TECHNICAL MANUAL

OPERATOR'S, AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

TEST STAND, HYDRAULIC SYSTEM GASOLINE ENGINE DRIVEN TYPE D-5C PART NO. 7469 AND 7469-1 NSN 4920-00-144-5581

HEADQUARTERS, DEPARTMENT OF THE ARMY
30 DECEMBER 1980

CHANGE NO. 3

HEADQUARTERS
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WASHINGTON, D.C., *6 January 88*

Operator's, Aviation Unit and
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TEST STAND, HYDRAULIC SYSTEM
GASOLINE ENGINE DRIVEN
TYPE D-5C
PART NO. 7469 AND 7469-1
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TM 55-4920-405-13&P, 30 December 1980, is changed as follows:

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

Remove pages	Insert pages
1-1 and 1-2	1-1 and 1-2
2-5 and 2-6	2-5 and 2-6
A-1/A-2	A-1/A-2
B-1 and B-2	B-1 and B-2
---	B-2.1/B-2.2
C-1 through C-4	C-1 through C-4
C-6	C-5 and C-6
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C-49 through C-56	C-50 through C-56
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C-89 and C-90	C-90
C-91 and C-92	C-91 and C-92
C-93 and C-94	C-94
C-95 through C-98	C-95 through C-122

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Operator's, Aviation Unit and
Aviation intermediate Maintenance Manual

TEST STAND, HYDRAULIC SYSTEM
GASOLINE ENGINE DRIVEN
TYPE D-5C
PART NO. 7469 AND 7469-1
NSN 4920-00-144-5581

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Remove pages	Insert pages
i and ii	i and ii
3-7 through 3-10	3-7 through 3-10
C-35 through C-38	C-35 through C-38

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Operator's, Aviation Unit and Aviation
Intermediate Maintenance Manual

TEST STAND, HYDRAULIC SYSTEM

GASOLINE ENGINE DRIVEN

TYPE D-5C

PART NO. 7469 AND 7469-1

NSN 4920-00-144-5581

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WARNING

WARNING AND PRECAUTIONARY DATA

Personnel performing operations, procedures and practices which are included or implied in this tecnical manual shall observe the following warnings. Disregard of these warnings and precautionary information can cause serious injury, death, or destruction of material.

WARNING

Operation of this equipment presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel; wear ear muffs or ear plugs which were fitted by a trained professional.

FUEL SYSTEM. Always ground the fuel container and the fuel tank when filling or draining the fuel tank. This will prevent generation of a spark as the gasoline flows over metal surfaces.
To avoid the possibility of fire caused by spilled fuel, never fill the fuel tank while the engine is running, or is hot.

CARBON MONOXIDE. Never operate the engine in a closed building unless the exhaust, which contains carbon monoxide, is piped outside. Inhalation of carbon monoxide can cause serous illness or death.

ADJUSTMENTS TO CONNECTED EQUIPMENT. Never make adjustments to mechanical equipment while it is connected to the engine unless the IGNITION SWITCH is set to OFF. Turning over equipment by hand during adjustment and cleaning might start the engine. This could rotate the mechanical equipment, causing serious injury to the operator.

OPERATING LOCATION. Keep the test stand at least 10 feet clear of aircraft engines and fuel tank areas during use.

FLUID PRESSURE. Never connect or disconnect hose assemblies while the system is under pressure, while the HIGH PRESS BYPASS VALVE control is set to CLOSED, or while the FLOW CONTROL VALVE is open (turned counterclockwise).

BATTERY. Battery electrolyte contains sulphuric acid. It can cause severe burns. If electrolyte comes in contact with the body, clothing, or painted surfaces, rinse the contacted surface immediately with clean water.
The battery generates explosive gas during activation and charging. Keep sparks, flames, and hot glowing objects away.
The battery becomes hot during activation. If you must handle the battery wear protective gloves.

LIFTING. Lift the test stand only by means of cable slings attached to the lifting eyebolts. Never try to lift the test stand with a fork lift.

ENGINE VENTILATION. Fasten the engine compartment top and side doors in the open position during engine operation.

RESERVOIR SELECTOR. Never move the RESERVOIR control to OUT with the FLOW CONTROL VALVE closed (fully clockwise) or when a complete hydraulic loop is not provided. Cavitation and damage to the hydraulic pump may occur.

HIGH PRESSURE RELIEF VALVE. Always set the HIGH PRESS RELIEF VALVE about 200 PSI above the highest pressure of the system you intend to test. Do not use the HIGH PRESS RELIEF VALVE to adjust test stand output pressure.

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OPERATOR'S, AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

TEST STAND, HYDRAULIC SYSTEM, TYPE D-5C

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedure, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publication and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, US Army Aviation Systems Command, ATTN: AMSAV-MPSD, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished to you.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. GENERAL. This technical manual provides operating aviation unit and aviation intermediate maintenance instructions for Gasoline Engine Driven Hydraulic Test Stand, Type D-5C. The test stand is manufactured by the United Manufacturing Division, UMC Electronics Co., North Haven, Connecticut. The manufacturer's designation is Test Stand, Hydraulic System, Gasoline Engine Driven, Type D-5C, part number 7469 or 7469-1.

1-2. MODEL DIFFERENCES. Unless otherwise specified, all instructions in this technical manual apply to both test stand, part number 7469, and test stand, part number 7469-1. Test stand, part number 7469-1 differs from test stand, part number 7469, in the following ways:

a. A hose connector adapter assembly is supplied with part number 7469-1 only. This adapter assembly permits you to connect the 1/2" hose assembly to the 3/4" hose assembly to form a closed loop system for self-checking the test stand.
b. The identification plate is different because of the difference in part numbers.
c. The capacity nameplates differ in wording.
d. The locations of control panel nameplates differ slightly.
e. The part number of the control panel is different because mounting holes for the nameplates have been relocated.

1-3. SCOPE. You can use the test stand to check the performance of aircraft hydraulic system components. The test stand is mobile, and contains its own reservoir, Volume and pressure of hydraulic fluid can be regulated without using aircraft power.

1-4. MAINTENANCE FORMS AND RECORDS. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by DA PAM 738-751.

1-5. REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS. Refer to Table of Contents.

Section II. DESCRIPTION AND LEADING PARTICULARS

1-6. DESCRIPTION. The test stand (figure l-l) is a self-contained, mobile, hydraulic test stand. It consists of a steel, weather-resistant cabinet that is mounted on a trailer assembly. The trailer has individually suspended wheels, hand operated parking brakes, and a hinged tow bar. You can tow the test stand from one operating location to another with a truck or other suitable vehicle. Two main assemblies and assorted hydraulic hose assemblies make up the test stand. Unit subassembly (2, figure 1-2) contains all parts and assemblies needed to provide hydraulic fluid at regulated pressure and flow, and monitoring devices. Cabinet assembly (1, figure 1-2) covers the unit subassembly. It protects the internal assemblies from the weather. You can get to internal assemblies and operating controls, and provide needed ventilation during operation by opening doors on the cabinet assembly.

1-7. FUNCTION OF PARTS AND ASSEMBLIES. See figures 1-3 through 1-7 for the locations of major parts and assemblies of the test stand. Refer to tables 1-1 through 1-5 for the functions of these parts and assemblies.

1-8. LEADING PARTICULARS. Refer to table 1-6 for a listing of the main capabilities and limitations of the test stand.

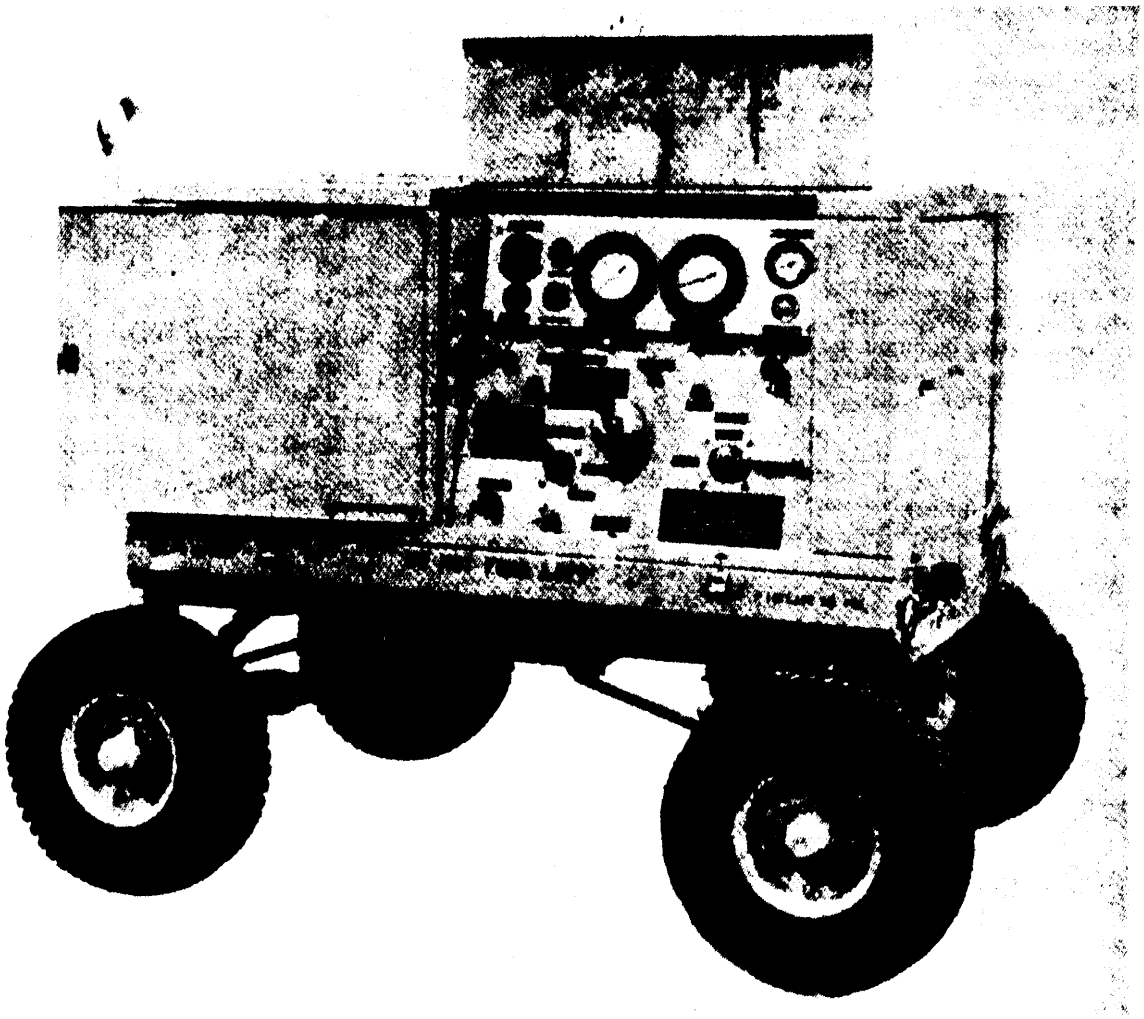
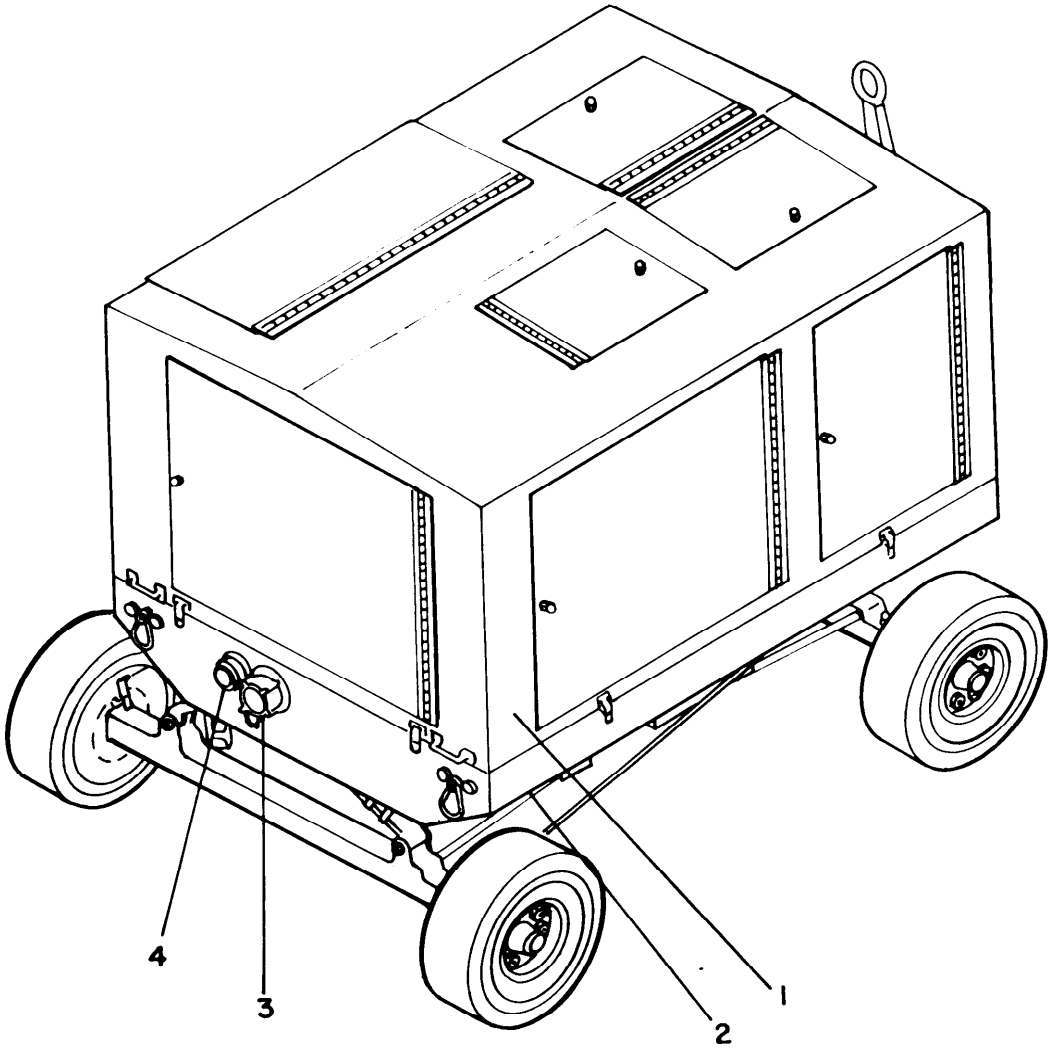


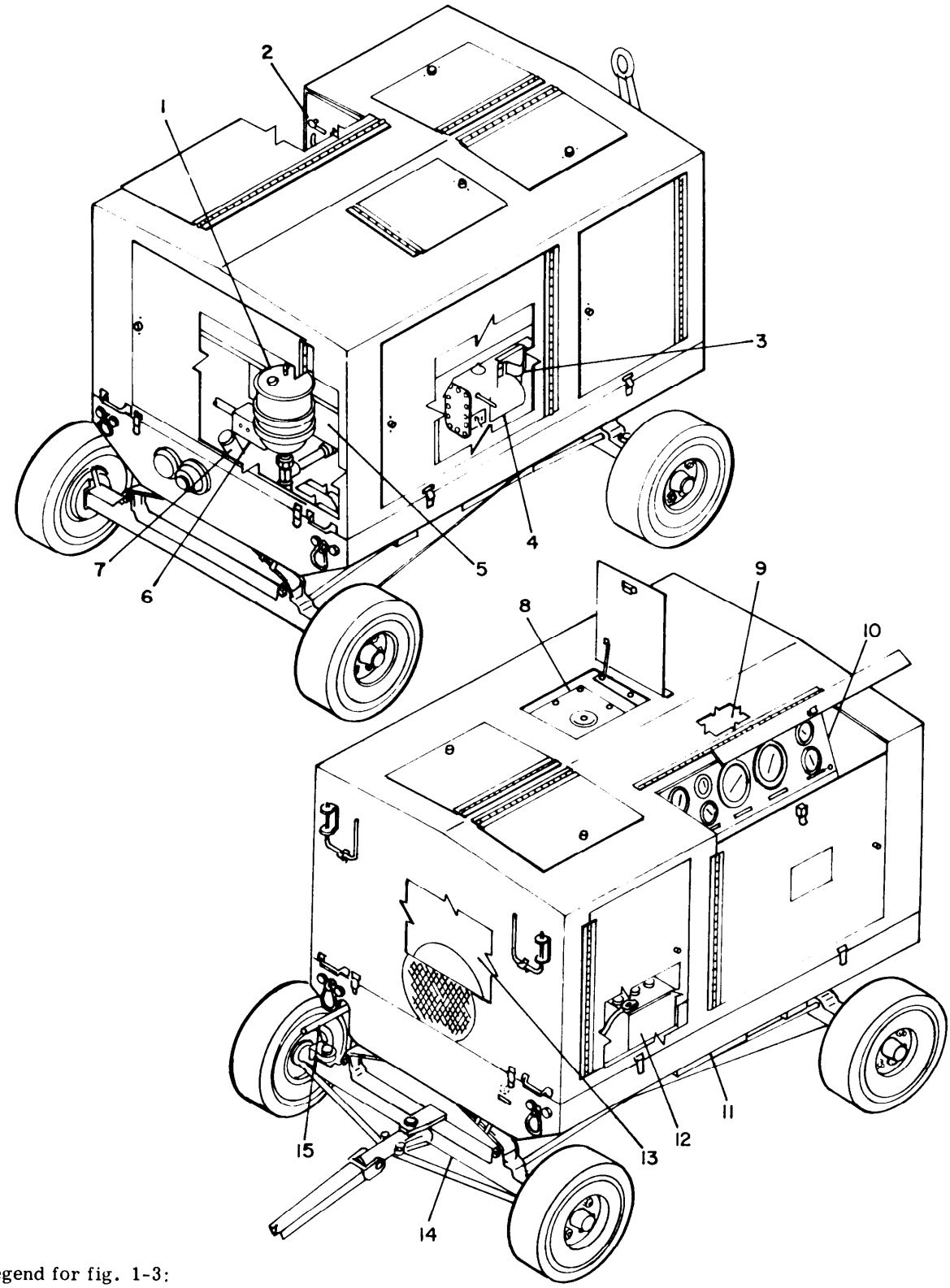
Figure 1-1. Hydraulic Test Stand, Type D-5C



Legend for fig. 1-2:

1. Cabinet assembly
2. Unit subassembly
3. SUCTION RETURN port
4. 1/2" OUTLET port

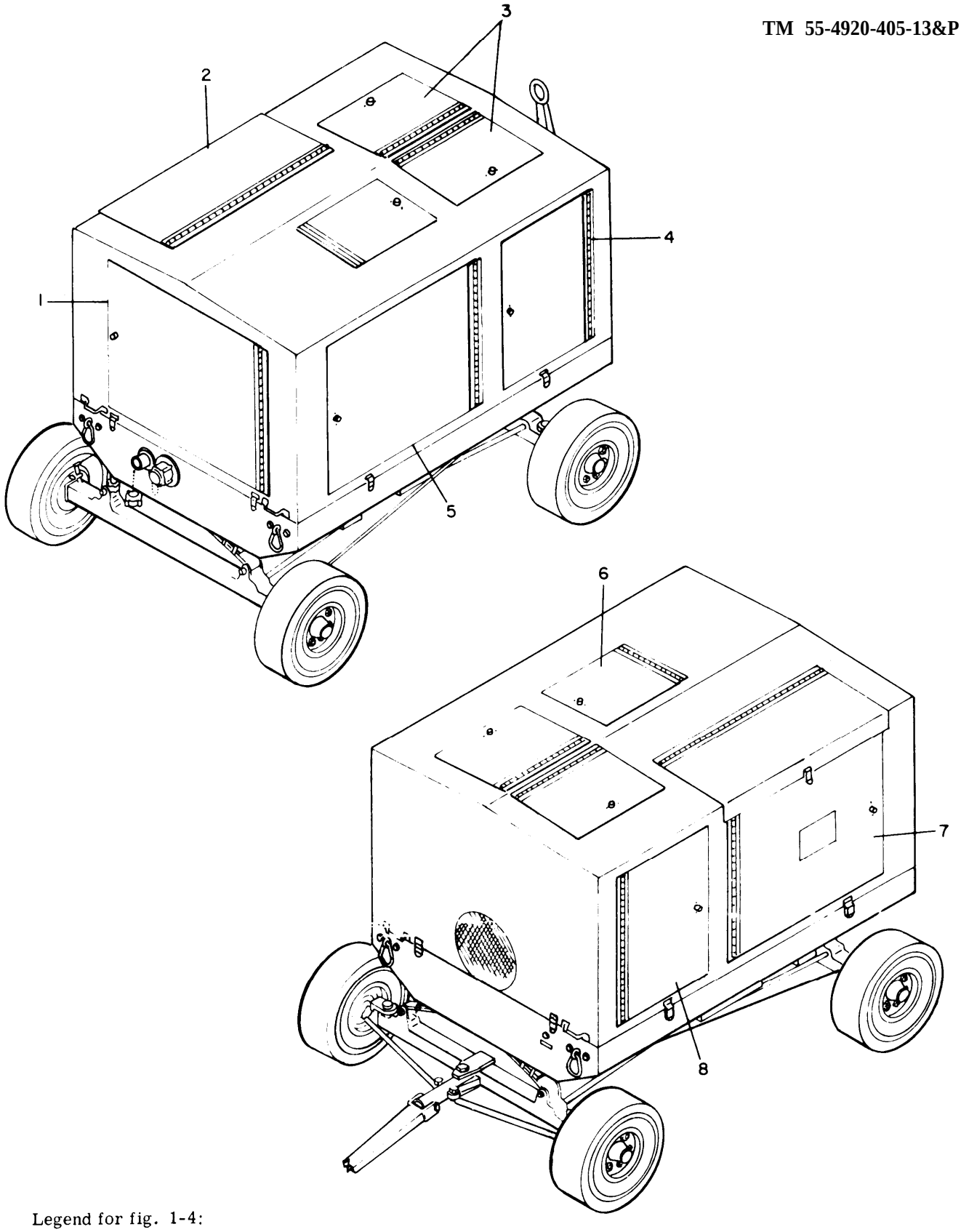
Figure 1-2. Hydraulic Test Stand, Type D-5C, Major Assemblies



Legend for fig. 1-3:

1. Low pressure filter assembly
2. Control panel
3. High pressure filter
4. Hydraulic pump
5. Low pressure relief valve
6. Manifold assembly
7. Gas tank
8. Hydraulic reservoir
9. Pressure pulsation dampener
10. Control panel
11. Trailer frame assembly
12. Battery
13. Gasoline engine
14. Trailer running gear
15. Handbrake lever assembly

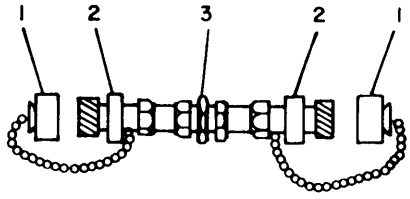
Figure 1-3. Hydraulic Test Stand, Type D-5C, Location of Components and Assemblies



Legend for fig. 1-4:

1. Hose storage door
2. Control panel access door
3. Engine ventilation doors
4. Engine access and ventilation door
5. Hydraulic system component access door
6. Reservoir access door
7. Control panel access door
8. Battery and engine access and ventilation door

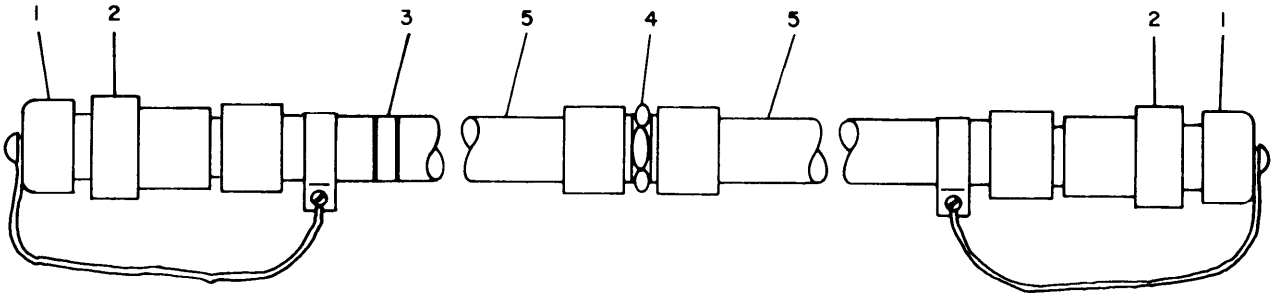
Figure 1-4. Hydraulic Test Stand, Type D-5C, Cabinet Assembly Doors



Legend for fig. 1-7:

1. Dust plug
2. Coupling half
3. Reducer union

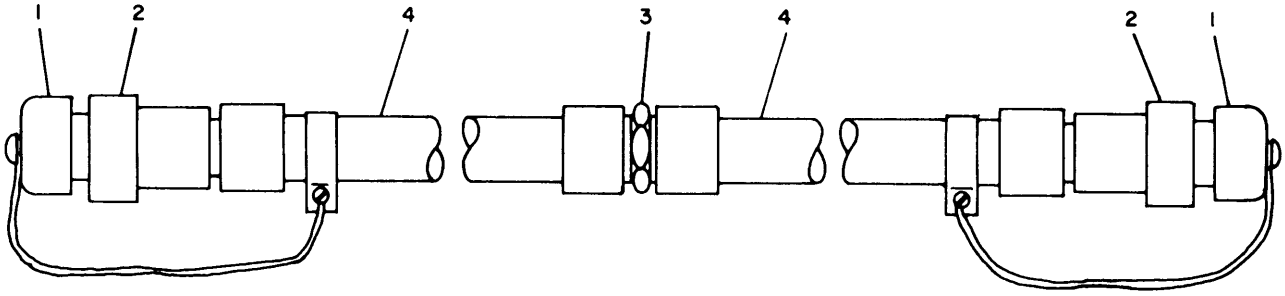
Figure 1-7. Adapter Assembly (Part No, 7469-1 Only), Component Location



Legend for fig. 1-6:

1. Dust plug
2. 3/4 inch coupling half
3. Tag
4. Union
5. Hose

Figure 1-6 Three Quarter Inch Inlet Hose Assembly, Component Location



Legend for fig. 1-5:

1. Dust plug
2. 1/2 inch coupling half
3. Union
4. Hose

Figure 1-5. Half-Inch Outlet Hose Assembly, Component Location

Table 1-1. Function of Components and Assemblies of Unit Subassembly

Fig. 1-3 Index No.	Description	Function
1	Low pressure filter assembly	Filters micronic particles from hydraulic fluid of test stand and system under test
2,10	Control panels	Contain controls needed to start engine, gages for monitoring operations, and hydraulic valves and controls needed to regulate hydraulic fluid and volume
3	High pressure filter	Located between hydraulic pump and flow control valve to filter micronic particles from hydraulic pump fluid
4	Hydraulic pump	Provides required hydraulic fluid delivery
5	Low pressure relief valve	Limits maximum pressure in hydraulic system return line
6	Manifold assembly	Contains sensing bulb for fluid temperature indicator, and thermos witch to shut off engine when fluid temperature becomes too high
7	Gas tank	Holds gasoline to run engine
8	Hydraulic reservoir	Holds hydraulic fluid for components or systems under test
9	Pressure pulsation dampener	Absorbs sudden high increases in hydraulic fluid pressure so that high pressure gage needle will not peg or indicate small erratic changes in fluid pressure
11	Trailer frame	Provides mounting for components and assemblies of test stand
12	Battery	Provides DC power to start engine of test stand
13	Gasoline engine	Drives high pressure hydraulic pump and alternator for battery charging circuit
14	Trailer running gear	Allows test stand to be towed by vehicle for relocation to another operating site
15	Handbrake lever assembly	Sets test stand brake to prevent rolling of test stand

Table 1-2. Function of Cabinet Assembly Components

Fig. 1-4 Index No.	Description	Function
1	Hose storage door	Provides access to storage space for hose assemblies
2,7	Control panel access doors	Provide access to controls needed for operation of test stand
3	Engine ventilation doors	Provide ventilation for engine when it is running
4	Engine access and ventilation door	Provides access to engine for maintenance, and engine ventilation during operation of test stand
5	Hydraulic system access door	Provides access to components of hydraulic system for maintenance
6	Reservoir access door	Provides access to hydraulic fluid reservoir
8	Battery and engine access and ventilation door	Provides access to battery and engine for maintenance, and engine ventilation during operation of test stand

Table 1-3. Function of Components of 1/2 Inch Hose Assembly

Fig. 1-5 Index No.	Description	Function
1	Dust plug	Prevents entry of foreign particles while hose assembly is not in use, thereby preventing damage to internal parts of coupling
2	Nut	Secures coupling on hose assembly to couplings on test stand and system under test
3	1/2 inch coupling	Attaches to test stand and system under test
4	Union	Couples two halves of hose assembly together
5	Hose	Carries hydraulic fluid at high pressure to aircraft

Table 1-4. Function of Components of 3/4 Inch Hose Assembly

Fig. 1-6 Index No.	Description	Function
1	Dust plug	Prevents entry of foreign particles while hose assembly is not in use, thereby preventing damage to internal parts of coupling
2	Nut	Secures coupling on hose assembly to couplings on test stand and system under test
3	3/4 inch coupling	Attaches to test stand and system under test
4	Tag	Cautions operator not to use this hose assembly on high pressure side of hydraulic system
5	Union	Couples two halves of hose assembly together
6	Hose	Carries hydraulic fluid at low pressure from aircraft

Table 1-5. Function of Components of Adapter Assembly (Part No. 7469-1 Only)

Fig. 1-7 Index No.	Description	Function
1	Dust plug	Prevents entry of foreign particles into adapter assembly while it is not in use, thereby preventing damage to internal parts of coupling
2	Nut	Secures coupling of adapter assembly to couplings of test stand
3	Coupling half	Attaches to coupling on test stand
4	Reducer	Couples two halves of adapter assembly together

Table 1-6. Leading Particulars

Item	Characteristics
TRAILER AND CABINET	
Construction	Welded steel
Running Gear	Leaf spring suspension, 6:00 x 9, 6 ply rated tires, 60 psi tire inflation
Brake	Mechanical type, hand set, holds test stand at 8.5 degree incline in any direction
Steering	Knuckle type, pivot
Cabinet	Welded steel, weather-resistant, hinged doors
HYDRAULIC SYSTEM	
Fluid Reservoir:	
Construction	Aluminum
Capacity	20 U.S. gallons
Fluid Specification	MIL-H-5606/MIL-H-83282
High Pressure Pump:	
Type	Axial piston, variable stroke, pressure compensated
Delivery	0 to 10 GPM from 0 to 3000 PSI at 1800 RPM 0 to 5 GPM from 3000 to 5000 PSI at 1800 RPM
Rotation	Clockwise rotation facing shaft
FILTERS	
Low Pressure	Replacement element, AN6236-3, micronic type, 150 PSI, 30 GPM
High Pressure	Replacement element, AN6235-4A, micronic type, 5000 PSI, 12 GPM
POWER PLANT	
Gasoline Engine	30.2 HP at 1800 RPM. 4 cylinder, 4 cycle, V-type governor, air cooled
Gasoline Tank	14 gallons
Engine Crank Case	5 quarts
OPERATING RANGE	
Altitude	Sea level to 6000 feet
Ambient Temperature	-20° to +125°F (-29° to +52°C)
Humidity	95 to 100 percent
Deflection	8.5° in any plane from horizontal
ELECTRIC START	12 volt battery, ignition and start switch, voltage regulator
ELECTRIC WIRING	Overload protected

Table 1-6. Leading Particulars - Continued

Item	Characteristics
PHYSICAL DATA	
Overall Length	77-1/2 inches, excluding tow bar
Overall Width	56 inches
Overall Height	54 inches
Weight (empty)	1800 pounds (approximate)
HOSE ASSEMBLIES	
3/4 Inch ID	Suction (input), armored, hydraulic
1/2 Inch ID	Output, armored, hydraulic
Adapter Assembly (Part No. 7469-1 only)	Output to suction (input), armored, hydraulic
TO WING SPEED	20 MPH (maximum) on improved roads, 10 MPH (maximum) on unimproved roads

Section III. TEST EQUIPMENT, SPECIAL TOOLS, AND MATERIALS

1-8. SPECIAL TOOLS AND TEST EQUIPMENT. There are no special tools and test equipment required for maintenance of the test stand.

1-9. CONSUMABLE MATERIALS. Refer to table 1-7 for a list of consumable materials needed to maintain the test stand.

Table 1-7. Consumable Materials

Item No.	Nomenclature	Specification
1	Solvent	PP-S-661
2	Fluid, hydraulic	MIL-H-5606/MIL-H-83282
3	Hydraulic oil, preservative	MIL-O-6083
4	Corrosion preventive compound	MIL-C-6529
5	Barrier material, water-resistant	MIL-B-131
6	Tape, pressure sensitive	PPP-T-60
7	Desiccant	MIL-D-3464
8	Gasoline	MIL-G-3056 or MIL-F-5572

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTATION

2-1. LOCATION AND FUNCTION. All controls and instrumentation used in operation of the test stand are mounted conveniently on the two control panels. See figures 2-1 and 2-2 for the locations of the individual controls and instruments. Refer to tables 2-1 and 2-2 for the functions of these items.

Section II. OPERATING PROCEDURES

WARNING

Keep test stand at least 10 feet away from aircraft engines and fuel tank areas during operation. To prevent carbon monoxide poisoning, never operate the test stand in a closed building unless the exhaust is piped out.

2-2. PRELIMINARY SETUP. To set up the test stand for operation, tow it to the operating area and do the following:

a. Set the parking brake at the front end of the test stand.
b. Open all engine compartment and control panel doors and fasten them in the open position.
c. Set the hydraulic valves (figure 2-1) as follows:
   (1) Turn PRESSURE COMPENSATOR (16) counterclockwise to open.
   (2) Turn COMPENSATOR SHUTOFF VALVE (17) counterclockwise to open.
   (3) Turn FLOW CONTROL VALVE (12) clockwise to close.
   (4) Turn HIGH PRESS RELIEF VALVE (19) counterclockwise to open.
   (5) Turn FLUID PRESS GAGE SHUTOFF valve (22) counterclockwise to open.
   (6) Set HIGH PRESS BYPASS VALVE (19) to OPEN.
   (7) Set SUCTION PRESSURE FILTER-OUT control (21) to FILTER-OUT.
   (8) Turn VOLUME control (14) counterclockwise to zero flow.
   (9) Set RESERVOIR valve (15) to IN.
d. Make sure that the hydraulic system has been prepared for use as directed in paragraph 3-
e. Make sure that there is enough gasoline in the fuel tank for the complete test that you intend to perform. A full tank (about 20 gallons) will provide at least 4 hours of continuous operation.

CAUTION

Keep the engine compartment top and side doors fastened in the open position whenever you operate the engine.

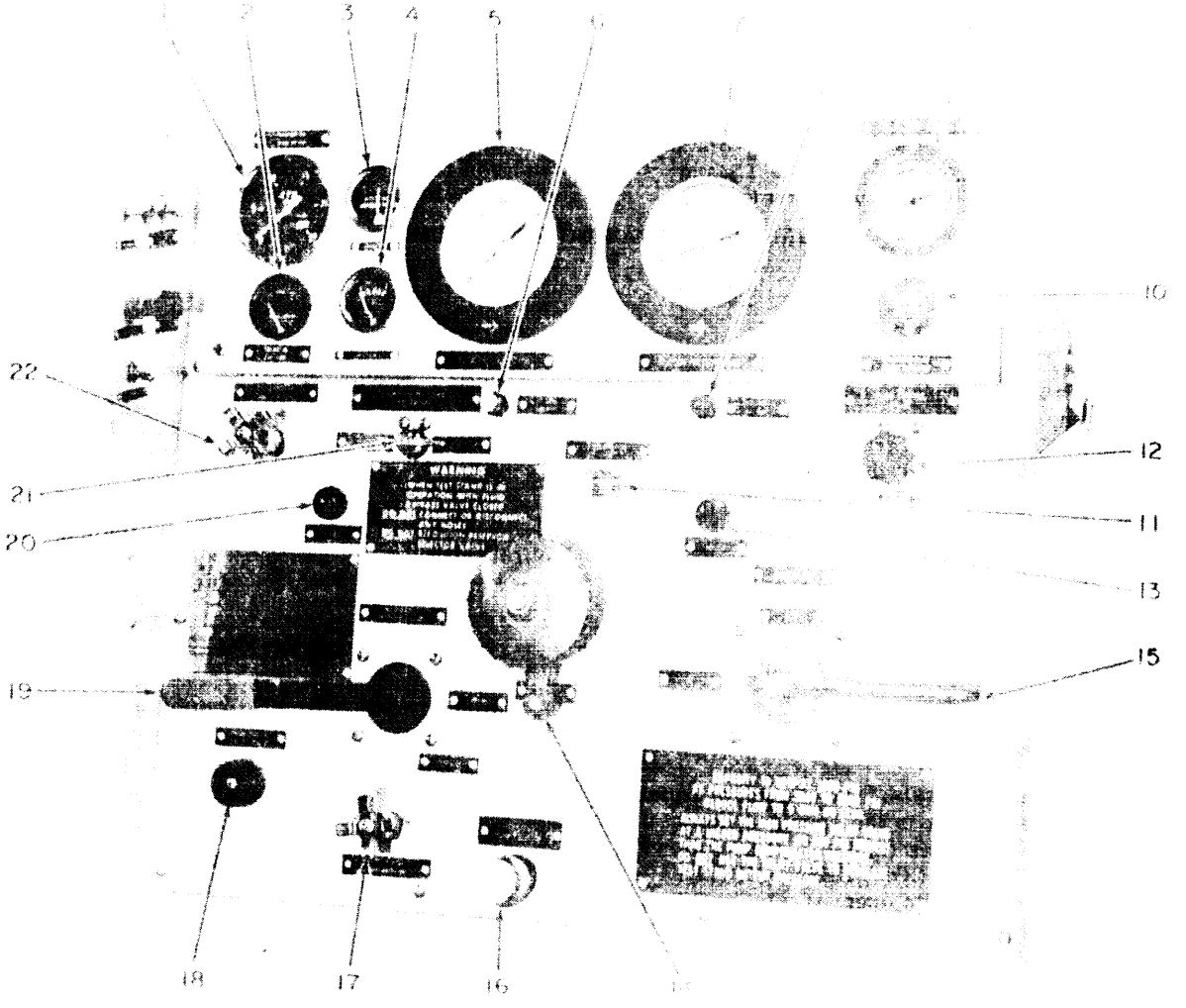
f. Connect the 1/2 inch outlet hose assembly and the 3/4 inch suction hose assembly to the 1/2" OUTLET anti SUCTION RETURN ports at the rear end of the test stand. Connect the other ends of the hose assemblies to the system you are going to test.

2-3. ENGINE START-UP. To start the engine, do the following:

WARNING

Operation of this equipment presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel; wear ear muffs or ear plugs which were fitted by a trained professional.

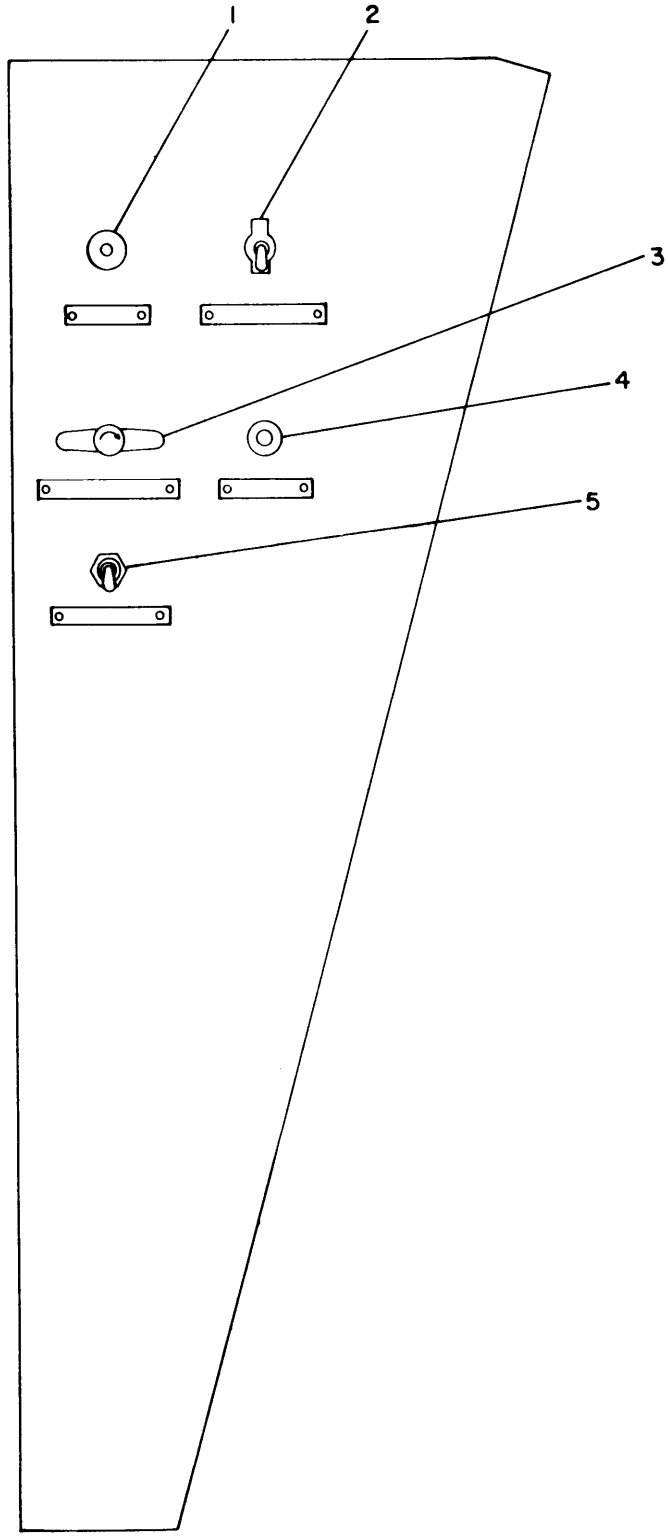
a. Make sure that all valves have been set according to paragraph 2-2c.
b. Make sure that HIGH PRESS BYPASS VALVE control (19, figure 2-1) is set to OPEN. This setting allows the engine to be started with no load.
c. Pull out positive action ground switch (3, figure 2-3) at the bottom of the engine magneto end cover. Leave the ground switch in the full out position.
d. Pull CHOKE control (1, figure 2-2) out about half way.
e. Pull THROTTLE (3, figure 2-2) and twist it to lock at the one-quarter open position.
f. Set IGNITION SWITCH (2, figure 2-2) to ON.
g. Set STARTER switch (5, figure 2-2) to the up position. Hold the switch in this position until the engine starts, then release the switch.
h. Open the choke slowly by pushing in CHOKE control (1, figure 2-2) until the engine is running normally with the CHOKE control pushed all the way in.
i. Using THROTTLE (3, figure 2-2), adjust the engine speed to between 1000 and 1400 RPM. The engine RPM can be read on TACHOMETER HOUR METER (1, figure 2-l). Run the engine



Legend for fig. 2-1:

1. TACHOMETER/HOUR METER
2. ENGINE OIL PRESSURE gage
3. AMMETER
4. FUEL LEVEL gage
5. FLUID PRESSURE GAGE
6. HP GAGE CAL PORT
7. SUCTION PRESSURE GAGE
8. SUCT PRESS CAL PORT
9. FLUID TEMP GAGE
10. RESERVOIR FLUID LEVEL INDICATOR gage
11. FLOW INDICATOR GPM
12. FLOW CONTROL VALVE
13. HP P indicator
14. VOLUME control
15. RESERVOIR valve
16. PRESSURE COMPENSATOR
17. COMPENSATOR SHUTOFF VALVE
18. HIGH PRESS RELIEF VALVE
19. HIGH PRESS BYPASS VALVE control
20. LP P indicator
21. SUCTION PRESSURE FILTER-OUT control
22. FLUID PRESS GAGE SHUTOFF valve

Figure 2-1. Main Control Panel, Controls and Instrumentation



Legend for fig. 2-2:

1. CHOKE control
2. IGNITION SWITCH
3. THROTTLE control
4. FUSE 10A
5. STARTER switch

Figure 2-2. Start-up Panel, Controls

Table 2-1. Function of Main Panel Controls and Instrumentation

Fig. 2-1 Index No.	Description	Function
1	TACHOMETER/HOUR METER	Dual purpose instrument; indicates engine speed (0-2500 RPM) and elapsed operating time of test stand
2	ENGINE OIL PRESSURE gage	Direct reading gage indicates engine oil pressure; normal pressure is shown by green region on gage
3	AMMETER	Direct reading, 30-0-30 ampere meter, located in battery charging circuit; normal reading during operation is at some point to right of zero
4	FUEL LEVEL gage	Indicates amount of gasoline in gas tank of test stand; full tank provides at least four hours of operation
5	FLUID PRESSURE GAGE	High pressure (0-6000 PSI) fluid gage; measures output pressure of test stand
6	HP GAGE CAL PORT	Provides means for connecting external gage for calibration of FLUID PRESSURE GAGE; make sure cap on this port is securely fastened during normal operation of test stand
7	SUCTION PRESSURE GAGE	Direct reading gage (0-30 inches of vacuum, 0-150 PSI pressure); measures suction pressure of test stand
8	SUCT PRESS CAL PORT	Permits connection of external gage for calibration of SUCTION PRESSURE GAGE; make sure cap on this port is securely fastened for normal operation of test stand
9	FLUID TEMP GAGE	Measures temperature of hydraulic fluid over range of -20° to +250°F, with red warning zone beginning at +160°F; never allow fluid temperature to rise above +160° F
10	RESERVOIR FLUID LEVEL INDICATOR gage	Indicates level of hydraulic fluid in reservoir of test stand
11	FLOW INDICATOR GPM	Indicates rate of flow of hydraulic fluid in GPM at 1800 RPM
12	FLOW CONTROL VALVE	Controls flow of hydraulic fluid from test stand; locking device is provided to lock control knob at selected setting
13	HP P indicator	Lights when high pressure filter differential fluid pressure reaches 40 PSI, indicating need to replace high pressure filter element
14	VOLUME control	Positions cam plate of hydraulic pump to provide desired output volume; locking device is provided for locking control at selected setting
15	RESERVOIR valve	When set to OUT, shuts off test stand reservoir to permit use of external reservoir; when set to IN, turns on test stand reservoir
16	PRESSURE COMPENSATOR	Provides means of adjustment to obtain desired discharge pressure; locking device is provided for locking control at selected setting
17	COMPENSATOR SHUTOFF VALVE	Used to isolate pressure compensator from hydraulic system and establish setting of HIGH PRESS RELIEF VALVE; when closed, prevents hydraulic pump from compensating, thereby allowing pump to go to maximum pressure
18	HIGH PRESS RELIEF VALVE	Adjustable, bypass type relief valve that serves as safety device, protecting hydraulic system under test from excessive pressure; knurled locknut is provided to lock valve at selected setting

Table 2-1. Function of Main Panel Controls and Instrumentation - Continued

Fig. 2-1 Index No.	Description	Function
19	HIGH PRESS BYPASS VALVE control	Provides means for directing pump output back to suction return; used with HIGH PRESS RELIEF VALVE and PRESSURE COMPENSATOR to set up fluid flow; dumps pressure
20	LP P indicator	Lights when low pressure filter differential fluid pressure reaches 10 PSI, thereby indicating need to replace filter element
21	SUCTION PRESSURE FILTER-OUT control	Allows SUCTION PRESSURE GAGE to measure pressure drop across low-pressure filter; in FILTER-OUT position, gage measures pressure at low pressure filter output; in FILTER IN position, gage measure pressure at low pressure filter inlet; in CLOSED position, gage is shut off
22	FLUID PRESS GAGE SHUT-OFF valve	When closed, shuts off fluid to FLUID PRESSURE GAGE while external gage is connected to HP GAGE CAL PORT for calibration; make sure this valve is open during normal operation of test stand

Table 2-2. Function of Startup Panel Controls

Fig. 2-2 Index No.	Description	Function
1	CHOKE control	When pulled out, enriches engine fuel mixture for starting engine
2	IGNITION SWITCH	In OFF position, engine magneto is grounded; in ON position, magneto is ungrounded and 12 volt DC is applied to electrical circuits
3	THROTTLE control	Push-pull, twist-to-lock control that sets engine speed governor for desired engine speed
4	FUSE 10A	Protects electrical circuits from overloads and short circuits
5	STARTER switch	Momentary on type; when held in pu position, starter solenoid is energized, thereby applying 12 volts DC momentarily to starter, which starts engine

about 10 minutes to warm it up to its normal operating temperature.

j. Check the oil pressure on ENGINE OIL PRESSURE gage (2, figure 2-1). The needle of the gage should be in the green region on the gage.

k. Check the reading on AMMETER (3, figure 2-1). The AMMETER needle should be a little to the right of center scale.

l. After the engine has warmed up, adjust THROTTLE (3, figure 2-2) to bring the engine speed up to 2000 RPM. Read engine speed on TACHOMETER HOUR METER (1, figure 2-l). Lock the THROTTLE at the setting that produces 2000 RPM (NO LOAD); 1800 RPM at LOAD .

2-4. OPERATION FOR EXTERNAL SYSTEM TESTING. To test an aircraft hydraulic system, operate the test stand as follows:

WARNING

Do not connect or disconnect hose assemblies while the system is under pressure, when HIGH PRESS BYPASS VALVE (19, figure 2-1) is set to CLOSED, or when FLOW CONTROL VALVE (12, figure 2-1) is open.

NOTE

Review the technical manuals for the system that you are going to test. During testing, check FLUID PRESSURE GAGE (5, figure 2-1) and SUCTION PRESSURE GAGE (7, figure 2-1) for erratic or abnormal indications.

a. Check to make sure that all preliminary setup procedures of paragraph 2-2 have been done.

b. Check to see that the outlet hose assembly is tightly connected between the 1/2" OUTLET port of the test stand and the inlet port of the system to be tested. Check to see that the return hose assembly is tightly connected between the 3/4" SUCTION RETURN port of the test stand and the outlet port of the system to be tested.

CAUTION

Always start with RESERVOIR valve (15) set to IN. Never set the RESERVOIR valve to OUT while FLOW CONTROL VALVE (12) is closed, or when a complete hydraulic loop is not provided. Cavitation and damage to the test stand pump may occur if you disregard this caution.

c. Set RESERVOIR valve (15, figure 2-1) to IN if an open loop hydraulic flow system is to be used for testing. Set the RESERVOIR valve to OUT if a closed loop hydraulic flow system is to be used.

d. Start the engine, using the procedures of paragraph 2-3.

e. Turn COMPENSATOR SHUTOFF VALVE (17) fully clockwise to the closed position.

f. Adjust VOLUME control (14) to the position where FLOW INDICATOR GPM (11) indicates the GPM flow needed for the system you are going to test. As you turn the VOLUME control clockwise, you increase the flow. Lock the VOLUME control when you have the correct flow reading.

g. Set HIGH PRESS BYPASS VALVE control (19) to CLOSED.

h. Adjust HIGH PRESS RELIEF VALVE (18) so that it relieves pressure at about 200 PSI above the system pressure needed for test. As you turn this valve clockwise, you increase the pressure relief point. Read system pressure on FLUID PRESSURE GAGE (5).

i. Turn COMPENSATOR SHUTOFF VALVE (17) fully counterclockwise to open. The system pressure reading on FLUID PRESSURE GAGE (5) will drop.

j. Turn PRESSURE COMPENSATOR (16) clockwise until FLUID PRESSURE GAGE (5) reads slightly above the highest pressure of the system you are going to test. Lock the PRESSURE COMPENSATOR at this setting.

k. Turn FLOW CONTROL VALVE (12) counterclockwise to the open position. Proceed with the specified tests of the aircraft hydraulic system.

l. Set RESERVOIR valve (15) to IN if the test stand reservoir is to be used. Set this valve to OUT if the reservoir of the system under test is to be used.

2-5. SHUT-DOWN. To shut down the test stand after use, do the following:

a. Set HIGH PRESS BYPASS VALVE control (19, figure 2-1) to OPEN.

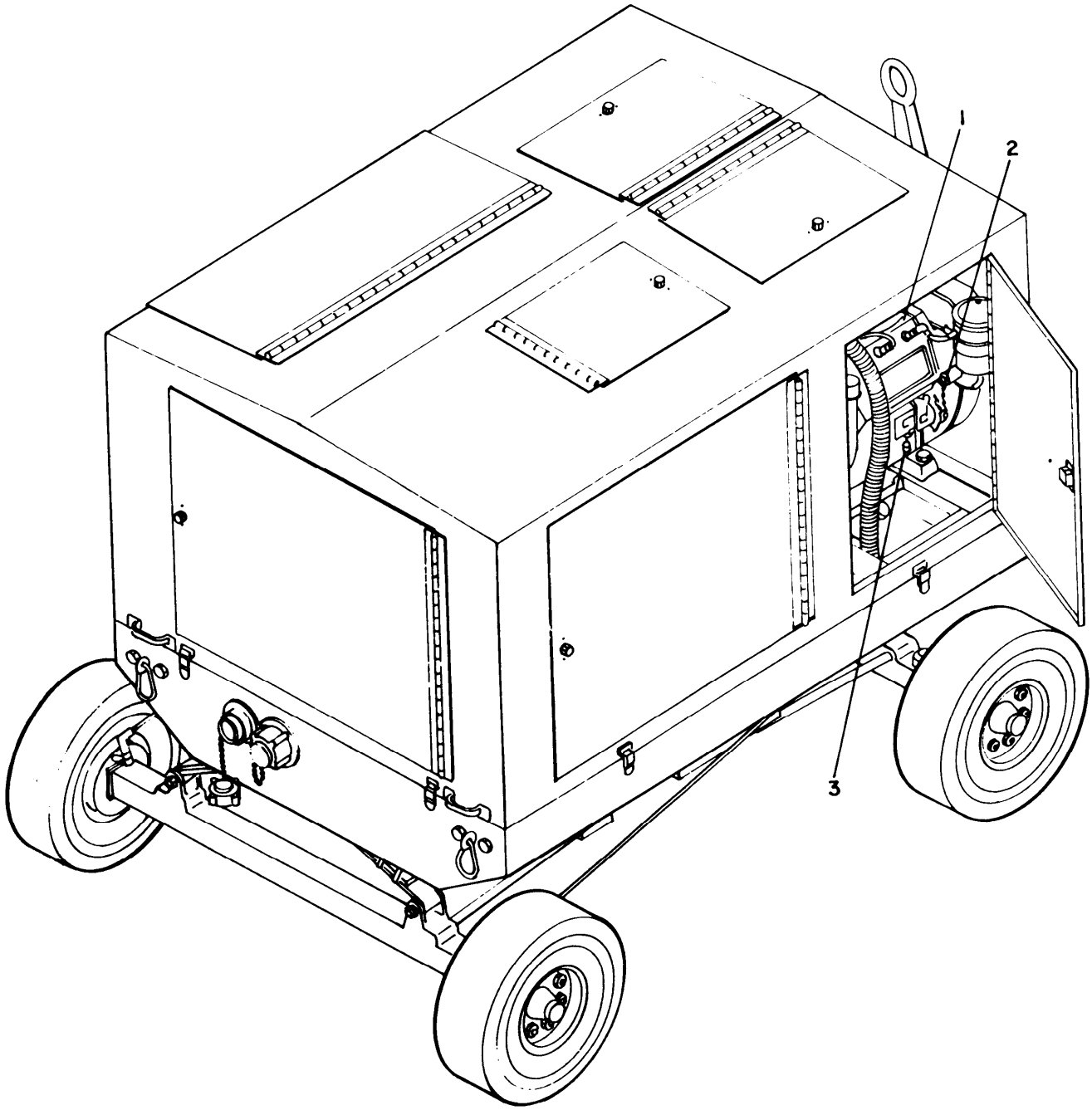
b. Turn FLOW CONTROL VALVE (12, figure 2-1) fully clockwise to close.

c. Turn PRESSURE COMPENSATOR (16, figure 2-1) fully counterclockwise to open.

d. Idle the engine of the test stand for about five minutes.

e. Set IGNITION SWITCH (2, figure 2-2) to OFF.

f. Remove the hose assemblies from the test stand and the system that you tested. Install dust plugs on both ends.



Legend for fig. 2-3:

1. Gasoline engine
2. Magneto
3. Positive action ground switch

Figure 2-3. Magneto Control

CHAPTER 3

AVIATION UNIT MAINTENANCE INSTRUCTIONS

Section I. PREPARATION FOR INSTALLATION, STORAGE, AND SHIPMENT

3-1. PREPARATION FOR INSTALLATION.

a. Uncrating. Remove the test stand from its shipping container (figure 3-1) as follows:

(1) Disconnect the tie down straps.
(2) Connect cable slings to the lifting eyebolts of the test stand. Using a lifting device that can lift over 2000 pounds, lift the test stand out of its shipping container.

b. Unpacking. After uncrating the test stand, do the following:

(1) Remove all pressure sensitive tape from seams, doors, panel screens, and ventilation ducts.
(2) Remove all barrier material from ventilation ducts and screens.
(3) Remove all dessicant bags from inside the test stand cabinet.
(4) Remove pressure sensitive tape from all sealed openings.

c. Cleaning. After unpacking the test stand, clean it as follows:

(1) Remove preservative from the outside surfaces of the test stand with solvent (item 1, table 1-7).
(2) Blow away dust and loose packing material from the test stand, using a low pressure air source.

d. Preinstallation Inspection. Carefully inspect the test stand for any signs of damage that might have occurred during shipment. Correct all deficiencies. Make certain that:

(1) All gages and controls on the control panels are not damaged, missing, or loose.
(2) All major components (figures 1-2 and 1-3) are not damaged, missing, or loosely mounted.
(3) Hydraulic tubing is not damaged, and all fittings in the hydraulic and fuel line systems are tightly connected.
(4) All hand operated controls and switches operate freely.
(5) All electrical connections are tight.
(6) All four tires show no signs of deep cuts, fabric breaks. or excessive wear.
(7) All tires are inflated to about 60 PSI.

e. Preliminary Lubrication. Check the oil level in the engine crankcase. Make sure that all points listed in table 3-5 are properly lubricated.

NOTE

If the engine crankcase has been filled with corrosion preventive compound for storage or shipment, drain all corrosion preventive compound before lubrication.

f. Battery Activation. The battery is supplied with the test stand, but is not activated. The battery must be activated as follows:

WARNING

The battery generates explosive gas; keep flames, sparks, and hot glowing objects away. Ventilate the area while charging a battery. The battery heats up during activation. Wear protective gloves if you have to handle the battery before it can cool down.

CAUTION

Never add acid to the battery. Do not break seals until the battery is to be activated. Do not use mineral water to activate the battery; use fresh, clean water from the cold water tap.

(1) Open the flip cap vents along the center line of the battery top. Using the knockout tool supplied with the battery, break the seal in each of the six vent tubes. Do not try to retrieve the sealing discs.
(2) Close the flip cap vents.
(3) Remove the initial fill caps along the edge of the battery top. Using the knockout tool, break the seal at the bottom of each of the six filler tubes. Do not try to retrieve the sealing discs.

CAUTION

Keep your fingers out of the filler tubes. Newly exposed surfaces may have a film of concentrated acid.

(4) Pour clean, cold tap water slowly through the filler tubes until the water level in each cell is up to the bottom of the filler tube.
(5) Install the initial fill cap filler plugs. Press them down firmly, and make sure that they rest on the cover. These plugs need never be removed again.

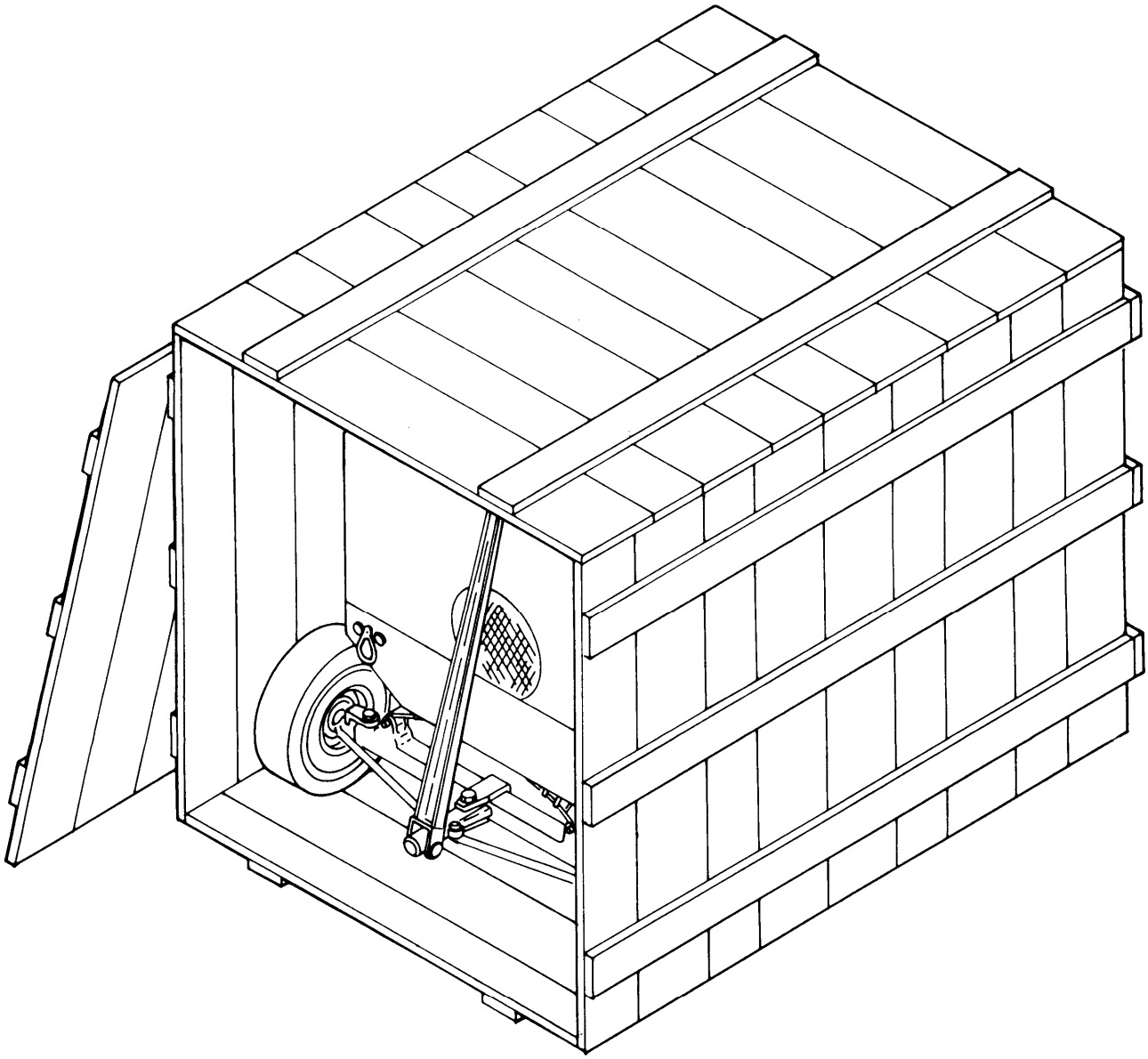


Figure 3-1. Test Stand Packing/Unpacking

(6) Charge the battery at 30 amperes for 30 minutes only if it is to be installed during cold weather.
(7) Install the battery in the test stand, noting the following:
  (a) Inspect the battery cables, clamps, and hold- down. Clean, if dirty: replace, if worn or corroded. New battery cables insure efficient battery operation.
  (b) Install the battery in the test stand. Make sure that terminal posts and battery connections are clean and tight, and that connections are not reversed, Reversed battery connections will damage the charging system. Check with a DC voltmeter.
(8) After the battery has cooled, or within one month of installation, check the battery liquid level. If necessary, add clean, cold tap water through the flip cap vent tubes to bring the liquid to the right level.

WARNING

Before filling the fuel tank of the test stand, always ground the fuel tank and the fuel container. This prevents sparking. Do not fill the fuel tank near flames or hot glowing objects.

g. Fuel System. Fill the fuel tank of the test stand with fuel, Specification MIL-G-3056 or MIL-F-5572. Make sure that fuel shutoff cock (figure 3-2) is open. Check the fuel strainer for leaks.

h. Hydraulic System. Prepare the hydraulic system as follows:

(1) Remove the drain plug from the low pressure filter and drain any corrosion preventive compound from the hydraulic system. Then, install the drain plug.
(2) Set all test stand valves according to paragraph 2-2c.
(3) Fill the hydraulic reservoir of the test stand with about 20 gallons of hydraulic fluid.
(4) Remove the 1/2 inch cap from the 1/2 inch tee going to the hydraulic pump case. This tee is behind the left rear access door of the test stand near the reservoir drain valve. Fill the hydraulic pump case with hydraulic fluid. Install the 1/2 inch cap on the tee.
(5) Open the bleed valve on low pressure filter assembly (1, figure 1-3). When a steady flow of hydraulic fluid shows that all traces of air have been removed, close the bleed valve.

NOTE

If you have trouble bleeding the hydraulic system, check the filter element of the low pressure filter assembly.

(6) Remove the cap from the filler neck of the test stand reservoir.
(7) Connect the 1/2 inch outlet hose assembly to the 1/2" OUTLET port at the front end of the test stand. Remove the coupling from the free end of the hose assembly. Insert the free end of the hose assembly in the reservoir filler neck. Take care not to damage the strainer screen.
(8) Start up the engine of the test stand, using the procedures of paragraph 2-3.
(9) Turn FLOW CONTROL VALVE (12, figure 2-1) fully counterclockwise to open.
(lo) Set VOLUME control (14) to the position that produces a 2 GPM indication on FLOW INDICATOR GPM (11).
(11) Set HIGH PRESS BYPASS VALVE control (19) to CLOSED.
(12) Turn COMPENSATOR SHUTOFF VALVE (17) clockwise to close until some pressure is shown on FLUID PRESSURE GAGE (5). Check the fluid flow until there is no trace of air in the fluid.
(13) Shut down the test stand. Set HIGH PRESS BYPASS VALVE (19) to OPEN. Turn VOLUME control (14) counterclockwise to the fully closed setting. Turn FLOW CONTROL VALVE (12) clockwise to the fully closed setting.
(14) Remove the 1/2 inch outlet hose assembly from the reservoir. Install the cap on the filler neck of the reservoir. Install the coupling removed from the hose assembly. Disconnect the hose assembly from the 1/2" OUTLET port of the test stand, and install the dust plugs on the cable assembly.
(15) Check the test stand for hydraulic leaks.

3-2. PREPARATION FOR STORAGE.

a. Fuel System. Drain the gasoline from the engine fuel system as follows:

WARNING

To prevent sparks, always ground the fuel container and the test stand fuel tank before draining gasoline. Do not drain gasoline near flames or glowing hot objects.

(1) Make sure that the engine of the test stand is cool.
(2) Make sure that engine shutoff cock (figure 3-2) is open.
(3) Drain the gasoline into a suitable container.
(4) Leave the fuel tank cap off for about 15 minutes to let gasoline fumes escape.
(5) Start up the engine and let it run until it stops by itself.
(6) Install the cap on the fuel tank.

b. Hydraulic System. Drain the hydraulic system as follows:

(1) Get a container that can hold about 30 gallons.

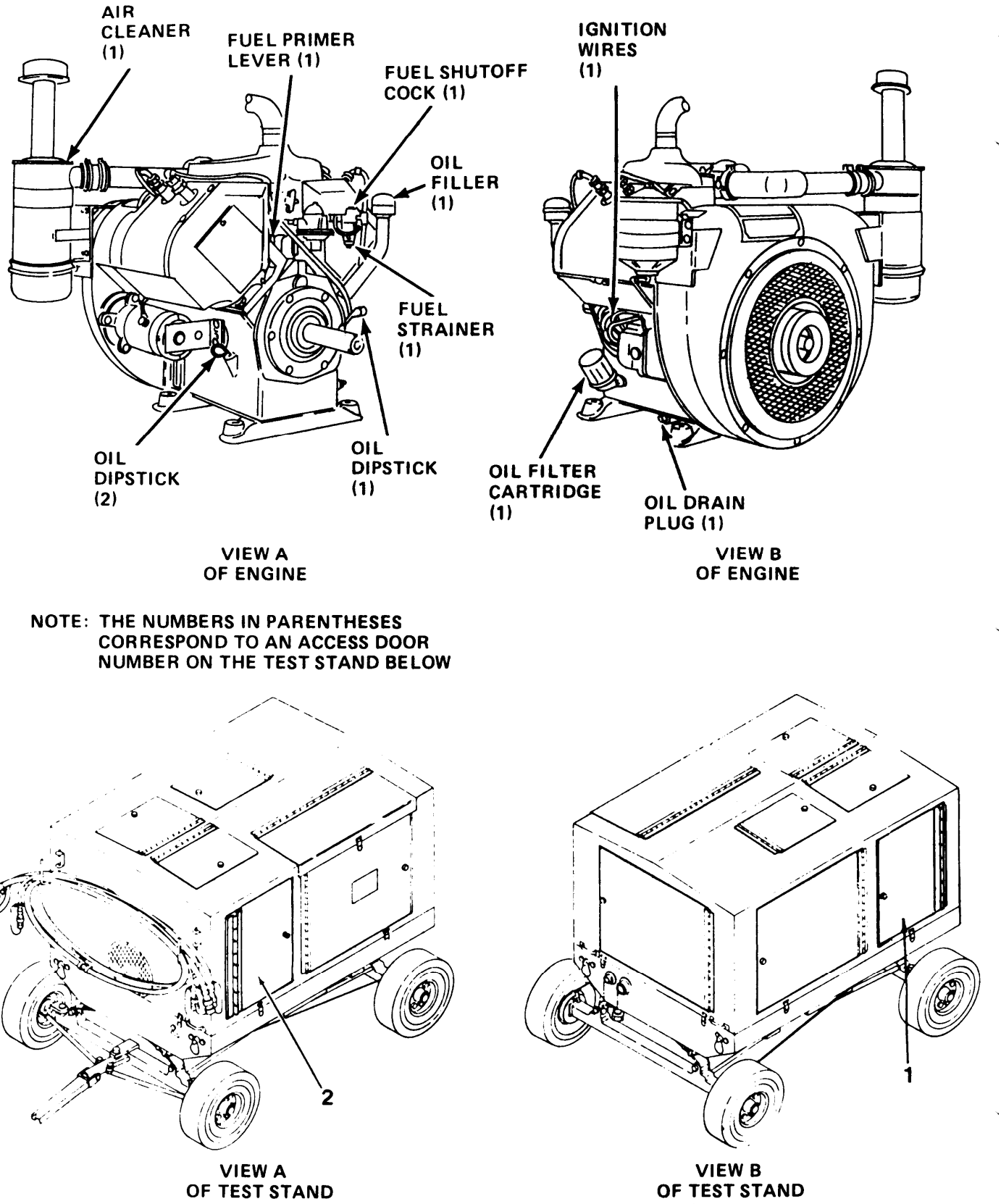


Figure 3-2. Test Stand Engine and Access Points

(2) Place the container under the drain plug at the bottfom of low pressure filter assembly (1, figure 1-3). Remove the drain plug and drain the hydraulic fluid into the container. Then. install the drain plug.
(3) Place the container under the drain plug at the lower right hand corner of pump case (4, figure 1-3). Remove the drain plug and drain the hydraulic fluid from the pump case into the container. Then, install the drain plug.
(4) Fill the hydraulic system with preservative hydraulic oil (item 3, table 1-7).

Remove the battery from the test stand. (Refer to paragraph 3-1la.)

WARNING

Battery electrolyte contains sulphuric acid that can cause severe burns. In case of contact with electrolyte, rinse the area of contact with clean water immediately. Battery cells contain gas: keep flames and hot glowing objects away.

d. Engine Lubrication. Lubricate the engine for storage as follows:

(1) Remove the oil drain plug (figure 3-2) and drain all crankcase oil from the engine. Install the oil drain plug.
(2) Fill the crankcase through oil filler (figure 3-2) with corrosion preventive compound (item 4, table 1-7) to the fill level on the dip stick.

3-3. PREPARATION FOR SHIPMENT, The test stand can be shipped without a shipping container; however, if you received the test stand in a shipping container, use the same container for shipment.

a. Packing. To pack the test stand, proceed as follows:

(1) Complete all steps of paragraph 3-2.
(2) Put several bags of dessicant (item 7, table 1-7) inside the test stand cabinet.
(3) Cover all trailer openings with water resistant barrier material (item 5, table 1-7), Use pressure sensitive tape (item 6, table 1-7) to attach and seal the barrier material.
(4) Seal screens, doors, panels, and other small openings with pressure sensitive tape (item 6, table 1-6).

b. Crating. Crate the test stand as follows:

(1) If a lifting device with a capacity of at least 2000 pounds is available, connect cable slings to the lifting eyebolts on the test stand, and lift the test stand into its carrier. Do not attempt to lift the test stand with a fork lift, If a lifting device is not available, build a ramp to the carrier and roll the test stand into its carrier.
(2) Fasten the test stand to its shipping container using tiedown straps.

c. Special Form. Fill in the shipping form (figure 3-3) and attach it to the unit being shipped.

CONTINUATION SHEET
(AVSCOM Suppl 1 to AR 700-15)

REF NO OF DOCUMENT BEING CONTINUED: TM55-4920-405-13

PAGE | OF

NAME OF OFFEROR OR CONTRACTOR

SECTION G - PRESERVATION/PACKAGING/PACKING
PREPARATION FOR DELIVERY *(OVERHAUL)*

All specifications and standards applicable to the requirements herein shall be the issue in effect on date of invitations for bids.

NOMENCLATURE	STOCK NUMBER
TEST STAND, HYDRAULIC SYSTEM	
	PART NUMBER: 7469 and 7469-1

NET WEIGHT	SHIPPING DIMENSIONS	GROSS WEIGHT	CUBIC FEET
1800 lbs			

1. PRESERVATION AND PACKAGING [X] LEVEL A [ ] LEVEL B

[ ] PACKAGING SHALL BE IN ACCORDANCE WITH SPECIFICATION MIL-P-116. THE FOLLOWING DETAILED REQUIREMENTS SHALL APPLY:

UNIT PKG QTY	METHOD	PRESERVATIVE	WRAP	DUNNAGE	CONTAINER
I	II	AS REQUIRED	MIL-B-131 CLASS 1	WOOD BLOCKING AND BRACING	SEE PACKING

[ ] a. ITEMS SHALL BE PRESERVED AND PACKAGED IN ACCORDANCE WITH FED-STD-356.

[ ] b. OTHER

2. PACKING [X] LEVEL A [ ] LEVEL B

[ ] a. ITEMS, PRESERVED AND PACKAGED AS ABOVE, SHALL BE PACKED IN SNUG-FITTING FIBERBOARD CONTAINERS CONFORMING TO WEATHER-RESISTANT CLASS OF PPP-B-636.

[ ] b. ITEMS, PRESERVED AND PACKAGED AS ABOVE, SHALL BE PACKED IN SNUG-FITTING CONTAINERS CONFORMING TO PPP-B-601, STYLE I, OVERSEAS TYPE.

[ ] c. ITEMS, PRESERVED AND PACKAGED AS ABOVE, SHALL BE PACKED IN ACCORDANCE WITH FED-STD-356.

[ ] d. NO PACKING REQUIRED (THE UNIT CONTAINER IS THE SHIPPING CONTAINER).

[X] e. OTHER MIL-C-104 CRATE, TYPE I, CLASS 1 OR 2
STYLE A

3. MARKING

[X] a. MARKING OF SHIPMENTS
THE CONTRACTOR SHALL MARK ALL SHIPMENTS UNDER THIS CONTRACT IN ACCORDANCE WITH THE EDITION OF MIL-STD-129, "MARKING FOR SHIPMENT AND STORAGE," IN EFFECT AS OF THE DATE OF THE SOLICITATION.

[ ] b. MARKING SHALL CONFORM TO REQUIREMENTS OF FED-STD-356.

[ ] c. MATERIEL CONDITION MARKING SHALL BE APPLIED IN ACCORDANCE WITH MIL-STD-129. A MATERIEL CONDITION TAG OF THE APPLICABLE TYPE WILL BE SECURELY ATTACHED DIRECTLY TO ALL UNINSTALLED OR STORED AERONAUTICAL OR AIR DELIVERY ITEMS. WHEN SUCH ITEMS ARE PLACED OR STORED IN CARTONS, PACKAGES, CRATES OR METAL SHIPPING CONTAINERS, A DUPLICATE MATERIEL CONDITION TAG OR LABEL WILL BE SECURELY ATTACHED TO THE EXTERIOR OF THE PACKAGE OR CONTAINER IN SUCH A MANNER THAT WILL AFFORD MAXIMUM PROTECTION FROM HANDLING AND WEATHER. TAGS WILL BE COMPLETED EITHER BY TYPEWRITTEN OR PRINTED BLACK LEAD PENCIL ENTRIES. ITEMS OF A COMMON OR NONTECHNICAL NATURE *(i.e., common hardware, bulk materials, etc.)* THE SERVICEABILITY OF WHICH IS OBVIOUS, AND THE IDENTITY AND INSPECTION REQUIREMENTS ADEQUATELY INDICATED BY COMMERCIAL TAGS, LABELS OR MARKINGS, MAY BE RECEIVED, STORED, ISSUED OR SHIPPED WITHOUT MATERIEL CONDITION TAGS.

[ ] d. EXTERIOR SHIPPING CONTAINERS OF SIMS *(Selected Item Management System)* MATERIEL SHALL BE MARKED WITH SIM PROJECT CODE DISC LABELS IN ACCORDANCE WITH MIL-STD-129. THE CONTRACTING OFFICER WILL PROVIDE SIM PROJECT CODE LABELS ON REQUEST. THEY ARE AVAILABLE IN TWO SIZES, 3 X 3 AND 9 X 9. SPECIFY ON YOUR ORDER THE SIZE AND QUANTITY REQUIRED.

PREPARED BY	ORGANIZATION	DATE
NATHAN SILVERMAN	DRSTS-SDP(2)	3 FEB 78

SAV HQ Form 1512
1 Jun 77

Edition of 1 Nov 75, is obsolete.

Figure 3-3. Preservation, Packaging, Packing, and Marking Requirements Document

Section II. INSPECTIONS AND SERVICING

3-4. INSPECTIONS. Refer to table 3-1 for daily inspection requirements. Daily inspections should be performed before and/or after each day's operation. Intermediate and periodic inspections (tables 3-2 and 3-3) will be done at operating intervals of 50 and 100 hours.

3-5. SERVICING. Refer to table 3-4 for daily servicing requirements, and to table 3-5 for a list of lubricants to be used.

NOTE

Keep all foreign matter out of lubricants. Do not leave lubricant containers open any longer than necessary. Store lubricants in a clean, dry area.

Table 3-1. Daily Inspection Requirements

Item	Period	Requirements
Hydraulic reservoir	Preinspect/postinspect	Check fluid level; add fluid as needed. Inspect for leaks. Check hydraulic line connections for loose connections and damage. Correct or report defects.
Fuel system	Preinspect/postinspect	Check fuel level; add gasoline as needed. Inspect for leaks. Check fuel lines for loose connections and damage. Correct or report defects.
Fuel strainer	Preinspect/postinspect	Inspect bowl of strainer for dirt or water; clean as needed. Correct or report defects.
Engine	Preinspect/postinspect	Check oil level; add oil as needed. Inspect for oil leaks near oil filter and crankcase drain plug. Correct or report defects.
Battery	Preinspect/postinspect	Check electrolyte level; add water as needed. Inspect for loose or broken connections, and excessive corrosion. Correct or report defects.
Cabinet interior	Preinspect/postinspect	Check electrical wiring for breaks, worn insulation, and loose connections. Correct or report defects.
Trailer	Preinspect/postinspect	Check tires for 60 PSI pressure; inflate as needed. Inspect tires for deep cuts and excessive wear. Correct or report defects.
Control panel gages and controls	Preinspect/postinspect	Check for broken glass, bent indicating needles, or other obvious defects. Check that all controls operate smoothly and are tightly mounted. Correct or report defects.
Test stand	Postinspect	Start and operate test stand and check for hydraulic leaks. Check to make sure that 3000 PSI hydraulic pressure can be obtained at maximum GPM flow. Check temperature and flow indicators. (Refer to chapter 2, section II.)

Table 3-2. Intermediate Inspection Requirements

Item	Period	Requirements
General	50 hr	Check general appearance of test stand, paying particular attention to cleanliness. perform services listed in table 3-1.
Lubrication fittings	50 hr	Check for missing or damaged lubrication fittings and for indications of improper lubrication. Lubricate according to table 3-5. Replace missing or damaged fittings. Correct all oil or grease leaks.
Crankcase	50 hr	Inspect oil level in engine crankcase. Check for oil leaks.
Manifold	50 hr	Inspect for leaks, loose mounting hardware, and defective gaskets. Tighten loose mounting hardware. During first weekly servicing of new or reconditioned engine, let engine warm up to normal operating temperature and tighten all loose bolts between 25 and 32 ft-lb torque.
Muffler	50 hr	Inspect for leaks, corrosion, loose mounting hardware, and defective gaskets. Tighten loose mounting hardware.
Valve mechanism	50 hr	If engine valves are noisy, or loss of power is noticed, inspect valve mechanism. Remove valve covers and adjust valve lifter clearance as needed. Correct intake valve lifter clearance is 0.0080 inch; exhaust valve lifter clearance is 0.0160 inch. Replace cover gaskets as necessary.
Magneto	50 hr	Inspect ignition magneto for loose mounting bolts and loose wiring connections. Correct any defects. Remove end cap and inspect distributor cap for cracks and corroded terminals. Check breaker point gap; correct gap is 0.015 inch at full separation of points.
Spark plugs	50 hr	Inspect for loose spark plugs, poor connections, and dirty or broken insulators. Replace damaged spark plugs. Clean dirty spark plugs. Set spark plug gap to 0.0300 inch.
Starter motor	50 hr	Check for loose mounting hardware. Examine brushes, brush holders, and sprinngs. Inspect commutators for dirt and scoring. Correct or report defects.
Alternator	50 hr	Check for loose mounting hardware, and loose electrical connections. Correct defects.
Voltage regulator	50 hr	Check to ensure roper operation, tight electrical connections, and firm mounting. Voltage regulators should allow appreciable charge to battery after starter is used. After battery is fully charged. AMMETER should read only a slight charge. Tighten loose mounting hardware and electrical connections. Adjust or replace defective voltage regulator.
Control panel	50 hr	Inspect control panel for loose mounting hardware and missing shock mounts.
Gages and meters	50 hr	Check to see that all gages indicate correctly and that glass is not cracked or broken. Tighten loose mounting hardware and hydraulic connections. Replace any defective or damaged gage. Check to see that all meters are tightly mounted and operate proper ly. Check that glass is not cracked or broken and pointers are not bent or broken. Tighten loose electrical connections and mounting hardware. Replace any defective or damaged meter.
Control valves	50 hr	Inspect all control valves for packing leaks. Check to see that the operate properly. See that handwheels are tightly mounted. Tighten packing, or replace if necessary. Replace any defective or damaged valve.

Table 3-2. Intermediate Inspection Requirements – Continued.

Item	Period	Requirements
Tires	50 hr	Inspect all tires for underinflation, abnormal or uneven wear, cuts, embedded foreign matter, and missing valve caps. Remove embedded foreign matter. Replace cut or worn tires. Ensure that all tires are inflated to correct pressure (60 PSI) and that all valve caps are in place.
Wheels	50 hr	Inspect for loose wheel mounting bolts. Inspect wheel bearings for proper adjustment. Tighten loose wheel bolts and adjust wheel bearings as required.
Axle	50 hr	Inspect axle assemblies for loose mounting and misalignment. Inspect springs for cracks, breaks, and weakened condition. Tighten all axle mounting bolts. Align front wheels as required. Replace defective springs.
Brake assembly	50 hr	Check brake assembly for unsatisfactory braking action. Check brake rods for loose mounting. Tighten all brake assembly mounting hardware and adjust brakes as required.
High pressure filter assembly	50 hr	Inspect filter assembly for dirt or clogged condition causing excessive pressure drop. Replace dirty or clogged filter element.
Thermoswitch	50 hr	Inspect thermoswitch for correct temperature response and for loose mounting. Replace defective or damaged thermoswitch.
Low pressure filter assembly	50 hr	Inspect falter assembly for dirt or clogged condition causing excessive pressure drop. Replace dirty or clogged filter element.
Engine air cleaner	50 hr	Inspect air cleaner for accumulated dirt. Clean and service if necessary. (See table 3-5).

Table 3-3. Periodic Inspection Requirements

Item	Period	Requirements
General	100 hr	Inspect test stand for general appearance, paying particular attention to cleanliness. Perform services listed in table 3-1.
Lubrication fittings	100 hr	Inspect for missing or damaged lubrication fittings and for indications of improper lubrication. Replace missing or damaged fittings. Correct all oil and grease leaks. Lubricate in accordance with table 3-5
Crankcase	100 hr	Inspect oil level in engine crankcase. Inspect for oil leaks. Add oil as necessary. Correct all oil leaks.
Oil seals	100 hr	Inspect for damaged or defective oil seals.
Markings	100 hr	Inspect identification plates and markings for illegibility.
Paint	100 hr	Inspect for chipped paint and exposed and rusty metal.
Cylinder head	100 hr	Inspect engine cylinder head for leaks, loose mounting bolts, and defective gaskets. Tighten loose mounting hardware. (During first weekly servicing of new or reconditioned engine, let engine warm up to normal operating temperature and tighten all loose bolts to between 25 and 32 ft-lb torque.
Manifold	100 hr	Inspect for leaks, loose mounting hardware, and defective gaskets. Tighten loose mounting hardware.
Engine air cleaner	100 hr	Inspect air cleaner for accumulated dirt. Clean and service if necessary (See table 3-5).

Table 3-3. Periodic Inspection Requirements - Continued

Item	Period	Requirements
Muffler	100 hr	Inspect for leaks, loose mounting hardware, and defective gaskets. Tighten loose mounting hardware.
Valve mechanism	100 hr	Inspect valve mechanism if valves are noisy or loss of engine power is evident. Remove valve covers and adjust valve lifter clearance, if necessary. Correct valve lifter clearance is 0.0080 inch for intake valves, and 0.0160 inch for exhaust valves. Replace defective cover gasket.
		Remove spark plugs from engine and test cylinder compression by turning over engine several times to stabilize compression gage reading. If gage reading varies more than 10 pounds between four cylinders, inspect cylinder head bolts for looseness. Tighten any loose bolts and retest. If low compression or variation in compression persists, trouble lies with cylinder head gasket, valves, or piston rings.
Spark plugs	100 hr	Inspect for loose spark plugs, poor connections, dirty or broken insulators, and fouled spark 'plugs. Replace damaged or worn plugs. Clean dirty plugs and set gap to 0.0300 inch.
Magneto	100 hr	Inspect ignition magneto for loose mounting bolts and electrical connections. Correct any deficiencies noted. Remove end cap and inspect distributor cap for cracks and corroded terminals. Check breaker point gap. Correct gap is 0.015 inch at full separation of points.
Starter motor	100 hr	Inspect for loose mounting bolts and electrical connections. Examine brushes, brush holders, and springs. Inspect commutator for dirt and scoring. Tighten loose mounting bolts and electrical connections. Replace brushes worn to one-half their original length.
Alternator	100 hr	Check alternator using procedures of paragraph 4-3.
Voltage regulator	100 hr	Check for incorrect operation, loose electrical connections, and loose mounting hardware. Voltage regulator should allow appreciable charge into battery after starter is used; afterwards, only a slight charge in current should be read on AMMETER. Tighten loose mounting hardware and electrical connections. Adjust or replace defective voltage regulator.
Control panel	100 hr	Inspect control panel for loose or missing shock mounts.
Gages and meters	100 hr	Check to see that all gages indicate correctly and that glass is not cracked or broken. Tighten loose mounting hardware and hydraulic connections. Replace damaged or defective gage. Check to see that all meters are tightly mounted, are operating properly, glass is not cracked or broken, and pointers are not bent or broken. Tighten loose mounting hardware and electrical connections. Replace damaged or defective meter.
Control valves	100 hr	Check to see that control valves operate properly, show no signs of packing leaks, and manual controls are tightly mounted. Tighten or replace packing as necessary. Replace defective or damaged control valve.
Tires	100 hr	Inspect tires for underinflation, abnormal or uneven wear, cuts, embedded foreign material, and missing valve caps. Remove any foreign matter from tires. Ensure that all tires are inflated to 60 PSI, and that all valve caps are in place.

Table 3-3. Periodic Inspection Requirements - Continued

Item	Period	Requirements
Wheels	100 hr	Inspect for loose wheel mounting bolts. Inspect wheel bearings for proper adjustment. Tighten loose wheel bolts and adjust wheel bearings as necessary.
Axle	100 hr	Inspect axle assemblies for loose mounting hardware and improper alignment. Inspect springs for cracks, breaks, and weakened condition. Tighten all axle mounting hardware. Align front wheels as necessary. Replace defective springs.
Brake assembly	100 hr	Check to ensure that brakes operate properly. Inspect brake rods for loose mounting. Tighten all mounting hardware. Adjust brakes as necessary.
Hydraulic pump	100 hr	Inspect hydraulic pump for loose mounting hardware and hydraulic connections. Make sure that drive coupling is securely mounted and properly aligned. Tighten all loose mounting hardware and hydraulic connections. Replace defective drive coupling.
Hose assemblies	100 hr	Inspect all hose assemblies for loose connections, cracks, breaks, and frayed or rotted fabric covering. Tighten loose connections. Replace hose assembly, if it is otherwise defective.
Hydraulic tubing	100 hr	Inspect tubing for cracks, breaks, and distortion. Tighten all hydraulic connections. Replace damaged or defective tubing or fittings.
High pressure filter assembly	100 hr	Inspect filter assembly for dirty or clogged filter element that causes excessive pressure drop. Replace dirty or clogged filter element.
Thermoswitch	100 hr	Check thermoswitch for correct temperature response. Make sure it is tightly installed. Replace damaged or defective thermoswitch.
Low pressure filter assembly	100 hr	Inspect filter assembly for dirty or clogged filter element that causes excessive pressure drop. Replace dirty or clogged filter element.

Table 3-4. Daily Servicing

System	Component	Requirement
Electrical	Battery	Open flip-cap vents along center line of battery top and check water level. If necessary, add clean, cold tap water through flip-cap vent tubes to bring level of each cell to bottom of tube.
	Ignition wires (figure 3-2)	Check connections; tighten if necessary.
Hydraulic	Reservoir (figure 1-3)	Check reservoir fluid level. Add hydraulic fluid, if necessary, to fill.
Engine	Crankcase (figure 3-2)	Using dip stick, check oil level. If low, add oil (table 3-5).
	Fuel strainer (figure 3-2)	Check for foreign matter and water. Clean as needed.
Miscellaneous	Fuel tank	Check reading on FUEL LEVEL GAGE with IGNITION SWITCH set to ON. Add gasoline as needed to bring reading to full mark (paragraph 3-8).
	Tires	Check tire pressure. Inflate to 60 PSI.
	Access door hinges	Check for free movement. Lubricate, if needed (table 3-5).
	Draw bar	Check for free movement. Lubricate, if needed (table 3-5).

Table 3-5. Lubricants

Item	Operating Temperature Ranges (°F)		
	Above +32° to +40°	-10° to +40°	-65° to 0°
Engine crankcase	SAE 30 MIL-L-2104	SAE 10 MIL-L-2104	Engine oil, sub zero MIL-L-10295
Air cleaner	SAE 30 MIL-L-2104	SAE 10 MIL-L-2104	Engine oil, sub zero MIL-L-10295
Flow indicator	2190	2110	2075
Draw bar assembly	2190	2110	2075
Door hinges and latches	2190	2110	2075
Wheel bearings	GAA grease	GAA grease	GAA grease
Tie rod ends	MIL-G-10924	MIL-G-10924	MIL-G-10924

Section III. PREVENTIVE MAINTENANCE

3-6. GENERAL. To keep the test stand ready for operation, you must attend to preventive maintenance. Correct any defects you find during inspections. Section V of this chapter supplies the information you need to replace authorized parts. Other normal preventive maintenance you must perform consists of cleaning, lubrication, and special maintenance for extreme environmental conditions.

3-7. CLEANING. Clean the test stand using the instructions in paragraph 3-lc.

3-8. LUBRICATION. Lubricate the test stand as follows :

a. Using cleaning solvent (item 1, table 1-7), clean all surfaces around the point that you are going to lubricate.
b. Lubricate each of the points listed in table 3-5. Using the lubricant listed for that point.
c. Operate the test stand for five minutes after engine lubrication. Inspect the oil filter for leaks. Then, shut down the test stand. Wiat five minutes and recheck the oil filter for leaks. Check the oil level in the engine crankcase, using the oil dip stick. Add specified oil as needed to bring the oil level to the full mark on the dip stick.

NOTE

Take proper care of lubricants. When not being used, keep containers tightly covered. Store containers in a dry, clean area. Keep dirt and other foreign matter out of lubricants.

3-9. EXTREME ENVIRONMENTAL MAINTENANCE.

a. Extreme Cold. For extreme environmental maintenance, proceed as follows:

(1) Lubricate in accordance with lubricants in table 3-5.
(2) Always keep the battery electrolyte at the correct level. Keep the battery fully charged.

CAUTION

Whenever you add water to the battery under extreme cold conditions, keep the engine running. This will charge the battery and circulate the water you added. If you do not observe this caution, the added water may freeze and crack the battery case.

(3) Close engine access doors as needed to keep the engine at its normal operating temperature.
(4) Make sure that the oil in the air cleaner is the correct type (table 3-5).
(5) When the test stand is shut down, keep the fuel tank full to prevent condensation.

b. Extreme Heat.

(1) Set up the test stand in a well ventilated area. Keep all access doors open during operation.
(2) Lubricate in accordance with lubricants in table 3-5.
(3) Keep the engine air shrouding, cylinder head, fins, and air openings in the housing free of dirt and other obstructions.
(4) When the test stand is shut down, keep the fuel tank full to prevent condensation.

c. Dusty or Sandy Areas.

(1) Use the lubricants listed in the proper column of table 3-5 to lubricate the test stand. Be careful to keep dust and sand *away* from lubricants, the grease gun, and lubricant containers.
(2) Protect the test stand from dust and sand as much as possible. Keep the test stand clean.
(3) Cover the test stand with a tarpaulin when it is not in use.
(4) If you can, water down the area around the operating site to keep down dust and sand.
(5) Clean the engine oil cleaner after every two to four hours of operation.

d. Rainy or Humid Conditions.

(1) Use the lubricants listed in table 3-5 to lubricate the test stand.
(2) When the test stand is shut down, keep the fuel tank full to prevent condensation.
(3) Keep all electrical parts clean and dry. Watch for fungus growth; remove fungus at once.
(4) Cover the test stand with a tarpaulin or keep it under shelter when it is not in use.

e. Salt Water Areas.

(1) Use the lubricants listed in table 3-5 to lubricate the test stand.
(2) Wipe all exposed areas of the test stand often. Clean off salt deposits with clean water, and wipe dry.
(3) Coat all exposed machined metal surfaces with a thin film of oil.
(4) Retouch or repaint damaged painted surf aces.
(5) Cover the test stand with a tarpaulin or keep it under shelter when it is not in use.

f. High Altitude Areas. If you must use the test stand at high altitudes, use the following special maintenance procedures:

(1) At high altitudes, less oxygen is available to the carburetor. The fuel mixture must be adjusted. Refer to intermediate maintenance for adjustment.
(2) Keep the air cleaner clean in order to let as much air as possible get through to the carburetor.

Section IV. OPERATIONAL CHECKOUT

3-10. GENERAL. Refer to Chapter 2, Section II Operating Procedures for test stand checkout. Section V of this chapter provides repair or replacement instructions authorized at the Aviation Unit Maintenance level. Repair or replacement of all other parts is to be done at Aviation Intermediate maintenance levels.

Section V. REPAIR AND REPLACEMENT OF AUTHORIZED PARTS

3-11. REMOVAL AND REPLACEMENT.

a. Battery. (See figure 3-4.) To remove and replace the battery, proceed as follows:

NOTE

If you are going to install a new battery, activate the new battery according to the instructions in paragraph 3-1f.

(1) Remove nuts (1) and lockwashers (2) from hook bolts (3) that hold cover (4) over battery (7).
(2) Loosen nuts on terminal adapters (5 and 6) and remove terminal adapters, positive terminal first, from battery terminals.
(3) Inspect and clean battery cables.
(4) Remove defective battery and ins tall new battery with positive terminal in the same position as it was with the old battery.
(5) Clean battery terminals and terminal adapters with a stiff wire brush.

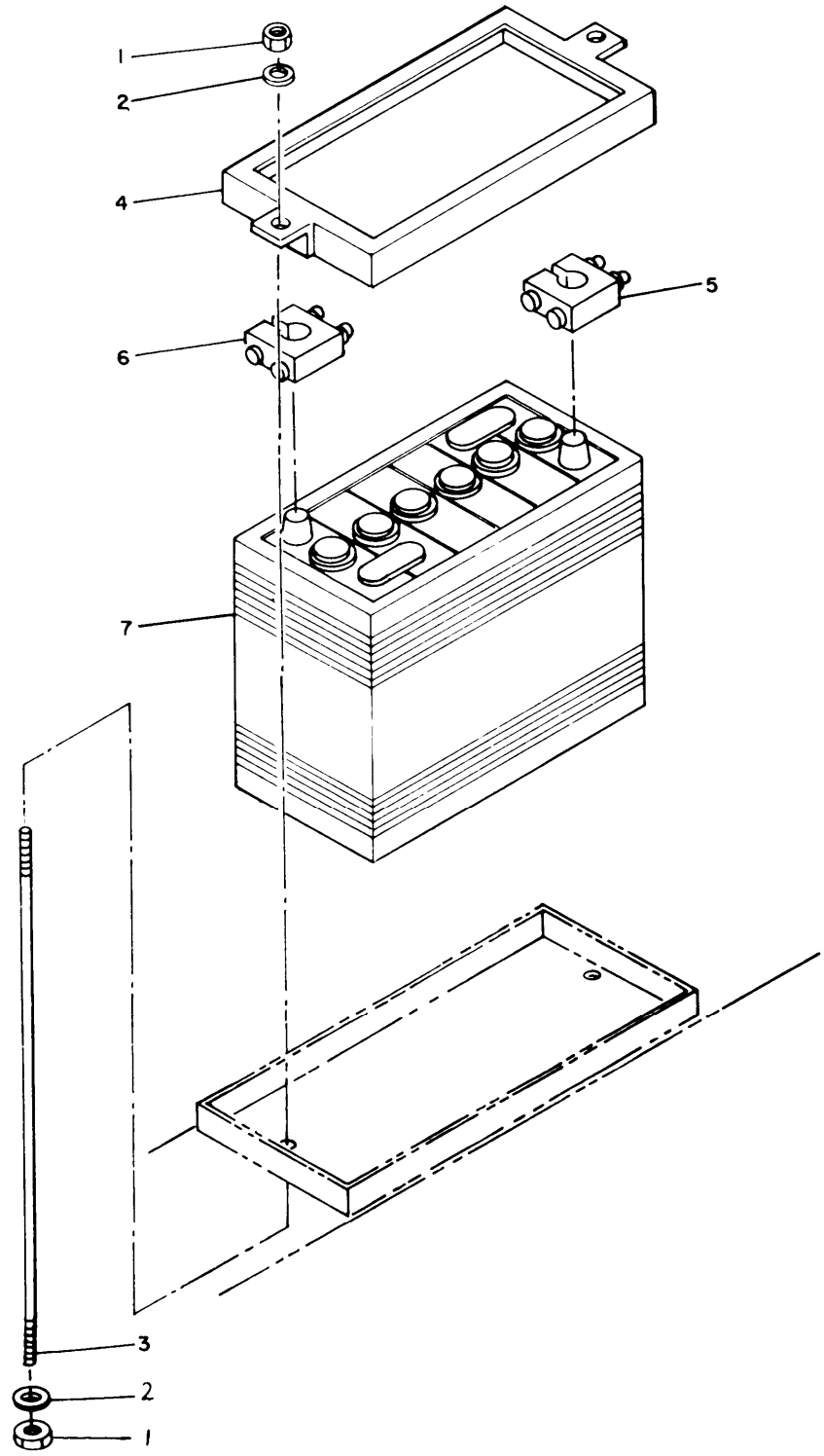
CAUTION

Make sure battery cable connections are not reversed. Damage to the charging system can be caused by polarity reversal.

(6) Install terminal adapters (5 and 6) on the proper battery terminals. Tighten nuts on terminal adapters until terminal adapters are tight and will not move.
(7) Install cover (4) over battery and insert ends of hook bolts (3) through holes in cover.
(8) Install lockwashers (2) and nuts (1) on hook bolts (3).

b. Air Cleaner. (See figure 3-5.) Disassemble and service the air cleaner as follows:

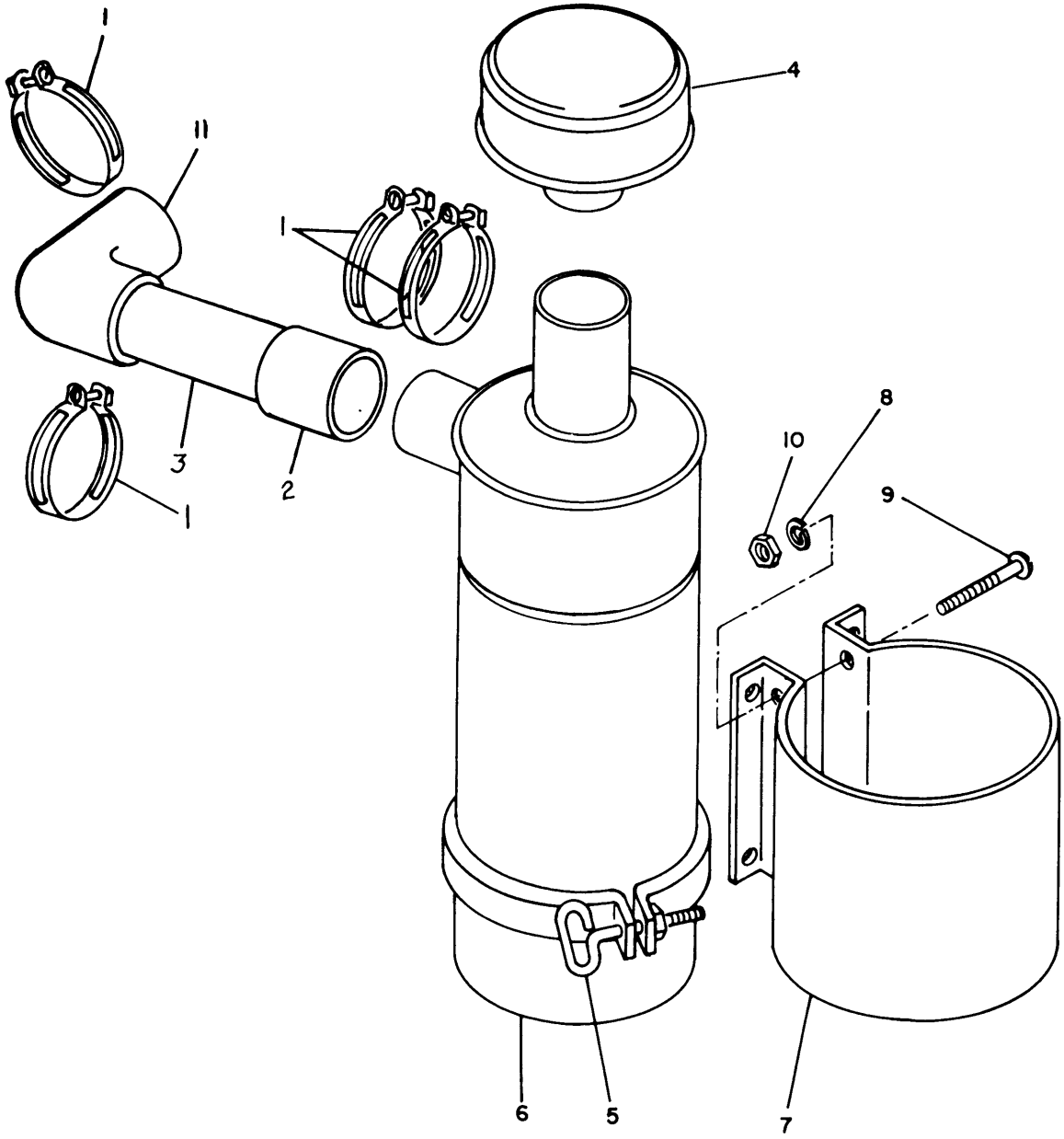
(1) Remove air intake cap (4).
(2) Loosen thumbscrew (5) and remove oil cup (6) from air cleaner assembly.
(3) Discard oil in oil cup (6). Wash oil cup and air intake in approved cleaning solvent (item 1, table 1-7). Dry thoroughly. Fill oil cup (6) to level mark with clean oil of proper grade (table 3-5). Install oil cup on air cleaner assembly and tighten thumbscrew (5).
(5) Install air intake cap (4) on top of air cleaner assembly.



Legend for fig. 3-4:

1. Nut
2. Lockwasher
3. Threaded rod
4. Hold down cover
5. Terminal adapter
6. Terminal adapter
7. Battery

Figure 3-4. Battery Removal and Replacement



Legend for fig. 3-5:

1. Clamp
2. Connector hose
3. Pipe
4. Cap
5. Thumbscrew
6. Oil cup
7. Mounting band
8. Lockwasher
9. Screw
10. Nut
11. Connector hose (elbow)

Figure 3-5. Air Cleaner Disassembly

CHAPTER 4

AVIATION INTERMEDIATE MAINTENANCE INSTRUCTIONS

Section I. PREPARATION FOR MAINTENANCE, STORAGE, AND SHIPMENT

4-1. GENERAL. Preparation for maintenance, storage, and shipment at Aviation Intermediate maintenance is the same as at Aviation Unit maintenance. Refer to Chapter 3, Section I.

Section II. CHECKOUT AND ANALYSIS

4-2. CHECKOUT INSTRUCTIONS. Refer to tables 4-1 through 4-4 for detail performance checks. See figure 4-1 for test setups. Probable causes and corrective actions for problems you find during the performance checks are listed in the tables. Refer to paragraph 4-3 for additional trouble analysis instructions. Repair procedures are provided in Section III of this chapter.

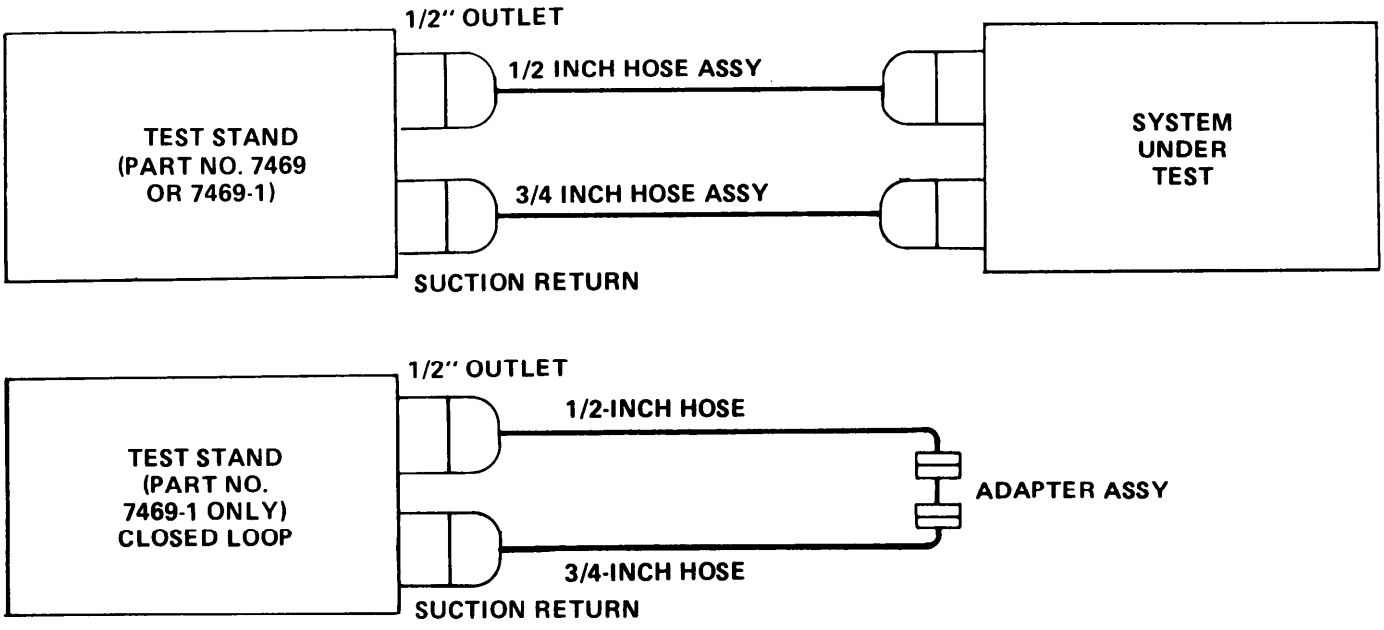


Figure 4-1. Test Setups

Table 4-1. Preliminary Performance Checks

Step	Action	Normal Indication	Abnormal Indication	Corrective Action
1	Set parking brake.	Test stand cannot roll.	Wheels will not lock, continue to roll freely. Probable cause: a. Faulty handbrake assembly. b. Faulty brake rod. c. Faulty brake shoe on rear wheels.	a. Inspect, test, adjust, or replace, as necessary. b. Inspect, test, and replace, as necessary. c. Inspect, test, and replace, as necessary.
2	Open access doors.	Doors open freely and can be locked in open position.	Doors cannot be opened or cannot be locked open because of: a. Faulty latches. b. Faulty hinges. c. Faulty locking bars.	a. Inspect. test, and replace, as necessary. b. Replace as necessary. c. Replace as necessary.
3	Turn PRESSURE COMPENSATOR (16, figure 2-1) fully CCW to open.	PRESSURE COMPENSATOR operates freely.	PRESSURE COMPENSATOR binds or cannot be turned because it is defective.	Replace or repair as necessary.
4	Turn COMPENSATOR SHUTOFF VALVE (17, figure 2-1) fully CCW to open.	COMPENSATOR SHUTOFF VALVE operates freely.	COMPENSATOR SHUTOFF VALVE binds or cannot be turned because it is defective.	Replace or repair as necessary.
5	Turn FLOW CONTROL VALVE (12, figure 2-1) fully CW to close.	FLOW CONTROL VALVE operates freely.	F LOW CONTROL VALVE binds or cannot be turned because it is defective.	Replace or repair as necessary.
6	Turn HlGH PRESS RELIEF VALVE (14, figure 2-1) fully CCW to open.	HIGH PRESS RELIE F VALVE operates freely.	HIGH PRESS RELIEF VALVE binds or cannot be turned because it is defective.	Replace or repair as necessary.
7	Turn FLUID PRESS GAGE SHUTOFF VALVE (22, figure 2-1) fully CCW to open.	FLUID PRESS GAGE SHUTOFF VALVE operates freely.	FLUID PRESS GAGE SHUTOFF VALVE binds or cannot be turned because it is defective.	Replace or repair as necessary.
8	Set HIGH PRESS BYPASS VALVE control (19, figure 2-1) to open.	HIGH PRESS BYPASS VALVE control operates freely.	HIGH PRESS BYPASS VALVE control binds or cannot be turned because valve is defective.	Replace or repair as necessary.
	Set SUCTION PRESSURE FILTER-OUT control (21, figure 2-1) through each of its positions, ending at FILTER-OUT.	SUCTION PRESSURE FILTER-OUT control operates freely.	SUCTION PRESSURE FILTER-OUT control binds or cannot be turned because valve is defective.	Replace or repair as necessary.
10	Turn VOLUME control (14, figure 2-1) fully CCW to zero flow.	VOLUME control turns freely.	VOLUME control binds or cannot be turned because of defective control or pump.	Replace or repair as necessary.

Table 4-1. Preliminary Performance Checks - Continued

Step	Action	Normal Indication	Abnormal Indication	Corrective Action
11	Set RESERVOIR valve (15, figure 2-1) to IN.	RESERVOIR valve turns freely.	RESERVOIR valve binds or cannot be turned because it is defective.	Replace or repair as necessary.
12	Fill fuel tank.	FUEL LEVEL gage (4, figure 2-1) reads full when IGNITION SWITCH (2, figure 2-2) is set to ON.	FUEL LEVEL gage does not indicate, or indicates incorrectly.	Replace FUEL LEVEL gage.
13	Connect hose assemblies between test stand and system that is to be tested.	Hose assembly couplings lock to couplings on test stand and system to be tested.	Hose assembly couplings cannot be attached to test stand or system to be tested because of defective hose assemblies or defective coupling on test stand.	Replace defective hose assemblies or couplings.

Table 4-2. Engine Start-up Performance Checks

Step	Action	Normal Indication	Abnormal Indication	Corrective Action
1	Make sure HIGH PRESS BYPASS VALVE control (19, figure 2-1) is set to OPEN. Pull out positive action ground switch (3, figure 2-2).	Positive action ground switch pulls out and remains out.	Positive action ground switch does not pull out and engine will not start because switch or magneto assembly is defective.	Replace switch.
2	Pull CHOKE control (1, figure 2-2) to full out position, then reset it to about midway.	CHOKE control operates freely.	CHOKE control cannot be pulled, can be pulled out only part way, or binds. Probable cause: a. Defective carburetor. b. Stuck cable to carburetor linkage, or stuck carburetor linkage.	a. Adjust, repair or replace. b. Adjust or replace.
3	Pull THROTTLE (3, figure 2-2) to full out position, and reset to about one-quarter out position. Twist to right to lock, and release.	THROTTLE Operates freely and can be locked.	THROTTLE cannot be pulled out and locked. Probable cause: a. Jammed throttle cable or carburetor linkage. b. Defective carburetor.	a. Adjust or replace. b. Repair or replace.
4	Set IGNITION SWITCH (2, figure 2-2) to ON.	IGNITION SWITCH can be set to ON and remains at ON when released.	IGNITION SWITCH cannot be set to ON because it is defective.	Replace switch.

Table 4-2. Engine Start-up Performance Checks - Continued

Step	Action	Normal Indication	Abnormal Indication	Corrective Action
5	Set STARTER switch (5, figure 2-2) to up position, hold until engine starts, then release switch.	Engine cranks and then starts.	a. Engine will not crank. Probable cause: (1) IGNITION SWITCH set to OFF. (2) Defective battery cable. (3) Defective STARTER switch or wiring. (4) Defective starter solenoid or wiring (5) Defective starter motor. (6) Battery discharged.	a. (1) Set IGNITION SWITCH to ON and repeat step. (2) Repair or replace battery cable. (3) Replace switch or repair wiring as necessary. (4) Test and replace starter solenoid and/or wiring as necessary. (5) Test and replace or repair as necessary. (6) Replace or charge battery.
			b. Engine cranks, but will not start. Probable cause: (1) Carburetor flooded. (2) Defective carburetor. (3) Defective spark plug. (4) Defective magneto. (5) Battery discharged.	b. (1) Wait 10 minutes and repeat this step. (2) Adjust or replace carburetor. (3) Replace spark plug. (4) Replace or repair magneto. (5) Replace or charge battery.
6	Open engine choke by pushing in CHOKE control (1, figure 2-2).	Engine runs sm smoothly at selected RPM. Read RPM on TACHOMETER HOUR METER (1, figure 2-1).	a. Engine stops suddenly. Probable cause: (1) Carburetor flooded. (2) Carburetor defective. (3) Defective air cleaner. (4) Defective thermal switch on manifold. (5) Insufficient fuel.	a. (1) Wait 10 minutes and repeat steps 5 and 6. (2) Adjust, repair or replace carburetor. (3) Repair defective air cleaner. (4) Replace thermal switch. (5) Fill fuel tank with gasoline.
			b. Engine runs erratically. Probable cause: (1) Carburetor defective or misadjusted. (2) Foreign matter in fuel tank. (3) Foreign matter in fuel strainer. (4) Faulty fuel pump.	). (1) Adjust, repair or replace carburetor. (2) Flush fuel tank or replace damaged fuel tank . (3) Replace fuel strainer. (4) Replace or repair fuel pump,
			c. Engine exhaust smokey (black). Probable cause: defective internal engine parts.	c. Inspect and repair engine as necessary.

Table 4-2. Engine Start-up Performance Checks - Continued

Step	Action	Normal Indication	Abnormal Indication	Corrective Action
6 (cont)			d. Engine exhaust smokey (white). Probable cause: carburetor misadjusted or defective.	d. Adjust, repair or replace carburetor.
			e. Fuel consumption too high. Probable cause: (1) Carburetor choke control incorrectly adjusted. (2) Air cleaner clogged. (3) Fuel leaks in tubing or fittings.	e. (1) Adjust carburetor. (2) Replace air cleaner. (3) Replace defective tubing and fittings.
7	Let engine warm up about 10 minutes to normal operating temperature.	a. ENGINE OIL PRESSURE gage (2, figure 2-1) indicates between XX and ON, or at ON.	a. Abnormal reading on ENGINE OIL PRESSURE gage. Probable cause: (1) Crankcase oil level too low. (2) Oil filter clogged. (3) ENGINE OIL PRESSURE gage defective.	a. (1) Drain crankcase and refill with oil (table 3-5). (2) Drain crankcase oil and replace oil filter. (3) Refill crankcase with oil (table 3-5). (3) Test and replace gage.
		b. AMMETER (3, figure) reads a little to right of center.	b. AMMETER reading abnormal. Probable cause: (1) Defective alternator. voltage regulator, or rectifier unit. (2) Defective AMMETER.	b. (1) Test, adjust, and/or replace. (2) Replace AMMETER.
8	Using THROTTLE (3, figure 2-2), raise engine speed to 2000 RPM.	TACHOMETER HOUR METER (1, figure 2-1) 2000 RPM.	TACHOMETER HOUR METER reads reading is abnormal. Probable cause: defective TACHOMETER HOUR METER.	Remove and replace TACHOMETER HOUR METER.

Table 4-3. Hydraulic Performance Checks During System Test

Step	Action	Normal Indication	Abnormal Indication	Corrective Action
1	Turn COMPENSATOR SHUTOFF VALVE (17, figure 2-1) slowly CW to close.	COMPENSATOR SHUTOFF VALVE can be closed.	COMPENSATOR SHUTOFF VALVE cannot be closed because it is defective,	Repair or replace.
2	Adjust VOLUME control (14, figure 2-1) as needed to obtain desired GPM flow reading on FLOW INDICATOR GPM (11, figure 2-1).	FLOW INDICATOR GPM reads desired GPM.	Desired GPM cannot be obtained, Probable cause: a. COMPENSATOR SHUTOFF VALVE not fully closed. b. Hydraulic fluid level too low, c. Low pressure filter clogged, as shown by lighting of LP P indicator (20, figure 2-1).	a. Close COMPENSATOR SHUTOFF VALVE . b. Add hydraulic fluid to reservoir. c Replace low pressure filter.
3	Set HIGH PRESS BYPASS VALVE control (19, figure 2-1) to CLOSED.	HIGH PRESS BYPASS VALVE can be closed.	HIGH PRESS BYPASS VALVE cannot be closed because valve is defective,	Repair or replace.
4	Adjust HIGH PRESS RELIEF VALVE (18, figure 2-1) to relieve pressure at about 200 PSI above pressure needed by system to be tested.	FLUID PRESSURE GAGE (5, figure 2-1) reads about 200 PSI above pressure needed by system to be tested.	FLUID PRESSURE GAGE reading is much higher than specified, Probable cause: HIGH PRESS RELIEF VALVE incorrectly adjusted or defective.	Adjust, repair or replace valve.
5	Turn COMPENSATOR SHUTOFF VALVE (17, figure 2-1) fully CCW to open.	FLUID PRESSURE GAGE (5, figure 2-1) reading drops to below 1000 PSI.	COMPENSATOR SHUTOFF VALVE cannot be opened because it is defective.	Repair or replace valve.
6	Adjust PRESSURE COMPENSATOR (16, figure 2-1) CW to obtain desired system pressure.	FLUID PRESSURE GAGE (5, figure 2-1) reads desired system pressure.	Desired pressure reading cannot be obtained. Probable cause: a. Defective PRESSURE COMPENSATOR. b. Defective hydraulic pump, c. Defective FLUID PRESSURE GAGE .	a. Repair or replace PRESSURE COMPENSATOR. b. Test, service, repair or replace pump. c. Replace defective gage.
7	Turn FLOW CONTROL VALVE (12, figure 2-1) fully CCW to open.	FLUID PRESSURE GAGE (5, figure 2-1) reading stays at or below value set in step 4.	a. FLUID PRESSURE GAGE reads higher than selected system pressure plus 200 PSI. Probable cause:	a. (1) Repair or replace defective valve. (2) Adjust or replace defective valve.

Table 4-3. Hydraulic Performance Checks During System Test - Continued

Step	Action	Normal Indication	Abnormal Indication	Corrective Action
7 (cont)			(1) Defective HIGH PRESS RELIEF VALVE. (2) Defective or incorrectly set FLUID PRESS GAGE SHUTOFF valve. (3) FLUID PRESSURE GAGE defective.	(3) Replace defective gage,
		Hydraulic fluid flows through system under test.	b. Fluid not flowing through system under test because of blockage in system under test, or defective hose assembly or coupling.	b. Clear problem in system under test. Replace defective hose assembly or coupling.

Table 4-4. Test Stand Shutdown Performance Checks

Step	Action	Normal Indication	Abnormal Indication	Corrective Action
1	Set HIGH PRESS BYPASS VALVE control (19, figure 2-1) to OPEN.	HIGH PRESS BYPASS VALVE control operates smoothly.	HIGH PRESS BYPASS VALVE control binds or cannot be set to OPEN because valve is defective.	Repair or replace valve.
2	Turn FLOW CONTROL VALVE (12, figure 2-1) fully CW to close.	Hydraulic fluid flow to system under test is shut off.	FLOW CONTROL VALVE cannot be closed because valve is defective.	Repair or replace valve.
3	Turn PRESSURE COMPENSATOR (16, figure 2-1) fully CCW to open.	PRESSURE COMPENSATOR operates smoothly.	PRESSURE COMPENSATOR cannot be opened because it is defective.	Repair or replace pressure compensator.
4	Adjust THROTTLE (3, figure 2-2) and idle engine about 5 minutes.	Engine idles smoothly.	Engine stalls. Probable cause: a. Defective fuel pump. b. Clogged fuel strainer. c. Carburetor incorrectly adjusted.	a. Repair or replace defective fuel pump. b. Replace fuel strainer. c. Adjust, repair or replace carburetor.
5	Set IGNITION SWITCH (2, figure 2-2) to OFF.	Engine stops.	Engine continues to run for several minutes. Probable cause: a. Defective IGNITION switch. b. Engine temperature is too high.	a. Replace switch. b. Replace defective engine temperature switch.
6	Remove hose assemblies.	Hose assemblies can be removed without difficulty.	Hose assemblies are difficult to remove because hose assembly or coupling is defective.	Replace defective hose assembly or coupling.

4-3. TROUBLE ANALYSIS.

a. Electrical System. Locate defective parts of the electrical system as follows:

(1) Battery. Check the specific gravity of the battery with a hydrometer. The specific gravity of each cell should be between 1.285 and 1.300. If it is below 1.285, charge the battery. If the battery fails to take a charge, replace the battery.

(2) Ignition Wire Assembly. Check for continuity from end to end of each ignition wire with an ohmmeter. You should get a continuity (less than 1 ohm) indication for each wire. If you do not, the ignition wire is defective.

(3) Alternator. The alternator is made up of two major parts: a rotor and a stator. Check to see that each separate cut between the rotor electromagnets is free of dirt. See figure 4-2 for the schematic diagram of the stator. Wire numbers shown on the schematic diagram are for convenience in referencing only. These numbers do not appear on the wires. Squeeze the outer ends of the plug receptacles on the alternator leadwires, and pull the plugs apart. Then, check the resistance of the stator windings with an ohmmeter. The approximate resistance readings are:

Black 1 to black 2 - 0.40 ohm
Black 1 to engine ground - 0.20 ohm
Black 2 to engine ground - 0.20 ohm
Black 1 to red - 3.20 ohms
Black 2 to red - 2.80 ohms.

If you get an open indication between any of these measurement points, the alternator is bad.

(4) Voltage Regulator. To test the voltage regulator, use an ohmmeter and check to see that you get the following ohmmeter readings between the listed points:

Red leadwire to engine ground - no continuity
Engine ground to red leadwire - no continuity.
Red leadwire to black leadwire - no continuity
Black leadwire to red leadwire - no continuity
Black leadwire to engine ground - no continuity
Engine ground to black leadwire - continuity

If any of these readings is not obtained, the voltage regulator is bad.

(5) Rectifier. With the rectifier plug disconnected from the rest of the electrical system, check ohmmeter readings between the following points:

White leadwire to black 1 leadwire - no continuity
Black 1 leadwire to white leadwire - continuity
White leadwire to black 2 leadwire - no continuity
Black 2 leadwire to white leadwire - continuity

NOTE

Continuity should be in one direction only. If you do not get these readings, the rectifier is bad.

(6) Starter Switch, Solenoid, and Motor. If you think that the starter circuits may be bad, use a DC voltmeter to trace voltage in these circuits. Set the IGNITION SWITCH to ON. Hold in the STARTER switch, and check for 12 volts DC (measured to ground) at the input and output terminals of the STARTER solenoid, and at the input terminal of the starter motor. (See figure 4-3.) You should get a 12 volt reading at each of these points. If you do and the starter motor does not turn over, the starter motor is bad. If you get a 12 volt reading at the input of the STARTER solenoid, but not at the output terminal of the same part, that part is bad.

(7) Electrical Wiring and Cables. To check the electrical wiring and cables, disconnect the battery cables from the battery terminals. Then, check each wire and

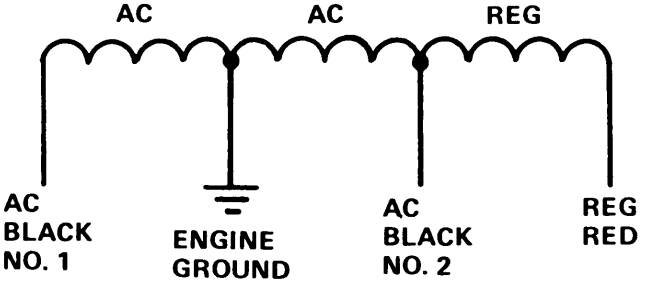


Figure 4-2. Alternator Stator, Schematic Diagram

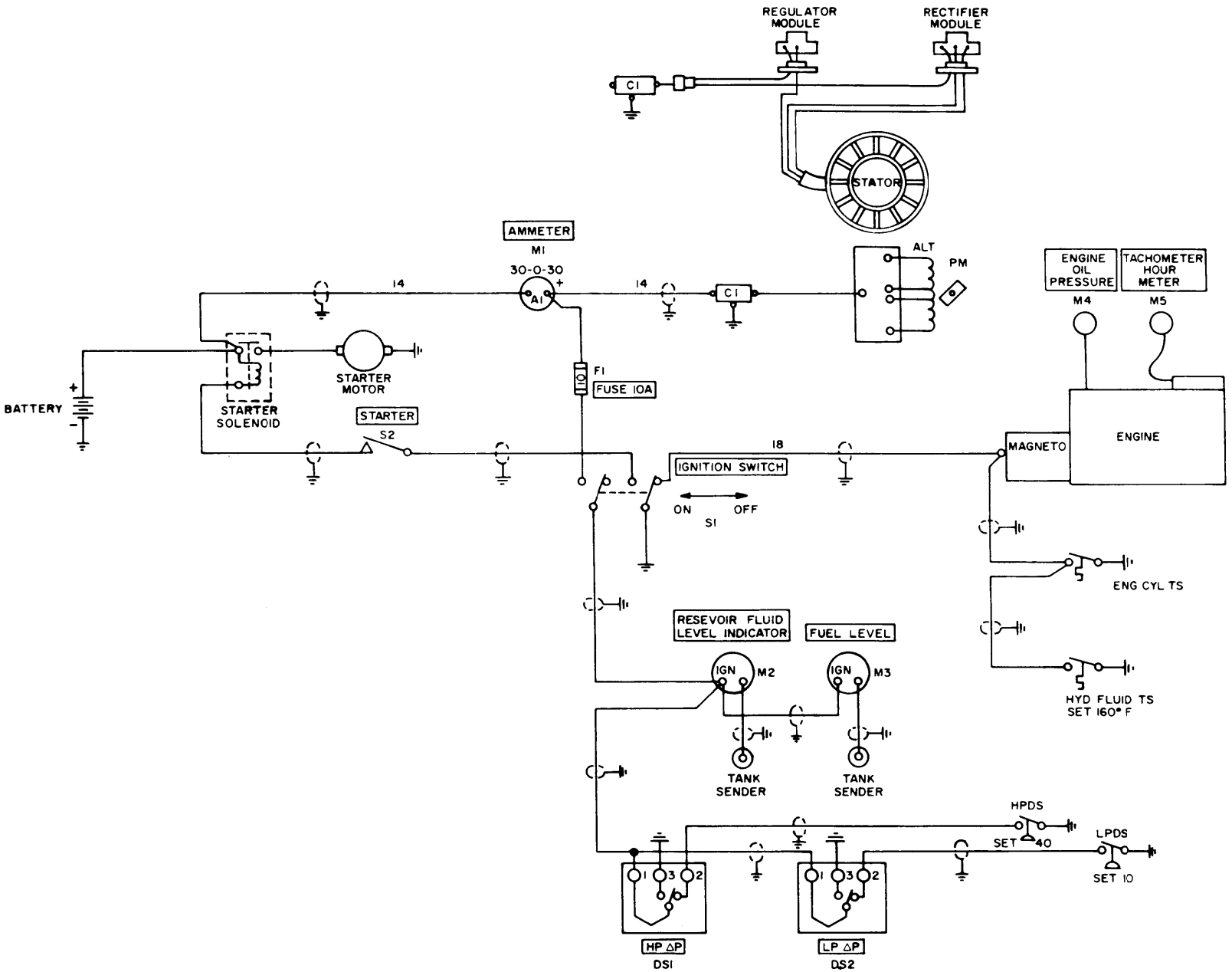


Figure 4-3. Electrical System, Schematic Diagram

cable with an ohmmeter for continuity. (See figure 4-3.)

b. Hydraulic System. (See figure 4-4.) Check the hydraulic system as follows:

(1) Examine all tubing for punctures and leaks.
(2) Examine all couplings for signs of leaks and corrosion.
(3) Examine hoses for punctures and breaks, especially at points where the hoses bend or rub against metal or sharp edges.

c. Engine. Check the engine components as follows:

(1) Magneto. If you have trouble starting the engine, or if the engine misfires, check the strength of the magneto spark. Pull out the positive action ground switch on the engine. Disconnect the ignition wire from one of the spark plugs. Being careful not to touch the conductor, hold the terminal of the ignition wire 1/8 inch away from any unpainted metal part of the engine. Turn the engine over slowly, and watch carefully for the spark. You should see the spark at the moment when the impulse coupling on the magneto opens. Repeat the same check at each of the other spark plugs. If there is no spark or the spark is weak at all four points, the magneto is bad. If you notice a weak spark at only one point, the ignition wiring is probably bad.
(2) Carburetor Cables. Check the operation of the control cables between the carburetor and the control panel visually. Operate the THROTTLE and CHOKE control on the control panel, and make sure that these controls operate the throttle and choke at the carburetor.
(3) Overall Engine Check, Check the overall condition of the engine as follows:

(a) Check to see that the engine shrouds are tightly fastened.
(b) Inspect the fan grill. Remove all dirt and other foreign matter.
(c) Open the inspection covers at the rear end of the cylinder head shrouds. Check for signs of oil leakage around the valve covers, Replace the inspection covers.
(d) Make sure that the starting motor, magneto, exhaust manifold, oil filter, carburetor, fuel strainer, and air cleaner are not loose.
(e) Check for signs of leakage at the carburetor, oil filter, and fuel strainer.
(f) Check for signs of oil leakage at the point where the starting motor mates with the engine front plate.
(g) Check to see that the oil level is correct. Use the dipstick.
(h) Check each ignition wire to see that it is tightly connected at both ends.
(i) Check to see that the engine mounting bolts are tight.
(j) Check to see that there is enough gasoline in the fuel tank.
(k) Start the engine. (Refer to Chapter 2, Section II.) The engine should start easily.
(l) With the engine running, check to see that the normal operating speed (2250 RPM idle) can be reached easily.
(m) Check the engine exhaust. It should show small amounts of gray or light black smoke. Make sure that there are no signs of heavy black or heavy white smoke.
(n) Listen for unusual noise, such as loud knocking or sharp metal-against-metal sounds.
(o) While the engine is running, check all gaskets for leakage.

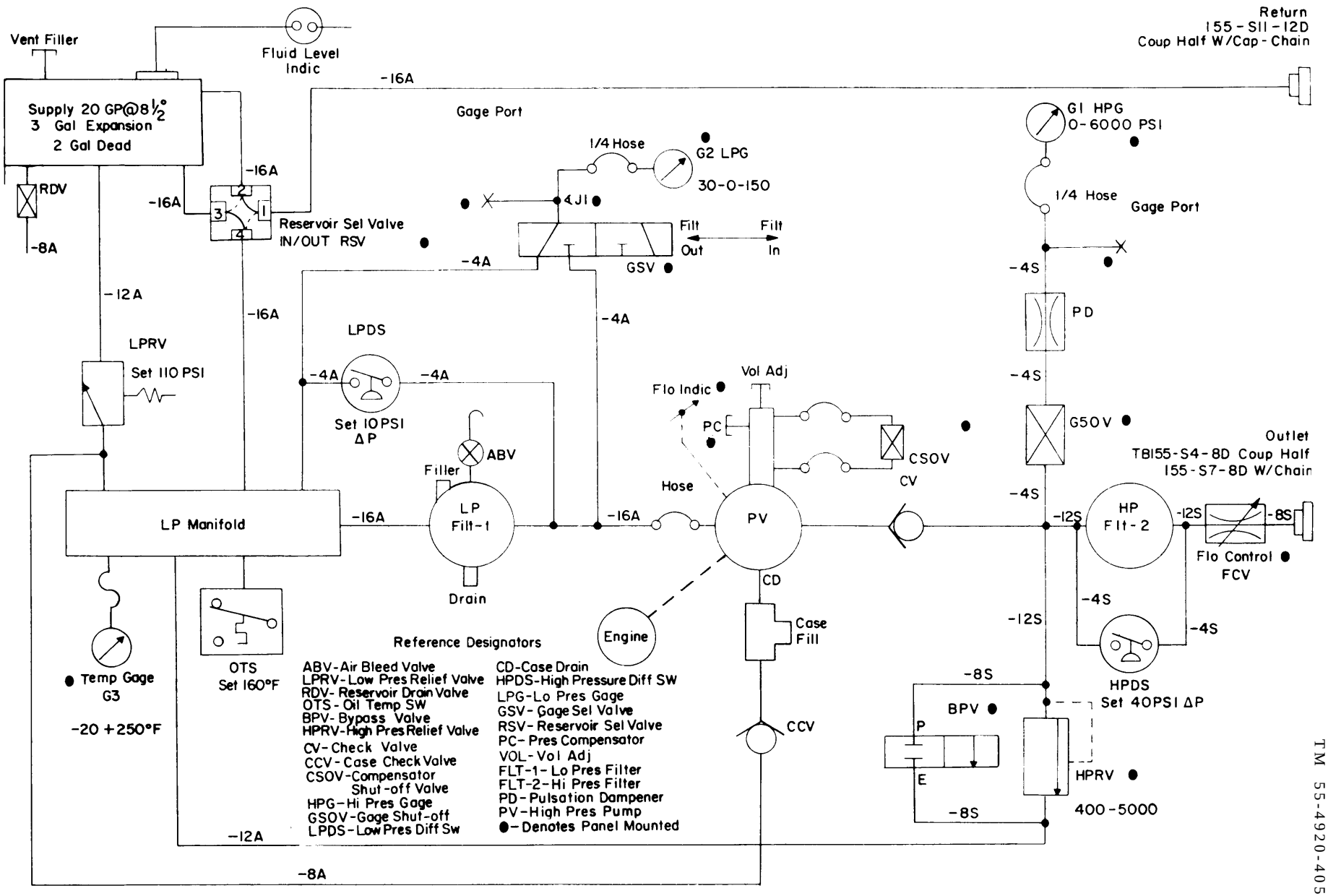


Figure 4-4. Hydraulic System, Schematic Diagram

Section III. REPAIR PROCEDURES

4-4. REMOVAL AND DISASSEMBLY. Remove and disassemble only those parts authorized at the intermediate maintenance levels

CAUTION

Before making repairs, disconnect both battery cables from the battery terminals.

a. Electrical System. Remove and disassemble parts of the electrical system as follows:

(1) Ignition Wire Assembly.

(a) Remove the nut that fastens each ignition wire to a spark plug (2. figure 4-5).
(b) Remove) the nut that fastens each ignition wire to magneto (1).
(c) Remove the screw and lockwasher that attaches the ignition wire clip to the engine. Remove the ignition wire assembly.
(d) Replace all defective ignition wires.

(2) Starter Motor. To remove starter motor (9, figure 4-5) proceed as follows:

(a) Disconnect the electrical cable from the starter motor terminal.
(b) Remove the two nuts and lockwashers that attach support bracket (8) to the engine.
(c) Hold the starter motor up, and remove the three bolts and lockwashers that attach the starter motor to the engine.
(d) Pull the starter motor and support bracket free of the engine.
(e) Remove the screw and washer that attach the starter motor to the support bracket, and remove the starter motor from the support bracket.
(f) Replace the defective starter motor.

(3) Temperature Switch. To remove the temperature switch from manifold (6, figure 4-6), disconnect the electrical leadwire from the temperature switch. Then, unscrew the temperature switch. Replace a defective temperature switch.

(4) Ammeter. To remove AMMETER (3, figure 2-1), proceed as follows:

(a) Remove the nuts that attach the leadwires to the studs at the rear of the AMMETER.
(b) Disconnect the leadwires and tag them so that you can reconnect them correctly.
(c) Remove the u-clamp from the meter. Push the AMMETER carefully out through the control panel, Handle the AMMETER carefully.
(d) Replace the defective AMMETER.

(5) Reservoir Fluid Level Indicator Gage. To remove RESERVOIR FLUID LEVEL INDICATOR gage (10, figure 2-1), proceed as follows:

(a) Remove the nuts that attach the electrical leadwires to the studs at the rear of the gage. Tag the leadwires so that you can reconnect them correctly.
(b) Remove the u-clamp from the gage. Push the gage out of the control panel. Handle the gage carefully.
(c) Replace the defective gage.

(6) Fuel Level Gage. To remove FUEL LEVEL gage (4, figure 2-1), proceed as follows:

(a) Remove the nuts that attach the electrical leadwires to the studs at the rear of the gage. Tag the leadwires so that you can reconnect them correctly.
(b) Remove the u-clamp from the gage. Push the gage carefully out of the control panel. Handle the gage with care.
(c) Replace the defective gage.

(7) Electrical Wiring and Cables. To remove electrical wiring or cables, proceed as follows:

(a) For electrical wires or cables that are not laced or taped into a wiring harness, disconnect the wire or cable at both ends. Then, remove it from the test stand.
(b) For electrical wires or cables that are laced or taped into a wiring harness, disconnect both ends. Cut back one end, and try to snake the wire or cable out of the harness. If it cannot be snaked out of the harness, cut back the other end as well, and let it remain in the harness.

(8) Starter and Ignition Switches. To remove STARTER switch (5, figure 2-2) or IGNITION SWITCH (2), proceed as follows:

(a) Disconnect the electrical leadwire lugs from the switch terminals. Tag the leadwires so that you can reconnect them correctly.
(b) Using a wrench, back off the nex nut at the rear of the control panel. This will loosen the switch.

Legend for fig. 4-5:

1. Magneto
2. Spark plug
3. Mufflet
4. Manifold
5. Fuel pump
6. Fuel strainer
7. Oil filler tube
8. Support bracket
9. Starter motor
10. Air cleaner
11. Carburetor

(c) Remove the knurled round nut that attaches the switch to the front of the control panel. Remove the switch from the control panel.
(d) Replace the defective switch.

(9) Starter Solenoid. The starter solenoid is located on the back side of the start-up control panel, near the battery. To remove the starter solenoid, proceed as follows:

(a) Remove the nuts that attach the electrical cables to the starter solenoid terminals.
(b) Remove the screws and lockwashers that attach the starter solenoid to the control panel, and remove the starter solenoid.
(c) Replace the defective starter solenoid.

NOTE

Removal of the alternator, voltage regulator, rectifier unit, and engine high-temperature safety switch involves partial disassembly of the engine. Removal procedures for these items are, therefore, included with the engine removal procedures.

b. Hydraulic System. Before removing any components of the hydraulic system, drain the hydraulic fluid. (Refer to paragraph 3-2b.) Then, proceed as follows:

(1) Tubing, Hoses, and Fittings. To remove tubing, hoses, or fittings, proceed as follows:

(a) Tag each item that you intend to remove so that you will knowhow to reconnect it.
(b) Using the proper size wrench, disconnect the coupling.
(c) Use the proper size wrench to remove fittings after you have disconnected the hose or tubing.

CAUTION

Remove only those parts that you have to replace. Use care to avoid bending or denting hydraulic tubing.

(2) Hydraulic Fluid Reservoir. To remove hydraulic fluid reservoir (1, figure 4-6), proceed as follows:

(a) Release the eight quick disconnect fasteners (two on each of the four sides of the cabinet assembly) that attach the cabinet assembly to the trailer frame.
(b) Lift the cabinet assembly off the trailer frame.
(c) Disconnect the fluid lines from the hydraulic fluid reservoir.
(d) Remove the mounting bolts, nuts, and lockwashers that attach the hydraulic fluid reservoir to the trailer frame.
(e) Remove the hydraulic fluid reservoir.
(f) Replace the defective hydraulic fluid reservoir.

(3) Low Pressure Filter Assembly. To remove low pressure filter assembly (7, figure 4-6), proceed as follows:

(a) Using the proper size wrench, disconnect the inlet and outlet couplings.
(b) Remove the four bolts that attach the mounting bands to the test stand frame. Support the low pressure filter assembly while removing these bolts.
(c) Replace the defective low pressure filter assembly.

(4) High Pressure Filter Assembly. To remove high pressure filter assembly (4, figure 4-6) proceed as follows:

(a) Disconnect the two bypass couplings for the switch on top of the high pressure filter assembly.
(b) Disconnect the inlet and outlet tube couplings.
(c) Remove the high pressure filter assembly.
(d) Replace the defective high pressure filter assembly.

(5) Hydraulic Fluid Manifold. To remove hydraulic fluid manifold (6, figure 4-6), proceed as follows:

(a) Disconnect the five hydraulic tube couplings from the ports on the hydraulic fluid manifold.
(b) Disconnect the electrical wiring from the temperature switch on the hydraulic fluid manifold.
(c) Disconnect the temperature sensor.
(d) Remove the hydraulic fluid manifold.
(e) Replade the defective hydraulic fluid manifold.

(6) Compensator Control. To remove PRESSURE COMPENSATOR (16, figure 2-1), proceed as follows:

(a) Unlock the PRESSURE COMPENSATOR locking control. Turn the PRESSURE COMPENSATOR to its fully counterclockwise setting.

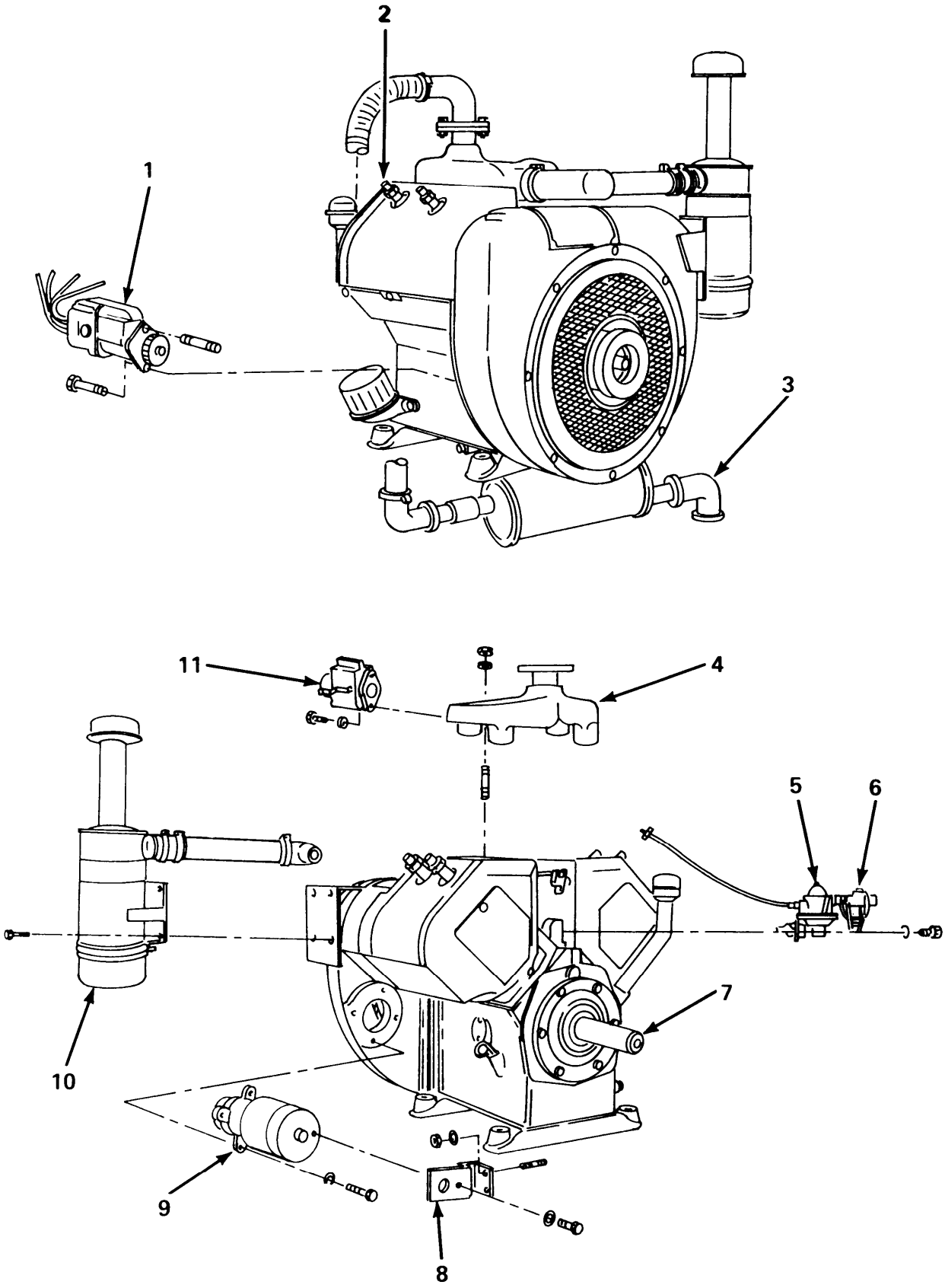


Figure 4-5. Removal of Minor Engine Components

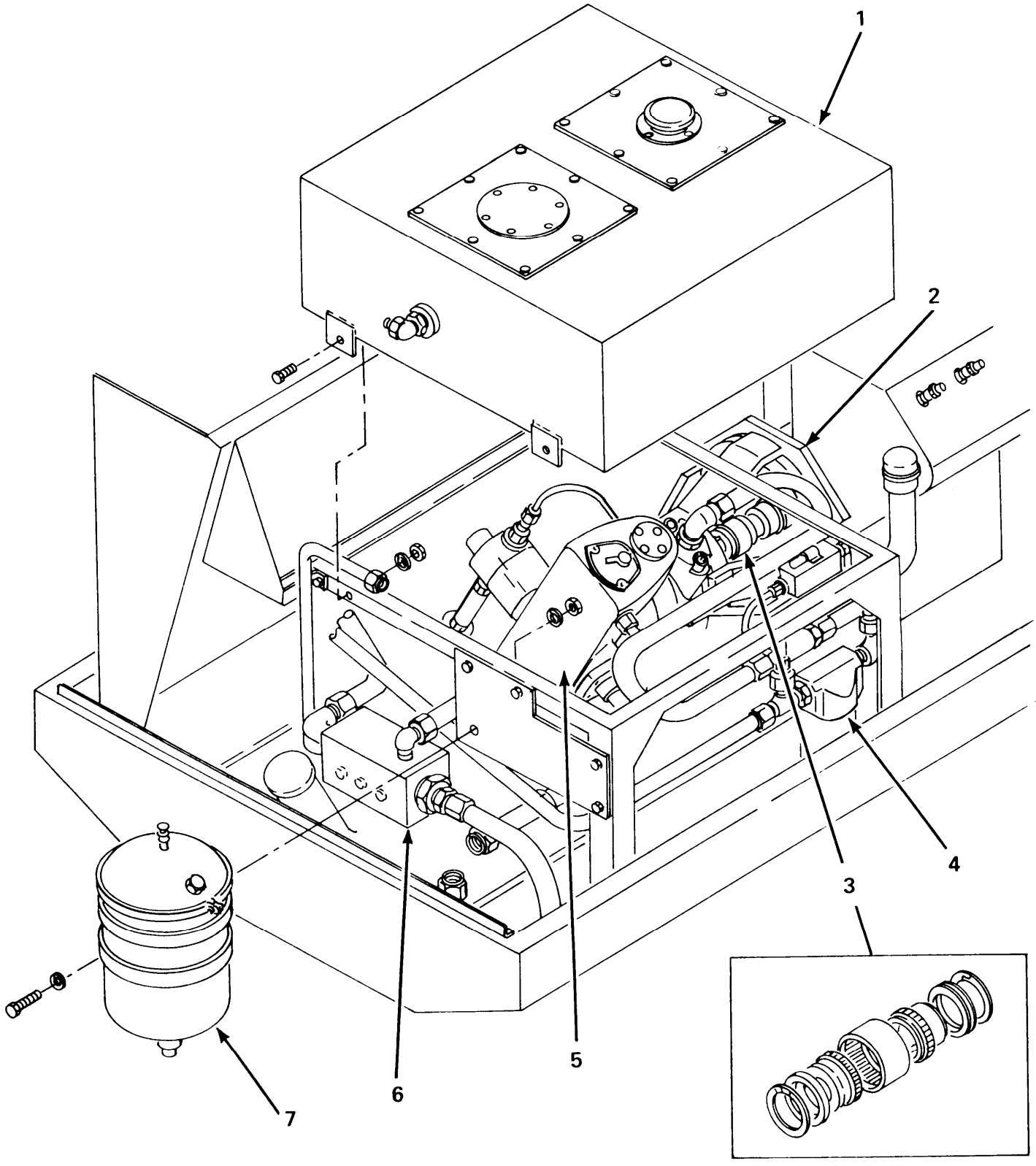


Figure 4-6. Removal of Hydraulic System Components

Legend for fig. 4-6:

1. Hydraulic fluid reservoir
2. Pump mounting bracket
3. Pump coupling assembly
4. High pressure filter
5. Hydraulic pump
6. Manifold
7. Low pressure filter

(b) Using a wrench, loosen the nut that attaches. the pressure compensator control assembly to the hydraulic pump.
(c) Separate the pressure compensator control assembly from the hydraulic pump. Be careful that you do not let the plunger and ball bearings fall out of the pressure compensator control assembly. Tape the open end of the pressure compensator control assembly to keep these parts in place.
(d) Pull the pressure compensator control assembly out through the control panel.
(e) Replace the defective pressure compensator control assembly.

(7) Volume Control. To remove VOLUME control (14, figure 2-1), proceed as follows:

(a) Release the locking lever on the VOLUME control.
(b) Loosen the nut that attaches the VOLUME control handwheel. (See figure 4-7.) Remove the handwheel, washer, and key.
(c) Unscrew the locking lever, and remove it.
(d) Loosen the setscrew that attaches the sleeve to the hydraulic pump. Unscrew the sleeve, and remove it.
(e) Loosen the setscrews that attach the extension shaft to the hydraulic pump volume adjusting screw. Remove the extension shaft.
(f) Replace any defective part.

(8) Hydraulic Pump. To remove hydraulic pump (5, figure 4-5), remove the hydraulic fluid reservoir, the pressure compensator, and the volume control. Then, proceed as follows:

(a) Remove all interconnecting tubing, hoses, and fittings from the hydraulic pump.
(b) Note how the hydraulic pump is mounted. It is turned 15 degrees from a level plane. Mark the hydraulic pump housing, the mounting bracket. and the engine housing so that you can install the hydraulic pump in the same position after repair.
(c) Check to see that hydraulic tubing does not interfere with your moving the hydraulic pump forward.
(d) Disconnect FLOW INDICATOR GPM (11, figure 2-1) from the hydraulic pump.
(e) Remove the snap ring at the engine side of the coupling, and slide the coupling cover overt the engine shaft to unmesh the gears.
(f) Remove the bolts that attach the hydraulic pump to the pump mounting bracket. Lift the hydraulic pump off the test stand chassis.
(g) Repair or replace the defective hydraulic pump.

(9) Selector Valves. To remove SUCTION PRESSURE FILTER-OUT valve (21, figure 2-1), RESERVOIR valve (15), or HIGH PRESS BYPASS VALVE (19), proceed as follows:

(a) Remove the screw that attaches the handle to the valve. Remove the handle.
(b) Disconnect all hydraulic tubing at the rear of the valve. Tag the tubing so that you will know how to reconnect it.
(c) Remove the hardware that attaches the valve to the control panel. Remove the valve from the back side of the control panel.
(d) Replace the defective valve.

(10) Flow Control Valve. To remove FLOW CONTROL VALVE (12, figure 2-1) proceed as follows:

(a) Unlock the FLOW CONTROL VALVE locking lever.
(b) Loosen the setscrew in the knob, and remove the knob.
(c) Unscrew the locking lever.
(d) Disconnect the hydraulic tubing at the rear of the valve. Tag the tubing so that you will know how to reconnect it.
(e) Remove the hardware that attaches the valve to the control panel. Remove the valve.
(f) Replace the defective valve.

(11) Shutoff Valves. To replace FLUID PRESS GAGE SHUTOFF valve (22, figure 2-1) or COMPENSATOR SHUTOFF VALVE (17), proceed as follows:

(a) Remove the screw that attaches the handle to the valve. Remove the handle.
(b) Disconnect the hydraulic tubing at the rear of the valve. Tag the tubing so that you will know how to reconnect it.
(c) Using a wrench, remove the nut that attaches the valve to the control panel. Remove the valve.
(d) Replace the defective valve.

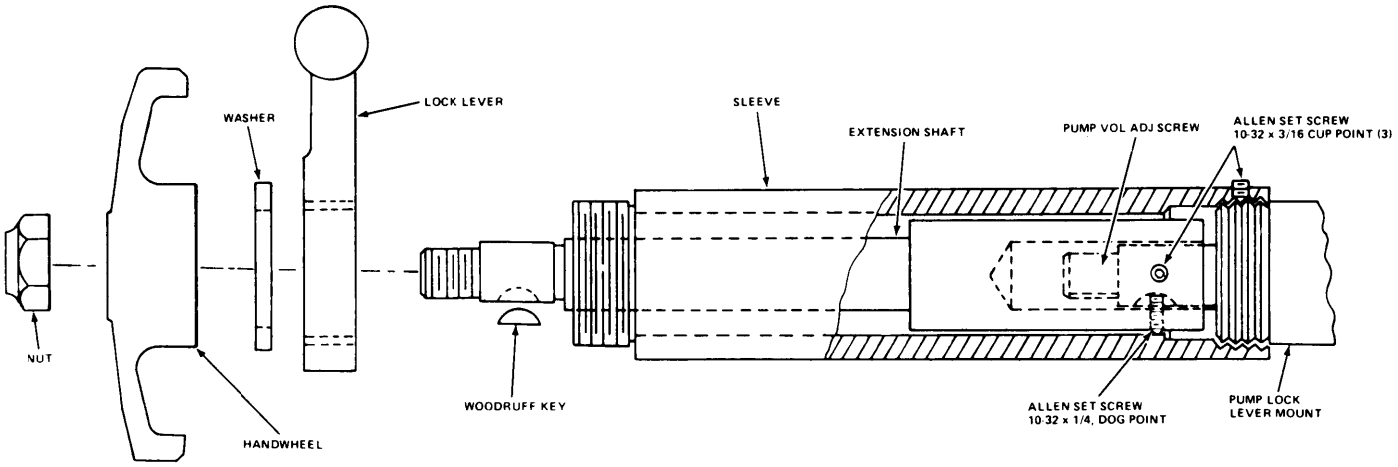


Figure 4-7. VOLUME Control, Assembly

(12) Fluid Flow Indicator. To remove FLOW INDICATOR GPM (11, figure 2-1), disconnect it from the hydraulic pump. Then, pull it back until the end clears the control panel, and remove it.

(13) Pressure Gages. To remove FLUID PRESSURE GAGE (5, figure 2-1) or SUCTION PRESSURE GAGE (7), proceed as follows:

(a) Disconnect the hydraulic tubing at the rear of the gage.
(b) Remove the hardware that attaches the gage to the control panel. Pull the gage out of the control panel.
(c) Replace the defective gage.

(14) Temperature Gage. To remove FLUID TEMP GAGE (9, figure 2-1), proceed as follows:

(a) Remove sensing bulb from the hydraulic manifold.
(b) Remove the hardware that attaches the gage to the control panel. Pull the gage out of the control panel.
(c) Replace the defective gage.

c. Engine. (See figure 4-8.)

(1) Shrouding. To remove the shrouding from the engine, proceed as follows:

(a) Remove the lock nut from the top of each of the four spark plugs. Disconnect the ignition wires from the spark plugs .
(b) The four ignition wires are secured to the shrouding with clamps, each of which is attached with a screw and lockwasher. Remove these screws and lockwashers.
(c) Remove the screws and lockwashers that attach cylinder head shrouds (16). Remove the cylinder head shrouds.

NOTE

Screws of different lengths are used to attach the shrouding. As you remove screws, note their length and tag them so that you can later return the right screw to the right location.

(d) Disconnect the leadwire from high-temperature safety switch (2).
(e) Remove the screws and lockwashers that attach rear shroud covers (13). Remove the rear shroud covers.
(f) Remove cylinder heat deflectors (15) and lower cylinder shrouds (14).
(g) Remove the screws and lockwashers that attach flywheel shroud (17). Remove the flywheel shroud with attached screen.

(2) High-Temperature Safety Switch. To remove high-temperature safety switch (2), proceed as follows:

(a) Remove the cylinder head shroud on the number 2 and 4 spark plug side of the engine.
(b) Pull the wire assembly off the terminal of the high-temperature safety switch.
(c) Remove the capscrew and washer that attaches the high-temperature safety switch, and remove the switch.
(d) Replace the defective switch.

(3) Spark Plugs. To remove spark plugs (1), proceed as follows:

(a) Remove the locknuts that attach the ignition wires to the spark plugs. Disconnect the ignition wires.
(b) Using a spark plug wrench, remove the spark plugs from the cylinder head.
(c) Clean and gap the spark plugs, or replace as required. The proper gap is 0.030 inch.

(4) Magneto. To remove magneto (1, figure (4- 5), proceed as follows:

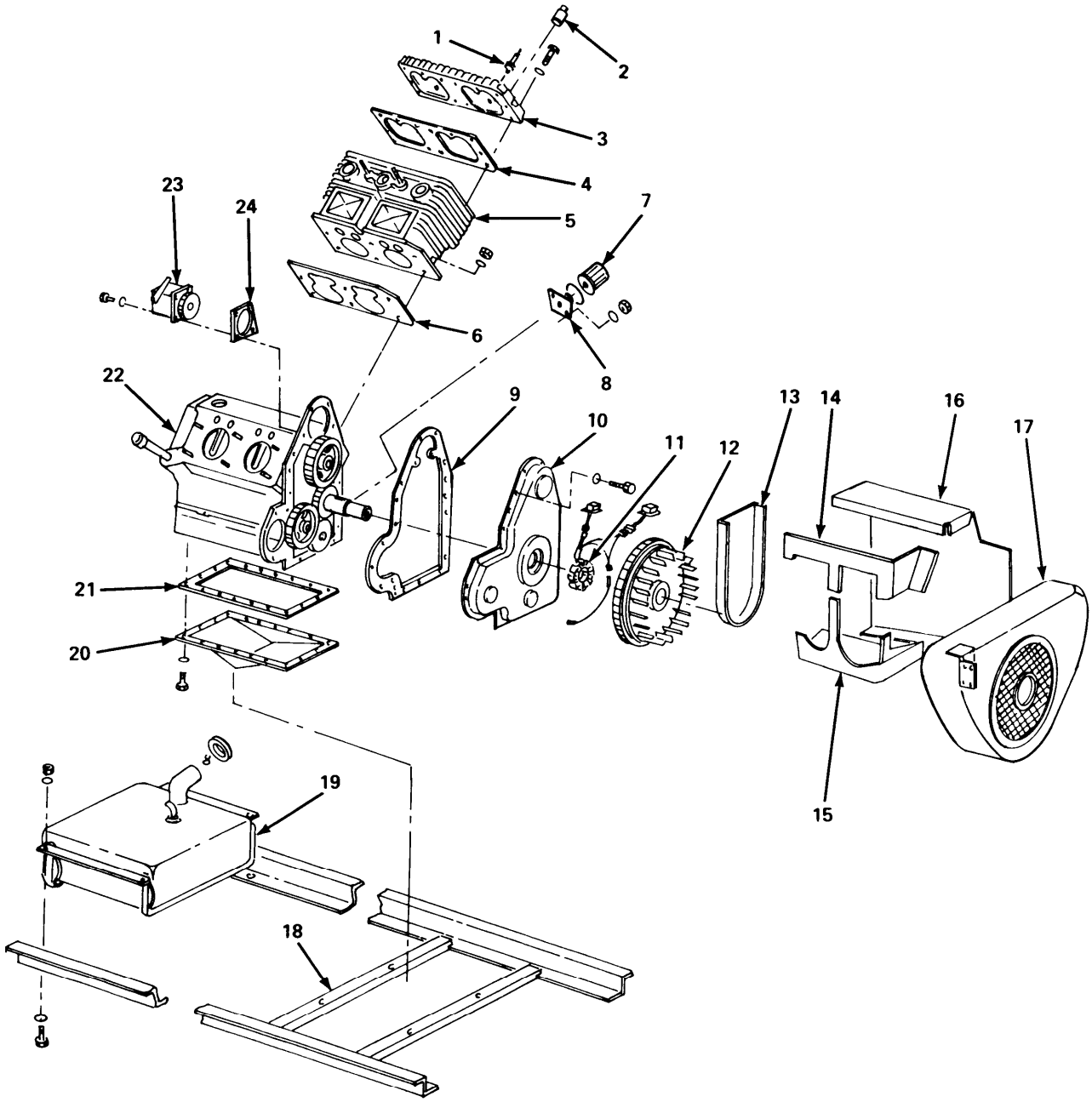
(a) Loosen the nuts that secure the ignition wires to the magneto and disconnect the ignition wires. Tag each ignition wire as you disconnect it so that you will know where to reconnect

(b) Remove the screw and washer that attach the ground strap to the magneto, and disconnect the ground strap.
(c) Disconnect the IGNITION SWITCH wire at the top rear of the magneto by removing one screw.
(d) Support the magneto so that it will not drop when -mounting hardware is removed. Remove the bolts, nuts, and lockwashers that attach the magneto, and remove the magneto.
(e) Replace the defective magneto.

(5) Oil Filter. The engine uses a cartridge-type oil filter. To remove oil filter cartridge (7, figure 4-8), unscrew it from oil filter base assembly (8). Replace the defective oil filter cartridge.

(6) Fuel Strainer. To remove fuel strainer (6, figure 4-5), proceed as follows:

(a) Loosen the knurled nut at the bottom of the fuel strainer.
(b) Swing the wire bail to one side, and remove the bowl, gasket, and screen.
(c) Disconnect the inlet fuel line from the fuel strainer.



Legend for fig. 4-8:

1. Spark plug
2. High-temperature safety switch
3. Cylinder head
4. Cylinder head gasket
5. Cylinder block
6. Cylinder block gasket
7. Oil filter cartridge
8. Oil filter base assembly
9. Gear cover gasket
10. Gear cover
11. Alternator stator
12. Flywheel
13. Rear shroud cover
14. Lower cylinder shroud
15. Cylinder heat deflector
16. Cylinder head shroud
17. Flywheel shroud
18. Test stand frame
19. Fuel tank
20. Cover plate
21. Cover plate gasket
22. Crankcase assembly
23. Governor
24. Governor gasket

Figure 4-8. Engine Disassembly

(d) Carefully unscrew the fuel strainer housing from the pipe nipple that connects it to the fuel pump.
(e) Clean all parts thoroughly. Replace the gasket and any damaged parts.

(7) Fuel Pump. To remove fuel pump (5, figure 4-5), proceed as follows:

(a) Remove the fuel strainer.
(b) Disconnect the outlet fuel line.
(c) Remove the screws and lockwashers that attach the fuel pump to the fuel pump adapter. Remove the fuel pump and the fuel pump gasket.
(d) Repair or replace the defective fuel pump.

(8) Carburetor. To remove carburetor (11, figure 4-5), proceed as follows:

(a) Disconnect the fuel lines from the carburetor.
(b) Disconnect the throttle and choke control cables from the carburetor.
(c) Hold the carburetor so that it wont drop when mounting hardware is removed. Remove the mounting bolts and lockwashers, and remove the carburetor and the carburetor gasket.
(d) Repair or replace the carburetor as applicable.

(9) Governor. To remove governor (23, figure 4-8), proceed as follows:

(a) Remove the governor spring from the lever. Make a note of the lever hole from which you disconnected the spring.
(b) Disconnect the governor oil line.
(c) Remove the cotter pin in the control rod to the carburetor, and disconnect the control rod.
(d) Disconnect the tachometer cable from the tachometer adapter.
(e) Remove the screws and lockwashers that attach the governor to the front plate of the engine. Remove the governor and governor gasket.
(f) Repair or replace the governor as applicable.

(10) Cylinder Head. To remove cylinder head (3, figure 4-8), proceed as follows:

(a) Remove spark plugs.
(b) Remove shrouding.
(c) Remove the high-temperature safety switch. (Do this only if that cylinder head to which the switch is attached is to be removed.)
(d) Remove the head bolts and washers that attach the cylinder head to the cylinder block.
(e) Remove the cylinder head and cylinder head gasket. You may have to insert a flat tool and pry the cylinder head loose. If you do have to pry the cylinder head loose, make sure that you do not score the machined mating faces.
(f) Clean and repair or replace the cylinder head as applicable.

(11) Cylinder Block. To remove cylinder block (5), proceed as follows:

(a) Remove the cylinder head and gasket from the cylinder block that you wish to remove.
(b) Remove the nuts and lockwashers that attach the cylinder block to the crankcase assembly.
(c) Lift the cylinder block off the crankcase assembly. Remove the cylinder block gasket.
(d) Clean and repair or replace the cylinder block as necessary.

(12) Flywheel. To remove flywheel (12, figure 4-8), proceed as follows:

(a) Remove flywheel shroud (17).
(b) Remove the flywheel locknut and washer.
(c) Grasp the flywheel fins, pull outward, and hit the end of the crankshaft with a soft hammer. The flywheel will slide off the taper of the crankshaft. Remove the flywheel and key.

CAUTION

Do not use a hard hammer to hit the end of the crankshaft. If you do, you may ruin the crankshaft and bearings.

(d) Clean and repair or replace the flywheel as necessary.

(13) Alternator. To remove alternator stator (11, figure 4-8), proceed as follows:

(a) Remove flywheel shroud (17).
(b) Remove flywheel (12). The alternator rotor is part of the flywheel.
(c) Squeeze the outer ends of the connector plugs on the alternator rotor wiring, and pull the plugs apart.
(d) Disconnect the electrical leadwire from AMMETER (3, figure 2-1).
(e) Remove the attaching hardware, and remove the voltage regulator and rectifier modules.
(f) Remove the attaching hardware, and remove the alternator stator.
(g) Repair the alternator, or replace defective parts as needed.

(14) Engine Gear Cover. To remove engine gear cover (10, figure 4-8), proceed as follows:

(a) Remove flywheel shroud (17).

(b) Remove flywheel (12).
(c) Remove alternator stator (11).
(d) Remove governor (23).
(e) Remove the gear cover screws and lockwashers.
(f) Drive out two dowel pins at the right side of the gear cover.
(g) Remove the gear cover and gear cover gasket.

(15) Cover Plate. To remove cover plate (20, figure 4-8), proceed as follows:

(a) Remove the screws and lockwashers that attach the cover plate to the crankcase assembly.
(b) Remove the cover plate and cover plate gasket.
(c) Clean cover plate, replace it if it is damaged, and replace the cover plate gasket.

(16) Fuel Tank. To remove fuel tank (19, figure 4-8), proceed as follows:

(a) Remove all hydraulic system components around the fuel tank.
(b) Make sure that there is no gasoline in the fuel tank.
(c) Disconnect the fuel line from the fuel tank.
(d) Remove the hardware that attaches the fuel tank to test stand frame (18).
(e) Remove the fuel tank.
(f) Clean and repair, or replace a damaged fuel tank as needed.

(17) Crankcase Assembly. To remove crankcase assembly (22, figure 4-8), proceed as follows:

(a) Remove shrouding.
(b) Remove ignition wires.
(c) Remove spark plugs.
(d) Remove the magneto.
(e) Remove the oil filter.
(f) Remove the fuel strainer.
(g) Remove the fuel pump.
(h) Remove the carburetor.
(i) Remove the governor.
(j) Remove the two cylinder heads and cylinder blocks.
(k) Remove the flywheel.
(1) Remove the alternator.
(m) Remove the engine gear cover.
(n) Remove the cover plate.
(o) Remove the engine mounting bolts. Lift the crankcase assembly out of the test stand frame.
(p) Clean and repair, or replace the crankcase assembly as necessary.

(18) Engine Oil Pressure Gage. To remove ENGINE OIL PRESSURE gage (2, figure 2-1), proceed as follows:

(a) Disconnect the tubing from the rear of the gage.
(b) Remove the hardware that retains the u-clamp. Push the gage out of the control panel.
(c) Replace the defective gage.

d. Miscellaneous.

(1) Tires and Wheels. (See figure 4-9.) To remove a tire and wheel, proceed as follows:

(a) Jack up the corner of the test stand to raise the tire off the ground.
(b) Remove lug nuts (1) and washers (2).
(c) Remove tire (4) with assembled tube and wheel halves from the test stand.

CAUTION

At this point, remove valve cap (6) and stem (7) from the tire that you are removing. Make sure that tube (3) is completely deflated before proceeding with the next step.

(d) Remove nuts (8), washers (9), and bolts (10).
(e) Using a tire iron or other prying tool, separate two wheel halves (5 and 11). Remove the tire and deflated tube.
(f) Replace the defective tire.

(2) Brake Drum. To remove the brake drum from a wheel, proceed as follows:

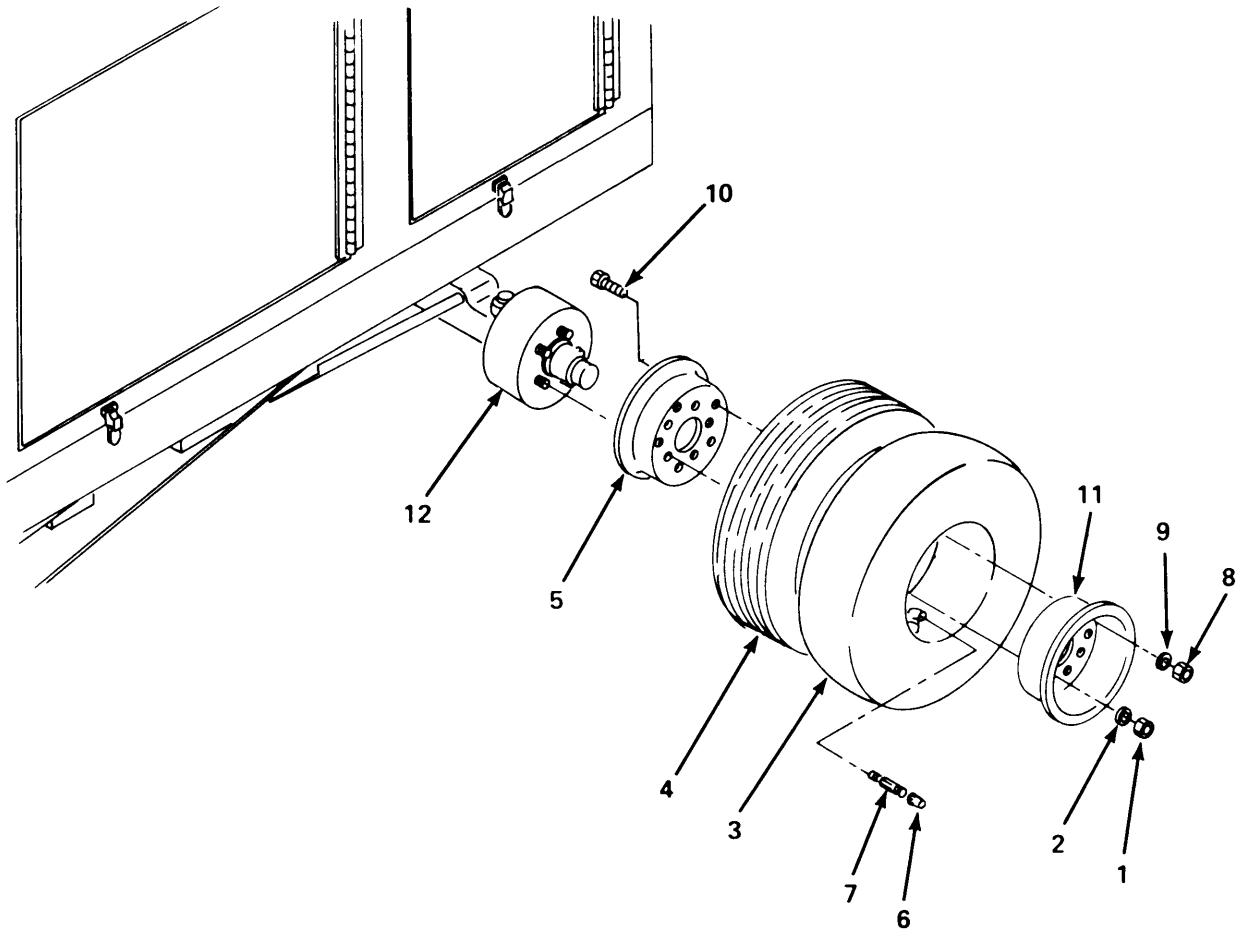
(a) Remove the tire and wheel from the axle on which the brake drum you want to remove is located.
(b) Remove the cotter pin from the castellated locknut that attaches the brake drum to the axle.
(c) Remove the castellated locknut, washer, and bearing from the axle.
(d) Slide the brake drum off over the axle spindle and brake assembly.
(e) Replace the defective brake drum.

4-5. DETAILED REPAIR INSTRUCTIONS.

a. Electrical System.

(1) Ignition Wire Assembly. To repair the ignition wire assembly, proceed as follows:

(a) Replace damaged end connectors.
(b) Using insulating tape, wrap all insulation breaks. Use at least four layers of tape over the insulation breaks.
(c) If an ignition wire is beyond repair, replace it.



Legent for fig. 4-9:

1. Nut	5. Wheel half	9. Washer
2. Washer	6. Valve cap	10. Bolt
3. Tube	7. Valve stem	11. Wheel half
4. Tire	8. Nut	12. Brake drum

Figure 4-9. Tire and Wheel Removal

(2) Alternator. To repair the alternator, proceed as follows:

(a) Replace the voltage regulator or rectifier if these items do not check out correctly according to the trouble-shooting procedures.
(b) Replace the voltage regulator and rectifier if their cases are cracked or broken.
(c) Replace broken wires and broken connectors.
(d) Replace the alternator stator if the troubleshooting test shows it to be defective.

(3) Starter Motor. To repair the starter motor, proceed as follows:

(a) Disassemble the starter motor. (See figure 4-10.)
(b) Check brushes (2). Replace the brushes if they are worn too far, or if they are damaged.
(c) Clean armature (1) and inspect the commutator segments. If the commutator is gouged or scored heavily, replace the armature.
(d) Check bearing (7) and bearing plate assembly (5) for wear. Replace these parts if they are worn excessively.
(e) Using an ohmmeter, check field coil package (3) for continuity. Replace the field coil package if you get an open indication.
(f) Replace all other worn or damaged parts.
(g) Reassemble the starter motor.

b. Hydraulic System.

(1) Hydraulic Pump. To repair the hydraulic pump, proceed as follows:

(a) Disassemble the hydraulic pump.
(b) Examine all gaskets and seals. Replace any of these parts that you find are defective.
(c) Replace all parts that show excessive wear, corrosion, or scoring.
(d) Replace defective bearings, and end plates that have scored machined surfaces.
(e) Thoroughly clean all metal parts of the hydraulic pump.
(f) Reassemble the hydraulic pump.

(2) High Pressure Filter. To repair the high pressure filter, proceed as follows:

(a) Disassemble the high pressure filter.
(b) Throw away the element and gasket.
(c) Thoroughly clean all other parts.
(d) Replace the case if it is dented or punctured.
(e) Replace the top case if the threads for the fittings are damaged.
(f) Reassemble the high pressure filter. Install a new element and gasket.

(3) Low Pressure Filter. To repair the low pressure filter, proceed as follows:

(a) Disassemble the low pressure filter.
(b) Throw away the filter element and gasket.
(c) Thoroughly clean all parts.
(d) Replace the case if it is dented or ruptured.
(e) Replace the fittings if their threads are damaged.
(f) Reassemble the low pressure filter. Install a new filter element and gasket.

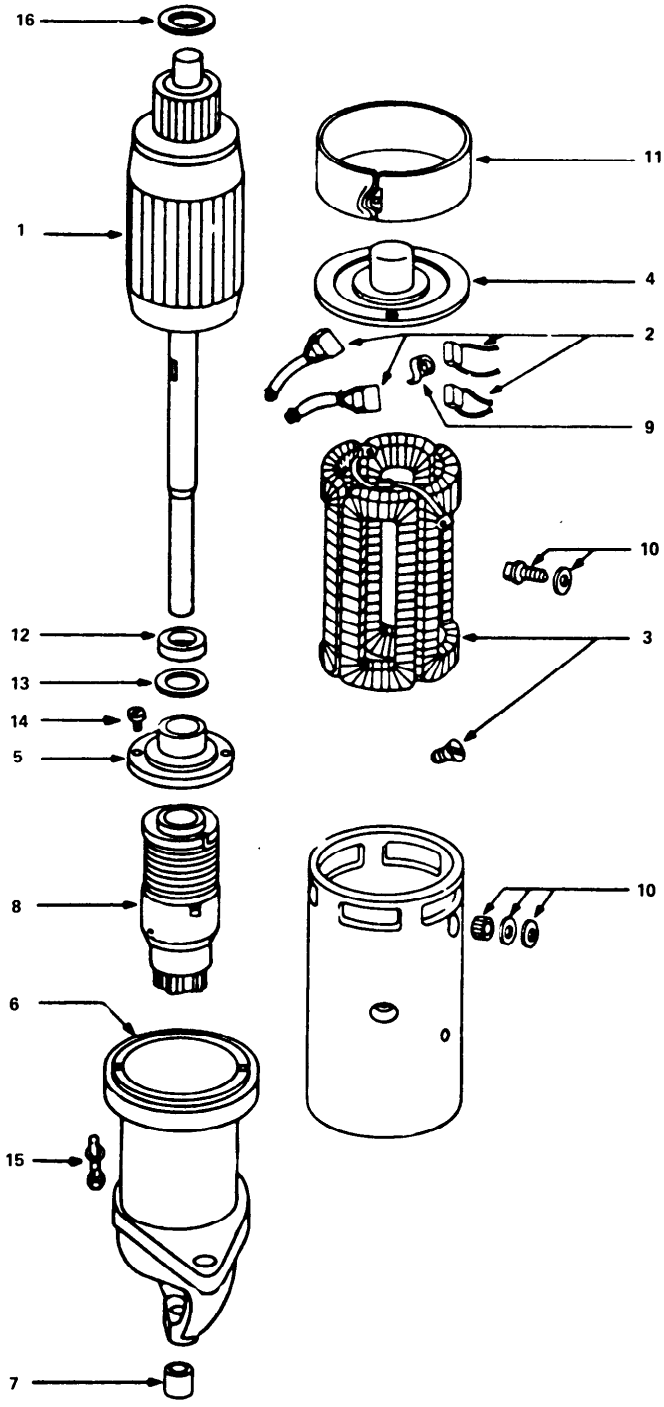
(4) Valves. To repair valves, proceed as follows:

(a) Disassemble the valve.
(b) Check all threaded parts for damaged threads. Replace any of these parts that show thread damage.
(c) Replace any damaged “O” rings and seals.
(d) Replace any damaged valve seats.
(e) Replace all other parts that show signal of scoring or excessive wear.
(f) Reassemble the valve.

c. Engine.

(1) Fuel Pump. To repair the fuel pump, proceed as follows:

(a) File a groove across a point where mounting bracket (15, figure 4-11) and fuel head (16) join so that you can put these parts back together in the same way.
(b) Remove screws (3), and remove fuel head (16) with attached parts from mounting bracket (15).
(c) Remove screw (2) and washer (8), and remove cover (7) and gasket (4). Throw the gasket away.
(d) Turn fuel head (16) over. Remove both valve assemblies (5) and gaskets (6). Note the positions of the valve assemblies.
(e) Clean fuel head (16) thoroughly with kerosene or diesel fuel and a fine brush.
(f) Position fuel head (16) with the diaphragm surface up. Assemble new gaskets (6), and insert valve assemblies (5) in the position shown in figure 4-11. Press the valves in evenly without distorting them, and stake the valves in place.
(g) Install new cover gasket (4), cover (7), and washer (8), and install screw (2).
(h) Set the assembled fuel head section aside.



Legend for fig. 4-10:

1. Armature
2. Brush set
3. Field coil package
4. Commutator and head assembly
5. Bearing plate assembly
6. Pinion housing assembly
7. Bronze bearing
8. Bendix drive
9. Brush spring set
10. Terminal stud package
11. Cover band
12. Oil seal
13. Gasket
14. Mounting screw package
15. Screw
16. Thrust washer package

Figure 4-10. Starter Motor, Repair Parts

(i) Insert the end of a small screwdriver into the coils of rocker arm spring (12), and remove the spring.

(j) Hold mounting bracket (15) in your left hand, with the rocker arm turned toward your body. Put your left hand thumb nail on the end of link (10). With the heel of your right hand on diaphragm (1), compress diaphragm spring (11) and, at the same time, pull toward your body. Unhook link (10) from the end of diaphragm (1), and remove the diaphragm.

(k) Drive out rocker arm pin (13). Use a punch and drive it from the small end.

(l) Clean mounting bracket (15) with kerosene or diesel fuel.

(m) Assemble new link (10), bushing (9), and rocker arm (14). Install these parts in mounting bracket (15), using pin (13). Stake pin (13) to mounting bracket (15) to hold the pin in place.

(n) Place new diaphragm spring (11) into mounting bracket (15). Use a new diaphragm (1), and install the diaphragm by reversing the procedure of step (j).

(0) Assemble new rocker arm spring (12).

(p) Mount the mounting bracket and assembled parts on the fuel pump adapter on the engine. Use a new flange gasket (17).

(q) Crank the engine to a position where diaphragm (1) is lying fiat on mounting bracket (15). Place fuel head (16) with its attached parts in position so that the groove marks you made in step (a) are in line. Insert screws (3) and turn them in about three turns.

(r) Crank the engine to a position where diaphragm (1) is pulled down to its lowest position in mounting bracket (15). Tighten screws (3).

(2) Carburetor. You will find either of two types of carburetors on your engine. Identify your carburetor, and repair it by following the correct procedure below.

(a) Marvel-Schebler Carburetor. Repair this as follows:

1. Disassemble the carburetor. (See figure 4-12.)
2. Clean all parts thoroughly. Blow out all passages with low-pressure air. Do not use a drill or wire to clean out passages.
3. Inspect the tapered end of idle adjusting needle (22). Make sure it is smooth and free of grooves; otherwise, replace it.
4. Replace all gaskets and packings.
5. Replace all other parts that show signs of wear or damage.
6. Reassemble the carburetor.

(b) Zenith Carburetor. Repair this carburetor as follows:

1. Disassemble the carburetor. (See figure 4-13.)
2. Clean all parts thoroughly. Blow out all passages with low-pressure air. Do not use a drill or wire to clean out passages.
3. Inspect float assembly (36). Replace it if it is loaded with gasoline. if it is damaged. or if the float axle bearing is worn. Inspect the float lever for wear at the point of contact with fuel valve needle (31). Replace the float assembly if wear is excessive.
4. Replace float axle (35) if its bearing surface is worn.
5. Replace fuel valve needle and fuel valve seat (31) as a unit if either of these parts is worn.
6. Inspect the tapered end of idle adjusting needle (17). Make sure that it is smooth and free of grooves; otherwise, replace the idle adjusting needle.
7. Replace all gaskets. throttle shaft seal (15), and retainer (14).
8. Replace all other parts that show signs of wear or damage.
9. Reassemble the carburetor. Note the following special instructions during reassembly:

a. To install float assembly (36), install fuel valve needle in seat (31). Then, install float assembly (36) and float axle (35).

NOTE

Insert the tapered end of float axle (35) into the float bracket on the side opposite the slot, and push it through to the other side. Press float axle (35) into the slotted side until the float axle is centered in the float bracket.

b. After installing float assembly (36), invert body (26). Check to see that the float body of float assembly (36) is centered at right angles to the machined surface. Using a depth gage, measure the distance from the machined surface of body (26). with no gasket, to the top side of the float body at the highest point. This distance must be 31/32 ±1/32 inch. If the nleasurement is off by more than 1/16 inch, replace float assembly (36). If it is off by 1/16 inch or less, bend the lever arm

Legend for fig. 4-11:

1. Diaphragm
2. Cover screw
3. Screw
4. Gasket
5. Valve assembly
6. Gasket
7. Cover
8. Washer
9. Bushing
10. Link
11. Spring
12. Spring
13. Pin
14. Rocker arm
15. Mounting bracket
16. Fuel head
17. Gasket

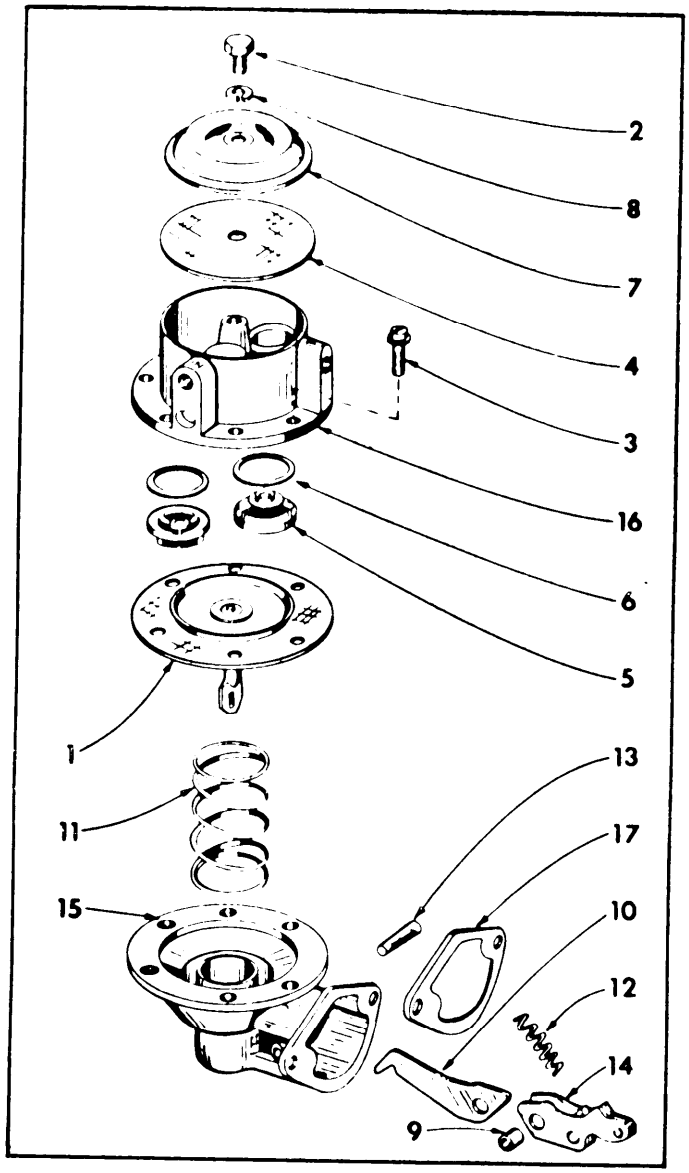
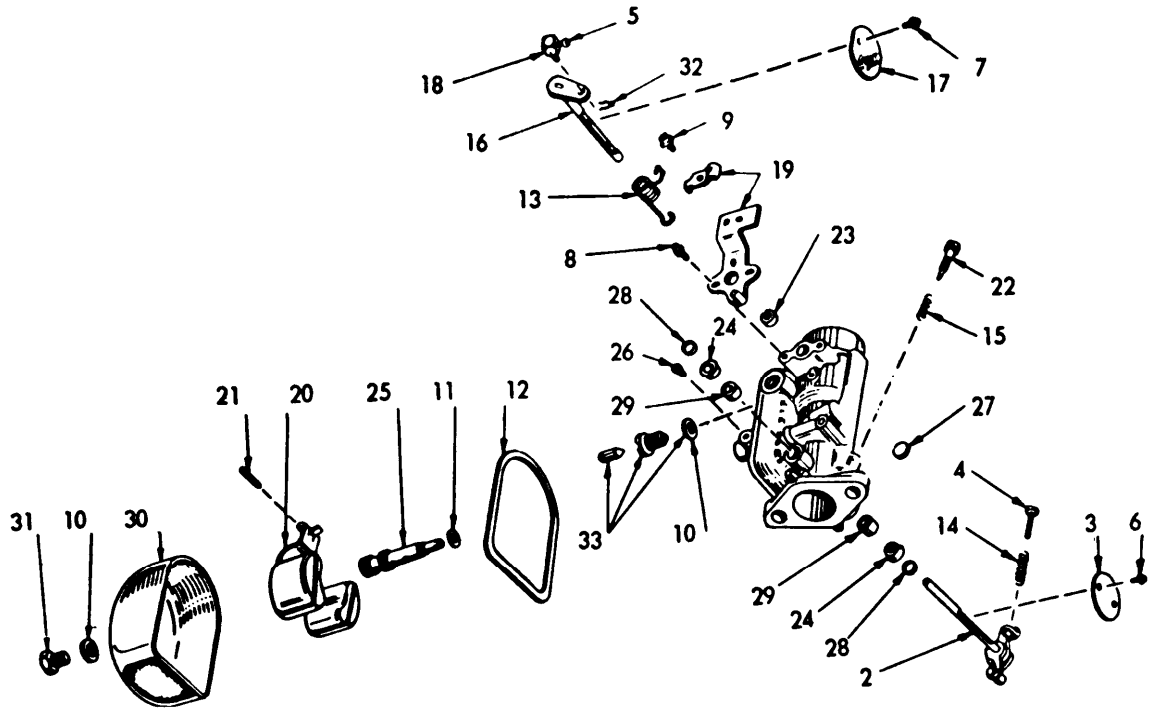


Figure 4-11. Fuel Pump, Exploded View



Legend for fig. 4-12:

1. Not used
2. Throttle shaft assembly
3. Throttle fly
4. Screw
5. Screw
6. Screw
7. Screw
8. Screw
9. Screw
10. Gasket
11. Gasket
12. Gasket
13. Spring
14. Spring
15. Spring
16. Choke shaft assembly
17. Choke fly assembly
18. Choke swivel
19. Choker bracket assembly
20. Float and lever assembly
21. Float lever shaft
22. Idle adjusting needle
23. Packing
24. Packing
25. Main nozzle
26. Power jet
27. Cup
28. Packing retainer
29. Bushing
30. Fuel bowl
31. Lug
32. Cotter
33. Matched float valve, seat, and gasket assembly

Figure 4-12. Marvel-Schebler Carburetor

on float assembly (36) close to the float body, using long nose pliers.

CAUTION

Do not bend, twist, or apply pressure to the float body.

c. When installing idle adjusting needle (17), turn it in until it seats lightly against the idle discharge hole, then back it out 1-1/2 turns. This is the preliminary idle adjustment.

(3) Governor. To repair the governor, proceed as follows:

(a) Disassemble the governor. (See figure 4-14.)
(b) Replace governor gear (27) if it is damaged.
(c) Replace shaft bearing (28) and housing bearing (21) if they are damaged or worn.
(d) Replace roll pins (2) if they are worn.
(e) Replace threaded fittings if threads are damaged.
(f) Reassemble the governor.

(4) Cylinder Head. To repair a cylinder head, proceed as follows:

(a) Clean the cylinder head thoroughly of all carbon and lead deposits.
(b) Cleaned machined mating surfaces of all particles of gasket material.
(c) Refinish machined surfaces with fine emery cloth, if necessary to remove minor scratches.

(d) If the cylinder head has deep scratches on machined surfaces or is cracked, replace the cylinder head.
(e) Use a new gasket with the cylinder head.

(5) Cylinder Block. To repair the cylinder block, proceed as follows:

(a) Clean all dirt and other foreign matter from between the cylinder fins and the manifold ports.
(b) Rebore the cylinder block if cylinder bores are out of round or are oversize by more than 0.005 inch.

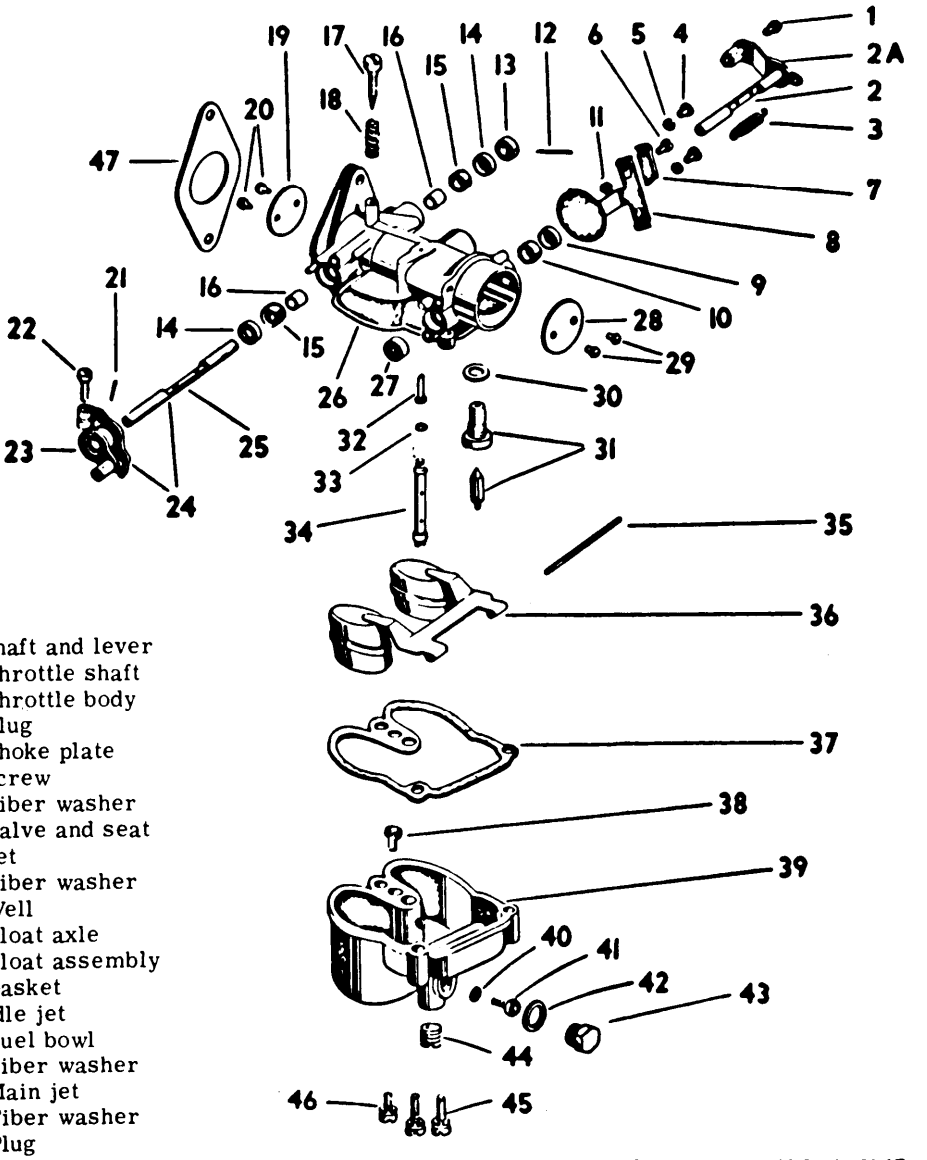
NOTE

If the cylinder block is rebored, oversize pistons and rings must be used.

(c) Remove the tappet inspection cover. Compress the valve springs with a standard automotive valve lifter. (See figure 4-15.)
(d) Wedge a rag into the opening at the bottom of the valve chamber. Remove the retaining locks, seats, springs, and valves. Tag each valve so that you can put it back in the same guide when you reassemble the cylinder block. Clean the removed items and the ports and guides in the cylinder block of all carbon and gum deposits.
(e) Replace valves that are burned or pitted.
(f) Clean and check operation of the valve rotators. The valve must rotate slightly each time it is opened. Replace the valve rotators if they are defective.
(g) Drive out and replace the valve guides if the clearance between the valve stem and the valve guide is 0.007 inch or more.
(h) If necessary, grind the valves and valve seat inserts. Grind the valve face at 45 degrees to the vertical center line of the valve stem. Grind the valve seat insert at the same 45 degree angle. After grinding, lap the valves in place so that you see a uniform ring around the face of the valve. Clean the valves and wash the cylinder block thoroughly with a hot solution of soap and water. Then, wipe the cylinder wall with a clean, lint-free cloth, and apply a light coating of light engine oil.
(i) Reassemble the cylinder block.

(6) Crankcase Assembly. To repair the crankcase assembly, proceed as follows:

(a) Remove the screws and lockwashers that hold crankshaft gear (figure 4-16)



Legend for fig. 4-13:

1. Screw
2. Choke shaft
2A. Choke lever
3. Choke lever spring
4. Screw
5. Lockwasher
6. Tube clamp screw
7. Bracket clamp
8. Choke bracket
9. Retainer
10. Washer
11. Nut
12. Pin
13. Washer
14. Retainer
15. Seal
16. Bushing
17. Idle adjusting needle
18. Spring
19. Plate
20. Screw
21. Roll pin
22. Screw
23. Lever and stop
24. Shaft and lever
25. Throttle shaft
26. Throttle body
27. Plug
28. Choke plate
29. Screw
30. Fiber washer
31. Valve and seat
32. Jet
33. Fiber washer
34. Well
35. Float axle
36. Float assembly
37. Gasket
38. Idle jet
39. Fuel bowl
40. Fiber washer
41. Main jet
42. Fiber washer
43. Plug
44. Plug
45. Screw
46. Screw
47. Gasket

CARB. REF. NO.	ZENITH ASSEM. NO.	WISCONSIN PART NO.	WIS. ENGINE MODEL
1	11288	L-57	VP4D
3	12347	L-57-B	VG4D
4	13401	L-57-E	VG4D
5	13714	L-57-G	VH4D

CARB. REF. NO.	ZENITH ASSEM. NO.	WISCONSIN PART NO.	WIS. ENGINE MODEL
14	12708	LZ-77-S1	V-460D
		LZ-77B-S1	V-461D, V-465D
15	12825	LZ-77C-S1 (w/Auto-Choke)	V-465D V-461D

Figure 4-13. Zenith Carburetor, Exploded View

to the end of the crankshaft. Pry the crankshaft gear off the crankshaft with a wedge type tool.

NOTE

The mounting holes in the crankshaft gear are staggered so that the gear can be installed only one way. This ensures that the gear will be automatically timed to the crankshaft.

(b) Remove the Allen head setscrew on the magneto side of the crankcase. (See figure 4-17.) This setscrew locks the idler shaft in position. Using a gear puller, remove the idler shaft and idler gear assembly from the crankcase.

(c) Remove the locknut and oil pump gear (figure 4-16) from the oil pump gear shaft. Use a gear puller. Do not hammer on the shaft because this will damage the oil pump.

(d) Remove the oil pump as follows:

1. Take out the slotted pipe plug from the bottom of the crankcase. (See figure 4-18.)
2. Using a 5/32 inch Allen wrench, remove the lockscrew from the pipe plug hole.
3. Withdraw the oil pump from inside the crankcase. If it fits too tightly to remove it by hand, tap the front end of the oil pump housing (not the shaft) with a hammer and brass rod to loosen it.

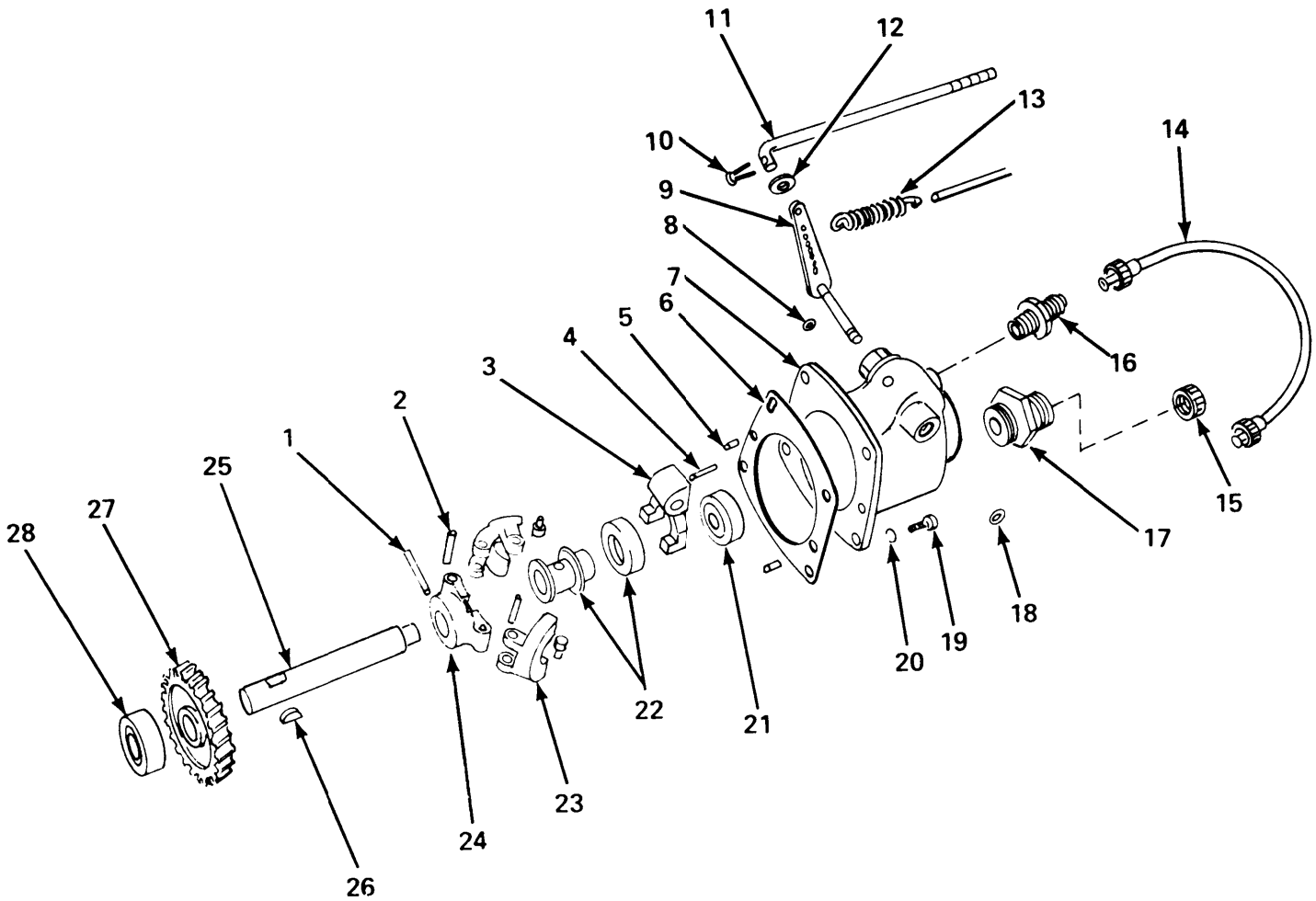
(e) Remove pistons and connecting rods as follows:

1. Using a 9/16 inch socket wrench, remove the hex nuts from the connecting rod bolts. (See figure 4-19.) Tap the ends of the bolts lightly to break the connecting rod cap free from the bolts. Remove the connecting rod cap.
2. Scrape off all carbon deposits that might interfere with removal of pistons from the upper end of the cylinder.
3. Turn the crankshaft until the piston that you want to remove is at the top. Then, push the connecting rod and piston assembly up and out through the top of the cylinder. Be careful that you do not mar the crank pin by letting the rod bolts strike it or scrape across it.
4. Put the connecting rod cap on the removed connecting rod at once so that the caps and connecting rods will not be mismatched when you reassemble the crankcase assembly. If your engine uses babbit bearing rods, make sure that the shims are in place before you put on the cap.
5. Replace the piston rings if necessary. Use a ring expander tool. If you do not have a ring expander tool, install the rings by placing the open end of the ring on the piston first, as shown in figure 4-20. Spread the ring only enough to slip it over the piston and into the right groove. Be careful that you do not distort the ring. Install the bottom ring first, and work toward the head of the piston, installing the top ring last. (See figure 4-21.) Mount the scraper ring with the scraper edge down; otherwise, oil pumping and excessive oil consumption will result. Stagger the piston ring gaps 90 degrees apart around the piston.

(f) Remove the crankshaft as follows:

1. Remove the screws and lockwashers that attach the main bearing plate and remove the main bearing plate from the crankcase. (See figure 4-22.)
2. Carefully take out the crankshaft from the same end of the crankcase.

(g) Remove the valve tappets. (See figure 4-23.)



Legend for fig. 4-14:

1. Taper pin
2. Roll pin
3. Governor yoke
4. Roll pin
5. Dowel pin
6. Gasket
7. Governor housing
8. "O" ring
9. Cross shaft and lever
10. Cotter pin
11. Governor control rod
12. Washer
13. Governor spring
14. Oil line
15. Cap
16. Fitting
17. Tachometer adapter
18. Plug
19. Screw
20. Lockwasher
21. Housing bearing
22. Thrust sleeve and bearing assembly
23. Governor flyweight
24. Flyweight hub
25. Drive shaft
26. Key
27. Governor gear
28. Shaft bearing

Figure 4-14. Governor, Exploded View

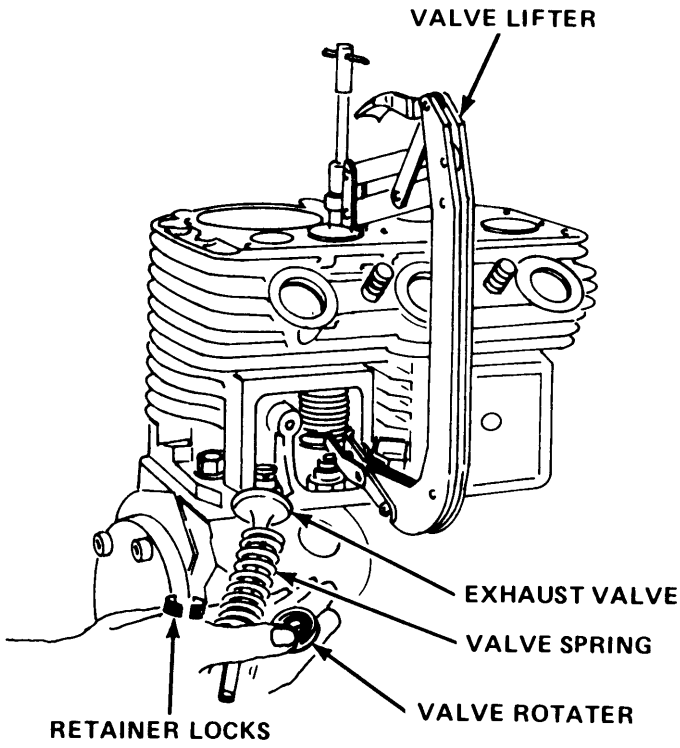


Figure 4-15. Removal of Valves

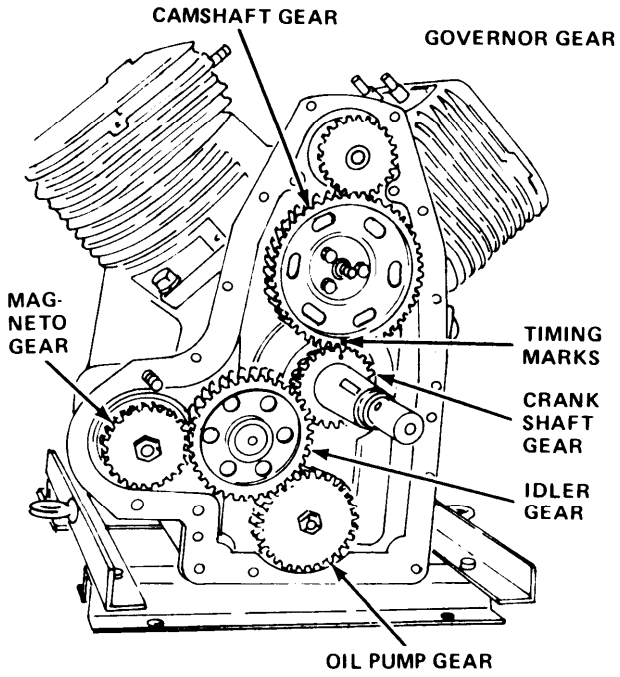


Figure 4-16. Crankcase Assembly Gears

(h) Lift the camshaft out from the flywheel end of the crankcase.

(i) Examine all parts for damage or excessive wear. Replace all damaged or worm parts. See figure 4-24 for correct piston, ring, and rod clearances.

(j) Reassemble the crankcase assembly, noting the following:

1. When you are installing the camshaft, make sure that the spring and plunger are in place in the end of the camshaft. (See figure 4-25.) These parts hold the camshaft in position endwise.
2. Install the valve tappets after the camshaft is installed.
3. When you are installing the crankshaft, use gaskets and-shims of the thickness needed to set the end plate of the tapered roller bearings at 0.002 to 0.004 inch.
4. Make sure that you install the main bearing plate with the word "TOP" which is cast on the outside of the plate, in the up position. If you install this plate upside down, the main bearing will not be properly lubricated. Tighten the main bearing plate screws to a torque of 25 to 30 foot-pounds.

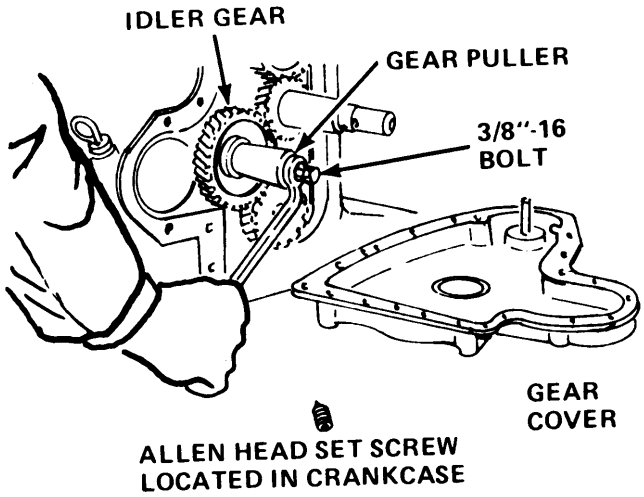


Figure 4-17. Removal of Gear

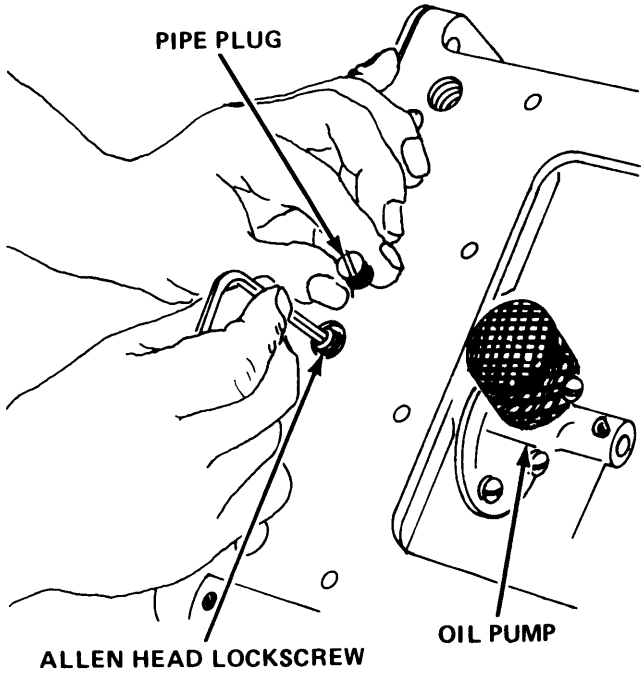


Figure 4-18. Removal of Oil Pump

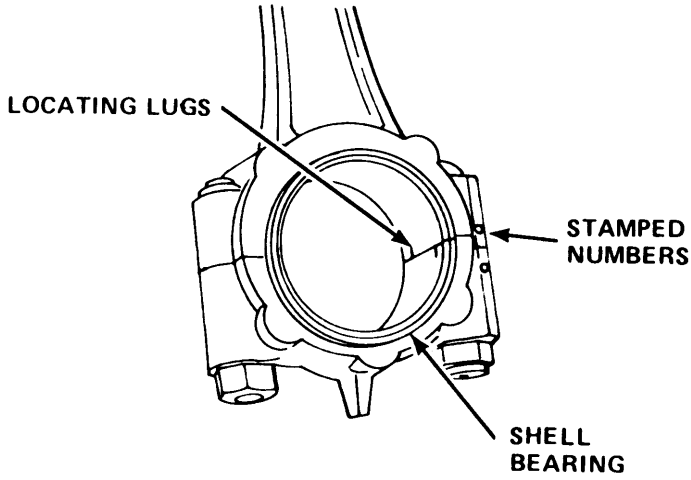


Figure 4-19. Connecting Rod

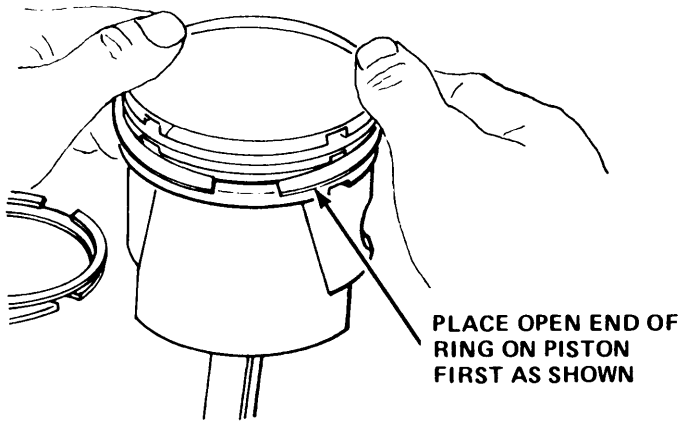


Figure 4-20. Installation of Piston Rings

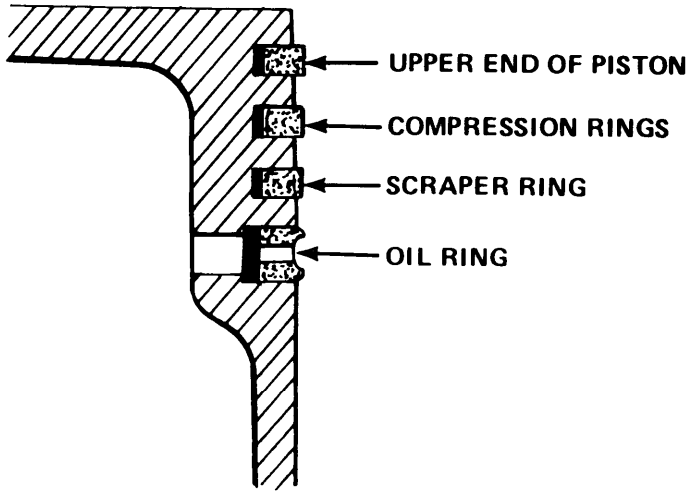


Figure 4-21. Piston Ring Positioning

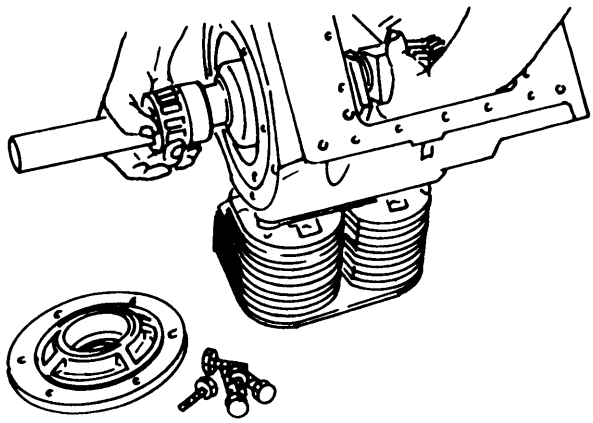


Figure 4-22. Removal of Crankshaft

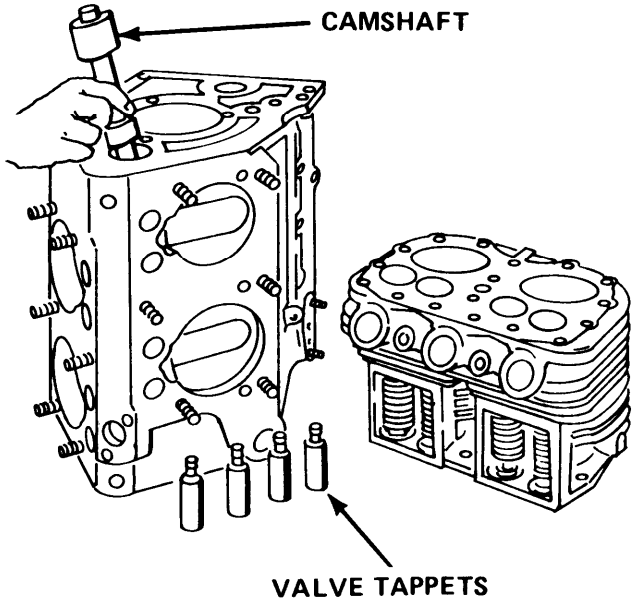
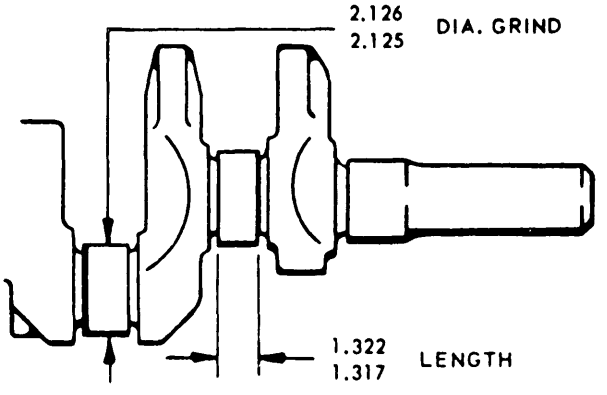


Figure 4-23. Removal of Tappets and Camshaft

5. Check to see whether your engine uses case-ground pistons or split-skirt pistons. On a cam-ground piston, the piston skirt is cam-ground to an elliptical contour. Clearance between the piston and cylinder must be measured at the center of the thrust face at the bottom of the piston skirt. See figure 4-24 for proper clearances. Mount the pistons as shown in figure 4-25.
6. Make sure that you install the piston and connecting rod assemblies in the same bores from which you removed them. Oil the pistons, rings, wrist pins, rod bearings. and cylinder walls before assembly.

PISTON TO CYLINDER AT PISTON SKIRT	SPLIT-SKIRT	CAM-GROUND
	.004 to .005"	.0037 to .0042"
PISTON RING GAP		.010 to .020"
PISTON RING SIDE CLEARANCE IN GROOVES	TOP RING	.0015 to .0035"
	2nd, 3rd RING	.0015 to .0035"
	OIL RING	.002 to .004"
PISTON PIN TO CONNECTING ROD BUSHING		.0005 to .0011"
PISTON PIN TO PISTON		.0000 to .0008" tight
CONNECTING ROD TO CRANK PIN - SIDE CLEARANCE		.009 to .016"
CONNECTING ROD SHELL BEARING TO CRANK PIN DIA. (VERTICAL)		.0013 to .0035"
CONNECTING ROD BABBITT BEARING TO CRANK PIN		.0015 to .0028"



STANDARD CRANK PIN DIMENSIONS

Figure 4-24. Piston, Ring, and Rod Clearances

CAUTION

Identical numbers are stamped on the side of each connecting rod and its cap. Make sure these numbers are both on the same side of the connecting rod when mounted in the crankcase assembly. Make sure that the oil hole in the connecting rod cap is facing toward the oil spray nozzle. (See figure 4-26.) Make sure that the lugs on the connecting rod bearing halves are both on the same side. (See figure 4-19.) Install new nuts on the connecting rod bolts and torque the nuts to 26 to 32 foot-pounds. See figure 4-24 for the proper clearance between the bearing and the crank pin.

NOTE

You may find either babbit cast bearing connecting rods or shell bearing connecting rods in your engine. You can use shell bearing connecting rods to replace babbit cast bearing connecting rods.

7. When you install the idler gear on the crankcase, allow a 0.003 to 0.004 inch clearance between the idler gear and the stud collar.
8. When you install the crankshaft gear, turn the crankshaft so that the timing marks on the crankshaft gear and the camshaft gear are aligned. (See figure 4-16.) If you do not align the timing marks, the engine will run poorly or not at all.

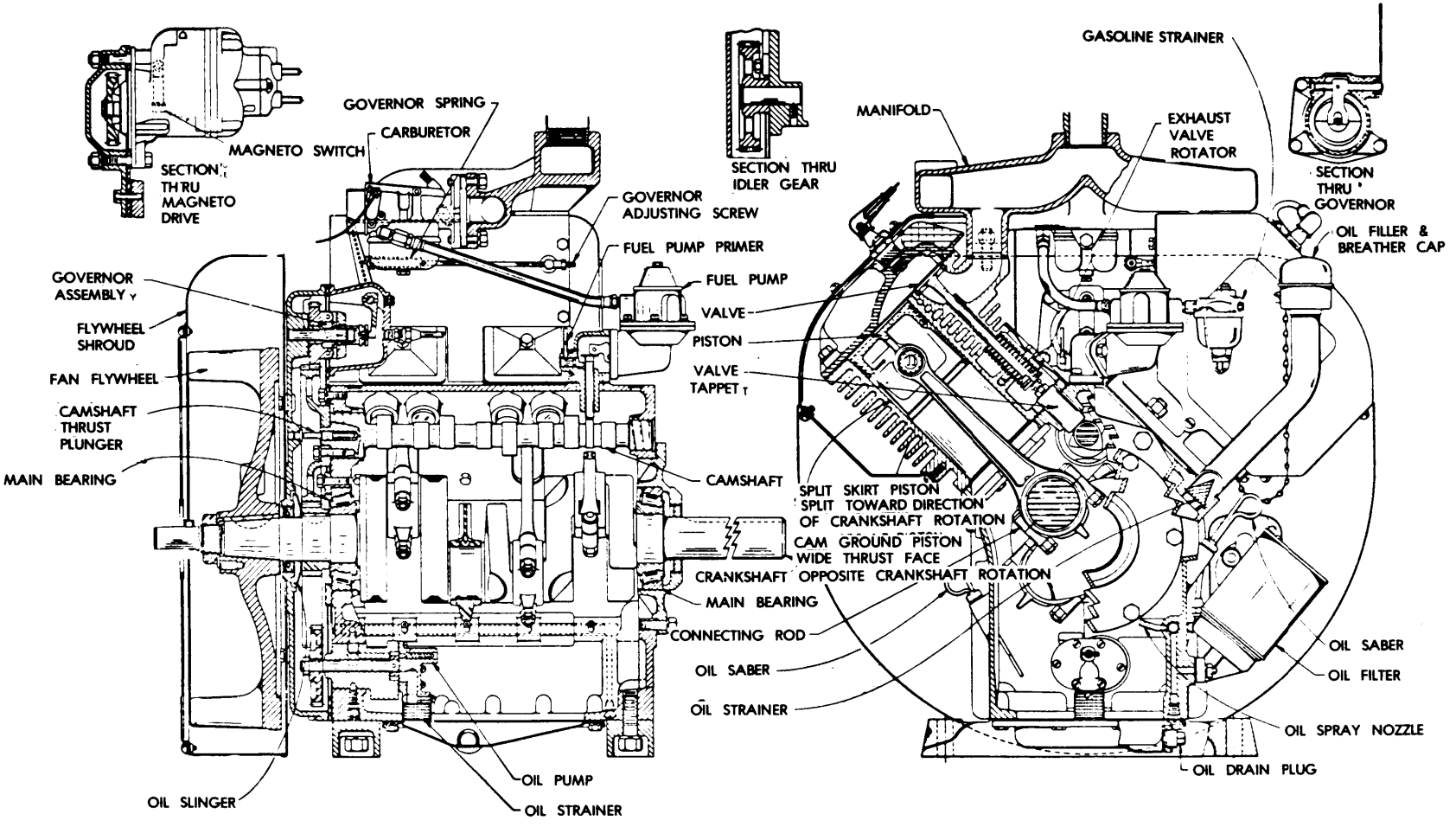


Figure 4-25. Engine Cross Section.

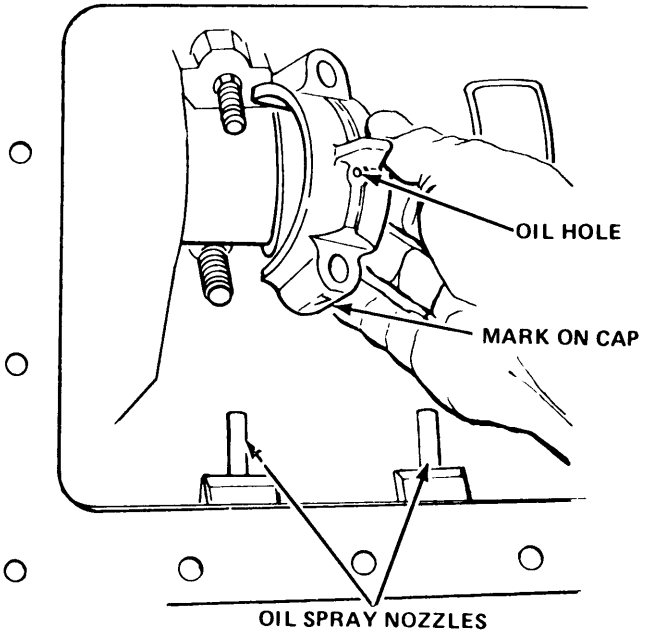


Figure 4-26. Installation of Connecting Rods

Section IV. REASSEMBLY AND ALIGNMENT

4-6. REASSEMBLY. Reassemble the components of the test stand using the following procedures.

a. Electrical System.

(1) Ignition Wire Assembly. Install the ignition wire assembly as follows:

(a) Feed new ignition wire through the clamps removed from the old ignition wire.
(b) Note that numbers are stamped on the end of the magneto and on the engine shrouding next to the spark plugs. Attach each ignition wire to the same numbered magneto terminal and spark plug. For example, connect one ignition wire to the number 2 terminal of the magneto and the number 2 spark plug.
(c) Tighten the nut on one end of each ignition wire to the magneto terminal, and the nut on the opposite end to the spark plug.
(d) Attach the clamps on the ignition wires to the engine shrouding with screws and lockwashers.

(2) Starter Motor. After the engine has been assembled, install starter motor (9, figure 4-5) as follows:

(a) Attach the starter motor support bracket to the starter motor with a screw and washer. Do not tighten the screw at this point.
(b) Insert the starter motor into the engine. Make sure that the starter motor engages the engine flywheel. Attach the starter motor to the engine with bolts and lockwashers.
(c) Slide the starter motor support bracket over the studs on the engine. Install the bracket mounting nuts and lockwashers, and tighten the nuts.
(d) Tighten the screw that attaches the starter motor support bracket to the starter motor.
(e) Connect the starter cable to the starter motor terminal with one screw and lockwasher.

(3) Temperature Switch. To install the temperature switch in manifold (6, figure 4-6), screw the temperature switch into the manifold. Then, attach the electrical leadwire to the temperature switch terminal.

(4) Ammeter. To install AMMETER (3, figure 2-1), proceed as follows:

(a) Push the AMMETER carefully into position in the control panel.
(b) Attach the AMMETER to the control panel by installing the u-clamp behind the meter.
(c) Check the tags you placed on the electrical leadwires when you removed the AMMETER. Connect the leadwires to the correct meter lugs, and install and tighten the nuts on the meter lugs.

(5) Reservoir Fluid Level Indicator Gage. To install RESERVOIR FLUID LEVEL INDICATOR GAGE (10, figure 2-1), proceed as follows:

(a) Position the RESERVOIR FLUID LEVEL INDICATOR GAGE in the control panel. Install u-clamp behind the gage.
(b) Check the tags you attached to the electrical leadwires when you removed the gage. Secure the leadwires to the correct gage studs with nuts.

(6) Fuel Level Gage. To install FUEL LEVEL gage (4, figure 2-1), proceed as follows:

(a) Position the FUEL LEVEL gage in the control panel. Install the u-clamp behind the gage.
(b) Check the tags you attached to the electrical leadwires when you removed the gage. Connect the leadwires to the correct gage studs, and install the nuts on the studs.

(7) Electrical Wiring and Cables. To install electrical wiring and cables, proceed as follows:

(a) For electrical leadwires or cables that are not laced or taped into a harness, cut the wire or cable to the proper length, and attach lugs to the ends. Use standard procedures for cutting, tinning, and attaching lugs. Route the leadwire or cable the same as the removed leadwire or cable, and connect the lugs to the proper terminating points.
(b) For electrical leadwires or cables that are laced or taped into a wiring harness, proceed as follows:

1. Measure the length of the leadwire or cable to be replaced. Add one extra foot to this length, and cut a replacement wire or cable to this new length. Make sure you use wire of the correct gauge.

2. Cut back the insulation on the wire that is to be replaced and on the replacement wire about 1/2 inch.
3. Tin each end of the exposed wire, and cut one half the diameter of each soldered end.
4. Place the cut halves on one end of the new and old wires end to end on top of each other, and solder the two wires together.
5. Cut away stray ends to make a smooth surface.
6. Disconnect the opposite end of the leadwire that is to be removed, and gently pull that end. This will cause the new wire to follow the wire being replaced into the wiring harness. Continue pulling until the new wire extends the required distance at each end of the wiring harness.
7. Cut the new leadwire to length, and trim back the insulation far enough to attach lugs.
8. Tin the exposed portion of the wire, and attach lugs at the ends of the leadwire.
9. Connect the lugs to the proper connection points.

(8) Starter and Ignition Switches. To install STARTER switch (5, figure 2-2) or IGNITION SWITCH (2), proceed as follows:

(a) Make sure that a hex nut and external tooth lockwasher are on the switch shaft. Push the switch shaft through the hole in the control panel from the back side.
(b) Install the round knurled nut on the switch shaft, and tighten this nut only until the nut is flush with the end of the switch shaft.
(c) Hold the switch in its proper position. Tighten the hex nut against the rear of the control panel.
(d) Check the tags on the leadwires you disconnected when removing the switch. Connect the leadwires to the correct switch terminals.

(9) Starter Solenoid. To install the starter solenoid, proceed as follows:

(a) Attach the starter solenoid to the back side of the start-up control panel with screws and lock washers.
(b) Attach the electrical cables to the starter solenoid terminals with nuts.

b. Hydraulic System.

(1) Tubing, Hoses, and Fittings. To install hydraulic lines, tubing, and fittings, proceed as follows:

(a) Check the tags you attached when you removed these items.
(b) Install each of these items in the reverse order of removal.

CAUTION

Use care to avoid bending or denting hydraulic tubing.

(2) Hydraulic Pump. To install hydraulic pump (5, figure 4-5), proceed as follows:

NOTE

The hydraulic pump must be installed before the fluid reservoir is installed.

(a) Position the hydraulic pump on the test stand chassis so that the marks you made during hydraulic pump removal line up.
(b) Secure the hydraulic pump to the chassis with four bolts.
(c) Slide the coupling cover over the shaft of the hydraulic pump so that the gears mesh. Install the snap ring on the engine side of the coupling.
(d) Connect FLOW INDICATOR GPM (11, figure 2-1) to the hydraulic pump.
(e) Connect all hydraulic tubing and fittings removed during disassembly of the hydraulic pump.

(3) Volume Control. To install VOLUME control (14, figure 2-1), proceed as follows:

NOTE

The hydraulic pump must be installed before you install the VOLUME control.

(a) Install the extension shaft in the hydraulic pump volume adjusting screw, and tighten the setscrews. (See figure 4-7.)
(b) Slide the sleeve over the extension shaft, and screw the sleeve onto the hydraulic pump. Tighten the setscrews in the sleeve.
(c) Working from the front end of the control panel, screw the locking lever onto the sleeve.
(d) Install the washer. Install the key in the keyway in the extension shaft. and install the VOLUME control handwheel over the key onto the extension shaft.
(e) Install and tighten the nut that secures the VOLUME control handwheel.

(4) Compensator Control. To install PRESSURE COMPENSATOR (16, figure 2-1), proceed as follows:

NOTE

The hydraulic pump must be installed before you install the PRESSURE COMPENSATOR.

(a) Route the pressure compensator control assembly through the opening in, the control panel.
(b) Remove the tape that you put over the end of the pressure compensator assembly when you removed it. Be careful that you do not let the plunger and ball bearings fall out of the pressure compensator assembly. Slide this end of the pressure compensator assembly into the pressure compensator coupling on the hydraulic pump, and tighten the nut to fasten the pressure compensator assembly to the hydraulic pump.

(5) Hydraulic Fluid Manifold. To install hydraulic fluid manifold (6, figure 4-6), proceed as follows:

(a) Install the temperature switch on the hydraulic fluid manifold. Place the hydraulic fluid manifold in position on the test stand chassis.
(b) Connect the electrical wiring to the temperature switch.
(c) Connect the hydraulic tube couplings to the ports of the hydraulic fluid manifold.

(6) High Pressure Filter Assembly. To install high pressure filter assembly (4, figure 4-6), proceed as follows:

(a) Connect the inlet and outlet hydraulic lines to the high pressure filter assembly. Hold the filter assembly to relieve the weight while you are making these connections.
(b) Connect the switch and the switch bypass lines.

(7) Low Pressure Filter Assembly. To install low pressure filter assembly (7, figure 4-6), proceed as follows:

(a) Position the low pressure filter assembly against the test stand chassis. Install four bolts through the mounting bands into the test stand chassis.
(b) Connect the inlet and outlet couplings.

(8) Hydraulic Fluid Reservoir. To install hydraulic fluid reservoir (1, figure 4-6), proceed as follows:

NOTE

The hydraulic pump must be installed before you install the hydraulic fluid reservoir.

(a) Position the hydraulic fluid reservoir on the test stand frame. Attach it to the frame with the mounting bolts, lockwashers, and nuts.
(b) Connect the fluid outlet line and the level indicator line.

(9) Selector Valves. To install SUCTION PRESSURE FILTER-OUT valve (21, figure 2-1), RESERVOIR VALVE (15), or HIGH PRESS BYPASS VALVE (19), proceed as follows:

(a) With the handle removed from the valve, insert the valve into the control panel from the rear. Attach the valve to the control panel with the mounting hardware.
(b) Check the tags you attached to the hydraulic tubing when you removed the valve. Connect the tubing to the correct ports of the valve.
(c) Install the handle on the front end of the valve using one screw.

(10) Flow Control Valve. To install FLOW CONTROL VALVE (12, figure 2-1), proceed as follows:

(a) With the handle of the valve removed, ins tall the valve in the proper opening of the control panel. Install the attaching hardware.
(b) Check the tags you attached to the hydraulic tubing when you removed the valve. Connect the hydraulic tubing to the valve.
(c) Install the knob on the valve shaft, and tighten the setscrew in the knob.

(11) Shutoff Valves. To install FLUID PRESS GAGE SHUTOFF valve (22, figure 2-1) or COMPENSATOR SHUTOFF VALVE (17), proceed as follows:

(a) With the handle removed from the valve, install the valve on the control panel.
(b) Check the tags you attached to the tubing when you removed the valve. Connect the tubing to the valve.
(c) Install the handle on the valve with one screw.

(12) Pressure Gages. To install FLUID PRESSURE GAGE (5, figure 2-1) or SUCTION PRESSURE GAGE (7), proceed as follows:

(a) Position the gage in the proper opening on the control panel and install the gage mounting hardware.
(b) Connect the hydraulic tubing to the port at the rear of the gage.

(13) Temperature Gage. To install FLUID TEMP GAGE (9, figure 2-1), proceed as follows:

(a) Position the gage in the proper opening on the control panel and install the gage mounting hardware.

(b) Install sensor in the hydraulic manifold.

c. Engine.

(1) Engine Oil Pressure Gage. To install ENGINE OIL PRESSURE gage (2, figure 2-1), proceed as follows:

(a) Position the gage in the proper opening on the control panel. Install the u-clamp behind the gage.
(b) Connect the tubing to the rear of the gage.

(2) Fuel Tank. To install fuel tank (19, figure 4-8), proceed as follows:

NOTE

The fuel tank must be installed before you install the hydraulic pump or other hydraulic components.

(a) Install the fuel tank on the test stand frame with four bolts and nuts.
(b) Connect the fuel line to the fuel tank.
(c) Connect the fuel level indicator.

(3) Crankcase Assembly. To install crankcase assembly (22, figure 4-8), proceed as follows:

(a) Position the crankcase assembly on the test stand frame.
(b) Install and tighten the engine mounting bolts.

(4) Cylinder Block. To install cylinder blocks (5, figure 4-8), proceed as follows:

(a) Install new cylinder block gaskets on the crankcase assembly.
(b) Position each cylinder block over the studs on the crankcase assembly,
(c) Install the attaching nuts and lockwashers on the studs. Tighten the nuts.
(d) Adjust the valve tappets in the cylinder block using the procedures of paragraph 4-7.

(5) Cylinder Head. To install a cylinder head (3, figure 4-8), proceed as follows:

(a) Install a new cylinder head gasket on the cylinder block.
(b) Position the cylinder head on the cylinder block.
(c) Install the head bolts and washers. Torque the bolts to 25 to 32 foot-pounds, Recheck this bolt torque after the engine has been completely assembled and warmed up.

(6) Governor. To install governor (23, figure 4-8), proceed as follows:

(a) Install a new governor gasket.
(b) Hold the governor so as to relieve the weight, and attach it to the engine front plate with four screws and lockwashers.
(c) Connect the tachometer cable to the tachometer adapter.
(d) Attach the control rod to the control lever. Install the washer and cotter pin on the end of the control rod.
(e) Connect the governor oil line.
(f) Hook the governor control spring in hole number 9 on the control lever.
(g) Adjust the governor using the instructions in paragraph 4-7.

(7) Carburetor. To install carburetor (11, figure 4-5), proceed as follows:

(a) Install a new carburetor gasket.
(b) Position the carb ureter, and attach it with two bolts and lockwashers.
(c) Connect the fuel line to the carburetor.
(d) Connect the choke and throttle control cables.
(e) Adjust the carburetor using the instructions in paragraph 4-7.

(8) Fuel Pump. To install fuel pump (5, figure 4-5), proceed as follows:

(a) Install a new fuel pump gasket on the fuel pump adapter.
(b) Attach the fuel pump to the fuel pump adapter with the two mounting screws and lockwashers.
(c) Connect the outlet fuel line to the fuel pump.

(9) Fuel Strainer. To install fuel strainer (6, figure 4-5), proceed as follows:

(a) Install and tighten the brass pipe nipple on the fuel pump.
(b) Thread the fuel strainer housing onto the brass pipe nipple.
(c) Position the screen, a new gasket, and the bowl of the fuel strainer on the fuel strainer housing, and swing the wire bail down to hold these parts. Tighten the knurled nut at the bottom of the fuel strainer.
(d) Connect the fuel inlet line to the fuel strainer.

(10) Oil Filter. To install oil filter cartridge (7. figure 4-8), screw it into oil filter base assembly (8) hand tight.

(11) Engine Gear Cover. To install engine gear cover (10, figure 4-8), proceed as follows:

(a) Install a new gear cover gasket.
(b) Install the engine gear cover on the engine using the gear cover screws and lockwashers. Tighten the screws to a torque of 14 to 18 foot-pounds.

(c) Press in two dowel pins in the right side of the engine gear cover.

(12) Alternator. To install alternator stator (11, figure 4-8), proceed as follows:

(a) Slide the alternator stator over the crankshaft, and attach it to the engine gear cover with 4 screws and 1 roll pin.
(b) Attach the voltage regulator and the rectifier module to the engine gear cover with two screws and lockwashers each.
(c) Connect the connectors on the stator leadwires to the corresponding connectors on the voltage regulator and the rectifier module.
(d) Connect the ammeter leadwire (green) to the charge side of AMMETER (3, figure 2-1).

(13) Flywheel. To install flywheel (12, figure 4-8), proceed as follows:

(a) Position the key in the keyway on the crankshaft.
(b) Carefully slide the flywheel onto the crankshaft over the key. Carefully fit the rotor portion of the alternator over the stator portion.
(c) Install the flywheel washer and locknut.

(14) Cover Plate. To install cover plate (20, figure 4-8), proceed as follows:

(a) Install a new cover plate gasket.
(b) Attach the cover plate to the crankcase assembly with the cover plate mounting screws and lockwashers.

(15) High Temperature Safety Switch. To install high temperature safety switch (2, figure 4-8), proceed as follows:

(a) Attach the high temperature safety switch to the cylinder head with one capscrew and washer.
(b) Connect the wire assembly to the terminal of the high temperature safety switch. Make sure that the other end of the wire assembly is connected to engine ground.

(16) Spark Plugs. To install a spark plug (1, figure 4-8), proceed as follows:

(a) Insert the spark plug into the threaded opening on the cylinder head.
(b) Tighten the spark plug to 25 to 30 foot-pounds torque.
(c) Connect the ignition wire to the spark plug. Make sure that you do not interchange ignition wire connections.

(17) Shrouding. To install the shrouding on the engine, proceed as follows:

(a) Disconnect the ignition wires from the spark plugs.
(b) Disconnect the leadwire from the high temperature safety switch terminal.
(c) Slide the flywheel shroud with attached screen into position over the end of the crankshaft.
(d) Attach cylinder heat deflectors (15) and lower cylinder shrouds (14) to the flywheel shroud with screw and lockwashers.
(e) Thread the leadwire for the high temperature safety switch through the grommet in the cylinder heat deflector. Connect the leadwire to the high temperature safety switch terminal.
(f) Install rear shroud covers (13) on the lower cylinder shrouds and cylinder heat deflectors with screws and lock washers.
(g) put cylinder head shrouds (16) in position. Install screws and lockwashers to attach the cylinder head shrouds and the clamps on the ignition wires.

(18) Magneto. To install magneto (1, figure 4-5), proceed as follows:

(a) Remove the screen over the flywheel air intake to expose the timing marks on the flywheel and shroud. (See figure 4-27.)
(b) Remove the number 1 spark plug. Hold your finger over the spark plug hole and turn the engine over with a handcrank.
(c) When you feel air blowing out of the spark plug hole, continue turning the engine until the flywheel mark is lined up with the air shroud mark.
(d) Connect the ignition wire for the number 1 spark plug to the number 1 connection on the magneto. Hold the other end of the same ignition wire about 1/8 inch from the magneto body.
(e) Turn the magneto gear clockwise until you see a spark at the end of the ignition wire. Hold the magneto gear at the position where you saw the spark.
(f) Attach the magneto to the engine with the attaching bolts, lockwashers. and nuts. Be careful to see that the gears mesh before you tighten the bolts.
(g) Connect the remaining three ignition wires to the correct numbered terminals of the magneto.
(h) Attach the IGNITION SWITCH wire to the top rear of the magneto with one screw.
(i) Connect the ground strap to the magneto with one screw and washer.

d. Miscellaneous Parts.

(1) Brake Drum and Hub. To replace a brake drum and hub (12, figure 3-6), proceed as follows:

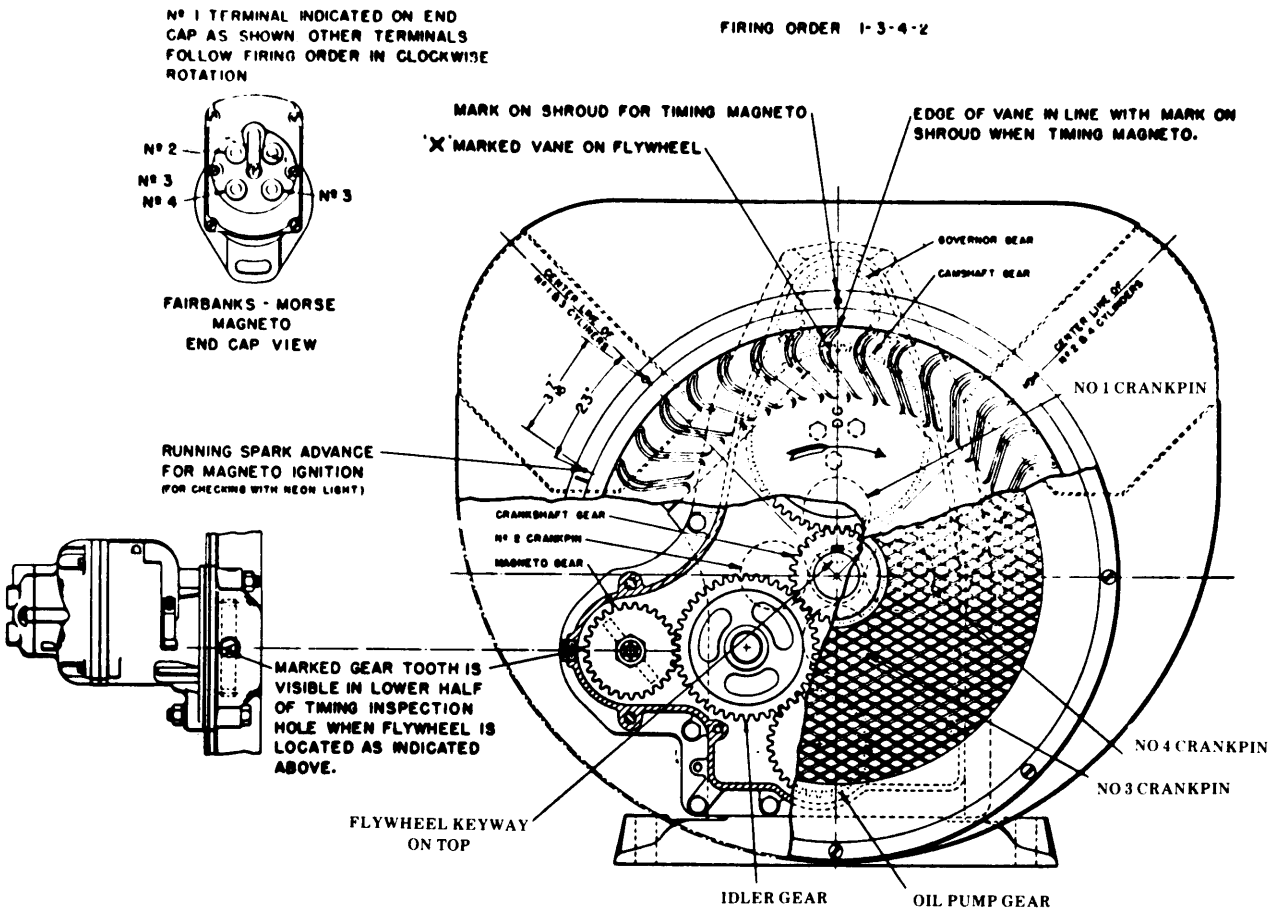


Figure 4-27. Magneto Timing Diagram

(a) With the wheel removed, slide the brake drum over the axle spindle and brake assembly.
(b) Insert the bearing.
(c) Install the washer and castellated locknut.
(d) Tighten the locknut until the brake drum turns with a slight bind.
(e) Back the locknut off just until the next cotter pin hole in the spindle is lined up with the hole in the locknut.
(f) Install the cotter pin.

(2) Tire and Tube. To install a tire and tube, proceed as follows:

(a) Place deflated tube (3, figure 3-6) in tire (4).
(b) Install wheel halves (5 and 11). You may have to lubricate the rim surfaces in order to slide the tire onto the wheel halves.
(c) Using bolts (10), washers (9), and nuts (8), fasten the wheel halves together.
(d) Install the assembled tire and wheel over the axle spindle, and install lug nuts (1) and washers (2).
(e) Inflate tube (3) to remove internal wrinkles and creases. Then let out the air.
(f) Install valve stem (7). Inflate the tire to 60 psi. Install valve cap (6).

4-7. ALIGNMENT. Adjust the engine components as follows:

a. Valve Tappets. (See figure 4-28.) With the engine cold, adjust the inlet valve tappets to a clearance of 0.008 inch, and the exhaust valve tappets to a clearance of 0.016 inch.

b. Magneto Breaker Point Gap. (See figure 4-29.) To adjust the magneto breaker point gap, proceed as follows:

(1) Take off the end cover of the magneto.
(2) Turn the engine over with a handcrank until the breaker points are opened their widest.
(3) Measure the breaker point gap with a feeler gauge. The gap should be 0.015 inch.
(4) If the gap is not right, loosen the locking screws on the contact plate just enough to let you move the contact plate.
(5) Insert a small screwdriver into the adjusting slot at the bottom of the contact plate. Move the plate with the screwdriver until you get the right gap.
(6) Tighten the locking screws. Make sure that you do not disturb the position of the contact plate.
(7) Recheck the gap. Readjust it if it is not 0.015 inch.
(8) Install the end cover on the magneto.

c. Governor. The control rod between the governor and the carburetor must be adjusted to the correct length. Make this adjustment as follows:

(1) Remove the cotter pin and washer from the end of the control rod at the governor.
(2) Disconnect the control rod from the lever on the governor.
(3) Push the control rod toward the carburetor as far as it will go. The bent end of the control rod should align with the hole in the carburetor lever. If it does not. screw the control rod into or out of the swivel block on the carburetor lever until you get the right alignment.
(4) Connect the control rod to the governor lever. Install the washer and cotter pin at the end of the control rod.

d. Carburetor. After the engine has been serviced and is in operating order, adjust the carburetor as follows:

(1) Start the engine and let it warm up.
(2) Hold the throttle closed. Adjust the idle adjusting needle (17, figure 4-13) or (22, figure 4-12) for smoothest idling of the engine. Turn the idle adjusting needle out to make the mixture richer, and in to make the mixture leaner.

4-8. SERVICING. After reassembly, service the test stand as instructed in paragraph 3-5 before you try to operate it.

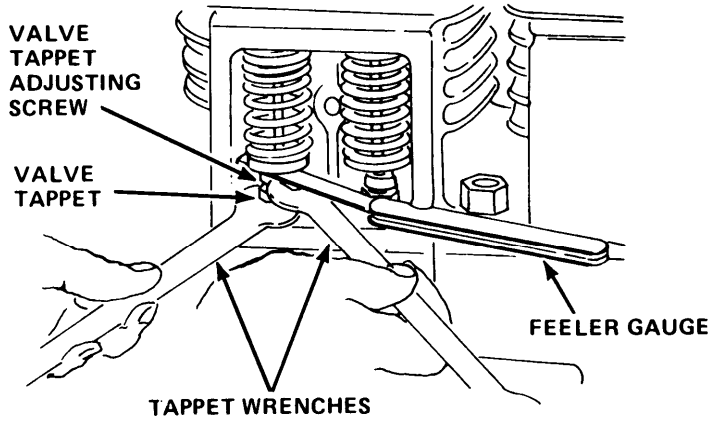


Figure 4-28. Valve Tappet Adjustment

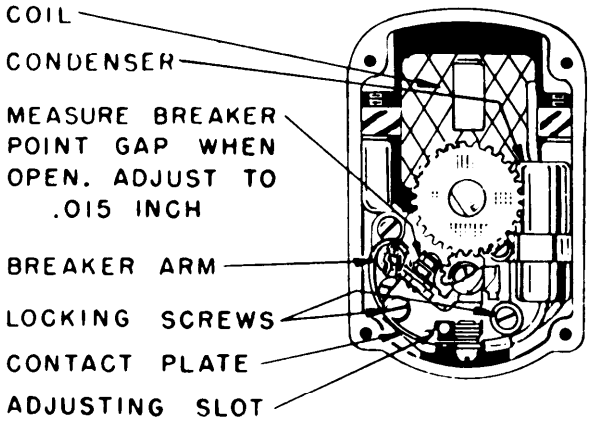


Figure 4-29. Magneto Breaker Point Adjustment

APPENDIX A

REFERENCES

A-1. Dictionaries of Terms and Abbreviations.

AR 310-25	Dictionary of United States Army Terms
AR 310-50	Authorized Abbreviations and Brevity Codes

A-2. Publication Index.

DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms

A-3. Logistics and Storage.

TM 740-90-1	Administrative Storage of Equipment
TM 743-200-1	Storage and Materials Handling

A-4. Maintenance of Supplies and Equipment.

AR 750-1	Army Material Maintenance Concepts and Policies
DA PAM 738-751	Functional Users Manual for the Army Maintenance Management System-Aviation (TAMMS-A)
TM 9-213	Painting Instructions for Field Use

A-5. Other Publications.

TM 750-244-1-4	Procedures for the Destruction of Aviation Ground Support Equipment (FSC 4920) to Prevent Enemy Use
AR 420-90	Fire Prevention and Protection

APPENDIX B

MAINTENANCE ALLOCATION CHART

THREE LEVELS OF MAINTENANCE CONCEPT

B-1. MAINTENANCE ALLOCATION CHART.

a. This Maintenance Allocation Chart (MAC) assigns maintenance functions in accordance with the Three Levels of Maintenance concept for army aircraft. These maintenance levels, Aviation Unit Maintenance (AVUM): Aviation Intermediate Maintenance (AVIM) and Depot Maintenance are depicted on the MAC as:

O - AVUM
F - AVIM
D - DEPOT

b. The maintenance to be performed below depot and in the field is described as follows.

(1) Aviation Unit Maintenance (AVUM) - AVUM activities will be staffed and equipped to perform high frequency "On-Equipment maintenance tasks required to retain or return equipment to a serviceable condition. The maintenance capability of the AVUM will be governed by the Maintenance Allocation Chart (MAC) and limited by the amount and complexity of support equipment, facilities required, and number of spaces and critical skills available. The range and quantity of authorized spare modules/components will be consistent with the mobility requirements dictated by the air mobility concept. (Assignment of maintenance tasks to divisional company size aviation units will consider the overall maintenance capability of the division, the requirement to conserve personnel and equipment resources and air mobility requirements.)

(a) Company Size Aviation Units: Perform those tasks which consist primarily of preventive maintenance and maintenance repair and replacement functions associated with sustaining a high level of equipment operational readiness. Perform maintenance inspections and servicing to include daily, intermediate, periodic and special inspections as authorized by the MAC or higher headquarters. Identify the cause of equipment/system malfunctions using applicable technical manual troubleshooting instructions, built-in-test equipment (BITE), installed instruments, or easy to use/interpret diagnostic/fault isolation devices (TMDE). Replace worn or damaged modules/components which do not require complex adjustments or system alignment and which can be removed/installed with available skills, tools and equipment. Perform operational and continuity checks and make minor repairs. Perform servicing, functional adjustments, and minor repair/replacement. Evacuate unserviceable modules/components and end items beyond the repair capability of AVUM to the supporting AVIM.

(b) Less than Company Size Aviation Units: Aviation elements organic to brigade, group, battalion headquarters and detachment size units are normally small and have less than ten aircraft assigned. Maintenance tasks performed by the aircraft crew chief or assigned aircraft repairman and will normally be limited to preventive maintenance, inspections, servicing, spot painting, stop drilling, application of nonstress patches, minor adjustments, module/component fault diagnosis and replacement of selected modules/components. Repair functions will normally be accomplished by the supporting AVIM unit.

(2) Aviation Intermediate Maintenance (AVIM) - AVIM provides mobile, responsive "One Stop" maintenance support. (Maintenance functions which are not conducive to sustaining air mobility will be assigned to depot maintenance.) Performs all maintenance functions authorized to be done at AVUM. Repair of equipment for return to user will emphasize support or operational readiness requirements. Authorized maintenance includes replacement and repair of modules/components and end items which can be accomplished efficiently with available skills, tools, and equipment. Establishes the Direct Exchange (DX) program for AVUM units by repairing selected items for return to stock when such repairs cannot be accomplished at the AVUM level. Inspects, troubleshoots, tests, diagnoses, repairs, adjusts, calibrates, and aligns system modules/components. Module/component disassembly and repair will support the DX program and will normally be limited to tasks requiring cleaning and the replacement of seals, fittings and items of common hardware. Unserviceable reparable modules/components and end items which are beyond the capability of AVIM to repair will be evacuated to Depot Maintenance. This level will perform special inspections which exceed AWM capability. Provides quick response maintenance support, on-the-job training, and technical assistance through the use of mobile maintenance contact teams. Maintains authorized operational readiness float. Provides collections and classification services for serviceable/unserviceable material. Operates a cannibalization activity in accordance with AR 750-50. (The aircraft maintenance company within the maintenance battalion of a division will perform AVIM functions consistent with air mobility requirements and conservation of personnel and equipment resources. Additional intermediate maintenance support will

be provided by the supporting non-divisional AVIM unit).

B-2. USE OF THE MAINTENANCE ALLOCATION CHART .

a. The Maintenance Allocation Chart assigns maintenance functions to the lowest level of maintenance based on past experience and the following consideration:

(1) Skills available.
(2) Time required.
(3) Tools and test equipment required and/or available.

b. Only the lowest level of maintenance authorized to perform a maintenance is indicated.

c. A maintenance function assigned to a maintenance level will automatically be authorized to be performed at any higher maintenance level.

d. A maintenance function that cannot be performed at the assigned level of maintenance for any reason may be evacuated to the next higher maintenance organization. Higher maintenance levels will perform the maintenance functions of lower maintenance levels when required or directed by the appropriate commander.

e. The assignment of a maintenance function will not be construed as authority to carry the associated repair parts in stock. Authority to requisition, stock, or otherwise secure necessary repair parts will be as specified in the repair parts appendix.

f. Normally there will be no deviation from the assigned level of maintenance. In cases of operational necessity, maintenance functions assigned to a maintenance level may, on a one-time basis and at the request of the lower maintenance level, be specifically authorized by the maintenance officer of the level of maintenance to which the function is assigned. The special tools, equipment, etc. required by the lower level of maintenance to perform this function will be furnished by the maintenance level to which the function is assigned. The transfer of a maintenance function to a lower maintenance level does not relieve the higher maintenance level of the responsibility for the function. The higher level of maintenance has the authority to determine:

(1) If the lower level is capable of performing the work.

(2) If the lower level will require assistance or technical supervision and on-site inspection.

(3) If the authorization will be granted.

g. Organizational through depot maintenance of the U.S. Army Electronics Command equipment will be performed by designated U.S. Army Electronics Command personnel.

h. Changes to the Maintenance Allocation Chart will be based on continuing evaluation and analysis by responsible technical personnel and on reports received from field activities.

B-3. DEFINITIONS.

a. Inspect. To determine serviceability of an item by comparing its physical, mechanical and electrical characteristics with established standards.

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

c. Service. To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents and air.

d. Adjust. To rectify to the extent necessary to bring into proper operating range.

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

f. Calibrate. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison 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 or test equipment being compared with the certified standard.

g. Install. To set up for use in an operational environment such as an emplacement, site or vehicle.

h. Replace. To replace unserviceable items with serviceable assemblies, subassemblies or parts.

i. Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This includes, but is not limited to, inspection, cleaning, preserving, adjusting, replacing, welding, riveting, and strengthening.

J. Overhaul. To restore an item to a completely serviceable condition as prescribed by maintenance serviceability standards prepared and published for the specific item to be overhauled.

k. Rebuild. To restore an item to a standard as nearly as possible to the original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components; repair or replacement of worn or unserviceable elements (items) using original manufacturing tolerances and specifications, and subsequent reassembly of the item.

B-4. FUNCTIONAL GROUPS.

Standard functional groupings are not considered feasible for aviation ground support equipment due to variation and complexity. Therefore; variations to functional groupings may occur.

B-5. SYMBOLS.

The letters "O - (AVUM), F - (AVIM), and D - (Depot)", when placed on the Maintenance Allocation Chart indicate the lowest level of maintenance responsible for performing the particular maintenance function. Maintenance levels higher than the level of maintenance marked by the symbol are authorized to perform the indicated function.

NOMENCLATURE OF END ITEMS

HYDRAULIC TEST STAND - TYPE D5C

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
00	Test Stand, Hydraulic Systems, Gasoline Engine Drive, Type D5C						
01	Electrical System						
0101	Battery	Inspect	0.1				
		Test	0.3			1	
		Service	0.2				
		Replace	0.5			2	
0102	Ignition Leads	Inspect	0.2				
		Test	0.3			3	
		Service	0.2				
		Replace	0.5			2	
0103	Alternator	Inspect	0.2				
		Test	0.5			3	
		Service	0.2				
		Replace	1.0			2	
		Repair		2.0			
0104	Starter Motor	Inspect	0.2				
		Test		0.5		4	
		Service	0.2				
		Replace	1.0			2	
		Repair		2.0			
0105	Indicators	Inspect	0.2				
		Replace		0.5		4	
0106	Electrical Wiring, Cables and Switches	Inspect	0.2				
		Test		0.3		4	
		Replace		0.5		4	
				0.5		4	
02	Hydraulic System						
0201	Pump	Inspect	0.1				
		Test		0.5		5	
		Service	0.2				
		Replace		2.5		5	
		Repair			16.0		

NOMENCLATURE OF END ITEMS

HYDRAULIC TEST STAND - TYPE D5C

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
0202	Compensator Control	Inspect	0.1				
		Test		0.5		5	
		Service	0.2				
		Replace		1.0		5	
		Repair		1.0			
0203	Valves,	Inspect	0.1				
		Test		0.5		5	
		Service	0.2				
		Replace		1.0		5	
		Repair		1.0		5	
0204	Fluid Reservoir	Inspect	0.1				
		Service	0.2				
		Replace		2.0		5	
		Repair		1.0		5	
0205	Filter Assemblies	Inspect	0.1				
		Test	0.5				A
		Service	1.0			2	
		Replace	1.5			5	
		Repair	0.5			5	
0206	Pressure Gages	Inspect	0.1				
		Replace		1.0		5	
		Calibrate	*				B
0207	Lines, Tubing's, Fittings and Hose Assemblies	Inspect	0.1				
		Service	0.3				
		Replace	0.5			2	
03	Engine						
0301	Cylinder Block	Inspect		0.3			
		Replace		2.5		6	
		Repair		1.5		6	
0302	Crankcase	Inspect		0.3			
		Replace		8.0		6	
		Repair		1.5		6	
0303	Governor Assembly	Inspect	0.1				
		Test		0.5			A
		Adjust		0.5			
		Replace		1.0		6	
		Repair		1.5		6	

NOMENCLATURE OF END ITEMS

HYDRAULIC TEST STAND - TYPE D5C

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
0304	Fuel Pump	Inspect	0.1				
		Test		0.5			A
		Replace		1.0		6	
		Repair		1.0		6	
0305	Oil Filter Assembly	Inspect	0.1				
		Service	0.5			2	
		Replace	0.6			2	
0306	Magneto	Inspect	0.1				
		Test		0.5		6	
		Adjust		0.5		6	
		Replace		0.6		6	
		Repair		1.0		6	
0307	Carburetor	Inspect	0.1				
		Test		0.5			A
		Service	0.3			2	
		Adjust		0.3		6	
		Replace		1.0		6	
		Repair		1.5		6	
0308	Air Cleaner	Inspect	0.1				
		Service	0.3			2	
		Replace	0.5			2	
		Repair	0.5			2	
04	Chassis						
0401	Axle and Steering Assembly	Inspect	0.2				
		Service	0.5				2, 7
		Repair	1.0				2, 7
0402	Wheel Assembly	Inspect	0.1				
		Service	0.5				2, 7
		Repair	0.5	1.0			2, 7
0403	Brake Assembly	Inspect	0.2				
		Service	0.2				2, 7
		Adjust	0.5				2
		Repair	0.8				2, 7

REMARKS

HYDRAULIC TEST STAND - TYPE D5C

Reference Code	Remarks
A	Operational test can be performed with component installed on end item.
B	See TB 43-180

HYDRAULIC TEST STAND - TYPE D5C

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBERS	TOOL NO.
1	0	TESTER, BATTERY ELECTROLYTE SOLUTION	6630-00-171-5126	
2	0	TOOL, KIT, AIRRAFT MECHANICS	5180-00-323-4692	
3	0	MULTIMETER	6625-00-999-7465	
4	F	TOOL SET, ELECTRIC-INSTRUMENT	4920-00-165-1453	
5	F	TOOL SET, HYDRAULIC	4920-00-165-1454	
6	F	TOOL SET, RECIPRO-CATING ENGINE	4920-00-464-0222	
7	0	TOOL SET, AVIATION UNIT MAINTENANCE	4920-00-567-0467	

APPENDIX C

REPAIR PARTS AND SPECIAL TOOLS LIST

SECTION I. INTRODUCTION

C-1. Scope. This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TM DE); and other special support equipment required for performance of Aviation Unit and Aviation intermediate maintenance of the Test Stand Hydraulic System Gasoline Engine Driven. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance and recoverability (SMR) codes.

C-2. General. In addition to Section I, introduction, 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 by this RPSTL 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 ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in item name sequence. Repair parts kits are listed separately in their own functional group within Section 11. Repair parts for repairable special tools are also listed in this section. Items listed are shown on the associated illustration(s)/figure(s).

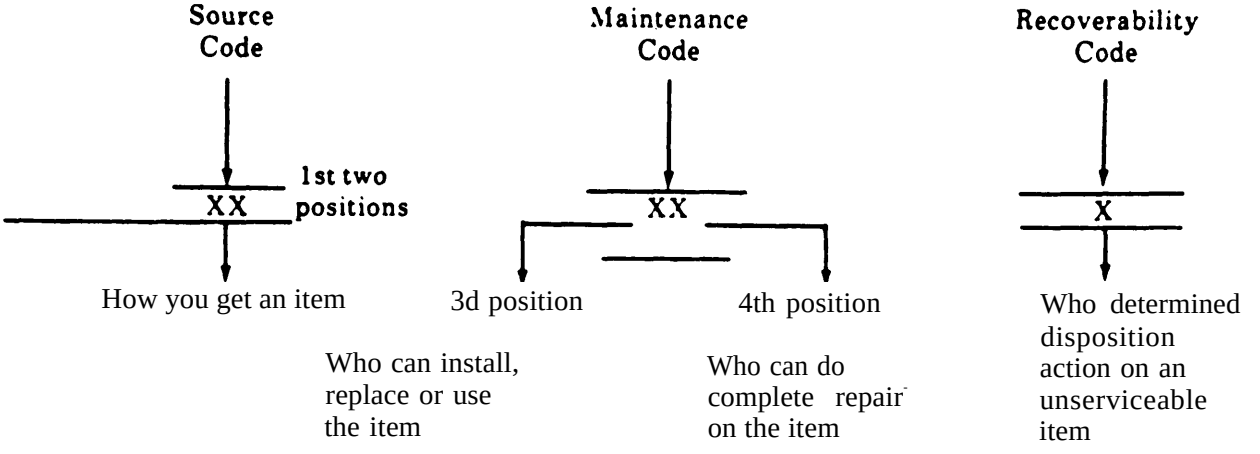
b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE column) for the performance of maintenance. (Not applicable)

c. Section IV. National Stock Number and Part Number Index. A list, in National Item Identification Number (NIIN) sequence, of all National stock numbered items appearing in the listing, 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.

C-3. Explanation of Columns (Sections II and III).

a. Item No. (Column (1)). Indicates the number used to identify items called out in the illustration.

b. SMR Code (Column (2)). The Source, Maintenance, and Recoverability (SMR) code is a 5-Position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instruction, as shown in the following breakout:



*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of-the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) ***Source Code.*** The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follows:

Code	Explantion
PA PB PC** PD PE PF PG	Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3d position of the SMR code. **NOTE: Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3d position of the SMR code. The complete kit must be requisitioned and applied.

Code	Explanation
MO - (Made at org/ AVUM Level) MF - (Made at DS/ AVUM Level) MH - (Made at GS Level) ML- (Made at Specialized Repair Act (SRA)) MD- (Made at Depot)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in this RPSTL. If the item is authorized to you by the 3d position code of the SMRcode, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.

Code	Explanation;
AO - (Assembled by org/ AVUM Level) AF - (Assembled by DS / AVIM Level) AH - (Assembled by GS Category) AL - (Assembled by SRA) AD - (Assembled by Depot]	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3d position code of the SMR code authorizes you to replace the item. but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.

XA - Do not requisition an "XA"-coded item. Order its next higher assembly. (Also, refer to the NOTE below,)
XB - If an "XB" item is not available from salvage, order it using the FSCM and part number given.
XC - Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
XD - Item is not stocked. Order an "XD''-coded. item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE: Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 700-42.

(2) ***Maintenance Code.*** .Maintenance codes tells you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR Code as follows:

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

Code	Application/Explanation
C	-Crew or operator maintenance done within organizational or aviation unit maintenance.
O	-Organizational or aviation unit category can remove. replace. and use the item.
F	-Direct support or aviation intermediate level can remove. replace, and use the item.
H	-General support level can remove, replace, and use the item.
L	-Specialized repair activity can remove. replace. and use the item.
D	-Depot level can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair [i. e.. perform all authorized repair functions.) (NOTE: Some limited repair may be done on the item at a lower level of maintenance. if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.) This position will contain one of the following maintenance codes.

Code	Application/Explanation
O	-organizational or (aviation unit) is the lowest level that can do complete repair of the item.
F	-Direct support or aviation intermediate is the lowest level that can do complete repair of the item.
H	-General support is the lowest level that can do complete repair of the item,
L	-Specialized repair activity (designate the specialized repair activity) is the lowest level that can do complete repair of the item.
D	-Depot is the lowest level that can do complete repair of the item.
Z	-Nonreparable. No repair is authorized.
B	-No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B" coded item). However, the item may be reconditioned by adjusting, lubricating. etc., at the user level.

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

Recoverability Codes	Application/Explanation
Z	-Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3d position of SMR Code.
O	-Reparable item. When uneconomically reparable. condemn and dispose of the item at organizational or aviation unit level.
F	-Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or aviation intermediate level.
H	-Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D	-Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L	-Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A	-Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value. critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. FSCM (Column (3)). The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer. distributor. or Government agency etc., that supplies the item.

d. Part Number (Column (4)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specification standards, and inspection requirements to identify an item or range of items,

NOTE: When you use a NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. Description and Usable On Code (UOC) (Column (5)). This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) The physical security classification of the item is indicated by the parenthetical entry (insert applicable physical security classification abbreviation, e.g., Phy Sec C1 (C) - Confidential, Phy Sec C1 (S) - Secret, Phy Sec C1 (T) - Top Secret).

(3) Items that are included in kits and sets are listed below the name of the kit or set.

(4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(5) Part numbers for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated.

(6) When the item is not used with all serial numbers of the same model. the effective serial numbers are shown on the last line(s) of the description (before UOC).

(7) The usable on code, when applicable (see paragraph 5. Special information).

(8) In the Special Tools List section, the basis of issue (BOI) appears as the last line(s) in the entry for each special tool, special TM DE, and other special support equipment. When density of equipments supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.

(9) The statement "END OF FIGURE" appears just below the last item description in Column 5 for a given figure in both Section II and Section III.

f. QTY (Column (6)). The QTY (quantity per figure column) indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group. subfunctional group, or an assembly. A "'V" appearing in this column in lieu of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

C-4. Explanation of Columns (Sect. IV).

a. National Stock Number (NSN) Index.

(1) Stock Number Column. This column lists the NSN by National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN (i.e., 5305-01-674-1467). When using this column to locate an item, ignore the first 4 digits of the NSN. However. the complete NSN should be used when ordering items by stock number.

(2) Fig. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II and Section III.

(3) Item Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. Part Number Index. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combination which places the first letter or digit of each group in order A through Z, followed by the numbers O through 9 and **each** following letter or digit in like order).

(1) FSCM Column. The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

(2) Part Number Column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which Controls the design and characteristics of the item by means of its engineering drawings,. specifications standards, and inspection requirements to identify an item or range of items.

(3) Stock Number Column. This column lists the NSN for the associated part number and manufacturer identified in the Part Number and FSCM Columns to the left.

(4) FIG. Column. This column lists the number of the figure where the item is identified/located in Section II and III.

(5) Item Column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

C-5. Special Information. Use the following subparagraphs as applicable:

a. Usable On Code. The usable on code appears in the lower left corner of the Description column heading. Usable on codes are shown as "UOC: . . ." in the Description Column (justified left) on the first line applicable item description/nomenclature. Uncoded items are applicable to all models. Identification of the usable on codes used in the RPSTL are:

Code	Used On	
PAA	Model Ml14	
PAB	Model Ml14A	(These codes and model
PAC	Model M1l4B	numbers are examples only)

b. Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the National Stock Number/Part Number Index and the bulk material list in Section II.

c. Associated Publications. The publication(s) listed below pertain to (insert applicable equipment nomenclature) and its components:

Publication	Short Title

NOT APPLICABLE

NOTE: Associated publications shall not be listed herein combined narrative and RPSTL manuals.

C-6. How to Locate Repair Parts.

a. When National Stock Number or Part Number is Not Known.

(1) Fist. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the assembly group or subassembly group to which the item belongs.

(3) Third. Identify the item on the figure and note the item number.

(4) Fourth. Refer to the Repair Parts List for the figure to find the part number for the item number noted on the figure.

(5) Fifth. Refer to the Part Number Index to find the NSN, if assigned.

b. When National Stuck Number or 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. The NSN index is in National Item Identification Number (NIIN) sequence (see C-4a(l)). The part numbers in the Part Number index are listed in ascending alphanumeric **sequence (see** C-4.b). Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

(2) Second. After finding the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

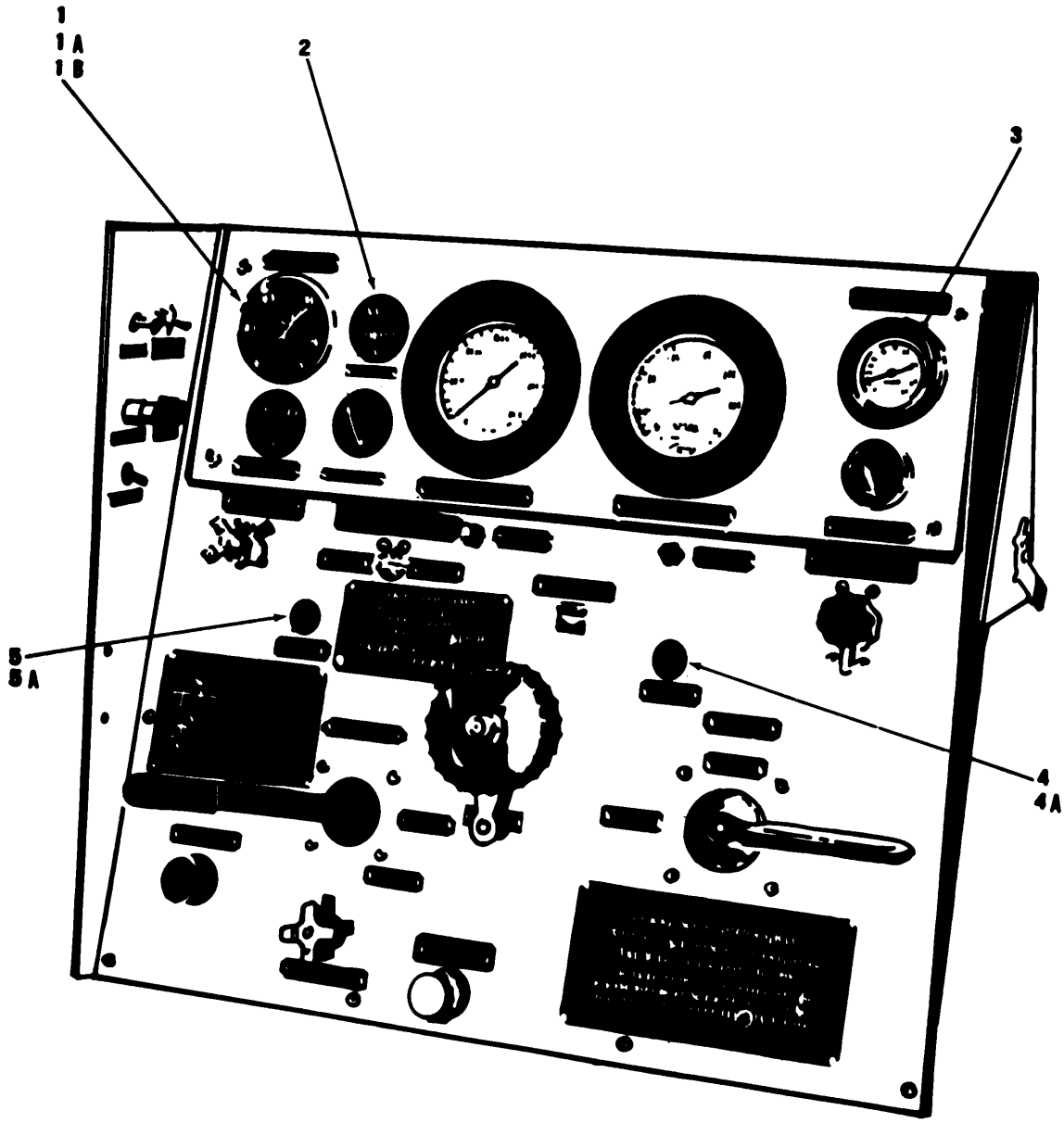


Figure C-1. Main Control Panel, Electrical Instruments

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				GROUP 01 ELECTRICAL SYSTEM	
				FIGURE C-1 MAIN CONTROL PANEL, ELECTRICAL INSTRUCTIONS	
1	XDFZZ	70040	6468074	GAGE,TACHOMETER /HOURMETER	1
1A	XDFZZ	57733	411335	ADAPTER RIGHT ANGLE TACHOMETER	1
1B	XDFZZ	70040	6454458	SHAFT ASSEMBLY TACHOMETER	1
2	XDFZZ	57733	YE2	AMMETER (30-0-30 AMPS)	1
3	XDFZZ	61349	8111-152	GAGE,TEMP HYRAULIC FLUID	1
4	XDFZZ	72619	806-1710-0431-50 4	LIGHT,INDICATOR HIGH PRESSURE FILTER DIFFERENTIAL FLUID PRESSURE	1
4A	XDFZZ	72619	T3	LAMP HIGH PRESSURE FILTER DIFFERENTIAL FLUID PRESSURE	1
5	XDFZZ	72619	806-1710-0431-50 4	LIGHT,INDICATOR LOW PRESSURE FILTER DIFFERENTIAL FLUID PRESSURE	1
5A	XDFZZ	72619	T3	LAMP LOW PRESSURE FILTER DIFFERENTIAL FLUID PRESSURE	2
				END OF FIGURE	

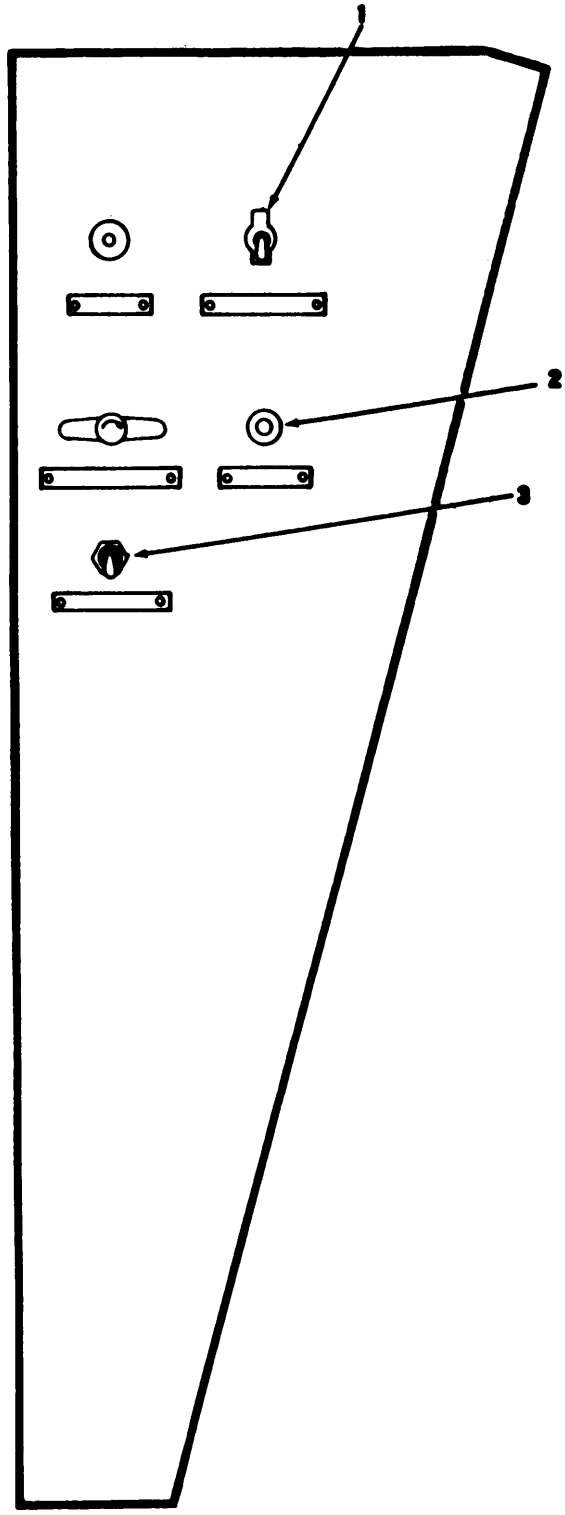


Figure C-2. Start-up Panel, Electrial Controls

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-2 START-UP PANEL, ELECTRICAL CONTROLS	
1	XDFZA	96906	MS35059-23	SWITCH,TOGGLE IGNITION	1
2	XDOZZ	75915	311010	FUSE,CARTRIDGE 10 AMPS	1
3	XDFZZ	96906	MS35058-30	SWITCH,TOGGLE STARTER	1
				END OF FIGURE	

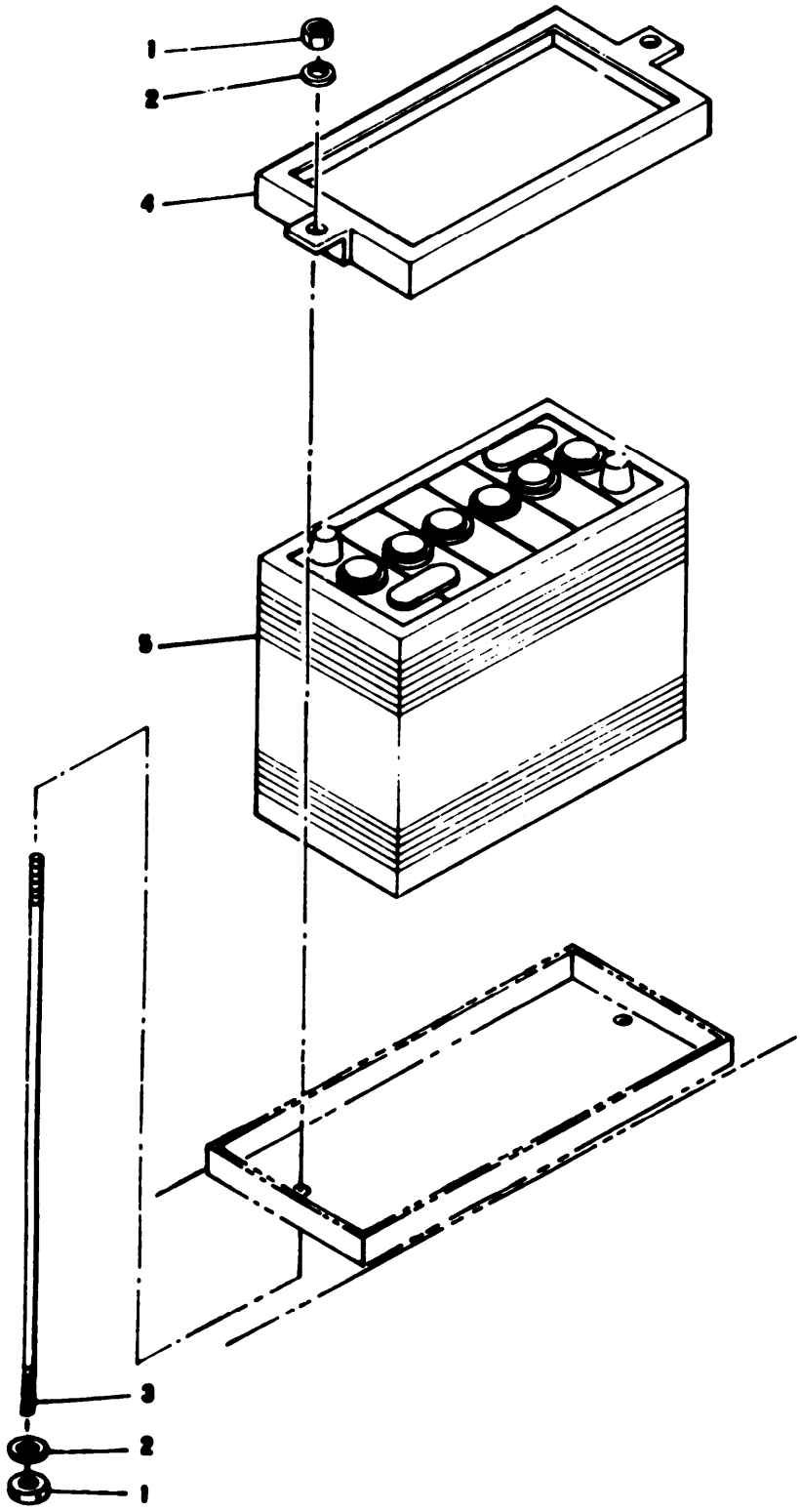


Figure C-3. Battery

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-3 BATTERY	
1	XDFZZ	96906	MS35690-516	NUT,HEX	4
2	XDFZZ	88044	AN960-516	WASHER,FLAT	4
3	XDFZZ	22680	89280	ROD BATTY HOLD DOWN	2
4	XDFZZ	78174	HD-27	HOLD DOWN,BATTY UOC:D69	1
5	XDOFF	81348	WB131HTYPE2SMD	BATTERY,STORAGE	1
				END OF FIGURE	

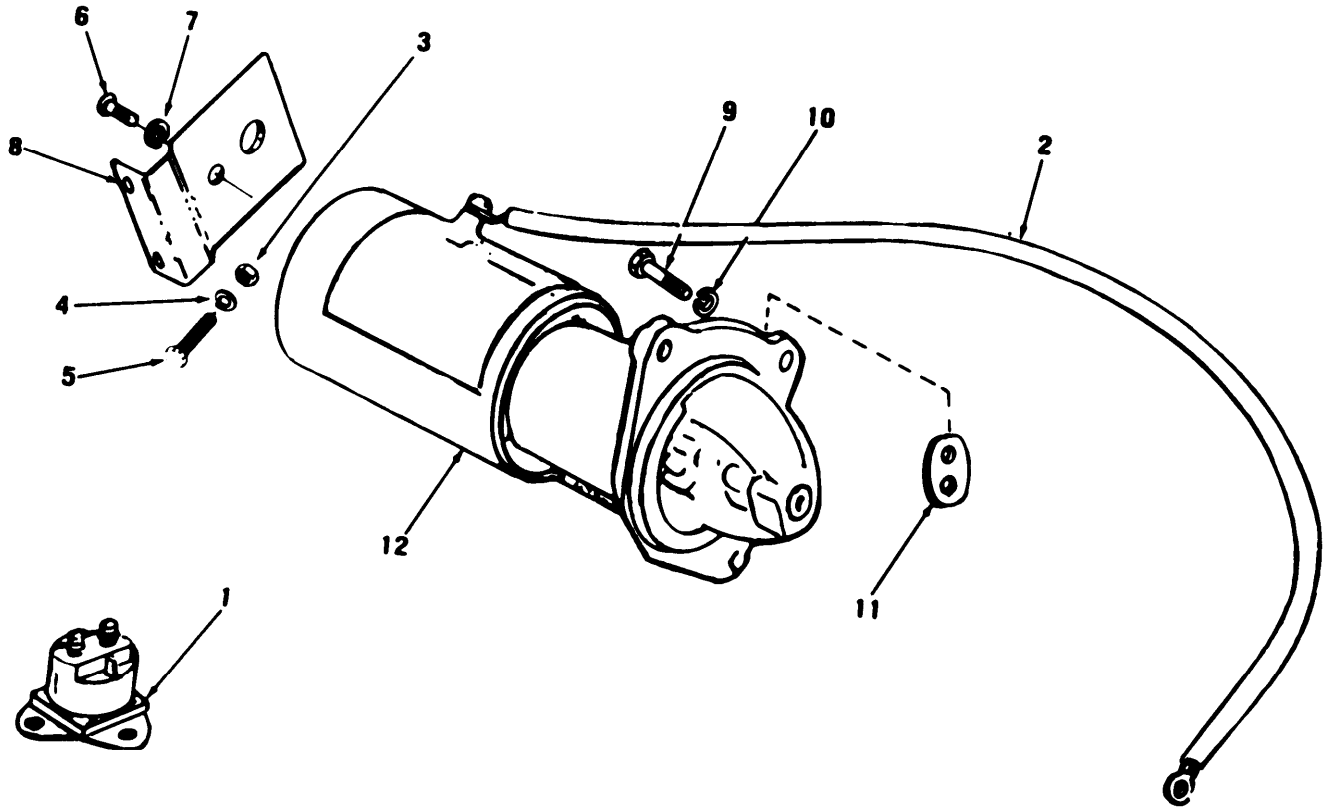


Figure C4. Starter Installation

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-4 STARTER INSTALLATION	
1	XDFZZ	19728	YC-96	SWITCH,STARTER SOLENOID	1
2	XDFZZ	66289	YL-356-28	CABLE ASSY	1
3	XDFZZ	66289	PD-10	NUT	2
4	XDFZZ	66289	PE-4	WASHER,LOCK	2
5	XDFZZ	66289	PC-396	STUD,PLAIN	2
6	XDFZZ	66289	XA-8	SCREW	1
7	XDFZZ	66289	PH-194	WASHER	1
8	XDFZZ	66289	PG-515-A	BRACKET,SUPPORT	1
9	XDFZZ	66289	PB-187	BOLT,MACHINE	3
10	XDFZZ	66289	PE-5	WASHER,LOCK	3
11	XDFZZ	66289	YD-296	CONNECTOR,TERMINAL	1
12	XDFZZ	66289	YA-54-A	STARTER SEE FIG.C-5 FOR BREAKDOWN	1
				END OF FIGURE	

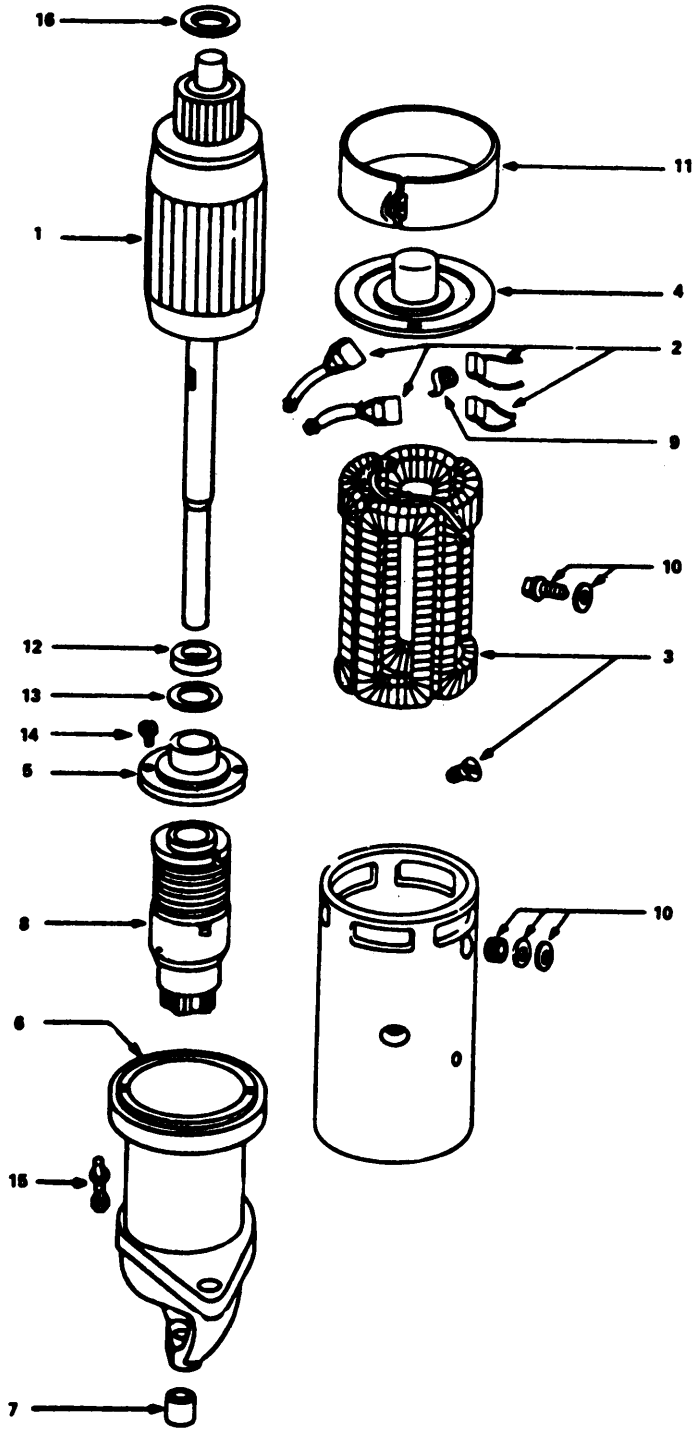


Figure C-5. Starter Motor

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-5 STARTER MOTOR	
	XDFZZ	19728	YA-54-A	STARTER,ELEC (SEE FIG.C-4 FOR NHA)	1
1	XDFZZ	19728	MBG-2411	.ARMATURE	1
2	XDFZZ	19728	MBG-2012S	.BRUSH SET	1
3	XDFZZ	19728	MBG-3005AS	.FIELD COIL PKG (INCLUDES POLE SHOE SCREW)	1
4	XDFZZ	19728	MZ-2002Q	.COMMUTATOR ENDHEAD	1
	XDFZZ	19728	MAD-110	..FELT	1
5	XDFZZ	19728	MZ-1360	.BEARING,SLEEVE	1
6	XDFZZ	19728	PS1330B	.PINION HSG ASSY	1
7	XDFZZ	19728	MZ-364	.BEARING	1
8	XDFZZ	19728	EBB-137A	.DRIVE,BENDIX	1
9	XDFZZ	19728	MZ-19S	.BRUSH SPRING SET	1
10	XDFZZ	19728	P90-743	.TERMINAL,STUD	1
11	XDFZZ	19728	MZ-1024U	.BAND,COVER	1
12	XDFZZ	19728	XA-832	.SEAL,OIL	1
13	XDFZZ	19728	MZ-359	.GASKET	1
14	XDFZZ	19728	P90-822	.MOUNTING SCREW PKG	4
15	XDFZZ	19728	MZ-52	.SCREW	4
16	XDFZZ	19728	P90-448	.THRUST WASHER PKG	1
				END OF FIGURE	

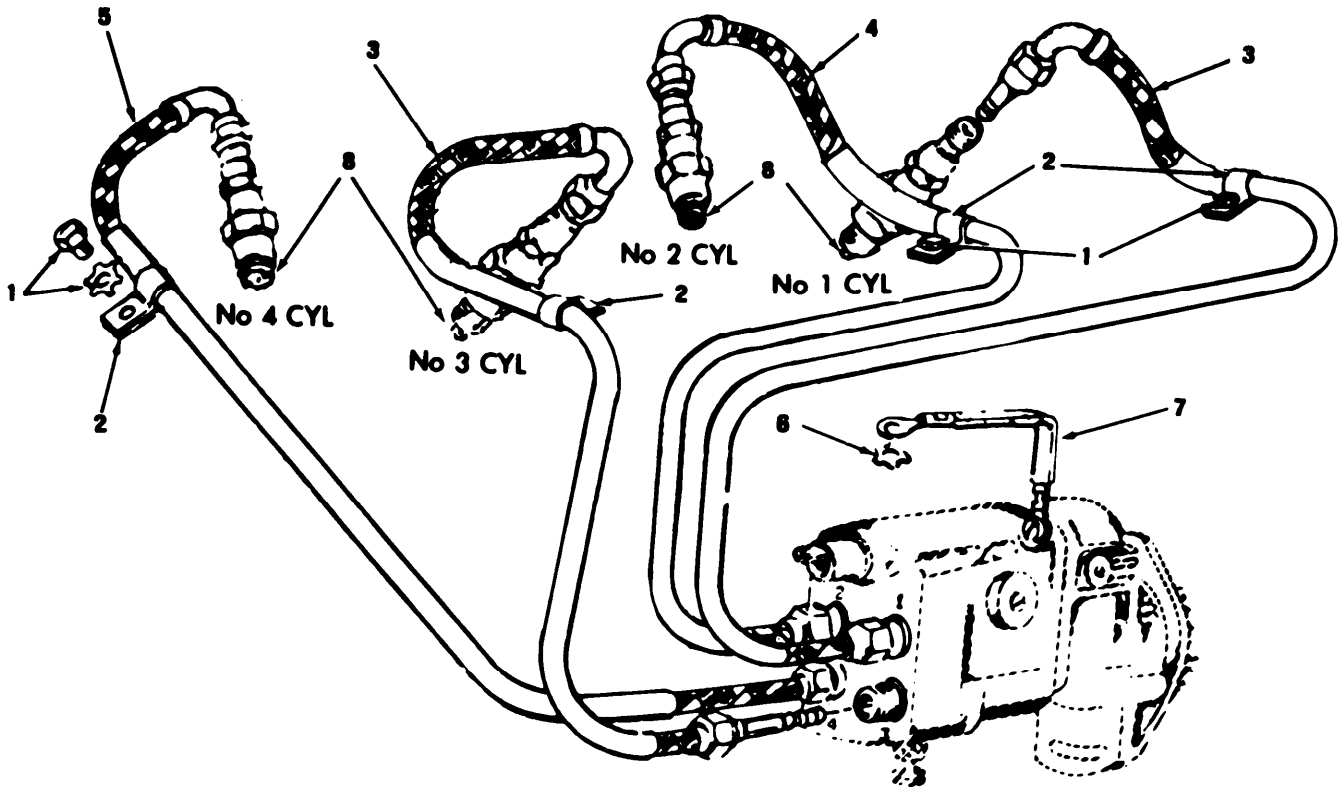


Figure C-6. Radio Shielded Magneto Ignition

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-6 RADIO SHIELDED MAGNETO IGNITION	
1	XDFZZ	66289	PE-34A	SCREW	4
2	XDFZZ	66289	PG-558	CLIP	4
3	XDFZZ	66289	YD-300-32	CABLE,IGN 1 AND 3	2
4	XDFZZ	66289	YD-300-40	CABLE,IGN.,2	1
5	XDFZZ	66289	YD-300-23	CABLE,IGN.,4	1
6	XDFZZ	66289	PE-45A	WASHER	1
7	XDFZZ	66289	YL-355-5	LEAD,ELECTRICAL	1
8	XDFZZ	66289	YD-311	SPARK,PLUG	4
				END OF FIGURE	

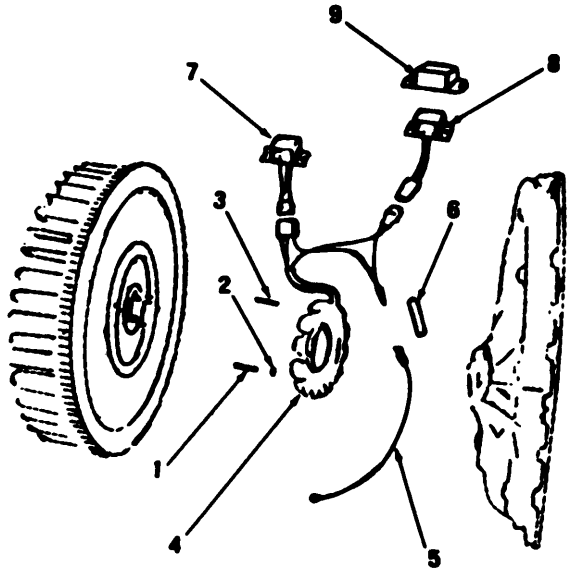


Figure C-7. Alternator

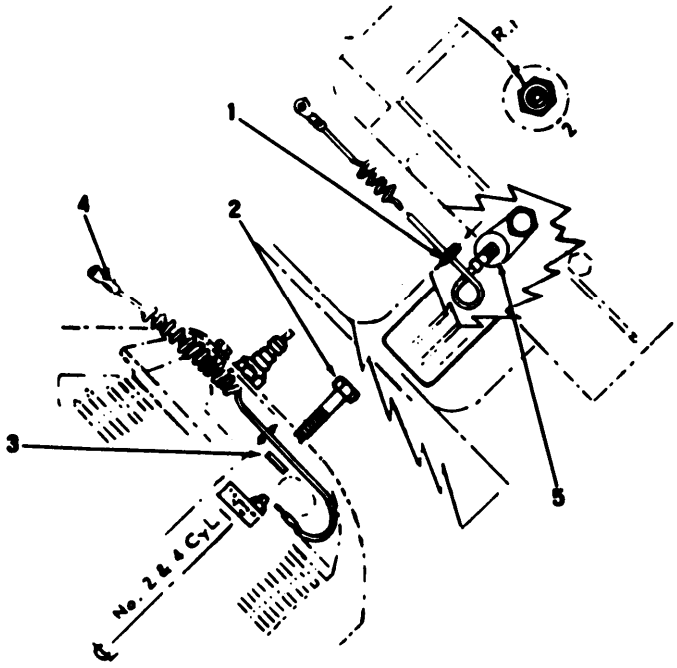


Figure C-8. High Temperature Safety Switch

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-7 ADAPTER ASSEMBLY	
1	XDFZZ	66289	XB-106	SCREW STATOR MTG	4
2	XDFZZ	66289	PE-14	LOCKWASHER	4
3	XDFZZ	66289	PA-340	PIN,ROLL	2
4	XDFZZ	66289	YB-82	STATOR,ASSY ALTERNATOR	1
5	XDFZZ	66289	YL-380-18	WIRE ASSY	1
6	XDFZZ	66289	YD-350	INSULATION SLEEVING	1
7	XDFZZ	66289	YJ-68	MOULER,RECT	1
8	XDFZZ	66289	YJ-60	MODULE,REG	1
9	XDFZZ	66289	YD-353	SHIELD,REG.MOD	1
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-8 HIGH TEMPERATURE SAFETY SWITCH	
1	XDFZZ	16794	PH-377-B	GROMMET	1
2	XDFZZ	66289	XD-32	CAPSCREW	1
3	XDFZZ	16794	PH-22-A	WASHER	1
4	XDFZZ	66289	YL-357-25	WIRE ASSY	1
5	XDFZZ	66289	YC-66-G-S1	KIT,SWITCH HIGH TEM	1
				END OF FIGURE	

(1) ILLUSTRATION (A) FIG NO	(B) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 02 HYDRAULIC SYSTEM			
C-9		XDOZZ		22680	48404	HOSE ASSY HALF-INCH OUTLET		EA	1
C-9	1	XDOZZ	5340-00-576-5545	00624	155S9-8D	.PLUG,PROTECTIVE		EA	2
C-9	2	XDOZZ	5310-00-934-9751	96906	MS35650-302	.NUT,PLAIN,HEXAGON		EA	2
C-9	2A	XDOZZ	5305-00-989-7434	96906	MS35207-263	.SCREW,MACHINE		EA	2
C-9	3	XDOFZ	5340-00-106-0552	96906	MS21104D12	.CLAMP		EA	2
C-9	4	XDOZZ	4730-00-554-7737	00624	155S5-8D	.COUPLING HALF,QUICK DISCONNECT ONE-HALF INCH		EA	2
C-9	5	XDOZZ	4730-00-804-1926	96906	MS24392-8	.NIPPLE,TUBE		EA	1
C-9	6	XDOZZ	4720-00-580-8446	96906	MS28759H1200	.HOSE ASSEMBLY,NONME		EA	2
C-10		XDOOO		22680	48405	HOSE ASSY THREE-QUARTER INCH OUTLET		EA	1
C-10	1	XDOZZ		00624	155S9-12	.PLUG,PROTECTIVE		EA	2
C-10	2	XDOZZ	5310-00-934-9751	96906	MS35650-302	.NUT,PLAIN,HEXAGON		EA	2
C-10	2A	XDOZZ	5305-00-989-7434	96906	MS35207-263	.SCREW,MACHINE		EA	2
C-10	3	XDOZZ	5340-00-106-0554	96906	MS21104D/6	.CLAMP,LOOP		EA	2
C-10	4	XDOZZ	4730-00-540-1268	00624	155S5-12D	.COUPLING HALF,QUICK DISCONNECT		EA	2
C-10	5	XDOZZ		22680	89518	.TAG,CABLE		EA	2
C-10	6	XDOZZ	4730-00-804-1925	96906	MS24392-12	.NIPPLE,TUBE		EA	1
C-10	7	XDOZZ		96906	MS28741-12-1200	.HOSE ASSY		EA	2
C-11		XDOZZ	4730-00-722-4891	22860	48422	ADAPTER ASSY ONE-HALF INCH TO THREE-QUARTER INCH	09	EA	1
C-11	1	XDOZZ	5310-00-934-9751	96906	MS35650-302	.NUT,PLAIN,HEXAGON CHAIN MTG	D9	EA	2
C-11	1A	XDOZZ	5305-00-989-7434	96906	MS35207-263	.SCREW,MACHINE CHAIN MTG	D9	EA	2
C-11	2	XDOZZ	5340-00-543-3904	00624	155S7-8D	.CAP,PROTECTIVE ONE-HALF INCH		EA	1
C-11		XDOZZ	5365-00-804-2027	00624	21002-2	..RING,RETAINER	D9	EA	1
C-11		XDOZZ	5330-00-198-6163	00624	22500-14	..PACKING,PREFORMED	D9	EA	1
C-11		XDOZZ	4730-00-098-4273	00624	E155-25-8D	..NUT,UNION ONE-HALF INCH	D9	EA	1
C-11	3	XDOZZ		00624	5100S10-8	..CHAIN PROTECTIVE CAP	D9	EA	1
C-11	4	XDOOZ	4730-00-561-1544	00624	155S7-12D	.CAP,QUICK DISCONNEC THREE-QUARTER INCH	D9	EA	1
C-11		XDOZZ		00624	21002-3	..RING,RETAINING	D9	EA	1
C-11		PBOZZ	5330-00-122-5787	00624	22500-19	..PACKING,PREFORMED	D9	EA	1
C-11		XDOZZ	4730-00-098-4274	00624	E155-25-12D	..NUT,UNION THREE-QUARTER INCH	D9	EA	1
C-11	5	XDOZZ		00624	5100S10-8	..CHAIN PROTECTIVE CAP	D9	EA	1
C-11	6	XDFZZ	4730-00-540-0392	00624	155S2-8D	.COUPLING,HALF ONE-HALF INCH		EA	1
C-11		XDFZZ		00624	155-37B8	..SPRING,LOCK	D9	EA	1
C-11		XDFZZ		00624	155-37C8	..WASHER	D9	EA	1
C-11	7	XDFZZ		00624	155S2-12D	.COUPLING,HALF THREE-QUARTER INCH	D9	EA	1
C-11		XDFZZ		00624	155-37B12	..SPRING,LOCK	D9	EA	1
C-11		XDFZZ		00624	155-37C12	..WASHER	D9	EA	1
C-11	8	XDOZZ	5340-00-106-0550	96906	MS21104D8	.CLAMP,LOOP ONE-HALF INCH	D9	EA	1
C-11	9	XDOZZ	5340-00-106-0552	96906	MS21104D12	.CLAMP,LOOP THREE-QUARTER INCH	D9	EA	1
C-11	10	XDOZZ	4730-00-433-3376	96906	MS20819-8	.SLEEVE,FLARED,TUBE ONE-HALF INCH	D9	EA	2

(1) ILLUSTRATION (A) FIG NO	(B) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-11	10A	XDFZZ	4730-00-722-4891	88044	AN818-8	.NUT,COUPLING	D9	EA	2
C-11	11	XDFZZ	4730-00-433-3377	96906	MS20819-12	.SLEEVE,FLARED,TUBE THREE-QUARTER INCH	D9	EA	2
C-11	11A	XDFZZ	4730-00-287-0296	88044	AN818-12	.NUT,TUBE COUPLING THREE-QARTER INCH	D9	EA	2
C-11	12	XDFZZ		22680	132688	.TUBING 1/2 X .065 WALL THICKNESS	D9	EA	1
C-11		XDFZZ		22680	48406	COUPLING ASSY ACCESSORY 1/2 INCH		EA	1
C-11		XDFZZ		00680	48407	COUPLING ASSY ACCESSORY 3/4 INCH		EA	1

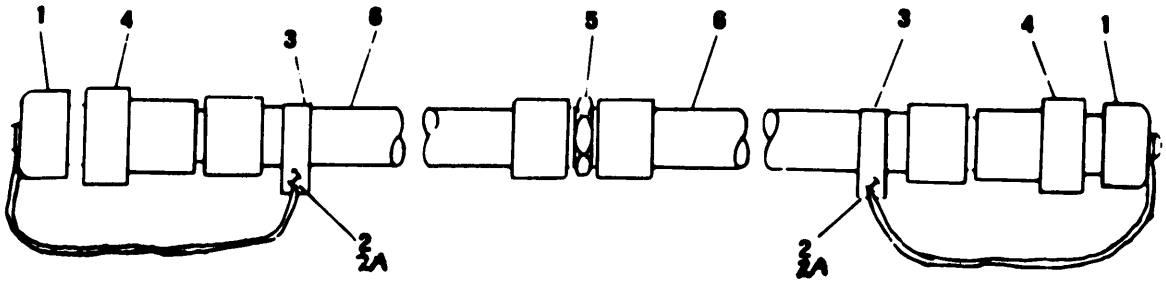


Figure C-9. Half-Inch Outlet Hose Assembly

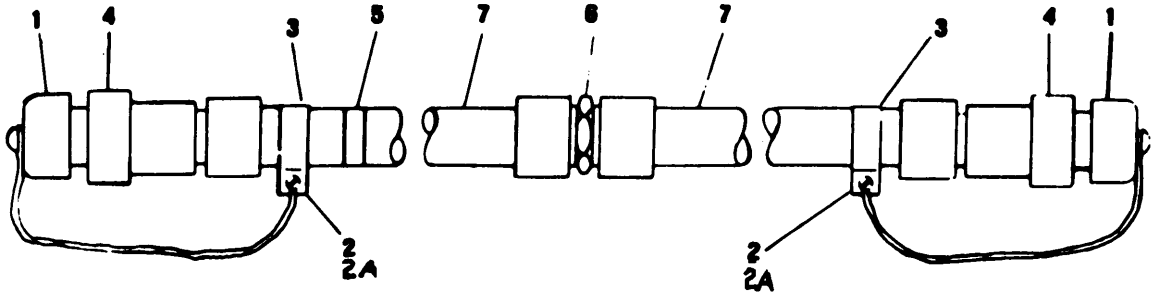


Figure C-10. Three Quarter Inch Inlet Hose Assembly

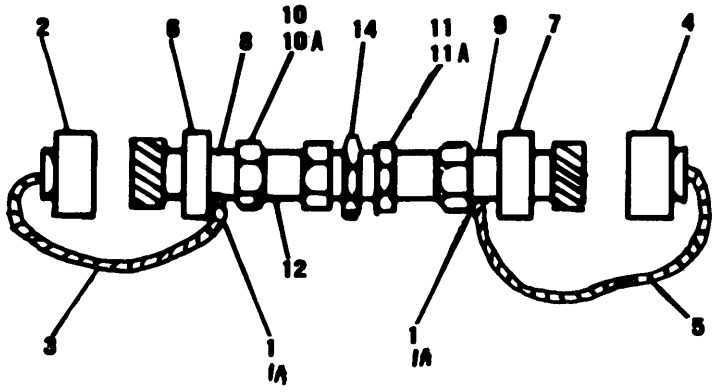


Figure C-11. Adapter Assembly

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				GROUP 02 HYDRAULIC SYSTEM	
				FIGURE C-9 HALF-INCH OUTLET HOSE ASSEMBLY	
	XDOZZ	22680	48404	HOSE ASSY HALF-INCH OUTLET	1
1	XDOZZ	00624	155S9-8D	.PLUG,PROTECTIVE,DUS	2
2	XDOZZ	96906	MS35650-302	.NUT,PLAIN,HEXAGON	2
2A	XDOZZ	96906	MS35207-263	.SCREW,MACHINE	2
3	XDOFZ	96906	MS21104D12	.CLAMP	2
4	XDOZZ	00624	155S5-8D	.COUPLING HALF,QUICK DISCONNECT ONE-HALF INCH	2
5	XDOZZ	96906	MS24392-8	.NIPPLE,TUBE	1
6	XDOZZ	96906	MS28759H1200	.HOSE ASSEMBLY,NONME	2
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-10 THREE QUARTER INCH IN-LET HOSE ASSEMBLY	
	PBOZ	22680	48405	HOSE ASSEMBLY,NONME THREE-QUARTER INCH OUTLET	1
1	XDFZZ	00624	155S9-12	.PLUG,PROTECTIVE	2
2	XDOZZ	96906	MS35650-302	.NUT,PLAIN,HEXAGON	2
2A	XDOZZ	96906	MS35207-263	.SCREW,MACHINE	2
3	XDOZZ	96906	MS21104D/6	.CLAMP,LOOP	2
4	XDOZZ	00624	155S5-12D	.COUPLING HALF,QUICK DISCONNECT	2
5	XDOZZ	22680	89518	.TAG,CABLE	2
6	XDOZZ	96906	MS24392-12	.NIPPLE,TUBE	1
7	XDOZZ	96906	MS28741-12-1200	.HOSE ASSY	2
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-11. ADAPTER ASSEMBLY	
	XDOZZ	22860	48422	ADAPTER ASSY ONE-HALF INCH TO THREE-QUARTER INCH UOC:D91	1
1	XDOZZ	96906	MS35650-302	.NUT,PLAIN,HEXAGON CHAIN MTG UOC:D91	2
1A	XDOZZ	96906	MS35207-263	.SCREW,MACHINE CHAIN MTG UOC:D91	2
2	XDOZZ	00624	155S7-8D	.CAP,PROTECTIVE ONE-HALF INCH	1
	XDOZZ	00624	21002-2	..RING,RETAINER UOC:D91	1
	XDOZZ	00624	22500-14	..PACKING,PREFORMED UOC:D91	1
	XDOZZ	00624	E155-25-8D	..NUT,UNION ONE-HALF INCH UOC:D91	1
3	XDOZZ	00624	5100S10-8	..CHAIN PROTECTIVE CAP UOC:D91	1
4	XDOOZ	00624	155S7-12D	.CAP,QUICK DISCONNEC THREE-QUARTER INCH UOC:D91	1
	XDOZZ	00624	21002-3	..RING,RETAINING UOC:D91	1
	XDOZZ	00624	22500-19	..PACKING,PREFORMED UOC:D91	1
	XDOZZ	00624	E155-25-12D	..NUT,UNION THREE-QUARTER INCH UOC:D91	1
5	XDOZZ	00624	5100S10-8	..CHAIN PROTECTIVE CAP UOC:D91	1
6	XDFZZ	00624	155S2-8D	.COUPLING,HALF ONE-HALF INCH	1
	XDFZZ	00624	155-37B8	..SPRING,LOCK UOC:D91	1
	XDFZZ	00624	155-37C8	..WASHER UOC:D91	1
7	XDFZZ	00624	155S2-12D	.COUPLING,HALF THREE-QUARTER INCH UOC:D91	1
	XDFZZ	00624	155-37B12	..SPRING,LOCK UOC:D91	1
	XDFZZ	00624	155-37C12	..WASHER UOC:D91	1
8	XDOZZ	96906	MS21104D8	.CLAMP,LOOP ONE-HALF INCH UOC:D91	1
9	XDOZZ	96906	MS21104D12	.CLAMP,LOOP THREE-QUARTER INCH UOC:D91	1
10	XDOZZ	96906	MS20819-8	.SLEEVE,FLARED,TUBE ONE-HALF INCH UOC:D91	2
10A	XDFZZ	88044	AN818-8	.NUT,COUPLING UOC:D91	2
11	XDFZZ	96906	MS20819-12	.SLEEVE,FLARED,TUBE THREE-QUARTER INCH UOC:D91	2
11A	XDFZZ	88044	AN818-12	.NUT,TUBE COUPLING THREE-QUARTER	2

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				INCH	
				UOC:D91	
12	XDFZZ	22680	132688	.TUBING 1/2 X .065 WALL THICKNESS	1
				UOC:D91	
	XDFZZ	22680	48406	COUPLING ASSY ACCESSORY 1/2 INCH	1
	XDFZZ	22680	48407	COUPLING ASSY ACCESSORY 3/4 INCH	1
				END OF FIGURE	

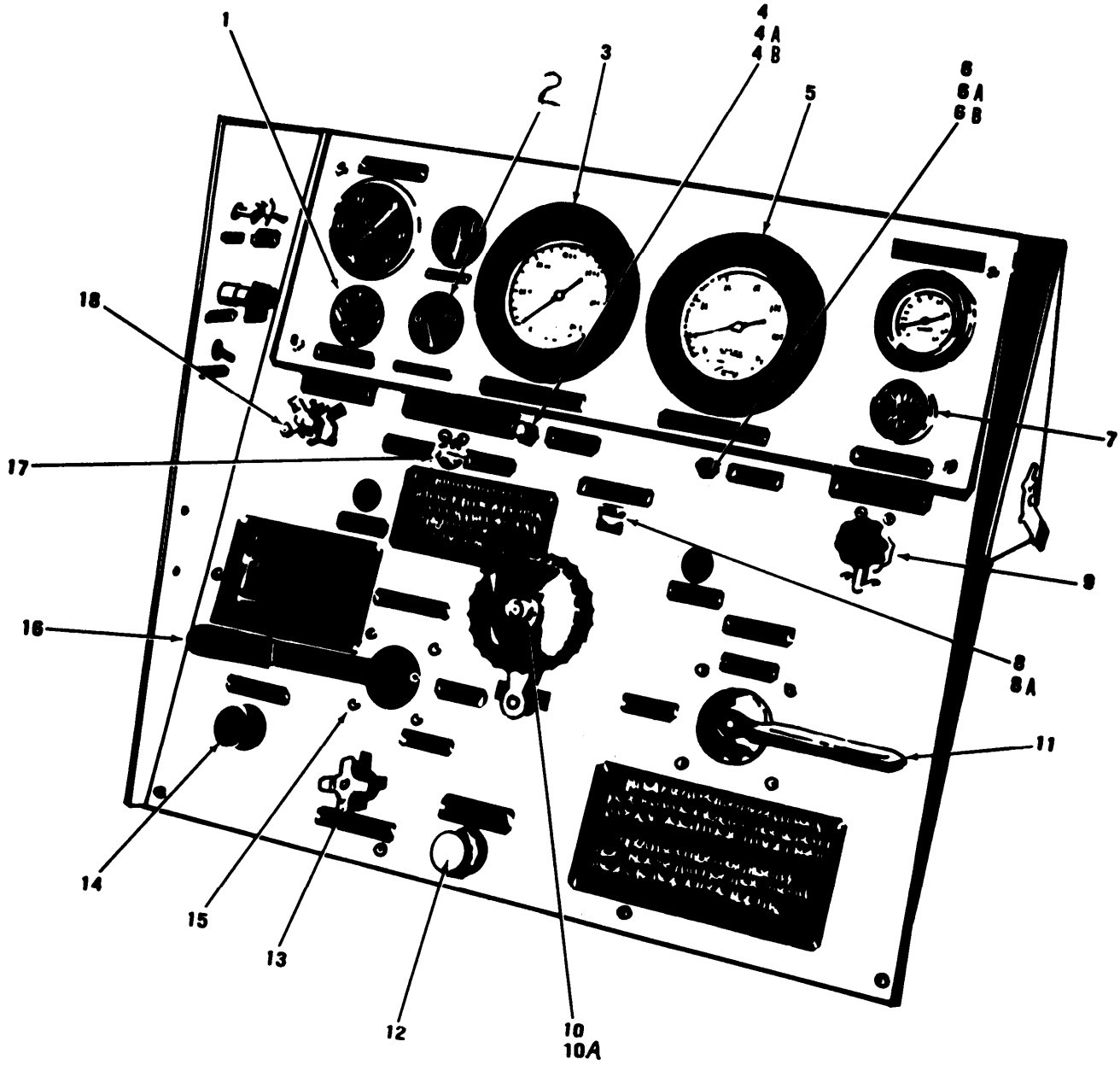


Figure C-12. Main Control Panel, Hydraulic Controls and Instrument

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-12. MAIN CONTROL PANEL, HYDRAULIC CONTROLS AND INSTURMENTS	
1	XDFZZ	66289	RS11	GAGE,PRESSURE,DIAL ENGINE OIL	1
2	XDFZZ	57733	378-P	GAGE,FLUID LEVEL (12V) FUEL TANK	2
3	XDFZZ	03773	206SFAS0-6000	GAGE,PRESSURE,DIAL FLUID OUTPUT(O-6000 PSI)	1
4	XDFZZ	88044	AN929-4	CAP,TUBE CALIBRATION PORT,HIGH PRESSURE FLUID GAGE	1
4A	XDFZZ	88044	AN924-4	NUT,PLAIN HEXAGON CALIBRATION PORT, HIGH PRESSURE FLUID GAGE	1
4B	XDFZZ	96906	MS24393-4	NIPPLE,TUBE CALIBRATION PORT,HIGH PRESSURE FLUID GAGE	1
5	PBFZZ	03773	206SFAS30-0-150	GAGE,PRESS SUCTION (0-30 INCHES)	1
6	XDFZZ	88044	AN924-4D	NUT,PLAIN,HEXAGON SUCTION PRESSURE CALIBRATION PORT	1
6A	XDFZZ	88044	AN929-4D	CAP,TUBE SUCTION PRESSURE CALIBRATION PORT	1
6B	XDFZZ	96906	MS24393D4	NIPPLE,TUBE	1
7	XDFZZ	57733	378-P	GAGE,FUEL LEV	1
8	XDFZZ	22680	520018	INDICATOR,FLOW GPM	1
8A	XDFZZ	22680	89282	BRACKET,FLOW IND	1
9	XDFZZ	86768	155-12D2	VALVE,HIGH PRESS FLOW CONTROL	1
	XDFZZ	86768	10-1862-1	.HANDLE,VALVE	1
10	XDFZZ	72962	1/2-13HEX HVY	NUT,ELASTIC STOP PUMP HANDWHEEL MTG	1
10A	XDFZZ	16954	035-14076	WASHER PUMP HANDWHEEL	1
11	XDFFF	86768	744-1 1/4D-2	VALVE RESERVOIR SHUT-OFF (SEE FIG.C-13 FOR BREAKDOWN)	1
12	XDFZZ	22680	48221	CONTROL,PRESS,COMP	1
13	XDFFF	09990	MV-400-S	VALVE,H.PRESS COMPENSATOR SHUT-OFF (SEE FIG.C-14 FOR BREAKDOWN)	2
14	XDFFF	96256	1A32-R12-60S	VALVE,RELIEF	1
	XDFZZ	96259	134104-16	.PKG,PREFORMED	1
	XDFZZ	96259	131116	.PACKING,PREFORMED	1
15	XDFZZ	86768	7/16-14NC-3X2LG	SCREW SOCKET HEAD CAP SCREW,HIGH PRESSURE BY-PASS FLOW VALVE MTG	4
16	PBFFZ	86768	8111E-1/2-HS2	VALVE,FLOW BY-PASS HIGH PRESSURE (SEE FIG.C-15 FOR BREAKDOWN)	1
17	XDFZZ	30327	105-HD-1/4	VALVE,3WAY	1
18	XDFFF	09990	MV-400-S	VALVE,H.PRESS (SEE FIG.C-14 FOR BREAKDOWN)	1
				END OF FIGURE	

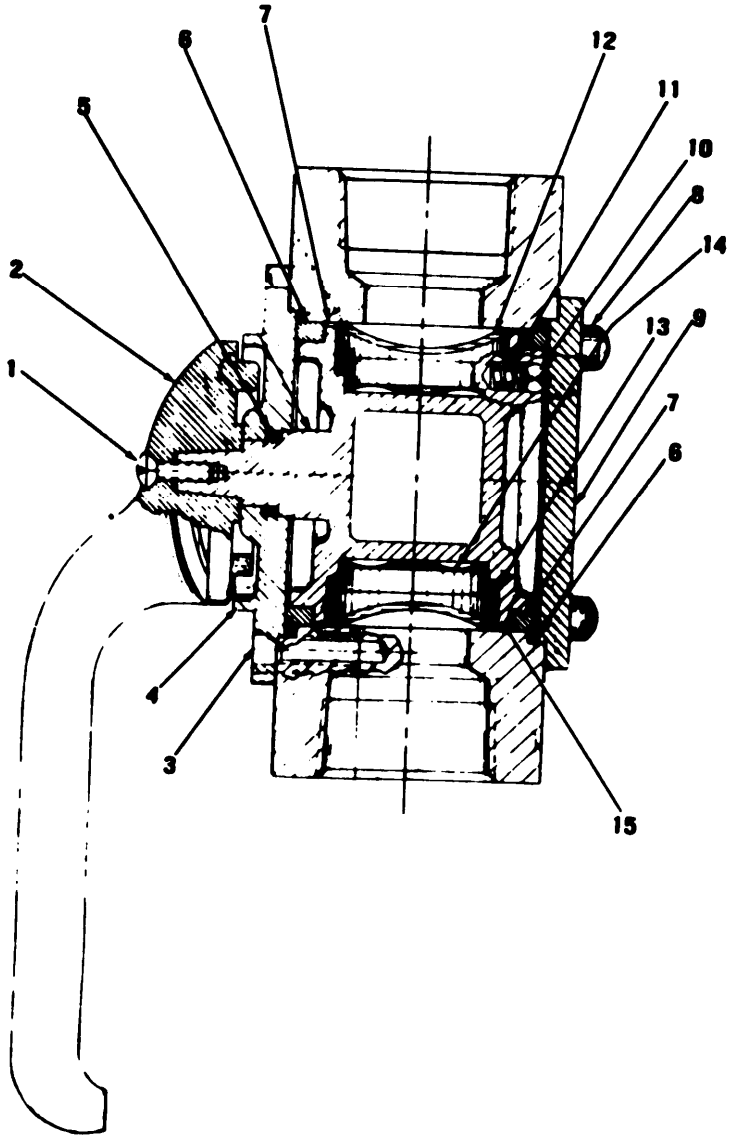


Figure C-13. Valve Assembly, Reservoir Shut-off

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-13. VALVE ASSEMBLY, RESERVOIR SHUT-OFF	
	XDFFF	86768	744-1 1/4D-2	VALVE RESERVOIR SHUT-OFF (SEE FIG.C-12 FOR NHA) UOC:D69	1
1	XDFZZ	86768	10-24NC-2X5/8LG	.SCREW,OVAL HEAD HANDLE MTG	1
2	XDFZZ	86768	2-2866-3	.HANDLE RESERVOIR SHUT-OFF VALVE	1
3	XDFZZ	86768	1/4-20NC-2X5/8LG	.SCREW FLAT HEAD MACHINE,PHILLIPS TYPE,TOP COVER PLATE MTG	4
4	XDFZZ	86768	5-1061-2-1	.PLATE,COVER TOP	1
5	XDFZZ	86768	SP100-92	.PACKING,PREFORMED VALVE PLUG	1
6	XDFZZ	86768	SP100-137	.PACKING,PREFORMED	2
7	XDFZZ	86768	4-2156-4	.SPACER,RING	2
8	XDFZZ	86768	1/4-20NC-2X5/8	.SCREW	4
9	XDFZZ	86768	10-2956-5-1	.COVER,PLATE,BTM	1
10	XDFZZ	86768	1/4DIA	.BALL,DETENT	2
11	XDFZZ	86768	4-1454-15	.SPRING,HELICAL,COMP	2
12	XDFZZ	86768	10-3156-10-1	.SEAL ASSY	2
13	XDFZZ	86768	SP100-114	.PACKING,PREFORMED	2
14	XDFZZ	86768	10-3156-1	.WASHER,SPRING	2
15	XDFZZ	86768	10-1562-7	.PLUG VALVE	1
				END OF FIGURE	

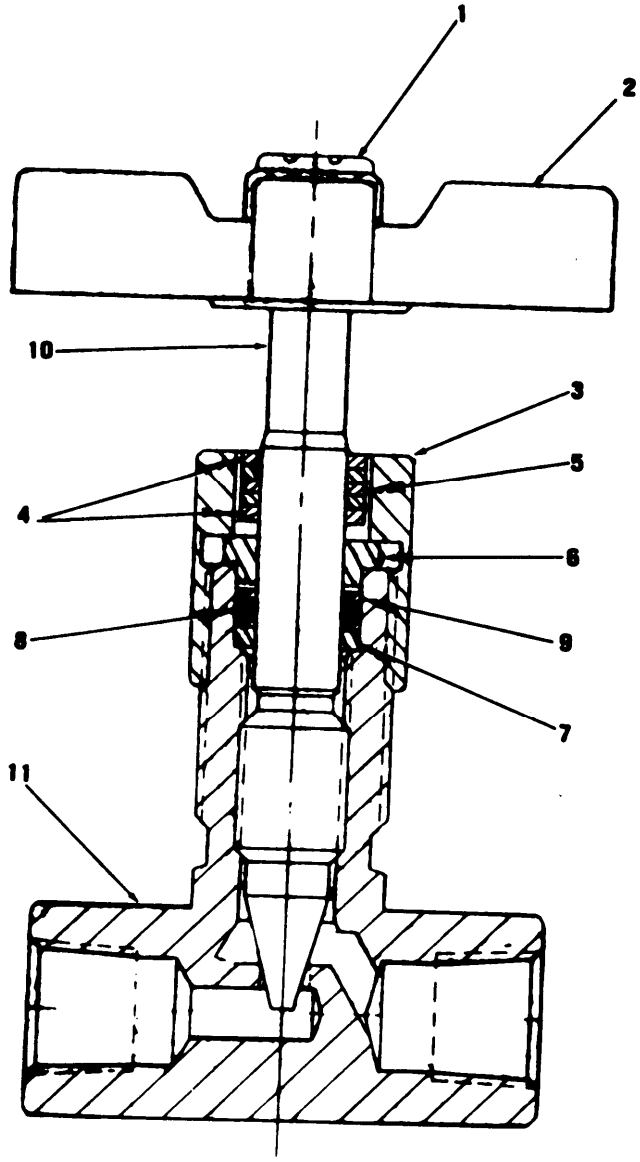


Figure C-14. High Pressure Shut-off Valve

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-14. HIGH PRESSURE SHUT-OFF VALVE	
	XDFFF	09990	MV-400-S	VALVE,H.PRESS (SEE FIG.C-12 FOR NHA)	1
1	XDFZZ	09990	454-B-1	.NUT,SELF-LOCK	1
2	XDFZZ	09990	2-B-118-6	.HANDLE,VALVE	1
3	XDFZZ	09990	2-A-19-2	.BONNET	1
4	XDFZZ	09990	2-A-21-2	.RING,S	2
5	XDFZZ	09990	2-A-22-6	.RING,A	3
6	XDFZZ	09990	2-A-28-2	.FOLLOWER	1
7	XDFZZ	09990	2-A-23-A	.WASHER	1
8	XDFZZ	09990	0-011-1	.PACKING,PREFORMED	1
9	XDFZZ	09990	400-A-4-2	.RING,PACKUP	1
10	XDFZZ	09990	2-B-18-3	.NEEDLE	1
11	XDFZZ	09990	2-B-32-2	.BODY,VALVE	1
				END OF FIGURE	

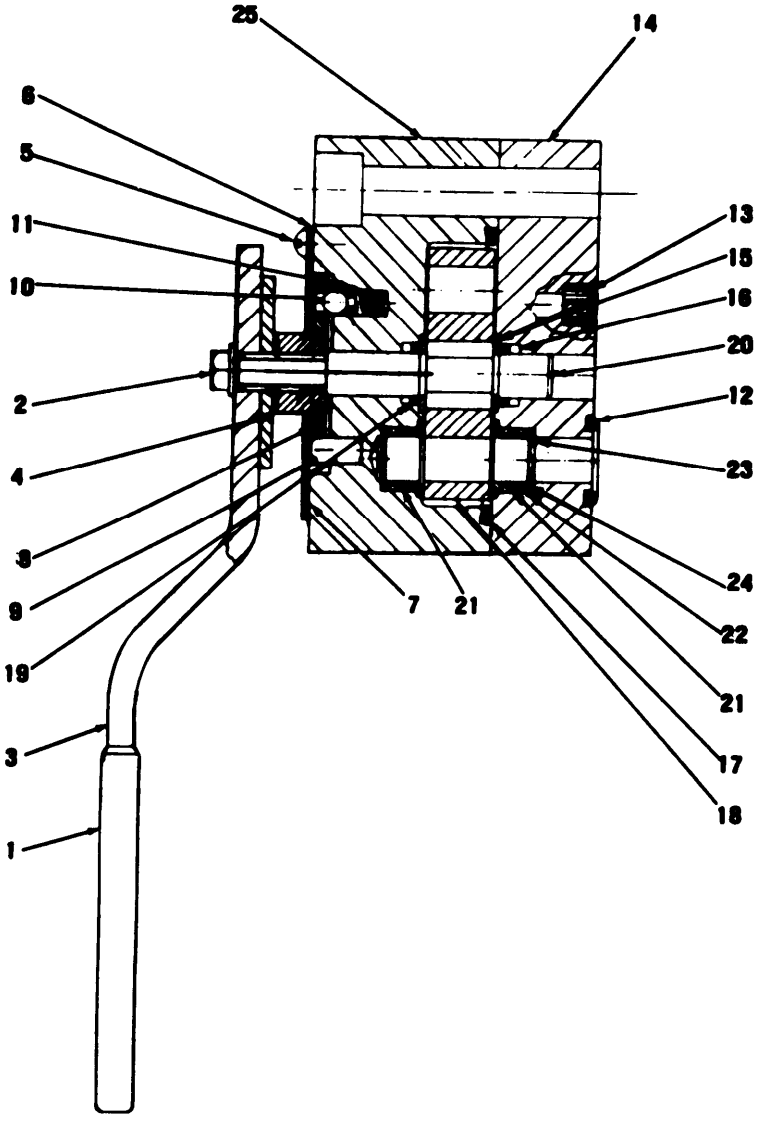


Figure C-15. F1ow By-pass Valve

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-15. FLOW BY-PASS VALVE	
	PBFFZ	86768	8111E-1/2-HS2	VALVE,FLOW BY-PASS (SEE FIG.C-12 FOR NHA)	1
1	XDFZZ	86768	11-1273-5	.HANDLE PLASTIC	1
2	XDFZZ	86768	10-24NCX1/2	.SCREW	1
3	XDFZZ	86768	2-277-16	.HANDLE ASSY	1
4	XDFZZ	86768	5103-37	.RING,SNAP	1
5	XDFZZ	86768	10-24NC-2X5/16LG	.SCREW PHILLIPS RECESSED ROUND HEAD,NAMEPLATE MTG	4
6	XDFZZ	86768	2-277-20	.NAMEPLATE	1
7	XDFZZ	86768	3-673-5	.GASKET	1
8	XDFZZ	86768	59-048-250-0500	.PIN STOP	2
9	XDFZZ	86768	2-277-17	.STOP PLATE ASSY	1
10	XDFZZ	86768	1/4 DIA GR 200	.BALL,DETENT	2
11	XDFZZ	86768	4-2672-1	.SPRING	2
12	XDFZZ	86768	SP100-9	.PACKING,PREFORMED	2
13	XDFZZ	86768	1/4X3/4LG	.SCREW SOCKET HEAD SHOULDER,CAP MTG	2
14	XDFZZ	86768	3-772-14-1	.BODY	1
15	XDFZZ	86768	12-1057-8	.WASHER,SHAFT	2
16	XDFZZ	86768	2-1257-14	.BACKUP RING	2
17	XDFZZ	86768	SP100-141	.O-RING	1
18	XDFZZ	86768	10-3074-2-2	.DISK ASSY	1
19	XDFZZ	86768	SP100-7	.O-RING	2
20	XDFZZ	86768	2-277-33	.SHAFT	1
21	XDFZZ	86768	SP100-6	.O-RING	6
22	XDFZZ	86767	SP201-6	.BACKUP RING	1
23	XDFZZ	86768	3-1854-3	.SPRING,SEAL	1
24	XDFZZ	86768	3-1854-7-1	.SEAL	1
25	XDFZZ	86768	3-772-2-1	.CAP	1
				END OF FIGURE	

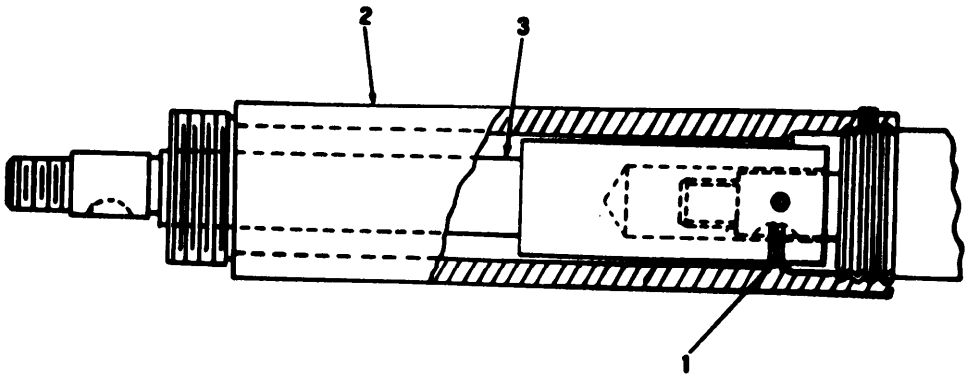


Figure C-16. Pump Control Extension

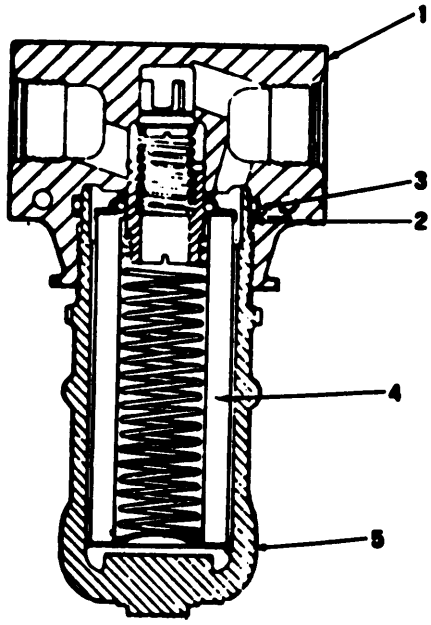


Figure C-17. High Pressure Filter

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-16. PUMP CONTROL EXTENSION	
1	XDFZZ	96906	MS51044-35	SETSCREW	1
2	XDFZZ	22680	89249	SLEEVE	1
3	XDFZZ	22680	89248	SHAFT,EXT	1
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-17, HIGH PRESSURE FILTER	
	XDFZZ	80205	NAS818-12	PLUG,PROTECTIVE,DUS HIGH PRESSURE FILTER	2
	XDFFF	81321	50223	FILTER, HIGH PRESSURE	1
1	XDFZZ	81321	7502406	.HEAD ASSY	1
2	XDFZZ	96906	MS28774-228	.RETAINER,PACKING	1
3	XDFZZ	96906	MS28775-228	.PACKING,PREFORMED	1
4	XDFZZ	81321	6655568	.FILTER ELEMENT,FLUI	1
5	XDFZZ	81321	7502410	.CASE	1
				END OF FIGURE	

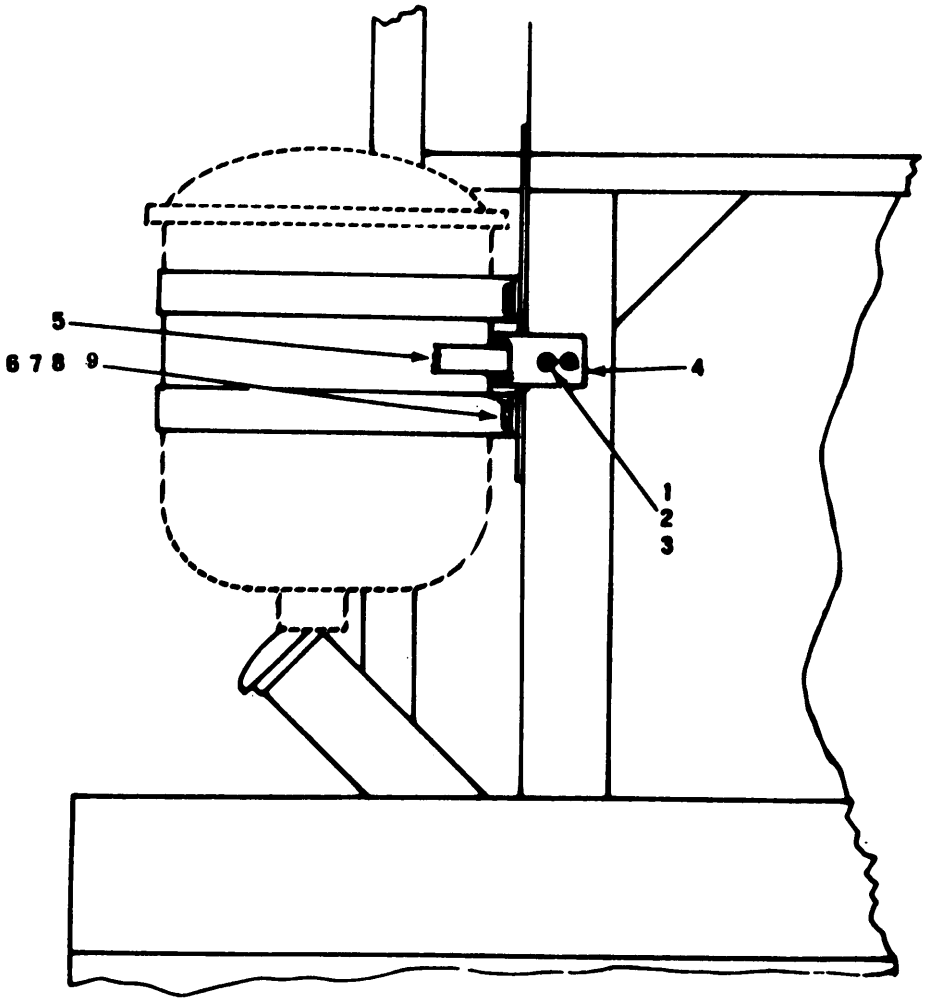


Figure C-18. Low Pressure Filter Mounting Straps

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-18. LOW PRESSURE FILTER MOUNTING STRAPS	
1	XDOZZ	96906	MS35650-302	NUT,PLAIN,HEXAGON	4
2	XDFZZ	96906	MS35338-43	WASHER,LOCK	4
3	PBFZZ	96906	MS35207-264	SCREW,MACHINE UOC:D91	4
4	XDFZZ	22680	89281	HANGER	1
4	XDFZZ	22680	89279	HANGER UOC:D91	1
5	XDFZZ	39428	9587K58	STRAP,WEB	3
6	XDFZZ	96906	MS35690-602	NUT,HEX	24
7	XDFZZ	96906	MS35338-46	WASHER,LOCK	4
8	XDFZZ	96906	MS18154-58	SCREW,CAP,HEXAGON H UOC:D91	4
9	XDFZZ	81321	22202	BRACKET ASSY	2
				END OF FIGURE	

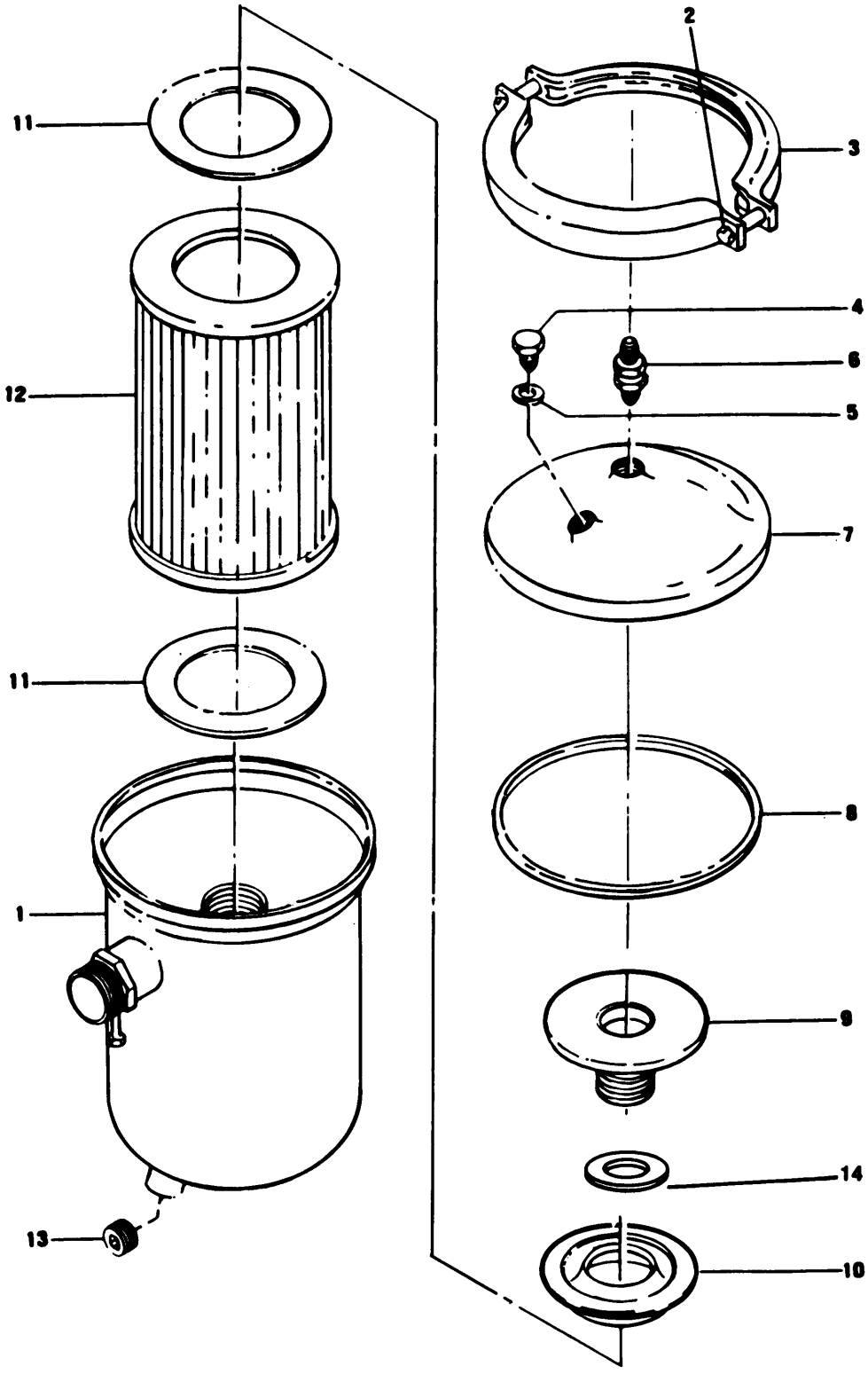


Figure C-19. Low Pressure Filter

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-19. LOW PRESSURE FILTER	
1	PBFZZ	81321	63080	FILTER, LOW PRESSURE	1
2	XDFZZ	81321	6653481	.SCREW,CLAMPING	2
3	XDFZZ	81321	6654655	.RING,CLAMPING ASSY	
4	XDFZZ	81321	7335	.PLUG,FILTER	1
5	XDFZZ	81321	7494	.GASKET	1
6	XDFZZ	81321	15002	.COCK,SHUTOFF,SCREW	1
7	XDFZZ	81321	60260	.COVER ASSY	1
8	XDFZZ	81321	6653463	.GASKET	1
9	XDFZZ	81321	6670117	.RETAINER,ELEMENT	1
10	XDFZZ	81321	60263	.GUIDE,END	1
11	XDFZZ	81321	30102	.WASHER,FLAT	2
12	XDFFF	81321	30316-20	.ELEMENT	1
13	XDFZZ	81321	7886	.PLUG,PIPE	1
14	XDFZZ	81321	6658157	.GASKET	1
				END OF FIGURE	

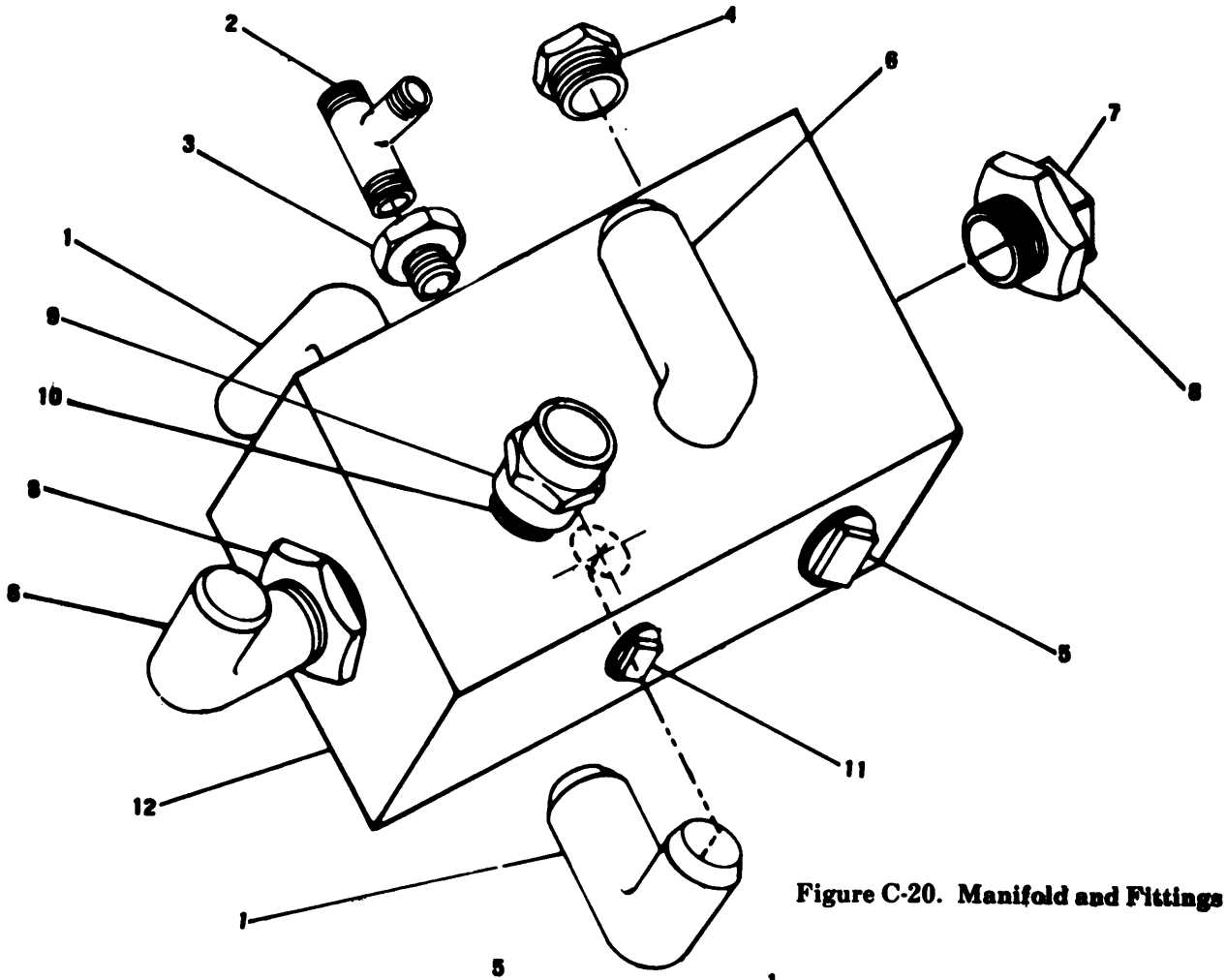


Figure C-20. Manifold and Fittings

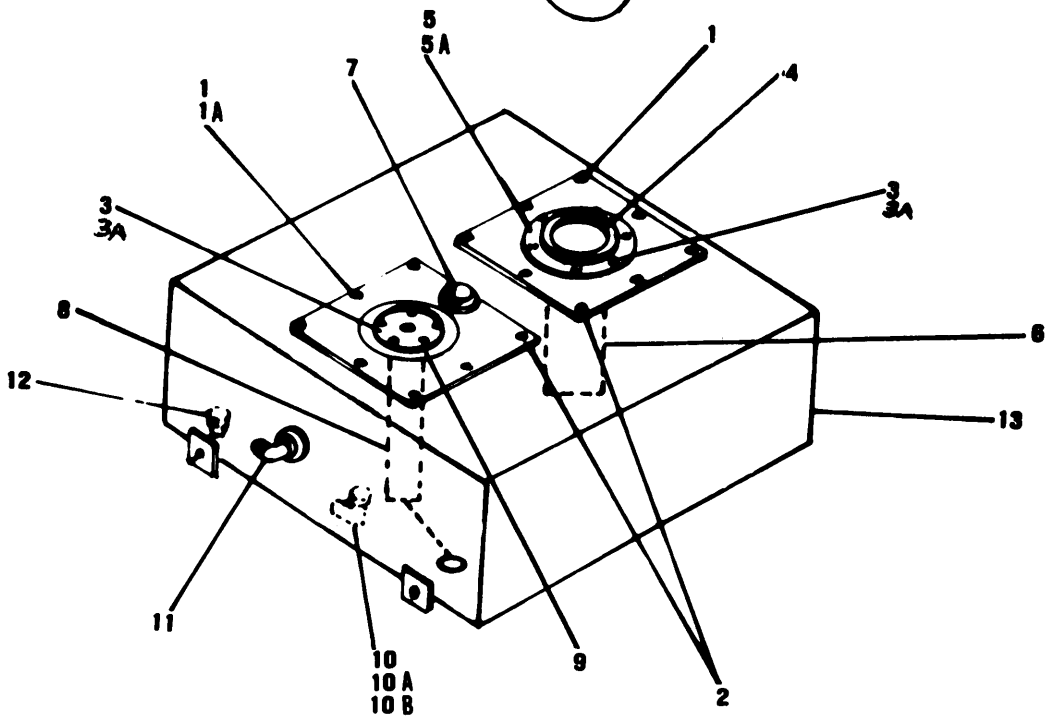


Figure C-2 1. Hydraulic Reservoir

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-20. MANIFOLD AND FITTINGS	
1	XDFZZ	96906	MS20822-12D	ELBOW,PIPE TO TUBE	2
2	XDFZZ	96906	MS20826-4D	TEE,PIPE TO TUBE	1
3	XDFZZ	81349	AN912-1D	BUSHING,PIPE	1
4	XDFZZ	88044	AN912-7D	BUSHING,REDUCER	1
5	XDOZZ	96906	MS20913-6S	PLUG,PIPE	1
6	XDFZZ	96906	MS20822-16D	ELBOW,PIPE TO TUBE	2
7	XDFZZ	79470	C3179X16	PLUG,PIPE	1
8	XDFZZ	25841	1 1/2X1PTR-S	BUSHING,REDUCER	2
9	XDFZZ	88044	AN910-4D	COUPLING,PIPE	1
10	XDFZZ	22680	89389	NIPPLE,CLOSE	1
11	XDFZZ	96906	MS20913-2S	PLUG,PIPE	1
12	XDFZZ	22680	101920	MANIFOLD	1
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-21. HYRAULIC RESERVOIR	
	XDFFF	22680	48410	RESERVOIR ASSY HYD	1
1	XDFZZ	96906	MS90725-3	.SCREW,CAP HEX HD	16
1A	XDFZZ	96906	MS35338-44	.WASHER,LOCK	16
2	XDFZZ	00624	E155-25-8D	.NUT,UNION	2
3	XDFZZ	96906	MS35690-516	.SCREW,MACH FIL HD	10
3A	XDFZZ	96906	MS35338-42	.WASHER,LOCK	10
4	XDFZZ	79502	CD-297	.CAP,FILLER	1
5	XDFZZ	79502	ND-1252	.NECK,FILLER	1
5A	XDFZZ	22680	101469	.GASKET,FILLER	1
6	XDFZZ	22680	72430	.STRAINER,OIL,HYDRAU	1
7	XDFZZ	81321	12098-97	.FILTER,BREATHER	1
8	XDFZZ	57730	391-A	.SENDER,OIL LEVEL	1
9	XDFZZ	22680	101470	.GASKET,SENSOR	1
10	XDFZZ	96906	MS20822-12D	.ELBOW,PIPE TO TUBE	1
10A	XDFZZ	96906	MS51953-103	.FITTING DRAIN	2
10B	XDFZZ	88044	AN941-12	.FITTING	1
11	XDFZZ	96906	MS20822-16D	.ELBOW,PIPE TO TUBE	1
12	XDFZZ	81349	AN816-16D	.ADAPTER,STRAIGHT,PI	1
13	XDFZZ	22680	89514	.RESERVOIR	1
				END OF FIGURE	

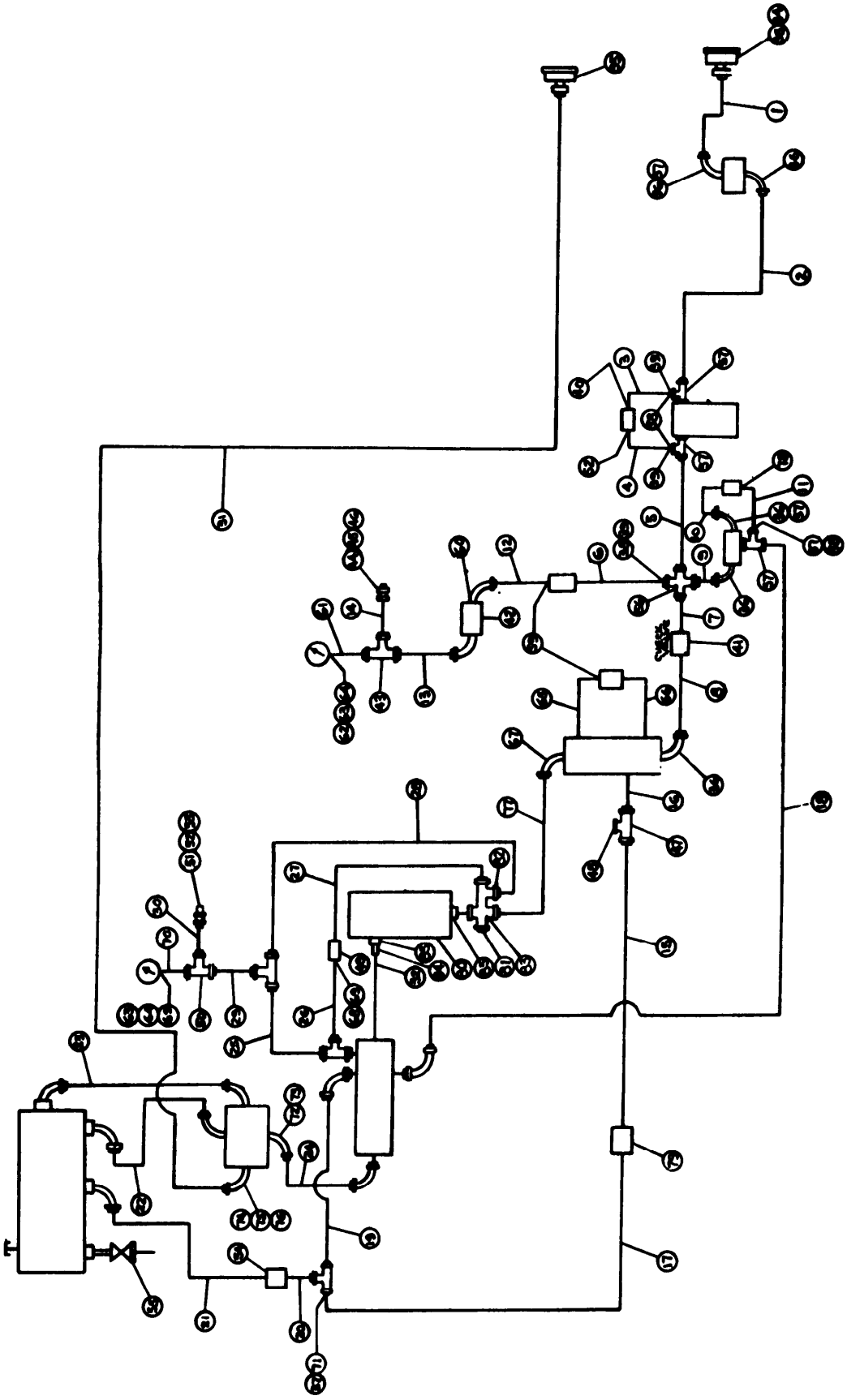


Figure C-22. Hydraulic Piping Diagram.

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-22. HYDRAULIC PIPING DIAGRAM	
1	XDFZZ	22680	48412-1	TUBE ASSY	1
2	XDFZZ	22680	48412-2	TUBE ASSY	1
3	XDFZZ	22680	48412-3	TUBE ASSY	1
4	XDFZZ	22680	48412-4	TUBE ASSY	1
5	XDFZZ	22680	48412-5	TUBE ASSY	1
6	XDFZZ	22680	48412-6	TUBE ASSY	1
7	XDFZZ	22680	48412-7	TUBE ASSY	1
8	XDFZZ	22680	48412-8	TUBE ASSY	1
9	XDFZZ	22680	48412-9	TUBE ASSY	1
10	XDFZZ	22680	48412-10	TUBE ASSY	1
11	XDFZZ	22680	48412-11	TUBE ASSY	1
12	XDFZZ	22680	48412-12	TUBE ASSY	1
13	XDFZZ	22680	48412-13	TUBE ASSY	1
14	XDFZZ	22680	48412-14	TUBE ASSY	1
15	XDFZZ	22680	48412-15	TUBE ASSY	1
16	XDFZZ	22680	48412-16	TUBE ASSY	1
17	XDFZZ	22680	48412-17	TUBE ASSY	1
18	XDFZZ	22680	48412-18	TUBE ASSY	1
19	XDFZZ	22680	48412-19	TUBE ASSY	1
20	XDFZZ	22680	48412-20	TUBE ASSY	1
21	XDFZZ	22680	48412-21	TUBE ASSY	1
22	XDFZZ	22680	48412-22	TUBE ASSY	1
23	XDFZZ	22680	48412-23	TUBE ASSY	1
24	XDFZZ	22680	48412-24	TUBE ASSY	1
25	XDFZZ	22680	48412-25	TUBE ASSY	1
26	XDFZZ	22680	48412-26	TUBE ASSY	1
27	XDFZZ	22680	48412-27	TUBE ASSY	1
28	XDFZZ	22680	48412-28	TUBE ASSY	1
29	XDFZZ	22680	48412-29	TUBE ASSY	1
30	XDFZZ	22680	48412-30	TUBE ASSY	1
31	XDFZZ	22680	48412-31	TUBE ASSY	1
32	XDFZZ	22680	48412-32	TUBE ASSY	1
33	XDFZZ	00624	155-S7-8D	CAP,DUST UOC:D91	1
	PBFZZ	00624	E155-25-8D	.NUT,UNION UOC:D91	1
	XDFZZ	00624	22500-14	.PACKING,PREFORMED UOC:D91	1
	XDFZZ	00624	21002-2	.RING,RETAINING UOC:D91	1
	XDFZZ	00624	5100S10-8	.CHAIN UOC:D91	1
34	XDFZZ	00624	TB-155-S4-8D	.COUPLING ASSY,1/2 UOC:D91	1
35	XDFZZ	00624	155-S11-12D	.COUPLING ASSY UOC:D91	1
	XDFZZ	00624	155S7-12D	.CAP	1
	XDFZZ	00624	TB155S4-100	.COUPLING HALF	1
36	XDFZZ	79470	C35515X12	FITTING	7

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
37	XDFZZ	79470	C5015X12X8	REDUCER,TUBE	4
38	XDFZZ	88044	AN818-12	FITTING	16
39	XDFZZ	79470	C5015X12X4	FITTING	3
40	XDFZZ	30839	1202PS-1	SWITCH,H.P	1
41	PBFZZ	86768	458-12S2-6	VALVE,CHECK	1
42	XDFZZ	86768	609-1/4B	DAMPER,PULS	1
43	XDFZZ	88044	AN824-4	TEE	16
44	XDFZZ	88044	AN929-4	CAP,TUBE	1
45	XDFZZ	96906	MS24393-4	NIPPLE,TUBE	1
46	XDFZZ	88044	AN924-4	NUT,PLAIN,HEXAGON	1
47	XDFZZ	96906	MS24402D8	TEE,TUBE	3
48	XDFZZ	88044	AN929-8D	FITTING	1
49	XDFZZ	30839	1201PS-1	SWITCH,L.P	1
50	XDFZZ	96906	MS24402D4	TEE,TUBE	1
51	XDFZZ	96906	MS24393D4	NIPPLE,TUBE	1
52	XDFZZ	88044	AN924-4D	NUT,PLAIN,HEXAGON	1
53	XDFZZ	88044	AN929-4D	CAP,TUBE	1
54	XDFZZ	86768	624 X B-3-12-2	VALVE,RELIFF	1
55	XDFZZ	30327	101-HD1/2-3/8	VALVE,SHUT-OFF	1
56	XDFZZ	88044	AN827-12	CROSS,TUBE UOC:D69	1
57	XDFZZ	45681	12R50X-S	FITTING	3
58	XDFZZ	96906	MS24392-4	NIPPLE,TUBE	2
59	XDFZZ	96906	MS20822-4-4	ELBOW,PIPE TO TUBE	4
60	XDFZZ	45682	4-4CBTX-S	ELBOW-TUBE FITTING	1
61	XDFZZ	79470	212R4-JSN4-JSN4-18	HOSE ASSY UOC:D69	1
62	XDFZZ	96906	MS28778-4	PACKING,PREFORMED	6
63	XDFZZ	88044	AN6289-4	LOCKNUT,TUBE FITTIN	2
64	XDFZZ	96906	MS24394-4	ELBOW,TUBE	2
65	XDFZZ	98441	212R4-JSN-4-JNS-4-0240	HOSE ASSY	1
66	XDFZZ	98441	212R4-JSN-4-JSN-4-0300	HOSE ASSY	1
67	XDFZZ	79470	C5515X16	FITTING	1
68	XDFZZ	96906	MS24392D4	NIPPLE,TUBE	1
69	XDFZZ	96906	MS28777-4	WASHER,FLAT	3
70	XDFZZ	98441	193000-4-1080	HOSE ASSY	1
71	XDFZZ	96906	MS24402D12	TEE,TUBE	1
72	XDFZZ	96906	MS20822-16D	ELBOW,PIPE TO TUBE	2
73	XDFZZ	79470	C3109X20X16	BUSHING,PIPE	2
74	XDFZZ	96906	MS20822-16D	ELBOW,PIPE TO TUBE	2
75	XDFZZ	79470	C5015X16X12	FITTING	1
76	XDFZZ	88044	AN818-16D	NUT,TUBE COUPLING	2
77	XDFZZ	98441	111417-16D-0260	HOSE ASSY	1
78	XDFZZ	79470	C5405X8X8	ELBOW,PIPE TO TUBE	2
79	XDFZZ	86768	404HTX-8D-20	VALVE,CHECK	1
80	XDFZZ	22680	48231	FILTER ASSEMBLY,HYD LOW PRESSURE	1
81	XDFZZ	88044	AN820-16D	.CAP,FLARED TUBE	1
82	XDFZZ	96906	MS20826-4D	.TEE,PIPE TO TUBE	1
83	XDFZZ	22680	89262	.TEE	1
84	XDFZZ	81349	AN816-16D	.ADAPTER,STRAIGHT,PI	1

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
85	XDFZZ	79470	C3109X20X16	.BUSHING,PIPE	2

END OF FIGURE

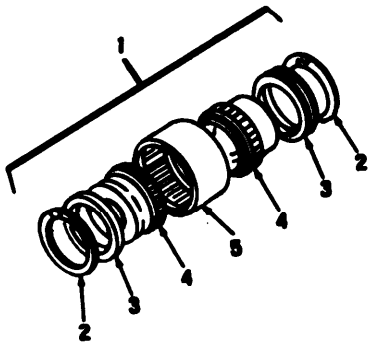


Figure C-23. Pump Coupling

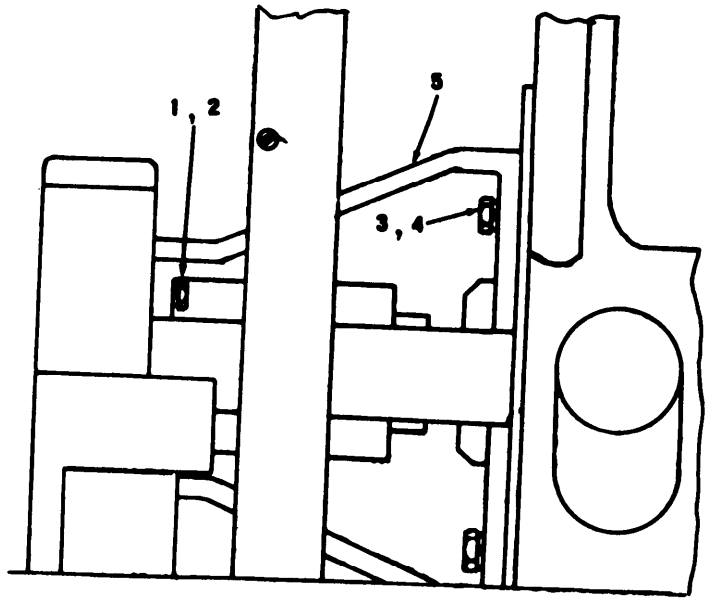


Figure C-24. Pump Mounting Bracket

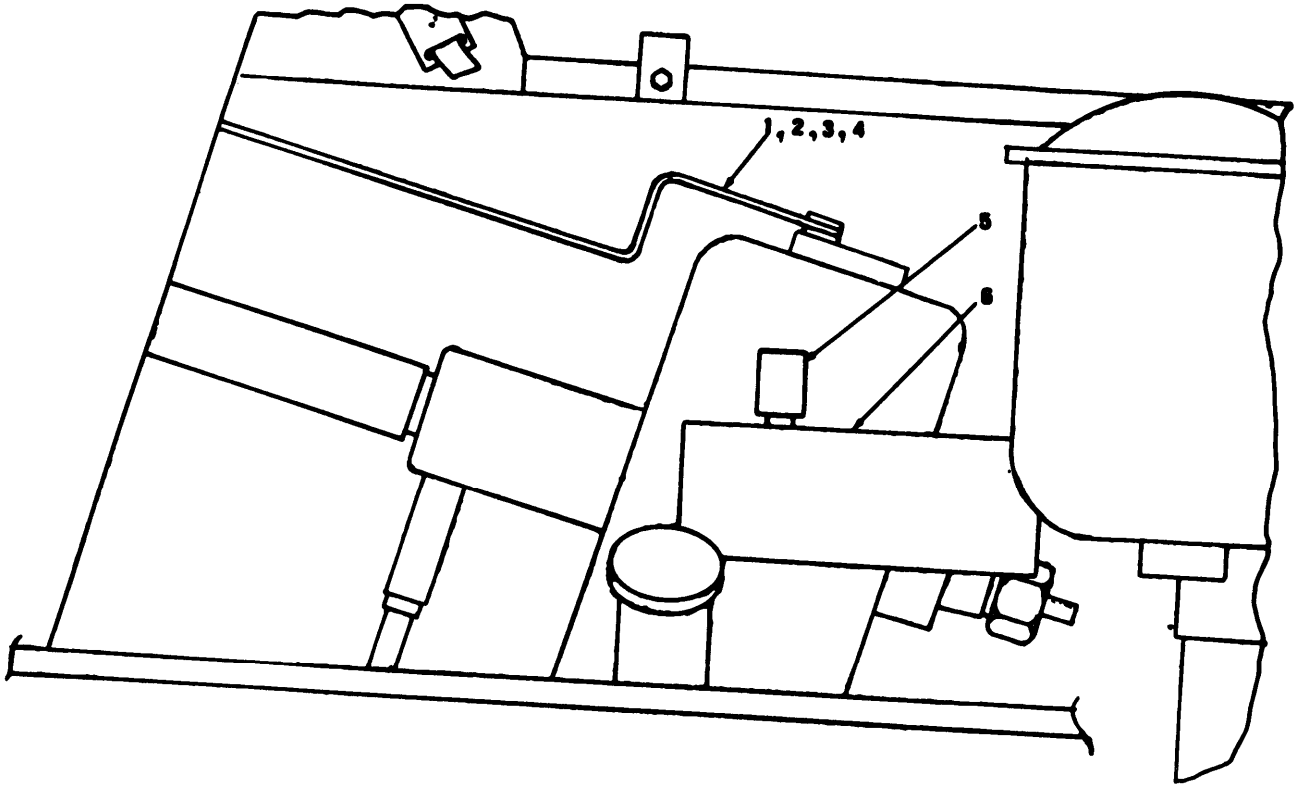


Figure C-25. Pump Pivot Indicator

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-23. PUMP COUPLING	
1	XDFZZ	75665	12-S	COUPLING PUMP	1
	XDFZZ	75665	3-8-16UNC-ZA	.SET SCREW UOC:D69	
	XDFZZ	75665	10-24UNC-2A	.SETSCREW	1
2	XDFZZ	80756	RR331	.RING,RETAINING	2
3	XDFZZ	75665	OS71	.SEAL	2
4	XDFZZ	75665	1/16X27NPT	.PLUG,LUBE	2
5	XDFZZ	75665	6013101	.UNISLEEVE	1
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-24. PUMP MOUNTING BRACKET	
1	XDFZZ	96906	MS90725-62	SCREW,CAP,HEXAGON PUMP BRACKET MTG	18
2	XDFZZ	96906	MS35338-46	WASHER,LOCK PUMP BRACKET MTG	28
3	XDFZZ	96906	MS90725-160	BOLT,HEX HD PUMP BRACKET MTG	4
4	XDFZZ	96906	MS35338-50	WASHER,LOCK PUMP BRACKET MTG	8
5	XDFZZ	22680	89234	BRACKET,PUMP MTG	1
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-25. PUMP PIVOT INDICATOR	
1	XDFZZ	96906	MS24665-134	PIN,COTTER	1
2	XDFZZ	96906	MS51020-49	SETSCREW	1
3	XDFZZ	22680	89284	ROD,INC	1
4	XDFZZ	22680	89283	PIVOT-PUMP,IND	1
5	XDFZZ	73168	20110	SWITCH,THERMD	1
6	XDFZZ	22680	48411	MANIFOLD ASSY	1
				END OF FIGURE	

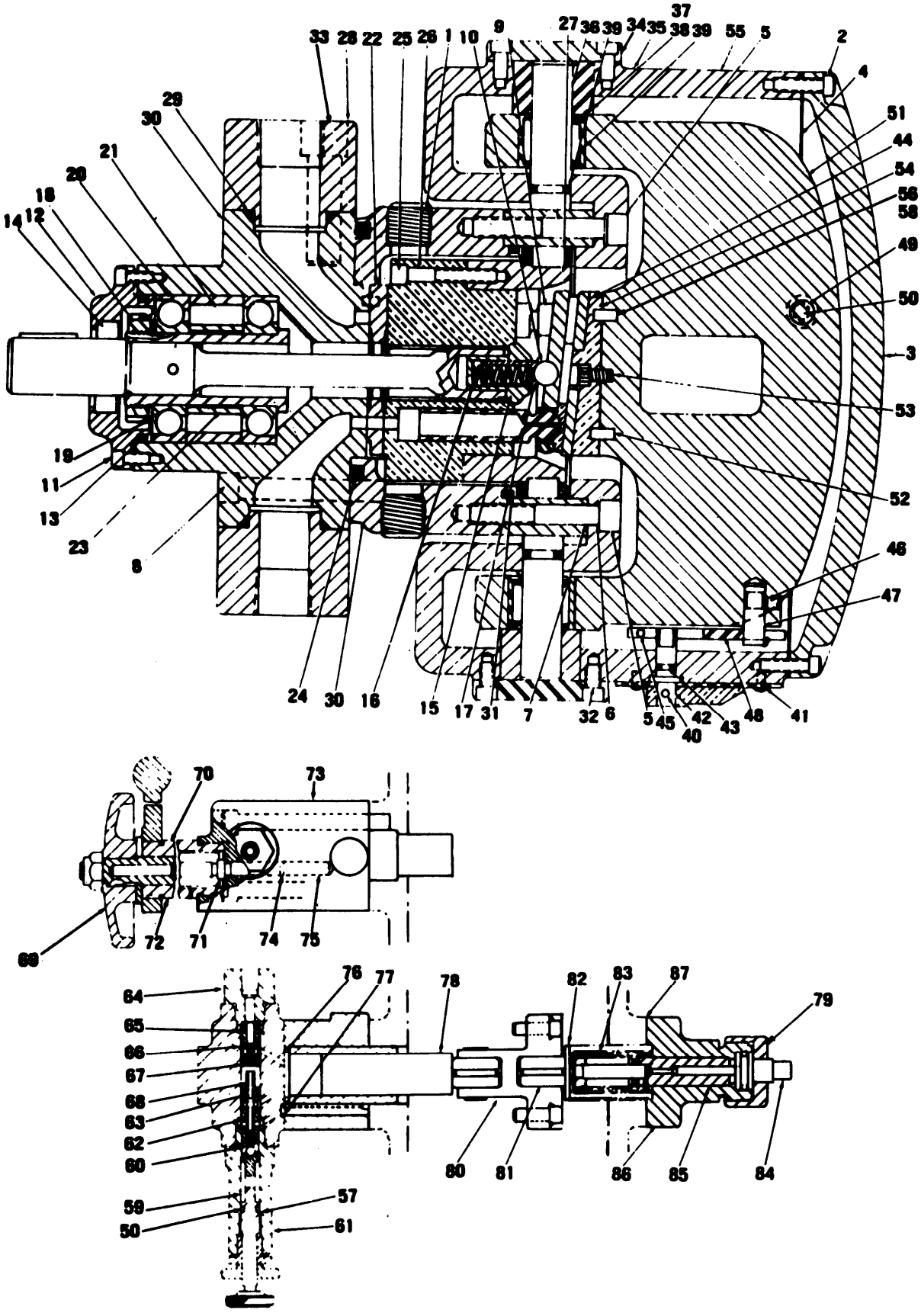


Figure C-26. Hydraulic Pump

FIGURE C-26. HYDRAULIC PUMP

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
	XDFDD	16954	015-16817	PUMP,HDRAULIC RAM	1
1	XDFZZ	70276	1/2 IPS	.PLUG,PIPE	5
2	XDFZZ	96906	MS16997-61	.SCREW,CAP,SOC	14
3	XDFZZ	16954	035-18297	.CAP	1
4	XDFZZ	16954	035-18064	.GASKET	1
5	XDDZZ	96906	MS16997-105	.SCREW,CAP,SOC	6
6	XDDZZ	16954	035-22731	.GASKET	6
7	XDDZZ	16954	035-11900	.GASKET	1
8	XDDZZ	96906	MS16997-106	.SCREW,CAP,SOC	6
9	XDDZZ	16954	S15-01017	.PISTON AND SHOE	1
10	XDDZZ	29337	1/2 DIA.	.BALL	1
11	XDDZZ	96906	MS16997-43	.SCREW,CAP SOCKET	4
12	XDDZZ	16954	035-21323	.RETAINER,SEAL	1
13	XDDZZ	86579	676-00230	.O RING	1
14	XDDZZ	77931	623-09971	.SEAL,SHAFT	1
15	XDDZZ	16954	035-10240	.SPRING,RETAINER	1
16	XDDZZ	16954	035-18530	.SPRING,HOLD DOWN	1
17	XDFZZ	16954	035-13343	.SOCKET,SPRING	1
18	XDDZZ	16954	035-17950	.NUT,LOCK SEAL	1
19	XDDZZ	43334	W-07	.WASHER,LOCK	1
20	XDDZZ	43334	230-00217	.BEARING	1
21	XDDZZ	16954	S15-12575	.SPACER	1
22	XDDZZ	16954	035-16506	.PLATE,PORT	1
23	XDDZZ	16954	S15-00465	.SHAFT AND SLEEVE	1
24	XDDZZ	86579	676-00241	.O RING	1
25	XDDZZ	96906	MS16997-64	.SCREW,CAP,SOC	7
26	XDDZZ	16954	035-11837	.BARREL,CYL	1
27	XDDZZ	16954	035-12421	.BEARING,BARREL	1
28	XDDZZ	969067	MS18154-137	.SCREW-SHC	2
29	XDDZZ	86579	676-00220	.O RING	2
30	XDDZZ	16954	035-11836	.BLOCK,PORT	1
31	XDDZZ	16954	035-11835	.BODY	1
32	XDZZ	86579	676-00246	.O RING	1
33	XDDZZ	96906	MS18154-137	.SCREW-SHC	2
34	XDDZZ	16954	035-12622	.PLATE,END	1
35	XDDZZ	16954	035-15023	.GASKET	1
36	XDDZZ	16954	035-12996	.PIN,TRUNNION	2
37	XDDZZ	86579	676-00113	.O RING	2
38	XDDZZ	16954	035-12995	.SPACER,TRUNNION	1
39	XDDZZ	80648	230-10018	.BEARING,NEEDLE	2
40	XDDZZ	96906	MS35671-24	.PIN	1
41	XDDZZ	96906	MS35275-261	.SCREW,RD HD	3
42	XDDZZ	16954	035-17203	.SHAFT,IND	1
43	XDDZZ	86579	676-00010	.O RING	1
44	XDDZZ	16954	035-14205	.PLATE,CREEP	1
45	XDDZZ	96906	MS16998-31	.SCREW,CAP,SOC	6
46	XDDZZ	96906	MS16997-57	.SCREW,SET	1
47	XDDZZ	16954	035-14857	.PIN,IND.OPER	1
48	XDDZZ	16954	035-14856	.LINK,IND	1
49	XDDZZ	96906	MS16997-139	.SCREW,SET	1

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
50	XDDZZ	96906	MS16997-141	.SCREW,CAP HEX	1
51	XDDZZ	16954	035-14712	.HANGER	1
52	XDDZZ	96906	MS16555-88	.PIN,DOWEL	1
53	XDDZZ	96906	MS16997-59	.SCREW,CAP,SOC	1
54	XDDZZ	16954	035-17204	.PLATE,INDEX	1
55	XDDZZ	16954	035-12990	.HOUSING,HGR	1
56	XDDZZ	96906	MS16555-27	.PIN,DOWEL	1
57	XDDZZ	16954	036-11712	.DISK,VALVE	1
58	XDDZZ	86579	676-00012	.O RING	4
59	XDDZZ	16954	035-11697	.SUPPORT,BALL	1
60	XDDZZ	16954	035-45998	.PISTON,CONTROL	1
61	XDDZZ	16954	035-12555	.HOUSING-ADJ	1
62	XDDZZ	16954	035-13981	.SLEEVE-CONTROL	1
63	XDDZZ	16954	035-13976	.SEAT,HELICAL COMPRE	1
64	XDDZZ	16954	035-12562	.STOP-SPOOL	1
65	XDDZZ	80756	MS-90138	.RING,RETAINER	2
66	XDDZZ	16954	035-13982	.SLEEVE CONTROL	1
67	XDDZZ	16954	035-13977	.PISTON,PRESSURE COM	1
68	XDDZZ	16954	035-22051	.SPRING,COMPRESSION	1
69	XDFZZ	16954	035-14007	.HANDWHEEL PUMP VOLUME CONTROL	1
70	XDDZZ	16954	036-14090	.HOUSING	1
71	XDDZZ	16954	035-14008	.GUIDE	1
72	XDDZZ	16954	035-18001	.SCREW,ADJUSTING	1
73	XDDZZ	16954	035-18000	.CAP-CONTROL	1
74	XDDZZ	86579	676-00012	.PACKING	1
75	XDDZZ	16954	035-17914	.STOP,CONTROL	1
76	XDDZZ	86579	676-00217	.O RING	1
77	XDDZZ	86579	676-00008	.O RING	1
78	XDDZZ	16954	035-14190	.PISTON	1
79	XDDZZ	16954	035-14716	.NUT	1
80	XDFZZ	16954	035-15868	.CLEVIS	1
80	XDFZZ	16954	035-15868	.CLEVIS	1
81	XDDZZ	92563	230-10016	.BEARING	2
82	XDDZZ	16954	035-14717	.PISTON	1
83	XDDZZ	16954	035-22404	.SPRING,HELICAL,COMP	1
84	XDDZZ	16954	035-14718	.TONGUE	1
85	XDDZZ	16954	035-14719	.STOP	1
86	XDDZZ	16954	035-14715	.BODY,STOP	1
87	XDDZZ	16954	035-12592	.GASKET	2

END OF FIGURE

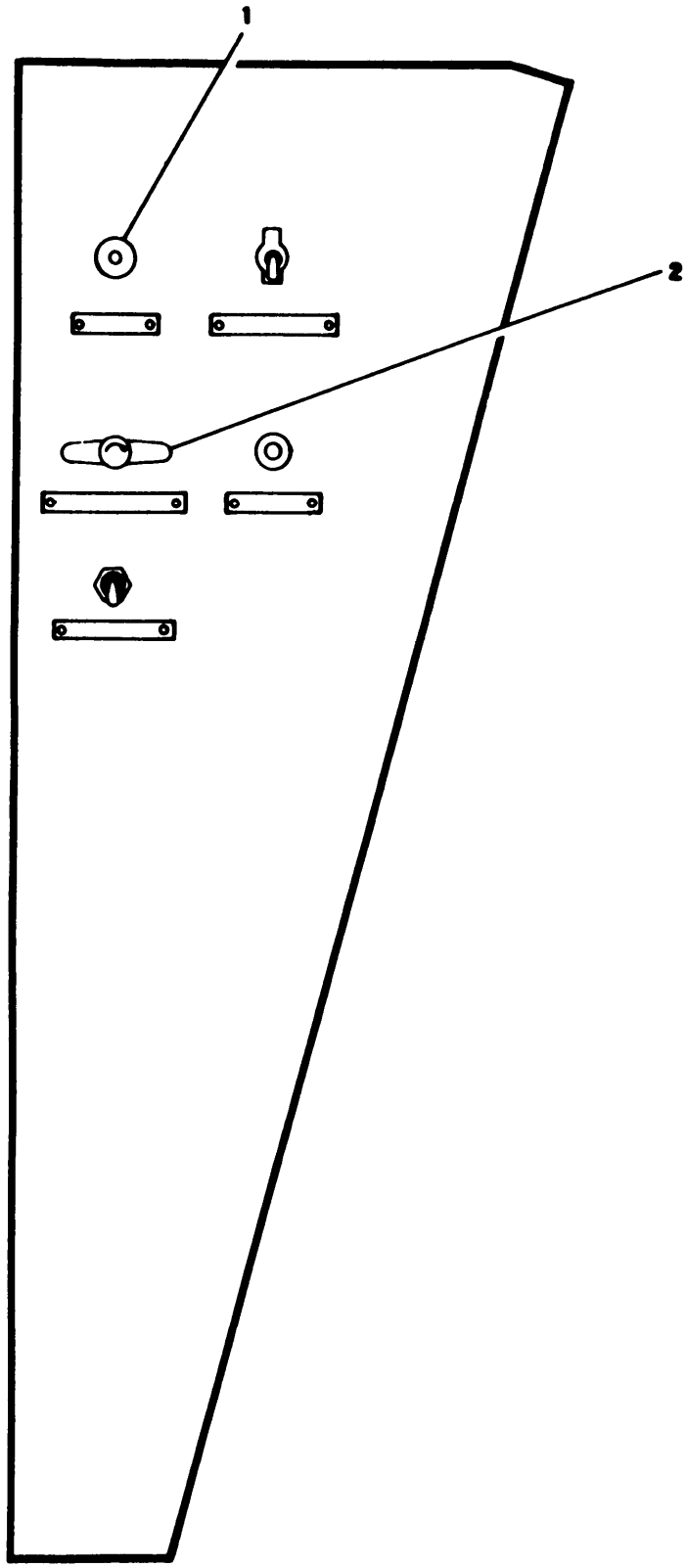


Figure C-27. Start-Up Panel, Engine Controls

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-27. START-UP PANEL, ENGINE CONTROLS	
1	XDFZZ	66289	VE435E	CONTROL ASSEMBLY, CHOKE	1
2	XDDZZ	66289	VE-527-WV	CONTROL ASSEMBLY, THROTTLE	1
				END OF FIGURE	

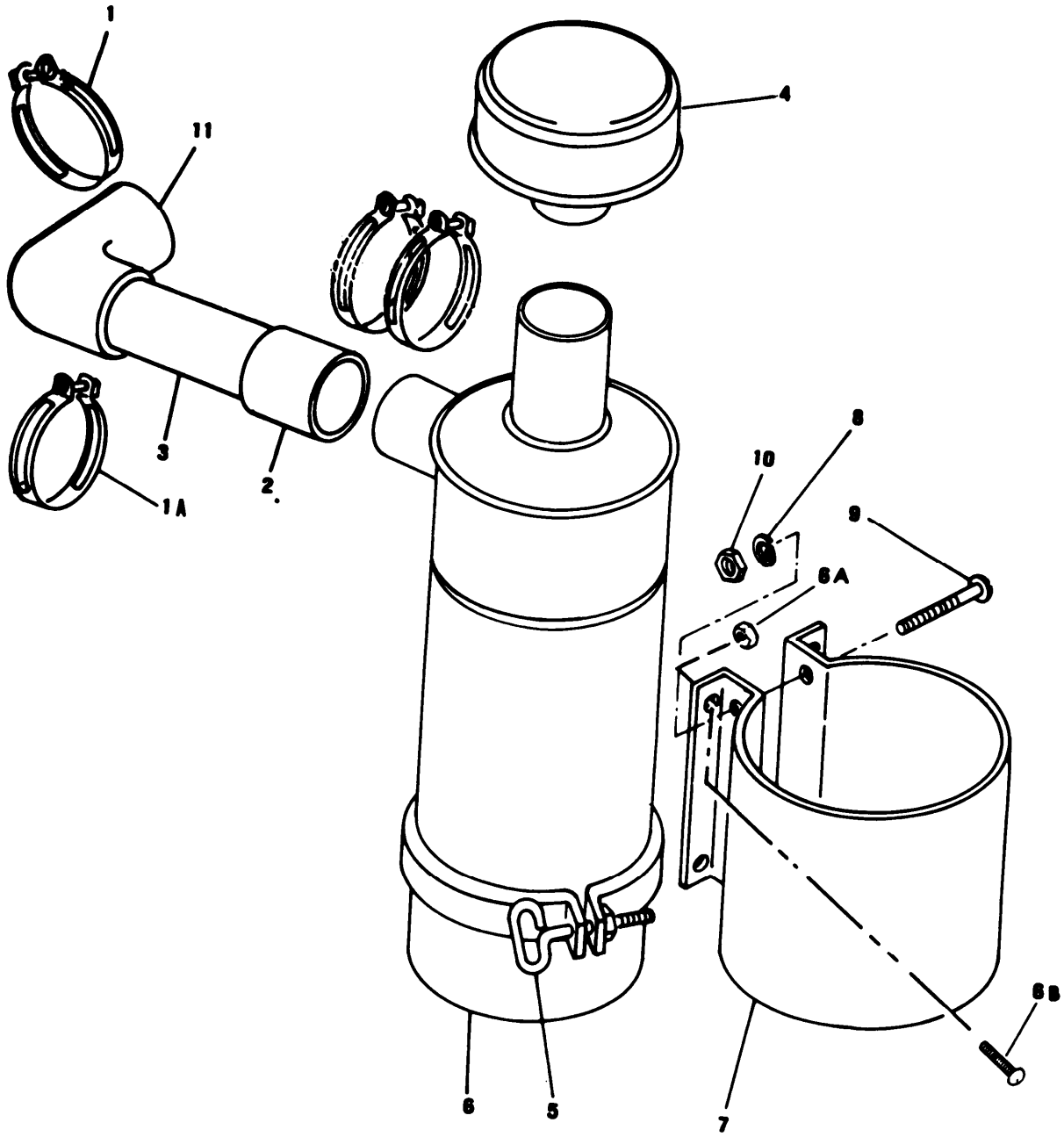


Figure C-28. Air Cleaner

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-28. AIR CLEANER	
1	XDFZZ	73370	LK-9	CLAMP,HOSE	3
1A	XDFZZ	73370	LK-24	CLAMP,HOSE ELBOW	1
2	XDFZZ	73370	LL-18	HOSE RUBBER	1
3	XDFZZ	73370	LJ-131	TUBE	1
4	XDFZZ	73370	LO-62	CAP,AIR STACK	1
	XDFZZ	73370	FGA05-2522	CLEANER,AIR	1
5	XDFZZ	73370	P-2706	.CLAMP,OIL CUP	1
6	XDFZZ	73370	P-17244	.OIL CUP,OUTER	1
6	XDFZZ	73370	P-17242	.OIL CUP INNER	1
6A	XDFZZ	73370	PD-78	NUT STRAP MOUNTING	3
6B	XDFZZ	73370	XD-14	SCREW STRAP MOUNTING	4
7	XDFZZ	73370	PG-512	STRAP AIR CLEANER MOUNTING	1
8	XDFZZ	66289	PE-4	WASHER,LOCK	4
9	XDFZZ	73370	XA-74	SCREW STRAP CLAMPING	2
10	XDFZZ	73370	PD-198	NUT STRAP CLAMPING	2
11	XDFZZ	73370	LL-89-2	ELBOW,RUBBER	1
				END OF FIGURE	

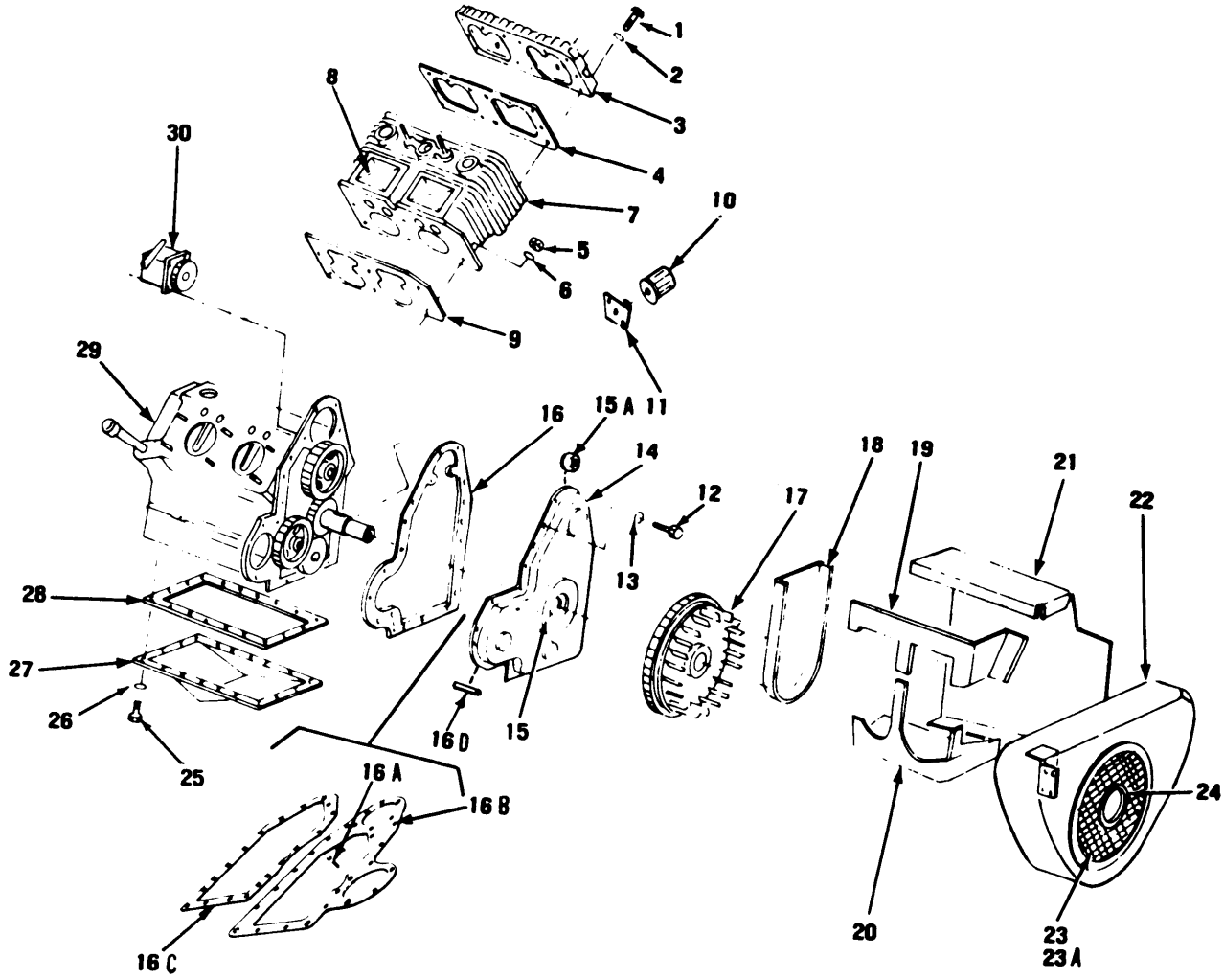


Figure C-29. Engine

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-29. ENGINE	
	XDFZZ	96906	MS35690-1002	NUT,HEX ENGINE MTG	4
	XDFZZ	96906	MS90725-168	BOLT ENGINE MTG	4
	PFFDD	66289	394098	ENGINE,GASOLINE	1
1	XDFZZ	66289	XD-30	.SCREW 3/8-16X1 1/2 FOR MOUNTING CYLINDER HEADS	33
2	XDFZZ	66289	PH-22	.WASHER 3/8IDX11/160 FOR MOUNTING CYLINDER HEADS	33
3	XDFZZ	66289	AB-111	.CYLINDER,HEAD	2
4	XDFZZ	66289	QD-631	.GASKET,CYLINDER HEA	2
5	XDFZZ	66289	PD-13	.NUT 1/2-20 CYLINDER BLOCK CRANKCASE MTG	12
6	XDFZZ	66289	PE-7	.WASHER,LOCK 1/2 IN CYLINDER BLOCK CRANKCASE MTG	10
7	XDFDD	66289	AA90AS8	.BLOCK ASSY CYL	1
8	XDFZZ	66289	QD-482	..GASKET INSPECTION COVER	4
9	XDFZZ	66289	QD-632	.GASKET CYLINDER BLOCK	1
10	PBOZZ	66289	RV40	.FILTER ELEMENT,FLUI	1
11	XDFZZ	66289	RV-40A-1	.OIL,FILTER BASE ASS	1
12	XDFZZ	66289	XD-19	.SCREW 5/16-18X1 5/8 GEAR COVER MTG	10
13	XDFZZ	66289	PE-4	.WASHER,LOCK GEAR COVER MTG	10
14	XDFZZ	66289	BD101-B-2-S1	.GEAR COVER ASSY	1
15	XDFZZ	66289	PH-269	..SEAL OIL GRANKSHAFT,FLYWHEEL END	1
15A	XDFZZ	66289	XK-3	..PLUG PIPE 3/8 SQ HD GEAR COVER TIMING HOLE	1
16	XDFZZ	66289	QD-634	.GASKET	1
16A	XDFZZ	66289	XD-15	.SCREW 5/16-18X3/4 GEAR COVER SPACER MTG	8
16B	XDFZZ	66289	WE-243	.SPACER GEAR COVER	1
16C	XDFZZ	66289	QD-633	.GASKET GEAR COVER SPACER	1
16D	XDFZZ	66289	PA-291	.PIN DOWEL GEAR COVER TO CASE	2
17	XDFZZ	66289	N-100-9	.FLYWHEEL	1
18	XDFZZ	66289	SE-125-A	.SHROUD,CVR REAR LH	1
18	XDFZZ	66289	SE-125	.SHROUD CVR,REAR RH	1
19	XDFZZ	66289	SE-126	.SHROUD,CYL LOWER LH	1
19	XDFZZ	66289	SE-126-A	.SHROUD,CYL,LOWER RH	1
20	XDFZZ	66289	SE-128-C	.DEFLECTOR,HEAT,LH	1
20	XDFZZ	66289	SE-128-B	.DEFLECTOR,HEAT,RH	1
21	XDFZZ	66289	SE-127-A-14	.SHROUD,CYL.HD LH	1
21	XDFZZ	66289	SE-127	.SHROUD,CYL HD RH	1
22	XDFZZ	66289	SE-124-AP-1	.SHROUD,FLYWHEEL	1
23	XDFZZ	66289	XA-33	.SCREW FLYWHEEL SHROUD SCREEN MTG	8
23A	XDFZZ	66289	PE-3	.WASHER,LOCK FLYWHEEL SHROUD SCREEN MTG	8
24	XDFZZ	66289	SE-48	.SCREEN FLYWHEEL SHROUD	1
25	XDFZZ	66289	XD-14	.SCREW 5/16-18X5/8 CRANKCASE COVER PLATE MTG	14
26	XDFZZ	66289	PE-4	.WASHER,LOCK CRANKCASE COVER PLATE MTG	14
27	XDFZZ	66289	BH-155-A	.PLATE,COVER	1
28	XDFZZ	66289	QD635	.GASKET	1

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
29	XDFZZ	66289	BA-49-A	.CRANKCASE ASSY	1
30	XDFFF	43766	T-84-D-1	.GOVERNOR,ASSY (SEE FIG.C-31 FOR BREAKDOWN)	1
	XDFZZ	66289	Q-18-C	GASKET SET ENGINE	1

END OF FIGURE

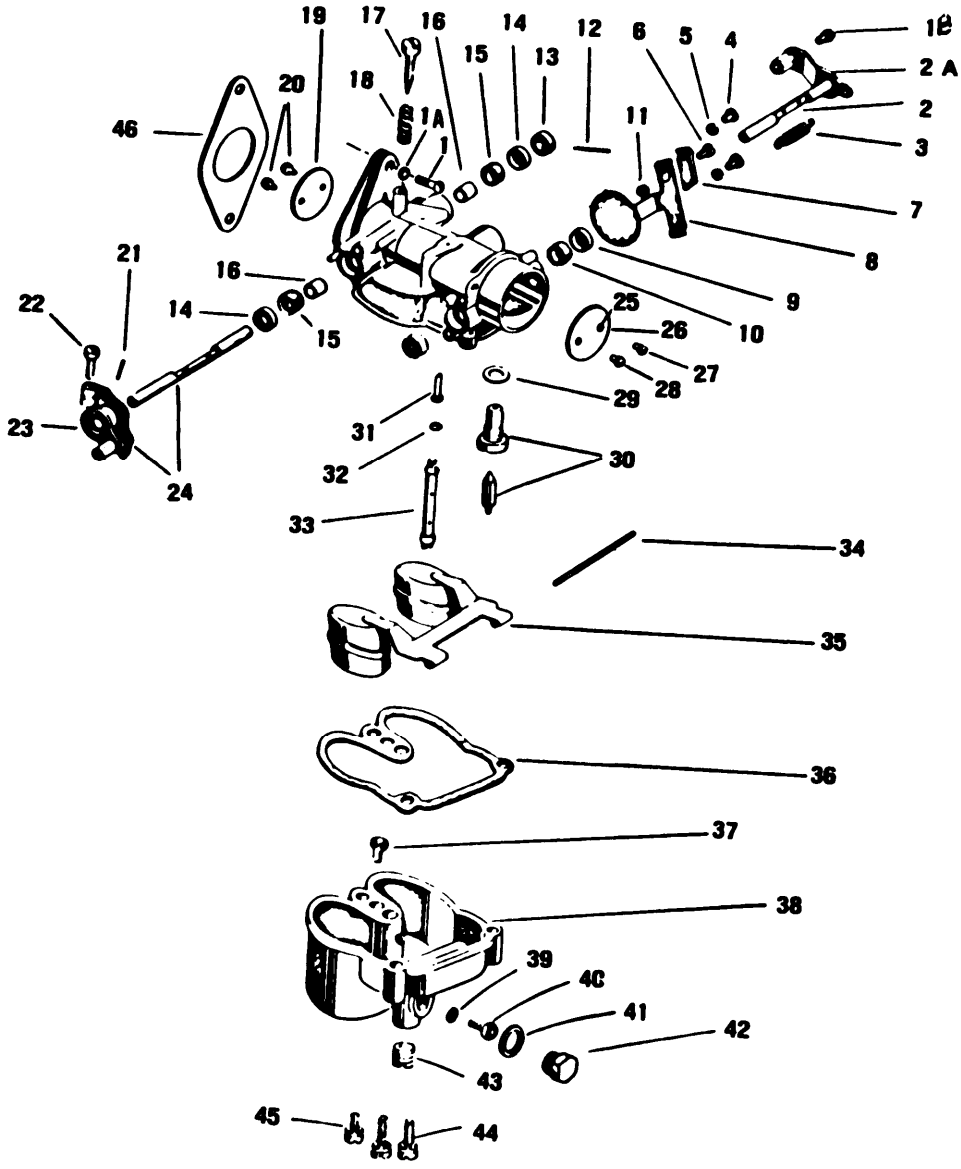


Figure C-30. Carburetor

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-30. CARBURETOR	
1	XDFZZ	66289	XD-19	SCREW CARBURETOR MTG	2
1A	XDFZZ	66289	PE-4	WASHER,LOCK CARNBURETOR MTG	2
	XDFFF	79960	L-57-1-S1	CARBURETOR	1
1B	XDFZZ	79960	93-T8S8-7	.SCREW	1
2	XDFZZ	79960	93-C105-3	.SHAFT,CHOKE	1
2A	XDFZZ	79960	93-C106-2	.LEVER-CHOKE	1
3	XDFZZ	79960	93-C112-12	.SPRING,CHOCK LEVER	1
4	XDFZZ	79960	93-C140-58	.SCREW,BRACKET ASSY	2
5	XDFZZ	79960	93-T41-8	.LOCKWASHER	2
6	XDFZZ	79960	93-T8S8-8	.SCREW TUBE CLAMP	1
7	XDFZZ	79960	93-C110-7	.CLAMP,BRACKET	1
8	XDFZZ	79960	93-C109-60	.BRACKET,CHOKE	1
9	XDFZZ	79960	93-C131-4X2	.RETAINER PKG	1
10	XDFZZ	76690	93-T57-4	.WASHER,PACKING	1
11	XDFZZ	79960	93-T21S8	.NUT,SCREW	1
12	XDFZZ	79960	93-T63-9	.PIN,TAPERED	1
13	XDFZZ	79960	93-C130-4	.WASHER,SHAFT	1
14	XDFZZ	79960	93-T52-57	.RETAINER,PKG	1
15	XDFZZ	79960	93-T48-9	.WASHER,SHAFT	1
16	XDFZZ	79960	93-C9-75	.BUSHING,SHAFT	1
17	XDFZZ	79960	93-C46-49	.NEEDLE,ADJ	1
18	XDFZZ	79960	93-C111-155	.SPRING,NEEDLE	1
19	XDFZZ	79960	93-C21-42	.PLATE,THROTTLE	1
20	XDFZZ	79960	93-T315S5-4	.SCREW,PLATE	2
21	XDFZZ	79960	93-T63-9	.PIN,TAPERED	1
22	XDFZZ	79960	93-T8S8-10	.SCREW,STOP	1
23	XDFZZ	79960	93-CR27-241	.LEVER AND STOP	1
24	XDFZZ	79960	93-C29-1037	.SHAFT AND LEVER	1
25	XDFZZ	79960	93-CR37-1X1	.PLUG,CHOKE SHAFT	1
26	XDFZZ	79960	93-C102-113	.PLATE,CHOKE	1
27	XDFZZ	79960	93-T315S5-4	.SCREW,PLATE	2
28	XDFZZ	79960	93-T315S5-4	.SCREW,PLATE	2
29	XDFZZ	79960	93-T56-20	.WASHER,FIBER	1
30	XDFZZ	79960	93-C81-17-35	.VALVE AND SEAT	1
31	XDFZZ	79960	93-C66-104-42	.JET,DISCHARGE	1
32	XDFZZ	79960	93-T56-73	.WASHER,FIBER	1
33	XDFZZ	79960	93-C76-50-1	.WELL,METERING	1
34	XDFZZ	79960	93-C120-18	.AXLE,FLOAT	1
35	XDFZZ	79960	93-C85-97	.FLOAT	1
36	XDFZZ	79960	93-C142-55	.GASET,BOWL	1
37	XDFZZ	79960	93-C52-2-12	.JET,IDLE	1
38	XDFZZ	79960	93-B3-98A	.BOWL,FUEL	1
39	XDFZZ	79960	93T56-24	.WASHER,FIBER	1
40	XDFZZ	79960	93-C52-7-38	.JET,MAIN	1
41	XDFZZ	79960	93-T56-23	.WASHER,FIBER	1
42	XDFZZ	79960	93-C138-24	.PLUG	1
43	XDFZZ	79960	93-T91-1	.PLUG,BOWL DRAIN	1
44	XDFZZ	79960	93-T301S8-14	.SCREW,BOWL LONG	1
45	XDFZZ	79960	93-T301S8-9	.SCREW BOWL SHORT	1
46	XDFZZ	79960	93-C141-4-6	.GASKET	1
				END OF FIGURE	

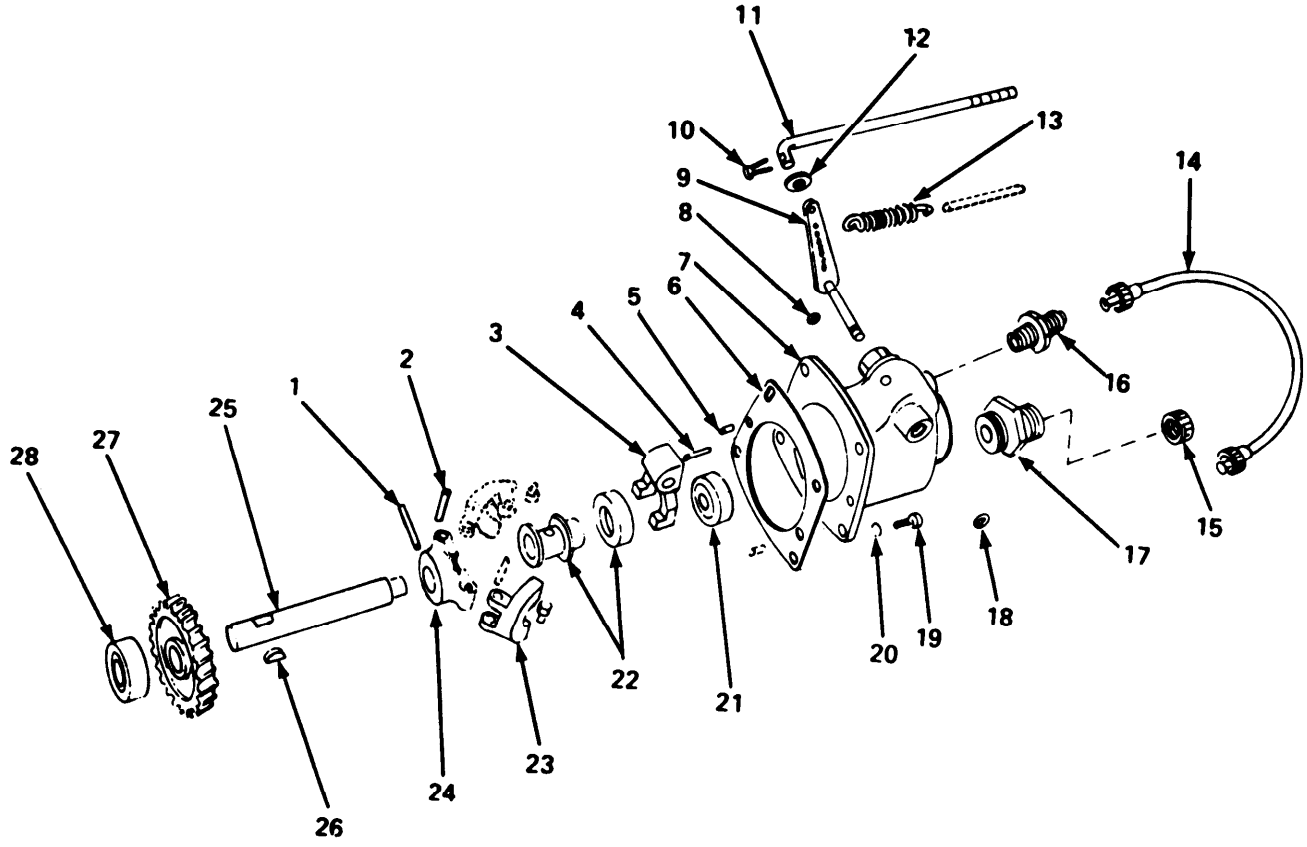


Figure C-31. Governor

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-31. GOVERNOR	
	XDFFF	43766	T-84-D-1	GOVERNOR,ASSY (SEE FIG.C-29 FOR NHA)	1
1	XDFZZ	66289	XH-9	.PIN,TAPER	1
2	XDFZZ	66289	PA-340	.PIN,ROLL	1
3	XDFZZ	66289	VB-98A-4	.YOKE,GOVERNOR	1
4	XDFZZ	66289	PA-367	.PIN,STRAIGHT,HEADLE	1
5	XDFZZ	66289	PA-294	.PIN,DOWEL	2
6	XDFZZ	66289	QD-615-A	.GASKET	1
7	XDFZZ	43766	TC-363B	.HOUSING,GOVERNOR	1
8	XDFZZ	66289	JK-52	.O-RING	1
9	XDFZZ	43766	TC-398-9	.SHAFT AND LEVER GOV	1
10	XDFZZ	66289	X1-32	.PIN,COTTER 3-64X3/8	1
11	XDFZZ	66289	VE-549	.ROD,GOVERNOR CONTRO	1
12	XDFZZ	66289	PH-332	.WASHER	1
13	XDFZZ	66289	PM-76	.SPRING,HELICAL,EXTE	1
14	XDFZZ	73370	RM-900	.OIL LINE	1
15	XDFZZ	43766	TC-403	.CAP	1
16	XDFZZ	66289	RF-269-2	.ADAPTER,STRAIGHT,PI	1
17	XDFZZ	66289	TB-109	.ADAPTER	1
18	XDFZZ	66289	SA-52	.PLUG	1
19	XDFZZ	66289	XD-16	.BOLT,MACHINE	4
20	XDFZZ	66289	PE-4	.WASHER,LOCK	5
21	XDFZZ	66289	ME-111	.BEARING	1
22	XDFZZ	43766	TC-348-S1	.SLEEVE/BEARING ASSY	1
23	XDFZZ	43766	TC-322-D-S1	.WEIGHTS,FLY GOVERNO	2
24	XDFZZ	43766	TC-346B	.HUB,FLYWEIGHT	1
25	XDFZZ	43766	TA-112-A	.SHAFT,DRIVE	1
26	XDFZZ	16794	PL-21	.KEY,WOODRUFF	1
27	XDFZZ	66289	GD-95-A	.GEAR	1
28	XDFZZ	66289	ME-112	.SHAFT,BEARING	1
				END OF FIGURE	

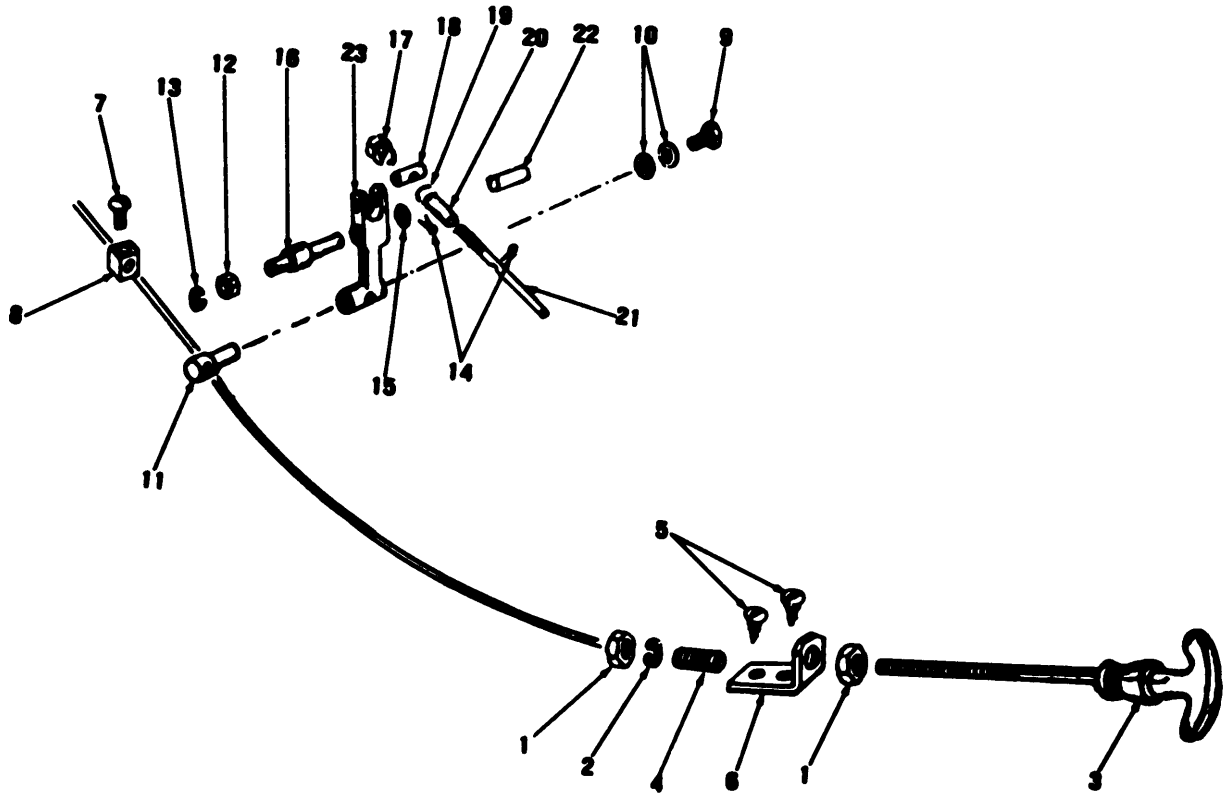


Figure C-32. Governor Control Assembly

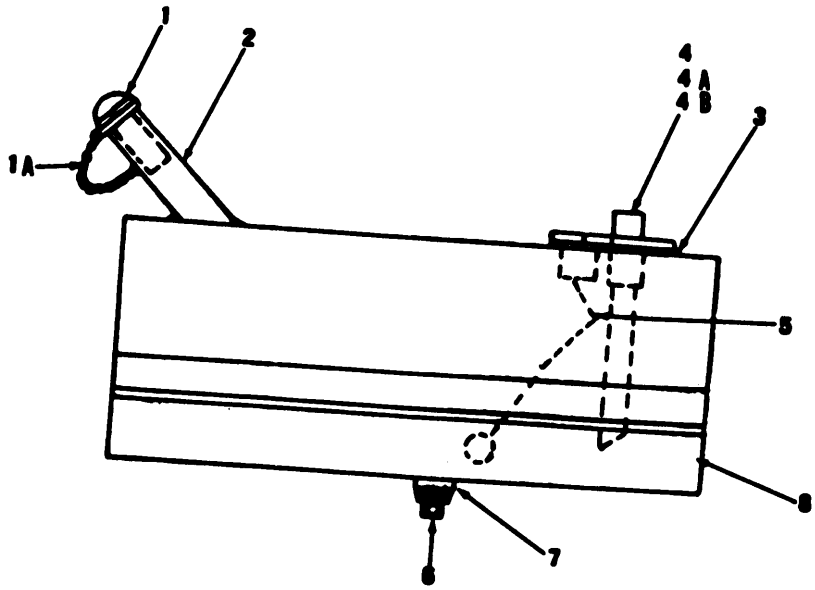


Figure C-33. Gas Tank Assembly

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-32. GOVERNOR CONTROL ASSEMBLY	
	XDFFF	66289	TT-61F-3	CONTROL,ASSY GOV	1
1	XDFZZ	66289	PD-76	.NUT 3/8 16 STEEL	2
2	XDFZZ	66289	PE-5	.WASHER,LOCK	1
3	XDFZZ	66289	VE-527-WV	.CONTROL ASSEMBLY,PU	1
4	XDFZZ	66289	VE-556	.SUPPORT	1
5	XDFZZ	96906	MS51861-35	.SCREW,TAPPING,THREA	
6	XDFZZ	66289	PG-475	.BRACKET SPEED CONTR	
7	XDFZZ	66289	XA-66	.SCREW 5-40X1/4	1
8	XDFZZ	66289	VE-339A	.STOP,CONTROL WIRE	1
9	XDFZZ	66289	XD-158	.SCREW 10-32X1/2 HEX	1
10	XDFZZ	66289	PH-293-A	.WASHER 1/4IDX1732TH	2
11	XDFZZ	66289	VE-598	.BLOCK,SWIVEL	1
12	XDFZZ	66289	PD-77	.NUT 1/4X20 STEEL	1
13	XDFZZ	66289	PE-3	.WASHER,LOCK 1/4	1
14	XDFZZ	66289	X1-1	.PIN,COTTER 1/16X1/2	2
15	XDFZZ	66289	PH-77-A	.WASHER 5/16IDX5/8	1
16	XDFZZ	66289	TC-365-D	.PIN	1
17	XDFZZ	66289	PD-173-A	.NUT,SLEEVE	1
18	XDFZZ	66289	TC-368-A	.PIN,STRAIGHT,HEADLE	1
19	XDFZZ	66289	PK-121	.RETAINER,HELICAL CO	1
20	XDFZZ	66289	PM-111	.SPRING,HELICAL,COMP	1
21	XDFZZ	66289	P1-145-1	.SCREW ADJUSTING	1
22	XDFZZ	66289	HG-203	.BUSHING	1
23	XDFZZ	66289	VB-134-A-9	.LEVER,SPEED	1
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-33. GAS TANK ASSEMBLY	
	XDFFF	22680	48230	TANK ASSY,GAS	1
1	XDFZZ	22680	89263	.CAP,TANK	1
1A	XDFZZ	00624	5100-10-8	.CHAIN ASSY	1
2	XDFZZ	22680	72432	.STRAINER	1
3	XDFZZ	22680	101467	.GASKET	1
4	XDFZZ	22680	89246	.OUTLET,GAS TANK	1
4A	XDFZZ	96906	MS35207-263	.SCREW,MACHINE	4
4B	XDFZZ	96906	MS35338-43	.WASHER,LOCK	4
5	XDFZZ	57730	385-B	.SENDER,FUEL LEVEL	1
6	XDFZZ	96906	MS20913-4S	.PLUG,PIPE	1
7	XDFZZ	22680	18669	.COUPLING ASSY	1
8	PBFZZ	22680	48229	.TANK WELDMENT	1
				END OF FIGURE	

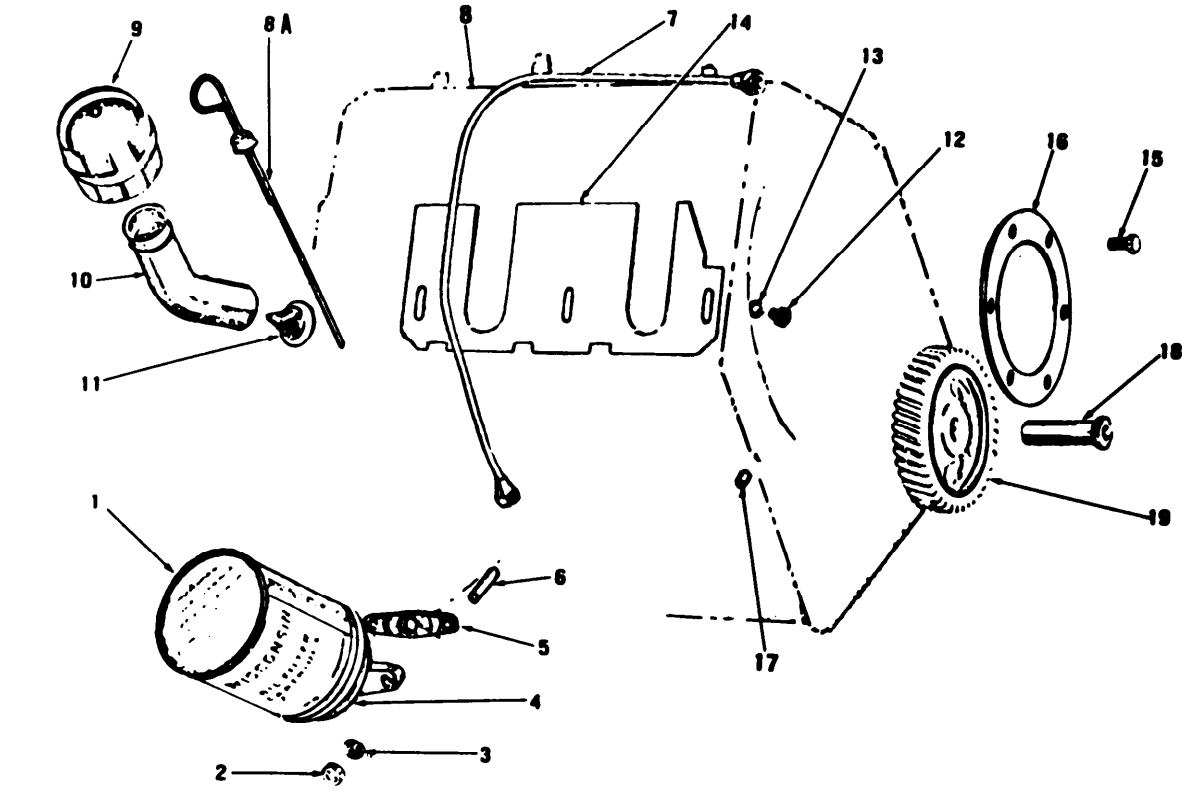


Figure C-34. Oil Filter and Related Parts

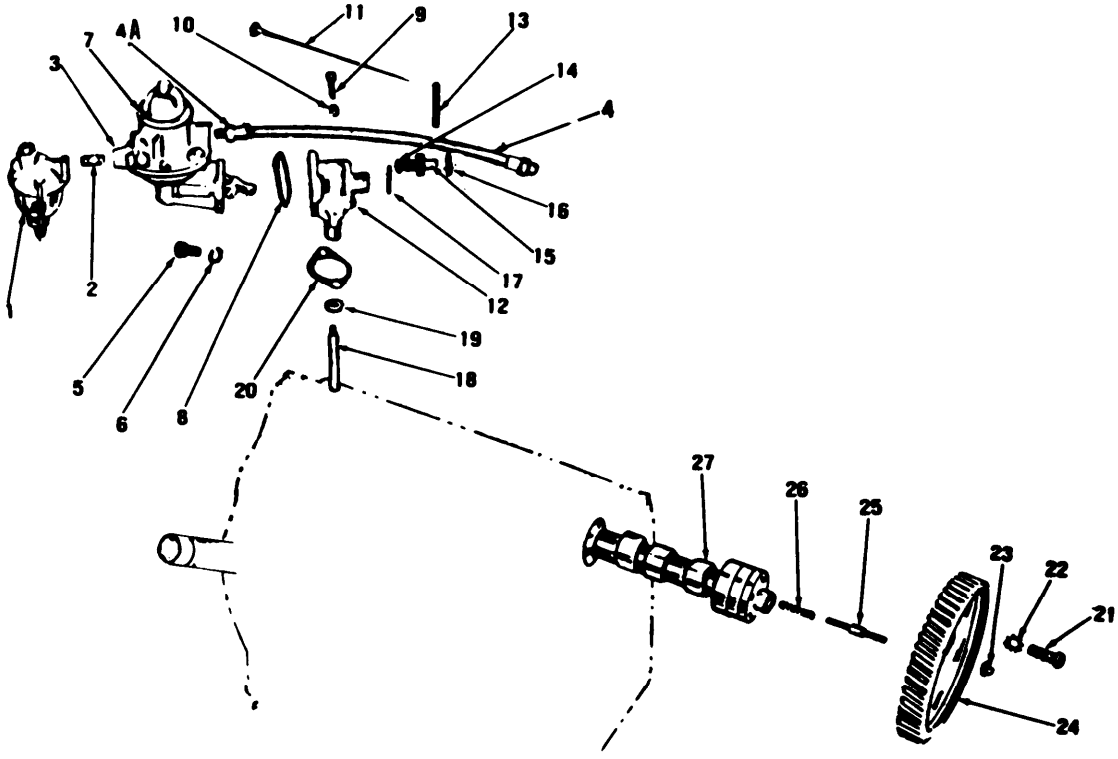


Figure C-35. Fuel Pump and Camshaft

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-34. OIL FILTER AND RELATED PARTS	
1	PBOZZ	66289	RV40	FILTER ELEMENT,FLUI CARTRIDGE	1
2	XDFZZ	66289	PD-10	NUT OIL FILTER BASE MTG	2
3	XDFZZ	66289	PE-4	WASHER,LOCK OIL FILTER BASE MTG	2
4	XDFZZ	66289	RV-40A-1	BASE ASSY OIL FILTE	1
5	XDFZZ	66289	QD-595-A	GASKET OIL FILTER BASE	1
6	XDFZZ	66289	PC-112	STUD OIL FILTER BASE	2
7	XDFZZ	66289	RM-536	OIL LINE CRANKCASE TO GOVERNOR	1
8	XDFZZ	66289	RJ-173-A	DIP STICK STARTER SIDE 6-1/4 IN. LONG	1
8A	XDFZZ	66289	RJ-173	DIP STICK	1
9	XDFZZ	66289	LO-60-1	OIL FILLER AND CAP	1
10	XDFZZ	66289	LJ-300-M	TUBE,OIL FILLER	1
11	XDFZZ	66289	RC-91	STRAINER ELEMENT,SE	1
12	XDFZZ	66289	XA-34	SCREW	6
13	XDFZZ	66289	PE-3	WASHER,LOCK	6
14	XDFZZ	66289	RK-181	PLATE,SPLASH CRANKCASE	2
15	XDFZZ	66289	XD-17	SCREW	6
16	XDFZZ	66289	BG-223	PLATE	1
17	XDFZZ	66289	XE-55	SCREW SET,ALLEN HEAD	1
18	XDFZZ	66289	PJ-105	STUD, IDLER	1
19	XDFZZ	66289	GC-28	GEAR,IDLER	1
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-35. FUEL PUMP AND CAMSHAFT	
1	XDFZZ	66289	LP19B	STRAINER,SEDIMENT	1
	XDFZZ	66289	QD-653	.GASKET,BOWL	1
	XDFZZ	66289	OW-363	.BOWL,GLASS	1
2	XDFZZ	66289	RF-794	NIPPLE,PIPE 1/8X3/4	1
3	XDFZZ	66289	XK-38	ELL,STREET 1/8X90	1
4	XDFZZ	66289	RM-1049-L-S1	FUEL LINE	1
4A	XDFZZ	66289	RF-269	FITTING FUEL PUMP OUTLET	1
5	XDFZZ	66289	XD-15	SCREW 5/16-18X3/4	2
6	XDFZZ	66289	PE-4	WASHER,LOCK	2
7	PBFZZ	66289	LP38ES1	PUMP,FUEL,CAM ACTUA	1
8	XDFZZ	66289	QD-538-A	GASKET	1
9	XDFZZ	66289	XD-6	BOLT,MACHINE	2
10	XDFZZ	66289	PE-3	WASHER,LOCK	2
11	XDFZZ	66289	VE-471-1	CONTROL,PRIMER	1
12	XDFZZ	66289	TF-96-4	ADAPTER AND PRIMER ASSEMBLY	1
13	XDFZZ	66289	TA-115	.HANDLE,PRIMER	1
14	XDFZZ	66289	JK-50	.RING,PKG	1
15	XDFZZ	66289	XE-65	.SCREW ALLEN HEAD,FUEL PUMP PRIMER SHAFT	1
16	XDFZZ	66289	TA-114-S1	.SHAFT,PRIMER	1
17	XDFZZ	66289	PM-145	.SPRING	1
18	XDFZZ	66289	TA-111-A	.PLUNGER	1
19	XDFZZ	66289	TA-116	.CAP	1
20	XDFZZ	66289	QD-67	GASKET	1
21	XDFZZ	66289	XD-17	SCREW	3
22	XDFZZ	66289	PE-46	WASHER,LOCK	3
23	XDFZZ	66289	PF-52	BUTTON	1
24	XDFZZ	66289	GB-46	GEAR,CAMSHAFT	1
25	XDFZZ	66289	PF-101	THRUST PLUNGER	1
26	XDFZZ	66289	PM-108	SPRING,PLUNGER	1
27	XDFZZ	66289	EA-112	CAMSHAFT	1
				END OF FIGURE	

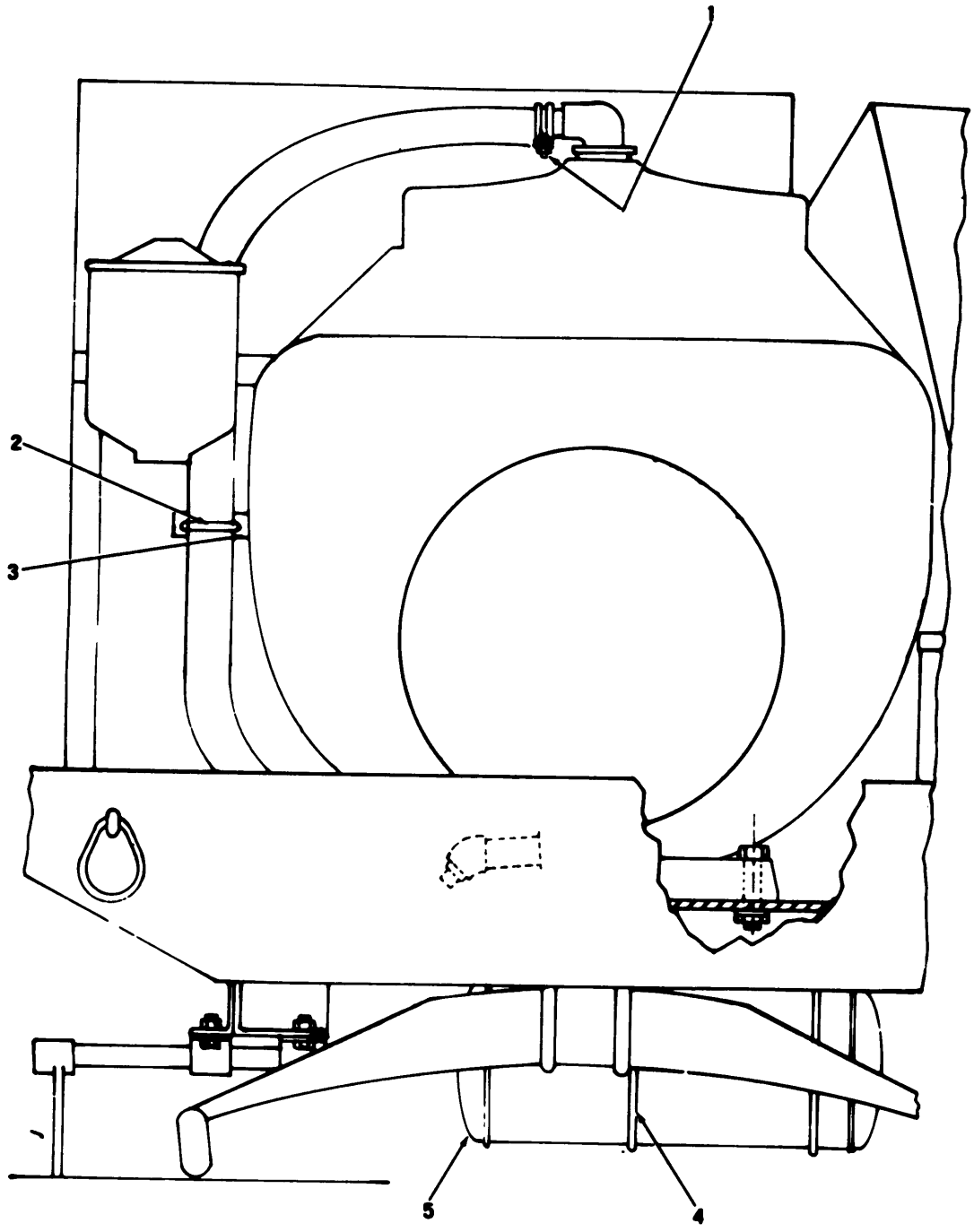


Figure C-36. Muffler and Related Parts

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-36 MUFFLER AND RELATED PARTS	
1	PAFZZ	90940	70921913	CLAMP,HOSE	1
2	XDFZZ	78229	H-286-1 1/2	U BOLT	1
3	XDFZZ	22680	89286	SUPPORT,EXHAUS	1
4	XDFZZ	22680	89251	U BOLT MUFFLER MTG	2
5	XDFZZ	66289	WD50A	MUFFLER,EXH	1
	XDFZZ	66289	SB-23	PLUG,PAPER FOR EXHAUST MUFFLER OUTLET	1
				END OF FIGURE	

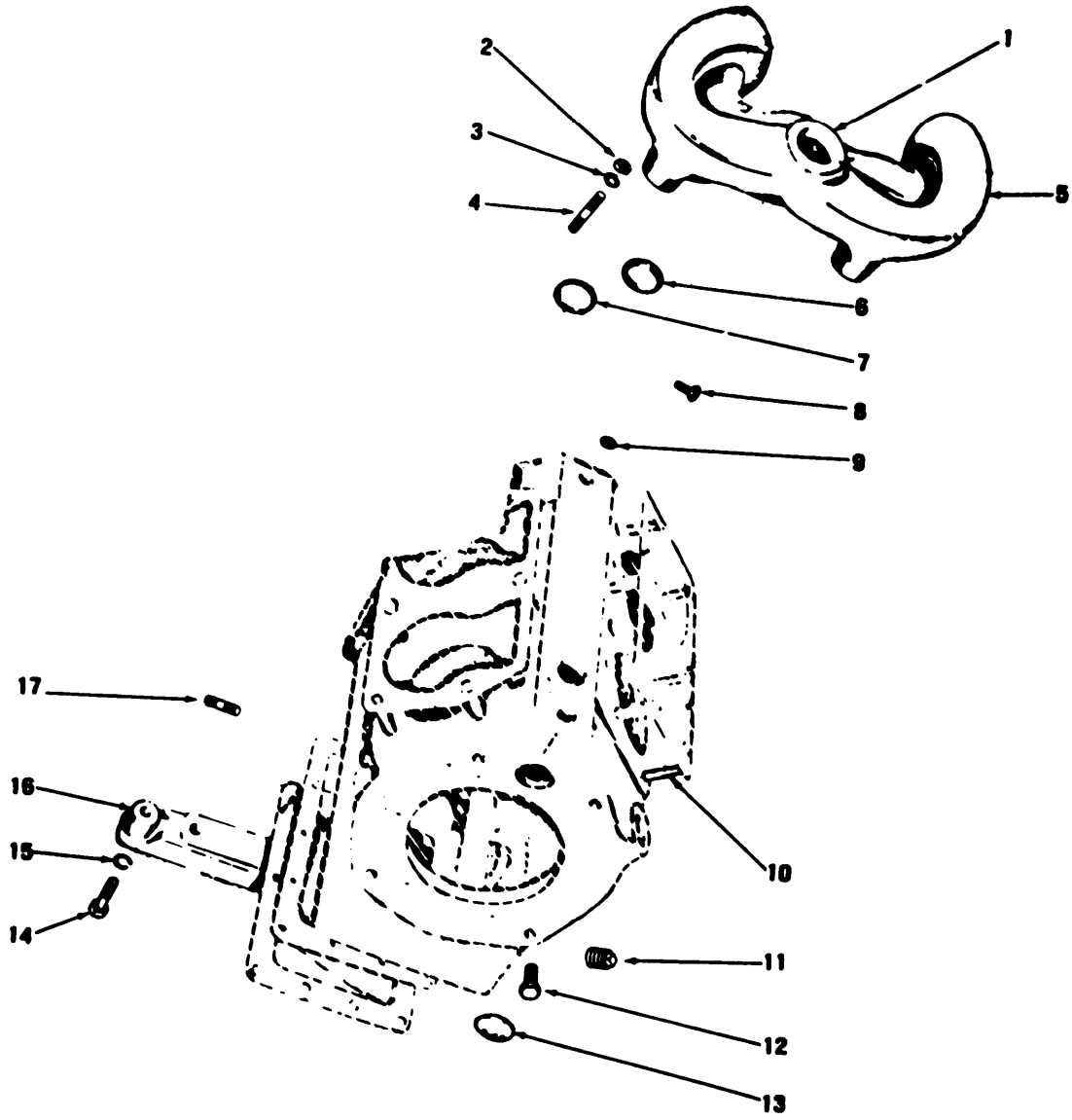


Figure C-37. Manifold and Related Parts

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-37 MANIFOLD AND RELATED PARTS	
1	XDFZZ	66289	XK-1	PLUG,PIPE,1/8	1
2	XDFZZ	66289	PD207	NUT 7/16-20	4
3	XDFZZ	66289	PH-79A	WASHER	4
4	XDFZZ	66289	PC-615	STUD BOLT	4
5	XDFZZ	66289	LD-240	MANIFOLD,INTAKE	1
6	XDFZZ	66289	QB-83	.INSERT	6
7	XDFZZ	66289	QC-66	GASKET,MANIFOLD CYL	6
8	XDFZZ	66289	XA-33	SCREW 1/4-20X3/8 FOR TAP IN CYLINDER BLOCK	1
9	XDFZZ	66289	SA26	PLUG,EXPANSION	2
10	XDFZZ	66289	PC-435	STUD,BLOCK TO CASE FOR MOUNTING CYLINDER BLOCK TO CASE	12
11	XDFZZ	66289	XK-4	PLUG,PIPE 1/2	1
12	XDFZZ	66289	PF-143	PLUG 5/8-11	1
13	XDFZZ	66289	SA-58	PLUG,EXPANSION	1
14	XDFZZ	66289	XD-52	SCREW 5/8-11X1 3/4	4
15	XDFZZ	66289	PE-37	WASHER,LOCK 5/8	4
16	XDFZZ	66289	BK-72	SUPPORT,ENGINE	2
17	XDFZZ	66289	PC-396	STUD,PLAIN	2
				END OF FIGURE	

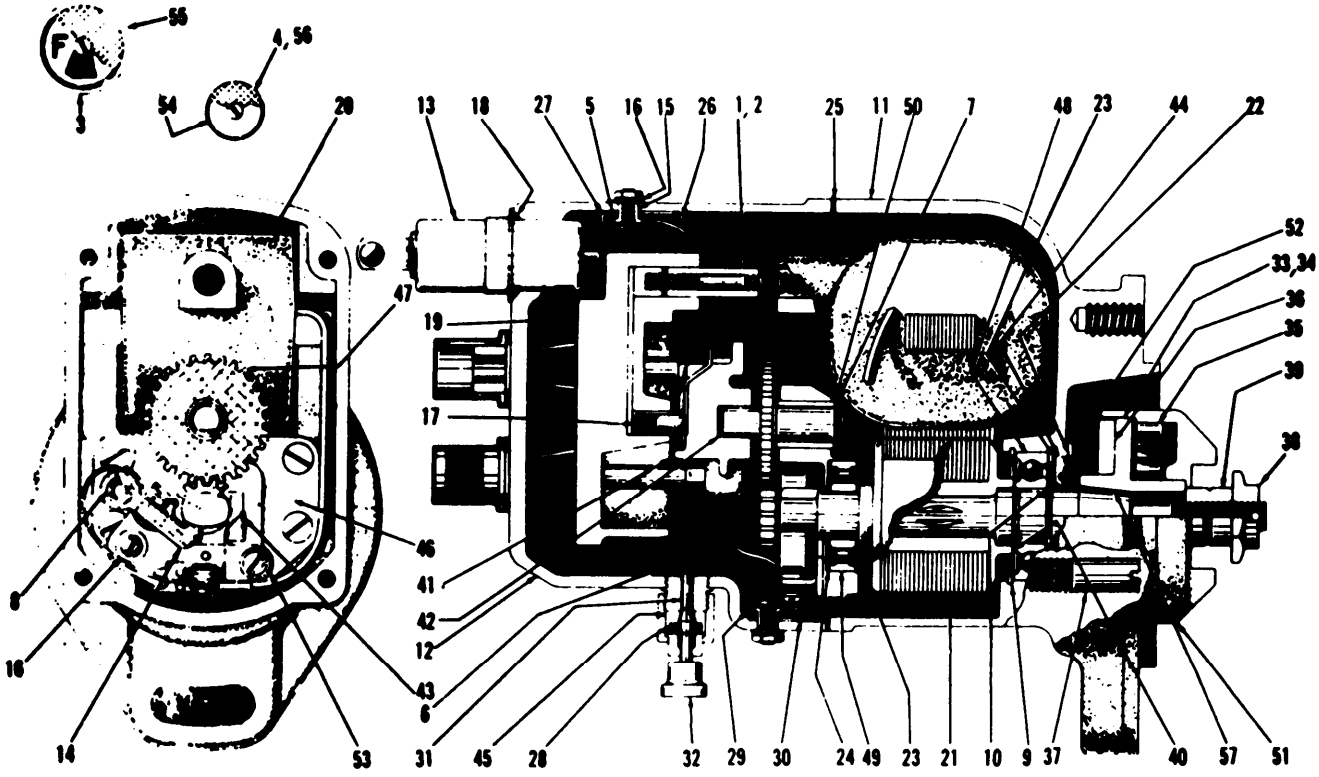


Figure C-38. Magneto

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-38 MAGNETO	
	XDFZZ	21387	Y-98-C-S1	MAGNETO,RAD.SHLD	1
1	XDFZZ	21387	F983B	.LEAD	1
2	XDFZZ	21387	D1182	.INSULATOR	1
3	XDFZZ	21387	A1232	.COVER,VENT	2
4	XDFZZ	21387	A1233	.WOOL,COPPER V COVER	4
5	XDFZZ	21387	B1355	.GUIDE,GND STRIP	1
6	XDFZZ	21387	D1498	.RING SNAP	1
7	XDFZZ	21387	G1498	.RING,SNAP	1
8	XDFZZ	21387	C1498G	.RING,SNAP	1
9	XDFZZ	21387	B1498B	.RING,SNAP	1
10	XDFZZ	21387	B1498D	.RING,SNAP	1
11	XDFZZ	21387	WW2425	.HOUSING	1
12	XDFZZ	21387	LY2430A	.CAP ASSY,END	1
13	XDFZZ	21387	MX2433	.CONDENSER	1
14	XDFZZ	21387	A2437A	.POINTS AND BRACKET	1
15	XDFZZ	21387	G2457A	.BUSHING,INSULATING	1
16	XDFZZ	21387	D2458	.WASHER,FLAT	1
17	XDFZZ	21387	E2460B	.BRUSH,SPRING ASSY	1
18	XDFZZ	21387	H2473	.O-RING	1
19	XDFZZ	21387	L2474E	.BLOCK,DIST	1
	XDFZZ	21387	8S8D	.SCR,DIST. BLOCK MTG	4
20	XDFZZ	21387	RS2477C	.COIL,MAGNETO	1
	XDFZZ	21387	31SS14A	.SETSCREW COIL MTG	2
21	XDFZZ	21387	TS2480	.ROTOR,MAGNETO	1
22	XDFZZ	21387	A2492A	.WASHER	1
23	XDFZZ	21387	A2492C	.WASHER	2
24	XDFZZ	21387	E2493	.WASHER,RETAIN	1
25	XDFZZ	21387	K2498	.END CAP	1
26	XDFZZ	21387	K2499A	.WIRE ASSY	1
27	XDFZZ	21387	K2513	.CONTACT,CONDENSER	1
28	XDFZZ	21387	E2513A	.SPRING,BUTTON	1
	XDFZZ	21387	6S8N	.SCREW,TERMINAL STRIP MTG	1
	XDFZZ	21387	6LW1	.LOCKWASHER TERMINAL STRIP MTG	2
	XDFZZ	21387	6N1	.SCREW NUT TERMINAL STRIP MTG	2
29	XDFZZ	21387	H2514	.STRIP,TERMINAL	1
30	XDFZZ	21387	W2514	.SUPPORT,CONTACT	1
31	XDFZZ	21387	HW2514	.NUT AND BUTTON ASSY	1
32	XDFZZ	21387	LX2514C	.SWITCH ASSY GND	1
33	XDFZZ	21387	CZ2563	.COUPLING HUB ASSY	1
34	PBFZZ	82796	BW2563C30	.COUPLING,IMPULSE	1
35	XDFZZ	21387	E2565	.SPRING,DRIVE	1
36	XDFZZ	21387	Q2566	.PAWL,COUPLING	2
37	XDFZZ	21387	S2568	.PIN,STOP	1
38	XDFZZ	21387	M2560	.NUT,COUPLING	1
39	XDFZZ	21387	F2572	.BUSHING,COULPING	1
40	XDFZZ	21387	C2723	.SHIM,BEARING	1
41	XDFZZ	21387	X2765	.ROTOR,DISTRIBUTOR	1
42	XDFZZ	21387	A2766	.CLIP,SPRING	1
43	XDFZZ	21387	G2788	.CAM WICK AND HOLDER	1
44	XDFZZ	21387	G3861	.SEAL,END	1

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
45	XDFZZ	21387	F4373	.SPACER,SWITCH	1
46	XDFZZ	21387	UX4631	.SUPPORT,BEARING	1
47	XDFZZ	21387	Q5939	.DIST.GEAR ASSY	1
48	XDFZZ	43991	7109TF	.BEARING,BALL,ANNULA	1
49	XDFZZ	21387	D5949A	.BEARING,END	1
50	XDFZZ	21387	D5950C	.BEARING,DIST	1
51	XDFZZ	21387	Y5957	.SHELL,COUPLING	1
52	XDFZZ	21387	S5963	.SPRING,PAWL	2
53	XDFZZ	21387	B5969	.WASHER	1
54	XDFZZ	21387	B6030A	.COVER,VENT	1
55	XDFZZ	21387	A6032A	.SCREEN,COVER	2
56	XDFZZ	21387	C6032B	.SCREEN,COVER	2
57	XDFZZ	21387	3K1	.KEY	1
	XDFZZ	21387	SK90	KIT MAGNETO SERVICE	1

END OF FIGURE

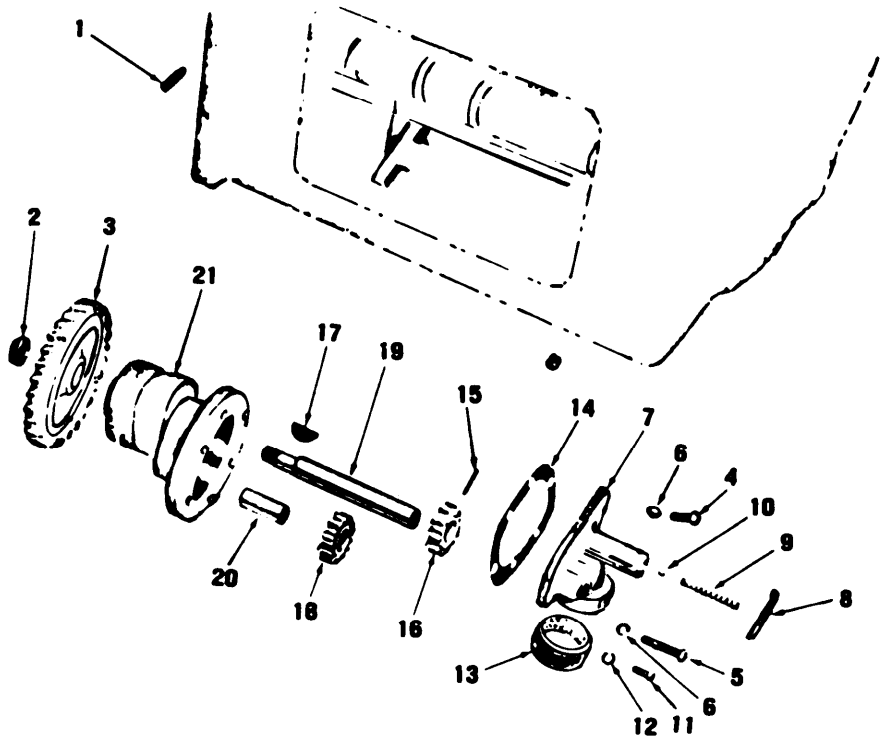


Figure C-39. Oil Pump Assembly

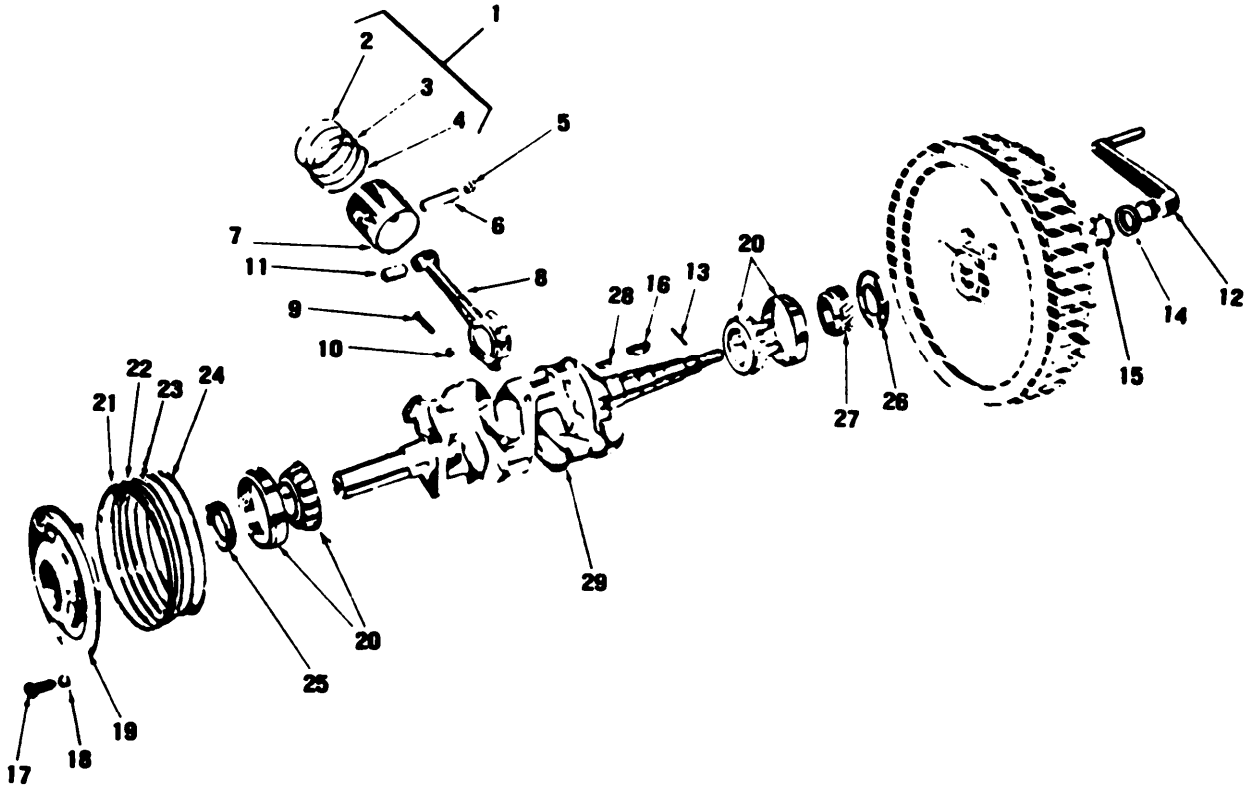


Figure C-40. Crankshaft, Piston, and Connecting Rods

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-39 OIL PUMP ASSEMBLY	
	XDFZZ	66289	K-95-L	OIL PUMP ASSY	1
1	XDFZZ	66289	P1-143-B	.LOCK,SCREW	
2	XDFZZ	66289	PD-195	.NUT	1
3	XDFZZ	66289	GD-94-C	.GEAR,OIL PUMP	1
4	XDFZZ	66289	XA-8	.SCREW 10-32X1/2	4
5	XDFZZ	66289	XA-56	.SCREW	2
6	XDFZZ	66289	PE-14	.WASHER,LOCK	6
7	XDFZZ	66289	KB-42-S2	.COVER ASSY	1
8	XDFZZ	66289	X1-16	.PIN,COTTER	1
9	XDFZZ	66289	PM-111	.SPRING,HELICAL,COMP	1
10	XDFZZ	66289	ME-60	.BALL,STEEL	1
11	XDFZZ	66289	XA-7	.SCREW	1
12	XDFZZ	66289	PE-14	.LOCKWASHER	1
13	XDFZZ	66289	RD-112	.SCREEN,OIL PUMP	1
14	XDFZZ	66289	QD-535-A	.GASKET	1
15	XDFZZ	66289	PA-64	.PIN	1
16	XDFZZ	66289	KC-56-A	.GEAR,DRIVERS	1
17	XDFZZ	66289	PL-137	.KEY,WOODRUFF	1
18	XDFZZ	66289	KC-56-A	.GEAR,DRIVER	1
19	XDFZZ	66289	KD-121-S1	.SHAFT,DRIVE	1
20	XDFZZ	66289	KD-122A	.SHAFT,STUB	1
21	XDFZZ	66289	RF-1121	NOZZLE,SPRAY OIL	4
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-40 CRANKSHAFT, PISTON AND CONNECTING RODS	
1	XDFZZ	66289	DR-15-D	PISTION RING SET	1
2	XDFZZ	66289	DC-126-B	.RING,COMPRESS, (CHORME) TOP	4
2	XDFZZ	66289	DC-126-C	.RING,COMPRESS, 2ND GROOVE	4
3	XDFZZ	66286	DC-345	.RING,SCRAPER, 3RD GROOVE	4
4	XDFZZ	66289	DC-111-B	.RING,OIL 4TH GROOVE	4
5	XDFZZ	66289	PK-37-A	RING,RETAINING FOR PISTON PIN	8
6	XDFZZ	66289	DE-59	PIN,PISTON STANDARD SIZE	4
7	XDFZZ	66287	DB-183-D-1	PISTON STANDARD SIZE	4
8	XDFFF	66289	DA-66B-S1	ROD,CONNECTING	4
9	XDFZZ	66289	PB-146-1-S1	.BOLT ASSY CONN ROD	8
10	XDFZZ	66289	PD-247	.NUT 3/8-24 SPECIAL	8
11	XDFZZ	66289	HG-131-C	.BUSHING,PIN, PISTON	4
12	XDFZZ	66289	U212M	CRANK,STARTING	1
13	XDFZZ	66289	PA-334	PIN,STARTING CRANK	1
14	XDFZZ	66289	PD-157	NUT	1
15	XDFZZ	66289	PE-65-1	WASHER,LOCK	1
16	XDFZZ	66289	PL-24	KEY,WOODRUFF NO29	1
17	XDFZZ	66289	XD-29	SCREW 3/8-16X 1-1/4 MAIN BEARING PLATE MTG	6
18	XDFZZ	66289	PE-5-A	WASHER,LOCK	6
19	XDFZZ	66289	BG-193A-S2	PLATE ASSY	1
20	XDFZZ	66289	ME-98	MAIN BRG ASSY	2
21	XDFZZ	66289	QD-636-A	GASKET BEARING PLATE,TAKE-OFF END	3
22	XDFZZ	66289	QF-67-C	SHIM .014 TK	1
23	XDFZZ	66289	QF-67-B	SHIM .006 TK	1
24	XDFZZ	66289	QD-636-B	GASKET .006 TK	3
25	XDFZZ	66289	PH-202	SEAL,OIL	1
26	XDFZZ	66289	RK-173	SLING,OIL	1
27	XDFZZ	66289	GA-35A-1	GEAR,CRANKSHAFT	1
28	XDFZZ	66289	PL-49	KEY WOODRUFF NO.15	1
29	XDFDD	66289	CA-69-C-57-S1	CRANK SHAFT ASSY	1
				END OF FIGURE	

FSCM	PART NUMBER	FIGURE NO	ITEM NO
66289	KC-56-A	C-39	16
66289	KC-56-A	C-39	18
66289	KD-121-S1	C-39	19
66289	KD-122A	C-39	20
21387	K2498	C-38	25
21387	K2499A	C-38	26
21387	K2513	C-38	27
79960	L-57-1-S1	C-30	
66289	LD-240	C-37	5
73370	LJ-131	C-28	3
66289	LJ-300-M	C-34	10
73370	LK-24	C-28	1A
73370	LK-9	C-28	1
73370	LL-18	C-28	2
73370	LL-89-2	C-28	11
66289	LO-60-1	C-34	9
73370	LO-62	C-28	4
66289	LP19B	C-35	1
66289	LP38ES1	C-35	7
21387	LX2514C	C-38	32
21387	LY2430A	C-38	12
21387	L2474E	C-38	19
19728	MAD-110	C-5	
19728	MBG-2012S	C-5	2
19728	MBG-2411	C-5	1
19728	MBG-3005AS	C-5	3
66289	ME-111	C-31	21
66289	ME-112	C-31	28
66289	ME-112	C-31	28
66289	ME-60	C-39	10
66289	ME-98	C-40	20
80756	MS-90138	C-26	65
96906	MS16555-27	C-26	56
96906	MS16555-88	C-26	52
96906	MS16997-105	C-26	5
96906	MS16997-106	C-26	8
96906	MS16997-139	C-26	49
96906	MS16997-141	C-26	50
96906	MS16997-43	C-26	11
96906	MS16997-57	C-26	46
96906	MS16997-59	C-26	53
96906	MS16997-61	C-26	2
96906	MS16997-64	C-26	25
96906	MS16998-31	C-26	45
96906	MS18154-137	C-26	28
96906	MS18154-137	C-26	33
96906	MS18154-58	C-18	8
96906	MS18154-60	C-45	13
96906	MS20813-1	C-42	6
96906	MS20819-12	C-11	11
96906	MS20819-8	C-11	10
96906	MS20822-12D	C-20	1
96906	MS20822-12D	C-21	10
96906	MS20822-16D	C-20	6
96906	MS20822-16D	C-21	11
96906	MS20822-16D	C-22	72
96906	MS20822-16D	C-22	74
96906	MS20822-4-4	C-22	59
96906	MS20826-4D	C-20	2
96906	MS20826-4D	C-22	82
96906	MS20913-2S	C-20	11
96906	MS20913-4S	C-33	6
96906	MS20913-6S	C-20	5
96906	MS21104D/6	C-10	3
96906	MS21104D12	C-11	9
96906	MS21104D12	C-9	3
96906	MS21104D8	C-11	8
96906	MS24392-12	C-10	6
96906	MS24392-4	C-22	58
96906	MS24392-8	C-9	5
96906	MS24392D4	C-22	68
96906	MS24393-4	C-12	4
96906	MS24393-4	C-22	45
96906	MS24393D4	C-12	6
96906	MS24393D4	C-22	51
96906	MS24394-4	C-22	64
96906	MS24402D12	C-22	71
96906	MS24402D4	C-22	50
96906	MS24402D8	C-22	47
96906	MS24665-134	C-25	1
96906	MS25281-4P	C-41	
96906	MS28741-12-1200	C-10	7
96906	MS287591-1200	C-9	6
96906	MS28774-228	C-17	2
96906	MS28775-228	C-17	3
96906	MS28777-4	C-22	69
96906	MS28778-4	C-22	62
96906	MS35058-30	C-2	3
96906	MS35059-23	C-2	1
96906	MS35207-263	C-10	2
96906	MS35207-263	C-11	1
96906	MS35207-263	C-33	
96906	MS35207-263	C-9	2
96906	MS35207-264	C-18	3
96906	MS35275-261	C-26	41
96906	MS35335-34	C-43	29
96906	MS35338-42	C-21	3
96906	MS35338-43	C-18	2
96906	MS35338-43	C-33	
96906	MS35338-44	C-21	1
96906	MS35338-46	C-18	7
96906	MS35338-46	C-24	2
96906	MS35338-46	C-43	15
96906	MS35338-50	C-24	4
96906	MS35650-302	C-10	2
96906	MS35650-302	C-11	1
96906	MS35650-302	C-18	1
96906	MS35650-302	C-9	2
96906	MS35671-24	C-26	40
96906	MS35671-66	C-44	27
96906	MS35690-1002	C-29	
96906	MS35690-516	C-21	3
96906	MS35690-516	C-3	1
96906	MS35690-602	C-18	6
96906	MS35690-602	C-43	14
96906	MS35691-13	C-43	29
96906	MS51020-49	C-25	2
96906	MS51044-35	C-16	1
96906	MS51953-103	C-21	10
96906	MS90725-160	C-24	3
96906	MS90725-168	C-29	
96906	MS90725-3	C-21	1
96906	MS90725-60	C-43	17
96906	MS90725-62	C-24	1
09990	MV-400-S	C-12	13
09990	MV-400-S	C-12	18
09990	MV-400-S	C-14	
21387	MX2433	C-38	13
19728	MZ-1024U	C-5	11
19728	MZ-1360	C-5	5
19728	MZ-19S	C-5	9
19728	MZ-2002Q	C-5	4
19728	MZ-359	C-5	13
19728	MZ-364	C-5	7
19728	MZ-52	C-5	15
21387	M2560	C-38	38
66289	N-100-9	C-29	17
80205	NAS1099-6	C-43	16
80205	NAS818-12	C-17	
79502	ND-1252	C-21	5
75665	OS71	C-23	3
66289	OW-363	C-35	
73370	P-17242	C-28	
73370	P-17244	C-28	6
73370	P-2706	C-28	5
66289	PA-291	C-29	
66289	PA-294	C-31	5
66289	PA-334	C-40	13
66289	PA-340	C-31	2
66289	PA-340	C-7	3
66289	PA-367	C-31	4
66289	PA-64	C-35	15
66289	PB-146-1-S1	C-40	9
66289	PB-187	C-4	9
66289	PC-112	C-34	6
66289	PC-396	C-37	17
66289	PC-396	C-4	5
66289	PC-435	C-37	10
66289	PC-615	C-37	4
66289	PD-10	C-4	3

FSCM	PART NUMBER	FIGURE NO	ITEM NO	FSCM	PART NUMBER	FIGURE NO	ITEM NO
66289	PD-10	C-34	2	66289	QD-633	C-29	
66289	PD-13	C-29	5	66289	QD-634	C-29	16
66289	PD-157	C-40	14	66289	QD-636-A	C-40	21
66289	PD-173-A	C-32	17	66289	QD-636-B	C-40	24
66289	PD-195	C-39	2	66289	QD-653	C-35	
73370	PD-198	C-28	10	66289	QD-67	C-35	20
66289	PD-247	C-40	10	66289	QD635	C-29	28
66289	PD-76	C-32	1	66289	QF-67-B	C-40	23
66289	PD-77	C-32	12	66289	QF-67-C	C-40	22
73370	PD-78	C-28	6A	21387	Q2566	C-38	36
66289	PD207	C-37	2	21387	Q5939	C-38	47
66289	PE-14	C-39	6	66289	RC-91	C-34	11
66289	PE-14	C-39	12	66289	RD-112	C-39	13
66289	PE-14	C-7	2	66289	RF-1121	C-39	21
66289	PE-3	C-29	23	66289	RF-269	C-35	
66289	PE-3	C-32	13	66289	RF-269-2	C-31	16
66289	PE-3	C-34	13	66289	RF-794	C-35	2
66289	PE-3	C-35	10	66289	RJ-173	C-34	8
66289	PE-34A	C-6	1	66289	RJ-173-A	C-34	
66289	PE-37	C-37	15	66289	RK-173	C-40	26
66289	PE-4	C-28	8	66289	RK-181	C-34	14
66289	PE-4	C-29		66289	RM-1049-L-S1	C35	4
66289	PE-4	C-29	26	66289	RM-536	C-34	7
66289	PE-4	C-30		73370	RM-900	C-31	14
66289	PE-4	C-31	20	80756	RR331	C-23	2
66289	PE-4	C-34	3	66289	RS11	C-12	1
66289	PE-4	C-35	6	21387	RS2477C	C-38	20
66289	PE-4	C-4	4	66289	RV-40-S4	C-29	10
66289	PE-45A	C-6	6	66289	RV-40-S4	C-34	1
66289	PE-46	C-35	22	66289	RV-40A-1	C-29	11
66289	PE-5	C-32	2	66289	RV-40A-1	C-34	4
66289	PE-5	C-4	10	66289	SA-52	C-31	18
66289	PE-5-A	C-40	18	66289	SA-58	C-37	13
66289	PE-65-1	C-40	15	66289	SA26	C-37	9
66289	PE-7	C-29	6	66289	SB-23	C-36	
66289	PF-101	C-35	25	98003	SC-B-83314-2CE	C-41	10
66289	PF-143	C-37	12	66289	SE-124-AP-1	C-29	22
66289	PF-52	C-35	23	66289	SE-125	C-29	18
66289	PG-475	C-32	6	66289	SE-125-A	C-29	18
73370	PG-512	C-28	7	66289	SE-126	C-29	19
66289	PG-515-A	C-4	8	66289	SE-126-A	C-29	19
66289	PG-558	C-6	2	66289	SE-127	C-29	21
66289	PH-194	C-4	7	66289	SE-127-A-14	C-29	21
66289	PH-202	C-40	25	66289	SE-128-B	C-29	20
66289	PH-22	C-29	2	66289	SE-128-C	C-29	20
16794	PH-22-A	C-8	3	66289	SE-48	C-29	24
66289	PH-269	C-29	15	21387	SK90	C-38	
66289	PH-293-A	C-32	10	86768	SP100-114	C-13	13
66289	PH-332	C-31	12	86768	SP100-137	C-13	6
16794	PH-377-B	C-8	1	86768	SP100-141	C-15	17
66289	PH-77-A	C-32	15	86768	SP100-6	C-15	21
66289	PH-79A	C-37	3	86768	SP100-7	C-15	19
66289	PJ-105	C-34	18	86768	SP100-9	C-15	12
66289	PK-121	C-32	19	86768	SP100-92	C-13	5
66289	PK-37-A	C-40	5	86767	SP201-6	C-15	22
66289	PL-137	C-39	17	16954	S15-00465	C-26	23
16794	PL-21	C-31	26	16954	S15-01017	C-26	9
66289	PL-24	C-40	16	16954	S15-12575	C-26	21
66289	PL-49	C-40	28	21387	S2568	C-38	37
66289	PM-108	C-35	26	21387	S5963	C-38	52
66289	PM-111	C-32	20	43766	T-84-D-1	C-29	30
66289	PM-111	C-39	9	43766	T-84-D-1	C-31	
66289	PM-145	C-35	17	66289	TA-111-A	C-35	18
66289	PM-76	C-31	13	43766	TA-112-A	C-31	25
19728	PS1330B	C-5	6	66289	TA-114-S1	C-35	16
66289	P1-143-B	C-39	1	66289	TA-115	C-35	13
66289	P1-145-1	C-32	21	66289	TA-116	C-35	19
19728	P90-44B	C-5	16	66289	TB-109	C-31	17
19728	P90-743	C-5	10	00624	TB-155-S4-8D	C-22	34
19728	P90-822	C-5	14	00624	TB155S4-100	C-22	35
66289	Q-18-C	C-29		43766	TC-322-D-S1	C-31	23
66289	QB-83	C-37	6	43766	TC-346B	C-31	24
66289	QC-66	C-37	7	43766	TC-348-S1	C-31	22
66289	QD-482	C-29	8	43766	TC-363B	C-31	7
66289	QD-535-A	C-39	14	66289	TC-365-D	C-32	16
66289	QD-538-A	C-35	8	66289	TC-368-A	C-32	18
66289	QD-595-A	C-34	5	43766	TC-398-9	C-31	9
66289	QD-615-A	C-31	6	43766	TC-403	C-31	15
66289	QD-631	C-29	4	66289	TF-96-4	C-35	12
66289	QD-632	C-29	9	21387	TS2480	C-38	21

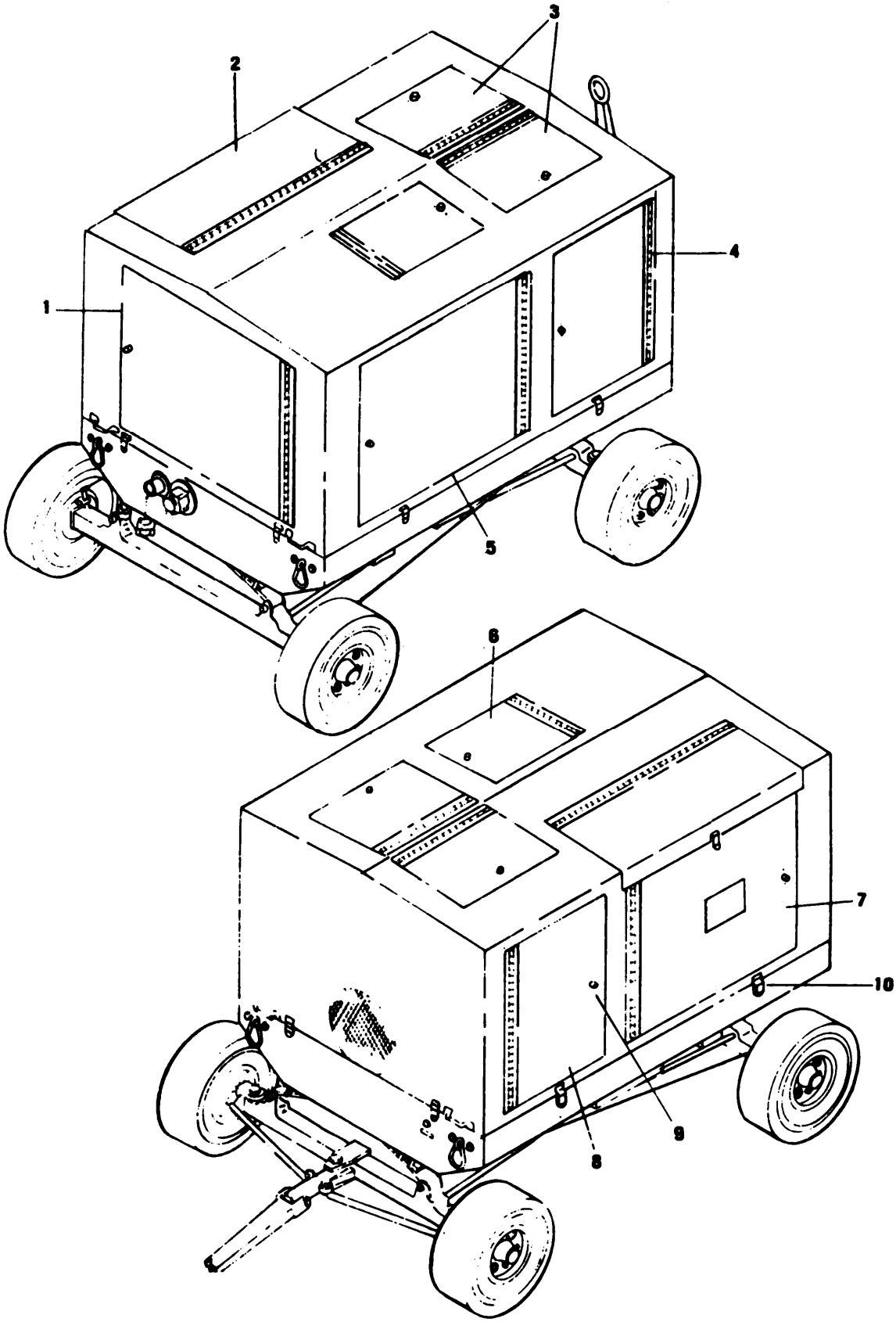


Figure C-41. Cabinet

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				GROUP 04 CHASSIS	
				FIGURE C-41. CABINET	
	XDFFF	22680	48409	CABINET ASSY	1
1	XDFZZ	22680	89257	.DOOR,REAR ACCESS HOSE STORAGE	1
2	XDFZZ	22680	89256	.DR,TOP PAN ACCESS	1
3	XDFZZ	22680	89264	.DOOR,TOP ENG COMP. VENTILATION	2
4	XDFZZ	22680	89255	.DOOR,ENG.COMP. ACCESS AND VENTILATION	1
5	XDFZZ	22680	89253	.DOOR,SIDE ACCESS HYDRAULIC SYSTEM COMPONENT	1
6	XDFZZ	22680	89258	.DOOR,TOP RES FILL	1
7	XDFZZ	22680	89254	.DOOR,PAN ACCESS	1
8	XDFZZ	22680	89255	.DOOR,ENG.COMP. AND BATTERY ACCESS	1
9	XDFZZ	94222	44-1-2-0	.LATCH,ADJ.GRIP	8
10	XDFZZ	98003	SC-B-83314-2CE	.CATCH,COMP SPRING	9
				END OF FIGURE	

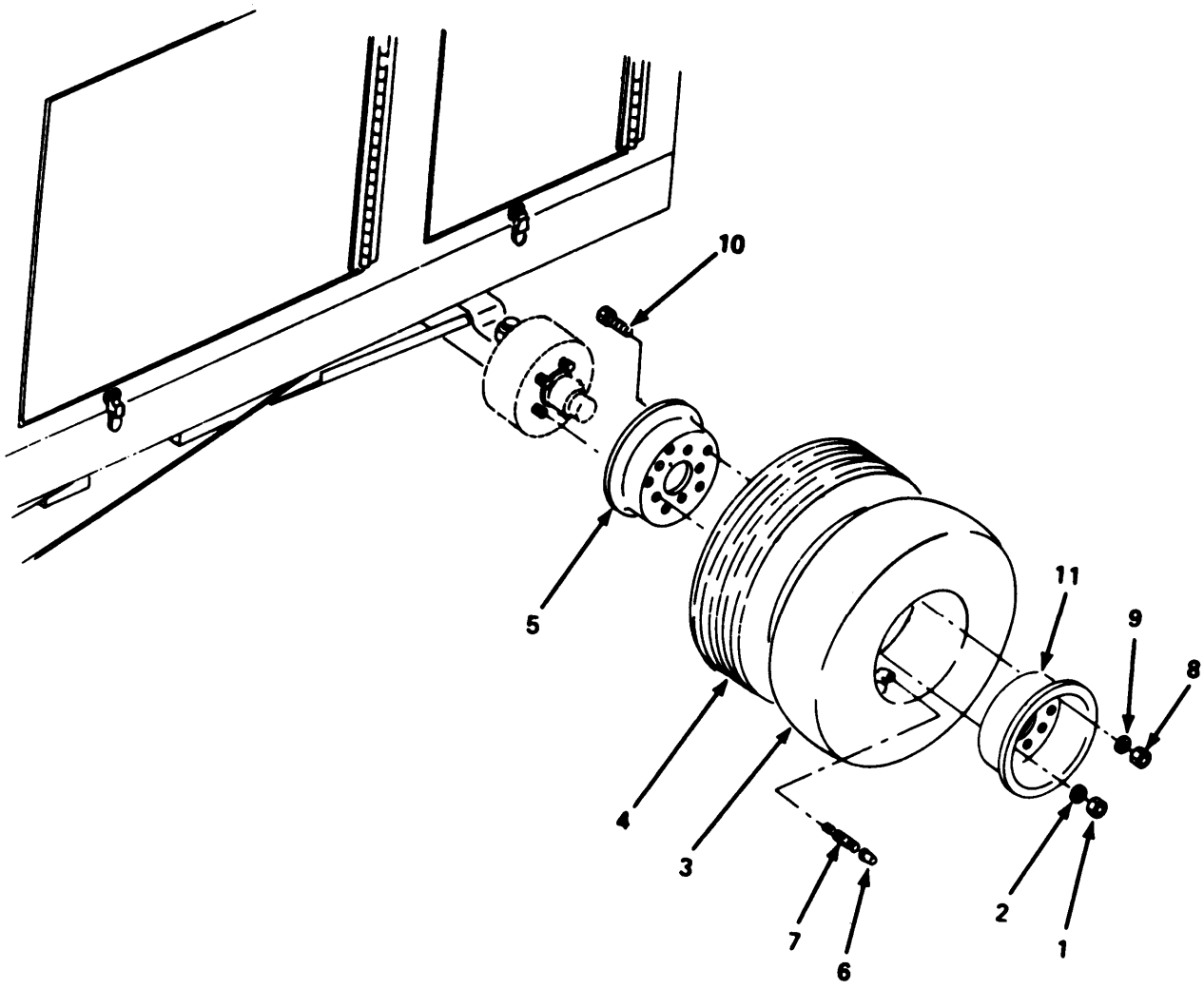


Figure C-42. Tire and Wheel

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-42. TIRE AND WHEEL	
1	XDOZZ	22938	4601-5	NUT,MTG WHEEL	8
2	XDFZZ	22938	4700-4	WASHER LOCK	8
	XDFFZ	22938	1-3712	WHL TIRE ASSY	4
	XDFZZ	22938	6555	.TIRE AND TUBE	4
3	XDOFF	73808	6-00X9	..INNER TUBE,PNEUMATI	4
4	XDFFH	81349	ZZT410	..TIRE,PNEUMATIC	4
	XDFFZ	22938	3712	.WHEEL,PNEUMATIC TIR	4
5	XDFZZ	22938	3712-2	..WHL DISC W/O VALVE	1
6	XDOZZ	96906	MS20813-1	..CAP,VALVE	4
7	XDOZZ	88044	AN809-1	..VALVE CORE	4
8	XDFZZ	22938	4601-5	..NUT,WHEEL DISC	8
9	XDOZZ	22938	4601-5	..NUT,WHEEL DISC	8
10	XDFZZ	22938	4901-8	..SCREW,CAP,SOCKET HE	8
11	XDFZZ	22938	3712-1	..WHL DISC W/VALVE	1
				END OF FIGURE	

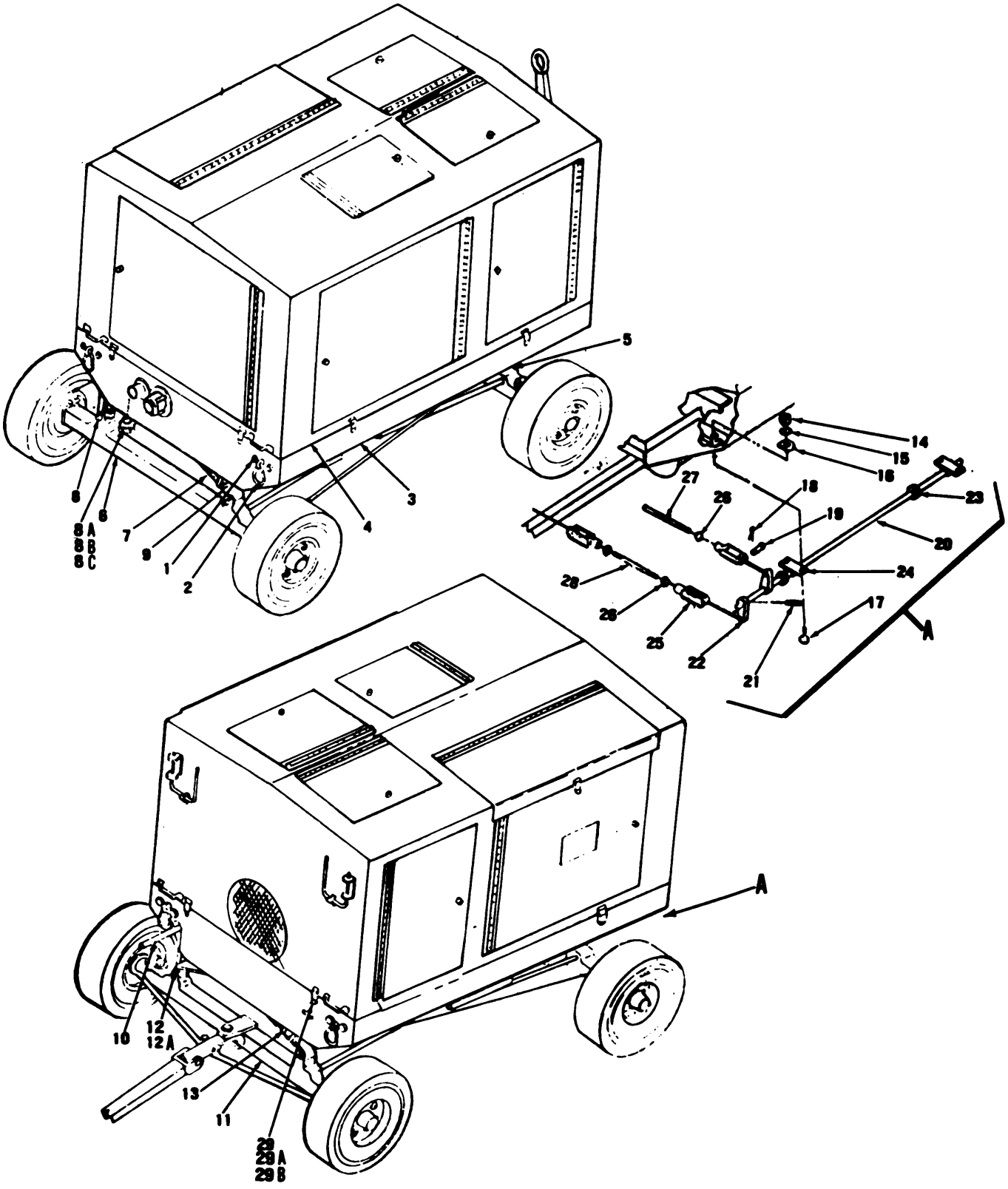


Figure C-43. Frame and Running Gear

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-43. FRAME AND RUNNING GEAR	
1	XDFZZ	04368	AF54B6236	NUT PLATE	4
2	XDFZZ	04368	AF48B7796	RING ASSY,TIE DOWN	4
3	XDFDD	22680	89516	FRAM,TRAILER	1
4	XDFDD	22680	89238	FRAME,PANNEL	1
5	XDFDD	22938	184	TRAILER,RUNNING GR	1
6	XDFDD	22938	184-1346	.AXLE ASSY,REAR (SEE FIG.C-45 FOR BREAKDOWN)	1
7	XDFZZ	22938	5100-2	.U-BOLT SPRING	4
8	XDFZZ	22938	4800-8	.PIN,COTTER	3
8A	XDFZZ	22938	4600-3	.NUT	3
8B	XDFZZ	22938	5402-1	.BOLT,SHACKLE	3
8C	XDFZZ	22938	4257	.LINK,SHACKLE	2
9	XDFZZ	22938	4020-1	.SPRING REAR	1
10	XDFZZ	22938	1-5904	.HANDBRAKE ASSY	1
11	XDFDD	22938	184-1396	.AXLE ASSY FRONT SEE FIG.C-27 FOR BREAKDOWN)	1
12	XDFZZ	22938	4800-8	.PIN,COTTER SHACKLE BOLT NUT	3
12A	XDFZZ	22938	4600-3	.NUT SHACKLE BOLT	3
13	XDFZZ	22938	4020-1	.SPRING FRONT	1
14	XDFZZ	96906	MS35690-602	.NUT,HEX	4
15	XDFZZ	96906	MS35338-46	.WASHER,LOCK	4
16	XDFZZ	80205	NAS1099-6	.WASHER,BEVEL	4
17	XDFZZ	96906	MS18514-60	.SCREW,CAP HEX	4
18	XDFZZ	22938	4800-7	.PIN,COTTER YOKE	5
19	XDFZZ	22938	5206	.PIN,YOKE	5
20	XDFFF	22938	184-5911	.CROSS SHAFT ASSY	1
21	XDFZZ	22938	5000-2	..PIN,ROLL	3
22	XDFZZ	22938	5909	..LEVER	3
23	XDFZZ	22938	6319-2	..COLLAR,SHAFT	1
24	XDFZZ	22938	5908	..BEARING	2
25	XDFZZ	22938	5205	.YOKE	6
26	XDFZZ	22938	4601-5	.NUT YOKE	6
27	XDFZZ	22938	8300-070	.ROD,BRAKE	2
28	XDFZZ	22938	8300-400	.ROD,BRAKE	1
29	XDFZZ	96906	MS35691-13	NUT,JAM	6
29A	XDFZZ	96906	MS35335-34	WASHER,LOCK	2
29B	XDFZZ	22680	32491	STUD	1
				END OF FIGURE	

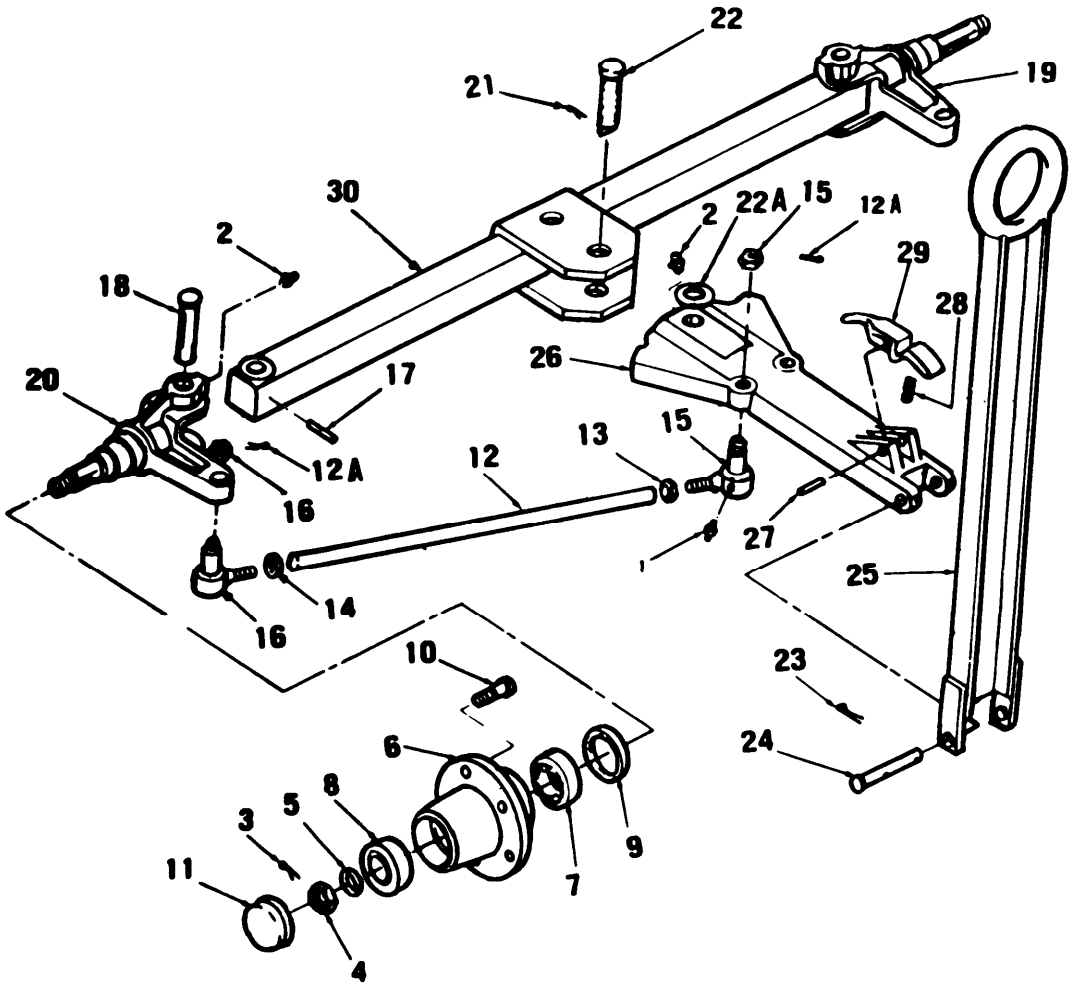


Figure C-44. Front Axle and Hub Assembly

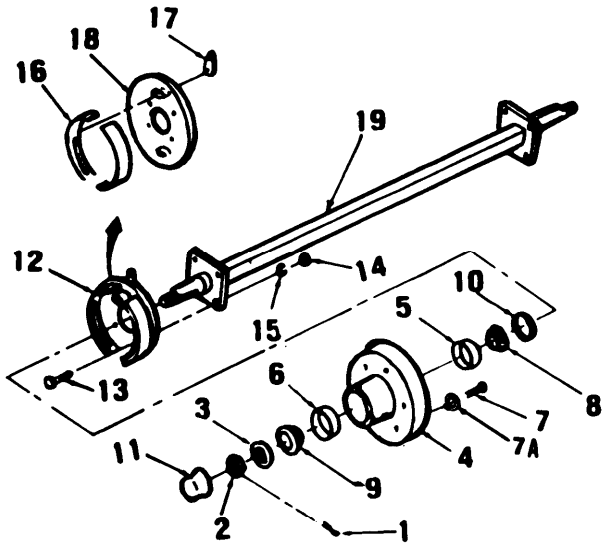


Figure C-45. Rear Axle

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-44. FRONT AXLE AND HUB ASSEMBLY	
	XDFDD	22938	184-1396	AXLE ASSY FRONT (SEE FIG.C-43 FOR NHA)	1
1	XDFZZ	22938	5801	.FITTING,LUBE	4
2	XDFZZ	22938	5800	.FITTING,LUBE	12
3	XDFZZ	22938	4800-5	.PIN,COTTER	2
4	XDFZZ	22938	4600-2	.NUT,SPINDLE	2
5	XDFZZ	22938	4702-2	.WASHER, SPINDLE	2
6	XDFFF	22938	1-3612	.HUB ASSY	2
7	XDFZZ	22938	6057	..CONE AND ROLLERS,TA INNER	1
8	XDFZZ	22938	6058	..CONE AND ROLLERS,TA OUTER	1
9	XDFZZ	22938	6311	..SEAL,GREASE	1
10	XDFZZ	22938	6251-10	..STUD,PLAIN	5
11	XDFZZ	22938	6312	..CAP,GREASE	1
12	XDFFF	22938	3906-190	.ROD ASSY TIE	2
12A	XDFZZ	22938	4800-4	..PIN,COTTER BALL JOINT	4
13	XDFZZ	22938	4602-1	..NUT,JAM LH	1
14	XDFZZ	22938	4602-2	..NUT,JAM RH	1
15	XDFZZ	22938	3950-1	..BALL JOINT LH	1
16	XDFZZ	22938	3950-2	.BALL JOINT RH	1
17	XDFZZ	22938	5000-1	.ROLL PIN	2
18	XDFZZ	22938	5401	.KING PIN	2
19	XDFZZ	22938	4-3806	.KNUCKLE ASSY, LH	1
20	XDFZZ	22938	3-3806	.KNUCKLE ASSY RH	1
21	XDFZZ	22938	4800-6	.PIN,COTTER CENTER PIN	1
22	XDFZZ	22938	5400-1	.PIN,CENTER	1
22A	XDFZZ	22938	4701-3	.WASHER FLAT	3
23	XDOZZ	22938	4800-6	.PIN,COTTER LEVER	1
24	XDOZZ	22938	5416	.PIN,HINGE	1
24	XDFZZ	22938	5404	.PIN,HINGE	1
25	XDFZZ	22938	1-3502	.DRAWBAR ASSY	1
26	XDFFF	22938	1-3851	.ARM ASSY CENTER	1
27	XDFZZ	96906	MS35671-66	..PIN,ROLL	1
28	XDFFZ	22938	4006	..SPRING	1
29	XDFZZ	22938	3855	..LATCH PEDAL (SEE FIG.C-44 FOR BREAKDOWN)	1
30	XDFDD	22938	184-1396-1	.BEAM ASSY	1
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				FIGURE C-45. REAR AXLE	
	XDFDD	22938	184-1346	AXLE ASSY,REAR (SEE FIG.C-43 FOR NHA)	1
1	XDFZZ	22938	4800-5	.COTTER,SPINDLE	2
2	XDFZZ	22938	4600-2	.NUT,SPINDLE	2
3	XDFZZ	22938	4702-2	.WASHER,S	
4	XDFFF	22938	2-3612	.HUB DRUM ASSY	2
5	XDFZZ	22938	6152	..BEARING	1
6	XDFZZ	22938	6151	..BEARING	1
7	XDFZZ	22938	4601-6	..NUT	10
7A	XDFZZ	22938	4700-5	..LOCKWASHER STUD	10
8	XDFZZ	22938	6057	..CONE AND ROLLERS,TA	1
9	XDFZZ	22938	6058	..CONE AND ROLLERS,TA OUTER	1
10	XDFZZ	22938	6311	.SEAL,GREASE	1
11	XDFZZ	22938	6312	.CAP,GREASE	1
12	XDFFF	22938	1-8209	.BRAKE ASSY	2
13	XDOZZ	96906	MS18154-60	.SCREW,CAP,HEXAGON H	8
14	XDFZZ	22938	4601-7	.NUT	8
15	XDOZZ	22938	4700-4	.WASHER,LOCK	8
16	XDFZZ	22938	8209	.BRAKE	2
17	XDFZZ	22938	8225	.LEVER ASSY	2
18	XDFZZ	22938	8210	.SHIELD,DUST	2
19	XDFDD	22938	184-1346-2	.BEAM	1
				END OF FIGURE	

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG	ITEM	STOCK NUMBER	FIG	ITEM
2910-00-030-1505	C-35	7			
4730-00-098-4273	C-22				
4730-00-278-2513	C-36	1			
2920-00-566-7395	C-38	34			
4820-00-800-9582	C-22	41			
4920-00-829-7781	C-19	1			
2940-00-891-9342	C-29	10			
	C-34	1			
5305-00-989-7435	C-18	3			
4820-01-076-5593	C-12	16			
	C-15				
2805-01-087-1799	C-29				
5210-01-167-5298	C-12	5			
4920-01-167-5299	C-33	8			
4720-01-168-0633	C-10				

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66289	AA90AS8		C-29	7
66289	AB-111		C-29	3
04368	AF48B7796		C-43	2
04368	AF54B6236		C-43	1
88044	AN6289-4		C-22	63
88044	AN809-1		C-42	7
81349	AN816-16D		C-21	12
			C-22	84
88044	AN818-12		C-11	11A
			C-22	38
88044	AN818-16D		C-22	76
88044	AN818-8		C-11	10A
88044	AN820-16D		C-22	81
88044	AN824-4		C-22	43
88044	AN827-12		C-22	56
88044	AN910-4D		C-20	9
81349	AN912-1D		C-20	3
88044	AN912-7D		C-20	4
88044	AN924-4		C-12	4A
			C-22	46
88044	AN924-4D		C-12	6
			C-22	52
88044	AN929-4		C-12	4
			C-22	44
88044	AN929-4D		C-12	6A
			C-22	53
88044	AN929-8D		C-22	48
88044	AN941-12		C-21	10B
88044	AN960-516		C-3	2
21387	A1232		C-38	3
21387	A1233		C-38	4
21387	A2437A		C-38	14
21387	A2492A		C-38	22
21387	A2492C		C-38	23
21387	A2766		C-38	42
21387	A6032A		C-38	55
66289	BA-49-A		C-29	29
66289	BD101-B-2-S1		C-29	14
66289	BG-193A-S2		C-40	19
66289	BG-223		C-34	16
66289	BH-155-A		C-29	27
66289	BK-72		C-37	16
82796	BW2563C30	2920-00-566-7395	C-38	34
21387	B1355		C-38	5
21387	B1498B		C-38	9
21387	B1498D		C-38	10
21387	B5969		C-38	53
21387	B6030A		C-38	54
66289	CA-69-C-57-S1		C-40	29
79502	CD-297		C-21	4
21387	CZ2563		C-38	33

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21387	C1498G		C-38	8
21387	C2723		C-38	40
79470	C3109X20X16		C-22	73
			C-22	85
79470	C3179X16		C-20	7
79470	C35515X12		C-22	36
79470	C5015X12X4		C-22	39
79470	C5015X12X8		C-22	37
79470	C5015X16X12		C-22	75
79470	C5405X8X8		C-22	78
79470	C5515X16		C-22	67
21387	C6032B		C-38	56
66289	DA-66B-S1		C-40	8
66289	DB-183-D-1		C-40	7
66289	DC-111-B		C-40	4
66289	DC-126-B		C-40	2
66289	DC-126-C		C-40	2
66289	DC-345		C-40	3
66289	DE-59		C-40	6
66289	DR-15-D		C-40	1
21387	D1182		C-38	2
21387	D1498		C-38	6
21387	D2458		C-38	16
21387	D5949A		C-38	49
21387	D5950C		C-38	50
66289	EA-112		C-35	27
19728	EBB-137A		C-5	8
00624	E155-25-12D		C-11	
00624	E155-25-8D		C-11	
			C-21	2
		4730-00-098-4273	C-22	
21387	E2460B		C-38	17
21387	E2493		C-38	24
21387	E2513A		C-38	28
21387	E2565		C-38	35
73370	FGA05-2522		C-28	
21387	F2572		C-38	39
21387	F4373		C-38	45
21387	F983B		C-38	1
66289	GA-35A-1		C-40	27
66289	GB-46		C-35	24
66289	GC-28		C-34	19
66289	GD-94-C		C-39	3
66289	GD-95-A		C-31	27
21387	G1498		C-38	7
21387	G2457A		C-38	15
21387	G2788		C-38	43
21387	G3861		C-38	44
78229	H-286-1 1/2		C-36	2
78174	HD-27		C-3	4
66289	HG-131-C		C-40	11

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66289	HG-203		C-32	22
21387	HW2514		C-38	31
21387	H2473		C-38	18
21387	H2514		C-38	29
66289	JK-50		C-35	14
66289	JK-52		C-31	8
66289	K-95-L		C-39	
66289	KB-42-S2		C-39	7
66289	KC-56-A		C-39	16
			C-39	18
66289	KD-121-S1		C-39	19
66289	KD-122A		C-39	20
21387	K2498		C-38	25
21387	K2499A		C-38	26
21387	K2513		C-38	27
79960	L-57-1-S1		C-30	
66289	LD-240		C-37	5
73370	LJ-131		C-28	3
66289	LJ-300-M		C-34	10
73370	LK-24		C-28	1A
73370	LK-9		C-28	1
73370	LL-18		C-28	2
73370	LL-89-2		C-28	11
66289	LO-60-1		C-34	9
73370	LO-62		C-28	4
66289	LP19B		C-35	1
66289	LP38ES1	2910-00-030-1505	C-35	7
21387	LX2514C		C-38	32
21387	LY2430A		C-38	12
21387	L2474E		C-38	19
19728	MAD-110		C-5	
19728	MBG-2012S		C-5	2
19728	MBG-2411		C-5	1
19728	MBG-3005AS		C-5	3
66289	ME-111		C-31	21
66289	ME-112		C-31	28
66289	ME-60		C-39	10
66289	ME-98		C-40	20
80756	MS-90138		C-26	65
96906	MS16555-27		C-26	56
96906	MS16555-88		C-26	52
96906	MS16997-105		C-26	5
96906	MS16997-106		C-26	8
96906	MS16997-139		C-26	49
96906	MS16997-141		C-26	50
96906	MS16997-43		C-26	11
96906	MS16997-57		C-26	46
96906	MS16997-59		C-26	53
96906	MS16997-61		C-26	2
96906	MS16997-64		C-26	25
96906	MS16998-31		C-26	45

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96906	MS18154-137		C-26	28
			C-26	33
96906	MS18154-58		C-18	8
96906	MS18154-60		C-45	13
96906	MS18514-60		C-43	17
96906	MS20813-1		C-42	6
96906	MS20819-12		C-11	11
96906	MS20819-8		C-11	10
96906	MS20822-12D		C-20	1
			C-21	10
96906	MS20822-16D		C-20	6
			C-21	11
			C-22	72
			C-22	74
96906	MS20822-4-4		C-22	59
96906	MS20826-4D		C-20	2
			C-22	82
96906	MS20913-2S		C-20	11
96906	MS20913-4S		C-33	6
96906	MS20913-6S		C-20	5
96906	MS21104D/6		C-10	3
96906	MS21104D12		C-9	3
			C-11	9
96906	MS21104D8		C-11	8
96906	MS24392-12		C-10	6
96906	MS24392-4		C-22	58
96906	MS24392-8		C-9	5
96906	MS24392D4		C-22	68
96906	MS24393-4		C-12	4B
			C-22	45
96906	MS24393D4		C-12	6B
			C-22	51
96906	MS24394-4		C-22	64
96906	MS24402D12		C-22	71
96906	MS24402D4		C-22	50
96906	MS24402D8		C-22	47
96906	MS24665-134		C-25	1
96906	MS28741-12-1200		C-10	7
96906	MS28759H1200		C-9	6
96906	MS28774-228		C-17	2
96906	MS28775-228		C-17	3
96906	MS28777-4		C-22	69
96906	MS28778-4		C-22	62
96906	MS35058-30		C-2	3
96906	MS35059-23		C-2	1
96906	MS35207-263		C-9	2A
			C-10	2A
			C-11	1A
			C-33	4A
96906	MS35207-264	5305-00-989-7435	C-18	3
96906	MS35275-261		C-26	41

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96906	MS35335-34		C-43	29A
96906	MS35338-42		C-21	3A
96906	MS35338-43		C-18	2
			C-33	4B
96906	MS35338-44		C-21	1A
96906	MS35338-46		C-18	7
			C-24	2
			C-43	15
96906	MS35338-50		C-24	4
96906	MS35650-302		C-9	2
			C-10	2
			C-11	1
			C-18	1
96906	MS35671-24		C-26	40
96906	MS35671-66		C-44	27
96906	MS35690-1002		C-29	
96906	MS35690-516		C-3	1
			C-21	3
96906	MS35690-602		C-18	6
			C-43	14
96906	MS35691-13		C-43	29
96906	MS51020-49		C-25	2
96906	MS51044-35		C-16	1
96906	MS51861-35		C-32	5
96906	MS51953-103		C-21	10A
96906	MS90725-160		C-24	3
96906	MS90725-168		C-29	
96906	MS90725-3		C-21	1
96906	MS90725-62		C-24	1
09990	MV-400-S		C-12	13
			C-12	18
			C-14	
21387	MX2433		C-38	13
19728	MZ-1024U		C-5	11
19728	MZ-1360		C-5	5
19728	MZ-19S		C-5	9
19728	MZ-2002Q		C-5	4
19728	MZ-359		C-5	13
19728	MZ-364		C-5	7
19728	MZ-52		C-5	15
21387	M2560		C-38	38
66289	N-100-9		C-29	17
80205	NAS1099-6		C-43	16
80205	NAS818-12		C-17	
79502	ND-1252		C-21	5
75665	OS71		C-23	3
66289	OW-363		C-35	
73370	P-17242		C-28	6
73370	P-17244		C-28	6
73370	P-2706		C-28	5
66289	PA-291		C-29	16D

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66289	PA-294		C-31	5
66289	PA-334		C-40	13
66289	PA-340		C-7	3
			C-31	2
66289	PA-367		C-31	4
66289	PA-64		C-39	15
66289	PB-146-1-S1		C-40	9
66289	PB-187		C-4	9
66289	PC-112		C-34	6
66289	PC-396		C-4	5
			C-37	17
66289	PC-435		C-37	10
66289	PC-615		C-37	4
66289	PD-1O		C-4	3
66289	PD-10		C-34	2
66289	PD-13		C-29	5
66289	PD-157		C-40	14
66289	PD-173-A		C-32	17
66289	PD-195		C-39	2
73370	PD-198		C-28	10
66289	PD-247		C-40	10
66289	PD-76		C-32	1
66289	PD-77		C-32	12
73370	PD-78		C-28	6A
66289	PD207		C-37	2
66289	PE-14		C-7	2
			C-39	6
			C-39	12
66289	PE-3		C-29	23A
			C-32	13
			C-34	13
			C-35	10
66289	PE-34A		C-6	1
66289	PE-37		C-37	15
66289	PE-4		C-4	4
			C-28	8
			C-29	13
			C-29	26
			C-30	1A
			C-31	20
			C-34	3
			C-35	6
66289	PE-45A		C-6	6
66289	PE-46		C-35	22
66289	PE-5		C-4	10
			C-32	2
66289	PE-5-A		C-40	18
66289	PE-65-1		C-40	15
66289	PE-7		C-29	6
66289	PF-101		C-35	25
66289	PF-143		C-37	12

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66289	PG-475		C-32	6
73370	PG-512		C-28	7
66289	PG-515-A		C-4	8
66289	PG-558		C-6	2
66289	PH-194		C-4	7
66289	PH-202		C-40	25
66289	PH-22		C-29	2
16794	PH-22-A		C-8	3
66289	PH-269		C-29	15
66289	PH-293-A		C-32	10
66289	PH-332		C-31	12
16794	PH-377-B		C-8	1
66289	PH-77-A		C-32	15
66289	PH-79A		C-37	3
66289	PJ-105		C-34	18
66289	PK-121		C-32	19
66289	PK-37-A		C-40	5
66289	PL-137		C-39	17
16794	PL-21		C-31	26
66289	PL-24		C-40	16
66289	PL-49		C-40	28
66289	PM-108		C-35	26
66289	PM-111		C-32	20
			C-39	9
66289	PM-145		C-35	17
66289	PM-76		C-31	13
19728	PS1330B		C-5	6
66289	P1-143-B		C-39	1
66289	P1-145-1		C-32	21
19728	P90-448		C-5	16
19728	P90-743		C-5	10
19728	P90-822		C-5	14
66289	Q-18-C		C-29	
66289	QB-83		C-37	6
66289	QC-66		C-37	7
66289	QD-482		C-29	8
66289	QD-535-A		C-39	14
66289	QD-538-A		C-35	8
66289	QD-595-A		C-34	5
66289	QD-615-A		C-31	6
66289	QD-631		C-29	4
66289	QD-632		C-29	9
66289	QD-633		C-29	16C
66289	QD-634		C-29	16
66289	QD-636-A		C-40	21
66289	QD-636-B		C-40	24
66289	QD-653		C-35	
66289	QD-67		C-35	20
66289	QD635		C-29	28
66289	QF-67-B		C-40	23

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21387	Q2566		C-38	36
21387	Q5939		C-38	47
66289	RC-91		C-34	11
66289	RD-112		C-39	13
66289	RF-1121		C-39	21
66289	RF-269		C-35	4A
66289	RF-269-2		C-31	16
66289	RF-794		C-35	2
66289	RJ-173		C-34	8A
66289	RJ-173-A		C-34	8
66289	RK-173		C-40	26
66289	RK-181		C-34	14
66289	RM-1049-L-S1		C-35	4
66289	RM-536		C-34	7
73370	RM-900		C-31	14
80756	RR331		C-23	2
66289	RS11		C-12	1
21387	RS2477C		C-38	20
66289	RV-40A-1		C-29	11
			C-34	4
66289	RV40	2940-00-891-9342	C-29	10
			C-34	1
66289	SA-52		C-31	18
66289	SA-58		C-37	13
66289	SA26		C-37	9
66289	SB-23		C-36	
98003	SC-B-83314-2CE		C-41	10
66289	SE-124-AP-1		C-29	22
66289	SE-125		C-29	18
66289	SE-125-A		C-29	18
66289	SE-126		C-29	19
66289	SE-126-A		C-29	19
66289	SE-127		C-29	21
66289	SE-127-A-14		C-29	21
66289	SE-128-B		C-29	20
66289	SE-128-C		C-29	20
66289	SE-48		C-29	24
21387	SK90		C-38	
86768	SP100-114		C-13	13
86768	SP100-137		C-13	6
86768	SP100-141		C-15	17
86768	SP100-6		C-15	21
86768	SP100-7		C-15	19
86768	SP100-9		C-15	12
86768	SP100-92		C-13	5
86767	SP201-6		C-15	22
16954	S15-00465		C-26	23
16954	S15-01017		C-26	9
16954	S15-12575		C-26	21
21387	S2568		C-38	37

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21387	S5963		C-38	52
43766	T-84-D-1		C-29	30
			C-31	
66289	TA-111-A		C-35	18
43766	TA-112-A		C-31	25
66289	TA-114-S1		C-35	16
66289	TA-115		C-35	13
66289	TA-116		C-35	19
66289	TB-109		C-31	17
00624	TB-155-S4-8D		C-22	34
00624	TB155S4-100		C-22	
43766	TC-322-D-S1		C-31	23
43766	TC-346B		C-31	24
43766	TC-348-S1		C-31	22
43766	TC-363B		C-31	7
66289	TC-365-D		C-32	16
66289	TC-368-A		C-32	18
43766	TC-398-9		C-31	9
43766	TC-403		C-31	15
66289	TF-96-4		C-35	12
21387	TS2480		C-38	21
66289	TT-61F-3		C-32	
72619	T3		C-1	4A
			C-1	5A
21387	UX4631		C-38	46
66289	U212M		C-40	12
66289	VB-134-A-9		C-32	23
66289	VB-98A-4		C-31	3
66289	VE-339A		C-32	8
66289	VE-471-1		C-35	11
66289	VE-527-WV		C-27	2
			C-32	3
66289	VE-549		C-31	11
66289	VE-556		C-32	4
66289	VE-598		C-32	11
66289	VE435E		C-27	1
43334	W-07		C-26	19
81348	WB131HTYPE2SMD		C-3	5
66289	WD50A		C-36	5
66289	WE-243		C-29	16B
21387	WW2425		C-38	11
21387	W2514		C-38	30
66289	XA-33		C-29	23
			C-37	8
66289	XA-34		C-34	12
66289	XA-56		C-39	5
66289	XA-66		C-32	7
66289	XA-7		C-39	11
73370	XA-74		C-28	9
66289	XA-8		C-4	6
			C-39	4

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19728	XA-832		C-5	12
66289	XB-106		C-7	1
73370	XD-14		C-28	6B
			C-29	25
66289	XD-15		C-29	16A
			C-35	5
66289	XD-158		C-32	9
66289	XD-16		C-31	19
66289	XD-17		C-34	15
			C-35	21
66289	XD-19		C-29	12
			C-30	1
66289	XD-29		C-40	17
66289	XD-30		C-29	1
66289	XD-32		C-8	2
66289	XD-52		C-37	14
66289	XD-6		C-35	9
66289	XE-55		C-34	17
66289	XE-65		C-35	15
66289	XH-9		C-31	1
66289	XK-1		C-37	1
66289	XK-3		C-29	15A
66289	XK-38		C-35	3
66289	XK-4		C-37	11
66289	X1-1		C-32	14
66289	X1-16		C-39	8
66289	X1-32		C-31	10
21387	X2765		C-38	41
21387	Y-98-C-S1		C-38	
66289	YA-54-A		C-4	12
			C-5	
66289	YB-82		C-7	4
66289	YC-66-G-S1		C-8	5
19728	YC-96		C-4	1
66289	YD-296		C-4	11
66289	YD-300-23		C-6	5
66289	YD-300-32		C-6	3
66289	YD-300-40		C-6	4
66289	YD-311		C-6	8
66289	YD-350		C-7	6
66289	YD-353		C-7	9
57733	YE2		C-1	2
66289	YJ-60		C-7	8
66289	YJ-68		C-7	7
66289	YL-355-5		C-6	7
66289	YL-356-28		C-4	2
66289	YL-357-25		C-8	4
66289	YL-380-18		C-7	5
21387	Y5957		C-38	51
81349	ZZT410		C-42	4
09990	0-011-1		C-14	8

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16954	015-16817		C-26	
16954	035-10240		C-26	15
16954	035-11697		C-26	59
16954	035-11835		C-26	31
16954	035-11836		C-26	30
16954	035-11837		C-26	26
16954	035-11900		C-26	7
16954	035-12421		C-26	27
16954	035-12555		C-26	61
16954	035-12562		C-26	64
16954	035-12592		C-26	87
16954	035-12622		C-26	34
16954	035-12990		C-26	55
16954	035-12995		C-26	38
16954	035-12996		C-26	36
16954	035-13343		C-26	17
16954	035-13976		C-26	63
16954	035-13977		C-26	67
16954	035-13981		C-26	62
16954	035-13981		C-26	66
16954	035-13982		C-26	66
16954	035-14007		C-26	69
16954	035-14008		C-26	71
16954	035-14076		C-12	10A
16954	035-14190		C-26	78
16954	035-14205		C-26	44
16954	035-14712		C-26	51
16954	035-14715		C-26	86
16954	035-14716		C-26	79
16954	035-14717		C-26	82
16954	035-14718		C-26	84
16954	035-14719		C-26	85
16954	035-14856		C-26	48
16954	035-14857		C-26	47
16954	035-15023		C-26	35
16954	035-15868		C-26	80
			C-26	80
16954	035-16506		C-26	22
16954	035-17203		C-26	42
16954	035-17204		C-26	54
16954	035-17914		C-26	75
16954	035-17950		C-26	18
16954	035-18000		C-26	73
16954	035-18001		C-26	72
16954	035-18064		C-26	4
16954	035-18297		C-26	3
16954	035-18530		C-26	16
16954	035-21323		C-26	12
16954	035-22051		C-26	68
16954	035-22404		C-26	83
16954	035-22731		C-26	6
16954	035-45998		C-26	60

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22938	1-3502		C-44	25
22938	1-3612		C-44	6
22938	1-3712		C-42	
22938	1-3851		C-44	26
22938	1-5904		C-43	10
22938	1-8209		C-45	12
75665	1/16X27NPT		C-23	4
29337	1/2 DIA.		C-26	10
70276	1/2 IPS		C-26	1
72962	1/2-13HEX HVY		C-12	10
86768	1/4 DIA GR 200		C-15	10
86768	1/4-20NC-2X5/8		C-13	8
86768	1/4-20NC-2X5/8LG		C-13	3
86768	1/4DIA		C-13	10
86768	1/4X3/4LG		C-15	13
96256	1A32-R12-60S		C-12	14
86768	10-1562-7		C-13	15
86768	10-1862-1		C-12	
86768	10-24NC-2X5/16LG		C-15	5
86768	10-24NC-2X5/8LG		C-13	1
86768	10-24NCX1/2		C-15	2
75665	10-24UNC-2A		C-23	
86768	10-2956-5-1		C-13	9
86768	10-3074-2-2		C-15	18
86768	10-3156-1		C-13	14
86768	10-3156-10-1		C-13	12
30327	101-HD1/2-3/8		C-22	55
22680	101467		C-33	3
22680	101469		C-21	5A
22680	101470		C-21	9
22680	101920		C-20	12
30327	105-HD-1/4		C-12	17
86768	11-1273-5		C-15	1
98441	111417-16D-0260		C-22	77
75665	12-S		C-23	1
86768	12-1057-8		C-15	15
45681	12R50X-S		C-22	57
30839	1201PS-1		C-22	49
30839	1202PS-1		C-22	40
81321	12098-97		C-21	7
96259	131116		C-12	
22680	132688		C-11	12
96259	134104-16		C-12	
81321	15002		C-19	6
00624	155-S11-12D		C-22	35
00624	155-S7-8D		C-22	33
86768	155-12D2		C-12	9
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00624	155S2-8D		C-11	6
00624	155S5-12D		C-10	4
00624	155S5-8D		C-9	4
00624	155S7-12D		C-11	4
			C-22	
00624	155S7-8D		C-11	2
00624	155S9-12		C-10	1
00624	155S9-8D		C-9	1
22938	184		C-43	5
22938	184-1346		C-43	6
			C-45	
22938	184-1346-2		C-45	19
22938	184-1396		C-43	11
			C-44	
22938	184-1396-1		C-44	30
22938	184-5911		C-43	20
22680	18669		C-33	7
98441	193000-4-1080		C-22	70
09990	2-A-19-2		C-14	3
09990	2-A-21-2		C-14	4
09990	2-A-22-6		C-14	5
09990	2-A-23-A		C-14	7
09990	2-A-28-2		C-14	6
09990	2-B-118-6		C-14	2
09990	2-B-18-3		C-14	10
09990	2-B-32-2		C-14	11
86768	2-1257-14		C-15	16
86768	2-277-16		C-15	3
86768	2-277-17		C-15	9
86768	2-277-20		C-15	6
86768	2-277-33		C-15	20
86768	2-2866-3		C-13	2
22938	2-3612		C-45	4
73168	20110		C-25	5
03773	206SFAS0-6000		C-12	3
03773	206SFAS30-0-150	5210-01-167-5298	C-12	5
00624	21002-2		C-11	
			C-22	
00624	21002-3		C-11	
98441	212R4-JSN-4-JNS-4-0240		C-22	65
98441	212R4-JSN-4-JSN-4-0300		C-22	66
79470	212R4-JSN4-JSN4-18		C-22	61
81321	22202		C-18	9
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92563	230-10016		C-26	81
80648	230-10018		C-26	39
86768	3-1854-3		C-15	23
86768	3-1854-7-1		C-15	24
22938	3-3806		C-44	20
86768	3-673-5		C-15	7
86768	3-772-14-1		C-15	14
86768	3-772-2-1		C-15	25
75665	3-8-16UNC-ZA		C-23	
21387	3K1		C-38	57
81321	30102		C-19	11
81321	30316-20		C-19	12
21387	31SS14A		C-38	
75915	311010		C-2	2
22680	32491		C-43	29B
22938	3712		C-42	
22938	3712-1		C-42	11
22938	3712-2		C-42	5
57733	378-P		C-12	2
			C-12	7
57730	385-B		C-33	5
22938	3855		C-44	29
22938	3906-190		C-44	12
57730	391-A		C-21	8
66289	394098	2805-01-087-1799	C-29	
22938	3950-1		C-44	15
22938	3950-2		C-44	16
86768	4-1454-15		C-13	11
86768	4-2156-4		C-13	7
86768	4-2672-1		C-15	11
22938	4-3806		C-44	19
45681	4-4CBTX-S		C-22	60
09990	400-A-4-2		C-14	9
22938	4006		C-44	28
22938	4020-1		C-43	9
			C-43	13
86768	404HTX-8D-20		C-22	79
57733	411335		C-1	1A
22938	4257		C-43	8C
94222	44-1-2-0		C-41	9
09990	454-B-1		C-14	1
86768	458-12S2-6	4820-00-800-9582	C-22	41
22938	4600-2		C-44	4
			C-45	2
22938	4600-3		C-43	8A
			C-43	12A
22938	4601-5		C-42	1
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22938	4601-7		C-45	14
22938	4602-1		C-44	13
22938	4602-2		C-44	14
22938	47OO-4		C-42	2
22938	4700-4		C-42	9
			C-45	15
22938	4700-5		C-45	7A
22938	4701-3		C-44	22A
22938	4702-2		C-44	5
			C-45	3
22938	4800-4		C-44	12A
22938	4800-5		C-44	3
			C-45	1
22938	4800-6		C-44	21
			C-44	23
22938	4800-7		C-43	18
22938	4800-8		C-43	8
			C-43	12
22680	48221		C-12	12
22680	48229	4920-01-167-5299	C-33	8
22680	48230		C-33	
22680	48231		C-22	80
22680	48404		C-9	
22680	48405	4720-01-168-0633	C-10	
22680	48406		C-11	
22680	48407		C-11	
22680	48409		C-41	
22680	48410		C-21	
22680	48411		C-25	6
22680	48412-1		C-22	1
22680	48412-10		C-22	10
22680	48412-11		C-22	11
22680	48412-12		C-22	12
22680	48412-13		C-22	13
22680	48412-14		C-22	14
22680	48412-15		C-22	15
22680	48412-16		C-22	16
22680	48412-17		C-22	17
22680	48412-18		C-22	18
22680	48412-19		C-22	19
22680	48412-2		C-22	2
22680	48412-20		C-22	20
22680	48412-21		C-22	21
22680	48412-22		C-22	22
22680	48412-23		C-22	23
22680	48412-24		C-22	24
22680	48412-25		C-22	25
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22680	48412-3		C-22	3
22680	48412-30		C-22	30
22680	48412-31		C-22	31
22680	48412-32		C-22	32
22680	48412-4		C-22	4
22680	48412-5		C-22	5
22680	48412-6		C-22	6
22680	48412-7		C-22	7
22680	48412-8		C-22	8
22680	48412-9		C-22	9
22860	48422		C-11	
22938	4901-8		C-42	10
86768	5-1061-2-1		C-13	4
22938	5000-1		C-44	17
22938	5000-2		C-43	21
81321	50223		C-17	
00624	5100-10-8		C-33	1A
22938	5100-2		C-43	7
00624	5100S10-8		C-11	3
			C-11	5
			C-22	
86768	5103-37		C-15	4
22680	520018		C-12	8
22938	5205		C-43	25
22938	5206		C-43	19
22938	5400-1		C-44	22
22938	5401		C-44	18
22938	5402-1		C-43	8B
22938	5404		C-44	24
22938	5416		C-44	24
22938	5800		C-44	2
22938	5801		C-44	1
86768	59-048-250-0500		C-15	8
22938	5908		C-43	24
22938	5909		C-43	22
73808	6-00X9		C-42	3
21387	6LW1		C-38	
21387	6N1		C-38	
21387	6S8N		C-38	
75665	6013101		C-23	5
81321	60260		C-19	7
81321	60263		C-19	10
22938	6057		C-44	7
			C-45	8
22938	6058		C-44	8
			C-45	9
86768	609-1/4B		C-22	42
22938	6151		C-45	6
22938	6152		C-45	5

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22938	6251-10		C-44	10
81321	63080	4920-00-829-7781	C-19	1
22938	6311		C-44	9
			C-45	10
22938	6312		C-44	11
			C-45	11
22938	6319-2		C-43	23
70040	6454458		C-1	1B
70040	6468074		C-1	1
22938	6555		C-42	
81321	6653463		C-19	8
81321	6653481		C-19	2
81321	6654655		C-19	3
81321	6655568		C-17	4
81321	6658157		C-19	14
81321	6670117		C-19	9
86579	676-00008		C-26	77
86579	676-00010		C-26	43
86579	676-00012		C-26	58
			C-26	74
86579	676-00113		C-26	37
86579	676-00217		C-26	76
86579	676-00220		C-26	29
86579	676-00230		C-26	13
86579	676-00241		C-26	24
86579	676-00246		C-26	32
86768	7/16-14NC-3X2LG		C-12	15
90940	70921913	4730-00-278-2513	C-36	1
43991	7109TF		C-38	48
22680	72430		C-21	6
22680	72432		C-33	2
81321	7335		C-19	4
86768	744-1 1/4D-2		C-12	11
			C-13	
81321	7494		C-19	5
81321	7502406		C-17	1
81321	7502410		C-17	5
81321	7886		C-19	13
21387	8S8D		C-38	
72619	806-1710-0431-50 4		C-1	4
			C-1	5
61349	8111-152		C-1	3
86768	8111E-1/2-HS2	4820-01-076-5593	C-12	16
			C-15	
22938	8209		C-45	16
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22680	89238		C-43	4
22680	89246		C-33	4
22680	89248		C-16	3
22680	89249		C-16	2
22680	89251		C-36	4
22680	89253		C-41	5
22680	89254		C-41	7
22680	89255		C-41	4
			C-41	8
22680	89256		C-41	2
22680	89257		C-41	1
22680	89258		C-41	6
22680	89262		C-22	83
22680	89263		C-33	1
22680	89264		C-41	3
22680	89279		C-18	4
22680	89280		C-3	3
22680	89281		C-18	4
22680	89282		C-12	8A
22680	89283		C-25	4
22680	89284		C-25	3
22680	89286		C-36	3
22680	89389		C-20	10
22680	89514		C-21	13
22680	89516		C-43	3
22680	89518		C-10	5
79960	93-B3-98A		C-30	38
79960	93-CR27-241		C-30	23
79960	93-CR37-1X1		C-30	25
79960	93-C102-113		C-30	26
79960	93-C105-3		C-30	2
79960	93-C106-2		C-30	2A
79960	93-C109-60		C-30	8
79960	93-C110-7		C-30	7
79960	93-C111-155		C-30	18
79960	93-C112-12		C-30	3
79960	93-C120-18		C-30	34
79960	93-C130-4		C-30	13
79960	93-C131-4X2		C-30	9
79960	93-C138-24		C-30	42
79960	93-C140-58		C-30	4
79960	93-C141-4-6		C-30	46
79960	93-C142-55		C-30	36
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79960	93-C29-1037		C-30	24
79960	93-C46-49		C-30	17
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79960	93-C9-75		C-30	16
79960	93-T21S8		C-30	11
79960	93-T301S8-14		C-30	44
79960	93-T301S8-9		C-30	45
79960	93-T315S5-4		C-30	20
			C-30	27
			C-30	28
79960	93-T41-8		C-30	5
79960	93-T48-9		C-30	15
79960	93-T52-57		C-30	14
79960	93-T56-20		C-30	29
79960	93-T56-23		C-30	41
79960	93-T56-73		C-30	32
76690	93-T57-4		C-30	10
79960	93-T63-9		C-30	12
			C-30	21
79960	93-T8S8-10		C-30	22
79960	93-T8S8-7		C-30	1B
79960	93-T8S8-8		C-30	6
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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

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

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

DATE

PUBLICATION NUMBER	DATE	TITLE
TM 55-4920-405-13&P	30 Dec 80	Test Stand, Hydraulic System Gasoline Engine Driven Type D-5C, P/N

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.
6	2-1 a		
81		4-3	
125	line 20		

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT: 7469 and 7469-1

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

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

I ordered a gasket, item 19 on figure B-16 by NSN 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.

SAMPLE

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

SIGN HERE:
John Doe

DA FORM 1 AUG 74 2028-2

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.
DRSTS-M Overprint 1, 1 Nov 78

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REVERSE OF DA FORM 2028-2

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

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

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER	DATE	TITLE
TM 55-4920-405-13&P	30 Dec 80	Test Stand, Hydraulic System, Gasoline Engine Driven, Type D-5C

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.

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

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.365	metric tons	short tons	1.102
pound-inches	mewton-meters	.11375			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

047891

[redacted]