



## 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.
- Optional gearbox pump version or electric motor option.

#### Quality Materials

- Precision design 304 stainless steel valves and seats are hardened and polished for ultimate seating and extended valve life.
- Forged brass manifold for strength and corrosion resistance.
- Special concentric, high-density, polished, solid ceramic plungers provide a true wear surface 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

#### MODEL 30 Direct Drive

Flow .....3.2 GPM (12.1 L/M)  
 Pressure Range .....100 to 2200 PSI (7 to 155 BAR)  
**RPM .....1725 RPM (1725 RPM)**  
 Inlet Pressure Range .....Flooded to 60 PSI (Flooded to 4 BAR)  
 Stroke .....**0.315"** (8 mm)

#### MODEL 31

Flow .....4.0 GPM (15 L/M)  
 Pressure Range .....100 to 2200 PSI (7 to 155 BAR)  
**RPM .....950 RPM (950 RPM)**  
 Inlet Pressure Range .....-5 to 60 PSI (-0.35 to 4 BAR)  
 Stroke .....**0.709"** (18 mm)

#### MODEL 34 Direct Drive or Gearbox

Flow .....4.0 GPM (15 L/M)  
 Pressure Range .....100 to 1800 PSI (7 to 125 BAR)  
**RPM .....1725 RPM (1725 RPM)**  
 Inlet Pressure Range .....Flooded to 60 PSI (Flooded to 4 BAR)  
 Stroke .....**0.394"** (10 mm)

#### MODEL 35 Direct Drive or Gearbox

Flow .....5.0 GPM (19 L/M)  
 Pressure Range .....100 to 1500 PSI (7 to 105 BAR)  
**RPM .....1725 RPM (1725 RPM)**  
 Inlet Pressure Range .....Flooded to 60 PSI (Flooded to 4 BAR)  
 Stroke .....**0.472"** (12 mm)

### 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)

### ELECTRIC 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 85   | BAR 105  | BAR 140  | BAR 155  | 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 |

**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.**  $\frac{\text{GPM} \times \text{PSI}}{1460}$  = Electric Brake H. P. Required

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

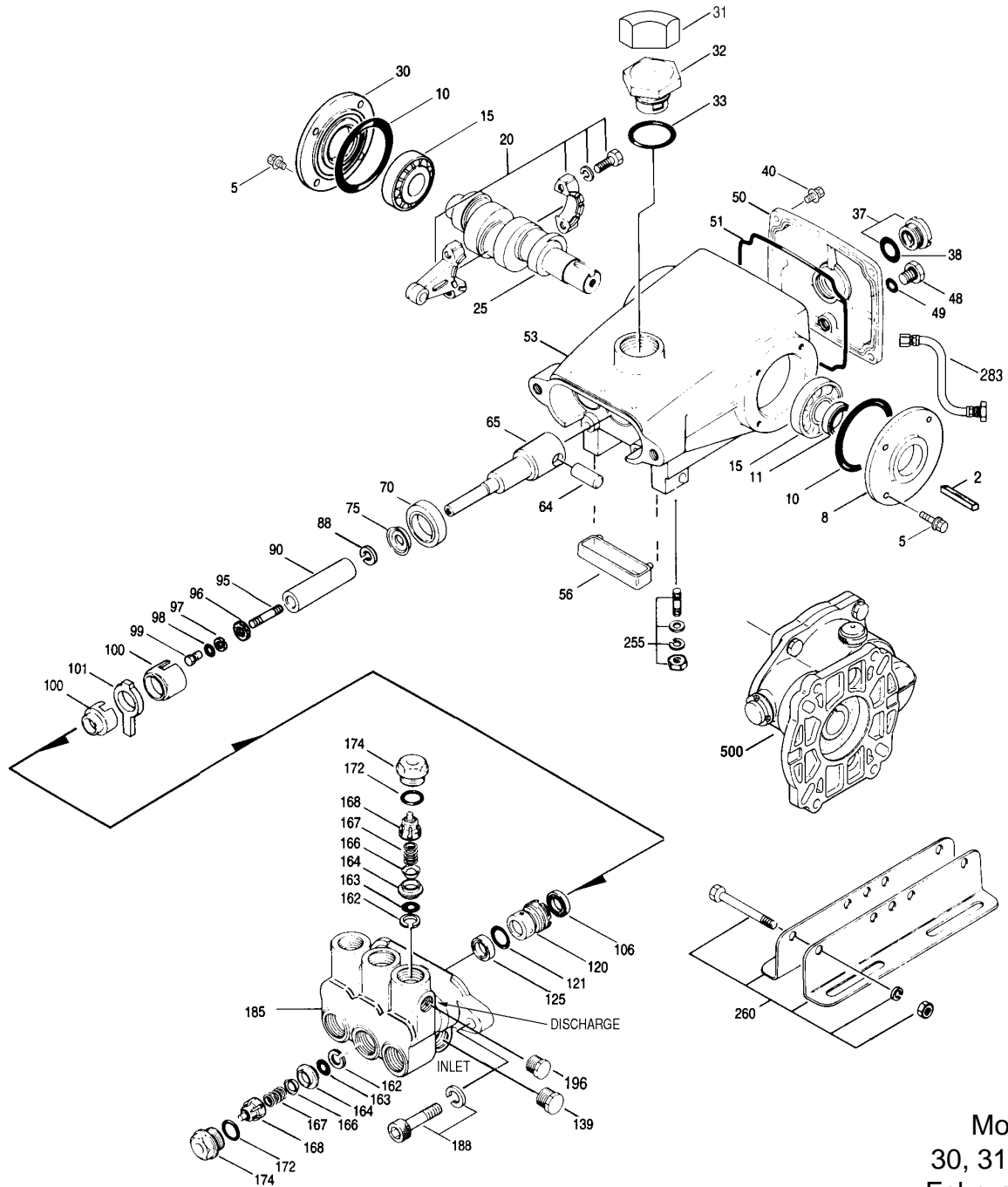
See complete Drive Packages [Incls: Pulleys, Belts, Hubs, Key] Tech Bulletin 003.  
 Refer to pump **Service Manual** for repair procedure, additional technical information and **pump warranty**.

*"Customer confidence is our greatest asset"*

# PARTS LIST

| ITEM | PART NUMBER      |                   |                  |                  | DESCRIPTION  | QTY |
|------|------------------|-------------------|------------------|------------------|--|-----|
|      | 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, HHC Sems (M6x16)                              | 8   |
|      | 125824 STCP R    | 125824 STCP R     | 125824 STCP R    | 125824 STCP R    | Screw, HHC Sems (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 - 70D                           | 2   |
| 11   | 43222 NBR        | 43222 NBR         | 43222 NBR        | 43222 NBR        | Seal, Oil, Crankshaft - 70D                          | 1   |
| 15   | 14480 STL        | 14480 STL         | 14480 STL        | 14480 STL        | Bearing, Ball  | 2   |
| 20   | 45883 HS         | 45883 HS          | 45883 HS         | 48737 TNM        | Rod, Connecting, Assy                                | 3   |
| 25   | <b>44923 FCM</b> | <b>45911 FCM</b>  | <b>44945 FCM</b> | <b>44270 FCM</b> | 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 w/Foam Gasket                     | 1   |
| 32   | 43211 ABS        | 43211 ABS         | 43211 ABS        | 43211 ABS        | Cap, Oil Filler                                      | 1   |
|      | <b>44666 RTP</b> | —                 | <b>44666 RTP</b> | <b>44666 RTP</b> | 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, HHC Sems (M6x20)                              | 4   |
|      | 126541 STCP R    | 126541 STCP R     | 126541 STCP R    | 126541 STCP R    | Screw, HHC Sems (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   | 48774 AL         | 48774 AL          | 48774 AL         | 48774 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   |
|      | 126558 STCP R    | 126558 STCP R     | 126558 STCP R    | 126558 STCP R    | 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 - 70D                       | 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  | 45688 PVDF       | 45688 PVDF        | 45688 PVDF       | 45688 PVDF       | Retainer, Seal, 2-Pc [04/06]                         | 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 2-Pc w/S-Support, 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  | 46756 BB         | 46756 BB          | 46756 BB         | 46756 BB         | Plug, Valve  | 6   |
| 185  | 45062 BB         | 45062 BB          | 45062 BB         | 45062 BB         | Head, Manifold                                       | 1   |
| 188  | 124396 STZP      | 124396 STZP       | 124396 STZP      | 124396 STZP      | Screw, HSH Sems (M10x35)                             | 2   |
|      | 126520 STCP R    | 126520 STCP R     | 126520 STCP R    | 126520 STCP R    | Screw, HSH Sems (M10x35)                             | 2   |
| 196  | 43633 BB         | 43633 BB          | 43633 BB         | 43633 BB         | Plug, Discharge, (3/8" NPT)                          | 1   |
| 255  | —                | <b>30243 STZP</b> | —                | —                | Mount Kit, Direct (Belt Drive Only)                  | 1   |
| 260  | —                | <b>30611 STZP</b> | —                | —                | Rail Mounting, Angle - B                             | 1   |
| 265  | —                | <b>30659</b>      | —                | —                | Kit, Complete Mounting (Incls: 30611, 30633, 118672) | 1   |
| 270  | —                | <b>30633 STL</b>  | —                | —                | Pulley & Key Assy (Incls: 30058, 30057)              | 1   |
| 275  | —                | <b>30944 STL</b>  | —                | —                | Hub & Key Assy (Incls: 30945, 300057)                | 1   |
| 277  | 34131 AL         | 34131 AL          | 34131 AL         | 34131 AL         | Housing, Bell (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   |

# EXPLODED VIEW



Models  
30, 31, 34, 35  
February 2007

|     | <b>30 MATL</b> | <b>31 MATL</b> | <b>34 MATL</b> | <b>35 MATL</b> |   |   |
|-----|----------------|----------------|----------------|----------------|---|---|
| 299 | 812208 FBB     | 812208 FBB     | 812208 FBB     | 812208 FBB     | Head, Complete  | 1 |
| 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 |
| 500 | —              | —              | 8061 —         | 8061 —         | Gearbox (See Individual Data Sheet)   | 1 |
| —   | 6575 —         | 6575 —         | 6575 —         | 6575 —         | Plunger Pump Service DVD  | 1 |
| —   | 6107 —         | 6107 —         | 6107 —         | 6107 —         | Oil, Bottle (21 oz.) ISO 68 Multi-viscosity Hydraulic<br>(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.** R Components comply with RoHS Directive.

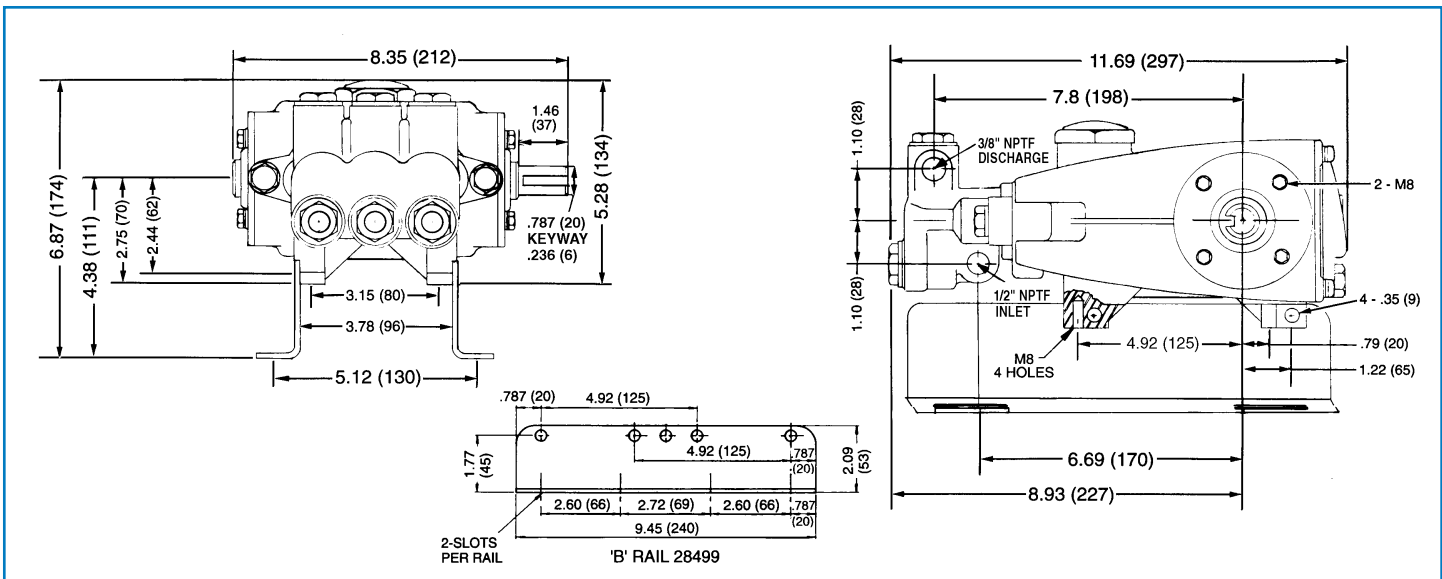
[ ] Date of latest production change. See Tech Bulletins 003, 024, 036, 074, 077, 078, 083 and 090 for additional information.

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

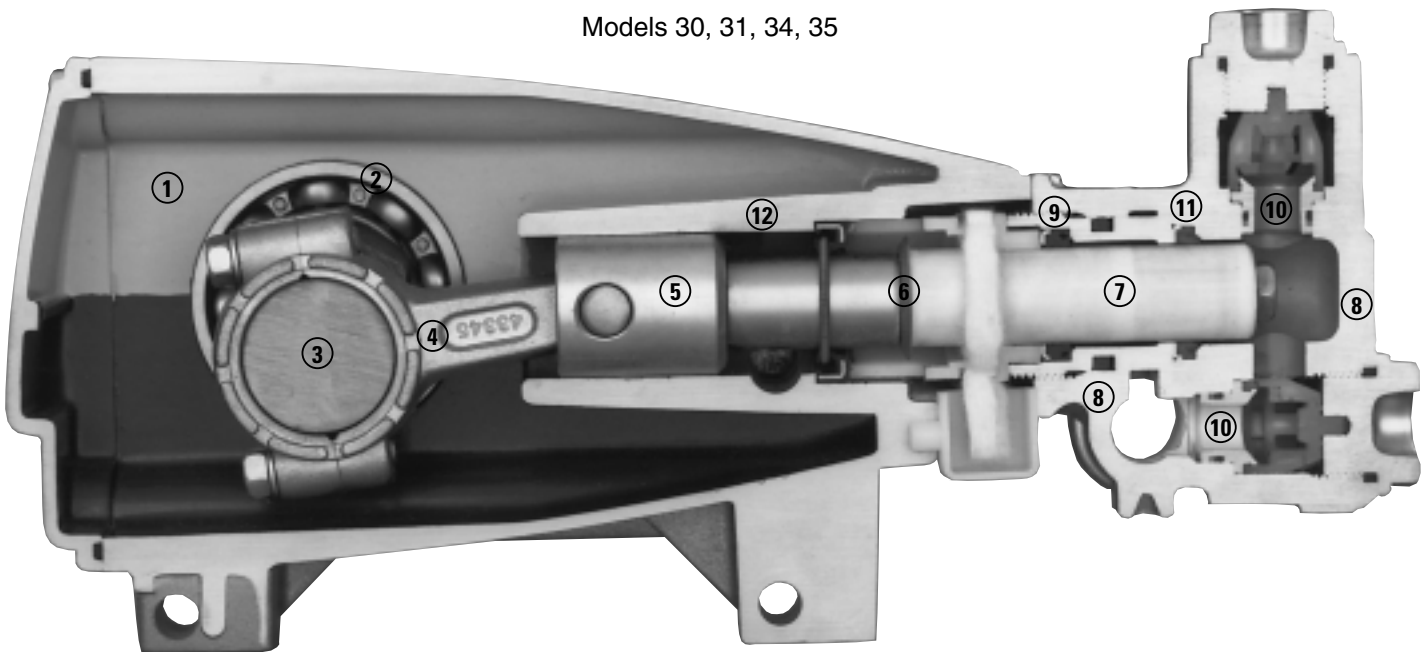
MATERIAL CODES (Not Part of Part Number): ABS=ABS Plastic AL=Aluminum BB=Brass BCCP=Brass/Chrome Plated CC=Ceramic CM=Chrome-Moly CU=Copper D=Acetal FBB=Forged Brass FCM=Forged Chrome-moly FPM=Fluorocarbon HS=High Strength HT=High Temp (EPDM Alternative) NBR=Medium Nitrile (Buna-N)

POP=Polypropylene PTFE=Pure Polytetrafluoroethylene PVDF=Polyvinylidene Fluoride RTP=Reinforced Composite

S=304SS SNG=Special Blend (Buna) STL=Steel STCP=Steel/Chrome Plated STZP=Steel/Zinc Plated 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 high strength **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, solid ceramic **plungers** provide a true wear surface and 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.

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