

**Piston  
Pump  
Model**

**420**

#### HORSEPOWER REQUIREMENTS

Flow		PRESSURE			Pump RPM
		PSI 400	PSI 600	PSI 800	
GPM	L/M	BAR 30	BAR 40	BAR 55	
4.0	—	1.10	1.60	2.20	850
3.0	—	.82	1.23	1.64	638
2.0	—	.54	.82	1.10	425
<b>DETERMINING THE PUMP R.P.M.</b>		Rated G.P.M.	=	"Desired" G.P.M.	
		Rated R.P.M.		"Desired" R.P.M.	
<b>DETERMINING THE REQUIRED H.P.</b>		GPM x PSI	=	Electric Brake	
		1460		H.P. Required	
<b>DETERMINING MOTOR PULLEY SIZE</b>		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
<b>Volume</b> .....	4 G.P.M.
<b>Discharge Pressure</b> .....	800 P.S.I.
<b>Max. Inlet Pressure</b> .....	- 8.5 to + 40 P.S.I.
<b>RPM</b> .....	850 RPM
<b>Crankcase Capacity</b> .....	20 Oz.
<b>Max. Fluid Temperature</b> .....	160°F
<b>Inlet Ports (1)</b> .....	(1) 1/2" NPT and (1) 1/4" NPT
<b>Discharge Ports (3)</b> .....	(2) 3/8" NPT and (1) 1/2" NPT
<b>Pulley Mounting</b> .....	Either side
<b>Shaft Diameter</b> .....	.650"
<b>Weight w/Rail &amp; Pulley</b> .....	15.75 Lbs.
<b>Dimensions w/Rail</b> .....	13.0" x 8.78" x 6.93"

#### 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.

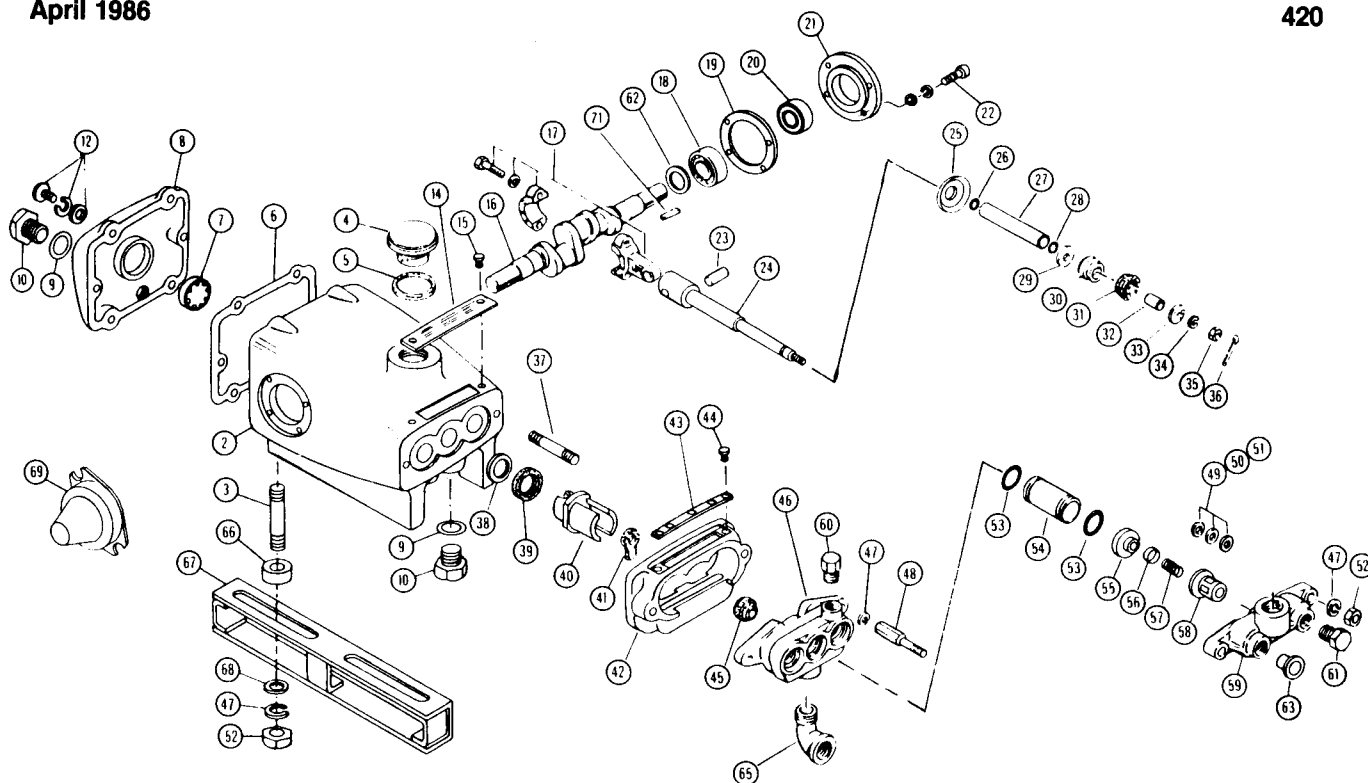
See High Pressure Guide for more information on pump protection and maintenance.

## EXPLODED VIEW

April 1986

## PISTON MODEL

420



## PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY.	ITEM	PART NO.	DESCRIPTION	QTY.
2	43735	Crankcase, 4 Screw Cover	1	38	20017	Seal Washer	3
3	14137	Stud	4	39	25301	Crankcase Piston Rod Seal	3
4	43211	Oil Filler Cap	1	40	25303	Seal Retainer	3
5	14177	O-Ring	1	41	25304	Oil Wick	3
6	43340	Cover Seal, O Section	1	42	—	Lubricator Housing	1
7	43987	Oil Gauge, Bubble Style	1	43	—	Oil Hole Cover	1
	44428	Flex Gasket, Oil Gauge		44	—	Screw	2
8	43339	Rear Cover, 4 Screw Cover	1	45	25153	Manifold Piston Rod Seal	3
9	23170	O-Ring, Drain Plug	3	46	25128	Inlet Manifold	1
10	25625	Drain Plug, Oil	3	46	25635	Inlet Manifold, S.S.	1
12	92520	Hex Head Screw, Sems M6 x 16	6	47	15845	Lockwasher	8
14	—	Plate	1	48	25337	Stud Coupling Assembly	2
15	—	Rivet	2	49	43258	Shim Washer, M8 x 13 OD x .3	2-4
16	43163	Crankshaft, Tapped (M8 x 20)	1	50	13533	Shim Washer, M8 x 13 OD x .5	2-4
17	24139	Connecting Rod Assembly	3	51	22902	Shim Washer, M8 x 13 OD x 1.	2-4
18	14487	Bearing	2	52	81109	Hex Nut M8 Reg Thread	6
19	25528	Oil Seal Case Gasket	2	53	23172	O-Ring, Cylinder	6
20	24159	Crankshaft Oil Seal	2	54	24285	Cylinder	3
21	25393	Oil Seal Case	2	55	29487	Discharge Valve Seat	3
22	92519	Hex Head Screw, Sems M6 x 16	8	56	22842	Discharge Valve	3
23	16948	Piston Rod Pin	3	57	22031	Valve Spring	3
24	25395	Piston Rod Assembly	3	58	22841	Valve Spring Retainer	3
25	25327	Barrier Washer	3	59	24459	Discharge Manifold	1
26	25392	O-Ring	3	59	25634	Discharge Manifold - S.S.	1
27	25299	Piston Rod Sleeve	3	60	22177	1/4"-18 NPT Chrome Plug	1
28	21549	O-Ring	3	61	22187	3/8"-18 NPT Chrome Plug	1
29	22020	Inlet Valve	3	62	16305	Shim	2
30	22021	Piston	3	63	23946	3/8" Plastic Plug	1
31	43172	Piston Cup, M20 Viton	3	65	22160	1/2"-14 NPT Street Ell	1
32	23357	Piston Spacer	3	66	24461	Spacer	4
33	22023	Piston Retainer	3	67	23950	Mounting Rail	2
34	15848	Lock Washer	3	68	12489	Flat Washer	4
35	27986	Slotted Nut, S.S., M5	3	69	25130	Shaft Protector	1
36	14158	Cotter Pin, S.S., M1.5 x 10	3	71	30047	5mm Key	1
37	14059	Stud	2		—	8" AB Pulley	1