Model 280 shown

3 Frame Piston Pump

Models 280 290

FEATURES

Superior Design

- Triplex Uniflow design provides continuous forward liquid flow for smooth operation.
- Wetted cups and floating pistons are lubricated and cooled by pumped liquid for long cup life.
- Mechanically actuated inlet valves give strong lift and easy prime.
- 304 stainless steel discharge valves for wear resistance.
- Oil bath crankcase assures optimum lubrication.
- 100% wetted seal design allows pumped liquid to cool and lubricate for longer life.

Quality Materials

- Cylinder and sleeve wear surfaces are hard chrome plated 304 stainless steel for maximum durability and abrasion resistance.
- Chrome plated, brass manifolds and optional stainless steel manifolds are strong and corrosion resistant.
- Special high strength TNM connecting rods offer superior bearing quality strength.
- Chrome-moly crankshaft gives unmatched strength and surface hardness.
- Oversized crankshaft bearings with greater loading capacity mean longer bearing life.

Easy Maintenance

- Stepped stainless steel piston rod with chrome-plated, stainless steel sleeve allows easy replacement from front of pump.
- All wet-end wear parts are easily serviced without entering crankcase, requiring less time and effort.
- Wear parts are available in convenient kits.

⚠ WARNING

All systems require both a primary pressure regulating device (i.e., regulator, unloader) and a secondary pressure safety relief device (i.e., pop-off valve, safety valve). Failure to install such relief devices could result in personal injury or damage to the pump or to system components. CAT PUMPS does not assume any liability or responsibility for the operation of a customer's high pressure system.

SPECIFICATIONS

	U.S. Measure	Metric Measure
MODEL 280		
Flow	3.0 GPM	(11.4 L/M)
Pressure Range	100 to 1000 PSI	(7 to 70 Bar)
RPM	1330 RPM	(1330 RPM)
Stroke	0.394"	(10 mm)
Weight	11.7 lbs.	(5.3 kg)
MODEL 290		
Flow	3.5 GPM	(13.2 L/M)
Pressure Range	100 to 1200 PSI	(7 to 85 BAR)
RPM	1200 RPM	(1200 RPM)
Stroke	0.472"	(12 mm)
Weight	12.1 lbs.	(5.5 kg)
COMMON SPECIFICATIONS		
Inlet Pressure Range	–8.5 to 40 PSI	(–0.6 to + 2.8 BAR)
Bore	0.787"	(20 mm)
Crankcase Capacity	10 oz.	(.3 L)
Maximum Liquid Temperature	160°F	(71°C)
Above 130°F call CAT PUMPS for inlet conditions and elastomer recommendations.		
Inlet Port (1)	1/2" NPTF	(1/2" NPTF)
Chemical Injection Port (1)	1/4" NPTF	(1/4" NPTF)
Discharge Ports (2)	3/8" NPTF	(3/8" NPTF)
Discharge Port (1)	1/2" NPTF	(1/2" NPTF)
Pulley Mounting	Either side	(Either side)
Shaft Diameters	0.650"	(16.5 mm)
Dimensions (280)	10.63 x 8.79 x 5.30"	(270 x 223x 134.5 mm)
Dimensions (290)	10.83 x 8.79 x 5.30"	(275 x 223x 134.5 mm)

ELECTRIC HORSEPOWER REQUIREMENTS

MODEL	FLOW		PRESSURE			MOTOR PULLEY SIZE	
			PSI 800	PSI 1000	PSI 1200	Using 1725 Nom. RPM Motor & 5.0" Pump Pulley O.D.	
	U.S. GPM	L/M	BAR 55	BAR 70	BAR 85	RPM	Pulley O.D.
280	3.0	11.4	1.6	2.1	N/A	1330	3.9
	2.5	9.5	1.4	1.7	N/A	1108	3.2
	2.0	7.6	1.1	1.4	N/A	887	2.8
290	3.5	13.2	1.9	2.4	2.9	1200	3.5
	3.0	11.4	1.6	2.1	2.5	1029	3.0
	2.5	9.5	1.4	1.7	2.1	858	2.5

DETERMINING THE PUMP R.P.M. $\frac{\text{Rated G.P.M.}}{\text{Rated R.P.M.}} = \frac{\text{"Desired" G.P.M.}}{\text{"Desired" R.P.M.}}$

DETERMINING THE REQUIRED H.P. $\frac{\text{GPM x PSI}}{1460} = \text{Electric Brake H. P. Required}$

DETERMINING MOTOR PULLEY SIZE $\frac{\text{Motor Pulley O.D.}}{\text{Pump R.P.M.}} = \frac{\text{Pump Pulley O.D.}}{\text{Motor R.P.M.}}$

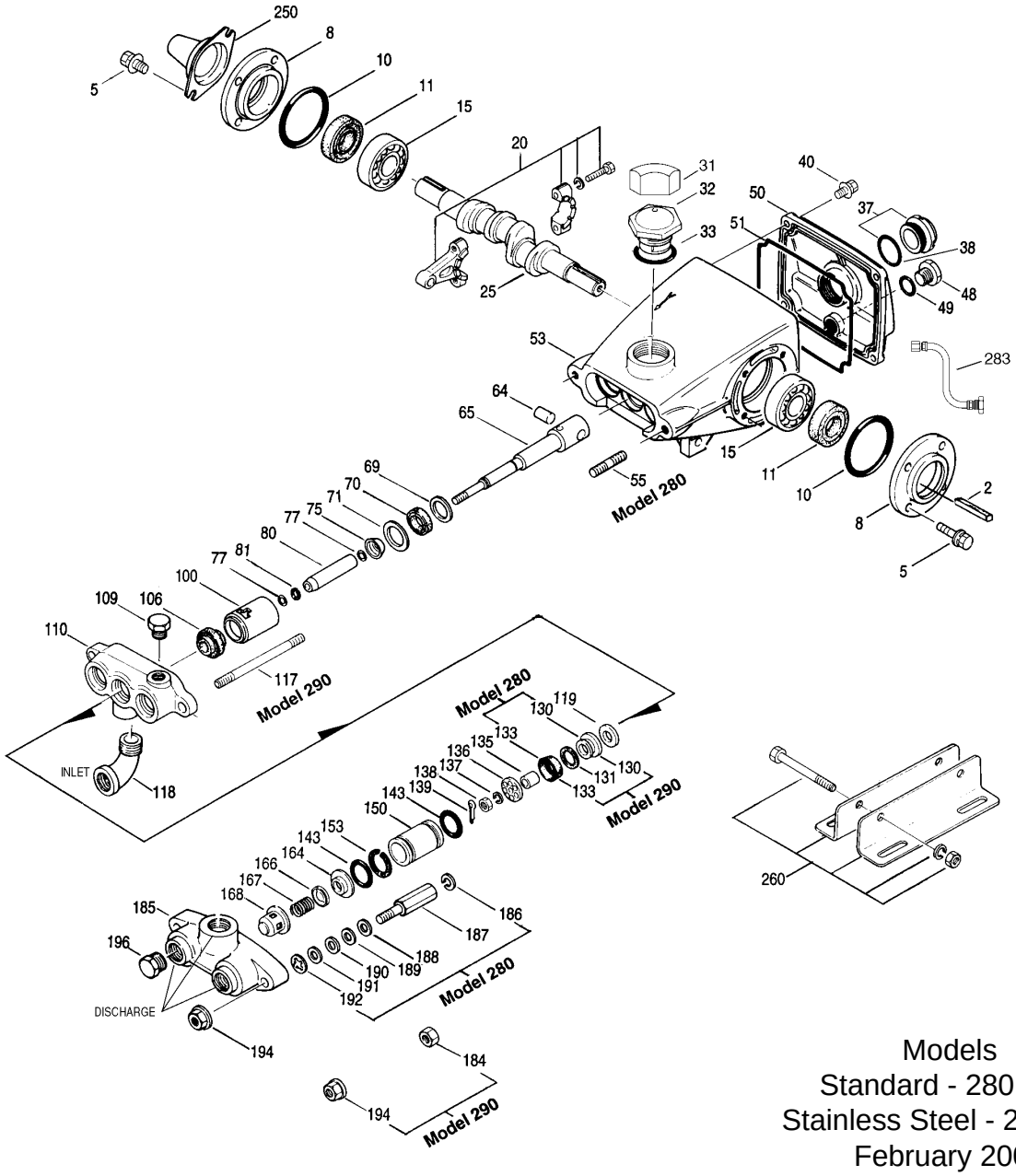
See complete Drive Packages [Incldes: Pulleys, Belts, Hubs, Key] Tech Bulletin 003.
Refer to pump **Service Manual** for repair procedure, additional technical information and **pump warranty**.

"Customer confidence is our greatest asset"

PARTS LIST

ITEM	PART NUMBER				DESCRIPTION	QTY
	280	MATL	290	MATL		
2	*30047*	*STL*	*30047*	*STL*	*Key (M5x5x24)*	*1*
5	92519	STZP	92519	STZP	Screw, HHC Sems (M6x16)	8
	125824	*STCP R*	*125824*	*STCP R*	*Screw, HHC Sems (M6x16)*	*8*
8	27950	AL	27950	AL	Cover, Bearing	2
10	26536	NBR	26536	NBR	O-Ring, Bearing Cover - 70D	2
11	24159	NBR	24159	NBR	Seal, Oil, Crankshaft	2
15	14487	STL R	14487	STL R	Bearing, Ball	2
20	**122041**	**TNM**	**48867**	**TNM**	Rod, Assy Connecting [280-8/02, 290-9/02]	3
25	**26239**	**FCM**	**43804**	**FCM**	Crankshaft	1
31	*828710*	—	*828710*	—	*Protector, Oil Cap w/Foam Gasket*	*1*
32	43211	ABS	43211	ABS	Cap, Oil Filler	1
33	14177	NBR	14177	NBR	O-Ring, Oil Filler Cap - 70D	1
37	92241	—	92241	—	Gauge, Oil Bubble w/Gasket - 80D	1
38	44428	NBR	44428	NBR	Gasket, Flat, Oil Gauge - 80D	1
40	92520	STZP	92520	STZP	Screw, HHC Sems (M6x20)	4
	126541	*STCP R*	*126541*	*STCP R*	*Screw, HHC Sems (M6x20)*	*4*
48	25625	STCP	25625	STCP	Plug, Drain (1/4"x19BSP)	1
49	23170	NBR	23170	NBR	O-Ring, Drain Plug - 70D	1
50	43339	AL	43339	AL	Cover, Rear	1
51	43340	NBR	43340	NBR	O-Ring, Rear Cover	1
53	44658	AL	44658	AL	Crankcase, 4 Screws	1
55	**126546**	**STCP R**	—	—	Stud (M8x41.4)	2
64	16948	CM	16948	CM	Pin, Crosshead	3
65	**29612**	**SZZ**	**101800**	**SZZ**	Rod, Piston	3
69	126259	STCP R	126259	STCP R	Washer, Oil Seal	3
70	25301	NBR	25301	NBR	Seal, Oil - 80D	3
71	126189	STCP R	126189	STCP R	Washer, Oil Seal	3
75	25327	S	25327	S	Slinger, Barrier	3
77	25392	NBR	25392	NBR	O-Ring, Sleeve	6
	28771	*FPM*	*28771*	*FPM*	*O-Ring, Sleeve*	*6*
80	29614	SCP	29614	SCP	Sleeve	3
	29743	*S*	*29743*	*S*	*Sleeve (Unchromed)*	*3*
81	—	—	**29003**	**PTFE**	Back-up-Ring, Sleeve	3
100	28597	PVDF	28597	PVDF	Retainer, Seal	3
106	30315	NBR	30315	NBR	Seal, LPS, Prrrrrm-A-Lube	3
	30325	*FPM*	*30325*	*FPM*	*Seal, LPS, Prrrrrm-A-Lube*	*3*
109	*22177*	*BBCP*	*22177*	*BBCP*	*Plug HH (I/4" NPT)*	*1*
110	25128	BBCP	25128	BBCP	Manifold, Inlet	1
	25635	*SS*	*25635*	*SS*	*Manifold, Inlet*	*1*
117	—	—	**85680**	**STZP**	Stud (M8x99.5)	2
118	22160	BBCP	22160	BBCP	Elbow (1/2" NPT)	1
119	27004	S	27004	S	Valve, Inlet	3
130	**22021**	**S**	**30543**	**S**	Piston	3
131	—	—	**30544**	**PTFE**	Bac-Cup Ring	3
133	43172	FPM	43172	FPM	Cup, Piston	3
133	—	—	***43474***	***FPM***	*Assy, Bac-Cup (Incldes: 130, 131, 133) (290 Only)*	*3*
133	*29089*	*SNG*	*29089*	*SNG*	*Cup, V-Hot*	*3*
135	**27003**	**S**	**27983**	**S**	Spacer, Piston	3
136	27002	S	27002	S	Retainer, Piston	3
137	27006	S	27006	S	Washer, Conical (M6)	3
138	27000	S	27000	S	Nut (M6)	3
139	14158	S	14158	S	Cotterpin (M1.6x10)	3
143	23172	NBR	23172	NBR	O-Ring, Cylinder -70D	6
	11377	*FPM*	*11377*	*FPM*	*O-Ring, Cylinder -80D*	*6*
	26961	*PTFE*	*26961*	*PTFE*	*O-Ring, Cylinder*	*3*
150	**26112**	**SCP**	**101802**	**SCP**	Cylinder	3
	28774	***S***	***43834***	***S***	*Cylinder (Unchromed)*	*3*
153	—	—	**21985**	**PTFE**	Back-Up-Ring, Cylinder	3
164	43434	S	43434	S	Seat, Q.V.	3
	29487	*S*	*29487*	*S*	*Seat, F.V.*	*3*
166	43723	S	43723	S	Valve, Q.V.	3
	22842	*S*	*22842*	*S*	*Valve, F.V.*	*3*
167	43360	S	43360	S	Spring, Q.V.	3
	22031	*S*	*22031*	*S*	*Spring, F.V.*	*3*
168	43442	S	43442	S	Retainer, Spring, Q.V.	3
	22841	*S*	*22841*	*S*	*Retainer, Spring, F.V.*	*3*
184	—	—	**81109**	**STZP**	Nut, Hex (M8)	2
	—	—	***126521***	***STCP R***	*Nut, Hex (M8)*	*2*
185	24459	BBCP	24459	BBCP	Manifold, Discharge	1
	25634	*SS*	*25634*	*SS*	*Manifold, Discharge*	*1*
186	**15845**	**STZP**	—	—	Lockwasher (M8)	2
	126232	***STCP R***	—	—	*Lockwasher (M8)*	*2*
187	**26245**	**STZP**	—	—	Bolt, Cylinder (M8x62.5)	2
	126565	***STCP R***	—	—	*Bolt, Cylinder (M8x62.5)*	*2*
188	**126813**	**STCP R**	—	—	Shim (M8x13x1.0)	2-4
189	**126576**	**STCP R**	—	—	Shim (M8x13x0.5)	2-4
190	**43258**	**STZP**	—	—	Shim (M8x13x0.3)	2-4
	126590	***STCP R***	—	—	*Shim (M8x13x0.3)*	*2-4*
191	**43425**	**STZP**	—	—	Shim (M8x13x2.0)	2-4
	126591	***STCP R***	—	—	*Shim (M8x13x2.0)*	*2-4*
192	**26676**	**S**	—	—	Lockwasher (M8)	2

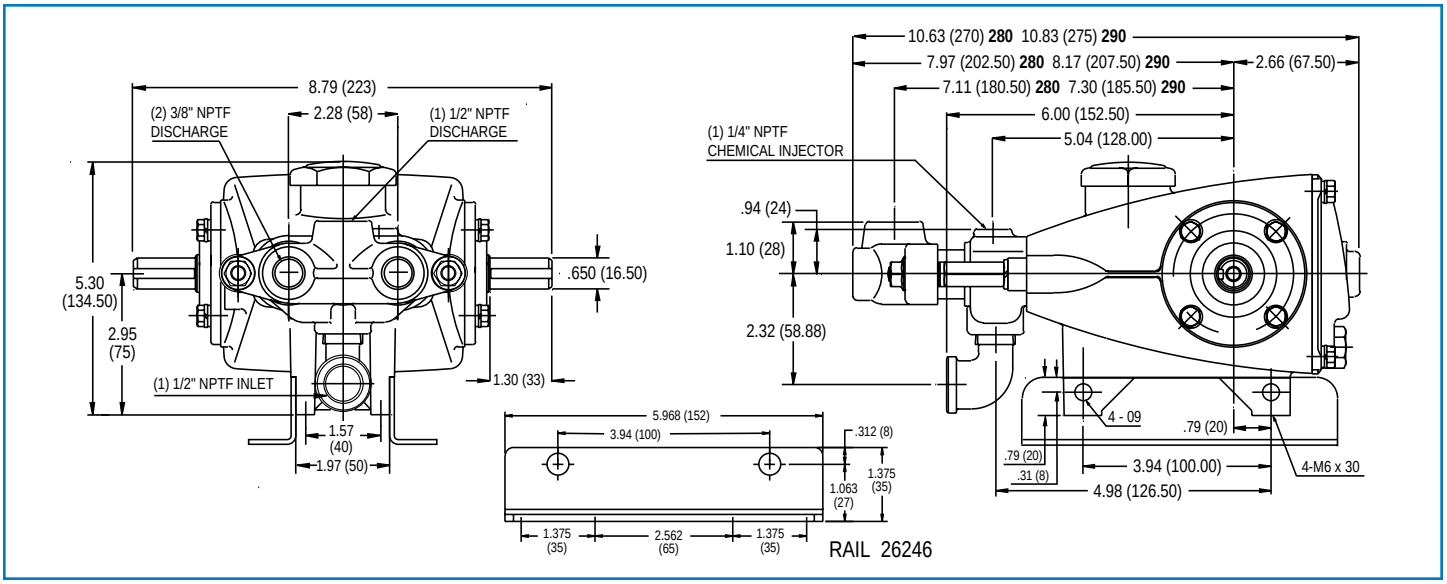
EXPLODED VIEW



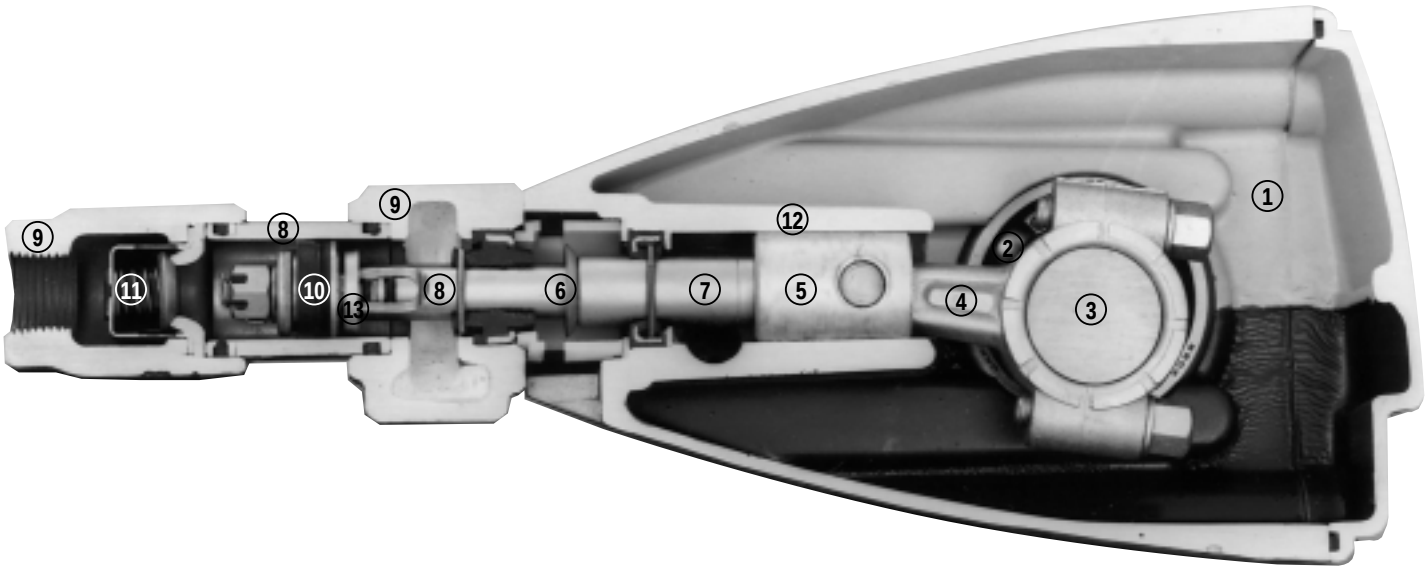
Models
Standard - 280, 290
Stainless Steel - 281, 291
February 2008

	280	MATL	290	MATL		
194	126201	STCP R	126201	STCP R	Nut, Hex Flange (M8)	2
196	22187	BBCP	22187	BBCP	Plug HH (3/8" NPT)	1
250	*25130*	*STCP*	*25130*	*STCP*	*Protector, Shaft*	*1*
260	*30612*	*STZP*	*30612*	*STZP*	*Assy, Angle Rail*	*1*
270	*30246*	*STL*	*30246*	*STL*	*Pulley Assy (Incldes: 30032, 30047)*	*1*
275	*30942*	*STL*	*30942*	*STL*	*Hub & Key Assy (Incldes: 30943, 30047)*	*1*
283	*34334*	*—*	*34334*	*—*	*Kit, Oil Drain*	*1*
298	*34961*	*STZP*	*34961*	*STZP*	*Clutch, Assy, Single Groove, 16.5mm, 12VDC*	*1*
	34964	*STZP*	*34964*	*STZP*	*Clutch, Assy, Dual Groove, 16.5mm, 12VDC*	*1*
300	***30023***	***FPM***	***76023***	***FPM***	*Kit, Cup (Incldes: 133, 139, 143, 355)*	*1*
302	***30202***	***NBR***	***30860***	***NBR***	*Kit, Piston (Incldes: 119-139, 143, 153, 355)*	*1*
304	*30272*	*NBR*	*30272*	*NBR*	*Kit, Hot Cup (Incldes: 133, 139, 143)*	*1*
305	*30431*	*NBR*	*30431*	*NBR*	*Kit, Sleeve & Seal (Incldes: 75, 77, 80, 106, 139)*	*1*
306	*30305*	*NBR*	*30305*	*NBR*	*Kit, Seal (Incldes: 106, 139)*	*1*
310	*30686*	*NBR*	*30686*	*NBR*	*Kit, Valve, Q.V. (Incldes: 143, 164, 166, 167, 168)*	*1*
	30024	*NBR*	*30024*	*NBR*	*Kit, Valve, F.V. (Incldes: 143, 164, 166, 167, 168)*	*1*
355	*22130*	*NY*	*22130*	*NY*	*Inserter, Cup*	*1*
	6107	*—*	*6107*	*—*	*Oil, Bottle (21 oz.) ISO 68 Multi-viscosity Hydraulic (Fill to specified crankcase capacity prior to start-up)*	*1*

Bold print part numbers are unique to a particular pump model. *Italics are optional items.* [ ] Date of latest production change. R Components comply with RoHS Directive.
See Tech Bulletins 002, 003, 012, 016, 017, 020, 024, 026, 030, 033, 034, 036, 074, 077 and 083 for additional information.
All Q.V. parts are necessary for conversions, Q.V. and F.V. parts cannot be mixed.
MATERIAL CODES (Not Part of Part Number): ABS=ABS Plastic AL=Aluminum BBCP=Brass/Chrome Plated CM=Chrome-moly FCM=Forged Chrome-moly FPM=Fluorocarbon NBR=Medium Nitrile (Buna-N) NY=Nylon PTFE=Pure Polytetrafluoroethylene PVDF=Polyvinylidene Fluoride S=304SS SCP=304SS/Chrome Plated SNG=Special Blend (Buna) SS=316SS STCP=Steel/Chrome Plated STL=Steel STZP=Steel/Zinc Plated SZZ=304SS/Zamak TNM=Special High Strength



Models 280, 290



1 Die cast aluminum **crankcase** means high strength, lightweight, and excellent tolerance control.

2 Oversized crankshaft **bearings** provide extended bearing life and pump performance.

3 Chrome-moly **crankshaft** provides unmatched strength and surface hardness for long life.

4 Matched oversized TNM **connecting rods** noted for superior tensile strength and bearing quality.

5 The **piston rods** are high tensile strength 304 stainless steel with Zamak crossheads.

6 The stainless steel **slinger** provides back-up protection for the crankcase seal, keeping pumped liquids out of the crankcase.

7 The **patented stepped piston rod** with hard chrome-plated stainless steel **sleeve** provides a durable wear surface and easy wet-end servicing.

8 The **cylinder** and **sleeve** wear surfaces are hard chrome-plated 304 stainless steel for longer service life.

9 **Manifolds** are of high tensile strength chrome-plated brass or 316 stainless steel for special corrosion resistance.

10 100% wet **cup/seal** design adds to service life by allowing pumped liquids to cool and lubricate the elastomers on both sides.

11 304 stainless steel **valves, seats, and springs** provide corrosion-resistance, ultimate seating and extended life.

12 **Crossheads** are 360° supported for uncompromising alignment.

13 Mechanically actuated **inlet valves** provide strong lift and easy prime.

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