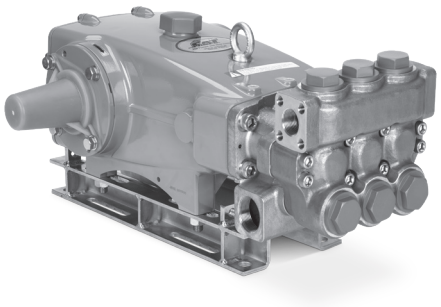
# DATA SHEET
## 35 FRAME PLUNGER PUMPS

CAT PUMPS®
*The Pumps with Nine Lives*

| Brass | Stainless Steel | Stainless Steel Flushed | Nickel Aluminum Bronze |
|---|---|---|---|
| **3535HS** | **3531DHS** | **3531CHS** | **3537HS** |



Model 3531DHS Shown
(Shaft protector included, mounting rails sold separately)

### FEATURES

- Triplex plunger design ensures high efficiency and low pulsation.
- Advanced connecting rod and plunger rod materials optimize drive-end operation for continuous-duty applications and increase capabilities for intermittent-duty performance.
- V-packings and low-pressure seals are completely lubricated and cooled by pumped liquid, greatly increasing service life.
- Model 3531CHS provides an external flush for high-temperature or low-lubricity liquids.
- Pump comes standard with NBR seals. Alternative seal materials are available for higher temperature or chemical compatibility.

| SPECIFICATIONS | U.S. Measure | Metric Measure |
|---|---|---|
| Flow | 36 gpm | 136 lpm |
| Pressure Range | 100–1200 psi | 6.9–83 bar |
| Pump RPM* | 800 rpm | 800 rpm |
| Inlet Pressure Range | Flooded to 70 psi | Flooded to 4.8 bar |
| Maximum Liquid Temp. (NBR) | 160° F | 71° C |
| **Alternative seals available for higher temperatures up to 200° F** | | |
| Bore | 1.575" | 40 mm |
| Stroke | 1.890" | 48 mm |
| Crankcase Capacity | 4.2 qts | 4 l |
| Inlet Ports (2) | 1½" NPT(F) | 1½" NPT(F) |
| Flush Ports (2) | ¼" NPT (F) | ¼" NPT (F) |
| Discharge Ports (2) | 1" NPT(F) | 1" NPT(F) |
| Shaft Diameter | 1.378" | 35 mm |
| Pulley Mounting | Either Side | Either Side |
| Weight | 139 lbs | 63 kg |
| Dimensions | 24.33 x 18.11 x 9.72" | 618 x 460 x 247 mm |
| **ALTERNATE SPECIFICATIONS**** | | |
| Flow | 40 gpm | 151 lpm |
| Pressure Range | 100–2000 psi | 6.9–138 bar |
| Pump RPM* | 888 rpm | 888 rpm |

* Pump minimum is 100 RPM.

**** Intermittent Duty Cycle Defined As:**
Operating pump at maximum rated flow and pressure for no more than 50% of time in any given hour.

### ALTERNATIVE SEAL CONFIGURATION

| MATERIAL | SUFFIX CODE | MAXIMUM TEMPERATURE | |
|---|---|---|---|
| NBR | — | 160° F | (71° C) |
| FPM | .0110 | 180° F | (82° C) |
| EPDM | .0220 | 160° F | (71° C) |
| FFKM | .0770 | 200° F | (93° C) |

See **Tech Bulletin 002** for inlet conditions and RPM at higher temperatures.

**DETERMINING THE PUMP RPM**

$$\frac{\text{Rated gpm}}{\text{Rated rpm}} = \frac{\text{Desired gpm}}{\text{Desired rpm}}$$

**DETERMINING THE REQUIRED HP**

$$\frac{\text{hp (Electric Brake)}}{} = \frac{\text{gpm x psi}}{1460}$$

**DETERMINING MOTOR PULLEY SIZE**

$$\frac{\text{Motor Pulley OD}}{\text{Pump rpm}} = \frac{\text{Pump Pulley OD}}{\text{Motor rpm}}$$

Refer to pump **Service Manual** for repair procedure and additional technical information.

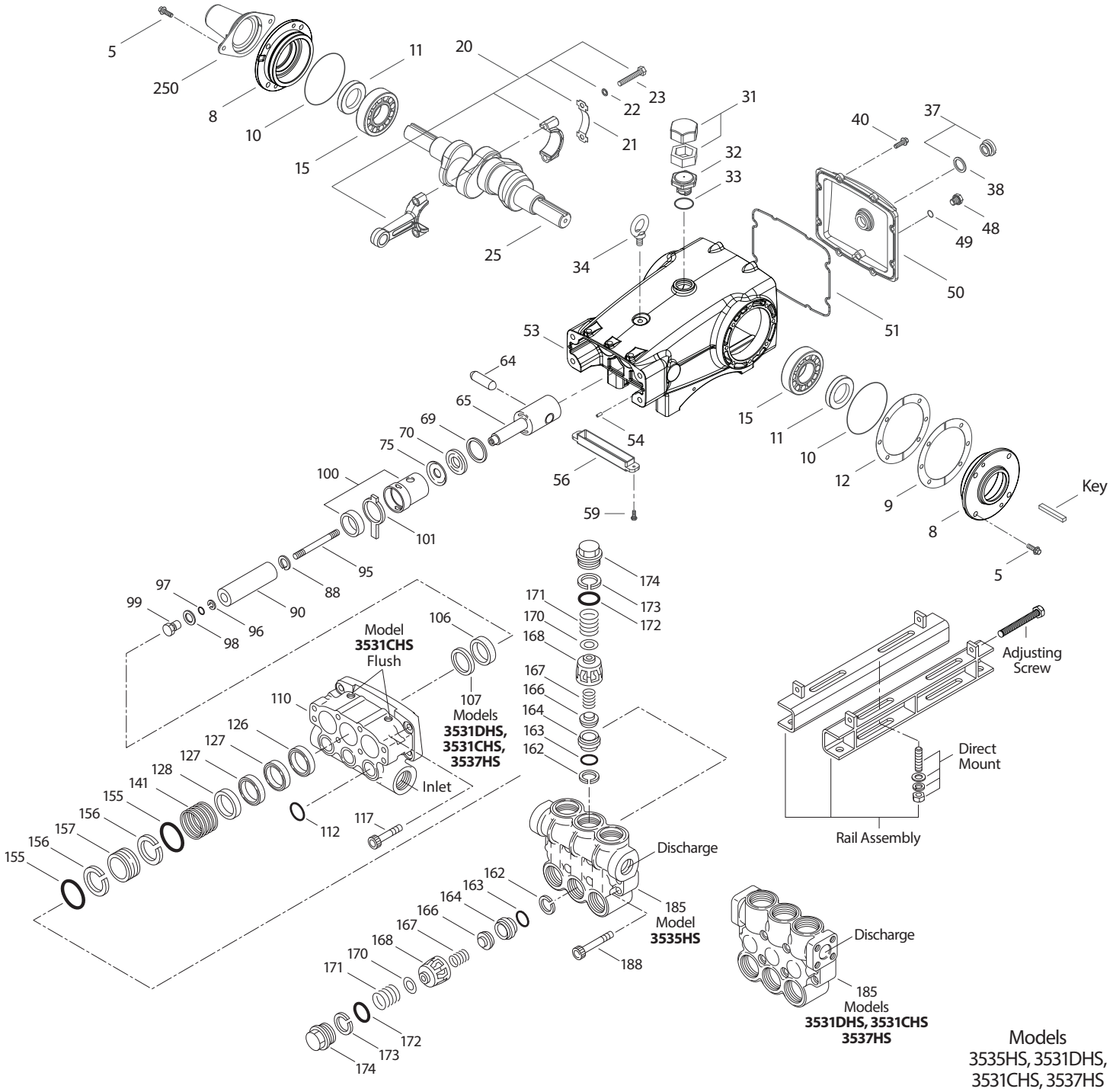
# PARTS LIST

| ITEM | | PART NUMBER 3535HS | MATL | 3531DHS 3531CHS | MATL | 3537HS | MATL | DESCRIPTION | QTY |
|---|---|---|---|---|---|---|---|---|---|
| 5 | | 96049 | S | 96049 | S | 96049 | S | Screw, HHC Sems (M10x25) (See Tech Bulletin 074) | 8 |
| 8 | | 134604 | ALE | 134604 | ALE | 134604 | ALE | Cover, Bearing | 2 |
| 9 | | 815279 | FBR | 815279 | FBR | 815279 | FBR | Shim, Split 2-Piece | 2 |
| 10 | | 12398 | NBR | 12398 | NBR | 12398 | NBR | O-Ring, Bearing Cover–70D | 2 |
| 11 | | 13296 | NBR | 13296 | NBR | 13296 | NBR | Seal, Oil, Crankshaft | 2 |
| 12 | | 855049 | S | 855049 | S | 855049 | S | Shim, Split 2-Piece | 0–2 |
| 15 | | 29326 | STL | 29326 | STL | 29326 | STL | Bearing, Roller | 2 |
| 20 | | 126725 | BZ R | 126725 | BZ R | 126725 | BZ R | Rod, Connecting Assembly (Includes: 21, 22, 23) (See Tech Bulletin 074) | 3 |
| 21 | | 126749 | STCP R | 126749 | STCP R | 126749 | STCP R | Locking Washer (M10) | 3 |
| 22 | | 126593 | STCP R | 126593 | STCP R | 126593 | STCP R | Washer, Flat (M10.5) | 6 |
| 23 | | 122045 | STZP | 122045 | STZP | 122045 | STZP | Screw, HH (M10 x 55) | 6 |
| 25 | | 29325 | FCM | 29325 | FCM | 29325 | FCM | Crankshaft, Dual End (M48) | 1 |
| 31 | | 828710 | PE | 828710 | PE | 828710 | PE | Protector, Oil Cap with Foam Gasket | 1 |
| 32 | | 43211 | ABS | 43211 | ABS | 43211 | ABS | Cap, Oil Filler | 1 |
| 33 | | 14177 | NBR | 14177 | NBR | 14177 | NBR | O-Ring, Oil Filler Cap–70D | 1 |
| 34 | | 126743 | STCP R | 126743 | STCP R | 126743 | STCP R | Bolt, Eye (M12 x 1.75) (For Lifting Pump Only) | 1 |
| 37 | | 92241 | PC | 92241 | PC | 92241 | PC | Gauge, Oil, Bubble with Gasket | 1 |
| 38 | | 44428 | NBR | 44428 | NBR | 44428 | NBR | Gasket, Flat, Oil Gauge–80D | 1 |
| 40 | | 125753 | S | 125753 | S | 125753 | S | Screw, HHC Sems (M8 x 25) (See Tech Bulletin 074) | 8 |
| 48 | | 25625 | STCP | 25625 | STCP | 25625 | STCP | Plug, Drain (¼" x 19 BSP) | 1 |
| 49 | | 23170 | NBR | 23170 | NBR | 23170 | NBR | O-Ring, Drain Plug–70D | 1 |
| 50 | | 45936 | ALE | 45936 | ALE | 45936 | ALE | Cover, Rear | 1 |
| 51 | | 16612 | NBR | 16612 | NBR | 16612 | NBR | O-Ring, Crankcase Cover–70D | 1 |
| 53 | | 134784 | ALE | 134784 | ALE | 134784 | ALE | Crankcase Assembly (Includes: 54) | 1 |
| 54 | | 27488 | S | 27488 | S | 27488 | S | Pins, Guide | 2 |
| 56 | | 27790 | POP | 27790 | POP | 27790 | POP | Pan, Oil | 1 |
| 59 | | 92538 | S | 92538 | S | 92538 | S | Screw, HHC Sems (M6 x 16) | 2 |
| 64 | | 43864 | CM | 43864 | CM | 43864 | CM | Pin, Crosshead | 3 |
| 65 | | 49166 | SSHB | 49166 | SSHB | 49166 | SSHB | Rod, Plunger | 3 |
| 69 | | 126587 | STCP R | 126587 | STCP R | 126587 | STCP R | Washer, Oil Seal | 3 |
| 70 | | 100488 | NBRS | 100488 | NBRS | 100488 | NBRS | Seal, Oil, Crankcase | 3 |
| 75 | | 43865 | S | 43865 | S | 43865 | S | Slinger, Barrier | 3 |
| 88 | | 45676 | S | 45676 | S | 45676 | S | Washer, Keyhole (M16) | 3 |
| 90 | | 43921 | CC | 43921 | CC | 43921 | CC | Plunger (M40 x 145) | 3 |
| 95 | † | 89778 | SS | 89778 | SS | 89778 | SS | Stud, Plunger Retainer (M10 x 135) | 3 |
| 96 | | 20189 | PTFE | 20189 | PTFE | 20189 | PTFE | Backup Ring, Plunger Retainer | 3 |
| 97 | | 11345 | NBR | 11345 | NBR | 11345 | NBR | O-Ring, Plunger Retainer–70D | 3 |
| 98 | | 44085 | SS | 44085 | SS | 44085 | SS | Gasket, Retainer | 3 |
| 99 | † | 44084 | SS | 44084 | SS | 44084 | SS | Retainer, Plunger (M10) (See Tech Bulletin 074) | 3 |
| 100 | | 814279 | PVDF | 814279 | PVDF | 814279 | PVDF | Retainer, Seal, 2-Piece | 3 |
| 101 | | 44112 | — | 44112 | — | 44112 | — | Wick, Long Tab | 3 |
| 106 | † | 44113 | NBR | 44113 | NBR | 44113 | NBR | Seal, Low-Pressure with SS-Spring | 3 |
| 107 | | — | — | **45381** | SS | **44115** | NAB | Spacer, Low-Pressure Seal | 3 |
| 110 | | **49464** | BBCP R | **45365** | SS | **45124** | NAB | Manifold, Inlet | 1 |
| | | — | — | **125397** | SS | — | — | Manifold, Inlet, Flushed (Model 3531CHS) | 1 |
| 112 | | 11379 | NBR | 11379 | NBR | 11379 | NBR | O-Ring, Inlet Manifold–70D | 3 |
| 117 | | 44585 | S | 44585 | S | 44585 | S | Screw, HSH (M14 x 40) (See Tech Bulletin 074) | 4 |
| 126 | | **46494** | BB | **48391** | D | **48391** | D | Adapter, Female | 3 |
| 127 | | 44609 | STG | 44609 | STG | 44609 | STG | V-Packing | 6 |
| 128 | | **43928** | BB | **45368** | SS | **45368** | SS | Adapter, Male | 3 |
| 141 | | 49519 | SS | 49519 | SS | 49519 | SS | Spring, Large Coil | 3 |
| 155 | | 48860 | NBR | 48860 | NBR | 48860 | NBR | O-Ring, V-Packing Spacer–90D | 6 |
| 156 | | 48362 | D | 48362 | D | 48362 | D | Backup Ring, V-Packing Spacer | 6 |
| 157 | | **49478** | BB | **49520** | SS | **49521** | NAB | Spacer, V-Packing | 3 |
| 162 | | 48363 | D | 48363 | D | 48363 | D | Backup Ring, Valve Seat | 6 |
| 163 | | 26142 | NBR | 26142 | NBR | 26142 | NBR | O-Ring, Seat–80D | 6 |
| 164 | | **44727** | S | **44612** | SS | **44612** | SS | Seat, Stepped | 6 |
| 166 | | **43932** | S | **44108** | SS | **44108** | SS | Valve | 6 |
| 167 | | 44109 | SS | 44109 | SS | 44109 | SS | Spring | 6 |
| 168 | | 44728 | PVDF | 44728 | PVDF | 44728 | PVDF | Retainer, Spring | 6 |
| 170 | | 44729 | SS | 44729 | SS | 44729 | SS | Washer, Spring Retainer | 6 |
| 171 | | 44644 | SS | 44644 | SS | 44644 | SS | Coil Spring (70 kg), Valve Plug | 6 |
| 172 | | 89827 | NBR | 89827 | NBR | 89827 | NBR | O-Ring, Valve Plug–90D | 6 |
| 173 | | 48364 | D | 48364 | D | 48364 | D | Backup Ring, Valve Plug | 6 |
| 174 | | **46444** | FBB | **49300** | SSD | **44643** | NAB | Plug, Valve | 6 |
| 185 | | **49465** | BBCP R | **49299** | SSD | **76335** | NAB | Manifold, Discharge | 1 |
| 188 | | 89981 | S | 89981 | S | 89981 | S | Screw, HSH (M12 x 70) (See Tech Bulletin 074) | 8 |
| 250 | | 855042 | NY | 855042 | NY | 855042 | NY | Protector, Shaft with Two (2) Screws, Lockwashers and Washers | 1 |

**Bold Part Numbers are unique to a particular pump model.** *Italics are optional items.* † Production parts are different from repair parts.
R Compoments comply with RoHS Directive. For additional technical information see www.catpumps.com/literature/tech-bulletins.
MATERIAL CODES (Not Part of Part Number): ABS=ABS Plastic AL=Aluminum ALE=Aluminum Epoxy BB=Brass BBCP=Brass/Chrome Plated BZ=Bronze CC=Ceramic CM=Chrome-Moly D=Acetal EPDM=Ethylene Propylene Diene Monomer FBB=Forged Brass FBR=Fiber FCM=Forged Chrome-moly FFKM=Perfluoroelastomer FPM=Fluorocarbon NAB=Nickel Aluminum Bronze NBR=Medium Nitrile (Buna-N) NBRS=Buna, Silicone Free NY=Nylon PC= Poly Carbonate PE=Polyethylene POP=Polypropylene PTFE=Pure Polytetrafluoroethylene PVDF=Polyvinylidene Fluoride S=304SS SS=316SS SSHB=316SS/High Strength Brass STCP=Steel/Chrome Plated SFG=Special Blend (FPM) STG=Special Blend (PTFE) White SSD=Duplex Stainless Steel STL=Steel STZP=Steel/Zinc Plated ZP=Zinc Plated

**Optional Parts and Accessories and Service parts listed on page 3. Standard and Optional Seal and Valve Kits listed on page 4.**

# EXPLODED VIEW




Models
3535HS, 3531DHS,
3531CHS, 3537HS
October 2023

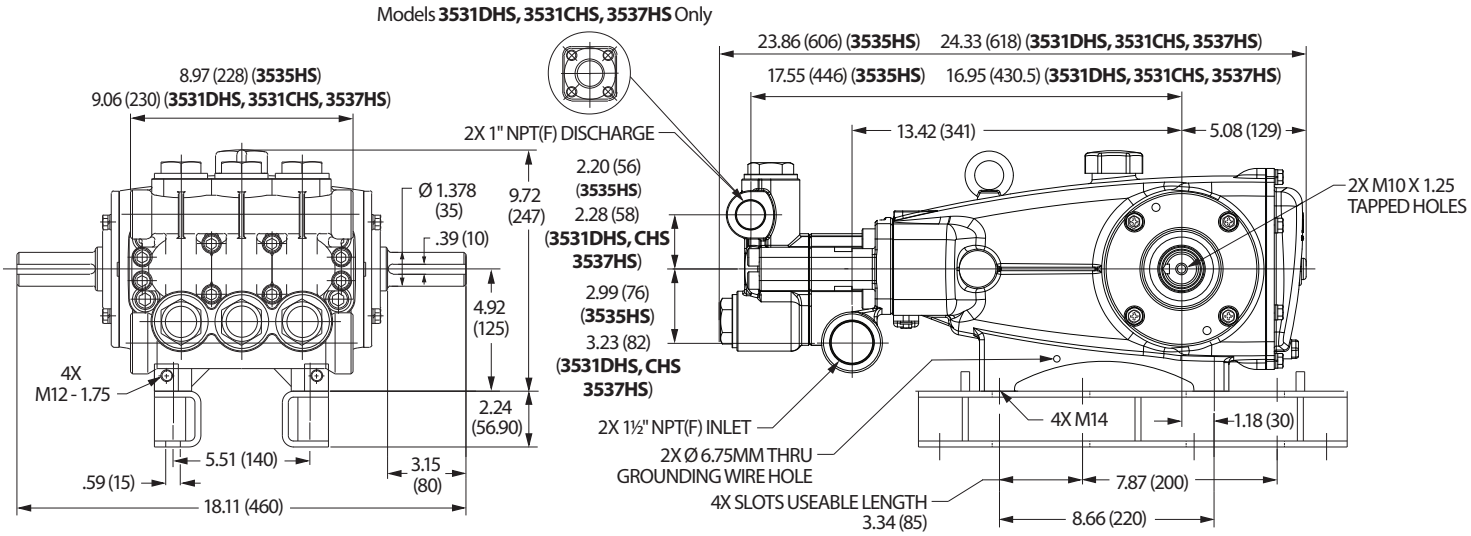
## OPTIONAL PARTS AND ACCESSORIES

| PART | DESCRIPTION | QTY |
|---|---|---|
| 34021 | Key (M10 x 8 x 70) | 1 |
| 92674 | Rail Assembly (STZP R) (Includes: 34018) | 1 |
| 34018 | Mount, Direct (STZP R) | 1 |
| 76514 | Rail Assembly (S) (Includes: 34039) | 1 |
| 34039 | Mount, Direct (S) | 1 |
| 990013 | Hub, "B", 35 mm (Not Shown) | 1 |
| 80540 | Screw, Adjusting (M12 x 100) | 2 |
| 30278 | Oiler (1 oz) (Not Shown) | 3 |
| 34314 | Kit, Oil Drain (⅜" x 48") (Not Shown) | 1 |
| 819000 | Assembly, Crankcase, Cast Iron Conversion (Not Shown) | 1 |

## SERVICE PARTS

| PART | DESCRIPTION | QTY |
|---|---|---|
| **31040** | Kit, Seal – Standard NBR | 1 |
| **34235** | Kit, Valve – Standard NBR (Model 3535HS) | 2 |
| **34017** | Kit, Valve – Standard NBR (Models 3531DHS, 3531CHS, 3537HS) | 2 |
| 6100 | Oil, Case (12–21 oz bottles)<br>(Fill to Specific Crankcase Capacity Prior to Start-up) | 1 |
| 6124 | Gasket, Liquid (3 oz) | 1 |
| 6139 | Lubricant, Anti-Seize (8 oz) (Models 3531DHS, 3531CHS) | 1 |
| 30696 | Reverse Pliers (Not Shown) | 1 |
| 32273 | Kit, Crankcase Oil Seals (Not Shown) | 1 |
| **818427** | Head, Complete with NBR Seals and O-Rings (Model 3535HS) | 1 |
| **818372** | Head, Complete with NBR Seals and O-Rings (Model 3531DHS ) | 1 |
| **814522** | Head, Complete with NBR Seals and O-Rings (Model 3537HS) | 1 |

**Kits - NBR, FPM (.0110), EPDM (.0220), FFKM (.0770) listed on page 4.**




Models 3535HS, 3531DHS, 3531DHS, 3537HS

## SEAL KITS One (1) seal kit required per pump

| PUMP MODELS | NBR (STD) | FPM (.0110) | EPDM (.0220) ◆ | FFKM (.0770) |
|---|---|---|---|---|
| 3535HS, 3531DHS, 3531CHS, 3537HS | **31040 *** | **33055** | **33262 *** | **76948*** |

| ITEM (Included in Seal Kits) | | | | | DESCRIPTION | QTY |
|---|---|---|---|---|---|---|
| 97 | 11345 | 11375 | 701490 | 702961 | O-Ring, Plunger Retainer | 3 |
| 106 | 44113 | 44740 | 46955 | 76398 | Seal, Low-Pressure, with SS-Spring | 3 |
| 112 | 11379 | 14183 | 701491 | 702705 | O-Ring, Inlet Manifold | 3 |
| 127 | 44609 | 44741 | 44609 | 76780 | V-Packing | 6 |
| 155 | 48860 | 20137 | 701492 | 703159 | O-Ring, V-Packing Spacer | 6 |
| 156 | 48362 | 48362 | 48362 | 202164 | Backup Ring, V-Packing Spacer | 6 |

◆ Silicone oil/grease required *Review material codes for individual items (STG generally may be used as alternative)

## VALVE KITS Two (2) valve kits required per pump

| PUMP MODELS | NBR (STD) | FPM (.0110) | EPDM (.0220) ◆ | FFKM (.0770) |
|---|---|---|---|---|
| 3535HS | **34235** | **31955** | **31952** | **76617** |
| 3531DHS, 3531CHS, 3537HS | **34017** | **31955** | **31952** | **76617** |

| ITEM (Included in Valve Kits) | | | | | DESCRIPTION | QTY |
|---|---|---|---|---|---|---|
| 162 | 48363 | 48363 | 48363 | 44614 | Backup Ring, Valve Seat | 3 |
| 163 | 26142 | 14330 | 701493 | 702808 | O-Ring, Valve Seat | 3 |
| 164 | 44727 | — | — | — | Seat (Models 3535HS, 3535CHS) | 3 |
| | — | 44612 | 44612 | 44612 | Seat (Models 3531DHS, 3531CHS, 3537HS) | 3 |
| 166 | 43932 | — | — | — | Valve (Models 3535HS, 3535CHS) | 3 |
| | — | 44108 | 44108 | 44108 | Valve (Models 3531DHS, 3531CHS, 3537HS) | 3 |
| 167 | 44109 | 44109 | 44109 | 44109 | Spring | 3 |
| 168 | 44728 | 44728 | 44728 | 44728 | Retainer, Spring | 3 |
| 170 | 44729 | 44729 | 44729 | 44729 | Washer, Spring Retainer | 3 |
| 172 | 89827 | 11747 | 701494 | 703169 | O-Ring, Valve Plug | 3 |
| 173 | 48364 | 48364 | 48364 | 20388 | Backup Ring, Valve Plug | 3 |

◆ Silicone oil/grease required

**⚠ CAUTIONS AND WARNINGS**

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