



Bulletin PM 1632-10-M1/USA

# Parker Pumps Parts & Service

Effective: March 1999

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PHP Series  
Variable Volume  
Piston Pump  
Service Bulletin

Model PHP6050 \*\*\*\* 10

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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 PHP6050 \*\*\*\* 10 series piston pumps are designed to provide long life while operating with Hydraulic Oil. Refer to Bulletin 2600-109/USA for limits. However, should maintenance be required, the following instructions should be used for disassembly, replacement of parts, cleaning and assembly.

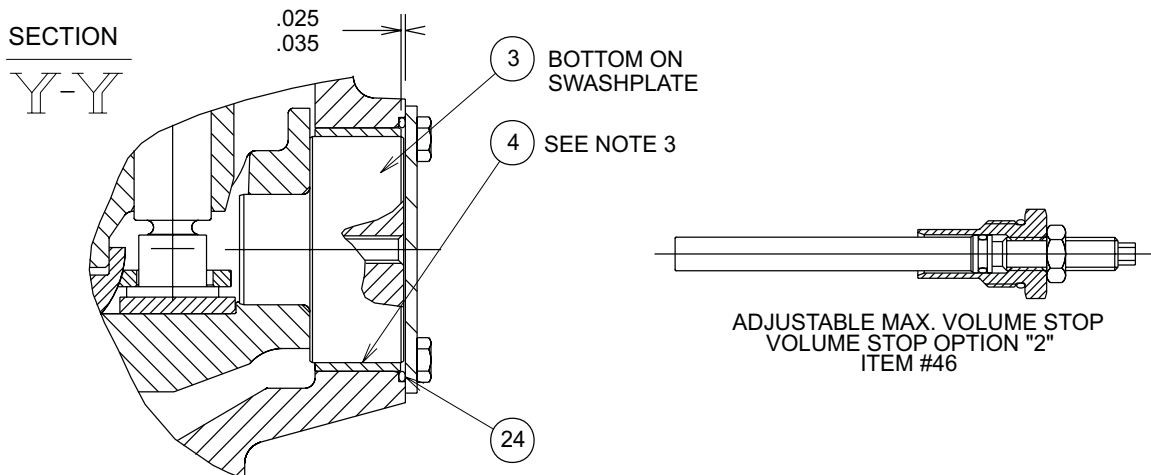
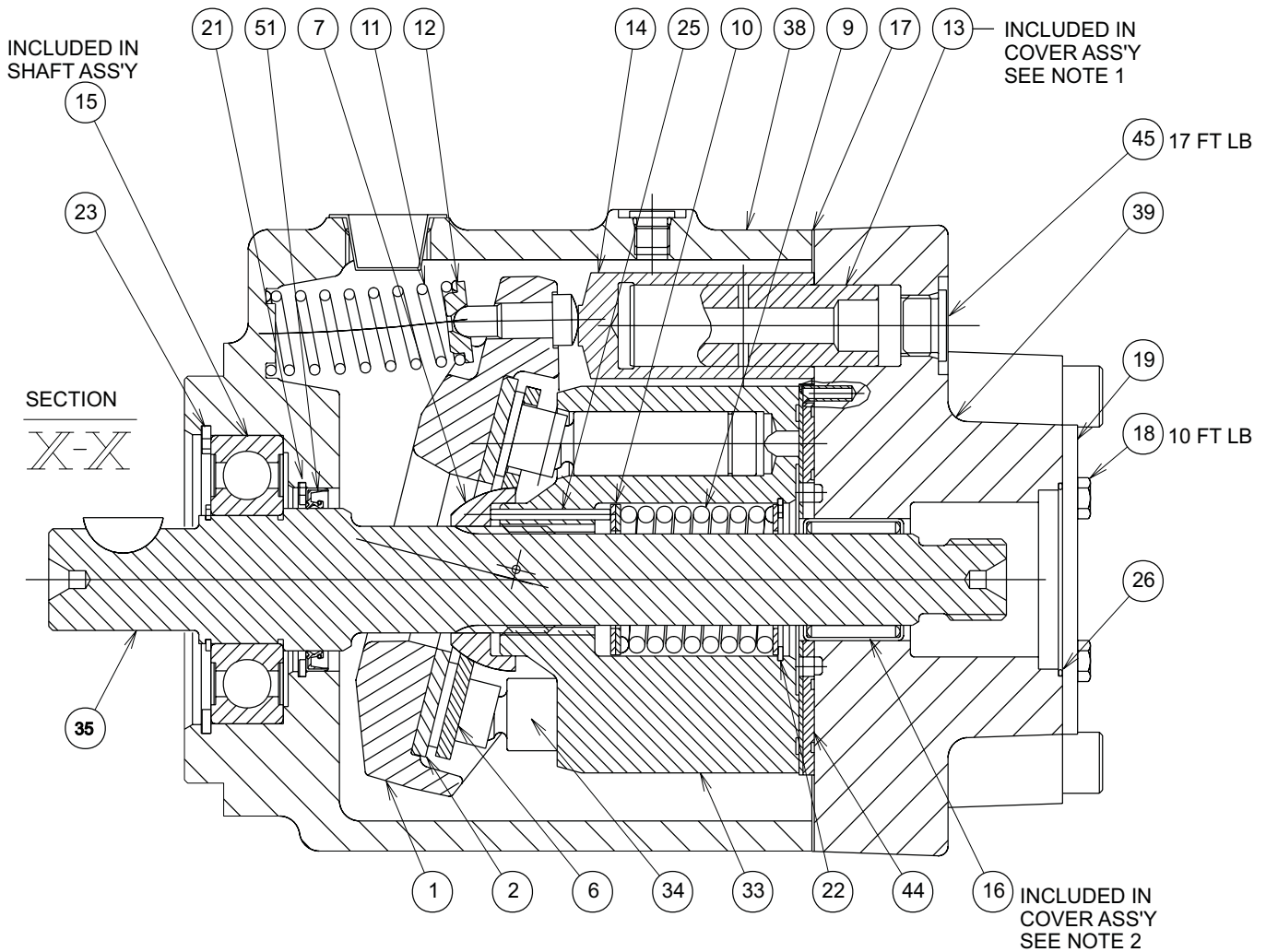
**Note:**

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.

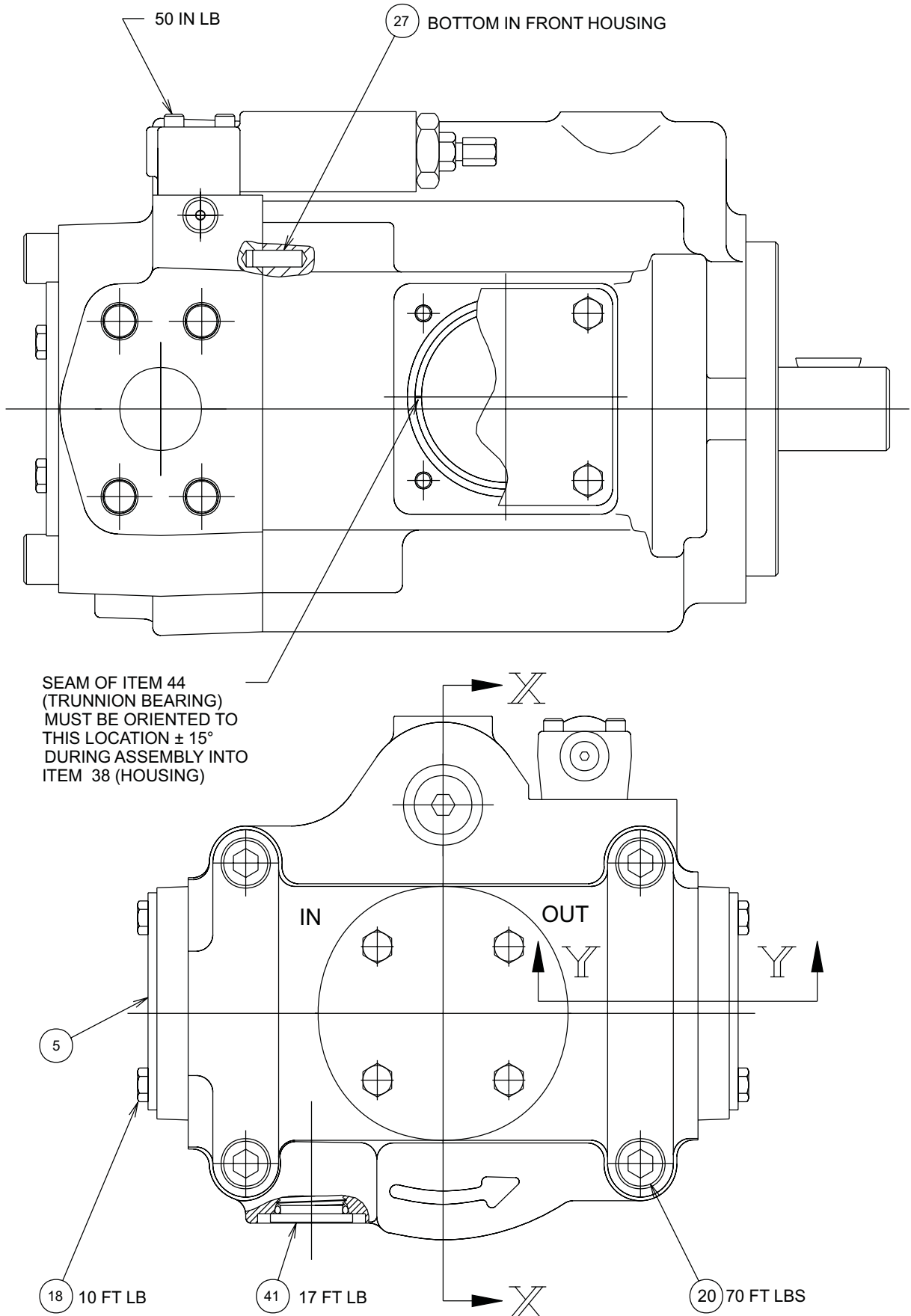
**Warning:**

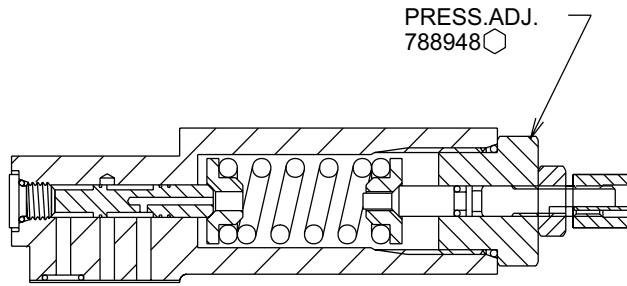
Protective eye wear should be worn during all maintenance procedures.



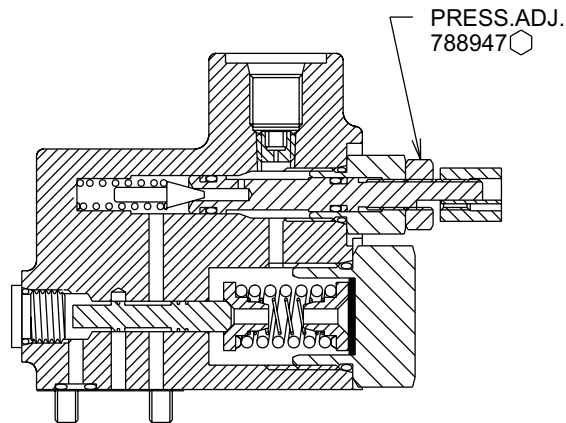
**NOTE:**

1. Installed height of item 13 (Servo Post) above item 39 (Rear Cover) to be 2.305/2.295 inches.
2. Installed height of item 16 (Needle Bearing) above item 39 (Rear Cover) to be .130/.150 inches.
3. Install item 4 (Bushing) .025 to .035 inches below housing trunnion boss.
4. Pumps shown are right hand (CCW) rotation. Left hand rotation pumps have pressure, suction & cover drain port reversed. Compensator is also on opposite side.

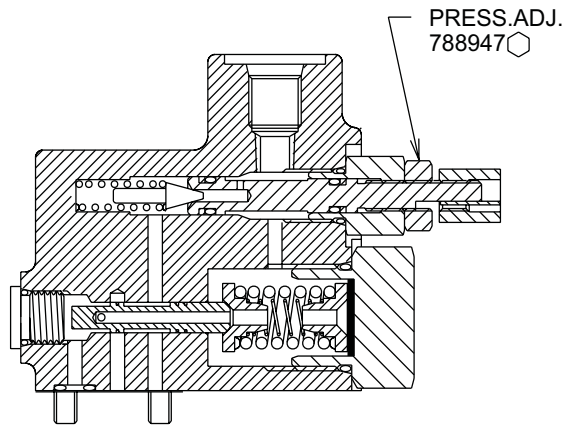




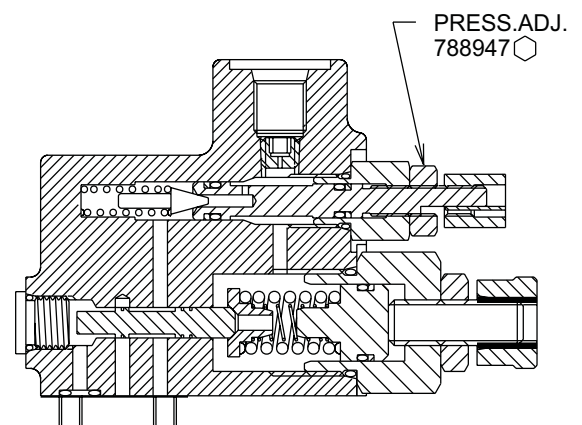
"OMIT" COMPENSATOR (STANDARD)  
ITEM 61



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



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



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

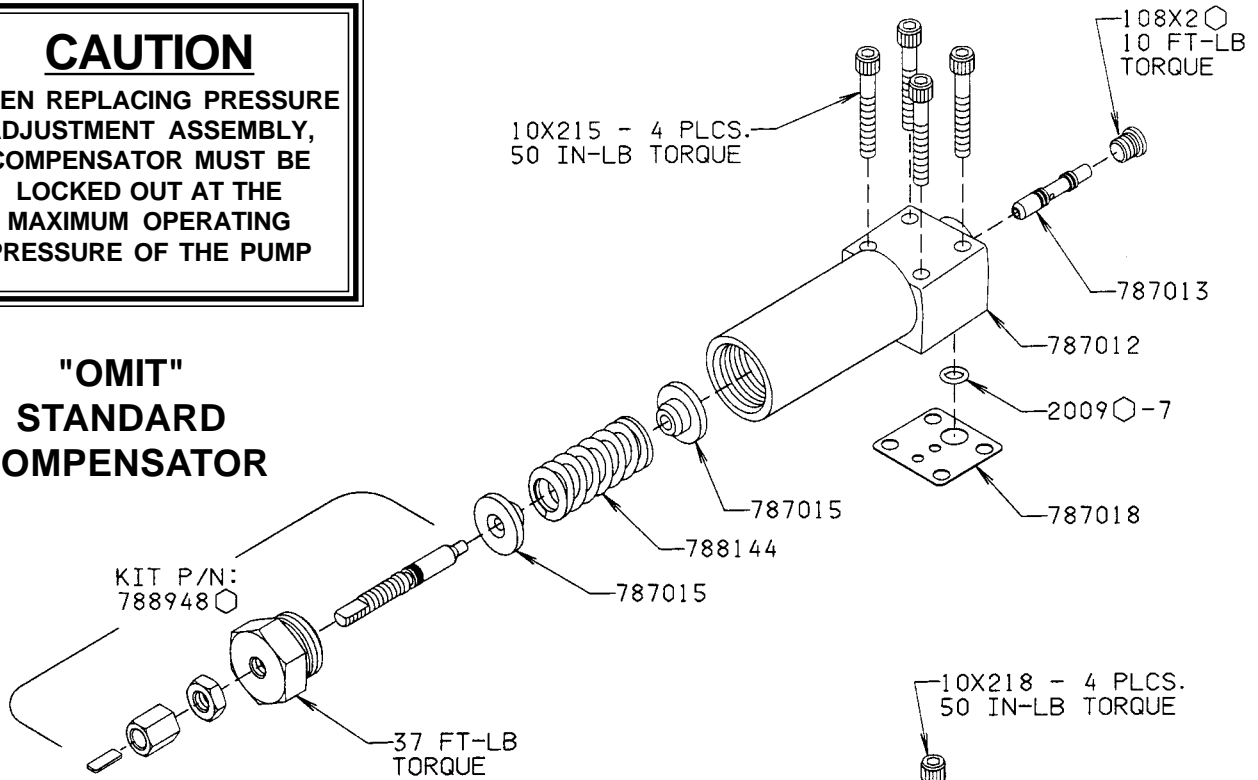
**Notes:**

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.

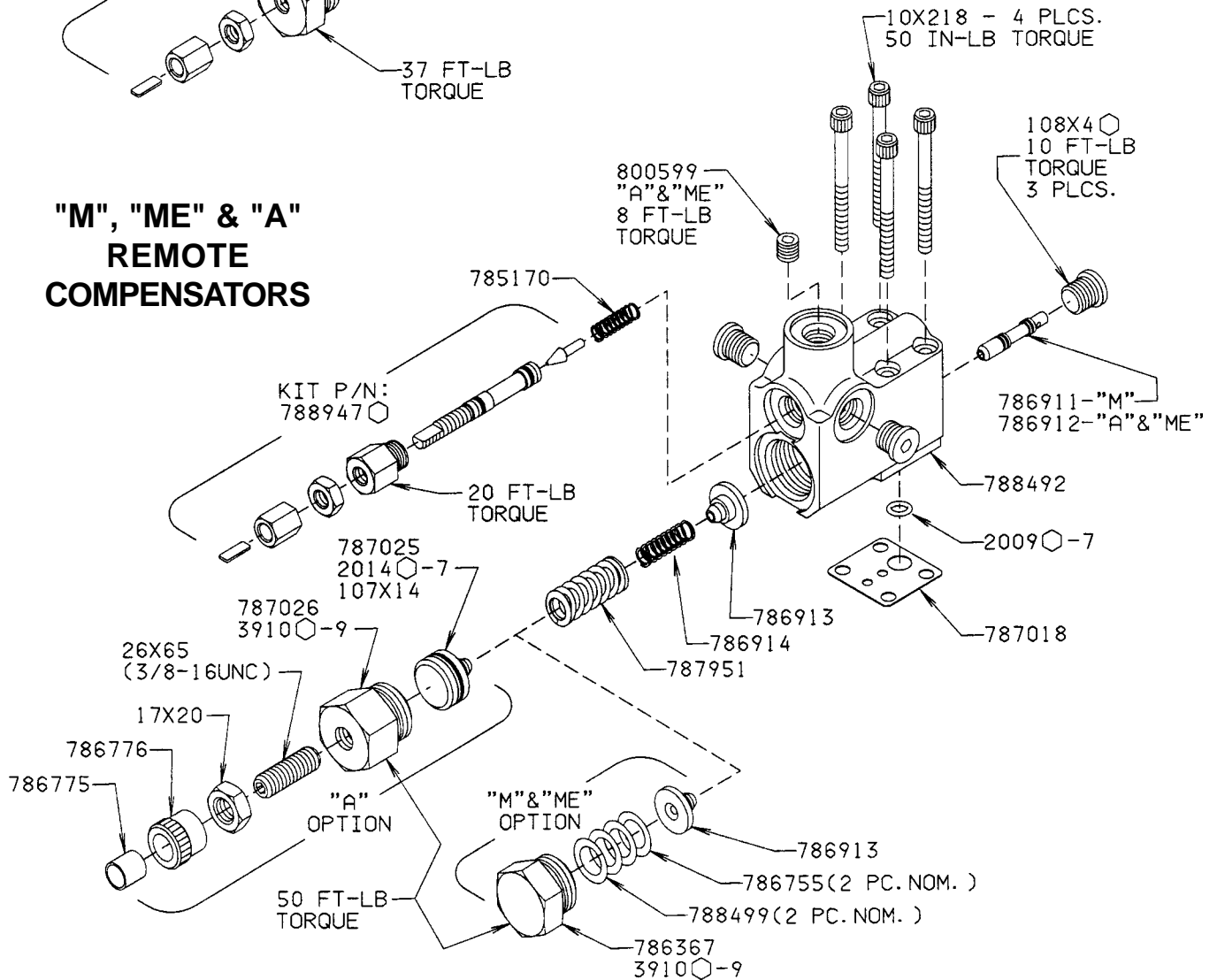
**CAUTION**

WHEN REPLACING PRESSURE  
 ADJUSTMENT ASSEMBLY,  
 COMPENSATOR MUST BE  
 LOCKED OUT AT THE  
 MAXIMUM OPERATING  
 PRESSURE OF THE PUMP

**"OMIT"  
 STANDARD  
 COMPENSATOR**



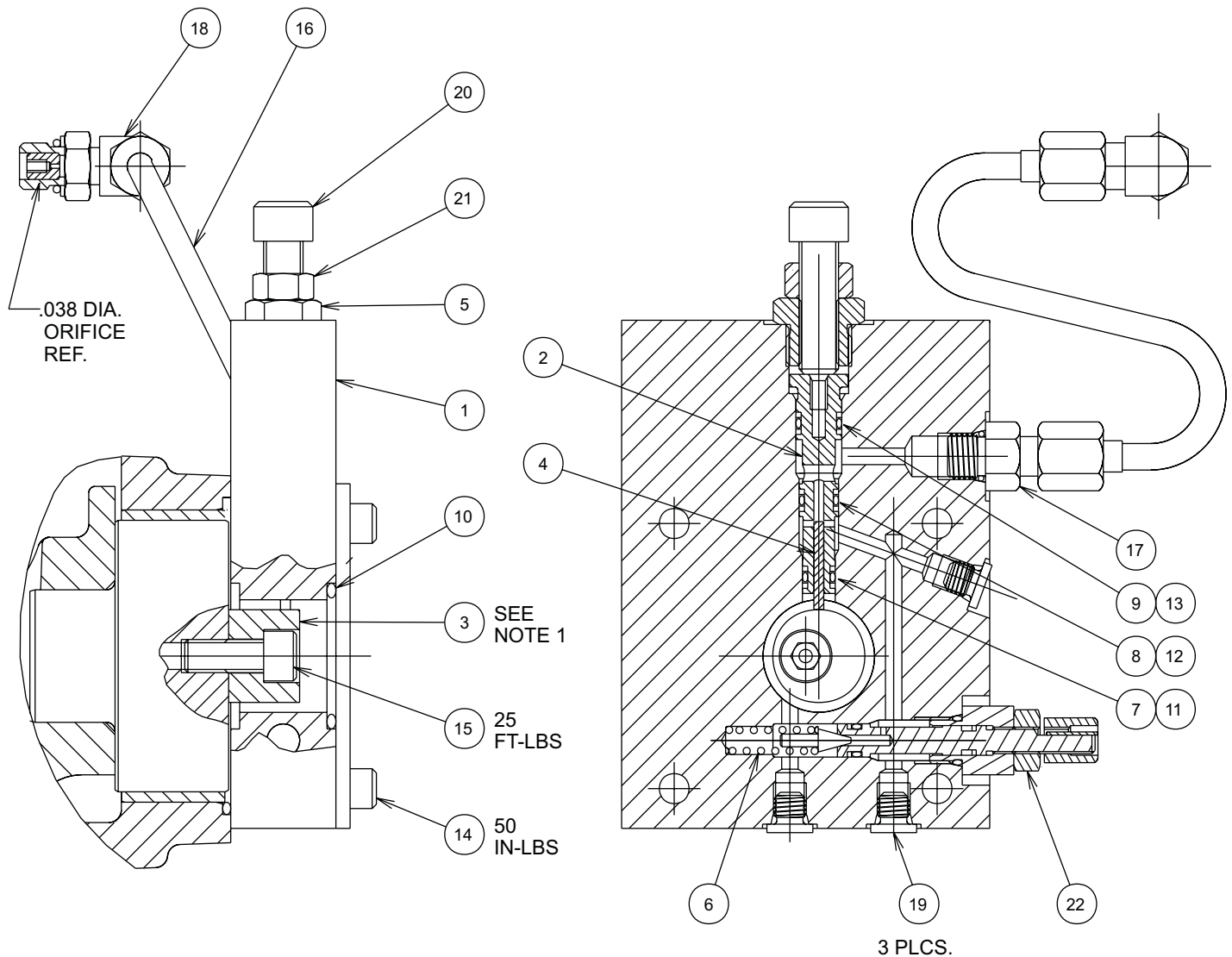
**"M", "ME" & "A"  
 REMOTE  
 COMPENSATORS**



P/N: 788789- COMPLETE HI-LO ASSEMBLY

ITEM	PART NUMBER	QTY	DESCRIPTION
1	788328	1	HI-LO BODY
2	788713	1	HI-LO SLEEVE
3	787822	1	HP CONTROL CAM
4	787975	1	HI-LO SPOOL
5	787977	1	HI-LOW SLEEVE RET.
6	785170	1	SPRING
7	2008-7	1	O-RING
8	2010-7	1	O-RING
9	2011-7	1	O-RING
10	2123-7	1	O-RING
11	107X8	2	BACK-UP RING

ITEM	PART NUMBER	QTY	DESCRIPTION
12	107X10	2	BACK-UP RING
13	107X11	2	BACK-UP RING
14	10X227	4	1/4-20X1.5 CAP SCREW
15	787836	1	BOLT - SPECIAL
16	788479	1	TUBING ASSEMBLY
17	4F50X-S	1	STRAIGHT CONNECTOR
18	787523	1	ORIFICE FITTING
19	108X2	3	-2 PLUG W/ O-RING
20	10X89	1	3/8-24X1.25 CAP SCREW
21	16X42	1	JAM NUT
22	788947	1	PRESS.ADJUST.KIT



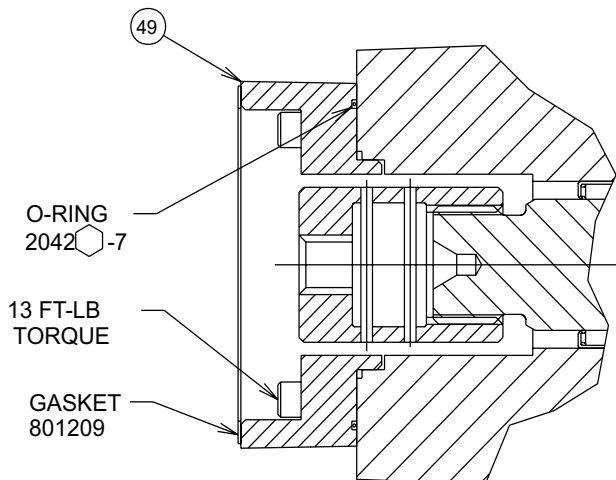
**NOTE:**

1. With the pump at full stroke, install the cam (item 3) concentric with the hole in the Hi-Lo body.
2. For proper operation of Hi-Lo torque control (option HLM & HLA) it must be used with corresponding compensator. "M" control for "HLM" and "A" control for "HLA".



# Thru Shaft Options

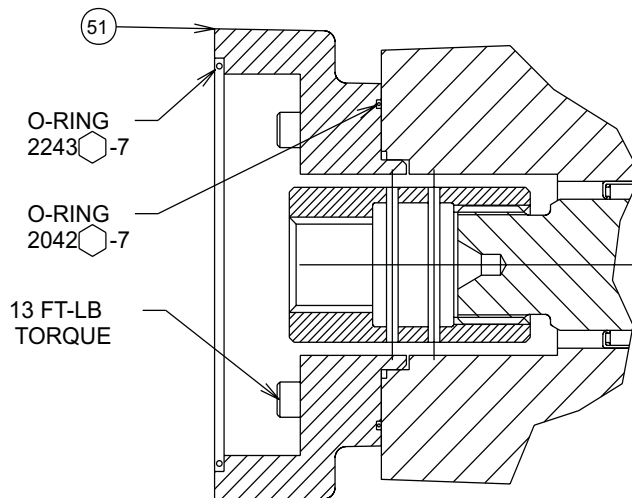
# Model PHP6050 \*\*\*\* 10



THRU SHAFT VARIATIONS  
"6A4", "6A5", "9A4", "9A5"

REAR PUMP CONFIGURATION:

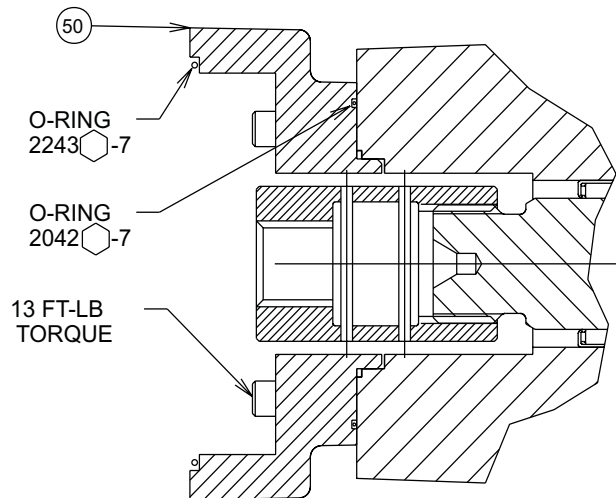
- SAE A 2 BOLT
- 3.25 PILOT DIAMETER
- 9 TOOTH 16/32 PITCH



THRU SHAFT VARIATIONS  
"6B4", "9B4"

REAR PUMP CONFIGURATION:

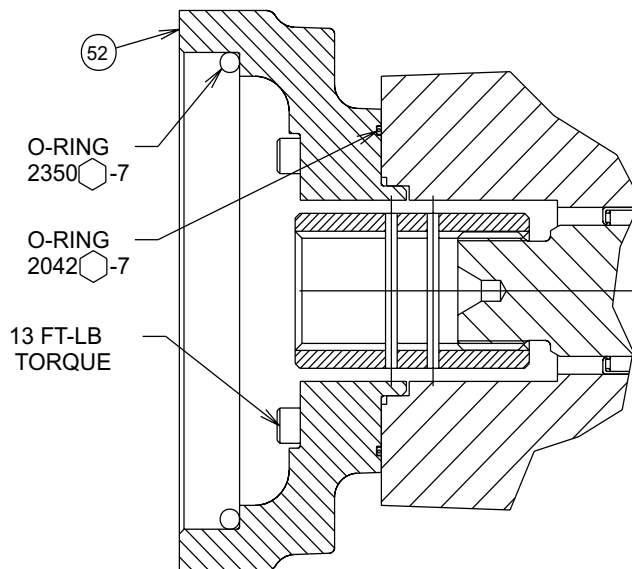
- SAE B 2 BOLT
- 4.00 PILOT DIAMETER
- 15 TOOTH 16/32 PITCH



THRU SHAFT VARIATIONS  
"6B3", "9B3"

REAR PUMP CONFIGURATION:

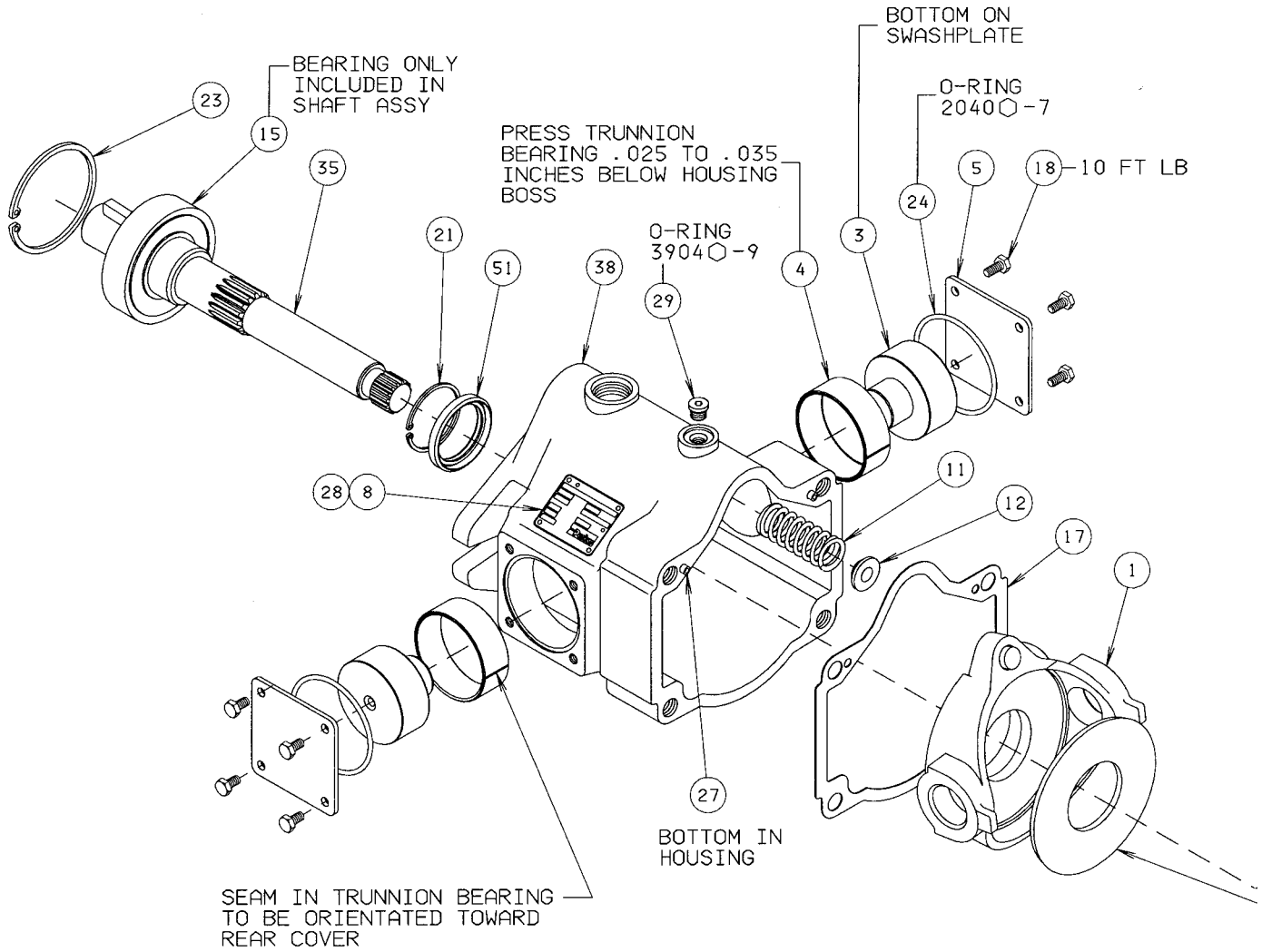
- SAE B 2 BOLT
- 4.00 PILOT DIAMETER
- 13 TOOTH 16/32 PITCH



THRU SHAFT VARIATIONS  
"6C3", "9C3"

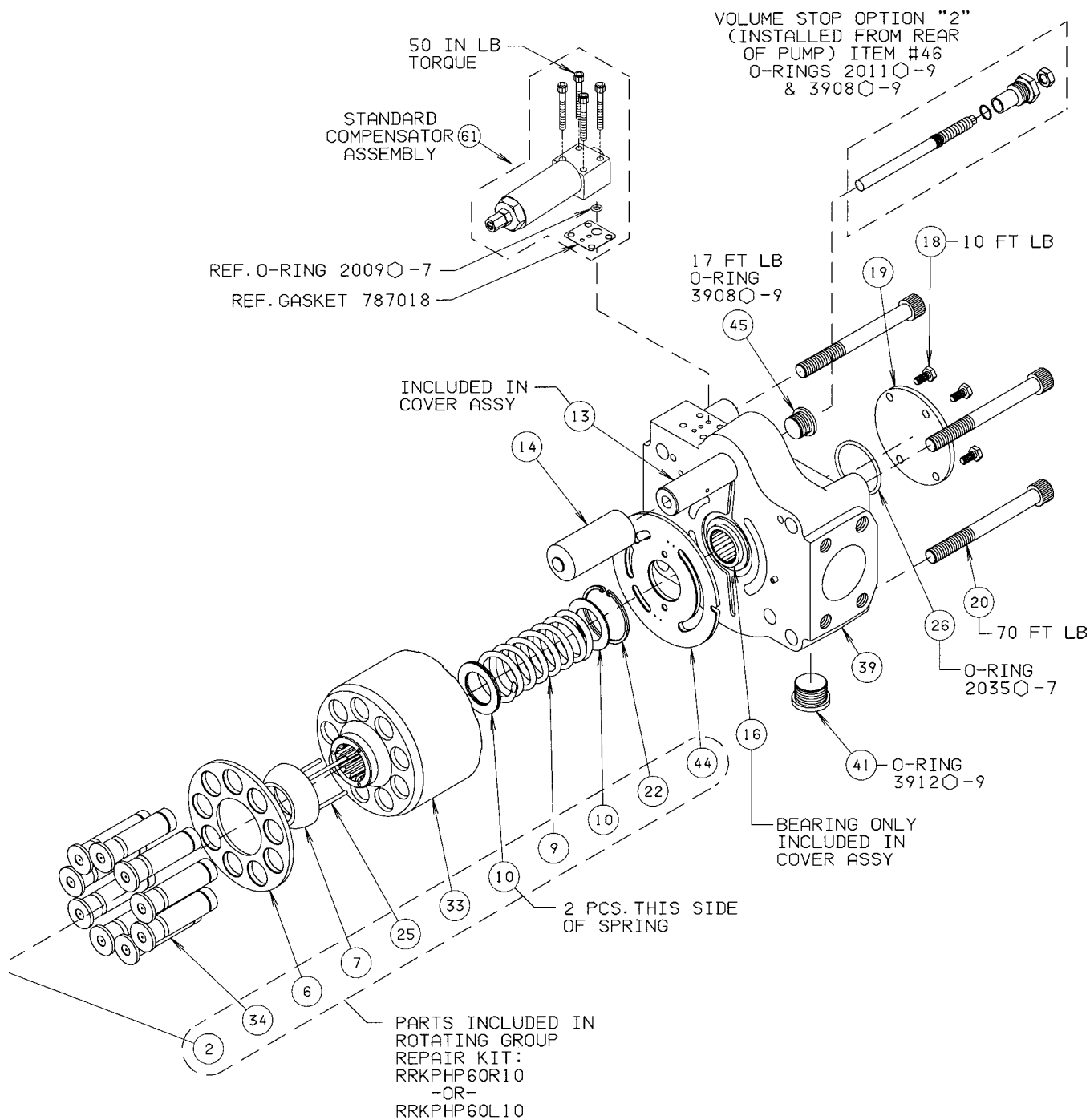
REAR PUMP CONFIGURATION:

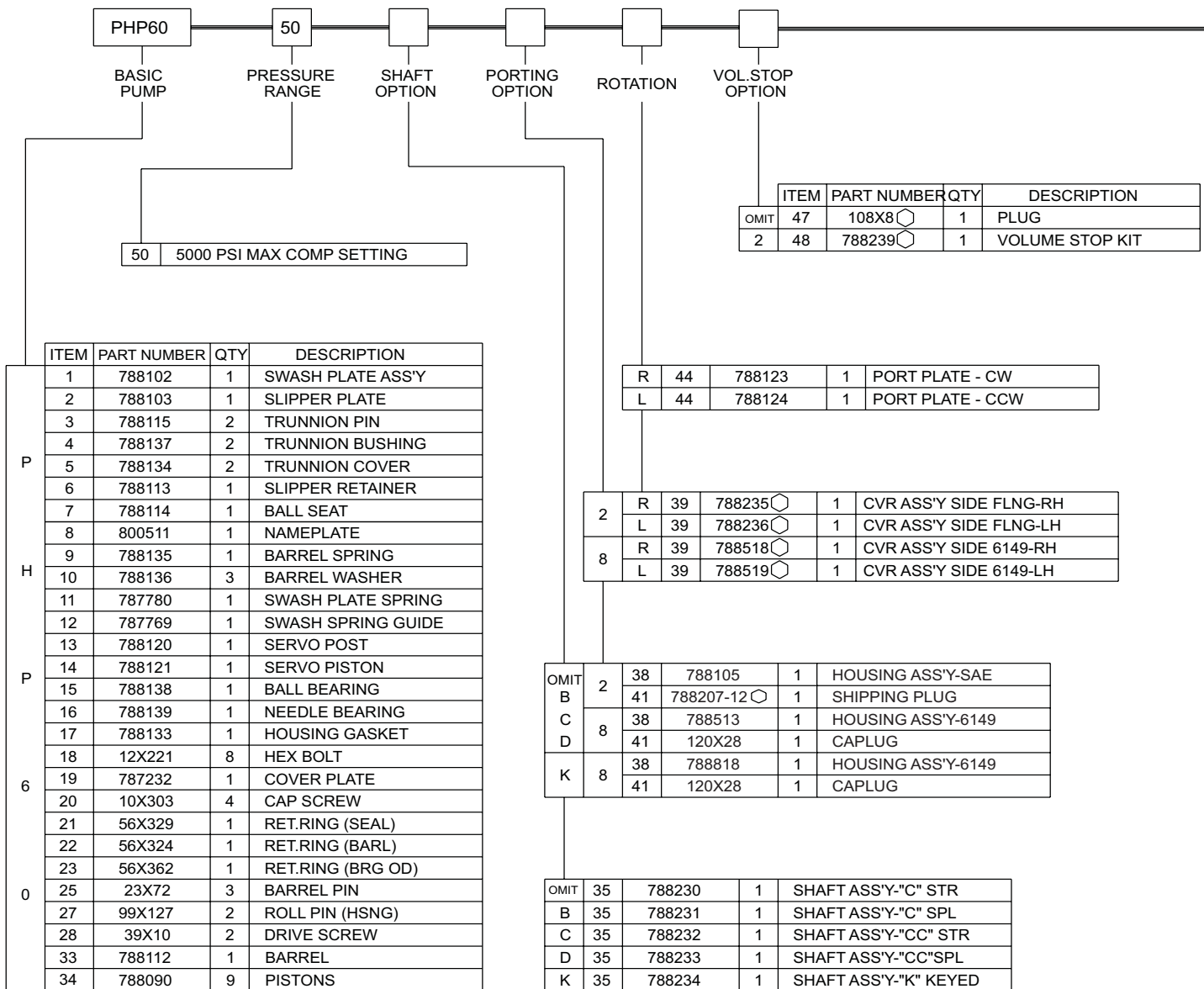
- SAE C 2 BOLT
- 5.00 PILOT DIAMETER
- 14 TOOTH 12/24 PITCH



**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 (SKPHP60-10) consists of all O-rings, gaskets and shaft seal.



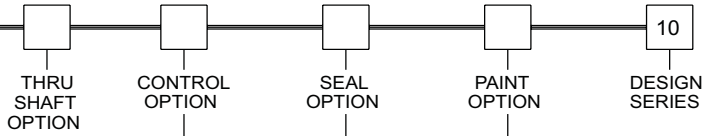


**CAUTION**

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.



OMIT	DO NOT PAINT PUMP
P	PAINT PUMP

OMIT	51	787549	1	SHAFT SEAL - BUNA
	24	2149N-7	2	O-RING
	26	2035N-7	1	O-RING
	29	108X6	1	PLUG
V	51	788043	1	SHAFT SEAL - VITON
	24	2149V-7	2	O-RING
	26	2035V-7	1	O-RING
	29	108X6V	1	PLUG

OMIT	61	788240	⊖-5	1	STANDARD COMP ASSY
M	62	788751	⊖-5	1	REMOTE COMP ASSY (INT)
ME	63	788752	⊖-5	1	REMOTE COMP ASSY (EXT)
A	64	788753	⊖-5	1	LOAD SENSE COMP ASSY
②	HLM	65	788489	⊖	HI-LO TORQUE ASSEMBLY
		62	788751	⊖-5	REMOTE COMP ASSY (INT)
③	HLA	65	788489	⊖	HI-LO TORQUE ASSEMBLY
		64	788753	⊖-5	LOAD SENSE COMP ASSY

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

CONTROL	PART NUMBER	QTY	DESCRIPTION
OMIT	210X105	4	CAPSCREW-M5X35MM
ALL OTHER	210X108	4	CAPSCREW-M5X50MM

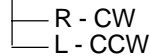
NOTE:  
 WHEN ORDERING CONTROLS M,ME,A,C,H FOR  
 METRIC VERSION PUMPS(OPTION 8)  
 ADDITIONAL ADAPTOR FITTING IS REQUIRED.

PORTING	PART NUMBER	QTY	DESCRIPTION
8	788517	1	FITTING(ISO6149)

OMIT	78				NO THRU SHAFT
6	A4	79	788147	⊖	"A" PILOT,9T SPLINE
	A5	79	788934	⊖	"A" PILOT,11T SPLINE
	B3	81	788148	⊖	"B" PILOT,13T SPLINE
	B4	83	788149	⊖	"B" PILOT,15T SPLINE
	C3	85	788150	⊖	"C" PILOT,14T SPLINE
9	A4	79	788203	⊖	"A" PILOT,9T SPLINE
	A5	79	788935	⊖	"A" PILOT,11T SPLINE
	B3	81	788202	⊖	"B" PILOT,13T SPLINE
	B4	83	788201	⊖	"B" PILOT,15T SPLINE
	C3	85	788200	⊖	"C" PILOT,14T SPLINE

**Notes:**

- ⊖ O-Ring compound designation ⊖=Nitrile, ⊖= Viton.
- For proper operation of "H" control, it must be used with a remote compensator assembly.
- For proper operation of "C" control, it must be used with a load sense compensator assembly.
- Seal Kit P/N SKPHP 60 ⊖10  
 Rotating Group Kit P/N: RRPHP60 ⊖10



**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 reinstalling 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 its 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.

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**1. Terms and Conditions of Sale:** All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer's acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between Buyer and Seller unless expressly accepted in writing by Seller. Seller's acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer's assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer's offer. Acceptance of Seller's products shall in all events constitute such assent.

**2. Payment:** Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

**3. Delivery:** Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

**4. Warranty:** Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from Parker Hannifin Corporation. **THIS WARRANTY COMPROMISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW. TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.**

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**6. Changes, Reschedules and Cancellations:** Buyer may request to modify the designs or specification for items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between buyer and Seller unless accepted by Seller in written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

**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.

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**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.

FPG 9-91-P



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3/99 DBHESS 5000