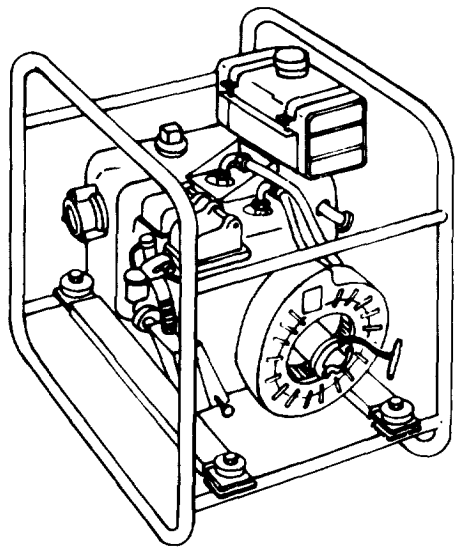
TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)



INTRODUCTION

OPERATING INSTRUCTIONS

OPERATOR MAINTENANCE INSTRUCTIONS

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

APPENDIX A REFERENCES

APPENDIX B MAINTENANCE ALLOCATION CHART

APPENDIX C ADDITIONAL AUTHORIZED LIST

APPENDIX D REPAIR PARTS AND SPECIAL TOOLS LIST

PUMP, CENTRIFUGAL:
GASOLINE ENGINE DRIVEN; FRAME MTD:
2-INCH, 125 GPM, 50-FOOT HEAD
(MILITARY DESIGN MODEL 2-125-50-G)
NSN 4320-00-542-3347

HEADQUARTERS, DEPARTMENT OF THE ARMY

10 SEPTEMBER 1982

CHANGE
NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., 19 March 1991

Operator's and Organizational Maintenance Manual
(Including Repair Parts and Special Tools List)

PUMP, CENTRIFUGAL:
GASOLINE ENGINE DRIVEN; FRAME MTD;
2-INCH, 125 GPM, 50-FOOT HEAD
(MILITARY DESIGN MODEL 2-125-50-G)
NSN 4320-00–542-3347

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TM 5-4320-208-12&P, 10 September 1982, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
D-9 through D-12	D-9 through D-12

2. Retain this sheet in front of manual for reference purposes.

By order of the Secretary of the Army:

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General, United States Army
Chief of Staff

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Brigadier General, United States Army
The Adjutant General

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CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 4 November 1986

Operator's and Organizational Maintenance Manual
(Including Repair Parts and Special Tools List)

PUMP, CENTRIFUGAL:
GASOLINE ENGINE DRIVEN; FRAME MTD;
2-INCH, 125 GPM, 50-FOOT HEAD
(MILITARY DESIGN MODEL 2-125-50-G)
NSN 4320-00-542-3347

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General United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator and Organizational Maintenance requirements for Pump, Centrifugal, Gas Driven, Frame Mounted, 125 GPM, 50 FT Head, 2 IN (2-125-50-G).

WARNING

- When filling the fuel tank, do not smoke or use open flame in the area. Always make metal-to-metal contact between the container and the fuel tank. This will prevent a spark as fuel flows over metallic surfaces. Failure to observe this warning may result in death to personnel.

- Never operate the centrifugal pump in an enclosed area unless the exhaust gases are piped to the outside. Exhaust gases contain carbon monoxide which is a colorless, odorless, and poisonous gas.

- Make sure spark plug leads are disconnected before performing maintenance on the pump.

- Avoid breathing smoke when using a fire extinguisher.

- Do not fill the fuel tank while the engine is running. Gasoline spilled on a hot engine may explode and cause serious injury to personnel.

- Do not attempt to perform any maintenance on the pump while the engine is running.

- Make sure all gasoline fumes are removed from tank before starting welding operations. Fumes in tank can cause a severe explosion if ignited.

- Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid inhalation of fumes and repeated or prolonged skin exposure. Wash exposed skin thoroughly with soap and water. Use in well ventilated area away from open flame or excessive heat. Flash point is 100°F (38°C).

CAUTION

- Do not start pump without first priming with water. Dry operation will damage pump seals and cause pump to fail. After priming, do not run pump more than 3 to 5 minutes without water flowing through it.

- When tying centrifugal pump to carrier, install bands through frame. Do not secure by banding across channels.

TECHNICAL MANUAL

No. 5-4320-208-12&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 10 September 1982

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

PUMP, CENTRIFUGAL: GASOLINE ENGINE DRIVEN; FRAME MTD; 2-INCH, 125 GPM, 50-FOOT HEAD (MILITARY DESIGN MODEL 2-125-50-G)

NSN 4320-00-542-3347

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MPSD, 4300 Goodfellow Blvd., Saint Louis, MO 63120. A reply will be furnished directly to you.

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*This manual supersedes TM 5-4320-208-12, October 1968, including all changes, and TM 5-4320-208-20P, April 1969.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE.

This manual covers Centrifugal Pump, Military Design Model 2-152-50-G. It contains operating instructions, and maintenance instructions for Operator, and Organizational Maintenance. The pump (figure 1-1) is used to pump fresh water.

b. The engine is covered in TM 5-2805-257-14.

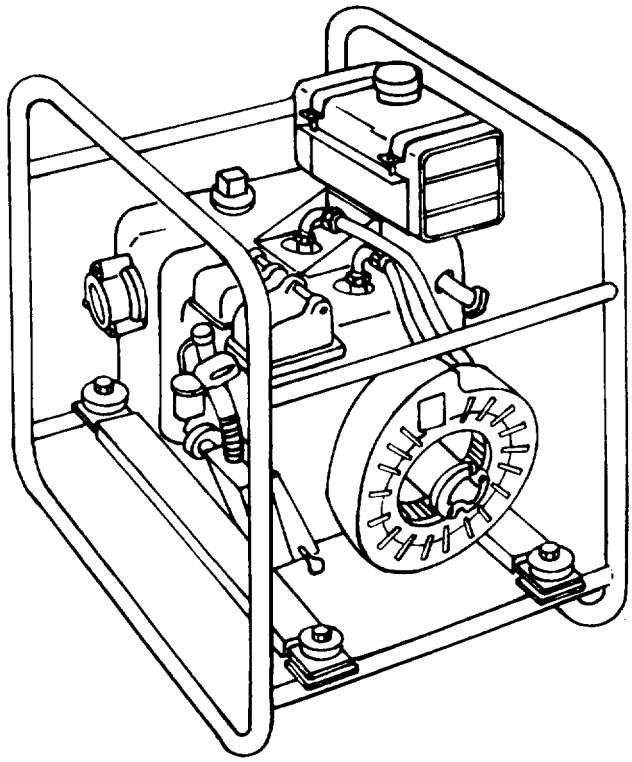


Figure 1-1. Centrifugal pump

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, the Army Maintenance Management System (TAMMS).

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Procedures for destroying Army materiel to prevent enemy use are listed in TM 750-224-3.

1-4. PREPARATION FOR STORAGE OR SHIPMENT.

For administrative storage of equipment refer to TM 740-90-1 for instructions.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your pump needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at Commander, US Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MPM, 4300 Goodfellow Boulevard, St. Louis, MO 63120. We'll send you a reply.

Section II. EQUIPMENT DESCRIPTION

1-6. DESCRIPTION AND DATA.

The pump is:

CENTRIFUGAL. Uses a high speed rotating motion and forces water away from the center.

SELF CONTAINED. Pump and engine are coupled together as one unit. No additional equipment is needed to run the pump.

FRAME MOUNTED. For ease of handling.

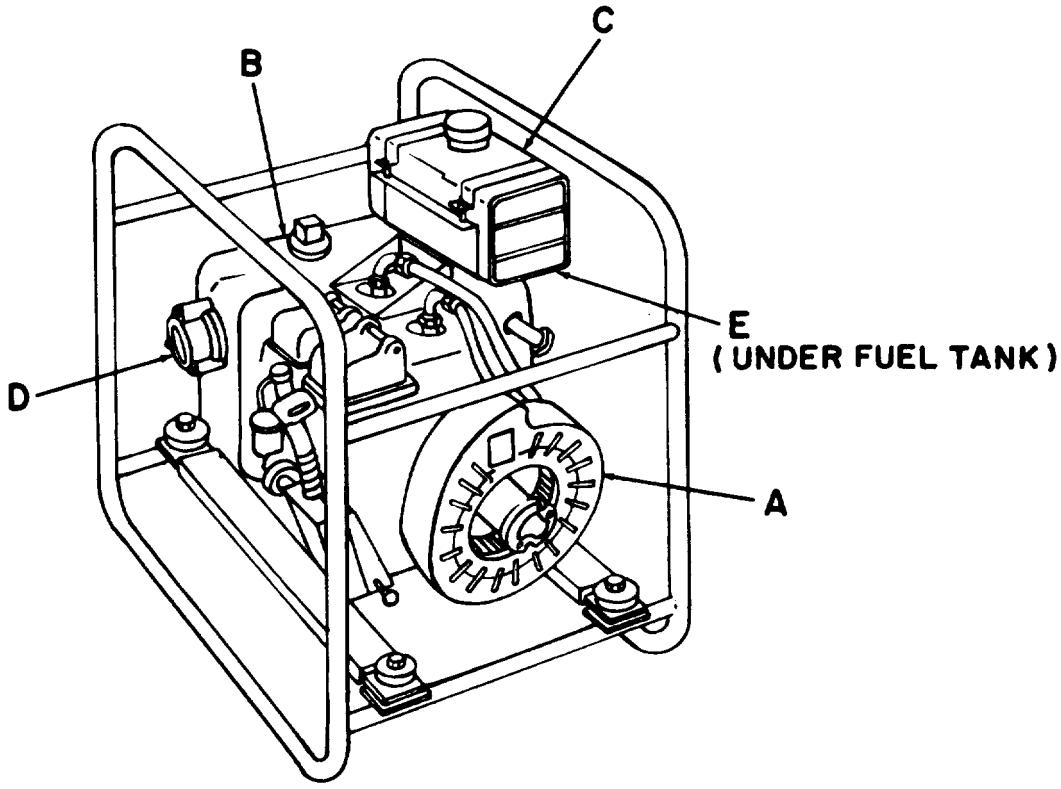
The pump can:

Pump 125 gallons of fresh water per minute at 50 foot head.

Operate in all weather conditions.

1-7. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

Major components are shown and described in figure 1-2.



A. ENGINE. Supplies operating power to pump.

B. CENTRIFUGAL PUMP. (Direct coupled to engine), used for pumping water.

C. FUEL TANK. Contains fuel to operate engine.

D. INLET HOSE ADAPTER. Water inlet to pump.

E. OUTLET HOSE ADAPTER. Water outlet from pump.

Figure 1-2. Location and description of major components.

1-8. DIFFERENCES BETWEEN MODELS.

This manual covers the Military Design Model 2-125-50-G Centrifugal Pump which is built to Military specifications from Military drawings. All components and parts are interchangeable without regard to manufacturing origin.

1-9. EQUIPMENT DATA.

NOMENCLATURE	Pump, Centrifugal, Fresh Water, 125 gpm, 50-foot head.
STOCK NUMBER	NSN 4320-00-542-3347
MODEL	Military Model 2-125-50-G. (52109 and A52109)
ENGINE MODEL	2A016-2 or 2A016-3

WEIGHTS AND DIMENSIONS

Shipping Weight	146 lb.	(66.28 kg)
Length	22 in.	(55.88 cm)
Width	18 in.	(45.,72 cm)
Height	28 in.	(71.12 cm)
Cube	6.4 cu. ft.	(0.179 cu m)

CAPACITIES

Fuel Tank	1 gal. (3.785 L)
Crankcase	4/5 qt. (0.7568 L)
Air Cleaner	1/8 qt. (0.1183 L)

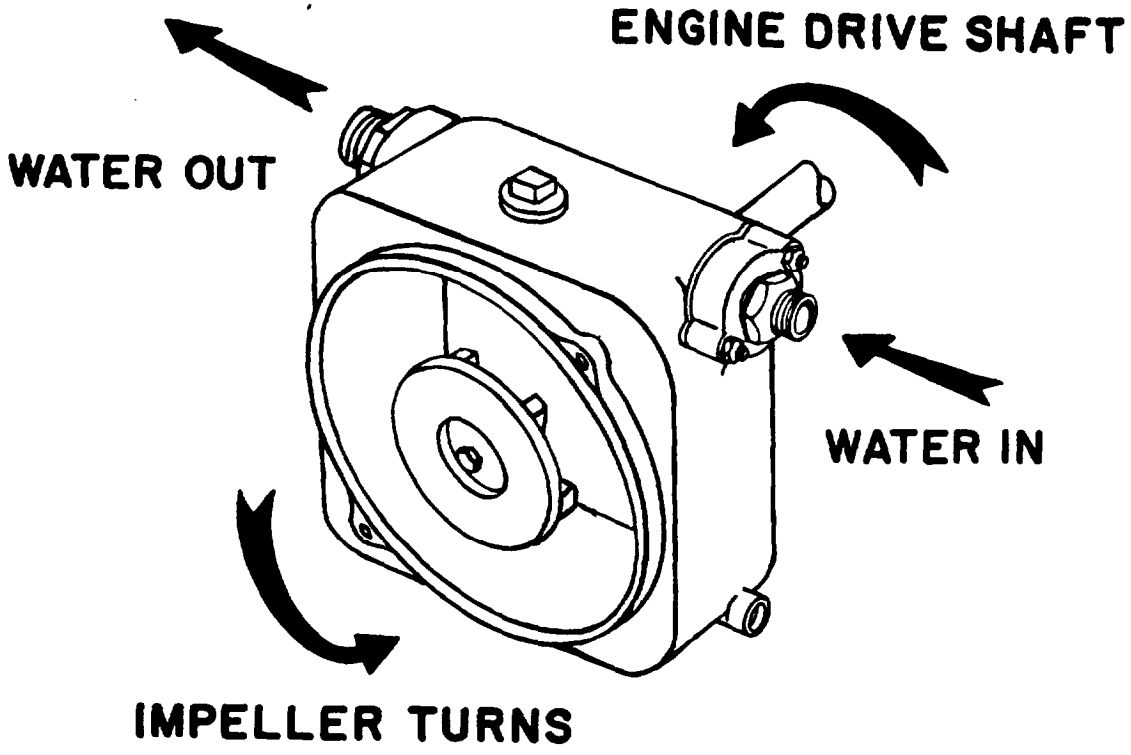
PERFORMANCE

Pump	125 Gallons Per Minute

Section III. PRINCIPLES OF OPERATION

1-10. HOW IT WORKS.

When the engine is running a shaft with attached fins (impeller) turns inside the pump water chamber. This causes water to be drawn into the chamber thru an inlet opening (port). Water then is discharged thru an outlet opening (port). A check valve located in the suction port keeps water from running back out of the pump when it is stopped.



CHAPTER 2

OPERATING INSTRUCTIONS

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

2-1. GENERAL.

Figure 2-1 shows the location of the operator's controls on the gasoline engine driven pump. Before you operate the pump make sure you know the location and operation of all controls.

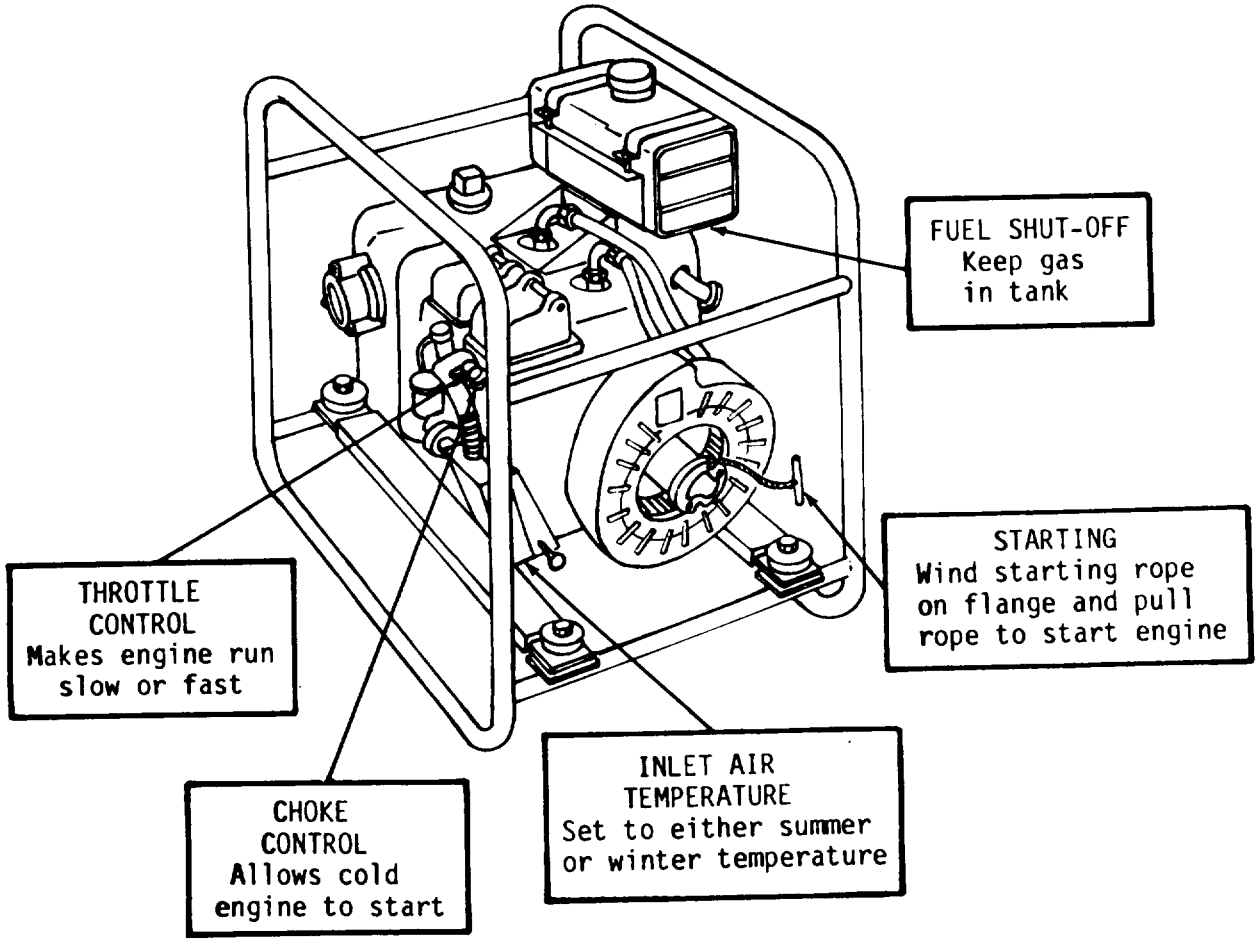


Figure 2-1. Operating controls.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

2-2. GENERAL.

a. Preventive Maintenance Checks and Services (PMCS, Table 2-1) are to be done to be sure the pump is ready to use at all times. These checks and services help you find and fix defects before the pump is damaged or fails.

b. Item numbers in the first column of Table 2-1 are the order in which things are to be done. Column two “Interval” lists when to do them and who should do them.

c. If minor defects are found when the pump is running take notes on what they are. Fix them or have them fixed after you have stopped running the pump.

NOTE

While the pump is running if any defect develops that you think will damage the pump, stop it at once.

Record all defects and steps taken to fix them on DA Form 2404 (Equipment Inspection and Maintenance Work Sheet) as soon as possible. See figure 2-2).

Before you operate. Always keep in mind the WARNINGS and CAUTIONS located on the inside *front cover. Perform you before (B) PMCS.*

Table 2-1. Preventive Maintenance Checks and Services

B - Before operation
D - During operation
A - After operation
W - Weekly
M - Monthly
Q - Quarterly

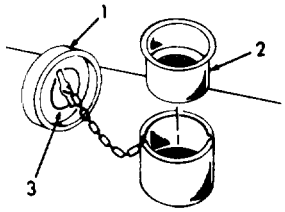
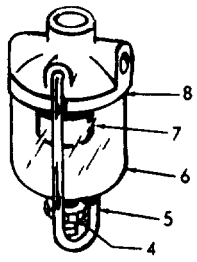
Item Number	Interval: Operator Daily B	D	A	W	Org M	Q	ITEM TO BE INSPECTED PROCEDURE Check for and have repaired or adjusted as necessary.	Equipment Will Be Reported Not Ready (Red) If:
							- FRONT -	
1	X						FUEL TANK ... Remove cap (1) and check cap, strainer (2) and gasket (3). Replace as required. 	Fuel Tank: Leaks, cap missing, missing gasket clogged or missing strainer.
2						X	SHOCK MOUNTS ... Inspect for cracks or deterioration. Replace as necessary.	Shock Mounts: Cracked, broken or deteriorated.
3						X	FRAME ... Inspect for cracks, breaks, or damage. Repair or replace as necessary.	Frame: Cracks, broken.
							- REAR -	
4	X	X	X			X	PUMP ... Inspect pump for leaks, cracks, or other damage. Repair or replace as necessary.	Pump: Cracks leaks.
5						X	ADAPTERS ... Inspect inlet and outlet adapters for leaks or damage. Tighten or replace as necessary.	Adapters: Leaks damage.
							-LEFT SIDE-	
6	X		X			X	FUEL FILTER ... Loosen bail nut (4) and swing bail (5) to remove bowl (6). Clean bowl and replace filter (7) or gasket (8) as required. 	Fuel Filter: Leaks, clogged, missing gasket.

Table 2-1. Preventive Maintenance Checks and Services (Continued)

B - Before operation
D - During operation
A - After operation
W - Weekly
M - Monthly
Q - Quarterly

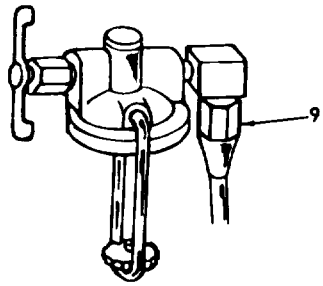
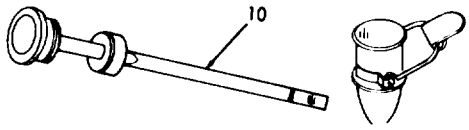
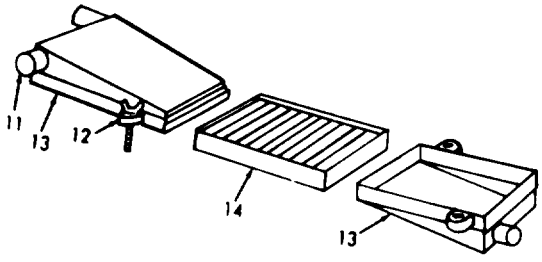
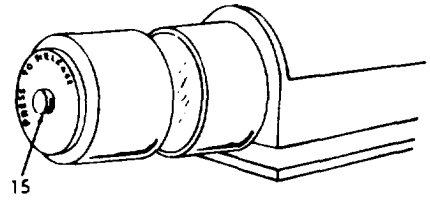
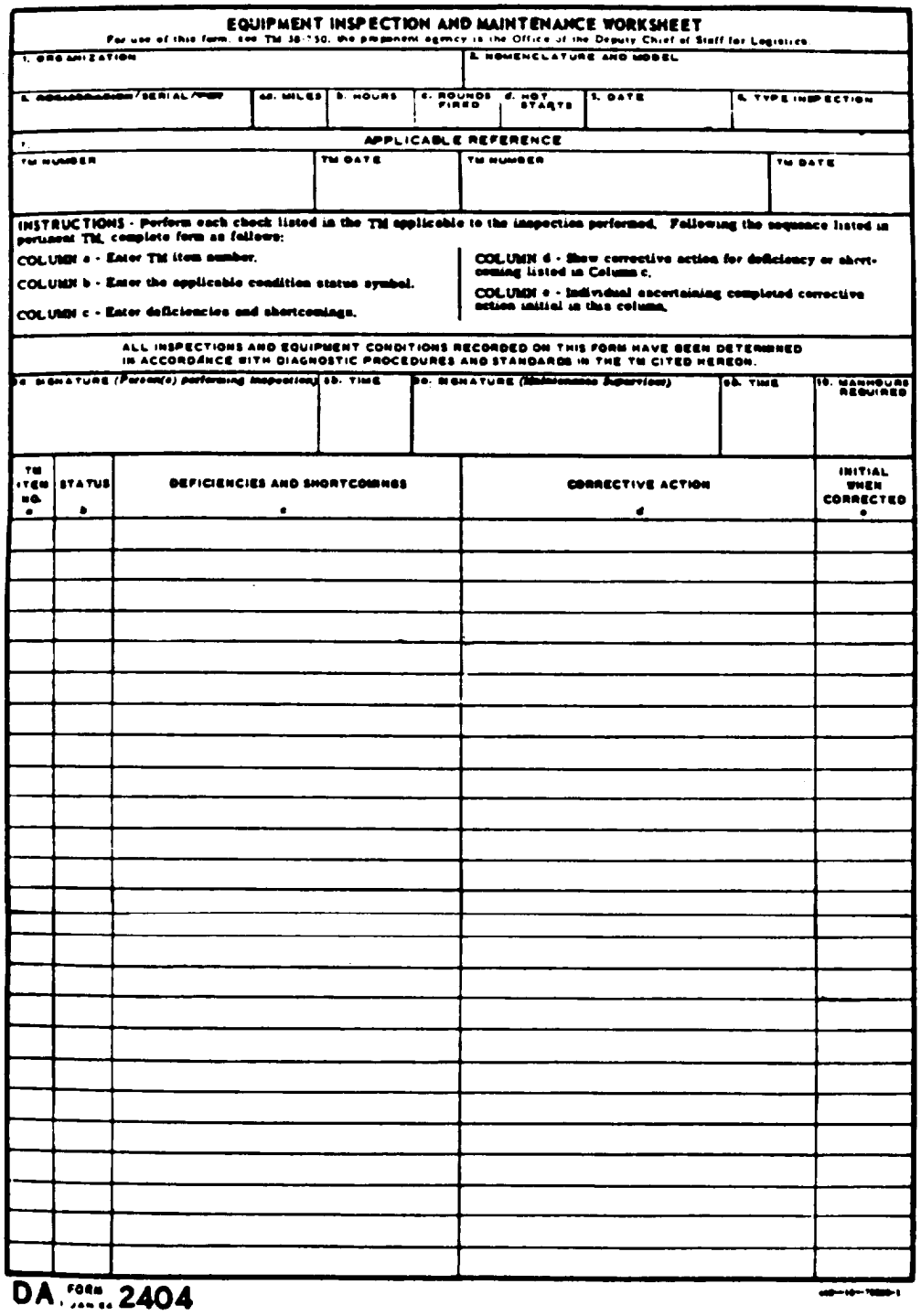
Item Number	Interval: Operator Daily B	D	A	W	Org M	Q	ITEM TO BE INSPECTED PROCEDURE Check for and have repaired or adjusted as necessary.	Equipment Will Be Reported Not Ready (Red) If:
7						X	FUEL LINES ... Inspect fuel lines (9) for leaks, kinks, breaks, and loose connections. Replace as necessary. 	Fuel Lines: Leaks, kinks, breaks loose fittings.
8						X	MUFFLER ... Inspect for cracks, holes, and faulty connections. Tighten loose connections and replace as necessary. -TOP-	Muffler: Cracks ,holes, loose connections.
9	X		X				OIL LEVEL DIP STICK ... Remove oil level dip stick (10) and check for oil level. Add oil if needed. 	Oil Level: No oil, low oil, no Dip Stick.
10	X			X			AIR CLEANER ... Inspect air cleaner visual signal (11) to detemine if red SERVICE LEVEL signal is visable. If the signal is visible proceed as follows. Turn wing bolts (12) one quarter turn to loosen. Wipe out inside of element housings (13). To clean filter (14) element blow off element with compressed air - 	Air Cleaner: Missing, clogged.

Table 2-1. Preventive Maintenance Checks and Services (Continued)

B - Before operation
D - During operation
A - After operation
W - Weekly
M - Monthly
Q - Quarterly

Item Number	Interval: Operator Daily (B D A W)	Interval: Org M	Interval: Org Q	ITEM TO BE INSPECTED PROCEDURE Check for and have repaired or adjusted as necessary.	Equipment Will Be Reported Not Ready (Red) If:
10 (Cont)				from clean to dirty side of element wash in detergent and water. To reassemble insert cleaned element (14). Turn wing bolts (12) one quarter turn to tighten. DO NOT USE WRENCH. EMERGENCY - To clean gently tap element against hand. Do not tap against hard objects. Filter element (14) can be washed in soap and water. DO NOT use gasoline or other solvents. CAUTION - Use care when cleaning. Do not puncture filter element. Press button (15) in SERVICE LEVEL signal.  	
11	X		X	OPERATIONAL TEST ... During operation, listen for any unusual noises or vibration.	
12			X	ADJUSTMENTS ... Make all necessary adjustments during operational test.	



EQUIPMENT INSPECTION AND MAINTENANCE WORKSHEET

For use of this form, see TM 38-750; the proponent agency is the Office of the Deputy Chief of Staff for Logistics

1. ORGANIZATION		2. NOMENCLATURE AND MODEL					
3. [illegible]/SERIAL [illegible]	4a. MILES	4b. HOURS	4c. ROUNDS FIRED	4d. HOT STARTS	5. DATE	6. TYPE INSPECTION	

7. APPLICABLE REFERENCE

TM NUMBER	TM DATE	TM NUMBER	TM DATE

INSTRUCTIONS - Perform each check listed in the TM applicable to the inspection performed. Following the sequence listed in pertinent TM, complete form as follows:

COLUMN a - Enter TM item number.

COLUMN b - Enter the applicable condition status symbol.

COLUMN c - Enter deficiencies and shortcomings.

COLUMN d - Show corrective action for deficiency or shortcoming listed in Column c.

COLUMN e - Individual ascertaining completed corrective action initial in this column.

ALL INSPECTIONS AND EQUIPMENT CONDITIONS RECORDED ON THIS FORM HAVE BEEN DETERMINED IN ACCORDANCE WITH DIAGNOSTIC PROCEDURES AND STANDARDS IN THE TM CITED HEREON.

8a. SIGNATURE (Person(s) performing inspection)	8b. TIME	9a. SIGNATURE (Maintenance Supervisor)	9b. TIME	10. MANHOURS REQUIRED

TM ITEM NO. a	STATUS b	DEFICIENCIES AND SHORTCOMINGS c	CORRECTIVE ACTION d	INITIAL WHEN CORRECTED e

DA FORM 2404

Figure 2-2. Equipment Inspection and Maintenance Worksheet.

Section III. OPERATION UNDER USUAL CONDITIONS

2-3. GENERAL.

The instructions in this section are for personnel who operate the pump. It describes how the pump is started and stopped in normal conditions.

2-4. ASSEMBLY AND PREPARATION FOR USE.

2-4.1. Unloading the Equipment.

The total weight of the crated centrifugal pump is 146 pounds. A handtruck, forklift, or manpower may be used to unload the crated unit. The crate must be kept in an upright position as shown on the crate while unloading.

2-4.2. Unpacking the Equipment.

a. General. For domestic shipping, the centrifugal pump is packed in a cardboard box.

b. Unpacking. Cut and remove all retaining straps from cardboard box. Remove centrifugal pump from its container.

CAUTION

Be careful while unpacking to avoid damaging equipment.

c. Removal of Protective Materials and Preservatives. Remove protective tape and coverings from inlet and outlet ends of centrifugal pump. Prepare engine for inspection and operation as outlined on DA Form 2258 (Depreservation Guide).

2-4.3 Inspecting and Servicing Equipment.

a. Check identification plate against packing bill for positive identification of equipment.

b. Visually inspect equipment for any damage which may have occurred during shipment. Make certain that all nuts and bolts are in place and secure.

c. For inspection and servicing of a new or used engine, refer to TM 5-2805-257-14 and LO 5-2805-257-12.

d. Perform daily preventive maintenance services listed in paragraph 2-2.

2-4.4. Installation or Setting-Up Instructions.

a. General. The pump is shipped assembled for operation.

b. Installation.

(1) Place pump on a base that is solid and strong enough to support weight of unit. Refer to paragraph 1-9 for dimensions of base.

(2) Select a level site where there will be enough space on all sides for servicing and operation of the unit.

(3) Place pump as close a possible to source of water. Avoid long suction lifts which reduce pumping efficiency.

(4) Connect hoses to inlet and outlet adapters. Make sure intake end of inlet hose is connected.

(5) If pump is operated in an enclosed area, make certain that there is proper ventilation and exhaust gases are piped outside.

WARNING

Never operate pump in enclosed areas unless exhaust gases are piped outside. Exhaust gases contain carbon monoxide, a colorless, oderless, and poisonous gas, which can cause serious illness or death.

2-5. STARTING THE EQUIPMENT.

Before you operate. Always keep in *mind the CAUTIONS and WARNINGS.*

a. Preparation for Starting.

(1) Do the before operation preventive maintenance services (paragraph 2-2).

(2) Prime pump as described in figure 2-3, if pump is not full of water.

CAUTION

Do not start pump without first priming with water. Dry operation will damage pump seals and cause pump to fail. After priming, do not run pump more than 3 to 5 minutes without water flowing through it.

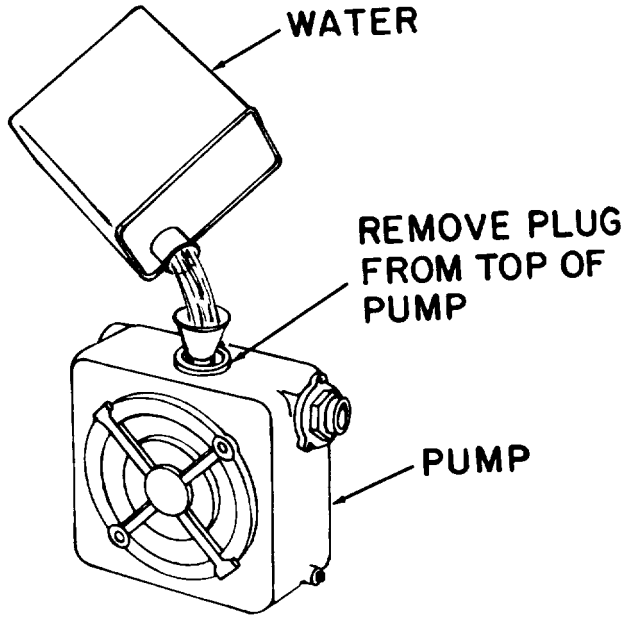


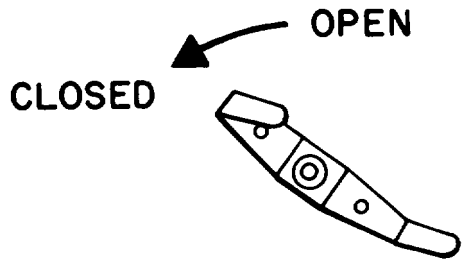
Figure 2-3. Priming the pump.

b. Starting Start pump as shown below:

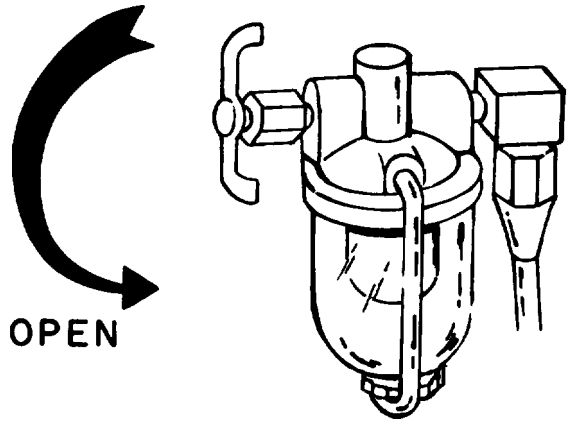
NOTE

Allow engine sufficient warmup time before starting pumping operation at IDLE speed not to exceed three minutes.

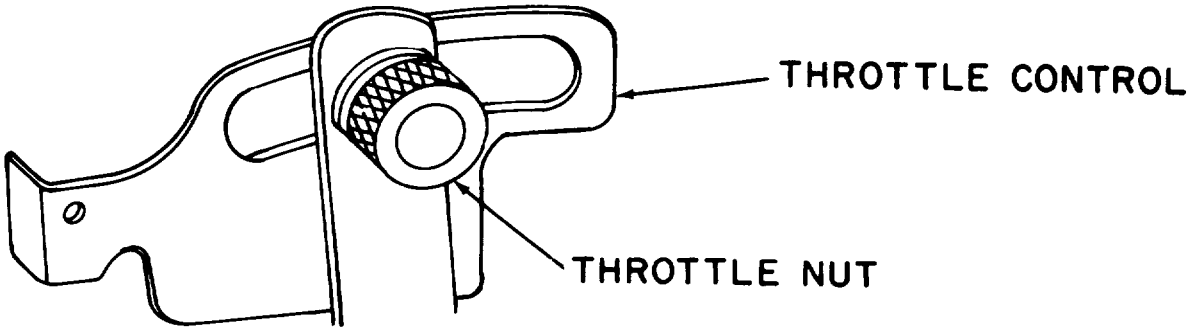
1 - Move choke control to CLOSE.



2 - Turn Fuel Shut off valve to OPEN.

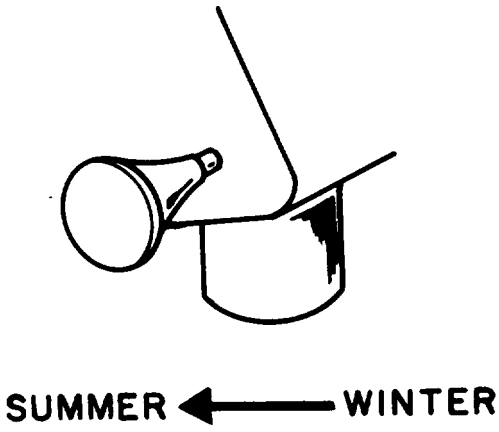


3 - Move throttle control to half throttle and tighten throttle nut.

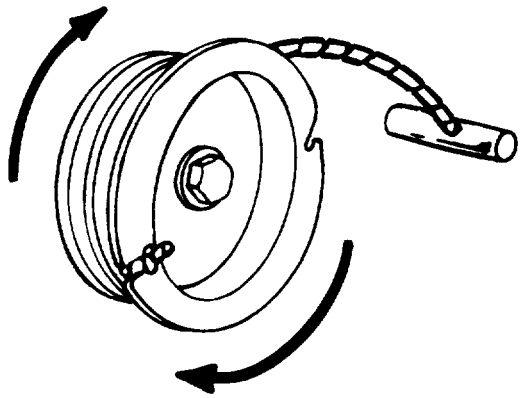


4 - Set ignition switch to RUN

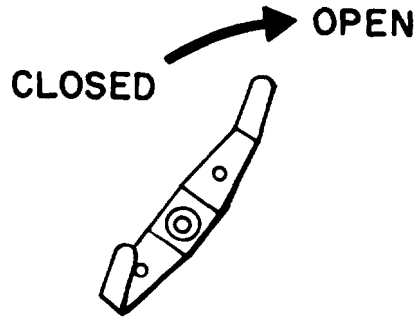
5 - Place the Inlet Air Temperature Control in the SUMMER position.



6 -Wind starter rope as shown around starter pulley and pull rope sharply.

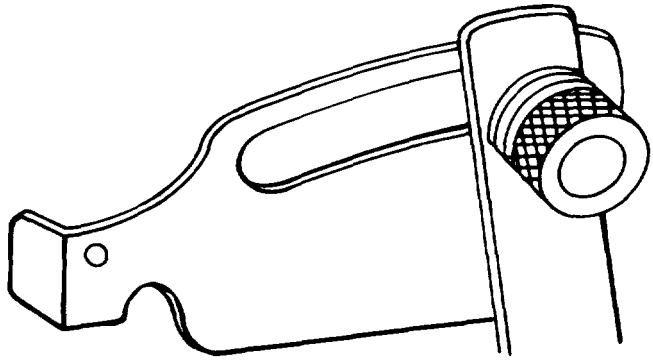


7 - When engine starts and warms up, slowly open choke. Maintain smooth operation until choke is fully open.



8 - Let engine run at about one-half throttle until it reaches operating temperature.

9 - When operating temperature is reached, move throttle control to full throttle for maximum pumping rate. If less than maximum pumping rate is desired, adjust throttle control position to the required speed setting.



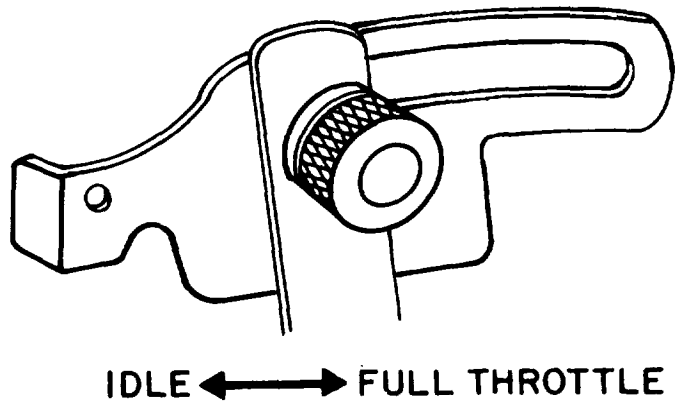
10 - To stop pumping without stopping engine, move throttle control to idle position and allow engine to idle.

11 - To resume pumping operation move throttle control to desired speed setting.

2-6. STOPPING THE EQUIPMENT

To stop pumping operation:

1 - Place the throttle control in the idle position, and let the engine idle for 3 to 5 minutes. This will allow the engine to cool.



2 - Set the Ignition Switch to OFF.

2-7. DISMANTLING FOR MOVEMENT.

The pump is completely self-contained and can be moved over short distances manually by lifting at the ends of the pump frame. If the pump is to be transported by carrier, block or tie it to the carrier to prevent it from shifting while being transported.

CAUTION

When tying pump to carrier, install bands through frame. Do not secure by banding across channels.

a. Disconnect inlet and outlet hoses from inlet and outlet adapters.

b. Disconnect exhaust pipe extension if used.

c. Remove plug from bottom of fuel tank and drain fuel into suitable container.

d. Cover openings of inlet and outlet adapters to protect adapter threads and prevent foreign matter from entering pump.

2-8. REINSTALLATION AFTER MOVEMENT.

Refer to paragraph 2-4.4 for installation and setting up procedures.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-9. GENERAL.

This section contains instructions for operation of the equipment in the following conditions: extreme cold, extreme heat, dusty or sandy areas, rainy or humid conditions, salt water areas, and high altitudes.

2-10. OPERATION IN EXTREME COLD.

a. Keep fuel tank full to prevent condensation. Drain and service fuel filter more frequently than under normal conditions (paragraph 3-5.2).

b. Before starting engine, remove any accumulated ice or snow from spark plugs and wiring.

c. Make sure Inlet Air Temperature shutter on engine is set for winter operation.

d. Run engine at low speed to warm to operating temperature before applying full load.

e. Lubricate engine in accordance with current lubrication order LO 5-2805-257-12.

f. Fill pump with warm water to prevent freezing at starting.

9“ Drain pump immediately after operation as shown in figure 2-4.

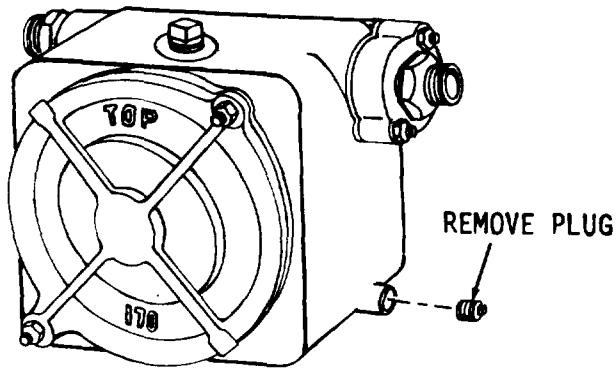


Figure 2-4. Pump draining instructions.

2-11. OPERATION IN EXTREME HEAT.

a. Make sure Inlet Air Temperature shutter is set for summer operation.

b. Keep pump clean and free of dust. If pump is operated indoors, allow sufficient room around unit for air circulation. Make sure exhaust is vented outside.

c. Inspect shrouding and cooling fins of engine for dust or foreign matter which might stop flow of air.

d. Lubricate engine in accordance with current Lubrication Order LO 5-2805-257-14 or TM 5-2805-257-14.

2-12. OPERATION IN DUSTY OR SANDY AREAS.

a. If installation is permanent, erect protective shield for pump. If installation is temporary, take advantage of natural barriers which offer protection from dust and sand.

b. Service air cleaner daily to keep fuel system free from sand and dirt (TM 5-2085-257-14).

c. Strain all fuel before adding to fuel tank. Drain and service fuel filter more frequently than under normal conditions (paragraph 3-5.2).

d. Clean pump frequently. Wipe it with a cloth dampened in approved cleaning solvent.

e. Lubricate engine in accordance with current lubrication order LO 5-2805-257-14 and TM 5-2805-257-14.

2-13. OPERATION UNDER RAINY OR HUMID CONDITIONS.

a. If unit is outside and not operating, cover unit with canvas or other waterproof material during damp, rainy weather. Remove cover during dry weather to allow unit to dry out.

b. Keep fuel tank full at all times to prevent condensation. Drain and service fuel filter frequently (paragraph 3-5.2).

c. Humid conditions can cause corrosion and deterioration of electrical components. Keep electrical components clean and dry.

d. Lubricate engine in accordance with current lubrication order LO 5-2805-257-14 and TM 5-2805-257-14.

2-14. OPERATION IN SALT WATER AREAS.

a. Salt water causes corrosive action on metal. Care must be taken to avoid contact with salt water. After contact with salt water, wash unit with clean, fresh water.

b. Coat exposed metal with rustproofing material. Remove any rust immediately and cover exposed surface with a coat of paint.

2-15. OPERATION AT HIGH ALTITUDES.

Because of thinner air at higher altitudes, the carburetor may require an adjustment providing a leaner mixture. If this condition exists, refer to TM 5-2805-257-14.

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. GENERAL LUBRICATION INFORMATION.

The engine is the only component of the centrifugal pump that requires lubrication. The pump uses prelubricated, sealed ball bearings that require no further lubrication.

3-2. DETAILED LUBRICATION INFORMATION.

Refer to the current lubrication order LO 5-2805-257-14 and to TM 5-2805-257-14 for engine lubrication instructions.

When OES oil is used, it will be checked more often.

Section II. TROUBLESHOOTING

3-3. GENERAL.

The table lists the common malfunctions which you may find during the operation or maintenance of the pump or it's components. You should perform the tests/inspections and corrective actions in the order listed.

This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor. Refer to TM 5-2805-257-14 for engine troubleshooting.

Table 3-1. OPERATOR TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. PUMP FAILS TO PUMP TO RATED CAPACITY.
Step 1 - Check for low engine speed. Adjust engine speed.
Step 2 - Check for sufficient fuel. Adjust fuel control valve.
Step 3 - Check position of Choke Control. Readjust.
Step 4 - Check position of Inlet Air Temperature Control. Readjust.
Step 5 - Check that pump is located close to source of supply. Relocate pump.
Step 6 - Check pump for leaks, cracks, or other damage. Notify maintenance activity.
2. PUMP FAILS TO PRIME.
Step 1 - Check pump for leaks, cracks or other damage. Notify maintenance activity.
Step 2 - Check pump for sufficient prime. Reprime pump.
Step 3 - Check drain plug. Repair or replace.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

4-1. GENERAL.

This chapter contains the removal, cleaning, inspection, and installation procedures for Organizational Maintenance. Refer to TM 5-2850-257-14 for engine maintenance.

Before *maintenance always keep in mind the WARNINGS and CAUTIONS located on the inside front cover.*

4-2. FUEL SYSTEM.

This section contains the maintenance instructions for the engine fuel system components which are not described in TM 5-2850-257-14. It includes coverage of the fuel tank, fuel filter, and fuel lines and fittings.

4-2.1. Fuel Tank.

a. Removal.

(1) Refer to figure 4-1. Remove drain plug (1) and drain fuel into a suitable container.

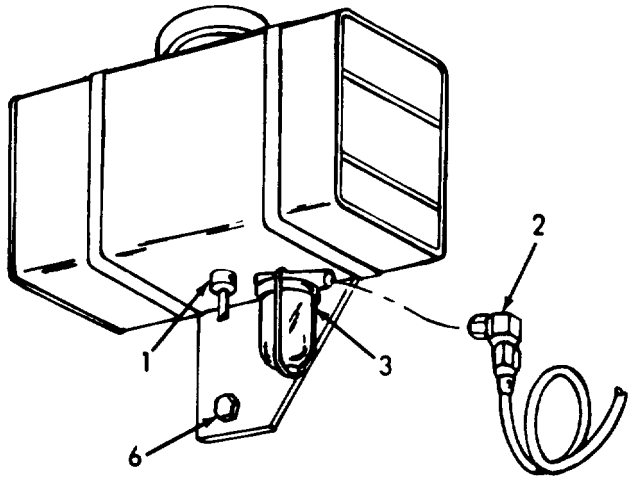
(2) Disconnect fuel line (2) at fuel filter (3).

(3) Remove spark plug wire (4).

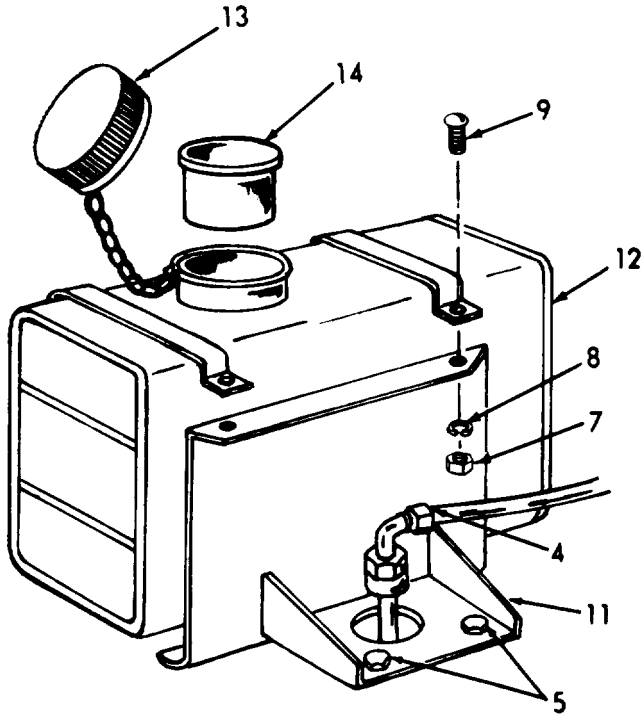
(4) Remove screws (5) and (6) that attach fuel tank to engine.

(5) Remove nuts (7), washers (8), and screws (9) that secure straps (10) to bracket (11), remove fuel tank (12).

(6) Remove fuel tank cap (13) and strainer (14).



BOTTOM VIEW



REAR VIEW

Figure 4-1. Fuel Tank Removal.

b. Cleaning and Inspection.

(1) Thoroughly clean fuel tank.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid inhalation of fumes and repeated or prolonged skin exposure. Wash exposed skin thoroughly with soap and water. Use in well ventilated area away from open flame or excessive heat. Flash point is 100°F (38°C).

(2) Clean fuel strainer and cap with approved cleaning solvent; shake dry.

(3) Inspect for cracks, breaks, or other damage.

(4) Repair cracks and breaks, using approved arc welding methods.

WARNING

Make sure all gasoline fumes are removed from tank before starting welding operations. Fumes in tank can cause a severe explosion if ignited

c. Installation.

Repeat the removal procedure in reverse sequence.

4-2.2. Fuel Lines, Filter.

a. Removal.

(1) Remove fuel tank as per 4-2.1.

(2) Refer to figure 4-2. Loosen finger nut (1) on yoke (2) of fuel filter. Swing yoke upward and remove fuel bowl (3) and filter (4).

(3) Disconnect fuel line (5) to engine. Disconnect fuel line (6) to fuel tank.

(4) Remove elbow (7).

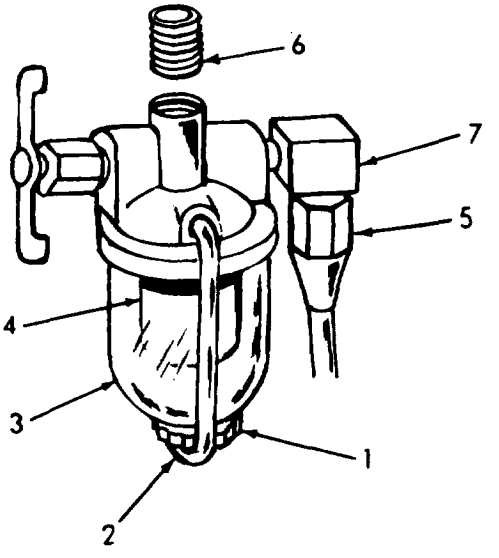


Figure 4-2. Fuel line and filter removal.

b. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid inhalation of fumes and repeated or prolonged skin exposure. Wash exposed skin thoroughly with soap and water. Use in well ventilated area away from open flame or excessive heat. Flash point is 100°F (38°C).

(1) Clean fuel filter, bowl assembly and fuel lines with approved cleaning solvent and dry thoroughly.

(2) Inspect fuel filter, connector threads, bowl, and bowl gasket for cracks, breaks, and other damage.

(3) Inspect fuel lines for cracks, distortion, or other damage.

(4) Replace all damaged or defective parts.

c. Installation.

Using figure 4-2 repeat the removal procedure in reverse sequence.

4-3. EXHAUST SYSTM.

The exhaust system maintenance and inspection procedures are described and illustrated in TM 5-2805-257-14.

4-4. CENTRIFUGAL PUMP.

The centrifugal pump is direct coupled to the engine. The pump case houses the impeller, wear plate, and seal and serves as a water chamber with suction and discharge ports. The volute, which bolts to the front of the pump case,. completely encircles the impeller. A check valve prevents water backflow through the pump.

4-4.1. Troubleshooting.

Table 4-1 is used for organizational maintenance activity troubleshooting. This table is to be used in conduction with the preventative maintenance troubleshooting table contained in paragraph 2-1.

Table 4-1. MAINTENANCE ACTIVITY TROUBLESHOOTING.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. PUMP FAILS TO PUMP TO RATED CAPACITY.
Step 1 - Check if check valve is defective. Replace check valve. (Refer to 4-4.4.)
Step 2 - Check if impeller is clogged or broken. Flush pump case or replace impeller. (Refer to 4-4.2.)
Step 3 - Check pump case for leaks, cracks or damage. Repair or replace case. (Refer to 4-4.2.)
Step 4 - Check if packing seals are worn or defective. Replace packing seals. (Refer to 4-4.2.)
Step 5 - Check if clearance between wear plate and impeller is excessive. Install shims as required. (Refer to 4-4.2.)
2. PUMP FAILS TO PRIME.
Step 1 - Check if check valve is defective. Replace check valve. (Refer to 4-4.4.)
Step 2 - Check if suction flange is loose or defective. Tighten mounting nuts or replace suction flange. (Refer to 4-4.4.)
Step 3 - Check if impeller is damaged. Replace impeller. (Refer to 4-4.2.)

Table 4-1. MAINTENANCE ACTIVITY TROUBLESHOOTING (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
3. PUMP NOISY.
Step 1 - Check if pump mounting hardware is loose. Tighten pump mounting hardware. (Refer to 4-4.2.)
Step 2 - Check if impeller is broken. Replace impeller. (Refer to 4-4.2.)
Step 3 - Check if impeller shaft adapter is defective. Replace impeller shaft. (Refer to 4-4.2.)

4-4.2. Pump.

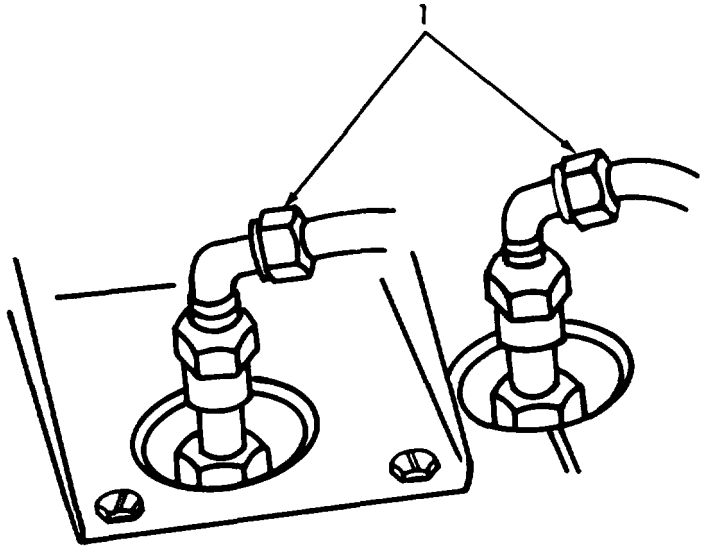
a. Removal.

Use the special Allen-type screw socket and adapter to remove and install the pump. Refer to Appendix B, Section III for part numbers.

WARNING

Make sure spark plug leads are disconnected before performing maintenance on the pump.

(1) Disconnect two spark plug leads (1).



(2) Disassemble pump in numerical sequence as shown in figure 4-3.

NOTE

When removing impeller (9) unscrew from adapter (18) right hand thread.

b. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid inhalation of fumes and repeated or prolonged skin exposure. Wash exposed skin thoroughly with soap and water. Use in well ventilated area away from open flame or excessive heat. Flash point is 100°F (38°C).

(1) Clean all parts with approved cleaning solvent and dry thoroughly.

(2) Inspect housings, impeller, wear plate, seals, and adapter for cracks, breaks, wear, leaky seals, and other damage.

(3) Repair cracks and breaks in housings using approved arc welding methods, provided repair does not upset critical pump tolerances.

(4) Replace all damaged or defective parts.

c. Installation.

(1) Refer to figure 4-3, reassemble pump in reverse sequence.

(2) Torque screw (16) to 32 - 35 ft. lbs.

(3) Install shims (12) as needed to provide .010 to .015 inch clearance between impeller (9) and wear plate (11).

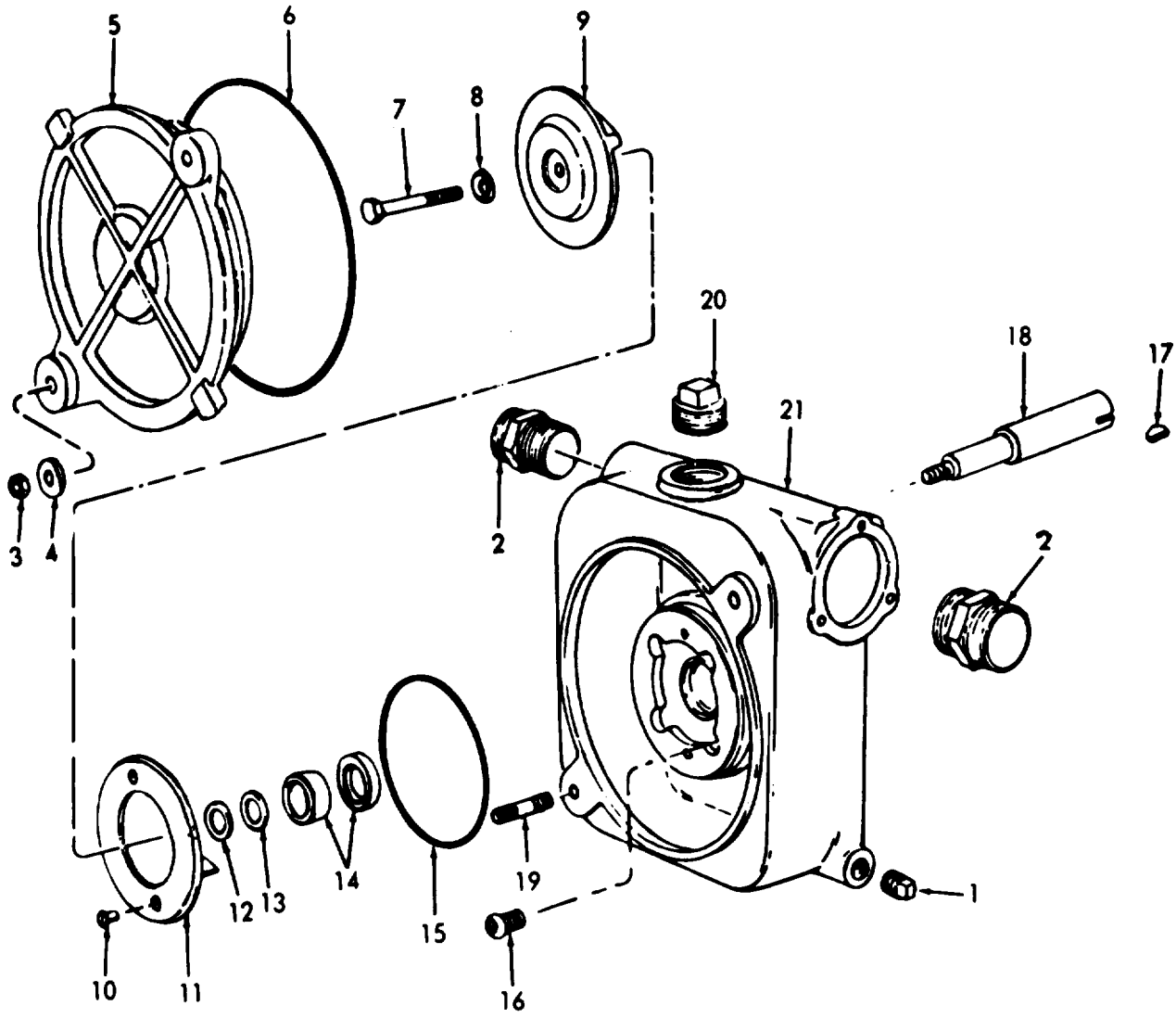


Figure 4-3. Pump, disassembly and reassembly.

4-5. ENGINE.

This section contains the engine removal procedures. All engine maintenance procedures and instructions are described and illustrated in TM 5-2805-257-14.

a. Removal.

(1) Remove exhaust system as per 4-3.

(2) Remove fuel tank and line as per 4-2.1.

(3) Remove centrifugal pump as per 4-4.2.

(4) Refering to figure 4-4. Remove nuts (1), washers (2), and screws (3) that attach the engine mounting bracket (4) to the frame (5).

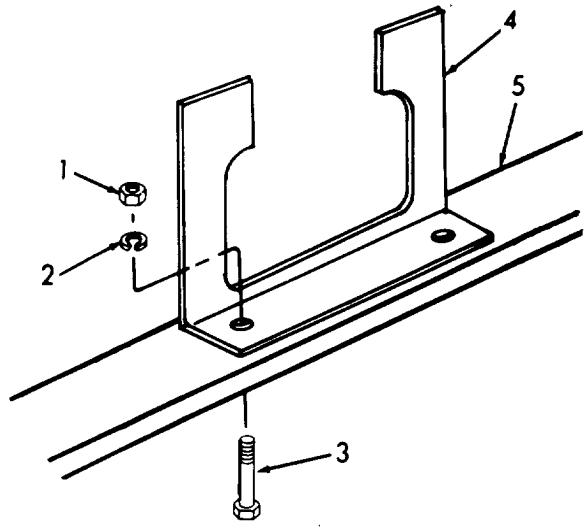


Figure 4-4. Engine removal.

b. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid inhalation of fumes and repeated or prolonged skin exposure. Wash exposed skin thoroughly with soap and water. Use in well ventilated area away from open flame or excessive heat. Flash point is 100°F (38°C).

(1) Clean exterior of engine with approved cleaning solvent and dry thoroughly.

(2) Inspect engine for any external damage, tag engine, noting any defects or damage, and return it to depot maintenance.

c. Installation.

Refer to figure 4-4. Repeat the removal procedure in reverse sequence.

4-6. FRAME.

Two channels mounted on the frame with shock mounts support the engine and pump and absorb the shock and vibration of the pump while in operation. The tubular frame supports and protects the pump and engine.

a. Removal.

(1) Remove exhaust system as per 4-3.

(2) Remove fuel tank and line as per 4-2.1.

(3) Remove centrifugal pump as per 4-4.2.

(4) Remove engine as per 4-5.

(5) Refer to figure 4-5. Remove capscrews (1), lock washers (2), and flat washers (3).

(6) Remove channels (4) and shock mounts (5).

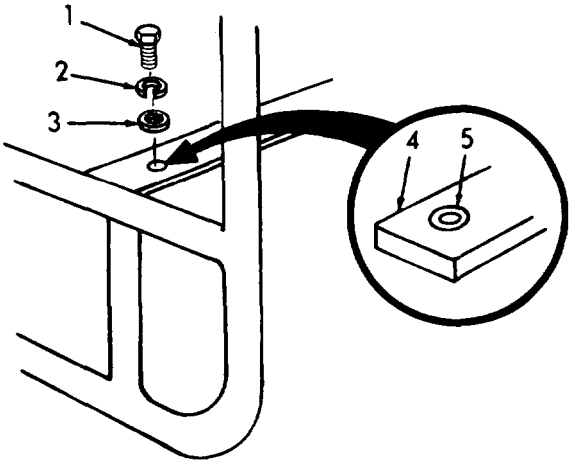


Figure 4-5. Channel removal.

b. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid inhalation of fumes and repeated or prolonged skin exposure. Wash exposed skin thoroughly with soap and water. Use in well ventilated area away from open flame or excessive heat. Flash point is 100°F (38°C).

(1) Clean channels and frame with approved cleaning solvent or wire brush as required.

(2) Inspect channels and frame for cracks or bends.

(3) Inspect shock mounts for cracks, wear, and deterioration.

c. Installation.

Refer to figure 4-5. Repeat the removal procedure in reverse sequence.

4-6.4. Check Valve.

a. Removal.

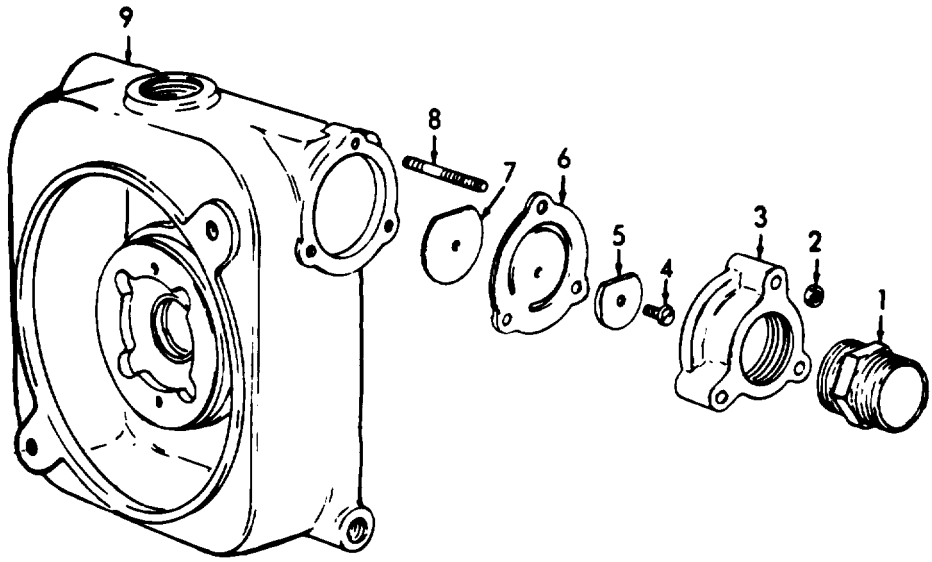
(1) Refer to figure 4-6. Remove adapter (l), nuts (2), then suction flange (3).

(2) Remove gasket (6), consisting of small weight (5) and large weight (7).

(3) Remove screw (4) separating items (5), (7), and (6).

b. Installation.

(1) Reverse the above procedure.



1. Straight adapter
2. Nut, plain, hex, 5/16-24 (3 rqr)
3. Suction flange
4. Screw, machine, 1/4-20 x 1/2 in.
5. Small weight
6. Gasket
7. Large weight
8. Stud, plain, 5/16-24 x 5/16-18 x 2-1/2 in. (3 rqr)
9. Pump case

Figure 4-6. Check valve.

APPENDIX A

REFERENCES

A-1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users.

A-2. Lubrication

LO 5-2805-257-12	Engine, Gasoline: 3 HP; Military Standard Model 2A016-2 and 2A016-3
C9100-IL	FSC Group 91; Fuels, Lubricants, Oils, and Waxes

A-3. Painting

TM 9-213	Painting Instruction for Field Use

A-4. Maintenance

TM 38-750	Army Equipment Record Procedures
TM 5-4320-209-25P	Organizational, Direct and General Support and Depot Maintenance Repair Parts and Special Tools Lists, Pumps, Centrifugal: Gasoline Driven; Frame Mounted, 2 in. 125 gpm, 50 ft. Head, Military Model 2-125-50-G, NSN 4320-00-542-3347, less MIL STD Engine.
TM 5-2805-257-24P	Operator, Organizational, Direct and General Support Maintenance Repair Parts and Special Tool Lists: Engine Gasoline (Military Standard Models) (Model 2A016-2) 3 hp NSN 2805-00-714-8553 (Model 2A016-3) 3 hp NSN 2805-00-072-4871

A-5. Shipment and Storage.

TB 740-93-2	Preservation of USAMEC Mechanical Equipment for Shipment and Storage.
TM 740-90-1	Administrative Storage of Equipment
TM 38-230	Preservation, Packaging, and Packing of Military Supplies and Equipment

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from section II.

d. Section IV contains supplemental instructions on explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS.

a. Inspect. To determine the serviceability of an item by comparing its physical mechanical and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments 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.

g. Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), and item, or system.

j. Overhaul. The maintenance effort (services/actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/ Assembly	(3) Maintenance function	(4) Maintenance level C	O	F	H	D	(5) Tools and equipment	(6) Remarks
01	Engine								
0100	Engine Assembly	Inspect	0.2						
		Service		1.0					
		Replace		1.0					A
02	Fuel System								
0200	Tank, Lines and Fittings	Inspect	0.1						
		Service	0.2						
		Replace		0.5				3	
03	Frame								
0300	Frame Assembly	Inspect	0.1						
		Replace		1.0				3	
		Repair			2.0			5	
04	Accessory Items								
0400	Data Plates	Inspect	0.1						
		Replace		2.0				4	
05	Pump								
0500	Pump Assembly	Inspect	0.1						
		Service	0.4					3	
		Replace		2.0				1,2,4	B
		Repair		2.0				3	
0501	Impeller Assembly								
	Impeller	Inspect		0.2					
		Service	0.1					3	
		Replace		0.3				3	
	Seal	Inspect	0.1					3	
		Replace		0.5				3	
0502	Discharge and Suction Valve, Check	Inspect	0.1						
		Replace		0.3				3	
	Adaptors	Replace		0.3				4	
	Gasket, Flange	Replace	0.1					3	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS.

(1) Reference Code	(2) Maintenance Level	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
1	O	Allen type screw socket		4990 7/32 (93389)
2	O	Adapter	5120-00-240-8792	
3	O,F	Tool Kit, General Mechanics Automotive (W33004) or equivalent	5180-00-177-7033	
4	O	Shop Equipment Automotive maintenance and repair; organizational maintenance or equivalent	4910-00-754-0654	
5	F	Welding Shop, trailer mounted (Y48323) or equivalent	3431-00-935-7821	

Section IV. REMARKS

Maintenance Allocation Chart

Reference Code	Remarks
A	Maintenance allocation chart for engine is in TM 5-2805-257-14.
B	Special tools required to torque pump mounting screws (32-35 FT-LBS)

APPENDIX C

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

C-1. SCOPE.

This appendix-lists additional items you are authorized for the support of the Centrifugal Pump.

C-2. GENERAL.

This list identifies items that do not have to accompany the Centrifugal Pump and that do not have to be turned in with it.

C-3. EXPLANATION OF LISTING.

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment.

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER & FSCM USABLE ON CODE	(3) U/M	(4) QTY. AUTH.
7520-00-559-9618	CASE: Operator Maintenance	ea	1
2990-00-972-7950	ROPE: Starting	ea	1
4210-00-555-8837	EXTINGUISHER: Fire	ea	1

APPENDIX D

REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

D-1. SCOPE.

This manual lists repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of organizational maintenance of the centrifugal pump. It authorizes the requestioning and issue of repair parts as indicated by the source and maintenance codes.

D-2. GENERAL.

This Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in numeric sequence, with the parts in each group listed in figure and item number sequence. Bulk materials are listed in NSN sequence.

b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized for the performance of maintenance (Not Applicable.)

Section IV. National Stock Number and Part Number Index. A list; in National item identification number (NIIN) sequence, of all National stock numbers (NSN) appearing in the listings, followed by a list in alphameric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance. This index is followed by a cross-reference list of reference designators to figure and item number.

D-3. EXPLANATION OF COLUMNS.

a. Illustration. This column is divided as follows:

(1) Figure Number. Indicates the figure number of the illustration of which the item is shown.

(2) Item Number. The number used to identify item called out in the illustration.

b. Source, Maintenance, and Recoverability (SMR) Codes.

(1) Source Code. Source codes indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items.

Source codes are entered in the first and second positions of the UNIFORM SMR Code format as follows:

Code	Definition
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purposes because essentiality dictates that a minimum quantity be available in the supply system.
PC	Item procured and stocked and which otherwise would be coded PA except that it is deteriorative in nature.
PD	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional initial issues or outfittings. Not subject to automatic replenishment.
PE	Support equipment procured and stocked for initial issue or outfitting to specified maintenance repair activities.
PF	Support equipment which will not be stocked but which will be centrally procured on demand.
PG	Item procured and stocked to provide for sustained support for the life of the equipment. It is applied to an item peculiar to the equipment which, because of probable discontinuance or shutdown of production facilities, would prove uneconomical to reproduce at" a later time.
KD	An item of a depot overhaul /repair kit and not purchased separately. Depot kit defined as a kit that provides items required at the time of overhaul or repair.
KF	An item of maintenance kit and not purchased separately. Maintenance kit defined as a kit that provides an item that can be replaced at organizational or intermediate levels of maintenance.
KB	Item included in both a depot overhaul/repair kit and a maintenance kit.
MO	Item to be manufactured or fabricated at organizational level.
MF	Item to be manufactured or fabricated at the direct support maintenance level.
MH	Item to be manufactured or fabricated at the general support maintenance level.
MD	Item to be manufactured or fabricated at the depot maintenance level.
AO	Item to be assembled at organizational level.
AF	Item to be assembled at direct support maintenance level.
AH	Item to be assembled at general support maintenance level.
AD	Item to be assembled at depot maintenance level.
XA	Item is not procured or stocked becaused the requirements for the item will result in the replacement of the next higher assembly.
XB	Item is not procured or stocked. If not available through salvage, requisition.
XD	A support item that is not stocked. When required, item will be procured through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items coded above except those coded XA and support items as restricted by AR 700-42.

(2) Maintenance Code. Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

Code	Application/Explanation
C	Crew or operator maintenance performed within organizational maintenance.
O	Support item is removed, replaced, used at the organizational level.
I	Support item is removed, replaced, used by the direct support element of integrated direct support maintenance.
F	Support item is removed, replaced, used at the direct support level.
H	Support item is removed, replaced, used at the general support level.
D	Support items that are removed. replaced, used at depot, mobile depot, or specialized repair activity only.

NOTE

Codes I and F will be considered the same by direct support units.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the" lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes.

Code	Application/Explanation
O -	The lowest maintenance level capable of complete repair of the support item is the organizational level.
F -	The lowest maintenance level capable of complete repair of the support item is the direct support level.
H -	The lowest maintenance level capable of complete repair of the support item is the general support level.
D -	The lowest maintenance level capable of complete repair of the support item is the depot level.
L -	Repair restricted to designated, Specialized Repair Activity.
Z -	Nonreparable. No repair is authorized.

Code	Application/Explanation
B -	No repair is authorized. The item may be reconditioned by adjusting, lubricating, etc., at the user level. No parts or special tools are procured for the maintenance of this item.

(3) Recoverability Code. Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR code, format as follows:

Recoverability Codes	Definition
Z -	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
O -	Reparable item. When uneconomically reparable, condemn and dispose at organizational level.
F -	Reparable item. When uneconomically reparable, condemn and dispose at the direct support level.
H -	Reparable item. When uneconomically reparable, condemn and dispose at the general support level.
D -	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.
L -	Reparable item. Repair, condemnation, and disposal not authorized below depot/specialized repair activity level.
A -	Item requires special handling or condemnation procedures because of specific reason (i.e., precious metal content, high dollar value, critical material or hazardous material). Refer to appropriate manual/directives for specific instructions.

c. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

d. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which control 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 a stock numbered item is requisitioned, the item received may have a different part number than the part being replaced.

e. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code listed in SB 708-42; which is used to identify the manufacturer, distributor, or Government agency, etc.

f. Description. Indicates the Federal item name and, if required, a minimum description to identify the items. Items that are included in kits and sets are listed below the name of the kit or set with the quantity of each item in the kit or set indicated in the quantity incorporated in unit column.

g. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function, This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr, etc). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated in Unit. Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for functional group, subfunctional group, or an assembly. A "v" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable, (e.g., shims, spacers, etc).

D-4. SPECIAL INFORMATION.

Repair parts kits and gasket sets appear as the last entries in the repair parts listing for the figure in which its parts are listed as repair parts.

D-5. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Number or Part Number is Unknown:

(1) Using the table of contents determine the assembly group within which the repair part belongs. This is necessary since illustration are prepared for assembly groups, and listings are divided into the same groups.

(2) Find the illustration covering the assembly group to which the repair part belongs.

(3) Identify the repair part on the illustration and note the illustration figure number and item number of the repair part.

(4) Using the repair parts listing, find the assembly group to which the repair part belongs and locate the illustration figure and item number noted on the illustration.

b. When National Stock Number or Part Number is Known:

(1) First. Using the Index of National Stock Number and Part numbers, find the pertinent National Stock number or part number. This index is in NIIN sequence followed by a list of part numbers in alpha-merit sequence, cross-referenced to the illustration figure number and item number.

(2) Second. After finding the figure and item number, locate the figure and item number in the repair parts list.

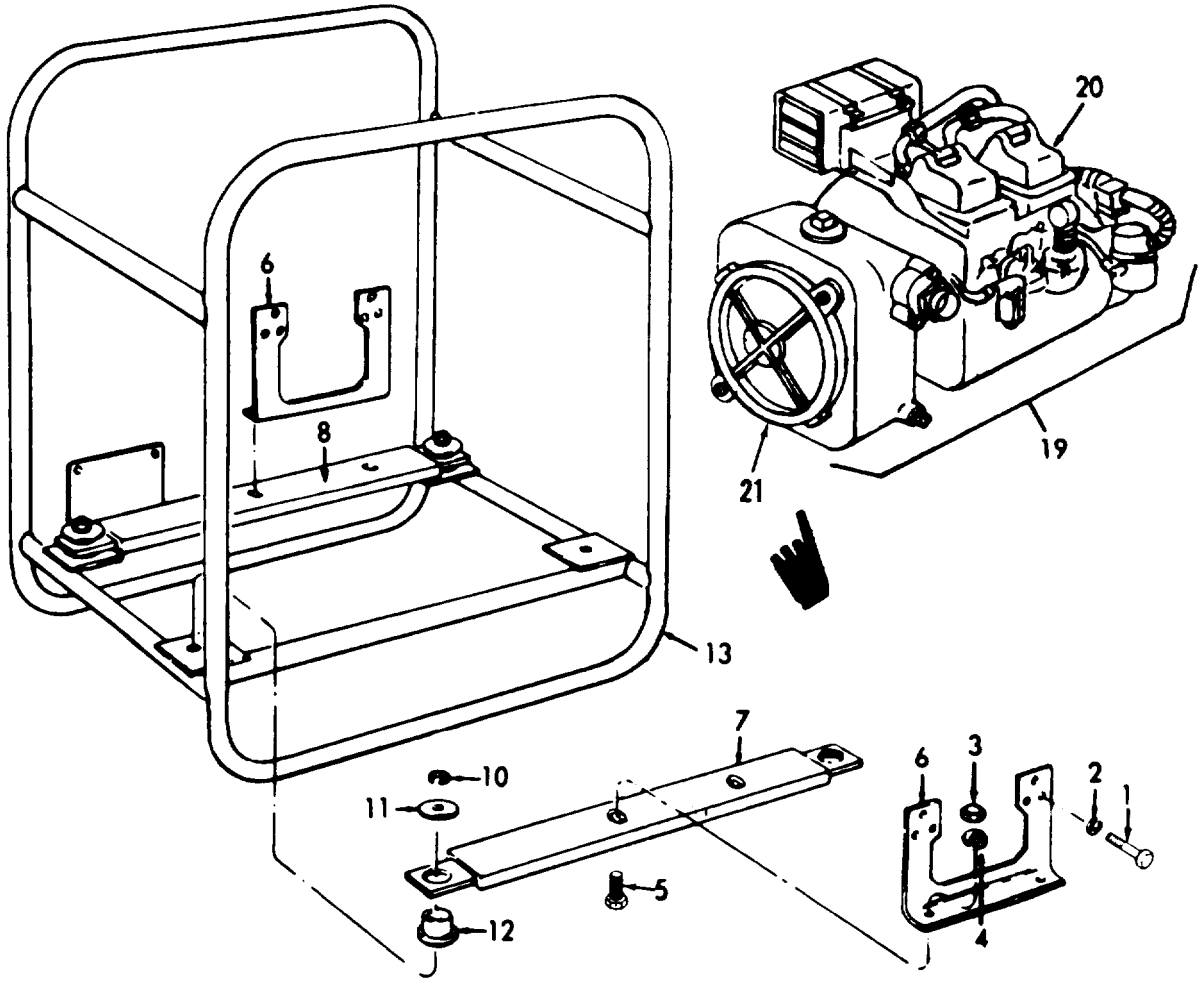


Figure D-1 Engine Assembly

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6)	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
D1	1	PAOZZ	5305-00-068-0502	96906	MS90725-6	SCREW,CAP,HEXAGON		EA	6
D1	2	PAOZZ	5310-00-582-5965	96906	MS35338-44	WASHER,LOCK		EA	12
D1	3	PAOZZ	5310-00-732-0558	96906	MS51967-8	NUT,PLAIN,HEXAGON		EA	4
D1	4	PAOZZ	5310-00-637-9541	96906	MS35338-46	WASHER,LOCK		EA	2
D1	5	PAOZZ	5305-00-942-2196	96906	MS90725-60	SCREW,CAP,HEXAGON		EA	4
D1	6	XBOZZ		97403	13200E8820	BRACKET,ENGINE		EA	2
D1	7	XBOZZ		97403	13200E8818	CHANNEL ASSEMBLY, RH		EA	1
D1	8	XBOZZ		97403	13200E8824	CHANNEL ASSEMBLY, LH		EA	1
D1	9	PAOZZ	5305-00-269-3215	96906	MS90725-65	SCREW,CAP,HEXAGON HEAD		EA	4
D1	10	PAOZZ	5310-00-637-9541	96906	MS35338-46	WASHER,LOCK		EA	4
D1	11	PAOZZ	5310-00-167-0769	88044	AN970-7	WASHER,FLAT		EA	2
D1	12	PAOZZ	5340-00-792-8233	97403	13200E8819	MOUNT,SHOCK		EA	4
D1	13	XBOZZ	4320-01-102-3021	97403	13200E8817	FRAME ASSEMBLY		EA	1
D1	14	PAOZZ	5305-00-253-5614	96906	MS21318-20	SCREW,MACHINE		EA	2
D1	15	XDFZZ		97403	13217E975-1	PLATE,IDENTIFICATION		EA	1
D1	16	PAOZZ	5310-00-934-9758	96906	MS35649-202	NUT,PLAIN,HEXAGON		EA	2
D1	17	PAOZZ	5305-00-984-6211	96906	MS35206-264	SCREW,MACHINE		EA	2
D1	18	XDFZZ		97403	13219E2950	PLATE,MOUNTING		EA	1
D1	19	AOOHH	4320-01-012-9937	97403	13200E8801	PUMP AND ENGINE ASSEMBLY		EA	1
D1	20	XBOHH	2805-01-169-1100	97403	2A016-4	ENGINE, GASOLINE, 3 HP, MIL STD MODEL LA016-3 (FOR REPAIR PARTS REFER TO TM 5-2805-257-24P)		EA EA	1 1
D1	21	PBOHH	4320-01-146-2922	97403	13226E1868	PUMP ASSEMBLY		EA	1

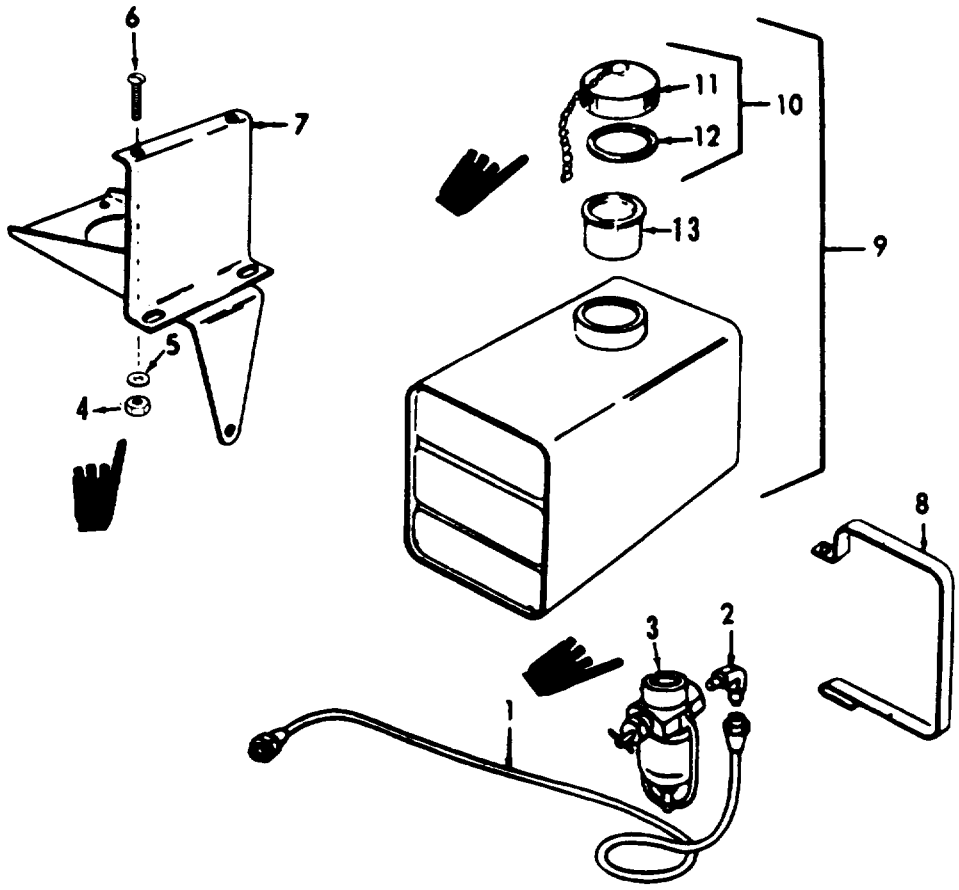


Figure D-2. Fuel Tank.

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
D2	1	PAOZZ	4720-00-937-0952	81349	MIL-H-13444	HOSE ASSEMBLY		EA	1
D2	2	PAOZZ	4730-00-287-1029	97403	13218E0114-32	ELBOW,PIPE		EA	1
D2	3	PAOZZ	2910-00-905-9792	96906	MS51086-1	STRAINER,SEDIMENT,BOWL		EA	1
D2	4	PAOZZ	5310-00-934-9758	96906	MS35649-202	NUT,PLAIN,HEXAGON,FUEL TANK STRAP TO BRACKET		EA	2
D2	05	PAOZZ	5310-00-045-3296	96906	MS35338-43	WASHER,LOCK,FUEL TANK STRAP TO BRACKET		EA	2
D2	6	PAOZZ	5325-00-984-6214	96906	MS35206-267	SCREW,MACHINE		EA	2
D2	7	XBOZZ		97403	13200E8822	BRACKET,FUEL TANK		EA	1
D2	8	PAOZZ	4320-01-161-0301	97403	13200E8823	STRAP,FUEL TANK		EA	2
D2	9	PAOZZ	2910-00-707-7502	97403	13200E8821	TANK,FUEL		EA	1
D2	10	PAOZZ	2910-00-605-1353	97403	13200E8826	CAP,ASSEMBLY,FUEL TANK		EA	1
D2	11	XAOZZ		97403	13200E8826-1	CAP,FUEL TANK		EA	1
D2	12	XAOZZ		97403	13200E8826-2	GASKET,FUEL TANK CAP		EA	1
D2	13	PAOZZ	2910-00-697-1384	08645	293007	STRAINER,NECK,FUEL TANK		EA	1

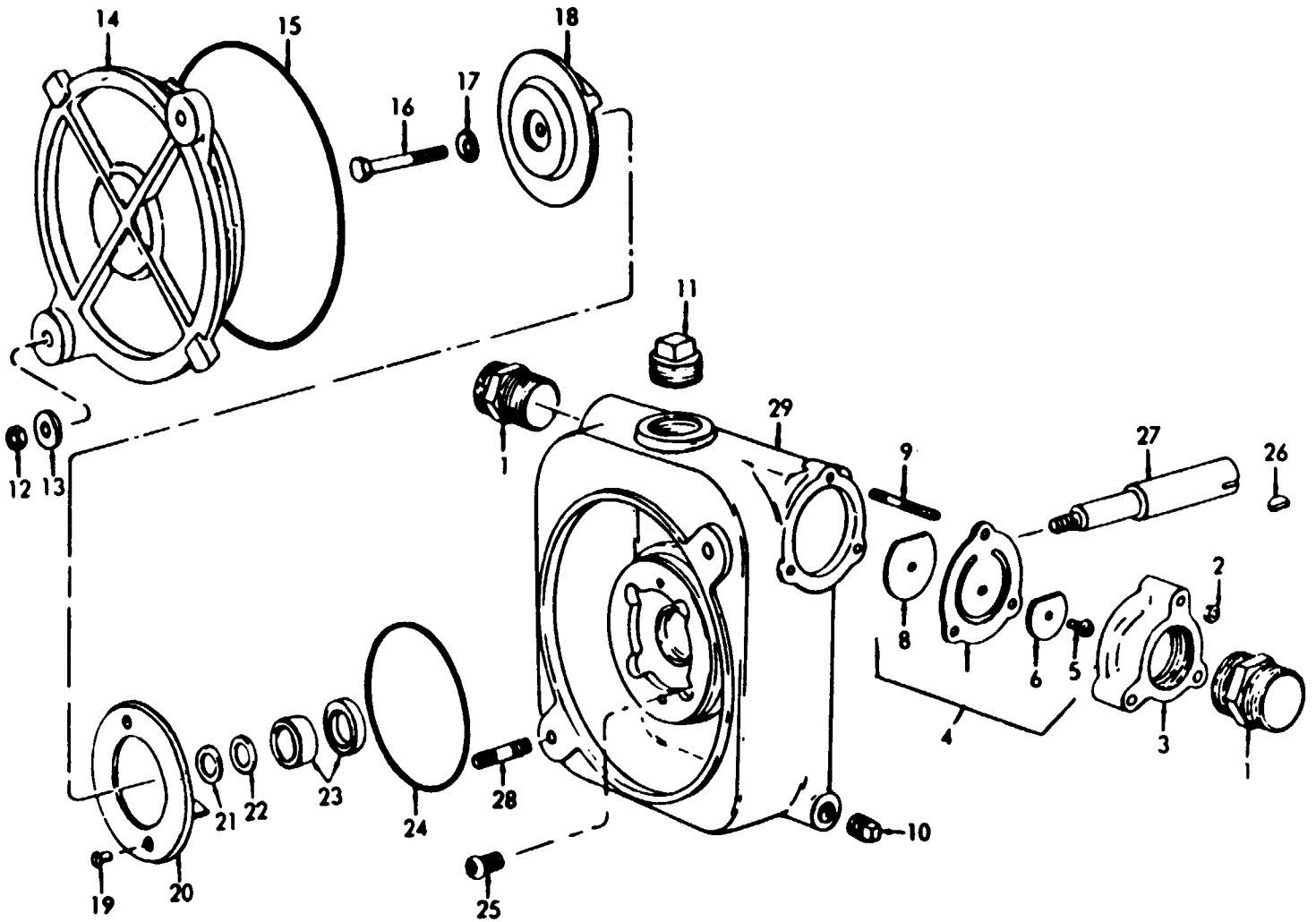


Figure D-3. Pump.

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
D3	1	PAOZZ	4730-00-277-5845	97403	13218E0479-37	ADAPTER,INLET AND OUTLET		EA	2
D3	2	PAOZZ	5310-00-880-7746	96906	MS51968-5	NUT,PLAIN,HEXAGON		EA	3
D3	3	PAOZZ	4730-00-991-6516	97403	13200E8814	FLANGE,PUMP SECTION		EA	1
D3	4	PAOZZ	4820-00-991-5517	97403	13200E8810	CHECK VALVE		EA	1
D3	5	XAOZZ		96906	MS35214-69	SCREW,MACHINE		EA	1
D3	06	XAOZZ		97403	13200E8812	WEIGHT,CHECK VALVE,SMALL		EA	1
D3	7	XAOZZ		97403	13200E8813	GASKET,CHECK VALVE FLAPPER		EA	1
D3	08	XAOZZ		97403	13200E8811	WEIGHT,CHECK VALVE,LARGE		EA	1
D3	9	PAOZZ	5307-01-013-7888	96906	MS51864-103-18	STUD,PLAIN		EA	3
D3	10	PAOZZ	4730-00-289-5176	96906	MS51884-50	PLUG,PIPE,PUMP CASE DRAIN		EA	1
D3	11	PAOZZ	4730-01-116-6784	96906	MS51884-17	PLUG,PIPE,PUMP CASE FILLER		EA	1
D3	12	PAOZZ	5310-00-732-0560	96906	MS51968-14	NUT,PLAIN,HEXAGON		EA	2
D3	13	PAOZZ	5310-00-809-5998	96906	MS27183-18	WASHER,FLAT		EA	2
D3	14	XBOZZ	4320-00-991-6515	97403	13200E8809	VOLUTE		EA	1
D3	15	PAOZZ	5330-00-263-8015	96906	MS29513-273	PACKING,PREFORMED		EA	1
D3	16	PAOZZ	5306-00-225-9098	96906	MS90726-43	SCREW,CAP,HEXAGON HEAD		EA	1
D3	17	PAOZZ	5330-00-712-7730	97403	13200E8802	WASHER,NONMETALLIC		EA	1
D3	18	PAOZZ	4320-00-792-8187	97403	13200E8808	IMPELLER,PUMP		EA	1
D3	19	PAOZZ	5305-00-206-3689	96906	MS35198-70	SCREW,MACHINE		EA	2
D3	20	PAOZZ	4320-00-792-8186	97403	13200E8815	PLATE,WEAR,PUMP		EA	1
D3	21	PAOZZ	5365-00-712-5972	97403	13200E8807-1	SHIM		EA	2
D3	22	PAOZZ	5310-00-712-7731	97403	13200E8807-2	SHIM		EA	2
D3	23	PAOZZ	4320-00-790-6357	97403	13200E8806	SEAL,MECHANICAL		EA	1
D3	24	PAOZZ	5330-00-551-3963	96906	MS29513-253	PACKING,PREFORMED		EA	1
D3	25	PAOZZ	5305-01-072-9137	97403	13200E8861	SCREW,MACHINE		EA	4
D3	26	PAOZZ	5315-00-043-1787	96906	MS35756-34	KEY,WOODRUFF		EA	1
D3	27	PBOZZ	4320-00-792-8185	97403	13200E8804	SHAFT,SHOULDERED		EA	1
D3	28	PAOZZ	5307-01-016-4423	96906	MS5164-106-20	STUD,PLAIN		EA	2
D3	29	PBOZZ	4320-00-991-6514	97403	13200E8803	CASE,PUMP		EA	1

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.
M5315-00-043-1787	D3	26
5310-00-045-3296	D2	05
5305-00-068-0502	D1	1
5310-00-167-0769	D1	11
5305-00-206-3689	C3	19
5306-00-229-9098	D3	16
5305-00-253-5614	D1	14
5330-00-263-8015	D3	15
5305-00-269-3215	D1	9
4730-00-277-6845	D3	1
4730-00-280-1029	D2	2
4730-00-289-5176	D3	10
5330-00-551-3963	D3	24
5310-00-562-5965	D1	2
2910-00-605-1353	D2	10
5310-00-637-9541	D1	4
5310-00-637-5541	D1	10
2910-00-697-1384	D2	13
2910-00-707-7502	D2	9
5365-00-712-5972	D3	21
5330-00-712-7730	D3	17
5310-00-712-7731	D3	22
5310-00-732-0558	D1	3
5310-00-732-0560	D3	12
4320-00-790-6357	D3	23
4320-00-792-8185	D3	27
4320-00-792-8186	D3	20
4320-00-792-8187	D3	18
5340-00-792-8233	D1	12
5310-00-809-5998	D3	13
5310-00-880-7746	D3	2
2910-00-905-9792	D2	3
5310-00-934-9758	D1	16
5310-00-934-9758	D2	4
4720-00-937-0952	D2	1
5305-00-942-2196	D1	5
5305-00-984-6211	D1	17
5305-00-984-6214	D2	6
4320-00-991-6514	D3	29
4320-00-991-6515	D3	14
4730-00-991-6516	D3	3
4820-00-991-6517	D3	4
4320-01-012-9937	D1	19
5307-01-013-7888	D3	9
5307-01-016-4423	D3	28
4730-01-116-6784	D3	11
5305-01-072-9137	D3	25
4320-01-102-3021	D1	13
2805-01-146-2922	D1	20
4320-01-161-0301	D2	8
2805-01-169-1100	D1	21

FSCM	PART NUMBER	FIGURE NO.	ITEM NO.
88044	AN970-7	D1	11
81349	MIL-H-13444	D2	1
96906	MS21318-20	D1	14
96906	MS27183-18	D3	13
96906	MS29513-253	D3	24
96906	MS29513-273	D3	15
96906	MS35198-70	D3	19
96906	MS35206-264	D1	17
96906	MS35206-267	D2	6
96906	MS35214-69	D3	5
96906	MS35338-43	D2	5
96906	MS35338-44	D1	2
96906	MS35338-46	D1	4
96906	MS35338-46	D1	10
96906	MS35649-202	D1	16
96906	MS35649-202	D2	4
96906	MS35756-34	D3	26
96906	MS51086-1	D2	3
96906	MS51864-103-18	D3	9
96906	MS51864-106-20	D3	28
96906	MS51884-17	D3	11
96906	MS51884-50	D3	10
96906	MS51967-8	D1	3
96906	MS51968-14	D3	12
96906	MS51968-5	D3	2
96906	MS90725-6	D1	1
96906	MS90725-60	D1	5
96906	MS90725-65	D1	9
96906	MS90726-43	D3	16
97403	13200E8801	D1	19
97403	13200E8802	D3	17
97403	13200E8803	D3	29
97403	13200E8804	D3	27
97403	13200E8806	D3	23
97403	13200E8807-1	D3	21
97403	13200E8807-2	D3	22
97403	13200E8808	D3	18
97403	13200E8809	D3	14
97403	13200E8810	D3	4
97403	13200E8811	C3	08
97403	13200E8812	D3	06
97403	13200E8813	D3	7
97403	13200E8814	D3	3
97403	13200E8815	D3	20
97403	13200E8817	D1	13
97403	13200E8818	D1	7
97403	13200E8819	C1	12
97403	13200E8820	D1	6
97403	13200E8821	D2	9
97403	13200E8822	D2	7
97403	13200E8823	D2	8
97403	13200E8824	D1	8
97403	13200E8826	D2	10
97403	13200E8826-1	D2	11
97403	13200E8826-2	D2	12
97403	13200E8861	D3	25
97403	13217E975-1	D1	15
97403	13218E0114-32	D2	2
97403	13218E0479-37	D3	1
97403	13219E2950	D1	18
97403	13226E1868	D1	21
97403	2A016-4	D1	20
08645	293007	D2	13

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TM 5-4320-208-12&P	10 Sep 82	Pump, Centrifugal: Gasoline Eng Driven, Frame Mounted

BE EXACT. PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
6	2-1 a		
81		4-3	
125	line 20		

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 Cylenders. The engine on my set only has 4 Cylenders. Clenge the manual to show 4 Cylenders.

Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please Correct one or the other.

I ordered a gasket, item 19 on figure B-16 by NSN 2 910-00-762-3001. I got a gasket bit it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

Sample

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
JOHN DOE, PFC (268) 317-7111

SIGN HERE John Doe
JOHN DOE

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TEAR ALONG PERFORATED LINE

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ST. LOUIS, MO 63120

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BE EXACT. . . PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO

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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 decigram = .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 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
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: 051461-002