**Quick Reference Data Chart**

| Pump Series | Displacement<br>IN <sup>3</sup> /REV. (CC/REV.) | Pump Delivery<br>@ 1000 RPM In GPM (LPM) | Weight<br>In Pounds (Kg) |
|-------------|---|--|--------------------------|
| D           | .114 - .641 (1.87 - 10.50)                      | .5 - 2.7 (1.9 - 10.2)                    | 2 - 3 (.9 - 1.4)         |
| H           | .603 - 2.227 (9.88 - 36.50)                     | 2.5 - 9.3 (9.5 - 35.2)                   | 5 - 7 (2.3 - 3.2)        |
| HD          | See above                                       | See above                                | See above                |

**Features**

- Pressure-loaded design
- Efficient, simple design - few moving parts
- Exceptionally compact and lightweight for their capacity
- Efficient at high pressure operation
- Resistant to cavitation effects
- High tolerance to system contamination
- Reliable under cold weather operation
- Sleeve-bearing construction
- Multi-fluid compatibility

**Pressure capabilities**

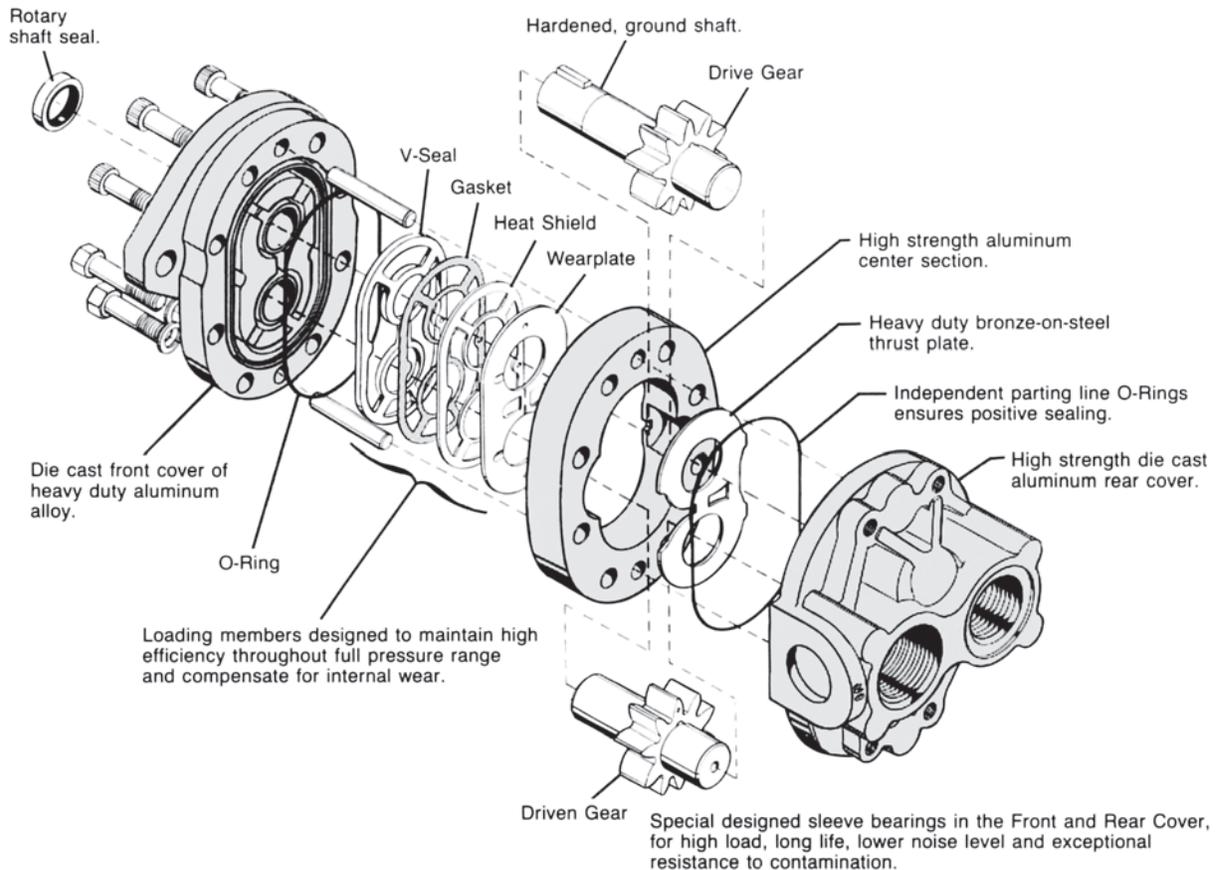
- D - to 2500 PSI (172 Bar) continuous
- H - to 2500 PSI (172 Bar) continuous
- HD - to 2500 PSI (172 Bar) continuous

**Controls**

- Optional built-in relief valve on "D" series
- Optional built-in relief valve on "H" series
- Optional built-in relief valve, and flow divider on "H" series
- Special controls (Consult Technical Services)

**Speed capabilities**

- D - to 4000 RPM
- H - to 4000 RPM
- HD - to 4000 RPM



A Parker pressure-loaded gear pump consists of two, intermeshing, hardened-steel, precision-ground gear assemblies. These precision gears are enclosed by a high-strength, die-cast aluminum front cover, back cover and a high-yield, strength-extruded aluminum center section.

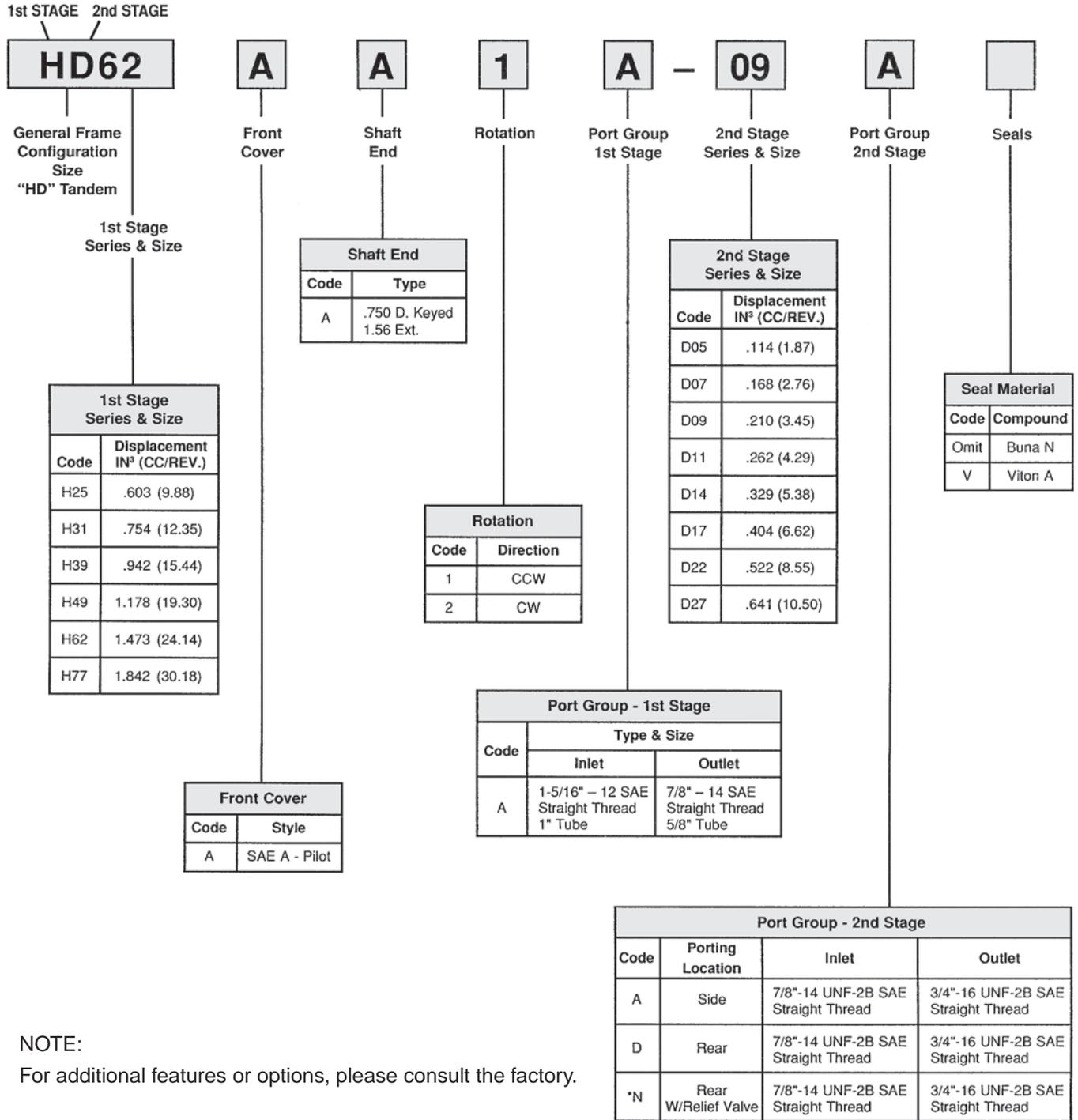
Gear assemblies consist of one drive gear, shrink-fitted on a precision-ground and polished drive shaft. This shaft extends outside the pump to permit coupling to an external prime mover. The second gear, being the driven gear, is also shrink-fitted on a precision-ground and polished driven shaft. Retaining rings, which are installed in grooves provided on the shaft, ensure that the gears will not move axially, and a key keeps the drive gear from moving radially.

A lip-type, shaft seal is provided at the drive shaft to prevent external leakage of pump fluid. The sealing lip in contact with the fluid is spring-loaded. Vent passages within the housings and driven shaft communicate pump inlet pressure to the rotary seal area, thus imposing the lowest possible pressure at the rotary seal for extended seal life.

The phenolic heat shield, backup gasket, and molded rubber seal form chambers behind the steel-backed bronze wearplate. These chambers are connected either to inlet or discharge pressure. Discharge pressure, acting within the chambers, axially loads and deflects the wear plate toward the gear faces to take up gear side clearances. This pressure-loading on the wear plate increases pump efficiency by reducing internal leakage to a minimum, providing longer pump life.

Pump rotation is dependent upon the proper orientation of the heat shield, backup gasket, and rubber seal in the front cover housing, the center section and rear cover, respectively.

Pumping action is achieved by connecting the pump drive shaft to a prime mover, and rotating the gears away from the inlet port. Rotation causes the gear mesh to increase on the inlet side and decrease on the outlet (pressure) side.



NOTE:  
 For additional features or options, please consult the factory.

Buna-N Seal Kit: 805041K  
 Buna-N Seal Kit with Plates: 81552K  
 Viton Seal Kit with Plates: 825092K

\* Relief valve limits rear pump pressure only.  
 Specify pressure setting at end of model code.  
 (PSI + 10, I.E. 1750 PSI = 175)

## Performance Data

Series HD Fixed Displacement, Tandem Pump

### Features

- Integral pressure-loaded pump design
- Individual inlet & outlet ports for 1st & 2nd stages of pump
- Fluids common/intermix between 1st & 2nd stages of pump.
- "H" series front cover mount - SAE "A" 2-Bolt
- Efficient at high-pressure operation
- Optional built-in relief - 2nd stage pump

### Specifications

#### Flow Ratings:

See appropriate specification chart.

#### Pressure Ratings:

See appropriate specification chart.

#### Speed Ratings:

Minimum: 500 RPM

Maximum: Maximum rated speed of the larger displacement of the two pumps.

See appropriate specification chart for this data.

#### Torque:

- Combined: 800 in. lb. maximum total continuous duty
- 950 in. lb. maximum total intermittent duty
- 2nd Stage pump cannot exceed 260 in. lb.

For additional information, see the Performance Data chart on page 26.

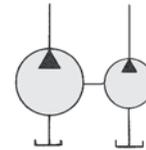
#### Housing Material:

Die-cast aluminum



### Schematic Symbol

(Basic Pump)



### Installation Data

#### Inlet Conditions:

10 in. hg. max. vacuum condition (At 1200 RPM)

5 in. hg. max. vacuum condition (At 3000 RPM)

20 PSI (1.4 Bar) max. positive pressure

#### Operating Temperature Range:

-40°F to 185°F (-40°C to 85°C)

#### Filtration:

Maintain SAE Class 4

#### Installation Note:

See page 28 for specific recommendations pertaining to system cleanliness, fluids, start-up, inlet conditions, shaft alignment, and other important factors relative to the proper installation and use of these pumps.

**Performance Data**

|                     | Model | In. Lb. Torque Per 1000 PSI | Maximum Allowable |      |
|---------------------|-------|-----------------------------|-------------------|------|
|                     |       |                             | PSI               | RPM  |
| <b>FIRST STAGE</b>  | H25   | 121                         | 2500              | 4000 |
|                     | H31   | 152                         | 2500              | 4000 |
|                     | H39   | 190                         | 2500              | 4000 |
|                     | H49   | 237                         | 2500              | 4000 |
|                     | H62   | 296                         | 2250              | 3600 |
|                     | H77   | 372                         | 2000              | 3600 |
| <b>SECOND STAGE</b> | D05   | 23                          | 2500              | 4000 |
|                     | D07   | 34                          | 2500              | 4000 |
|                     | D09   | 42                          | 2500              | 4000 |
|                     | D11   | 53                          | 2500              | 4000 |
|                     | D14   | 66                          | 2500              | 4000 |
|                     | D17   | 81                          | 2500              | 4000 |
|                     | D22   | 105                         | 2250              | 4000 |
|                     | D27   | 129                         | 2000              | 3000 |

Combined First and Second stage torque cannot exceed:

- 800 in. lb. Total continuous duty
- 950 in. lb. Total intermittent duty

Second stage torque cannot exceed 260 in. lb.

Example:

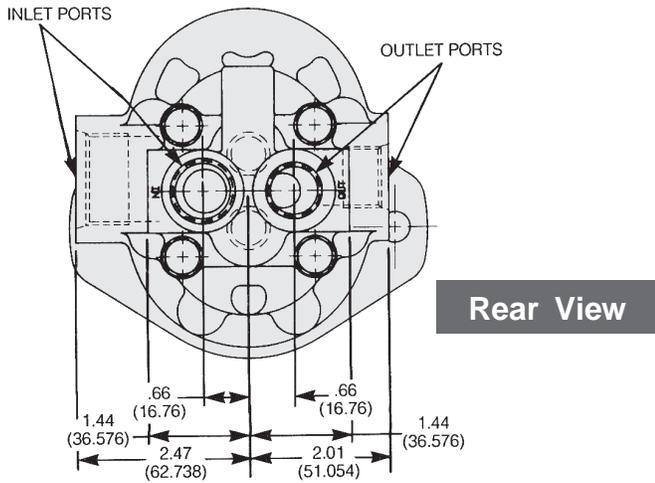
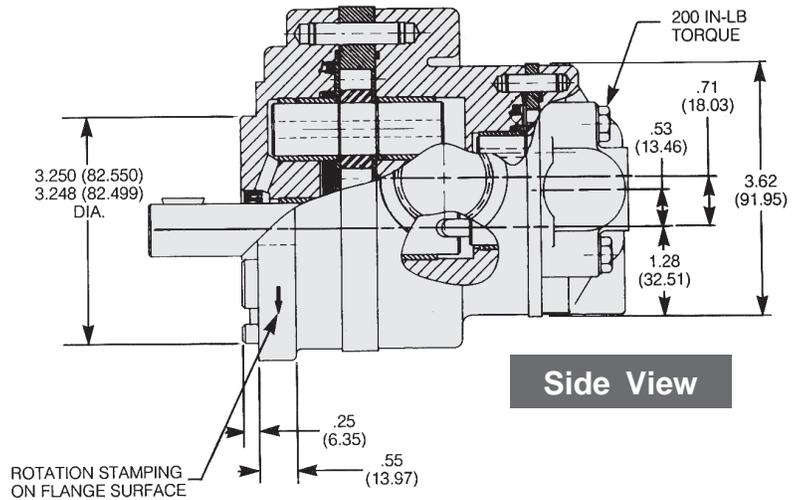
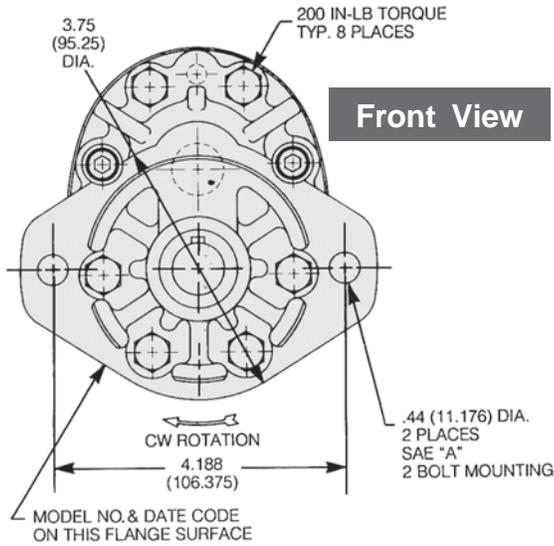
H39 @ 2500 PSI = 190 in. lb. x 2.5/1000 PSI = 475 in. lb. torque

D17 @ 2500 PSI = 81 in. lb. x 2.5/1000 PSI = 203 in. lb. torque

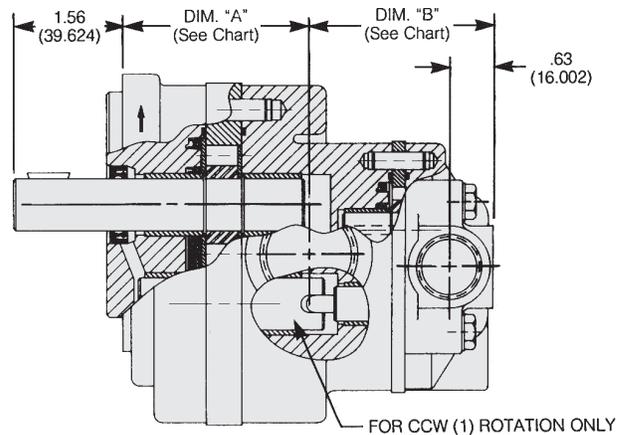
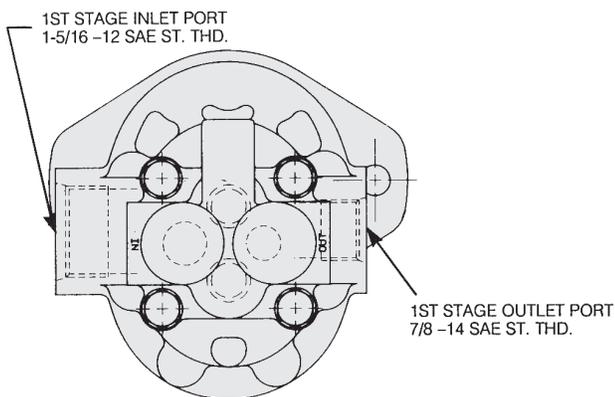
678 in. lb. total torque

**Performance Data**

Dimensions: Inches (mm)



| H-Pump Size | DIM "A"       | D-Pump Size | DIM "B"       |
|-------------|---------------|-------------|---------------|
| 25          | 2.67 (67.818) | 05          | 2.66 (67.564) |
| 31          | 2.78 (70.612) | .07         | 2.77 (70.358) |
| 39          | 2.92 (74.168) | 09          | 2.81 (71.374) |
| 49          | 3.10 (78.740) | 11          | 2.89 (73.406) |
| 62          | 3.32 (84.328) | 14          | 3.01 (76.454) |
| 77          | 3.60 (91.440) | 17          | 3.13 (79.502) |
|             |               | 22          | 3.33 (84.582) |
|             |               | 27          | 3.52 (89.408) |

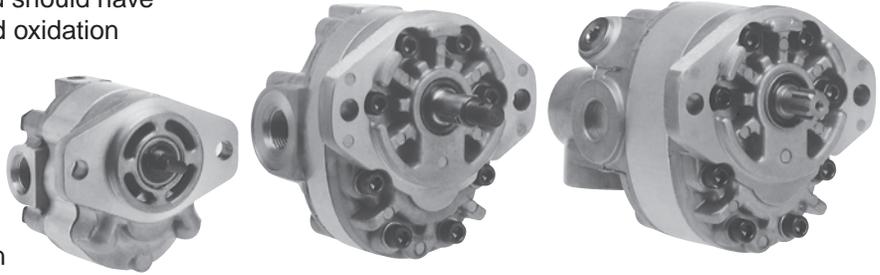


## Fluid Recommendations

Use premium-quality hydraulic fluid with operating viscosity range of 80-1000 SSU. The maximum start-up viscosity is 4000 SSU. The fluid should have maximum anti-wear properties, rust and oxidation treatment.

### Filtration

For maximum pump and system component life, the system should be protected from contamination at a level not to exceed 125 particles greater than 10 microns per milliliter of fluid (SAE Class 4).



### Fluid Compatibility

- Petroleum-based fluid
- Water glycols
- Water emulsions
- Transmission fluid
- Mineral oil fluid

NOTE: All data in this catalog are based on petroleum-based fluid. Pump pressure reduced by 1/2 of specified rating; pump speed rating, reduced by 1000 RPM from specified rating and "DU" bushings must be used when pump operates on water glycols and water emulsions. Consult the factory for special fluids.

### Start-Up

On any start-up, where the pump suction line is empty of fluid, the circuit should be open to permit priming.

### Inlet Conditions

Conditioning should not exceed 10 in. Hg. at 1800 RPM or 5 in. Hg. at pump maximum rated RPM. Inlet positive pressure should not exceed 20 PSI (1.4 Bar) maximum.

### Shaft Rotation And Line Up

Pump and motor shaft alignment must be within .007 inches total indicator reading. Please follow the coupling manufacturer's recommended installation instructions to prevent end thrust on the pump shaft. Turn the pump by hand to assure freedom of rotation. The pump and motor must be on a rigid base.

The coupling should be sized to absorb the peak horsepower generated.

### Installation And Mounting

The mounting position is not restricted.

### Special Installations

Consult your Parker representative for any application requiring the following:

- Pressure above rated
- Drive speed above maximum
- Indirect drive
- Fluids other than those specified
- Fluid temperature above 185° F. (85° C.).

## Instructions for Reversing Gear Pump Rotation

The basic tools needed are a vise, preferably with soft jaws, a torque wrench, a thin screwdriver, a small hone stone, a ratchet and a paper clip. The "D" series will require a 1-1/2" socket; the "H" series an additional 1/4" hex head driver. It is also recommended that you have extra heat shields and gaskets on hand. Part numbers are 655287 and 655288 for the "HD" series; 656942 and 656943 for "H" series.

To change rotation, hold the pump by the rear cover with the drive shaft pointing up. Remove all the bolts. The "HD" series will have four hex heads, and the "H" series will have six hex and two alien heads. For future reference, it would be helpful to scribe a line down the outlet side of the pump. If you choose not to mark it, the outlet port is usually the smallest.

If the pump has a key-type shaft, remove the key and hone down any burrs that may be on the shaft. This is important as the next step will be to lift off the front cover, and any sharp edges could possibly damage the front seal or bearing.

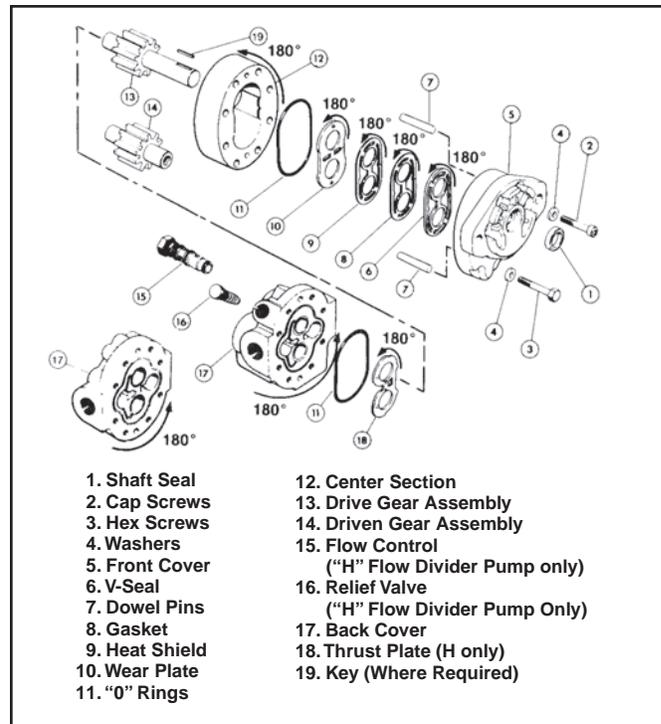
After the front cover is off, note the position of the little vent hole in the bronze wear plate, which should have come off with the front cover. The parts underneath also have a similar vent hole.

Remove in order, the wear plate, the heat shield, the gasket, and the V-seal. To facilitate this, make a small hook with a paper clip and lift the part high enough to slip a screwdriver under it and carefully pry up. Please note that the heat shield, in particular, is very brittle and may crack if bent.

After removing these four parts, reinstall the V-seal with the lips down in the front cover so that the vent hole is on the opposite side across from the reference mark. Use the screwdriver to seat it completely. Next, install the gasket, heat shield, and wear plate; again with the vent hole in line with that of the V-seal. The wear plate should be almost flush with the surface of the front cover.

Remove the center section and note the notch cut on the inside. This will be installed in line and next to the vent hole in the wear plate. The dowel pins used to locate the center section may be removed temporarily to facilitate sliding the center section over the gear assemblies. Be careful not to pinch the O-ring between the front cover and center section. If it doesn't want to stay in place, it can be "glued" using heavy grease.

If the pump is an "H" series, install the thrust plate



into the center section, orienting the side with the bar in line with the vent hole, ensuring that the bronze side faces the gears.

The rear cover is installed with the outlet side in line with the vent hole. The outlet side will be marked or can be identified by the smaller, internal cavity. As when installing the center section, be careful not to pinch the O-ring seal.

The line that was originally scribed on the side should now be located at 180° on both the rear cover and center section from that on the front cover.

Install the bolts and tighten down by hand. Then, torque to the proper setting, alternating from side to side. The correct torque specifications are 190-210" lbs. for the "D" and "H" series. Reverse or remove the rotation arrow originally stamped on the mounting flange.

### Testing Procedure

After the pump has been reinstalled, run for 2-3 minutes before pressurizing. Try to apply pressure gradually for an additional five minutes, but do not pressurize for longer than 5 seconds at a time.