



Bulletin PM 1620-12-M1/USA

# Parker Pumps Parts & Service

Revised: May 1998

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PVP Series  
Variable Volume  
Piston Pump  
Service Bulletin

Model PVP16 \*\*\*\* 12

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## **WARNING**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.**

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**Introduction:**

The PVP16 \*\*\*\* 12 series piston pumps are designed to provide long life while operating with Hydraulic Oil. Refer to catalog 1550/USA for limits. However, should maintenance be required, the following instructions should be used for disassembly, replacement of parts, cleaning and assembly.

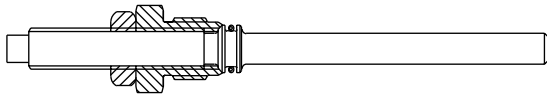
**Note:**

Prior to any pump disassembly, plug the open ports and clean all dirt from the outside of the pump.

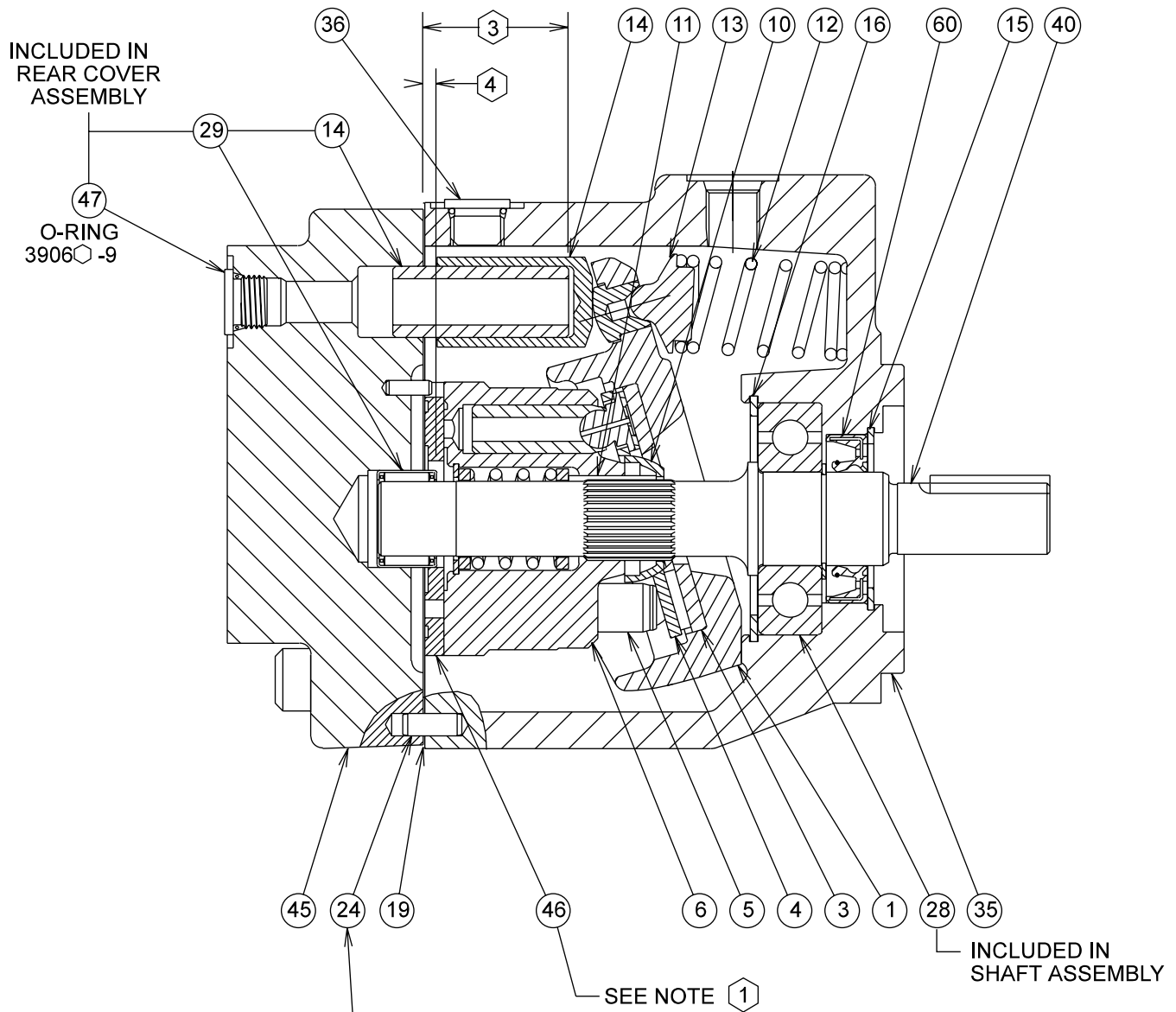
Prior to assembly all parts should be cleaned and then lightly coated with oil.

**Warning:**

Protective eye wear should be worn during all maintenance procedures.

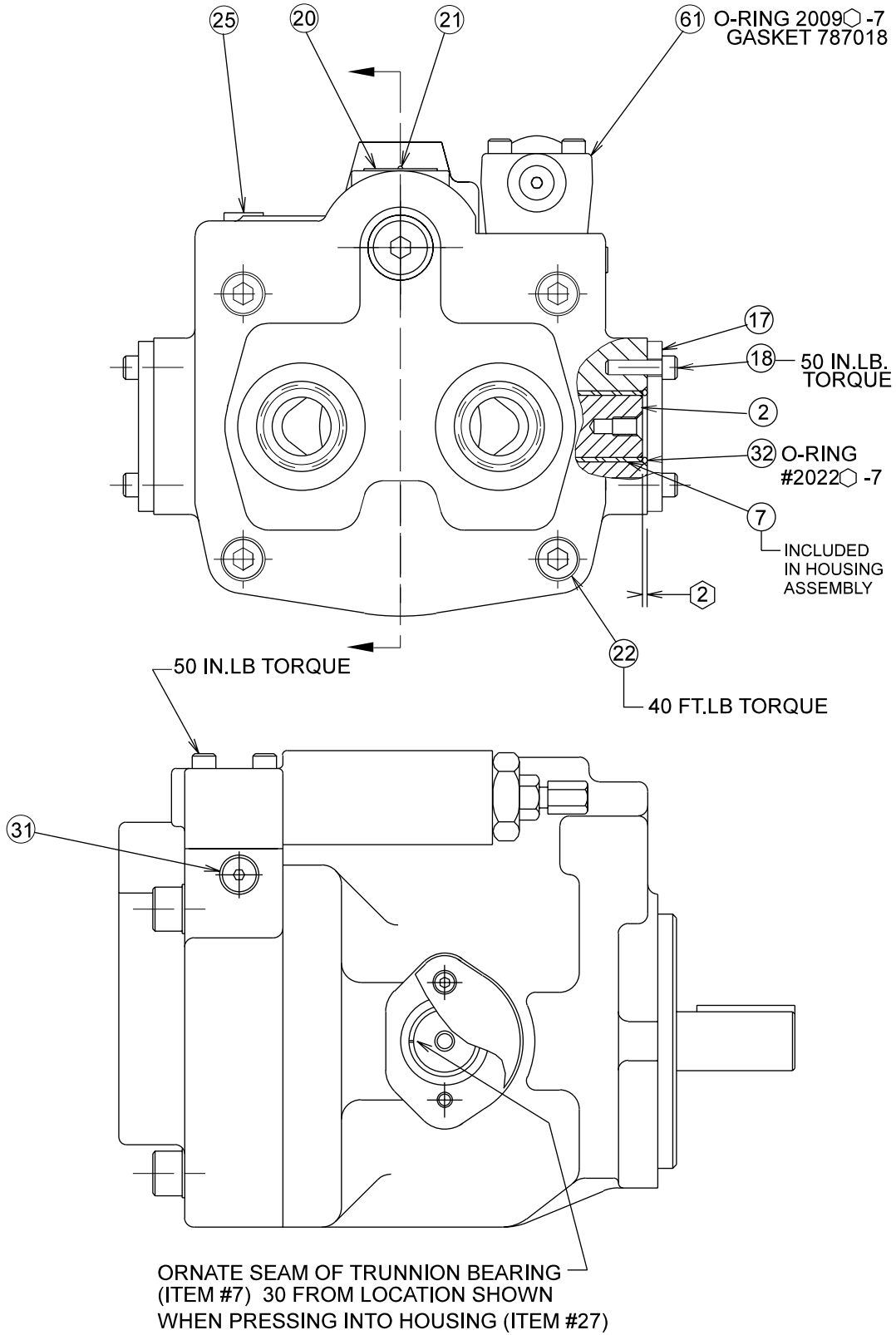


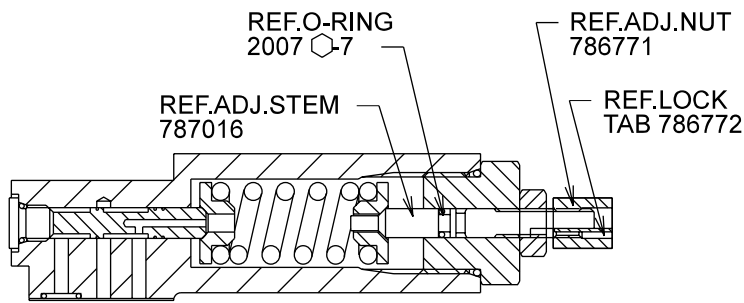
ADJUSTABLE MAX. VOLUME STOP  
 VOLUME STOP OPTION "2"  
 O-RING 2011 -9  
 ITEM #48



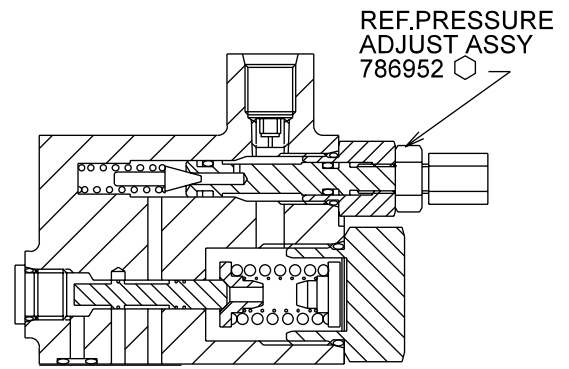
**Notes:**

- 1. Make sure "R" or "L" stamped on port plate (corresponding to rotation) is by antirotation pin.
- 2. Installed depth of item 2 (trunnion pin) below surface of item 35 (housing) to be .050/.100 with swashplate clearance removed by pressing "in" on pin.
- 3. Installed height of item 14 (servo post) above item 45 (rear cover) to be 1.538/1.534.
- 4. Installed height of item 29 (needle bearing) above item 45 (rear cover) to be .150/.130.
- 5. Illustration shows righthand (CW) rotation pump. Lefthand (CCW) pumps will have inlet and outlet ports reversed with compensator on outlet side.



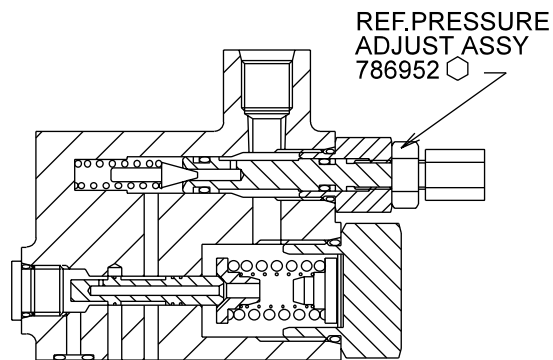
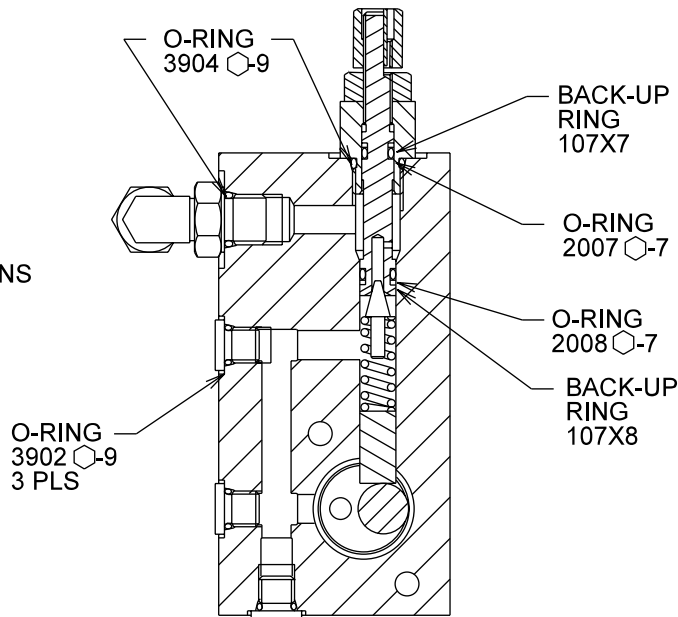


"OMIT" COMPENSATOR (STANDARD)  
ITEM 61

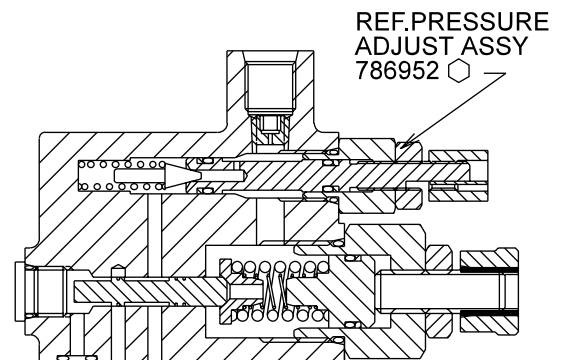


"ME" COMPENSATOR  
(REMOTE W/EXTERNAL SENSE)  
ITEM 63

HORSEPOWER  
CONTROL OPTIONS  
"H" & "C" ITEM 65  
(SEE NOTE 1)



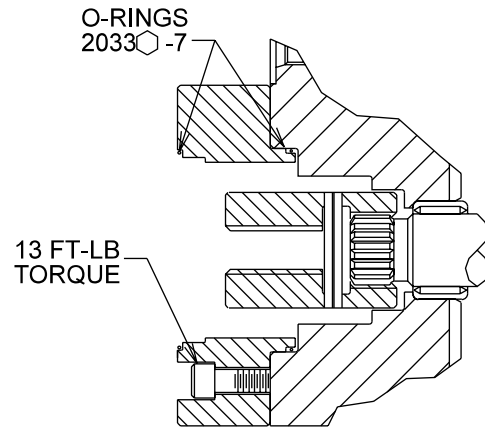
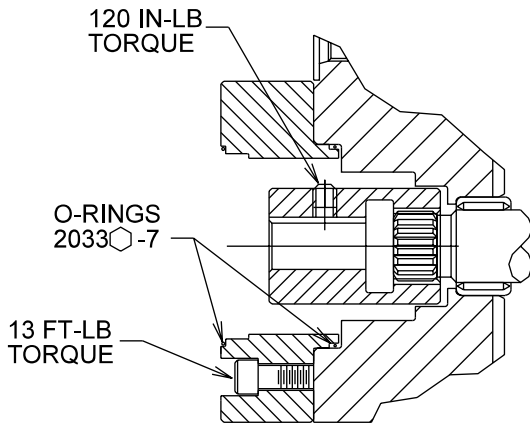
REMOTE CONTROL OPTION "M"  
REQUIRED W/POWER OPTION "H"  
ITEM 62



LOAD SENSE OPTION "A"  
REQUIRED W/POWER OPTION "C"  
ITEM 64

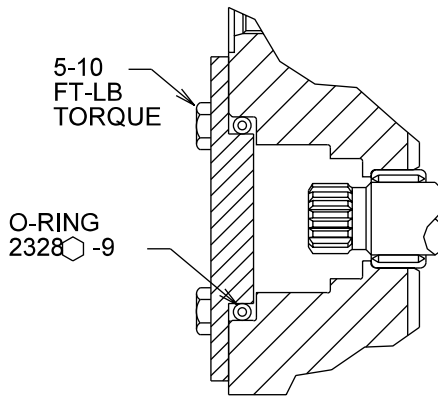
**Notes:**

1. Must be used with proper compensator assembly. Horsepower (torque) control assembly does not include pressure compensator assembly. For "H" option use "M" compensator, for "C" option use "A" compensator.



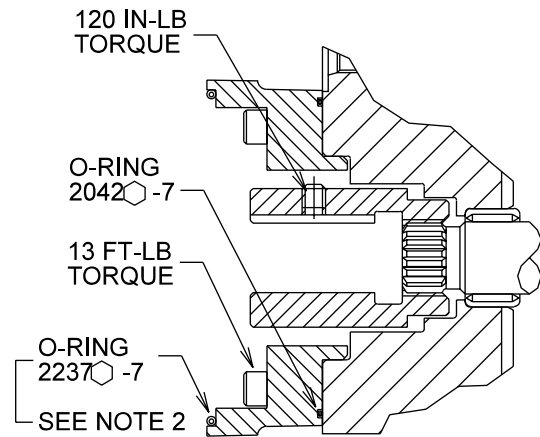
**THRU SHAFT VARIATION "6A1"**  
 (ITEM 52 - 787241)

- REAR PUMP CONFIGURATION:
- SAE AA 2 BOLT
  - 2.000 PILOT DIAMETER
  - SHAFT SIZE: .500 X .125 KEY

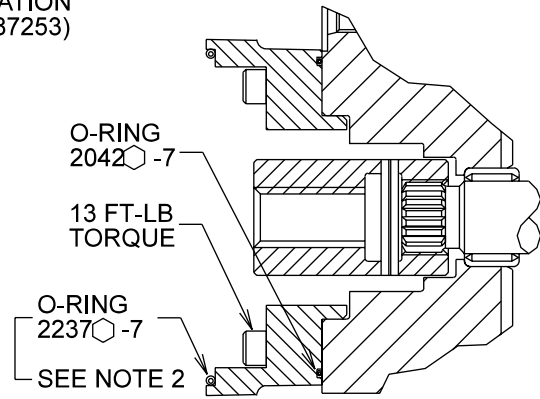


**THRU SHAFT VARIATION "6A3"**  
 (ITEM 54 - 787243)

- REAR PUMP CONFIGURATION:
- SAE AA 2 BOLT
  - 2.000 PILOT DIAMETER
  - SHAFT SIZE: 9 TOOTH 20/40 PITCH SPLINE



**"6T" VARIATION**  
 (ITEM 56 - 787253)



**THRU SHAFT VARIATION "6A2"**  
 (ITEM 53 - 787242)

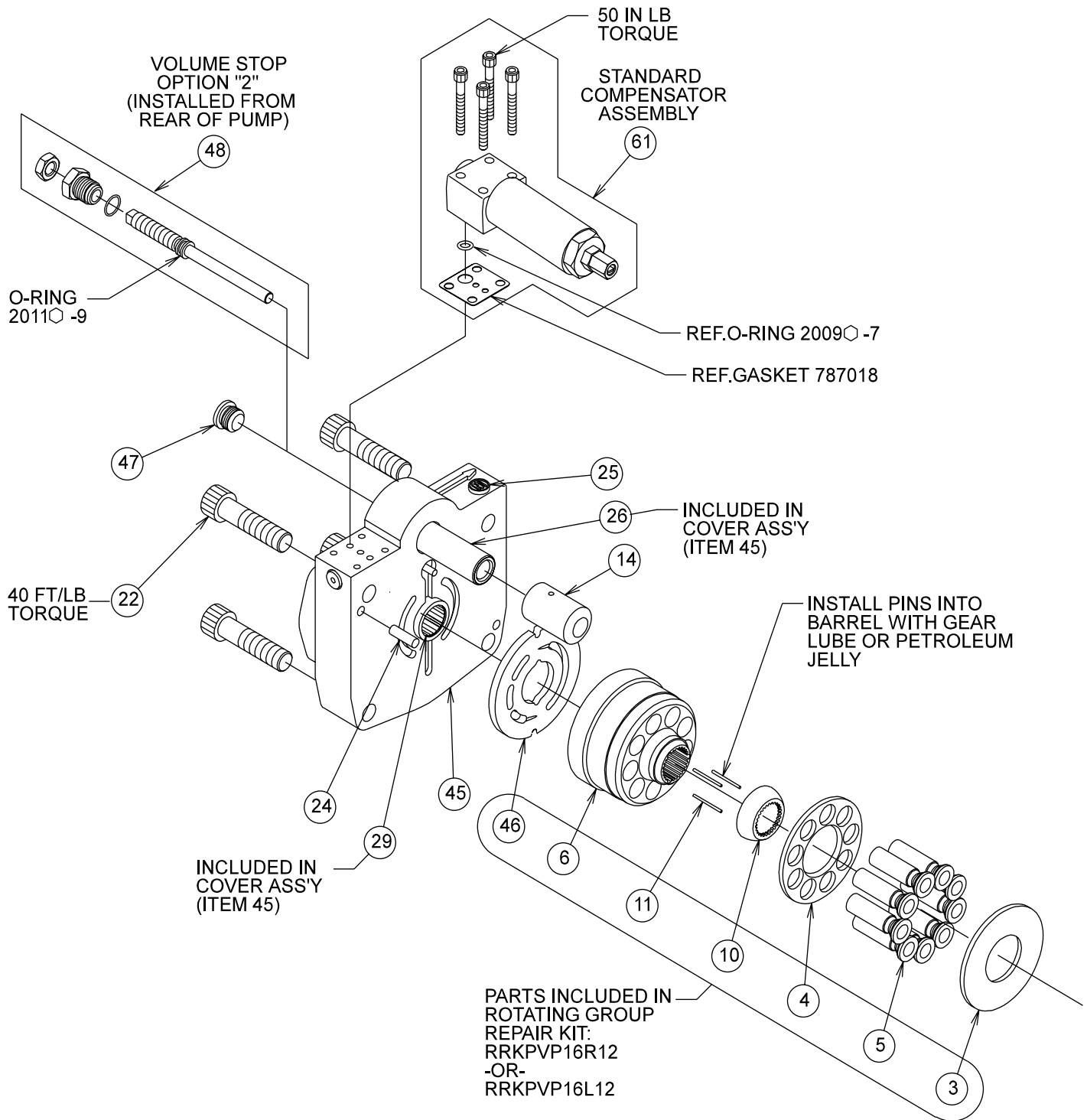
- REAR PUMP CONFIGURATION:
- SAE A 2 BOLT
  - 3.250 PILOT DIAMETER
  - SHAFT SIZE: .750 X .188 KEY

**THRU SHAFT VARIATION "6A4"**  
 (ITEM 55 - 787244)

- REAR PUMP CONFIGURATION:
- SAE A 2 BOLT
  - 3.250 PILOT DIAMETER
  - SHAFT SIZE: 9 TOOTH 16/32 PITCH SPLINE

**Notes:**

1. Shaft and cover assemblies not included in kits. They must be ordered separately.
2. Later designs incorporate a gasket, P/N 801209 rather than an O-ring.

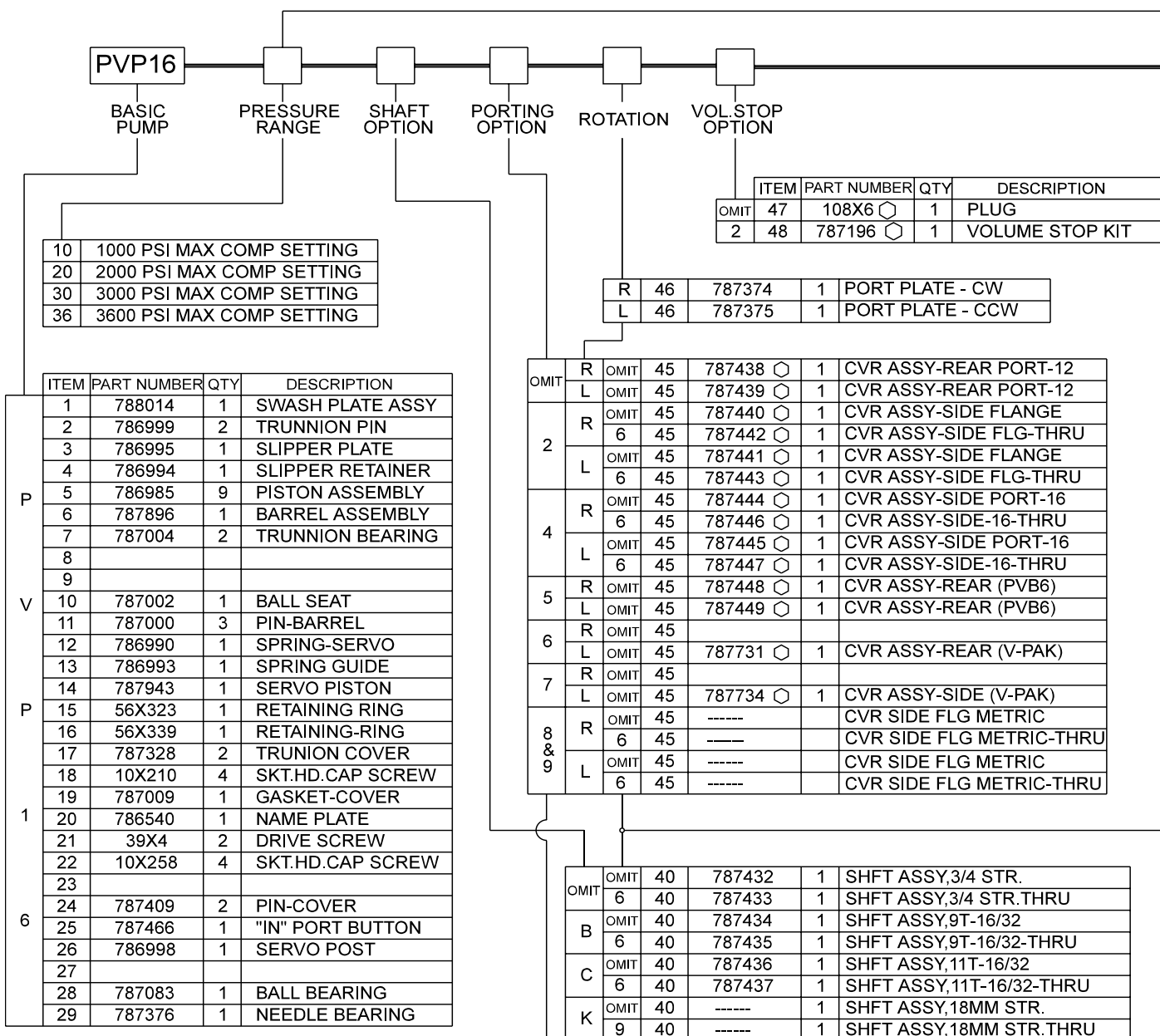


**Notes:**

1. Illustration shows righthand (CW) rotation pump. Lefthand (CCW) pumps will have the compensator on opposite side, and port plate kidneys reversed.
2. Seal kit (SKPVP16-12) consists of all O-rings, gaskets and shaft seal.



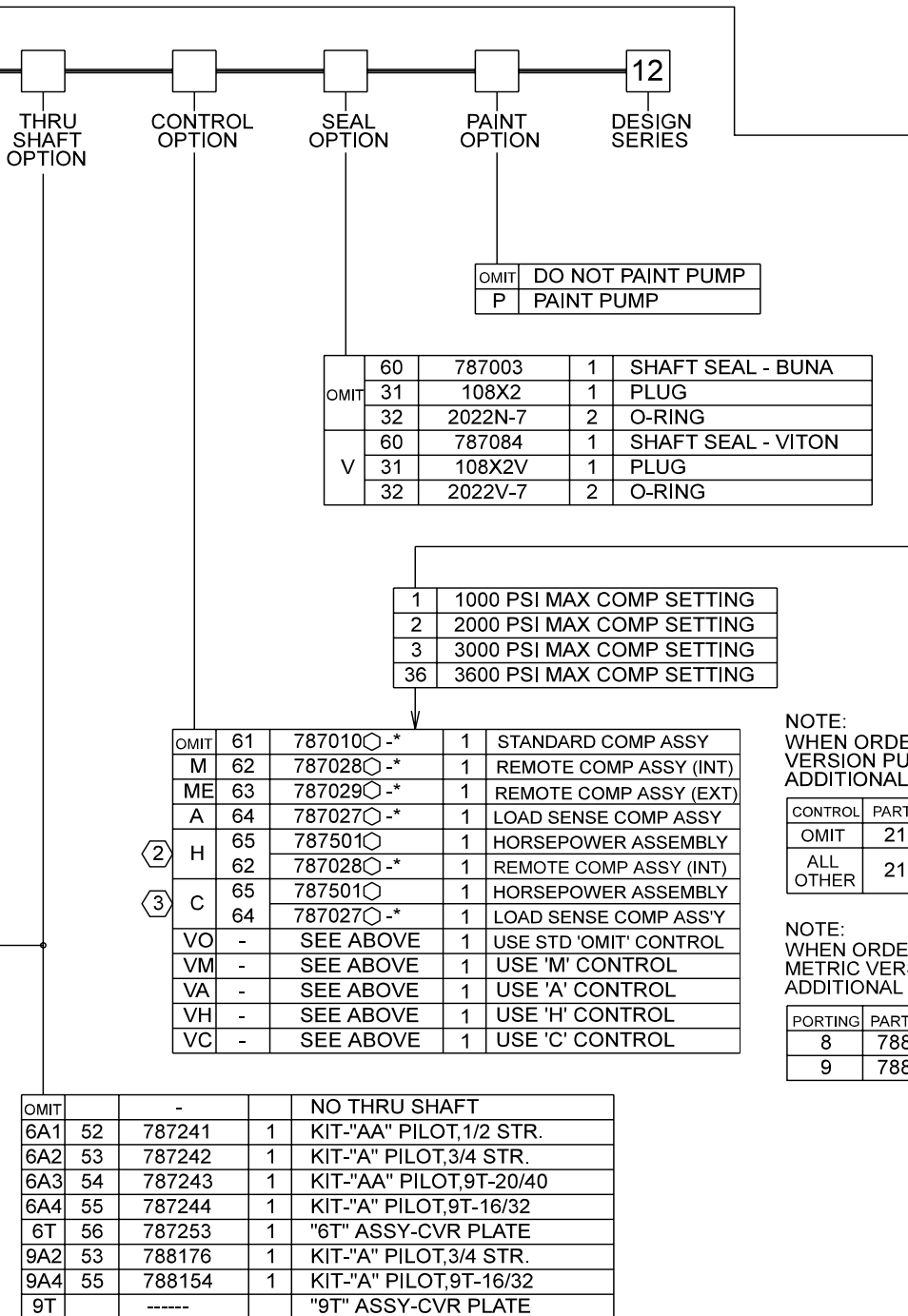




**CAUTION**

These service parts are intended for use in hydraulic pumps. Incorrect installation or assembly of these parts could cause the pump or pumps being repaired to fail in subsequent use or to operate incorrectly. The following precautions should be followed:

1. All parts should be cleaned and then lightly coated with mineral oil, or another lubricating fluid compatible with the system fluid being used, prior to assembly.
2. The pump should be disassembled, repaired and reassembled in a clean environment.
3. Use proper tools to disassemble and reassemble the pump.
4. If you are uncertain at how to install these parts, you should obtain assistance either from a Parker Hannifin distributor, or from the Hydraulic Pump/Motor Division.



NOTE:  
 WHEN ORDERING CONTROLS FOR METRIC  
 VERSION PUMPS(OPTIONS 8 & 9)  
 ADDITIONAL METRIC SCREWS ARE REQUIRED.

CONTROL	PART NUMBER	QTY	DESCRIPTION
OMIT	210X105	1	CAPSCREW-M5X35MM
ALL OTHER	210X108	1	CAPSCREW-M5X50MM

NOTE:  
 WHEN ORDERING CONTROLS M,ME,A,C,H FOR  
 METRIC VERSION PUMPS(OPTIONS 8 & 9)AN  
 ADDITIONAL ADAPTOR FITTING IS REQUIRED.

PORTING	PART NUMBER	QTY	DESCRIPTION
8	788517	1	FITTING(ISO6149)
9	788157	1	FITTING(1/4BSPP)

**Notes:**

1. O-Ring compound designation =Nitrile, = Viton.
2. For proper operation of "H" control, it must be used with a remote compensator assembly.
3. For proper operation of "C" control, it must be used with a load sense compensator assembly.
4. Seal Kit P/N SKPVP 1612  
 Rotation Group Kit P/N: RRPVP1612

— R - CW  
 — L - CCW

## Service Notes:

- Use a clean lubricant (compatible with the working fluid) on all pump components during assembly.
- Most premature pump failures occur when contaminants from a previous failure have not been removed from the system, or cause for previous failure is still present (i.e. water in oil, filter bypassing, etc.)
- Thoroughly clean the reservoir, suction lines, suction strainer, drain lines, etc. before re-installing the pump.
- Always fill the pump case with clean fluid before starting a new or serviced pump for flooded suction, purge air from suction lines by cracking the inlet fitting or vent plug on pump. This should prevent an airlock condition and allow for faster priming.
- Starting the pump slowly by jogging (or turning over engine without allowing it to start) will help the pump prime and make it easier to determine when priming has occurred.
- Start pump with an open circuit whenever possible. Reduce the compensator to it's minimum setting during start-up. Cycle the pump on and off stroke while increasing the compensator to its required setting.  
This will assist in break-in of new components and help purge air from the case.

## Basic Troubleshooting:

### Pump Will Not Prime

- △ Pump should prime within 30 seconds. If it does not, **STOP**.
- △ Check for proper drive rotation.
- △ Make sure pump shaft is turning (i.e. key at coupling hubs is engaged).
- △ Make sure reservoir is full.
- △ Check for major sources of a suction leak (vent plug open, shaft seal missing (PAVC), flange not tight, pinched O-Ring at flange or pump housing).

### Cannot Build Any Pressure

- △ Make sure pump is primed.
- △ Check alignment, especially on PAVC pumps without "9" option.
- △ Make sure systems is not an open circuit. A pump produces flow, not pressure. It can only limit pressure when the system requirement is higher than the pump compensator setting.

### Can Only Build A Few Hundred PSI

- △ Compensator is backed all the way out.
- △ The remote or load sense line is vented.
- △ Control orifice or spool is plugged.
- △ Incorrect compensator spool (PVP).
- △ Pressure control dart is lodged open.
- △ Torque control plug is missing (PAVC).

### Pump Will Not Compensate

- △ Differential spring over-compressed (i.e. spring guide dislocated).
- △ Control drain line blocked (PAVC).
- △ Pressure control stem vent hole is plugged.
- △ Control spool travel is hindered.
- △ Control orifice is missing (PAVC).
- △ Saturation orifice is missing in load sense circuit.

**Notes:**

**Notes:**

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**7. Special Tooling:** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer, in no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

**8. Buyer's property:** Any designs, tools, patterns, materials, drawings. Confidential information or equipment furnished by buyer, or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

**9. Taxes:** Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount hereof shall be in addition to amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

**10. Indemnity For Infringement of Intellectual Property Rights:** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. Trademarks, copyrights, trade dress and trade secrets (hereinafter "Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, buyer shall defend and indemnify Seller for all costs, expenses of or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

**11. Force Majeure:** Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation, accidents, acts of god, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carries or suppliers, shortages of materials and any other cause beyond Seller's control.

**12. Entire Agreement/Governing Law:** The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representation or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.



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5/98 DBHESS 5000





# PVP16 DESIGN SERIES 12 CHANGES

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## Design Series 12 Changes

1. Change housing machining to incorporate o-ring seal around trunnion pin versus gasket.
2. Change swashplate machining to use intergral hardened wear pin versus flame hardening process.
3. Change geometry on servo piston to match new swashplate contact point.

## Interchangeability of Design 12 and Design 11 PVP16.

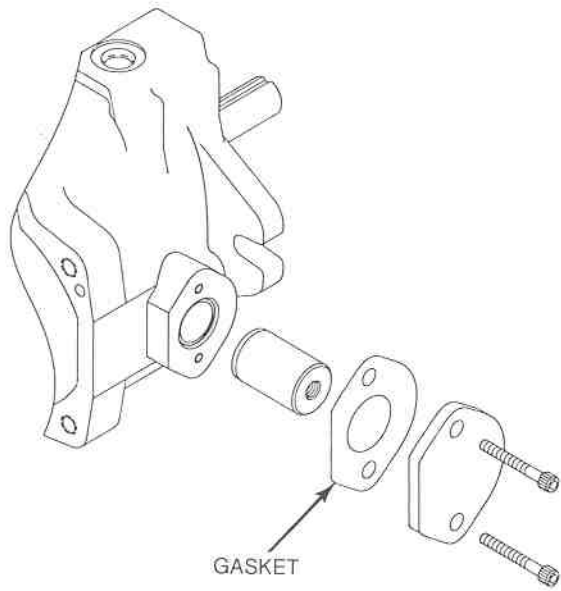
1. Design series 12 housing (788046) is totally interchangeable with design series 11 pumps.
2. Design series 12 swashplate (788014) will fit in design series 11 pumps, but will only work with design series 12 servo piston (787943).

**NOTE:** When repairing a design 11 pump the swashplate and servo piston must be changed as a set.

3. The seal kit for a design 12 PVP16 (SKPVP16/12) is fully compatible with design 11 PVP16's.

PVP16 DESIGN 11	PVP16 DESIGN 12	PART NAME	DESCRIPTION OF CHANGE
786968	788046	Housing	Machine O-ring groove around trunnion area
787326	2022*-7	Gasket, O-ring	Change from gasket seal to O-ring seal (more positive seal)
787248	788014	Swashplate	Change from flame heat treated swashplate to installing hardened wear pin
786992	787943	Servo Piston	Changed to match swashplate contact point

# PVP16 Design Series 11



# PVP16 Design Series 12

