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Form No. 102652

Operating Instructions for:

	PG1204-LRC
PG1203	PG1204-MC
PG1204	PG1204-PRO
PG1204-ITE	PG1204-SEW
PG1204-LEAD	PG1204S- ATLAS

MODEL B
GAS HYDRAULIC PUMP

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.**

Note: Removed all references to models PG1204S and PG1204S-CCL at the last revision(s) made to this form.

SET-UP

Motor Hook-up and Operation

Refer to the instruction manual for the gasoline engine.

Hydraulic Connections

1. Clean all areas around the oil ports of the pump and cylinders.
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 oil outlets. Connect the hose assembly to the hydraulic oil outlet , and couple the hose to the cylinder. **IMPORTANT: Seal all external pipe connections with a high-quality, nonharding pipe sealant, such as Power Team HTS6.** 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 oil in the reservoir. High-grade Power Team hydraulic oil has been shipped with the pump in separate containers. If additional oil is required, use only Power Team hydraulic oil.

1. Remove the filler vent cap and insert a funnel with a filter. Using the Power Team hydraulic oil provided fill the reservoir to 1/2" 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:

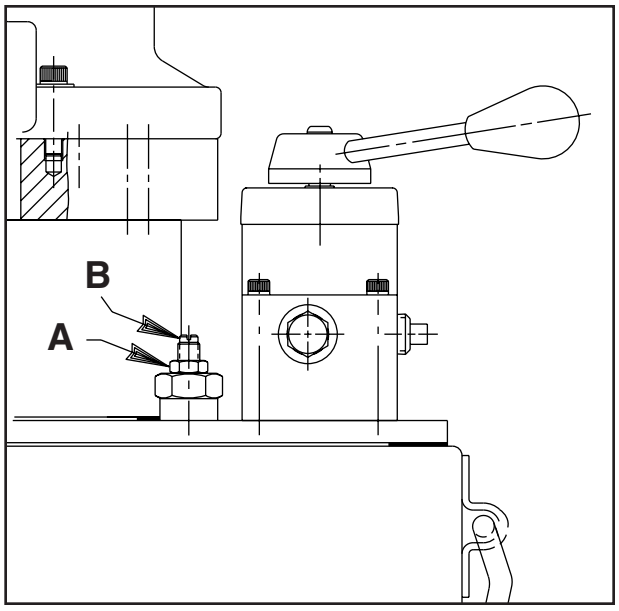
1. After filling the pump reservoir and checking that the hose connections are secure, place the valve in the neutral position and start the gas engine according to the manual instructions. Let the pump idle for a few minutes.
2. Disconnect a hose from the system and route it back to the pump reservoir. Run the pump until a steady flow of oil 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 section titled "Bleeding Air from the System."
4. Retract the cylinder(s) and check the reservoir oil level. It should be 1/2" from the filler vent cap. Add Power Team hydraulic oil if necessary.

Pressure Regulating Valve

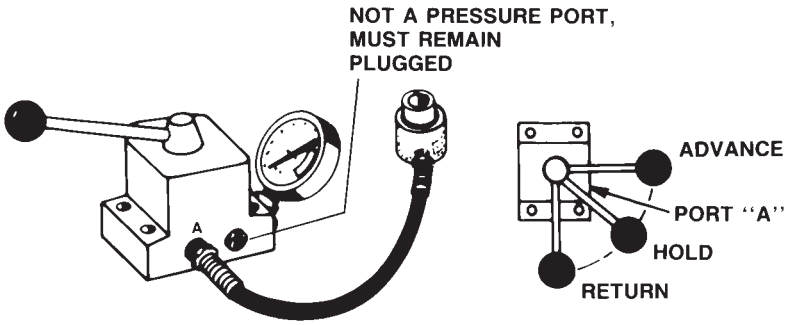
A pressure regulating valve can be adjusted to bypass oil at a desired pressure setting while the pump motor continues to run.

IMPORTANT: For easy adjustment of the pressure regulating valve, always adjust the pressure by INCREASING it to a desired pressure setting. The pressure range for this pump is from 1,000 PSI to 10,000 PSI.

1. Loosen the locknut (A) on the pressure regulating valve, and turn the adjusting screw a few turns counterclockwise (CCW) to decrease the pressure setting to a lower than desired pressure.
2. With the engine running, shift the valve into the operating position.
3. Slowly turn the adjusting screw (B) in a clockwise (CW) direction to gradually increase the pressure setting. When the desired pressure setting is reached, lock the adjusting screw into position by tightening the locknut (A).



Valve Operation



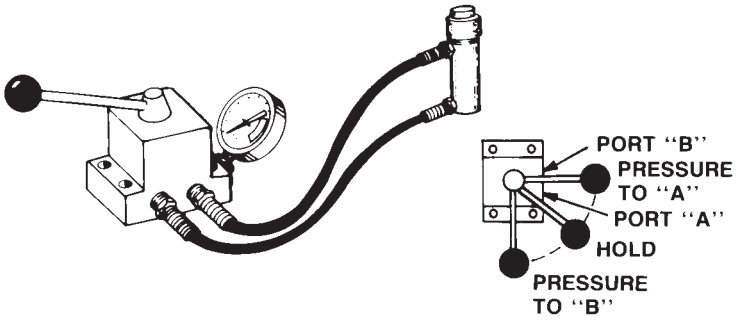
3-Way Manual Valve

Neutral (Hold): Pressure to tank - cylinder port blocked.

Advance: Pressure to cylinder port "A."

Return: Pressure and cylinder port to tank.

Pressure holds without loss when shifted from cylinder port to "hold" position.



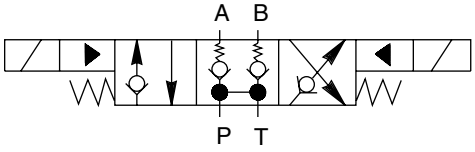
4-Way Manual Valve

Neutral (Hold): Pressure to tank, ports "A" and "B" blocked.

Position "A": Pressure to port "A," port "B" to tank.

Position "B": Pressure to port "B," port "A" to tank.

Pressure holds without loss when shifted from either cylinder port to "hold" position.



4-Way Solenoid Valve

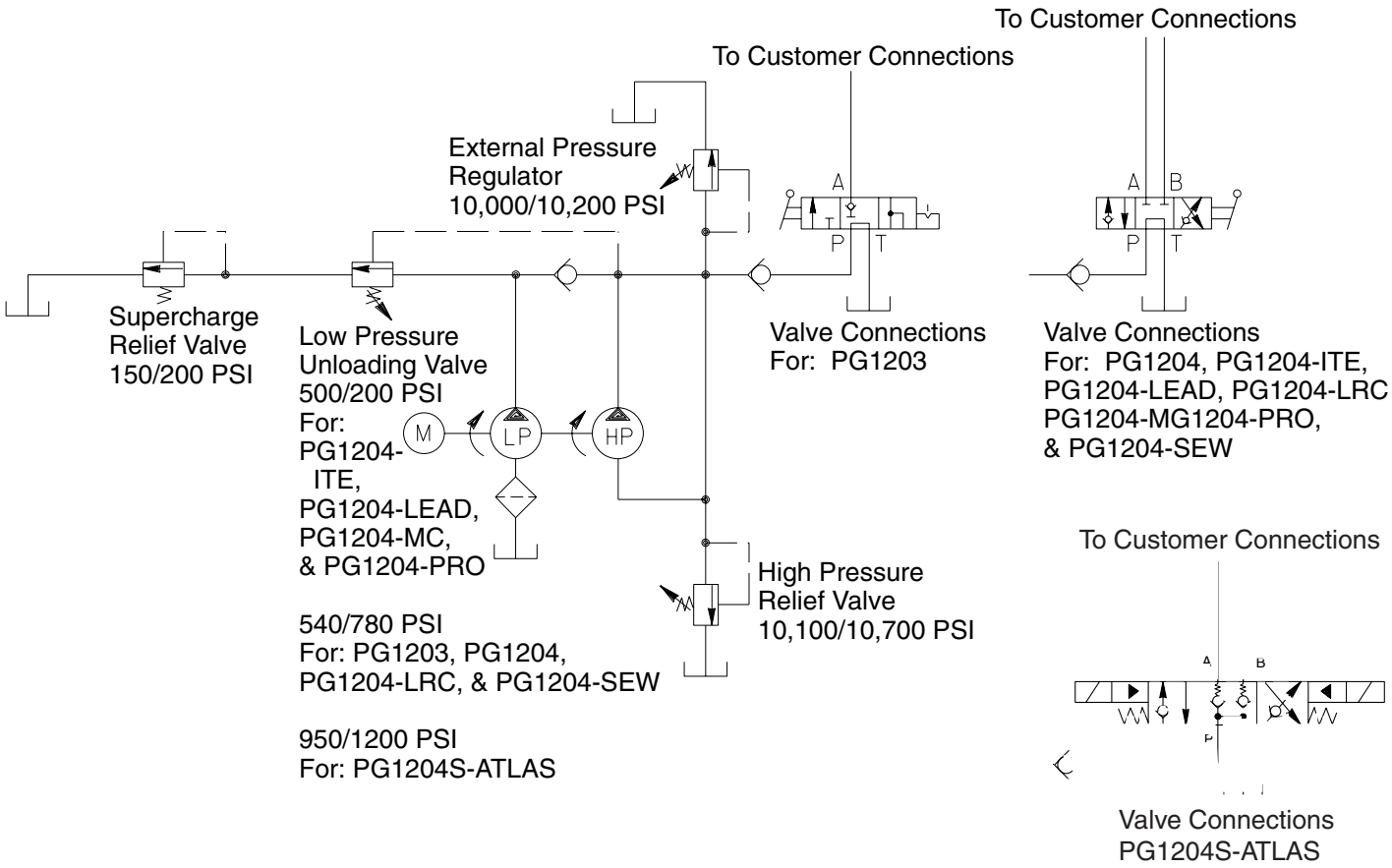
Neutral (Hold): When both solenoids are de-energized, oil from pump circulates at free flow from the pressure port “P” to tank “T”. Both cylinder ports are blocked.

Solenoid "A" Energized: Pressure to cylindder port "A". Cylinder port "B" to tank.

Solenoid "B" Energized: Pressure to cylinder port "B". Cylinder port "A" to tank.

NOTE: Pressure holds without loss when shifted from cylinder port to the neutral (Hold) position.

HYDRAULIC SCHEMATICS



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 Oil Level

Check the oil level in the reservoir periodically. With all cylinder(s) retracted, the oil level should be 1/2" from the filler vent cap. Drain, clean and replenish the reservoir with Power Team hydraulic oil yearly or more often if necessary. The frequency of oil 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 Power Team hydraulic oil 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 oil. Refill half full with clean Power Team hydraulic oil.
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 Power Team hydraulic oil to 1/2" from the filler vent cap. Place the pump assembly (with gasket) on the reservoir and install the screws. Tighten securely and evenly.

Adding Oil to the Reservoir

1. Cylinder(s) must be fully retracted and the gas engine shut off when adding oil 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 oil.
4. Use only Power Team hydraulic oil.
5. Fill to 1/2" from the filler/breather cap.

TROUBLESHOOTING GUIDE

WARNING:

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

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 oil 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.**

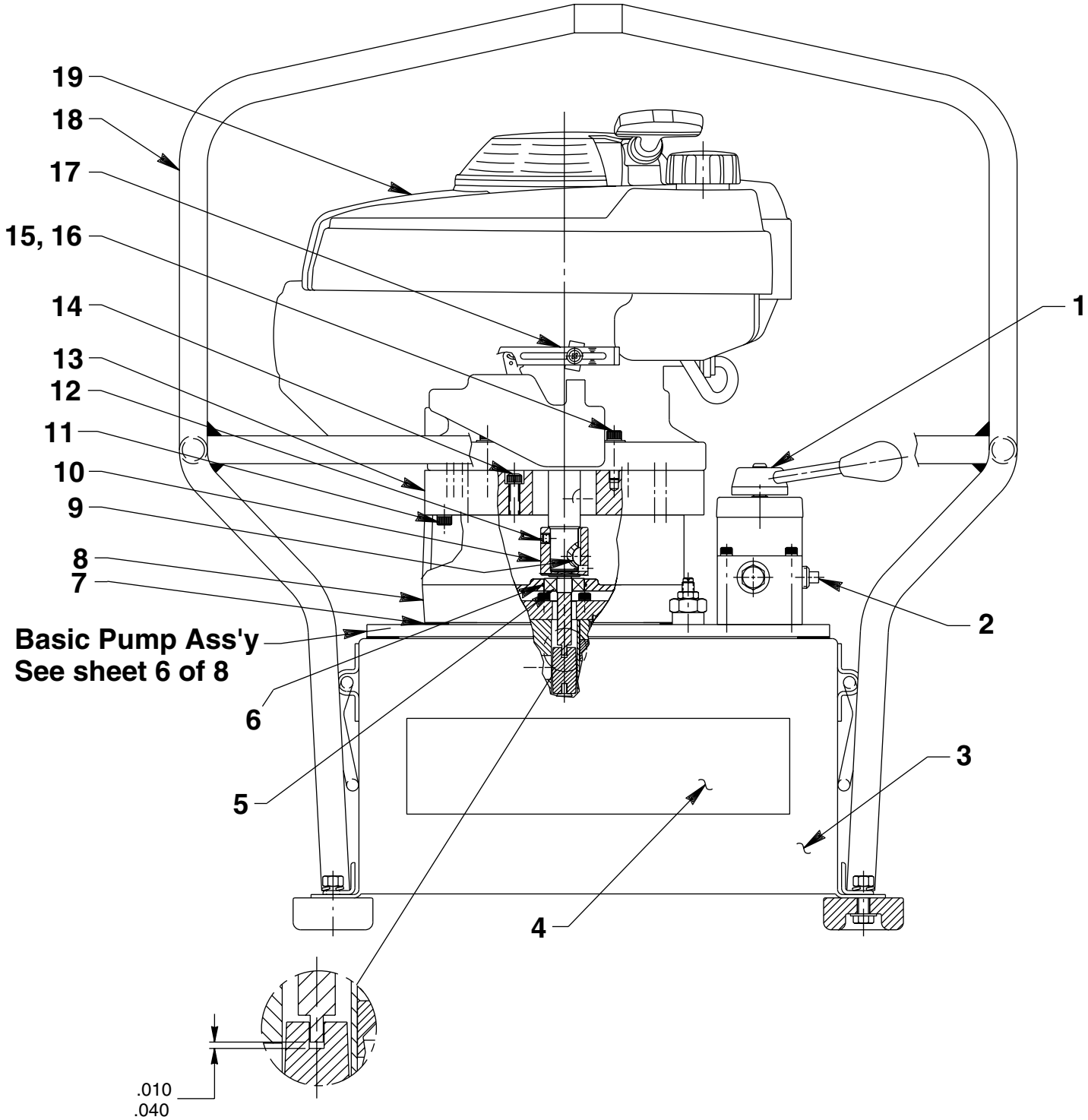
PROBLEM	CAUSE	SOLUTION
Pump is not delivering oil or delivers only enough oil to advance cylinder(s) partially or erratically.	1. Oil level too low.	1. With all cylinders retracted, fill reservoir to 1/2" of fill hole.
	2. Loose-fitting coupler to cylinder.	2. Check quick-disconnect couplings to cylinders. 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. Oil 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 oil or oil is too heavy (Hydraulic oil is of a higher viscosity than necessary).	7. Change to lighter oil.
	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.

PROBLEM	CAUSE	SOLUTION
Pump builds pressure but cannot maintain pressure.	1. Check to see if there are any external leaks. If no oil 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.	1. Seal leaking pipe fittings with pipe sealant.
	2. To test for a leaking control valve lift the pump from the reservoir but keep the filter in the oil. Remove the drain line to see if the oil 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 oil leaks at the beginning of this Trouble-shooting Guide.	2. Clean, reseat 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.	1. Seal faulty pipe fitting with pipe sealant.
	2. Check the relief valve setting.	2. Lift the pump from the reservoir, but keep the filter immersed in oil. 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. Look for internal leakage in double-acting cylinders.	3. Remove the cylinder from the pump. If the pump builds full pressure, the cylinder is defective.
	4. Check for leaks in the flow control valve.	4. Clean and reseat or replace parts.
	5. Inspect the pump for internal leakage. Check high pressure pump inlet or outlet ball checks.	5. Same procedure as above, but look for leads 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 reseat if necessary. Inspect for damage and replace parts if necessary, then reassemble.
	6. Sheared key(s).	6. Replace.
	7. Shifting spool seat and/or shifting spool poppet (located under high pressure pump assembly) worn.	7. Clean and reseat or replace.
	8. Shifting spool o-ring (located within shifting spool bore) worn or broken.	8. Remove and replace o-ring and backup washer through low pressure pump assembly end.

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 oil pressure	1. Relief valve not properly set.	1. Adjust the relief valve.
Gasoline engine.		1. Refer to instruction manual included with gasoline engine.

PARTS LIST

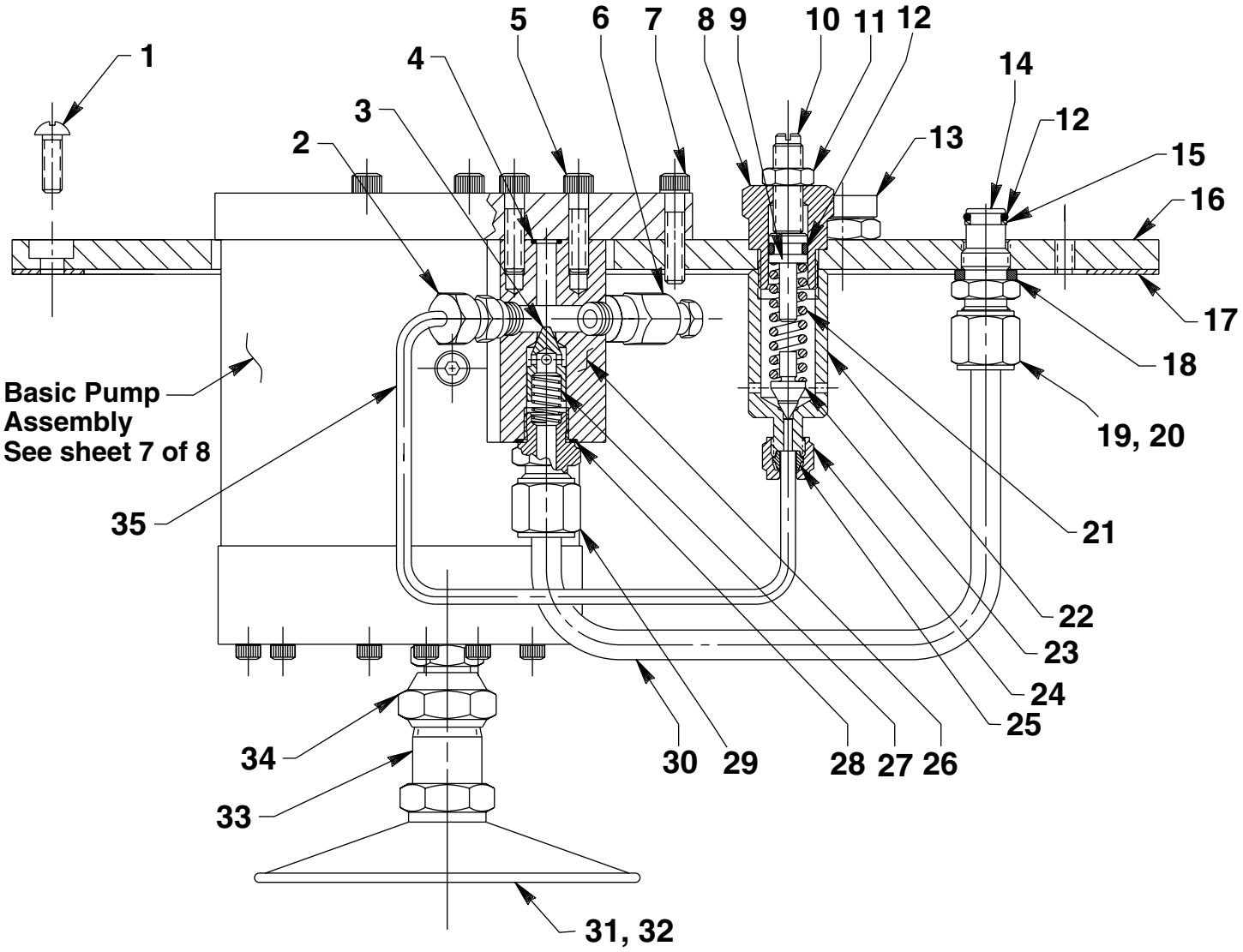
SIDE VIEW



Item No.	Part No.	No. Req'd	Description
1	**9520**	1	Valve Assembly (3 pos./3-way; For PG1203; See Form No.'s 101377 & 102527)
	9506	1	Valve Assembly (3 pos./4-way; For PG1204, PG1204-ITE, PG1204-LRC, & PG1204-SEW; See Form No.'s 100628 & 102527)
	58566	1	Valve Assembly (For PG1204-LEAD; See Form No. 101447 & 102527)
	58524	1	Valve Assembly (For PG1204-PRO; See Form No. 101405 & 102527)
	9500	1	Valve Assembly (For PG1204-MC; See Form No. 100623 & 102527)
	9516	1	Solenoid Valve (3 pos., 4 way; For PG1204S-ATLAS; See Form No. 101653)
2	**11127**	1	Pipe Plug (For PG1203)
	11127	2	Pipe Plug (For PG1204, PG1204-ITE, PG1204-LEAD, PG1204-LRC, PG1204-MC, PG1204-PRO, & PG1204-SEW)
3	**40137OR9**	1	Reservoir (5 gal.)
4	**309221**	2	Trade Name Decal
5	**10439**	1	Radial Ball Bearing
6	**15124**	1	O-ring (1-3/8 x 1-1/4 x 1/16)
7	**40987**	1	Gasket
8	***50384WH2**	1	Motor Base
9	**10945**	1	Woodruff Key (No. 6)
10	**420052**	1	Shaft Extension
11	***251566**	1	Cap Screw (5/16-24 UNF x 2” Lg.)
12	**10556**	1	Hex. Soc. Hd. Set Screw (1/4-20 UNC x 1/4 Lg.)
13	***420200**	1	Gas Engine Mounting Plate
14	**250427**	4	Soc. Hd. Cap Screw (5/16-18 UNC x 5" Lg.)
15	**10948**	2	Soc. Hd. Cap Screw (5/16-18 UNC x 1-1/4 Lg.)
16	**10257**	2	Flat Washer (5/16 I.D.)
17	**17596**	1	Slide Control
18	**RC5**	1	Roll Cage Frame (For PG1203, PG1204, PG1204S-ATLAS; See Form No. 102641)
19	**420202**	1	Gasoline Engine (Honda 5.5 H.P.)

***NOTE: If replacing any of these parts on a pump manufactured before 7-1-94, order motor base replacement kit no. 251271.**

GENERAL PUMP ASSEMBLY

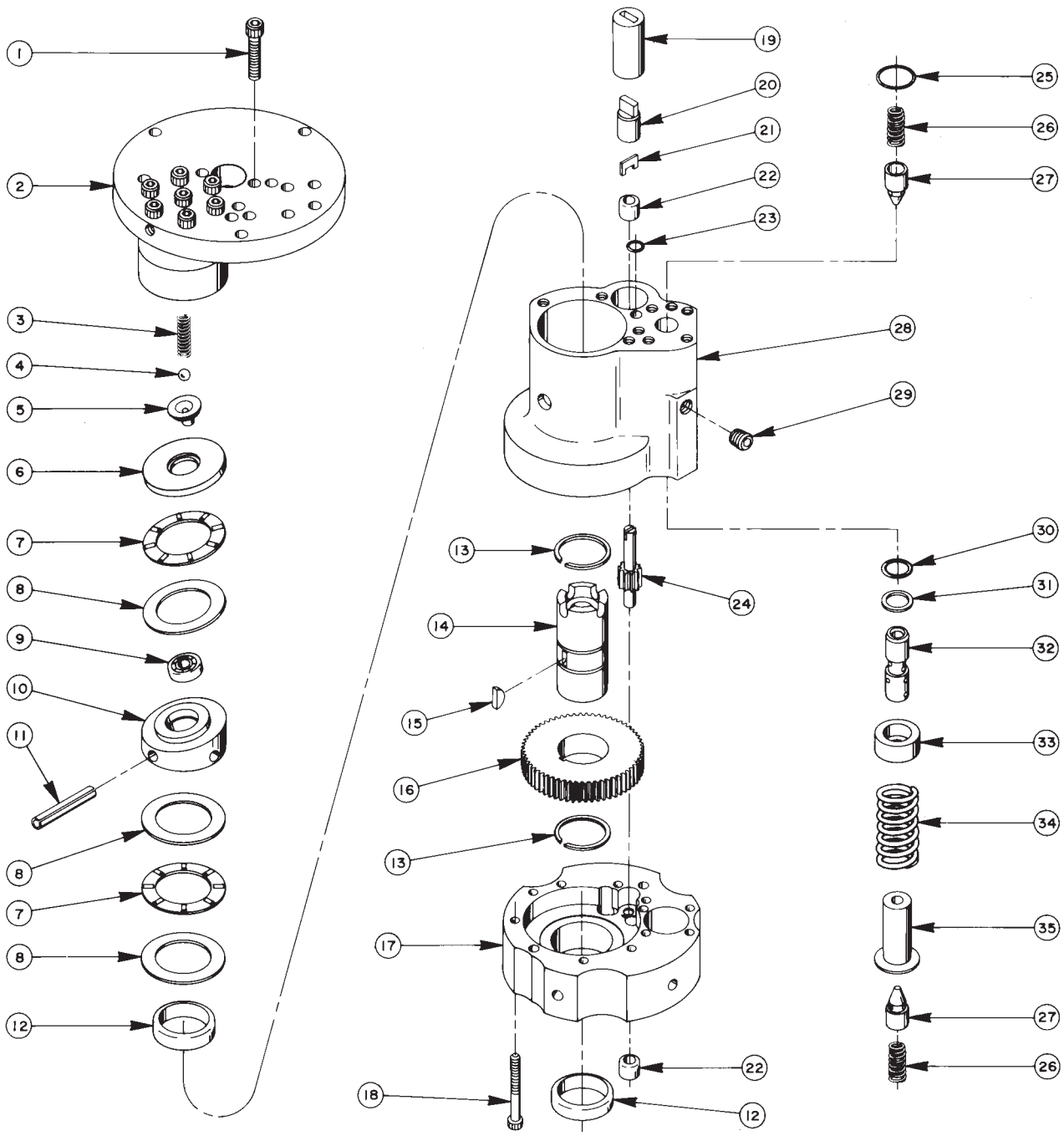


Item No.	Part No.	No. Req'd	Description
1	**10177**	10	Machine Screw (1/4-20 UNC x 3/4 Lg.)
2	**11173**	1	Fitting
3	**20771**	1	Poppet
4	**10266**	1	O-ring (3/8 x 1/4 x 1/16)
5	**10015**	2	Soc. Hd. Cap Screw (1/4-28 UNF x 1" Lg.)
6	**21278**	1	Relief Valve (Set at 10,100/10,700 PSI)
7	**10016**	3	Cap Screw (1/4-20 UNC X 1" Lg.)
8	**21305**	1	Valve Cap
9	**21306**	1	Spring Guide
10	**22362**	1	Valve Adjusting Screw (Set at 10,000/10,200 PSI)
11	**10386**	1	Hex Nut (3/8-24 UNF)
12	**10268**	2	O-ring
14	**20787**	1	Valve Connector
15	**11863**	1	Backup Washer (11/16 x 1/2 x .048)
16	**50058WH2**	1	Cover Plate
17	**58506**	1	Reservoir Gasket
18	**21484**	1	Washer
19	**10430**	2	Tube Sleeve
20	**10431**	2	Tube Nut
21	**10495**	1	Compression Spring (.450 x 1-5/8 Lg.)
22	**22361**	1	External Pressure Valve Body
23	**21046**	1	Valve Stem
24	**11342**	1	Tube Nut
25	**11174**	1	Tube Sleeve
26	**20776**	1	Outlet Check Body
27	**10425**	1	Compression Spring (3/8 O.D. x 3/4 Lg.)
28	**10261**	1	Copper Washer
29	**20770**	1	Valve Connector
30	**21495**	1	Oil LIne Tube
31	**21345**	1	Filter Assembly (Includes o-ring, Item #32)
32	**10266**	1	O-ring (3/8 X 1/4 X 1/16)
33	**22033**	1	Suction Line
34	**10528**	1	Straight Fitting
35	**22399**	1	External Pressure Regulator Tube

PARTS INCLUDED BUT NOT SHOWN

202120	1	Name Plate
200609	1	Drain Tube

BASIC PUMP ASSEMBLY



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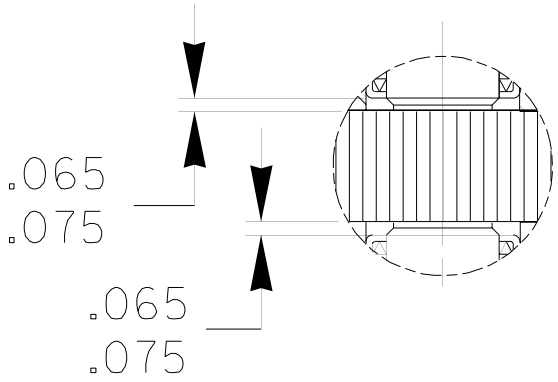
Item No.	Part No.	No. Req'd	Description
1	**10020**	9	Soc. Hd. Cap Screw (1/4-20 UNC x 1-1/4 Lg; Torque to 170/180 in. lbs.)
2	**33114**	1	High Pressure Pump Assembly (See sheet 8 of 8)
3	**10361**	1	Compression Spring (1/4 O.D. x 1" Lg.)
4	**10375**	1	Steel Ball (1/4 dia.)
5	**23547**	1	Bearing Top 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

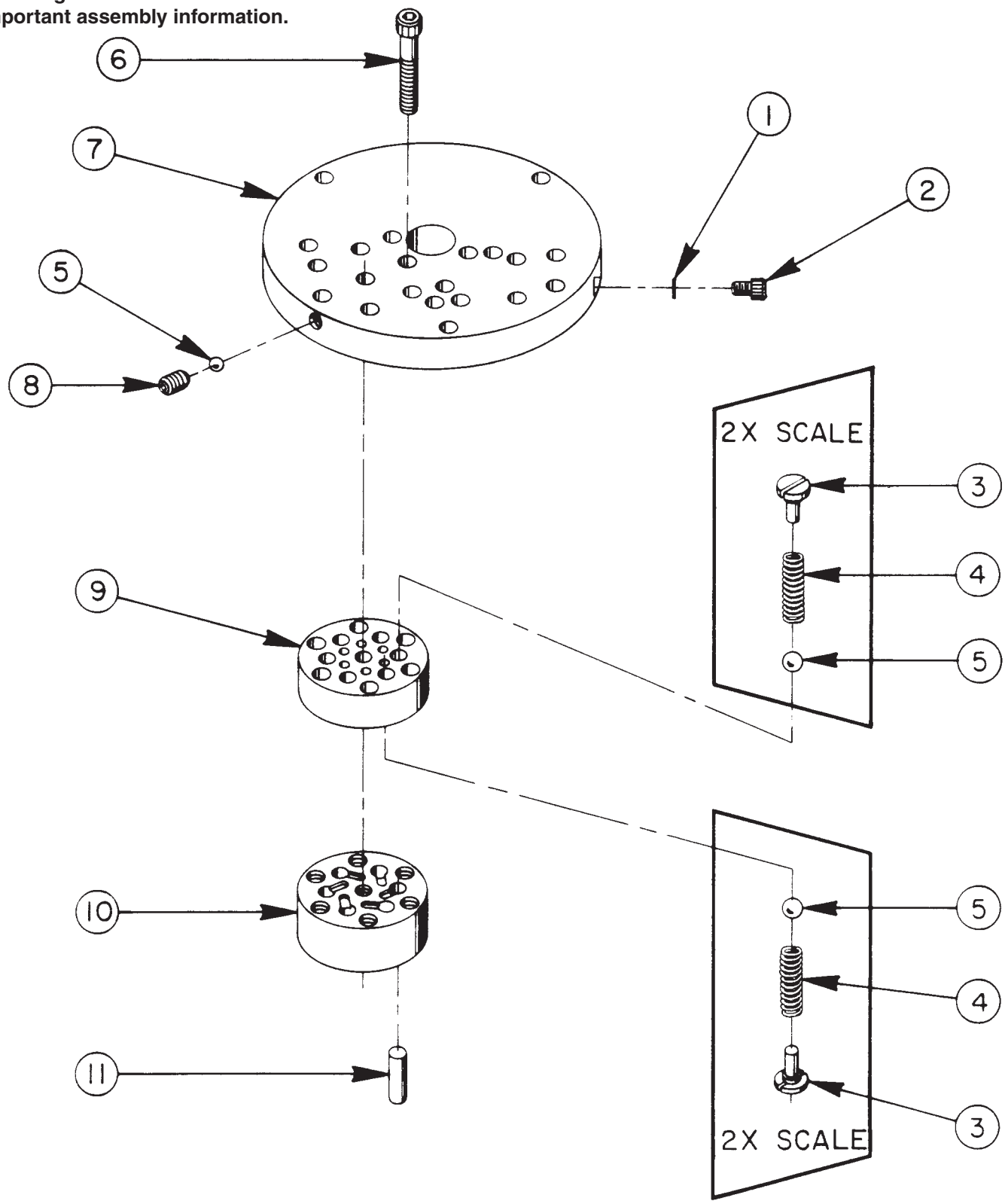
NEEDLE BEARING INSTALLATION SPECIFICATIONS



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 inportant assembly information.



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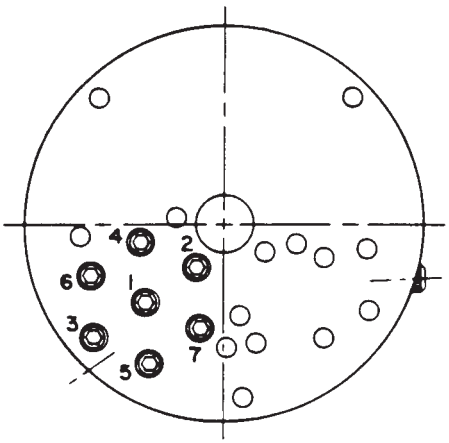
33114 PUMP ASSEMBLY

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.