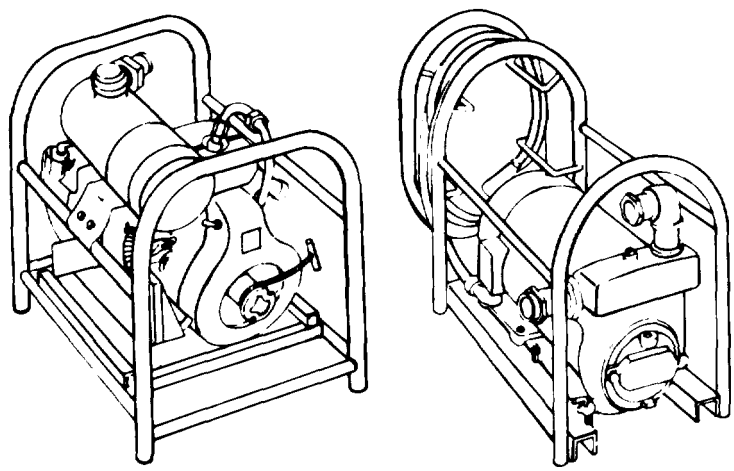
TECHNICAL MANUAL

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



PUMP, CENTRIFUGAL ´
FRAME MOUNTED, 1 1/2 IN.,
GASOLINE ENGINE DRIVEN, LESS ENGINE,
(BARNES MODEI 17570) NSN 4320-00-752-9466
ELECTRICAL MOTOR DRIVEN,
(SCHLEYER MODEL 4M-SE2000), NSN 4320-00-010-5888
ELECTRICAL MOTOR DRIVEN
(BARNES MODEL US4CCE), NSN 4320-00-937-8099

HEADQUARTERS, DEPARTMENT OF THE ARMY

17 SEPTEMBER 1982

CHANGE

NO. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 28 MAY 1993

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

PUMP, CENTRIFUGAL FRAME MOUNTED, 1 1/2 IN.,
GASOLINE ENGINE DRIVEN, LESS ENGINE,
(BARNES MODEL 17570), NSN 4320-00-752-9466
(SCHLEYER MODEL 4M-SG-2000) NSN 4320-00-752-9466
ELECTRICAL MOTOR DRIVEN,
(SCHLEYER MODEL 4M-SE2000), NSN 4320-01-010-5888
(BARNES MODEL US4CCE), NSN 4320-00-937-8099

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Remove pages	Insert pages
i and ii	i and ii
1-3 through 1-6	1-3 through 1-6
2-3 through 2-8	2-3 through 2-8
----	2-8.1 through 2-8.4
4-1 and 4-2	4-1 and 4-2
----	4-2.1 through 4-2.7/ (4-2.8 blank)
4-11 through 4-14	4-11 through 4-14
D-5 and D-6	D-5 and D-6
D-9 through D-16	D-9 through D-18

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General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
04285

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No. 4

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WASHINGTON, D.C., 25 April 1990

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

PUMP, CENTRIFUGAL FRAME MOUNTED, 1½ IN.,
GASOLINE ENGINE DRIVEN, LESS ENGINE,
(BARNES MoDEL 17570) NSN 4320-00-752-9466
ELECTRICAL MOTOR DRIVEN,
(SCHLEYER MODEL 4M-SE2000), NSN 4320-01-010-5888
ELECTRICAL MOTOR DRIVEN
(BARNES MODEL US4CCE) NSN 4320-00-937-8099

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D-7 through D-10	D-7 through D-10
D-15 and D-16	D-15 and D-16

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CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., 21 August 1989

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

PUMP, CENTRIFUGAL FRAME MOUNTED, 1½ IN.,
GASOLINE ENGINE DRIVEN, LESS ENGINE,
(BARNES MODEL 17570) NSN 4320-00-752-9466
ELECTRICAL MOTOR DRIVEN,
(SCHLEYER MODEL 4M-SE2000), NSN 4320-01-010-5888
ELECTRICAL MOTOR DRIVEN
(BARNES MODEL US4CCE) NSN 4320-00-937-8099

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2-3 and 2-4	2-3 and 2-4

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CHANGE
NO 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 November 1987

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

PUMP, CENTRIFUGAL
FRAME MOUNTED, l½ IN.,
GASOLINE ENGINE DRIVEN, LESS ENGINE,
(BARNES MODEL 17570) NSN 4320-00-752-9466
ELECTRICAL MOTOR DRIVEN,
(SCHEYLER MODEL 4M-SE2000), NSN 4320-01-010-5888
ELECTRICAL MOTOR DRIVEN
(BARNES MODEL US4CCE) NSN 4320-00-937-8099

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2-15 through 2-18	2-15 through 2-18
D-7 through D-12	D-7 through D-12
D-15 and D-16	D-15 and D-16

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CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 30 June 1986

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

PUMP, CENTRIFUGAL
FRAME MOUNTED, 1 1/2 IN.,
GASOLINE ENGINE DRIVEN, LESS ENGINE,
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ELECTRICAL MOTOR DRIVEN,
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(BARNES MODEL US4CCE), NSN 4320-00-937-8099

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C-1/(C-2 Blank)	C-1/(C-2 Blank)
D-13 thru D-16	D-13 thru D-16

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JOHN A. WICKHAM, JR.
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, Organizational , Direct Support and General Support Maintenance requirements for Pump, Centrifugal, Frame Mounted, 1½ In, (Gas: 17570; Electric: 4M-SE-2000, US4CCE).

WARNING

o 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.

o 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.

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

o Avoid breathing smoke when using a fire extinguisher.

o 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.

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

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

o 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

o Do not operate pump without priming. Running pump dry will damage pump seals and make pump inoperative. Do not operate pump for long periods of time without fluid flowing through it.

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

TECHNICAL MANUAL

No. 5-4320-200-13&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 17 September 1982

OPERATOR'S, ORGANIZATIONAL, AND DIRECT SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARIS AND SPECIAL TOOLS LIST) PUMP, CENTRIFUGAL FRAME MOUNTED, 1 1/2 IN., GASOLINE ENGINE DRIVEN, LESS ENGINE, (BARNES MODEL 17570), NSN 4320-00-752-9466 (SCHLEYER MODEL 4M-SE-2000) NSN 4320-00-752-9466 ELECTRICAL MOTOR DRIVEN, (SCHLEYER MODEL 4M-SE2000), NSN 4320-01-010-5888 (BARNES MODEL US4CCE), NSN 4320-00-937-8099

REPORTING ERRORS **AND RECOMMENDING IMPROVEMENTS**

You can help improve this manual. If you fired any mistake 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@ Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

Distribution Statement A: Approved for public release; distribution is unlimited.

TABLE OF CONTENTS

This manual supersedes TM 5-4320-200-15,27 November 1968, including all changes.

TABLE OF CONTENTS (Continued)

LIST OF ILLUSTRATIONS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE.

a. This manual covers three Centrifugal Pumps. These pumps output water at the rate of 65 gallons per minute. One pump is gasoline engine powered and the other two are electric motor powered.

This manual contains operating instructions, and maintenance instructions for Operator's, Organizational and Direct Support Maintenance. The pump (figure 1-1, 1-2) is used to pump fresh water.

b. The gasoline engine is covered in TM 5-2805-256-14.

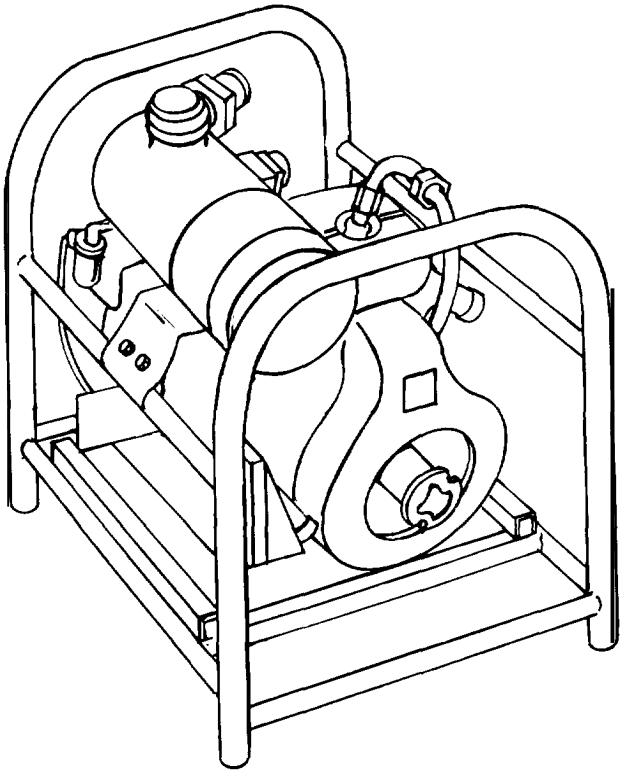


Figure 1-1. Centrifugal Pump (Gasoline Engine Powered)

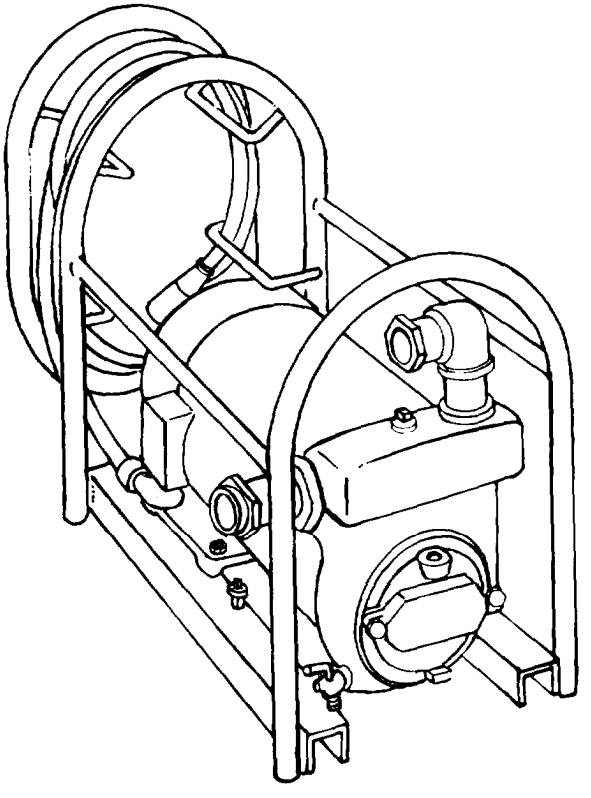


Figure 1-2. Centrifugal Pump (Electric Motor Powered Typical)

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

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

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

Procedures for destroying Army materiel to prevent enemy use are listed in TM 750-224-1-4.

1-4. PREPARATION FOR STORAGE OR SHIPMENT.

a. Placement of equipment in administrative storage should be for short periods of time when a shortage of maintenance effort exists. Items should be in mission readiness within 24 hours or within the time factors as determined by the directing authority. During the storage period appropriate maintenance records will be kept.

b. Before placing equipment in administrative storage, current preventive maintenance checks and services (PMCS) should be completed, shortcomings and deficiencies should be corrected, and all modification work orders (MWO's) should be applied.

c. Storage site selection. Inside storage is preferred for items selected for administrative storage. If inside sotrage is not available, trucks, vans, conex containers and other containers may be used.

Section H. EQUIPMENT DESCRIPTION AND DATA

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 Aviation and Troop Command, ATTN: AMSAT-I-MDO, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798, We'll send you a reply.

1-6. DESCRIPTION AND DATA.

The pump is:

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

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

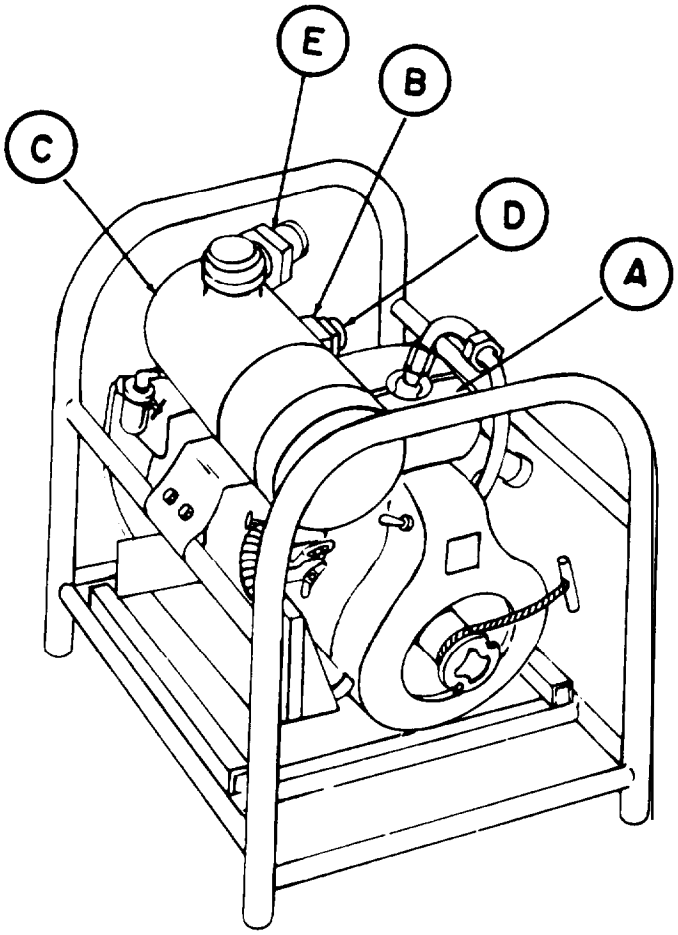
FRAME MOUNTED. For ease of handling.

The pump can:

Pump 50 gallons (Gasoline Engine Powered) of fresh water per minute at 70 foot head, or 65 gallons 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 1-3 and 1-4.



A. GASOLINE ENGINE. Supplies operating power to pump.

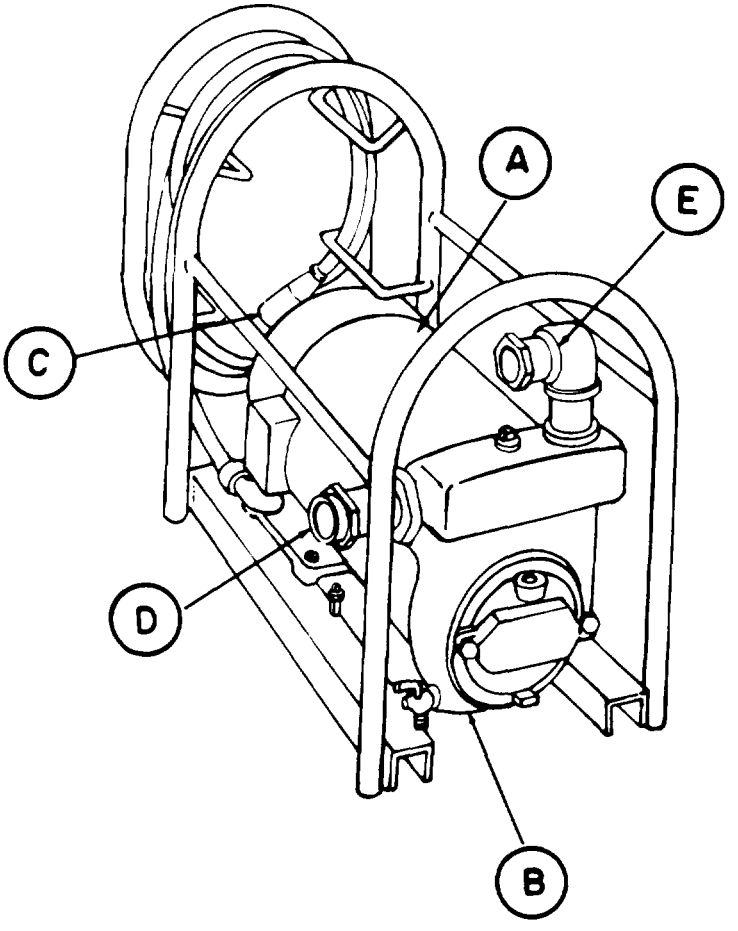
B. CENTRIFUGAL PUMP. (Direct coupled to engine), used for pumping water.

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 1-3. Location and Description of Major Components (Gasoline Engine Powered).



A. MOTOR. Supplies operating power to pump.

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

C. CABLE. Supplies power to motor.

D. INLET HOSE ADAPTER. Water inlet to pump.

E. OUTLET HOSE ADAPTER. Water outlet from pump.

Figure 1-4. Location and Description of Major Components (Electric Motor Powered).

1-8. DIFFERENCES BETWEEN MODELS.

This manual covers only the Barnes pump Models 17570, US4CCE, and the Schleyer pump Model 4M-SE2000. Model 17570 pumps with Military Standard Engine 1A08-1 were furnished with engine and fuel tank brackets which differ from those currently used with the 1A08-3 engine. Engine supports, brackets, and the fuel tanks now supplied can be adapted to the 1A08-1 engine or to mount a 1A08-3 engine as replacement. Refer to Organizational Maintenance Instructions for replacement procedures.

1-9. EQUIPMENT DATA

Barnes Model 17570 and Schleyer Model 4M-SG-2000

NOMENCLATURE	Pump Centrifugal, Fresh Water self-priming frame mounted, 1-1/2 inch, Type II.
STOCK NUMBER	NSN 4320-00-752-9466
MODEL	BARNES 17570 SCHLEYER 4M-SG-2000
GASOLINE ENGINE MODEL	Military Standard 1A08-1 or 1A08-3
WEIGHTS AND DIMENSIONS	
Shipping Weight	110 lbs (49.5 kg)
Length	18 in
Width	16 in
Height	22 in
Cube	3.7ft
CAPACITIES	
Fuel Tank	2 quarts
Crankcase	l/2 quart
PERFORMANCE	
Engine	
Pump	65 gallon per minute

Barnes Model US4CCE

NOMENCLATURE	Pump, Centrifugal, 1-1/2 in. frame mounted, fresh water, 65gpm, 50ft hd.
STOCK NUMBER	NSN 4320-00-937-8099
MODEL	US4CCE
ELECTRIC MOTOR MODEL	Baldor Electric 617M

WEIGHTS AND DIMENSIONS
- Shipping Weight---------- llO lbs (49.5 kg)
- Length ---------- 21 inches (53.3 cm)
- Width ---------- 13 inches (33 cm)
- Height ---------- 22 inches (55*8 cm)
- Cube ---------- 4 feet (0.112 cubic meters)

POWER REQUIREMENTS
- Horse Power---------- 2
- Volts---------- 2O8
- AMPS---------- 5.7
- Hertz ---------- 60
- Phase---------- 3

PERFORMANCE
- Motor ---------- 3450 revolutions per minute
- Pump ---------- 65 gallons per minute

Schleyer Model 4M-SE2000

NOMENCLATURE ---------- Pump, Centrifugal, 1-1/2 in., frame mounted, fresh water, 65gpm 50ft. head

STOCK NUMBER--- ---------- NSN 432O-O1-O1O-5888

MODEL---------- 4M-SE2OOO

ELECTRIC MOTOR MODEL ------- Baldar Electric 617M

WEIGHTS AND DIMENSIONS
- Shipping Weight---------- llO lbs (49.5 kg)
- Length ---------- 21 inches (53.3 cm)
- Width ---------- 13 inches (33 cm)
- Height ---------- 22 inches (55.8 cm)
- Cube ---------- 4 feet (0.112 cubic meters)

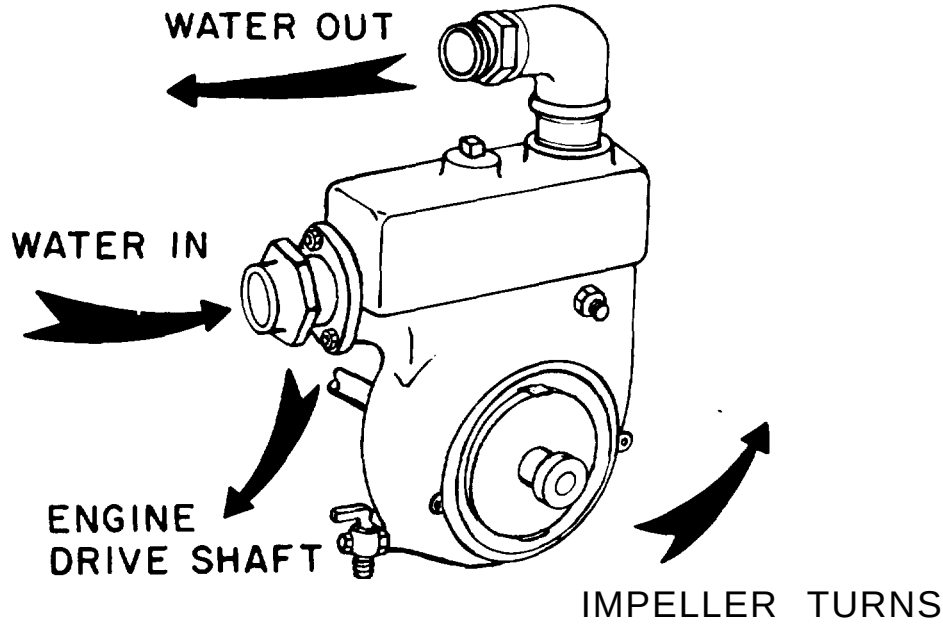
POWER REQUIREMENTS
- Horsepower---------- 2
- volts---------- 2O8
- AMPS---------- 5.7
- Hertz---------- 6O
- Phase---------- 3

PERFORMANCE
- Motor ---------- 3450 revolutions per minute
- Pump ---------- 65 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, and figure 2-2 shows the location of the operator's controls on the electric motor driven pump. Before you operate the pump make sure you know the location and operation of all controls.

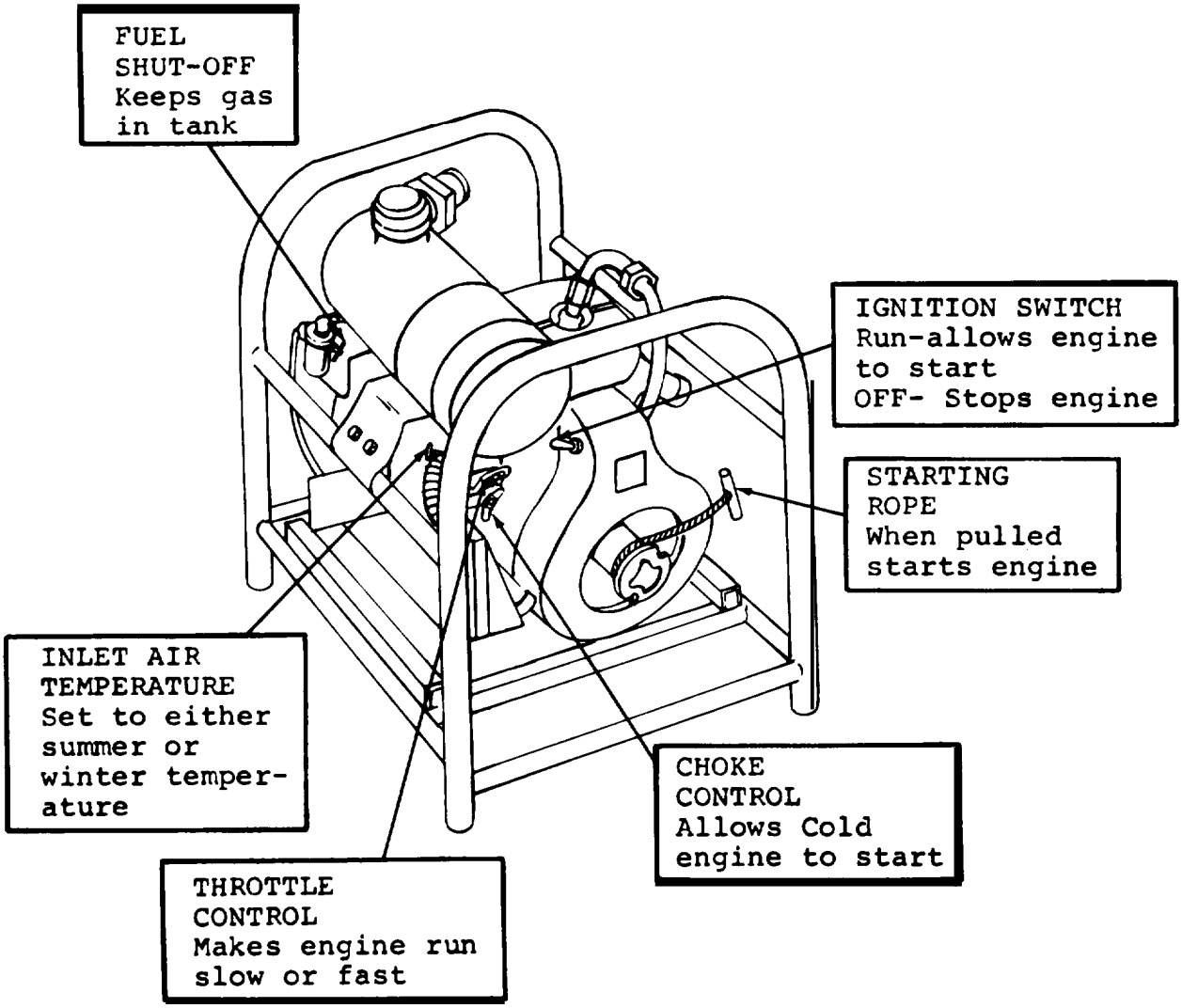


Figure 2-1. Operating Controls
(Gasoline Engine Driven Pump)

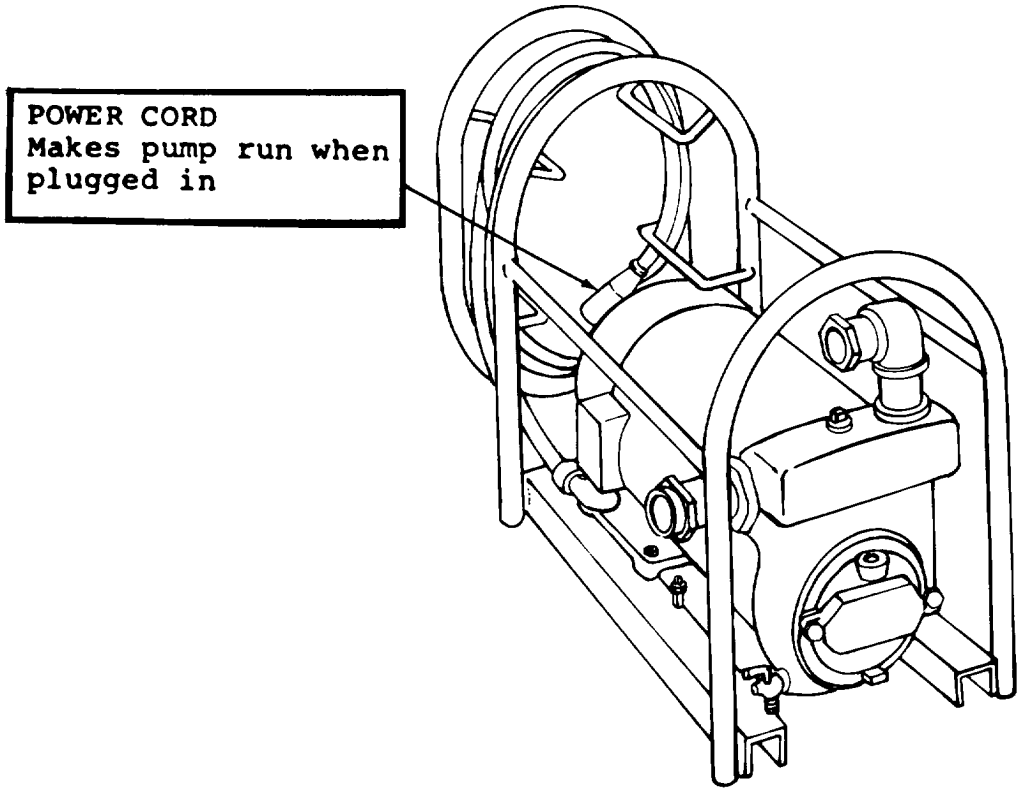


Figure 2-2. Operating Controls (Electric Motor Driven Pump).

Section 11. OPERATOR'S PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-1. GENERAL. Preventive Maintenance Checks and Services (PMCS) means systematic caring, inspecting, and servicing of equipment to keep it in good condition and to prevent breakdowns. As the pump's operator, your mission is to:

Be sure to perform your PMCS each time you operate the pump. Always do your PMCS in the same order, so it gets to be a habit. Once you've had some practice, you '11 quickly spot anything wrong.

Do your BEFORE (B) PMCS just before you operate the pump. Pay attention to WARNINGS, CAUTIONS, and NOTES.

Do your DURING (D) PMCS while you operate the pump. During operation means to monitor the pump and its related components while it is actually being operated. Pay attention to WARNINGS, CAUTIONS, and NOTES.

Do your AFTER (A) PMCS right after operating the pump. Pay attention to WARNINGS, CAUTIONS, and NOTES.

Do your WEEKLY (W) PMCS once a week.

Do your MONTHLY (M) PMCS once a month.

Use DA Form 2404 (Equipment Inspection and Maintenance Worksheet) to record any faults that you discover before, during. or after operation, unless you can fix them. You DO NOT need to record faults that you fm.

Be prepared to assist unit maintenance when they lubricate the pump. Perform any other services when required by unit maintenance.

2-2. PMCS PROCEDURES.

Your Preventive Maintenance Checks and Services, Table 2-1, lists inspections and care required to keep your pump in good operating condition. It is set up so you can make your BEFORE (B) OPERATION checks as you walk around the pump.

The "INTERVAL" column of Table 2-1 tells you when to do a certain check or service.

The "PROCEDURE" column of Table 2-1 tells you how to do required checks and services. Carefully follow these instructions. If you do not have tools, or if the procedure tells you to, notify your supervisor.

NOTE

Terms "ready/available" and "mission capable" refer to same status: Equipment is on hand and ready to perform its combat missions. (See DA Pam 738-750)

The "EQUIPMENT IS NOT READY/AVAILABLE IF:" column in Table 2-1 tells you when your pump is nonmission capable and why the pump cannot be used.

If the pump does not perform as required, refer to Chapter 3, Section II, Troubleshooting.

If anything looks wrong and you can't fix it, write it on your DA Form 2404. IMMEDIATELY, report it to your supervisor.

When you do your PMCS, you will always need a rag or two. Following are checks that are common to the entire pump:

Keep It Clean. Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (SD-2) on all metal surfaces. Use soap and water when you clean rubber or plastic material. Upholstery can be cleaned with soap and water and a clean, damp cloth.

Rust and Corrosion. Check pump body and frame for rust and corrosion. If any bare metal or corrosion exists, clean, and apply a thin coat of oil. Report it to your supervisor.

Bolts, Nuts, and Screws. Check them all for obvious looseness, missing, bent, or broken condition. You can't try them all with a tool, but look for chipped paint, bare metal, or rust around bolt heads. If you find a bolt, nut, or screw you think is loose, tighten it or report it to your supervisor.

Welds. Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to your supervisor.

Electric Wires and Connectors, Look for cracked, frayed, or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors. Report any damaged wires to your supervisor.

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

When you check for "operating condition," you look at the component to see if it's serviceable.

2-3. CLEANING AGENTS.

- DO NOT use diesel fuel, gasoline, or benzene (benzol) for cleaning.
- DO NOT SMOKE when using cleaning solvent. NEVER USE IT NEAR AN OPEN FLAME. Be sure there is a fire extinguisher nearby and use cleaning solvent only in well-ventilated places. Flash point of solvent is 138°F (60°C).
- USE CAUTION when using cleaning solvents. Cleaning solvents evaporate quickly and can irritate exposed skin if solvents contact skin. In cold weather, contact of exposed skin with cleaning solvents can cause frostbite.

CAUTION

When cleaning, engine must be COLD (same temperature as outside air). DO NOT point water or steam directly at any electrical connection. DO NOT point water stream directly at radiator fins. DO NOT use high pressure water supply system. Damage to engine, electrical system, and other components may result.

NOTE

Only use those authorized cleaning solvents or agents listed in Appendix D.

Cleaning Engine.

When using water to clean the engine use water pressure and volume similar to a standard household type water supply system (45-70psi, 6.5-10.2 kPa).

After cleaning, allow engine to air dry. Do not use compressed air to dry engine. Do not run engine to decrease drying time.

Remove all component covers before starting engine.

CAUTION

When cleaning, engine must be COLD (same temperature as outside air). DO NOT point water or steam directly at any electrical connection. DO NOT point water stream directly at radiator fins. DO NOT use high pressure water supply system. Damage to engine, electrical system, and other components may result.

Keep cleaning solvents, gasoline, and lubricants away from rubber or soft plastic parts. They will deteriorate material.

Cleaning Rust or Grease. When cleaning grease buildup or rusty places, use a cleaning solvent. Then apply a thin coat of light oil to affected area.

2-4. LEAKAGE DEFINITIONS FOR OPERATOR PMCS. It is necessary for you to know how fluid leakage affects the status of the pump. Following are types/classes of leakage an operator needs to know to be able to determine the status of the pump. Learn these leakage definitions and remember - when in doubt, notify your supervisor.

CAUTION

When cleaning, engine must be COLD (same temperature as outside air). DO NOT point water or stem directly at any electrical connection. DO NOT point water stream directly at radiator fins. DO NOT use high pressure water supply system. Damage to engine, electrical system, and other components may result.

- Equipment operation is allowable with minor leakages (Class I or II). Of course, consideration must be given to fluid capacity in the item/system being checked/inspected. 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 should be reported 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 item being checked/inspected.

--

Table 2-1 Operator Preventive Maintenance Checks and Semites

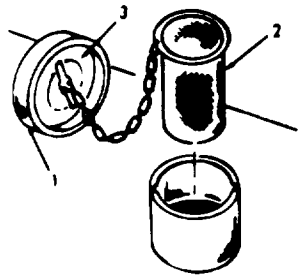
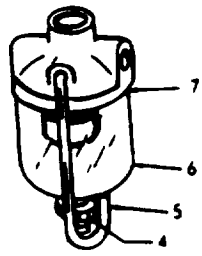
Item No.	Interval	Location Item to Check/ Service	Procedure	Not Fully Mission Capable
			-NOTE- Items 1 through 8 are for Gasoline Engine Driven (GED) pumps. Items 9 through 14 are for Electric Motor Driven (EMD) pumps.	
			-FRONT-	
1	Before	FUEL TANK	Remove Cap (1) and check cap, strainer (2) and gasket (3).  	Leaks, cap missing, trainer clogged, gasket broken or missing.
			-LEFT SIDE-	
2	Before	SEDIMENT STRAINER	Loosen ball nut (4) and swing bail (5) to remove bowl (6). Clean bowl and remove strainer or gasket (7) as required.  	Strainer leaking or loose connection.

Table 2-l Operator Preventive Maintenance Checks and Services (Cont.)

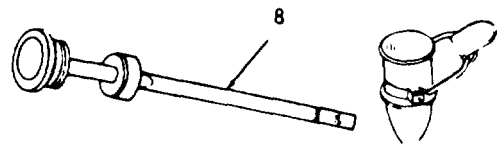
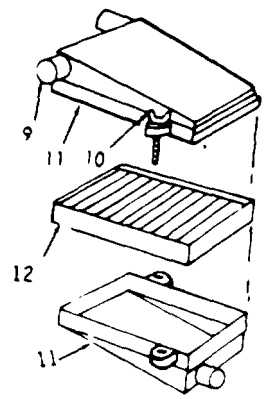
Item No.	Interval	Location / Item to Check Service	Procedure	Not Fully Mission Capable
3	Before	OIL LEVEL DIP STICK	Remove oil level dip stick (8) and check for oil level. Add oil if needed. 	No oil, oil level low or no dip stick.
4	Before	AIR CLEANER	Inspect air cleaner visual signal (9) to determine if red SERVICE LEVEL signal is visible. If the signal is visible proceed as follows. Turn wing bolts (10) one quarter turn o loosen. Wipe out inside of element housings (11). To clean filter element (12) blow off element with compressed air from clean o dirty side of element. To reassemble insert cleaned element (12). Turn wing bolts (10) 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 (12) can be washed in soap and water. Do not use gasoline or other solvents.** 	

Table 2-1 Operator Preventive Maintenance Checks and Services

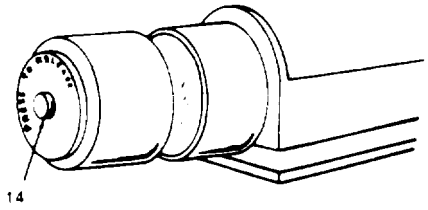
Item No.	Interval	Location: Item to Check/ Service	Procedure	Not Fully Mission Capable
			Caution use care when cleaning. do not puncture filter element. Press button (14) in SERVICE LEVEL signal.  **Perform lubrication to or in conjunction with with PMCS. Refer to LO 5-2805-256-16.**	
5	Before	ENGINE	Make the following walk around checks; a. Check for fuel leakage on around and under pump assembly. b. Check air cleaner restriction indicator if red **RED SERVICE** signal is visible, clean or replace filter element. c. Check for broken, cracked, and damaged motor mounts and components. Check for loose and missing hardware. Check frame and shock mounts for deterioration, cracks, and damage.	Class III oil leaks or any fuel leaks found. Motor mounts, shock mounts, components, or hardware missing, damaged cracked or deteriorated.

Table 2-l Operator Preventive Maintenance Checks and Services (Cont.)

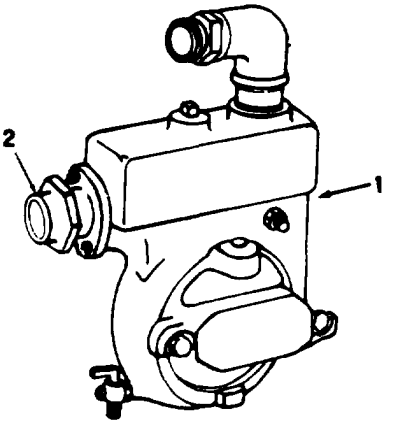
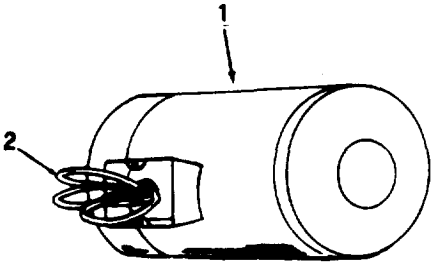
Item No.	Interval	Location: Item to Check/ Service	Procedure	Not Fully Mission Capable
6	Before	PUMP	Inspect pump (1) for Class III leaks, cracks, or other damage.	Pump has cracks, Class III leaks, or other damage.
7	Before	SUCTION **VALVE**	Check suction valve(2) for proper operation and leaks. 	Suction valve leaks, has cracks or is loose.
8	During	ENGINE/ PUMP	During starting and operation, check pump for fuel and oil leakage. Check for excessive vibration unusual noise, and any indication of failing or defective components.	Excessive vibration, unusual noise or failling or defective components.
9	Before	ELECTRIC CORD AND CONNECTORS	Inspect for breaks, frayed insulation and loose connections.	Loose connections, frayed, or broken wires.
10	Before	ELECTRIC MOTOR	Inspect electric motor (1) for proper mounting, dirt, and loose connections (2). 	Electric motor has loose mountings or connections.

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

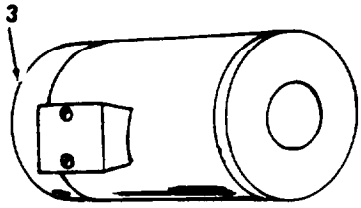
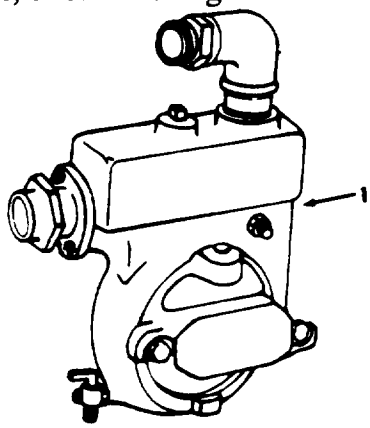
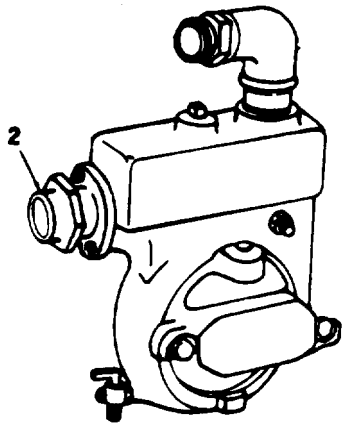
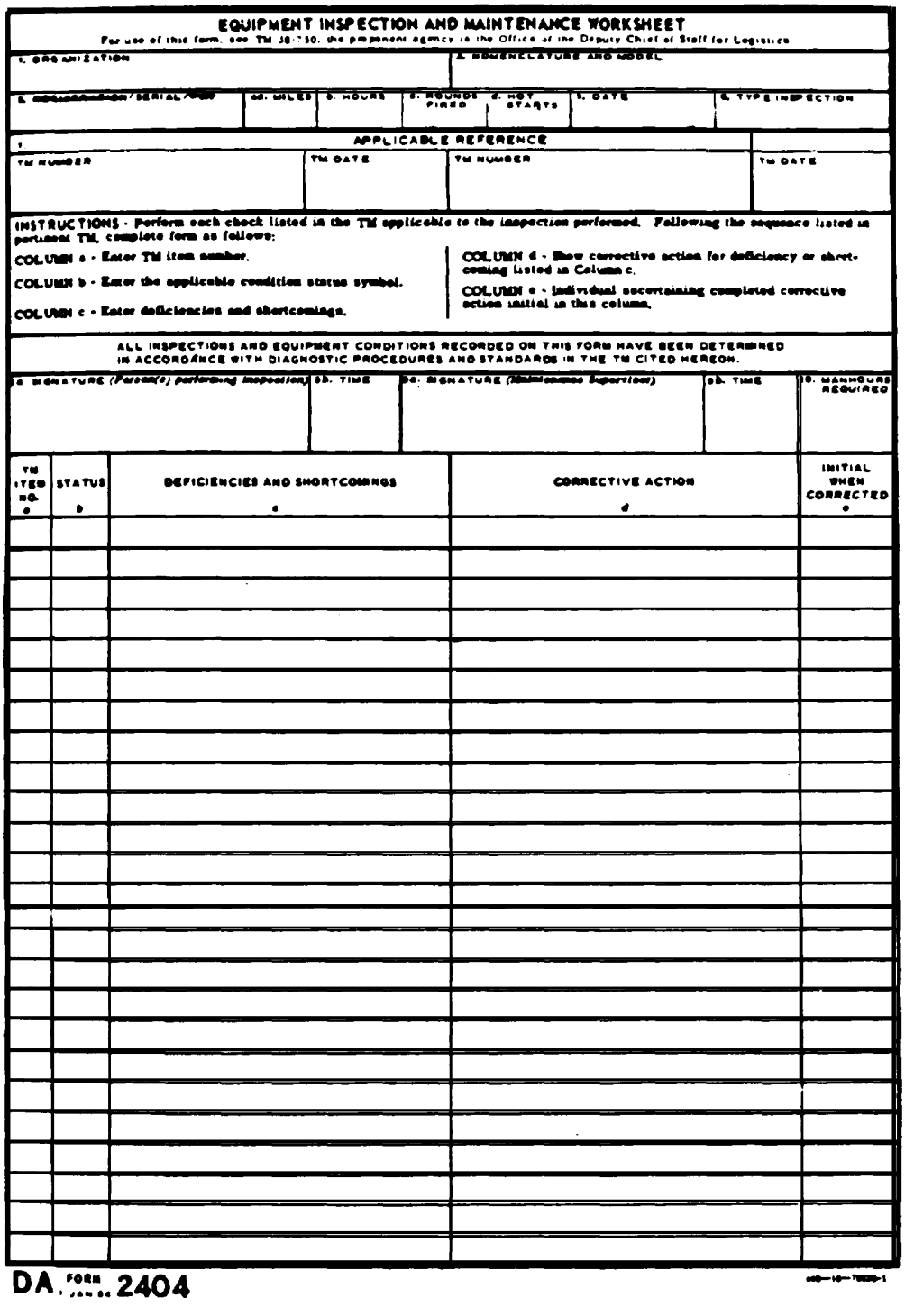
Item No.	Interval	Location Item to Check/ Service	Procedure	Not Fully Mission Capable
11	Before	ELECTRIC MOTOR FAN	inspect electric motor fan guard (3) for dirt, foreign matter, and damage. 	Fan motor has loose fan guard
12	Before	ELECTRIC MOTOR AND PUMP	Make the following walk around checks;	
			a. Check the electric motor and cable for loose connections, evidence of over heating, and damaged insulation.	Motro or pump has loose connection or evidence of overheating.
			b. Check for broken, cracked, and damaged motor mounts and components. Check for loose and missing hardware. Check shock mounts for deterioration, cracks , and damage.	Motor or pump haa loose, missing, damaged, or deteriorating motor mounts, shock mounts or components.
13	During	ELECTRIC MOTOR AND PUMP	During starting and operation, check for excessive vibration, unusual noise, and indication of a failling or defective component. If suspected, notify your supervisor.	Motor or pump has excessive vibration, unusual noise or indication of failling component.
14	During	PUMP	Inspect pump (1) for Class III leaks, cracks, or other damage. 	Pump has cracks, Class III leaks or other damage.

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

Item No.	Interval	Location Item to Check/ Service	Procedure	Not Fully Mission Capable
15	During	SUCTION VALVE	Check suction valve (2) for proper operation and leaks. 	Suction valve inoperable or has class III leaks.



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. REGISTRATION/SERIAL NUMBER | 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 2-3. 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 weather conditions.

2-4. ASSEMBLY AND PREPARATION FOR USE.

2-4.1. Unloading the Equipment.

The total weight of the crated centrifugal pump is 110 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.

For inspection and servicing of new or used engine, refer to TM 5-2805-256-14.

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 as 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 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, odorless, 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 (para 2-2).

(2) Prime pump as described in figure 2-4, if pump *is not* full of water.

CAUTION

Do not operate pump without priming. Running pump dry will damage pump seals and the pump will not operate. Do not operate pump for long periods of time without water flowing through it.

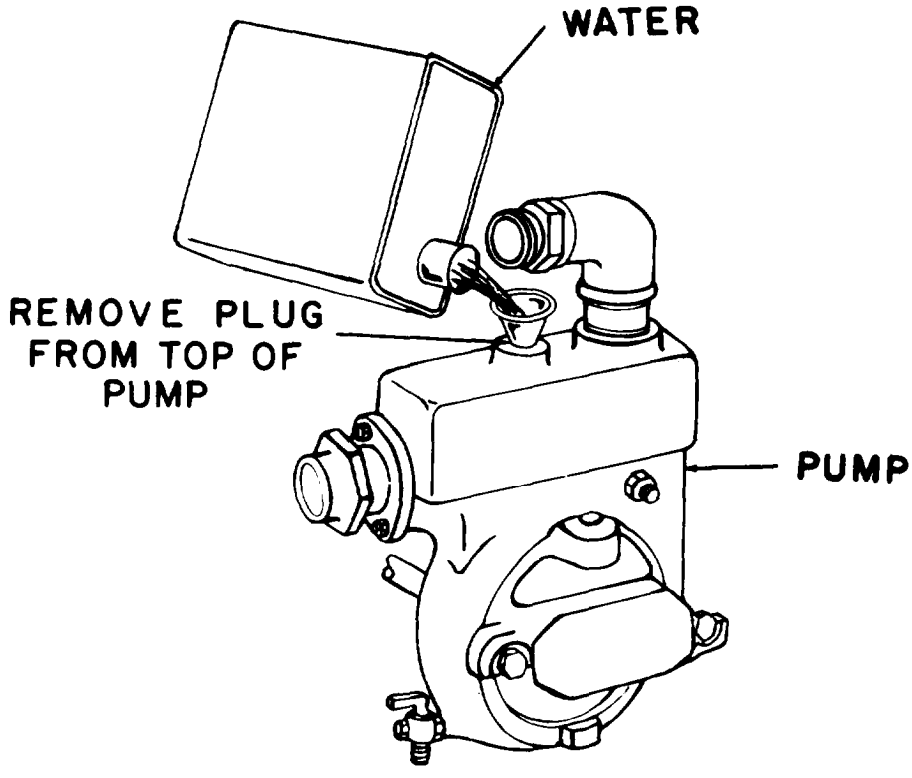


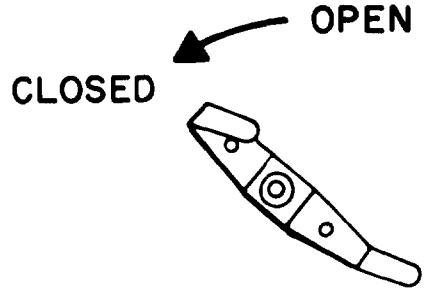
Figure 2-4. Priming the pump.

b. Starting the Gasoline Engine Driven Pump. Start pump as shown below:

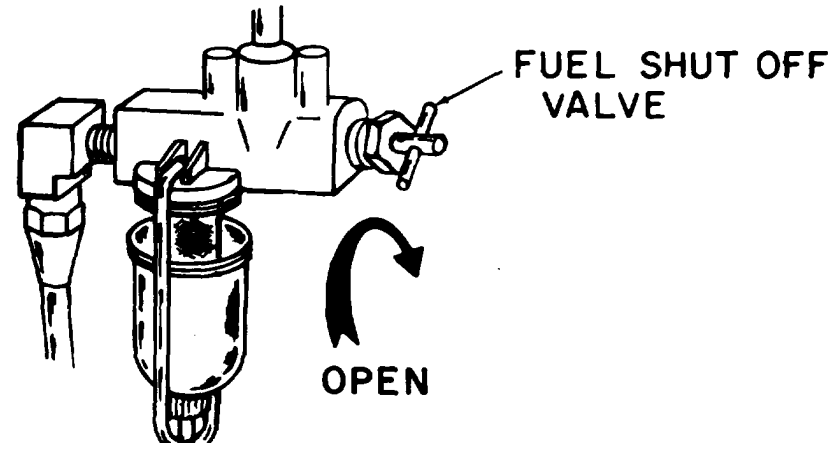
NOTE

Allow engine sufficient warmup time before starting pumping operations.

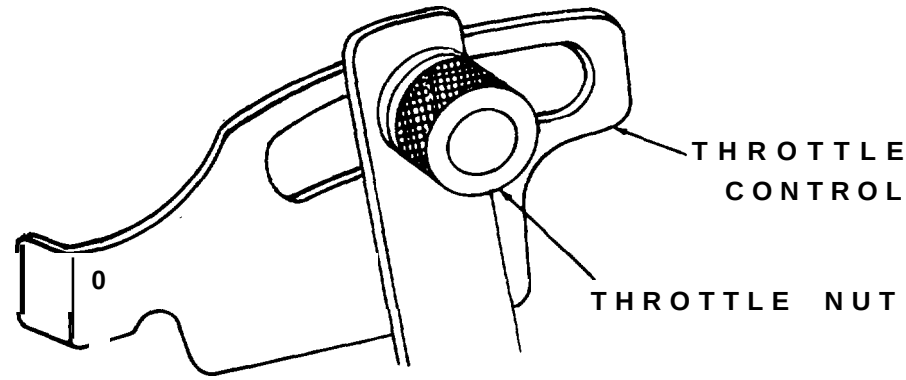
1 - Move choke control to CLOSE.



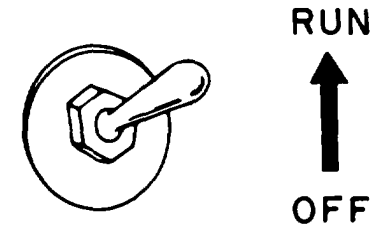
2 - Turn Fuel Shut Off Valve to OPEN.



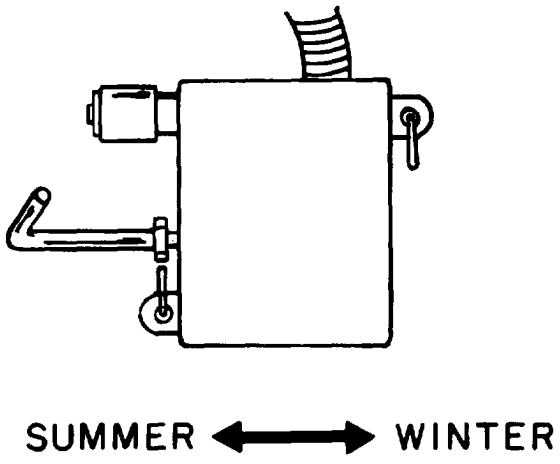
3 - Move throttle control to half throttle and tighten throttle nut.



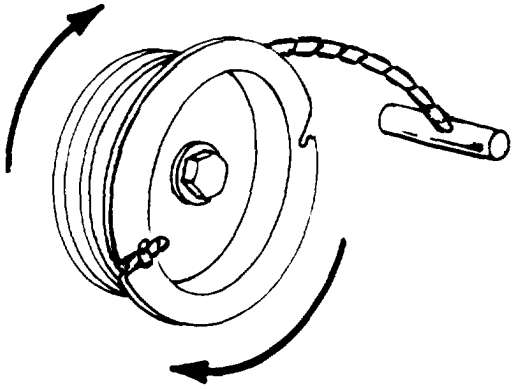
4 - Set ignition switch to Run.



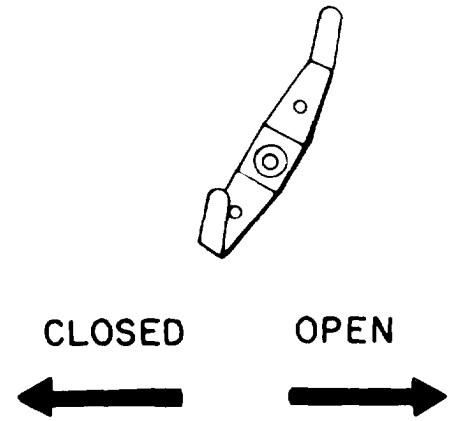
5 - Place the Inlet Air Temperature Control in the SUMMER position.



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

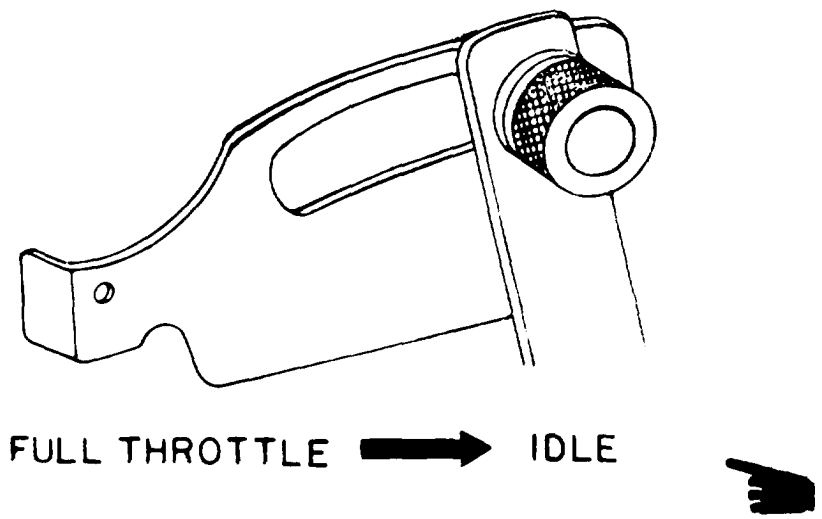


7 - When engine starts and warms up, slowly open choke. Maintain smooth operation until choke is fully open.



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.

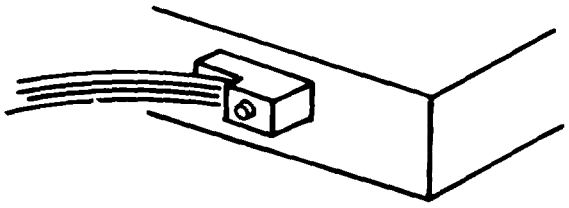


10 - To stop pumping without stopping engine, move throttle control to idle position and allow engine to idle.

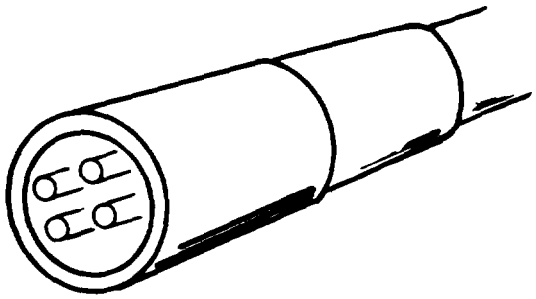
11 - To resume pumping operation move throttle control to desired speed setting.

c. Starting the Electric Motor Driven Pump. Start pump as shown below:

1 - Using the Ground Rod and Attachments, ground unit as follows. (Required on Electrical Powered Pump only.) Drive the rod into the ground at least 8 feet. Attach one end of 6 AWG wire to the generator's ground terminal and tighten the nut. Slip the other end between the clamp and the rod and tighten the screw. If there is a wire hole in the clamp, use it.

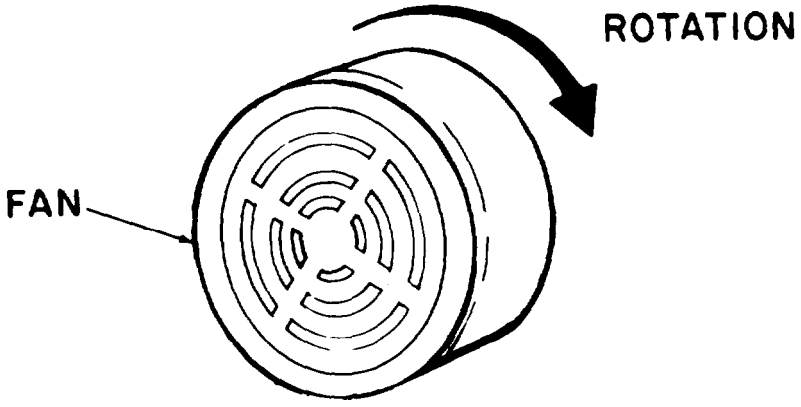


2 - Connect the power connector to a power source.



The pump will be pumping.

3 - Check fan to see If it rotates as shown:

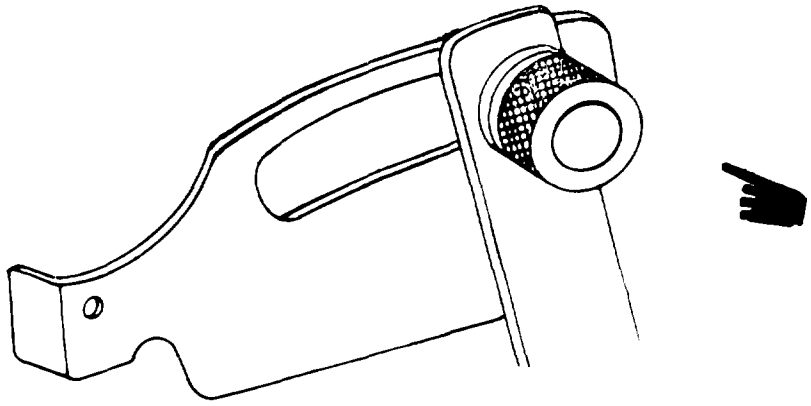


4 - If rotation is not correct check incoming power source.

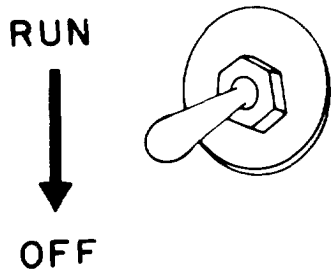
2-6. STOPPING THE EQUIPMENT.

a. Stopping Gasoline Engine Driven Pump.

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.



b. Stopping Electric Motor Driven Pump.

Disconnect connector on cable from power source.

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. Cover openings of inlet and outlet adapters to protect adapter threads and prevent foreign matter from entering pump. If the pump is gasoline driven proceed as follows:

c. Disconnect exhaust pipe extension if used.

d. Drain fuel from fuel tank into suitable container.

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. Gasoline Engine Driven Pump.

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

(2) Before starting engine, remove any accumulated ice *or* snow from spark plugs and wiring.

(3) Make sure Inlet Air Temperature shutter on engine is set for winter operation.

(4) Run engine at low speed to warm to operating temperature before applying full load.

(5) Lubricate engine in accordance with current lubrication order LO 5-2805-256-14.

(6) Fill pump with warm water to prevent freezing at starting.

(7) Drain pump immediately after operation as shown in figure 2-5.

b. Electric Motor Driven Pump.

(1) Fill pump with warm water to prevent freezing at starting.

(2) Drain pump immediately after operation as shown in figure 2-5.

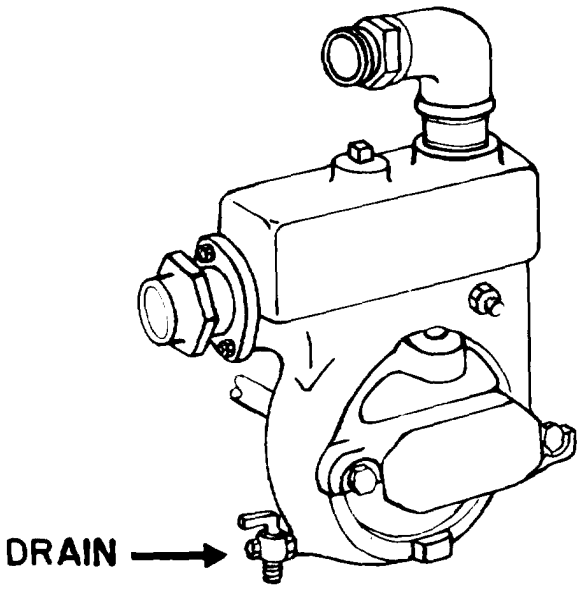


Figure 2-5. Pump Draining Instructions.

2-11. OPERATION IN EXTREME HEAT.

a. Gasoline Engine Driven Pump.

(1) Make sure Inlet Air Temperature shutter is set for summer operation.

(2) 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.

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

(4) Lubricate engine in accordance with current lubrication order LO 5-2805-256-14 and TM 5-2805-256-14.

b. Electric Motor Driven Pump.

(1) 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.

(2) Inspect cooling fins of motor for dust or foreign matter that might stop flow of air.

2-12. OPERATION IN DUSTY OR SANDY AREAS.

a. Gasoline Engine Driven Pump.

(1) 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.

(2) Service air cleaner daily to keep fuel system free from sand and dirt (TM 5-2805-256-14).

(3) Strain all fuel before adding to fuel tank. Drain and service fuel filter more frequently than under normal conditions (paragraph 4-2.2).

(4) Clean pump frequently. Wipe it with a cloth dampened in approved cleaning solvent.

(5) Lubricate engine in accordance with current lubrication order LO 5-2805-256-14 and TM 5-2805-256-14.

b. Electric Motor Driven Pump.

(1) 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.

(2) Clean pump frequently. Wipe it with cloth dampened in approved cleaning solvent.

2-13. OPERATION UNDER RAINY OR HUMID CONDITIONS.

a. Gasoline Engine Driven Pump.

(1) 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.

(2) Keep fuel tank full at all times to prevent condensation. Drain and service fuel filter frequently (paragraph 4-2.2).

(3) Humid conditions can cause corrosion and deterioration of electrical components. Keep electrical components clean and dry.

(4) Lubricate engine in accordance with current lubrication order LO 5-2805-256-14 and TM 2805-256-14.

b. Electric Motor Driven Pump.

(1) 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.

(2) Humid conditions can cause corrosion and deterioration of electrical components. Keep electrical components clean and dry.

2-14. OPERATION IN SALT HATER AREAS.

a. Gasoline Engine Driven Pump.

(1) 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.

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

(3) Clean lubrication surfaces prior to lubricating. Lubricate engine in accordance with current lubrication order LO 5-2805-256-14 and TM 4-2805-256-14.

b. Electric Motor Driven Pump.

(1) 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.

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

WARNING

Disconnect pump from **source** of electric power, to eliminate electric shock.

2-15. OPERATION AT HIGH ALTITUDES.

a. Gasoline Engine Driven Pump.

Because of thinner air at higher altitudes, the carburetor may require an adjustment providing a leaner mixture. **If** this condition exists, refer to TM 5-2805-256-14.

b. Electric Motor Driven Pump .

There are no special requirements.

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. GENERAL LUBRICATION INFORMATION.

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

3-2. DETAILED LUBRICATION INFORMATION.

Refer to the current lubrication order LO 5-2805-256-14 and to TM 5-2805-256-14 for engine lubrication instructions.

CAUTION

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. should perform the test/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 5-2805-256-14 for engine troubleshooting.

Table 3-1. OPERATOR TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. GASOLINE ENGINE DRIVEN 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. ELECTRIC MOTOR DRIVEN PUMP.
a. INTERMITTEN OPERATION
Step 1 - Check for bad connections or power cable. Notify maintenance activity.
Step 2 - Suction line clogged. Clean

Table 3-1. OPERATOR TROUBLESHOOTING (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 3 - Suction line too long. Move pump closer to water.
Step 4 - Air leak. Notify maintenance activity.
Step 5 - Pump impeller clogged. Clean.
b. MOTOR FAILS TO RUN PROPERLY. Notify maintenance activity.
c. MOTOR OVERHEATS
Step 1 - Defective motor. Notify maintenance activity.
Step 2 - Incorrect power source (voltage to high or low). Check power source.
3. 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 pet cock. Clean or notify maintenance activity.

CHAPTER 4
UNIT MAINTENANCE INSTRUCTIONS

4-1. GENERAL .

This chapter contains the removal, cleaning, inspection, and installation procedures for Organizational Maintenance.

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

Preventive Maintenance Checks and Services (PMCS) means systematic care, inspection, and service of equipment to keep it in good condition and to prevent breakdowns. As the pump's operator, your mission is to:

Be sure to perform your PMCS regulary. Always do your PMCS in the same order, so it gets to be a habit. Once you've had some practice, you'll quickly spot anything wrong. Pay attention to WARNINGS, CAUTIONS, and NOTES.

4-1.1 PMCS PROCEDURES.

a. Your Preventive Maintenance Checks and Services, Table 4-1, lists inspections and care required to keep your pump in good operating condition.

b. The "INTERVAL" column of Table 4-1 tells you when to do a certain check or service.

c. The "PROCEDURE" column of Table 4-1 tells you how to do required checks and services. Carefully follow these instructions.

NOTE

Terms "ready/available" and "mission capable" refer to same status: Equipment is on hand and ready to perform its combat missions. (See DA Pam 738-750)

d. The "EQUIPMENT IS NOT READY/AVAILABLE IF:" column in Table 4-1 tells you when your pump is nonmission capable and why the pump cannot be used,

e. If the pump does not perform as required, refer to Paragraph 4-4.1 Unit Troubleshooting.

f. When you do your PMCS, you will always need a rag or two. Following are checks that are common to the entire pump:

(1) Keep It Clean. Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (SD-2) on all metal surfaces. Use soap and water when you clean rubber or plastic material. Upholstery can be cleaned with soap and water and a clean, damp cloth.

(a) Rust and Corrosion. Check pump body and frame for rust and corrosion, If any bare metal or corrosion exists, clean, and apply a thin coat of oil.

(b) Bolts, Nuts, and Screws. Check them all for obvious looseness, missing, bent, or broken condition. You can't try them all with a tool, but look for chipped paint, bare metal, or rust around bolt heads. If you find a bolt, nut, or screw you think is loose, tighten it.

(c) Welds. Look for loose or chipped paint, rust, or gaps where parts are welded together.

(d) Electric Wires and Connectors, Look for cracked, frayed, or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors.

(e) Hoses and Fluid Lines. Look for wear, damage, and leaks, and make sure clamps and fittings are tight. Wet spots show leaks, but a stain around a fitting or connector can also mean a leak. If a leak comes from a loose fitting or connector, tighten it.

g. When you check for "operating condition," you look at the component to see if it's serviceable.

4-1.2 CLEANING AGENTS.

- DO NOT use diesel fuel, gasoline, or benzene (benzol) for cleaning.
- DO NOT SMOKE when using cleaning solvent. NEVER USE IT NEAR AN OPEN FLAME. Be sure there is a fire extinguisher nearby and use cleaning solvent only in well-ventilated places. Flash point of solvent is 138°F (60°C).
- USE CAUTION when using cleaning solvents. Cleaning solvents evaporate quickly and can irritate exposed skin if solvents contact skin. In cold weather, contact of exposed skin with cleaning solvents can cause frostbite.

NOTE

Only use those authorized cleaning solvents or agents listed in Appendix D.

h. Cleaning Engine.

(1) When using water to clean the engine use water pressure and volume similar to a standard household type water supply system (45-70psi, 6.5-10.2 kpa).

(a) After cleaning, allow engine to air dry. Do not use compressed air to dry engine. Do not run engine to decrease drying time.

Remove all component covers before starting engine.

CAUTION

Keep cleaning solvents, gasoline, and lubricants away from rubber or soft plastic parts. They will deteriorate material.

Cleaning Rust or Grease. When cleaning grease buildup or rusty places, use a cleaning solvent. Then apply a thin coat of light oil to affected area.

4-1.3 LEAKAGE DEFINITIONS FOR UNIT PMCS, It is necessary for you to know how fluid leakage affects the status of the pump. Following are types/classes of leakage the maintainer needs to know to be able to determine the status of the pump.

CAUTION

Equipment operation is allowable with minor leakages (Class I or II). Of course, consideration must be given to fluid capacity in the hem/system being checked/inspected.

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 item being checked/inspected.

Table 4-1 Unit Preventive Maintenance Checks and Services

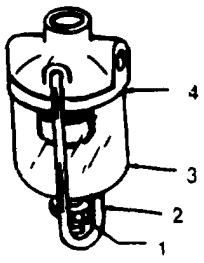
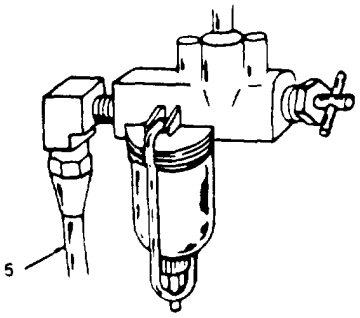
Item No.	Interval	Item To Be Checked Or Serviced	Procedure	Not Fully Mission Capable If:
1	Quarterly	SHOCK MOUNTS	Inspect shocks mounts for cracks or deterioration.	Shock mounts are cracked or deteerio-rated.
2	Quarterly	FRAME	Inspect frame for cracks, breaks or deterioration.	Frame cracked, broken, or deteriorated.
3	Quarterly	SEDIMENT STRAINER	Loosen ball nut (1) and swing bail (2) to remove bowl (3). Clean bowl and remove strainer or gasket (4) as required. 	Strainer leaking or loose connection.
4	Quarterly	FUEL LINE	Inspect fuel line (5) for leaks, kinks, breaks, and loose connections. 	Fuel line leaks or has kinks, breaks or loose connections.

Table 4-1 Unit Preventive Maintenance Checks and Services (Cont.)

Item No.	Interval	Item To Be Checked Or Serviced	Procedure	Not Fully Mission Capable If:
5	Quarterly	MUFFLER	Inspect muffler for cracks, holes, and faulty connections.	Muffler has cracks, holes, or loose connections.
6	Quarterly	ADJUSTMENTS	During operational test listen for any unusual noises or vibration. Make all necessary adjustments during operational test.	
7	Quarterly	PUMP	Inspect pump (1) for Class III leaks, cracks, or other damage.	Pump has cracks, Class III leaks, or other damage.
8	Quarterly	ADAPTERS	Inspect inlet and outlet adapters (2) for class III leaks or damage.	Adapters are cracked, loose or have class III leaks.
9	Quarterly	SUCTION VALVE	Check suction valve (3) for proper operation and leaks.	Suction valve leaks, has cracks or is loose.

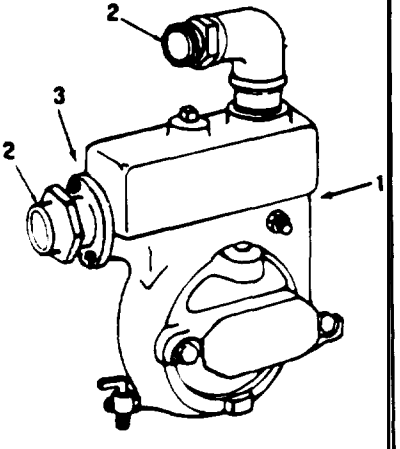


Table 4-1 Unit Preventive Maintenance Checks and Services (Cont.)

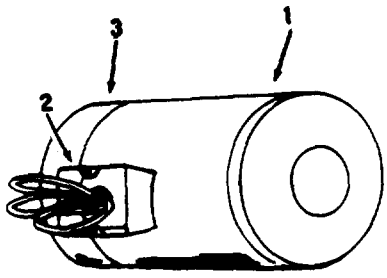
Item No.	Interval	Item To Be Checked Or Serviced	Procedure	Not Fully Mission Capable If:
10	Quarterly	ELECTRIC CORD AND CONNECTORS	Inspect cord and connectors for breaks, frayed insulation or loose connections.	Cord or connector are loose or cracked.
11	Quarterly	ELECTRIC MOTOR	Inspect Electric motor (1) and connections (2) for proper mounting, and dirt.	Motor mounts or connections are loose.
12	Quarterly	ELECTRIC MOTOR FAN	Inspect electric motor fan guard (3) for dirt, foreign matter and damage. 	Fan guard loose or is damaged.

Table 4-1 Unit Preventive Maintenance Checks and Services (Cont.)

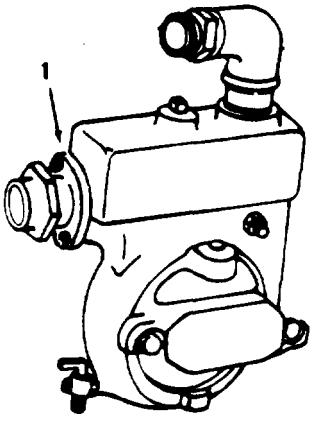
Item No.	Interval	Item To Be Checked Or Serviced	Procedure	Not Fully Mission Capable If
13	Semiannually	SUCTION VALVE	Check suction valve(1) for proper operation and leaks. 	suction valve leaks, has cracks or is loose.
14	Semiannually	SPARKPLUG AND CABLE	a. Check spark plug for cracked insulation or burned electrodes. Clean and set plug gap (para 4-22).	Spark plug has burned electrodes or cracked insulation.
			b. Check spark plug cable for loose connections and damaged insulation.	Spark plug cable is loose or insulation is damaged.
15	Semiannually	CONTACT POINTS AND CONDENSER	Check for pitted or burned points. Clean and set point gap (para 4.31)	Point or burned or pitted. Condenser defective.
16	Semiannually	CRANKCASE	Check vent assembly for dirt or damage.	Vent assembly damaged or dirty.

Table 4-1 Unit Preventive Maintenance Checks and Services (Cont.)

Item No.	Interval	Item To Be Checked Or Serviced	Procedure	Not Fully Mission Capable If:
17	Semiannually	FUEL FILTER	Remove and clean sediment bowl and filter.	Filter defective or damaged.

4-2. GASOLINE ENGINE DRIVEN PUMP.

This section contains the maintenance instructions for the engine, and fuel system components which are not described in TM 5-2850-256-14. It includes coverage of the fuel tank, fuel filter, fuel lines and fittings, and engine. Also included is information on the fuel tank, mounting hardware, and fuel line changes necessary to change from engine Model 1A08-1 to engine Model 1A08-3.

4-2.1. Fuel Tank

a. Removal

(1) Refer to figure 4-1. Drain fuel tank (1) into a suitable container.

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

(3) Remove screws (4) that attach fuel tank to bracket.

(4) Remove fuel tank cap and strainer (5).

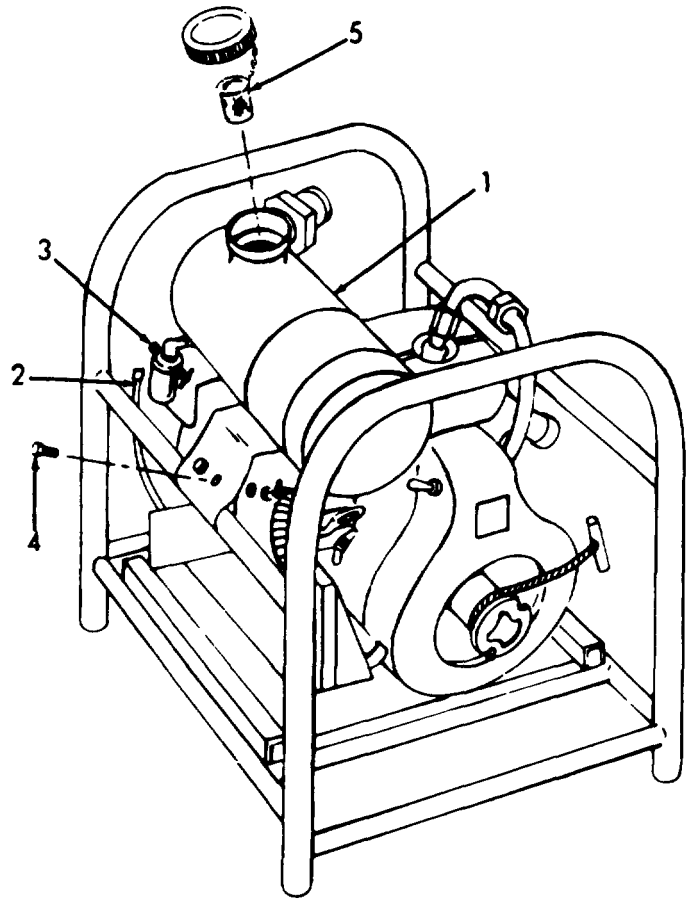


Figure 4-1. Fuel Tank Removal.

Table 4-1 Unit Preventive Maintenance Checks and Services (Cont.)

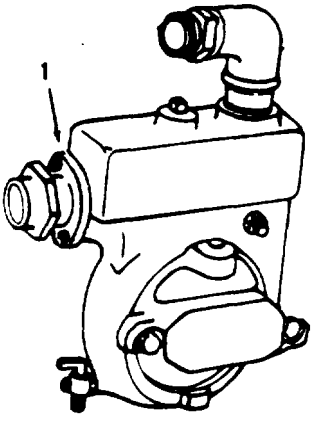
Item No.	Interval	Item To Be Checked Or Serviced	Procedure	Not Fully Mission Capable If:
13	Semiannually	SUCTION VALVE	Check suction valve (1) for roper operation and leaks. 	Suction valve leaks, has racks or is loose.
14	Semiannually	SPARKPLUG AND CABLE	a. Check spark plug for cracked insulation or burned electrodes. Clean and set plug gap (para 4-22).	Spark plug has burned electrodes or cracked insulation.
			b. Check spark plug cable for loose connections and damaged insulation.	Spark plug cable is loose or insulation is damaged.
15	Semiannually	CONTACT POINTS AND CONDENSER	Check for pitted or burned points. Clean and set point gap (para 4.31)	Point or burned or pitted. Condenser defective.
16	Semiannually	CRANKCASE	Check vent assembly for dirt or damage.	Vent assembly damaged or dirty.

Table 4-1 Unit Preventive Maintenance Checks and Services (Cont.)

Item No.	Interval	Item To Be Checked Or Serviced	Procedure	Not Fully Mission Capable If:
17	Semiannually	FUEL FITER	Remove and clean sediment bowl and filter.	Filter defective or damaged.

4-2. GASOLINE ENGINE DRIVEN PUMP.

This section contains the maintenance instructions for the engine, and fuel system components which are not described in TM 5-2850-256-14. It includes coverage of the fuel tank, fuel filter, fuel lines and fittings, and engine. Also included is information on the fuel tank, mounting hardware, and fuel line changes necessary to change from engine Model 1A08-1 to engine Model 1A08-3.

4-2.1. Fuel Tank

a. Removal

(1) Refer to figure 4-1. Drain fuel tank (1) into a suitable container.

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

(3) Remove screws (4) that attach fuel tank to bracket.

(4) Remove fuel tank cap and strainer (5).

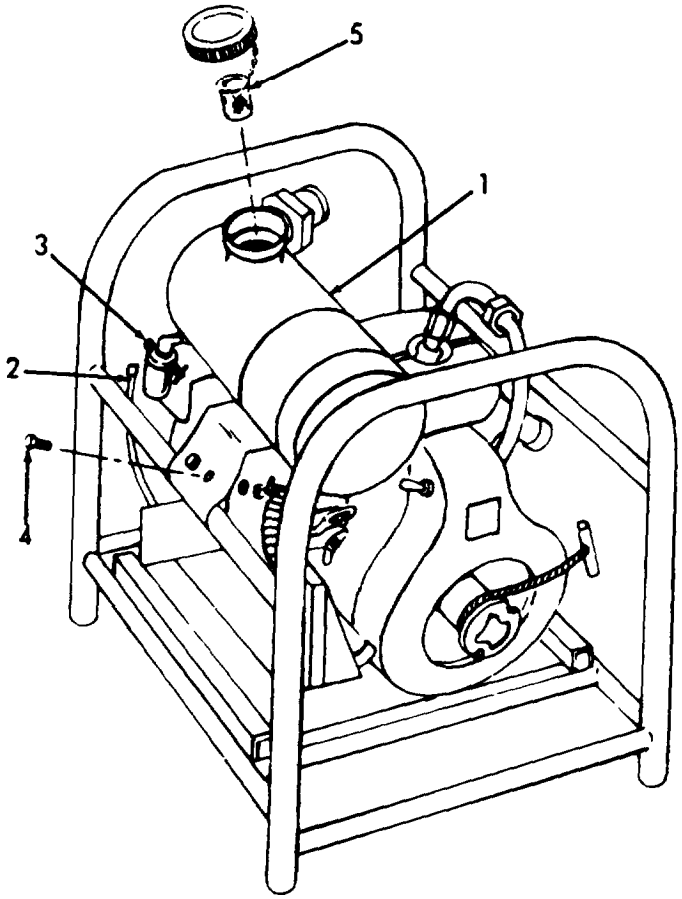


Figure 4-1. Fuel Tank Removal.

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

(2) Disconnect fuel line (5) from tank and fuel filter.

(3) Disconnect fuel filter from engine fuel pump.

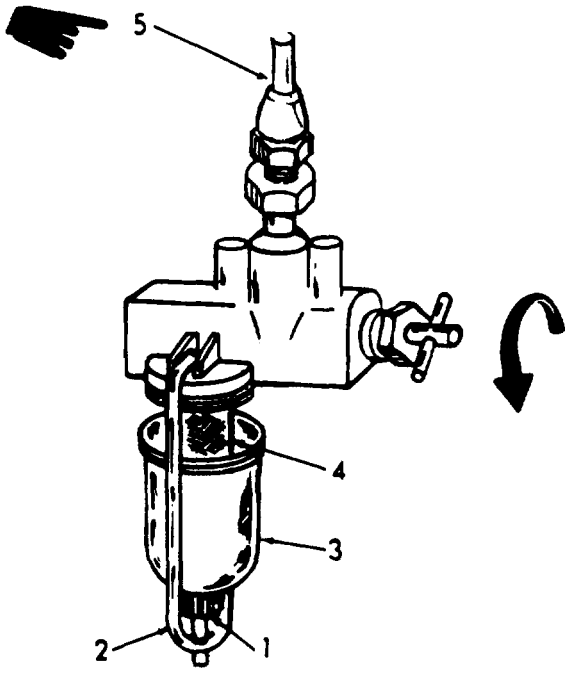


Figure 4-2. Fuel Line and Filter Removal,

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.

4-2.3. Exhaust System.

The exhaust system maintenance and inspection procedures, are listed and illustrated in TM 5-2805-256-14.

4-2.4. Engine.

This section contains the engine removal procedures. All engine maintenance procedures and instructions are described and illustrated in TM 5-2805-256-14.

a. Removal.

(1) Remove fuel lines and filter as per paragraph 4-2.2.

(2) Remove centrifugal pump as per paragraph 4-4.

b. Cleaning and Inspection.

-

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.

Repeat the removal procedure (para 4-2.4) in reverse sequence.

4-2.5. 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 fuel lines and filter as per paragraph 4-2.2.

(2) Remove centrifugal pump as per paragraph 4-4.

(3) Remove engine as per paragraph 4-2.4.

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

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

(6) Remove channels (4).

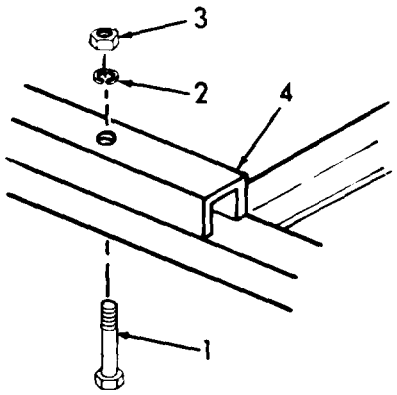


Figure 4-3. Channel Removal.

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.

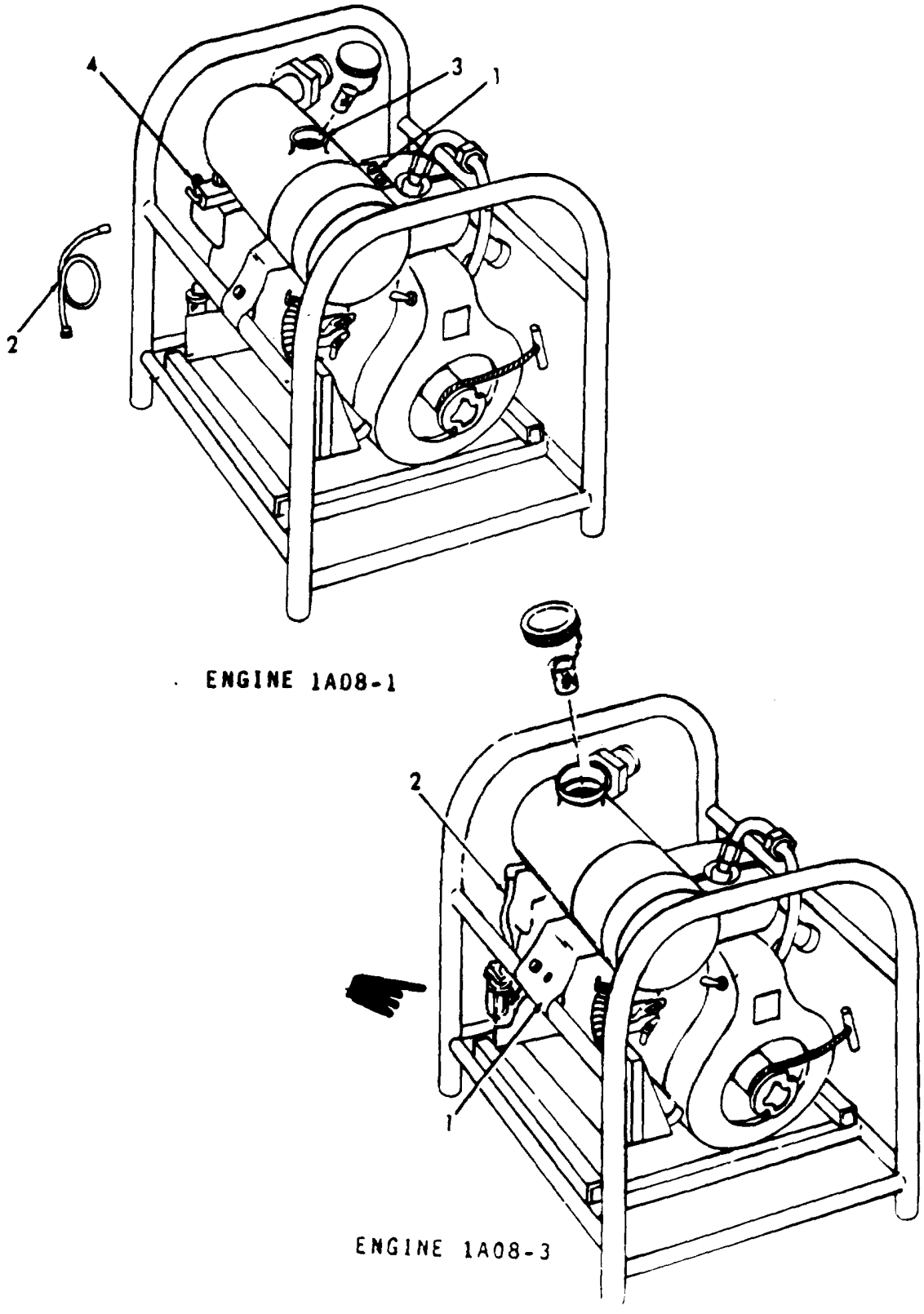


Figure 4-4. Fuel Tank Replacement

c. Repair.

Refer to Direct Support Maintenance.

d. Installation.

(1) Refer to figure 4-3. Repeat the removal procedures in reverse sequence.

4-2.6. Conversion Engine Model 1A08-1 to Model 1A08-3.

When the Model 1A08-1 engine is replaced with a Model 1A08-3 engine the following changes are required.

a. Engine mounting. The rails used to mount the 1A08-1 engine are made with the brackets as an assembly. The rails used to mount the 1A08-3 engine are separate from the brackets. When replacing the 1A08-1 with a 1A08-3 model, requisition the rails and brackets for installation. The brackets used for mounting the 1A08 engine will fit any Military Standard engine.

b. Fuel System. When the engine is replaced the fuel system must also e rep aced. The items to be replaced are as shown in figure 4-4 and are as follows:

1 - Bracket
2 - Fuel line
3 - Fuel tank

NOTE

The existing fuel tank can be used with a possible modification of the bracket.

4 - Fuel filter.

Refer to Appendix D for part numbers.

4-3. ELECTRIC MOTOR DRIVE in PUMP.

4-3.1. Power Cord.

a. Removal.

(1) Refer to figure 4-5. Remove screws (1) that attach connection box cover (2) to motor (3).

(2) Disconnect power cable (4) from wires (5) inside connection box.

(3) Loosen connector (7) and remove cable (4).

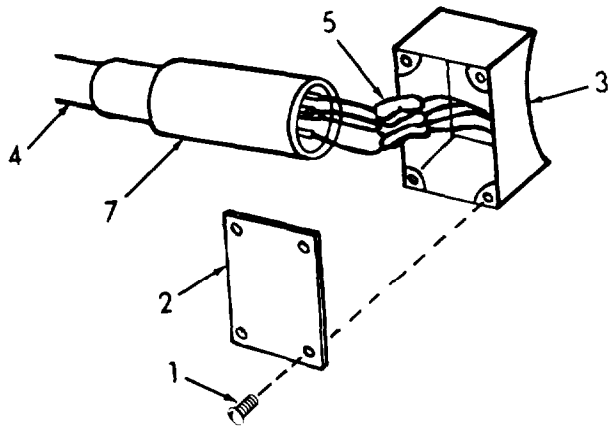


Figure 4-5. Power Cable Replacement (Electric Motor Driven Pump).

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).

Clean the metal parts with an approved solvent and dry thoroughly.

c. Installation.

(1) Repeat the removal procedure in reverse sequence.

(2) Connect wires as follows:

MOTOR WIRE	CABLE WIRE
1	Black
2	White
3	Red
Ground	Green

(3) Insulate cable connections in accordance with standard practices.

4-3.2. Electric Motor.

This section contains the motor removal procedures.

a. Removal.

(1) Remove the centrifugal pump as per paragraph 4-4.

(2) Remove the power cable as per paragraph 4-3.1.

(3) Refer to figure 4-6. Remove nuts (l), washers (2) and screws (3) that attach motor (4) to frame (5).

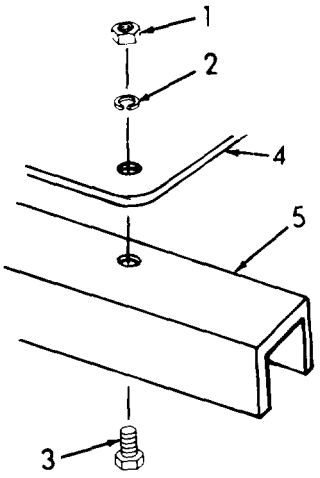


Figure 4-6. Electric Motor Removal.

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 the metal parts with an approved solvent and dry thoroughly.

(2) Inspect for damage and defects, replace as necessary.

c. Installation.

Refer to figure 4-6. Repeat the removal procedure in reverse sequence.

4-3.3. Frame.

Two channels welded to the frame support the electric motor and pump. The tubular frame supports and protects the motor and pump.

a. Removal.

(1) Remove power card as per paragraph 4-3.1.

(2) Remove centrifugal pump as per paragraph 4-4.

(3) Remove electric motor as per paragraph 4-3.2.

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 the frame with an approved drycleaning solvent.

(2) Inspect frame for cracks or other damage.

c. Repair.

Refer to Direct Support Maintenance.

d. Installation.

Repeat the removal procedure in reverse sequence.

4-4. CENTRIFUGAL PUMP.

The centrifugal pump is coupled to the gasoline engine or electric motor. 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 encirles the impeller. A check valve prevents water backflow through the pump.

4-4.1. Troubleshooting.

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

Table 4-2. 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 para 4-4.3)
Step 2- Check if impeller is clogged or broken. Flush pump case or replace impeller. (Refer to para 4-4.2)
Step 3- Check pump case for leaks, cracks, or damage. Repair or replace case. (Refer to para 4-4.2)
Step 4- Check if packing seals are worn or defective. Replace packing seals. (Refer to para 4-4.2)
Step 5- Check if clearance between wear plate and impeller is excessive, Install shims as required. (Refer to para 4-4.2)
2. PUMP FAILS TO PRIME.
Step 1- Check if check valve is defective Replace check valve. (Refer to para 4-4.3)
Step 2- Check if suction flange is loose or defective, Tighten mounting nuts or replace suction flange. (Refer to para 4-4.3)
Step 3- Check if packing seals are worn or defective. Replace impeller. (Refer to para 4-4.2)

Table 4-2. Maintenance Activity Troubleshooting (Continued).

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

4-4.2. Pump.

a. Removal.

(1) Gasoline engine disconnect one spark plug lead (1). Electric motor disconnect power cord (l).

(2) Disassemble pump in numerical sequence as shown in figure 4-7.

4-4.3. Check Valve.

a. Removal.

(1) Refer to figure 4-7. Remove nuts (23) and washers (24), then suction flange (25).

(2) Remove gasket (28), consisting of small weight (27) and large weight (29).

(3) Remove screw (26) separating items (29), (28), and (27).

b. Installation.

Reverse the above procedure.

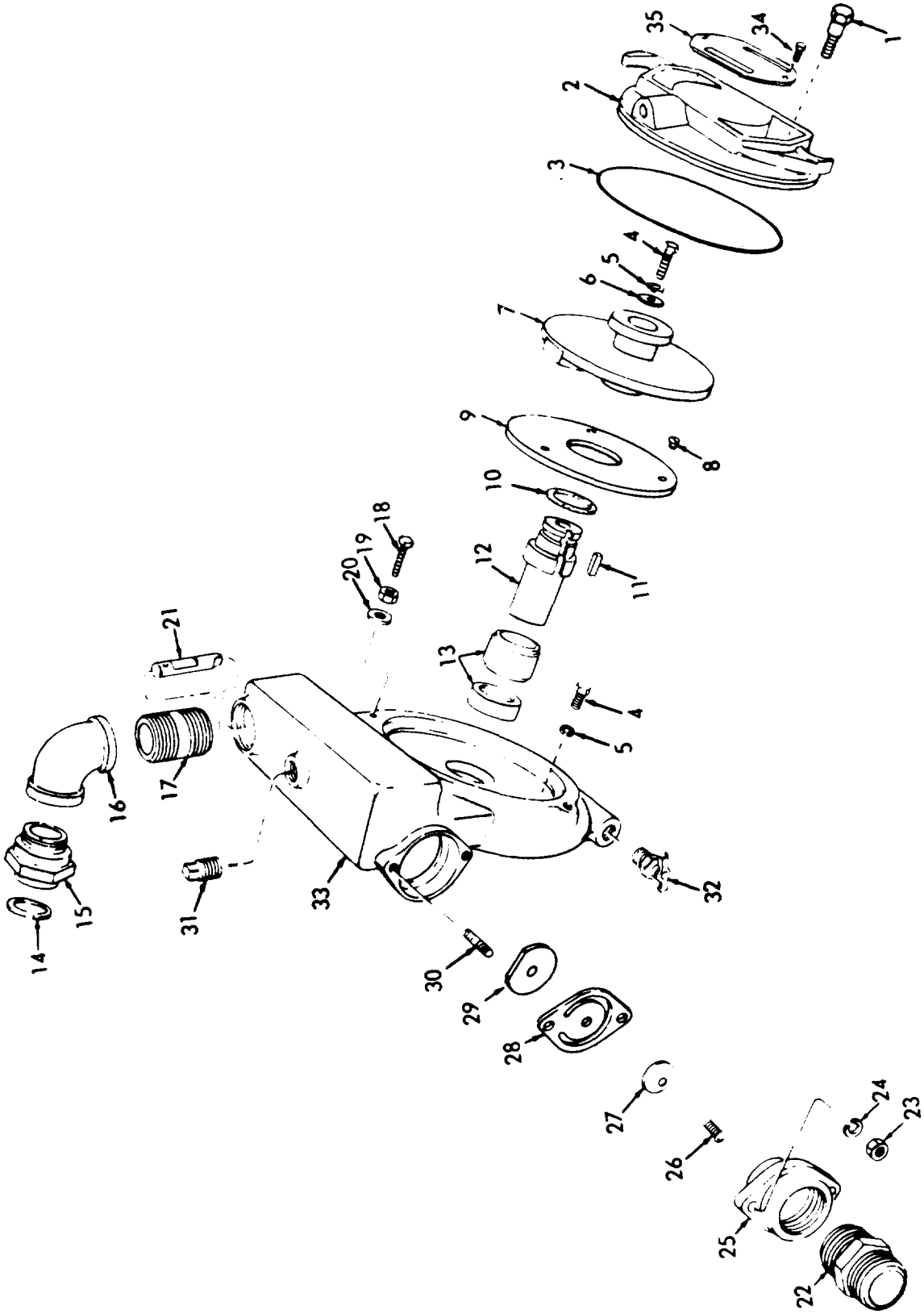


Figure 4-7. Centrifugal Pump Assembly, Disassembly and Reassembly.

Figure 4-7 Legend.

1. Shoulder bolt
2. Cover plate
3. O-ring
4. Cap Screw
5. Lockwasher
6. Washer
7. Impeller
8. Screw
9. Wear plate
10. Shim
11. Key
12. Adapter shaft
13. Seal assembly
14. Gasket, adapter
15. Adapter, discharge
16. Elbow, discharge
17. Nipple, discharge
18. Setscrew
19. Nut
20. Washer
21. Diverter
22. Adapter, suction flange
23. Nut
24. Lockwasher
25. Suction flange
26. Screw
27. Weight (small)
28. Gasket, check valve
29. Weight (large)
30. Stud
31. Plug
32. Draincock
33. Body
34. Drive screw
35. Serial plate

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 shaft, and shaft coupling 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 4-7, reassembly pump in reverse sequence.

(2) Reassemble shaft/impeller assembly using sufficient shims (10) to result in an impeller-face to wear plate-face clearance of 0.010″ to 0.015″.

(3) Reassemble peeler and adjust to result in peeler-to-impeller clearance of 0.005″ to 0.0015″.

(4) Lightly oil O-ring (3) and reassemble cover (2) in place on body (33).

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

5-1. GENERAL.

This chapter contains maintenance instructions for Direct Support personnel. Reference to TM 5-2805-265-14 for engine maintenance.

5-2. FRAME .

5-2.1. Gasoline Driven Pump.

a. Removal.

Remove all components from frame (para 4-2.5 a).

b. Cleaning and Inspection.

Clean and inspect frame (para 4-2.5 b).

c. Repair.

(1) Repair cracks and broken welds using approved arc welding methods.

(2) Straighten bends with hammer, anvil or vise.

(3) Replace shock mounts if required.

d. Installation.

Refer to paragraph 4-2.5. Repeat removal procedure in reverse sequence.

5-2.2. Electric Motor Drive Pump.

a. Removal.

Remove all components from frame (para 4-3.3 a).

b. Cleaning and Inspection.

Clean and inspect frame (para 4-3.3 b).

c. Repair.

(1) Repair cracks and broken welds using approved arc welding methods.

(2) Straighten bends with hammer, anvil or vise.

(3) Replace shock mounts if required.

d. Installation.

Refer to paragraph 4-3.3. Repeat removal procedure in reverse sequence.

5.3. ELECTRIC MOTOR.

This section contains testing and repair procedures for the electric motor.

a. Removal.

Remove all components from frame (para 4-3.3 a).

b. Cleaning and Inspection.

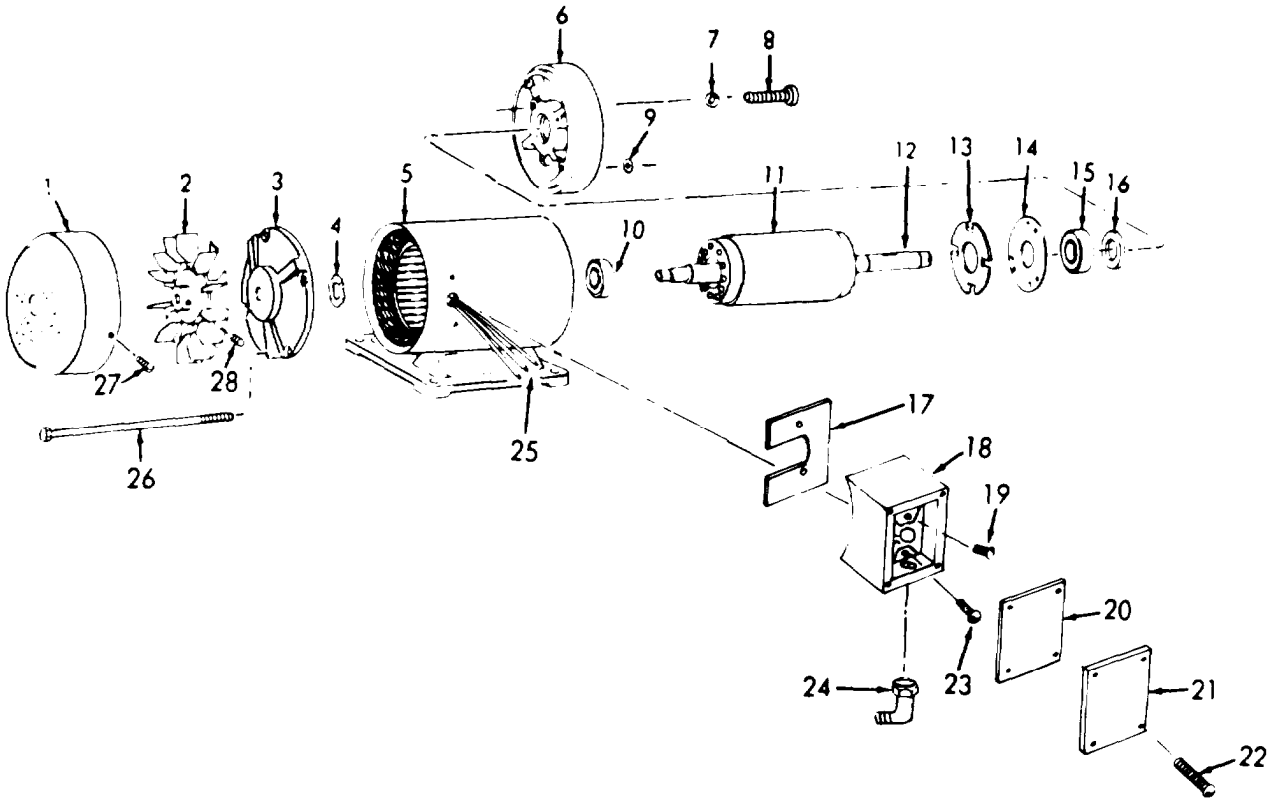
Clean and inspect motor (para 4-3.3 b).

c. Testing.

Using a suitable test lamp circuit, test for continuity between each of the motor wires. Replace the motor if lamp does not light. Test for grounds between one motor (any one) wire and frame If lamp does light, replace the motor.

d. Repair.

Disassemble the motor and replace components as needed. Refer to figure 5-1 for electric motor component breakdown.



1.	Cover	**15.**	Bearing
2.	Fan	**16.**	Sleeve
3.	End Plate	**17.**	Gasket
4.	Washer	**18.**	Box
5.	Stator	**19.**	Screw
6.	End Plate	**20.**	Gasket
7.	Washer	21.	Lid
8.	Screw	22.	Screw
9.	Nut	23.	Screw
10.	Bearing	24.	Fitting
11.	Rotor	25.	Wire
12.	Shaft	26.	Bolt
13.	Fan	27.	Set Screw
14.	Retainer	28.	Set Screw

Figure 5-1. Electric Motor.

APPENDIX A

REFERENCES

A-1. Fire Protection

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

A-2. Lubrication

C91OO-12	Fuels, Lubricants, Oils and **Waxes**
TB703-1	Specification List of Standard Liquid Fuels, Lubricants, Preservatives and Related Products Authorized by U.S. Army
LO 5-2805-256-12	Lubrication Orders: Engine, Gasoline, 1-1/2 HP Military Standard Models (Model 1A08-1) Models A108-2 (Model 1A08-3) to 38G2-102-2LC-1 L103520A-10/1

A-3. Painting

AR746-1	Color, Marking and Preparation for Equipment for Shipment
AR746-5	Marking and Packing of Supplies and Equipment Color and Marking of Army Materiel.

A-4. Maintenance

TM 5-764	Electric Motor and Generator Repair
TM 5-2805-256-24P	Organizational, Direct and General Support Maintenance Repair Parts: Engine, Gasoline 1-1/2 HP Military Standard Models 1A08-1 FSN 2805-601-5181, Model 1A08-2, FSN 2805-714-8552: Model 1A08-3 FSN 2805-068-7510 (SL-4-03620A; TO38G2-102-4)
TM 38-750	The Army Maintenance Management System (TAMMS) Field Command Procedures
TM 9-207	Operation and Maintenance of Ordnance Materiel in Cold Weather (O to -65°F).

A-5. Shipment and Storage

TB 740-93-2	Preservation of USAMECOM Mechanical Equipment for Shipment and Storage
TM 740-90-1	Administrative Storage Equipment

A-6. Demolition

TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use

A-7. Radio Suppression

TM 11-483	Radio Interference Suppression

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.

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 prope;"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 unserviceble 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), end item, or system.

j. Overhaul. The maintenance effort (service/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 Assembly								
0100	Engine Gasoline	Inspect	0.2				**		
		Service		1.0					
		Replace		2.0					A
	Mount Shock	Replace		1.0				1	
02	Fuel System								
0200	Tank, Lines and Fittings	Inspect	0.1						
		Service	0.2						
		Replace		0.5				1	
03	Frame								
0300	Frame Assembly	Inspect	0.1						
		Replace		1.0					
		Repair			2.0			4	
04	Accessory Items								
0400	Cable Assembly	Inspect	0.1	0.5				2	
		Replace		0.5				1	
0401	Data Plates	Inspect	0.1						
		Replace		2.0				2	
05	Electric Motors	Inspect		0.1			**		
0500	Motor	Test			2.5			3	
		Replace		2.0					
		Repair			2.8			3	
0501	Ventilating System	Inspect	0.1						
		Replace		0.5					
06	Pump						**		
0600	Pump Assembly	Inspect	0.1						
		Service	0.4						
		Replace		2.0				1	
		Repair		2.0				2	
0601	Impeller								
		Inspect		0.2				1	
		Replace		0.3				1	
	Seal Assembly	Inspect	0.1						
		Replace		0.5				1	
0602	Oischarge and Suction Valve, Check	Inspect	0.1						
		Replace		0.3				1	
	Adaptors	Replace		0.3				2	
	Gasket, Flange	Replace	0.1						

** Indicates WT/MH Required

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS.

(1) Reference Code	(2) Maintenance Level	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
1	0, F	Tool Kit, General Mechanics Automotive (W33004) or equivalent	5180-00-177-7033	
2	0	Shop Equipment Automotive maintenance and repair; organizational maintenance or equivalent (W32593)	4910-00-754-0654	
3		Shop Set, Fuel and Electrical System: Fuel Maintenance, Basic (T30414) or equivalent	4910-00-390-7774	
4	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 5-2805-256-14.

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 identi fies 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 FSCM & PART NUMBER USABLE ON CODE	(3) U/M	(4) QTY. AUTH
7520-00-559-9618	CASE: Operator Maintenance ..BYZ CTH BZB	ea	1
5975-00-243-5861	CLAMP: Wire . . . . . CTH BZB	ea	1
4210-00-555-8837	EXTINGUISHER:Fire . . . . . BYZ CTH BZB	ea	1
5975-00-642-8937	ROD: Ground . . . . . .CTH BZB	ea	1
2990-00-972-7950	ROPE: Starting . . . .BYZ	ea	1
6145-00-189.6695	WIRE: Electrical . . . .CTH BZB	ft	10

APPENDIX D

REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

D-1. Scope.

This manual lists spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of operator's organizational, and direct support maintenance of the Centrifugal Pump. It authorizes the requisitioning 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 spares and 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.)

c. 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 alphanumeric 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 numbers.

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 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 date.
KD	An item of 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 a 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 general maintenance support level.
MD	Item to be manufactured or fabricated at 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 because the requirements for the item will result in replacement of the next higher assembly.
XB	Item not procured or stocked. If not available through salvage, requisition.
XD	A support item that is not stocked. When required,item will be procure 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 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 organization 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.

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 code 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 Code	Definition
z	Non-repairable item. When unserviceable, condemn and dispose at the level indicated in position three (3).
o	Repairable item. When uneconomically repairable, condemn and dispose at organizational level.
F	Repairable item. When uneconomically repairable, condemn and dispose at direct support level.
H	Repairable item. When uneconomically repairable, condemn and dispose at general support level.
D	Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.
L	Repairable item. Repair, condemnation, and disposal not authorized below depot/specialized repair activity level.
A	Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/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 or 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.

a. Usable on codes are shown in the description column. Uncoded items are applicable to all models. Identifications of the usable codes used in this publication are:

Code	Used On		
BYZ	Barnes	Model	17570
BYZ	Schleyer	Model	4M-SG-2000
CTH	Schleyer	Model	4M-SE2000
BZB	Barnes	Model	US4CCE

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 illustrations are prepared for assembly groups, and listings are divided into the same group.

(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 of Part Number is Known:

(1) First. Using the Index of National Stock Numbers 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 alphanumeric 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.

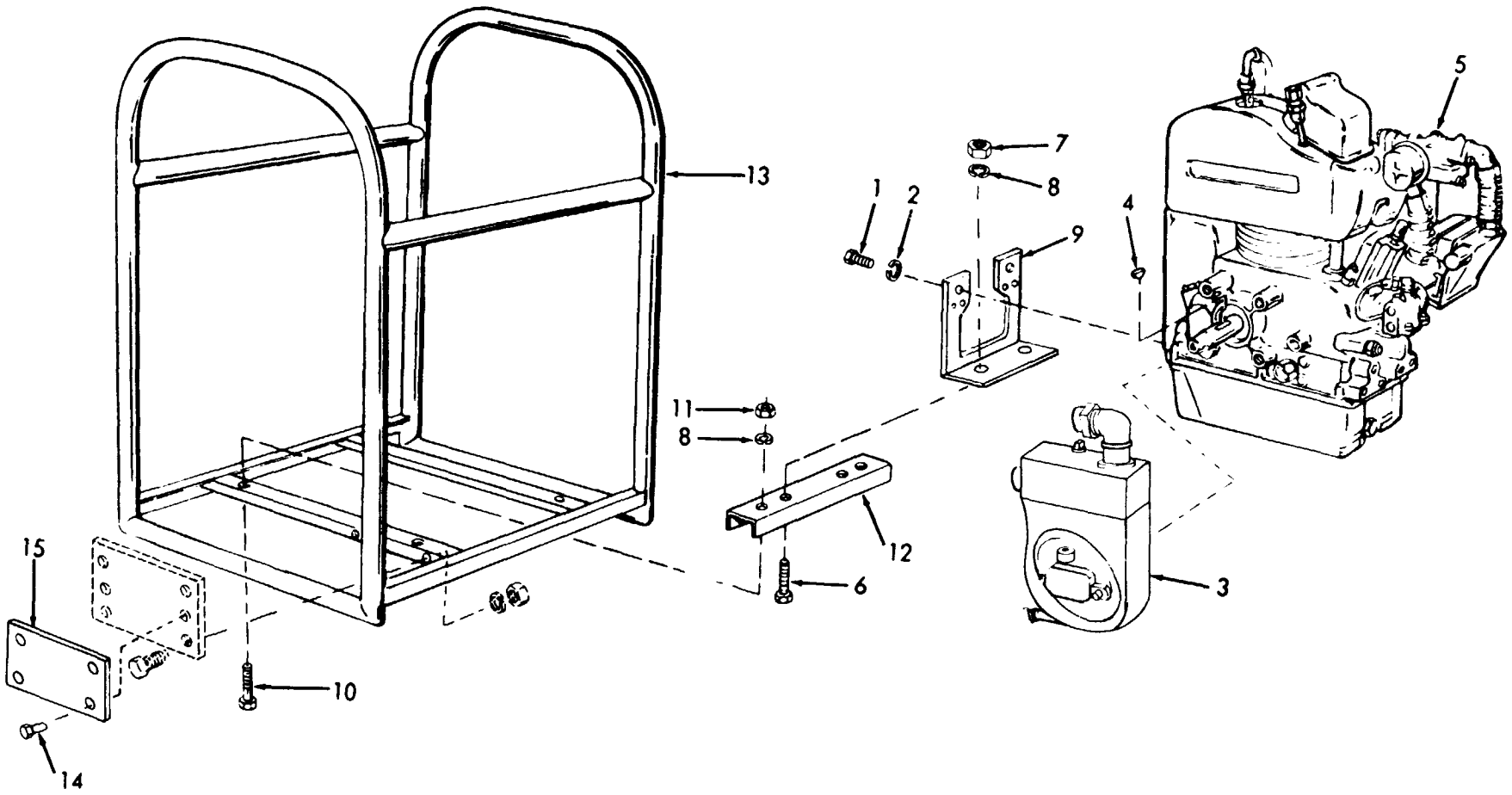


Figure D-1. Engine, Support and Carrying Frame.

(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) USABLE ON U/M	(8) QTY INC IN UNIT
						GROUP 01 ENGINE ASSEMBLY			
D-1	1	PAOZZ	5305-00-068-0502	96906	MS90725-6	SCREW, CAP, HEXAGON HEAD	BYZ	EA	8
D-1	2	PAOZZ	5310-00-012-0380	96906	MS35338-25	WASHER LOCK	BYZ	EA	8
D-1	3	PBOZZ	4320-00-717-1380	97403	13200E7202	PUMP, BODY		EA	1
D-1	4	PBOZZ	5315-00-043-1787	96906	MS35756-34	KEY, MACHINE		EA	8
D-1	5	PBOZZ	2805-00-068-7510	96906	A1A08-3	ENGINE, GASOLINE USE ON SERIAL NO. 27139-121 AND UP	BYZ	EA	1
D-1	6	PBOZZ	5306-00-225-9093	96906	MS90726-38	BOLT, MACHINE	BYZ	EA	8
D-1	7	PBOZZ	5310-00-582-5615	96906	MS35690-522	NUT, PLAIN, HEXAGON	BYZ	EA	8
D-1	8	PBOZZ	5310-00-012-0214	96906	MS35338-26	WASHER,LOCK	BYZ	EA	8
D-1	9	XOBZZ		97403	13200E7229	BRACKET, ENGINE	BYZ	EA	2
D-1	10	PBOZZ	5306-00-225-9093	96906	MS90726-38	BOLT, MACHINE	BYZ	EA	8
D-1	11	PBOZZ	5310-00-880-7746	96906	MS51968-5	NUT, PLAIN, HEXAGON		EA	8
D-1	12	XBOZZ		97403	13200E7230	SUPPORT,ENGINE	BYZ	EA	2
D-1	13	XBOZZ		97403	13200E7217	FRAME ASSEMBLY	BYZ	EA	1
D-1	14	XBOZZ		08288	MSS5305-3	SCREW, DRIVE	BYZ,BZB	EA	8
D-1	15	XBOZZ		08288	MSS9905-3	PLATE, IDENTIFICATION	BZB	EA	1

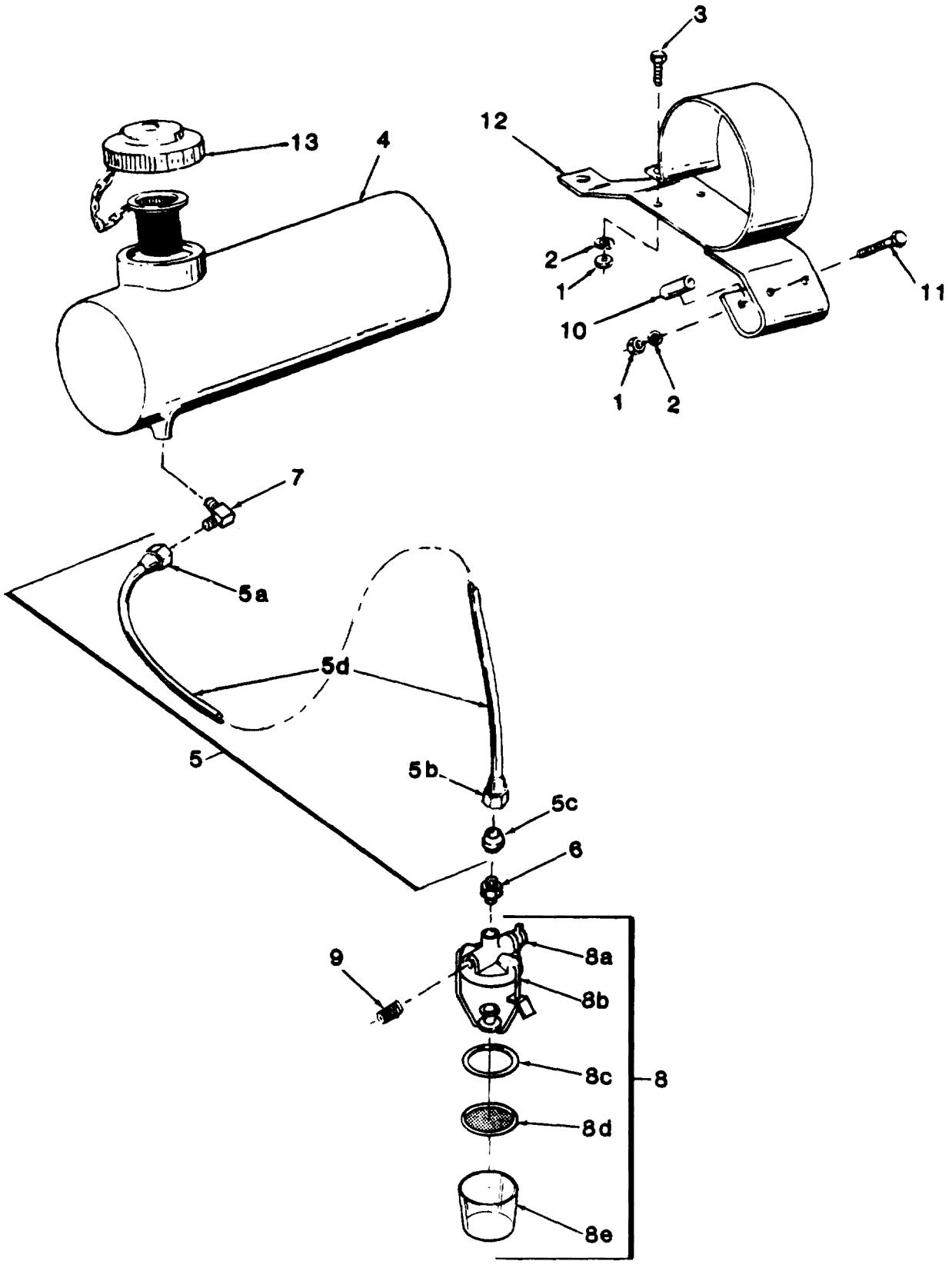


Figure D-2. Fuel Tank Lines and Fittings

(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) USABLE ON U/M	(8) QTY INC IN UNIT
						GROUP 02 FUEL SYSTEM			
D-2	1	PAOFF	5310-00-584-5005	96906	MS36890-408	NUT, PLAIN, HEXAGON	BYZ	EA	5
D-2	2	PAOFF	5310-00-012-0380	96906	MS35338-05	WASHER, LOCK	BYZ	EA	5
D-2	3	PAOZZ	5305-00-068-0502	96906	MS35927-6	SCREW, CAP, HEXAGON HEAD	BYZ	EA	4
D-2	4	PAOZZ	2910-00-735-2526	05748	17838SA	TANK, FUEL	BYZ	EA	1
D-2	5	MOOZZ				LINE ASSEMBLY,MAKE FROM NSN 4710-00-277-5525	BYZ	EA	1
D-2	5A		4730-00-011-8537	96906	MS39166-3L	NUT,TUBE,COUPLING,45°FLARE TYPE		EA	1
D-2	5B		4730-00-011-4627	96906	MS39176-3	NUT,TUBE,COUPLING,TAPPERED SLEEVE TYPE		EA	1
D-2	5C		4730-00-278-8763	96906	MS39177-3	SLEEVE,COMPRESSION		EA	1
D-2	5D		4710-00-277-5525			TUBING(BULK)		EA	1
D-2	6	PBOZZ	4730-00-270-4615	97403	13215E5883	ADAPTER,STRAIGT,PIPE TO TUBE	BYZ	EA	1
D-2	7	PBOZZ	4730-00-263-4963	08288	MSS4730-13	ELBOW,PIPE TO TUBE	BYZ	EA	1
D-2	8	PAOZZ	2910-00-905-9792	96906	MS51086-1	STRAINER,SEDIMENT	BYZ	EA	1
D-2	8A	XAOZZ		80463	100-7	VALVE,FUEL SHUTOFF		EA	1
D-2	8B			70040	854-254	BAIL ASSY,STRAINER		EA	1
D-2	8C	PAOZZ	5330-00-594-2293	70040	854-389	GASKET		EA	1
D-2	8D	XAOZZ		80463	854187	STRAINER,FUEL		EA	1
D-2	8E	XAOZZ		70040	1522092	BOWL,SEDIMENT		EA	1
D-2	9	PBOZZ	4730-00-921-3628	96906	MS51953-1	NIPPLE, PIPE	BYZ	EA	1
D-2	10	XBOZZ		05748	18021	SPACER, BRACKET	BYZ	EA	2
D-2	11	PBOZZ	5306-00-071-2242	96906	MS90725-9	SCREW, CAP, HEXAGON HEAD	BYZ	EA	1
D-2	12	XBOZZ		97403	13215E5883	BRACKET, FUEL TANK	BYZ	EA	1
D-2	13	PBOZZ	2910-00-294-1579	78252	17900	CAP,ASSEMBLY	BYZ	EA	1
D-2	14	PAOZZ	4320-00-111-5163	78252	23438051	STRAINER,FUEL TANK	BYZ	EA	1

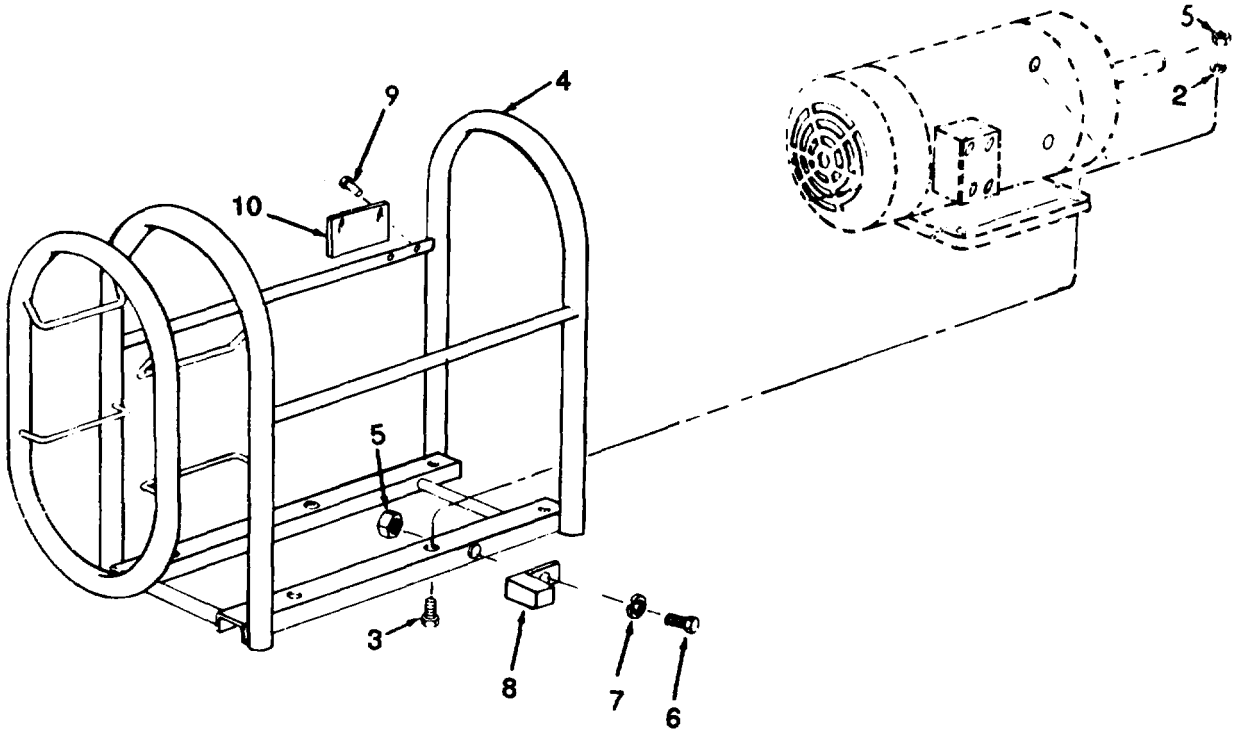


Figure D-3. Frame

(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) USABLE ON U/M	(8) QTY INC IN UNIT
						GROUP 03 FRAME			
D-3	1	PAOZZ	5310-00-732-0558	96906	MS51967-8	NUT,PLAIN,HEXAGON	CTH,BZB	EA	4
D-3	2	PAOZZ	5310-00-543-5101	96906	MS35338-46	WASHER,LOCK	CTH,BZB	EA	4
D-3	3	PAOZZ	5310-00-269-3214	96906	MS90725-64	SCREW,CAP,HEXAGON HEAD	CTH,BZB	EA	4
D-3	4	XBOZZ		97403	13200E7218	FRAME ASSEMBLY	CTH,BZB	EA	1
D-3	5	PAOZZ	5305-00-269-3209	96906	MS51967-2	NUT,PLAIN,HEXAGON	CTH,BZB	EA	1
D-3	6	PAOZZ	5305-00-269-3209	96906	MS90725-6	SCREW,CAP,HEXAGON HEAD	CTH,BZB	EA	1
D-3	7	PAOZZ	5310-00-543-5101	96906	MS35338-44	WASHER,LOCK	CTH,BZB	EA	1
D-3	8	PAOZZ	5940-00-143-4794	96906	MS20659-109	THERMINAL,LUG	CTH,BZB	EA	1
D-3	9	XBOZZ		08288	MSS5305-3	SCREW,DRIVE	BZB	EA	2
D-3	10	XBOZZ		08288	MSS9905-3	PLATE,IDENTIFICATION	BYZ,BZB	EA	1

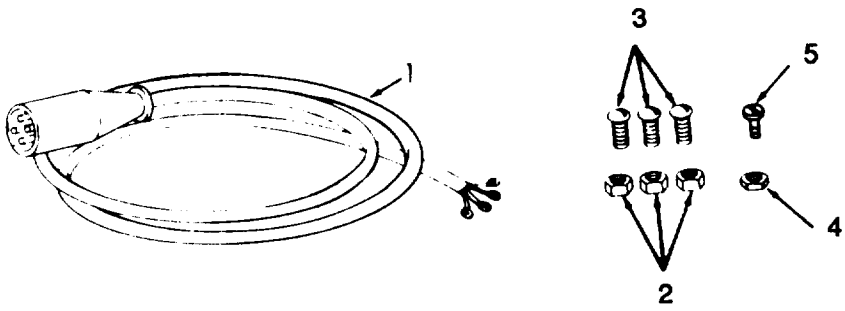


Figure D-4 Cable Assembly

(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) USABLE ON U/M	(8) QTY INC IN UNIT
						GROUP 04 ACCESSORY ITEMS			
D-4	1	PAOZZ	6150-00-971-2116	81336	13200E7222	CABLE ASSEMBLY	BZB	EA	1
D-4	2	PAOZZ	5310-00-732-0558	96906	MS21083N3	NUT,PLAIN,HEXAGON	CTH,BZB	EA	3
D-4	3	PAOZZ	5305-00-957-6652	96906	MS35207-264	SCREW,MACHINE	BZB	EA	3
						(USED TO SECURE POWER CABLE TO MOTOR)			
D-4	4	PAOZZ	5310-00-903-8282	96906	MS210683N4	NUT,SELF-LOCKING,HEXAGON	CTH,BZB	EA	1
						(USED TO SECURE POWER CABLE TO MOTOR)			
D-4	5	PAOZZ	5305-00-993-2641	96906	MS35207-281	SCREW,MACHINE	CTH,BZB	EA	1
						(USED TO SECURE POWER CABLE TO MOTOR)			

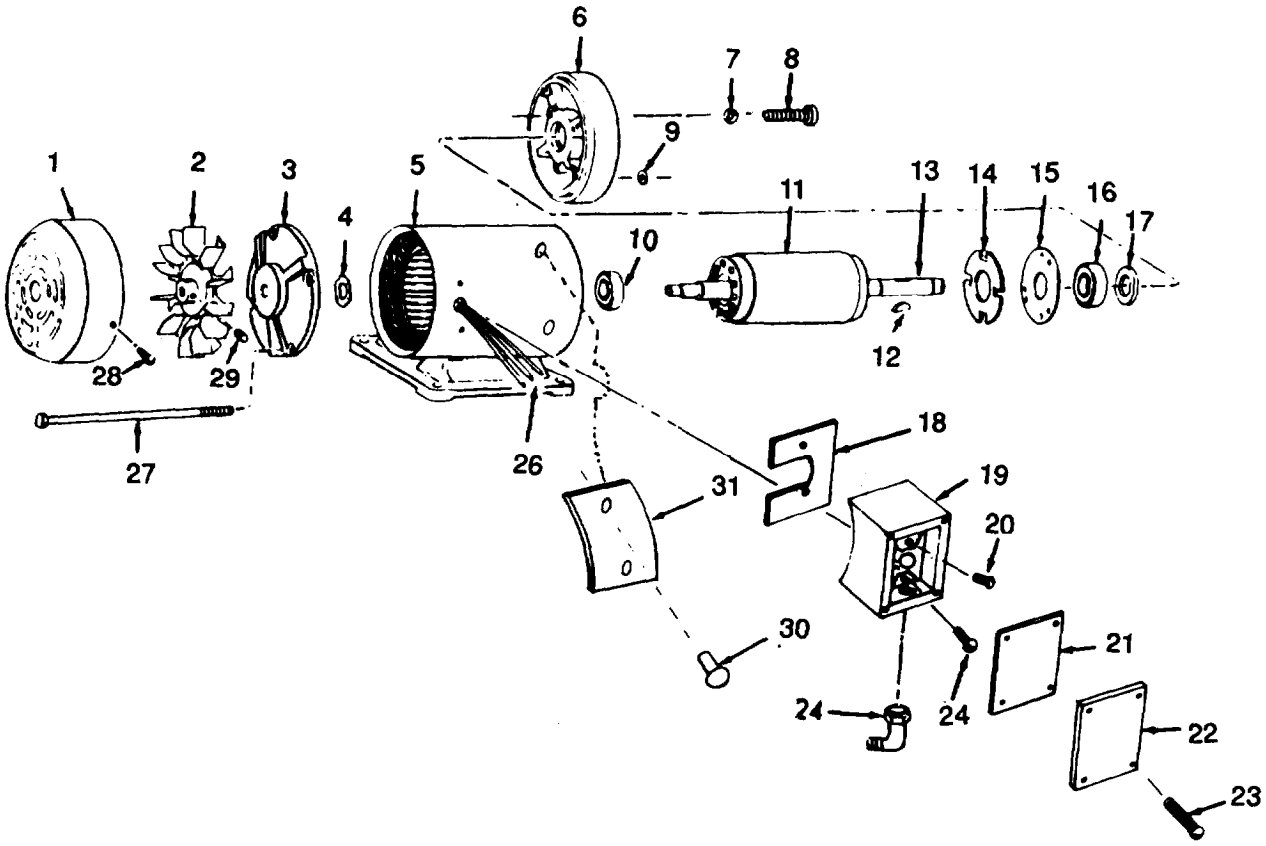


Figure D-5. Electric Motor.

(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) USABLE ON U/M	(8) QTY INC IN UNIT
						GROUP 05 ELECTRIC MOTOR			
D-5		PBOFZ	4320-00-932-9705	97403	13200E7211	ELECTRIC MOTOR AND PUMP ASSEMBLY	CTH,BZB	EA	1
						(SEE FIGURE D-6 FOR PUMP BREAKDOWN)			
D-5	1	XBFZZ		05472	36-696	COVER,FAN	CTH,BZB	EA	1
D-5	2	XDFZZ		05472	36-100A	FAN,COOLING	CTH,BZB	EA	1
D-5	3	XBFZZ		05472	36-2120	ENDPLATE	CTH,BZB	EA	1
D-5	4	XBFZZ		96906	MS35338-5	WASHER,FLAT	CTH,BZB	EA	2
D-5	5	XDFZZ		05472	36-2118	STATOR,WITH BASE	CTH,BZB	EA	1
D-5	6	XBFZZ		05472	36-694	ENDPLATE	CTH,BZB	EA	1
D-5	7	XBOZZ		05472	52WEB	WASHER,WAVY	CTH,BZB	EA	1
D-5	8	PAFZZ	5305-00-995-3441	96906	MS35207-269	SCREW,CAP,HEXAGON HEAD	CTH,BZB	EA	2
D-5	9	XBFZZ		96906	MS35690-401	NUT,PLAIN,HEXAGON	CTH,BZB	EA	1
D-5	10	PBFZZ	6105-00-876-6356	38443	205SZZ	BEARING,BALL,ANNULAR	BZB	EA	1
D-5	11	XDOZZ		05472	36-271	ROTOR	CTH,BZB	EA	1
D-5	12	PBOZZ	5315-00-043-1787	96906	MS357565-34	KEY,MACHINE		EA	1
D-5	13	XBFZZ		05472	36-2119	SHAFT	CTH,BZB	EA	1
D-5	14	XDFZZ		05472	36-136	PLATE,RETAINING	CTH,BZB	EA	1
D-5	15	XBOZZ		05472	36417	RETAINER,BEARING	CTH,BZB	EA	1
D-5	16	PBFZZ	3110-00-109-1157	38443	205SZZ	BEARING,BALL,ANNULAR	CTH,BZB	EA	2
D-5	17	XBFZZ		05472	6-31	SPACER,SLEEVE	CTH,BZB	EA	1
D-5	18	XBFZZ		05472	36-48	GASKET	CTH,BZB	EA	1
D-5	19	XBFZZ		05472	36-213	BOX,CONDUCT	CTH,BZB	EA	1
D-5	20	XBFZZ		96906	MS24641-49	SCREW,MACHINE	CTH,BZB	EA	2
D-5	21	XBFZZ		05472	36-49	GASKET	CTH,BZB	EA	1
D-5	22	XBOZZ		05472	36-40	LID,BOX	CTH,BZB	EA	1
D-5	23	XBFZZ		96096	MS2464945	SCREW,MACHINE	CTH,BZB	EA	3
D-5	24	XBFZZ		96906	MS35230-61	SCREW,MACHINE	CTH,BZB	EA	1
D-5	25	XBOZZ		05472	22549	GLAND,CABLE	BZB	EA	1
D-5	26	PAFZZ	5940-00-143-4794	96906	MS25036-12	TERMINAL,LUG	CTH,BZB	EA	3
D-5	27	XBFZZ		05472	36-37A	SCREW,CAP,HEXAGON HEAD	CTH,BZB	EA	1
D-5	28	PAFZZ	5305-00-579-2972	96906	02781	SCREW,FAN MOUNTING	BZB	EA	1
D-5	29	PAOZZ	5305-00-723-9305	96906	MS51963-65	SETSCREW	CTH,BZB	EA	2
D-5	30	XBOZZ		08288	MSS5305-3	SCREW,DRIVE	BZB	EA	8
D-5	31	XBOZZ		08288	MSS9905-3	PLATE,IDENTIFICATION	BZB	EA	1

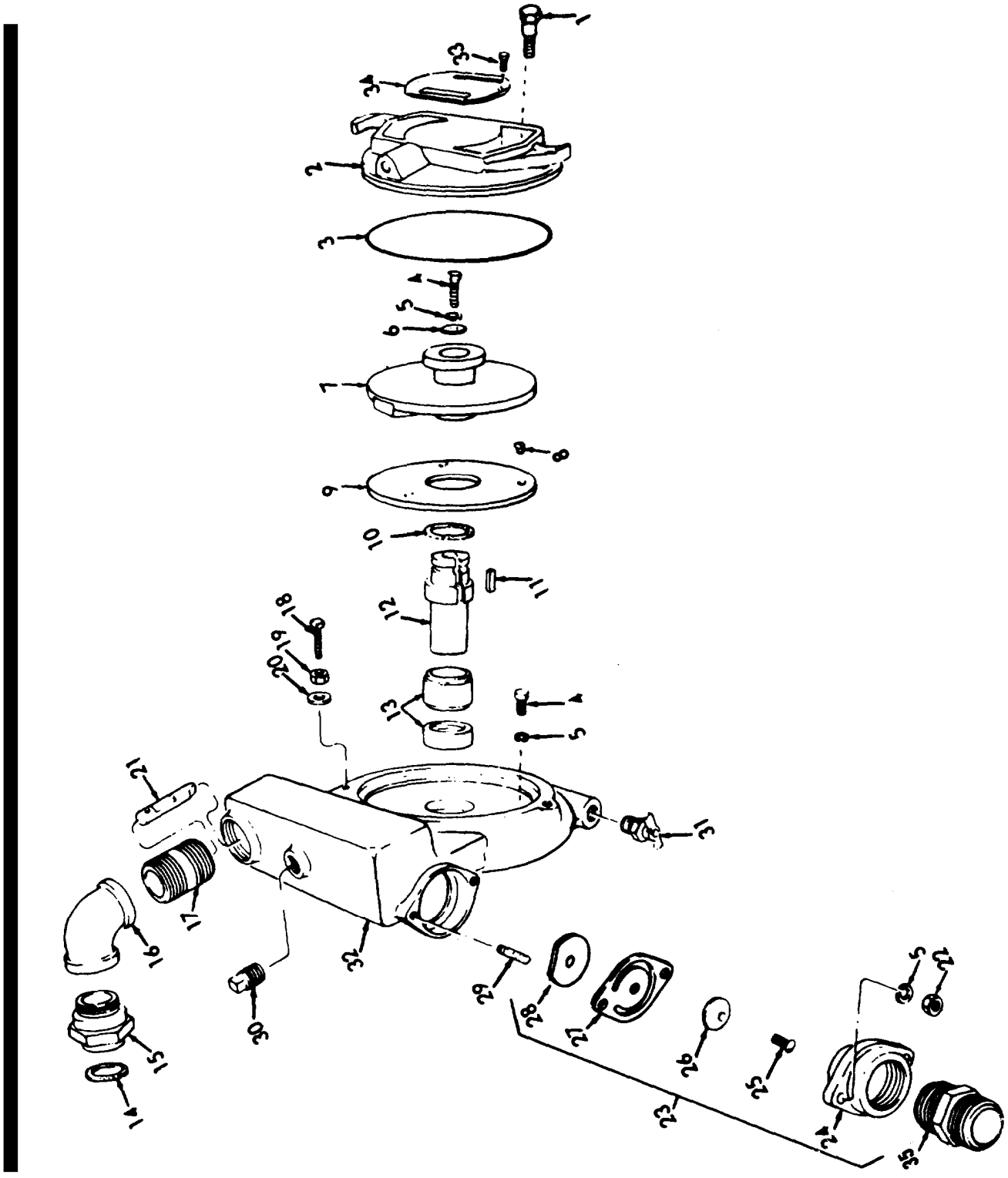


Figure D-6. Pump

(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) USABLE ON	U/M	(8) QTY INC IN UNIT
						GROUP 06 PUMP				
D-6		XBOZZ		97403	13200E7211	PUMP,CENTRIFUGAL		CTH,BZB	EA	1
D-6	1	XBOZZ	5306-00-686-5722	97403	13200E7212	BOLT,SHOULDER			EA	2
D-6	2	XBOZZ		97403	13200E7203	COVER,PLATE			EA	1
D-6	3	PBOZZ	5330-00-527-8116	96906	MS29513-252	PACKING,PREFORMED			EA	1
D-6	4	PAOZZ	5300-00-225-9089	96906	MS90726-34	SCREW,MACHINE		BYZ	EA	1
D-6	4	PAOZZ	5306-00-225-9089	96906	MS90726-33	BOLT,MACHINE		CTH,BZB	EA	3
D-6	5	XDOZZ		96906	MS35338 45	WASHER,LOCK		BYZ	EA	2
D-6	5	XDOZZ	5310-00-407-9566	96906	MS35336-45	WASHER,LOCK		CTH,BZB	EA	3
D-6	6	XBOZZ		97403	13214E9380-5	WASHER,FLAT		BZB	EA	1
D-6	7	PBOZZ	4320-00-784-6797	97403	13200E7204	IMPELLER,PUMP			EA	1
D-6	8	PAOZZ	5305-00-957-6652	96906	MS35198-67	SCREW,MACHINE			EA	3
D-6	9	PAOZZ	4320-00-790-6358	97403	13200E7214	PLATE WEAR			EA	1
D-6	10	XBOZZ		81349	MIL-S-22499	SHIM			EA	1
D-6	11	PBOZZ	5315-00-054-3207	80205	NAS558-606-10	KEY,MACHINE		BZB	EA	1
D-6	12	PBOZZ	4320-00-784-6799	97403	13200E7205	ADAPTER,SHAFT			EA	1
D-6	13	PAOZZ	4320-00-790-6357	97403	13200E8806	SEAL ASSEMBLY			EA	1
D-6	14	PAOZZ	5330-00-202-4645	05748	18451	SEALPUMP		BYZ,BZB	EA	1
D-6	15	PAOZZ	4730-01-043-7867	97403	13218E0479-17	ADAPTER,STRAIGHT			EA	1
D-6	16	XBOZZ		96906	MS39230-8	ELBOW,PIPE		BZB	EA	1
D-6	17	PAOZZ	4730-00-196-1531	96906	MS51953-172	NIPPLEPIPE			EA	1
D-6	18	PAOZZ	5305-00-054-9261	96906	MS51054-6	SETSCREW		BYZ	EA	1
D-6	19	XBOZZ		96906	MS35691-402	NUT,PLAIN,HEXAGON			EA	1
D-6	20	XBOZZ		80205	NAS1515H4	WASHER,FLAT			EA	1
D-6	21	XBOZZ		97403	13200E7213	DIVERTER,PUMP			EA	1
D-6	22	PAOZZ	5310-00-012-0368	97403	13200E7201-22	NUT,PLAIN,HEXAGON			EA	2
D-6	23	PBOZZ	4320-00-103-8199	97403	13200E7224	FLANGE ASSEMBLY			EA	1
D-6	24	XBOZZ		97403	13200E7225	FLANGE,SUCTION		BYZ,BZB	EA	1
D-6	25	PAOZZ	5305-00-984-6210	96906	MS35206-263	SCREW,MACHINE			EA	1
D-6	26	XAOZZ		97403	13200E7227	WEIGHT,SMALL			EA	
D-6	27	XBOZZ		97403	13200E7226	GASKET			EA	1
D-6	28	XAOZZ		97403	13200E7228	WEIGHT,LARGE			EA	
D-6	29	PAOZZ	5307-01-078-2425	80205	NAS183-5-13A	STUD,PLAIN			EA	2
D-6	30	PAOZZ	4730-00-555-1355	96906	MS20913 60R	PLUG,PIPE			EA	1
D-6	31	PAOZZ	4820-00-272-3346	96906	MS35784 3	COCK,DRAIN		BYZ	EA	1
D-6	32	PBOZZ	4320-00-717-1380	97403	13200E7202	BODY,PUMP			EA	1
D-6	33	PAOZZ	5305-00-253-5625	96906	MS21318-46	SCREW,DRIVE			EA	2
D-6	34	XDOZZ		97403	13219E2404	PLATE,PUMP		CTH,BZB	EA	1
D-6	35	PAOZZ	4730-00-277-6844	81349	MIL-C-52404	ADAPTER,STRAIGHT			EA	1

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCKNUMBER	FIGURE NO	ITEM NO
4730-00-011-4627	D-2	5B
5310-00-012-0214	D-1	8
5310-00-012-0368	D-6	22
5310-00-012-0380	D-1	2
5310-00-012-0380	D-2	2
5315-00-043-1787	D-1	4
5315-00-043-1787	D-5	12
5315-00-054-3207	D-6	11
5305-00-054-9261	D-6	18
5305-00-068-0502	D-1	1
5305-00-068-0502	D-2	3
2805-00-068-7510	D-1	5
5305-00-071-2242	D-2	11
4320-00-103-8199	D-6	23
3110-00-109-1157	D-5	16
4320-00-111-5163	D-2	14
5940-00-143-4794	D-3	8
5940-00-143-4794	D-3	26
4730-00-196-1531	D-6	17
5330-00-202-4645	D-6	14
5306-00-225-9089	D-6	4
5306-00-225-9093	D-1	6
5306-00-225-9093	D-1	10
4730-00-227-6844	D-6	35
5305-00-253-5625	D-6	33
4730-00-263-4983	D-2	7
5305-00-269-3209	D-3	10
5305-00-269-3209	D-3	11
5310-00-269-3214	D-3	7
4730-00-270-4615	D-2	6
4820-00-272-3346	D-6	31
4710-00-277-5525	D-2	5D
4730-00-278-8763	D-2	5C
4730-00-011-8537	D-2	5A
5330-00-527-8116	D-6	3
5310-00-543-5101	D-3	2
5310-00-543-5101	D-3	7
4730-00-555-1355	D-6	30
5305-00-579-2972	D-5	28
5310-00-582-5615	D-1	7
5310-00-584-5005	D-2	1
5330-00-594-2293	D-2	8C
5306-00-686-5722	D-6	1
4320-00-717-1380	D-1	3
4320-00-717-1380	D-6	32
5305-00-723-9305	D-5	29
5310-00-732-0558	D-3	1
5310-00-732-0558	D-4	2
2910-00-735-2526	D-2	4
4320-00-784-6797	D-6	7
4230-00-784-6799	D-6	12
4320-00-790-6357	D-6	13
4320-00-790-6358	D-6	9
6105-00-876-6356	D-5	10
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2910-00-905-9792	D-2	8
4730-00-921-3626	D-2	9
4320-00-932-9705	D-5	
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5305-00-957-6652	D-6	8
6150-00-971-2116	D-4	1
5305-00-984-6210	D-6	25
5305-00-995-3441	D-5	8
5307-01-078-2425	D-6	29

FSCM	PART NUMBER	FIGURE NO.	ITEM NO.
96906	A1A08-3	D-1	5
81349	MIL-C-52404	D-6	35
81349	MIL-S-22499	D-6	10
08288	MSS4730-13	D-2	7
08288	MSS5305-3	D-1	14
08288	MSS5305-3	D-3	9
08288	MSS5305-3	D-5	30
08288	MSS9905-3	D-1	15
08288	MSS9905-3	D-3	10
08288	MSS9905-3	D-5	31
96906	MS20659-109	D-3	8
96906	MS20913-60R	D-6	30
96906	MS21083N3	D-4	2
96906	MS21083N4	D-4	4
96906	MS21318-46	D-6	33
96906	MS24641-49	D-5	20
96906	MS24649-45	D-5	23
96906	MS25036-12	D-5	26
96906	MS29513-252	D-6	3
96906	MS35198-67	D-6	8
96906	MS35206-263	D-6	25
96906	MS35207-264	D-4	3
96906	MS35207-269	D-5	8
96906	MS35207-281	D-4	5
96906	MS35230-61	D-5	24
96906	MS35297-6	D-2	3
96906	MS35336-45		
96906	MS35338-05	D-2	2
96906	MS35338-25	D-1	2
96906	MS35338-26	D-1	8
96906	MS35338-44	D-3	7
96906	MS35338-45	D-6	5
96906	MS35338-46	D-3	2
96906	MS35338-5	D-5	12
96906	MS35690-401	D-5	9
96906	MS35690-408	D-2	1
96906	MS35690-522	D-1	7
96906	MS35691-402	D-6	19
96906	MS35756-34	D-1	4
96906	MS35756-34		
96906	MS35784-3	D-6	31
96906	MS39166-3L	D-2	5A
96906	MS39176-3	D-2	5B
96906	M539177-3	D-2	5C
96906	MS39230-8	D-6	16
96906	MS51054-6	D-6	18
96906	MS51086-1	D-2	8
96906	MS51953-1	D-2	9
96906	MS51953-172	D-6	17
96906	MS51963-65	D-4	29
96906	MS51967-2	D-3	5
96906	MS51967-8	D-3	1
96906	MS51968-5	D-1	11
96906	MS90725-6	D-1	1
96906	MS90725-6	D-3	6
96906	MS90725-64	D-3	3
96906	MS90725-9	D-2	11
96906	MS90726-33		
96906	MS90726-34	D-6	4
96906	MS90726-38	D-1	6
96906	MS90726-38	D-1	10
80205	NAS1515H4	D-6	20
80205	NAS183-5-13A	D-6	29
80205	NAS558-606-10	D-6	11
96906	02781	D-5	28
80463	100-7	D-2	8A
97403	13200E7201-22	D-6	22
97403	13200E7202	D-1	3
97403	13200E7202	D-6	32
97403	13200E7203	D-6	2
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97403	13200E7211	D-6	
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81336	13200E7222	D-4	2
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97403	13200E7226	D-6	27
97403	13200E7227	D-6	26
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97403	13200E7229	D-1	9
97403	13200E7230	D-1	12
97403	13200E8806	D-6	13
97403	13214E9380-5	D-6	6
97403	13215E5883	D-2	6
97403	13215E5883	D-2	12
97403	13218E0479-17	D-6	15
97403	13219E2404	D-6	34
80463	100-7	D-2	8A
70040	1522092	D-2	8C
05748	17838SA	D-2	4
78252	17900	D-2	13
05748	18021	D-2	10
05748	18451	D-6	14
38443	205SZZ	D-5	10
38443	205SZZ	D-5	16
05472	22549	D-5	25
78252	2343B051	D-2	14
05472	36-100A	D-5	2
05472	36-136	D-5	14
05472	36-2118	D-5	5
05472	36-2119	D-5	13
05472	36-2120	D-5	3
05472	36-213	D-5	19
05472	36-271	D-5	11
05472	36-37A	D-5	27
05472	36-40	D-5	22
05472	36417	D-5	14
05472	36-48	D-5	18
05472	36-49	D-5	21
05472	36-694	D-5	6
05472	36-696	D-5	1
05472	52WEB	D-5	7
05472	6-31	D-5	17
80463	854187	D-2	8D
70040	854254	D-2	8B
70040	854389	D-2	8C

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E. C. MEYER
General, United States Army
Chief of Staff

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The Adjutant General

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To be distributed in accordance with DA Form 12–25A, operator Maintenance requirements for Pumps, Fresh Water.

☆U.S. GOVERNMENT PRINTING OFFICE: 1982-564029/1322

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
PFC JOHN DOE
COA, 3d ENGINEER BN
FT. LEONARDWOOD, MO 63108

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-4320-200-13&P		

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 Cylenders. The engine on my set only has 4 Cylenders. Change the manual to show 4 Cylenders.
B1		4-3		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.
125	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

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

SIGN HERE John Doe
JOHN DOE

TEAR ALONG PERFORATED LINE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRST-M Overprint 1, 1 Now 80

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2 **Reverse of DRSTS-M** Overprint **2, l Nov 80**

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DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

COMMANDER
U.S. ARMY AVIATION AND TROOP COMMAND
Am: AMSAT-I-MP
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

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THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL'

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PIN: 051552-005

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