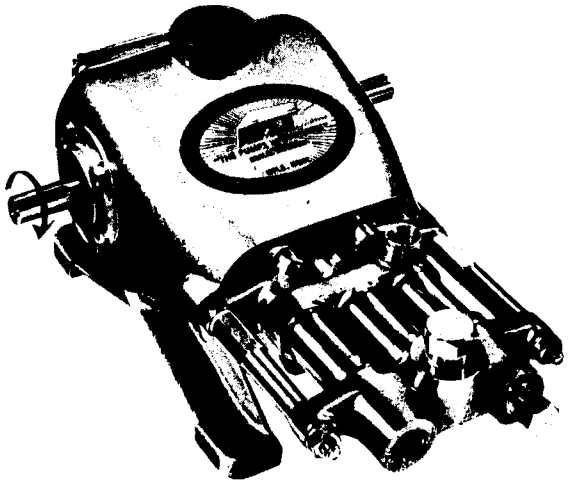


CAT PUMPS®

Piston Pump Model 400

HORSEPOWER REQUIREMENTS

Flow		PRESSURE PSI 300	PSI 500	PSI 700	Pump RPM
GPM	L/M	BAR —	BAR —	BAR —	
4.0	—	.83	1.4	2.0	1050
3.0	—	.62	1.1	1.5	788
2.0	—	.42	.69	.96	525

DETERMINING THE PUMP R.P.M. Rated G.P.M. / Rated R.P.M. = "Desired" G.P.M. / "Desired" R.P.M.

DETERMINING THE REQUIRED H.P. GPM × PSI / 1460 = Electric Brake H.P. Required

DETERMINING MOTOR PULLEY SIZE Motor Pulley O.D. / Pump R.P.M. = Pump Pulley O.D. / 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 Diameter	.650"
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. Suprisingly, 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.

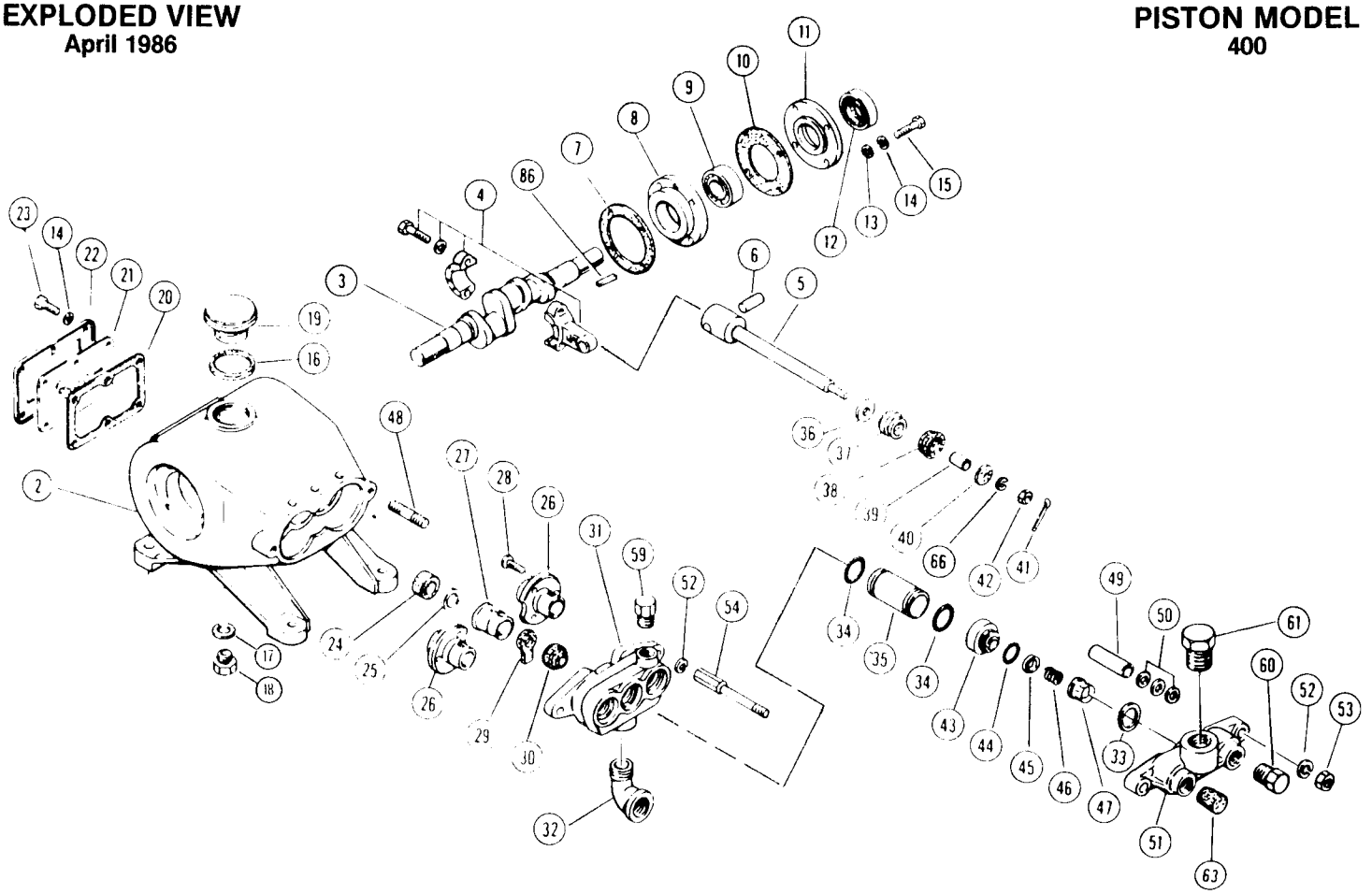
BY-PASS TO INLET Care should be exercised when deciding the method of by-pass. It is recommended the by-pass be directed to a baffled reservoir tank, with at least one baffle between the by-pass line and the inlet line to the pump. Although not recommended, by-pass fluid may be returned to the inlet 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 trouble-shooting, 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
400



PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY.
2	22151	Crankcase	1
3	—	Crankshaft	1
4	18836	Connecting Rod Ass'y	3
5	22153	Piston Rod	3
6	15733	Piston Rod Pin	3
7	11330	Gasket, Bearing Case	2
8	15789	Bearing Case	2
9	13832	Bearing	2
10	11329	Gasket, Oil Seal Case	2
11	15791	Oil Seal, Case	2
12	20355	Oil Seal, Crankshaft	2
13	12488	Flat Washer, M6	8
14	12502	Split Lock Washer - M6	8
15	15420	Screw	8
16	14177	O-Ring	1
17	23170	O-Ring, Drain Plug	1
18	18878	Drain Plug, Oil	1
19	43211	Oil Filler Cap	1
20	11291	Gasket, Oil Gauge	1
21	22186	Window, Oil Gauge	1
22	—	Frame, Oil Gauge	1
23	92519	Hex Head Screw, Sems M6 x 16	6
24	11410	Oil Seal, Piston Rod	3
25	14803	Seal Wiper	3
26	22156	Seal Retainer (Outsie)	2
27	22157	Seal Retainer (Center)	1
28	15871	Screw	6
29	22158	Wick, Oil	3
30	25461	Oil Seal	3
31	22159	Inlet Manifold	1
32	22160	Elbow, 1/2" St. Ell.	1
33	22163	Spacer, Cylinder	1
34	23172	O-Ring, Cylinder	6
35	22161	Cylinder	3
36	22020	Valve, Inlet	3
37	22021	Piston	3
38	43172	Piston Cup, M20, Viton	3
39	23357	Piston Spacer	3
40	22023	Retainer, Piston	3
41	14158	Cotter Pin, S.S., M1.5 x 10	3
42	27986	Slotted Nut, S.S., M5	3
43	25020	Discharge Valve Seat	3
44	19261	O-Ring	3
45	22175	Valve Discharge	3
46	22164	Valve Spring	3
47	22165	Retainer, Valve Spring	3
48	15787	Stud, Inlet Manifold	2
49	25019	Cylinder Bolt, 5 x 16"	2
50	43258	Shim Washer, M8 x 13 OD x .3	6-10
51	22168	Discharge Manifold	1
52	15845	Split Lock Washer, M8	4
53	30910	Hex Nut 5/16" US Course	2
54	25019	Cylinder Bolt, 5/16"	2
59	22177	Plug, 1/4" Chrome	1
60	22187	Plug, 3/8" Chrome	1
61	22179	Plug, 1/2" Chrome	1
62	—	Plug, Rubber	1
63	23946	3/8" Plastic Dust Plug	1
65	30005	Operating Instructions	1
66	15848	Lock Washer	3
86	—	Key (Pulley)	1