

# Danfoss Cast Iron Gear Pumps Service Manual



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## General Information

### Overview

The D Series fixed displacement gear pump has been specifically designed for demanding mobile equipment applications where maximum performance is required at peak power levels and operating temperatures.

The design integrates cast iron construction with pressure balanced thrust plates to deliver consistent efficiency across the entire operating range of pressure, speed, and temperature; all in an industry-leading package size that maximizes power density.

### Features and benefits

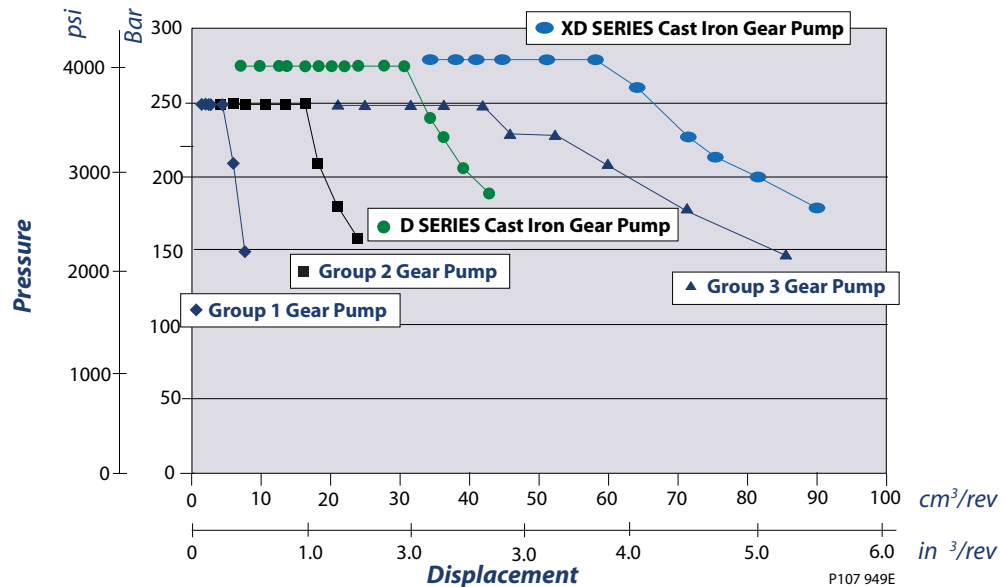
- High strength cast iron construction allows consistently efficient performance and long life in continuous operation at 276 bar [4000 psi] and peak conditions of 303 bar [4400 psi].
- Custom engineered bearings, pressure-balanced load plates, and viton seals optimize internal lubrication allowing for long life with intermittent fluid temperatures up to 115 °C [239 °F] and fluid viscosities as low as 8 mm<sup>2</sup>/sec (cSt) [36 SUS].
- Compact three-piece design maximizes power density and creates one of the shortest multisection pumps (with up to four pumping sections) in the global marketplace.
- Bearings located in the front flange increase radial/axial load carrying capability and eliminate the need for most bolt-on outrigger bearings.

### Quick chart overview

The D Series pump blends the traditional Group 2 (SAE-A) and Group 3 (SAE-B) frame sizes in a single package with displacements from 7 to 45 cm<sup>3</sup> (0.43 to 2.75 in<sup>3</sup>).

These displacements, in addition to a wide variety of shafts, flanges, ports, and integrated valve options can be used in virtually any combination to offer greater design flexibility and meet specific application requirements.

*Gear pumps quick chart overview*



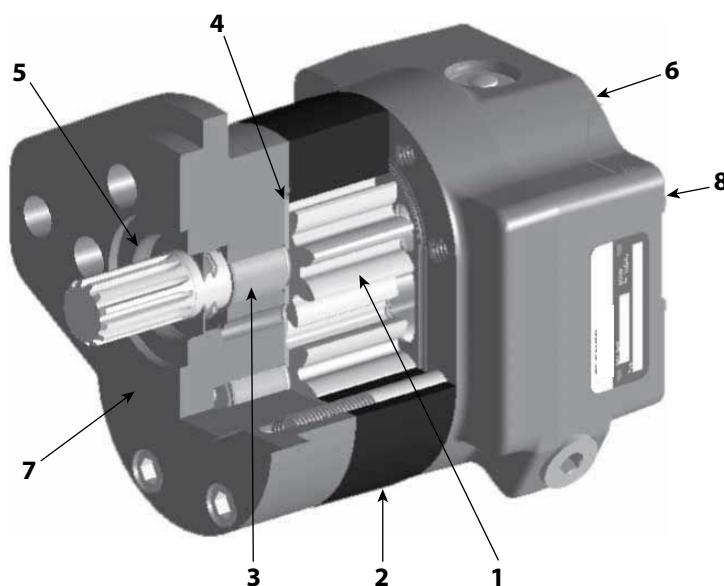
## General Information

### Typical applications

The D Series gear pump is commonly applied in the following type of applications:

- Wheel loader - Aggressive duty cycles with continuous working pressures above 250 bar [3600 psi]
- Mining equipment - Increased exposure to system contamination in a corrosive environment
- Skid steer loaders - Multiple pump combinations with short length and common inlets
- Work function attachments - Rapid loading of cylinders/motors in high bulk modulus systems causing pressure rise rates greater than 3000 bar/sec
- Agricultural sprayers - Pumps with integrated valves including priority flow dividers and load sense steering
- Pavers - D pumps integrated with other Turolla components including variable displacement piston pumps, aluminum gear pumps and cartridge valves
- Fan drives - High levels of performance with elevated temperatures and minimal oil viscosities and restrictive envelope dimensions

### Design



1. High-quality, heat-treated alloy steel integral gears and shaft
2. High-strength ductile iron body and covers
3. Heavy-duty low-friction sleeve bushings
4. Pressure balanced bronze-on-steel thrust plates
5. High temperature Viton seals
6. *Optional:* flow control with load sensing priority flow or factory preset fixed priority flow divider valve
7. SAE-A/SAE-B 2-bolts mounting flange
8. *Optional:* Side or rear port options

### Cast iron housings, bearings

The three piece structural members of the pump are made of high-strength cast ductile iron. Cast iron provides contamination resistance, thermal stability and the strength needed for consistently high levels of performance and durability needed in demanding off highway applications.

Heavy-duty low friction PTFE-lined sleeve bushings are optimized to provide long life in low viscosity, high pressure conditions. The bearings are located in the front mounting flange, rear cover, and bearing plate (for multiple section pumps) and allow the D pump to be 20% shorter than a typical bearing block

## General Information

design pump. In addition, the proximity of the front bearing to the mounting flange increases the radial load capacity of the pump, eliminating the need for most bolt-on outrigger requirements.

### Pressure balance, sealing

The pump incorporates two steel-backed bronze thrust plates seated in depressions in the mounting flange, rear cover, and bearing plate (for multiple section pumps). Underneath the front plate (known as the deflecting plate) is the load seal.

The E-shaped load seal distributes system pressure underneath the plate and enables the plate to deflect and maintain a tight sealing surface against the side face of the gears.

The tight sealing action allows the pump to maintain very high levels of volumetric efficiency, even when operating in extreme temperature, pressure and speed conditions.

### One-piece gear design

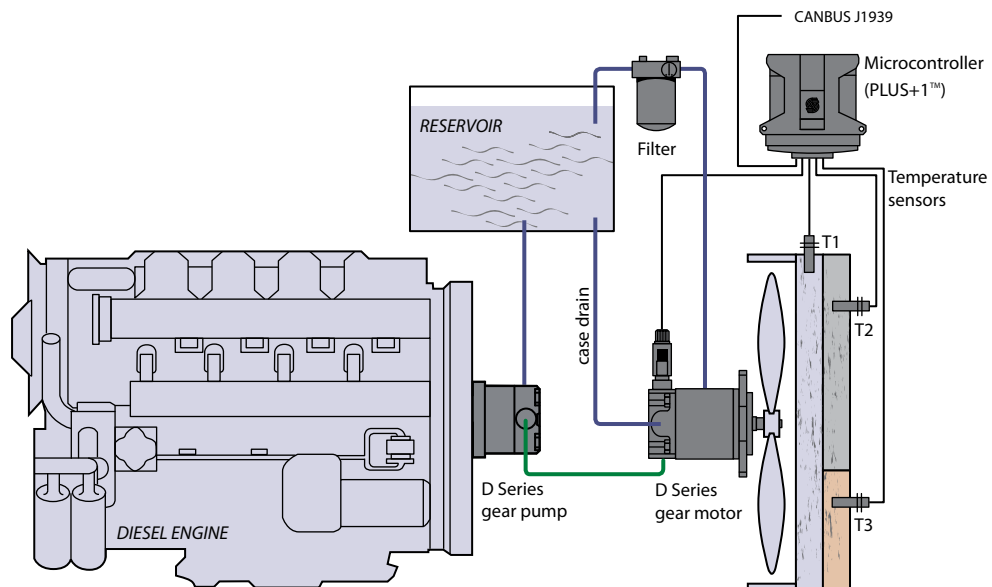
All D Series pump gear shafts are of one-piece design. This enables the shaft to provide uniform high strength and accurate gear profile relative to the journals for smooth mesh operation. The integral gear shafts are made of heat treated AISI 8620 steel, manufactured to precise tolerances and surface finishes, for maximal life and minimal leakage. This integral design eliminates the potential problems of fatigue stress and gear face mismatch often associated with two-piece gear shaft designs.

### Multiple pump configuration

D Series pumps can be coupled together to produce tandem, triple and even quadruple section units. The interconnecting chambers accommodate fluid flow between sections and allow the number of inlet connections to be minimized. Systems that require operation with different fluids and/or reservoirs can be accommodated with sealed auxiliary covers between sections.

## System schematic

*Gear Pump/Gear Motor Fan Drive System with Electronic Control*



P107 929E

## General Information

### Product features

| Features                        | Description   |
|---------------------------------|---|
| <b>Construction</b>             | Heavy duty ductile iron 3-piece construction with pressure balance load plates and viton seals  |
| <b>Displacements</b>            | 7 to 45 cm <sup>3</sup> [0.43 to 2.75 in <sup>3</sup> /rev]   |
| <b>Continuous Pressure</b>      | 276 bar [4000 psi] up to 32 cm <sup>3</sup> [1.94 in <sup>3</sup> /rev]   |
| <b>Peak Pressure</b>            | 303 bar [4400 psi] up to 32 cm <sup>3</sup> [1.94 in <sup>3</sup> /rev]   |
| <b>Speed</b>                    | 600 to 3400 min <sup>-1</sup> (rpm) - up to 25cm <sup>3</sup> [1.55 in <sup>3</sup> /rev]   |
| <b>Mounting</b>                 | SAE A two bolt, SAE B two bolt, Perkins engine mount  |
| <b>Shaft (types)</b>            | Straight keyed, 1:8 tapered keyed, 9T, 11T, 13T and 15T splined   |
| <b>Ports</b>                    | SAE O-ring boss, SAE split flange, beaded tube inlet (axial and radial)   |
| <b>Fluid viscosity*</b>         | 8 mm <sup>2</sup> /sec (cSt) [36 SUS] minimum, 1600 mm <sup>2</sup> /sec (cSt) [7500 SUS] maximum   |
| <b>Filtration requirement</b>   | 22/18/13 ISO 4406 at motor inlet  |
| <b>Fluids</b>                   | Petroleum/mineral based   |
| <b>Operating temperature*</b>   | -40°C [-40°F] minimum for cold start<br>110°C [230°F] normal operating conditions 115°C [239°F] peak intermittent                                 |
| <b>Configurations</b>           | Single, tandem, triple, and quadruple multisection pumps available with common inlets. Integrated auxiliary cover for through drive applications. |
| <b>Integrated valve options</b> | Priority flow divider with priority relief Priority steering with steering relief<br>Load sense priority flow divider                             |

\* Temperature and viscosity requirements must be satisfied concurrently.

## Technical Specifications

### Technical specifications

| Ratings                       | Units                                  | 07   | 10   | 11   | 13   | 14   | 17   | 19   | 21   | 23   | 25   | 29   | 32   | 36   | 38    | 41    | 45    |
|-------------------------------|--|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| Displacement                  | cm <sup>3</sup> /rev                   | 7.0  | 9.5  | 10.8 | 12.6 | 14.3 | 17.0 | 19.0 | 20.5 | 22.5 | 25.4 | 29.0 | 31.8 | 36.1 | 38.0  | 41.0  | 45.1  |
|                               | in <sup>3</sup> /rev                   | 0.43 | 0.58 | 0.66 | 0.77 | 0.87 | 1.04 | 1.16 | 1.25 | 1.37 | 1.55 | 1.77 | 1.94 | 2.20 | 2.32  | 2.50  | 2.75  |
| Rated pressure                | bar                                    | 276  | 276  | 276  | 276  | 276  | 276  | 276  | 276  | 276  | 276  | 276  | 276  | 241  | 228   | 207   | 190   |
|                               | psi                                    | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 3500 | 3300  | 3000  | 2750  |
| Peak pressure                 | bar                                    | 303  | 303  | 303  | 303  | 303  | 303  | 303  | 303  | 303  | 303  | 303  | 303  | 265  | 250   | 228   | 209   |
|                               | psi                                    | 4400 | 4400 | 4400 | 4400 | 4400 | 4400 | 4400 | 4400 | 4400 | 4400 | 4400 | 4400 | 3850 | 3630  | 3300  | 3025  |
| Speed min <sup>-1</sup> (rpm) | maximum                                | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3200 | 3000 | 2750 | 2750  | 2500  | 2500  |
|                               | minimum*                               | 1200 | 900  | 900  | 700  | 700  | 600  | 600  | 600  | 600  | 600  | 600  | 600  | 600  | 600   | 600   | 600   |
| Theoretical flow at max speed | l/min                                  | 24.0 | 32.3 | 36.7 | 42.9 | 48.5 | 57.9 | 64.6 | 69.6 | 76.3 | 86.4 | 92.8 | 95.4 | 99.0 | 104.5 | 102.4 | 112.7 |
|                               | US gal/min                             | 6.3  | 8.5  | 9.7  | 11.3 | 12.8 | 15.3 | 17.1 | 18.4 | 20.2 | 22.8 | 24.5 | 25.2 | 26.2 | 27.6  | 27.1  | 29.8  |
| Weight                        | kg                                     | 7.2  | 7.3  | 7.4  | 7.5  | 7.6  | 7.8  | 7.9  | 7.9  | 8.1  | 8.3  | 8.4  | 8.6  | 8.8  | 9.0   | 9.1   | 9.4   |
|                               | lb                                     | 15.8 | 16.1 | 16.3 | 16.5 | 16.7 | 17.1 | 17.4 | 17.5 | 17.8 | 18.2 | 18.6 | 19.0 | 19.6 | 19.8  | 20.2  | 20.7  |
| Mass moment of inertia        | x10 <sup>-6</sup> kg·m <sup>2</sup>    | 60   | 71   | 77   | 85   | 92   | 104  | 105  | 119  | 128  | 141  | 157  | 170  | 188  | 197   | 218   | 228   |
|                               | x10 <sup>-6</sup> slug·ft <sup>2</sup> | 44   | 53   | 57   | 63   | 68   | 77   | 77   | 88   | 95   | 104  | 116  | 125  | 139  | 145   | 155   | 168   |

\* minimum speed at maximum pressure

### Fluid specifications

| Parameter                                | Unit                            | Minimum                           | Continuous           | Maximum        |
|--|---------------------------------|-----------------------------------|----------------------|----------------|
| Viscosity*                               | mm <sup>2</sup> /sec (cSt)[SUS] | 8<br>[52]                         | 10 - 100<br>[59-456] | 1600<br>[7500] |
| Temperature*                             | °C [°F]                         | -40 [-40]                         | 110 [230]            | 115 [239]      |
| Cleanliness                              |                                 | ISO 4406 Class 22/18/13 or better |                      |                |
| Filtration efficiency, charge filtration |                                 | b15-20 =75 (b10 <sup>3</sup> 10)  |                      |                |

\* Temperature and viscosity requirements must be satisfied concurrently

Ratings are based on operation with premium petroleum-based hydraulic fluids containing oxidation, rust, and foam inhibitors.

### Inlet pressure

|                                |   |            |
|--------------------------------|---|------------|
| Maximum continuous vacuum      | bar atmospheric [inches mercury vacuum] | 0.8 [5.9]  |
| Maximum intermittent vacuum    |   | 0.6 [11.8] |
| Maximum charged inlet pressure | bar atmospheric [psi]                   | 3.0 [44]   |



## Operating Parameters

### Sizing equations

Use these formulas to determine the nominal pump size for a specific application.

|              | <b>Based on SI units</b>  |  | <b>Based on US units</b>  |
|--------------|---|--|---|
| <b>Flow</b>  | Output flow $Q_o = \frac{V_g \cdot n \cdot \eta_v}{1000}$ (l/min)                               |  | Output flow $Q_o = \frac{V_g \cdot n \cdot \eta_v}{231}$ (US gal/min)             |
|              | Input torque $M_i = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_m}$ (N·m)                 |  | Input torque $M_i = \frac{V_g \cdot \Delta p}{2 \cdot \pi \cdot \eta_m}$ (lb·in)  |
| <b>Power</b> | Input power $P_i = \frac{M_i \cdot n}{9550} = \frac{Q_o \cdot \Delta p}{600 \cdot \eta_t}$ (kW) |  | Input power $P_i = \frac{V_g \cdot n \cdot \Delta p}{396\,000 \cdot \eta_t}$ (hp) |

### Variables SI units [US units]

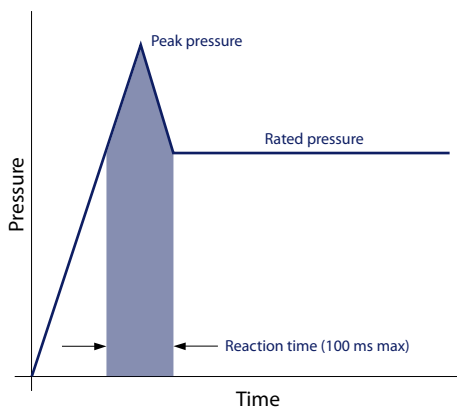
|             |  |   |
|-------------|--|---|
| $V_g$       | = Displacement per revolution                  | cm <sup>3</sup> /rev [in <sup>3</sup> /rev] |
| $p_{iD}$    | = Outlet pressure                              | bar [psi]                                   |
| $p_{iD}$    | = Inlet pressure                               | bar [psi]                                   |
| $\Delta p$  | = $p_{iD} - p_{iD}$ (system pressure)          | bar [psi]                                   |
| $n$         | = Speed  | min <sup>-1</sup> (rpm)                     |
| $\eta_v$    | = Volumetric efficiency                        |   |
| $\eta_{mh}$ | = Mechanical efficiency                        |   |
| $\eta_t$    | = Overall efficiency ( $\eta_v \cdot \eta_m$ ) |   |
| $p$         | = Differential hydraulic pressure              | bar [psi]                                   |

## Pressure

Definitions of the D Series operating parameters appear below. Consult Danfoss technical support for applications running outside of these parameters.

### Peak pressure

Peak pressure is the highest intermittent pressure allowed. The relief valve overshoot (reaction time) determines peak pressure. It is assumed to occur for less than 100 ms. The illustration to the right shows peak pressure in relation to rated pressure and reaction time (100 ms maximum).



### Rated pressure

Rated pressure is the average, regularly occurring operating outlet pressure that should yield satisfactory product life. The maximum machine load demand determines rated pressure. For all systems, the load should move below this pressure.

## Operating Parameters

### System pressure

System pressure is the differential between the inlet and outlet ports. It is a dominant operating variable affecting hydraulic unit life. High system pressure reduces expected pump life. System pressure must remain at, or below, rated pressure during normal operation to achieve expected life.

### Inlet vacuum

Inlet vacuum must be controlled in order to realize expected performance and pump life. System design must meet inlet vacuum requirements during all modes of operation. Expect lower inlet vacuums during cold start situations. Low vacuum condition should improve quickly as fluid warms.

### Pressure rise rate

The maximum pressure rise rate is the rate of increase in system pressure as measured at the outlet port of the pump. High pressure rise rates are commonly seen on work function applications during motor start-up, completion of cylinder stroke, and during rapid shifting of control valves. The maximum pressure rise rate of the D pump is 11,720 bar/sec [170,000 psi/sec]. During rapid rise rate situations, the system pressure must not exceed the rated pressure of the pump.

## Temperature and viscosity

### Temperature

High temperature limits apply at the inlet port of the pump. The pump should run at or below the maximum continuous temperature.

**Minimum (cold start) temperature** relates to the physical properties of component materials.

Cold oil, generally, doesn't affect the durability of pump components. It may affect the ability of oil to flow and transmit power. For this reason, keep the temperature at 16°C [29 °F] above the pour point of the hydraulic fluid.

**Continuous temperature** is the temperature at or below the temperature which normal pump life can be expected.

**Maximum temperature** is the highest temperature that is tolerable by the machine for a transient/limited time (duty cycle 1% or less). At maximum temperature, oil viscosity must not go lower than minimum recommended viscosity.

### Viscosity

**Continuous viscosity:** Recommended viscosity range for maximum efficiency and pump life.

**Minimum viscosity** occurs only during brief occasions of maximum fluid temperature and severe duty cycle operation. It's the minimum acceptable viscosity to guarantee the pump life. (Duty cycle 1% or less)

**Maximum viscosity** occurs only during cold start at very low temperatures. It is the upper limit of viscosity that allows the pump to start. During this condition, limit speeds until the system warms up.

---

[Temperature and viscosity requirements must be concurrently satisfied.](#)

---

## Speed

**Maximum speed** is the limit recommended for operation at rated pressure. It is the highest speed at which normal life can be expected.

The lower limit of operating speed is the **minimum speed**.

## Operating Parameters

### Hydraulic fluid

Ratings and data for gear pumps are based on operation with premium hydraulic fluids containing oxidation, rust, and foam inhibitors. These fluids must possess good thermal and hydrolytic stability to prevent wear, erosion, and corrosion of internal components.

Use only clean fluid in the pump and hydraulic circuit.

**! Caution**

**Never mix hydraulic fluids.**

### Filtration

#### Filters

Use a filter that conforms to Class 22/18/13 of ISO 4406 (or better). It may be on the pump outlet (pressure filtration), inlet (suction filtration), or reservoir return (return-line filtration).

#### Selecting a filter

When selecting a filter, please consider:

- contaminant ingress rate (determined by factors such as the number of actuators used in the system)
- generation of contaminants in the system
- required fluid cleanliness
- desired maintenance interval
- filtration requirements of other system components

Measure filter efficiency with a Beta ratio ( $\beta_x$ ). For:

- suction filtration, with controlled reservoir ingress, use a  $\beta_{35-45} = 75$  filter
- return or pressure filtration, use a pressure filtration with an efficiency of  $\beta_{10} = 75$

$\beta_x$  ratio is a measure of filter efficiency defined by ISO 4572. It is the ratio of the number of particles greater than a given diameter ("x" in microns) upstream of the filter to the number of these particles downstream of the filter.

#### Fluid cleanliness level and $\beta_x$ ratio

|   |   |
|---|---|
| <b>Fluid cleanliness level (per ISO 4406)</b>                     | Class 22/18/13 or better                  |
| <b><math>\beta_x</math> ratio (suction filtration)</b>            | $\beta_{35-45} = 75$ and $\beta_{10} = 2$ |
| <b><math>\beta_x</math> ratio (pressure or return filtration)</b> | $\beta_{10} = 75$                         |
| <b>Recommended inlet screen size</b>                              | 100-125 $\mu\text{m}$ [0.004-0.005 in]    |

The filtration requirements for each system are unique. Evaluate filtration system capacity by monitoring and testing prototypes.

#### Reservoir

The **reservoir** provides clean fluid, dissipates heat, removes entrained air, and allows fluid volume changes associated with fluid expansion and cylinder differential volumes. A correctly sized reservoir accommodates maximum volume changes during all system operating modes. It promotes deaeration of the fluid as it passes through, and accommodates a fluid dwell-time between 60 and 180 seconds, allowing entrained air to escape.

**Minimum reservoir capacity** depends on the volume required to cool and hold the oil from all retracted cylinders, allowing for expansion due to temperature changes. A fluid volume of 1 to 3 times the pump output flow (per minute) is satisfactory. The minimum reservoir capacity is 125% of the fluid volume.

Install the suction line above the bottom of the reservoir to take advantage of gravity separation and prevent large foreign particles from entering the line. Cover the line with a 100-125 micron screen. The

## Operating Parameters

pump should be below the lowest expected fluid level. Put the return-line below the lowest expected fluid level to allow discharge into the reservoir for maximum dwell and efficient deaeration. A baffle (or baffles) between the return and suction lines promotes deaeration and reduces fluid surges.

## Line sizing

Choose line sizes that accommodate maximum fluid velocity to reduce system noise, pressure drops, and overheating in order to maximize system life and performance. Line velocities shown in the following table provide a general rule of thumb. Final selection of line sizing and fittings must comply with all pressure ratings.

|               |                       |                |
|---------------|-----------------------|----------------|
| <b>Inlet</b>  | <b>m/sec [ft/sec]</b> | 2.4-4.3 [8-14] |
| <b>Outlet</b> |                       | 6-9 [20-30]    |

Most systems use hydraulic oil containing 10% dissolved air by volume. Over-eration, or entrained air is the result of flow line restrictions, where the dissolved air comes out of solution, or when air is allowed to leak into the hydraulic circuit. These include inadequate pipe sizes, sharp bends, or elbow fittings, causing reduction of flow-line cross-sectional area. This problem will not occur if these circuit recommendations are followed, rated speed requirements are maintained, and reservoir size and location are adequate.

## Pump life

Pump life is a function of speed, system pressure, and other system parameters (such as fluid quality and cleanliness).

All Danfoss gear pumps use hydrodynamic journal bearings with an oil film between the gear/shaft and bearing surfaces. If the oil film is sufficiently sustained through proper system maintenance and operating within recommended limits, long life can be expected.

[β10 life expectancy number is generally associated with rolling element bearings. It does not exist for hydrodynamic bearings.](#)

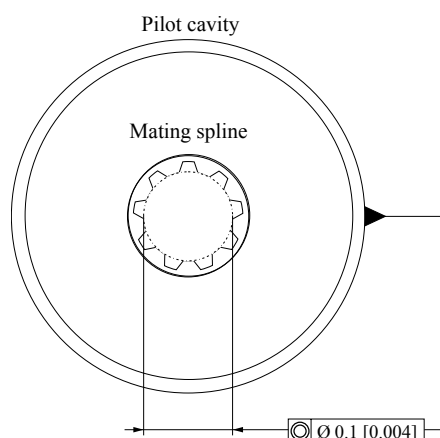
When submitting an application for review, provide machine duty cycle data including percentage of time at various loads and speeds. We strongly recommend a prototype testing program to verify operating parameters and their impact on life expectancy before finalizing any system design.

## Pump shaft connection

Shaft options for gear pumps include tapered, splined, or parallel shafts.

Plug-in drives, with a splined shaft, can impose severe radial loads when the mating spline is rigidly supported. Increasing spline clearance does not alleviate this condition.

*Pump shaft connection*



## Operating Parameters

Lubricate all shaft couplings. Failure to do so will result in premature shaft failure.

Use plug-in drives if the concentricity between the mating spline and pilot diameter is within 0.1 mm [0.004 in]. Lubricate the drive by flooding it with oil. A 3-piece coupling minimizes radial or thrust shaft loads.

**! Caution**

To avoid spline shaft damages it is recommended to use carburized and hardened steel couplings with 80-82 HRA surface hardness.

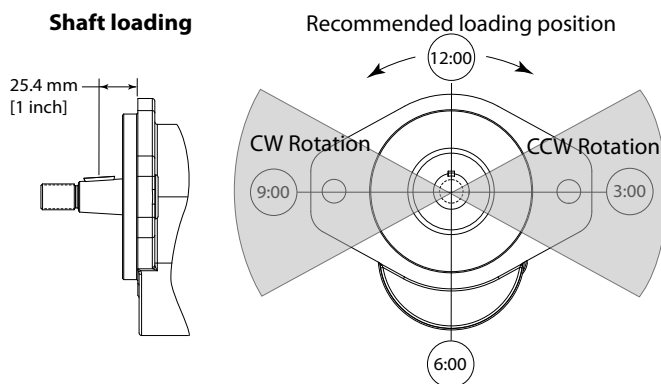
## Radial and axial loading

Allowable radial shaft loads are a function of the load position, load orientation, and operating pressure. All external shaft loads have an effect on bearing life, and may affect pump performance.

In applications where external shaft loads cannot be avoided, minimize the impact on the pump by optimizing the orientation and magnitude of the load. Use tapered input shafts for applications with radial shaft loads. The table below shows the preferred orientation for radial loads assuming maximum pressure. For assistance concerning shaft loading, contact your Danfoss representative.

Maximum radial and axial loads

| Ratings              | Units | 7    | 10   | 11   | 13   | 14   | 17   | 19   | 21   | 23   | 25   | 29   | 32   | 36   | 38   | 41   | 45   |
|----------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Maximum radial load  | lbf   | 1430 | 1430 | 1430 | 1430 | 1430 | 1430 | 1360 | 1300 | 1210 | 1070 | 870  | 700  | 420  | 270  | 450  | 620  |
|                      | N     | 6361 | 6361 | 6361 | 6361 | 6361 | 6361 | 5943 | 5783 | 5382 | 4760 | 3870 | 3114 | 1868 | 1201 | 2002 | 2758 |
| Push/Pull axial load | lbf   | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 350  |
|                      | N     | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 | 1557 |



- All values measured 25.4 mm [1 inch] from the mounting flange
- For other orientations and distances, higher radial loads at lower pressures contact your S-D representative

P107 928E

D Series Model Code

Single pump order code

Example

|   |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|----|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A |   |   | B1 |   | B2 |   | C |   | D |   |   |   | E |   |   | F |   |   | H |   | J |   | K |   |   |   |
| D | E | 1 | R  | 2 | 1  | S | H | A | C | F | 0 | 9 | A | 1 | 5 | X | 1 | 7 | 2 | C | Z | A | N | N | N | N |

| Code | Position | Description   |
|------|----------|---|
| DE1R | A        | D Series pump, single section, right hand rotation  |
| 21   | B1       | 21 cm <sup>3</sup> displacement   |
| SH   | B2       | 13 tooth spline input shaft   |
| AC   | C        | SAE A two bolt mounting flange  |
| F09A | D        | Integrated priority flow divider with cartridge style priority relief, 1 5/16-12 side inlet, 3/14-16 side priority, 7/8-14 side secondary |
| 15X  | E        | 15.1 l/min[4 US gal/min] priority flow setting  |
| 172  | F        | 172 bar [2495 psi] priority relief setting  |
| CZ   | H        | Assembly screws   |
| AN   | J        | Standard Nameplate  |
| NNN  | K        | No special features, black paint  |

DE1: D series cast iron gear pump, single section

*A Rotation - viewed from drive shaft*

|   |   |   |    |  |    |  |   |  |   |  |  |  |   |  |  |   |  |  |   |  |   |  |   |  |  |
|---|---|---|----|--|----|--|---|--|---|--|--|--|---|--|--|---|--|--|---|--|---|--|---|--|--|
| A |   |   | B1 |  | B2 |  | C |  | D |  |  |  | E |  |  | F |  |  | H |  | J |  | K |  |  |
| D | E | 1 | •  |  |    |  |   |  |   |  |  |  |   |  |  |   |  |  |   |  |   |  |   |  |  |

| Code | Description                 |
|------|-----------------------------|
| L    | Lefthand (counterclockwise) |
| R    | Right hand (clockwise)      |

*B1 Displacement*

|   |   |   |    |   |    |  |   |  |   |  |  |  |   |  |  |   |  |  |   |  |   |  |   |  |  |
|---|---|---|----|---|----|--|---|--|---|--|--|--|---|--|--|---|--|--|---|--|---|--|---|--|--|
| A |   |   | B1 |   | B2 |  | C |  | D |  |  |  | E |  |  | F |  |  | H |  | J |  | K |  |  |
| D | E | 1 | •  | • |    |  |   |  |   |  |  |  |   |  |  |   |  |  |   |  |   |  |   |  |  |

| Code | Description   |
|------|---|
| 07   | 7.0 cm <sup>3</sup> /rev [0.43 in <sup>3</sup> /rev]  |
| 10   | 9.5 cm <sup>3</sup> /rev [0.58 in <sup>3</sup> /rev]  |
| 11   | 10.8cm <sup>3</sup> /rev [0.66 in <sup>3</sup> /rev]  |
| 13   | 12.6cm <sup>3</sup> /rev [0.77 in <sup>3</sup> /rev]  |
| 14   | 14.3cm <sup>3</sup> /rev [0.87 in <sup>3</sup> /rev]  |
| 17   | 17.0cm <sup>3</sup> /rev [1.04 in <sup>3</sup> /rev]  |
| 19   | 19.0cm <sup>3</sup> /rev [1.16 in <sup>3</sup> /rev]  |
| 21   | 20.5cm <sup>3</sup> /rev [1.25 in <sup>3</sup> /rev]  |
| 23   | 22.5 cm <sup>3</sup> /rev [1.37 in <sup>3</sup> /rev] |
| 25   | 25.4 cm <sup>3</sup> /rev [1.55 in <sup>3</sup> /rev] |

### D Series Model Code

| Code | Description   |
|------|---|
| 29   | 29.0 cm <sup>3</sup> /rev [1.77 in <sup>3</sup> /rev] |
| 32   | 31.8 cm <sup>3</sup> /rev [1.94 in <sup>3</sup> /rev] |
| 36   | 36.1 cm <sup>3</sup> /rev [2.20 in <sup>3</sup> /rev] |
| 38   | 38.0 cm <sup>3</sup> /rev [2.32 in <sup>3</sup> /rev] |
| 41   | 41.0 cm <sup>3</sup> /rev [2.50 in <sup>3</sup> /rev] |
| 45   | 45.1 cm <sup>3</sup> /rev [2.75 in <sup>3</sup> /rev] |

### B2 Input shaft

| A |   |   | B1 | B2  | C | D |  |  | E | F | H | J | K |
|---|---|---|----|-----|---|---|--|--|---|---|---|---|---|
| D | E | 1 |    | • • |   |   |  |  |   |   |   |   |   |

| Code | Description  |
|------|--|
| SE*  | SAE 9 tooth spline, 31.8 mm [1.25 in] length   |
| SC   | SAE 11 tooth spline, 38.1 mm [1.5 in] length   |
| SF   | 11 tooth spline, 31.8 mm [1.25 in] length (special modified length)                          |
| SH   | SAE 13 tooth spline, 41 mm [1.62 in] length  |
| SV   | 15 tooth spline, 46 mm [1.81 in] length (use with mounting flange AR or BR)                  |
| PB   | 22 mm [7/8 in] diameter, 41 mm [1.62 in] length, with 1/4 key                                |
| PD   | 19 mm [3/4 in] diameter, 51 mm [2 in] length, with 3/16 key                                  |
| PZ   | 25.4 mm [1 in] diameter, 46 mm [1.81 in] length with 1/4 key                                 |
| TA   | 1:5taper, 25mm [1 in] dia, 58mm [2.30 in] length, 5/8 thread, M5 key with locknut and washer |
| TG   | 1:8taper, 22mm [7/8 in] dia, 50mm [1.95 in] length, 5/8 thread with key, locknut and washer  |
| TH   | 1:8taper, 22mm [7/8 in] dia, 49mm [1.94 in] length, 9/16 thread with key, locknut and washer |
| TX   | 1:4 taper, 22mm [7/8 in] dia, 50mm [1.98 in] length, 5/16 internal thread with key           |
| WT   | Input shaft similar to TH option with 34 tooth helical gear for Perkins engine mount         |
| AB   | 22mm[7/8 in] diameter, 41mm [1.62] length with 1/4 key with 9T spline through drive          |
| AC   | SAE 11 tooth spline, 38.1 mm [1.5 in] length with 9T spline through drive                    |
| AH   | SAE 13 tooth spline, 41 mm [1.62 in] length with 9T spline through drive                     |

\* Contact factory for units with SE (9T spline) to verify torque limits

### C Mounting flange

| A |   |   | B1 | B2 | C   | D |  |  | E | F | H | J | K |
|---|---|---|----|----|-----|---|--|--|---|---|---|---|---|
| D | E | 1 |    |    | • • |   |  |  |   |   |   |   |   |

| Code | Description   |
|------|---|
| AA   | SAE A 2-bolt  |
| AC   | SAE A 2-bolt, use with integral PFD/Steering Cover              |
| AL   | SAE A 2-bolt, two shaft seals with weep hole                    |
| AM   | SAE A 2-bolt, with T seal                                       |
| AP   | SAE A 2-bolt, with T seal, use with integral PFD/Steering cover |
| AR   | SAE A 2-bolt, use with 15 T spline input drive                  |

**D Series Model Code**

| Code      | Description   |
|-----------|---|
| <b>AS</b> | SAE A 2-bolt, use with integral PFD/Steering cover and 15 T input spline              |
| <b>AT</b> | SAE A 2-bolt, two shaft seals with weep hole, use with integral PFD/Steering cover    |
| <b>BB</b> | SAE B 2-bolt  |
| <b>BC</b> | SAE B 2-bolt, use with integral PFD/Steering cover                                    |
| <b>BM</b> | SAE B 2-bolt, with T seal   |
| <b>BP</b> | SAE B 2-bolt, with T seal, use with integral PFD/Steering cover                       |
| <b>BR</b> | SAE B 2-bolt, use with 15 T spline input drive  |
| <b>BS</b> | SAE B 2-bolt, use with integral PFD/Steering cover and 15 T input spline              |
| <b>BT</b> | SAE B 2-bolt, two shaft seals with weep hole, use with integral PFD/Steering Cover    |
| <b>BW</b> | SAE B 2-bolt, two shaft seals with weep hole  |
| <b>PP</b> | Perkins 6 bolt flange with (2) seals (use with WT input shaft and clockwise rotation) |

**D Rear cover: Port options, integrated valves, and auxiliary flange**

| A |   |   | B1 | B2 | C | D |   |   |   | E | F | H | J | K |  |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|--|
| D | E | 1 |    |    |   | • | • | • | • |   |   |   |   |   |  |

| Code         | Inlet                         | Outlet                                    | Description  |
|--------------|-------------------------------|---|--|
| <b>N101</b>  | 1 1/16-12 side inlet          | 7/8-14 side outlet                        | SAE O-ring boss ports No integrated valves No auxiliary flange                               |
| <b>N103</b>  | 1 5/16-12 side inlet          | 7/8-14 side outlet                        |  |
| <b>N104</b>  | 1 5/16-12 side inlet          | 1 1/16-12 side outlet                     |  |
| <b>N125</b>  | 1 5/8-12 side inlet           | 1 1/16-12 side outlet                     |  |
| <b>N501</b>  | 1 1/16-12 rear inlet          | 7/8-14 rear outlet                        |  |
| <b>N503</b>  | 1 5/16-12 rear inlet          | 7/8-14 rear outlet                        |  |
| <b>N504</b>  | 1 5/16-12 rear inlet          | 1 1/16-12 rear outlet                     |  |
| <b>N252</b>  | M33x2-6H rear inlet           | M22x1.5-6H side outlet                    | SAE Metric Ports – No Integrated Valves  |
| <b>N402</b>  | 3/4-14 side inlet             | 1/2-14 side outlet                        | British Standard Pipe Parallel (BSPP) threads - No integrated valves                         |
| <b>N403</b>  | 1-11 side inlet               | 1/2-14 side outlet                        |  |
| <b>N404</b>  | 1 1/4-11 side inlet           | 1/2-14 side outlet                        |  |
| <b>N407</b>  | 1-11 side inlet               | 3/4-14 side outlet                        |  |
| <b>N408</b>  | 1 1/4-11 side inlet           | 3/4-14 side outlet                        |  |
| <b>N342</b>  | 1 1/4 side split flange inlet | 3/4side split flange outlet (SAE code 61) | SAEsplitt flange ports No integrated valves Noauxiliary flange                               |
| <b>N704</b>  | 1 1/4 side tube inlet         | 7/8-14 side ORB outlet                    | Beaded tube inlet port, SAE O-ring boss outlet port No integrated valves No auxiliary flange |
| <b>N708</b>  | 1 1/4 side tube inlet         | 1 1/16-12 side ORB outlet                 |  |
| <b>N715</b>  | 1 1/4 REAR tube inlet         | 1 1/16-12 REAR ORB outlet                 |  |
| <b>N716</b>  | 1 1/2 side tube inlet         | 1 1/16-12 side ORB outlet                 |  |
| <b>N720</b>  | 1 1/4 REAR tube inlet         | 7/8-14 REAR ORB outlet                    |  |
| <b>B103*</b> | 1 5/16-12 side inlet          | 7/8-14 side outlet                        |  |
| <b>B104*</b> | 1 5/16-12 side inlet          | 1 1/16-12 side outlet                     |  |



**D Series Model Code**

| Code          | Inlet   | Outlet                | Description  |
|---------------|---|-----------------------|--|
| <b>R104</b>   | 1 5/16-12 side inlet  | 1 1/16-12 side outlet | Integrated Relief Valve Internally Drained<br>Maximum Displacement 23cc  |
| <b>F09A**</b> | 15/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE A flange)                   |                       | Integrated Priority Flow Divider, cartridge style relief<br>for settings up to: 221 bar and 34.3 l/min<br>[3200 psi and 9 US gal/min]        |
| <b>F09B‡</b>  | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange)                   |                       |  |
| <b>F13A**</b> | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange)                   |                       |  |
| <b>F13B‡</b>  | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE B flange)                   |                       |  |
| <b>F21A**</b> | 15/8-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE A flange)                    |                       |  |
| <b>F21B‡</b>  | 15/8-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE B flange)                    |                       |  |
| <b>F25A**</b> | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange)                  |                       |  |
| <b>F25B‡</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE B flange)                  |                       |  |
| <b>D23A*</b>  | 15/16-12 side inlet, 3/4-16 side priority, no secondary port (SAE A flange)                       |                       | Integrated Steering Cover, Priority Relief Valve (Cartridge Style) for settings up to: 221 bar and 34.3 l/min<br>[3200 psi and 9 US gal/min] |
| <b>D23B**</b> | 15/16-12 side inlet, 3/4-16 side priority, no secondary port (SAE B flange)                       |                       |  |
| <b>D24A*</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, no secondary port (SAE A flange)                      |                       |  |
| <b>D24B**</b> | 1 5/16-12 rear inlet, 3/4-16 rear priority, no secondary port (SAE B flange)                      |                       |  |
| <b>L01A**</b> | 1 5/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary, 7/16-20 side LS (SAE-A flange) |                       | Integrated Load Sense Divider (Dynamic), Priority Relief Valve   |
| <b>L01B‡</b>  | 1 5/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary, 7/16-20 side LS (SAE-B flange) |                       |  |
| <b>L08A**</b> | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary, 7/16-20 rear LS (SAE-A flange) |                       |  |
| <b>L08B‡</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary, 7/16-20 rear LS (SAE-B flange) |                       |  |

\* Integrated auxiliary flange requires use of input shaft option AH or AC

\*\* Requires use of mounting flange option AC or AP

‡ Requires use of mounting flange option BC or BP

[A variety of integrated load sense priority flow divider covers are available from Danfoss. Please contact your technical representative to determine which hardware best suits specific application needs.](#)

**E Flow control valve setting**

| A |   |   | B1 | B2 | C | D |  |  | E | F | H | J | K |
|---|---|---|----|----|---|---|--|--|---|---|---|---|---|
| D | E | 1 |    |    |   |   |  |  | • | • | • |   |   |

**D Series Model Code**

| Code       | Description   |  |
|------------|---|--|
| <b>NNN</b> | Noflow control setting, standard for units without integrated flow control valves |  |
| <b>04X</b> | 3.8 l/min [1 US gal/min]  | For integrated PFD<br>Steering cover with cartridge style relief valve<br>(Cover options F09A, F09B, F13A, F13B, F21A, F21B, F25A or F25B) |
| <b>08X</b> | 7.6 l/min [2 US gal/min]  |  |
| <b>11X</b> | 11.4 l/min [3 US gal/min]   |  |
| <b>15X</b> | 15.1 l/min [4 US gal/min]   |  |
| <b>19X</b> | 18.9 l/min [5 US gal/min]   |  |
| <b>23X</b> | 22.7 l/min [6 US gal/min]   |  |
| <b>27X</b> | 26.5 l/min [7 US gal/min]   |  |
| <b>30X</b> | 30.3 l/min [8 US gal/min]   |  |
| <b>34X</b> | 34.3 l/min [9 US gal/min]   |  |
| <b>38A</b> | 10 bar standby  |  |
| <b>38L</b> | 10 bar standby  | Forintegrated load sense divider (use with L01A or L01B side ports)  |
| <b>R1N</b> | Maximum flow not to exceed 75 l/min, pressure range from 7-55bar                  | For integrated relief valve, internally drained (without flow control)<br>Use with R104 cover option 23cc and under                        |
| <b>R2N</b> | Maximum flow not to exceed 75 l/min, pressure range from 41-248bar                | For integrated relief valve, internally drained (without flow control)<br>Use with R104 cover option 23cc and under                        |

**F Pressure control valve setting**

| A |   | B1 | B2 | C | D |  | E | F |   |   | H | J | K |  |  |
|---|---|----|----|---|---|--|---|---|---|---|---|---|---|--|--|
| D | E | 1  |    |   |   |  |   |   | • | • | • |   |   |  |  |

**D Series Model Code**

| Code | Description  |   |
|------|--|---|
| 000  | Nopressure control settings, standard for units without integrated pressure control valves |   |
| 034  | 34 bar [500 psi]   | <p>For integrated priority flow divider (PFD) cover with cartridge style relief valve (Cover options F09A, F09B, F13A, F13B, F21A, F21B, F25A, F25B)</p> <p>For integrated steering cover with cartridge style relief valve (Cover options D23A, D23B, D24A, D24B)</p> <p>For integrated load sense (LS) cover with cartridge relief valve (Cover options L01A, L01B, L08A, L08B)</p> |
| 041  | 41 bar [600 psi]   |   |
| 048  | 48 bar [700 psi]   |   |
| 055  | 55 bar [800 psi]   |   |
| 062  | 62 bar [900 psi]   |   |
| 069  | 69 bar [1000 psi]  |   |
| 076  | 76 bar [1100 psi]  |   |
| 083  | 83 bar [1200 psi]  |   |
| 090  | 90 bar [1300 psi]  |   |
| 097  | 97 bar [1400 psi]  |   |
| 103  | 103 bar [1500 psi]   |   |
| 110  | 110 bar [1600 psi]   |   |
| 117  | 117 bar [1700 psi]   |   |
| 124  | 124 bar [1800 psi]   |   |
| 131  | 131 bar [1900 psi]   |   |
| 138  | 138 bar [2000 psi]   |   |
| 145  | 145 bar [2100 psi]   |   |
| 152  | 152 bar [2200 psi]   |   |
| 159  | 159 bar [2300 psi]   |   |
| 165  | 165 bar [2400 psi]   |   |
| 172  | 172 bar [2500 psi]   |   |
| 179  | 179 bar [2600 psi]   |   |
| 186  | 186 bar [2700 psi]   |   |
| 193  | 193 bar [2800 psi]   |   |
| 200  | 200 bar [2900 psi]   |   |
| 207  | 207 bar [3000 psi]   |   |
| 214  | 214 bar [3100 psi]   |   |
| 221  | 221 bar [3200 psi]   |   |

**H Assembly Screws - depending on rear cover**

| A |   |   | B1 |  |  | B2 |  |  | C |  |  | D |  |  | E |  |  | F |  |  | H |   | J |  |  | K |  |  |
|---|---|---|----|--|--|----|--|--|---|--|--|---|--|--|---|--|--|---|--|--|---|---|---|--|--|---|--|--|
| D | E | 1 |    |  |  |    |  |  |   |  |  |   |  |  |   |  |  |   |  |  | • | • |   |  |  |   |  |  |

(Choose Table 1 or Table 2)

Table 1. Single pumps without auxiliary cover or integrated valves

| Displacement (Module B) | Rear Cover - Controls & Ports (Module D)       |      |
|-------------------------|--|------|
|                         | N101, N103, N104, N501, N503, N504, N704, N708 | N125 |
| 07                      | AF   | AJ   |
| 10                      | AG   | AJ   |

## D Series Model Code

Table 1. Single pumps without auxiliary cover or integrated valves (continued)

| Displacement (Module B) | Rear Cover - Controls & Ports (Module D)       |      |
|-------------------------|--|------|
|                         | N101, N103, N104, N501, N503, N504, N704, N708 | N125 |
| 11                      | AG   | AJ   |
| 13                      | AG   | AJ   |
| 14                      | AG   | AK   |
| 17                      | AH   | AK   |
| 19                      | AH   | AK   |
| 21                      | AH   | AL   |
| 23                      | AJ   | AL   |
| 25                      | AJ   | AL   |
| 29                      | AK   | AM   |
| 32                      | AK   | AM   |
| 36                      | AL   | AN   |
| 38                      | AL   | AN   |
| 41                      | AM   | AP   |
| 45                      | AM   | AR   |

Table 2. Single pumps with auxiliary cover or integrated valves, dependent on rotation

| Displacement (Module B) | Rear Cover - Controls & Ports (Module D) |                 |      |                          |                 |      |
|-------------------------|--|-----------------|------|--------------------------|-----------------|------|
|                         | Right Hand (CW) Rotation                 |                 |      | Left Hand (CCW) Rotation |                 |      |
|                         | F09A F13A, F21A                          | F09B F13B, F21B | B104 | F09A F13A, F21A          | F09B F13B, F21B | B104 |
| 07                      | CV                                       | DG              | AG   | EM                       | DG              | AG   |
| 10                      | CV                                       | DG              | AH   | EM                       | DG              | AH   |
| 11                      | CV                                       | DG              | AH   | EM                       | DG              | AH   |
| 13                      | CX                                       | DJ              | AH   | EP                       | DJ              | AH   |
| 14                      | CX                                       | DJ              | AH   | EP                       | DJ              | AH   |
| 17                      | CY                                       | DK              | AJ   | ER                       | DK              | AJ   |
| 19                      | CZ                                       | DL              | AJ   | ES                       | DL              | AJ   |
| 21                      | CZ                                       | DL              | AJ   | ES                       | DL              | AJ   |
| 23                      | CZ                                       | DM              | AJ   | ES                       | DM              | AJ   |
| 25                      | DA                                       | DN              | AK   | ET                       | DN              | AK   |
| 29                      | DB                                       | DP              | AK   | EY                       | DP              | AK   |
| 32                      | DC                                       | DR              | AL   | EU                       | DR              | AL   |
| 36                      | DD                                       | DS              | AM   | EV                       | DS              | AM   |
| 38                      | DE                                       | DT              | AM   | EW                       | DT              | AM   |
| 41                      | DE                                       | DT              | AM   | EW                       | DT              | AM   |
| 45                      | DF                                       | DU              | AN   | EX                       | DU              | AN   |

## D Series Model Code

### J Nameplates

| A |   |   | B1 | B2 | C | D |  |  | E | F | H | J | K |
|---|---|---|----|----|---|---|--|--|---|---|---|---|---|
| D | E | 1 |    |    |   |   |  |  |   |   |   | • | • |

| Code | Description        |
|------|--------------------|
| AN   | Standard nameplate |

### K Special feature

| A |   |   | B1 | B2 | C | D |  |  | E | F | H | J | K |   |   |
|---|---|---|----|----|---|---|--|--|---|---|---|---|---|---|---|
| D | E | 1 |    |    |   |   |  |  |   |   |   |   | • | • | • |

| Code | Description                               |
|------|---|
| NNN  | No special features, standard black paint |

## Two section (tandem) pump order code

### Example

The order code below provides an example of a single section pump with integrated priority flow divider

| A |   |   | B1 | B2 | C | R | S | D |   |   | E | F | H | J | K |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E | 2 | R  | 2  | 3 | S | H | B | B | 1 | 0 | 4 | 1 | 3 | N | 1 | 1 | 3 | N | N | N | O | O | O | A | V | A | N | N | N | N |

| Code | Position | Description  |
|------|----------|--|
| DE2R | A        | D Series pump with two pumping sections, right hand rotation |
| 23   | B1       | 23 cm <sup>3</sup> displacement on first section             |
| SH   | B2       | 13 tooth spline input shaft                                  |
| BB   | C        | SAE B two bolt mounting flange                               |
| 104  | R        | 1 5/16-12 side inlet, 1 1/16 side outlet on first section    |
| 13   | S        | 13 cm <sup>3</sup> displacement on second section            |
| N113 | D        | No inlet and 7/8-14 side outlet on second section            |
| NNN  | E        | No flow control setting                                      |
| 000  | F        | No pressure control setting                                  |
| AV   | H        | Assembly screws  |
| AN   | J        | Standard Nameplate   |
| NNN  | K        | No special features, black paint                             |

### A Rotation - viewed from drive shaft

| A |   |   | B1 | B2 | C | R | S | D |  |  | E | F | H | J | K |  |
|---|---|---|----|----|---|---|---|---|--|--|---|---|---|---|---|--|
| D | E | 2 | •  |    |   |   |   |   |  |  |   |   |   |   |   |  |

| Code | Description                 |
|------|-----------------------------|
| L    | Lefthand (counterclockwise) |
| R    | Right hand (clockwise)      |

## D Series Model Code

### B1 Displacement

| A |   |   | B1 |   | B2 | C | R | S | D | E | F | H | J | K |  |
|---|---|---|----|---|----|---|---|---|---|---|---|---|---|---|--|
| D | E | 2 | •  | • |    |   |   |   |   |   |   |   |   |   |  |

| Code | Description  |
|------|--|
| 07   | 7.0 cm <sup>3</sup> /rev [0.43 in <sup>3</sup> /rev] |
| 10   | 9.5 cm <sup>3</sup> /rev [0.58 in <sup>3</sup> /rev] |
| 11   | 10.8cm <sup>3</sup> /rev [0.66 in <sup>3</sup> /rev] |
| 13   | 12.6cm <sup>3</sup> /rev [0.77 in <sup>3</sup> /rev] |
| 14   | 14.3cm <sup>3</sup> /rev [0.87 in <sup>3</sup> /rev] |
| 17   | 17.0cm <sup>3</sup> /rev [1.04 in <sup>3</sup> /rev] |
| 19   | 19.0cm <sup>3</sup> /rev [1.16 in <sup>3</sup> /rev] |
| 21   | 20.5cm <sup>3</sup> /rev [1.25 in <sup>3</sup> /rev] |
| 23   | 22.5cm <sup>3</sup> /rev [1.37 in <sup>3</sup> /rev] |
| 25   | 25.4cm <sup>3</sup> /rev [1.55 in <sup>3</sup> /rev] |
| 29   | 29.0cm <sup>3</sup> /rev [1.77 in <sup>3</sup> /rev] |
| 32   | 31.8cm <sup>3</sup> /rev [1.94 in <sup>3</sup> /rev] |
| 36   | 36.1cm <sup>3</sup> /rev [2.20 in <sup>3</sup> /rev] |
| 38   | 38.0cm <sup>3</sup> /rev [2.32 in <sup>3</sup> /rev] |
| 41   | 41.0cm <sup>3</sup> /rev [2.50 in <sup>3</sup> /rev] |
| 45   | 45.1cm <sup>3</sup> /rev [2.75 in <sup>3</sup> /rev] |

### B2 Input shaft

| A |   |   | B1 | B2 |   | C | R | S | D | E | F | H | J | K |  |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|--|
| D | E | 2 |    | •  | • |   |   |   |   |   |   |   |   |   |  |

| Code | Description  |
|------|--|
| SE*  | SAE 9 tooth spline, 31.8 mm [1.25 in] length   |
| SC   | SAE 11 tooth spline, 38.1 mm [1.50 in] length  |
| SF   | 11 tooth spline, 31.8 mm [1.25 in] length (special modified length)                          |
| SH   | SAE 13 tooth spline, 41 mm [1.62 in] length  |
| SV   | 15 tooth spline, 46 mm [1.81 in] length (requires mounting flange AR or BR)                  |
| PB   | 22 mm [7/8 in] diameter x 41 mm [1.62 in] length, with 1/4 inch key                          |
| PD   | 19 mm [3/4 in] diameter x 51 mm [2.0 in] length, with 3/16 inch key                          |
| PZ   | 25.4 mm [1 inch] diameter x 46 mm [1.81 in] length, with 1/4 inch key                        |
| TA   | 1:5taper, 25mm [1 in] dia, 58mm [2.30 in] length, 5/8 thread, M5 key with locknut and washer |
| TG   | 1:8taper, 22mm [7/8 in] dia, 50mm [1.95 in] length, 5/8 thread with key, locknut and washer  |
| TH   | 1:8taper, 22mm [7/8 in] dia, 49mm [1.94 in] length, 9/16 thread with key, locknut and washer |
| WT   | Input shaft similar to TH option with 34 tooth helical gear for Perkins engine mount         |

\* Contact factory for units with SE (9T spline) to verify torque limits

## D Series Model Code

### C Mounting flange

| A |   |   | B1 | B2 | C   | R | S | D |  |  | E | F | H | J | K |  |
|---|---|---|----|----|-----|---|---|---|--|--|---|---|---|---|---|--|
| D | E | 2 |    |    | • • |   |   |   |  |  |   |   |   |   |   |  |

| Code | Description   |
|------|---|
| AA   | SAE A 2-bolt  |
| AC   | SAE A 2-bolt, use with integral PFD/Steering Cover                                    |
| AM   | SAE A 2-bolt, with T seal   |
| AP   | SAE A 2-bolt, with T seal, use with integral PFD/Steering cover                       |
| AR   | SAE A 2-bolt, use with 15 T spline input drive  |
| AS   | SAE A 2-bolt, use with integral PFD/Steering cover and 15 T input spline              |
| AL   | SAE A 2-bolt, two shaft seals with weep hole  |
| AT   | SAE A 2-bolt, two shaft seals with weep hole, use with integral PFD/Steering cover    |
| BB   | SAE B 2-bolt  |
| BC   | SAE B 2-bolt, use with integral PFD/Steering cover                                    |
| BM   | SAE B 2-bolt, with T seal   |
| BP   | SAE B 2-bolt, with T seal, use with integral PFD/Steering cover                       |
| BR   | SAE B 2-bolt, use with 15 T spline input drive  |
| BS   | SAE B 2-bolt, use with integral PFD/Steering cover and 15 T input spline              |
| BT   | SAE B 2-bolt, two shaft seals with weep hole, use with integral PFD/Steering Cover    |
| BW   | SAE B 2-bolt, two shaft seals with weep hole  |
| PP   | Perkins 6 bolt flange with (2) seals (use with WT input shaft and clockwise rotation) |

### R Ports - First section

| A |   |   | B1 | B2 | C | R     | S | D |  |  | E | F | H | J | K |  |
|---|---|---|----|----|---|-------|---|---|--|--|---|---|---|---|---|--|
| D | E | 2 |    |    |   | • • • |   |   |  |  |   |   |   |   |   |  |

| Code | Description   |   |
|------|---|---|
| 101  | 1 1/16-12 side inlet, 7/8-14 side outlet                                  | SAE O-ring boss ports No integrated valves    |
| 103  | 1 5/16-12 side inlet, 7/8-14 side outlet                                  |   |
| 104  | 1 5/16-12 side inlet, 1 1/16-12 side outlet                               |   |
| 113  | No inlet, 7/8-14 side outlet  |   |
| 125  | 1 5/8-12 side inlet, 1 1/16-12 side outlet                                |   |
| 126  | No inlet, 1 1/16-12 side outlet   |   |
| 341  | No inlet, 3/4 side split flange outlet (SAE Code 61)                      | SAE Split Flange Ports - No integrated valves |
| 342  | 1 1/4 side split flange inlet, 3/4 side split flange outlet (SAE Code 61) |   |

**D Series Model Code**

| Code | Description                                     |  |
|------|---|--|
| 401  | No inlet, 1/2-14 side outlet                    | British Standard Pipe Parallel (BSPP) threads - No integrated valves |
| 402  | 3/4-14 side inlet, 1/2-14 side outlet           |  |
| 403  | 1-11 side inlet, 1/2-14 side outlet             |  |
| 404  | 1 1/4-11 side inlet, 1/2-14 side outlet         |  |
| 405  | No inlet, 3/4-14 side outlet                    |  |
| 407  | 1-11 side inlet, 3/4-14 side outlet             |  |
| 408  | 1 1/4-11 side inlet, 3/4-14 side outlet         |  |
| 704  | 1 1/4 side tube inlet, 7/8-14 side ORB outlet   |  |
| 708  | 11/4 side tube inlet, 1 1/16-12 side ORB outlet |  |
| 716  | 11/2 side tube inlet, 1 1/16-12 side ORB outlet |  |
| 717  | 1 1/2 side tube inlet, 7/8-14 side ORB outlet   |  |

**S Displacement - Second section**

| A |   |   | B1 | B2 | C | R | S | D |  |  | E | F | H | J | K |  |
|---|---|---|----|----|---|---|---|---|--|--|---|---|---|---|---|--|
| D | E | 2 |    |    |   |   | • | • |  |  |   |   |   |   |   |  |

| Code | Description   |
|------|---|
| 07   | 7.0 cm <sup>3</sup> /rev [0.43 in <sup>3</sup> /rev]  |
| 10   | 9.5 cm <sup>3</sup> /rev [0.58 in <sup>3</sup> /rev]  |
| 11   | 10.8cm <sup>3</sup> /rev [0.66 in <sup>3</sup> /rev]  |
| 13   | 12.6cm <sup>3</sup> /rev [0.77 in <sup>3</sup> /rev]  |
| 14   | 14.3cm <sup>3</sup> /rev [0.87 in <sup>3</sup> /rev]  |
| 17   | 17.0cm <sup>3</sup> /rev [1.04 in <sup>3</sup> /rev]  |
| 19   | 19.0cm <sup>3</sup> /rev [1.16 in <sup>3</sup> /rev]  |
| 21   | 20.5 cm <sup>3</sup> /rev [1.25 in <sup>3</sup> /rev] |
| 23   | 22.5 cm <sup>3</sup> /rev [1.37 in <sup>3</sup> /rev] |
| 25   | 25.4 cm <sup>3</sup> /rev [1.55 in <sup>3</sup> /rev] |
| 29   | 29.0 cm <sup>3</sup> /rev [1.77 in <sup>3</sup> /rev] |
| 32   | 31.8 cm <sup>3</sup> /rev [1.94 in <sup>3</sup> /rev] |
| 36   | 36.1 cm <sup>3</sup> /rev [2.20 in <sup>3</sup> /rev] |
| 38   | 38.0 cm <sup>3</sup> /rev [2.32 in <sup>3</sup> /rev] |
| 41   | 41.0 cm <sup>3</sup> /rev [2.50 in <sup>3</sup> /rev] |
| 45   | 45.1 cm <sup>3</sup> /rev [2.75 in <sup>3</sup> /rev] |

**D Rear cover: Port options, integrated valves and auxillary flange**

| A |   |   | B1 | B2 | C | R | S | D |   |   |   | E | F | H | J | K |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E | 2 |    |    |   |   |   | • | • | • | • |   |   |   |   |   |



**D Series Model Code**

| Code         | Inlet                         | Outlet                                    | Description  |
|--------------|-------------------------------|---|--|
| <b>N101</b>  | 1 1/16-12 side inlet          | 7/8-14 side outlet                        | SAE O-ring boss ports No integrated valves No auxiliary flange                               |
| <b>N103</b>  | 1 5/16-12 side inlet          | 7/8-14 side outlet                        |  |
| <b>N104</b>  | 1 5/16-12 side inlet          | 1 1/16-12 side outlet                     |  |
| <b>N113</b>  | No inlet                      | 7/8-14 side outlet                        |  |
| <b>N125</b>  | 1 5/8-12 side inlet           | 1 1/16-12 side outlet                     |  |
| <b>N126</b>  | No inlet                      | 1 1/16-12 side outlet                     |  |
| <b>N501</b>  | 1 1/16-12 rear inlet          | 7/8-14 rear outlet                        |  |
| <b>N503</b>  | 1 5/16-12 rear inlet          | 7/8-14 rear outlet                        |  |
| <b>N504</b>  | 1 5/16-12 rear inlet          | 1 1/16-12 rear outlet                     |  |
| <b>N401</b>  | No inlet                      | 1/2-14 side outlet                        |  |
| <b>N402</b>  | 3/4-14 side inlet             | 1/2-14 side outlet                        |  |
| <b>N403</b>  | 1-11 side inlet               | 1/2-14 side outlet                        |  |
| <b>N404</b>  | 1 1/4-11 side inlet           | 1/2-14 side outlet                        |  |
| <b>N407</b>  | 1-11 side inlet               | 3/4-14 side outlet                        |  |
| <b>N408</b>  | 1 1/4-11 side inlet           | 3/4-14 side outlet                        |  |
| <b>N341</b>  | No inlet                      | 3/4side split flange outlet (SAE code 61) | SAE split flange ports No integrated valves No auxiliary flange                              |
| <b>N342</b>  | 1 1/4 side split flange inlet | 3/4side split flange outlet (SAE code 61) |  |
| <b>N704</b>  | 1 1/4 side tube inlet         | 7/8-14 side ORB outlet                    | Beaded tube inlet port, SAE O-ring boss outlet port No integrated valves No auxiliary flange |
| <b>N708</b>  | 1 1/4 side tube inlet         | 1 1/16-12 side ORB outlet                 |  |
| <b>N715</b>  | 1 1/4 REAR tube inlet         | 1 1/16-12 REAR ORB outlet                 |  |
| <b>N716</b>  | 1 1/2 side tube inlet         | 1 1/16-12 side ORB outlet                 |  |
| <b>N720</b>  | 1 1/4 REAR tube inlet         | 7/8-14 REAR ORB outlet                    |  |
| <b>B103*</b> | 1 5/16-12 side inlet          | 7/8-14 side outlet,                       | SAE-A2-Bolt Auxiliary Flange<br>SAE O-ring boss ports<br>No integrated valves                |
| <b>B104*</b> | 1 5/16-12 side inlet          | 1 1/16-12 side outlet                     | Integrated Relief Valve Internally Drained<br>Maximum Displacement 23cc                      |
| <b>R104</b>  | 1 5/16-12 side inlet          | 1 1/16-12 side outlet                     |  |
| <b>N252</b>  | M33x2-6H rear inlet           | M22x1.5-6H side outlet                    | SAE Metric Ports – No Integrated Valves  |

\* Integrated auxiliary flange requires use of input shaft option AH or AC

**D Series Model Code**

| Code           | Inlet/Outlet  | Description   |
|----------------|---|---|
| <b>F09A**</b>  | 15/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE A flange)                   | Integrated Priority Flow Divider, cartridge style relief for settings up to: 221 bar and 34.3 l/min [3200 psi and 9 US gal/min]           |
| <b>F09B‡</b>   | 15/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE B flange)                   |   |
| <b>F13A**</b>  | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange)                   |   |
| <b>F13B‡</b>   | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE B flange)                   |   |
| <b>F21A**</b>  | 15/8-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE A flange)                    |   |
| <b>F21B‡</b>   | 15/8-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE B flange)                    |   |
| <b>F25A**</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange)                  |   |
| <b>F25B‡</b>   | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE B flange)                  |   |
| <b>D23A*</b>   | 15/16-12 side inlet, 3/4-16 side priority, no secondary port (SAE A flange)                       | Integrated Steering Cover, Priority Relief Valve (Cartridge Style) for settings up to: 221 bar and 34.3 l/min [3200 psi and 9 US gal/min] |
| <b>D23B**</b>  | 15/16-12 side inlet, 3/4-16 side priority, no secondary port (SAE B flange)                       |   |
| <b>D24A*</b>   | 1 5/16-12 rear inlet, 3/4-16 rear priority, no secondary port (SAE A flange)                      |   |
| <b>D24B**</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, no secondary port (SAE B flange)                      |   |
| <b>L01A**</b>  | 1 5/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary, 7/16-20 side LS (SAE-A flange) | Integrated Load Sense Divider (Dynamic), Priority Relief Valve  |
| <b>L01B***</b> | 1 5/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary, 7/16-20 side LS (SAE-B flange) |   |
| <b>L08A**</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary, 7/16-20 rear LS (SAE-A flange) |   |
| <b>L08B***</b> | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary, 7/16-20 rear LS (SAE-B flange) |   |

\*\* Requires use of mounting flange option AC or AP

‡ Requires use of mounting flange option BC or BP

\* Integrated auxilliary flange requires use of input shaft option AH or AC

[A variety of integrated valve options including PFD, Steering Covers, and Load sense priority flow dividers covers are available with D Series multiple pumps. Please contact your technical representative to determine which hardware best suits specific application needs.](#)

**E Flow control valve**

| A |   |   | B1 | B2 | C | R | S | D | E | F | H | J | K |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|
| D | E | 2 |    |    |   |   |   |   | • | • | • |   |   |

**D Series Model Code**

| Code       | Description   |  |
|------------|---|--|
| <b>NNN</b> | Noflow control setting, standard for units without integrated flow control valves |  |
| <b>04X</b> | 3.8 l/min [1 US gal/min]  | For integrated PFD<br>Steering cover with cartridge style relief valve<br>(Cover options F09A, F09B, F13A, F13B, F21A, F21B, F25A or F25B) |
| <b>08X</b> | 7.6 l/min [2 US gal/min]  |  |
| <b>11X</b> | 11.4 l/min [3 US gal/min]   |  |
| <b>15X</b> | 15.1 l/min [4 US gal/min]   |  |
| <b>19X</b> | 18.9 l/min [5 US gal/min]   |  |
| <b>23X</b> | 22.7 l/min [6 US gal/min]   |  |
| <b>27X</b> | 26.5 l/min [7 US gal/min]   |  |
| <b>30X</b> | 30.3 l/min [8 US gal/min]   |  |
| <b>34X</b> | 34.3 l/min [9 US gal/min]   |  |
| <b>38A</b> | 10 bar standby  | Forintegrated load sense divider (use with L08A or L08B rear ports)  |
| <b>38L</b> | 10 bar standby  | Forintegrated load sense divider (use with L01A or L01B side ports)  |
| <b>R1N</b> | Maximum flow not to exceed 75 l/min, pressure range from 7-55bar                  | For integrated relief valve, internally drained (without flow control)<br>Use with R104 cover option<br>23cc and under                     |
| <b>R2N</b> | Maximum flow not to exceed 75 l/min, pressure range from 41-248bar                | For integrated relief valve, internally drained (without flow control)<br>Use with R104 cover option<br>23cc and under                     |

**F Pressure control valve**

| A |   | B1 | B2 | C | R | S | D |  | E | F |   |   | H | J | K |
|---|---|----|----|---|---|---|---|--|---|---|---|---|---|---|---|
| D | E | 2  |    |   |   |   |   |  |   |   | • | • | • |   |   |

**D Series Model Code**

| Code | Description                 |   |
|------|-----------------------------|---|
| 000  | Nopressure control settings |   |
| 034  | 34 bar [500 psi]            | <p>For integrated priority flow divider (PFD) cover with cartridge style relief valve (Cover options F09A, F09B, F13A, F13B, F21A, F21B, F25A, F25B)</p> <p>For integrated steering cover with cartridge style relief valve (Cover options D23A, D23B, D24A, D24B)</p> <p>For integrated load sense (LS) cover with cartridge relief valve (Cover options L01A, L01B, L08A, L08B)</p> |
| 041  | 41 bar [600 psi]            |   |
| 048  | 48 bar [700 psi]            |   |
| 055  | 55 bar [800 psi]            |   |
| 062  | 62 bar [900 psi]            |   |
| 069  | 69 bar [1000 psi]           |   |
| 076  | 76 bar [1100 psi]           |   |
| 083  | 83 bar [1200 psi]           |   |
| 090  | 90 bar [1300 psi]           |   |
| 097  | 97 bar [1400 psi]           |   |
| 103  | 103 bar [1500 psi]          |   |
| 110  | 110 bar [1600 psi]          |   |
| 117  | 117 bar [1700 psi]          |   |
| 124  | 124 bar [1800 psi]          |   |
| 131  | 131 bar [1900 psi]          |   |
| 138  | 138 bar [2000 psi]          |   |
| 145  | 145 bar [2100 psi]          |   |
| 152  | 152 bar [2200 psi]          |   |
| 159  | 159 bar [2300 psi]          |   |
| 165  | 165 bar [2400 psi]          |   |
| 172  | 172 bar [2500 psi]          |   |
| 179  | 179 bar [2600 psi]          |   |
| 186  | 186 bar [2700 psi]          |   |
| 193  | 193 bar [2800 psi]          |   |
| 200  | 200 bar [2900 psi]          |   |
| 207  | 207 bar [3000 psi]          |   |
| 214  | 214 bar [3100 psi]          |   |
| 221  | 221 bar [3200 psi]          |   |

**H Assembly screws**

| A | B1 | B2 | C | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|
| D | E  | 2  |   |   |   |   |   |   | • | • |   |

1. Step 1 - Select the table corresponding to the port codes of the front and rear pump
2. Step 2 - Select the row corresponding to the displacement of the front pump
3. Step 3 - Select the column corresponding to the displacement of the rear pump
4. Step 4 - Select the 2 letter code where the two displacements meet

Example from Table 1: AW = 21+19 tandem

The following tables are only applicable to port codes shown. For all other port code options (including PFD, LS and auxiliary cover), please consult factory.

### D Series Model Code

| Table number | Front pump port code Module R       | Rear pump port code Module D                                  |
|--------------|-------------------------------------|---|
| 1            | 101, 103, 104, 113, 126, 704 or 708 | N101, N103, N104, N113, N126, N501, N503, N504, N704, or N708 |
| 2            | 125, 716, 717                       | N101, N103, N104, N113, N126, N501, N503, N504, N704, or N708 |
| 3            | 101, 103, 104, 113, 126, 704 or 708 | N125  |
| 4            | 125, 716, 717                       | N125  |

| Table 1                            | Frontpump port code, Module: R = 101, 103, 104, 113, 126, 704, or 708 Rearpump port code, Module: D = N101, N103, N104, N113, N126, N501, N503, N504, N704, or N708 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Displacement front pump (Module B) | Displacement rear pump, Module: S   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                    | 07  | 10 | 13 | 14 | 17 | 19 | 21 | 23 | 25 | 29 | 32 | 36 | 38 | 41 | 45 |
| 07                                 | AS  | AS | AS | AT | AT | AT | AU | AU | AU | AV | AV | AW | AW | AX | AY |
| 10                                 | AS  | AS | AT | AT | AU | AU | AU | AU | AV | AV | AW | AX | AX | AX | AY |
| 13                                 | AS  | AT | AT | AU | AU | AU | AV | AV | AV | AW | AW | AX | AX | AY | AY |
| 14                                 | AT  | AT | AU | AU | AU | AV | AV | AV | AW | AW | AX | AX | AY | AY | AZ |
| 17                                 | AT  | AU | AU | AU | AV | AV | AV | AW | AW | AX | AX | AY | AY | AY | AZ |
| 19                                 | AT  | AU | AU | AV | AV | AV | AW | AW | AW | AX | AX | AY | AZ | AZ | AZ |
| 21                                 | AU  | AU | AV | AV | AV | AW | AW | AW | AX | AX | AY | AY | AZ | AZ | BA |
| 23                                 | AU  | AU | AV | AV | AW | AW | AW | AW | AX | AX | AY | AZ | AZ | AZ | BA |
| 25                                 | AU  | AV | AV | AW | AW | AW | AX | AX | AX | AY | AZ | AZ | AZ | BA | BA |
| 29                                 | AV  | AV | AW | AW | AX | AX | AX | AX | AY | AY | AZ | AZ | BA | BA | BB |
| 32                                 | AV  | AW | AW | AX | AX | AX | AY | AY | AY | AZ | AZ | BA | BA | BB | BB |
| 36                                 | AW  | AX | AX | AX | AY | AY | AY | AY | AZ | AZ | BA | BA | BB | BB | BC |
| 38                                 | AW  | AX | AX | AY | AY | AY | AZ | AZ | AZ | BA | BA | BB | BB | BC | BC |
| 41                                 | AX  | AX | AY | AY | AY | AZ | AZ | AZ | BA | BA | BB | BB | BC | BC | BD |
| 45                                 | AY  | AY | AY | AZ | AZ | AZ | BA | BA | BA | BB | BB | BC | BC | BD | BE |

| Table 2                            | Frontpump port code, Module: R = 125, 716, 717 Rearpump port code, Module: D = N101, N103, N104, N113, N126, N501, N503, N504, N704, or N708 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------------|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Displacement front pump (Module B) | Displacement rear pump, Module: S  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                    | 07   | 10 | 13 | 14 | 17 | 19 | 21 | 23 | 25 | 29 | 32 | 36 | 38 | 41 | 45 |
| 07                                 | AT   | AT | AU | AU | AV | AV | AV | AV | AW | AW | AX | AY | AY | AY | AZ |
| 10                                 | AT   | AU | AU | AV | AV | AV | AV | AW | AW | AX | AX | AY | AY | AZ | AZ |
| 13                                 | AU   | AU | AV | AV | AV | AW | AW | AW | AX | AX | AY | AY | AZ | AZ | BA |
| 14                                 | AU   | AV | AV | AV | AW | AW | AW | AX | AX | AY | AY | AZ | AZ | AZ | BA |
| 17                                 | AV   | AV | AV | AW | AW | AW | AX | AX | AX | AY | AY | AZ | AZ | BA | BB |
| 19                                 | AV   | AV | AW | AW | AW | AX | AX | AX | AY | AY | AZ | AZ | BA | BA | BB |
| 21                                 | AV   | AV | AW | AW | AX | AX | AX | AY | AY | AZ | AZ | BA | BA | BA | BB |
| 23                                 | AV   | AW | AW | AX | AX | AX | AY | AY | AY | AZ | AZ | BA | BA | BB | BB |
| 25                                 | AW   | AW | AX | AX | AX | AY | AY | AY | AZ | AZ | BA | BA | BB | BB | BC |

D Series Model Code

| <b>Table 2</b>                            | <b>Frontpump port code, Module: R = 125, 716, 717 Rearpump port code, Module: D = N101, N103, N104, N113, N126, N501, N503, N504, N704, or N708</b> |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|---|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Displacement front pump (Module B)</b> | <b>Displacement rear pump, Module: S</b>  |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|   | <b>07</b>   | <b>10</b> | <b>13</b> | <b>14</b> | <b>17</b> | <b>19</b> | <b>21</b> | <b>23</b> | <b>25</b> | <b>29</b> | <b>32</b> | <b>36</b> | <b>38</b> | <b>41</b> | <b>45</b> |
| <b>29</b>                                 | AW  | AX        | AX        | AY        | AY        | AY        | AY        | AZ        | AZ        | BA        | BA        | BB        | BB        | BC        | BC        |
| <b>32</b>                                 | AX  | AX        | AY        | AY        | AY        | AZ        | AZ        | AZ        | BA        | BA        | BB        | BB        | BC        | BC        | BD        |
| <b>36</b>                                 | AY  | AY        | AY        | AZ        | AZ        | AZ        | AZ        | BA        | BA        | BB        | BB        | BC        | BC        | BD        | BE        |
| <b>38</b>                                 | AY  | AY        | AZ        | AZ        | AZ        | BA        | BA        | BA        | BB        | BB        | BC        | BC        | BD        | BD        | BE        |
| <b>41</b>                                 | AY  | AZ        | AZ        | AZ        | BA        | BA        | BA        | BB        | BB        | BC        | BC        | BD        | BD        | BE        | BE        |
| <b>45</b>                                 | AZ  | AZ        | BA        | BA        | BB        | BB        | BB        | BB        | BC        | BC        | BD        | BE        | BE        | BE        | BF        |

| <b>Table 3</b>                            | <b>Frontpump port code, Module: R = 101, 103, 104, 113, 126, 704, or 708 Rearpump port code, Module: D = N125</b> |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|---|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Displacement front pump (Module B)</b> | <b>Displacement rear pump, Module: S</b>  |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|   | <b>07</b>   | <b>10</b> | <b>13</b> | <b>14</b> | <b>17</b> | <b>19</b> | <b>21</b> | <b>23</b> | <b>25</b> | <b>29</b> | <b>32</b> | <b>36</b> | <b>38</b> | <b>41</b> | <b>45</b> |
| <b>07</b>                                 | AU  | AU        | AV        | AV        | AW        | AW        | AW        | AW        | AX        | AX        | AY        | AZ        | AZ        | AZ        | BA        |
| <b>10</b>                                 | AU  | AV        | AV        | AV        | AW        | AW        | AW        | AX        | AX        | AY        | AY        | AZ        | AZ        | AZ        | BA        |
| <b>13</b>                                 | AV  | AV        | AW        | AW        | AW        | AX        | AX        | AX        | AY        | AY        | AZ        | AZ        | BA        | BA        | BB        |
| <b>14</b>                                 | AV  | AV        | AW        | AW        | AX        | AX        | AX        | AY        | AY        | AZ        | AZ        | BA        | BA        | BA        | BB        |
| <b>17</b>                                 | AW  | AW        | AW        | AX        | AX        | AX        | AY        | AY        | AY        | AZ        | AZ        | BA        | BA        | BA        | BC        |
| <b>19</b>                                 | AW  | AW        | AX        | AX        | AX        | AY        | AY        | AY        | AZ        | AZ        | BA        | BA        | BB        | BB        | BC        |
| <b>21</b>                                 | AW  | AW        | AX        | AX        | AY        | AY        | AY        | AY        | AZ        | BA        | BA        | BB        | BB        | BB        | BC        |
| <b>23</b>                                 | AW  | AX        | AX        | AY        | AY        | AY        | AY        | AZ        | AZ        | BA        | BA        | BB        | BB        | BB        | BC        |
| <b>25</b>                                 | AX  | AX        | AY        | AY        | AY        | AZ        | AZ        | AZ        | BA        | BA        | BB        | BB        | BC        | BC        | BD        |
| <b>29</b>                                 | AX  | AY        | AY        | AZ        | AZ        | AZ        | BA        | BA        | BA        | BB        | BB        | BC        | BC        | BC        | BD        |
| <b>32</b>                                 | AY  | AY        | AZ        | AZ        | AZ        | BA        | BA        | BA        | BB        | BB        | BC        | BC        | BD        | BD        | BE        |
| <b>36</b>                                 | AZ  | AZ        | AZ        | BA        | BA        | BA        | BB        | BB        | BB        | BC        | BC        | BD        | BD        | BD        | BF        |
| <b>38</b>                                 | AZ  | AZ        | BA        | BA        | BA        | BA        | BB        | BB        | BC        | BC        | BD        | BD        | BE        | BE        | BF        |
| <b>41</b>                                 | AZ  | BA        | BA        | BA        | BB        | BB        | BB        | BC        | BC        | BD        | BD        | BE        | BE        | BE        | BF        |
| <b>45</b>                                 | BA  | BA        | BB        | BB        | BC        | BC        | BC        | BC        | BD        | BD        | BE        | BF        | BF        | BF        | BG        |

| <b>Table 4</b>                            | <b>Front pump port code, Module: R = 125, 716, 717 Rear pump port code, Module: D = N125</b> |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|---|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Displacement front pump (Module B)</b> | <b>Displacement rear pump, Module: S</b>   |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|   | <b>07</b>  | <b>10</b> | <b>13</b> | <b>14</b> | <b>17</b> | <b>19</b> | <b>21</b> | <b>23</b> | <b>25</b> | <b>29</b> | <b>32</b> | <b>36</b> | <b>38</b> | <b>41</b> | <b>45</b> |
| <b>07</b>                                 | AV   | AW        | AW        | AW        | AX        | AX        | AX        | AY        | AY        | AZ        | AZ        | BA        | BA        | BB        | BB        |
| <b>10</b>                                 | AW   | AW        | AX        | AX        | AX        | AY        | AY        | AY        | AZ        | AZ        | BA        | BA        | BB        | BB        | BC        |
| <b>13</b>                                 | AW   | AX        | AX        | AX        | AY        | AY        | AY        | AZ        | AZ        | BA        | BA        | BB        | BB        | BC        | BC        |
| <b>14</b>                                 | AX   | AX        | AX        | AY        | AY        | AY        | AZ        | AZ        | AZ        | BA        | BA        | BB        | BB        | BC        | BC        |
| <b>17</b>                                 | AX   | AX        | AY        | AY        | AY        | AZ        | AZ        | AZ        | BA        | BA        | BB        | BB        | BC        | BC        | BD        |
| <b>19</b>                                 | AX   | AY        | AY        | AY        | AZ        | AZ        | AZ        | BA        | BA        | BB        | BB        | BC        | BC        | BD        | BD        |
| <b>21</b>                                 | AY   | AY        | AY        | AZ        | AZ        | AZ        | BA        | BA        | BA        | BB        | BB        | BC        | BC        | BD        | BD        |
| <b>23</b>                                 | AY   | AY        | AZ        | AZ        | AZ        | BA        | BA        | BA        | BB        | BB        | BC        | BC        | BD        | BD        | BE        |

### D Series Model Code

| Table 4                            | Front pump port code, Module: R = 125, 716, 717 Rear pump port code, Module: D = N125 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Displacement front pump (Module B) | Displacement rear pump, Module: S   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                    | 07  | 10 | 13 | 14 | 17 | 19 | 21 | 23 | 25 | 29 | 32 | 36 | 38 | 41 | 45 |
| 25                                 | AY  | AZ | AZ | AZ | BA | BA | BA | BB | BB | BC | BC | BD | BD | BE | BE |
| 29                                 | AZ  | AZ | BA | BA | BA | BA | BB | BB | BC | BC | BD | BD | BE | BE | BF |
| 32                                 | AZ  | BA | BA | BA | BB | BB | BB | BC | BC | BD | BD | BE | BE | BF | BF |
| 36                                 | BA  | BA | BB | BB | BB | BB | BC | BC | BD | BD | BE | BE | BF | BF | BG |
| 38                                 | BA  | BB | BB | BB | BC | BC | BC | BD | BD | BE | BE | BF | BF | BG | BG |
| 41                                 | BB  | BB | BC | BC | BC | BC | BC | BD | BE | BE | BF | BF | BG | BG | BH |
| 45                                 | BB  | BC | BC | BC | BD | BD | BD | BE | BE | BF | BF | BG | BG | BH | BH |

### J Nameplate

| A | B1 | B2 | C | R | S | D | E | F | H | J | K |  |
|---|----|----|---|---|---|---|---|---|---|---|---|--|
| D | E  | 2  |   |   |   |   |   |   |   |   |   |  |

| Code | Description        |
|------|--------------------|
| AN   | Standard nameplate |

### K Special features

| A | B1 | B2 | C | R | S | D | E | F | H | J | K |  |
|---|----|----|---|---|---|---|---|---|---|---|---|--|
| D | E  | 2  |   |   |   |   |   |   |   |   |   |  |

| Code | Description                               |
|------|---|
| NNN  | No special features, standard black paint |

### Three section (triple) pump order code

#### Example

The order code below provides an example of a three section (triple) pump with single inlet.

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 3  | R | 2 | 5 | S | H | B | B | 7 | 1 | 6 | 2 | 5 | 1 | 2 | 6 | 2 | 5 | N | 1 | 2 | 6 | N | N | N | 0 | 0 | 0 | B | M | A | N | N | N | N |

| Code | Position | Description  |
|------|----------|--|
| DE3R | A        | D Series pump with three pumping sections, right hand rotation           |
| 25   | B1       | 25 cm <sup>3</sup> displacement on first section                         |
| SH   | B2       | 13 tooth spline input shaft  |
| BB   | C        | SAE B two bolt mounting flange   |
| 716  | L        | 1 1/2 inch beaded tube inlet, 1 1/16-12 side ORB outlet on first section |
| 25   | M        | 25 cm <sup>3</sup> displacement on second section                        |
| 126  | R        | No inlet and 1 1/16-12 side outlet on second section                     |
| 25   | S        | 25 cm <sup>3</sup> displacement on third section                         |
| N126 | D        | No inlet and 1 1/16-12 side outlet on third section                      |

**D Series Model Code**

| Code | Position |                                  |
|------|----------|----------------------------------|
| NNN  | E        | No flow control setting          |
| 000  | F        | No pressure control setting      |
| BM   | G        | Assembly screws                  |
| AN   | H        | Standard Nameplate               |
| NNN  | J        | No special features, black paint |

**A Rotation - viewed from drive shaft**

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 3  | • |   |   |   |   |   |   |   |   |   |   |

| Code | Description                 |
|------|-----------------------------|
| L    | Lefthand (counterclockwise) |
| R    | Right hand (clockwise)      |

**B1 Displacement - First section**

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 3  | • | • |   |   |   |   |   |   |   |   |   |

| Code | Description   |
|------|---|
| 07   | 7.0 cm <sup>3</sup> /rev [0.43 in <sup>3</sup> /rev]  |
| 10   | 9.5 cm <sup>3</sup> /rev [0.58 in <sup>3</sup> /rev]  |
| 11   | 10.8 cm <sup>3</sup> /rev [0.66 in <sup>3</sup> /rev] |
| 13   | 12.6 cm <sup>3</sup> /rev [0.77 in <sup>3</sup> /rev] |
| 14   | 14.3 cm <sup>3</sup> /rev [0.87 in <sup>3</sup> /rev] |
| 17   | 17.0 cm <sup>3</sup> /rev [1.04 in <sup>3</sup> /rev] |
| 19   | 19.0 cm <sup>3</sup> /rev [1.16 in <sup>3</sup> /rev] |
| 21   | 20.5 cm <sup>3</sup> /rev [1.25 in <sup>3</sup> /rev] |
| 23   | 22.5 cm <sup>3</sup> /rev [1.37 in <sup>3</sup> /rev] |
| 25   | 25.4 cm <sup>3</sup> /rev [1.55 in <sup>3</sup> /rev] |
| 29   | 29.0 cm <sup>3</sup> /rev [1.77 in <sup>3</sup> /rev] |
| 32   | 31.8 cm <sup>3</sup> /rev [1.94 in <sup>3</sup> /rev] |
| 36   | 36.1 cm <sup>3</sup> /rev [2.20 in <sup>3</sup> /rev] |
| 38   | 38.0 cm <sup>3</sup> /rev [2.32 in <sup>3</sup> /rev] |
| 41   | 41.0 cm <sup>3</sup> /rev [2.50 in <sup>3</sup> /rev] |
| 45   | 45.1 cm <sup>3</sup> /rev [2.75 in <sup>3</sup> /rev] |

**B2 Input shaft**

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 3  | • | • |   |   |   |   |   |   |   |   |   |



### D Series Model Code

| Code | Description  |
|------|--|
| SE*  | SAE 9 tooth spline, 31.8 mm [1.25 in] length   |
| SC   | SAE 11 tooth spline, 38.1 mm [1.50 in] length  |
| SF   | 11 tooth spline, 31.8 mm [1.25 in] length (special modified length)                          |
| SH   | SAE 13 tooth spline, 41 mm [1.62 in] length  |
| SV   | 15 tooth spline, 46 mm [1.81 in] length (requires mounting flange AR or BR)                  |
| PB   | 22 mm [7/8 in] diameter x 41 mm [1.62 in] length, with 1/4 inch key                          |
| PD   | 19 mm [3/4 in] diameter x 51 mm [2.0 in] length, with 3/16 inch key                          |
| PZ   | 25.4 mm [1 inch] diameter x 46 mm [1.81 in] length, with 1/4 inch key                        |
| TA   | 1:5taper, 25mm [1 in] dia, 58mm [2.30 in] length, 5/8 thread, M5 key with locknut and washer |
| TG   | 1:8taper, 22mm [7/8 in] dia, 50mm [1.95 in] length, 5/8 thread with key, locknut and washer  |
| TH   | 1:8taper, 22mm [7/8 in] dia, 49mm [1.94 in] length, 9/16 thread with key, locknut and washer |
| WT   | Input shaft similar to TH option with 34 tooth helical gear for Perkins engine mount         |

\* Contact factory for units with SE (9T spline) to verify torque limits

### C Mounting flange

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 3  | • | • |   |   |   |   |   |   |   |   |   |

| Code | Description   |
|------|---|
| AA   | SAE A 2-bolt  |
| AC   | SAE A 2-bolt, use with integral PFD/Steering Cover                                    |
| AM   | SAE A 2-bolt, with T seal   |
| AP   | SAE A 2-bolt, with T seal, use with integral PFD/Steering cover                       |
| AR   | SAE A 2-bolt, use with 15 T spline input drive  |
| AS   | SAE A 2-bolt, use with integral PFD/Steering cover and 15 T input spline              |
| AL   | SAE A 2-bolt, two shaft seals with weep hole  |
| AT   | SAE A 2-bolt, two shaft seals with weep hole, use with integral PFD/Steering cover    |
| BB   | SAE B 2-bolt  |
| BC   | SAE B 2-bolt, use with integral PFD/Steering cover                                    |
| BM   | SAE B 2-bolt, with T seal   |
| BP   | SAE B 2-bolt, with T seal, use with integral PFD/Steering cover                       |
| BR   | SAE B 2-bolt, use with 15 T spline input drive  |
| BS   | SAE B 2-bolt, use with integral PFD/Steering cover and 15 T input spline              |
| BT   | SAE B 2-bolt, two shaft seals with weep hole, use with integral PFD/Steering Cover    |
| BW   | SAE B 2-bolt, two shaft seals with weep hole  |
| PP   | Perkins 6 bolt flange with (2) seals (use with WT input shaft and clockwise rotation) |

### L Ports - First section

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 3  |   | • | • | • |   |   |   |   |   |   |   |

**D Series Model Code**

| Code | Description   |  |
|------|---|--|
| 101  | 1 1/16-12 side inlet, 7/8-14 side outlet                                  | SAE O-ring boss ports No integrated valves                           |
| 103  | 1 5/16-12 side inlet, 7/8-14 side outlet                                  |  |
| 104  | 1 5/16-12 side inlet, 1 1/16-12 side outlet                               |  |
| 113  | No inlet, 7/8-14 side outlet  |  |
| 125  | 1 5/8-12 side inlet, 1 1/16-12 side outlet                                |  |
| 126  | No inlet, 1 1/16-12 side outlet   |  |
| 341  | No inlet, 3/4 side split flange outlet (SAE Code 61)                      | SAE Split Flange Ports - No integrated valves                        |
| 342  | 1 1/4 side split flange inlet, 3/4 side split flange outlet (SAE Code 61) |  |
| 401  | No inlet, 1/2-14 side outlet  | British Standard Pipe Parallel (BSPP) threads - No integrated valves |
| 402  | 3/4-14 side inlet, 1/2-14 side outlet                                     |  |
| 403  | 1-11 side inlet, 1/2-14 side outlet                                       |  |
| 404  | 1 1/4-11 side inlet, 1/2-14 side outlet                                   |  |
| 405  | No inlet, 3/4-14 side outlet  |  |
| 407  | 1-11 side inlet, 3/4-14 side outlet                                       |  |
| 408  | 1 1/4-11 side inlet, 3/4-14 side outlet                                   |  |
| 704  | 1 1/4 side tube inlet, 7/8-14 side ORB outlet                             |  |
| 708  | 1 1/4 side tube inlet, 1 1/16-12 side ORB outlet                          |  |
| 716  | 1 1/2 side tube inlet, 1 1/16-12 side ORB outlet                          |  |
| 717  | 1 1/2 side tube inlet, 7/8-14 side ORB outlet                             |  |

**M Displacement - Second section**

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 3  |   |   |   | • | • |   |   |   |   |   |   |

| Code | Description   |
|------|---|
| 07   | 7.0 cm <sup>3</sup> /rev [0.43 in <sup>3</sup> /rev]  |
| 10   | 9.5 cm <sup>3</sup> /rev [0.58 in <sup>3</sup> /rev]  |
| 11   | 10.8 cm <sup>3</sup> /rev [0.66 in <sup>3</sup> /rev] |
| 13   | 12.6 cm <sup>3</sup> /rev [0.77 in <sup>3</sup> /rev] |
| 14   | 14.3 cm <sup>3</sup> /rev [0.87 in <sup>3</sup> /rev] |
| 17   | 17.0 cm <sup>3</sup> /rev [1.04 in <sup>3</sup> /rev] |
| 19   | 19.0 cm <sup>3</sup> /rev [1.16 in <sup>3</sup> /rev] |
| 21   | 20.5 cm <sup>3</sup> /rev [1.25 in <sup>3</sup> /rev] |
| 23   | 22.5 cm <sup>3</sup> /rev [1.37 in <sup>3</sup> /rev] |
| 25   | 25.4 cm <sup>3</sup> /rev [1.55 in <sup>3</sup> /rev] |
| 29   | 29.0 cm <sup>3</sup> /rev [1.77 in <sup>3</sup> /rev] |
| 32   | 31.8 cm <sup>3</sup> /rev [1.94 in <sup>3</sup> /rev] |
| 36   | 36.1 cm <sup>3</sup> /rev [2.20 in <sup>3</sup> /rev] |
| 38   | 38.0 cm <sup>3</sup> /rev [2.32 in <sup>3</sup> /rev] |

### D Series Model Code

| Code | Description   |
|------|---|
| 41   | 41.0 cm <sup>3</sup> /rev [2.50 in <sup>3</sup> /rev] |
| 45   | 45.1 cm <sup>3</sup> /rev [2.75 in <sup>3</sup> /rev] |

### R Ports - Second section

| A | B1 | B2 | C | L | M | R | S     | D | E | F | H | J | K |
|---|----|----|---|---|---|---|-------|---|---|---|---|---|---|
| D | E  | 3  |   |   |   |   | • • • |   |   |   |   |   |   |

| Code | Description   |
|------|---|
| 101  | 1 1/16-12 side inlet, 7/8-14 side outlet                                  |
| 103  | 1 5/16-12 side inlet, 7/8-14 side outlet                                  |
| 104  | 1 5/16-12 side inlet, 1 1/16-12 side outlet                               |
| 113  | No inlet, 7/8-14 side outlet  |
| 125  | 1 5/8-12 side inlet, 1 1/16-12 side outlet                                |
| 126  | No inlet, 1 1/16-12 side outlet   |
| 341  | No inlet, 3/4 side split flange outlet (SAE Code 61)                      |
| 342  | 1 1/4 side split flange inlet, 3/4 side split flange outlet (SAE Code 61) |
| 401  | No inlet, 1/2-14 side outlet  |
| 402  | 3/4-14 side inlet, 1/2-14 side outlet                                     |
| 403  | 1-11 side inlet, 1/2-14 side outlet                                       |
| 404  | 1 1/4-11 side inlet, 1/2-14 side outlet                                   |
| 405  | No inlet, 3/4-14 side outlet  |
| 407  | 1-11 side inlet, 3/4-14 side outlet                                       |
| 408  | 1 1/4-11 side inlet, 3/4-14 side outlet                                   |
| 704  | 1 1/4 side tube inlet, 7/8-14 side ORB outlet                             |
| 708  | 1 1/4 side tube inlet, 1 1/16-12 side ORB outlet                          |
| 716  | 1 1/2 side tube inlet, 1 1/16-12 side ORB outlet                          |
| 717  | 1 1/2 side tube inlet, 7/8-14 side ORB outlet                             |

### S Displacement - Third section

| A | B1 | B2 | C | L | M | R | S   | D | E | F | H | J | K |
|---|----|----|---|---|---|---|-----|---|---|---|---|---|---|
| D | E  | 3  |   |   |   |   | • • |   |   |   |   |   |   |

| Code | Description   |
|------|---|
| 07   | 7.0 cm <sup>3</sup> /rev [0.43 in <sup>3</sup> /rev]  |
| 10   | 9.5 cm <sup>3</sup> /rev [0.58 in <sup>3</sup> /rev]  |
| 11   | 10.8 cm <sup>3</sup> /rev [0.66 in <sup>3</sup> /rev] |
| 13   | 12.6 cm <sup>3</sup> /rev [0.77 in <sup>3</sup> /rev] |
| 14   | 14.3 cm <sup>3</sup> /rev [0.87 in <sup>3</sup> /rev] |
| 17   | 17.0 cm <sup>3</sup> /rev [1.04 in <sup>3</sup> /rev] |
| 19   | 19.0 cm <sup>3</sup> /rev [1.16 in <sup>3</sup> /rev] |
| 21   | 20.5 cm <sup>3</sup> /rev [1.25 in <sup>3</sup> /rev] |

**D Series Model Code**

| Code | Description  |
|------|--|
| 23   | 22.5cm <sup>3</sup> /rev [1.37 in <sup>3</sup> /rev] |
| 25   | 25.4cm <sup>3</sup> /rev [1.55 in <sup>3</sup> /rev] |
| 29   | 29.0cm <sup>3</sup> /rev [1.77 in <sup>3</sup> /rev] |
| 32   | 31.8cm <sup>3</sup> /rev [1.94 in <sup>3</sup> /rev] |
| 36   | 36.1cm <sup>3</sup> /rev [2.20 in <sup>3</sup> /rev] |
| 38   | 38.0cm <sup>3</sup> /rev [2.32 in <sup>3</sup> /rev] |
| 41   | 41.0cm <sup>3</sup> /rev [2.50 in <sup>3</sup> /rev] |
| 45   | 45.1cm <sup>3</sup> /rev [2.75 in <sup>3</sup> /rev] |

**D Rear cover: Port options, integrated valves and auxiliary**

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 3  |   |   |   |   |   | • | • | • | • |   |   |

| Code | Inlet                         | Outlet                                     | Description  |
|------|-------------------------------|--|--|
| N101 | 1 1/16-12 side inlet          | 7/8-14 side outlet                         | SAE O-ring boss ports No integrated valves No auxiliary flange                               |
| N103 | 1 5/16-12 side inlet          | 7/8-14 side outlet                         |  |
| N104 | 1 5/16-12 side inlet          | 1 1/16-12 side outlet                      |  |
| N125 | 1 5/8-12 side inlet           | 1 1/16-12 side outlet                      |  |
| N126 | No inlet                      | 1 1/16-12 side outlet                      |  |
| N501 | 1 1/16-12 rear inlet          | 7/8-14 rear outlet                         | SAE Metric Ports – No Integrated Valves  |
| N503 | 1 5/16-12 rear inlet          | 7/8-14 rear outlet                         |  |
| N504 | 1 5/16-12 rear inlet          | 1 1/16-12 rear outlet                      |  |
| N252 | M33x2-6H rear inlet           | M22x1.5-6H side outlet                     |  |
| N254 | M33x2-6H rear inlet           | M22x1.5-6H side outlet                     | British Standard Pipe Parallel (BSPP) threads - No integrated valves                         |
| N401 | No inlet                      | 1/2-14 side outlet                         |  |
| N402 | 3/4-14 side inlet             | 1/2-14 side outlet                         |  |
| N403 | 1-11 side inlet               | 1/2-14 side outlet                         |  |
| N404 | 1 1/4-11 side inlet           | 1/2-14 side outlet                         |  |
| N407 | 1-11 side inlet               | 3/4-14 side outlet                         |  |
| N408 | 1 1/4-11 side inlet           | 3/4-14 side outlet                         | SAE split flange ports No integrated valves No auxiliary flange                              |
| N341 | No inlet                      | 3/4 side split flange outlet (SAE code 61) |  |
| N342 | 1 1/4 side split flange inlet | 3/4 side split flange outlet (SAE code 61) | Beaded tube inlet port, SAE O-ring boss outlet port No integrated valves No auxiliary flange |
| N704 | 1 1/4 side tube inlet         | 7/8-14 side ORB outlet                     |  |
| N708 | 1 1/4 side tube inlet         | 1 1/16-12 side ORB outlet                  |  |
| N715 | 1 1/4 REAR tube inlet         | 1 1/16-12 REAR ORB outlet                  |  |
| N716 | 1 1/2 side tube inlet         | 1 1/16-12 side ORB outlet                  |  |
| N720 | 1 1/4 REAR tube inlet         | 7/8-14 REAR ORB outlet                     |  |

**D Series Model Code**

| Code          | Inlet   | Description  |  |
|---------------|---|--|--|
| <b>F09A**</b> | 15/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE A flange)                   | Integrated Priority Flow Divider, cartridge style relief for settings up to:<br>221 bar and 34.3 l/min [3200psi and 9 US gal/min]        |  |
| <b>F09B‡</b>  | 15/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE B flange)                   |  |  |
| <b>F13A**</b> | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange)                   |  |  |
| <b>F13B‡</b>  | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE B flange)                   |  |  |
| <b>F21A**</b> | 15/8-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE A flange)                    |  |  |
| <b>F21B‡</b>  | 15/8-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE B flange)                    |  |  |
| <b>F25A**</b> | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange)                  |  |  |
| <b>F25B‡</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE B flange)                  |  |  |
| <b>D23A*</b>  | 15/16-12 side inlet, 3/4-16 side priority, no secondary port (SAE A flange)                       | Integrated Steering Cover, Priority Relief Valve (Cartridge Style) for settings up to: 221 bar and 34.3 l/min [3200psi and 9 US gal/min] |  |
| <b>D23B**</b> | 15/16-12 side inlet, 3/4-16 side priority, no secondary port (SAE B flange)                       |  |  |
| <b>D24A*</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, no secondary port (SAE A flange)                      |  |  |
| <b>D24B**</b> | 1 5/16-12 rear inlet, 3/4-16 rear priority, no secondary port (SAE B flange)                      |  |  |
| <b>L01A**</b> | 1 5/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary, 7/16-20 side LS (SAE-A flange) | Integrated Load Sense Divider (Dynamic), Priority Relief Valve   |  |
| <b>L01B‡</b>  | 1 5/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary, 7/16-20 side LS (SAE-B flange) |  |  |
| <b>L08A**</b> | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary, 7/16-20 rear LS (SAE-A flange) |  |  |
| <b>L08B‡</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary, 7/16-20 rear LS (SAE-B flange) |  |  |
| <b>B103*</b>  | 1 5/16-12 side inlet  | 7/8-14 side outlet,  | SAE-A2-Bolt Auxiliary Flange SAE O-ring boss ports<br>No integrated valves |
| <b>B104*</b>  | 1 5/16-12 side inlet  | 11/16-12 side outlet   |  |
| <b>R104</b>   | 1 5/16-12 side inlet  | 11/16-12 side outlet   | Integrated Relief Valve Internally Drained<br>Maximum Displacement 23cc    |

\*\* Requires use of mounting flange option AC or AP

‡ Requires use of mounting flange option BC or BP

\* Integrated auxiliary flange requires use of input shaft option AH or AC

A variety of integrated valve options including PFD, Steering Covers, and Load sense priority flow dividers covers are available with D Series multiple pumps. Please contact your technical representative to determine which hardware best suits specific application needs.

**D Series Model Code**
**E Flow control valve**

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 3  |   |   |   |   |   |   | • | • | • |   |   |

| Code       | Description  |  |
|------------|--|--|
| <b>NNN</b> | No flow control setting, standard for units without integrated flow control valves |  |
| <b>04X</b> | 3.8 l/min [1 US gal/min]   | For integrated PFD Steering cover with cartridge style relief valve (Cover options F09A, F09B, F13A, F13B, F21A, F21B, F25A or F25B) |
| <b>08X</b> | 7.6 l/min [2 US gal/min]   |  |
| <b>11X</b> | 11.4 l/min [3 US gal/min]  |  |
| <b>15X</b> | 15.1 l/min [4 US gal/min]  |  |
| <b>19X</b> | 18.9 l/min [5 US gal/min]  |  |
| <b>23X</b> | 22.7 l/min [6 US gal/min]  |  |
| <b>27X</b> | 26.5 l/min [7 US gal/min]  |  |
| <b>30X</b> | 30.3 l/min [8 US gal/min]  |  |
| <b>34X</b> | 34.3 l/min [9 US gal/min]  |  |
| <b>38A</b> | 10 bar standby   | Forintegrated load sense divider (use with L08A or L08B rear ports)  |
| <b>38L</b> | 10 bar standby   | Forintegrated load sense divider (use with L01A or L01B side ports)  |
| <b>R1N</b> | Maximum flow not to exceed 75 l/min, pressure range from 7-55bar                   | For integrated relief valve, internally drained (without flow control) Use with R104 cover option 23cc and under                     |
| <b>R2N</b> | Maximum flow not to exceed 75 l/min, pressure range from 41-248bar                 | For integrated relief valve, internally drained (without flow control) Use with R104 cover option 23cc and under                     |

**F Pressure control valve**

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 3  |   |   |   |   |   |   |   | • | • | • |   |

### D Series Model Code

| Code | Description                  |
|------|------------------------------|
| 000  | No pressure control settings |
| 034  | 34 bar [500 psi]             |
| 041  | 41 bar [600 psi]             |
| 048  | 48 bar [700 psi]             |
| 055  | 55 bar [800 psi]             |
| 062  | 62 bar [900 psi]             |
| 069  | 69 bar [1000 psi]            |
| 076  | 76 bar [1100 psi]            |
| 083  | 83 bar [1200 psi]            |
| 090  | 90 bar [1300 psi]            |
| 097  | 97 bar [1400 psi]            |
| 103  | 103 bar [1500 psi]           |
| 110  | 110 bar [1600 psi]           |
| 117  | 117 bar [1700 psi]           |
| 124  | 124 bar [1800 psi]           |
| 131  | 131 bar [1900 psi]           |
| 138  | 138 bar [2000 psi]           |
| 145  | 145 bar [2100 psi]           |
| 152  | 152 bar [2200 psi]           |
| 159  | 159 bar [2300 psi]           |
| 165  | 165 bar [2400 psi]           |
| 172  | 172 bar [2500 psi]           |
| 179  | 179 bar [2600 psi]           |
| 186  | 186 bar [2700 psi]           |
| 193  | 193 bar [2800 psi]           |
| 200  | 200 bar [2900 psi]           |
| 207  | 207 bar [3000 psi]           |
| 214  | 214 bar [3100 psi]           |
| 221  | 221 bar [3200 psi]           |

Change Description to:  
 For integrated priority flow divider (PFD) cover with cartridge style relief valve  
 (Cover options F09A, F09B, F13A, F13B, F21A, F21B, F25A, F25B)  
 and  
 For integrated steering cover with cartridge style relief valve (Cover options D23A, D23B, D24A, D24B)  
 and  
 For integrated load sense (LS) cover with cartridge relief valve (Cover options L01A, L01B, L08A, L08B)

### H Assembly screws

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |  |  |  |  |  |  |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|
| D | E  | 3  |   |   |   |   |   |   |   |   |   | • | • |  |  |  |  |  |  |

| Code | Description                                       |
|------|---|
| **   | Will be assigned by Danfoss upon receipt of order |

### J Nameplate

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |  |  |  |  |  |  |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|
| D | E  | 3  |   |   |   |   |   |   |   |   |   | • | • |  |  |  |  |  |  |

### D Series Model Code

| Code | Description        |
|------|--------------------|
| AN   | Standard nameplate |

### K Special feature

| A | B1 | B2 | C | L | M | R | S | D | E | F | H | J | K |     |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|-----|
| D | E  | 3  |   |   |   |   |   |   |   |   |   |   |   | ••• |

| Code | Description                               |
|------|---|
| NNN  | No special features, standard black paint |

### Four section (quad) pump order code

#### Example

The order code below provides an example of a three section (triple) pump with single inlet.

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  | R | 2 | 5 | S | H | B | B | 1 | 0 | 4 | 2 | 3 | 1 | 0 | 4 | 1 | 0 | 1 | 2 | 6 | 1 | 0 | N | 1 | 2 | 6 | N | N | N | 0 | 0 | 0 | B | T | A | N | N | N | N |

| Code | Position | Description   |
|------|----------|---|
| DE4L | A        | D Series pump with four pumping sections, left hand rotation  |
| 25   | B1       | 25 cm <sup>3</sup> displacement on first section              |
| SH   | B2       | 13 tooth spline input shaft                                   |
| BB   | C        | SAE B two bolt mounting flange                                |
| 104  | L        | 1 5/16-12 side inlet, 1 1/16-12 side outlet on first section  |
| 23   | M        | 23 cm <sup>3</sup> displacement on second section             |
| 104  | N        | 1 5/16-12 side inlet, 1 1/16-12 side outlet on second section |
| 10   | P        | 10 cm <sup>3</sup> displacement on third section              |
| 126  | R        | No inlet and 1 1/16-12 side outlet on third section           |
| 10   | S        | 10 cm <sup>3</sup> displacement on fourth section             |
| N126 | D        | No inlet and 1 1/16-12 side outlet on fourth section          |
| NNN  | E        | No flow control setting                                       |
| 000  | F        | No pressure control setting                                   |
| BT   | H        | Assembly screws   |
| AN   | J        | Standard nameplate  |
| NNN  | K        | No special features, black paint                              |

### A Rotation - viewed from drive shaft

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  | • |   |   |   |   |   |   |   |   |   |   |   |   |

| Code | Description                 |
|------|-----------------------------|
| L    | Lefthand (counterclockwise) |
| R    | Right hand (clockwise)      |



## D Series Model Code

### B1 Displacement - First section

| A |   |   | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E | 4 | •  | •  |   |   |   |   |   |   |   |   |   |   |   |   |   |

| Code | Description  |
|------|--|
| 07   | 7.0 cm <sup>3</sup> /rev [0.43 in <sup>3</sup> /rev] |
| 10   | 9.5 cm <sup>3</sup> /rev [0.58 in <sup>3</sup> /rev] |
| 11   | 10.8cm <sup>3</sup> /rev [0.66 in <sup>3</sup> /rev] |
| 13   | 12.6cm <sup>3</sup> /rev [0.77 in <sup>3</sup> /rev] |
| 14   | 14.3cm <sup>3</sup> /rev [0.87 in <sup>3</sup> /rev] |
| 17   | 17.0cm <sup>3</sup> /rev [1.04 in <sup>3</sup> /rev] |
| 19   | 19.0cm <sup>3</sup> /rev [1.16 in <sup>3</sup> /rev] |
| 21   | 20.5cm <sup>3</sup> /rev [1.25 in <sup>3</sup> /rev] |
| 23   | 22.5cm <sup>3</sup> /rev [1.37 in <sup>3</sup> /rev] |
| 25   | 25.4cm <sup>3</sup> /rev [1.55 in <sup>3</sup> /rev] |
| 29   | 29.0cm <sup>3</sup> /rev [1.77 in <sup>3</sup> /rev] |
| 32   | 31.8cm <sup>3</sup> /rev [1.94 in <sup>3</sup> /rev] |
| 36   | 36.1cm <sup>3</sup> /rev [2.20 in <sup>3</sup> /rev] |
| 38   | 38.0cm <sup>3</sup> /rev [2.32 in <sup>3</sup> /rev] |
| 41   | 41.0cm <sup>3</sup> /rev [2.50 in <sup>3</sup> /rev] |
| 45   | 45.1cm <sup>3</sup> /rev [2.75 in <sup>3</sup> /rev] |

### B2 Input shaft

| A |   |   | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E | 4 |    | •  | • |   |   |   |   |   |   |   |   |   |   |   |   |

| Code | Description  |
|------|--|
| SE*  | SAE 9 tooth spline, 31.8 mm [1.25 in] length   |
| SC   | SAE 11 tooth spline, 38.1 mm [1.50 in] length  |
| SF   | 11 tooth spline, 31.8 mm [1.25 in] length (special modified length)                          |
| SH   | SAE 13 tooth spline, 41 mm [1.62 in] length  |
| SV   | 15 tooth spline, 46 mm [1.81 in] length (requires mounting flange AR or BR)                  |
| PB   | 22 mm [7/8 in] diameter x 41 mm [1.62 in] length, with 1/4 inch key                          |
| PD   | 19 mm [3/4 in] diameter x 51 mm [2.0 in] length, with 3/16 inch key                          |
| PZ   | 25.4 mm [1 inch] diameter x 46 mm [1.81 in] length, with 1/4 inch key                        |
| TA   | 1:5taper, 25mm [1 in] dia, 58mm [2.30 in] length, 5/8 thread, M5 key with locknut and washer |
| TG   | 1:8taper, 22mm [7/8 in] dia, 50mm [1.95 in] length, 5/8 thread with key, locknut and washer  |
| TH   | 1:8taper, 22mm [7/8 in] dia, 49mm [1.94 in] length, 9/16 thread with key, locknut and washer |
| WT   | Input shaft similar to TH option with 34 tooth helical gear for Perkins engine mount         |

\* Contact factory for units with SE (9T spline) to verify torque limits

**D Series Model Code**

**C Mounting flange**

|   |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
|---|----|----|----|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B1 | B2 | C  | L | M | N | P | R | S | D | E | F | H | J | K |
| D | E  | 4  | •• |   |   |   |   |   |   |   |   |   |   |   |   |

| Code | Description   |
|------|---|
| AA   | SAE A 2-bolt  |
| AC   | SAE A 2-bolt, use with integral PFD/Steering Cover                                    |
| AM   | SAE A 2-bolt, with T seal   |
| AP   | SAE A 2-bolt, with T seal, use with integral PFD/Steering cover                       |
| AR   | SAE A 2-bolt, use with 15 T spline input drive  |
| AS   | SAE A 2-bolt, use with integral PFD/Steering cover and 15 T input spline              |
| AL   | SAE A 2-bolt, two shaft seals with weep hole  |
| AT   | SAE A 2-bolt, two shaft seals with weep hole, use with integral PFD/Steering cover    |
| BB   | SAE B 2-bolt  |
| BC   | SAE B 2-bolt, use with integral PFD/Steering cover                                    |
| BM   | SAE B 2-bolt, with T seal   |
| BP   | SAE B 2-bolt, with T seal, use with integral PFD/Steering cover                       |
| BR   | SAE B 2-bolt, use with 15 T spline input drive  |
| BS   | SAE B 2-bolt, use with integral PFD/Steering cover and 15 T input spline              |
| BT   | SAE B 2-bolt, two shaft seals with weep hole, use with integral PFD/Steering Cover    |
| BW   | SAE B 2-bolt, two shaft seals with weep hole  |
| PP   | Perkins 6 bolt flange with (2) seals (use with WT input shaft and clockwise rotation) |

**L Ports - First section**

|   |    |    |   |     |   |   |   |   |   |   |   |   |   |   |   |
|---|----|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|
| A | B1 | B2 | C | L   | M | N | P | R | S | D | E | F | H | J | K |
| D | E  | 4  |   | ••• |   |   |   |   |   |   |   |   |   |   |   |

| Code | Description   |   |
|------|---|---|
| 101  | 1 1/16-12 side inlet, 7/8-14 side outlet                                  | SAE O-ring boss ports No integrated valves    |
| 103  | 1 5/16-12 side inlet, 7/8-14 side outlet                                  |   |
| 104  | 1 5/16-12 side inlet, 1 1/16-12 side outlet                               |   |
| 113  | No inlet, 7/8-14 side outlet  |   |
| 125  | 1 5/8-12 side inlet, 1 1/16-12 side outlet                                |   |
| 126  | No inlet, 1 1/16-12 side outlet   |   |
| 341  | No inlet, 3/4 side split flange outlet (SAE Code 61)                      | SAE Split Flange Ports - No integrated valves |
| 342  | 1 1/4 side split flange inlet, 3/4 side split flange outlet (SAE Code 61) |   |

### D Series Model Code

| Code | Description                                      |   |
|------|--|---|
| 401  | No inlet, 1/2-14 side outlet                     | British Standard Pipe Parallel (BSPP) threads - No integrated valves          |
| 402  | 3/4-14 side inlet, 1/2-14 side outlet            |   |
| 403  | 1-11 side inlet, 1/2-14 side outlet              |   |
| 404  | 1 1/4-11 side inlet, 1/2-14 side outlet          |   |
| 405  | No inlet, 3/4-14 BSPP side outlet                |   |
| 407  | 1-11 side inlet, 3/4-14 side outlet              |   |
| 408  | 1 1/4-11 side inlet, 3/4-14 side outlet          |   |
| 704  | 1 1/4 side tube inlet, 7/8-14 side ORB outlet    | Beaded tube inlet port<br>SAE O-ring boss outlet port<br>No integrated valves |
| 708  | 1 1/4 side tube inlet, 1 1/16-12 side ORB outlet |   |
| 716  | 1 1/2 side tube inlet, 1 1/16-12 side ORB outlet |   |
| 707  | 1 1/2 side tube inlet, 7/8-14 side ORB outlet    |   |

### M Displacement - Second section

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  |   |   |   | • | • |   |   |   |   |   |   |   |   |

| Code | Description   |
|------|---|
| 07   | 7.0 cm <sup>3</sup> /rev [0.43 in <sup>3</sup> /rev]  |
| 10   | 9.5 cm <sup>3</sup> /rev [0.58 in <sup>3</sup> /rev]  |
| 11   | 10.8 cm <sup>3</sup> /rev [0.66 in <sup>3</sup> /rev] |
| 13   | 12.6 cm <sup>3</sup> /rev [0.77 in <sup>3</sup> /rev] |
| 14   | 14.3 cm <sup>3</sup> /rev [0.87 in <sup>3</sup> /rev] |
| 17   | 17.0 cm <sup>3</sup> /rev [1.04 in <sup>3</sup> /rev] |
| 19   | 19.0 cm <sup>3</sup> /rev [1.16 in <sup>3</sup> /rev] |
| 21   | 20.5cm <sup>3</sup> /rev [1.25 in <sup>3</sup> /rev]  |
| 25   | 25.4 cm <sup>3</sup> /rev [1.55 in <sup>3</sup> /rev] |
| 29   | 29.0 cm <sup>3</sup> /rev [1.77 in <sup>3</sup> /rev] |
| 32   | 31.8 cm <sup>3</sup> /rev [1.94 in <sup>3</sup> /rev] |
| 36   | 36.1 cm <sup>3</sup> /rev [2.20 in <sup>3</sup> /rev] |
| 38   | 38.0 cm <sup>3</sup> /rev [2.32 in <sup>3</sup> /rev] |
| 41   | 41.0 cm <sup>3</sup> /rev [2.50 in <sup>3</sup> /rev] |
| 45   | 45.1 cm <sup>3</sup> /rev [2.75 in <sup>3</sup> /rev] |

### N Ports - Second section

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  |   |   |   | • | • | • |   |   |   |   |   |   |   |

**D Series Model Code**

| Code | Description   |  |
|------|---|--|
| 101  | 1 1/16-12 side inlet, 7/8-14 side outlet                                  | SAE O-ring boss ports No integrated valves                                 |
| 103  | 1 5/16-12 side inlet, 7/8-14 side outlet                                  |  |
| 104  | 1 5/16-12 side inlet, 1 1/16-12 side outlet                               |  |
| 113  | No inlet, 7/8-14 side outlet  |  |
| 125  | 1 5/8-12 side inlet, 1 1/16-12 side outlet                                |  |
| 126  | No inlet, 1 1/16-12 side outlet   |  |
| 341  | No inlet, 3/4 side split flange outlet (SAE Code 61)                      | SAE Split Flange Ports - No integrated valves                              |
| 342  | 1 1/4 side split flange inlet, 3/4 side split flange outlet (SAE Code 61) |  |
| 401  | No inlet, 1/2-14 side outlet  | British Standard Pipe Parallel (BSPP) threads - No integrated valves       |
| 402  | 3/4-14 side inlet, 1/2-14 side outlet                                     |  |
| 403  | 1-11 side inlet, 1/2-14 side outlet                                       |  |
| 404  | 1 1/4-11 side inlet, 1/2-14 side outlet                                   |  |
| 405  | No inlet, 3/4-14 BSPP side outlet   |  |
| 407  | 1-11 side inlet, 3/4-14 side outlet                                       |  |
| 408  | 1 1/4-11 side inlet, 3/4-14 side outlet                                   |  |
| 704  | 1 1/4 side tube inlet, 7/8-14 side ORB outlet                             | Beaded tube inlet port<br>SAE O-ring boss outlet port No integrated valves |
| 708  | 1 1/4 side tube inlet, 1 1/16-12 side ORB outlet                          |  |
| 716  | 1 1/2 side tube inlet, 1 1/16-12 side ORB outlet                          |  |
| 717  | 1 1/2 side tube inlet, 7/8-14 side ORB outlet                             |  |

**P Displacement - Third section**

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  |   |   |   |   | • | • |   |   |   |   |   |   |   |

| Code | Description   |
|------|---|
| 07   | 7.0 cm <sup>3</sup> /rev [0.43 in <sup>3</sup> /rev]  |
| 10   | 9.5 cm <sup>3</sup> /rev [0.58 in <sup>3</sup> /rev]  |
| 11   | 10.8 cm <sup>3</sup> /rev [0.66 in <sup>3</sup> /rev] |
| 13   | 12.6 cm <sup>3</sup> /rev [0.77 in <sup>3</sup> /rev] |
| 14   | 14.3 cm <sup>3</sup> /rev [0.87 in <sup>3</sup> /rev] |
| 17   | 17.0 cm <sup>3</sup> /rev [1.04 in <sup>3</sup> /rev] |
| 19   | 19.0 cm <sup>3</sup> /rev [1.16 in <sup>3</sup> /rev] |
| 21   | 20.5 cm <sup>3</sup> /rev [1.25 in <sup>3</sup> /rev] |
| 23   | 22.5 cm <sup>3</sup> /rev [1.37 in <sup>3</sup> /rev] |
| 25   | 25.4 cm <sup>3</sup> /rev [1.55 in <sup>3</sup> /rev] |
| 29   | 29.0 cm <sup>3</sup> /rev [1.77 in <sup>3</sup> /rev] |
| 32   | 31.8 cm <sup>3</sup> /rev [1.94 in <sup>3</sup> /rev] |
| 36   | 36.1 cm <sup>3</sup> /rev [2.20 in <sup>3</sup> /rev] |
| 38   | 38.0 cm <sup>3</sup> /rev [2.32 in <sup>3</sup> /rev] |

### D Series Model Code

| Code | Description   |
|------|---|
| 41   | 41.0 cm <sup>3</sup> /rev [2.50 in <sup>3</sup> /rev] |
| 45   | 45.1 cm <sup>3</sup> /rev [2.75 in <sup>3</sup> /rev] |

### R Ports - Third Section

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  |   |   |   |   |   | • | • | • |   |   |   |   |   |

| Code | Description   |
|------|---|
| 101  | 1 1/16-12 side inlet, 7/8-14 side outlet                                  |
| 103  | 1 5/16-12 side inlet, 7/8-14 side outlet                                  |
| 104  | 1 5/16-12 side inlet, 1 1/16-12 side outlet                               |
| 113  | No inlet, 7/8-14 side outlet  |
| 125  | 1 5/8-12 side inlet, 1 1/16-12 side outlet                                |
| 126  | No inlet, 1 1/16-12 side outlet   |
| 341  | No inlet, 3/4 side split flange outlet (SAE Code 61)                      |
| 342  | 1 1/4 side split flange inlet, 3/4 side split flange outlet (SAE Code 61) |
| 401  | No inlet, 1/2-14 side outlet  |
| 402  | 3/4-14 side inlet, 1/2-14 side outlet                                     |
| 403  | 1-11 side inlet, 1/2-14 side outlet                                       |
| 404  | 1 1/4-11 side inlet, 1/2-14 side outlet                                   |
| 405  | No inlet, 3/4-14 side outlet  |
| 407  | 1-11 side inlet, 3/4-14 side outlet                                       |
| 408  | 1 1/4-11 side inlet, 3/4-14 side outlet                                   |
| 704  | 1 1/4 side tube inlet, 7/8-14 side ORB outlet                             |
| 708  | 1 1/4 side tube inlet, 1 1/16-12 side ORB outlet                          |
| 716  | 1 1/2 side tube inlet, 1 1/16-12 side ORB outlet                          |
| 717  | 1 1/2 side tube inlet, 7/8-14 side ORB outlet                             |

### S Displacement - Fourth section

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  |   |   |   |   |   |   | • | • |   |   |   |   |   |

| Code | Description   |
|------|---|
| 07   | 7.0 cm <sup>3</sup> /rev [0.43 in <sup>3</sup> /rev]  |
| 10   | 9.5 cm <sup>3</sup> /rev [0.58 in <sup>3</sup> /rev]  |
| 11   | 10.8 cm <sup>3</sup> /rev [0.66 in <sup>3</sup> /rev] |
| 13   | 12.6 cm <sup>3</sup> /rev [0.77 in <sup>3</sup> /rev] |
| 14   | 14.3 cm <sup>3</sup> /rev [0.87 in <sup>3</sup> /rev] |
| 17   | 17.0 cm <sup>3</sup> /rev [1.04 in <sup>3</sup> /rev] |
| 19   | 19.0 cm <sup>3</sup> /rev [1.16 in <sup>3</sup> /rev] |
| 21   | 20.5 cm <sup>3</sup> /rev [1.25 in <sup>3</sup> /rev] |

D Series Model Code

| Code | Description   |
|------|---|
| 23   | 22.5 cm <sup>3</sup> /rev [1.37 in <sup>3</sup> /rev] |
| 25   | 25.4 cm <sup>3</sup> /rev [1.55 in <sup>3</sup> /rev] |
| 29   | 29.0 cm <sup>3</sup> /rev [1.77 in <sup>3</sup> /rev] |
| 32   | 31.8 cm <sup>3</sup> /rev [1.94 in <sup>3</sup> /rev] |
| 36   | 36.1 cm <sup>3</sup> /rev [2.20 in <sup>3</sup> /rev] |
| 38   | 38.0 cm <sup>3</sup> /rev [2.32 in <sup>3</sup> /rev] |
| 41   | 41.0 cm <sup>3</sup> /rev [2.50 in <sup>3</sup> /rev] |
| 45   | 45.1 cm <sup>3</sup> /rev [2.75 in <sup>3</sup> /rev] |

D Rear cover: Port options, integrated valves and auxiliary flange

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  |   |   |   |   |   |   |   | • | • | • |   |   |   |

| Code | Inlet                         | Outlet                                    | Description  |
|------|-------------------------------|---|--|
| N101 | 1 1/16-12 side inlet          | 7/8-14 side outlet                        | SAE O-ring boss ports No integrated valves No auxiliary flange                               |
| N103 | 1 5/16-12 side inlet          | 7/8-14 side outlet                        |  |
| N104 | 1 5/16-12 side inlet          | 1 1/16-12 side outlet                     |  |
| N125 | 1 5/8-12 side inlet           | 1 1/16-12 side outlet                     |  |
| N126 | No inlet                      | 1 1/16-12 side outlet                     |  |
| N501 | 1 1/16-12 rear inlet          | 7/8-14 rear outlet                        |  |
| N503 | 1 5/16-12 rear inlet          | 7/8-14 rear outlet                        |  |
| N504 | 1 5/16-12 rear inlet          | 1 1/16-12 rear outlet                     |  |
| N252 | M33x2-6H rear inlet           | M22x1.5-6H side outlet                    | SAE Metric Ports – No Integrated Valves  |
| N254 | M33x2-6H rear inlet           | M22x1.5-6H side outlet                    |  |
| N401 | No inlet                      | 1/2-14 side outlet                        | British Standard Pipe Parallel (BSPP) threads - No integrated valves                         |
| N402 | 3/4-14 side inlet             | 1/2-14 side outlet                        |  |
| N403 | 1-11 side inlet               | 1/2-14 side outlet                        |  |
| N404 | 1 1/4-11 side inlet           | 1/2-14 side outlet                        |  |
| N407 | 1-11 side inlet               | 3/4-14 side outlet                        |  |
| N408 | 1 1/4-11 side inlet           | 3/4-14 side outlet                        |  |
| N341 | No inlet                      | 3/4side split flange outlet (SAE code 61) | SAE split flange ports No integrated valves - No auxiliary flange                            |
| N342 | 1 1/4 side split flange inlet | 3/4side split flange outlet (SAE code 61) |  |
| N704 | 1 1/4 side tube inlet         | 7/8-14 side ORB outlet                    | Beaded tube inlet port, SAE O-ring boss outlet port No integrated valves No auxiliary flange |
| N708 | 1 1/4 side tube inlet         | 1 1/16-12 side ORB outlet                 |  |
| N715 | 1 1/4 REAR tube inlet         | 1 1/16-12 REAR ORB outlet                 |  |
| N716 | 1 1/2 side tube inlet         | 1 1/16-12 side ORB outlet                 |  |
| N720 | 1 1/4 REAR tube inlet         | 7/8-14 REAR ORB outlet                    |  |

**D Series Model Code**

| Code         | Inlet                | Outlet                | Description  |
|--------------|----------------------|-----------------------|--|
| <b>B103*</b> | 1 5/16-12 side inlet | 7/8-14 side outlet,   | SAE-A2-Bolt Auxiliary Flange<br>SAEO-ring boss ports<br>No integrated valves |
| <b>B104*</b> | 1 5/16-12 side inlet | 1 1/16-12 side outlet |  |
| <b>R104</b>  | 1 5/16-12 side inlet | 1 1/16-12 side outlet | Integrated Relief Valve -<br>Internally Drained Maximum<br>Displacement 23cc |

\* Integrated auxiliary flange requires use of input shaft option AH or AC

A variety of integrated valve options including PFD, Steering Covers, and Load sense priority flow dividers covers are available with D Series multiple pumps. Please contact your technical representative to determine which hardware best suits specific application needs.

| Code          | Inlet  | Description  |
|---------------|--|--|
| <b>F09A**</b> | 15/16-12 side inlet, 3/4-16 side priority, 7/8-14side secondary (SAE A flange)                   | Integrated Priority Flow Divider, cartridge style relief for settings up to:<br>221 bar and 34.3 l/min [3200psi and 9 US gal/min]              |
| <b>F09B‡</b>  | 15/16-12 side inlet, 3/4-16 side priority, 7/8-14side secondary (SAE B flange)                   |  |
| <b>F13A**</b> | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange)                  |  |
| <b>F13B‡</b>  | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE B flange)                  |  |
| <b>F21A**</b> | 15/8-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE A flange)                   |  |
| <b>F21B‡</b>  | 15/8-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE B flange)                   |  |
| <b>F25A**</b> | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange)                 |  |
| <b>F25B‡</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE B flange)                 |  |
| <b>D23A*</b>  | 15/16-12 side inlet, 3/4-16 side priority, nose secondary port (SAE A flange)                    | Integrated Steering Cover,<br>Priority Relief Valve<br>(Cartridge Style) for settings up to: 221 bar and 34.3 l/min [3200psi and 9 US gal/min] |
| <b>D23B**</b> | 15/16-12 side inlet, 3/4-16 side priority, nose secondary port (SAE B flange)                    |  |
| <b>D24A*</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, no secondary port (SAE A flange)                     |  |
| <b>D24B**</b> | 1 5/16-12 rear inlet, 3/4-16 rear priority, no secondary port (SAE B flange)                     |  |
| <b>L01A**</b> | 1 5/16-12 side inlet, 3/4-16 side priority, 7/8-14side secondary, 7/16-20 side LS (SAE-A flange) | Integrated Load Sense Divider (Dynamic), Priority Relief Valve   |
| <b>L01B‡</b>  | 1 5/16-12 side inlet, 3/4-16 side priority, 7/8-14side secondary, 7/16-20 side LS (SAE-B flange) |  |
| <b>L08A**</b> | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14rear secondary, 7/16-20 rear LS (SAE-A flange) |  |
| <b>L08B‡</b>  | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14rear secondary, 7/16-20 rear LS (SAE-B flange) |  |

\*\* Requires use of mounting flange option AC or AP

‡ Requires use of mounting flange option BC or BP

\* Integrated auxiliary flange requires use of input shaft option AH or AC

**D Series Model Code**

**E Flow control valve**

|          |           |           |          |          |          |          |          |          |          |          |          |          |          |          |          |
|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>A</b> | <b>B1</b> | <b>B2</b> | <b>C</b> | <b>L</b> | <b>M</b> | <b>N</b> | <b>P</b> | <b>R</b> | <b>S</b> | <b>D</b> | <b>E</b> | <b>F</b> | <b>H</b> | <b>J</b> | <b>K</b> |
| D        | E         | 4         |          |          |          |          |          |          |          |          | •        | •        | •        |          |          |

| Code       | Description  |  |
|------------|--|--|
| <b>NNN</b> | No flow control setting, standard for units without integrated flow control valves |  |
| <b>04X</b> | 3.8 l/min [1 US gal/min]   | For integrated PFD<br>Steering cover with cartridge style relief valve<br>(Cover options F09A, F09B, F13A, F13B, F21A, F21B, F25A or F25B) |
| <b>08X</b> | 7.6 l/min [2 US gal/min]   |  |
| <b>11X</b> | 11.4 l/min [3 US gal/min]  |  |
| <b>15X</b> | 15.1 l/min [4 US gal/min]  |  |
| <b>19X</b> | 18.9 l/min [5 US gal/min]  |  |
| <b>23X</b> | 22.7 l/min [6 US gal/min]  |  |
| <b>27X</b> | 26.5 l/min [7 US gal/min]  |  |
| <b>30X</b> | 30.3 l/min [8 US gal/min]  |  |
| <b>34X</b> | 34.3 l/min [9 US gal/min]  |  |
| <b>38A</b> | 10 bar standby   | Forintegrated load sense divider (use with L08A or L08B rear ports)  |
| <b>38L</b> | 10 bar standby   | Forintegrated load sense divider (use with L01A or L01B side ports)  |
| <b>R1N</b> | Maximum flow not to exceed 75 l/min, pressure range from 7-55bar                   | For integrated relief valve, internally drained (without flow control) Use with R104 cover option 23cc and under                           |
| <b>R2N</b> | Maximum flow not to exceed 75 l/min, pressure range from 41-248bar                 | For integrated relief valve, internally drained (without flow control) Use with R104 cover option 23cc and under                           |



## D Series Model Code

### F Pressure control valve

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  |   |   |   |   |   |   |   |   |   |   |   |   |   |

| Code | Description                  |
|------|------------------------------|
| 000  | No pressure control settings |
| 034  | 34 bar [500 psi]             |
| 041  | 41 bar [600 psi]             |
| 048  | 48 bar [700 psi]             |
| 055  | 55 bar [800 psi]             |
| 062  | 62 bar [900 psi]             |
| 069  | 69 bar [1000 psi]            |
| 076  | 76 bar [1100 psi]            |
| 083  | 83 bar [1200 psi]            |
| 090  | 90 bar [1300 psi]            |
| 097  | 97 bar [1400 psi]            |
| 103  | 103 bar [1500 psi]           |
| 110  | 110 bar [1600 psi]           |
| 117  | 117 bar [1700 psi]           |
| 124  | 124 bar [1800 psi]           |
| 131  | 131 bar [1900 psi]           |
| 138  | 138 bar [2000 psi]           |
| 145  | 145 bar [2100 psi]           |
| 152  | 152 bar [2200 psi]           |
| 159  | 159 bar [2300 psi]           |
| 165  | 165 bar [2400 psi]           |
| 172  | 172 bar [2500 psi]           |
| 179  | 179 bar [2600 psi]           |
| 186  | 186 bar [2700 psi]           |
| 193  | 193 bar [2800 psi]           |
| 200  | 200 bar [2900 psi]           |
| 207  | 207 bar [3000 psi]           |
| 214  | 214 bar [3100 psi]           |
| 221  | 221 bar [3200 psi]           |

For integrated priority flow divider (PFD) cover with cartridge style relief valve (Cover options F09A, F09B, F13A, F13B, F21A, F21B, F25A, F25B)  
and  
For integrated steering cover with cartridge style relief valve (Cover options D23A, D23B, D24A, D24B)  
and  
For integrated load sense (LS) cover with cartridge relief valve (Cover options L01A, L01B, L08A, L08B)

### H Assembly screws

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  |   |   |   |   |   |   |   |   |   |   |   |   |   |

| Code | Description                                       |
|------|---|
| **   | Will be assigned by Turolla upon receipt of order |

**D Series Model Code**

**J Nameplate**

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |   |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  |   |   |   |   |   |   |   |   |   |   |   |   | • | • |

| Code | Description        |
|------|--------------------|
| AN   | Standard nameplate |

**K Special feature**

| A | B1 | B2 | C | L | M | N | P | R | S | D | E | F | H | J | K |   |   |
|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E  | 4  |   |   |   |   |   |   |   |   |   |   |   |   | • | • | • |

| Code | Description                               |
|------|---|
| NNN  | No special features, standard black paint |

**D Series Options**

**Shaft options**

| A |   | B1 | B2 | C | D |  | E | F | H | J | K |  |
|---|---|----|----|---|---|--|---|---|---|---|---|--|
| D | E | 1  |    |   |   |  |   |   |   |   |   |  |
|   |   |    | •  | • |   |  |   |   |   |   |   |  |

|  |  |   |
|--|--|---|
| <p><b>Code SE</b><br/>           SAE 9-tooth 16/32-pitch flat root side fit<br/>           31.8 mm [1.25 in] length</p> <p>Allowable shaft torque:<br/>           118.6 N·m [1050 lbf·in]</p>  | <p><b>Code SC and AC</b><br/>           SAE 11-tooth 16/32-pitch flat root side fit<br/>           38.1 mm [1.50 in] length</p> <p>ACoption has 9T auxiliary drive output spline</p> <p>Allowable shaft torque:<br/>           176.3 N·m [1560 lbf·in]</p> | <p><b>Code SF</b><br/>           SAE 11-tooth 16/32-pitch flat root side fit<br/>           (modified length)<br/>           31.8 mm [1.25 in] length</p> <p>Allowable shaft torque:<br/>           176.3 N·m [1560 lbf·in]</p> |
| <p><b>Code SH and AH</b><br/>           SAE 13-tooth 16/32-pitch flat root side fit<br/>           41.2 mm [1.62 in] length</p> <p>AHoption has 9T auxiliary drive output spline</p> <p>Allowable shaft torque:<br/>           248.6 N·m [2200 lbf·in]</p> | <p><b>Code SV</b><br/>           SAE 15-tooth 16/32-pitch flat root side fit<br/>           46.0 mm [1.81 in] length</p> <p>Allowable shaft torque:<br/>           452 N·m [4000 lbf·in]</p>   | <p><b>Code PB - 22.2mm</b><br/>           SAE 7/8 in straight keyed, 1/4 in key<br/>           41.2 mm [1.62 in] length</p> <p>Allowable shaft torque:<br/>           248.6 N·m [2200 lbf·in]</p>                               |
| <p><b>Code PD</b><br/>           19mm [3/4 inch] Dia. x 51mm [2.0 inch]<br/>           3/16 inch key</p> <p>Allowable shaft torque:<br/>           158.2 N·m [1400 lbf·in]</p>   | <p><b>Code PZ</b><br/>           25.4mm [1 inch] Dia. x 46mm [1.62 inch]<br/>           1/4 inch key</p> <p>Allowable shaft torque:<br/>           452 N·m [4000 lbf·in]</p>   | <p>Dimensions mm [in]</p>   |

P108 171E

**D Series Options**

**Code TH**  
 1.8 taper, 22mm [7/8 inch] diameter x 49.3 mm [1.94 in] length, threaded, with nut and washer

Washer  
 Locknut  
 torque  
 50 Nm  
 [37 lbf•ft]

49.3  
 [1.94]

31.8  
 [1.25]

9/16 - 18 x 0.56 thread

Allowable shaft torque:  
 225.9 N•m [2000 lbf•in]

---

**Code TG**  
 1.8 taper, 22mm [7/8 inch] diameter x 50.0 mm [1.95 in] length, threaded, with nut and washer

50.0  
 [1.95]

31.8  
 [1.25]

5/8 - 18 x 0.56 thread

Allowable shaft torque:  
 225.9 N•m [2000 lbf•in]

---

**Code WT**  
 1.8 taper, 22mm [7/8 in] diameter x 49mm [1.94 in] length, threaded, with locknut, washer and 34 tooth helical gear for Perkins engine mount

34 tooth helical gear

Code WT - Only available in 17cc, 19cc, 25cc, 32cc with clockwise [RH] rotation.  
 Use PP mounting flange option.

P106172E

**Multiple pump connecting shaft**

Allowable shaft torque between sections is 144 N•m [1273 lbf•in].

Limit operating pressures when applying multiple section pumps. This ensures the maximum simultaneous input torque through the drive shaft and connecting shafts.

Do not exceed the Allowable Shaft Torque Limits.

**Mounting flanges**

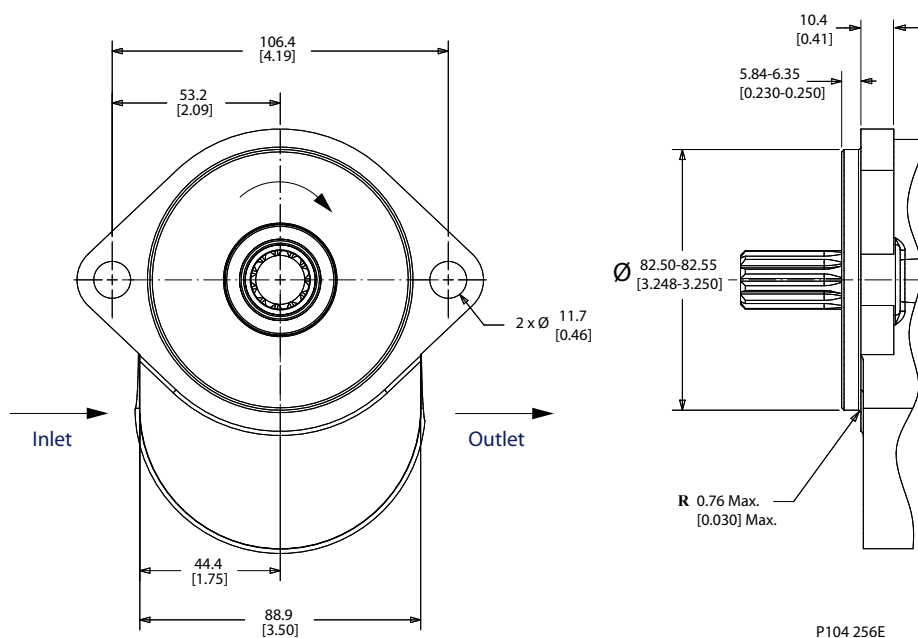
| A |   |   | B1 | B2 | C   | D | E | F | H | J | K |
|---|---|---|----|----|-----|---|---|---|---|---|---|
| D | E | 1 |    |    | • • |   |   |   |   |   |   |

## D Series Options

### C Mounting flange

| Code | Description  |
|------|--|
| AA   | SAE A 2-bolt   |
| AC   | SAE A 2-bolt, use with integral PFD/Steering Cover                                 |
| AM   | SAE A 2-bolt, with T seal  |
| AP   | SAE A 2-bolt, with T seal, use with integral PFD/Steering cover                    |
| AR   | SAE A 2-bolt, use with PZ or SV input drive  |
| AS   | SAE A 2-bolt, use with integral PFD/Steering cover and PZ or SV input drive        |
| AL   | SAE A 2-bolt, two shaft seals with weep hole                                       |
| AT   | SAE A 2-bolt, two shaft seals with weep hole, use with integral PFD/Steering cover |

### SAE-A 2-bolt



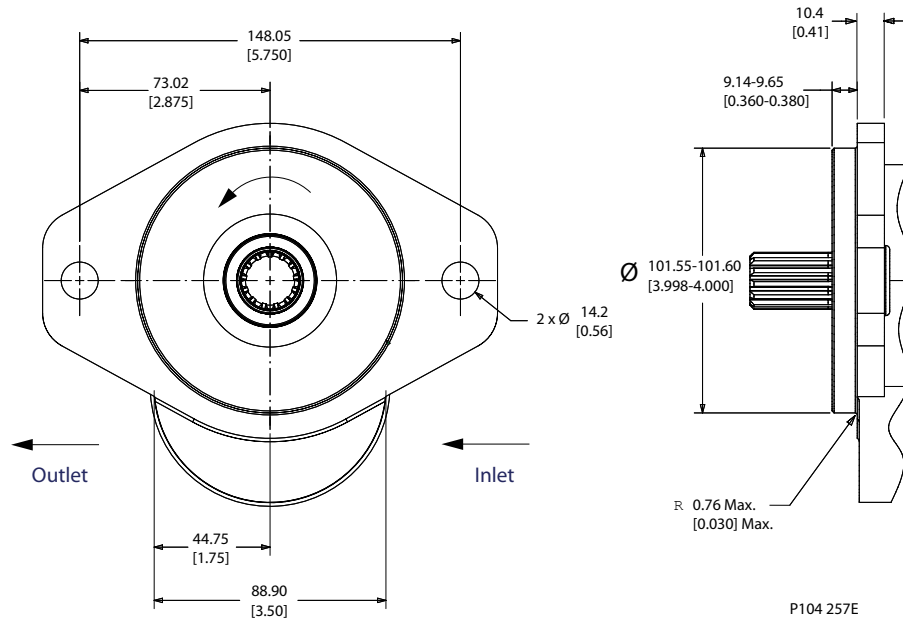
The optional T-Seal is a single piece shaft seal with back-to-back sealing lips. It is most commonly used to prevent mixing of internal/external fluids.

### C Mounting flange

| Code | Description  |
|------|--|
| BB   | SAE B 2-bolt   |
| BC   | SAE B 2-bolt, use with integral PFD/Steering cover                                 |
| BM   | SAE B 2-bolt, with T seal  |
| BP   | SAE B 2-bolt, with T seal, use with integral PFD/Steering cover                    |
| BR   | SAE B 2-bolt, use with PZ or SV input drive  |
| BS   | SAE B 2-bolt, use with integral PFD/Steering cover and PZ or SV input drive        |
| BW   | SAE B 2-bolt, two shaft seals with weep hole                                       |
| BT   | SAE B 2-bolt, two shaft seals with weep hole, use with integral PFD/Steering cover |

**D Series Options**

*SAE B 2-bolt*

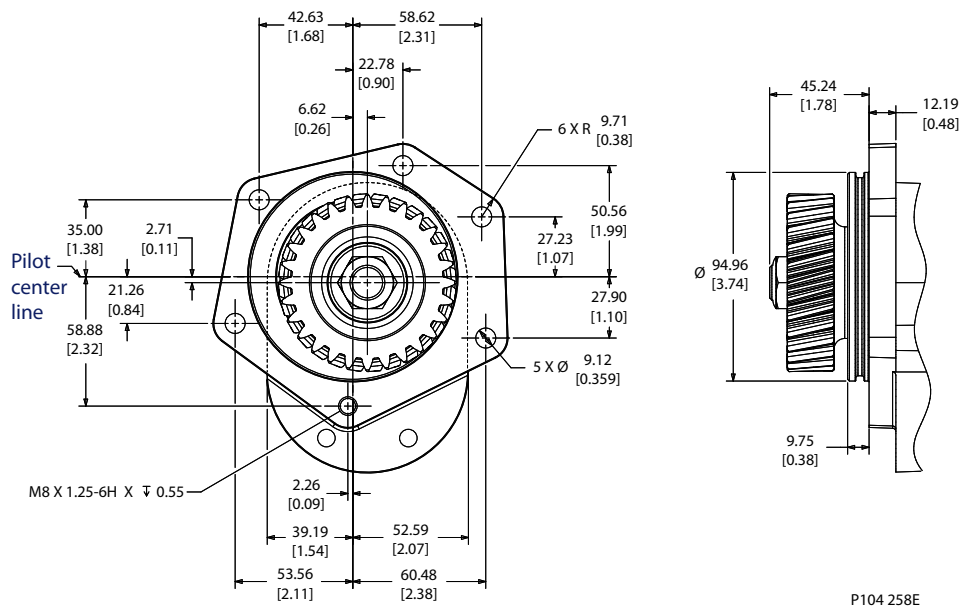


The optional T-Seal is a single piece shaft seal with back-to-back sealing lips. It is most commonly used to prevent mixing of internal/external fluids.

*C Mounting flange*

| Code | Description   |
|------|---|
| PP   | Perkins 6 bolt flange with (2) seals (use with WT input shaft and clockwise rotation) |

*Perkins® 1000 Series Engine Mount, shown with drive gear option WT and clockwise rotation*



**Multiple pump port options**

The D Series pump is uniquely designed to accommodate multiple pumps with a variety of porting configurations including units with a reduced number of inlets. Reducing the number of inlets can

### D Series Options

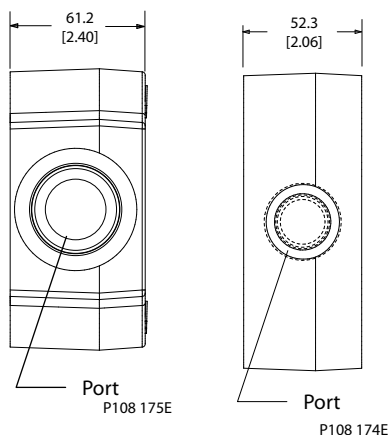
eliminate unnecessary hoses and fittings, thereby providing an overall system savings. A typical D series multiple pump does not have isolated sections. Applications requiring sealing between sections should use the SAE auxiliary flange to ensure separation of fluids between sections.

The reference drawings and model code options (R, L, and N) below, describe the first and intermediate port sections of multiple pump configurations. Refer to module D for port options on the final section of a multiple pump.

|          |           |           |          |          |          |          |          |          |          |          |          |
|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>A</b> | <b>B1</b> | <b>B2</b> | <b>C</b> | <b>R</b> | <b>S</b> | <b>D</b> | <b>E</b> | <b>F</b> | <b>H</b> | <b>J</b> | <b>K</b> |
| D        | E         | 2         |          | •        | •        | •        |          |          |          |          |          |

|          |           |           |          |          |          |          |          |          |          |          |          |          |          |
|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>A</b> | <b>B1</b> | <b>B2</b> | <b>C</b> | <b>L</b> | <b>M</b> | <b>R</b> | <b>S</b> | <b>D</b> | <b>E</b> | <b>F</b> | <b>H</b> | <b>J</b> | <b>K</b> |
| D        | E         | 3         |          | •        | •        | •        | •        | •        | •        |          |          |          |          |

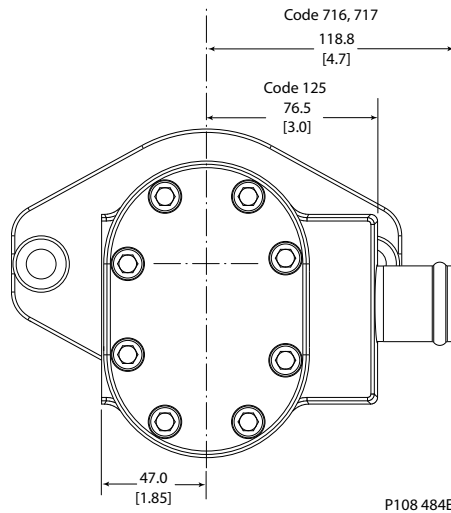
|          |           |           |          |          |          |          |          |          |          |          |          |          |          |          |          |
|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>A</b> | <b>B1</b> | <b>B2</b> | <b>C</b> | <b>L</b> | <b>M</b> | <b>N</b> | <b>P</b> | <b>R</b> | <b>S</b> | <b>D</b> | <b>E</b> | <b>F</b> | <b>H</b> | <b>J</b> | <b>K</b> |
| D        | E         | 4         |          | •        | •        | •        | •        | •        | •        |          |          |          |          |          |          |



Port code options for modules R, L and N in multiple pump

| Code       | Inlet port            | Outlet port               | Maximum recommended inlet flow l/min [US gal/min] |
|------------|-----------------------|---------------------------|---|
| <b>101</b> | 1 1/16 - 12, SAE side | 7/8 - 14, SAE side        | 49 [13]   |
| <b>103</b> | 1 5/16 - 12, SAE side | 7/8 - 14, SAE side        | 91 [24]   |
| <b>104</b> | 1 5/16 - 12, SAE side | 1 1/16 - 12, SAE side     | 91 [24]   |
| <b>113</b> | No inlet              | 7/8 - 14 SAE, side        | N/A   |
| <b>126</b> | No inlet              | 1 1/16 - 12, side         | N/A   |
| <b>704</b> | 1 1/4 side tube inlet | 7/8 - 14, SAE side ORB    | 151 [40]  |
| <b>708</b> | 1 1/4 side tube inlet | 1 1/16 - 12, SAE side ORB | 151 [40]  |

### D Series Options



Codes 125, 716 and 717 are commonly used for large displacements and multiple pumps with reduced number of inlets

| Code       | Inlet port            | Outlet port               | Maximum recommended inlet flow l/min [US gal/min] |
|------------|-----------------------|---------------------------|---|
| <b>125</b> | 1 5/8 - 12, SAE side  | 1 1/16 - 12, side         | 151 [40]  |
| <b>716</b> | 1 1/2 side tube inlet | 1 1/16 - 12, SAE side ORB | 204 [54]  |
| <b>717</b> | 1 1/2 side tube inlet | 7/8 - 14, SAE side ORB    | 204 [54]  |

### Rear cover - port options

#### Integrated Valves and Auxiliary Flange

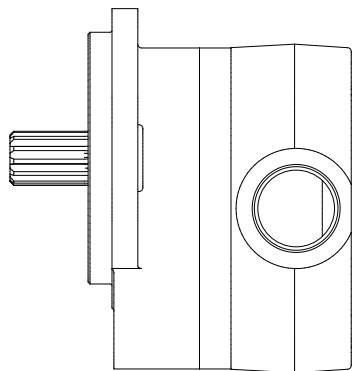
SAE O-ring boss ports - No integrated valves - No auxiliary flange

| Code        | Inlet port            | Outlet port           | Maximum recommended inlet flow l/min [US gal/min] |
|-------------|-----------------------|-----------------------|---|
| <b>N101</b> | 1 1/16 - 12, SAE side | 7/8 - 14, SAE side    | 49 [13]   |
| <b>N103</b> | 1 5/16 - 12, SAE side | 7/8 - 14, SAE side    | 91 [24]   |
| <b>N104</b> | 1 5/16 - 12, SAE side | 1 1/16 - 12, SAE side | 91 [24]   |
| <b>N113</b> | None*                 | 7/8 - 14 SAE, side    | - N/A -   |
| <b>N126</b> | None*                 | 1 1/16 - 12, side     | - N/A -   |

\* Used with multiple pump configurations

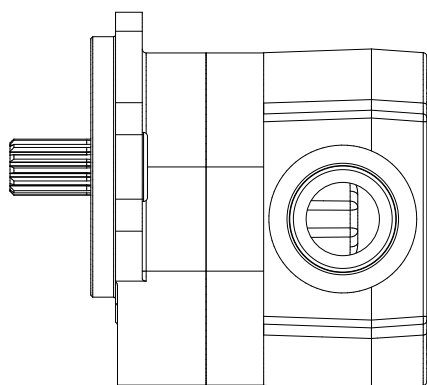


**D Series Options**



P104 268E

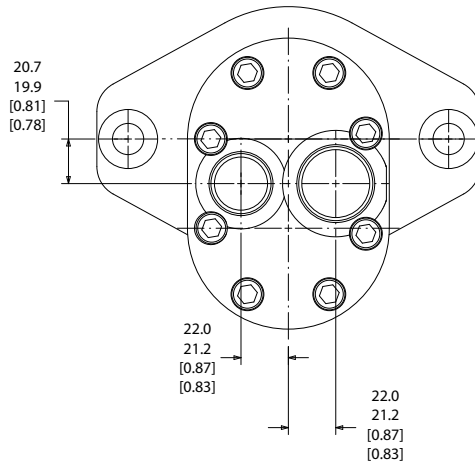
| Code        | Inlet port            | Outlet port            | Maximum recommended inlet flow l/min [US gal/min] |
|-------------|-----------------------|------------------------|---|
| <b>N125</b> | 1 5/8 - 12, SAE, side | 1 1/16 - 12, SAE, side | 151 [40]  |



P104 270E

| Code        | Inlet port            | Outlet port           | Maximum recommended inlet flow l/min [US gal/min] |
|-------------|-----------------------|-----------------------|---|
| <b>N501</b> | 1 1/16 - 12, SAE rear | 7/8 - 14 SAE, rear    | 49 [13]   |
| <b>N503</b> | 1 5/16 - 12, SAE rear | 7/8 - 14, rear        | 91 [24]   |
| <b>N504</b> | 1 5/16 - 12, SAE rear | 1 1/16 - 12, SAE rear | 91 [24]   |

**D Series Options**

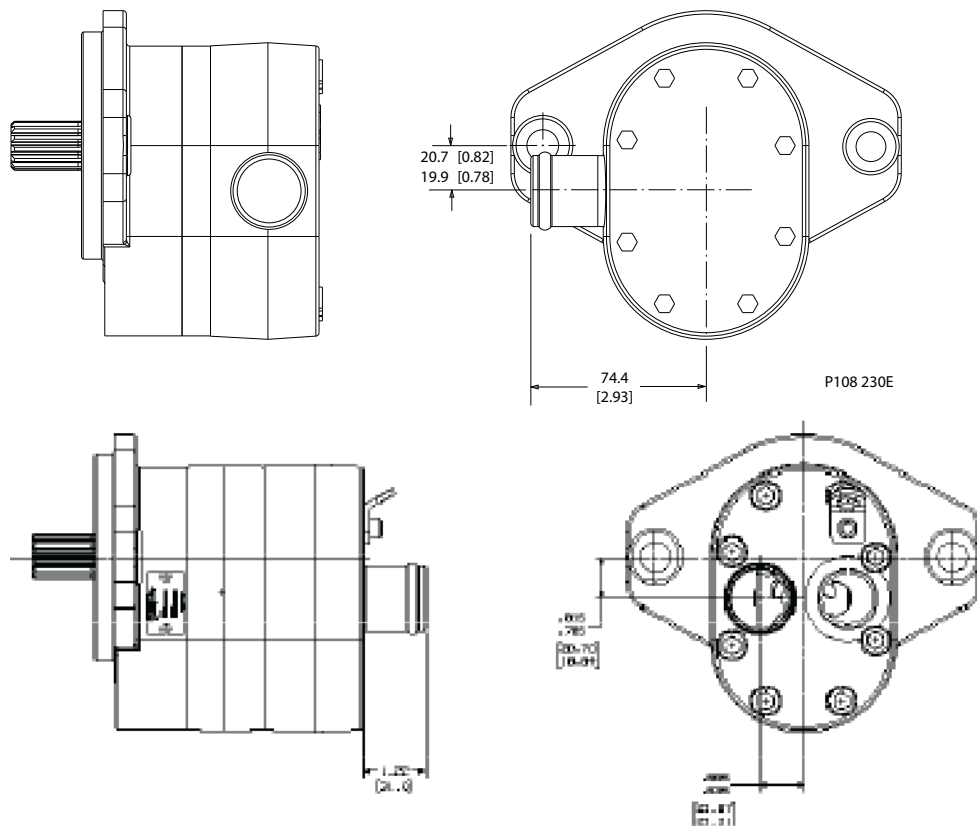


P104 269

*Beaded tube inlet port, SAE O-ring boss ports - No integrated valves - No auxiliary flange*

| Code        | Inlet port      | Outlet port        | Maximum recommended inlet flow l/min [US gal/min] |
|-------------|-----------------|--------------------|---|
| <b>N704</b> | 1 1/4 inch side | 7/8 - 14 ORB side  | 151 [40]  |
| <b>N708</b> | 1 1/4 inch side | 1 1/16-12 ORB side | 151 [40]  |
| <b>N715</b> | 1 1/4 inch rear | 1 1/16-12 ORB rear | 151 [40]  |
| <b>N720</b> | 1 1/4 inch rear | 7/8 - 14 ORB rear  | 151 [40]  |

**D Series Options**



**SAE-A 2-bolt auxiliary flange - SAE O-ring boss ports - No integrated valves**

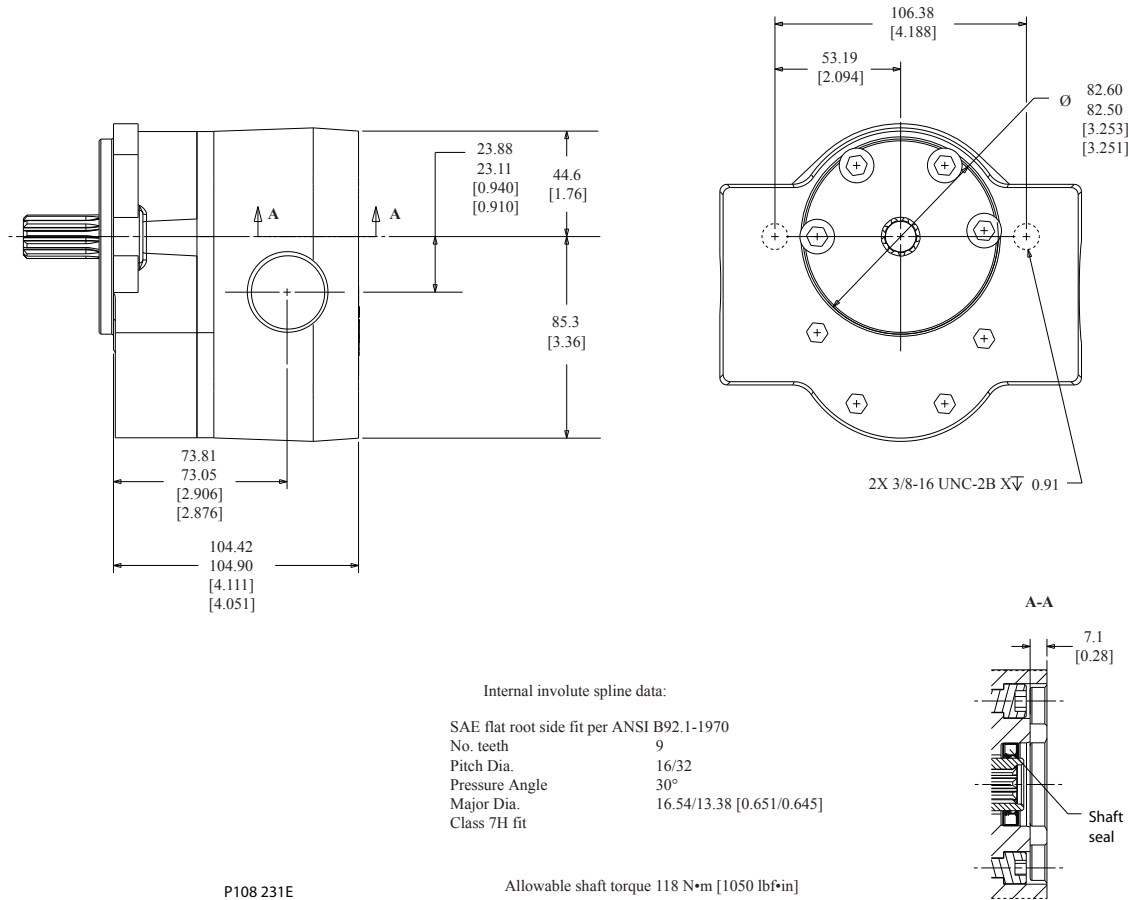
D Series pumps are available with an optional SAE-A 2-bolt auxiliary flange. Benefits include:

- Flexibility to auxiliary mount any product with SAE-A mounting flange
- Easily combine different product families including D Series with SNP2 aluminum pumps
- Enables sealing between sections to keep fluids isolated for applications where fluids may be drawn from different reservoirs or where sections operate with different fluid types
- Provides capability for customer add-on option

| Code         | Auxiliary drive  | Inlet port     | Outlet port    | Maximum recommended inlet flow l/min [US gal/min] |
|--------------|------------------|----------------|----------------|---|
| <b>B103*</b> | SAE-A 2-bolt, 9T | 1 5/16-12 side | 7/8 - 14 side  | 91 [24]   |
| <b>B104*</b> | SAE-A 2-bolt, 9T | 1 5/16-12 side | 1 1/16-12 side | 91 [24]   |

\* Auxiliary flange requires use of input shaft option AC or AH

**D Series Options**



P108 231E

Allowable shaft torque 118 N•m [1050 lbf•in]

The auxiliary flange option does not ship with a running cover. If the pump will be operated without an auxiliary pump, install a running cover to prevent environmental contamination.

**Integrated Priority Flow Divider**

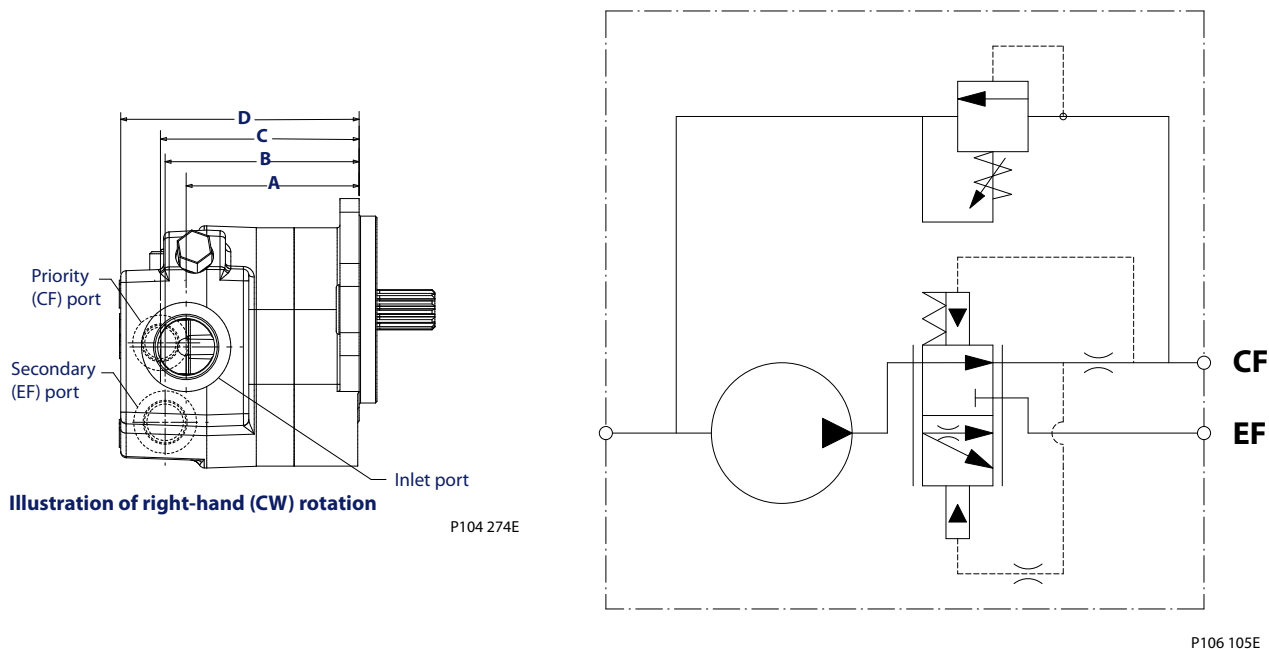
**Integrated Priority Flow Divider**

D series pumps are available with an optional Priority Flow Divider (PFD) valve integrated into the rear cover. The PFD divides the flow and provides a fixed amount of Controlled Flow (CF) to priority functions such as steering. The remaining flow is routed to the Excess Flow (EF) port for additional functions such as directional control valves and fan drives. The priority flow is pressure compensated and is therefore independent of the excess flow working pressures. The priority flow circuit has an integral, direct acting pilot relief valve with internal drain.

Relief valves are available to suit application pressure and flow requirements. Cartridge style relief - pressures to 221 bar (3200 psi), flows to 34.3 l/min (9 US gal/m)

The D series PFD can be used in tandems and other multiple pump configurations, but only in the rear pumping section. A variety of port sizes and port locations are available. Pumps with PFD covers are rotation specific and require a unique front mounting flange to accommodate the spacing of the assembly bolts.

**D Series Options**

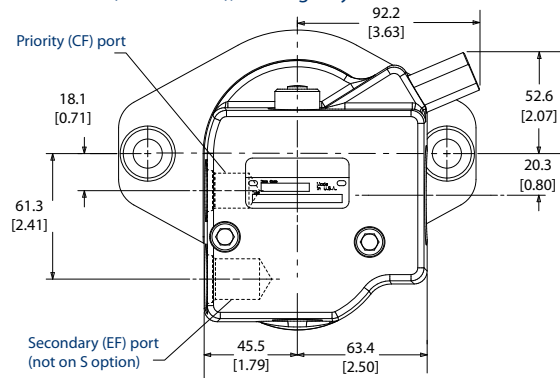


| Description   | Code    | 07    | 10    | 13    | 14    | 17    | 19    | 21    | 23    | 25    | 29    | 32    | 36    | 38    | 41    | 45    |
|---|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Displacement</b>   | cm3/rev | 7.0   | 9.5   | 12.6  | 14.3  | 17.0  | 19.0  | 20.5  | 22.5  | 25.4  | 29.0  | 31.8  | 36.0  | 38.0  | 41.0  | 45.1  |
|   | in3/rev | 0.43  | 0.58  | 0.77  | 0.87  | 1.04  | 1.16  | 1.25  | 1.37  | 1.55  | 1.77  | 1.94  | 2.20  | 2.32  | 2.50  | 2.75  |
| <b>Weight</b>   | kg      | 8.8   | 9.0   | 9.2   | 9.3   | 9.4   | 9.6   | 9.6   | 9.8   | 9.9   | 10.1  | 10.3  | 10.6  | 10.7  | 10.7  | 11.0  |
|   | lb      | 19.5  | 19.8  | 20.2  | 20.4  | 20.8  | 21.1  | 21.2  | 21.5  | 21.9  | 22.3  | 22.7  | 23.3  | 23.5  | 23.9  | 24.4  |
| <b>Dimension A1</b><br>Inlet port distance up to 1-5/16 SAE | mm      | 80.5  | 82.9  | 86.1  | 88.3  | 90.4  | 92.5  | 94.0  | 95.8  | 98.8  | 102.4 | 105.2 | 109.4 | 111.4 | 114.4 | 118.6 |
|   | in      | 3.17  | 3.27  | 3.39  | 3.48  | 3.56  | 3.64  | 3.70  | 3.77  | 3.89  | 4.03  | 4.14  | 4.31  | 4.39  | 4.50  | 4.67  |
| <b>Dimension A2</b><br>Inlet port distance 1-5/8 SAE        | mm      | 90.2  | 92.6  | 95.8  | 97.9  | 100.1 | 102.1 | 103.6 | 105.5 | 108.5 | 112.0 | 114.8 | 119.1 | 121.1 | 124.1 | 128.3 |
|   | in      | 3.55  | 3.65  | 3.77  | 3.86  | 3.94  | 4.02  | 4.08  | 4.15  | 4.27  | 4.41  | 4.52  | 4.69  | 4.77  | 4.88  | 5.05  |
| <b>Dimension B</b><br>Secondary port distance               | mm      | 91.9  | 94.4  | 97.5  | 99.7  | 101.9 | 103.9 | 105.4 | 107.3 | 110.2 | 113.8 | 116.6 | 120.9 | 122.8 | 125.8 | 130.0 |
|   | in      | 3.62  | 3.72  | 3.84  | 3.93  | 4.01  | 4.09  | 4.15  | 4.22  | 4.34  | 4.48  | 4.59  | 4.76  | 4.84  | 4.95  | 5.12  |
| <b>Dimension C</b><br>priority port distance                | mm      | 94.5  | 96.9  | 100.1 | 102.2 | 104.4 | 106.4 | 108.0 | 109.8 | 112.8 | 116.4 | 119.1 | 123.4 | 125.4 | 128.4 | 132.6 |
|   | in      | 3.72  | 3.82  | 3.94  | 4.03  | 4.11  | 4.19  | 4.25  | 4.32  | 4.44  | 4.58  | 4.69  | 4.86  | 4.94  | 5.05  | 5.22  |
| <b>Dimension D</b><br>overall length                        | mm      | 116.1 | 118.5 | 121.7 | 123.8 | 126.0 | 128.0 | 129.5 | 131.4 | 134.4 | 137.9 | 140.7 | 145.0 | 147.0 | 150.0 | 154.2 |
|   | in      | 4.57  | 4.67  | 4.79  | 4.88  | 4.96  | 5.04  | 5.10  | 5.17  | 5.29  | 5.43  | 5.54  | 5.71  | 5.79  | 5.90  | 6.07  |

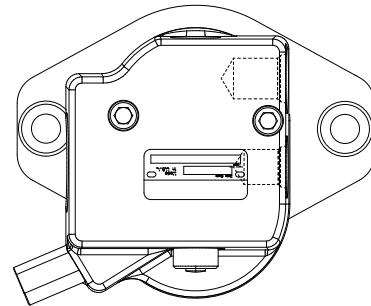
**D Series Options**

**Integrated Priority Flow Divider**

Side Ports (CW rotation), cartridge style

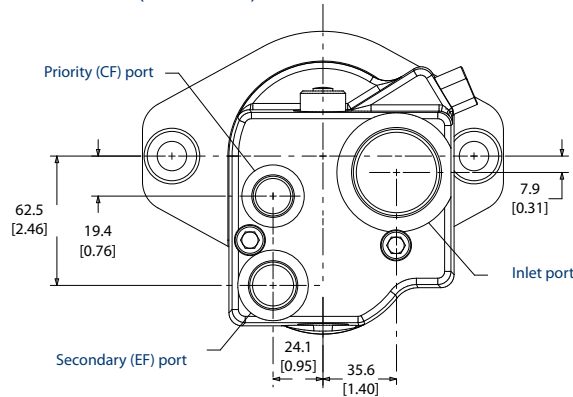


Side Ports (CCW rotation), cartridge style

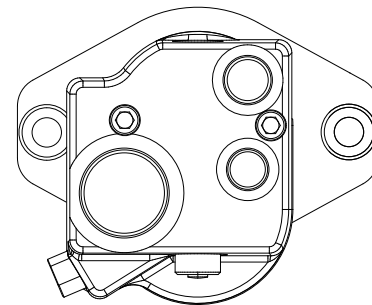


P108 182E

Rear Ports (CW rotation)



Rear Ports (CCW rotation)



P108 183E

Integrated priority flow dividers require use of mounting flange options AC, AB, AP or BF

**Integrated Priority Flow Divider, cartridge style relief for settings up to 221 bar and 34.3 l/min [3200 psi and 9 US gal/min]**

| Code | Description  |
|------|--|
| F09A | 1 5/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE A flange) |
| F09B | 1 5/16-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE B flange) |
| F13A | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange)  |
| F13B | 1 5/8-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE B flange)  |
| F21A | 1 5/8-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE A flange)  |
| F21B | 1 5/8-12 side inlet, 3/4-16 side priority, 7/8-14 side secondary (SAE B flange)  |
| F25A | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE A flange) |
| F25B | 1 5/16-12 rear inlet, 3/4-16 rear priority, 7/8-14 rear secondary (SAE B flange) |

**Integrated Steering Cover**

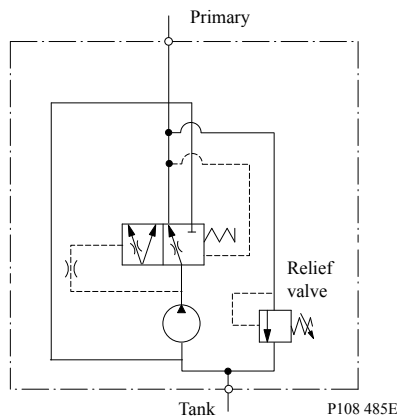
D series pumps are available with an optional steering valve integrated into the rear cover.

The steering valve provides a fixed amount of Controlled Flow (CF) for priority functions such as steering. The remaining flow is routed internally to the inlet. The control flow circuit has an integral, direct acting pilot relief valve with internal drain. The relief valve is a cartridge style design suitable for pressures to 221 bar (3200 psi) and flows to 34.3 l/min (9 US gal/m).

The D series steering cover can be used in tandems and other multiple pump configurations, but only in the rear pumping section. A variety of port sizes and port locations are available. Pumps with steering

**D Series Options**

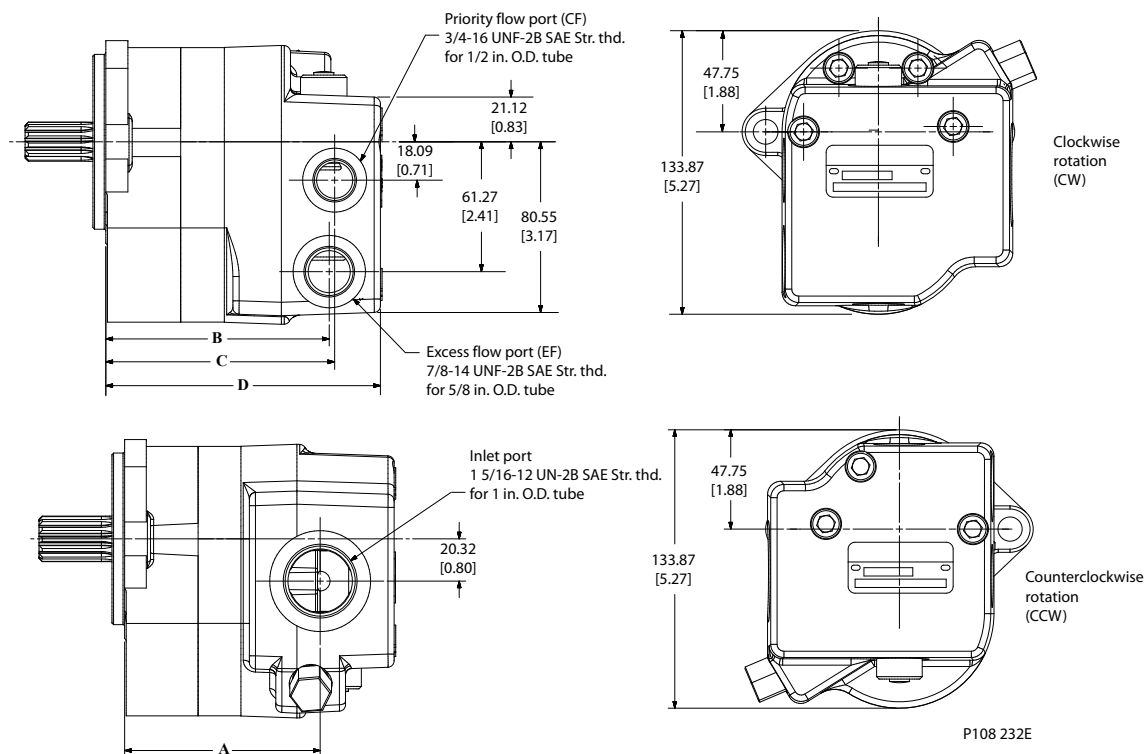
covers are rotation specific and require a unique front mounting flange to accommodate the spacing of the assembly bolts.



**Integrated Steering Cover**

| Integrated Steering Cover, cartridge style relief forsettings up to [3200 psi and 9 US gal/m*] |   |
|--|---|
| Code   | Description   |
| D23A   | 1 5/16-12 side inlet, 3/4-16 side priority, use with SAE-A mounting flange. No secondary port |
| D23B   | 1 5/16-12 side inlet, 3/4-16 side priority, use with SAE-B mounting flange. No secondary port |
| D24A   | 1 5/16-12 rear inlet, 3/4-16 rear priority, use with SAE-A mounting flange No secondary port  |
| D24B   | 1 5/16-12 rear inlet, 3/4-16 rear priority, use with SAE-B mounting flange No secondary port  |

\* Requires use of mounting flange option AC, BC, AP or BP



**D Series Options**

| Dimension |    | Displacement cm <sup>3</sup> /rev [in <sup>3</sup> /rev] |               |                |                |                |                |                |                |                |                |                |                |                |                |                |
|-----------|----|--|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|           |    | 7.0<br>[0.43]  | 9.5<br>[0.58] | 12.6<br>[.077] | 14.3<br>[0.87] | 17.0<br>[1.04] | 19.0<br>[1.16] | 20.5<br>[1.25] | 22.5<br>[1.37] | 25.4<br>[1.55] | 29.0<br>[1.77] | 31.8<br>[1.94] | 36.0<br>[2.20] | 38.0<br>[2.32] | 41.0<br>[2.50] | 45.1<br>[2.75] |
| A         | mm | 80.5   | 82.9          | 86.1           | 87.8           | 90.4           | 92.5           | 94.0           | 95.8           | 98.8           | 102.4          | 105.2          | 109.4          | 111.4          | 114.4          | 118.6          |
|           | in | 3.17   | 3.27          | 3.39           | 3.46           | 3.56           | 3.64           | 3.70           | 3.77           | 3.89           | 4.03           | 4.14           | 4.31           | 4.39           | 4.50           | 4.67           |
| B         | mm | 92.0   | 94.4          | 97.5           | 99.2           | 101.9          | 103.9          | 105.4          | 107.3          | 110.2          | 113.8          | 116.6          | 120.9          | 122.8          | 125.8          | 130.1          |
|           | in | 3.62   | 3.72          | 3.84           | 3.91           | 4.01           | 4.09           | 4.15           | 4.22           | 4.34           | 4.48           | 4.59           | 4.76           | 4.84           | 4.95           | 5.12           |
| C         | mm | 94.5   | 96.9          | 100.1          | 101.7          | 104.4          | 106.4          | 108.0          | 109.8          | 112.8          | 116.4          | 119.1          | 123.4          | 125.4          | 128.4          | 132.6          |
|           | in | 3.72   | 3.82          | 3.94           | 4.01           | 4.11           | 4.19           | 4.25           | 4.32           | 4.44           | 4.58           | 4.69           | 4.86           | 4.94           | 5.05           | 5.22           |
| D         | mm | 116.1  | 118.5         | 121.7          | 123.3          | 126.0          | 128.0          | 129.6          | 131.4          | 134.4          | 138.0          | 140.7          | 145.0          | 147.0          | 150.0          | 154.2          |
|           | in | 4.57   | 4.67          | 4.79           | 4.86           | 4.96           | 5.04           | 5.10           | 5.17           | 5.29           | 5.43           | 5.54           | 5.71           | 5.79           | 5.90           | 6.07           |

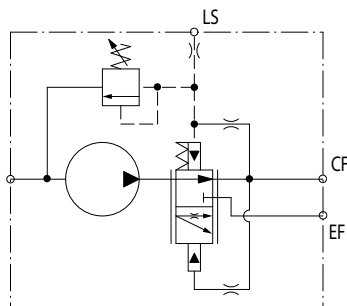
**Load Sense Priority Flow Valve**

D series pumps are available with an optional Load Sense (LS) priority valve integrated into the rear cover.

The LS priority valve supplies priority flow on demand to functions such as load sense steering, while the Excess Flow (EF) is available for secondary functions such as directional control valves and fan drives.

A load sense signal line from the priority circuit to the gear pump's LS port governs flow to the primary circuit. As the load sense signal pressure increases, priority (CF) flow also increases. When the controlled function is idle (no load sense demand), full pump flow is available for the secondary functions.

- The D series LS priority valve is available with 40 l/min [10 US gal/min] and 80 l/min [21 US gal/min] flow settings.
- The priority circuit is available with an optional integral direct acting pilot relief valve with internal drain. Pressure settings range from 34 to 172 bar [500 to 2500 psi].
- The load sense valve is dynamic and has a constant flow of 0.5 to 1.0 l/min [0.13 to 0.26 US gal/min] present at all times to ensure fast reaction.
- The D series PFD can be used in tandems and other multiple pump configurations, but only in the rear pumping section.
- Rear and side porting options are available.



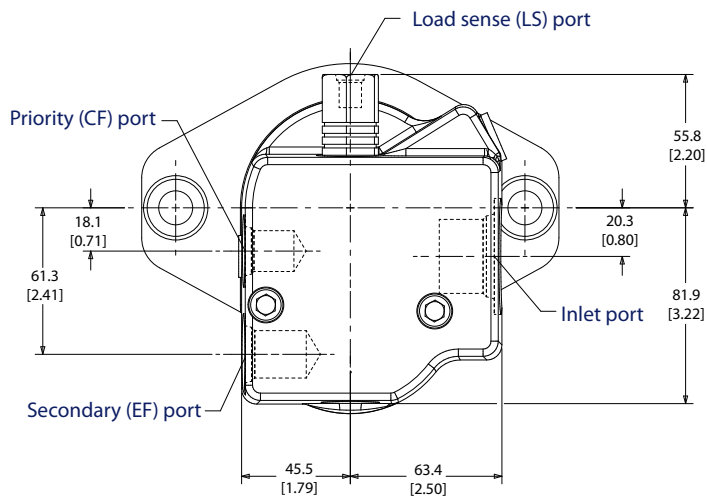
P104 279

[Contact your Danfoss representative for information concerning load sense port options.](#)

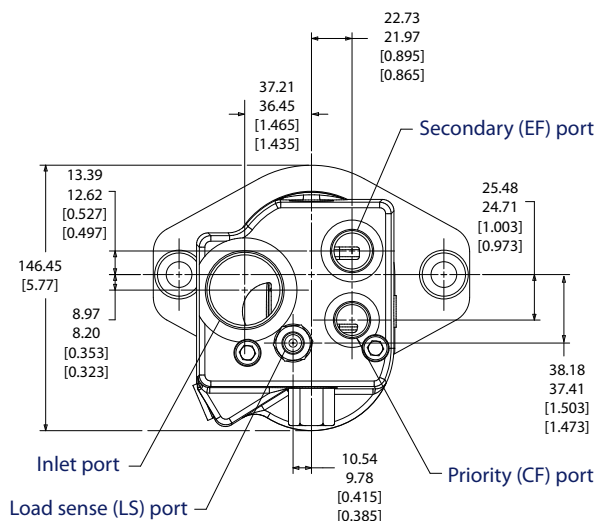
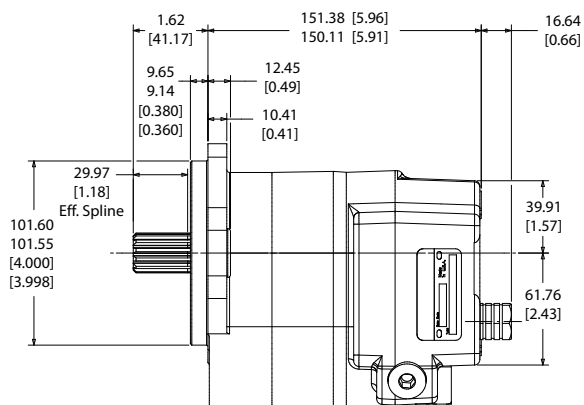


**D Series Options**

**Pumps with Load Sense Priority Flow Valves**



P104 280E



P104 281E

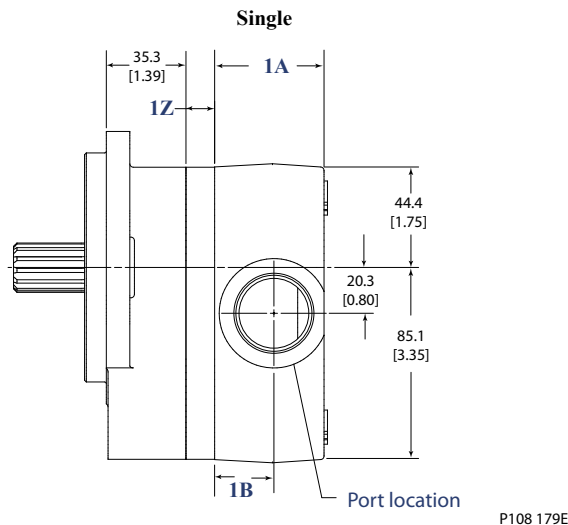
| Description  | Code                 | 07   | 10   | 11   | 13    | 14    | 17    | 19    | 21    | 23    | 25    | 29    | 32    | 36    | 38    | 41    | 45    |
|--|----------------------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Displacement   | cm <sup>3</sup> /rev | 7.0  | 9.5  | 10.8 | 12.6  | 14.3  | 17.0  | 19.0  | 20.5  | 22.5  | 25.4  | 29.0  | 31.8  | 36.0  | 38.0  | 41.0  | 45.1  |
|  | in <sup>3</sup> /rev | 0.43 | 0.58 | 0.66 | 0.77  | 0.87  | 1.04  | 1.16  | 1.25  | 1.37  | 1.55  | 1.77  | 1.94  | 2.20  | 2.32  | 2.50  | 2.75  |
| Weight   | kg                   | 8.8  | 9.0  | 9.1  | 9.2   | 9.3   | 9.4   | 9.6   | 9.6   | 9.8   | 9.9   | 10.1  | 10.3  | 10.6  | 10.7  | 10.7  | 11.0  |
|  | lb                   | 19.5 | 19.8 | 20.0 | 20.2  | 20.4  | 20.8  | 21.1  | 21.2  | 21.5  | 21.9  | 22.3  | 22.7  | 23.3  | 23.5  | 23.9  | 24.4  |
| Dimension A1 Inlet port distance sizes up to 1-5/16 in SAE | mm                   | 80.5 | 82.9 | 84.5 | 86.1  | 88.3  | 90.4  | 92.5  | 94.0  | 95.8  | 98.8  | 102.4 | 105.2 | 109.4 | 111.4 | 114.4 | 118.6 |
|  | in                   | 3.17 | 3.27 | 3.31 | 3.39  | 3.48  | 3.56  | 3.64  | 3.70  | 3.77  | 3.89  | 4.03  | 4.14  | 4.31  | 4.39  | 4.50  | 4.67  |
| Dimension A2 Inlet port distance 1-5/8 in SAE              | mm                   | 90.2 | 92.6 | 94.0 | 95.8  | 97.9  | 100.1 | 102.1 | 103.6 | 105.5 | 108.5 | 112.0 | 114.8 | 119.1 | 121.1 | 124.1 | 128.3 |
|  | in                   | 3.55 | 3.65 | 3.69 | 3.77  | 3.86  | 3.94  | 4.02  | 4.08  | 4.15  | 4.27  | 4.41  | 4.52  | 4.69  | 4.77  | 4.88  | 5.05  |
| Dimension B Secondary port distance                        | mm                   | 91.9 | 94.4 | 95.8 | 97.5  | 99.7  | 101.9 | 103.9 | 105.4 | 107.3 | 110.2 | 113.8 | 116.6 | 120.9 | 122.8 | 125.8 | 130.0 |
|  | in                   | 3.62 | 3.72 | 3.78 | 3.84  | 3.93  | 4.01  | 4.09  | 4.15  | 4.22  | 4.34  | 4.48  | 4.59  | 4.76  | 4.84  | 4.95  | 5.12  |
| Dimension C priority port distance                         | mm                   | 94.5 | 96.9 | 98.5 | 100.1 | 102.2 | 104.4 | 106.4 | 108.0 | 109.8 | 112.8 | 116.4 | 119.1 | 123.4 | 125.4 | 128.4 | 132.6 |
|  | in                   | 3.72 | 3.82 | 3.88 | 3.94  | 4.03  | 4.11  | 4.19  | 4.25  | 4.32  | 4.44  | 4.58  | 4.69  | 4.86  | 4.94  | 5.05  | 5.22  |

**D Series Options**

| Description                       | Code | 07    | 10    | 11    | 13    | 14    | 17    | 19    | 21    | 23    | 25    | 29    | 32    | 36    | 38    | 41    | 45    |
|-----------------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Dimension D overall length</b> | mm   | 116.1 | 118.5 | 120.0 | 121.7 | 123.8 | 126.0 | 128.0 | 129.5 | 131.4 | 134.4 | 137.9 | 140.7 | 145.0 | 147.0 | 150.0 | 154.2 |
|                                   | in   | 4.57  | 4.67  | 4.71  | 4.79  | 4.88  | 4.96  | 5.04  | 5.10  | 5.17  | 5.29  | 5.43  | 5.54  | 5.71  | 5.79  | 5.90  | 6.07  |

## D Series Dimension Drawings

### One Section - Single



| Dimension  | Section 1     |                 |
|--|---------------|-----------------|
|  | 1A            | 1B              |
| Standard Ports: N101, N103, N113, N126, N501, N503, N504 | 45<br>[1.91]  | 24<br>[0.96]    |
| Oversized Ports<br>N125, N704, N708                      | 63.5<br>[2.5] | 31.75<br>[1.25] |

| Displacement | Units | 07   | 10   | 11   | 13   | 14   | 17   | 19   | 21   | 23   | 25   | 29   | 32   | 36   | 38   | 41   | 45   |
|--------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Dimension Z  | mm    | 7.1  | 9.7  | 10.9 | 12.7 | 14.4 | 17.0 | 19.1 | 20.6 | 22.5 | 25.4 | 29.0 | 31.8 | 36.1 | 38.1 | 41.0 | 45.2 |
|              | in    | 0.28 | 0.38 | 0.43 | 0.50 | 0.57 | 0.67 | 0.75 | 0.81 | 0.88 | 1.00 | 1.14 | 1.25 | 1.42 | 1.50 | 1.61 | 1.78 |

#### How to determine overall length

The overall length of the single section pump (as measured from the mounting flange) can be calculated by adding the dimension of the mounting flange to the combined length of the pumping section. The length of the pumping section is dependent upon the displacement (dimension Z) and the selection of ports (standard or oversized).

$$\text{Overall length of single section pump} = 35.3 [1.39] + 1Z + 1A$$

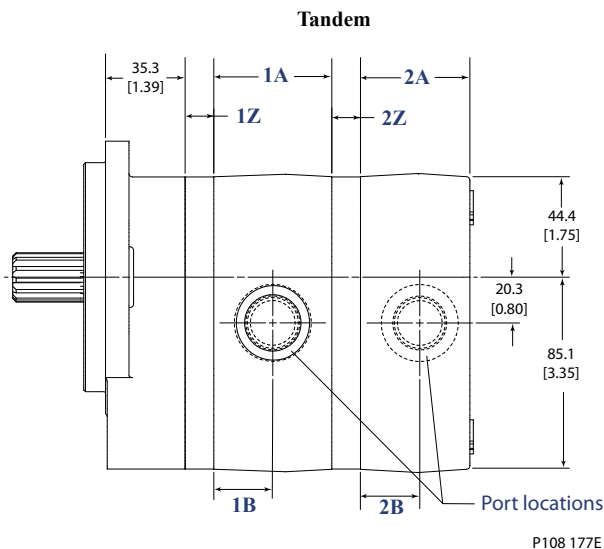
#### How to determine the position of inlet/outlet ports

Generally speaking, the inlet and outlet ports are centrally located within each port section. Therefore, the position of the inlet/outlet port (as measured from the mounting flange) can be calculated as follows:

$$\text{Location of port 1} = 35.3 [1.39] + 1Z + 1B$$

**D Series Dimension Drawings**

**Two section - Tandem**



| Dimension   |             |              |             |              |
|---|-------------|--------------|-------------|--------------|
| Standard Ports: 101, 103, 104, 113, 126, 704, 708<br>N101, N103, N113, N126, N501, N503, N504 | 52.3 [2.06] | 26.15 [1.03] | 48.5 [1.91] | 24.25 [1.03] |
| Oversized Ports: 125, 716, 717, N125, N704, N708  | 61.2 [2.4]  | 30.6 [1.2]   | 63.5 [2.5]  | 31.75 [1.25] |

**How to determine overall length**

The overall length of the two section pump (as measured from the mounting flange) can be calculated by adding the dimension of the mounting flange to the combined length of each section. The length of the section is dependent upon the displacement (dimension Z) and the selection of ports (standard or oversized).

$$\text{Overall length of two section pump} = 35.3 [1.39] + 1Z + 1A + 2Z + 2A$$

**How to determine the position of inlet/outlet ports**

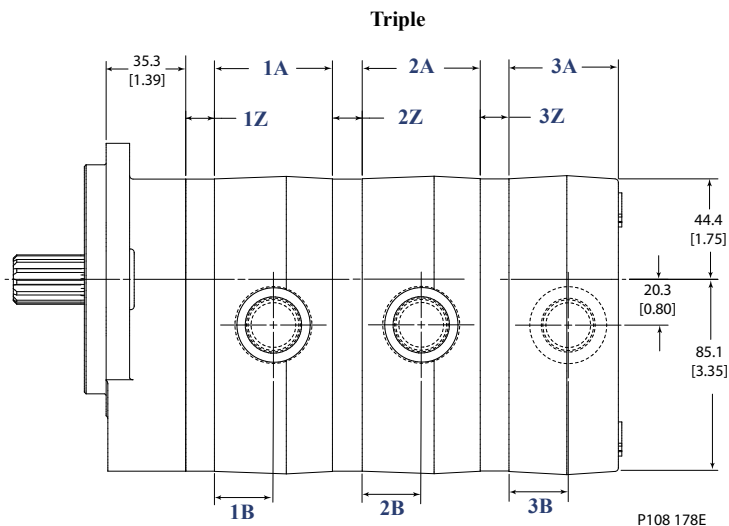
Generally speaking, the inlet and outlet ports are centrally located within each port section. Therefore, the position of each port (as measured from the mounting flange) can be calculated as follows:

$$\text{Location of port 1} = 35.3 [1.39] + 1Z + 1B$$

$$\text{Location of port 2} = 35.3 [1.39] + 1Z + 1A + 2Z + 2B$$

## D Series Dimension Drawings

### Three Section - Triple



| Dimension   | Section 1 and 2 |              | Section 3   |              |
|---|-----------------|--------------|-------------|--------------|
|   | 1A              | 1B           | 2A          | 2B           |
| Standard Ports: 101, 103, 104, 113, 126, 704, 708<br>N101, N103, N113, N126, N501, N503, N504 | 52.3 [2.06]     | 26.15 [1.03] | 48.5 [1.91] | 24.25 [1.03] |
| Oversized Ports: 125, 716, 717, N125, N704, N708  | 61.2 [2.4]      | 30.6 [1.2]   | 63.5 [2.5]  | 31.75 [1.25] |

| Displacement | Units | 07   | 10   | 11   | 13   | 14   | 17   | 19   | 21   | 23   | 25   | 29   | 32   | 36   | 38   | 41   | 45   |
|--------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Dimension Z  | mm    | 7.1  | 9.7  | 10.9 | 12.7 | 14.4 | 17.0 | 19.1 | 20.6 | 22.5 | 25.4 | 29.0 | 31.8 | 36.1 | 38.1 | 41.0 | 45.2 |
|              | in    | 0.28 | 0.38 | 0.43 | 0.50 | 0.57 | 0.67 | 0.75 | 0.81 | 0.88 | 1.00 | 1.14 | 1.25 | 1.42 | 1.50 | 1.61 | 1.78 |

#### How to determine overall length

The overall length of the three section pump (as measured from the mounting flange) can be calculated by adding the dimension of the mounting flange to the combined length of each pumping section. The length of each pumping section is dependent upon the displacement (dimension Z) and the selection of ports (standard or oversized).

$$\text{Overall length of three section pump} = 35.3 [1.39] + 1Z + 1A + 2Z + 2A + 3Z + 3A$$

#### How to determine the position of inlet/outlet ports

Generally speaking, the inlet and outlet ports are centrally located within each port section. Therefore, the position of each port (as measured from the mounting flange) can be calculated as follows:

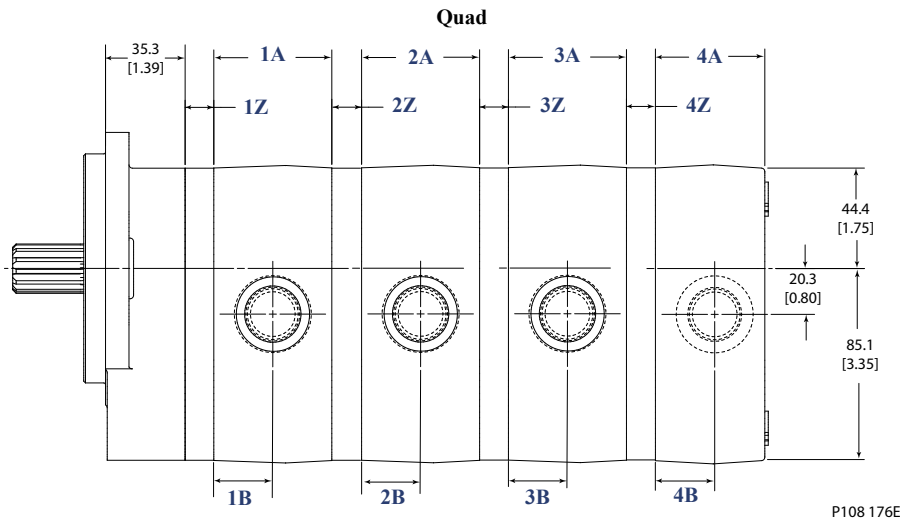
$$\text{Location of port 1} = 35.3 [1.39] + 1Z + 1B$$

$$\text{Location of port 2} = 35.3 [1.39] + 1Z + 1A + 2Z + 2B$$

$$\text{Location of port 3} = 35.3 [1.39] + 1Z + 1A + 2Z + 2A + 3Z + 3B$$

**D Series Dimension Drawings**

**Four Section - Quad**



| Dimension   | Section 1, 2, 3 |              | Section 4   |              |
|---|-----------------|--------------|-------------|--------------|
|   | 1A              | 1B           | 2A          | 2B           |
| Standard Ports: 101, 103, 104, 113, 126, 704, 708<br>N101, N103, N113, N126, N501, N503, N504 | 52.3 [2.06]     | 26.15 [1.03] | 48.5 [1.91] | 24.25 [1.03] |
| Oversized Ports: 125, 716, 717, N125, N704, N708  | 61.2 [2.4]      | 30.6 [1.2]   | 63.5 [2.5]  | 31.75 [1.25] |

| Displacement | Units | 07   | 10   | 11   | 13   | 14   | 17   | 19   | 21   | 23   | 25   | 29   | 32   | 36   | 38   | 41   | 45   |
|--------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Dimension Z  | mm    | 7.1  | 9.7  | 10.9 | 12.7 | 14.4 | 17.0 | 19.1 | 20.6 | 22.5 | 25.4 | 29.0 | 31.8 | 36.1 | 38.1 | 41.0 | 45.2 |
|              | in    | 0.28 | 0.38 | 0.43 | 0.50 | 0.57 | 0.67 | 0.75 | 0.81 | 0.88 | 1.00 | 1.14 | 1.25 | 1.42 | 1.50 | 1.61 | 1.78 |

**How to determine overall length**

The overall length of the four section pump (as measured from the mounting flange) can be calculated by adding the dimension of the mounting flange to the combined length of each pumping section. The length of each pumping section is dependent upon the displacement (dimension Z) and the selection of ports (standard or oversized).

$$\text{Overall length of four section pump} = 35.3 [1.39] + 1Z + 1A + 2Z + 2A + 3Z + 3A + 4Z + 4A$$

**How to determine the position of inlet/outlet ports**

Generally speaking, the inlet and outlet ports are centrally located within each port section. Therefore, the position of each port (as measured from the mounting flange) can be calculated as follows:

$$\text{Location of port 1} = 35.3 [1.39] + 1Z + 1B$$

$$\text{Location of port 2} = 35.3 [1.39] + 1Z + 1A + 2Z + 2B$$

$$\text{Location of port 3} = 35.3 [1.39] + 1Z + 1A + 2Z + 2A + 3Z + 3B$$

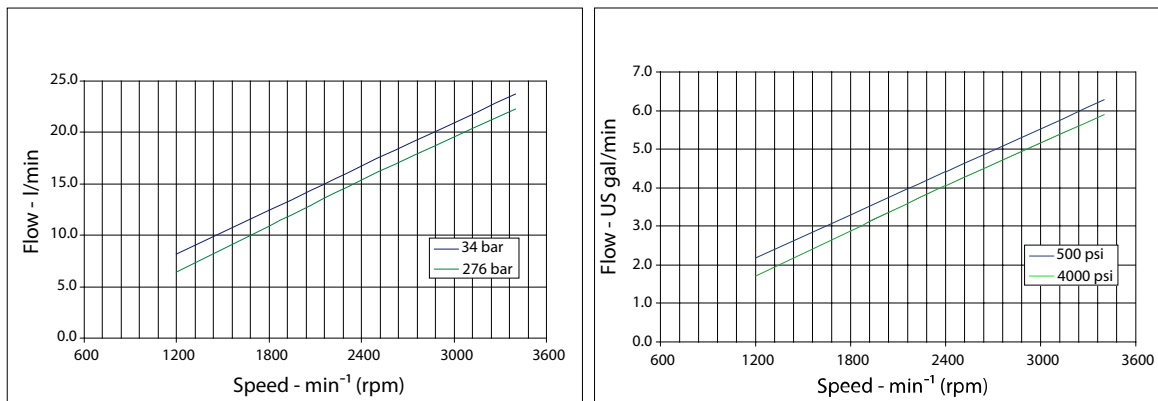
$$\text{Location of port 4} = 35.3 [1.39] + 1Z + 1A + 2Z + 2A + 3Z + 3A + 4Z + 4B$$

## D Series Performance Data

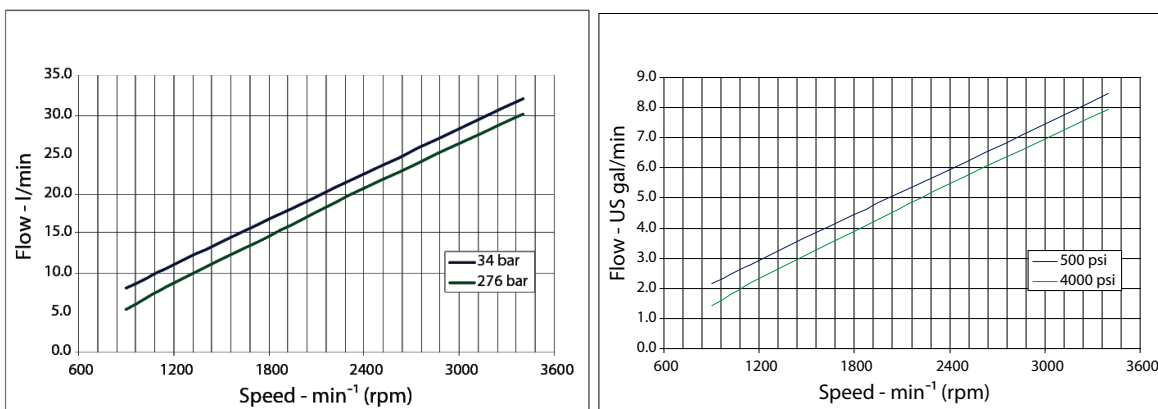
### Flow performance

The graphs on this, and the following pages, show output flow for the D series single pumps at various working pressures as a function of speed. Data were taken using hydraulic fluid conforming to ISO VG46 at 50°C (120° F) with viscosity at 28 mm<sup>2</sup>/sec (cSt) [132 SUS].

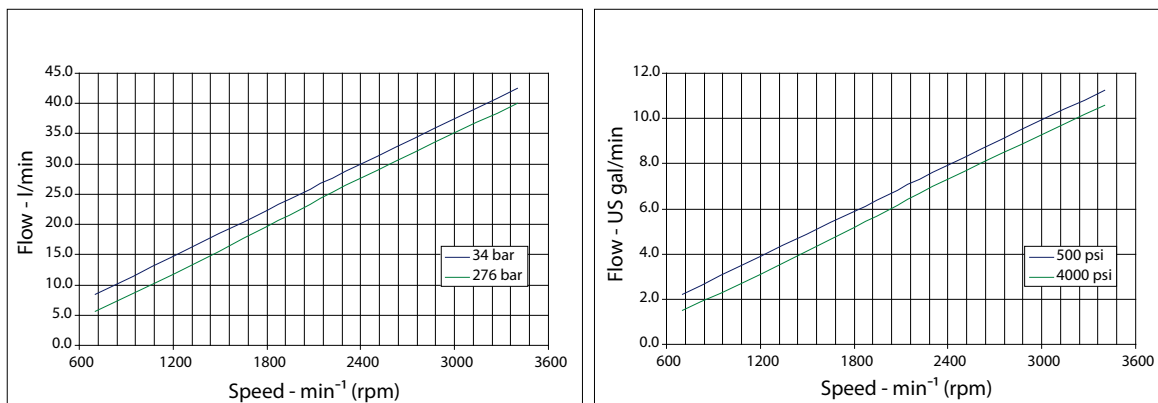
Model 07D ... l/min (left); US gal/min (right)



Model 10D ... l/min (left); US gal/min (right)

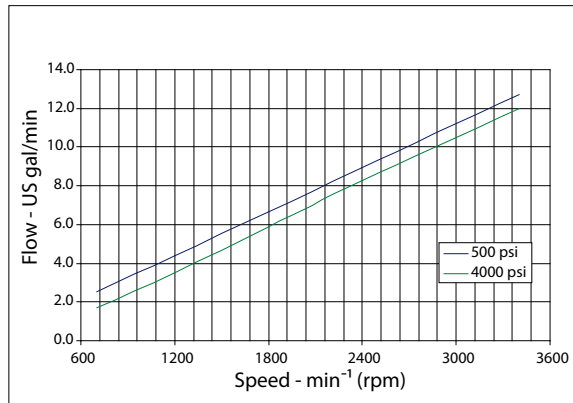
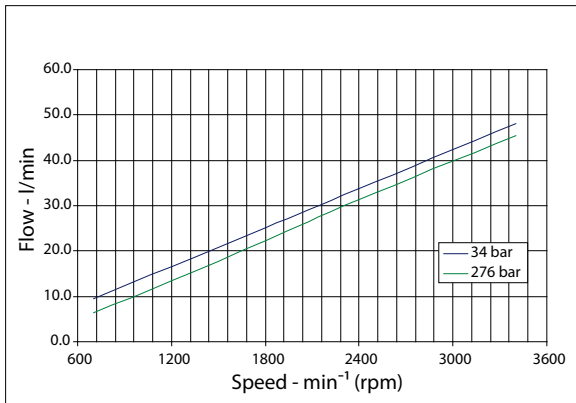


Model 13D ... l/min (left); US gal/min (right)

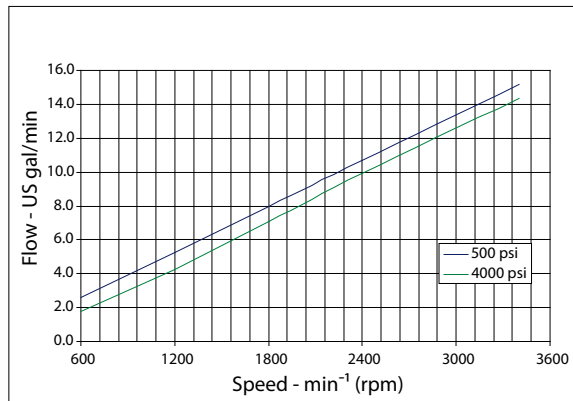
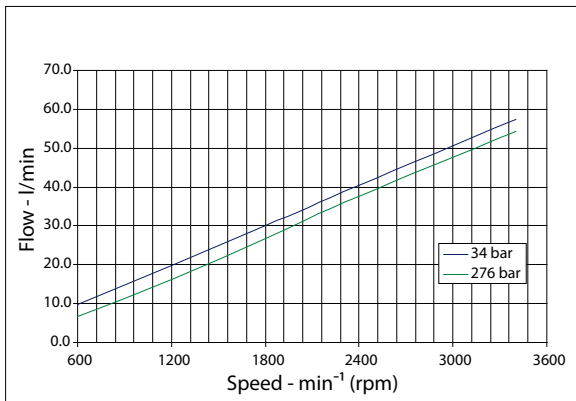


**D Series Performance Data**

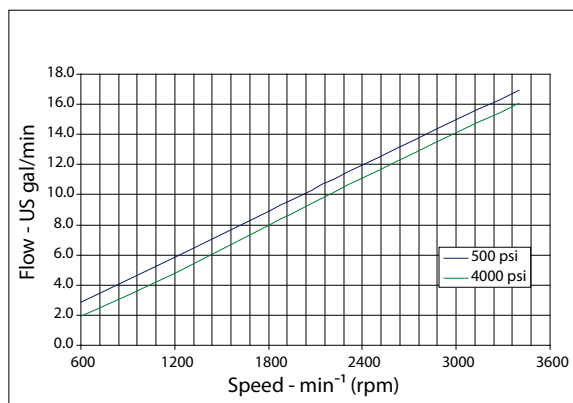
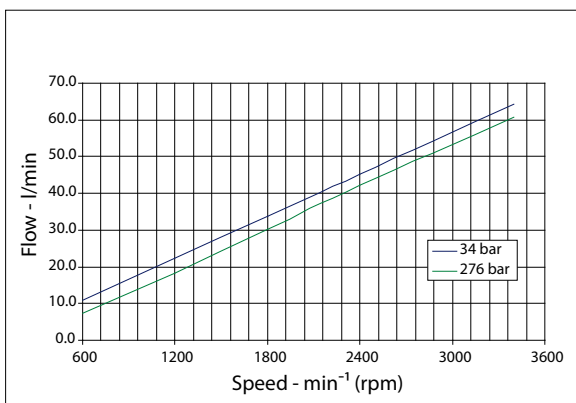
Model 14D ... l/min (left); US gal/min (right)



Model 17D ... l/min (left); US gal/min (right)



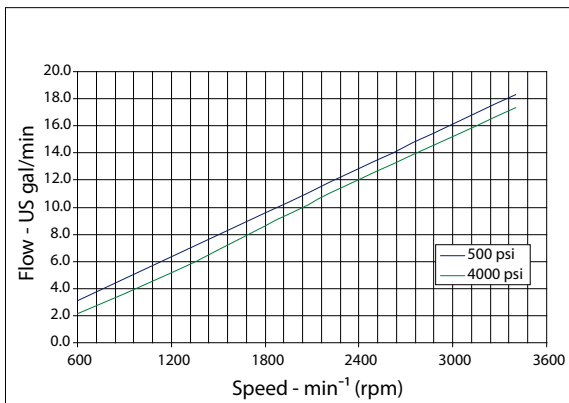
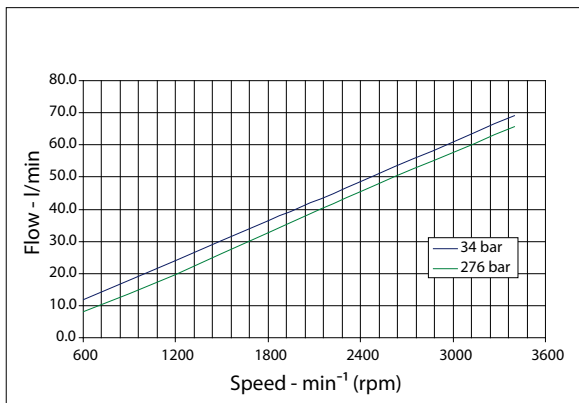
Model 19D ... l/min (left); US gal/min (right)



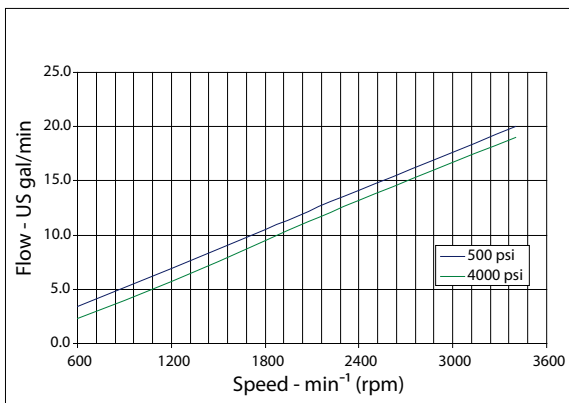
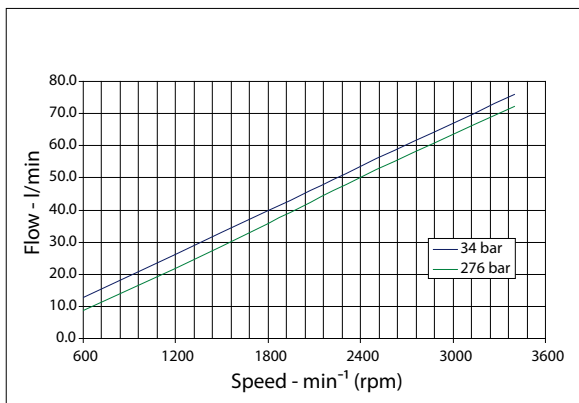


**D Series Performance Data**

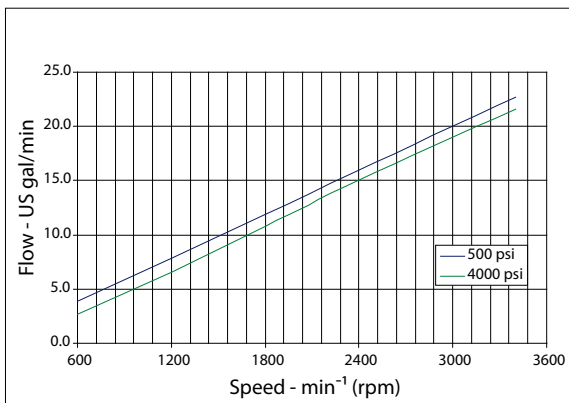
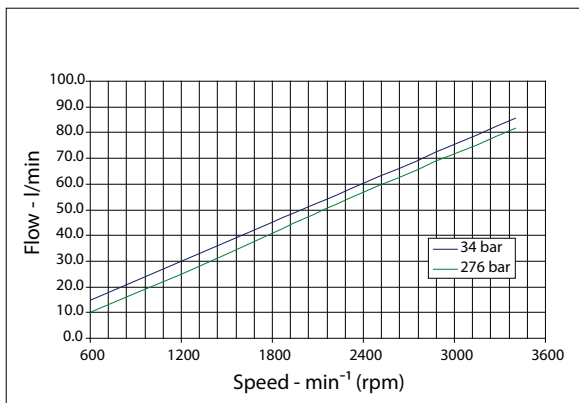
Model 21D ... l/min (left); US gal/min (right)



Model 23D ... l/min (left); US gal/min (right)

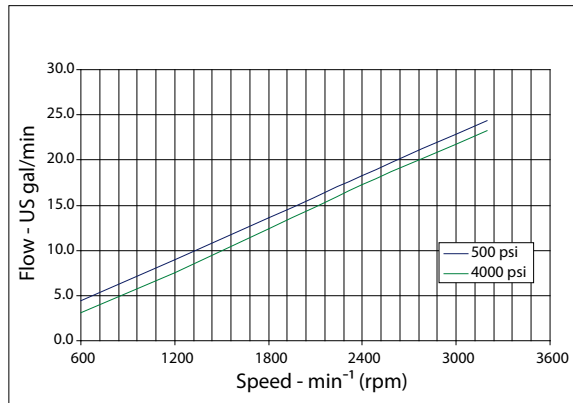
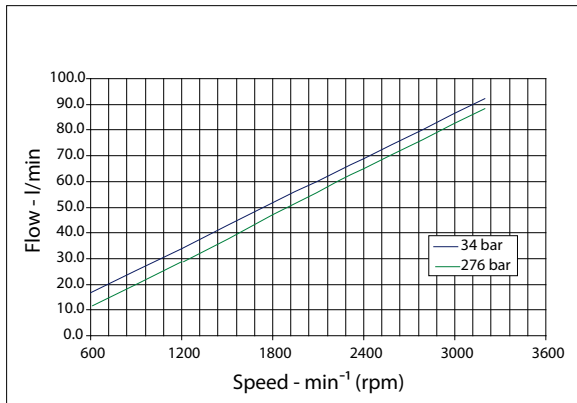


Model 25D ... l/min (left); US gal/min (right)

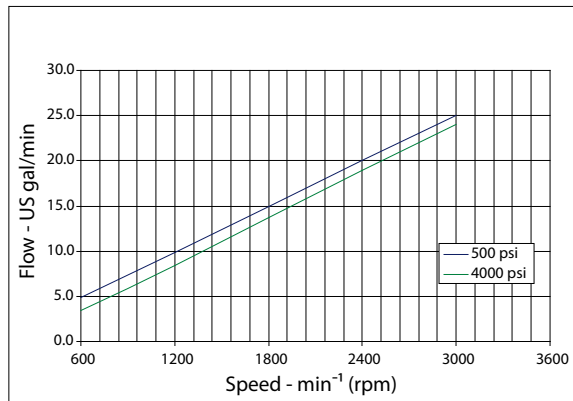
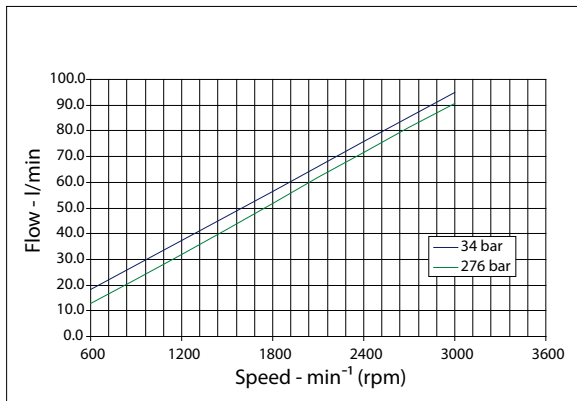


**D Series Performance Data**

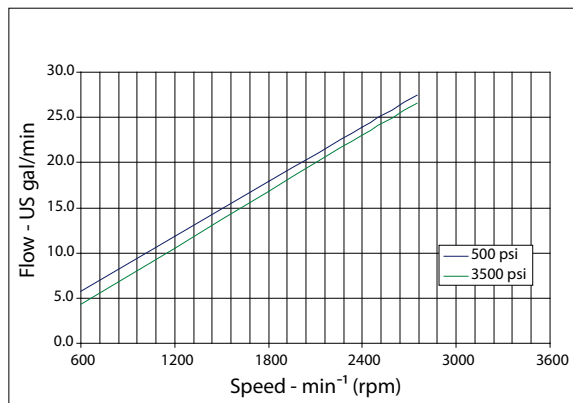
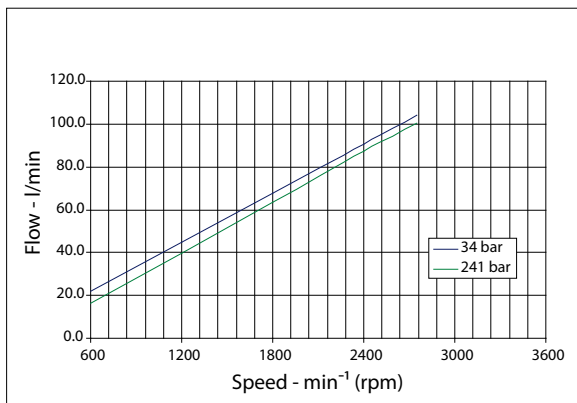
*Model 29D ... l/min (left); US gal/min (right)*



*Model 32D ... l/min (left); US gal/min (right)*

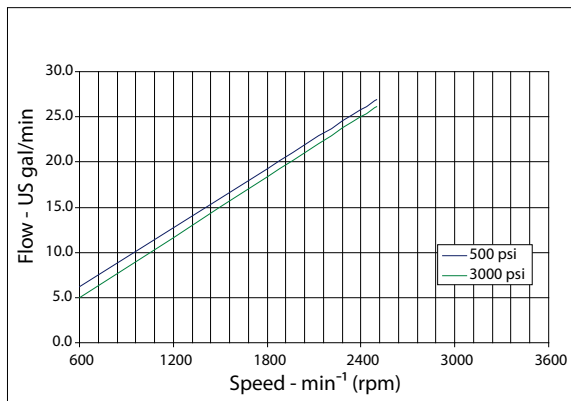
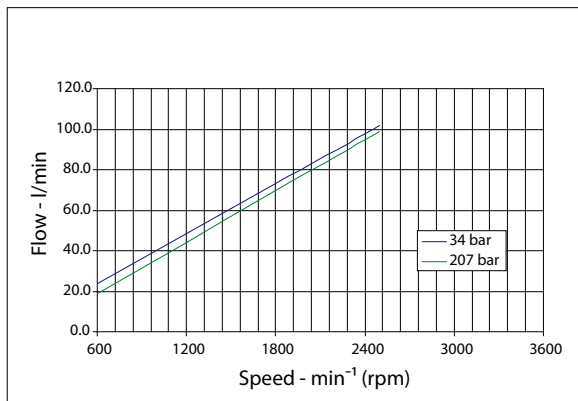


*Model 38D ... l/min (left); US gal/min (right)*

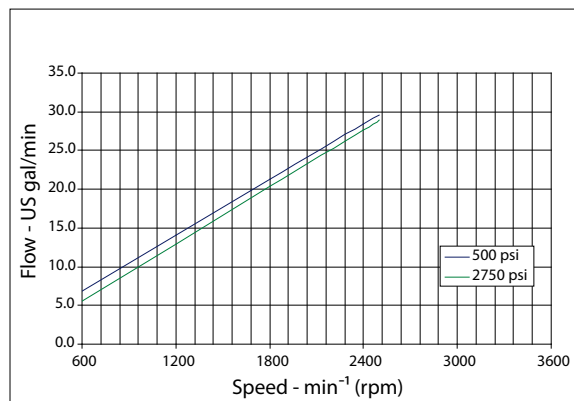
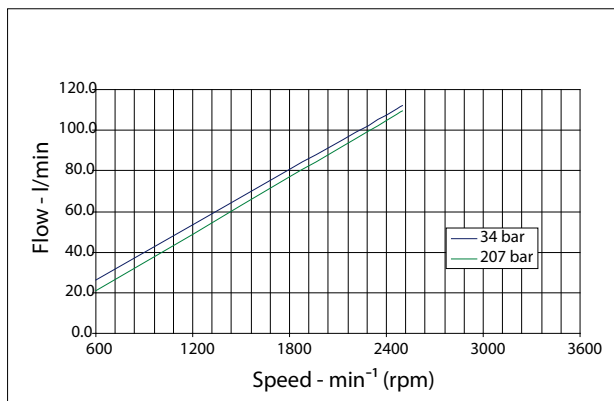


**D Series Performance Data**

Model 41D ... l/min (left); US gal/min (right)



Model 45D ... l/min (left); US gal/min (right)



### XD Model Code Information

#### A Rotation - viewed from drive shaft

| A |   |   |   | B1 | B2 | C | R | S | D | E | F | H | J | K |  |
|---|---|---|---|----|----|---|---|---|---|---|---|---|---|---|--|
| D | E | 2 | • |    |    |   |   |   |   |   |   |   |   |   |  |

| Code | Description                         |
|------|-------------------------------------|
| DE2  | DE2- XD Series, Cast Iron Gear Pump |
| L    | Left hand (CCW) Rotation            |
| R    | Right hand (CW) Rotation            |

#### B1 Displacement - front section

| A |   |   |  | B1 | B2 | C | R | S | D | E | F | H | J | K |  |
|---|---|---|--|----|----|---|---|---|---|---|---|---|---|---|--|
| D | E | 2 |  | •  | •  |   |   |   |   |   |   |   |   |   |  |

For the B module, the first two numbers specify the displacement

| Code | Description     |
|------|-----------------|
| 17   | 17cc [1.04 CIR] |
| 19   | 19cc [1.16 CIR] |
| 21   | 21cc [1.25 CIR] |
| 23   | 23cc [1.37 CIR] |
| 25   | 25cc [1.55 CIR] |
| 29   | 29cc [1.77 CIR] |
| 32   | 32cc [1.94 CIR] |
| 36   | 36cc [2.20 CIR] |
| 38   | 38cc [2.32 CIR] |
| 41   | 41cc [2.50 CIR] |
| 45   | 45cc [2.75 CIR] |

#### B2 Input shaft

| A |   |   |   | B1 | B2 | C | R | S | D | E | F | H | J | K |  |
|---|---|---|---|----|----|---|---|---|---|---|---|---|---|---|--|
| D | E | 2 | • |    |    |   |   |   |   |   |   |   |   |   |  |

For the B module, the second two letters specify the shaft code

| Code | Description  |
|------|--|
| SH*  | SAE 13 tooth spline, 41 mm [1.62 in] length                                |
| SV   | 15tooth spline, 46 mm [1.81 in] length (use with mounting flange AR or BR) |
| PB*  | 22 mm [7/8 in] diameter, 41 mm [1.62 in] length, with 1/4 key              |
| PZ   | 25.4 mm [1 in] diameter, 46 mm [1.81 in] length with 1/4 key               |

\* SH and PB shafts are torque limited. Displacements above 51cc require reduced operating pressures when using these shafts

## XD Model Code Information

### C Mounting flange

| A |   |   | B1 | B2 | C   | R | S | D |  |  | E | F | H | J | K |
|---|---|---|----|----|-----|---|---|---|--|--|---|---|---|---|---|
| D | E | 2 |    |    | • • |   |   |   |  |  |   |   |   |   |   |

| Code | Description                                   |
|------|---|
| AA   | SAE A 2-bolt                                  |
| AR   | SAEA 2-bolt, use with 15 T spline input drive |
| BB   | SAE B 2-bolt                                  |
| BR   | SAEB 2-bolt, use with 15 T spline input drive |

### R Ports - first section

| A |   |   | B1 | B2 | C | R     | S | D |  |  | E | F | H | J | K |
|---|---|---|----|----|---|-------|---|---|--|--|---|---|---|---|---|
| D | E | 2 |    |    |   | • • • |   |   |  |  |   |   |   |   |   |

| Code | Description   |
|------|---|
| 150* | 1 5/8-12 SAE ORB side inlet, 1 5/16-12 SAE ORB side outlet                      |
| 154* | 1 5/8-12 SAE ORB side inlet, 1 1/16-12 SAE ORB side outlet                      |
| 346  | 1 1/4 side split flange inlet, 1 1/4 side split flange outlet (SAE Code 61)     |
| 736  | 1 1/2 inch side beaded tube inlet, 1 1/4 side split flange outlet (SAE Code 61) |
| 750  | 1 1/2 inch side beaded tube inlet, 1 5/16-12 SAE ORB side outlet                |
| 946  | 1 1/4 Split flange inlet (SAE Code 61), 1 5/16-12 SAE ORB side outlet           |

\* N150 and N154 ports are flow limited. Displacements above 45cc require reduced operating speed when using this port option.

### S Displacement - rear section

| A |   |   | B1 | B2 | C | R | S   | D |  |  | E | F | H | J | K |
|---|---|---|----|----|---|---|-----|---|--|--|---|---|---|---|---|
| D | E | 2 |    |    |   |   | • • |   |  |  |   |   |   |   |   |

| Code | Description     |
|------|-----------------|
| X5   | 17cc [1.04 CIR] |
| X6   | 19cc [1.16 CIR] |
| X7   | 21cc [1.25 CIR] |
| X8   | 23cc [1.37 CIR] |
| X9   | 25cc [1.55 CIR] |
| XC   | 29cc [1.77 CIR] |
| XD   | 32cc [1.94 CIR] |
| XF   | 36cc [2.20 CIR] |
| XG   | 38cc [2.32 CIR] |
| XH   | 41cc [2.50 CIR] |
| XK   | 45cc [2.75 CIR] |

### D Rear cover

| A |   |   | B1 | B2 | C | R | S | D       |  |  | E | F | H | J | K |
|---|---|---|----|----|---|---|---|---------|--|--|---|---|---|---|---|
| D | E | 2 |    |    |   |   |   | • • • • |  |  |   |   |   |   |   |

### XD Model Code Information

| Code | Description         |
|------|---------------------|
| N100 | No Inlet, No Outlet |

### E Flow control valve

| A |   |   | B1 | B2 | C | R | S | D | E |  |   | F | H | J | K |  |
|---|---|---|----|----|---|---|---|---|---|--|---|---|---|---|---|--|
| D | E | 2 |    |    |   |   |   |   |   |  | • | • | • |   |   |  |

| Code | Description             |
|------|-------------------------|
| NNN  | No flow control setting |

### F Pressure control valve

| A |   |   | B1 | B2 | C | R | S | D | E | F |   |   | H | J | K |  |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|---|--|
| D | E | 2 |    |    |   |   |   |   |   |   | • | • | • |   |   |  |

| Code | Description                  |
|------|------------------------------|
| 000  | No pressure control settings |

### H Assembly screws

| A |   |   | B1 | B2 | C | R | S | D | E | F | H |   | J | K |  |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|--|
| D | E | 2 |    |    |   |   |   |   |   |   |   | • | • |   |  |

|                   |   |    |    |    |    |    |    |    |    |    |    |  |  |  |
|-------------------|---|----|----|----|----|----|----|----|----|----|----|--|--|--|
| <b>Screws</b>     | <b>Front pump port code, Module: R = 150, 154, 346, 736, 750, 946</b> |    |    |    |    |    |    |    |    |    |    |  |  |  |
|                   | <b>Rear pump port code, Module: D = N100</b>                          |    |    |    |    |    |    |    |    |    |    |  |  |  |
|                   | <b>Combined Displacement</b>  |    |    |    |    |    |    |    |    |    |    |  |  |  |
|                   | 34  | 38 | 41 | 45 | 51 | 58 | 64 | 72 | 76 | 82 | 90 |  |  |  |
| <b>Screw Code</b> | AW  | AX | AX | AX | AY | AZ | BA | BC | BC | BE | BE |  |  |  |

### J Name plate

| A |   |   | B1 | B2 | C | R | S | D | E | F | H | J |   | K |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|
| D | E | 2 |    |    |   |   |   |   |   |   |   | • | • |   |

| Code | Description        |
|------|--------------------|
| AN   | Standard nameplate |

### K Special features

| A |   |   | B1 | B2 | C | R | S | D | E | F | H | J | K |   |   |   |
|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E | 2 |    |    |   |   |   |   |   |   |   |   |   | • | • | • |

| Code | Description                               |
|------|---|
| NNN  | No special features, standard black paint |

### XD Options

### XD Shaft options

| A |   |   | B1 | B2 | C | R | S | D |  |  | E | F | H | J | K |  |
|---|---|---|----|----|---|---|---|---|--|--|---|---|---|---|---|--|
| D | E | 2 |    | •  | • |   |   |   |  |  |   |   |   |   |   |  |

|   |  |
|---|--|
| <p><b>Code SH</b><br/>           SAE 13-tooth 16/32-pitch flat root side fit<br/>           41.2 mm [1.62 in] length</p> <p>Allowable shaft torque:<br/>           248.6 N•m [2200 lbf•in]</p>    | <p><b>Code SV</b><br/>           SAE 15-tooth 16/32-pitch flat root side fit<br/>           46.0 mm [1.81 in] length</p> <p>Allowable shaft torque:<br/>           452 N•m [4000 lbf•in]</p> |
| <p><b>Code PB - 22.2mm</b><br/>           SAE 7/8 in straight keyed, 1/4 in key<br/>           41.2 mm [1.62 in] length</p> <p>Allowable shaft torque:<br/>           248.6 N•m [2200 lbf•in]</p> | <p><b>Code PZ</b><br/>           25.4mm [1 inch] Dia. x 46mm [1.62 inch]<br/>           1/4 inch key</p> <p>Allowable shaft torque:<br/>           452 N•m [4000 lbf•in]</p>                 |

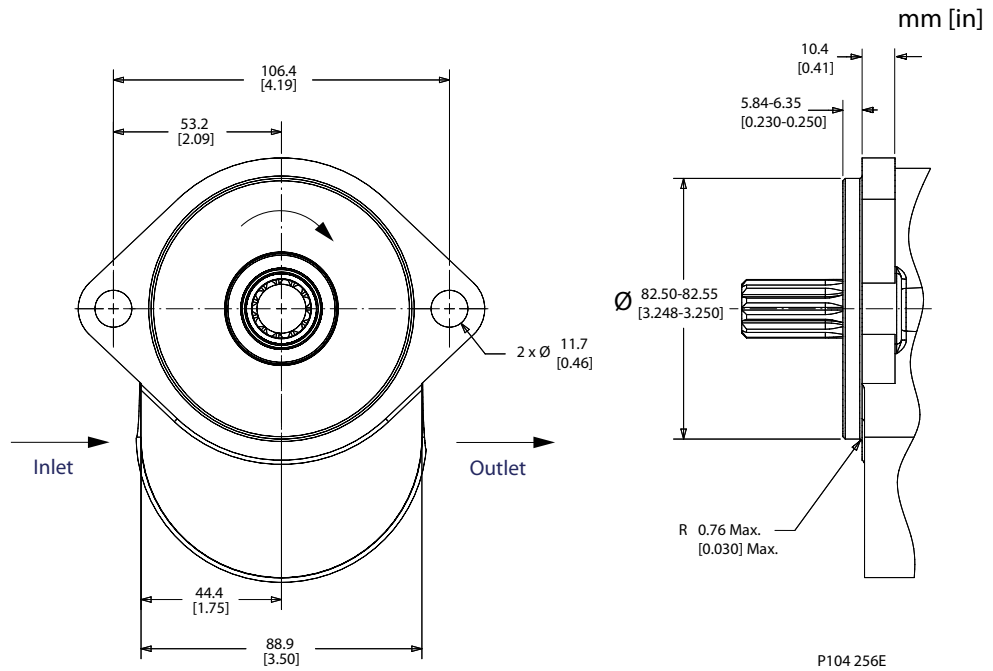
### XD Mounting flanges

| A |   |   | B1 | B2 | C | R | S | D |  |  | E | F | H | J | K |  |
|---|---|---|----|----|---|---|---|---|--|--|---|---|---|---|---|--|
| D | E | 2 |    |    | • | • |   |   |  |  |   |   |   |   |   |  |

| Code | Description                                 |
|------|---|
| AA   | SAE A 2-bolt                                |
| AR   | SAE A 2-bolt, use with PZ or SV input drive |

**XD Options**

SAE A 2-bolt



| A | B1 | B2 | C | R | S | D | E | F | H | J | K |
|---|----|----|---|---|---|---|---|---|---|---|---|
| D | E  | 2  | • | • |   |   |   |   |   |   |   |

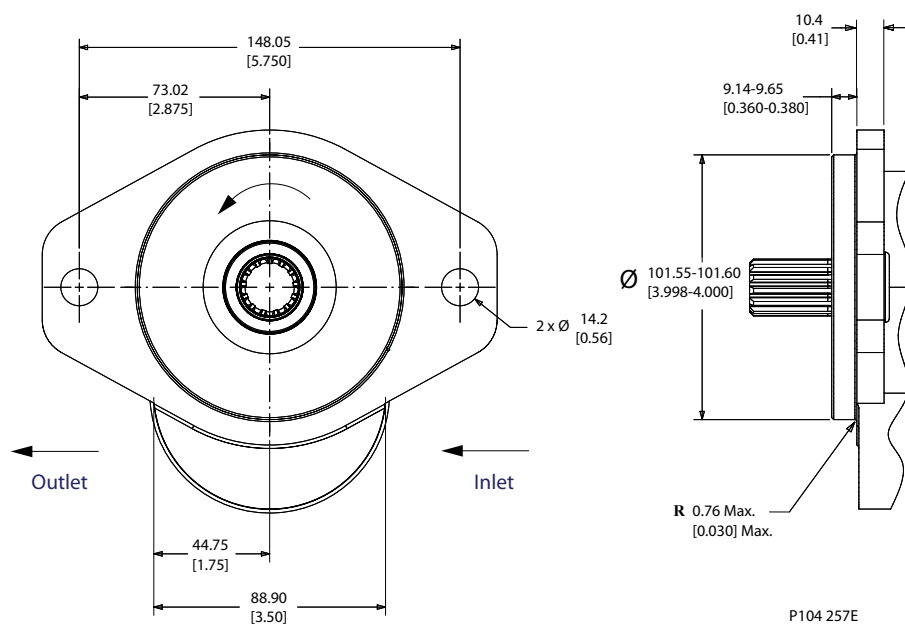
| Code | Description                                 |
|------|---|
| BB   | SAE B 2-bolt                                |
| BR   | SAE B 2-bolt, use with PZ or SV input drive |



**XD Options**

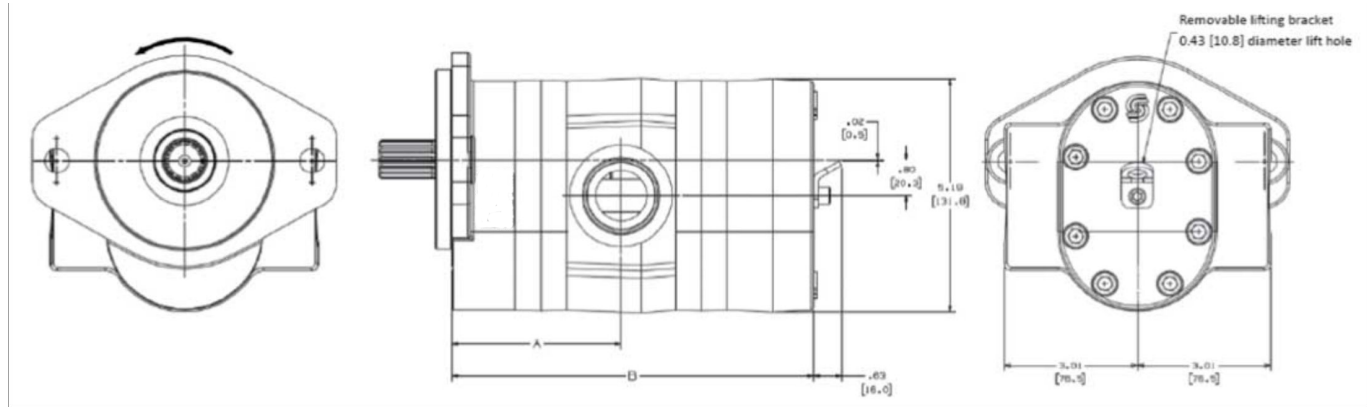
SAE B 2-bolt

mm [in]



**XD Dimension Drawings Information**

**Dimensions**



*Reference Combination*

| Ratings                       | Units                | 34    | 38    | 41    | 45    | 51    | 58    | 64    | 72    | 76    | 82    | 90    |
|-------------------------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Displacement                  | cm <sup>3</sup> /rev | 34.0  | 38.0  | 41.0  | 45.0  | 50.8  | 58.0  | 63.6  | 72.2  | 76.0  | 82.0  | 90.2  |
|                               | in <sup>3</sup> /rev | 2.08  | 2.32  | 2.50  | 2.74  | 3.10  | 3.54  | 3.88  | 4.40  | 4.64  | 5.00  | 5.50  |
| Rated pressure                | bar                  | 276   | 276   | 276   | 276   | 276   | 276   | 255   | 226   | 215   | 200   | 180   |
|                               | psi                  | 4000  | 4000  | 4000  | 4000  | 4000  | 4000  | 3700  | 3275  | 3100  | 2880  | 2620  |
| Peak pressure                 | bar                  | 303   | 303   | 303   | 303   | 303   | 303   | 285   | 250   | 235   | 220   | 200   |
|                               | psi                  | 4400  | 4400  | 4400  | 4400  | 4400  | 4400  | 4130  | 3625  | 3400  | 3200  | 2900  |
| Maximum speed                 | maximum              | 3400  | 3400  | 3400  | 3400  | 3400  | 3200  | 3000  | 2750  | 2700  | 2500  | 2275  |
| Theoretical flow at max speed | l/min                | 116   | 129   | 139   | 153   | 173   | 186   | 191   | 199   | 205   | 205   | 205   |
|                               | US gal/min           | 31    | 34    | 37    | 40    | 46    | 49    | 50    | 52    | 54    | 54    | 54    |
| Dimension A                   | mm                   | 82.9  | 85.0  | 86.5  | 88.3  | 91.3  | 94.9  | 97.7  | 102   | 104   | 106.8 | 111.1 |
|                               | in                   | 3.27  | 3.35  | 3.41  | 3.48  | 3.6   | 3.74  | 3.85  | 4.02  | 4.1   | 4.21  | 4.38  |
| Dimension B                   | mm                   | 179.1 | 183.1 | 186.2 | 189.7 | 195.8 | 202.9 | 208.5 | 217.2 | 221.2 | 226.8 | 235.5 |
|                               | in                   | 7.05  | 7.21  | 7.33  | 7.47  | 7.71  | 7.99  | 8.21  | 8.55  | 8.71  | 8.93  | 9.27  |

[Review application speeds and pressures for specific displacement, shaft, and port combinations.](#)

**Shandong Topkit Construction Machinery Equipment Co., Ltd., is a high-tech company specialized in the manufacturing and supplying for hydraulic pumps, valves, motors, reducers, gearboxes, etc.**

**We mainly focuses on hydraulic parts for hydraulic excavators, and the products have been serialized. We dedicated on the following three systems and five series products. We specialized in Positive flow system, negative flow system, load sensing control system;**

**Five series refer to 6-ton products, 8-ton products, 20-ton products, 40-ton products, concrete series products.**

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