

TM 10-4630-207-13&P

**OPERATOR'S, UNIT AND DIRECT SUPPORT
MAINTENANCE MANUAL, INCLUDING
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)
FOR
WASTE WATER EVACUATION TANK TRAILER
(WWET/T)**

NSN 4630-01-513-8155



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

HEADQUARTERS, DEPARTMENT OF THE ARMY

31 MAY 2005

WARNING SUMMARY

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation of this equipment. Failure to observe these precautions could result in serious injury or death to personnel. Also included are explanations of safety and hazardous materials icons used within this technical manual.

EXPLANATION OF SAFETY WARNING ICONS



BIOLOGICAL - abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.



CHEMICAL - drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



FIRE - flame shows that a material may ignite and cause burns.



HEAVY OBJECT - human figure stooping over heavy object shows physical injury potential from improper lifting technique.



HEAVY PARTS - heavy object on human figure shows that heavy parts present a danger to life or limb.



HOT AREA - hand over object radiating heat shows that part is hot and can burn.



SHARP OBJECT - pointed object in hand shows that a sharp object presents a danger to limb.



MOVING PARTS - hand with fingers caught between gears shows that the moving parts of the equipment present a danger to life or limb.



HEAVY PARTS – heavy object pinning human figure against wall shows that heavy, moving parts present a danger to life or limb..



MOVING PARTS - hand with fingers caught between rollers shows that the moving parts of the equipment present a danger to life or limb.



VAPOR - human figure in a cloud shows that material vapors present a danger to life or health.

GENERAL SAFETY WARNINGS DESCRIPTION



WARNING

The WWET/T weighs approximately 8,000 pounds empty. Extreme care should be used at all times when lifting it. Proper lifting equipment and observation of safety precautions is required to safely lift the WWET/T. Under No Circumstances should anyone stand under the WWET/T when it is being lifted or moved. Serious injury or death may result.



WARNING

Some items associated with or installed on the WWET/T require two to three people to lift/move. Use appropriate number of personnel when moving large, bulky, or heavy items. Never should an individual attempt to lift an item if it requires more than one person, to avoid serious injury.



WARNING

Allow the engine to cool for approximately 30 minutes before performing any maintenance. Coming in contact with hot engine parts or fluids may cause burns and severe injury.



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, safety splash goggles, face shield and respirator are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel.



WARNING

To prevent injuries from cutting, be careful when removing gasket with screwdriver. Keep hands away from hatch lip.

WARNING



Implement confined space procedures as defined in Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.146, when entering the tank.

WARNING



To prevent injuries from electrical shock, disconnect the battery cable from the negative battery terminal before making any electrical repairs.

WARNING



The vacuum pump inside mounting bolts are located in a restricted space. Exercise caution and wear gloves when loosening and tightening these bolts to avoid injuries due to pinching.

WARNING



The engine/vacuum pump skid is heavy. To prevent injuries, never stand or reach under a suspended skid. Ensure lifting equipment is of adequate capacity (2,000 pounds) and operator is familiar with the equipment.

WARNING



Fuel spills are fire and environmental hazards. Clean up any spills in accordance with local regulations.
When removing fuel supply and return hoses, avoid diesel fuel spills. Always disconnect supply hose at the fuel filter and return hose at the engine block, first. Hold up disconnected end of hose and let fuel drain back into the tank before disconnecting tank end of hoses. Fuel spills are fire hazards. Clean up any spills in accordance with local regulations.

WARNING



When handling wastewater components respiratory protection must be worn. Personnel may be exposed to the following gases: hydrogen sulfide, carbon dioxide, methane and ammonia. Death or serious injury may result.

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HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C. 31 May 2005

TECHNICAL MANUAL
OPERATOR'S, UNIT AND DIRECT SUPPORT
MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST
FOR
WASTE WATER EVACUATION TANK TRAILER
(WWET/T)

NSN 4630-01-513-8155

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 together with DA Form 2028 (Recommended Changes to Publications and Blank Forms), located in the back of this manual, directly to: Commander, U.S. Army Tank – Automotive and Armament Command, ATTN: AMSTA-LC-CECT, Kansas Street, Natick, MA 01760. You may also send in your recommended changes via electronic mail directly to amssbriml@natick.army.mil. A reply will be furnished to you. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028.

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HOW TO USE THIS MANUAL

This Manual contains General Information, Operating Instructions, Preventive Maintenance Checks and Services (PMCS), Troubleshooting, and Maintenance Information for the Waste Water Evacuation Tank Trailer.

Chapter 1 contains introductory information on the Waste Water Evacuation Tank Trailer and any associated equipment as well as a Location and Description of Major Components. Chapter 2 details operator instructions. Chapter 3 contents contain operator troubleshooting procedures. Chapter 4 details operator maintenance procedures. Chapter 5 contains unit troubleshooting procedures and Chapter 6 the unit maintenance instructions. Chapter 7 contains direct support maintenance procedures. Chapter 8 collectively contains supporting information.

Manual Organization and Page Numbering System. The Manual is divided into eight major chapters that detail the topics mentioned above. Within each chapter are work packages covering a wide range of topics. Each work package is numbered sequentially starting at page 1. The work package has its own page numbering scheme and is independent of the page numbering used by other work packages. Every work package has an even number of pages so that it does not interfere with any other work package. Each page of a work package has a page number of the form XXXX YY-ZZ where “XXXX” is the work package number (e.g. 0010 is work package 10). “YY” is a number that allows for a work package to be inserted between two existing work packages without disturbing the remainder of the TM (eg. WP 0010 01 would fall between WP 0010 and WP 0011). “ZZ” represents the number of the page within that work package. A page number such as 0010 00-1/(2 Blank) means that page 1 contains information but page 2 of that work package has been intentionally left blank. A page number such as 0010 00-(1 Blank)/2 means that page 1 of that work package has been intentionally left blank but page 2 contains information.

Illustrations. Illustrations for procedures in this manual always follow the procedure. For example, if given a procedural instruction such as “1. Locate the pump assembly **(1)**.”, the **(1)** references the photo or illustration immediately *following* the procedure.

Finding Information. The Table of Contents permits the reader to find information in the manual quickly. The reader should start here first when looking for a specific topic. The Table of Contents lists the topics contained within each chapter and the work package sequence number where it can be found.

Example: If the reader were looking for instructions on “Preventive Maintenance Checks and Services”, which in this manual is an Operator Maintenance topic, the Table of Contents indicates that Operator Maintenance information can be found in Chapter 4. Scanning down the listings for Chapter 4, “Preventive Maintenance Checks and Services” information can be found in WP 0010 00 and WP 0011 00 (i.e. Work Packages 10 and 11).

An Alphabetical Index can be found at the back of the manual. It lists specific topics with the corresponding work package.

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CHAPTER 1

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

WASTE WATER EVACUATION TANK TRAILER

**OPERATOR, UNIT AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
NSN 4630-01-513-8155
GENERAL INFORMATION**

SCOPE

This manual contains the equipment description, operating instructions and maintenance procedures for the Waste Water Evacuation Tank Trailer (WWET/T), NSN 4630-01-513-8155. The WWET/T is intended for use with the Force Provider Base Camp System (refer to TM 10-5419-206-13).

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for WWET/T maintenance shall be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS) (Maintenance Management Update).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your WWET/T needs improvement, let us know. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on a Standard Form 368 Product Quality Deficiency Report. Mail the report to:

Commander, Tank – Automotive and Armament Command
Attn: AMSTA-LC-CECT
Kansas Street, Natick, MA 01760-5052

A reply will be sent directly to you. Instructions for sending an electronic 2028 may be found in the back of this manual immediately preceding the hardcopy 2028.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of U.S. Army materiel is a continuing concern. It is important that any corrosion problems with the WWET/T be reported so that the problem can be corrected and improvements made to prevent the problem in future items. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling or breaking of these materials may be considered a corrosion problem. If a corrosion problem is identified, it can be reported using a Standard Form 368 Product Quality Deficiency Report. Using key words such as "corrosion," "rust," "deterioration," or "cracking" will assure that the information is identified as a CPC problem. This form should be submitted to:

Commander, Tank – Automotive and Armament Command
Attn: AMSTA-LC-CECT
Kansas Street, Natick, MA 01760-5052

OZONE DEPLETING SUBSTANCES (ODS)

The operation of the WWET/T when used to collect, transport and discharge wastewater does not require the use of any ODS.

DESTRUCTION OR ARMY MATERIEL TO PREVENT ENEMY USE

Destruction of Army materiel to prevent enemy use shall be in accordance with TM 750-244-3.

PREPARATION FOR STORAGE AND SHIPMENT

Before placing the WWET/T in administrative storage or preparing the system for shipment, current maintenance services must be applied; defects and failures corrected; and Modification Work Orders (MWO's) applied. Prepare the system for storage and shipment as described in Chapter 2.

Placement of equipment in storage. Equipment should be placed in storage for limited periods only, when a shortage of maintenance capability exists. Items should be mission ready within 24 hours, or within time factors set by directing authority. During storage periods, maintenance records must be kept current.

Storage site selection. Covered space is preferred. When sufficient covered space is not available, priority should be given to items that are most susceptible to deterioration from the elements. Open sites should be improved hardstand, if available. Unimproved sites should be firm, well-drained locations, free of excessive vegetation. Store the WWET/T in an open area and away from working and sleeping areas.

WARRANTY INFORMATION

Warranty information for WWET/T components is contained in the commercial literature accompanying the components.

The manufacturer delivers the WWET/T as a U.S. Department of Transportation (DOT) certified Type 407 Cargo Tank Trailer. Refer to the applicable COSIS Plan to maintain certification of equipment in storage. Refer to DOT Specification 407 to maintain certification of equipment deployed in CONUS. Equipment deployed outside CONUS is exempt from certification requirements.

NOMENCLATURE CROSS-REFERENCE LIST

The following lists cross-reference, common names used throughout this manual to official nomenclature.

COMMON NAME	OFFICIAL NOMENCLATURE
ASH TEMPER QD, QDC Vacuum Pump	Army Space Heater Tent, Extendable, Modular, Personnel Quick Disconnect Coupling Vacuum-Pressure Pump

LIST OF ABBREVIATIONS/ACRONYMS

A	Amperes	L	Liter(s)
AAL	Additional Authorization List	lb	Pound(s)
AC	Alternating Current	m, M	Meter(s)
AWG	American Wire Gage	MAC	Maintenance Allocation Chart
BII	Basic Issue Item	MOS	Military Occupational Specialty
°C	Celsius (centigrade)	MTOE	Modified Table of Organization and Equipment
COEI	Component of End Item	NTE	Not to Exceed
CONUS	Continental United States	ODS	Ozone Depleting Substances
CPC	Corrosion Prevention Control	PACC	Procuring Activity Cage Code
CTA	Common Table of Allowances	PMCS	Preventive Maintenance Checks and Services
DOT	Department of Transportation	PMCS	Services
EIR	Equipment Improvement Recommendation	POL	Petroleum, Oil and Lubricant
°F	Degree Fahrenheit	PSI	Pounds per Square Inch
ft	Foot	PVC	Poly Vinyl Chloride
ft-lb	Foot/pound(s)	QD	Quick Disconnect
GFCI	Ground Fault Circuit Interrupt	RPM	Revolutions per Minute
Hrs	Hours	RPSTL	Repair Parts and Special Tools List
Hz	Hertz	SOP	Standard Operating Procedure
in, IN, “	Inch(es)	TEMPER	Tent, Extendable, Modular, Personnel
In/vac	Inches of Vacuum	TOE	Table of Organization and Equipment
ISO	International Organization for Standardization	TRICON	Triple Container
kg	Kilogram(s)	U/M	Unit of Measure
Kg-m	Kilogram-meter	UOC	Usable On Code
kPa	Kilopascal(s)	V	Volts
KW	Kilowatt(s)	WWET/T	Wastewater Evacuation Tank Trailer

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this manual. If quality of material requirements are not stated in this manual, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

SUPPORTING INFORMATION FOR REPAIR PARTS, SPECIAL TOOLS, AND SUPPORT EQUIPMENT

Refer to the Maintenance Allocation Chart (MAC) in WP 0053 for a listing of maintenance items and tools or test equipment. Refer to the Repair Parts and Special Tools List (RPSTL) beginning in WP 0054 for details concerning repair parts. No special tools are required for the WWET/T.

SAFETY, CARE AND HANDLING

Be alert and note **WARNINGS, CAUTIONS, and NOTES**. These provide for safe operation of the equipment, and protect you and your equipment from injury and damage.

**OPERATOR, UNIT AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
EQUIPMENT DESCRIPTION AND DATA**

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

The following characteristics, capabilities and features are unique to the WWET/T and are relevant in planning for its proper employment.

Characteristics:

Fully equipped hazardous waste tank trailer meeting DOT Specifications for transport over public roads.
Self-contained system with integral power source.
Designed for operation in temperatures above 32 °F.
Designed for over-the-road and rough terrain mobility.
Land, sea, air and rail transportable.

Capabilities:

Transports 1000 Gallons of waste water over rough terrain or improved road
Maximum speed over rough terrain is 20 MPH
Maximum speed over improved road is 45 MPH
Operates 8 Hours on one tank of fuel

Features:

Brake system
Full over-the-road lighting
Work area illumination
Hydraulically operated intake and drain valves.
Automatic and manual vacuum shutoff.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Wastewater Tank

The wastewater tank has a maximum capacity of 1000-gallons. It incorporates a float valve mechanism (1) that will shut off the vacuum system when the tank is full. It also incorporates a safety relief valve (2) that will relieve internal tank pressure when it reaches 30 PSI. An internally mounted float indicates the level of liquid in the tank on an externally mounted indicator/scale (3). A manway assembly (4) provides access into the tank interior. A 4-inch hydraulically operated drain valve (5) is mounted onto the manway. A 2½-inch hydraulically operated intake valve (6) is welded directly onto the tank. A manual hydraulic pump (7) mounted onto the rear platform is used to operate the intake and drain valves. Separate fusible frangible links (8) provide for emergency shutoff of the hydraulic system to either the intake or drain valve, or both, closing the valve(s). See Figure 1.

Power System

Power is furnished by a water-cooled, four-cycle, in-line overhead valve type diesel engine (9) mounted together with the vacuum pump (10) on a removable skid (11) that is bolted onto the front of the trailer frame. The engine drives the vacuum pump with a belt (12) attached to the pulleys (13). The engine (9) also powers the 12-Volt electrical system used on the trailer and maintains the battery (14). Engine performance is indicated on a control panel (15), which incorporates oil pressure (16), battery charge (17), temperature (18), tachometer (RPM) (19) and hour meter gages (20). The control panel also incorporates the ignition (21), emergency shutoff, (22) the rear work light toggle switch (23), a preheat light (24), and warning lights for temperature (25), oil pressure (26) and battery charging (27) conditions. The engine throttle (28) is mounted above the pulley guard (29). The engine exhausts through a vertically mounted cylindrical muffler (30). See Figures 2 and 3.

Vacuum/Pressure System

The vacuum/pressure system consists of the vacuum pump (10) mounted together with the diesel engine (9) on a removable skid that is bolted to the trailer frame, a primary shutoff located inside the tank (refer to Wastewater Tank), a moisture trap (31), which functions as a secondary shutoff, a breather (32) that evacuates air from the pump, an isolation valve (33) on the tank and a ball valve (34) on the intake chopper tube/wand (35). See Figure 4.

Electrical System

The WWET/T includes a 12-volt battery (14) mounted to the trailer frame behind the vacuum pump (10). The battery provides starting power for the engine (9), which in turn powers the electrical functions. The trailer is equipped with turning, stopping and running lights (36) on the fenders as well as the tank. In addition, license plate (37) and rear platform illumination is provided by lights mounted on a bracket welded to the upper part of the tank. The control panel (15) has control gages. Standard automotive wiring is used on the trailer. See Figure 5.

Trailer

The trailer is a three-axle frame construction incorporating two equipment trays (38) to carry the 2 ½-inch intake (39), and 4-inch drain hoses (40) as well as the chopper tube/wand (35), and a toolbox (41) containing spare parts. The trailer is equipped with hydraulic brakes (42) and utilizes 16-in by 6-in-rims mounting 85R16 tires (43). The 13-gallon fuel tank (44) is mounted under the equipment tray on the engine side of the trailer. A trailer jack (45) to raise the front of the trailer is located on the left front of the trailer frame. A lunette eye (46) and safety chains (47) are provided for connection to the prime mover. See Figures 6, 7, and 8

Hoses

Two each 2 ½-inch x 20-foot intake hoses with QD fittings (39) and two each 4-inch x 10-foot drain hoses with QD fittings (40) are carried in the equipment trays (38) and on two hose hooks (48). One 2 ½-inch chopper tube/wand with integral 3-inch PVC valve (35) is also carried in one of the equipment trays (38). See Figures 6, 7, and 8

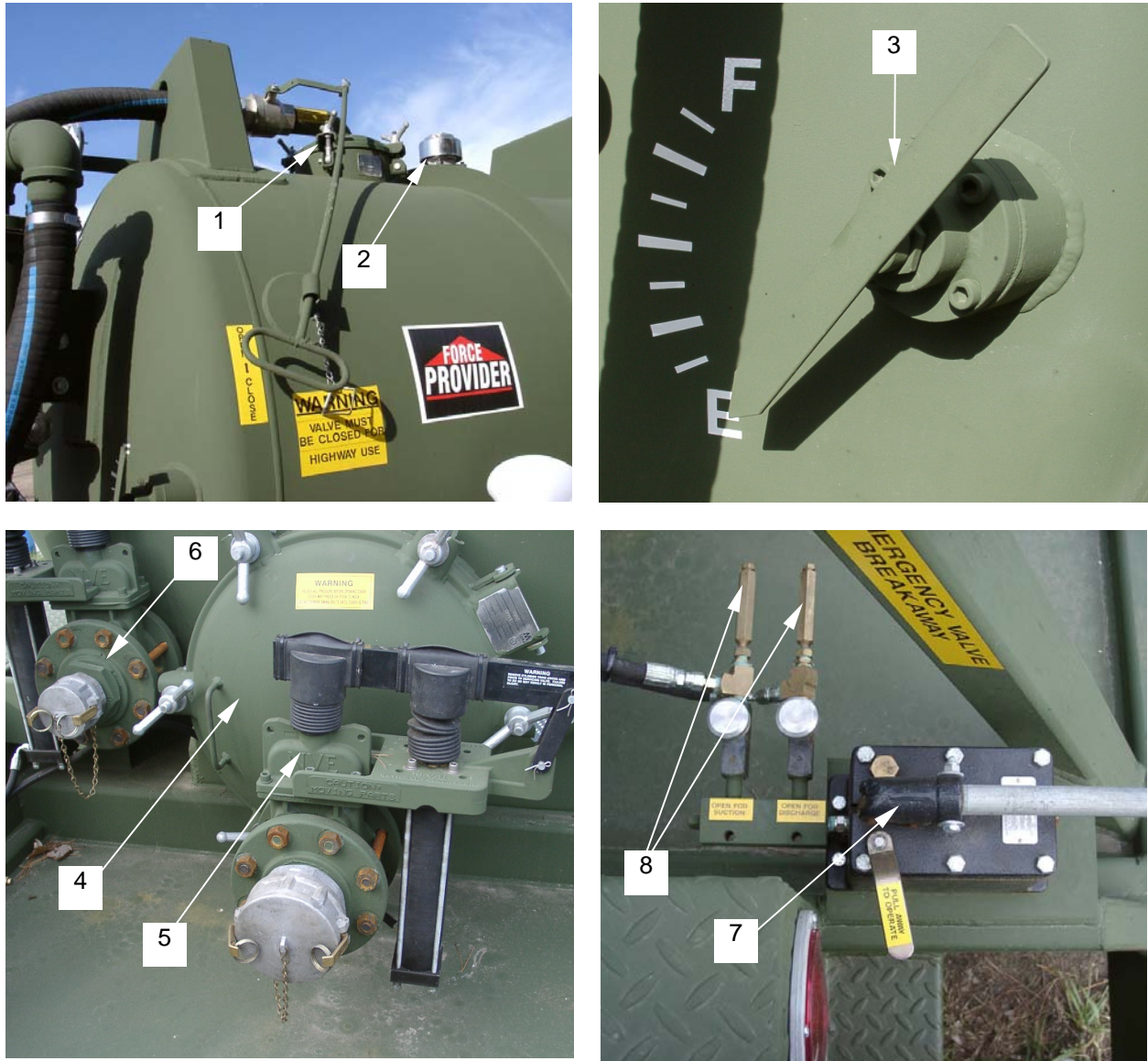


Figure 1. Wastewater Tank

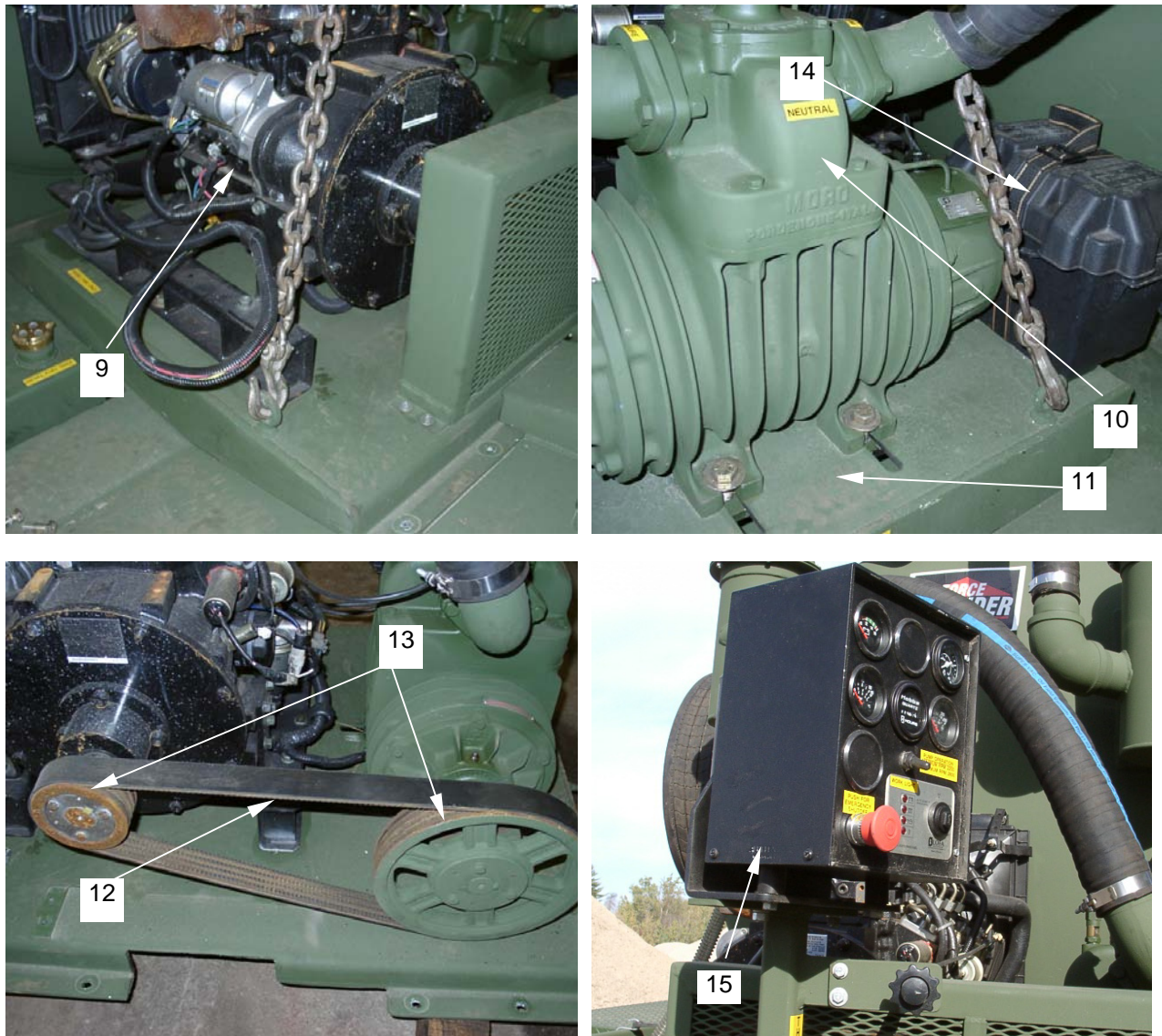


Figure 2. Power System

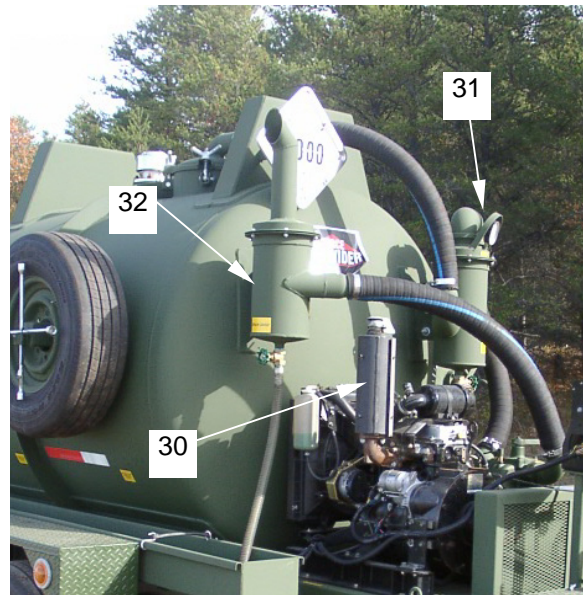
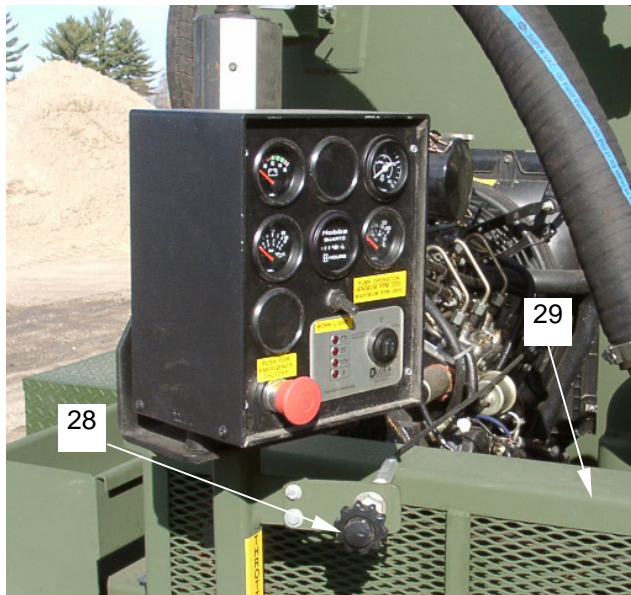
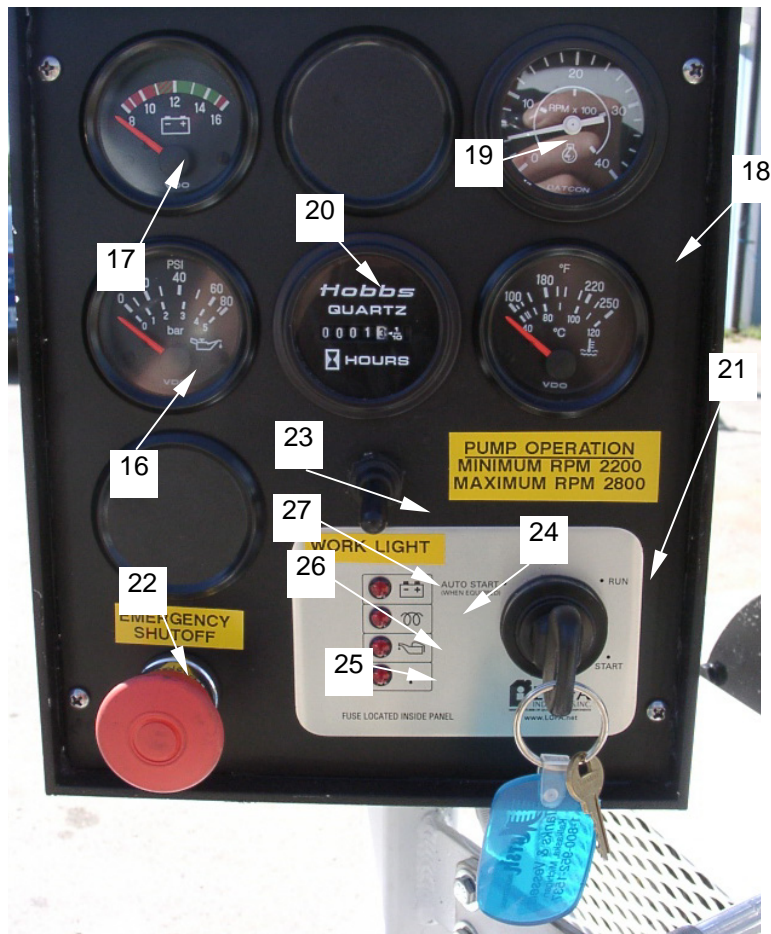


Figure 3. Power System - continued



Figure 4. Vacuum/Pressure System

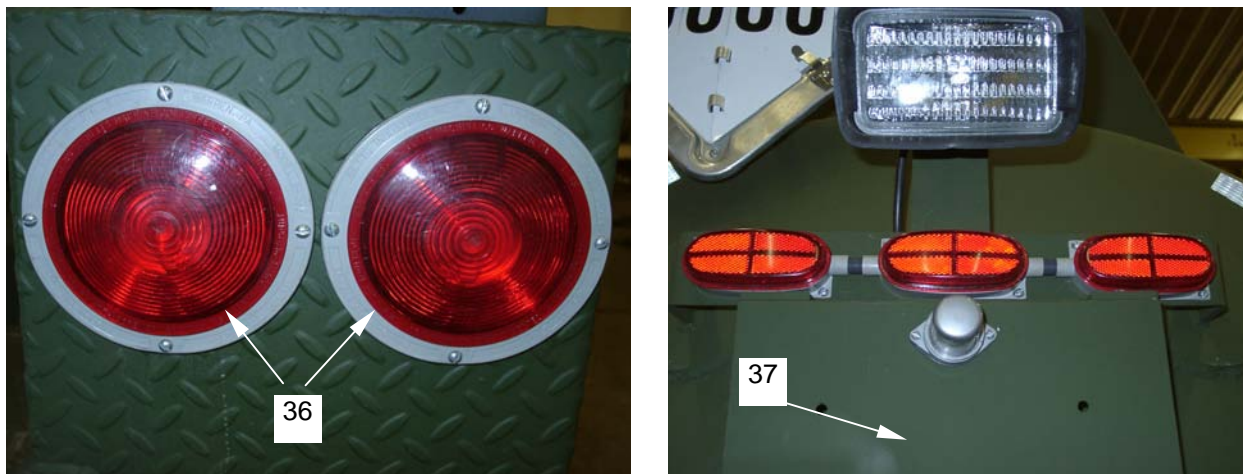


Figure 5. Electrical System

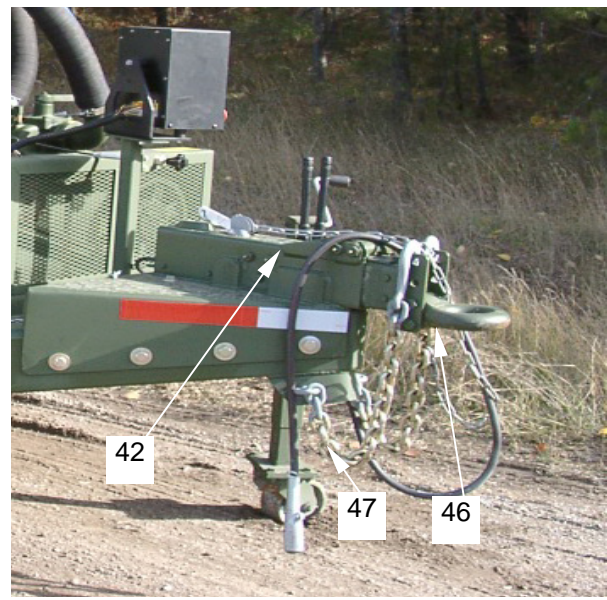
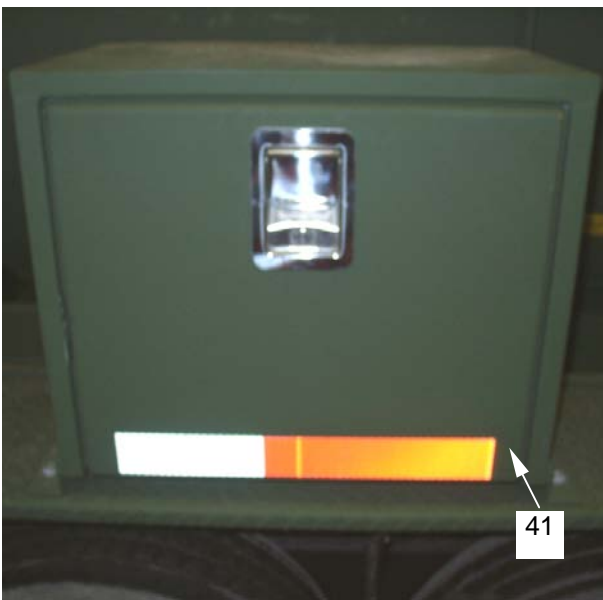
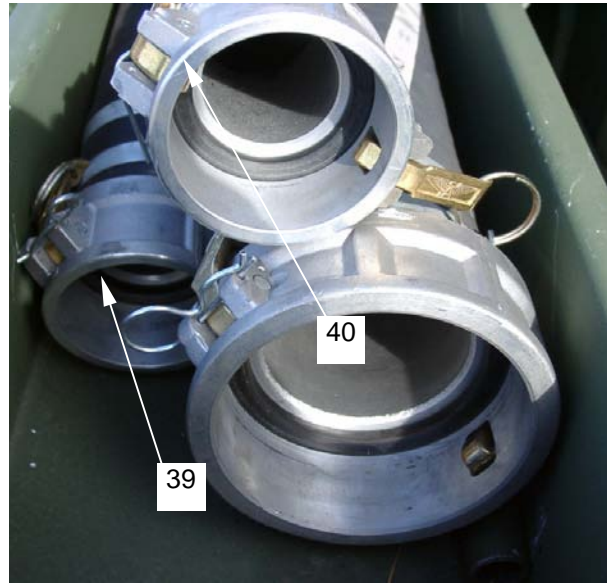


Figure 6. Trailer/Hoses



Figure 7. Trailer/Hoses - continued



Figure 8. Trailer/Hoses - continued

EQUIPMENT DATA

The following technical data pertains to the WWET/T and its components.

Table 1-1 Equipment Data

WWET/T EXTERNAL DIMENSIONS (LXWXH)	206.15-in X 96-in X 108.34-in
OVERALL WEIGHT (EMPTY)	7920 lbs
OVERALL WEIGHT (LOADED)	17920 lbs
WASTEWATER TANK CAPACITY	1000 Gallon
FUEL REQUIREMENTS	JP8
FUEL TANK CAPACITY	13 Gallon
TIRE SIZE	85R16
TIRE PRESSURE	110 lbs
ENGINE	water-cooled, four-cycle, in-line overhead valve type, diesel
VACUUM/PRESSURE PUMP	vane type
BATTERY TYPE	12 Volt
AIR TRANSPORT	C130, C141, C5
MAXIMUM SPEED (ROUGH TERRAIN)	20 MPH
MAXIMUM SPEED (ROAD)	45 MPH
INTAKE HOSES	two each 2 ½-inch x 20-foot
DRAIN HOSES	two each 4-inch x 10-foot
ENGINE OIL TYPE/CAPACITY	SAE 10W40 (Summer) SAE 10W30 (Winter)/6.7 QUART
VACUUM PUMP OIL REQUIREMENT	SAE 40W
HYDRAULIC FLUID REQUIREMENT	AW32
HYDRAULIC PUMP	cast iron, 3000 PSI, 1½ -Pint capacity
HYDRAULIC SURGE BRAKES	surge actuator type
OIL FILTER	cartridge type
BRAKE FLUID	cartridge type

**OPERATOR, UNIT AND DIRECT SUPPORT MAINTENANCE
WASTEWATER EVACUATION TANK TRAILER
THEORY OF OPERATION**

THEORY OF OPERATION

General. The WWET/T is a trailer-mounted wastewater evacuation system for operation in temperatures above 32 °F. An on-board vacuum/pressure system is used to load the 1,000 Gallon capacity wastewater tank at the evacuation point and discharge it at the disposal point. A water-cooled, four-cycle, in-line overhead valve type, diesel engine provides the power to operate a vane-type vacuum pump. The pump creates a vacuum in the tank during loading, and pressurizes the tank during unloading. The intake and drain valves located at the back of the trailer are operated through a manual hydraulic hand pump. A float ball type shutoff located at the top of the tank blocks the airflow when the tank is full. A moisture trap, or secondary shutoff, is located externally, in front of the tank. A float level indicator activated by a separate float ball indicates the fluid level in the tank. A 12-Volt battery provides starting power for the diesel engine. The trailer is fully equipped with running, backup and license plate lights and connects to the prime mover using an adjustable lunette. It can be towed over the road as well as rough terrain. See Figures 1 and 2.

Operational Concept. (Loading) The WWET/T (1) is positioned within 20 to 30-feet of the facility to be serviced. Two intake hoses (2½-inch x 20-foot) (2) and a chopper tube/wand (3) are then assembled in series. The assembled hoses are then attached to the intake valve (4). With the chopper tube/wand immersed in the liquid to be evacuated, the diesel engine (5) is started and the vacuum pump (6) set to the VACUUM function. The isolation valve (7) and intake valve (4) are opened. When a specified vacuum (approximately 15-inch/vac) is reached as indicated on the pressure gage (8), the ball valve (9) located on the chopper tube/wand is opened and the tank will fill. The float level indicator (10) indicates the level of the accumulating liquid in the tank. When the tank is full a primary shutoff mechanism located inside the tank will terminate the loading function. The intake valve (4) and isolation valve (7) is then closed. The intake hoses and chopper tube/wand are then removed and the trailer can be moved to the disposal point.

(Disposal) With the WWET/T positioned within 10 to 15-feet of the disposal point, two 4-inch drain hoses, assembled in series (11), are attached to the drain valve (12) and the disposal facility. The drain valve (12) and the isolation valve (7) are then opened to let the liquid drain from the tank. To drain the tank under pressure, the diesel engine (5) is started and the vacuum pump (6) set to the PRESSURE function. As pressure builds inside the tank, the contents are expelled. When the tank is empty as shown on the float level indicator (10) the drain valve (12) is closed and the assembled 4-inch x 10-foot hoses (11) disconnected. A 20-inch hatch (13) located at the rear of the tank can be opened to remove solids that will not evacuate during normal unloading.

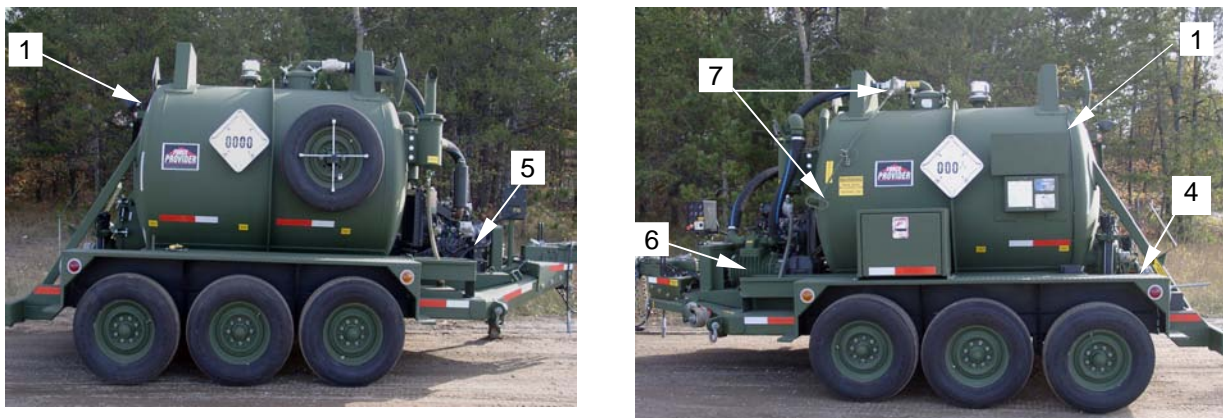


Figure 1. Location Of Major Components



Figure 2. Location of Major Components - continued

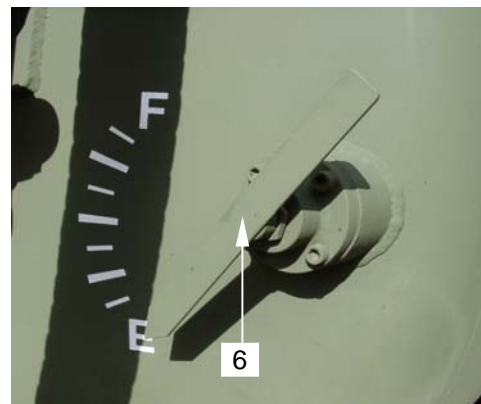
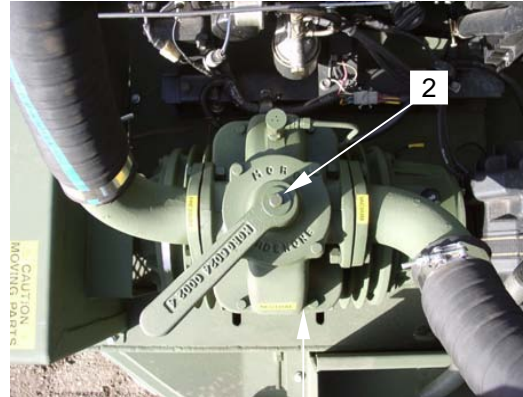
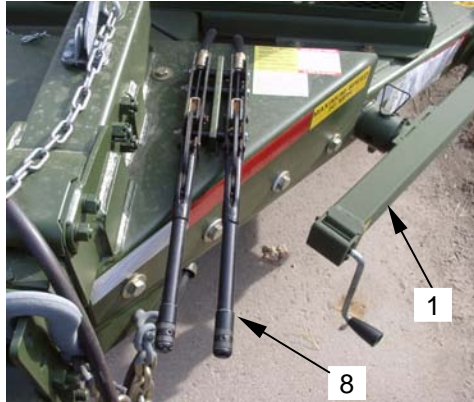
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CHAPTER 2
OPERATOR INSTRUCTIONS
WASTE WATER EVACUATION TANK TRAILER

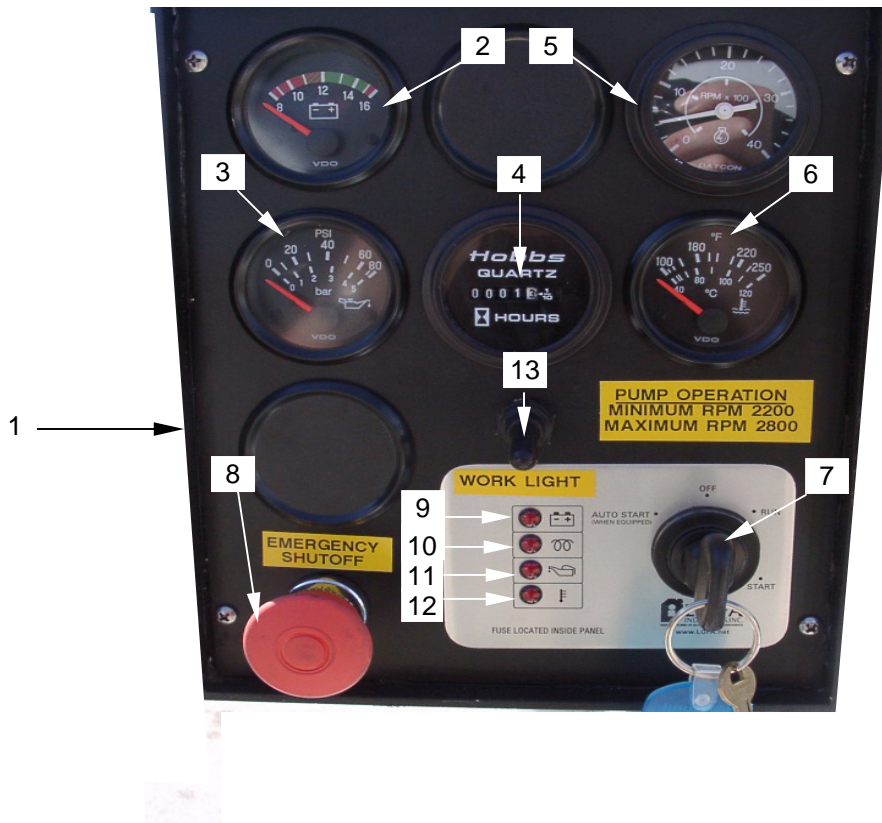
**OPERATOR, UNIT AND DIRECT SUPPORT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS**

INTRODUCTION

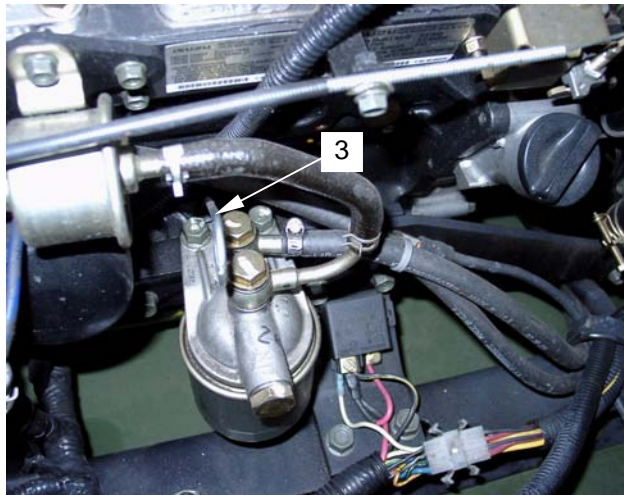
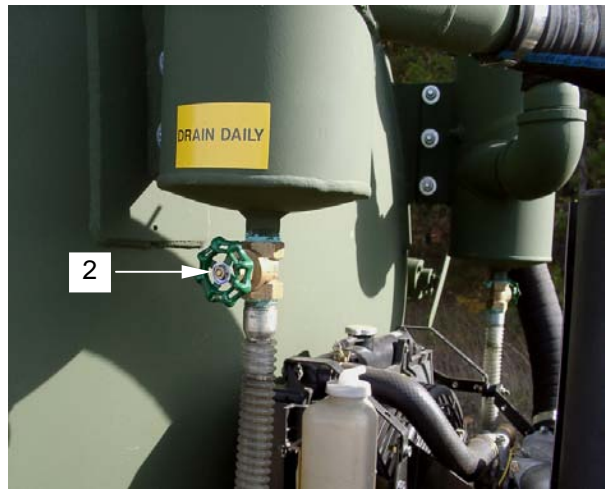
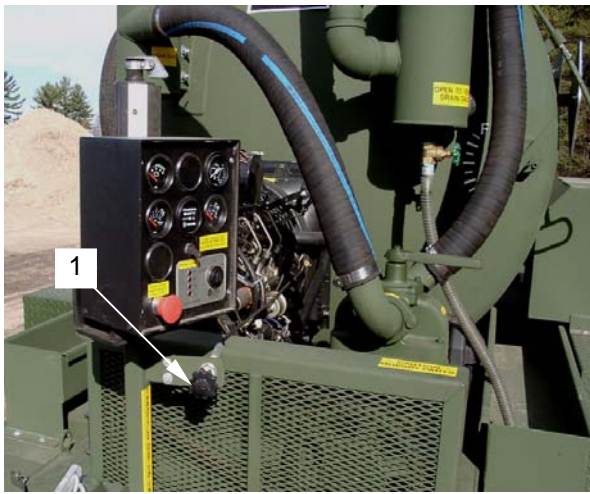
This WP shows the location and describes the use of WWET/T controls and indicators. The following illustrations show the location of major components of the WWET/T. You should know the location and proper use of every control and indicator before operating the WWET/T. Use this WP to learn about each control and indicator and how it works.



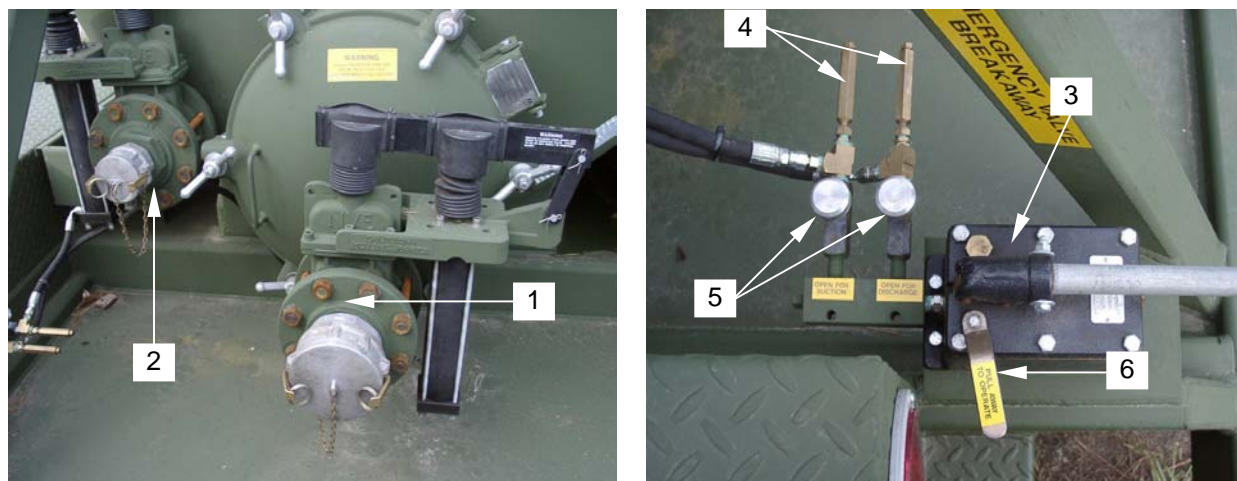
Waste Water Evacuation Tank Trailer (WWET/T) (Right Side/Front)		
Key	Control or Indicator	Function
1	Trailer Jack	Raises front of trailer
2	Vacuum Pump Control	Engages/switches pump to vacuum or pressure function
3	Vacuum/Pressure Gage	Indicates vacuum or pressure within tank
4	Moisture Trap Drain Valve	Drains moisture from trap
5	Moisture Trap Sight Glass	Indicates pollutants in trap
6	Float Level Indicator	Indicates content level of tank
7	Isolation Valve	Isolates tank contents during transport. Equalizes pressure
8	Brake Handles	Activate parking brake



Waste Water Evacuation Tank Trailer (WWET/T)		
Key	Control or Indicator	Function
1	Control Panel	Houses WWET/T starting, operating and shutdown (including emergency) controls
2	Voltmeter	Indicates battery status
3	Oil Pressure Gage	Indicates engine oil pressure
4	Hour Meter	Shows accumulated hours of engine operation
5	Tachometer (RPM Indicator)	Indicates engine RPM
6	Water Temperature Gage	Indicates engine operating temperature
7	Key Switch	Starts and shuts off engine
8	Emergency Shutdown	Engine emergency shut down
9	Battery Light	Battery warning light
10	Preheat Light	Indicates duration of preheating cycle
11	Oil Pressure Light	Oil pressure warning light
12	Temperature Light	Temperature warning light
13	Toggle Switch	Controls work light at rear of trailer



Waste Water Evacuation Tank Trailer (WWET/T) (Left Side/Front)		
Key	Control or Indicator	Function
1	Diesel Engine Throttle	Regulates engine speed
2	Oil Catch Muffler Drain	Drains sediment from breather
3	Diesel Engine Dipstick	Indicates engine oil level



Waste Water Evacuation Tank Trailer (WWET/T) (Rear)		
Key	Control or Indicator	Function
1	Drain Valve	Controls tank draining
2	Intake Valve	Controls tank filling
3	Hydraulic Pump	Operates drain and intake valves
4	Tangible Fusible Links	Emergency closure of valves
5	Hydraulic Lines Control Knobs	Opens/closes hydraulic lines to drain/intake valves
6	Hydraulic Pump Selector Lever	Opens or closes intake or drain valve (clockwise fully as pictured opens valves, counterclockwise fully, valve handle parallel to pump handle, closes valves).

**OPERATOR, UNIT AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
OPERATION UNDER USUAL CONDITIONS**

SECURITY MEASURES FOR ELECTRONIC DATA

There are no security measures for electronic data requirements for the WWET/T.

SITING REQUIREMENTS

The WWET/T is employed as part of a Force Provider base camp and specifically designed to service the Force Provider latrine subsystem. There are no specific siting requirements for the WWET/T but its intended use requires that it be kept in the vicinity of either the serviced facilities or the designated disposal point.

SHELTER REQUIREMENTS

There are no specific shelter requirements when the WWET/T is operated under usual conditions. When the WWET/T is operated in temperatures below 32 °F (refer to WP 0006 00) it must be sheltered during periods when it is not in use.

ASSEMBLY AND PREPARATION FOR USE

Upon receipt, and prior to use, preservation and packing material must be removed from the WWET/T.

Operators must familiarize themselves with controls and indicators described in WP 0004 00 before moving the trailer.

Perform a visual inspection of the WWET/T to determine any obvious damage sustained during shipment. Inventory the contents of the toolbox, which should contain the following items:

Item	Quantity
Vacuum pump drive belt	1
Intake valve gasket 2 ½"	2
Drain valve gasket 4"	2
Engine fuel filters	2 of each
Engine oil filter	2
Engine air filter	2
Primary shutoff seat	1
Secondary shutoff (moisture trap) seat	1
Engine glow plug	2
Float level packing (Teflon)	36-in
Fusible frangible link	2
Running light bulb	2
Tail light bulb	2
Engine fan belt	1
Bottle jack (12 ton)	1
Wheel chocks	2

Record any deficiencies or shortages on SF Form 368 and distribute as specified on form.

Perform PMCS (refer to WP 0011 00).

Fill the fuel tank with 13 gallons of diesel fuel (JP8)

INITIAL ADJUSTMENTS

Initial control/valve settings and adjustments before the WWET/T is used in the vacuum (tank filling) mode are as follows: (Refer to WP 0004 00 for location of controls)

CONTROL/VALVE	POSITION
Moisture trap drain valve	Closed
Oil catch muffler drain valve	Closed
Intake valve (suction) hydraulic control knob	Closed
Drain valve (discharge) hydraulic control knob	Closed
Chopper tube/wand PVC ball valve	Closed
Vacuum pump control	Neutral
Engine emergency shutoff	Pull Out
Isolation valve	Open

OPERATING PROCEDURES

The normal operational cycle of the WWET/T consists of connecting the trailer to a prime mover, moving it from its designated parking position to one or more locations for wastewater evacuation (tank filling), moving the trailer to the designated disposal site, draining the tank and returning the trailer to its designated parking position.

The actual operational cycle can be varied and should reflect local requirements. If the collection and/or discharge points are relatively far apart, a partially filled tank can be temporarily stored in the trailer until the tank is filled to capacity before draining.

Connecting WWET/T to Prime Mover

To connect the WWET/T to a prime mover proceed as follows:



WARNING

Ensure that two persons (not including the prime mover operator) are available for this operation to properly guide the prime mover into position and connect the trailer. Trailer parking brakes must be ON and chocks in place to avoid injuries from a moving trailer to avoid serious injury/death between the prime mover and the trailer when guiding the prime mover into position.

1. Ensure trailer parking brakes (**figure 1, item 1**) are ON (brake handles in horizontal position) and chocks (**figure 2, item 1**) are in place.

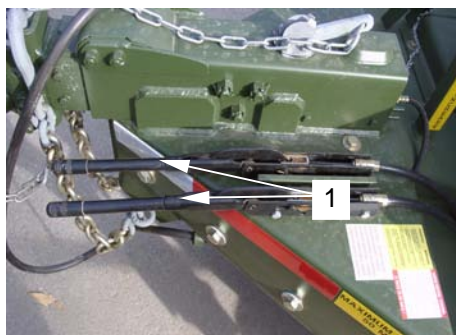


Figure 1. Parking Brakes ON

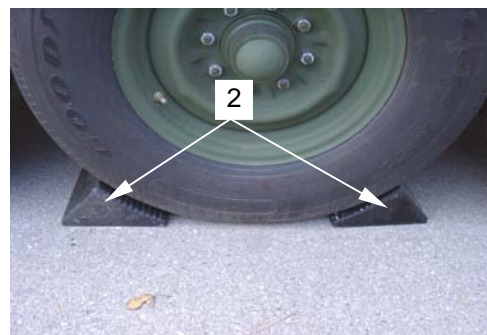


Figure 2. Chocks in Place

2. Position the prime mover so that its towing pintle (**figure 3, item 1**) is located close to the lunette eye (**figure 3, item 2**) of the trailer.

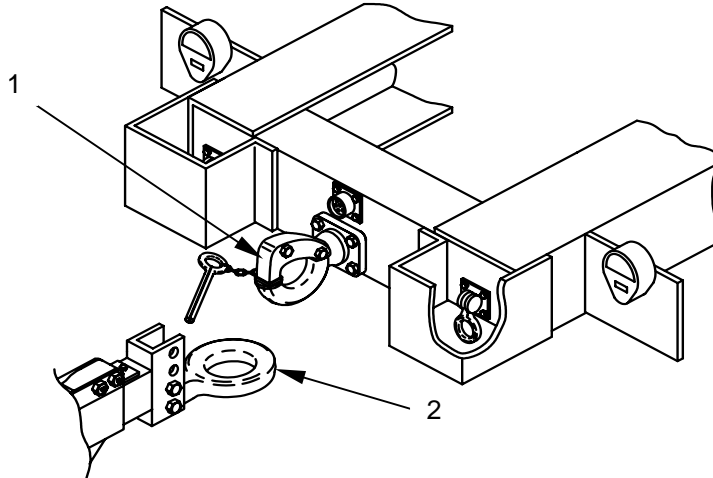


Figure 3. Connecting WWET/T to Prime Mover

NOTE

If the same prime mover is habitually used with the WWET/T, the trailer lunette eye should be adjusted to the proper height to mate with the prime mover towing pintle.

3. To adjust the height of the lunette eye (**figure 4, item 1**), if necessary, remove two lock nuts (**figure 4, item 2**) and two lag bolts (**figure 4, item 3**) that secure the lunette eye to the leveler slide (**figure 4, item 4**). Adjust the lunette eye to the desired height, then re-install and tighten two lag bolts and lock nuts.



Figure 4. Lunette Eye Adjustment

4. Raise or lower the trailer as necessary with the jack (**figure 5, item 1**) so that the lunette eye (**figure 5, item 2**) is at the same height as the towing pintle (**figure 5, item 3**) of the prime mover.

- To raise the trailer, rotate the handle clockwise. To lower the trailer, rotate the handle counter clockwise. Lock in place by inserting locking pin (figure 5, item 4).

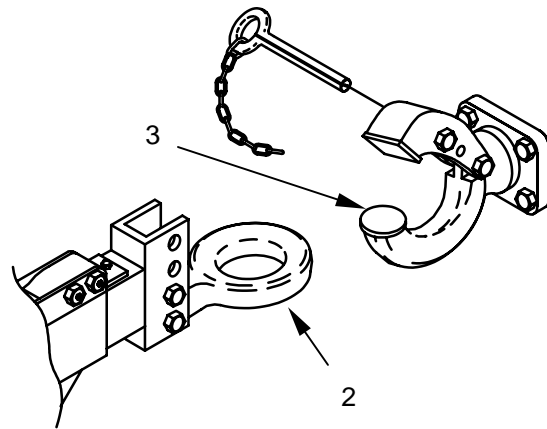


Figure 5. Adjusting Towing Height



WARNING

To avoid serious injuries, do not place hands between the prime mover towing pintle and the trailer lunette eye when connecting the trailer to the prime mover.

6. Remove lock pin (**figure 6, item 1**) on towing pintle (**figure 6, item 2**) and open pintle.
7. Slowly back up prime mover until trailer lunette eye (**figure 6, item 3**) is centered over lower part of towing pintle (**figure 6, item 4**). Lower the trailer with the jack until the lunette eye sits on the lower part of the towing pintle. Close towing pintle and install lock pin.

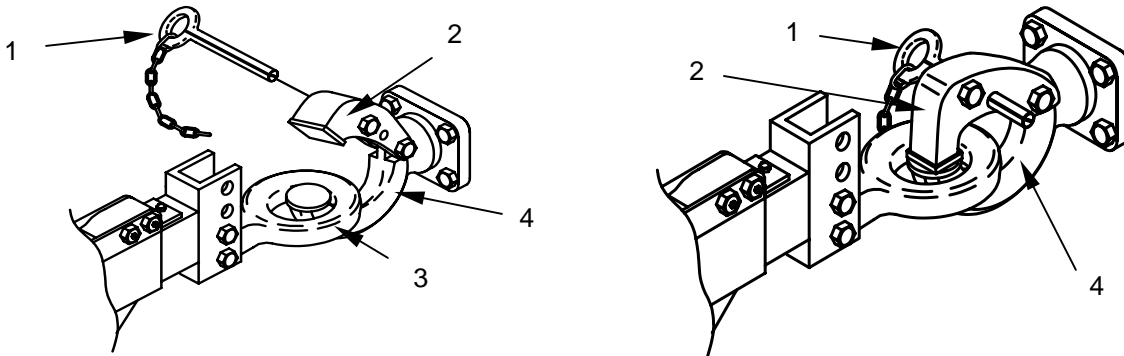


Figure 6. Connecting WWET/T to Prime Mover



WARNING

Ensure that two persons (not including the prime mover operator) are available for this operation to properly guide the prime mover into position and connect the trailer. Trailer parking brakes must be ON and chocks in place to avoid injuries from a moving trailer to avoid serious injury/death between the prime mover and the trailer when guiding the prime mover into position.

If lockout device isn't removed prior to forward motion, death, serious injury or property damage will result.

8. If trailer is to be backed up, remove brake lockout (**figure 7, item 1**) from its mounting bracket and install on the brake (**figure 7, item 2**). Remove lockout to resume forward motion.

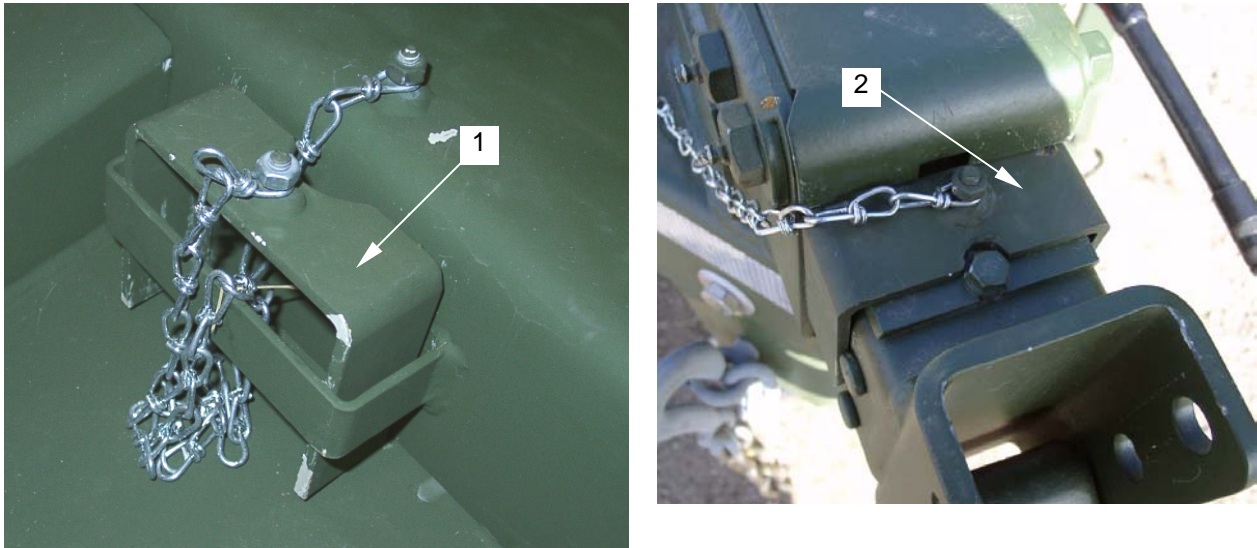


Figure 7. Brake Lockout

9. Connect trailer safety chains (**figure 8, item 1**) to prime mover connecting points (**figure 8, item 2**). Cross the chains under the trailer drawbar as shown in Figure 8.

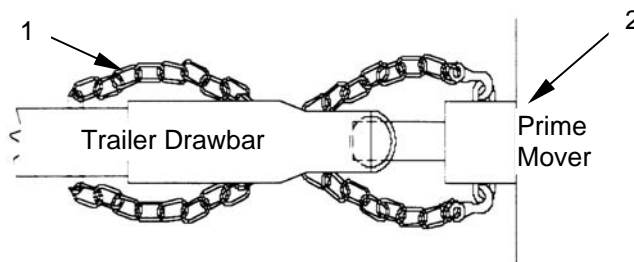


Figure 8. Connecting Safety Chains

NOTE

If the breakaway lever is not in the ready-position as shown in Figure 9, do not tow the trailer. The brakes must be reset before the trailer can be moved. Notify unit maintenance to re-set the brakes as described in WP 0045 00.

10. Connect the S-Hook at the end of the breakaway chain (**figure 9, item 1**) to one of the safety chain connecting points (**figure 9, item 2**) on the prime mover as shown in Figure 8.
11. Connect the inter-vehicular cable (**figure 9, item 3**) to the prime mover.

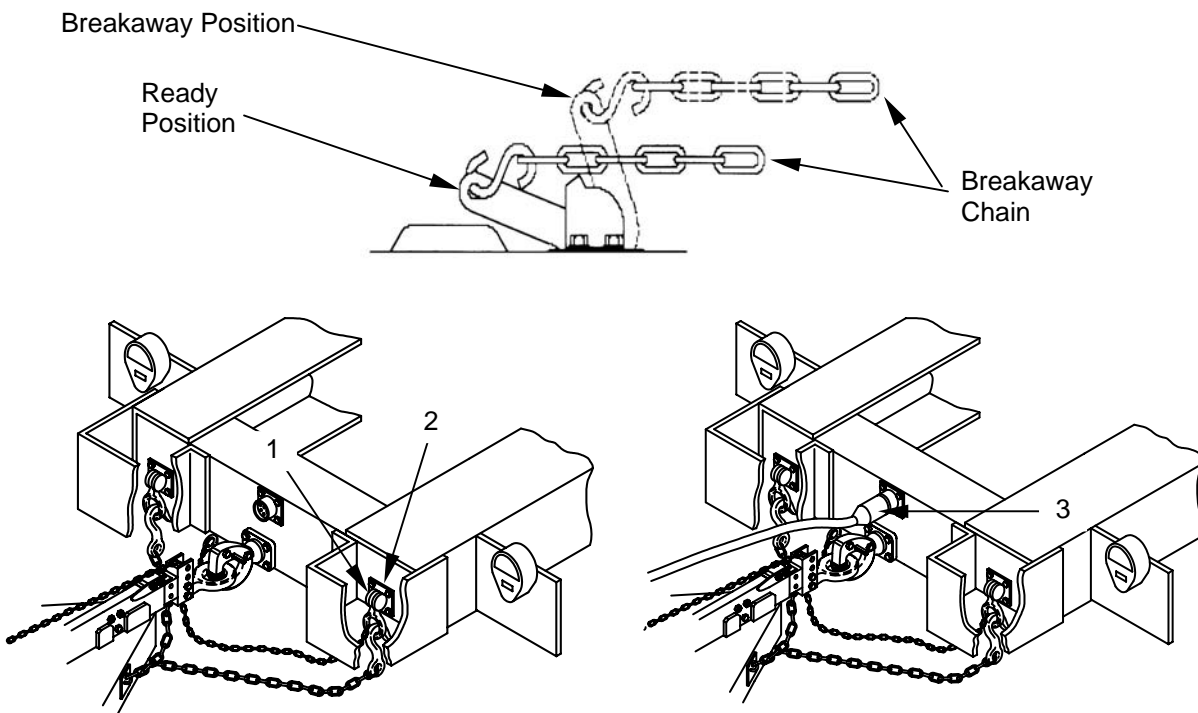


Figure 9. Connecting Breakaway Chain and Inter-vehicular Cable to Prime Mover

12. Check lights for proper operation as described in WP 0036 00.
13. Remove chocks (**figure 2, item 1**) from trailer wheels and release the parking brakes (**figure 10, item 1**) on the trailer (brake handles in vertical position).
14. Retract the trailer jack and rotate to traveling position (**figure 11, item 1**).

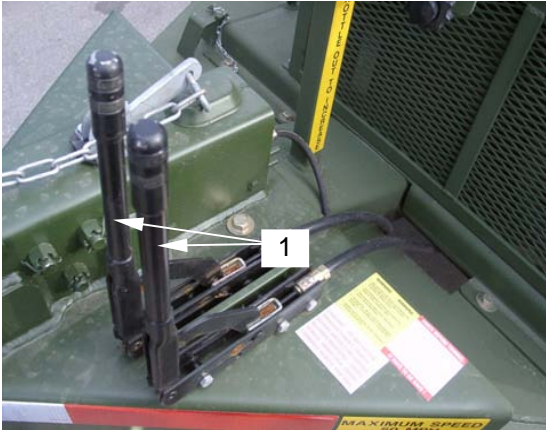


Figure 10. Releasing Parking Brakes



Figure 11. Trailer Jack in Traveling Position

The trailer is now ready to be moved to its intended point of use.

Tank Filling Operation

To fill the WWET/T tank, proceed as follows (2 person operation):

**WARNING**

When handling wastewater components, particularly hoses and the chopper tube/wand, wear gloves, apron, eye protection and respirator to prevent serious illness due to contamination. Prevent spills by draining hoses into the wastewater source before storing them on the trailer. Rinse the intake and drain valve as well as the rear platform and equipment trays on a daily basis with freshwater when the WWET/T is in use. Serious health problems may result from contaminated components.

**WARNING**

WWET/T operators must practice good personal hygiene techniques (frequent hand washing, showering, and eliminating the use of tobacco, food and drink) while operating the WWET/T. Wash exposed skin and change contaminated clothing promptly after any exposure. Serious health problems may result from contaminated components.

**WARNING**

All personnel within 19-feet of an operating WWET/T must wear Army approved hearing protective devices to protect against hearing loss.

CAUTION

The WWET/T must be positioned on level ground when loading the tank to ensure proper operation of the float level indicator.

1. Position the WWET/T not more than twenty to thirty-feet from the facility to be serviced.

NOTE

Use the work light located at the rear of the tank to illuminate the work area during periods of limited visibility. It can be turned on and off with a toggle switch located on the control panel.

2. Remove two 2½-inch x 20-foot intake hoses (**figure 12, item 1**) from hose hooks (**figure 12, item 2**) and equipment tray (**figure 13, item 3**). Retrieve 2½-inch chopper tube/wand (**figure 13, item 4**) from equipment tray.



Figure 12. Removing 2 ½-inch Hoses



Figure 13. Retrieving Chopper Tube/Wand

3. Remove dust cover (**figure 14, item 4**) from the 2 ½-inch intake valve (**figure 14, item 5**). Connect the female cam-lock (**figure 14, item 6**) of the other hose end to the 2 ½-inch intake valve.
4. Connect two 2½-inch x 20-foot intake hoses (**figure 14, item 1**) in series. Connect the 2½-inch chopper tube/wand (**figure 14, item 2**) to the end of the assembled intake hoses closest to the facility to be serviced. Place the end of the chopper tube/wand, with the ball valve (**figure 14, item 3**) closed (handle pointing away from wand), into the liquid to be pumped.

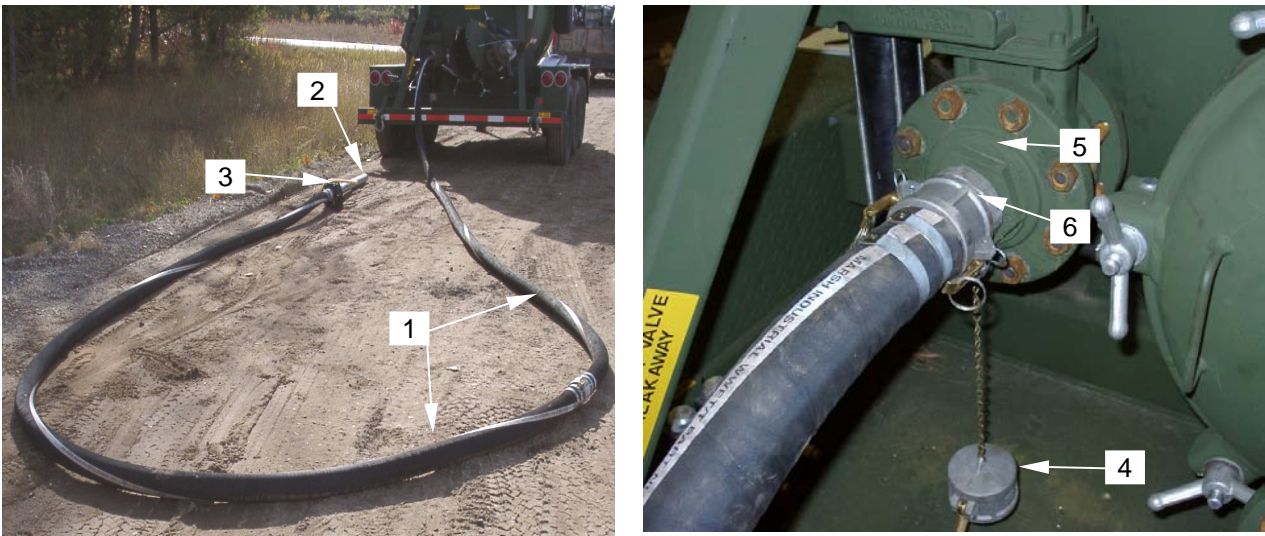


Figure 14. Assembling Intake Hoses

5. Place vacuum pump control handle (figure 15, item 1) in neutral position.
6. Remove pin (figure 16, item 1) and place isolation valve (handle) (figure 16, item 2) in the OPEN position (in line with hose).

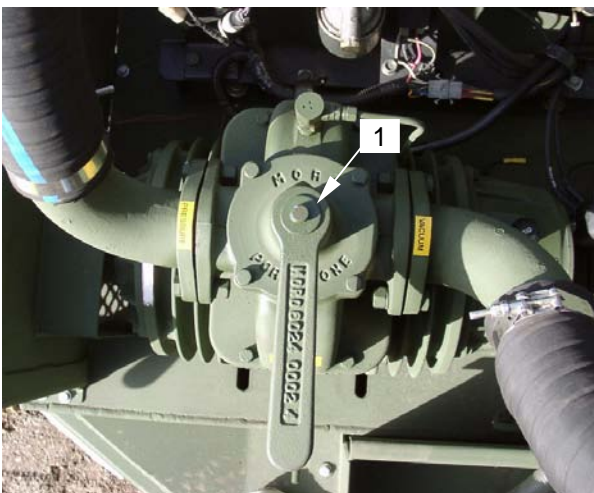


Figure 15. Vacuum Pump Control



Figure 16. Isolation Valve Control

7. Close drain valve on moisture trap (figure 17, item 1) and oil catch muffler (figure 18, item 1).



Figure 17. Moisture Trap Drain

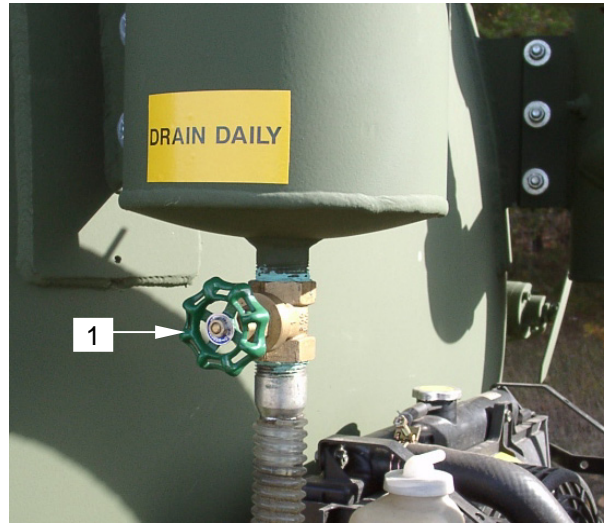


Figure 18. Oil Catch Muffler Drain

8. Ensure red emergency shutoff button (figure 19, item 1) on the control panel is pulled out.
9. Turn engine ignition key (figure 19, item 2) to the first position (between RUN and START) to preheat engine.
10. When preheat light (figure 19, item 3) goes out, start engine by placing key (figure 19, item 2) momentarily on START position (figure 19, item 4) until engine starts (key will automatically return to RUN position (figure 19, item 5)).
11. Regulate engine speed with throttle (figure 19, item 6). Set not to exceed 2800 RPM. (Operating RPM range between 2200 and 2800 on the tachometer (figure 19, item 7)).

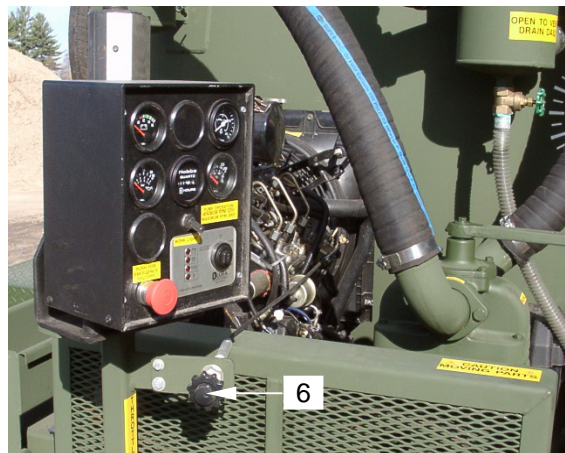
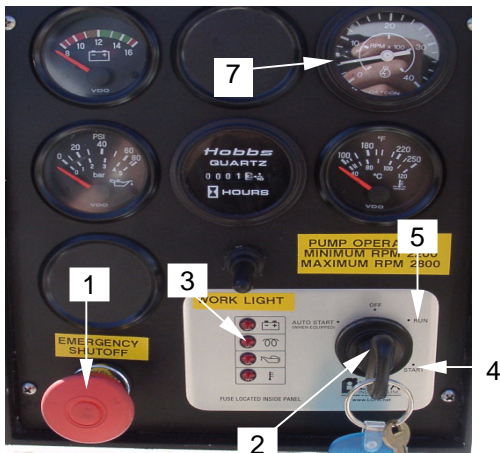


Figure 19. Control Panel and Throttle

12. Place vacuum pump control handle (figure 20, item 1) in vacuum position.

13. Let vacuum build up to 15-inch/vac as indicated on the pressure/vacuum gage (**figure 20, item 2**).

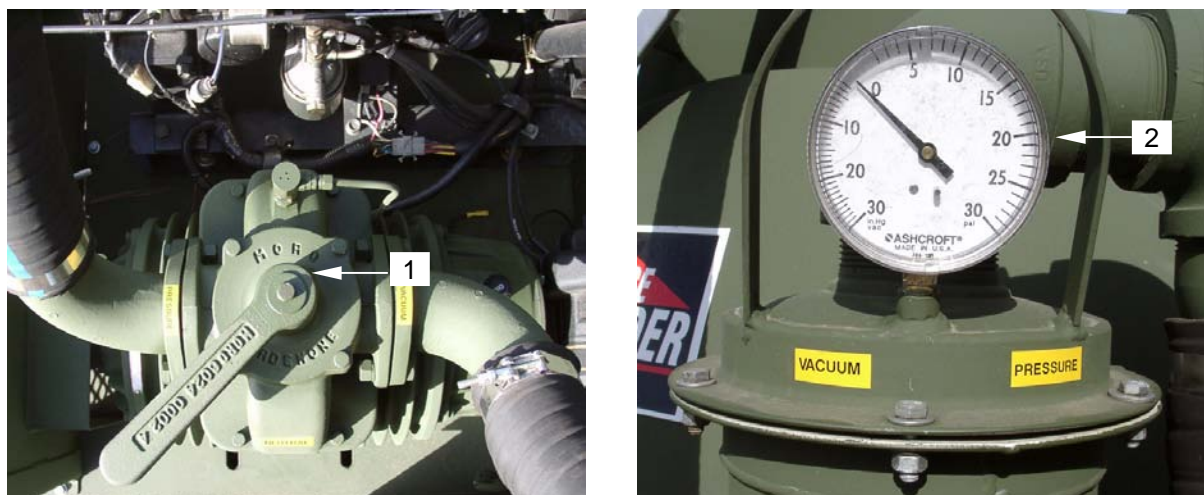


Figure 20. Vacuum Pump Control and Pressure Gage

14. Open intake valve (SUCTION) hydraulic control knob (**figure 21, item 1**).
15. Place hydraulic pump selector lever (**figure 21, item 2**) so it is pointing away from pump handle.

NOTE

Intake valve must be opened completely to prevent clogging of the valve.

16. Operate hydraulic pump handle (**figure 21, item 3**) to open intake valve fully.



WARNING

Maintain a firm grip on the chopper tube/wand while opening the intake valve. Failure to do so may result in losing control of the hose. Serious injury may result.

17. Open ball valve (**figure 22, item 1**) on chopper tube/wand (**figure 22, item 2**) (handle aligned with wand).

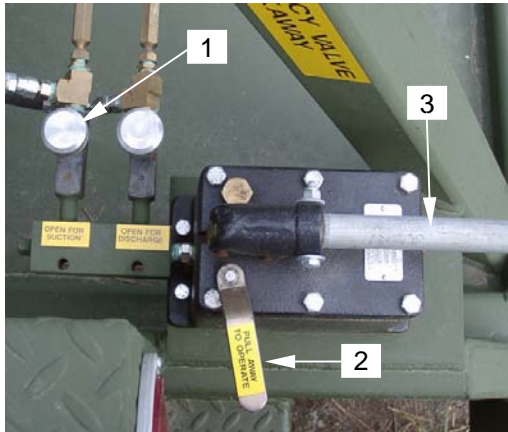


Figure 21. Hydraulic Valve Controls

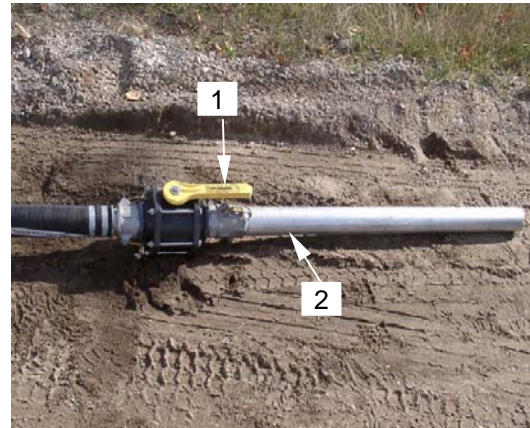


Figure 22. PVC Valve on Chopper Tube/Wand

18. Adjust engine speed, if necessary, to maintain vacuum during loading.

NOTE

Ensure that chopper tube/wand remains submerged during loading process to maintain vacuum. If vacuum drops below a level necessary to evacuate the waste liquid, close the ball valve on the chopper tube/wand briefly to let the vacuum build up before re-opening the valve.

NOTE

By observing the float level indicator you can determine approximately when the tank is full. When the tank is full, the primary shutoff valve will close and stop the loading action. This will be noticeable by a drop in engine speed and a decrease of vacuum indicated on the pressure/vacuum gage. The float level indicator will point to F.

19. When the tank is full as shown on the float level indicator (**figure 23, item 1**), the primary shutoff (**figure 23, item 2**) will stop the filling operation.



Figure 23. Float Level Indicator and Primary Shutoff

20. Close intake valve by placing hydraulic pump selector lever (**figure 24, item 1**) parallel with pump handle (**figure 24, item 2**). This procedure is also applicable if the filling operation is to be terminated before the tank is full.
21. Close intake valve (SUCTION) hydraulic control knob (**figure 24, item 3**).
22. Place vacuum pump control handle (**figure 24, item 4**) in neutral position.
23. Regulate engine speed down to 850 rpm with throttle.

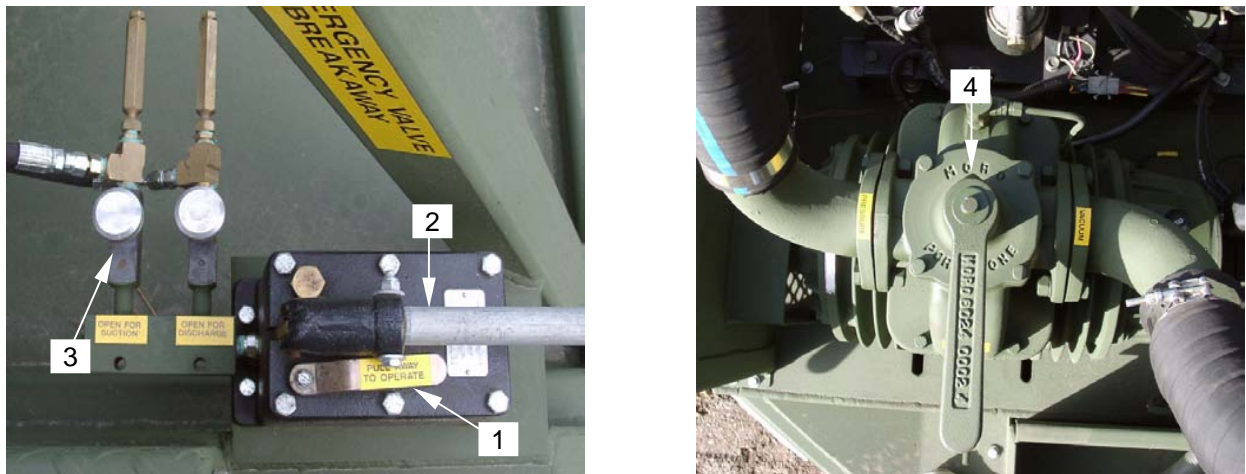


Figure 24. Hydraulic Valve Controls and Vacuum Pump Control

24. Shut down diesel engine by turning ignition key (**figure 25, item 1**) to the OFF position (**figure 25, item 2**). Remove key and push in emergency shutoff button (**figure 25, item 3**).
25. Close the isolation valve (**figure 26, item 1**).

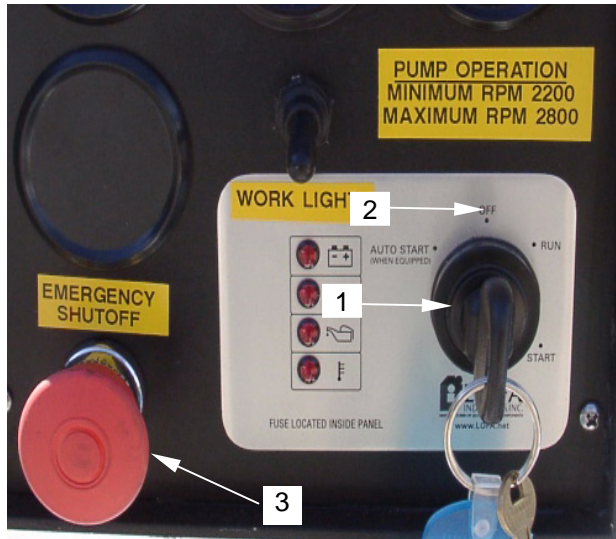


Figure 25. Control Panel



Figure 26. Isolation Valve

26. Disconnect 2½-inch intake hose (**figure 27, item 1**) from intake valve (**figure 27, item 2**) and drain into source.
27. Disconnect 2½-inch intake hoses from each other and the chopper tube/wand. Flush hoses with freshwater. Place hoses onto hose hooks (**figure 28, item 2**) and ends into the equipment trays.
28. Place chopper tube/wand with the PVC ball valve (**figure 22, item 1**) open, into one of the equipment trays. Install dust cover (**figure 29, item 2**) on intake valve (**figure 29, item 1**).

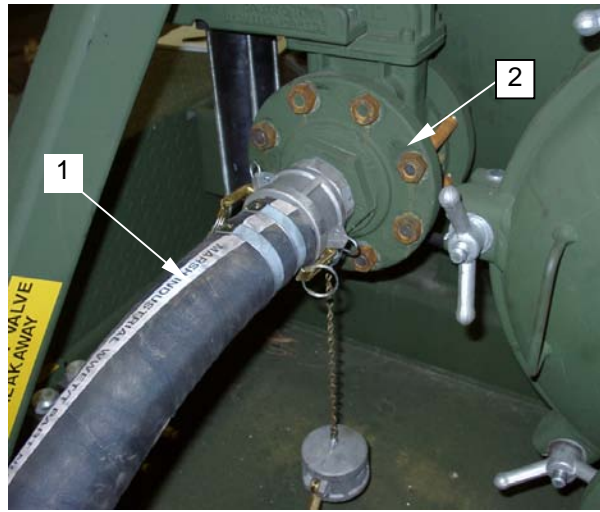


Figure 27. Intake hose connected

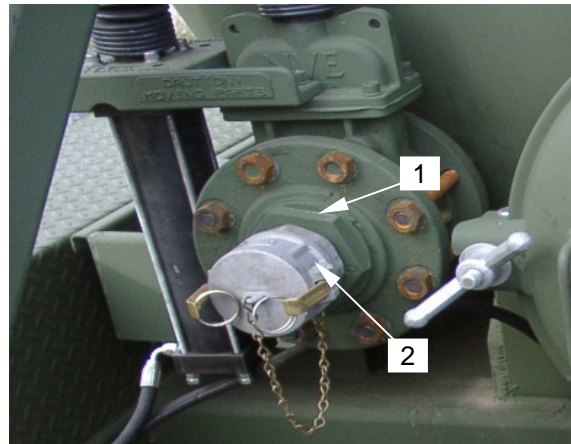


Figure 28. Intake Hoses in Storage Position Figure 29. Intake Valve with Dust Cover

**WARNING**

When handling wastewater components, particularly hoses and the chopper tube/wand, wear gloves, apron, eye protection and respirator to prevent serious illness due to contamination. Prevent spills by draining hoses into the wastewater source before storing them on the trailer. Rinse the intake and drain valve as well as the rear platform and equipment trays on a daily basis with freshwater when the WWET/T is in use. Serious health problems may result from contaminated components.

29. Open drain on moisture trap (**figure 31, item 1**) and oil catch muffler (**figure 31, item 2**). Observe discharge. An excessive amount of moisture draining from the trap or oil catch muffler indicate problems with the primary shutoff, requiring service. (Refer to WP 0019 00).
30. Clean equipment tray using sludge rake (**figure 30, item 1**) and freshwater. Dispose of waste in an approved treatment system or waste disposal site in accordance with host nation, local, or unit procedures designed to protect human health and the environment.

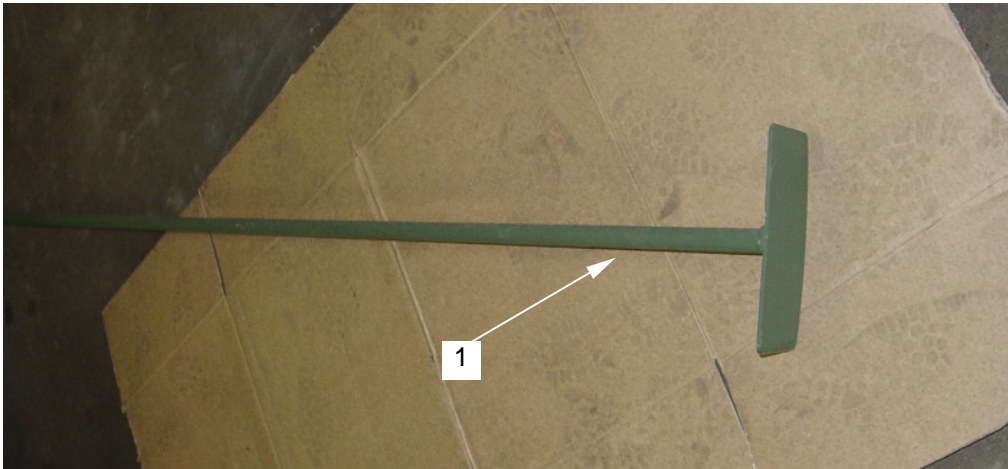


Figure 30. Sludge Rake

31. Close drain on moisture trap (**figure 31, item 1**) and oil catch muffler (**figure 31, item 2**) after accumulated moisture has drained.

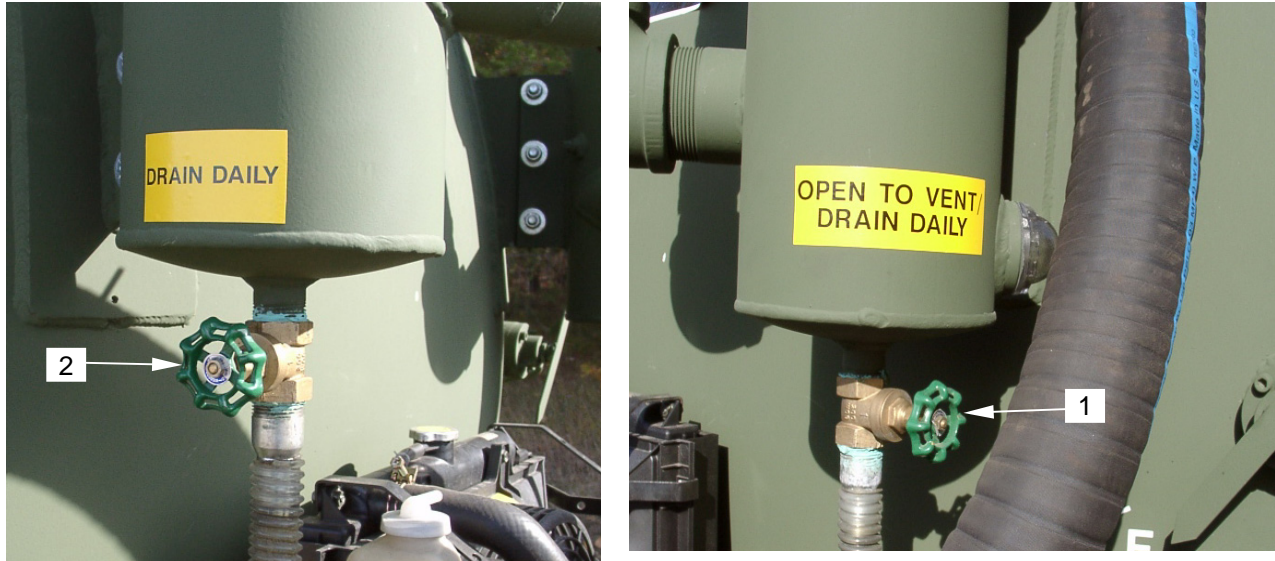


Figure 31. Moisture Trap and Oil Catch Muffler Drains

Tank Draining Operation

To drain the WWET/T tank, proceed as follows: Dispose of waste in an approved treatment system or waste disposal site in accordance with host nation, local, or unit procedures designed to protect human health and the environment.



WARNING

When handling wastewater components, particularly hoses and the chopper tube/wand, wear gloves, apron, eye protection and respiratory protection to prevent serious illness due to contamination. Prevent spills by draining hoses into the wastewater source before storing them on the trailer. Rinse the intake and drain valve as well as the rear platform and equipment trays on a daily basis with freshwater when the WWET/T is in use. Serious health problems may result from contaminated components.

1. Position the WWET/T not more than fifteen feet from the designated disposal point.
2. Remove 4-inch x 10-foot drain hoses (**figure 32, item 1**) from hose hooks and equipment trays.
3. Connect two 4-inch x 10-foot drain hoses in series (**figure 32, item 2**) as shown.



Figure 32. Drain Hose Removal and Assembly

4. Remove dust cover (**figure 33, item 1**) from drain valve (**figure 33, item 2**). Connect the female cam-lock of one 4-inch drain hose (**figure 33, item 3**) to the drain valve.



Figure 33. Drain Hose Connection

5. Connect or place the other end of the assembled drain hoses to/into the designated disposal point.
6. If tank is to be drained by gravity, proceed to step 7. If tank is to be drained under pressure, proceed to step 8.
7. To drain tank by gravity, proceed as follows:
 - a. Open the drain valve (DISCHARGE) hydraulic control knob (**figure 34, item 1**).
 - b. Place hydraulic pump selector lever (**figure 34, item 2**) so it is pointing away from the pump handle (**figure 34, item 3**).
 - c. Operate hydraulic hand pump (**figure 34, item 3**) until drain valve fully opens.
 - d. Open the isolation valve (**figure 34, item 4**).

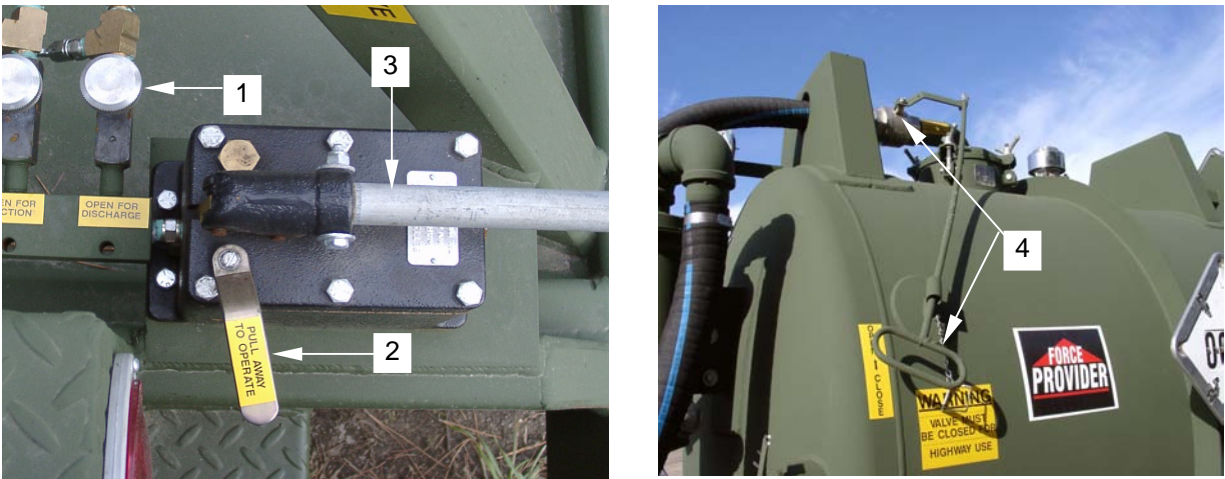


Figure 34. Hydraulic Valve Controls and Isolation Valve

- e. Observe tank draining as shown on float level indicator (**figure 35, item 1**).
- f. When tank is empty, close drain valve (DISCHARGE) hydraulic control knob (**figure 35, item 2**).
- g. Place hydraulic pump selector lever (**figure 35, item 3**) so it is aligned with the pump handle (**figure 35, item 4**).

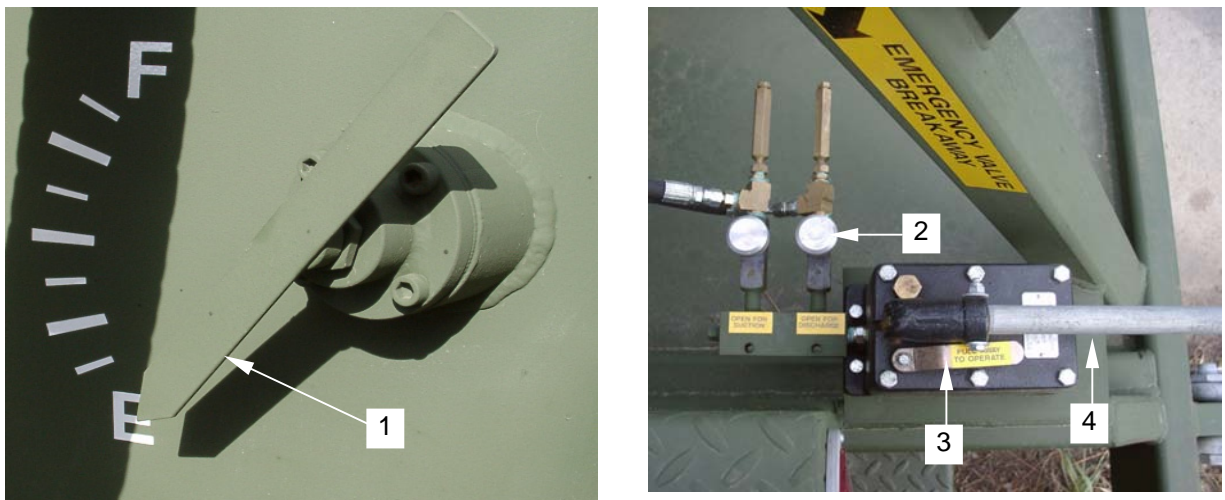


Figure 35. Float Level Indicator and Hydraulic Valve Controls

- h. Proceed to step 9.

8. To drain tank under pressure, proceed as follows:
 - a. Open the drain valve (DISCHARGE) hydraulic control knob (**figure 36, item 1**).
 - b. Place hydraulic pump selector lever (**figure 36, item 2**) so it is pointing away from the pump handle (**figure 36, item 3**).
 - c. Operate hydraulic hand pump (**figure 36, item 3**) until drain valve fully opens.
 - d. Place vacuum pump control handle (**figure 36, item 4**) in neutral position.

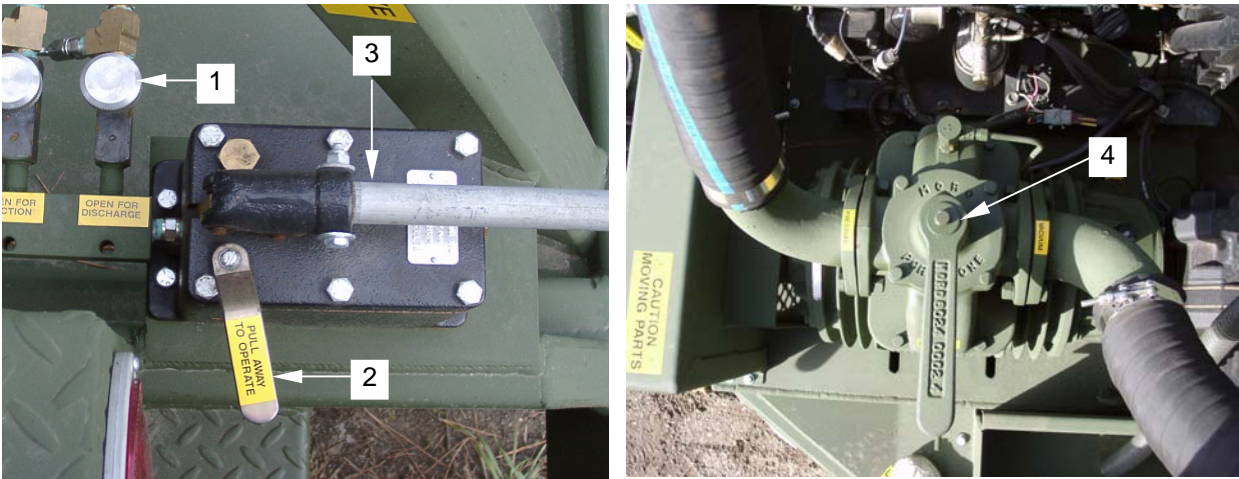


Figure 36. Hydraulic Valve Controls and Vacuum Pump Control

- e. Ensure red emergency shutoff button (**figure 37, item 1**) on the control panel is pulled out.
- f. Turn engine ignition key (**figure 37, item 2**) to the first position (between RUN and START) to preheat engine.
- g. When preheat light (**figure 37, item 3**) goes out, start engine by placing key (**figure 37, item 2**) momentarily on START position (**figure 37, item 4**) until engine starts (key will automatically return to RUN (**figure 37, item 5**) position). Regulate engine idle speed to 850 RPM with throttle.
- h. Regulate engine speed with throttle (**figure 37, item 6**). Set not to exceed 2200 RPM. (Operating RPM range between 2200 to 2800).

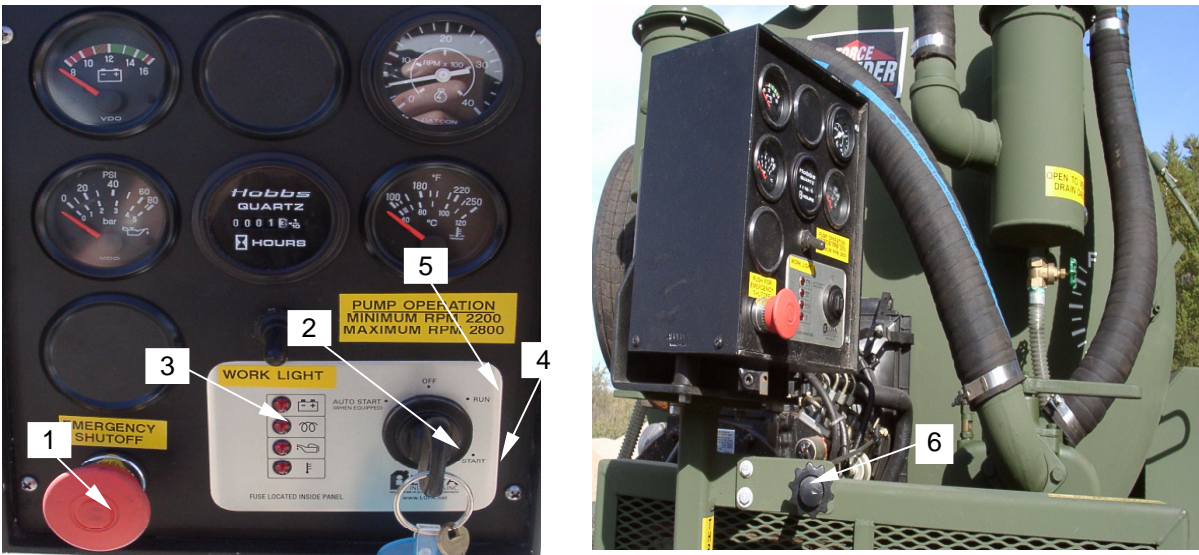


Figure 37. Control Panel and Throttle

- i. Place vacuum pump control handle (**figure 38, item 1**) in PRESSURE position.
- j. Open the isolation valve (**figure 38, item 2**).



Figure 38. Pump Controls and Isolation Valve

- k. Observe tank draining as shown on float level indicator (**figure 39, item 1**).
- l. When tank is empty, Place vacuum pump control handle (**figure 39, item 2**) in neutral position.
- m. Regulate engine idle speed down to 850 RPM with throttle (**figure 37, item 6**).

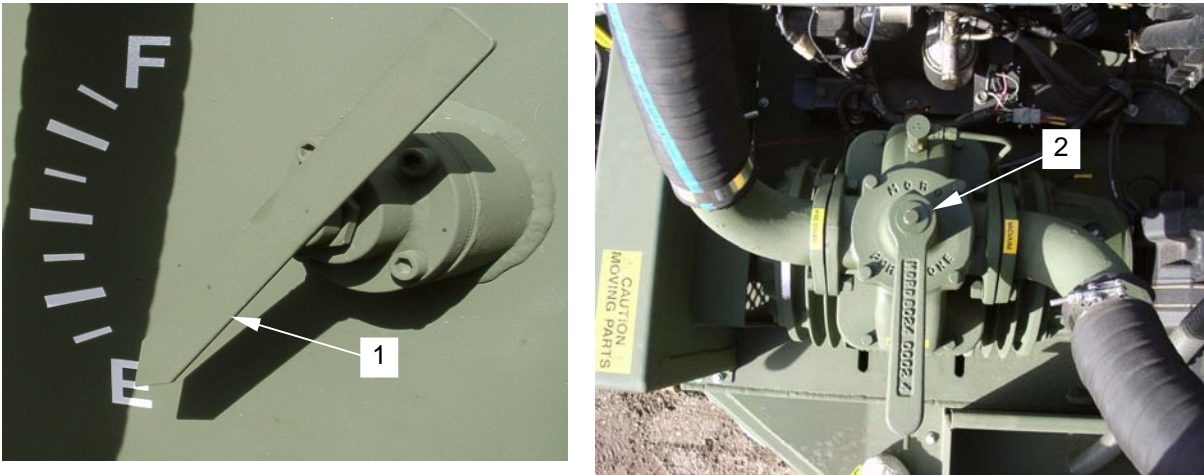


Figure 39. Float Level Indicator and Vacuum Pump Control

- n. Close drain valve by placing hydraulic pump selector lever (figure 40, item 3) parallel with pump handle (figure 40, item 4).
- o. Shut down diesel engine by turning ignition key (figure 40, item 1) to the OFF position (figure 40, item 2). Remove key and push in emergency shutoff button (figure 40, item 6).
- p. Close drain valve (DISCHARGE) hydraulic control knob (figure 40, item 5).

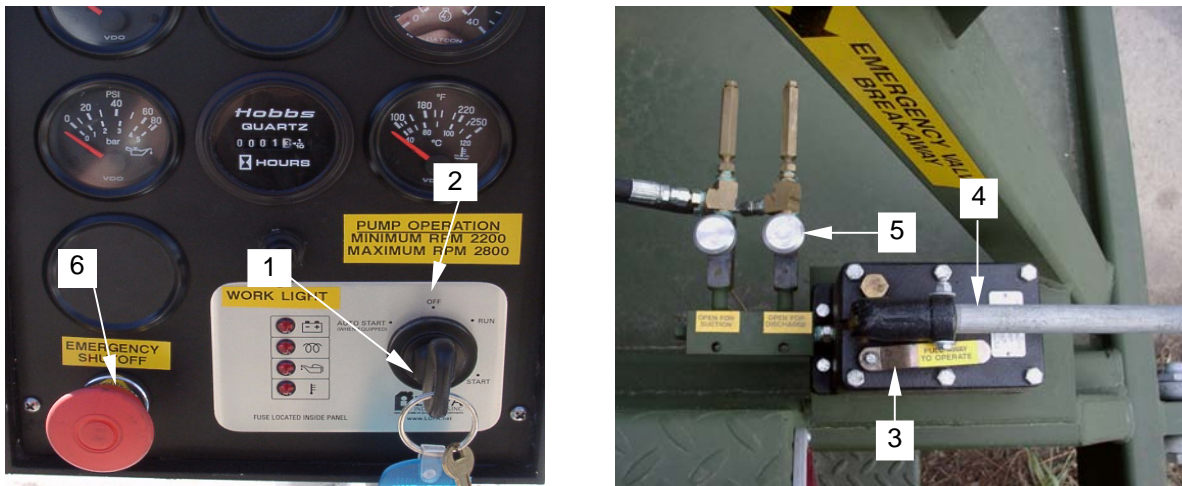


Figure 40. Control Panel and Hydraulic Valve Controls

- 9. Disconnect assembled 4-inch drain hose (figure 41, item 1) from drain valve (figure 41, item 2). Install dust cover (figure 41, item 3) on valve. Drain assembled 4-inch x 10-foot hoses into the designated disposal point.
- 10. Clean and sanitize hoses by flushing with fresh water and draining in accordance with local regulations and Unit SOP. Dispose of waste in an approved treatment system or waste disposal site in accordance with host nation, local, or unit procedures designed to protect human health and the environment.

11. Separate assembled 4-inch x 10-foot drain hoses (**figure 41, item 1**). Place hoses onto hose hooks (**figure 41, item 4**) and ends into the equipment trays (**figure 41, item 5**).



Figure 41. Drain Hose Disassembly and Storage

12. After final daily operational cycle, perform after-operation PMCS as described in WP 0011 00.
13. Return WWET/T to its designated location.

DECALS AND INSTRUCTION PLATES

The following decals and instruction plates are located on the WWET/T:

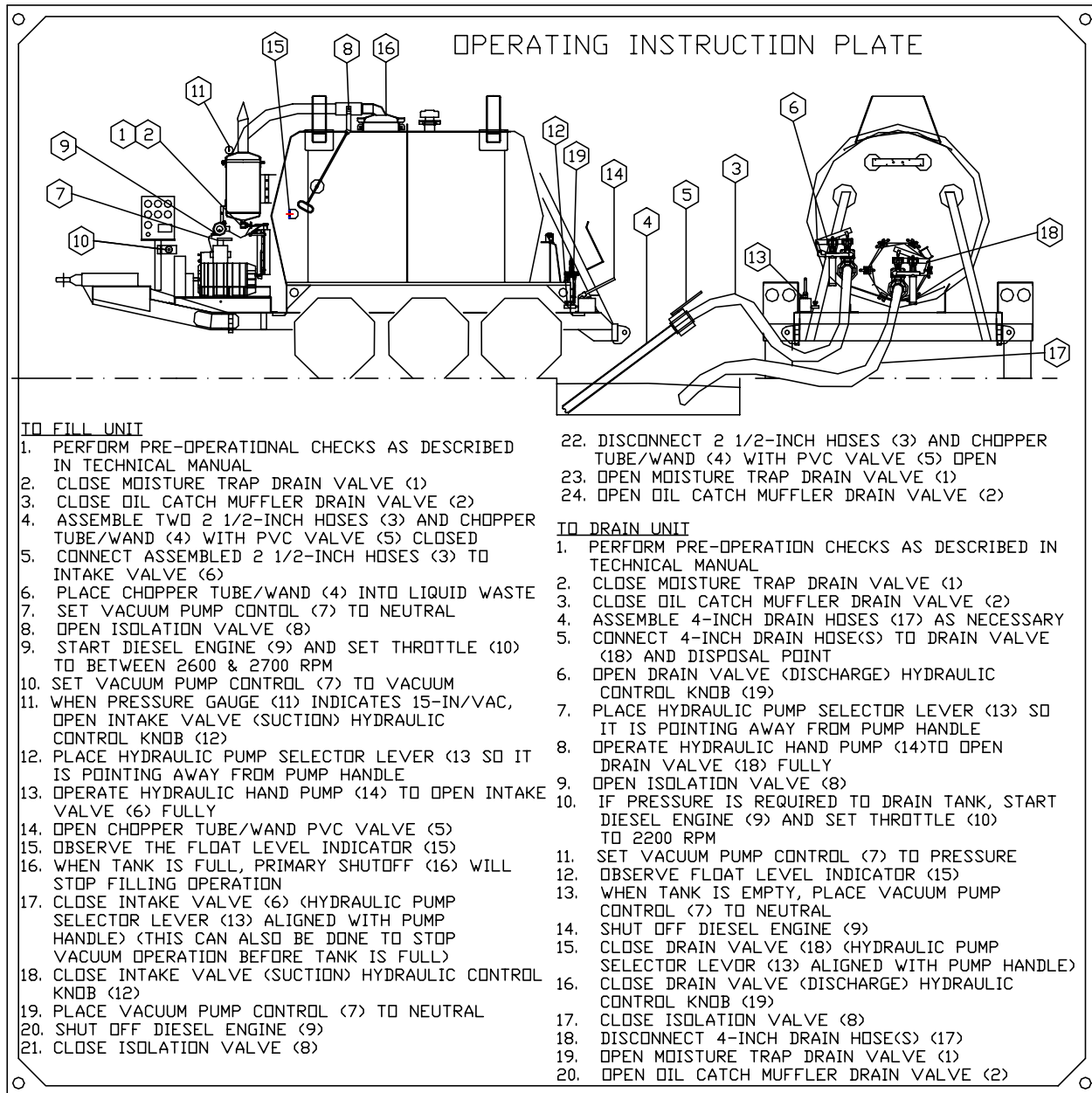


Figure 42. Operating Instruction Plate

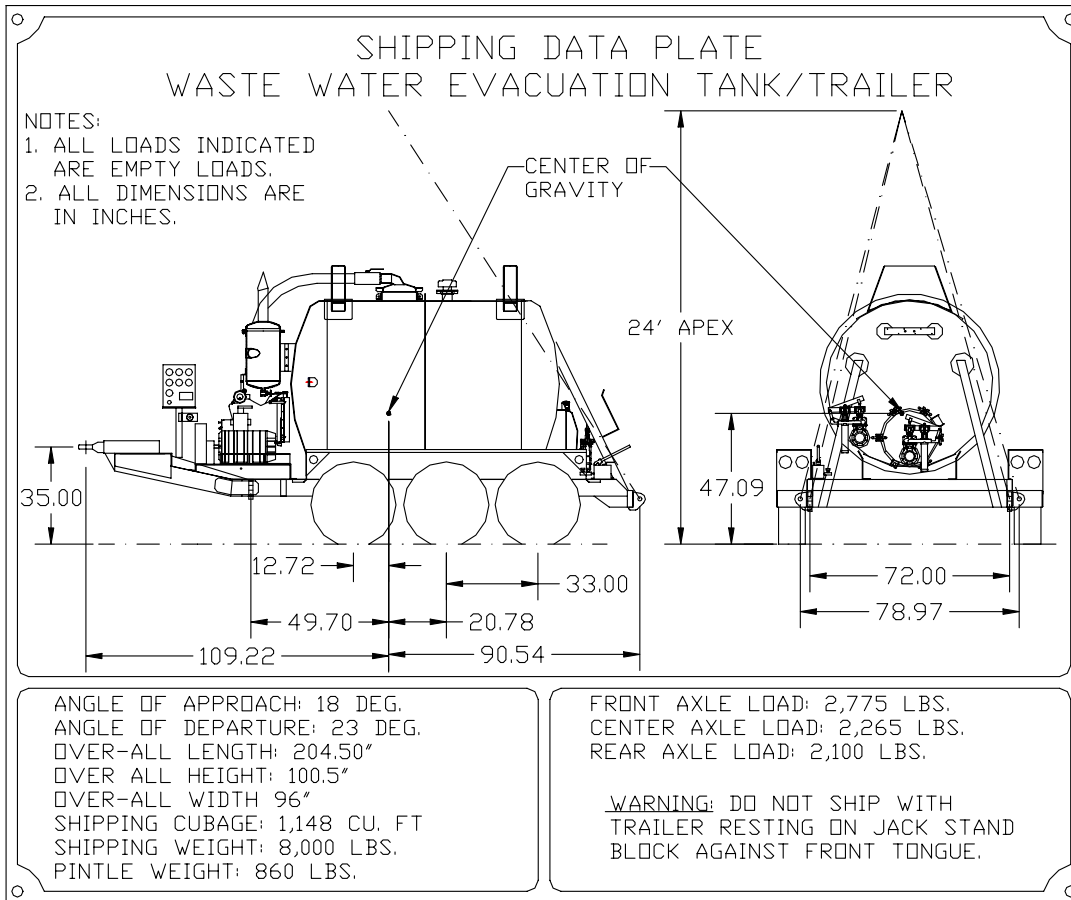


Figure 43. Shipping Data Plate

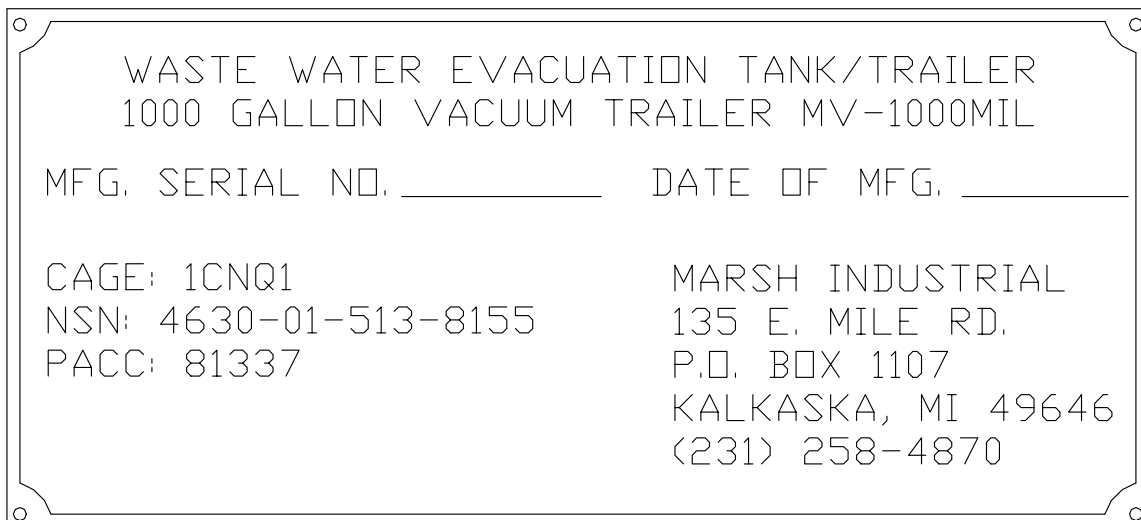


Figure 44. Manufacturer's Data Plate

<p>WARNING WARNING</p> <ol style="list-style-type: none"> 1. TRAILER IS NOT TO BE TOWED UNLESS BRAKES ARE WORKING AND SAFETY CHAINS ARE SECURELY ATTACHED TO TOWING VEHICLE. 2. SAFETY BREAKAWAY SYSTEM SHOULD BE KEPT IN WORKING CONDITION AT ALL TIMES. 3. TRAILER MUST BE CONNECTED TO TOW VEHICLE WHEN LOADING MACHINERY. 4. TIRE INFLATION. INFLATE TIRES TO RECOMMENDED INFLATION. THIS INFORMATION IS FOUND ON TIRE SIDE WALL. 5. ALWAYS CLOSE HITCH BEFORE TOWING. CHECK DAILY FOR WEAR OR DISTORTION. 	<p>CHECK BEFORE TOWING:</p> <ul style="list-style-type: none"> <input type="checkbox"/> ALL PARTS, BOLTS AND NUTS ARE TIGHT <input type="checkbox"/> LOAD IS PROPERLY SECURED ON TRAILER <input type="checkbox"/> TIRES PROPERLY INFLATED <input type="checkbox"/> TRAILER IS NOT OVERLOADED <input type="checkbox"/> ELECTRICAL CONNECTIONS ARE WORKING <input type="checkbox"/> BRAKES ARE WORKING PROPERLY <input type="checkbox"/> THE SAFETY CHAIN IS SECURED <input type="checkbox"/> THE HITCHING MECHANISMS ARE SECURED <input type="checkbox"/> ALL VALVES ARE SECURED <input type="checkbox"/> THE JACK IS RAISED TO ITS TRAVELING POSITION <input type="checkbox"/> THE CRANK HANDLE IS SECURED <p>IT PAYS TO BE SAFE !</p>
<p>CAUTION!! DO NOT EXCEED MANUFACTURER'S VEHICLE WEIGHT RATINGS OR LOADING RECOMMENDATIONS – GROSS VEHICLE, GROSS AXLE, GROSS COMBINED VEHICLE AND AXLE.</p>	

Figure 45. Towing Warning Labels

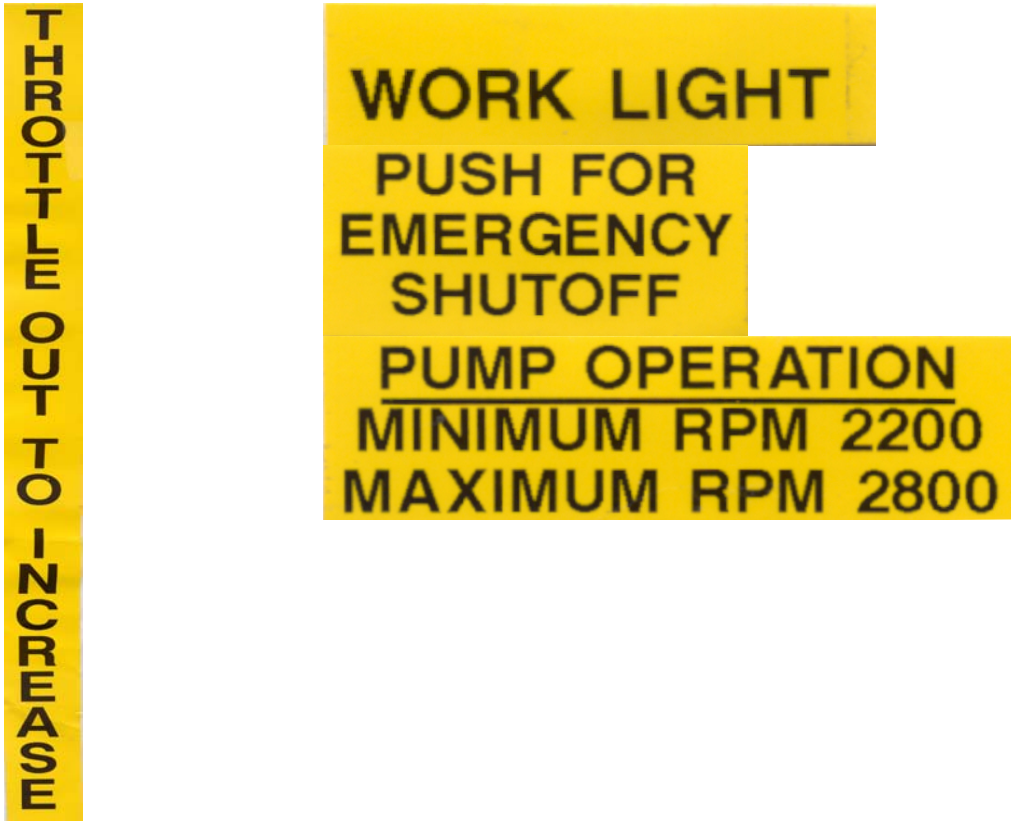


Figure 46. Control Panel Labels



Figure 47. Fuel Tank/Engine Skid Labels



Figure 48. Hydraulic Control Labels



Figure 49. Moisture Trap Labels

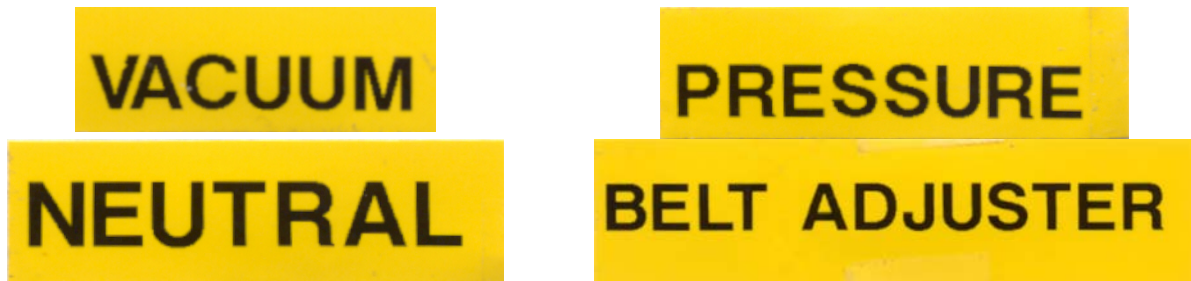


Figure 50. Vacuum Pump Labels



Figure 51. Oil Catch Muffler Label



Figure 52. Primary Shutoff

⚠ DANGER CONFINED SPACE
ENTER BY PERMIT ONLY

WARNING
RELIEVE ALL PRESSURE BEFORE OPENING COVER
COVER MAY FREEZE OR STICK TO NECK
DO NOT REMOVE SWING BOLTS UNTIL COVER IS FREE

Figure 53. Manway Assembly

OPTIMAL TIRE
PRESSURE
110 PSI

MAXIMUM SPEED
50 MPH.

**LIFT HERE/
TIE DOWN**

Figure 54. Trailer Labels

PREPARATION FOR MOVEMENT

To prepare the WWET/T for re-location or return shipment to CONUS the wastewater tank must be cleaned and sanitized as described in WP 0018 00.

Perform Before and After Operation PMCS as described in WP 0011 00.

Disconnect battery cables.

Wrap controls and pressure gage with barrier paper and secure with tape

**WARNING**

Do not use the tiedown rings located on the engine/vacuum pump skid to lift the WWET/T. Serious injuries to personnel and damage to equipment may result.

Use the tiedowns on the WWET/T frame to lift the WWET/T, or to secure it to a flatbed truck or rail car. These tiedowns are located at the front (**figure 55, item 1**) and rear (**figure 55, item 2**) of the trailer frame.

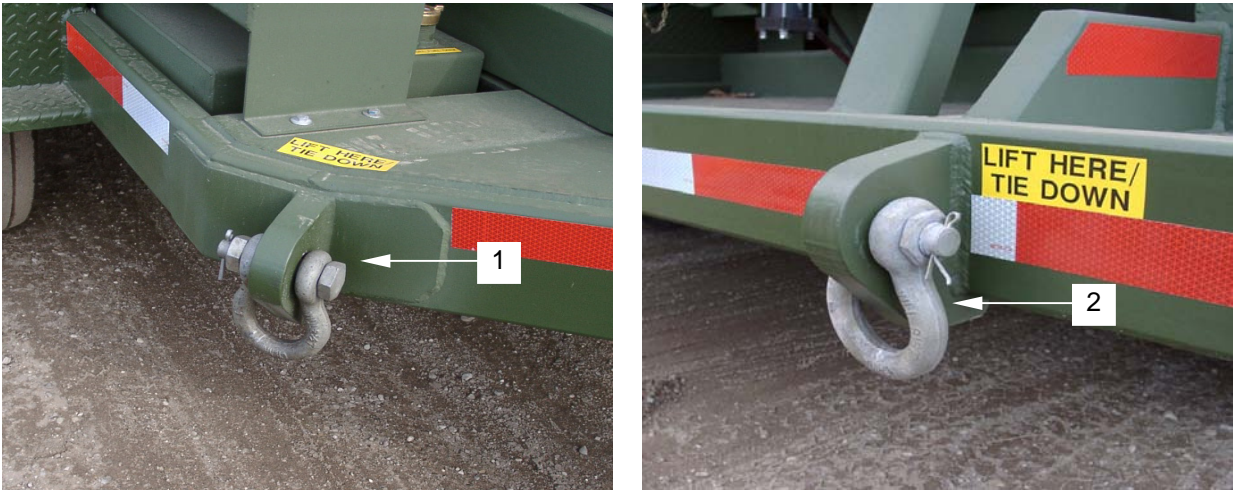


Figure 55. Lifting and Tiedown Points

END OF WORK PACKAGE

**OPERATOR, UNIT AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
OPERATION UNDER UNUSUAL CONDITIONS**

SECURITY MEASURES FOR ELECTRONIC DATA

Not applicable

UNUSUAL ENVIRONMENT / WEATHER

The following precautions are necessary under the conditions indicated to maintain the WWET/T in good working order.

Operation in conditions below 32 °F

Do not keep wastewater stored in the WWET/T. Dispose of any wastewater collected. In conditions below 32 °F the WWET/T must be kept inside an enclosure where temperature above 32 °F can be maintained, when not in use.

When used with the Force Provider base camp this is accomplished by storing the WWET/T in separate or complexed 20-foot x 32-foot TYPE IV TEMPER, each heated by an ASH. The TEMPER are erected over a gravel bed, and incorporate modified entry walls to provide increased clearance required by the trailers. Refer to TM 10-5419-206-13 for specific set-up procedures.

Operation in extreme heat (moist and dry) conditions

Do not keep wastewater stored in the WWET/T. Dispose of any wastewater collected. Keep exterior of WWET/T, particularly the intake and discharge valves, as well as the rear platform, hoses and chopper tube/wand as clean as possible by frequent rinsing with fresh water.

Operation in rainy and/or humid conditions

Do not keep wastewater stored in the WWET/T. Dispose of any wastewater collected. Keep exterior of WWET/T, particularly the intake and discharge valves, as well as the rear platform, hoses and chopper tube/wand as clean as possible by frequent rinsing with fresh water.

Operation in extreme dry and dusty conditions

Check the diesel engine air filters and the breather filter frequently and change as necessary. Keep exterior of WWET/T, particularly the diesel engine, intake and discharge valves, and the hose QD fittings as clean as possible.

Operation in salt air or sea spray

Frequent rinsing with fresh water will lessen the corrosive effect of salt air or sea spray.

Operation at high altitude

Vacuum levels will be diminished.

FORDING AND SWIMMING

The WWET/T can be used when fording requirements do not exceed 18-inches. The WWET/T does not have a swimming capability.

INTERIM NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) DECONTAMINATION PROCEDURES

Not applicable

JAMMING AND ELECTRONIC COUNTERMEASURES (ECM) PROCEDURES

Not applicable

EMERGENCY PROCEDURES

To stop the diesel engine in an emergency situation, push in the red emergency shutoff button (**figure 1, item 1**) located on the control box.



Figure 1. Emergency Shutoff Button

To shut off (close) the hydraulically operated intake and drain valves, activate the fusible frangible links (**figure 2, item 1**) located on the rear platform by grasping the frangible link with the hand and apply downward pressure until it breaks.

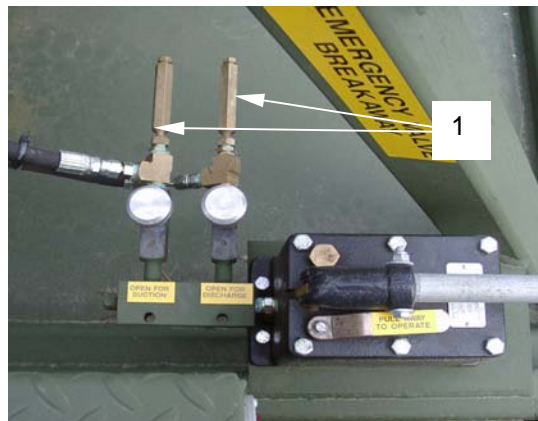


Figure 2. Fusible Frangible Links

TM 10-4630-207-13&P

CHAPTER 3
TROUBLESHOOTING PROCEDURES
WASTE WATER EVACUATION TANK TRAILER

**OPERATOR MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
TROUBLESHOOTING INDEX**

GENERAL

This chapter provides operator maintenance information and includes troubleshooting and general maintenance procedures. Troubleshooting instructions covered in this section are unique to the WWET/T.

MALFUNCTION SYMPTOM INDEX

The malfunction symptom index lists common malfunctions that may occur during WWET/T inspection and operation. Find the malfunction to be eliminated and go to the indicated troubleshooting paragraph that follows. The index cannot list all malfunctions that may occur, all tests or inspections needed to find the fault, nor all actions required to correct the fault. If the existing malfunction is not listed, or cannot be corrected through this troubleshooting index, notify unit maintenance.

Malfunction	Troubleshooting Procedure
Diesel engine won't start.....	1
No vacuum/pressure building in tank.....	2
Tank not loading.....	3
Tank not draining	4
Float level indicator not functioning.....	5
Hydraulic valve(s) won't open/close.....	6

**OPERATOR MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
OPERATOR TROUBLESHOOTING PROCEDURES**

INITIAL SETUP:**Tools****Personnel Required**

77W Water Treatment Specialist

Materials/Parts

Rags, Wiping (WP 0091 00, Item 28)

Gloves, Rubber (WP 0089 00, Table 2, Item 4)

Equipment Condition

TROUBLESHOOTING PROCEDURE 1**DIESEL ENGINE WON'T START****SYMPTOM**

Engine won't crank over.

MALFUNCTION

Emergency shutoff button not pulled out.

CORRECTIVE ACTION

Pull red emergency shutoff button on the control panel out before attempting to start the engine. Refer to WP 0005 00.

Engine cranks but won't start.

MALFUNCTION

Insufficient preheating.

CORRECTIVE ACTION

Preheat engine before starting as described in WP 0005 00.

MALFUNCTION

Insufficient fuel in tank.

CORRECTIVE ACTION

Open fuel tank and add diesel fuel (JP8) as required. Tank capacity is 13 Gallons.

TROUBLESHOOTING PROCEDURE 2

NO VACUUM/PRESSURE BUILDING IN TANK

SYMPTOM

Erratic pressure gage reading.

MALFUNCTION

Vacuum pump control in improper position.

CORRECTIVE ACTION

Place pump control in the VACUUM position when filling the tank, and in PRESSURE position when draining the tank. Refer to WP 0005 00.

MALFUNCTION

Isolation valve closed.

CORRECTIVE ACTION

Open isolation valve during both, filling, and draining operation. Refer to WP 0005 00.

MALFUNCTION

Engine not operating at proper speed.

CORRECTIVE ACTION

Set engine throttle at 2800 RPM during tank filling VACUUM operation.
Set engine throttle at 2200 RPM during tank draining PRESSURE operation. Refer to WP 0005 00.

MALFUNCTION

No airflow through oil catch muffler.

CORRECTIVE ACTION

Check airflow at oil catch muffler. If no airflow is noted during vacuum or pressure cycles, the breather, or vacuum hoses may be blocked. Clean and service the oil catch muffler as described in WP 0013 00.

MALFUNCTION

Intake or drain valve open.

CORRECTIVE ACTION

Close both intake and drain valves when attempting to built up pressure or vacuum inside the tank. Refer to WP 0005 00.

TROUBLESHOOTING PROCEDURE 3

TANK NOT LOADING

SYMPTOM

Float level indicator at F.

MALFUNCTION

Tank is full.

CORRECTIVE ACTION

Drain tank as described in WP 0005 00.

MALFUNCTION

Chopper tube/wand not immersed in liquid, or ball valve closed.

CORRECTIVE ACTION

Place chopper tube/wand into liquid and open ball valve at wand. Refer to WP 0005 00.

MALFUNCTION

Intake valve closed.

CORRECTIVE ACTION

Open intake valve FULLY as described in WP 0005 00.

MALFUNCTION

Vacuum not at prescribed level.

CORRECTIVE ACTION

Let vacuum built up to 15-inch/vac before opening ball valve at chopper tube/wand. Refer to WP 0005 00.

TROUBLESHOOTING PROCEDURE 4

TANK NOT DRAINING

SYMPTOM

Float level indicator remains at F.

MALFUNCTION

Drain valve not open.

CORRECTIVE ACTION

Open drain valve FULLY as described in WP 0005 00.

MALFUNCTION

Isolation valve closed.

CORRECTIVE ACTION

Open isolation valve as described in WP 0005 00.

MALFUNCTION

Hoses clogged.

CORRECTIVE ACTION

Check for proper connection of drain hoses to drain valve and disposal point. Do not turn hoses at sharp angles. Ensure drain valve is FULLY open.

TROUBLESHOOTING PROCEDURE 5

FLOAT LEVEL INDICATOR NOT FUNCTIONING

SYMPTOM

Float level indicator not moving.

MALFUNCTION

Linkage binding or float stuck.

CORRECTIVE ACTION

Gently move the float level indicator arrow back and forth to free the float arm or float ball from any internal interference.

TROUBLESHOOTING PROCEDURE 6**HYDRAULIC VALVES WON'T OPEN OR CLOSE****SYMPTOM**

Tank won't load or drain.

MALFUNCTION

Hydraulic control knobs closed.

CORRECTIVE ACTION

Open hydraulic control knobs to open or close the intake (SUCTION) or drain (DISCHARGE) valves. Refer to WP 0005 00.

MALFUNCTION

Hydraulic pump selector lever in wrong position.

CORRECTIVE ACTION

The selector lever should be at 45-degree angle to the hydraulic pump handle to open the valves, and aligned with the hydraulic pump handle to close the valves. Refer to WP 0005 00.

MALFUNCTION

Insufficient hydraulic fluid in pump.

CORRECTIVE ACTION

Check the area around the hydraulic hose connections and fusible frangible links to determine any sign of hydraulic fluid leak(s). If a leak is found report it to unit maintenance.

TM 10-4630-207-13&P

CHAPTER 4

MAINTENANCE INSTRUCTIONS

WASTE WATER EVACUATION TANK TRAILER

**UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
SERVICE UPON RECEIPT**

INITIAL SETUP:

Tools

Flashlight, General Mechanics Tool Kit (WP 0053 00, Table 2, Item 15)

Personnel Required

77W Water Treatment Specialist
63B Light Vehicle Mechanic

Materials/Parts

Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off
Ignition key removed
Emergency stop button pushed in
Wheel chocked
Emergency brake set

GENERAL

Upon receipt, retrieve keys by removing the tape from the vacuum pump hose towards the front of the vehicle. Inspect the WWET/T for damage sustained during shipment and presence of Components of End Item (COEI) and Basic Issue Items (BI) identified in WP 0089 00. Document any shortages on SF Form 364, Report of Discrepancy. Open the tool box and inventory the contents of the over pack for presence of the following items:

Item	Quantity
Vacuum pump drive belt	1
Cam-groove gasket 2 ½"	2
Cam-groove gasket 4"	2
Engine fuel filters	2 (1 of each type)
Engine oil filter	2
Engine air filter	2
Primary shutoff seat	1
Secondary shutoff (Moisture Trap) seat	1
Engine glow plug	2
Float level packing (Teflon)	36"
Fusible frangible link	2
Running light bulb	2
Tail light bulb	2
Engine fan belt	1
Bottle jack (12 ton)	1

SERVICE UPON RECEIPT OF MATERIAL

CAUTION

The WWET/T is equipped with inertia activated, hydraulically operated brakes. A horseshoe lockout device must be installed to prevent damage to the brakes due to lock up when the prime mover (and trailer) are being backed up. The lockout device must be removed prior to resuming forward motion.

1. Familiarize operator with operation of brakes (**figure 1, item 1**), lockout device (**figure 2, item 2**) and other operating controls and indicators as described in WP 0004 00 and WP 0005 00.

- Remove preservative packaging applied to certain components to protect the equipment during shipping. The unit maintenance technician must check the vacuum pump and diesel engine oil levels and ensure both are at correct levels before the WWET/T is used. Refer to Preventive Maintenance Checks and Services, WP 0011 00.



Figure 1. Brake Actuator



Figure 2. Lockout Device

- Open the manway cover (**figure 3, item 1**) on the tank as described in WP 0022 00. Secure in place with safety chain.
- Remove two 2½-inch x 20-foot intake (**figure 3, item 2**), and two 4-inch x 10-foot drain hoses (**figure 3, item 3**) from inside the tank. Close manway cover as described in WP 0022 00.

NOTE

Only the 4-inch hoses remained connected for storage. Do not connect the 2½-inch hoses together prior to stowage.

- Drape the drain hoses over the trailer hose hooks (**figure 4, item 4**), with the two ends resting in the equipment trays (**figure 4, item 5**). (Do not connect the chopper tube/wand (**figure 4, item 6**) to the intake hoses at this time; store chopper tube/wand in equipment tray)
- Connect the drain hoses in series and drape over the trailer hose hooks (**figure 4, item 4**), with the two ends resting in the equipment trays.

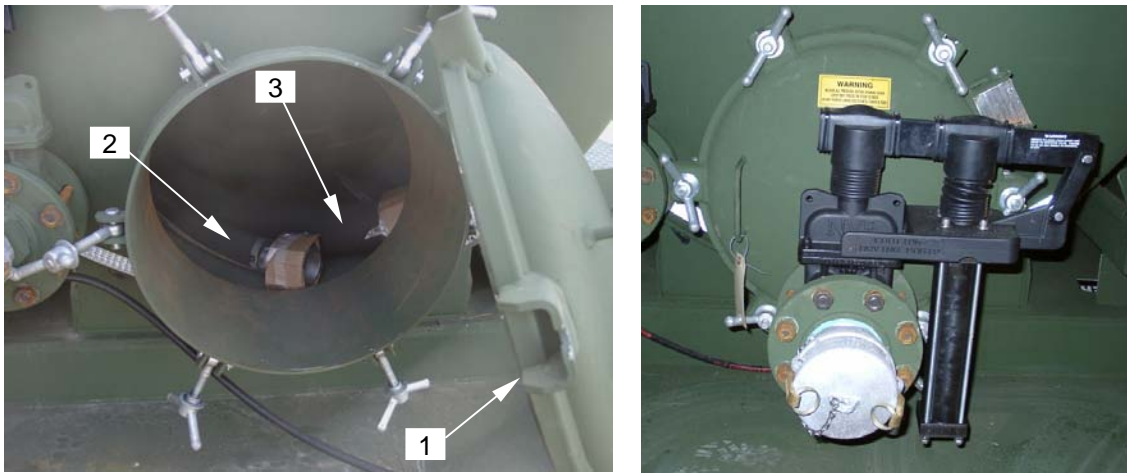


Figure 3. Manway

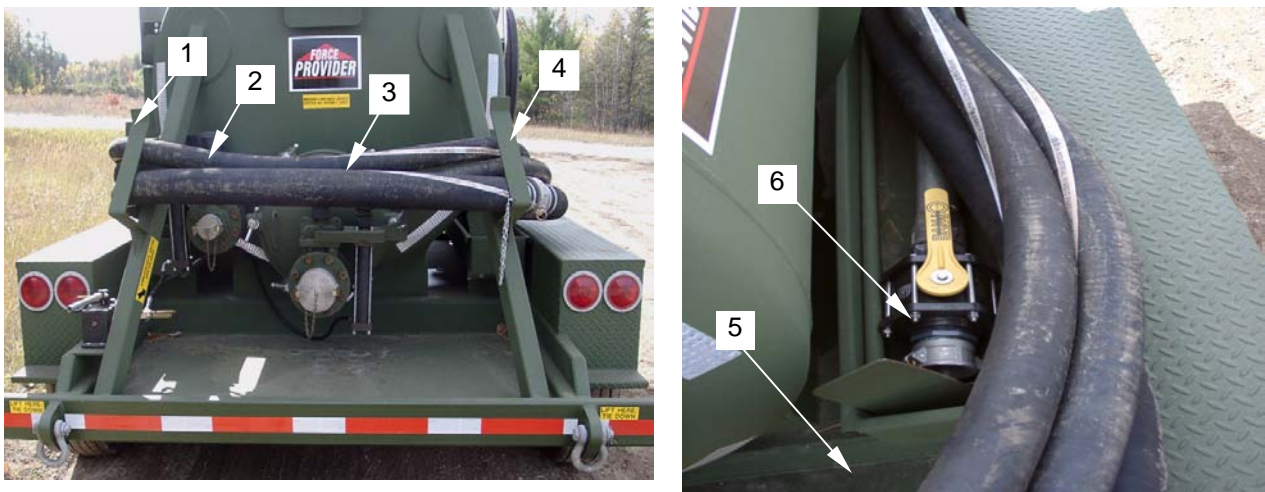


Figure 4. Drain Hose Storage and Equipment Tray

7. Connect battery cables (**figure 5, item 1**) to battery (**figure 5, item 2**) as described in WP 0034 00.

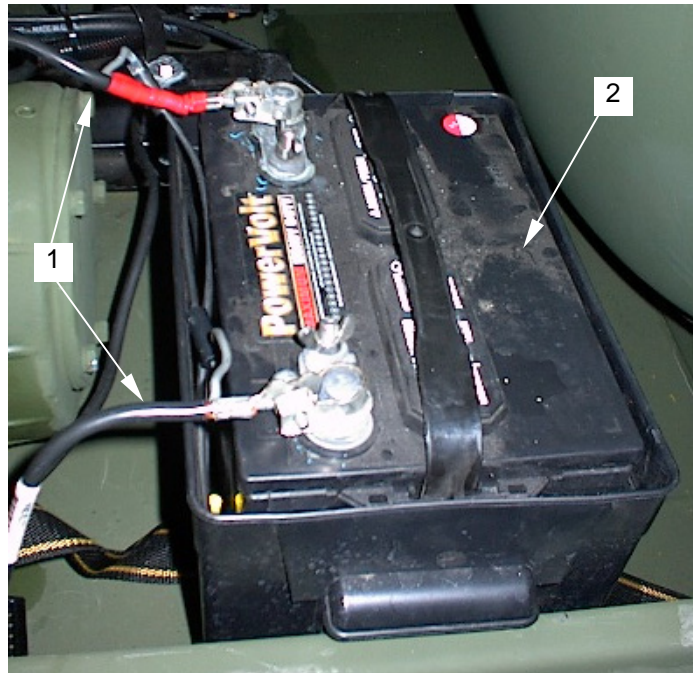


Figure 5. Battery and Cables

8. Upon initial startup, apply vacuum seal to rear manway (figure 6, item 1) and primary shutoff cover (figure 6, item 2) by tightening cover access screws (figure 6, item 3) while the tank is empty and vacuum is applied.

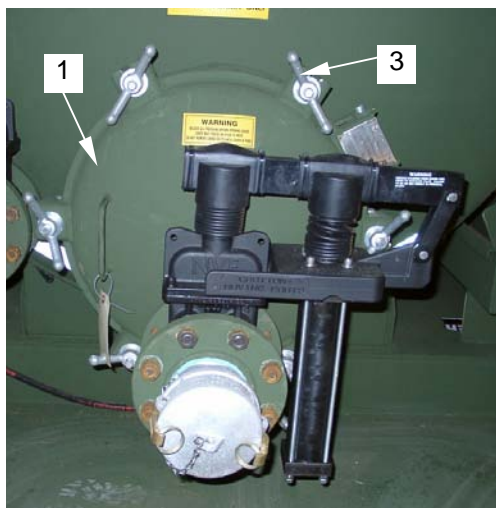


Figure 6. Manway and Primary Shutoff Cover

PRELIMINARY SERVICING OF EQUIPMENT

Perform operator PMCS as described in WP 0011 00.

END OF WORK PACKAGE

**OPERATOR MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
PREVENTIVE MAINTENANCE CHECKS AND SERVICES INTRODUCTION**

INTRODUCTION

Preventive Maintenance Checks and Services (PMCS) are performed to keep the WWET/T in good operating condition and ready for its primary mission. The checks are used to find, correct, and report problems. PMCS is performed every day the WWET/T is in operation, and is done according to the PMCS table provided. Pay attention to **WARNING**, **CAUTION**, and **NOTE** statements. A **WARNING** indicates that someone could be hurt or killed. A **CAUTION** indicates that equipment could be damaged. A **NOTE** may make your maintenance or repair task easier.

Be sure to perform scheduled PMCS. Always perform PMCS in the same order so it becomes habit. With practice, you will quickly recognize problems with the equipment.

Use DA Form 2404, Equipment Inspection and Maintenance Worksheet, to record any discovered faults. Do not record faults that you fix!

PMCS PROCEDURES

Table 1 lists inspections and care required to keep your equipment in good operating condition. It is arranged so that you can perform before operation checks as you walk around the equipment.

Explanation of Table 1 columns**Item Number**

Indicates the reference number. When completing DA Form 2404, Equipment Inspection and Maintenance Worksheet, include the item number for the item to check/service indicating a fault. Item numbers appear in the order you must perform the checks/services listed.

Interval

Indicates when you must perform the procedure in the procedure column.

- before** - perform before equipment operation
- during** - perform during equipment operation
- after** - perform after equipment has been operated
- weekly** - perform every week
- monthly** - perform each month
- hours** - perform at the noted hourly interval

Item to Check/Service

Indicates the item to be checked or serviced.

Procedure

Indicates the procedure you must perform on the item listed in Item to Check/Service column. You must perform the procedure at the time specified in the Interval column.

Not Fully Mission Capable If:

Indicates faults which will prevent your equipment from performing its primary mission. If you perform procedures listed in Procedure column which show faults listed in this column, do not operate the equipment. Follow standard procedures for maintaining the equipment or reporting equipment failure.

Other special entries

Observe all special information and notes that appear in Table 1.

When a check/service procedure is required for both weekly and before intervals, it is not necessary to perform the procedure twice if the equipment is operated during the weekly period.

COMMON CHECKS AND CLEANING

Cleaning

Always keep the equipment clean. Remove dirt, sand, and debris from all controls and hose connections.

Bolts, nuts, and screws

Check them for obvious looseness, missing, bent, or broken condition on equipment. If you find a bolt, nut, or screw you think is loose, tighten it or report it to your supervisor.

Hoses

Look for wear, damage, and leaks. Ensure clamps are tight. Wet spots show leaks, but a stain around a fitting or connector can also mean a leak. If a leak comes from a loose fitting or coupling, tighten it. If something is broken or worn out, report it to your supervisor.

LEAKAGE DEFINITION FOR PERFORMING PMCS

It is necessary for you to know how fluid leakage affects the status of the equipment. The following are the types/classes of leakage an operator needs to know to be able to determine the status of the water system. Learn these leakage definitions and remember - when in doubt, notify your supervisor.

CAUTION

Equipment operation is allowable with minor leakages (Class I or II). Of course, consideration must be given to fluid capacity in the system. When in doubt, notify your supervisor.

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

Class III leaks, cease all operations and report immediately to your supervisor.

Class I - Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

Class II - Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.

Class III - Leakage of fluid great enough to form drops that fall from items being checked/inspected.

**OPERATOR MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
PREVENTIVE MAINTENANCE CHECKS AND SERVICES**

Table 1. Preventive Maintenance Checks and Services (PMCS).

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
1	Before	Isolation Valve	Open/close isolation valve (figure 1, item 1) to check proper working of linkage (figure 1, item 2). Refer to unit maintenance if linkage is bent. WP 0019 00	Valve won't open or close. Linkage bent.
2	Before	Safety Relief Valve	Check safety relief valve (figure 1, item 3) for damage. WP 0020 00	Damaged safety relief valve

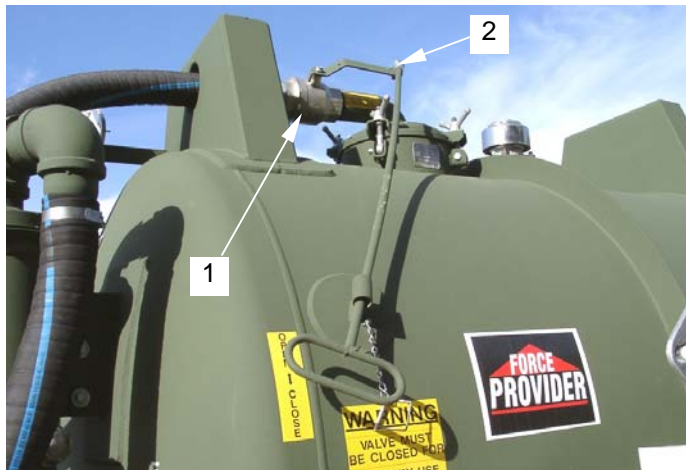


Figure 1. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
3	Before	Float Level Indicator	Gently manipulate float level indicator (figure 2, item 1) arrow to determine free movement of linkage. Refer to unit maintenance if linkage is binding. WP 0021 00	Tank level indicator inoperable.
4	Before	Intake and Drain Valves	Close intake (figure 2, item 2) and drain valves (figure 2, item 3) . Check for leaking. Ensure dust caps (figure 2, item 4) are present and installed. WP 0005 00	Valves won't close. Valve(s) leak. Dust caps missing.

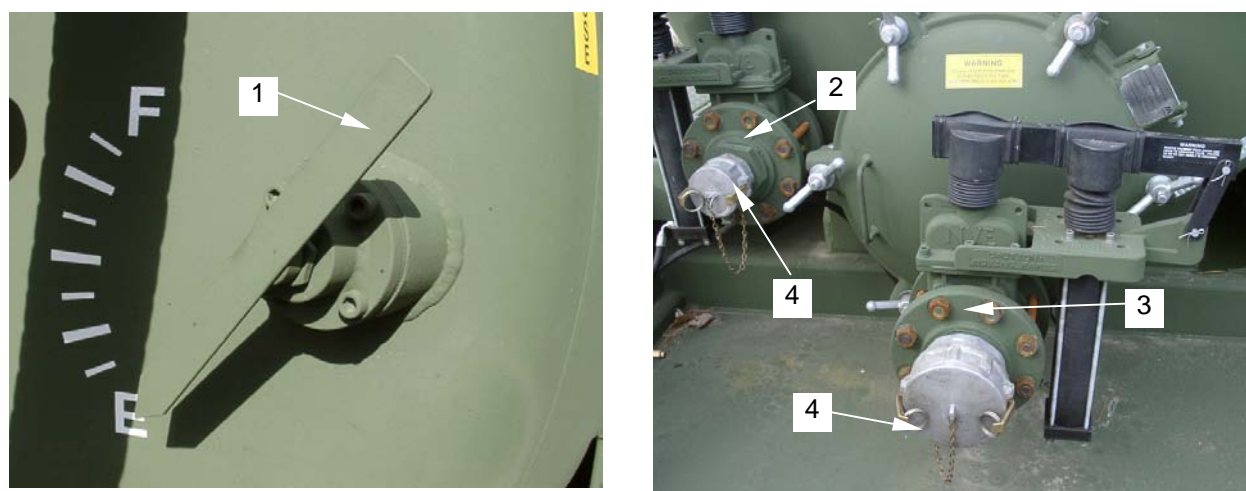


Figure 2. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
5	Before	Hydraulic System	Visually inspect the hydraulic pump (figure 3, item 1), hoses (figure 3, item 2), piston valves (figure 3, item 3) and fusible frangible links (figure 3, item 4) for hydraulic fluid leaks. Check fluid level in pump. (Fill reservoir (figure 3, item 5) to top of internal ring) Refer to unit maintenance if leak is found. WP 0025 00	Hydraulic fluid leaks from pump, hoses, or piston valves. Fluid level low. Class III leaks.

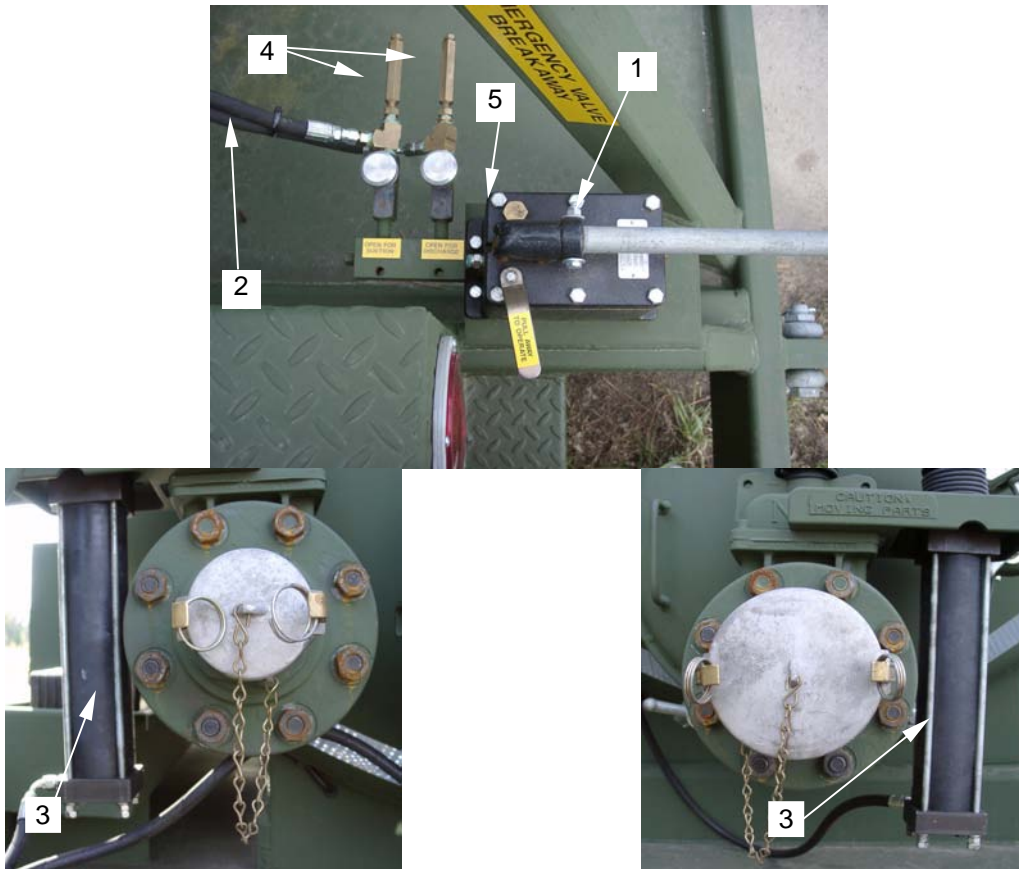


Figure 3. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
6	Before	Engine	<p>Check engine oil (figure 4, item 1) for proper level. Add engine oil as required. WP 0026 00</p> <p>Check diesel fuel level in tank (figure 4, item 2). Add fuel if needed. (Tank capacity 13 Gallon) WP 0026 00</p> <p>Check engine coolant level in Radiator bottle (figure 4, item 3). Add coolant (50/50 ethylene glycol/water) if necessary. WP 0026 00</p> <p>Check air filter (figure 4, item 4) for clogging. Clean air filter. WP 0026 00</p> <p>Check for loose, frayed, broken or missing fan belt (figure 4, item 5). Refer to unit maintenance to replace engine fan belt. WP 0026 00</p>	<p>Oil level below mark on dipstick.</p> <p>Not enough fuel to complete mission.</p> <p>Coolant level below mark on bottle.</p> <p>Clogged or otherwise dirty air filter.</p> <p>Fan belt frayed, broken or missing.</p>

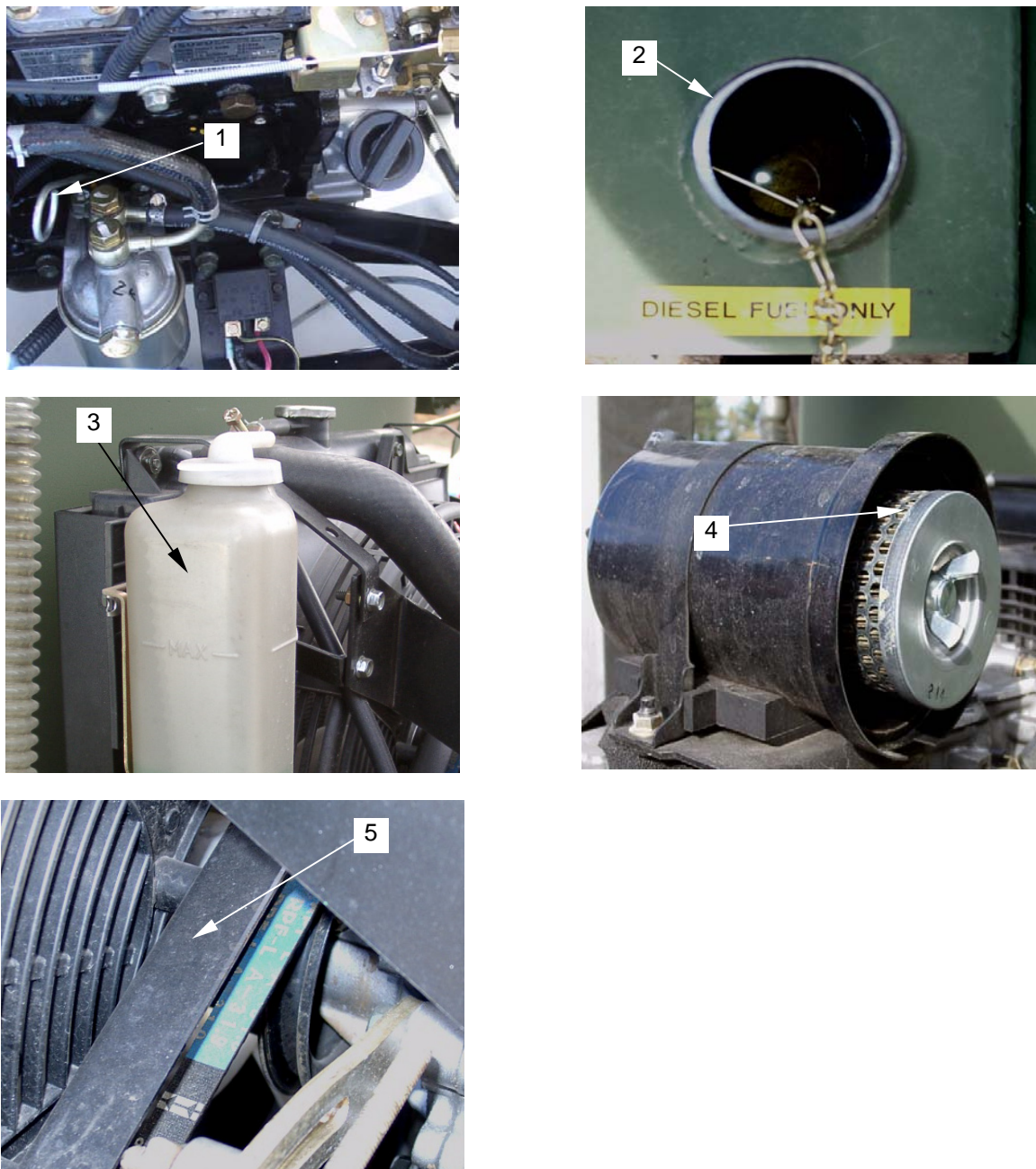


Figure 4. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
7	Before	Control Panel	Check control panel (figure 5, item 1) for damaged instruments. Check for presence of keys (figure 5, item 2). Pull emergency button (figure 5, item 3) out. WP 0027 00	Instruments damaged or illegible. Keys missing. Emergency button inoperative.
8	Before	Fuel Supply/Return Hoses	Check fuel supply (figure 5, item 4) and return hoses (figure 5, item 5) for leaks and tight connection to diesel tank elbow fittings (figure 5, item 6). WP 0028 00	Hoses leaking. Loose connection on elbow fitting(s). Class III leaks.
9	Before	Vacuum Pump	Check oil level (figure 5, item 7). Add oil (SAE 40 Summer, SAE 30 Winter) as required. Place control handle (figure 5, item 8) in neutral position. WP 0030 00	Oil level below mark on dipstick.
10	Before	Moisture trap	Open drain on moisture trap (figure 5, item 9). Service moisture trap if more than 1 cup of liquid drains from trap. WP 0031 00	More than 1 cup of moisture drained from trap.

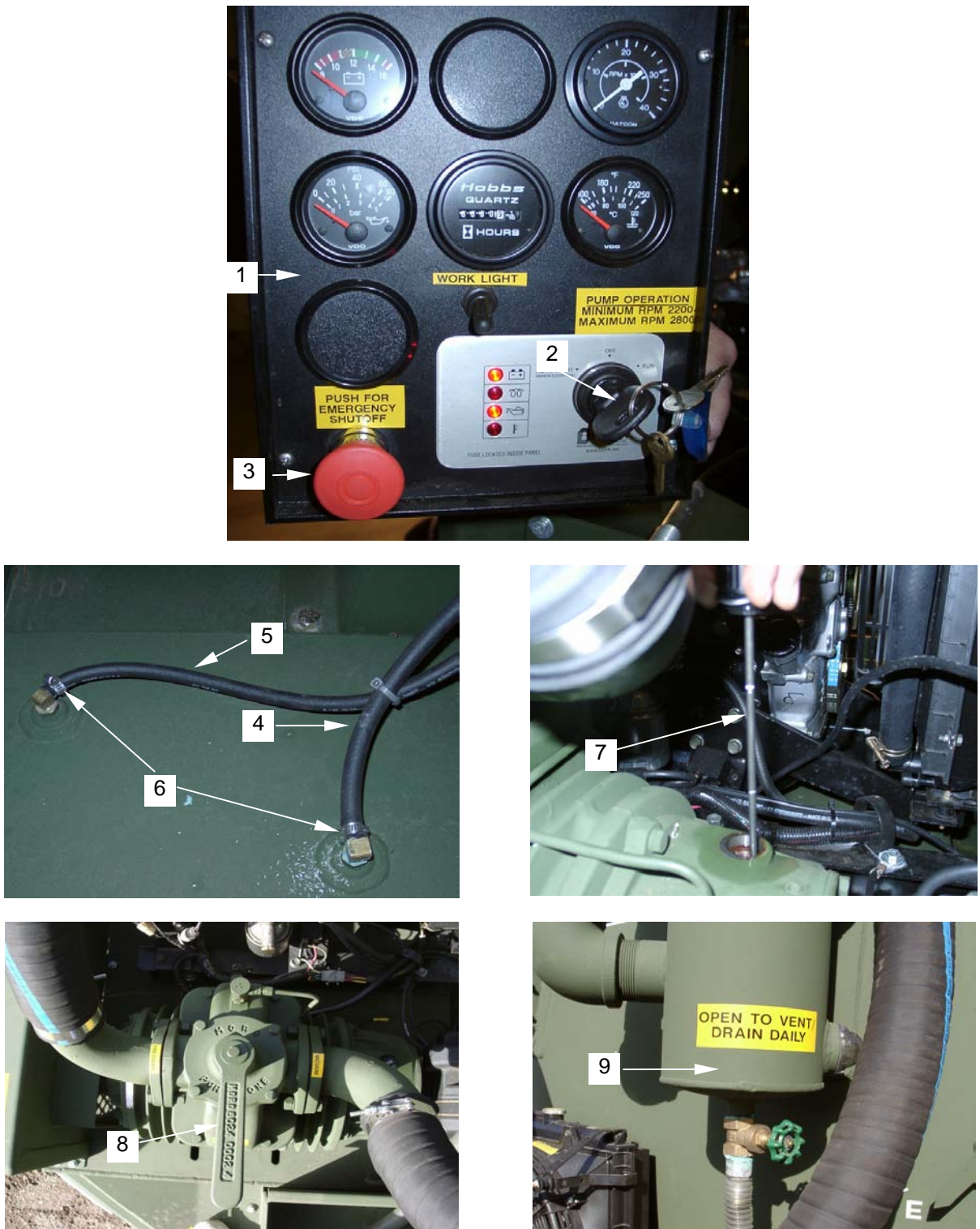



Figure 5. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
11	Before	Battery	<p>Check battery cables (figure 6, item 1) for security. Tighten cables if necessary. WP 0034 00</p> <p>Check for deposits around terminals (figure 6, item 2), fluid around battery (figure 6, item 3) and frayed cables. WP 0034 00</p> <p>Check for damage to battery (figure 6, item 3). Refer to unit maintenance to replace battery. WP 0034 00</p>	<p>Battery cable(s) loose.</p> <p>Corroded terminals, leaking battery, worn cables</p> <p>Battery damaged.</p>
12	Before	Parking Brakes	<p> WARNING</p> <p>To prevent injuries from a moving trailer, place chocks on trailer wheels before checking parking brakes.</p> <p>Check parking brake (figure 6, item 4) for proper operation. Brakes must hold trailer.</p>	<p>Brake inoperative, or won't hold trailer.</p>

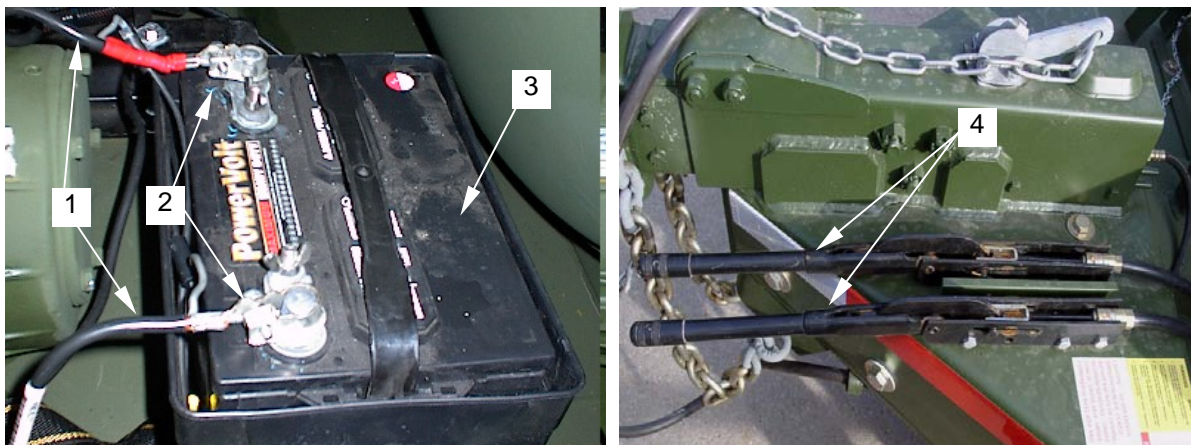


Figure 6. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
13	Before	Lights	Check turning, stopping, running lights (figure 7, item 1), license plate and rear platform illumination (figure 7, item 2), for lights that are not functioning, cracked lenses, and damage to fixtures. WP 0035 00	Lights not functioning. Cracked lenses. Fixtures damaged.

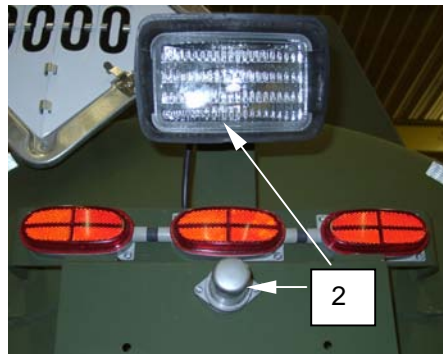
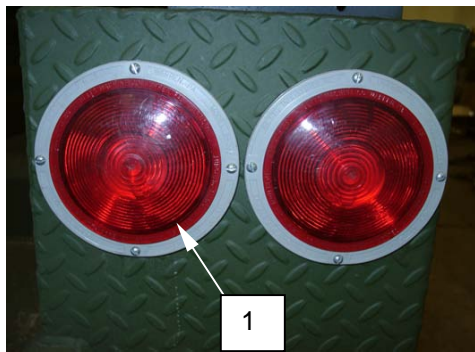
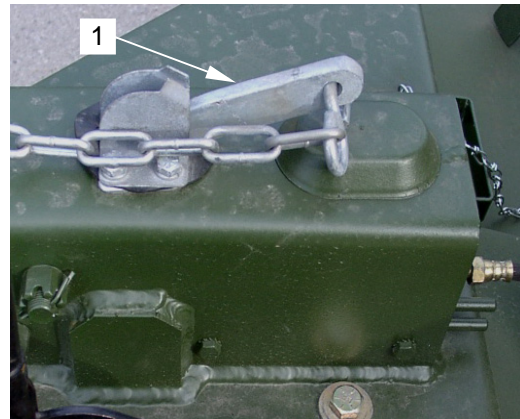
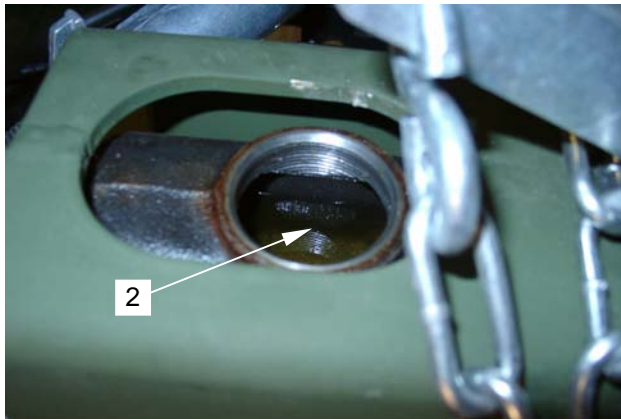


Figure 7. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
14	Before	Tires	Check for under-inflated, or flat tires with tire gauge. WP 0014 00.	Tire(s) under-inflated, or flat
15	Before	Brake	<p>Check brake lever (figure 8, item 1) position. It must be in the 'Ready' position. Notify unit maintenance if the lever is in the breakaway position. WP 0045 00</p> <p>Check brake master cylinder (figure 8, item 2). It must be about $\frac{3}{4}$ full. Add DOT-3 or DOT-4 type brake fluid as necessary. WP 0045 00</p>	<p>Brake lever in the breakaway position.</p> <p>Master cylinder less than $\frac{3}{4}$ full</p>



Breakaway Position

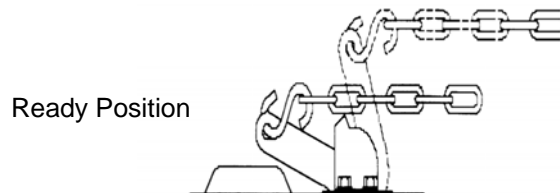


Figure 8. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
16	Before	Fuel Tank	Check fuel tank (figure 9, item 1) for damage and leaks. WP 0040 00 Ensure drain plug (figure 9, item 2) is present and not damaged or leaking.	Fuel tank is damaged or leaking. Drain plug is missing, damaged, or leaking.

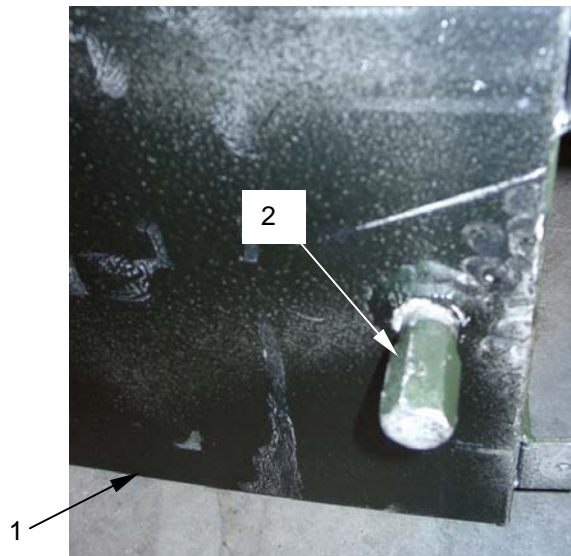


Figure 9. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
17	Before	Trailer Jack	<p>Ensure trailer jack (figure 10, item 1) is present and attached to turning fixture (figure 10, item 2).</p> <p>Check trailer jack (figure 10, item 1) for damage.</p> <p>Ensure locking pin (figure 10, item 3) is present and not damaged. WP 0040 00</p>	<p>Trailer jack is missing or not attached to turning fixture.</p> <p>Trailer jack is damaged.</p> <p>Locking pin is missing or damaged.</p>

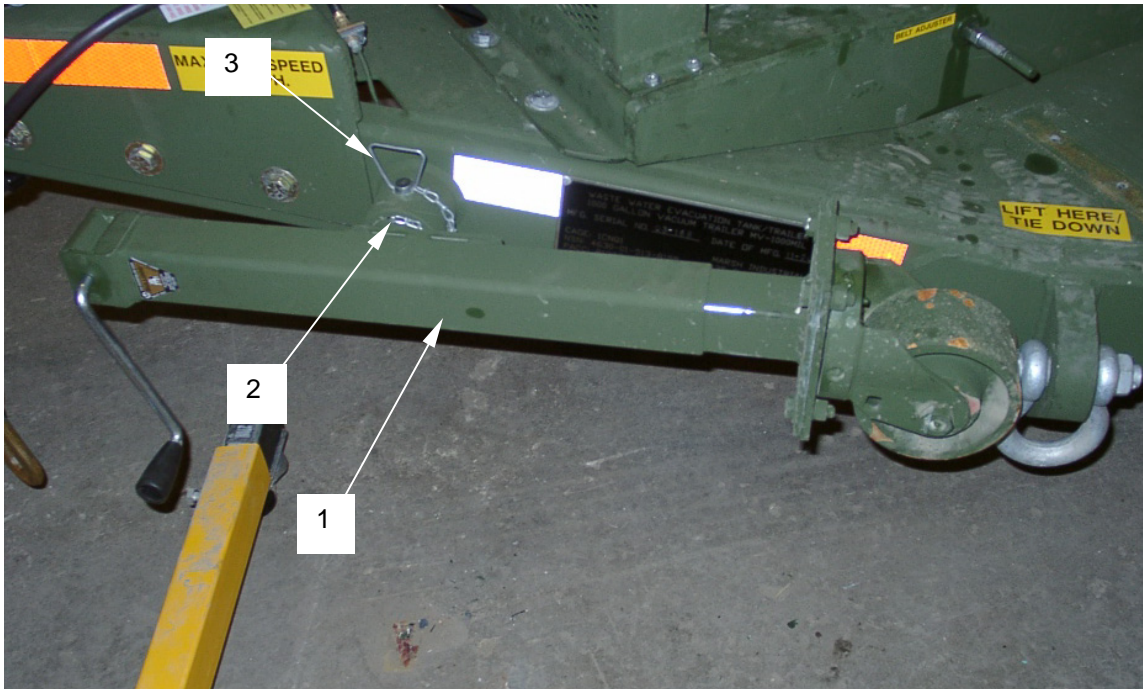


Figure 10. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
18	Before	Lunette Eye/Chains	<p>Check lunette eye (figure 11, item 1) for damage and is securely fastened to the leveler channel (figure 11, item 2).</p> <p>Check chains (figure 11, item 3) for damage and is securely fastened to the trailer. WP 0043 00</p>	<p>Lunette eye damaged or loose.</p> <p>Chains damaged or loose.</p>

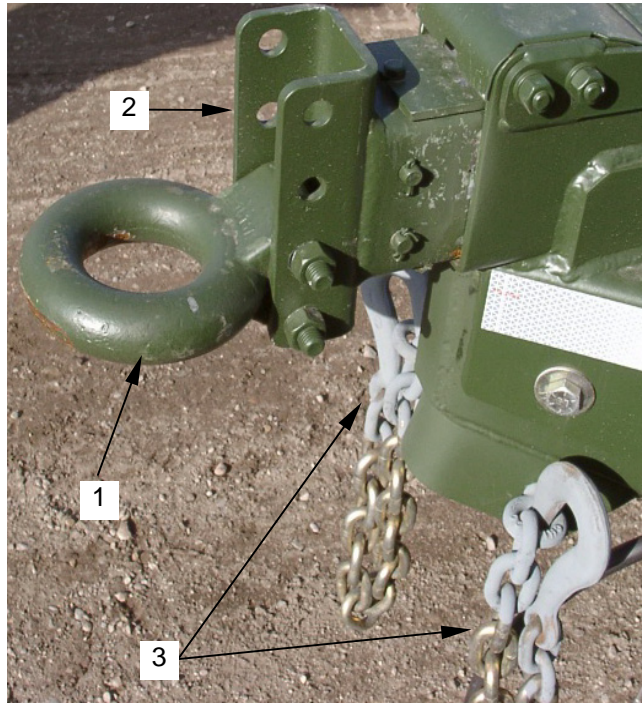


Figure 11. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
19	Before	Pulley Guard	Check pulley guard (figure 12, item 1) for damage and is securely fastened to the trailer (figure 12, item 2). WP 0029 00	Pulley guard damaged or loose.

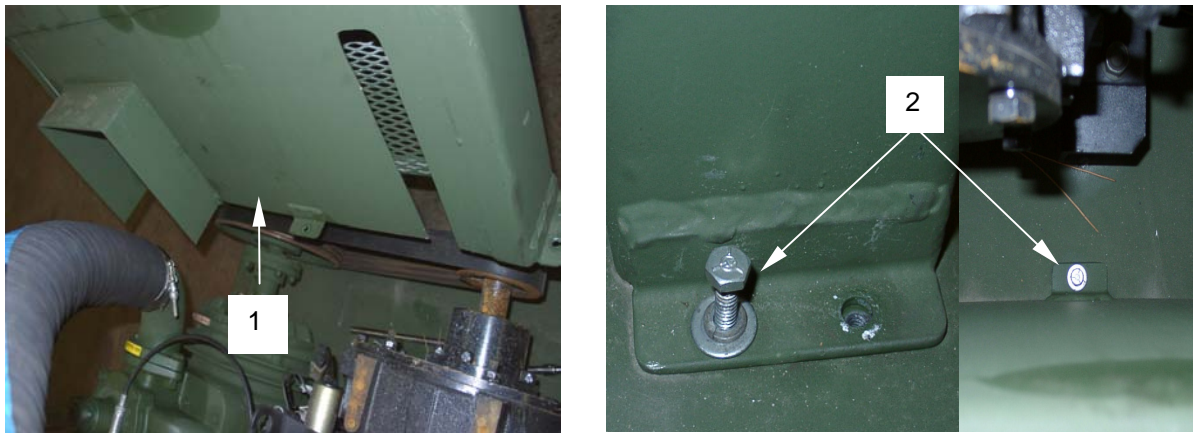


Figure 12. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
20	Before	Intake and Drain Hoses. Chopper Tube/wand	Inspect hoses (figure 13, item 1) and chopper tube/ wand (figure 13, item 2) for damage. Check for presence and condition of gaskets (figure 13, item 3). Check ball valve (figure 13, item 4) for binding. WP 0046 00, WP 0047 00	Hoses/chopper tube/wand damaged. Gaskets missing/worn. Valve binding.

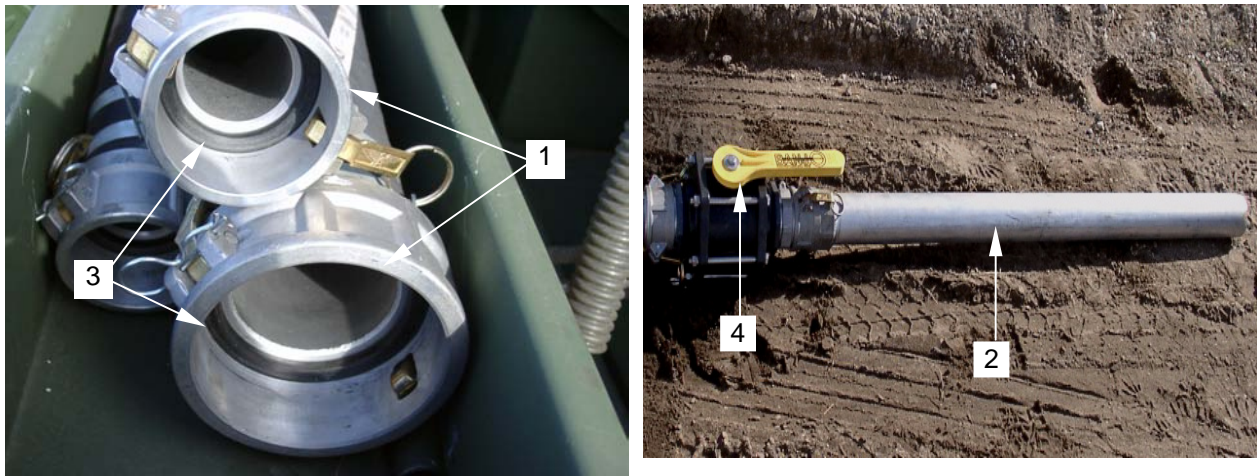


Figure 13. Before PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
21	During	Float Level Indicator	Check float level indicator (figure 14, item 1) for tank content level. WP 0021 00	Tank is full.
22	During	Control Panel	Check oil pressure gage (figure 14, item 2) and warning light (figure 14, item 3), voltmeter gage (figure 14, item 4) and warning light (figure 14, item 5) and water gage (figure 14, item 6) and warning light (figure 14, item 7). Refer any warning light to unit maintenance. WP 0027 00	Oil pressure, battery, or temperature warning light is on.
23	During	Moisture Trap	Check moisture trap sight glass (figure 14, item 8) frequently to determine any moisture buildup in the trap. WP 0031 00	Liquid visible through sight glass on moisture trap.
24	During	Pressure Gage	Monitor pressure gage (figure 14, item 9) for required vacuum/pressure readings. WP 0005 00	Gage does not show correct pressure or vacuum readings.

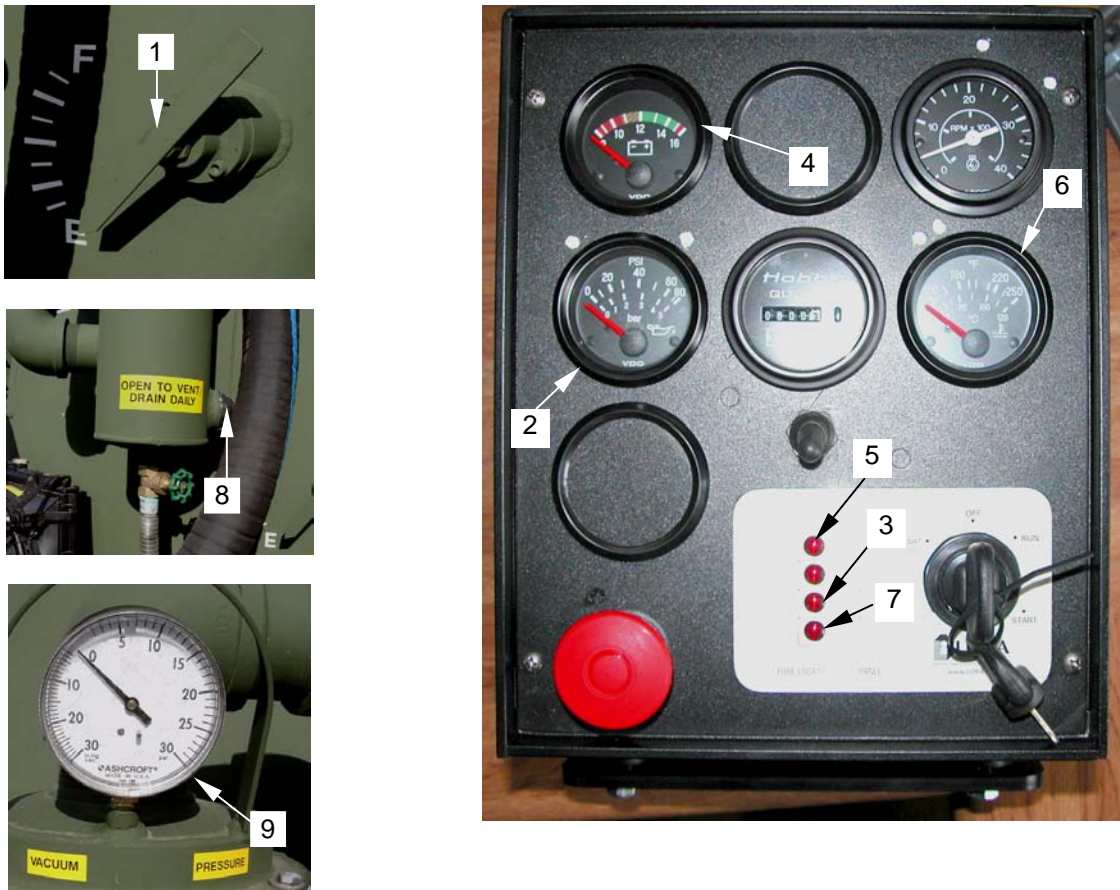


Figure 14. During PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
25	During	Intake and Drain Hoses. Chopper Tube/Wand	Inspect hoses (figure 15, item 1) and chopper tube/wand (figure 15, item 2) for leaks. WP 0047 00	Hoses/chopper tube/wand leak.

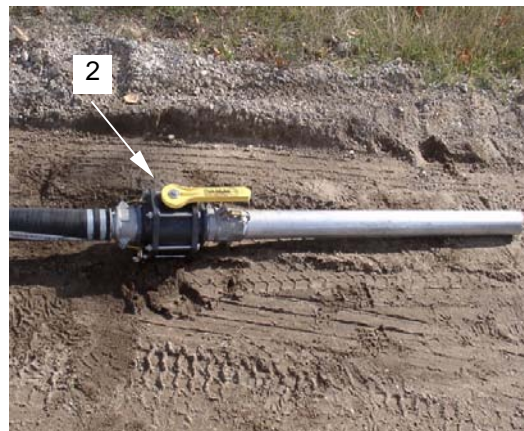
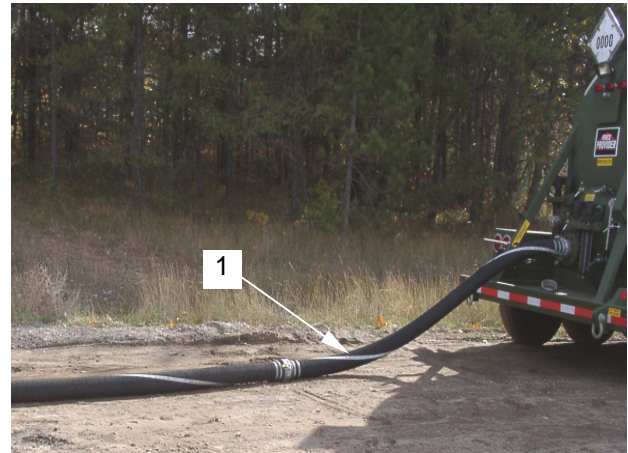


Figure 15. During PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
26	During	Intake and Drain Valves	Check intake (figure 16, item 1) and drain (figure 16, item 2) valves for leaking. WP 0023 00 WP 0024 00	Valves leak.

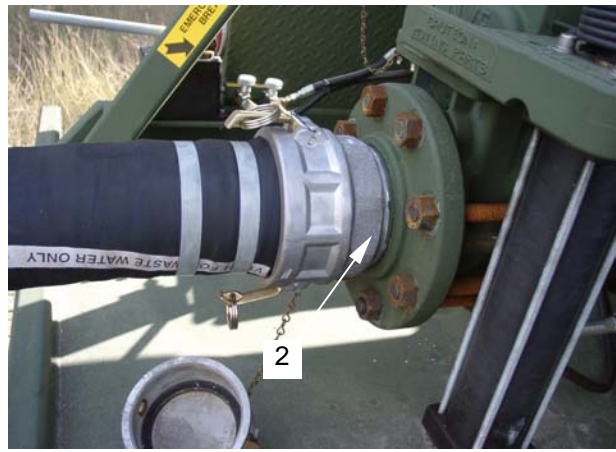
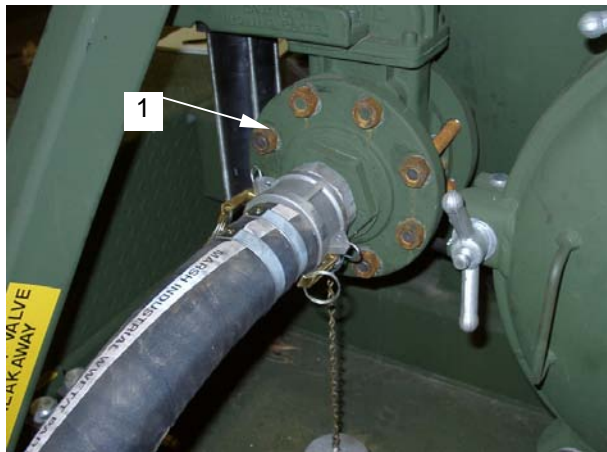


Figure 16. During PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
27	After	Tank, intake and drain valves	Check tank for leaks around manway assembly outlet (figure 17, item 1) WP 0018 00. Check intake (figure 17, item 2) WP 0023 00 and drain valve (figure 17, item 3) WP 0024 00 for leaks or spills. If contaminated with wastewater, hose down the manway cover, intake and drain valves with freshwater.	Tank leaks. Valve(s) leaking.
28	After	Control Panel	Push in emergency shutoff button (figure 17, item 4) on control panel (figure 17, item 5). WP 0027 00	

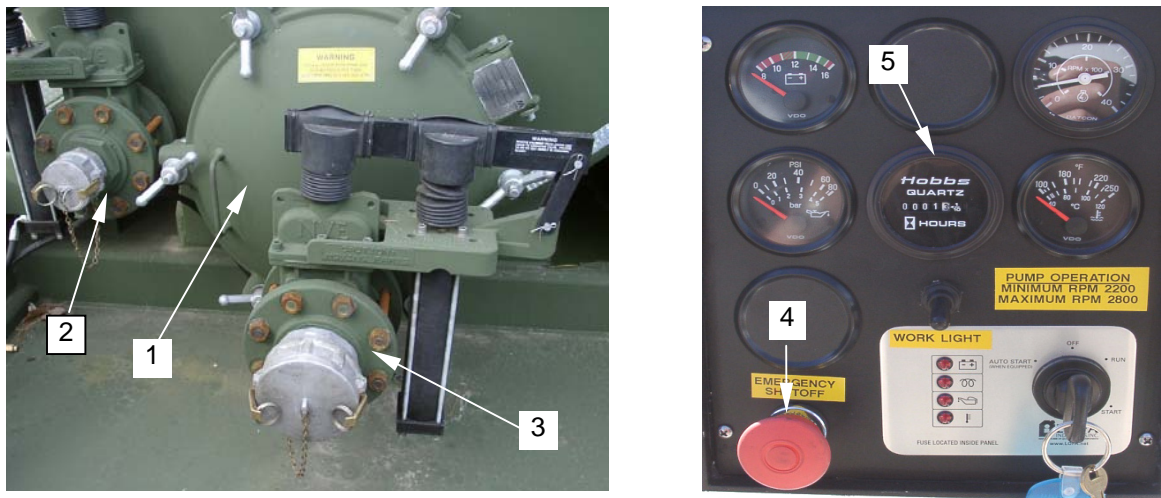


Figure 17. After PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
29	After	Trailer	Visually inspect trailer for damage and rust. Using freshwater, hose down areas of the trailer that have been contaminated with wastewater, such as the rear platform, and equipment trays (figure 18, item 1). Then disinfect hosed down areas. WP 0005 00	Damaged. Trailer contaminated with wastewater.
30	After	Moisture Trap	Open the moisture trap drain valve (figure 18, item 2) and let the trap drain. WP 0005 00	More than 1 cup of moisture drained from trap.

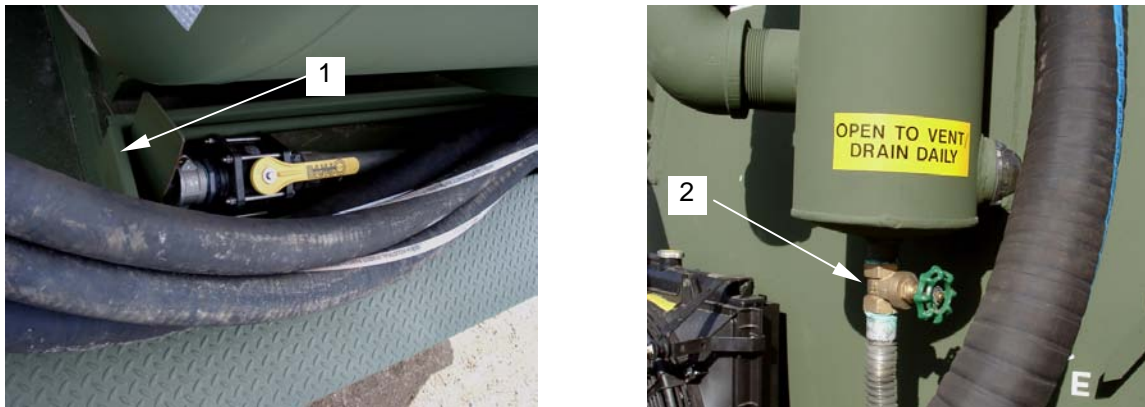


Figure 18. After PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
31	After	Intake and Drain Hoses	Check for presence of 4" drain hoses (figure 19, item 1), 2½" intake hoses (figure 19, item 2) WP 0046 00 and chopper tube/ wand (figure 19, item 3) WP 0047 00. Check for damage to ball valve (figure 19, item 4). Clean hoses and chopper tube/wand with fresh water and let air-dry. WP 0005 00	Drain or intake hoses and/or chopper tube/wand missing, damaged, or dirty.
32	After	Chopper Tube/Wand	Check chopper tube/wand (figure 19, item 3) for clogs or deformation. Check for operation of the ball valve (figure 19, item 4). Rinse chopper tube/wand with fresh water WP 0005 00	Drain or intake hoses and/or chopper tube/wand missing, damaged, or dirty.

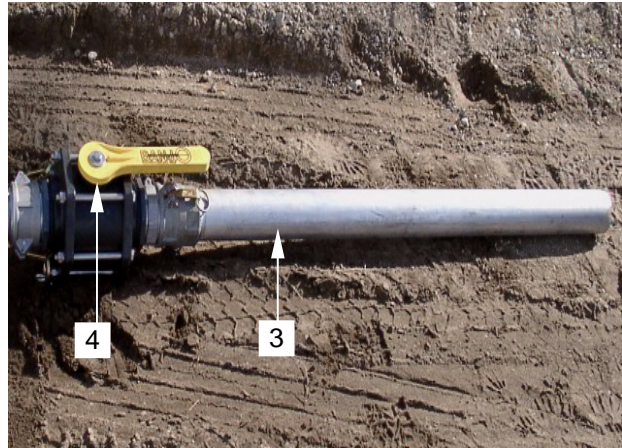


Figure 19. After PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
33	After	Lights	Check turning, stopping, running lights (figure 20, item 1), license plate and rear platform illumination (figure 20, item 2), for lights that are not functioning, cracked lenses, and damage to fixtures. WP 0035 00	Lights not functioning. Cracked lenses. Fixtures damaged.



Figure 20. During PMCS

Table 1. Preventive Maintenance Checks and Services (PMCS) - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
34	After	Confined Space Entry Sign	Inspect the confined space entry sign (figure 21, item 1) on the manway assembly (WP 0022 00) for legibility and damage	Sign damaged, faded or illegible.



Figure 21. After PMCS

LUBRICATION INSTRUCTIONS

GENERAL

These lubrication instructions are for unit level maintenance personnel. Lube intervals (on-condition or hard time) are based on normal operation. Lube more during constant use, and less during inactive periods. Use correct grade of lubricant for seasonal temperature expected.

CAUTION

Always wipe clean oil filler components before starting your lube service. Use correct type or grade of oil. Overfilling will cause spillage and harm engine components.

1. Vacuum Pump.

To lubricate the vacuum pump, proceed as follows:

- a. Lubricate the front bearing grease nipple, **(figure 22, item 1)** with ball bearing grease every 100 hours of operation.
- b. Check and replenish vacuum pump oil as indicated by the dipstick **(figure 22, item 2)**. Use SAE 40 grade oil in the summer and SAE 30 grade oil in the winter.

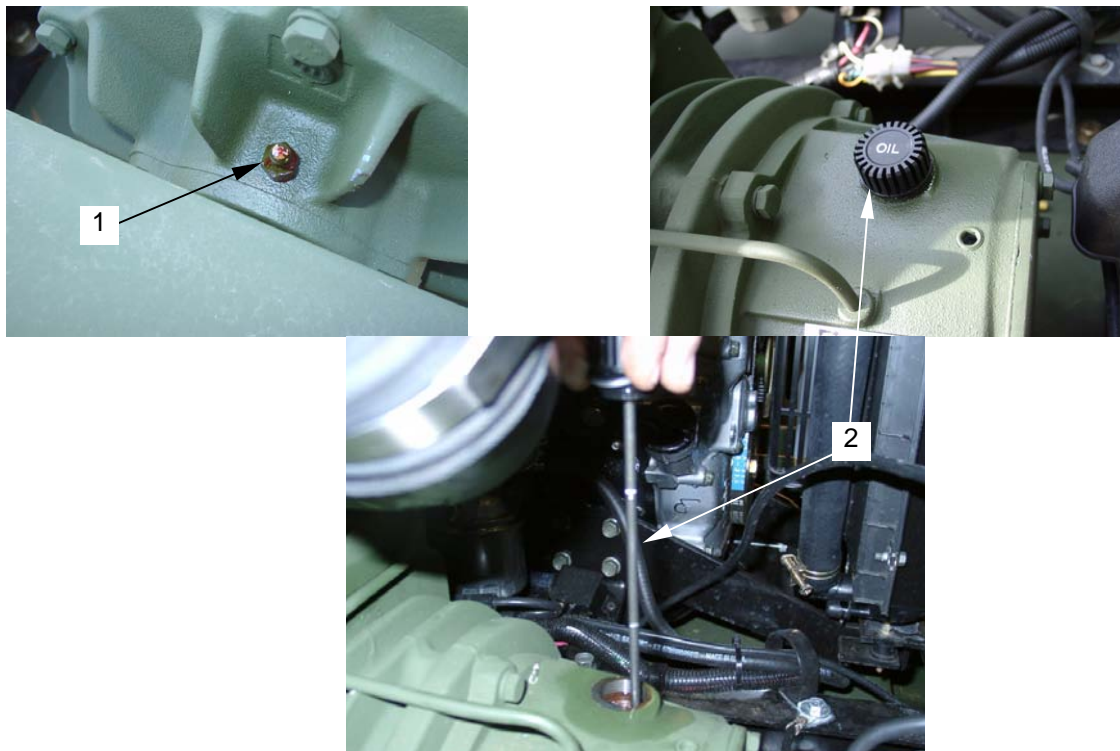


Figure 22. Vacuum Pump

END OF WORK PACKAGE

**OPERATOR MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
OPERATOR MAINTENANCE INTRODUCTION**

INTRODUCTION

NOTE

Maintenance programs must be followed in the applicable technical manuals. It is very important to adhere to maintenance procedures in order to prolong the service life of these items.

This TM contains Operator Maintenance procedures applicable to the WWET/T as authorized by the Maintenance Allocation Chart (MAC) in Work Package 0053 00 of this manual. All maintenance instructions covered in this Work Package are unique to the WWET/T.

All maintenance procedures in this Work Package can be performed by one person unless otherwise indicated. Read all **WARNINGS**, **CAUTIONS**, and **NOTES** carefully before attempting any procedures. This includes the warnings at the front of this manual.

Operator Maintenance Work Packages begin with a header specifying the applicable equipment, the item being maintained, and what the maintenance action entails. This is followed by a chart specifying the initial setup of the equipment before starting maintenance, the tools required to perform the maintenance, any materials or parts required, and the number of MOS specific personnel required. Maintenance items, which do not list an MOS for the task, are non-MOS specific Maintenance items.

Operator Maintenance tasks may be performed by Operator, Unit Maintenance, Direct Support, General Support, or Depot personnel.

**OPERATOR MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
NSN 4630-01-513-8155
MOISTURE TRAP AND OIL CATCH MUFFLER
INSPECT, SERVICE**

INITIAL SETUP:**Tools****Personnel Required**

77W Water Treatment Specialist

Materials/Parts

Gloves, Rubber (WP 0089 00, Table 2, Item 4)

Oil 10W40 (Summer) (WP 0091 00, Item 23)

Oil 10W30 (Winter) (WP 0091 00, Item 22)

Rags, Wiping (WP 0091 00, Item 28)

Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

Engine shut off

Ignition key removed

Emergency stop button pushed in

Wheel chocked

Emergency brake set



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

INSPECT (MOISTURE TRAP)

Inspect the moisture trap as described below. Describe any condition that must be reported to unit maintenance on DA Form 2404.

1. Inspect the moisture trap body (**figure 1, item 1**) for damage, secure attachment to the tank bracket (**figure 1, item 2**) and condition of pressure gage (**figure 1, item 3**). Report a damaged moisture trap housing and/or pressure gage to unit maintenance. Replace missing, or tighten loose bracket nuts and bolts (**figure 1, item 4**).
2. Visually inspect the drain valve (**figure 1, item 5**) for damage. Report a broken or bent drain valve to unit maintenance.
3. Determine the condition and ensure secure attachment of the drain hose (**figure 1, item 6**). Replace a missing or damaged drain hose as required.
4. Inspect the condition of the upper air hose (**figure 1, item 7**) and the pump air hose (**figure 1, item 8**). Ensure hose clamps (**figure 1, item 9**) are tight. Report a damaged air hose to unit maintenance. Tighten hose clamps as necessary.
5. Ensure moisture trap cover (**figure 1, item 10**) is securely fastened to the body (**figure 1, item 1**) and attaching hardware is in place and tight (**figure 1, item 11**). Report a loose lid or missing hardware to unit maintenance.

6. Check sight glass (**figure 1, item 12**) for sediment buildup. Inspect glass for cracks. If sight glass shows sediment, drain trap as described under SERVICE in this WP. Report a broken sight glass to unit maintenance.

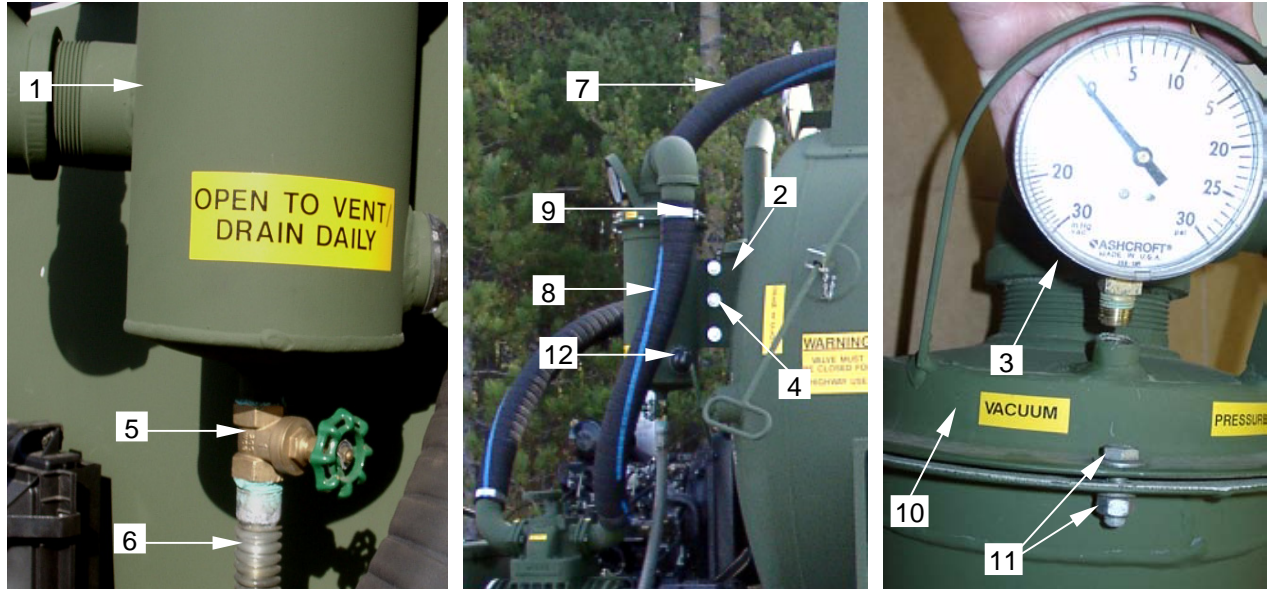


Figure 1. Moisture Trap

INSPECT (OIL CATCH MUFFLER)

Inspect the oil catch muffler as described below. Describe any condition that must be reported to unit maintenance on DA Form 2404.

1. Inspect the oil catch muffler housing (**figure 2, item 1**) for damage, and secure attachment to the tank bracket (**figure 2, item 2**). Report a damaged oil catch muffler housing to unit maintenance. Replace missing, or tighten loose bracket nuts and bolts (**figure 2, item 3**).
2. Visually inspect the drain valve (**figure 2, item 4**) for damage. Report a broken or bent drain valve to unit maintenance.
3. Determine the condition and secure attachment of the drain hose (**figure 2, item 5**). Replace a missing or damaged drain hose as required.
4. Inspect the condition of the breather hose (**figure 2, item 6**). Ensure hose clamps (**figure 2, item 7**) are tight. Report a damaged breather hose to unit maintenance. Tighten hose clamps as necessary.
5. Ensure oil catch muffler lid (**figure 2, item 8**) is securely fastened to the housing (**figure 2, item 1**) and attaching hardware is in place and tight (**figure 2, item 9**). Report a loose lid or missing hardware to unit maintenance.

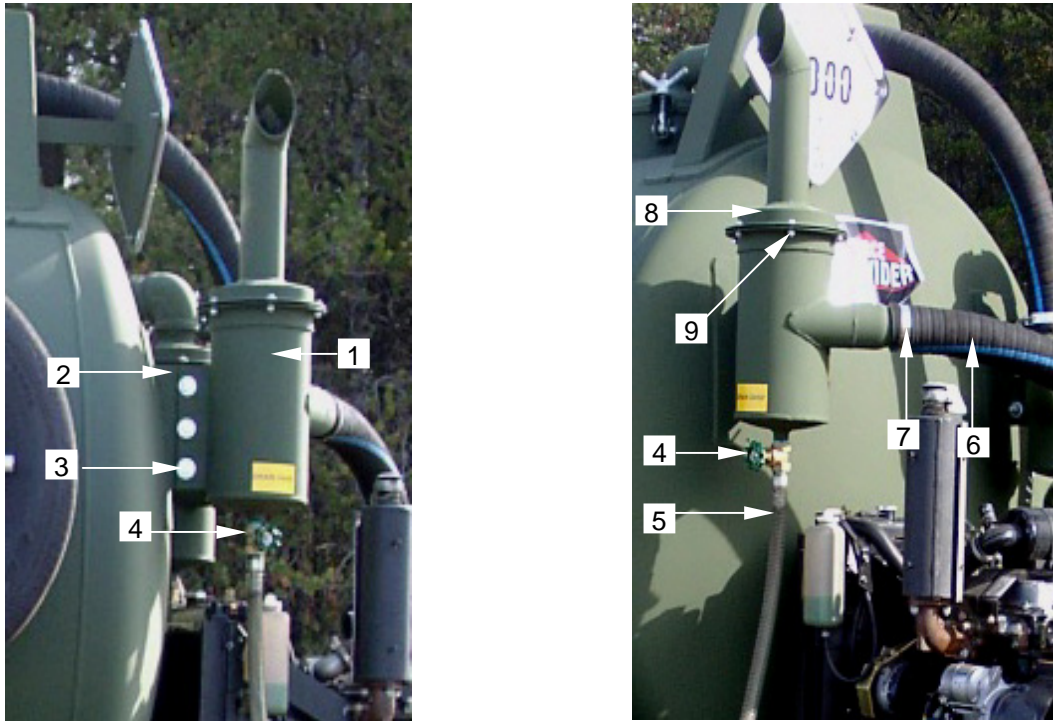


Figure 2. Oil Catch Muffler

SERVICE

Service the moisture trap and oil catch muffler as described below. Describe any condition that must be reported to unit maintenance on DA Form 2404.

1. Moisture Trap.

- a. Open the drain valve (**figure 1, item 5**) and observe the amount of liquid draining from the trap. Drain in accordance with local health regulations and unit SOP. An excessive amount of moisture (more than 1 Cup) draining from the moisture trap indicates a problem with the primary shutoff that may require service.
- b. Report an excessive amount of moisture draining from the moisture trap to unit maintenance. Also report any problems with the drain valve such as a bent valve stem or binding of the valve.

2. Oil Catch Muffler.

- a. Open the drain valve (**figure 2, item 4**) and observe the amount of oil draining from the trap. The muffler will discharge oil as a normal part of its function. The amount will vary depending on how long the vacuum pump is in operation. Close valve after muffler is drained. Catch oil in an approved container and dispose of in accordance with local regulations and unit SOP.
- b. To replace the oil discharged, remove the oil filler cap (**figure 3 item 1**) and check the vacuum pump oil level. Refill to the correct level as indicated on the dipstick (**figure 3, item 2**).

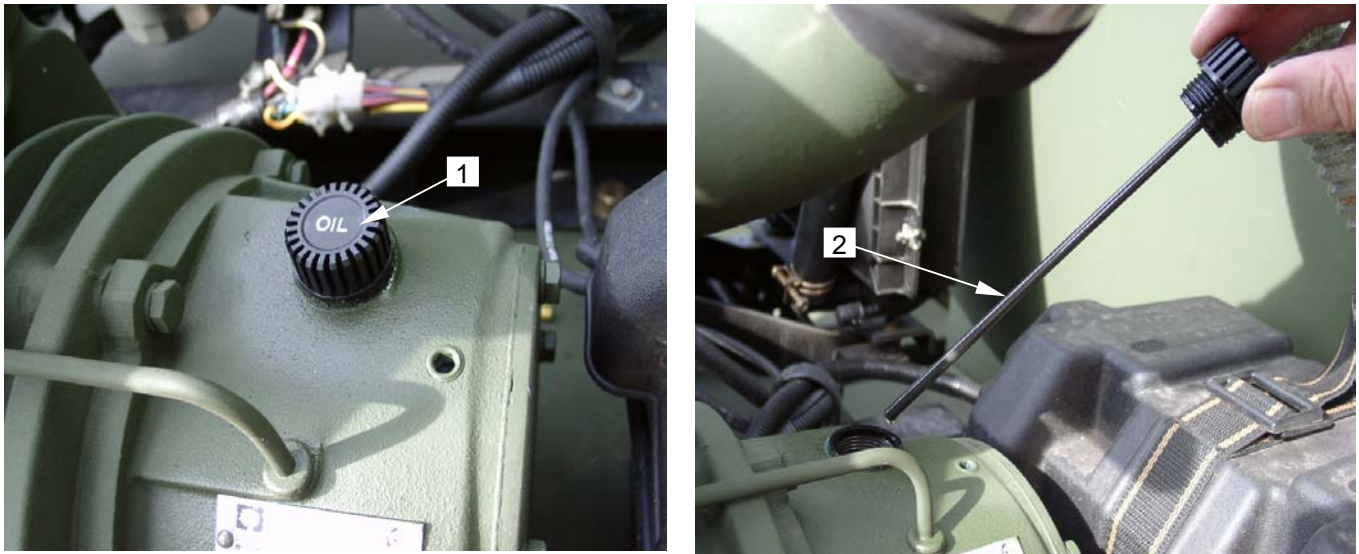


Figure 3. Vacuum Pump Lubrication Level

END OF WORK PACKAGE

OPERATOR MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
NSN 4630-01-513-8155
RIMS/TIRES
INSPECT

INITIAL SETUP:**Tools****Personnel Required**

MOS 77W, Water Treatment Specialist

Materials/Parts

Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off
 Ignition key removed
 Emergency stop button pushed in
 Wheel chocked
 Emergency brake set



WARNING

If the WWET/T is attached to a prime mover during this procedure, the prime mover engine must be shut OFF and parking brakes ON. Trailer parking brakes must be ON and chocks in place to avoid injuries from a moving trailer.

INSPECT

Inspect the rims and tires as described below. Describe any condition that must be reported to unit maintenance on DA Form 2404.

1. Inspect the rims (**figure 1, item 1**) for breaks, dents or other damage. Note any missing lug nuts (**figure 1, item 2**). Report a damaged rim and/or missing lug nuts to unit maintenance.
2. Inspect tires (**figure 1, item 3**) for damage and worn threads. Report damaged nuts and threads to unit maintenance. Note any flat or under-inflated tires.

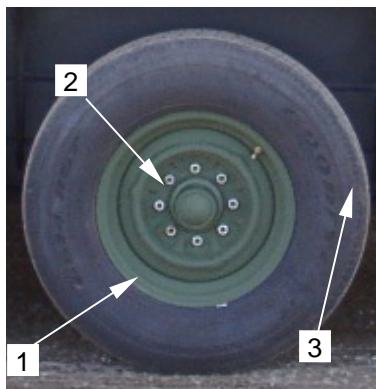


Figure 1. Rim and Tire

END OF WORK PACKAGE

**OPERATOR MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
NSN 4630-01-513-8155
HOSES AND CHOPPER TUBE/WAND
INSPECT**

INITIAL SETUP:**Tools**

Round Nose Pliers

Personnel Required

77W Water Treatment Specialist

Materials/Parts

Gasket, Coupling Half, QDisc 2½-in, (WP 0091 00, Item 13)

Gasket, Qdisc, 4-in, (WP 0091 00, Item 16)

General Lubricating Oil (WP 0091 00, Item 18)

Gloves, Work (WP 0089 00, Table 2, Item 5)

Rags, Wiping (WP 0091 00, Item 28)

Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

Hoses detached from WWET/T

Hoses steam cleaned/disinfected



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

INSPECT

Inspect the chopper tube/wand and intake and drain hoses as described below. Describe any condition that must be reported to unit maintenance on DA Form 2404.

1. Ensure that the chopper tube/wand and all hoses to be inspected have been rinsed, steam cleaned and disinfected as described in WP 0018 00.
2. Inspect hoses for damage, such as cuts, frayed areas, abrasions or any other damage that would cause it to leak.
3. Inspect hose couplings (**figure 1, item 1**) for damage such as dents and missing or broken lock arms (**figure 1, item 2**). Check hose clamps (**figure 1, item 3**) for secure attachment to the hose. Check for presence and condition of gaskets (**figure 1, item 4**) in female QD coupling half.
4. Ensure valve on chopper tube/wand is open before disconnecting.

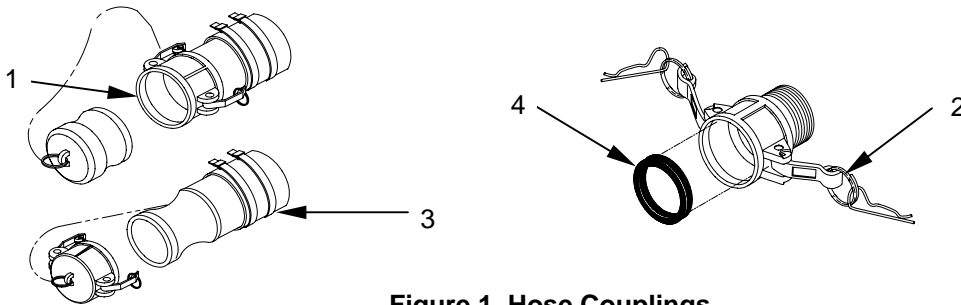


Figure 1. Hose Couplings

5. Inspect the chopper tube/wand for damage such as dents on the tube (**figure 2, item 1**), QD coupling (**figure 2, item 2**), or the ball valve (**figure 2, item 3**) handle. Check the handle for free movement. Check for presence and condition of coupling gasket.



Figure 2. Chopper Tube/Wand

SERVICE

Service the chopper tube/wand and intake and drain hoses as described below.

1. Using long round nose pliers remove any unserviceable gaskets (**figure 3, item 1**) from the female coupling (**figure 3, item 2**) on the hoses and chopper tube/wand (**figure 3, item 3**). Install new gaskets as required.

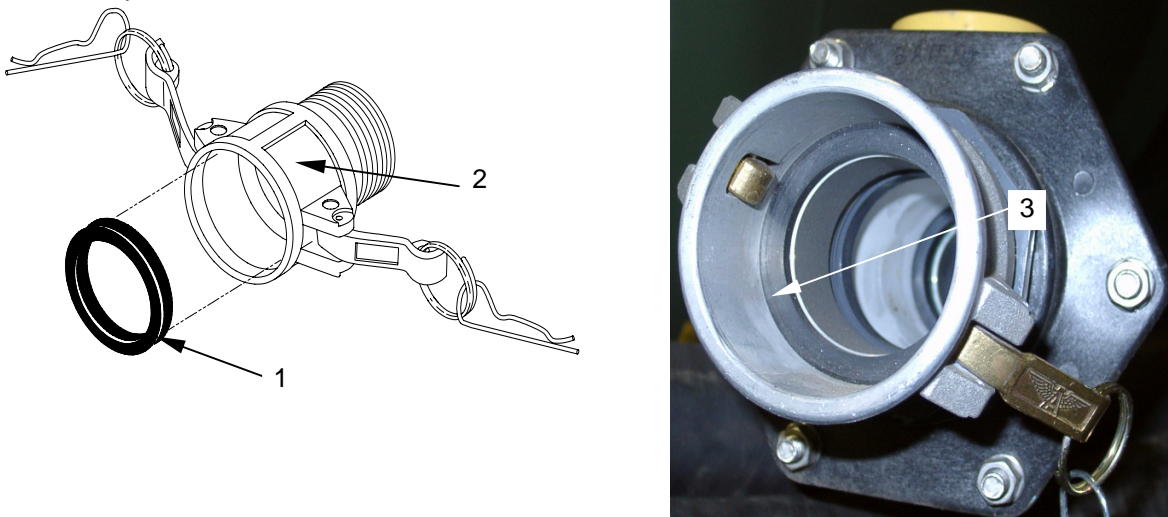


Figure 3. Gasket Installation

2. Apply two drops of general lubricating oil to the hinges (**figure 4, item 1**) of the lever arms (**figure 4, item 2**) on the female QD hose couplings (**figure 4, item 3**) dust caps (**figure 4, item 4**) and chopper tube/wand coupling (**figure 4, item 5**).

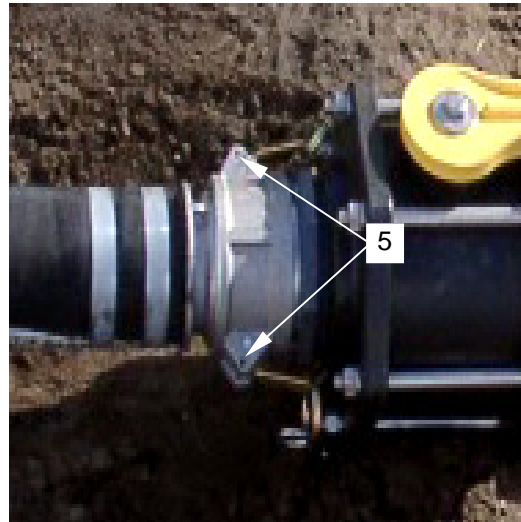
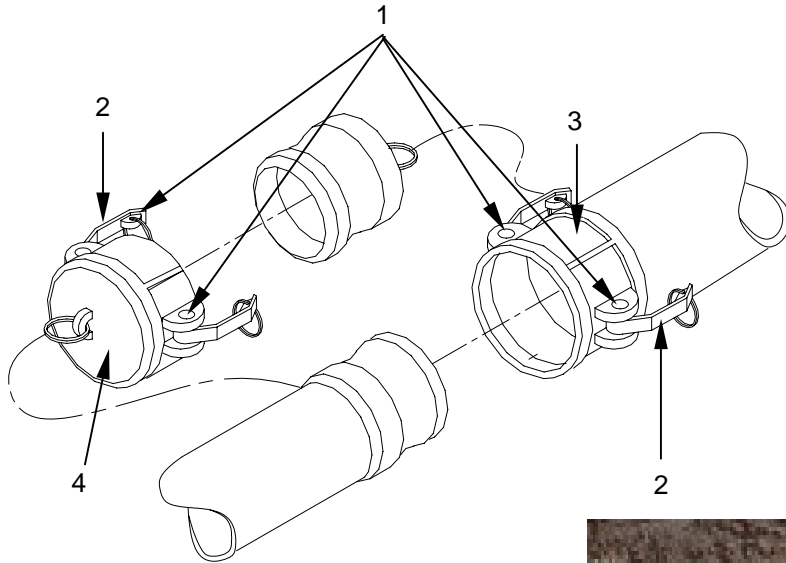


Figure 4. Lever Arm Lubricating Point

END OF WORK PACKAGE

TM 10-4630-207-13&P

CHAPTER 5

UNIT MAINTENANCE TROUBLESHOOTING PROCEDURES

WASTE WATER EVACUATION TANK TRAILER

**UNIT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
UNIT MAINTENANCE MALFUNCTION SYMPTOM INDEX**

GENERAL

This chapter provides unit maintenance information and includes troubleshooting and general maintenance procedures. Troubleshooting instructions covered in this section are unique to the WWET/T.

MALFUNCTION SYMPTOM INDEX

The malfunction symptom index lists common malfunctions that may occur during WWET/T inspection and operation. Find the malfunction to be eliminated and go to the indicated troubleshooting paragraph that follows. The index cannot list all malfunctions that may occur, all tests or inspections needed to find the fault, nor all actions required to correct the fault. If the existing malfunction is not listed, or cannot be corrected through this troubleshooting index, notify unit maintenance.

Malfunction	Troubleshooting Table
Engine won't crank over	1
Engine cranks but won't start.....	2
No vacuum/pressure building in tank.....	3
Tank not loading.....	4
Tank not draining	5
Float level indicator not functioning.....	6
Parking brakes not holding	7
Brakes locked	8

**UNIT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
UNIT MAINTENANCE TROUBLESHOOTING INSTRUCTIONS**

TROUBLESHOOTING PROCEDURES

The troubleshooting procedures contain tables listing the malfunctions, tests or inspections, and corrective action required to return the WWET/T to normal operation. Perform the steps in the order they appear in the tables. Each procedure is headed by an initial setup. This setup outlines what is needed as well as certain conditions, which must be met before starting the task. **DO NOT START THE TASK UNTIL:**

- You understand the task.
- You understand what you are to do.
- You understand what is needed to do the work.
- You have the things you need.

Table 1. Engine won't crank.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. Engine won't crank.	Step 1. Perform Procedure 1 as described in WP 0008 00.	
	Step 2. Examine battery cable(s) (1) connection at starter (2) , engine mount (3) and battery terminals. Check for corrosion.	Tighten connections of battery cable(s) at starter and battery terminals. If cables show corrosion, clean and reinstall.
	Step 3. Inspect and test ignition wires (4) . Look for loose or broken wires.	Replace key switch (5) as described in WP 0027 00.
		If condition persists, notify direct support maintenance.

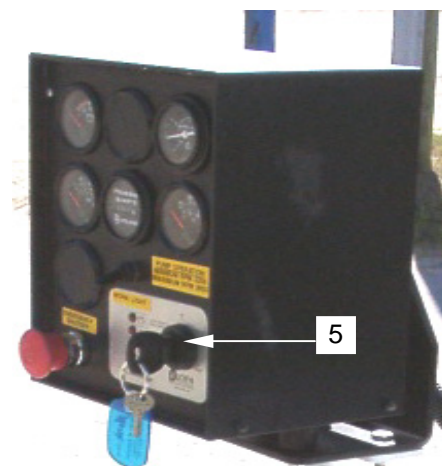
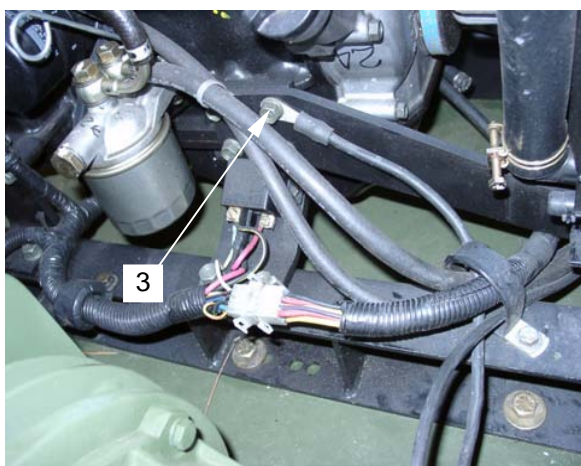
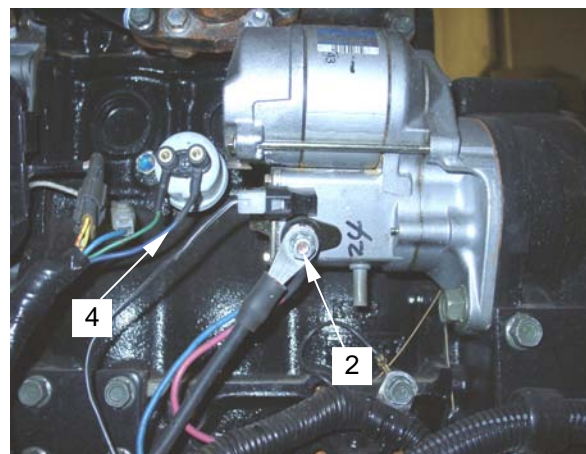


Table 2. Engine cranks but won't start.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. Engine cranks but won't start.	Step 1. Perform Procedure 1 as described in WP 0008 00.	
	Step 2. Determine if battery (1) is turning engine fast enough by observing battery voltage on the control panel while the engine turns.	Recharge or replace battery as described in WP 0034 00.
	Step 3. Check fuel filter (2) element for clogging.	Replace fuel filter as described in WP 0026 00.
		If condition persists, notify direct support maintenance.

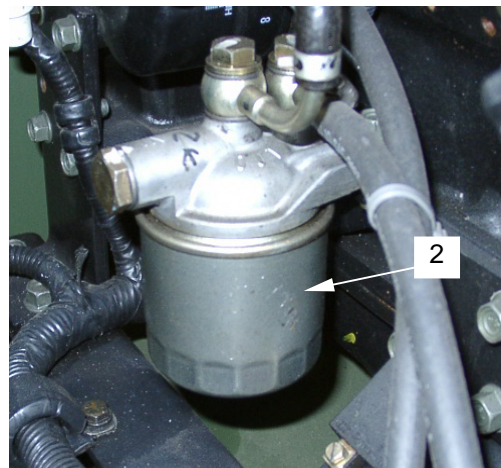
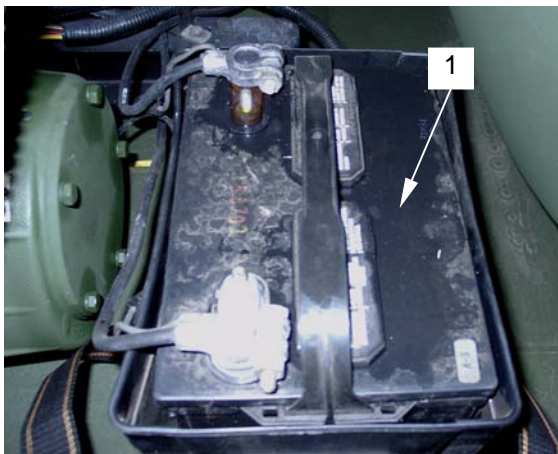


Table 3. No vacuum/pressure building in tank.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
3. No vacuum/pressure building in tank.	Step 1. Perform Procedure 2 as described in WP 0008 00.	
	Step 2. Check vacuum pump drive belt (1) for proper adjustment ($\frac{1}{4}$ -inch at center)	Adjust vacuum pump drive belt as described in WP 0029 00.
		If condition persists, notify direct support maintenance.

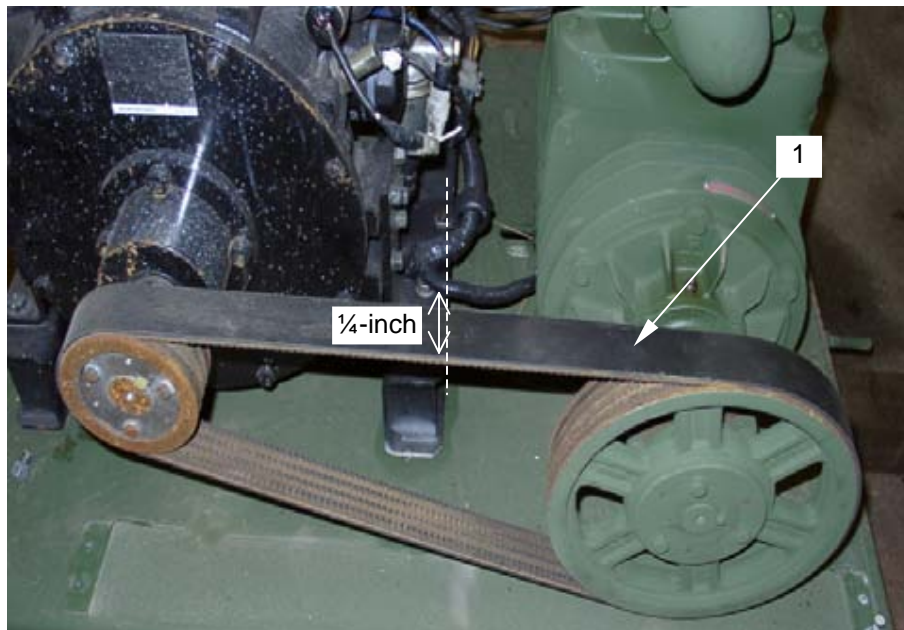


Table 4. Tank not loading.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. Tank not loading.	Step 1. Perform Procedure 3 as described in WP 0008 00.	
	Step 2. Perform Procedure 6 as described in WP 0008 00.	Replace any malfunctioning hydraulic component(s) as described in WP 0025 00.
	Step 3. Check operation of intake valve (1) WP 0005 00. Determine if valve is obstructed and will not open and close completely.	Remove obstruction in intake valve. Replace an intake valve, if required, as described in WP 0023 00.
	Step 4. Check operation of ball valve (2) on chopper tube/wand. Determine if valve is obstructed and won't open/close completely.	Replace a ball valve, if required, as described in WP 0047 00. Clear obstruction.
	Step 5. Ensure moisture trap (3) is drained and free of material. Examine sight glass (4) for evidence of clogging.	Open drain on moisture trap and let drain. Clean or replace the moisture trap as described in WP 0031 00.
	Step 6. Ensure isolation valve (5) is fully open. Check primary shutoff (6) float ball for free movement.	Pull valve handle down. Replace primary shutoff as described in WP 0019 00.

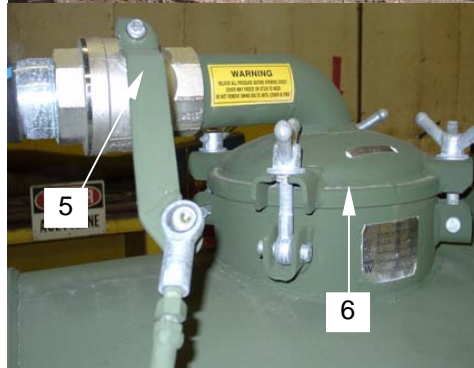
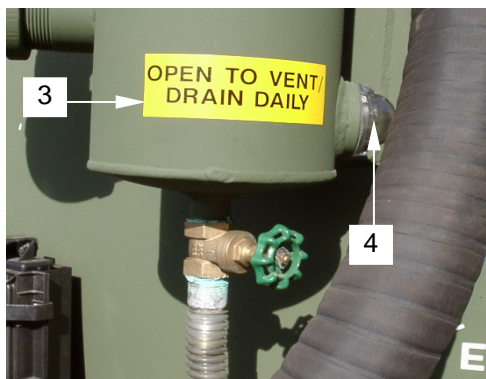
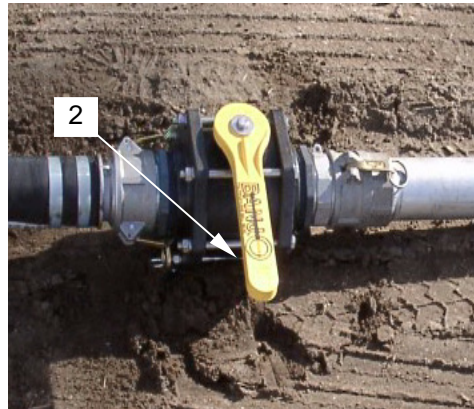
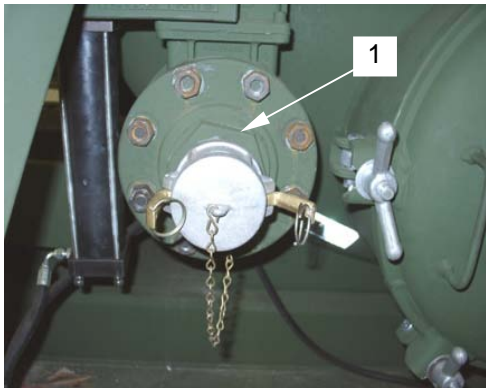


Table 5. Tank not draining.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
5. Tank not draining.	Step 1. Perform Procedure 4 as described in WP 0008 00.	
	Step 2. Perform Procedure 6 as described in WP 0008 00.	Replace any malfunctioning hydraulic component(s) as described in WP 0025 00.
	Step 3. Check operation of drain valve (1). Determine if valve is obstructed and will not open and close completely.	Remove obstruction in drain valve. Replace a drain valve, if required, as described in WP 0024 00.
	Step 4. Check operation of isolation valve (2). The valve must be open during draining operation.	Replace a malfunctioning isolation valve as described in WP 0032 00.
	Step 5. Ensure vacuum pump (3) is supplying pressure. Check pressure gage (4) reading (5 psi minimum).	Place lever in pressure position. Check drive belt and adjust if necessary as described in WP 0029.

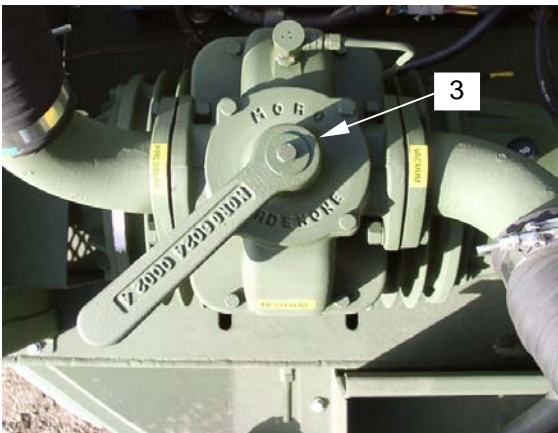
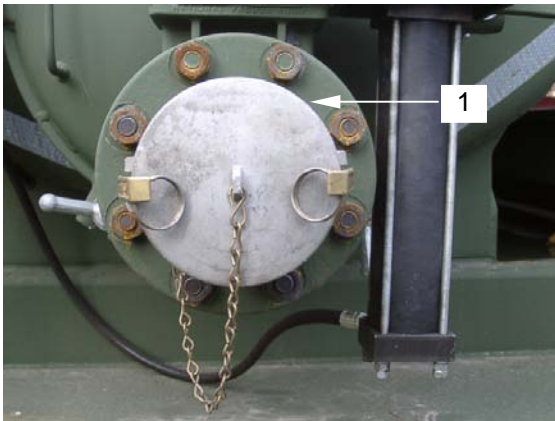

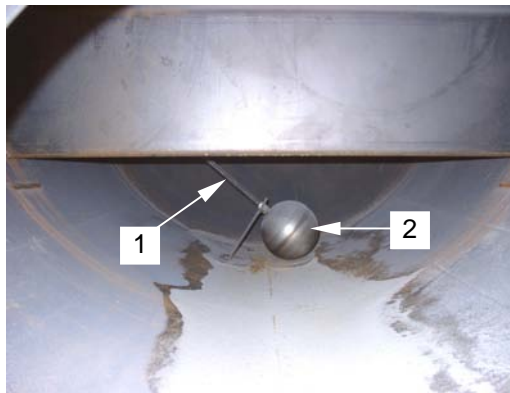


Table 6. Float level indicator not functioning.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6. Float level indicator not functioning.	Step 1. Perform Procedure 5 as described in WP 0008 00.	
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	Step 2. Inspect linkage (1) and ball (2) for binding due to dents or corrosion.	Replace defective parts of the float level linkage as described in WP 0021 00.



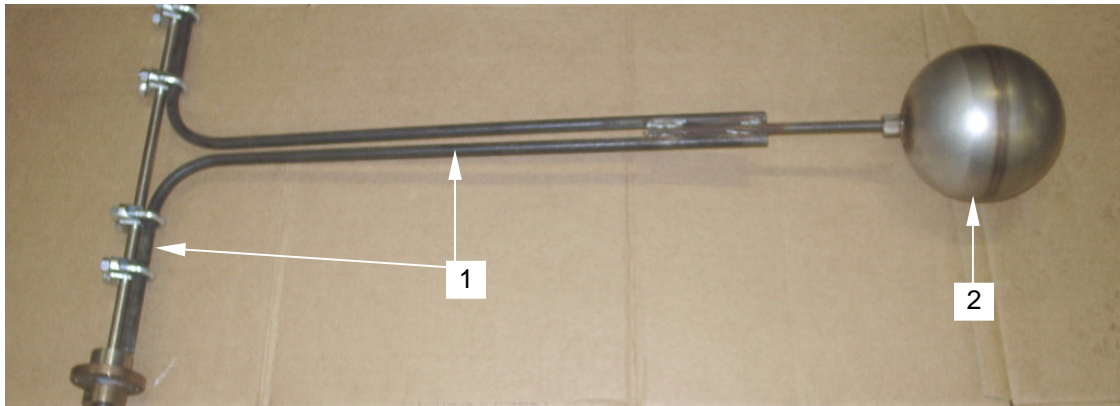
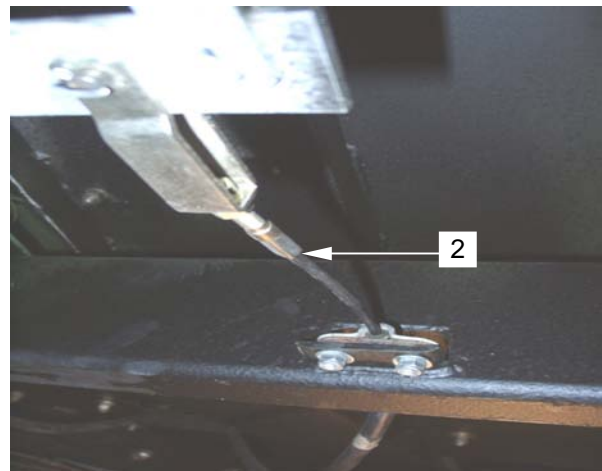


Table 7. Parking brakes not holding.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
7. Parking brakes not holding.	Step 1. Adjust brake cables on brake handles (1) .	Adjust and/or replace brake cables as described in WP 0037 00.
	Step 2. Inspect parking brake cables (2) for broken cable and improper adjustment.	Replace parking brake components as described in WP 0037 00.
	Step 3. Inspect brake shoes (3) for wear.	Replace brake shoes as described in WP 0045 00.



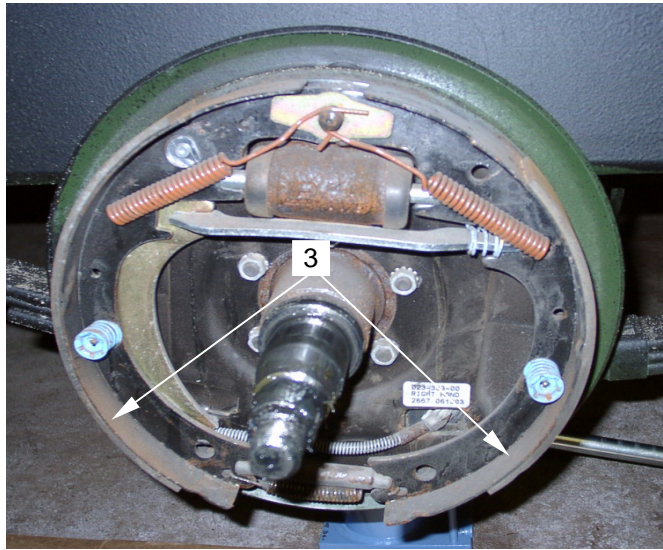
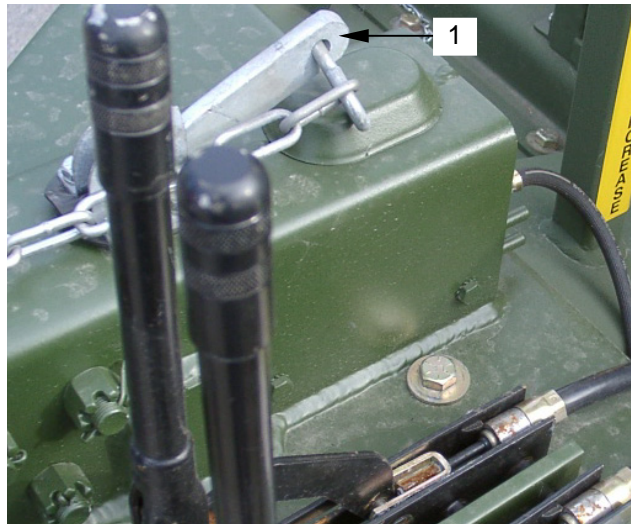
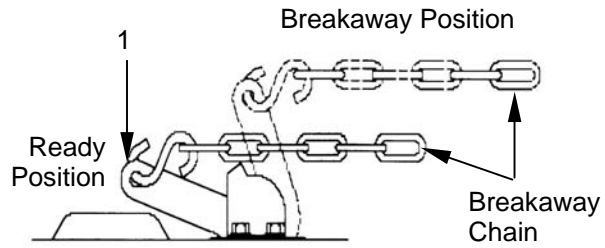


Table 8. Brakes locked.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
8. Brakes locked.	Step 1. Determine if brake lever (1) is in the Ready, or the Breakaway position.	If the lever is in the Breakaway position, reset the brake as described in WP 0045 00.



TM 10-4630-207-13&P

CHAPTER 6

UNIT MAINTENANCE INSTRUCTIONS

WASTE WATER EVACUATION TANK TRAILER

**UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
WASTEWATER TANK
SERVICE**

INITIAL SETUP:

Tools

Cleaner, Steam Pressure Jet, Trailer Mounted
(WP 0053 00, Table 2, Item 3)

Personnel Required

77W Water Treatment Specialist

Materials/Parts

Apron, Rubber (WP 0089 00, Table 2, Item 1)
Calcium Hypochlorite (WP 0091 00, Item 4)
Coveralls, Hooded (WP 0089 00, Table 2, Item 2)
Gloves, Rubber (WP 0089, Table 2, Item 4)
Goggles, Splash (WP 0089 00, Table 2, Item 6)
Rags, Wiping (WP 0091 00, Item 28)
Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

WWET/T empty, at atmospheric pressure
Tank cleaned and sanitized
Engine shut off
Ignition key removed
Emergency stop button pushed in
Wheel chocked
Emergency brake set
Manway open

CLEANING AND SANITIZING

The WWET/T tank requires periodic emptying and steam cleaning to maintain the proper function of the primary shutoff mechanism, drain valve, and float level indicator linkage. In addition, whenever access to the tank interior is required, or repairs to the primary shutoff, manway, float level indicator, hoses, or oil catch muffler are necessary, the tank and/or applicable component must be disinfected as described in paragraph 8.

1. Empty the wastewater tank as described under Tank Draining Operation in WP 0005 00. Ensure isolation valve is in the open position and the pressure gage reads \emptyset (zero).



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in this work procedure.



WARNING

Relieve pressure before opening intake and drain valves, or rear hatch. Manway cover may freeze or stick to hatch rim. To prevent serious injuries, do not remove swing bolts until cover is free of the manway rim.

2. Remove dust covers from intake (**figure 1, item 1**) and drain valve (**figure 1, item 2**). Open both intake and drain valves as described under Tank Filling Operation, and Tank Draining Operation in WP 0005 00.

3. Loosen but do not remove six swing bolts assemblies (**figure 1, item 3**) on the manway (**figure 1, item 4**).
4. Work manway (**figure 1, item 4**) free of the rim (**figure 1, item 5**).
5. When manway is free of the rim, swing it open (**figure 1, item 4**) and secure with the chain.
6. Remove the sludge rake (**figure 1, item 6**) from the equipment tray and scrape any remaining tank contents out of the tank.

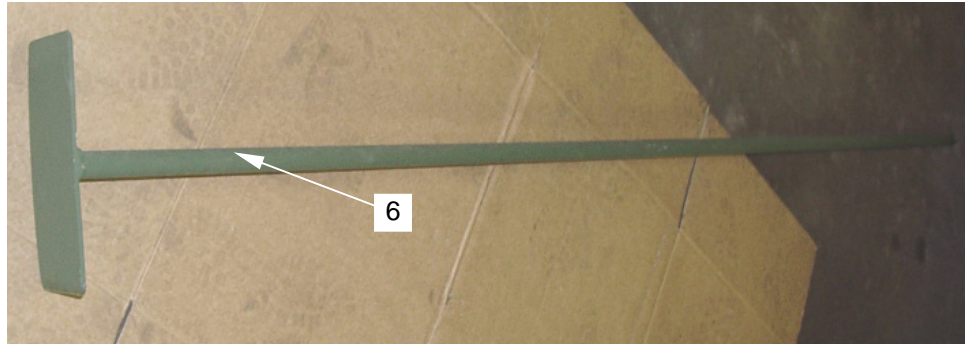
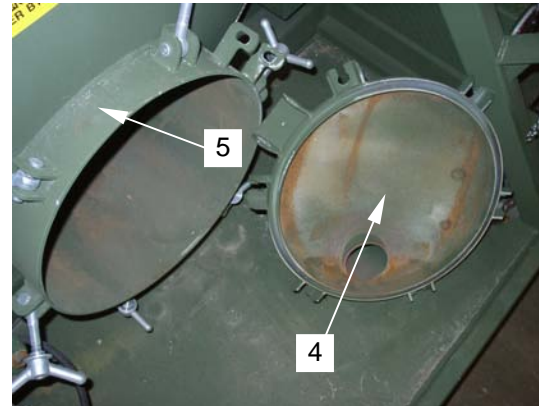
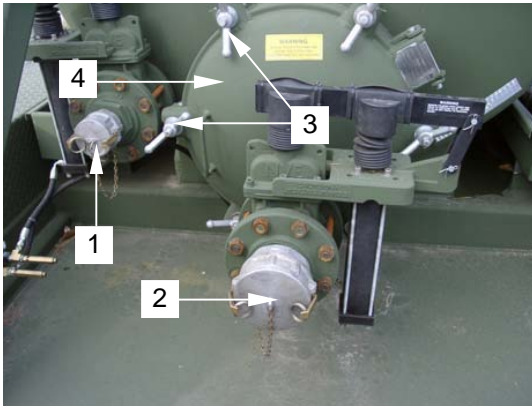


Figure 1. Opening Manway to Clean Tank.

7. Remove primary shutoff mechanism as described in WP 0019 00 under SERVICE.

**WARNING**

Implement confined space procedures as defined in Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.146, whenever someone is inside the tank.

**WARNING**

Contact the local safety office and obtain a confined space entry permit before entering the holding tank.

**WARNING**

Operators must wear heavy-duty plastic or rubber aprons, rubber gloves, safety goggles and/or face shield when cleaning wastewater-contaminated surfaces. Material may contain bacteria or viruses that present a danger to life or health.

NOTE

Clean the interior of the holding tank with a high pressure, multi-hose, detergent type steam cleaning unit and disinfect before performing any maintenance on the interior of the holding tank.

8. When the tank is completely empty (**figure 2, item 1**), rinse and steam clean the interior, the primary shutoff assembly, manway, as well as intake, drain hoses and oil catch muffler.

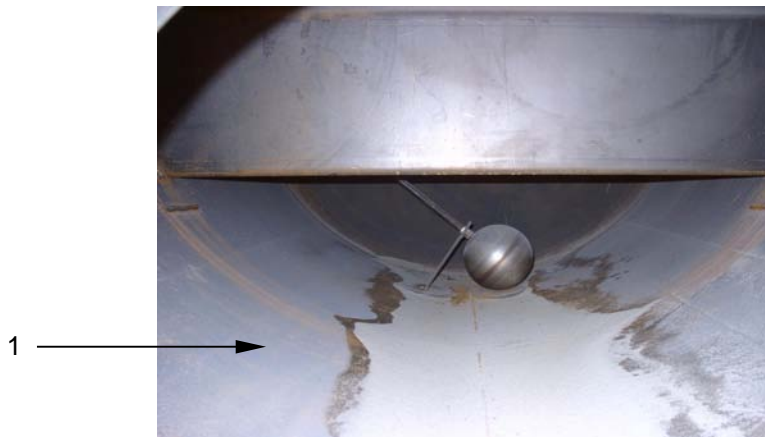


Figure 2. Tank Interior

NOTE

When components, such as the primary shutoff, manway, moisture trap, intake, drain hoses, or chopper tube/wand must be disinfected, they can be placed inside the tank and disinfected together with the tank.

9. Place any components to be disinfected inside the tank.
10. Close manway (**figure 3, item 1**) by placing swing bolt assemblies (**figure 3, item 2**) onto the cover and tighten them in a star pattern.
11. Close intake valve (**figure 3, item 3**) and drain valve (**figure 3, item 4**).

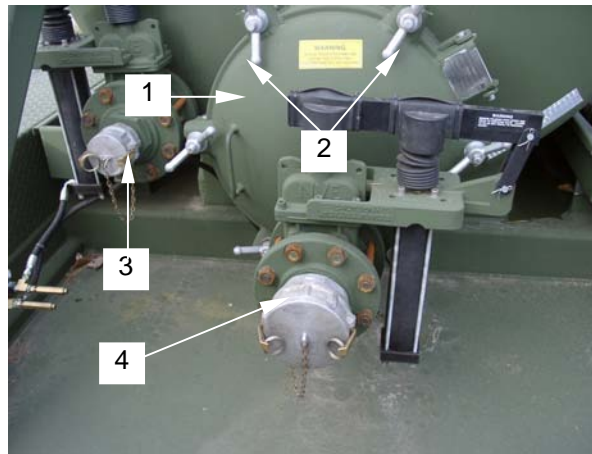


Figure 3. Closing Manway

**WARNING**

Calcium hypochlorite can be fatal if swallowed. In confined areas, inhalation can result in burns to the respiratory tract and cause permanent lung damage. Coming into contact with skin can cause chemical burns. Contact with eyes can cause eye irritation and corneal damage. Wear personal protective equipment: face shield, rubber gloves and apron while handling calcium hypochlorite. Mixing of calcium hypochlorite must be done in an open environment, but out of the wind, where toxic concentrations of reagents cannot form and wind will not cause exposure.

Practice good personal hygiene (frequent hand washing and showering, and eliminate the use of tobacco, food and drink) while handling chemicals. Wash exposed skin and change contaminated clothing promptly after any exposure.

12. Disinfect the interior of the tank and any components placed inside by filling it with a 100 PPM chlorine solution IAW TB MED 577. The tank capacity is 1,000 Gallons. Prepare the solution in one of four approved methods:
 - a. One (1) ampule of calcium hypochlorite to 1 gallon (3.8 liters) of potable water.
 - b. Five (5) level mess kit spoonfuls of calcium hypochlorite to 100 Gallons (380 liters) of potable water.
 - c. One (1) mess kit spoonful of liquid bleach to 1 Gallon (3.8 liters) potable water.
 - d. One (1) Gallon of liquid bleach to 100 Gallons (380 liters) of potable water.
13. The chlorine solution must remain in the tank for a period of 8 hours.
14. Tank disinfectant disposal.
 - a. As a hazardous solid waste, it must be disposed of in accordance with local, state, and federal regulations in a permitted hazardous waste treatment, storage and disposal facility treatment.
 - b. Rinse the tank and interior components with fresh water. Let tank and components air dry.
15. Calcium hypochlorite handling and storage
 - a. Spill release procedure: Remove all sources of ignition. Stop source of spill as soon as possible. Air release- suppress vapors by use of a water fog. All water must be contained and disposed of. Water release- Material is heavier than water and soluble. Advise local authorities of any contaminated water release. Land spill-notify local authorities.

15. Calcium hypochlorite handling and storage

- a. Spill release procedure: Remove all sources of ignition. Stop source of spill as soon as possible. Air release- suppress vapors by use of a water fog. All water must be contained and disposed of. Water release- Material is heavier than water and soluble. Advise local authorities of any contaminated water release. Land spill-notify local authorities.
- b. Keep product tightly sealed in original containers. Store product in a cool, dry, well ventilated area. Keep free from incompatible materials. Do not store at temperatures above 52° C. 125° F.

END OF WORK PACKAGE

**UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
PRIMARY SHUTOFF
SERVICE, REPLACE**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 77W, Water Treatment Specialist

Materials/Parts

Apron, Rubber (WP 0089 00, Table 2, Item 1)
Coveralls, Hooded (WP 0089 00, Table 2, Item 2)
Gasket, Manway Assembly (WP 0091 00, Item 15)
Gloves, Rubber (WP 0089 00, Table 2, Item 4)
Rags, Wiping (WP 0091 00, Item 28)
Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

Tank empty, at atmospheric pressure
Tank cleaned and sanitized
Engine shut off
Ignition key removed
Emergency stop button pushed in
Wheel chocked
Emergency brake set



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, safety splash goggles, respirator and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

SERVICE

The primary shutoff must be serviced when there is evidence that the mechanism is not shutting off tank loading completely when the tank is full. In that case, moisture will escape through the upper air hose into the moisture trap where it will collect. Whenever the amount of liquid drained from the moisture trap after tank loading exceeds approximately one cup, the primary shutoff must be serviced. To service the primary shutoff proceed as follows:

1. Ensure tank is at atmospheric pressure, isolation valve is open and pressure gage reads 0.
2. Remove the nut on the handle linkage (**figure 1, item 1**), and disconnect linkage.
3. Loosen hose clamp (**figure 1, item 2**) on upper air hose (**figure 1, item 3**) and disconnect it from the isolation valve (**figure 1, item 4**).

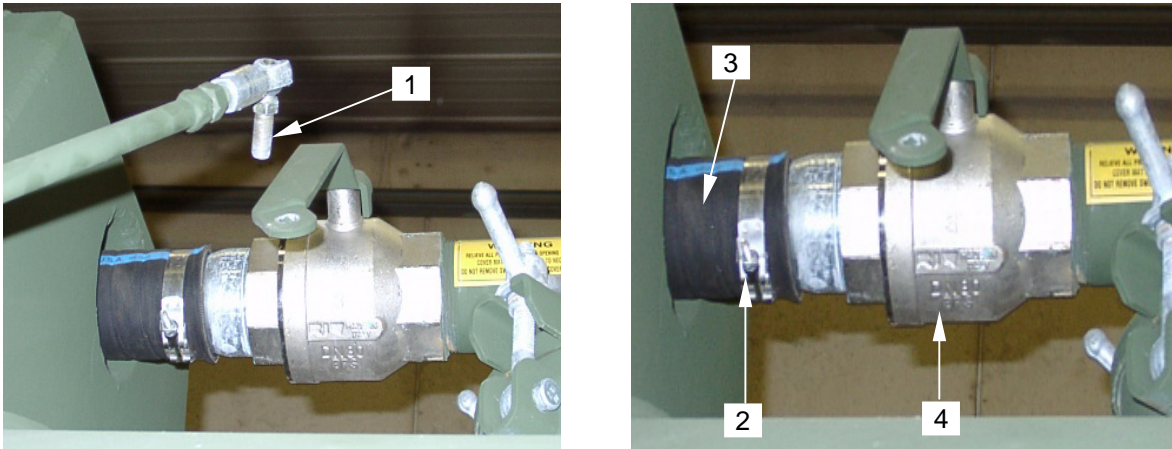


Figure 1. Primary Shutoff Linkage and Upper Air Hose Clamp Removal

- Loosen primary hatch cover (figure 2, item 1) wing nut assemblies (figure 2, item 2) enough to move them aside.



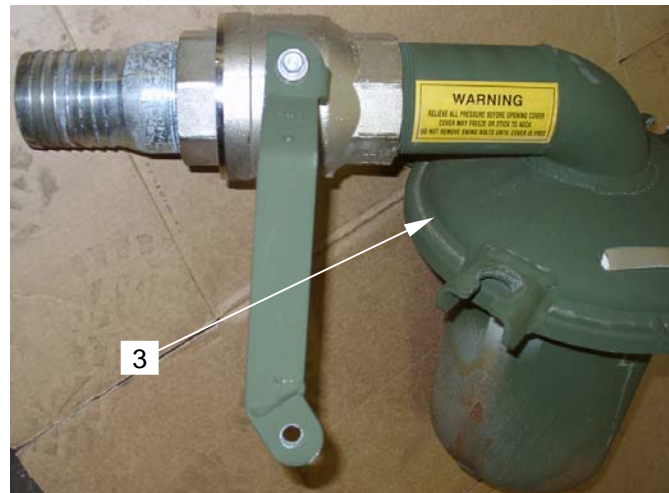
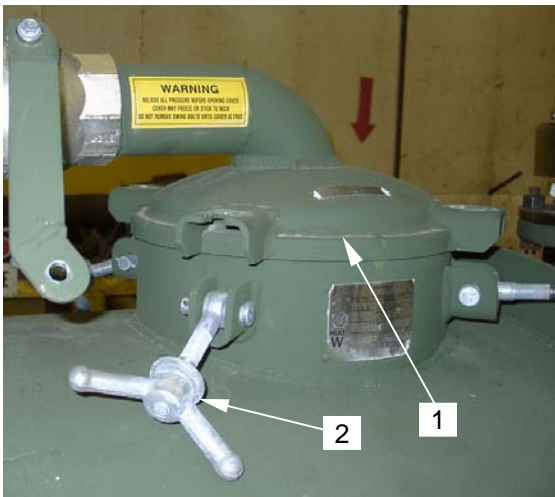
WARNING

The primary shutoff portal lid and isolation valve assembly is heavy (40 lbs). To prevent injuries, two people are required to remove it from the trailer.

CAUTION

For equipment located in CONUS, use only a certified, new replacement cover to retain DOT certification of the WWET/T.

- Using two people, remove the portal lid and isolation valve assembly (figure 2, item 3) from the trailer.



6. Rinse with fresh water and clear assembly of obstructions that may prevent their proper functioning. Inspect the primary shutoff mechanism, particularly the float ball (**figure 3, item 1**), ball cage lid mount (**figure 3, item 2**), and seat (**figure 3, item 3**).

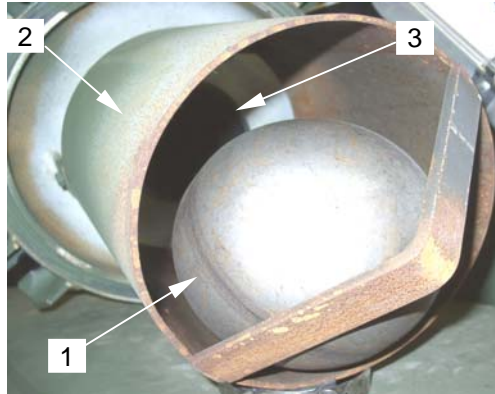


Figure 3. Primary Shutoff Mechanism

7. Replace a defective float ball, basket, or seat, if necessary, as described under REPLACE in this WP.
8. Re-install primary shutoff portal lid and isolation valve assembly as described under REPLACE in this WP.

REPLACE

Replace the following parts as required:

1. Primary shutoff portal lid gasket.
 - a. Remove the primary shutoff portal lid and isolation valve assembly (**figure 4, item 1**) from the tank as described under SERVICE in this WP.



WARNING

To prevent injuries from pinching, be careful when removing gasket with needle nose pliers. Keep hands away from hatch lip.

- b. Replace a hatch gasket (**figure 4, item 2**) by prying it from the portal lid (**figure 4, item 3**) using long round nose pliers.
- c. Remove remnants of the unserviceable gasket from the groove (**figure 4, item 4**) and clean groove before installing a new gasket.
- d. Cut a 36-inch length of gasket and install in groove.



Figure 4. Primary Shutoff Gasket Removal



WARNING

The primary shutoff portal lid and isolation valve assembly are heavy. To prevent injuries, two people are required to install it.

- e. Place the primary shutoff portal lid and isolation valve assembly (figure 5, item 1) onto the portal lid collar (figure 5, item 2).
- f. Install upper air hose (figure 5, item 3) onto isolation valve hose nipple (figure 5, item 4) and secure with hose clamp (figure 5, item 5).
- g. Secure primary shutoff portal lid with wing nut assemblies (figure 5, item 6).
- h. Re-connect isolation valve handle linkage (figure 5, item 7).

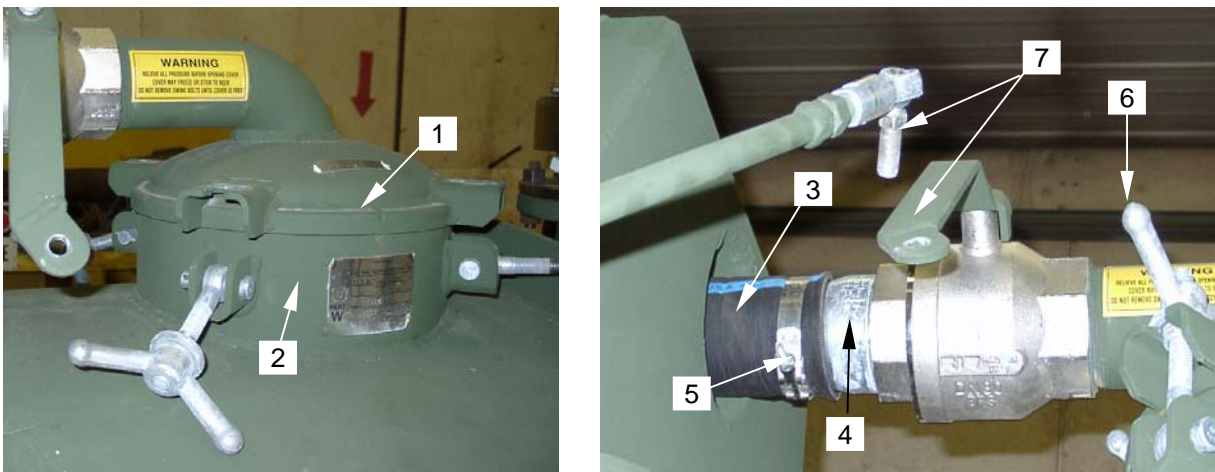


Figure 5. Installing Primary Shutoff and Isolation Valve Assembly

2. Wing Nut Assembly.

- a. Loosen wing nut assembly (**figure 6, item 1**) to be replaced and move it off the portal lid (**figure 6, item 2**).
- b. Using a $\frac{5}{32}$ -inch punch (**figure 6, item 3**), remove the lock pin (**figure 6, item 4**) from the wing nut assembly hinge pin (**figure 6, item 5**).
- c. Remove the hinge pin (**figure 6, item 5**) from the portal lid collar bracket (**figure 6, item 6**) and wing nut assembly eyebolt (**figure 6, item 7**).
- d. Position new wing nut assembly eyebolt (**figure 6, item 7**) into the portal lid collar bracket (**figure 6, item 6**) and insert hinge pin (**figure 6, item 5**) through the bracket and eyebolt.
- e. Install the lock pin (**figure 6, item 4**) into hinge pin (**figure 6, item 5**). Place wing nut assembly (**figure 6, item 1**) onto portal lid (**figure 6, item 2**) and tighten.

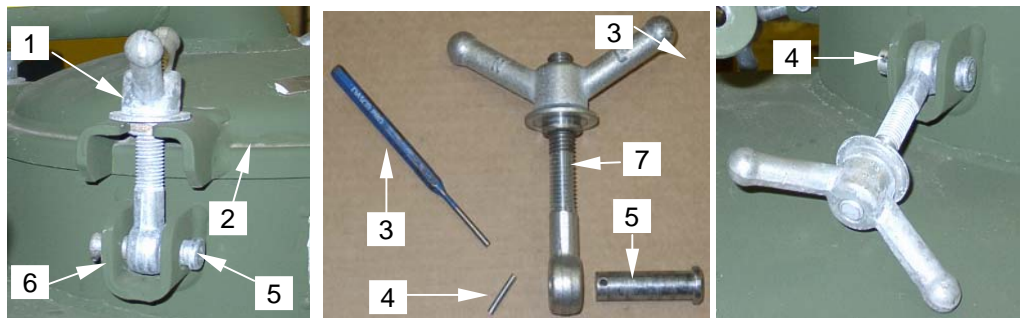


Figure 6. Replacing Wing Nut Assembly

3. Primary Shutoff Mechanism.

- a. Remove the primary shutoff portal lid and isolation valve assembly from the tank as described under SERVICE in this WP.
- b. Remove hex bolts, hex nuts and lock washers (**figure 7, item 1**) from the three cage lid mounting brackets (**figure 7, item 2**).
- c. Remove basket (**figure 7, item 3**) from portal lid (**figure 7, item 4**).
- d. Remove float ball (**figure 7, item 5**) from shutoff seat (**figure 7, item 6**).

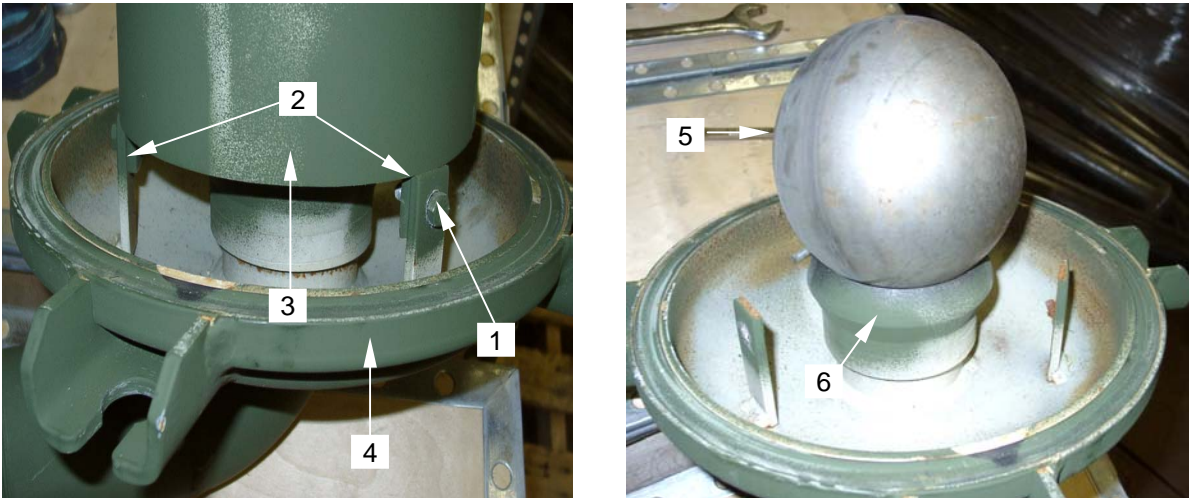


Figure 7. Removing Primary Shutoff Mechanism

- e. Loosen hose clamp (**figure 8, item 1**) on shutoff seat collar (**figure 8, item 2**) and remove seat from portal lid.
- f. Place new shutoff seat (**figure 8, item 3**) into position and secure with hose clamp (**figure 8, item 1**).
- g. Place new float ball (**figure 8, item 4**) onto shutoff seat (**figure 8, item 3**) as shown.

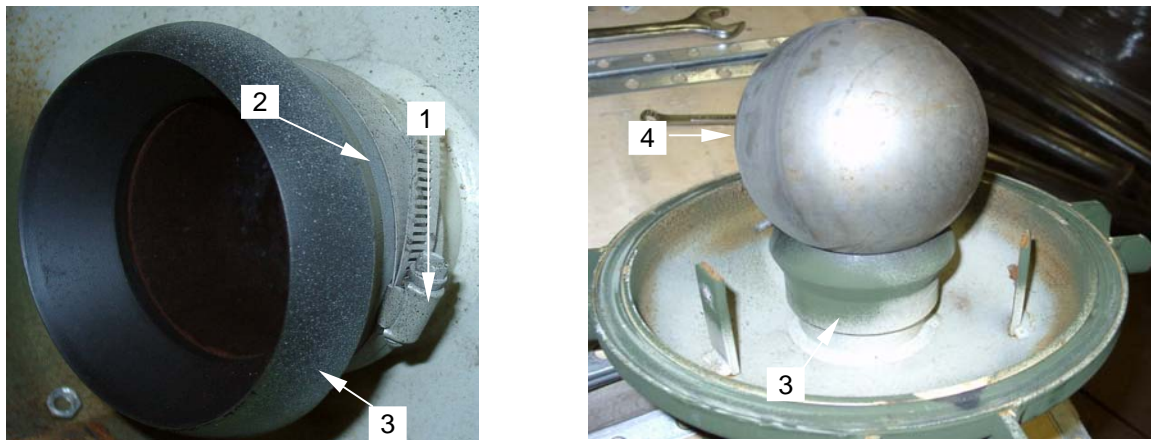


Figure 8. Removing Primary Shutoff Seat

- h. Position new basket (**figure 9, item 1**) over float ball and align with brackets (**figure 9, item 2**). Install new hex bolts, hex nuts and flat washers (**figure 9, item 3**) to secure basket to primary shutoff portal lid and isolation valve assembly (**figure 9, item 4**).
- i. Place the primary shutoff portal lid and isolation valve assembly (**figure 9, item 4**) onto the portal lid (**figure 9, item 5**).

- j. Install upper air hose (**figure 9, item 6**) onto isolation valve hose nipple (**figure 9, item 7**) and secure with hose clamp (**figure 9, item 8**).
- k. Secure primary shutoff portal lid (**figure 9, item 9**) with wing nut assemblies (**figure 9, item 10**).
- l. Re-connect isolation valve handle linkage (**figure 9, item 11**).

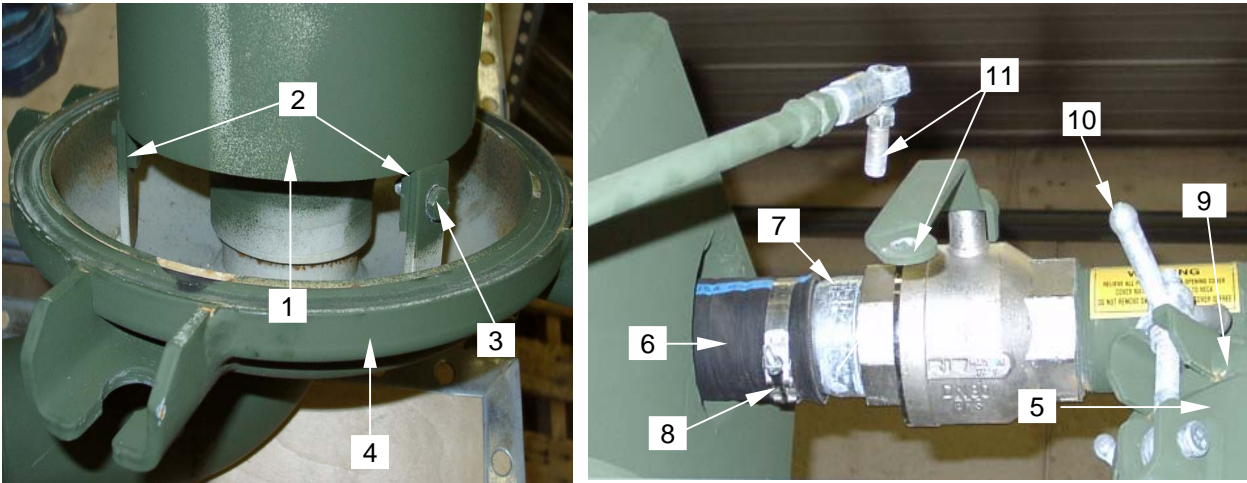


Figure 9. Installing Primary Shutoff Mechanism

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
SAFETY RELIEF VALVE
INSPECT, REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 63B, Light Vehicle Mechanic

Materials/Parts

Gasket, Safety Relief (WP 0091 00, Item 17)
 Gloves, Rubber (WP 0089 00, Table 2, Item 4)
 Rags, Wiping (WP 0091 00, Item 28)
 Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

Tank empty, at atmospheric pressure
 Engine shut off
 Ignition key removed
 Emergency stop button pushed in
 Wheel chocked
 Emergency brake set

INSPECT

WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

1. Inspect the safety relief valve (**figure 1, item 1**) for damage, missing, or loose mounting hardware.
2. Replace missing and tighten loose hardware.

REPLACE

1. Ensure isolation valve is open and pressure gage on the oil catch muffler reads zero.
2. Loosen and remove the four hex nuts (**figure 1, item 2**) from the flange studs (**figure 1, item 3**).
3. Remove safety relief valve (**figure 1, item 1**) from flange (**figure 1, item 4**).

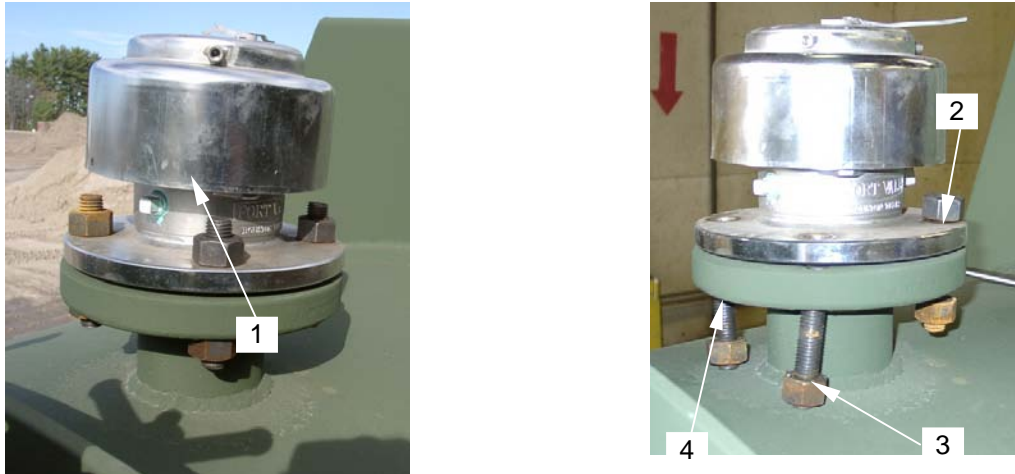


Figure 1. Safety Relief Valve and Mounting Hardware

4. Remove gasket (**figure 2, item 1**) and discard in an approved container.
5. Clean mating surfaces of tank flange (**figure 2, item 2**) and safety relief valve seating surface (**figure 3, item 1**).



Figure 2. Gasket and Mating Surface

6. Install new gasket (**figure 3, item 2**) onto flange (**figure 3, item 3**).
7. Install new safety relief valve (**figure 3, item 4**) onto flange (**figure 3, item 3**)
8. Install and tighten mounting nuts (**figure 3, item 5**) to flange studs (**figure 3, item 6**).

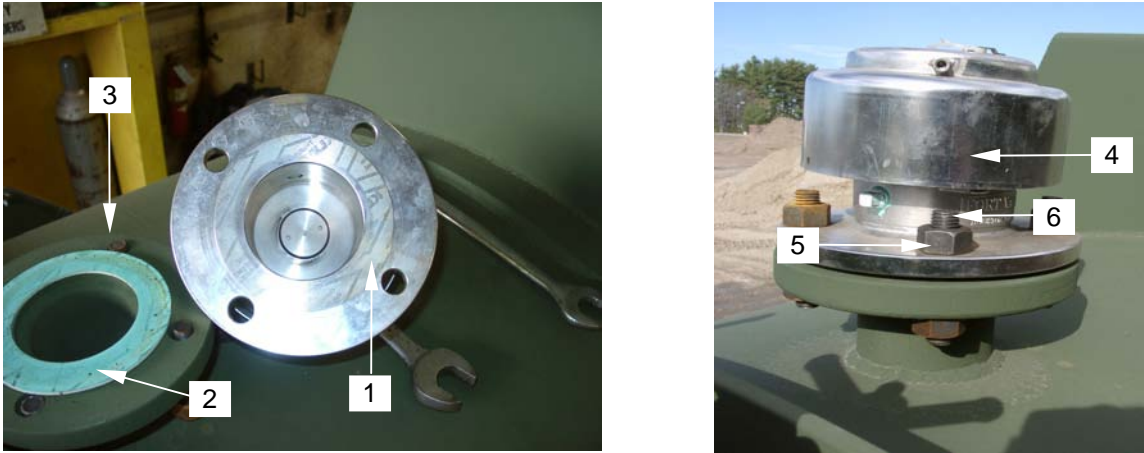


Figure 3. Installing Safety Relief Valve

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
FLOAT LEVEL INDICATOR
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 77W Water Treatment Specialist (2)

Materials/Parts

Apron, Rubber (WP 0089 00, Table 2, Item 1)
 Coveralls, Hooded (WP 0089 00, Table 2, Item 2)
 Gloves, Rubber (WP 0089 00, Table 2, Item 4)
 Goggles, Splash (WP 0089 00, Table 2, item 6)
 Packing, Float Level Indicator (WP 0091 00, Item 25)
 Rags, Wiping (WP 0091 00, Item 28)
 Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

Tank empty, at atmospheric pressure
 Tank cleaned and sanitized
 Engine shut off
 Ignition key removed
 Emergency stop button pushed in
 Wheel chocked
 Emergency brake set

REPLACE**NOTE**

To replace the float level indicator packing, or exterior arrow indicator, proceed as described in paragraph 1., below. To replace any part of the internal float level indicator linkage, the tank must be cleaned and disinfected as described in WP 0018 00. Proceed as described in paragraph 2., below.



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

1. To replace the float level indicator packing or exterior arrow indicator (**figure 1, item 1**), proceed as follows:
 - a. Loosen the setscrew (**figure 1, item 2**) on the float level indicator sleeve (**figure 1, item 3**) and remove the float level indicator (**figure 1, item 1**).

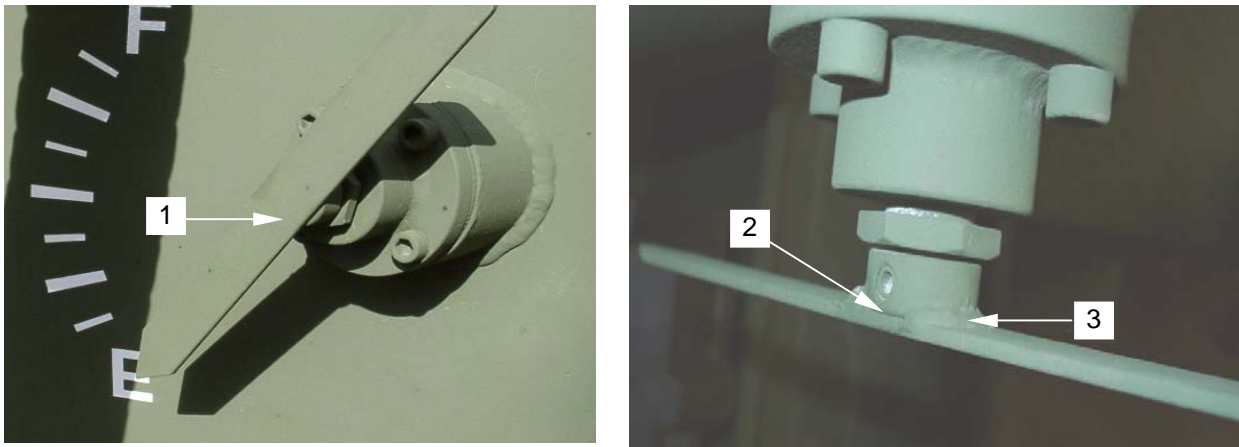


Figure 1. Removing Arrow Indicator

- b. Remove the level indicator packing gland nut (**figure 2, item 1**) and existing packing.

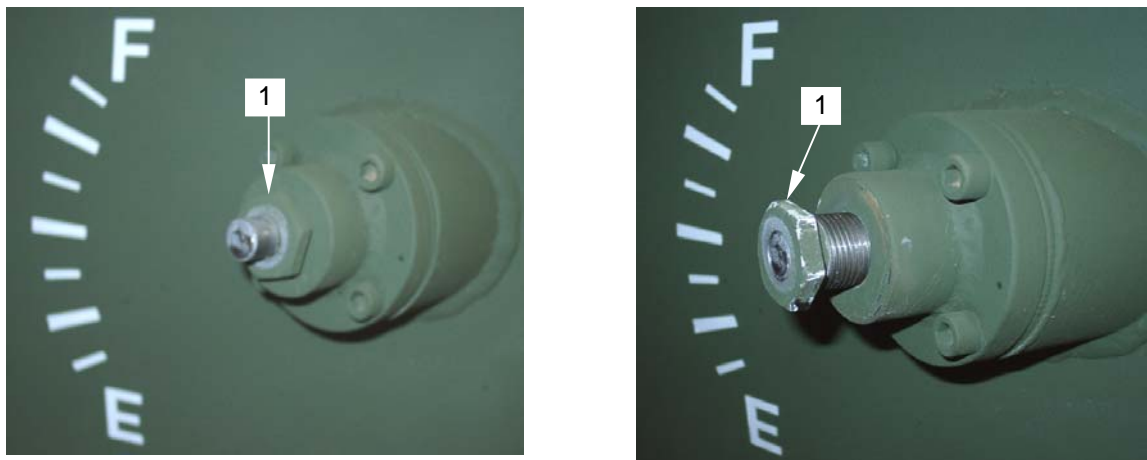


Figure 2. Removing Packing Gland Nut

- c. Obtain an approximately six inch length of packing (**figure 3, item 1**) and wrap it around the threaded cylinder rod (**figure 3, item 2**).
- d. Re-install packing gland nut (**figure 3, item 3**) and tighten sufficiently to stop the leak, but ensure arrow indicator moves freely.

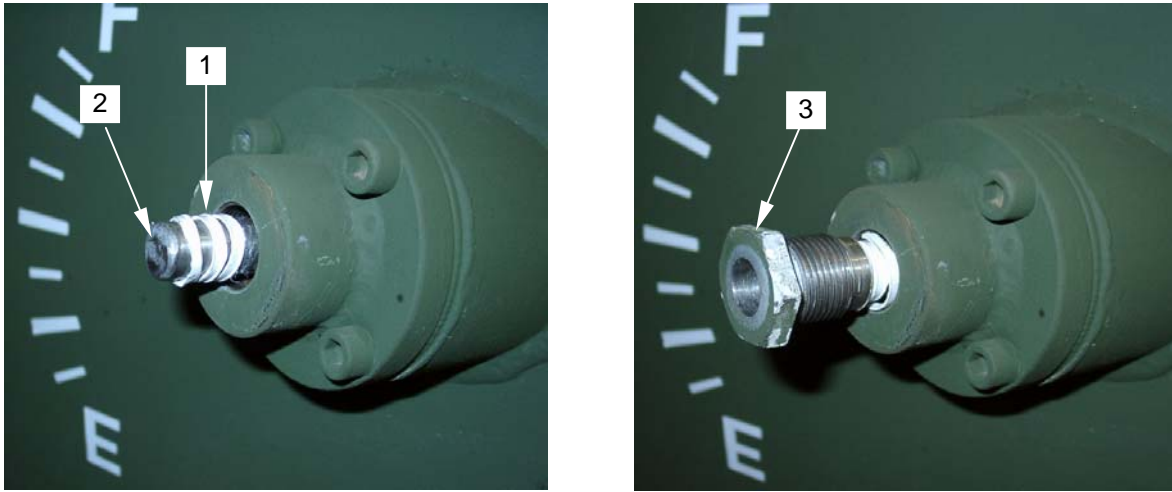


Figure 3. Installing Float Level Indicator Packing

- e. Repeat procedure in b. through d. if leak persists.
- f. Re-install arrow indicator (**figure 4, item 1**) and tighten setscrew (**figure 4, item 2**).

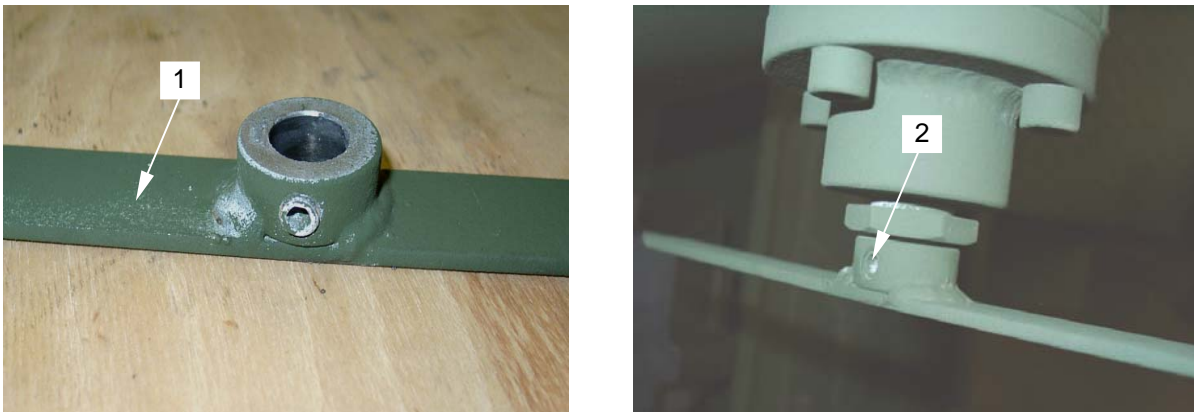


Figure 4. Installing Arrow Indicator

**WARNING**

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

**WARNING**

Do not enter the wastewater tank interior until it has been cleaned and disinfected. Wear gloves and protective suit to prevent serious illness due to contamination. Wear personnel protective clothing, hardhat, and breathing mask. Post a second person outside the tank at all times during entry.

**WARNING**

Contact the local safety office and obtain a confined space entry permit before entering the holding tank.

**WARNING**

Implement confined space procedures as defined in Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.146, when entering the tank.

2. To replace the float level indicator linkage, proceed as follows:
 - a. Clean and sanitize the tank interior as described in WP 0018 00.

**WARNING**

To prevent injuries from pinching be careful when moving the rear hatch cover and float ball linkage. Keep hands away from hinge.

- b. Ensure isolation valve is in open position and pressure gage reads.

- c. Open manway assembly outlet (**figure 5, item 1**) as described in paragraphs 2., through 5., under CLEANING, in WP 0018 00.
- d. Wearing full protective clothing (suit and gloves), enter the tank through the manway.
- e. Locate the float ball linkage assembly (**figure 5, item 2**) with float ball (**figure 5, item 3**) and the four clamps (**figure 5, item 4**) that hold it to the cylinder rod (**figure 5, item 5**).

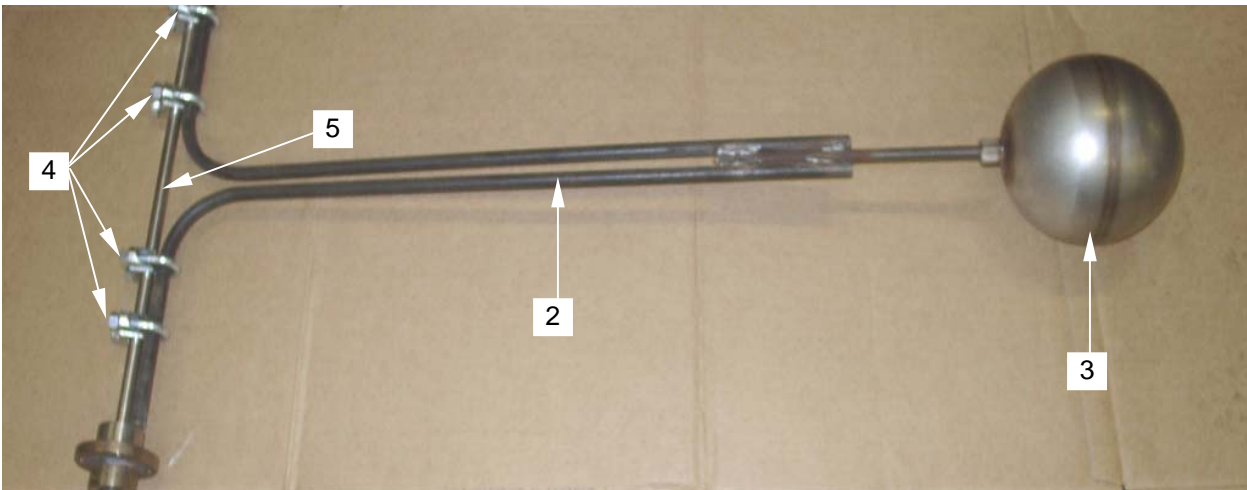
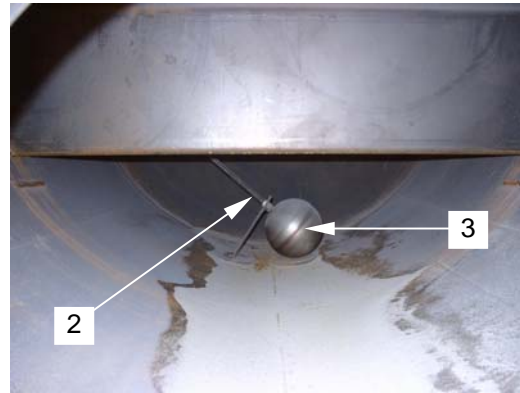
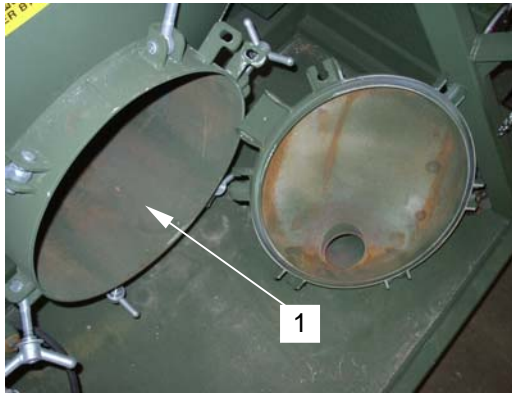


Figure 5. Rear Hatch and Float Ball Linkage Assembly

- f. Remove the clamp nuts (**figure 6, item 1**) and the float ball linkage (**figure 6, item 2**) with float ball (**figure 5, item 3**) from the cylinder rod (**figure 6, item 3**).

NOTE

Two people are required to install the float ball linkage assembly. One inside the tank and one outside.

- g. Place new float ball linkage (**figure 6, item 2**) with float ball (**figure 5, item 3**) attached into position and install the clamps in opposite directions as pictured (**figure 5, item 4**) to hold it loosely to the cylinder rod (**figure 6, item 3**).

- h. Outside the tank, position the tank level indicator to the 'empty' position (**figure 7, item 1**).
- i. Inside the tank, while the float sits at the 'empty' position, tighten the float ball linkage clamp nuts (**figure 6, item 1**).



Figure 6. Float Ball Linkage Clamps

- j. Lift the float ball (**figure 5, item 3**) to check for proper movement of the float level indicator (**figure 7, item 1**).
- k. Exit tank through manway (**figure 7, item 2**).

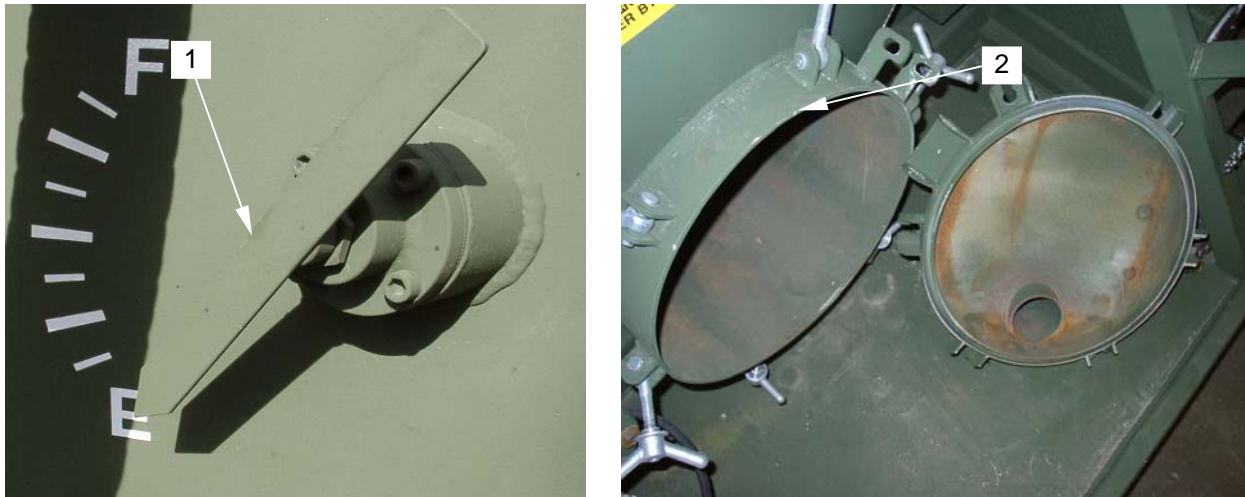


Figure 7. Float Level Indicator and Manway

END OF WORK PACKAGE

**UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
MANWAY ASSEMBLY
SERVICE, REPLACE**

INITIAL SETUP:

Tools

Cleaner, Steam Pressure Jet, Trailer Mounted (WP 0053 00, Table 2, Item 3)
Roll Pin Punch Set (WP 0053 00, Table 2, Item 11)

Personnel Required

77W Water Treatment Specialist

Materials/Parts

Gasket 4-inch (WP 0091 00, Item 12)
Gasket (Manway Assembly) (WP 0091 00, Item 15)
Gloves, Rubber (WP 0089 00, Table 2, Item 4)
Rags, Wiping (WP 0091 00, Item 28)
Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

WWET/T empty, at atmospheric pressure
Tank cleaned and sanitized
Isolation valve open
Drain valve removed

SERVICE



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.



WARNING

To prevent injuries from pinching, be careful when removing gasket. Keep hands away from manway assembly lip.



WARNING

Relieve pressure before opening manway. Manway may freeze or stick to manway rim. To prevent serious injuries, do not remove swing bolts until cover is free of the manway rim.

1. To service the manway, empty the wastewater tank as described under Tank Draining Operation in WP 0005 00. Ensure isolation valve is in open position and the pressure gage reads ∅ (zero).

2. Loosen but do not remove six wing nut assemblies (**figure 1, item 1**) on the rear manway (**figure 1, item 2**).
3. Work manway (**figure 1, item 2**) free of the rim (**figure 1, item 3**).
4. When manway is free of the rim, move wing nut assemblies off the cover (**figure 1, item 1**). Swing it open and secure with chain (**figure 1, item 4**).

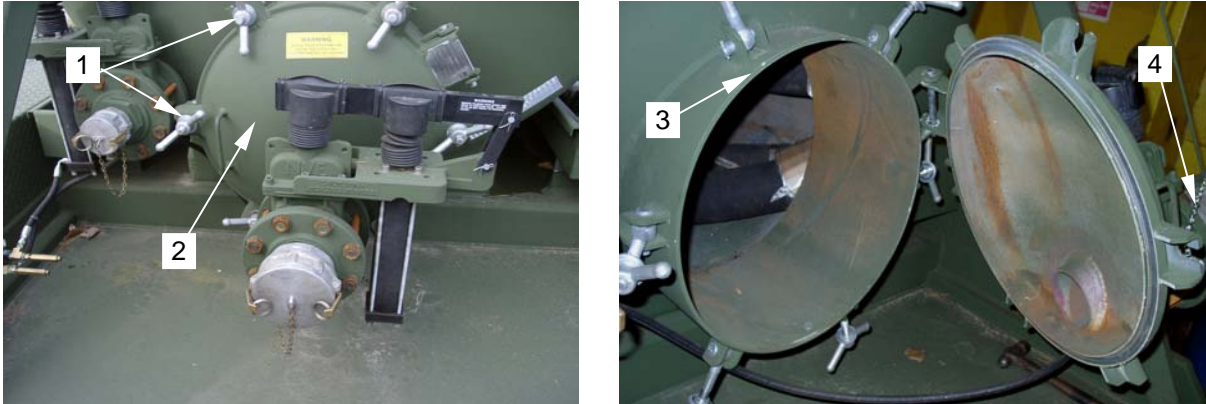


Figure 1. Opening Manway to Change Gasket

5. Rinse with fresh water and steam clean manway (**figure 2, item 1**).
6. Pry the gasket (**figure 2, item 2**) from the groove and remove it.
7. Clean out the groove of gasket remnants and wipe clean with rag.
8. Cut a 40-inch length of gasket and place it into the groove. Make sure it is firmly seated around the cover.
9. Unhook chain (**figure 2, item 3**) and close manway. Place swing bolt assemblies (**figure 2, item 4**) onto cover and tighten in a star pattern.

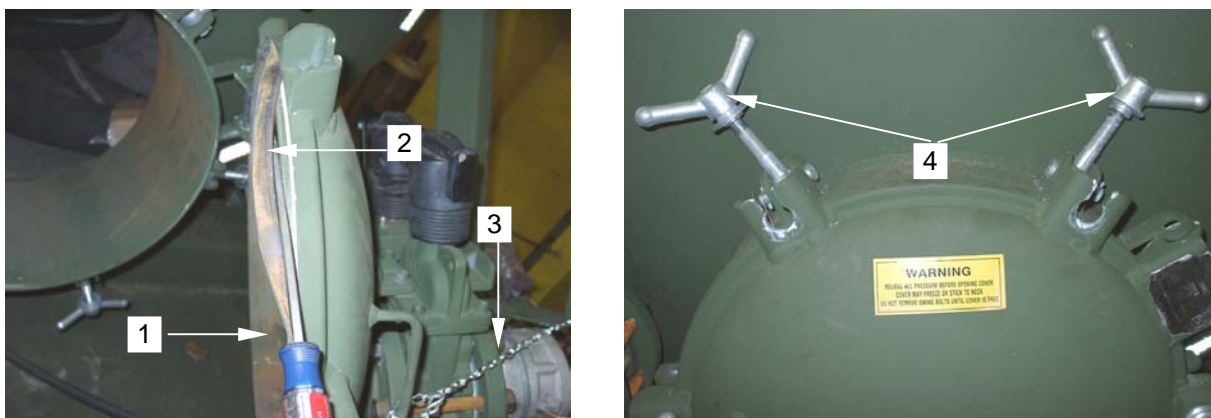


Figure 2. Replacing Gasket and Closing Manway

REPLACE

Ensure the tank is empty and at atmospheric pressure before performing the following procedures to replace the manway:



WARNING

When handling wastewater components, wear gloves to prevent serious illness due to contamination. Minimize the effect of spills by draining any remaining fluids and rinse water into a designated disposal point.

NOTE

The 4-inch drain valve gaskets are mandatory replacement parts.

1. Remove the drain valve (**figure 3, item 1**) from the manway (**figure 3, item 2**) as described in WP 0024 00 and set aside.
2. Using a $\frac{5}{32}$ -inch punch, remove and retain two lock pins (**figure 3, item 3**) from the manway hinge pin (**figure 3, item 4**).

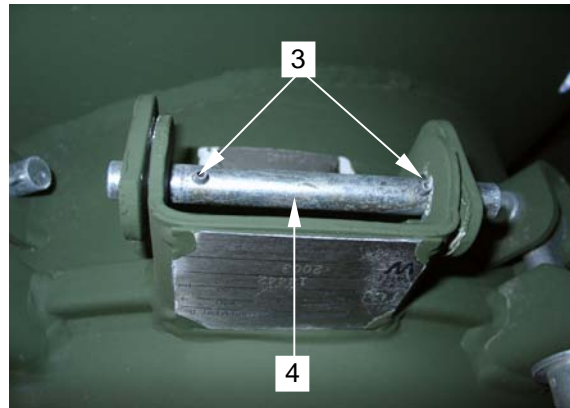
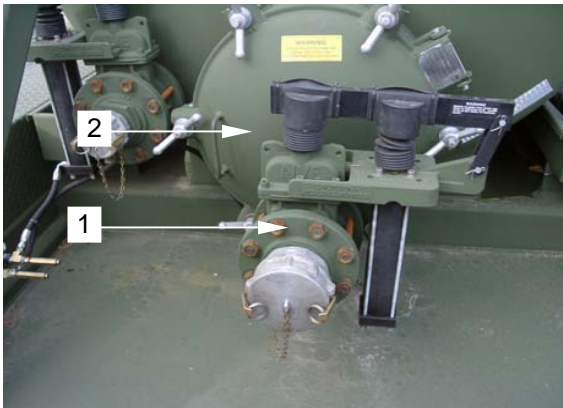


Figure 3. Replacing Gasket and Closing Hatch

3. Remove and retain the hinge pin (**figure 4, item 1**).
4. Loosen and remove the top two and bottom two swing bolt assemblies (**figure 4, item 2**) off cover.

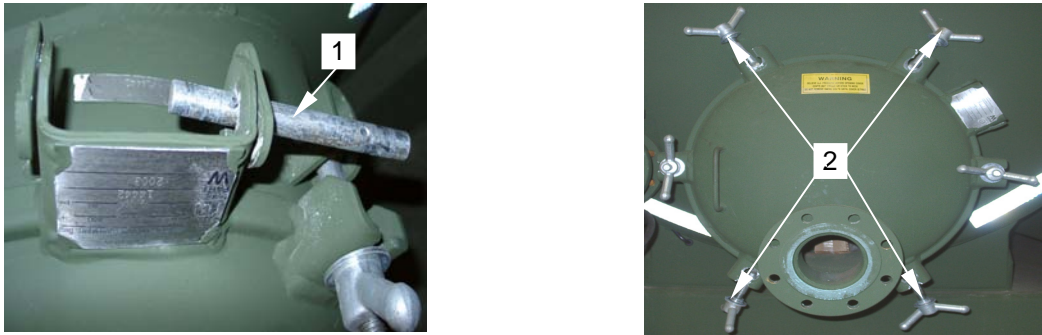


Figure 4. Replacing Gasket and Closing Manway



WARNING

The manway is heavy. To prevent injuries, two persons are required to lift the cover off the rim.

5. While supporting the manway, remove the remaining swing bolt assemblies (figure 5, item 1) and lift the manway (figure 5, item 2) off the rim (figure 5, item 3).

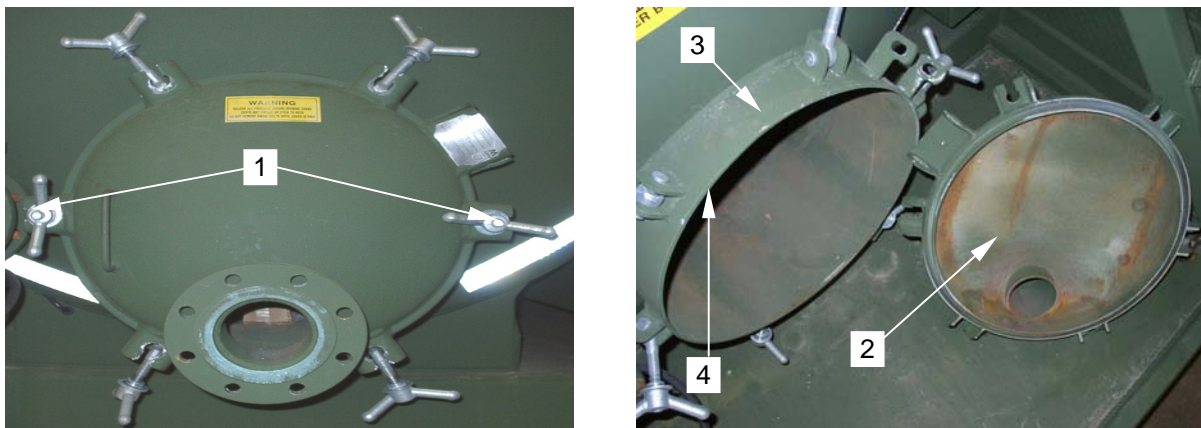


Figure 5. Replacing Gasket and Closing Manway

CAUTION

For equipment located in CONUS, use only a certified, new replacement cover to retain DOT certification of the WWET/T.

6. Clean the edge of the manway rim (figure 5, item 4) with a rag.
7. Apply antiseize tape to the swing bolt threads (figure 6, item 1).

**WARNING**

The manway is heavy. To prevent injuries, two persons are required to lift the cover off the rim.

8. Obtain a new rear manway (**figure 6, item 2**) and position it in place over the manway rim so that the gasket seats firmly against the rim and the cover is aligned with the wing nut assemblies (**figure 6, item 3**).
9. Install hinge pin (**figure 6, item 4**) through the hinge brackets (**figure 6, item 5**) and secure with two lock pins (**figure 6, item 6**).
10. Position swing bolt assemblies onto cover (**figure 6, item 2**) and tighten in a star pattern.

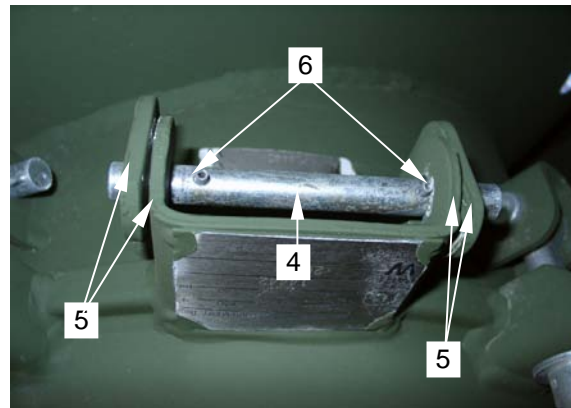
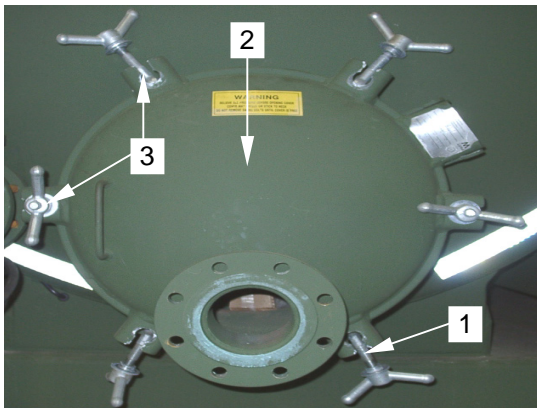


Figure 6. Installing Rear Manway Cover

11. Install the 4-inch drain valve (**figure 7, item 1**) as described in WP 0024 00. Ensure new 4-inch gaskets (**figure 7, item 2**) are installed.

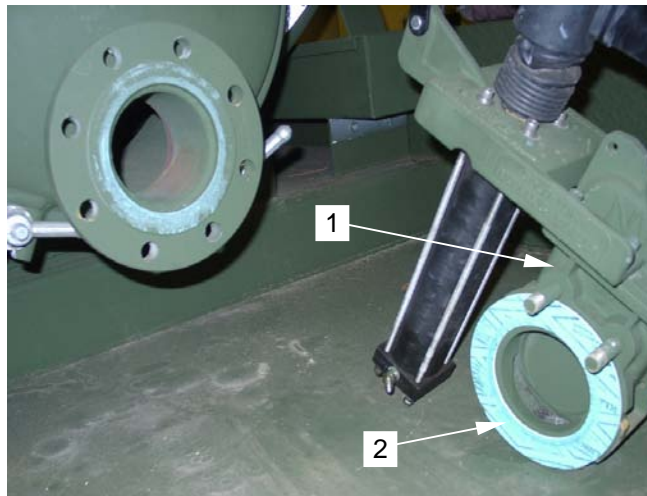


Figure 7. Installing Rear Manway Cover

END OF WORK PACKAGE

**UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
INTAKE VALVE
SERVICE, REPLACE**

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)
Cleaner, Steam Pressure Jet, Trailer Mounted (WP 0053 00, Table 2, Item 3)

Personnel Required

MOS 77W, Water Treatment Specialist

Materials/Parts

Fluid, Hydraulic (WP 0091 00, Item 11)
Gasket, 4-Inch (2) (WP 0091 00, Item 12)
Gloves, Rubber (WP 0089 00, Table 2, Item 4)
Rags, Wiping (WP 0091 00, Item 28)
Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

Tank empty, at atmospheric pressure
Tank cleaned and sanitized
Engine shut off
Ignition key removed
Emergency stop button pushed in
Wheel chocked
Emergency brake set

SERVICE

Service the intake valve by lubricating the piston stem and clevis (**figure 1, item 1**) using general purpose grease. Apply general purpose oil to the cam lock arm hinges (**figure 1, item 2**) on the dust cap.

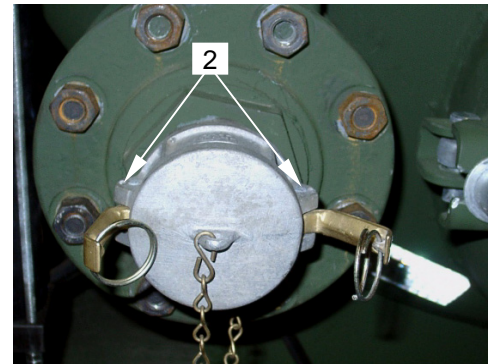
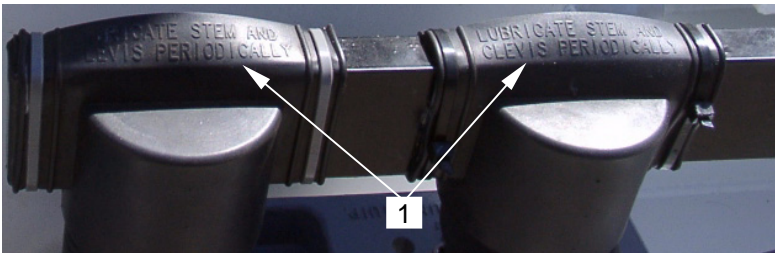


Figure 1. Lubricating Points

REPLACE

**WARNING**

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

**WARNING**

Relieve pressure before opening intake and drain valves. Remove pressure before opening intake valve by turning knob on secondary shutoff. Do not remove swing bolts until cover is free of the hatch rim.

NOTE

Empty the Wastewater tank as described under Tank Operation in WP 0005 00. Ensure isolation valve is in open position and pressure gage reads 0.

1. Close intake valve (**figure 2, item 1**) by placing hydraulic pump selector lever (**figure 2, item 2**) parallel with pump handle (**figure 2, item 3**).
2. Close the hydraulic line control knobs (**figure 2, item 4**). Swing handle inline with pump.
3. Disconnect the intake valve hydraulic line (**figure 2, item 5**) from the fitting (**figure 2, item 6**) on the piston valve.

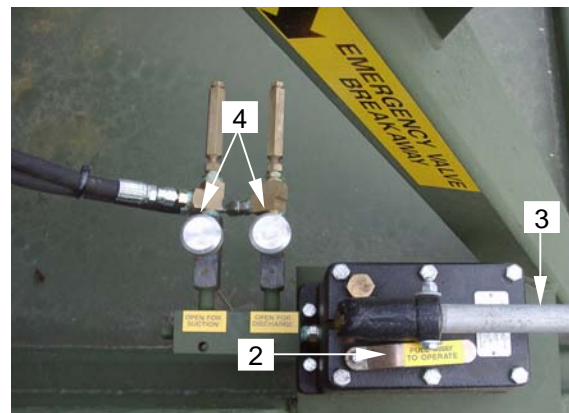
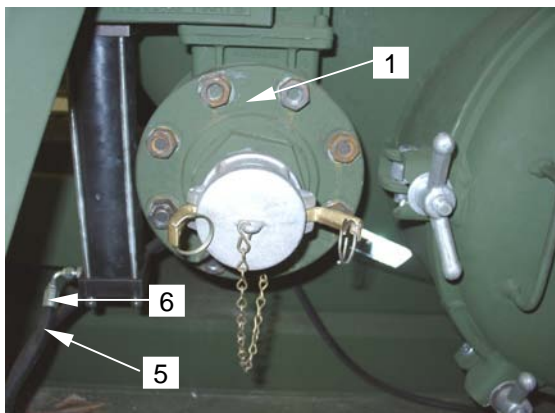


Figure 2. Closing Intake Valve. Disconnect Hydraulic Line

4. Remove dust cap from intake valve (**figure 3, item 1**).
5. Remove hex nuts and bolts (**figure 3, item 2**) securing front flange (**figure 3, item 3**) to intake valve (**figure 3, item 4**) and rear flange (**figure 3, item 5**).
6. Remove front flange (**figure 3, item 3**) from intake valve (**figure 3, item 4**).
7. Remove 4-inch gasket (**figure 3, item 6**) and discard.

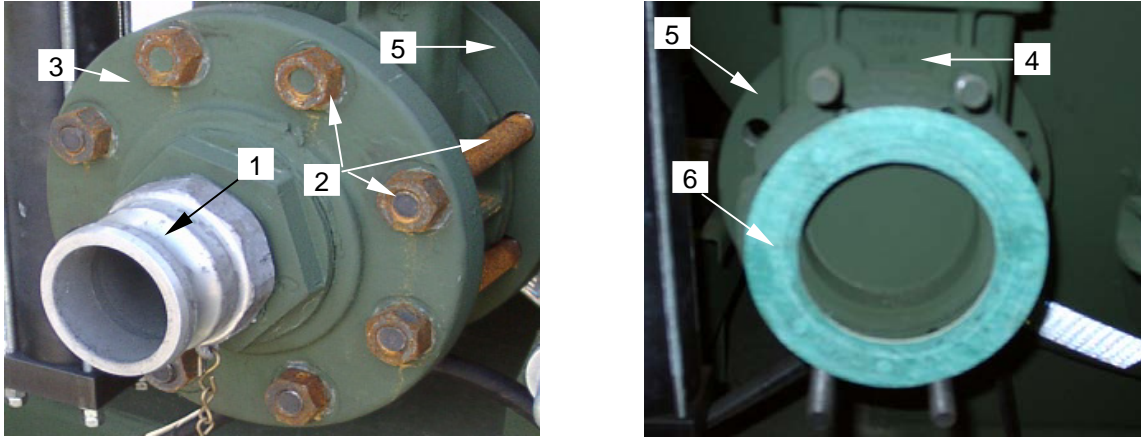


Figure 3. Removing Dust Cap and Front Flange/Gasket

**WARNING**

The intake valve assembly is heavy. To prevent injuries, two people are required to remove it.

8. While supporting the intake valve (**figure 4, item 1**), remove the top two nuts (**figure 4, item 2**) from the back of the rear flange (**figure 4, item 3**).

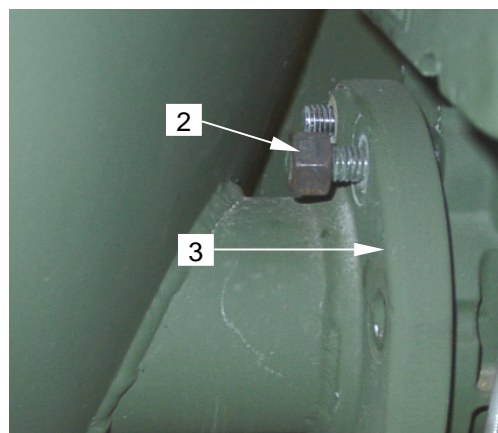
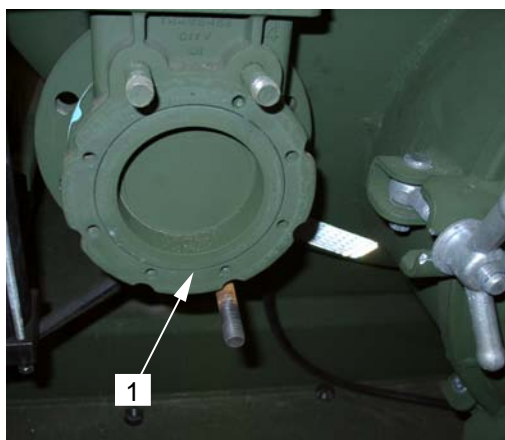


Figure 4. Removing Intake Valve

9. Remove the intake valve (**figure 4, item 1**) from the rear flange (**figure 5, item 1**).
10. Remove the 4-inch gasket (**figure 5, item 2**) from the rear flange (**figure 5, item 1**).
11. Clean flange gasket surface (**figure 5, item 3**) and remove gasket remnants from the rear flange (**figure 5, item 1**).

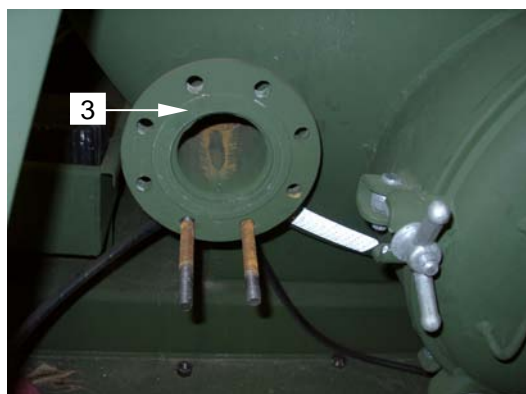
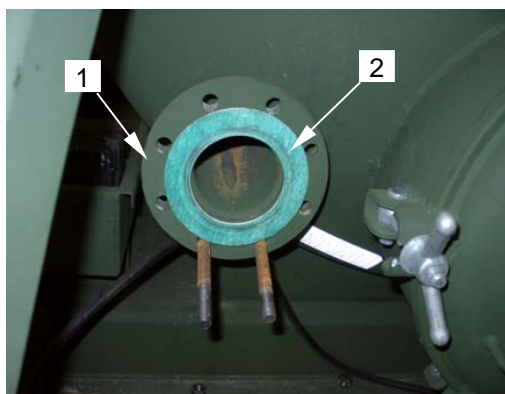


Figure 5. Removing Gasket and Cleaning Rear Flange

NOTE

Prior to installing a new intake valve, obtain two new 2¹/₂-inch gaskets for use during the installation. These are mandatory replacement parts.

12. Place a new 2¹/₂-inch gasket (**figure 6, item 1**) onto the rear flange (**figure 6, item 2**) as shown.

**WARNING**

The intake valve assembly is heavy. To prevent injuries, two people are required to remove it.

13. Place new intake valve (**figure 6, item 3**) over the gasket onto the rear flange (**figure 6, item 2**) and pass studs (**figure 6, item 4**) through top two holes on flange as shown.
14. Install two nuts (**figure 6, item 5**) as shown and hand tighten.

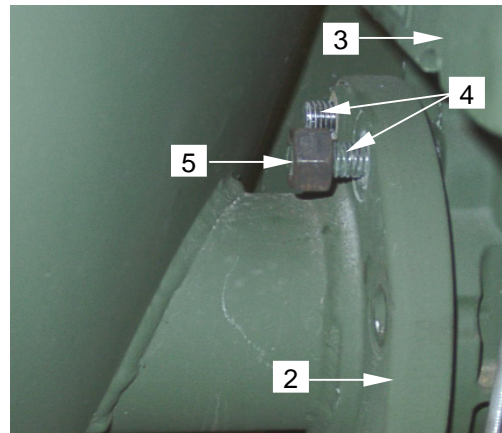
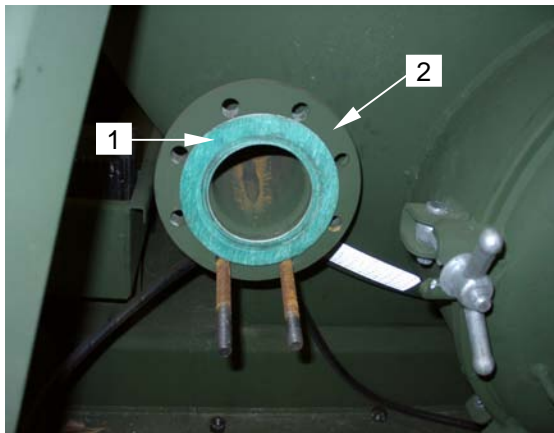


Figure 6. Installing Rear Gasket and Intake Valve

15. Place a new 2¹/₂-inch gasket (**figure 7, item 1**) onto the intake valve (**figure 7, item 2**) as shown.
16. Install hex nuts and bolts (**figure 7, item 3**) securing front flange (**figure 7, item 4**) to intake valve and rear flange (**figure 7, item 5**).

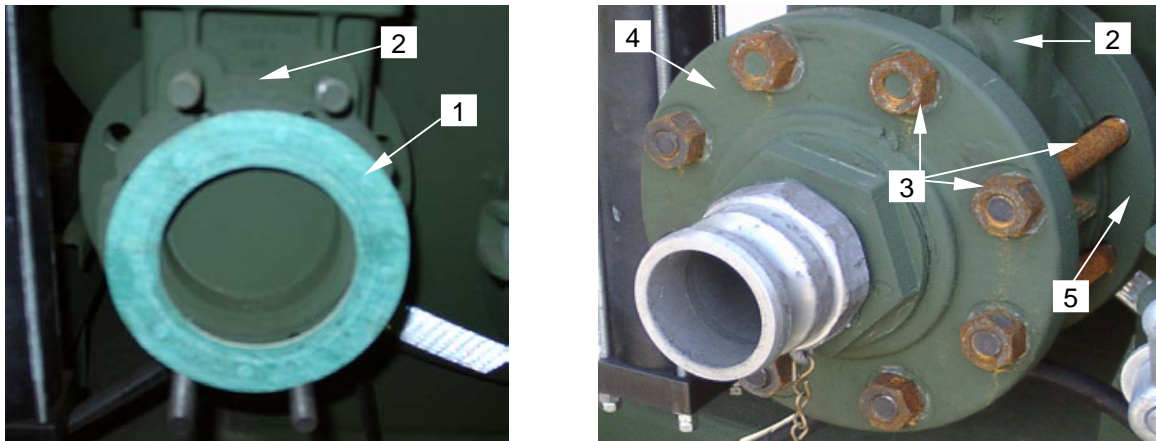


Figure 7. Installing Front Gasket and Flange

17. Install dust cap (**figure 8, item 1**) or 2½-inch hose (**figure 8, item 2**) as appropriate.
18. Re-connect the intake valve hydraulic line (**figure 8, item 3**) to the fitting (**figure 8, item 4**) on the piston valve.

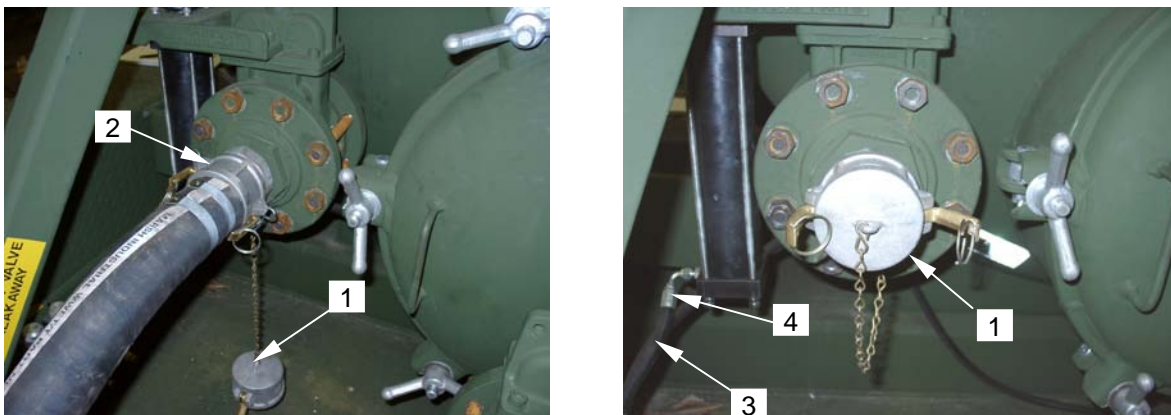


Figure 8. Installing Dust Cap/Hose and Hydraulic Line

19. Refill and bleed hydraulic system as described in WP 0025 00.

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
DRAIN VALVE
SERVICE, REPLACE

INITIAL SETUP:

Tools

Cleaner, Steam Pressure Jet, Trailer Mounted (WP 0053 00, Table 2, Item 3)
 Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 77W, Water Treatment Specialist

Materials/Parts

Fluid, Hydraulic (WP 0091 00, Item 11)
 Gasket 4-inch (2) (WP 0091 00, Item 12)
 Gloves, Rubber (WP 0089 00, Table 2, Item 4)
 Respirator (WP 0089 00, Table 2, Item 8)
 Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Tank empty, at atmospheric pressure
 Tank cleaned and sanitized
 Engine shut off
 Ignition key removed
 Emergency stop button pushed in
 Wheel chocked
 Emergency brake set

SERVICE

Service the intake valve by lubricating the piston stem and clevis (**figure 1, item 1**) using general purpose grease. Apply general purpose oil to the cam lock arm hinges (**figure 1, item 2**) on the dust cap.

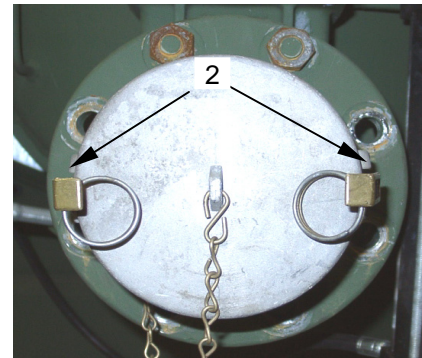
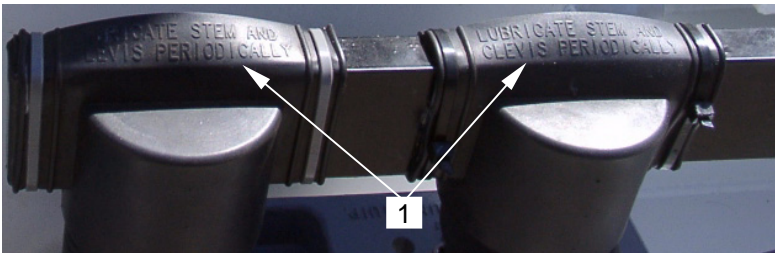


Figure 1. Lubricating Points

REPLACE

**WARNING**

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

**WARNING**

When handling wastewater components, wear gloves, apron, eye protection and respirator to prevent serious illness due to contamination. Minimize the effect of spills by draining any remaining fluids and rinse water into a designated disposal point. Wear a protective suit when steam cleaning the tank or associated components.

**WARNING**

Relieve tank pressure before opening drain valve to prevent serious injuries. Ensure isolation valve is in the open position and the pressure gage reads \emptyset (zero).

**WARNING**

The drain valve assembly is heavy. To prevent injuries, two people are required to remove it.

NOTE

Prior to installing a new drain valve, obtain two new 4-inch gaskets for use during the installation. These are mandatory replacement parts.

1. Close drain valve by placing hydraulic pump selector lever (**figure 2, item 1**) parallel with pump handle (**figure 2, item 2**).
2. Close the hydraulic line control knobs (**figure 2, item 3**).
3. Disconnect the intake valve hydraulic line (**figure 2, item 4**) from the fitting (**figure 2, item 5**) on the piston valve.

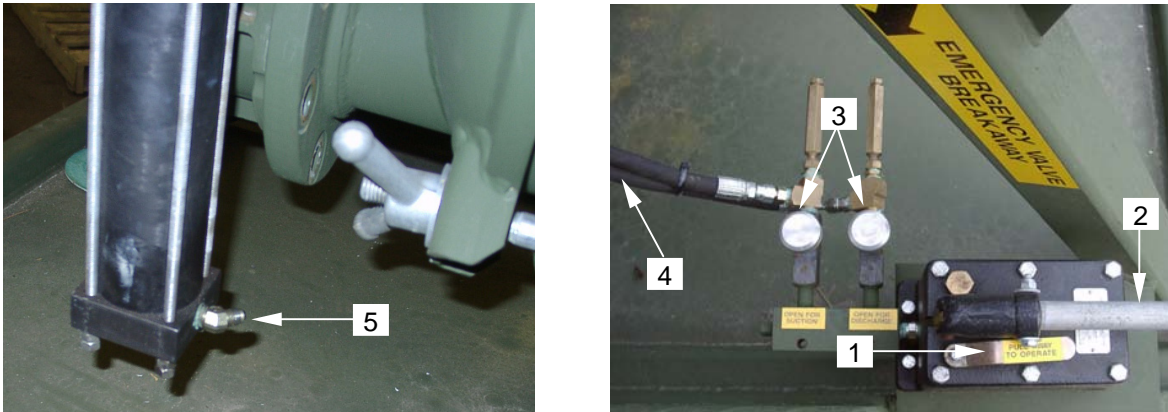


Figure 2. Closing Intake Valve. Disconnect Hydraulic Line

4. Remove dust cap (**figure 3, item 1**) from drain valve (**figure 3, item 2**).
5. Remove six lower hex nuts and bolts (**figure 3, item 3**) securing front flange (**figure 3, item 4**) to rear flange (**figure 3, item 5**).
6. Remove two remaining hex nuts (**figure 3, item 6**) securing front flange (**figure 3, item 4**) to drain valve (**figure 3, item 2**)
7. Remove front flange (**figure 3, item 4**) from drain valve (**figure 3, item 2**)
8. Remove 4-inch gasket (**figure 3, item 7**) and discard.

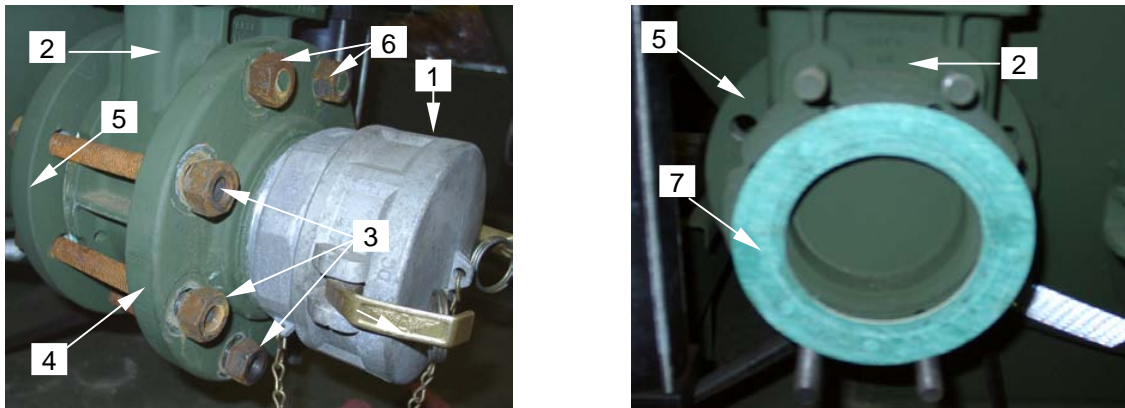


Figure 3. Removing Dust Cap and Front Flange/Gasket



WARNING

The drain valve assembly is heavy. To prevent injuries, two people are required to remove it.

9. While supporting the drain valve (**figure 4, item 1**), remove the two nuts from the back (**figure 4, item 2**) of the rear flange (**figure 4, item 3**).

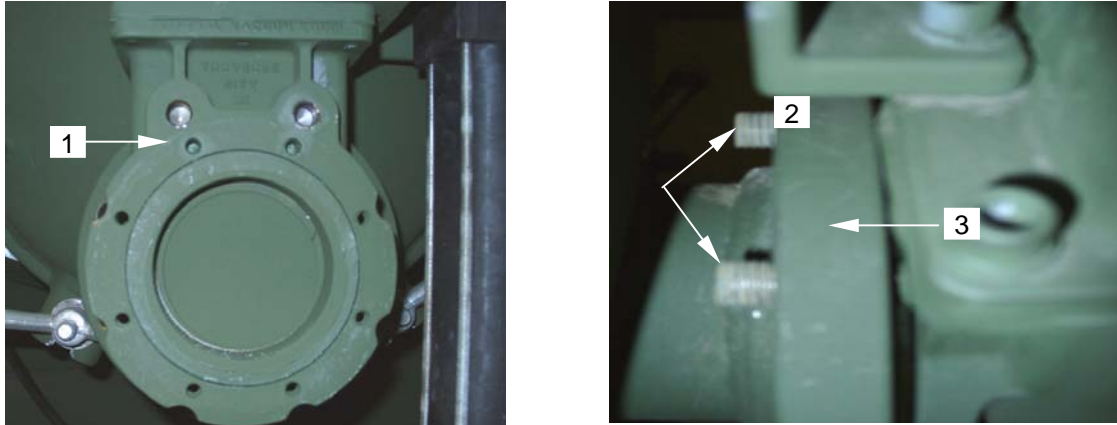


Figure 4. Removing Drain Valve

10. Remove the drain valve (**figure 5, item 1**) from the rear flange (**figure 5, item 2**).
11. Remove the 4-inch gasket (**figure 5, item 3**) from the drain valve (**figure 5, item 1**).
12. Clean flange gasket surface (**figure 5, item 4**) and remove gasket remnants from the rear flange (**figure 5, item 2**).
13. Refill and bleed hydraulic lines as described in WP 0025 00.

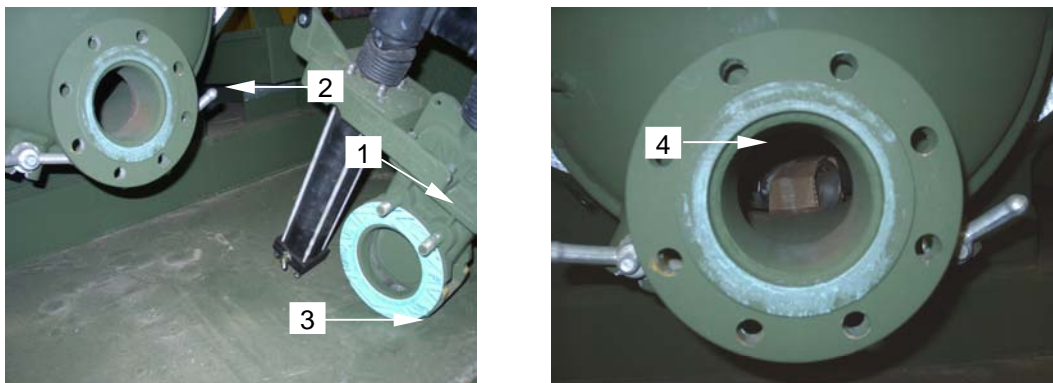


Figure 5. Removing Gasket and Cleaning Rear Flange

14. Place a new 4-inch gasket (**figure 6, item 1**) onto the rear flange (**figure 6, item 2**) as shown.



WARNING

The drain valve assembly is heavy. To prevent injuries, two people are required to remove it.

15. Place new drain valve (**figure 6, item 3**) over the gasket onto the rear flange (**figure 6, item 2**). Pass studs through top two holes on flange and install two nuts (**figure 6, item 4**). Hand tighten.

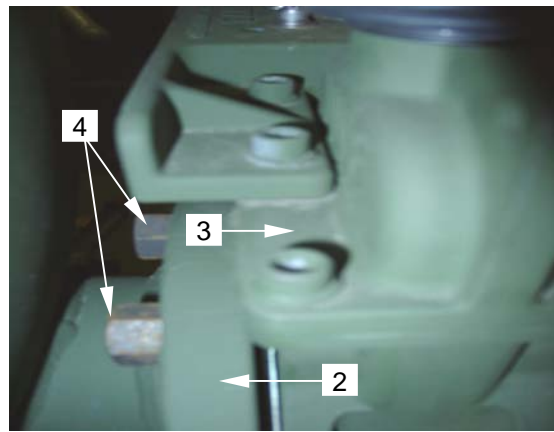
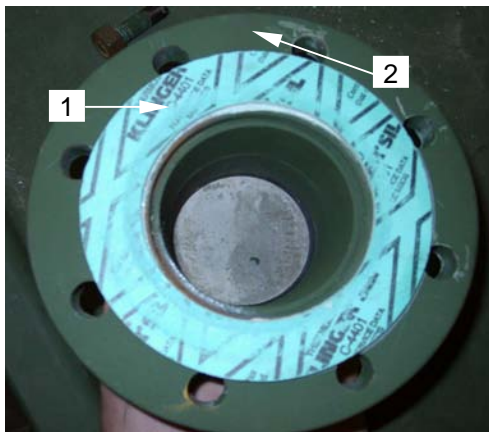


Figure 6. Installing Rear Gasket and Drain Valve

16. Place a new 4-inch gasket (**figure 7, item 1**) onto the drain valve (**figure 7, item 2**) as shown.
17. Install the six lower hex nuts and bolts (**figure 7, item 3**) securing front flange (**figure 7, item 4**) to the rear flange (**figure 7, item 5**).
18. Install upper two hex nuts and bolts (**figure 7, item 6**) securing front flange (**figure 7, item 4**) to the drain valve (**figure 7, item 2**).
19. Tighten all hex nuts and bolts on the front and rear of the drain valve in a star pattern.

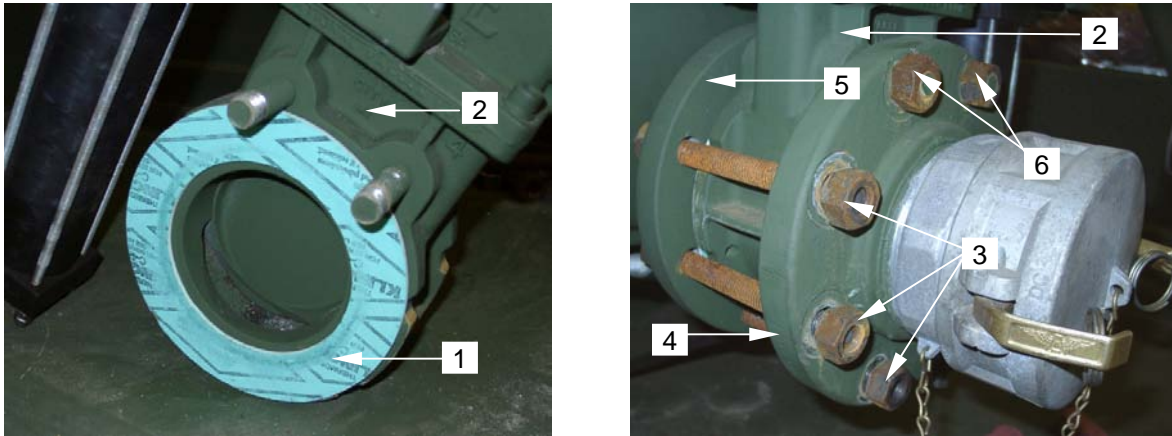


Figure 7. Installing Front Gasket and Flange

- 20. Install dust cap (**figure 8, item 1**) or 4-inch hose as appropriate.
- 21. Re-connect the drain valve hydraulic line to the fitting (**figure 8, item 2**) on the piston valve.

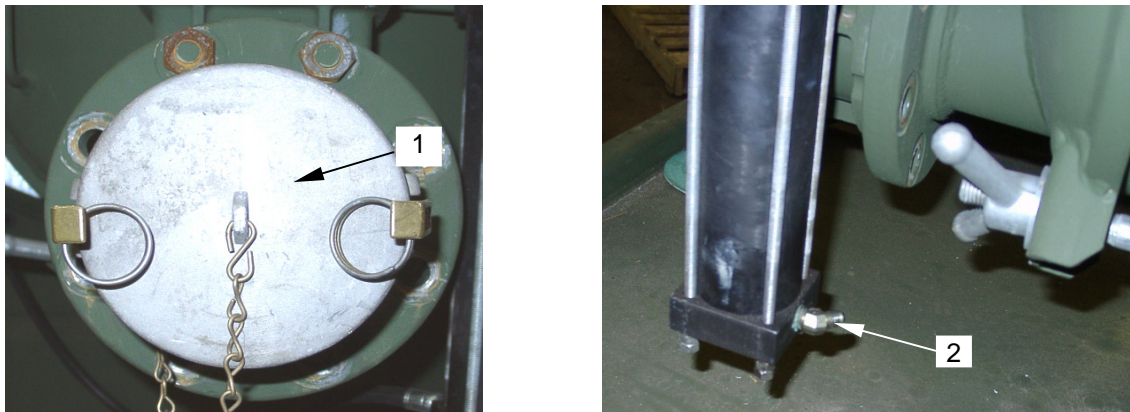


Figure 8. Installing Dust Cap/Hose and Hydraulic Line

END OF WORK PACKAGE

**UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
HYDRAULIC SYSTEM
SERVICE, REPLACE**

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 77W, Water Treatment Specialist

Materials/Parts

Fluid, Hydraulic (WP 0091 00, Item 11)
Gloves, Work (WP 0089 00, Table 2, Item 5)
Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Tank empty, at atmospheric pressure
Isolation valve open
Intake and drain valve closed

SERVICE

Service the hydraulic system by replenishing hydraulic fluid as required through the fill port (**figure 1, item 1**) on top of the pump, and tightening loose hose, or component connections as necessary.

REPLACE



WARNING

Hydraulic fluid can irritate bare skin. Wear protective gloves to prevent exposure. Prevent hydraulic fluid spills. Drain a hand pump that must be replaced and dispose of drained hydraulic fluid in accordance with local guidelines.

NOTE

To replace a component of the hydraulic system, ensure that intake (**figure 1, item 2**) and drain (**figure 1, item 3**) valves are closed (hydraulic lines drained into pump) to prevent spills. To do this, open both control knobs (**figure 1, item 4**) and position the pump lever (**figure 1, item 5**) along the pump handle (**figure 1, item 6**). To replace components, proceed as follows:

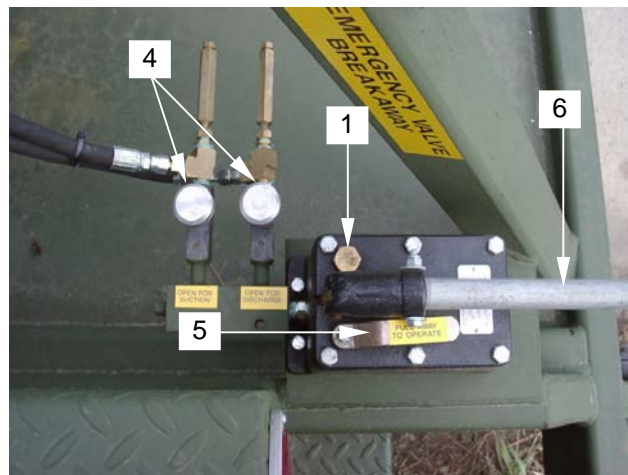
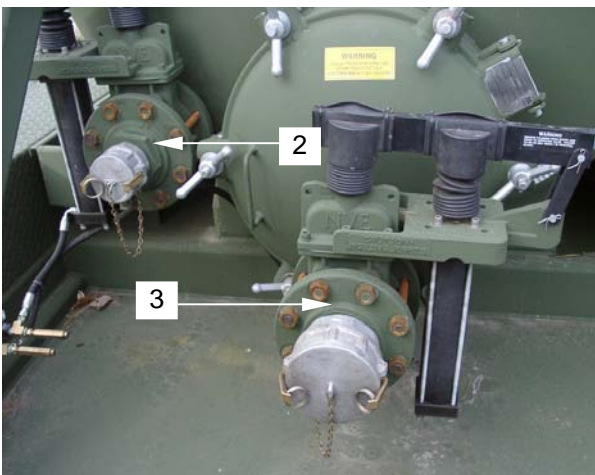


Figure 1. Closing Intake and Drain Valves

Hose

1. To replace hoses (**figure 2, item 1**), disconnect the appropriate hose from the elbow fitting at the bottom of the piston valve (**figure 2, item 2**) (on the intake, or drain valve) first. Then disconnect the hose from the adapter (**figure 2, item 3**). Remove cable ties as necessary. Reconnect new hose as appropriate. Install cable ties as necessary.



Figure 2. Replacing Hydraulic Hoses

Fusible Frangible Link

2. To replace the fusible frangible link (**figure 3, item 1**) disconnect the link from the T fitting (**figure 3, item 2**). Apply pipe sealant onto the threads of a new link and install onto the T fitting.

Manifold Assembly and its Components

3. To replace the hose nipples (**figure 3, item 3**), T fittings (**figure 3, item 4**), control knobs (**figure 3, item 5**), or manifold (**figure 3, item 6**), disassemble the components in the sequence listed. Reassemble new components in reverse sequence, applying pipe sealant onto the threads of components being assembled.

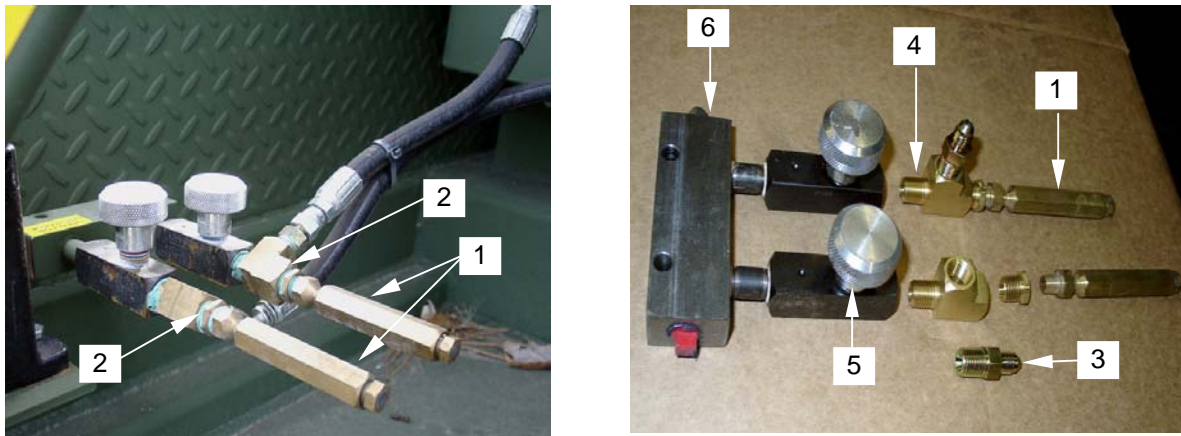


Figure 3. Replacing Hydraulic System Components

4. Remove drain plug from pump and drain hydraulic fluid from pump through the drain port (**figure 4, item 5**). (Fill port (**figure 4, item 6**) must be open.)
5. To replace a hydraulic hand pump (**figure 4, item 1**), disconnect the hoses from the elbow fittings and piston valves as described in step 1., above. Open control knobs (**figure 4, item 2**).
6. Remove the hand pump mounting bolts (**figure 4, item 3**) from the pump base.
7. Disconnect the manifold (**figure 4, item 4**) (leaving the control knobs, elbow fittings, hose nipples and breakaways connected) from the pump.
8. Reinstall the manifold (**figure 4, item 4**) onto new hand pump. Reinstall drain port plug (**figure 4, item 5**) and fill hand pump with hydraulic fluid through fill port (**figure 4, item 6**).

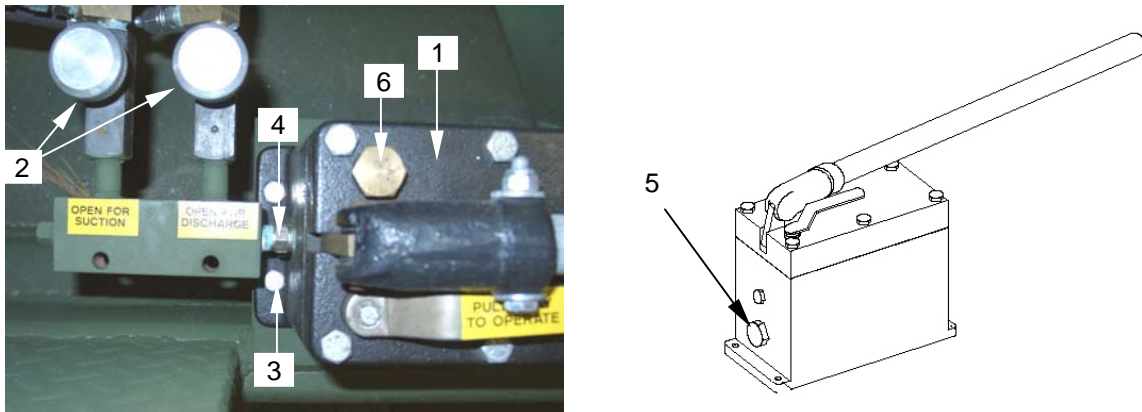


Figure 4. Replacing Hydraulic Pump

9. Re-connect hoses to the T fittings (**figure 5, item 1**).
10. Do not connect hoses to piston valves at this time. Refill and bleed hydraulic system as follows.
11. Place the pump lever (**figure 5, item 2**) diagonally away from the handle and slowly operate the pump handle (**figure 5, item 3**).

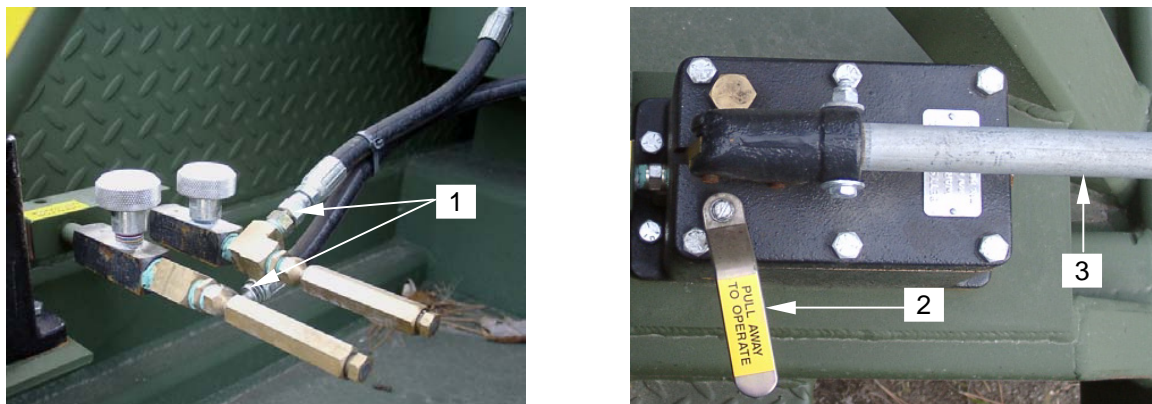


Figure 5. Re-connecting Hoses

12. When hydraulic fluid appears at the end of the hoses (**figure 6, item 1**), stop pumping and connect the hoses to the piston valve fittings (**figure 6, item 2**). Wipe up any fluid that may have spilled.

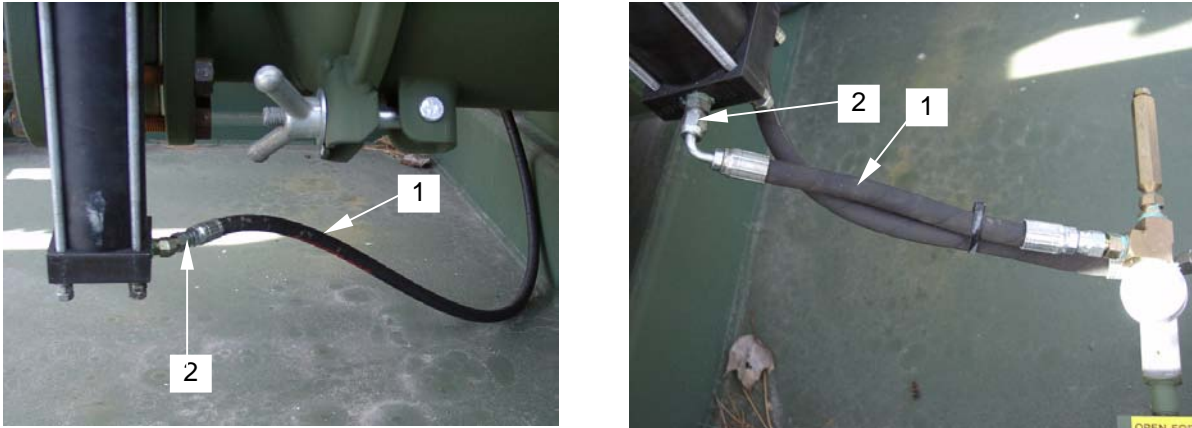


Figure 6. Re-connecting Hoses to Piston Valves

13. With both control knobs (figure 7, item 1) open, place the pump lever (figure 7, item 2) along handle. Open fill port (figure 7, item 3) and check fluid level. Top off as necessary.

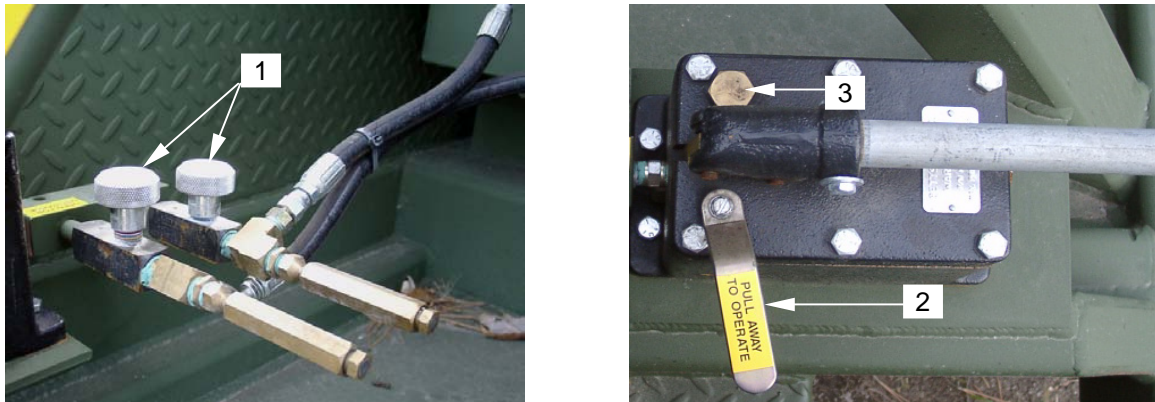


Figure 7. Checking Hydraulic Fluid Level

END OF WORK PACKAGE

**UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
DIESEL ENGINE
SERVICE, REPAIR**

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)
Metric socket wrench set (WP 0053 00, Table 2, Item 7)
Torque Wrench 90-120 in-lbs (WP 0053 00, Table 2, Item 16)

Personnel Required

63B Light Vehicle Mechanic

Materials/Parts

Antifreeze, Ethylene Glycol (WP 0091 00, Item 1)
Gasket, Liquid (WP 0091 00, Item 14)
Gloves, Work (WP 0089 00, Table 2, Item 5)
Oil, 10W40 (Summer) (WP 0091 00, Item 23)
Oil, 10W30 (Winter) (WP 0091 00, Item 22)
Pan, Drain (WP 0091 00, Item 26)
Rags, Wiping (WP 0091 00, Item 28)
Rubber Gloves (WP 0089 00, Table 2, Item 4)
Splash Goggles (WP 0089 00, Table 2, Item 6)
Tags, Marking (WP 0091 00, Item 32)

Equipment Condition

Engine shut off
Emergency stop button pushed in
Wheel chocked
Ignition key removed
Emergency brake set

SERVICE

Manufacturer's recommended services of the diesel engine are as follows:

Service	Interval
Add engine oil	As required
Change engine oil and oil filter	After initial 50 Hrs then at 250 Hrs interval
Flush/replace coolant	Every Six months
Replace air filter	When dust indicator signal turns red
Fuel filter	500 operating hours

CAUTION

Always keep fuel hoses and fuel containers clean and free of dust, dirt, and water. Make sure fuel hoses lie flat without kinks or loops that could trap air in the lines and clog the lines.

NOTE

Replace the air filter more often in dusty or extremely humid conditions or whenever recommended as part of the troubleshooting procedures

1. To add engine oil, follow the instructions below.

**WARNING**

Allow the engine to cool for approximately 30 minutes before adding oil. The engine is hot and presents a burn hazard. Coming in contact with hot engine parts may cause severe injury.

- a. Wipe clean around the oil filler cap (**figure 1, item 1**) taking care so that no foreign particles enter.
- b. Remove the filler cap (**figure 1, item 1**).
- c. Add new engine oil through the oil filler port (**figure 1, item 2**).
- d. Wait approximately fifteen minutes until the oil reaches the pan. Check oil level with dipstick (**figure 2, item 1**) for proper oil level as marked.
- e. Reinstall the oil filler cap (**figure 1, item 1**).

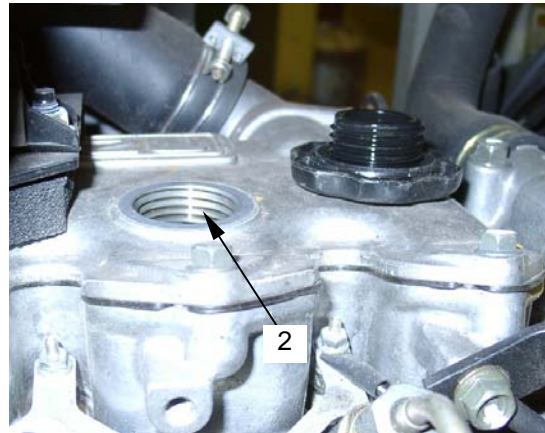
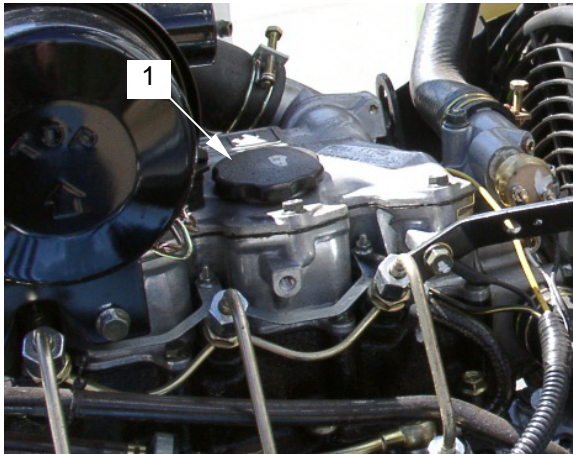


Figure 1. Oil Filler Cap with Port

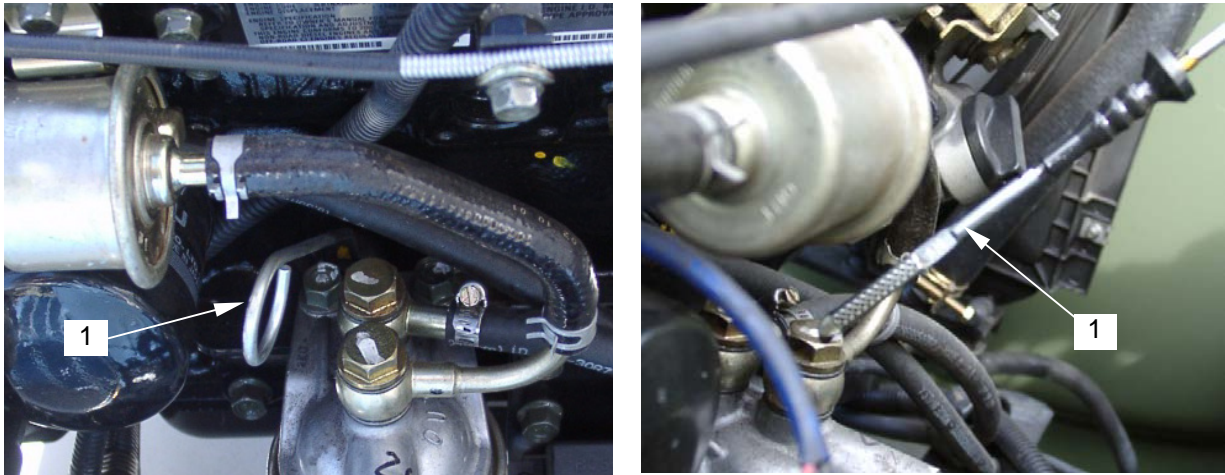


Figure 2. Dipstick

2. To change engine oil and filter proceed as follows:



WARNING

Allow the engine to cool for approximately 30 minutes before adding oil. The engine is hot and presents a burn hazard. Coming in contact with hot engine parts may cause severe injury.

NOTE

The engine must be in level position and switched off. Be sure to change the oil when the engine is warm (not hot) so that the engine oil remains easy to drain. Be sure to collect the used oil and dispose of as regulated waste in accordance with Unit SOP and local regulations.

- a. Wipe clean around the oil filler cap (**figure 3, item 1**) taking care so that no foreign particles enter.
- b. Remove the filler cap (**figure 3, item 1**).
- c. Remove the oil pan drain plug (**figure 4, item 1**) and drain the engine oil completely into an approved drip pan as regulated waste.
- d. Using oil filter wrench, loosen and remove oil filter (**figure 5, item 1**). Discard of old filter in an approved container.
- e. Apply light coat of engine oil to the new oil filter O-ring (**figure 5, item 2**).
- f. Hand tighten the new filter (**figure 5, item 2**) until its sealed face comes in contact with the O-ring.

- g. Using oil filter wrench, tighten the filter with a $\frac{3}{4}$ -inch turn.
- h. Reinstall oil drain plug (**figure 4, item 1**).
- i. Fill with new 5 and $\frac{1}{4}$ -quarts of oil through the filler port (**figure 3, item 2**).
- j. Wait approximately fifteen minutes until the oil reaches the pan. Check oil level with dipstick (**figure 5, item 3**) for proper oil level as marked.
- k. Reinstall the oil filler cap (**figure 3, item 1**) onto the port (**figure 3, item 2**).
- l. Start the engine and check for oil leakage from the oil filter (**figure 5, item 1**) and drain plug (**figure 4, item 1**).
- m. Shut off engine and check oil level with dipstick for proper oil level as marked.

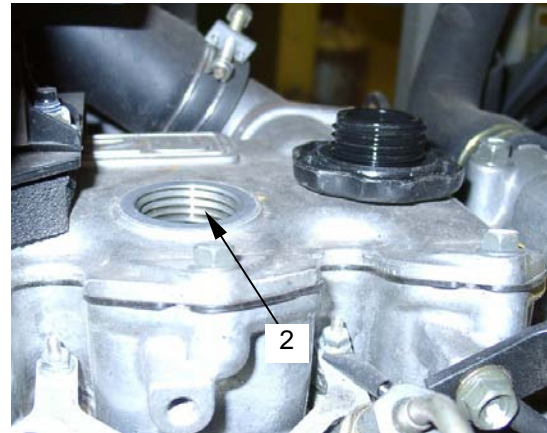
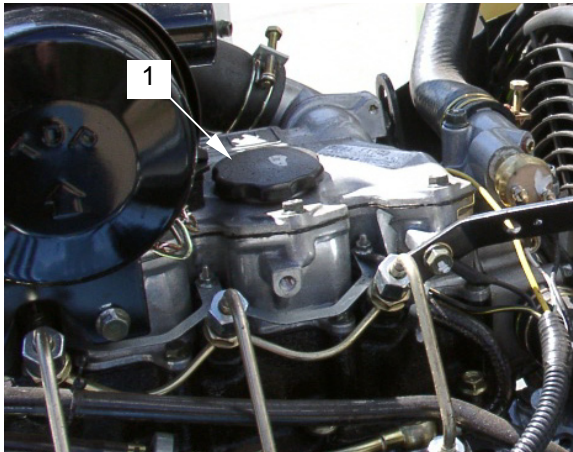


Figure 3. Oil Filler Cap with Port

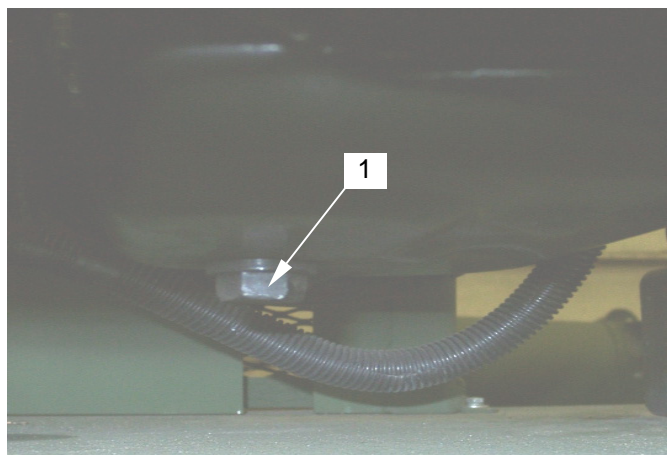


Figure 4. Oil Drain Plug

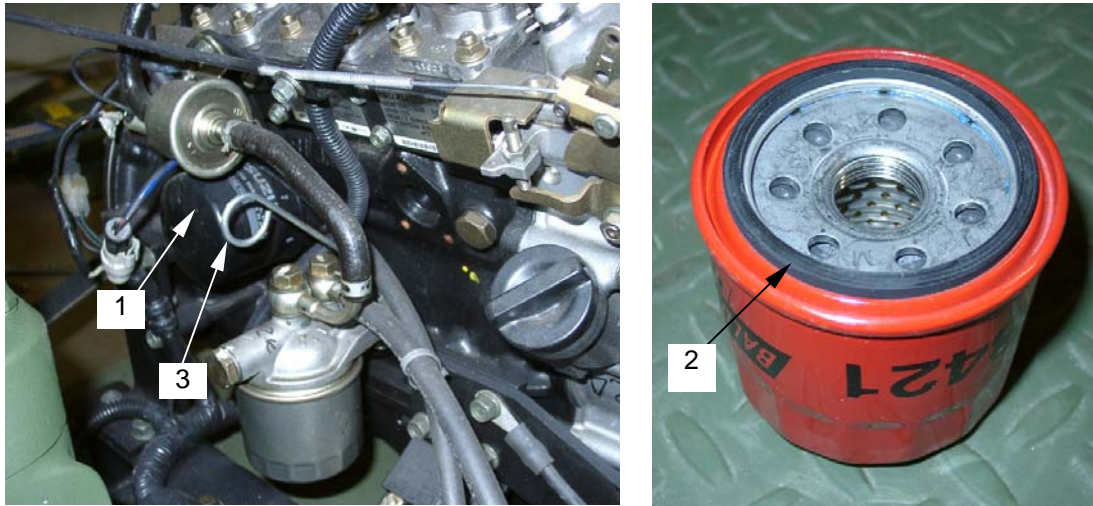


Figure 5. Oil Filter

3. To add engine coolant, proceed as follows:



WARNING

Allow the engine to cool for approximately 30 minutes before adding coolant. The engine is hot and presents a burn hazard. Coming in contact with hot engine coolant may cause burns and severe injury.

- a. Remove the radiator bottle cap (**figure 6, item 1**).
- b. Using a 50/50 ethylene glycol base antifreeze/water mix fill the radiator bottle with coolant until the level reaches the full line on the bottle (**figure 6, item 2**).
- c. Fill gradually to prevent air entry.
- d. Install the radiator bottle cap (**figure 6, item 1**).
- e. Operate the engine for five minutes at a low idle speed, allowing the air contained in the coolant system to bleed. The coolant level will drop.
- f. Remove radiator bottle cap (**figure 6, item 1**).
- g. Replenish with coolant until radiator is full.
- h. Install radiator bottle cap (**figure 6, item 1**).

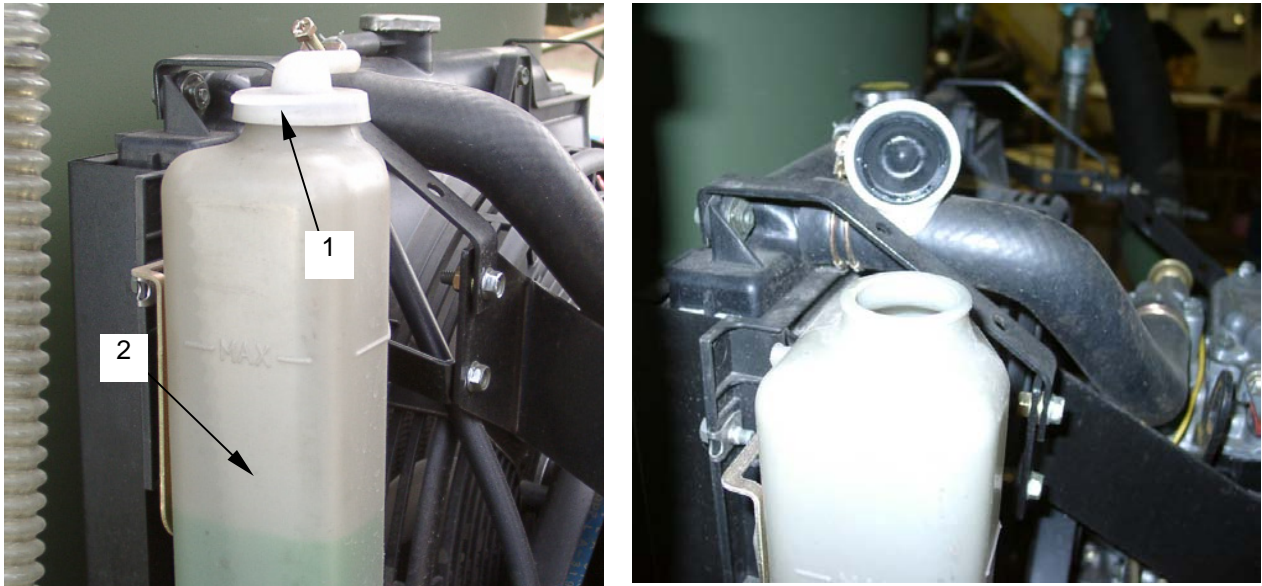


Figure 6. Radiator Bottle and Radiator Bottle Fill Port

4. Replace engine coolant.



WARNING

Allow the engine to cool for approximately 30 minutes before changing coolant. The engine is hot and presents a burn hazard. Coming in contact with hot engine coolant may cause burns and severe injury.

- a. Remove the radiator cap (**figure 7, item 1**).
- b. Loosen and remove the drain plug hose clamp (**figure 8, item 1**) and drain plug (**figure 8, item 2**) on the radiator and drain the coolant into an approved container.
- c. Dispose as regulated waste in accordance with unit SOP and local regulations.
- d. Install the drain plug (**figure 8, item 2**) and hose clamp (**figure 8, item 1**).
- e. Using a 50/50 ethylene glycol base antifreeze/water mix fill the radiator with coolant until the level reaches the filler port (**figure 7, item 2**).
- f. Fill gradually to prevent air entry.
- g. Install radiator cap (**figure 7, item 1**).
- h. Operate the engine for five minutes at a low idle speed, allowing the air contained in the coolant system to bleed. The coolant level will drop.

- i. Replenish with coolant until radiator is full.
- j. Install radiator cap (**figure 7, item 1**).

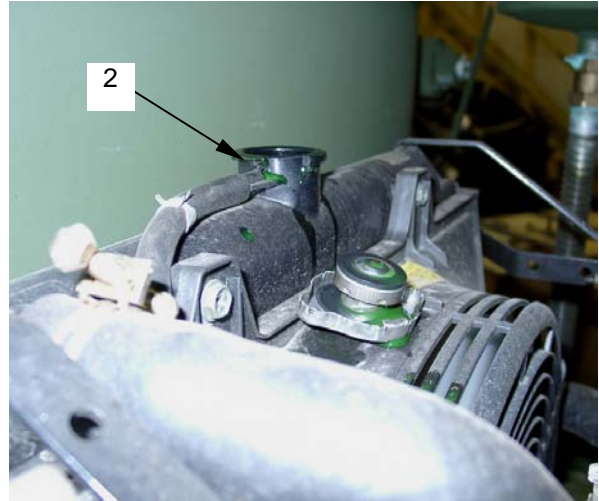


Figure 7. Radiator Cap and Radiator Fill Port

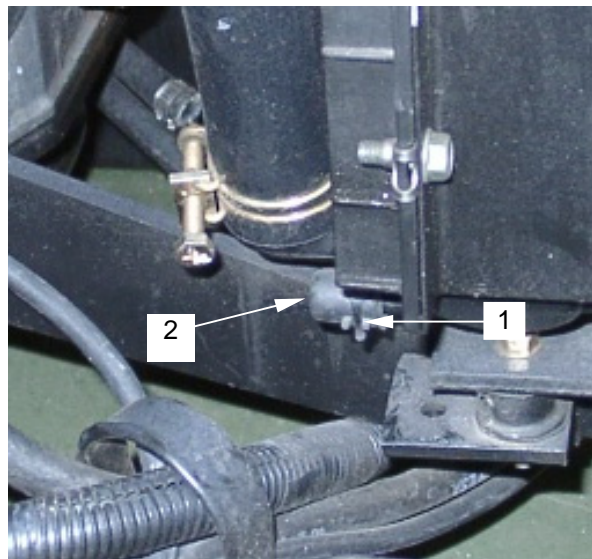


Figure 8. Radiator Drain Plug

5. Coolant system cleaning.

NOTE

When the cooling system circuit is fouled with water scales or sludge particles, cooling efficiently will be lowered. Periodically clean the circuit interior with a cleaner.

- a. Drain system coolant in accordance with instructions listed in Replace Engine Coolant (4) steps a through d.
- b. Flush the coolant system with fresh water.
- c. Remove water from the coolant system in accordance with steps a through d in Replace Engine Coolant Procedures.
- d. Add system coolant in accordance with instructions listed in Add Engine Coolant (3) steps a through h.



Figure 9. Radiator Cap and Radiator Fill Port

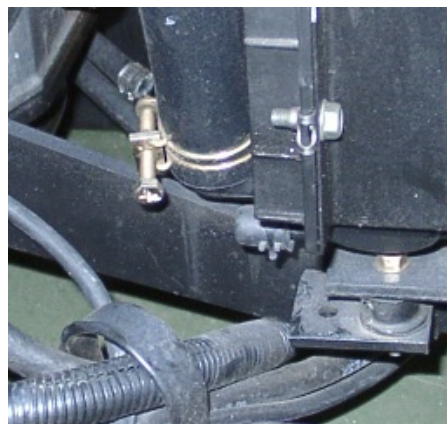


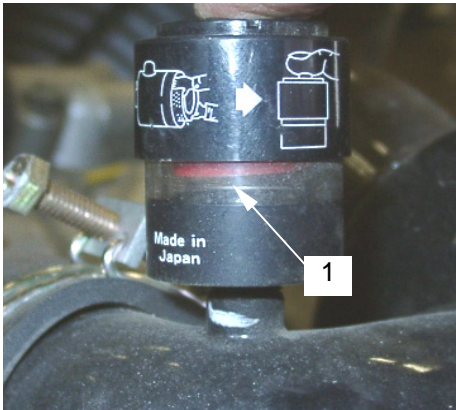
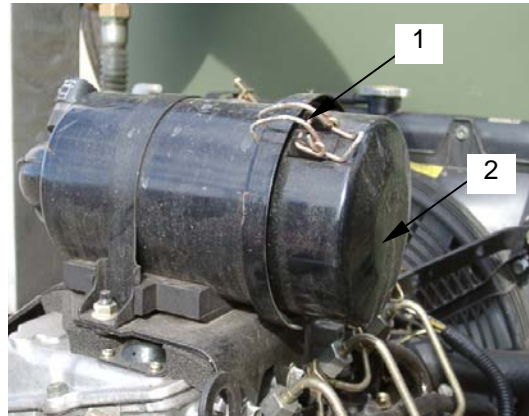
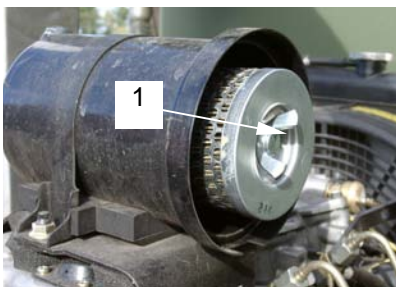
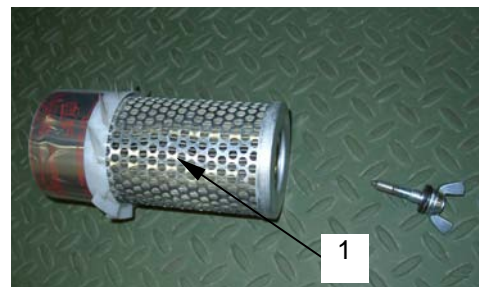
Figure 10. Radiator Drain Plug

6. Replace air filter.

NOTE

When the air cleaner element is clogged, air intake resistance becomes greater and the dust indicator (**figure 11, item 1**) signal turns red indicating the filter element requires changing.

- a. Loosen and remove clamps (**figure 12, item 1**).
- b. Remove cap (**figure 12, item 2**).
- c. Loosen and remove filter element wing nut (**figure 13, item 1**).
- d. Remove filter (**figure 14, item 1**) and clean in an approved container.
- e. Install filter element (**figure 14, item 1**).
- f. Fasten and tighten filter element wing nut (**figure 13, item 1**).
- g. Install filter cap (**figure 12, item 2**).
- h. Install and fasten clamps (**figure 12, item 1**).

**Figure 11. Dust indicator****Figure 12. Air Filter****Figure 13. Air Filter Cap Removed****Figure 14. Air Filter Element**

REPAIR

Repair the engine by replacing the following components:

1. Starter

**WARNING**

Allow the engine to cool for approximately 30 minutes before removing starter. The engine is hot and presents a burn hazard. Coming in contact with hot engine parts may cause burns.

- a. Disconnect battery cable at negative terminal post.
- b. Tag and disconnect starter wiring (**figure 15, item 1**).
- c. Loosen and remove starter mounting bolts (**figure 15, item 2**).
- d. Remove starter (**figure 15, item 3**).
- e. Install new starter.
- f. Fasten new starter in place with mounting bolts (**figure 15, item 2**). Torque from 8.7 to 10.5 kg-m (63-76 ft-lbs).
- g. Connect starter wiring (**figure 15, item 1**) and remove tags.
- h. Reconnect battery cable at negative terminal post.

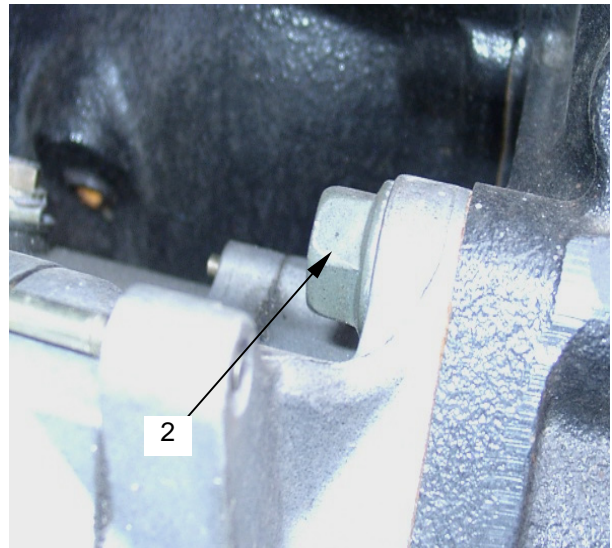
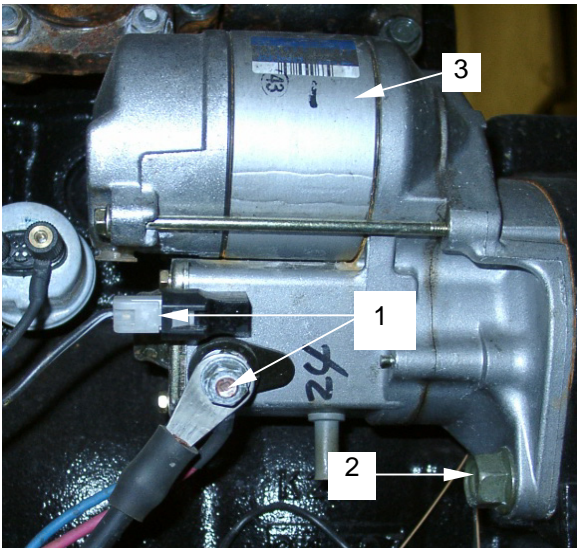


Figure 15. Starter Replacement

2. Fan belt
 - a. Ensure battery is disconnected at the negative terminal post.
 - b. Loosen and remove fan shroud (**figure 16, item 1**) mounting bolts (**figure 16, item 2**).
 - c. Remove fan shroud (**figure 16, item 1**).
 - d. Loosen belt tension bolt (**figure 17, item 1**) on generator (**figure 17, item 2**).
 - e. Pivot generator towards water pump to slacken the fan belt (**figure 18, item 1**).
 - f. Remove the fan belt (**figure 18, item 1**).
 - g. Install new fan belt (**figure 18, item 1**) on generator, fan and engine pulleys.
 - h. Pivot generator away from water pump, tightening fan belt tension (**figure 17, item 1**).
 - i. Check the drive belt tension between the fan pulley (**figure 19, item 1**) and the generator pulley (**figure 19, item 2**). Ensure belt has ¼-inch deflection at the center between the two pulleys.
 - j. Install fan shroud (**figure 16, item 1**).
 - k. Install and tighten fan shroud mounting bolts (**figure 16, item 2**).
 - l. Reconnect the battery at the negative terminal post.

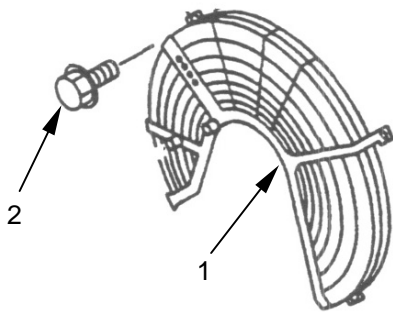


Figure 16. Fan Shroud Mounting Bolts

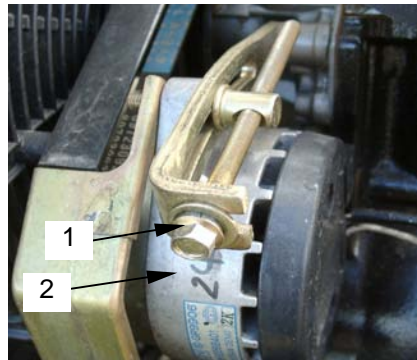


Figure 17. Belt Tension Bolt

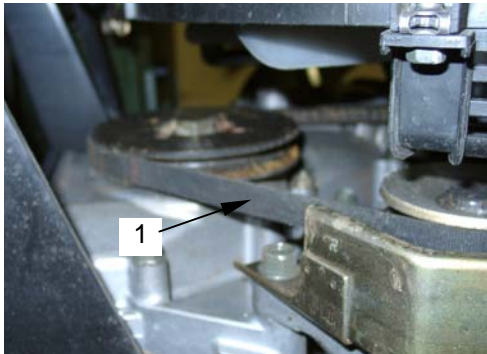


Figure 18. Fan Belt

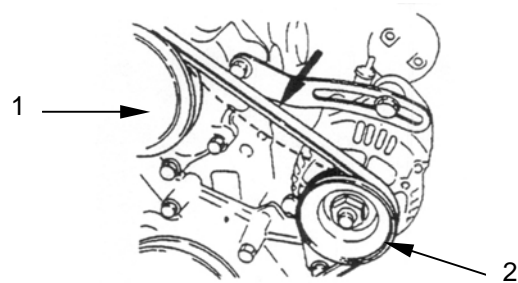


Figure 19. Fan belt tension

3. Exhaust

**WARNING**

Allow the engine to cool for approximately 30 minutes before removing exhaust silencer. The engine is hot and presents a burn hazard. Coming in contact with hot exhaust parts may cause burns.

- a. Loosen and remove outer shroud (**figure 20, item 1**) mounting bolts (**figure 20, item 2**) (qty 2).
- b. Remove outer shroud (**figure 20, item 1**).
- c. Loosen and remove inner shroud (**figure 20, item 3**) mounting bolts (**figure 20, item 4**) (qty 4).
- d. Remove inner shroud (**figure 20, item 3**).
- e. Loosen and remove silencer mounting nuts (**figure 20, item 5**) (qty 3).
- f. Remove silencer (**figure 20, item 6**) from exhaust elbow (**figure 20, item 7**).
- g. Remove gasket (**figure 20, item 8**) and discard in an approved container.
- h. Clean mating surfaces of exhaust pipe elbow (**figure 20, item 7**).
- i. Install new gasket (**figure 20, item 8**).
- j. Install silencer (**figure 20, item 6**) on exhaust elbow (**figure 20, item 7**).
- k. Fasten silencer to elbow with mounting nuts (**figure 20, item 5**) (qty 3).
- l. Install inner shroud (**figure 20, item 3**) on silencer.
- m. Fasten inner shroud in place with mounting bolts (**figure 20, item 4**) (qty 4).

- n. Install outer shroud (**figure 20, item 1**) to silencer.
- o. Fasten outer shroud in place with mounting bolts (**figure 20, item 2**) (qty 2).

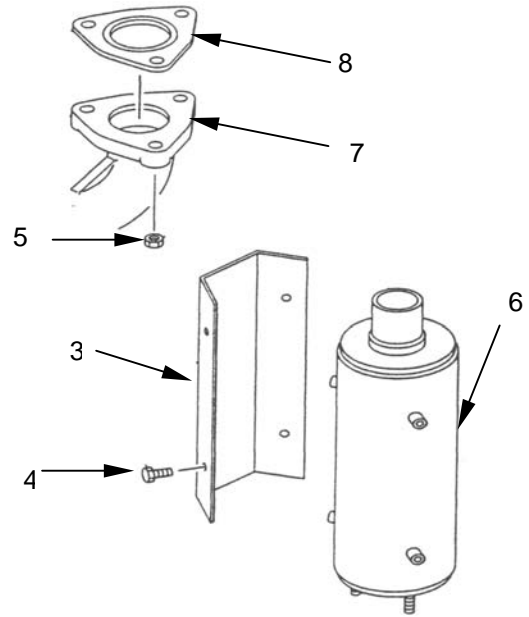
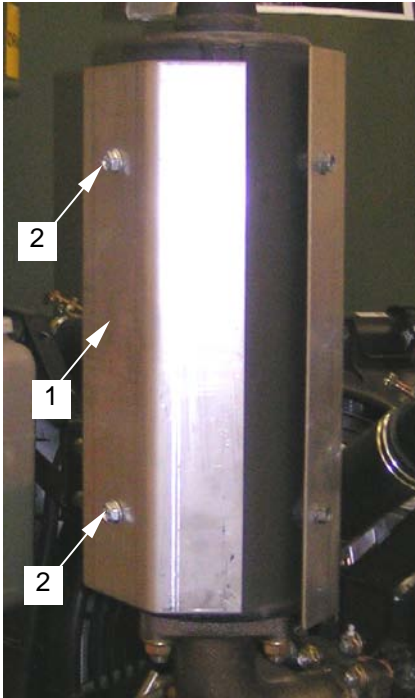


Figure 20. Exhaust

- 4. Generator
 - a. Disconnect battery cable at negative terminal post.
 - b. Loosen and remove fan shroud (**figure 21, item 1**) mounting bolts (**figure 21, item 2**).
 - c. Remove fan shroud (**figure 21, item 1**).
 - d. Loosen generator adjusting bolt (**figure 22, item 1**) on generator (**figure 22, item 2**).
 - e. Pivot generator towards water pump to slacken the fan belt (**figure 23, item 1**).
 - f. Remove the fan belt (**figure 23, item 1**).
 - g. Tag and disconnect generator wiring (**figure 24, item 1**).
 - h. Loosen and remove generator mounting bolts (**figure 22, item 4**) (**figure 23, item 2**) on generator (**figure 22, item 2**).
 - i. Loosen and remove generator adjusting plate mounting bolt (**figure 22, item 3**).

- j. Remove generator (**figure 22, item 2**).
- k. Install new generator (**figure 22, item 2**).
- l. Fasten generator in place loosely with generator mounting bolts (**figure 22, item 4**) (**figure 23, item 2**).
- m. Install fan belt (**figure 23, item 1**) on the generator (**figure 22, item 2**) fan and engine pulleys.
- n. Pivot generator away from water pump, tightening the generator adjusting bolt (**figure 22, item 1**).
- o. Tighten generator mounting bolts (**figure 22, item 4**) (**figure 23, item 2**) from 3.5-4.7 kg-m (25.3-34.0 ft-lbs).
- p. Tighten adjust plate mounting bolt (**figure 22, item 3**) from 1.9-2.9 kg-m (13.7-21 ft-lbs).
- q. Connect generator wiring and remove tags (**figure 24, item 1**).
- r. Check the drive belt tension between the fan pulley (**figure 25, item 1**) and the generator pulley (**figure 25, item 2**). Ensure belt has ¼-inch deflection at the center between the two pulleys.
- s. Install fan shroud (**figure 21, item 1**).
- t. Fasten fan shroud in place with mounting bolts (**figure 21, item 2**).
- u. Reconnect battery cable to negative terminal post.

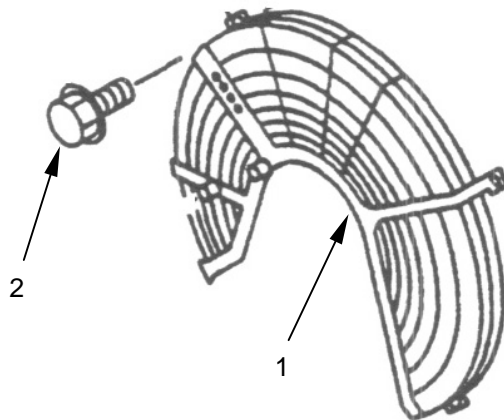


Figure 21. Fan Shroud

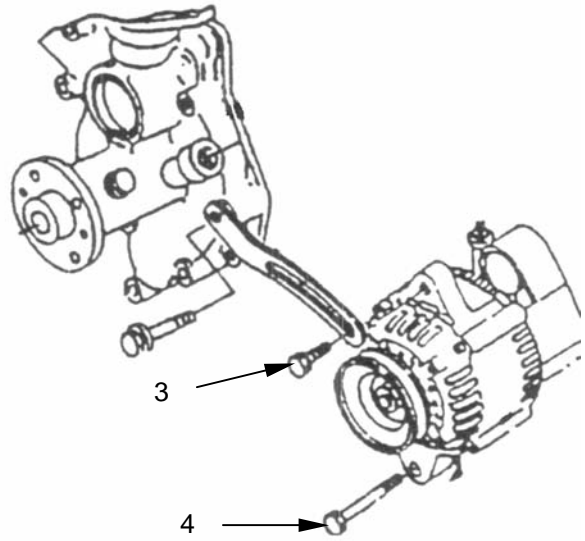
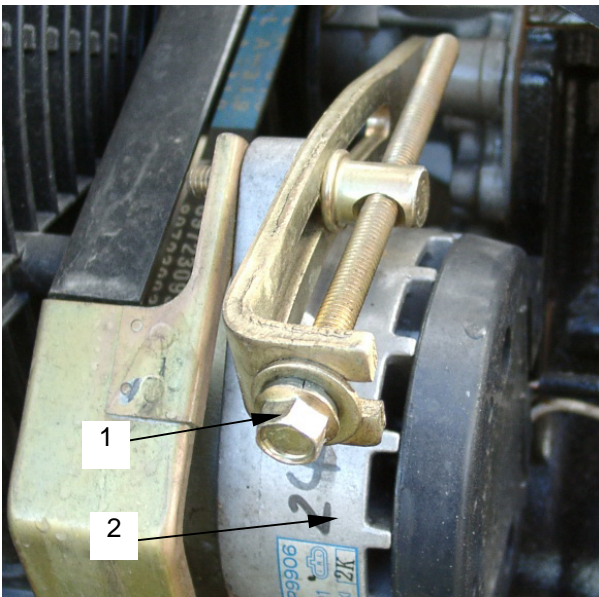


Figure 22. Generator Adjusting Bolts

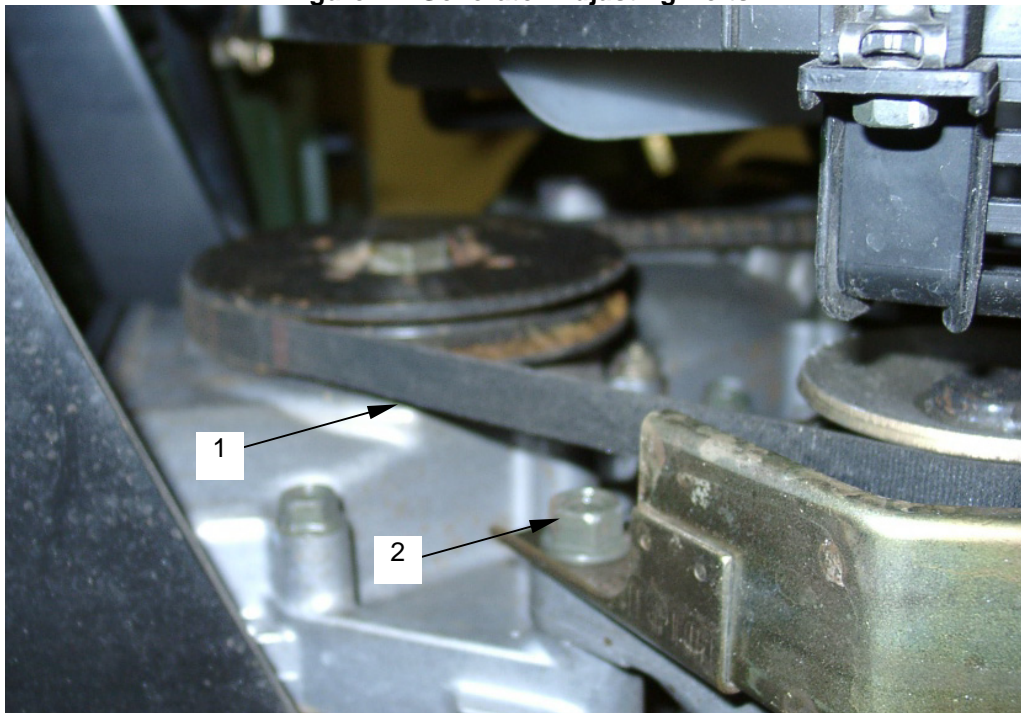


Figure 23. Fan Belt and Generator Mounting Bolt

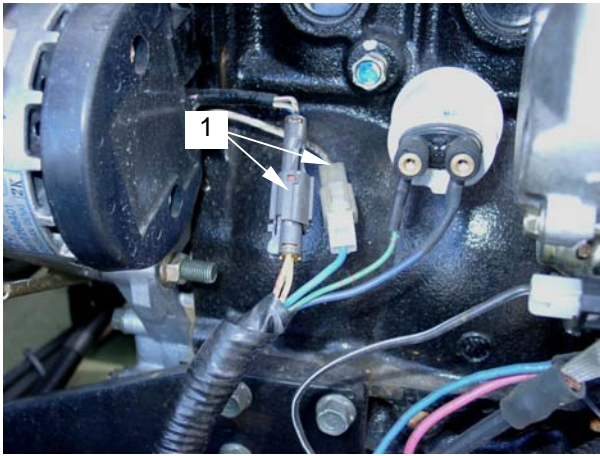


Figure 24. Generator Wiring

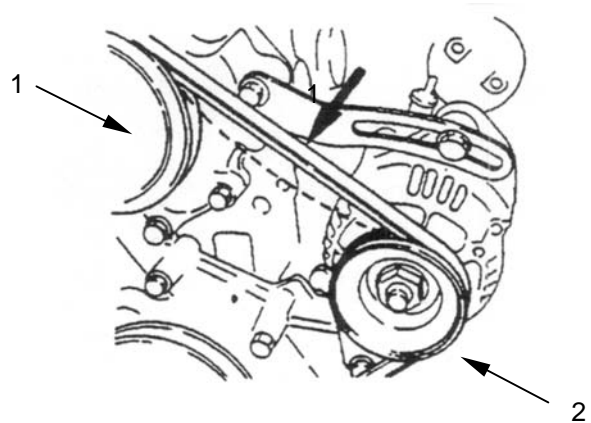


Figure 25. Fan belt adjustment

5. Fuel Filter

**WARNING**

Allow the engine to cool for approximately 30 minutes before replacing the fuel filter. The engine is hot and presents a burn hazard. Coming in contact with hot engine parts may cause burns and severe injury.

- a. Loosen and remove fuel filter (**figure 26, item 1**).
- b. Discard old fuel filter element as regulated waste in accordance with unit SOP and local regulations in an approved container.
- c. Wipe fuel filter fitting face (**figure 26, item 2**) clean with a rag to allow the new filter to seat correctly.
- d. Apply a light coat of engine oil to the fuel filter o-ring (**figure 26, item 3**).
- e. Fill filter with diesel fuel.
- f. Install new fuel filter (**figure 26, item 1**).
- g. Supply fuel to the new filter to allow air to bleed off.
- h. Tighten the new fuel filter until the o-ring is fitted against the sealing face.
- i. Using the filter wrench turn in the fuel filter an additional 2/3 of a turn.

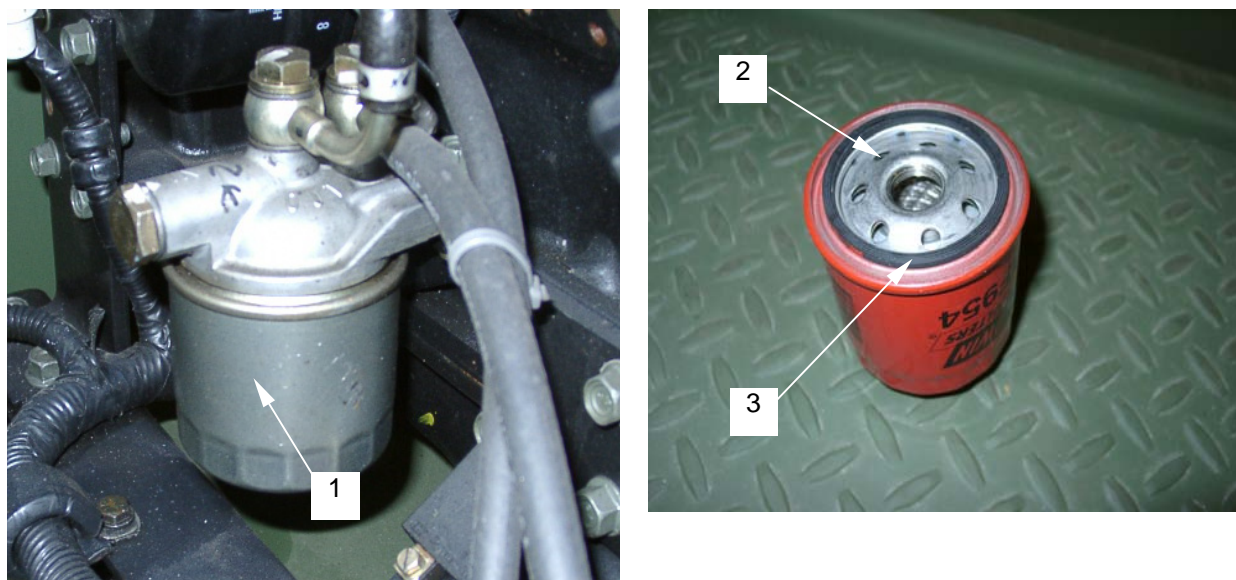


Figure 26. Fuel Filter

6. Radiator



WARNING

Allow the engine to cool for approximately 30 minutes before draining coolant. The engine is hot and presents a burn hazard. Coming in contact with hot engine parts may cause burns.

- a. Remove the radiator cap (**figure 27, item 1**).
- b. Loosen and remove the drain plug hose clamp (**figure 27, item 2**) and drain plug (**figure 27, item 3**) on the radiator and drain the coolant into an approved container.
- c. Dispose as regulated waste in accordance with unit SOP and local regulations.
- d. Drain coolant from radiator. Dispose of coolant using an approved container in accordance with local environmental procedures.
- e. Loosen and remove lower radiator hose clamp (**figure 27, item 4**). Remove lower radiator hose.

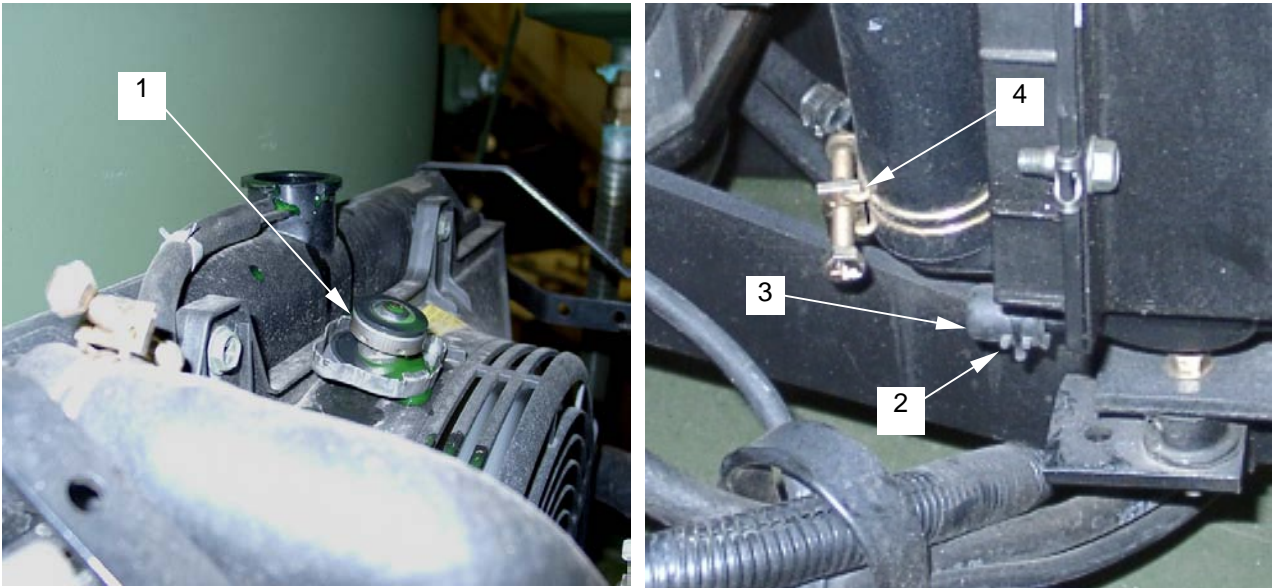


Figure 27. Radiator Fill And Drain

- f. Loosen and slide back upper radiator hose clamp (**figure 28, item 1**). Remove hose from radiator.
- g. Loosen and slide back radiator overflow (**figure 28, item 2**) hose clamp. Remove hose from radiator.

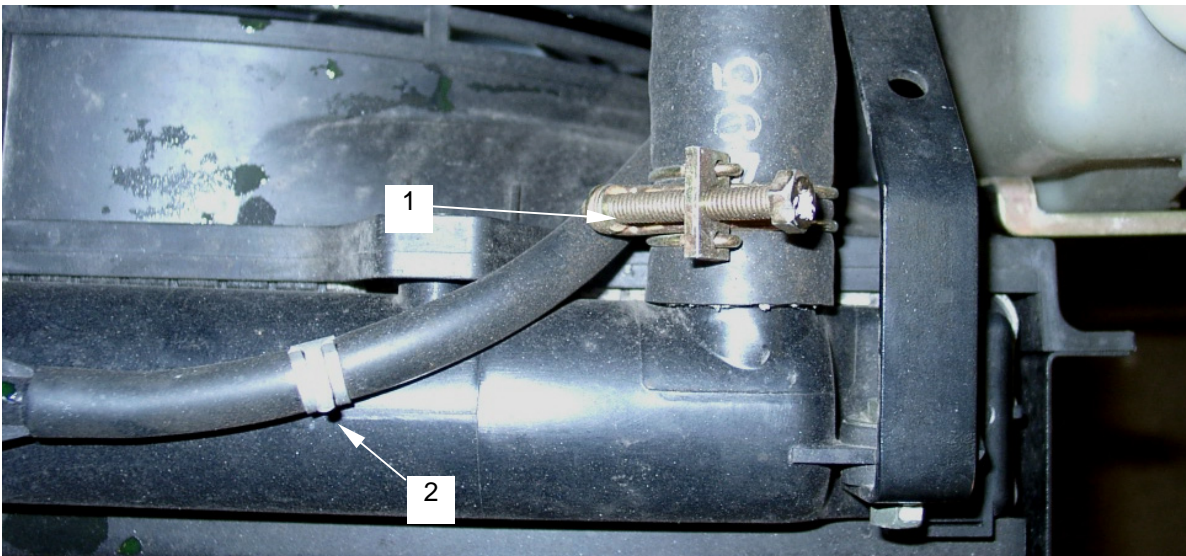


Figure 28. Upper Hose Clamps

- h. Loosen and remove radiator cover mounting bolts (**figure 29, item 1**).
- i. Remove radiator cover (**figure 29, item 2**).

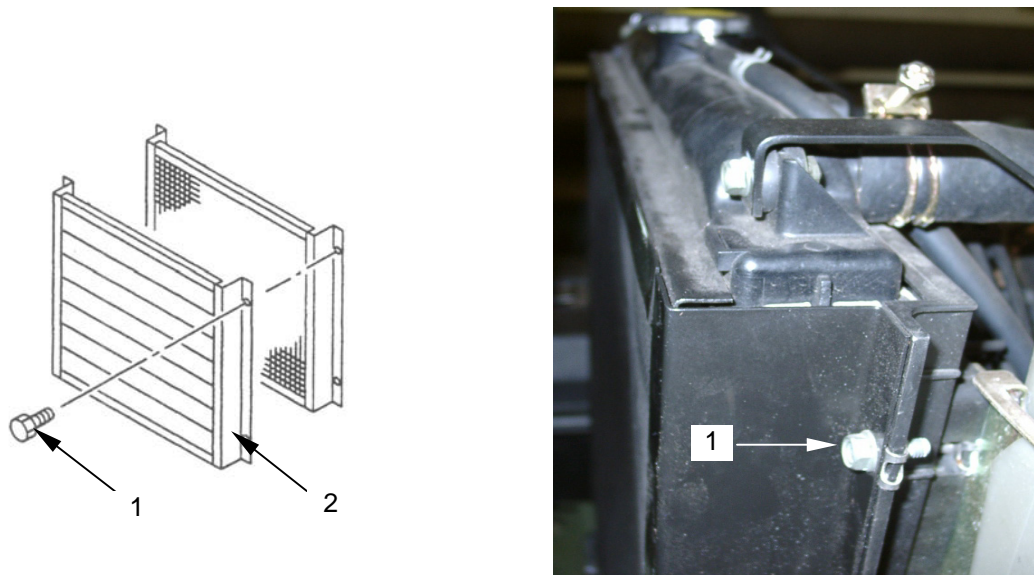


Figure 29. Radiator Cover Mounting Bolts

- j. Loosen and remove radiator bracket (**figure 30, item 1**) (**figure 30, item 2**) mounting nuts (**figure 30, item 3**) and bolts (**figure 30, item 4**).
- k. Remove radiator brackets.

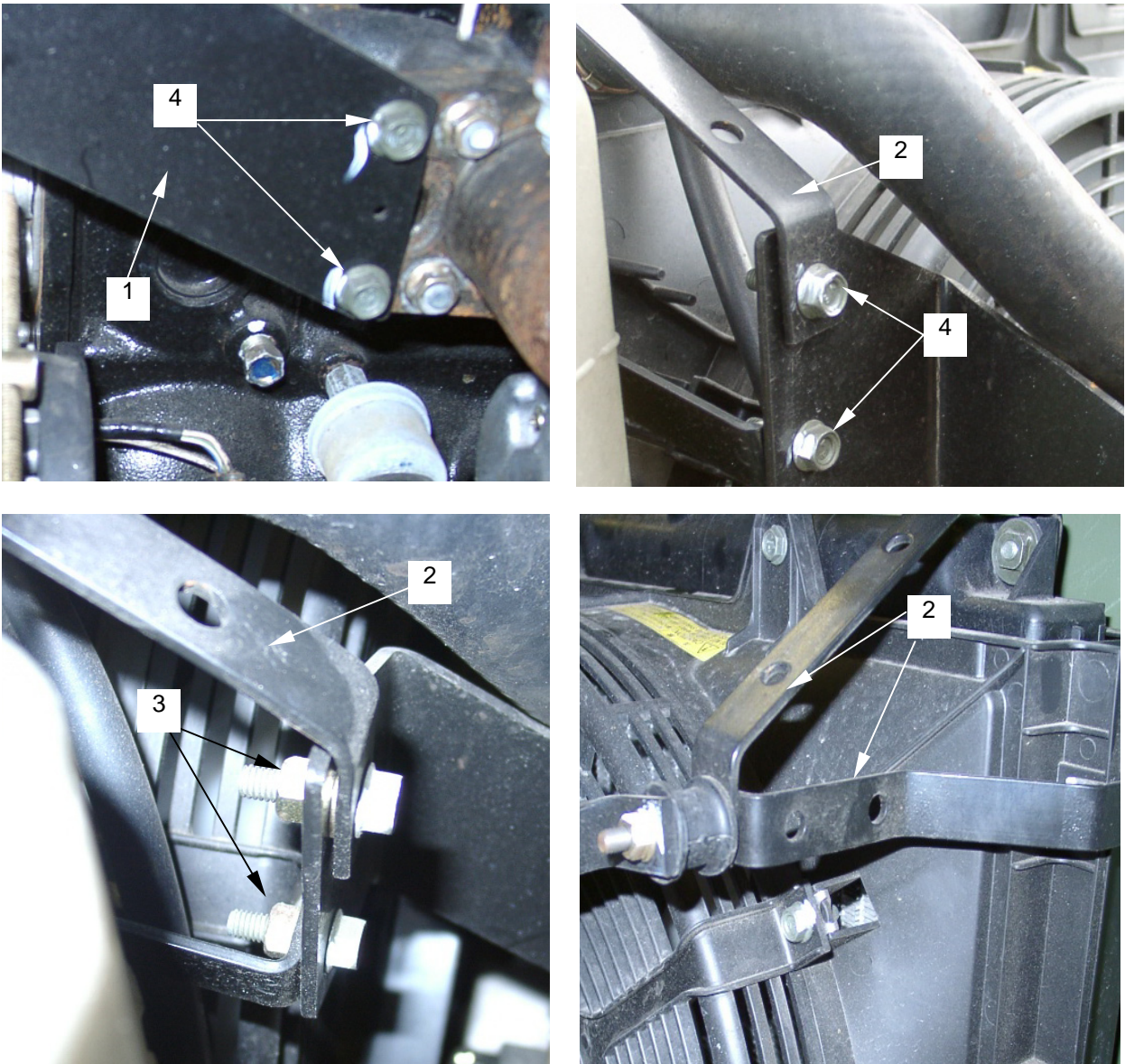


Figure 30. Radiator Brackets

- I. Remove radiator.
- m. Install new radiator.
- n. Install radiator brackets (**figure 31, item 1**) (**figure 31, item 2**).
- o. Fasten and tighten radiator bracket nuts (**figure 31, item 3**) and bolts (**figure 31, item 4**).

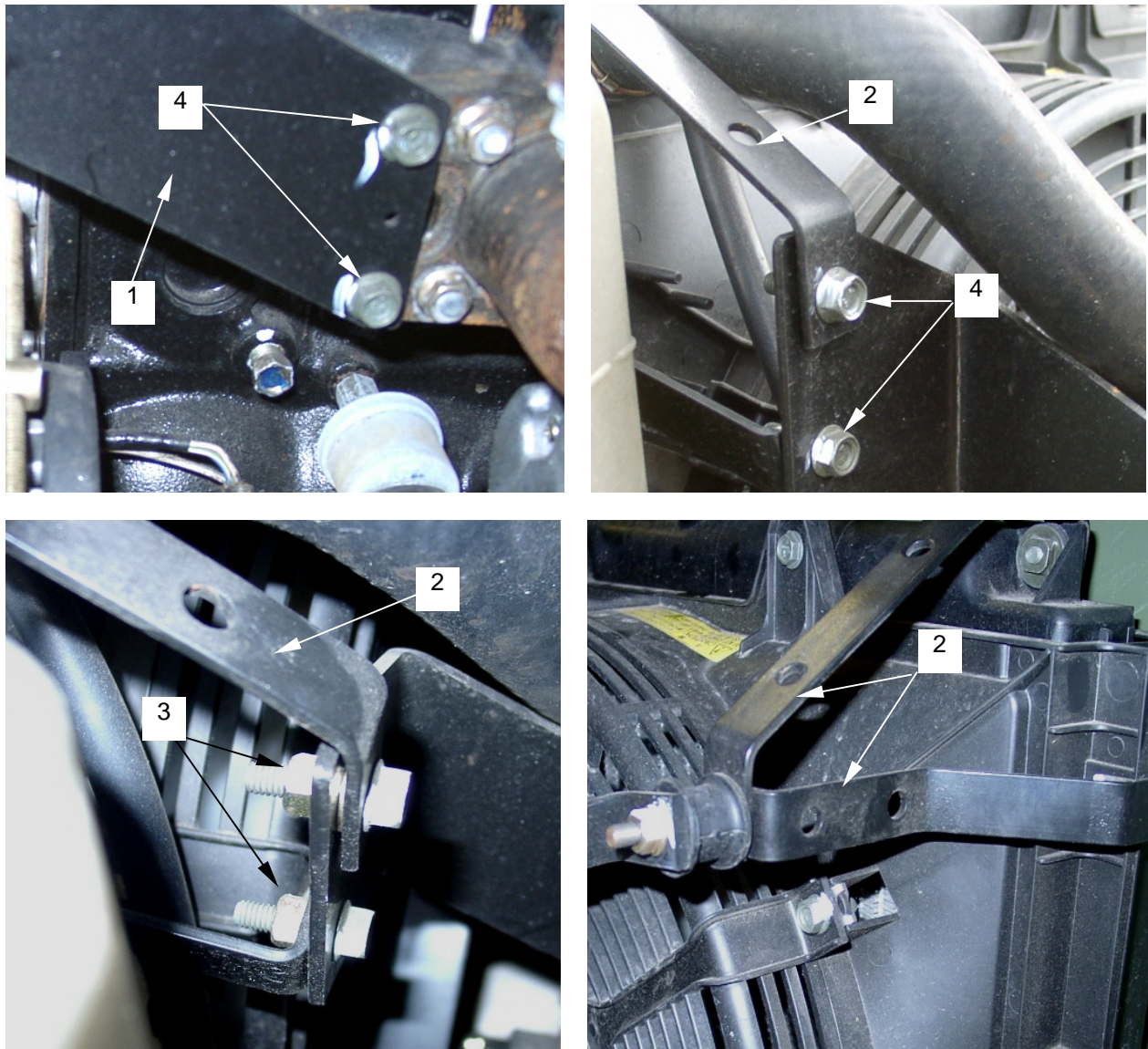


Figure 31. Radiator Brackets

- p. Install radiator cover (**figure 32, item 1**).
- q. Fasten radiator cover with mounting bolts (**figure 32, item 2**).

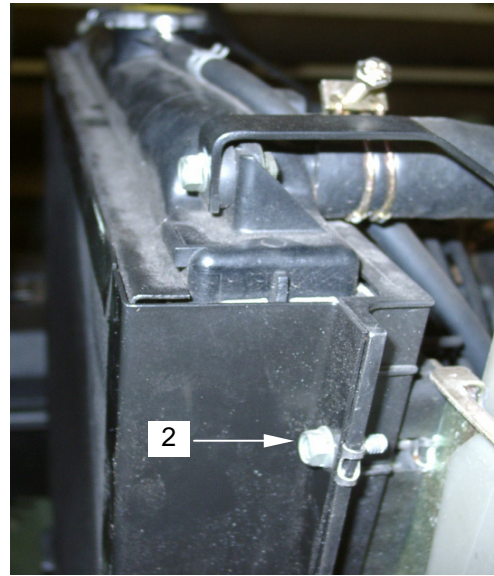
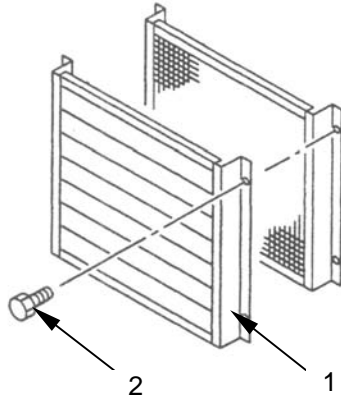


Figure 32. Radiator Cover Mounting Bolts

- r. Install drain plug and hose clamp (**figure 33, item 1**).
- s. Install lower radiator hose and hose clamp (**figure 33, item 2**).
- t. Install upper radiator hose and hose clamp (**figure 33, item 3**).
- u. Install radiator overflow hose and hose clamp (**figure 33, item 4**).

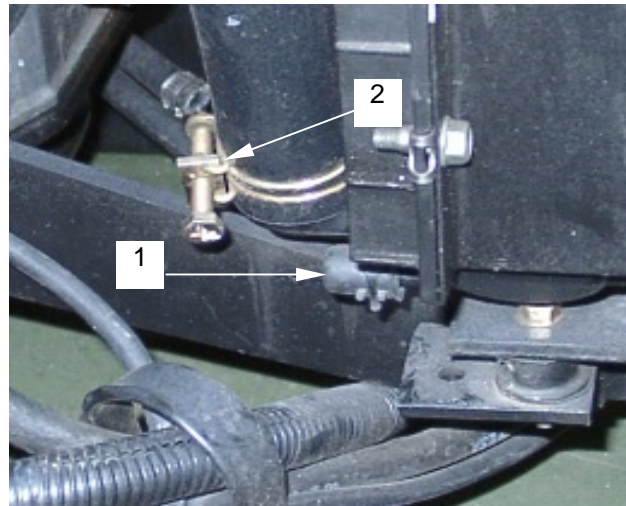
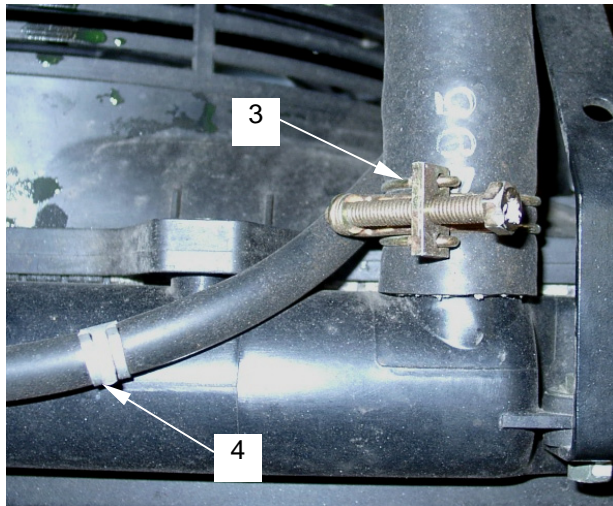


Figure 33. Radiator Fill and Drain

- v. Fill radiator with coolant in accordance with radiator fill procedure of this work package and install radiator fill cap.

7. Fuel Pump
 - a. Tag and disconnect fuel pump wiring (**figure 34, item 1**).
 - b. Loosen and remove inlet (**figure 34, item 2**) and outlet hose clamps (**figure 34, item 3**).
 - c. Remove inlet hose (**figure 34, item 4**) and outlet hose (**figure 34, item 5**) from fuel pump.
 - d. Loosen and remove fuel pump mounting bolt (**figure 34, item 6**).
 - e. Remove fuel pump (**figure 34, item 7**) and discard in an approved container.
 - f. Fasten and tighten new fuel pump with mounting bolt (**figure 34, item 6**).
 - g. Connect inlet (**figure 34, item 4**) and outlet hoses (**figure 34, item 5**).
 - h. Fasten hoses in place with hose clamps (**figure 34, item 2**) (**figure 34, item 3**).
 - i. Remove tag and reconnect wiring (**figure 34, item 1**) to fuel pump.

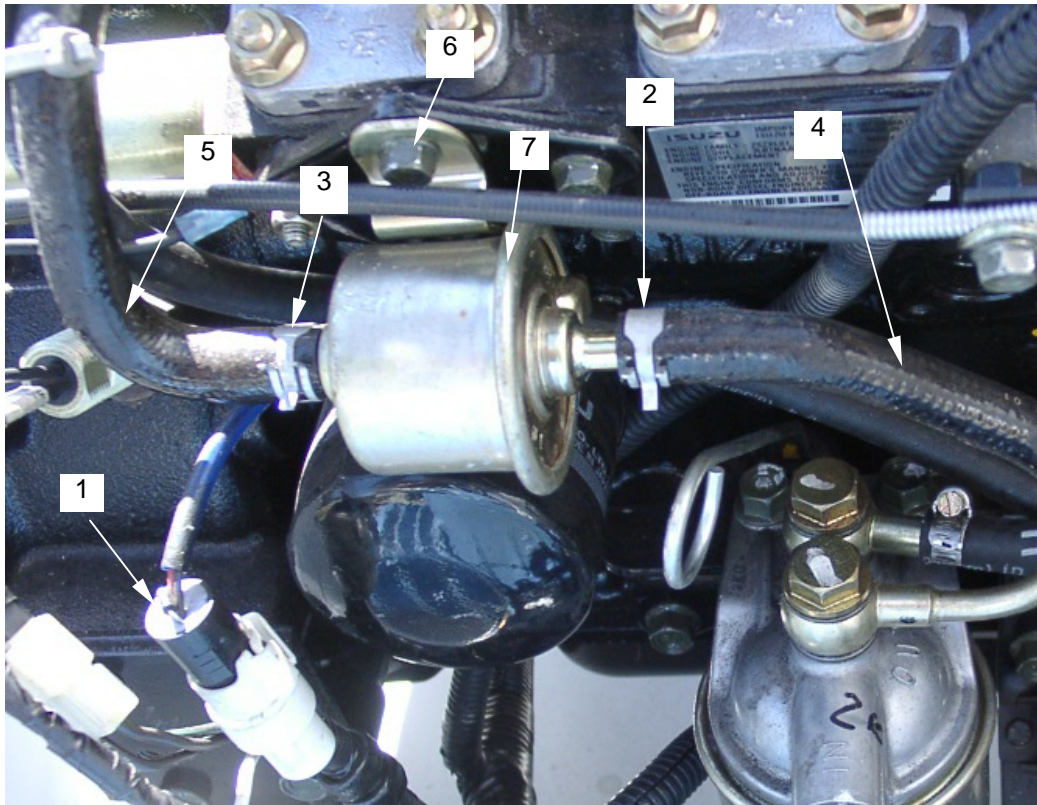


Figure 34. Fuel Pump

8. Thermostat
 - a. Remove the radiator cap (**figure 35, item 1**).
 - b. Loosen and remove the drain plug hose clamp (**figure 35, item 2**) and drain plug (**figure 35, item 3**) on the radiator and drain the coolant into an approved container.
 - c. Dispose as regulated waste in accordance with unit SOP and local regulations.
 - d. Install drain plug (**figure 35, item 2**) and hose clamp (**figure 35, item 2**).

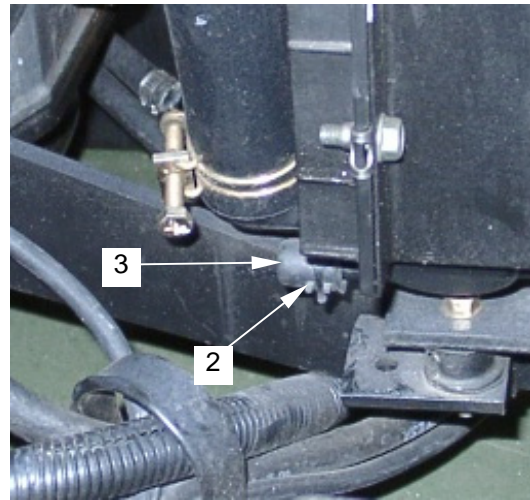
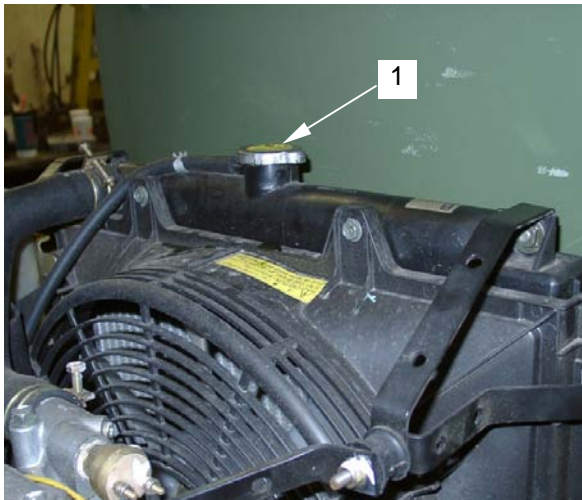


Figure 35. Radiator Fill Cap and Drain Plug

- e. Loosen and remove hose clamp (**figure 36, item 1**) securing radiator hose (**figure 36, item 2**) to water outlet pipe (**figure 36, item 3**).
- f. Remove hose from water outlet pipe (**figure 36, item 3**).
- g. Loosen and remove water inlet mounting bolts (**figure 36, item 4**).
- h. Remove water outlet pipe (**figure 36, item 3**).
- i. Remove gasket (**figure 36, item 5**).
- j. Remove thermostat (**figure 36, item 6**).
- k. Clean mating surfaces of water pump (**figure 36, item 7**) and water outlet pipe (**figure 36, item 3**).
- l. Install new thermostat (**figure 36, item 6**).
- m. Install new gasket (**figure 36, item 5**).
- n. Install water outlet pipe (**figure 36, item 3**).

- o. Fasten and tighten water outlet pipe mounting bolts (**figure 36, item 4**) from 1.9 to 2.9 kg-m (13.7-21.0 ft-lbs).
- p. Install radiator hose to water outlet pipe and tighten hose clamp (**figure 36, item 1**).
- q. Fill radiator with coolant in accordance with fill procedures within this work package.

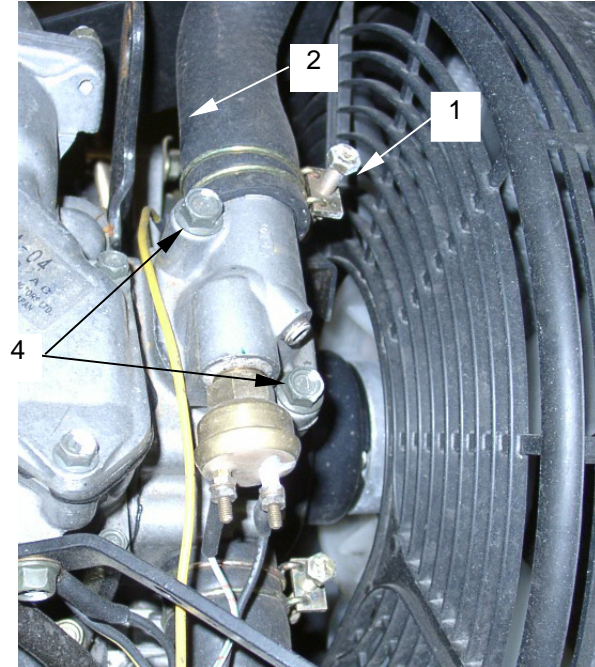
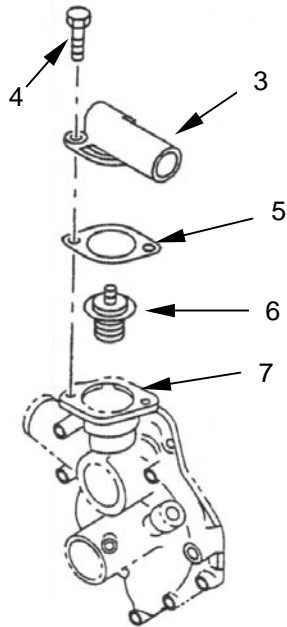


Figure 36. Thermostat

9. Water Pump

- a. Remove the radiator cap (**figure 37, item 1**).
- b. Loosen and remove the drain plug hose clamp (**figure 37, item 2**) and drain plug (**figure 37, item 3**) on the radiator and drain the coolant into an approved container.
- c. Dispose as regulated waste in accordance with unit SOP and local regulations.
- d. Install drain plug (**figure 37, item 3**) and hose clamp (**figure 37, item 2**).

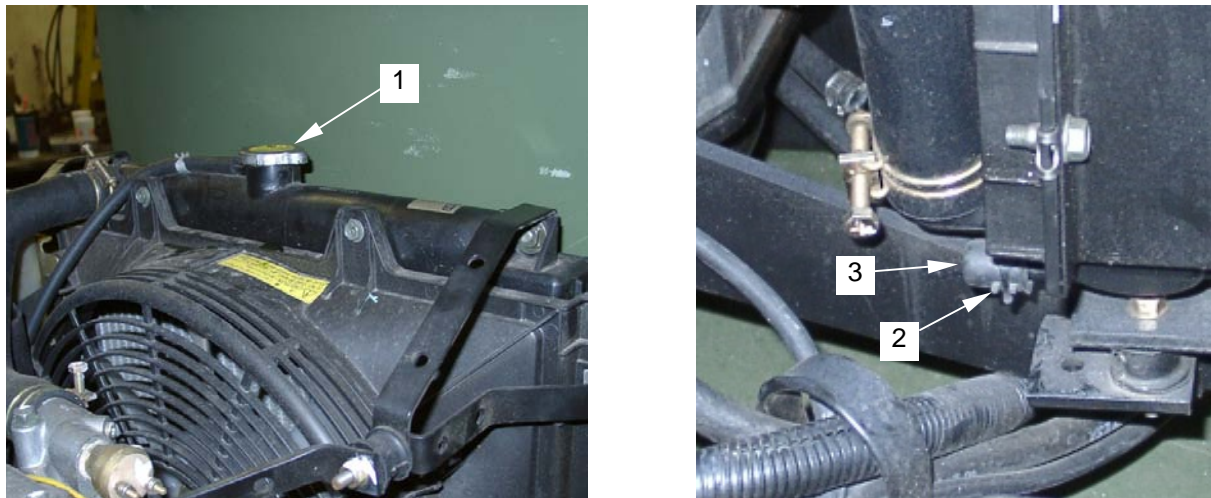


Figure 37. Radiator Fill Cap and Drain Plug

- e. Remove radiator in accordance with radiator removal procedure.
- f. Loosen and remove fan mounting bolts (**figure 38, item 1**).
- g. Loosen generator mounting bolts (**figure 39, item 1**).
- h. Remove fan (**figure 38, item 2**) and spacer (**figure 38, item 3**).
- i. Remove fan belt in accordance with fan belt removal procedure.
- j. Remove pulley (**figure 38, item 4**) by loosening and removing pulley mounting bolts (**figure 38, item 5**).
- k. Loosen and remove adjust plate mounting bolts (**figure 39, item 2**) and adjust plate (**figure 39, item 3**).
- l. Remove water pump mounting bolts (**figure 40, item 1**) and nuts (**figure 40, item 2**).
- m. Remove water pump (**figure 40, item 3**).
- n. Remove water pump cover (**figure 40, item 4**).
- o. Clean mating surface on engine.
- p. Install new cover (**figure 40, item 4**).
- q. Install new water pump (**figure 40, item 3**) and seal with RTV silicone.
- r. Install water pump mounting bolts (**figure 40, item 1**) and nuts (**figure 40, item 2**).
- s. Torque water pump mounting bolts (**figure 40, item 1**) from 1.9 to 2.9 kg-m (13.7 to 21 ft-lbs).
- t. Torque water pump mounting nuts (**figure 40, item 2**) from 1.9 to 2.9 kg-m (13.7 to 21 ft-lbs).

- u. Reinstall thermostat in accordance with thermostat removal procedure.
- v. Install generator adjust plate (**figure 39, item 3**) and bolts (**figure 39, item 2**).
- w. Torque generator mounting bolts (**figure 39, item 1**) from 3.5 to 4.7 kg-m (25.3 to 34.0 ft-lbs).
- x. Torque adjust plate mounting bolts (**figure 39, item 2**) from 1.9 to 2.9 kg-m (13.7 to 21.0 ft-lbs).
- y. Install pulley (**figure 38, item 4**).
- z. Install pulley mounting bolts (**figure 38, item 5**).
- aa. Torque pulley mounting bolts from 0.8 to 1.2 kg-m (5.8 to 8.6 ft-lbs).
- bb. Install spacer (**figure 38, item 3**).
- cc. Install fan (**figure 38, item 2**) on water pump (**figure 40, item 3**).
- dd. Fasten fan (**figure 38, item 2**) to water pump with mounting bolts (**figure 38, item 1**).
- ee. Torque fan mounting bolts (**figure 38, item 1**) from 1.9 to 2.9 kg-m (13.7-21.0 ft-lbs).
- ff. Reinstall fan belt in accordance with fan belt replacement procedure.
- gg. Reinstall radiator in accordance with radiator replacement procedure.
- hh. Fill radiator with coolant in accordance with fill procedures within this work package.

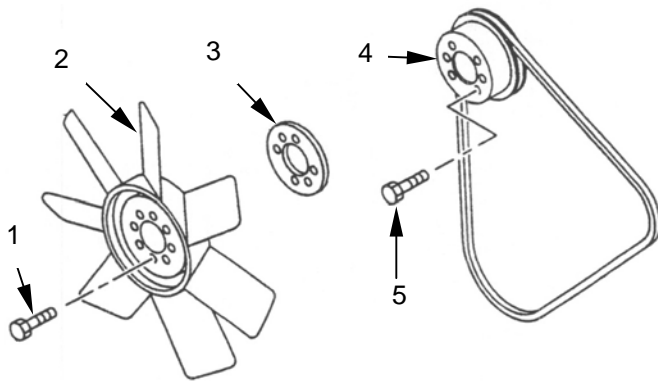


Figure 38. Fan And Belt

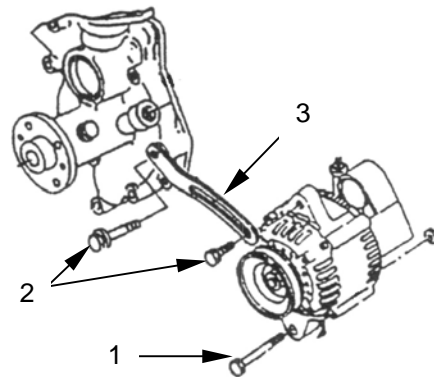


Figure 39. Generator Mounting Hardware

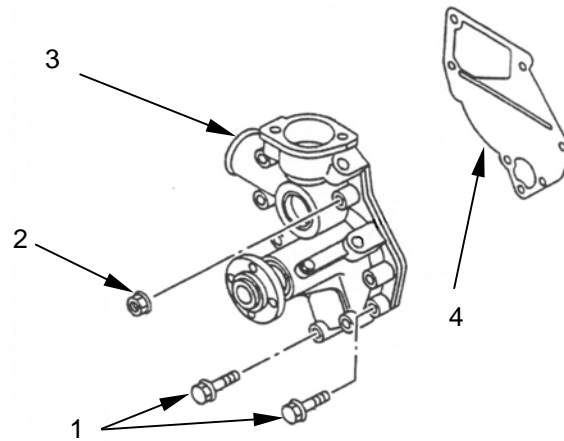


Figure 40. Water Pump

10. Replace glow plug

a. Remove air filter

- (1) Loosen hose clamps (**figure 41, item 1**).
- (2) Loosen and remove nuts (**figure 41, item 2**), lockwashers (**figure 41, item 3**) and bolts (**figure 41, item 4**) from air filter mounting bracket.
- (3) Remove mounting bracket (**figure 41, item 5**).
- (4) Remove air filter assembly (**figure 41, item 6**) from flex hose (**figure 41, item 7**).
- (5) Remove foam padding (**figure 41, item 8**).

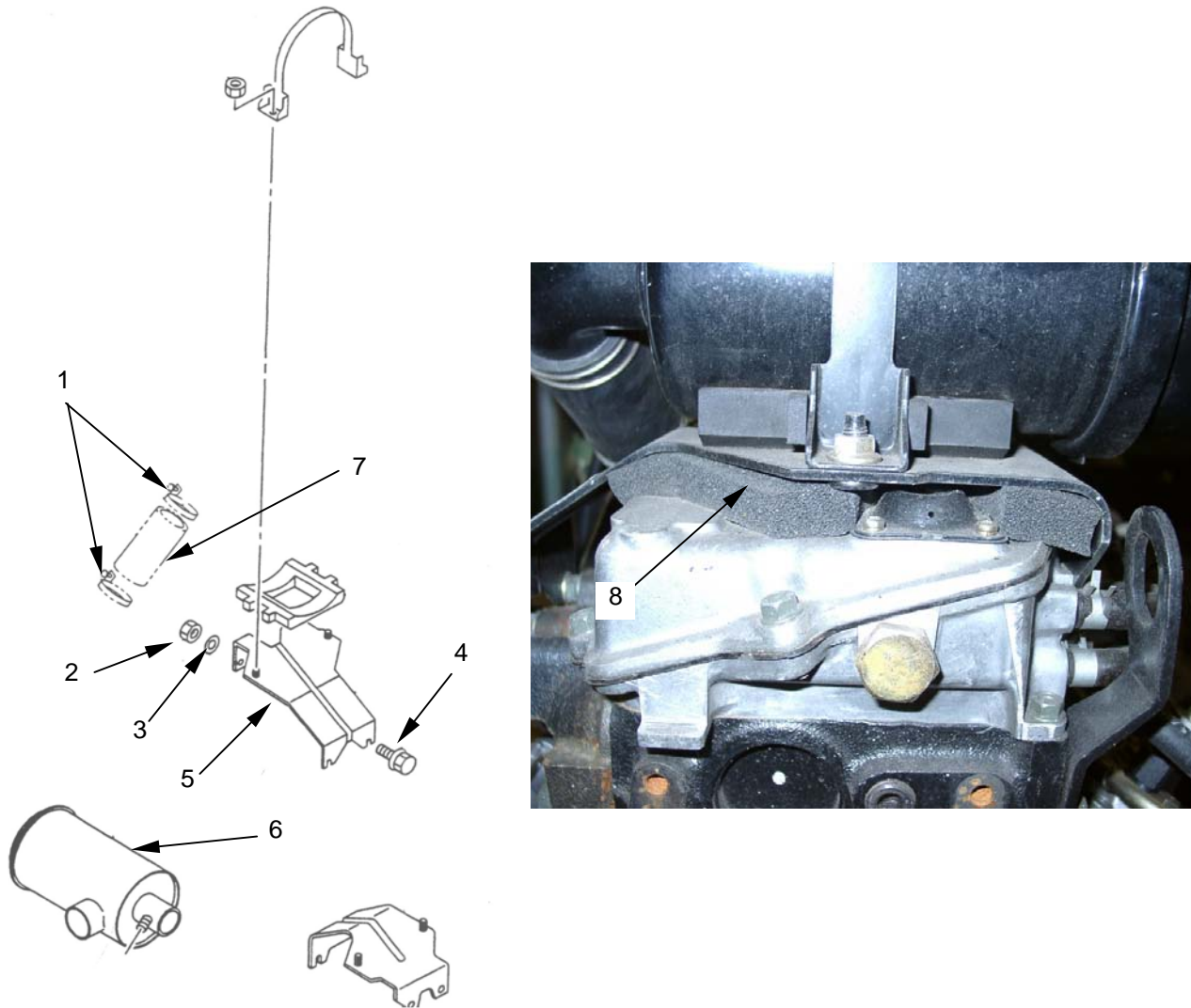


Figure 41. Air Filter

- b. Loosen and remove connector mounting nuts (**figure 42, item 1**).
- c. Tag and disconnect wire (**figure 42, item 2**).
- d. Remove connector (**figure 42, item 3**).
- e. Loosen and remove glow plug (**figure 42, item 4**) to be replaced.
- f. Install new glow plug (**figure 42, item 4**).
- g. Install connector (**figure 42, item 3**).

- h. Remove tag and connect wire (**figure 42, item 2**).
- i. Install and tighten connector mounting nuts (**figure 42, item 1**).

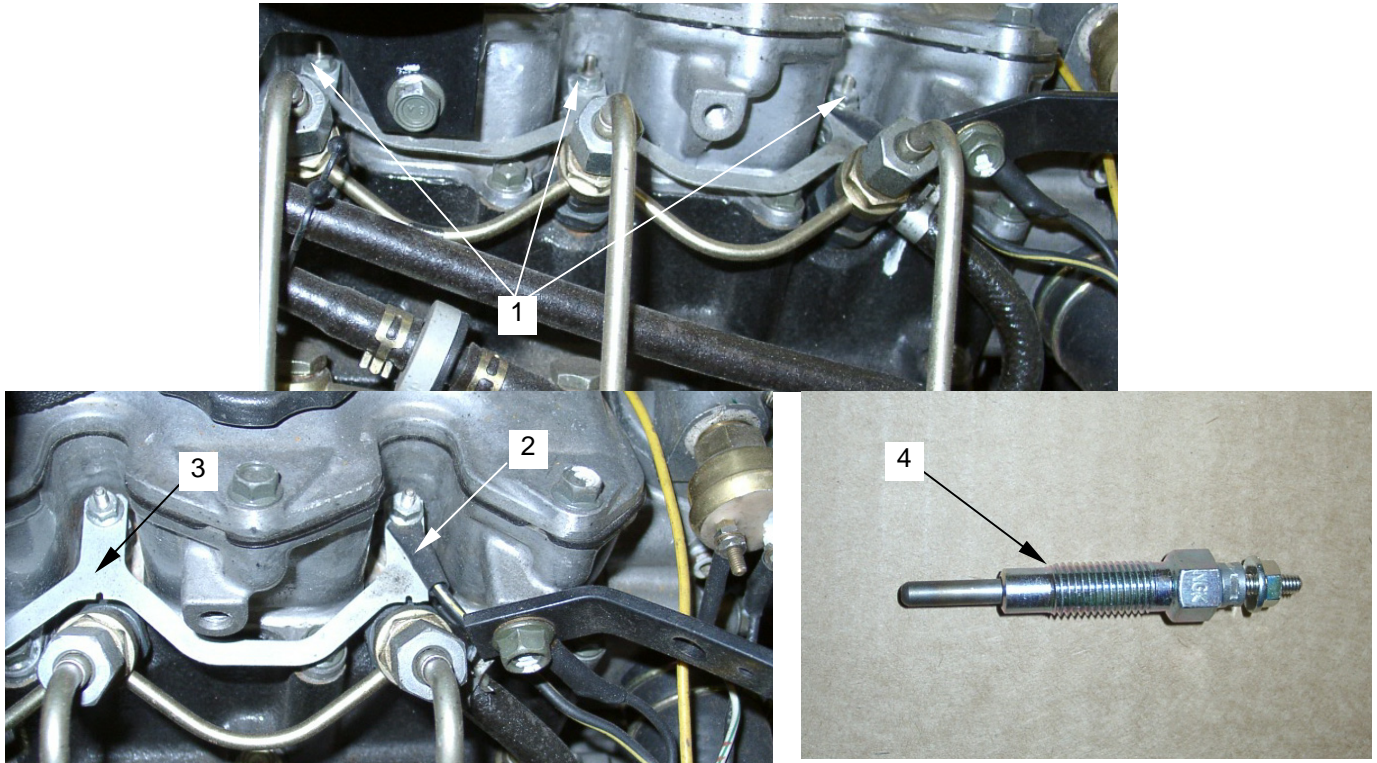


Figure 42. Glow Plug Replacement

- j. Install air filter
 - (1) Install foam padding (**figure 43, item 1**) on top of engine cover.
 - (2) Slide hose clamps (**figure 43, item 2**) over flex hose (**figure 43, item 3**).
 - (3) Connect air filter assembly (**figure 43, item 4**) to engine with flex hose (**figure 43, item 3**).
 - (4) Tighten hose clamps (**figure 43, item 2**).
 - (5) Install lockwashers (**figure 43, item 5**) and tighten mounting bracket nuts (**figure 43, item 6**) and bolts (**figure 43, item 7**).

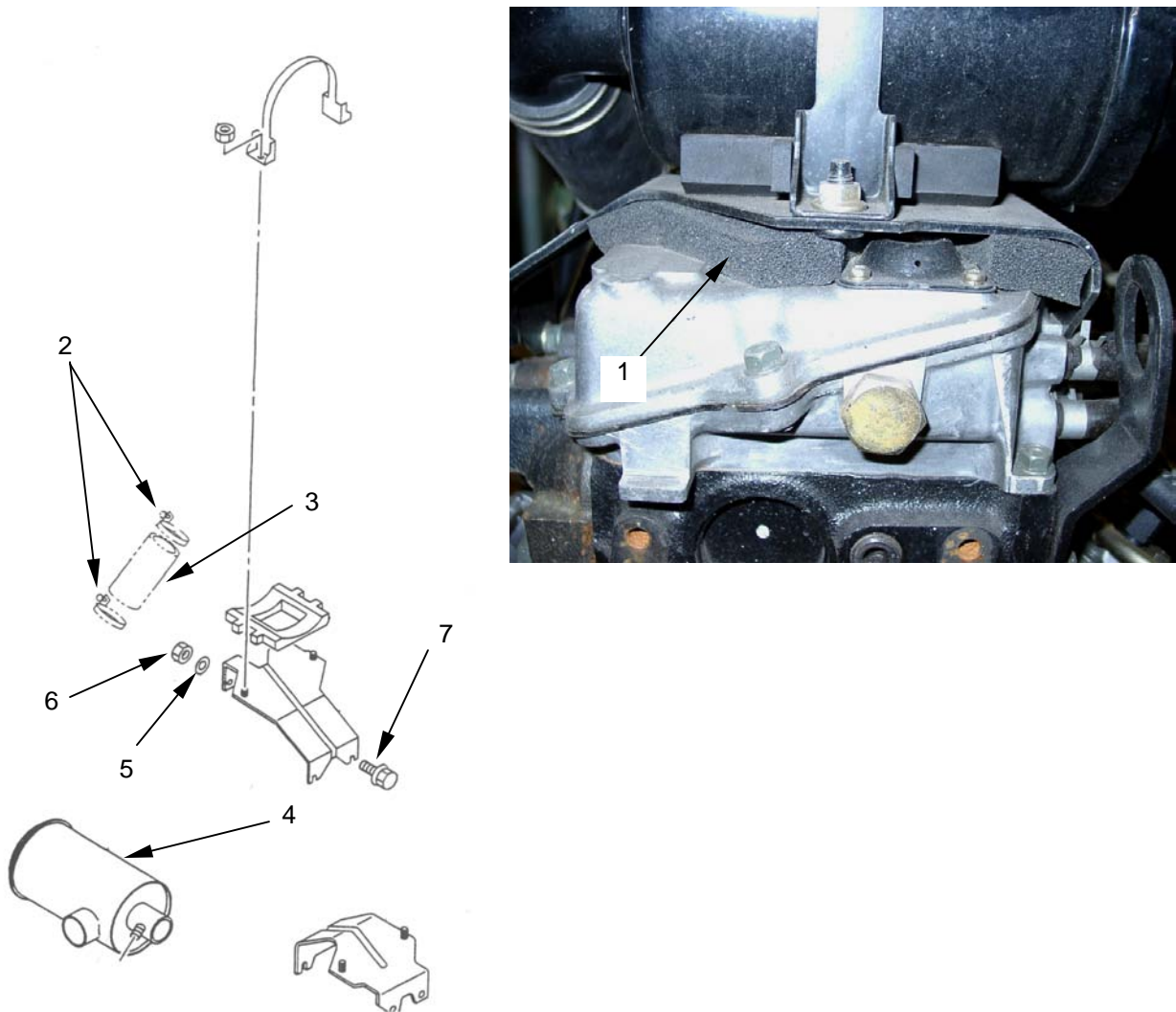


Figure 43. Air Filter

11. Throttle

- a. Loosen and remove cap screw (**figure 44, item 1**) securing throttle cable (**figure 44, item 2**) to engine.
- b. Loosen throttle cable housing clamp (**figure 44, item 3**).
- c. Loosen and remove throttle control mounting nut (**figure 45, item 1**).
- d. Remove throttle cable and cable housing from engine.

- e. Remove throttle (**figure 46, item 2**) and lockwasher (**figure 46, item 1**) from bracket (**figure 46, item 3**).
- f. Install lockwasher (**figure 46, item 1**) and new throttle (**figure 46, item 2**) on bracket (**figure 46, item 3**).
- g. Fasten throttle in place with throttle control mounting nut (**figure 45, item 1**).
- h. Install cable housing in cable clamp (**figure 44, item 3**).
- i. Connect throttle cable (**figure 44, item 2**) to engine. Ensure slack is removed.
- j. Tighten cap screw (**figure 44, item 1**).
- k. Tighten throttle cable housing clamp (**figure 44, item 3**).

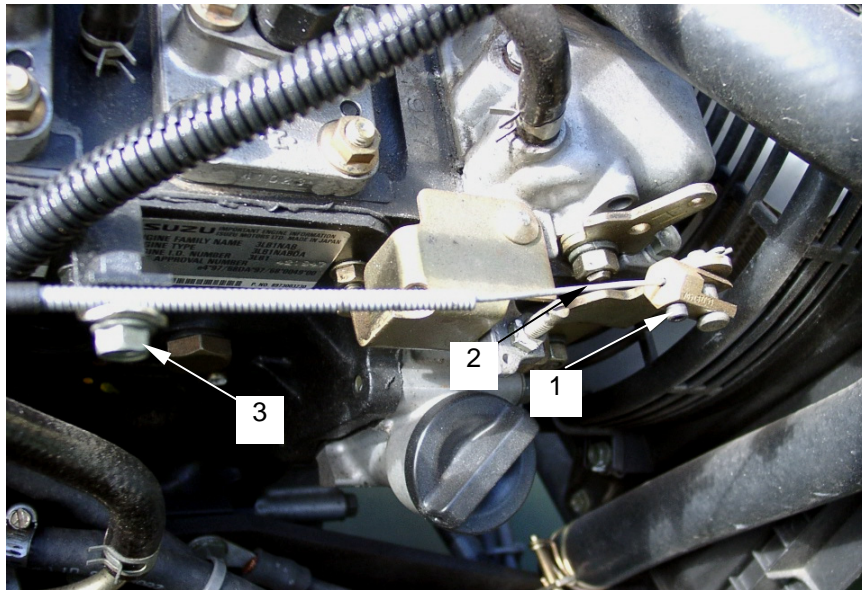


Figure 44. Throttle Cable to Engine

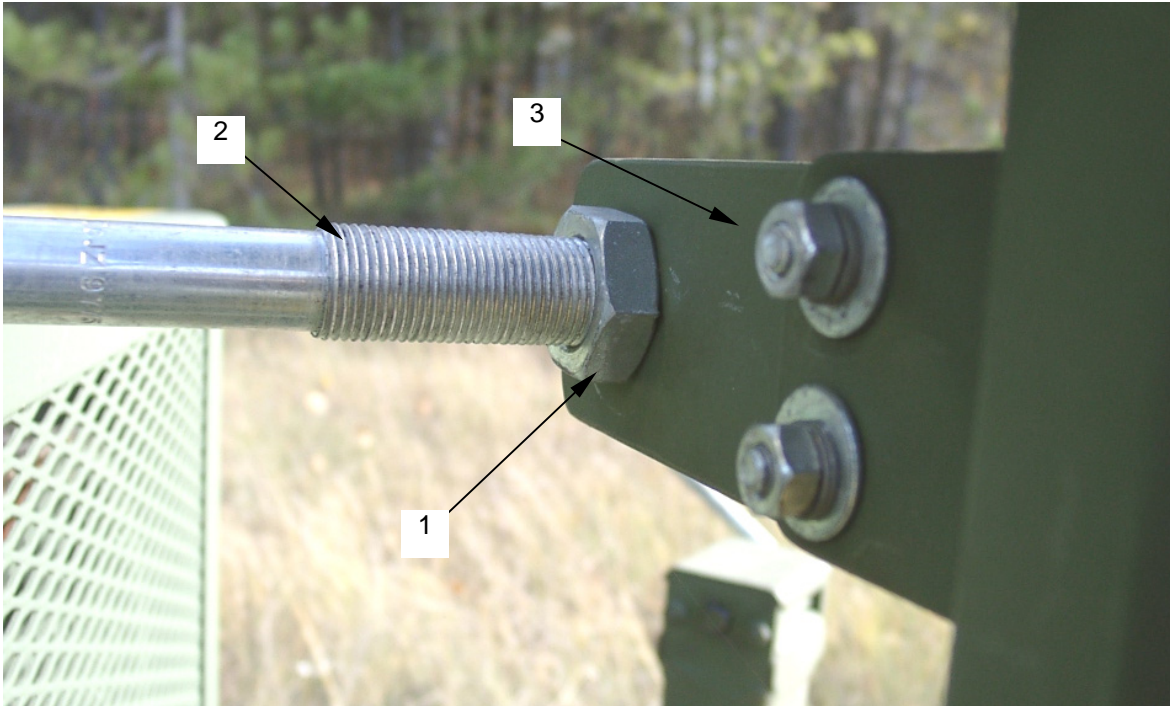


Figure 45. Mounting Nut

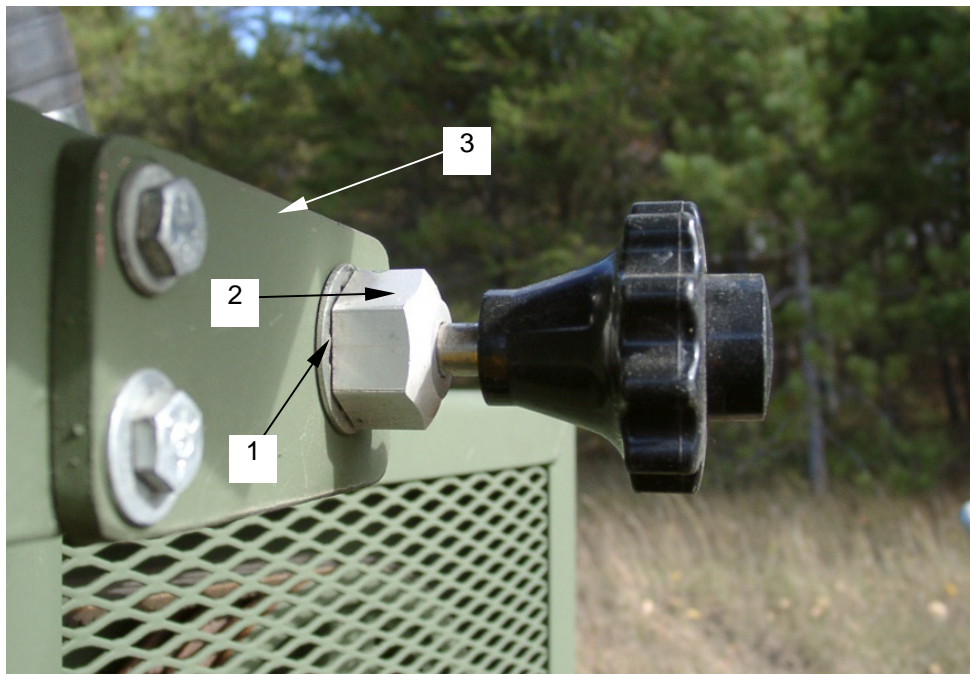


Figure 46. Throttle Control

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
CONTROL PANEL
REPAIR, TEST, REPLACE

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)
 Multimeter (WP 0053 00, Table 2, Item 8)

Personnel Required

MOS 63B, Light Vehicle Mechanic

Materials/Parts

Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut down



WARNING

To prevent injuries from electrical shock ensure battery cable is disconnected at the negative terminal post before making any repairs to the control box.

REPAIR

NOTE

The control panel (**figure 1, item 1**) can be repaired by replacing the basic enclosure (**figure 1, item 2**), the faceplate (**figure 1, item 3**), the backplate (**figure 1, item 4**), or the mounting bracket (**figure 1, item 5**).

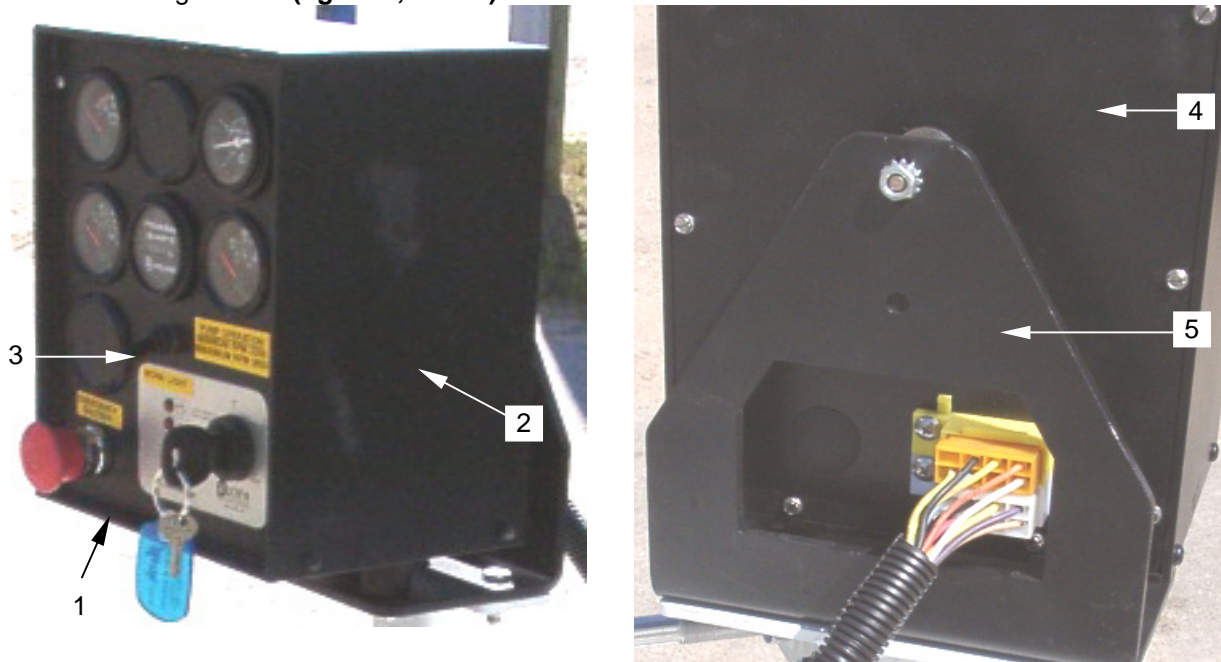


Figure 1. Control Panel

To disassemble the control panel, proceed as follows:

1. Disconnect the orange and white external wire harness (**figure 2, item 1**) from the connector (**figure 2, item 2**) at the rear of the control panel.

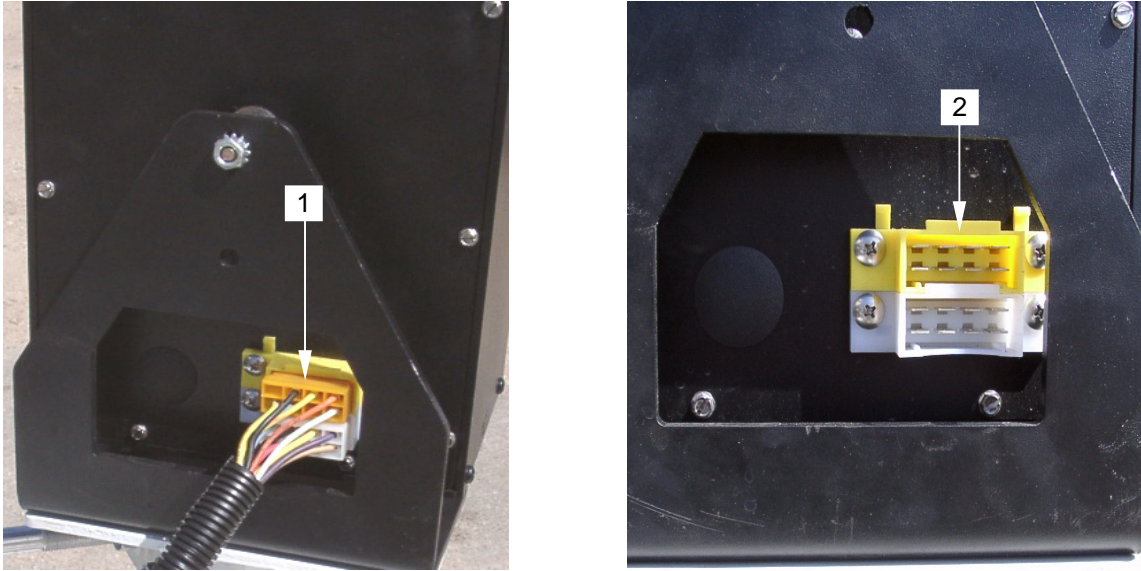


Figure 2. Control Panel External Harness Connection

2. Remove two hex nuts (**figure 3, item 1**) securing the control panel (**figure 3, item 2**) to the bottom of the control post bracket.
3. Remove control panel (**figure 3, item 2**) and bracket (**figure 3, item 3**) from control post. Remove the hex nuts (**figure 3, item 4**) securing the control panel (**figure 3, item 2**) to the bracket (**figure 3, item 3**).

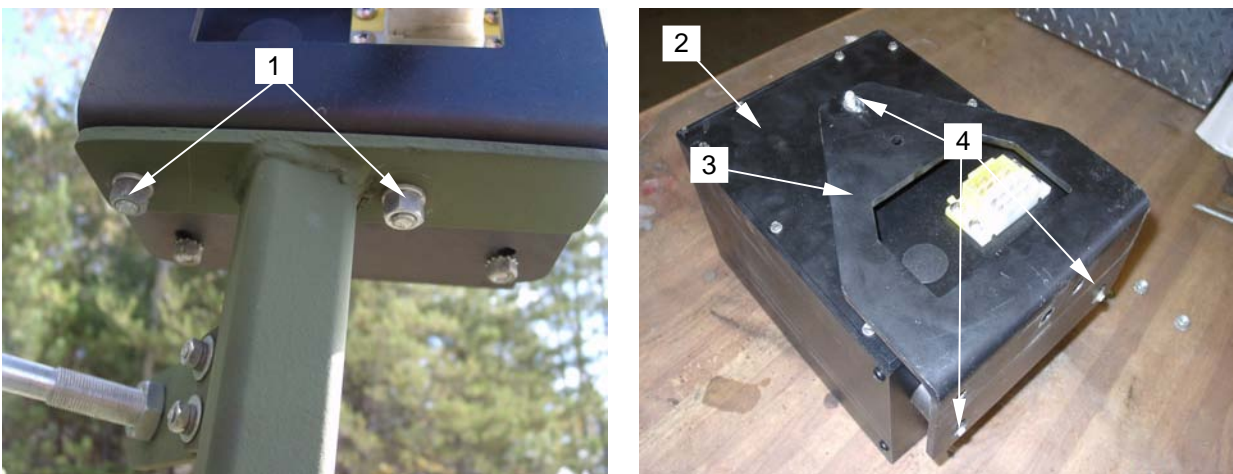


Figure 3. Removing Control Box Hardware

4. Separate control panel (figure 4, item 1) from bracket (figure 4, item 2). Recover washers (figure 4, item 3) on isolation mounts (figure 4, item 4).

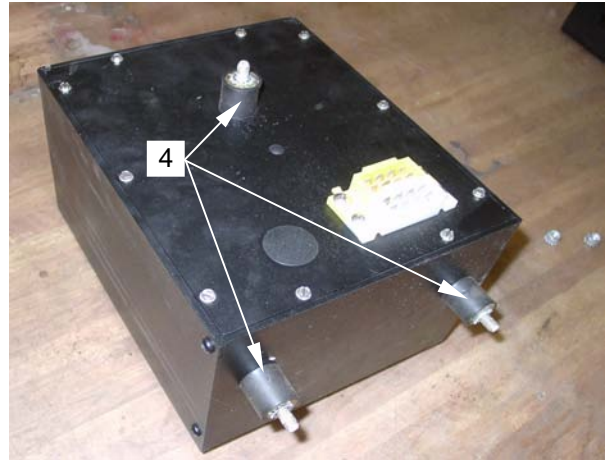
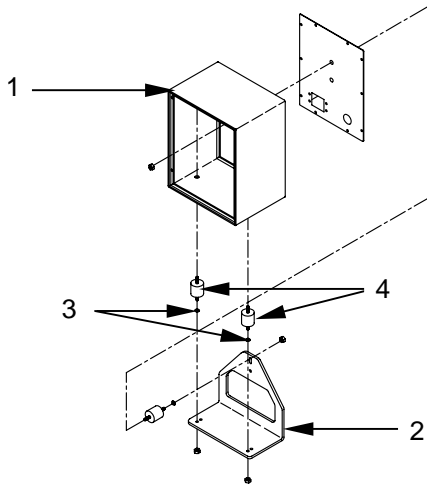


Figure 4. Removing Control Box from Bracket

5. To remove the backpanel (figure 5, item 1), unscrew and remove ten slotted hex head screws (figure 5, item 2) that hold the panel to the enclosure (figure 5, item 3). Tilt the backpanel open and separate the internal harness connectors (figure 5, item 4) from the 8-position male connectors (figure 5, item 5) mounted on the backpanel (figure 5, item 1).
6. Remove large (figure 5, item 6), and small (figure 5, item 7) dome plug. Remove rear isolation mount (figure 5, item 8) and washer (figure 5, item 9).
7. Remove four cross-tipped screws (figure 5, item 10) holding the 8-position male connectors (figure 5, item 5) to the backpanel (figure 5, item 1). Remove the connectors from the panel. Recover four nuts (figure 5, item 11).

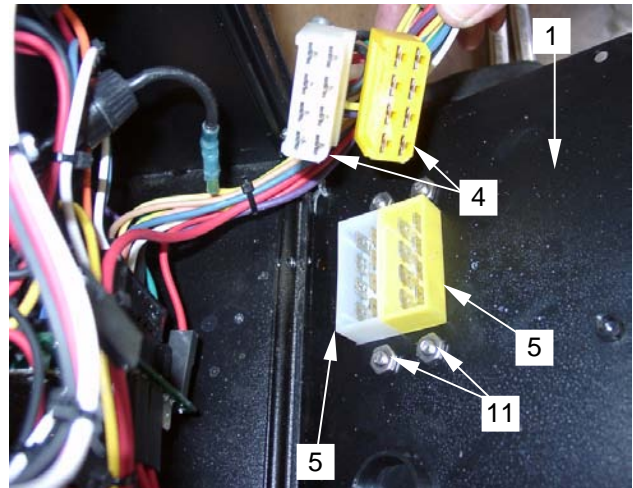
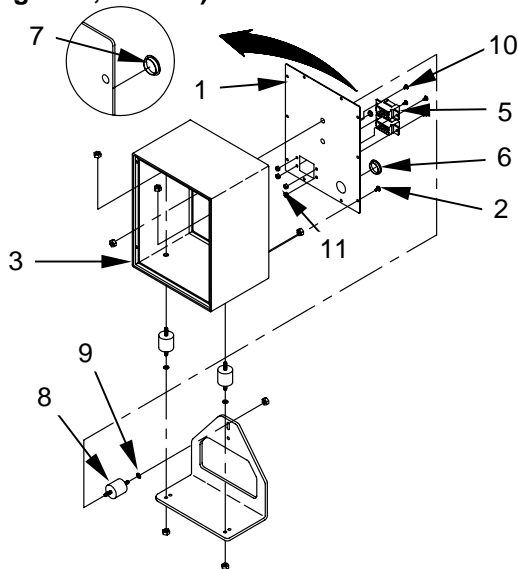


Figure 5. Removal of Backpanel

8. To remove the frontpanel (**figure 6, item 1**) from the enclosure (**figure 6, item 2**), remove four hex screws (**figure 6, item 3**) that hold the panel to the enclosure.
9. If enclosure is being replaced, remove bottom isolation mounts (**figure 6, item 4**) from enclosure. Retain hex nuts (**figure 6, item 5**).

NOTE

To remove the individual components (**figure 6, item 6**) mounted on the frontpanel, follow the procedures under REPLACE, in this WP.

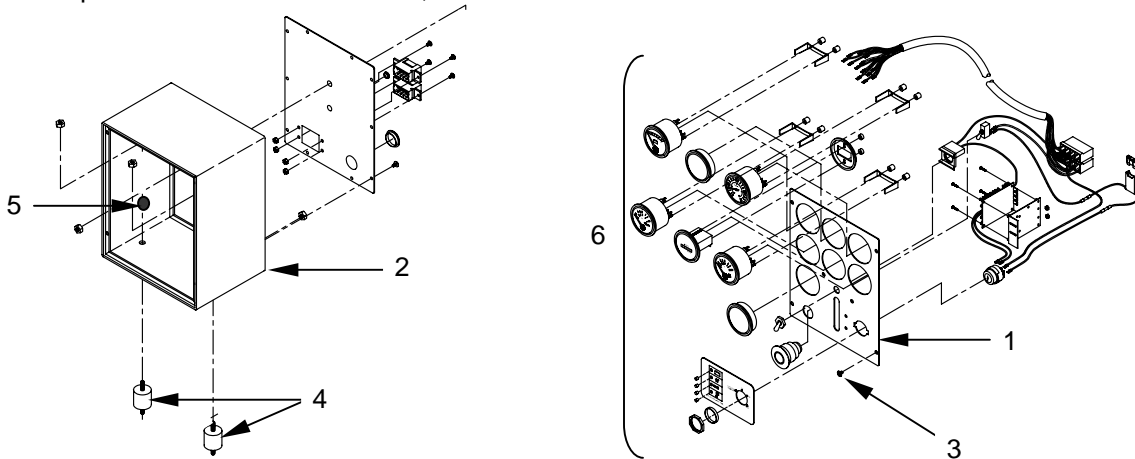


Figure 6. Removal of Frontpanel

10. Replace a bent, dented or otherwise damaged front panel (**figure 7, item 5**), backpanel (**figure 7, item 2**), enclosure (**figure 7, item 3**), mounting bracket (**figure 7, item 4**) that cannot be repaired or straightened out. Also replace deteriorated isolation mounts (**figure 6, item 4**),

NOTE

To install the components mounted to the front panel (**figure 7, item 5**), follow the procedures under REPLACE, in this WP.

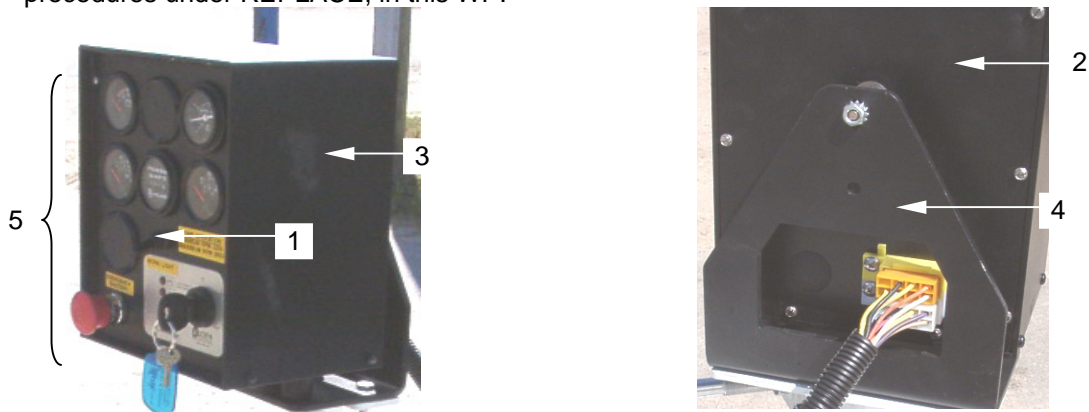


Figure 7. Control Panel Components

**WARNING**

To prevent injuries avoid contact with sharp metal edges on the control panel enclosure and internal components.

11. Install bottom isolation mounts (**figure 8, item 1**), if enclosure (**figure 8, item 2**) was replaced, and secure with hex nuts (**figure 8, item 3**).
12. Apply a bead of silicon to the edge of the box.
13. Install the frontpanel (**figure 8, item 4**) onto the enclosure (**figure 8, item 2**) with four hex head pan screws (**figure 8, item 5**).
14. Install the 8-position male connectors (**figure 8, item 6**) to the backpanel (**figure 8, item 7**) with four cross-tipped screws (**figure 8, item 8**) and nuts (**figure 8, item 9**).
15. Connect the internal wire harness (**figure 8, item 10**) to the 8-position male connectors (**figure 8, item 6**) on the inside of the backpanel (**figure 8, item 7**).
16. Install rear isolation mount (**figure 8, item 11**) onto backpanel (**figure 8, item 7**) and secure with hex nut (**figure 8, item 12**).
17. Apply a bead of silicon to the edge of the back panel.
18. Install the back panel (**figure 8, item 7**) onto the enclosure (**figure 8, item 2**) with ten slotted hex head screws (**figure 8, item 13**).
19. Install the large (**figure 8, item 14**), and small (**figure 8, item 15**) dome plug into the backpanel (**figure 8, item 7**).
20. Place washers (**figure 8, item 16**) onto the isolation mount studs and position control panel onto the bracket (**figure 8, item 17**) so that the isolation mount studs pass through the holes in the bottom and at the rear of the bracket (**figure 8, item 17**).
21. Install nuts (**figure 8, item 18**) onto the bottom and rear isolation mount studs.
22. Place assembled control panel onto the control post bracket (**figure 8, item 19**) and install two hex bolts through the control panel bracket (**figure 8, item 20**). Secure with flat washers and hex nuts (**figure 8, item 21**).

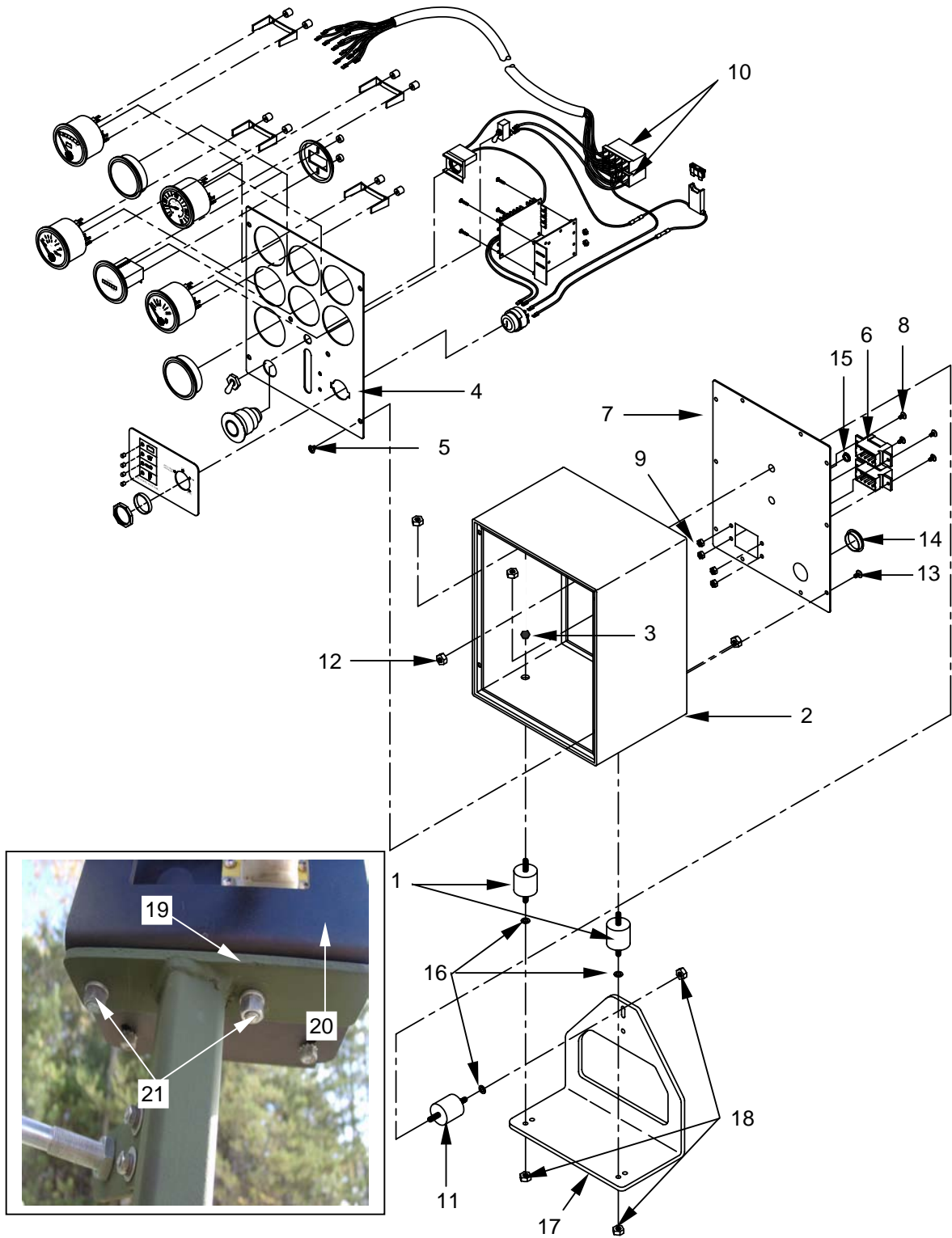


Figure 8. Reassembly of the Control Panel

23. Locate the 8-pin yellow and white male connectors (**figure 9, item 1**) at the rear of the control box and connect the orange and white external wire harness (**figure 9, item 2**) to it.

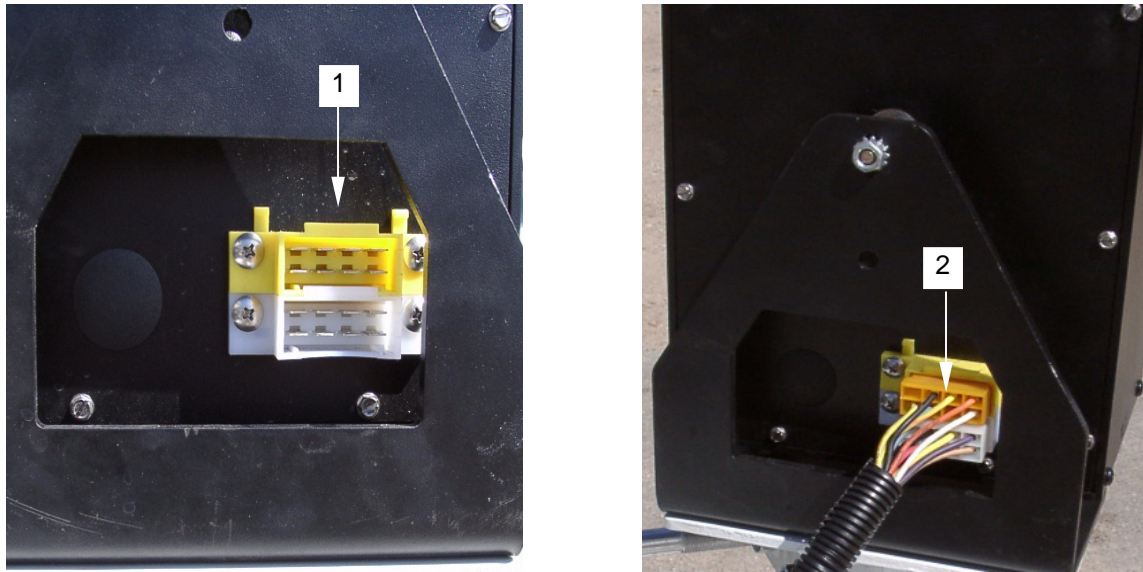


Figure 9. Control Panel External Harness Connection

TEST



WARNING

To prevent injuries from electrical shock ensure battery cable is disconnected at the negative terminal post before making any repairs to the control box.

NOTE

The gages and controls on the control panel can be tested to check electrical continuity. Refer to the wiring diagram in Figure 10.

1. To test the instruments, proceed as follows: Remove the wires from the instrument to be tested as described under REPLACE in this WP.
2. Attach the leads of a multimeter to the positive (+) and negative (-) contacts on the back of the voltmeter, the oil pressure gage, the water temperature gage, the tachometer, or the key switch as applicable.
3. If no continuity is present, indicating an open circuit, replace the instrument as described under REPLACE in this WP.
4. Failure of multiple instruments or the emergency button and key switch is indicative of a printed circuit board failure. Replace the entire box. Remove it as described in paragraphs 1., and 2., and install it as described in paragraphs 21., and 22., under REPAIR in this WP.

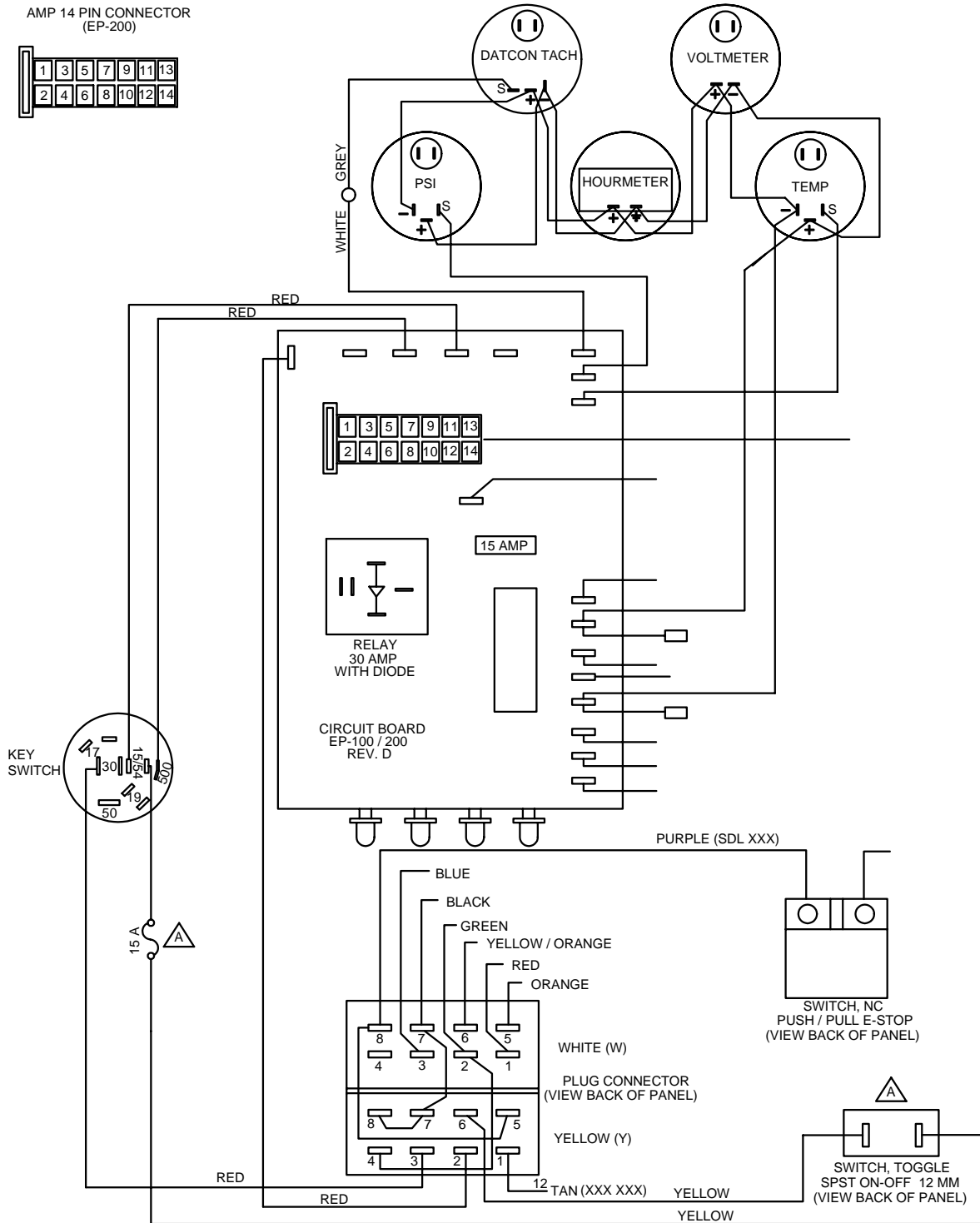


Figure 10. Control Panel Wiring Diagram

REPLACE

**WARNING**

To prevent injuries from electrical shock ensure battery cable is disconnected at the negative terminal post before making any repairs to the control box.

NOTE

Replace a voltmeter (**figure 11, item 1**), oil pressure gage (**figure 11, item 2**), water temperature gage (**figure 11, item 3**), tachometer (**figure 11, item 4**), hour meter (**figure 11, item 5**), or toggle switch (**figure 11, item 6**) as follows:

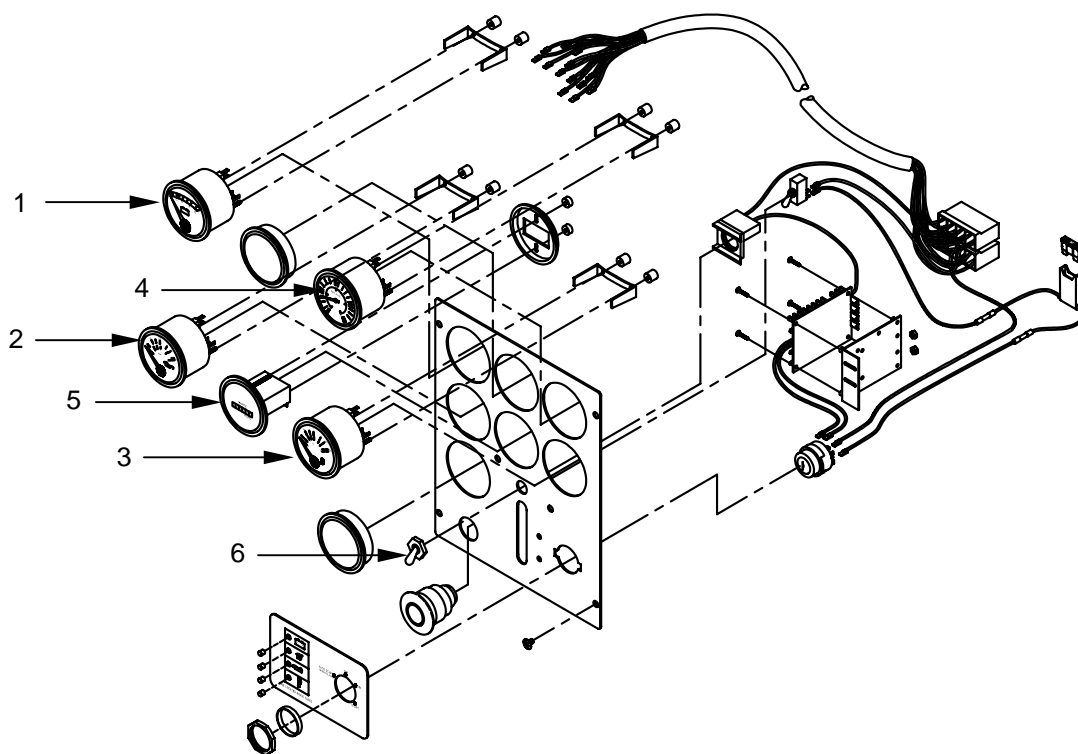


Figure 11. Front Panel Assembly

1. Disassemble the control panel as described in step 1., through step 9., under REPAIR in this WP.
2. Tag and disconnect wires (**figure 12, item 1**) from the instrument (**figure 12, item 2**) to be replaced.
3. Remove hex nuts (**figure 12, item 3**) from mounting brackets (**figure 12, item 4**) on the voltmeter (**figure 12, item 5**), oil pressure gage (**figure 12, item 6**), and temperature gage (**figure 12, item 7**)

4. Remove mounting bracket (figure 12, item 4) from instrument. Remove instrument (figure 12, item 2) through the front of the panel. Re-install new instrument as required.

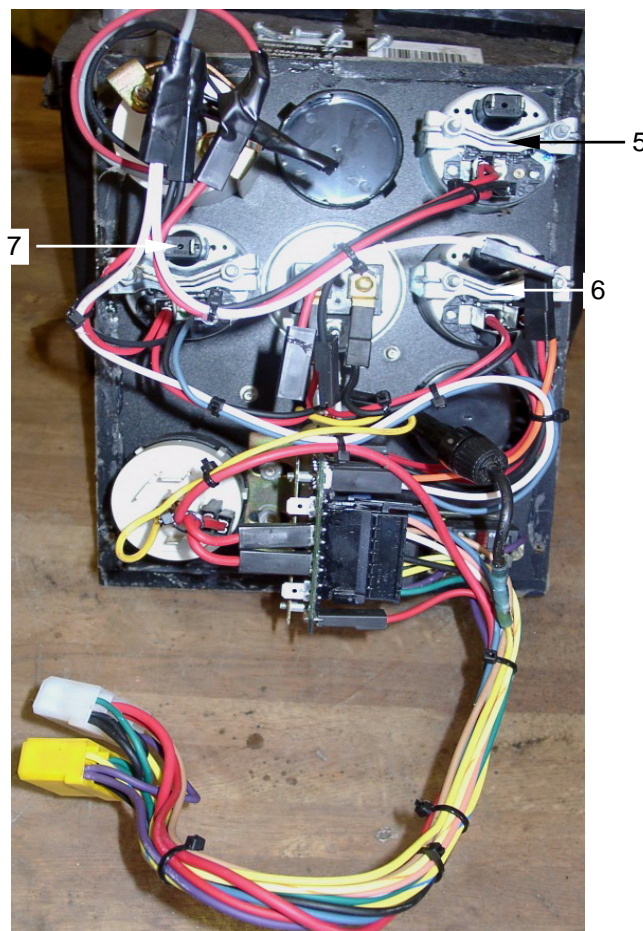
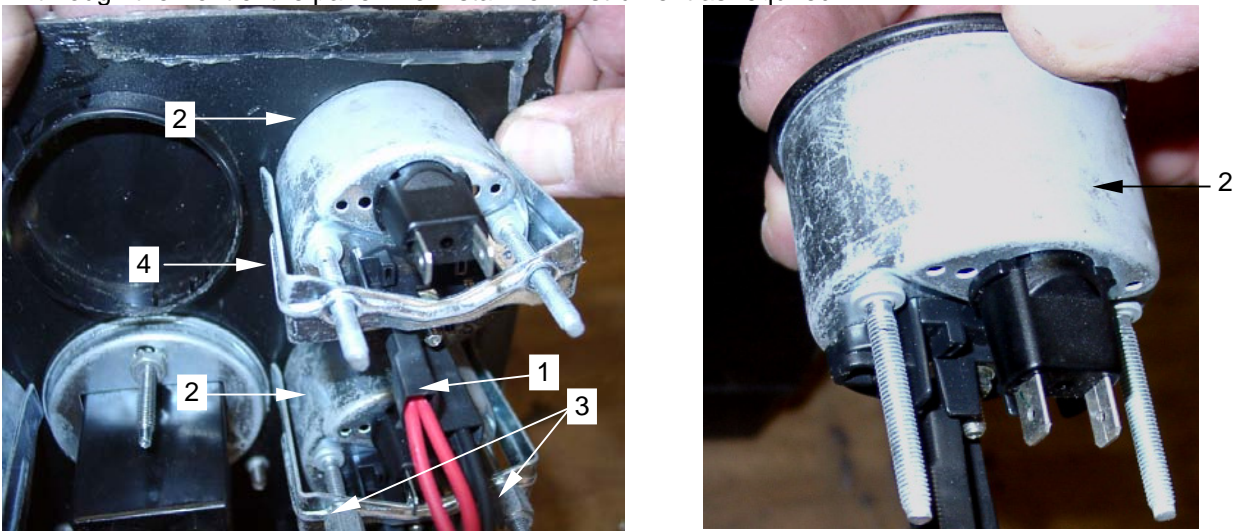


Figure 12. Removal/Installation of Controls/Gages

5. To remove the toggle switch (**figure 13, item 1**), tag and remove the wires (**figure 13, item 2**) from the rear of the switch. Remove the rubber boot and retainer (**figure 13, item 3**) from the front of the switch. Remove the switch through the rear of the panel. Install new switch as required.

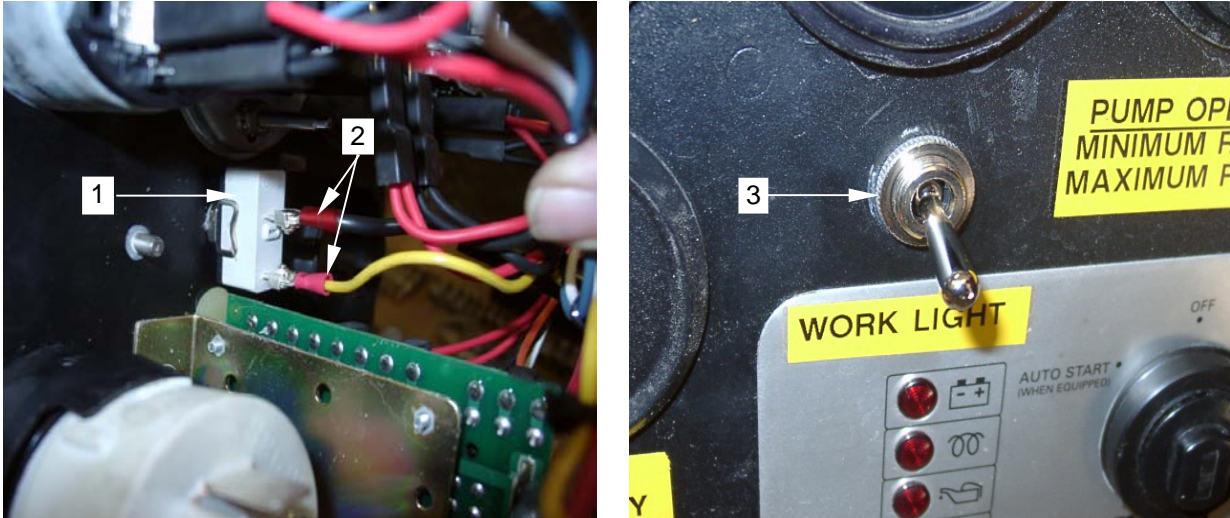


Figure 13. Removal/Installation of Toggle Switch

6. To remove the tachometer (**figure 14, item 1**), tag and disconnect the wires (**figure 14, item 2**) and remove two screws from the angle brackets (**figure 13, item 3**). Remove the tachometer through the front of the panel. Install a new tachometer as required.

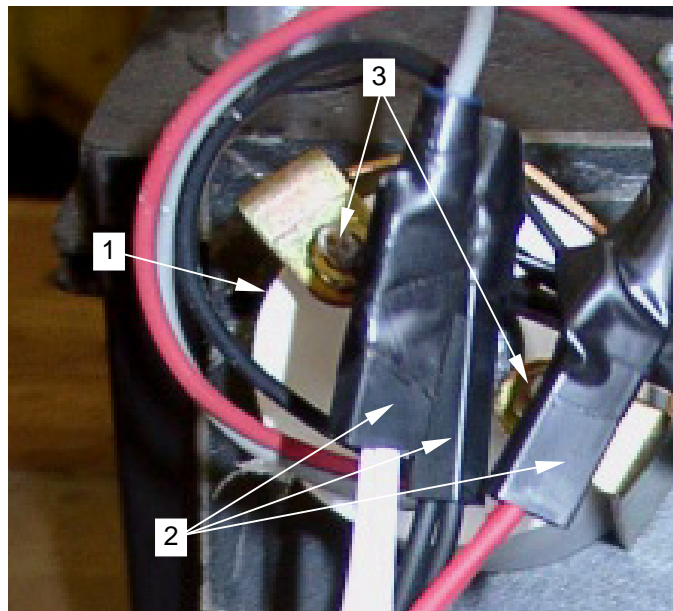


Figure 14. Removal/Installation of Tachometer

7. To remove the hour meter (**figure 15, item 1**), tag and remove wires (**figure 15, item 2**) from rear of switch. Unscrew two nuts (**figure 15, item 3**) from retainer (**figure 15, item 4**). Remove meter through front of panel. Place a new meter into position. Install retainer and re-connect wires

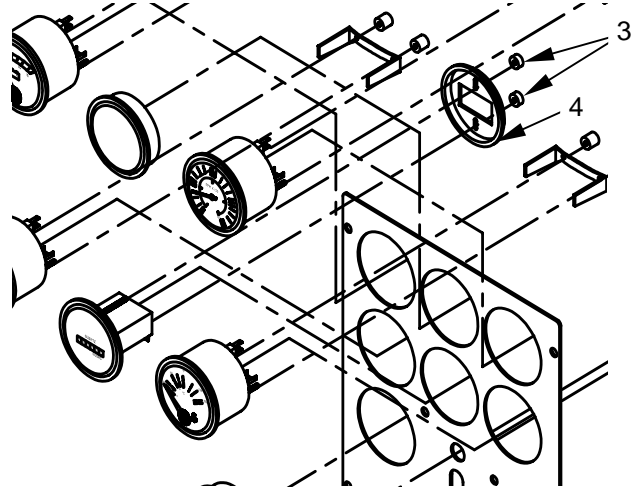
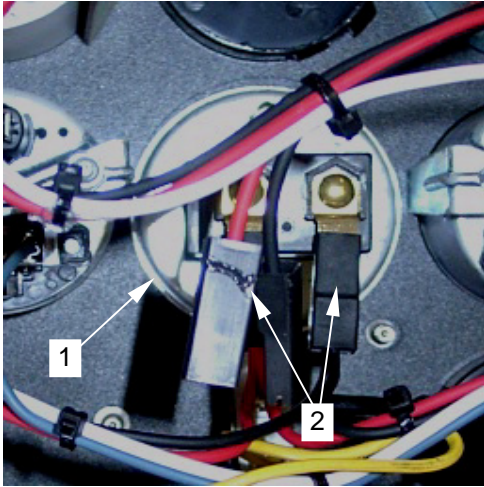


Figure 15. Removal/Installation of Hour Meter

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
FUEL SUPPLY/RETURN HOSES
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

63B Light Vehicle Mechanic

Materials/Parts

Gloves, Work (WP 0089 00, Table 2, Item 5)
 Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off
 Emergency button pushed in
 Ignition key removed

REPLACE

To replace the fuel supply and return hose, proceed as follows:

**WARNING**

Fuel spills are fire and environmental hazards. Clean up any spills in accordance with local regulations. Hold up disconnected end of hose and let fuel drain back into the tank before disconnecting tank end of hoses.

1. When removing fuel supply and return hoses, avoid diesel fuel spills. Always disconnect supply hose at the fuel filter and return hose at the engine block, first.
2. Cut all cable ties (**figure 1, item 1**) on $\frac{5}{16}$ -inch fuel supply hose and $\frac{1}{4}$ -inch fuel return hose.

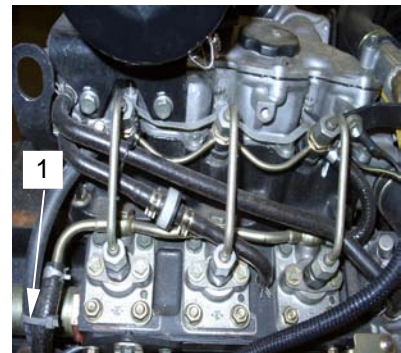
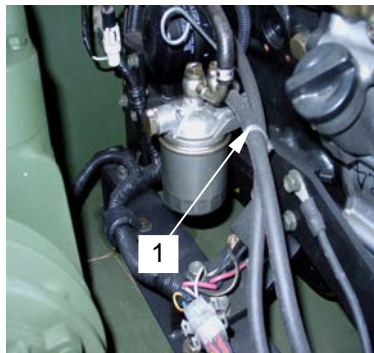
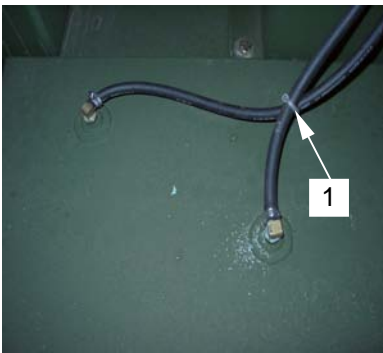


Figure 1. Removing Cable Ties

3. Using pliers, loosen hose clamp of $\frac{5}{16}$ -inch fuel supply hose (**figure 2, item 1**) at the fuel filter (**figure 2, item 2**). Hold disconnected hose up momentarily to let any fuel drain back into tank.
4. Using pliers, loosen hose clamp of $\frac{1}{4}$ -inch fuel return hose (**figure 2, item 3**) at the engine block. Hold disconnected hose up momentarily to let any fuel drain back into tank.

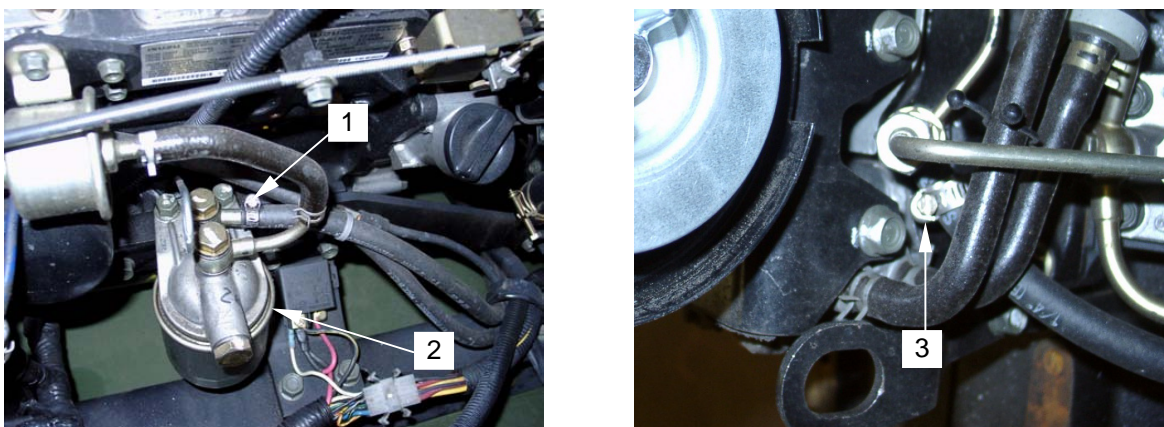


Figure 2. Disconnecting Fuel Supply and Return Hoses

5. Disconnect the hose clamp (**figure 3, item 1**) of $\frac{5}{16}$ -inch fuel supply hose (**figure 3, item 2**) at the fuel tank (**figure 3, item 3**).
6. Disconnect the hose clamp (**figure 3, item 4**) of $\frac{1}{4}$ -inch fuel return hose (**figure 3, item 5**) at the fuel tank (**figure 3, item 6**).

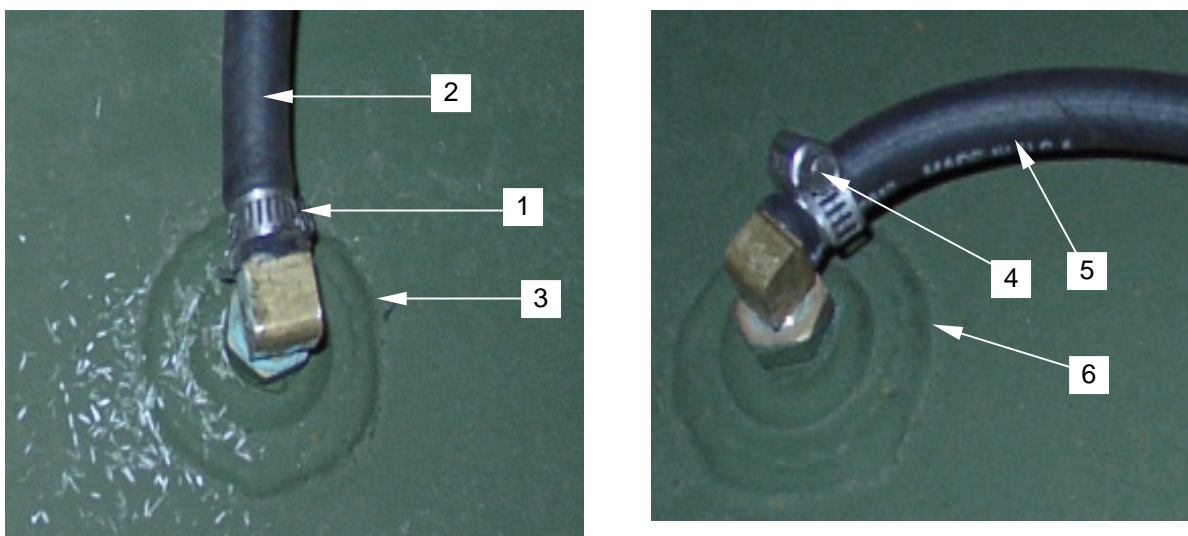


Figure 3. Disconnecting Fuel Supply and Return Hoses at the Fuel Tank

7. Cut a 6.5-ft length of $\frac{1}{4}$ -inch fuel return hose and install it in the reverse manner as the one removed.
8. Cut a 4.5-ft length of $\frac{5}{16}$ -inch fuel supply hose and install it in the reverse manner as the one removed.
9. Install new cable ties in the same location as those removed.

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
DRIVE BELT
INSPECT, REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

63B Light Vehicle Mechanic

Materials/Parts

Gloves, Work (WP 0089 00, Table 2, Item 5)
 Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off
 Emergency button pushed in
 Ignition key removed

INSPECT**WARNING**

Allow the vacuum pump to cool for approximately 30 minutes before servicing. The vacuum pump is hot and presents a burn hazard. Coming in contact with hot vacuum pump parts may cause burns and severe injury.

**WARNING**

The vacuum pump inside mounting bolts are located in a restricted space. Exercise caution and wear gloves when loosening and tightening these bolts to avoid injuries due to pinching.

**WARNING**

The drive belt guard is heavy. To avoid injury, two soldiers are required to remove and install the guard from and onto the trailer.

1. To remove drive belt guard proceed as follows: remove hex bolts (**figure 1, item 1**) on the drive belt guard brackets. Two are located at each end of the guard (**figure 1, item 1**), and one at the rear center (**figure 1, item 2**). Retain hardware.

- Remove drive belt guard (**figure 1, item 3**) to inspect condition of drive belt.

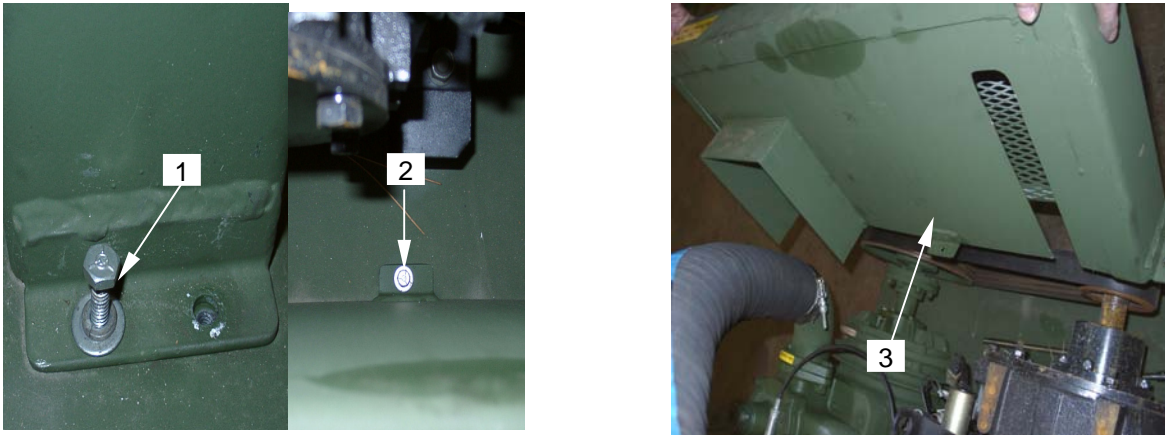


Figure 1. Inspecting Drive Belt

ADJUST

- To adjust the drive belt, proceed as follows: Loosen but do not remove the 1-inch vacuum pump inside mounting bolts (**figure 2, item 1**).
- Loosen but do not remove the 1-inch vacuum pump outside mounting bolts (**figure 2, item 2**).

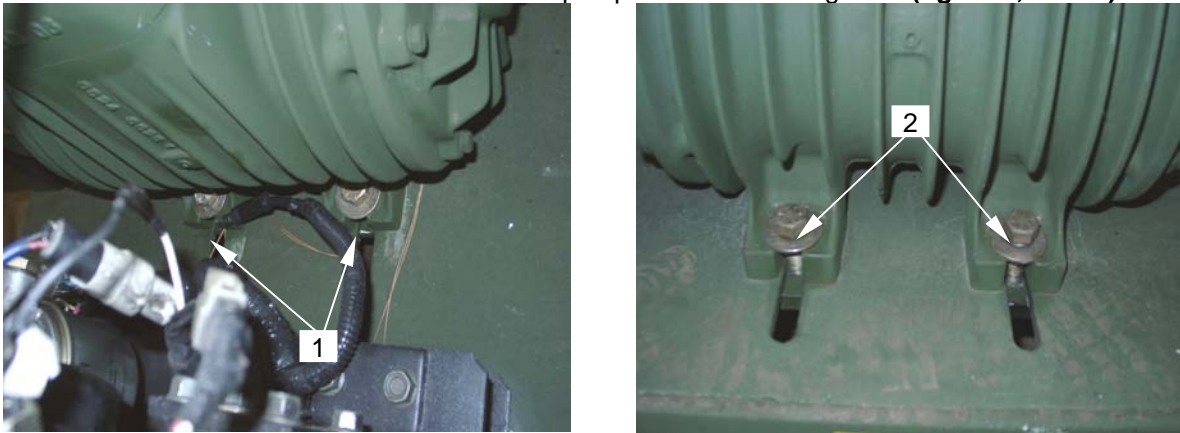


Figure 2. Vacuum Pump Mounting Bolts

- Loosen the belt adjuster mechanism (**figure 3, item 1**) locknut (**figure 3, item 3**).
- Turn adjusting nut (**figure 3, item 2**) to the right to tighten the drive belt.
- Tighten drive belt (**figure 4, item 1**) until ¼-inch of belt deflection is measured.

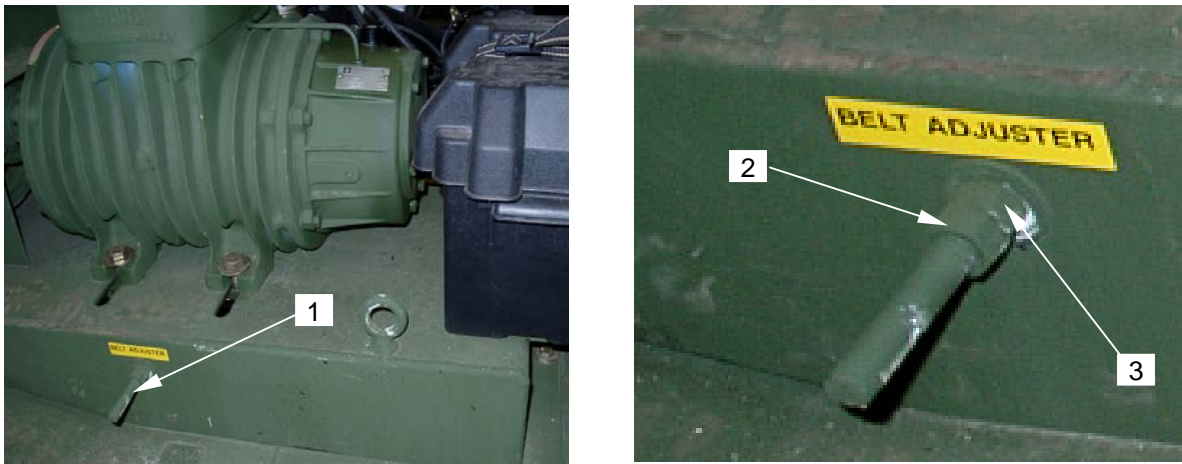


Figure 3. Belt Adjuster

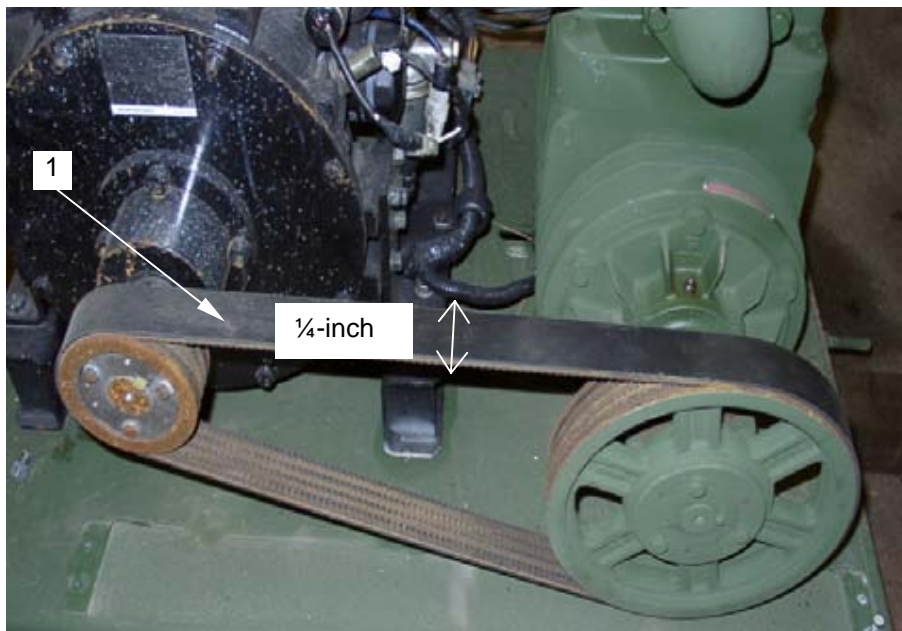


Figure 4. Drive Belt



WARNING

The vacuum pump inside mounting bolts are located in a restricted space. Exercise caution and wear gloves when loosening and tightening these bolts to avoid injuries due to pinching.

6. Tighten the 1-inch outside mounting bolts (figure 5, item 1).

7. Tighten the 1-inch inside mounting bolts (**figure 5, item 2**).



Figure 5. Tightening Vacuum Mounting Bolts

REPLACE

To replace the drive belt, proceed as follows:

1. Remove throttle mounting plate (**figure 6, item 1**) with throttle attached (**figure 6, item 2**), by removing two hex bolts (**figure 6, item 3**), nuts, flat and lock washers (**figure 6, item 4**). Retain hardware. Do not disconnect throttle from engine. Move the disconnected throttle linkage out of the way during replacement of vacuum pump.

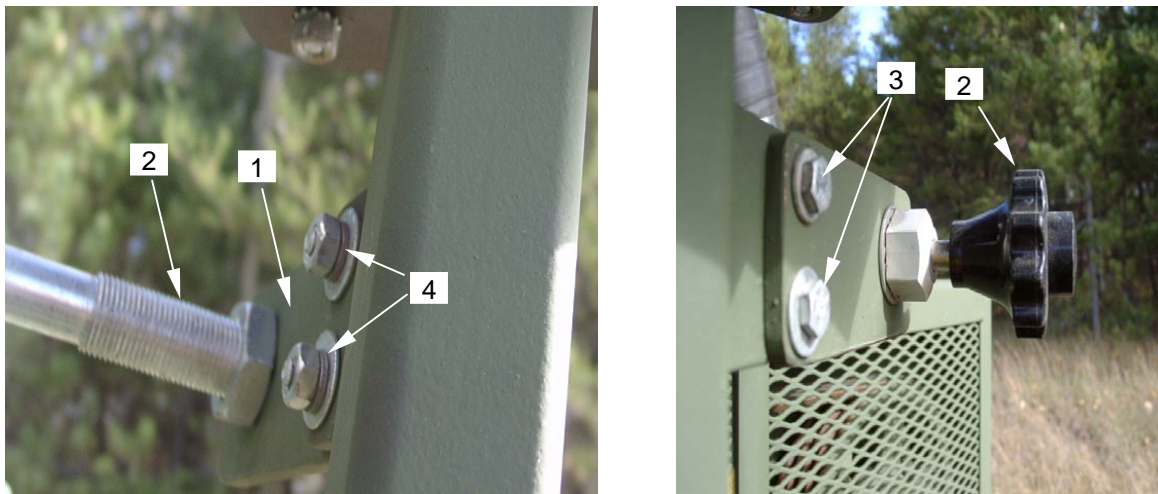


Figure 6. Removal of Hoses and Throttle

2. Remove hex bolts and washers (**figure 7, item 1**) from the drive belt guard brackets. Two are located at each end of the guard (**figure 7, item 1**), and one at the rear center (**figure 7, item 2**).

**WARNING**

The drive belt guard is heavy. To avoid injury, two soldiers are required to remove and install the guard from and onto the trailer.

3. Remove drive belt guard (**figure 7, item 3**).

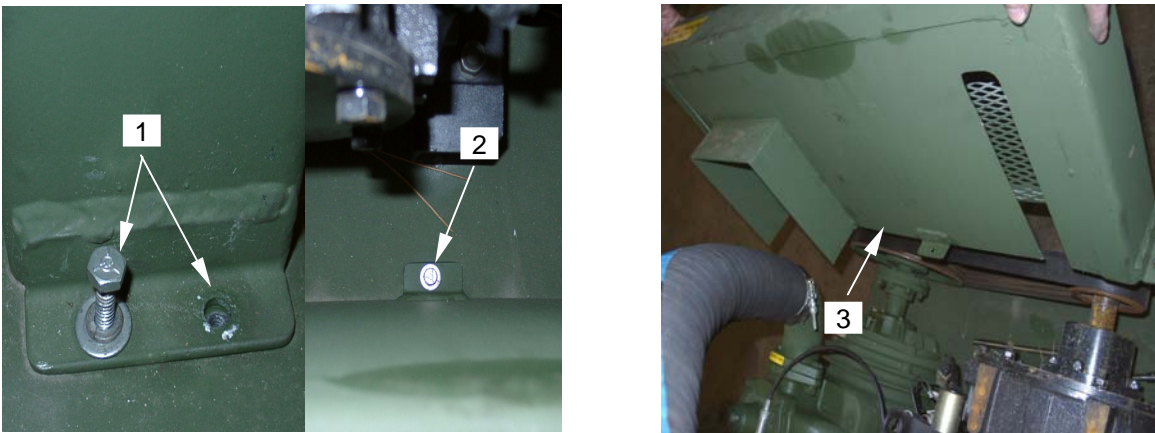


Figure 7. Removing Drive Belt Guard



WARNING

The vacuum pump inside mounting bolts are located in a restricted space. Exercise caution and wear gloves when loosening and tightening these bolts to avoid injuries due to pinching.

4. Loosen but do not remove the 1-inch vacuum pump inside mounting bolts (**figure 8, item 1**).
5. Loosen but do not remove the 1-inch vacuum pump outside mounting bolts (**figure 8, item 2**).

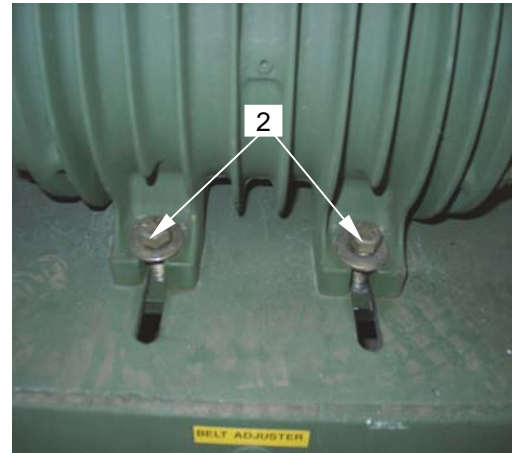


Figure 8. Removing Vacuum Pump Mounting Bolts

6. Loosen the belt adjuster mechanism (**figure 9, item 1**) locknut (**figure 9, item 2**).
7. Turn adjusting nut (**figure 9, item 3**) to the left to loosen the drive belt.

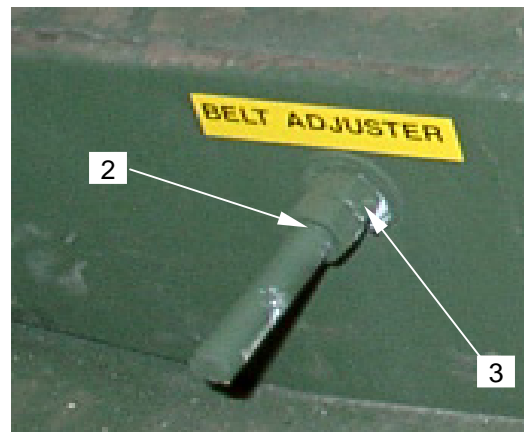
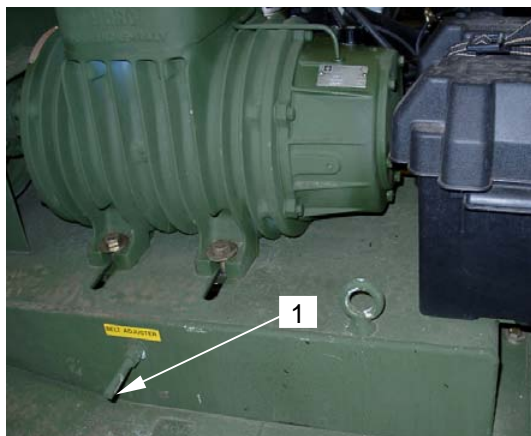


Figure 9. Belt Adjuster

8. Push vacuum pump (**figure 10, item 1**) towards the engine (**figure 10, item 2**) to loosen and remove the drive belt (**figure 10, item 3**) from engine pulley (**figure 10, item 4**) and vacuum pump pulley (**figure 10, item 5**).

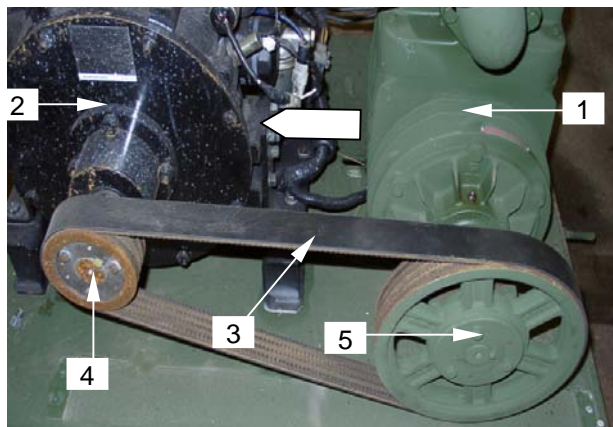


Figure 10. Removing Drive Belt

NOTE

When a previously used drive belt is re-installed, a belt tensioning gage will not be available. Disregard references to the belt tensioning gage in paragraphs 9., through 18., and adjust belt to ¼-inch deflection at center between pulleys. Refer to illustration in Procedure #3 of WP 0017 00.

9. Remove belt-tension gage (**figure 11, item 1**) from belt and place new belt (**figure 11, item 2**) onto the engine and pump pulleys. Position brand area (**figure 11, item 3**) at center between pulleys.
10. Move vacuum pump (**figure 11, item 4**) away from engine to take up belt slack.

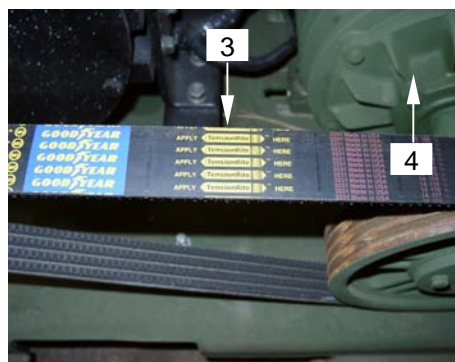
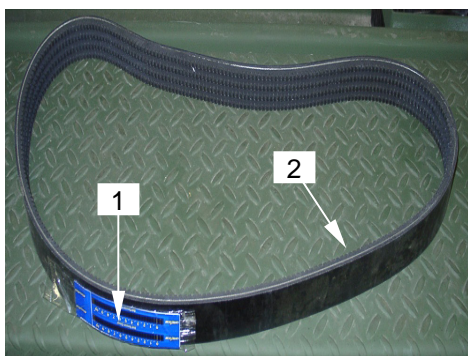


Figure 11. Installing Drive Belt

11. Align the pulleys (**figure 12, item 1**) as shown, moving the pump slightly to make adjustment.
12. When the pulleys are aligned and the belt slack is taken up, clean the brand area (**figure 12, item 2**) of the belt of dust, oil or other debris

13. Tear the belt tensoning gage from the instruction card.
14. Peel the end tabs from the back of the belt tensoning gage and apply the gage in the center of the belt with downward pressure only. Belt tensoning gage must read 0 zero. If not, apply a new gage.

CAUTION

While tensoning, if the yellow mark gets to the end of the window and reappears on the left, the belt is over-tensioned. Reduce to correct setting.

15. Turn belt adjuster (**figure 12, item 3**) to the right to tighten the belt to a setting of 3.5 on belt tensoning gage.

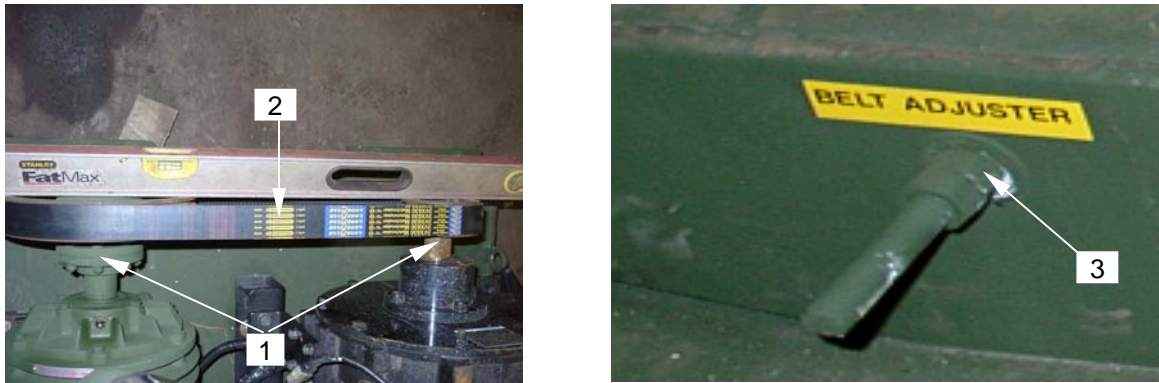


Figure 12. Belt Alignment and Tensioning

16. When the correct belt tensoning setting on the gage has been achieved, tighten the 1-inch outside mounting bolts (**figure 13, item 1**) on the vacuum pump.
17. Tighten the 1-inch vacuum pump inside mounting bolts (**figure 13, item 2**).
18. Remove belt tensoning gage from belt.



Figure 13. Tightening Vacuum Pump Mounting Bolts



WARNING

The drive belt guard is heavy. To avoid injury, two soldiers are required to remove and install the guard from and onto the trailer.

19. Position pulley guard (**figure 14, item 1**) over pulleys and belt for installation.
20. Install hex bolts and washers (**figure 14, item 2**) into the pulley guard brackets. Two are located at each end and one at the rear center (**figure 14, item 3**).

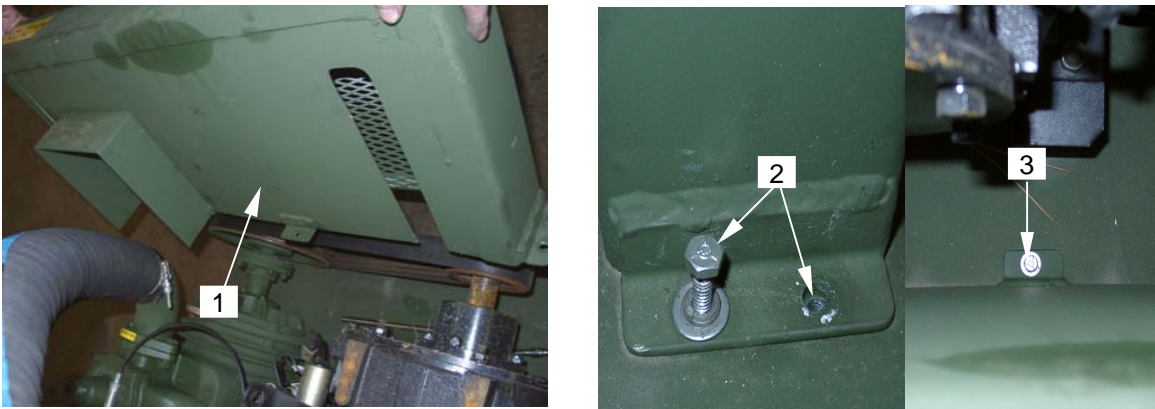


Figure 14. Installing Drive Belt Guard

21. Position the throttle mounting plate (**figure 15, item 1**) with throttle attached (**figure 15, item 2**) onto the control post. Install two hex bolts (**figure 15, item 3**), nuts, flat and lock washers (**figure 15, item 4**) to secure throttle to post.

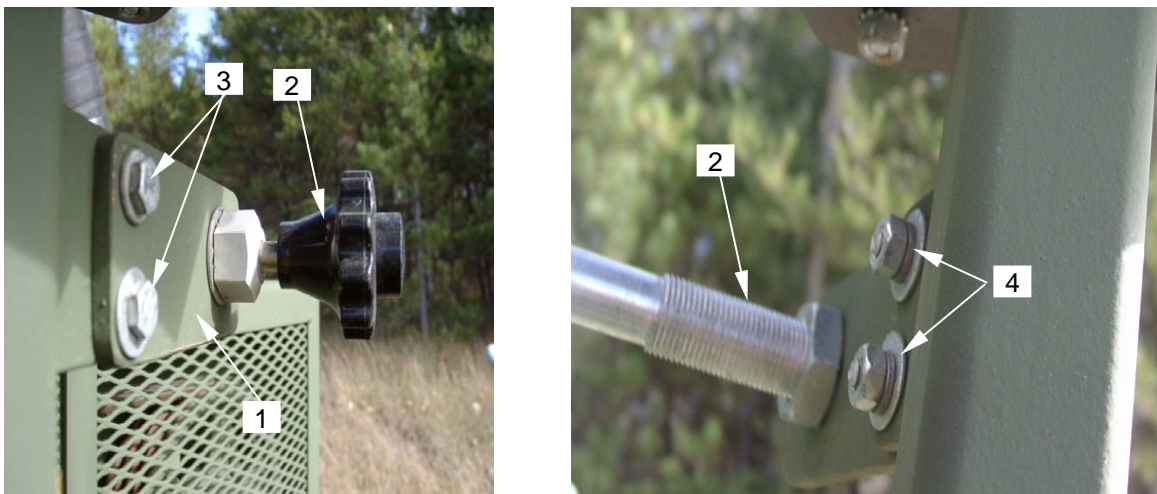


Figure 15. Installing Throttle Bracket

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
VACUUM PUMP
SERVICE, REPLACE

INITIAL SETUP:

Tools

Pulley Puller Kit, Mechanical (WP 0053 00, Table 2, Item 10)
 Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)
 Gun, Fluid, Direct Delivery (WP 0053 00, Table 2, Item 4)
 Work gloves (WP 0089 00, Table 2, Item 5)

Personnel Required

63B Light Vehicle Mechanic

Materials/Parts

Grease, ball bearing (WP 0091 00, Item 19)
 Motor Oil, SAE40W, Summer (WP 0091 00, Item 21)
 Motor Oil, SAE30W, Winter (WP 0091 00, Item 23)
 Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off
 Ignition key removed
 Emergency stop button pushed in
 Wheel chocked
 Emergency brake set

SERVICE Print sections 2-sided



WARNING

Allow the vacuum pump to cool for approximately 30 minutes before servicing. The vacuum pump is hot and presents a burn hazard. Coming in contact with hot vacuum pump parts may cause burns and severe injury.

To service the vacuum pump, proceed as follows:

1. Lubricate the front bearing grease nipple (**figure 1, item 1**) with ball bearing grease every 100 hours of operation.
2. Check and replenish vacuum pump oil as indicated by the dipstick (**figure 1, item 2**). Use SAE40 grade oil in summer and SAE30 grade in winter.

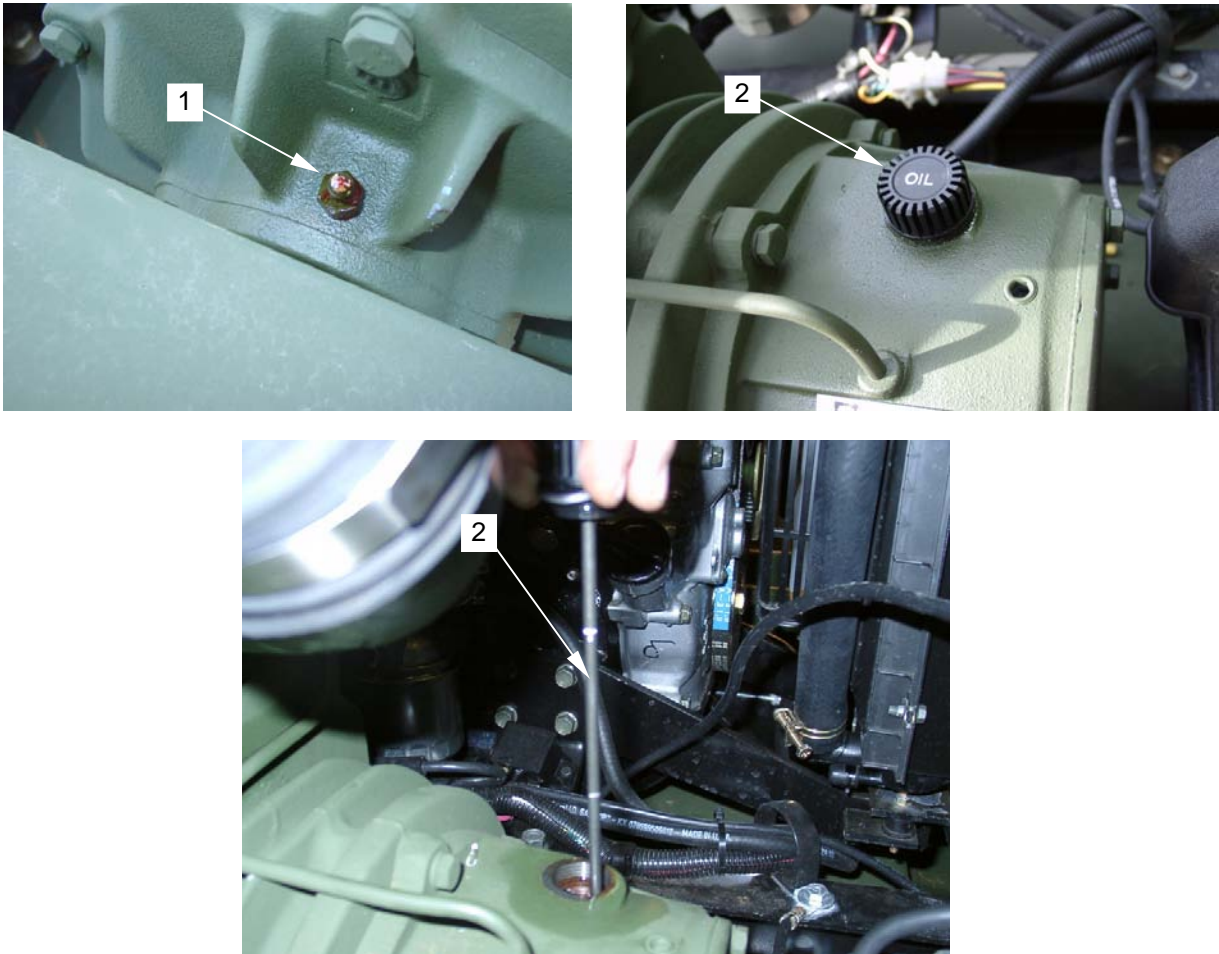


Figure 1. Lubricating Front Bearing and Replenishing Vacuum Pump Oil

3. Check hose clamps (**figure 2, item 1**) on breather hose (**figure 2, item 2**) and pump hose (**figure 2, item 3**). Tighten or replace the hose clamps as necessary.
4. Check handle (**figure 2, item 4**) for free movement from pressure (**figure 2, item 5**) to vacuum (**figure 2, item 6**) position.
5. Tighten bolts (**figure 2, item 7**) on breather port elbow (**figure 2, item 8**) and vacuum port elbow (**figure 2, item 9**).

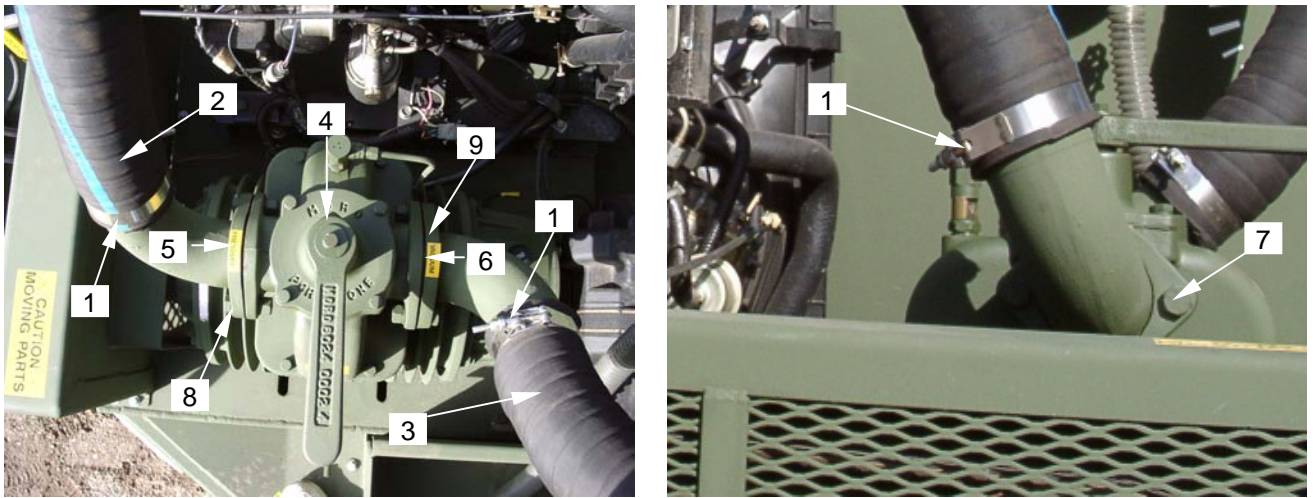


Figure 2. Servicing Vacuum Pump

6. Tighten the 1-inch vacuum pump inside mounting bolts (**figure 3, item 1**) as necessary.
7. Tighten the 1-inch vacuum pump outside mounting bolts (**figure 3, item 2**) as necessary.



Figure 3. Tightening Vacuum Pump Mounting Bolts

REPLACE

To replace the pump pulley, proceed as follows:

1. Remove the throttle, pulley guard, and drive belt as described in paragraphs 1., through 6., under REPLACE in WP 0029 00.
2. Remove three bolts (**figure 4, item 1**) and lockwashers (**figure 4, item 2**) from pump pulley (**figure 4, item 3**) and install bolts into the threaded holes (**figure 4, item 4**). By tightening these bolts the pulley is forced off the adapter (**figure 4, item 5**).

- Remove pulley (**figure 4, item 3**) from the adapter (**figure 4, item 5**).

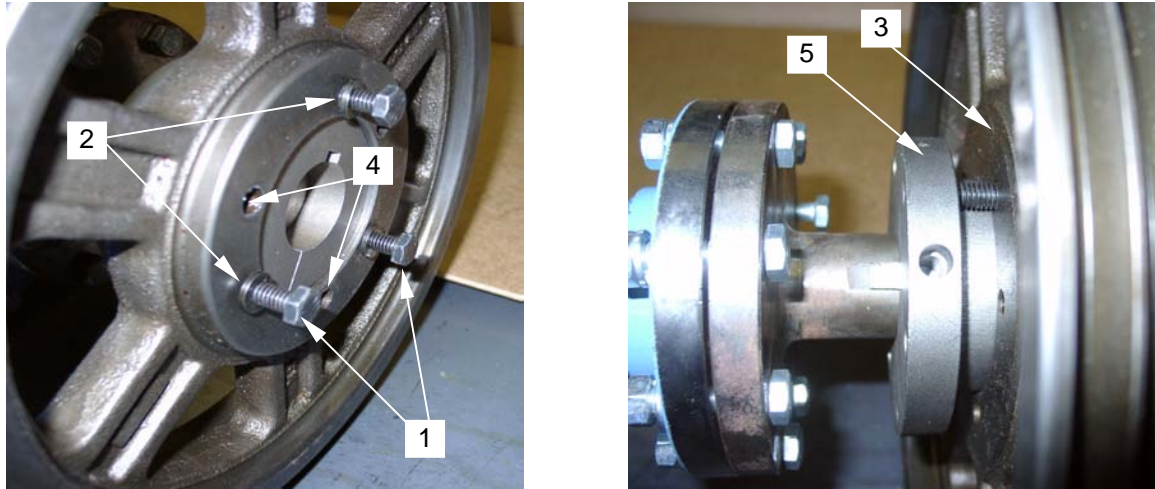


Figure 4. Removing Vacuum Pump Pulley

- Loosen setscrew (**figure 5, item 1**) and remove adapter (**figure 5, item 2**) from flanged pump shaft extension (**figure 5, item 3**). Retain key (**figure 5, item 4**).
- Remove eight bolts (**figure 5, item 5**) from the flanged pump shaft extension (**figure 5, item 6**).

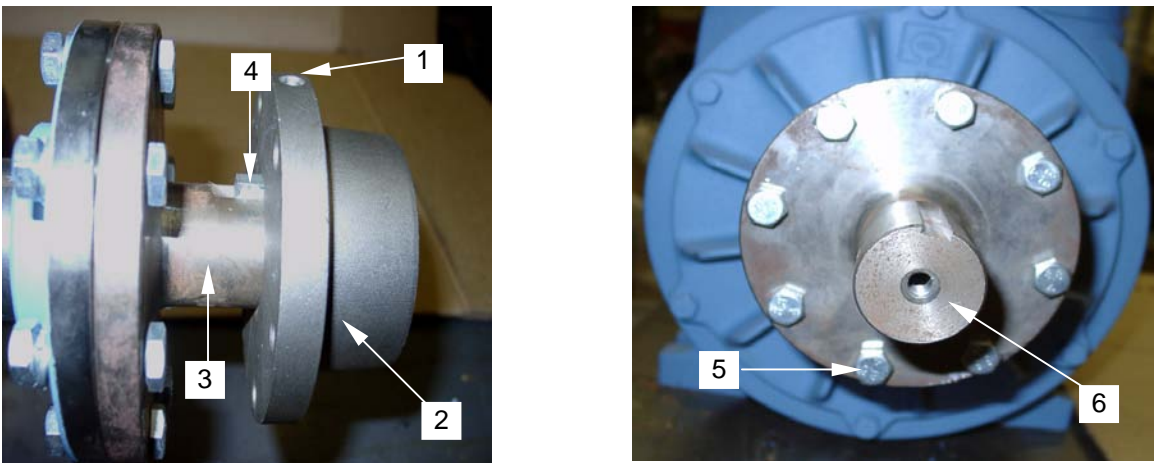


Figure 5. Removing Vacuum Pump Pulley

- Remove flanged pump shaft extension (**figure 6, item 1**).
- Remove bolt and flat washer (**figure 6, item 2**) from the flanged pump shaft extension (**figure 6, item 1**).
- Remove the flanged pump shaft extension (**figure 6, item 1**) off the pump shaft (**figure 6, item 3**). Retain key (**figure 6, item 4**).

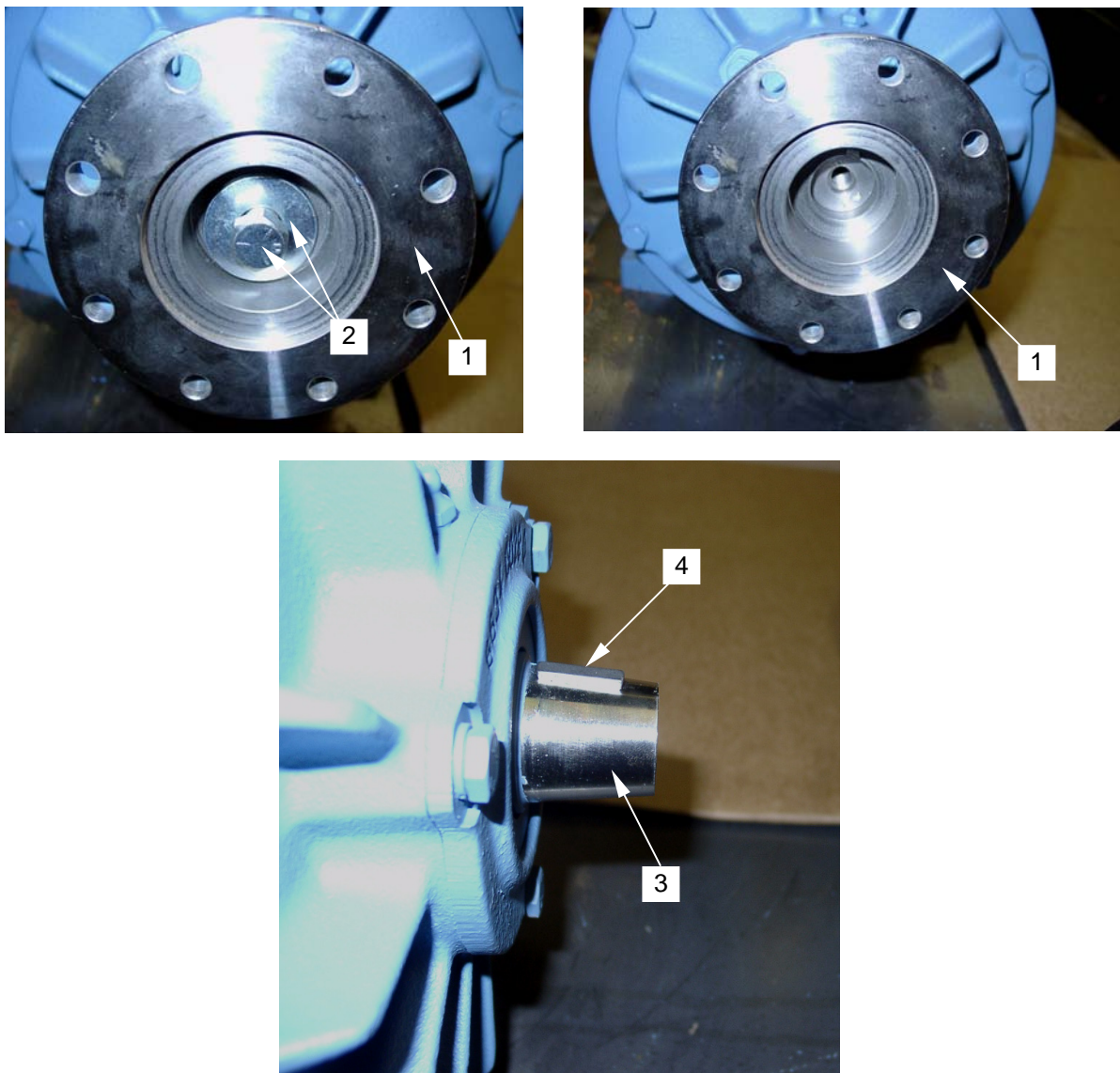


Figure 6. Removing Flanged Pump Shaft Extension

9. Place retained or new key (**figure 7, item 1**) in place on tapered pump shaft of new pump.
10. Install tapered shaft coupler (**figure 7, item 2**) onto pump shaft.

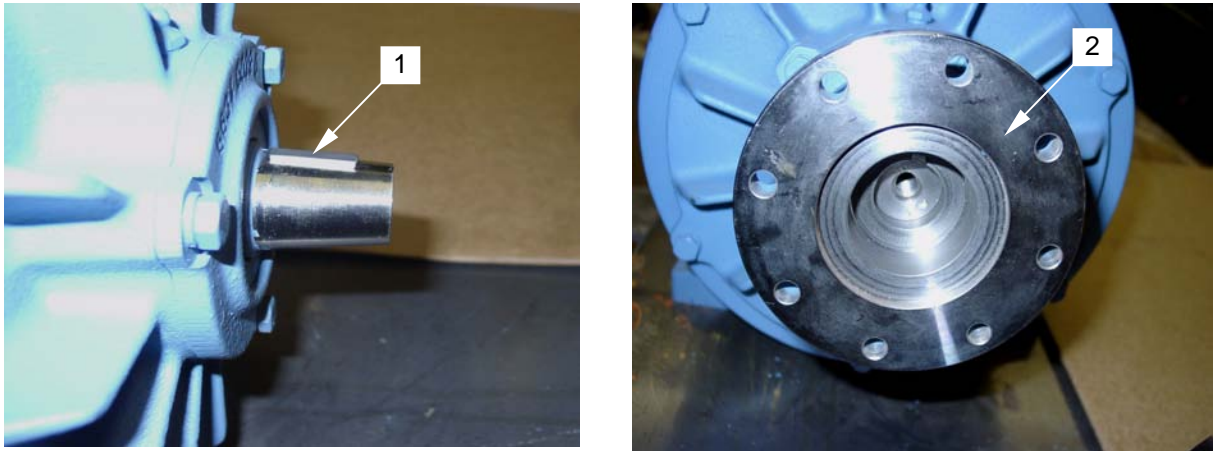


Figure 7. Installing Tapered Shaft Coupler

11. Install flat washer and bolt (**figure 8, item 1**) into tapered shaft coupler (**figure 8, item 2**) and tighten.
12. Install flanged pump shaft extension (**figure 8, item 3**) onto tapered shaft coupler (**figure 8, item 2**) and secure with eight 13-millimeter hex bolts, nuts and lock washers (**figure 8, item 4**).

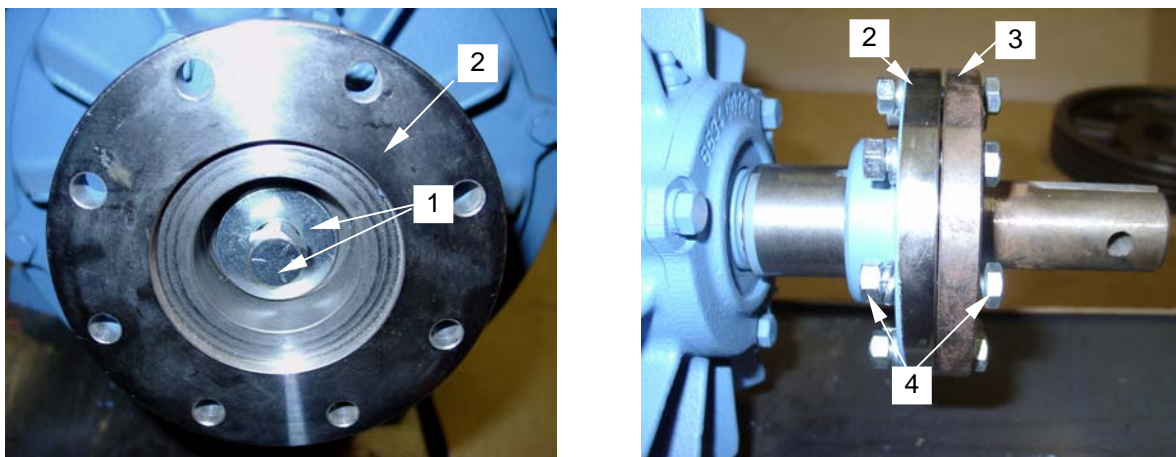


Figure 8. Installing Flanged Pump Shaft Extension

13. Place retained or new key (**figure 9, item 1**) into position on the flanged pump shaft extension (**figure 9, item 2**).
14. Install pulley adapter (**figure 9, item 3**) over key on the flanged pump shaft extension (**figure 9, item 4**). Do not install/tighten set screw (**figure 9, item 5**) at this time.

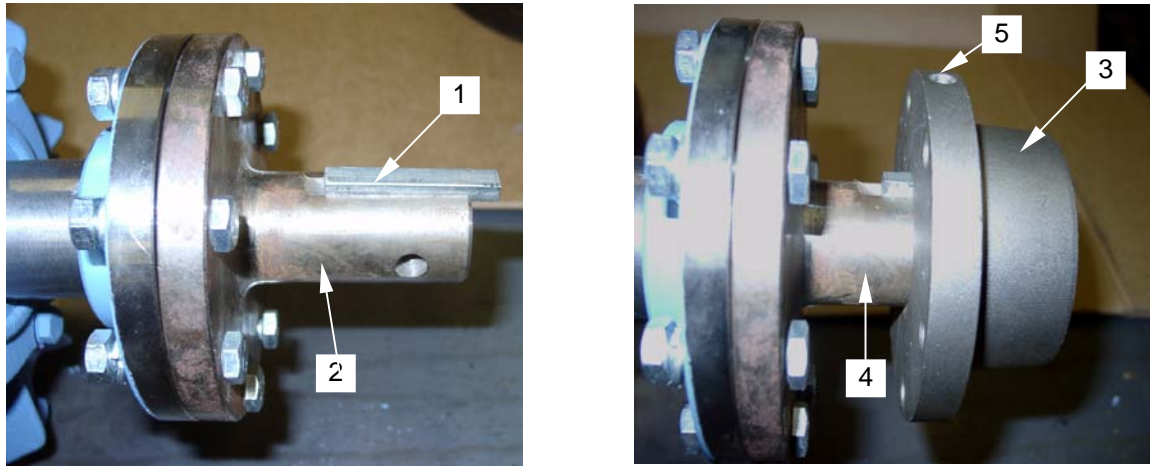


Figure 9. Installing Pulley Adapter

15. Install pulley (figure 10, item 1) over adapter (figure 10, item 2), aligning the un-threaded holes (figure 10, item 3).
16. Install the bolts and lock washers (figure 10, item 4). Tighten bolts.



Figure 10. Installing Pulley

NOTE

If a new drive belt will be installed, perform the tensioning procedure described under REPLACE in WP 0029 00. If a retained belt will be used, adjust it to ¼-inch deflection at center.

17. Install retained, or new drive belt (**figure 11, item 1**) (refer to WP 0029 00 as necessary).
18. Align vacuum pump and engine pulleys (**figure 11, item 2**) as shown, moving the vacuum pump pulley adapter (**figure 11, item 3**) slightly to make adjustments.
19. Install and tighten setscrew (**figure 11, item 4**) on pulley adapter (**figure 11, item 3**).

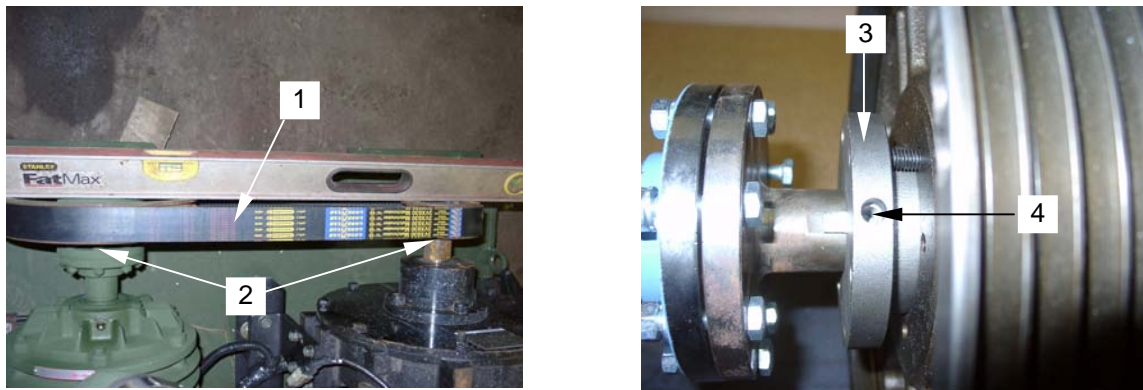


Figure 11. Installing Pulley

20. Install the throttle, and drive belt guard as described under REPLACE in WP 0029 00.

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
MOISTURE TRAP
NSN 4630-01-513-8155
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 77W, Water Treatment Specialist

Materials/Parts

Apron, Rubber (WP 0089 00, Table 2, Item 1)
 Face shield (WP 0089 00, Table 2, Item 3)
 O-ring (WP 0091 00, Item 24)
 Pipe Sealant (WP 0091 00, Item 27)
 Rags, Wiping (WP 0091 00, Item 28)
 Respirator (WP 0089 00, Table 2, Item 8)
 Splash goggles (WP 0089 00, Table 2, Item 6)

Equipment Condition

Tank empty, at atmospheric pressure
 Tank cleaned and sanitized
 Engine shut off
 Ignition key removed
 Emergency stop button pushed in
 Wheel chocked
 Emergency brake set



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

REPLACE

To replace the moisture trap, proceed as follows:

NOTE

If moisture trap is being removed as part of the engine/vacuum pump skid removal, perform only steps 1., 6., and 7., to remove it and steps 15., 16., and 22 to install.

1. Loosen the hose clamps (**figure 1, item 1**) on the pump air hose (**figure 1, item 2**) and upper air hose (**figure 1, item 3**) and remove the hoses from the nipples (**figure 1, item 4**). Retain hose clamps on the hoses.
2. Using a pipe wrench remove the nipples (**figure 1, item 4**) and elbow fittings (**figure 1, item 5**) from the moisture trap. (The nipples and fittings may also be removed as an assembly, as required.)

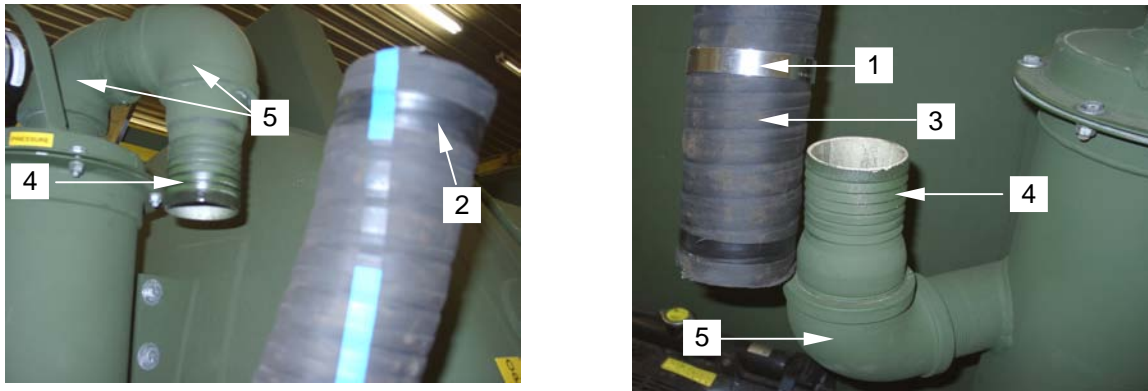


Figure 1. Removing Hoses from Moisture Trap

3. Remove the drain hose (figure 2, item 1) from drain hose nipple (figure 2, item 2).
4. Remove the drain valve (figure 2, item 3) from the bottom of the trap housing (figure 2, item 4).

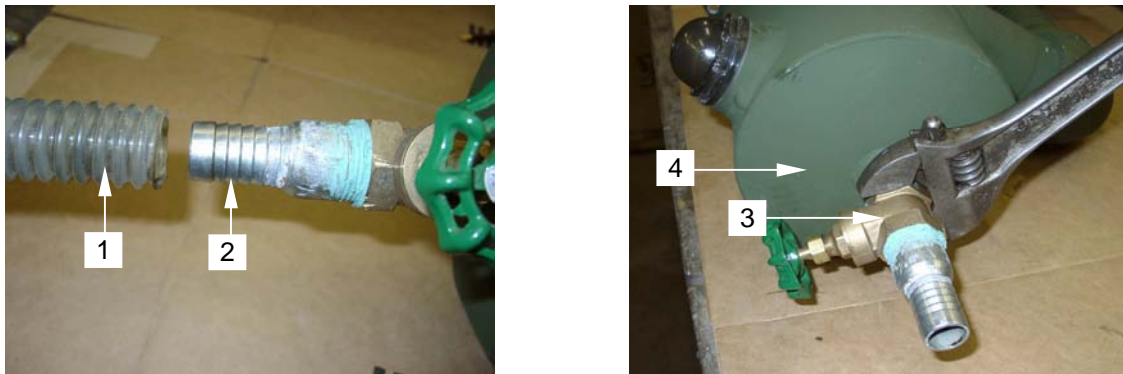


Figure 2. Removing Drain Hose and Valve

5. Remove (unscrew) the vacuum/pressure gage (figure 3, item 1) from the moisture trap lid.
6. Unscrew the sight glass (figure 3, item 2) from the moisture trap if desired. (New replacement moisture trap is being furnished with sight glass installed.)

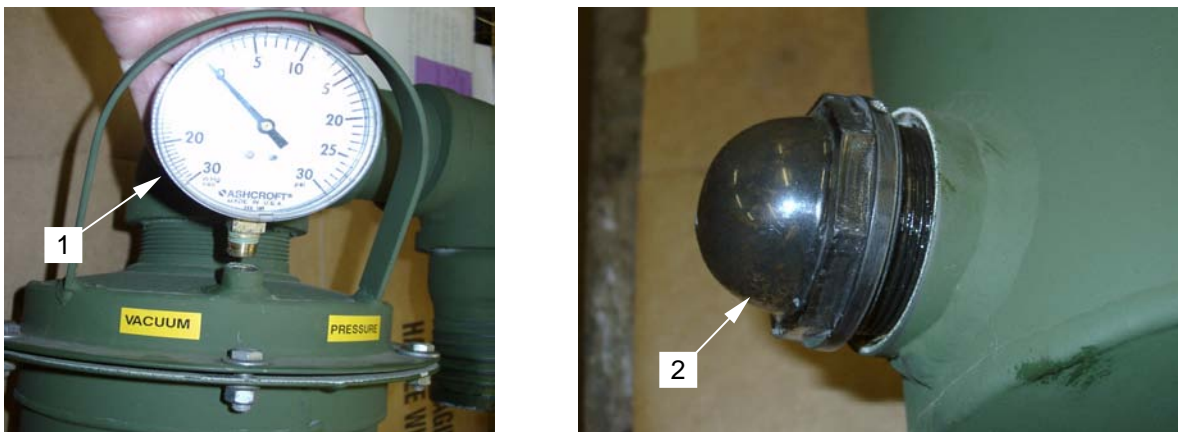


Figure 3. Removing Pressure Gage and Sight Glass



WARNING

The moisture trap hatch cover and isolation valve assembly are heavy (40 lbs). To prevent injuries, two people are required to remove them from the trailer.

7. Remove six hex bolts, nuts, and flat washers (**figure 4, item 3**) holding the lid (**figure 4, item 4**) to the moisture trap body (**figure 4, item 5**).
8. While supporting the moisture trap, remove three hex bolts, nuts and flat washers (**figure 4, item 1**) from the moisture trap mounting bracket (**figure 4, item 2**).
9. Lift the moisture trap off the trailer.



Figure 4. Removing Moisture Trap from Bracket

10. Remove lid (**figure 5, item 1**) from moisture trap body (**figure 5, item 2**).
11. Loosen hose clamp (**figure 5, item 3**) and remove shutoff seat (**figure 5, item 4**).
12. Remove O-Ring (**figure 5, item 5**) from moisture trap body.

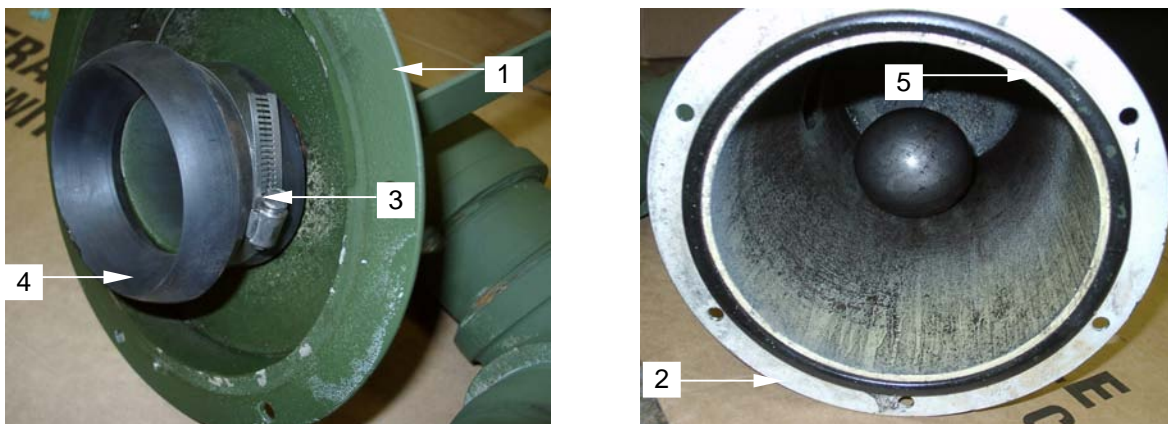


Figure 5. Removing Shutoff Seat and O-Ring from Moisture Trap

13. To reassemble the moisture trap, install a new shutoff seat (**figure 6, item 1**) and secure with a hose clamp (**figure 6, item 2**).
14. Place new O-Ring (**figure 6, item 3**) into the groove on the moisture trap body (**figure 6, item 4**).

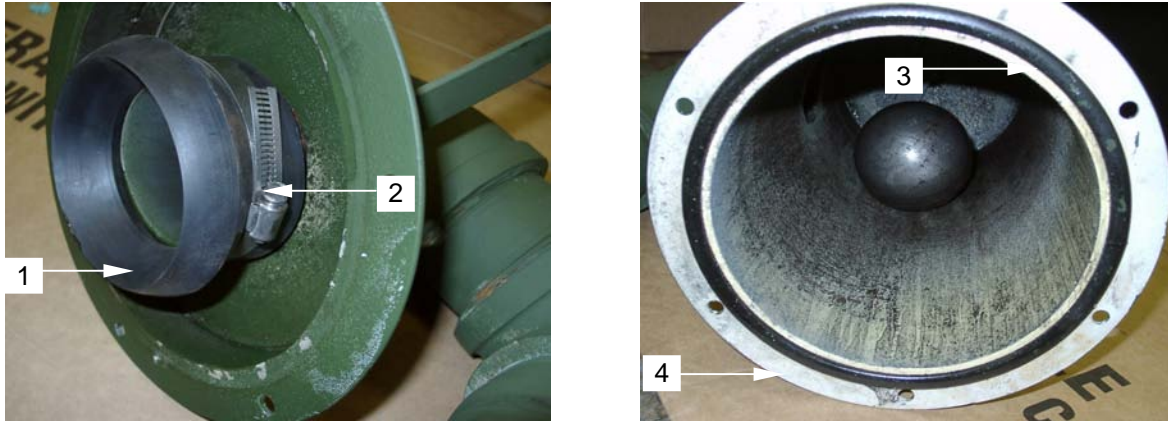


Figure 6. Installing Shutoff Seat and O-Ring from Moisture Trap

15. Install six hex bolts, nuts, and flat washers (**figure 7, item 1**) holding the lid (**figure 7, item 2**) to the moisture trap body (**figure 7, item 3**) and tighten in a star pattern. Orient the gage to line up with the sight glass.



WARNING

The moisture trap hatch cover and isolation valve assembly are heavy (40 lbs). To prevent injuries, two people are required to remove them from the trailer.

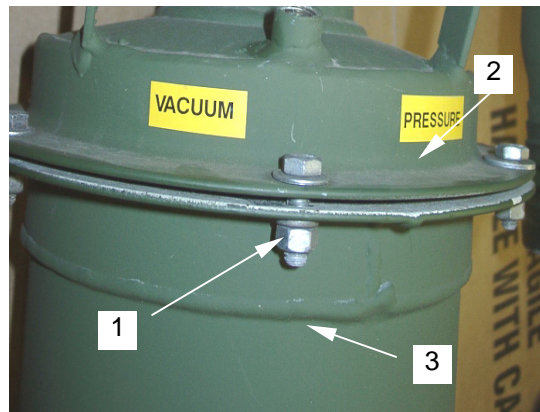


Figure 7. Installing Lid to Moisture Trap Body

16. Install (thread) the vacuum/pressure gage (**figure 8, item 1**) into the moisture trap lid.
17. Install the sight glass (**figure 8, item 2**) on the moisture trap if necessary. (New replacement moisture trap is being furnished with sight glass installed.)

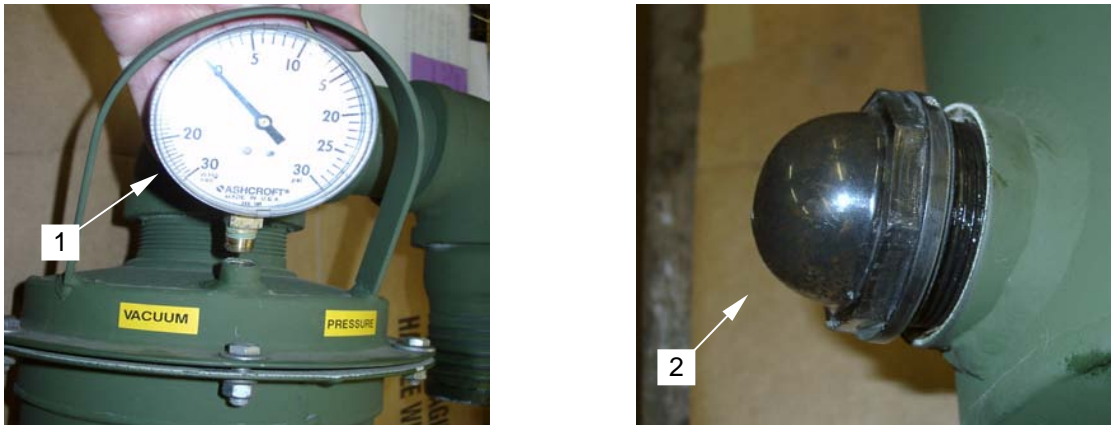


Figure 8. Installing Pressure Gage and Sight Glass

18. If the drain hose nipple (**figure 9, item 1**) needs to be replaced, remove and install a new nipple onto the drain valve as shown below.

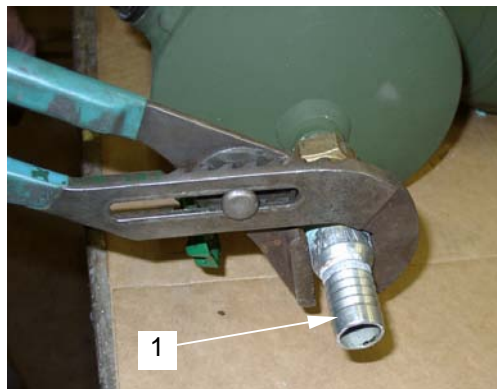


Figure 9. Drain Hose Nipple

19. Install the drain valve (**figure 10, item 3**) onto the bottom of the trap housing (**figure 10, item 4**).
20. Position the moisture trap onto the bracket (**figure 11, item 1**).
21. While supporting the moisture trap, install three hex bolts (**figure 11, item 2**), nuts (**figure 11, item 3**) flat washers (**figure 11, item 4**) and lockwashers (**figure 11, item 5**) into the moisture trap mounting bracket (**figure 11, item 1**).
22. Install the drain hose (**figure 10, item 1**) onto the drain hose nipple (**figure 10, item 2**).

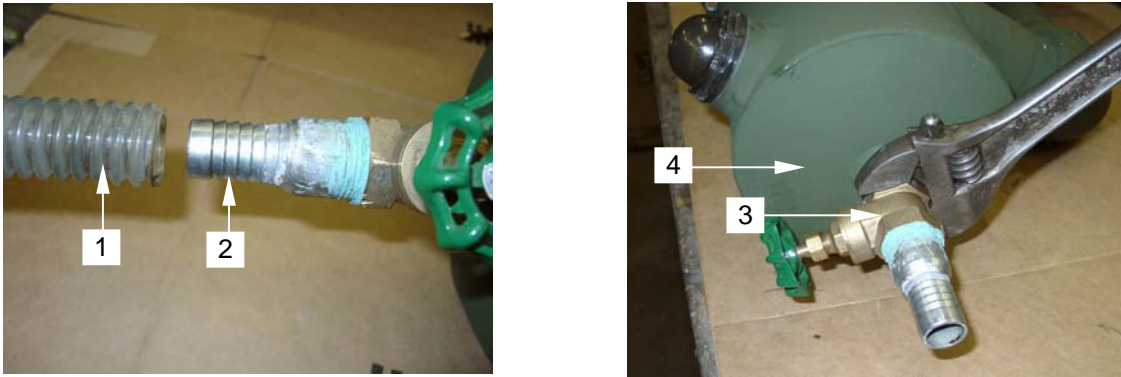


Figure 10. Install Drain Hose and Valve

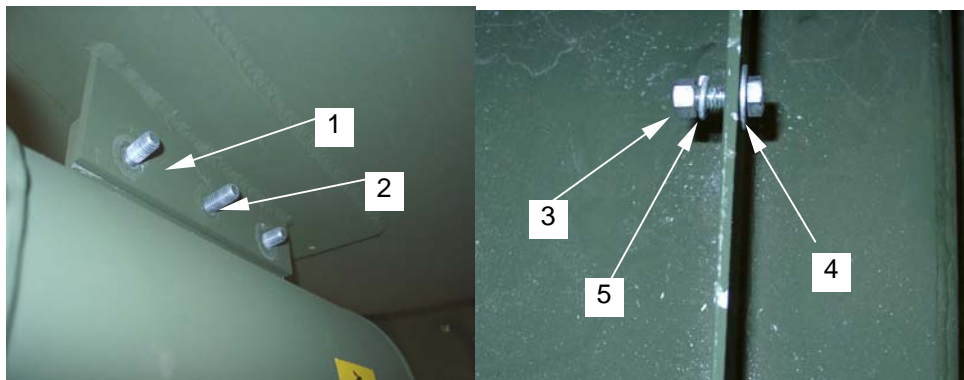


Figure 11. Installing Moisture Trap Body to Bracket

23. Using a pipe wrench install the elbow fittings (figure 12, item 1) and air hose nipples (figure 12, item 2) to the moisture trap. (The nipples and fittings can be re-installed as assembly, if removed as assembly.)
24. Place the air hoses (figure 12, item 3) onto the hose nipples (figure 12, item 2). Position the hose clamps (figure 12, item 4) over the hose nipples (figure 12, item 2) and tighten.

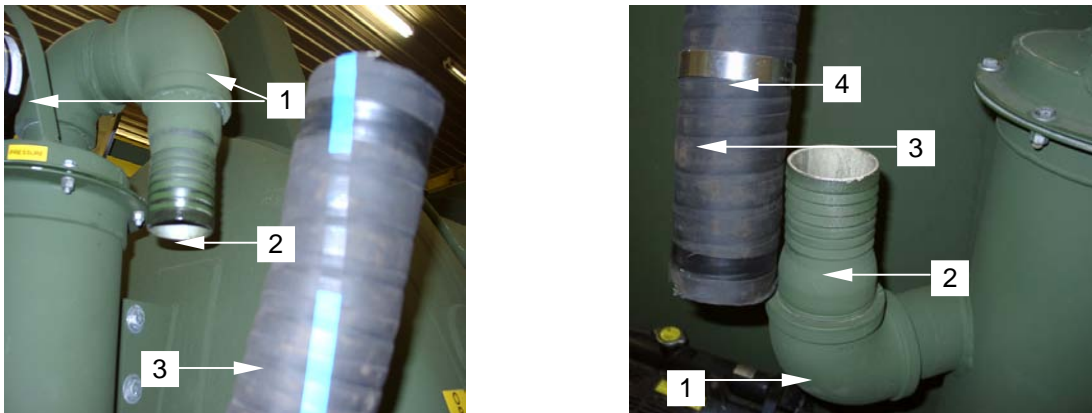


Figure 12. Install Hose onto Moisture Trap

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
ISOLATION VALVE
INSPECT, REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)
 Wrench, Pipe (WP 0053 00, Table 2, Item 19)

Personnel Required

MOS 77W, Water Treatment Specialist

Materials/Parts

Gloves, Rubber (WP 0089 00, Table 2, Item 4)
 Pipe Sealant (WP 0091 00, Item 27)
 Rags, Wiping (WP 0091 00, Item 28)
 Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

Tank empty, at atmospheric pressure
 Tank cleaned and sanitized
 Engine shut off
 Ignition key removed
 Emergency stop button pushed in
 Wheel chocked
 Emergency brake set

INSPECT

WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

Inspect the upper air hose connection on the isolation valve. Check for evidence of leaks. Tighten hose clamp as necessary.

REPLACE

To replace the isolation valve, proceed as follows:

1. Loosen and remove the valve handle mounting bolt (**figure 1, item 1**).
2. Remove valve handle (**figure 1, item 2**) from valve stem.

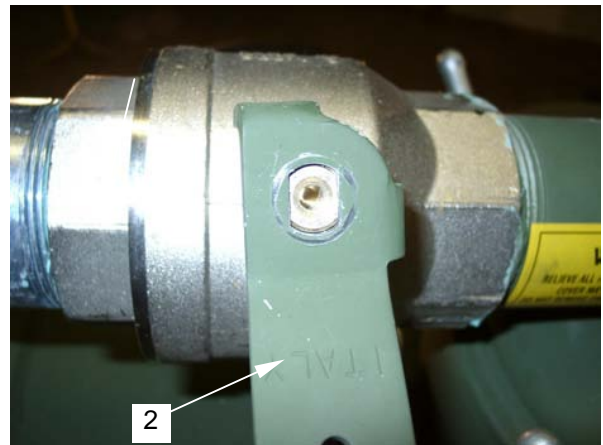
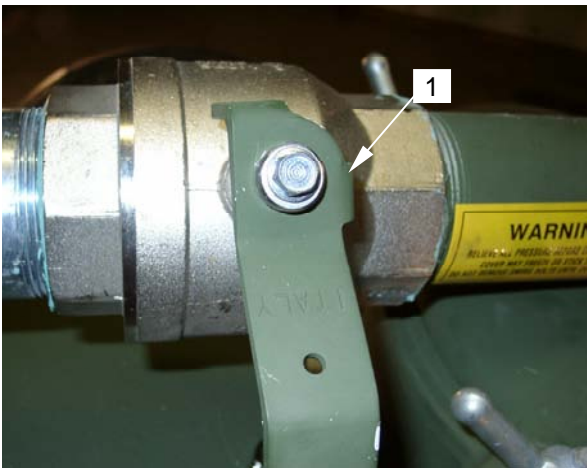


Figure 1. Isolation Valve Linkage and Upper Air Hose Removal

3. Loosen hose clamp (**figure 2, item 1**) until it moves freely on the upper air hose (**figure 2, item 2**).
4. Remove upper air hose (**figure 2, item 2**) from the valve (**figure 2, item 3**).
5. Loosen and remove hose fitting (**figure 2, item 4**) with a pipe wrench.

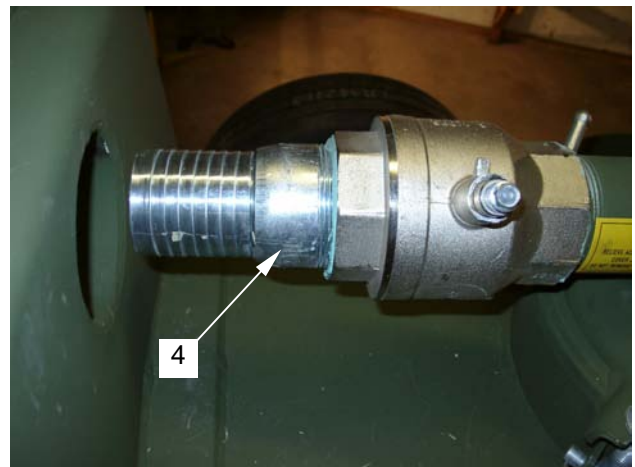
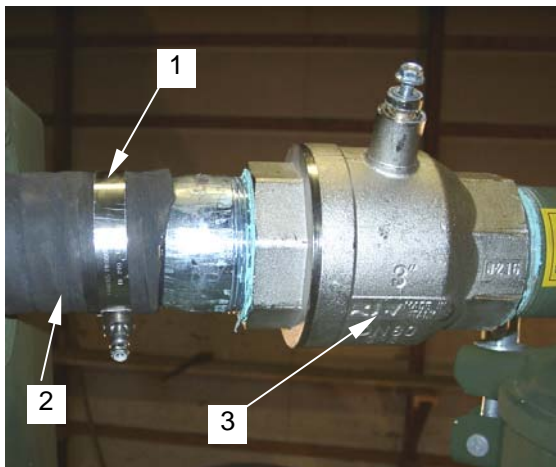


Figure 2. Hose Clamp and Hose Fitting

6. Loosen and remove valve (**figure 3, item 1**) with a pipe wrench.
7. Clean threads and apply pipe sealant to the cover threads (**figure 3, item 2**).
8. Install new valve in place and tighten with pipe wrench.

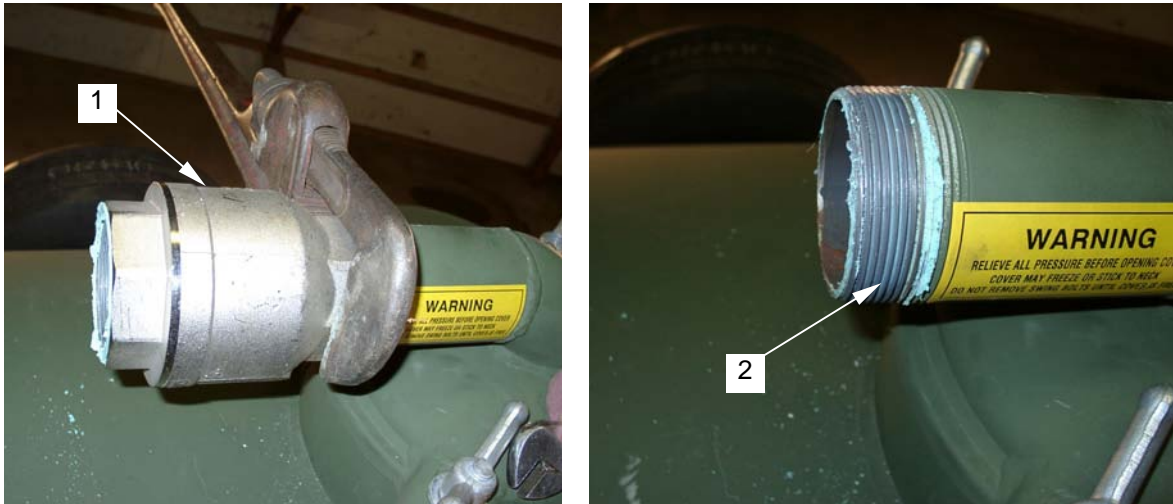


Figure 3. Valve Removal and Installation

9. Clean hose fitting threads and apply pipe sealant to the valve threads (**figure 4, item 1**).
10. Install hose fitting to valve (**figure 4, item 2**) and tighten with pipe wrench.

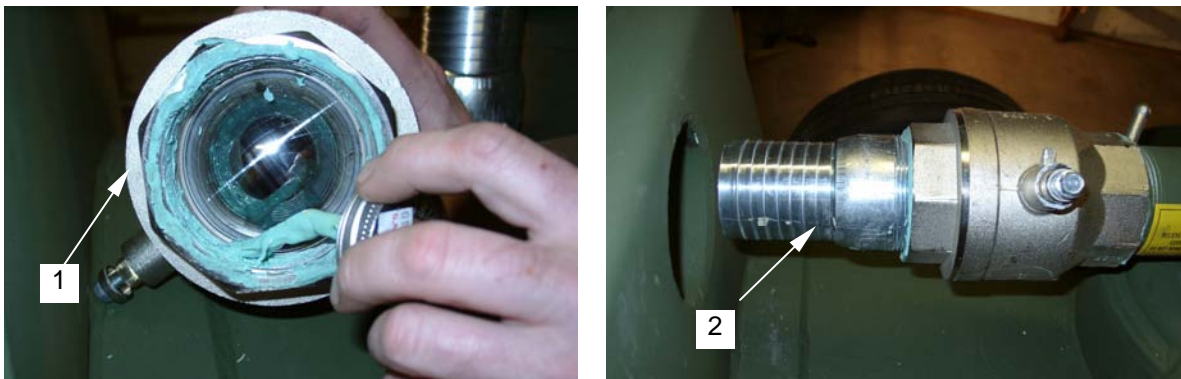


Figure 4. Connecting Hose Fitting To Valve

11. Connect upper air hose (**figure 5, item 1**) on to the hose fitting.
12. Slide hose clamp (**figure 5, item 2**) into place and tighten.

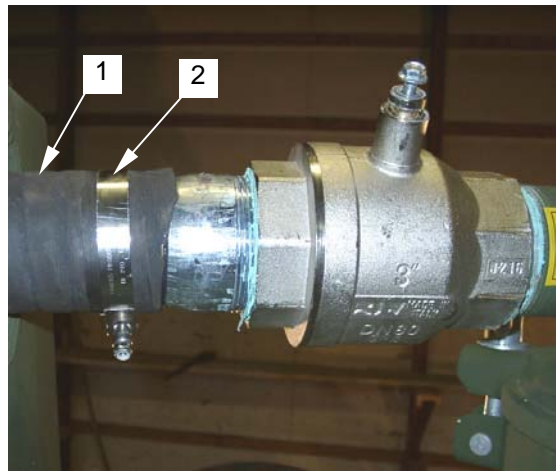


Figure 5. Upper Air Hose and Hose Clamp

13. Install valve handle (figure 6, item 1) on to valve stem.

14. Fasten valve handle with mounting bolt (figure 6, item 2).

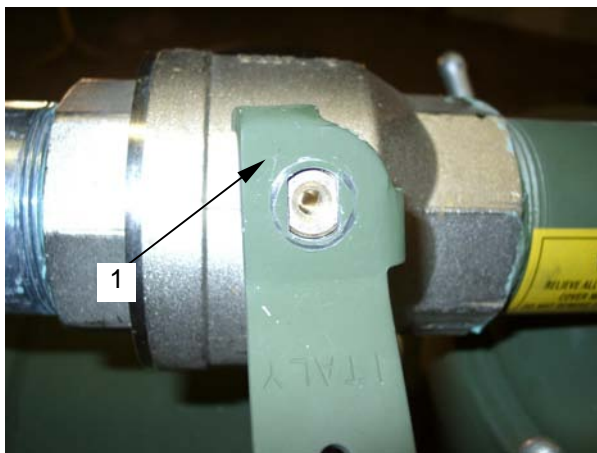


Figure 6. Valve Handle

If the isolation valve handle and linkage must be replaced, proceed as follows:

1. Remove the pin assembly **(figure 7 item 1)** from the handle rod **(figure 7 item 2)**.
2. Disconnect the swivel assembly **(figure 7 item 3)** from isolation valve handle **(figure 7 item 4)**.
3. Remove the swivel assembly **(figure 7 item 3)** from the handle rod **(figure 7 item 2)**.
4. Remove the handle rod **(figure 7 item 2)** by pulling it through the guide **(figure 7 item 5)**.
5. Remove the lock and adjusting nut **(figure 7 item 6)** from the handle rod **(figure 7 item 2)**.
6. Remove the isolation valve handle **(figure 7 item 4)** from the valve housing **(figure 7 item 7)**.
7. Install new isolation valve handle.
8. Install isolation valve handle **(figure 7 item 4)** to the valve housing **(figure 7 item 7)**.
9. Fasten and tighten lock and adjusting nut **(figure 7 item 6)** to the handle rod **(figure 7 item 2)**.
10. Feed the handle rod **(figure 7 item 2)** through the guide **(figure 7 item 5)**.
11. Fasten the swivel assembly **(figure 7 item 3)** to the handle rod **(figure 7 item 2)**.
12. Connect the swivel assembly **(figure 7 item 3)** to the isolation valve handle **(figure 7 item 4)**.
13. Connect the pin assembly **(figure 7 item 1)** to the handle rod **(figure 7 item 2)**.

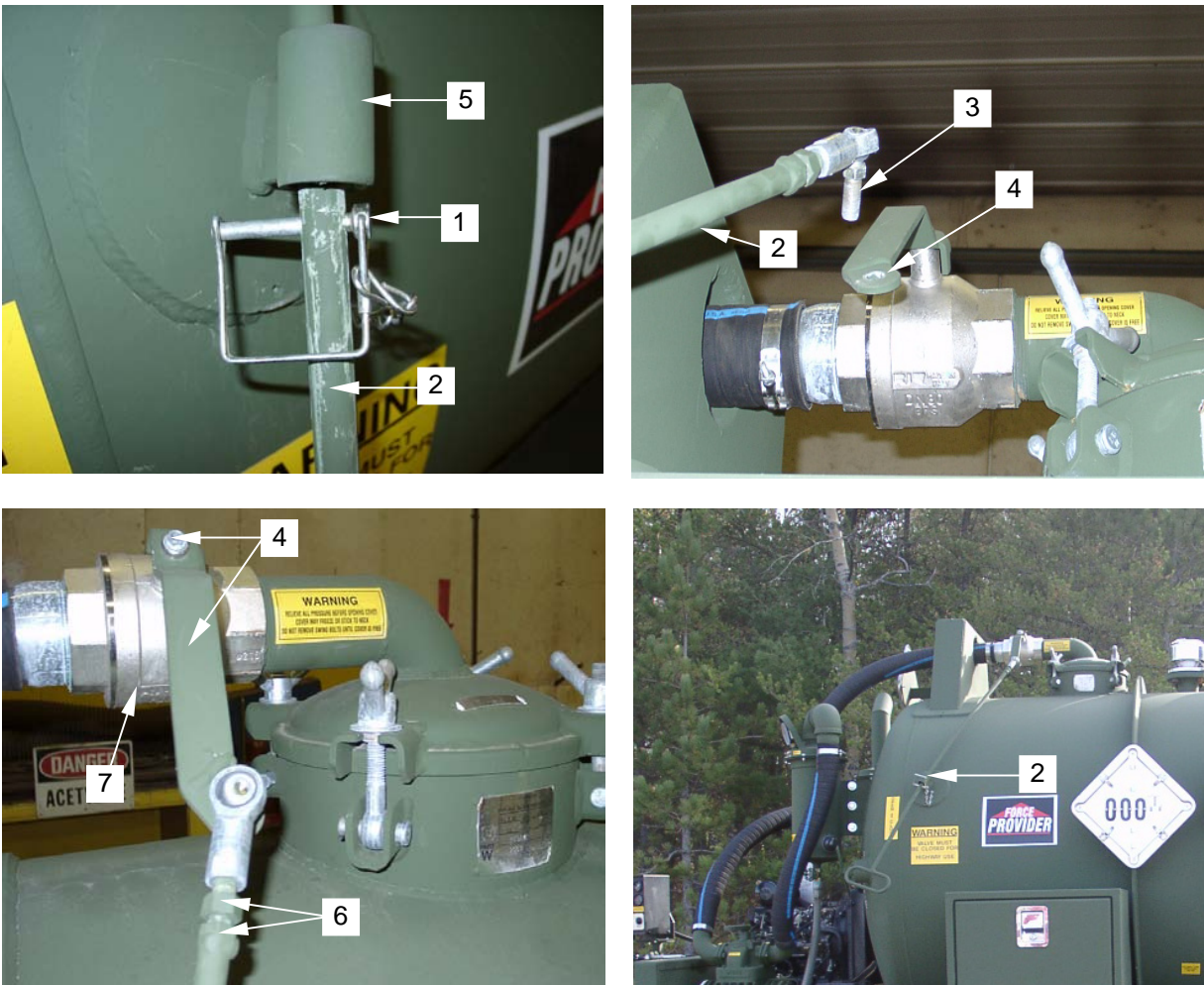


Figure 7. Replacing Isolation Valve Handle

END OF WORK PACKAGE

**OPERATOR MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
NSN 4630-01-513-8155
OIL CATCH MUFFLER
INSPECT, SERVICE**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 77W, Water Treatment Specialist

Materials/Parts

Gloves, Work (WP 0089 00, Table 2, Item 5)
Pipe Sealant (WP 0091 00, Item 27)
Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off
Tank at atmospheric pressure

REPLACE

To replace the oil catch muffler, proceed as follows:

NOTE

If the oil catch muffler is being removed as part of the engine/vacuum pump skid removal, do only steps 5., 7., and 8., to remove it, and steps 9., 10., and 11 to install.

1. Drain oil catch muffler (**figure 1, item 1**) by opening the drain valve (**figure 1, item 4**) and drain contents into an approved container.
2. Remove the drain hose (**figure 1, item 2**) from the hose nipple (**figure 1, item 3**) at the drain valve (**figure 1, item 4**). Retain removed items if serviceable.
3. Using a pipe wrench remove hose nipple (**figure 1, item 3**) from the drain valve (**figure 1, item 4**).
4. Remove the drain valve (**figure 1, item 4**) from the oil catch muffler (**figure 1, item 1**).
5. Loosen the hose clamp (**figure 1, item 5**) on the breather hose (**figure 1, item 6**), and remove hose from oil catch muffler (**figure 1, item 1**).
6. If breather hose (**figure 1, item 6**) must be replaced, loosen hose clamp (**figure 1, item 7**) securing breather hose to vacuum pump port (**figure 1, item 8**) and remove hose from pump.



Figure 1. Removing Components from the Oil Catch Muffler



WARNING

The oil catch muffler is heavy (40-lbs). To prevent injuries, two people are required to remove it from the trailer.

7. While supporting the oil catch muffler (**figure 2, item 1**), remove hex bolts, nuts and flat washers (**figure 2, item 2**) securing the muffler to the tank bracket (**figure 2, item 3**). Retain hardware.
8. Lift the oil catch muffler (**figure 2, item 1**) off the bracket (**figure 2, item 3**).
9. Place new oil catch muffler (**figure 2, item 1**) onto tank bracket (**figure 2, item 3**) and install hex bolts, nuts and flat washers (**figure 2, item 2**).

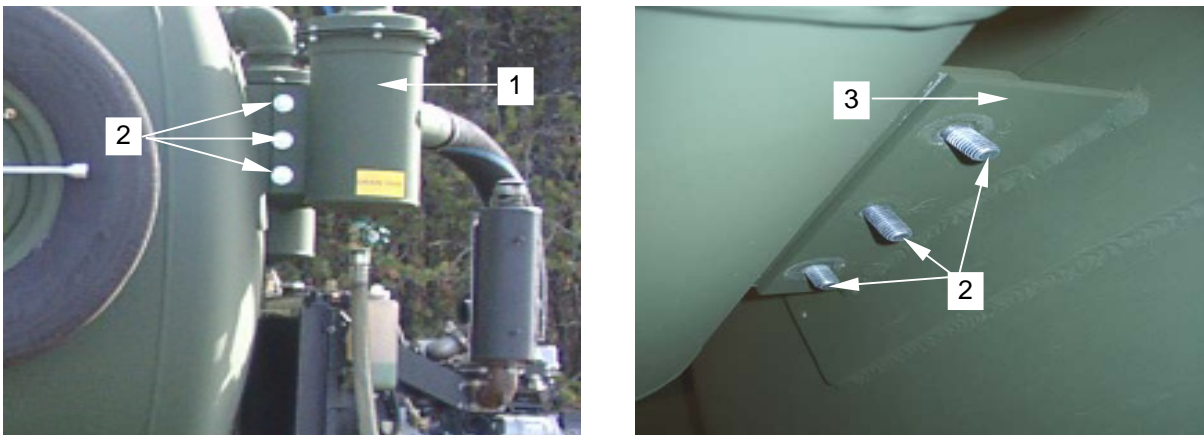


Figure 2. Removing Oil Catch Muffler from Bracket

10. If breather hose (**figure 3, item 1**) is being replaced, place hose clamps (**figure 3, item 2**) over both hose ends and install hose onto oil catch muffler (**figure 3, item 3**) and vacuum pump port (**figure 3, item 4**).
11. Tighten hose clamps (**figure 3, item 2**) securing breather hose to vacuum pump port (**figure 1, item 4**) and oil catch muffler (**figure 3, item 3**).

12. Applying pipe sealant to threads, install the drain valve (**figure 3, item 5**) onto the oil catch muffler drain port (**figure 3, item 6**).
13. Applying pipe sealant to threads install hose nipple (**figure 3, item 7**) onto the drain valve (**figure 3, item 5**) using a pipe wrench.
14. Install the drain hose (**figure 3, item 8**) onto the hose nipple (**figure 3, item 7**).
15. Secure hose with hose clamp (**figure 3, item 2**).

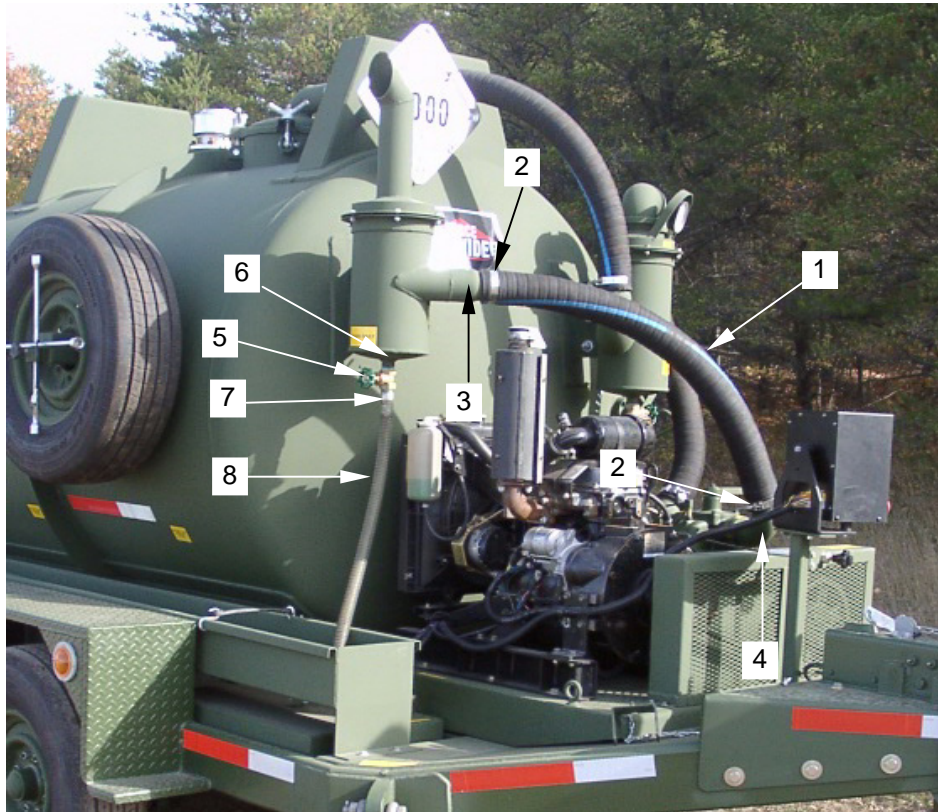


Figure 3. Installing Components onto the Oil Catch Muffler

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
BATTERY
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

63B Light Vehicle Mechanic

Materials/Parts

Brush, Battery Cleaner (WP 0091 00, Item 2)

Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off

Ignition key removed

Emergency stop button pushed in

Wheel chocked

Emergency brake set

REPLACE

To replace a battery, battery cables and battery box proceed as follows:

1. Locate the battery box (**figure 1, item 1**) and unbuckle the strap (**figure 1, item 2**) securing the lid (**figure 1, item 3**) to the box.
2. Remove the lid (**figure 1, item 3**) from the box (**figure 1, item 1**).

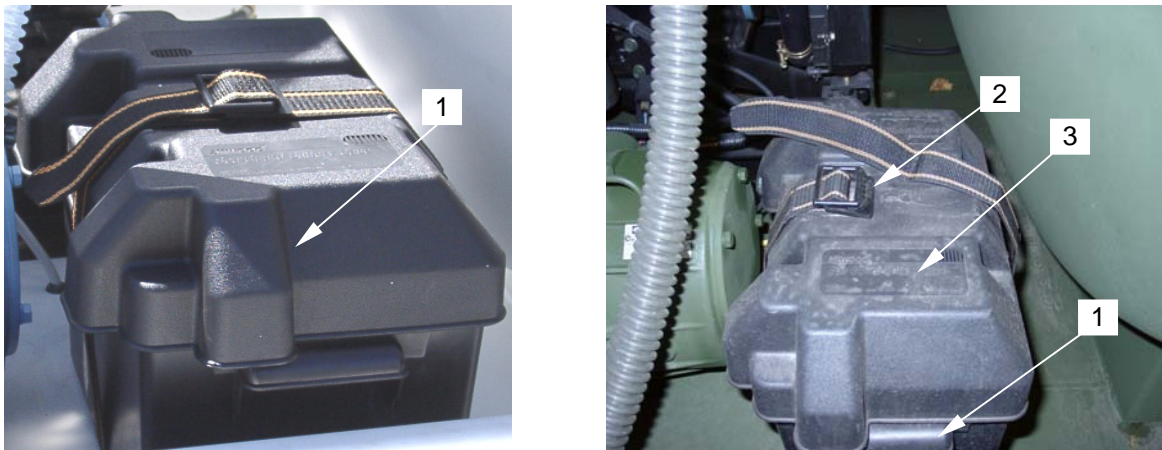


Figure 1. Unbuckling Battery Box Strap



WARNING

Shorting out the terminals and crossing battery cables can cause a battery to explode.

3. Loosen the hex nut (**figure 2, item 1**) on the battery cable clamp (**figure 2, item 2**) and remove the clamp from the negative terminal (**figure 2, item 3**)

4. Remove the battery cable clamp (**figure 2, item 4**) from the positive terminal (**figure 2, item 5**) by loosening the hex nut (**figure 2, item 6**) and moving clamp off the terminal (**figure 2, item 5**).

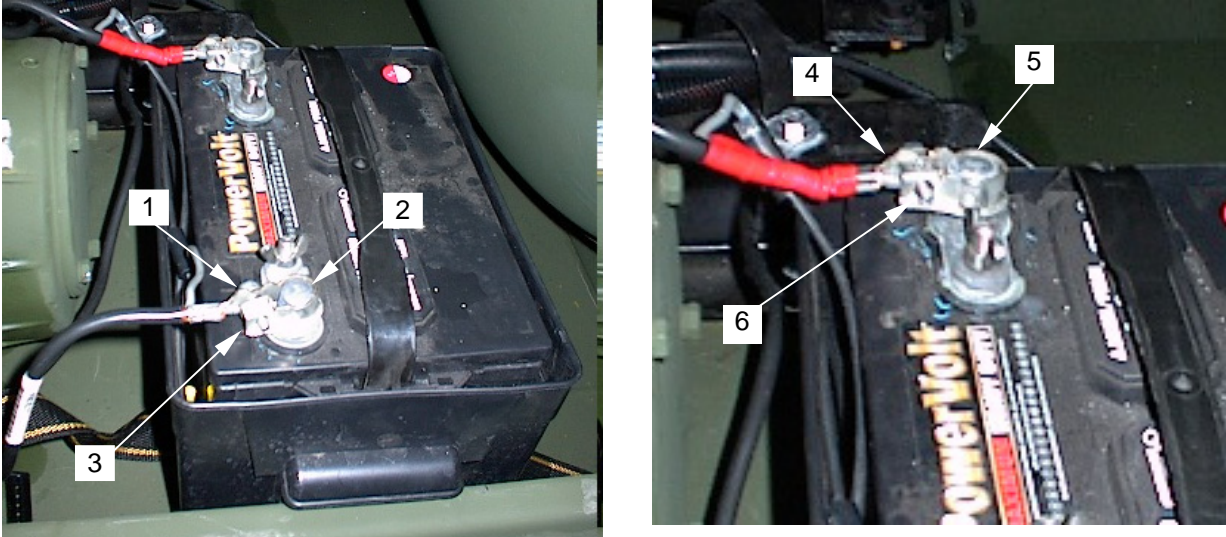


Figure 2. Removing Cables from Battery

5. If negative cable (**figure 3, item 1**) has to be replaced, disconnect the cable from the engine mount (**figure 3, item 2**) by removing the hex bolt and washer (**figure 3, item 3**). Retain hardware. Remove cable.
6. If positive cable (**figure 3, item 4**) has to be replaced, disconnect the cable from the starter (**figure 2, item 5**) by removing the hex nut and washer (**figure 3, item 6**). Retain hardware. Remove cable.

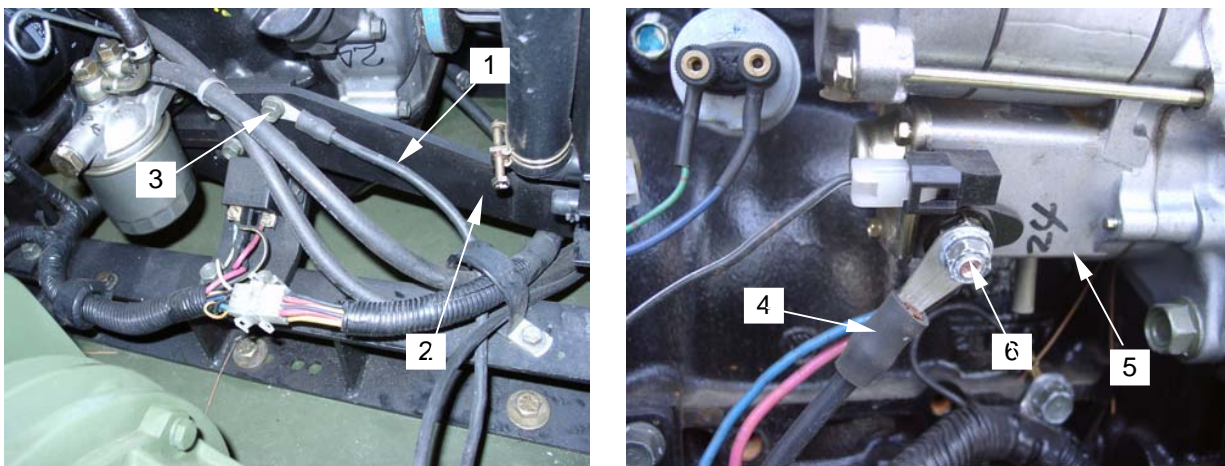


Figure 3. Removing Cables from Engine Mount and Starter

7. Remove battery from battery box (**figure 4, item 1**).
8. Dispose of battery in accordance with Unit SOP and local regulations.

9. If the battery box is to be replaced, remove the cushioning material (**figure 4, item 2**) from the bottom of the box.
10. Remove two bolts and flat washers (**figure 4, item 3**) from the bottom of the battery box. Retain hardware. Remove the box (**figure 4, item 1**) from the skid.

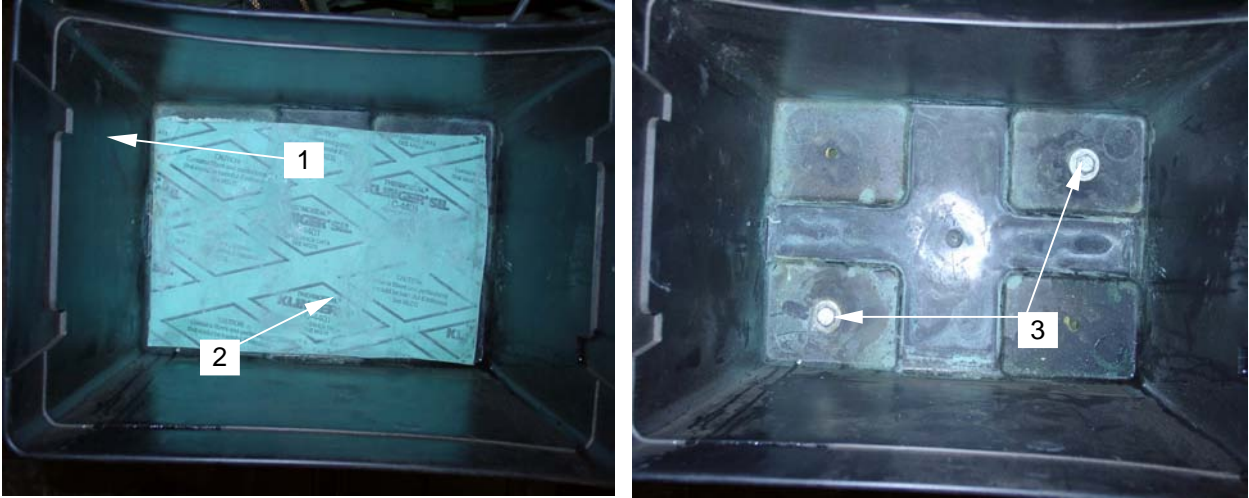


Figure 4. Removing Battery Box

11. Install a new battery box (**figure 5, item 1**), as necessary, with retained hardware.

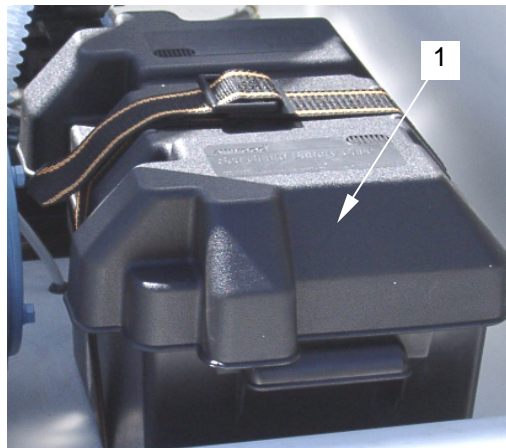


Figure 5. Battery Box

12. Install a new negative battery cable (**figure 6, item 1**), as necessary, onto engine mount (**figure 6, item 2**) with the retained hardware.
13. Install a new positive battery cable (**figure 6, item 3**), as necessary, onto the starter (**figure 6, item 4**) with the retained hardware.

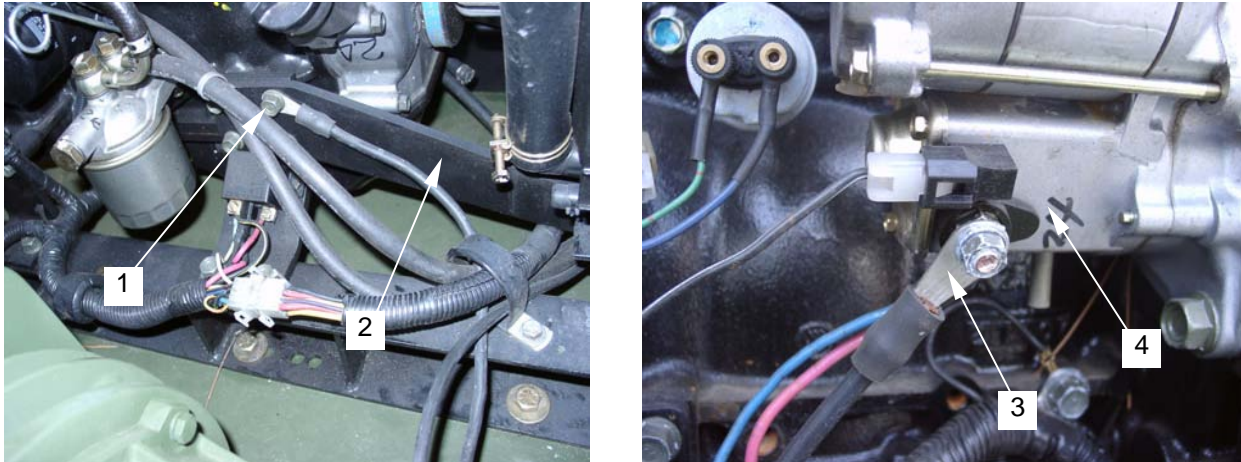


Figure 6. Battery Cables

14. Place a new battery (figure 7, item 1) into the battery box (figure 7, item 2) and reconnect the cable clamps to the terminals (positive (figure 7, item 3) first, then negative (figure 7, item 4)). Tighten each clamp as it is installed.

15. Place lid (figure 7, item 5) onto battery box and secure buckle (figure 7, item 6).

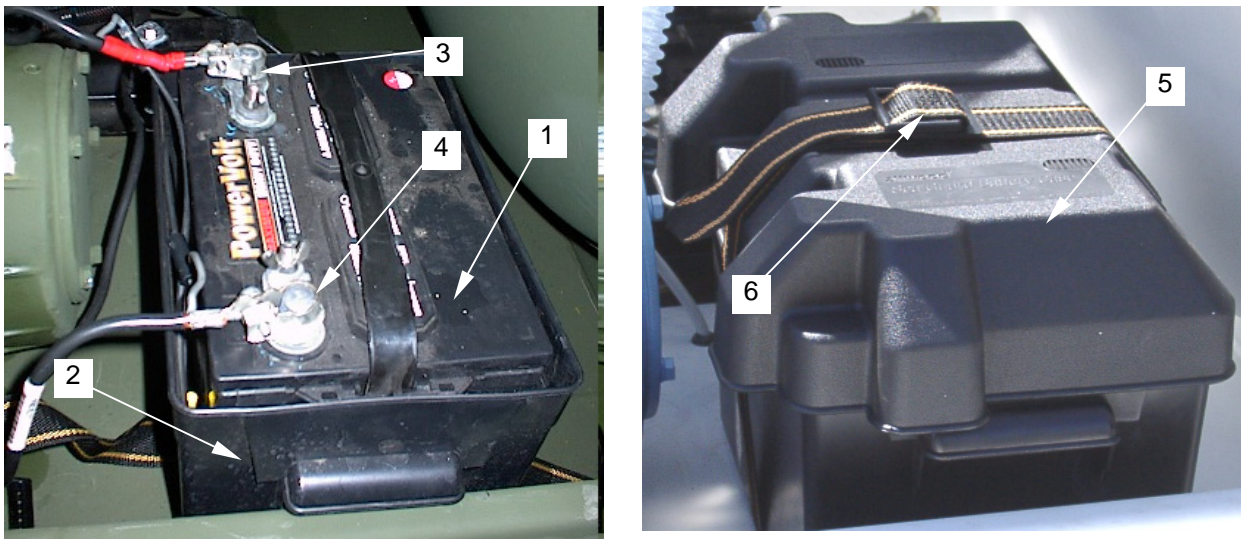


Figure 7. Battery and Battery Box

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
LIGHTS
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

63B Light Vehicle Mechanic

Materials/Parts

Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off
Inter-vehicular cable disconnected

REPLACE

1. Work light bulb replacement:
 - a. Ensure battery is disconnected from negative terminal post.
 - b. Remove light bulb (**figure 1, item 1**) from hood (**figure 1, item 2**).
 - c. Disconnect wiring (**figure 1, item 3**) from bulb.
 - d. Remove bulb and discard in an approved container.
 - e. Connect new bulb to wiring (**figure 1, item 3**).
 - f. Insert bulb (**figure 1, item 1**) into hood (**figure 1, item 2**).

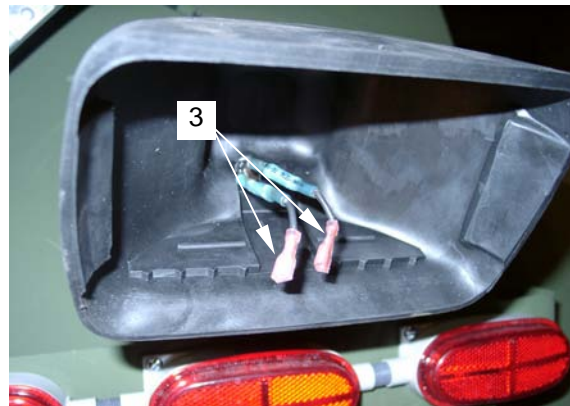
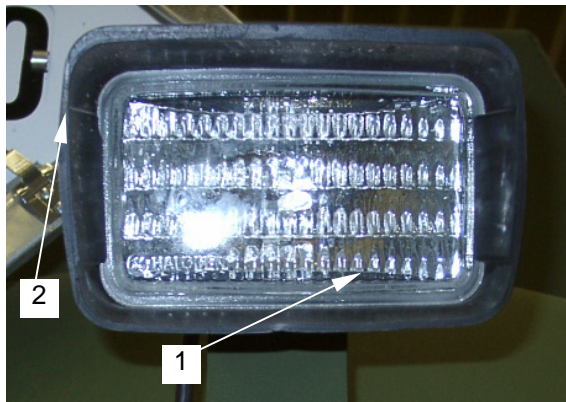


Figure 1. Light Bulb Replacement

2. Work light hood replacement:
 - a. Ensure battery is disconnected from negative terminal.
 - b. Remove light bulb (**figure 2, item 1**) from hood (**figure 2, item 2**).
 - c. Disconnect wiring (**figure 2, item 3**) from bulb (**figure 2, item 1**).
 - d. Remove bulb
 - e. Remove wiring from hood (**figure 2, item 2**).
 - f. Loosen and remove mounting nut (**figure 2, item 4**) and bolt (**figure 2, item 5**).
 - g. Remove hood and discard in accordance with unit SOP in an approved container.
 - h. Install new hood.
 - i. Fasten hood in place with mounting nut (**figure 2, item 4**) and bolt (**figure 2, item 5**).
 - j. Insert wiring (**figure 2, item 3**) into hood.
 - k. Connect wiring to bulb (**figure 2, item 1**).
 - l. Insert bulb into hood (**figure 2, item 2**).

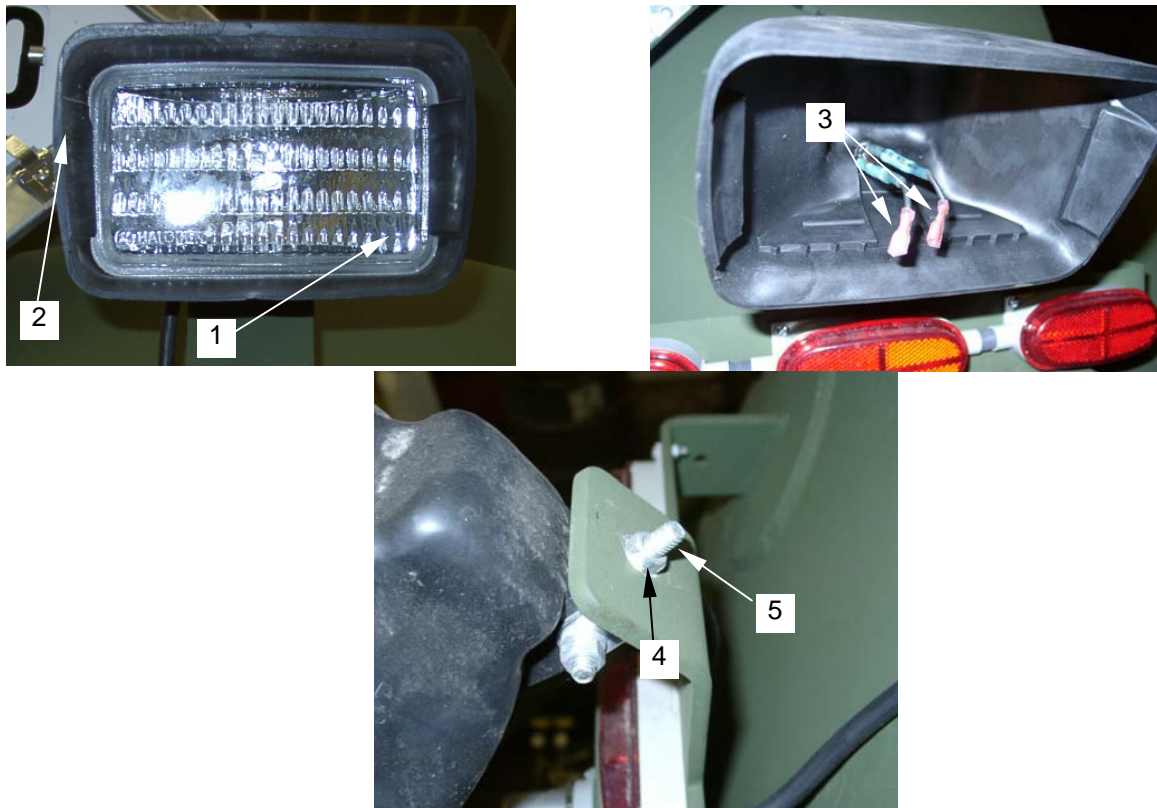


Figure 2. Work Light Hood Replacement

3. Replace a light bulb as follows:
 - a. Remove lens cover (**figure 3, item 1**) from light fixture by loosening with a screwdriver.
 - b. Remove light bulb (**figure 3, item 2**) from socket by twisting it counterclockwise, and discard in an approved container.
 - c. Install new light bulb in socket.
 - d. Install lens cover (**figure 3, item 1**) on light fixture.



Figure 3. Light Bulb Replacement

4. Light fixture replacement (side and rear lights):
 - a. Remove lens cover (**figure 4, item 1**) from light fixture.
 - b. Tag and disconnect wires (**figure 4, item 2**) from light fixture.
 - c. Loosen and remove fixture mounting screws (**figure 4, item 3**) and nuts
 - d. Remove light fixture and discard.
 - e. Install new light fixture.
 - f. Feed wires into light fixture, connect wires and remove tags.
 - g. Fasten light fixture with mounting screws (**figure 4, item 3**) and nuts.
 - h. Install lens cover (**figure 4, item 1**) on light fixture.

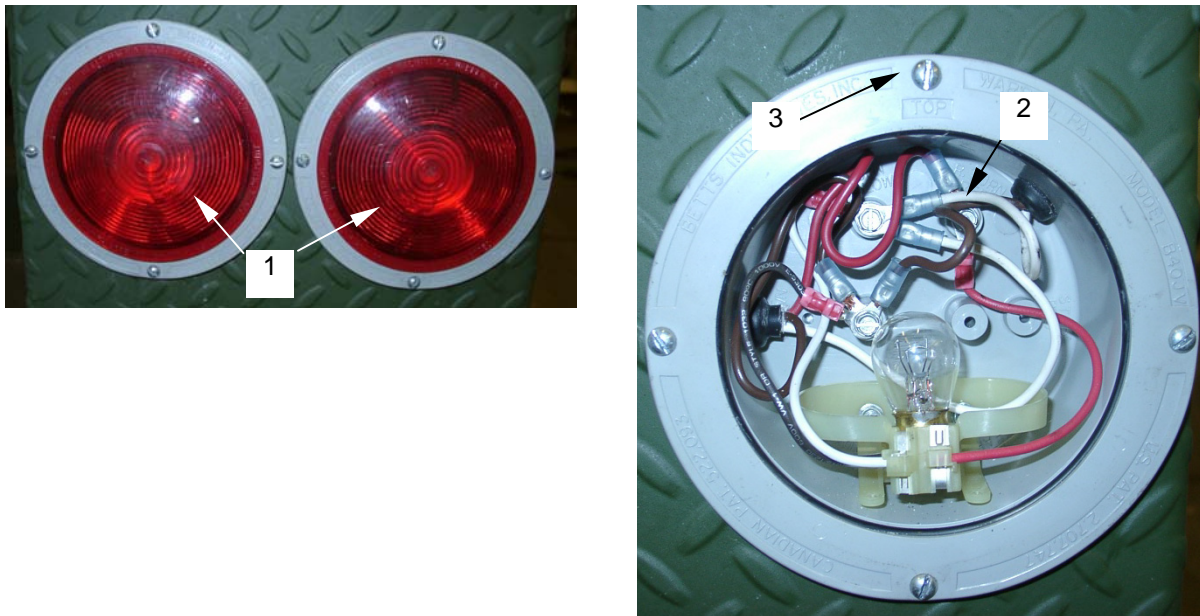


Figure 4. Rear and Side Light Fixture

5. Light fixture replacement (rear trailer lights):
 - a. Remove lens cover (**figure 5, item 1**) from middle light.
 - b. Tag and disconnect wiring (**figure 5, item 2**) to rear trailer lights.
 - c. Loosen and remove mounting screws (**figure 5, item 3**) and nuts.
 - d. Remove rear trailer light and dispose in an approved container.
 - e. Install new rear trailer light.
 - f. Fasten light in place with mounting screws (**figure 5, item 3**) and nuts.
 - g. Feed wiring into housing, connect wires and remove tags.
 - h. Install lens cover (**figure 5, item 1**) on middle light.

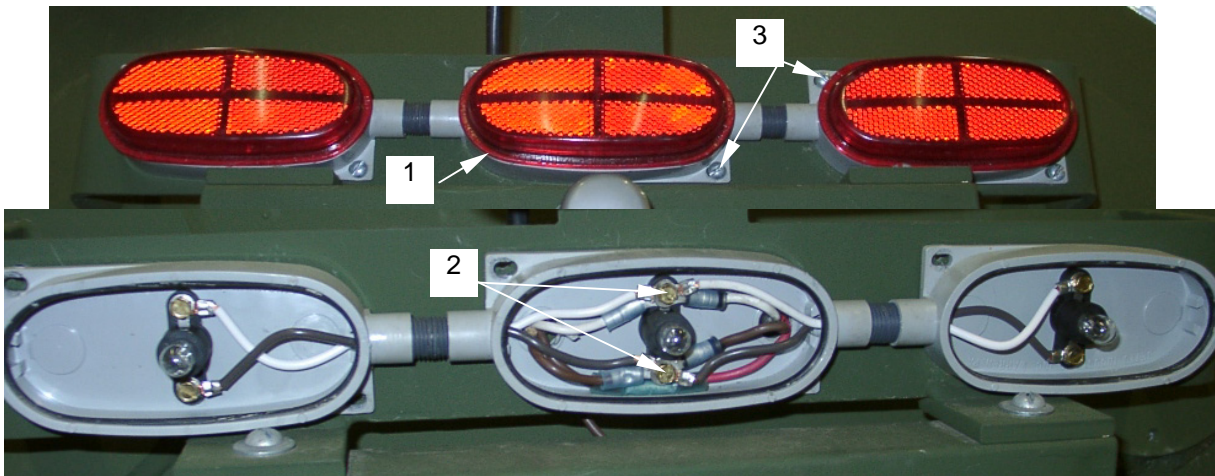


Figure 5. Rear trailer lights

6. Replace a marker light fixture as follows:
 - a. Remove lens cover (**figure 6, item 1**) from marker light.
 - b. Loosen and remove mounting screws (**figure 6, item 2**) and nuts.
 - c. Remove lens cover (**figure 6, item 3**) from middle trailer light.
 - d. Tag and disconnect marker light wiring (**figure 6, item 4**).
 - e. Remove marker light and dispose.
 - f. Install new marker light.
 - g. Fasten fixture in place with screws (**figure 6, item 2**) and nuts.
 - h. Feed wiring into middle trailer light fixture, connect wires and remove tags.
 - i. Install lens cover (**figure 6, item 3**) on marker light.
 - j. Install lens cover (**figure 6, item 3**) on middle trailer light.

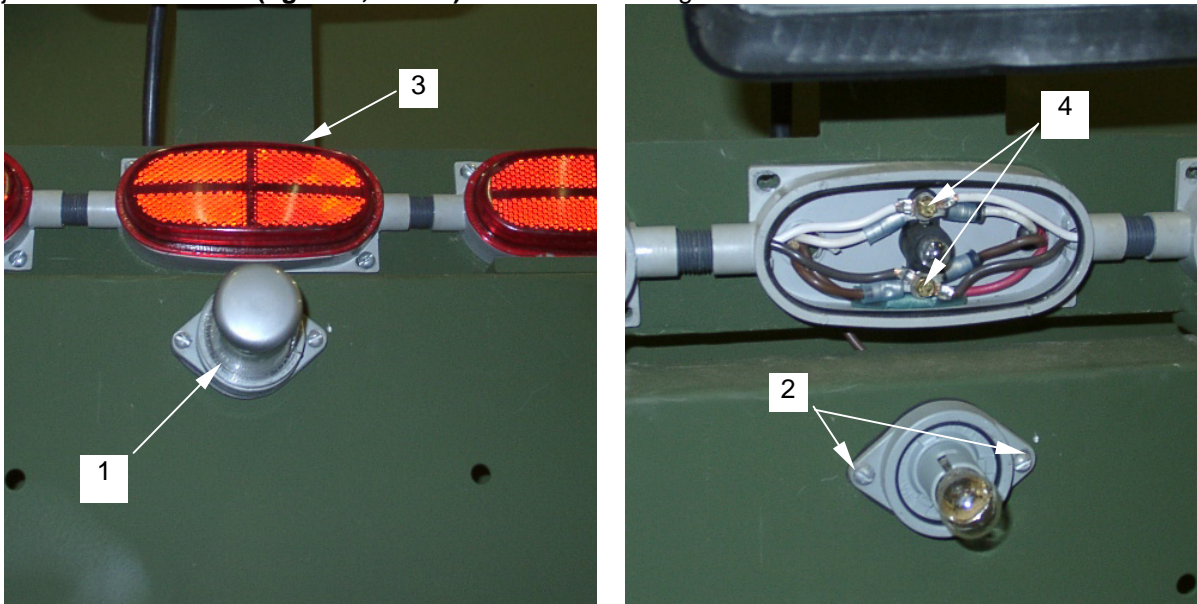


Figure 6. Marker Light

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
WIRING
TEST, REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

63B Light Vehicle Mechanic

Materials/Parts

Rags, Wiping (WP 0091 00, Item 28)
Tags, Marking (WP 0091 00, Item 32)

Equipment Condition

Engine shut off
Inter-vehicular cable disconnected

TEST

1. Perform a visual inspection of all lenses for breaks and cracks.
2. Connect Inter-vehicular cable (**figure 1, item 1**) to prime mover.
3. Operate brakes and turn signals in the prime mover and ensure lights energize.

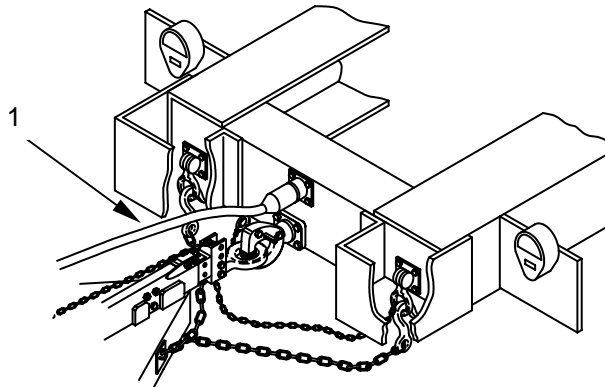


Figure 1. Inter-Vehicular Cable to Prime Mover

REPLACE

NOTE

The WWET/T lighting is a 12-Volt system using standard insulated wire to distribute power to the running and utility lights. The running lights are powered through the inter-vehicular cable by the prime mover. The rear working light is powered by the WWET/T 12-Volt battery. The wiring layout is shown in Figure 2

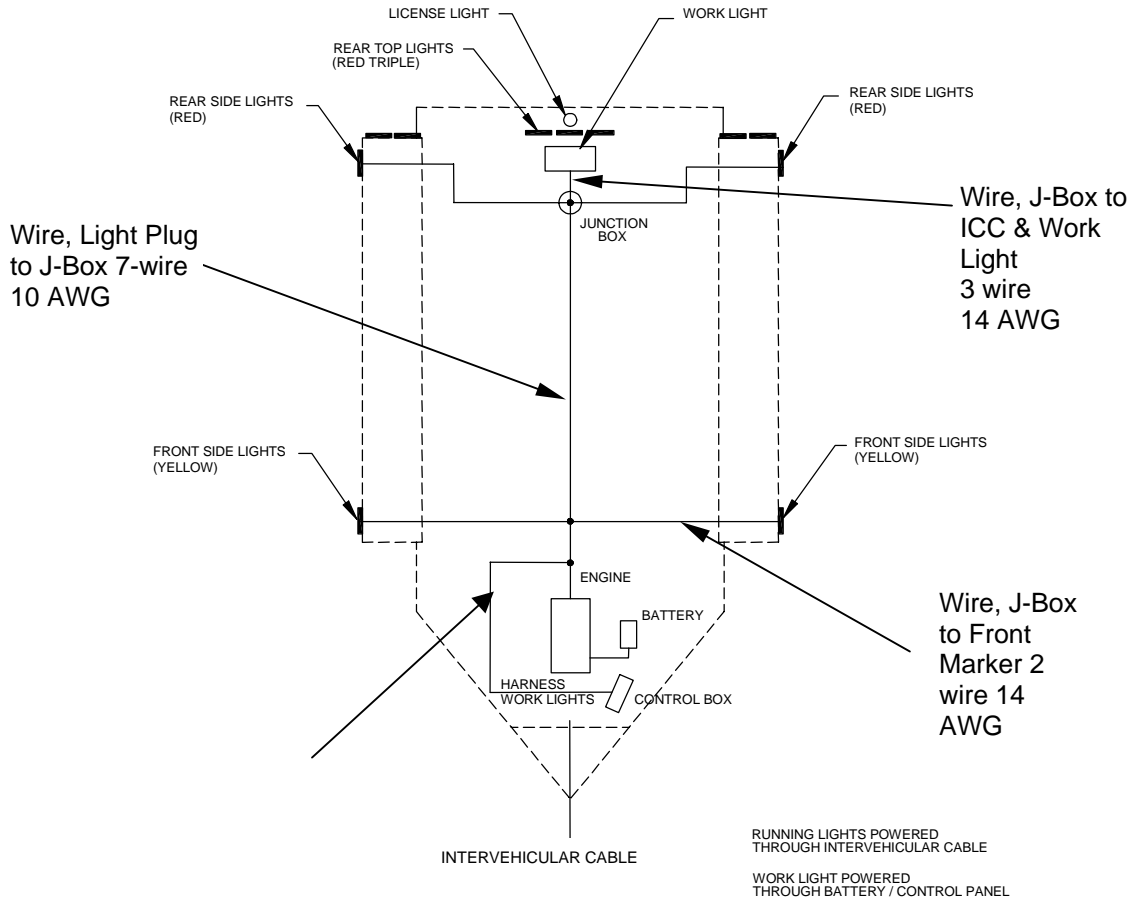


Figure 2. Wiring Diagram

To replace the wiring for the various light fixtures, proceed as follows:

1. Remove lens cap (**figure 3, item 1**) from light fixture.
2. Tag and disconnect wires (**figure 3, item 2**) from light fixture.



Figure 3. Light Side Light Fixture

3. Remove cover (**figure 4, item 1**) from J-Box (**figure 4, item 2**).
4. Tag and disconnect wires (**figure 4, item 3**) from J-box.
5. Loosen and remove strain relief nut (**figure 4, item 4**) and grommet (**figure 4, item 5**).

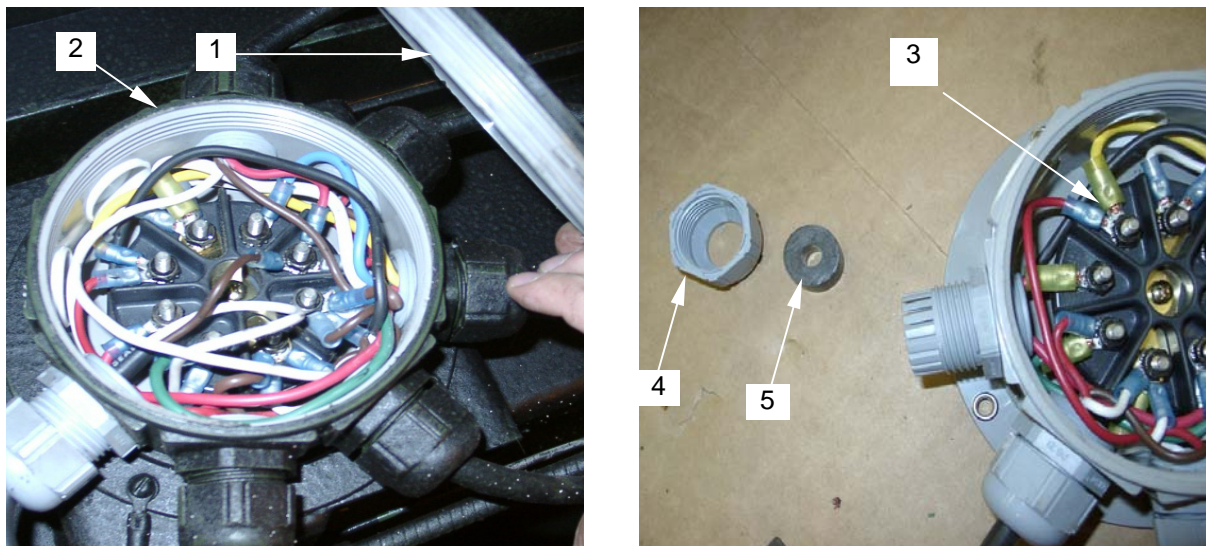


Figure 4. J-Box

6. Loosen and remove wire clamps (**figure 5, item 1**).
7. Remove old wire and discard.
8. Install new wire in wire clamps (**figure 5, item 1**).
9. Fasten wire clamps in place.

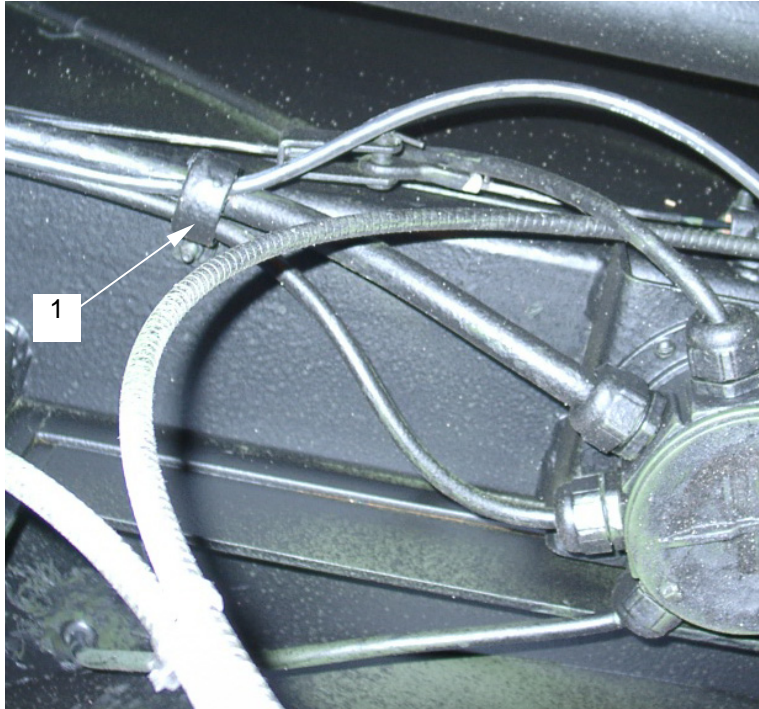


Figure 5. Wire Clamp

10. Strip 6-in of outer insulation off of wire (**figure 6, item 1**).
11. Cut wires to same length as those being replaced (**figure 6, item 2**).
12. Strip 3/8-in insulation off individual wires (**figure 6, item 3**).
13. Feed wire through strain relief nut (**figure 7, item 1**) and grommet (**figure 7, item 2**).
14. Install and crimp ring terminal to wires (**figure 6, item 4**).
15. Install ring terminal on connection post (**figure 7, item 3**).
16. Fasten ring terminals with mounting nuts.
17. Tighten strain relief nut (**figure 7, item 1**).
18. Install cover (**figure 7, item 4**) on J-Box (**figure 7, item 5**).

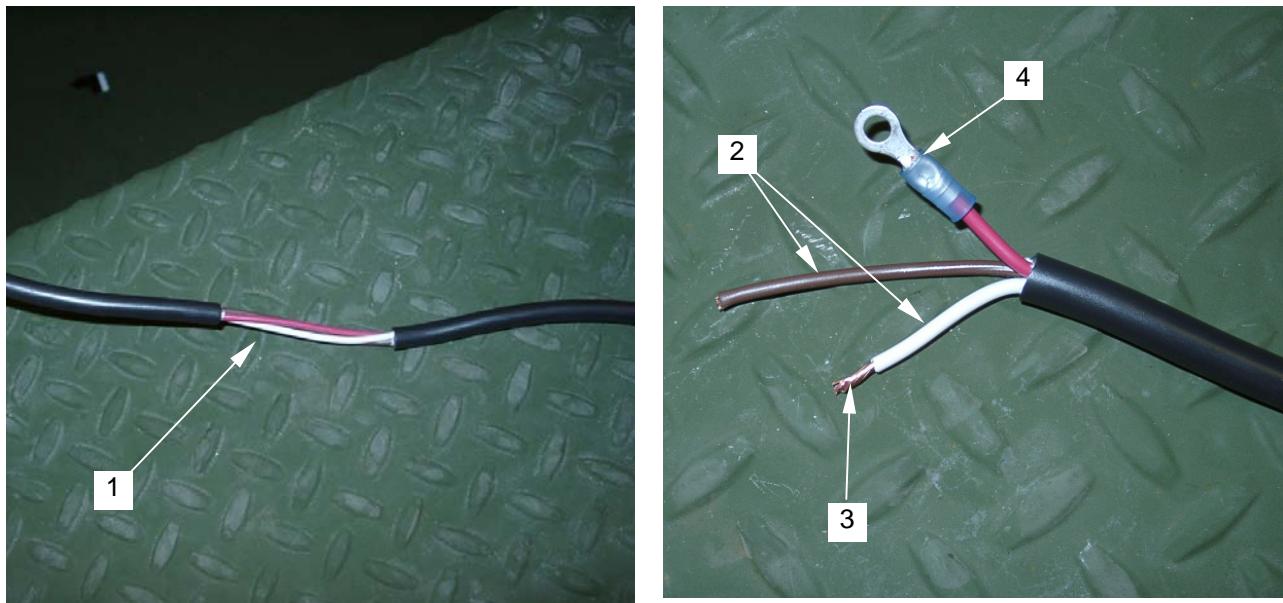


Figure 6. Wire Insulation

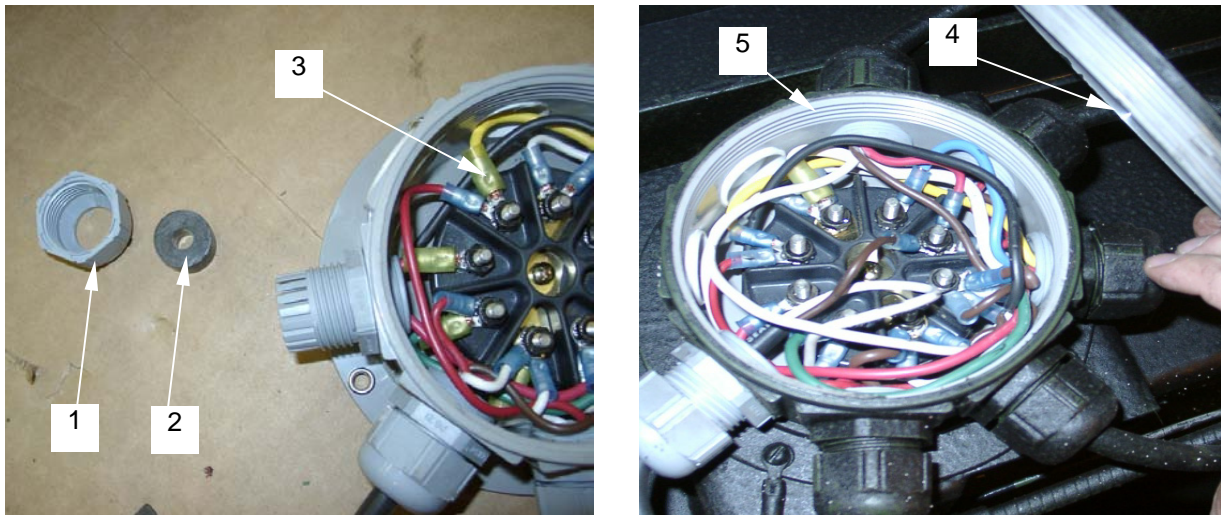


Figure 7. J-Box

19. Connect wiring (**figure 8, item 1**) in light fixture.

20. Install cover (**figure 8, item 2**) on light fixture.

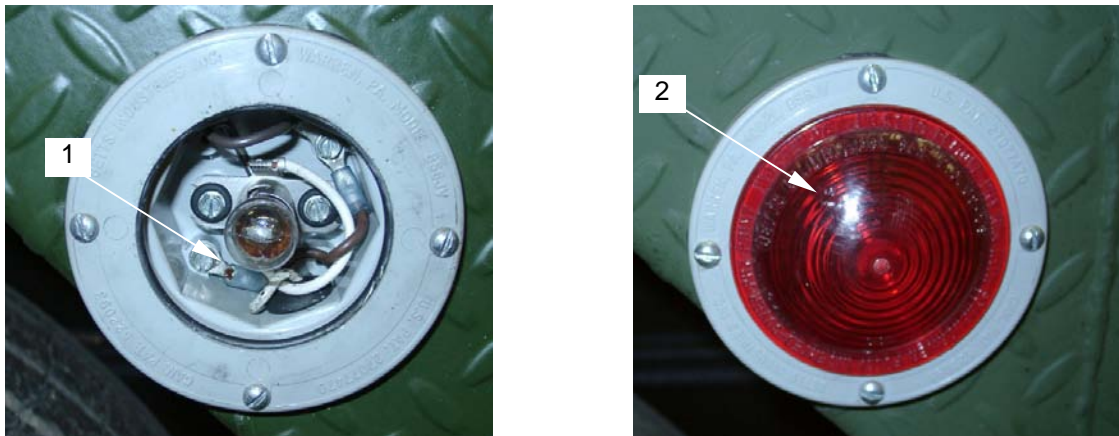


Figure 8. Rear Light Fixture

To replace the wiring for the work light, proceed as follows:

1. Remove light bulb (**figure 9, item 1**) from hood (**figure 9, item 2**).
2. Disconnect wiring (**figure 9, item 3**) from bulb (**figure 9, item 1**).
3. Remove bulb.
4. Remove wiring (**figure 9, item 3**) from hood (**figure 9, item 2**).
5. Loosen and remove mounting nut (**figure 9, item 4**) and bolt (**figure 9, item 5**).

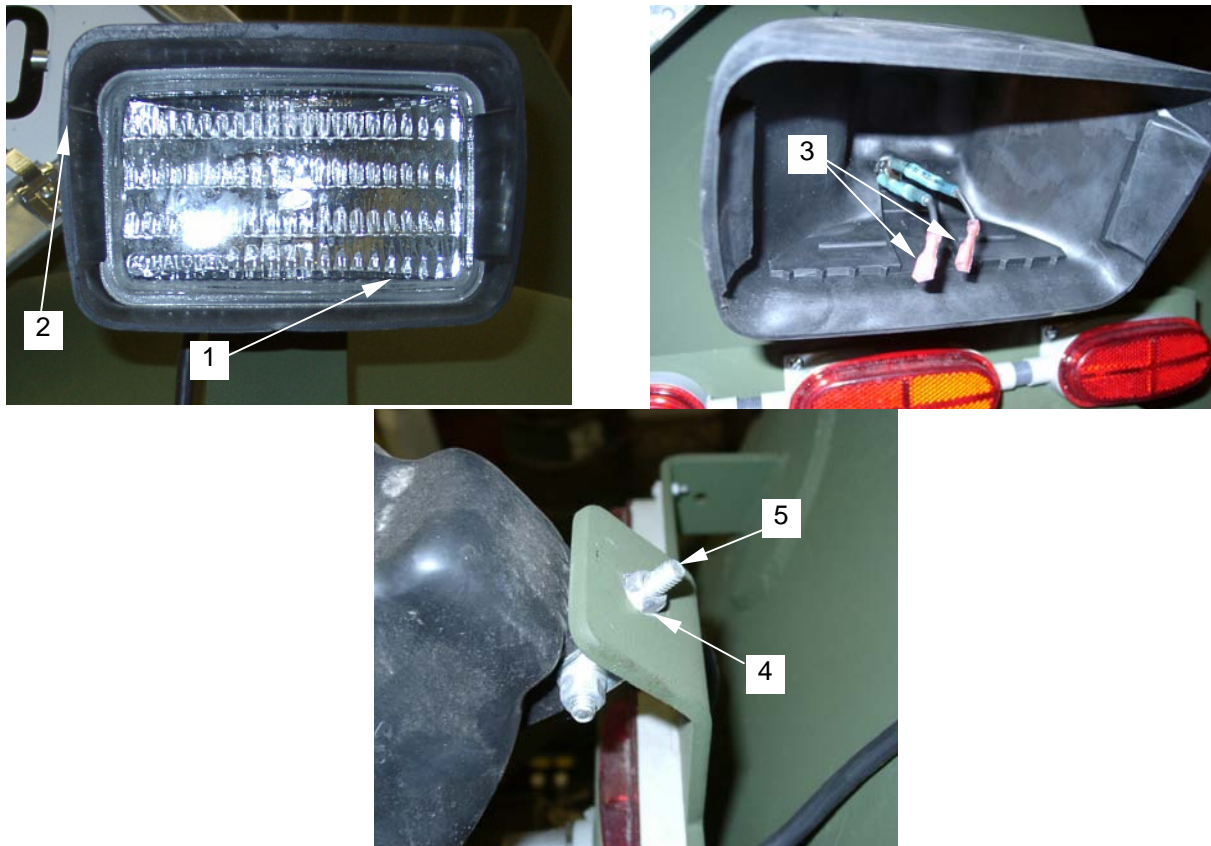


Figure 9. Work Light Removal

6. Pry back wire clamps (**figure 10, item 1**) to free wire from the trailer.
7. Loosen and remove wire clamp (**figure 10, item 2**).

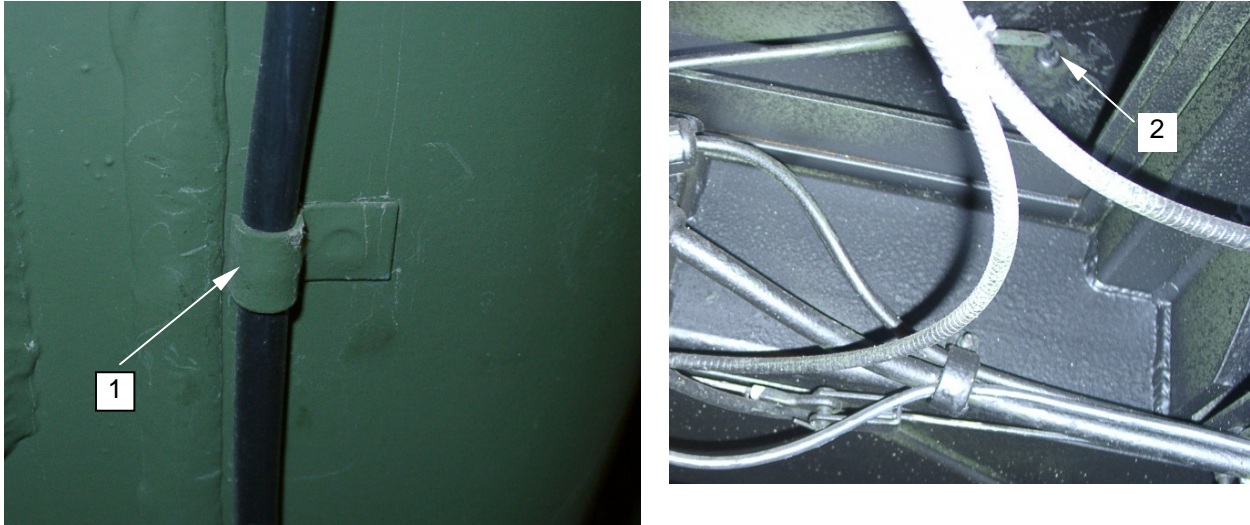


Figure 10. Wire Clamps

8. Remove cover (**figure 11, item 1**) to J-Box (**figure 11, item 2**).
9. Loosen and remove strain relief mounting nut (**figure 11, item 3**) and grommet (**figure 11, item 4**).
10. Tag and remove wires.
11. Remove wire from J-Box.

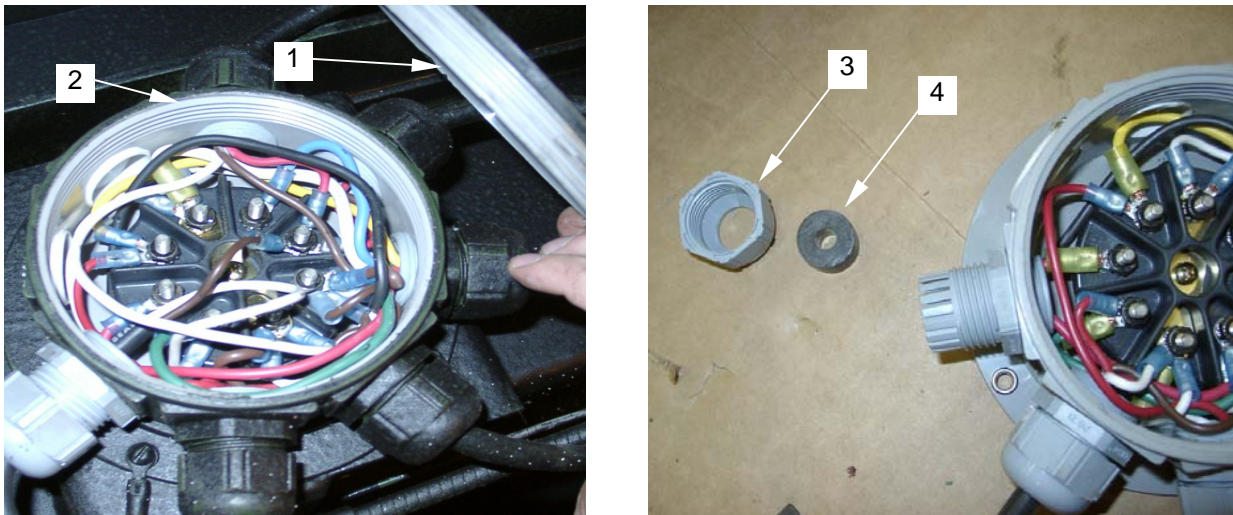


Figure 11. J-Box

12. Strip 6-in of outer insulation off of wire (**figure 12, item 1**).
13. Cut and strip new wire to same length as wires removed (**figure 12, item 1**).
14. Strip 3/8-in insulation off individual wires (**figure 12, item 1**).
15. Feed new wire through strain relief nut (**figure 13, item 1**) and grommet (**figure 13, item 2**) into J-Box.
16. Crimp ring terminals on wires (**figure 12, item 4**).
17. Install ring terminal on connection post (**figure 13, item 3**).
18. Fasten ring terminal with mounting nuts.
19. Tighten strain relief nut (**figure 13, item 1**).
20. Install cover (**figure 13, item 4**) on J-Box (**figure 13, item 5**).

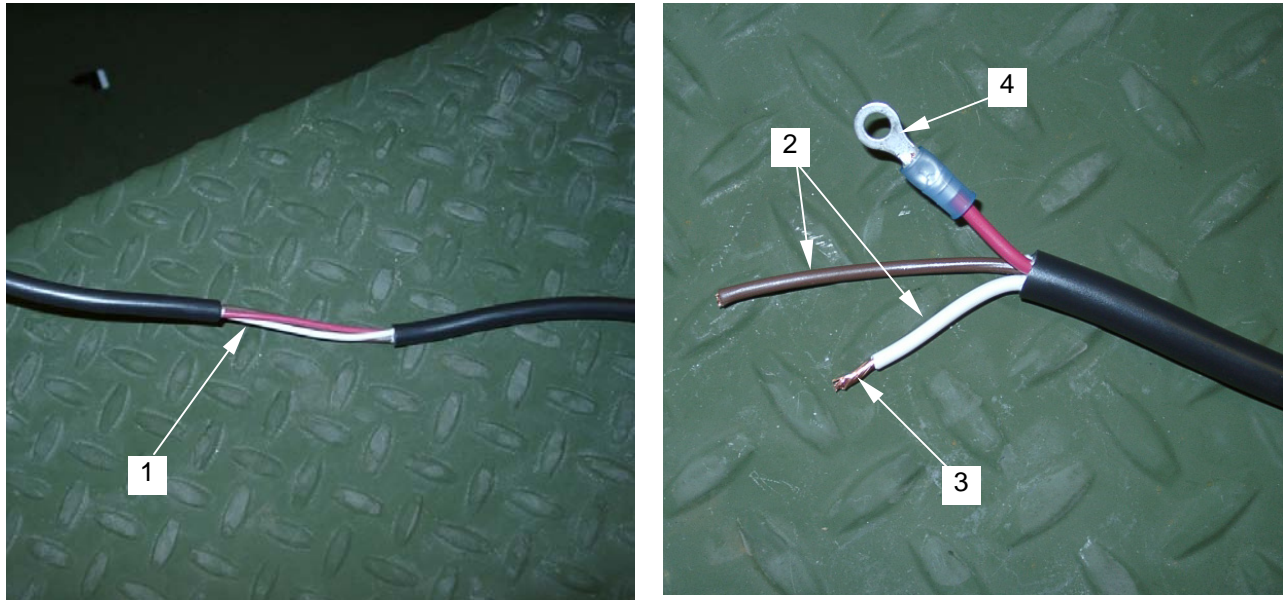


Figure 12. Wire Insulation

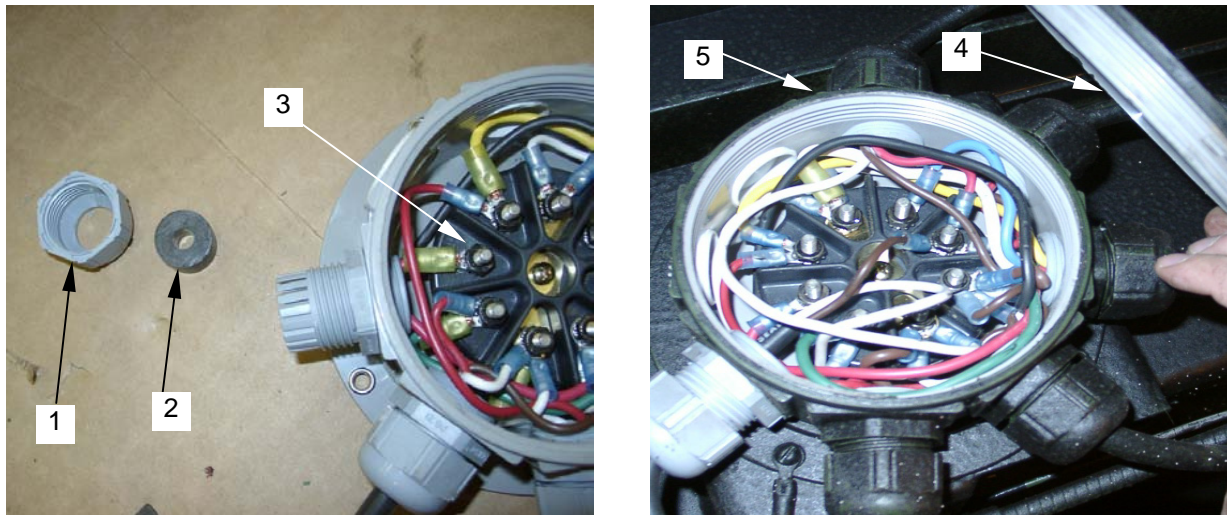


Figure 13. J-Box

21. Install new wire in wire clamps (figure 14, item 1).
22. Fasten wire clamps in place.
23. Install wire into wire clamps (figure 15, item 1) on the side of the trailer.
24. Bend wire clamps into place.

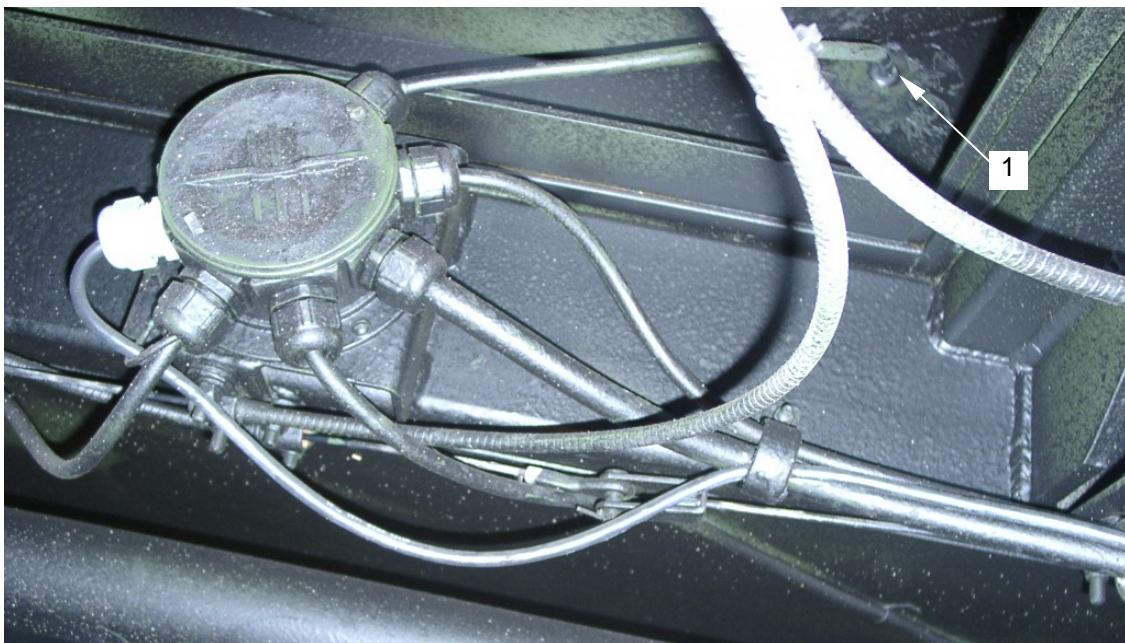


Figure 14. Wire Clamp

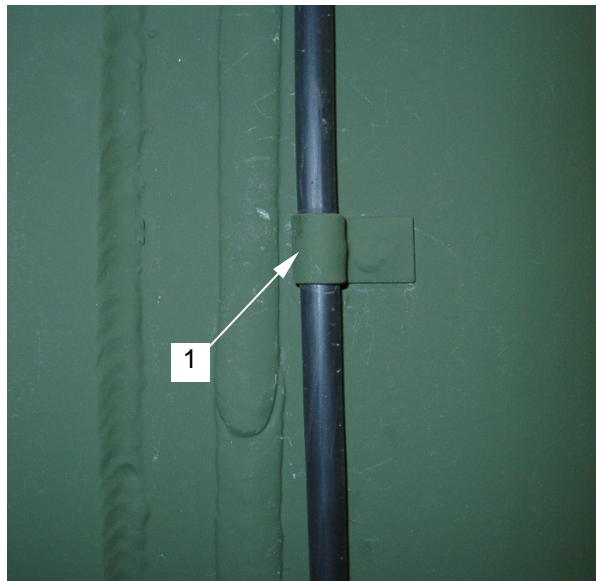


Figure 15. Wire Clamp

25. Strip 6-in of outer insulation off of wire (**figure 16, item 1**).
26. Cut wires to same length as those being replaced.
27. Strip 3/8-in insulation off individual wires.
28. Fasten work light hood in place with mounting nut (**figure 17, item 1**) and bolt (**figure 17, item 2**).
29. Feed wires through work light hood (**figure 17, item 3**).
30. Crimp terminals on work light wires (**figure 17, item 4**).
31. Connect terminals to work light.
32. Install work light (**figure 17, item 5**) into hood.

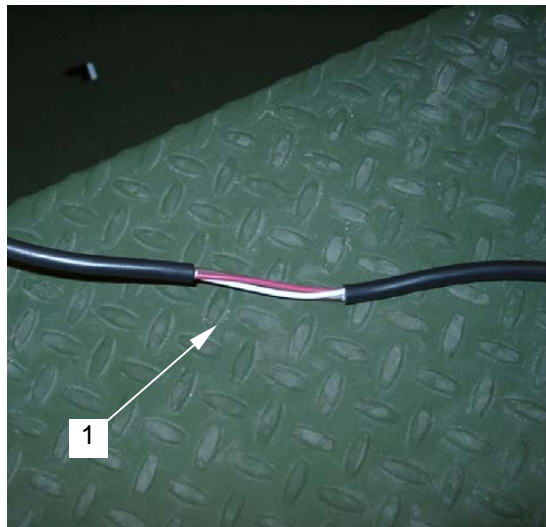


Figure 16. Wire Insulation

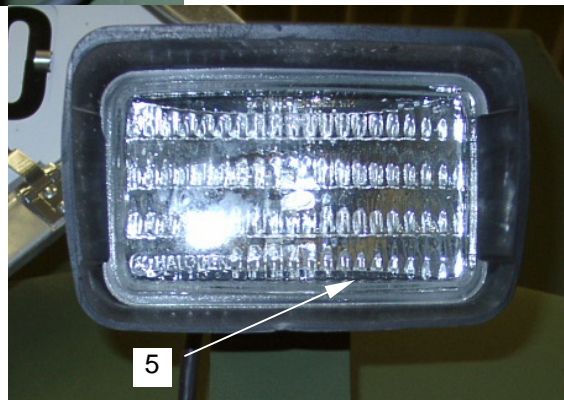
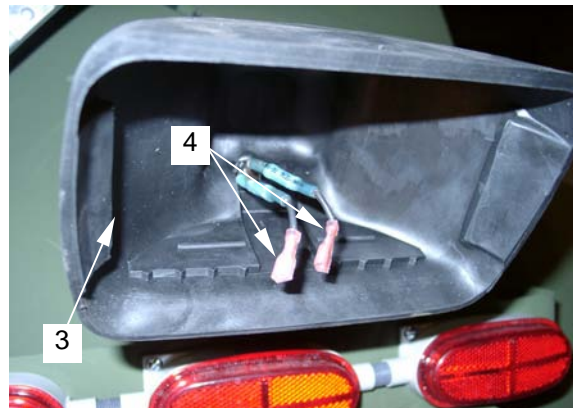
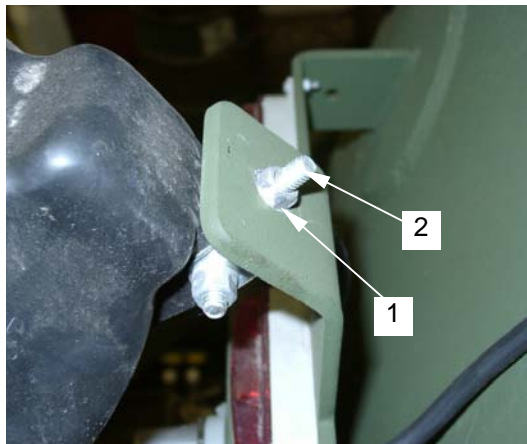


Figure 17. Work Light

Wiring to J-Box Identification:

1. Work Light (**figure 18, item 1**).
2. ICC Light (**figure 18, item 2**).
3. Inter Vehicle Power Cable (**figure 18, item 3**).
4. Front Marker Lights (**figure 18, item 4**).
5. Left Back Lights (**figure 18, item 5**).
6. Right Back Lights (**figure 18, item 6**).

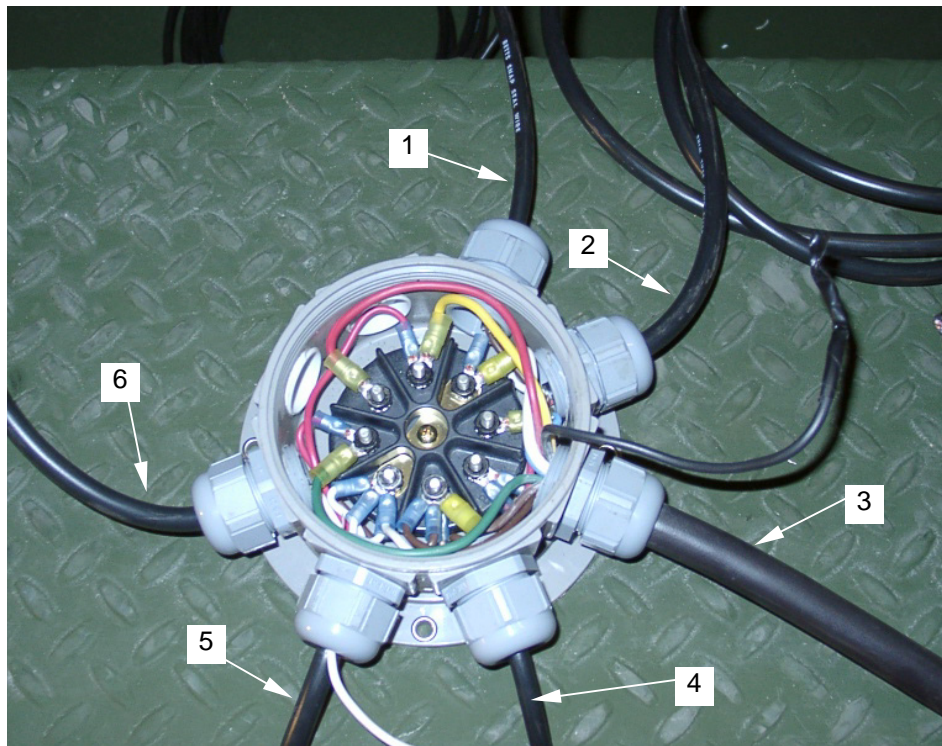


Figure 18. J-Box Connections

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
PARKING BRAKES
ADJUST, REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 63B Light Vehicle Mechanic

Materials/Parts

Gloves, Work (WP 0089 00, Table 2, Item 5)
Rags, Wiping (WP 0091 00, Item 28)
Wheel Chocks (WP 0091 00, Item 34)

Equipment Condition

Trailer empty and disconnected from prime mover
Chocks in place
Set trailer jack

ADJUST

The parking brakes may be adjusted collectively on each side or individually for each wheel. Minor collective adjustments can be made at the brake handle. More substantial adjustments can be made on the main cable. To make any adjustment, loosen the brake (handle in upright position) of the side of the trailer being adjusted and proceed as follows:

1. With the brake released (handle in upright position (**figure 1, item 1**)) turn the adjustment knob (**figure 1, item 2**) on top of the handle to the right to tighten and the left to loosen the brakes on all wheels of the side being adjusted.

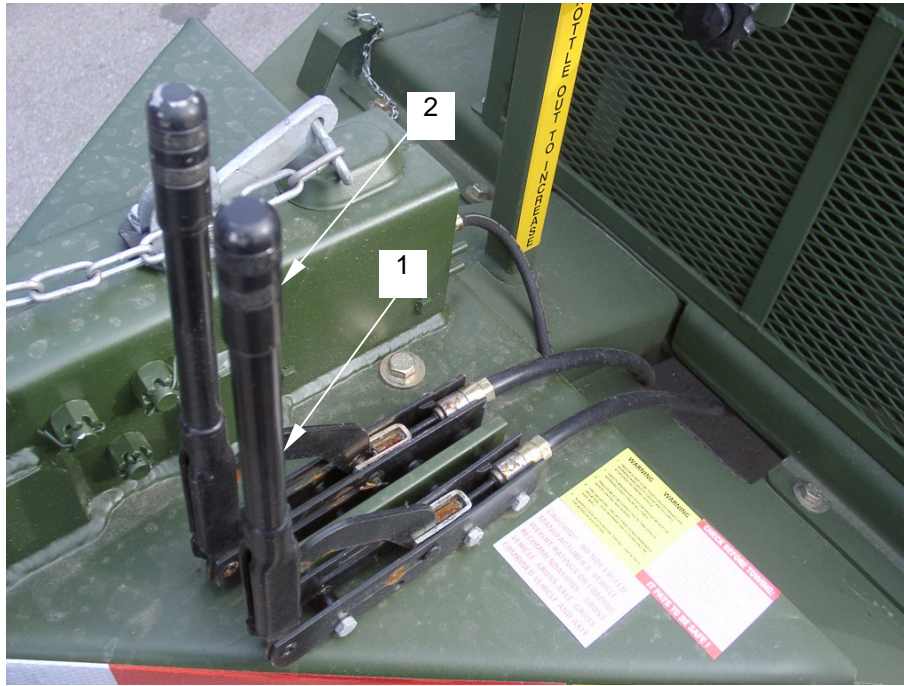


Figure 1. Brake Handle Adjustment

2. To make more substantial adjustments, proceed as follows:
 - a. Locate threaded end of brake cable (**figure 2, item 1**) and cable clamp (**figure 2, item 2**).
 - b. Remove the cotter pin (**figure 2, item 3**) holding the retaining pin (**figure 2, item 4**) and cable clamp (**figure 2, item 2**) to the spreader bar (**figure 2, item 5**).
 - c. Remove the cable clamp (**figure 2, item 2**) from the spreader bar (**figure 2, item 5**). Turn the adjusting nut (**figure 2, item 6**) to the right to tighten the brakes or to the left to loosen the brakes.
 - d. Secure the cable (**figure 2, item 1**) to the cable clamp (**figure 2, item 2**) by tightening the adjusting nut (**figure 2, item 6**) and brake cable lock nut (**figure 2, item 7**).
 - e. Connect the cable clamp (**figure 2, item 2**) to the spreader bar (**figure 2, item 5**) with the retaining pin (**figure 2, item 4**).
 - f. Fasten retaining pin (**figure 2, item 4**) in place with cotter pin (**figure 2, item 3**).
 - g. Perform adjustment procedures within this work package to check adjustment of brakes.

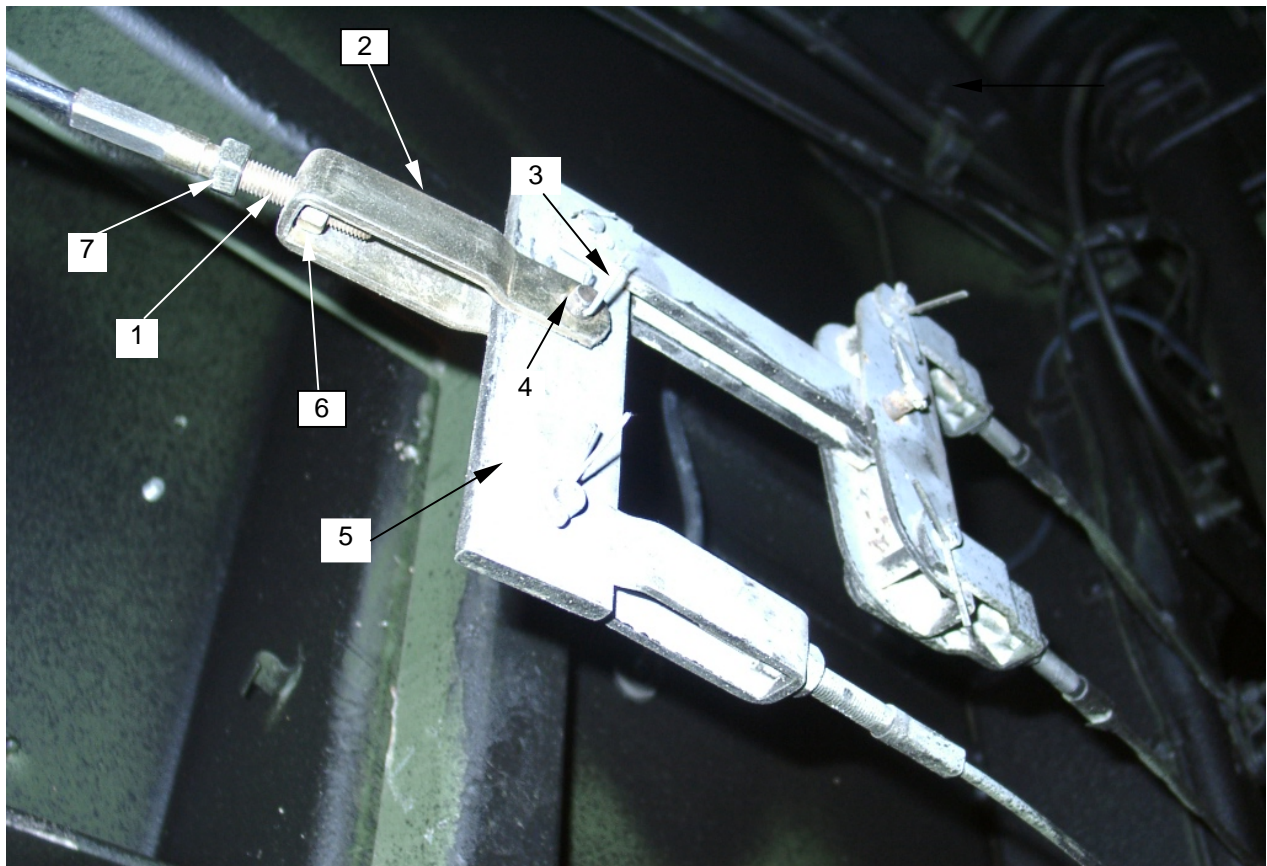


Figure 2. Collective Brake Adjustment

3. To adjust the brake lines for individual wheels, loosen the brakes (handle in upright position) of the side of the trailer being adjusted and proceed as follows:
 - a. Locate the spreader bars (**figure 3, item 1**) separating the main brake cable (**figure 3, item 2**) into three individual wheel cables (**figure 3, item 3**).
 - b. Identify the individual cable (**figure 3, item 3**) requiring adjustment. Make adjustment as described under 2 b through f, above.

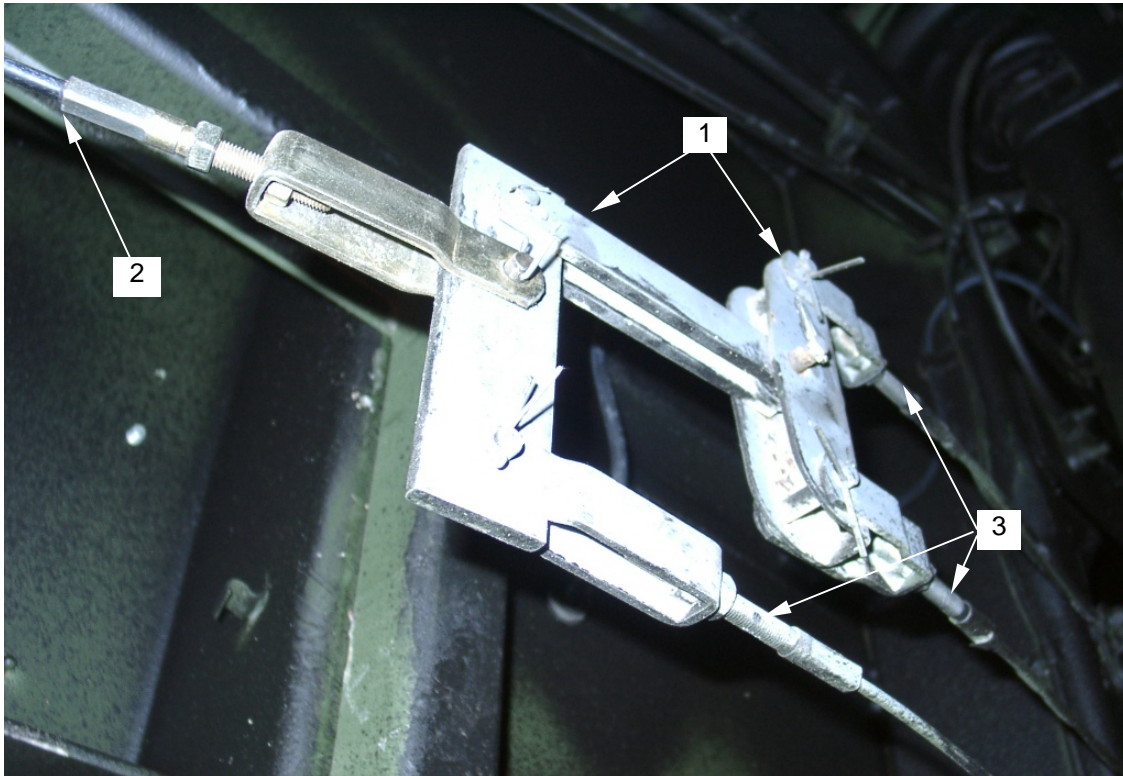


Figure 3. Individual Brake Adjustment

REPLACE

To replace a parking brake handle assembly, proceed as follows:

1. Loosen and remove hex nuts (**figure 4, item 1**) on bolts (**figure 4, item 2**) securing the brake handle assembly (**figure 4, item 3**) to the bracket (**figure 4, item 4**).
2. Remove bolts (**figure 4, item 2**). Retain hardware.

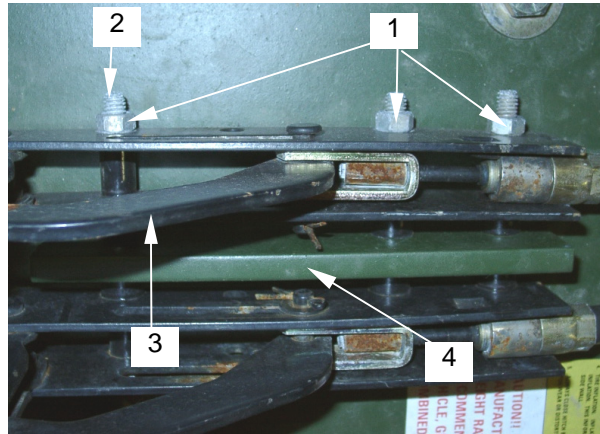


Figure 4. Parking Brake Handle Assembly Removal

3. Remove cotter pin (**figure 5, item 1**), washer (**figure 5, item 2**) and retaining pin (**figure 5, item 3**) from brake handle assembly.
4. Remove cable (**figure 5, item 4**) from handle. Retain cable clamp in place (**figure 5, item 5**).
5. Install cable (**figure 5, item 4**) onto new handle assembly (**figure 5, item 6**) using retaining pin (**figure 5, item 3**), washer (**figure 5, item 2**) and cotter pin (**figure 5, item 1**).

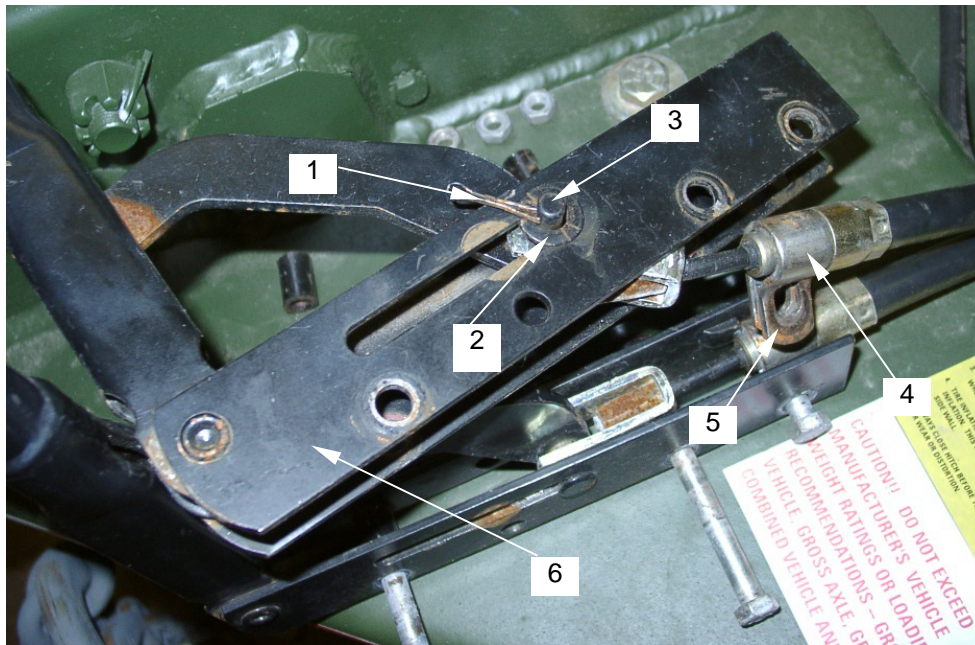


Figure 5. Disconnecting/ Reconnecting Main Brake Cable

6. Reinstall brake handle assembly (**figure 6, item 1**) onto the bracket (**figure 6, item 2**) using retained bolts (**figure 6, item 3**), spacers (**figure 6, item 4**) and nuts (**figure 6, item 5**).

7. Ensure cables sit straight inside brake handle.

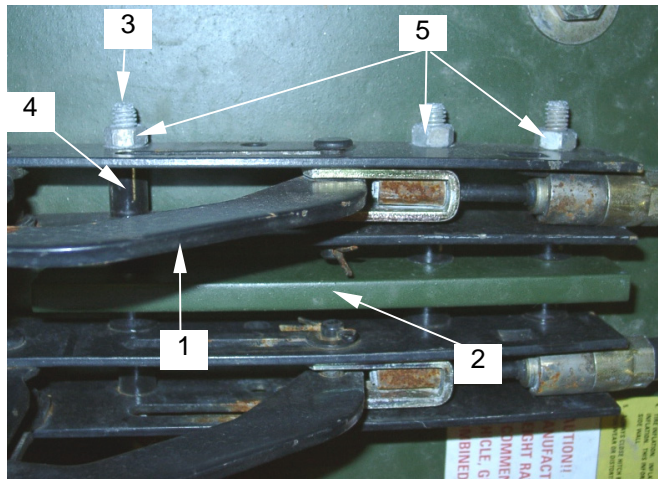


Figure 6. Reinstalling Brake Handle Assembly

To replace a main brake cable, proceed as follows:

1. Using long nose pliers, remove the cotter pin (**figure 7, item 1**) and retainer pin (**figure 7, item 2**) from the brake handle assembly (**figure 7, item 3**).
2. Remove the rear hex nut (**figure 7, item 4**) and bolt (**figure 7, item 5**) from both brake handle assemblies and bracket (**figure 7, item 6**).
3. Remove cable (**figure 7, item 7**) from the brake handle assembly (**figure 7, item 3**). Retain cable bracket (**figure 7, item 8**).

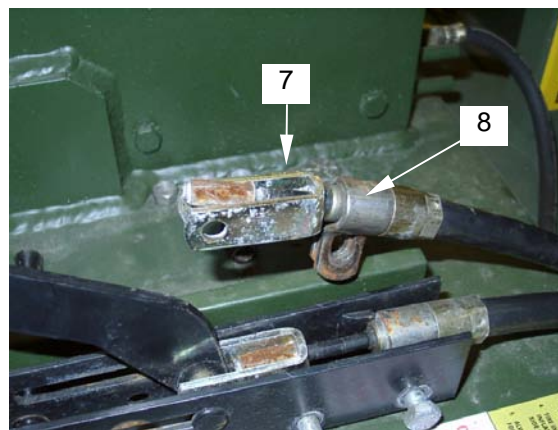
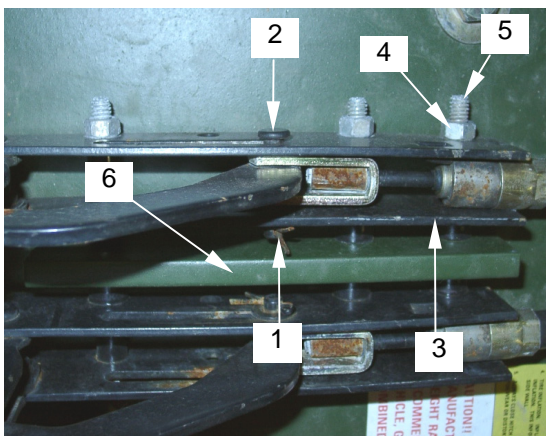


Figure 7. Removing Main Brake Cable from Brake Handle Assembly

4. Locate parking brake cable clamp (**figure 8, item 1**) beneath trailer.
5. Loosen nuts (**figure 8, item 2**) on clamp and remove cable.

6. Remove cotter pin (**figure 8, item 3**) and retaining pin (**figure 8, item 4**) on cable bracket (**figure 8, item 5**).
7. Slide cable clamp (**figure 8, item 5**) off of spreader bar (**figure 8, item 6**).
8. Unscrew parking brake cable (**figure 8, item 7**) from cable bracket (**figure 8, item 5**).
9. Remove parking brake cable.
10. Feed new cable through cable clamp (**figure 8, item 1**).
11. Screw new cable into cable bracket (**figure 8, item 5**).
12. Slide cable clamp (**figure 8, item 5**) on to spreader bar (**figure 8, item 6**).
13. Install retaining pin (**figure 8, item 4**). Secure with cotter pin (**figure 8, item 3**).
14. Place new cable into clamp (**figure 8, item 1**) and tighten nuts (**figure 8, item 2**).

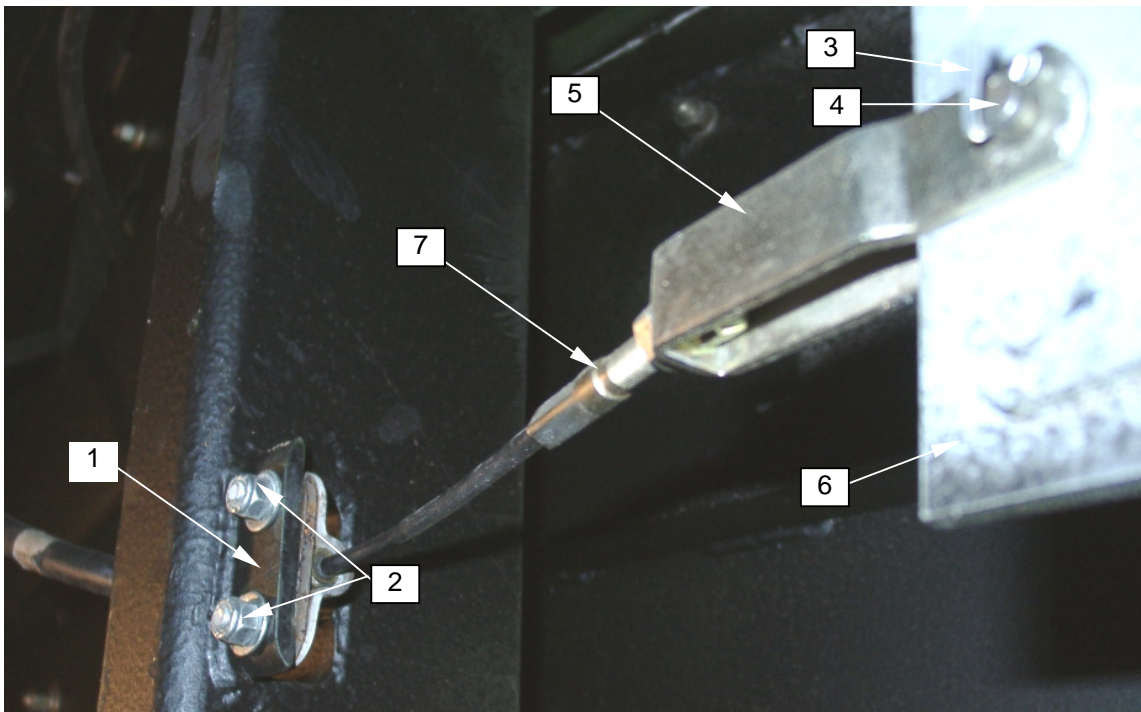


Figure 8. Installing Main Brake Cable

15. Install parking brake cable (**figure 9, item 1**) into brake handle assembly (**figure 9, item 2**).
16. Secure cable with retaining pin (**figure 9, item 3**) washer, and cotter pin (**figure 9, item 4**).

17. Install rear mounting bolt (**figure 9, item 5**) through both handle assemblies, the center bracket (**figure 9, item 6**) and cable clamp (**figure 9, item 7**). Secure with nuts (**figure 9, item 8**).

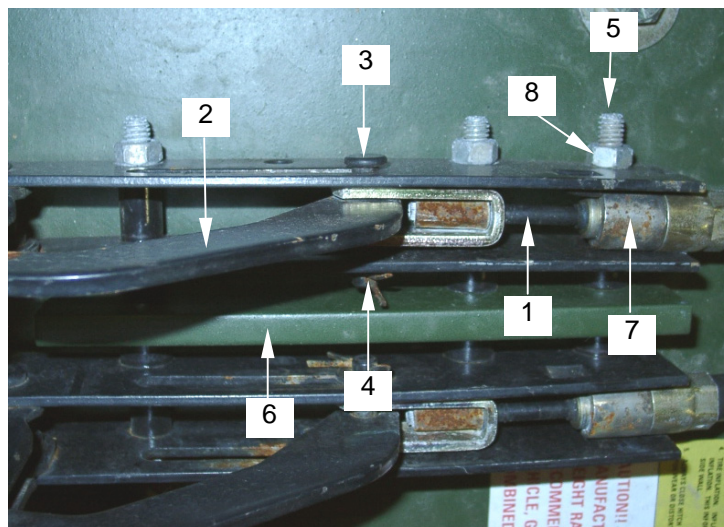


Figure 9. Installing Brake Cable into Brake Handle Assembly

To replace an individual brake cable, proceed as follows:

1. Remove cotter pin (**figure 10, item 1**) and retaining pin (**figure 10, item 2**).
2. Loosen and remove cable bracket mounting nut (**figure 10, item 3**).
3. Remove cable clamp (**figure 10, item 4**).
4. Loosen and remove cable clamp mounting nuts (**figure 11, item 1**).
5. Remove cable clamp (**figure 11, item 2**).
6. Remove cotter pin (**figure 11, item 3**) and retaining pin (**figure 11, item 4**) attaching cable to clevis (**figure 11, item 5**).
7. Remove cable from clevis.
8. Install new cable on clevis (**figure 11, item 5**) and fasten with retaining pin (**figure 11, item 4**) and cotter pin (**figure 11, item 3**).
9. Install cable clamp (**figure 11, item 2**) and fasten with mounting nuts (**figure 11, item 1**).
10. Install cable bracket (**figure 10, item 4**) on new cable with mounting nut (**figure 10, item 3**).
11. Fasten cable clamp to spreader with retaining pin (**figure 10, item 2**) and cotter pin (**figure 10, item 1**).

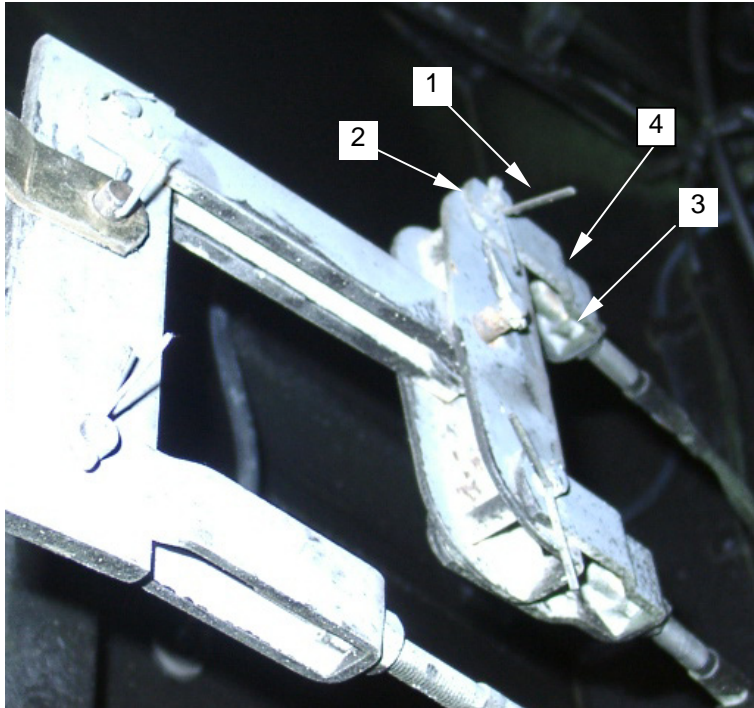


Figure 10. Parking Brake Cable

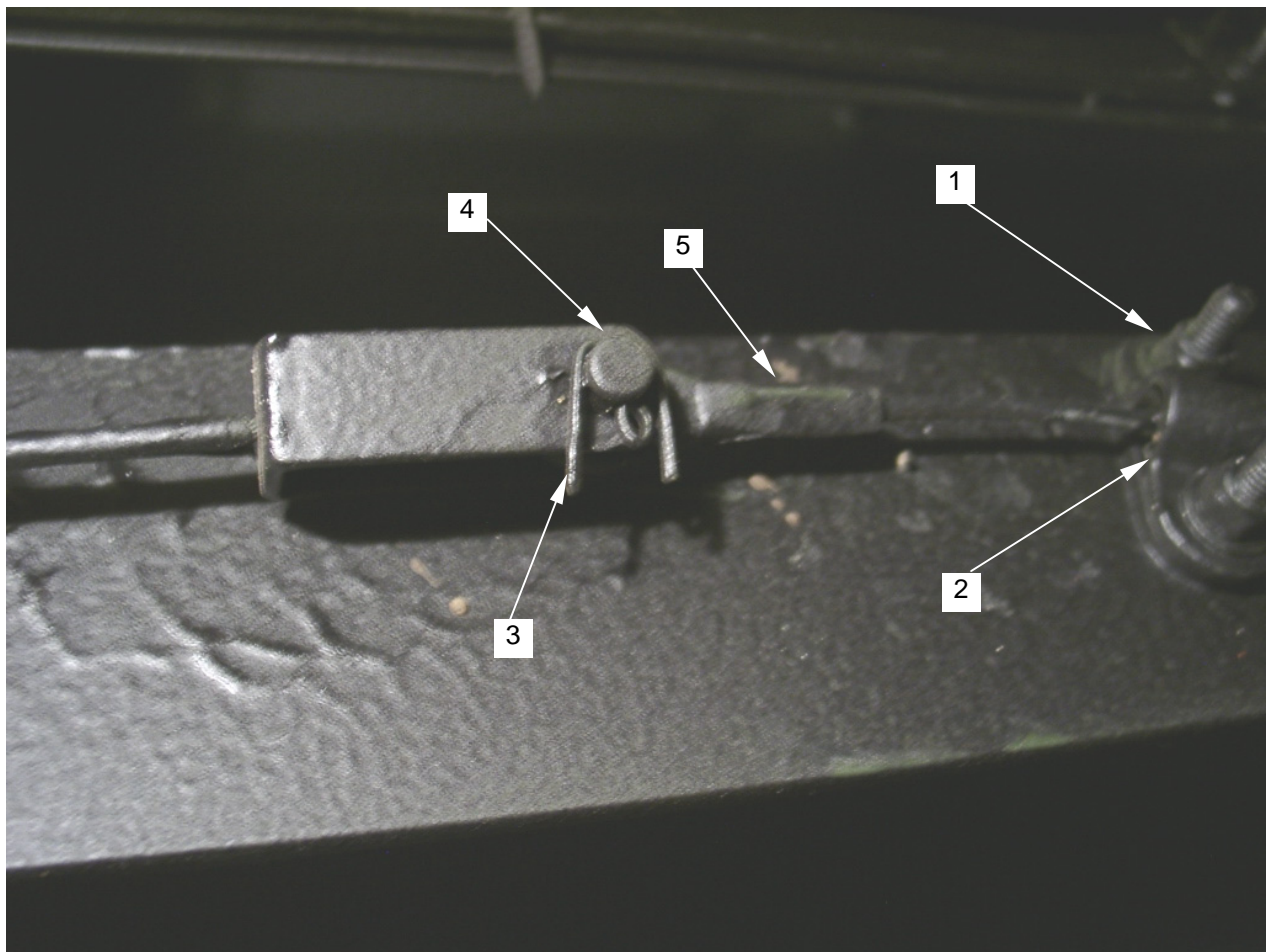


Figure 11. Cable Clamp and Clevis

END OF WORK PACKAGE

**OPERATOR MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
NSN 4630-01-513-8155
RIMS/TIRES
SERVICE, REPLACE**

INITIAL SETUP:**Tools**

Bottle Jack (WP 0053 00, Table 2, Item 2)
Lug Wrench (WP 0053 00, Table 2, Item 6)
Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)
Tire Gage (WP 0053 00, Table 2, Item 13)

Personnel Required

MOS 63B Light Vehicle Mechanic

Materials/Parts

Gloves, Work (WP 0089 00, Table 2, Item 5)
Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Trailer unhitched
Hand brakes applied
Chocks in place

SERVICE

1. Using a tire gage, check tire pressure and adjust/inflate tires to 110-lbs pressure.
2. Replace a tire that won't hold pressure or a bent rim.

REPLACE

To replace a tire or rim, proceed as follows:

1. If the spare rim and tire (**figure 1, item 1**) are to be used, unlock the wire lock (**figure 1, item 2**) (key located on ignition key ring) securing the spare tire and lug wrench(**figure 1, item 3**) to the bracket (**figure 1, item 4**).
2. Loosen friction screw (**figure 1, item 5**) to release and remove the lug wrench (**figure 1, item 3**)
3. Remove two hex nuts (**figure 1, item 6**) from the studs (**figure 1, item 7**) securing the rim and tire (**figure 1, item 1**) to the bracket (**figure 1, item 4**).



WARNING

The spare rim and tire is heavy. To prevent injuries, two people are required to remove it and replace it from and onto the trailer.

4. Remove the spare rim and tire (**figure 1, item 1**) from the bracket (**figure 1, item 4**).



Figure 1. Removing the Spare Rim and Tire

5. Loosen and remove lug nuts (**figure 2, item 1**) on the rim to be replaced in star pattern.



Figure 2. Removing the Rim



WARNING

The WWET/T is heavy and presents a crush hazard. Prior to raising the trailer, do not place body parts underneath. Death or serious injury may result.

6. Place the bottle jack (**figure 3, item 1**) (stored in toolbox) under the axle (**figure 3, item 2**) to be raised.
7. Raise the axle only high enough to clear the tire (**figure 3, item 3**) off the ground.
8. Remove lug nuts on tire to be replaced.

**WARNING**

The spare rim and tire is heavy. To prevent injuries, two people are required to remove it and replace it from and onto the trailer.

9. Remove the rim and tire from the studs (figure 3, item 4) on the drum (figure 3, item 5).

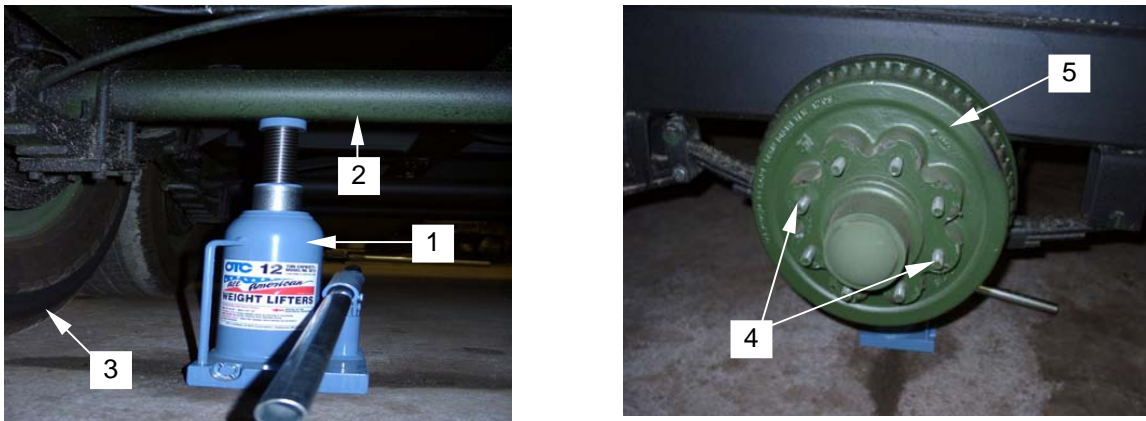


Figure 3. Lifting the Axle and Removing the Rim and Tire

10. Place new/spare rim and tire onto studs on the drum.
11. Install lug nuts and hand tighten until nut is snug against the rim.
12. Lower the bottle jack to return the axle to the ground and recover it. Store in toolbox.
13. Using the lug wrench, tighten the lug nuts in a star pattern.
14. When spare rim and tire is serviceable, install it onto the bracket and secure with wire lock.

END OF WORK PACKAGE

**UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
EQUIPMENT TRAYS
REPLACE**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 77W, Water Treatment Specialist

Materials/Parts

Gloves, Work (WP 0089 00, Table 2, Item 5)
Rags, Wiping (WP 0091 00, Item 28)
Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

Tank exterior cleaned and sanitized

REPLACE

To replace an equipment tray, proceed as follows:



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

NOTE

To remove/install the equipment tray on the side of the trailer on which the toolbox is mounted, the toolbox must be removed first. Perform procedure described in WP 0041 to remove the toolbox.

1. Remove hoses (**figure 1, item 1**), sludge rake (**figure 1, item 2**), and chopper tube/wand (**figure 1, item 3**) from the equipment tray (**figure 1, item 4**) to be replaced.
2. If necessary, remove the toolbox as described in WP 0041 00.
3. Loosen and remove equipment tray (**figure 2, item 1**) front mounting bolts, (**figure 3, item 1**) and rear mounting bolts (**figure 4, item 1**).
4. Remove nuts (**figure 5, item 2**) flat washers (**figure 5, item 4**) and lockwashers (**figure 5, item 3**).
5. Remove equipment tray (**figure 2, item 1**).
6. Install new (or previously removed) equipment tray.

7. Fasten equipment tray in place with bolts (figure 5, item 1), nuts (figure 5, item 2) flat washers (figure 5, item 3) and lockwashers (figure 5, item 4).
8. Install hoses (figure 1, item 1) sludge rake (figure 1, item 2), and chopper tube/wand (figure 1, item 3) in new equipment tray (figure 1, item 4).

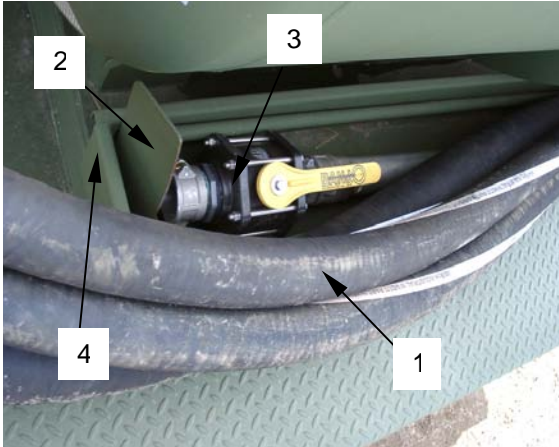


Figure 1. Equipment Tray Loaded

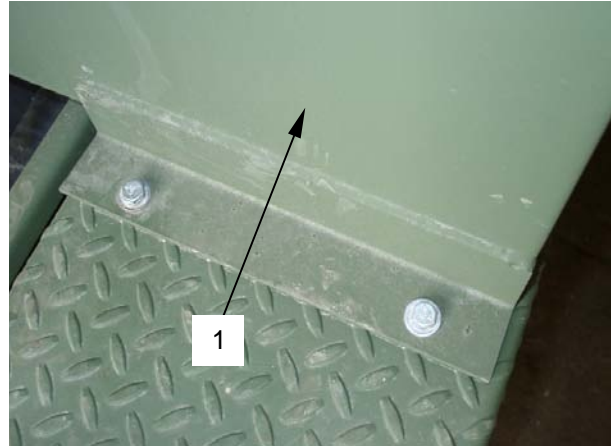


Figure 2. Equipment Tray Mounting Bolts

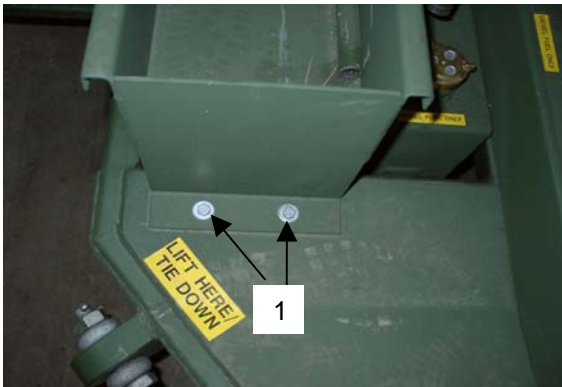


Figure 3. Front Mounting Bolts

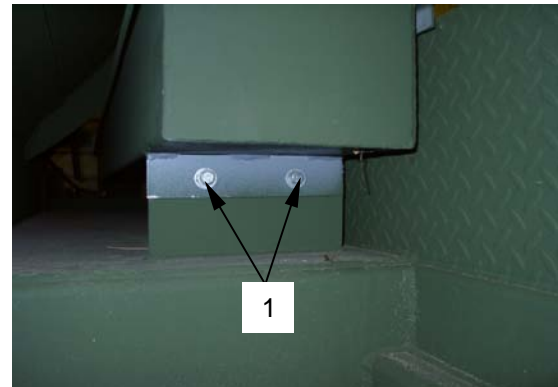


Figure 4. Rear Mounting Bolts

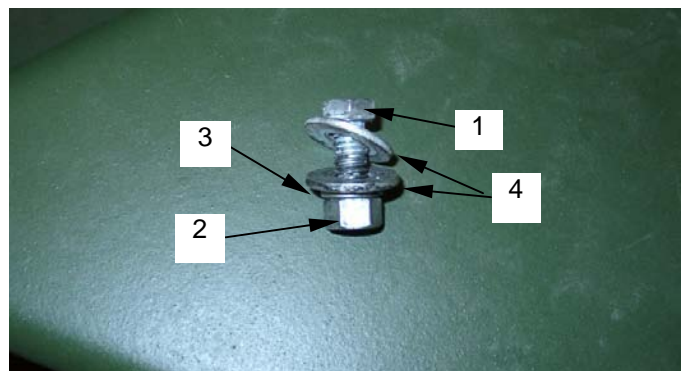


Figure 5. Equipment Tray Mounting Hardware

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
FUEL TANK
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 63B Light Vehicle Mechanic

Materials/Parts

Gloves, Work (WP 0089 00, Table 2, Item 5)
 Pipe Sealant (WP 0091 00, Item 27)
 Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off
 Fuel supply and return hoses removed (WP 0028 00)
 Ignition key removed
 Emergency stop button pushed In
 Wheel chocked
 Emergency brake set

REPLACE

To replace the fuel tank, proceed as follows:



WARNING

Fuel spills are potential fire and environmental hazards. Clean up any spills in accordance with local regulations. When replacing the fuel tank and disconnecting the fuel supply and return hoses, avoid diesel fuel spills. Always disconnect supply hose at the fuel filter and return hose at the engine block, first. Hold up disconnected end of hose and let fuel drain back into the tank before disconnecting tank end of hoses.

1. Remove the equipment tray as described in WP 0039 00.
2. Remove the fuel supply and return hoses as described in WP 0028 00.

NOTE

The fuel tank can be drained after it has been removed. However, depending on how much fuel it contains, it may be more conveniently drained in place. This is also the case if it has to be drained to remove contaminated fuel.

3. As applicable, remove the filler cap (retain) (**figure 1, item 1**) and drain the fuel tank by removing the drain plug (**figure 1, item 2**). Drain fuel into an approved container.

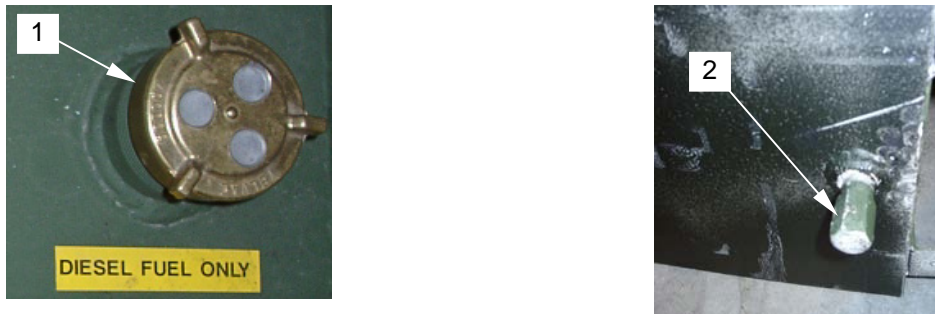


Figure 1. Fuel Filler Cap and Drain Plug

4. Remove the hex bolts and flat washers (**figure 2, item 1**) securing the fuel tank to the fuel tank brackets (**figure 2, item 2**) on the trailer frame. Recover hex nuts and flat washers from below the brackets (**figure 2, item 2**). Retain hardware.

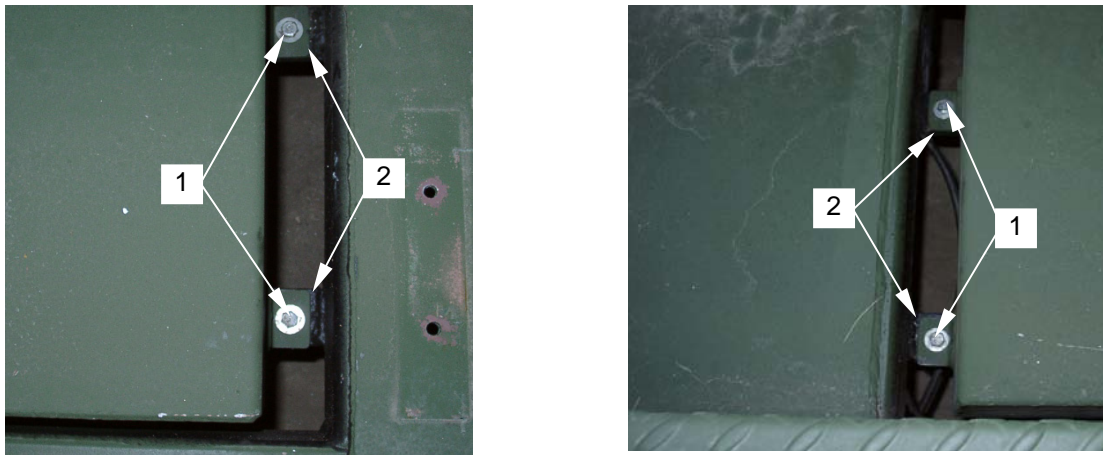


Figure 2. Removing Hardware



WARNING

The fuel tank is heavy. To prevent injuries, two people are required to remove it.

5. Remove the fuel tank from the trailer frame brackets (**figure 3, item 1**).
6. Remove tank (**figure 3, item 2**) and elbow hose fitting (**figure 3, item 3**) from fuel tank.
7. Applying pipe sealant to threads of new or retained fittings (**figure 3, item 2 and 3**), install fittings onto the new fuel tank.

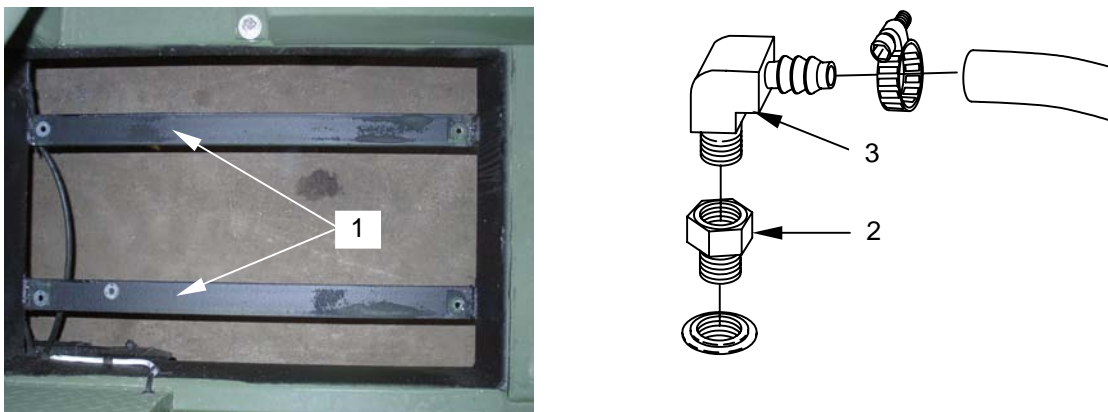


Figure 3. Removing Hardware

8. Install new fuel tank onto trailer frame brackets using retained hardware. Install filler cap.
9. Install drain plug.
10. Install fuel supply and return hoses onto the fuel tank as described in WP 0028 00.
11. Install equipment tray as described in WP 0039 00.

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
TOOL BOX
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 63B Light Vehicle Mechanic

Materials/Parts

Gloves, Work (WP 0089 00, Table 2, Item 5)
Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

REPLACE

1. Open toolbox (key is on ignition key ring) (**figure 1, item 1**) and empty its contents.
2. Close toolbox cover (**figure 1, item 2**).
3. Loosen and remove tool box mounting bolts (**figure 3, item 1**), flat washers (**figure 3, item 2**) nuts (**figure 4, item 1**) and lock washers (**figure 4, item 2**)
4. Remove toolbox (**figure 1, item 1**).
5. Install new (or previously removed) toolbox.
6. Fasten toolbox in place with mounting bolts (**figure 3, item 1**), flat washers (**figure 3, item 2**), nuts (**figure 4, item 1**) and lock washers (**figure 4, item 2**).
7. Place contents back into toolbox.
8. Close and lock toolbox cover.

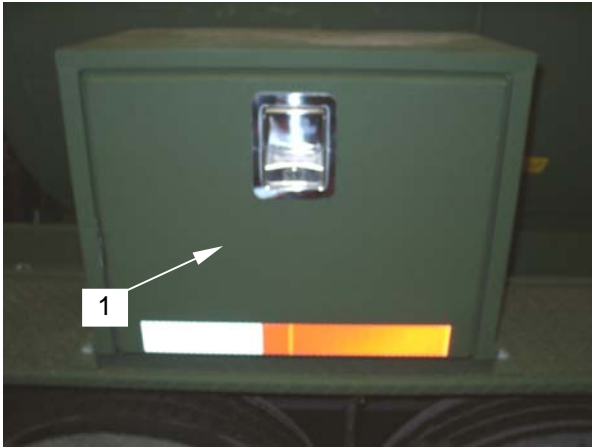


Figure 1. Tool Box

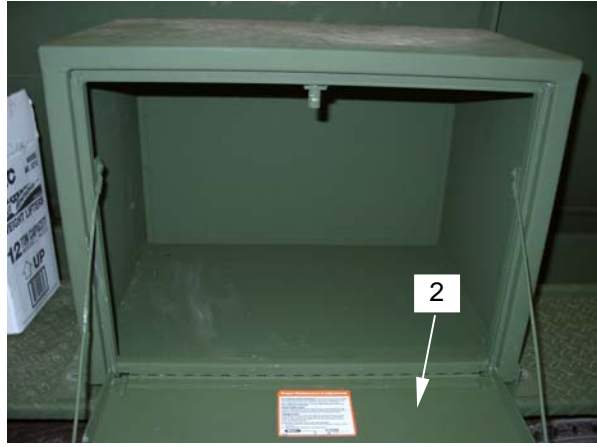


Figure 2. Tool Box Interior

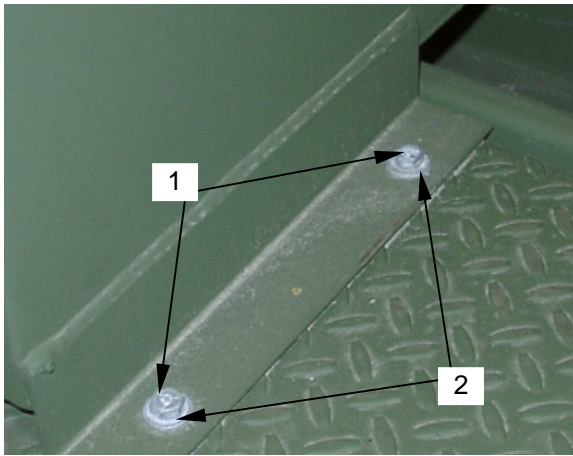


Figure 3. Tool Box Mounting Bolts

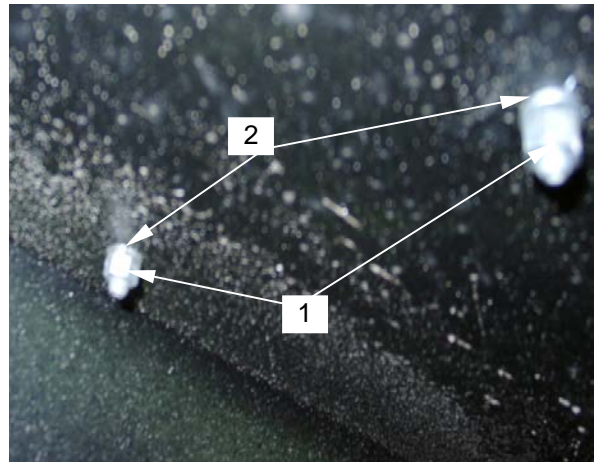


Figure 4. Tool Box Hex Nuts

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
TRAILER JACK
REPLACE

INITIAL SETUP:**Tools**

None

Personnel Required**Materials/Parts**

Gloves, Work (WP 0089 00, Table 2, Item 5)

Equipment Condition

Jack not in use

Trailer hooked to prime mover

REPLACE

Replace the trailer jack as follows:

1. Disengage locking pin (**figure 1, item 1**) from turning fixture (**figure 1, item 2**).
2. Remove jack (**figure 1, item 3**).
3. Install new jack (**figure 1, item 3**) onto turning fixture (**figure 1, item 2**).
4. Lock jack (**figure 1, item 3**) in place with locking pin (**figure 1, item 1**).

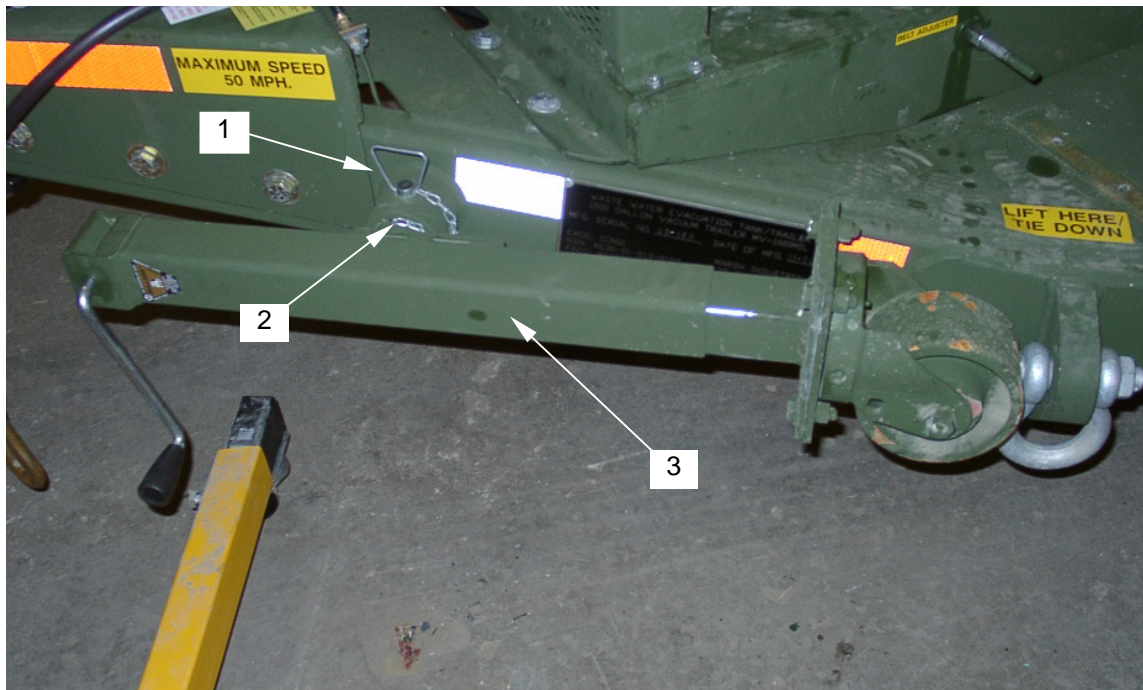


Figure 1. Trailer Jack

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
LUNETTE EYE/CHAINS
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 63B Light Vehicle Mechanic

Materials/Parts

Rags, Wiping (WP 0091 00, Item 28)

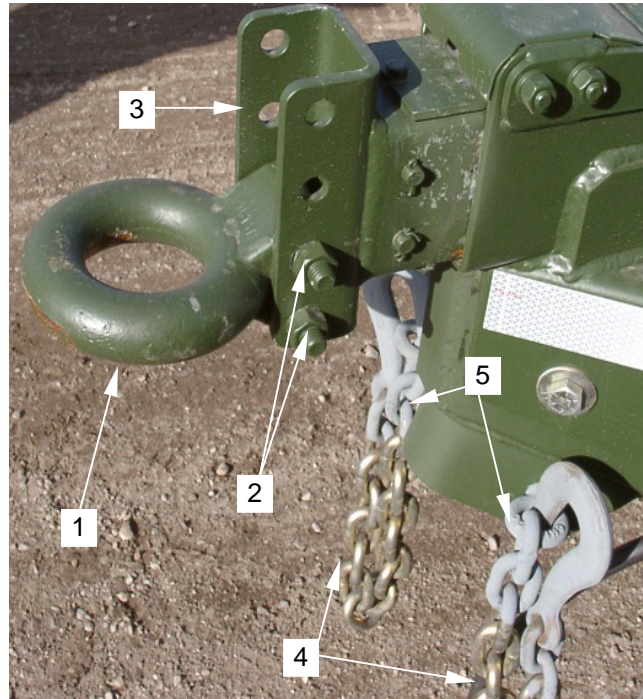
Equipment Condition

WWET/T disconnected from prime mover

REPLACE

Replace the lunette eye and chains as follows:

1. To replace the lunette eye (**figure 1, item 1**), remove the hex nuts, and hex bolts (**figure 1, item 2**) that secure the lunette eye (**figure 1, item 1**) to the leveler channel (**figure 1, item 3**). Retain hardware.
2. Install new lunette eye in the same position on the leveler channel using retained hardware.
3. To replace the chains (**figure 1, item 4**), remove the eyebolts (**figure 1, item 5**) from the trailer frame and discard a damaged chain.
4. Install eyebolt on new chain into threaded holes on frame.



END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
PULLEY GUARD
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

63B Light Vehicle Mechanic

Materials/Parts

Gloves, Work (WP 0089 00, Table 2, Item 5)
Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off.
Ignition key removed
Emergency stop button pushed In
Wheel chocked
Emergency brake set

REPLACE

To replace the pulley guard, proceed as follows:

1. Remove throttle mounting plate (**figure 1, item 1**) with throttle attached (**figure 1, item 2**), by removing two hex bolts (**figure 1, item 3**), nuts, flat and lock washers (**figure 1, item 4**). Retain hardware. Do not disconnect throttle from engine. Move the disconnected throttle linkage out of the way during replacement of the pulley guard.

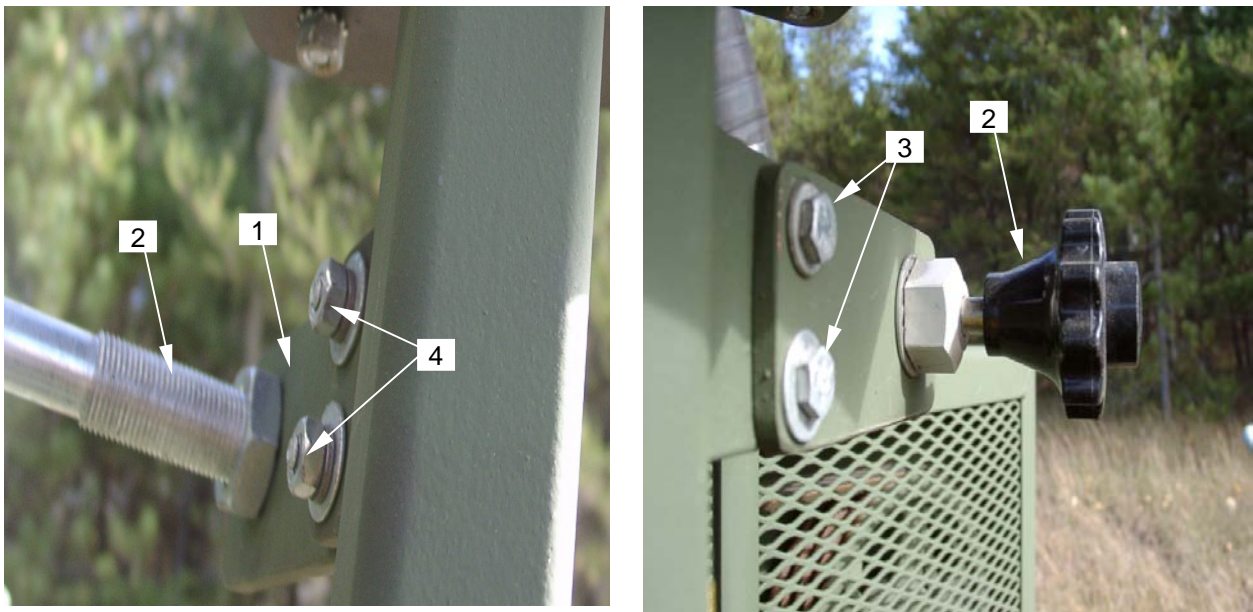


Figure 1. Removal of Throttle

2. Remove hex bolts and washers (**figure 2, item 1**) from the pulley guard brackets. Two are located at each end of the guard, and one at the rear center (**figure 2, item 2**).

**WARNING**

The pulley guard is heavy. To avoid injury, two soldiers are required to remove and install the guard from and onto the trailer.

3. Remove pulley guard (**figure 2, item 3**).

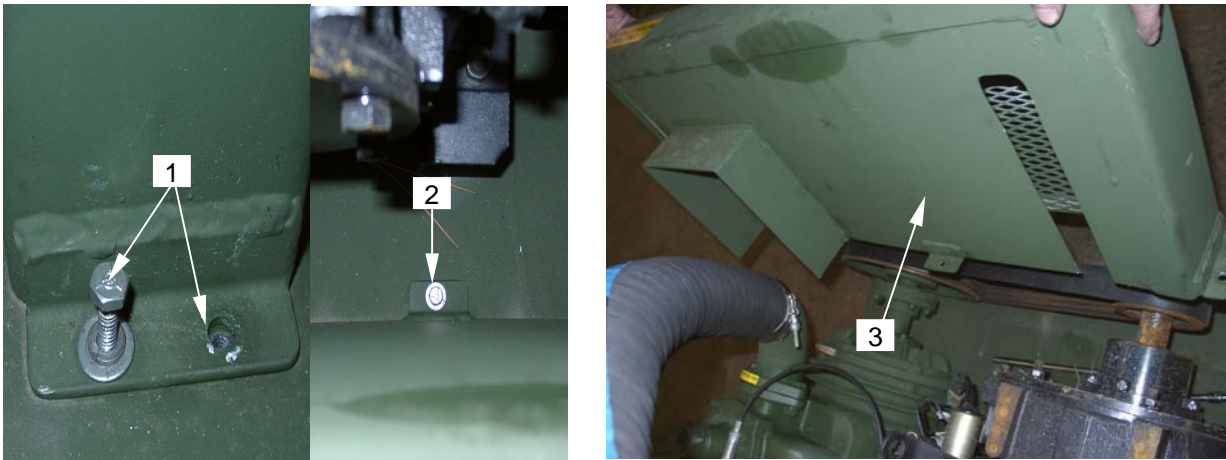


Figure 2. Removing Pulley Guard

4. Position new pulley guard (**figure 3, item 1**) over pulleys and belt for installation.
5. Install hex bolts and washers (**figure 3, item 5**) into the pulley guard brackets. Two are located at each end and one at the rear center (**figure 3, item 6**).

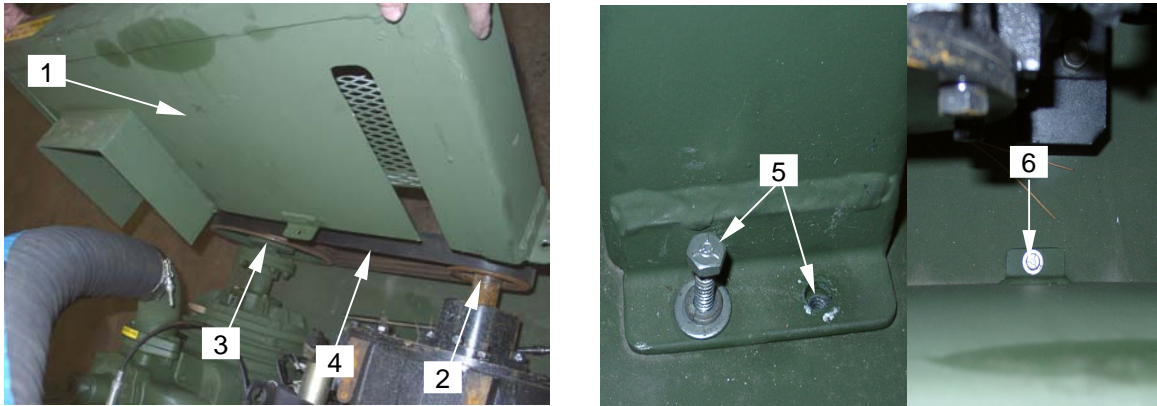


Figure 3. Installing Pulley Guard

6. Position the throttle mounting plate (**figure 4, item 1**) with throttle attached (**figure 4, item 2**) onto the control post. Install two hex bolts (**figure 4, item 3**), nuts, flat and lock washers (**figure 4, item 4**) to secure throttle to post.

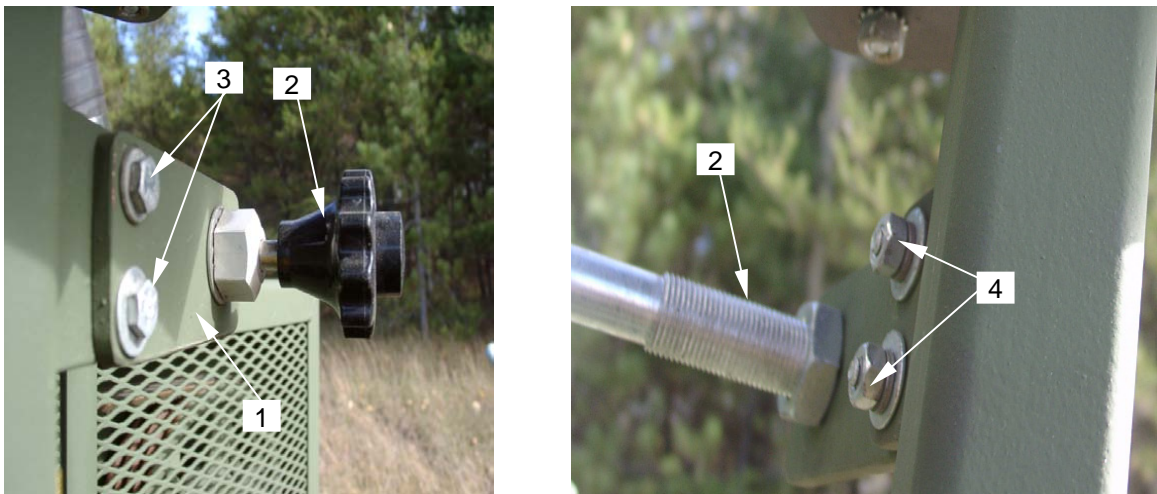


Figure 4. Installing Throttle Bracket

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
BRAKES
REPAIR, REPLACE

INITIAL SETUP:**Tools**

Gun, Fluid, Direct Delivery (WP 0053 00, Table 2, Item 4)
 Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)
 Torque Wrench 90-120-in/lbs (WP 0053 00, Table 2, Item 16)
 Torque Wrench 0-100-ft/lbs (WP 0053 00, Table 2, Item 17)

Personnel Required

63B Light Vehicle Mechanic (Qty 2)

Materials/Parts

Rags, Wiping (WP 0091 00, Item 28)

Equipment Condition

Engine shut off
 Ignition key removed
 Emergency stop button pushed in
 Wheel chocked

REPAIR

To reset a brake breakaway lever, proceed as follows:

1. Loosen but do not remove the bolts (**figure 1, item 1**) located on each side of the breakaway lever (**figure 1, item 2**).
2. Remove the bolts (**figure 1, item 1**) and lockwashers (**figure 1, item 4**) located towards the rear of the trailer.



WARNING

The hydraulic pressure held in the system may cause the lever to snap back quickly. To avoid serious injuries, do not place hands between the lever and cylinder cover.

3. Move the two breakaway locks (**figure 2, item 1**) out of the way and reposition the breakaway lever (**figure 2, item 2**) to the ready position (**figure 3, item 1**).
4. Place the breakaway locks (**figure 2, item 1**) into their original position, and reinstall the two rear bolts (**figure 1, item 3**) and lockwashers (**figure 1, item 4**) located on each side of the breakaway lever (**figure 1, item 2**).
5. Reinstall the two remaining front bolts (**figure 1, item 1**).
6. Torque all four bolts between 90 to 120 inch-pounds.

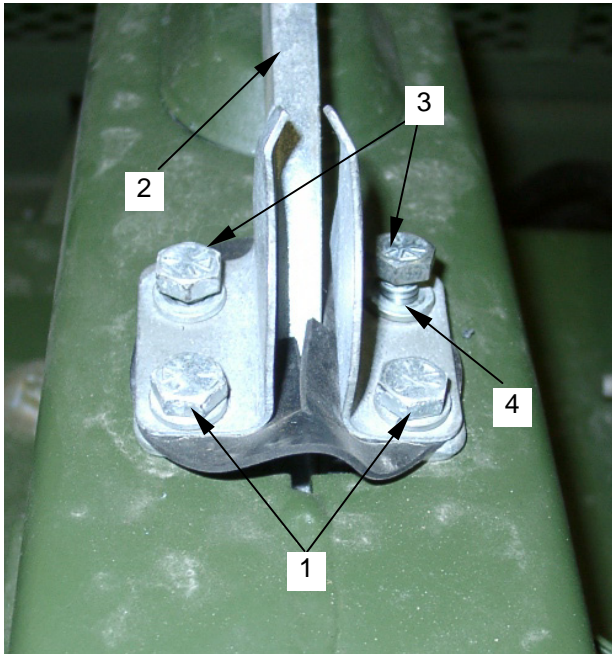


Figure 1. Breakaway Lever Mounting Bolts

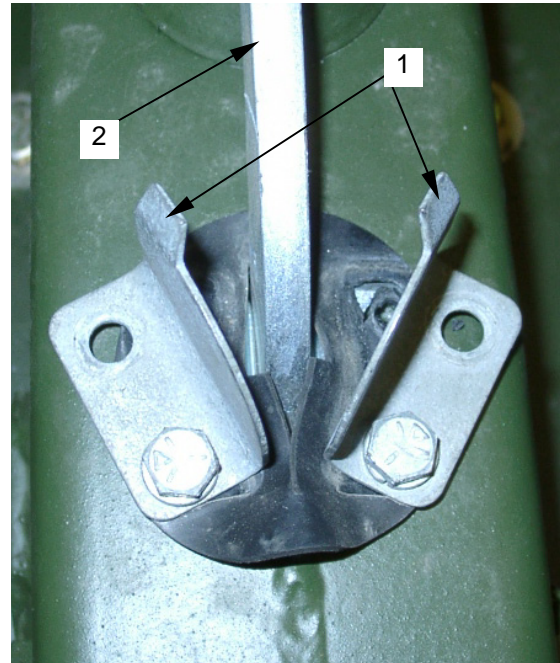


Figure 2. Breakaway Locks

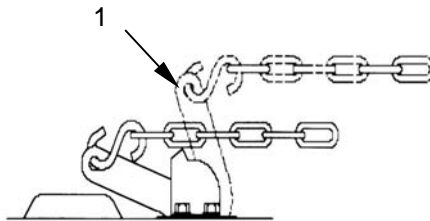


Figure 3. Breakaway Lever Position

Brake fluid filling and bleeding



WARNING

Use only fresh brake fluid from a sealed container. Do not reuse fluid. After filling and bleeding, refill the actuator. Failure to maintain an adequate fluid level may cause brake failure. Do not allow brake fluid to contact painted surfaces since it will damage the finish. Wipe up any spills immediately and wash the area with water.

1. Remove the cylinder cover (**figure 4, item 1**), and master cylinder cap (**figure 4, item 2**) and fill the reservoir to three-quarters full with DOT-3 or DOT-4 brake fluid.

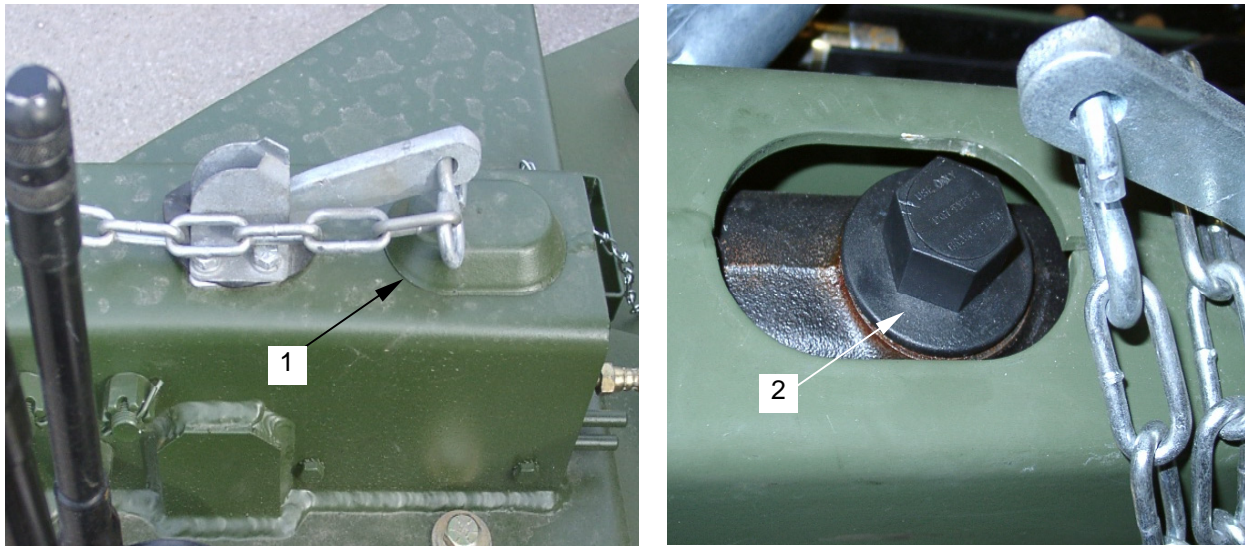


Figure 4. Master Cylinder

2. To manually bleed the brake system proceed as follows:
 - a. Ensure the trailer is disconnected from the tow vehicle and jack the trailer's tongue (**figure 5, item 1**) until it is horizontal.
 - b. Ensure wheel chocks (**figure 5, item 2**) from equipment tray are put in place on a tire.



Figure 5. Trailer Leveling and Wheels Chocked

- c. Remove cylinder cover (**figure 6, item 1**).

- d. Loosen and remove master cylinder fill cap (**figure 6, item 2**).
- e. Fill the master cylinder with fluid as described in step 1.

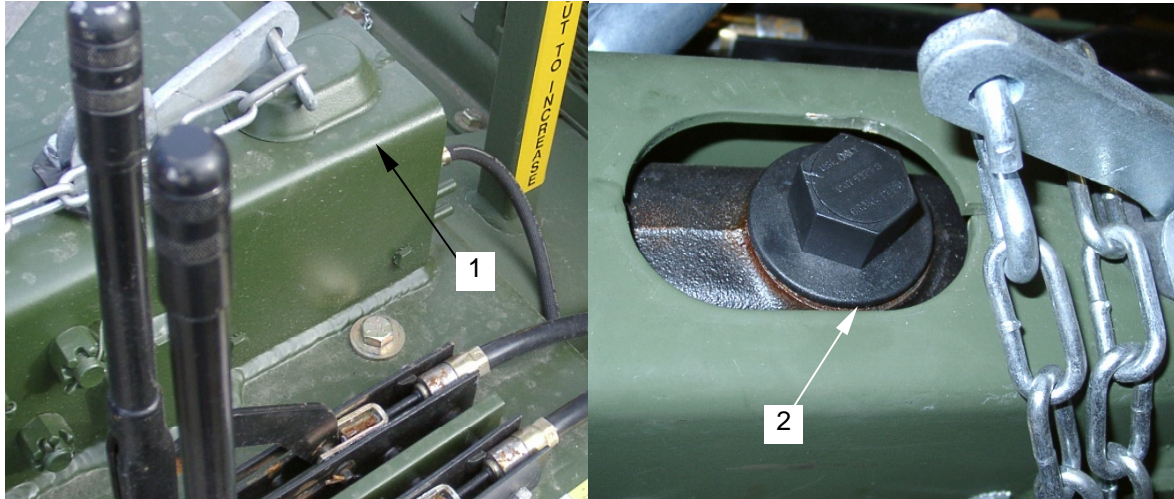


Figure 6. Brake Fluid Filling



WARNING

The hydraulic pressure held in the system may cause the lever to snap back quickly. To avoid serious injuries, do not place hands between the lever and cylinder cover.

- f. Loosen the four breakaway mounting bolts (**figure 7, item 1**) to keep the break-away locks from restricting the lever motion.
- g. Rotate the breakaway lever (**figure 7, item 2**) forward slowly using small strokes until bubbling stops inside the master cylinder.

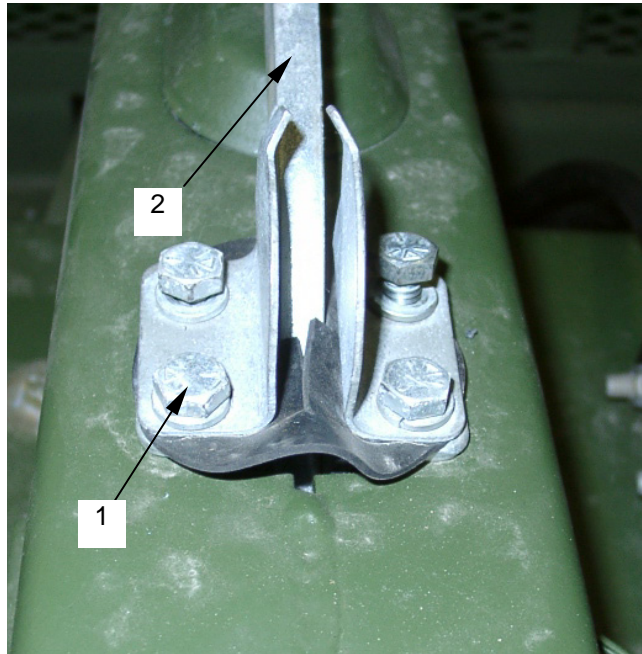


Figure 7. Breakaway Lever Mounting Bolts

- h. Remove dust cap from wheel cylinder bleeder valve.
- i. Install a bleeder hose on the bleeder valve (**figure 8, item 1**) of the farthest wheel cylinder from the breakaway lever. Bleed the rear axle first.
- j. Submerge the other end of the hose in a glass container of brake fluid so bubbles can be observed.
- k. Open the bleeder valve (**figure 8, item 1**) and have the operator stroke and maintain pressure on the break-away lever. Brake fluid and/or bubbles will flow into the jar.
- l. Close the bleeder valve when bubbles stop. The operator can allow the break-away lever to return to its rest position.

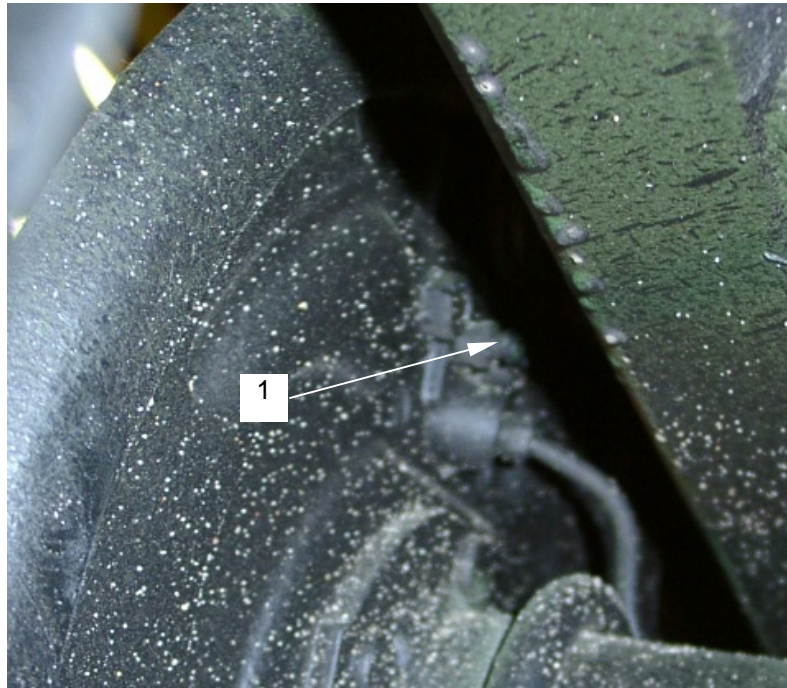


Figure 8. Bleeder Valve



WARNING

Ensure all air bubbles are bled from the brake lines. Air trapped in the brake lines will greatly reduce efficiency and affect brake performance.

- m. Repeat the process until no more bubbles are released with the stroke.
- n. Close the bleeder valve securely when the cylinder is fully bled.
- o. Repeat the bleeding operation as described in steps h through m in the sequence pictured in Figure 9.

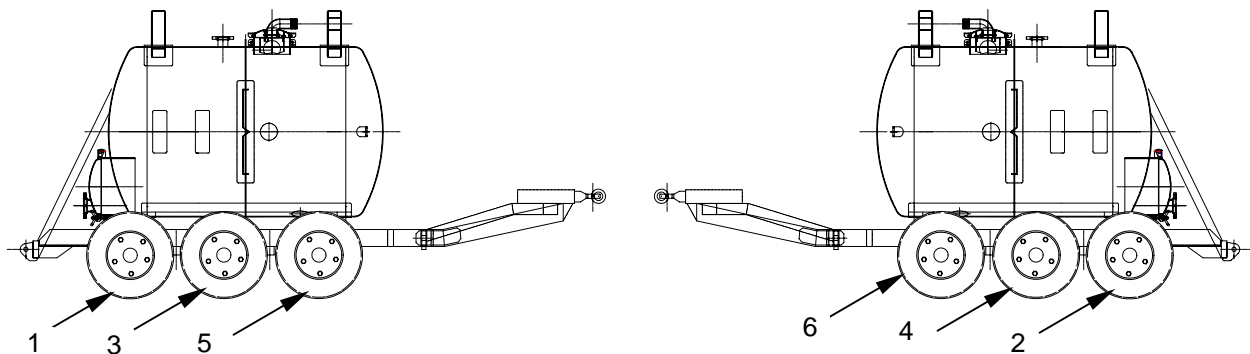


Figure 9. Brake Line Bleeding Sequence

- p. During the bleeding process, replenish the master cylinder reservoir with fresh brake fluid so the level does not fall below half full, ensuring no air will be drawn into the system.
3. After all brakes have been bled, refill the master cylinder reservoir to three-quarters full before operating.
 4. Move the two breakaway locks (**figure 10, item 1**) out of the way and reposition the breakaway lever (**figure 10, item 2**) to the ready position.
 5. Place the breakaway locks (**figure 11, item 1**) into their original position, and reinstall the two rear bolts (**figure 11, item 2**) and lockwashers (**figure 11, item 3**) located on each side of the breakaway lever (**figure 11, item 4**).
 6. Reinstall the two remaining front bolts (**figure 10, item 3**).
 7. Torque all four bolts between 90 to 120 inch-pounds.
 8. Screw the filler cap back into position and replace the cylinder cover. The filler cap can be tightened finger tight.

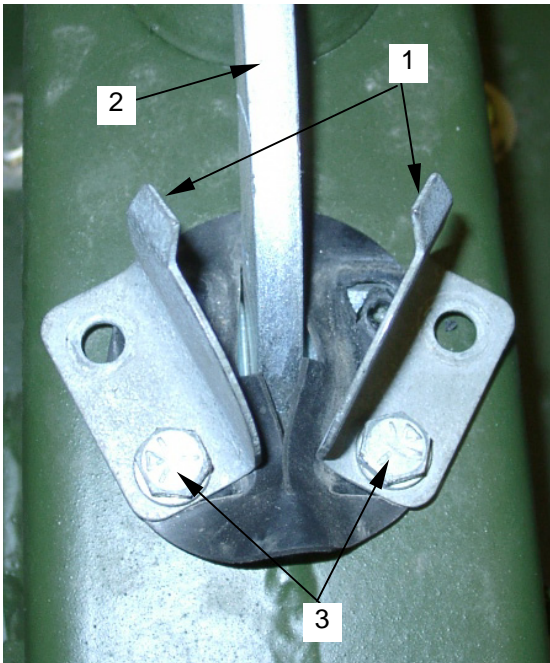


Figure 10. Breakaway Locks

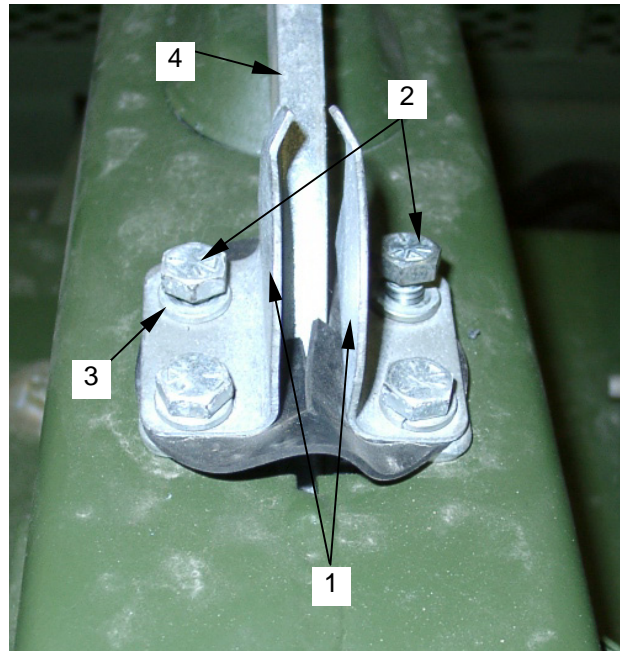


Figure 11. Breakaway Lever Mounting Bolts

Brake

Disassembly

1. Master cylinder
 - a. Place an approved container under the master cylinder hose bracket (**figure 12, item 1**).
 - b. Loosen and remove hard line fitting (**figure 12, item 2**) from the brake hose (**figure 12, item 3**).
 - c. Drain brake fluid from master cylinder into an approved container.
 - d. Loosen and remove cylinder hose bracket mounting bolts (**figure 12, item 4**) and lockwashers (**figure 12, item 5**). Retain hardware.
 - e. Loosen and remove the brake hose from the orifice connector (**figure 12, item 6**).

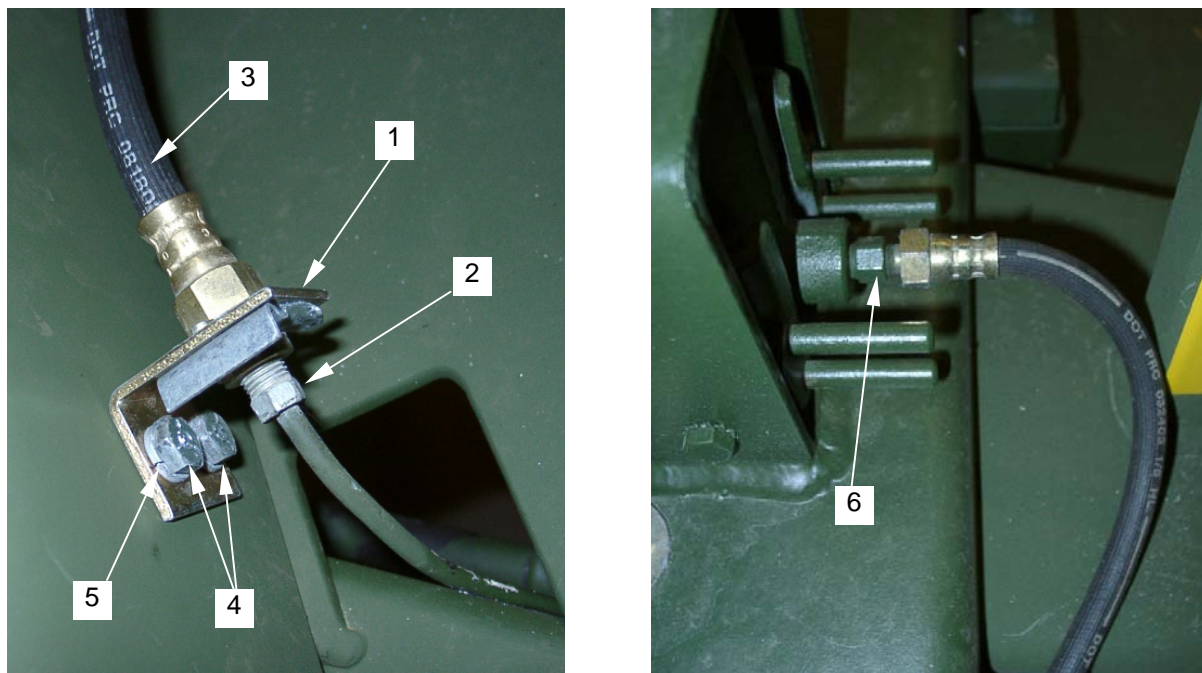


Figure 12. Master Cylinder Brake Hose

- f. Remove cylinder cover (**figure 13, item 4**).
- g. Unscrew cap (**figure 13, item 5**) from master cylinder.
- h. Loosen and remove mounting bolts (**figure 13, item 6**) and lockwashers (**figure 13, item 7**).
- i. Slide master cylinder assembly out from outer case (**figure 13, item 8**).
- j. Loosen and remove cylinder bracket mounting bolts (**figure 13, item 9**) nuts (**figure 13, item 10**) and lockwashers (**figure 13, item 11**).

- k. Remove left hand (**figure 13, item 12**) and right hand (**figure 13, item 13**) cylinder bracket from master cylinder.

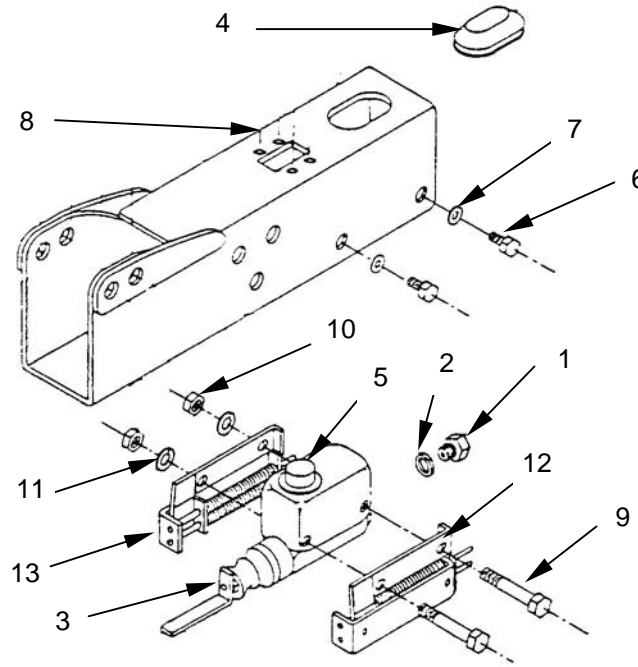


Figure 13. Master Cylinder

2. Breakaway lever assembly

- a. Remove chain (**figure 14, item 1**) from breakaway lever (**figure 14, item 2**).
- b. Remove mounting bolts (**figure 14, item 3**) and lockwashers (**figure 14, item 4**).
- c. Remove left (**figure 14, item 5**) and right (**figure 14, item 6**) breakaway locks.
- d. Remove weather seal (**figure 14, item 7**).
- e. Remove breakaway lever (**figure 14, item 2**) from outer case (**figure 14, item 8**).

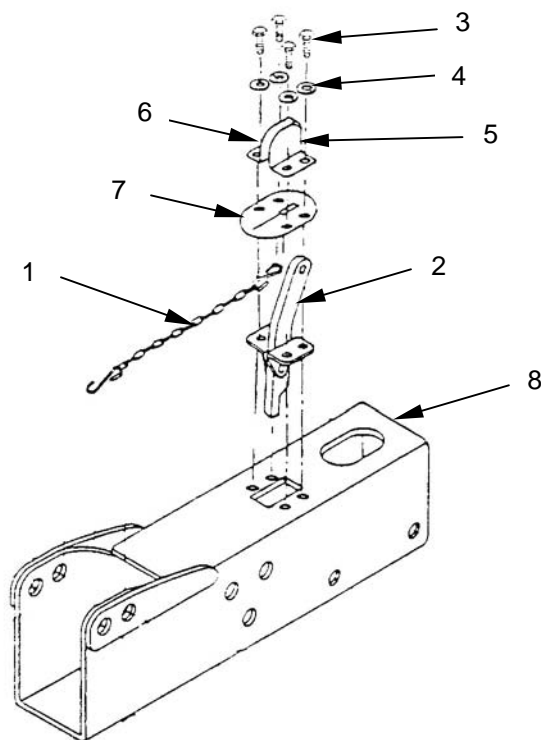


Figure 14. Breakaway Assembly

3. Inner roller and dampers
 - a. Remove lunette eye (**figure 15, item 1**) mounting nuts (**figure 15, item 2**) and bolts (**figure 15, item 3**).
 - b. Remove lunette eye (**figure 15, item 1**) from leveler channel (**figure 15, item 4**).
 - c. Remove cotter pins (**figure 15, item 5**) from castle nuts (**figure 15, item 6**).
 - d. Loosen and remove castle nuts (**figure 15, item 6**) from roller bolts (**figure 15, item 7**).
 - e. Remove roller bolts (**figure 15, item 7**).
 - f. Remove inner shell (**figure 15, item 8**) from outer case (**figure 15, item 9**).
 - g. Remove push rod block (**figure 15, item 10**) from inner shell (**figure 15, item 8**).
 - h. Remove cotter pins (**figure 15, item 11**) from damper pins (**figure 15, item 12**).
 - i. Remove spacer tube (**figure 15, item 13**) from upper damper (**figure 15, item 14**) in top slot (**figure 15, item 15**).
 - j. Remove spacer tube (**figure 15, item 13**) from lower damper (**figure 15, item 16**) in bottom slot (**figure 15, item 17**).
 - k. Remove spacer tube (**figure 15, item 13**) from spacer (**figure 15, item 18**) in top slot.
 - l. Remove rear rollers (**figure 15, item 19**) and spacer from inner shell (**figure 15, item 8**).
 - m. Remove upper (**figure 15, item 14**) and lower (**figure 15, item 16**) dampers from inner shell.
 - n. Loosen and remove centering plate (**figure 15, item 20**) mounting bolts (**figure 15, item 21**) and lockwashers (**figure 15, item 22**).
 - o. Remove centering plate (**figure 15, item 20**).

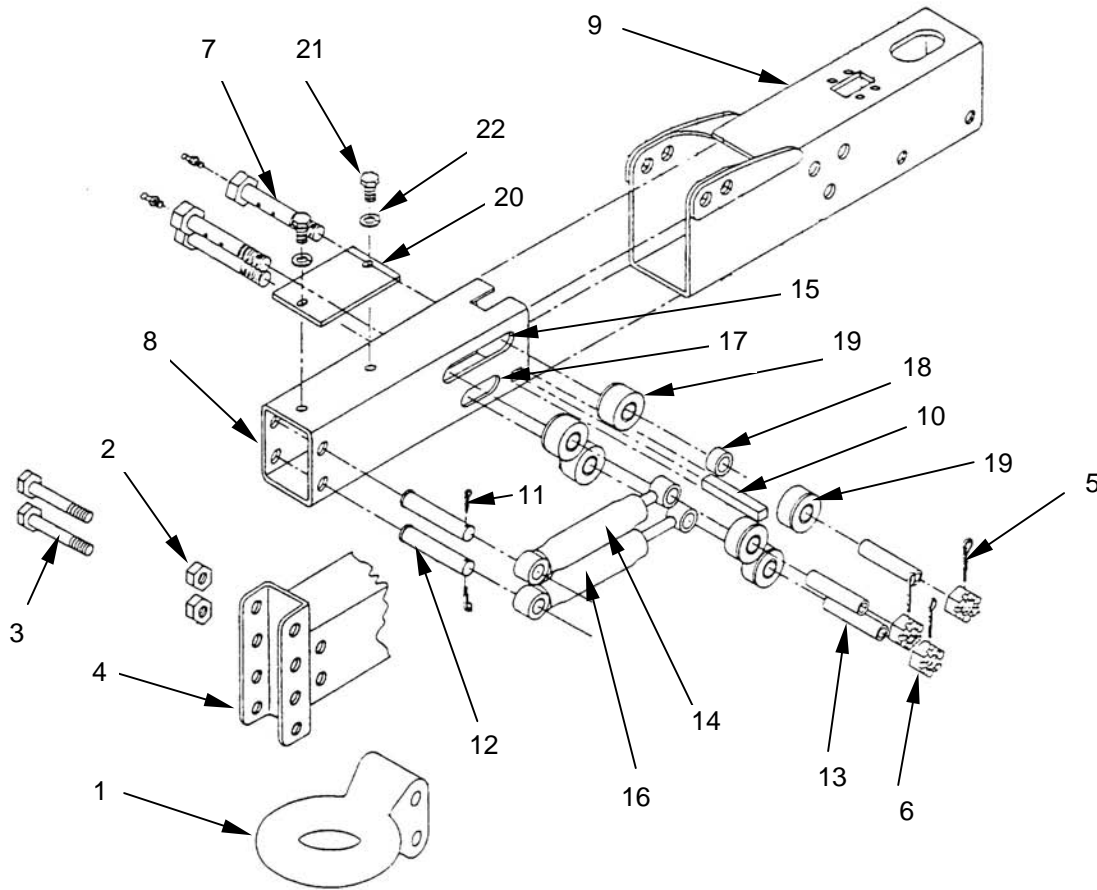


Figure 15. Inner Roller And Dampers

4. Front roller
 - a. Remove nuts (**figure 16, item 1**) and lockwashers (**figure 16, item 2**) from roller bolts (**figure 16, item 3**).
 - b. Remove roller bolts (**figure 16, item 3**) from outer case (**figure 16, item 4**).
 - c. Remove front rollers (**figure 16, item 5**) and roller cover (**figure 16, item 6**) from outer case.

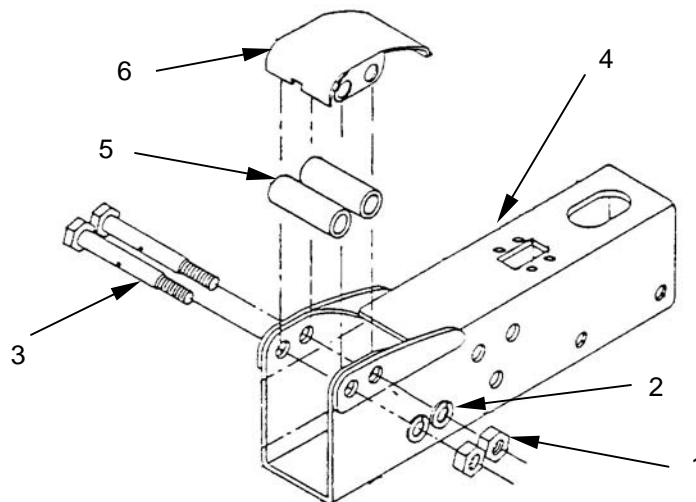
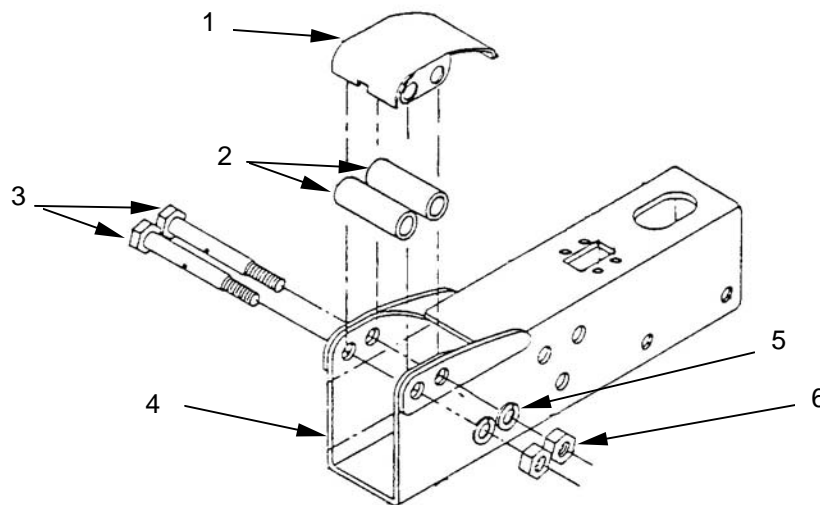


Figure 16. Front Roller

Assembly

1. Front roller

- a. Place the front roller cover (**figure 17, item 1**) into position.
- b. Hold the front rollers (**figure 17, item 2**) from the bottom, lining up the holes and thread the front roller bolt (**figure 17, item 3**) through the outer case (**figure 17, item 4**) and roller into place.
- c. Secure bolts (**figure 17, item 3**) with lockwashers (**figure 17, item 5**) and nuts (**figure 17, item 6**).
- d. Torque nuts to 75 ft-lbs.

**Figure 17. Front Roller**

2. Inner rollers and dampers

- a. Place the centering plate (**figure 18, item 1**) on the inner slide (**figure 18, item 2**).
- b. Secure centering plate in place with bolts (**figure 18, item 3**) and lockwashers (**figure 18, item 4**).
- c. Reach through the rear of the inner slide with the top damper (**figure 18, item 5**).
- d. Using a damper pin (**figure 18, item 6**), secure the small end into the top hole.
- e. Reach through the rear of the inner slide with the lower damper (**figure 18, item 7**).
- f. Using a damper pin (**figure 18, item 6**), secure the small end into the bottom hole.
- g. Insert cotter pins (**figure 18, item 8**) into top and bottom damper pins.
- h. Insert a spacer tube (**figure 18, item 9**) into the top slot (**figure 18, item 10**) of the inner slide.
- i. Reach in from the rear of the inner slide with one of the rear rollers (**figure 18, item 11**) (chamfered edge out) and thread it onto the spacer tube (**figure 18, item 9**).
- j. Next on the spacer tube place the end of the top damper (**figure 18, item 5**), and then the other rear roller (chamfered edge out).
- k. Reach in from the rear of the inner slide with one of the rear rollers (**figure 18 item 11**) (chamfered edge out) and thread it onto the spacer tube (**figure 18, item 9**).
- l. Next on the spacer tube place the end of the bottom damper (**figure 18, item 7**), and finally the other rear roller (chamfered edge out).
- m. Insert the third and final spacer tube (**figure 18, item 9**) onto the top slot (**figure 18, item 10**) of the inner slide.
- n. Reach in from the rear of the inner slide with one of the rear rollers (**figure 18, item 11**) (chamfered edge out) and thread it onto the spacer tube.
- o. Next on the spacer tube place a spacer (**figure 18, item 12**) then the final roller (chamfered edge out).
- p. Insert push rod block (**figure 18, item 13**) into inner slide (**figure 18, item 2**).
- q. Carefully insert the inner slide (**figure 18, item 2**) into the outer case (**figure 18, item 14**) so as not to dislodge the spacer tube assemblies.
- r. Insert a rear roller bolt (**figure 18, item 15**) into the front top spacer tube and loosely secure the bolt with a castle nut (**figure 18, item 16**).
- s. Insert a rear roller bolt into the bottom spacer tube and loosely secure the bolt with a castle nut (**figure 18, item 16**).

- t. Thread the final top bolt through the final spacer tube and loosely secure.
- u. Tighten the castle nuts on the three bolts and secure with cotter pins (**figure 18, item 17**).
- v. Install lunette eye (**figure 18, item 18**) in the leveler channel (**figure 18, item 19**) in the same position on the leveler channel using retained hardware.
- w. Fasten lunette eye in place with mounting bolts (**figure 18, item 20**) and nuts (**figure 18, item 21**).

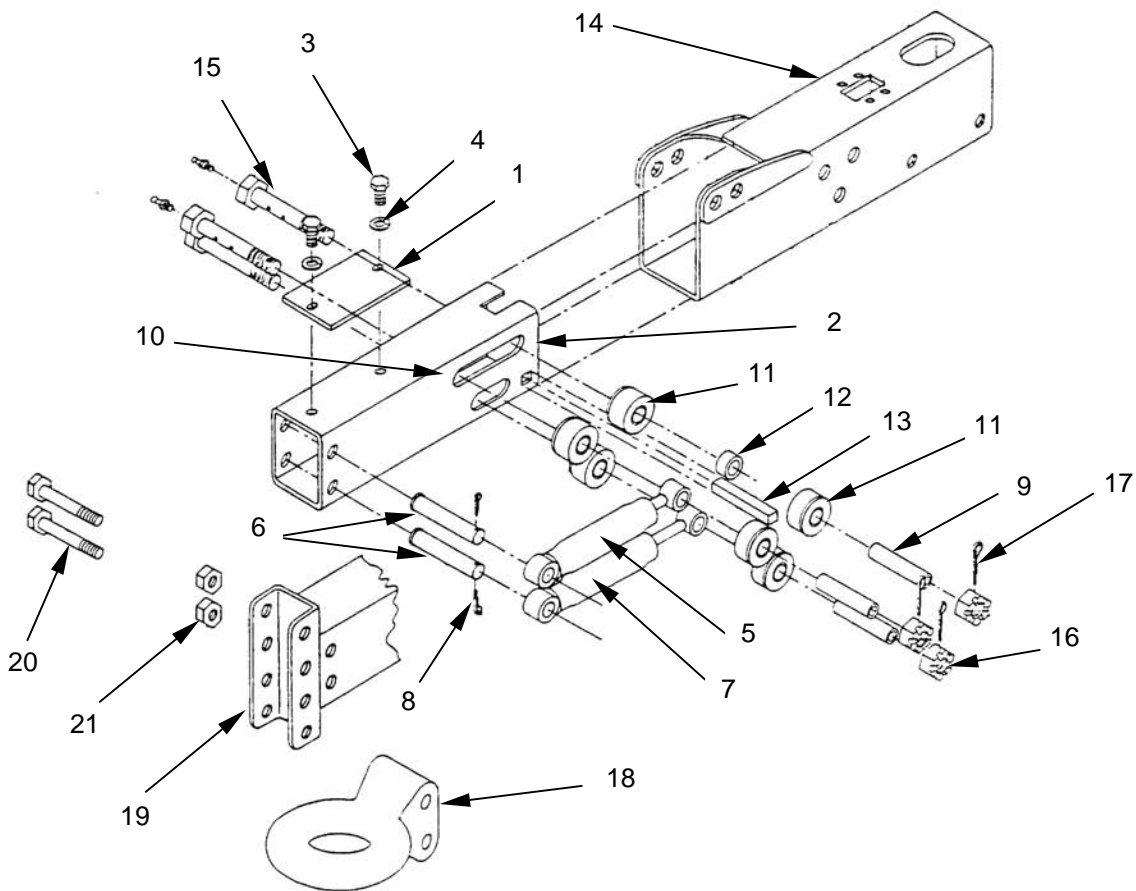


Figure 18. Inner Roller and Dampers

3. Breakaway assembly
 - a. Place the breakaway lever assembly (**figure 19, item 1**) into the mounting hole (**figure 19, item 2**).
 - b. Position the weather seal (**figure 19, item 3**) on top of the breakaway assembly.
 - c. Attach the left (**figure 19, item 4**) and right (**figure 19, item 5**) breakaway locks using the bolts (**figure 19, item 6**) and lockwashers (**figure 19, item 7**).
 - d. Attach chain (**figure 19, item 8**) to breakaway lever.

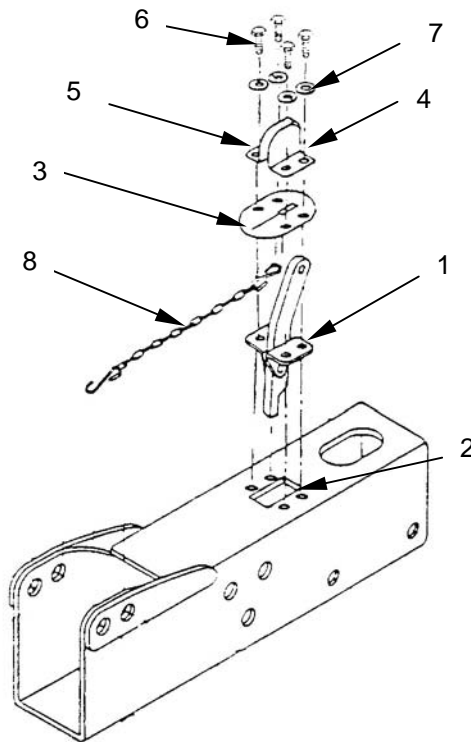


Figure 19. Breakaway Assembly

4. Master Cylinder

- a. Position left hand cylinder bracket (**figure 20, item 1**) against master cylinder (**figure 20, item 2**).
- b. Position right hand cylinder bracket (**figure 20, item 3**) against master cylinder (**figure 20, item 2**).
- c. Fasten left and right hand cylinder brackets to the master cylinder with bolts (**figure 20, item 4**), lockwashers (**figure 20, item 5**), and nuts (**figure 20, item 6**).
- d. Slide master cylinder with right and left hand brackets into the outer case (**figure 20, item 7**).
- e. Secure the master cylinder assembly with the four bolts (**figure 20, item 8**) and lockwashers (**figure 20, item 9**).
- f. Screw the cap (**figure 20, item 10**) onto the master cylinder.
- g. Install o-ring (**figure 20, item 12**) and orifice connector (**figure 20, item 13**) to master cylinder.
- h. Connect brake hose (**figure 21, item 1**) to orifice connector (**figure 21, item 2**).
- i. Install master cylinder hose bracket (**figure 21, item 3**) with mounting bolts (**figure 21, item 4**) and lockwashers (**figure 21, item 5**).
- j. Fasten hard line fitting (**figure 21, item 6**) to the brake hose (**figure 21, item 7**).
- k. Install cylinder cover (**figure 20, item 11**). Bleed brake system lines in accordance with brake fluid filling and bleeding procedures within this Work Package.

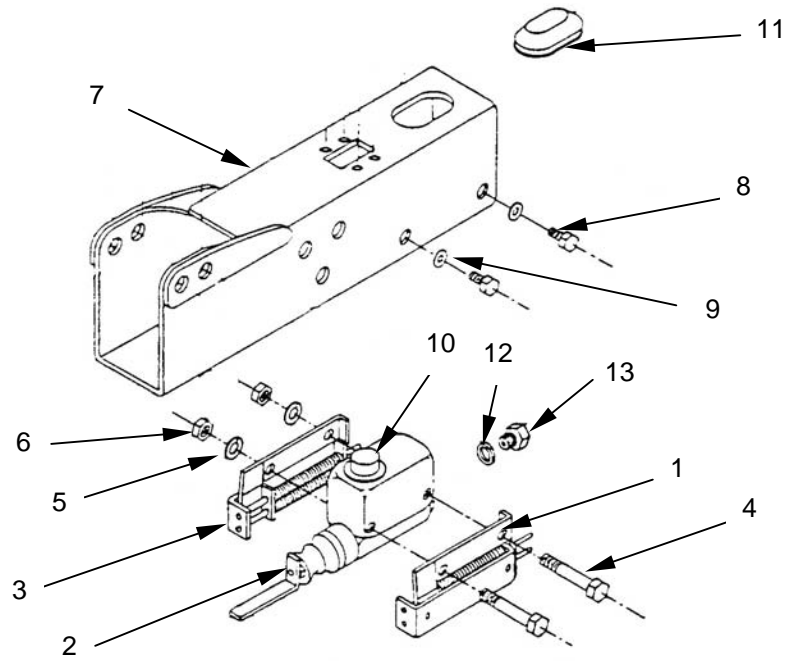


Figure 20. Master Cylinder

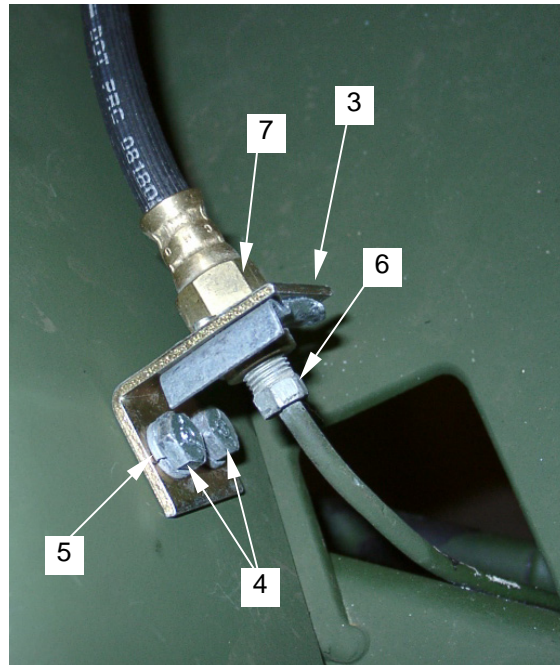
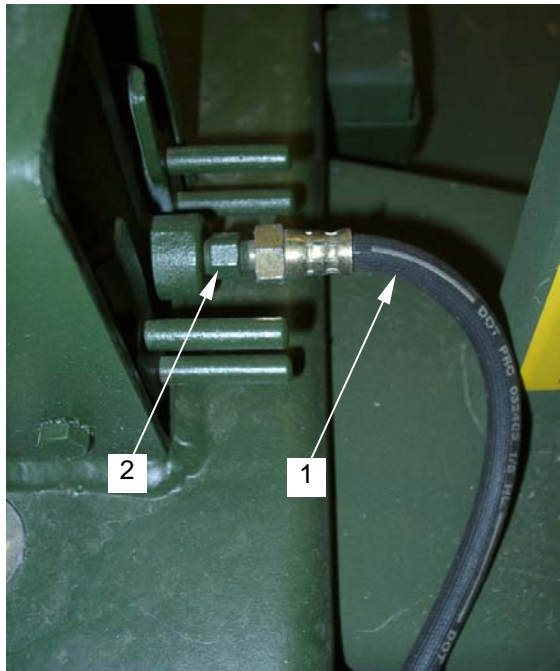


Figure 21. Brake Hose

5. Brake Drums

**WARNING**

The tire is heavy. To prevent injuries, two people are required to remove it and replace it from and onto the trailer.

- a. Remove chocks (**figure 22, item 1**) from equipment tray and put in place on a tire. (**figure 22, item 2**).

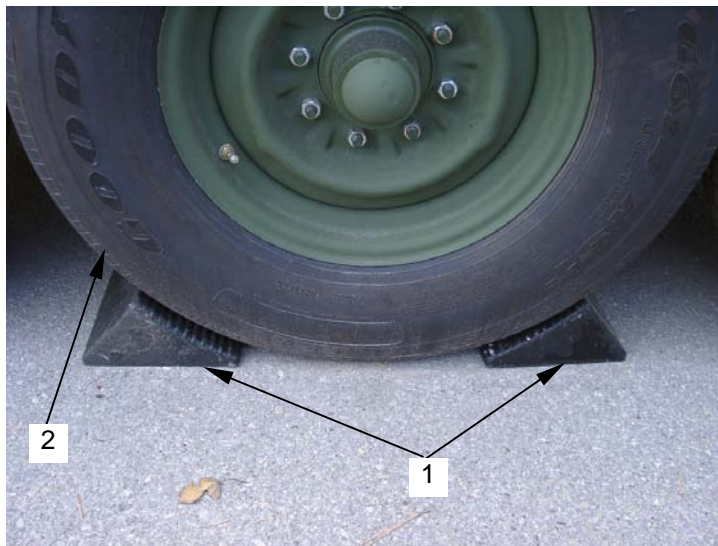


Figure 22. Wheel Chocks

NOTE

The brakes need to be released on the side being serviced.

- b. To release the brake, place parking brake handle (**figure 23, item 1**) in the vertical position.



Figure 23. Parking Brakes

- c. Loosen lug nuts (**figure 24, item 1**) on the rim in a star pattern.

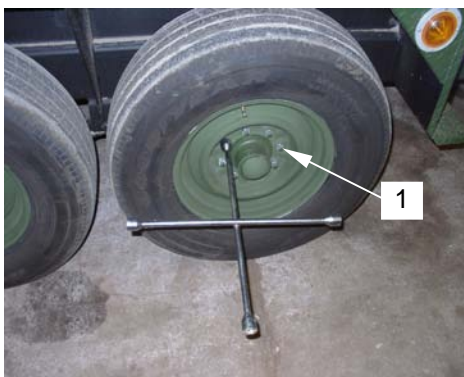


Figure 24. Removing the Rim

- d. Place the bottle jack (**figure 25, item 1**) (stored in WWET/T toolbox) under the axle (**figure 25, item 2**) to be raised on a hard surface.



WARNING

The WWET /T is heavy and presents a crush hazard. Prior to raising the trailer, do not place body parts underneath. Death or serious injury may result.

- e. Raise the axle only high enough to clear the tire off the ground.

- f. To raise the jack, close the release valve (**figure 25, item 3**) by turning it clockwise, insert handle (**figure 25, item 4**) into the pump receiver and operate the jack.
- g. Place dunnage beneath the trailer chassis.
- h. Remove lug nuts on the rim to be removed.
- i. Remove the rim and tire from the studs (**figure 25, item 5**). (2 person operation)

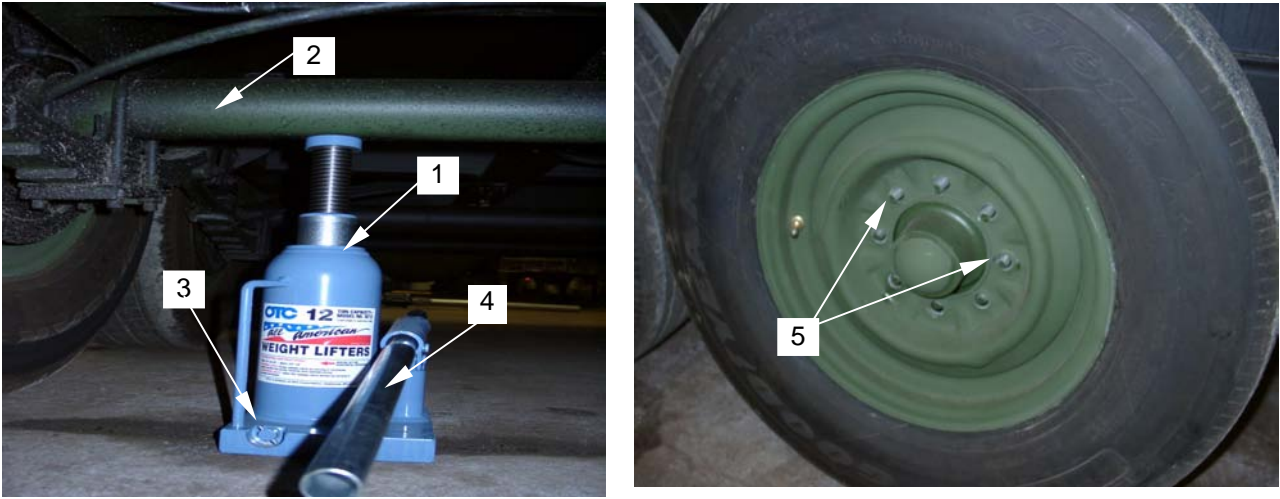


Figure 25. Lifting the Axle and Removing the Rim and Tire

NOTE

The brake shoes may need to be adjusted prior to removing the drum from the wheel. To adjust the brake shoes prior to removing the brake drum, proceed as follows:

- j. Remove the plug covering the adjustment access slot (**figure 26, item 1**) located on the rear of the brake assembly.
- k. Insert a brake adjusting tool or screwdriver in the slot.
- l. While holding the adjusting tool away from the star wheel (**figure 26, item 2**) with a small screwdriver, turn the adjuster up until the drum turns freely.

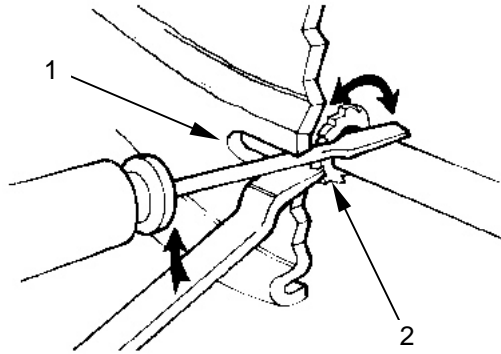


Figure 26. Star Wheel Adjustment

- m. Using a screwdriver, pry the wheel bearing cap (**figure 27, item 1**) off the wheel.

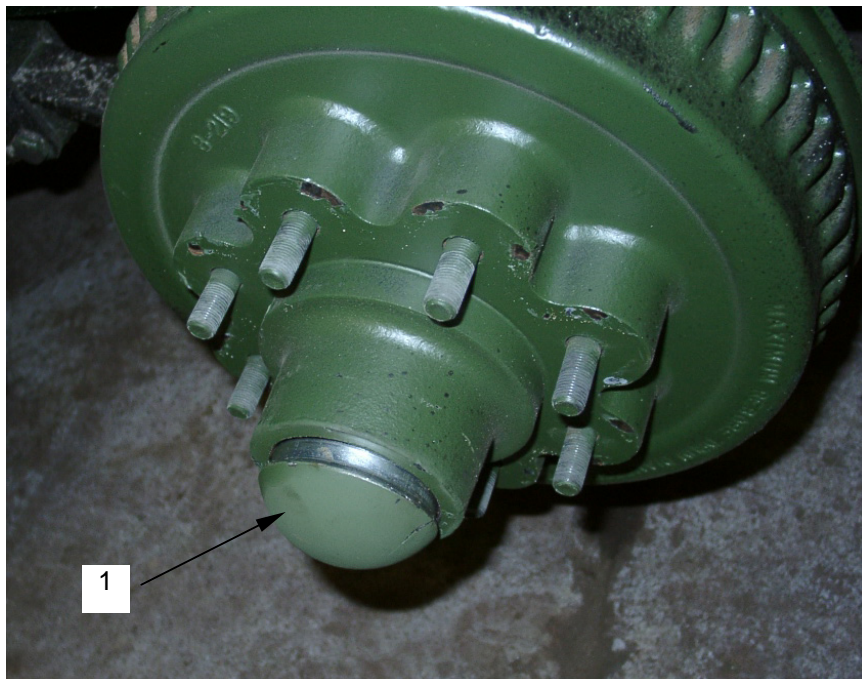


Figure 27. Wheel Bearing Cap

- n. Bend cotter pin (**figure 28, item 1**) straight to allow removal.
o. Remove cotter pin.

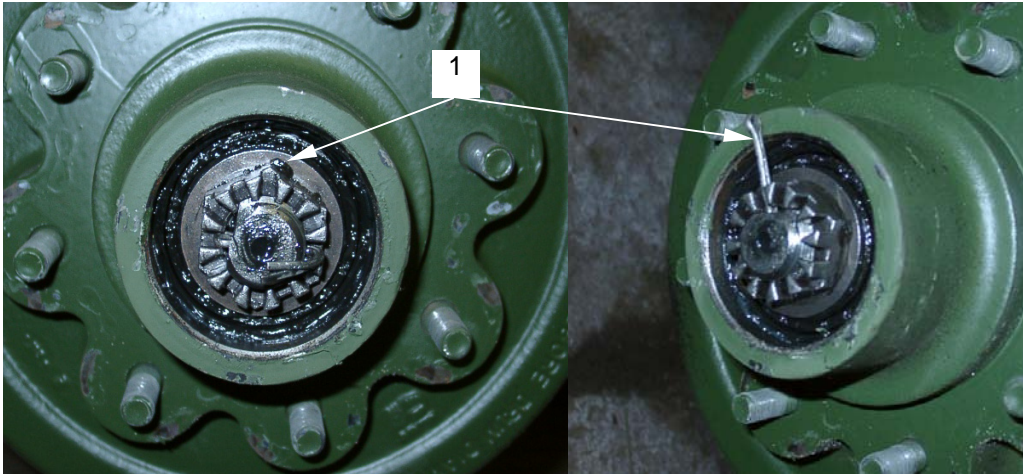


Figure 28. Cotter Pin

- p. Loosen and remove castle nut (figure 29, item 1).
- q. Remove washer (figure 29, item 2).
- r. Remove wheel bearing (figure 29, item 3).

NOTE

The brakes need to be released on the side being serviced.

- s. Remove brake drum (figure 29, item 4).

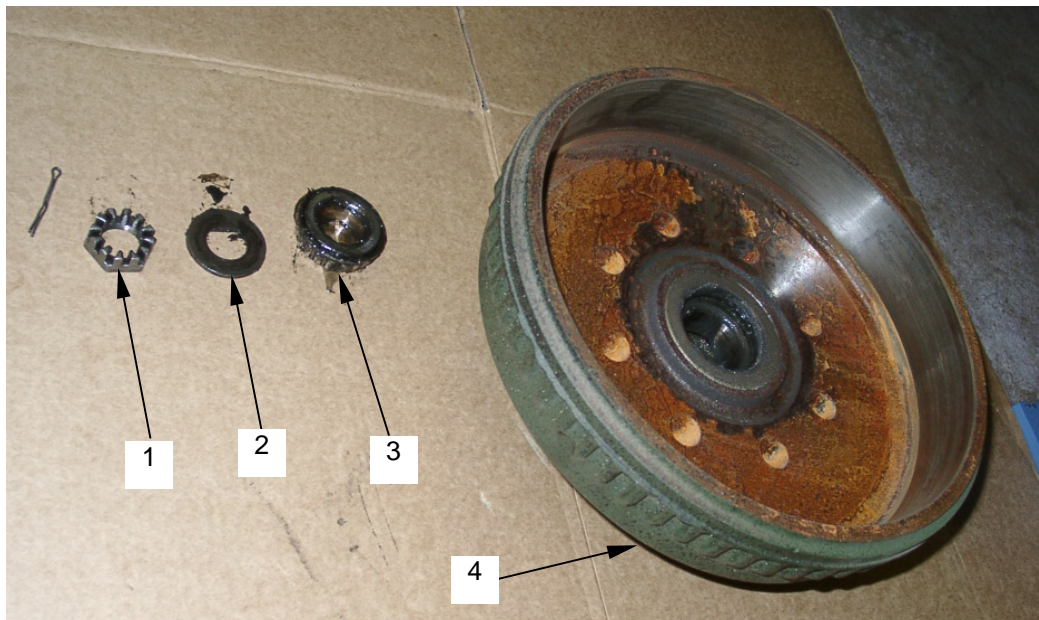


Figure 29. Brake Drum Parts

- t. Push, turn and release the hold down springs (**figure 30, item 1**).
- u. Pull retaining pins (**figure 30, item 2**) out through the back of the brake.

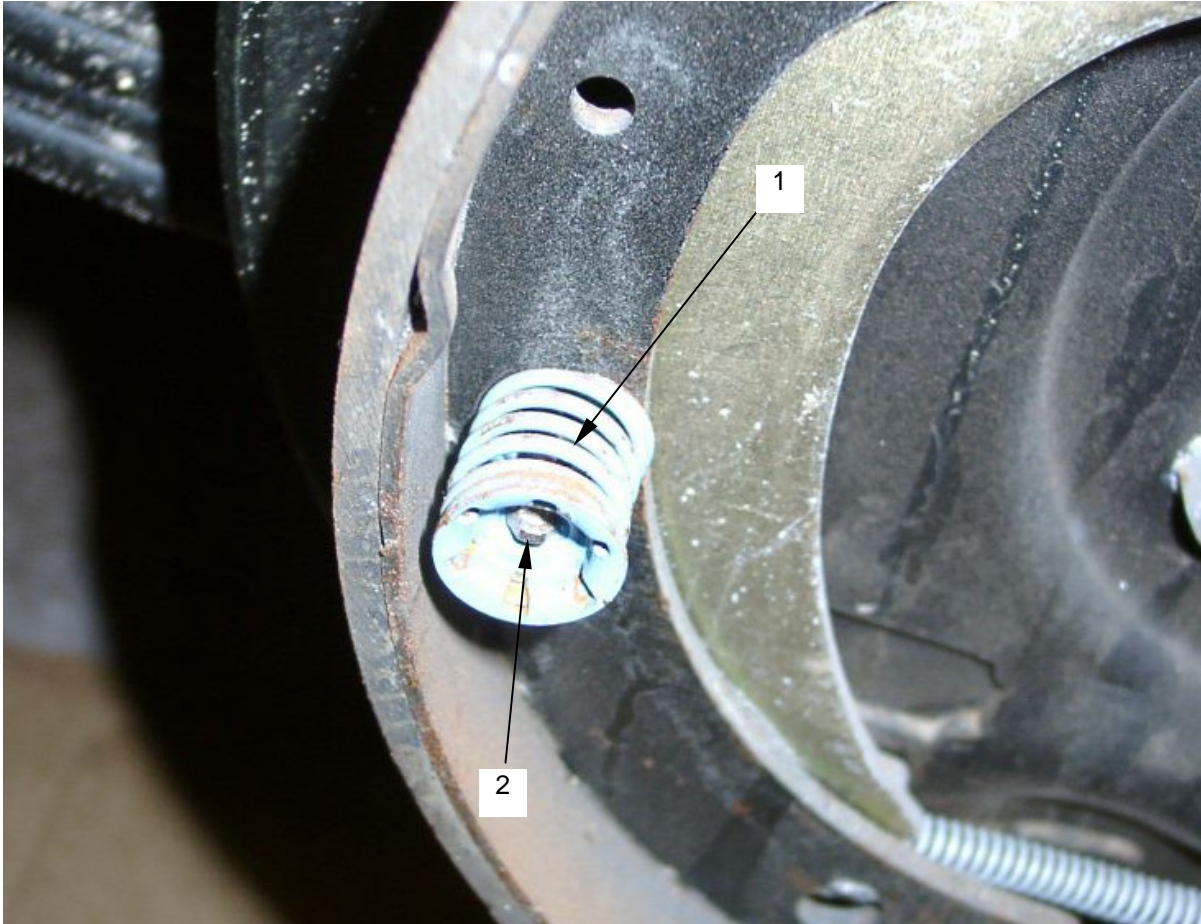


Figure 30. Hold Down Spring And Pin

- v. Remove retractor springs (**figure 31, item 1**) from anchor pin (**figure 31, item 2**).
- w. Remove shoe guide plate (**figure 31, item 3**).
- x. Remove primary brake shoe (**figure 31, item 4**) from wheel.
- y. Remove spreader (**figure 31, item 5**) and spreader spring (**figure 31, item 6**).
- z. Remove retractor spring (**figure 31, item 1**) and adjuster spring (**figure 31, item 7**) from primary brake shoe (**figure 31, item 4**).
- aa. Remove secondary brake shoe (**figure 31, item 8**) from wheel.
- bb. Remove retractor spring (**figure 31, item 1**) and adjuster spring (**figure 31, item 7**) from secondary brake shoe (**figure 31, item 8**).

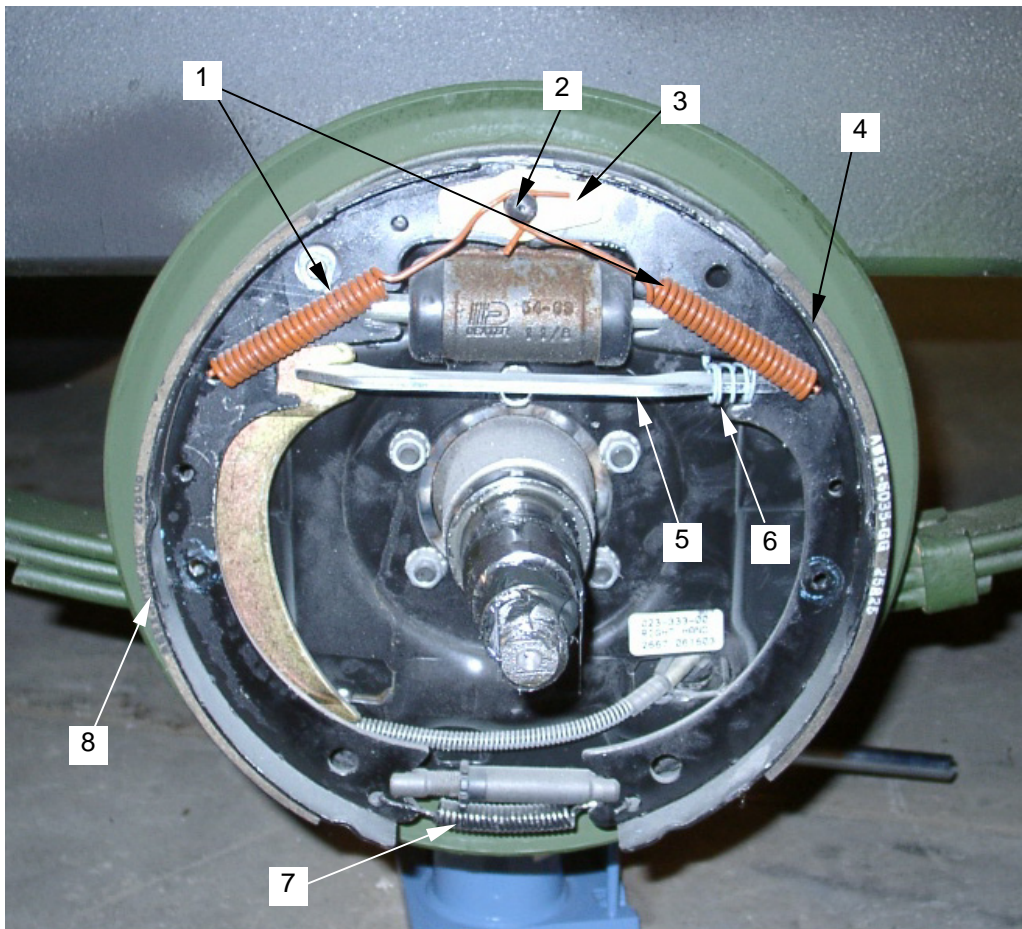


Figure 31. Brake Drum Assembly

- cc. Remove horseshoe clip (**figure 32, item 2**) from emergency brake lever (**figure 32, item 3**).
- dd. Remove emergency brake lever from secondary shoe.
- ee. Discard old brake shoes in an approved container.
- ff. Reinstall emergency brake lever (**figure 32, item 3**) and horseshoe clip (**figure 32, item 2**) on secondary brake shoe (**figure 32, item 1**).

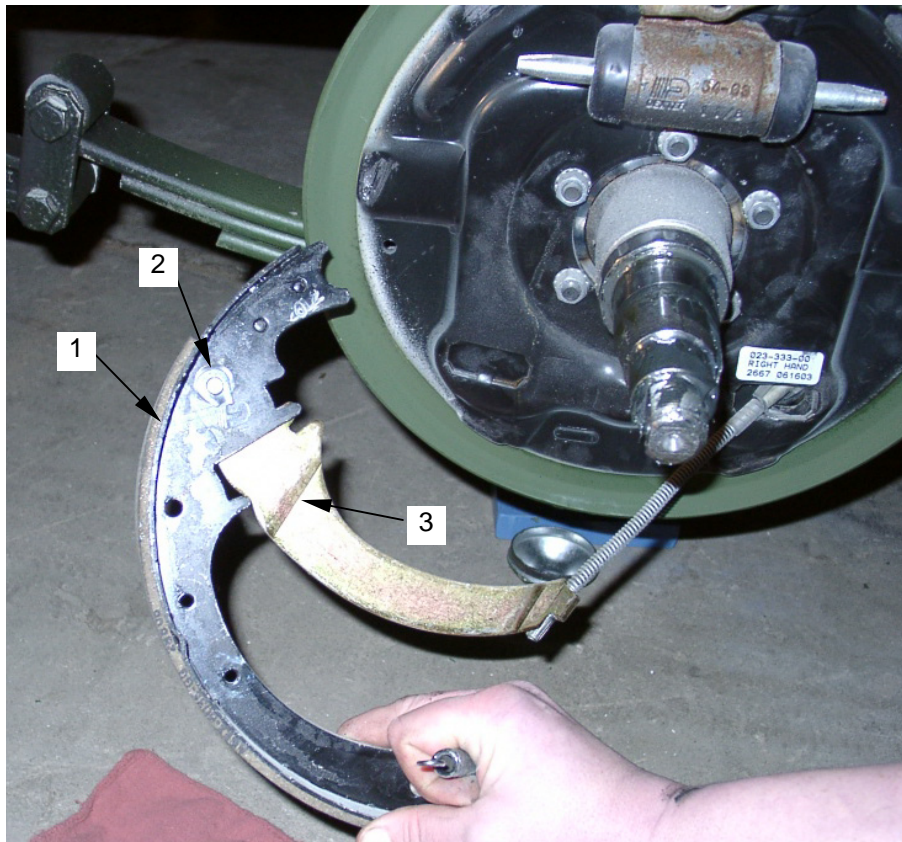


Figure 32. Emergency Brake Lever

- gg. Install retractor spring (**figure 33, item 1**) and adjuster spring (**figure 33, item 2**) on secondary brake shoe (**figure 33, item 3**).
- hh. Install secondary brake shoe on wheel.
- ii. Install retaining pin (**figure 34, item 1**) on secondary brake shoe.
- jj. Install hold down spring (**figure 34, item 2**) on retaining pin.
- kk. Install adjuster (**figure 33, item 4**).
- ll. Install spreader (**figure 33, item 5**) and spreader spring (**figure 33, item 6**).
- mm. Install retractor spring (**figure 33, item 7**) and adjuster spring (**figure 33, item 2**) on primary brake shoe (**figure 33, item 8**).
- nn. Install primary brake shoe (**figure 33, item 8**).
- oo. Install retaining pin (**figure 34, item 1**) on primary brake shoe.
- pp. Install hold down spring (**figure 34, item 2**) on primary brake shoe.
- qq. Install shoe guide plate (**figure 33, item 9**).

rr. Install retractor springs on spring post (figure 33, item 10).

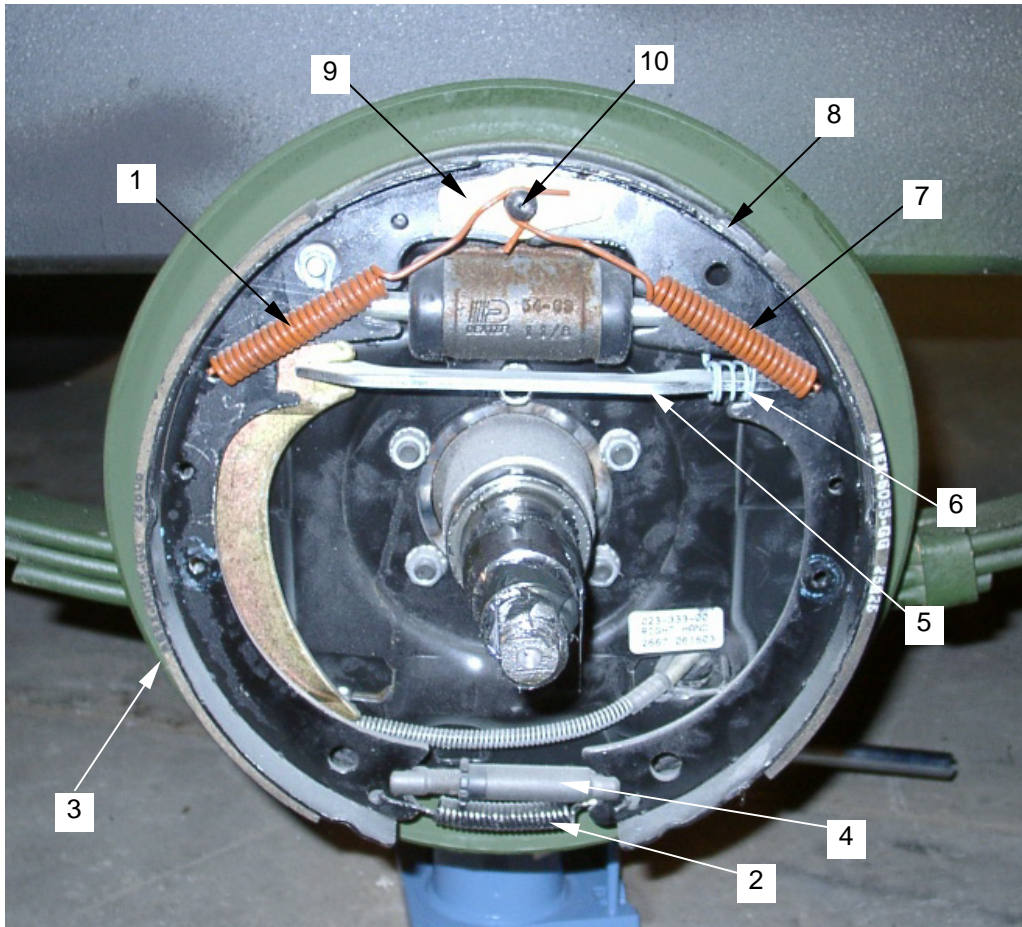


Figure 33. Brake Drum Assembly

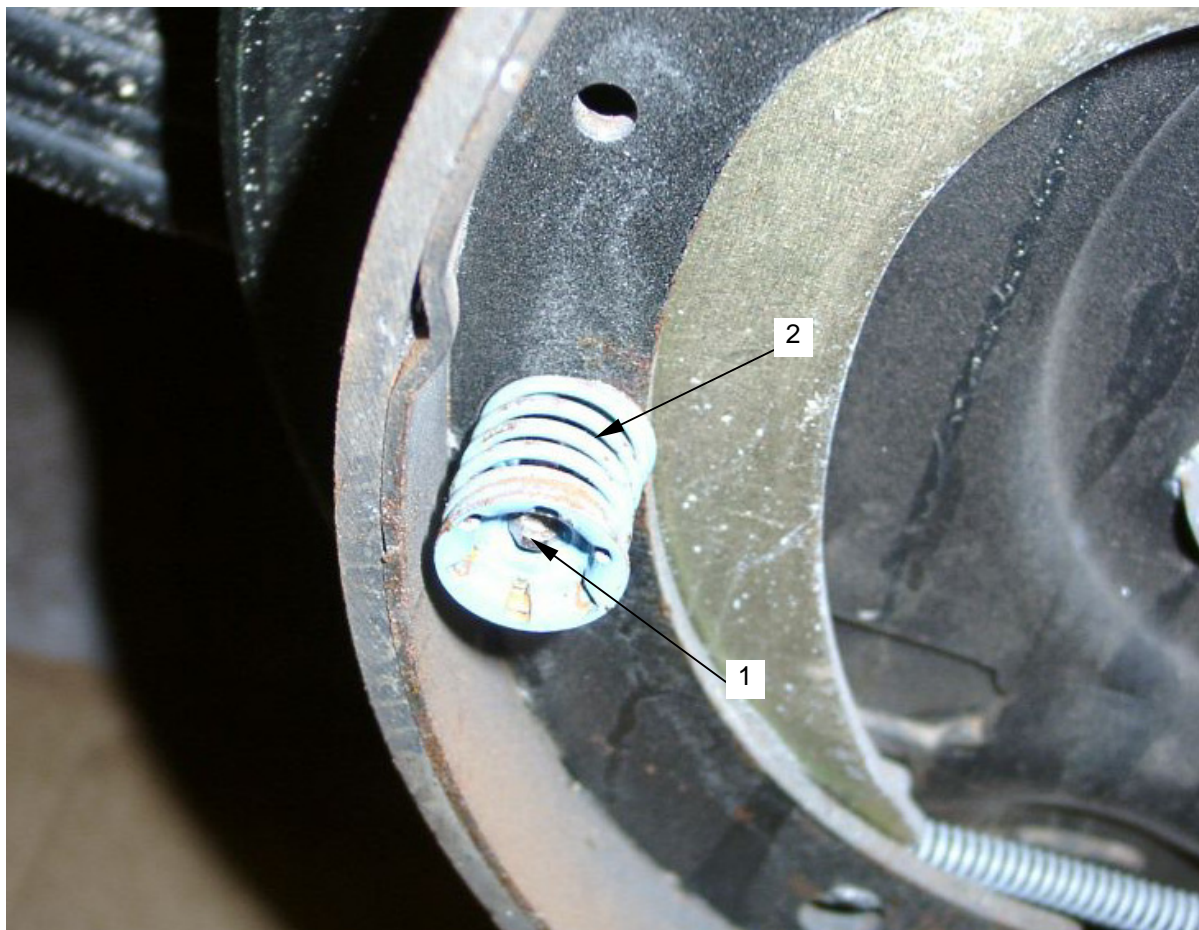


Figure 34. Hold Down Spring

- ss. Install brake drum (**figure 35, item 1**).
- tt. Install wheel bearing (**figure 35, item 2**).
- uu. Install washer (**figure 35, item 3**).
- vv. Install castle nut (**figure 35, item 4**).
- ww. Tighten castle nut (**figure 36, item 1**) and install cotter pin (**figure 36, item 2**).
- xx. Bend cotter pin legs.



Figure 35. Brake Drum Parts

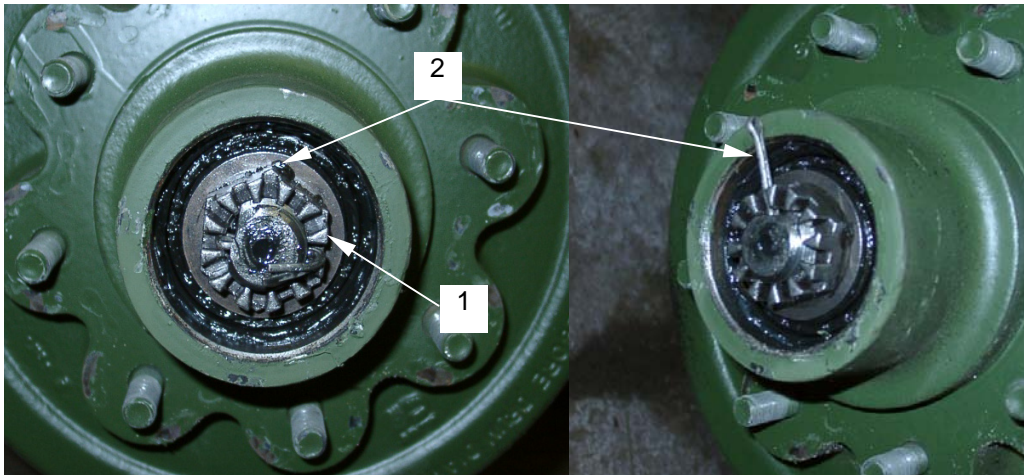


Figure 36. Cotter Pin

yy. Install wheel bearing cap (**figure 37, item 1**) on wheel.

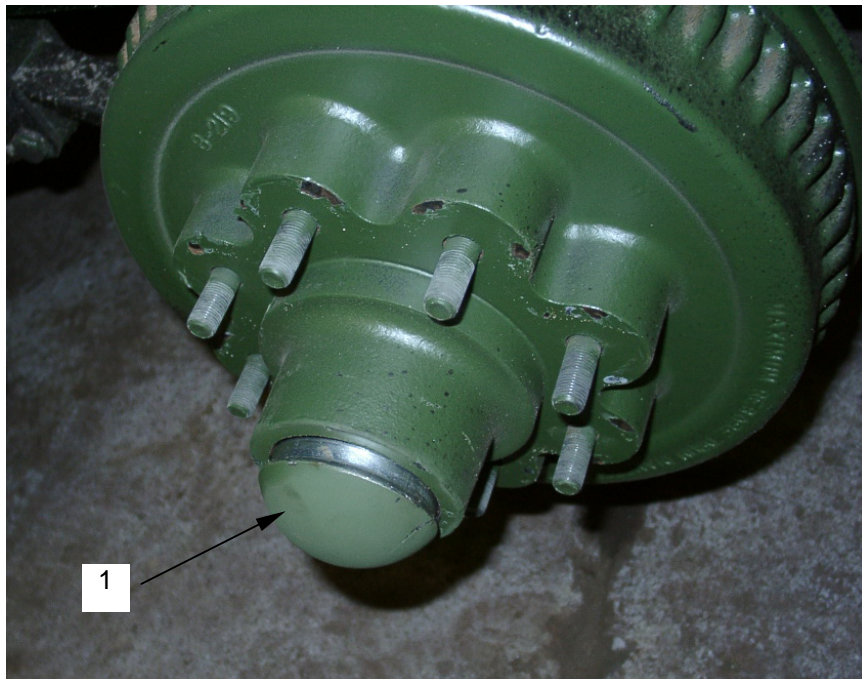


Figure 37. Wheel Bearing Cap

zz. Install tire (**figure 38, item 1**) on wheel.

aaa. Install lug nuts (**figure 38, item 2**) and tighten with lug nut wrench (**figure 38, item 3**).

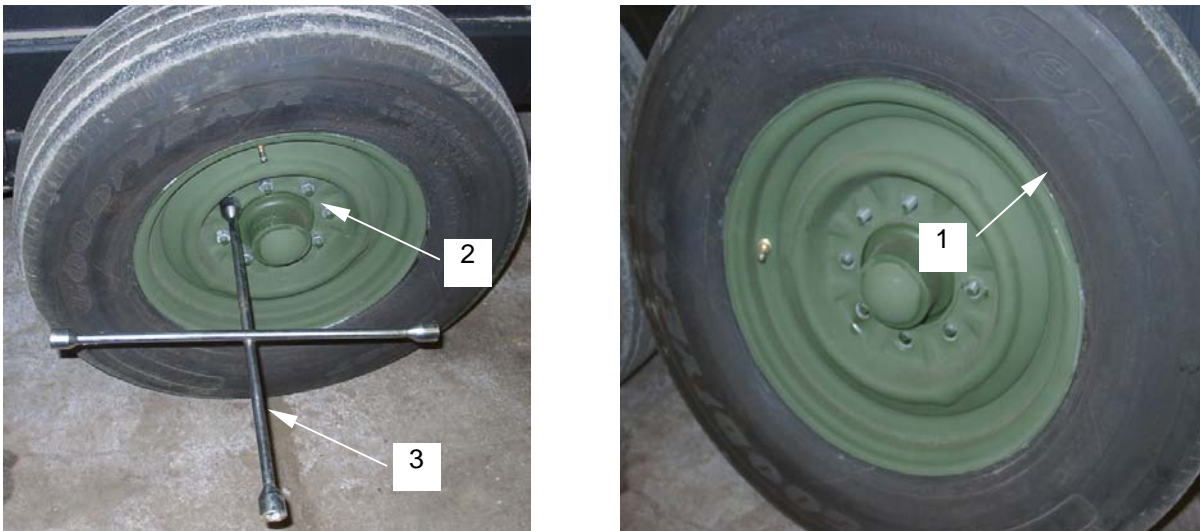


Figure 38. Tire Lug Nuts

bbb. Raise axle with jack (**figure 39, item 1**) to remove dunnage.

ccc. To lower the jack, slowly open the release valve (**figure 39, item 2**) by turning it counterclockwise with the jack handle (**figure 39, item 3**).

ddd. Remove chocks (**figure 40, item 1**) from wheel (**figure 40, item 2**) and store in equipment tray.

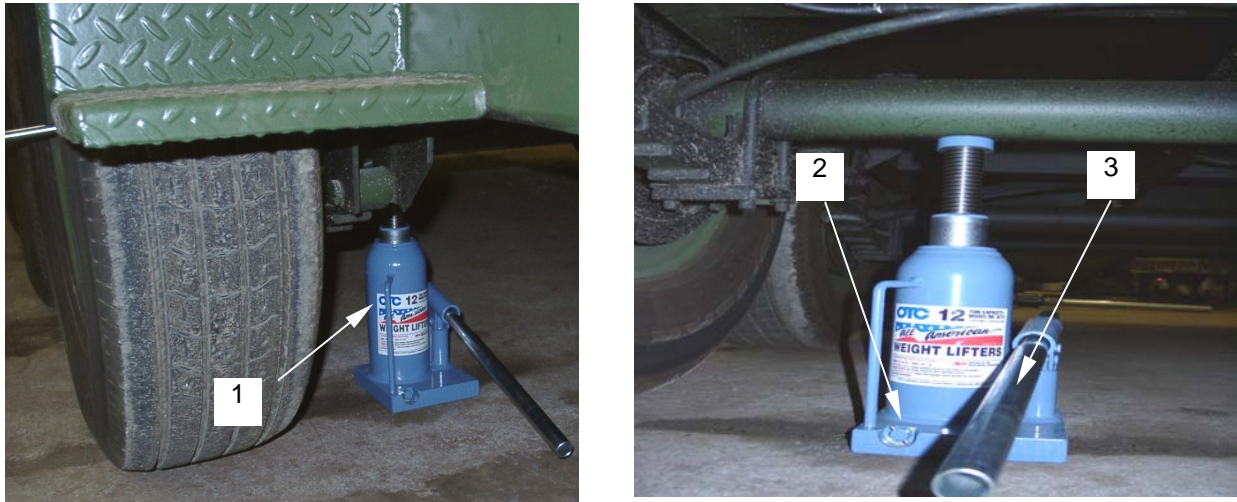


Figure 39. Jack Under Trailer

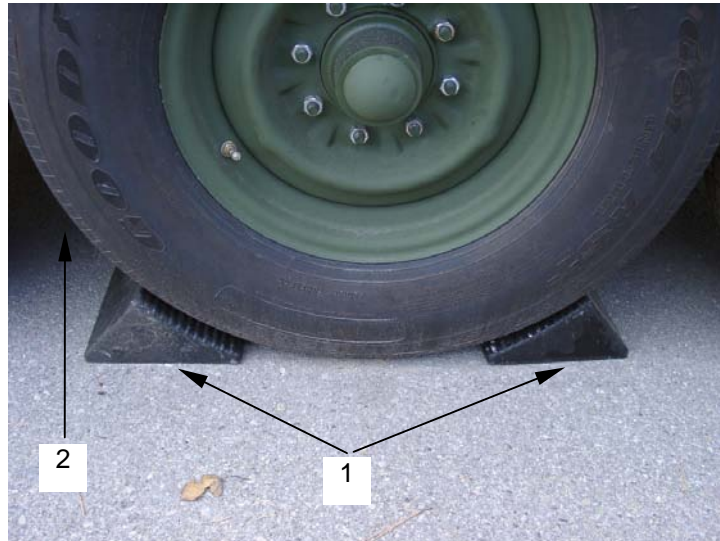
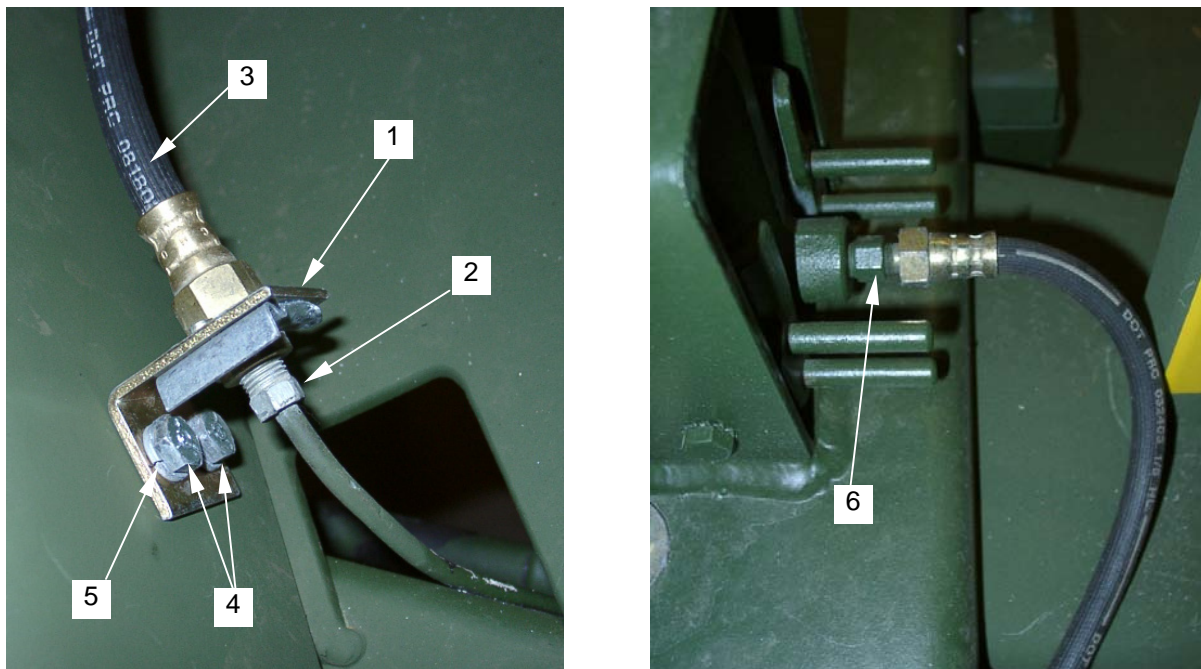


Figure 40. Wheel Chocks

Brake lines**REPLACE**

1. Actuator hose
 - a. Place an approved container under the master cylinder hose bracket (**figure 41, item 1**).
 - b. Loosen and remove hard line fitting (**figure 41, item 2**) from the brake hose (**figure 41, item 3**).
 - c. Drain brake fluid from master cylinder into an approved container.
 - d. Loosen and remove cylinder hose bracket mounting bolts (**figure 41, item 4**) and lockwashers (**figure 41, item 5**). Retain hardware.
 - e. Loosen and remove the brake hose from the orifice connector (**figure 41, item 6**) and discard in an approved container.
 - f. Connect new brake hose (**figure 41, item 3**) to orifice connector (**figure 41, item 6**).
 - g. Install master cylinder hose bracket (**figure 41, item 1**) with mounting bolts (**figure 41, item 4**) and lockwashers (**figure 41, item 5**).
 - h. Fasten hard line fitting (**figure 41, item 6**) to the brake hose (**figure 41, item 3**).
 - i. Bleed brake lines in accordance with brake filling and bleeding procedures within this Work Package.

**Figure 41. Actuator Brake Hose**

2. Hard line to 'tee'.

- a. Loosen and remove hard line to 'tee' (**figure 42, item 1**).
- b. Loosen and remove hard line clamp mounting nut (**figure 43, item 2**). Retain hardware.
- c. Discard old hard line in an approved container.
- d. Connect new hard line to 'tee' (**figure 43, item 1**).
- e. Connect hard line to brake actuator hose fitting (**figure 42, item 1**).
- f. Fasten hard line in place with clamp and tighten mounting nut (**figure 43, item 2**).
- g. Refill brake fluid system in accordance with brake filling and bleeding procedures within this Work Package.

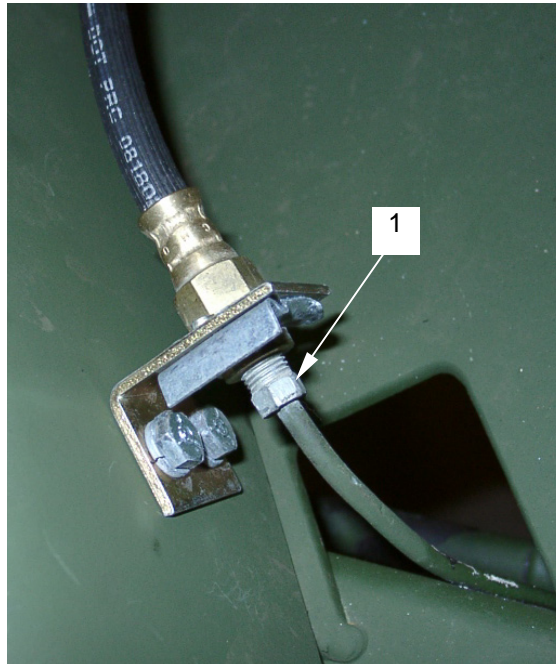


Figure 42. Hard Line To Actuator Hose Fitting

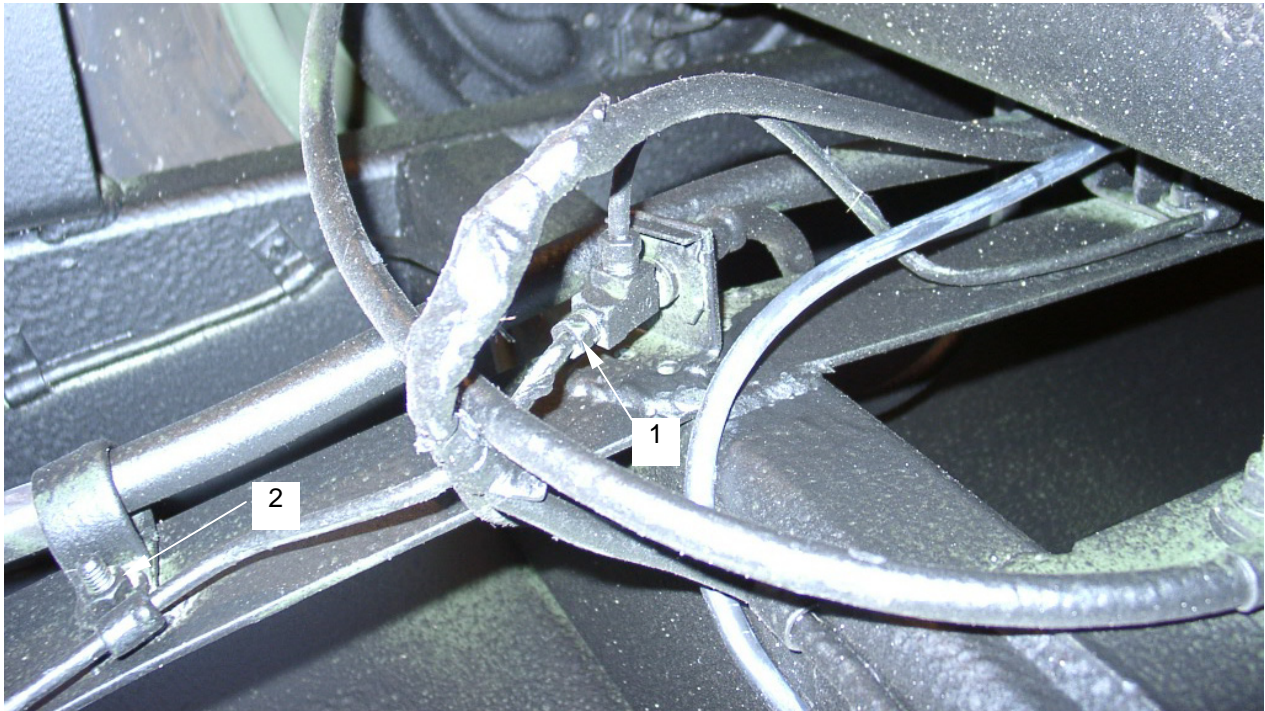


Figure 43. Hard Line To Tee Fitting

3. Hose, tee to tee

- a. Loosen and remove hose to first tee (**figure 44, item 1**).
- b. Loosen and remove hose to second tee (**figure 44, item 2**).
- c. Discard of hose in accordance with unit SOP.
- d. Fasten and tighten hose to first tee (**figure 44, item 1**).
- e. Fasten and tighten hose to second tee (**figure 44, item 2**).
- f. Refill brake fluid system in accordance with brake filling and bleeding procedures within this Work Package.

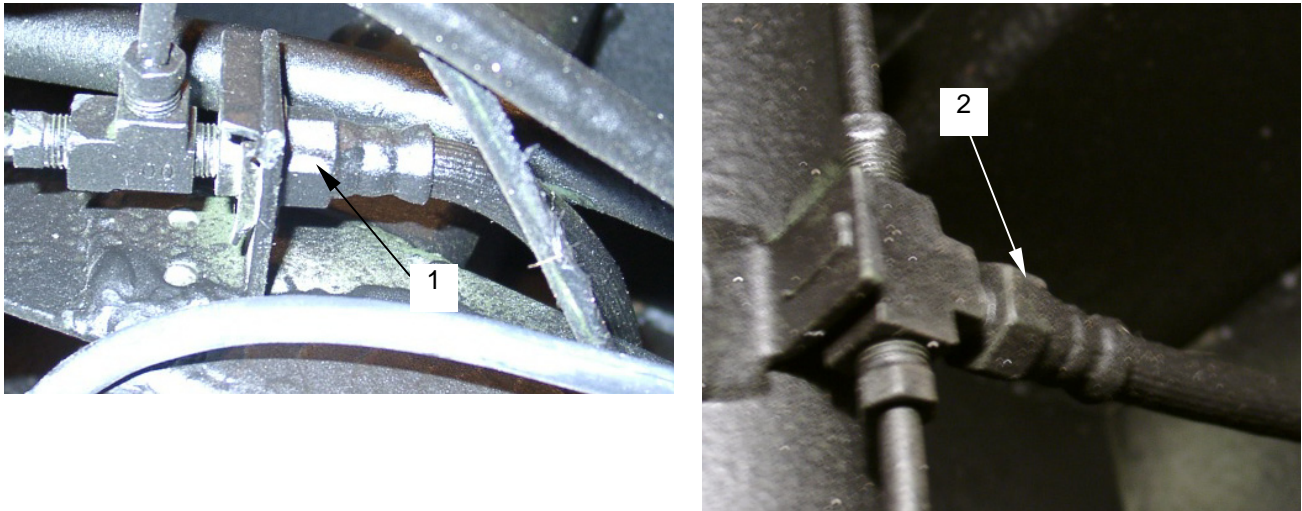


Figure 44. Hose, Tee To Tee

4. Hard line, tee to wheel cylinder.

- a. Loosen and remove hard line from tee (**figure 45, item 1**).
- b. Loosen and remove hard line to tire (**figure 45, item 2**).
- c. Discard hard line in accordance with unit SOP.
- d. Connect hard line to tee (**figure 45, item 1**).
- e. Connect hard line to tire (**figure 45, item 2**).
- f. Refill brake fluid system in accordance with brake filling and bleeding procedures within this Work Package.

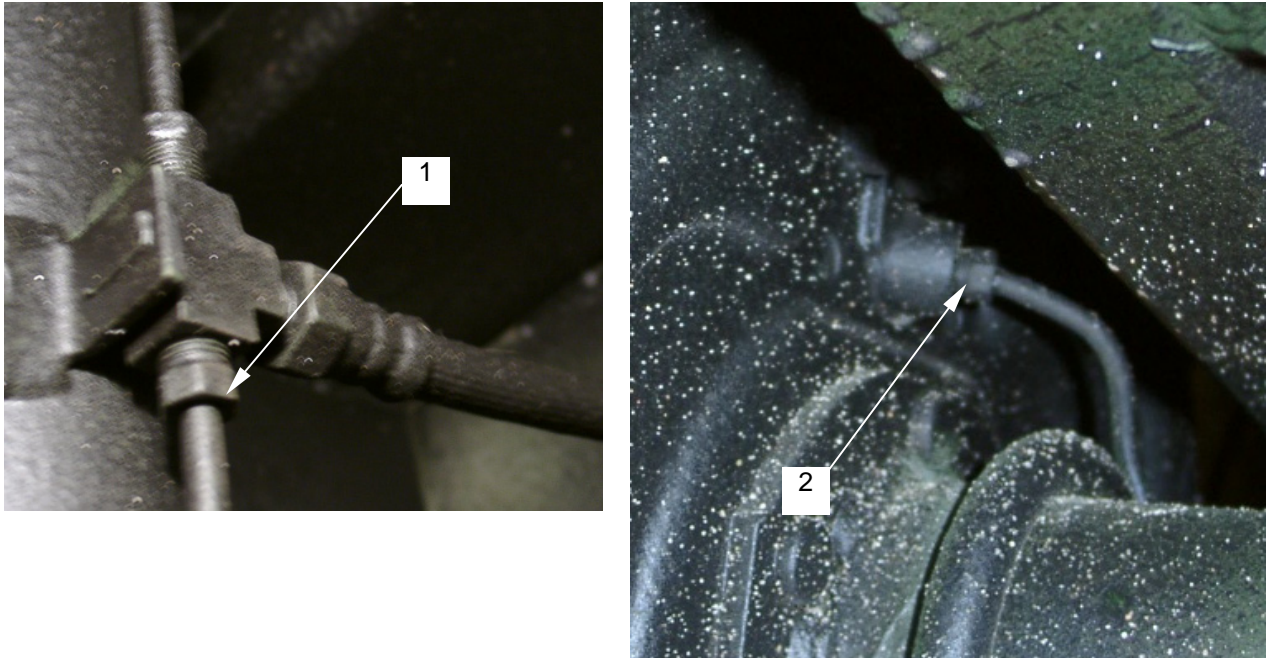


Figure 45. Hard Line, Tee To Wheel

END OF WORK PACKAGE

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
HOSES
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)
 Banding tool (WP 0053 00, Table 2, Item 1)

Personnel Required

MOS 77W, Water Treatment Specialist

Materials/Parts

Gloves, Rubber (WP 0089 00, Table 2, Item 4)
 Gloves, Work (WP 0089 00, Table 2, Item 5)
 Rags, Wiping (WP 0091 00, Item 28)
 Respirator (WP 0089 00, Table 2, Item 8)
 Seal, Strapping, ½-in (WP 0091 00, Item 29)
 Strap, Steel Band ½-in (WP 0091 00, Item 31)

Equipment Condition

Wastewater hoses steam cleaned



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

REPLACE

To replace a 2½-inch intake (**figure 1, item 1**), or 4-inch drain hose (**figure 1, item 2**), as well as a QD fitting (**figure 1, item 3**), ensure item has been cleaned, sanitized and proceed as follows:

1. Cut banding (**figure 1, item 4**) from hose.
2. Remove coupling (**figure 1, item 3**) from hose.

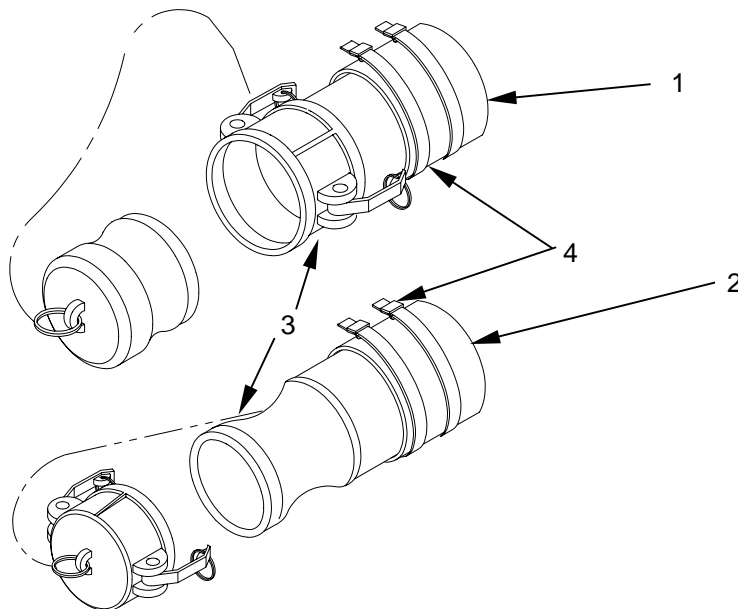


Figure 1. Hoses and Quick Disconnect Couplings



WARNING

Wear eye protection and gloves while banding. Banding may break if operator does not release tension on handle when bending over buckle. Flying banding may cause severe injury to personnel.

NOTE

Use the banding procedure described below as long as supplies of banding material are available. Thereafter, use worm and drive hose clamps.

3. Insert serviceable coupling (**figure 2, item 1**) into hose (**figure 2, item 2**).
4. Band hose as follows.
 - a. Cut a 36-inch section of banding (**figure 2, item 3**).
 - b. Slide buckle onto banding (**figure 2, item 3**); bend end of banding (**figure 2, item 3**) under buckle (**figure 2, item 4**).
 - c. Wrap opposite end of banding (**figure 2, item 3**) around hose (**figure 2, item 2**) and through buckle (**figure 2, item 4**). Position banding (**figure 2, item 3**) on hose approximately one inch from coupling (**figure 2, item 1**).

- d. Wrap another loop of banding (**figure 2, item 3**) around hose and through buckle (**figure 2, item 4**).
- e. Position banding (**figure 2, item 3**) in slots of banding tool (**figure 2, item 5**).

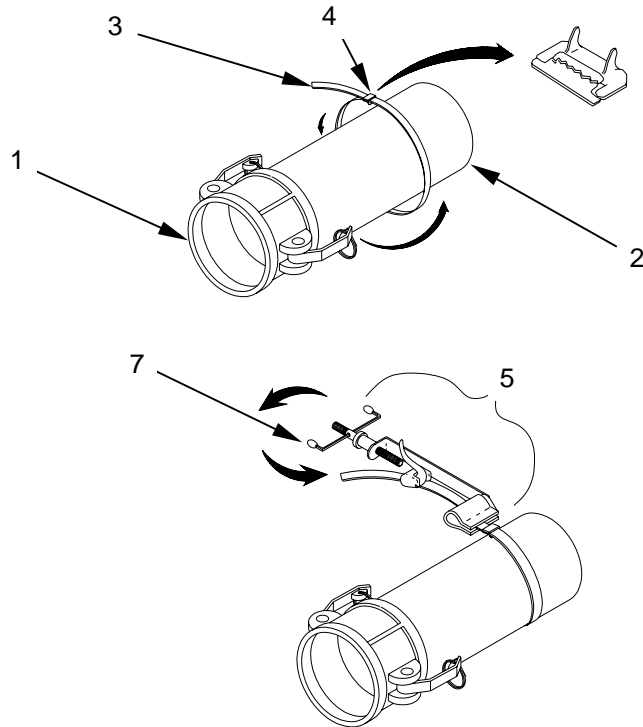


Figure 2. Fastening Banding Strap



WARNING

Do not over-tighten banding when turning handle. Banding may snap, causing severe injury.

- f. Apply pressure to gripper lever (**figure 3, item 1**) and turn handle (**figure 3, item 2**) until banding (**figure 3, item 3**) is snug. The banding tool will lock in place when tension is applied. Reposition tool as required.
- g. Continue turning handle (**figure 3, item 2**) until banding stops moving through buckle (**figure 3, item 4**).
- h. While reversing handle $\frac{3}{4}$ -in turn, roll banding tool to opposite side of buckle (**figure 3, item 4**). This will bend banding (**figure 3, item 3**) and prevent it from slipping through buckle (**figure 3, item 4**) when the banding tool is removed.

- i. Pull cutting handle (**figure 3, item 1**) on tool to cut banding (**figure 3, item 3**).
- j. Remove tool while holding banding (**figure 3, item 3**) stud down on buckle with thumb.
- k. Clinch end of banding (**figure 3, item 3**) by hammering down taps of buckle over banding (**figure 3, item 3**) stud.
- l. Repeat step 1 above for the second band.

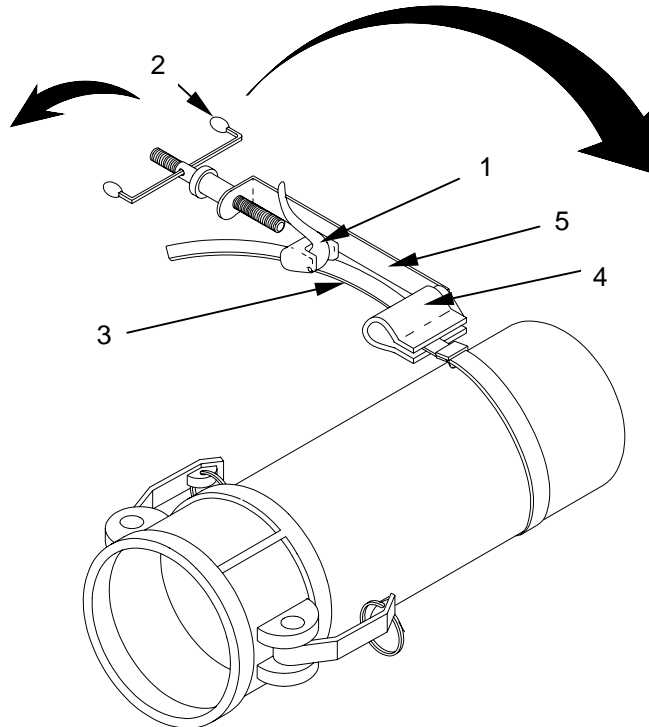


Figure 3. Tightening Banding Strap

5. Replace a breather hose (**figure 4, item 1**), vacuum pump hose (**figure 4, item 2**), or upper air hose (**figure 4, item 3**), by loosening the hose clamp and retaining (**figure 4, item 4**) and removing the hose to be replaced.

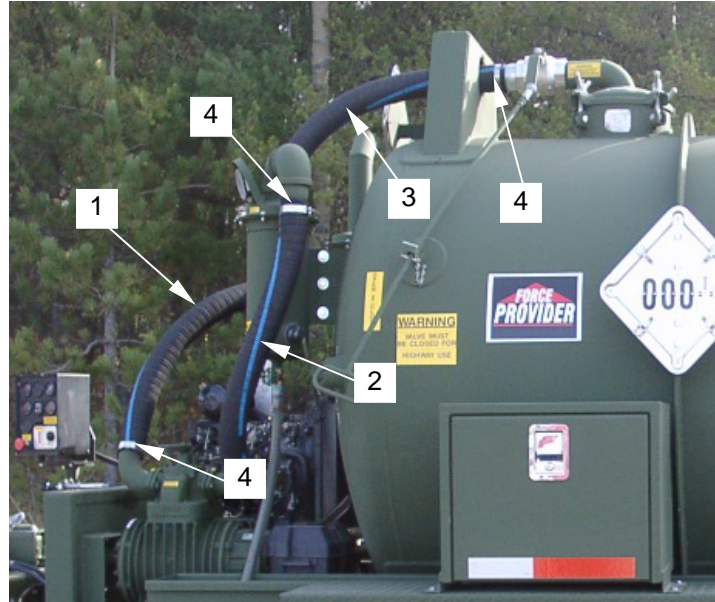


Figure 4. Air Hoses

6. Reinstall air hoses (**figure 5, item 1**) and secure with retained hose clamps (**figure 5, item 2**).

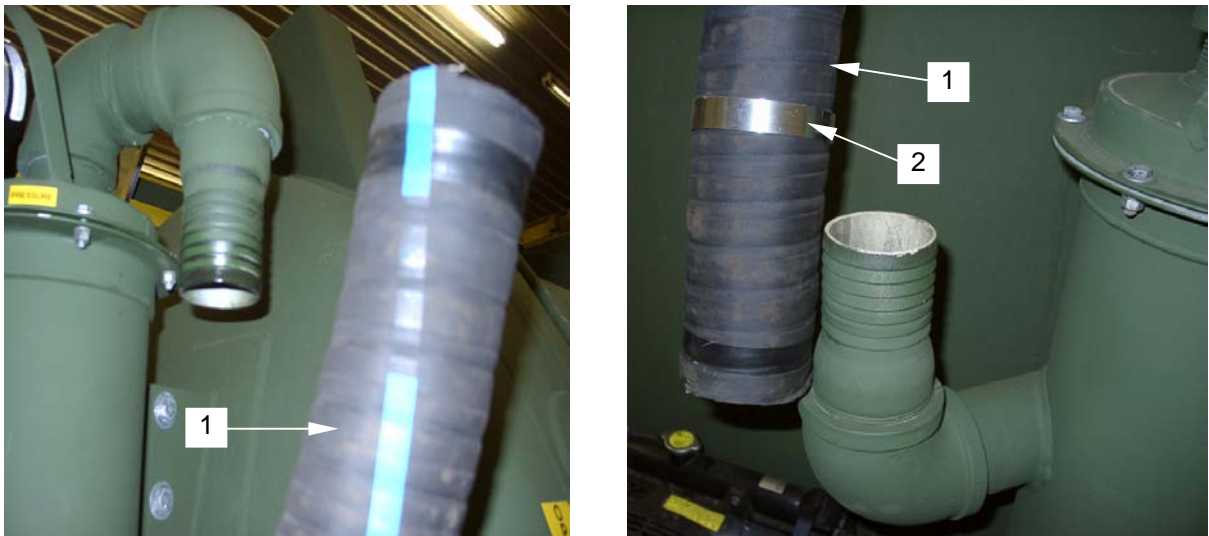


Figure 5. Installing Air Hoses

UNIT MAINTENANCE
WASTE WATER VACUUM TANK TRAILER
NSN 4630-01-513-8155
CHOPPER TUBE/WAND
REPLACE

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)

Personnel Required

MOS 77W, Water Treatment Specialist

Materials/Parts

Gloves, Rubber (WP 0089 00, Table 2, Item 4)
 Pipe Sealant (WP 0091 00, Item 27)
 Rags, Wiping (WP 0091 00, Item 28)
 Respirator (WP 0089 00, Table 2, Item 8)

Equipment Condition

Copper tube/wand disconnected, steam cleaned



WARNING

Protective clothing and equipment must be worn. A heavy-duty rubber apron, rubber gloves, respirator, safety splash goggles and/or face shield are required when potential exists for contact with wastewater or contaminated surfaces. Wastewater and surfaces may be contaminated with pathogenic microorganisms, bacteria or viruses, which present a risk of serious illness or death to personnel. Refer to cleaning and sanitizing procedures in WP 0018 00.

REPLACE

To replace the chopper tube/wand or ball valve, proceed as follows:

1. Ensure the chopper tube/wand has been cleaned and sanitized if it must be disassembled to remove the ball valve (**figure 1, item 1**).



Figure 1. Chopper Tube/Wand

2. Disassemble the chopper tube/wand and ball valve (**figure 2, item 1**) by disconnecting the chopper tube cam lock fitting (**figure 2, item 2**) from the ball valve male fitting (**figure 2, item 3**).
3. Using a pipe wrench, disconnect the male fitting (**figure 2, item 3**) from the valve fitting (**figure 2, item 4**) and the valve fitting from the ball valve (**figure 2, item 1**).
4. Disconnect the female cam lock hose fitting (**figure 2, item 5**) from the valve fitting (**figure 2, item 6**) and the valve fitting from the ball valve (**figure 2, item 1**).

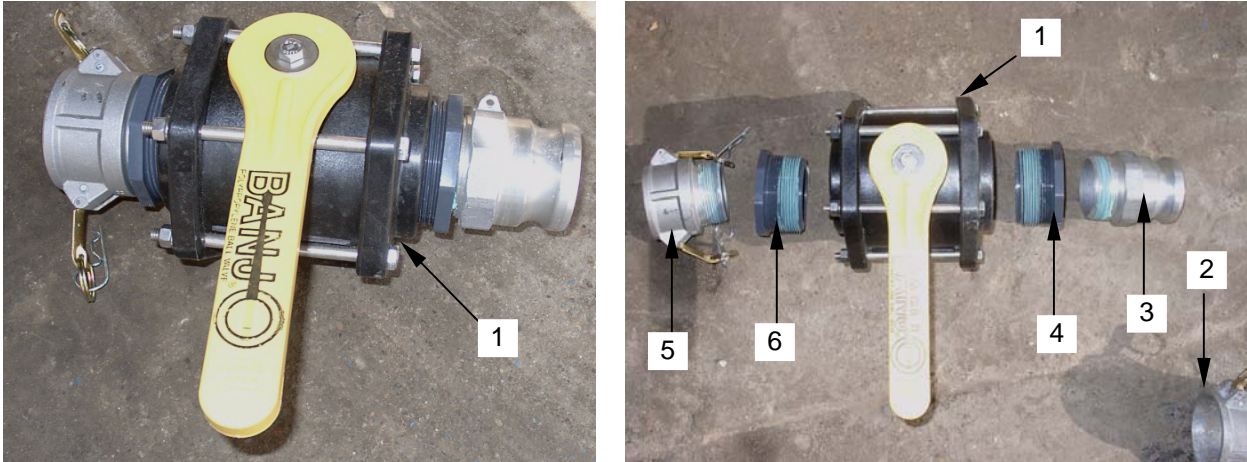


Figure 2. Disassembling the Ball Valve

5. Connect valve fittings (**figure 3, item 1**) to the ball valve (**figure 3, item 2**).
6. Connect female cam lock hose fitting (**figure 3, item 3**) and male cam lock hose fitting (**figure 3, item 4**).

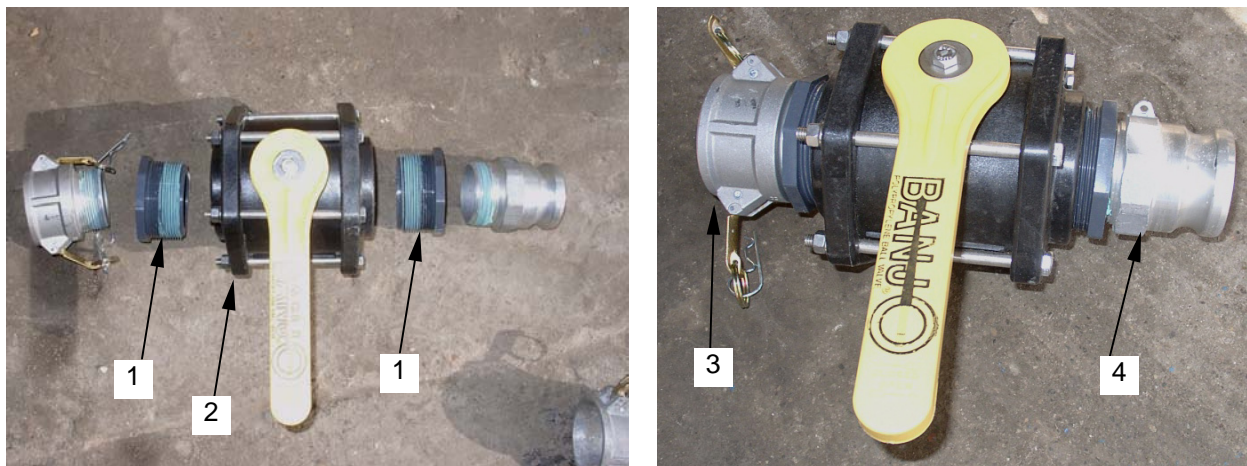


Figure 3. Assembling the Ball Valve

END OF WORK PACKAGE

TM 10-4630-207-13&P

CHAPTER 7

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

WASTE WATER EVACUATION TANK TRAILER

**DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
DIRECT SUPPORT MAINTENANCE INTRODUCTION**

GENERAL

This section contains Direct Support Maintenance applicable to the WWET/T as authorized by the Maintenance Allocation Chart (MAC), Work Package 0053 00, of this manual. Direct Support Maintenance personnel may also perform all functions allocated in Operator and Unit Maintenance.

All maintenance procedures in this section can be performed by one person unless otherwise indicated. Read all **WARNINGS, CAUTIONS, NOTES**, and instructions carefully before attempting any procedures. Read and understand all warnings at the front of this manual.

Each maintenance action will include a heading, which lists the actions to be taken, the tools and parts/materials required, and the condition in which the equipment must be in to perform the action.

**DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
NSN 4630-01-513-8155
DIESEL ENGINE
REPLACE**

INITIAL SETUP:**Tools**

Lifting Equipment (WP 0053 00 Table 2, Item 5)
Metric socket wrench set (WP 0053 00, Table 2, Item 7)
Sling, Chain and Hook (WP 0053 00, Table 2, Item 12)
Tool Kit, General Mechanics, Automotive (WP 0053 00, Table 2, Item 15)
Torque Wrench, 0-100-ft/lbs (WP 0053 00, Table 2, Item 17)

Personnel Required

63B Light Vehicle Mechanic

Materials/Parts

Antifreeze, Ethylene Glycol (WP 0091 00, Item 1)
Gasket, Liquid (WP 0091 00, Item 14)
Gloves, Work (WP 0089 00, Item 5)
Oil, 10W40 (Summer) (WP 0091 00, Item 23)
Oil, 10W30 (Winter) (WP 0091 00, Item 22)
Rags, Wiping (WP 0091 00, Item 28)
Tags, Marking (WP 0091 00, Item 32)

Equipment Condition

Parking brakes on
Chocks in place
Battery disconnected

REPLACE

To replace the engine head gasket, proceed as follows:

1. Disconnect battery cable at negative terminal post.
2. Drain oil from engine in accordance with WP 0026 00.
3. Remove air filter.
 - a. Loosen hose clamps (**figure 1, item 1**).
 - b. Loosen and remove nuts (**figure 1, item 2**), lockwashers (**figure 1, item 3**) and bolts (**figure 1, item 4**) from air filter mounting bracket (**figure 1, item 5**).
 - c. Remove mounting bracket (**figure 1, item 5**).
 - d. Remove air filter assembly (**figure 1, item 6**) from flex hose (**figure 1, item 7**).
 - e. Remove foam padding (**figure 1, item 8**).

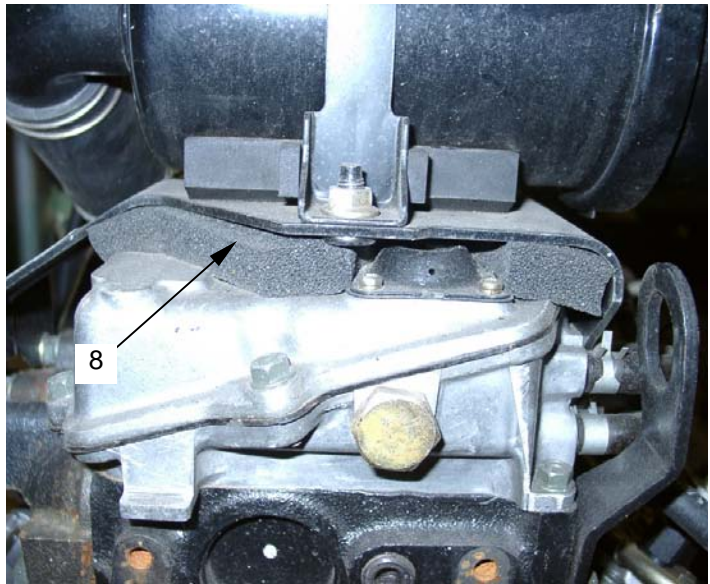
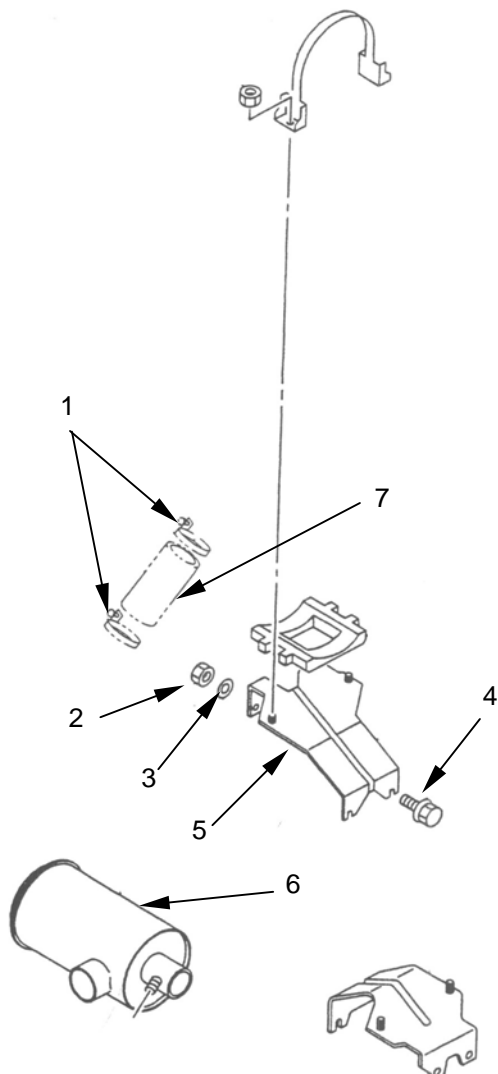


Figure 1. Air Filter

4. Remove exhaust manifold
 - a. Loosen and remove radiator bracket (figure 2, item 1) mounting bolts (figure 2, item 2) and nuts (figure 2, item 3).

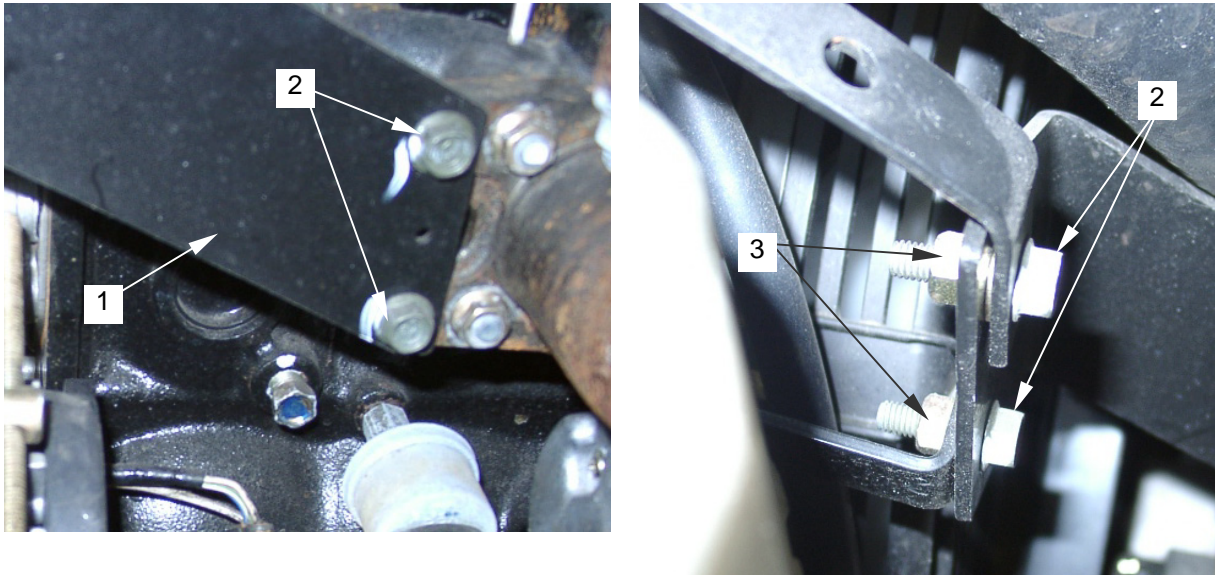


Figure 2. Radiator Bracket

- b. Loosen and remove exhaust manifold elbow (**figure 3, item 1**) mounting nuts (**figure 3, item 2**) (quantity 4).
- c. Remove exhaust manifold elbow (**figure 3, item 1**) and elbow gasket (**figure 3, item 3**).
- d. Loosen and remove exhaust manifold mounting nuts (**figure 3, item 4**) (quantity 2).
- e. Loosen and remove exhaust manifold mounting bolts (**figure 3, item 5**) (quantity 2).
- f. Remove exhaust manifold (**figure 3, item 6**) and gasket (**figure 3, item 7**).
- g. Clean mating surfaces of exhaust manifold and engine with a clean, lint free cloth.

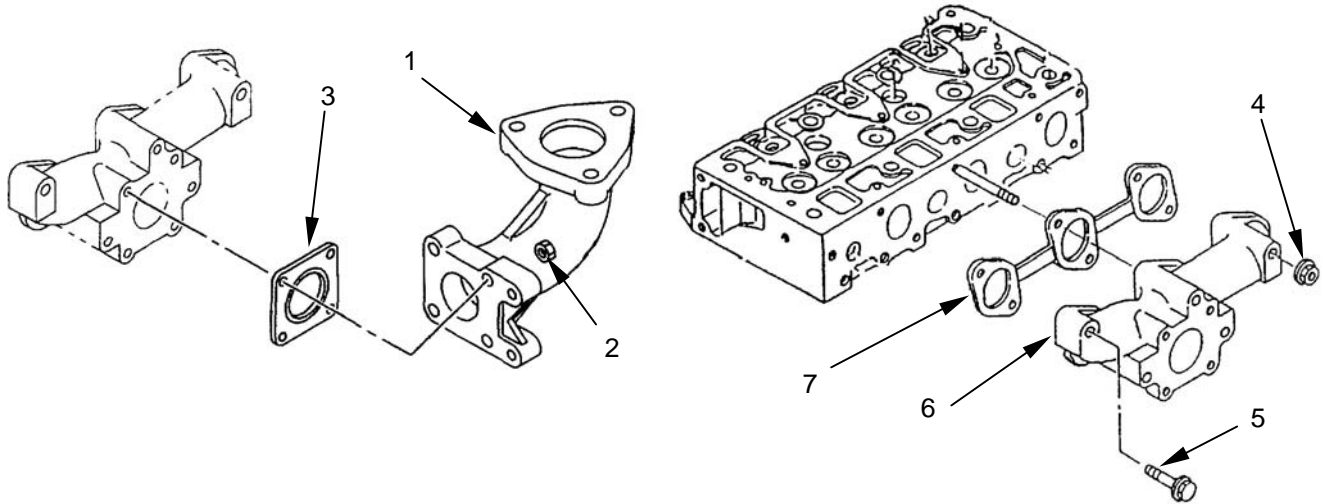


Figure 3. Exhaust Manifold and Elbow

5. Remove cylinder head cover
 - a. Loosen and remove cylinder head cover mounting bolts (**figure 4, item 1**) (quantity 9).
 - b. Remove cylinder head cover (**figure 4, item 2**).
 - c. Remove cylinder head cover gasket (**figure 4, item 3**). If gasket remains on seating surface, gently remove with a non-metallic tool.
 - d. Wipe off mating surfaces of cylinder head and cylinder head cover with a lint free cloth.

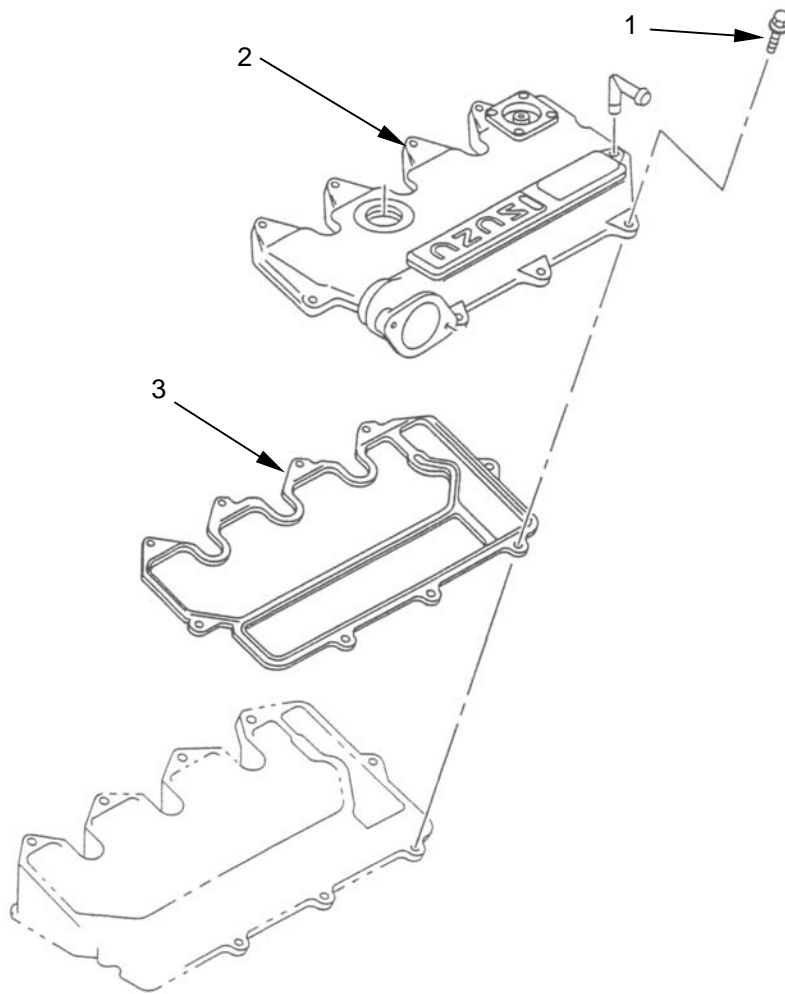


Figure 4. Cylinder Head Cover

6. Rocker bracket and head gasket access.
 - a. Loosen and remove glow plug connector nuts (**figure 5, item 1**).
 - b. Tag and remove wires (**figure 5, item 2**).
 - c. Remove glow plug connector (**figure 5, item 3**).
 - d. After placing a rag under the fittings, loosen and remove fuel lines (**figure 5, item 4**).
 - e. Loosen and remove radiator bracket mounting bolt (**figure 5, item 5**).
 - f. Tag and remove wires (**figure 5, item 6**).
 - g. Loosen and remove fuel lines (**Figure 5, item 7**).

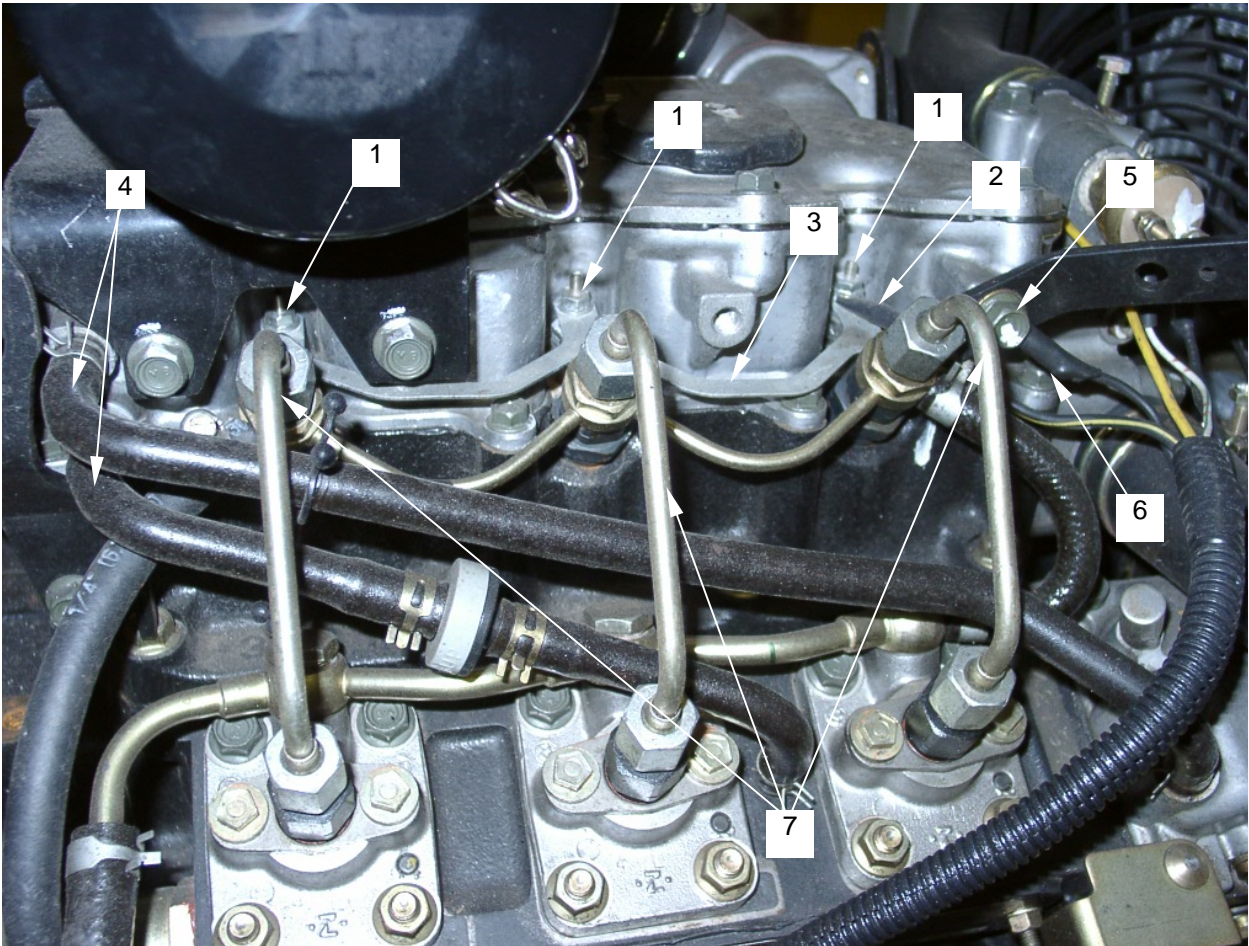


Figure 5. Rocker Head And Head Gasket Access

- h. Loosen and remove fuel leak hose (**figure 6, item 1**) hose clamps (**figure 6, item 2**).
- i. Remove fuel leak hose (**figure 6, item 1**).
- j. After placing a rag under the fittings, loosen and remove fuel line (**figure 6, item 3**) hose clamps (**figure 6, item 4**).
- k. Remove fuel lines (**figure 6, item 3**).

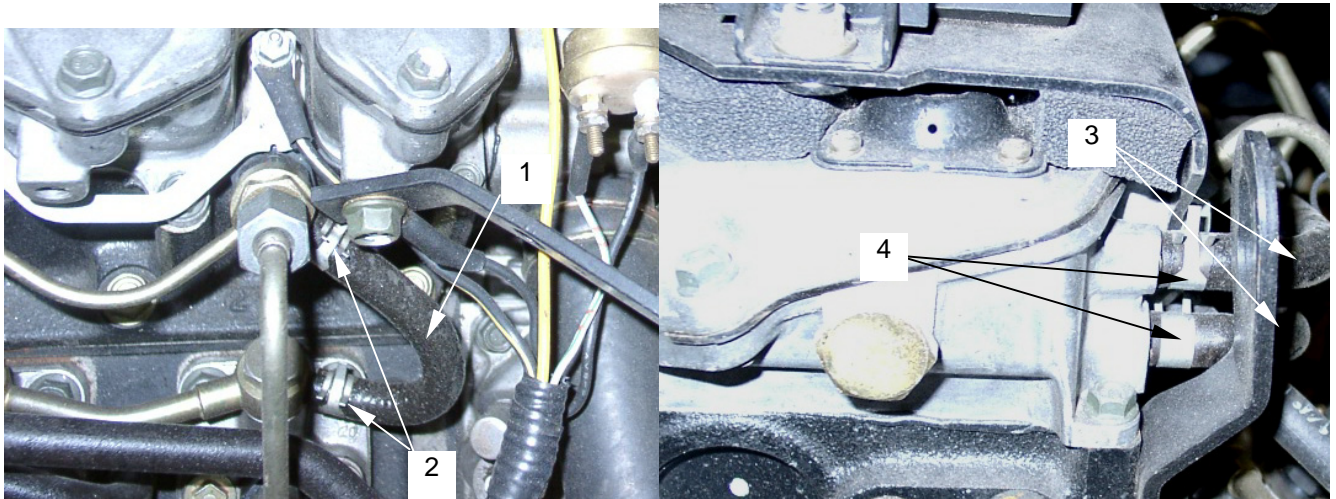


Figure 6. Fuel Hoses

7. Remove rocker arm bracket
 - a. Loosen and remove mounting nuts (**figure 7, item 1**) (qty 5).
 - b. Loosen and remove mounting bolts (**figure 7, item 2**) (qty 4).
 - c. Pull out the push rods (**figure 7, item 3**) (qty 6).
 - d. Remove rocker arm bracket (**figure 7, item 4**) from cylinder head assembly.

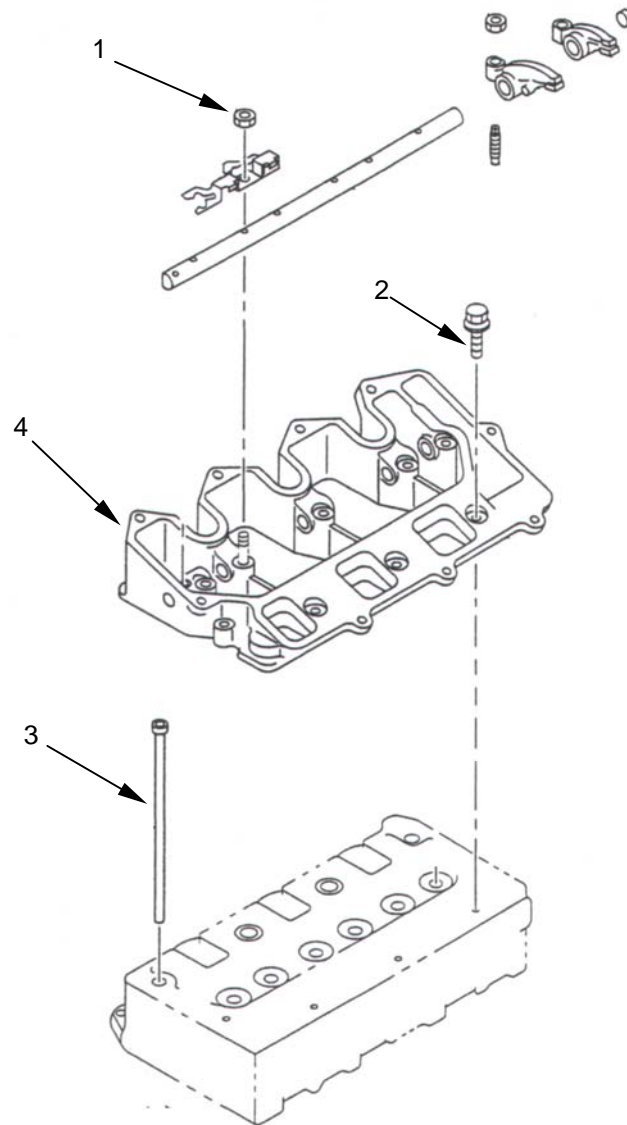


Figure 7. Rocker Arm Bracket

8. Remove cylinder head
 - a. Remove rear (**figure 8, item 1**) and front hangers (**figure 8, item 2**).
 - b. Loosen and remove cylinder head mounting bolts (**figure 9, item 1 through 12**) slowly, a half turn at a time, starting with the outside bolts, then working inwards in a circular pattern. Continue loosening the mounting bolts in sequence until the bolts are hand tight.
 - c. Remove mounting (**figure 8, item 3**) bolts from cylinder head.

- d. Remove the cylinder head assembly (figure 8, item 4) and the head gasket (figure 8, item 5).

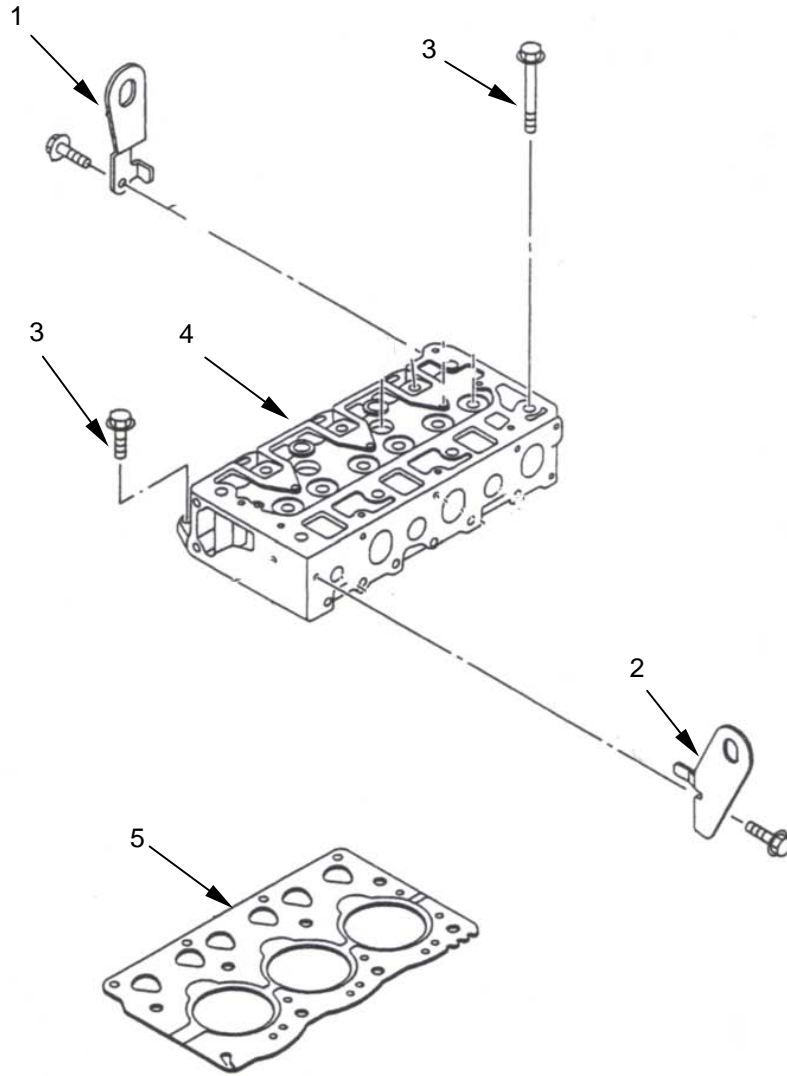


Figure 8. Cylinder Head

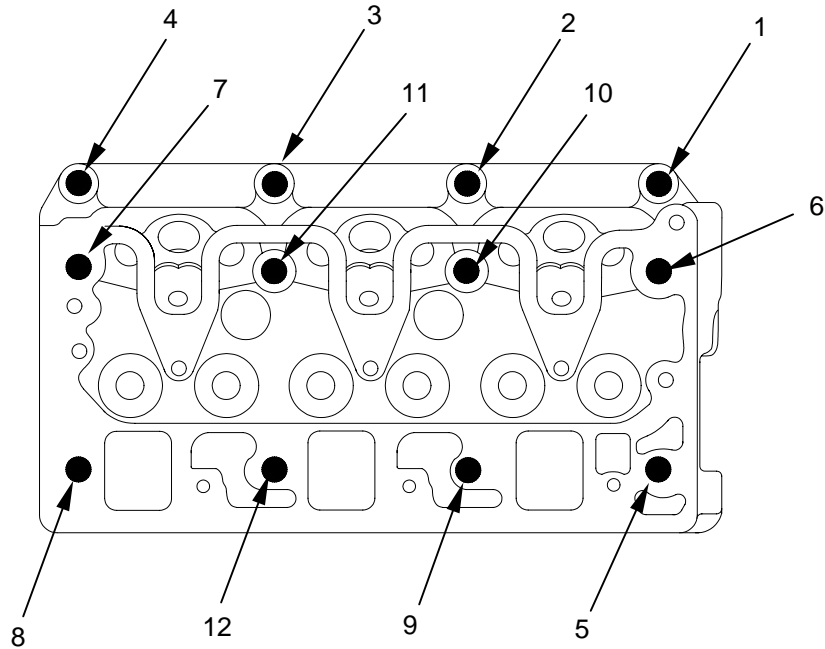


Figure 9. Cylinder Head Bolt Removal Sequence

9. Inspect cylinder body upper face warpage
 - a. Use a straight edge (**figure 10, item 1**) and feeler gauge (**figure 10, item 2**) to measure the four sides and the two diagonals of the cylinder body upper face.
 - b. If the measured value exceeds the maximum allowance or if the measured value is less than the limit, the engine must be replaced.

Cylinder Body Upper Face Warpage		mm (in.)
Standard		Limit
0.075 (0.0029)		0.15 (0.0059)

Cylinder Body Height (Reference)		mm (in.)
Standard		Limit
281 (11.0630)		280.7 (11.0512)

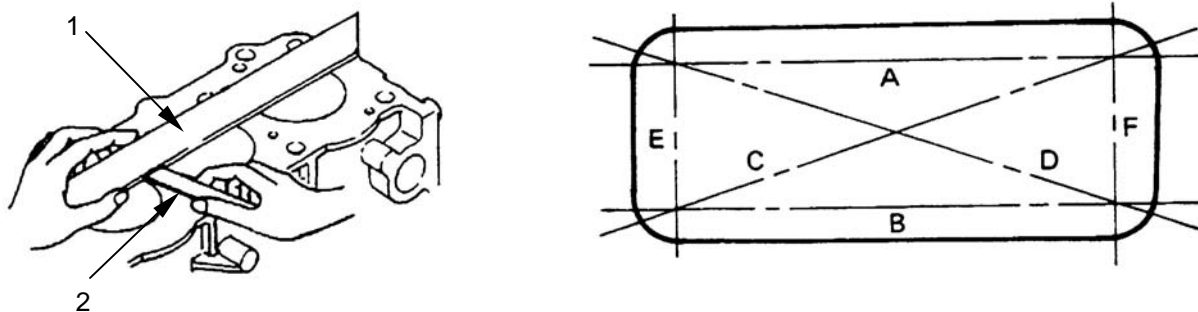


Figure 10. Cylinder Body Upper Face

10. Inspect cylinder head lower face warpage

- a. Use a straight edge (figure 11, item 1) and feeler gauge (figure 11, item 2) to measure the four sides and two diagonals of the cylinder head lower face.
- b. If the measured values exceed the maximum allowance, the engine must be replaced.

Cylinder Body Lower Face Warpage		mm (in.)
Standard	Limit	
0.075 (0.0029)	0.15 (0.0059)	

Cylinder Body Height (Reference)		mm (in.)
Standard	Limit	
64 (2.5197)	63.7 (2.5079)	

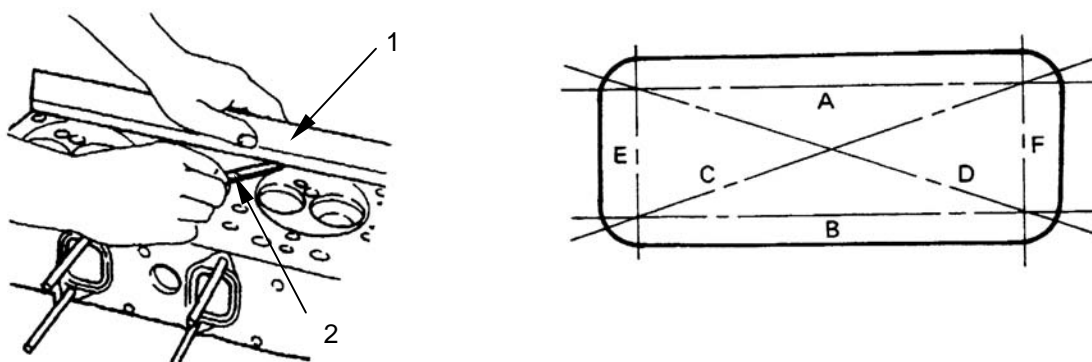


Figure 11. Cylinder Lower Face

11. Install cylinder head

- a. Wipe mating surfaces clean on engine block and cylinder head seating surfaces using a lint free cloth.
- b. Install the new head gasket (**figure 12, item 1**) with the stamp mark of the part number facing up (**figure 12, item 2**). The gasket part number is located between the No. 2 and No. 3 cylinders on the gasket.
- c. Install the cylinder head (**figure 12, item 3**) on the engine block.
- d. Lubricate the cylinder head mounting bolts (**figure 12, item 4**) with oil.
- e. Install the M12 bolts (**figure 13, item 1 through 8**) and M8 bolts (**figure 13, item 9 through 12**) hand tight.
- f. Tighten the bolts in the sequence shown in figure 13 to the following torques: M12X1.5 8.5 to 9.5 kg-m (61-69 ft-lbs). M8X1.25 18-25 kg-m (61-69 ft-lbs).
- g. Torque the bolts in the sequence in figure 13 an additional 60° (one flat of the bolt).
- h. Install and tighten front (**figure 12, item 5**) and rear hangers (**figure 12, item 6**) from 1.9 to 2.9 kg-m. (14 to 16 ft-lbs).

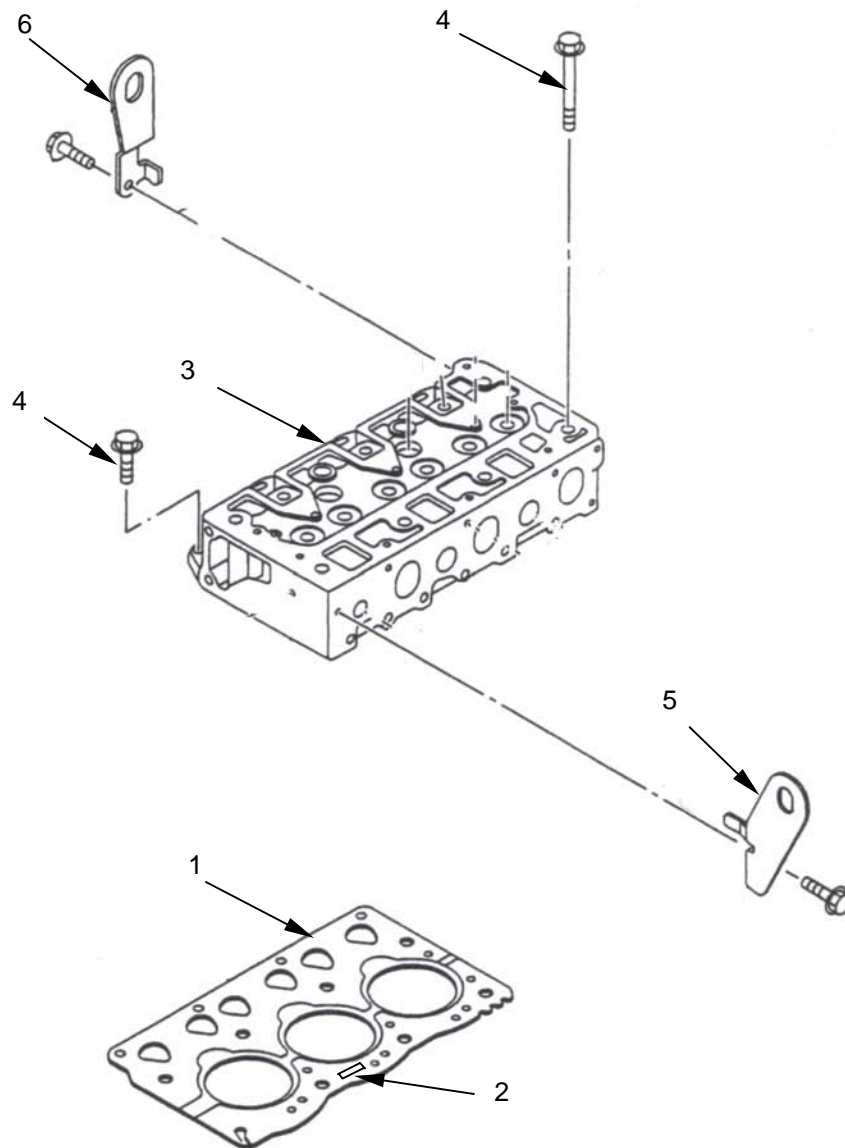


Figure 12. Cylinder Head

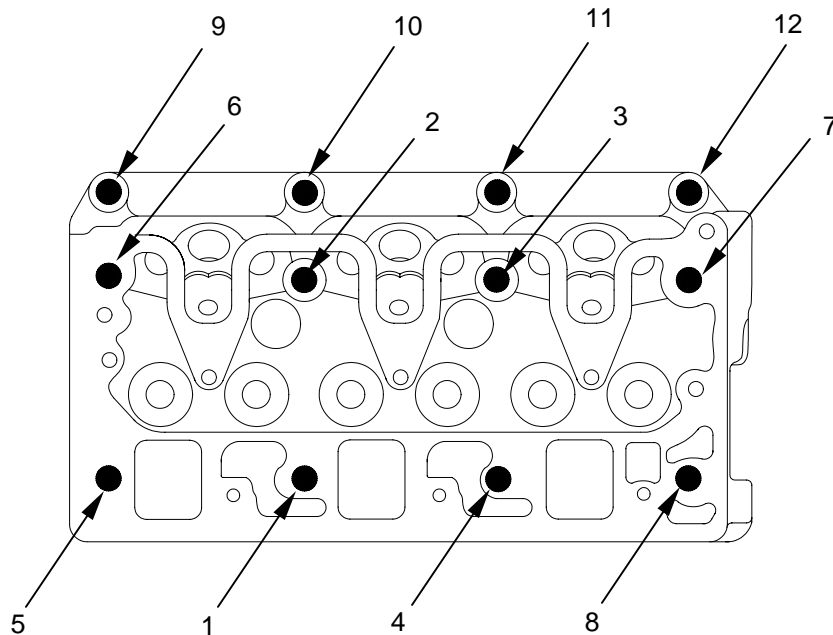


Figure 13. Cylinder Head Bolt Installation Sequence

12. Install rocker bracket.
 - a. Install the push rods (**figure 14, item 1**).
 - b. Apply liquid gasket (**figure 15, item 1**) to the bottom of the rocker arm bracket assembly (**figure 14, item 2**). Do not get any liquid gasket in the oil galley (**figure 15, item 2**).
 - c. Install rocker arm bracket assembly (**figure 14, item 2**) ensuring push rods (**figure 14, item 1**) align with the rocker arm. Tighten from 0.8 to 1.2 kg-m (6-9 ft-lbs).
 - d. Install mounting nuts (**figure 14, item 3**) (qty 5).
 - e. Torque mounting nuts from 0.8 to 1.2 kg-m (5.8 to 8.7 ft-lbs).
 - f. Install mounting bolts (**figure 14, item 4**) (qty 4).
 - g. Torque mounting bolts from 0.8 to 1.2 kg-m (5.8 to 8.7 ft-lbs).

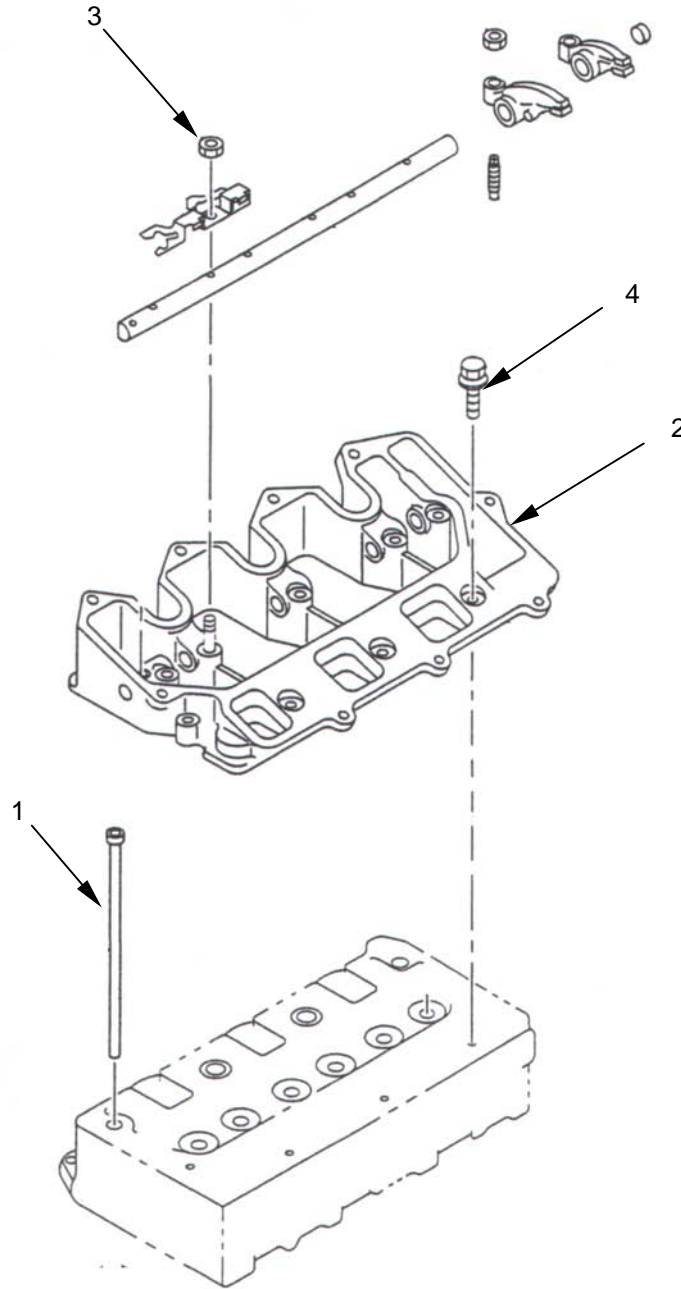


Figure 14. Rocker Bracket Assembly

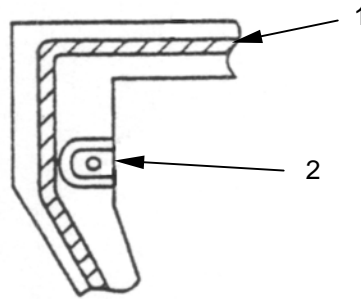


Figure 15. Oil Galley

13. Install items removed for rocker arm bracket and head gasket access.
- Install fuel line (**figure 16, item 1**) and fasten with hose clamps (**figure 16, item 2**).
 - Install wiring (**figure 16, item 3**) and remove tags.
 - Install glow plug connector (**figure 17, item 1**) and fasten with glow plug connector mounting nuts (**figure 17, item 2**).
 - Install radiator bracket (**figure 17, item 3**) and fasten with mounting bolts (**figure 17, item 4**).
 - Install fuel lines (**figure 17, item 5**) and tighten.
 - Install fuel hoses (**figure 17, item 6**) and fasten with hose clamps (**figure 17, item 7**).

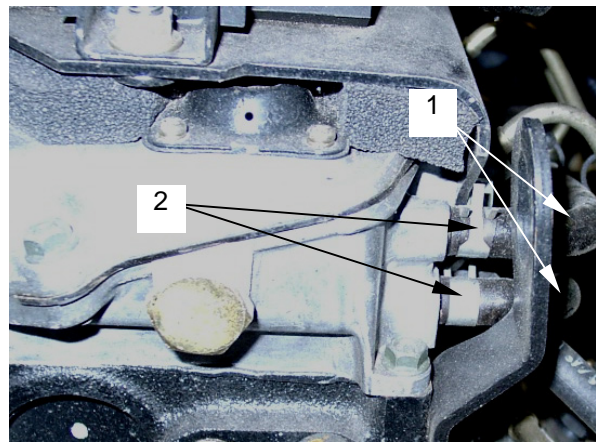
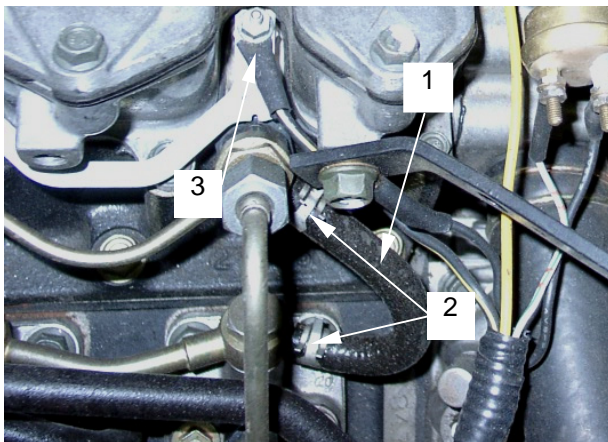


Figure 16. Fuel Hoses

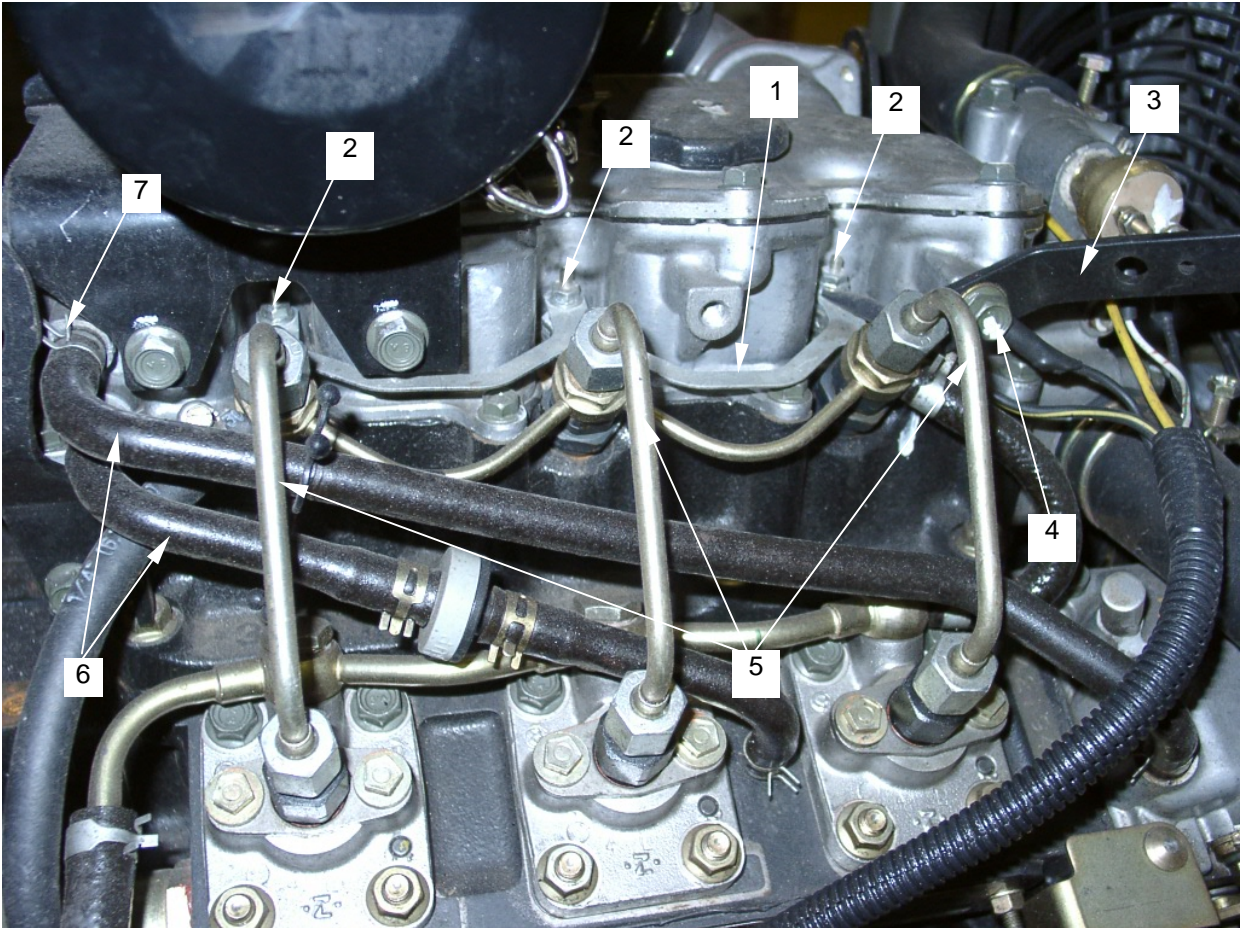


Figure 17. Rocker Head and Head Gasket Access

14. Install cover

NOTE

Ensure the gasket does not get dislocated or twisted when installing the cover. Do not install liquid gasket to the rubber gasket.

- a. Ensure mating surfaces of cylinder head and cylinder head cover are clean.
- b. Install new gasket (**figure 18, item 1**) to cylinder head.
- c. Install cylinder head cover (**figure 18, item 2**).
- d. Install cylinder head cover mounting bolts (**figure 18, item 3**).
- e. Tighten cylinder head mounting bolts from 0.2 to 0.5 kg-m (1.4-3.6 ft-lbs).

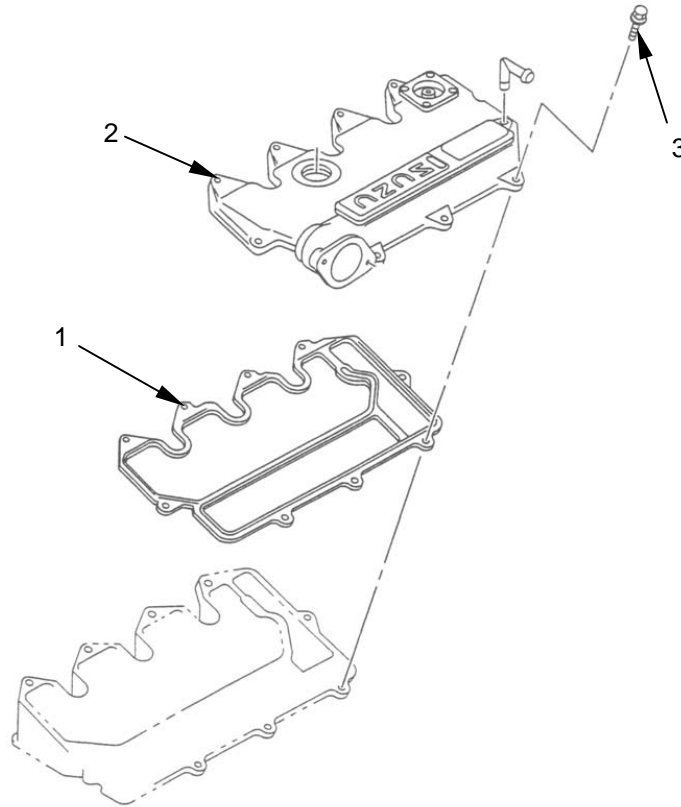


Figure 18. Cylinder Cover

15. Install exhaust manifold

- a. Ensure mating surfaces of exhaust manifold and engine are clean.
- b. Install gasket (**figure 19, item 1**) and exhaust manifold (**figure 19, item 2**) on engine.
- c. Fasten exhaust manifold with mounting nuts (**figure 19, item 3**) (qty 4).
- d. Fasten exhaust manifold with mounting bolts (**figure 19, item 4**) (qty 2).
- e. Torque mounting nuts from 1.9 to 2.9 kg-m (13.7-21.0 ft-lbs).
- f. Torque mounting bolts from 1.9 to 2.9 kg-m (13.7-21 ft-lbs).
- g. Install elbow gasket (**figure 19, item 5**) and elbow (**figure 19, item 6**) on exhaust manifold.
- h. Fasten elbow in place with mounting nuts (**figure 19, item 7**).

- i. Torque mounting nuts from 1.9 to 2.9 kg-m (13.7-21.0 ft-lbs).

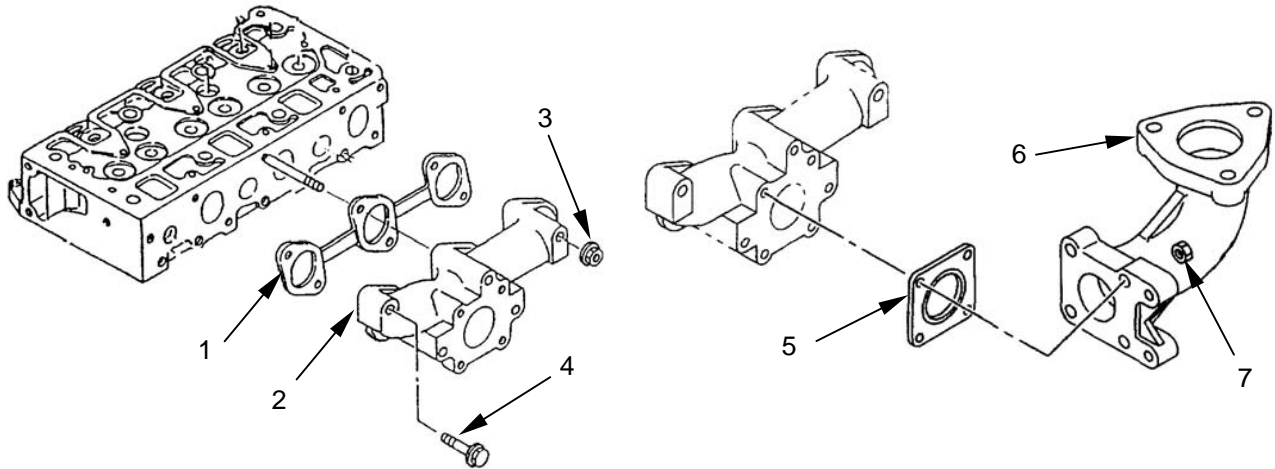


Figure 19. Exhaust manifold and elbow

- j. Install radiator bracket (figure 20, item 1).
- k. Fasten radiator bracket in place with mounting bolts (figure 20, item 2) and nuts (figure 20, item 3).

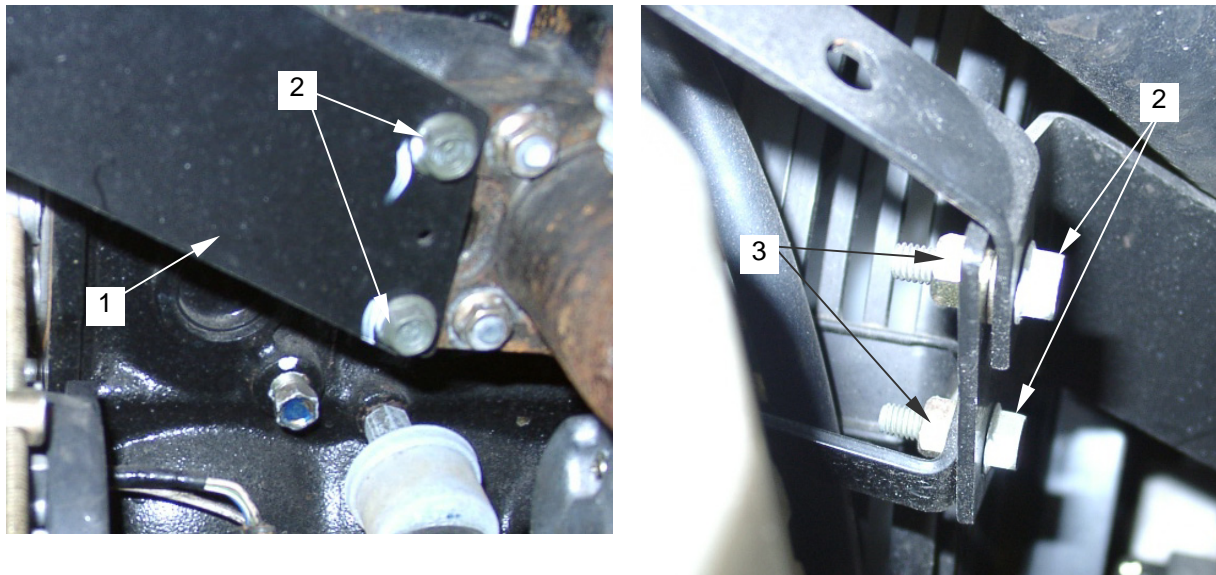


Figure 20. Radiator Bracket

16. Install air filter
 - a. Install foam padding (**figure 21, item 1**) on top of engine cover.
 - b. Slide hose clamps (**figure 21, item 2**) over flex hose (**figure 21, item 3**).
 - c. Connect air filter assembly (**figure 21, item 4**) to engine with flex hose (**figure 21, item 3**) attached.
 - d. Tighten hose clamps (**figure 21, item 2**).
 - e. Install lockwashers (**figure 21, item 5**) and tighten mounting bracket nuts (**figure 21, item 6**) and bolts (**figure 21, item 7**).

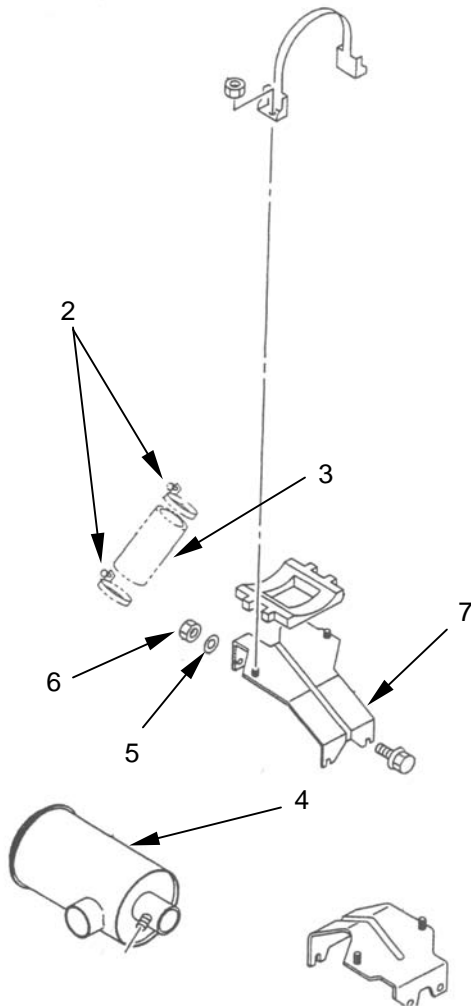


Figure 21. Air Filter

NOTE

The diesel engine and vacuum pump are mounted on a skid. The skid is removed from the trailer when the engine and/or vacuum pump must be replaced. Overhead lifting equipment with a capacity of at least 2,000 pounds is necessary to remove/install the skid with the engine and vacuum pump installed.

To replace the engine, proceed as follows:

1. Ensure battery cable is disconnected at negative terminal.
2. Remove the oil catch muffler as described in WP 0033 00.
3. Remove the moisture trap as described in WP 0031 00.
4. Remove the control panel as described in WP 0027 00.
5. Remove the equipment tray (toolbox side only) as described in WP 0039 00.
6. Remove the wire harness (**figure 22, item 1**) from the control panel and engine harness (**figure 22, item 2**). Remove wire harness from engine cable retainers (**figure 22, item 3**).
7. Separate the lighting harness plug (**figure 22, item 4**).

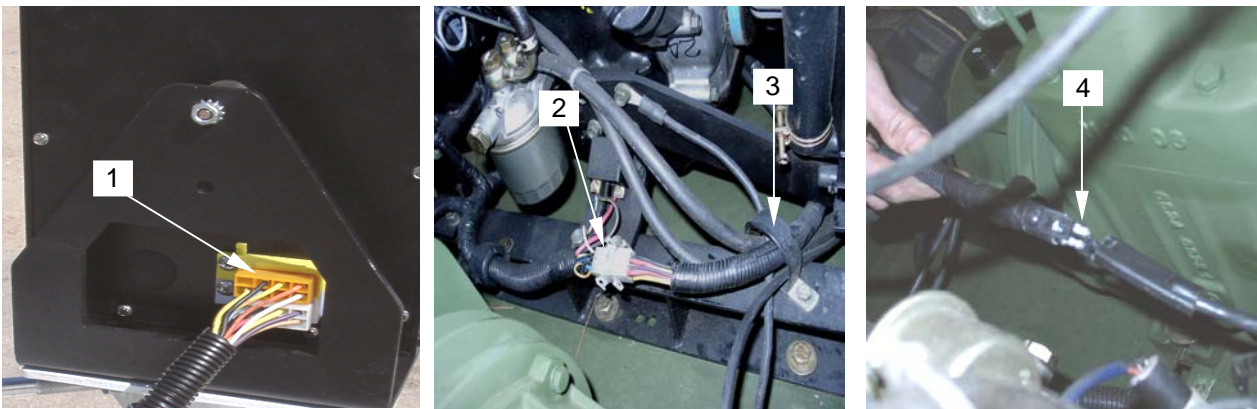


Figure 22. Control Panel and Lighting Harness

8. Remove the fuel supply and return hoses from the fuel tank as described in WP 0028 00.
9. Remove throttle from control post and engine as described in WP 0026 00.
10. Loosen hose clamps on vacuum pump hose (**figure 23, item 1**) and breather hose (**figure 23, item 2**) at vacuum pump ports (**figure 23, item 3**), retain clamps. Remove hoses.

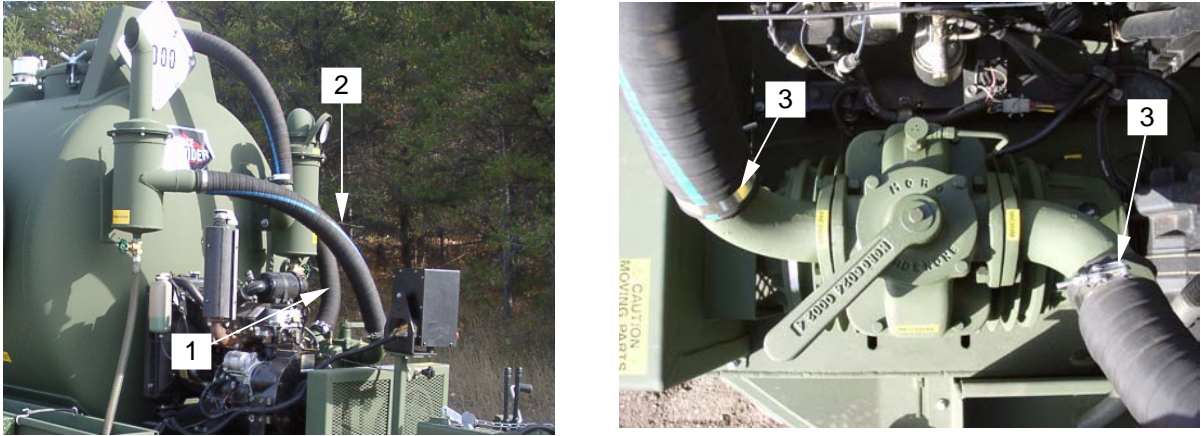


Figure 23. Removing Air Hoses



WARNING

The wastewater evacuation tank trailer is heavy. To prevent injuries, never stand or reach under a suspended trailer. Ensure lifting equipment is of adequate capacity (2,000 pounds) and operator is trained and approved to use the equipment. Have dunnage available and in position below the trailer.

11. Remove seven bolts, nuts and flat washers (**figure 24, item 1**), securing the engine/vacuum pump skid (**figure 24, item 2**) to the trailer frame (**figure 24, item 3**).

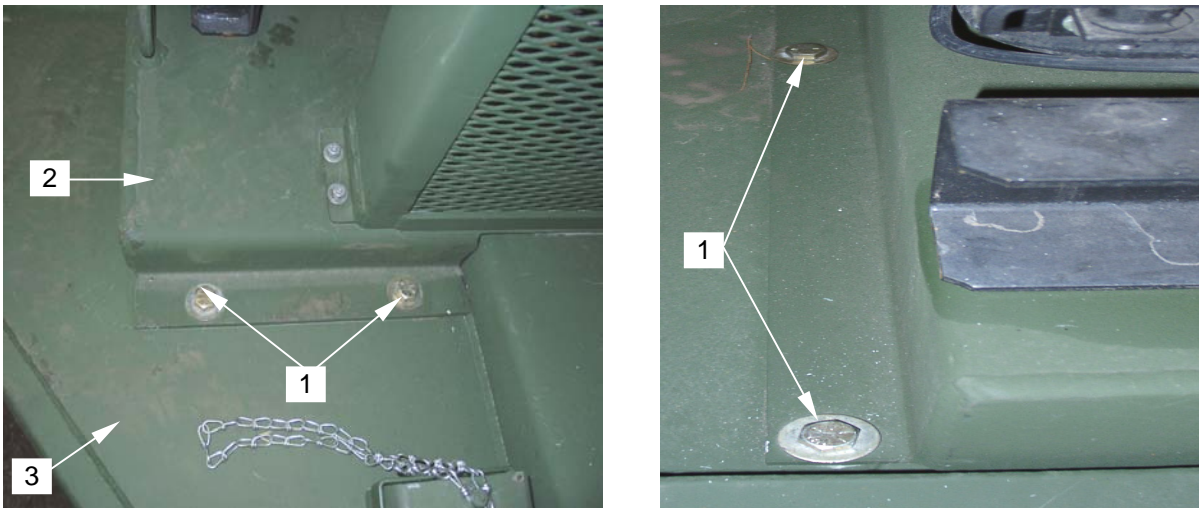


Figure 24. Removing Skid Mounting Bolts

CAUTION

To maintain balance of the skid while suspended, it is important to position the rear lifting chain behind the vacuum pump.

12. Attach lift hooks (**figure 25, item 1**) to skid lifting eyes (**figure 25, item 2**) as shown. Ensure rear lifting chain (**figure 25, item 3**) is positioned behind vacuum pump port (**figure 25, item 4**).

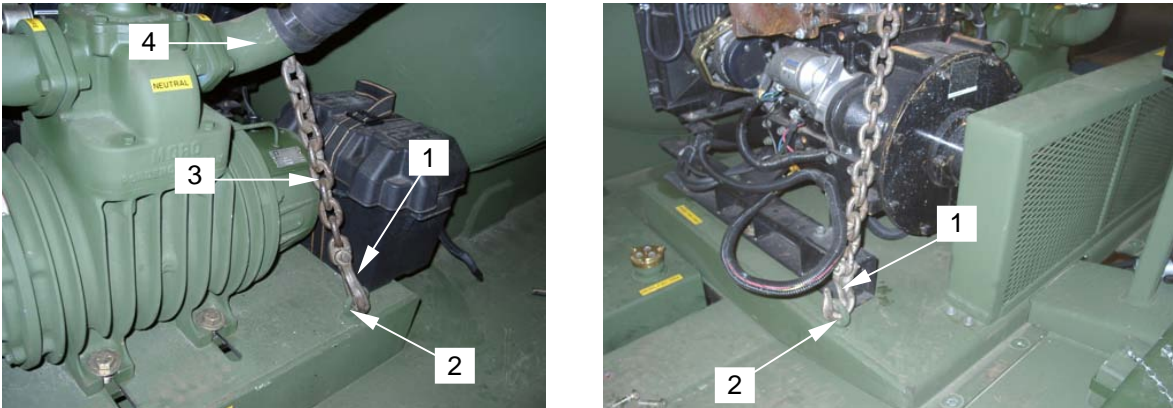


Figure 25. Attaching Lifting Hooks

**WARNING**

The engine/vacuum pump skid is heavy. To prevent injuries, never stand or reach under a suspended skid. Ensure lifting equipment is of adequate capacity (2,000 pounds) and operator is trained and approved to use the equipment. Have dunnage ready and in position to set the skid onto.

13. Lift engine/vacuum pump skid (**figure 26, item 1**) off the trailer frame and set it upon dunnage (**figure 26, item 2**) (preferably lengths of 2-inch x 4-inch lumber).

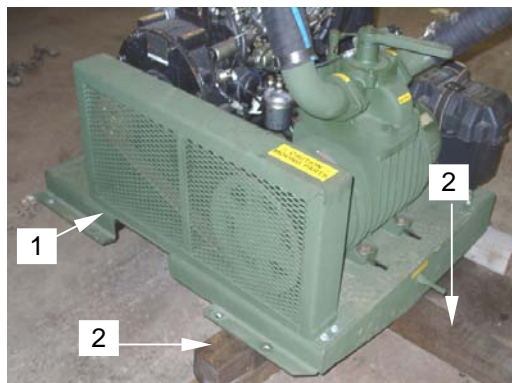


Figure 26. Setting Skid onto Dunnage

14. Remove the drive belt guard from the skid as described in WP 0044 00.
15. Remove the drive belt as described in WP 0029 00.
16. Remove the battery cables as described in WP 0034 00. Retain cables.
17. Remove the engine mounting bolts, nuts and flat washers (**figure 27, item 1**) that secure the engine (**figure 27, item 2**) frame to the skid (**figure 27, item 3**).

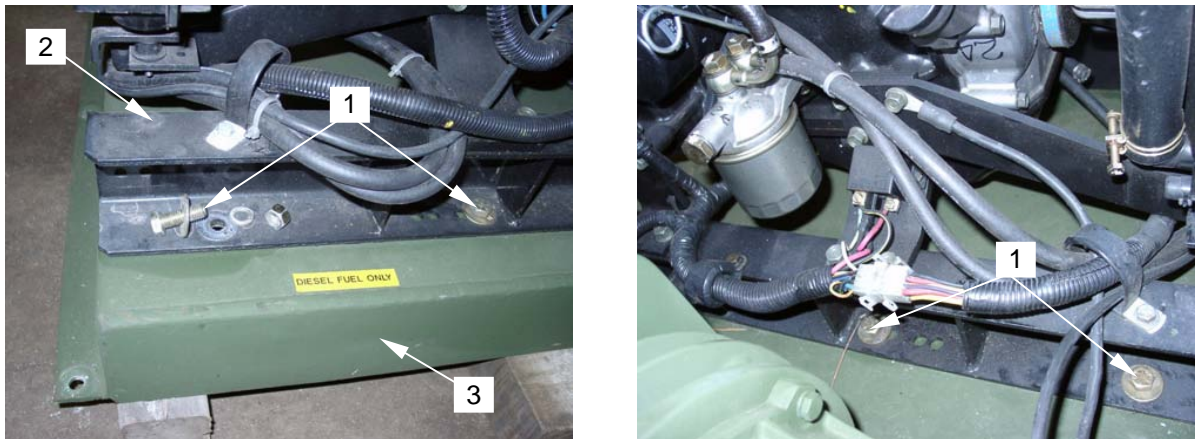


Figure 27. Removing Engine Mounting Hardware



WARNING

The engine is heavy. To prevent injuries, never stand or reach under a suspended engine. Ensure lifting equipment is of adequate capacity (2,000 pounds) and operator is trained and approved to use the equipment. Have dunnage ready and in position to set the engine onto.

18. Attach lift hooks to the engine brackets and lift the engine off the skid.
19. Remove the pulley from the engine drive shaft as follows:
 - a. Remove three bolts and flat washers (**figure 28, item 1**) that hold the pulley adapter (**figure 28, item 2**) to the engine drive shaft.
 - b. Install bolts removed into the threaded holes (**figure 28, item 3**) on the face of the pulley adapter as shown.

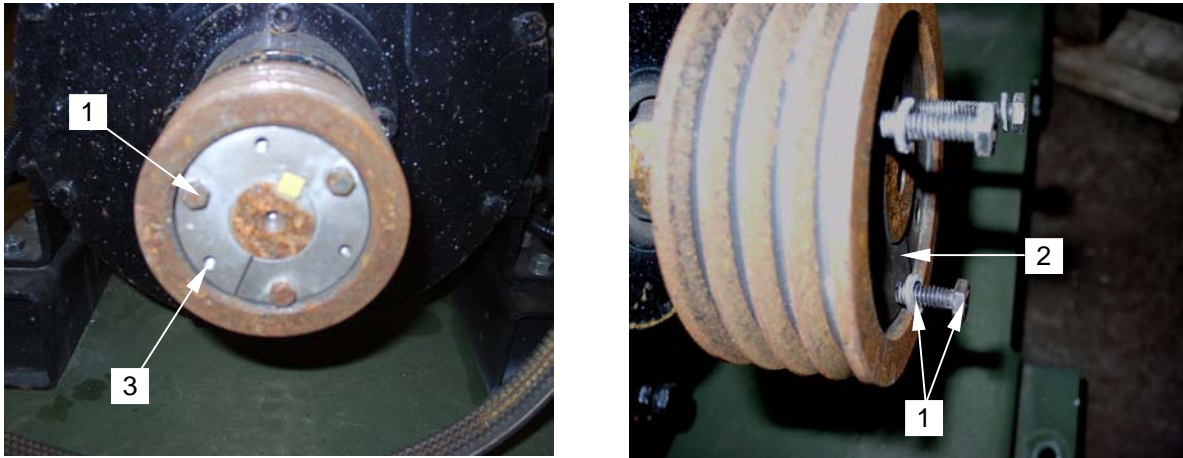


Figure 28. Removing the Engine Pulley Adapter

- c. Keep tightening the bolts in a star pattern until the pulley adapter (**figure 29, item 1**) is extracted. Recover and retain key.
 - d. Remove the pulley (**figure 29, item 2**) and pulley rim from the drive shaft (**figure 29, item 3**).
20. Install the pulley on the replacement engine as follows:
- a. Place pulley (**figure 29, item 2**) with deep stop towards engine onto drive shaft (**figure 29, item 3**).
 - b. Ensuring that the key is in place, install pulley adapter (**figure 29, item 1**) onto drive shaft.
 - c. Install three bolts and flat washers (**figure 29, item 4**) to secure the pulley in place.

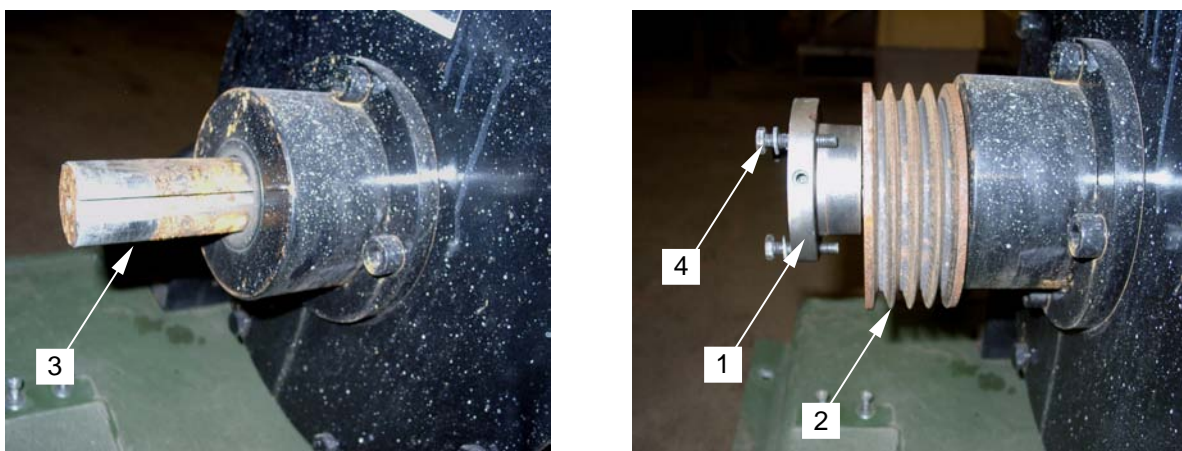


Figure 29. Removing the Engine Pulley and Rim



WARNING

The engine is heavy. To prevent injuries, never stand or reach under a suspended engine. Ensure lifting equipment is of adequate capacity (2000-lbs) and operator is trained and approved to use the equipment.

21. Attach lift hooks to new engine and lift the engine onto the skid lining up the holes (**figure 30, item 1**) to install the mounting hardware.
22. Install the engine mounting bolts, nuts and flat washers (**figure 30, item 1**) that secure the engine to the skid (**figure 30, item 2**).

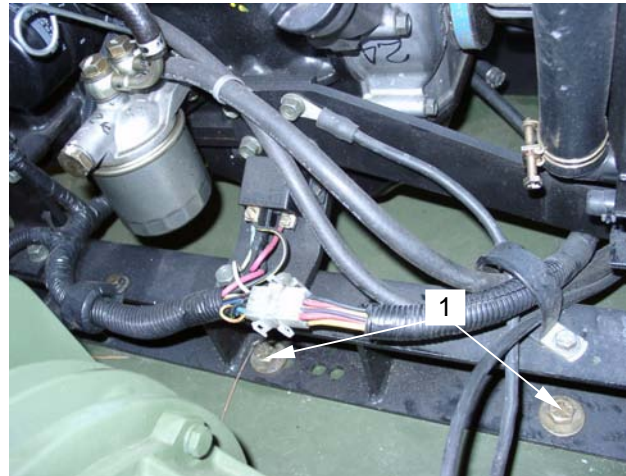
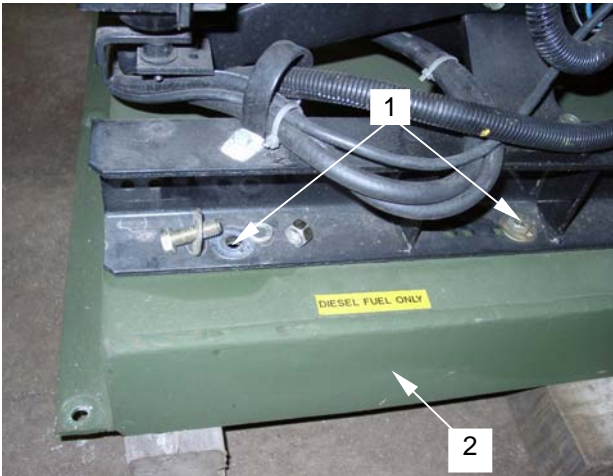


Figure 30. Installing Engine onto Skid

23. Install the drive belt as described in WP 0029 00.
24. Install the pulley guard onto the skid as described in WP 0044 00.

CAUTION

To maintain balance of the skid while suspended, it is important to position the rear lifting chain behind the vacuum pump.

25. Attach lift hooks (**figure 31, item 1**) to skid lifting eyes (**figure 31, item 2**) as shown. Ensure rear lifting chain (**figure 31, item 3**) is positioned behind vacuum pump port (**figure 31, item 4**).

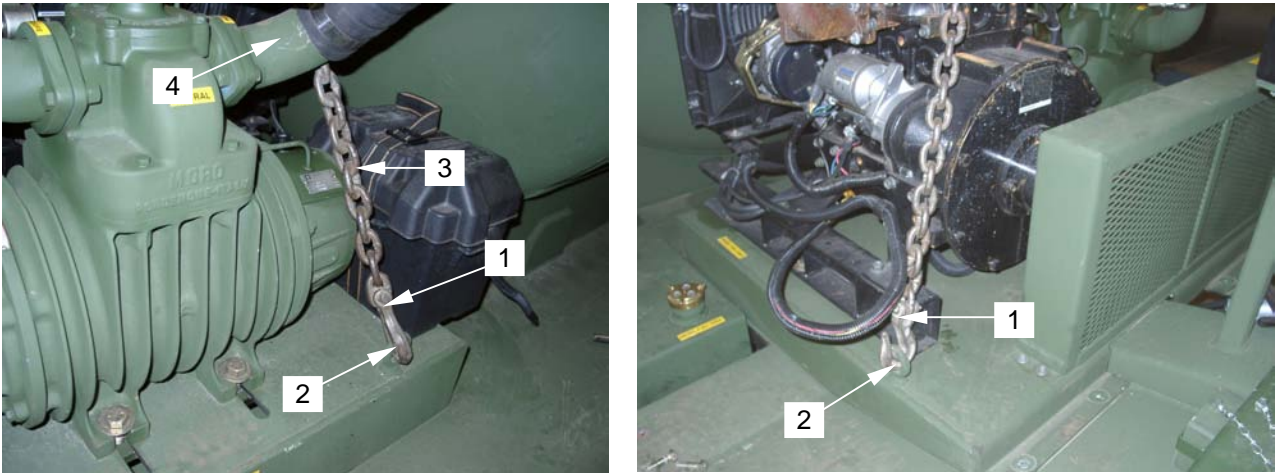


Figure 31. Attaching Lifting Hooks



WARNING

The engine/vacuum pump is heavy. To prevent injuries, never stand or reach under a suspended skid. Ensure lifting equipment is of adequate capacity (2000-lbs) and operator is trained and approved to use the equipment.

26. Lift engine/vacuum pump skid (**figure 32, item 1**) off the dunnage and set it upon trailer frame so that mounting holes (**figure 32, item 2**) are aligned.
27. Install seven bolts, nuts and flat washers (**figure 32, item 3**), securing the engine/vacuum pump skid (**figure 32, item 1**) to the trailer frame (**figure 32, item 4**).

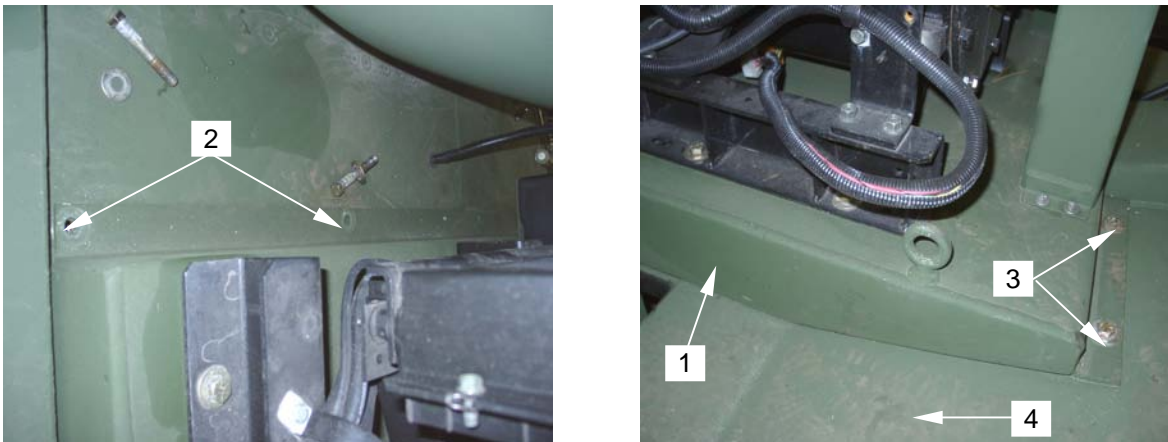


Figure 32. Securing Skid to Trailer Frame

28. Install the fuel supply and return hoses as described in WP 0028 00.
29. Install throttle onto engine and bracket as described in WP 0026 00.

30. Connect wire harness plug (**figure 33, item 1**) to engine harness plug (**figure 33, item 2**) and install wire harness (**figure 33, item 3**) onto engine cable retainers (**figure 33, item 4**).

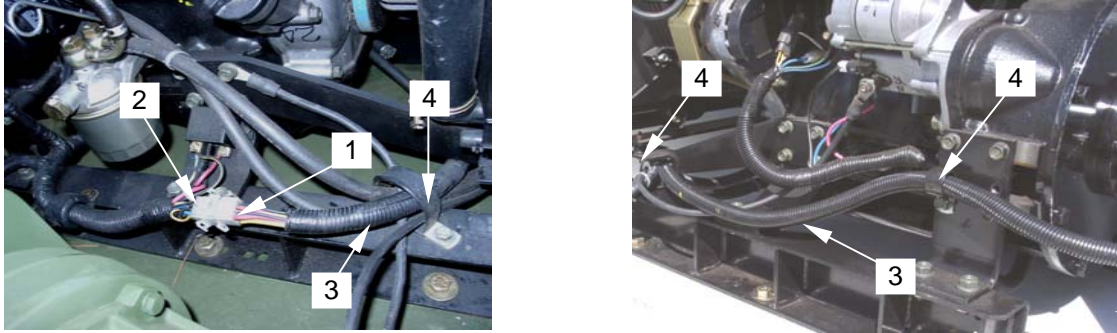


Figure 33. Installing Wire Harness

31. Install the battery cables (onto the engine only) as described in WP 0034 00.
32. Connect the lighting harness plug (**figure 34, item 1**)

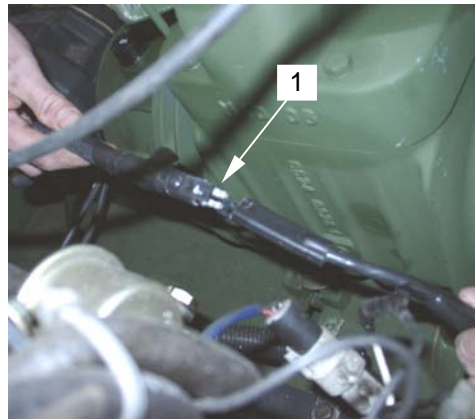


Figure 34. Connecting Lighting Harness

33. Install the oil catch muffler as described in WP 0033 00.
34. Install the moisture trap as described in WP 0031 00.
35. Install the equipment tray (toolbox side only) as described in WP 0039 00.
36. Install the control box as described in WP 0027 00.
37. Ensure the engine and coolant levels are filled as necessary in WP 0026 00.
38. Install the battery cables onto the battery as described in WP 0034 00.

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
NSN 4630-01-513-8155
VACUUM PUMP
REPLACE**

INITIAL SETUP:**Tools**

Lifting Equipment (WP 0053 00, Table 2, Item 5)
Sling, Chain And Hook (WP 0053 00, Table 2, Item 12)
Tool Kit, General Mechanic's, Automotive (WP 0053 00, Table 2, Item 15)
Wrench, Half, 15/16-inch (WP 0053 00, Table 2, Item 18)

Personnel Required

63B Light Vehicle Mechanic

Materials/Parts

Antifreeze, Ethylene Glycol (WP 0091 00, Item 1)
Gasket, Liquid (WP 0091 00, Item 14)
Gloves, Work (WP 0089 00, Table 2, Item 5)
Oil, SAE40W, Nondetergent (WP 0091 00, Item 21)
Rags, Wiping (WP 0091 00, Item 28)
Tags, Marking (WP 0091 00, Item 32)

Equipment Condition

Engine shut off
Ignition key removed
Emergency stop button pushed in
Wheel chocked
Emergency brake set

REPLACE**NOTE**

The diesel engine and vacuum pump are mounted on a skid. The skid is removed from the trailer when the engine and/or vacuum pump must be replaced. Overhead lifting equipment with a capacity of at least 2,000 pounds is necessary to remove/install the skid with the engine and vacuum pump on it.

To replace the vacuum pump, proceed as follows:

1. Ensure the battery cable is disconnected at the negative terminal.
2. Remove the oil catch muffler as described and noted in WP 0033 00.
3. Remove the moisture trap as described and noted in WP 0031 00.
4. Remove the tool box as described in WP 0041 00.
5. Remove the control panel as described in WP 0027 00.
6. Remove the equipment tray (tool box side only) as described in WP 0039 00.
7. Remove the wire harness (**figure 1, item 1**) from the control panel and engine harness (**figure 1, item 2**). Remove wire harness from engine cable retainers (**figure 1, item 3**).
8. Separate the lighting harness plug (**figure 1, item 4**).

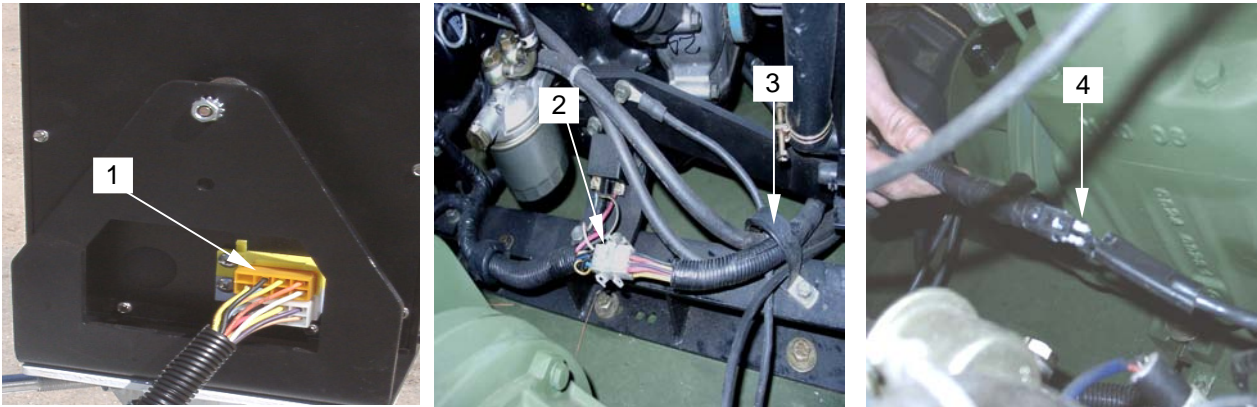


Figure 1. Control Panel and Lighting Harness



WARNING

Use suitable container to catch any fuel draining from disconnected hoses.

9. Remove the fuel supply and return hoses from the fuel tank as described in paragraph 4., and 5., of WP 0028 00.
10. Remove throttle from control post and engine as described in step 1., WP 0044 00.
11. Loosen hose clamps on vacuum pump hose (**figure 2, item 1**) and breather hose (**figure 2, item 2**) at vacuum pump ports (**figure 2, item 3**). Remove hoses.

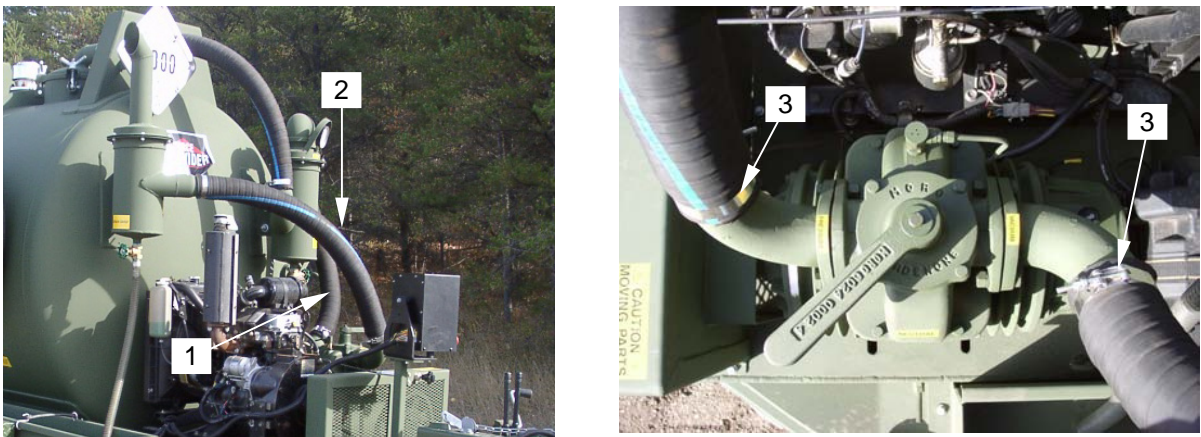


Figure 2. Removing Air Hoses

12. Remove seven bolts, nuts and flat washers (**figure 3, item 1**), securing the engine/vacuum pump skid (**figure 3, item 2**) to the trailer frame (**figure 3, item 3**).

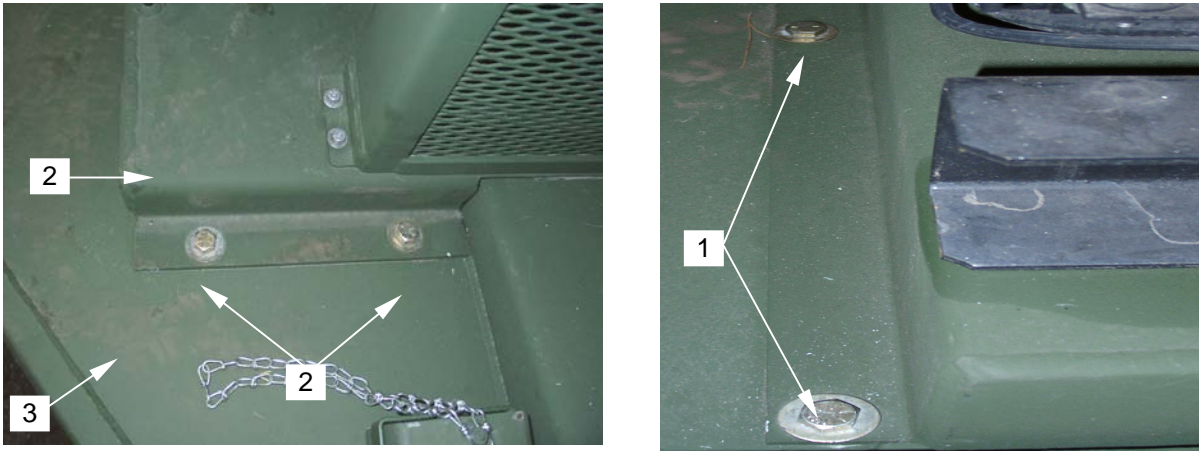


Figure 3. Removing Skid Mounting Bolts

CAUTION

To maintain balance of the skid while suspended, it is important to position the rear lifting chain behind the vacuum pump port.

13. Attach lift hooks (figure 4 item 1) to skid lifting eyes (figure 4 item 2) as shown. Ensure rear lifting chain (figure 4 item 3) is positioned behind vacuum pump port (figure 4 item 4).

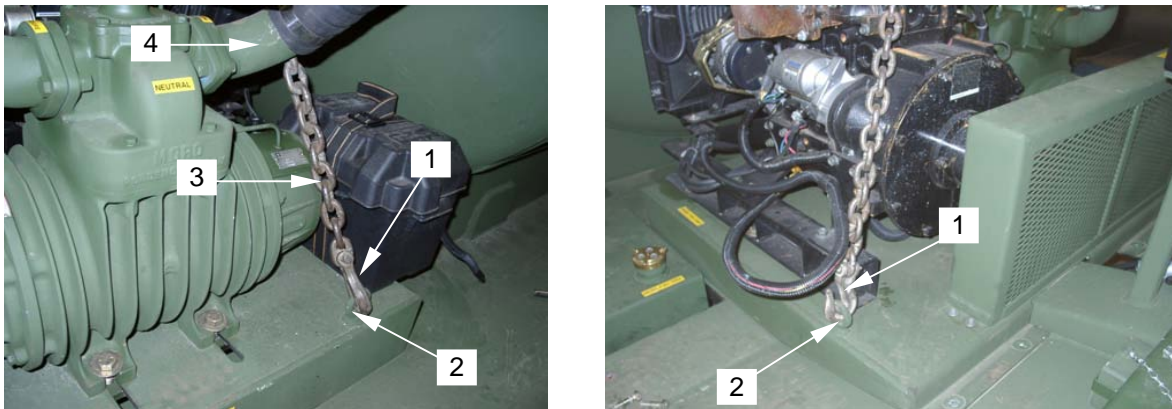


Figure 4. Attaching Lifting Hooks



WARNING

The engine/vacuum pump skid is heavy. To prevent injuries, never stand or reach under a suspended skid. Ensure lifting equipment is of adequate capacity (2,000 pounds) and operator is trained and approved to operate the equipment. Have dunnage ready and in position to set the skid onto.

14. Lift engine/vacuum pump skid (**figure 5, item 1**) off the trailer frame and set it upon dunnage (**figure 5, item 2**) (preferably lengths of 2-inch x 4-inch lumber).

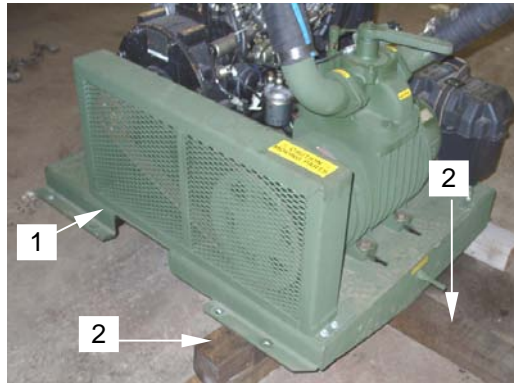


Figure 5. Setting Skid onto Dunnage

15. Remove the pulley guard from the skid as described in steps 2., and 3., of WP 0044 00.
16. Loosen the vacuum pump outside mounting bolts and flat washers (**figure 6, item 1**). Retain bolts and washers.



WARNING

The vacuum pump inside mounting bolts are located in a restricted space. Exercise caution and wear gloves when loosening and tightening these bolts to avoid injuries due to pinching.

17. Loosen the vacuum pump inside mounting bolts and flat washers (**figure 6, item 2**). Retain bolts and washers.



Figure 6. Removing Vacuum Pump Mounting Bolts

- 18. Loosen belt tensioning nuts (**figure 7, item 2**) on belt adjuster (**figure 7, item 3**).
- 19. Push vacuum pump towards the engine to loosen and remove the drive belt (**figure 7, item 1**).



Figure 7. Drive Belt and Belt Adjuster

- 20. Remove pulley (**figure 8, item 1**), pulley adapter (**figure 8, item 2**), flanged pump shaft extension (**figure 8, item 3**) and tapered shaft coupler (**figure 8, item 4**) from the vacuum pump and install onto new pump as described in steps 2., through 18., under REPLACE in WP 0030 00.

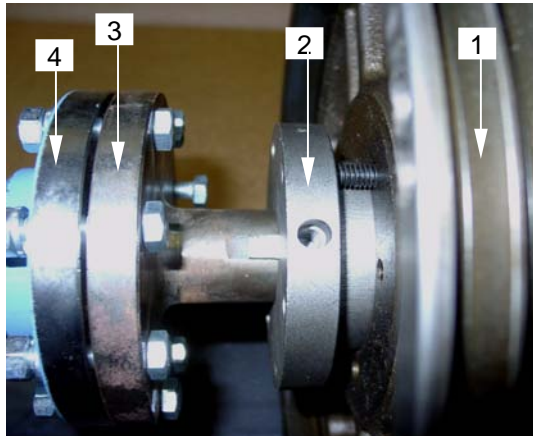


Figure 8. Vacuum Pump Pulley Assembly



WARNING

The vacuum pump weighs in excess of 150 pounds. To avoid injury, do not attempt to lift the pump. Use a mechanical lifting device to remove a pump and install a new one onto the trailer skid.

21. Secure the vacuum pump with a lifting strap. Remove the vacuum pump from the skid using a mechanical lifting device. Place new pump onto the skid in the same manner. Align the pump legs with the slots in the skid (**figure 9, item 1**).
22. Install hex bolts and flat washers (**figure 9, item 2**) securing the pump to the skid through the pump legs (**figure 9, item 3**) and into the adjuster plate (**figure 9, item 4**). Do not tighten.

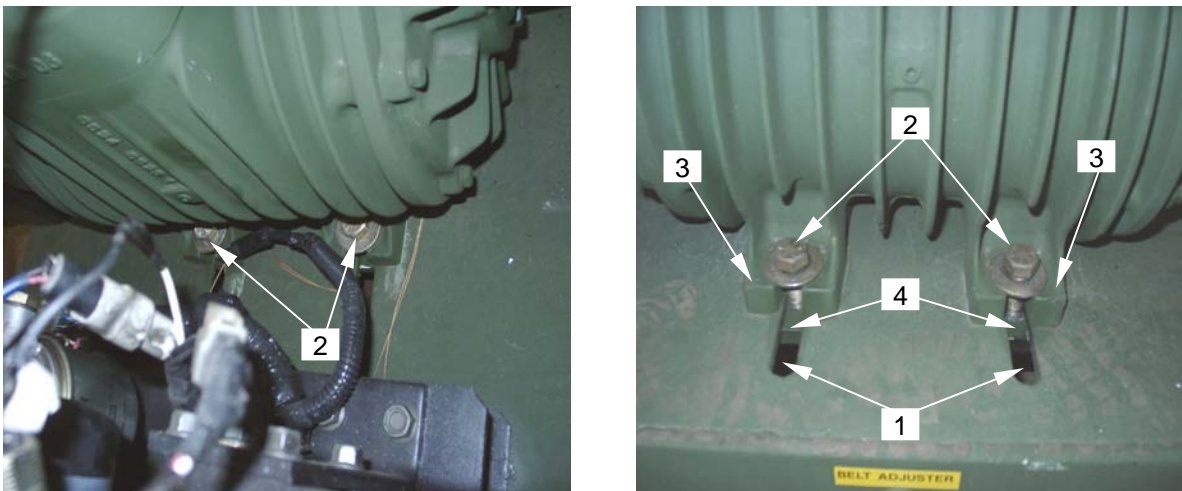


Figure 9. Vacuum Pump Installation

23. Place new, or presently used drive belt onto engine and vacuum pump pulleys.

24. Align pulleys and adjust drive belt as described in steps 7., through 16., as applicable, under REPLACE in WP 0029 00.
25. Tighten down the four vacuum pump bolts.
26. Install the pulley guard as described in steps 17., and 18., of WP 0044 00 then connect throttle cable.

CAUTION

To maintain balance of the skid while suspended, it is important to position the rear lifting chain behind the vacuum pump port.

27. Attach lift hooks (**figure 10 item 1**) to skid lifting eyes (**figure 10 item 2**) as shown. Ensure rear lifting chain (**figure 10 item 3**) is positioned behind vacuum pump port (**figure 10 item 4**).

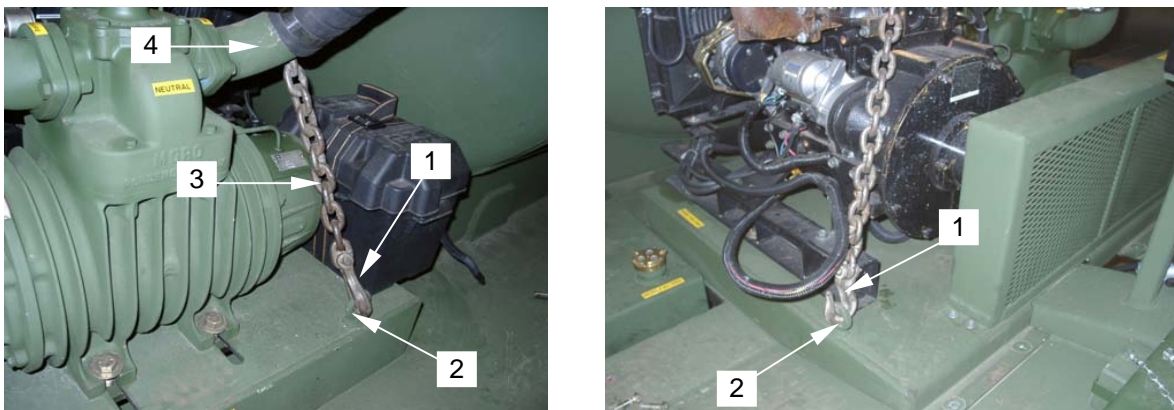


Figure 10. Attaching Lifting Hooks



WARNING

The engine/vacuum pump skid is heavy. To prevent injuries, never stand or reach under a suspended skid. Ensure lifting equipment is of adequate capacity (2,000 pounds) and operator is trained and approved to operate the equipment.

28. Lift engine/vacuum pump skid (**figure 11, item 1**) off the dunnage and set it upon trailer frame so that mounting holes (**figure 11, item 2**) are aligned.
29. Install seven bolts, nuts and flat washers (**figure 11, item 3**), securing the engine/vacuum pump skid (**figure 11, item 1**) to the trailer frame (**figure 11, item 4**).

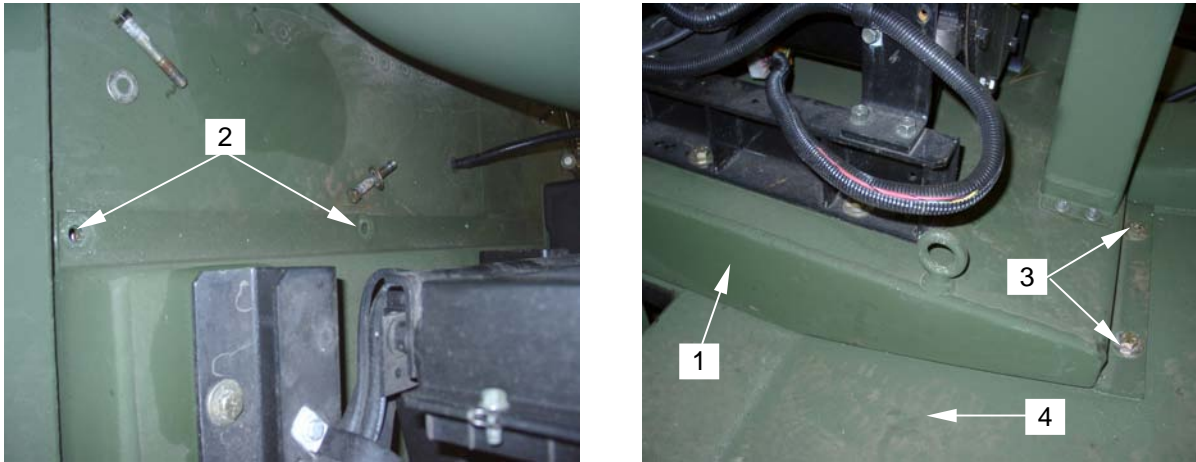


Figure 11. Securing Skid to Trailer Frame

30. Install the throttle as described in step 19., of WP 0026 00.
31. Install the equipment tray as described in steps 6., through 8., of WP 0039 00.
32. Install the tool box as described in steps 1., through 8., of WP 0041 00.
33. Install the control panel as described in steps 1., through 7., of WP 0027 00.
34. Place air hoses onto vacuum pump ports (**figure 12, item 1**) and tighten hose clamps on vacuum pump hose (**figure 12, item 2**) and breather hose (**figure 12, item 3**).

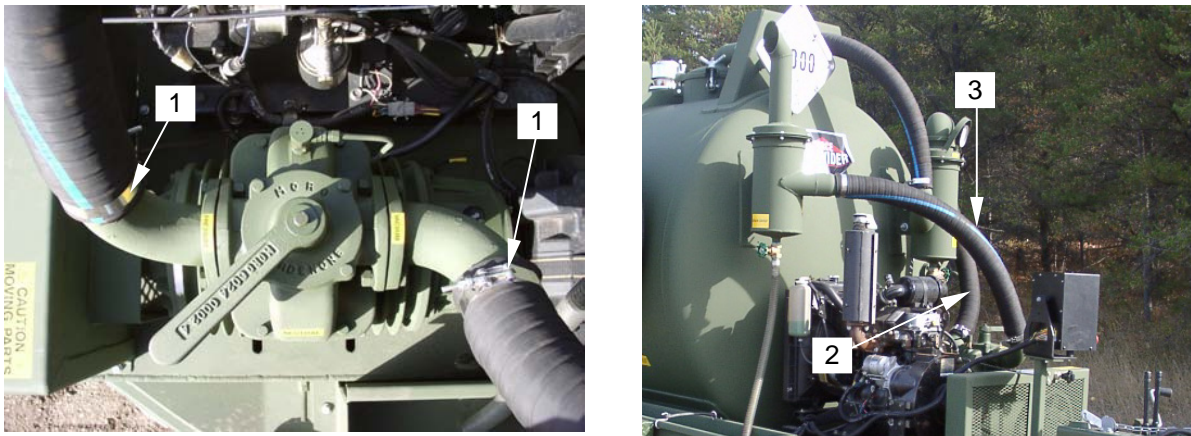


Figure 12. Installing Air Hoses

35. Install the fuel supply (**figure 13, item 1**) and return hoses (**figure 13, item 2**) onto the fuel tank fittings. Tighten hose clamps (**figure 13, item 3**).

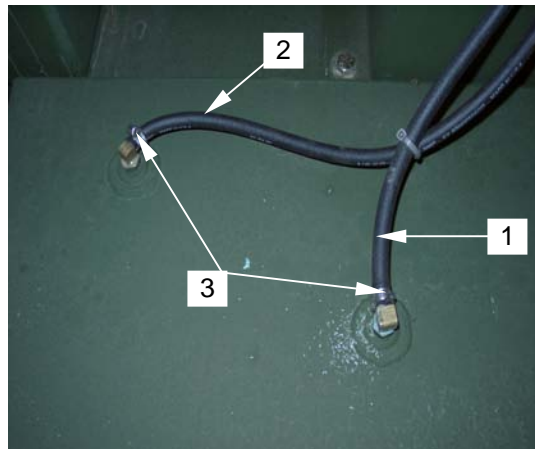


Figure 13. Installing Fuel Supply and Return Hoses

36. Reconnect the lighting harness plug (**figure 14, item 1**).
37. Install wire harness through engine cable retainer (**figure 14, item 2**) and to the connector (**figure 14, item 3**).
38. Reconnect the wire harness (**figure 14, item 4**) onto the control panel.

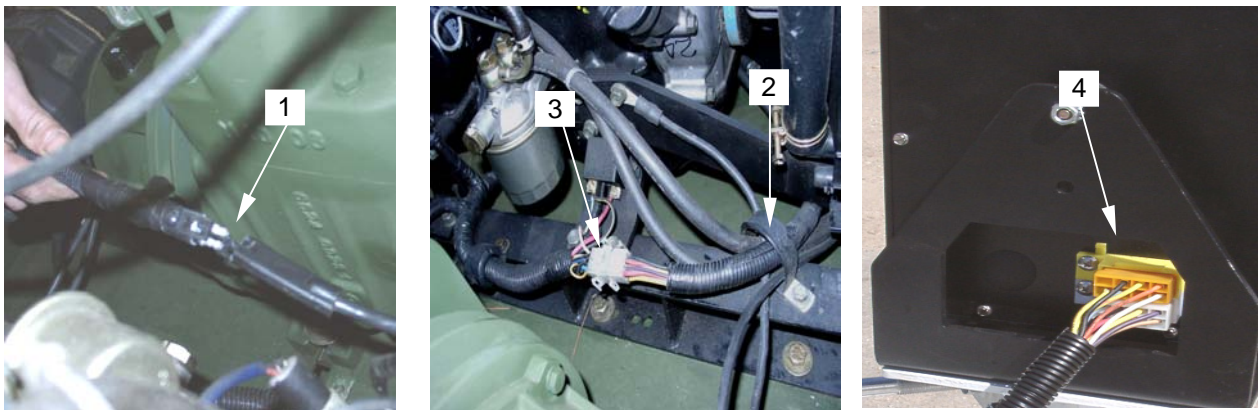


Figure 14. Reconnecting Wire and Lighting Harness

38. Install the oil catch muffler as described in WP 0033 00.

39. Install the moisture trap as described in WP 0031 00.

40. Check and/or fill oil as appropriate.

41. Reconnect the cables to the battery.

END OF WORK PACKAGE

TM 10-4630-207-13&P

CHAPTER 8

SUPPORTING INFORMATION

WASTE WATER EVACUATION TANK TRAILER

**OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
REFERENCES**

SCOPE

This Work Package lists all field manuals, technical manuals, forms, pamphlets, Army regulations, and military standards referenced throughout this manual.

FIELD MANUALS

FM 10-52-1	Water Supply Point, Equipment and Operations
FM 21-10	Field Hygiene and Sanitation
FM 21-11	First Aid for Soldiers
FM 42-424	Quartermaster Force Provider Company

FORMS

SF Form 368	Product Quality Deficiency Report
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2028	Recommended Changes to Equipment Technical Publications
DA PAM 738-750	The Army Maintenance Management System (TAMMS) (Maintenance Management Update)
SF Form 364	Report of Discrepancy

TECHNICAL MANUALS

TM 10-5419-206-13	Operator's, Unit and Direct Support Maintenance Manual for Force Provider
TM 750-244-1-2	Procedure for the Destruction of Life Support Equipment to Prevent Enemy Use
TM 750-244-3	Destruction of Army Materiel to Prevent Enemy Use

MISCELLANEOUS PUBLICATIONS

OSHA Standard 29 CFR 1910.146	Permit-Required Confined Spaces
TB MED 577	Occupational and Environmental Health: Sanitary Control and Surveillance of Field Water Supplies
AR 750-1	Army Materiel Maintenance Policy and Real Maintenance Operations
ASME Y14.38	Abbreviations and Acronyms
CTA 50-970	Expendable/Durable Items (except Medical, Class V Repair Parts, and Heraldic Items)
CTA 8-100	Army Medical Department Expendable/Durable Items
DOT Specification 407	Specification for Cargo Tank Motor Vehicle

**UNIT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
MAINTENANCE ALLOCATION CHART, INTRODUCTION**

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

The MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

- Unit -- includes two subcolumns, C (operator/crew) and O (unit) maintenance
- Direct Support -- includes an F subcolumn
- General Support -- includes an H subcolumn
- Depot -- includes a D subcolumn

The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

Maintenance Functions

Maintenance functions will be limited to and are defined as follows:

1. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gagings and evaluation of cannon tubes.
2. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis; i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. **Service.** Operations required periodically to keep an item in proper operating condition, i.e. to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms.
4. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.
5. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.
6. **Calibrate.** To determine and cause corrections to be made, or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of

two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

7. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper function of equipment or system.
8. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.
9. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, and disassembly/assembly procedures, and maintenance actions to identify troubles, and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

NOTE

The following definitions are applicable to the "repair" maintenance function:

Services - Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting - The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly - The step by step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions - Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

10. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., Depot Maintenance Work Requirement [DMWR]). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
11. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles, etc.) considered in classifying Army equipment/components.

Explanation of Columns in the MAC

Column (1) -- Group Number. Column (1) lists FGC numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) -- Component/Assembly. Column (2) contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) -- Maintenance Function. Column (3) lists the functions to be performed on the item listed in Column (2). (For detailed explanation of these functions, refer to "Maintenance Functions" outlined above.)

Column (4) -- Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

- C -- Operator or crew
- O -- Unit maintenance
- F -- Direct support maintenance
- L -- Specialized repair activity (SRA)
- H -- General support maintenance
- D -- Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by a work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) -- Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools) common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special (TMDE), and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) -- Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) -- Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) -- Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) -- Nomenclature. Name or identification of tool or test equipment.

Column (4) -- National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) -- Tool Number. The manufacturer's part number, model number, or type number.

Explanation of Columns in Remarks

Column (1) -- Remarks Code. The code recorded in Column (6) of the MAC.

Column (2) -- Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

**OPERATOR, UNIT, AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER (WWET/T)
MAINTENANCE ALLOCATION CHART (MAC)**

Table 1. MAC for WASTEWATER EVACUATION TANK TRAILER (WWET/T).

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
00	WASTE WATER EVACUATION TANK/ TRAILER								
01	Tank	Inspect Service	.10	8.00				1	B A
0101	Primary Shutoff	Service Replace		0.3 2.00					
010101	Portal Lid Assembly	Service Replace		0.50 2.00				11	
010102	Float Ball, 6"	Replace		2.00				11	
010103	Seat	Replace		2.00				11	
010104	Wing Nut Assembly	Replace		0.3					
010105	Ball Cage, 8"	Replace		2.00				11	
0102	Safety Relief Valve	Inspect Replace	.10	0.50				11	B
0103	Float Level Indicator	Inspect Replace	.10	0.3				11	B
010301	Packing	Replace		0.3				11	
010302	Float Ball Linkage Assembly	Replace		2.00				11	
0104	Manway Assy, Outlet	Inspect Service Replace	.10	0.50 1.00				11 11	B
0105	Intake Valve	Inspect Service Replace	.10	0.50 0.50				11 11	B
010501	Gasket, 2 ½-inch	Replace		0.50				11	
0106	Drain Valve	Inspect Service Replace	.10	0.50 0.8				11 11	B
010601	Gasket, 4-inch	Replace		0.50				11	
0107	Hydraulic System	Inspect Service	.10	0.30					B
010701	Hydraulic Hand Pump	Replace		0.8				11	
010702	Valves	Replace		0.8				11	
010703	Hoses	Replace		0.50				11	
010704	Fusible Frangible Links	Replace		0.3				11	
010705	Line Control Knobs	Replace		0.50				11	
010706	Hose Nipples	Replace		0.50				11	

Table 1. MAC for WASTEWATER EVACUATION TANK TRAILER (WWET/T).

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
010707	Manifold	Replace		0.50				11	
010708	T Fittings	Replace		0.50				11	
02	Power System								
0201	Diesel Engine	Inspect	.10						B
		Service		0.3					
		Replace			2.50			4, 11, 13	
020101	Starter	Test		0.10				4, 11	
		Repair		0.50					
020102	Fan Belt	Adjust		0.20				4, 11	
		Replace		0.50					
020103	Exhaust	Replace		0.3				4, 11	
020104	Generator	Replace		0.50				4, 11, 13	
020105	Cylinder Head Gasket	Replace			2.50			4, 11, 13	
020106	Fuel Filter	Repair		0.3				4, 11	
020107	Air Filter	Service		0.10				4, 11	
020108	Radiator	Replace		0.15				4, 11	
020109	Fuel Pump	Service		0.15					
		Test		0.10					
		Replace		0.3				4, 11	
020110	Thermostat	Replace		0.50				4, 11	
020111	Water Pump	Replace		1.00				4, 11	
020112	Throttle	Replace		0.30				11	
020113	Glow Plug	Replace		0.3				4, 11	
0202	Control Panel	Inspect	.10						B
		Test		0.50					
		Repair		0.50				5	
		Replace		1.00				11	
020201	Tachometer	Test		0.10				5	
		Replace		0.3				11	
020202	Water Gage	Test		0.10				5	
		Replace		0.3				11	
020203	Hour Meter	Test		0.10				5	
		Replace		0.3				11	
020204	Voltmeter	Test		0.10				5	
		Replace		0.3				11	
020205	Oil Pressure Gage	Test		0.10				5	
		Replace		0.3				11	
020206	Toggle Switch	Replace		0.10				11	
020207	Key Switch	Test		0.10				5	
020208	Connector	Replace		0.3				11	
020209	Wire Harness	Replace		0.3					
0203	Fuel Supply Hoses	Inspect	.10						B
		Replace		0.3				11	

Table 1. MAC for WASTEWATER EVACUATION TANK TRAILER (WWET/T).

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0204	Drive Belt	Inspect		.10					
		Adjust		0.3				11	
		Replace		0.8				11	
03	Vacuum/Pressure System								
0301	Vacuum Pump	Inspect	.10						B
		Service		.10					
		Replace			2.0			11	
030101	Pulley	Replace		1.0				11	
0302	Moisture Trap	Inspect	.10						B
		Service	.10						
		Replace		0.8				11	
030201	Drain Valve	Replace		0.5				11, 15	
030202	Pressure Gage	Replace		0.8				11	
030203	Upper Air Hose	Replace		0.2				11	
030204	Pump Air Hose	Replace		0.2				11	
030205	Drain Hose	Replace		.10					
030206	Shutoff Seat	Replace		0.8				11	
030207	Sight Glass	Replace		0.8				11	
0303	Isolation Valve	Inspect	.10						B
		Replace		0.8				11, 15	
030301	Linkage	Replace		0.5				11	
0304	Oil Catch Muffler	Inspect	.10						
		Service	0.1						
		Replace		0.8				11	
030401	Drain Hose	Replace		.10					
030402	Drain Valve	Replace		0.5				11, 15	
030403	Breather Hose	Replace		0.2				11	
04	Electrical System								
	Battery	Inspect	0.1					11	B
		Replace		0.3					
040101	Battery Cables	Replace		0.5				11	
0402	Lights	Inspect	.10						B
		Service		0.2				11	
		Replace		0.5					
0403	Wiring	Inspect		0.2				5, 11	
		Test		0.2					
		Replace		0.8					
05	Trailer	Inspect	.10						B
		Service		0.2					
0501	Parking Brakes	Test	0.1						B
		Adjust		.10				11	
		Replace		1.0					

Table 1. MAC for WASTEWATER EVACUATION TANK TRAILER (WWET/T).

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0502	Rims/Tires	Inspect	0.1						B
		Service	0.1						
		Replace		0.5				11	
0503	Equipment Trays	Inspect	0.1						B
		Service	0.1						
		Replace		0.2				11	
0504	Fuel Tank	Inspect	0.1						B
		Replace		0.8				11	
0505	Tool Box	Replace		0.2				11	
0506	Trailer Jack	Inspect	0.1						B
		Service	0.1						
		Replace		0.3				11	
0507	Lunette Eye, Chains	Inspect	0.1						B
		Replace		0.3				11	
0508	Pulley Guard	Inspect	0.1						B
		Replace		0.3				11	
0509	Brakes	Inspect	0.1						B
		Repair		1.0				11, 14	
		Replace		1.0					
050901	Brake Shoes	Replace		1.0				11	
050902	Actuator	Replace		1.0					
06	Hoses	Inspect	0.3						
		Service	0.3						
		Replace		0.2				11	
0601	QD Couplings	Replace		0.2				11	
07	Chopper Tube/Wand	Inspect	0.2						
		Service	0.3						
		Replace		0.2				11	
0701	Ball Valve	Replace		0.3				11	

Table 2. Tools and Test Equipment for WWET/T.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	O	Banding Tool	5120-00-278-9925	A-A-2591
2	O	Bottle Jack		
3	O	Cleaner, Steam Pressure Jet, Trailer Mounted		
4	O	Adapter Kit, Grease Gun, Coupling	4930-01-178-8848	AIMIII
5	F	Lifting Equipment	N/A	
6	O	Lug Wrench	5120-00-335-5390	125
7	O	Metric Socket Wrench Set	5120-01-024-6150	M107.5M
8	O	Multimeter	6625-00-999-6282	ANURM105C
9	O	Multimeter, Digital Facsimile, AN/PSM 45	6625-01-265-6000	AN/PSM45A
10	O	Puller Kit, Universal	5180-00-313-9496	1178
11	O	Punch Set Drive Pin	5120-00-883-3003	GGG-P-831
12	F	Sling, Chain and Hook		
13	O	Gage, Tire Pressure	4910-01-489-5229	14-6830-6011
14	O	Tool Kit Electronic	5180-00-064-5178	PPL964ISSUE6
15	O	Tool Kit, General Mechanic's, Automotive	5180-00-177-7033	SC5180-90-CL-N26
16	O	Torque Wrench 90-120 in-lbs	5120-00-776-1841	A-A-2411
17	O, F	Torque Wrench 0-100 ft-lbs	5120-01-113-9564	B107.14M
18	O	Wrench, Half, 15/16-in		
19	O	Wrench, Pipe	5120-00-277-1462	GGG-W-651

Table 3. Remarks for WWET/T.

REMARKS CODE	REMARKS
A	Consult Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.146.
B	Preventive Maintenance Checks and Services (PMCS).

**UNIT AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
(NSN 4630-01-513-8155)
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL) INTRODUCTION**

SCOPE

This Repair Parts and Special Tools List (RPSTL) lists and authorizes spare and repair parts; special tools; special test, measurement and diagnostic equipment (TMDE); and other special support equipment required for performance of Operator, Unit, Direct Support, and General Support maintenance of the Waste Water Evacuation Tank Trailer. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

GENERAL

In addition to the Introduction Work Package, this RPSTL is divided into the following work packages:

1. Repair Parts List Work Packages. Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed separately in their own functional group and work package. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.

2. Special Tools List Work Packages. Work packages containing lists of special tools, special TMDE, and special support equipment authorized by RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) COLUMN). Tools that are components of common tool sets and/or Class VII are not listed.

3. Cross-Reference Indexes Work Packages. There are two cross-reference indexes work packages in this RPSTL: the National Stock Number (NSN) Index work package and the Part Number (P/N) Index work package. The National Stock Number Index work package refers you to the figure and item number. The Part Number Index work package refers you to the figure and item number.

EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGES

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column (2)). The Source, Maintenance, and Recoverability (SMR) code containing supply/requisitioning information, maintenance level authorization criteria and disposition instruction, as shown in the following breakout.

Source Code	Maintenance Code	Recoverability Code
----	----	----
XX	X	X
----	----	----
1st two Positions: How to get an item.	3rd Position: Who can install, replace or use the item.	4th Position: Who can do complete repair* on the item.
		5th Position: Who determines disposition action on unserviceable items.

* Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanation of source codes follows.

Source Code	Explanation
PA	Stock items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the third position of the SMR code.
PB	
PC	
PD	
PE	
PF	
PG	
KD	
KF	
KB	
	NOTE: Items coded PC are subject to deterioration.
	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.
MO-(Made at Unit/AVUM Level)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the P/N in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.
MF-(Made at DS/AVIM Level)	
MH-(Made at GS Level)	
ML-(Made at Specialized Repair Act (SRA))	
MD-(Made at Depot)	
AO-(Assembled by Unit/AVUM Level)	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the third position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
AF-(Assembled by DS/AVIM Level)	
AH-(Assembled by GS level)	
AL-(Assembled by SRA)	
AD-(Assembled by Depot)	
XA	Do not requisition an "XA" coded item. Order its next higher assembly. (Also, refer to the NOTE below.)
XB	If an "XB" item is not available from salvage, order it using the CAGEC and part number given.
XC	Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
XD	Item is not stocked. Order an "XD" coded item through normal supply channels using the CAGEC and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR Code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate authorization to one of the following levels of maintenance.

Maintenance

Code	Application/Explanation
C	Crew or operator maintenance done within unit/AVUM maintenance.
O	Unit level/AVUM maintenance can remove, replace, and use the item.
F	Direct support/AVIM maintenance can remove, replace, and use the item.
H	General support maintenance can remove, replace, and use the item.
L	Specialized repair activity can remove, replace, and use the item.
D	Depot level can remove, replace, and use the item.

Fourth Position. The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions).

NOTE

Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Maintenance

Code	Application/Explanation
O	Unit/AVUM is the lowest level that can do complete repair of the item.
F	Direct support/AVIM is the lowest level that can do complete repair of the item.
H	General support is the lowest level that can do complete repair of the item.
L	Specialized repair activity (SRA) is the lowest level that can do complete repair of the item.
D	Depot is the lowest level that can do complete repair of the item.

Z	Nonrepairable. No repair is authorized.
B	No repair is authorized. No parts or special tools are authorized for the maintenance of a "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Code	Application/Explanation
Z	Nonrepairable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3rd position of SMR Code.
O	Reparable item. When uneconomically repairable, condemn and dispose of the item at organizational or aviation unit level.
F	Reparable item. When uneconomically repairable, condemn and dispose of the item at the direct support level.
H	Reparable item. When uneconomically repairable, condemn and dispose of the item at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

NSN (Column (3)). The NSN for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a 5-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different P/N from the number listed.

UOC (Column (6)). This column includes the following information:

1. The federal item name and, when required, a minimum description to identify the item.
2. P/Ns of bulk materials are referenced in this column in the line entry to be manufactured/fabricated.

3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.
4. The statement "END OF FIGURE" appears just below the last item description in Column (6) for a given figure in both the repair parts list and special tools list work packages.

QTY (Column (7)). The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column instead of quantity indicates that the quantity is a variable with each application.

EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGES FORMAT AND COLUMNS

National Stock Number (NSN) Index Work Package.

STOCK NUMBER Column. This column lists the NSN in National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN, i.e.,

NSN
<u>5305-01-574-1467</u>
NIIN

When using this column to locate an item, ignore the first four digits of the NSN. Use the complete NSN (13 digits) when requisitioning by stock number.

FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in the repair parts list and special tools list work packages.

ITEM Column. The Item number identifies the item associated with the figure listed in the adjacent FIG. Column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index Work Package. P/Ns in this index are listed in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combinations which place the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9, and each following letter or digit in like order).

PART NUMBER Column. Indicates the P/N assigned to the item.

FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list work packages.

ITEM Column. The item number is the number assigned to the item as it appears in the figure referenced in adjacent figure number column.

SPECIAL INFORMATION

USABLE ON CODE (UOC). The usable on code appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC: ..." in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Identification of the usable on codes used in this RPSTL are:

<u>Code</u>	<u>Used On</u>
FTV	WWET/T

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in this technical manual.

Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / P/N index work packages and the bulk material list in the repair parts list work package.

Illustrations List. The illustrations in this RPSTL contain unit authorized items. Illustrations published in this TM that contain unit authorized items also appear in this RPSTL. The tabular list in the repair parts list work package contains only those parts coded "O" in the third position of the SMR code, therefore, there may be a break in the item number sequence.

HOW TO LOCATE REPAIR PARTS

1. When NSNs or P/Ns Are Not known.

First. Using the table of contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number(s).

Fourth. Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When NSN is Known.

First, if you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

3. When P/N is Known.

First. If you have the P/N and not the NSN, look in the PART NUMBER column of the P/N index work package. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package:

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

PRIMARY SHUTOFF

REPAIR PARTS LIST

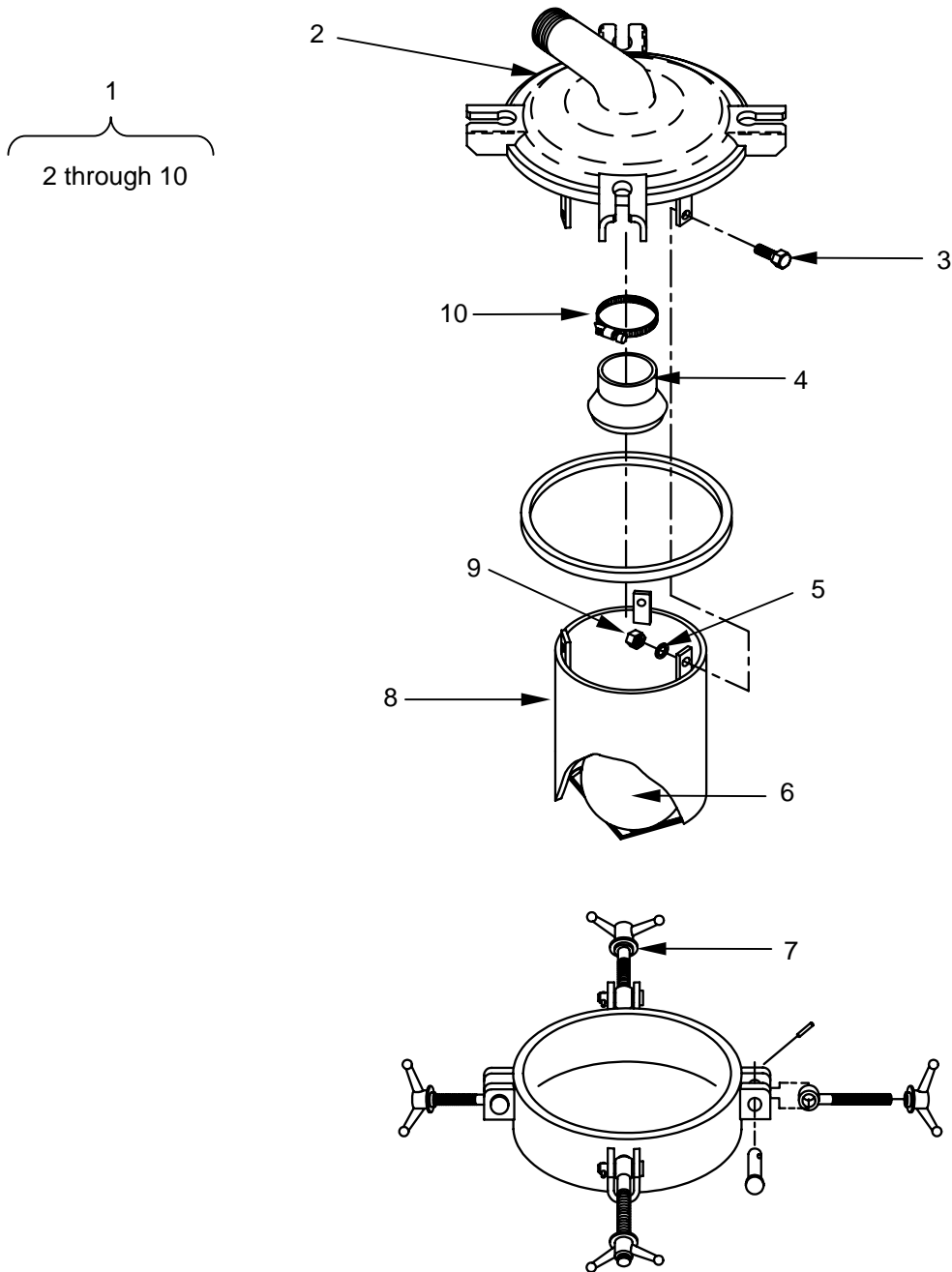


Figure 1. Primary Shutoff Components
0055 00-(1 Blank)/2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 01	
					GROUP 0101 FIG. 1 PRIMARY SHUTOFF COMPONENTS	
1	XDOZZ		1CNQ1	VTSP-701	PORTAL LID SHUTOFF ASSEMBLY.....	1
2	XDOZZ		1CNQ1	VT-118	. PORTAL LID ASSM.....	1
3	XDOZZ		3A4R0	20125	. HEX BOLT.....	3
4	XDOZZ		1CNQ1	FP-3028	. SEAT	1
5	XDOZZ		3A4R0	76122	. LOCK WASHER	3
6	XDOZZ		1CNQ1	FP-6204	. FLOAT BALL 6-IN.....	1
7	XDOZZ		1CNQ1	FCP-908-5	. WING NUT ASSEMBLY	4
8	XDOZZ		1CNQ1	FP-907	. 8-IN BALL CAGE LID MOUNT	1
9	XDOZZ		3A4R0	40132	. HEX NUT.....	3
10	XDOZZ		3A4R0	72348	. HOSE CLAMP	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

SAFETY RELIEF VALVE

REPAIR PARTS LIST

1
2 through 5

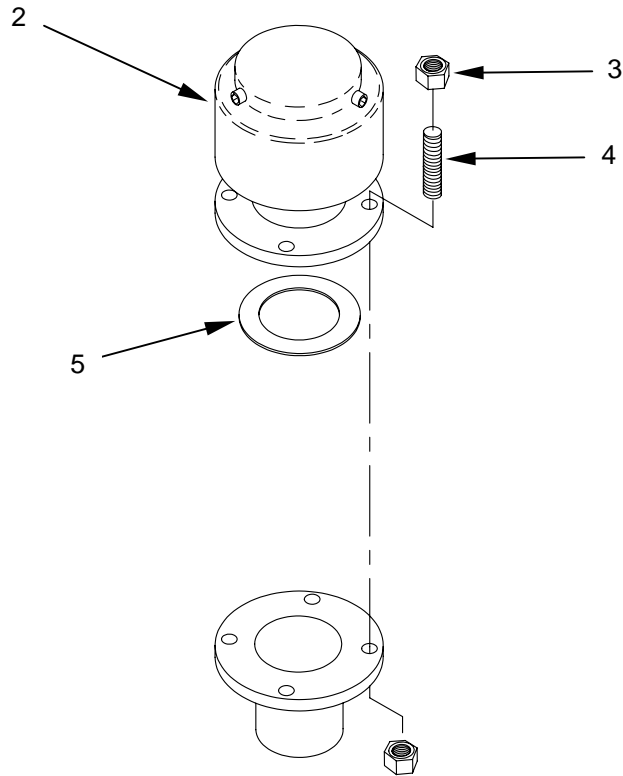


Figure 2. Safety Relief Valve Components

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 01	
					GROUP 0102 FIG. 2 SAFETY RELIEF VALVE COMPONENTS	
1	XDOZZ		1CNQ1	VTSP-702	RELIEF VALVE ASSM.	1
2	XDOZZ		1CNQ1	A29/13044	. DOT SAFETY RELIEF VALVE	1
3	XDOZZ		1CNQ1	5/8316HHMT	. NUT	8
4	XDOZZ		1CNQ1	5/8X3/12SDSS	. STUD.....	4
5	XDOZZ		1CNQ1	TA-181- R0NVE3	. GASKET	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

FLOAT LEVEL INDICATOR

REPAIR PARTS LIST

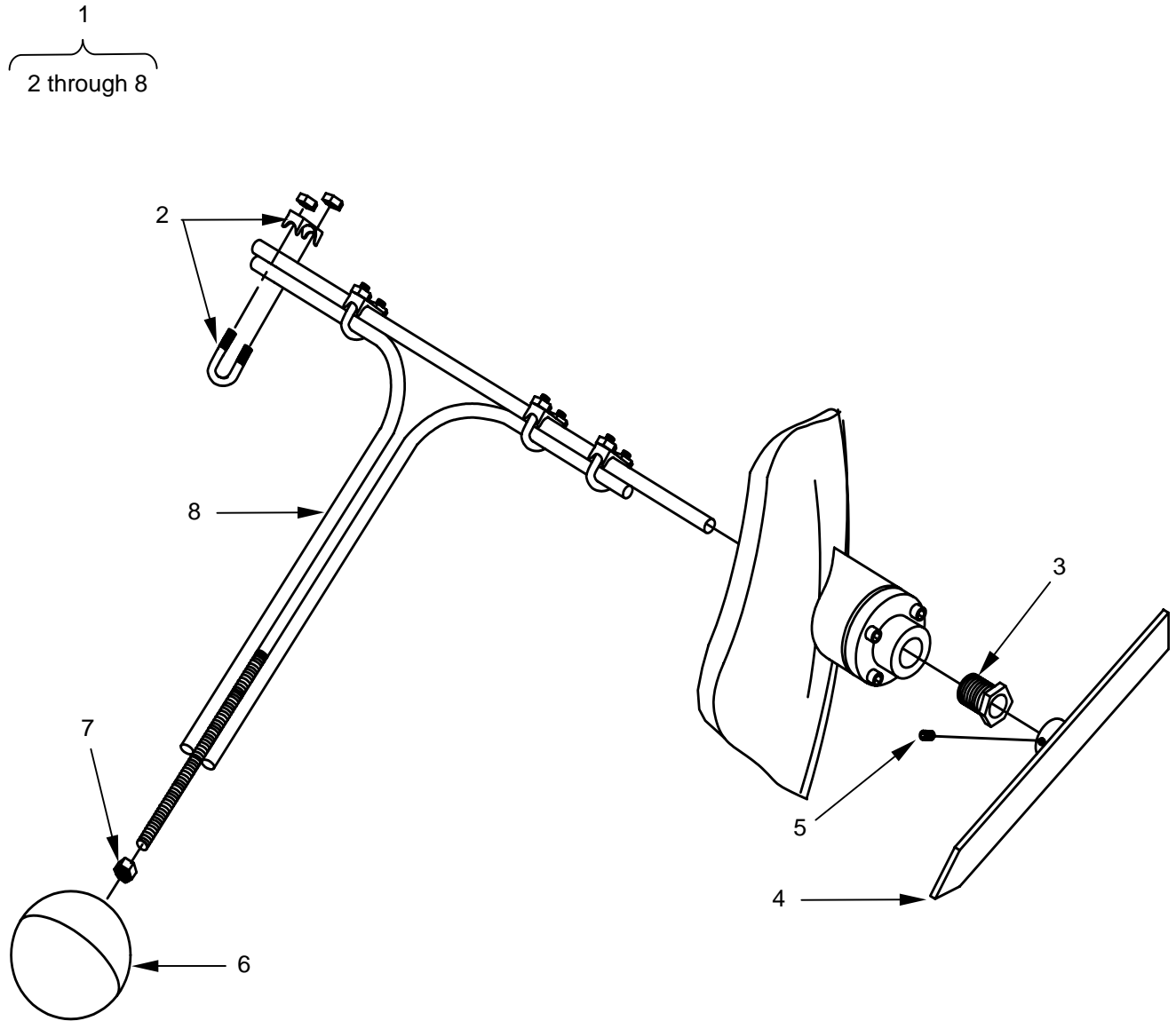


Figure 3. Float Level Indicator
0057 00-(1 Blank)/2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 01 GROUP 0103 FIG. 3 FLOAT LEVEL INDICATOR	
1	XDOZZ		1CNQ1	VTSP-703	FLOAT LEVEL INDICATOR ASSM.	1
2	XDOZZ		1CNQ1	10WRC	. CLAMP	4
3	XDOZZ		1CNQ1	TA-136R0	. PACKING GLAND NUT	1
4	XDOZZ		1CNQ1	SATA-134R0	. FLOAT LEVEL INDICATOR ARROW.....	1
5	XDOZZ		1CNQ1	4655C	. SET SCREW	1
6	XDOZZ		1CNQ1	040382058RPD	. FLOAT BALL	1
7	XDOZZ		3A4R0	40160	. NUT	1
8	XDOZZ		1CNQ1	SATA121	. FLOAT, "Y" ASSEMBLY	1
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

MANWAY ASSEMBLY

REPAIR PARTS LIST

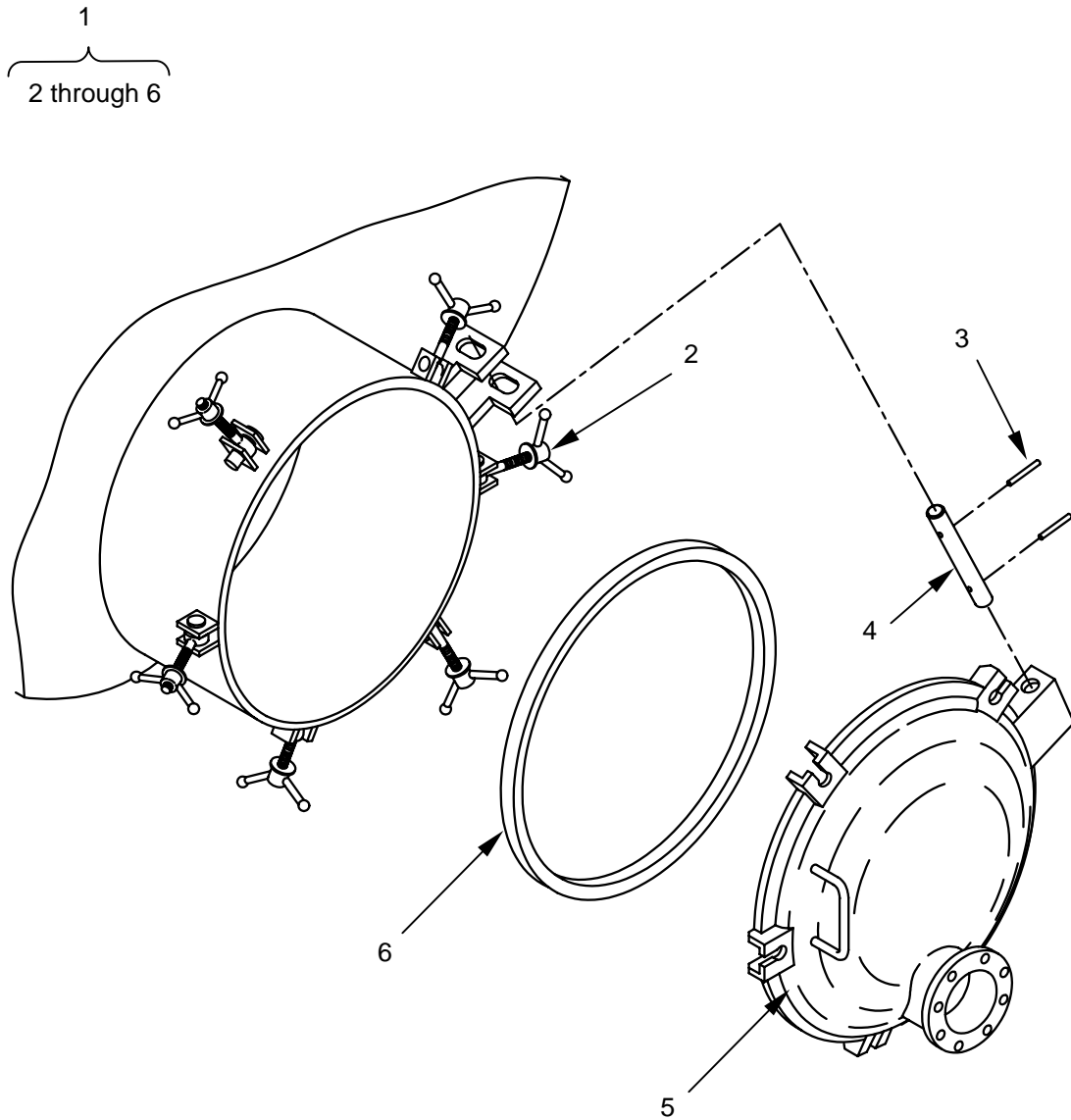


Figure 4. Manway Assembly
0058 00-(1 Blank)/2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 01 GROUP 0104 FIG. 4 MANWAY ASSEMBLY	
1	XDOZZ		1CNQ1	VTSP-704	MANWAY ASSEMBLY W/ 4-IN 150#	1
2	XDOZZ		1CNQ1	FCP-908-5	. WING NUT ASSEMBLY	6
3	XDOZZ		1CNQ1	FP-704	. ROLL PIN	2
4	XDOZZ		1CNQ1	FP-703	. HINGE PIN	1
5	XDOZZ		1CNQ1	VT-119	. MANWAY ASSM. CODE W/4-IN 150# OUTLET	1
6	XDOZZ		1CNQ1	FP-706-8	. PORTAL, 12-IN LID GASKET	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

INTAKE VALVE

REPAIR PARTS LIST

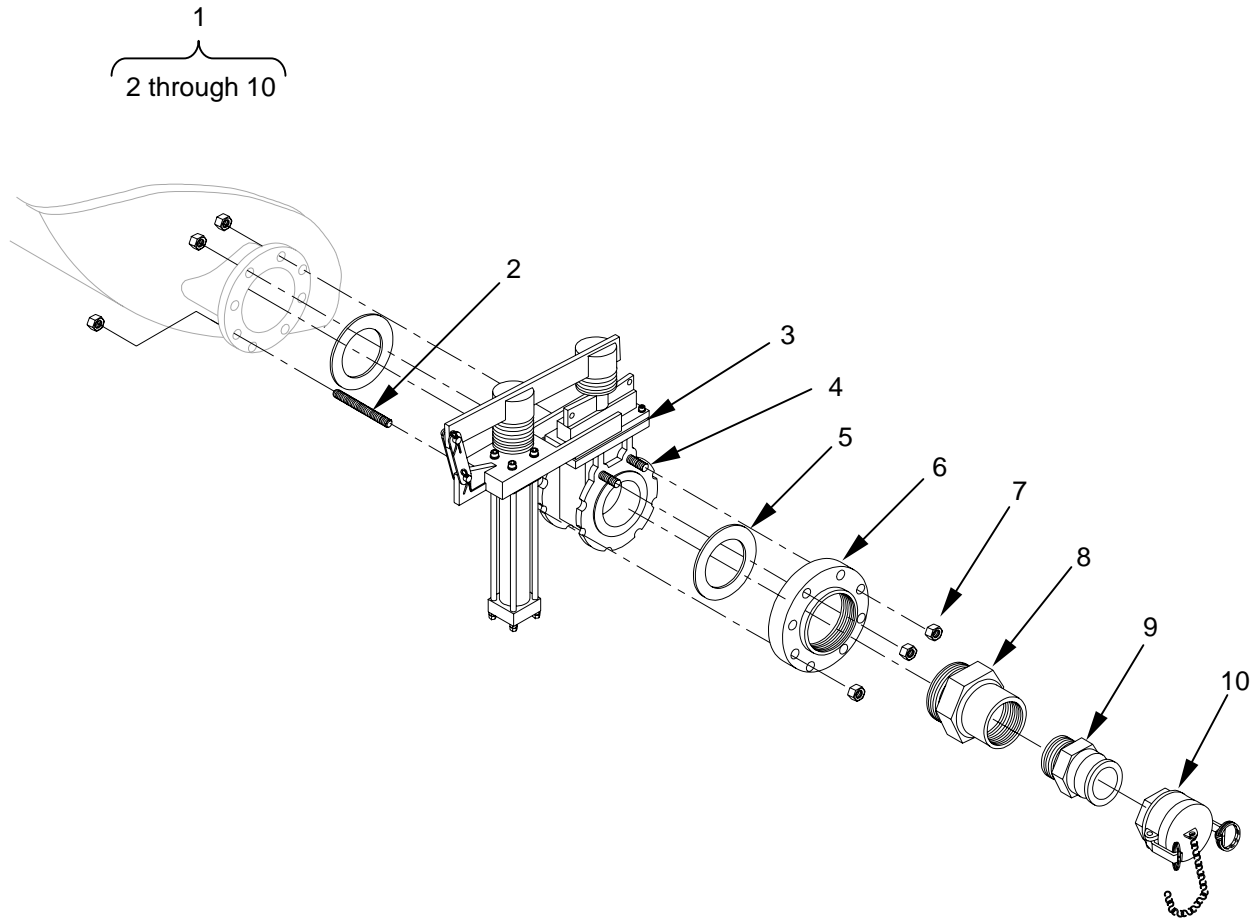


Figure 5. Intake Valve
0059 00-(1 Blank)/2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 01 GROUP 0105 FIG. 5 INTAKE VALVE	
1	XDOZZ		1CNQ1	VTSP-705	INTAKE VALVE ASSM. 4-IN	1
2	XDOZZ		1CNQ1	5/8X7SDSS	. STUD.....	6
3	XDOZZ		1CNQ1	NPV4C-2.5HS	. VALVE.....	1
4	XDOZZ		1CNQ1	5/8X212SDSS	. STUD.....	4
5	XDOZZ		1CNQ1	TA-181R0FVL-4	. GASKET 4-IN	2
6	XDOZZ		1CNQ1	4150TRD	. FLANGE FRONT.....	1
7	XDOZZ		1CNQ1	5/8316HHNT	. NUT	16
8	XDOZZ		1CNQ1	RC4343	. 4-IN X2-1/2-IN REDUCING BUSHING ...	1
9	XDOZZ		1CNQ1	3TFX250	. CAM LOCK FITTING 2½-IN	1
10	XDOZZ		1CNQ1	3TDCX250	. DUST CAP 2½-IN.....	1
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

DRAIN VALVE

REPAIR PARTS LIST

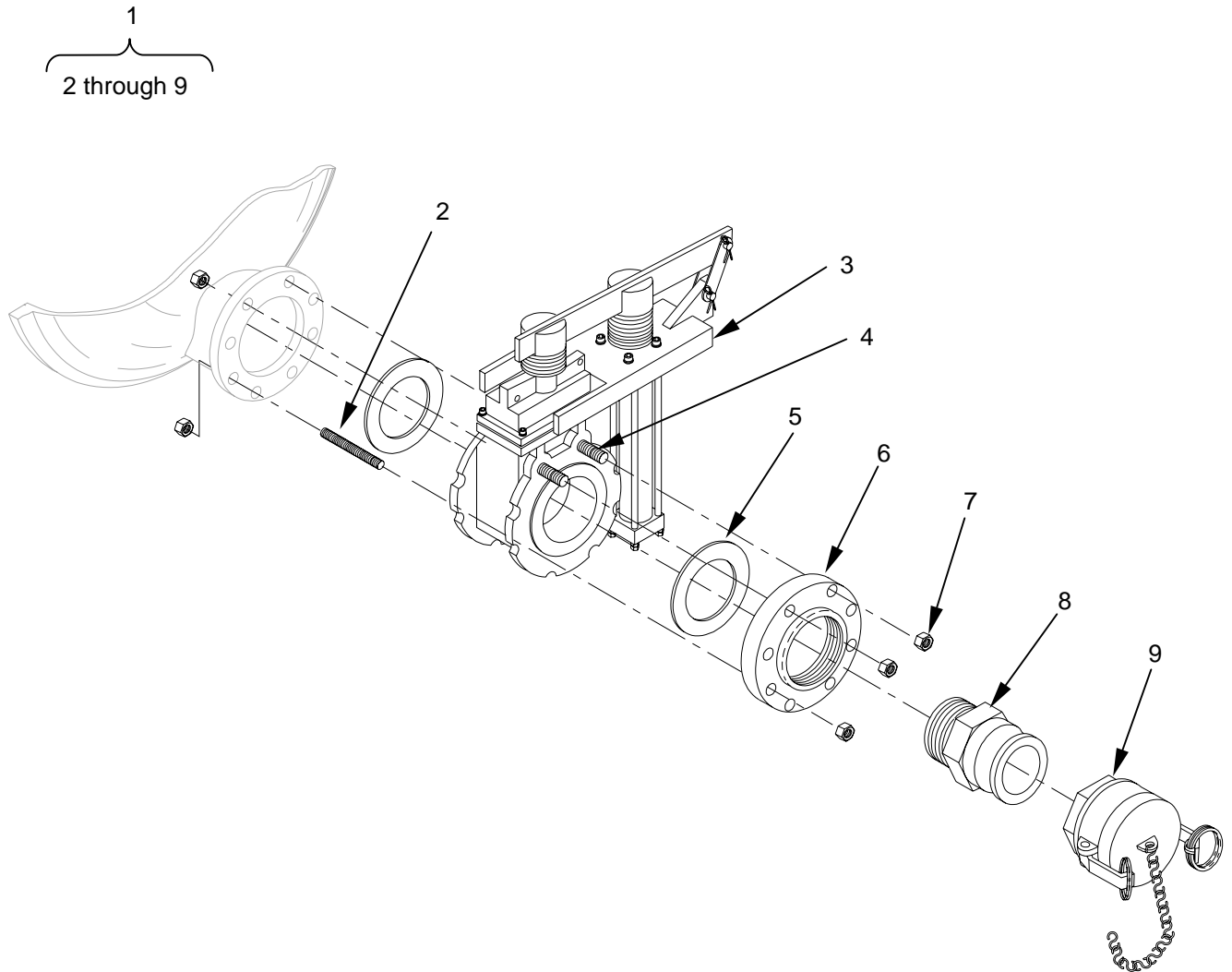


Figure 6. Drain Valve

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 01 GROUP 0106 FIG. 6 DRAIN VALVE	
1	XDOZZ		1CNQ1	VTSP-706	DRAIN VALVE ASSM. 4-IN.....	
2	XDOZZ		1CNQ1	5/8X7SDSS	. STUD.....	6
3	XDOZZ		1CNQ1	NPV4C-2.5HS	. VALVE.....	1
4	XDOZZ		1CNQ1	5/8X212SDSS	. STUD.....	4
5	XDOZZ		1CNQ1	TA-181R0FVL-4	. GASKET 4-IN.....	2
6	XDOZZ		1CNQ1	4150TRD	. FLANGE FRONT.....	1
7	XDOZZ		1CNQ1	5/8316HHNT	. NUT.....	16
8	XDOZZ		1CNQ1	3TFX400	. CAM LOCK FITTING 4-IN.....	1
9	XDOZZ		1CNQ1	3TDCX400	. DUST CAP 4-IN.....	1
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

HYDRAULIC SYSTEM

REPAIR PARTS LIST

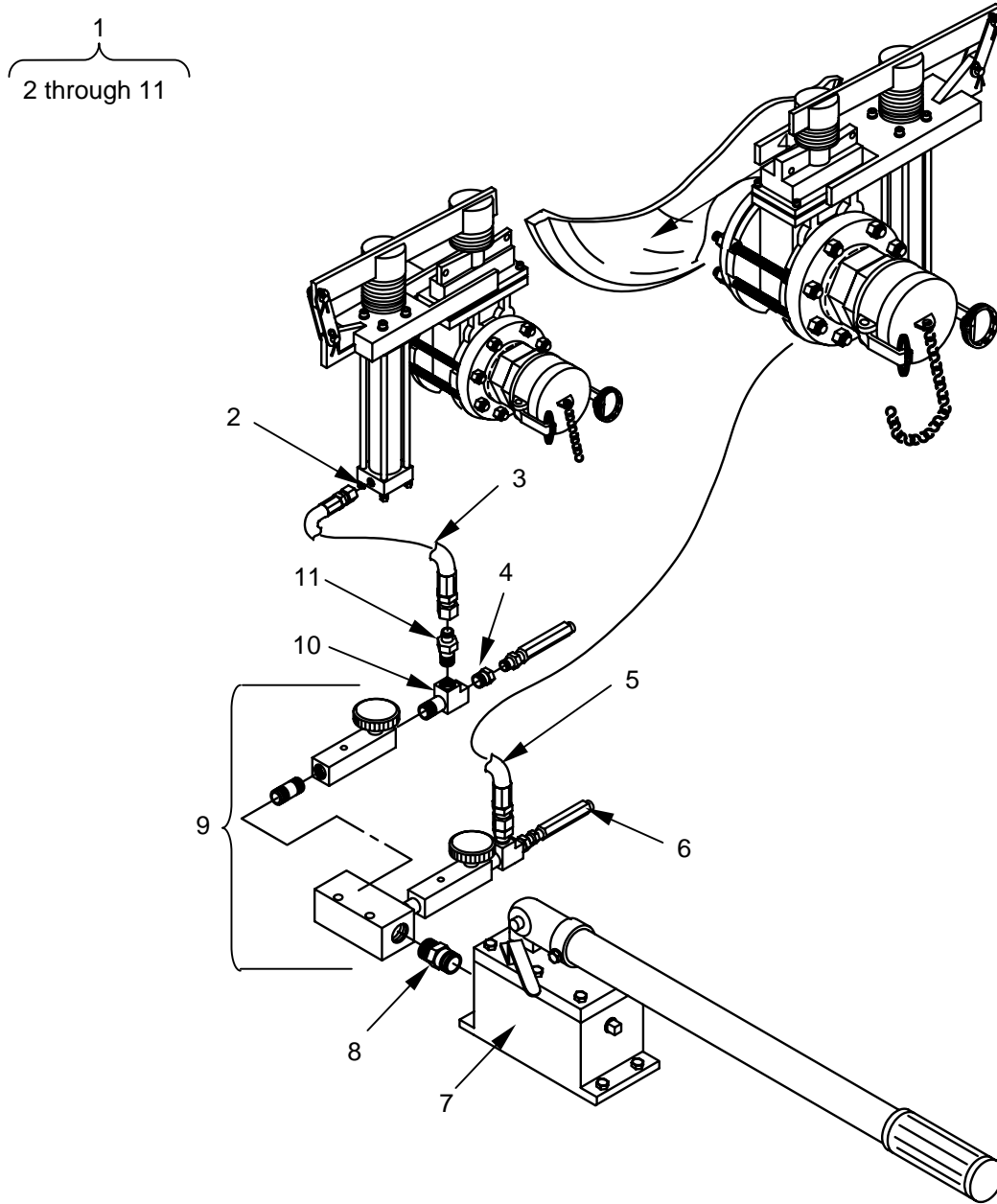


Figure 7. Hydraulic System

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 01 GROUP 0107 FIG. 7 HYDRAULIC SYSTEM	
1	XDOZZ		1CNQ1	VTSP-707	HYDRAULIC VALVE CONTROL.....	1
2	XDOZZ		1CNQ1	2023-4-4	. 45 DEG. ADAPTER.....	1
3	XDOZZ		1CNQ1	VT-511	. HOSE INTAKE	1
4	XDOZZ		1CNQ1	90319	. BUSHING	2
5	XDOZZ		1CNQ1	VT-513	. HOSE DRAIN	1
6	XDOZZ		1CNQ1	FP15017BR	. FUSIBLE-FRANGIBLE LINK	2
7	XDOZZ		1CNQ1	HP19165MS	. HYDRAULIC HAND PUMP	1
8	XDOZZ		1CNQ1	97066	. HEX NIPPLE	1
9	XDOZZ		1CNQ1	CH16283-2MS	. HYD. MANIFOLD.....	1
10	XDOZZ		1CNQ1	90383	. STREET TEE	2
11	XDOZZ		1CNQ1	2021-4-4	. ADAPTER.....	2
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

DIESEL ENGINE

REPAIR PARTS LIST

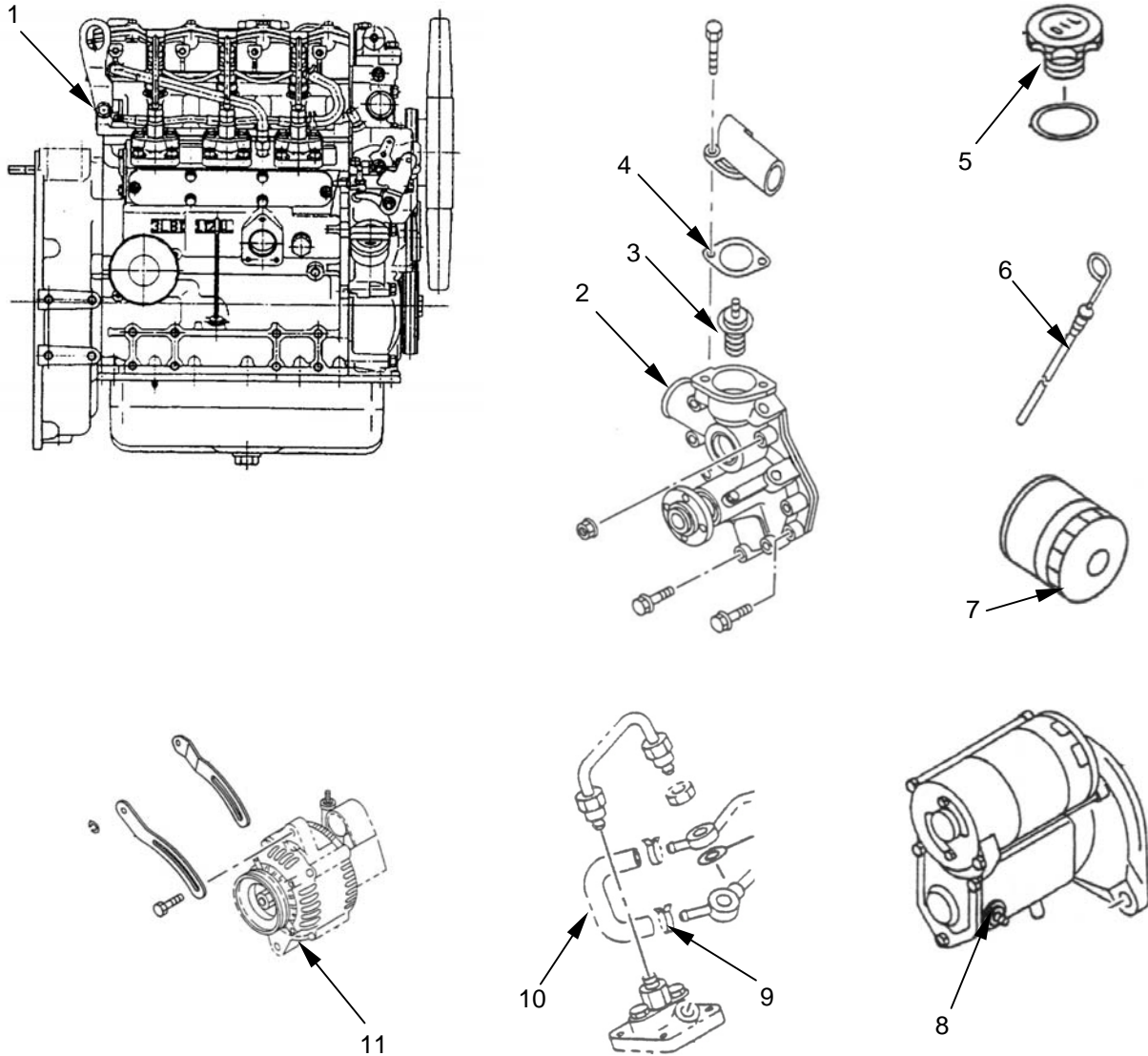


Figure 8. Diesel Engine (Sheet 1 of 3)

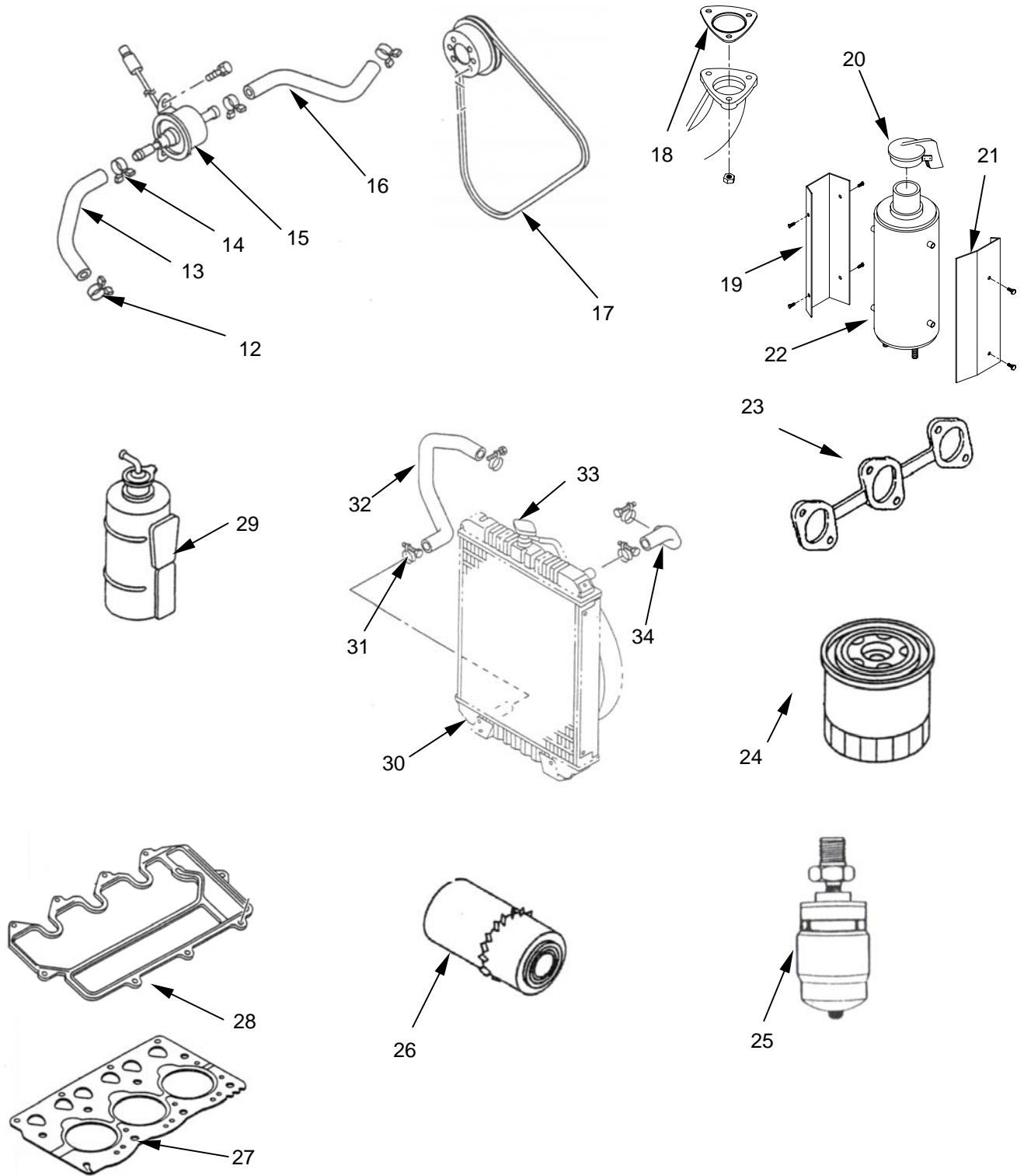


Figure 8. Diesel Engine (sheet 2 of 3)

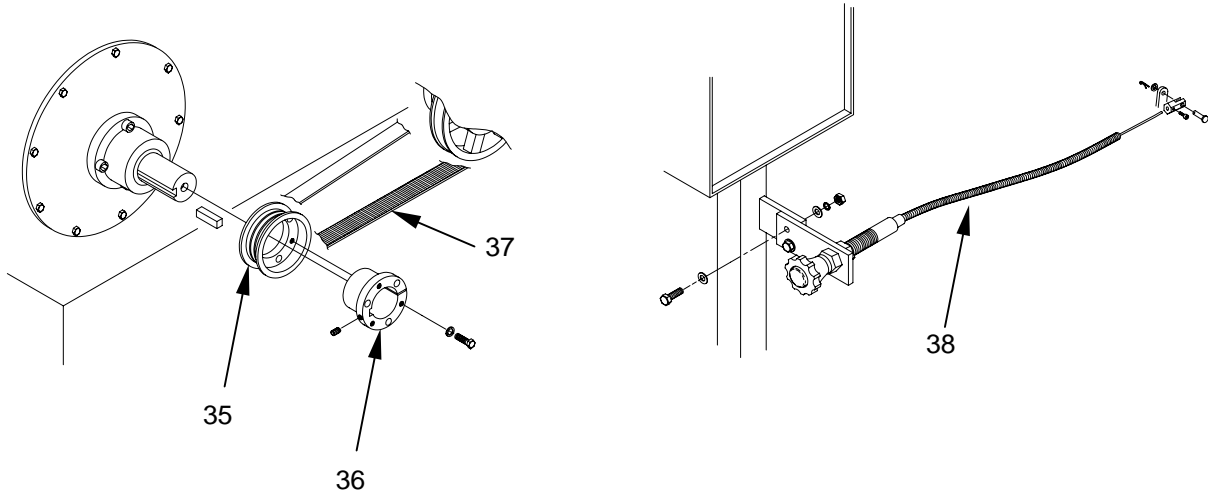


Figure 8. Diesel Engine (sheet 3 of 3)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 02 POWER SYSTEM GROUP 0201 DIESEL ENGINE FIG. 8 DIESEL ENGINE	
1	XDFZZ		1CNQ1	3LB1EA04	ENGINE, DIESEL	1
2	XDOZZ		1CNQ1	8971632590	.PUMP, WATER	1
3	XDOZZ		1CNQ1	8971606540	.THERMOSTAT	1
4	XDOZZ		1CNQ1	8943259561	.GASKET	1
5	XDOZZ		1CNQ1	8941332075	.CAP, OIL FILL	1
6	XDOZZ		1CNQ1	8971078701	.DIPSTICK	1
7	XDOZZ		1CNQ1	8944567412	.FILTER, OIL	1
8	XDOZZ		1CNQ1	8970489663	.STARTER	1
9	XDOZZ		1CNQ1	5097070051	.HOSE CLAMP	2
10	XDOZZ		1CNQ1	8970408091	.HOSE, FUEL	1
11	XDOZZ		1CNQ1	8972268401	.GENERATOR	1
12	XDOZZ		1CNQ1	5097070041	.HOSE CLAMP	2
13	XDOZZ		1CNQ1	8971115712	.HOSE, FUEL	1
14	XDOZZ		1CNQ1	5097070041	.HOSE CLAMP	2
15	XDOZZ		1CNQ1	8971830130	.PUMP, FUEL	1
16	XDOZZ		1CNQ1	8971115702	.HOSE, FUEL	1
17	XDOZZ		1CNQ1	8972309380	.BELT, FAN	1
18	XDOZZ		1CNQ1	9141450761	.GASKET	1
19	XDOZZ		1CNQ1	8971077130	.BRACKET, MOUNTING	1
20	XDOZZ		1CNQ1	D3JL5C208F	.RAIN CAP 1-3/4 IN	1
21	XDOZZ		1CNQ1	VT-330	.MUFFLER GUARD	1
22	XDOZZ		1CNQ1	8971077140	.EXHAUST	1
23	XDOZZ		1CNQ1	8970378622	.EXHAUST MANIFOLD GASKET	1
24	XDOZZ		1CNQ1	8941329471	.FILTER, FUEL	1
25	XDOZZ		1CNQ1	1142192120	.INDICATOR, DUST	1
26	XDOZZ		1CNQ1	8970423170	.FILTER, AIR	1
27	XDOZZ		1CNQ1	8970655472	.GASKET, COVER	1
28	XDOZZ		1CNQ1	8970439332	.GASKET, HEAD	1
29	XDOZZ		1CNQ1	8971275911	.BOTTLE, RADIATOR	1
30	XDOZZ		1CNQ1	8971164733	RADIATOR	1
31	XDOZZ		1CNQ1	5097040313	HOSE CLAMP	4
32	XDOZZ		1CNQ1	8971313140	HOSE, LOWER, RADIATOR	1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
33	XDOZZ		1CNQ1	8972259470	FILL CAP, RADIATOR.....	1
34	XDOZZ		1CNQ1	8971312950	HOSE, UPPER, RADIATOR.....	1
35	XDOZZ		1CNQ1	43V450SDS	HUB 1-1/2.....	1
36	XDOZZ		1CNQ1	SDS 1-1/2	BUSHING	1
37	XDOZZ		1CNQ1	4/3V630	PULLEY, ENGINE	1
38	XDOZZ		1CNQ1	C6J29775B	THROTTLE CABLE.....	1
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

CONTROL PANEL

REPAIR PARTS LIST

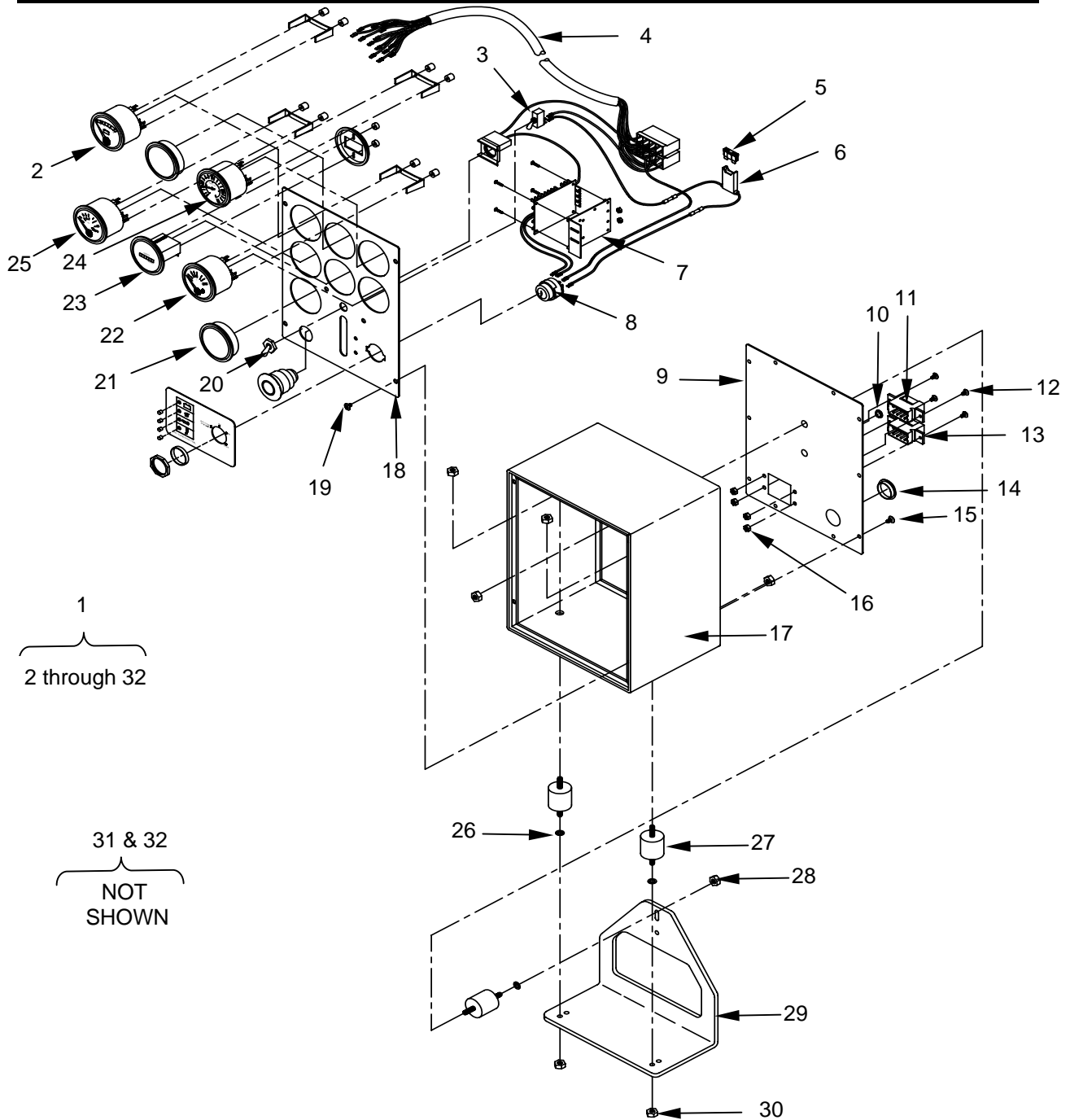


Figure 9. Control Panel
0063 00-(1 Blank)/2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 02 GROUP 0202 FIG. 9 CONTROL PANEL	
1	XDOZZ		1CNQ1	998-0014-5	CONTROL PANEL, ASSEMBLED	1
2	XDOZZ		1CNQ1	550-4012-01	. VOLTMETER.....	1
3	XDOZZ		1CNQ1	502-0030-00	. TOGGLE SWITCH.....	1
4	XDOZZ		1CNQ1	801-0310-16	. HARNESS, INTERNAL.....	1
5	XDOZZ		1CNQ1	344-1015-00	. FUSE ATC 15A	1
6	XDOZZ		1CNQ1	354-0020-00	. FUSE HOLDER ATC.....	1
7	XDOZZ		1CNQ1	116-0000-00	. CONTROLLER BRACKET	1
8	XDOZZ		1CNQ1	500-0020-01	. KEY SWITCH	1
9	XDOZZ		1CNQ1	112-0810-00	. BACKPLATE	1
10	XDOZZ		1CNQ1	400-0079-01	. PLUG, DOME 7.9-mm.....	1
11	XDOZZ		1CNQ1	043-1008-01	. CONNECTOR, 8 POSITION, Y	1
12	XDOZZ		1CNQ1	132-1032-50	. SCREW	4
13	XDOZZ		1CNQ1	043-1008-02	. CONNECTOR, 8 POSITION, W	1
14	XDOZZ		1CNQ1	400-0254-01	. PLUG, DOME 25.4-mm.....	1
15	XDOZZ		1CNQ1	132-0008-00	. SCREW	10
16	XDOZZ		1CNQ1	130-0516-00	. NUT 5/16-18	4
17	XDOZZ		1CNQ1	100-0810-00	. ENCLOSURE	1
18	XDOZZ		1CNQ1	113-0810-00	. FACEPLATE.....	1
19	XDOZZ		1CNQ1	132-0008-5	. SCREW	4
20	XDOZZ		1CNQ1	509-0030-01	. TOGGLE SWITCH BOOT	1
21	XDOZZ		1CNQ1	550-0002-00	. GAUGE COVER BLIND	2
22	XDOZZ		1CNQ1	550-2250-01	. TEMPERATURE GAGE	1
23	XDOZZ		1CNQ1	550-0000-03	. HOUR METER	1
24	XDOZZ		1CNQ1	106913	. TACHOMETER	1
25	XDOZZ		1CNQ1	550-3080-01	. OIL GAGE	1
26	XDOZZ		1CNQ1	131-0516-10	. WASHER.....	3
27	XDOZZ		1CNQ1	180-0516-00	. ISOLATION MOUNT	3
28	XDOZZ		1CNQ1	130-0516-00	. NUT, ZINC.....	6
29	XDOZZ		1CNQ1	115-0810-00	. BRACKET.....	1
30	XDOZZ		1CNQ1	130-1032-00	. NUT STAINLESS.....	4
31	XDOZZ		1CNQ1	804-0310-16	. HARNESS, 6-FOOT EXTERNAL	1
32	XDOZZ		1CNQ1	71255	. TACHOMETER PICKUP PROBE.....	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

FUEL SUPPLY/RETURN HOSES

REPAIR PARTS LIST

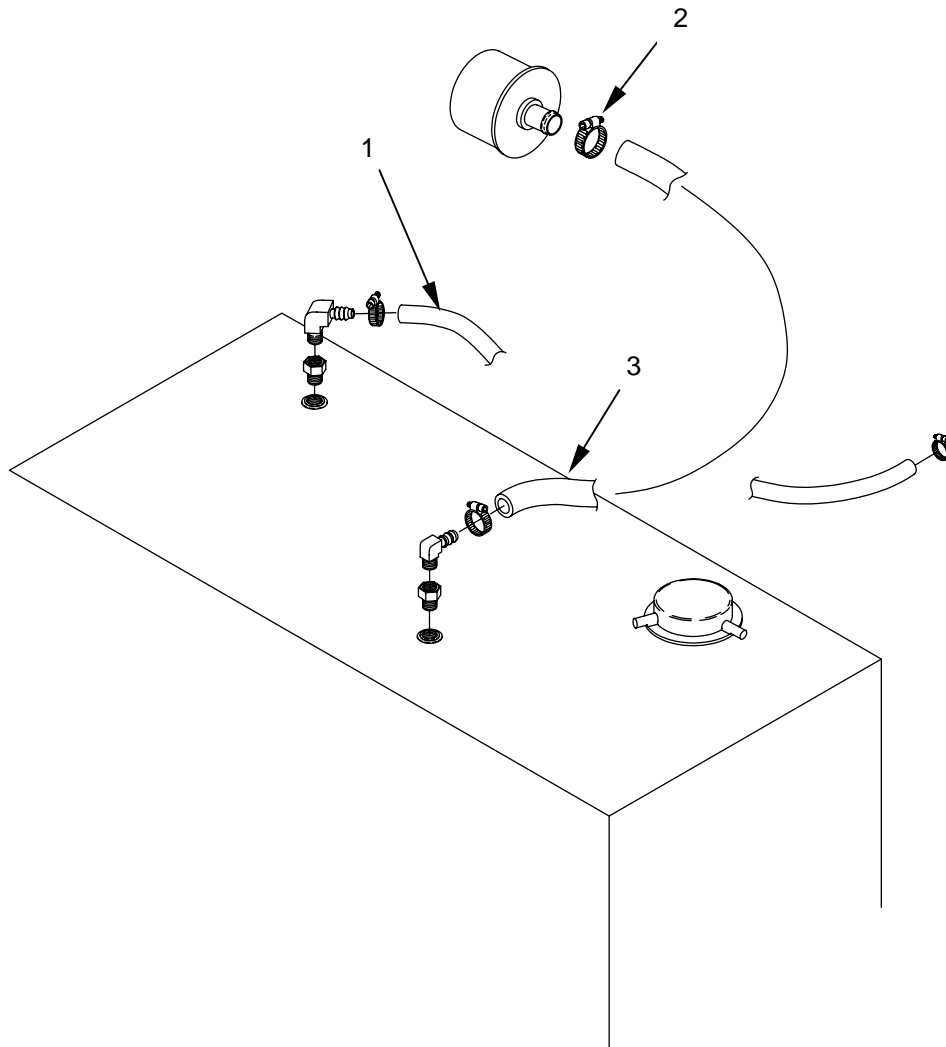


Figure 10. Fuel Supply and Return Hoses

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 02 GROUP 0203 FIG. 10 FUEL SUPPLY/RETURN HOSES	
1	XDOZZ		1CNQ1	95925	FUEL RETURN HOSE	1
2	XDOZZ		3A4R0	72314	HOSE CLAMP	4
3	XDOZZ		1CNQ1	95926	FUEL SUPPLY HOSE	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

DRIVE BELT

REPAIR PARTS LIST

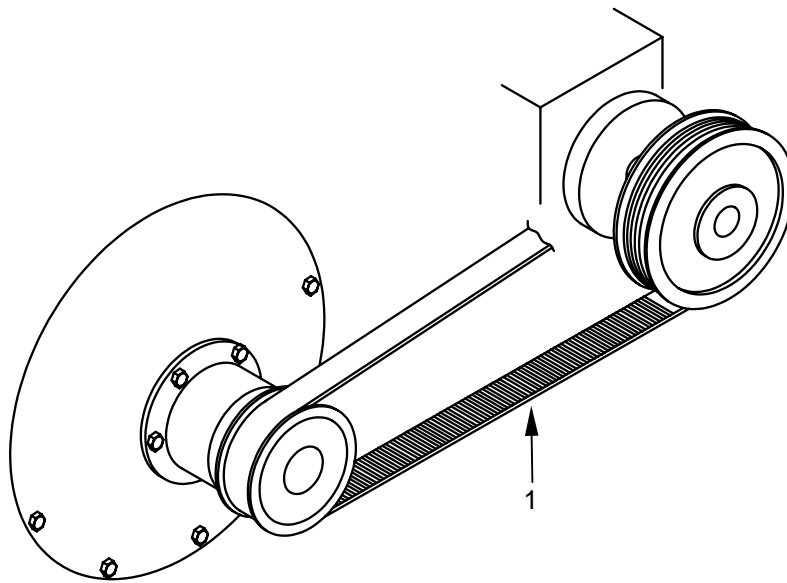


Figure 11. Drive Belt

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
1	XDOZZ		1CNQ1	4/3V630	GROUP 02 GROUP 0204 FIG. 11 DRIVE BELT DRIVE BELT..... END OF FIGURE	1

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

VACUUM PUMP

REPAIR PARTS LIST

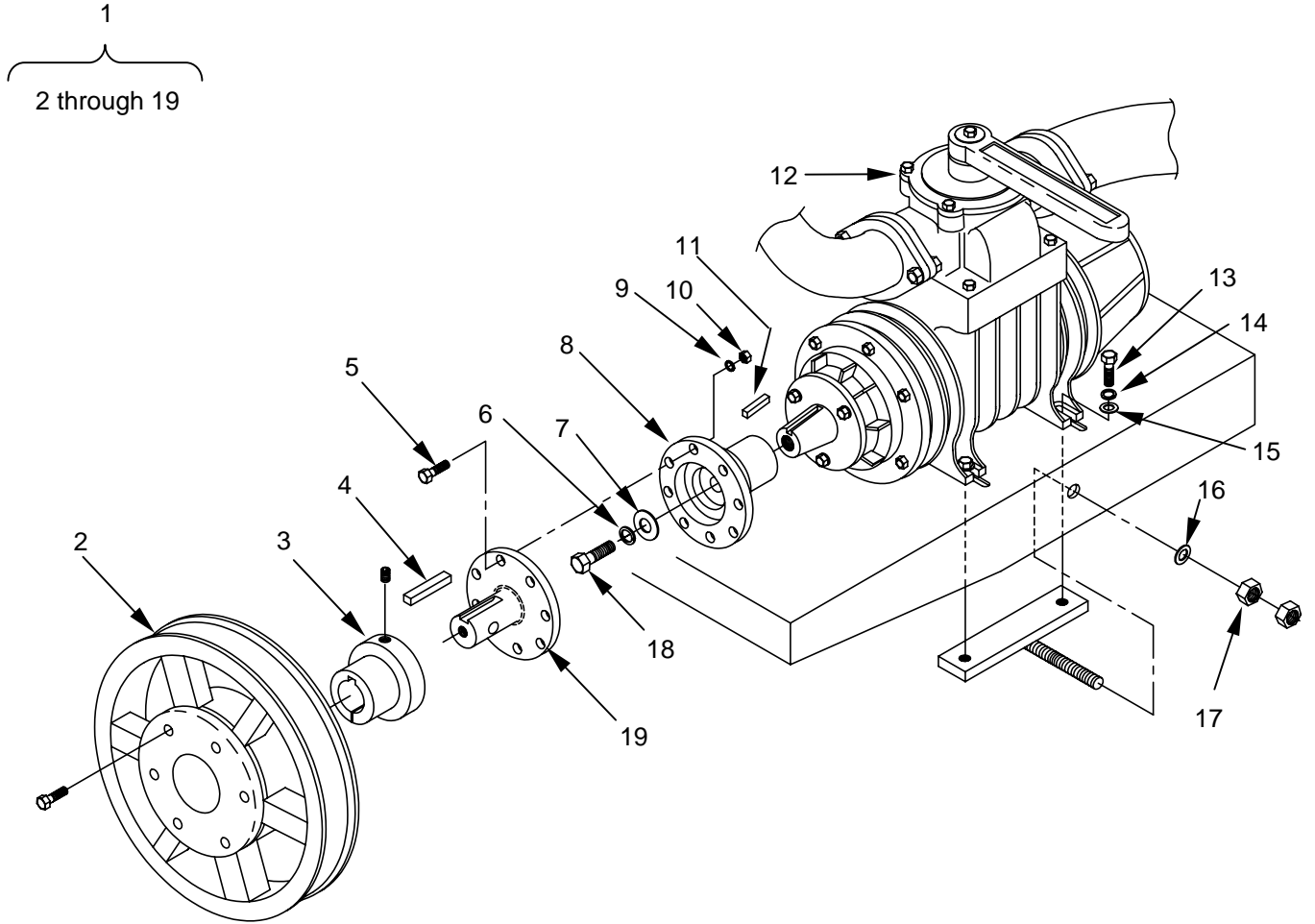


Figure 12. Vacuum Pump

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 03 GROUP 0301 FIG. 12 VACUUM PUMP	
1	XDFZZ		1CNQ1	VTSP-708	VACUUM PUMP MORO M-10	1
2	XDOZZ		1CNQ1	43V1060SK	. PULLEY	1
3	XDOZZ		1CNQ1	SK1-3/8	. PULLEY ADAPTER (1-3/8 KEY 5/16)	1
4	XDOZZ		1CNQ1	71038	. KEY 5/16 X2-IN	1
5	XDOZZ		1CNQ1	961013005	. BOLT 8MMX35MM 1.25 PITCH	8
6	XDOZZ		1CNQ1	683000101	. WASHER, RETAINING	1
7	XDOZZ		1CNQ1	964001003	. LOCK WASHER 10MM	1
8	XDOZZ		1CNQ1	656000200	. TAPERED SHAFT COUPLER.....	1
9	XDOZZ		1CNQ1	964001002	. LOCK WASHER 8MM	8
10	XDOZZ		3A4R0	962007001	. NUT 8MM 1.25 PITCH.....	8
11	XDOZZ		1CNQ1	KS4512	. KEY	1
12	XDOZZ		1CNQ1	211003090	. VACUUM PUMP.....	1
13	XDOZZ		3A4R0	20241	. BOLT	4
14	XDOZZ		3A4R0	76127	. LOCKWASHER	4
15	XDOZZ		3A4R0	76007	. FLAT WASHER	4
16	XDOZZ		3A4R0	76005	. FLAT WASHER	1
17	XDOZZ		3A4R0	40138	. NUT	2
18	XDOZZ		1CNQ1	961021001	. BOLT 10MM X30 1.5 PITCH	1
19	XDOZZ		1CNQ1	550000440	. FLANGED PUMP SHAFT EXT.....	1
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

MOISTURE TRAP

REPAIR PARTS LIST

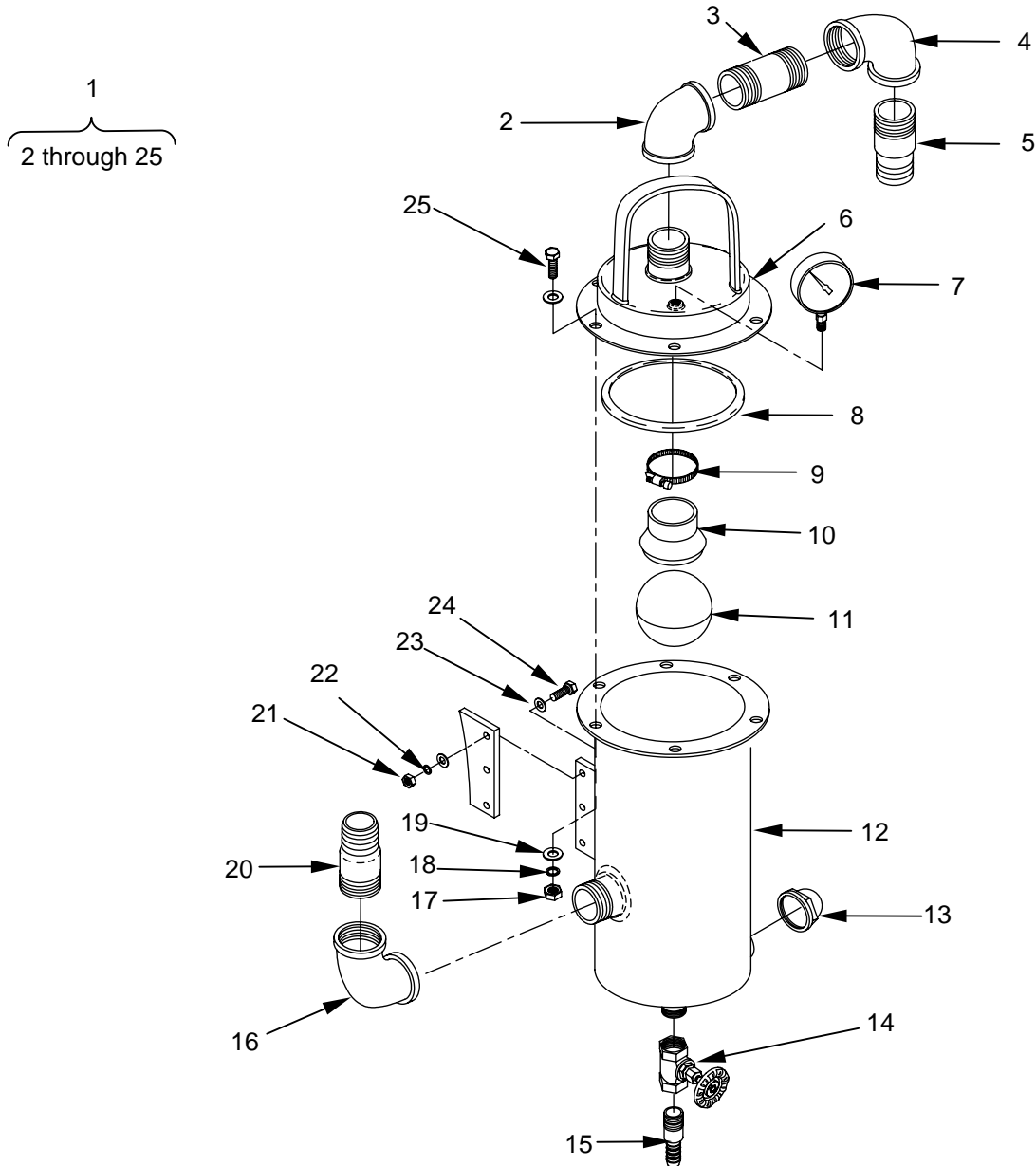


Figure 13. Moisture Trap

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 03 GROUP 0302 FIG. 13 MOISTURE TRAP	
1	XDOZZ		1CNQ1	VTSP-709	MOISTURE TRAP ASSM. 4 GAL.	1
2	XDOZZ		1CNQ1	390STD	. ELBOW.....	1
3	XDOZZ		1CNQ1	4399663	. FITTING.....	1
4	XDOZZ		1CNQ1	390STD	. ELBOW.....	1
5	XDOZZ		1CNQ1	3TCNP0300	. HOSE NIPPLE.....	1
6	XDOZZ		1CNQ1	VT-306B	. COVER.....	1
7	XDOZZ		1CNQ1	A-309-1	. PRESSURE GAGE.....	1
8	XDOZZ		1CNQ1	FP-7063/8	. O-RING.....	1
9	XDOZZ		1CNQ1	72348	. HOSE CLAMP	1
10	XDOZZ		1CNQ1	FP-3028	. SEAT	1
11	XDOZZ		1CNQ1	FP-6204	. FLOAT, BALL 6-IN.....	1
12	XDOZZ		1CNQ1	VT-306A	. MOISTURE TRAP BODY	1
13	XDOZZ		1CNQ1	AP-308-1/GOR	. SIGHT EYE	1
14	XDOZZ		1CNQ1	FP-10164	. DRAIN VALVE	1
15	XDOZZ		1CNQ1	3TCNP0100	. HOSE NIPPLE.....	1
16	XDOZZ		1CNQ1	390STD	. ELBOW.....	1
17	XDOZZ		3A4R0	40132	. NUT	6
18	XDOZZ		3A4R0	76122	. LOCKWASHER	6
19	XDOZZ		3A4R0	76002	. FLAT WASHER	6
20	XDOZZ		1CNQ1	3TCNP0300	. HOSE NIPPLE.....	1
21	XDOZZ		3A4R0	40138	. NUT	1
22	XDOZZ		3A4R0	76125	. LOCK WASHER	3
23	XDOZZ		3A4R0	76005	. FLAT WASHER	3
24	XDOZZ		3A4R0	20198	. BOLT	3
25	XDOZZ		3A4R0	20125	. BOLT	6
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

ISOLATION VALVE

REPAIR PARTS LIST

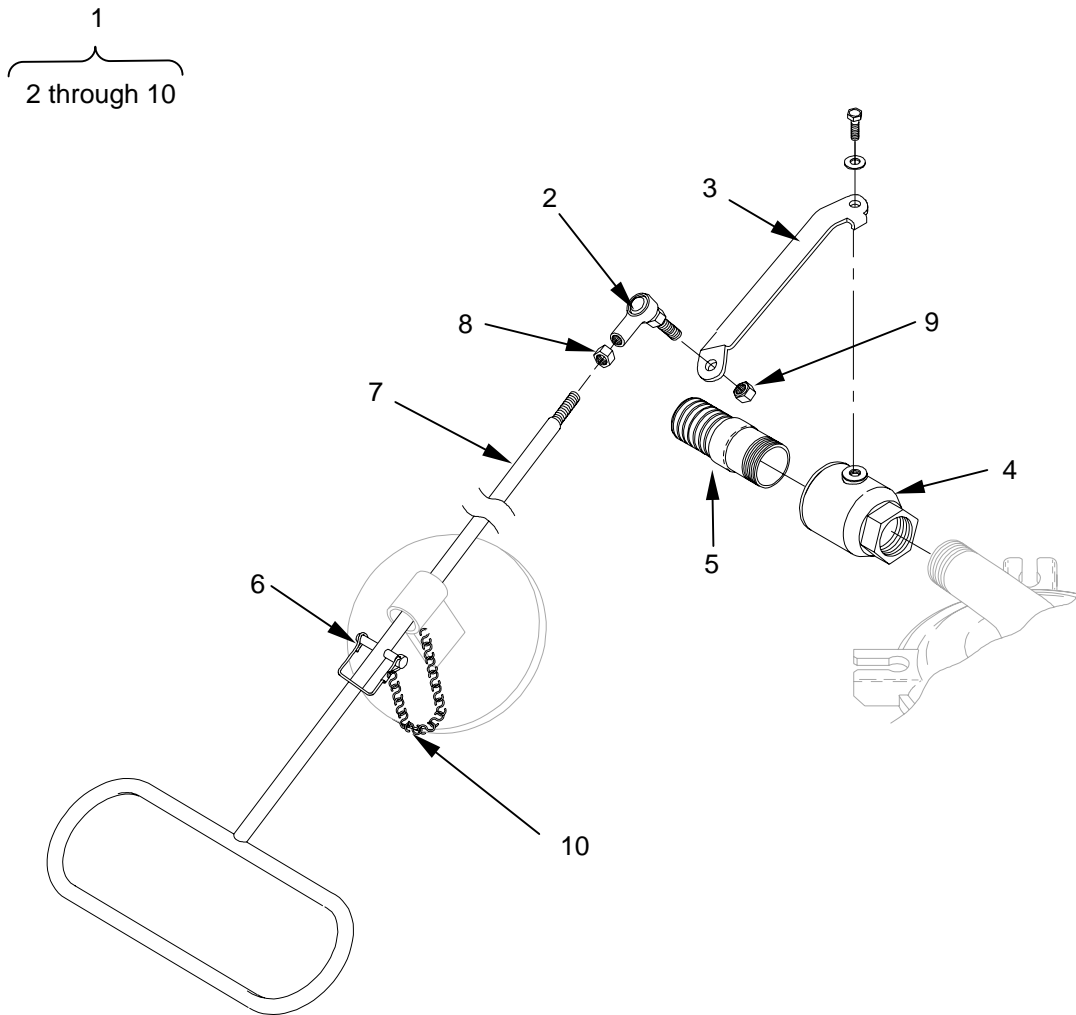


Figure 14. Isolation Valve

0068 00-(1 Blank)/2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 03	
					GROUP 03 GROUP 0303 FIG. 14 ISOLATION VALVE	
1	XDOZZ		1CNQ1	VTSP-710	ISOLATION VALVE ASSEMBLY.....	1
2	XDOZZ		1CNQ1	BRE82S	. SWIVEL ASSEMBLY.....	1
3	XDOZZ		1CNQ1	VT-109A	. HANDLE	1
4	XDOZZ		1CNQ1	VB-310-1	. ISOLATION VALVE	1
5	XDOZZ		1CNQ1	3TCNP0300	. HOSE NIPPLE.....	1
6	XDOZZ		1CNQ1	66050	. PIN ASSEMBLY	1
7	XDOZZ		1CNQ1	VT-109B	. VALVE LINKAGE ROD.....	1
8	XDOZZ		3A4R0	41139	. LOCK NUT	1
9	XDOZZ		3A4R0	41139	. ADJUSTING NUT	1
10	XDOZZ		1CNQ1	709326	. CHAIN	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

OIL CATCH MUFFLER

REPAIR PARTS LIST

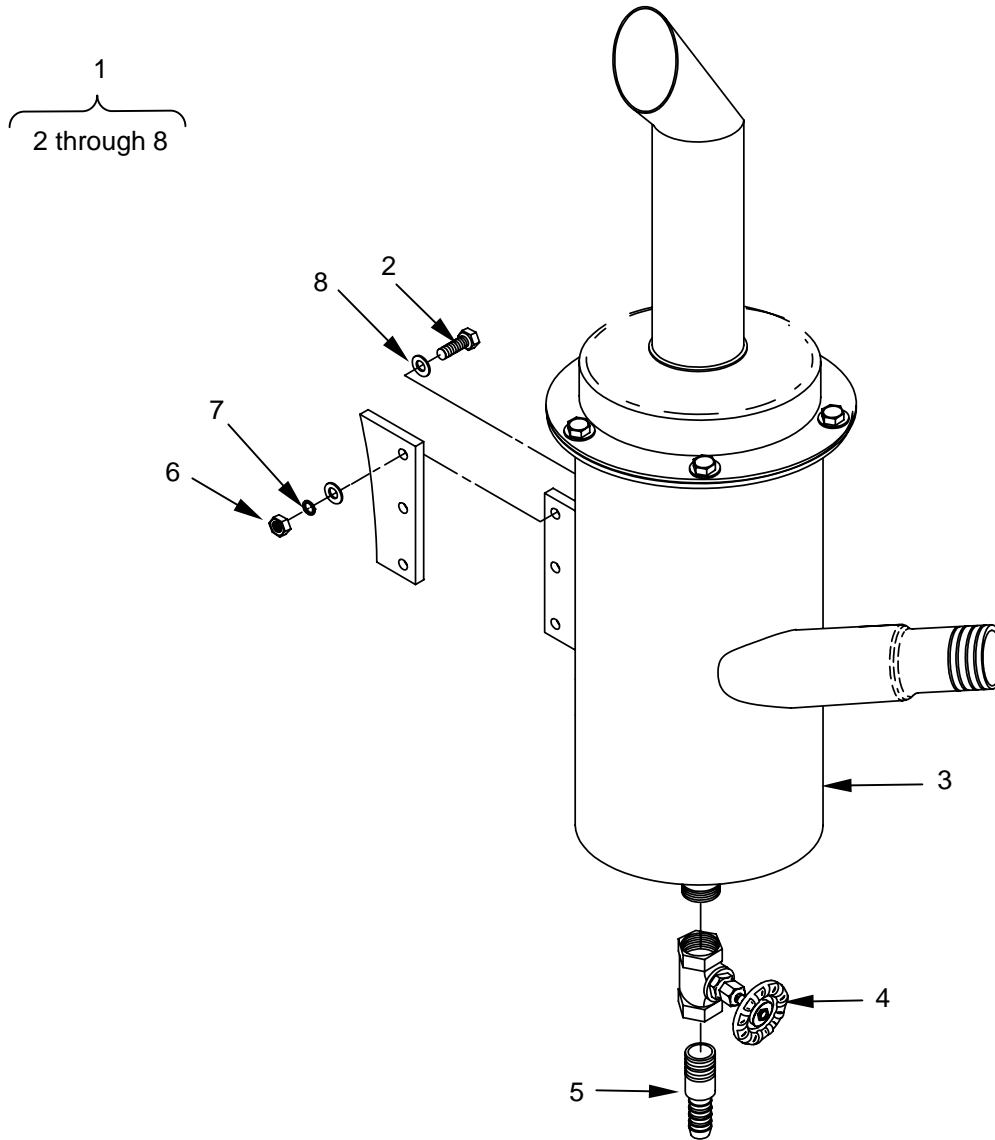


Figure 15. Oil Catch Muffler

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 03 GROUP 0304 FIG. 15 OIL CATCH MUFFLER	
1	XDOZZ		1CNQ1	VTSP-711	OIL CATCH MUFFLER ASSM.	1
2	XDOZZ		3A4R0	20198	. HEX BOLT	3
3	XDOZZ		1CNQ1	VT-305	. OIL CATCH MUFFLER.....	1
4	XDOZZ		1CNQ1	FP-10164	. DRAIN VALVE	1
5	XDOZZ		1CNQ1	3TCNP0100	. HOSE NIPPLE.....	1
6	XDOZZ		3A4R0	40138	. HEX NUT	3
7	XDOZZ		3A4R0	76125	. LOCK WASHER	3
8	XDOZZ		3A4R0	76005	. FLAT WASHER	6
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

BATTERY

REPAIR PARTS LIST

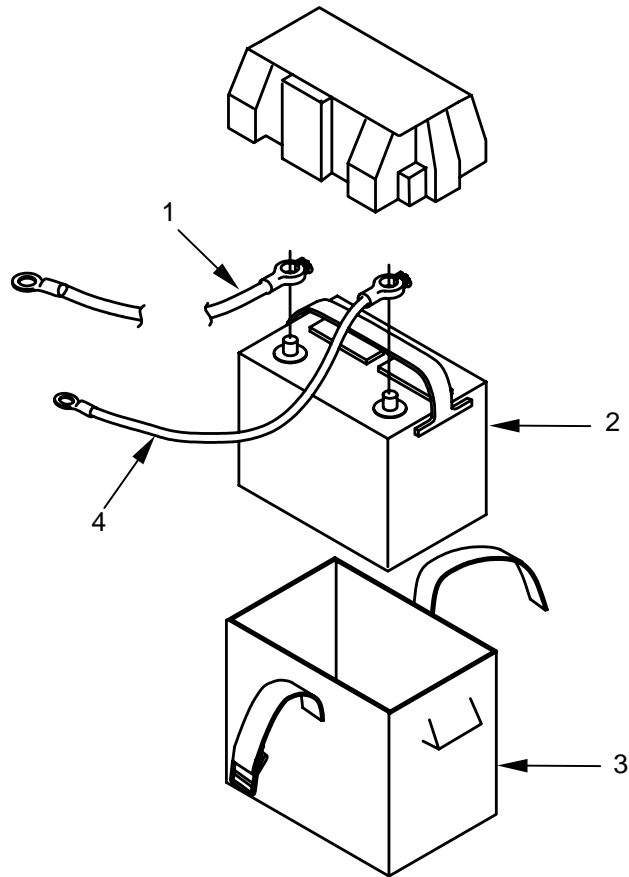


Figure 16. Battery

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 04 GROUP 0401 FIG. 16 BATTERY	
1	XDOZZ		1CNQ1	4F53	CABLE, STARTER	1
2	XDOZZ		1CNQ1	V-24M-6P	BATTERY	1
3	XDOZZ		1CNQ1	23355	BATTERY BOX	1
4	XDOZZ		1CNQ1	4F30	CABLE, GROUND	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

LIGHTS

REPAIR PARTS LIST

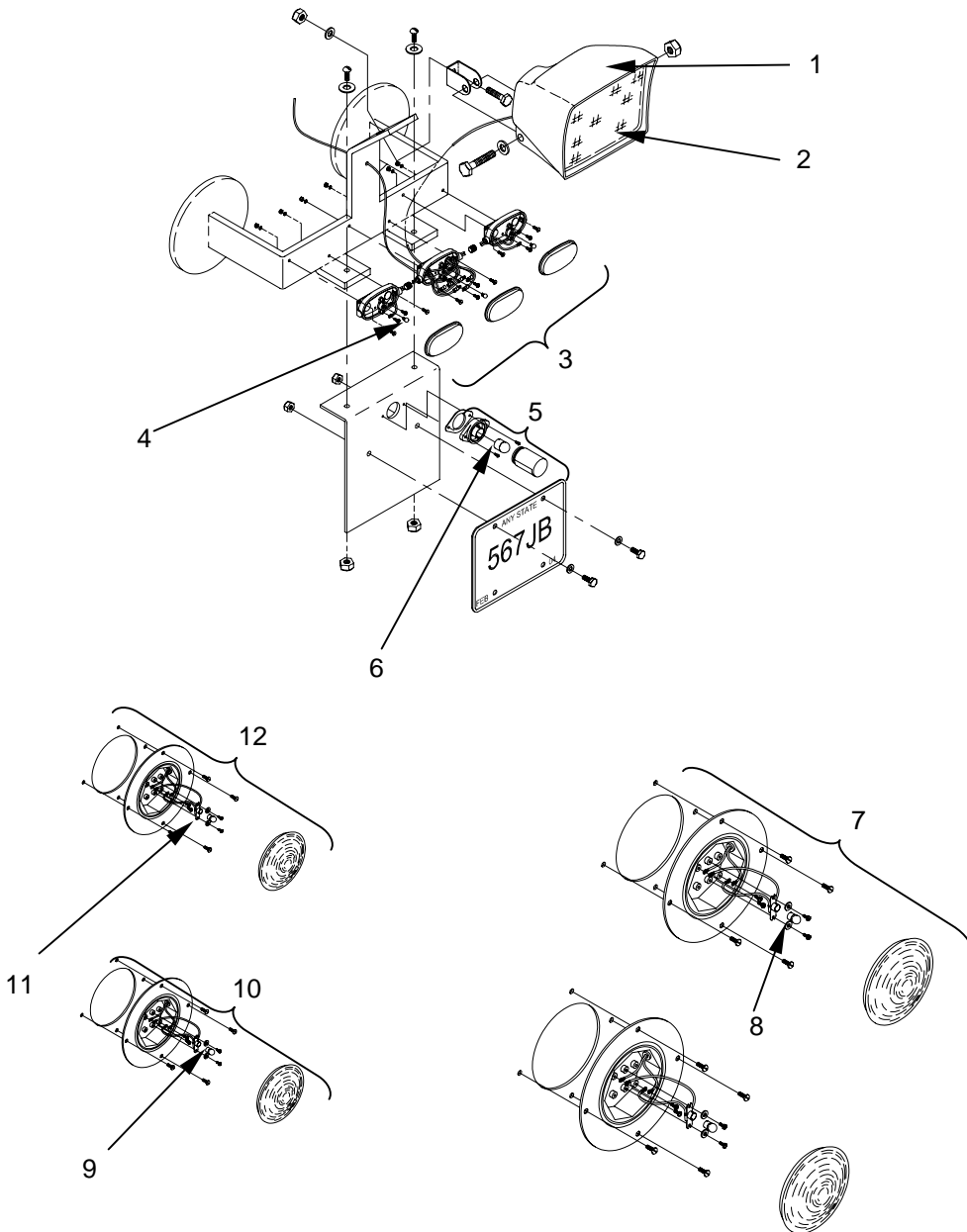


Figure 17. Lights

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 04 GROUP 0402 FIG. 17 LIGHTS	
1	XDOZZ		1CNQ1	80394	WORK LIGHT ASSY	1
2	XDOZZ		1CNQ1	H9411	.WORK LIGHT BULB	1
3	XDOZZ		1CNQ1	211007	REAR ICC LIGHTS	1
4	XDOZZ		1CNQ1	194	. ICC BULB.....	3
5	XDOZZ		1CNQ1	240010	LICENSE PLATE LIGHT	1
6	XDOZZ		1CNQ1	67	. LICENSE PLATE LIGHT BULB.....	1
7	XDOZZ		1CNQ1	400039	REAR TAIL LIGHT (RED).....	4
8	XDOZZ		1CNQ1	1157	. TAIL LIGHT BULB.....	4
9	XDOZZ		1CNQ1	560019	REAR MARKER LIGHT (RED).....	2
10	XDOZZ		1CNQ1	67	. REAR MARKER LIGHT BULB	2
11	XDOZZ		1CNQ1	560020	FRONT MARKER LIGHT (YELLOW).....	2
12	XDOZZ		1CNQ1	67	. FRONT MARKER LIGHT BULB.....	2
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

WIRING

REPAIR PARTS LIST

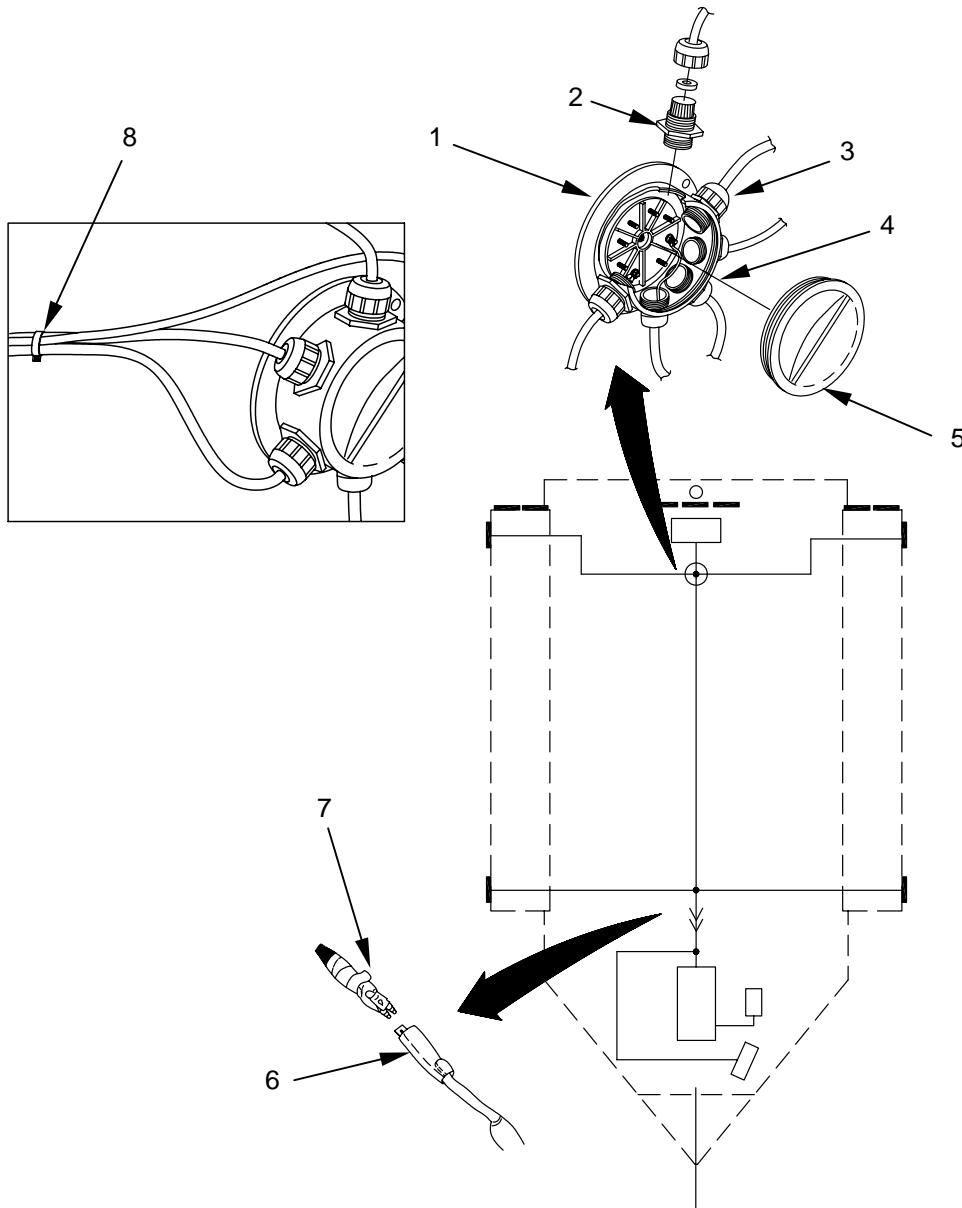


Figure 18. Wiring

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 04 GROUP 0403 FIG. 18 WIRING	
1	XDOZZ		1CNQ1	50400	J-BOX	1
2	XDOZZ		1CNQ1	50842	FITTING 7 WIRE 3/4-IN	1
3	XDOZZ		1CNQ1	50841	FITTING 3 WIRE 1/2-IN	3
4	XDOZZ		1CNQ1	50840	FITTING 2 WIRE 3/8-IN	2
5	XDOZZ		1CNQ1	50816	COVER.....	1
6	XDOZZ		1CNQ1	920520	PLUG 2 PIN FEMALE 10-IN.....	1
7	XDOZZ		1CNQ1	920476	PLUG 2 PIN MALE 15-FT	1
8	XDOZZ		1CNQ1	RBC-3/4	WIRE CLAMPS	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

PARKING BRAKES

REPAIR PARTS LIST

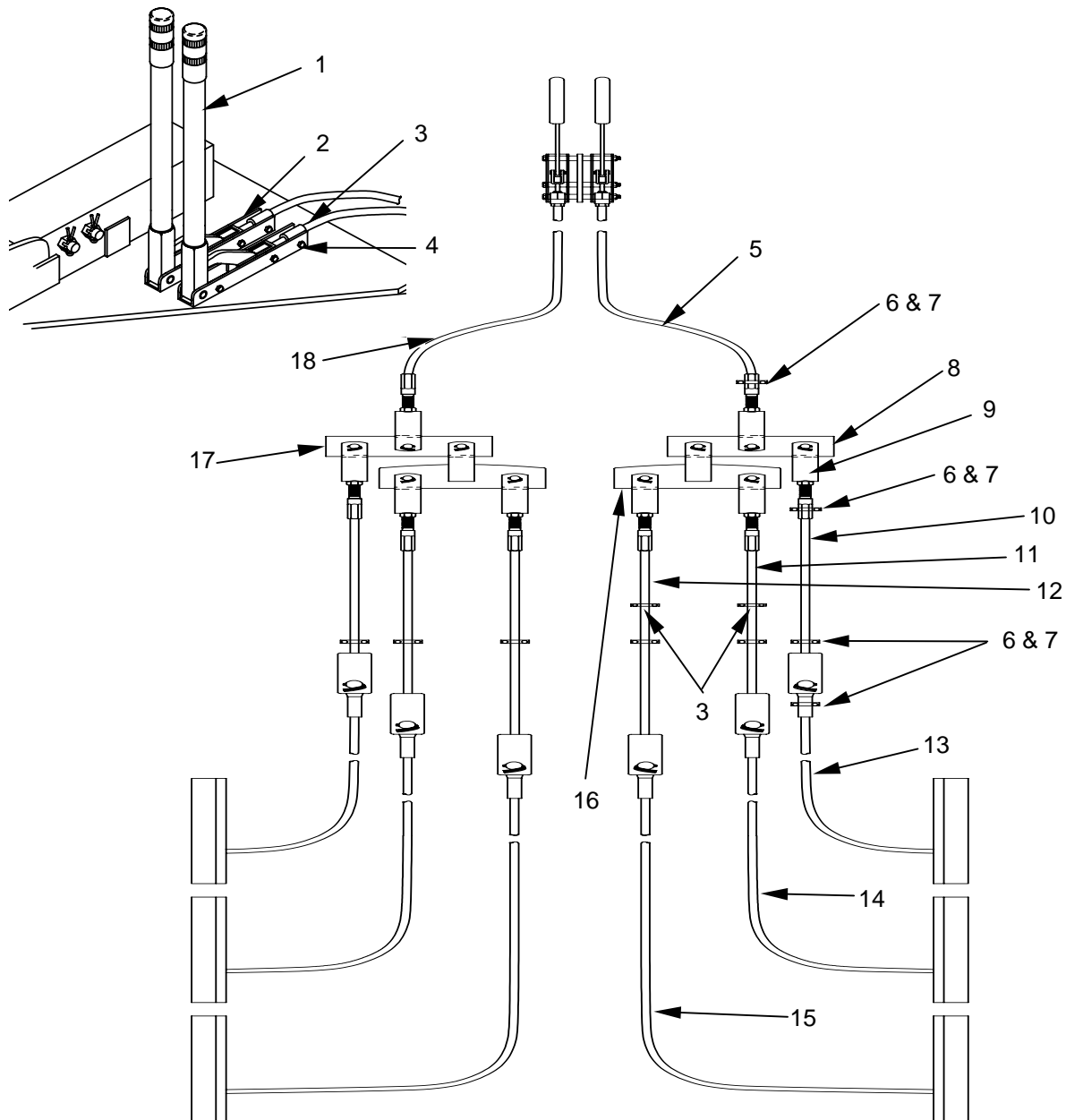


Figure 19. Parking Brakes

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 05 GROUP 0502 FIG. 19 PARKING BRAKES	
1	XDOZZ		1CNQ1	01219101	BRAKE HANDLE ASSEMBLY.....	2
2	XDOZZ		3A4R0	42106	NUT, NYLON LOCK ¼-20.....	3
3	XDOZZ		1CNQ1	81000191	CABLE CLAMP	6
4	XDOZZ		3A4R0	20117	BOLT, ¼-20 X 4.5.....	3
5	XDOZZ		1CNQ1	15494102	MAIN CABLE, RIGHT SIDE	1
6	XDOZZ		1CNQ1	81000131	LINK SPACER.....	10
7	XDOZZ		1CNQ1	81000108	CABLE CLAMP	10
8	XDOZZ		1CNQ1	6177700R	MULTIPLIER (EQUALIZER) RIGHT HAND	1
9	XDOZZ		1CNQ1	81000053	LINK.....	4
10	XDOZZ		1CNQ1	15829701	CABLE AXLE #2 MIDDLE	2
11	XDOZZ		1CNQ1	15822402	CABLE AXLE #3 REAR.....	2
12	XDOZZ		1CNQ1	15829700	CABLE AXLE #1 FRONT	2
13	XDOZZ		1CNQ1	15830000	CABLE, BACKING PLTE DEXTER #1 AXLE	2
14	XDOZZ		1CNQ1	15830000	CABLE, BACKING PLTE DEXTER #2 AXLE	2
15	XDOZZ		1CNQ1	15830000	CABLE, BACKING PLTE DEXTER #3 AXLE	2
16	XDOZZ		1CNQ1	81007269	EQUALIZER (SPREADER BAR).....	2
17	XDOZZ		1CNQ1	6177700L	MULTIPLIER, (EQUALIZER) LEFT HAND	1
18	XDOZZ		1CNQ1	15194101	MAIN CABLE, LEFT SIDE.....	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

RIMS AND TIRES

REPAIR PARTS LIST

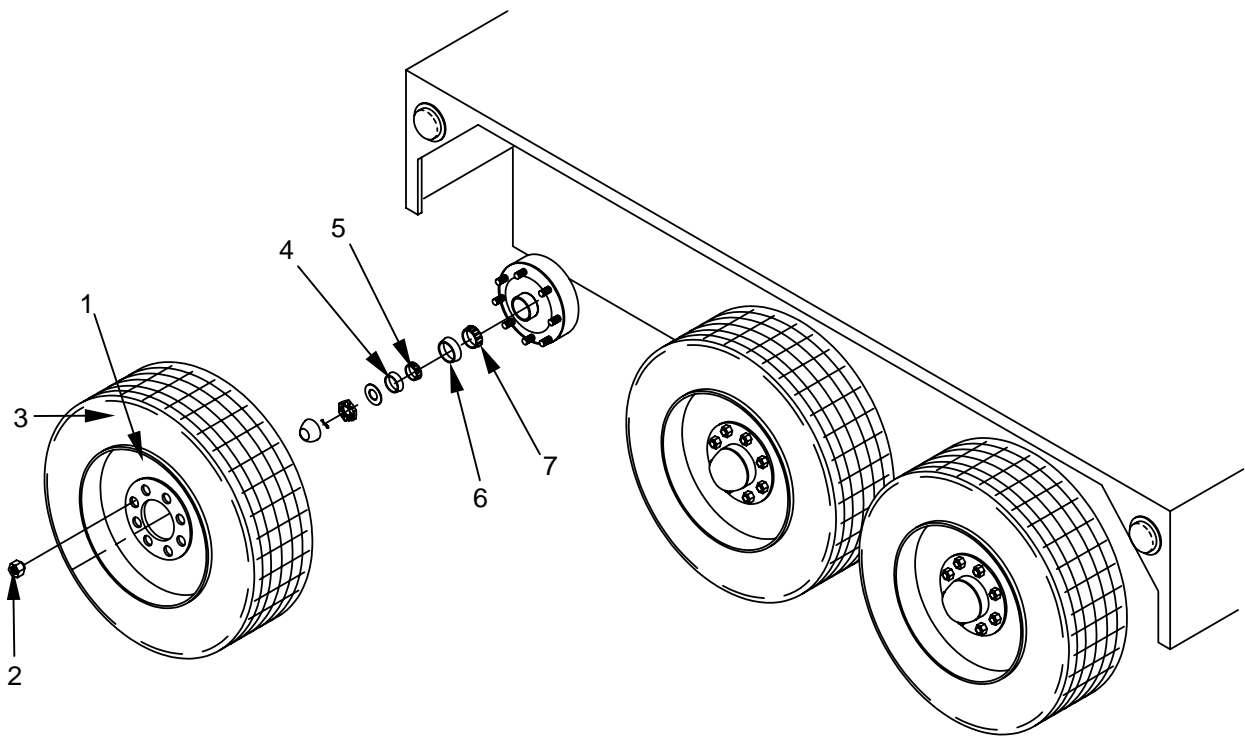


Figure 20. Rims and Tires

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 05 GROUP 0502 FIG. 20 RIMS AND TIRES	
1	XDOZZ		1CNQ1	017-153-25	RIM	7
2	XDOZZ		1CNQ1	006-053-00	LUG NUT	48
3	XDOZZ		1CNQ1	139-229-099	TIRES	7
4	XDOZZ		1CNQ1	14276	WHEEL BEARING, OUTER, CUP	6
5	XDOZZ		1CNQ1	14125A	WHEEL BEARING, OUTER, CONE	6
6	XDOZZ		1CNQ1	25520	WHEEL BEARING, INNER, CUP	6
7	XDOZZ		1CNQ1	25580	WHEEL BEARING, INNER, CONE	6
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

EQUIPMENT TRAYS

REPAIR PARTS LIST

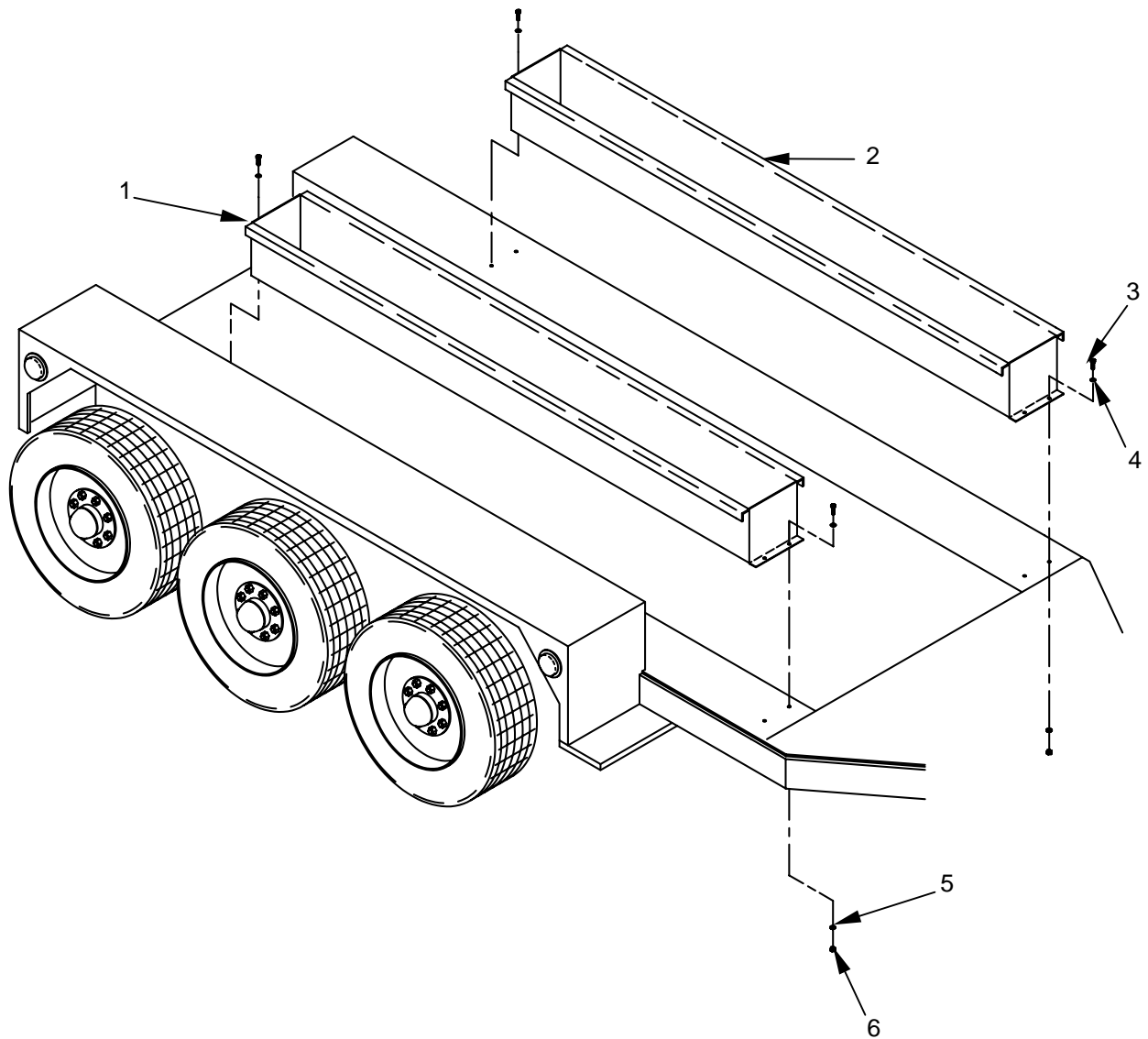


Figure 21. Equipment Trays

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 05 GROUP 0503 FIG. 21 EQUIPMENT TRAYS	
1	XDOZZ		1CNQ1	VT-213L	EQUIPMENT TRAY, LEFT SIDE.....	1
2	XDOZZ		1CNQ1	VT-213R	EQUIPMENT TRAY, RIGHT SIDE	1
3	XDOZZ		3A4R0	20148	BOLT	8
4	XDOZZ		3A4R0	76003	FLAT WASHER	8
5	XDOZZ		3A4R0	76123	LOCK WASHER.....	8
6	XDOZZ		3A4R0	40134	HEX NUT.....	8
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

FUEL TANK

REPAIR PARTS LIST

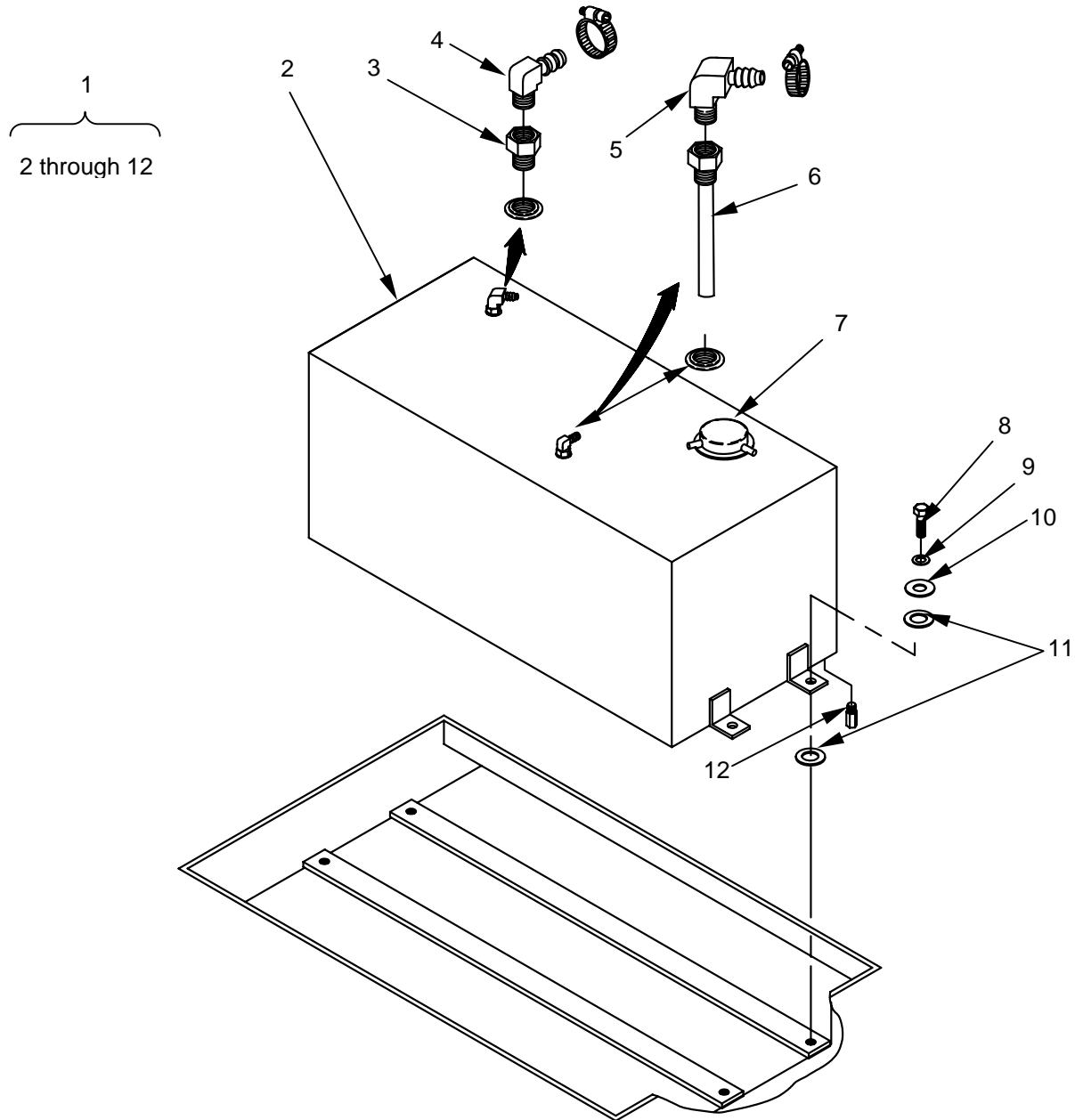


Figure 22. Fuel Tank

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 05 GROUP 0504 FIG. 22 FUEL TANK	
1	XDOZZ		1CNQ1	VTSP-712	FUEL TANK ASSM WITH FITTINGS	1
2	XDOZZ		1CNQ1	VT-326E	. FUEL TANK.....	1
3	XDOZZ		3A4R0	90320	. TANK BUSHING.....	2
4	XDOZZ		3A4R0	90785	. ELBOW HOSE FITTING, 1/4-IN.....	1
5	XDOZZ		3A4R0	90787	. ELBOW HOSE FITTING, 5/16-IN.....	1
6	XDOZZ		1CNQ1	VT-326B	. DIPTUBE	1
7	XDOZZ		1CNQ1	600007	. FUEL FILLER CAP	1
8	XDOZZ		3A4R0	20148	. BOLT	4
9	XDOZZ		3A4R0	76123	. LOCKWASHER	4
10	XDOZZ		3A4R0	76003	. FLATWASHER.....	4
11	XDOZZ		3A4R0	180142	. NYLON WASHER.....	8
12	XDOZZ		1CNQ1	98084	. DRAIN PLUG.....	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

TOOL BOX

REPAIR PARTS LIST

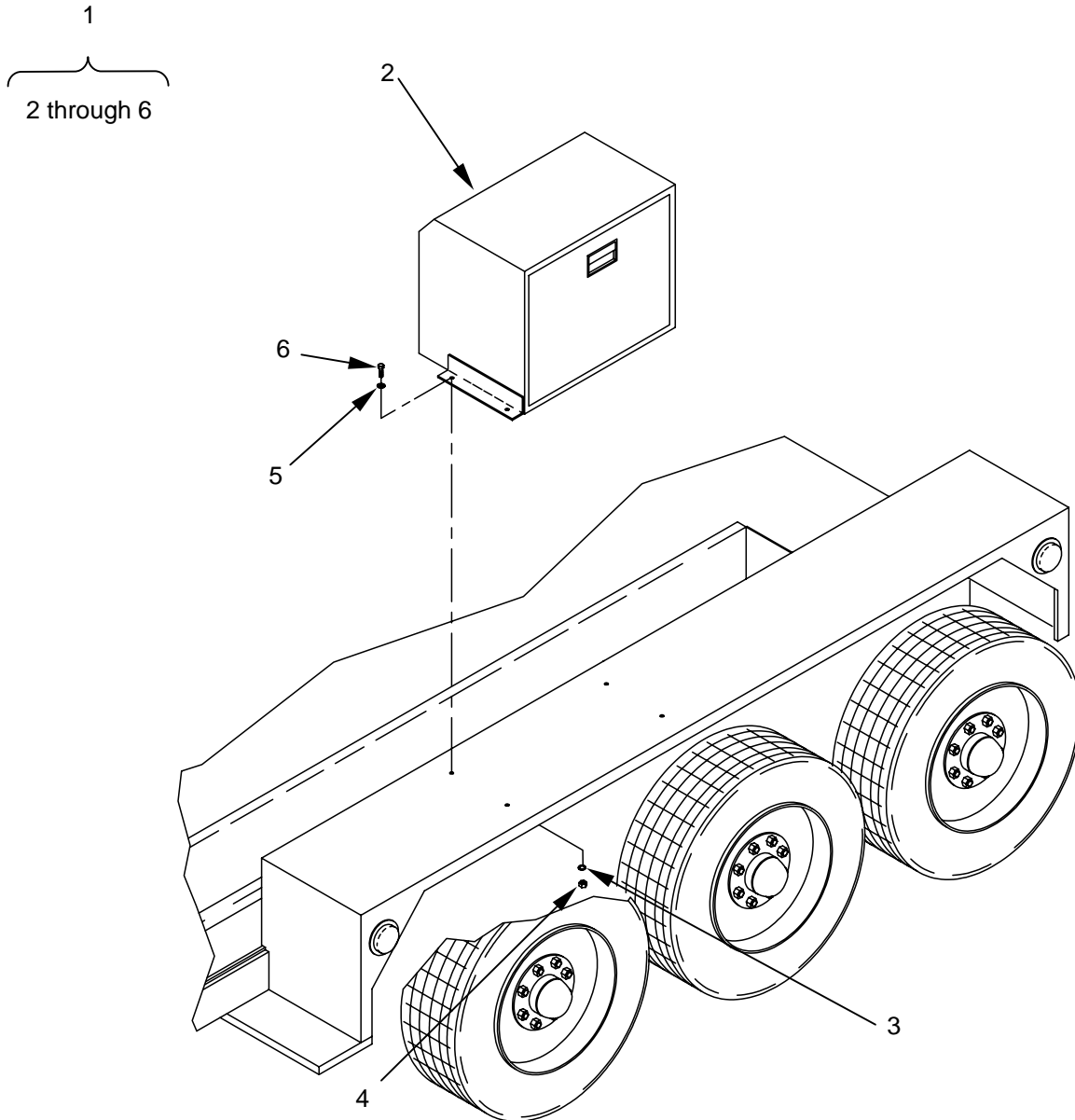


Figure 23. Tool box

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 05 GROUP 0505 FIG. 23 TOOL BOX	
1	XDOZZ		1CNQ1	VTSP-231	TOOL BOX	1
2	XDOZZ		1CNQ1	VT-229B	. TOOL BOX	1
3	XDOZZ		3A4R0	76123	. LOCKWASHER	4
4	XDOZZ		3A4R0	40134	. NUT	4
5	XDOZZ		3A4R0	76003	. FLATWASHER	4
6	XDOZZ		3A4R0	20148	. BOLT	4
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

TRAILER JACK

REPAIR PARTS LIST

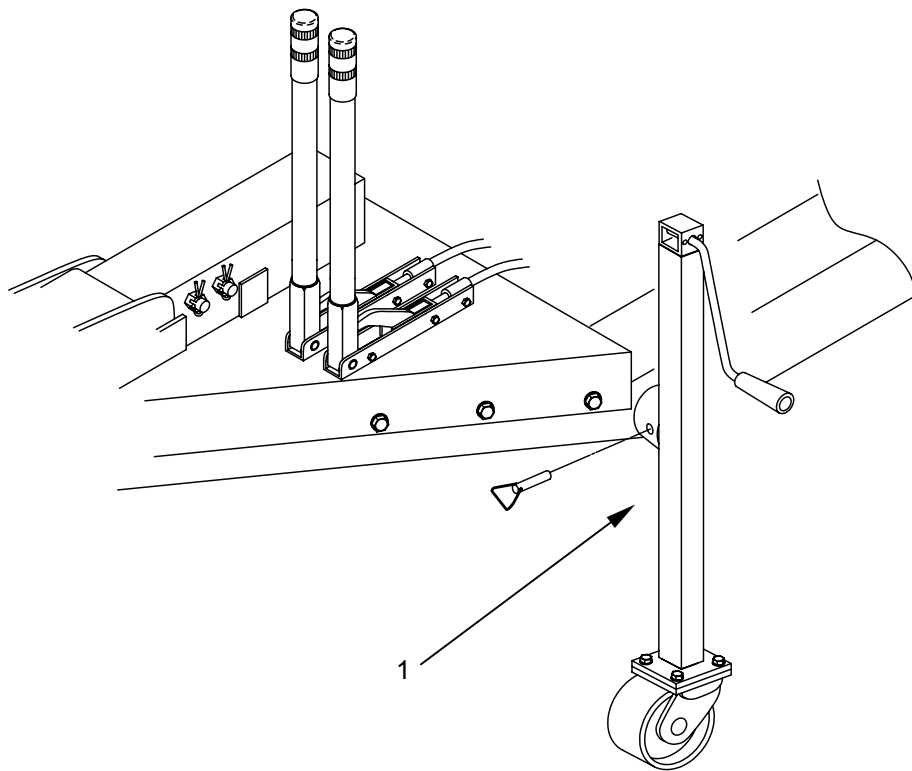


Figure 24. Trailer Jack

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 05	
					GROUP 05 GROUP 0506 FIG. 24 TRAILER JACK	
1	XDOZZ		1CNQ1	VTSP-714	TRAILER JACK ASSM. W/CASTER	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

LUNETTE EYE AND CHAINS

REPAIR PARTS LIST

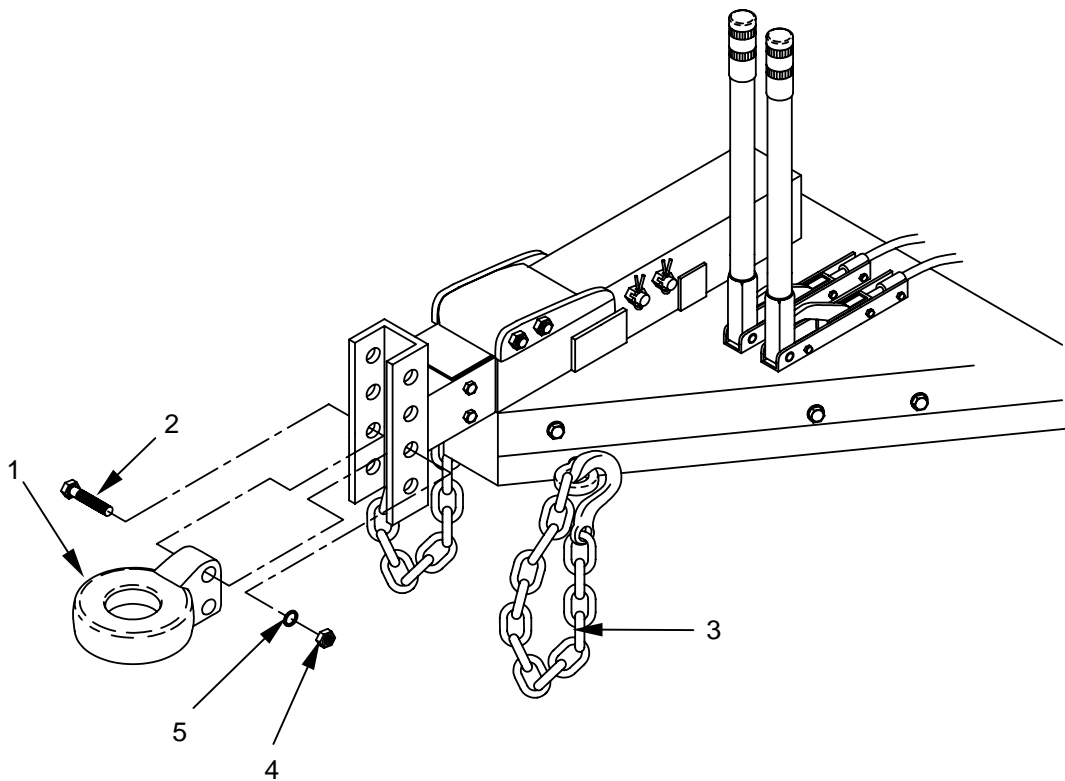


Figure 25. Lunette Eye and Chains

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 05 GROUP 0507 FIG. 25 LUNETTE EYE AND CHAINS	
1	XDOZZ		1NCQ1	1613700	LUNETTE EYE	1
2	XDOZZ		3A4R0	20249	BOLT 5/8-11X4.5 GR5	2
3	XDOZZ		1NCQ1	VT-231A	CHAIN	2
4	XDOZZ		3A4R0	40142	NUT 5/8-11	2
5	XDOZZ		3A4R0	76127	WASHER.....	2
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

PULLEY GUARD

REPAIR PARTS LIST

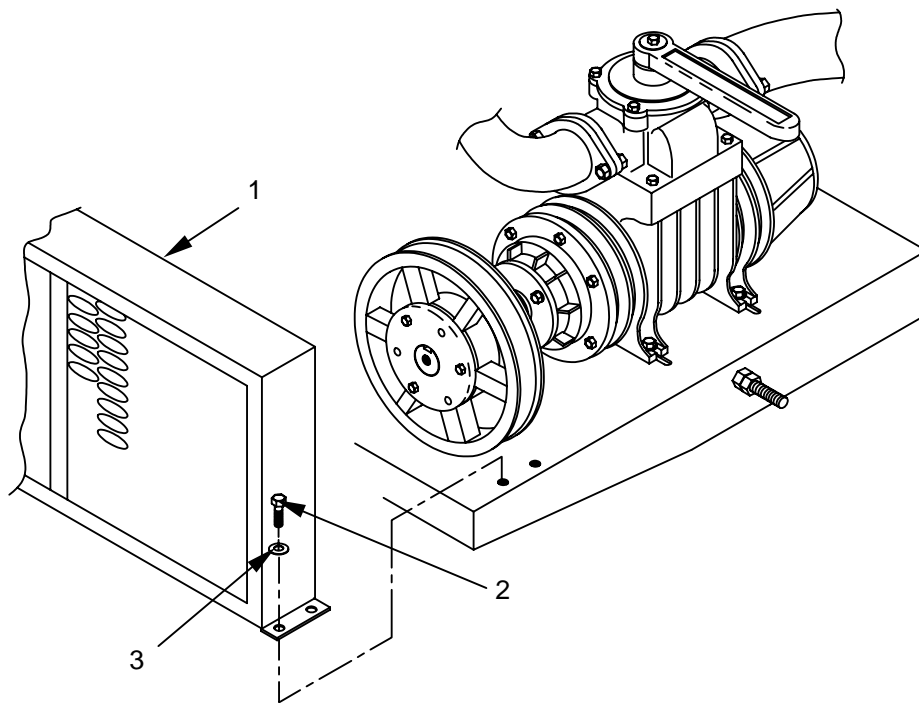


Figure 26. Pulley Guard

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 05 GROUP 0508 FIG. 26 PULLEY GUARD	
1	XDOZZ		1CNQ1	VT-327	PULLEY GUARD	1
2	XDOZZ		3A4R0	20104	HEX BOLT	5
3	XDOZZ		3A4R0	76121	LOCK WASHER	5
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

BRAKES

REPAIR PARTS LIST

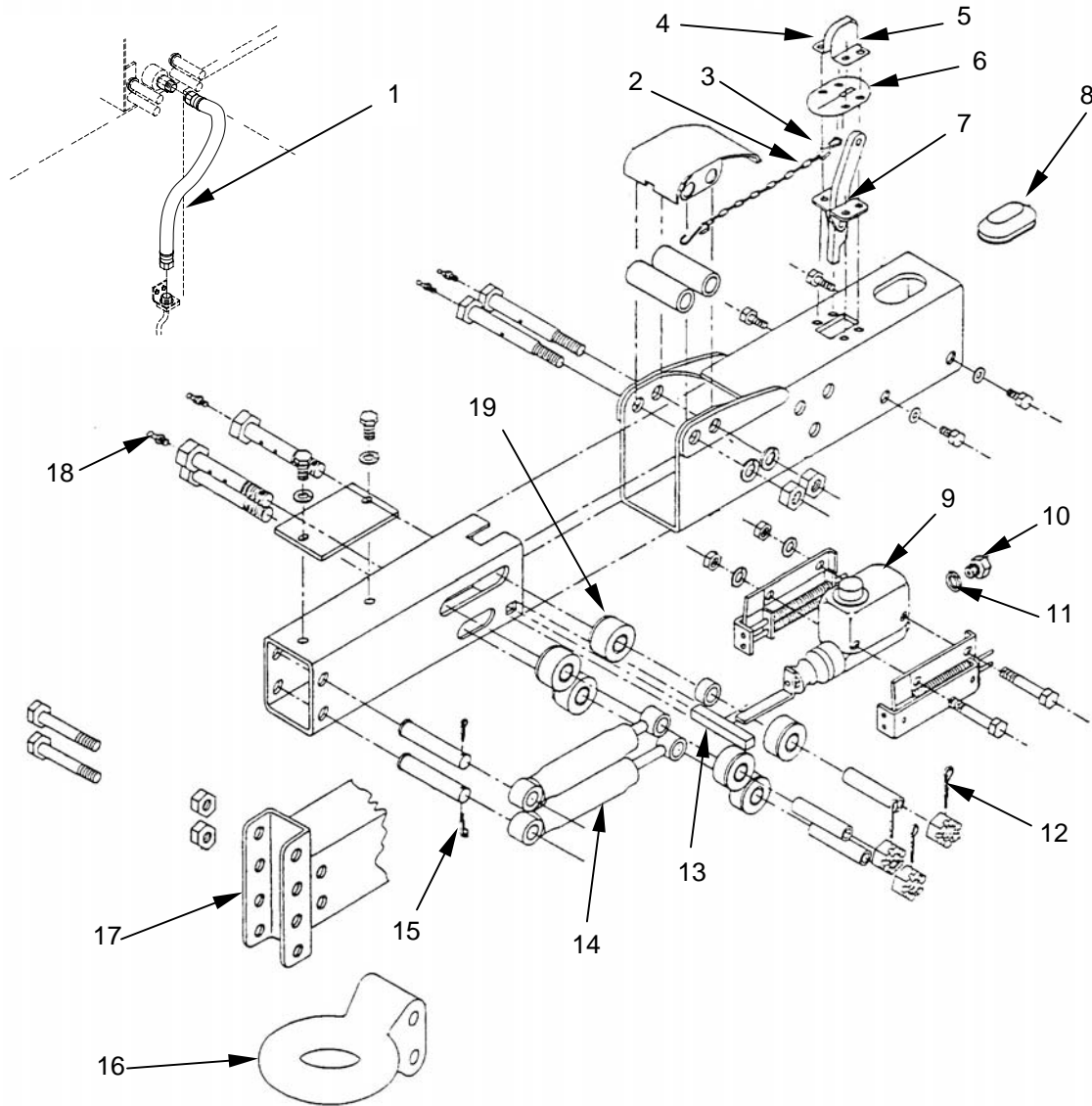


Figure 27. Surge Brake (Sheet 1 of 3)

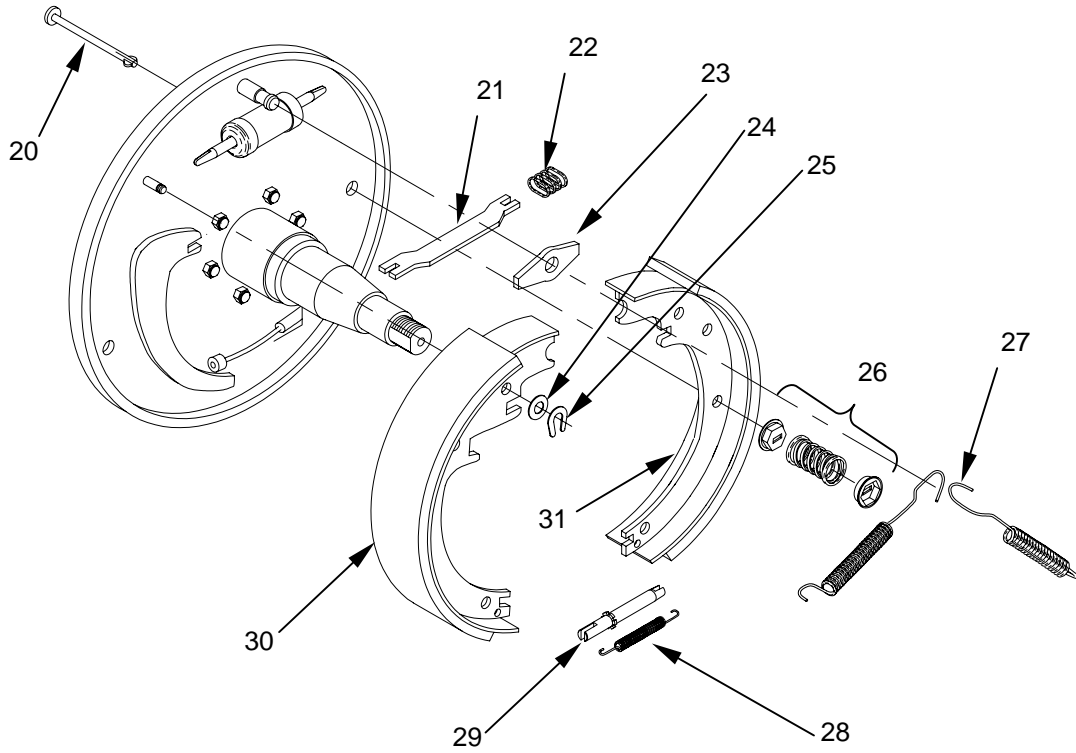


Figure 27. Brake Shoes (Sheet 2 of 3)

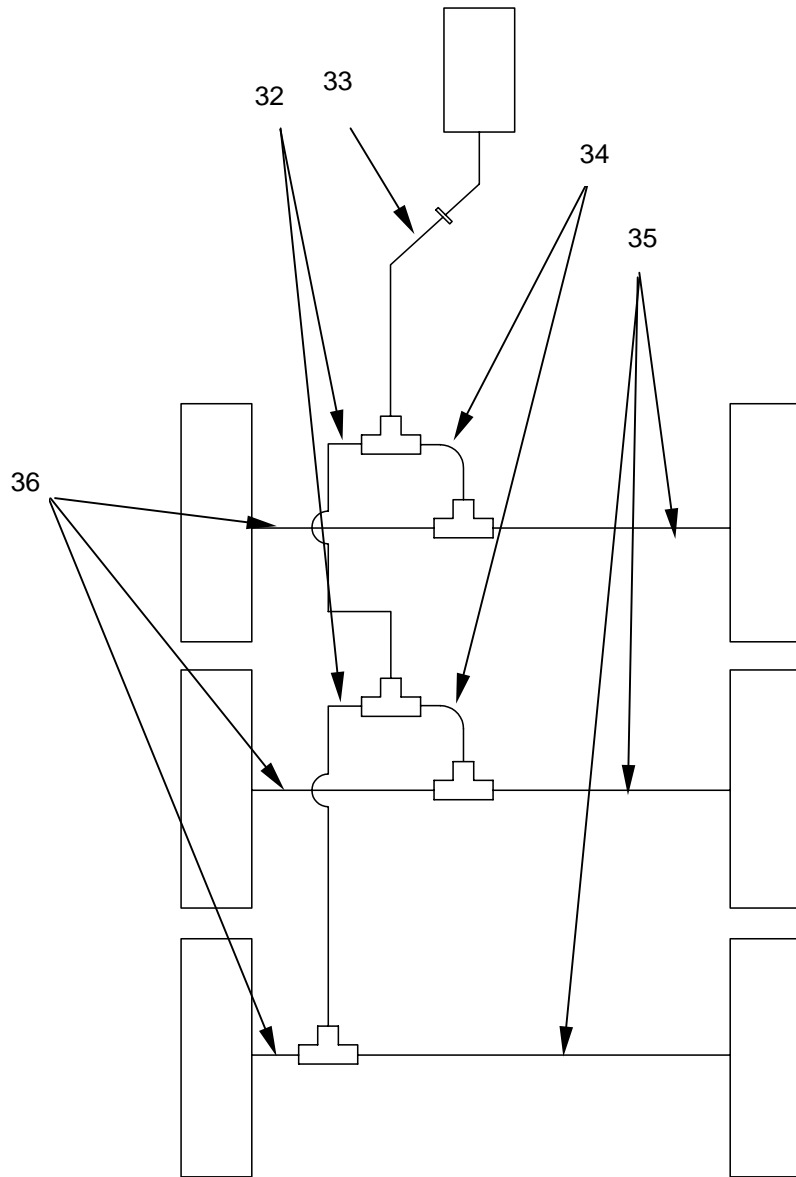


Figure 27. Brake Diagram (Sheet 3 of 3)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 05 GROUP 0509 FIG. 27 BRAKES	
1	XDOZZ		1CNQ1	18018-MF	HOSE, FLEXIBLE, ACTUATOR TO CONNECTOR	1
2	XDOZZ		1CNQ1	0776800	SAFETY CHAIN	1
3	XDOZZ		1CNQ1	1055500	S-HOOK	2
4	XDOZZ		1CNQ1	1052700	RIGHT HAND BREAKAWAY LOCK	1
5	XDOZZ		1CNQ1	1052600	LEFT HAND BREAKAWAY LOCK	1
6	XDOZZ		1CNQ1	1055200	WEATHER SEAL	1
7	XDOZZ		1CNQ1	1054100	BREAKAWAY LEVER ASSEMBLY	1
8	XDOZZ		1CNQ1	1507000	CYLINDER COVER	1
9	XDOZZ		1CNQ1	2374400	MASTER CYLINDER.....	1
10	XDOZZ		1CNQ1	1209900	ORIFICE CONNECTOR.....	1
11	XDOZZ		1CNQ1	0774500	GASKET	1
12	XDOZZ		1CNQ1	0799400	COTTER PIN.....	3
13	XDOZZ		1CNQ1	0830100	PUSHROD BLOCK.....	1
14	XDOZZ		1CNQ1	0778400	DAMPER	2
15	XDOZZ		1CNQ1	0799700	COTTER PIN.....	2
16	XDOZZ		1CNQ1	1613700	LUNETTE EYE	1
17	XDOZZ		1CNQ1	1058200317	LEVELER CHANNEL	1
18	XDOZZ		1CNQ1	0144901	ZERK FITTING	5
19	XDOZZ		1CNQ1	0829100	REAR ROLLER	6
20	XDOZZ		1CNQ1	049-012-00	SHOE HOLD DOWN PIN #4	2
21	XDOZZ		1CNQ1	047-109-00	SPREADER ASSEMBLY.....	1
22	XDOZZ		1CNQ1	046-103-00	PARKING STRUT SPRING.....	1
23	XDOZZ		1CNQ1	005-113-00	ANCHOR POST WASHER.....	2
24	XDOZZ		1CNQ1	005-112-00	SPRING TENSION WASHER	2
25	XDOZZ		1CNQ1	069-055-00	RETAINER	2
26	XDOZZ		1CNQ1	046-077-00	SHOE HOLD DOWN SPRINGS AND CAPS.....	4
27	XDOZZ		1CNQ1	046-102-00	ADJUSTER SPRING	2
28	XDOZZ		1CNQ1	046-101-00	RETRACTOR SPRING.....	1
29	XDOZZ		1CNQ1	043-029-00	ADJUSTER ASSEMBLY	1
30	XDOZZ		1CNQ1	K71-269-00	L.H. SHOE KIT W/HARDWARE	1
31	XDOZZ		1CNQ1	K71-270-00	R.H. SHOE KIT W/HARDWARE	1
32	XDOZZ		1CNQ1	AG-16036-C1	LINE, TEE TO TEE.....	2
33	XDOZZ		1CNQ1	AG-16070-CA	LINE, ACTUATOR HOSE TO TEE.....	1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
34	XDOZZ		1CNQ1	18018-MF	HOSE, TEE TO TEE	2
35	XDOZZ		1CNQ1	AG-16070-CR	LINE, TEE TO WHEEL, LONG.....	3
36	XDOZZ		1CNQ1	AG-16012-S	LINE, TEE TO WHEEL, SHORT	3
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

HOSES

REPAIR PARTS LIST

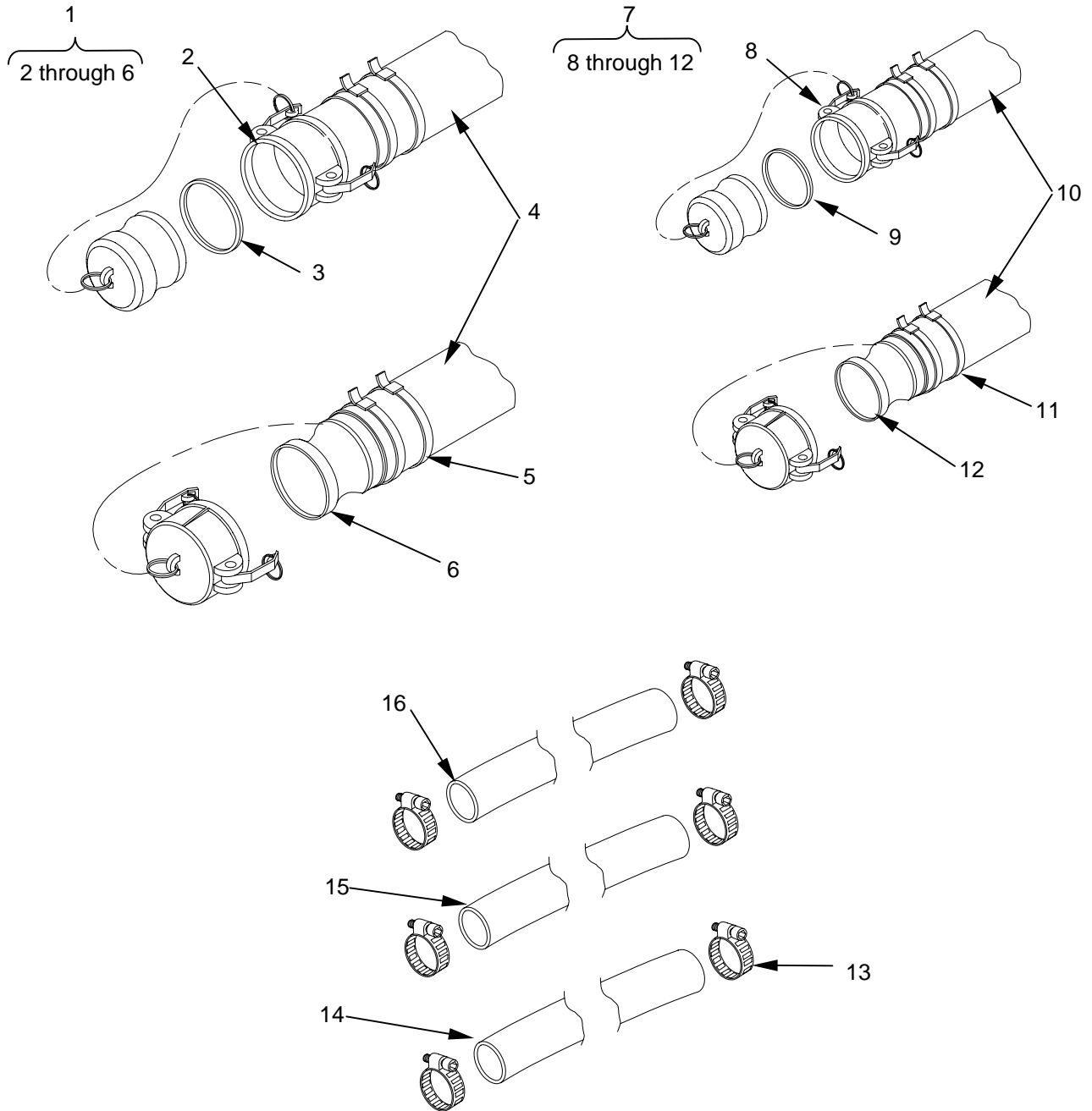


Figure 28. Hoses
0082 00-(1 Blank)/2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 06 GROUP 0601 FIG. 28 HOSES	
1	XDOZZ		1CNQ1	VTSP-716	HOSE ASSM. 4-IN x 10-FT	2
2	XDOZZ		1CNQ1	3TCX400	.QD FITTING, FEMALE, 4-IN	4
3	XDOZZ		1CNQ1	40YST	. . GASKET, 4-IN	4
4	XDOZZ		1CNQ1	VT-321B	.HOSE 4-INCH FOR 10-FOOT ASSM.....	4
5	XDOZZ		1CNQ1	P-20	. 4-IN HOSE CLAMP	4
6	XDOZZ		1CNQ1	3TEX400	. QD FITTING, MALE, 4-IN.....	4
7	XDOZZ		1CNQ1	VTSP-715	HOSE ASSM. 2 1/2-IN x 25-FT	2
8	XDOZZ		1CNQ1	3TCX250	. QD FITTING, FEMALE, 2 ¹ / ₂ -IN.....	4
9	XDOZZ		1CNQ1	212ST	. . GASKET, 2 ¹ / ₂ -IN.....	4
10	XDOZZ		1CNQ1	VT-320B	. HOSE 2 ¹ / ₂ -IN FOR 25-FOOT ASSM	4
11	XDOZZ		1CNQ1	P-12	. 2- ¹ / ₂ -IN HOSE CLAMP.....	4
12	XDOZZ		1CNQ1	3TEX250	. QD FITTING, MALE, 2 ¹ / ₂ -IN	4
13	XDOZZ		1CNQ1	HC280	HOSE CLAMP	6
14	XDOZZ		1CNQ1	VT-328C	PRIMARY TO MOISTURE TRAP HOSE	1
15	XDOZZ		1CNQ1	VT-328B	MOISTURE TRAP TO VACUUM PUMP HOSE	1
16	XDOZZ		1CNQ1	VT-328A	VACUUM PUMP TO OIL CATCH HOSE	1
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

CHOPPER TUBE/WAND

REPAIR PARTS LIST

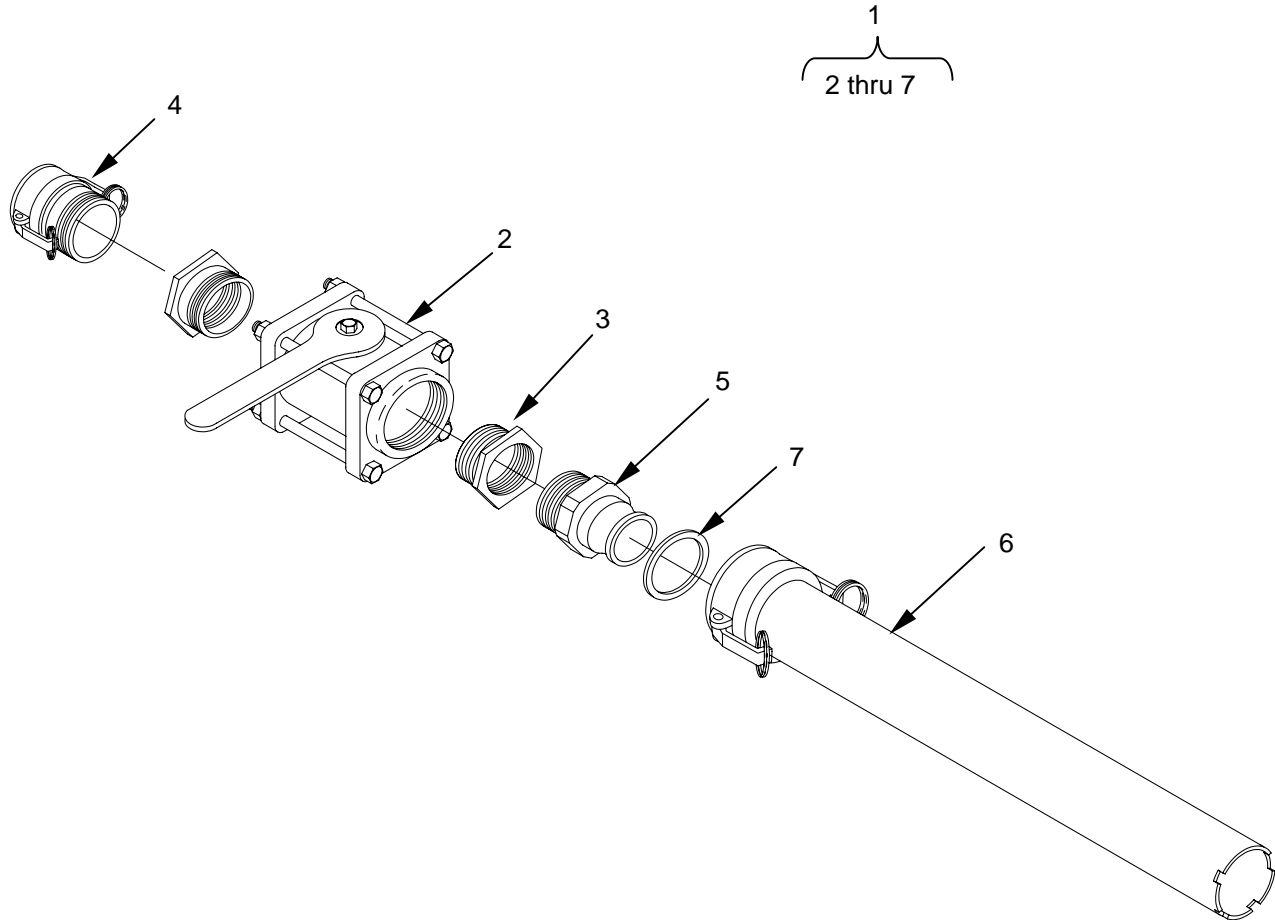


Figure 29. Chopper Tube/Wand

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 07 GROUP 0701 FIG. 29 CHOPPER TUBE/WAND	
1	XDOZZ		1CNQ1	VTSP-717	CHOPPER TUBE-WAND ASSEMBLY	1
2	XDOZZ		1CNQ1	VT-325	.VALVE, BUSHING AND CAMLOCK.....	1
3	XDOZZ		1CNQ1	ZZ0873	..BUSHING	2
4	XDOZZ		1CNQ1	3TBX250	..CAMLOC FITTING, FEMALE	1
5	XDOZZ		1CNQ1	3TFX250	..CAMLOC FITTING, MALE.....	1
6	XDOZZ		1CNQ1	VT-324	. CHOPPER TUBE/WAND	1
7	XDOZZ		1CNQ1	212ST	.. GASKET, 4-IN	1
END OF FIGURE						

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

BULK MATERIAL

REPAIR PARTS LIST

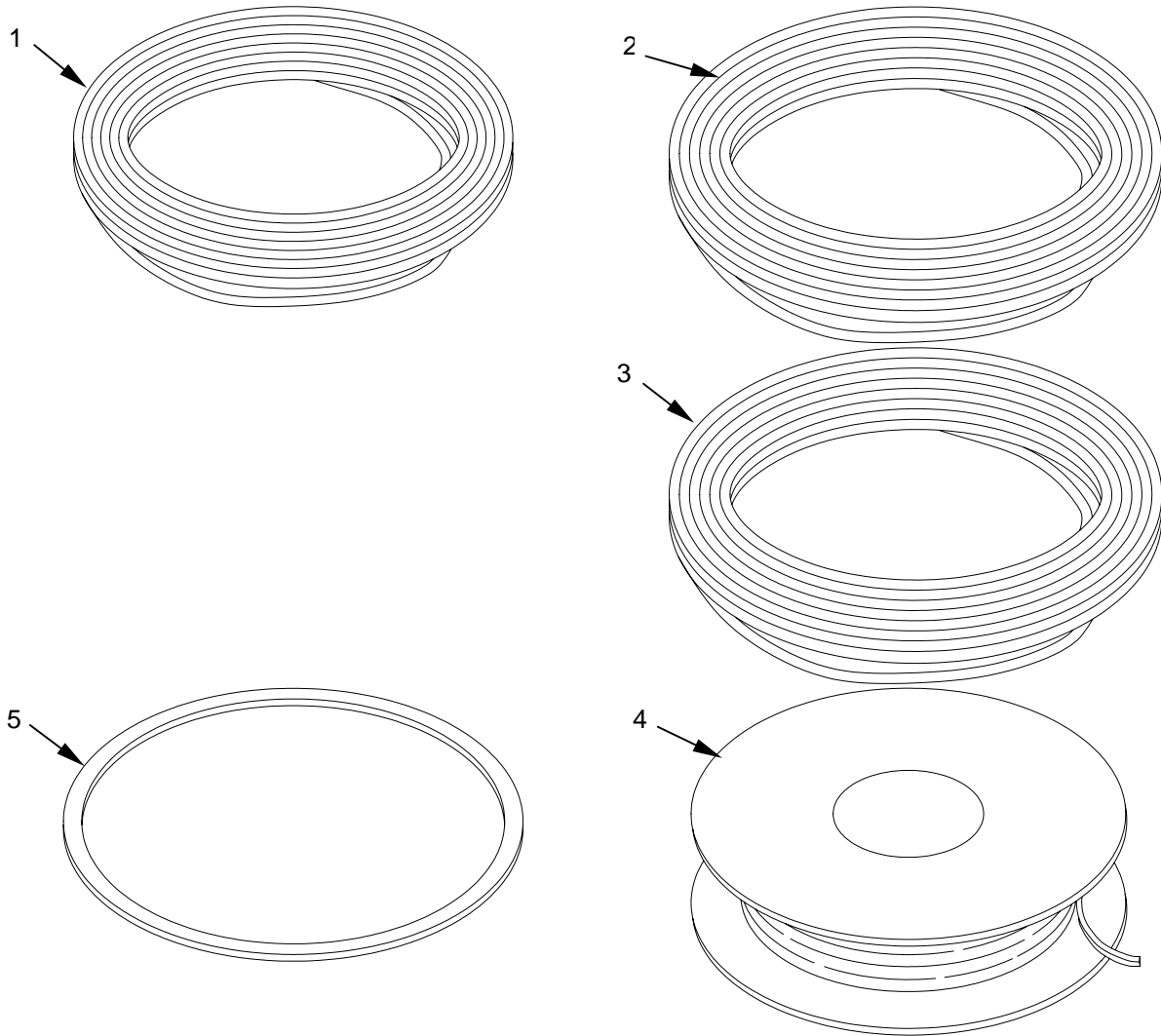


Figure 30. Bulk

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION AND USABLE ON CODE (UOC)	QTY
					GROUP 08 FIG. 30 BULK	
1	MOOZZ		1CNQ1	920195	WIRE, LIGHT PLUG TO J-BOX 7W	AR
2	MOOZZ		1CNQ1	920190	WIRE, J-BOX TO MODULES & ICC 3W ...	AR
3	MOOZZ		1CNQ1	920371	WIRE, J-BOX TO FRONT MARKER LIGHTS, 2W	AR
4	MOOZZ		1CNQ1	5030	PACKING (FLOAT LEVEL INDICATOR)...	AR
5	MOOZZ		1CNQ1	FP-706-8	PORTAL, 12-IN LID GASKET	AR
					END OF FIGURE	

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE

WASTE WATER EVACUATION TANK TRAILER

NATIONAL STOCK NUMBER INDEX

Stock Number	FIG.	ITEM	Stock Number	FIG.	ITEM

**OPERATOR, UNIT, AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
PART NUMBER INDEX**

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
005-112-00	27	24	132-1032-50	9	12
005-113-00	27	23	139-229-099	20	3
006-053-00	20	2	14125A	20	5
01219101	19	1	14276	20	4
0144901	27	18	1507000	27	8
017-153-25	20	1	15194101	19	18
040382058RPD	3	6	15494102	19	5
043-029-00	27	29	15822402	19	11
043-1008-01	9	11	15829700	19	12
043-1008-02	9	13	15829701	19	10
046-077-00	27	26	15830000	19	13
046-101-00	27	28		19	14
046-102-00	27	27		19	15
046-103-00	27	22	1613700	25	1
047-109-00	27	21		27	16
049-012-00	27	20	180-0516-00	9	27
069-055-00	27	25	180142	22	11
0774500	27	11	18018-MF	27	1
0776800	27	2		27	34
0778400	27	14	194	17	4
0799400	27	12	20104	26	2
0799700	27	15	20117	19	4
0829100	27	19	20125	1	3
0830100	27	13		13	25
100-0810-00	9	17	20148	21	3
1052600	27	5		22	8
1052700	27	4		23	6
1054100	27	7	20198	13	24
1055200	27	6		15	2
1055500	27	3	2021-4-4	7	11
1058200317	27	17	2023-4-4	7	2
106913	9	24	20241	12	13
10WRC	3	2	20249	25	2
112-0810-00	9	9	211003090	12	12
113-0810-00	9	18	211007	17	3
1142192120	8	25	212ST	28	9
115-0810-00	9	29		29	7
1157	17	8	23355	16	3
116-0000-00	9	7	2374400	27	9
1209900	27	10	240010	17	5
130-0516-00	9	16	25520	20	6
130-0516-00	9	28	25580	20	7
130-1032-00	9	30	344-1015-00	9	5
131-0516-10	9	26	354-0020-00	9	6
132-0008-00	9	15	390STD	13	2
132-0008-5	9	19		13	4

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0086 00

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
390STD	13	16	500-0020-01	9	8
3LB1EA04	8	1	502-0030-00	9	3
3TBX250	29	4	5030	30	4
3TCNP0100	13	15	50400	18	1
	15	5	50816	18	5
3TCNP0300	13	5	50840	18	4
	13	20	50841	18	3
	14	5	50842	18	2
3TCX250	28	8	509-0030-01	9	20
3TCX400	28	2	5097040313	8	31
3TDCX250	5	10	5097070041	8	12
3TDCX400	6	9		8	14
3TEX250	28	12	5097070051	8	9
3TEX400	28	6	550-0000-03	9	23
3TFX250	5	9	550-0002-00	9	21
	29	5	550000440	12	19
3TFX400	6	8	550-2250-01	9	22
4/3V630	8	37	550-3080-01	9	25
	11	1	550-4012-01	9	2
400-0079-01	9	10	560019	17	9
400-0254-01	9	14	560020	17	11
400039	17	7	600007	22	7
40132	1	9	6177700L	19	17
	13	17	6177700R	19	8
40134	21	6	656000200	12	8
	23	4	66050	14	6
40138	12	17	67	17	6
	13	21		17	10
	15	6		17	12
40142	25	4	683000101	12	6
40160	3	7	709326	14	10
40YST	28	3	71038	12	4
41139	14	8	71255	9	32
	14	9	72314	10	2
4150TRD	5	6	72348	1	10
	6	6		13	9
42106	19	2	76002	13	19
4399663	13	3	76003	21	4
43V1060SK	12	2		22	10
43V450SDS	8	35		23	5
4655C	3	5	76005	12	16
4F30	16	4		13	23
4F53	16	1		15	8
5/8-11NUT H2	2	3	76007	12	15
	5	7	76121	26	3
5/8-11NUTH2	6	7	76122	1	5
5/8X21/2STUD	5	4		13	18
	6	4	76123	21	5
5/8X3/12STUD	2	4		22	9
5/8X63/4STUD	5	2		23	3
	6	2	76125	13	22

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0086 00

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
76125	15	7	962007001	12	10
76127	12	14	964001002	12	9
76127	25	5	964001003	12	7
801-0310-16	9	4	97066	7	8
80394	17	1	98084	22	12
804-0310-16	9	31	998-0014-5	9	1
81000053	19	9	A29/13044	2	2
81000108	19	7	A-309-1	13	7
81000131	19	6	AG-16012-S	27	36
81000191	19	3	AG-16036-C1	27	32
81007269	19	16	AG-16070-CA	27	33
8941329471	8	24	AG-16070-CR	27	35
8941332075	8	5	AP-308-1/GOR	13	13
8943259561	8	4	BRE82S	14	2
8944567412	8	7	C6J29775B	8	38
8970378622	8	23	CH16283-2MS	7	9
8970408091	8	10	D3JL5C208F	8	20
8970423170	8	26	FCP-908-5	1	7
8970439332	8	28		4	2
8970489663	8	8	FP-10164	13	14
8970655472	8	27		15	4
8971077130	8	19	FP15017BR	7	6
8971077140	8	22	FP-3028	1	4
8971078701	8	6		13	10
8971115702	8	16	FP-6204	1	6
8971115712	8	13		13	11
8971164733	8	30	FP-703	4	4
8971275911	8	29	FP-704	4	3
8971312950	8	34	FP-7063/8	13	8
8971313140	8	32	FP-706-8	4	6
8971606540	8	3		30	5
8971632590	8	2	FP-907	1	8
8971830130	8	15	H9411	17	2
8972259470	8	33	HC280	28	13
8972268401	8	11	HP19165MS	7	7
8972309380	8	17	K71-269-00	27	30
90319	7	4	K71-270-00	27	31
90320	22	3	KS4512	12	11
90383	7	10	NPV4C-2.5HS	5	3
90785	22	4	NPV4C-2.5HS	6	3
90787	22	5	P-12	28	11
9141450761	8	18	P-20	28	5
920190	30	2	RBC-3/4	18	8
920195	30	1	RC4343	5	8
920371	30	3	SATA121	3	8
920476	18	7	SATA-134R0	3	4
920520	18	6	SDS 1-1/2	8	36
95925	10	1	SK1-3/8	12	3
95926	10	3	TA-136R0	3	3
961013005	12	5	TA-181R0FVL-4	5	5
961021001	12	18		6	5

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0086 00

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
TA-181-R0NVE3	2	5	VT-328C	28	14
V-24M-6P	16	2	VT-330	8	21
VB-310-1	14	4	VT-511	7	3
VT-109A	14	3	VT-513	7	5
VT-109B	14	7	VTSP-231	23	1
VT-118	1	2	VTSP-701	1	1
VT-119	4	5	VTSP-702	2	1
VT-213L	21	1	VTSP-703	3	1
VT-213R	21	2	VTSP-704	4	1
VT-229B	23	2	VTSP-705	5	1
VT-231A	25	3	VTSP-706	6	1
VT-305	15	3	VTSP-707	7	1
VT-306A	13	12	VTSP-708	12	1
VT-306B	13	6	VTSP-709	13	1
VT-320B	28	10	VTSP-710	14	1
VT-321B	28	4	VTSP-711	15	1
VT-324	29	6	VTSP-712	22	1
VT-325	29	2	VTSP-714	24	1
VT-326B	22	6	VTSP-715	28	7
VT-326E	22	2	VTSP-716	28	1
VT-327	26	1	VTSP-717	29	1
VT-328A	28	16	ZZ0873	29	3
VT-328B	28	15			

**OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
MANDATORY REPLACEMENT PARTS LIST**

INTRODUCTION

Scope

This work package includes a list of mandatory replacement parts referenced in the task initial setups and procedures. These are items that must be replaced during maintenance whether they have failed or not. This includes items based on usage intervals such as miles, time, rounds fired, etc.

MANDATORY REPLACEMENT PARTS LIST

Table 1. Mandatory Replacement Parts List

ITEM NO.	PART NUMBER (CAGEC)	NSN	NOMENCLATURE	QTY
1	TA-181R0FVL4		GASKET, 4-INCH, DRAIN VALVE	2
2	TA-181R0FVL4		GASKET, 4-INCH, INTAKE VALVE	2
3	TA-181R0NVE3		GASKET, 3-INCH, SAFETY RELIEF VALVE	1

**OPERATOR'S UNIT AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS INTRODUCTION**

INTRODUCTION

Scope

This work package lists COEI and BII for the WWET/T to help you inventory items for safe and efficient operation of the equipment.

General

The COEI and BII information is divided into the following lists:

Components of End Item (COEI). This list is for information purposes only and is not authority to requisition replacements. These items are part of the WWET/T. As part of the end item, these must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

Basic Issue Items (BII). These essential items are required to place the WWET/T in operation, operate it, and do emergency repairs. Although shipped separately packaged, BII must be with the Force Provider System 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.

Explanation of Columns in the COEI List and BII List.

Column (1) Illustration Number, gives you the number of the item illustrated.

Column (2) National Stock Number, identifies the stock number of the item to be used for requisitioning purposes.

Column (3) Description, CAGEC, and Part Number. Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The stowage location of COEI and BII is also included in this column. The last line below the description is the CAGEC (Commercial And Government Entity Code) (in parentheses) and the part number.

Column (4) Usable on Code. When applicable, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below:

<u>Code</u>	<u>Used on</u>
FTV	WWET/T

Column (5), Unit of Issue (U/I). Indicates the physical measurement or count of the item as per the National Stock Number shown in column (2).

Column (6), Qty. Rqr. indicates the quantity required.

**WASTE WATER EVACUATION TANK TRAILER (WWET/T)
COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LIST**

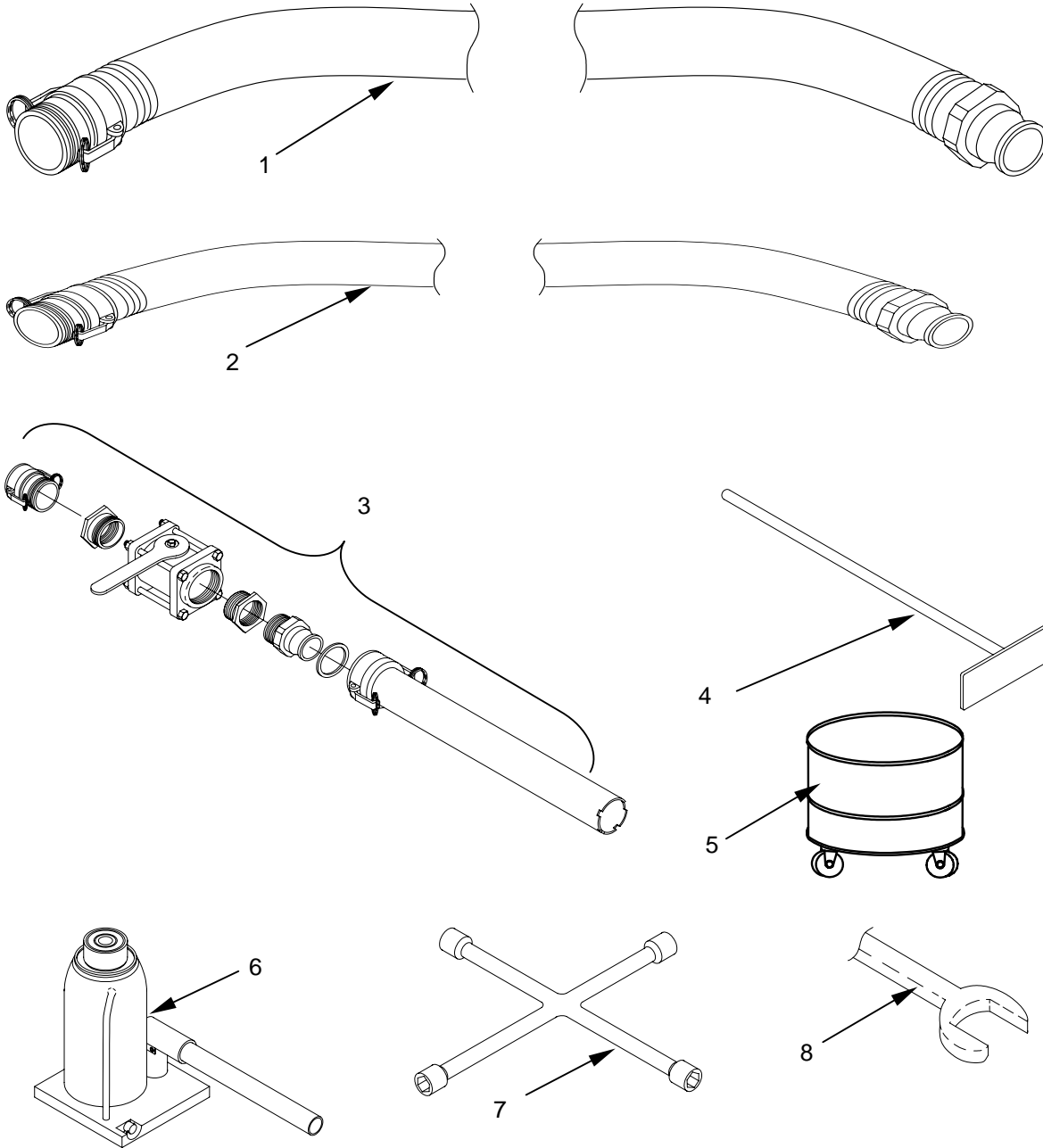


Table 1. Components of End Item List.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC, AND PART NUMBER	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
1		HOSE, WASTEWATER, DRAIN, 4-INCH X 10- FEET (1CNQ1) VT-321A	FTV	EA	2
2		HOSE, WASTEWATER, DRAIN, 2½-INCH X 20- FEET (1CNQ1) VT-320A	FTV	EA	2
3		CHOPPER TUBE/WAND (1CNQ1) VT-324	FTV	EA	1
4		SLUDGE RAKE (1CNQ1) VT-322	FTV	EA	1
5		BUCKET, PLASTIC, ROUND (780248) A-A-262	FTV	EA	1
6		BOTTLE JACK (1CNQ1) 5212	FTV	EA	1
7		LUG WRENCH, WHEEL (1CNQ1) TB4-WLW	FTV	EA	1
8		HALF WRENCH, 15/16-IN (1CNQ1) VT-332	FTV	EA	1

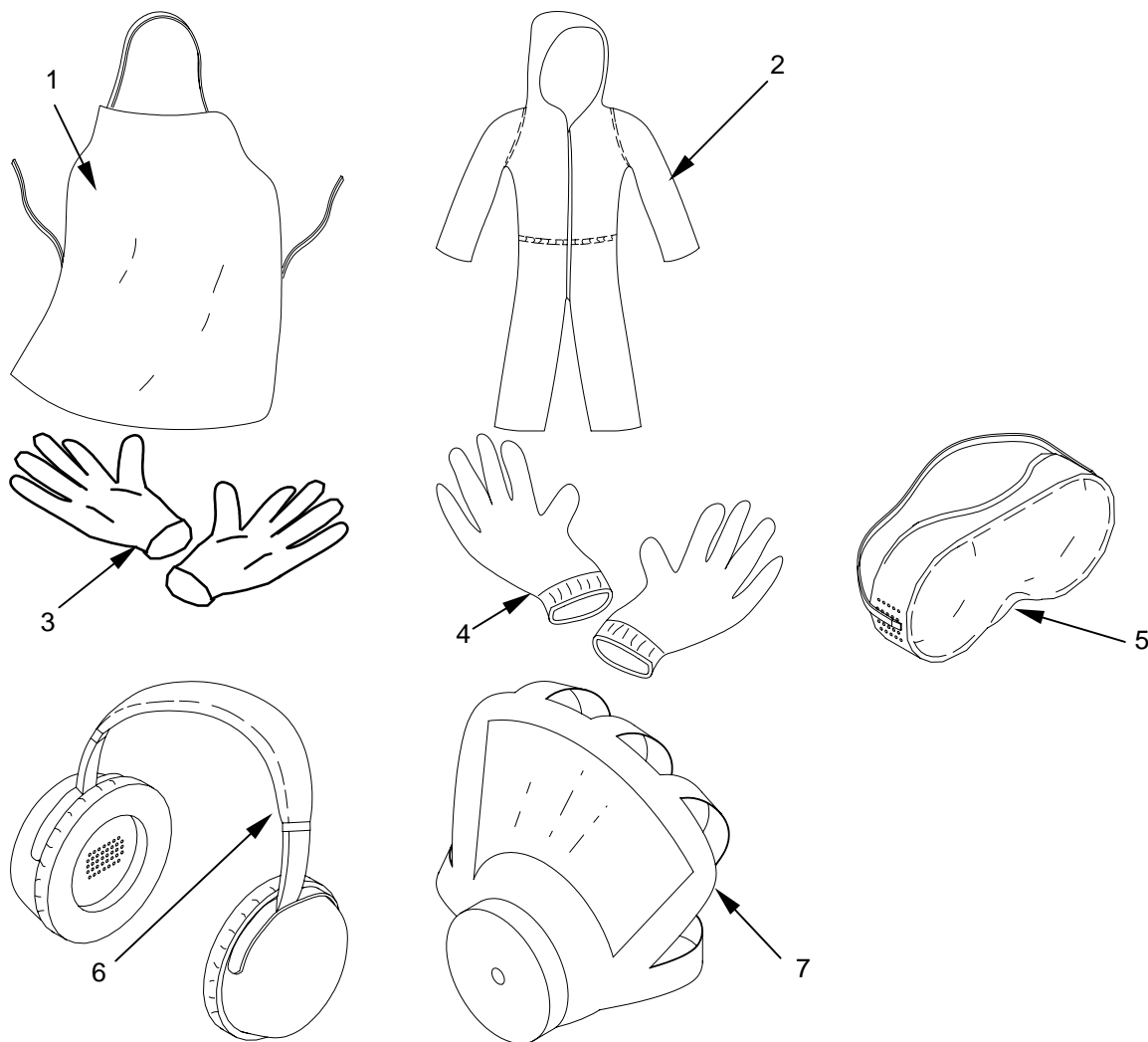


Table 2. Basic Issue Items List.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC, AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
1	8415-00-082-6108	APRON, RUBBER, (58536), A-A-55063	FTV	EA	1
2		COVERALLS, HOODED, (0ARV4), 4T049	FTV	EA	1
3	8415-00-753-6552	GLOVES, RUBBER, (81349), MIL-G-12233	FTV	EA	1
4	8415-00-268-7868	GLOVES, WORK, (58536), A-A-55060	FTV	EA	1
5	4240-00-190-6432	GOGGLES, SPLASH, (58536), A-A-1110	FTV	EA	1
6		PROTECTORS, HEARING, (0ARV4), 5FV03	FTV	EA	1
7		RESPIRATOR, (6M644), 4BW-48649	FTV	EA	2

**OPERATOR'S, UNIT, AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
ADDITIONAL AUTHORIZATION LIST (AAL)**

INTRODUCTION

Scope

This Work Package lists additional items you are authorized for the support of the Waste Water Evacuation Tank Trailer (WWET/T), and is provided to help you identify and request those items you need to support this equipment.

General

The identified items that do not have to accompany the Waste Water Evacuation Tank Trailer (WWET/T), and do not have to be turned in with it. These items are authorized to you by CTA, MTOE, TDA, or JTA.

Explanation Of Columns in the AAL

Column (1) – National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (2) – Description, Commercial and Government Entity Code (CAGEC) and Part Number (P/N). Identifies the Federal item name (an all capital letters) followed by a minimum description when needed. The last line below the description is the CAGEC (in parentheses) and the part number.

Column (3) – Usable On Code. When applicable, gives you a code of the item you need is not the same for different models of equipment. These codes are identified below:

Code	Usable On
FTV	Waste Water Evacuation Tank Trailer (WWET/T)

Column (4) – Unit of Issue (U/I). Indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (1).

Column (5) – Qty Recm. Indicated the quantity recommended.

ADDITIONAL AUTHORIZED LIST ITEMS

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION, CAGEC, AND PART NUMBER	(3) USABLE ON CODE	(4) U/I	(5) QTY RECM
6230-00-163-1856	FLASHLIGHT, 81349, W-F-0021	FTV	EA	AR
6640-00-063-7879	FUNNEL, 95352, 9232A	FTV	EA	AR
7240-00-025-3377	CAN, GAS, MILITARY, GREEN, 97403, CID A-A-59592	FTV	EA	AR
5340-00-682-1508	PADLOCK, 81348, FF-P-1012	FTV	EA	AR
4720-00-729-5334	GARDEN HOSE, 50-FT, 81348, L-H-520	FTV	EA	AR

**OPERATOR'S UNIT AND DIRECT SUPPORT MAINTENANCE
WASTE WATER EVACUATION TANK TRAILER
EXPENDABLE AND DURABLE ITEMS LIST**

EXPENDABLE AND DURABLE ITEMS LIST**INTRODUCTION****Scope**

This work package lists expendable and durable items that you will need to operate and maintain the WWET/T. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970. Expendable/Durable Items (except Medical, Class V Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanations of Columns in the Expendable/Durable Items List:

Column (1) Item Number. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use brake fluid (item 5,WP 0098 00).”).

Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item (C=Operator/Crew O=Unit/AVUM, F=Direct Support).

Column (3) National Stock Number (NSN). This is the NSN assigned to the item, which you can use to requisition it.

Column (4) Item name, Description, Commercial and Government Entity Code (CAGEC), and Part Number (P/N). This column provides the other information you need to identify the item.

Column (5) (Unit of Issue) U/I. Indicates the physical measurement or count of the item as issued per the National Stock Number shown as shown in column (3).

Table 1. Expendable and Durable Items List.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, (CAGEC) AND PART NUMBER	(5) U/I
1	C	6850-00-664-1403	ANTIFREEZE, ETHYLENE GLYCOL, (81348), O-A-548	GL
2	C	5120-00-926-5175	BRUSH, BATTERY CLEANER, (55719), BT1	EA
3	C	7920-00-240-7174	BRUSH, SCRUB, (80244), HB1490-5	EA
4	C	6810-12-132-2439	CALCIUM HYPOCHLORITE (D9478) 6810-0074	EA
5	C	4730-00-908-3193	CLAMP, HOSE, LP, TYPE F, SAE #24 (00724), 30-00724	BG
6	C	9140-00-286-5284	DIESEL FUEL, (81348), VVF800 GRADE DFAAR	GL
7	C		ENGINE OIL	GL
8	C		FILTER, AIR (CNQ1), PA1865-FN	EA
9	C		FILTER, FUEL, (CNQ1), BF954	EA
10	C		FILTER, OIL, (CNQ1), B421	EA
11	C	9510-01-102-9455	FLUID, HYDRAULIC, (81349) MIL-B-46176	GL
12	O		GASKET, 4-INCH, (1CNQ1), TA-181R0FVL-4	EA
13	O	5330-00-075-3268	GASKET, COUPLING HALF, QDISC, 2 ½ IN, (58536), A-A-59326-7	EA
14	C		GASKET, LIQUID	EA
15	O		GASKET, MANWAY ASSEMBLY (1CNQ1), FP-706-8	36-IN
16	O	5330-00-899-4509	GASKET, QDISC, 4 IN, (96906) MS 27030-9	EA
17	O		GASKET, SAFETY RELIEF, (1CNQ1), TA-181R0NVE3	EA
18	C		GENERAL LUBRICATING OIL	GL
19	C	9150-01-024-6469	GREASE, BALL BEARING, (81349), MIL-G-18709	QT

Table 1. Expendable and Durable Items List - Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, (CAGEC) AND PART NUMBER	(5) U/I
20	C	9150-00-265-9428	MOTOR OIL, LUBRICATING, ENGINE, OE10, (81349) MIL-L2104	GL
21	C		MOTOR OIL, SAE40W, NONDETERGENT	EA
22	C		OIL 10W30 (WINTER)	GL
23	C		OIL 10W40 (SUMMER)	GL
24	O		O-RING	EA
25	O		PACKING, FLOAT LEVEL INDICATOR	RL
26	C	4910-00-387-9592	PAN, DRAIN, (81349), MIL-P-45819	EA
27	O		PIPE SEALANT	EA
28	C	7920-00-205-1711	RAGS, WIPING (58536), A-A-2522	LB
29	O	5340-00-244-7325	SEAL, STRAPPING ½-IN (70847), C254	EA
30	C	6810-00-598-7316	SODIUM HYPOCHLORITE, (81348), O-S-602	GL
31	O	5340-00-245-9348	STRAP, STEEL BAND, HOSE, ½-IN STAINLESS (70847), C204	FT
32	C	9905-00-537-8954	TAGS, MARKING, (81349), MIL-T-12755	EA
33	O	8030-00-889-3535	TAPE, ANTISEIZE, 1/2 IN WIDE X 260 IN LONG (80244) MIL-T-27730, SIZE II	RL
34	C		WHEEL CHOCKS	EA

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By Order of the Secretary of the Army:

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

Official:


SANDRA R. RILEY
*Administrative Assistant to the
Secretary of the Army*
0511901

Distribution: To be distributed in accordance with initial distribution number (IDN) 256827 requirements for TM 10-4630-207-13&P.

These are the instructions for sending an electronic 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@avma27.army.mil>

To: amssbriml@natick.army.mil

Subject: DA Form 2028

1. From: Joe Smith
2. Unit: home
3. Address: 4300 Park
4. City: Hometown
5. St: MO
6. Zip: 77777
7. Date Sent: 19-OCT-93
8. Pub no: 55-2840-229-23
9. Pub Title: TM
10. Publication Date: 04-JUL-85
11. Change Number: 7
12. Submitter Rank: MSG
13. Submitter FName: Joe
14. Submitter MName: T
15. Submitter LName: Smith
16. Submitter Phone: 123-123-1234
17. Problem: 1
18. Page: 2
19. Paragraph: 3
20. Line: 4
21. NSN: 5
22. Reference: 6
23. Figure: 7
24. Table: 8
25. Item: 9
26. Total: 123
27. Text:

This is the text for the problem below line 27.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE 21 October 2003
TO: (Forward to proponent of publication or form) (Include ZIP Code) COMMANDER U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA-LC-CECT 15 KANSAS STREET NATICK, MA 01760-5052						FROM: (Activity and location) (Include ZIP Code) <i>PFC Jane Doe</i> <i>CO A 3rd Engineer BR</i> <i>Ft. Leonardwood, MO 63108</i>	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM 10-1670-296-23&P				DATE 30 October 2002	TITLE Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems		
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).	
	0036 00-2				1	<p><i>In table 1, Sewing Machine Code Symbols, the second sewing machine code symbol should be MD ZZ not MD 22.</i></p> <p><i>Change the manual to show Sewing Machine, Industrial: Zig-Zag; 308 stitch; medium-duty; NSN 3530-01-181-1421 as a MD ZZ code symbol.</i></p>	
<small>*Reference to line numbers within the paragraph or subparagraph.</small>							
TYPED NAME, GRADE OR TITLE Jane Doe, PFC				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 508-233-4141		SIGNATURE Jane Doe <i>Jane Doe</i>	

TO: <i>(Forward direct to addressee listed in publication)</i> COMMANDER U.S. ARMY SOLDIER AND BIOLOGICAL CHEMICAL COMMAND ATTN: AMSSB-RIM-L KANSAS STREET NATICK, MA 01760-5052	FROM: <i>(Activity and location) (Include ZIP Code)</i> <i>PFC Jane Doe</i> <i>CO A 3rd Engineer BR</i> <i>Ft. Leonardwood, MO 63108</i>	DATE 21 October 2003
--	---	--------------------------------

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER TM 10-1670-296-23&P	DATE 30 October 2002	TITLE Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems
--	--------------------------------	---

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
0066 00-1					4			<i>Callout 16 in figure 4 is pointed to a <u>D-Ring</u>. In the Repair Parts List key for figure 4, item 16 is called a <u>Snap Hook</u>. Please correct one or the other.</i>

SAMPLE

PART III – REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
For use of this form, see AR 25-30; the proponent agency is ODISC4.							
TO: (Forward to proponent of publication or form) (Include ZIP Code) COMMANDER U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN:AMSTA-LC-CECT 15 KANSAS STREET NATICK, MA 01760-5052						FROM: (Activity and location) (Include ZIP Code)	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM 10-4630-207-13&P				DATE 31 May 2005		TITLE Waste Water Evacuation Tank Trailer (WWET/T)	
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if possible).</i>	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

TO: <i>(Forward direct to addressee listed in publication)</i> COMMANDER U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA-LC-CECT 15 KANSAS STREET NATICK, MA 01760-5052	FROM: <i>(Activity and location) (Include ZIP Code)</i>	DATE
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PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER TM 10-4630-207-13&P	DATE 31 May 2005	TITLE Waste Water Evacuation Tank Trailer (WWET/T)
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III – REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

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For use of this form, see AR 25-30; the proponent agency is ODISC4.							
TO: (Forward to proponent of publication or form) (Include ZIP Code) COMMANDER U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN:AMSTA-LC-CECT 15 KANSAS STREET NATICK, MA 01760-5052						FROM: (Activity and location) (Include ZIP Code)	
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<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

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PART III – REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 dekagram = 10 grams = .35 ounce
 1 hectogram = 10 dekagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 feet

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

 °F Fahrenheit temperature 5/9 (after subtracting 32) Celsius temperature °C

PIN: 082363-000