

## 5CP Stainless Steel Plunger Pump

**Models** 5CP6221  
5CP6241CS  
5CP6251

### FEATURES

#### Superior Design

- Triplex plunger design provides 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.

#### Quality Materials

- Precision design 316 stainless steel valves and seats are hardened and polished for ultimate seating and extended valve life.
- 316 stainless steel manifold is strong and corrosion resistant.
- Special concentric, high-density, polished, solid ceramic plungers provide a true wear surface and 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 capacity mean longer bearing life.

#### Easy Maintenance

- Wet-end is easily serviced without entering crankcase, requiring less time and effort.
- 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

#### MODEL 5CP6221

|                      | U.S. Measure    | Metric Measure   |
|----------------------|-----------------|------------------|
| Flow                 | 6.0 GPM         | (23 L/M)         |
| Pressure Range       | 100 to 2000 PSI | (7 to 140 BAR)   |
| Inlet Pressure Range | -5 to 60 PSI    | (-0.35 to 4 BAR) |
| RPM                  | 1400 RPM        | (1400 RPM)       |
| Stroke               | 0.709"          | (18 mm)          |

#### MODEL 5CP6241CS Direct Drive

|                      | U.S. Measure      | Metric Measure     |
|----------------------|-------------------|--------------------|
| Flow                 | 4.0 GPM           | (15 L/M)           |
| Pressure Range       | 100 to 2000 PSI   | (7 to 140 BAR)     |
| Inlet Pressure Range | Flooded to 60 PSI | (Flooded to 4 BAR) |
| RPM                  | 1725 RPM          | (1725 RPM)         |
| Stroke               | 0.394"            | (10 mm)            |

#### MODEL 5CP6251 Direct Drive

|                      | U.S. Measure      | Metric Measure     |
|----------------------|-------------------|--------------------|
| Flow                 | 5.0 GPM           | (19 L/M)           |
| Pressure Range       | 100 to 2000 PSI   | (7 to 140 BAR)     |
| Inlet Pressure Range | Flooded to 60 PSI | (Flooded to 4 BAR) |
| RPM                  | 1725 RPM          | (1725 RPM)         |
| Stroke               | 0.472"            | (12 mm)            |

### COMMON SPECIFICATIONS

|  |                      |                        |
|--|----------------------|------------------------|
| Bore   | 0.787"               | (20 mm)                |
| Crankcase Capacity   | 17 oz.               | (0.53 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 lbs.              | (8 kg)                 |
| Dimensions   | 11.47 x 10.0 x 5.75" | (291.3 x 254 x 146 mm) |

### ELECTRIC HORSEPOWER REQUIREMENTS

| MODEL     | FLOW     |     | PRESSURE           |                     |                     | RPM  |
|-----------|----------|-----|--------------------|---------------------|---------------------|------|
|           | U.S. GPM | L/M | PSI 1200<br>BAR 85 | PSI 1600<br>BAR 110 | PSI 2000<br>BAR 140 |      |
| 5CP6221   | 6.0      | 23  | 5.0                | 6.6                 | 8.2                 | 1400 |
|           | 5.0      | 19  | 4.1                | 5.5                 | 6.8                 | 1208 |
|           | 4.0      | 15  | 3.3                | 4.4                 | 5.5                 | 966  |
| 5CP6241CS | 4.0      | 15  | 3.3                | 4.4                 | 5.5                 | 1725 |
| 5CP6251   | 5.0      | 19  | 4.1                | 5.5                 | 6.8                 | 1725 |

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

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

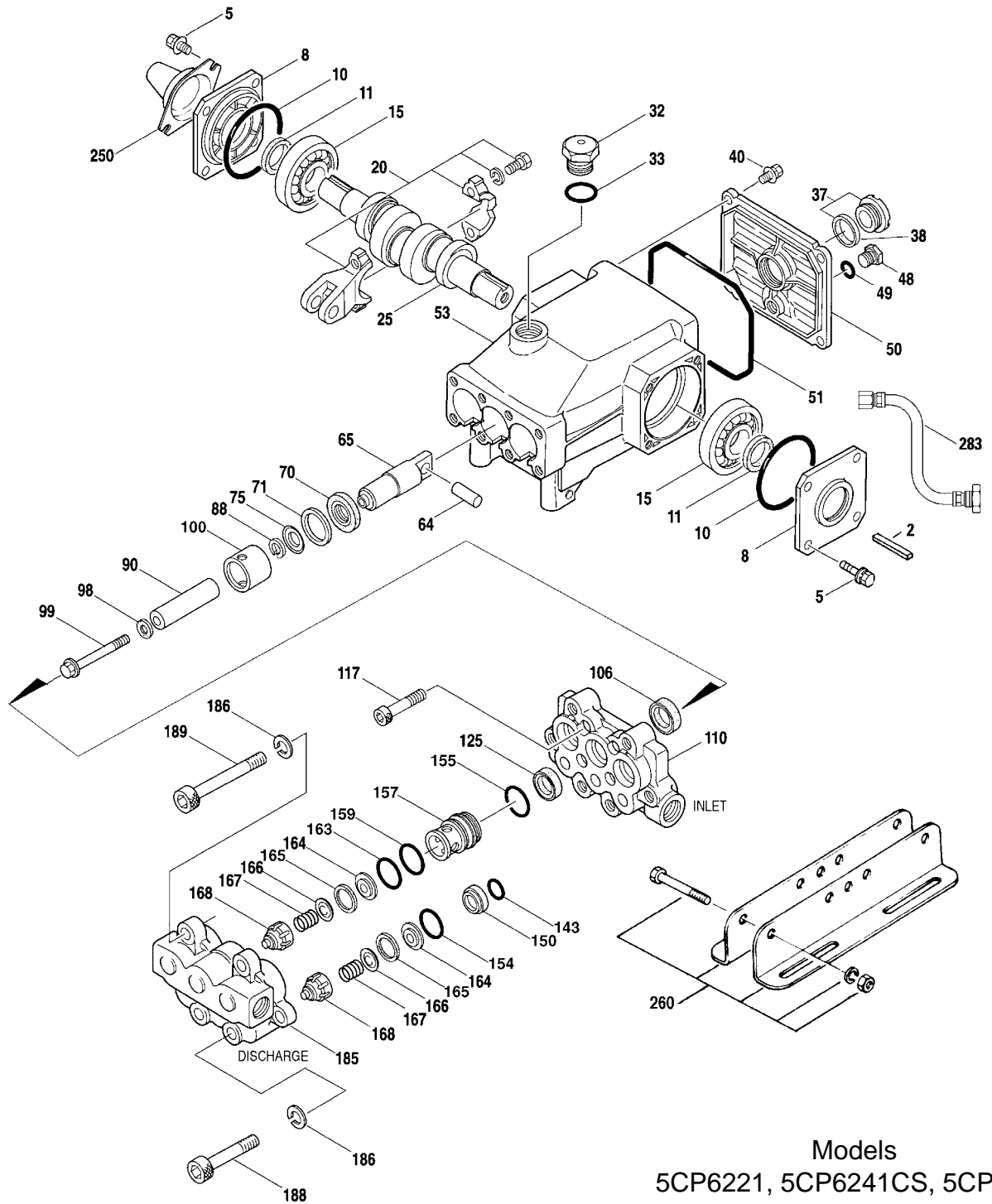
See complete Drive Packages [Inclds: Pulleys, Belts, Hubs, Key] Tech Bulletin 003. Refer to pump **Service Manual** for repair procedure, additional technical information and **pump warranty**.

*"Customer confidence is our greatest asset"*

# PARTS LIST

| ITEM | PART NUMBER |      | PART NUMBER |      | PART NUMBER |      | DESCRIPTION  | QTY |
|------|-------------|------|-------------|------|-------------|------|--|-----|
|      | 5CP6221     | MATL | 5CP6241CS   | MATL | 5CP6251     | MATL |  |     |
| 2    | 30057       | STL  | 30057       | STL  | 30057       | STL  | Key (M6x6x25)  | 1   |
| 5    | 119049      | SS   | 119049      | SS   | 119049      | SS   | Screw, HHC, Sems (M8x16)                                 | 8   |
| 8    | 46910       | AL   | 46910       | AL   | 46910       | AL   | Cover, Bearing   | 2/1 |
| 10   | 14028       | NBR  | 14028       | NBR  | 14028       | NBR  | O-Ring, Cover, Bearing - 70D                             | 2/1 |
| 11   | 43222       | NBR  | 43222       | NBR  | 43222       | NBR  | Seal, Oil, Crankshaft - 70D                              | 2   |
| 15   | 14480       | STL  | 14480       | STL  | 14480       | STL  | Bearing, Ball  | 2   |
| 20   | 48742       | TNM  | 48742       | TNM  | 48742       | TNM  | Rod Assy, Connecting [10/01]                             | 3   |
| 25   | 46928       | FCM  | —           | —    | 46982       | FCM  | Crankshaft, Dual End                                     | 1   |
|      | —           | —    | 48203       | FCM  | —           | —    | Crankshaft, Single End                                   | 1   |
| 30   | —           | —    | 48224       | AL   | —           | —    | Cover, Blind Bearing                                     | 1   |
| 32   | 46798       | —    | 46798       | —    | 46798       | —    | Cap, Oil Filler  | 1   |
| 33   | 14179       | NBR  | 14179       | NBR  | 14179       | NBR  | O-Ring, Oil Filler Cap - 70D                             | 1   |
| 37   | 92241       | —    | 92241       | —    | 92241       | —    | Gauge, Oil, Bubble w/Gasket - 80D                        | 1   |
| 38   | 44428       | NBR  | 44428       | NBR  | 44428       | NBR  | Gasket, Flat, Oil Gauge - 80D                            | 1   |
| 40   | 92538       | S    | 92538       | S    | 92538       | S    | Screw, HHC, Sems (M6x16)                                 | 4   |
| 48   | 25625       | STCP | 25625       | STCP | 25625       | STCP | Plug, Drain (1/4X19BSP)                                  | 1   |
| 49   | 23170       | NBR  | 23170       | NBR  | 23170       | NBR  | O-Ring, Drain Plug - 70D                                 | 1   |
| 50   | 46940       | AL   | 46940       | AL   | 46940       | AL   | Cover, Rear  | 1   |
| 51   | 14044       | NBR  | 14044       | NBR  | 14044       | NBR  | O-Ring, Cover, Rear                                      | 1   |
| 53   | 48617       | AL   | 48617       | AL   | 48617       | AL   | Crankcase  | 1   |
| 64   | 46746       | CM   | 46746       | CM   | 46746       | CM   | Pin, Crosshead   | 3   |
| 65   | 48458       | BBNP | 48458       | BBNP | 48458       | BBNP | Rod, Plunger   | 3   |
| 70   | 46838       | NBR  | 46838       | NBR  | 46838       | NBR  | Seal, Oil, Crankcase - 70D                               | 3   |
| 71   | 48208       | PVDF | 48208       | PVDF | 48208       | PVDF | Washer, Oil Seal   | 3   |
| 75   | 43328       | S    | 43328       | S    | 43328       | S    | Slinger, Barrier   | 3   |
| 88   | 45697       | S    | 45697       | S    | 45697       | S    | Washer, Keyhole (M18)                                    | 3   |
| 90   | 46841       | CC   | 46841       | CC   | 46841       | CC   | Plunger (M20x50)   | 3   |
| 98   | 46730       | NBR  | 46730       | NBR  | 46730       | NBR  | Washer, Seal - 90D                                       | 3   |
|      | 48394       | FPM  | 48394       | FPM  | 48394       | FPM  | Washer, Seal - 90D                                       | 3   |
|      | ◆ 48432     | EPDM | ◆ 48432     | EPDM | ◆ 48432     | EPDM | Washer, Seal   | 3   |
| 99   | † 48201     | SSL  | † 48201     | SSL  | † 48201     | SSL  | Retainer, Plunger (M6x30)                                | 3   |
| 100  | 46749       | PVDF | 46749       | PVDF | 46749       | PVDF | Retainer, Seal   | 3   |
| 106  | 44127       | NBR  | 44127       | NBR  | 44127       | NBR  | Seal, LPS w/SS-Spg                                       | 3   |
|      | 45153       | FPM  | 45153       | FPM  | 45153       | FPM  | Seal, LPS w/SS-Spg                                       | 3   |
|      | ◆ 48429     | EPDM | ◆ 48429     | EPDM | ◆ 48429     | EPDM | Seal, LPS w/SS-Spg, 2-Pc w/S Support                     | 3   |
| 110  | 48552       | SS   | 48552       | SS   | 48552       | SS   | Manifold, Inlet  | 1   |
| 117  | 119034      | S    | 119034      | S    | 119034      | S    | Screw, HSH (M8x35)                                       | 4   |
| 125  | 44649       | SNG  | 44649       | SNG  | 44649       | SNG  | Seal, HPS w/SS   | 3   |
|      | 44936       | FPM  | 44936       | FPM  | 44936       | FPM  | Seal, HPS w/SS   | 3   |
|      | 46667       | HT   | 46667       | HT   | 46667       | HT   | Seal, HPS w/S  | 3   |
| 143  | 17615       | NBR  | 17615       | NBR  | 17615       | NBR  | O-Ring, I.V. Adapter, Rear - 75D                         | 3   |
|      | 15855       | FPM  | 15855       | FPM  | 15855       | FPM  | O-Ring, I.V. Adapter, Rear - 70D                         | 3   |
|      | ◆ 48431     | EPDM | ◆ 48431     | EPDM | ◆ 48431     | EPDM | O-Ring, I.V. Adapter, Rear - 75D                         | 3   |
| 150  | 48212       | SSL  | 48212       | SSL  | 48212       | SSL  | Adapter, Inlet   | 3   |
| 154  | 43781       | NBR  | 43781       | NBR  | 43781       | NBR  | O-Ring, I.V. Adapter, Front - 75D                        | 3   |
|      | 11337       | FPM  | 11337       | FPM  | 11337       | FPM  | O-Ring, I.V. Adapter, Front - 75D                        | 3   |
|      | ◆ 48430     | EPDM | ◆ 48430     | EPDM | ◆ 48430     | EPDM | O-Ring, I.V. Adapter, Front - 75D                        | 3   |
| 155  | 43781       | NBR  | 43781       | NBR  | 43781       | NBR  | O-Ring, D.V. Adapter, Rear - 75D                         | 3   |
|      | 11337       | FPM  | 11337       | FPM  | 11337       | FPM  | O-Ring, D.V. Adapter, Rear - 75D                         | 3   |
|      | ◆ 48430     | EPDM | ◆ 48430     | EPDM | ◆ 48430     | EPDM | O-Ring, D.V. Adapter, Rear - 75D                         | 3   |
| 157  | 48211       | SSL  | 48211       | SSL  | 48211       | SSL  | Adapter, Discharge                                       | 3   |
| 159  | 43781       | NBR  | 43781       | NBR  | 43781       | NBR  | O-Ring, D.V. Adapter, Front - 75D                        | 3   |
|      | 11337       | FPM  | 11337       | FPM  | 11337       | FPM  | O-Ring, D.V. Adapter, Front - 75D                        | 3   |
|      | ◆ 48430     | EPDM | ◆ 48430     | EPDM | ◆ 48430     | EPDM | O-Ring, D.V. Adapter, Front - 75D                        | 3   |
| 163  | 43781       | NBR  | 43781       | NBR  | 43781       | NBR  | O-Ring, Seat - 75D                                       | 3   |
|      | 11337       | FPM  | 11337       | FPM  | 11337       | FPM  | O-Ring, Seat - 75D                                       | 3   |
|      | ◆ 48430     | EPDM | ◆ 48430     | EPDM | ◆ 48430     | EPDM | O-Ring, Seat - 75D                                       | 3   |
| 164  | 48216       | SSL  | 48216       | SSL  | 48216       | SSL  | Seat   | 6   |
| 165  | 43793       | NBR  | 43793       | NBR  | 43793       | NBR  | O-Ring, Seat - 90D                                       | 6   |
|      | 43791       | FPM  | 43791       | FPM  | 43791       | FPM  | O-Ring, Seat - 90D                                       | 6   |
|      | ◆ 48490     | EPDM | ◆ 48490     | EPDM | ◆ 48490     | EPDM | O-Ring, Seat - 90D                                       | 6   |
| 166  | 44038       | SSL  | 44038       | SSL  | 44038       | SSL  | Valve  | 6   |
| 167  | 44039       | SS   | 44039       | SS   | 44039       | SS   | Spring   | 6   |
| 168  | 44564       | PVDF | 44564       | PVDF | 44564       | PVDF | Retainer, Spring   | 6   |
| 185  | 48554       | SS   | 48554       | SS   | 48554       | SS   | Manifold, Discharge                                      | 1   |
| 186  | 19085       | S    | 19085       | S    | 19085       | S    | Lockwasher, Split (M12)                                  | 6   |
| 188  | 120774      | S    | 120774      | S    | 120774      | S    | Screw, HSH (M12x40)                                      | 2   |
| 189  | 89575       | S    | 89575       | S    | 89575       | S    | Screw, HSH (M12x60)                                      | 4   |
| 250  | 118672      | STCP | 118672      | STCP | 118672      | STCP | Protector, Shaft   | 1   |
| 260  | 30611       | STZP | 30611       | STZP | 30611       | STZP | Mount, Rail Assy   | 1   |
| 269  | —           | —    | —           | —    | —           | —    | Pulley [See Drive Packages, Tech Bulletin 003]           | 1   |
| 270  | 30944       | STL  | —           | —    | —           | —    | Hub and Key Assy [See Drive Packages, Tech Bulletin 003] | 1   |
| 278  | —           | —    | 8230        | AL   | 8235        | AL   | Flex Coupling Assy (M20 to 1-1/8" or 1")                 | 1   |
| 279  | —           | —    | 34424       | AL   | 34424       | AL   | Bell Housing Assy (184TC, 10 hp)                         | 1   |
| 280  | —           | —    | —           | —    | —           | —    | BD Direct Drive Motor [See Individual Data Sheet]        | 1   |
| 283  | 34334       | —    | 34334       | —    | 34334       | —    | Kit, Oil Drain   | 1   |
| 290  | 6124        | —    | 6124        | —    | 6124        | —    | Gasket, Liquid (3.0 oz.)                                 | 1   |
| 299  | 816720      | SS   | 816720      | SS   | 816720      | SS   | Head, Complete   | 1   |
| 300  | 34353       | NBR  | 34353       | NBR  | 34353       | NBR  | Kit, Seal (Incls: 98,106,125,143,154,155,159)            | 1   |
|      | 34351       | FPM  | 34351       | FPM  | 34351       | FPM  | Kit, Seal (Incls: 98,106,125,143,154,155,159)            | 1   |
|      | ◆ 34352     | EPDM | ◆ 34352     | EPDM | ◆ 34352     | EPDM | Kit, Seal (Incls: 98,106,125,143,154,155,159)            | 1   |

# EXPLODED VIEW



Models  
5CP6221, 5CP6241CS, 5CP6251  
May 2008

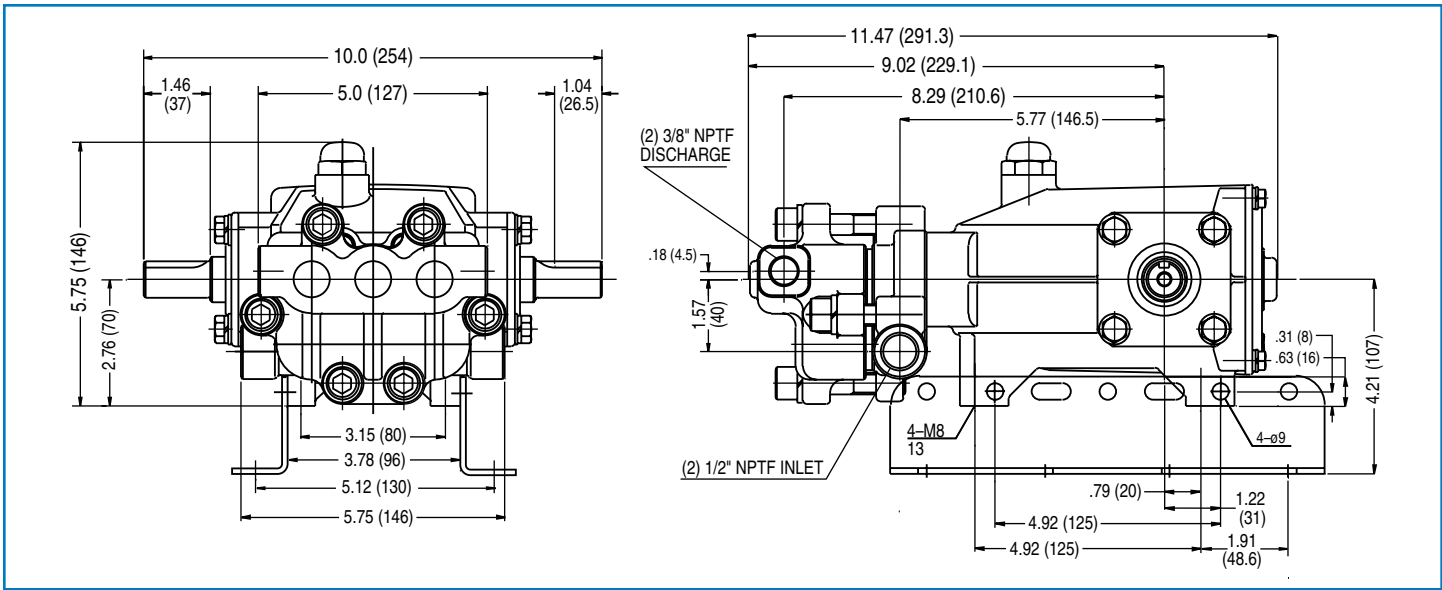
|     | 5CP6221 | MATL | 5CP6241CS | MATL | 5CP6251 | MATL |   |   |
|-----|---------|------|-----------|------|---------|------|---|---|
| 310 | 33972   | NBR  | 33972     | NBR  | 33972   | NBR  | Kit, Valve (Incls: 143,154,163,164,165,166,167,168)   | 1 |
|     | 34362   | FPM  | 34362     | FPM  | 34362   | FPM  | Kit, Valve (Incls: 143,154,163,164,165,166,167,168)   | 1 |
|     | ◆ 34363 | EPDM | ◆ 34363   | EPDM | ◆ 34363 | EPDM | Kit, Valve (Incls: 143,154,163,164,165,166,167,168)   | 1 |
| —   | 711500  | SS   | 711500    | SS   | 711500  | SS   | C.A.T. (Inlet pressure stabilizer for RO and boosted inlet applications)  | 1 |
| —   | 711502  | SS   | 711502    | SS   | 711502  | SS   | Adapter (2 per C.A.T.) (See Data Sheet for complete selection)  | 2 |
| —   | 6107    | —    | 6107      | —    | 6107    | —    | Oil, Bottle (21 oz.) ISO 68 Multi-Viscosity Hydraulic<br>(Fill to specified crankcase capacity prior to start-up) | 1 |
| —   | 6119    | —    | 6119      | —    | 6119    | —    | Lubricant, Antiseize (1.0 oz.)  | 1 |

**Bold print part numbers are unique to a particular pump model.** *Italics are optional items.* [ ] Date of latest production change.

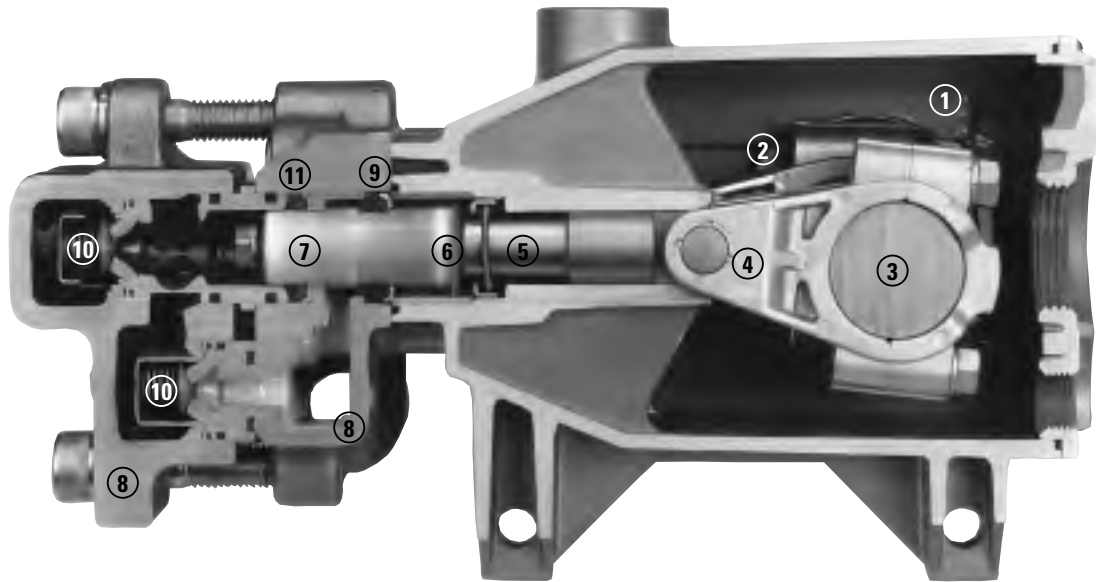
◆ Silicone oil/grease required. † Production parts are different than repair parts.

See Tech Bulletins 002, 003, 024, 036, 043, 053, 056, 074, 077, 083, 088 and 095 for additional information.

MATERIAL CODES (Not Part of Part Number): AL=Aluminum BBNP=Brass/Nickel Plated CC=Ceramic CM=Chrome-moly  
EPDM=Ethylene Propylene Diene Monomer FCM=Forged Chrome-Moly FPM=Fluorocarbon HT=Hi-Temp (EPDM Alternative)  
NBR=Medium Nitrile (Buna-N) PVDF=Polyvinylidene Fluoride S=304SS SS=316SS SSL=316SS/Low Carbon SNG=Special Blend (Buna)  
STCP=Steel/Chrome Plated STZP=Steel/Zinc Plated STL=Steel TNM=Special High Strength



Models 5CP6221, 5CP6241CS, 5CP6251



- 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 **plunger rods** are hardened, surface plated for wear resistance, with high load capacity.
- 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 high tensile strength 316 stainless steel for liquid compatibility and long term, continuous duty.
- 9 100% wet **seal** design adds to service life by allowing pumped liquids to cool and lubricate on both sides.
- 10 316 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.

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