

GAS HYDRAULIC PUMP

Max. Capacity: 10,000 PSI

Read and carefully follow these instructions before installation and use of this pump. Most problems with new equipment are caused by improper operation and installation.

SAFETY PRECAUTIONS



WARNING

- All WARNING statements must be carefully observed to help prevent personal injury.

Hydraulic Hose

- Before operating this tool, tighten all hose connections using the proper tools. Do not overtighten the connections. Connections need only be tightened securely and leak-free. Overtightening may cause premature thread failure or high pressure fittings to split at pressures lower than their rated capacities.
- Should a hydraulic hose ever burst, rupture, or need to be disconnected, immediately shut off the pump. Never attempt to grasp a leaking hose under pressure with your hands. The force of the escaping hydraulic fluid could cause serious injury.
- Do not subject the hose to potential hazard such as fire, extreme heat or cold, sharp surfaces, or heavy impact. Do not allow the hose to kink, twist, curl or bend so tightly that the oil flow within the hose is blocked or reduced. Periodically inspect the hose for signs of wear because any of these conditions can damage the hose and may result in personal injury.
- Do not use the hose to move attached equipment. Stress may damage the hose and cause personal injury.
- Hose material and coupler seals must be compatible with the hydraulic fluid used. Hoses also must not come in contact with corrosive materials such as creosote-impregnated objects and some paints. Consult the manufacturer before painting a hose. Never paint the couplers. Hose deterioration due to corrosive materials may result in personal injury.

Pump

- Do not exceed the PSI hydraulic pressure rating noted on the pump nameplate or tamper with the internal high pressure relief valve. Creating pressure beyond rated capacities may result in personal injury.
- Before replenishing the oil level, retract the system to prevent overfilling the pump reservoir. An overfill may cause personal injury due to excess reservoir pressure created when cylinders are retracted.

Cylinder

- Do not exceed rated capacities of the cylinders. Excess pressure may result in personal injury.
- Do not set poorly-balanced or off-center loads on a cylinder. The load may tip and cause personal injury.

Power Supply (Gasoline Engine)

- Read the instruction manual for the gasoline engine before using.
- Do not allow fuel to splash on the engine when refueling.
- Do not add fuel when the engine is running or very hot.
- Engine fuel must be mixed with the correct ratio of 2-cycle engine oil.

SET-UP

Engine Operation

Refer to the instruction manual for the gasoline engine.

Hydraulic Connections

1. Clean all areas around the fluid ports of the pump and cylinder(s).
2. Inspect all threads and fittings for signs of wear or damage, and replace as needed.
3. Clean all hose ends, couplers or unions ends.
4. Remove the thread protectors from the hydraulic fluid outlets. Connect the hose assembly to the hydraulic fluid outlet, and couple the hose to the cylinder. **IMPORTANT: Seal all external pipe connections with a high quality pipe thread sealant.** Teflon tape can also be used to seal hydraulic connections if only one layer of tape is used. Apply the tape carefully, two threads back, to prevent it from being pinched by the coupler and broken off inside the system. Any loose pieces of tape could travel through the system and obstruct the flow of oil or cause jamming of precision-fit parts.

Filling the Reservoir

NOTE: This pump has been shipped without hydraulic fluid in the reservoir. A high-grade hydraulic fluid has been shipped with the pump in separate containers. If additional fluid is required, use only approved hydraulic fluids.

1. Remove the filler vent cap and insert a funnel with a filter. Using the hydraulic fluid provided, fill the reservoir to 2" from the fill hole. Remove funnel and replace the filler vent cap.

PUMP OPERATION

Priming the Pump

When operating the pump for the first time:

1. After filling the pump reservoir and checking that the hose connections are secure, place the valve in the neutral position and start the gas engine according to the manual instructions. Let the pump idle for a few minutes.
2. Disconnect a hose from the system and route it back to the pump reservoir. Run the pump until a steady flow of hydraulic fluid is observed free of suspended air bubbles. Reconnect the hose to the system.
3. Cycle the pump several times, extending and retracting the cylinder(s) fully to eliminate air from the system. For more complete instructions refer to the section titled "Bleeding Air from the System."
4. Retract the cylinder(s) and check the reservoir fluid level. It should be 2" from the filler vent cap. Add approved hydraulic fluid if necessary.

PREVENTIVE MAINTENANCE

NOTE: Any repairs of servicing that requires dismantling the pump must be performed in a dirt-free environment by a qualified technician.

Bleeding Air from the System

Upon initial startup or after prolonged use, a significant amount of air may accumulate within the hydraulic system. This entrapped air can cause the cylinder to respond slowly or behave in an unstable manner. To remove the air, run the system through several cycles (extending and retracting cylinders) free of any load. **NOTE: The cylinder must be at a lower level than the pump to allow air to be released through the pump reservoir.**

Inspecting the Hydraulic Fluid Level

Check the hydraulic fluid level in the reservoir periodically. With all cylinder(s) retracted, the fluid level should be 2" from the filler vent cap. Drain, clean and replenish the reservoir with clean hydraulic fluid yearly or more often if necessary. The frequency of fluid change will depend upon the general working conditions, severity of use and overall cleanliness and care given the pump.

Maintenance Cleaning

1. Keep the outer surface of the pump as free from dirt as possible.
2. Protect all unused couplers.
3. Keep all hose connections free of dirt and grime.
4. Keep the filler vent cap clean and unobstructed at all times.
5. Equipment connected to the pump must be kept clean.
6. Use only approved hydraulic fluids in this pump. Change as recommended.

Draining and Cleaning the Reservoir

IMPORTANT: Clean the pump exterior before the pump interior is removed from the reservoir.

1. Remove the screws that fasten the pump assembly to the reservoir. Remove the pump assembly from the reservoir. Do not damage the gasket, filter or relief valve.
2. Drain the reservoir of all fluid. Refill half full with clean hydraulic fluid.
3. Place the pump assembly back onto the reservoir and secure with two machine screws assembled on opposite corners of the housing.
4. Run the pump for several minutes. Remove the two cover screws and lift off the pump assembly again. Drain and wipe out the reservoir with a clean, lint-free cloth.
5. Fill the reservoir with approved hydraulic fluid to 2" from the filler vent cap. Place the pump assembly (with gasket) on the reservoir and install the screws. Tighten securely and evenly.

Adding Fluid to the Reservoir

1. Cylinder(s) must be fully retracted and the gas engine shut off when adding fluid to the reservoir.
2. Clean the entire area around the filler vent cap before removing the filler/breather cap.
3. Use a clean funnel with filter when adding fluid.
4. Use only approved hydraulic fluids.
5. Fill to 2" from the filler/breather cap.

TROUBLE-SHOOTING GUIDE



WARNING:

- To help prevent personal injury, any repair work or trouble-shooting must be done by qualified personnel familiar with this equipment.
- Use the proper gauges and equipment when trouble-shooting.

NOTE:

- It is best to check for leaks by using a hand pump and applying pressure to the suspect area without the motor running. Watch for leaking fluid and follow it back to its source.
- Plug the outlet ports of the pump when checking for leakage to determine if the leakage is in the pump or in the cylinder or tool.

PROBLEM	CAUSE	SOLUTION
Pump is not delivering fluidl or delivers only enough fluid to advance cylinder(s) partially or erratically.	1. Fluid level too low.	1. With all cylinders retracted, fill reservoir to 2" of fill hole.
	2. Loose-fitting coupler to cylinder.	2. Check quick-disconnect couplings to cylinders. Inspect couplers to ensure that they are completely coupled. Occasionally couplers have to be replaced because the ballcheck does not stay open due to wear.
	3. Air in system.	3. Bleed the system.
	4. Air leak in suction line.	4. Check and tighten suction line.
	5. Dirt in pump or filter plugged.	5. Pump filter should be cleaned and, if necessary, pump should be dismantled and all parts inspected and cleaned.
	6. Fluid is bypassing through a double-acting cylinder.	6. By removing the cylinder and capping the hoses, the pump and valve can be checked. Observe if pump holds pressure.
	7. Cold fluid or fluid is too heavy (Hydraulic fluid is of a higher viscosity than necessary).	7. Change to lighter fluid.
	8. Relief valve or low pressure unloading valve out of adjustment.	8. Adjust as needed.
	9. Reservoir capacity is too small for the size of the cylinder(s) used.	9. Use smaller cylinder(s) or larger reservoir.
	10. Defective directional valve.	10. Inspect all parts carefully and replace if necessary.
	11. Sheared drive shaft key(s).	11. Replace.
	12. Vacuum in reservoir.	12. Check for plugged vent in breather cap.

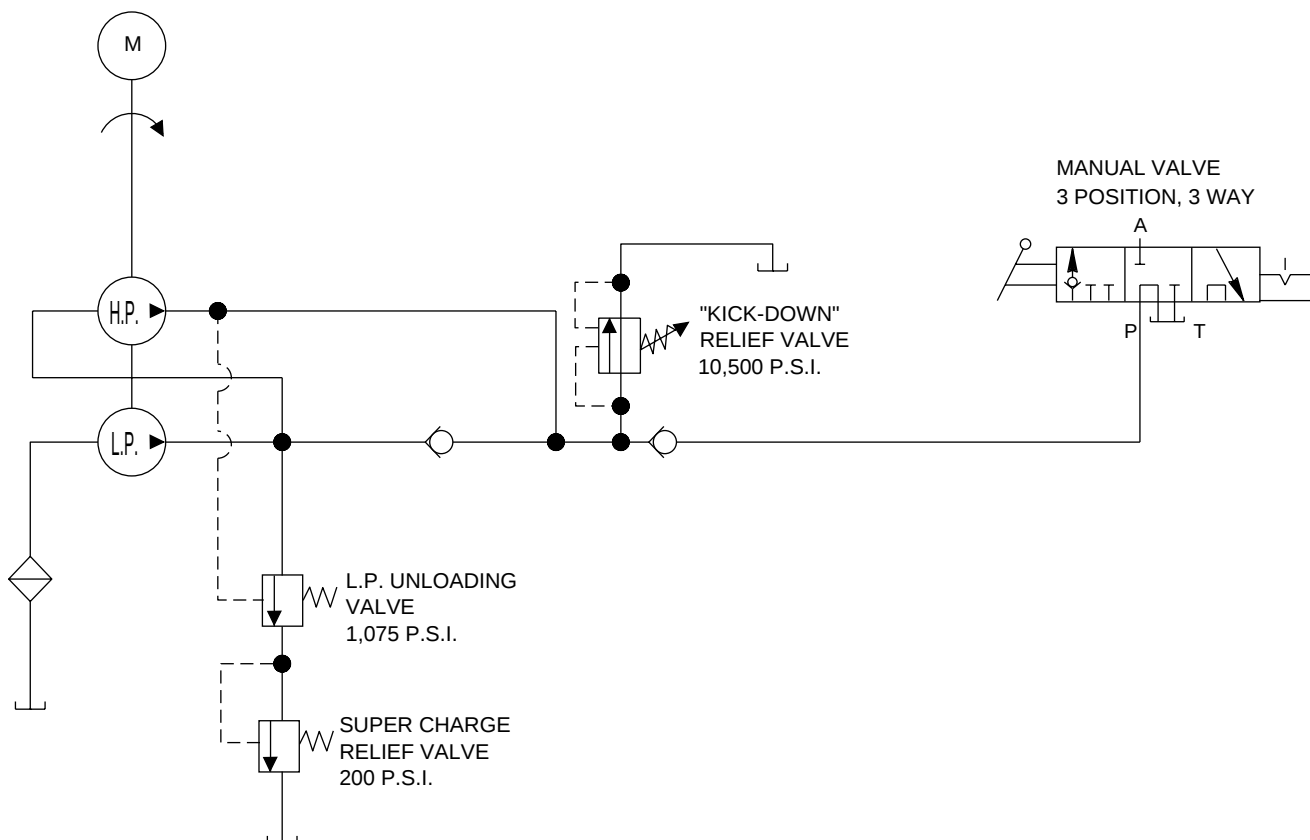
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PROBLEM	CAUSE	SOLUTION
Pump builds pressure but cannot maintain pressure.	1. Check to see if there are any external leaks. If no fluid leakage is visible, the problem is internal. If using a double-acting cylinder, remove it from the system to ensure that the leak is not in the cylinder. 2. To test for a leaking control valve lift the pump from the reservoir but keep the filter in the fluid. Remove the drain line to see if the fluid is leaking from the valve. If the valve is not leaking, the internal check valve could be leaking. Refer to the note concerning checking for fluid leaks at the beginning of this Trouble-shooting Guide.	1. Seal leaking pipe fittings with pipe sealant. 2. Clean, reseal or replace flow control valve parts. If the internal check valve(s) are leaking, the pump must be dismantled and the seat areas repaired, poppets replaced, etc.
Pump will not build full pressure	1. Check for external leakage. 2. Check the relief valve setting. 3. Look for internal leakage in double-acting cylinders. 4. Check for leaks in the flow control valve. 5. Inspect the pump for internal leakage. Check high pressure pump inlet or outlet ball checks. 6. Sheared key(s).	1. Seal faulty pipe fitting with pipe sealant. 2. Lift the pump from the reservoir, but keep the filter immersed in fluid. Note the pressure reading when the relief valve begins to open. If functioning normally, it should start to leak off at relief valve pressure. 3. Remove the cylinder from the pump. If the pump builds full pressure, the cylinder is defective. 4. Clean and reseal or replace parts. 5. Same procedure as above, but look for leaks around the entire inner mechanism. If there are no visible leaks, the high pressure pump subassembly may be leaking. Remove all parts. Check the valve head assembly body for any damage to the seat area. Clean and reseal if necessary. Inspect for damage and replace parts if necessary, then reassemble. 6. Replace.



PROBLEM	CAUSE	SOLUTION
Cylinder(s) will not retract.	1. Check the system pressure; if the pressure is zero, the control valve is releasing pressure and the problem may be in the cylinder(s), mechanical linkage connected to cylinder(s), or quick disconnect couplings. 2. Defective valve.	1. Check the cylinders for broken return springs, and check couplers to ensure that they are completely coupled. Occasionally couplers have to be replaced because one check does not stay open in the coupled position. 2. Check valve operation and inspect parts. Replace if necessary.
Pump delivers excess fluid pressure	1. Relief valve not properly set.	1. Adjust the relief valve.
Gasoline engine.		1. Refer to instruction manual included with gasoline engine.

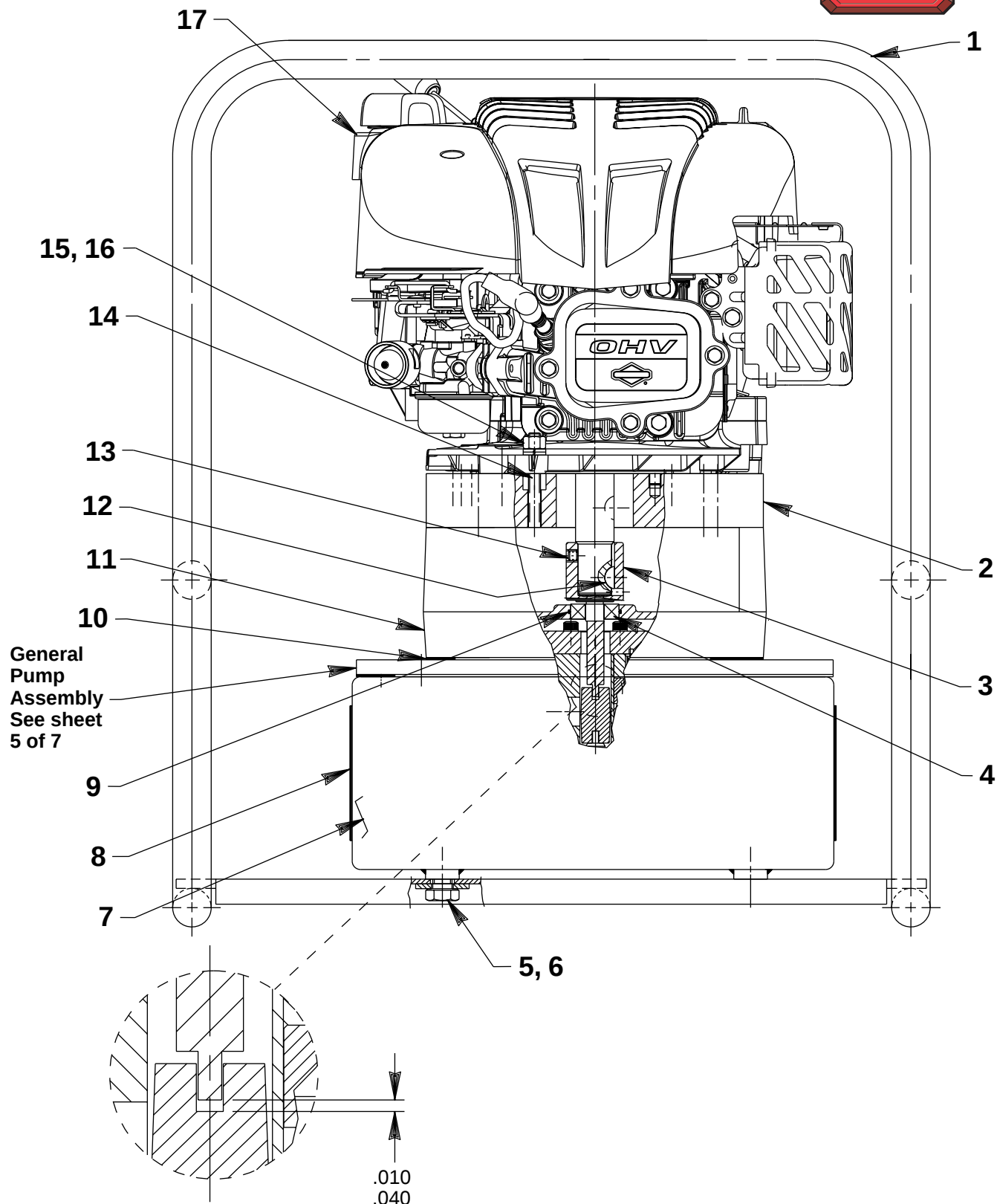
HYDRAULIC SCHEMATIC



Note: Revised schematic at last revision(s) made to this form.

PARTS LIST PUMP SIDE VIEW

To Parts
List



(DISTANCE BETWEEN BOTTOM OF
420052 SHAFT EXTENSION AND
BOTTOM OF SLOT IN 251206 COUPLER.)

Sheet No. 4 of 7

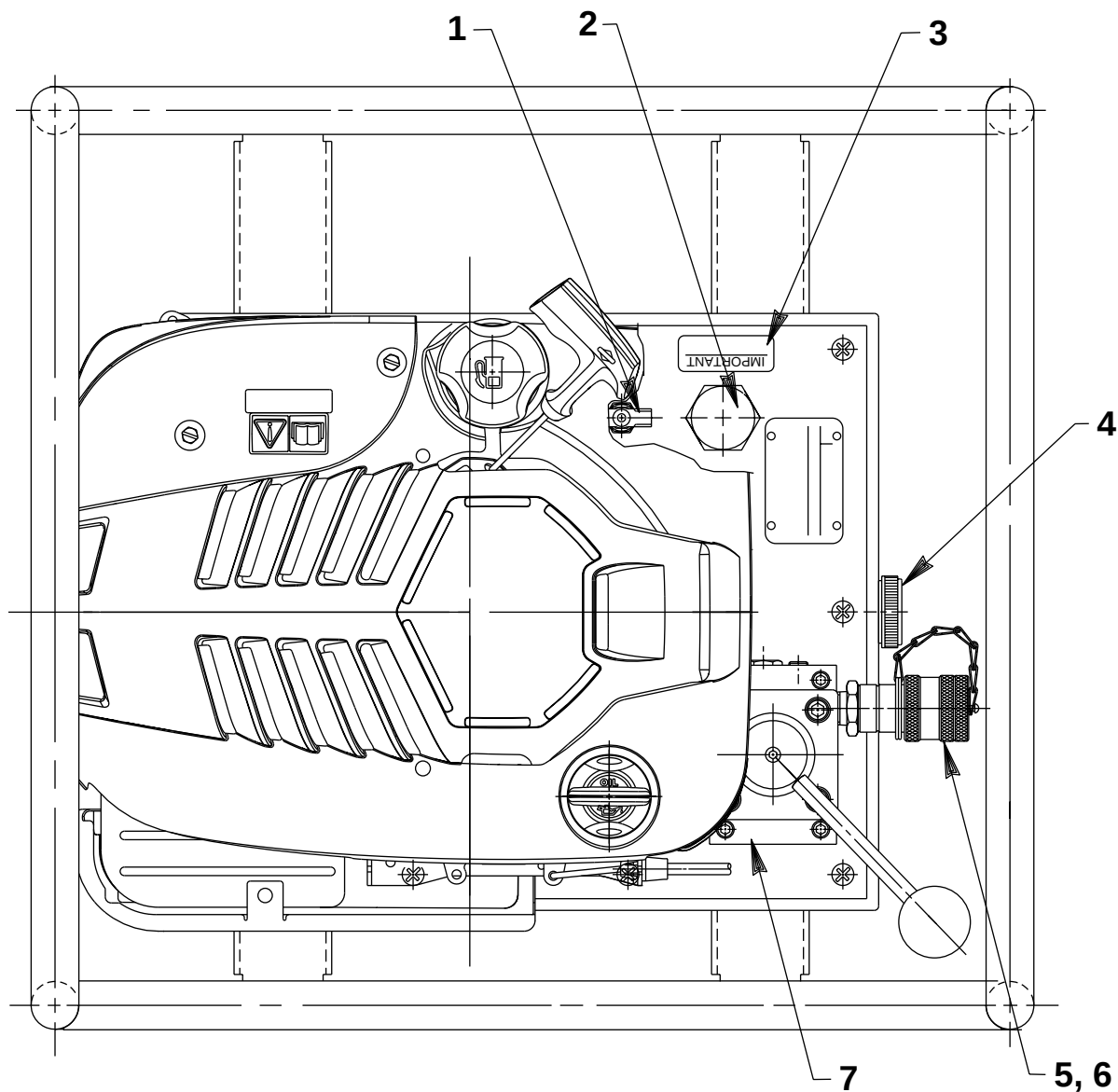
Rev. 1

Date: 9 Mar. 2001

Item No.	Part No.	No. Req'd	Description
1	66500BK2	1	Frame Weldment
2	420200	1	Mounting Plate
3	420052	1	Shaft Extension
4	10439	1	Ball Bearing
5	10586	4	Plain Washer (1.39 x .57)
6	10798	4	Cap Screw (1/2-20 x 3/4)
7	66497BK2	1	Reservoir
8	4-1191	2	Alcoa Carrying Case Label
9	15124	1	O-ring (1.37 x 1.25 Nitrile)
10	40987	1	Reservoir Gasket
11	50384WH2	1	Engine Mounting Plate
12	10945	1	Woodruff Key
13	10556	1	Set Screw (1/4-20 x 1/4)
14	260097	3	Stud
15	13116	3	Locknut (5/16-18)
16	10246	6	Lockwasher (.59 x .32)
17	66490	1	Gas Engine (6 H.P.)

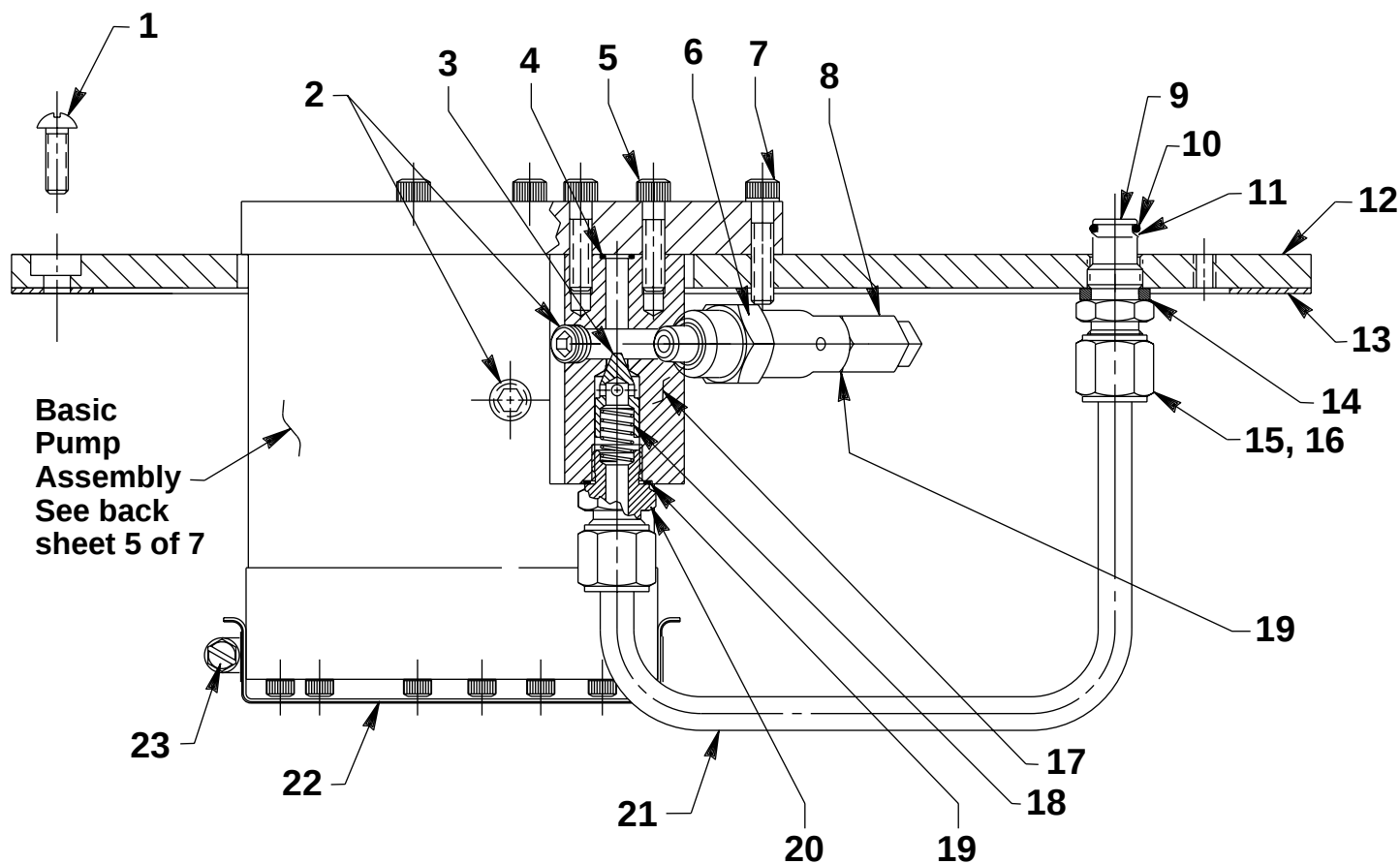


PUMP TOP VIEW



Item No.	Part No.	No. Req'd	Description
1	3-5910	1	Vent Plug Assembly
2	207908	1	Plug Fitting
3	4-0967	1	Oil Label
4	17586	1	Sight Gauge (1-1/2")
5	25600	1	Cylinder Half Coupler
6	9797	1	Dust Cap
7	58478	1	4-way Open Center Solenoid Valve (See Form No. 100562)

GENERAL PUMP ASSEMBLY

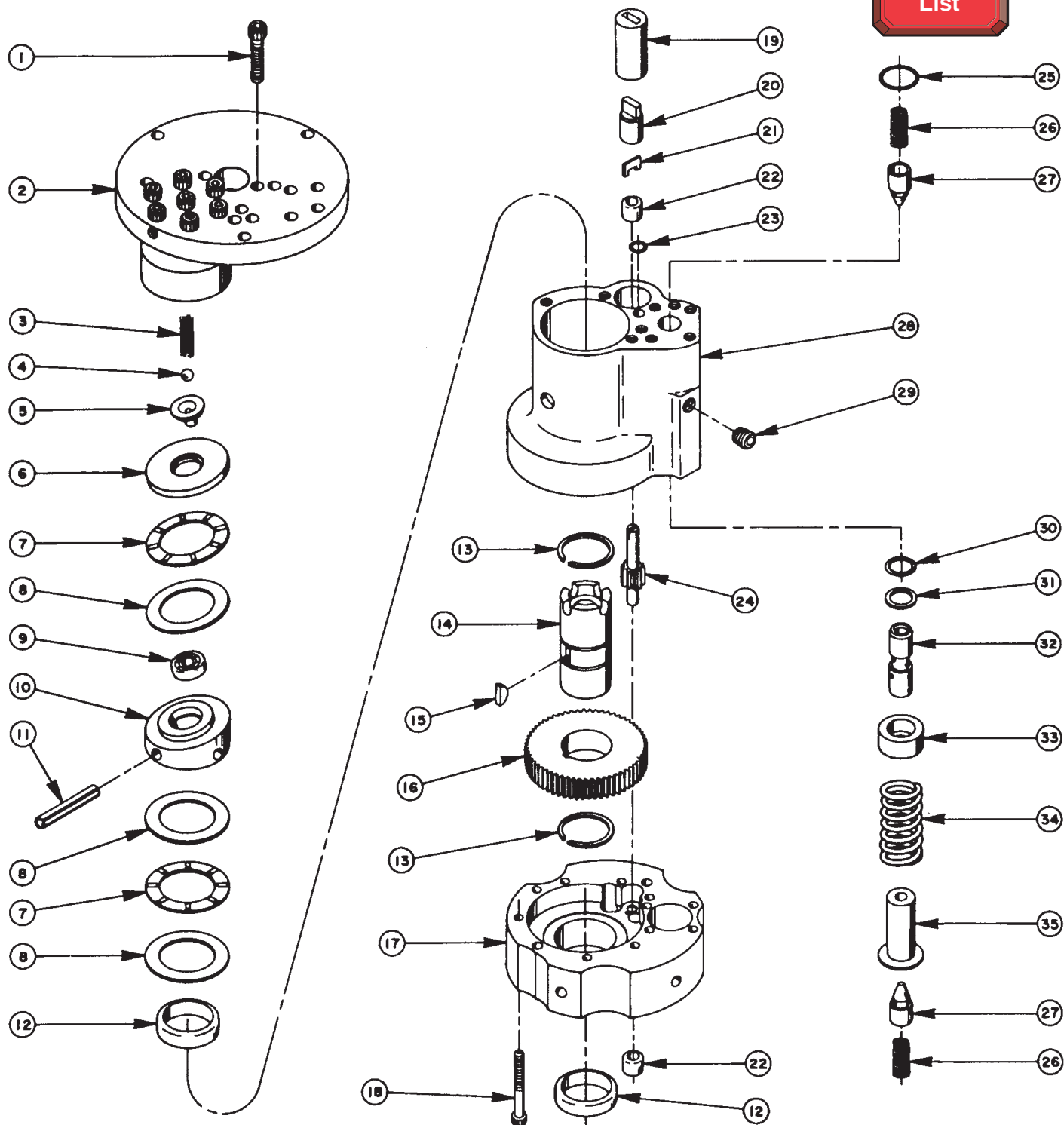


Item No.	Part No.	No. Req'd	Description
1	10177	10	Mach. Screw (1/4-20 UNC x 3/4 Lg.)
2	10427	1	Pipe Plug
3	20771	1	Poppet
4	10266	1	O-ring (3/8 x 1/4 x 1/16)
5	10015	2	Soc. Hd. Cap Screw (1/4-28 UNF x 1" Lg.; Torque to 130/180 in. lbs.)
6	360105	1	Relief Valve Adapter
7	10016	3	Cap Screw (1/4-20 UNC X 1" Lg.)
8	3-0655	1	Relief Valve (Set at 10,500/10,000 PSI; NOTE: Torque into relief valve adapter [Item #6] 40/50 ft. lbs. oiled.)
9	20787	1	Valve Connector
10	10268	2	O-ring
11	11863	1	Backup Washer (11/16 x 1/2 x .048)

Item No.	Part No.	No. Req'd	Description
12	66515WH2	1	Cover Plate
13	58506	1	Reservoir Gasket
14	21484	1	Washer
15	10430	2	Tube Sleeve
16	10431	2	Tube Nut
17	20776	1	Outlet Check Body
18	10425	1	Compression Spring (3/8 O.D. x 3/4 Lg.)
19	10261	2	Copper Washer
20	20770	1	Valve Connector (Torque to 40/50 ft. lbs.)
21	21495	1	Oil Line Tube
22	350304	1	Filter
23	350995	1	Hose Clamp

Note: Shaded areas reflect last revision(s) made to this form.

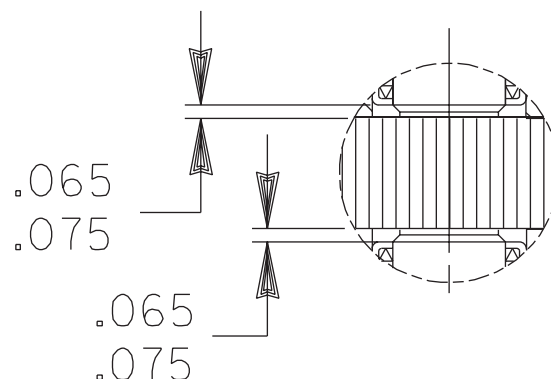
BASIC PUMP ASSEMBLY

**To Parts
List**

Item No.	Part No.	No. Req'd	Description
1	10020	9	Soc. Hd. Cap Screw (1/4-20 UNC x 1-1/4 Lg; Torque to 170/180 in. lbs.)
2	33114	1	High Pressure Pump Assembly (See sheet 7 of 7)
3	10361	1	Compression Spring (1/4 O.D. x 1" Lg.)
4	10375	1	Steel Ball (1/4 dia.)
5	23547	1	Bearing Top Plate
6	23548	1	Top Plate
7	11228	2	Thrust Bearing
8	11813	3	Bearing Race
9	11814	1	Ball Bearing
10	23549	1	Angle Plate
11	11955	1	Roll Pin (1/4 dia. x 3/4 Lg.)
12	11064	2	Needle Bearing
13	11261	2	Retaining Ring
14	23556	1	Shaft
15	11821	1	Woodruff Key
16	23557	1	Gear
17	30533	1	Pump End Plate
18	10001	12	Soc. Hd. Cap Screw (#10-32 UNF x 1-3/4 Lg.; Torque to 50 in. lbs.)
19	251206	1	Coupling
20	21092	1	Adapter
21	21093	1	Key
22	11199	2	Needle Thrust Bearing (See note below)
23	10266	1	O-ring (1/4 x 3/8 x 1/16)
24	21272	1	Drive Gear
25	10303	1	O-ring (3/4 x 7/8 x 1/16)
26	10425	2	Compression Spring (3/8 O.D. x 3/4 Lg.)
27	20771	2	Poppet
28	40120	1	Pump Body
29	10427	1	Pipe Plug (1/8 NPTF)
30	10271	1	O-ring (11/16 x 1/2 x 3/32)
31	12389	1	Teflon Backup Washer (11/16 x 1/2 x .048)
32	20849	1	Spool
33	23255	1	Spring Guide
34	10426	1	Compression Spring (1" O.D. x 1-13/16 Lg.)
35	23256	1	Spring Guide

To
Drawing

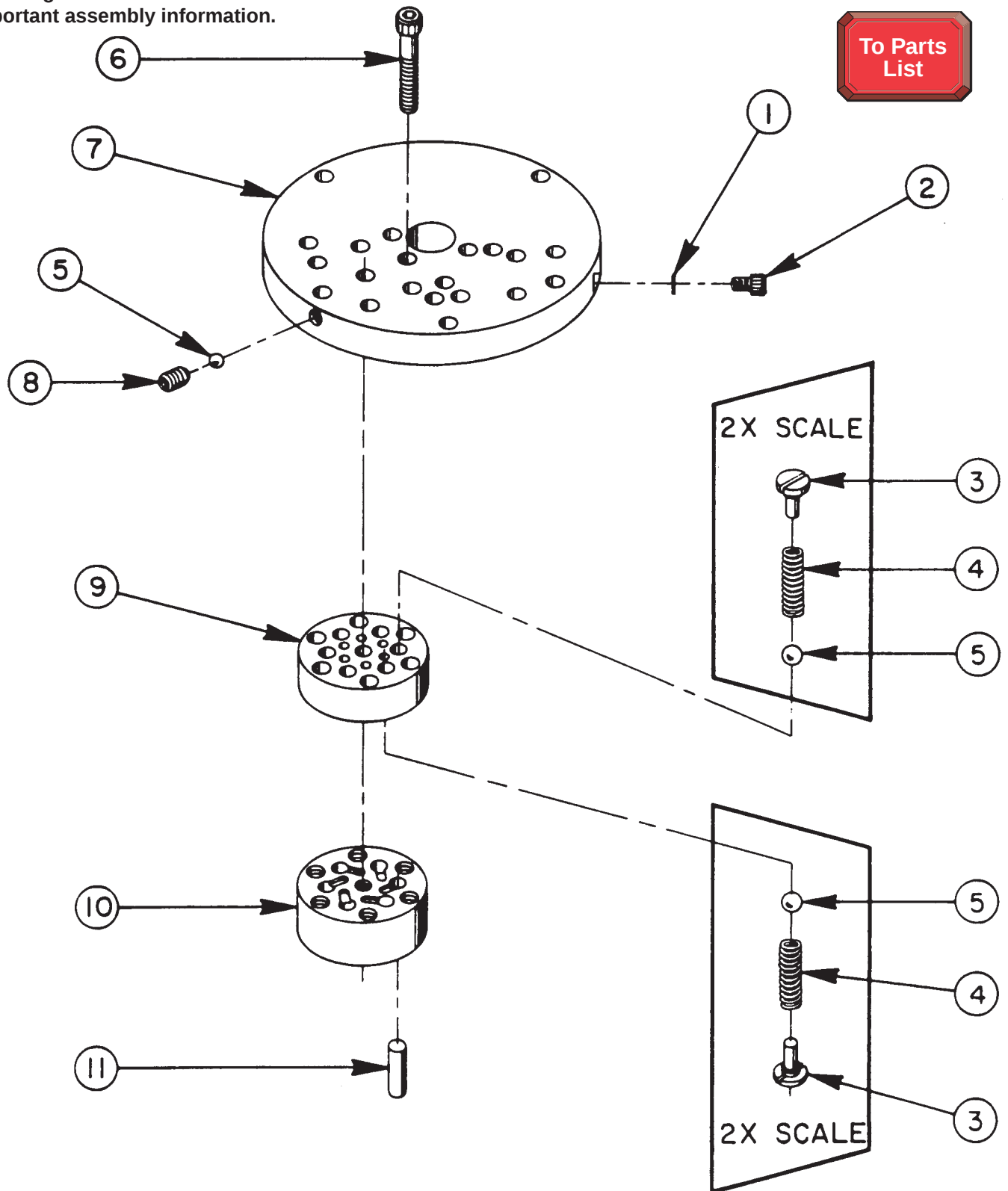
NEEDLE BEARING INSTALLATION SPECIFICATIONS



When replacing the needle bearings on the drive gear of the basic pump, the dimensions shown must be as specified.

HIGH PRESSURE PUMP ASSEMBLY

See diagram on reverse side for important assembly information.



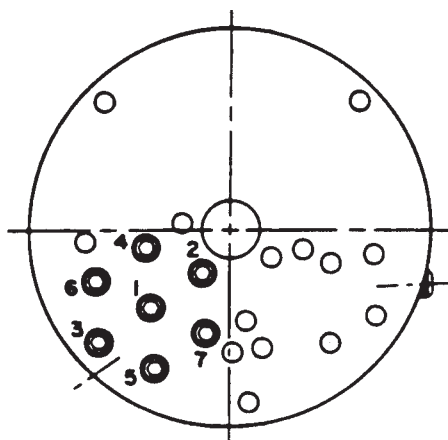
33114 PUMP ASSEMBLY

6 pistons -- 9/32 dia.

Item No.	Part No.	No. Req'd	Description
1	10442	1	Copper Washer (3/8 x 1/4 x 1/32)
2	10002	1	Soc. Hd. Cap Screw (1/4-20 UNC x 3/8 Lg.; Torque to 140/160 in. lbs.)
3	24549	12	Valve Guide
4	10445	12	Compression Spring (.164 O.D. x .718 Lg.)
5	12223	13	Steel Ball (3/16 dia.)
6	10023	7	Soc. Hd. Cap Screw (1/4-28 UNF x 1-1/2 Lg.; Torque to 170/180 in. lbs.; See note below)
7	50411	1	Top Plate
8	10519	1	Soc. Set Screw (1/4-20 UNC x 3/8 Lg.; Torque to 65/70 in. lbs.)
9	41048	1	Valve Head
10	41063	1	Pump Barrel
11	21628	6	Piston



BOLT TIGHTENING SEQUENCE



NOTE: Assemble in sequence shown.
Lubricate under head and on threads.
Torque to 180 in. lbs.