



## 5 Frame Plunger Pump

### Models

30, 31  
34, 35

### FEATURES

#### Superior Design

- Triplex plunger design gives smoother liquid flow.
- Hi-Pressure Seals are completely lubricated and cooled by the liquid being pumped.
- Inlet and discharge valve assemblies interchange for easier maintenance.
- Lubricated Lo-Pressure Seal provides double protection against external leakage.
- Oil bath crankcase assures optimum lubrication.
- Close tolerance concentricity of the ceramic plunger maximizes seal life.
- Convenient direct drive gearbox or electric motor options.

#### Quality Materials

- Precision design 304 stainless steel valves and seats are hardened and polished for ultimate seating and extended valve life.
- Forged brass manifolds for strength and corrosion resistance.
- Special concentric, high density, polished, graphite impregnated, solid ceramic plungers are abrasion resistant and result in extended seal life.
- Specially formulated, CAT PUMP exclusive, Hi-Pressure Seals offer unmatched performance and seal life.
- Die cast aluminum crankcase provides high strength, minimum weight and precision tolerance control.
- Chrome-moly crankshaft gives unmatched strength and surface hardness.
- Oversized crankshaft bearings with greater loading capacity 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.

#### **⚠ 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
<b>MODEL 30 Direct Drive or Gearbox</b>		
Flow .....	3.2 GPM	(12.1 L/M)
Pressure Range .....	100 to 2200 PSI	(7 to 155 BAR)
<b>RPM</b> .....	<b>1725 RPM</b>	<b>(1725 RPM)</b>
Inlet Pressure Range .....	Flooded to 60 PSI	(Flooded to 4 BAR)
Stroke .....	<b>0.315"</b>	<b>(8 mm)</b>
<b>MODEL 31</b>		
Flow .....	4.0 GPM	(15 L/M)
Pressure Range .....	100 to 2200 PSI	(7 to 155 BAR)
<b>RPM</b> .....	<b>950 RPM</b>	<b>(950 RPM)</b>
Inlet Pressure Range .....	-5 to 60 PSI	(-0.35 to 4 BAR)
Stroke .....	<b>0.709"</b>	<b>(18 mm)</b>
<b>MODEL 34 Direct Drive or Gearbox</b>		
Flow .....	4.0 GPM	(15 L/M)
Pressure Range .....	100 to 1800 PSI	(7 to 125 BAR)
<b>RPM</b> .....	<b>1725 RPM</b>	<b>(1725 RPM)</b>
Inlet Pressure Range .....	Flooded to 60 PSI	(Flooded to 4 BAR)
Stroke .....	<b>0.394"</b>	<b>(10 mm)</b>
<b>MODEL 35 Direct Drive or Gearbox</b>		
Flow .....	5.0 GPM	(19 L/M)
Pressure Range .....	100 to 1500 PSI	(7 to 105 BAR)
<b>RPM</b> .....	<b>1725 RPM</b>	<b>(1725 RPM)</b>
Inlet Pressure Range .....	Flooded to 60 PSI	(Flooded to 4 BAR)
Stroke .....	<b>0.472"</b>	<b>(12 mm)</b>

### COMMON SPECIFICATIONS

Bore .....	0.787"	(20 mm)
Crankcase Capacity .....	18 oz.	(0.55 L)
Maximum Liquid Temperature .....	160°F	(71°C)
Above 130°F call CAT PUMPS for inlet conditions and elastomer recommendations.		
Inlet Ports (2) .....	1/2" NPTF	(1/2" NPTF)
Discharge Ports (2) .....	3/8" NPTF	(3/8" NPTF)
Shaft Diameter .....	0.787"	(20 mm)
Weight .....	20.1 lbs.	(9.1 kg)
Dimensions .....	11.69 x 8.35 x 5.28"	(297 x 212 x 134 mm)

### HORSEPOWER REQUIREMENTS

MODEL	FLOW		PRESSURE				MOTOR PULLEY SIZE	
	U.S. GPM	L/M	PSI 1200	PSI 1500	PSI 2000	PSI 2200	Using 1725 RPM Motor & Std. 8" Pump Pulley	
			BAR	BAR	BAR	BAR	RPM	Pulley O.D.
31	5.0	19.0	4.1	5.1	N/A	N/A	1190	5.5
	4.5	17.0	3.7	4.6	6.2	6.8	1070	5.0
	4.0	15.0	3.3	4.1	5.5	6.0	950	4.4
30	3.2	12.1	2.6	3.3	4.4	4.8	1725	Direct Drive
34	4.0	15.0	3.3	4.1	5.5	N/A	1725	Direct Drive
35	5.0	19.0	4.1	5.1	N/A	N/A	1725	Direct Drive

<b>DETERMINING THE PUMP R.P.M.</b>	<u>Rated G.P.M.</u>	=	<u>"Desired" G.P.M.</u>
	<u>Rated R.P.M.</u>	=	<u>"Desired" R.P.M.</u>
<b>DETERMINING THE REQUIRED H.P.</b>	<u>GPM x PSI</u>	=	Electric Brake
	1460	=	H. P. Required
<b>DETERMINING MOTOR PULLEY SIZE</b>	<u>Motor Pulley O.D.</u>	=	<u>Pump Pulley O.D.</u>
	<u>Pump R.P.M.</u>	=	<u>Motor R.P.M.</u>

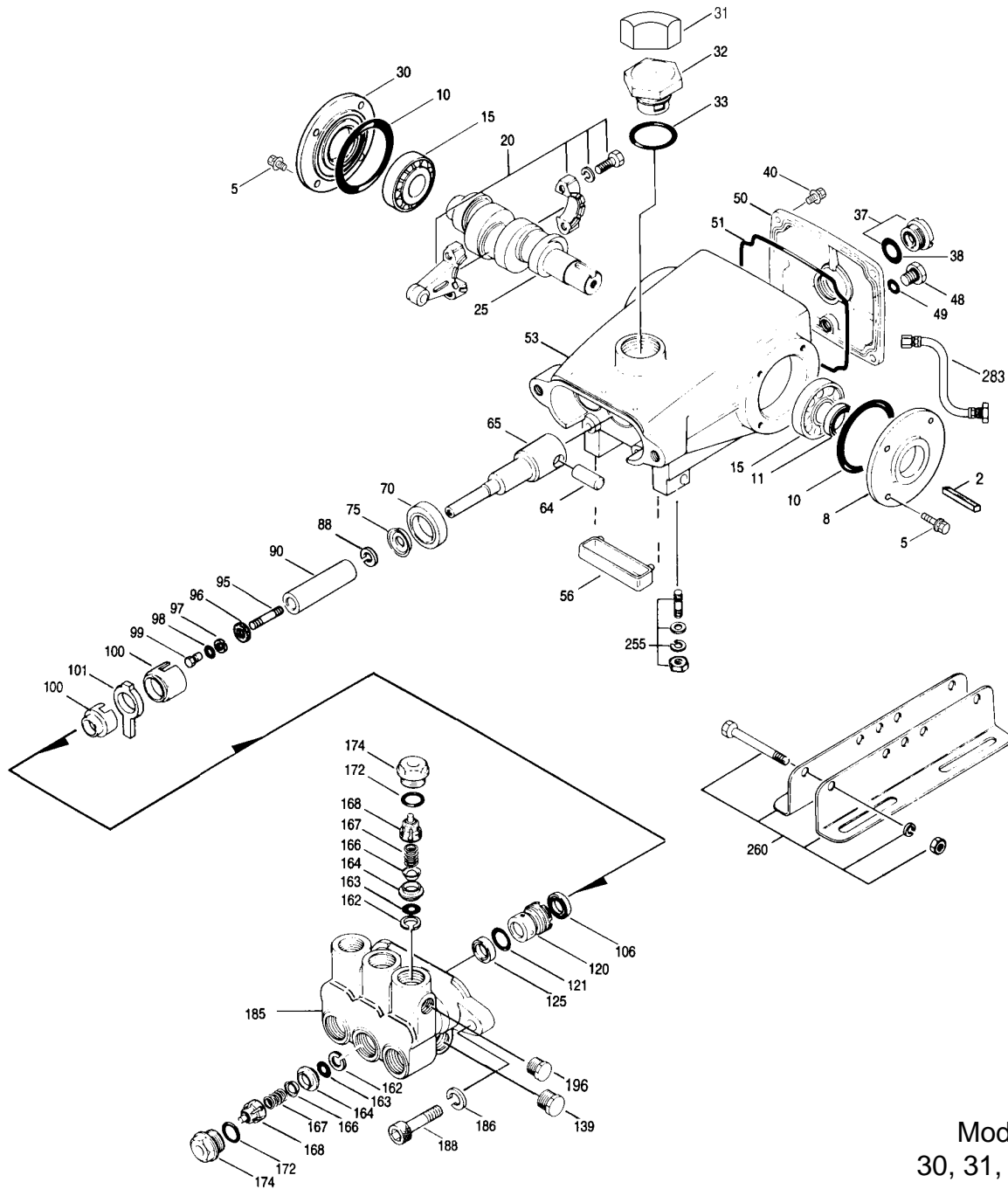
See complete Drive Packages [Incls: Pulleys, Belts, Hubs, Key] Tech Bulletin 003.  
Refer to pump Service Manual for repair procedure and additional technical information.

*"Customer confidence is our greatest asset"*

# PARTS LIST

ITEM	PART NUMBER							DESCRIPTION	QTY	
	30	MATL	31	MATL	34	MATL	35	MATL		
2	30057	STL	30057	STL	30057	STL	30057	STL	Key (M6x6x25)	1
5	92519	STZP	92519	STZP	92519	STZP	92519	STZP	Screw, Sems HHC (M6x16)	8
8	43745	AL	43745	AL	43745	AL	43745	AL	Cover, Bearing	1
10	43343	NBR	43343	NBR	43343	NBR	43343	NBR	O-Ring, Bearing Case	2
11	43222	NBR	43222	NBR	43222	NBR	43222	NBR	Seal, Oil, Crankshaft	1
15	14480	STL	14480	STL	14480	STL	14480	STL	Bearing, Ball	2
20	48737	TNM	48737	TNM	48737	TNM	48737	TNM	Rod, Connecting, Assy [12/01]	3
25	44923	FCM	45911	FCM	44945	FCM	44270	FCM	Crankshaft, Single End	1
30	44944	AL	44944	AL	44944	AL	44944	AL	Cover, Blind Shaft	1
31	828710		828710		828710		828710		Protector, Oil Cap	1
32	43211	ABS	43211	ABS	43211	ABS	43211	ABS	Cap, Oil Filler	1
	44666	RTP	—		44666	RTP	44666	RTP	Cap, Oil Filler, Domed - Gearbox Models	1
33	14177	NBR	14177	NBR	14177	NBR	14177	NBR	O-Ring, Filler Cap - 70D	1
37	92241		92241		92241		92241		Gauge, Oil, Bubble w/Gasket - 80D	1
38	44428	NBR	44428	NBR	44428	NBR	44428	NBR	Gasket, Flat, Oil Gauge - 80D	1
40	92520	STZP	92520	STZP	92520	STZP	92520	STZP	Screw, Sems HHC (M6x20)	4
48	25625	STCP	25625	STCP	25625	STCP	25625	STCP	Plug, Drain (1/4"x19BSP)	1
49	23170	NBR	23170	NBR	23170	NBR	23170	NBR	O-Ring, Drain Plug - 70D	1
50	48777	AL	48777	AL	48777	AL	48777	AL	Cover, Rear [10/01]	1
51	48773	NBR	48773	NBR	48773	NBR	48773	NBR	O-Ring, Crankcase Cover [10/01]	1
53	48775	AL	48775	AL	48775	AL	48775	AL	Crankcase [10/01]	1
56	43355	POP	43355	POP	43355	POP	43355	POP	Pan, Oil	1
64	43351	CM	43351	CM	43351	CM	43351	CM	Pin, Crosshead	3
65	45908	ZZCP	45908	ZZCP	45908	ZZCP	45908	ZZCP	Rod, Plunger, Short	3
70	43228	NBR	43228	NBR	43228	NBR	43228	NBR	Seal, Oil, Crankcase	3
75	43328	S	43328	S	43328	S	43328	S	Slinger, Barrier	3
88	45697	S	45697	S	45697	S	45697	S	Washer, Keyhole (M18)	3
90	43367	CC	43367	CC	43367	CC	43367	CC	Plunger (M20x72)	3
95	89648	STZP	89648	STZP	89648	STZP	89648	STZP	Stud, Plunger Retainer (M6x64.5)	3
96	43235	PTFE	43235	PTFE	43235	PTFE	43235	PTFE	Back-up-Ring, Plunger Retainer	3
97	17399	NBR	17399	NBR	17399	NBR	17399	NBR	O-Ring, Plunger Retainer - 80D	3
	14160	FPM	14160	FPM	14160	FPM	14160	FPM	O-Ring, Plunger Retainer - 80D	3
98	45891	CU	45891	CU	45891	CU	45891	CU	Gasket	3
99	46504	S	46504	S	46504	S	46504	S	Retainer, Plunger (M6)	3
100	45681	PVDF	45681	PVDF	45681	PVDF	45681	PVDF	Retainer, Seal - Rear	3
	45682	PVDF	45682	PVDF	45682	PVDF	45682	PVDF	Retainer, Seal, Adapter	3
101	43302		43302		43302		43302		Wick, Long Tab	3
106	43305	NBR	43305	NBR	43305	NBR	43305	NBR	Seal, LPS w/S-Spg	3
	45153	FPM	45153	FPM	45153	FPM	45153	FPM	Seal, LPS w/SS-Spg	3
120	45679	BB	45679	BB	45679	BB	45679	BB	Case, Seal	3
121	14200	NBR	14200	NBR	14200	NBR	14200	NBR	O-Ring, Seal Case - 70D	3
	11719	FPM	11719	FPM	11719	FPM	11719	FPM	O-Ring, Seal Case	3
125	43307	SNG	43307	SNG	43307	SNG	43307	SNG	Seal, HPS w/S	3
	44936	FPM	44936	FPM	44936	FPM	44936	FPM	Seal, HPS w/SS	3
	46667	HT	46667	HT	46667	HT	46667	HT	Seal, HPS w/S, Hi-Temp	3
139	22179	BBCP	22179	BBCP	22179	BBCP	22179	BBCP	Plug, Inlet (1/2" NPT)	1
162	48361	D	48361	D	48361	D	48361	D	Back-up-Ring, Seat	6
163	43358	NBR	43358	NBR	43358	NBR	43358	NBR	O-Ring, Seat - 70D	6
	44938	FPM	44938	FPM	44938	FPM	44938	FPM	O-Ring, Seat - 70D	6
164	43725	S	43725	S	43725	S	43725	S	Seat	6
166	43723	S	43723	S	43723	S	43723	S	Valve	6
167	43750	S	43750	S	43750	S	43750	S	Spring	6
168	44565	PVDF	44565	PVDF	44565	PVDF	44565	PVDF	Retainer, Spring	6
172	17615	NBR	17615	NBR	17615	NBR	17615	NBR	O-Ring, Valve Plug - 75D	6
	15855	FPM	15855	FPM	15855	FPM	15855	FPM	O-Ring, Valve Plug - 70D	6
174	44202	BB	44202	BB	44202	BB	44202	BB	Plug, Valve	6
185	45062	BB	45062	BB	45062	BB	45062	BB	Head, Manifold	1
186	12503	STZP	12503	STZP	12503	STZP	12503	STZP	Lockwasher (M10)	2
188	124396	STZP	124396	STZP	124396	STZP	124396	STZP	Screw, HSH (M10x35)	2
196	43633	BB	43633	BB	43633	BB	43633	BB	Plug, Discharge, (3/8" NPT)	1
255	—		30243	STZP	—		—		Mount Kit, Direct (Belt Drive Only)	1
260	—		30611	STZP	—		—		Rail Mounting, Angle - B - (Incls: 28499, 30900, 30910, 30920)	1
265	—		30659		—		—		Kit, Complete Mounting (Incls: 30611, 30633, 118672)	1
270	—		30633	STL	—		—		Pulley & Key Assy (Incls: 30058, 30057)	1
275	—		30944	STL	—		—		Hub & Key Assy (M20 w/M6 Keyway)	1
									<b>[See Drive Packages Tech Bulletin 003]</b>	
277	34131	AL	34131	AL	34131	AL	34131	AL	Housing, Bell (182TC-184TC)	1
278	8230	AL	8230	AL	8230	AL	8230	AL	Flexible Coupling & Key (M20 to 1-1/8")	1
283	34334		34334		34334		34334		Kit, Oil Drain	1
298	34962	STZP	34962	STZP	34962	STZP	34962	STZP	Clutch Assy, Single Groove, 20mm, 12VDC	1
	34963	STZP	34963	STZP	34963	STZP	34963	STZP	Clutch Assy, Dual Groove, 20mm, 12VDC	1
299	812208	FBB	812208	FBB	812208	FBB	812208	FBB	Head, Complete	1

# EXPLODED VIEW



Models  
30, 31, 34, 35  
April 2004

	<b>30</b>	<b>MATL</b>	<b>31</b>	<b>MATL</b>	<b>34</b>	<b>MATL</b>	<b>35</b>	<b>MATL</b>		
300	30623	NBR	30623	NBR	30623	NBR	30623	NBR	Kit, Seal (Incls: 97,101,106,121,125)	1
	34155	FPM	34155	FPM	34155	FPM	34155	FPM	Kit, Seal (Incls: 97,101,106,121,125)	1
	33623	HT	33623	HT	33623	HT	33623	HT	Kit, Seal (Incls: 97,101,106,121,125)	1
310	30821	NBR	30821	NBR	30821	NBR	30821	NBR	Kit, Valve (Incls: 162,163,164,166,167,168,172)	2
	31821	FPM	31821	FPM	31821	FPM	31821	FPM	Kit, Valve (Incls: 162,163,164,166,167,168,172)	2
350	30696	STZP	30696	STZP	30696	STZP	30696	STZP	Plier, Reverse	1
351	33004	STZP	33004	STZP	33004	STZP	33004	STZP	Seal Case Socket, 1/2" Drive	1
—	6565.1		6565.1		6565.1		6565.1		Plunger Pump Service Video	1
—	6107		6107		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. See Tech Bulletins 003, 024, 036, 074, 077, 078, 083 and 090 for additional information.

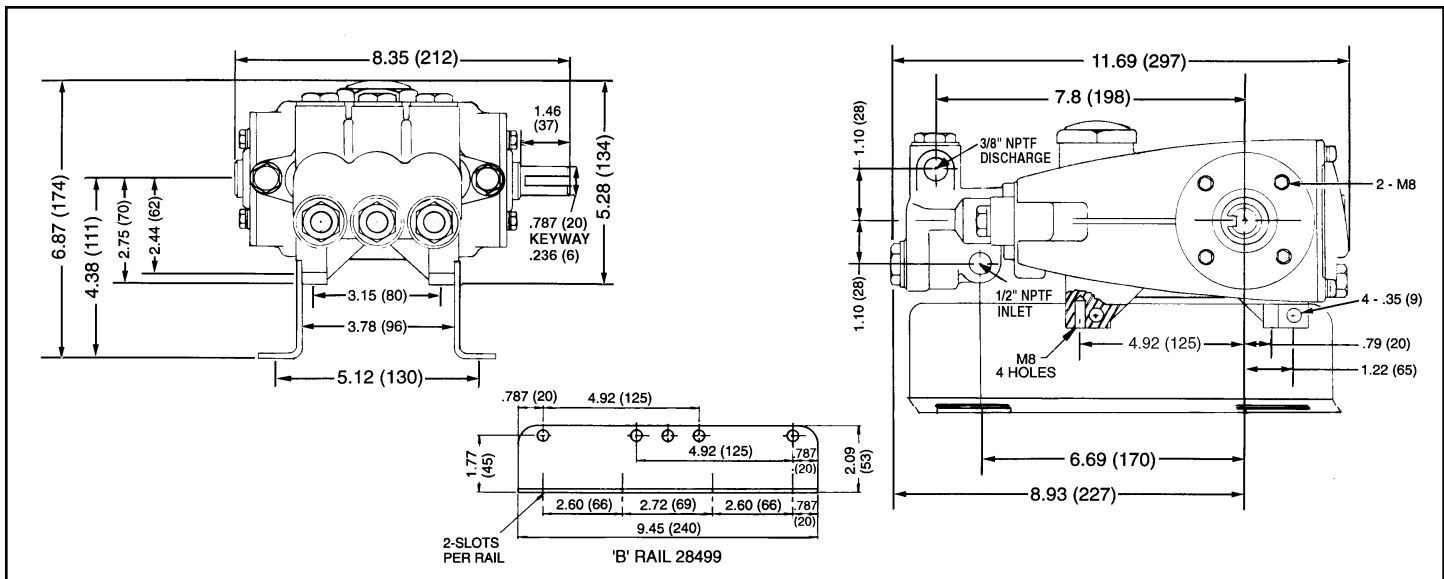
See 8051-8078 Gearbox Gas Engine Drive and 8023ES-8029ES BD Electric Motor Drive data sheets for additional information.

MATERIAL CODES (Not Part of Part Number): ABS=ABS Plastic AL=Aluminum BB=Brass BBCP=Brass/Chrome Plated CC=Ceramic CM=Chrome-Moly CU=Copper

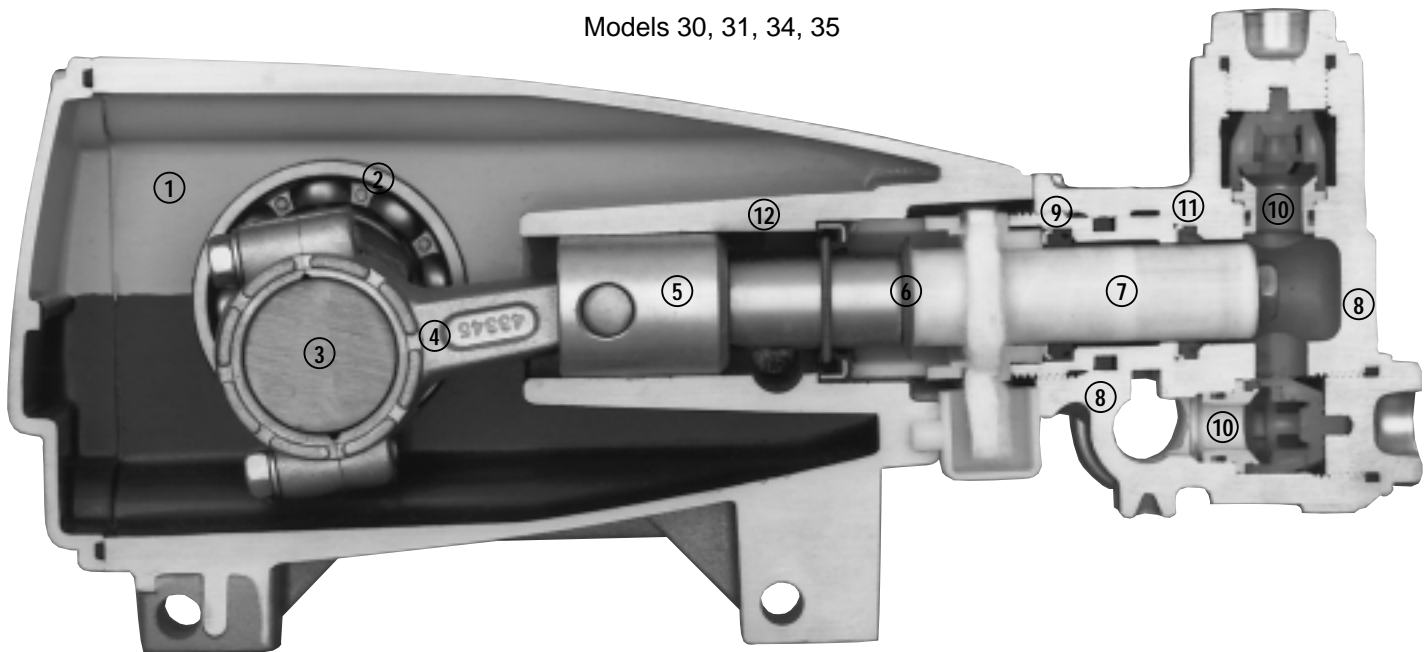
D=Delrin® FBB=Forged Brass FCM=Forged Chrome-moly FPM=Fluorocarbon (Viton®) HT=High Temp (EPDM Alternative) NBR=Medium Nitrile (Buna-N)

POP=Polypropylene PTFE=Pure Teflon® PVD=Fluoroplastic (High Strength) RTP=Reinforced Composite

S=304SS SNG=Special Blend (Buna) STL=Steel STCP=Steel/Chrome Plated STZP=Steel/Zinc Plated TNM=Special/High Strength ZZ/CP=Zamak/Chrome Plated



Models 30, 31, 34, 35



- 1 Die cast aluminum **crankcase** means high strength, light weight, 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 strength and bearing quality.
- 5 Special high strength **plunger rods** with ZAMAK crossheads for longevity and corrosion resistance.
- 6 The stainless steel **slinger** provides back-up protection for the crankcase seal, keeping pumped liquids out of the crankcase.
- 7 Special concentric, high density, polished, graphite impregnated, solid ceramic **plungers** are abrasion resistant and result in extended seal life.
- 8 **Manifolds** are a high tensile strength forged brass for long term, continuous duty.
- 9 100% **wet seal** design adds to service life by allowing pumped liquids to cool and lubricate on both sides.
- 10 Stainless steel **valves, seats and springs** provide corrosion-resistance, ultimate seating and extended life.
- 11 Specially formulated, CAT PUMP exclusive, **Hi-Pressure Seals** offer unmatched performance and seal life.
- 12 **Crossheads** are 360° supported for uncompromising alignment.

Products described hereon are covered by one or more of the following U.S. patents 3558244, 3652188, 3809508, 3920356, 3930756 and 5035580

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