

**Piston
Pump
Model**

410

HORSEPOWER REQUIREMENTS

Flow		PRESSURE			Pump RPM
		PSI 300	PSI 500	PSI 700	
GPM	L/M	BAR	BAR	BAR	
4.0	—	.83	1.4	2.0	850
3.0	—	.62	1.1	1.5	638
2.0	—	.42	.69	.96	425
DETERMINING THE PUMP R.P.M.		Rated G.P.M.		= "Desired" G.P.M.	
		Rated R.P.M.		"Desired" R.P.M.	
DETERMINING THE REQUIRED H.P.		GPM x PSI		= Electric Brake	
		1460		H.P. Required	
DETERMINING MOTOR PULLEY SIZE		Motor Pulley O.D.		= Pump Pulley O.D.	
		Pump R.P.M.		Motor R.P.M.	

Note: Consult engine manufacturer when using gas or diesel engine

SPECIFICATIONS

	U.S. Measure
Volume	4 G.P.M.
Discharge Pressure	700 P.S.I.
Max. Inlet Pressure	- 8.5 to + 40 P.S.I.
RPM	1050 RPM
Crankcase Capacity	1-1/4 Pts.
Max. Fluid Temperature	160°F
Inlet Ports (1)	(1) 1/2" NPT and (1) 1/4" NPT
Discharge Ports (3)	(2) 3/8" NPT and (1) 1/2" NPT
Pulley Mounting	Either side
Shaft Diameter650"
Weight w/Rail & Pulley	18 Lbs.
Dimensions w/Rails	12.75" x 9.45" x 6.25"

INLET CONDITION CHECK-LIST

Inadequate inlet conditions can cause serious malfunctions in the best designed pump. Surprisingly, the simplest of things can cause the most severe problems. Some of these conditions can go unnoticed to the unfamiliar or untrained eye. To help eliminate some of these costly headaches, we have put together a check list of probable cause areas which should be evaluated before operation of any system. Remember, no two systems are alike, so there can be no **ONE** best way to set-up a system. All factors must be carefully considered.

INLET SUPPLY should be adequate to accommodate the maximum flow being delivered by the pump.

- ☐ Avoid closed loop systems, especially at higher temperatures and larger volumes. By-pass should be returned to a holding tank.
- ☐ Low vapor pressure fluids, such as solvents, require a booster pump for adequate inlet supply.
- ☐ Higher viscosity fluids require a positive NPSH for adequate inlet supply.
- ☐ Higher temperature fluids tend to vaporize and require a positive NPSH for adequate supply.
- ☐ When using an inlet holding tank, size it to provide adequate fluid to accommodate the maximum output of the pump, generally a minimum of five times the GPM (however, a combination of system factors can change this requirement significantly); provide adequate baffling in the tank to eliminate air bubbles and turbulence; install diffusers on all return lines to the tank.

INLET LINE SIZE should be adequate to avoid starving the pump.

- ☐ The line should generally be 1-1/2 to 2 times the specified pump inlet port size.
- ☐ The line **MUST** be a FLEXIBLE hose, NOT a rigid pipe, and reinforced on SUCTION systems to avoid collapsing.
- ☐ The simpler the inlet plumbing the less the potential for problems. Keep the length to a minimum, the number of elbows and joints to a minimum (ideally no elbows) and the inlet accessories to a minimum.
- ☐ Use pipe sealant to assure air-tight, positive sealing pipe joints.

INLET PRESSURE should fall within the specifications of the pump. These conditions vary slightly from the plunger to the piston pumps.

- ☐ Higher temperatures require pressurized inlet.
- ☐ Optimum pump performance is achieved with a flooded or pressurized inlet, however, negative feed is possible under ideal conditions.

INLET ACCESSORIES are designed to protect against overpressurization, monitor inlet flow, control contamination, control temperature and provide ease of servicing.

- ☐ All accessories should be sized to avoid restricting the inlet flow.
- ☐ A pressure gauge is recommended to monitor the inlet pressure and should be mounted **AS CLOSE TO THE PUMP INLET** as possible.
- ☐ All accessories should be compatible with the solution being pumped to avoid malfunction.

BY-PASS TO INLET Care should be exercised when deciding the method of by-pass. It is recommended the by-pass be directed to a baffled reservoir tank, with at least one baffle between the by-pass line and the inlet line to the pump. Although not recommended, by-pass fluid may be returned to the inlet line of the pump if the system is properly designed to protect your pump. When using this method a **PRESSURE REDUCING VALVE** should be installed on the inlet line to avoid excessive pressure to the inlet of the pump. (**REDUCING VALVE SHOULD BE INSTALLED BETWEEN THE BY-PASS CONNECTION AND THE INLET TO THE PUMP**) It is also recommended that a **TEMPERATURE SENSING VALVE** be used to monitor the temperature build-up in the by-pass loop to avoid premature seal failure.

- ☐ A low-pressure, flexible cloth braid (not metal braid) hose should be used from the by-pass connection to the inlet of the pump.
- ☐ It is recommended to use a minimum 24" by-pass hose.
- ☐ On any new installation or during periodic maintenance or troubleshooting, it is recommended that the pressure in the by-pass line be checked to avoid overpressurizing the inlet.

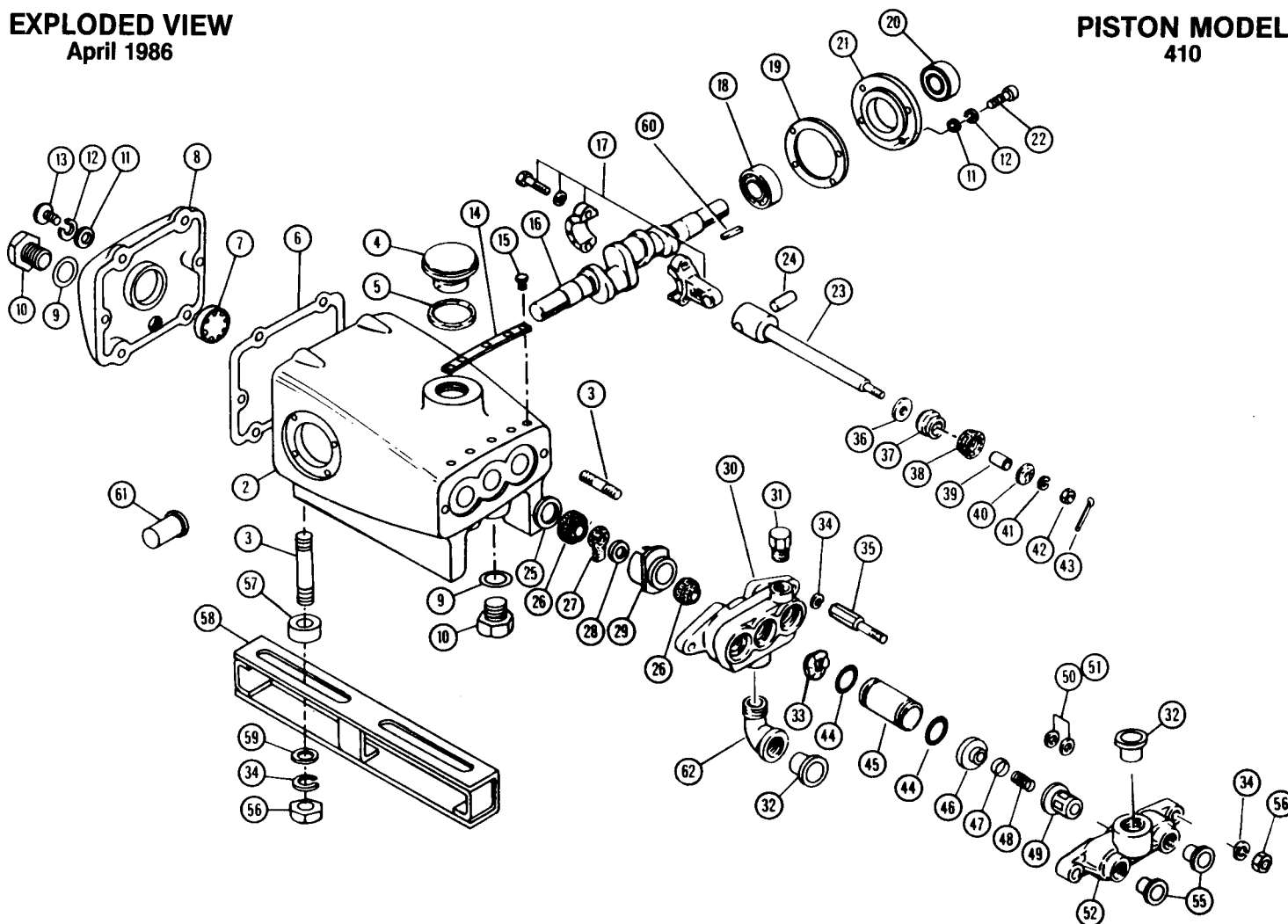
See High Pressure Guide for more information on pump protection and maintenance.

EXPLODED VIEW

April 1986

PISTON MODEL

410



PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY.	ITEM	PART NO.	DESCRIPTION	QTY.
2	43735	Crankcase, 4 Screw Cover	1	32	—	Plug, 1/2" Plastic	1
3	14137	Stud	6	33	—	Washer, Wave	3
4	43211	Oil Filler Cap	1	34	15848	Lock Washer	8
5	14177	O-Ring	1	35	24460	Cylinder Bolt	2
6	43340	Cover Seal, O-Section	1	36	22020	Valve, Inlet	3
7	43987	Oil Gauge, Bubble Style	1	37	22021	Piston	3
	44428	Flat Flex Gasket, Oil Gauge		38	43172	Cup, Piston	3
8	43339	Rear Cover, 4 Screw Cover	1	39	23357	Spacer, Piston	3
9	23170	O-Ring, Drain Plug	3	40	22023	Retainer, Piston	3
10	25625	Drain Plug, Oil	3	41	15848	Lock Washer	3
11	12488	Washer, Flat	14	42	27986	Slotted Nut, S.S., M5	3
12	12502	Lock Washer	14	43	14158	Cotter Pin	3
13	92520	Hex Head Screw, Sems M6 x 20	6	44	23172	O-Ring, Cylinder	6
14	—	Cover, Oil Holes	1	45	24285	Cylinder	3
15	—	Screw	2	46	29487	Discharge Valve Seat	3
16	43163	Crankshaft, Tapped (M8 x 20)	1	47	22842	Valve, Discharge	3
17	24139	Connecting Rod Assembly	3	48	22031	Valve Spring	3
18	14487	Bearing	2	49	22841	Retainer, Valve Spring	3
19	25526	Gasket, Bearing Case	2	50	13533	Shim Washer, M8 x 13 OD x .5	2
20	24159	Oil Seal, Crankshaft	2	51	43258	Shim Washer, M8 x 13 OD x .3	2-4
21	—	Bearing Case	2	52	24459	Discharge Manifold	1
22	92519	Hex Head Screw, Sems M6 x 16	8		30048	Pulley, 8" AB	1
23	24281	Piston Rod	3		—	Set Screw	1
24	16948	Piston Rod Pin	3	55	23946	Plug, 3/8" Plastic	2
25	20017	Washer, Retainer	3	56	81109	Nut	6
26	—	Seal, Piston Rod	6	57	24461	Spacer	4
27	22158	Wick, Oil	3	58	23950	Mounting Rails	2
28	—	Felt Packing	3	59	12489	Washer, Flat	4
29	23942	Seal Retainer	3	60	30047	Key, 5mm	1
30	25128	Inlet Manifold	1	61	—	Cap, Crankshaft	2
31	22177	Plug, 1/4" Chrome	1	62	22160	Elbow, 1/2" Street E11	1