

Gas engine must be purchased separately.

## PUMP FEATURES

- Triplex plunger design provides a smooth liquid flow.
- Specially formulated Hi-Pressure Seals and concentric solid ceramic plungers assure true wear surface and extended seal life.
- Ultra-compact, hollow-shafted pump for direct mounting to gas engine.
- Integral Regulating Unloader with built-in by-pass standard on all units to assure system pressure control and pump protection.
- Fixed chemical injector standard on all units offers cleaning flexibility.
- Stacked valve design for ease in servicing.
- Swivel garden hose fitting with filter screen for easy inlet connection.

## COMMON PUMP SPECIFICATIONS

|  |                     |                      |
|--|---------------------|----------------------|
| Inlet Pressure Range .....   | Flooded to 60 PSI   | (Flooded to 4 Bar)   |
| Bore .....   | 0.630"              | (16 mm)              |
| Max. Liquid Temperature .....  | 140°F               | (60°C)               |
| Above 130°F call CAT PUMPS for inlet conditions and elastomer recommendations. |                     |                      |
| Crankcase Capacity .....   | 8.5 oz.             | (0.25 L)             |
| Inlet Port (1) .....   | 3/4" GHF            | (3/4" GHF)           |
| Discharge Port (1) .....   | M18x1.0             | (M18x1.0)            |
| Chemical Discharge Port (1) .....  | 3/8" NPTM           | (3/8" NPTM)          |
| Chemical Injection Barb .....  | 8/32" UNF           | (8/32" UNF)          |
| Shaft Diameter .....   | 3/4"                | (19.0 mm)            |
| Weight .....   | 10.7 lbs.           | (4.9 kg)             |
| Dimensions .....   | 7.99 x 7.75 x 6.29" | (203 x 197 x 160 mm) |

### ⚠ CAUTIONS AND WARNINGS

All High Pressure Systems require a primary pressure regulating device (i.e. regulator, unloader) and a secondary pressure relief device (i.e. 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.

Read all CAUTIONS and WARNINGS before commencing service or operation of any high pressure system. The CAUTIONS and WARNINGS are included in each service manual and with each Accessory Data sheet. CAUTIONS and WARNINGS can also be viewed online at [www.catpumps.com/cautions-warnings](http://www.catpumps.com/cautions-warnings) or can be requested directly from CAT PUMPS.

### WARRANTY

View the Limited Warranty on-line at [www.catpumps.com/warranty](http://www.catpumps.com/warranty).

## Direct-Drive Plunger Pump Models

**3DX25GSI** Non-Production

**3DX27GSI** Non-Production

**3DX29GSI** See Current Data Sheet

**3DX30GSI** See Current Data Sheet

## SPECIFICATIONS

U.S. Measure

Metric Measure

### MODEL 3DX25GSI

|                               |          |            |
|-------------------------------|----------|------------|
| Flow .....                    | 2.5 GPM  | (9.5 L/M)  |
| Max. Discharge Pressure ..... | 2500 PSI | (175 BAR)  |
| Max. RPM .....                | 3450 RPM | (3450 RPM) |
| Stroke .....                  | 0.204"   | (5.2 mm)   |

### MODEL 3DX27GSI

|                               |          |            |
|-------------------------------|----------|------------|
| Flow .....                    | 2.7 GPM  | (10.2 L/M) |
| Max. Discharge Pressure ..... | 2500 PSI | (175 BAR)  |
| Max. RPM .....                | 3450 RPM | (3450 RPM) |
| Stroke .....                  | 0.220"   | (5.6 mm)   |

### MODEL 3DX29GSI

|                               |          |            |
|-------------------------------|----------|------------|
| Flow .....                    | 2.9 GPM  | (10.9 L/M) |
| Max. Discharge Pressure ..... | 2500 PSI | (175 BAR)  |
| Max. RPM .....                | 3450 RPM | (3450 RPM) |
| Stroke .....                  | 0.232"   | (5.9 mm)   |

### MODEL 3DX30GSI

|                               |          |            |
|-------------------------------|----------|------------|
| Flow .....                    | 3.0 GPM  | (11.4 L/M) |
| Max. Discharge Pressure ..... | 2500 PSI | (175 BAR)  |
| Max. RPM .....                | 3450 RPM | (3450 RPM) |
| Stroke .....                  | 0.244"   | (6.2 mm)   |

## ELECTRIC HORSEPOWER REQUIREMENTS

| MODEL    | FLOW     |      | PRESSURE |          |          |          |          | RPM  |
|----------|----------|------|----------|----------|----------|----------|----------|------|
|          |          |      | PSI 1000 | PSI 1200 | PSI 1500 | PSI 2000 | PSI 2500 |      |
|          | U.S. GPM | L/M  | BAR 70   | BAR 85   | BAR 105  | BAR 140  | BAR 175  |      |
| 3DX25GSI | 2.5      | 9.5  | 1.7      | 2.0      | 2.6      | 3.4      | 4.3      | 3450 |
| 3DX27GSI | 2.7      | 10.2 | 1.8      | 2.2      | 2.8      | 3.7      | 4.6      | 3450 |
| 3DX29GSI | 2.9      | 10.9 | 1.9      | 2.4      | 3.0      | 4.0      | 5.0      | 3450 |
| 3DX30GSI | 3.0      | 11.4 | 2.1      | 2.5      | 3.1      | 4.1      | 5.2      | 3450 |

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

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

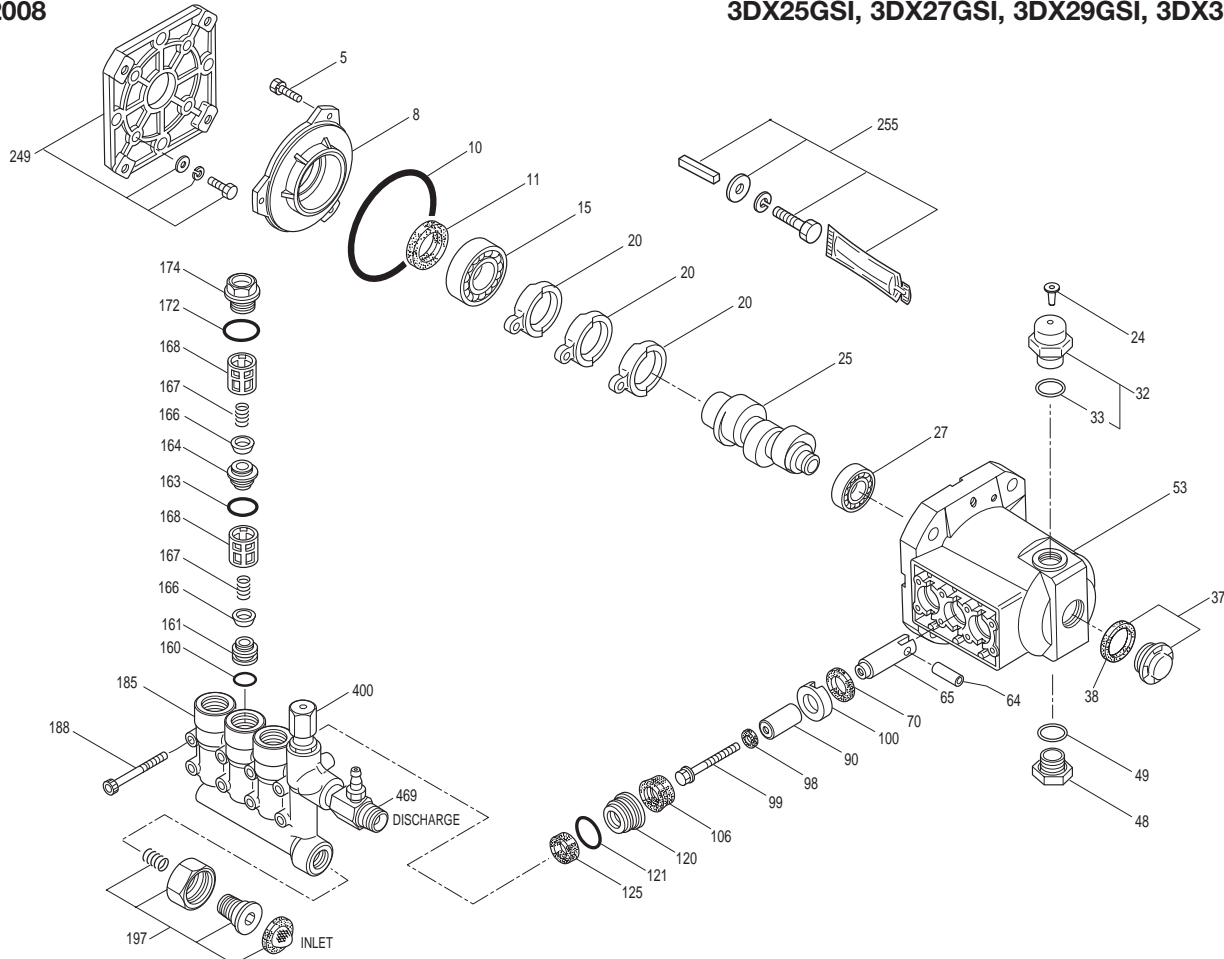
**DETERMINING MOTOR PULLEY SIZE**  $\frac{\text{Motor Pulley O.D.}}{\text{Pump R.P.M.}}$  =  $\frac{\text{Pump Pulley O.D.}}{\text{Motor R.P.M.}}$

Note: Consult engine manufacturer when using gas or diesel engine. Refer to pump Service Manual for repair procedure and additional technical information.

*"Customer confidence is our greatest asset"*

# EXPLODED VIEW

July 2008



# 3DX PLUNGER PUMP MODEL

3DX25GSI, 3DX27GSI, 3DX29GSI, 3DX30GSI

## PARTS LIST

| ITEM | PN     | MATL   | DESCRIPTION                                | QTY | ITEM  | PN     | MATL   | DESCRIPTION                                    | QTY |
|------|--------|--------|--|-----|-------|--------|--------|--|-----|
| 5    | 547161 | STCP   | Screw, HHC Sems (M6x14)                    | 3   | 164   | 545178 | S      | Seat, Discharge [1/04]                         | 3   |
|      | 549360 | STCP R | Screw, HHC Sems (M6x14)                    | 3   | 166   | 46764  | S      | Valve  | 6   |
| 8    | 547153 | AL     | Cover, Bearing [4/05]                      | 1   | 167   | 46865  | S      | Spring   | 6   |
| 10   | 14041  | NBR    | O-Ring, Bearing Cover - 70D                | 1   | 168   | 543988 | PVDF   | Retainer, Spring                               | 6   |
| 11   | 55337  | NBR    | Seal, Oil - 70D                            | 1   | 172   | 142807 | NBR    | O-Ring, Plug - 90D                             | 3   |
| 15   | 14488  | STL    | Bearing, Ball                              | 1   | 174   | 46759  | BB     | Plug, Valve (M20x1.5)                          | 3   |
| 20   | 547048 | TNM    | Rod, Connecting                            | 3   |       | 35759  | BB     | Plug, Valve w/1/4" NPT Port for Accessory      | 1   |
| 24   | 76045  | LDPE   | Plug, Oil Cap                              | 1   | 185 † | 548592 | BB     | Head, Manifold w/Integral Unloader Body        | 1   |
| 25   | 547307 | CM     | Crankshaft, 3450 RPM, 3/4", 5.2 mm [01/04] | 1   | 188   | 542406 | STZP   | Screw, HSH (M6x60)                             | 8   |
|      | 548195 | CM     | Crankshaft, 3450 RPM, 3/4", 5.6 mm [01/04] | 1   |       | 549357 | STCP R | Screw, HSH (M6x60)                             | 8   |
|      | 547946 | CM     | Crankshaft, 3450 RPM, 3/4", 5.9 mm [01/04] | 1   | 197   | 941516 | BB     | Assy, GH, 3/8" NPTM (Not Included on 3DX29GSI) | 1   |
|      | 548196 | CM     | Crankshaft, 3450 RPM, 3/4", 6.2 mm [01/04] | 1   |       | —      | —      | Nut, Swivel (3/4" FGH)                         | 1   |
| 27   | 56084  | STL    | Bearing, Ball [11/03]                      | 1   |       | —      | —      | Fitting, (3/8" NPTM)                           | 1   |
| 32   | 547961 | RTP    | Cap, Oil Filler w/O-Ring [01/04]           | 1   |       | —      | —      | Screen, Inlet                                  | 1   |
| 33   | 14179  | NBR    | O-Ring, Oil Filler Cap - 70D               | 1   |       | —      | —      | Spring   | 1   |
| 37   | 92241  | —      | Gauge, Bubble Oil w/Gasket                 | 1   | 249   | 30520  | —      | Assy, Adapter Mount, Standard, GAS             | 1   |
| 38   | 44428  | NBR    | Gasket, Flat Flex, Oil Gauge - 80D         | 1   |       | 46271  | AL     | Flange   | 1   |
| 48   | 44842  | NY     | Plug, Drain                                | 1   |       | 549351 | STCP R | Screw, HH (5/16"-24x20)                        | 4   |
| 49   | 14179  | NBR    | O-Ring, Drain Plug - 70D                   | 1   |       | 15845  | STZP   | Lockwasher (M8)                                | 4   |
| 53   | 548062 | AL     | Crankcase [02/05]                          | 1   |       | 126232 | STCP R | Lockwasher (M8)                                | 4   |
| 64   | 46229  | CM     | Pin, Crosshead                             | 3   |       | 126573 | STCP R | Washer, Flat (M8)                              | 4   |
| 65   | 542402 | BBCP   | Rod, Plunger                               | 3   | 255   | 30516  | STZP   | Assy, Bolt Mount, GAS                          | 1   |
| 70   | 47215  | NBR    | Seal, Oil - 70D                            | 3   |       | 126543 | STCP R | Screw, HH (3/8"-16x1-3/8")                     | 4   |
| 90   | 542403 | CC     | Plunger (M16x27)                           | 3   |       | 127024 | STZP R | Washer, Flat (3/8")                            | 4   |
| 98   | 46730  | NBR    | Washer, Seal - 90D                         | 3   |       | 127025 | STZP R | Lockwasher (3/8")                              | 4   |
| 99   | 542405 | S      | Retainer, Plunger (M6x35)                  | 3   |       | 6106   | —      | Lubricant, Antiseize                           | 1   |
| 100  | 46233  | NY     | Retainer, Seal                             | 3   |       | 34050  | STL    | Key (3/16x3/16x27 HD)                          | 1   |
| 106  | 48222  | NBR    | Seal, LPS w/S-Spg                          | 3   | 300   | 30530  | NBR    | Kit, Seal (Incls: 98,106,121,125)              | 1   |
| 120  | 547357 | BB     | Case, Seal                                 | 3   | 310   | 33057  | NBR    | Kit, Valve                                     | 1   |
| 121  | 13976  | NBR    | O-Ring, Seal Case - 70D                    | 3   |       |        |        | (Incls: 160,161,163,164,166,167,168,172)       |     |
| 125  | 547157 | SNG    | Seal, HPS w/S                              | 3   | 400   | —      | —      | Unloader, Modular (See Individual Parts)       | 1   |
| 160  | 13965  | NBR    | O-Ring, Inlet Valve Seat - 70D             | 3   | 469   | 7232   | BB     | Injector, Chemical Fixed - 3DX25, 27, 30GSI    | 1   |
| 161  | 545177 | S      | Seat, Inlet                                | 3   |       | 7242   | BB     | Injector, Chemical Fixed - 3DX29GSI            | 1   |
| 163  | 19285  | NBR    | O-Ring, Discharge Seat - 70D               | 3   |       |        |        |  |     |

Italics are optional items. [ ] Date of latest production change. † Production parts different than repair parts. R Components comply with RoHS Directive. See Tech Bulletins 02, 024, 036, 043, 055, 074 and 083 for additional information.

MATERIAL CODES (Not Part of Part Number): AL=Aluminum BB=Brass BBCP=Brass/Chrome Plated CC=Ceramic CM=Chrome-moly LDPE=Low Density Polyethylene NBR=Medium Nitrile (Buna-N) NY=Nylon PVDF=Polyvinylidene Fluoride RTP=Reinforced Composite S=304SS SNG=Special Blend (Buna) STL=Steel STCP=Steel/Chrome Plated STZP=Steel/Zinc Plated TNM=Special High Strength

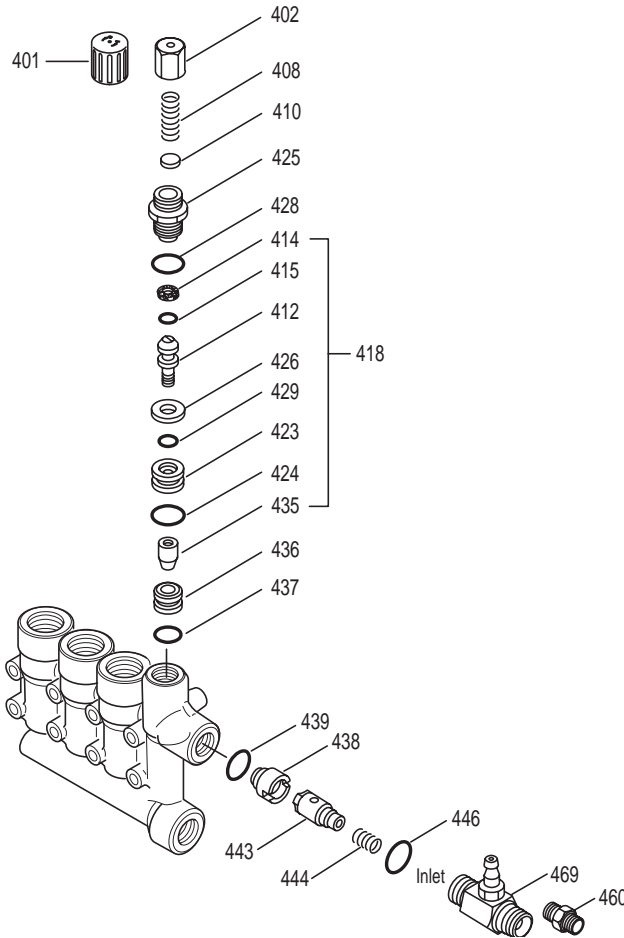
**NOTE:** Discard Key which may come standard with most engines and use only the key included in this kit.

Center raised pilot guide on the Adapter Plate assures proper alignment of pump and engine. Before mounting pump onto engine inspect engine for recessed seal and bearing guide to permit adapter to completely seat into recess and four bosses to be flush with engine face.

# INTEGRAL UNLOADER

## SPECIFICATIONS

|                      |                     |                       |
|----------------------|---------------------|-----------------------|
|                      | <b>U.S. Measure</b> | <b>Metric Measure</b> |
| Flow .....           | 3.0 GPM             | (11.4 L/M)            |
| PSI Range .....      | 100-2500 PSI        | (7-175 BAR)           |
| Inlet Port .....     | 3/4" GHF            | (3/4" GHF)            |
| Discharge Port ..... | M18x1.0             | (M18x1.0)             |



## PARTS LIST

| ITEM | PN     | MATL   | DESCRIPTION  | QTY. |
|------|--------|--------|--|------|
| 401  | 32088  | NY     | Handle, Adjusting  | 1    |
| 402  | 46570  | BB     | Cap, Adjusting   | 1    |
| 403  | 45070  | BB     | Nut, Lock (Not Shown) 3DX29GSI ONLY                      | 1    |
| 408  | 33394  | STZP R | Spring, Pressure   | 1    |
| 410  | 549352 | STCP R | Retainer, Spring   | 1    |
| 412  | 46251  | BB     | Stem, Piston   | 1    |
| 414  | 28338  | PTFE   | Back-up-Ring, Piston Stem                                | 1    |
| 415  | 22056  | NBR    | O-Ring, Piston Stem - 70D                                | 1    |
| 418  | 548230 | BB     | Assy, Piston<br>(Incls: 412,414,415,423,424,426,429,435) | 1    |
| 423  | 46249  | BB     | Retainer, Valve  | 1    |
| 424  | 13966  | NBR    | O-Ring, Valve Retainer (Outer) - 70D                     | 1    |
| 425  | 46248  | BB     | Retainer, Piston   | 1    |
| 426  | 46250  | S      | Washer   | 1    |
| 428  | 13969  | NBR    | O-Ring, Piston Retainer - 70D                            | 1    |
| 429  | 17399  | NBR    | O-Ring, Valve Retainer (Inner) - 80D                     | 1    |
| 435  | 547969 | S      | Valve  | 1    |
| 436  | 548075 | S      | Seat   | 1    |
| 437  | 13963  | NBR    | O-Ring, Seat - 70D                                       | 1    |
| 438  | 46254  | NY     | Seat, Check Valve  | 1    |
| 439  | 13963  | NBR    | O-Ring, Check Valve Seat - 70D                           | 1    |
| 443  | 541060 | BB     | Valve, Check w/O-Ring                                    | 1    |
| 444  | 45924  | S      | Spring   | 1    |
| 446  | 13969  | NBR    | O-Ring, Body - 70D                                       | 1    |
| 460  | 107681 | BB     | Fitting, Discharge (3/8" NPTM)                           | 1    |
| 468  | 33099  | NBR    | Kit, O-Ring (Incls: 414,415,424,428,429,437)             | 1    |
| -    | 30378  | NBR    | Kit, Repair (Incls: 418,428,436,437)                     | 1    |
| 469  | 7232   | BB     | Injector, Chemical Fixed, 3DX25,27,30GSI                 | 1    |
|      | 7242   | BB     | Injector, Chemical Fixed, 3DX29GSI                       | 1    |

Italics are optional items. R Components comply with RoHS Directive.

MATERIAL CODES (Not Part of Part Number): BB=Brass

NBR=Medium Nitrile (Buna-N) NY=Nylon PTFE=Pure Polytetrafluoroethylene

S=304SS STCP=Steel/Chrome Plated STZP=Steel/Zinc Plated

# UNLOADER TYPE

An integral unloader with built-in by-pass is part of the discharge manifold to provide system pressure regulation and pump protection. This pump also includes a fixed chemical injector for chemical application.

## OPERATION:

Pump should be purged of air before commencing with operation. Liquid must flow through the pump without discharge restriction to assure full system pressure is reached

Install a pressure gauge close to the manifold head of the pump to assist in setting system pressure and to periodically monitor system pressure.

Setting and adjusting the unloader pressure must be done with the system turned on. Start the system with the unloader backed off to the lowest pressure setting (counterclockwise direction). Squeeze the trigger and read the pressure on the gauge at the pump. Do not read pressure at the gun or nozzle. If more pressure is desired, release the trigger, turn adjusting cap one quarter turn in a clockwise direction. Squeeze the trigger and read the pressure. Repeat this process until the desired system pressure is reached. Thread locking nut up to adjusting cap (model 3DX29GSI only).

**NOTE:** Pressure is not set at the factory.

## SERVICE:

The unloader should be serviced on the same schedule as the seals in the pump. Refer to 3DX Service Manual for start-up, servicing of seals and valves, torque requirements and diagnosis and maintenance chart.

# FIXED CHEMICAL INJECTOR

## SPECIFICATIONS

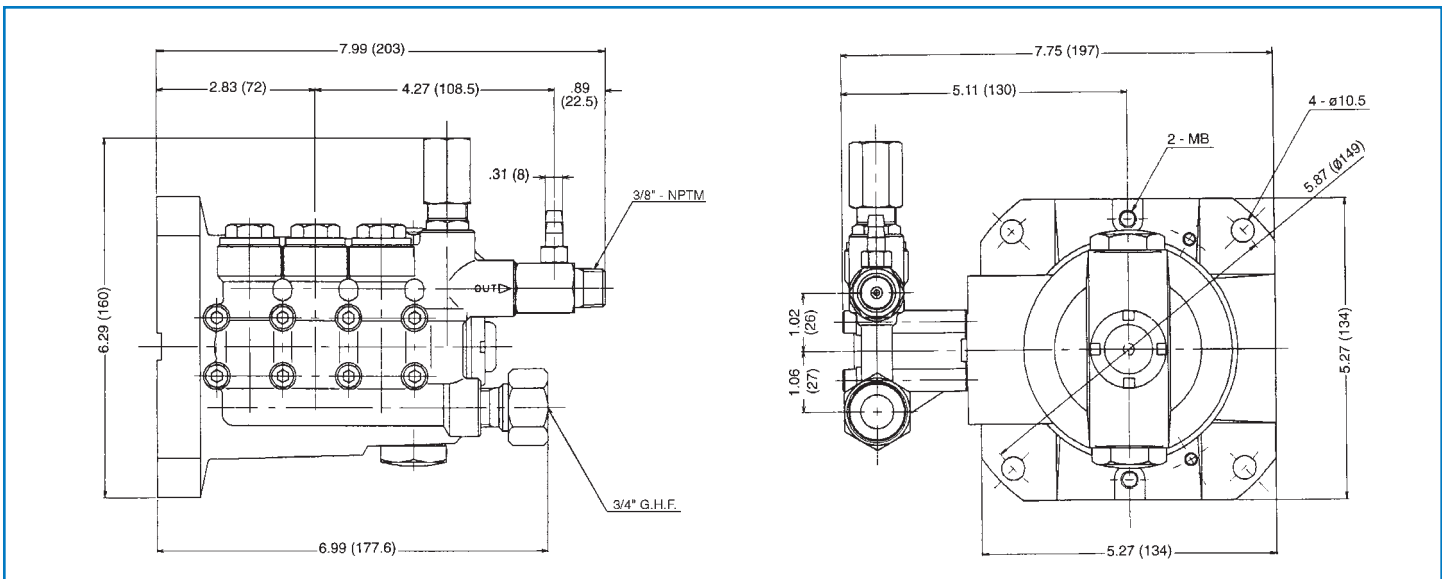
|                       |                     |                       |
|-----------------------|---------------------|-----------------------|
|                       | <b>U.S. Measure</b> | <b>Metric Measure</b> |
| Model 7232            |                     |                       |
| GPM .....             | 3.0 GPM             | (11.4 L/M)            |
| Nozzle Orifice .....  | 2.1 mm              | (2.1 mm)              |
| Model 7242            |                     |                       |
| GPM .....             | 2.9 GPM             | (10.9 L/M)            |
| Nozzle Orifice .....  | 2.0 mm              | (2.0 mm)              |
| Common Specifications |                     |                       |
| Hose Barb .....       | 1/4"                | (1/4")                |
| Tapped Barb .....     | 8/32" UNF           | (8/32" UNF)           |
| Inlet Port .....      | M18x1.0             | (M18x1.0)             |
| Discharge Port .....  | 3/8" NPTM           | (3/8" NPTM)           |
| Weight .....          | 5.3 oz.             | (0.15 kg)             |
| Dimensions .....      | 2 x 1 x 1.75"       | (52 x 25 x 45 mm)     |

## CHEMICAL INJECTOR PERFORMANCE CHART

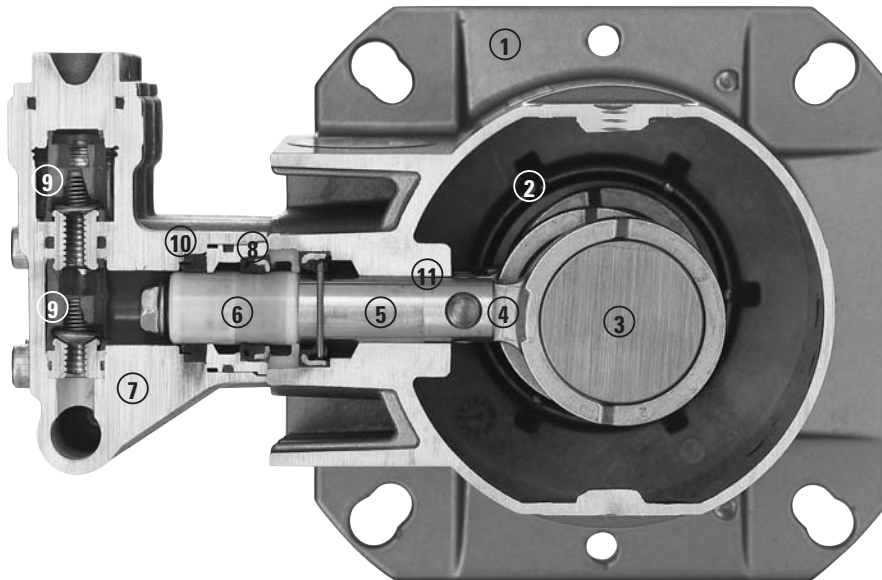
| Orifice Size | Injector Model | Maximum Injecting Pressure | Maximum Chemical Draw | Pressure Drop Across Injector At System Pressure (2500 PSI) |
|--------------|----------------|----------------------------|-----------------------|---|
| 2.1 mm       | 7232           | 250 PSI                    | 37.2 oz/min           | 141 PSI   |
| 2.0 mm       | 7242           | 280 PSI                    | 35.3 oz/min           | 148 PSI   |

Optimum performance of chemical injector occurs with a 35 ft. high pressure hose and a minimum 3/8" I.D. The type of hose, extended lengths, reduced I.D. and fittings may create back pressures in excess of the low pressure nozzle rating and prevent the injector from drawing chemical. See Hose Friction Loss Chart in Service Manual. Deduct hose friction loss from above low PSI Nozzle. Contact CAT PUMPS for assistance with other options.

**CAUTION:** Deduct the pressure drop shown in the performance chart from your desired system pressure to arrive at the maximum high pressure nozzle rating. This is essential to avoid over-pressurizing the pump.



Models 3DX25GSI, 3DX27GSI, 3DX29GSI, 3DX30GSI



- 1 Die cast flange-style aluminum **crankcase** means high strength, lightweight, and excellent tolerance control.
- 2 Heavy-duty dual crankshaft **bearings** provide extended drive-end life.
- 3 Chrome-moly **crankshaft** provides unmatched strength and surface hardness for long life.
- 4 High strength **connecting rods** assure durability and bearing quality.
- 5 Strong brass **plunger rods** with chrome-moly crosshead pins.
- 6 Special, concentric, high-density, polished solid ceramic **plungers** provide a true wear surface and extended seal life.
- 7 High tensile strength, forged brass **manifold head** with built-in integral unloader and eight mounting screws for exceptional strength.
- 8 100% wet **seal** design adds to service life by allowing pumped liquids to cool and lubricate on both sides.
- 9 **Stacked valve assemblies** include stainless steel valves, seats and springs to provide corrosion-resistance, ultimate seating and extended life.
- 10 Unique design and specially formulated **Hi-Pressure Seals** offer unmatched performance and seal life.
- 11 **Crossheads** are 360° supported for uncompromising alignment.

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