Introduction

620 Series Piston Pump

Eaton’s new 620 Series piston pump signifies a step change in the generation of hydraulic power. Utilizing the latest developments in hydraulic pump technology, the 620 is specifically designed for moderate flow, high pressure applications.

It is currently available in 98cc (6.0 in³) displacement with future plans to include the development of 65cc, 74cc and 120cc displacements in the family. With a wide range of pump controls, the 620 is rated for 280 bar and 2,200 rpm making it the ideal pump for an array of different mobile and stationary applications.

At only 11.4 inches (289mm) in length and capable of generating over 134 horsepower (100kW), the 98cc 620 provides more power in a smaller, compact package. This increased power generation allows equipment manufacturers to provide more hydraulic power with a smaller displacement pump. Also, as the shortest pump in its class, the 98cc is able to fit where other pumps cannot.

The new 620 design also incorporates many new advances in product reliability. Once equipment is in the field, pump failures can prove to be extremely expensive and costly downtime results. The 620 blends Eaton’s long tradition in providing quality pumps with the latest design and technology methods to ensure long lasting product reliability. The result is a two-piece housing and very simple design, consisting of 28% fewer parts.

Fewer parts also results in a lower product weight. At 91 lbs (49.7 kg), the 620 is the lightest pumps available in its class. A lighter hydraulic pump means lower overall vehicle weight, which results in increased fuel efficiency and lower operating costs for end-users. Lower weight also makes the 620 easier to handle in assembly, maintenance and repair.

Eaton employs a unique system of tools and processes, known as Eaton Business System, to ensure quality development and delivery of the 620 product. These tools and process include such known methods as Design for Six Sigma, Lean Manufacturing and ISO certification. Our global network of manufacturing locations and distribution partners enables the 620 to be flexibly configured and delivered throughout the world.

Eaton’s vision is to be our customer’s preferred global supplier of fluid power components. By incorporating the latest advancements in hydraulic pump design and manufacturing, the 620 delivers greater value in terms of power and reliability.

Typical Applications

- Construction
  - Wheel Loaders
  - Motor Graders
  - Concrete Equipment
- Truck and Bus
  - Salt and Sand Spreaders
  - Vacuum Trucks
  - Telehandler
  - Refuse Trucks
- Other Mobile
  - Rail Maintenance
  - Forestry Harvester
  - Oil and Gas
  - Drill Rigs

Features and Benefits

- More engine compartment flexibility due to compact size
- Increased hydraulic power per displacement
- Lower maintenance costs due to longer pump life and simpler design
- Greater fuel savings due to reduced weight and high efficiency design
- Low Noise resulting from low weight and optimized valve plate
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Model Codes
620 Mobile Piston Pump

Pump Series
ADY – 620 Series Open Circuit Piston Pump

Pump Displacement
098 – 98.0 cm³/r [5.98 in³/r]

Input Shaft Rotation
R – Right Hand
L – Left Hand

Front Mount and Shaft
05 – 4 Bolt C, 31.8 mm (1.25 in) Dia. Keyed Shaft
06 – 4 Bolt C, 14 Tooth 12/24 Spline
07 – 4 Bolt C, 38.1 (1.50 in) Dia Straight Keyed
08 – 4 Bolt C, 17 Tooth 12/24 Spline
10 – 4 Bolt C, 31.8 mm (1.25 in) Dia. Tapered Keyed Shaft

Main Ports Size & Location
AB – Side Ports
Suction - 2.5” (Code 61); Pressure - 1” (Code 61)
AD – Side Ports
Suction - 2.5” (Code 61) with M12 Threads; Pressure - 1” (Code 61) with M10 Threads.

Case Drain Ports
1 – #12 SAE O-Ring - Top
2 – #12 SAE O-Ring - Bottom
3 – M33 x 2.0 O-Ring - Top
4 – M33 x 2.0 O-Ring - Bottom

Diagnostic Pressure Ports
Not available on thru-drive units
0 – No Diagnostic Pressure Ports
1 – #6 SAE O-Ring - Plugged (Rear Ports Only)

Controller Type
A – Pressure Flow Compensator With #4 SAE O-Ring Load Sense Port
B – Pressure Flow Compensator With M14 Metric O-Ring Load Sense Port
C – Pressure Compensator Only

Pressure Compensator Setting (Tolerance on Setting)*
08 – 76 - 84 bar (1102-1218 lbf/in²)
20 – 196 - 204 bar (2843-2959 lbf/in²)
24 – 236 - 244 bar (3423-3539 lbf/in²)
28 – 276 - 284 bar (4003-4119 lbf/in²)

* Additional Settings Available by Request
## Model Codes

### 620 Mobile Piston Pump

| ADY | 098 | R | 05 | AB | 2 | 0 | A | 28 | 20 | 00 | 1 | 00 | 1 | 00 | CD | 0 | A |
|-----|-----|---|----|----|---|---|---|----|----|----|---|----|---|----|    |   |    |

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

### Flow Compensator Setting (Tolerance on Setting)
- **00**: No Flow Compensator Setting
- **14**: 13 - 15 bar (189-218 lbf/in²)
- **20**: 19 - 21 bar (276-305 lbf/in²)

### Torque Control Setting
- **00**: No Torque Control

### Control Special Features
- **00**: Control Special Features
- **0A**: Bleed Down Orifice
- **0B**: 24V Destroke Manifold w/150 Connector Metri Pack
- **0C**: 24V Destroke Manifold w/150 Connector Metri Pack and Bleed Down Orifice

### Maximum Displacement Option
- **1**: Standard Displacement (As Given in Code Title)
- **2**: External Manual Stroke Adjustment

### Auxiliary (Rear) Mount & Output Shaft
- **00**: No Auxiliary Mounting Features
- **AA**: SAE A 2 Bolt, 9T 16/32 Spline
- **AC**: SAE B 2/4 Bolt, 13T 16/32 Spline
- **AD**: SAE B 2/4 Bolt, 15T 16/32 Spline
- **AE**: SAE C 2/4 Bolt, 14T 12/24 Spline

### Shaft Seal
- **1**: Standard Polyacrylate Shaft Seal

### Pump Special Features
- **00**: No Special Features
- **AA**: Auxiliary Mounting Cover Plate
- **AB**: Swash Position Sensor

### Shaft Seal
- **1**: Standard Polyacrylate Shaft Seal

### Paint
- **00**: No Paint
- **CD**: Blue Primer

### Identification/Packaging
- **0**: Standard Eaton Identification Box Packaging

### Design Level
- **A**: First Design

* Additional Settings Available by Request
### Specifications and Performance

#### General Performance Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Units</th>
<th>ADY065</th>
<th>ADY074</th>
<th>ADY098</th>
<th>ADY120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>cc/r (in³/r)</td>
<td>98.0 (5.98)</td>
<td>98.0 (5.98)</td>
<td>98.0 (5.98)</td>
<td>98.0 (5.98)</td>
</tr>
<tr>
<td>Weight¹</td>
<td>kg (lbm)</td>
<td>41.5 (91.4)</td>
<td>41.5 (91.4)</td>
<td>41.5 (91.4)</td>
<td>41.5 (91.4)</td>
</tr>
<tr>
<td>Pressure</td>
<td>bar (psi)</td>
<td>280 (4060)</td>
<td>320 (4600)</td>
<td>350 (5000)</td>
<td>350 (5000)</td>
</tr>
<tr>
<td>Speed⁴</td>
<td>rpm</td>
<td>2200</td>
<td>2000</td>
<td>3000</td>
<td>600</td>
</tr>
<tr>
<td>Power</td>
<td>kW (hp)</td>
<td>100.6 (134.9)</td>
<td>2.6 (3.5)</td>
<td>426 (322)</td>
<td>426 (322)</td>
</tr>
<tr>
<td>Torque</td>
<td>Nm (lb-ft)</td>
<td>129,000</td>
<td>37,800</td>
<td>13,800</td>
<td>13,800</td>
</tr>
<tr>
<td>Mass Moment of Inertia</td>
<td>Nm-sec² (lb-in-sec²)</td>
<td>0.0114 (0.100)</td>
<td>0.0114 (0.100)</td>
<td>0.0114 (0.100)</td>
<td>0.0114 (0.100)</td>
</tr>
</tbody>
</table>

1. Standard SAE C non-through drive.
2. Less than 10% of duty cycle.
3. Momentary system pressure spikes only.
4. Ratings based on Flange ports.
5. Bearing life ratings at rated speed – 1 bar abs (0 psig) inlet.

#### Inlet Pressure, Case Pressure, and Operating Temperature Requirements

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>Case Pressure</th>
<th>Operating Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated bar abs (psig)</td>
<td>Minimum bar abs (in. Hg)</td>
<td>Maximum Continuous bar abs (psig)</td>
</tr>
<tr>
<td>1.0 (0)</td>
<td>0.85 (5)</td>
<td>4.4 (50)</td>
</tr>
</tbody>
</table>

#### Hydraulic Fluids

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Recommended Operating Viscosity Range cSt (SUS)</th>
<th>Maximum Continuous cSt (SUS)</th>
<th>Maximum Viscosity at Startup cSt (SUS)</th>
<th>Minimum Viscosity @ Max. Temperature of 93°C (200°F) cSt (SUS)</th>
<th>Minimum Intermittent cSt (SUS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use antiwear hydraulic oil, or automotive type crankcase oil (designations SC, SD, SE or SF) per SAE J183 FEB80</td>
<td>16 to 40 (80 to 188)</td>
<td>430 (1192)</td>
<td>2100 (9720)</td>
<td>10 (59)</td>
<td>6 (46)</td>
</tr>
</tbody>
</table>

For more information, see Eaton publication 579. For operation on other alternative or environmentally friendly fluids, please contact your Eaton Representative.
Control Options

Load Sense and Pressure Compensator Control

The pump will provide power matching of pump output to system load demand, maximizing efficiency and improving load metering characteristics of any directional control valve installed between the pump and the load.

Load sensing ensures that the pump always provides only the amount of flow needed by the load. At the same time, the pump operating pressure adjusts to the actual load pressure plus a pressure differential required for the control action. When the system is not demanding power, the load sense control will operate in an energy-saving stand-by mode.

Typically, the differential pressure is that between the pressure inlet and service port of a proportionally controlled directional valve, or a load sensing directional control valve. See the model code on page 4 for differential pressure settings for load sensing.

If the load pressure exceeds the system pressure setting, the pressure compensator de-strokes the pump. The load sensing line must be as short as possible and can also be used for remote control or unloading of the pump pressure. For remote control purposes, it is recommended that you contact your Eaton Representative for the correct configuration of the control.

Warning: When adjusting the pressure limiter, install a 0 to 350 bar (0 to 5000 psi) gage in the outlet gage port and limit the pressure setting to the continuous rated pressure for the pump displacement shown on page 6. It is possible to adjust the pressure compensator beyond the rated pressure of the pump. Doing so, may void the warranty of the 620 pump.

Pressure Limit Settings

The pressure compensator uses two springs to cover the full pressure range of the ADY pumps. The high pressure spring covers the range from 140 bar (2050 psi) to 280 bar (4060 psi). The low pressure spring is adjustable from minimum pressure through 140 bar (2050 psi). Optional bleed-down orifice with control special feature “OA”. ø 0.4 mm (.015 in.). Orifice is plugged for no bleed down in control.

Flow Compensator (Load Sense) Settings

There are three springs used to cover the load sense adjustment range of this control.

Typical Operating Curve

Dynamic Response per SAE J745 (Using Swash Plate Position)

<table>
<thead>
<tr>
<th>Code</th>
<th>Response (off stroke)</th>
<th>Recovery (on stroke)</th>
<th>Load Sense Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADY098</td>
<td>30</td>
<td>70</td>
<td>125</td>
</tr>
</tbody>
</table>
Control Options

Pressure Compensator Control

The pump will provide a continuously modulated flow to meet changing load demands at a pre-adjusted compensator pressure. At pressures below the compensator setting, the pump will operate at maximum displacement. See model code on page 4 for compensator pressure ranges.

**Warning**: When adjusting the pressure limiter, install a 0 to 350 bar (0 to 5000 psi) gage in the outlet gage port and limit the pressure setting to the continuous rated pressure for the pump displacement shown on page 6. It is possible to adjust the pressure compensator beyond the rated pressure of the pump. Doing so, may void the warranty of the 620 pump.

Pressure Limit Settings

The pressure compensator uses two springs to cover the full pressure range of the ADY pumps. The high pressure spring covers the range from 140 bar (2050 psi) to 280 bar (4060 psi). The low pressure spring is adjustable from minimum pressure through 140 bar (2050 psi).

**Pressure Cut-off Characteristics of Pressure Compensator Control**

@ 49°C (120°F), Static Conditions.

<table>
<thead>
<tr>
<th>Outlet Pressure</th>
<th>Outlet Flow</th>
<th>Q</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dynamic Response per SAE J745 (Using Swash Plate Position)**

<table>
<thead>
<tr>
<th></th>
<th>Response (off stroke)</th>
<th>Recovery (on stroke)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADY098</td>
<td>30</td>
<td>70</td>
</tr>
</tbody>
</table>
**Cold Start Valve**

The 620 Cold Start Valve reduces pump start-up torque by directing control pressure to the outlet. It is primarily used in cold weather applications and includes a 12 or 24 VDC directional control valve mounted between the pump housing and compensator.
Performance

Overall Efficiency Versus Speed @ 49°C (120°F), Full Flow, and 1.0 bar (0 psi) Inlet

Overall Efficiency Versus Speed @ 49°C (120°F), Full Flow, and 1.0 bar (0 psi) Inlet
Performance

ADY098

Input Power Versus Speed @ 49°C (120°F), Full Flow, and 1.0 bar (0 psi) Inlet

Input Torque Versus Speed @ 49°C (120°F), Full Flow, and 1.0 bar (0 psi) Inlet
Performance

Input Torque and Case Flow
Stand-by @ 49°C (120°F)

Input Torque and Case Flow
Cut-off @ 49°C (120°F)
Pump Installation
C-mount / Rear-ported

RH Rotation
C-mount / Rear-ported

View A-A

LH Rotation

Suction Port

Pressure Port

Top Case Drain

Diagnostic Port

Bottom Case Drain

For Compensator Configuration
See Separate Compensator Installation Drawing

4X .50-13 UNC-2B (M12 X 1.75-6H Optional) 14.5 [.57]

4X .375-16 UNC-2B (M10 X 1.5-6H Optional) 14.5 [.57]

For Shaft Configuration
See Separate Shaft Installation Drawing

99.4 [3.91]

99.4 [3.91]

45.0 [1.77]

53.0 [2.09]

93.0 [3.66]

For Compensator Configuration
See Separate Compensator Installation Drawing

4X 50-13 UNC-2B (M12 X 1.75-6H Optional) 14.5 [.57]

Pressure Port

Optional Diagnostic Port

Suction Port

For Compensator Configuration
See Separate Compensator Installation Drawing

4X .50-13 UNC-2B (M12 X 1.75-6H Optional) 14.5 [.57]

For Shaft Configuration
See Separate Shaft Installation Drawing

99.4 [3.91]

99.4 [3.91]

45.0 [1.77]

53.0 [2.09]

93.0 [3.66]

For Compensator Configuration
See Separate Compensator Installation Drawing

4X 50-13 UNC-2B (M12 X 1.75-6H Optional) 14.5 [.57]

For Shaft Configuration
See Separate Shaft Installation Drawing

99.4 [3.91]

99.4 [3.91]

45.0 [1.77]

53.0 [2.09]

93.0 [3.66]

For Compensator Configuration
See Separate Compensator Installation Drawing

4X 50-13 UNC-2B (M12 X 1.75-6H Optional) 14.5 [.57]

For Shaft Configuration
See Separate Shaft Installation Drawing

99.4 [3.91]

99.4 [3.91]

45.0 [1.77]

53.0 [2.09]

93.0 [3.66]
Pump Installation
C-mount / Side-ported

RH Rotation
C-mount 4 Bolt / Side-ported

View A-A

LH Rotation

For Compensator Configuration
See Separate Compensator Installation Drawing

For Shaft Configuration
See Separate Shaft Installation Drawing

Pressure Port
Top Case Drain
Bottom Case Drain

Suction Port
Diagnostic Port
Diagnostic Port

4X .375-16 UNC-2B
(M10 X 1.5-6H Optional)

4X Ø 15.0 [.59]

88.0 [3.46]
(88.0 [3.46])
(3.46) (Case Drain)

288.0 [11.34]

254.5 [10.02]
(Diagnostic Port)

127.2 [5.01]

4X .50-13 UNC-2B
(M12 X 1.75-6H Optional)

93.0 [3.66]
(Case Drain)

91.7 [3.60]

147.0 [5.79]

241.7 [9.52]

93.5 [3.68]

93.5 [3.68]

51.0 [2.00]

12.5 [.49]

101.7 [4.00]

113.5 [4.47]

60°

114.5 [4.51]

113.5 [4.47]

113.5 [4.47]

50.0 [1.97]

50.0 [1.97]

127.2 [5.01]

247.5 [9.76]

254.5 [10.02]
(Diagnostic Port)

60°

4X Ø 15.0 [.59]

88.0 [3.46]
(3.46) (Case Drain)

288.0 [11.34]

254.5 [10.02]
(Diagnostic Port)

60°

4X .50-13 UNC-2B
(M12 X 1.75-6H Optional)

93.0 [3.66]
(Case Drain)

91.7 [3.60]

147.0 [5.79]

241.7 [9.52]

93.5 [3.68]

93.5 [3.68]

51.0 [2.00]

12.5 [.49]

101.7 [4.00]

113.5 [4.47]

60°

114.5 [4.51]

113.5 [4.47]

50.0 [1.97]

50.0 [1.97]

127.2 [5.01]

247.5 [9.76]

254.5 [10.02]
(Diagnostic Port)

60°

4X Ø 15.0 [.59]

88.0 [3.46]
(3.46) (Case Drain)

288.0 [11.34]

254.5 [10.02]
(Diagnostic Port)

60°

4X .50-13 UNC-2B
(M12 X 1.75-6H Optional)

93.0 [3.66]
(Case Drain)

91.7 [3.60]

147.0 [5.79]

241.7 [9.52]

93.5 [3.68]

93.5 [3.68]

51.0 [2.00]

12.5 [.49]

101.7 [4.00]

113.5 [4.47]

60°

114.5 [4.51]

113.5 [4.47]

50.0 [1.97]

50.0 [1.97]

127.2 [5.01]

247.5 [9.76]

254.5 [10.02]
(Diagnostic Port)

60°

4X Ø 15.0 [.59]

88.0 [3.46]
(3.46) (Case Drain)

288.0 [11.34]

254.5 [10.02]
(Diagnostic Port)

60°

4X .50-13 UNC-2B
(M12 X 1.75-6H Optional)

93.0 [3.66]
(Case Drain)

91.7 [3.60]

147.0 [5.79]

241.7 [9.52]

93.5 [3.68]

93.5 [3.68]

51.0 [2.00]

12.5 [.49]

101.7 [4.00]

113.5 [4.47]

60°

114.5 [4.51]

113.5 [4.47]

50.0 [1.97]
Pump Installation
Thru-Drive SAE A

Thru-Drive SAE A

A Thru-Drive Cover Plate Installation

Output Shaft Installation 9T Spline

Output Shaft Installation 11T Spline

Maximum Torque
58 Nm [513 in-lbf]

Maximum Torque
124 Nm [1100 in-lbf]
Pump Installation
Thru-Drive SAE B

**Thru-Drive SAE B**

Groove to Accept an AS 568A Size 15250-ring
6X .500-13 UNC-2B

For Output Shaft Configuration
See Separate Shaft Installation Drawing

Ø101.7
[4.00]

115.0
[4.65]

89.8
[3.54]

89.8
[3.54]

B-Thru-Drive Cover
Plate Installation

18.0
[0.71]

9.7
[0.38]

Output Shaft Installation 13T Spline
Maximum Torque 209 Nm [1850 in-lbf]

Ø22.88[.901] 13 Tooth 30° Flat Root Side Fit 16/32 Class 6 per ANSI B92.1a-1996
Accepts 13 Tooth 16/32 Pitch Flat Root Side Fit Involute Spline Per SAE J744-22-4
Additional Unit Drive by This Spline Must Not Require More Than 209 Nm [1850 in-lbf] of Torque

Output Shaft Installation 15T Spline
Maximum Torque 338 Nm [2987 in-lbf]

Ø25.68[1.0110] 15 Tooth 30° Flat Root Side Fit 16/32 Class 6 per ASA B5-15-1960
Accepts 15 Tooth 16/32 Pitch Flat Root Side Fit Involute Spline Per SAE J744-25-4
Additional Unit Drive by This Spline Must Not Require More Than 338 Nm [2987 in-lbf] of Torque
Pump Installation
Thru-Drive SAE C

Groove to Accept an
AS 568A Size 159 O-ring
4 X 1/2-13 UNC-2B Thru

For Output Shaft
Configuration
See Separate Shaft
Installation Drawing

C-Thru-Drive Cover
Plate Installation

Output Shaft
Installation 14T Spline
Maximum Torque
640 Nm [660 in-lbf]

Output Shaft
Installation 17T Spline
Maximum Torque
760 Nm [6725 in-lbf]

Additional Unit Drive by
This Spline Must Not
Require More Than 640 Nm
(660 in-lbf) of Torque

Additional Unit Drive by
This Spline Must Not
Require More Than 760 Nm
(6725 in-lbf) of Torque
Control Installation
Load Sense and Pressure Compensator

![Diagram of control installation with dimensions: 198.8 mm (7.83 in), 168.5 mm (6.63 in), 130.9 mm (5.15 in), 70.4 mm (2.77 in).]
Control Installation

Pressure Compensator
Control Installation
Cold Start Valve

Optional Connectors

Deusch Option
Metri-Pack 280 Option
Metri-Pack 150 Option
External Manual
Stroke Adjustment
Maximum Stroke Limiter

Max displacement is Reduced
By Approximately 5 to 6%
Per Clockwise Turn

Compensator/Control
Not Shown for Clarity
Input Shaft Options

**05 Code**
Maximum Torque
450 Nm [3980 in-lbf]

**06 Code**
Maximum Torque
640 Nm [5660 in-lbf]

**07 Code**
Maximum Torque
765 Nm [6770 in-lbf]

**08 Code**
Maximum Torque
765 Nm [6770 in-lbf]
10 Code
Maximum Torque
640 Nm [5660 in-lbf]
## Center of Gravity

#### Examples: Calculation $L_1$ and $L_2$

**Tandem ADY098 Thru-drive with ADY098 Side Ported**

$L_1 = L_{cg}$

$L_2 = L_t + L_{cg}$

$L_1 = 153.8\,\text{mm} \, (6.06 \, \text{in})$

$L_2 = 318.1\,\text{mm} + 139.7\,\text{mm} = 457.8\,\text{mm} \, (18.0 \, \text{in})$

#### Tandem Pump Applications

Eaton recommends that tandem pump applications be provided with additional support to limit overhung loading of the mounting flange. The thru-drive alternate attachment points on the rear flange may be used with a customer designed support.
Installation and Start-up

**Warning:** Care should be taken that mechanical and hydraulic resonances are avoided in the application of the pump. Such resonances can seriously compromise the life and/or safe operation of the pump.

**Drive Data**
Mounting attitude should be horizontal using the appropriate case drain ports to ensure that the case remains full of fluid at all times. Consult your local Eaton Representative if a different arrangement is required.

In those cases where geometric tolerances of mounting are critical, or where specific tolerance ranges are required and not specified, consult Eaton Engineering for specific limits.

Direction of shaft rotation, viewed from the prime mover end, must be as indicated in the model designation on the pump – either right hand (clockwise) or left hand (counterclockwise).

Direct coaxial drive through a flexible coupling is recommended. If drives imposing radial shaft loads are considered, please consult your Eaton Representative.

**Start-up Procedure**
Make sure the reservoir and circuit are clean and free of dirt/debris prior to filling with hydraulic fluid.

Fill the reservoir with filtered oil and fill to a level sufficient enough to prevent vortexing at the suction connection to the pump inlet. It is good practice to clean the system by flushing and filtering, using an external slave pump.

**Caution:** Before the pump is started, fill the case through the uppermost drain port with hydraulic fluid of the type to be used. The case drain line must be connected directly to the reservoir and must terminate below the oil level.

Once the pump is started, it should prime within a few seconds. If the pump does not prime, check to make sure that there are no restrictions between the reservoir and the inlet to the pump, and that the pump is being rotated in the proper direction, and that there are no air leaks in the inlet line and connections. Also check to make sure that trapped air can escape at the pump outlet.

After the pump is primed, tighten the loose outlet connections, then operate for five to ten minutes (unloaded) to remove all trapped air from the circuit.

If the reservoir has a sight gage, make sure the fluid is clear – not milky.

**Fluid Cleanliness**
The 620 Series pumps are rated in anti-wear petroleum fluids with a contamination level of 21/18/13 per ISO 4066. Operation in fluids with levels more contaminated than this is not recommended. Fluids other than petroleum, severe service cycles, or temperature extremes are cause for adjustment of these codes. Please contact your Eaton Representative for specific duty cycle recommendation.

Eaton 620 Series pumps, as with any variable displacement pump, will operate with apparent satisfaction in fluids up to the rating specified here. Experience has shown however, that pump and hydraulic system life is not optimized with high fluid contamination levels (high ISO cleanliness codes).

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Eaton publication 561 – “Eaton Guide to Systemic Contamination Control” – available from your local Eaton distributor. In this publication, filtration and cleanliness levels for extending the life of axial piston pumps and other system components are listed. Included is an excellent discussion of the selection of products needed to control fluid condition.