PVH98/106 Variable Displacement Piston Pump - 11 Design
NOTE
Right hand rotation shown. View is opposite for left hand rotation. Please refer to Overhaul Manual M-2210-S.

NOTE
Use shims as required to obtain 0.01–0.10 mm (.0004–.004 in.) axial shaft end play.

NOTE
For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets cleanliness code 16/14/12 or cleaner.

Note
Complete replacement via rotating group kits is recommended.
Load Sensing & Pressure Compensator Control C(M)*V

Control Kit

Pressure range

Control Type  Control Kit  Pressure range  Spring  Body  Orifice Plug

CV  02–125161  140–280 Bar  857681  857733  –
CVB  02–160591  35–140 Bar  857675  857733  –
CMV  02–306056  35–140 Bar  857675  857733  –

All parts shown are included in control kit.

Pressures must be set by user to circuit requirements.

Pressure Compensator Control C & CM

Control spring

Control Kit

Pressure range

Control Type  Control Kit  Pressure range  Spring

C  02–125160  70–250 Bar  857681
CM  02–125162  40–130 Bar  857675

All parts shown are included in control kit.

Pressures must be set by user to circuit requirements.
Industrial Control (IC)

- **Screw (2 Req’d)**
  - Torque 31-37 N.m. (23-28 lb. ft.)

- **Plug**
  - Torque 5.1-5.9 N.m. (3.7-4.4 lb. ft.)

- **O-Ring**
  - Torque 1.7-2.3 N.m. (1.2-1.7 lb. ft.)

- **Nut**
  - Torque 14-20 N.m. (10-14 lb. ft.)

- **Adjusting Screw**
  - Torque 75-83 N.m. (55-60 lb. ft.)

- **Plug**
  - Torque 15-17 N.m (20-23 lb. ft.)

- **Guide**
  - Tongue 1.7-2.3 N.m (1.2-1.7 lb. ft.)

- **Pin spring stop**
  - Tongue 1.7-2.3 N.m (1.2-1.7 lb. ft.)

- **Spring guide (2 Req’d)**
  - Tongue 1.7-2.3 N.m (1.2-1.7 lb. ft.)

- **O-Ring**
  - Tongue 1.7-2.3 N.m (1.2-1.7 lb. ft.)

- **Body (see table)**
  - Tongue 1.7-2.3 N.m (1.2-1.7 lb. ft.)

- **Plug (3 Req’d)**
  - Torque 29-32 N.m. (21-24 lb. ft.)

- **Ring (2 Req’d)**
  - Torque 29-32 N.m. (21-24 lb. ft.)

- **O-Ring (2 Req’d)**
  - Torque 29-32 N.m. (21-24 lb. ft.)

- **O-Ring (5 Req’d)**
  - Torque 29-32 N.m. (21-24 lb. ft.)

- **Spool**
  - Torque 15-17 N.m (20-23 lb. ft.)

- **Torque Limiting Option**

- **O-Ring**
  - Torque 15-17 N.m (20-23 lb. ft.)

- **Retainer Ring**
  - Torque 54-59 N.m (32-40 lb. ft.)

- **Connector**
  - Torque 1.7-2.3 N.m (1.2-1.7 lb. ft.)

- **O-Ring**
  - Torque 1.7-2.3 N.m (1.2-1.7 lb. ft.)

- **Thread**
  - 02-151904
  - 02-151905
  - 02-151906
  - 02-151907

- **Retainer Ring**
  - (Screw into bottom of thread)

- **Torque summation parts**

---

### Control Kit Threads Body

<table>
<thead>
<tr>
<th>Control Kit</th>
<th>Threads</th>
<th>Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>02–151904</td>
<td>inch</td>
<td>883386</td>
</tr>
<tr>
<td>02–151905</td>
<td>metric</td>
<td>860628</td>
</tr>
</tbody>
</table>

All parts shown are included in control kit. Pressures must be set by user to circuit requirements.

### Model designation Control Kit

- **C**
  - **T**
    - 31
      - 02–314944
    - S-31
      - 02–335254

---

**NOTE**

IC kits pre-set to 20-30 bar differential pressure with all orifices/plugs in place. Reference Vickers Overhaul Manual M-2210-S for proper orifice/plug configuration in various circuits prior to control installation.
**A** Thru–drive

Valve block (See table)

514573 Screw (4 Req'd)
Torque 83-102 N.m. (61-75 lb. ft.)

**“A” Thru–drive**

<table>
<thead>
<tr>
<th>Model designation</th>
<th>Valve block w/ SAE “A” Pad</th>
<th>O-Ring</th>
<th>Coupling Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAF–11–C*</td>
<td>928710</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAM–11–C*</td>
<td>928711</td>
<td></td>
<td></td>
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<tr>
<td>RAF–11–C*</td>
<td>928734</td>
<td></td>
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<tr>
<td>RAM–11–C*</td>
<td>928735</td>
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<tr>
<td>LAF–11–CT</td>
<td>860841</td>
<td>576601</td>
<td>877039</td>
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<tr>
<td>LAM–11–CT</td>
<td>860842</td>
<td></td>
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<td>RAF–11–CT</td>
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<tr>
<td>RAM–11–CT</td>
<td>860833</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**“B” & “C” Thru–drive Adapter**

<table>
<thead>
<tr>
<th>Model Designation</th>
<th>Adapter Pad Kit</th>
<th>Adapter Flange</th>
<th>O-Ring</th>
<th>Coupling Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>“<em>”–“BF–11–</em>”</td>
<td>876390</td>
<td>526670</td>
<td></td>
<td>877040 SAE B - 13 tooth</td>
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<tr>
<td>“<em>”–“BM–11–</em>”</td>
<td>876394</td>
<td>876393</td>
<td></td>
<td>877044 SAE BB - 15 tooth</td>
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<tr>
<td>“<em>”–“CF–11–</em>”</td>
<td>876389</td>
<td>692934</td>
<td></td>
<td>877045 SAE C - 14 tooth</td>
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<tr>
<td>“<em>”–“CM–11–</em>”</td>
<td>876392</td>
<td>876391</td>
<td></td>
<td>877046 SAE CC - 17 tooth</td>
</tr>
</tbody>
</table>

**Notes:**
1. “F” type equal SAE threads
2. “M” type equal metric threads
3. “B” and “C” thru-drives created from “A” thru-drive pump with “B” or “C” thru-drive adapter kit installed.
4. All screws/O-rings are included with each “kit” to convert from “A” to “B” or “C” thru-drive unit.
Pump Startup

Make sure the reservoir and circuit are clean and free of dirt and debris prior to filling with hydraulic fluid.

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

Before starting the pump, fill with fluid through one of the ports. This is particularly important if the pump is above the fluid level of the reservoir.

When initially starting the pump, remove all trapped air from the system. This can be accomplished by loosening the pump outlet fittings or connections before starting the pump, or by using an air bleed valve. All inlet connections must be tight to prevent air leaks.

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

Add fluid to the reservoir up to the proper fill level.
**Model Code**

<table>
<thead>
<tr>
<th><strong>PVH</strong></th>
<th><em><em>(Q</em>)</em>*</th>
<th><strong>-</strong></th>
<th><strong>(*)</strong></th>
<th><strong>-</strong></th>
<th><strong>(*)</strong></th>
<th><strong>-</strong></th>
<th><strong>(*)</strong></th>
<th><strong>11</strong></th>
<th><strong>-</strong></th>
<th><strong>(*)</strong></th>
<th><strong>-</strong></th>
<th><strong>(*)</strong></th>
<th><strong>-</strong></th>
<th><strong>(*)</strong></th>
</tr>
</thead>
</table>

1. Piston pump, variable displacement

2. Maximum geometric displacement
   - 98: 98.3 cm³/r (6.0 in³/r)
   - 106: 106.5 cm³/r (6.50 in³/r)

3. Application style
   - Blank: Mobile application (rated speed & 250/280 bar (3600-4000 psi) pressures)
   - QI: Quiet industrial application (1500 - 1800 rpm & 250/280 bar (3600-4000 psi) pressures)
   - QP: Quiet power unit application (1800 rpm & 140 bar (2000 psi) max. pressures – R.H. rotation only)

4. Mounting flange, prime mover end
   - C: SAE “C” 4-bolt type (SAE J744-127-4)
   - C2: Optional combination 2- & 4-bolt SAE-C pilot
   - C3: Optional 4-bolt SAE-C pilot for vertical pump mounting

5. Shaft rotation, viewed at prime mover end
   - R: Right hand, clockwise
   - L: Left hand, counterclockwise

6. Configuration
   - Blank: Non-thru-drive (single pump)
   - A: SAE-A thru-drive pump, standard (SAE J744-82-2)
   - B: SAE-B thru-drive pump, optional (SAE J744-101-2/4)
   - C: SAE-C thru-drive pump, optional (SAE J744-127-2/4)
   - S: Adjustable maximum volume stop (“S” option not available on thru-drive and torque control pump models)

7. Main ports
   - F: SAE 4-bolt flange ports (standard)
   - M: SAE 4-bolt pads with metric mounting bolt threads

8. Shaft-end type, at prime mover end
   - 1: SAE C straight key
   - 2: SAE C 14 tooth spline
   - 3: SAE CC 17 tooth spline
   - 13: SAE CC straight key

9. Shaft seal, prime mover end
   - S: Single, one-way
   - D: Double, two-way

10. Pump design number
    - 11: (Subject to change. Installation dimensions unaltered for design numbers 10 to 19 inclusive.)

11. Pressure control type
    - C: Compensator, 140-280 bar (2000-4000 psi)
    - CM: Compensator, 35-140 bar (500-2000 psi)
    - IC: CETOP 3 interface compensator, 20 bar factory “differential” pressure setting (QI and QP models only)

12. Factory compensator pressure setting
    - Blank: Leave blank for “IC” controls only
    - 7: 70 bar (1015 psi) normal “CM7” setting (all pump sizes)
    - 23: 230 bar (3335 psi) normal “C23” setting (63, 81, 106, 141 models)
    - 25: 250 bar (3625 psi) normal “C25” setting (57, 74, 98, 131 models)

13. Optional pressure control functions
    - Blank: Leave blank for basic compensator controls of IC models.
    - V: Load sensing, 20 bar (290 psi) factory “differential” pressure setting
    - T: Torque limiting control (Used with sections 14 and 15)
    - VT: Load sensing with torque limiting
    - VB: Load sensing with internal bleed (0.15” dia. orifice)
    - VBT: Load sensing with internal bleed down and torque limiting

14. Torque limiting control pressure setting
    - Blank: Leave blank if no torque limiting control is used
    - 4: Standard minimum 40 bar setting of “T” torque control option

15. Torque limiting control summation
    - Blank: Standard torque control
    - S: Optional torque control with summation feature

16. Control design number
    - 31: All control options

17. Special feature suffix
    - 031: Mounting with SAE-A, 2-bolt cover plate
    - 036: #2 “C” spline shaft in thru-drive pumps

***CAUTION***
Maximum shaft input torque must not exceed 5660 lb-in.

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