviceable.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
29	After	RIGHT SIDE AIR RESERVOIRS	<ul style="list-style-type: none"> a. Wit HET Tractor parked and engine off, listen for sound of air system leaks around reservoirs. b. Pull two cables (1) by fuel tank (2) to drain reservoirs until no water comes out of system. 	Any air leakage is detected.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:	
		Item to Check/Service			
30	After	POWER STEERING RESERVOIR	<ul style="list-style-type: none"> a. Open hood (para 2-33). b. Check steering reservoir (1) fluid. <ul style="list-style-type: none"> (1) Level should be between ADD and FULL HOT mark on dipstick (2) if HET Tractor was just used. (2) Level should be between ADD and FULL COLD mark on dipstick if HET Tractor has been sitting. 	<ul style="list-style-type: none"> b. Fluid level is low or too high. 	

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
30 (cont)	After	POWER STEERING RESERVOIR (CONT)	c. Add oil if oil level is at or below ADD mark. If oil level is overfull, notify unit maintenance.	d. Class III leakage is evident.
			d. Check reservoir hoses, lines, and fittings for leaks or obvious damage.	
NOTE				
- Close engine hood.				
- If leakage is detected, further investigation is needed to determine the location and cause. If there is any doubt, contact your supervisor or unit maintenance.				
31	After	FRONT	a. Look under HET Tractor for evidence of fluid leakage.	a. Any leakage of fuel or Class III leakage of oil is evident.
			b. Check for obvious damage.	
NOTE				
- Assistant is needed to perform the following checks.				
- Checking condition of lights is a safety task that would not be performed in a combat mission. See AR 385-55.				
32	After	LIGHTS	a. Check headlights, blackout drive lights, clearance lights, stoplight, turn signals, reflectors, and backup lights.	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

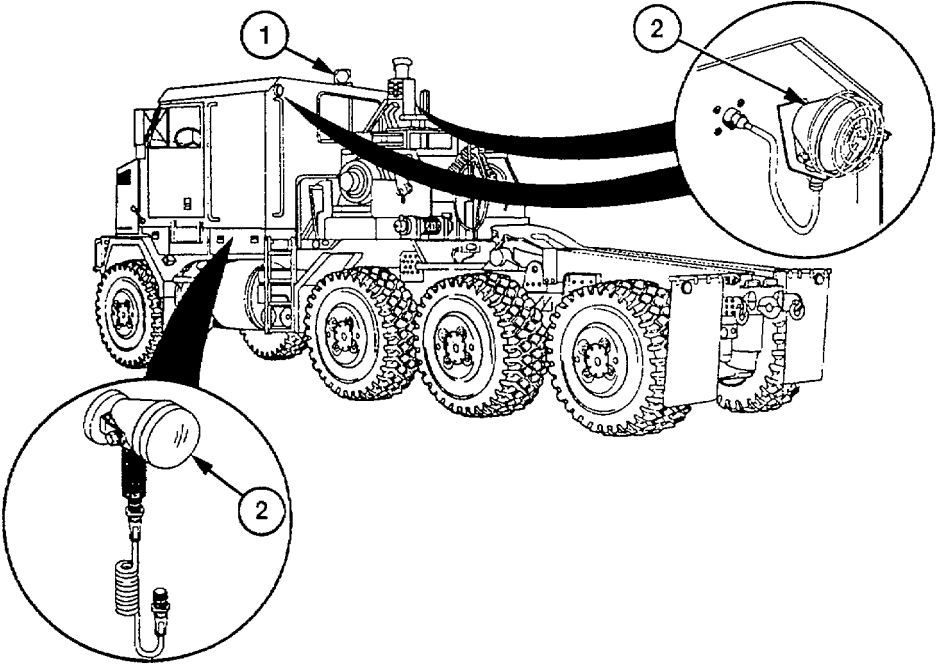
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
32 (cont)	After	LIGHTS (CONT) 	<ul style="list-style-type: none"> b. Check operation of beacon light (1). c. Check emergency flasher control for proper operation. d. Check operation of work lights (2). e. Check operation of dome light and map lights. 	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

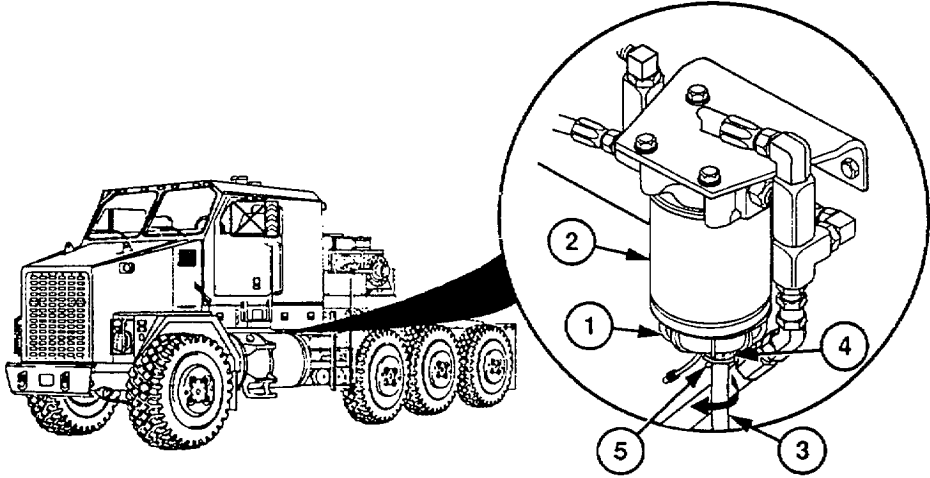
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
		<p><u>WARNING</u></p> <p>Fuel is very flammable and can explode easily. To avoid serious injury or death, keep open flame away from HET Tractor and keep fire extinguisher within easy reach when working 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.</p>		
		<p>NOTE</p> <p>Drain fuel in suitable container.</p>		
33	After	FUEL/WATER SEPARATOR	Check for presence of water in bowl (1) of fuel/water separator (2). If there is water, pull drain hose (3) from behind fuel tank. Turn knurled nut (4) counterclockwise on bottom of bowl to open contaminant drain valve (5).	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

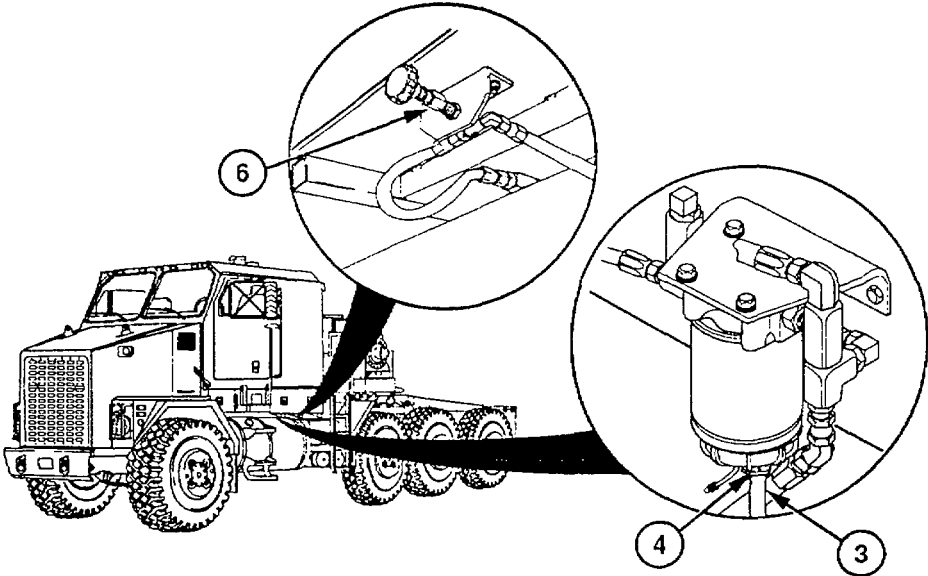
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
33 (cont)	After	FUEL/WATER SEPARATOR (CONT)	 <p>Push in and turn primer pump (6) 1/4 turn in either direction to release. Pump fuel primer pump (6) and purge water from fuel/water separator. Push in and turn fuel primer pump (6) 1/4 turn in either direction to lock. Keep drain open until only pure fuel is flowing out of drain hose (3). Close drain valve by turning knurled nut (4) clockwise. Position drain hose (3) back behind fuel tank.</p>	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

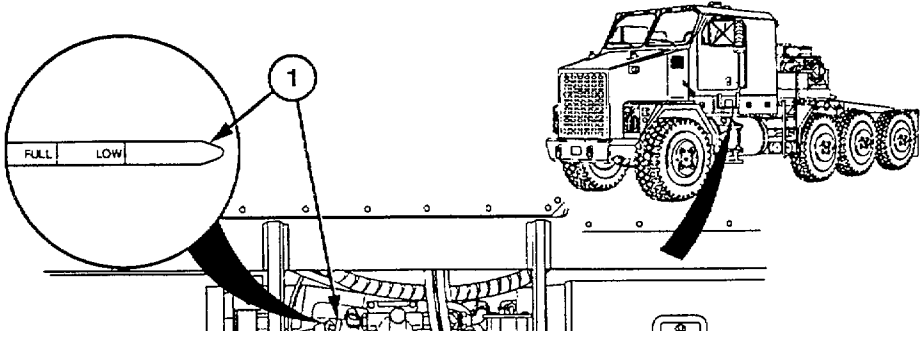
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
		 <p style="text-align: center;">CAUTION</p> <ul style="list-style-type: none"> - Dipstick must be inserted all the way into tube to ensure proper reading. Damage to equipment may result. - Never allow engine oil level to drop below the LOW mark. Damage to engine may result. <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> - Allow at least 15 minutes to elapse before checking oil. - Diesel engine slobber is an inherent condition of diesel engines. When engines are allowed to idle for prolonged periods of time, this may be interpreted as a Class III leak. Check engine oil level. If there is any doubt, consult with your supervisor or unit maintenance. 		
34	After	ENGINE OIL	a. Check engine oil level on dipstick (1). Proper oil level is between LOW mark and FULL mark.	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
34 (cont)	After	ENGINE OIL (CONT)	b. Add oil if engine oil level is at or below LOW mark. If engine oil level is overfull, notify unit maintenance.	
35	Weekly	ENGINE COMPARTMENT (LEFT)	<p>a. Open hood (para 2-33).</p> <p>b. Check radiator hoses (1) for rotting, leakage, and loose clamps.</p> <p>c. Check radiator (2) for leaks, damaged fins, and missing baffles.</p>	<p>b. Any Class III leakage is evident.</p> <p>c. Any Class III leakage is evident.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

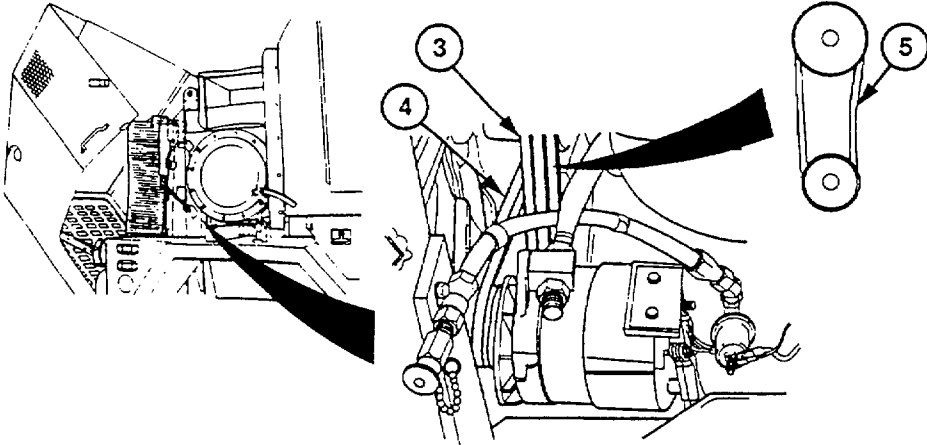
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:	
		Item to Check/Service			
35 (cont)	Weekly	ENGINE COMPARTMENT (LEFT)(CONT)		<p>d. Check fan drivebelts (3) and 24-volt alternator drive belts (4) for cracking, fraying, and breaks.</p> <p>e. Check drivebelts for tightness. There should be approximately 1/2 in. (1.25 cm) of play when pushing on belts in center (5) between pulleys.</p>	<p>d. Any drive belt is missing, broken, cracked to the belt fiber, has more than one crack (1/8 in. in depth or 50% of belt thickness), or has frays more than 2 in. long.</p> <p>e. Belts are out of adjustment.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
35 (cont)	Weekly	ENGINE COMPARTMENT (LEFT)(CONT)	f. Check fan clutch (6) for leaks and missing or loose mounting hardware.	f. Class III leakage is evident or missing or loose mounting hardware is found.
			g. Check fan and pulleys for cracks and damage.	g. Fan or any pulley is cracked or damaged.

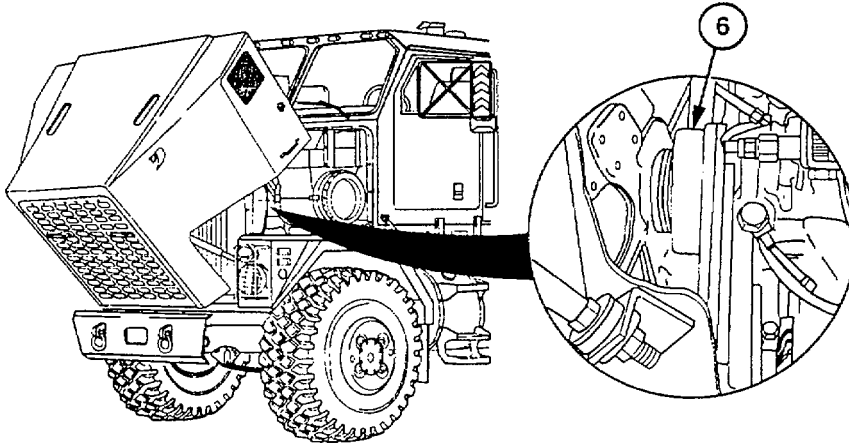


Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

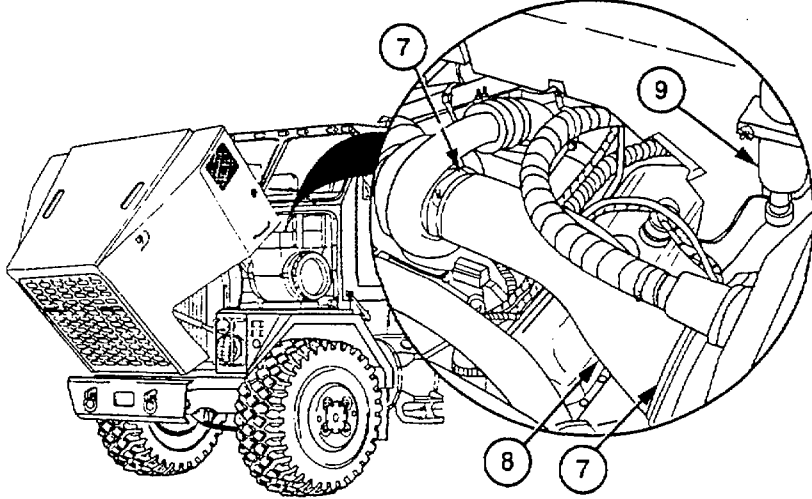
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
35 (cont)	Weekly	ENGINE COMPARTMENT (LEFT)(CONT)	<ul style="list-style-type: none"> h. Check air intake system for loose clamps (7) and damaged tubes (8). i. Check ether starting aid (9) for loose or damaged mounts and hardware. Check canister for damage. 	<ul style="list-style-type: none"> h. Any air intake hose has a hole or is torn.
				

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

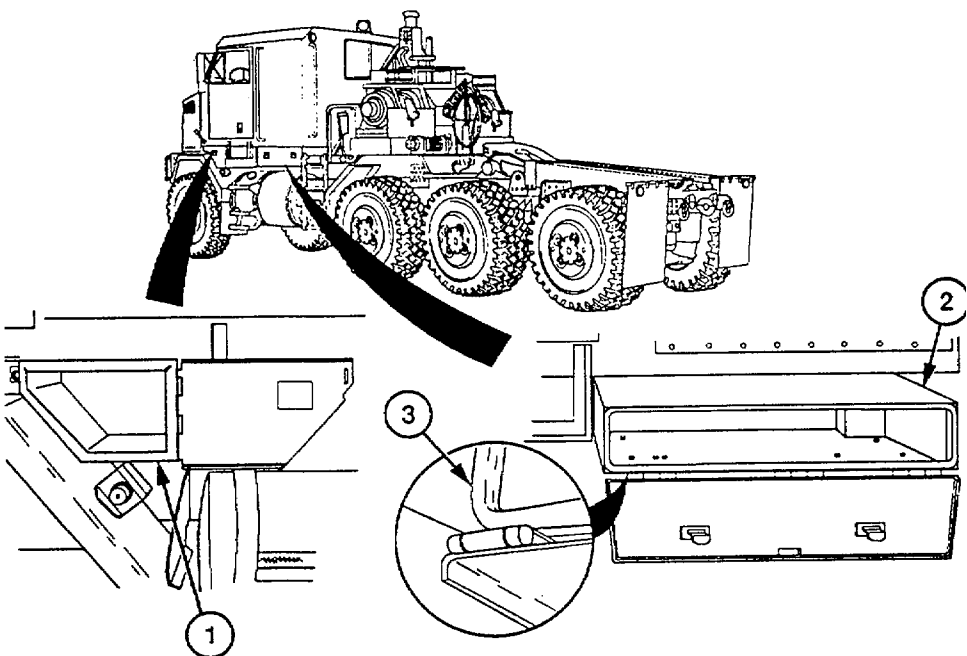
Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
36	Weekly	 <p>STORAGE BOXES</p>	<p>Check inside tool box (1) and stowage box (2) for torn or damaged seals (3), water in bottom, or other obvious damage. If damage is present or water is found in box, notify supervisor.</p>	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

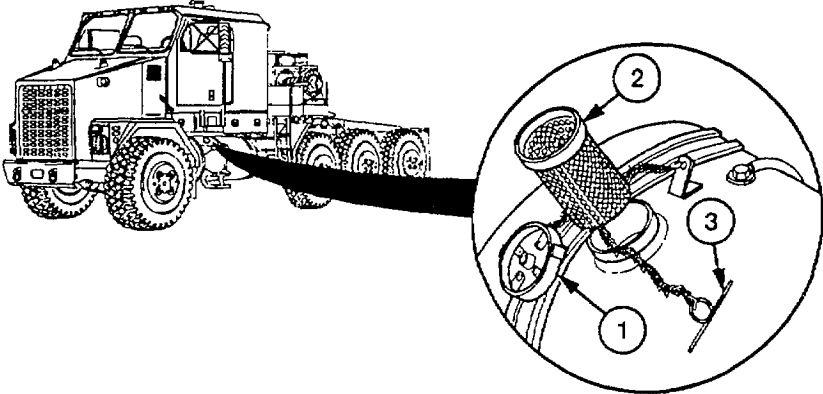
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:	
		Item to Check/Service			
					
		<p>WARNING</p> <p>Fuel is flammable and can explode easily. When working with fuel, keep HET Tractor away from open flame and keep fire extinguisher within easy reach. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Do not smoke while refueling.</p>			
37	Weekly	LEFT FUEL TANK	<p>a. Check fuel filler cap (1) for dirt and that chain is attached.</p> <p>(1) Remove fuel filler cap (1).</p> <p>(2) Pull strainer (2) out of fuel tank and release retaining wire (3). Clean with dry rag.</p>		

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:	
		Item to Check/Service			
37 (cont)	Weekly	LEFT FUEL TANK (CONT)	b. Check fuel tank (4), fuel hoses (5), and connections (6) for leaks and/or damage.	b. Any Class III leakage of fuel is present. Ensure all connections are secure.	
37.1	Weekly	COALESCING FILTER	Open drain (7) and drain coalescing filter (8). Close drain.		

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

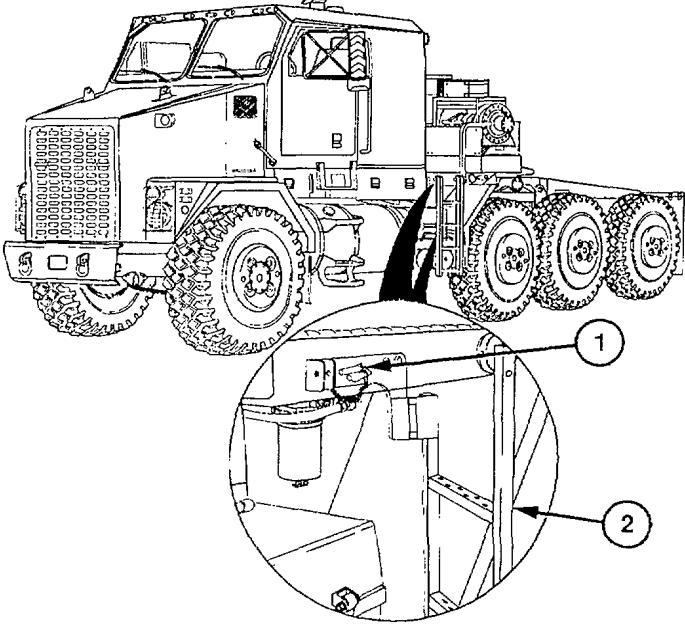
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:	
		Item to Check/Service			
					
		<p>WARNING</p> <ul style="list-style-type: none"> - Do not wear watches, rings, or other jewelry which could short out battery terminals while servicing batteries. Do not smoke or use open flame around batteries. Batteries may explode from a spark. Battery acid is harmful to skin and eyes. - Wear protective goggles to prevent injury to personnel when working with batteries. <p>NOTE Batteries are in battery box on left side of HET Tractor, forward of no. 2 axle.</p>			
38	Weekly	BATTERIES	a. Remove two clevis pins (1) from ladder (2). Swing out ladder (2).		

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

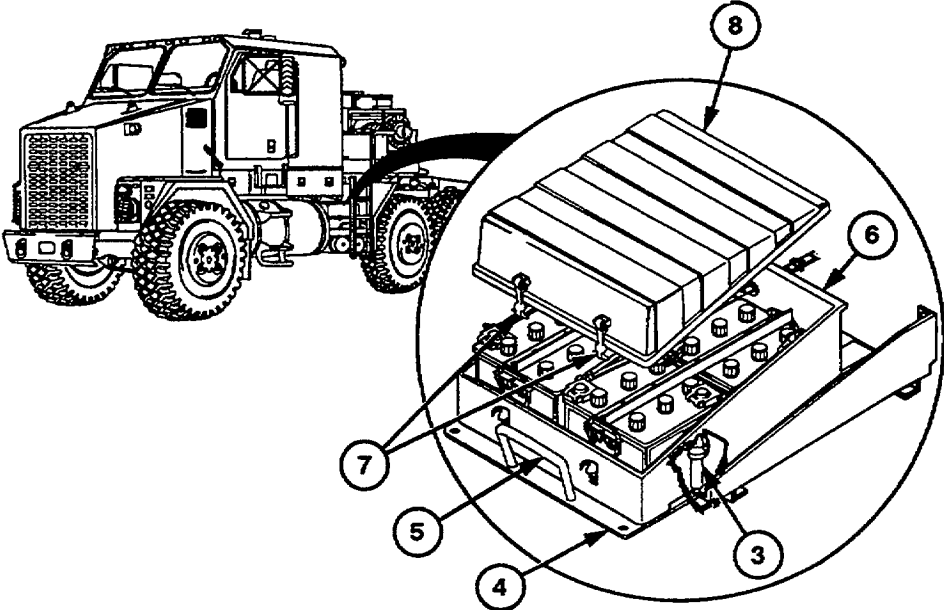
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
38 (cont)	Weekly	BATTERIES (CONT)		
			<p>b. Remove two clevis pins (3) from bracket (4). Pull handle(5) and slide battery box(6) out.</p> <p>c. Remove two rubber hood latches (7) from brackets. Remove battery box cover (8).</p>	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
38 (cont)	Weekly	BATTERIES (CONT)	d. Check battery box (6) and cover (8) for damage.	e. Battery is damaged, terminals are broken or burned. Any terminal, cable, or post is loose or damaged.
			e. Inspect batteries (9) for cracks or leaks and broken, loose, or burned terminal posts (10).	

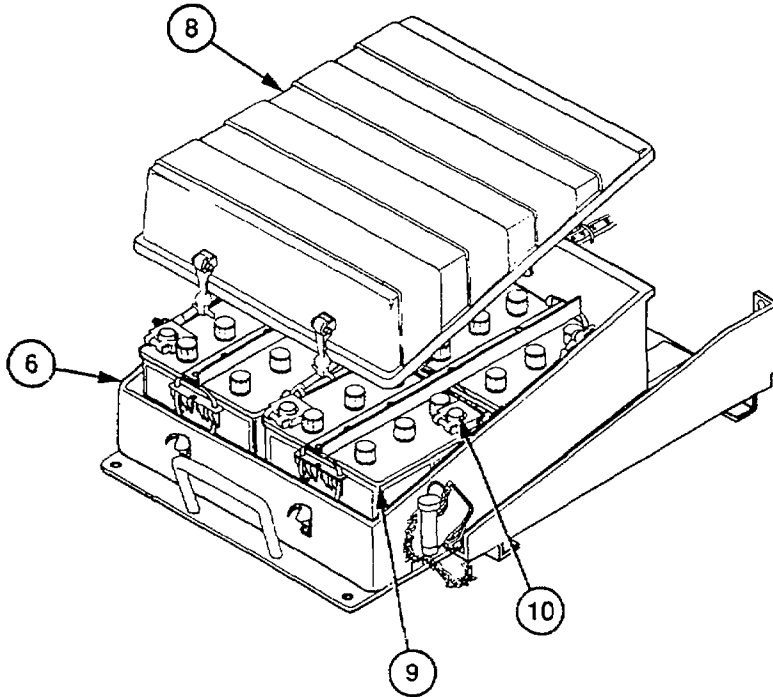


Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

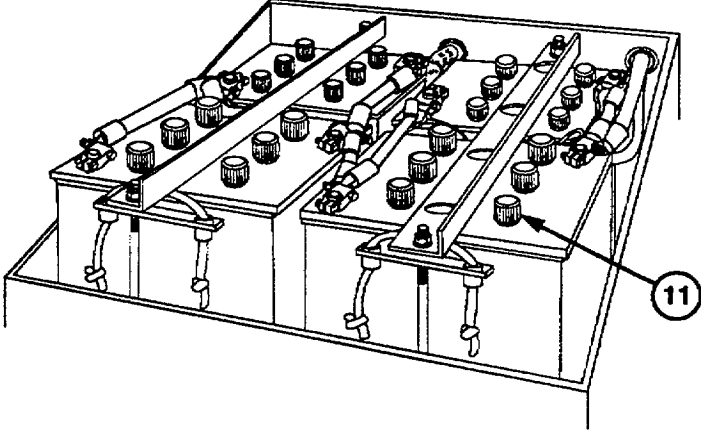
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
<p>NOTE</p> <ul style="list-style-type: none"> - It may be necessary to use a flashlight to check fluid level. - If fluid is boiling, notify unit maintenance. When ambient temperature is below 32°F (0°C), run engine for 15 mins to allow water added to mix with electrolyte. 				
38 (cont)	Weekly	BATTERIES (CONT)	<p>f. Remove battery caps (11) and check fluid level of each cell. Fluid level should be 1/8 in. (3.2 mm) below split ring.</p> <p>g. If fluid is low, fill with distilled water.</p>	<p>f. One or more batteries are missing, damaged, or fail to provide adequate power to crank engine.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
38 (cont)	Weekly	BATTERIES (CONT)	h. Install battery box cover, slide battery box in and secure ladder.	
			i. Check condition of slave receptacle (12).	

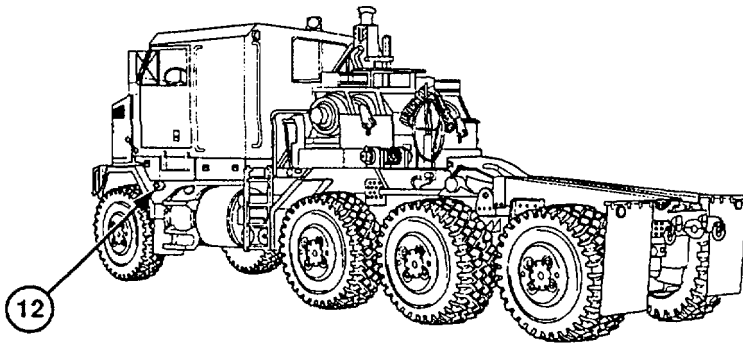


Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

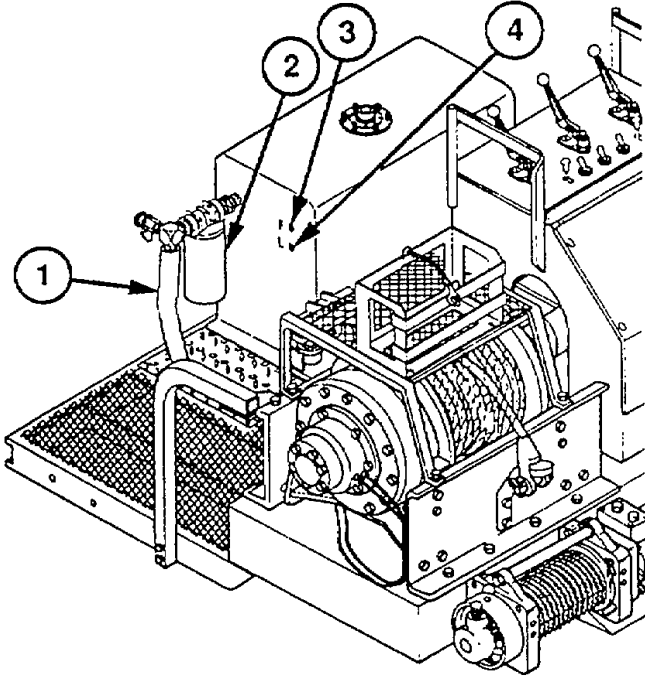
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:	
		Item to Check/Service			
39	Weekly	WINCH HYDRAULIC SYSTEM		<p>a. Check hydraulic hose (1) on filter (2) for rotting, leakage, or loose fittings.</p> <p>b. Check that hydraulic fluid level is between top (3)(F) and bottom (4)(L) of two sight glasses. Add hydraulic fluid if level is below bottom (4)(L) sight glass.</p> <p>c. Check filter (2) for leaks.</p>	<p>a. Any Class III leakage is evident.</p> <p>c. Any Class III leakage is evident.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
39 (cont)	Weekly	WINCH HYDRAULIC SYSTEM (CONT)	<ul style="list-style-type: none"> d. Remove access grate (5) and check hydraulic pump (6) for loose bolts or damage. e. Check hoses for loose fittings. f. Install access grate (5). 	
40	Weekly	WINCHES	<ul style="list-style-type: none"> a. Check winches for damage, leaks, and loose or missing mounting hardware. 	<ul style="list-style-type: none"> a. Class II leakage is evident or loose or missing hardware is found.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
40 (cont)	Weekly	WINCHES (CONT)	<p>NOTE Start engine and engage PTO.</p> <p>b. Check ENGINE SPEED CONTROL and LOCK switches for proper operation.</p>	<p>b. Engine speed does not increase to 1450-1500 rpm.</p>
			<p>WARNING Wear leather gloves when checking winch cable. Injury to hands may result if gloves are not worn.</p> <p>c. Pay winch cables (1) out completely and check for kinks, frays, and breaks.</p>	<p>c. Winch cables are kinked, frayed, or unserviceable and both are required for mission. Winch cable has more than three broken wires</p>

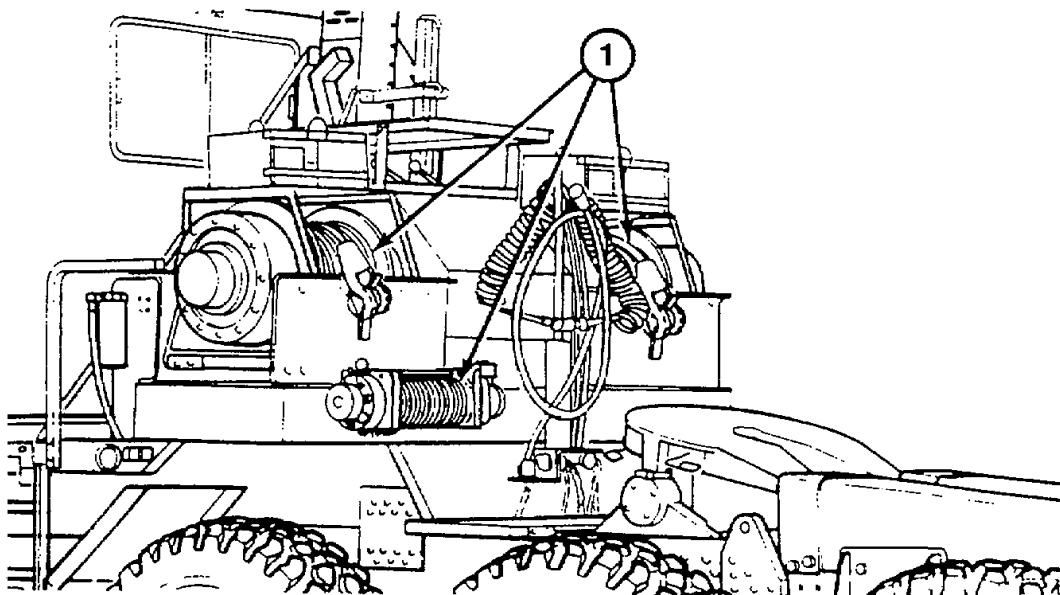


Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

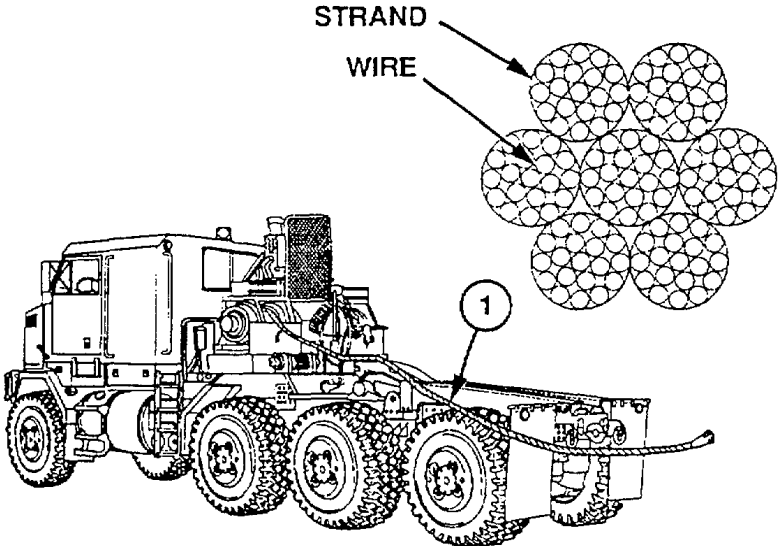
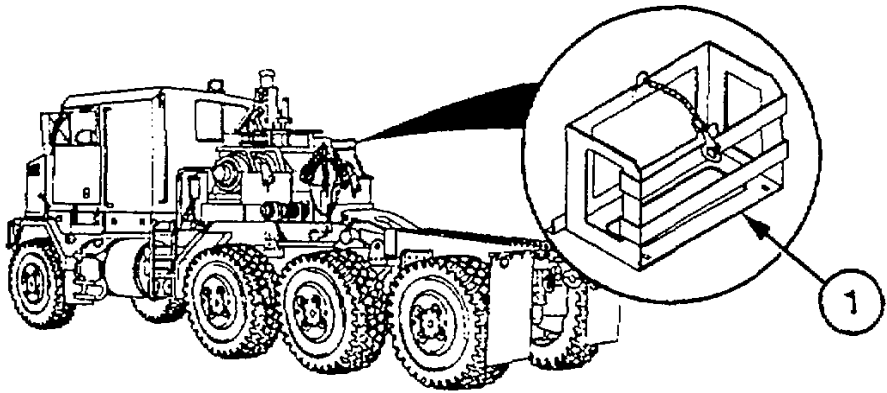
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
40 (cont)	Weekly	WINCHES (CONT)		<p>per inch on same strand or more than six broken wires on all strands in a 1 in. running length of cable. Maximum number of broken wires shall not occur in any two consecutive inches of cable; that is, if six wires are broken in 1 in. of cable, none would be allowed in the next consecutive in.</p>
			<p>d. Check winch controls for proper operation.</p>	
41	Weekly	CHOCK BOX		Check chock box (1) for looseness.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
42	Weekly	EXHAUST SYSTEM	Check exhaust pipe (1), muffler (2), heat guards (3), tailpipe (4), and raincap (5) for loose clamps, damaged mountings, and obvious damage.	Any exhaust pipe is damaged or missing.

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

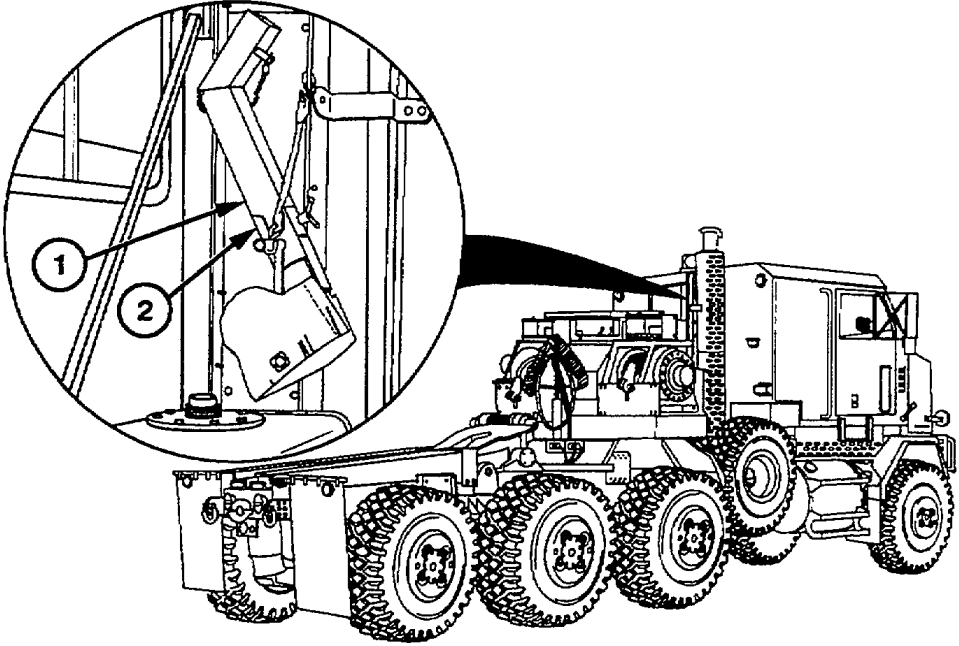
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
43	Weekly		<p>a. Check spare tire davit (1) for obvious damage.</p>	
			<p>WARNING Always wear heavy duty gloves when handling winch cable Never let cable run through hands. Frayed cable can cut hands severely.</p>	<p>b. Check spare tire davit winch cable for kinks, fray, and breaks.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
44	Weekly	ANTENNA MAST (IF EQUIPPED)	<p>c. Check spare tire davit mount (2) for loose or missing hardware.</p> <p>Check antenna mast for obvious damage and loose or missing hardware.</p>	<p>c. Hardware is loose or missing.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

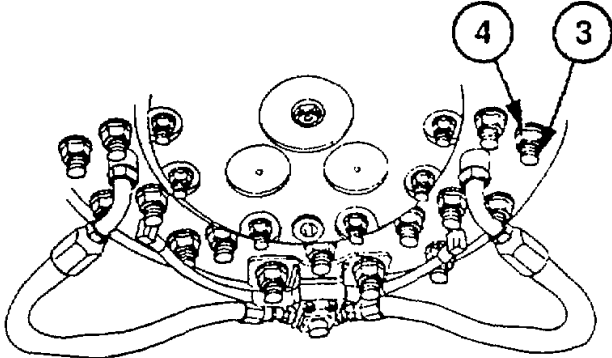
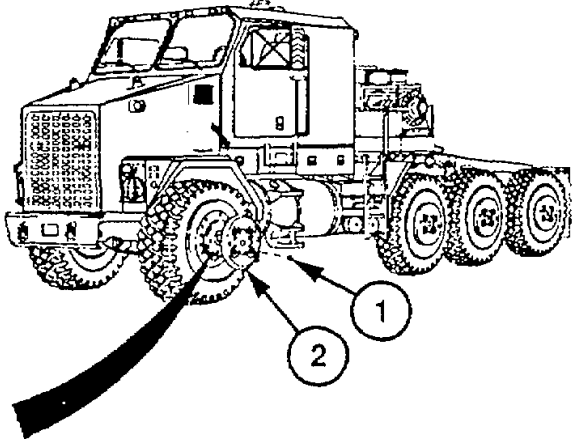
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
45	Weekly	TIRE ASSEMBLY (ALL)	 	
			<p>a. Remove four nuts (1) and wheel cover (2) from each wheel</p> <p>WARNING Tire must be completely deflated before attempting to loosen lugnuts if any studs are found loose or broken after removing wheel cover. Failure to comply may result in injury to personnel.</p> <p>b. Check wheel covers (2) for damage.</p> <p>c. Check wheel studs (3) and nuts (4) for obvious looseness. Check for bent or broken studs and missing or loose nuts.</p>	<p>c. Any hub has two or more nuts or studs missing, broken, or bent</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
<p><u>WARNING</u></p> <ul style="list-style-type: none"> - Wear approved hearing protection devices when working in high noise level areas. Permanent hearing loss may result if exposed to constant high noise levels. - Tire pressure must be checked properly or serious injury or death may result. <p><u>NOTE</u> Run engine at approximately 1500 rpm.</p>				
45 (cont)	Weekly	TIRE ASSEMBLY (ALL)(CONT)	<p>d. Check all eight tires pressures at each CTIS setting starting at the emergency setting after deflating and inflating.</p> <p>e. Install wheel cover (2) and four nuts (1) on each wheel.</p> <p>COLD TIRE PRESSURE (PSI)</p> <p>CTIS Setting:</p> <p>HIGHWAY 75 (517 kPa)</p> <p>CROSS COUNTRY 55 (379 kPa)</p> <p>MUD, SAND, & SNOW 40 (276 kPa)</p> <p>EMERGENCY 30 (207 kPa)</p>	d. CTIS does not reach or maintain desired pressures.
<p><u>NOTE</u> Tire pressures must be able to go back to highway pressures at 1500 rpm. (See para 2-13.)</p>				

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
46	Weekly	FRONT AND REAR TRAILER RECEPTACLE AND GLADHANDS	<ol style="list-style-type: none"> a. Check 12-volt receptacle (1) and seal for damage. b. Check HET Tractor gladhands (2). c. Remove dummy couplings from gladhands and check condition of seals. 	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
47	Weekly	PINTLE HOOK	Check pintle hook (1) for looseness and/or damaged locking mechanism.	Pints hook is loose or locking mechanism is damaged and equipment is required for mission.

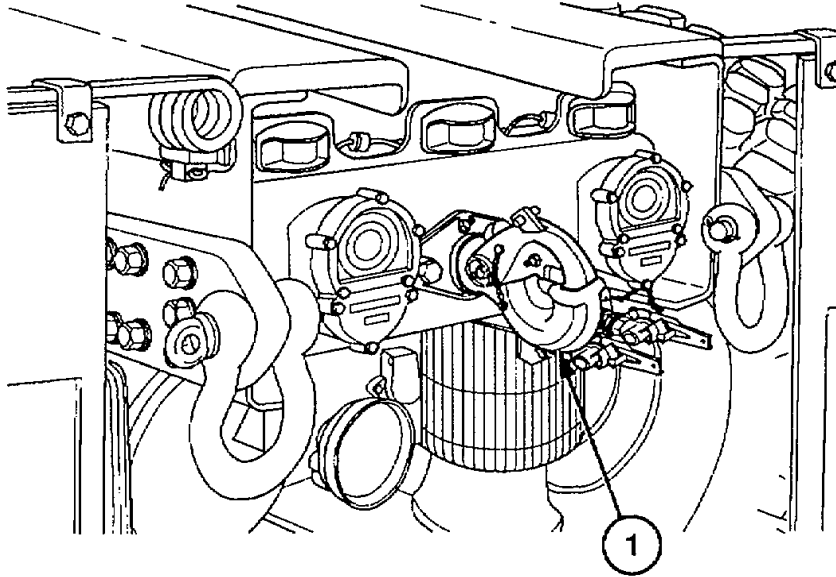


Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cant)

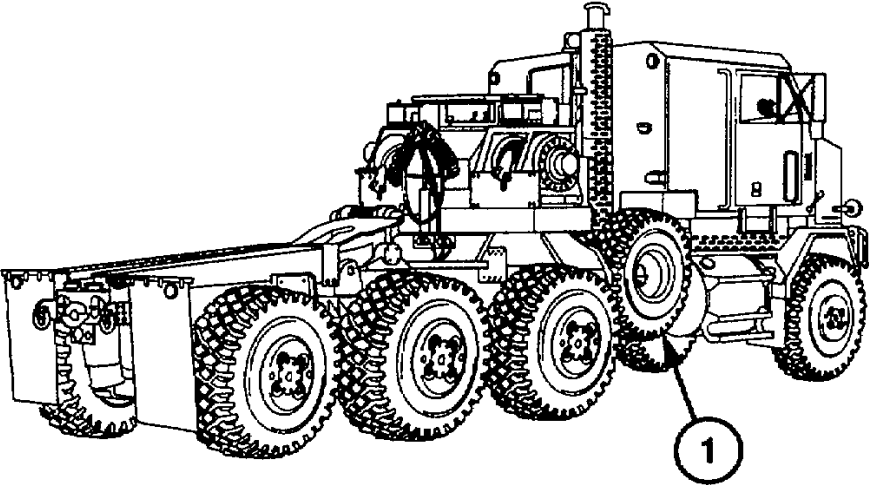
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
 <p>The diagram shows a side view of an HET tractor. A spare tire is mounted on the rear of the tractor and is circled with a line that leads to a circle containing the number '1'.</p>				
<p>WARNING</p> <ul style="list-style-type: none"> • Tire must be caged when inflating. Use caution when inflating tire. Over inflation may cause tire to blow apart. Failure to comply may result in serious injury or death to personnel. • Do not attempt to inflate a tire that is under-inflated, over-inflated, or has a questionable defect. Failure to comply may result in injury or death to personnel. • Spare tire air pressure must be checked properly or serious personal injury or death may result. 				
48	Weekly	SPARE TIRE	Check spare tire (1) for correct air pressure. Inflate tire to 75 psi (517 kpa) if air pressure is low (para 3-7).	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

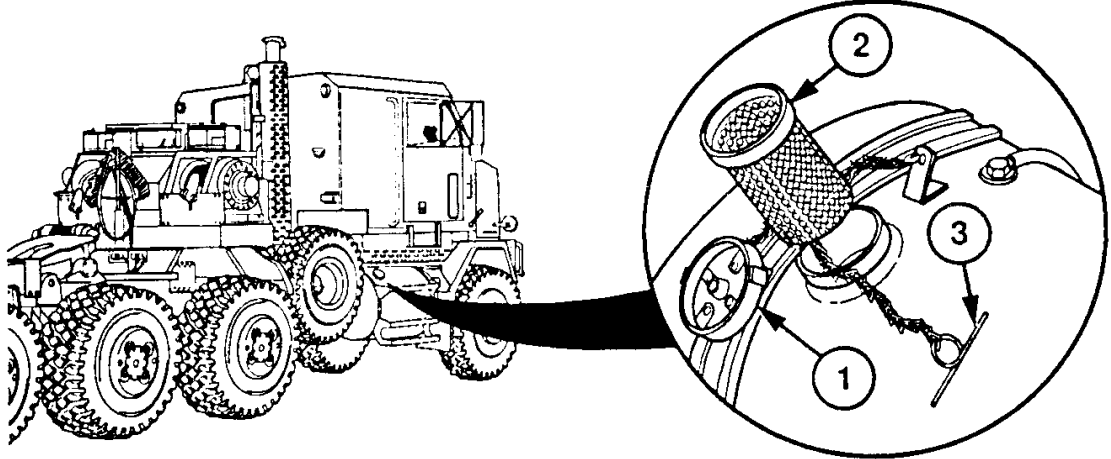
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
		<p>WARNING</p> <p>Fuel is flammable and can explode easily. When working with fuel, keep HET Tractor away from open flame and keep fire extinguisher within easy reach. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Do not smoke while refueling.</p>		
49	Weekly	RIGHT FUEL TANK	<p>a. Check fuel filler cap (1) for dirt and that chain is attached.</p> <p>(1) Remove fuel filler cap (1).</p> <p>(2) Pull strainer (2) out of fuel tank and release retaining wire (3). Clean with dry rag.</p>	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
49 (cont)	Weekly	RIGHT FUEL TANK (CONT)	b. Check fuel tank (4), fuel hoses (5), and connections (6) for leaks and/or damage.	b. Any Class III leakage of fuel is present. Ensure all connections are secure.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Corn)

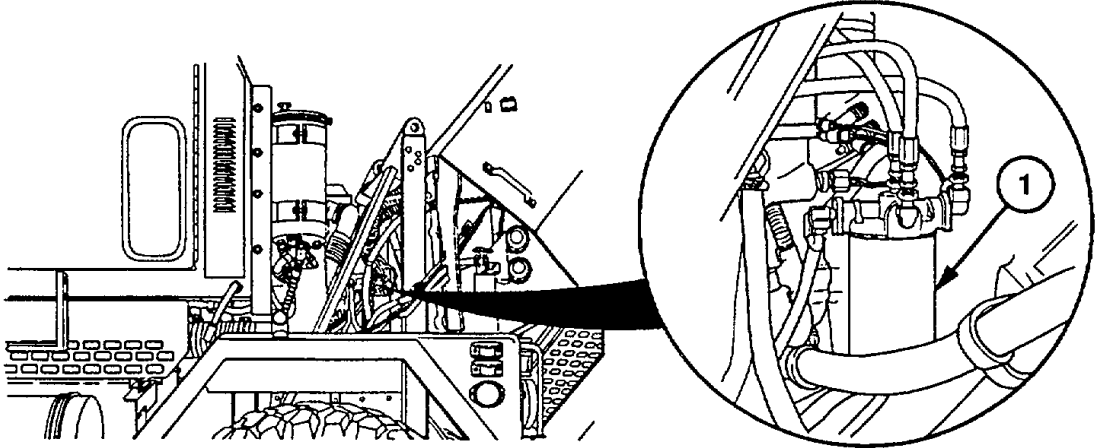
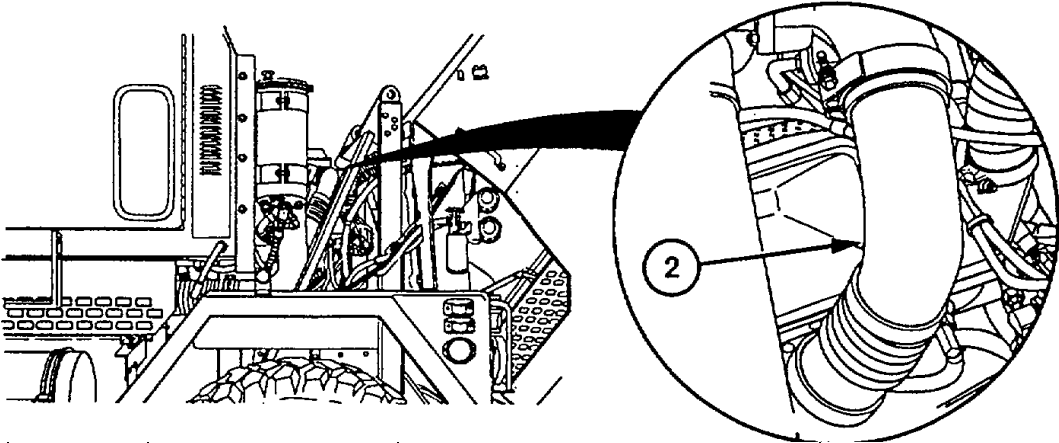
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
50	Weekly	ENGINE COMPARTMENT (RIGHT)	 <p>a. Check secondary fuel filter (1) for leaks or damage.</p>	a. Class III leakage of fuel is evident.
			 <p>b. Check pipe (2) between turbocharger and left exhaust manifold for cracks. Check for loose or missing clamps.</p>	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

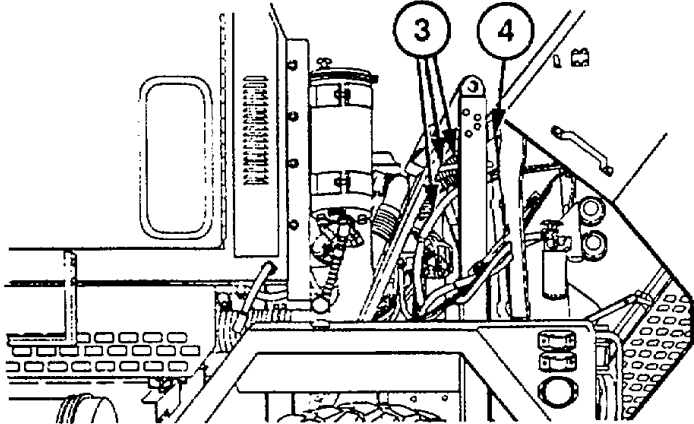
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:		
		Item to Check/Service				
50 (cont)	Weekly	ENGINE COMPARTMENT (RIGHT)(CONT)				
					<ul style="list-style-type: none"> c. Check radiator hoses (3) for rotting, leakage, and loose clamps. d. Check radiator (4) for leaks, damaged fins, and missing baffles. e. Close hood (para 2-33). 	<ul style="list-style-type: none"> c. Any Class III leakage is evident. d. Any Class III leakage is evident.
51	Weekly	UNDER-CARRIAGE			<ul style="list-style-type: none"> a. Check under-carriage for obvious damage to propeller shafts. b. Check universal joints for obvious damage or missing hardware. 	<ul style="list-style-type: none"> a. Propeller shaft is bent or broken. b. Any hardware is missing or broken.

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:			
		Item to Check/Service					
51 (cont)	Weekly	UNDER-CARRIAGE (CONT)	c. Check steering lines and shafts for obvious damage or missing hardware.	c. Any hardware is missing or broken.			
			d. Check PTO shaft for obvious damage or missing hardware.	d. Any hardware is missing or broken.			
			e. Check shock absorbers for obvious damage, leaks and missing or loose hardware.	e. Any hardware is loose or missing.			
			f. Check front and rear steering gears for obvious damage or missing hardware.	f. Any hardware is missing or broken.			
			NOTE				
			Some looseness of the front spring clip is permissible. The clip may rotate on the rivet.				
			g. Check front leaf springs for obvious damage or missing hardware.	g. Any hardware is missing or broken.			
			h. Check frame crossmembers for obvious damage or missing hardware.	h. Any broken crossmembers, broken welds, or missing or broken hardware is found.			

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
51 (cont)	Weekly	UNDER CARRIAGE (CONT)	<ul style="list-style-type: none"> i. Check ride height linkage for obvious damage or missing hardware. j. Check tie rods for obvious damage or missing hardware. k. Check torque rods for obvious damage or missing hardware. 	<ul style="list-style-type: none"> i. Any hardware is missing or broken. j. Any hardware is missing or broken. k. Any hardware is missing or broken.
			<ul style="list-style-type: none"> l. Check engine and transmission cradle (1) for obvious damage or missing hardware. 	<ul style="list-style-type: none"> l. Any hardware is missing or broken.

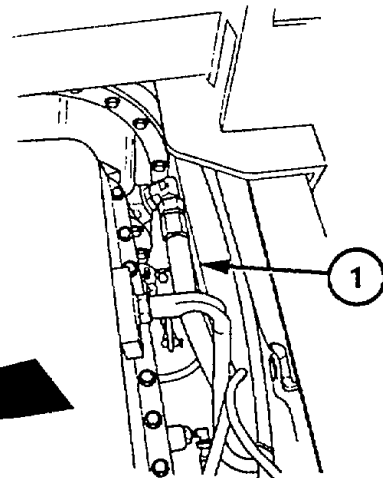
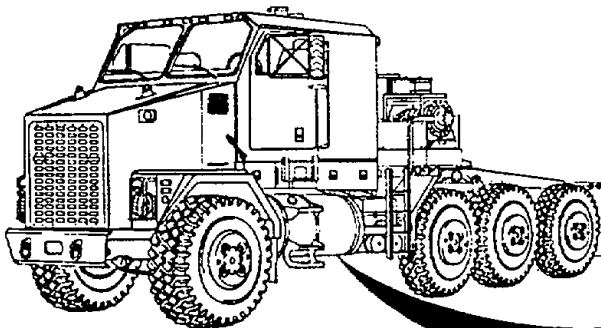


Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
51 (cont)	Weekly	UNDER-CARRIAGE (CONT)	<ul style="list-style-type: none"> m. Check engine and transmission for obvious damage or missing hardware. n. Check air lines and hoses for obvious damage. o. Check for chafed wiring. p. Check transfer case and mounts for obvious damage. 	<ul style="list-style-type: none"> m. Any hardware is missing or broken. n. Any leaks, kinks, or damage to lines, hoses, or fittings are found. o. Any wires are chafed or frayed. p. Any Class III leakage is evident. Damage is found that would limit operation. Transfer case mount is loose or damaged or mounting biscuits are missing.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

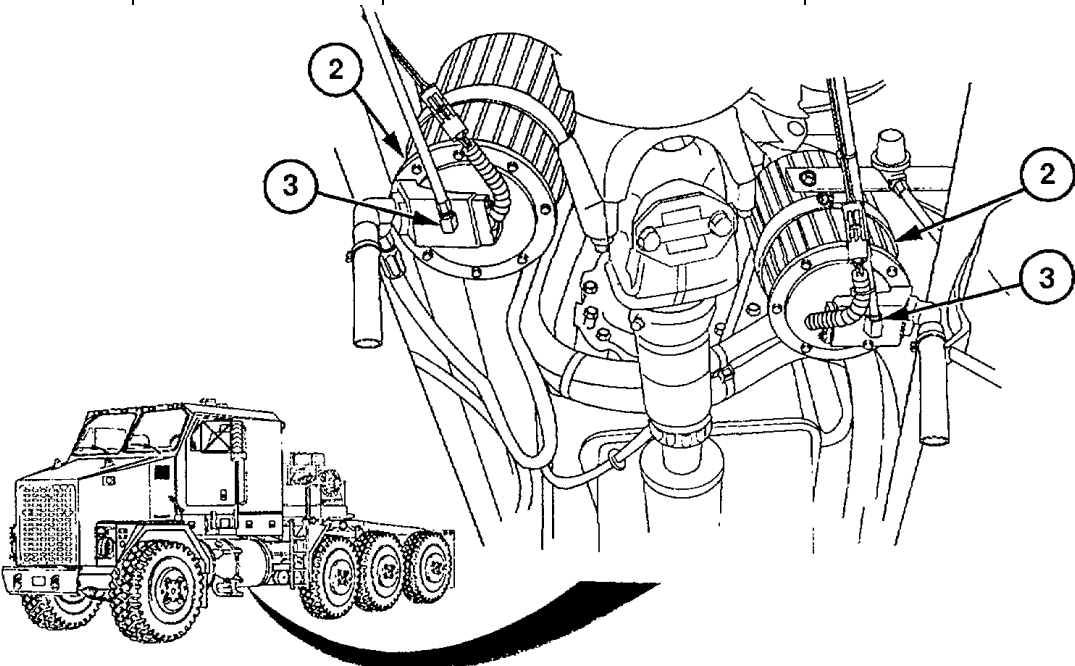
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:	
		Item to Check/Service			
51 (cont)	Weekly	UNDER-CARRIAGE (CONT)		<p>q. Check air dryers (2) for loose screws and connections (3).</p> <p>r. Check air springs (bags) for obvious damage.</p>	<p>r. Any air leaks or obvious damage is found.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

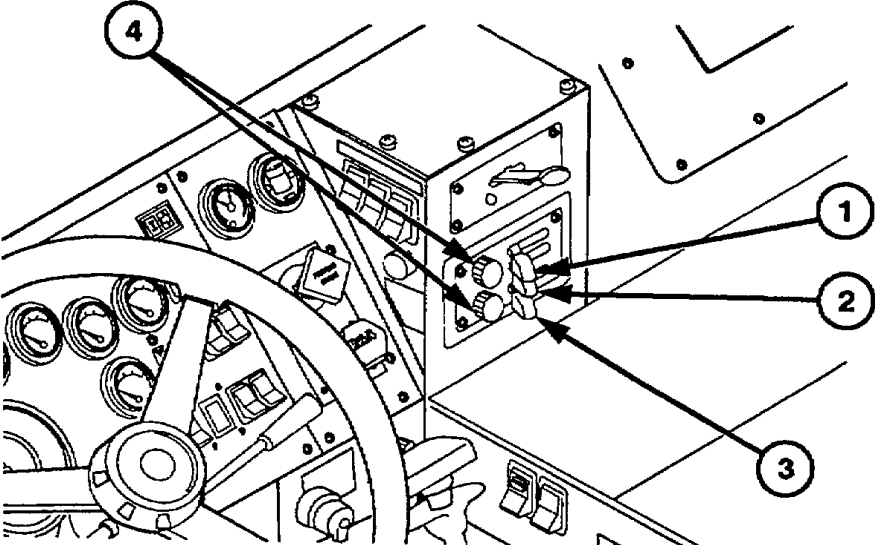
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
52	Weekly	INSTRUMENT PANEL	<ul style="list-style-type: none"> a. Check DEF/CAB (1), RECIRC/F/A (2), and OFF/HEAT (3) controls for proper operation. b. Check FRONT and REAR fan switches (4) for proper operation in speeds 1, 2, and 3. 	
53	Weekly	EXTERIOR	Check all data plates to ensure legibility.	
54	Weekly	CAB	Check condition and operation of door, window and mirror.	Either door is not operational or broken.

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

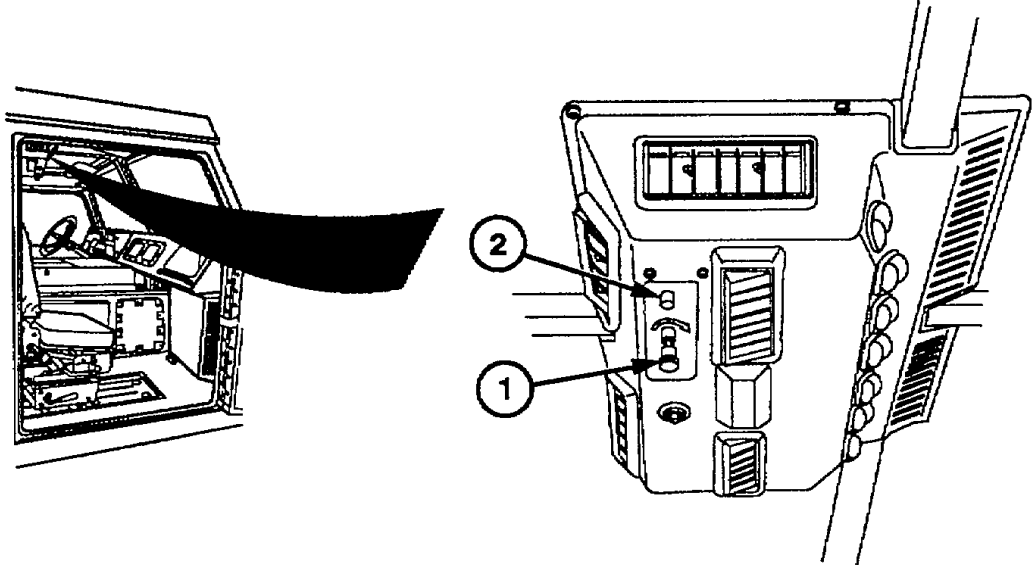
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:	
		Item to Check/Service			
					
54.1	Weekly	VENTILATOR	<ul style="list-style-type: none"> a. Check fresh air/recirculated air control (1) for proper operation. b. Check blower control switch (2) for proper operation in speeds low (L), medium (M), and high (H). 		

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

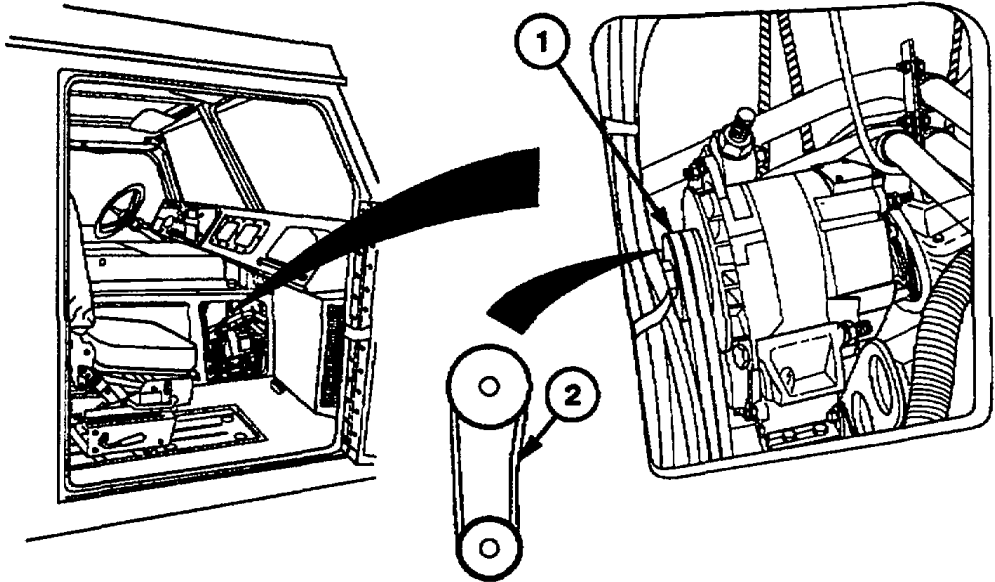
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
55	Weekly	 <p>ALTERNATOR BELTS (12 VOLT)</p>	<p>a. Check alternator drive belts (1) for cracking, fraying, and breaks.</p> <p>b. Check drive belts for tightness. There should be approximately 1/2 in. (1.25 cm) of play when pushing on belts in center (2) between pulleys.</p>	<p>a. Any drive belt is missing, broken, cracked to the belt fiber, has more than one crack (1/8 in. in depth or 50% of belt thickness), or has frays more than 2 in. long.</p> <p>b. Belts are out of adjustment.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
56	Weekly	SEATS AND SEAT BELTS	<ul style="list-style-type: none"> a. Check front seats, rear seats, and seat belts for loose or missing mounting hardware. b. Check seat belts for tears, frays, or holes. c. Check seatbelts flat metal ends and buckles for bends or cracks. d. Ensure seat belts function properly and lock securely. 	<ul style="list-style-type: none"> a. Loose or missing mounting hardware is found. b. Seat belt is torn. c. Metal ends or buckles are bent or cracked. d. Seat belts do not adjust properly or lock securely.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
AUXILIARY EQUIPMENT				
WARNING				
NBC-contaminated filters must be handled using adequate precautions and must be disposed of by trained personnel. (See FM 21-40.)				
NOTE				
For further information on operating the gas particulate filter see para 2-20.				
57	Weekly	GAS PARTICULATE FILTER UN	<ul style="list-style-type: none"> a. Check hoses (1) for cuts, tears, cracks, or holes. b. Make sure hose clamps (2) are secure. 	<ul style="list-style-type: none"> a. Filter assembly is defective.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

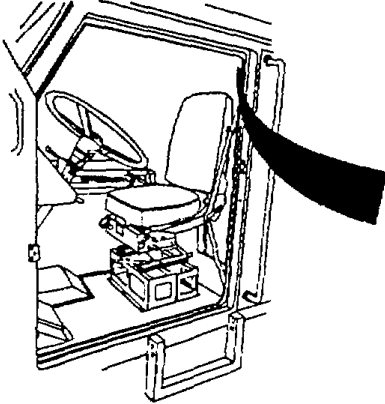
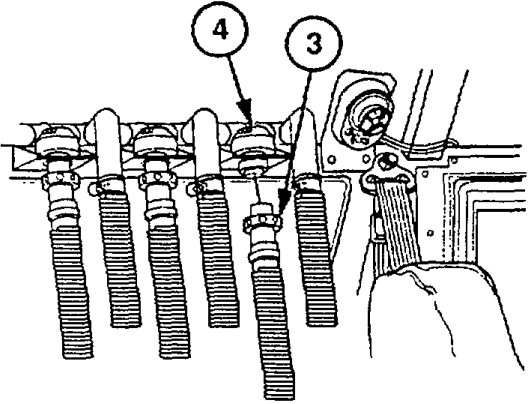
Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
57 (cont)	Weekly	 <p>GAS PARTICULATE FILTER UNIT (CONT)</p>	 <p>c. Check operation of gas particulate filter unit (para 2-20):</p> <ol style="list-style-type: none"> (1) Listen for gas particulate filter motor operation. (2) Disconnect five air duct breakaway sockets (3) from mount (4) and feel for steady airflow. 	

Table 2-1. Preventive Maintenance Checks and Services (PMCS)
for the HET Tractor (Cont)

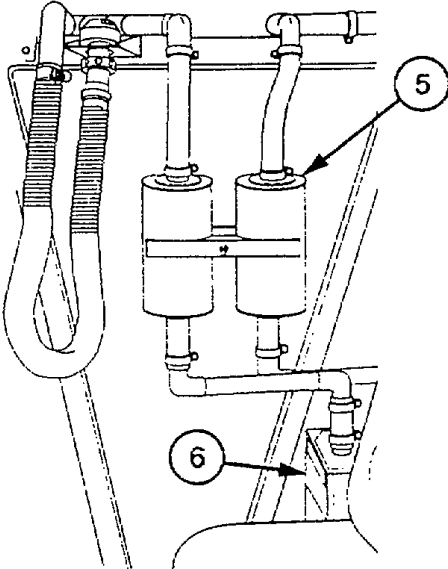
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
57 (cont)	Weekly	 <p>GAS PARTICULATE FILTER UNIT (CONT)</p>	<p>d. Check precleaner (5) and particulate filter housings (6) for cracks, dents, or breaks. Wipe with clean cloth.</p>	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

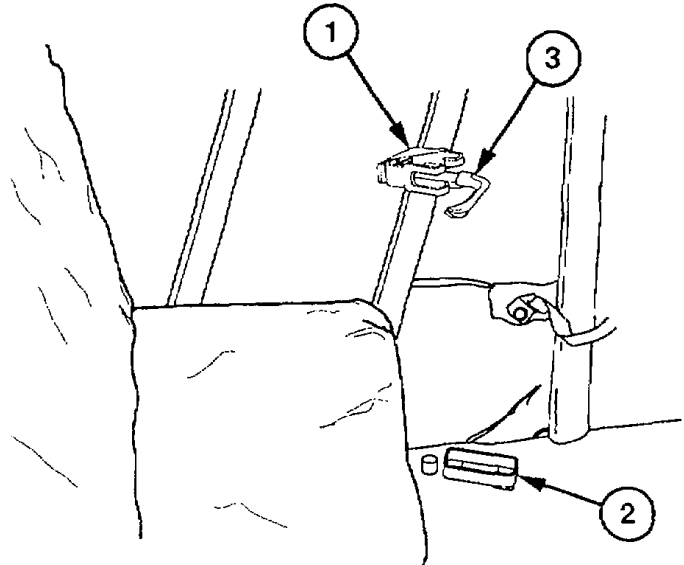
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
58	Weekly	RIFLE STOWAGE MOUNT	<ul style="list-style-type: none"> a. Check that mounting bolts on rifle mount bracket (1) and lower support (2) are not broken or missing. b. Check handles (3) for excessive looseness or binding. 	
59	Weekly	LUBRICATION	Perform all weekly lubrication as identified in LO 9-2320-360-12.	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

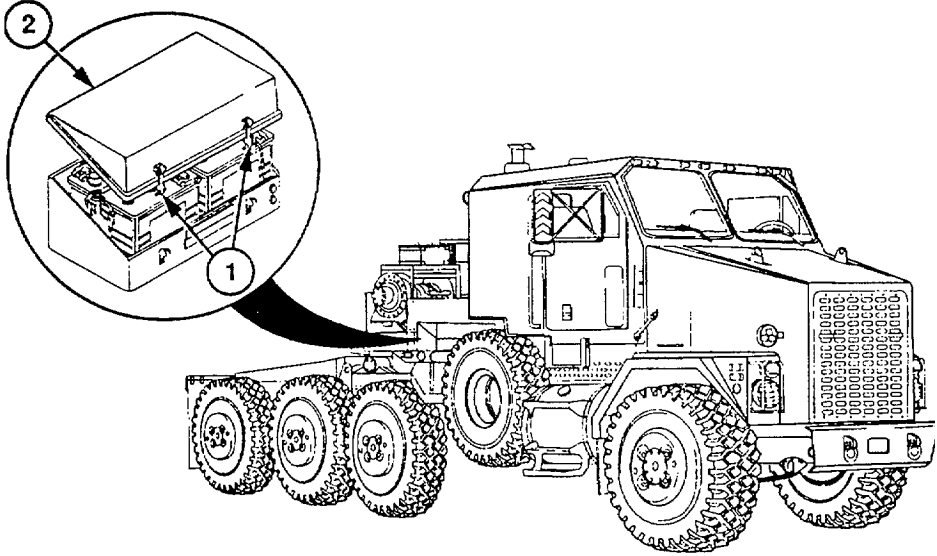
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
<p>AUXILIARY EQUIPMENT</p> 				
<p>WARNING</p> <ul style="list-style-type: none"> - Do not wear watches, rings, or other jewelry which could short out battery terminals while servicing batteries. Do not smoke or use open flame around batteries. Batteries may explode from a spark. Battery acid is harmful to skin and eyes. - Wear protective goggles to prevent personal injury when working with batteries. 				
<p>NOTE</p> <p>When arctic kit is installed, batteries are on right side of HET Tractor in front of right main winch.</p>				
60	Weekly	ARCTIC KIT BATTERIES	a. Remove two rubber hood latches (1) from brackets. Remove battery box cover (2).	

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

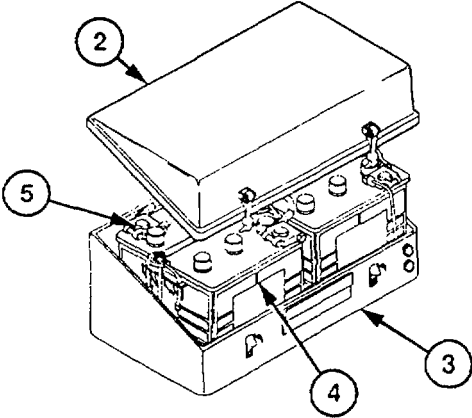
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
<p>60 (cont)</p>	<p>Weekly</p>	<p>ARCTIC KIT BATTERIES (CONT)</p>	 <p>b. Check battery box (3) and cover (2) for damage.</p> <p>c. Inspect batteries (4) for cracks or leaks, and for broken or burned terminal posts (5).</p>	<p>c. Battery is damaged, terminals are broken or burned.</p>

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

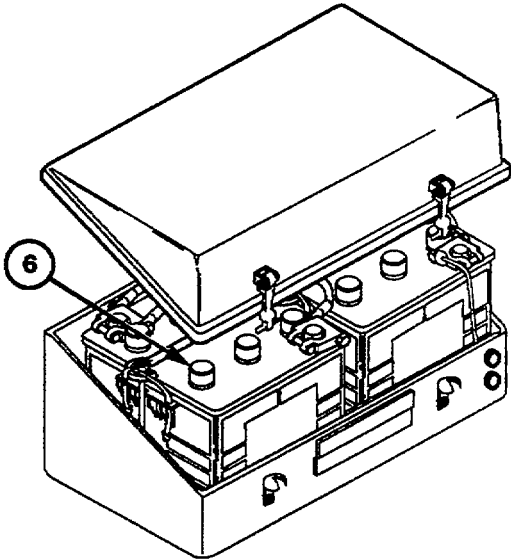
Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
				
			<p>NOTE</p> <ul style="list-style-type: none"> - It may be necessary to use a flashlight to check fluid level. - If fluid level stays low, or fluid is boiling, notify unit maintenance. When ambient temperature is below 20°F (-6.7°C), run engine for 15 minutes to allow water added to mix with electrolyte. 	
60 (cont)	Weekly	ARCTIC KIT BATTERIES (CONT)	<ul style="list-style-type: none"> d. Remove battery caps 6) and check fluid level of each cell. Fluid level should be 1/8 in. (32 mm) below split ring. e. If fluid is low, fill with distilled water. 	d. Any battery missing or damaged.

Table 2-1. Preventive Maintenance Checks and Services (PMCS) for the HET Tractor (Cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
61	Weekly	M-13 DECONTAMINATION UNIT	Refer to TM 3-4230-214-12&P for preventive maintenance checks and services.	
62	Weekly	M-42 CHEMICAL ALARM	Refer to TM 3-6665-225-12 for preventive maintenance checks and services.	

Section III. OPERATION UNDER USUAL CONDITIONS

This section provides all instructions necessary to operate the HET Tractor and its auxiliary equipment under usual (normal) conditions.

2-8. DECALS AND DATA PLATES

The following pages provide data plates and decals found on the HET Tractor. Pay close attention to warnings and cautions noted. Locations of these data plates on HET Tractor can be found in Appendix E.

CAUTION

THE FOLLOWING CONDITIONS MUST BE OBSERVED BEFORE WELDING ON HET TRACTOR

- ALL BATTERY CABLES DISCONNECTED (INCLUDING ARCTIC BATTERIES IF INSTALLED)
- DDEC ELECTRONIC CONTROL MODULE DISCONNECTED
- 12 AND 24 VOLT ALTERNATORS DISCONNECTED
- CTIS CONTROLLER AND POWER MANIFOLD DISCONNECTED

FAILURE TO COMPLY WILL RESULT IN DAMAGE TO VEHICLE'S ELECTRICAL SYSTEM
SEE TM 9-2320-360-20 MANUAL FOR CABLE CONNECTIONS

45152-189999

VIN

OSHKOSH TRUCK CORPORATION
 OSHKOSH, WISCONSIN, USA

CONTRACT NO.
DAAE07-90-C-0204
THIS COMPONENT IS
A WARRANTED ITEM

SHIPPING DATA

CENTER OF GRAVITY LATERAL LOCATION ON VEHICLE CENTER

CURB	118.4	CURB	45.7
MODEL	M1070	HEIGHT	140.1
FRONT AXLE WEIGHT CURB	17,400	WIDTH	102.0
3-REAR AXLES	22,600	LENGTH	361.6

NOTE: USE SHACKLES SUPPLIED ON VEHICLE AT LIFT POINTS

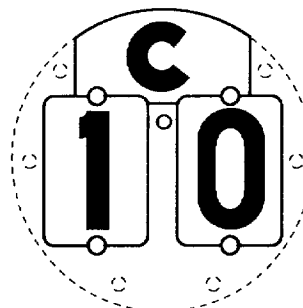
TURN ON CIRCULATION PUMP WHEN USING SWINGFIRE HEATER

TURN OFF WHEN FINISHED

ON

OFF

45152-1896930



2-8. DECALS AND DATA PLATES (CONT)

WARNING !

THE REMOVAL OR DEFACING OF WARNING LABELS APPLIED TO WINCHES BECOMES THE SOLE RESPONSIBILITY OF THE PURCHASER AND WILL CONSTITUTE A WAIVER OF CLAUSE TO DP MANUFACTURING, INC.

WINCHES ARE NOT INTENDED FOR USE IN THE LIFTING OR MOVING OF PERSONS.

Any such use shall be considered to be improper and the seller shall not be responsible for any claims that may arise therefrom.

TULSA, OKLAHOMA, USA

dp MANUFACTURING INCORPORATED

SERIAL NO _____
 MODEL NO _____

RATED LINE PULL ON:
 LAYER 4 (FULL DRUM)
 FIRST LAYER _____

ENGINE RPM @ RATED PULL _____
 DUTY CYCLE RATING _____
 WIRE ROPE DIAMETER _____

DO NOT USE WINCH TO LIFT OR MOVE PERSONS.

TULSA, OKLAHOMA, USA

dp MANUFACTURING INCORPORATED

SERIAL NUMBER _____
 MODEL NUMBER _____

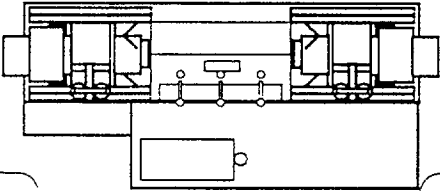
RATED LINE PULL ON:
 LAYER 5 (FULL DRUM)
 FIRST LAYER _____

ENGINE RPM @ RATED PULL _____
 DUTY CYCLE RATING _____
 MAX RECOMMENDED WIRE ROPE DIA _____

DO NOT USE WINCH TO LIFT OR MOVE PERSONS.

SERVICE INTERVAL	REFERENCE LUBRICATION	IDENTIFICATION	TYPE SERVICE	SERVICE POINTS	LUBRICATION

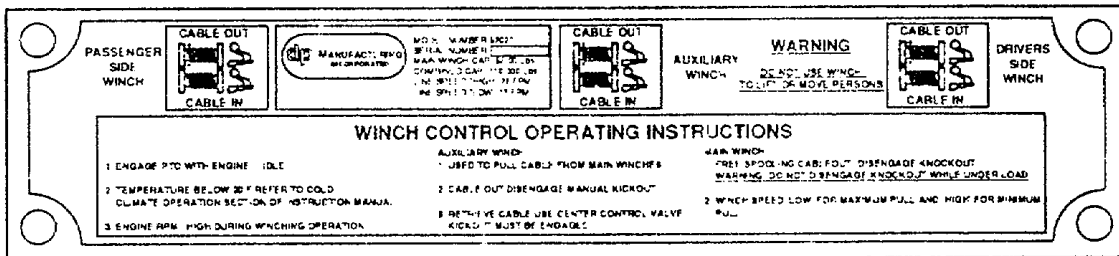
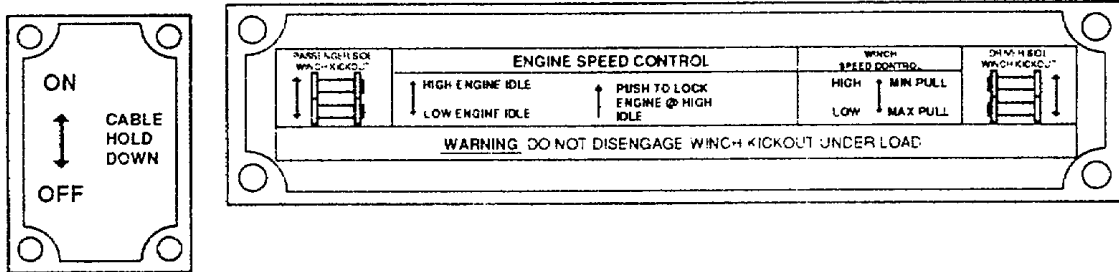
SEE OPERATION MANUAL FOR LUBRICANT TYPE SPECIFIC TEMP RANGE



TULSA, OKLAHOMA, USA

dp MANUFACTURING INCORPORATED

SERIAL NUMBER _____
 MODEL NUMBER _____



MAKE OSHKOSH TRUCK CORP	RUSTPROOF PRODUCT: WITCO SACI 2452
MODEL: M1670	DATE OF APPLICATION: (PUNCH OUT);
CONTRACT NUMBER: DAAEC7-90-C-0204	MONTH: JAN FEB MAR APR MAY JUN
APPLIED BY OSHKOSH TRUCK CORP	JUL AUG SEP OCT NOV DEC
RUSTPROOF MNFR: PER OPL 62218	YEAR: 92 93 94 95 96

CAUTION

STEAMCLEANING WILL REMOVE RUSTPROOFING.

45152-1R05210

2-8. DECALS AND DATA PLATES (CONT)

U. S. PROPERTY

NOMENCLATURE: TRUCK, TRACTOR

MAKE: **OSHKOSH TRUCK CORP.**

MODEL: **M1070**

CONTRACT NUMBER: **DAAE07-90-C-0204**

REGISTRATION NUMBER: _____

VIN NUMBER: **10T1K4JH**

NSN NUMBER: **2320-01-318-9902**

CAGE NUMBER: **45152**

VEHICLE CURB WEIGHT: **40,900 LBS**

PAYLOAD, MAXIMUM: **46,000 LBS**

GVWR, MAXIMUM: **86,000 LBS**

GCWR, MAXIMUM: **231,400 LBS**

DATE OF MANUFACTURE: _____

45152 1805190

WARRANTY

THIS VEHICLE IS WARRANTED FOR 12 MONTHS

WARRANTY TECHNICAL BULLETIN NO: **TB-9-2320-360-14**

GOVERNMENT ACCEPTANCE: _____

THIS VEHICLE CONFORMS TO ALL U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS AS APPLICABLE. FUTURE REPLACEMENT OF TIRES/WHEELS OF GREATER CAPACITY WILL NOT INCREASE GVWR SHOWING. OVERSPEEDING OR OVERLOADING WILL VOID WARRANTY.

MANUFACTURED BY OSHKOSH TRUCK CORPORATION

COLD TIRE PRESSURE (PSI)

TERRAIN	MPH MAX	FRONT (2)	FRONT (6)
HIGHWAY	45	75	75
CROSS COUNTRY	30	55	55
MUD SAND, SNOW	15	40	40
EMERGENCY	5	30	30

23142 1805

PRE OPERATIONAL MAINTENANCE

REF ID	IDENTIFICATION	SERVICE
1	ENGINE OIL	CHECK LEVEL
2	TRANSMISSION OIL	CHECK LEVEL
3	ROBATA OIL OIL	CHECK LEVEL
4	HYDRAULIC OIL	CHECK LEVEL
5	AIR FILTER	CHECK FOR WATER IN OIL
6	COIL	CHECK FOR DAMAGE
7	BRACKETS	CHECK FOR DAMAGE
8	MOUNTS	CHECK FOR DAMAGE
9	WHEELS AND TIRES	CHECK FOR DAMAGE
10	SPACERS	CHECK FOR DAMAGE
11	AXLE ASSEMBLY	CHECK FOR DAMAGE

CONSULT PARTS DATA PLATE FOR MAINTENANCE REQUIREMENTS

45152 1805200

PARTS DATA

NOMENCLATURE	PART NUMBER
ENGINE ASSEMBLY	1934740 U
TRANSMISSION ASSEMBLY	1934750 U
TRANSFER CASE ASSEMBLY	1934760 U
AXLE ASSEMBLY 1	1934700 U
AXLE ASSEMBLY 2	1934710 U
AXLE ASSEMBLY 3	1934720 U
AXLE ASSEMBLY 4	1934730 U

FOR PARTS & SERVICE CONTACT:
 PARTS DISTRIBUTION CENTER
 OSHKOSH TRUCK CORP.
 P.O. BOX 2596, OSHKOSH, WI 54603
 PHONE 414-231-9150 TELEEX 262750

AXLE	GROUP	RIM	TIRE	PSI @ 60
FIRST	20,122 Lbs.	20X10	18.00R20	75
SECOND	22,072 Lbs.	20X10	18.00R20	75
THIRD	21,982 Lbs.	20X10	18.00R20	75
FOURTH	21,674 Lbs.	20X10	18.00R20	75

45152 20052

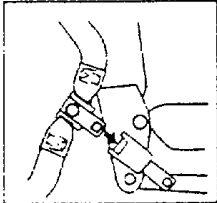
WARNING

WHEN CENTER SEAT IS OCCUPIED,
SNAP SHOULDER BELT LINK INTO
D-SHAPED HOLE IN LAP BELT
TONGUE AND ROTATE THE LINK.
THIS WILL HELP REDUCE THE
RISK OF PERSONAL INJURY IN
COLLISIONS OR SUDDEN MANEUVERS.

45152 1906100

WARNING

BEFORE OCCUPANT USES SEAT
BELT, INSERT TETHER LATCH
INTO BUCKLE UNTIL CLICK IS
HEARD. FAILURE TO COMPLY
PREVENTS PROPER FUNCTION OF
SEAT BELT AND COULD CAUSE
SERIOUS INJURY.
ALWAYS FASTEN SEAT BELTS



45152 1906110

CAUTION

TO HELP REDUCE THE RISK
OF PERSONAL INJURY IN
COLLISIONS OR SUDDEN
MANEUVERS ALWAYS USE
THE SAFETY BELTS

45152 1906090

**STE/ICE
ZERO OFFSET**

▲ ON
|
▼ OFF

45152 1783380

HEIGHT ADJUSTMENT

TO RAISE

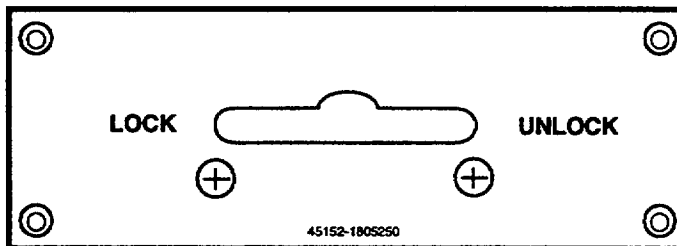
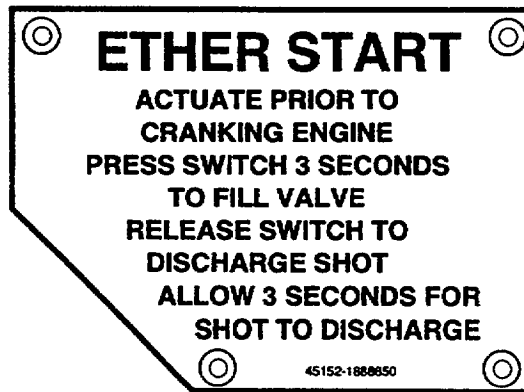
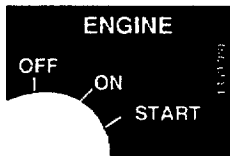
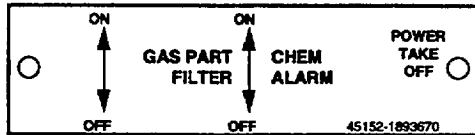
- LIFT RELEASE LEVER
- SEAT WILL RISE TO DESIRED HEIGHT
- RELEASE LEVER TO LOCK

TO LOWER

- LIFT LEVER
- SIT IN SEAT SLOWLY
- WEIGHT BRINGS TO DESIRED LEVEL LOCK LEVER

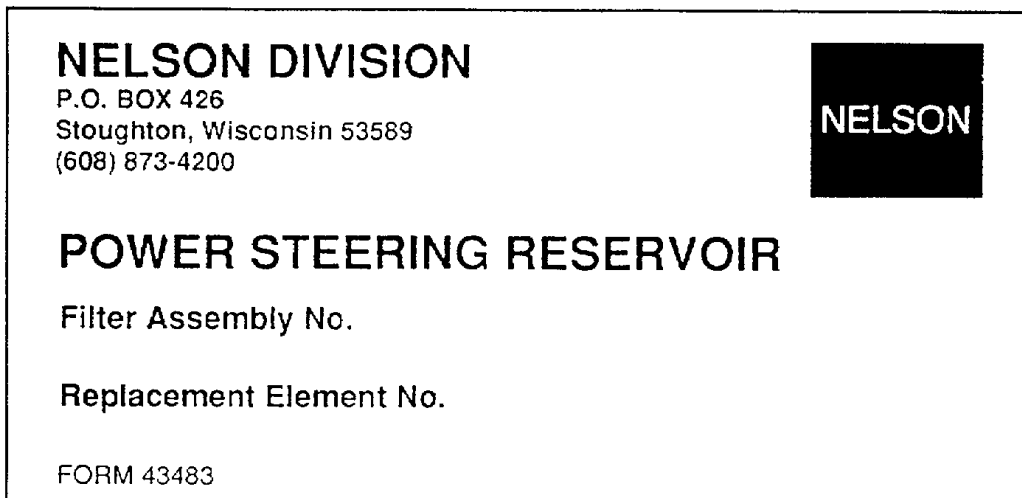
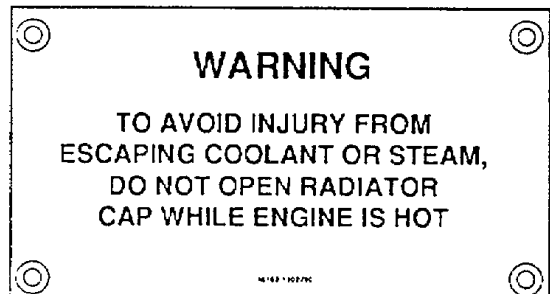
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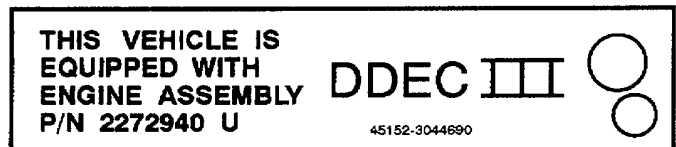
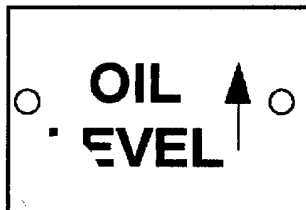
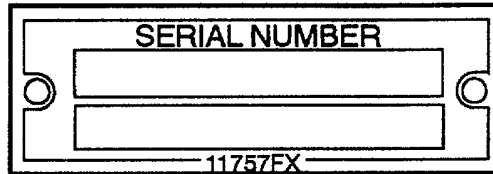
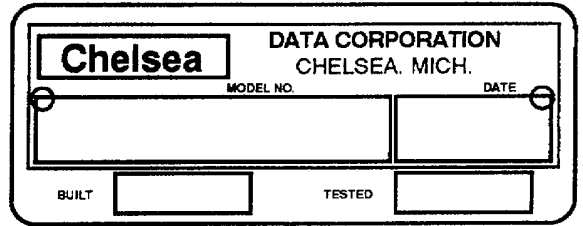
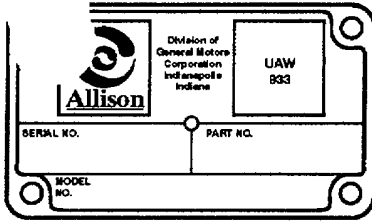
2-8. DECALS AND DATA PLATES (CONT)



PER CODE OF FEDERAL REGULATIONS, PARAGRAPH 206.5-2 (A) NATIONAL SECURITY EXEMPTION, OF TITLE 40 - PROTECTION OF ENVIRONMENT. THIS VEHICLE IS EXEMPT FROM EPA SOUND EMISSION REQUIREMENTS FOR 1988 AND CONFORMS TO U.S. GOVERNMENT SPECIFICATIONS.

2-8. DECALS AND DATA PLATES (CONT)





2-9. GENERAL TRACTOR-TRAILER OPERATING INSTRUCTIONS**NOTE**

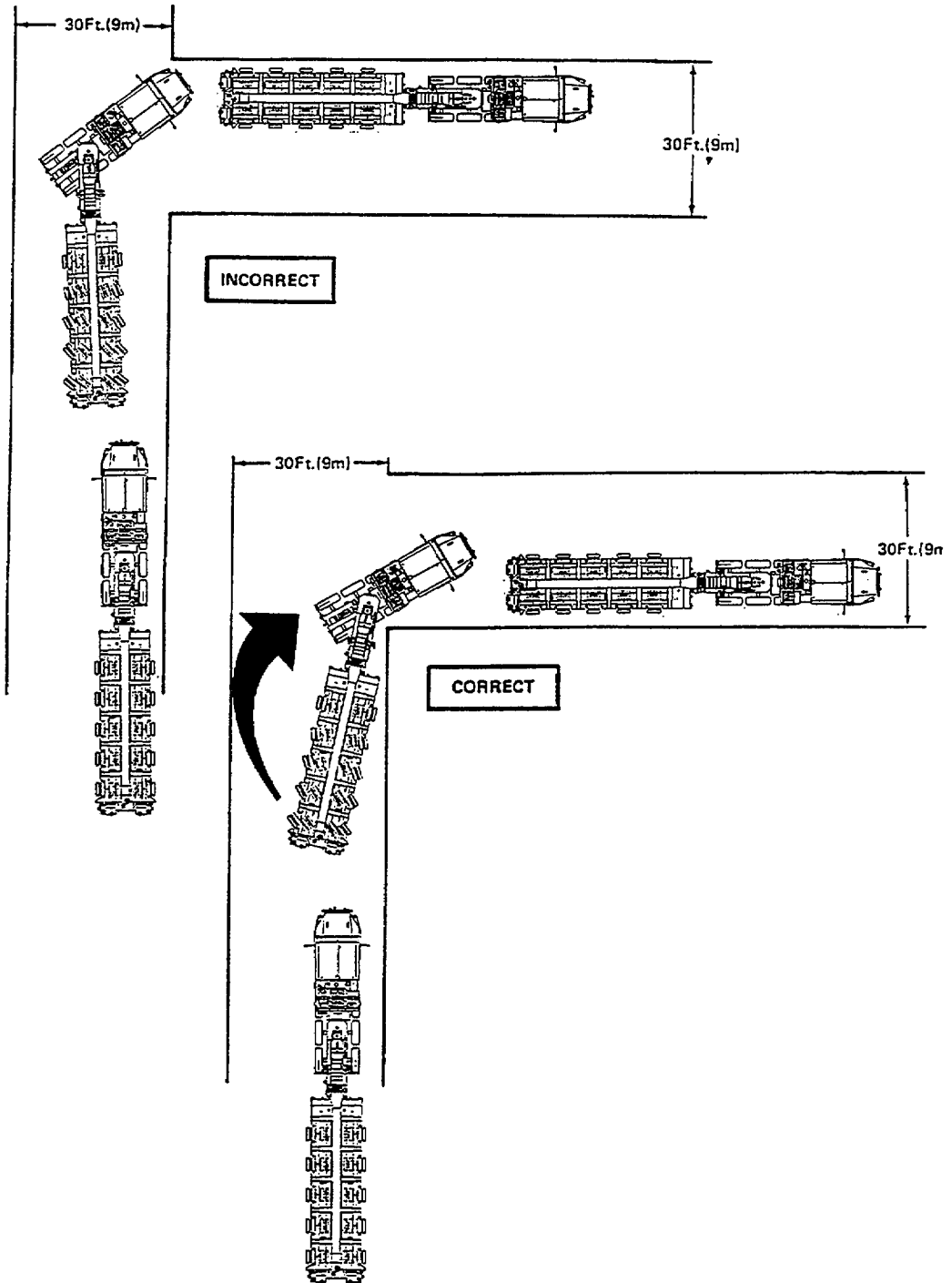
An assistant is required to give hand signals during backing operations.

a. Moving Trailer Forward**WARNING**

- Ensure the position of assistant is known at all times. Failure to observe this warning may result in personal injury or death.
 - All safety requirements such as hazard flags, road permits, flashing warning lights, escort vehicles, and wide load signs must be met. Failure to comply could result in injury to personnel or damage to equipment
- (1) Driving. When towing a trailer, overall length of HET Tractor/trailer must be kept in mind when passing other vehicles. During trailering operations, acceleration rate is reduced and stopping distance increases.

WARNING

- The HETS Tractor-trailer combination does not tract in the same way as standard or conventional tractor-trailer combinations. Operators must know and understand this prior to operating HETS on public access roads. Wide, conventional tractor-trailer turns may result in personal injury or damage to equipment.
 - When making sharp turns, the trailer may swing beyond normal turning radius. Failure to observe this warning may result in personal injury or damage to equipment.
- (2) Turning. When turning corners, trailer wheels turn inside the turning radius of towing HET Tractor. To make right or left turn at intersection, drive HET Tractor about halfway into intersection and then cut sharply right or left. This will prevent trailer from running over curb or from going into lane of oncoming traffic.



b. Backing Trailer**WARNING**

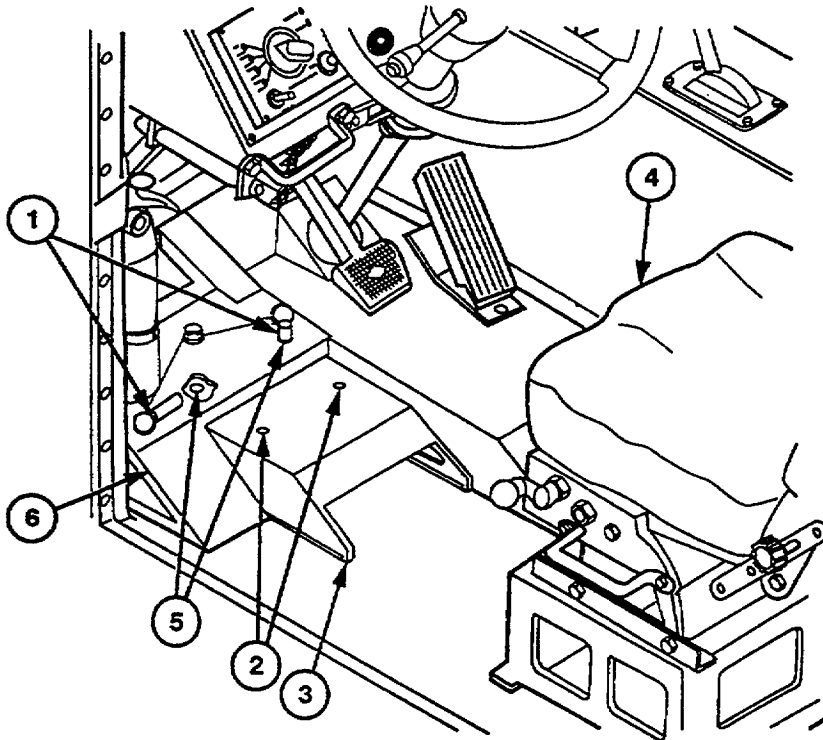
In some cases when trailer is backed up, wheels on trailer will not be straight when HET Tractor trailer is stopped and then driven forward. Rear of trailer will swing wide right or left and may cause injury to bystanders.

When backing, rear of trailer will always move in direction opposite of front wheels on HET Tractor. Trailer will turn quickly. When HET Tractor front wheels are turned right, rear of trailer will go left. When trailer has turned, and backing in a straight line is required, turn HET Tractor wheels in direction trailer is moving. This will bring HET Tractor and trailer in a straight line. Observe the following precautions when backing trailer:

- (1) Adjust side mirrors for best visibility.
- (2) Use a ground guide when backing HET Tractor/trailer. Ground guide must be visible to operator at all times to provide backing instructions.
- (3) Back up slowly and pay close attention to location and signals of ground guide.

c. Braking, Stopping, and Parking Trailer

During normal operation, brakes of HET Tractor and trailer are both applied when brake pedal is pushed. Brake pressure must be applied gradually and smoothly, keeping in mind that stopping distance will increase when trailer is being towed. The PARKING BRAKE control will apply brakes to both the tractor and trailer. Trailer handbrake control applies brake to trailer only. Do not apply trailer hand-brake control when parking.

2-10. ASSEMBLY AND PREPARATION FOR USE**a. Extend Footrest**

- (1) Remove two lockpins (1) from holes (2).
- (2) Pull footrest (3) toward set (4) so holes (5) are aligned.
- (3) Install two pins (1) in holes (5)

b. Stow Footrest

- (1) Remove two lockpins (1) from holes (5).
- (2) Push footrest (3) forward under floorbox (6) until holes (2) are aligned.

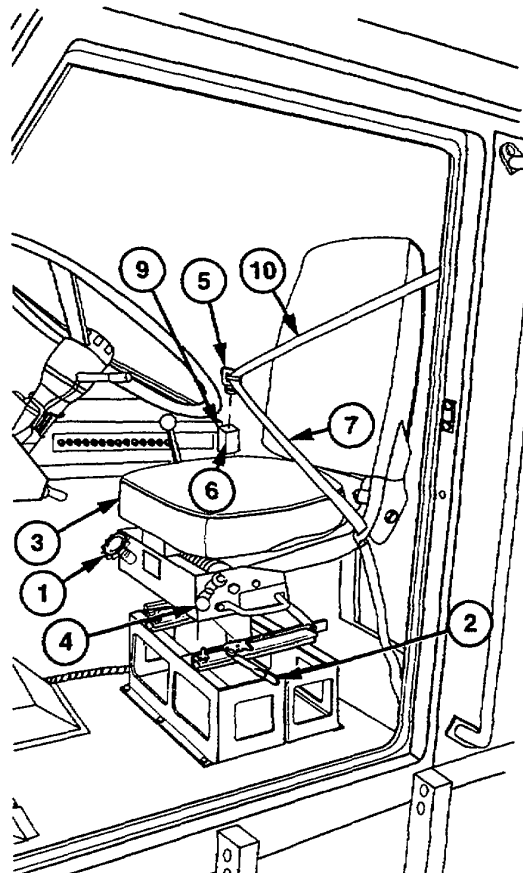
2-10. ASSEMBLY AND PREPARATION FOR USE (CONT)

c. Adjust Driver's Seat

NOTE

Sit in seat to make the following adjustments.

- (1) Turn knob (1) clockwise to increase cushion firmness, counter-clockwise to decrease cushion firmness.
- (2) Push lever (2) to left. Slide seat (3) forward or backward.
- (3) Release lever (2) to lock seat in place.
- (4) Pull up lever (4). Lift self off sea (3) to raise seat.
- (5) Pull up lever (4). Push down on seat (3) to lower seat.
- (6) Release lever (4) to lock seat (3) in place.



d. Operate Driver's Seatbelt

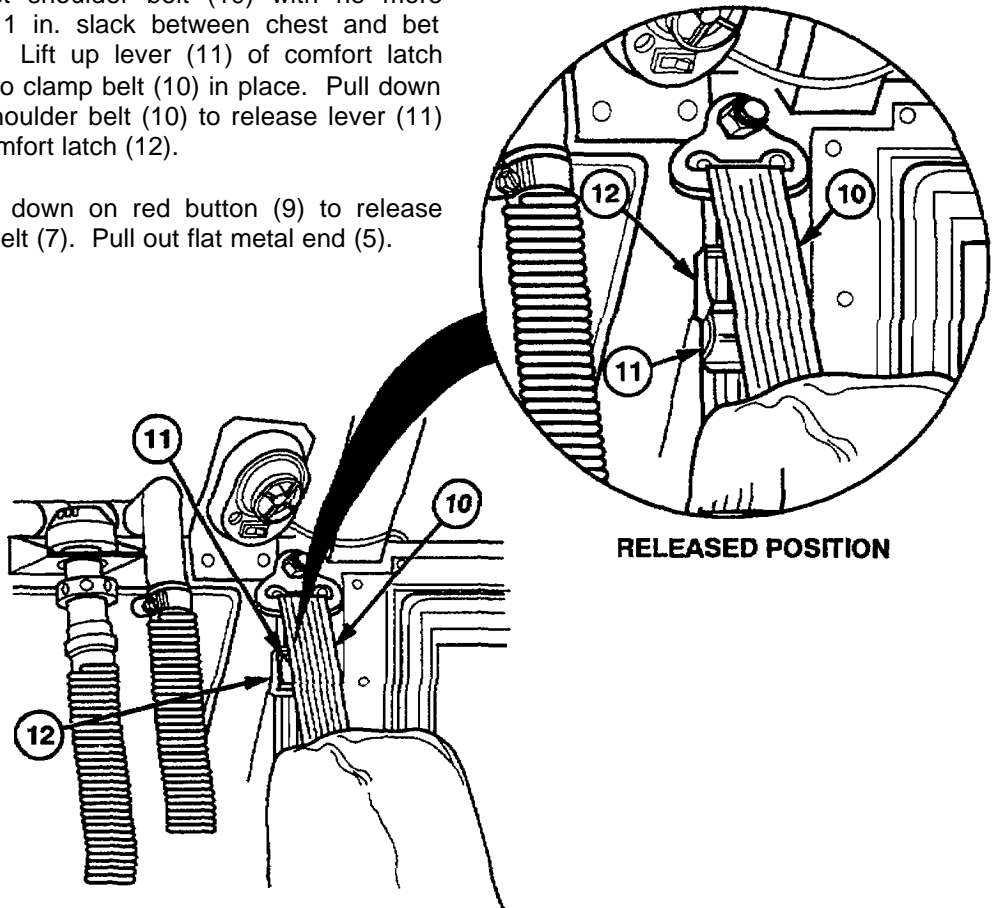
- (1) Insert seatbelt flat metal end (5) in buckle (6) until click is heard.
- (2) Place lapbelt (7) as low on hips as possible.

NOTE

Seatbelt does not have self-adjusting lock. Pull shoulder to take out slack from lapbelt.

- (3) Pull shoulder be (10) until lap belt (7) fits snug.

- (4) Adjust shoulder belt (10) with no more than 1 in. slack between chest and bet (10). Lift up lever (11) of comfort latch (12) to clamp belt (10) in place. Pull down on shoulder belt (10) to release lever (11) of comfort latch (12).
- (5) Push down on red button (9) to release seatbelt (7). Pull out flat metal end (5).



ENGAGED POSITION

RELEASED POSITION

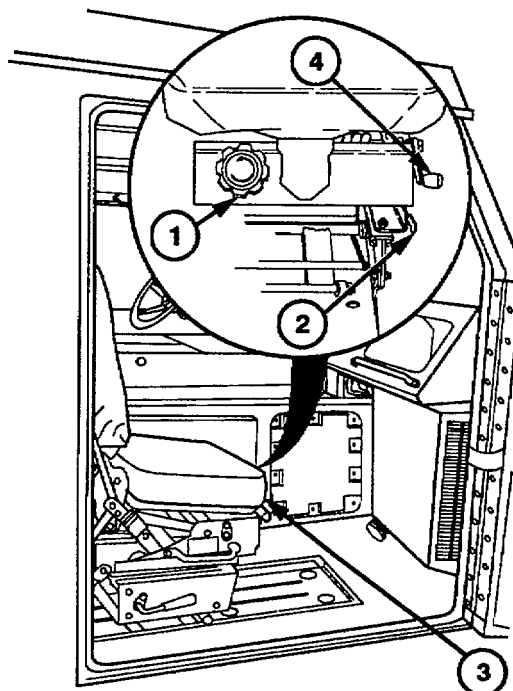
2-10. ASSEMBLY AND PREPARATION FOR USE (CONT)

e. Adjust Passenger's Seat

NOTE

Sit in seat to make the following adjustments.

- (1) Turn knob (1) clockwise to increase cushion firmness, counter-clockwise to decrease cushion firmness.
- (2) Pull lever (2) to left. Slide seat (3) forward or backward.
- (3) Release lever (2) to lock seat in place.
- (4) Pull up lever (4). Lift self off seat (3) to raise seat.
- (5) Pull up lever (4). Push down on seat (3) to lower sea.
- (6) Release lever (4) to lock seat (3) in place.

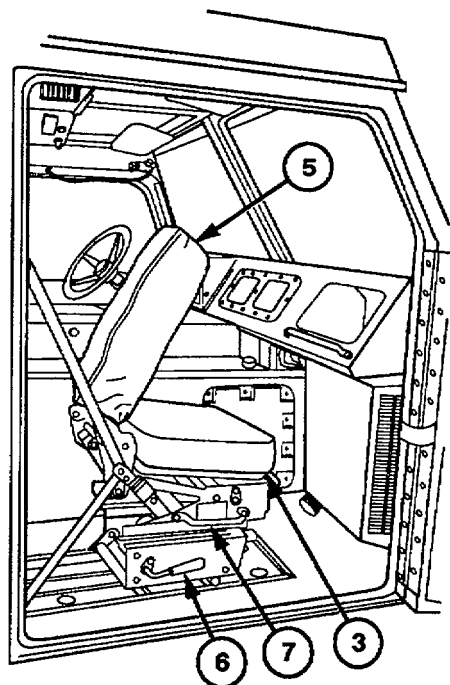


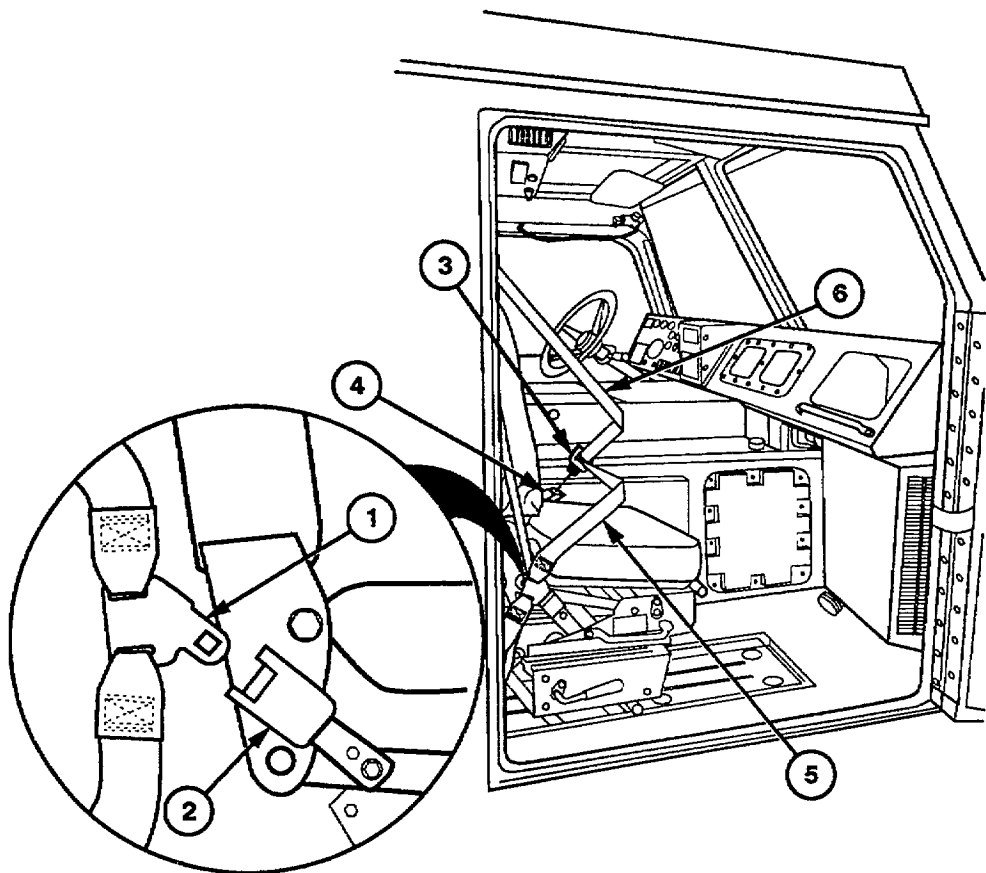
- (7) Lift backrest (5) up and push forward.

WARNING

Seat belts must be disconnected when pivoting passenger's seat forward for rear passenger set access. Failure to comply may result in injury to personnel.

- (8) Pull lever (6) up, lift seat (3) using grab handle (7), and push seat (3) forward.





f. Operate Passenger's Seatbelt

- (1) Insert seatbelt flat metal end (1) in buckle (2) until click is heard.
- (2) Insert seatbelt flat metal end (3) in buckle (4) until click is heard.
- (3) Place lap belt (5) as low on hips as possible.

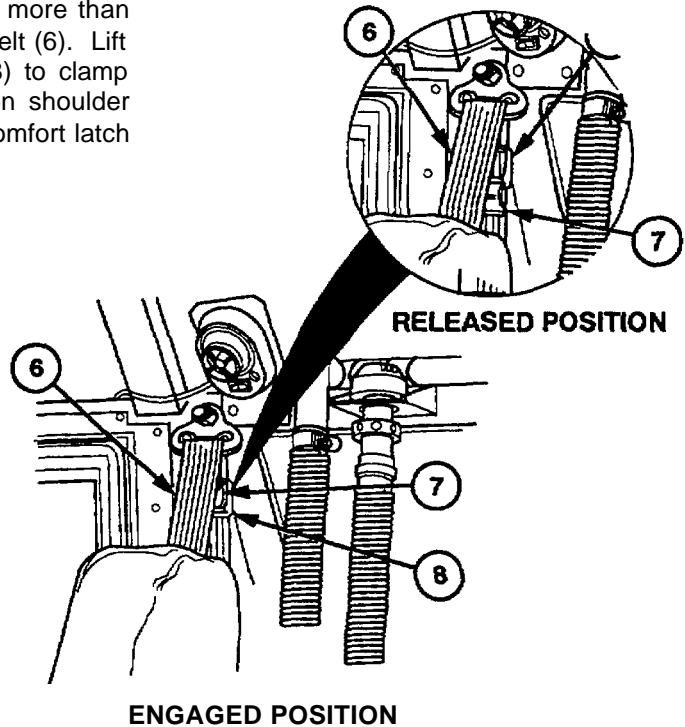
NOTE

Seatbelt does not have self-adjusting lock. Pull shoulder belt to take out slack from lap belt.

- (4) Pull shoulder belt (6) until lap belt (5) fits snug.

2-10. ASSEMBLY AND PREPARATION FOR USE (CONT)

- (5) Adjust shoulder belt (6) with no more than 1 in. slack between chest and belt (6). Lift up lever (7) of comfort latch (8) to clamp belt (6) in place. Pull down on shoulder belt (6) to release lever (7) of comfort latch (8).

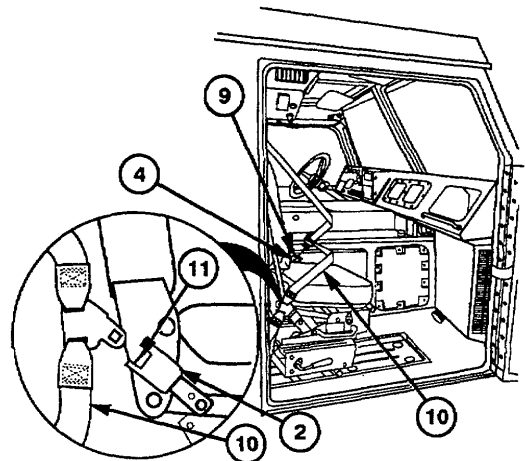


- (6) Push down on red button (9) on buckle (4) to release seatbelt (10).

NOTE

Seatbelts must be disconnected when pivoting passenger's seat forward for rear passenger seat access.

- (7) Push down red button (11) on buckle (2) to release seatbelt (10).



2-10. ASSEMBLY AND PREPARATION FOR USE (CONT)**h. Operate Rear Seatbelts**

- (1) Operate outer two seatbelts.

NOTE

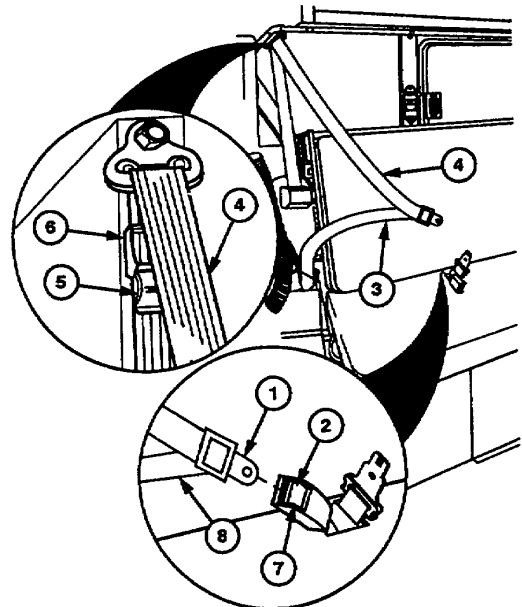
Right and left outer seatbelts are operated the same way. Right side is shown.

- (a) Insert seatbelt flat meal end (1) in buckle (2) until click is heard.
- (b) Place lap belt (3) as low on hips as possible.

NOTE

Seatbelt does not have self-adjusting lock. Pull shoulder belt to take out slack from lap bet.

- (c) Pull shoulder belt (4) until lap belt (3) fits snug.
- (d) Adjust shoulder belt (4) with no more than 1 in. slack between chest and belt (4). Lift up lever (5) of comfort latch (6) to clamp belt (4) in place. Pull down on shoulder belt (4) to release lever (5) of comfort latch (6).
- (e) Push down on red button (7) on buckle (2) to release seatbelt (8)



- (2) Operate inner two seatbelts.

NOTE

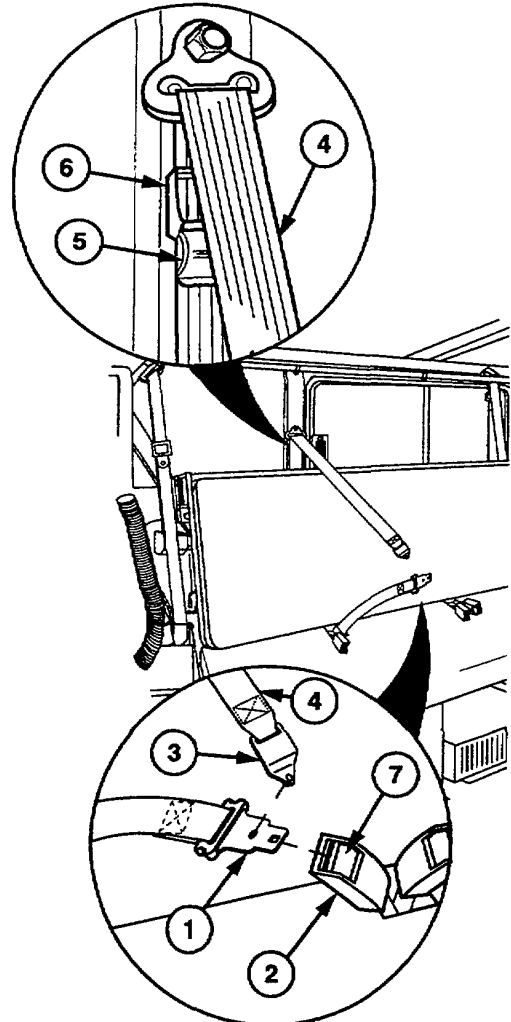
Right and left inner seatbelts are operated the same way. Right side is shown.

- (a) Insert seatbelt flat metal end (1) in buckle (2) until click is heard.
- (b) Insert shoulder belt metal end (3) in lap belt flat metal end (1).

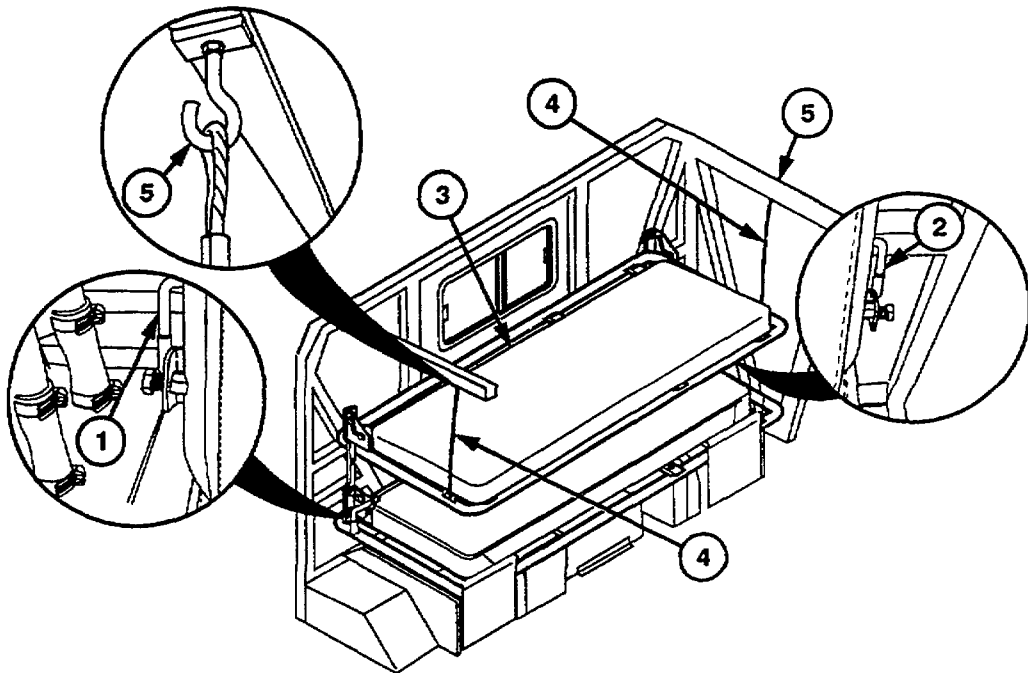
NOTE

Seatbelt does not have self-adjusting lock. Pull shoulder belt to take out slack from lap belt.

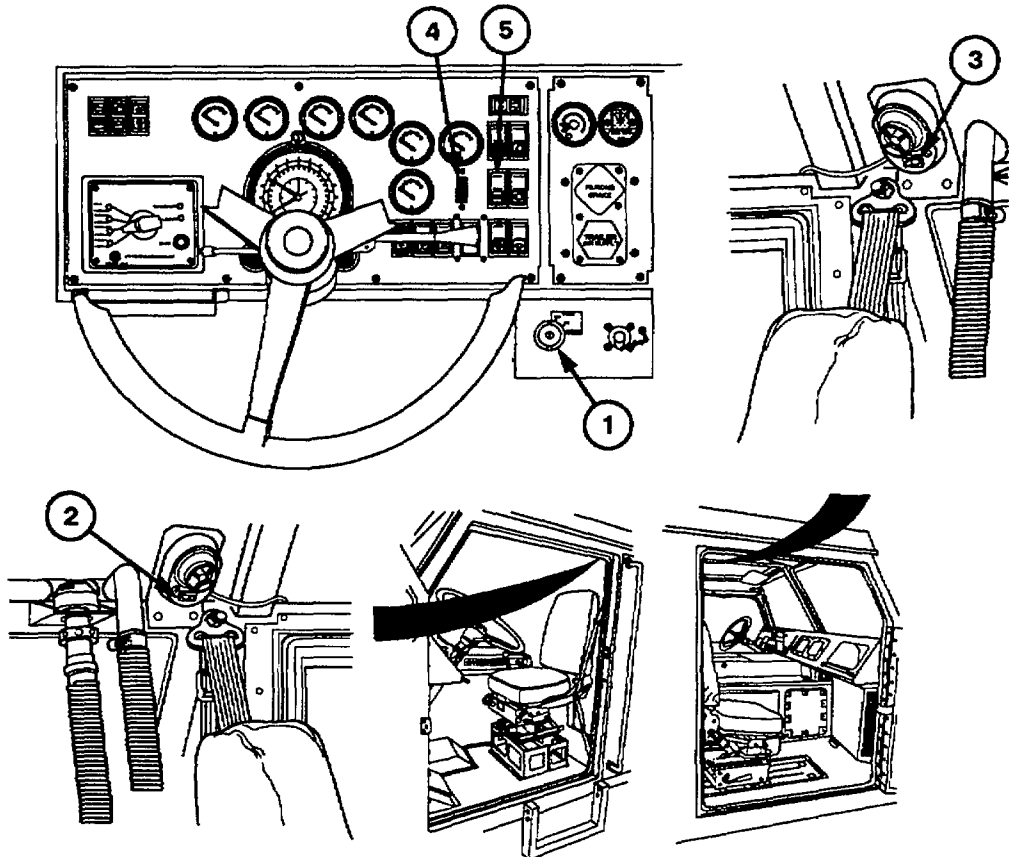
- (c) Adjust shoulder belt (4) with no more than 1 in. slack between chest and belt (4). Lift up lever (5) of comfort latch (6) to clamp belt (4) in place. Pull down on shoulder belt (4) to release lever (5) of comfort latch (6).
- (d) Remove shoulder belt metal end (3) from lap belt flat metal end (1).
- (e) Push down on red button (7) on buckle (2) to release lap belt (1).



g. Rear Seat/Bed Conversion



- (1) Change rear seat to beds.
 - (a) Pull up lever (1) while assistant pulls up lever (2) and raise back of seat (3) until it is in horizontal position.
 - (b) Attach two cables (4) to two hooks (5) on seat (3) with aid of assistant.
- (2) Change beds to rear seat.
 - (a) Remove two cables (4) from two hooks (5) on seat (3) with aid of assistant.
 - (b) Lower back of seat (3) until it is in vertical position with aid of assistant.
 - (c) Push in back of seat (3) and ensure back of seat (3) is locked in place.

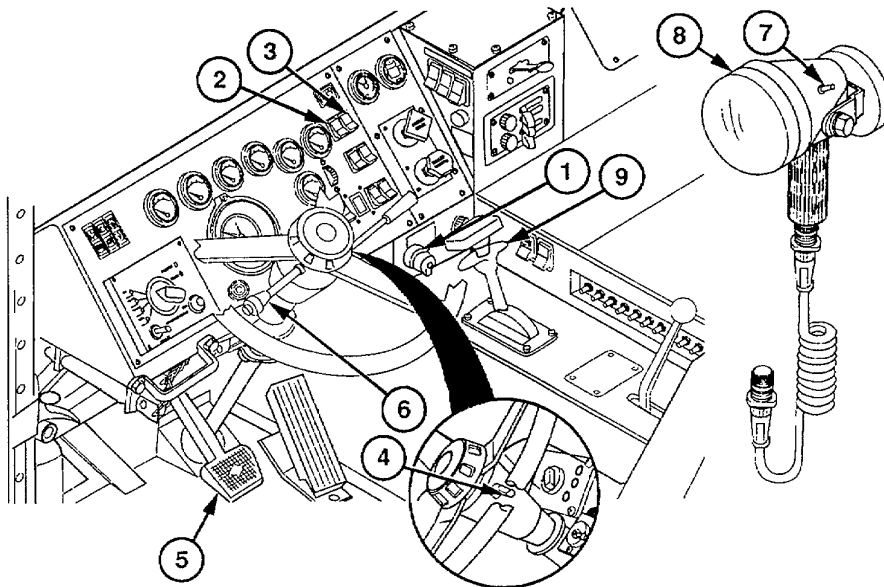
2-11. LIGHTS OPERATION**a. Cab Internal Lights**

- (1) Turn ENGINE switch (1) to ON position.
- (2) Press right map light switch (2) right to turn off, left to turn on.
- (3) Press left map light switch (3) right to turn off, left to turn on.

NOTE

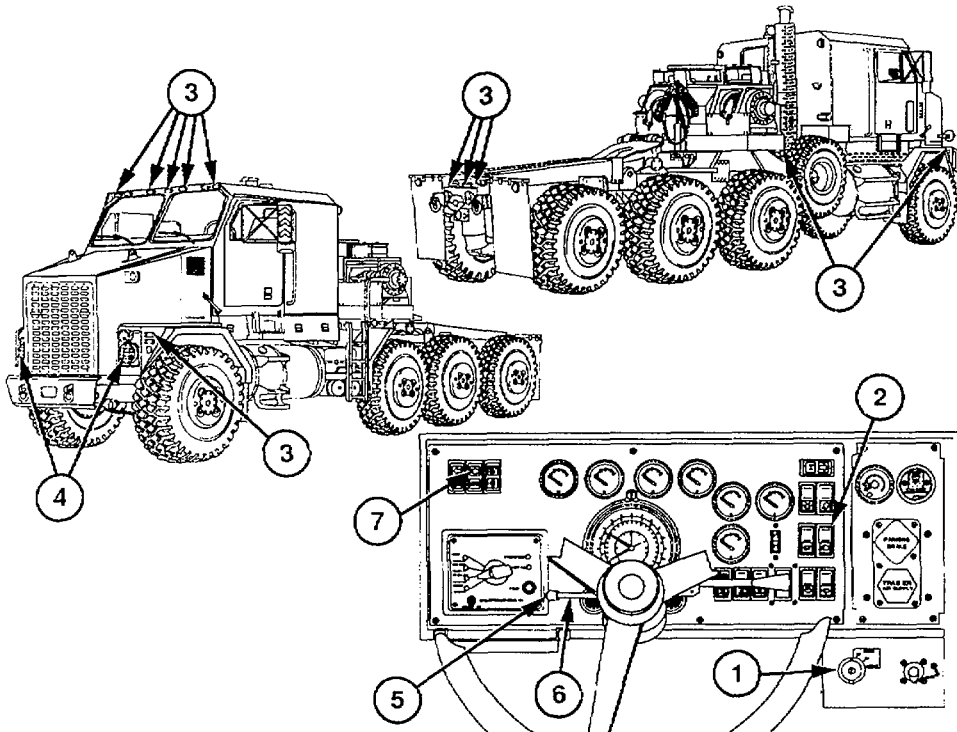
BLACK OUT LIGHTS switch must be in off position for internal lights to operate.

- (4) Roll instrument panel lighting control (4) up to brighten instrument panel lights, down to dim instrument panel lights. Roll switch, either up or down, until it stops to turn panel lights off.
- (5) Push dome light switch (5) down to turn dome light on, up to turn dome light off.

2-11. LIGHTS OPERATION (CONT)**b. Cab External Lights****NOTE**

- **BLACK OUT LIGHTS** switch must be in off position for external lights to operate.
- **Emergency flashers** will work with engine switch in any position.

- (1) Turn ENGINE switch (1) to ON position.
- (2) Push beacon light switch (2) down to turn beacon light on, up to turn beacon light off.
- (3) Push work light switch (3) down to turn work lights on, up to turn work lights off.
- (4) Push in emergency flasher control switch (4) to activate emergency flashers. Pull switch out to turn emergency flashers off.
- (5) Press brake treadle (5) to activate brake lights.
- (6) Push turn signal lever (6) up to activate right turn signal. Pull turn signal lever down to activate left turn signal.
- (7) Push switch (7) on portable work light (8) up to turn portable work light on, down to turn portable work light off.
- (8) Move transmission range selector (9) to R (reverse) position to turn reverse light on.

2-11. LIGHTS OPERATION (CONT)**c. Service Drive Lights****NOTE**

BLACK OUT LIGHTS switch must be off for service drive lights to operate.

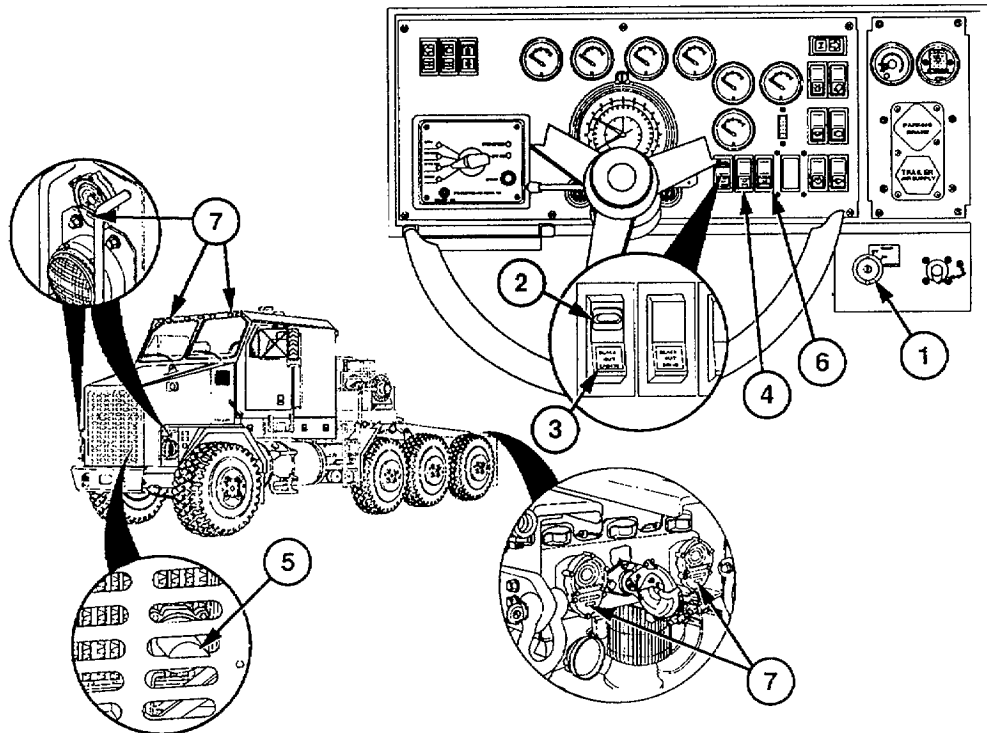
- (1) Turn ENGINE switch (1) to ON position.
- (2) Push headlights switch (2) to center position to turn parking/clearance lights (3) on. Push headlights switch up to turn parking/clearance lights off.

NOTE

Parking/clearance lights are turned on when headlights are on.

- (3) Push headlights switch (2) all the way down to turn headlights (4) on. Push headlights switch up to turn headlights off.
- (4) Press in headlight dimmer switch (5) on end of turn signal lever (6) to turn headlight high beams on/off. High beam indicator (7) lights (blue) when headlight high beams are on.

d. Blackout Lights

**NOTE**

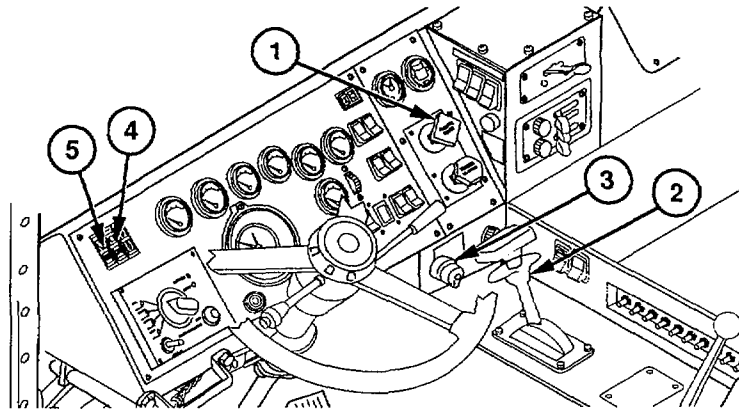
Cab internal lights, cab external lights, and service drive lights will not operate when BLACK OUT LIGHTS switch is turned on.

- (1) Turn ENGINE switch (1) to ON position.

NOTE

Safety lock on BLACK OUT LIGHTS switch must be pressed and held before BLACK OUT LIGHTS switch can be operated.

- (2) Push safety switch (2) down and hold while pushing BLACK OUT LIGHTS switch (3) down for on, up for off.
- (3) Push BLACK OUT DRIVE switch (4) down to turn blackout drive light (5) on, up to turn off.
- (4) Push BLACK OUT MARKER switch (6) down to turn blackout marker lights (7) on, up to turn off.

2-12. DRIVING HET TRACTOR**a. Cold Engine Starting****WARNING**

Before starting and moving vehicle, check on and around vehicle for other personnel. Failure to comply may result in injury to personnel

- (1) Pull out PARKING BRAKE control (1).
- (2) Set transmission range selector (2) to N (neutral) position.

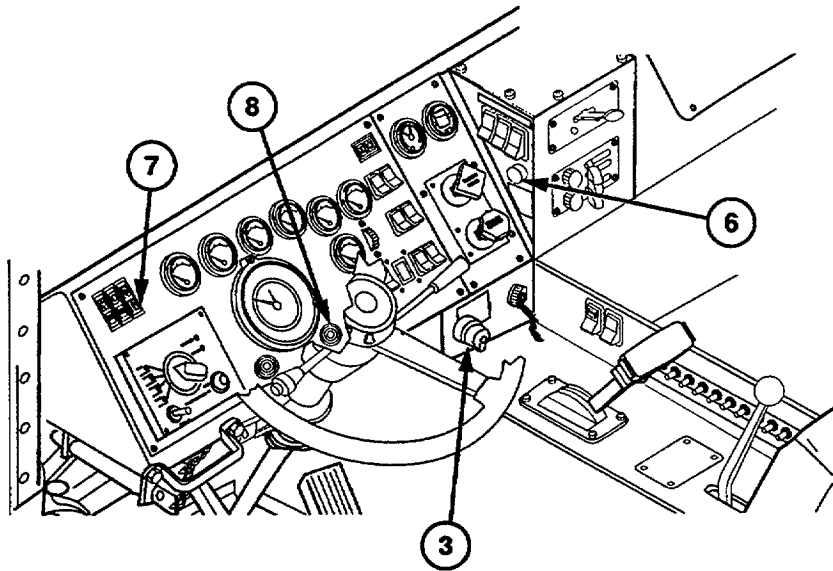
CAUTION

CHECK GAUGES indicator lights (amber) to warn driver when a potential engine failure (e.g., low oil pressure, low coolant, coolant overheating, etc.) has occurred. If light comes on, shut down engine immediately and notify unit maintenance.

CHECK ENGINE indicator lights (amber) to warn driver of failures that will not critically damage engine. HET Tractor should be serviced as soon as possible.

CHECK GAUGES and **CHECK ENGINE** indicators will light and warning alarm will sound for approximately 5 seconds when **ENGINE** switch is positioned to **ON**. Do not attempt to start engine if **CHECK GAUGES** or **CHECK ENGINE** indicators remain lit after approximately 5 seconds.

- (3) Turn **ENGINE** switch (3) to **ON** position. Observe **CHECK GAUGES** and **CHECK ENGINE** indicators (4 and 5). Refer to Troubleshooting Symptoms (para 3-3) if **CHECK GAUGES** or **CHECK ENGINE** indicators remain lit after approximately 5 seconds.



CAUTION

Do not press ETHER START control more than three times in a single starting attempt. Failure to observe this caution may cause severe engine damage.

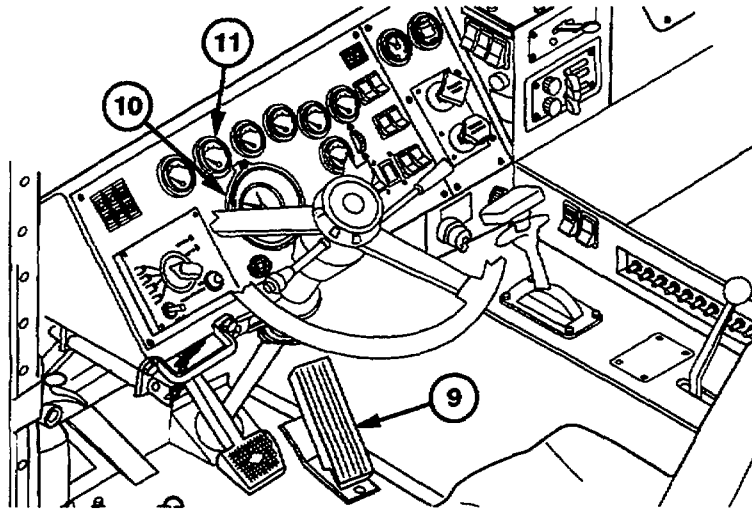
NOTE

- Press ETHER START control two times if outside temperature is below 10°F (-12°C).
 - Press ETHER START control three times if outside temperature is below -10°F (-23°C).
 - Do step (4) only if outside temperature is below 45°F (7°C).
- (4) Press ETHER START control (6) for 5 seconds and release. Wait 5 seconds and go to step (5).

NOTE

If engine fails to start repeat steps (3) thru (5). If engine fails to start after three starting attempts, refer to troubleshooting, table 3-1.

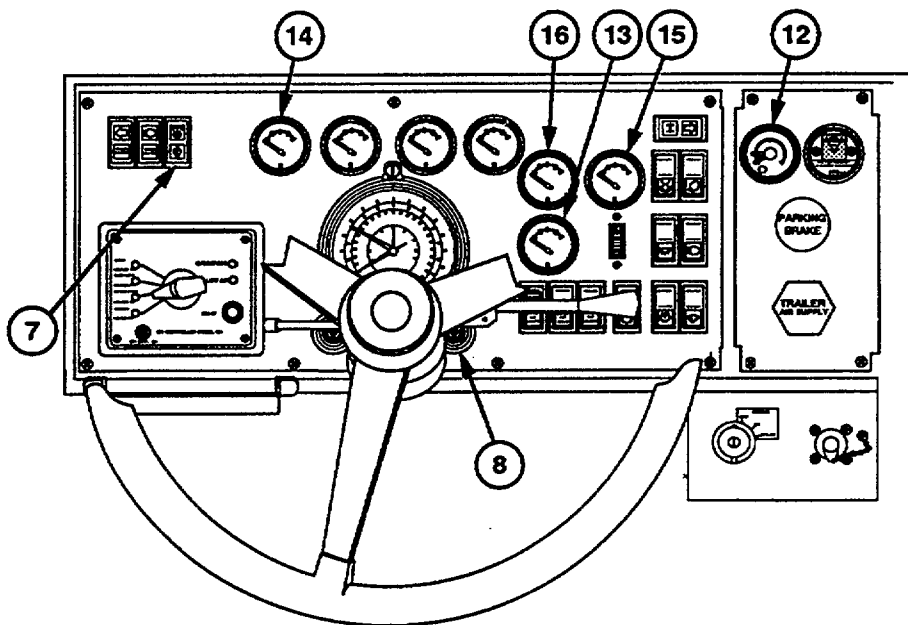
- (5) Turn ENGINE switch (3) to START for about 15 seconds or until engine starts. Release switch. Switch will return to ON position. LOW AIR indicator (7) will light (red) and warning alarm (8) will sound until air pressure is greater than 60 psi (414 kPa).

2-12. DRIVING HET TRACTOR (CONT)**CAUTION**

- If OIL PRESS gage does not show engine oil pressure within 10-15 seconds after starting engine, shut down engine immediately. Notify unit maintenance. Lack of lubrication may damage engine.
- Do not operate engine above 1000 rpm during warm up until OIL PRESS gage indicates 25-30 psi (172-207 kPa) at 800-1000 rpm. OIL PRESS gage should indicate 50-70 psi (345-483 kPa) when engine operates a 1800-2100 rpm. Lack of lubrication may damage engine.

NOTE

- At idle, oil pressure can go as low as 5 psi (34 kPa).
 - At temperatures between -26°F (-14°C) and -50°F (-28°C), run engine 1200-1500 rpm for an additional 10 minutes. If winches are going to be used immediately, only run engine at 1200-1500 RPM for 5 minutes before performing winch warm-up (para 2-25aa).
- 6) Deleted
- (7) Run engine at idle for 5 minutes.
- (8) Check that OIL PRESS gage (11) reads approximately 25-30 psi (172-207 kPa) at 800-1000 rpm.



NOTE

If red and green needles on AIR PRESS gage do not read 60-120 psi (414-827 kPa) after warmup, shut off engine. Notify unit maintenance.

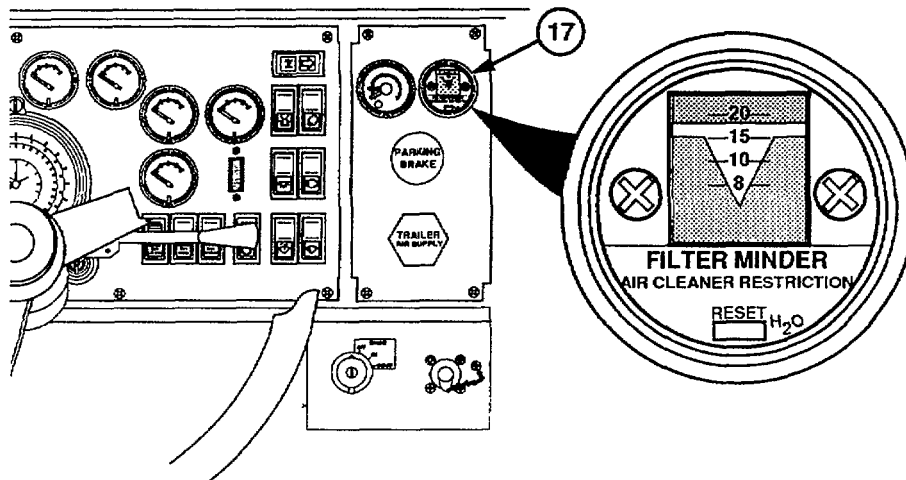
- (9) Check that AIR PRESS gage (12) reads 60-125 psi 414-861 kPa). LOW AIR indicator (7) lights (red) and warning alarm (8) will sound until both needles reach 60-75 psi (414-517 kPa).

NOTE

Approximate cruising range of HET Tractor is 325 mi (523 km) with full fuel tanks.

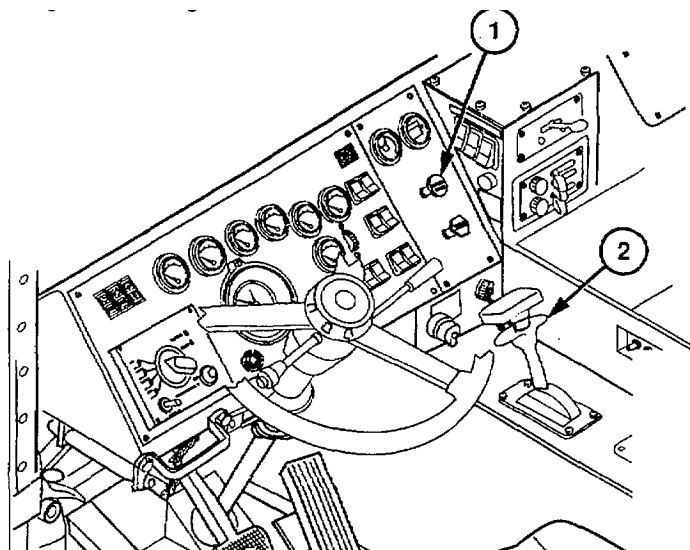
- (10) Check that FUEL gage (13) shows fuel.
- (11) Check that WATER TEMP gage (14) does not read over 210°F (100°C).
- (12) Check that BATTERY gage (24-volt system)(15) reads between 26 and 30 volts.
- (13) Check that BATTERY gage (12-volt system)(16) reads between 13 and 15 volts.

2-12. DRIVING HET TRACTOR (CONT)

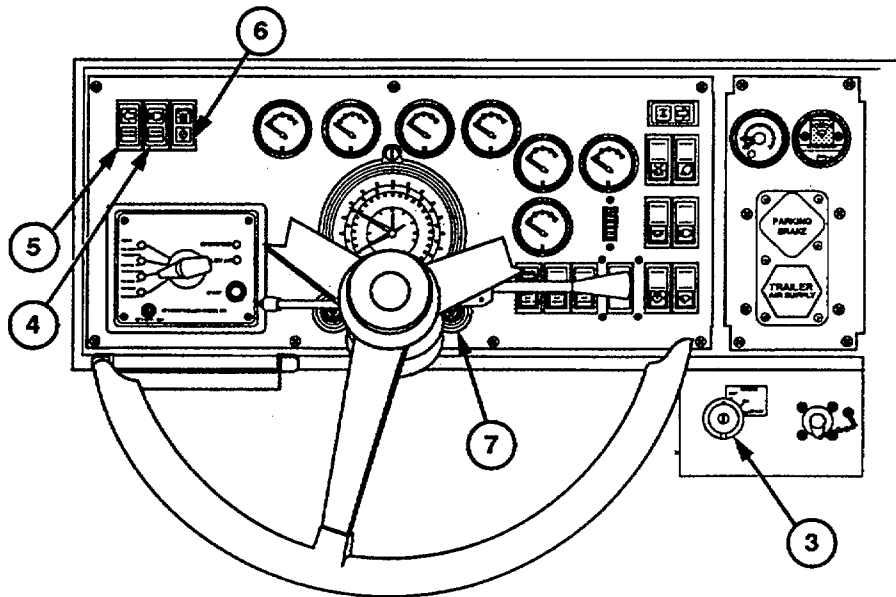


- (14) Check that AIR CLEANER RESTRICTION indicator (17) reads below 15 (in green area).
- (15) Stop engine and notify unit maintenance if AIR CLEANER RESTRICTION indicator (17) still reads greater than 15 (in yellow or red area) after reset button has been pressed.

b. Warm Engine Starting

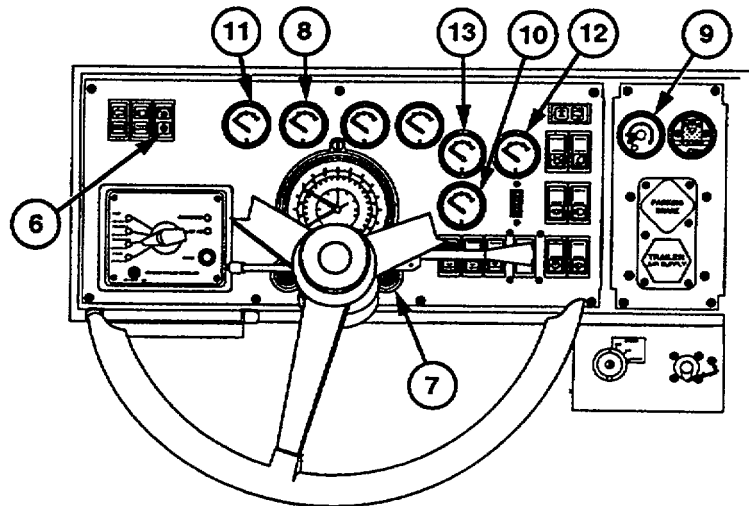


- (1) Pull out PARKING BRAKE control (1).
- (2) Set transmission range selector (2) to N (neutral) position.



CAUTION

- **CHECK GAUGES** indicator lights (amber) to warn driver when a potential engine failure (e.g., low oil pressure, low coolant, coolant overheating, etc.) has occurred. If light comes on, shut down engine immediately and notify unit maintenance.
 - **CHECK ENGINE** indicator lights (amber) to warn driver of failures that will not critically damage engine. HET Tractor should be serviced as soon as possible.
 - **CHECK GAUGES** and **CHECK ENGINE** indicators will light and warning alarm will sound for approximately 5 seconds when **ENGINE** switch is positioned to **ON**. Do not attempt to start engine if **CHECK GAUGES** or **CHECK ENGINE** indicators remain lit after approximately 5 seconds.
- (3) Turn **ENGINE** switch (3) to **ON** position. Observe **CHECK GAUGES** and **CHECK ENGINE** indicators (4 and 5). Refer to Troubleshooting Symptoms para 3-3 if **CHECK GAUGES** or **CHECK ENGINE** indicators remain lit after approximately 5 seconds and gage(s) indicate abnormal readings.
 - (4) Turn **ENGINE** switch (3) to **START** for about 15 seconds or until engine starts. Release switch. Switch will return to **ON** position. **LOW AIR** indicator (6) lights (red) and warning alarm (7) will sound until air pressure is greater than 60 psi (414 kPa).

2-12. DRIVING HET TRACTOR (CONT)**CAUTION**

If OIL PRESS gage does not show engine oil pressure with 10-15 seconds after starting engine, shut down engine immediately. Notify unit maintenance. Lack of lubrication may damage engine.

NOTE

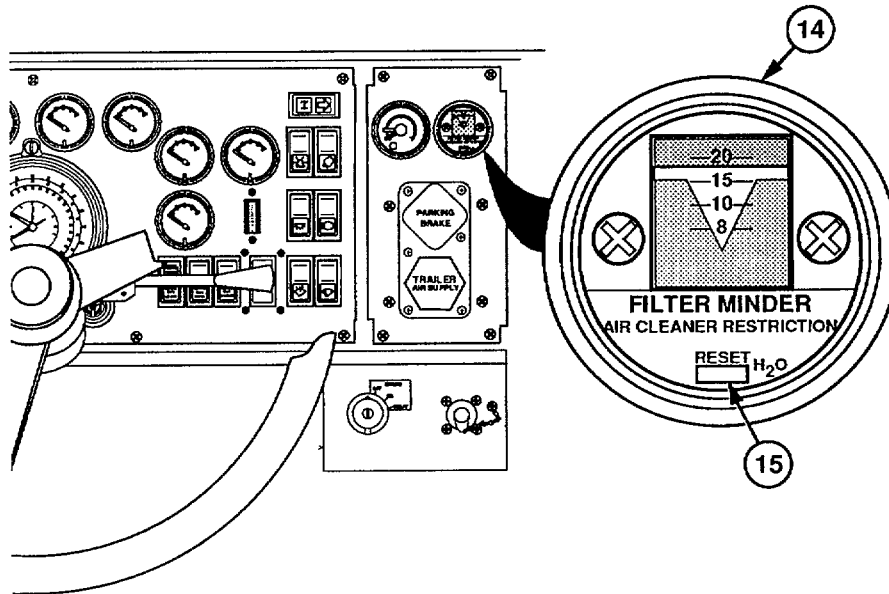
At idle, oil pressure can go as low as 5 psi (34 kPa).

- (5) Check that OIL PRESS gage (8) reads 50-70 psi (345-483 kPa) at 1800-2100 rpm.
- (6) Check that AIR PRESS gage (9) reads 60-120 psi (414-827 kPa). LOW AIR indicator (6) lights (red) and warning alarm (7) will sound until both needles reach 60-75 psi (414-517 kPa).

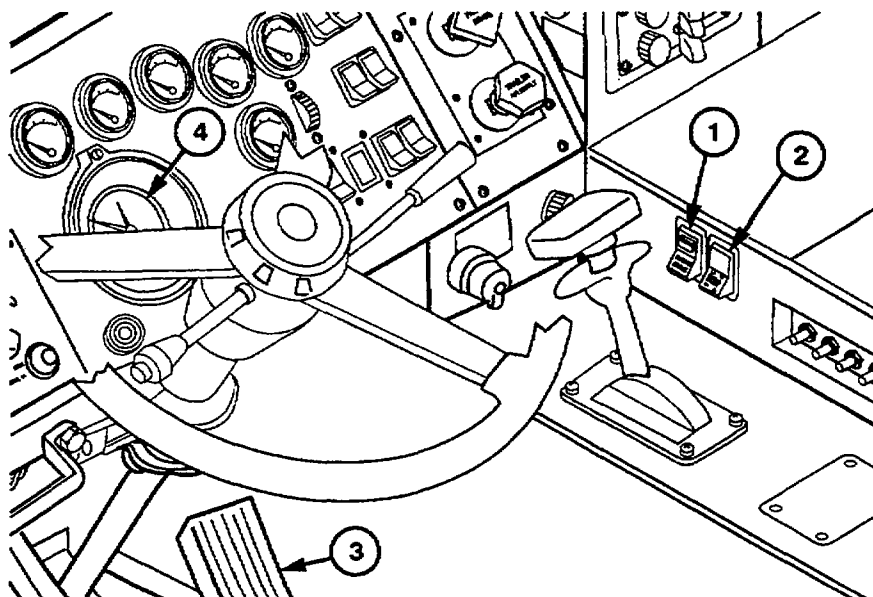
NOTE

Approximate cruising range of HET Tractor is 325 mi (523 km) with full fuel tanks.

- (7) Check that FUEL gage (10) shows fuel.
- (8) Check that WATER TEMP gage (11) does not read over 210°F (100°C).
- (9) Check that BATTERY gage (24-volt system) (12) reads between 26 and 30 volts.
- (10) Check that BATTERY gage (12-volt system) (13) reads between 13 and 15 vols.



- (11) Check that AIR CLEANER RESTRICTION indicator (14) reads below 15 (in green area).
- (a) Press reset button (15) if AIR CLEANER RESTRICTION indicator (14) reads greater than 15 (in yellow or red area).
 - (b) Stop engine and notify unit maintenance if AIR CLEANER RESTRICTION indicator (14) still reads greater than 15 (in yellow or red area) after reset button has been pressed.

2-12. DRIVING HET TRACTOR (CONT)**c. Engine Brake Retarder Operation****WARNING**

Do not use engine brake retarder in wet, slick, or icy road conditions. Failure to comply may result in loss of vehicle control. Personnel injury or death may result.

CAUTION

Use engine brake only when additional braking is required (i.e. descending grades). Continuous use of engine brake may cause increased consumption or driveline damage.

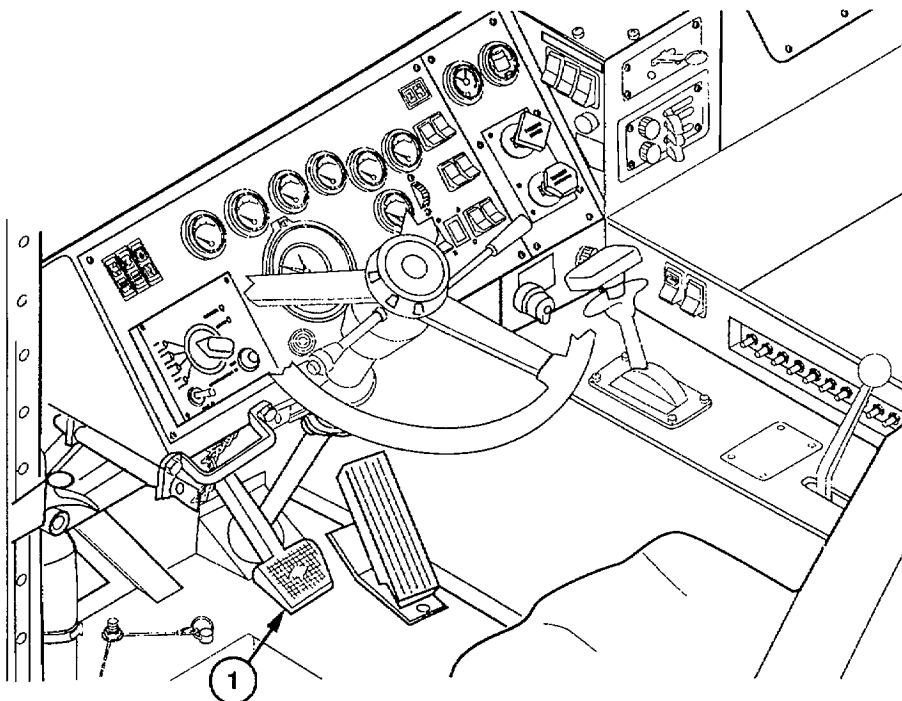
NOTE

- Wheel brakes must be used in addition engine brakes for maximum braking.
 - Allow engine to warm up before engaging engine brake retarder switch.
- (1) Check that engine brake retarder ON/OFF switch (1) is in OFF (uppermost) position.
- (2) Check that engine brake retarder HI/LO switch (2) is in LO (uppermost) position.

NOTE

Locking tab on switch must be pressed down to permit switch to be pressed ON.

- (3) Press engine brake retarder ON/OFF switch (1) to ON (lowest) position for reduced engine braking.
- (4) Press engine brake retarder HI/LO switch (2) to HI (lowest) position for maximum engine braking.
- (5) Lift foot off the throttle control (3). Engine brake will automatically slow truck.
- (6) Optimum braking occurs with engine between 1650 and 2100 rpm. Select appropriate transmission range and engine brake to maintain desired effect. Do not over "rev" engine during braking.
- (7) If more braking is required, set ENGINE BRAKE switch (1) to HIGH.
- (8) Check that tachometer (4) reads between 1650 and 2100 rpm whenever engine brake is used.

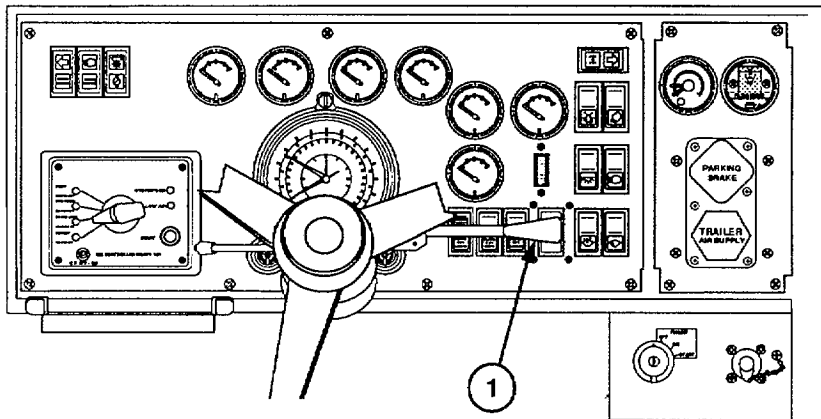
d. Service Brakes Operation**WARNING**

Repeated application of the brake pedal will deplete air supply and service brakes will not work until air pressure builds up again. Serious personal injury or death may result from loss of service brakes.

NOTE

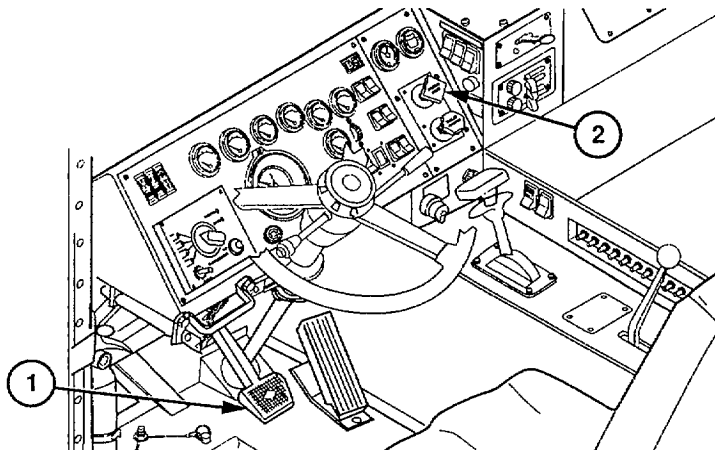
Normal operating air pressure is 100-120 psi (690-827 kPa). If air pressure drops below 85 psi (586 kPa), CTIS will become inoperative. If air pressure drops below 60 psi (414 kPa), the low air pressure alarm will sound.

Push down and hold service brake pedal (1) as needed to slow or stop HET Tractor

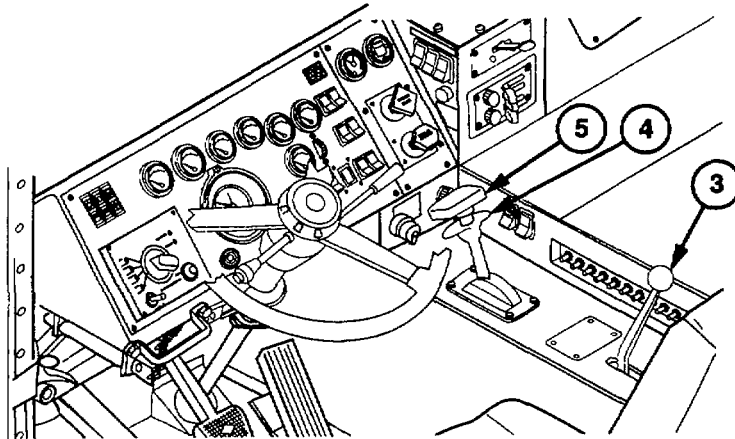
2-12. DRIVING HET TRACTOR (CONT)**e. Trailer Brakes Operation****NOTE**

When brake pedal is pressed, both truck and trailer brakes will be applied.

Pull down trailer handbrake control (1) during trailer connect/disconnect operations, if required, to apply trailer brakes only.

f. Transmission and Transfer Case Operation

- (1) Start engine (para 2-12a).
- (2) Push down on service brake pedal (1) to apply service brakes.
- (3) Push in PARKING BRAKE control (2).



CAUTION

- Do not force TRANSFER CASE shift lever. Lever may be hard to move if there is a driveline windup. Using excessive force may cause damage to shift linkage or change linkage adjustment.
- Do not move TRANSFER CASE shift lever when HET Tractor is moving or when transmission is in gear. Damage to driveline could result.

NOTE

If TRANSFER CASE shift lever is hard to move, it may be necessary to pull release lever up and set transmission range selector to 2-5 and/or R (reverse), then back to N (neutral) position. If transfer case still will not shift, refer to Table 3-1, Troubleshooting.

- (4) Select transfer case position.

CAUTION

- **When using 1 (first range) with transfer case in HIGH, stop and shift transfer case into LOW if transmission temperature exceeds 250°F (121°C) or if truck cannot maintain 4 mph. Failure to comply will result in transmission overheating.**
 - **Avoid using LOW transfer case with transmission selector in 1 (first range). If using LOW transfer case & 1 (first range), do not exceed 1200 RPM when starting from a stop. If the tractor does not move prior to reaching 1200 PRM, do not continue to increase engine RPM. Failure to comply may result in driveline damage.**
- (a) Set TRANSFER CASE shift lever (3) to HIGH for driving on level highway or secondary roads.
- (b) Set TRANSFER CASE shift lever (3) to LOW for off-road driving, and whenever extra traction/power is required.
- (5) Pull up on release lever (4). Set transmission range selector (5) to desired position.

2-12. DRIVING HET TRACTOR (CONT)

- (6) Use R (reverse) to move HET Tractor backwards.
- (7) Use N (neutral) to:
 - (a) Start engine (para 2-12).
 - (b) Park HET Tractor.
 - (c) Perform winch operation.

CAUTION

- **If transmission is continuously shifting up and down between two gears, manually select the next lower gear range. Failure to comply may damage equipment.**
- **If transmission or transfer case temperature exceeds 250°F (121°C), shift to next lower gear range. Failure to comply may damage equipment.**

- (8) Use 2-5 (drive) to:
 - (a) Move forward from a stop.
 - (b) Drive in normal conditions (approximately 45 mph (72 km/h)).
- (9) Use 2-4 (fourth range) to:
 - (a) Move forward from a stop.
 - (b) Drive in normal conditions (approximately 32 mph (51 km/h)).
- (10) Use 2-3 (third range) to:
 - (a) Move forward from a stop.
 - (b) Drive in off-road conditions.
 - (c) Drive in city traffic (approximately 22 mph (35 km/h)).
- (11) Use 2 (second range) to:
 - (a) Move forward from a stop.
 - (b) Drive down moderate grades (approximately 14 mph (23 km/h)).
 - (c) Control HET Tractor speed.

CAUTION

- **When using 1 (first range) with transfer case in HIGH, stop and shift transfer case into LOW if transmission temperature exceeds 250°F (121°C) or if truck cannot maintain 4 mph. Failure to comply will result in transmission overheating.**
- **Do not downshift into 1 (first range), with transfer case in LOW, while engine speed is above 1200 RPM. Failure to comply may result in driveline damage.**

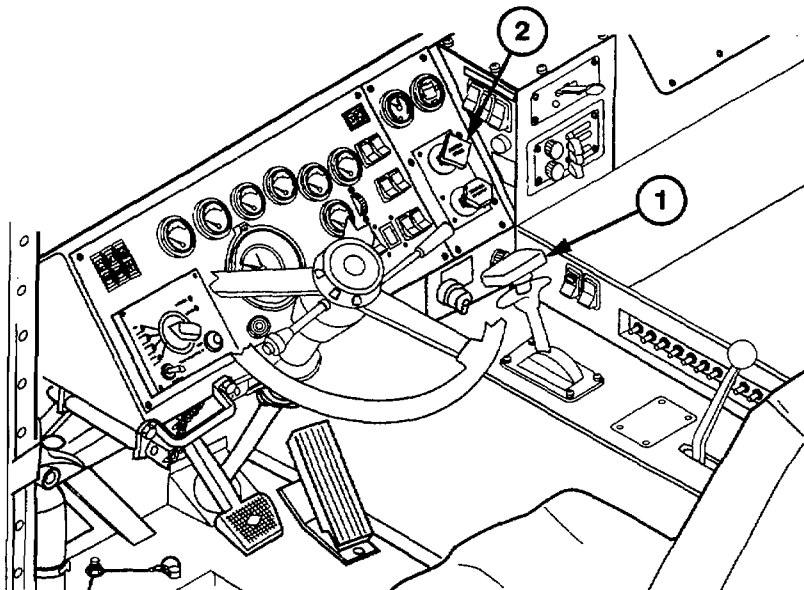
(12) Use 1 (first range) to:

- (a) Move forward from a stop.
- (b) Drive through mud or snow
- (c) Drive up or down steep grades (approximately 4-9 mph (6-14 km/h)).
- (d) Give maximum tractor speed control.

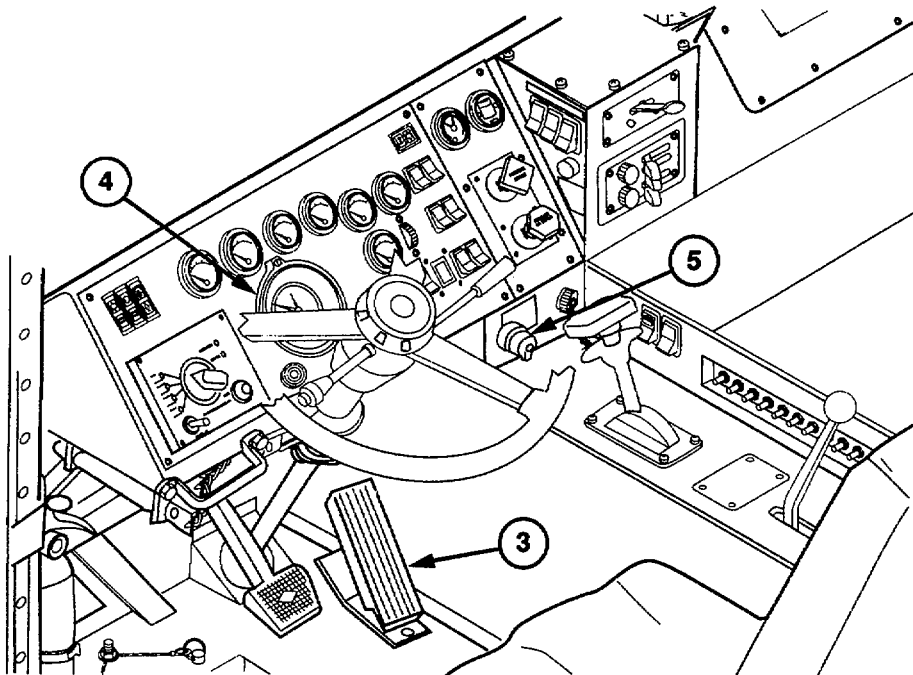
g. Engine Shutdown**WARNING**

Do not park HET Tractor on a steep grade. Injury to personnel or damage to equipment may result if HET Tractor breaks away. If HET Tractor must be parked on a grade, wheels must be chocked. If parked on a paved road, wheels must be turned toward the shoulder if facing down hill and away from the shoulder if facing uphill

- (1) Park HET Tractor.



- (2) Set transmission range selector (1) to N (neutral) position.
- (3) Pull out PARKING BRAKE control (2) to apply parking brakes.

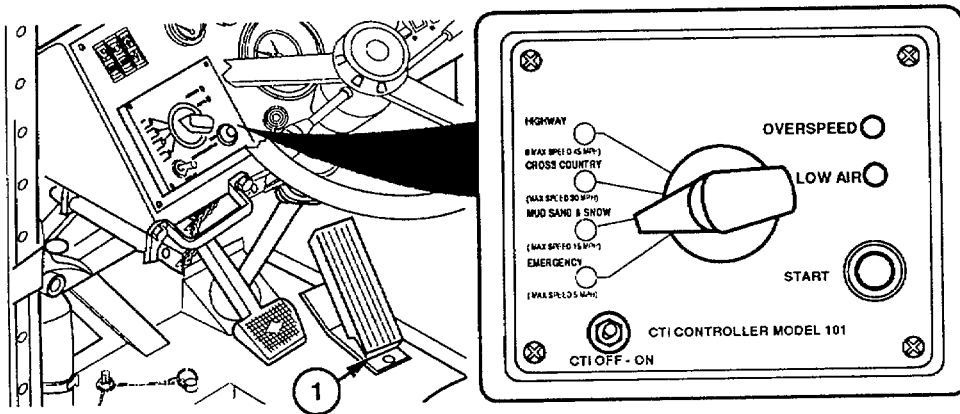
2-12. DRIVING HET TRACTOR (CONT)**CAUTION**

Before shutting down engine, run at reduced speed (800-1000 rpm) under no-load conditions for 3-5 minutes to allow turbocharger to slow down and cool off. Failure to comply may result in damage to turbocharger.

- (4) Increase accelerator pedal (3) pressure until tachometer (4) indicates 800-1000 rpm.
- (5) Run engine for 3-5 minutes.
- (6) Release pressure on accelerator pedal (3).
- (7) Turn off lights and electrical accessories.
- (8) Turn ENGINE switch (5) to OFF
- (9) Chock wheels on HET Tractor.

2-13. CENTRAL TIRE INFLATION SYSTEM (CTIS) OPERATION**a. CTIS Operation**

- (1) Start engine (para 2-12).

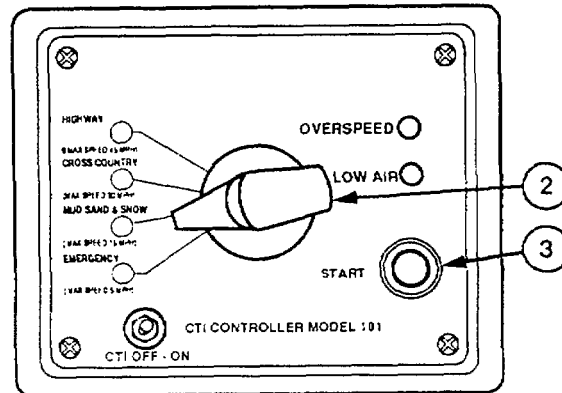
**CAUTION**

- When CTIS rotary selector switch is set to EMERGENCY do not exceed 5 mph (8 km/h). Distance traveled should not exceed 15 miles (24 km).
- When LOW AIR indicator lights (red), CTIS will not operate due to low air pressure.

NOTE

- CTIS ON/OFF switch should remain ON unless a system failure occurs.
- If HET Tractor is stopped during CTIS selection change, an increase in engine rpm is required to provide adequate air supply.
- CTIS automatically turns off if HET Tractor air pressure drops below 85 psi (621 kPa) to provide priority to HET Tractor air brake system. CTIS will automatically resume operation when air pressure increases to 110 psi (758 kPa) or above.
- During CTIS operation, it is normal to hear air coming out of wheel valve when inflating or deflating.
- If CTIS malfunctions, turn the ON/OFF switch to OFF then turn ON. This action will reset the controller and may eliminate the problem.

- (2) Slowly press down on accelerator pedal (1).

12-13. CENTRAL TIRE INFLATION SYSTEM (CTIS) OPERATION (CONT)**NOTE**

- If HET Tractor average speed exceeds speed limit setting for 1 minute, amber **OVERSPEED** light will begin to flash slowly CTIS will automatically inflate HET Tractor tires to next higher air pressure setting.
- While CTIS is operating, green light at next higher setting will flash slowly until next higher setting is reached.
- When next higher CTIS air pressure setting is reached, amber **OVERSPEED** light will stop flashing. Green light indicating new CTIS setting will stop flashing and remain lit.

(3) Set CTIS rotary selector switch (2) to appropriate position. Press **START** (CTIS) switch (3).

CAUTION

CTIS rotary selector switch should always match lighted terrain flashing green light. If switch and lighted settings do not match, operator must correct the problem.

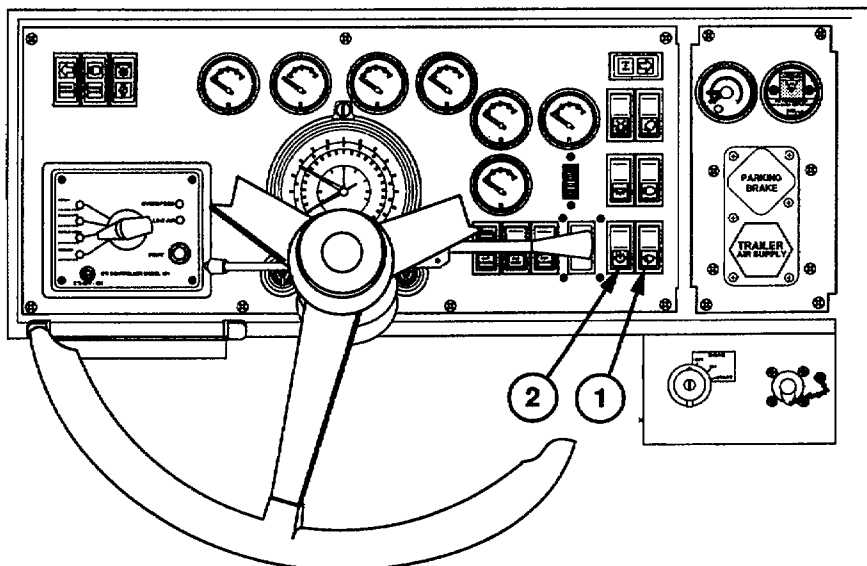
- (4) Perform one of the following tasks if CTIS setting and driving conditions do not match.
- (a) Move CTIS rotary selector switch (2) to flashing green light position to increase tire pressure.
 - (b) Reduce HET Tractor speed and check for continuous green light on selector switch (2) setting. This will indicate CTIS setting, vehicle speed, and ground conditions are correctly matched.

Table 2-2. Tire Pressure

TERRAIN	MPH (KM/H) MAX	FRONT (2) PSI (KPA)	REAR (6) PSI (KPA)
Highway	45 (72)	75 (517)	75 (517)
Cross Country	30 (48)	55 (379)	55 (379)
Mud, Sand, Snow	15 (24)	40 (276)	40 (276)
Emergency	5 (8)	30 (207)	30 (207)

2-14. WINDSHIELD WIPERS/WASHER OPERATION

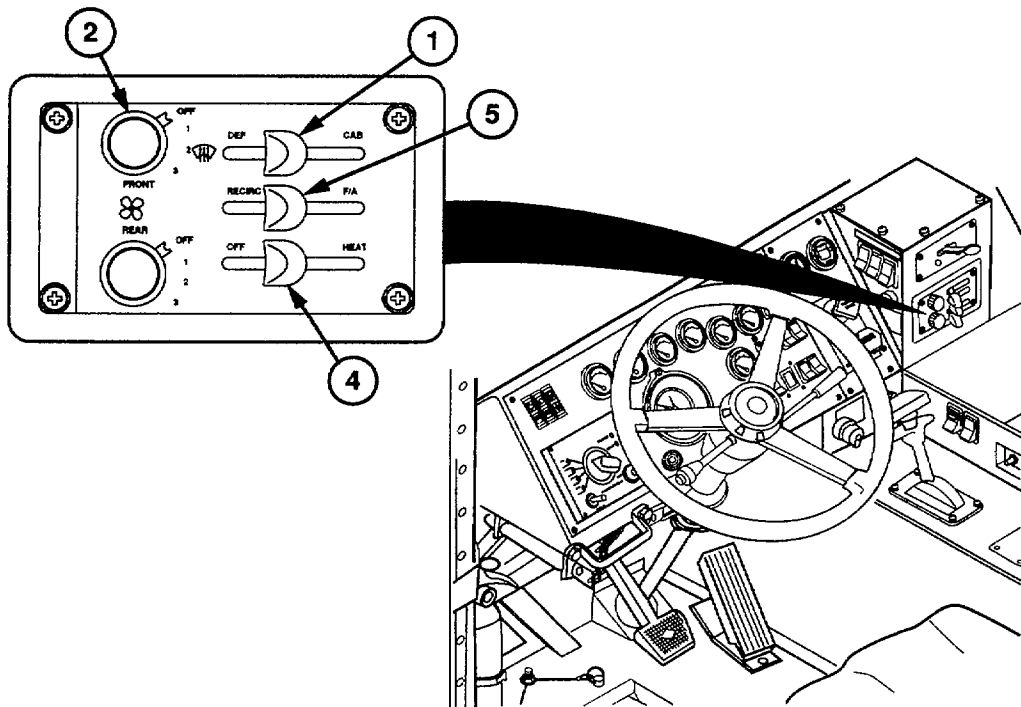
a. Windshield Wipers Operation



Push windshield wiper switch (1) to center position for low speed, down position for high speed, and up position to stop wipe.

b. Windshield Washer Operation

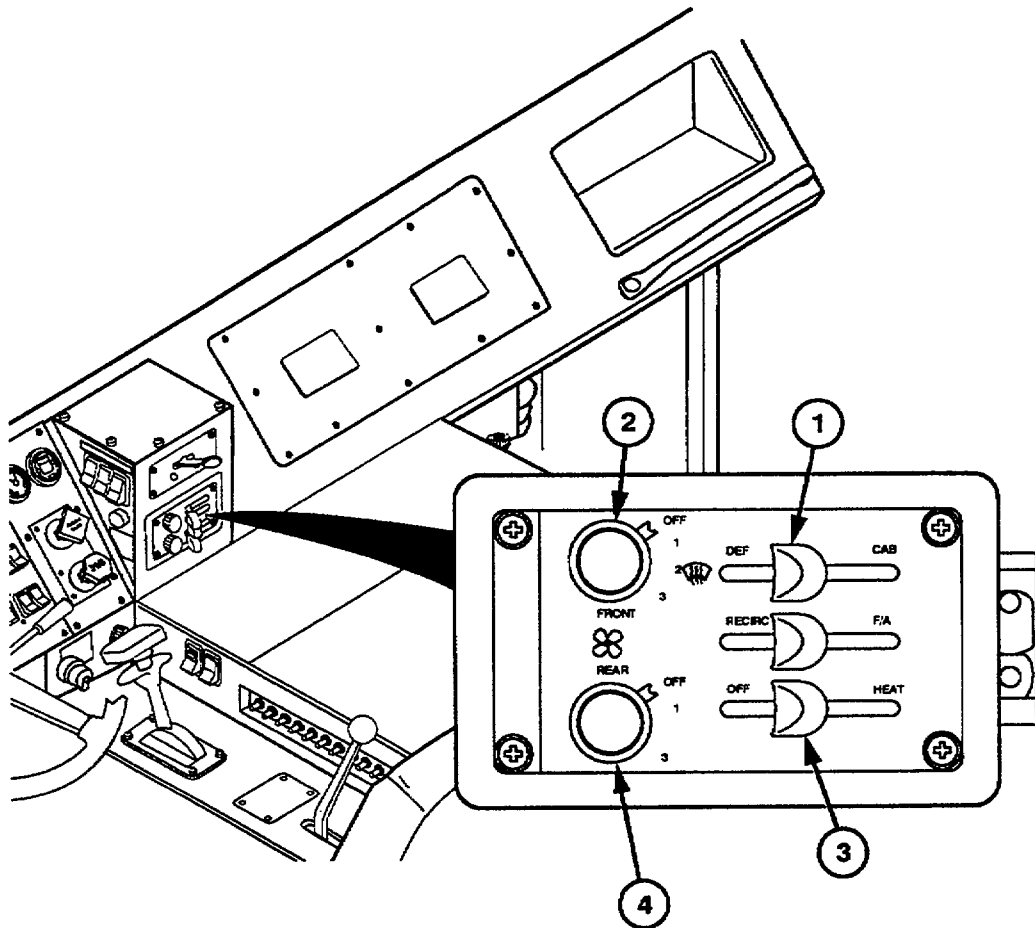
- (1) Push windshield wiper switch (1) down to turn on windshield wipers.
- (2) Push down and hold windshield washer switch (2) to spray cleaning fluid on windshield.
- (3) Release windshield washer switch (2) to stop washer spray.
- (4) Push windshield wiper switch (1) up to turn off windshield wipers.

2-15. PERSONNEL HEATER/EXHAUST FAN OPERATION**NOTE**

Heater temperature is controlled by position of OFF/HEAT control. Temperature increases as control is moved right. Temperature decreases as control is moved left.

a. Heater Operation

- (1) Side DEF/CAB control (1) to CAB position.
- (2) Set FRONT fan switch (2) to speed 1, 2, or 3.
- (3) Deleted.
- (4) Slide OFF/HEAT control (4) to the right until heat is at desired temperature.
- (5) Slide RECIRC/F/A control (5) to F/A (fresh air) to add fresh air for cab ventilation.
- (6) Slide RECIRCF/A control (5) to RECIRC if cab ventilation is not desired.
- (7) Slide OFF/HEAT control (4) to left to turn heat off.
- (8) Set FRONT fan switch (2) to OFF position if desired.
- (9) Deleted.

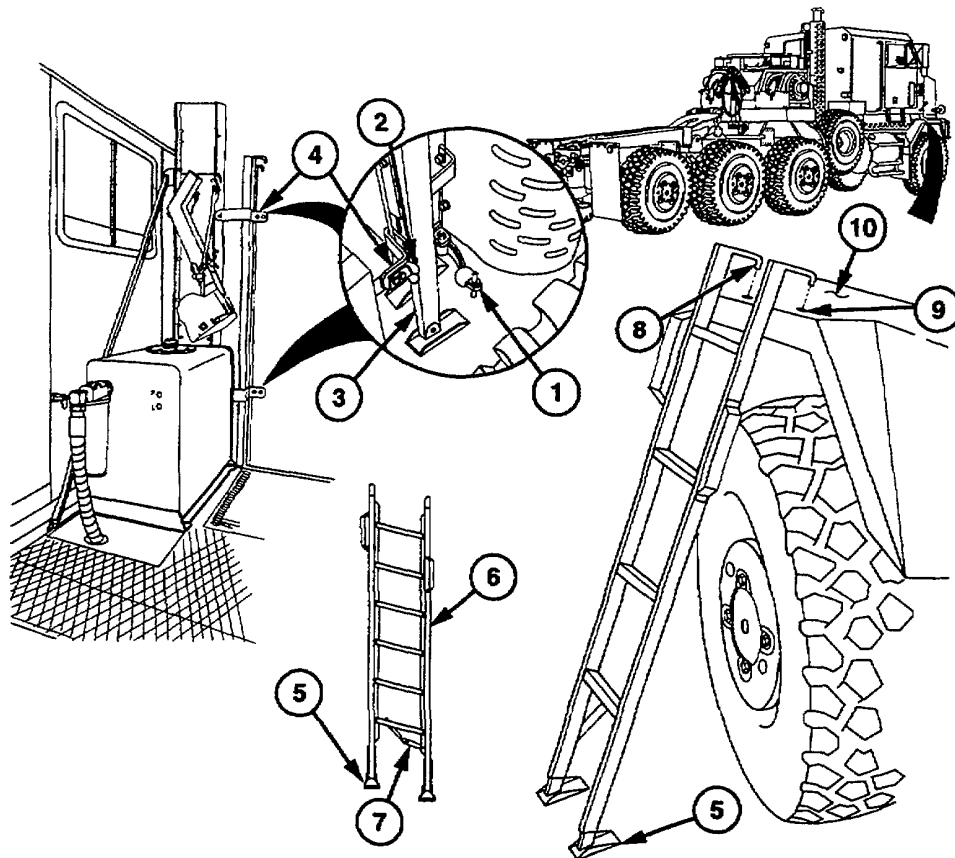


b. Windshield Defrost Operation

- (1) Slide DEF/CAB control (1) to DE
- (2) Set FRONT fan switch (2) to speed 1, 2, or 3.
- (3) Slide OFF/HEAT control (3) to the right until heat is at desired temperature.
- (4) Slide OFF/HEAT control (3) to left to turn heat off.
- (5) Set FRONT fan switch (2) to OFF if desired.

c. Exhaust Fan Operation

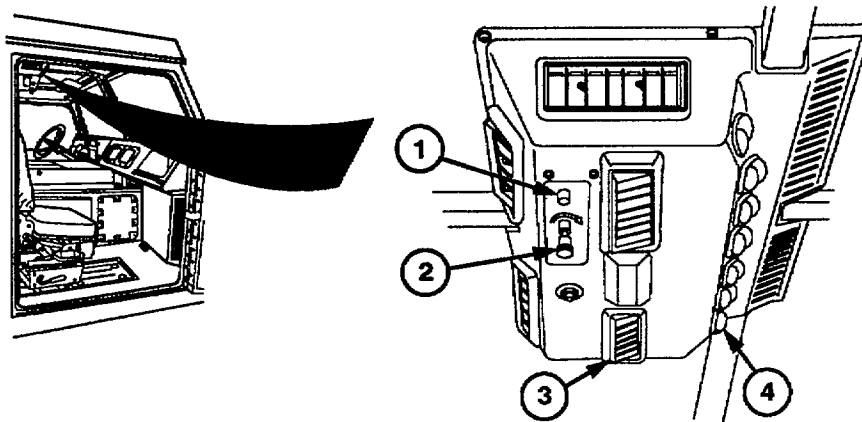
- (1) Set REAR fan switch (4) to speed 1, 2, or 3.
- (2) Turn REAR fan switch (4) to OFF position when exhaust fan operation is not desired.

2-16. PERSONNEL LADDER OPERATION**a. Setup Ladder**

- (1) Remove two rubber latches (1) from brackets (2) while supporting ladder (3).
- (2) Remove ladder (3) from two mounting bracket (4).
- (3) Set shoe (5) on hard surface.
- (4) Pull side rail (6) down until lock (7) engages.
- (5) Place two hooks (8) in holes (9) in fender (10).
- (6) Position two shoes (5) securely on ground.

b. Stow Ladder

- (1) Push in lock (7) and push side rail (6) up to collapse ladder (3).
- (2) Install ladder (3) in two mounting bracket (4) with two hooks (8) toward rear of vehicle.
- (3) Install two rubber latches (1) in brackets (2) while supporting ladder (3).

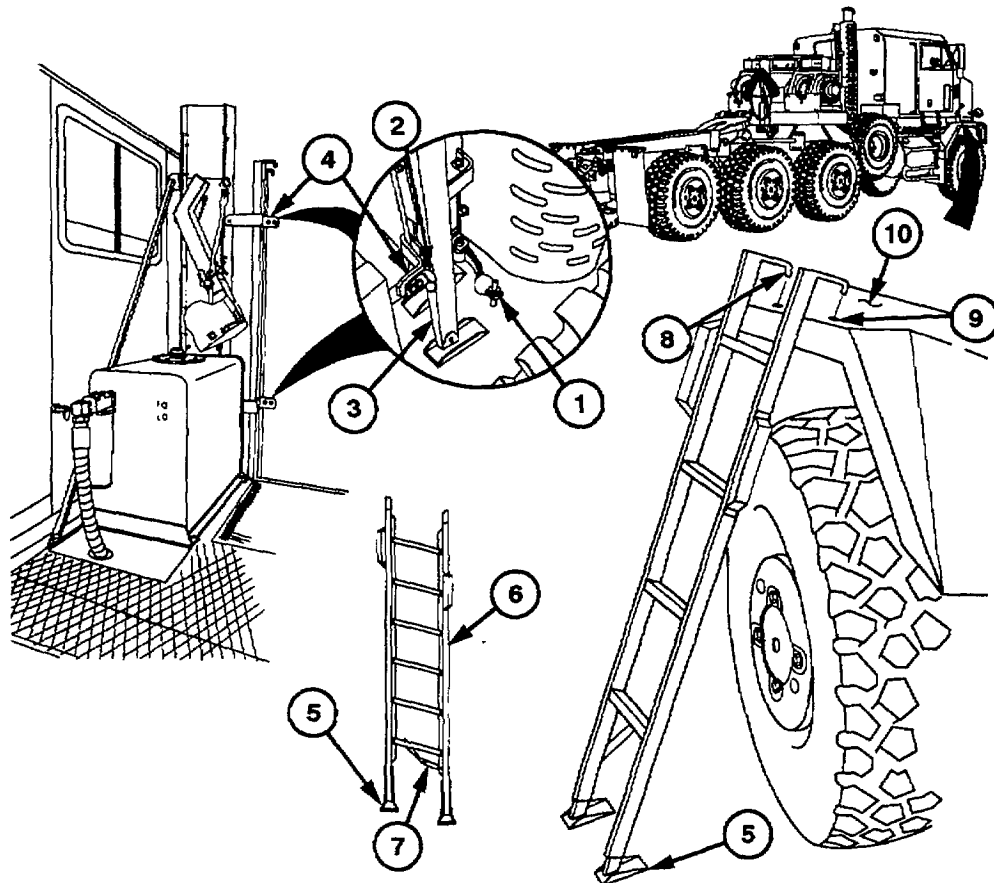
2-15.1. VENTILATOR OPERATION

- (1) Set blower fan switch (1) high (H), medium (M), or low (L) speed.
- (2) Turn recirculate/fresh air knob (2) counter-clockwise to unlock.

NOTE

Recirculate fresh air control knob should remain in recirculate position when operating HET tractor in dusty conditions.

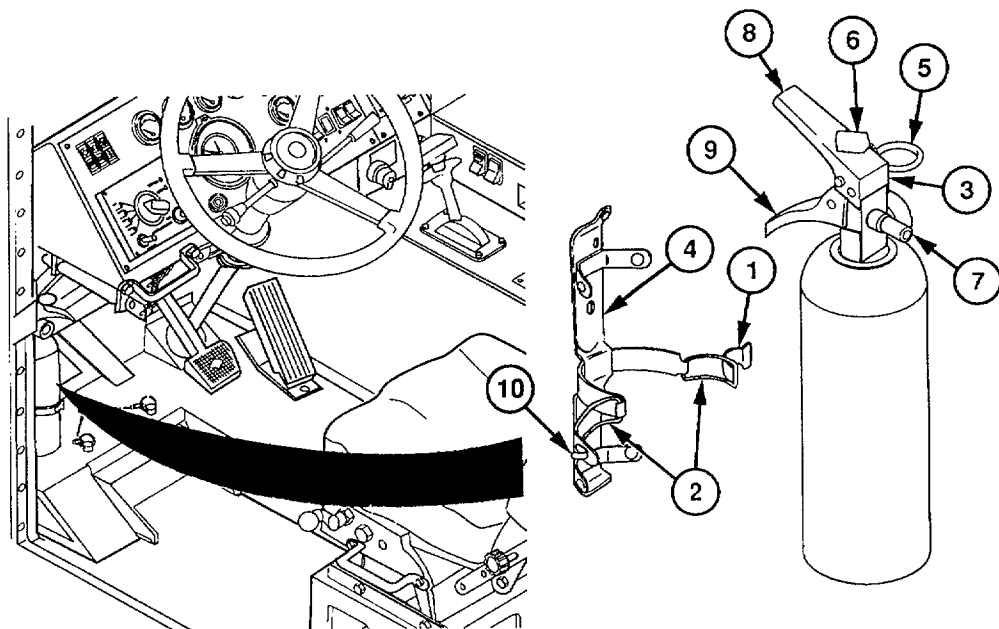
- (3) Pull control knob (2) out to add fresh outside air into cab.
- (4) Push control knob (2) in to recirculate air inside cab.
- (5) Turn recirculate/fresh air knob (2) clockwise to lock in position.
- (6) Adjust air flow rate and direction with louvers (3) and (4).
- (7) Turn blower fan switch (1) to OFF position when ventilator operation is not desired.

2-16. PERSONNEL LADDER OPERATION**a. Setup Ladder**

- (1) Remove two rubber latches (1) from brackets (2) while supporting ladder (3).
- (2) Remove ladder (3) from two mounting brackets (4).
- (3) Set shoe (5) on hard surface.
- (4) Pull side rail (6) down until lock (7) engages.
- (5) Place two hooks (8) in holes (9) in fender (10).
- (6) Position two shoes (5) securely on ground.

b. Stow Ladder

- (1) Push in lock (7) and push side rail (6) up to collapse ladder (3).
- (2) Install ladder (3) in two mounting brackets (4) with two hooks (8) toward rear of vehicle.
- (3) Install two rubber latches (1) in brackets (2) while supporting ladder (3).

2-17. FIRE EXTINGUISHER OPERATION**a. Fire Extinguisher Removal**

- (1) Pull latch (1) and open traps (2).
- (2) Pull fire extinguisher (3) straight out and off bracket (4).

b. Fire Extinguishing

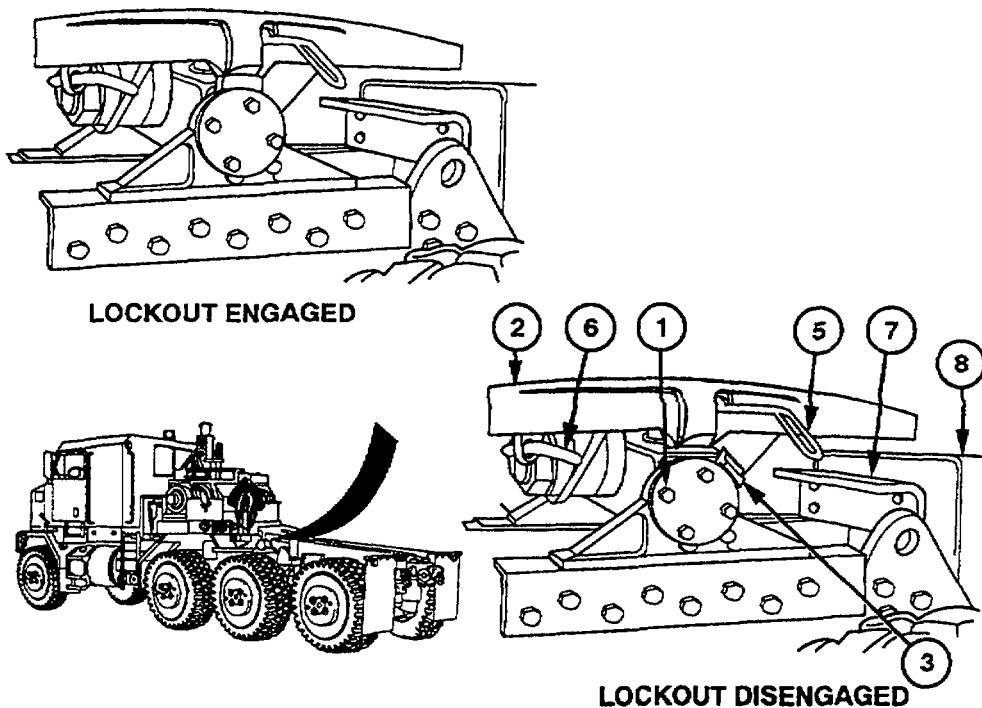
- (1) Hold fire extinguisher (3) upright. Pull safety pin (5) to break plastic seal (6).
- (2) Point nozzle (7) at base of fire and stand back 8 feet.
- (3) Squeeze together levers (8 and 9). Spray discharge in a side-to-side motion at base of fire.
- (4) Let go of lever (8) when fire is out.
- (5) Notify unit maintenance to replace fire extinguisher.

c. Fire Extinguisher Installation

- (1) Put fire extinguisher (3) in bracket (4).
- (2) Position latch (1) in hook (10).
- (3) Push on latch (1) to secure straps (2).

2-18. TRAILER CONNECTION/DISCONNECTION (FIFTH WHEEL)

a. Trailer Connection to HET Tractor



CAUTION

Lockouts must be positioned as identified in Table 2-3. Failure to comply may result in damage to equipment.

NOTE

If fifth wheel is not positioned in the correct mode, do steps (1) thru (3).

- (1) Loosen four screws (1) on each side of fifth wheel (2).

NOTE

Driver's side lockout pivots the rear and passenger's side lockout pivots to the front.

- (2) Rotate the two lockouts (3) into correct position per Table 2-3.

Table 2-3. Lockout Positions

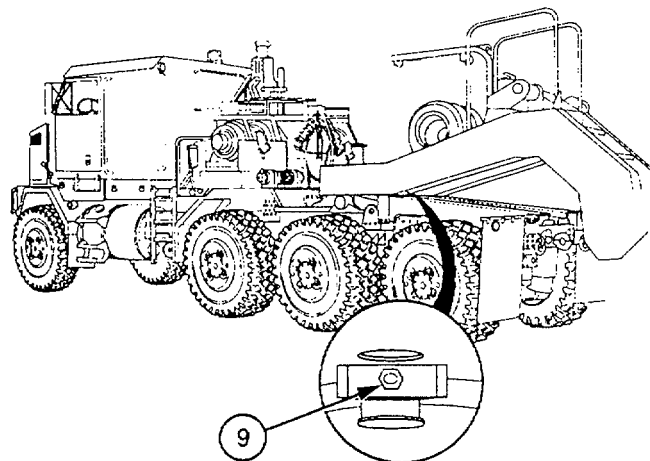
	On-Road	Off-Road
M1000 Trailer	Disengage Lockouts	Disengage Lockouts
Other trailers with combined center of gravity of trailer and payload BELOW 65 in. (165.1 cm)	Engage Lockouts	Disengage Lockouts
Other trailers with combined center of gravity of trailer and payload ABOVE 65 in. (165.1 cm)	Engage Lockouts	Engage Lockouts

- (3) Tighten screws (1) on each side of fifth wheel (2).
- (4) Pull fifth wheel secondary lock release handle (5) completely out and hook in the out position.
- (5) Pull out fifth wheel primary lock release handle (6) and hook in out position.
- (6) Push down fifth wheel (2) until it rests on stop (7) and below guide ramps (8).

CAUTION

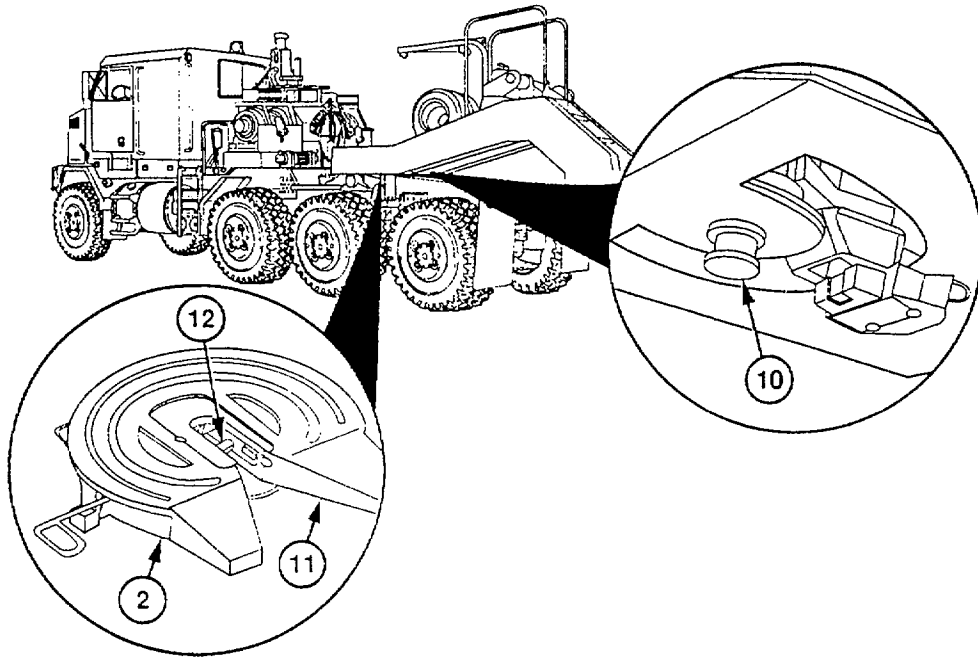
- Ensure there is a generous amount of grease on fifth wheel, ramps, kingpin, and steering wedge. Insufficient lubrication may result in damage to equipment.
- HET Tractor and trailer coupling should be done with the HET Tractor and trailer straight in line, not at an angle. If the wedge of the trailer is not aligned with fifth wheel, operate trailer to align them. Fifth wheel or steering wedge may be damaged.

(7) Prepare trailer for coupling (TM 9-2330-381-14&P).

**NOTE**

Loosening steering wedge adjusting nut ensures the steering wedge can be properly fitted and tightened after kingpin is locked in fifth wheel.

- (8) Turn steering wedge adjusting nut (9) about three full turns counterclockwise.
- (9) Start HET Tractor engine (para 2-12).

2-18. TRAILER CONNECTION/DISCONNECTION (FIFTH WHEEL)(CONT)**WARNING**

The position of assistant must be known at all times. Be careful no one is standing directly behind tractor or trailer or under trailer neck during coupling procedure. Serious personal injury or death could result.

CAUTION

- Do not allow kingpin to miss and overrun fifth wheel. Ensure trailer gooseneck is high enough to clear the rear of the ramps.
- Do not allow kingpin to run up fifth wheel ramps. Severe damage to HET Tractor and trailer may result.

NOTE

If trailer is too low to slide up on ramps, raise gooseneck on trailer in accordance with TM 9-2330-381-14&P.

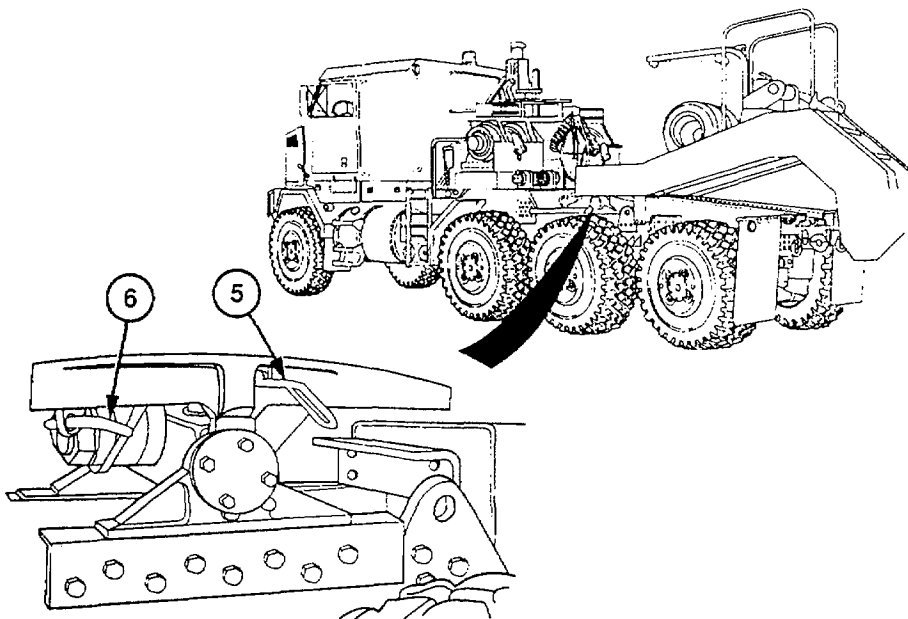
- (10) Instruct assistant to provide hand signals on left side of trailer.
- (11) Slowly back HET Tractor under trailer to align kingpin (10) with throat (11) of fifth wheel (2) while assistant provides hand signals on ground behind vehicle. (Refer to FM 21-305.)

- (12) Continue backing slowly until fifth wheel jaws (12) lock around kingpin (10) on trailer.

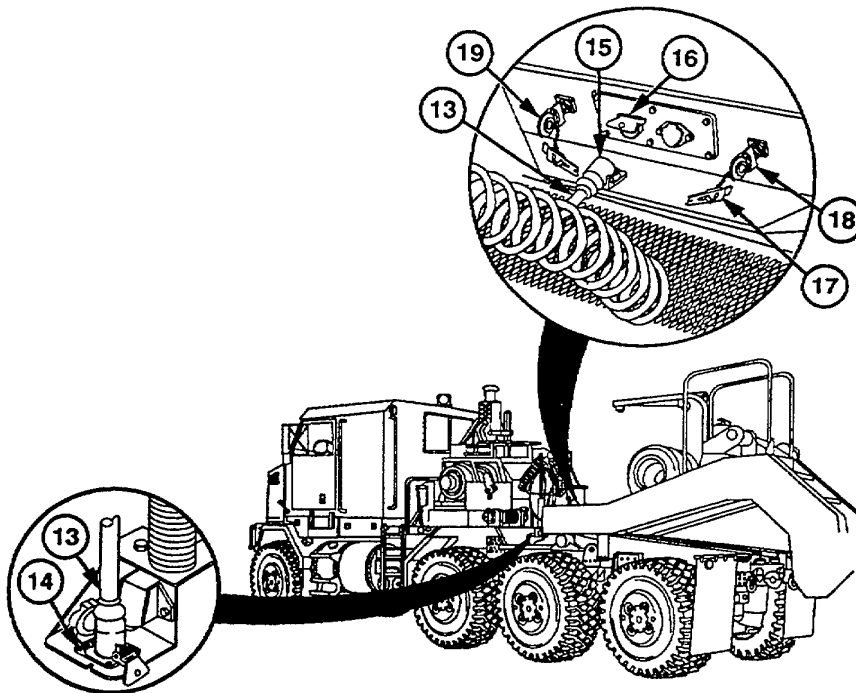
NOTE

Light should not show between top of fifth wheel plate and bottom of trailer when kingpin is properly locked in fifth wheel.

- (13) Inch HET Tractor forward to check coupling and rock tractor back and forth until kingpin (10) is locked in fifth wheel (2).
- (14) Put HET Tractor transmission in N (neutral) position and set parking brake in cab when kingpin is locked.



- (15) Check that primary lock release handle (6) and secondary lock release handle (5) are in locked position.

2-18. TRAILER CONNECTION/DISCONNECTION (FIFTH WHEEL) (CONT)**WARNING**

Personnel must be clear of steering wedge while cycling back and forth. Failure to comply may result in serious personal injury.

NOTE

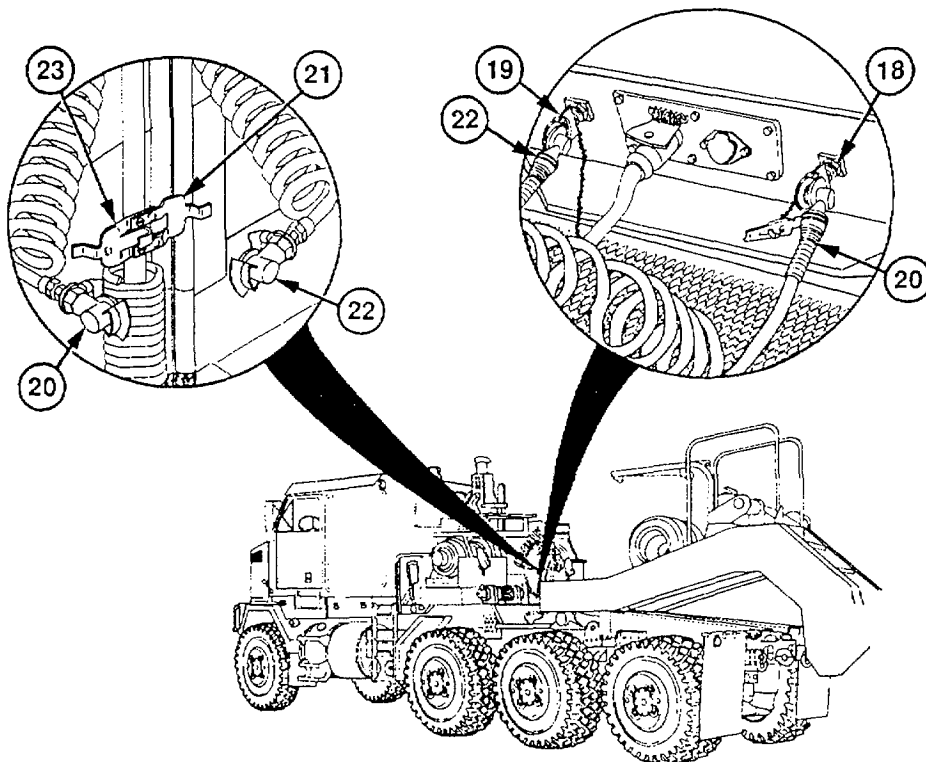
The 7-pin, 12-volt trailer light cable may be used in the appropriate connectors if the 12-pin, 24-volt intervehicular cable is damaged or missing.

- (16) Remove intervehicular wiring harness (13) from stowage box.

NOTE

Ensure connector is locked in position. Receptacle cover locks wiring harness connector in position when fully seated. If connector is not fully seated, intermittent operation of trailer lights could occur.

- (17) Install intervehicular wiring harness (13) in receptacle (14).
- (18) Connect cable plug (15) of intervehicular wiring harness (13) to trailer receptacle (16).
- (19) Remove dummy couplings (17) from EMERGENCY coupling (18) and SERVICE coupling (19) on trailer.

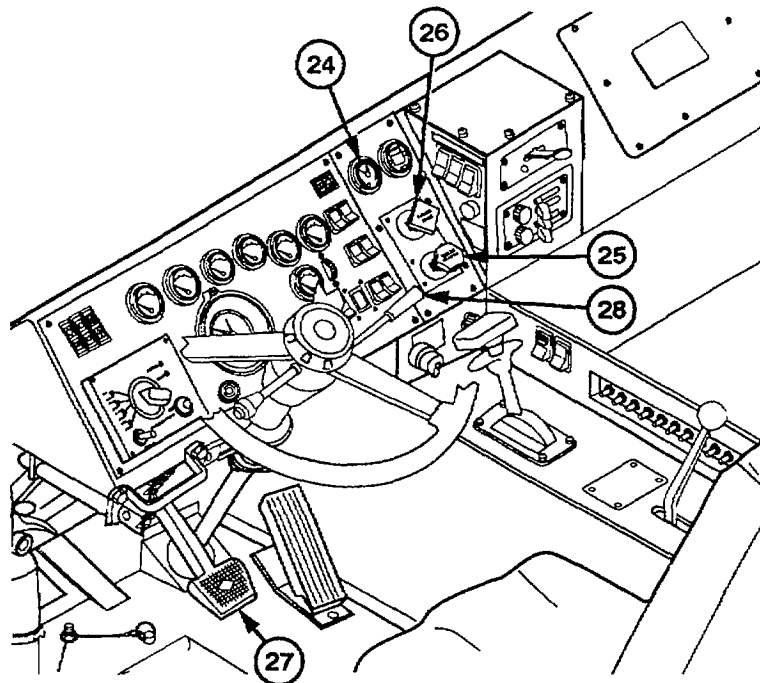


- (20) Disconnect red air hose (20) from dummy coupling (21) on pogo stick and connect to EMERGENCY coupling (18) on trailer.
- (21) Disconnect blue air hose (22) from dummy coupling (23) on pogo stick and connect to SERVICE coupling (19) on trailer.

CAUTION

Due to characteristics of air spring suspensions, approximately 5 minutes must be allowed for the HET Tractor suspension to compensate for the added load. Failure to comply may result in damage to suspension.

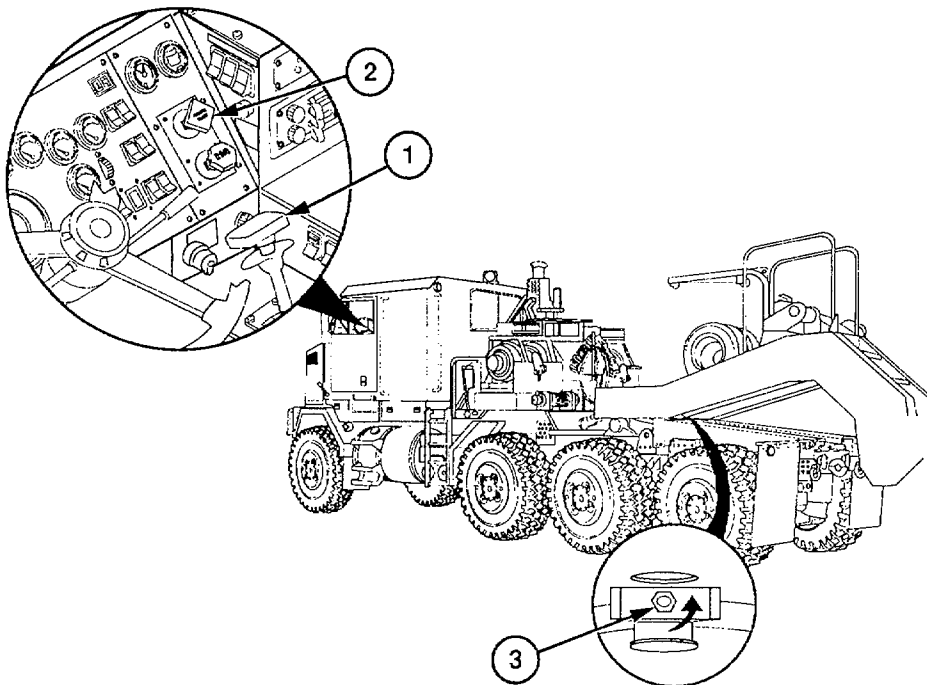
- (22) Refer to TM 9-2330-381-14&P to tighten steering wedge, raise landing gear, adjust trailer height, and prepare trailer for operation.

2-18. TRAILER CONNECTION/DISCONNECTION (FIFTH WHEEL)(CONT)**NOTE**

If AIR PRESS gage does not indicate 65 psi (448 kPa) or more, trailer brakes will not release.

- (23) Check that AIR PRESS gage (24) on cab dash indicates at least 65 psi (448 kPa) before starting out.
- (24) Push in TRAILER AIR SUPPLY button (25) in cab to pressurize air system.
- (25) Push in PARKING BRAKE control (26) in cab to release parking brake.
- (26) Apply brake pedal (27) and check for proper operation.
- (27) Apply and release trailer hand brake control (28) to check trailer brake operation.
- (28) Refer to TM 9-2330-381-14&P to adjust trailer steering.
- (29) Drive HET Tractor (para 2-12).

b. Trailer Disconnection from HET Tractor

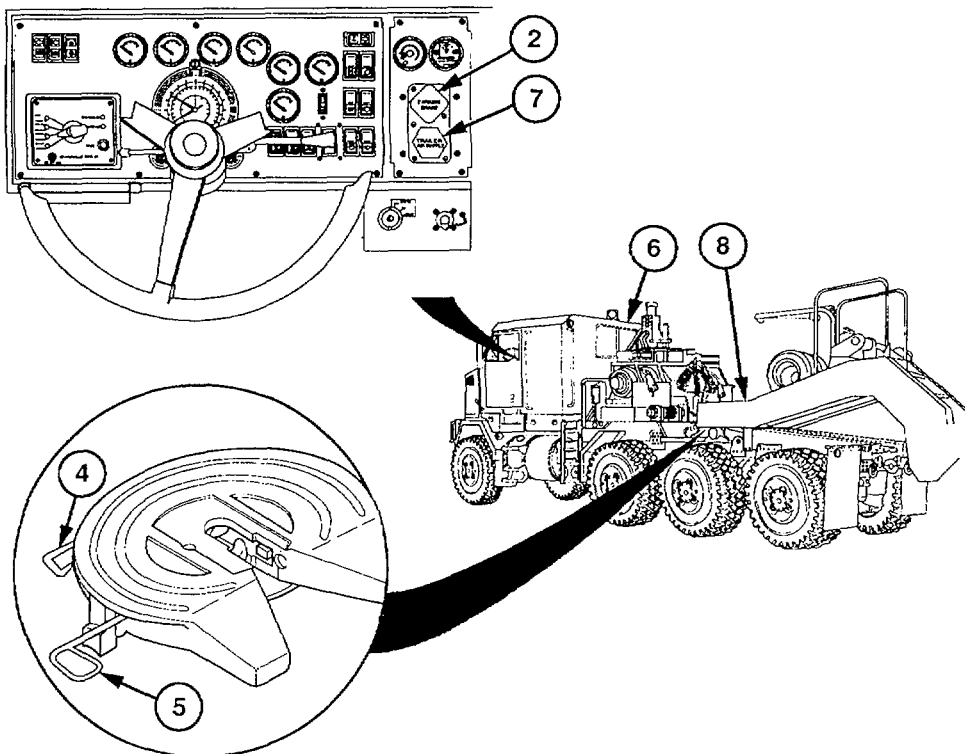


- (1) Park HET Tractor.
- (2) Set transmission range selector (1) to N (neutral) position.
- (3) Pull out PARKING BRAKE control (2) to apply parking brake.

CAUTION

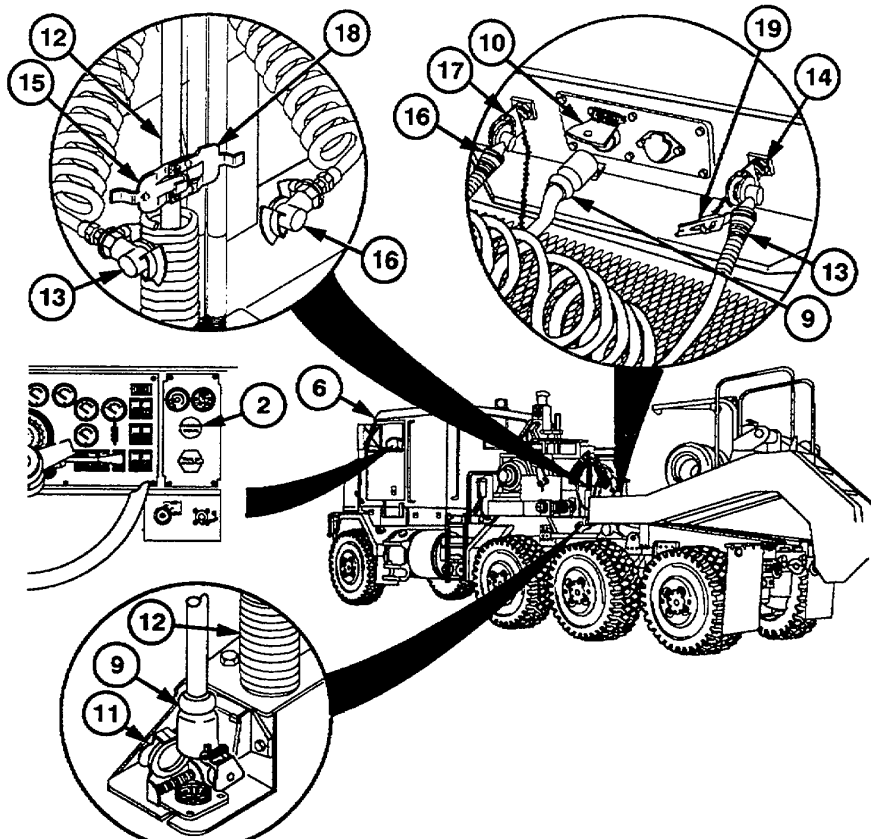
Use wheel chocks when uncoupling trailer. Trailer may roll resulting in damage to trailer.

- (4) Place two chock blocks in front of outside tires on driver' side front bogie and two chock blocks behind outside tires on curbside front bogie.
- (5) Lower trailer landing gear (TM 9-2330-381-14&P).
- (6) Loosen steering wedge adjusting nut (3) one full turn counterclockwise.

2-18. TRAILER CONNECTION/DISCONNECTION (FIFTH WHEEL)(CONT)**NOTE**

If lock release handles cannot be moved, set trailer brakes and move HET Tractor slight backward to relieve pressure on lock mechanism.

- (7) Pull primary lock release handle (4) and hook in out position.
- (8) Pull secondary lock release handle (5) on side of fifth wheel and hook in out position.
- (9) Push PARKING BRAKE control (2) in cab (6) to release parking brake.
- (10) Pull out TRAILER AIR SUPPLY button (7).
- (11) Drive HET Tractor forward slowly approximately 1 ft (0.305 m) until king pin is clear of lock mechanism.
- (12) Pull out PARKING BRAKE control (2) to apply parking brake.
- (13) Raise trailer gooseneck (8) off fifth wheel (TM 9-2330-381-14&P).



CAUTION

Ensure receptacle cover is closed completely over receptacle. Failure to do so may result in corrosion or intermittent operation.

- (14) Disconnect intervehicular wiring harness cable plug (9) from trailer receptacle (10).
- (15) Remove intervehicular harness cable plug (9) from receptacle (11) on pogo stick (12). Return harness to stowage box.
- (16) Disconnect red air hose (13) from EMERGENCY coupling (14) on trailer and connect to dummy coupling (15) on pogo stick (12).
- (17) Disconnect blue air hose (16) from SERVICE coupling (17) on trailer and connect to dummy coupling (18) on pogo stick (12).
- (18) Install dummy couplings (19) on trailer couplings (14 and 17).
- (19) Push PARKING BRAKE control (2) in cab (6) to release parking brake.
- (20) Drive HET Tractor forward slowly until it is clear of trailer.
- (21) Check HET Tractor brakes (Table 2-1. PMCS, Item 16).

2-19. WINCH OPERATION**a. Preparation to Operate Winch****NOTE**

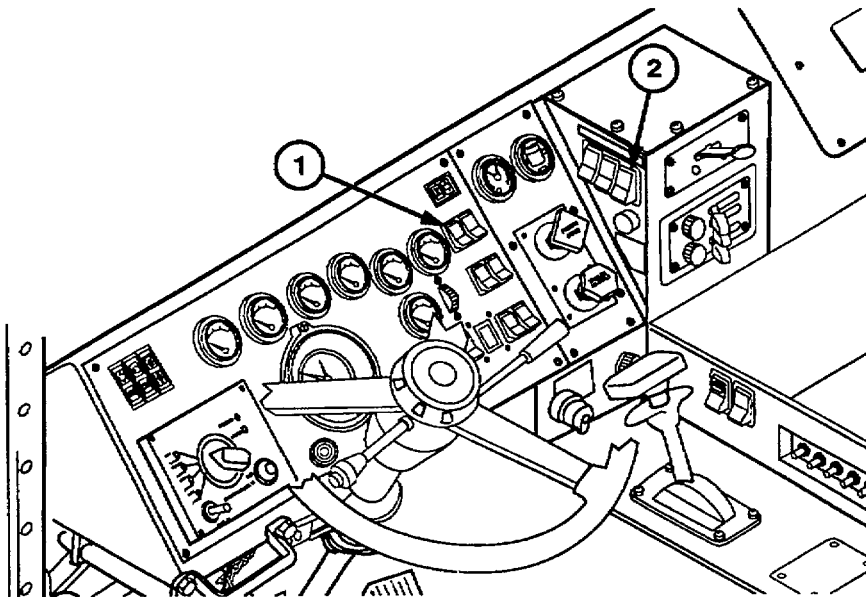
Both winches are required to load and unload the M1000 trailer. However, vehicle recovery operations can be performed using only one main winch.

- (1) Start engine (para 2-12).

CAUTION

HET Tractor must be positioned in a straight line with trailer. Failure to comply may damage winch cable.

- (2) Position HET Tractor on solid ground so tires have good traction. Position HET Tractor for straight pull.



- (3) Turn on beacon light switch (1).

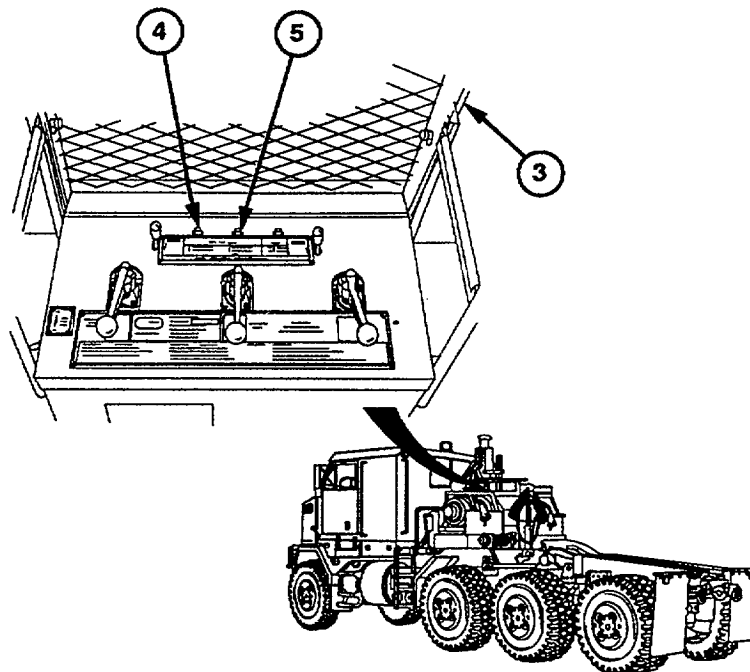
CAUTION

Do not attempt to engage PTO with engine in high idle. Failure to comply may result in damage to PTO.

NOTE

PTO indicator will light when switch is turned to on position.

- (4) With engine idling, set PTO switch (2) to on.



WARNING

- **Wear approved hearing protection devices when working within 30 ft. (9.2 m) of HET Tractor during winch operation. Permanent hearing loss may result if exposed to constant high noise levels.**
- **Winch platform safety chain must be installed in winch cable guard before winching. Failure to comply may result in personnel falling from winch platform.**

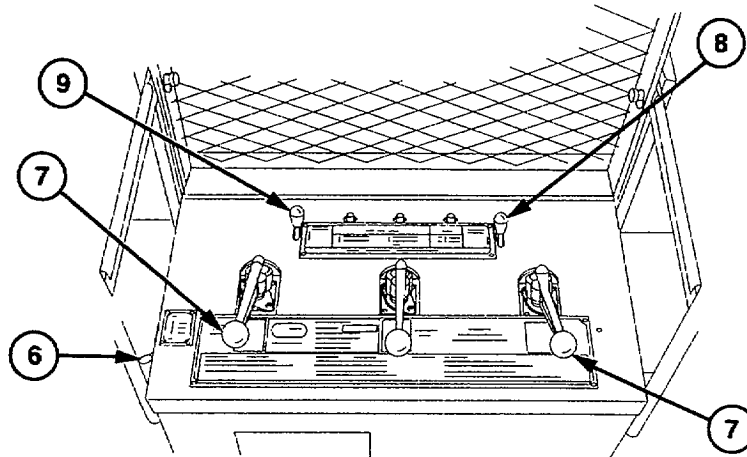
(5) Raise guard (3) and lock in vertical position.

(6) Push ENGINE SPEED CONTROL switch (4) to HIGH ENGINE IDLE.

NOTE

Engine speed should increase to approximately 1500 rpm when engine speed control switch is pushed.

(7) Push and release ENGINE SPEED CONTROL switch (5) forward to increase engine speed.

2-19. WINCH OPERATION (CONT)**CAUTION**

Never move main winch controls to **CABLE OUT** position with **CABLE HOLD DOWN** lever in **ON** position. Failure to comply may result in cable tangling up on drum and damage to equipment.

- (8) Move **CABLE HOLD DOWN** lever (6) to **OFF** position.
- (9) Pull up on control levers (7) just enough to relieve tension on winch cables.
- (10) Push **CABLE HOLD DOWN** lever (6) to **ON** position.

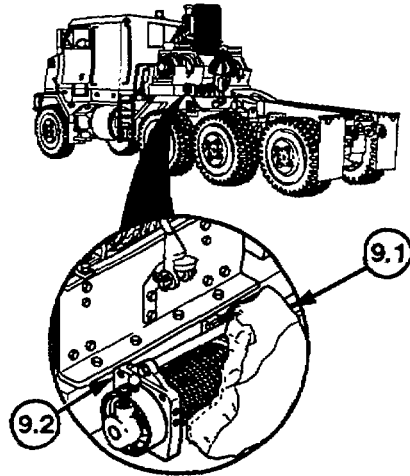
CAUTION

Never release kickouts with winch under load. Damage to equipment and load will result.

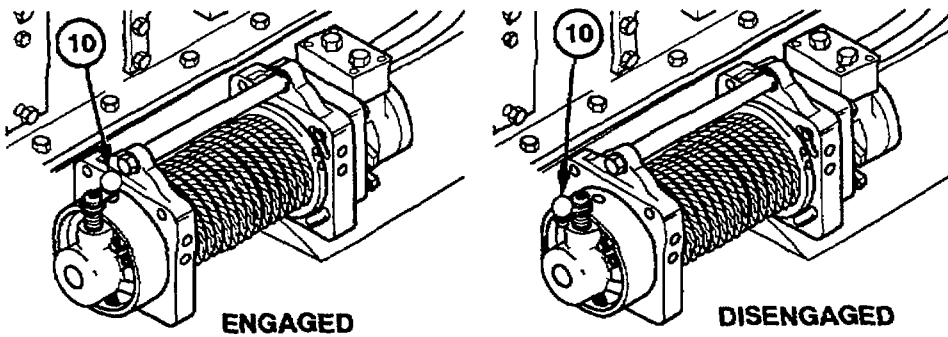
NOTE

- There are separate controls for driver's side winch and passenger's side winch. Use appropriate controls for winch being used.
- If the kickouts do not disengage, it may be necessary to rotate the winch drum slightly back and forth using the winch controls. This will relieve any tension so the kickouts can function.
- Kickouts are disengaged when winch drums do not turn when control levers are actuated.

- (11) Release **DRIVER'S WINCH KICKOUT** control (8) and **PASSENGER'S WINCH KICKOUT** control (9).

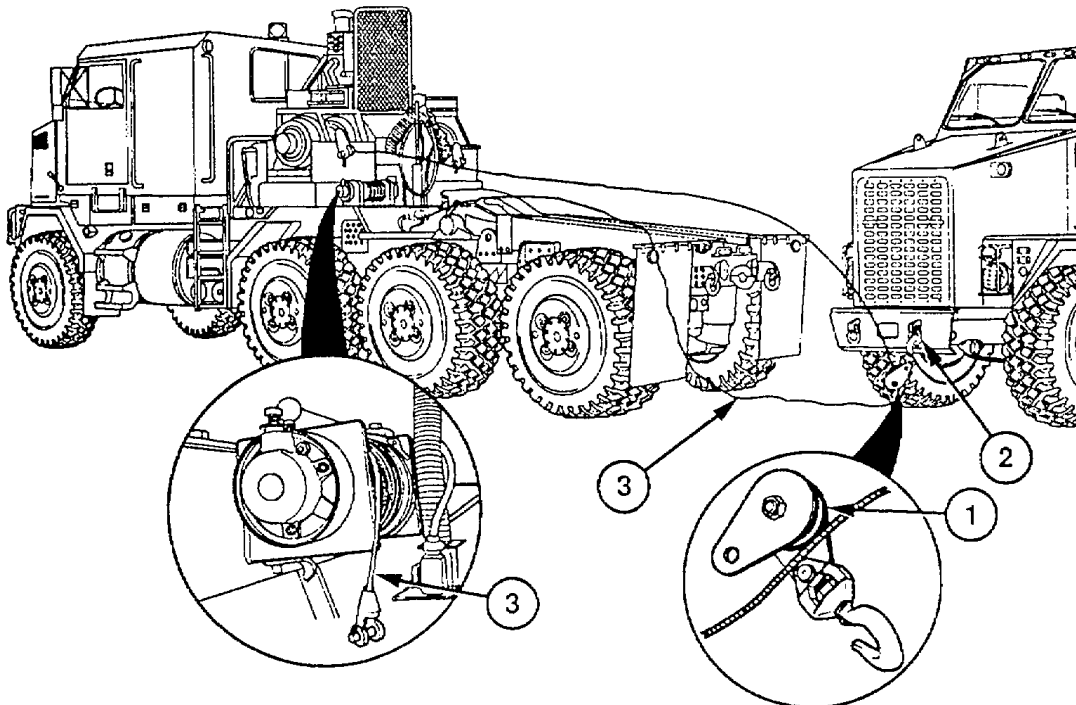


(11.1) Remove cover (9.1) from auxiliary winch (9.2).



(12) Release auxiliary winch kickout lever (10).

b. Cable Payout, Vehicle Connection, and Recovery



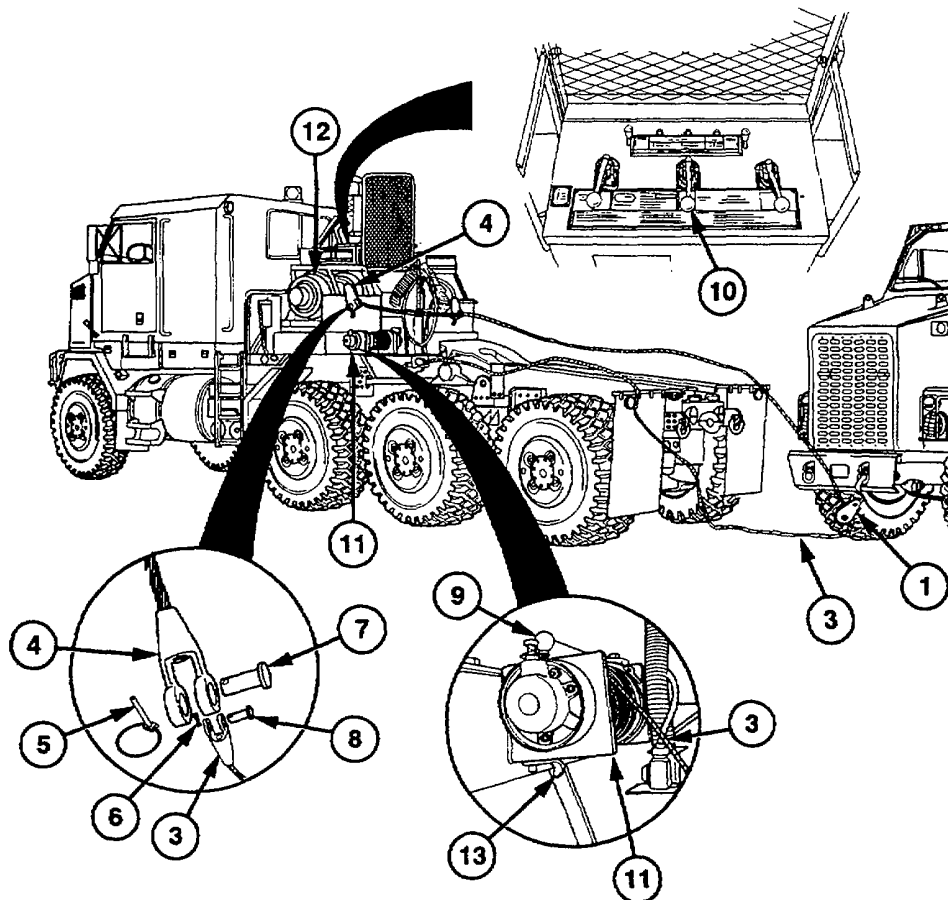
WARNING

- **DO NOT** use winches for lifting personnel.
- **Always** wear heavy gloves when handling winch cable. **Never** let cable run through hands. Frayed cable can cut severely.
- **DO NOT** operate winch without guard in place.
- **DO NOT** place hands or feet near winch during operation.

CAUTION

Never move main winch controls to **CABLE OUT** position with **CABLE HOLD DOWN** lever in **ON** position. Failure to comply may result in cable tangling up on drum and damage to equipment.

- (1) Remove snatch block (1) from rear stowage box.
- (2) Attach snatch block (1) to shackle (2) on disabled vehicle.
- (3) Grasp end of auxiliary winch cable (3) and pull through open snatch block (1).
- (4) Close snatch block (1).

2-19. WINCH OPERATION (CONT)

- (5) Pull end of auxiliary winch cable (3) back to main winch cable (4).

NOTE

Either driver's side winch or passenger's side winch cable can be attached to auxiliary winch cable to payout cab for vehicle recovery.

- (6) Remove pins (5 and 6) and clevis pins (7 and 8) from auxiliary winch cable (3) and main winch cable (4).
- (7) Attach auxiliary winch cable (3) to main winch cable (4).
- (8) Install clevis pin (8) and pin (6) in auxiliary winch cable (3) to secure.

NOTE

If kickout does not engage, it may be necessary to actuate the winch controls back and forth. This will internally align the gears so the kickouts can function.

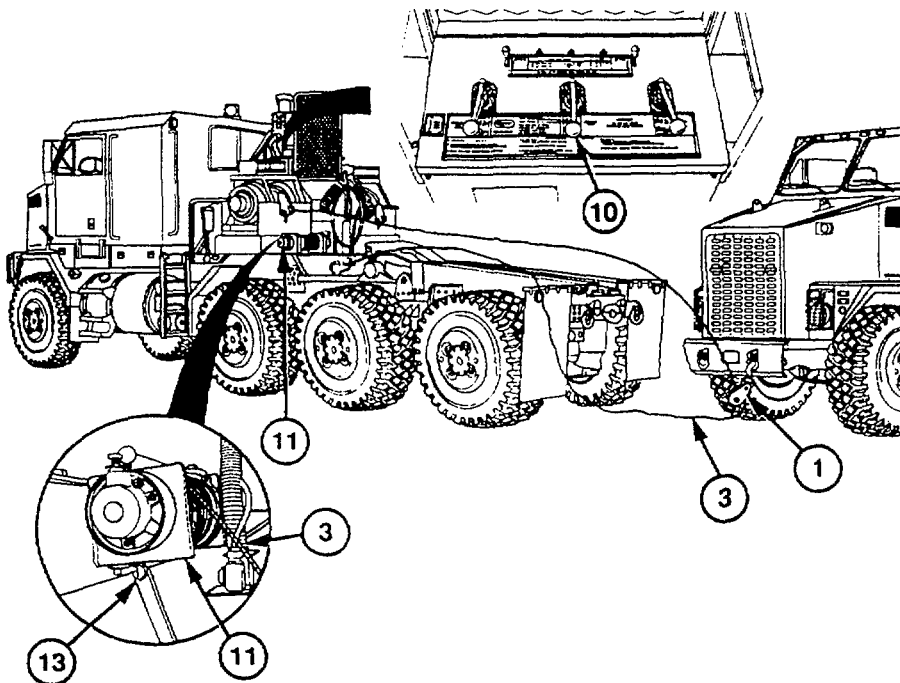
- (9) Engage auxiliary winch kickout lever (9).

WARNING

- **Ensure that both DRIVER'S SIDE and PASSENGER'S SIDE WINCH KICKOUT controls are disengaged. Failure to disengage KICKOUT controls may result in injury to personnel.**
 - **Use care when operating auxiliary winch control lever. Cable may pay out at high rate of speed causing injury to personnel.**
- (10) Push down and hold AUXILIARY WINCH control lever (10) to pull auxiliary winch cable (3) back to auxiliary winch (11).
- (11) Hold down AUXILIARY WINCH control lever (10) until main winch cable (4) has reached disabled vehicle.

CAUTION

- **There must be at least five wraps of cable left on drum. If not, move HET Tractor closer to disabled vehicle or shut down winch. Failure to do so may result in loosened cable and damaged equipment.**
 - **Never release cable hold downs with most of cable out. Failure to comply may result in cable becoming tangled.**
- (12) Ensure there are at least five wraps of cable left on drum (12).
- (13) Remove pin (6) and clevis pin (8) from auxiliary winch cable (3).
- (14) Disconnect auxiliary winch cable (3) from main winch cable (4).
- (15) Install clevis pin (8) and pin (6) in auxiliary winch cable (3).
- (16) Remove snatch block (1) from disabled vehicle. Remove auxiliary winch cable (3) from snatch block (1).
- (17) Walkout auxiliary winch cable (3) to eliminate uneven wraps on spool with aid of assistant.

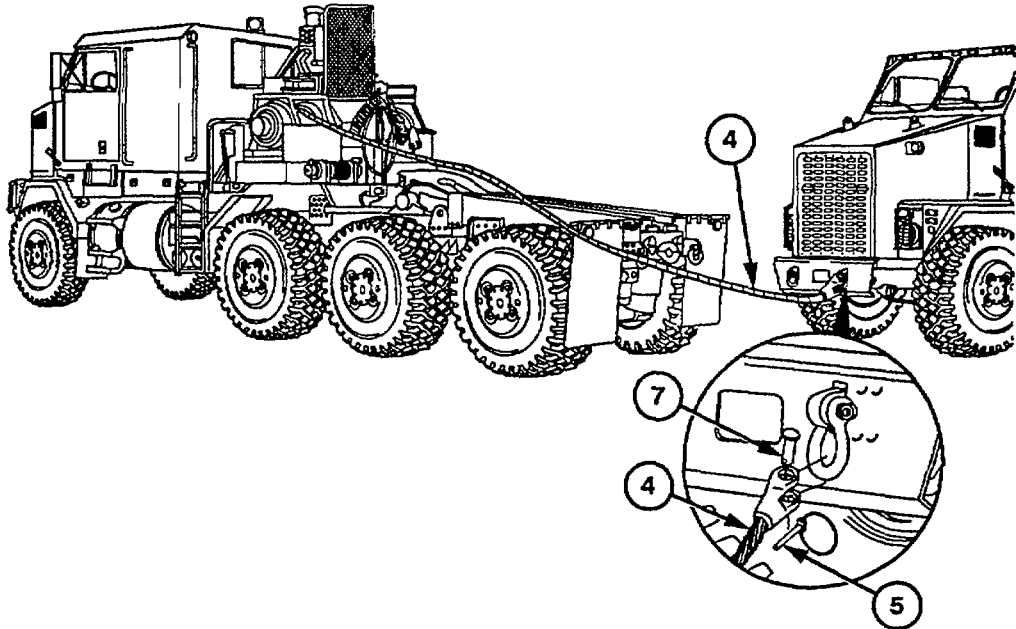
2-19. WINCH OPERATION (CONT)**WARNING**

- Always wear heavy gloves when handling winch cable. Never let cable run through hands. Frayed cable can cut severely resulting in injury to personnel.
- Personnel must exercise care when winding auxiliary winch cable onto the drum. Tension must be kept on cable when winding on drum. Failure to comply may cause improper layering or tangling of cable, resulting in injury to personnel.

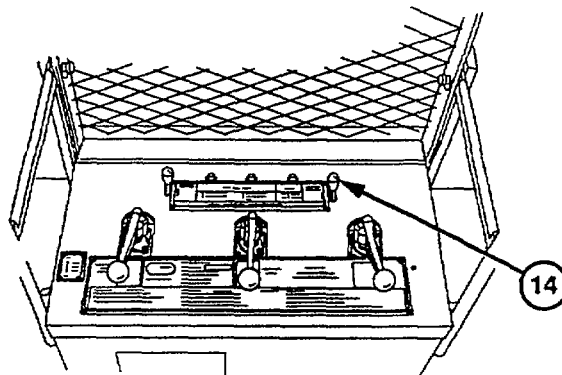
NOTE

Low idle may be used when paying in auxiliary winch cable for easier winding.

- (18) Walk auxiliary winch cable (3) back to auxiliary winch (11) while assistant operates AUXILIARY WINCH control lever (10).
- (19) Stow auxiliary winch cable (3) on hook (13).
- (20) Stow snatch block (1) in stowage box.



- (21) Connect main winch cable (4) to disabled vehicle.
- (22) Install clevis pin (7) and pin (5) in main winch cable (4).



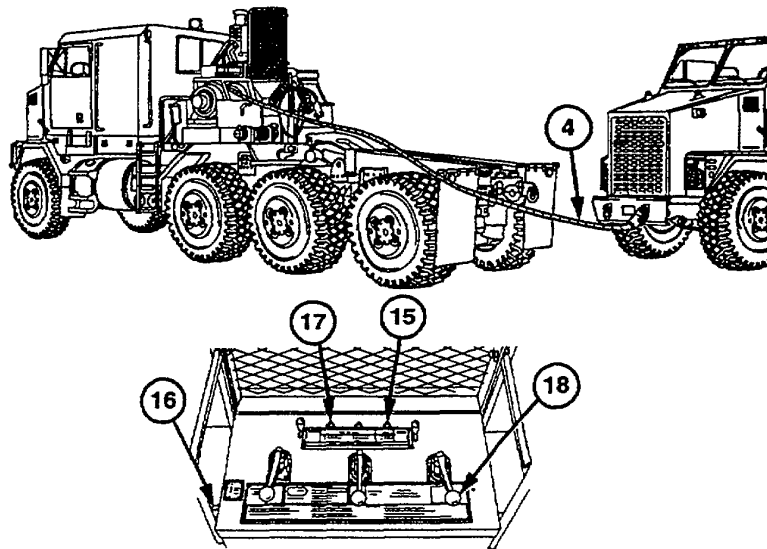
WARNING

Keep all personnel clear of area when tension is on winch cable. If cable breaks, winch cable can whip causing serious injury or death to personnel.

NOTE

There are separate controls for driver's side inch and passenger's side winch. Use appropriate controls for winch being used.

- (23) Engage WINCH KICKOUT control (14).

2-19. WINCH OPERATION (CONT)

- (24) Set WINCH SPEED CONTROL (15) to LOW position.
- (25) Push CABLE HOLD DOWN lever (16) to ON position.
- (26) Push ENGINE SPEED CONTROL switch (17) to HIGH ENGINE IDLE position.
- (27) Push and release ENGINE SPEED CONTROL switch (17) forward to increase engine speed.

WARNING

Personnel must exercise care when winding main winch cable onto the drum. Winch drum should be checked frequently for proper cable layering. Failure to comply may cause improper layering or tangling of cable, resulting in injury to personnel.

CAUTION

- Check cable routing before paying in cable. Failure to have cable routed correctly may damage equipment.
- If excess cable is laying on the platform or ground, assistant must provide tension while the operator takes up the slack. Failure to comply may result in damage to equipment.

NOTE

When both winch cables are being used, pay in cables in equal amounts.

- (28) Push down WINCH control (18) to CABLE IN position. Slowly tighten winch cable (4) to recover disabled vehicle.

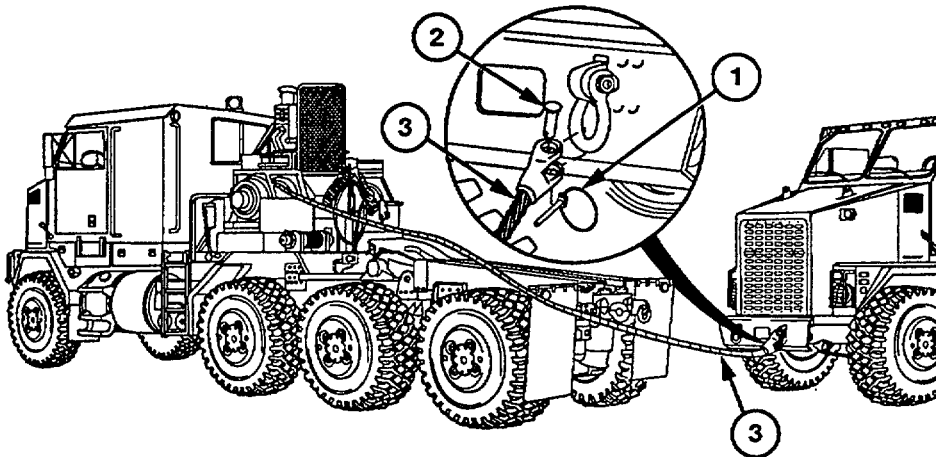
WARNING

Keep all personnel clear of area when tension is on winch cable. If cable breaks, winch cable can whip causing serious injury or death to personnel.

CAUTION

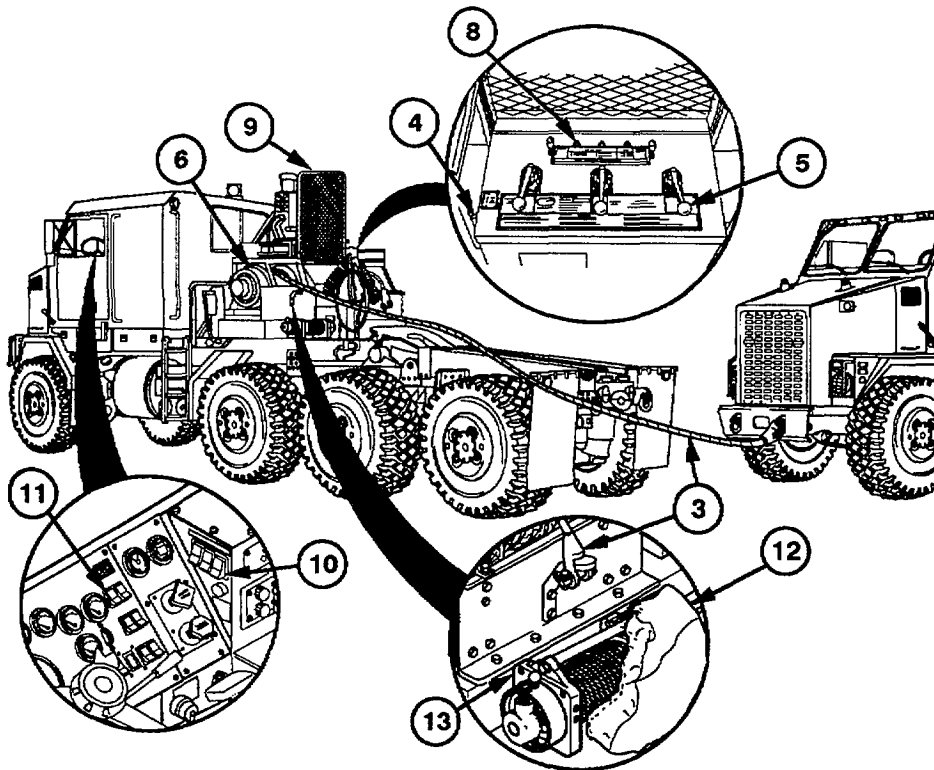
Never move main winch controls to CABLE OUT position with CABLE HOLD DOWN lever in ON position. Failure to comply may result in cable tangling up on drum and damage to equipment.

- (29) When disabled vehicle is fully recovered, move CABLE HOLD DOWN lever (16) to OFF position.
- (30) Pull up WINCH control (18) to CABLE OUT position to pay out cable (4) until there is enough slack to disconnect cable from disabled vehicle.

c. Disconnection and Stowage**WARNING**

Some windup may occur in the cable during winching. Any twisting of the cable can be felt when the pin is being removed from clevis. Do not attempt to hold cable end to prevent twisting. Do not put fingers or other objects into the jaws of the clevis when releasing the cable. Always drop the cable away from your body when releasing. Failure to comply may result in injury to personnel.

- (1) Remove pin (1) and clevis pin (2) from main winch cable (3).
- (2) Disconnect main winch cable (3) from recovered vehicle.
- (3) Install clevis pin (2) and pin (1) in main winch cable (3).

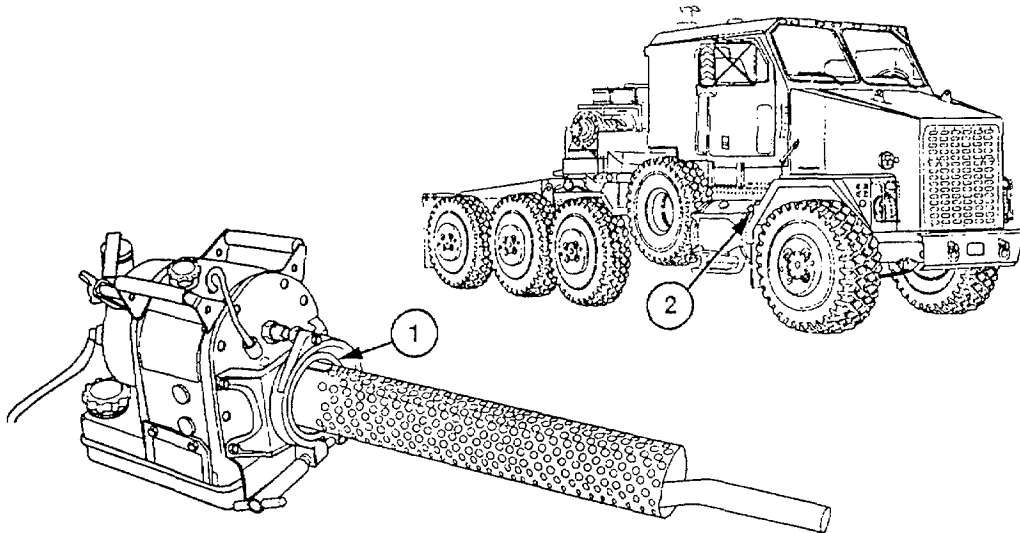
2-19. WINCH OPERATION (CONT)

- (4) Move CABLE HOLD DOWN lever (4) to ON position.
- (5) Push WINCH control (5) to CABLE IN. Reel in main winch cable (3) on winch drum (6).
- (6) Secure main winch cable (3) on drum hook (7).
- (7) Set ENGINE SPEED CONTROL switch (8) to LOW ENGINE IDLE position.
- (8) Lower guard (9) on winch control consoles.

NOTE

Engine may stall if transmission is shifted into gear before PTO switch is turned off.

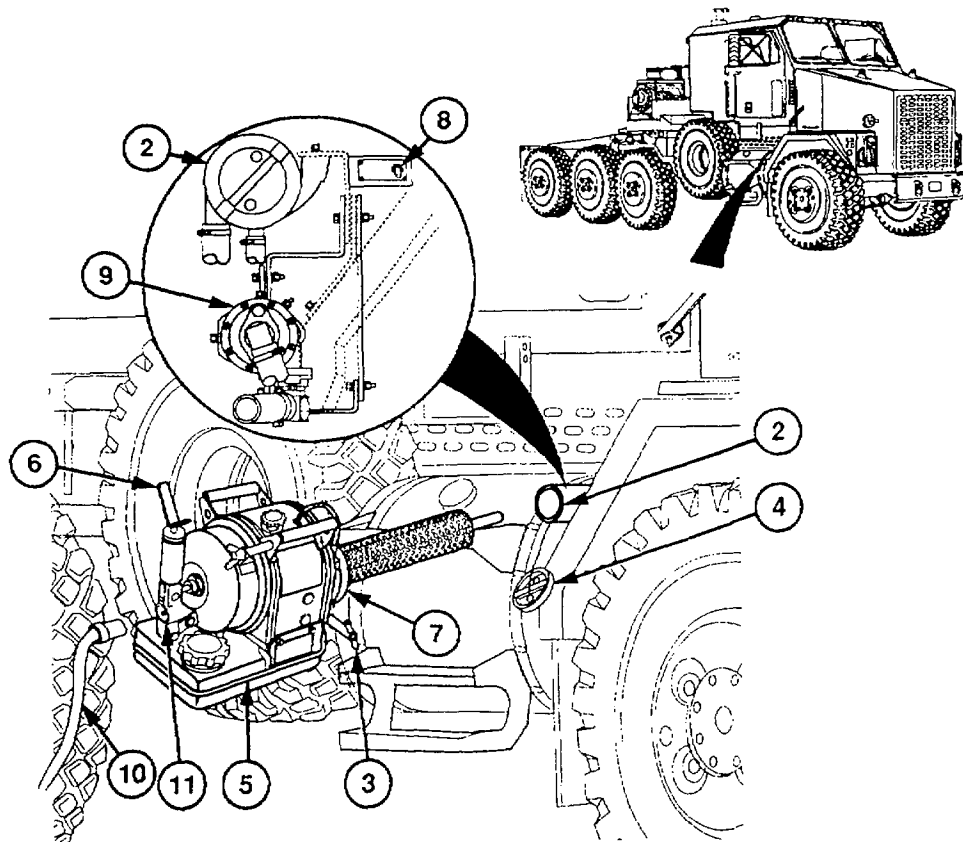
- (9) Set PTO switch (10) to off position.
- (10) Turn off beacon light switch (11).
- (11) Shut off engine (para 2-12).
- (12) Install cover (12) on auxiliary winch (13).

2-20. AUXILIARY EQUIPMENT OPERATION**WARNING**

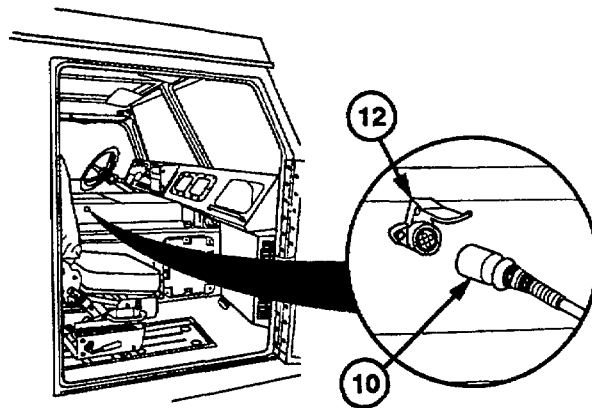
CARBON MONOXIDE (EXHAUST GAS) FROM ARCTIC HEATER EXHAUST CAN CAUSE DEATH. Allow for adequate ventilation when arctic heater is operating.

a. Arctic Heater Operation

- (1) Prepare heater for operation. Refer to swing fire heater operating instructions.
- (2) Check gasket (1) for adequate seating with water jacket (2) before installation.

2-20. AUXILIARY EQUIPMENT OPERATION (CONT)

- (3) Loosen wing nut (3) until it stops.
- (4) Remove cap (4) from water jacket (2).
- (5) Install heater (5) in water jacket (2) with hand pump lever (6) in upright vertical position.
- (6) Turn wing nut (3) until clamp (7) is tight around water jacket (2).
- (7) Flip switch (8) to the up position to start pump (9).
- (8) Install cable (10) in heater receptacle (11).

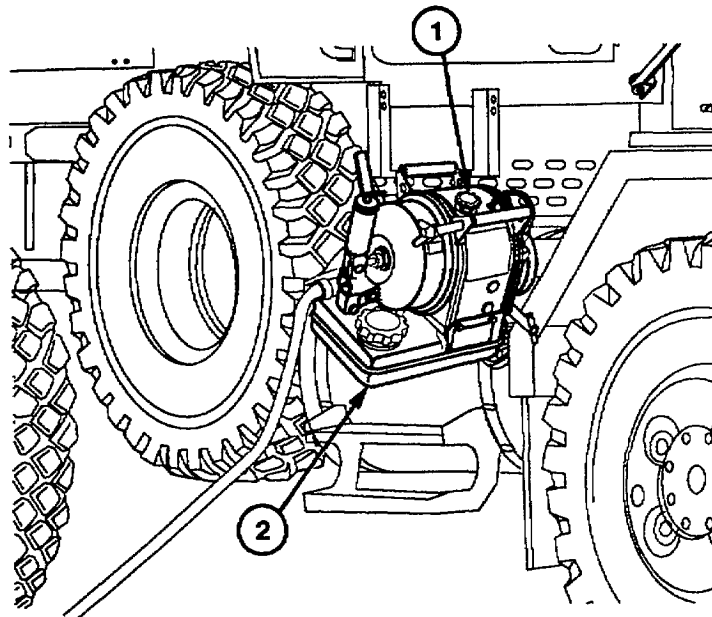


(9) Install other end of cable (10) in vehicle receptacle (12).

(10) Refer to swing fire heater operating instructions.

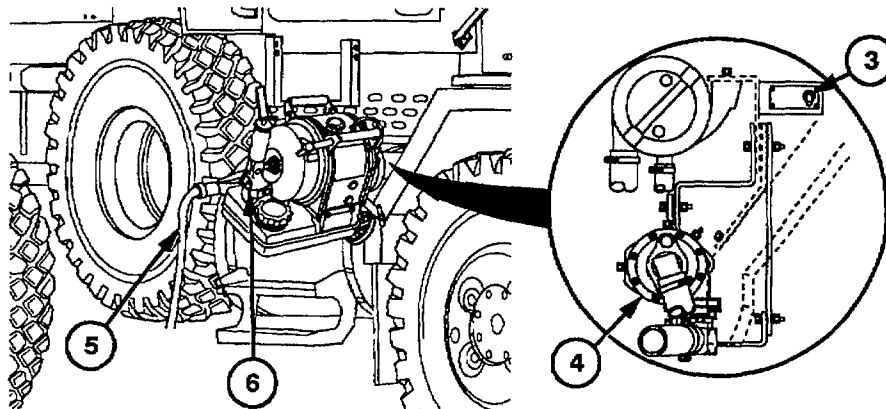
(11) Start engine (para 2-12).

b. Arctic Heater Shutdown

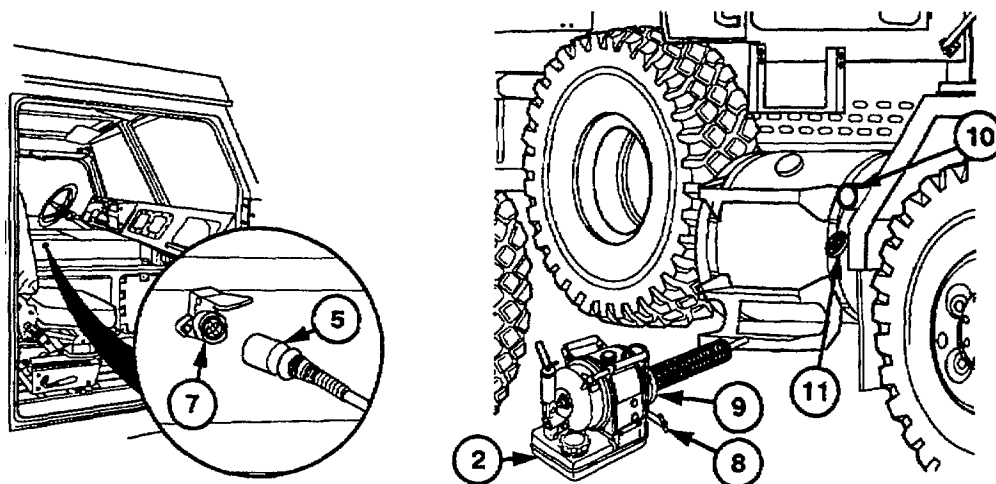


(1) Close fuel regulator valve (1) to shut off heater (2).

2-20. AUXILIARY EQUIPMENT OPERATION (CONT)



- (2) Flip switch (3) to the down position to turn off pump (4).
- (3) Remove cable (5) from heater receptacle (6).

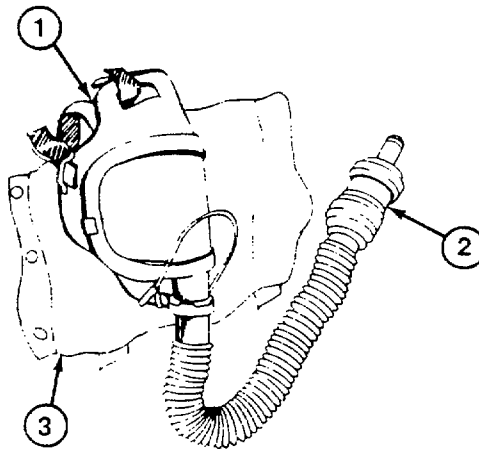


- (4) Remove cable (5) from vehicle receptacle (7).
- (5) Loosen wing nut (8) on heater (2) and clamp (9).

WARNING

Heater is very hot and can burn. Handle heater carefully to avoid personal injury.

- (6) Remove heater (2) from water jacket (10).
- (7) Install cap (11) on water jacket (10).

c. Gas Particulate Filter Unit (GPFU) Operation**WARNING**

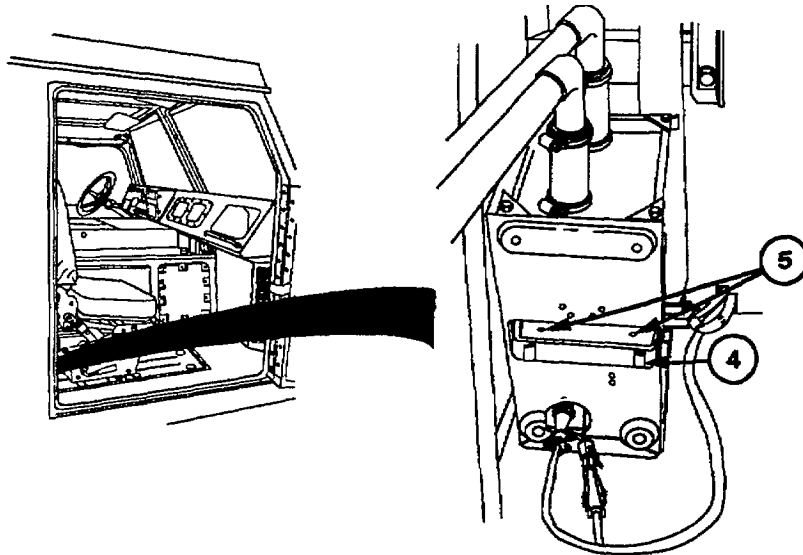
After Nuclear, Biological, or Chemical (NBC) exposure of HET Tractor, handle all air filters with extreme caution. Contaminated filters should be handled only by trained personnel. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. Wear protective mask, hood, protective overgarments, chemical protective gloves, and boots in NBC environments. Protective mask and filter unit will not protect against carbon monoxide.

NOTE

- The GPFU is designed to operate with the M25A1 or M42 protective mask.
- Do steps (1) thru (7) only when under NBC attack or when ordered to do so.
- For detailed information concerning protective mask, refer to TM 3-4240-280-10.

- (1) Remove protective mask (1) and canister (2) from pouch (3).
- (2) Put on protective mask (1).
- (3) Clear and seal protective mask (1).

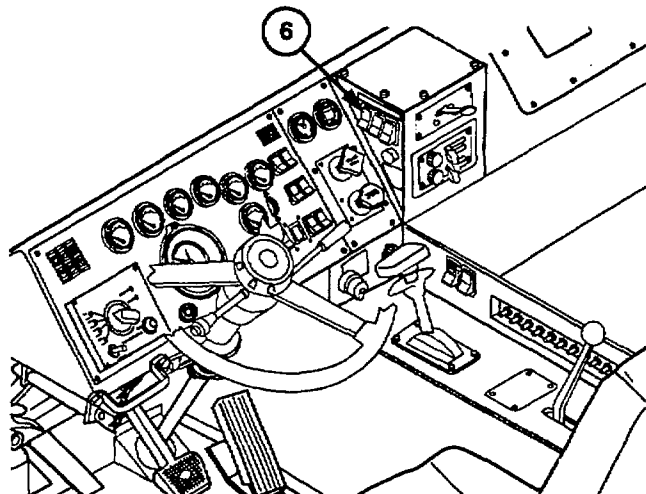
2-20. AUXILIARY EQUIPMENT OPERATION (CONT)



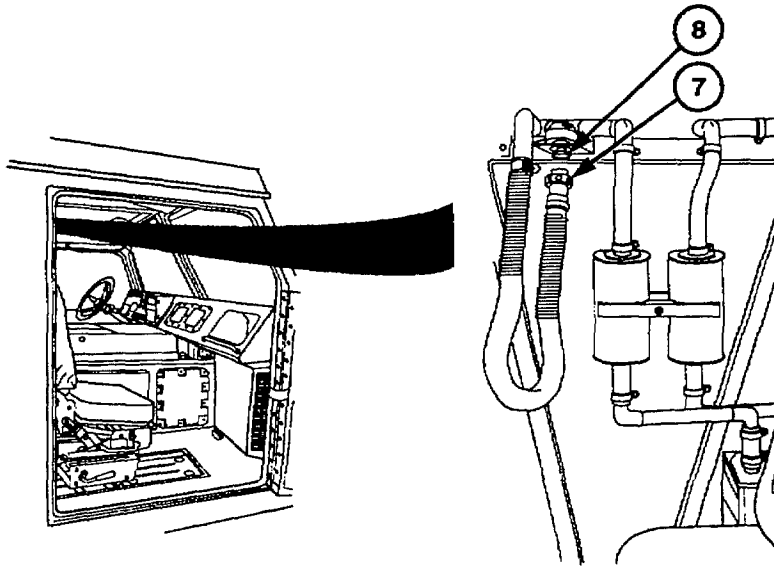
WARNING

Spring clip on filter assembly air intake must be pulled so intake holes are open for gas particulate filter system to work. Failure to pull out clip may result in death to personnel.

- (4) Pull out on spring clip (4) to uncover intake holes (5).



- (5) Press GAS PART (particulate) FILTER switch (6) on position.

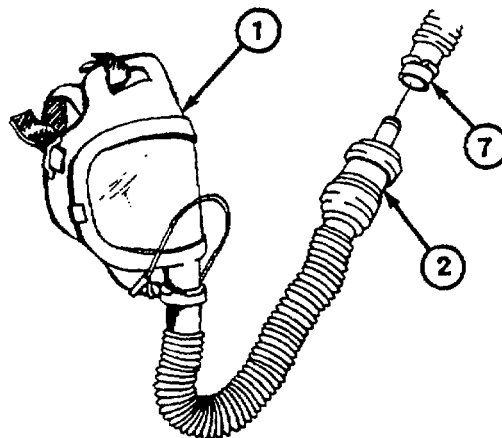


RIGHT SIDE SHOWN

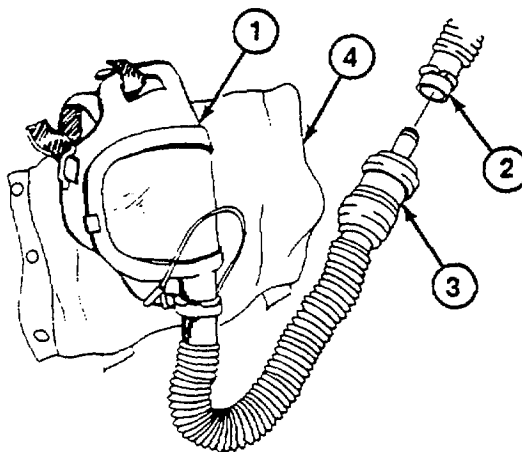
NOTE

Three hoses are located on left cab wall behind driver's seat. Two hoses are located on right cab wall behind passengers seat.

- (6) Disconnect air duct hose breakaway socket (7) from mount (8).

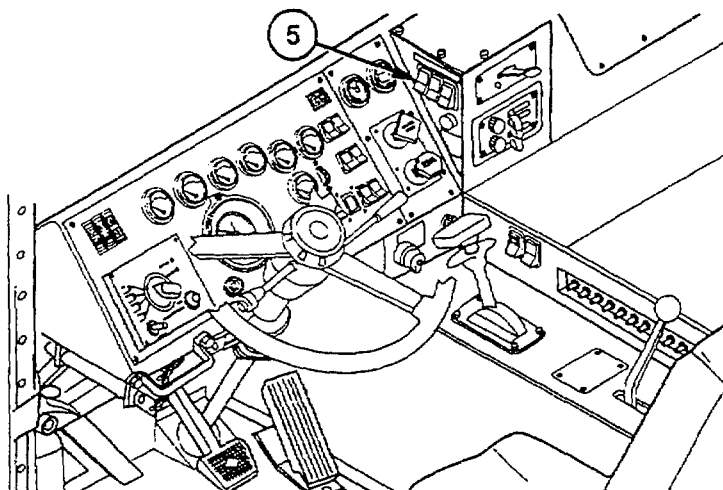


- (7) Connect air duct hose breakaway socket (7) to canister (2) of protective mask (1) and breathe through mask.

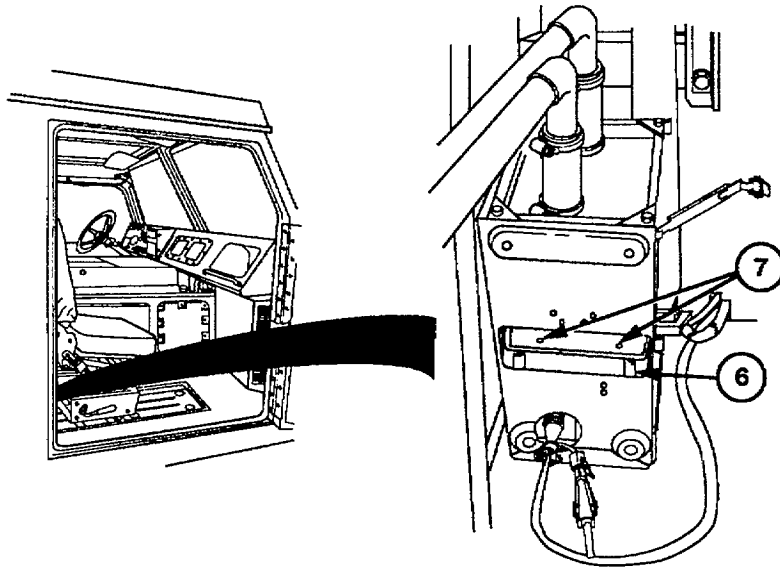
2-20. AUXILIARY EQUIPMENT OPERATION (CONT)**d. Gas Particulate Filter Hose Removal and Stowage****NOTE**

Do steps (1) thru (5) only when NBC attack is over or when ordered to do so.

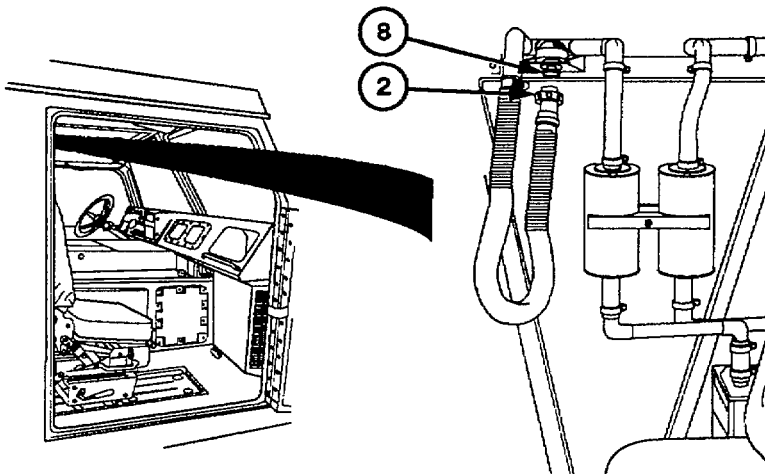
- (1) When protective mask (1) is no longer needed, disconnect air duct hose breakaway socket (2) from canister (3).
- (2) Remove mask (1) and place in pouch (4).



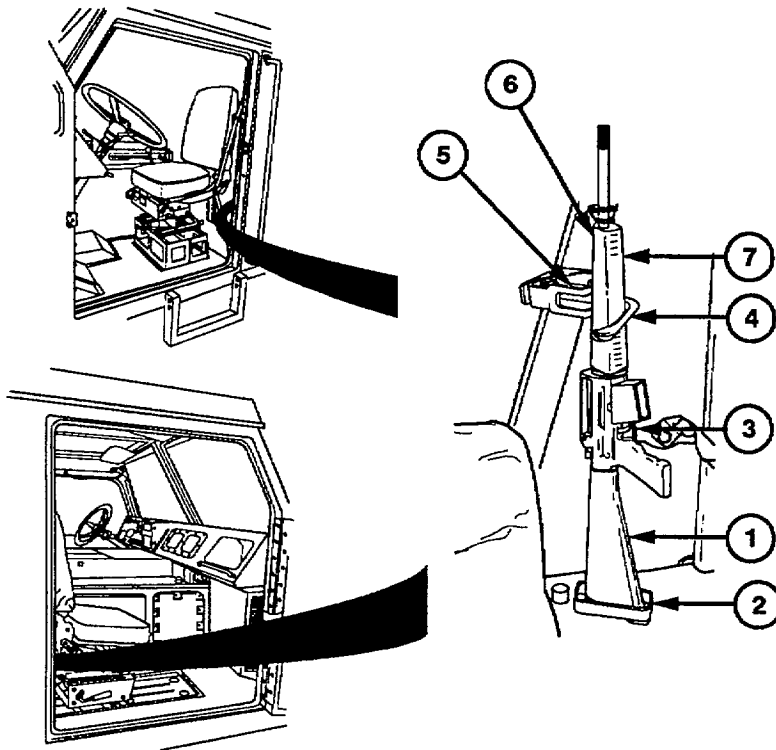
- (3) Press GAS PART (particulate) FILTER switch (5) to off position.



(4) Push in on spring clip (6) to cover intake holes (7).



(5) Connect air duct hose breakaway socket (2) to mount (8).

2-20. AUXILIARY EQUIPMENT OPERATION (CONT)**e. Rifle Stowage in Stowage Mount****NOTE**

There are two rifle mounts. Both are used the same way.

- (1) Position rifle butt (1) in lower support (2) with trigger guard (3) toward rear.
- (2) Pull handle (4) of top mount (5) out and toward middle of cab.
- (3) Place rifle heat guard (6) in top mount (5).
- (4) Push handle (4) across heat guard (6).
- (5) Ensure rifle (7) is held tightly in mount.

f. Rifle Removal from Stowage Mount

- (1) Pull handle (4) of top mount (5) out and toward outside of cab.
- (2) Remove rifle heat guard (6) from top mount (5).
- (3) Remove rifle butt (1) from lower support (2).

g. Chemical Alarm Kit Operation

Refer to TM 3-6665-225-12 for operating instructions.

h. Decontamination Kit Operation

Refer to TM 3-4320-214-12&P for operating instructions.

i. Radio Operation

Refer to TM 11-5820-401-10-(AN/VRC-46) or TM 11-5820-890-10-1 (AN/VRC-90) for operating instructions.



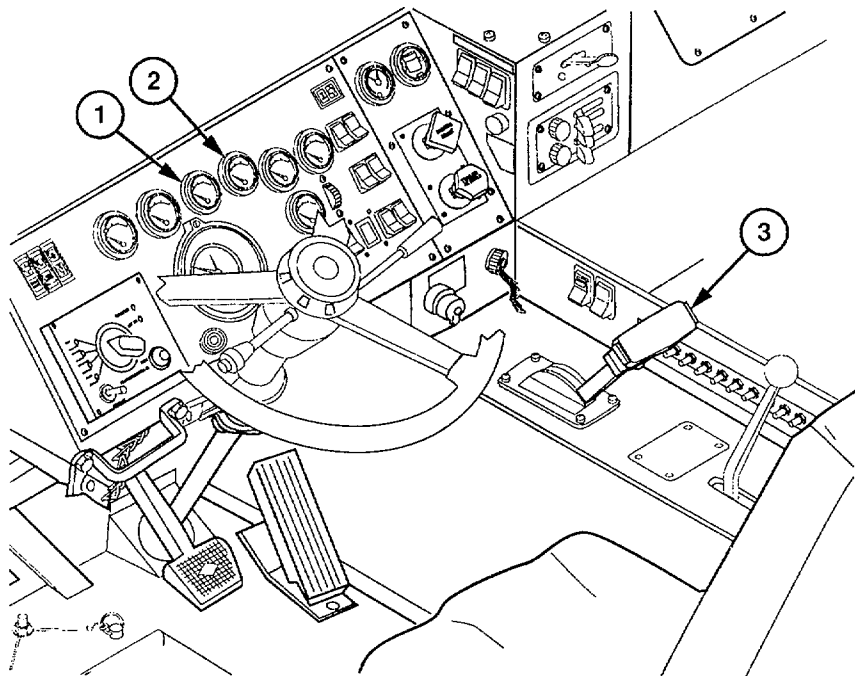
Section IV. OPERATION UNDER UNUSUAL CONDITIONS

This section provides instructions to operate HET Tractor and its auxiliary equipment under extreme and unusual conditions. Special maintenance instructions are provided for these conditions.

2-21. OPERATION IN EXTREME HEAT

CAUTION

- **When operating in temperatures above 100°F (38°C), extra care must be taken to prevent overheating engine (temperatures over 210°F (100°C)), transmission (temperatures over 250°F (121°C)), and transfer case (temperatures over 250°F (121°C)). Watch WATER TEMP gage, TRANS TEMP gage, and T-CASE TEMP gage close.**
 - **Check oil levels often and keep operating strain to a minimum. HET Tractor cooling and lubrication systems support each other. Failure of one system will rapidly cause failure of other system.**
 - **Idling the engine cools the engine faster than quick shutdown and may prevent damage from engine heat.**
- a.** Keep engine operating strain to a minimum.
- (1) Set transmission range selector to N (neutral) position while engine is running. Idle engine for approximately 2 minutes before shutting engine down.
 - (2) Use low gear ranges only when necessary.
- b.** Check oil levels often. Oil seals are more likely to leak in extremely hot weather.



c. When TRANS TEMP gage (1) or T-CASE (transfer) TEMP gage (2) reads higher than 250°F (121°C):

- (1) Shift transmission range selector (3) to lower gear range and continue operation.
- (2) Stop HET Tractor and let transmission/transfer case cool if TRANS TEMP gage (1) or T-CASE TEMP gage (2) does not return to normal range.
- (3) Shift to normal gear range and continue operation when TRANS TEMP gage (1) and T-CASE TEMP gage (2) read in normal range.

d. Check cooling system; notify unit maintenance if any of the following are found:

- (1) Leaky hose connections that have been tightened but still leak.
- (2) Loose fan belt.
- (3) Cracked or leaking hoses.
- (4) Radiator fins plugged with dust, leaves, or insects.

2-21. OPERATION IN EXTREME HEAT (CONT)**NOTE**

Batteries do not hold charge well in extreme heat. Battery specific gravity must be changed to adjust for heat. Refer to TM 9-6140-200-14 for battery care.

- e. Keep batteries filled to the bottom of the split ring.
- f. In hot, damp climates check body and chassis often; notify unit maintenance if any of the following are found:
 - (1) Signs of pitting or paint blistering on metal surfaces.
 - (2) Signs of mildew, mold, or fungus on fabrics and rubber.

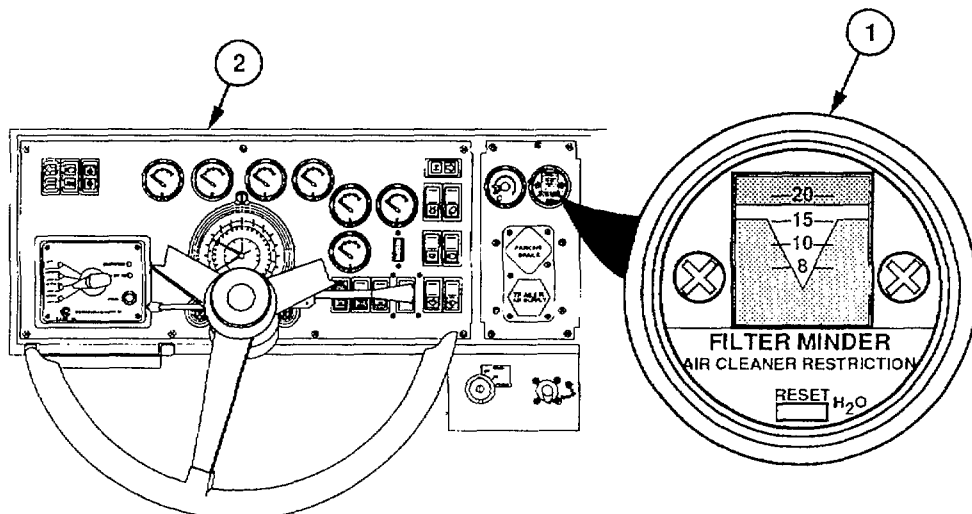
2-22. OPERATION IN EXTREME DUST**CAUTION**

Blowing dust can scratch glass surfaces. Keep glass surfaces covered with tarpaulin as much as possible in these conditions to prevent scratching.

NOTE

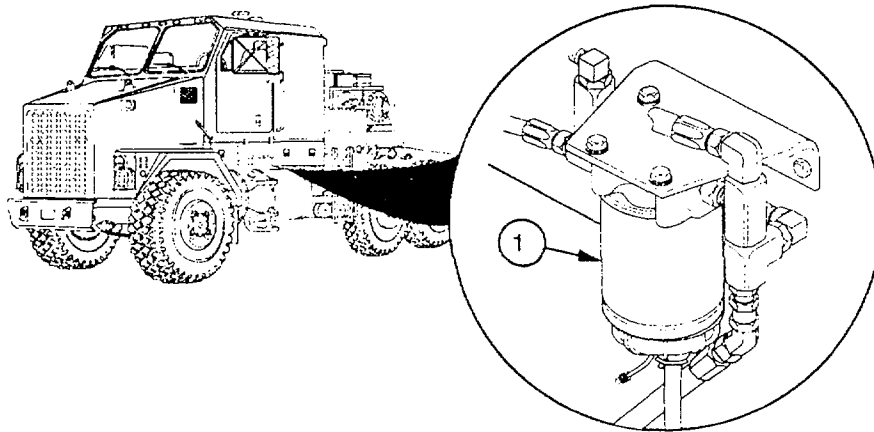
Take extra care when cleaning glass to prevent scratching surfaces.

- a. Leave glass surfaces covered if not needed for operations.



- b. Check AIR CLEANER RESTRICTION indicator (1) frequently. Shut down engine immediately when yellow diaphragm enters red zone. Check other gages and indicator lights on main instrument panel (2) to be sure dust does not affect equipment.

c. Allow as much distance as reasonable between vehicles and operate at low speeds to reduce impaired vision, vehicle overheating, or possible clogging of air filter.



d. Check and drain fuel/water separator (1) if water is present in bowl.

e. Park HET Tractor so it does not face into wind when possible to prevent sand and dust from damaging the vehicle.

f. Cover air intake, radiator, and cab with tarpaulin during extended shutdown.

2-23. OPERATION IN SAND OR MUD**WARNING**

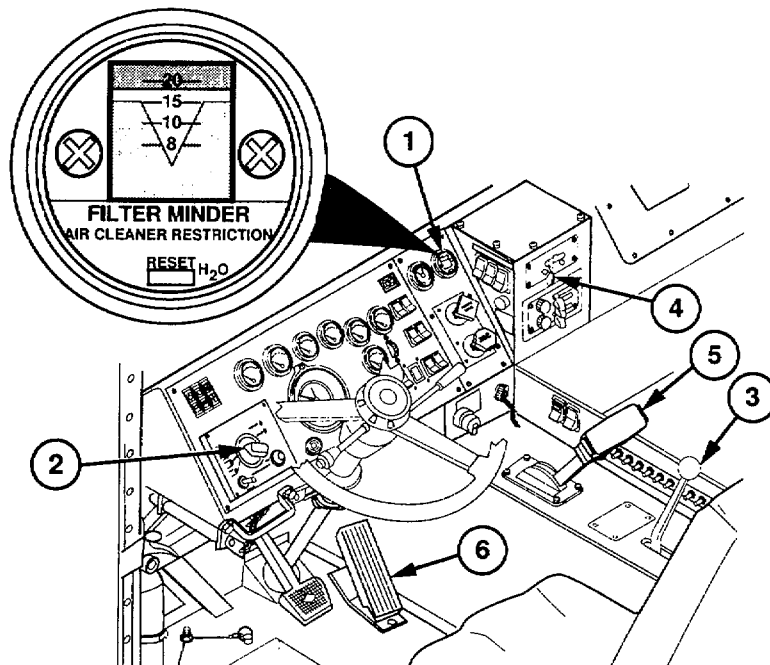
Operating in mud causes brake linings to get wet and can impair HET Tractor braking. If braking is impaired while operating in mud, dry brakes by driving HET Tractor about 500 ft (150 m) while applying service brakes frequently. This must be done with brake drums totally out of mud so that drying action can take place. If adequate braking is not restored by drying brakes, injury to personnel and damage to equipment may result.

CAUTION

Blowing sand can scratch glass surfaces. Keep glass surfaces covered with tarpaulin as much as possible in these conditions to prevent scratching.

NOTE

- Driving on sand at night or early morning when sand is damp is desirable. Damp sand gives better traction.
 - Take extra care when cleaning glass to prevent scratching surfaces.
- a. Leave glass surfaces covered if not needed for operations.



b. Check AIR CLEANER RESTRICTION indicator (1) frequently. Shut down engine immediately when yellow diaphragm enters red zone. Check other gages and indicator lights on main instrument panel to be sure dust does not affect equipment.

c. Set central tire inflation system (CTIS) rotary selector switch (2) to CROSS COUNTRY position (para 2-13).

CAUTION

Avoid using LOW transfer case with selector in 1 (first range). If using LOW transfer case & 1 (first range), do not exceed 1200 RPM when starting from a stop. If the tractor does not move prior to reaching 1200 RPM, do not continue to increase engine RPM. Failure to comply may result in driveline damage.

d. Set TRANSFER CASE shift lever (3) to LOW position.

e. Accelerate slowly so tires do not spin and dig into sand or mud. Set CTIS switch (2) to MUD, SAND & SNOW position if tires spin (para 2-13).

f. Set DRIVELINE control (4) to LOCK position for added tire traction.

CAUTION

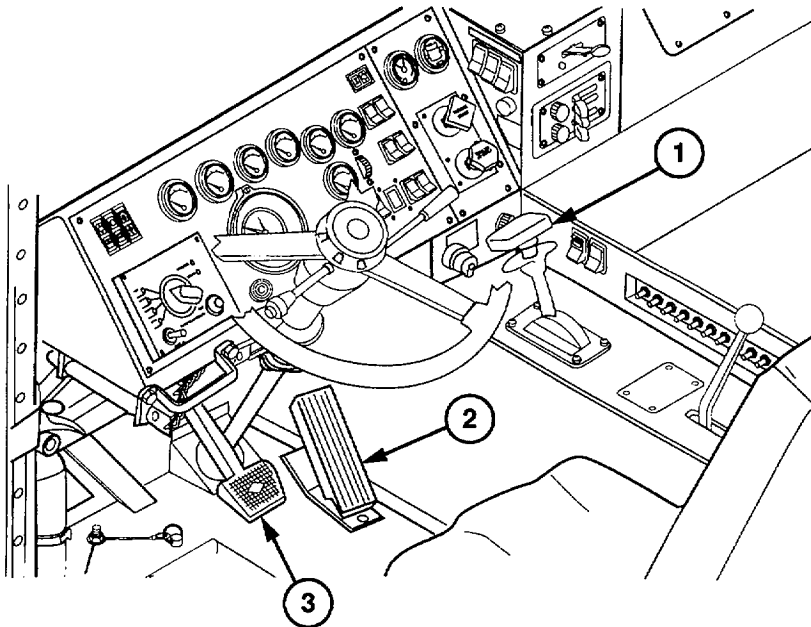
Do not downshift into 1 (first range), with transfer case in LOW, while engine speed is above 1200 RPM. Failure to comply may result in driveline damage.

g. Shift transmission range selector (5) to lower gear range for added tire traction.

NOTE

- **Do not straddle or drive on sides of sand mounds. Loose sand will not support HET Tractor on steep slopes.**
- **Drive HET Tractor slowly when in loose sand or mud to avoid becoming stuck.**

h. Keep accelerator pedal (6) steady after HET Tractor reaches desired speed.

2-23. OPERATION IN SAND OR MUD (CONT)**WARNING**

Avoid driving diagonally across a hill. HET Tractor may roll, causing injury or death to personnel and equipment damage.

NOTE

Steer HET Tractor straight up and down hills when possible. When necessary to drive across a hill, choose lowest angle possible, keep HET Tractor moving, and avoid quick, sharp turns.

- i. To move HET Tractor forward and turn after HET Tractor is stuck in loose sand or mud:
 - (1) Set transmission range selector (1) to R (reverse) position.
 - (2) Press accelerator pedal (2) and move HET Tractor straight back about 20 ft (6 m).
 - (3) Release accelerator pedal (2). Press brake pedal (3).

CAUTION

Avoid using LOW transfer case with transmission selector in 1 (first range). If using LOW transfer case & 1 (first range), do not exceed 1200 RPM when starting from a stop. If the tractor does not move prior to reaching 1200 RPM, do not continue to increase engine RPM. Failure to comply may result in driveline damage.

- (4) Set transmission range selector (1) to 1 position.
- (5) Release brake pedal (3). Press accelerator pedal (2) to move HET Tractor forward slowly then increase speed gradually.
- (6) Turn HET Tractor gradually to avoid oversteering the vehicle.
- (7) Set transmission range selector (1) to 2-5 position when HET Tractor picks up speed and is moving forward smoothly.

j. If HET Tractor starts to skid:

- (1) Release accelerator pedal (2).
- (2) Steer in direction of skid until HET Tractor stops skidding.
- (3) Press brake pedal (3) lightly when HET Tractor is under control.
- (4) Press accelerator pedal (2) slowly and steer HET Tractor on straight course.

k. To park HET Tractor:

- (1) Park HET Tractor so it does not face into wind when possible to avoid glass surfaces being scratches by sand, dust, and damage to radiator.
- (2) Clean mud off HET Tractor as soon as possible to avoid damage to paint.

CAUTION

- **Do not hit axle breathers when cleaning mud from axles. Damage to axle breathers could result.**
- **Do not direct high-pressure water stream at glass surfaces, seals, air intake, axle breathers, exhaust outlet, or any other component of HET Tractor that could be easily damaged by high-pressure water stream.**

NOTE

Ensure axle breather vent caps move freely on breather body.

- (3) Clean mud from wheels, brakes, axles, universal joints, steering mechanism, and radiator as soon as possible.

2-24. OPERATION IN DESERT ENVIRONMENT

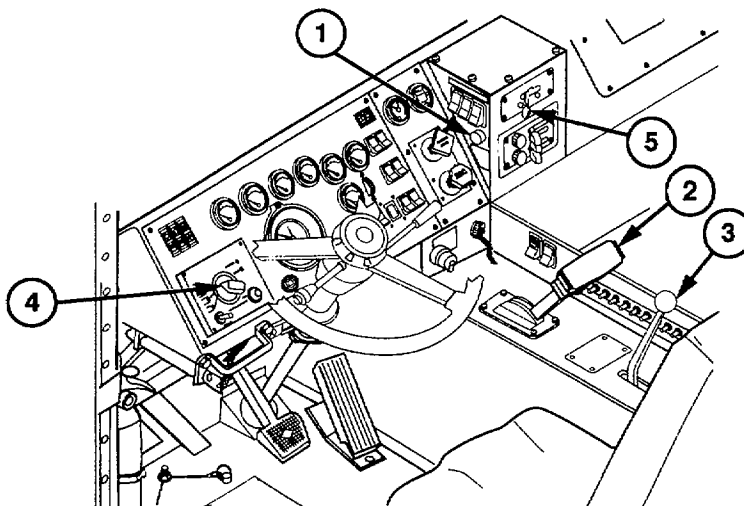
- a. Principles of operating in extreme heat, extreme dust, and in sand or mud apply to desert environment operation (para 2-21 thru 2-23).
- b. Temperatures can change as much as 70°F (40°C) between day and night. These changes can damage equipment if HET Tractor is no properly prepared.
 - (1) Due to expansion and contraction of all fluids and air, care should be taken when filling fuel tanks and fluid reservoirs to prevent overflow when temperatures change.
 - (2) Precision instruments can be affected by temperature changes and may need adjustment more often.
- c. FM 90-3 contains detailed instructions for living and working in desert.

2-25. OPERATION IN COLD ENVIRONMENT -25 to 32°F (-32 to 0°C)**WARNING**

When operating HET Tractor on snow or ice, be sure to remove all snow and ice from footwear, brake pedal, and accelerator pedal. Serious injury to personnel and damage to HET Tractor may result of feet slip from controls during operation.

CAUTION

- Drain fuel/water separator before topping off fuel tanks. Keep fuel tanks full during cold environment operations. Water forms in empty tanks as it cools. Water in fuel system can freeze and block fuel flow to engine. Damage to equipment may result.
- Special care must be used during cold environment operations. In severe cold, engine coolant, and windshield washer fluid can freeze. Batteries can freeze and crack. Oil and grease may get thick and stiff. Rubber will easily crack. Damage to equipment may result.
- Do not force dipstick removal in cold environment. Wait 3 to 5 minutes after loosening dipstick before attempting to remove. Failure to comply may result in damage to equipment.



NOTE

Prepare HET Tractor as described in FM 9-207 before operating in cold environment. Refer to FM 31-70, FM 31-71, and FM 21-305 for additional information on operation in cold environment

- a. Use ETHER START control (1) to start engine (para 2-12).

CAUTION

Before using winch system, hydraulic oil must be warmed whenever temperatures are below 32°F (0°C). Failure to comply may result in damage to winch pump.

- aa. Warm up winch system before operating.

- (1) Start engine (para 2-12).
- (2) Engage power takeoff (para 2-19).
- (3) Operate at idle for 15 minutes.
- (4) Engage high idle for 10 minutes (para 2-19).
- (5) Disengage high idle (para 2-19).
- (6) Pay winch cable out and in one drum revolution on all three winches (para 2-19).
- (7) Resume normal winch operations (para 2-19).

- ab. Drive HET Tractor 3-5 miles (5-8 km) before activating CTI system.

NOTE

The CTI system should be in ON position only when parked during cold start in cold environments. CTI will adjust tire pressures during warm up period while HET Tractor is parked.

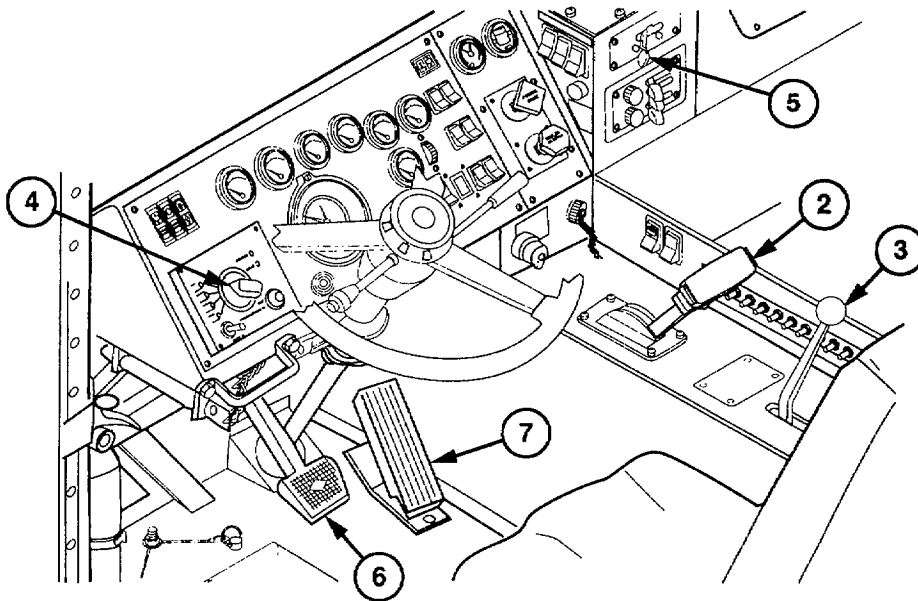
- (1) Move CTI switch to OFF position before moving HET Tractor (para 2-13).
- (2) Drive HET Tractor 3-5 miles (5-8 km).
- (3) Move CTI switch to ON position and select appropriate terrain position (para 2-13).

CAUTION

Avoid using LOW transfer case with transmission selector in 1 (first range). If using LOW transfer case & 1 (first range), do not exceed 1200 RPM when starting from a stop. If the tractor does not move prior to reaching 1200 RPM, do not continue to increase engine RPM. Failure to comply may result in driveline damage.

- b. Set transmission range selector (2) to 1 position and TRANSFER CASE shift lever (3) to HIGH position. Drive HET Tractor at the lowest possible speed to warm driveline components and tires.

2-25. OPERATION IN COLD ENVIRONMENT -25 to 32°F (-32 to 0°C)(CONT)
--

**WARNING**

Reduce speeds when operating on snow or ice. Provisions must be made for increased stopping distances. Failure to reduce speed and provide a greater stopping distance may result in personnel injury or death and cause damage to HET Tractor.

c. When driving on snow, ice, and slippery surfaces:

- (1) Set CTIS rotary selector switch (4) to CROSS COUNTRY (para 2-13).
- (2) Set TRANSFER CASE shift lever (3) to LOW.
- (3) Accelerate slowly so tires do not spin. Set CTIS switch (4) to MUD, SAND & SNOW if tires spin (para 2-13).
- (4) Set DRIVELINE control (5) to LOCK for added tire traction.

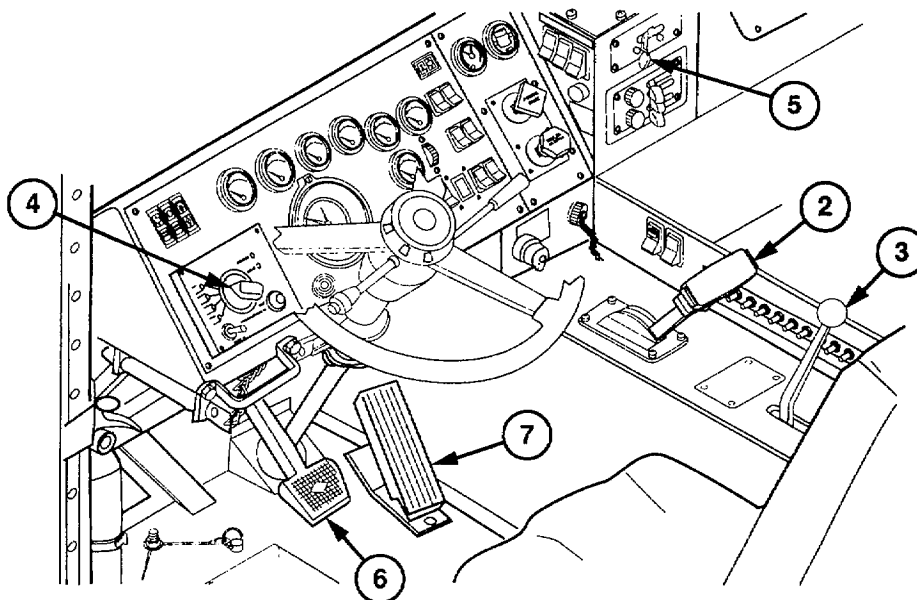
- (5) Shift transmission range selector (2) to lower gear range for added tire traction.

WARNING

Avoid driving diagonally across a hill. HET Tractor may roll causing injury or death to personnel and equipment damage.

- (6) Steer HET Tractor straight up and down hills when possible. When necessary to drive across a hill, choose lowest angle possible. Keep HET Tractor moving. Avoid quick, sharp turns.

2-25. OPERATION IN COLD ENVIRONMENT, -25 to 32°F (-32 to 0°C)(CONT)

**WARNING**

- Do not use engine brake retarder in wet, slick, or icy road conditions. Failure to comply may result in loss of vehicle control. Personnel injury or death may result.
- To stop on snow or ice, pump brakes gradually. Continuous braking can cause wheels to lock and HET Tractor to slide out of control. Injury or death to personnel and damage to HET Tractor may result.
- When operating HET Tractor on snow or ice, be sure to remove all snow and ice from footwear, brake pedal and accelerator pedal. Serious personnel injury and damage to HET Tractor can result if feet slip from controls during operation.

(7) Pump brake pedal (6) gradually to slow or stop HET Tractor.

CAUTION

Do not downshift into 1 (first range), with transfer case in LOW, while engine speed is above 1200 RPM. Failure to comply may result in driveline damage.

(8) Downshift transmission range selector (2) to slow HET Tractor if required.

e. Drive slowly and test brakes after driving through slush or water if brakes slip:

- (1) Continue to drive slowly.
- (2) Apply moderate pressure on brake pedal (6) to cause slight brake drag.
- (3) Let up on brake pedal (6) when brakes dry and no longer slip.
- (4) Resume normal driving speed.

f. If HET Tractor starts to skid:

- (1) Release accelerator pedal (7).
- (2) Steer in direction of skid until HET Tractor stops skidding.
- (3) Press brake pedal (6) lightly when HET Tractor is under control.
- (4) Press accelerator pedal (7) slowly Steer HET Tractor on straight course.

g. If HET Tractor starts to slide while climbing hill:

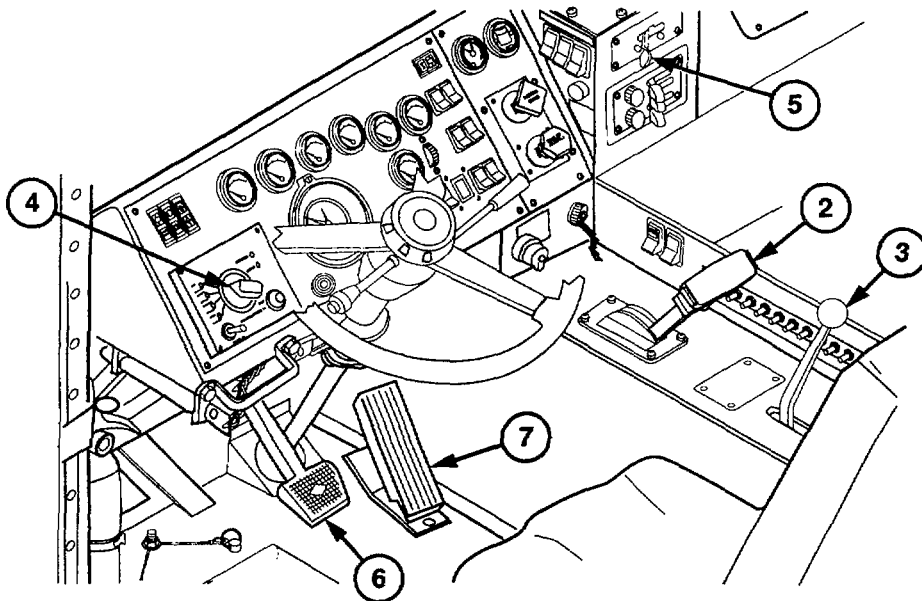
- (1) Release accelerator pedal (7).
- (2) Steer in direction of slide until HET Tractor stops.
- (3) Press accelerator pedal (7) slowly. Steer HET Tractor on straight course.

h. If HET Tractor becomes stuck:

CAUTION

Avoid using LOW transfer case with transmission selector in 1 (first range). If using LOW transfer case & 1 (first range), do not exceed 1200 RPM when starting from a stop. If the tractor does not move prior to reaching 1200 RPM, do not continue to increase engine RPM. Failure to comply may result in driveline damage.

- (1) Shovel clear path ahead of each wheel. Put boards, brush, mats, canvas, or similar material in cleared paths to get better tire traction.
- (2) Set CTIS rotary selector switch (4) to MUD, SAND & SNOW position (para 2-13).
- (3) Set TRANSFER CASE shift lever (3) to LOW position.
- (4) Set DRIVELINE control (5) to LOCK position.
- (5) Set transmission range selector (2) to 1 position.
- (6) Accelerate slowly so tires do not spin.
- (7) If HET Tractor remains stuck, set CTIS rotary selector switch (4) to EMERGENCY position.
- (8) Use another vehicle to recover.



i. To park HET Tractor:

- (1) Park HET Tractor so it does not face into wind when possible.
- (2) Park HET Tractor on dry ground when possible. Place wood planks, brush, mats, or canvas under tires if dry ground is not available.

NOTE

Do not apply parking brake in extremely cold weather. Brake shoes can freeze to brake drum. Ensure HET Tractor is parked on level terrain and wheels are chocked.

- (3) Park HET Tractor on level ground.
- (4) Set TRANSFER CASE shift lever (3) to LOW position.

2-25. OPERATION IN COLD ENVIRONMENT, -25 t 32°F (-32 to 0°C)(CONT)**CAUTION**

Do not hit axle breathers when cleaning mud, snow, and ice from axles. Damage to axle breathers could result.

NOTE

Ensure axle breather vent caps move freely on breather body.

- (5) Clean mud, snow, and ice from wheels, brakes, axles, universal joints, mirrors, steering mechanism, and radiator as soon as possible. Ensure all components are thoroughly dry after cleaning.

2-26. OPERATION IN EXTREMELY COLD ENVIRONMENT, -50 to -26°F (-46 to -32°C)**WARNING**

Do not touch extremely cold metal with bare skin. Bare skin may freeze to metal causing personnel injury.

CAUTION

- Drain fuel/water separator before topping off fuel tanks. Keep fuel tanks full during cold environment operations. Water forms in empty tanks as they cool. Water in system can freeze and block fuel flow to engine.
- Special care must be used during cold environment operations. In severe cold, engine coolant and windshield washer fluid can freeze. Batteries can freeze and crack. Oil and grease may get thick and stiff. Rubber will easily crack.
- Do not force dipstick removal in cold environment. Wait 3 to 5 minutes after loosening dipstick before attempting to remove. Failure to comply may result in damage to equipment.

NOTE

- Before operating HET Tractor in extremely cold environment, ensure engine arctic kit is installed.
- Prepare HET Tractor, as described in FM 9-207, before operating in cold environment. Refer to FM 31-70, FM 3-71, and FM 21-305 for additional information on operation in cold environment.

The **CHECK ENGINE** light may come on during cold starts in extremely cold environments. Typically, the light will come on 8 minutes after starting and go out 2-3 minutes later. If the light stays on longer than 15 minutes after starting, refer to troubleshooting.

- a. Principles of operating in cold environment (para 2-25) apply to extreme cold environment (para 2-26).
- b. Operate arctic kit for approximately 25 minutes to warm up engine (para 2-20).
- c. Idle engine rather than shutting it down during short stops.
- d. Deleted.

2-27. OPERATION IN FOREST OR UNEVEN TERRAIN

WARNING

Avoid driving diagonally across a hill. HET Tractor may roll causing injury or death to personnel and damage to equipment.

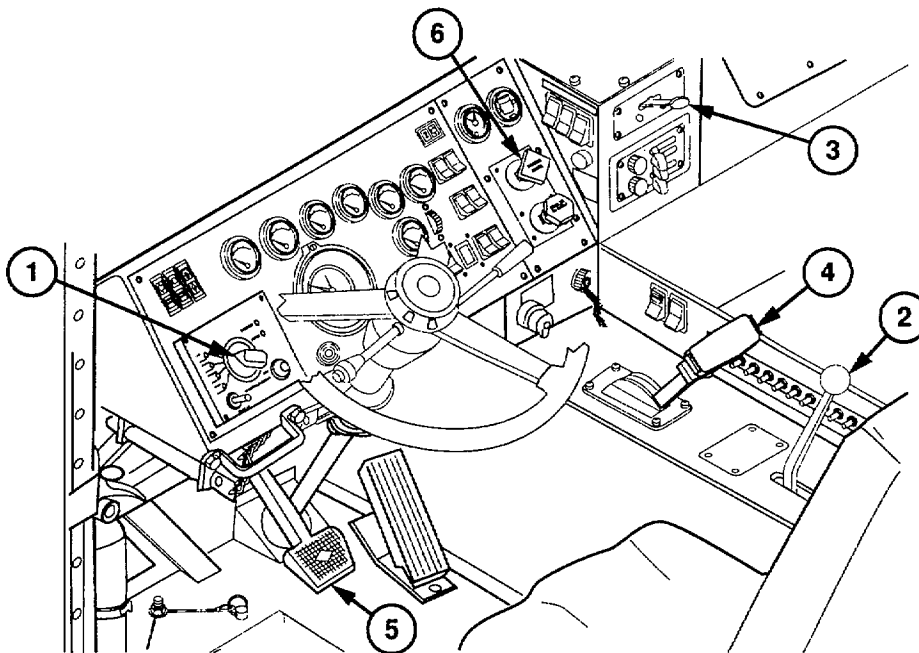
CAUTION

- **Ensure HET Tractor can clear ground obstructions, such as stumps and large rocks, before driving over. Stumps and rocks can damage component underneath HET Tractor.**
 - **Ensure HET Tractor can clear overhanging tree limbs and other obstructions. Low overhead obstructions can damage top of HET Tractor.**
- a. Avoid driving over ground obstruction when possible.
 - b. Avoid driving under low overhead obstructions when possible.
 - c. Steer HET Tractor straight up and down hills when possible. When necessary to drive across a hill, choose lowest angle possible. Keep HET Tractor moving. Avoid quick, sharp turns. Left fuel shutoff valve should be closed while driving across hill when left side of truck is higher than right.
 - d. Check tire traction and braking. Rocks and fallen leaves can be very slippery, especially when wet.
 - e. Ensure tire and spare wheel are in good condition when driving over rocky terrain. Tire punctures are more likely to occur when operating on rocky terrain.

2-28. FORDING WATER OBSTACLES**CAUTION**

Do not ford water unless depth is known. Fording water deeper than 28 in. (71 cm) will cause equipment damage.

- a. Ensure depth of water is not deeper than 28 in. (71 cm).
- b. Ensure bottom of fording site is firm enough so that HET Tractor will not become stuck.
- c. Stop HET Tractor at edge of water.
- d. If brakes have been used heavily and are hot, allow drums and shoes to cool before entering water if possible.
- e. Ensure HET Tractor is operating correctly before entering water.



- f. Set CTIS rotary selector switch (1) to EMERGENCY position (para 2-13).
- g. Set TRANSFER CASE shift lever (2) to LOW position.
- h. Set DRIVELINE control (3) to LOCK position.

CAUTION

Avoid using LOW transfer case with transmission selector in 1 (first range). If using LOW transfer case & 1 (first range), do not exceed 1200 RPM when starting from a stop. If the tractor does not move prior to reaching 1200 RPM, do not continue to increase engine RPM. Failure to comply may result in driveline damage.

- i. Set transmission range selector (4) to 2 position.

CAUTION

Limit HET Tractor speed to 3 or 4 mph (5 or 6 km/h) during fording operations. Failure to do this will result in equipment damage.

- j. Drive HET Tractor slowly into water. Keep speed steady while fording water. Do not stop unless absolutely necessary.

- k. Restart engine immediately if it stalls. If engine will no start, tow or winch HET Tractor from water with another vehicle as soon as possible.

- l. If HET Tractor accidentally enters water deeper than 28 in. (71 cm):

- (1) Press brake pedal (5) until HET Tractor stops.
- (2) .Set transmission range selector (4) to R (reverse) position.
- (3) Let up on brake pedal (5).
- (4) Slowly back HET Tractor out of deep water.

WARNING

Do not rely on service brakes after fording water. Wet brakes may not stop HET Tractor. Injury or death to personnel may result.

- m. After leaving water, press brake pedal (5) lightly and hold while driving slowly to dry out brake linings.

- n. Stop HET Tractor when clear of fording area.

- o. Apply and release PARKING BRAKE control (6) several times to remove water from brake components.

CAUTION

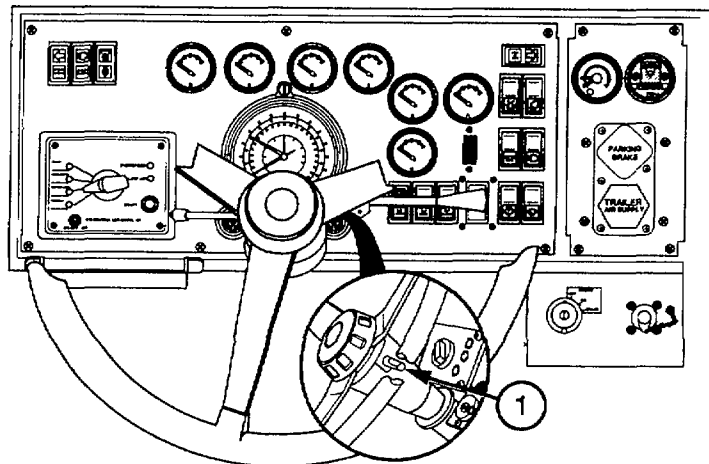
Sat water is corrosive and will damage HET Tractor parts that it contacts. HET Tractor parts that come in contact with salt water must be washed.

- p. Remove water and clean foreign deposits from all HET Tractor parts as soon as possible.

2-29. SET UP/SECURING OF HIGHWAY EMERGENCY MARKING KIT

NOTE

Highway emergency marking kit is used to mark location of stopped/disabled vehicle and to caution oncoming traffic.

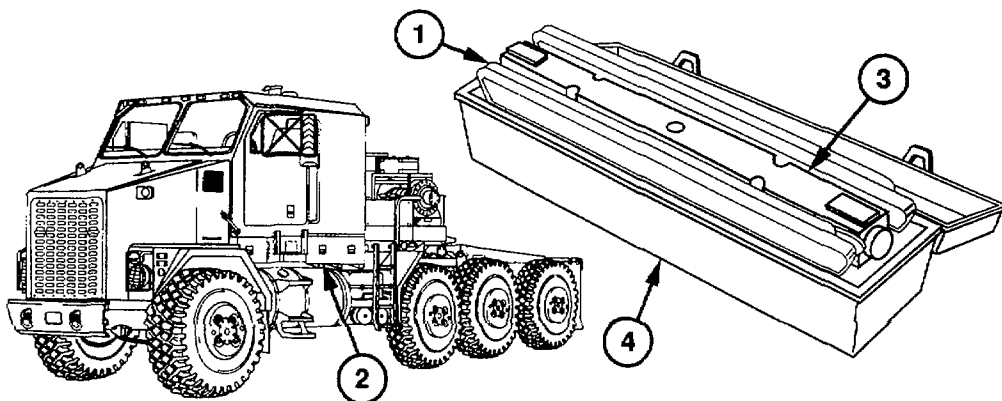


- a. Push in emergency flasher control (1).

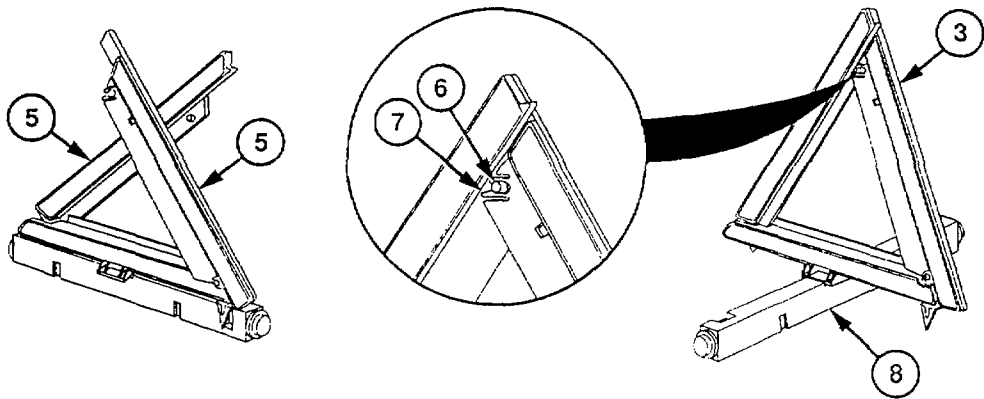
WARNING

Be aware of traffic when exiting HET Tractor. Serious injury or death may occur if struck by traffic.

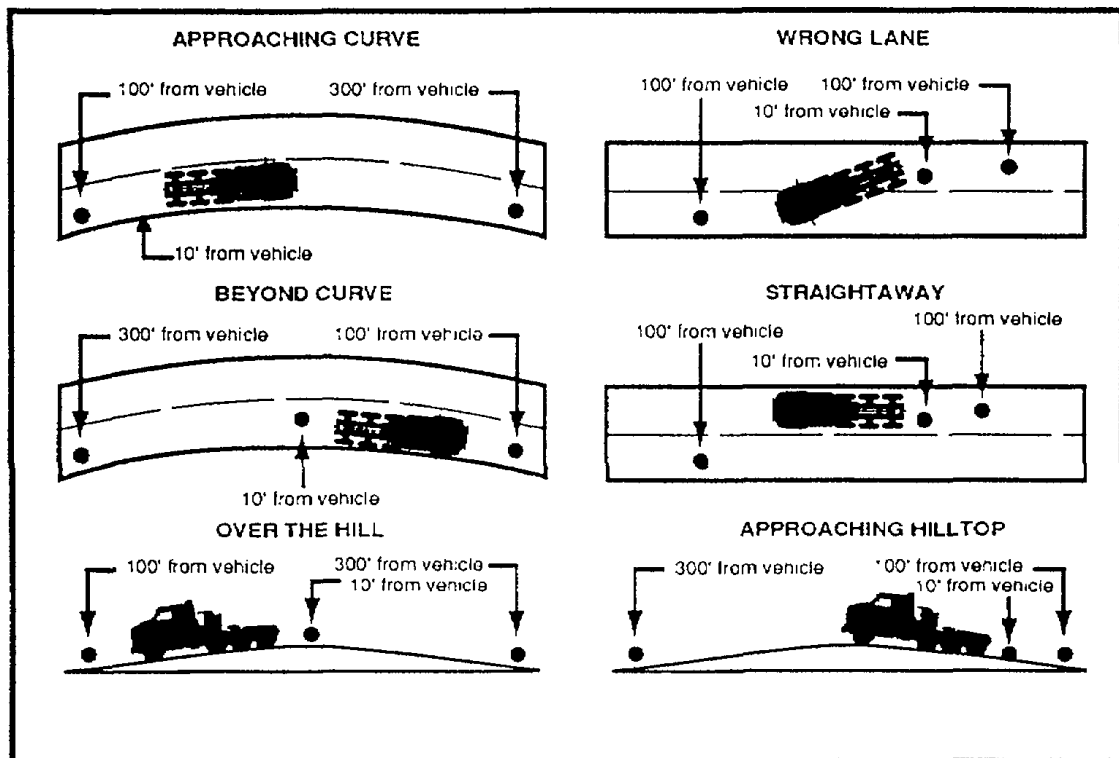
- b. Prepare each marker for use.



- (1) Remove emergency marking kit (1) from storage box (2).
- (2) Remove markers (3) from case (4).



- (3) Raise arms(5).
- (4) Overlap ends and snap pin (6) into slot (7).
- (5) Rotate marker (3) about 1/4 turn on base (8) until it stops.

2-29. SET UP/SECURING OF HIGHWAY EMERGENCY MARKING KIT (CONT)


- c. To place markers on highway during the time lights are required (sunset to sunrise).

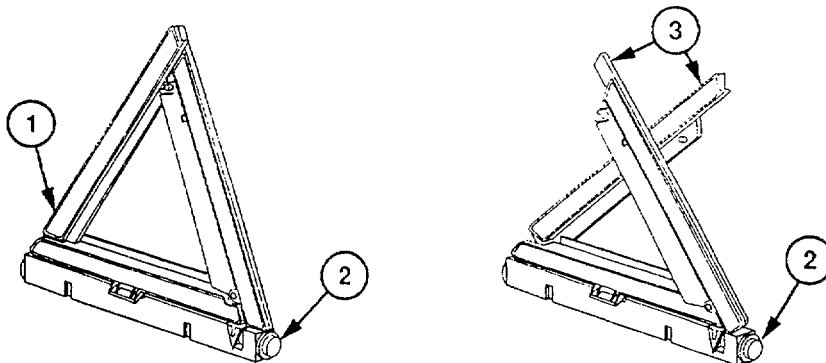
Place a reflector in the obstructed lane or on shoulder of road if the vehicle is on or over the shoulder at a point between the vehicle and the approaching traffic using that lane. Do this before making any attempt to repair the vehicle. Place the reflectors in the following manner:

- Place one reflector in the center of the lane of traffic occupied by the vehicle not less than 40 paces (approximately 100 ft (30 m)) from the vehicle in the direction of traffic approaching in that lane. If the vehicle is on or over the shoulder and does not occupy a traffic lane, place warning device alongside the edge of the roadway to avoid obstructing the traffic lane.
- Place one reflector on the traffic side of the vehicle 4 paces (approximately 10 ft (3 m)) to the rear of the vehicle in the direction in which traffic using that lane will approach.

- (c) Place one reflector not less than 40 paces (100 ft 30 m)) from vehicle in the opposite direction.
 - (d) If the motor of the vehicle is stopped within 300 ft (90 m)) of a curve, crest of a hill, or other obstruction to view, one reflector not less than 40 paces (10 ft 3 m)) not more than 120 paces (300 ft (90 m)) from the vehicle to afford ample warning to other users of the highway.
- d. To place markers on highway during the time lights are not required (sunrise to sunset)

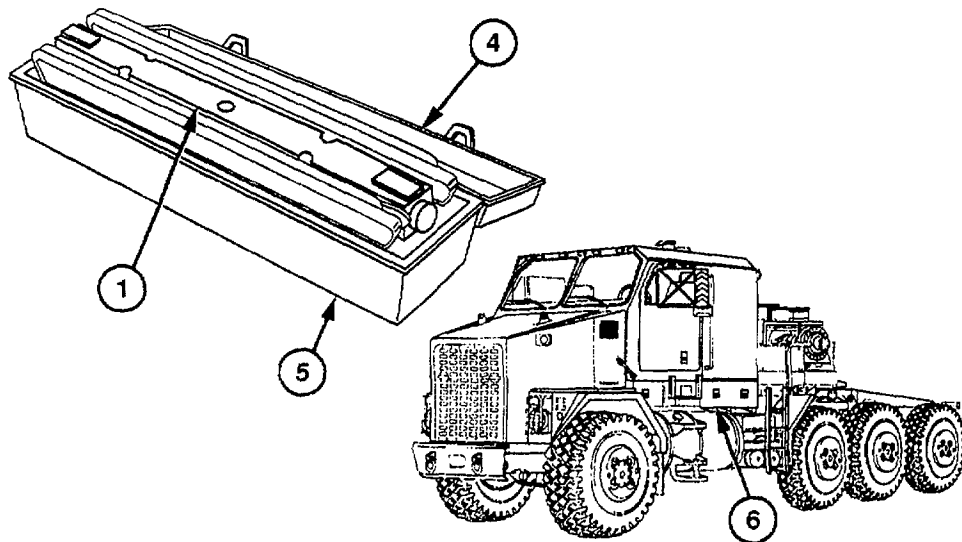
Place red flags or reflectors with flats mounted on them as prescribed for night except that since most warning kits contain only two flags, the reflector placed 10 ft (3 m) behind the vehicle will have not flag mounted on it.

- e. To stow markers:

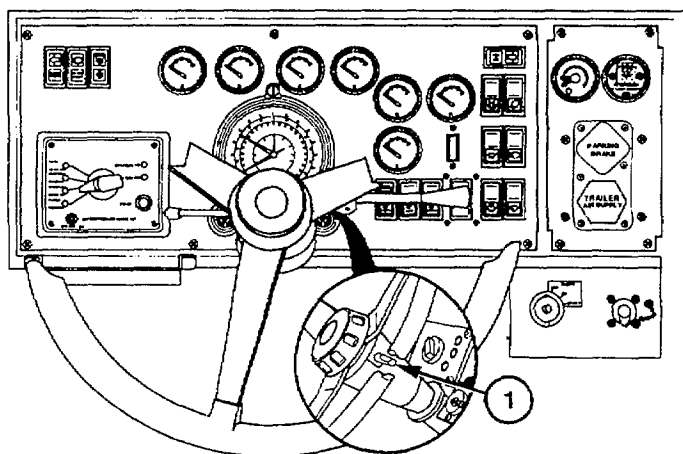


- (1) Rotate marker (1) over base (2).
- (2) Separate arms (3).
- (3) Fold arms (3) down onto base (2).

2-29. SET UP/SECURING OF HIGHWAY EMERGENCY MARKING KIT (CONT)



- (4) Put markers (1) in case (4).
- (5) Put emergency marking kit (5) in stowage box (6).



- f. Pull out emergency flasher control (1) when emergency flashers are no longer needed.

2-29.1. TIRE CHAIN INSTALLATION/REMOVAL**a. Install Tire Chains.****WARNING**

Do not back up without a ground guide. The location of the ground guide must be known at all times. Limited vision can lead to equipment damage and injury to personnel.

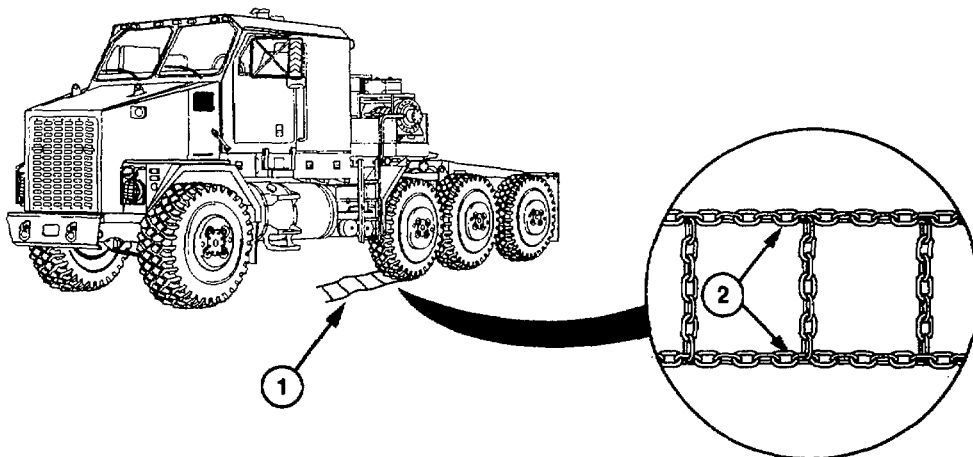
CAUTION

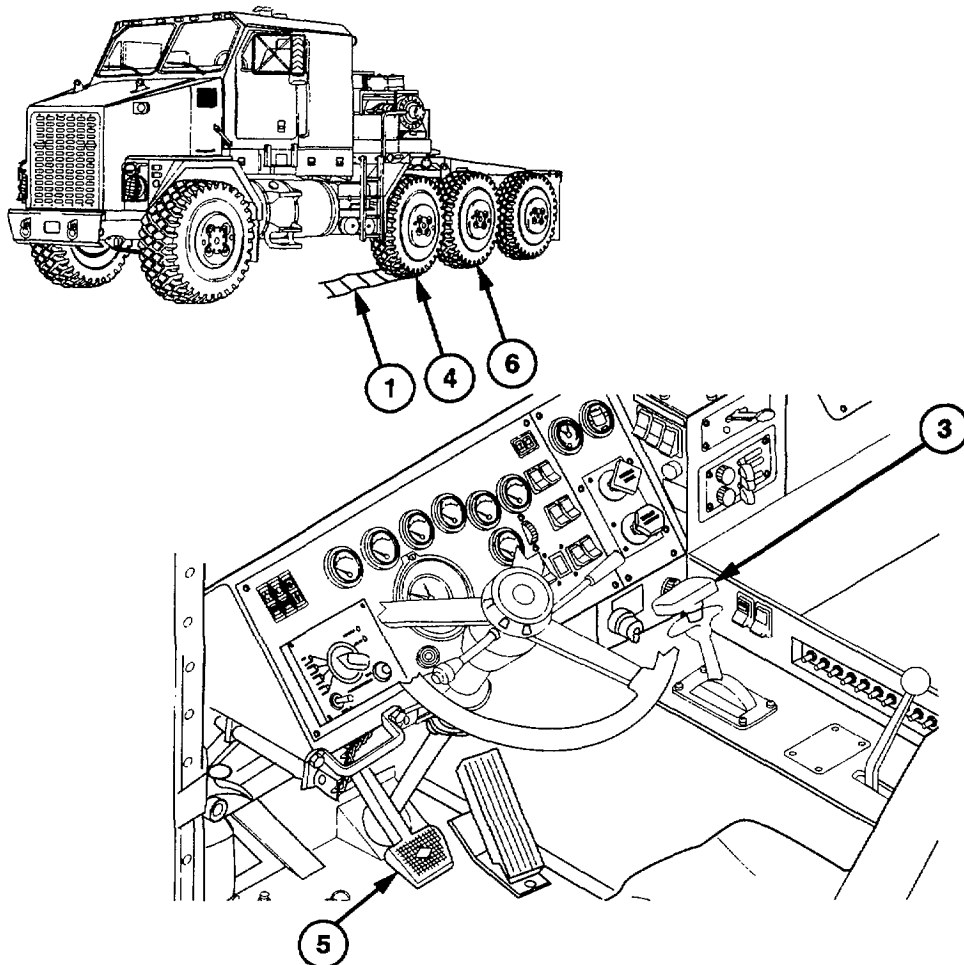
- Use tire chains on Axles No. 2 and No. 3 only. Chains must not be used when driving on hard surfaces where there is no wheel slippage. Improper use of tire chains may result in severe equipment damage.
- The Central Tire Inflation System (CTIS) setting must not be set below the CROSS COUNTRY setting, or equipment damage may result.
- The maximum speed limit for trucks with chains is 10 mph (16 km/h) on highway and 15 mph (24 km/h) off highway. Traveling above the maximum speed may result in damage to equipment

NOTE

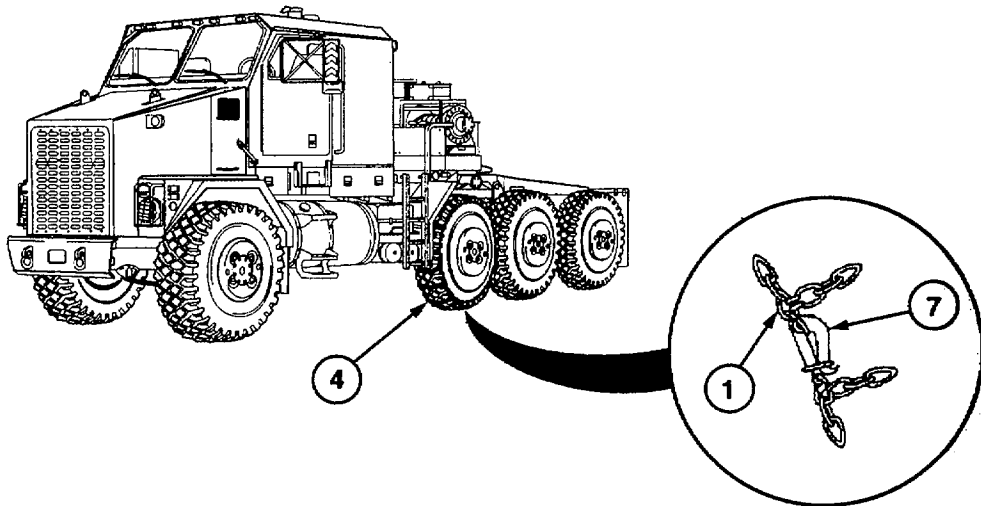
The installation and removal of tire chains requires two crew members.

- (1) Position tire chain (1) on the ground with cross chain connecting links (2) facing down.
- (2) Start engine (para 1-12a).



2-29.1. TIRE CHAIN INSTALLATION/REMOVAL (CONT)


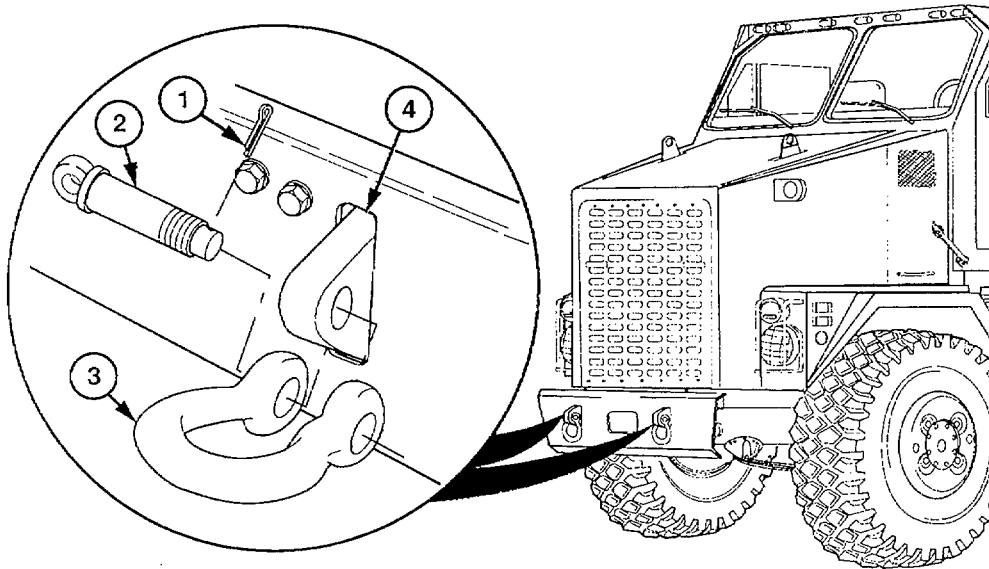
- (3) Set transmission range selector (3) to D (drive) position.
- (4) Move truck ahead onto tire chain (1) so tire (4) is about one-third of the way on tire chain.
- (5) Push down on service brake pedal (5) to apply service brakes.
- (6) Shut off engine (para 2-12g).
- (7) Ensure neighboring tire (6) is not on chain (1).
- (8) Wrap chain (1) around tire (4).



- (9) Connect and secure inside and outside clamps (7) so chain (1) is as tight as possible on tire (4)
- (10) Install tire chains (1) on remaining three tires by repeating steps (1) thru (9).

b. Remove Tire Chains.

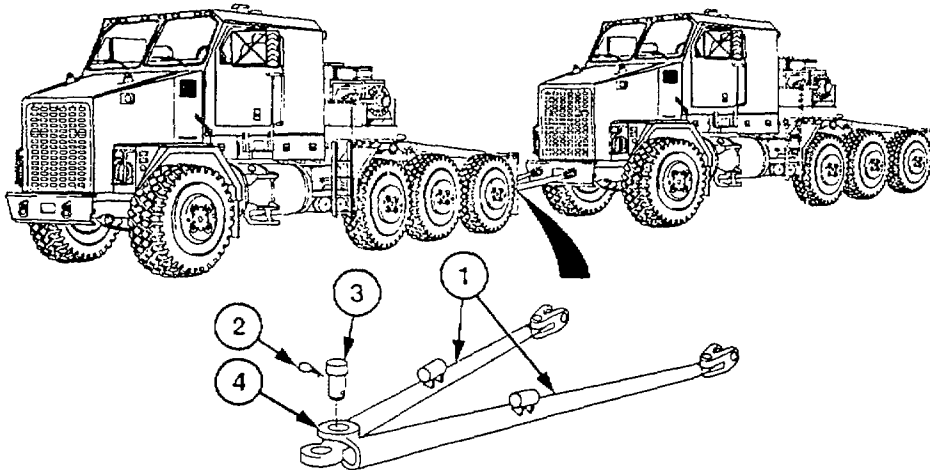
- (1) Start engine (para 2-12a).
- (2) Set transmission range selector (3) to D (drive) position.
- (3) Move truck ahead until chain clamps (7) are positioned toward front of vehicle.
- (4) Push down on service brake pedal (5) to apply service brakes.
- (5) Shut off engine (para 2-129).
- (6) Disconnect inside and outside clamps (7) on tire chain (1).
- (7) Unwrap tire chain (1) from tire (4) and spread tire chain out on ground behind tire.
- (8) Start engine para 2-12a).
- (9) Set transmission range selector (3) to D (drive) position.
- (10) Move truck forward off tire chain (1).
- (11) Push down on service brake pedal (5) to apply service brakes.
- (12) Remove tire chains (1) from remaining three tires by repeating steps (3) thru (11).
- (13) Shut off engine (para 2-12g).

2-30. TOW BAR CONNECTION/DISCONNECTION**a. Tow Eye Shackles Removal**

- (1) Remove cotter pins (1) from pins (2) on front tow eye shackles (3) of disabled vehicle. Remove pins (2) and tow eye shackles (3) from front tow eyes (4).
- (2) Install pins (2) in front tow eye shackles (3). Install cotter pins (1) in pins (2).
- (3) Set front tow eye shackles (3) aside for use with safety chains.

2-30. TOW BAR CONNECTION/DISCONNECTION (CONT)

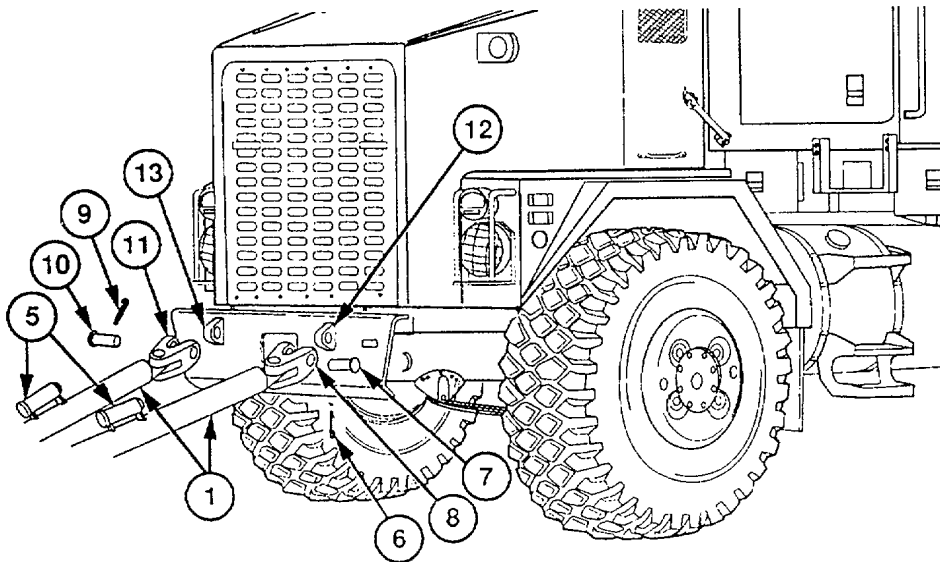
b. Tow Bar Connection



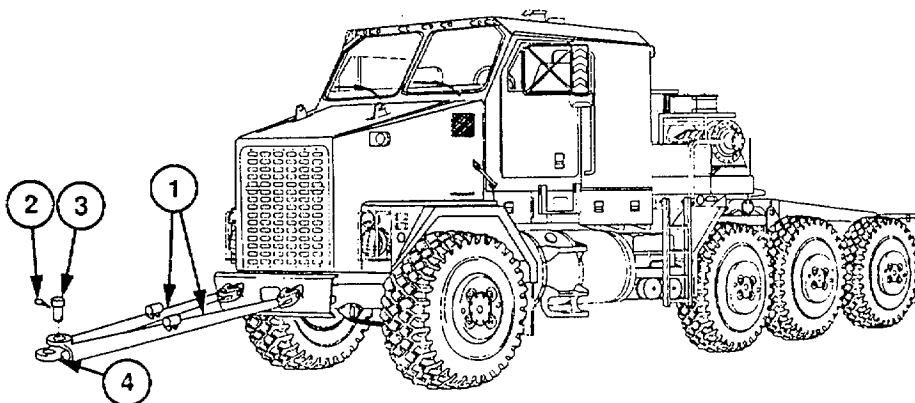
WARNING

- Towing vehicle and disabled vehicle must have parking brakes applied and disabled vehicle must have wheels chocked before connecting tow bar. Injury or death may result if vehicles roll into each other while personnel are making tow bar connections.
- Tow bar is heavy and requires four people to carry. Do not drop tow bar injury to personnel may result.

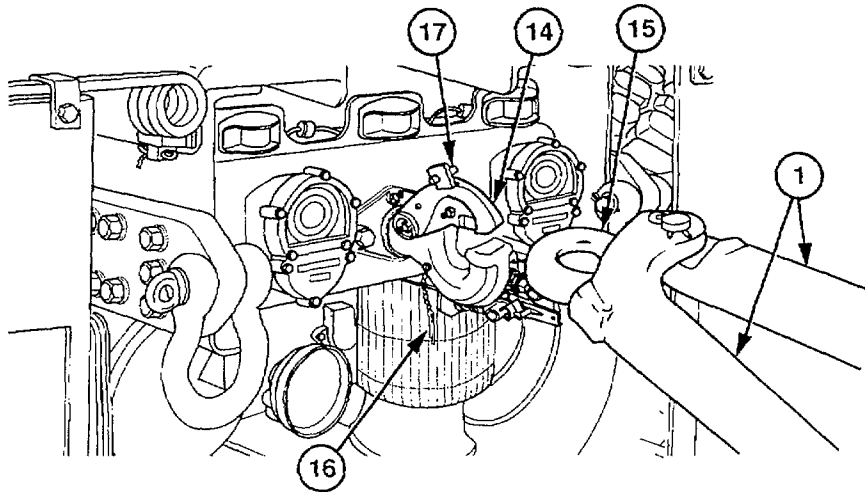
- (1) Position rear of towing vehicle near front of disabled vehicle.
- (2) Obtain tow bar (1) from unit maintenance with aid of assistants.
- (3) Remove cotter pin (2) from pin (3). Remove pin from tow bar (1).
- (4) Separate tow bar (1) at pivot point (4).



- (5) Position legs of tow bar (1) in front of disabled vehicle with spare pin holders (5) facing up.
- (6) Remove cotter pin (6) from pin (7) on tow bar shackle (8) and remove pin from tow bar shackle.
- (7) Remove cotter pin (9) from pin (10) on tow bar shackle (11). Remove pin from tow bar shackle.
- (8) Align shackle (8) with tow eye (12) while two assistants hold leg. Install pin (7) in shackle (8) of tow bar (1). Install cotter pin (6) in pin (7).
- (9) Align shackle (11) with tow eye (13) while two assistants hold leg. Install pin (10) in shackle (11) of tow bar (1). Install cotter pin (9) in pin (10).



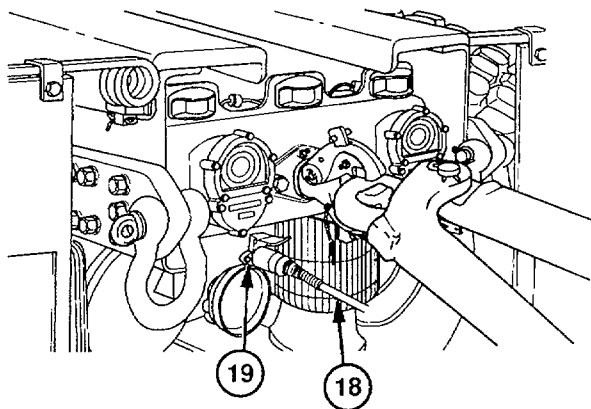
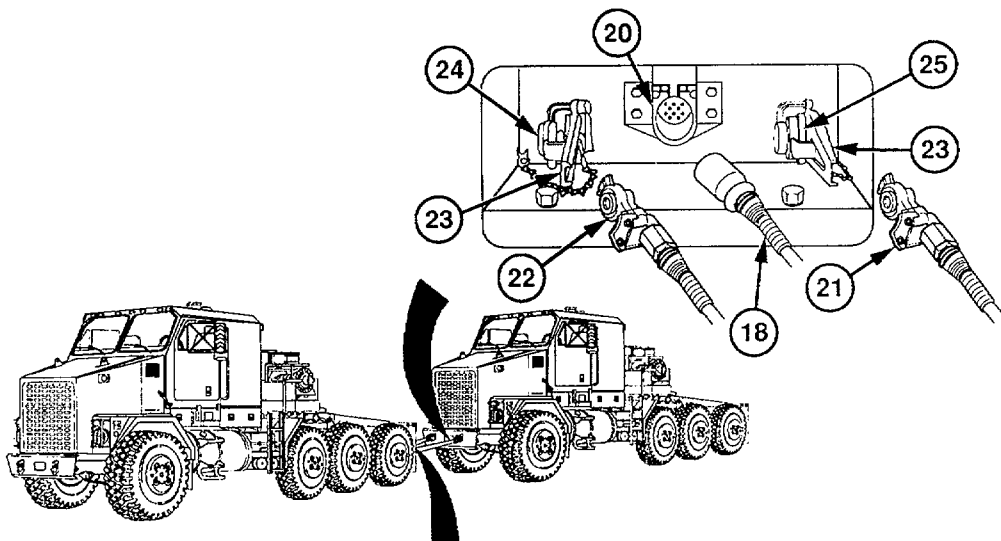
- (10) Align legs of tow bar (1) at pivot point (4). Install pin (3) in tow bar (1). Install cotter pin (2) in pin (3).

2-30. TOW BAR CONNECTION/DISCONNECTION (CONT)

- (11) Position towing vehicle so pintle hook (14) is aligned with tow bar lunette eye (15).
- (12) Remove cotter pin (16) from pintle hook (14).
- (13) Pull latch (17) away from vehicle and hold.
- (14) Lift top of pintle hook (14) and let go of latch (17). Pintle hook will be locked open.

WARNING

- **Do not put hands near pintle hook when aligning lunette eye with pintle hook. If towing vehicle moves suddenly, serious injury to personnel may result.**
 - **Do not move towing vehicle without assistance of ground guide. Injury or death to personnel may result.**
 - **Ground guide and personnel lifting tow bar must be visible to operator at all times. Injury or death to personnel may result.**
- (15) Slowly back up towing vehicle with aid of ground guide while assistants lift tow bar (1). Back up towing vehicle until tow bar lunette eye (15) is aligned with pintle hook (14).
 - (16) Connect tow bar lunette eye (15) to pintle hook (14).
 - (17) Pull latch (17) and close top part of pintle hook (14).
 - (18) Install cotter pin (16) in pintle hook (14).

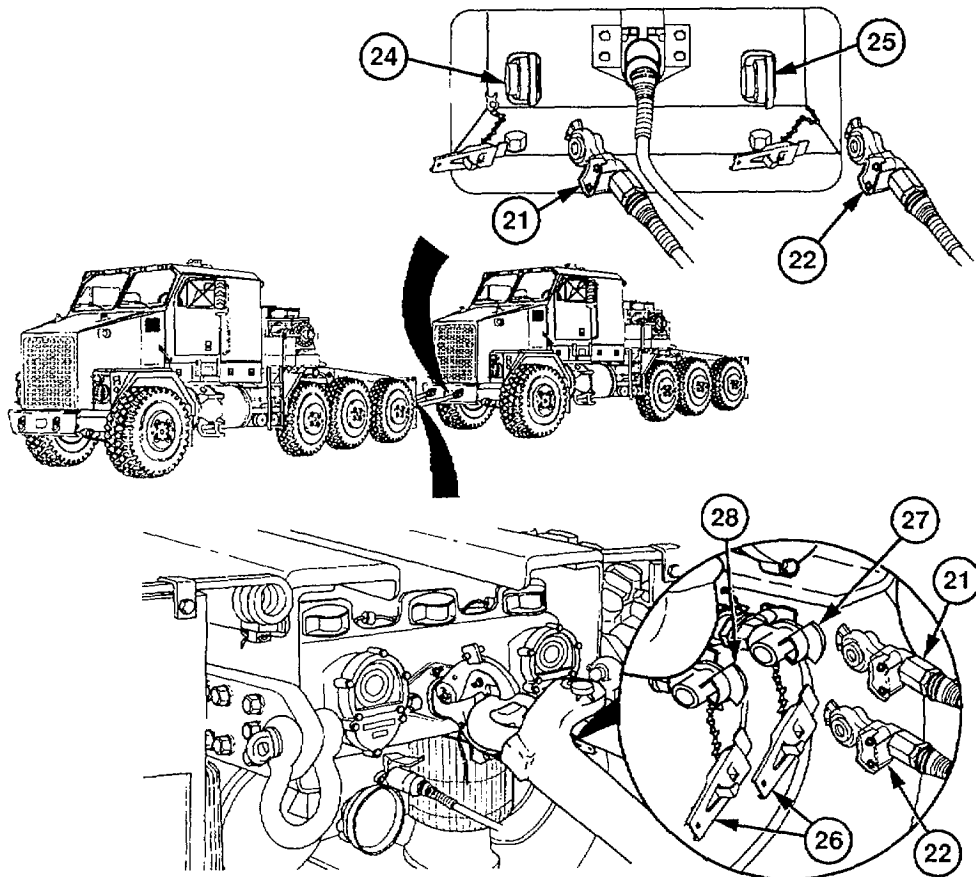


- (19) Remove intervehicular electrical cable (18) from stowage box.
- (20) Install electrical cable (18) on rear receptacle (19) of towing vehicle and front receptacle (20) of disabled vehicle.
- (21) Remove two intervehicular air hoses (21 and 22) from stowage box.

NOTE

Go to step (26) vehicle air system is damaged.

- (22) Remove dummy couplings (23) from front gladhands (24 and 25) of disabled vehicle.

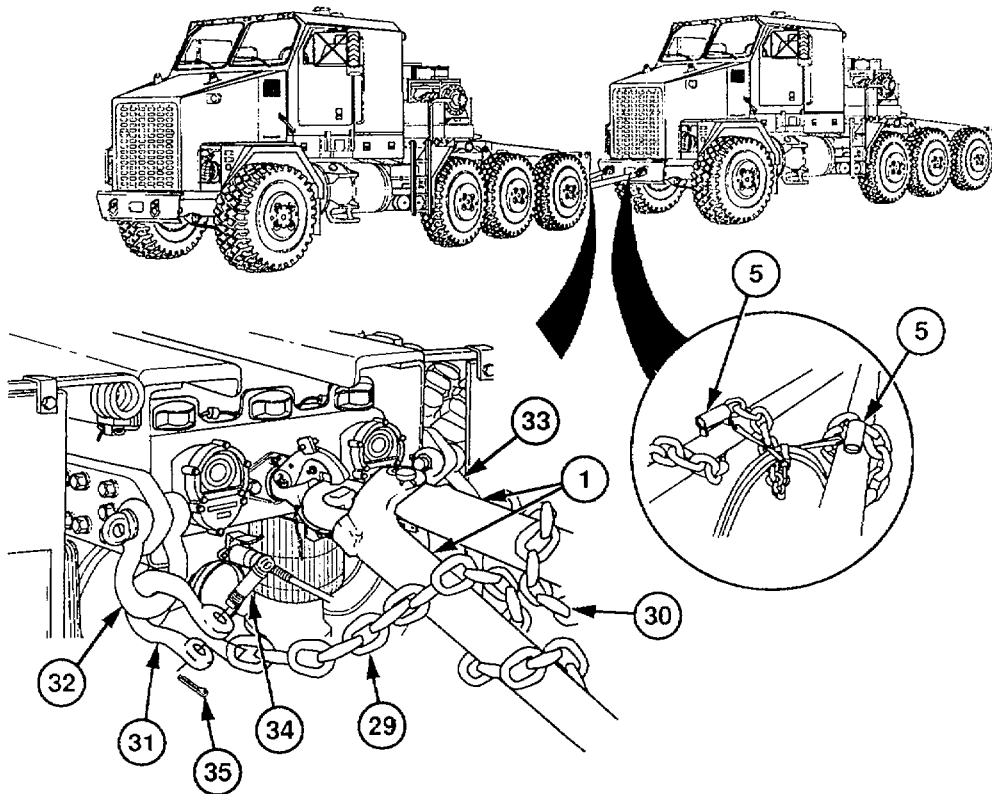
2-30. TOW BAR CONNECTION/DISCONNECTION (CONT)


- (23) Remove dummy couplings (26) from rear gladhands (27 and 28) of towing vehicle.
- (24) Connect service intervehicular air hose (21) to rear service gladhand (27) of towing vehicle and front service gladhand (24) of disabled vehicle.
- (25) Connect emergency intervehicular air hose (22) to rear emergency gladhand (28) of towing vehicle and to front emergency gladhand (25) of disabled vehicle.

NOTE

Go to step (27) if intervehicular air hoses are installed.

- (26) Manually release spring brakes (para 2-32).

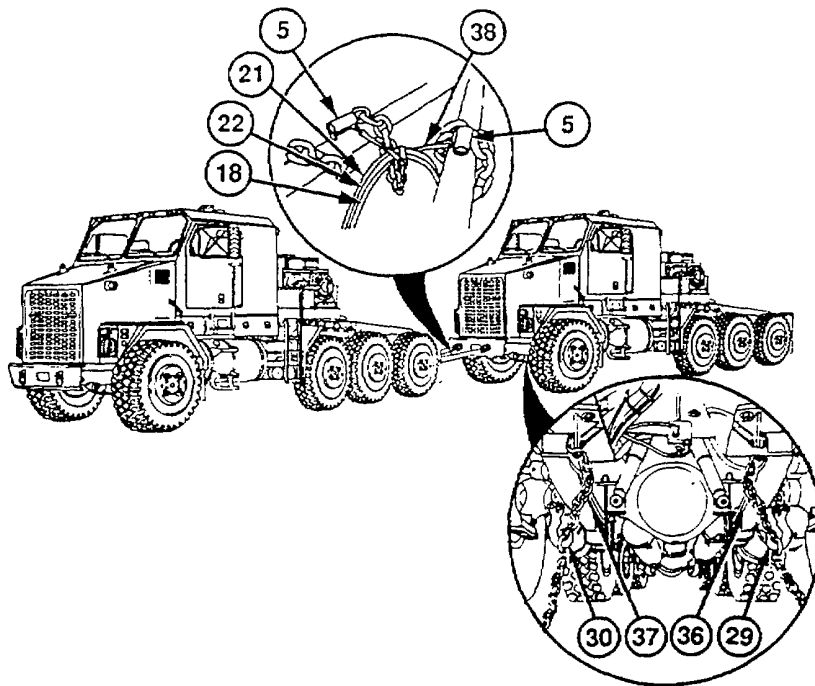


WARNING

Utility chains are heavy and difficult to handle. Two personnel are required when handling utility chains. Failure to comply may result in injury to personnel.

- (27) Remove two utility chains (29 and 30) one from each vehicle stowage box with aid of assistant.
- (28) Install tow eye shackles (31) on rear tow eye shackles (32 and 33) of towing vehicle.
- (29) Position utility chains (29 and 30) in tow eye shackles (31). Install pins (34) through tow eye shackles (31) and utility chains (29 and 30). Install cotter pins (35) in pins (34).
- (30) Install utility chains (29 and 30) around tow bar (1) with one wrap of chain in front of spare pin holder (5) and three wraps behind with aid of assistant

2-30. TOW BAR CONNECTION/DISCONNECTION (CONT)



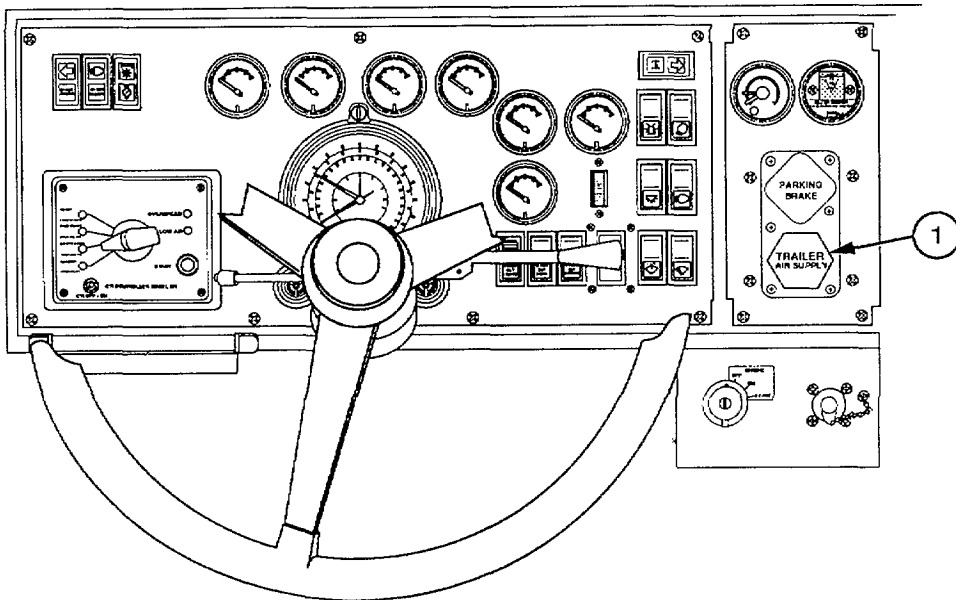
- (31) Attach one utility chain (29) to front spring (36) on disabled vehicle.
- (32) Attach other utility chain (30) to front spring (37) on disabled vehicle.

CAUTION

Slack in chain, air hoses, and electrical cable must be positioned evenly in front of and behind spare pin holder. Hoses and cable must not drag on ground. Failure to comply may result in damage to equipment.

- (33) Attach rubber strap (38) to one spare pin holder (5). Wrap strap (38) twice around two intervehicular air hoses (21 and 22) and electrical cable (18). Attach strap (38) to other spare pin holder (5).
- (34) Pick up and stow chock blocks.
- (35) Release parking brakes on disabled vehicle.
- (36) Push in TRAILER AIR SUPPLY control on towing vehicle.
- (37) Turn on emergency flashers.
- (38) Turn on beacon light.
- (39) Release parking brakes on towing vehicle.
- (40) Transport disabled vehicle (para 2-31).

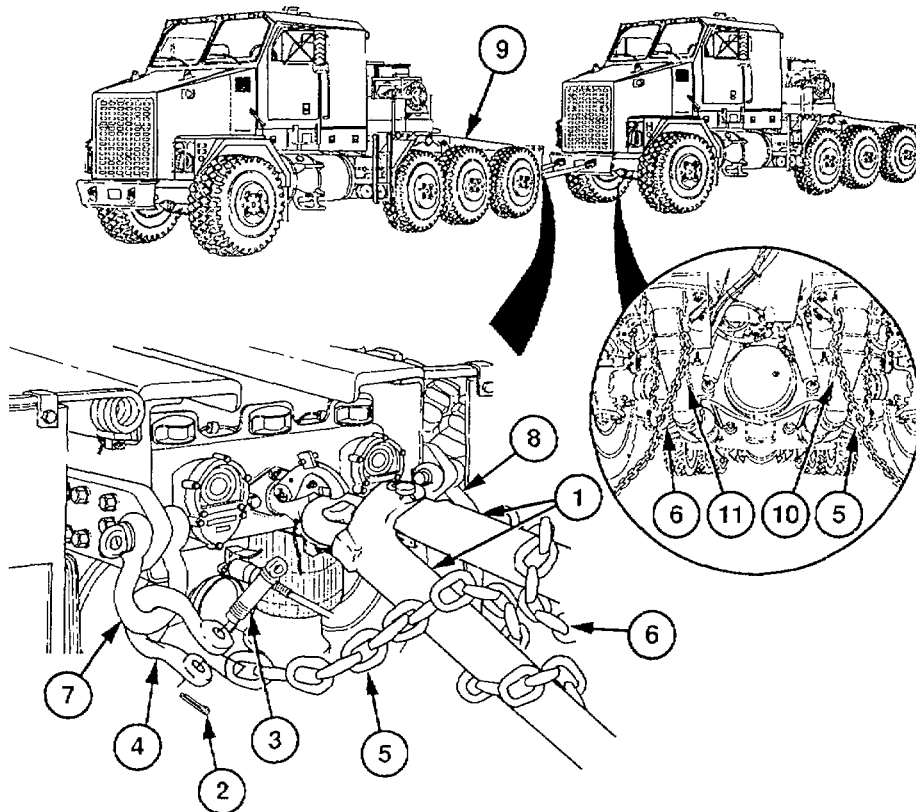
c. Tow Bar Disconnection

**WARNING**

- Towing vehicle and disabled vehicle must have parking brakes applied and disabled vehicles wheels chocked before disconnecting tow bar. Injury or death may result if vehicles roll into each other while personnel are disconnecting tow bar.
- Tow bar is heavy and requires four people to carry. Do not drop tow bar. Injury to personnel may result.

(1) Pull out TRAILER AIR SUPPLY control (1) on towing vehicle.

2-30. TOW BAR CONNECTION/DISCONNECTION (CONT)

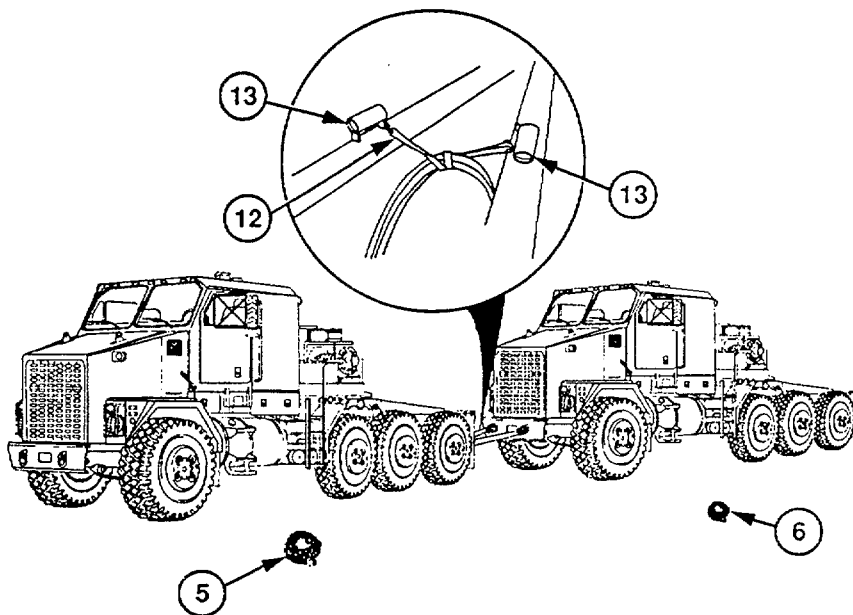


- (2) Remove two cotter pins (2), pins (3), and shackles (4) from utility chains (5 and 6) and rear tow eyes (7 and 8).

NOTE

Shackles will be installed on towed vehicle in para 2-30d.

- (3) Set shackles (4), pins (3), and cotter pins (2) aside until tow bar is disconnected.
- (4) Disconnect utility chain (5) from rear of towing vehicle (9) and from front spring (10) on disabled vehicle.
- (5) Disconnect utility chain (6) from rear of towing vehicle (9) and from front spring (11) on disabled vehicle.

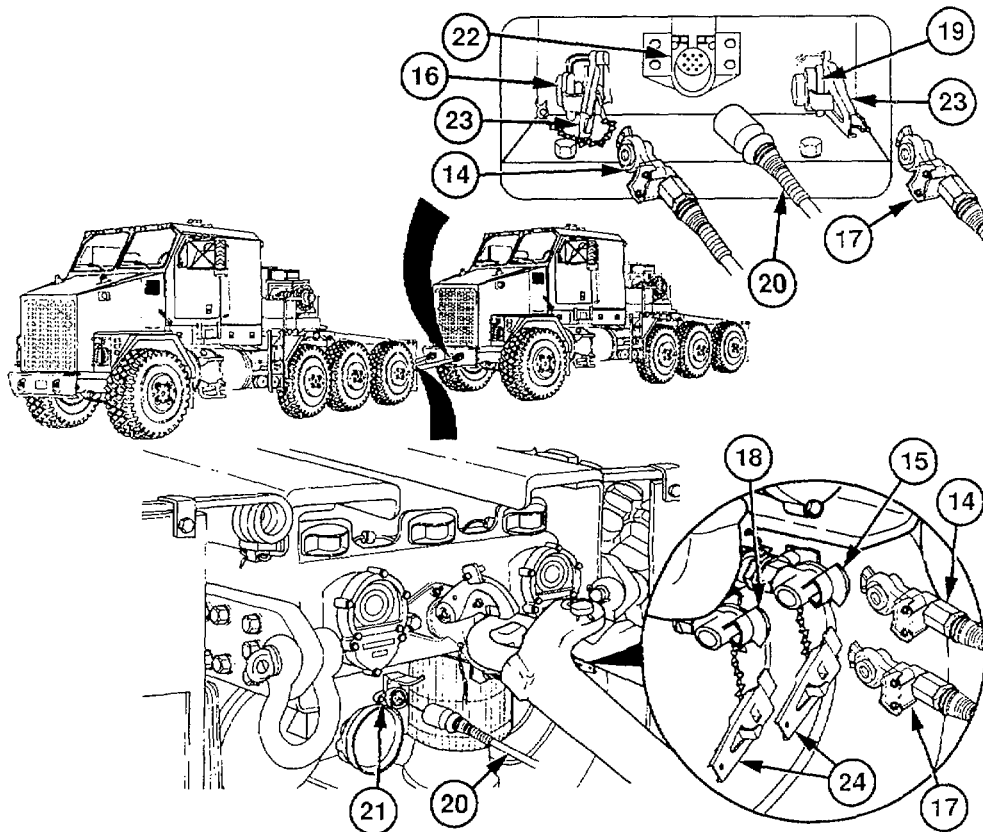


WARNING

Utility chains are heavy and difficult to handle. Two personnel are required to when handling utility chains. Failure to comply may result in injury to personnel.

- (6) Stow one utility chain (5/6) in each vehicle's stowage box with aid of assistant.
- (7) Chock wheels of disabled vehicle.
- (8) Remove rubber strap (12) from tow bar spare pin holders (13).

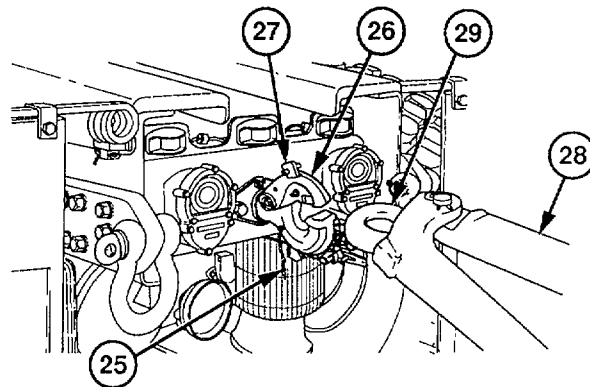
2-30. TOW BAR CONNECTION/DISCONNECTION (CONT)



NOTE

Go to step (15) if spring brakes were **MANUALLY RELEASED** before towing.

- (9) Disconnect service intervehicular air hose (14) from rear service gladhand (15) of towing vehicle and from front service gladhand (16) on disabled vehicle.
- (10) Disconnect emergency intervehicular air hose (17) from rear emergency gladhand (18) of towing vehicle and from front emergency gladhand (19) on disabled vehicle.
- (11) Disconnect electrical cable (20) from 7-pin connectors (21 and 22).
- (12) Install dummy couplings (23) on gladhands (16 and 19) of disabled vehicle.
- (13) Install dummy couplings (24) on gladhands (15 and 18) of towing vehicle.
- (14) Stow air hoses (14 and 17) and electrical cable (20) in stowage box.

**NOTE**

Go to step (16) if intervehicular air hoses and electrical cable were used.

- (15) Manually apply spring brakes (para 2-32).
- (16) Remove cotter pin (25) from pintle hook (26).
- (17) Pull latch (27) away from vehicle and hold.
- (18) Lift top of pintle hook (26) and let go of latch (27). Pintle hook will be locked open.

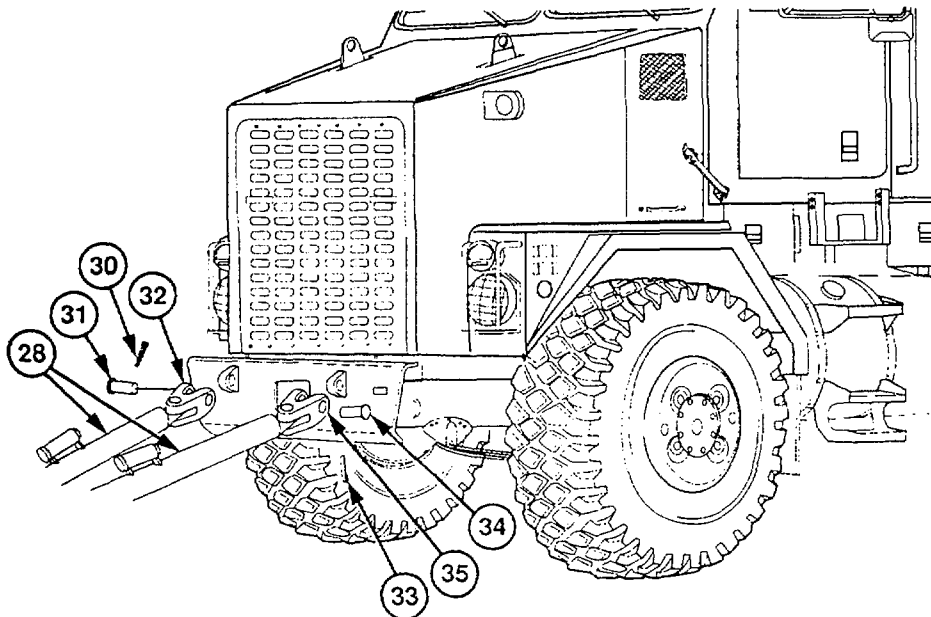
WARNING

- **Do not put hands near pintle hook when aligning lunette eye with pintle hook. If towing vehicle moves suddenly, serious injury to personnel may result.**
- **Do not move towing vehicle without assistance of ground guide. Injury or death to personnel may result.**
- **Ground guide and personnel lifting tow bar must be visible to operator at all times. Injury or death to personnel may result.**

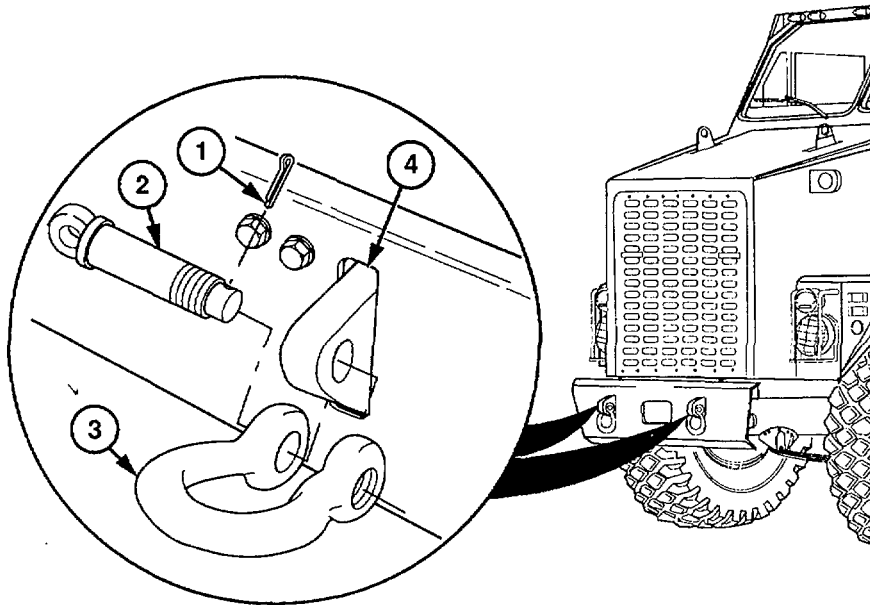
NOTE

To aid in tow bar removal, HET Tractors should be directly behind each other and pintle hook in vertical position.

- (19) Two assistants lift tow bar (28) until lunette eye (29) is clear of pintle hook (26).
- (20) Drive towing vehicle forward with aid of ground guide. When vehicle is clear, lower tow bar (28) to ground.
- (21) Pull latch (27) and close pintle hook (26). Install cotter pin (25) in pintle hook.

2-30. TOW BAR CONNECTION/DISCONNECTION (CONT)

- (22) While two assistant hold leg of tow bar (28), remove cotter pin (30) from pin (31) on tow eye shackle (32). Remove pin from tow eye shackle.
- (23) While two assistant hold leg of tow bar (28), remove cotter pin (33) from pin (34) on tow eye shackle (35). Remove pin from tow eye shackle.
- (24) Install pin (31) in tow eye shackle (32). Install cotter pin (30) in pin.
- (25) Install pin (34) in tow eye shackle (35). Install cotter pin (33) in pin.
- (26) Return tow bar (28) to unit maintenance.

d. Tow Eye Shackles Installation

- (1) Remove cotter pins (1) from pins (2) on front tow eye shackles (3).
- (2) Align tow eye shackles (3) with tow eyes (4).
- (3) Install pins (2) in tow eye shackles (3) and tow eyes (4). Install cotter pins (1) in pins.

2-31. TOWING DISABLED M1070 VEHICLE**WARNING**

Personnel must not occupy towed vehicle during towing operation. Injury or death can result if vehicle becomes disconnected while being towed.

CAUTION

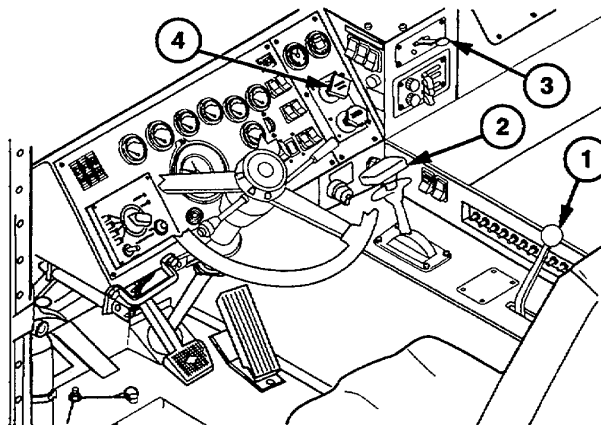
Disabled vehicle GVWR must be 49,000 b (22,226 kg) or less. Damage to towing or disabled vehicle may result.

NOTE

Disabled vehicles must be prepared and moved in accordance with FM 20-22 and FM 21-305.

a. Tow Bar Connection

Connect tow bar between towing vehicle and disabled vehicle (para 2-30).

b. Preparation of Disabled Vehicle for Towing Using Tow Bar**CAUTION**

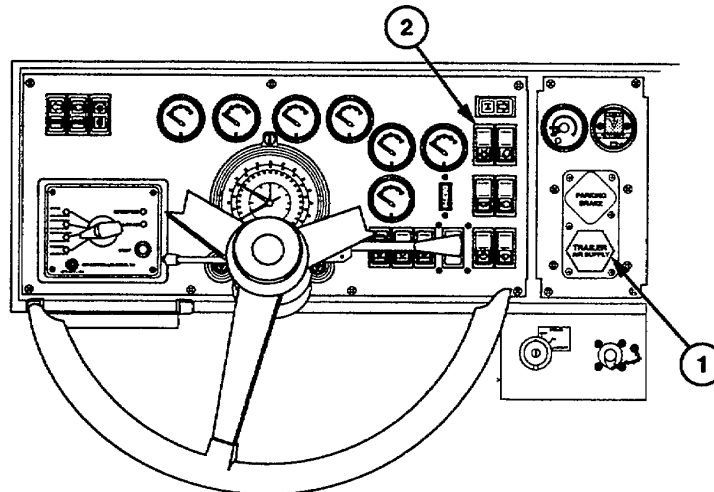
- Failure to fold in outside rear view mirrors may result in damage to equipment.
- In the event of a hydraulic steering system failure, the transfer case to no. 2 axle propshaft must be removed to prevent damage to steering pumps.

(1) Fold in rear view mirrors against doors.

(2) Set TRANSFER CASE shift lever (1) to NEUTRAL position.

- (3) Set transmission range elector (2) to N (neutral) position.
- (4) Set DRIVELINE control (3) to UNLOCK position.
- (5) Push in PARKING BRAKE control (4).

c. Preparation of Towing Vehicle Using Tow Bar



- (1) Start engine (para 2-12).
- (2) Push in TRAILER AIR SUPPLY control (1).
- (3) Turn on rotating beacon light switch (2).

d. Preparation of Disabled Vehicle for Towing Using M984E1 Wrecker.

CAUTION

The appropriate propshaft must be removed prior to performing lift and tow operations. Failure to comply may result in damage to transfer case.

NOTE

Do steps (1) and (2) only if towing from the rear.

- (1) Secure steering wheel steering column lock pin (para 2-2).
- (2) Remove transfer case to axle no. 1 propshaft.

NOTE

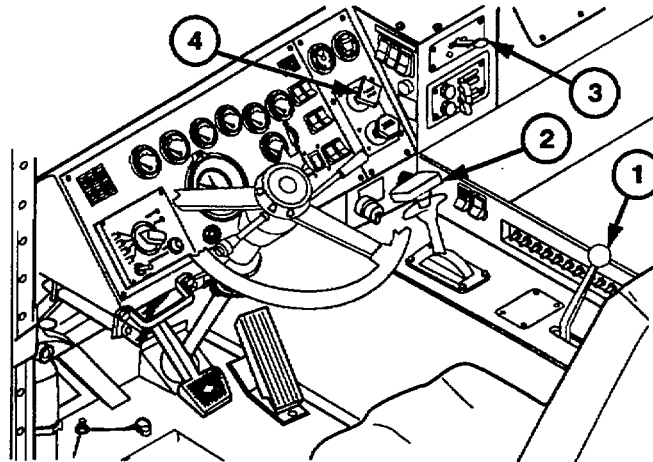
Do step (3) only if towing from the front.

- (3) Remove transfer case to axle no. 2 propshaft

CAUTION

Failure to fold in outside rear view mirrors may result in damage to equipment

- (4) Fold in rear view mirrors against doors.



- (5) Set TRANSFER CASE shift lever (1) to NEUTRAL position.
- (6) Set transmission range selector (2) to N (neutral) position.
- (7) Set DRIVELINE control (3) to UNLOCK position.
- (8) Push in PARKING BRAKE control (4).

e. Transport Disabled Vehicle.

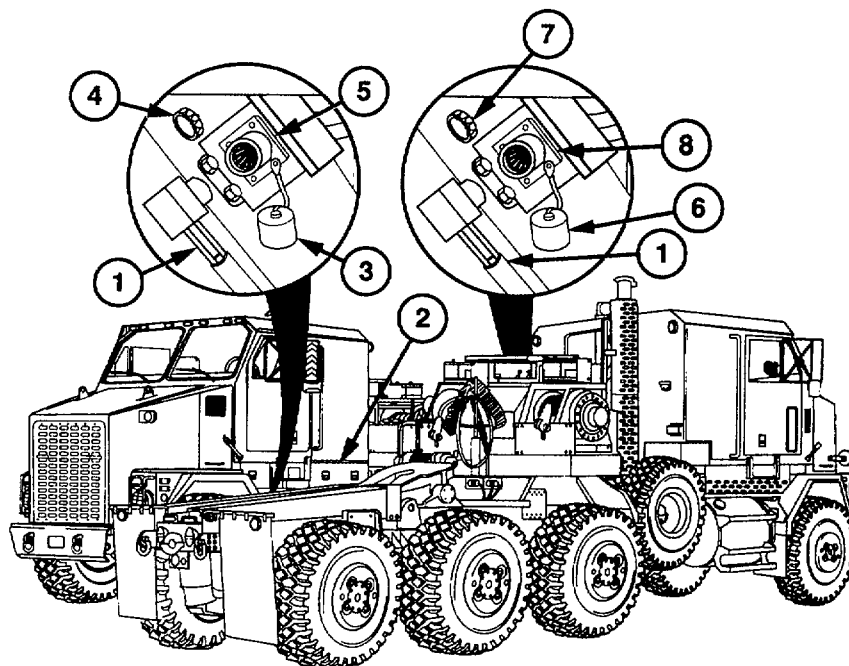
CAUTION

- Due to a reduced braking ability, do not exceed 15 mph (24 km/h) on highway or 5 mph (km/h) off-road while towing disabled vehicle with tow bar. Damage to towing or disabled vehicle may result.
- Avoid turning tight comers while towing another HET Tractor with tow bar. Damage to towing or disabled vehicle may result.
- Towed HET Tractor must be backed up in a straight line when using tow bar. Never attempt to steer towed HET Tractor into position. Failure to comply may result in damage tires or steering components.

2-32. EMERGENCY PROCEDURES**a. Slave Starting Vehicle****NOTE**

Report any malfunction requiring HET Tractor to be slave started to unit maintenance.

- (1) Start engine of slaving vehicle (para 2-12).
- (2) Position slaving vehicle next to disabled vehicle so NATO slave receptacles are side by side.
- (3) Shut down engine of slaving vehicle (para 2-12).
 - (3.1) Turn ENGINE switch of disabled vehicle to OFF (para 2-12).
 - (3.2) Set all electrical switches on both vehicles to OFF position.



- (4) Remove NATO slave cable (1) from stowage box (2).

WARNING

- **Ensure ENGINE START switch on both vehicles is OFF before connecting NATO slave cables. Ensure vehicles are not touching each other. Failure to do so may result in electrical shock.**
- **Remove all jewelry such as rings, dog tags, bracelets, etc. when slave starting vehicle. Wearing jewelry may result in electrical shock.**
- **Do not smoke, have open flame, or make sparks when slave starting vehicle. Batteries can explode and cause personnel injury or death.**

CAUTION

Always connect NATO slave cable to disabled vehicle before connecting it to saving vehicle. Damage to batteries or cable may result from improperly connecting NATO slave cable.

- (5) Remove slave receptacle cap (3) from disabled vehicle.
- (6) Remove cap (4) from NATO slave cable (1).
- (7) Plug NATO slave cable (1) into slave receptacle (5) on disabled vehicle.
- (8) Remove slave receptacle cap (6) from slaving vehicle.
- (9) Remove cap (7) from NATO slave cable (1).
- (10) Plug NATO slave cable (1) into slave receptacle (8) on slaving vehicle.
- (11) Start engine on slaving vehicle (para 2-12) and operate at 1000 rpm. Assistant starts engine on disabled vehicle (para 2-12).
- (12) Remove NATO slave cable (1) from slave receptacle (5) on disabled vehicle.
- (13) Install cap (4) on NATO slave cable (1).
- (14) Install slave receptacle cap (3) on disabled vehicle.
- (15) Remove NATO slave cable (1) from slave receptacle (8) on slaving vehicle.
- (16) Install cap (7) on NATO slave cable (1).
- (17) Install slave receptacle cap (6) on slaving vehicle.
- (18) Stow NATO slave cable (1) in stowage box (2).

2-32. EMERGENCY PROCEDURES (CONT)**b. Losing Air System Pressure****WARNING**

Maximum braking requires 90 psi (621 kPa) or more air pressure. If air pressure drops below 90 psi (621 kPa), braking ability will be reduced. If air pressure continues to drop, air system is malfunctioning. Brake failure may result causing injury or death to personnel.

NOTE

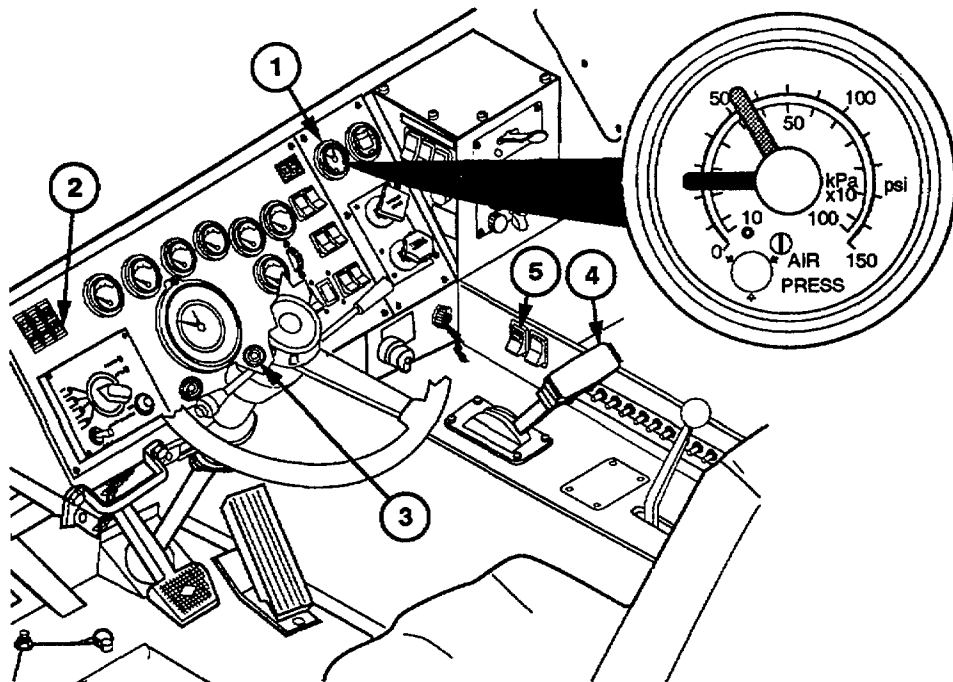
Air pressure shown by the green pointer indicates air pressure for:

- Front service brakes
- Trailer service brakes
- Winch system
- HI-LO range valve
- Tire inflation connectors
- Windshield washer
- Horns
- Transmission modulator
- Driveline backup
- Fan clutch

NOTE

Air pressure shown by the red pointer indicates air pressure for:

- Central tire inflation pressure transducer
- Rear tridem spring brakes
- Trailer emergency brakes
- Rear tridem service brakes
- Air suspension

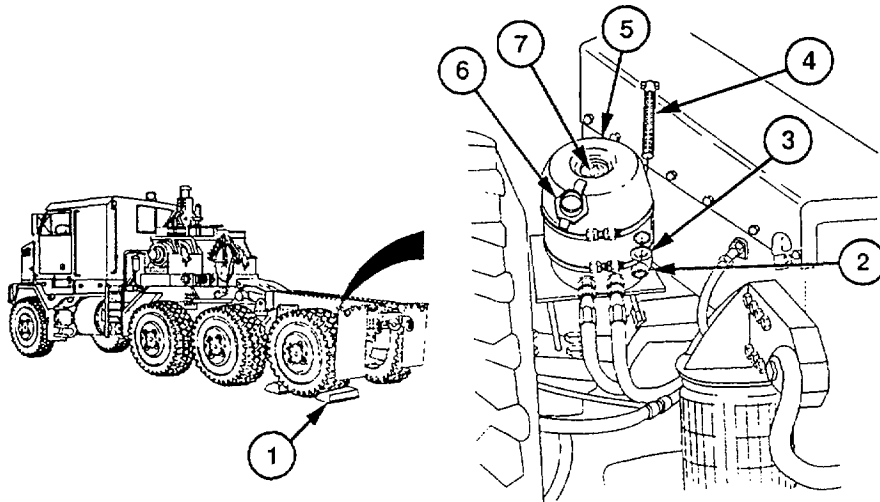


- (1) Check AIR PRESS gage (1) if LOW AIR indicator (2) lights and alarm (3) sounds while driving HET Tractor.
- (2) Look for place to stop HET Tractor without blocking other traffic.
- (3) Downshift transmission range selector (4) to control HET Tractor speed until place to stop is found.
- (4) Use engine brake retarder switch (5) to slow HET Tractor if necessary.
- (5) Stop HET Tractor.
- (6) Check for damage or leaks (para 3-4).

NOTE

If air loss is the result of a damaged air spring, do step (7).

- (7) Remove and plug air line (para 2-32e).
- (8) Notify unit maintenance.

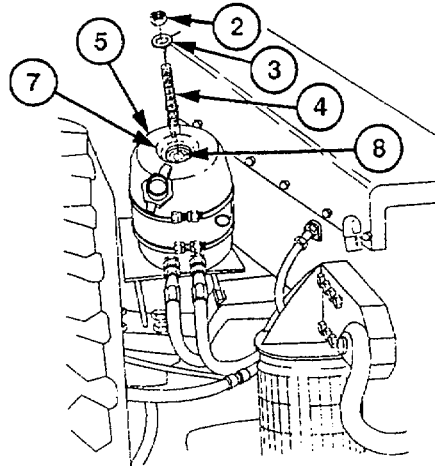
2-32. EMERGENCY PROCEDURES (CONT)**c. Manual Release of Spring Brakes****WARNING**

Do not operate vehicle with spring brakes released. HET Tractor will be able to roll free once spring brakes are released. Use wheel chocks, or similar aid, to prevent vehicle from moving once spring brakes are released. Failure to do so may result in serious personnel injury or death.

NOTE

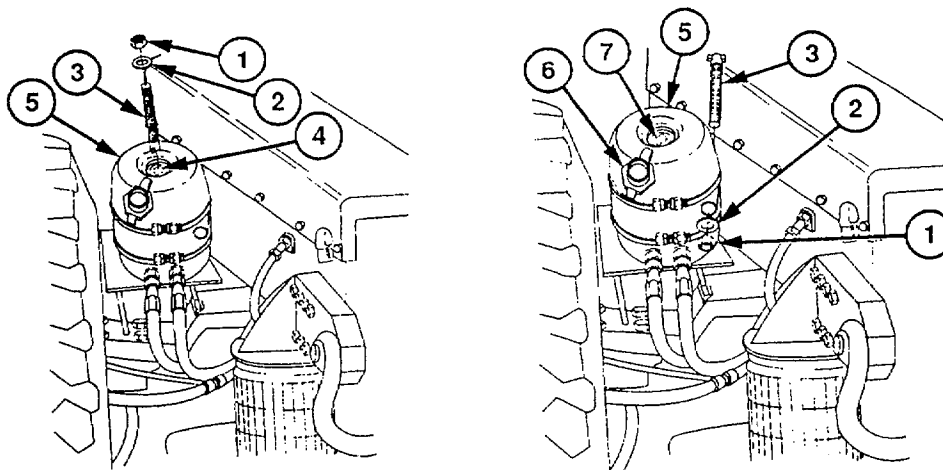
Procedures for releasing and applying spring brakes are identical for spring brakes on no. 2, no. 3, and no. 4 axles. There are no spring brakes on no. 1 axle.

- (1) Install wheel chocks (1).
- (2) Remove nut (2), washer (3), and tool (4) from mounting position on spring brake chamber (5).
- (3) Remove dust cap (6) from access hole (7) in spring brake chamber (5).



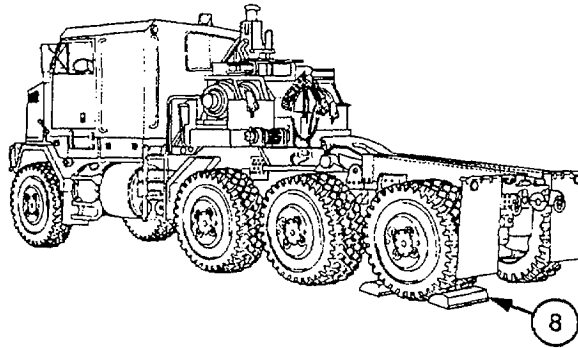
- (4) Insert tool (4) in access hole (7) and align with slot (8) inside spring brake chamber (5).
- (5) Push tool (4) in slot (8) until it stops.
- (6) Turn tool (4) and pull out until it is seated and stops.
- (7) Install washer (3) and nut (2) on tool (4).
- (8) Release spring brake chamber (5) by tightening nut (2) down until it stops.

d. Applying Spring Brakes



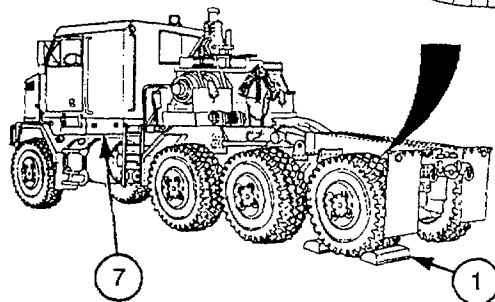
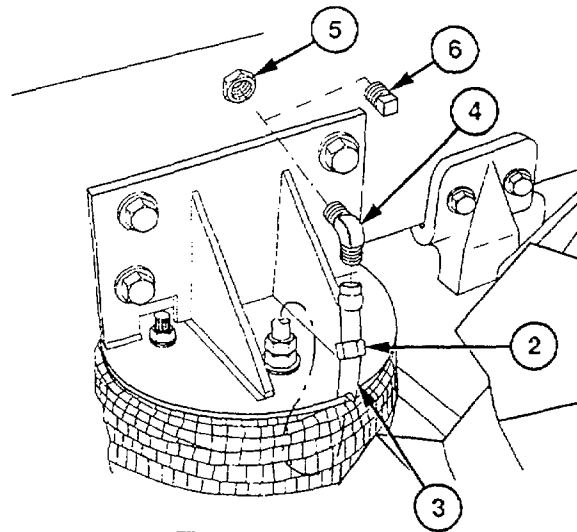
- (1) Loosen and remove nut (1) and washer (2) from tool (3).
- (2) Push tool (3) down and pull out of slot (4) inside spring brake chamber (5).
- (3) Install dust cap (6) in access hole (7).
- (4) Install tool (3), washer (2), and nut (1) in mounting position on spring brake chamber (5). Tighten nut.

2-32. EMERGENCY PROCEDURES (CONT)



(5) Remove wheel chocks (8).

e. Limp Home Procedure



CAUTION

Do not operate HET Tractor with more than one air spring disabled on a side. Damage to HET Tractor may result.

NOTE

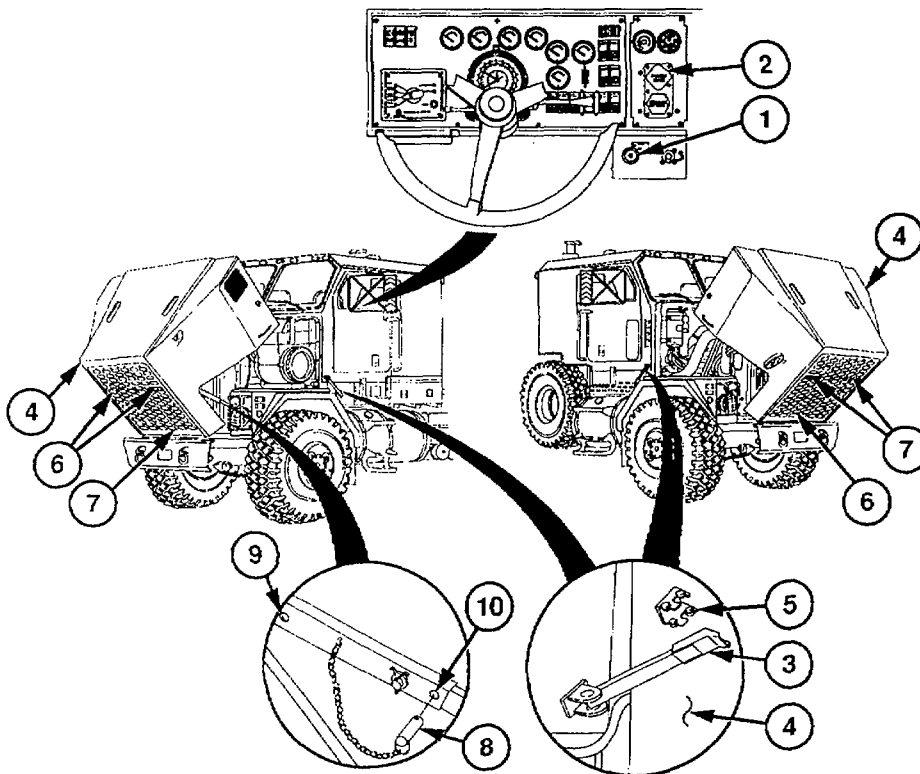
Limp home procedure is used after failure of an air spring.

- (1) Shut off engine (para 2-12).
- (2) Install wheel chocks (1).
- (3) Remove nut (2) and hose (3) from elbow (4).
- (4) Remove elbow (4) from fitting (5).
- (5) Remove plug (6) from stowage box (7) and install in fitting (5).
- (6) Position elbow (4) on hose (3).
- (7) Install nut (2) on elbow (4).
- (8) Stow wheel chocks (1).
- (9) Start engine (para 2-12).

CAUTION

Maximum speed of HET Tractor in limp home mode is 5 mph off-road and 15 mph on-road. Driving in speeds exceeding these may result in damage to HET Tractor.

- (10) Continue with mission.

2-33. OPENING/CLOSING HOOD**a. Opening**

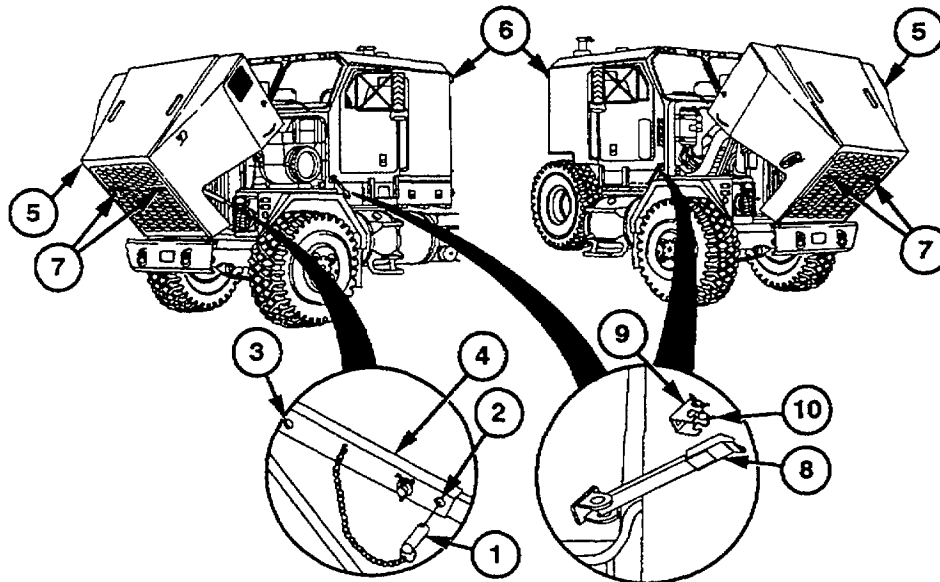
- (1) Turn ENGINE switch (1) to OFF position.
- (2) Pull out PARKING BRAKE control (2).
- (3) Install wheel chocks.
- (4) Pull down latch (3) on each side of hood (4).
- (5) Unhook latch (3) from hook (5) on each side of hood (4).
- (6) Pull hood (4) open using grab handles (6) on grill (7).

WARNING

Pin must be installed to lock hood in open position. Hood may accidentally close and cause personnel injury if not locked in open position.

- (7) Remove pin (8) from hole (9).
- (8) Install pin (8) in hole (10).

b. Closing



- (1) Remove pin (1) from hole (2).

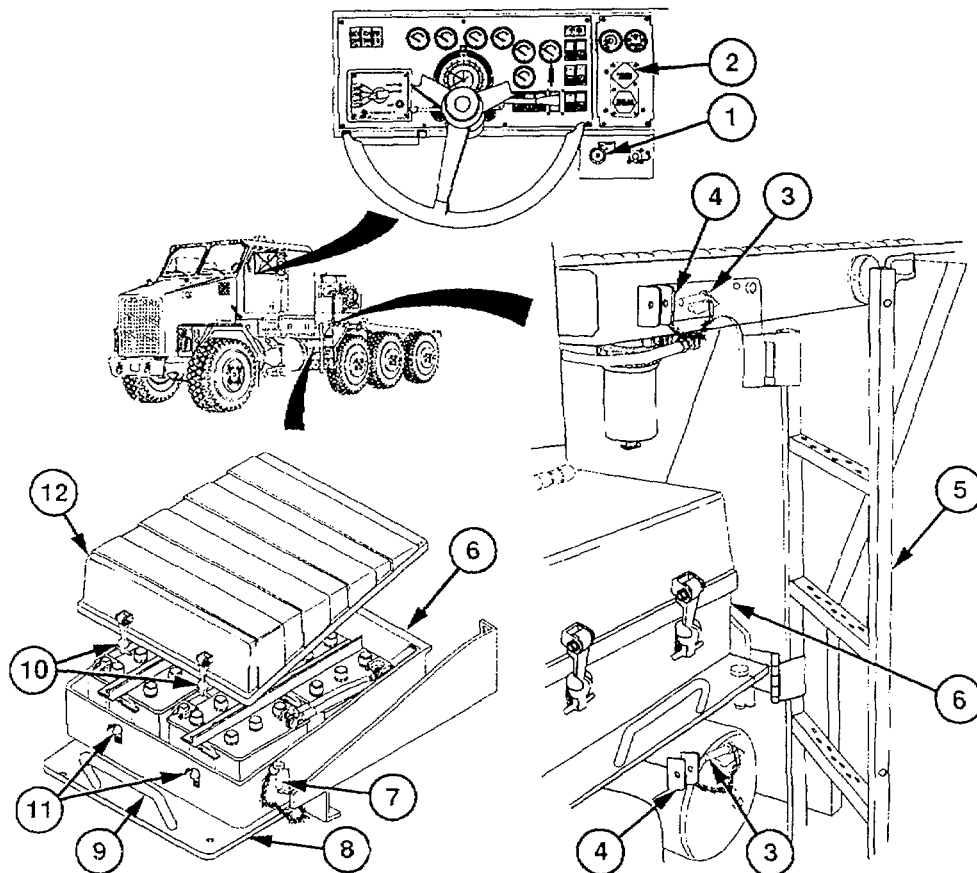
CAUTION

Pin tethering chain must be routed under hood support when stowing pin. Failure to comply may result in damage to chain.

- (2) Install pin (1) in hole (3).
- (3) Push up on hood support (4) and push hood (5) toward cab (6) using grab handles (7).
- (4) Connect two latches (8) to hooks (9) on each side of hood (5).
- (5) Push up on each latch (8) to engage latch in hook (9) and spring clip (10).

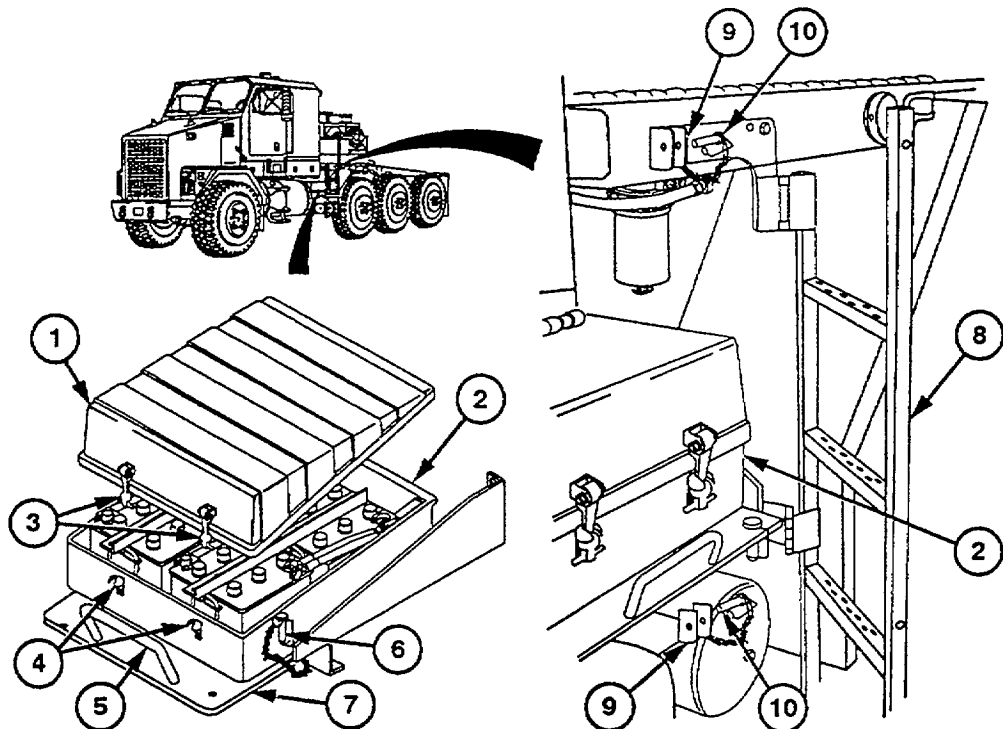
c. Follow-On Maintenance

Remove wheel chocks.

2-34. OPENING/CLOSING BATTERY BOX**a. Opening**

- (1) Turn ENGINE switch (1) to OFF position.
- (2) Pull out PARKING BRAKE control (2).
- (3) Install wheel chocks.
- (4) Remove two clevis pins (3) from ladder supports (4) and ladder (5).
- (5) Swing ladder (5) clear of battery box (6).
- (6) Remove two clevis pins (7) from battery box tray (8).
- (7) Pull on handle (9) and slide battery box (6) out.
- (8) Remove two rubber latches (10) from brackets (11).
- (9) Remove cover (12) from battery box (6).

b. Closing



NOTE

Retaining lip on inside of cover must hook over rear lip on battery box.

- (1) Install cover (1) on battery box (2).
- (2) Attach two rubber latches (3) on brackets (4).
- (3) Push on handle (5) and slide battery box (2) in.
- (4) Install two clevis pins (6) in battery box tray (7). Hook pin bails over pins.
- (5) Swing ladder (8) into ladder supports (9).
- (6) Install two clevis pins (10) through ladder supports (9) and ladder (8). Hook pin bails over pins.

c. Follow-On Maintenance

Remove wheel chocks.

**CHAPTER 3
MAINTENANCE INSTRUCTIONS**

Contents	Para	Page
Introduction	3-1	3-1
Troubleshooting Introduction	3-2	3-1
Troubleshooting Symptoms	3-3	3-1
Maintenance Procedures Introduction	3-4	3-44
HET Tractor Cleaning Instructions	3-5	3-44
Changing Tire Assembly	3-6	3-45
Servicing Tires	3-7	3-60
Dipstick Removal/Installation.....	3-8	3-63

Section I. LUBRICATION INSTRUCTIONS

3-1. INTRODUCTION

Refer to LO 9-2320-360-12 for lubrication procedures for the Truck, Tractor, M1070, 8 x 8, Heavy Equipment Transporter (HET).

Section II. TROUBLESHOOTING PROCEDURES

3-2. TROUBLESHOOTING, INTRODUCTION

Table 3-1 lists common malfunctions that you may find with your equipment. Perform the tests, inspections, and corrective actions in the order they appear in the table.

This table cannot list all malfunctions that may occur, all test or inspections needed to find the fault, or all corrective actions needed to correct the fault. If a malfunction is not listed or actions listed do not correct the fault, notify your supervisor.

3-3. TROUBLESHOOTING SYMPTOMS

To quickly find the required troubleshooting procedure, use the Malfunction Index.

MALFUNCTION INDEX

	Troubleshooting Procedure (Page)
ENGINE	
Engine will not crank when ENGINE switch is turned to start	3-5
Engine cranks but will not start	3-6
Engine starts but misfires, runs rough, lacks power, or makes excessive exhaust smoke	3-9
Excessive engine oil consumption.....	3-11
CHECK GAUGES indicator lights	3-12
CHECK ENGINE indicator lights.....	3-13
Low OIL PRESS gage reading	3-13
Engine overheats (WATER TEMP gage continuously reads in red area approximately 230°F (110°C))	3-14
AIR SYSTEM	
LOW AIR indicator lights and warning alarm sounds	3-15
Air system loses pressure during operation or air pressure buildup is slow	3-17
Trailer brakes will not operate when service brake pedal, trailer handbrake control, or PARKING BRAKE control are applied	3-20
Windshield washer will not operate.....	3-21
Horn (city) will not operate	3-22
Horn (country) will not operate	3-23
Large quantity of moisture expelled from reservoirs	3-23
Air system pressure builds up to more than 125 psi (862 kPa)	3-23
Noisy air compressor operation.....	3-23
STEERING, SUSPENSION	
HET Tractor wanders, pulls to one side, leans, or shimmies	3-24
HET Tractor difficult to steer or excessive play	3-26
POWER TRAIN (TRANSMISSION, TRANSFER CASE, PROPELLER SHAFT, AND AXLE)	
Transmission erratic shifting, slips in all gears, moves on level terrain	3-27

MALFUNCTION INDEX (CONT)

Troubleshooting
Procedure
(Page)

Transfer case does not shift into high or low or slips out of gear	3-28
TRANS TEMP gage indicates overheating during normal operation (TRANS TEMP gage reads over 300°F (149°C))	3-29
T-CASE TEMP gage indicates overheating during normal operation (T-CASE TEMP gage reads over 300°F (149°C))	3-30
Transmission, transfer case, axle, or propeller shaft(s) unusually noisy when operating	3-30
Transfer case does not engage front axle	3-30
WHEELS, TIRES, AND HUBS	
Tires worn unevenly or excessively	3-30
Wheel wobbles or shimmies	3-31
ELECTRICAL SYSTEM	
One or more electrical circuits will not operate	3-32
One or more lighting circuits will not operate	3-32
Batteries fail to maintain charge	3-34
WINCH	
Winches will not operate	3-35
Winches unusually noisy when operating	3-35
Winches operate too slow, too fast, or only one speed	3-36
Cable hold down does not operate	3-36
CENTRAL TIRE INFLATION SYSTEM (CTIS)	
CTIS will not operate	3-37
FIFTH WHEEL	
Fifth wheel will not lock when coupling trailer to HET Tractor	3-38
Excessive movement of trailer king pin in fifth wheel	3-38
Fifth wheel will not unlock when disconnecting trailer from HET Tractor	3-39
EXHAUST SYSTEM	
Exhaust system unusually noisy or exhaust fumes in cab	3-40

MALFUNCTION INDEX (CONT)

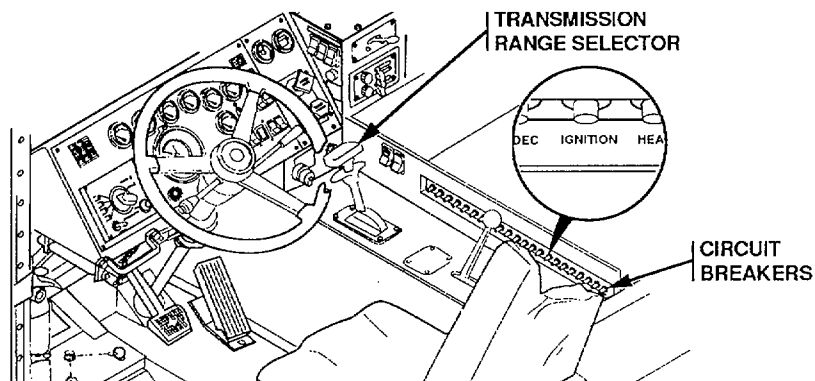
	Troubleshooting Procedure (Page)
SPECIAL PURPOSE KITS	
Radio.....	3-42
Chemical Alarm	3-42
M-13 Decontamination Unit	3-42
Gas Particulate Filter Unit will not operate	3-42

Table 3-1. Troubleshooting

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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ENGINE

1. **ENGINE WILL NOT CRANK WHEN ENGINE SWITCH IS TURNED TO START.**

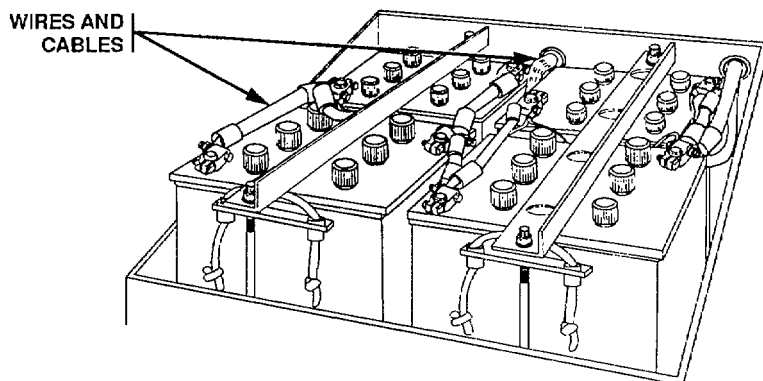


Step 1. Check if IGNITION circuit breaker has been tripped.

Reset IGNITION circuit breaker if it has been tripped.

Step 2. Check if transmission range selector is positioned in N (neutral).

Position transmission range selector in N (neutral).



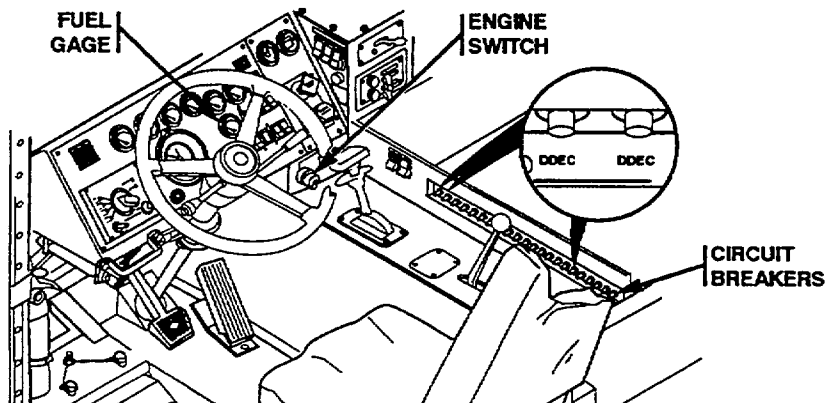
Step 3. Check wires and cables connected to batteries for dirty, loose, or broken connections.

Tighten loose cable connections. Notify unit maintenance if cable or wire connections are broken, damaged, or dirty.

Table 3-1. Troubleshooting (Cont)

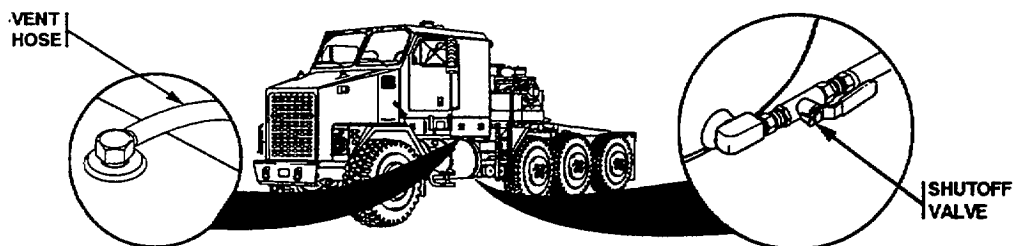
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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2. ENGINE CRANKS BUT WILL NOT START



Step 1. Check if three DDEC circuit breakers have been tripped. Reset DDEC circuit breaker(s) if they have been tripped.

Step 2. Turn ENGINE switch to ON position. Check FUEL gage for quantity of fuel in tanks. Add fuel as required.



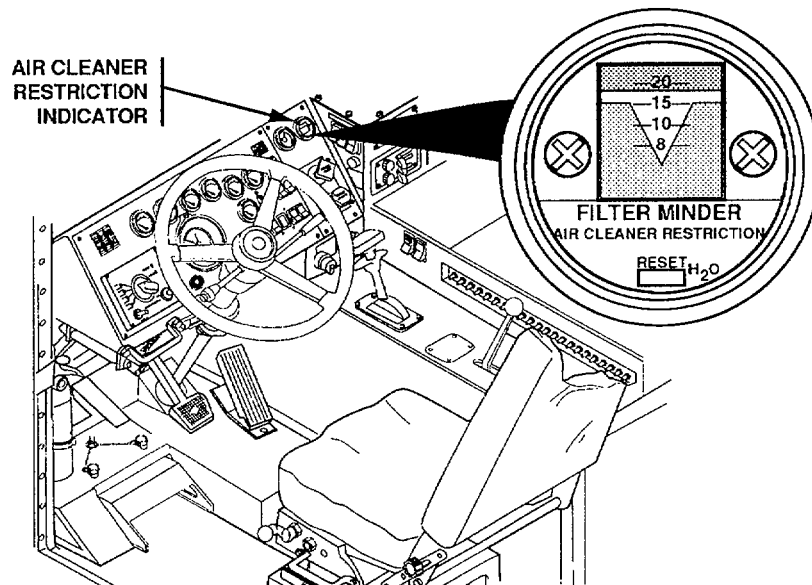
Step 3. Check if both fuel shutoff valves are in open position. If valves are closed, fuel cannot get from right to left fuel tank. Open valves if closed.

Step 4. Check if fuel tank vent hoses are plugged. If vent hoses are plugged, vacuum can be created inside fuel tank. Clean vent hoses as required.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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2. ENGINE CRANKS BUT WILL NOT START (CONT).



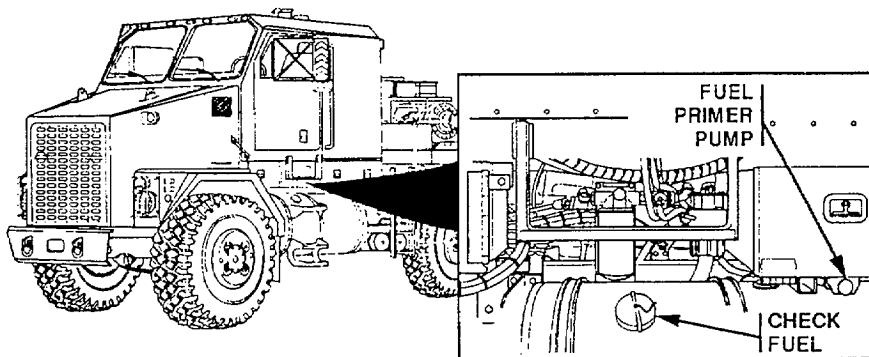
- Step 4. Check reading on AIR CLEANER RESTRICTION indicator. Press RESET button on AIR CLEANER RESTRICTION indicator if reading is between 15 and 20 (in yellow area) or above 20 (in red area). Attempt to start engine.

Notify unit maintenance if reading on AIR CLEANER RESTRICTION indicator is between 15 and 20 (in yellow area) or above 20 (in red area).

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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2.	ENGINE CRANKS BUT WILL NOT START (CONT).	
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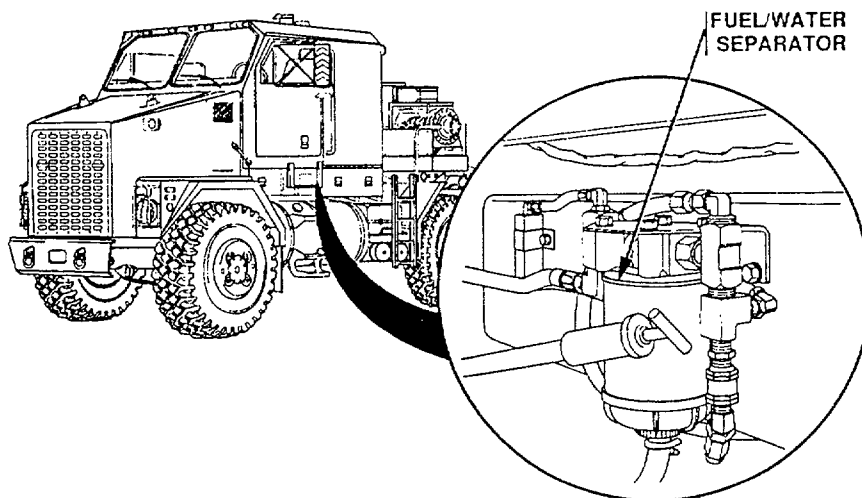
Step 5. Visually check fuel level in tanks.

Add fuel if fuel level is low. Prime engine with fuel primer pump if quantity of fuel in tanks is adequate. Push in and turn fuel primer pump 1/4 turn in either direction to release. Pump fuel primer pump two or three times to prime and purge air from fuel system. Push in and turn fuel primer pump 1/4 turn in either direction to lock.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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3. **ENGINE STARTS BUT MISFIRES, RUNS ROUGH, LACKS POWER, OR MAKES EXCESSIVE EXHAUST SMOKE.**



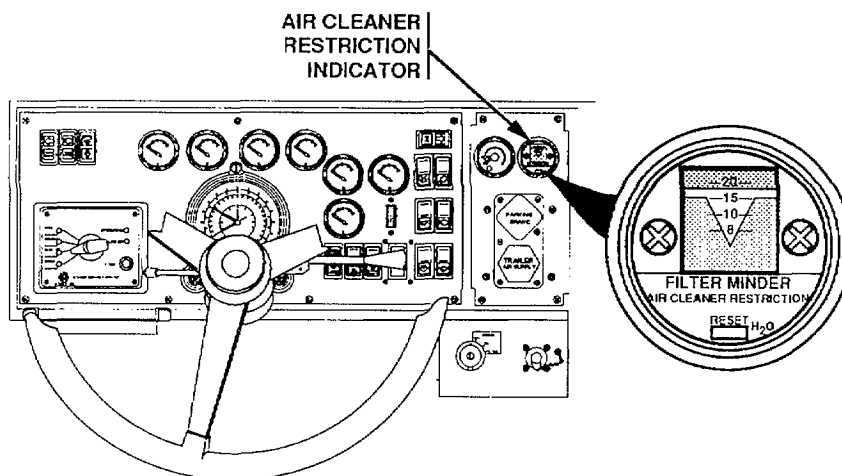
Step 1. Check for presence of water and other contaminants in bowl of fuel/water separator.

Remove water and other contaminants from fuel/water separator (para 2-7).

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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3. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, LACKS POWER, OR MAKES EXCESSIVE EXHAUST SMOKE (CONT).



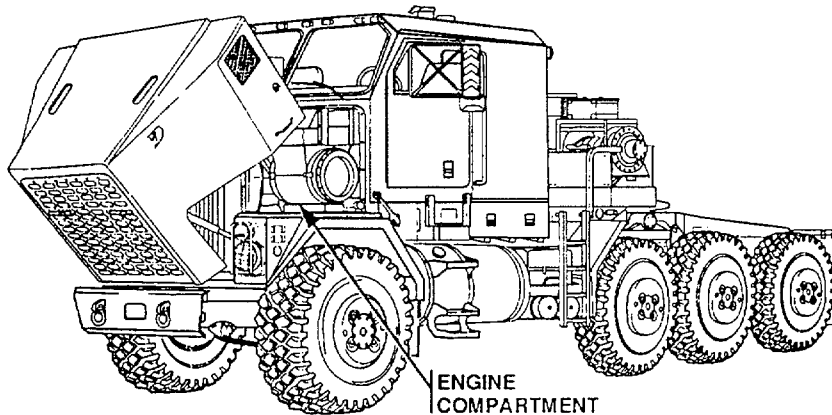
Step 2. Press RESET button. Start engine. Check reading on AIR CLEANER RESTRICTION indicator. Shut down engine.

Notify unit maintenance if reading on AIR CLEANER RESTRICTION indicator is greater than 15 (in yellow or red area).

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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4.	EXCESSIVE ENGINE OIL CONSUMPTION.	
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**NOTE**

Engine oil consumption is considered normal if engine uses less than 10 qt (9 L) of oil in 1000 mi (1609 km) of operation.

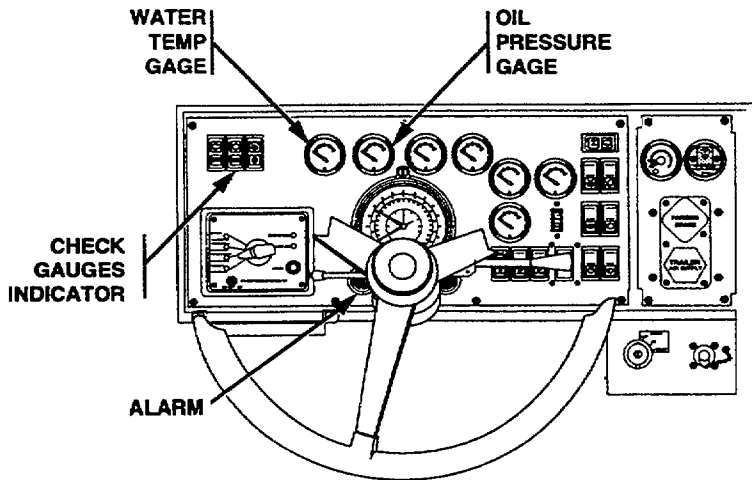
Check inside and under engine compartment for signs of oil leakage.

Tighten loose oil line connections. Notify unit maintenance if oil leakage or damage is found or oil consumption continues to be excessive.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

5. CHECK GAUGES INDICATOR LIGHTS.



CAUTION

CHECK GAUGES indicator light and alarm sounds when a potential engine failure (e.g. low oil pressure, low coolant, coolant overheating) has occurred. Shut down engine if gages indicate abnormal readings.

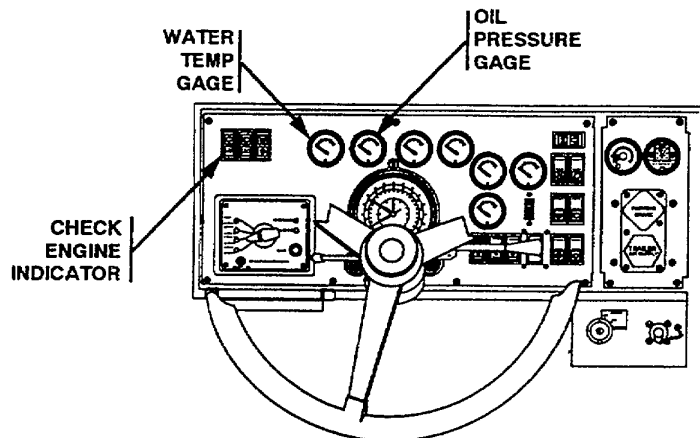
- Step 1. Scan engine gages quickly. Gages should read as follows:
 OIL PRESS gage.....25-30 psi (172-207 kPa) at 800-1000 rpm
 50-70 psi (345-483 kPa) at 1800-2100 rpm
 WATER TEMP gage ..below 230°F (110°C)
- Step 2. Check coolant level (para 2-7).
 Notify unit maintenance coolant level is low.
- Step 3. Check engine oil level (para 2-7).
 Fill if engine oil level is low.
- Step 4. Check status of CHECK GAUGES indicator.

If CHECK GAUGES indicator remains lit but both gages indicate normal, complete mission and then notify unit maintenance for DDEC troubleshooting.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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6. CHECK ENGINE INDICATOR LIGHTS.



NOTE

CHECK ENGINE indicator lights (amber) to warn driver of failures that will not critically damage engine. HET Tractor should be serviced as soon as possible.

Step 1. Scan OIL PRESS and WATER TEMP gages for abnormal readings.

Record abnormal OIL PRESS gage and WATER TEMP gage readings and notify unit maintenance as soon as possible.

Step 2. Check status of CHECK ENGINE indicator.

If CHECK ENGINE indicator remains lit but both gages indicate normal, complete mission and then notify unit maintenance for DDEC troubleshooting.

7. LOW OIL PRESS GAGE READING.

NOTE

Oil pressure can go as low as 5 psi (34 kPa) at engine idle.

Step 1. Check engine oil level (para 2-7).

Fill if engine oil level is low.

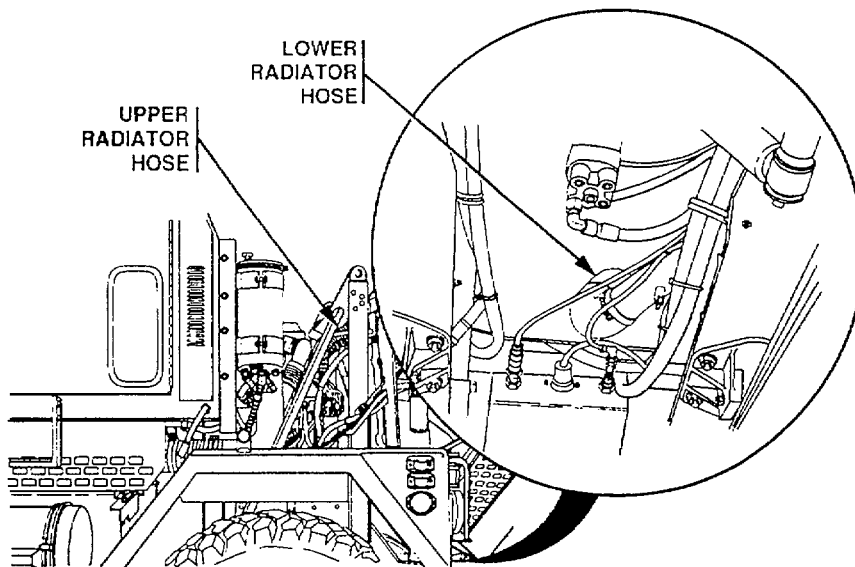
Step 2. Check status of CHECK GAUGES indicator

Notify unit maintenance if indicator lights/alarm sounds.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
8. ENGINE OVERHEATS. (WATER TEMP GAGE CONTINUOUSLY READS IN RED AREA APPROXIMATELY 230°F (110°C).)		

- Step 1. Check coolant level (para 2-7).
Notify unit maintenance if coolant level is low.



WARNING

Radiator coolant hoses are hot and pressurized during engine operation. Let radiator cool before checking hoses. Failure to let radiator and hoses cool may result in serious burns.

- Step 2. Check upper and lower radiator hoses and housing for leaks and damage.

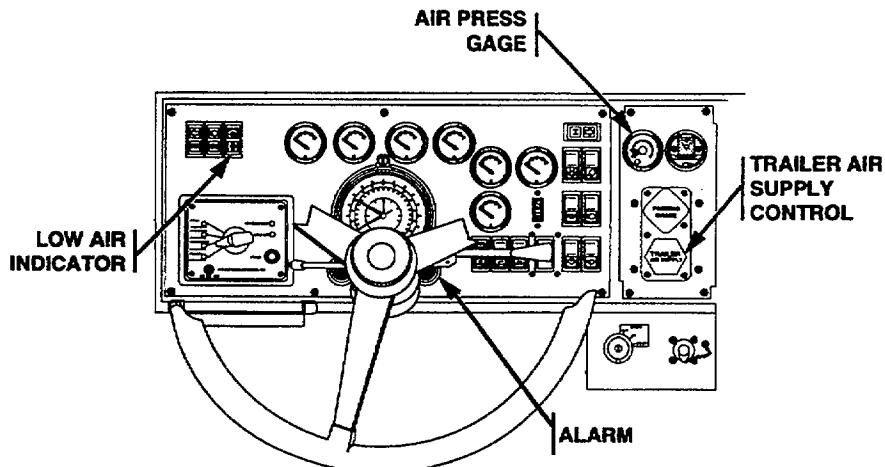
Tighten loose radiator hose connections. Notify unit maintenance if radiator hoses or housing are damaged.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

AIR SYSTEM

1. LOW AIR INDICATOR LIGHTS AND WARNING ALARM SOUNDS.



NOTE

Disconnect intervehicular air hoses between HET Tractor and trailer before performing tests or inspections.

- Step 1. Check green and red needles on AIR PRESS gage for low air pressure reading.

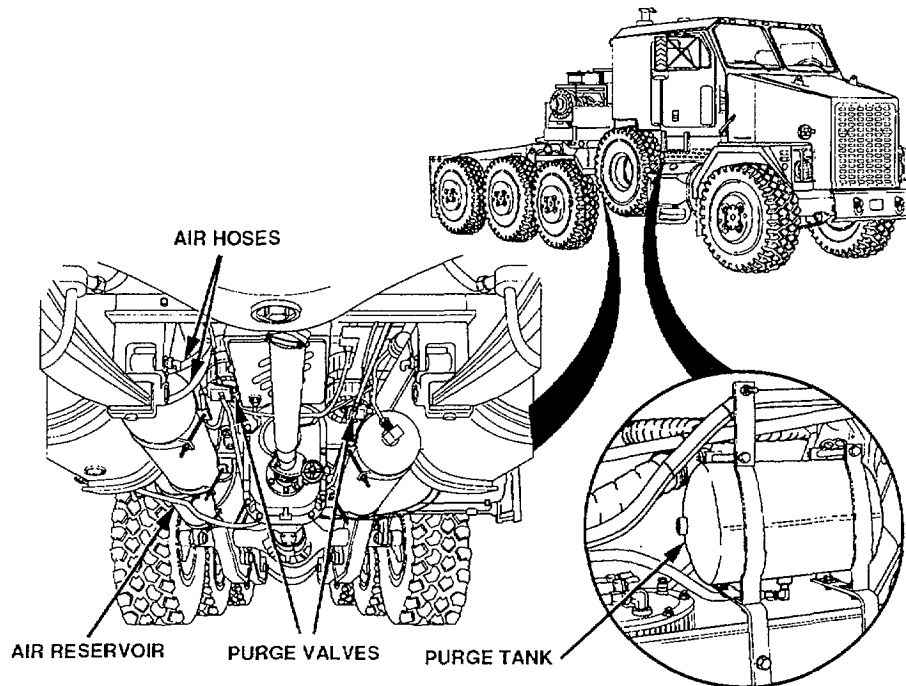
Notify unit maintenance if needle(s) on gage read 75 psi (517 kPa) or more, but indicator light and warning alarm are still on.

- Step 2. Check if TRAILER AIR SUPPLY control is in the off position. Pull out TRAILER AIR SUPPLY control to the off position.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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1.	LOW AIR INDICATOR LIGHTS AND WARNING ALARM SOUNDS (CONT).	
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Step 3. Check five air reservoirs, purge tank, and drain valves for leaks or damage.

Notify unit maintenance if air reservoirs or drain valves are leaking or damaged.

Step 4. Check two air dryer purge valves for leaks or damage.

Notify unit maintenance if air reservoirs or drain valves are leaking or damaged.

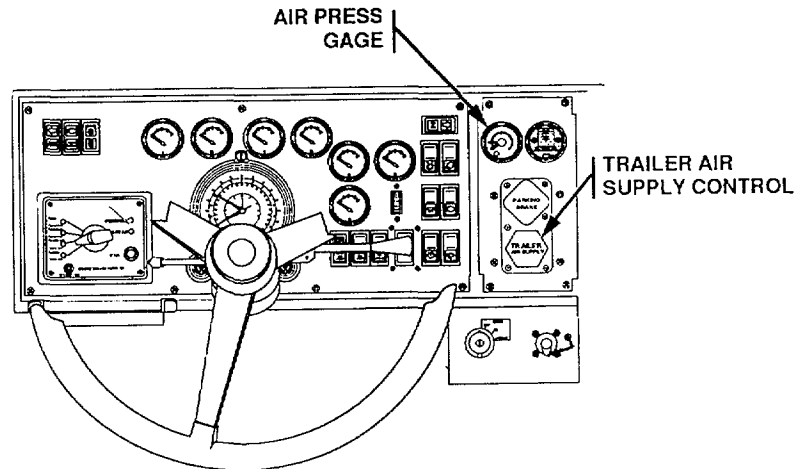
Step 5. Check air hoses and fittings for leaks and damage.

Tighten loose connections. Notify unit maintenance if air hoses or fittings are leaking or damaged.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. AIR SYSTEM LOSES PRESSURE DURING OPERATION OR AIR PRESSURE BUILDUP IS SLOW.



NOTE

Disconnect intervehicular air hoses between HET Tractor and trailer before performing tests or inspections.

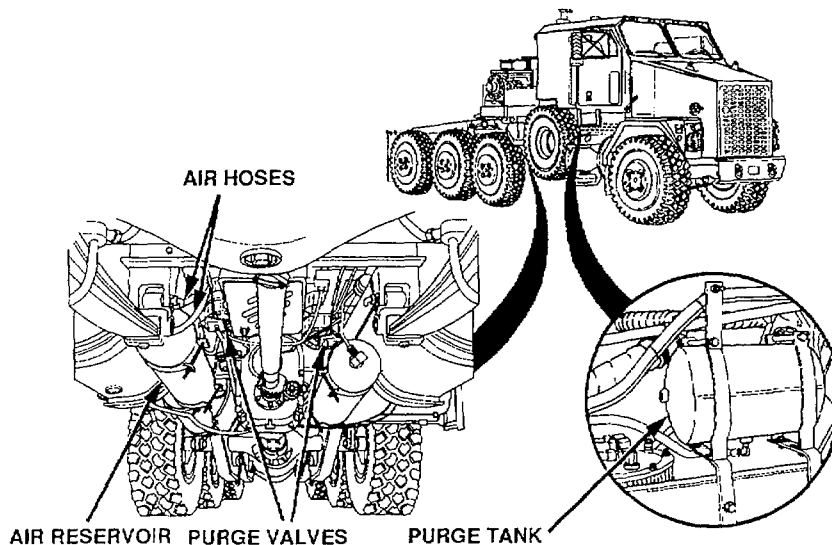
Step 1. Check if TRAILER AIR SUPPLY control is in the off position.

Pull out TRAILER AIR SUPPLY control to the off position.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. AIR SYSTEM LOSES PRESSURE DURING OPERATION OR AIR PRESSURE BUILDUP IS SLOW (CONT).



Step 2. Check five air reservoirs, purge tank, and drain valves for leaks or damage.

Notify unit maintenance if air reservoirs or drain valves are leaking or damaged.

Step 3. Check two air dryer purge valves for leaks or damage.

Notify unit maintenance if air reservoirs or drain valves are leaking or damaged.

Step 4. Check at hoses and fittings for leaks and damage.

Tighten loose connections. Notify unit maintenance if air hoses or fittings are leaking or damaged.

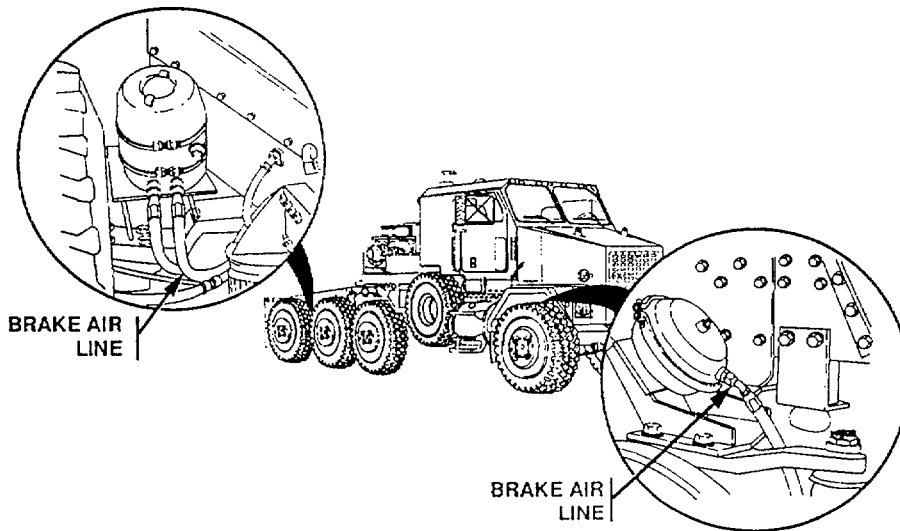
Step 5. Operate engine at 1450-1500 rpm and allow air pressure to build up to 120 psi (827 kPa).

Notify unit maintenance if 120 psi (827 kPa) cannot be reached.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. AIR SYSTEM LOSES PRESSURE DURING OPERATION OR AIR PRESSURE BUILDUP IS SLOW (CONT).



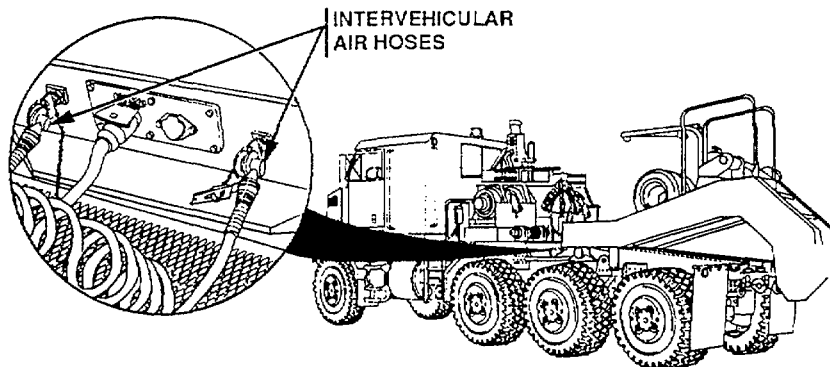
- Step 6. Press service brake pedal completely down while assistant listens for leaks in brake air lines.

Tighten loose connections. Notify unit maintenance if air lines or fittings are leaking or damaged.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

3. TRAILER BRAKES WILL NOT OPERATE WHEN SERVICE BRAKE PEDAL, TRAILER HANDBRAKE CONTROL, OR PARKING BRAKE CONTROL ARE APPLIED.



- Step 1. Check intervehicular air hoses for secure connections, leaks, and damage.

Securely connect intervehicular air hoses. Notify unit maintenance if intervehicular are hoses or connections are leaking or damaged.

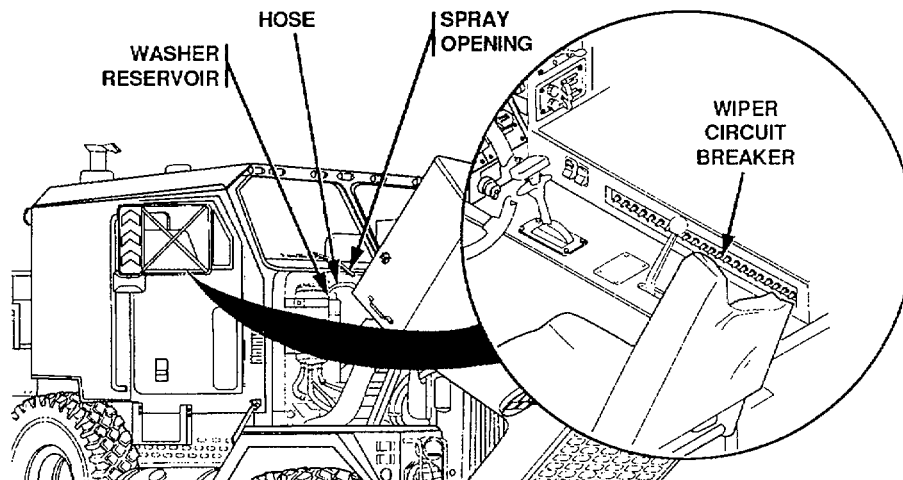
- Step 2. Check intervehicular air hoses for leaks if brakes are still inoperative.

Notify unit maintenance if intervehicular air hoses are not leaking.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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4. WINDSHIELD WASHER WILL NOT OPERATE.



Step 1. Check if circuit breaker has been tripped.

Reset circuit breaker if it has been tripped.

CAUTION

Do not fill windshield washer reservoir with water when temperatures are likely to be 32°F (0°C) or less. If water freezes, reservoir can crack or break.

Step 2. Check washer reservoir fluid level.

Notify unit maintenance if fluid level is low.

Step 3. Check washer reservoir, hoses, and hose connections for leaks and damage.

Tighten loose washer hose connections. Notify unit maintenance if washer reservoir or hoses are leaking or damaged.

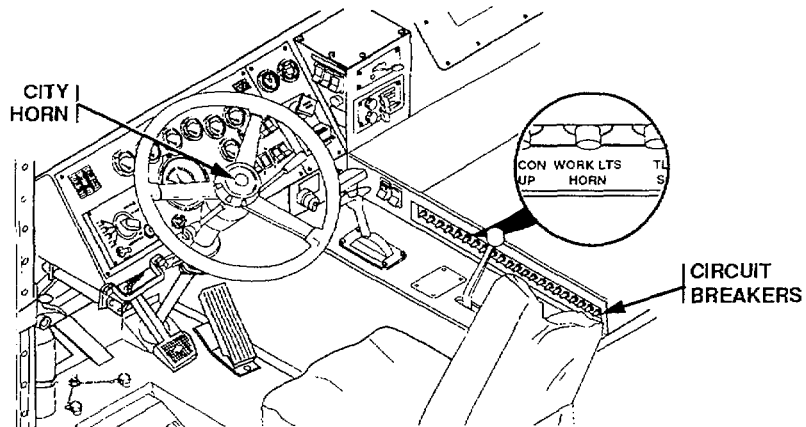
Step 4. Check washer spray openings for restrictions.

Clear washer spray openings using pin, wire, or similar item if restricted.

Table 3-1. Troubleshooting (Cont)

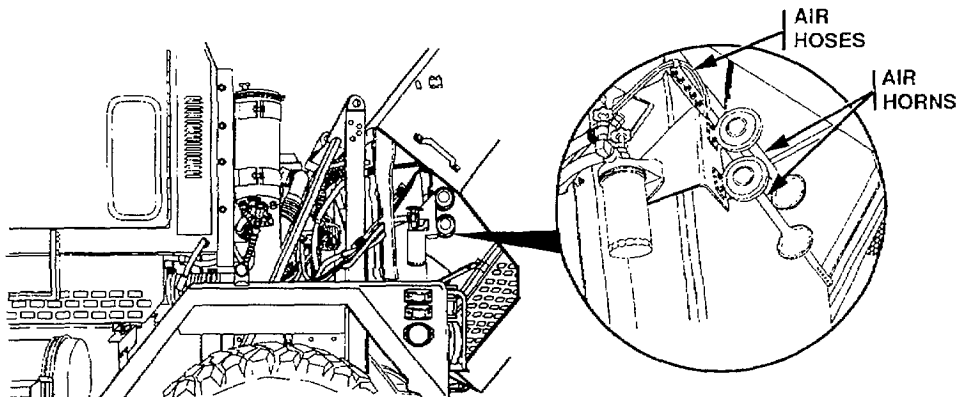
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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5. HORN (CITY) WILL NOT OPERATE.



Step 1. Check if WORK LTS/HORN circuit breaker has been tripped.

Reset WORK LTS/HORN circuit breaker if it has been tripped.



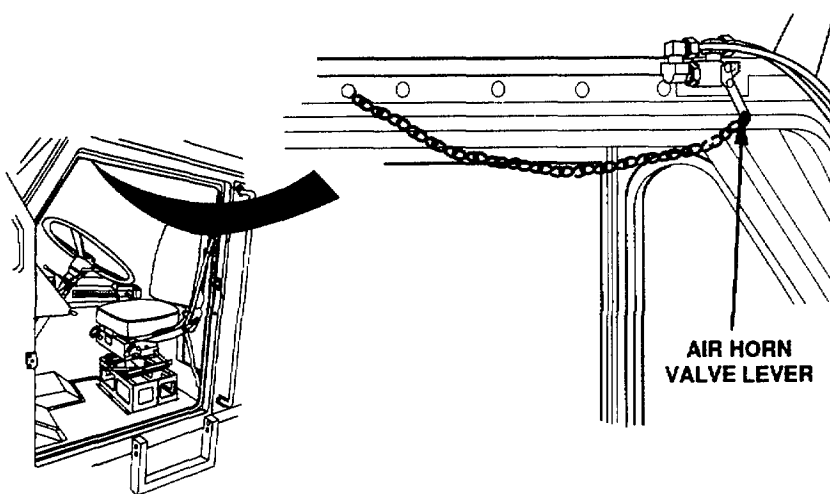
Step 2. Check air hoses and connections at air horns for leaks and damage.

Tighten loose air hose connections. Notify unit maintenance if air hoses are leaking or damaged.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

6. **HORN (COUNTRY) WILL NOT OPERATE.**



Step 1. Check if air horn valve lever clevis stuck.

Try to free air horn valve lever. Notify unit maintenance if air horn valve lever cannot be freed.

Step 2. Check air hoses and connections at air horns for leaks and damage.

Tighten loose air hose connections. Notify unit maintenance if air hoses are leaking or damaged.

7. **LARGE QUANTITY OF MOISTURE EXPELLED FROM RESERVOIRS.**

Notify unit maintenance.

8. **AIR SYSTEM PRESSURE BUILDS UP TO MORE THAN 125 PSI (862 KPA).**

Notify unit maintenance.

9. **NOISY AIR COMPRESSOR OPERATION.**

Notify unit maintenance.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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STEERING, SUSPENSION

1. HET TRACTOR WANDERS, PULLS TO ONE SIDE, LEANS, OR SHIMMIES.

WARNING

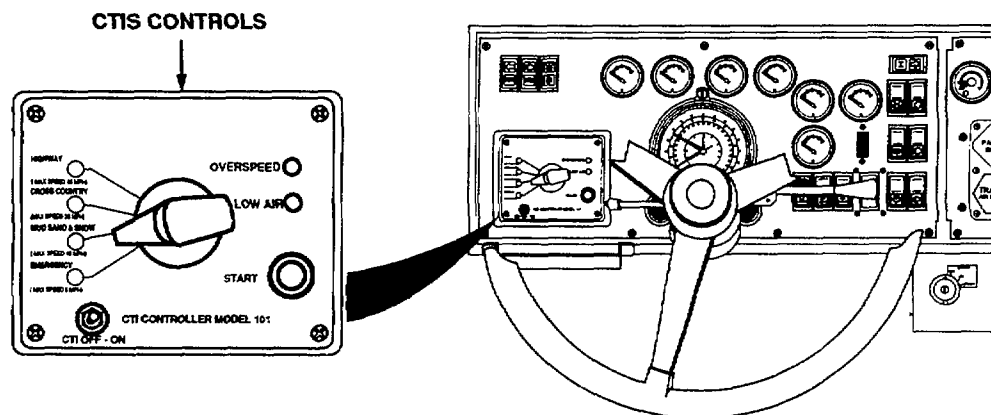
- Use caution when inflating tires. Over-inflation may cause tires to blow apart causing serious injury to personnel.
- Tire air pressure must be checked properly or serious personal injury or death may result.

NOTE

If CTIS is not working, tires may be inflated manually. Inflate tires only when they are cool. Inflate to proper pressure for terrain conditions.

Step 1. Check for proper tire pressure in all tires.

Manually inflate or deflate tires to proper pressure (para 3-7).



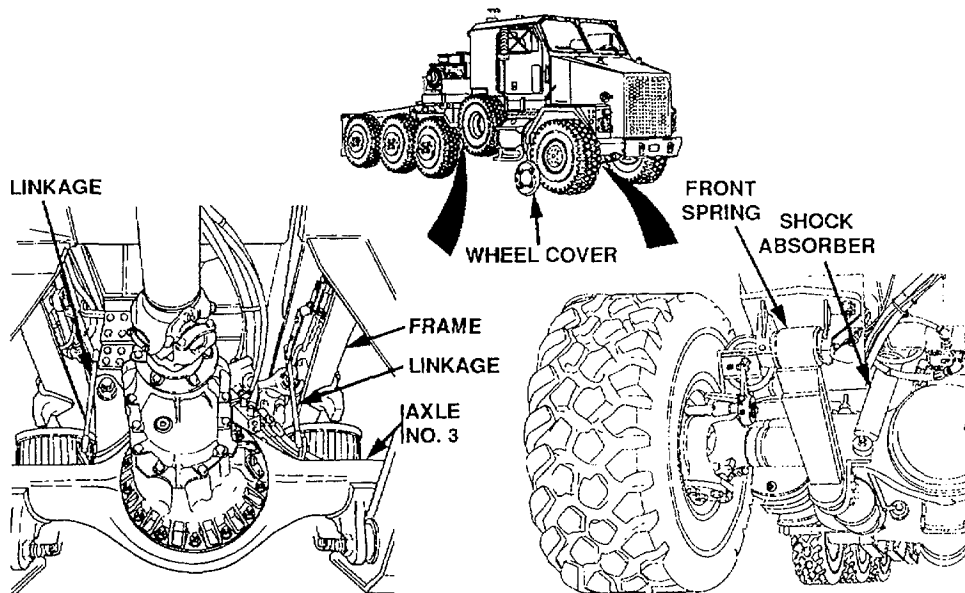
Step 2. Check CTIS controls for proper operation (para 2-13).

Notify unit maintenance if CTIS does not operate properly.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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1. HET TRACTOR WANDERS, PULLS TO ONE SIDE, LEANS, OR SHIMMIES (CONT).



Step 3. Remove wheel coves and check for damaged, loose, or missing wheel lugnuts.

Tighten loose lugnuts. Notify unit maintenance of damaged lugnuts and to tighten loose lugnuts to proper torque value.

Step 4. Check front spring assemblies and shock absorbers on front axle for loose mountings and damage.

Notify unit maintenance if front spring assemblies or shock absorbers are loose or damaged.

Step Check linkage on ride height valves.

Notify unit maintenance if linkage is damaged.

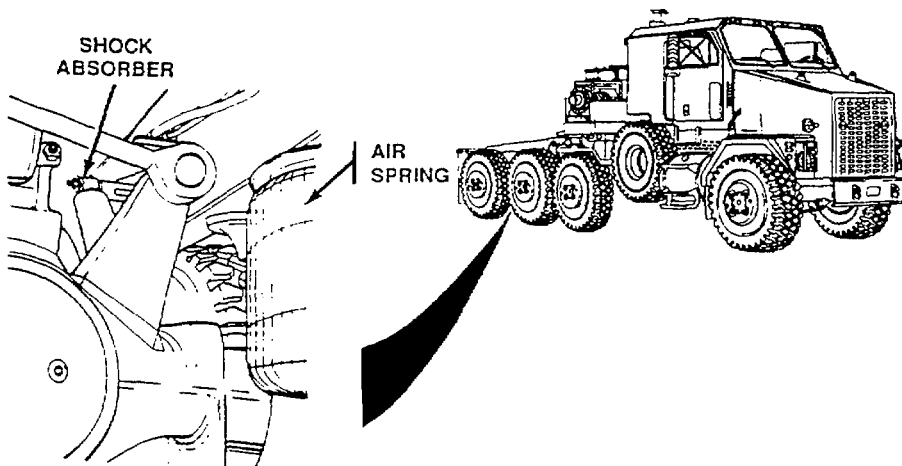
Step 6. Check for level ride height. Difference in distance between bottom of frame and ground should be less than 1.5 in. (38.1 mm) from side to side.

If distance is greater than 1.5 in. (38.1 mm), ride height requires adjustment. Notify unit maintenance.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. HET TRACTOR WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT).



Step 7. Check for spring assemblies and shock absorbers on rear three axles for loose mountings and damage. Check air spring assemblies for leakage.

Notify unit maintenance if air spring assemblies or shock absorbers are loose or damaged.

2. HET TRACTOR DIFFICULT TO STEER OR EXCESSIVE PLAY.

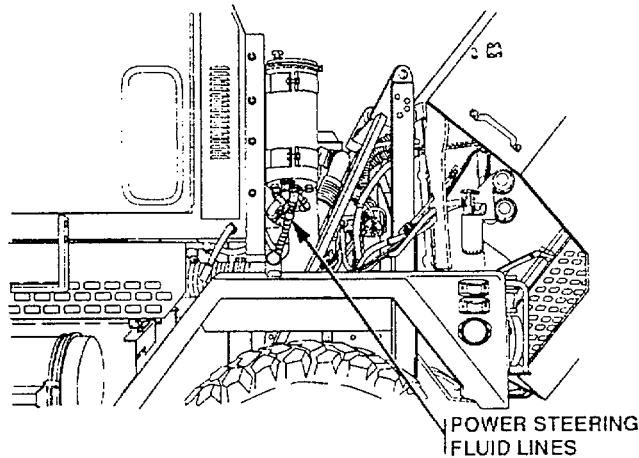
Step 1. Check power steering fluid level (para 2-7).

Notify unit maintenance if power steering fluid level is low.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. HET TRACTOR DIFFICULT TO STEER OR EXCESSIVE PLAY (CONT).



Step 2. Check power steering fluid lines for leakage and damage.

Notify unit maintenance if power steering fluid lines are leaking or damaged.

Step 3. Check steering component for damage.

Notify unit maintenance if steering components are damaged.

POWER TRAIN (TRANSMISSION, TRANSFER CASE, PROPELLER SHAFT, AND AXLE)

1. TRANSMISSION ERRATIC SHIFTING, SLIPS IN ALL GEARS, MOVES ON LEVEL TERRAIN.

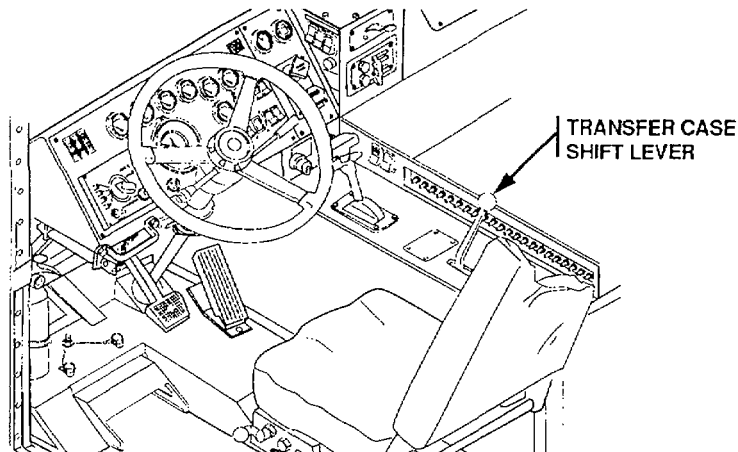
Check transmission fluid level (para 2-7).

Notify unit maintenance if transmission fluid level is low.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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2.	TRANSFER CASE DOES NOT SHIFT INTO HIGH OR LOW OR SLIPS OUT OF GEAR.	
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Step 1. Move transmission range selector from N (neutral) to 2-5 position. Apply throttle to move HET Tractor forward slightly. Shift transmission range selector from 2-5 to N (neutral) position.

Shift TRANSFER CASE shift lever when HE Tractor tops.

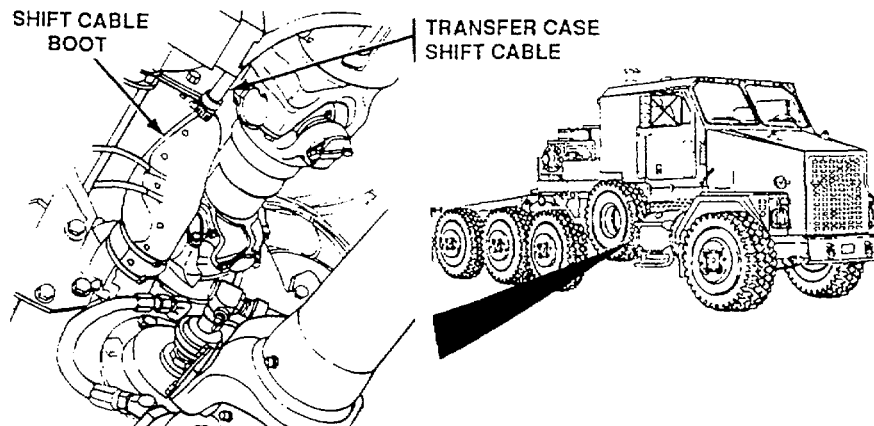
Step 2. Move transmission range selector from N (neutral) to R (reverse) position. Apply throttle to move HET Tractor rearward slightly. Shift transmission range selector from R (reverse) to N (neutral) position.

Shift TRANSFER CASE shift lever when HET Tractor stops.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. TRANSFER CASE DOES NOT SHIFT INTO HIGH OR LOW OR SHIPS OUT OF GEAR (CONT).



- Step 3. Check boot covering shift cable at transfer case for secure connection. Check if mud or other debris has built-up on transfer case shift cable.

Clean mud or other debris from transfer case shift cable. Notify unit maintenance if boot is damaged, loose, or missing or transfer case lever will not shift.

3. TRANS TEMP GAGE INDICATES OVERHEATING DURING NORMAL OPERATION (TRANS TEMP GAGE READS OVER 300°F (149°C)).

- Step 1. Check transmission fluid level (para 2-6).

Notify unit maintenance if transmission fluid level is low.

- Step 2. Shift transmission selector into lower gear and continue operation with engine brake in low position if transmission fluid is correct.

- Step 3. Stop and let transmission cool if gage does not return to normal.

- Step 4. After gage returns to normal, shift to normal range and continue operation.

Notify unit maintenance if overheating persists.

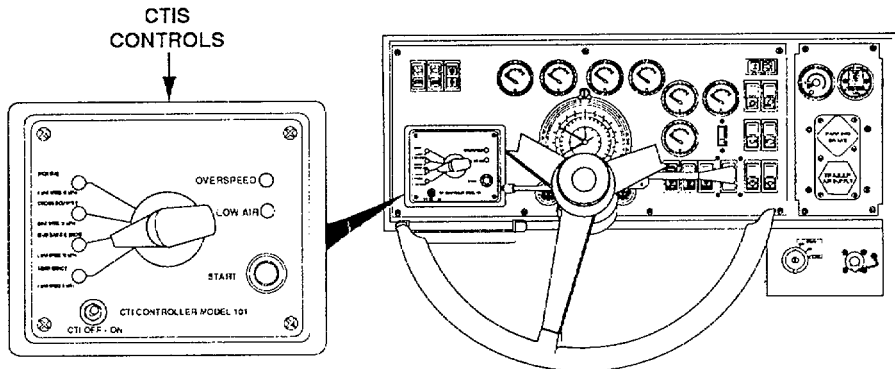
Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. T-CASE TEMP GAGE INDICATES OVERHEATING DURING NORMAL OPERATION. (T-CASE TEMP GAGE READS OVER 300°F (149°C).)		<p>Step 1. Shift transmission selector into lower gear and continue operation with engine brake in low position.</p> <p>Step 2. Stop and let transfer case cool if gage does not return to normal.</p> <p>Step 3. After gage returns to normal, shift to normal range and continue operation.</p> <p>Notify unit maintenance if overheating persists.</p>
5. TRANSMISSION, TRANSFER CASE, AXLE, OR PROPELLER SHAFT(S) UNUSUALLY NOISY WHEN OPERATING.		<p>Notify unit maintenance.</p>
6. TRANSFER CASE DOES NOT ENGAGE FRONT AXLE.		<p>Step 1. Check AIR PRESS gage for over 70 psi (483 kPa) on green needle.</p> <p>Notify unit maintenance if air pressure will not build over 70 psi (483 kPa).</p> <p>Step 2. Check if GAUGES/WARN LTS circuit breakers have been tripped.</p> <p>Reset circuit breaker.</p>
WHEELS, TIRES, AND HUBS		
1. TIRES WORN UNEVENLY OR EXCESSIVELY.		<p style="text-align: center;">WARNING</p> <p style="text-align: center;">Use caution when inflating tires. Over inflation may cause tires to blow apart causing serious injury to personnel.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;">If CTIS is not working, tires may be inflated manually.</p> <p style="text-align: center;">Inflate tires only when they are cool. Inflate to proper pressure for terrain conditions.</p> <p>Step 1. Check for proper tire pressure.</p> <p style="text-align: center;">Manually inflate or deflate tires to proper pressure (para 3-7).</p>

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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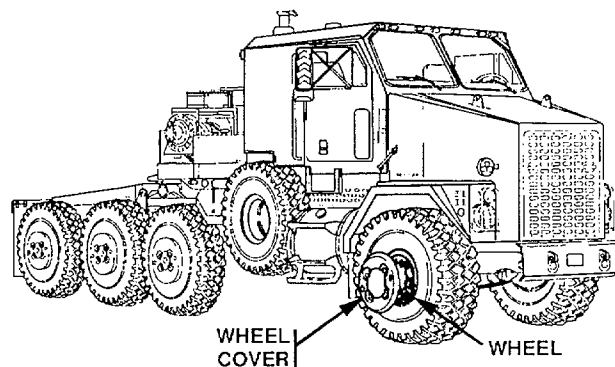
1. TIRES WORN UNEVENLY OR EXCESSIVELY (CONT).



Step 2. Check CTIS controls for proper operation (para 2-13).

Notify unit maintenance if CTIS does not operate properly.

2. WHEEL WOBBLER OR SHIMMIES.



Step 1. Remove wheel covers and check for damaged, loose, or missing wheel lugnuts.

Tighten loose lugnuts. Notify unit maintenance of damaged lugnuts and to tighten loose lugnuts to proper torque value.

Step 2. Check if wheel is bent.

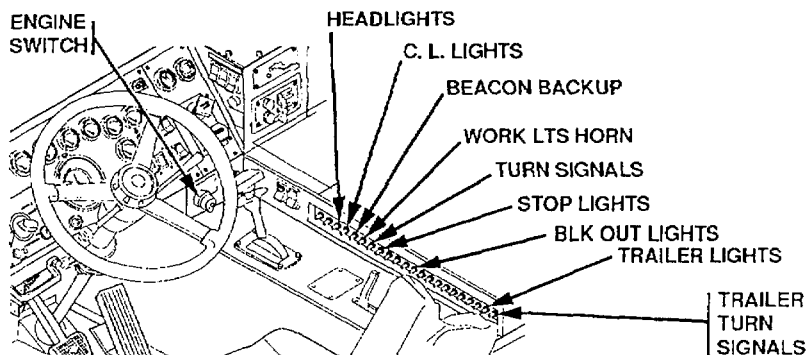
Change wheel and tire assembly (para 3-6) if wheel is bent. Notify unit maintenance if wheel still wobbles or shimmys.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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ELECTRICAL SYSTEM

1. ONE OR MORE ELECTRICAL CIRCUITS WILL NOT OPERATE.



Step 1. Check if ENGINE switch is positioned to ON.

Position ENGINE switch to ON.

Step 2. Check if any circuit breakers have been tripped.

Step 3. Check if HEADLIGHTS, C.L. LIGHTS, BEACON BACK UP, WORK LTS/HORN, TURN SIGNAL, STOP LIGHTS, BLK OUT LIGHTS, TRAILER LIGHTS, or TRAILER TURN SIGNALS circuit breakers have been tripped.

Reset circuit breaker(s) that have been tripped.

Step 4. Check if system controls are in correct operating positions (para 2-11, 2-13, 2-14, and 2-15).

Place system controls to the correct operating position. Notify unit maintenance if system still will not operate.

2. ONE OR MORE LIGHTING CIRCUITS WILL NOT OPERATE.

Step 1. Check if ENGINE switch is positioned to ON.

Position ENGINE switch to ON.

Step 2. Check if HEADLIGHTS, C.L. LIGHTS, BEACON BACK UP WORK LTS/HORN, STOP LIGHTS, BLK OUT LIGHTS, or TRAILER LIGHTS circuit breakers have been tripped.

Reset circuit breaker(s) that have been tripped.

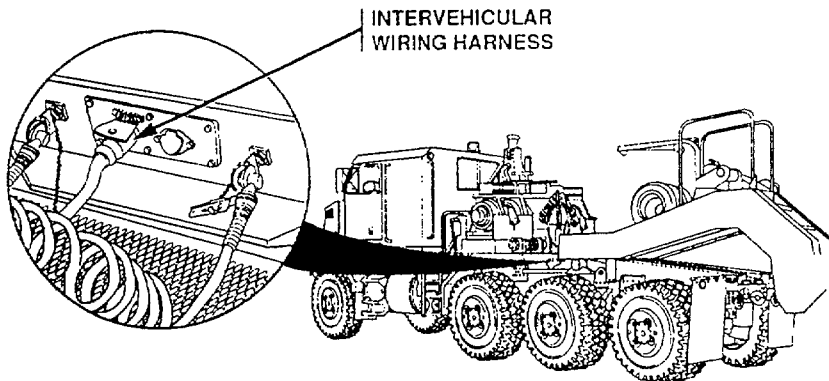
Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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2. ONE OR MORE LIGHTING CIRCUITS WILL NOT OPERATE (CONT).

Step 3. Check if lighting system controls are in correct operating positions (para 2-11).

Place system controls to the correct operating position.



Step 4. Check intervehicular wiring harness for secure connections and damage if trailer is attached and trailer light system will not operate.

Secure intervehicular wiring harness connections. Notify unit maintenance if intervehicular wiring harness is damaged.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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3. BATTERIES FAIL TO MAINTAIN CHARGE.

NOTE

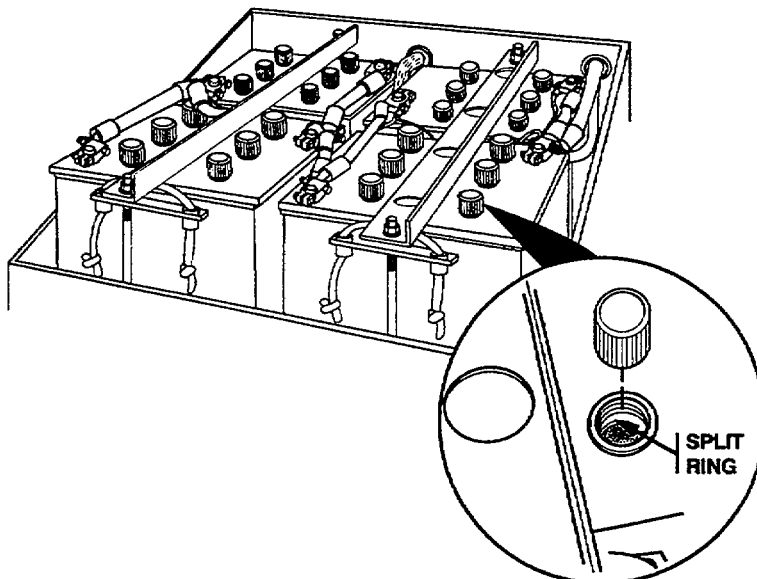
The DDEC system, tachograph, 24 volt alternator, and turn signal flasher draw on batteries even when the vehicle is shut off. It is possible for these accessories to discharge batteries if the vehicle is not operated for extended periods.

Step 1. Check if TRAILER LIGHTING and WIPER circuit breakers have been tripped.

Reset circuit breakers that have been tripped.

Step 2. Check all four batteries, terminals, cables, and posts for looseness, corrosion, or damage.

Notify unit maintenance if faults are found.



Step 3. Check fluid level of each cell on all four batteries. Fluid should be 1/8 in. (3.2 mm) below split ring.

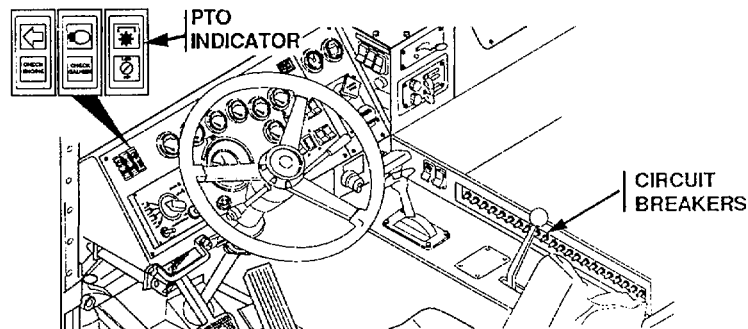
Fill cell(s) with distilled water if fluid level is low.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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WINCH

1. WINCHES WILL NOT OPERATE.



Step 1. Check if PTO is engaged.

Engage PTO (para 2-20).

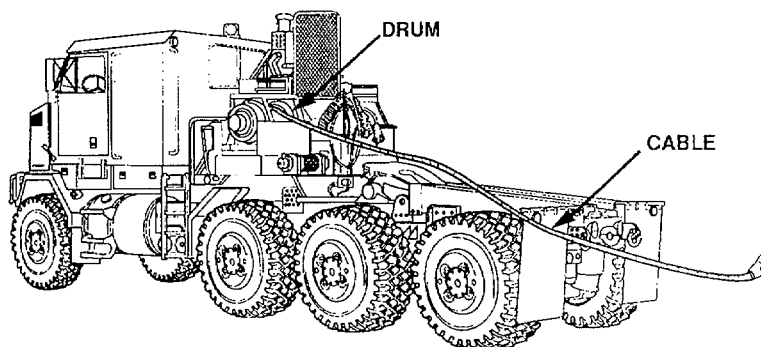
Step 2. Check if circuit breakers have been tripped.

Reset circuit breakers if they have been tripped.

Step 3. Check hydraulic fluid level (para 2-6).

Notify unit maintenance if hydraulic fluid level is low.

2. WINCHES UNUSUALLY NOISY WHEN OPERATING



Check if cable is twisted, tangled, or causing drum to bind.

Let out or take in cable, as necessary, to straighten cable and free drum. Notify unit maintenance if winch is still noisy when operating.

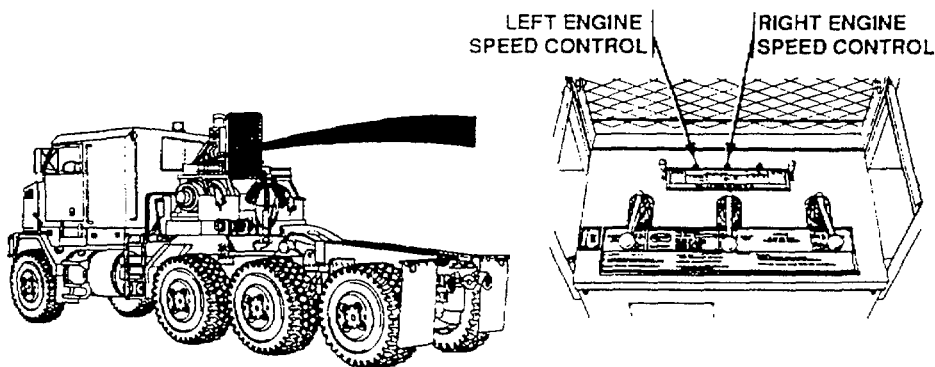
Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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3. WINCH OPERATES TOO SLOW, TOO FAST OR ONLY ONE SPEED.

Step 1. Check if WINCH SYSTEM/PTO/AIR DRYERS/GPF/HIGH IDLE circuit breaker has been tripped.

Reset circuit breaker if tripped.



Step 2. Engage PTO (para 2-20). Position left ENGINE SPEED CONTROL switch to HIGH ENGINE IDLE and press right ENGINE SPEED CONTROL switch. Check if engine is operating at 1450-1500 rpm.

Notify unit maintenance if engine speed does not increase to 1450-1500 rpm.

Step 3. Check hydraulic fluid level (para 2-7).

Notify unit maintenance if hydraulic fluid level is low.

Step 4. Check transmission fluid level (para 2-7).

Notify unit maintenance if transmission fluid level is low.

4. CABLE HOLD DOWN DOES NOT OPERATE

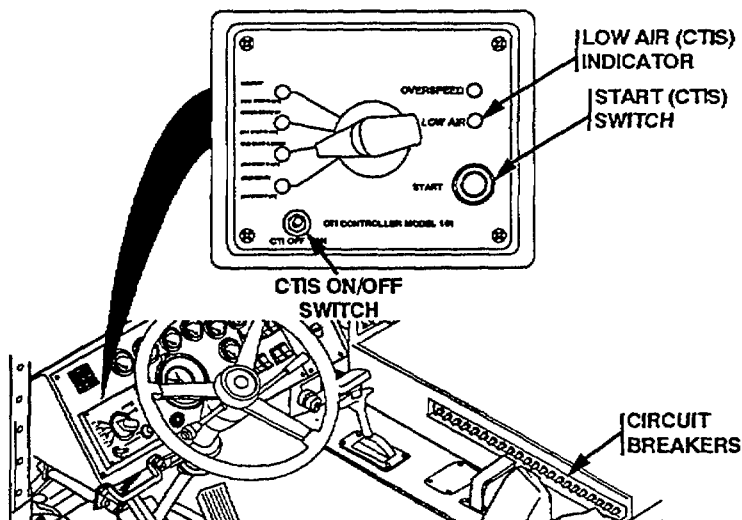
Check AIR PRESS gage for over 70 psi (483 kPa) on green needle.

Notify unit maintenance if air pressure will not build over 70 psi (483 kPa) or if cable hold down does not work over 70 psi.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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CENTRAL TIRE INFLATION SYSTEM (CTS)



NOTE

CTIS will not operate if air system pressure is less than 85 psi (586 kPa).

Step 1. Check if CTIS ON/OFF switch is in the ON position.

Place CTIS ON/OFF switch in the ON position and press START (CTIS) switch.

Step 1.1. Move CTIS ON/OFF switch to the OFF position, then back to the ON position. This action will reset the controller and may eliminate the problem.

Step 2. Check if CTIS circuit breaker has been tripped.

Reset CTIS circuit breaker if it has been tripped.

Step 3. Check LOW AIR (CTIS) indicator is it.

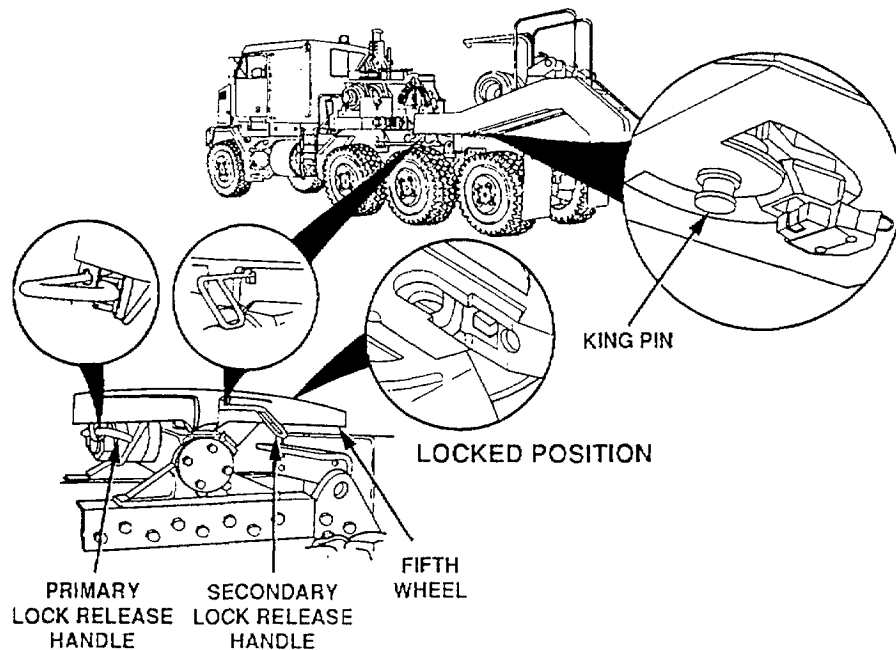
Start engine and wait for red needle on AIR PRESS gage to read 110 psi (759 kPa) or more and for LOW AIR (CTIS) indicator light to go out. Notify unit maintenance if red needle on AIR PRESS gage shows 110 psi (759 kPa) or more but CTIS still does not operate.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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FIFTH WHEEL

1. FIFTH WHEEL WILL NOT LOCK WHEN COUPLING TRAILER TO HET TRACTOR.



Step 1. Check if dirt, ice, snow, or other debris has built-up on fifth wheel.

Clean dirt, ice, snow, and other debris from fifth wheel.

Step 2. Check if secondary lock release handle is in the locked position.

Push secondary lock release handle in to the locked position.

Step 3. Check if primary lock release handle is in the locked position.

Push primary lock release handle in to the locked position.

2. EXCESSIVE MOVEMENT OF TRAILER KING PIN IN FIFTH WHEEL.

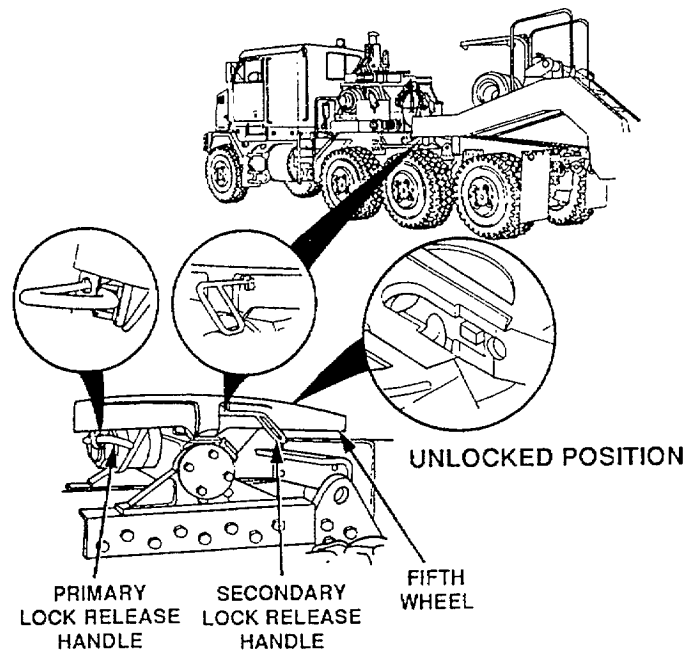
Check for loose or missing fifth wheel mounting screws or locknuts.

Notify unit maintenance if any hardware is loose or missing.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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3. FIFTH WHEEL WILL NOT UNLOCK WHEN DISCONNECTING TRAILER FROM HET TRACTOR.



- Step 1. Check if dirt, ice, snow, or other debris has built-up on fifth wheel. Clean dirt, ice, snow, and other debris from fifth wheel.

NOTE

It may be necessary to set trailer brakes and move HET Tractor slightly backward to relieve pressure on locking mechanism.

- Step 2. Check if secondary lock release handle is in the unlocked position.

Pull secondary lock release handle out to the unlocked position.

- Step 3. Check if primary lock release handle is in the unlocked position.

Pull primary lock release handle out to the unlocked position.

- Step 4. Check if fifth wheel needs lubrication.

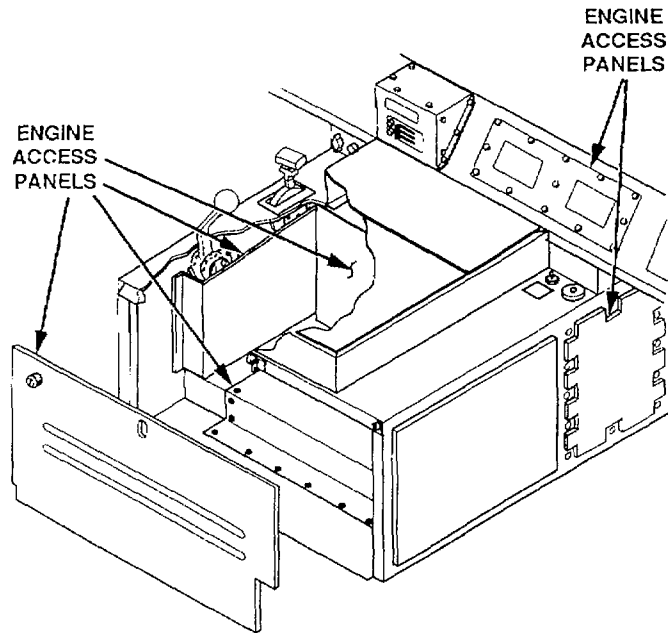
Notify unit maintenance if any hardware is loose or missing.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

EXHAUST SYSTEM

EXHAUST SYSTEM UNUSUALLY NOISY OR EXHAUST FUMES IN CAB.



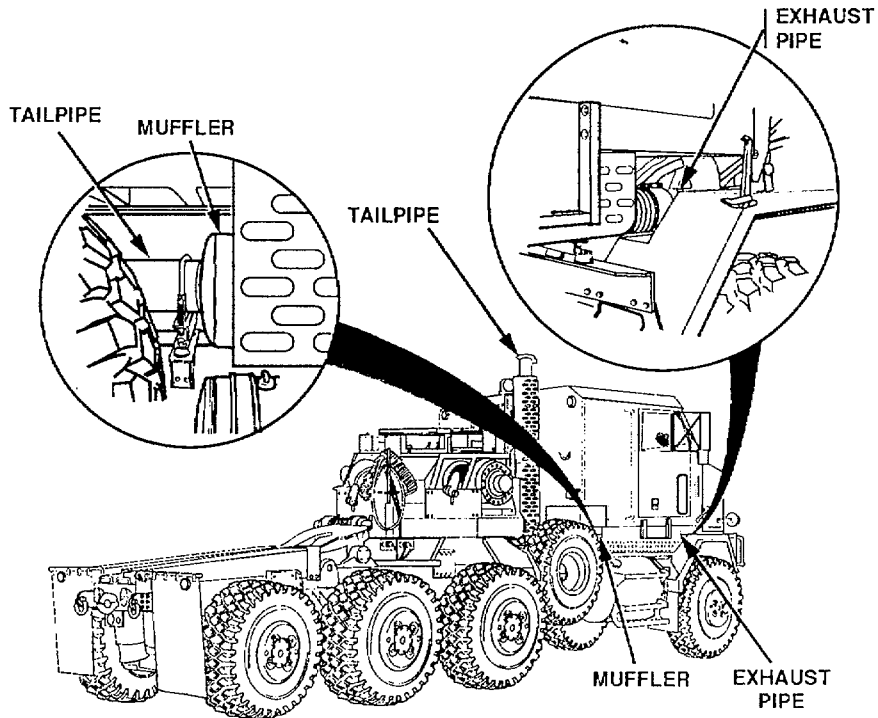
Step 1. Check that all engine access panels are in place and secure.

Tighten loose panels. Notify unit maintenance if any panels are missing.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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EXHAUST SYSTEM UNUSUALLY NOISY OR EXHAUST FUMES IN CAB (CONT).



Step 2. Check exhaust pipe, muffler, and tailpipe for holes or loose parts.

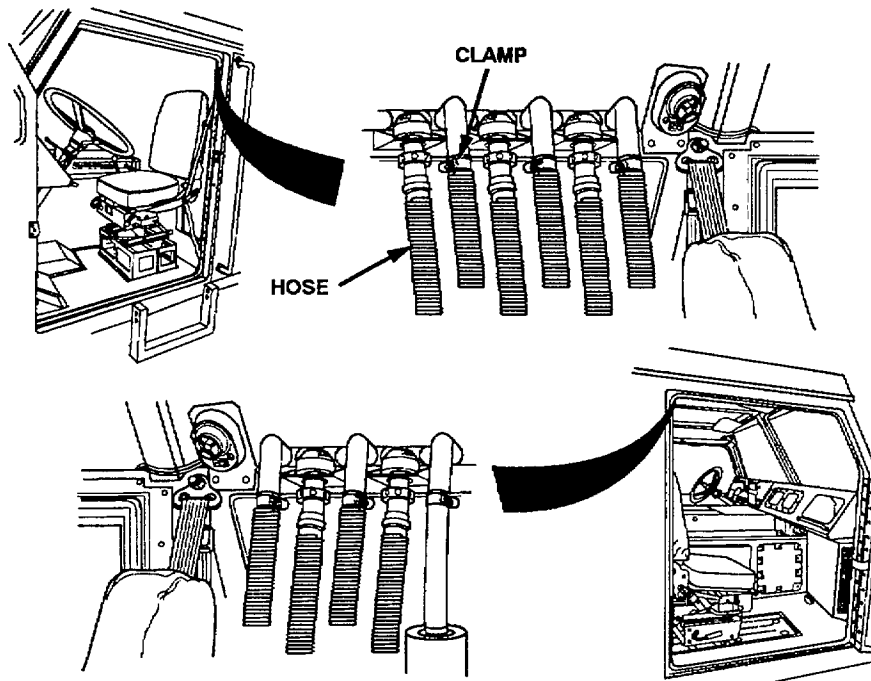
Tighten loose parts. Notify unit maintenance if any exhaust system parts are leaking or damaged.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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SPECIAL PURPOSE KITS

1. **RADIO.** Refer to TM 11-5820-498-12 for Radio Troubleshooting.
2. **CHEMICAL ALARM.** Refer to TM 3-6665-225-12 for Chemical Alarm Troubleshooting.
3. **M13 DECONTAMINATION UNIT.** Refer to TM 3-4230-214-12&P for M13 Decontamination Unit Troubleshooting.
4. **GAS PARTICULATE FILTER UNIT WILL NOT OPERATE.**



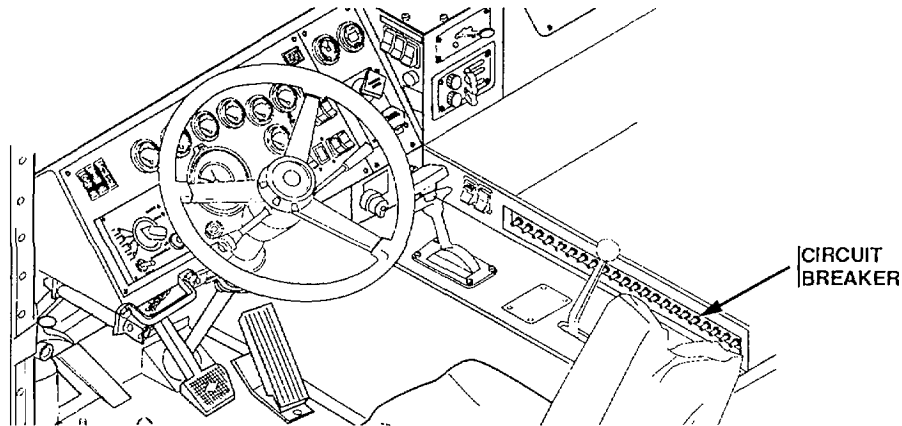
Step 1. Check hoses for cuts, tears, cracks, or holes.

Ensure hose clamps are secure.

Table 3-1. Troubleshooting (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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4. GAS PARTICULATE FILTER UNIT WILL NOT OPERATE (CONT).



Step 2. Check if WINCH SYSTEM/PTO/AIR DRYERS/GPF/HIGH IDLE circuit breaker has been topped. Reset circuit breaker if tripped.

Notify unit maintenance if unit still does not operate.

Section III. MAINTENANCE PROCEDURES

3-4. INTRODUCTION

This chapter contains instructions for service and repair of components at the operator maintenance level. Some subassemblies and part must be removed before the component can be repaired. Notify unit maintenance.

3-5. HET TRACTOR CLEANING INSTRUCTIONS

a. Cleaning Exterior

CAUTION

Do not wipe dirt off HET Tractor when it is dry. Dirt, stones, or debris may scratch and damage HET Tractor.

- (1) Wash HET Tractor often with warm soapy water. Do not use strong detergent or abrasives.
- (2) While cleaning HET Tractor, look for rust, corrosion, bare metal, or other damage. Report any damage to unit maintenance.

b. Cleaning Interior

CAUTION

Accelerator pedal and CTIS manifold have electrical components. Do not get water on these parts. Damage to accelerator pedal and CTIS manifold may result.

- (1) Remove loose dirt and dust from cab interior component.
- (2) Clean seat cushions, seatbelts, and shoulder harnesses with warm soapy water. Do not use abrasives or solvents.
- (3) Wipe seat cushions, seatbelts, and shoulder harnesses dry.

3-6. CHANGING TIRE ASSEMBLY

This task covers:

Removal

Installation

INITIAL SETUP

Equipment Conditions

- Vehicle shut down (para 2-12).
- Parking brake on (para 2-9).
- Emergency marker kit set out (para 2-29).
- Emergency flashers on (para 2-11).
- CTIS shut off (para 2-13).

Tools and Special Tools

- Adapter (Item 1, Appendix B)
- Chocks, Wheel (2)(Item 11, Appendix B)
- Extension, Wrench (Item 13, Appendix B)
- Handle, Extension (Item 17, Appendix B)
- Handle, Extension, 40 In. (Item 17.1, Appendix B)
- Handle, Sliding (Item 19, Appendix B)
- Hose Assembly Air (Item 21, Appendix B)
- Jack, Hydraulic (2)(Item 22, Appendix B)
- Pins, Adapter (2)(tem 30.1, Appendix B)
- Plate, Jack (Item 28, Appendix B)
- Socket, Impact (Item 36, Appendix B)

Tools and Special Tools (Cont)

- Socket, Impact (Item 37, Appendix B)
- Warning Device Kit (Item 39, Appendix B)
- Wrench, Adjustable (Item 41, Appendix B)
- Wrench, Air Powered (Item 43, Appendix B)
- Wrench, Open-End (Item 44, Appendix B)
- Wrench, Tube, 3/4 in. (Item 45, Appendix B)

Materials/Parts

- Rags (Item 14, Appendix D)
- Gloves, Leather (Appendix C)

General Safety Instructions

The two piece handle supplied with the hydraulic jack must not be used. Only use the 40 in. (102 cm) extension handle to operate the jack. Failure to comply may result in injury or death to personnel.

Personnel Required

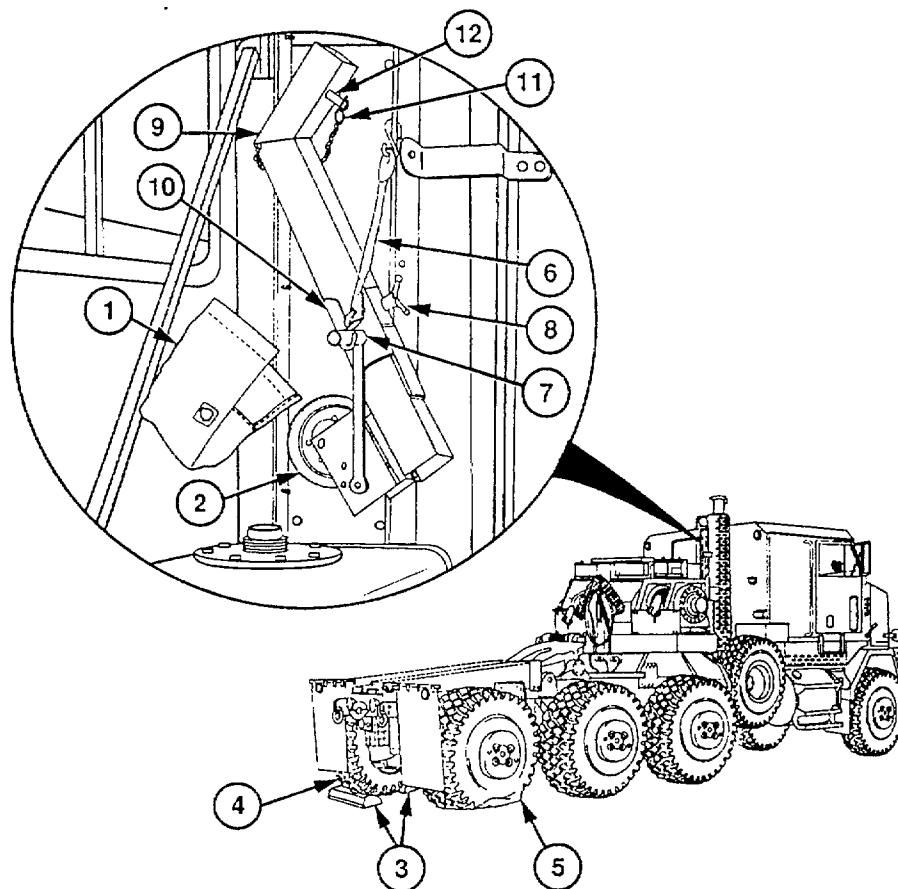
Two

WARNING

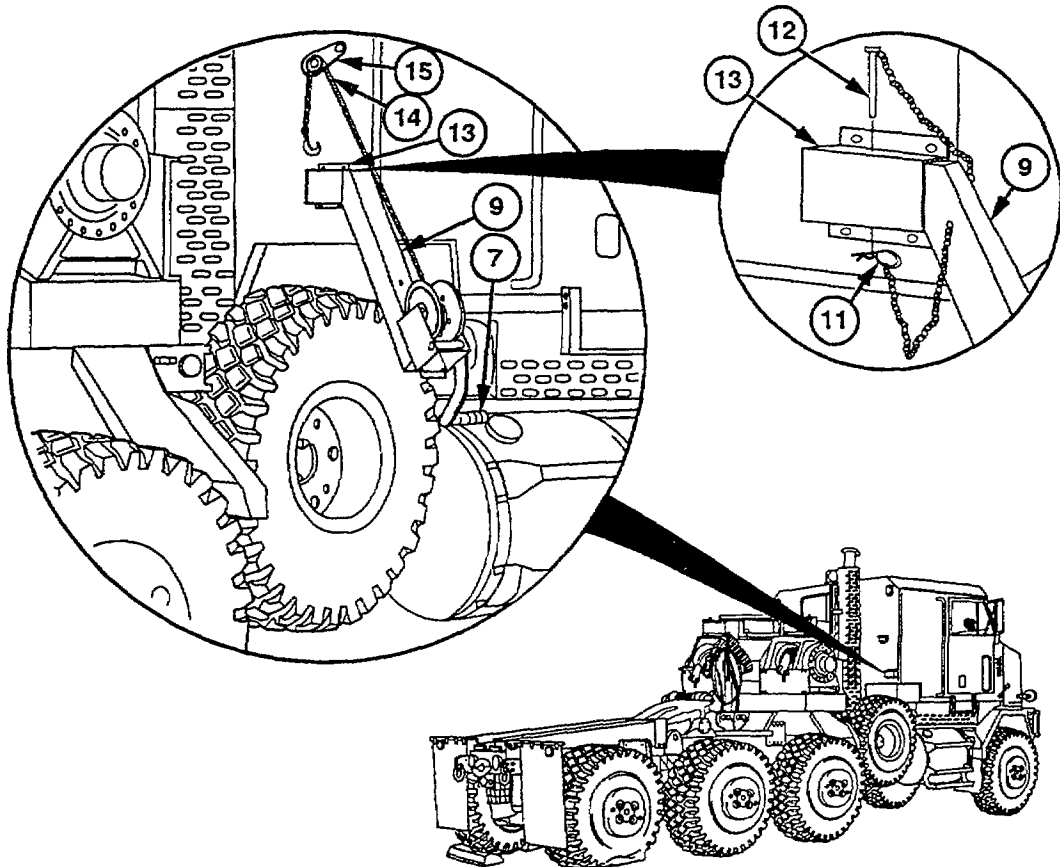
- **HET M1070 Tractor must be parked in a safe area, out of traffic, where there is no danger to personnel changing the tire assembly.**
- **HET M1070 Tractor must be parked on hard, level surface where jacks will have a stable surface. Attempting to change the tire assembly on unlevel or soft surface may result in truck falling and injury or death to personnel.**

3-6. CHANGING TIRE ASSEMBLY (CONT)**WARNING**

Tire assembly is very heavy. Do not try to lift or catch tire assembly. Injury or death to personnel may result.

a. HET Tractor Preparation

- (1) Remove boot (1) from winch (2).
- (2) Install two chocks (3) against tire (4) that is directly across from flat tire (5).
- (3) Remove rubber strap (6) from handcrank (7).
- (4) Remove T-handle (8) and tire lift arm (9) from mounting bracket (10).
- (5) Remove safety pin (11) from pin (12). Remove pin (12) from tire lift arm (9).

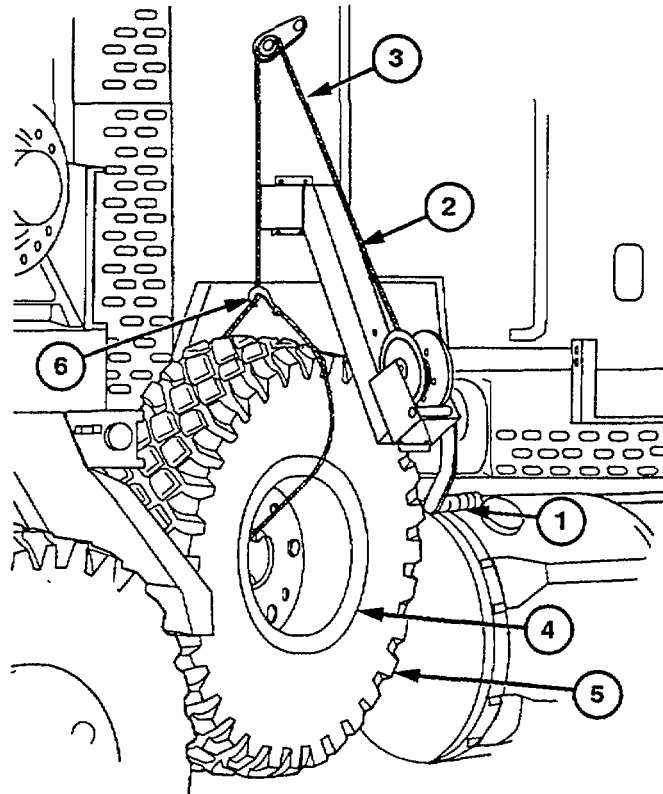


- (6) Install tire lift arm (9) in mount (13) and align holes.
- (7) Insert pin (12) through holes. Insert safety pin (11) through pin (12).

WARNING

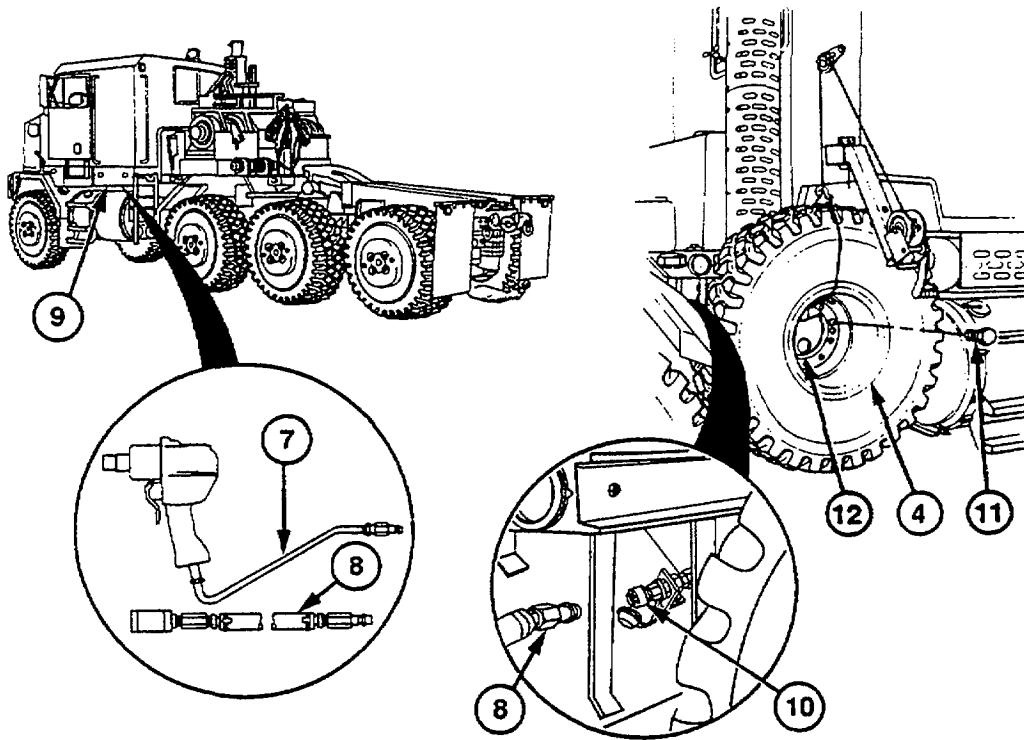
Always wear heavy duty gloves when handling winch cable. Never let cab run through hands. Frayed cable can cut hands severely.

- (8) Turn handcrank (7). Route cable (14) around pulley (15).

3-6. CHANGING TIRE ASSEMBLY (CONT)**b. Spare Tire Removal****WARNING**

Always wear heavy duty gloves when handling winch cable. Never let cable run through hands. Frayed cable can cut hands severely.

- (1) Turn handcrank (1) of tire davit (2) to let out enough cable (3) to route through wheel (4) and wrap around spare tire assembly (5).
- (2) Push hook (6) through wheel (4). Wrap cable (3) once around spare tire assembly (5).
- (3) Secure hook (6) to cable (3) at top of tire assembly (5).
- (4) Turn handcrank (1) to put light tension on cable (3).



NOTE

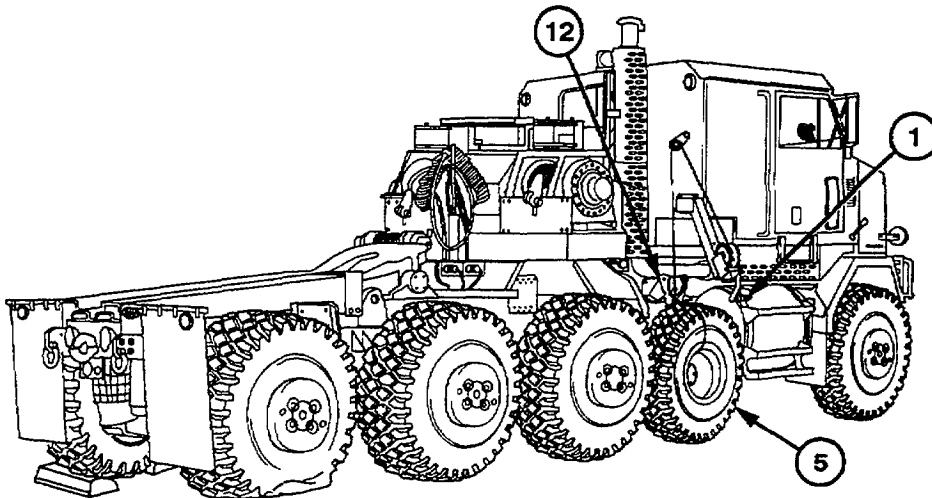
- If air powered wrench is used, HET Tractor air system will be depleted. Engine must be running to provide air to components. If air powered wrench is used, do steps (5) thru (7). If not, go to step (8).
- If engine is started during tire change, CTIS on/off switch must be in the off position.

- (5) Remove air wrench (7) and air hose (8) from stowage box (9).
- (6) Install air hose (8) in are supply coupling (10).
- (7) Install air hose (8) on air wrench (7).

WARNING

Cable must be secure and taut around wheel before removing screws. Failure to comply may result in tire falling, causing injury to personnel.

- (8) Remove three screws (11) from wheel (4) and bracket (12).

3-6. CHANGING TIRE ASSEMBLY (CONT)**WARNING**

- Tire is very heavy. Place tire on ground as soon as possible. Personal injury may result if tire falls.
- Always wear heavy duty gloves when handling winch cable. Never let cable run through hands. Frayed cable can cut hands severely.

CAUTION

Use care when lowering tire to prevent damage to CTIS wheel valve.

- (9) Turn handcrank (1) to lift spare tire assembly (5) just above bracket (12).
- (10) Turn handcrank (1) to lower spare tire assembly (5) to ground while assistant pulls spare tire away from bracket (12).

WARNING

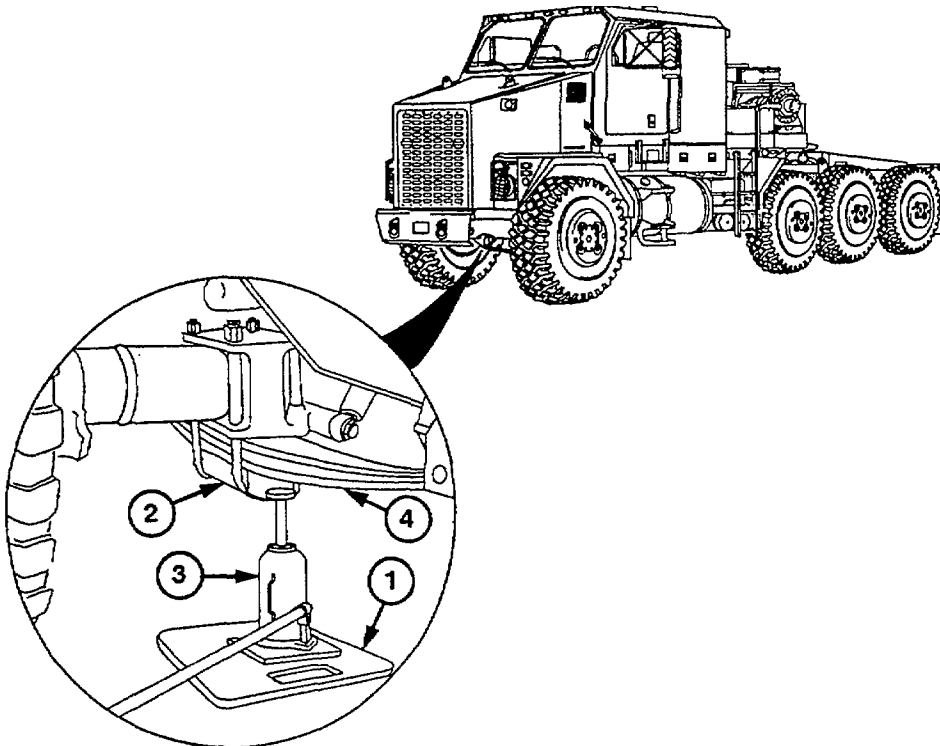
Do not remove cable at this time. Failure to comply may result in tire falling over causing serious injury or death to personnel.

- (11) Lean spare tire assembly (5) against HET Tractor with aid of assistant.

c. Flat Tire Removal

NOTE

If changing a tire on the front axle, start step (1). If changing a tire on one of the rear axles, start at step (4.6).

**WARNING**

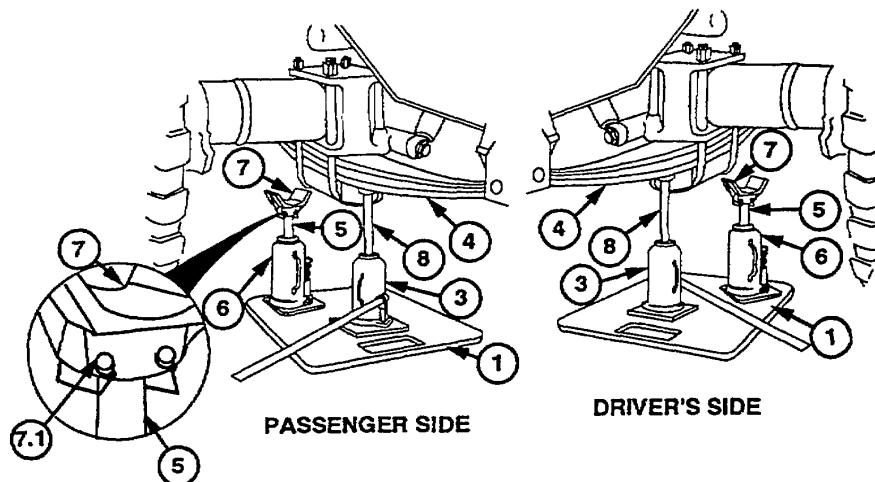
- Never go under equipment when supposed only by jack. Keep clear equipment when rising or lowering. Equipment may fall and use serious injury or death to personnel.
- Never go under HET Tractor with engine running. Vehicle may move unexpectedly and cause serious injury or death to personnel

- (1) Position jack plate (1) under spring saddle (2) so that both jacks can be placed on jack plate.

NOTE

Jack no. 1 should be positioned approximately 2 in. (5.08 cm) in front of spring saddle. Ensure jack cylinder is completely compressed.

- (2) Position jack no. 1 (3) on jack plate (1), under spring (4) and in front of spring saddle (2).

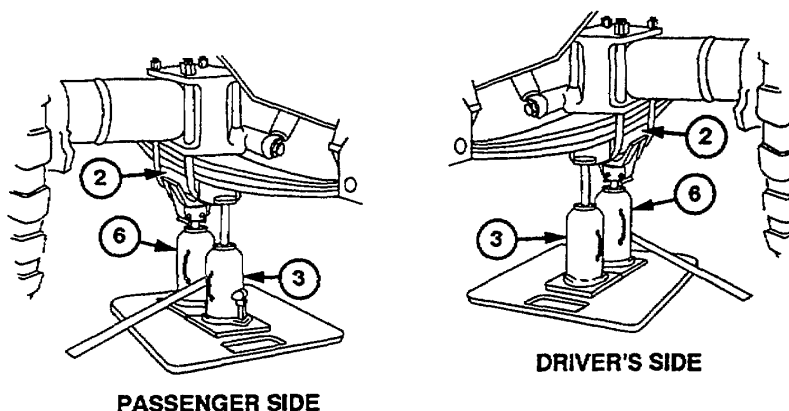


- (3) Unscrew ram (8) of jack no. 1 (3) until touches spring (4).
- (4) Unscrew ram (5) jack no. 2 (6) approximately 3 in. (7.62 cm).

NOTE

Adapter must be centered on jack.

- (4.1) Install adapter (7) on ram (5) of jack no. 2 (6) with two locking pins (7.1) and position jack on jack plate (1).
- (4.2) Raise jack no. 1 (3) to its maximum height.



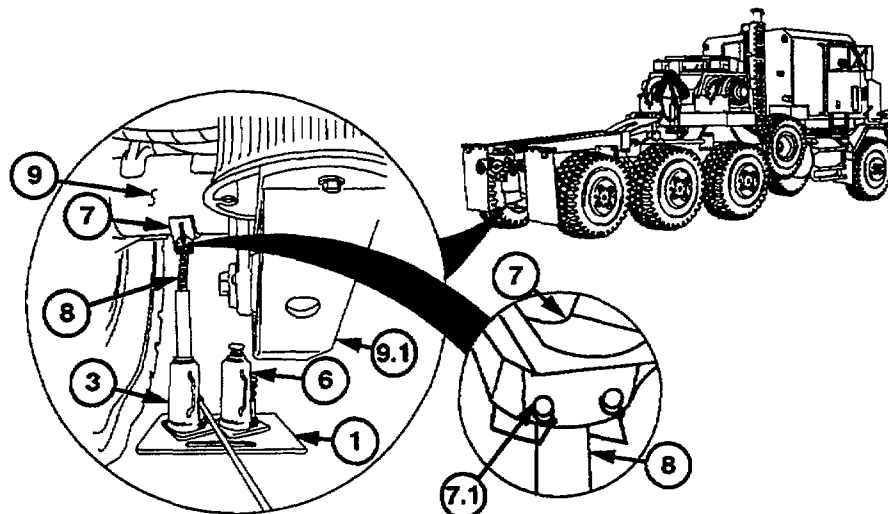
WARNING

Jack must be positioned using only the extension handle (Item 17.1, Appendix). Do not attempt to crawl under the vehicle to position jack. Failure to comply may result in injury to personnel.

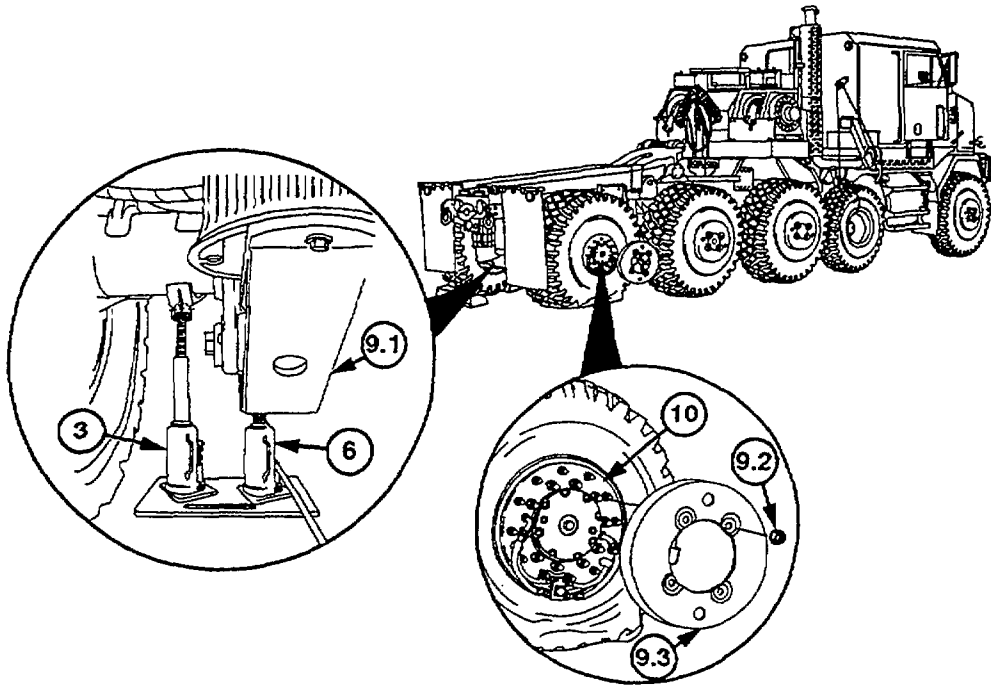
- (4.3) Move jack no. 2 (6) directly under spring saddle (2).
- (4.4) Raise jack no. 2 (6) until jack no. 1 (3) can be removed.
- (4.5) Move jack no. 1 (3) clear of the spring saddle (2) and spring (4) and go to step (4.13).

WARNING

- Never go under equipment when supported only by jack. Keep clear of equipment when raising or lowering. Equipment may fall and cause serious injury or death to personnel.
- Never go under HET Tractor with engine running. Vehicle may move unexpectedly and cause serious injury or death to personnel.



- (4.6) Position jack plate (1) under axle housing (9) and trailing arm (9.1) so both jacks can be placed on jack plate.
- (4.7) Install adapter (7) on ram (8) of jack no. 1 (3) with two locking pins (7.1) and position jack on jack plate (1) under axle housing (9).
- (4.8) Position jack no. 2 (6) on jack plate (1).
- (4.9) Unscrew ram (8) of jack no. 1 (3) until adapter (7) touches axle housing (9).
- (4.10) Raise jack no. 1 (3) to its maximum height.



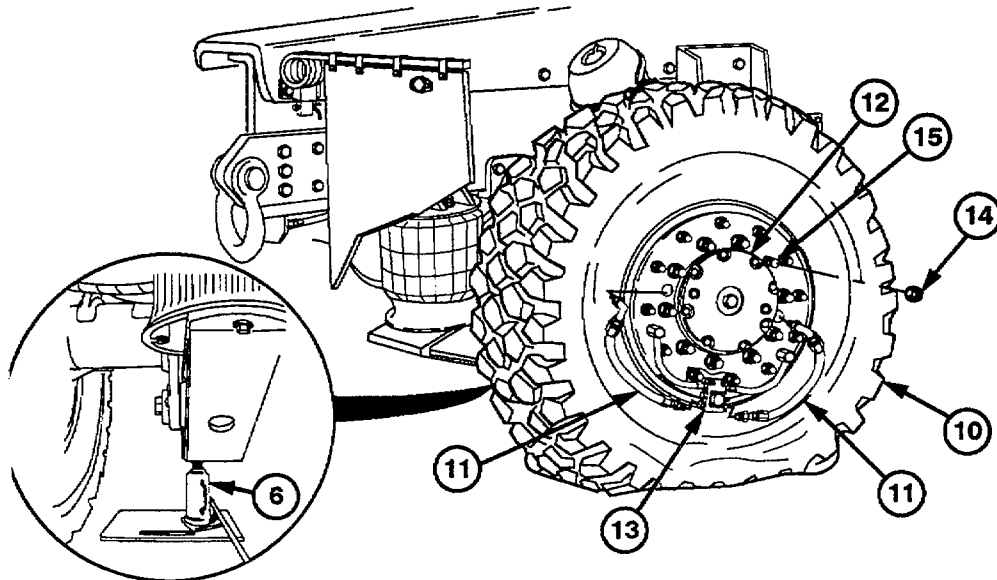
(4.11) Mow jack no. 2 (6) under trailing arm (9.1) and raise until jack no. 1 (3) can be removed.

NOTE

Wheel and tire assembly is removed from front and rear axles the same way. Axle no. 4 is shown.

(4.12) Remove jack no. 1 (3).

(4.13) Remove four nuts (9.2) and wheel cover (9.3) from flat tire assembly (10).

3-6. CHANGING TIRE ASSEMBLY (CONT)**CAUTION**

Keep hoses clean and dry when removing from CTIS wheel valve. Failure to comply may result in damage to CTIS wheel valve.

- (5) Remove two hoses (11) from hub (12) and wheel valve (13).

WARNING

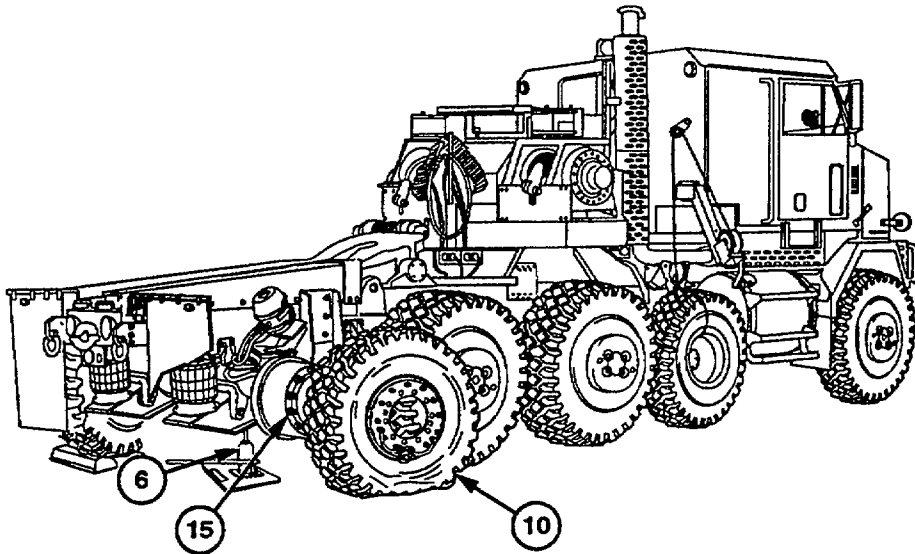
- Do not remove nuts. Tire assembly could pop off causing injury or death to personnel.
- Never loosen or remove the 12 smaller nuts around the outside of the rim assembly. Rim could separate and cause injury or death to personnel.

- (6) Loosen 10 nuts (14) on flat tire assembly (10). Do not remove nuts.
- (7) Raise jack no. 2 (6) until flat tire assembly (10) is off ground.

WARNING

Wheel assembly weighs 523 lbs (237 kg). Use caution when handling wheel assembly to keep it from tipping over. Failure to comply may result in serious injury or death to personnel.

- (8) Remove 10 nuts (14) from studs (15) while assistant holds flat tire assembly (10).
- (9) Deleted.



WARNING

Always wear heavy gloves when handling flat tire assembly to avoid injury.

CAUTION

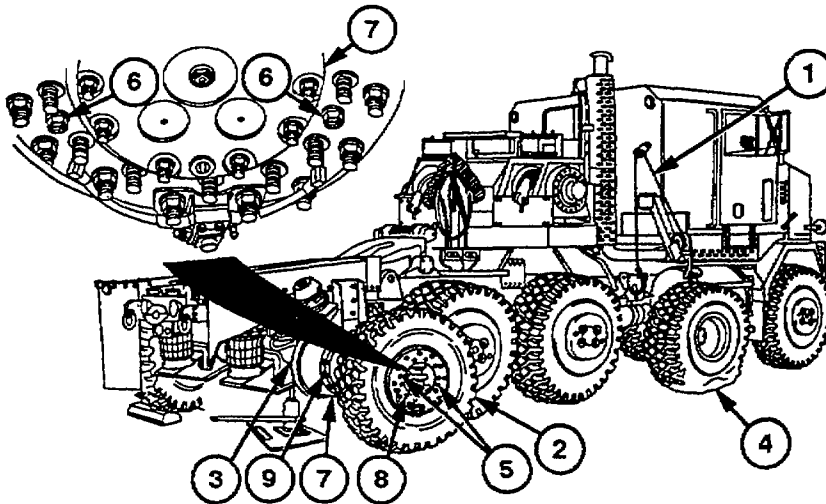
Use care when removing flat tire assembly. Dragging tire assembly across studs may result in damage to studs.

(10) Deleted.

(11) Deleted.

(12) Walk flat tire assembly (10) from HET Tractor with aid of assistant.

(13) Lean flat tire assembly (10) against HET Tractor with aid of assistant.

3-6. CHANGING TIRE ASSEMBLY (CONT)**d. Spare Installation****WARNING**

Always wear heavy duty gloves when handling winch cable. Never let cable run through hands. Frayed cable can cut hands severely.

- (1) Remove cable (1) from spare tire assembly (2) with aid of assistant.
- (2) Roll spare to assembly (2) up to axle (3) from which flat tire assembly (4) was removed with aid assistant.

CAUTION

Position spare tire assembly so that two larger holes in spare tire assembly are aligned with CTIS fittings.

Damage to CTIS fittings and wheel may result if spare tire assembly is not correctly installed.

NOTE

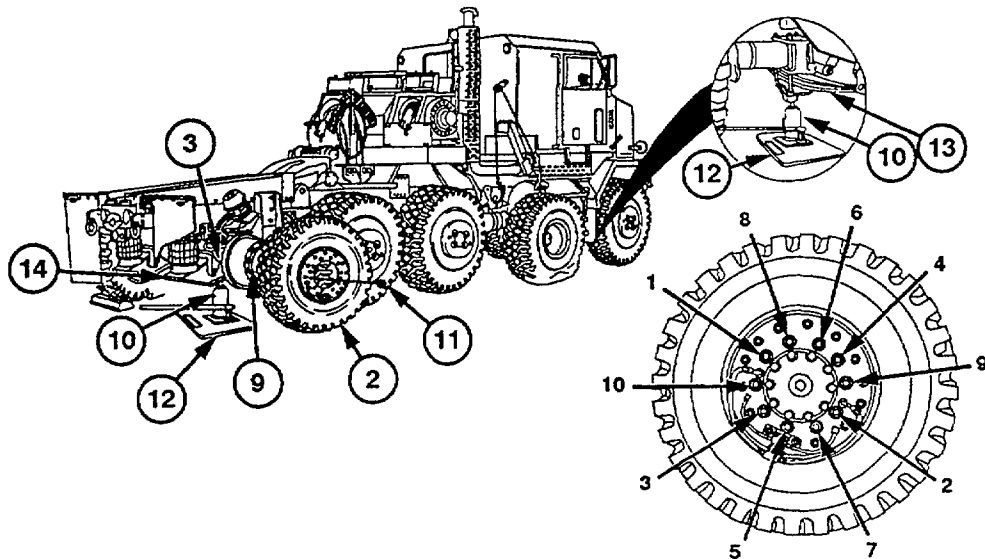
Spare tire assembly should have CTIS valve facing out.

- (3) Line up two holes (5) in spare tire assembly (2) with CTS fittings (6) in hub (7) with aid of assistant.
- (4) Line up 10 holes (8) in spare tire assembly (2) with studs (9) on hub (7) with aid of assistant.

WARNING

Tire assembly weighs 523 lbs (237 kg). Do not try to lift or catch tire assembly. Injury or death to personnel may result.

- (5) Lean top of spare tire assembly (2) against hub (7) and axle (3) with aid of assistant.



WARNING

- Use caution when operating jack. Personal injury or death may result if jack slips out from under HET Tractor.
- Never go under HET Tractor with engine running. Vehicle may move unexpectedly and cause injury or death to personnel.

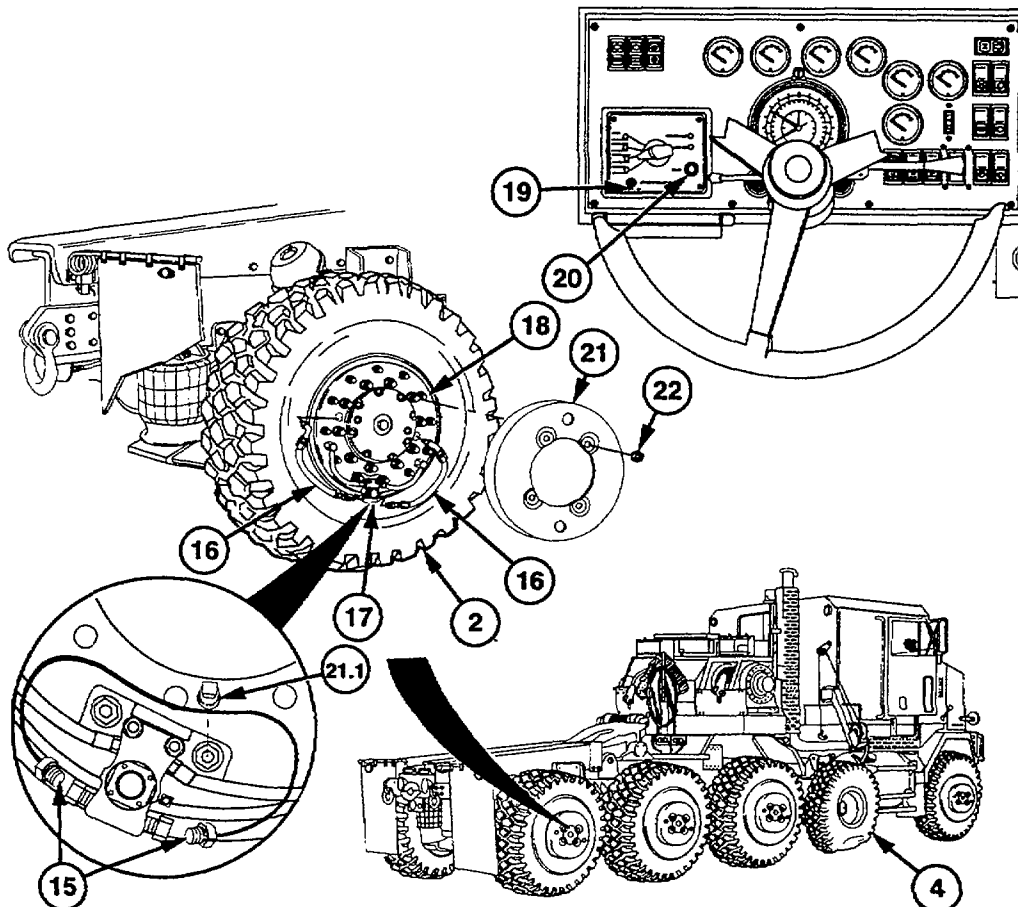
CAUTION

Use care when installing spare tire assembly and nuts. Dragging tire assembly across studs or cross-threading nuts may result in damage to studs.

NOTE

It may be necessary to raise jack to get inflated spare tire on wheel hub.

- (6) Slide spare tire assembly (2) onto studs (9) with tire extension handle (Item 17, Appendix B). Bottom of spare tire assembly (2) should swing toward HET Tractor.
- (7) Deleted.
- (8) Install 10 nuts (11) on studs (9). Tighten until spare tire assembly (2) is seated.
- (9) Lower HET Tractor with jack (10) until spare tire assembly (2) just touches ground.
- (9.1) Tighten 10 nuts (11) as tight as possible in order shown.
- (10) Lower HET Tractor to ground with Jack (10).
- (11) Remove jack (10) and jack plate (12) from under saddle (13) or trailing arm (14).

3-6. CHANGING TIRE ASSEMBLY (CONT)

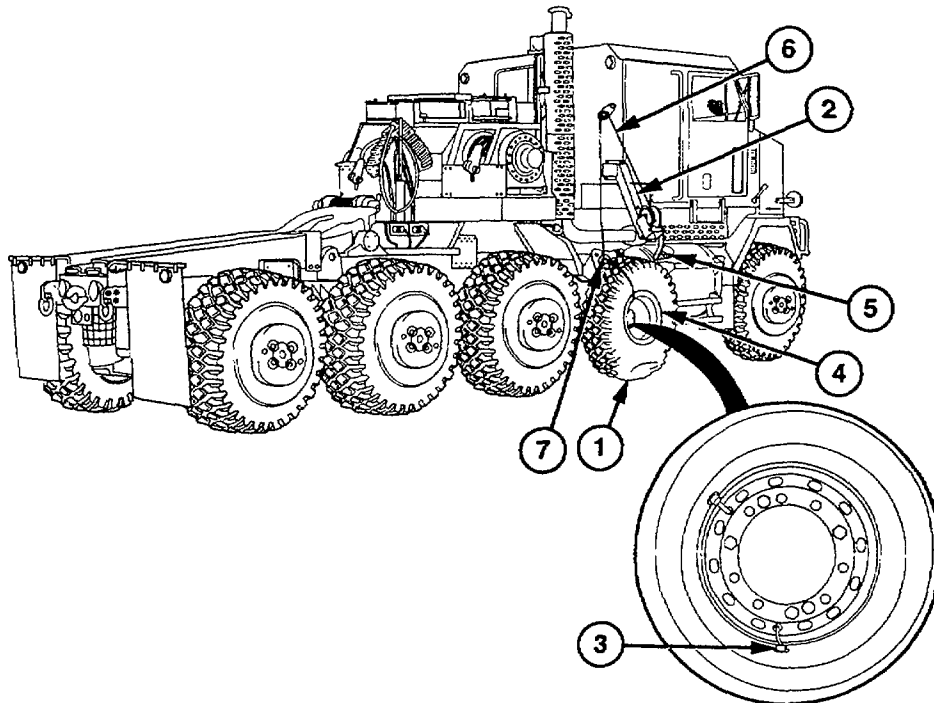
- (12) Remove CTI plugs (15) from spare tire assembly (2) and install in flat tire assembly (4).

CAUTION

**Keep hoses clean and dry when removing from CTIS wheel valve.
Failure to comply may result in damage to CTIS wheel valve.**

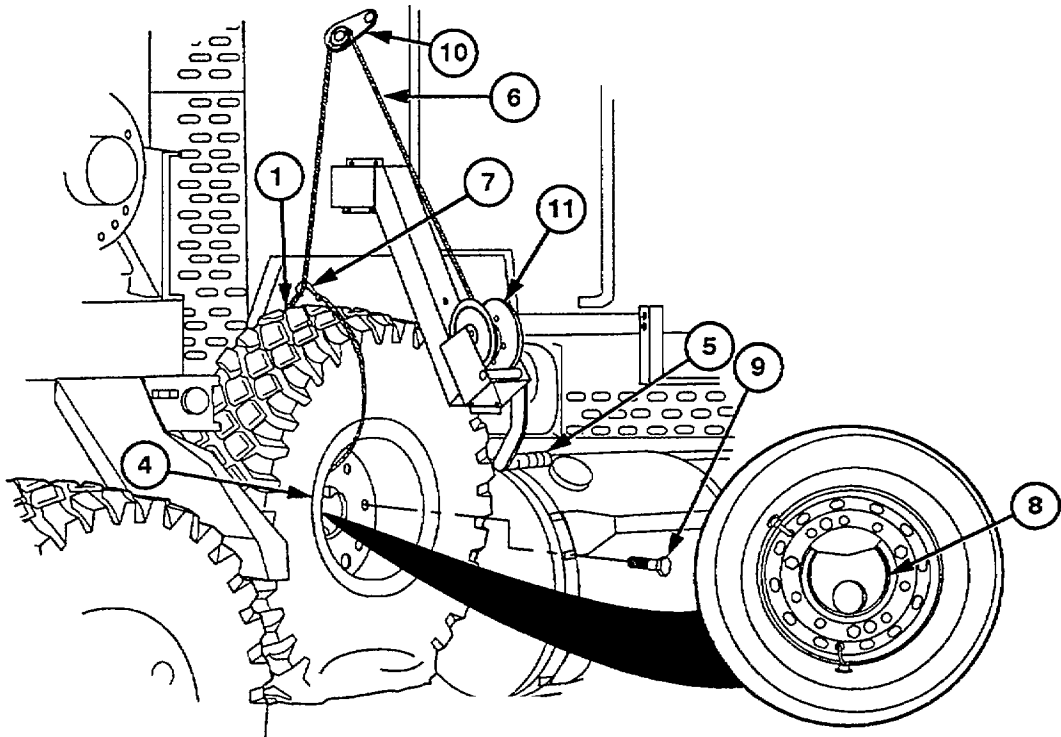
- (13) Install two hoses (16) on wheel valve (17) and hub (18).
 (14) Start engine (para 2-12).
 (15) Turn CTIS (19) to on position and push start switch (20).
 (16) Check two hoses (16) for leaks.
 (17) Shutdown engine (para 2-12).
 (18) Install wheel cover (21) on spare tire assembly (2) with four nuts (22).
 (19) Remove two nuts (21.1) from spare tire assembly (2) and install in flat tire assembly (4).

e. Flat Tire Stowage

**WARNING**

Always wear heavy duty gloves when handling inch cab. Never let cable run through hands. Frayed cab can cut hands severely.

- (1) Roll flat tire assembly (1) under tire davit (2) so valve stem (3) is down and the deep side of wheel (4) facing out from HET Tractor.
- (2) Turn handcrank (5) to let out cable (6).
- (3) Pull cable (6) with hook (7) through flat tire assembly (1) and attach hook (7) to top of cable (6).

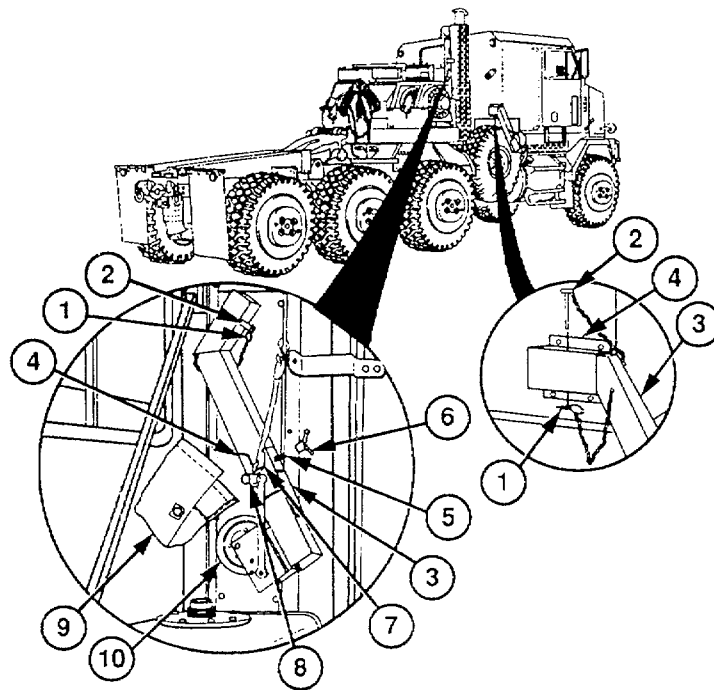
3-6. CHANGING TIRE ASSEMBLY (CONT)**WARNING**

- Tire is very heavy. Place tire on bracket as soon as possible. Personnel injury or death may result if tire falls.
- Always wear heavy duty gloves when handling winch cable. Never let cable run through hands. Frayed cable can cut hands severely.

CAUTION

- Use care when raising tire to prevent damage to CTIS wheel valve.
- Do not attempt to mount spare tire with CTIS wheel valve on top. Failure to comply will result in damage to CTIS wheel valve.

- (4) Turn handcrank (5) to raise flat tire assembly (1) just above bracket (8) while assistant pulls flat tire assembly away from bracket (8).
- (5) Turn handcrank (5) to lower flat tire assembly (1) onto bracket (8).
- (6) Install three screws (9) through wheel (4) and in bracket (8) with aid of assistant.
- (7) Remove hook (7) and cable (6) from flat tire assembly (1) and pulley (10).
- (8) Turn handcrank (5) to return cable (6) onto winch (11).



f. Tire Davit Winch Stowage

- (1) Remove safety pin (1) from pin (2). Remove pin (2) from tire lift arm (3) and mount (4).
- (2) Remove tire lift arm (3) from mount (4).
- (3) Install tire lift arm (3) on stud (5) with T-handle (6).
- (4) Install pin (2) in tire lift arm (3). Install safety pin (1) in pin (2).
- (5) Hook rubber strap (7) on handcrank (8).
- (6) Install boot (9) on winch (10).

g. Equipment Stowage

- (1) Remove and store chock blocks on mounting brackets.
- (2) Return all tools to stowage box.
- (3) Pick up and stow emergency marker kit (para 2-29).

h. Follow-On Maintenance

- (1) Turn emergency flashers off (para 2-11).
- (2) Notify unit maintenance to tighten nuts to proper torque values as soon as possible.
- (3) Notify unit maintenance to repair flat tire assembly as soon as possible.

3-7. SERVICING TIRES

This task covers:

Service

INITIAL SETUP

Equipment Conditions

- Vehicle shut down (para 2-12).
- Parking brake on (para 2-9).
- Wheels chocked.

Tools and Special Tools

- Hose Assembly, Air (Item 21, Appendix B)
 - Tire Inflator/Gage (Item 38.1, Appendix B)
-

Table 3-2. Tire Pressure

TERRAIN	MPH (KM/H) MAX	FRONT (2) PSI (KPA)	REAR (6) PSI (KPA)
Highway	45 (72)	75 (517)	75 (517)
Cross Country	30 (48)	55 (379)	55 (379)
Mud, Sand, Snow	15 (24)	40 (276)	40 (276)
Emergency	5 (8)	30 (207)	30 (207)

Table 3-2.1 Unsafe Inflation Pressures

WARNING

It is not safe to adjust tire pressure if tire has been run flat, is over or under inflated when compared to this table, or if wheel/tire assembly has obvious or suspected damage. Completely deflate tire and remove the tire from the axle (para 3-6). Failure to follow these procedures may result in serious personal injury or death.

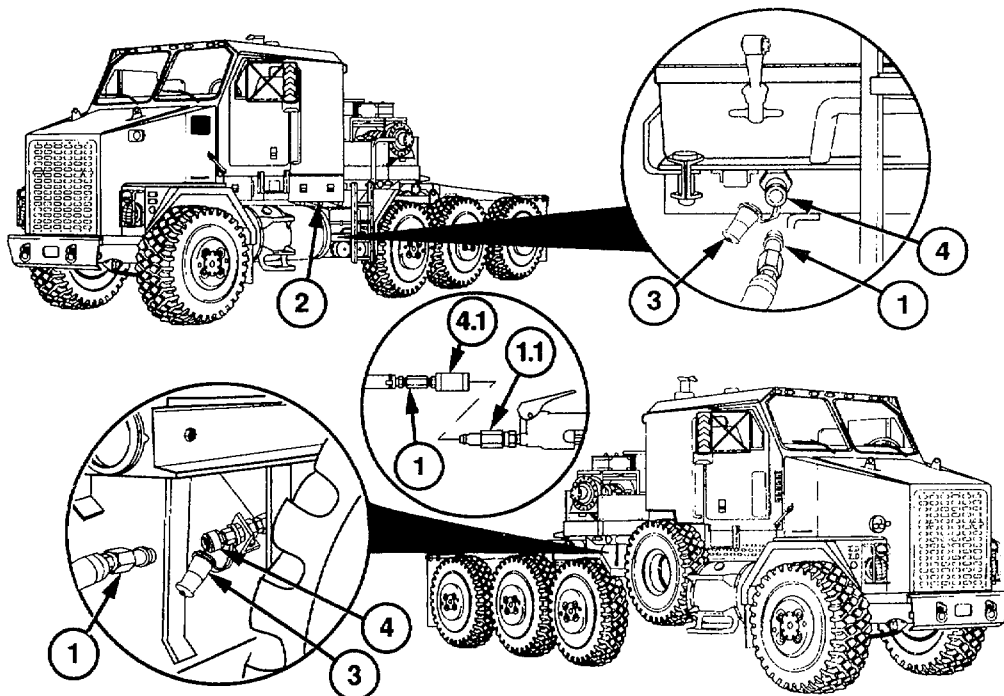
	Front Tires are:	Rear Tires are:	Front Tires are:	Rear Tires are:
	Over-inflated. Tire pressure measured is 25% or more above standard pressure. Do not adjust pressure if above pressure shown below.	Over-inflated. Tire pressure measured is 25% or more above standard pressure. Do not adjust pressure if above pressure shown below.	Under-inflated. Tire pressure measured is 80% or less than standard pressure. Do not adjust pressure if below pressure shown below.	Under-inflated. Tire pressure measured is 80% or less than standard pressure. Do not adjust pressure if below pressure shown below.
Highway	94 psi (648 kPa)	94 psi (648 kPa)	60 psi (414 kPa)	60 psi (414 kPa)
Cross Country	69 psi (476 kPa)	69 psi (476 kPa)	44 psi (303 kPa)	44 psi (303 kPa)
Mud, Sand, and Snow	50 psi (345 kPa)	50 psi (345 kPa)	32 psi (221 kPa)	32 psi (21 kPa)
Emergency	38 psi (262 kPa)	38 psi (262 kPa)	30 psi (270 kPa)	30 psi (270 kPa)

WARNING

Use caution when inflating tire. Over-inflation may cause tire to blow apart causing serious injury or death to personnel.

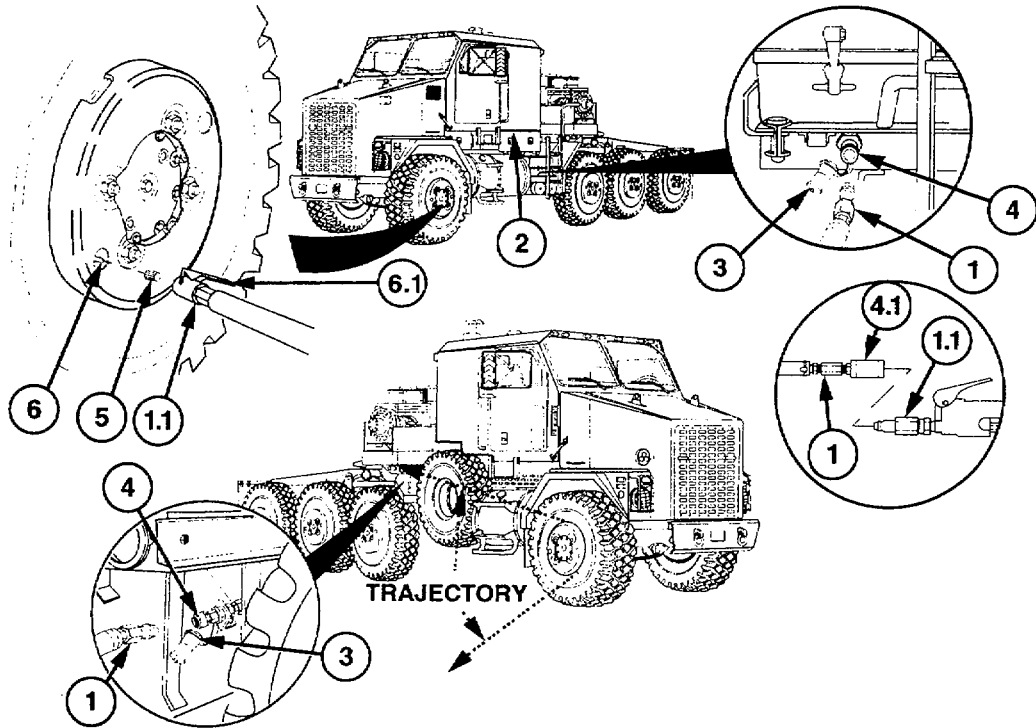
NOTE

If CTIS is not working, tires may be inflated manually. Inflate tires only when they are cool. Inflate to proper pressure for terrain conditions.

a. Manually Checking, Inflating and Deflating Tires

- (1) Remove air hose assembly (1) and tire inflator/gage (1.1) from stowage box (2).
- (2) Remove cover (3) from quick disconnect coupling (4).
- (3) Connect air hose assembly (1) to quick disconnect coupling (4).
- (3.1) Connect tire inflator/gage (1.1) to quick disconnect coupling (4.1) on air hose assembly (1).
- (4) Start engine (para 2-12).

3-7. SERVICING TIRES (CONT)



(5) Remove cap (5) from air valve (6).

NOTE

- Tire inflator/gage must clamp securely with no leaks or pressure reading will be inaccurate.
- Trajectory area as shown applies to all wheel/tire assemblies.

(6) Push latch handle (6.1) on tire inflator/gage (1.1) inward while pushing onto air valve (6). Release latch handle and immediately step out of the trajectory area. Read tire air pressure on tire inflator/gage and compare to Table 3-2.1.

WARNING

- Before inflating or deflating, stand out of trajectory area or personal injury or death may result.
 - If the tire is under-inflated or over-inflated, or there is obvious or suspected damage to tire or wheel component, tire must be completely deflated by removing the valve core from air valve or personal injury or death may result.
- (7) Inflate tire to proper pressure (see Table 3-2).
- (7.1) Disconnect tire inflator/gage (1.1) from air valve (6).
- (8) install cap (5) on air valve (6).

WARNING

Hold end of air hose when disconnecting from quick disconnect coupling. Air hose is under pressure and can fly out at fast rate of speed causing injury to personnel.

- (9) Remove tire inflator/gage (1) from quick disconnect coupling (4).
- (10) Install cover (3) on quick disconnect coupling (4).
- (10.1) Remove tire inflator/gage (1.1) from quick disconnect coupling (4.1) on air hose assembly (1).
- (11) Stow air hose assembly (1) and tire inflator/gage (1.1) in stowage box (2).
- (12) Shut off engine (para 2-12).

b. Follow-On Maintenance

Remove wheel chocks.

3-8. DIPSTICK REMOVAL/INSTALLATION

This task covers:

Removal

Installation

INITIAL SETUP

Equipment Conditions

- Vehicle shut down (para 2-12).
- Parking brake on (para 2-9).
- Wheels chocked.

Materials/Parts

- Rags (Item 14, Appendix D)
-

a. Removal.

CAUTION

**Do not attempt to remove dipstick without first loosening handle.
Failure to comply may damage dipstick.**

NOTE

Engine, transmission and power steering reservoir dipsticks are removed and installed the same way.

- (1) Loosen dipstick (1) by turning handle (2) counter-clockwise until disc (3) turns freely.
- (2) Remove dipstick (1) from dipstick tube (4).

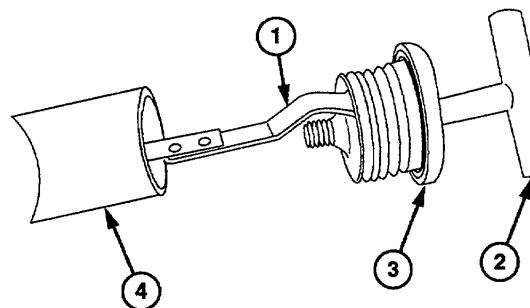
b. Installation.

- (1) Install dipstick (1) in dipstick tube (4).

NOTE

Maintain inward pressure on dipstick while tightening.

- (2) Turn handle (2) clockwise until disc (3) does not turn freely
- (3) Turn handle (2) clockwise an additional two turns to secure dipstick (1) in tube.



**APPENDIX A
REFERENCES**

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals, and other publications referenced in this manual. Also, those publications that should be consulted for additional information about vehicle operations are listed.

A-2. PUBLICATIONS INDEX

The following index should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

Consolidated Index of Army Publications and Blank Forms	DA Pam 25-30
The Army Maintenance Management System (TAMMS)	DA Pam 738-750

A-3. FORMS

The following forms pertain to this manual. See DA Pam 25-30 for index of blank forms. See DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to this material.

Recommended Changes to DA Publications and Blank Forms	DA Form 2028-2
Equipment Inspection and Maintenance Worksheet	DA Form 2404
Quality Deficiency Report/Equipment Improvement Recommendation	SF 368

A-4. OTHER PUBLICATIONS

The following publications contain information pertinent to the HET Tractor and associated equipment.

a. Safety

First Aid for Soldiers	FM 21-11
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A-4. OTHER PUBLICATIONS (CONT)

b. HET Tractor

Hand Receipt Manual for Truck, Tractor, M1070, 8x8,
 Heavy Equipment Transporter TM 9-2320-360-10-HR
 Lubrication Order for Truck, Tractor, M1070, 8x8,
 Heavy Equipment TransporterLO 9-2320-360-12
 Warranty Technical Bulletin for Truck, Tractor, M1070, 8x8,
 Heavy Equipment Transporter TB 9-2320-360-14

c. General Vehicle Operation

Vehicle Recovery Operations.....FM 20-22
 Manual for the Wheeled Vehicle DriverFM 21-305

d. General Maintenance and Repair

Operator's Manual, Mask, Chemical-Biological: Aircraft
 ABC-M24 and Accessories and Mask, Chemical-
 Biological: Tank M24/M25A1 and Accessories TM 3-4240-280-10
 Operator's, Organizational, Direct Support, and General
 Support Maintenance Manual for Semitrailer
 Transporter, Heavy Equipment 70 ton, M1000 TM 9-2330-381-14&P
 Operator's, Organizational, Direct Support, and General Support
 Maintenance Manual for Lead-Acid Storage Batteries TM 9-6140-200-14
 Operators Manual, Radio Set, AN/VRC-46 TM 11-5820-401-10-1
 Operator's and Organizational Maintenance Manual,
 Radio Set AN/VRC-53, AN/VRC-64, AN/GRC-125
 and Amplifier-Power Supply Groups OA-3633/GRC
 and OA 3633A/GRC..... TM 11-5820-498-12
 Operators Manual, Radio Set, AN/VRC-90 TM 11-5820-890-10-1

e. Cold Weather Operation

Operation and Maintenance of Ordnance Material in Extreme Cold
 Weather (0 to -65°F)FM 9-207
 Basic Cold Weather Manual.....FM 31-70
 Northern OperationsFM 31-71

f. Decontamination

Nuclear, Biological, and Chemical (NBC) DefenseFM 21-40

g. Maintenance of Special Purpose Kits

Operator and Organizational Maintenance Manual
Including Repair Parts and Special Tools List for
Decontamination Apparatus..... TM 3-4230-214-12&P
Operator and Organizational Maintenance Manual for
Chemical Alarm TM 3-6665-225-12

h. General

Principles of Automotive Vehicles TM 9-8000
Procedures for Destruction of Tank-Automotive Equipment
to Prevent Enemy Use TM 750-244-6

APPENDIX B
COMPONENTS OF END ITEM (COEI)
AND
BASIC ISSUE ITEMS (BII) LISTS

Section I. INTRODUCTION

B-1. SCOPE

This appendix lists COEI and BII for the HET Tractor to help you inventory the items for safe and efficient operation of the equipment.

B-2. GENERAL

The COEI and BII list are divided into the following sections:

a. Section II, Components of End Item. This listing is for information purposes only, and is not authority to requisition replacements. These items are part of the HET Tractor, 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.

b. Section III, Basic Issue Items. These essential items are required to place the HET Tractor in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the HET Tractor 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 the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

B-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

a. Column (1) - Illustration Number (Illus Number). This column indicates the number of the item called out in the illustration.

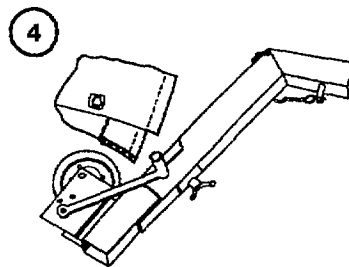
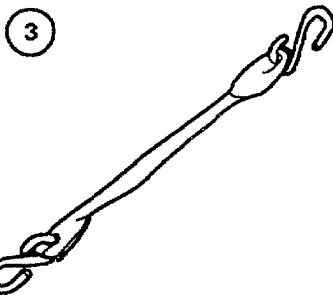
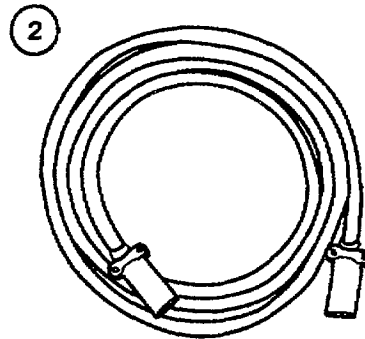
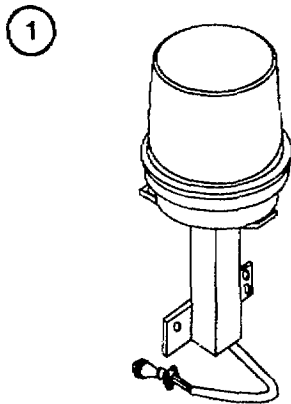
b. Column (2) - National Stock Number. Indicates the National Stock Number (NSN) assigned to the item and will be used for requisitioning purposes.

c. Column (3) - Description and Usable On Code. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. If the item you need is not the same for different models of the equipment, a usable on code (UOC) will appear on the right side of the description column on the same line as the part number. The last line for each item indicates the CAGE (in parentheses) followed by the part number.

d. Column (4) - Unit of Issue (U/I). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (ea, in., pr).

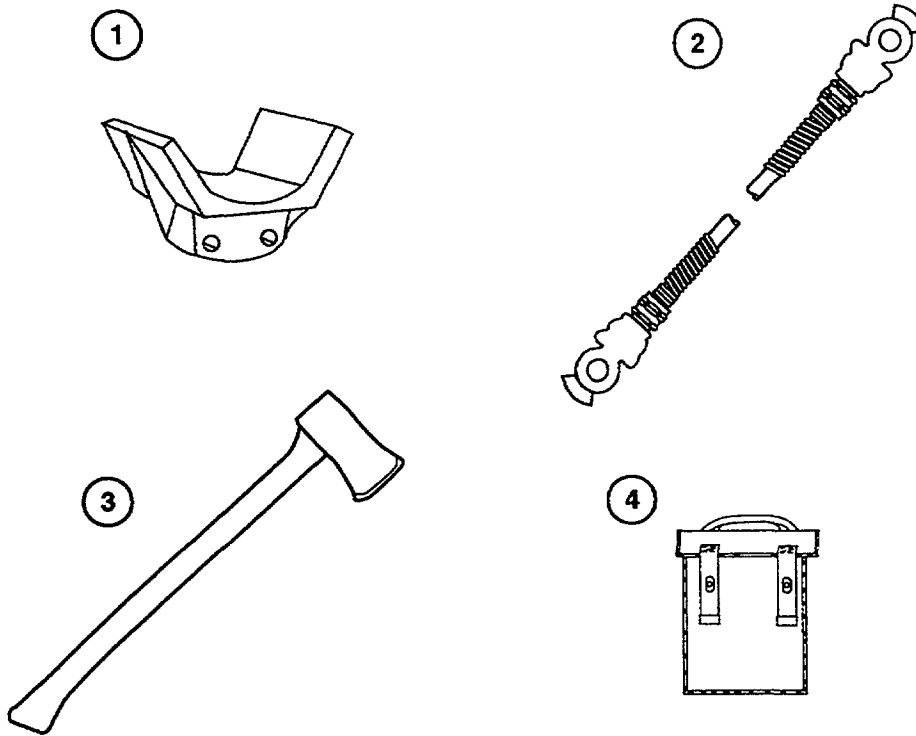
e. Column (5) - Quantity Required (Qty Rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM



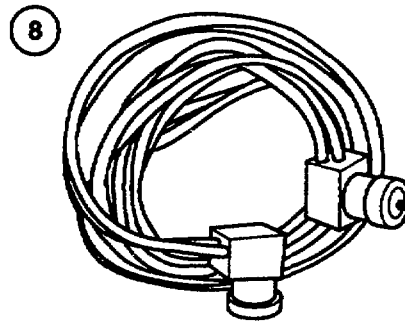
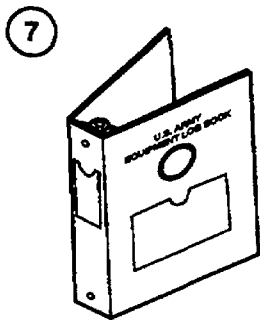
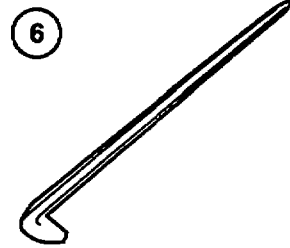
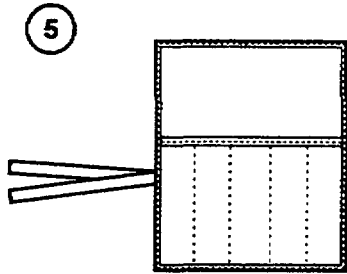
(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	Usable On Code	(4) U/I	(5) Qty Rqr
1		BEACON (on top rear of cab) (45152) 2050100U		EA	1
2	2590-01-053-6449	CABLE, INTERVEHICULAR 12-PIN, 24-VOLT (in stowage box) (45152) 64297CX		EA	1
3	5340-00-340-0980	STRAP, RUBBER (secures tire davit handle) (13435) 13013		EA	1
4		TIRE LIFT ARM ASSEMBLY (mounts on vertical exhaust stack) (45152) 1939170U		EA	1

Section III. BASIC ISSUE ITEMS



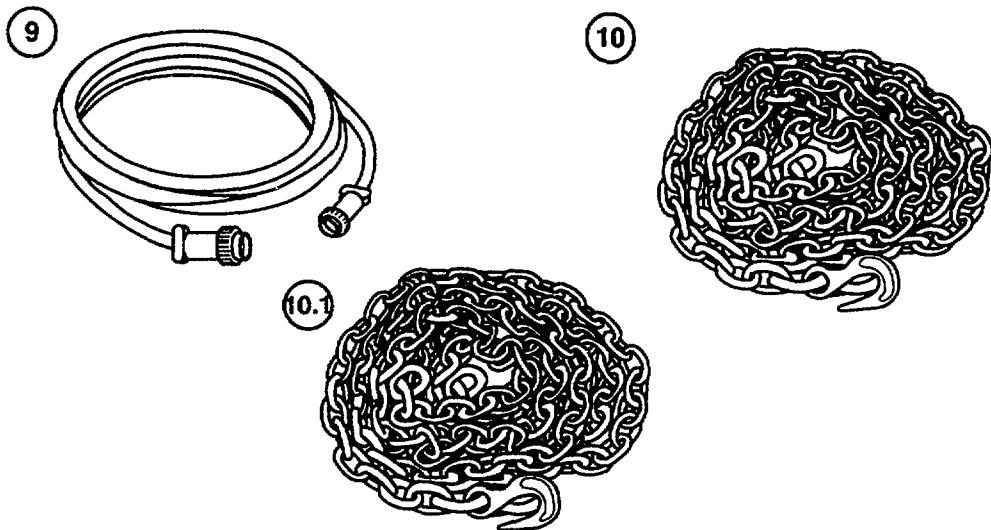
(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	Usable On Code	(4) U/I	(5) Qty Rqr
1		ADAPTER (in stowage box) (45152) 2067070		EA	1
2	4720-00-740-9662	AIR HOSE, COILED (in stowage box) (96906) MS39325-9-140-B		EA	2
3	5110-00-293-2336	AXE, SINGLE BIT (in stowage box) (19207) 6150925		EA	1
4		BAG, PAMPHLET (in stowage box) (15814) 1062710		EA	1

Section III. BASIC ISSUE ITEMS (CONT)



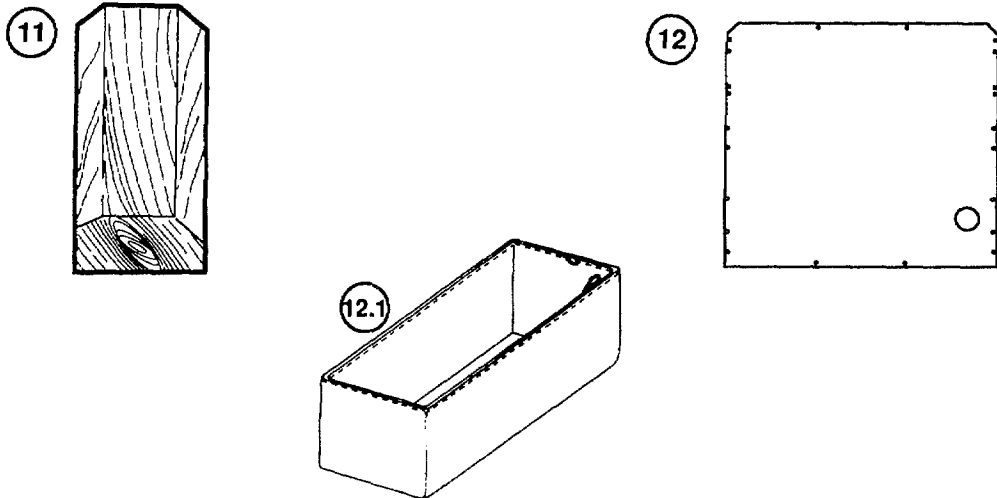
(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	Usable On Code	(4) U/I	(5) Qty Rqr
5	5140-01-167-1541	BAG, TOOL (in front stowage box) (45152) 1350190		EA	1
6	5120-00-224-1389	BAR, PINCH, 15 IN. (in stowage box) (72915) 8041183		EA	1
7	7510-00-889-3494	BINDER, LOOSE-LEAF (in glove box) (19207) 11677003		EA	1
8	6150-01-022-6004	CABLE, SLAVE, NATO (in stowage box) (19207) 11682336-1		EA	1

Section III. BASIC ISSUE ITEMS (CONT)



(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	(4) Usable On Code	(5) Qty Rqr
9	6150-01-353-3201	CABLE, TRAILER LIGHT, 7-PIN, 12-VOLT (in stowage box) (06721) 7742-168	EA	1
10	4010-01-351-5676	CHAIN, UTILITY, 7/8 IN. X 20 FT (in stowage box) (45152) 1839610	EA	1
10.1	4010-01-249-0548	CHAIN, UTILITY, 5/8 X 14 FT (in stowage box) (80535) 00044-9973	EA	1

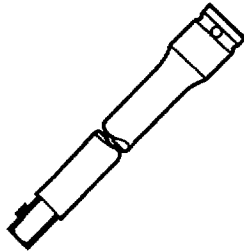
Section III. BASIC ISSUE ITEMS (CONT)



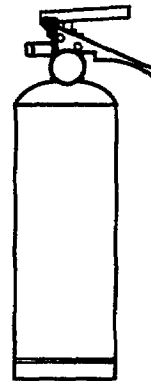
(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	Usable On Code	(4) U/I	(5) Qty Rqr
11	2540-01-165-6136	CHOCK, WHEEL (in stowage boxes on main winches) (45152) 1350250		EA	4
11.1		COVER, AUXILIARY WINCH (on auxiliary winch) (56605) 2084960		EA	1
12	2540-01-351-5965	COVER, GRILL in stowage box) (45152) 1805550		EA	1

Section III. BASIC ISSUE ITEMS (CONT)

13



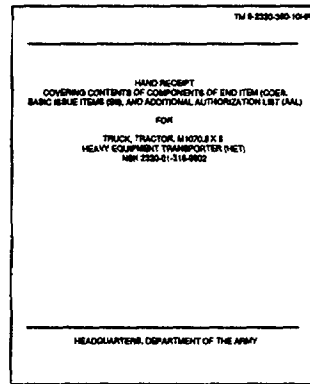
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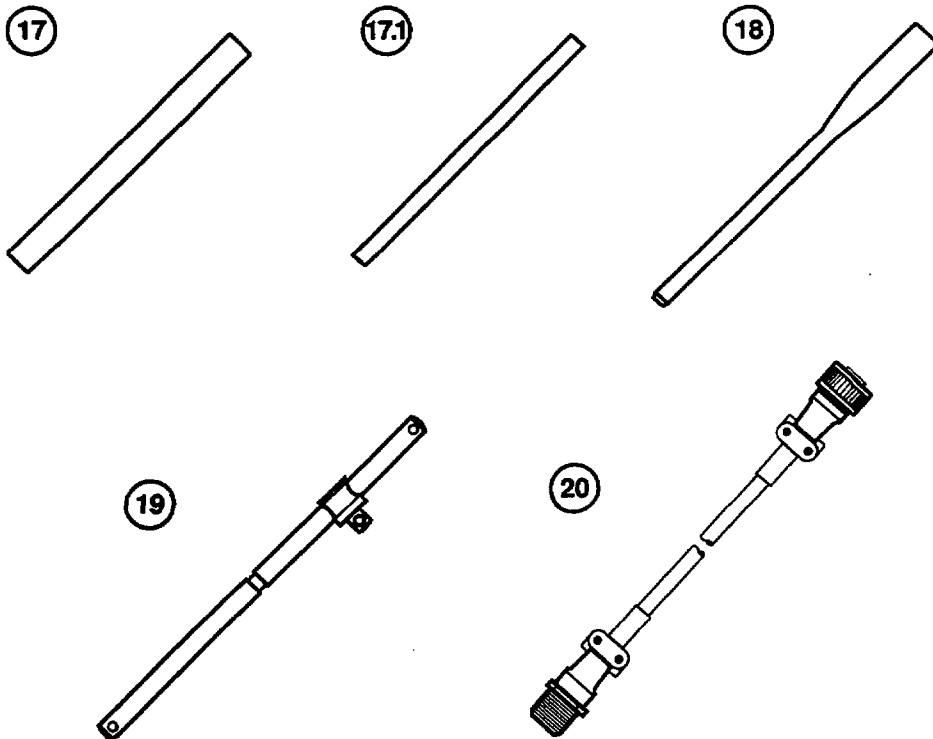


16



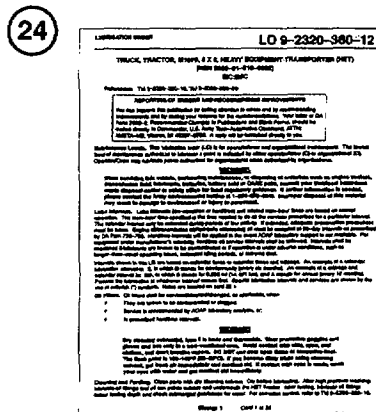
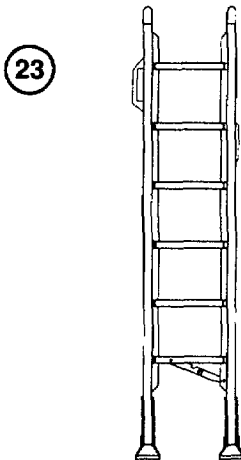
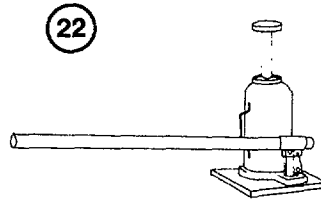
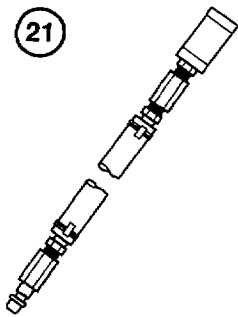
(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	Usable On Code	(4) U/I	(5) Qty Rqr
13	5130-01-400-0129	EXTENSION, WRENCH, 13 IN. (in stowage box) (1CV05) 07569		EA	1
14	4210-01-294-1123	FIRE EXTINGUISHER (under dash panel, driver's side) (99539) 35022		EA	1
15	6545-00-922-1200	FIRST AID KIT (in glove box) (64616) SC C-6545-IL VOL 2		EA	1
16		HAND RECEIPT, TRUCK, TRACTOR, M1070, 8 X 8, HEAVY EQUIPMENT TRANSPORTER (HET), TM 9-2320-360-10-HR (in stowage box)		EA	1

Section III. BASIC ISSUE ITEMS (CONT)



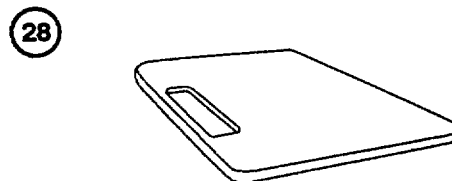
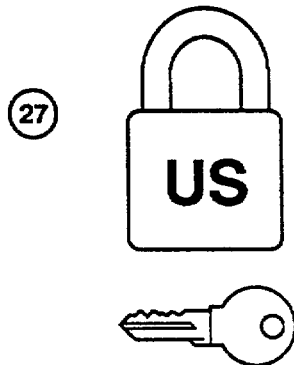
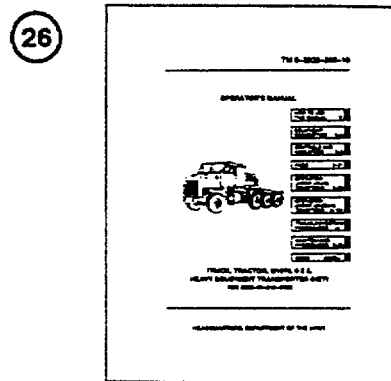
(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	Usable On Code	(4) U/I	(5) Qty Rqr
17	5340-01-209-7841	HANDLE, EXTENSION (in stowage box) (45152) 1347720		EA	1
17.1		HANDLE, EXTENSION, 40 IN. (in stowage box) (45152) 2073170		EA	1
18	5120-00-288-6574	HANDLE, MATTOCK PICK (in stowage box) (19207) 11677021		EA	1
19	5120-01-242-7218	HANDLE, SLIDING, 3/4 IN. SQUARE DRIVE (in stowage box) (45152) 1505380		EA	1
20	6210-01-354-5929	HARNESS, WORKLAMP (in front stowage box) (45152) 1858760		EA	2

Section III. BASIC ISSUE ITEMS (CONT)



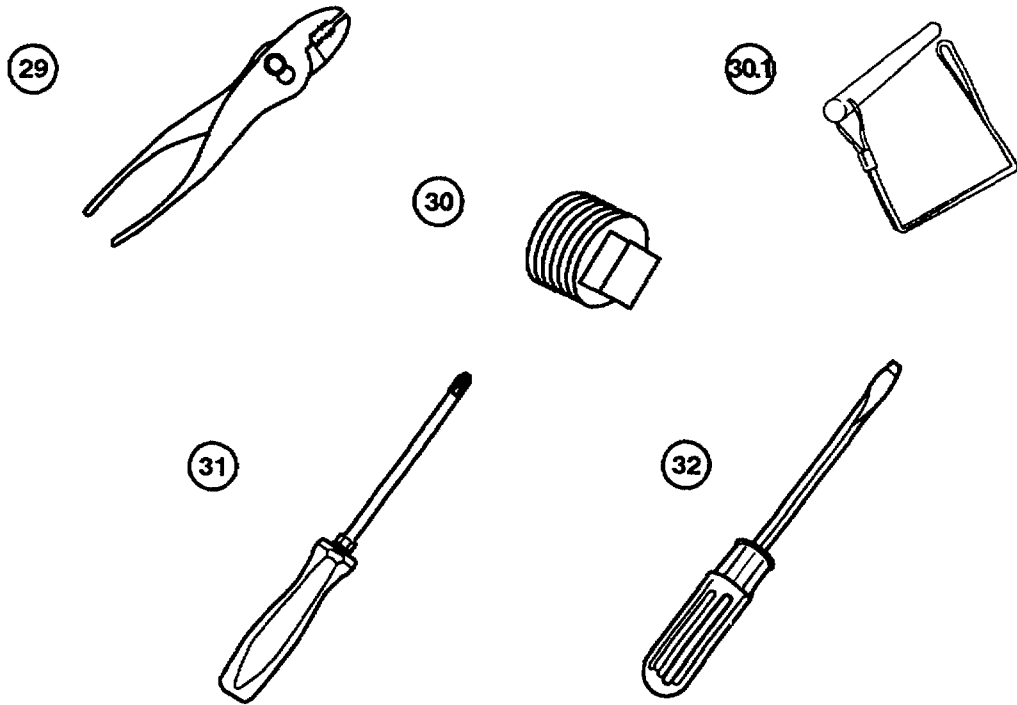
(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	Usable On Code	(4) U/I	(5) Qty Rqr
214720-01	386-3455	HOSE ASSEMBLY, AIR, 60 FT (in storage box) (01276) FK1780GGG7200		EA	1
22		JACK, HYDRAULIC WITH HANDLE (in storage box) (08844) 76412		EA	2
23	5440-01-342-0700	LADDER (on tail pipe support) (45152) 2019940		EA	1
24		LUBRICATION ORDER, TRUCK, TRACTOR, M1070, 8 X 8, HEAVY EQUIPMENT TRANSPORTER (HET), LO 9-2320-360-12 (in storage box)		EA	1

Section III. BASIC ISSUE ITEMS (CONT)



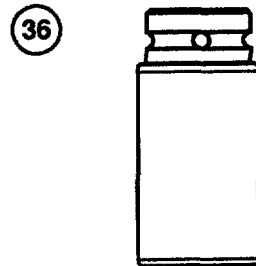
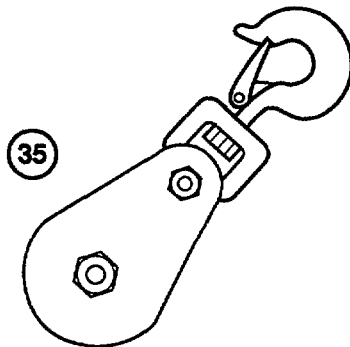
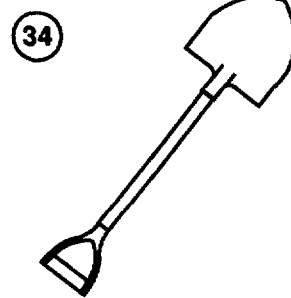
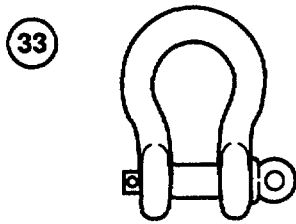
(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	Usable On Code	(4) U/I	(5) Qty Rqr
25	5120-00-243-2395	MATTOCK, PICK TYPE, 5 LB (in stowage box) (19207) 11677022		EA	1
26		OPERATOR'S MANUAL, TRUCK, TRACTOR, M1070, 8 X 8, HEAVY EQUIPMENT TRANSPORTER (HET), TM 9-2320-360-10 (in stowage box)		EA	1
27	5340-00-158-3805	PADLOCK WITHOUT CHAIN (for stowage and tool boxes) (96906) MS35647-10		EA	4
28	5340-01-350-0872	PLATE, JACK (in stowage box) (45152) 1731070		EA	1

Section III. BASIC ISSUE ITEMS (CONT)



(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	Usable On Code	(4) U/I	(5) Qty Rqr
29	5120-00-278-0352	PLIERS, SLIP JOINT (in tools and accessories roll) (18876) 8195590		EA	1
30	4730-00-221-2139	PLUG, LIMP HOME (in stowage box) (96906) MS20913-4S		EA	2
30.1	5315-01-358-3736	PIN, ADAPTER (in adapter) (96652) 28-07		EA	2
31	5120-01-367-3799	SCREWDRIVER, CROSS-TIP, 10 IN. (in tools and accessories roll) (55719) SDD P63		EA	1
32	5120-00-293-3309	SCREWDRIVER, STANDARD, NO. 6 (in tools and accessories roll) (65184) DR.30		EA	1

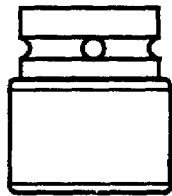
Section III. BASIC ISSUE ITEMS (CONT)



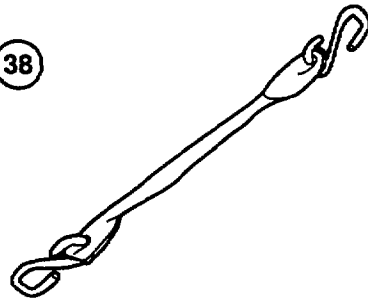
(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	(4) Usable On Code U/I	(5) Qty Rqr
33		SHACKLE, TOWING (in stowage box) (75535) M929259A	EA	4
34	5210-00-293-3336	SHOVEL, D-HANDLE, ROUND POINT (in stowage box) (19207) 11655784	EA	1
35	3940-01-453-2214	SNATCH BLOCK (in stowage box) (95975) 420000	EA	1
36	5120-00-293-0094	SOCKET IMPACT, 1.5 IN. (in stowage box) (26848) 47148	EA	1

Section III. BASIC ISSUE ITEMS (CONT)

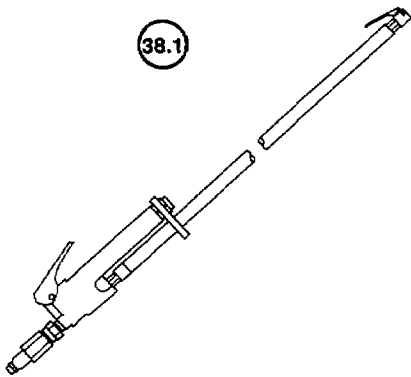
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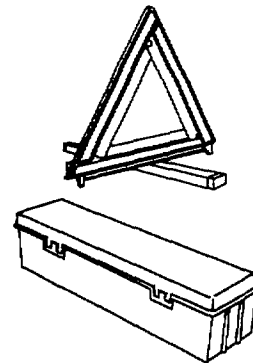
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38.1



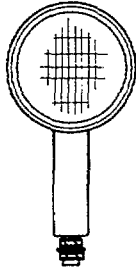
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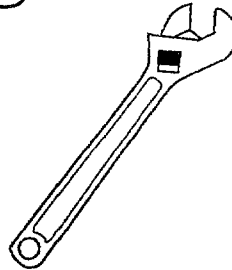
(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	(4) Usable On Code U/I	(5) Qty Rqr
37	5130-01-366-0376	SOCKET, IMPACT, 33 MM (in stowage box) (1CV05) 07533M	EA	1
38		STRAP, RETAINING, RUBBER (in stowage box) (45152) 54850-B	EA	1
38.1	4910-01-386-4300	TIRE INFLATOR/GAGE (in stowage box) (63900) I-405-10M	EA	1
39		WARNING DEVICE KIT (in stowage box) (20994) 182-04-620	EA	1

Section III. BASIC ISSUE ITEMS (CONT)

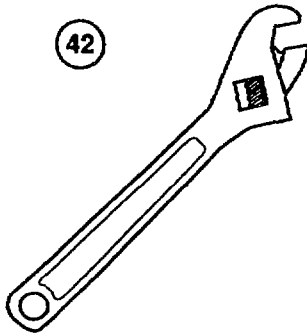
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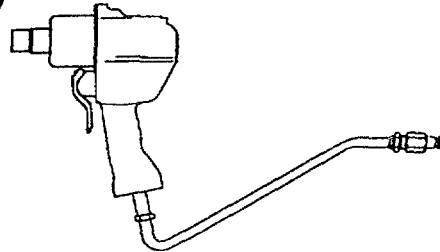
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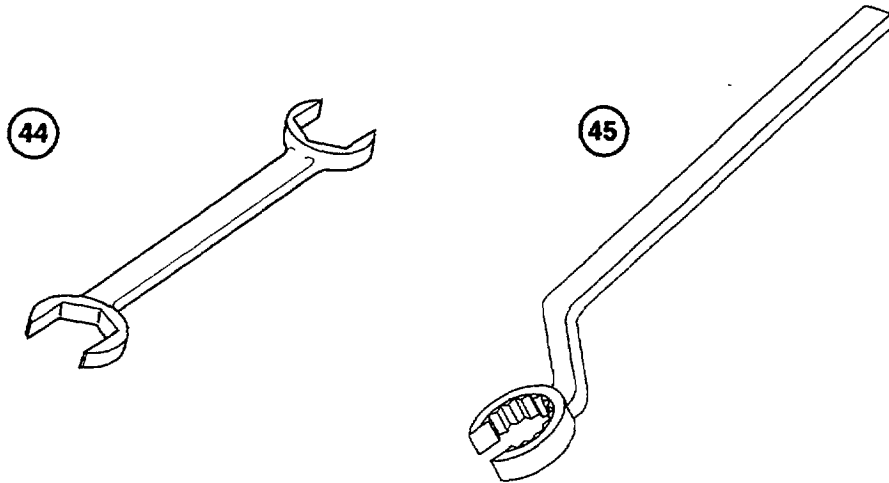


43



(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	Usable On Code	(4) U/I	(5) Qty Rqr
40	6230-01-354-1204	WORK LIGHT, PORTABLE (in front stowage box) (78422) 1401272		EA	2
41	5120-00-240-5328	WRENCH, ADJUSTABLE, 8 IN. (in tools and accessories roll) (19207) 11655778-3		EA	1
42	5120-00-264-3796	WRENCH, ADJUSTABLE, 12 IN. (in tools and accessories roll) (19207) 5323324		EA	1
43		WRENCH, AIR-POWERED, 3/4 IN. SQUARE DRIVE (in stowage box) (45152) 1789100U		EA	1

Section III. BASIC ISSUE ITEMS (CONT)



(1) Illus Number	(2) National Stock Number	(3) Description CAGE and Part Number	(4) Usable On Code U/I	(5) Qty Rqr
44	5120-01-373-8833	WRENCH, OPEN END (in tools and accessories roll) (82799) BW-731A	EA	1
45		WRENCH, TUBE, 3/4 IN. (in tools and accessories roll) (55719) XB24280OTC	EA	1

**APPENDIX C
ADDITIONAL AUTHORIZATION LIST (AAL)**

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists additional items you are authorized for the support of the HET Tractor.

C-2. GENERAL

This list identifies items that do not have to accompany the HET Tractor and that do not have to be turned in with it. These items are all authorized to you by Common Tables of Allowance (CTA), Modification Table of Organization and Equipment (MTOE), Tables of Distribution and Allowances DA, or Joint Table of Allowance (JTA).

C-3. EXPLANATION OF LISTING

National Stock Numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name. If the item you require differs between serial numbers of the same model, effective serial numbers are shown in the last line of the description.

Section II. ADDITIONAL AUTHORIZATION ITEMS LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION CAGE & PART NUMBER USABLE ON CODE	(3) U/I	(4) QTY RECM
	ARCTIC KT ENGINE (45152) 1787700U	KT	1
2540-01-152-7813	CHAINS, TIRE (80535) 16.00.00 X 20/2624	SE	2
6665-01-220-3220	CHEMICAL ALARM KIT (19207) 5705589	KT	1
4730-01-356-0340	GAS PARTICULATE FILTER UNIT (45152) 1795950U	KT	1

Section II. ADDITIONAL AUTHORIZATION ITEMS LIST (CONT)

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION CAGE & PART NUMBER USABLE ON CODE	(3) U/I	(4) QTY RECM
8415-00-634-4658	GLOVES, LEATHER (90142) 37G2940	PR	2
1730-00-906-1352	HAND OPERATED HOIST (93601) 302L	EA	1
5120-00-892-5709	MIRROR, INSPECTION (11676) UH1487	EA	1
4230-01-220-3221	M13 DECONTAMINATION APPARATUS (DAP) KIT (19207) 5705588	KT	1
3940-01-209-6008	SLING ASSEMBLY (45152) 1385750	EA	2

**APPENDIX D
EXPENDABLE AND DURABLE SUPPLIES
AND MATERIALS LIST**

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists all expendable and durable items that you will need to operate and maintain the HET Tractor. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-790, Expendable/Durable Items (except medical, class V, repair parts, and heraldic items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

Section II. EXPENDABLE AND DURABLE ITEMS LIST

D-2. EXPLANATION OF COLUMNS

a. Column (1) - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item (e.g., "Use dry cleaning solvent, item 16, appendix D.").

b. Column (2) - Level. This column identifies the lowest level of maintenance that requires the item.

C - Operator/Crew

c. Column (3) - National Stock Number. This is the National Stock Number assigned to the item which you can use to requisition it.

d. Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGE), and part number. This provides the other information you need to identify the item.

e. Column (5) - Unit of Measure. This code shows the physical measurement of an item, such as gallon, dozen, gross, etc.

Table D-1. Expendable and Durable Items List

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) (U/M)
1	C	6850-00-243-1992 6850-00-174-1806	Antifreeze, Arctic Type (MIL-A-11755) 1 gal can 55 gal drum	gal gal
2	C	6850-00-181-7940	Antifreeze, Permanent, Glycol, Inhibited (MIL-A-46153)	gal
3	C	7930-00-634-3935	Chips, Soap, P-S-579	
4	C	6850-00-926-2275	Compound, Cleaning, Windshield (CAGE 81348) (PN O-C-1901) 16 oz bottle or can	oz
5	C	9150-01-197-7789 9150-01-197-7693 9150-01-197-7690 9150-01-197-7692 9150-01-197-7691	Grease, Automotive and Artillery (GAA) (MIL-G-10924) 2-1/2 oz tube 14 oz cartridge 1.75 lb can 35 lb can 120 lb drum	oz oz lb lb lb
6	C	9140-00-286-5286 9140-00-286-5287 9140-00-286-5288 9140-00-286-5289	Oil, Fuel, Diesel, DF-1, Winter (VV-F-800) Bulk 5 gal can 55 gal drum, 16 gage 55 gal drum, 18 gage	gal gal gal gal
7	C	9140-00-286-5294 9140-00-286-5295 9140-00-286-5296	Oil, Fuel, Diesel, DF-2, Regular (VV-F-800) Bulk 5 gal can 55 gal drum, 16 gage	gal gal gal

Table D-1. Expendable and Durable Items List (Cont)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) (U/M)
8	C	9150-01-035-5392 9150-01-035-5391 9150-01-035-5394	Oil, Lubricating Gear, GO 75 (MIL-L-2105C) 1 qt can 5 gal drum 55 gal drum	qt gal gal
9	C	9150-01-035-5393	Oil, Lubricating Gear, GO 80/90 (MIL-L-2105C) 5 gal drum	gal
10	C	9150-00-402-4478 9150-00-402-2372 9150-00-491-7197	Oil, Lubricating, OEA, ICE, Subzero (MIL-L-46167) 1 qt can 5 gal drum 55 gal drum	qt gal gal
11		9150-01-177-3988 9150-00-186-6668 9150-00-191-2772	Oil, Lubricating, OE/HDO 10 (MIL-L-2104) 1 qt can 5 gal drum 55 gal drum	qt gal gal
11.1		9150-01-178-4725 9150-01-152-4118 9150-01-152-4119	Oil, Lubricating, OE/HDO 15/40 (SAE 15W-40) (MIL-L-2104) 1 qt can 5 gal drum 55 gal drum	qt gal gal
12	C	9150-01-178-4726 9150-00-188-9858 9150-00-189-6729	Oil, Lubricating, OE/HDO 30 (SAE 30)(MIL-L-2104) 1 qt can s 5 gal drum 55 gal drum	qt gal gal

Table D-1. Expendable and Durable Items List (Cont)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) (U/M)
13	C	9150-00-189-6730 9150-00-188-9860 9150-00-188-9862	Oil, Lubricating, OE/HDO 40 (MIL-L-2104) 1 qt can 5 gal drum 55 gal dram	qt gal gal
14	C		Rags	
15	C	6850-01-181-0273 6850-01-184-7453 6850-01-184-3182	Solvent, Biodegradable (MIL-C-87936) 1 qt can 5 gal drum 55 gal drum	qt gal gal
16	C	6850-00-664-5685 6850-00-281-1985	Solvent, Dry Cleaning SD (P-D-680) 1 qt can 1 gal can	qt gal

APPENDIX E
STOWAGE AND SIGN GUIDE

Section I. INTRODUCTION

E-1. SCOPE

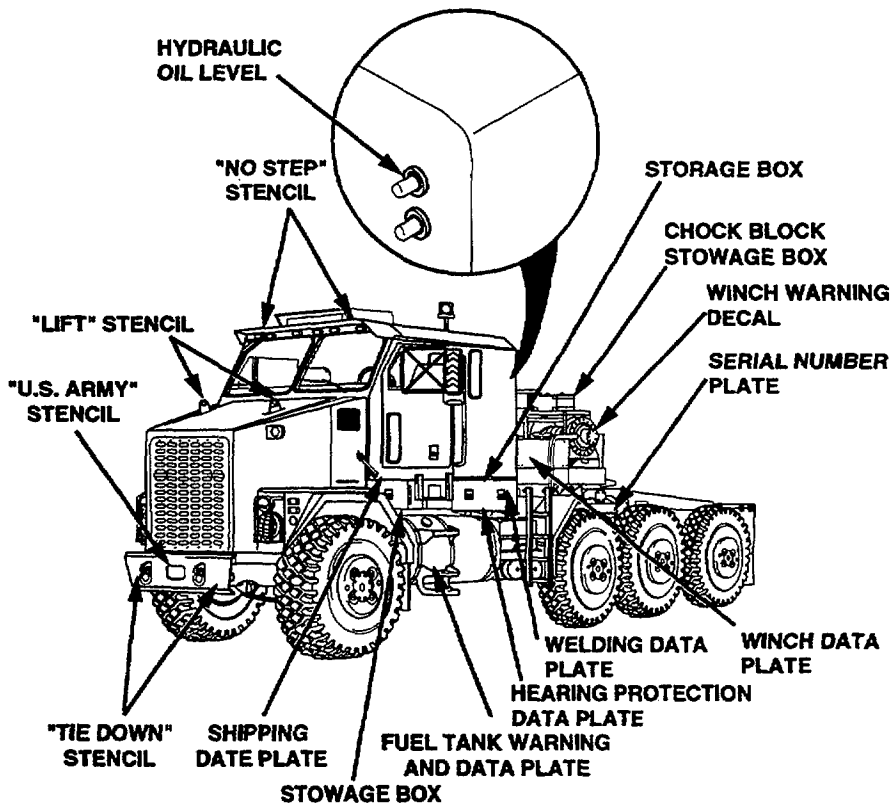
This appendix shows locations for data plates, decals, and stencils that are required to be in place on the M1070 vehicle.

Section I. STOWAGE AND SIGN GUIDE

E-2. GENERAL

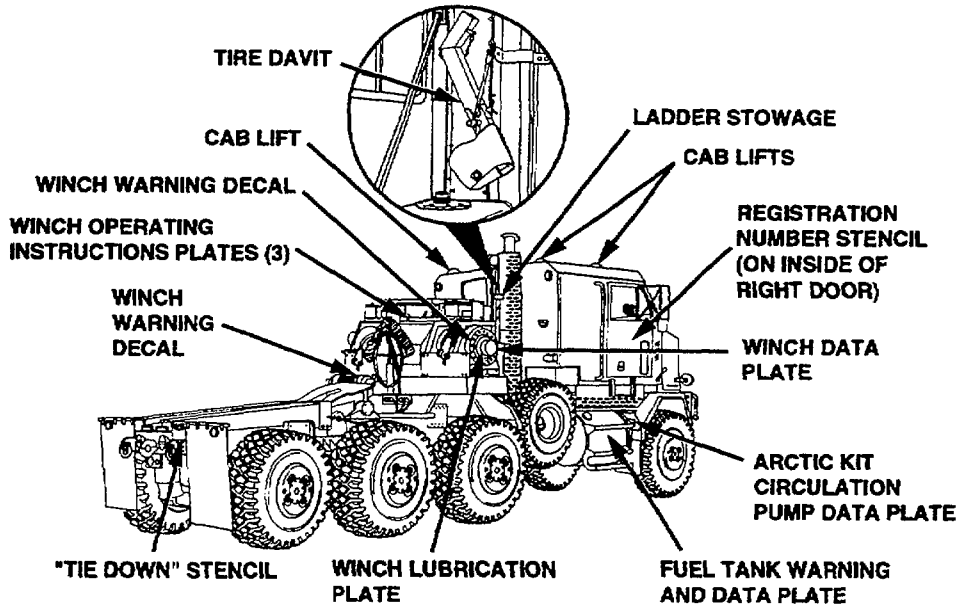
The figures on the next pages show the location of metal signs, decals, and stencils used on the vehicle. Most of these signs and stencils contain cautions or information needed to operate the vehicle safely.

HET Tractor Exterior

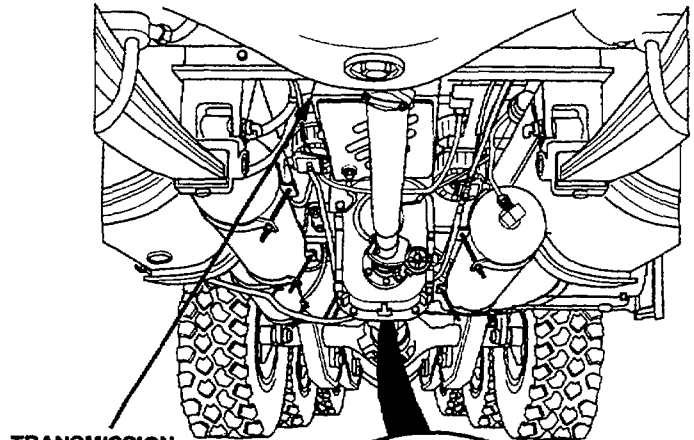
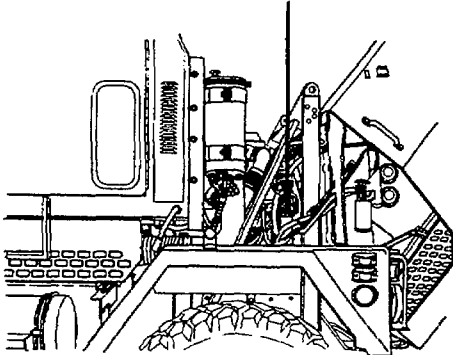


STOWAGE AND SIGN GUIDE - Continued

HET Tractor Exterior

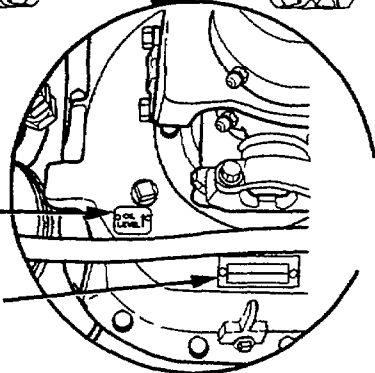


ENGINE SERIAL NUMBER
(STAMPED ON ENGINE BLOCK)

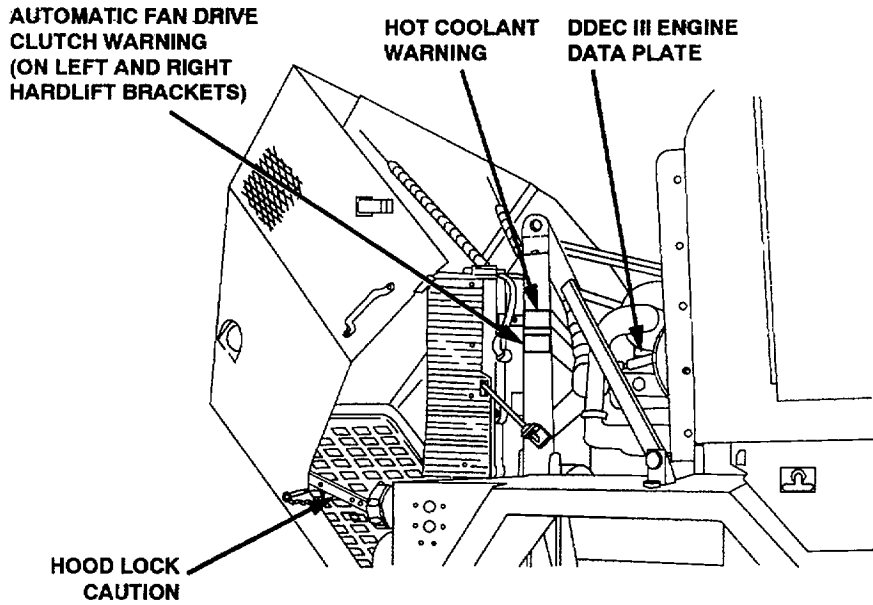


TRANSFER CASE OIL LEVEL

TRANSFER CASE SERIAL NUMBER



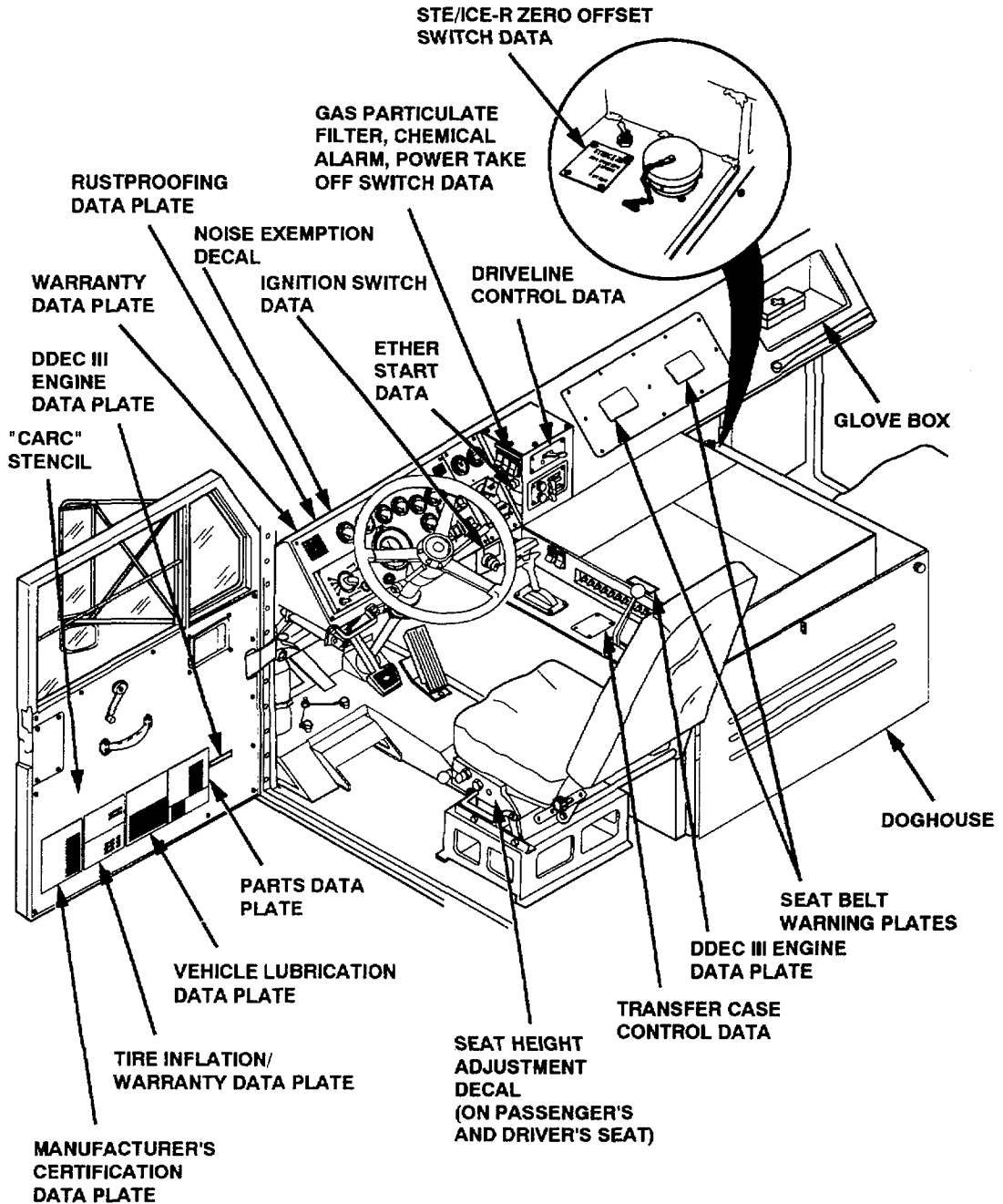
HET Tractor Engine Compartment



AIR FILTER REMOVED FOR CLARITY

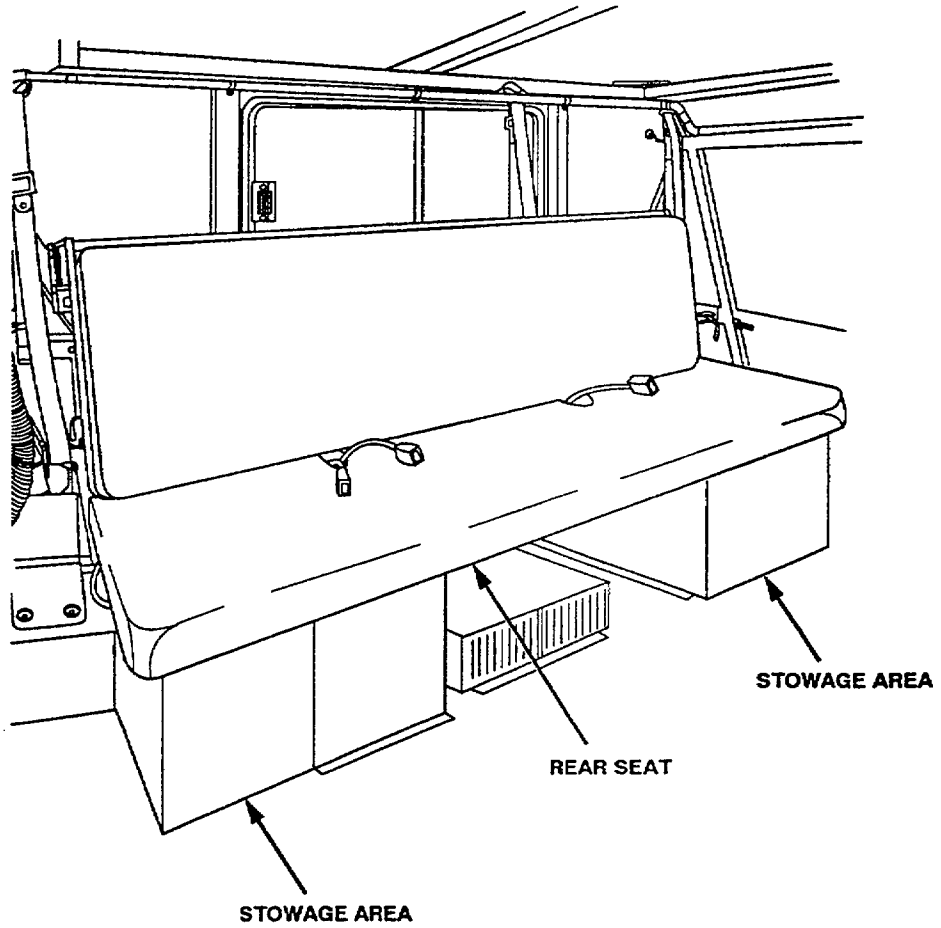
STOWAGE AND SIGN GUIDE - Continued

HET Tractor Interior



STOWAGE AND SIGN GUIDE - Continued

HET Tractor Interior



**APPENDIX F
ON-VEHICLE EQUIPMENT LOADING PLAN**

Section I. INTRODUCTION

F-1. SCOPE

This appendix shows stowage locations for equipment necessary to support the HET Tractor.

F-2. GENERAL

Stowage locations are given for equipment that must accompany the HET Tractor at all times. The following equipment is covered in this appendix.

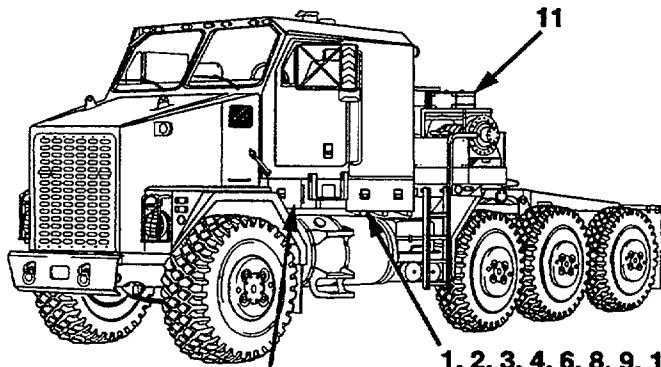
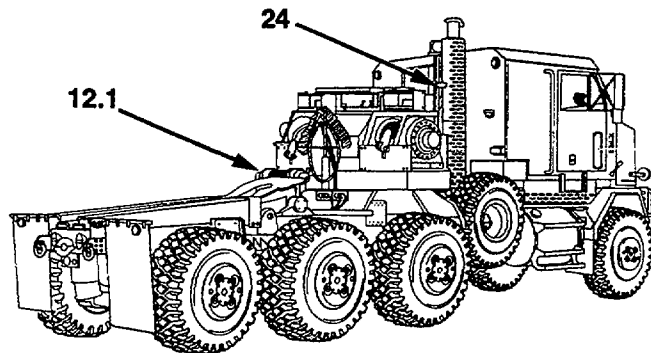
Section II. ON-VEHICLE EQUIPMENT LOADING PLAN

LOAD PLAN	
NO.	ITEM
1	ADAPTER
2	AIR HOSE, COILED
3	AXE, SINGLE BIT
4	BAG, PAMPHLET
5	BAG, TOOL
6	BAR, PINCH, 15 IN.
7	BINDER, LOOSE-LEAF
8	CABLE, SLAVE, NATO
9	CABLE, TRAILER LIGHT, 7-PIN, 12 VOLT
10	CHAIN, UTILITY, 7/8 IN. X 20 FT
10.1	CHAIN, UTILITY, 5/8 IN. X 14 FT
11	CHOCK, WHEEL
12	COVER, GRILL
12.1	COVER, AUXILIARY WINCH
13	EXTENSION, WRENCH, 13 IN.
14	FIRE EXTINGUISHER
15	FIRST AID KIT
17	HAND RECEIPT, TRUCK, TRACTOR, M1070
18	HANDLE, EXTENSION
18.1	HANDLE, EXTENSION, 40 IN.
19	HANDLE, MATTOCK PICK
20	HANDLE, SLIDING, 3/4 IN. SQUARE DRIVE
21	HARNESS, WORKLAMP
22	HOSE ASSEMBLY, AIR, 60 FT
23	JACK, HYDRAULIC WITH HANDLE
24	LADDER
25	LUBRICATION ORDER, TRUCK, TRACTOR, M1070
26	MATTOCK, PICK-TYPE, 5 LB
27	OPERATOR'S MANUAL, TRUCK, TRACTOR, M1070
28	PADLOCK WITHOUT CHAIN
29	PLATE, JACK
30	PLUG, LIMP HOME
31	SHACKLE, TOWING
32	SHOVEL, D-HANDLE, ROUND

Section II. ON-VEHICLE EQUIPMENT LOADING PLAN (CONT)

LOAD PLAN (CONT)	
NO.	ITEM
33	SNATCH BLOCK
34	SOCKET, IMPACT, 1 IN.
35	SOCKET, IMPACT 33 MM
36	STRAP, RETAINING RUBBER
36.1	TIRE INFLATOR/GAGE
37	WARNING DEVICE KIT
38	WORK LIGHT, PORTABLE
39	WRENCH, AIR-POWERED, 3/4 IN. SQUARE DRIVE

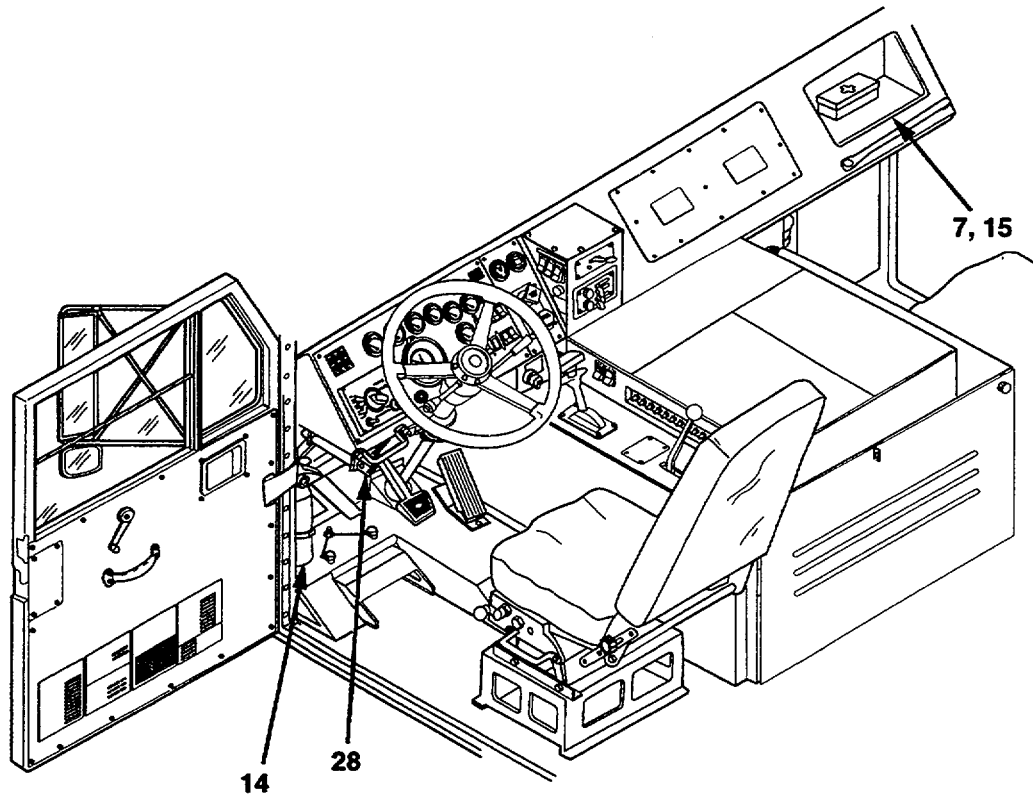
HET Tractor Exterior



5, 21, 28, 38

1, 2, 3, 4, 6, 8, 9, 10, 10.1, 12,
13, 17, 18, 18.1, 19, 20, 22,
23, 25, 26, 27, 28, 29, 30, 31,
32, 33, 34, 35, 36, 36.1, 37, 39

HET Tractor Interior



INDEX

Subject	Page
A	
Abbreviations, List of.....	1-3
Addition Authorization List (AAL).....	C-1
Air System	1-22
Assembly and Preparation for Use.....	2-115
Auxiliary Equipment Operation	2-169
B	
Basic Issue Items.....	B-1
Battery Box, Opening/Closing.....	2-228
C	
Central Tire Inflation System (CTIS).....	1-25
Central Tire Inflation System (CTIS) Operation	2-141
Characteristics, Capabilities, and Features, Equipment	1-4
Changing Tire Assembly	3-45
Checks and Services, Preventive Maintenance	2-21
Cleaning Instructions, Het Tractor	3-44
Components of End Item (COEI)	B-1
Controls and Indicators, Description and Use of Operators	2-2
Corrosion Prevention and Control	1-2
Cross-Reference List, Nomenclature	1-2
D	
Decals and Data Plates	2-105
Description and Use of Operator's Controls and Indicators	2-2
Destruction of Army Materiel to Prevent Enemy Use	1-2
Dipstick Removal/Installation.....	3-63
Draining Air System	2-56
Driving HET Tractor	2-126
E	
Electrical System.....	1-21
Emergency Marking KR, Set Up/Securing of.....	2-196
Emergency Procedures	2-218
Engine Starting	2-130
Engine Shutdown.....	2-139
Equipment Characteristics, Capabilities, and Features	1-4
Equipment Data	1-10
Equipment Description	1-4
Equipment Improvement Recommendations (EIR), Reporting	1-2
Exhaust Fan Operation.....	2-145
Expendable and Durable Supplies and Materials List	D-1

INDEX (CONT)

Subject	Page
F	
Fire Extinguisher Operation	2-147
Fluid Leakage	2-23
Fording Water Obstacles	2-194
Forest or Uneven Terrain, Operation in	2-193
Forms and Procedures, Maintenance	1-1
G	
General Information	1-1
General Maintenance Procedures	2-22
General Tractor-Trailer Operating Instructions	2-114
H	
Heater Operation, Personnel	2-144
HET Tractor Cleaning Instructions	3-44
Highway Emergency Marking KR, Setup/Securing of	2-196
Hood, Opening/Closing	2-226
How to Use This Manual	iii
I	
Introduction, PMCS	2-21
L	
Ladder Operation, Personnel	2-146
Leakage, Fluid	2-23
Lights Operation	2-122
List of Abbreviations	1-3
Loading Plan, On-Vehicle Equipment	F-1
Location and Description of Major Components	1-6
Lubrication Instructions	3-1
M	
Maintenance	
Changing Tire Assembly	3-45
Het Tractor Cleaning Instructions	3-44
Opening/Closing Battery Box	2-228
Opening/Closing Hood	2-226
Servicing Tires	3-60
Maintenance Forms and Procedures	1-1
Maintenance Procedures Introduction	3-44
Major Components, Location and Description of	1-6
Malfunction Index	3-2

INDEX (CONT)

Subject	Page
N	
Nomenclature Cross-Reference List.....	1-2
O	
On-Vehicle Equipment Loading Plan	F-1
Opening/Closing Battery Box	2-228
Opening/Closing Hood	2-226
Operating Instructions, General Tractor-Trailer	2-114
Operating Instructions Introduction.....	2-22
Operation	
Auxiliary Equipment	2-169
Central Tire Inflation System (CTIS).....	2-141
Fire Extinguisher.....	2-147
Lights.....	2-122
Personnel Heater.....	2-144
Personnel Ladder	2-146
Trailer Connection/Disconnection (Fifth Wheel)	2-148
Winch	2-158
Windshield Wipers/Washer.....	2-143
Operation in Cold Environment, -25 to 32°F (-32 to 0°C).....	2-188
Operation in Desert Environment	2-187
Operation in Extremely Cold Environment, -50 to -26°F (-46 to -32°C)	2-192
Operation in Extreme Dust	2-182
Operation in Extreme Heat	2-180
Operation in Forest or Uneven Terrain.....	2-193
Operation in Sand or Mud.....	2-184
Operation Under Unusual Conditions	2-180
Operation Under Usual Conditions	2-105
Operator's Controls and Indicators, Description and Use of	2-2
P	
Parking Brake Application.....	2-115
Personnel Heater Operation	2-144
Personnel Ladder Operation.....	2-146
Power Train.....	1-20
Preventive Maintenance Checks and Services (PMCS)	2-21
Fluid Leakage.....	2-23
General Maintenance Procedures	2-22
PMCS Introduction	2-21

INDEX (CONT)

Subject	P (CONT)	Page
Preventive Maintenance Checks and Services (PMCS)(Cont		
PMCS Table.....		2-23
PMCS Table, Use of.....		2-21
Principles of Operation.....		1-20

R

References.....		A-1
Reporting Equipment Improvement Recommendations (EIR).....		1-2
Reporting Errors and Recommending Improvements.....		i

S

Scope.....		1-1
Servicing Tires.....		3-60
Set Up/Securing of Highway Emergency Marking Kit.....		2-196
Shut Off Engine.....		2-139
Starting Engine.....		2-130
Stowage and Sign Guide.....		E-1
Systems Introduction.....		1-20

T

Tire Assembly, Changing.....		3-45
■ Tire Chain Installation/Removal.....		2-200.1
Tires, Servicing.....		3-60
Tow Bar Connection/Disconnection.....		2-201
Towing Disabled M1070 Vehicle.....		2-216
Tractor-Trailer Operating Instructions, General.....		2-114
Trailer Connection/Disconnection (Fifth Wheel).....		2-148
Troubleshooting Introduction.....		3-1
Troubleshooting Symptoms.....		3-1
Troubleshooting Table.....		3-5

UV

Use of PMCS Table.....		2-21
Ventilator Operation.....		2-146.1

W

Warning Page.....		a
Warranty Information.....		1-2
Winch Operation.....		2-158
Winch System.....		1-24
Windshield Washer Operation.....		2-143
Windshield Wiper Operation.....		2-143

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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

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

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

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

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu. Feet

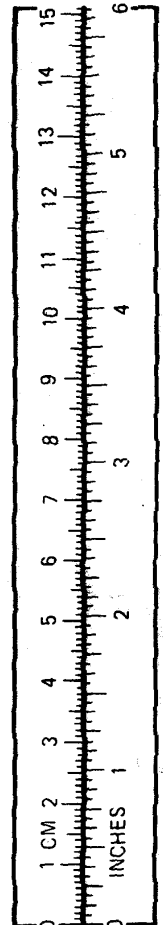
TEMPERATURE

$5/9 (°F - 32) = °C$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 °C + 32 = °F$

APPROXIMATE CONVERSION FACTORS

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Inches	Centimeters.....	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles.....	Kilometers.....	1.609
Square Inches.....	Square Centimeters.....	6.451
Square Feet.....	Square Meters.....	0.093
Square Yards.....	Square Meters.....	0.836
Square Miles.....	Square Kilometers.....	2.590
Acres.....	Square Hectometers.....	0.405
Cubic Feet.....	Cubic Meters.....	0.028
Cubic Yards.....	Cubic Meters.....	0.765
Fluid.....	Ounces Milliliters.....	29.573
Pints.....	Liters.....	0.473
Quarts.....	Liters.....	0.946
Gallons.....	Liters.....	3.785
Ounces.....	Grams.....	28.349
Pounds.....	Kilograms.....	0.454
Short Tons.....	Metric Tons.....	0.907
Pound-Feet.....	Newton-Meters.....	1.356
Pounds per Square.....	Inch Kilopascals.....	6.895
Miles per Gallon.....	Kilometers per Liter.....	0.425
Miles per Hour.....	Kilometers per Hour.....	1.609

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Centimeters.....	Inches.....	0.394
Meters.....	Feet.....	3.280
Meters.....	Yards.....	1.094
Kilometers.....	Miles.....	0.621
Square Centimeters.....	Square Inches.....	0.155
Square Meters.....	Square Feet.....	10.764
Square Meters.....	Square Yards.....	1.196
Square Kilometers.....	Square Miles.....	0.386
Square Hectometers.....	Acres.....	2.471
Cubic Meters.....	Cubic Feet.....	35.315
Cubic Meters.....	Cubic Yards.....	1.308
Milliliters Fluid.....	Ounces.....	0.034
Liters.....	Pints.....	2.113
Liters.....	Quarts.....	1.057
Liters.....	Gallons.....	0.264
Grams.....	Ounces.....	0.035
Kilograms.....	Pounds.....	2.205
Metric Tons.....	Short Tons.....	1.102
Newton-Meters.....	Pound-Feet.....	0.738
Kilopascals.....	Pounds per Square Inch.....	0.145
Kilometers per Liter.....	Miles per Gallon.....	2.354
Kilometers per Hour.....	Miles per Hour.....	0.621



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