PVH131/141 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.

**Shoe cage** (See table)
Load Sensing & Pressure Compensator Control C(M)V

857688 Load sense spring
857674 Spring guide

181728 Plug Torque 29-32 N.m. (21-24 lb. ft.)

▲ 396096 O-Ring

473765 Screw (4 Req’d) Torque 31-37 N.m. (23-28 lb. ft.)
857733 CV Body

857673 Load sense spool

627391 Plug (2 Req’d) Torque 29-32 N.m. (21-24 lb. ft.)

▲ 396096 O-Ring (2 Req’d)

857672 Pressure limiter spool

▲ 177969 O-Ring (3 Req’d)

Control Kit

857681 Control spring
857734 Spring guide

Pressure Compensator Control C & CM

Control spring (See table)

857734 Spring guide (2 Req’d)

857722 Body

473765 Screw (4 Req’d) Torque 31-37 N.m. (23-28 lb. ft.)

857672 Spool

▲ 396096 O-Ring

627391 Plug Torque 29-32 N.m. (21-24 lb. ft.)

▲ 177969 O-Ring (3 Req’d)

Control Kit

857681 Control spring
857734 Spring guide

Control Type Control Kit Pressure range Spring Body Orifice Plug

CV 02–125161 140–280 Bar 857681 857733 –
CVB 02–160591 140–280 Bar 857844 433543
CMV 02–306056 35–140 Bar 857675 857733 –

All parts shown are included in control kit.

Kit must be set by user to circuit requirements.

Pressure range

35–140 Bar

Control Type
C
CM

Control Kit
02–125160
02–125162

Pressure range
70–250 Bar
40–130 Bar

857681
857675

All parts shown are included in control kit.

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

473769 Screw (2 Req’d)
Torque 31-37 N.m. (23-28 lb. ft.)

407533 Plug
Torque 12.1-12.4 N.m. (8.9-9.1 lb. ft.)

396093 O-Ring

396092 O-Ring (3 Req’d)

398071 Plug (3 Req’d)
Torque 9.8-10.2 N.m. (7.2-7.5 lb. ft.)

Body (see table)

626157 Spring

860606 Spring guide (2 Req’d)

396100 O-Ring

860747 Nut
Torque 14-20 N.m. (10-14 lb. ft.)

860750 Adjusting screw

860748 Plug
Torque 75-83 N.m. (55-60 lb. ft.)

Control Kit | Threads | Body
--- | --- | ---
02-151906 | inch | 883386
02-151907 | metric | 860628

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

\[\text{NOTE}\]
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.

Torque Limiter – T Option

860749 Plug
Torque 75-83 N.m (102-112 lb. ft.)

860750 Adjusting Screw

860747 Nut
Torque 8-10 N.m (11-14 lb. ft.)

1649 Ball

471627 Pin

937272 Check valve
Torque 1.7-2.3 N.m (2.3-3.1 lb. ft.)

217669 O-ring

177969 O-ring (2 req’d)

913454 Spool

860653 Body

177969 O-ring (5 req’d)

577639 Sleeve

262499 O-ring

248845 Pin

932716 Retainer Ring
(Screw into bottom of thread)

913453 Guide

928388 Guide

857675 Spring

857734 Guide

263069 O-ring

473773 Screw (4 req’d)
Torque to 31-37 N.m (42-50 lb. ft.)

197594 Back-up ring

262356 O-ring

860555 Plug Torque 75-83 N.m (102-112 lb. ft.)

248823 Pin

186580 Plug
Torque 54-59 N.m (73-80 lb. ft.)

263497 O-ring

113000 Plug
Torque 15-17 N.m (20-23 lb. ft.)

932716 Connector
Torque 54-59 N.m (73-80 lb. ft.)

263497 O-ring

\[\text{Torque summation parts}\]
**A** Thru–drive

Valve block (See table)

- **473806 Screw (4 Req’d)**
  Torque 83-102 N.m. (61-75 lb. ft.)

- **473833 Screw (2 req’d)**
  Torque 257-315 N.m. (189-232 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>928713</td>
<td>576601</td>
<td>877039</td>
</tr>
<tr>
<td>LAM–11–C*</td>
<td>928714</td>
<td>576601</td>
<td>877039</td>
</tr>
<tr>
<td>RAF–11–C*</td>
<td>928736</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAM–11–C*</td>
<td>928737</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAF–11–CT</td>
<td>860843</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAM–11–CT</td>
<td>860844</td>
<td></td>
<td></td>
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<tr>
<td>RAF–11–CT</td>
<td>860834</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAM–11–CT</td>
<td>860835</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>401525</td>
<td>877040 SAE-B 13 tooth</td>
</tr>
<tr>
<td><em>“BM–11–</em>”</td>
<td>876394</td>
<td>876393</td>
<td></td>
<td>877044 SAE-BB 15 tooth</td>
</tr>
<tr>
<td><em>“CF–11–</em>”</td>
<td>876389</td>
<td>692934</td>
<td>353264</td>
<td>877045 SAE-C 14 tooth</td>
</tr>
<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.

**SAE–A, 2–Bolt Cover Plate 939790**
(Fits –031 Suffix Pumps)

*AF Units use Screw 170177 (2 req’d)
**AM Units use Screw 470837 (2 req’d)
**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.

---

**Note**

Parts are shown as installed for right hand rotation. For left hand rotation, install control rod and control piston in valve block port #2. Install bias rod, bias piston and spring in valve block port #2.

---

**Typical Cross Section**

- Control Piston
- Control Rod
- Valve Block Port #1
- Valve Block Port #2
- Bias Rod
- Bias Piston
- Spring
<table>
<thead>
<tr>
<th>Model Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVH ** (Q*) ** - * (<em>) * - ** * - 11 - ** * - (</em>**)(<em>)(</em>) - ** - ***</td>
</tr>
</tbody>
</table>

1. **Piston pump, variable displacement**

2. **Maximum geometric displacement**
   - 131 - 131.1 cm³/r (8.0 in³/r)
   - 141 - 141.6 cm³/r (8.64 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)
   - 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**
   - 2 - SAE-C 14 tooth spline
   - 3 - SAE-CC 17 tooth spline
   - 12 - SAE-D 13 tooth spline
   - 13 - SAE-CC straight keyed
   - 16 - SAE-D straight keyed

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 down (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

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