

## Plunger Pump Model 3515

### SPECIFICATIONS

	U.S. Measure	Metric Measure
Volume .....	14 G.P.M.	(53 L/M)
Discharge Pressure .....	3000 P.S.I.	(210 BAR)
Max. Inlet Pressure .....	Flooded to 70 P.S.I.	(to 4.9 BAR)
RPM .....	800 RPM	(800 RPM)
Bore .....	0.084"	(25 mm)
Stroke .....	1.890"	(48 mm)
Crankcase Capacity .....	4.2 Qts.	(4 L)
Maximum Fluid Temperature .....	160°F	(71°C)
Inlet Ports (2) .....	1-1/2" NPT	(1-1/2" NPT)
Discharge Ports (2) .....	1" NPT	(1" NPT)
Pulley Mounting .....	Either side	(Either side)
Shaft Diameter .....	1.378"	(35 mm)
Weight .....	152 lbs.	(69 kg)
Dimensions .....	24.33" x 18.11" x 9.33"	(618 x 460 x 237 mm)

## FEATURES

### SUPERIOR DESIGN

- Triplex plunger design gives smoother fluid flow.
- Wetted seal port keeps high pressure seals completely lubricated and cooled.
- Inlet and discharge valve and seat assemblies interchange for easier maintenance.
- Lubricated low pressure seal provides double protection against external leakage.
- Oil bath crankcase assures proper lubrication.
- Plunger design results in extra quiet operation.
- The close tolerance concentricity of the ceramic plunger maximizes seal life.

### QUALITY MATERIALS

- Special 316 stainless steel valve and seat for extended life.
- Heavy duty Nickel Aluminum Bronze inlet and discharge manifold for strength and corrosion resistance.
- Polished surface of solid ceramic plungers results in extended seal life.
- Extra hard finish of ceramic plunger is durable and abrasion resistant.
- Die cast aluminum crankcase provides lightweight strength and precision tolerance control.
- Forged, nitrited chrome-moly crankshaft gives unmatched strength and surface hardness.
- Oversized crankshaft bearings mean longer bearing life.

### EASY MAINTENANCE

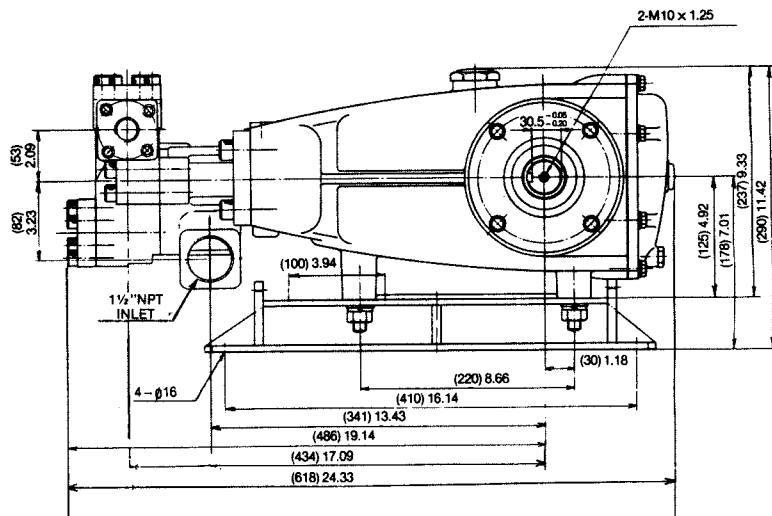
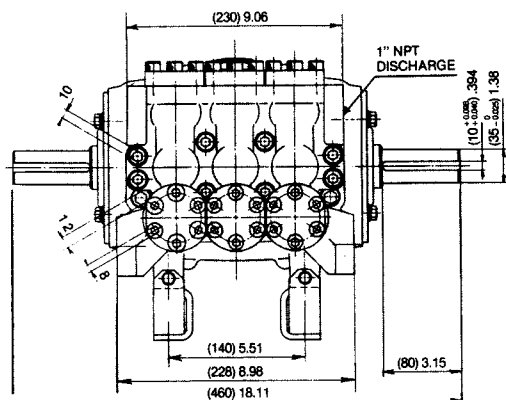
- Wet end is easily serviced without entering crankcase, requiring less time and effort.
- Valve assemblies are accessible without disturbing piping, for quick service.
- Preset packings mean no packing gland adjustment is necessary, reducing maintenance costs.

### HORSEPOWER REQUIREMENTS

Flow		PRESSURE			Pump RPM
GPM	L/M	PSI 2000	PSI 2500	PSI 3000	
		BAR 140	BAR 175	BAR 210	
14	53	19.2	24.0	28.9	800
12	45	16.5	20.6	24.7	685
10	38	13.7	17.2	20.6	571
<b>DETERMINING THE PUMP R.P.M.</b>		Rated G.P.M. / Rated R.P.M.		=	"Desired" G.P.M. / "Desired" R.P.M.
<b>DETERMINING THE REQUIRED H.P.</b>		GPM x PSI / 1460		=	Electric Brake H.P. Required
<b>DETERMINING MOTOR PULLEY SIZE</b>		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

**WORLD LEADER IN TRIPLEX HIGH PRESSURE PUMPS**



Matched oversized connecting rods are of Zamak, a material noted for strength and bearing quality.

Main bearings are oversized for longer pump life.

Stainless steel plunger rod for strength.

Polished, solid ceramic plunger for resistance to corrosion and abrasion which means a longer service life.

Completely interchangeable inlet and discharge valves, for easy service.

Heavy duty Aluminum Bronze inlet and discharge manifold for strength and corrosion resistance.

Crankshaft is nitrided chrome-moly forged. Cat Pumps is the only pump manufacturer in the world utilizing this quality.

Diecast aluminum crankcase means high strength, light weight and excellent tolerance control.

Pre-set seals require no adjustment. 100% wetted seal design lubricated and cooled by pumped fluid on both sides for extended seal life.

Special 316 stainless steel valve and seat for extended life.

3515-S-685 5M

Products described hereon are covered by one or more of the following U.S. patents 3558244, 3652188, 3809508, 3920356, and 3930756



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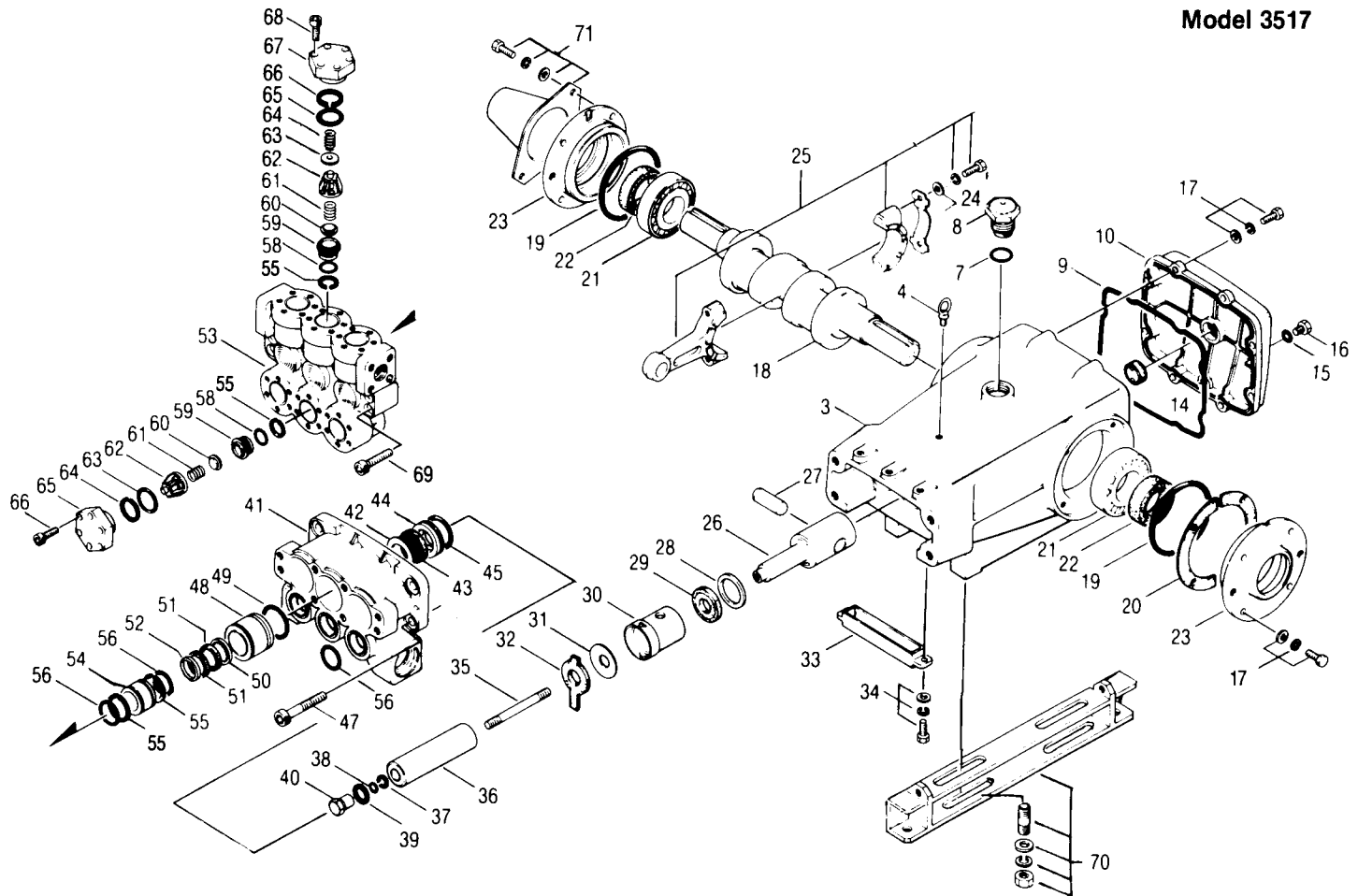
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# EXPLODED VIEW

May 1989

## PLUNGER Model 3515 Corrosion Resistant Model 3517

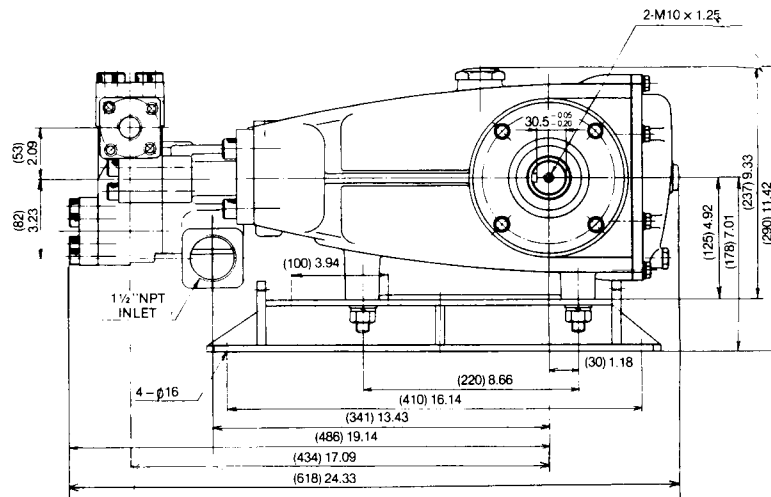
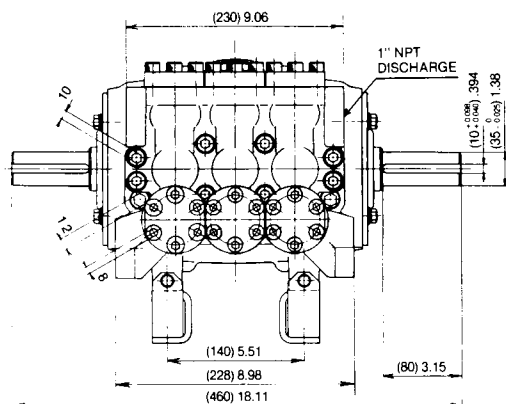


### PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY.	ITEM	PART NO.	DESCRIPTION	QTY.	ITEM	PART NO.	DESCRIPTION	QTY.
3	44559	Crankcase	1	34	92519	Sems Comb Head Screw (M6 x 16)	2	62	43886	Valve Spring Retainer (Nylon)	6
4	44319	Eyebolt	1		89618	Comb. Head Screw-S.S. (M6 x 16)	2		44735	Valve Spring Retainer-PVDF	6
7	14177	O-Ring, Oil Filler Cap (Buna-N)	1		19933	Washer-S.S. (M6)	2	63	44794	Washer-316 S.S.	6
8	43211	Oil Filler Cap	1		15849	Spring Washer (M6)	2	64	44793	Coil Spring-316 S.S.	6
9	16612	O-Ring, Crankcase Cover (Buna-N)	1	35	88627	Stud (M10 x 122)	3	65	15853	O-Ring Valve Plug (Buna-N)	6
10	44493	Crankcase Cover	1		89778	Stud (M10 x 122) 316 S.S.	3	66	20224	Back-Up Ring (Teflon)	6
14	22289	Oil Gauge	1	36	43866	Ceramic Plunger	3	67	44199	Valve Plug-Brass	6
15	23170	O-Ring, Drain Plug (Buna-N)	1	37	20189	Back-Up Ring (Teflon)	3		44795	Valve Plug-Aluminum Bronze	6
16	25625	Drain Plug	1	38	11345	O-Ring (Buna-N)	3	68	87934	Hex Socket Screw (M10 x 30)	36
17	92508	Sems Hex Head Screw (M8 x 25)	16	39	44085	Gasket (316SS)	3		87951	Hex Socket Screw-S.S. (M10 x 30)	56
	89277	Hex Head Screw-S.S. (M8 x 25)	16	40	44084	Retainer (316SS) (M10)	3	69	89573	Hex Socket Screw (M12 x 65)	8
	13534	Washer-S.S. (M8)	16	41	44206	Manifold (Aluminum Bronze)	1		89628	Hex Socket Screw-S.S. (M12 x 65)	8
	15846	Spring Washer-S.S. (M8)	16	42	44089	Washer (316SS)	3	70	92674	Box Mounting Assembly-Course	1
18	29325	Crankshaft	1	43	44086	Lo-Pres. U-Pack. (316SS) (Buna-N)	3		43888	Box Rail	2
19	12398	O-Ring, Oil Seal Case (Buna-N)	2	44	44088	Adapter (Aluminum Bronze)	3		34018	Stud Mount Kit-Course	1
20	44543	Shim, 1/2 Circle	0-2	45	43875	O-Ring, Adapter (Buna-N)	3		30149	Hub & Key Assembly (H Series)	1
21	29326	Bearing	2	47	44606	Hex Socket Screw (M14 x 40)	4		30148	Hub (M35) (H Series)	1
22	13296	Oil Seal, Crankshaft (Buna-N)	2		44585	Hex Socket Screw-S.S. (M14 x 40)	4		30055	Key (M10 x 6 x 32)	1
23	44542	Oil Seal Case	2	48	44090	V-Packing Case (Aluminum Bronze)	3		34039	Stud Mount - S.S.	1
24	44940	Locking Washer, Connecting Rod	3	49	12391	O-Ring, V-Packing Case (Buna-N)	3		34049	Hub & Key Assembly (R Series)	1
	43641	Washer, Connecting Rod	3	50	44091	Female Adapter (Alum.-Bronze)	3		34020	Hub (M35) (R Series)	1
25	43859	Connecting Rod	3	51	44610	V-Packing (Teflon)	6		34021	Key (M 10 x 8 x 70)	1
26	43861	Plunger Rod	3	52	44092	Male Adapter (Aluminum Bronze)	3	71	44516	Shaft Protector w/2 Screws (89283)	1
	45116	Plunger Rod-316 S.S.	3	53	44094	Discharge Manifold (Alum.-Bronze)	1		31035	Valve Kit	2
27	43864	Plunger Pin	3	54	44093	Disch. Valve Spacer (Alum.-Bronze)	3		34151	Valve Kit (316 SS) (Incl. in Kit)	2
28	29338	Washer	3	55	28243	Back-Up Ring (Teflon)	6		31038	Seal Kit	1
29	100488	Oil Seal, Plunger Rod (Buna-N)	3	56	11379	O-Ring O.V. Spacer (Buna-N)	9		30278	Oiler (1/4" NPT - 1 Oz.)	3
30	44119	Seal Retainer-2 Pc.	3	57	21985	Back-Up Ring (Teflon)	6		30967	Oiler Glass only	
31	43865	Barrier Slinger	3	58	23172	O-Ring (Buna-N)	6				
32	44096	Wick	3	59	44080	Valve Seat (316SS)	6				
33	27790	Oil Pan	1	60	44081	Valve (316SS)	6				
				61	44082	Valve Spring (316SS)	6				

ALL BOLD PRINTED ITEMS are necessary for service and conversion to Corrosion Resistant Model. See Tech Bulletin 41, 52 for additional information.

Before you begin servicing your pump, Please carefully read OPERATOR'S MANUAL and separate SERVICE MANUAL for special lubrication, disassembly and reassembly information.



## HORSEPOWER REQUIREMENTS

Flow		PRESSURE			Pump RPM
		PSI 2000	PSI 2500	PSI 3000	
GPM	L/M	BAR 140	BAR 175	BAR 210	
14	53	19.2	24.0	28.9	800
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<b>DETERMINING THE PUMP R.P.M.</b>		$\frac{\text{Rated G.P.M.}}{\text{Rated R.P.M.}} = \frac{\text{"Desired" G.P.M.}}{\text{"Desired" R.P.M.}}$			
<b>DETERMINING THE REQUIRED H.P.</b>		$\frac{\text{GPM} \times \text{PSI}}{1460} = \text{Electric Brake H.P. Required}$			
<b>DETERMINING MOTOR PULLEY SIZE</b>		$\frac{\text{Motor Pulley O.D.}}{\text{Pump R.P.M.}} = \frac{\text{Pump Pulley O.D.}}{\text{Motor R.P.M.}}$			

Note: Consult engine manufacturer when using gas or diesel engine

## SPECIFICATIONS

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<b>Bore</b> .....	0.984"	(25 mm)
<b>Stroke</b> .....	1.890"	(48 mm)
<b>Crankcase Capacity</b> .....	4.2 Qts.	(4 L)
<b>Maximum Fluid Temperature</b> .....	160°F	(71°C)
<b>Inlet Ports (2)</b> .....	1 1/2" NPT	(1 1/2" NPT)
<b>Discharge Ports (2)</b> .....	1" NPT	(1" NPT)
<b>Pulley Mounting</b> .....	Either side	(Either side)
<b>Shaft Diameter</b> .....	1.378"	(35 mm)
<b>Weight</b> .....	152 lbs.	(69 kg)
<b>Dimensions</b> .....	24.3" x 18.11" x 9.33"	(618 x 460 x 237 mm)

**LUBRICATION**—Before starting pump, fill crankcase per specification with Cat Pump Crankcase Oil, ISO-68 multi-viscosity petroleum-based lubricating oil with antiwear and rust inhibitor additives. Change initial fill after 50 hours running period. Change oil every 3 months or at 500 hour intervals thereafter. Oil setting at three drops per hole, twice per month is sufficient for normal operation. Oil adjustment is vertical to start feed, horizontal to stop feed, 45° to drain reservoir. Additional lubrication may be required with increased hours of operation and temperature.

## INLET CONDITION CHECK-LIST FOR LARGE CAPACITY SYSTEMS

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 the 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.
- ☐ Higher pump RPM's can increase the acceleration loss of the pumped fluid and may require pressurized inlet. This acceleration loss is also increased by higher temperatures, low vapor pressures and higher viscosity.
- ☐ 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. 3515/17-O 489-77 5M