

## Sleeved Piston Pump Model

# 524

HORSEPOWER REQUIREMENTS					
Flow		PRESSURE			Pump RPM
		PSI 500	PSI 1500	PSI 2150	
GPM	L/M	BAR	BAR	BAR	
4.5	—	1.5	4.6	7.0	990
3.0	—	1.1	3.1	4.5	661
2.0	—	.7	2.1	3.0	440
<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 × 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

Volume .....	4.5 GPM
Discharge Pressure .....	2150 PSI
Max. Inlet Pressure .....	- 8.5 to + 40 PSI
RPM .....	990 RPM
Bore .....	.630"
Stroke .....	1.122"
Crankcase Capacity .....	1-1/4 Qts.
Max. Fluid Temperature .....	140°F
Inlet Ports (1) .....	1/2" NPT
Discharge Ports (3) .....	3/8" NPT
Pulley Mounting .....	Either side
Shaft Diameter .....	.984"
Weight .....	35.4 Lbs.
Dimensions with Rail .....	17.70" × 11.81" × 8.39"

## 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.

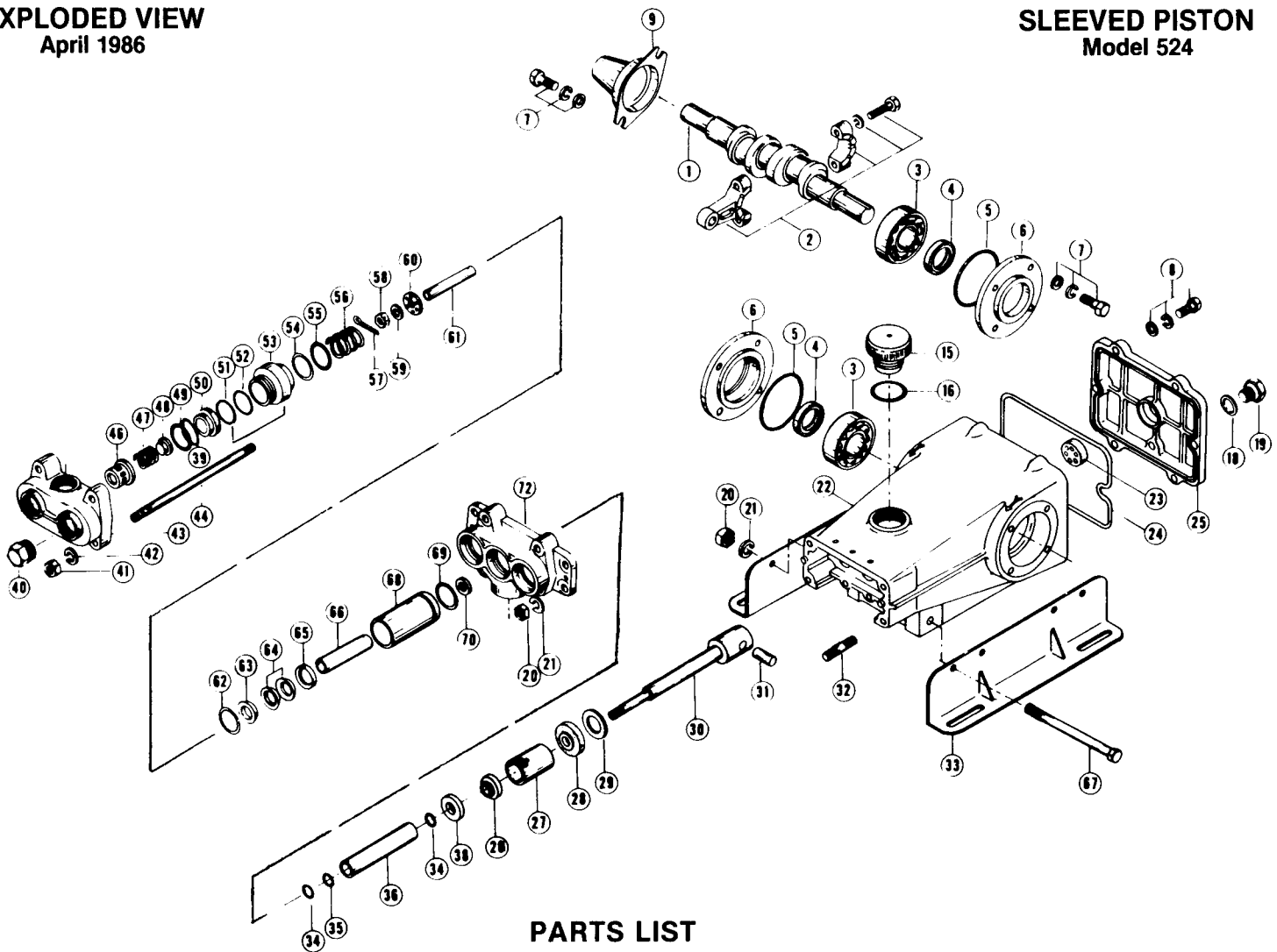
**INLET ACCESSORIES** are designed to protect against overpressurization, monitor inlet flow, control contamination, control temperature and provide ease of servicing.

- ☐ 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 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.



**PARTS LIST**

ITEM	PART NO.	DESCRIPTION	QTY.	ITEM	PART NO.	DESCRIPTION	QTY.
1	27329	Crankshaft	1	42	30908	Lockwasher, (1/2")	4
2	27334	Connecting Rod	3	43*	43060	Discharge Manifold	1
3	47080	Bearing	2	44	85364	Cylinder Bolt (M12)	4
4	27330	Oil Seal	2	46	43135	Retainer, Valve Spring	3
5	26965	O-ring, Oil Seal Case	2	47	28682	Valve Spring	3
6	27331	Oil Seal Case	2	48	28681	Discharge Valve	3
7	92519	Hex Head Screw (M6 x 16)	8	49	28820	O-ring, Discharge Valve Seat	3
8	92520	Comb Head Screw, 3 pc sems (M6 x 20)	6	50*	43061	Discharge Valve Seat	3
9	43139	Shaft Protector	1	51	23172	O-ring	3
15	43211	Cap, Oil Filler	1	52	21985	Back-up Ring	3
16	14177	O-ring, Cap	1	53	29162	Cylinder Adapter	3
18	23170	O-ring, Drain	1	54	28675	Back-up Ring	3
19	25625	Drain Plug	1	55	14200	O-ring	3
20	81048	Hex Nut (M10) Reg Thread	6	56	29165	Spring	3
21	12503	Split Lockwasher (M10)	6	57	14158	Cotterpin S.S. (M1.5 x 10)	3
22	27325	Crankcase	1	58	27986	Hex Nut-S.S. (M5)	3
23	43987	Oil Gauge, Bubble Style	1	59	15845	Split Lockwasher (M8)	3
	44428	Flat Flex Gasket, Oil Gauge	1	60	22023	Retainer, Piston	3
24	27418	O-ring, Rear Cover	1	61	28923	Spacer, Piston	3
25	43847	Rear Cover, Crankcase	1	62	29643	Washer	3
26	30315	Seal	3	63	29161	Male Adapter	3
27	27341	Seal Retainer	3	64	29160	V-Packing	6
28	27339	Oil Seal	3	65	29644	Female Adapter	3
29	26952	Seal Washer	3	66	29163	Piston (Sleeve-type)	3
30*	29640	Piston Rod	3	67	30903	Hex Cap Screw (3/8 x 5 1/2)	2
31	20251	Piston Pin	3	68	43131	Cylinder	3
32	85234	Stud (M10 x 45)	4	69**	27536	O-ring	3
33	30635	Angle Rail	2	70	22020	Inlet Valve	3
34	21549	O-ring, Piston Sleeve	6	72	28915	Inlet Manifold	1
35	20160	Back-up Ring, Sleeve	3	—	30284	Hub & Key	1
36	25299	Sleeve	3	—	30267	Pulley Assembly	1
38	25327	Barrier Slinger	3				
39	43059	Back-up Ring	3				
40	22187	Plug, 3/8"	1				
41	81060	Hex Nut (M12) Reg Thread	4				

\* Effective with S/N 6770101

\*\* Effective with S/N 2790101