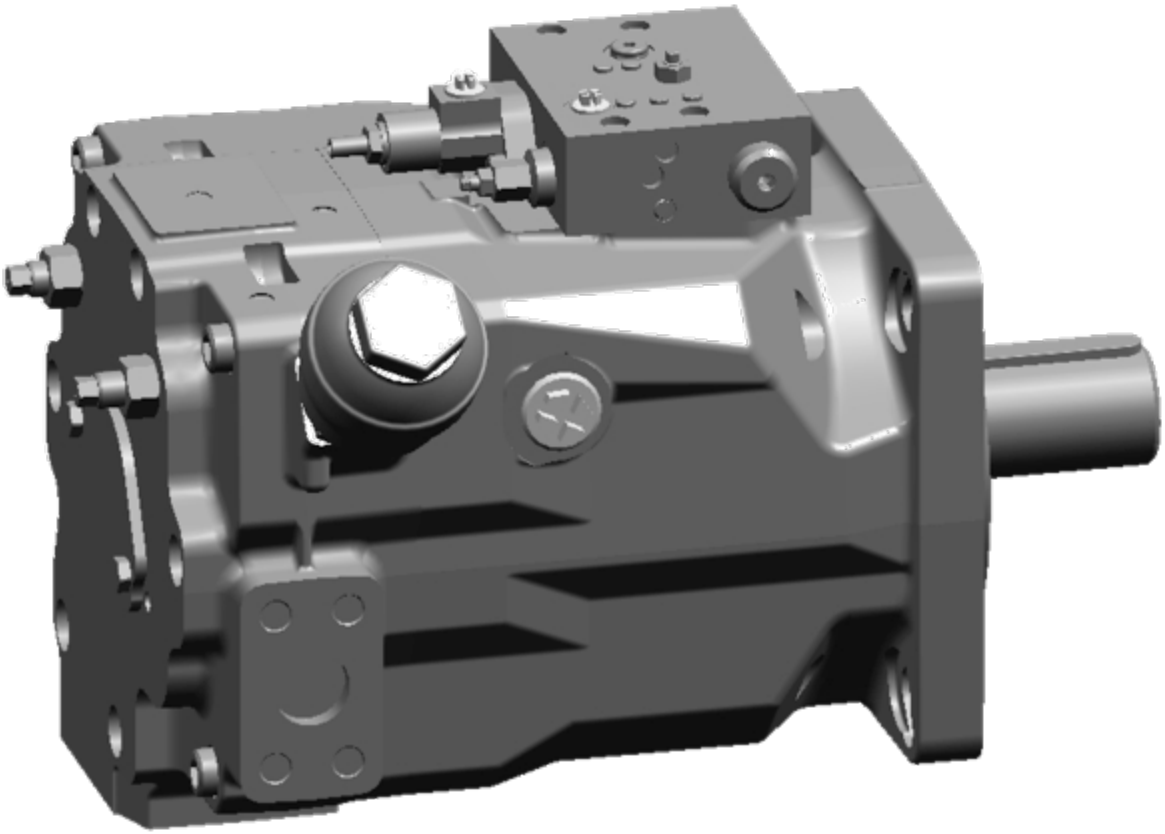
Eaton® DuraForce™
HPR Conversion Procedures



Powering Business Worldwide

Table of Contents

Tools Required

Exchanging Pressure Compensator Springs

- 5mm Allen wrench
- New pressure compensator spring
- Torque wrench capable of setting 14 N-m (10 ft-lb)

Externally Disabling the Load Sense

- 6mm wrench
- 13mm wrench
- One M14 metal plug (Refer to Customer Connect for correct part number)

Exchanging Control Types LP, E1L & H1L

- 6mm Allen wrench
- Torque wrench capable of setting 23 N-m (17 ft-lb)

Exchanging the Horsepower Spring - with TL2 or ETP Controls

- 6mm Allen wrench
- 21mm wrench
- Torque wrench capable of 45 ft-lb (61 N-m).

Activating the Z1 and Z2 Ports with TL2 or ETP Controls

- 2mm Allen wrench
- 6mm Allen wrench
- Torque wrench capable of 23 N-m (17 ft-lb).

Exchanging Solenoids on E1L Controls

- 3mm Allen wrench
- Torque wrench capable of setting 2.7 N-m (2.0 ft-lb)

Installing a PTO Kit onto HPR Pump Directly (W/O Auxiliary Pump)

- Metric Wrench (various sizes depending on the unit size)
- Allen wrench (various sizes depending on the unit size)
- Grease or petroleum jelly (optional)
- PTO Kit

Maximum & Minimum Displacement Adjustments

- 6mm Allen wrench
- 19mm closed-end wrench

Introduction

This manual will provide you with information and procedures for general conversions of Eaton® DuraForce™ HPR Self-Regulating Pump for Open Loop Operations. Procedures outlined in this manual will allow you to be more flexible with your inventory and better service your customers. To ensure accuracy of conversion and prevent part loss or damage, certain components or subassemblies are disassembled, inspected, and reassembled when removed from the pump.

Training

You have been provided information on the conversion of DuraForce products. Proper application of the information requires specific training and may require use of specialized tooling and equipment. All requests for training must be coordinated through your Eaton Account Manager. He can also provide you price and availability of any specialized tooling. If you choose to proceed with the conversion of the DuraForce products absent the necessary training and/or these specialized tools, you do so at your risk.

Eaton will accept no claim for warranty resulting from deficiencies in the conversion. Please refer to the Eaton literature web site for warranty information at www.eaton.com/hydraulics/warranty.

Labeling Converted Units

All units that have been converted must retain the original Eaton label and have a second Eaton label placed on the unit. This second label at a minimum must state

Converted Eaton Model Code # (Final Eaton model code of the converted unit)

Conversion done by (Name of your company)

Conversion Parts

All requests for specific conversion part information should be addressed to your Eaton account representative. Additional information can be found through your Eaton customer connect portal. All requests or inquiries must be accompanied by the complete model and serial number of the base unit you want to convert.

Cleanliness

Cleanliness is extremely important when repairing a hydrostatic pump or motor. Before disconnecting the lines, clean foreign material from exterior of unit. Work in a clean area. Clean all metal parts in clean solvent. Blow parts dry with air. Don't wipe parts with cloth or paper towel, because lint or other matter could cause damage. Check all mating surfaces. Replace any parts that have scratches or burrs that could cause leakage. Don't use coarse grit paper, files or grinders on parts.

Environmental Concerns

Protection of the natural fundamentals of life is one of our predominant tasks. We are continuously improving the protection of the environment as far as applications are concerned. We encourage you to contribute your share to comply with this demand. In connection with work to be performed, the environmental regulations of the machine manufacturer must be respected.

In general:

- Greases and oils which cannot be used any more have to be collected. They are normally a threat to water reserves and must be kept away from the environment.
- Adhere to national and local regulations for waste disposal.

Seals

A good conversion policy is to replace all old seals with new seals whenever units are disassembled. This avoids potential damage during seal removal. Lubricate seals with petroleum jelly. Use only clean and recommended oil when assembling unit. Information on recommended filters and fluids can be found in the Operational Parameters section.

Torque

All torque specifications are for lubricated threads. Bolts for gasketed surfaces should be checked for proper torque.

Model Code

HPR – Self-regulating Pump for Open Loop Operation

HPR	105	R	0	S1	M	A	AC	AC	000	0	0	0	0	AA	00	0	0	000	A	00	A	A	A
1 2 3	4 5 6	7	8	9 10	11	12	13 14	15 16	17 18 19	20	21	22	23	24 25	26 27	28	29	30 31 32	33	34 35	36	37	38

	55	75	105	135	165	210	280
1 2 3 Product							
HPR – Open Loop Variable Displacement Pump	●	●	●	●	●	●	●
4 5 6 Displacement							
055 – 55 cc/r	●						
075 – 75 cc/r		●					
105 – 105 cc/r			●				
135 – 135 cc/r				●			
165 – 165 cc/r					●		
210 – 210 cc/r						●	
280 – 280 cc/r							●
7 Rotation							
R – CW	●	●	●	●	●	●	●
L – CCW	•	•	•	•	•	•	
8 Mounting Flange							
0 – SAE J744 standard (size 105: LP;H1L;E1L only)	●	●	●	●		●	●
1 – SAE J744 standard / additional threads (sizes 105; 135; (*u))			●	●			
2 – SAE J744 standard / additional holes					●		
3 – ISO 30119-2 metric (TL2;ETP;LEP only)(*m)			●				●
4 – plug-in (LP;H1L;E1L only)/ (size 105; (*d))			•	•			
5 – Bell housing SAE 3 (LP;H1l;E1l only)/(sizes 105; (*d))			•	•			
6 – Bell housing SAE 4 (LP;H1l;E1l only)/(sizes 105; (*d))			•	•			
9 10 Input Driveshaft							
S1 – splined ANSI B92.1 12/24 - 14t (SAE C)/(size 105:(*w))	●	●	●				
S2 – splined ANSI B92.1 12/24 - 17t (SAE C-C)			●	●			
S3 – splined ANSI B92.1 8/16 - 13t (SAE D&E)				●	●		
S4 – splined ANSI B92.1 8/16 - 15t (SAE F)/(sizes 210; 280: (*t))						●	●
T1 – splined ANSI B92.1 16/32 - 21t (*t)		●					
T2 – splined ANSI B92.1 16/32 - 23t (*t)			●				
T3 – splined ANSI B92.1 16/32 - 27t (*t)				●	●	●	
K1 keyed ISO3019-2 / 40 mm (metric flange only (pos. 8))			●				
K2 – keyed ISO3019-2 / 60 mm							●
11 Porting							
M – ISO 6149 metric	●	●	●	●	●	●	●
D – DIN 3852	•	•	•	•			

	55	75	105	135	165	210	280
12 Pump Control							
A – LP:LS/pressure cut-off	●	●	●	●	●	●	●
B – H1L:LS/hydraulic override (*m)	●	●	●	●	●	●	●
C – E1L:LS/electric override (*m)	●	●	●	●	●	●	●
D – TL2:LS/power limiter (*m)/ (*r)			●	●		●	●
E – ETP:electro-proportional/ power limiter/PCO (*m)/ (*r)			●	●		●	●
F – LEP:LS/electric stroke limiter/PCO (*m)/(*r)			●	●		●	●
13 14 Pressure Compensator Setting							
00 – Not applicable (H1L; E1L; TL2)	•	•	•	•	•	•	•
AA – 250 bar	●	●	●	●	●	●	●
AB – 350 bar	●	●	●	●	●	●	●
AC – 420 bar	●	●	●	●	●	●	●
15 16 Load Sensing Differential Pressure							
00 – Not applicable (ETP)	•	•	•	•	•	•	•
AC – 20 bar	●	●	●	●	●	●	●
17 18 19 Power Limiter Setting							
000 – not applicable (LP; H1L; E1L; LEP)	●	●	●	●	●	●	●
value – 009 - 106 kW (numeric 3 digits)			●				
value – 012 - 136 kW (numeric 3 digits)				●			
value – 019 - 184 kW (numeric 3 digits)						●	
value – 032 - 221 kW (numeric 3 digits)							●
20 Pressure Limiter Remote Control							
0 – not applicable (LP; H1L; E1L;TL2)	●	●	●	●	●	●	●
D – disabled (ETP; LEP only)			●	●		●	●
R – enabled (ETP; LEP only)			●	●		●	●
21 Power Limiter Remote Control							
0 – not applicable (LP; H1L; E1L;LEP only)	●	●	●	●	●	●	●
1 – remote power uprating (default for TL2; ETP)			●	●		●	●
2 – remote power up- & downrating (TL2; ETP only)			●	●		●	●

• Available Option ● Preferred Option

♦ Separate Specification Required

(*d) DIN porting only (see position 11)

(*e) Availability depends on controller type (see position 12)

(*m) ISO metric porting only (see position 11)

(*r) CW rotation only (see position 7)

(*s) Second HPV/R unit has to be specified separately

(*t) Recommended if HPV/R unit is attached to PTO (see position 26,27)

(*u) Required for PTO flange size C (see position 26,27)

(*w) Not for tandem units (see position 26,27)

Model Code

HPR – Self-regulating Pump for Open Loop Operation

HPR	105	R	0	S1	M	A	AC	AC	000	0	0	0	0	AA	00	0	0	000	A	00	A	A	A
1 2 3	4 5 6	7	8	9 10	11	12	13 14	15 16	17 18 19	20	21	22	23	24 25	26 27	28	29	30 31 32	33	34 35	36	37	38

		55	75	105	135	165	210	280
22	**Control Solenoids**							
0	– not applicable (LP; H1L; TL2)	●	●	●	●	●	●	●
A	– AMP / 12V	●	●	●	●	●	●	●
B	– AMP / 24 V	●	●	●	●	●	●	●
C	– DIN / 12 V	•	•	•	•	•	•	•
D	– DIN / 24 V	•	•	•	•	•	•	•
E	– Deutsch / 12V	•	•	•	•	•	•	•
F	– Deutsch / 24V	•	•	•	•	•	•	•
23	**Noise Optimization Devices**							
0	– No Noise Reduction Device	●	●	●	•	•	•	
1	– With SPU primary noise reduction (sizes 55-105: (*r))	●	●	●	●	●	●	●
24 25	**Auxiliary Pad and Shaft Definition**							
0G	– to add gear pump see positions 26,27	•	•	•	•	•	•	•
AA	– SAE J744 A without shaft coupling (default)	●	●	●	●	●	●	●
AB	– SAE J744 A / ANSI B92.1 16/32-9 teeth (A)	●	●	●	●	●	●	
AC	– SAE J744 A / ANSI B92.1 16/32 - 11 teeth				•		•	
AD	– SAE J744 A / ANSI B92.1 16/32 - 13 teeth			•	•		•	•
AE	– SAE J744 B without shaft coupling	•	•	•	•	•	•	•
AF	– SAE J744 B / ANSI B92.1 16/32-13 teeth (B)	•	•	•	•	•	•	•
AG	– SAE J744 B / ANSI B92.1 16/32-15 teeth (B-B)	•	•	•	•			•
AH	– SAE J744 C without shaft coupling	•	•	•	•	•	•	•
AJ	– SAE J744 C / ANSI B92.1 12/24-14 teeth (C)	•	•	•	•	•	•	•
AK	– SAE J744 C / ANSI B92.1 16/32 - 21 teeth		•	•	•		•	
AL	– SAE J744 C / ANSI B92.1 16/32 - 23 teeth			•	•	•	•	
AM	– SAE J744 D without shaft coupling				•	•	•	•
AN	– SAE J744 D / ANSI B92.1 8/16-13 teeth (D)				•			
AP	– SAE J744 D / ANSI B92.1 12/24 - 17 teeth				•			
AQ	– SAE J744 D / ANSI B92.1 16/32 - 27 teeth				•	•	•	
AR	– SAE J744 E without shaft coupling						•	•
AS	– SAE J744 E / ANSI B92.1 16/32 - 27 teeth						•	
26 27	**Auxiliary Pump or Tandem Adapter**							
00	– without	●	●	●	●	●	●	●
BA	– internal gear pump 16cc	●	●	•	•			
BB	– internal gear pump 22,5cc	•	•	●	●			
BC	– internal gear pump tandem 16+16cc	•	•	•	•			
BD	– internal gear pump tandem 16+22,5cc	•	•	•	•			
BE	– internal gear pump tandem 22,5+16cc	•	•	•	•			
BF	– internal gear pump tandem 22,5+22,5cc	•	•	•	•			
BG	– external gear pump 31cc (*r)			•	•			
BH	– external gear pump 38cc			•	•		•	•
BJ	– external gear pump 44cc (*r)						•	•
BK	– external gear pump tandem 22,5+22,5 cc (*r)				•	•	•	•
BL	– HPV/R 55 mounting preparation (*s)	•	•	•	•	•	•	•
BM	– HPV/R 75 mounting preparation (*s)		•	•	•	•	•	•
BN	– HPV/R 105 mounting preparation (*s)			•	•	•	•	•
BP	– HPV/R 135 mounting preparation (*s)				•	•	•	
BQ	– HPV/R 210 mounting preparation (*s)						•	•
28	**Auxiliary Drive on Internal Gear Pump**							
0	– Without internal gear pump	●	●	●	●	●	●	●
A	– SAE J744 A / ANSI B92.1 16/32 - 9 teeth (A) (default)	●	●	●	●			
B	– SAE J744 B without shaft coupling	•	•	•	•			
C	– SAE J744 B/ANSI B92.1 16/32 - 13 teeth (B)	•	•	•	•			
D	– SAE J744 B/ANSI B92.1 16/32 - 15 teeth (B-B)	•	•	•	•			
E	– SAE J744 C without shaft coupling			•	•			
F	– SAE J744 C/ANSI B92.1 12/24 - 14 teeth (C)			•	•			
29	**Internal Gear Pump Supply**							
0	– Without internal gear pump	●	●	●	●	●	●	●
E	– External supply port	●	●	●	●			
30 31 32	**Maximum Displacement Setting**							
000	– Catalog Pump Rating	●	●	●	●	●	●	●
33	**Operating Speed**							
A	– Catalog Pump Rating	●	●	●	●	●	●	●
34 35	**Special Requirements**							
00	– Without special requirements (default)	●	●	●	●	●	●	●
36	**Surface Coating**							
0	– Anti rust conservation oil (default)	●	●	●	●	●	●	●
A	– Primer blue	●	●	●	●	●	●	●
37	**Unit Identification**							
A	– Eaton	●	●	●	●	●	●	●
38	**Type Code Release**							
A	– Revision Level A	●	●	●	●	●	●	●

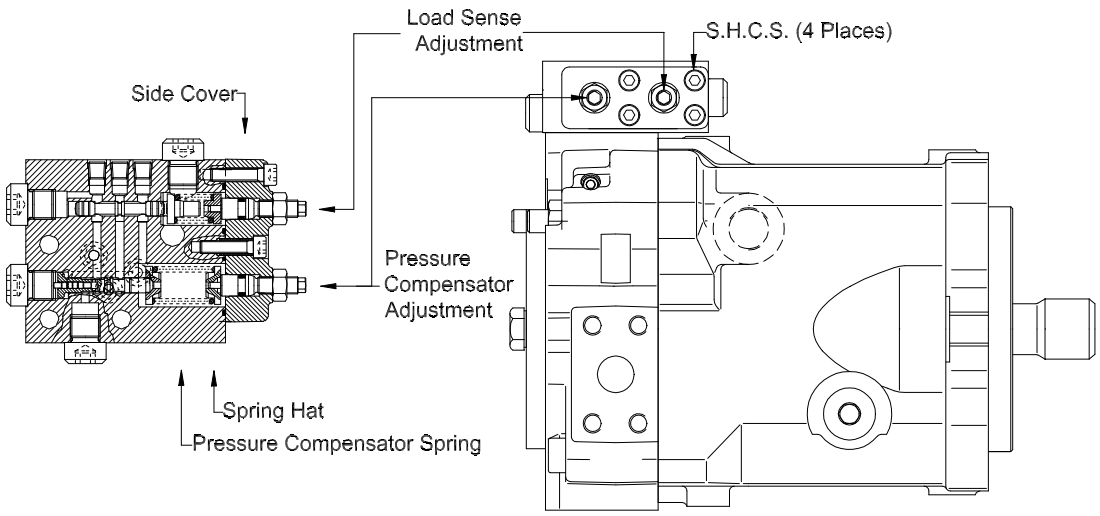
• Available Option ● Preferred Option ♦ Separate Specification Required

Exchanging Pressure Compensator Springs

Set-up and Procedure

⚠ Important

Care should be taken when removing the last S.H.C.S. The Side Cover is spring-loaded by the Pressure Compensator Spring and it may spring-out at you when the last S.H.C.S. is removed.



Pressure Compensator

Part Number	Spring Pressure Range, bar	Spring Free Length, mm	Spring Wire Diameter, mm
000 921 2428	125-230	35.4	2.4
000 921 2447	230-350	40.0	2.4
000 921 2551	350-420	45.1	2.5

Procedure to Exchange Pressure Compensator Springs

1. Remove the four socket head cap screws (S.H.C.S) from the Side Cover with the 5mm Allen wrench. Keep them for reuse.
2. Remove the Side Cover from the pump control. Make sure not to lose or damage the two o-rings between the Side Cover and the pump control. Keep the two o-rings for reuse.
3. Remove the Spring Hat from the Pressure Compensator Spring. Keep for reuse.
4. Remove the existing Pressure Compensator Spring from the pump control.
5. Install the new Pressure Compensator Spring into the pump control. See table above for available springs.
6. Reinstall the Spring Hat from step #3.
7. Prior to reinstalling the Side Cover, make sure that the two o-rings are in good condition (i.e. not damaged) and are properly positioned in the o-ring grooves.
8. Reinstall the Side Cover onto the pump control. Secure the Side Cover with the four S.H.C.S.removed in step #1.

⚠ **Note:** Since the Pressure Compensator Spring pre-loads the Side Cover, you will have to compress the spring in order to get the threads of the first S.H.C.S. started. To do this, you will have to push in the Side Cover to compress the spring. For the higher pressure rated springs, the assistance of a second person or a clamping device may be required.

9. Tighten each S.H.C.S. with the 5mm Allen wrench and torque each one to 14 N-m (10 ft-lb).
10. Restamp the pump control with the new Control Part Number to reflect the correct spring.
Refer to Eaton for a listing of control part numbers.

Externally Disabling the Load Sense

Set-up and Procedure

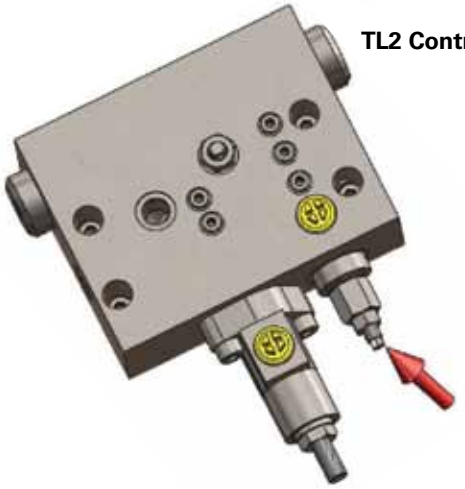
⚠ Important

This procedure must be performed in a clean environment using clean Parts, Tools and Lubricants

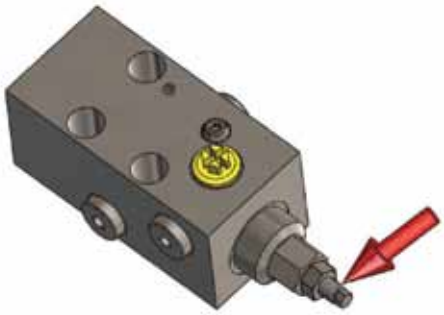
LP Control

E1L Control

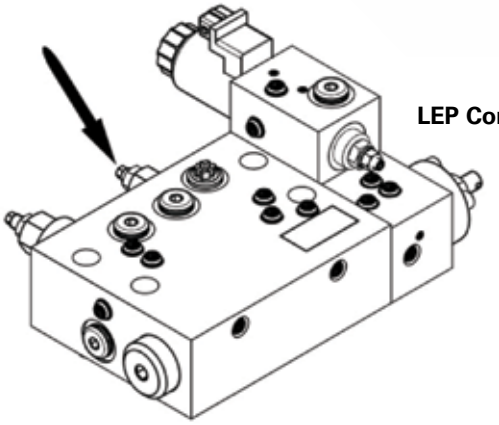
TL2 Control



H1L Control



LEP Control



Procedure to Externally Disable the Load Sense

1. While holding the Adjustment Stud stationary with the 6mm wrench, loosen the Locking Nut on the Load Sense Adjustment with the 13mm wrench.
2. Turn the Adjustment Stud IN fully until it cannot be turned in anymore.
3. Hold the Adjustment Stud stationary and tighten the Locking Nut.
4. Remove the plastic shipping plug from the load sense (LS) port and install the metal M14 plug. Torque the metal plug per the table to the right.

⚠ **Important** Each style pump control is equipped with two load sense (LS) ports. Each pump shipped from Eaton will have a plastic shipping plug in one of the load sense ports and a metal plug in the other (unless otherwise instructed by the customer). Step #4 is extremely critical. Failure to replace the plastic shipping plug with a metal plug could result in oil spillage and/or personal injury.

Plug Part Number	Plug Type	Torque
9148010156	DIN	45 N-m (33 ft-lb)
0009524020	ISO	25 N-m (18 ft-lb)
0009033200	UNF	30 N-m (22 ft-lb)

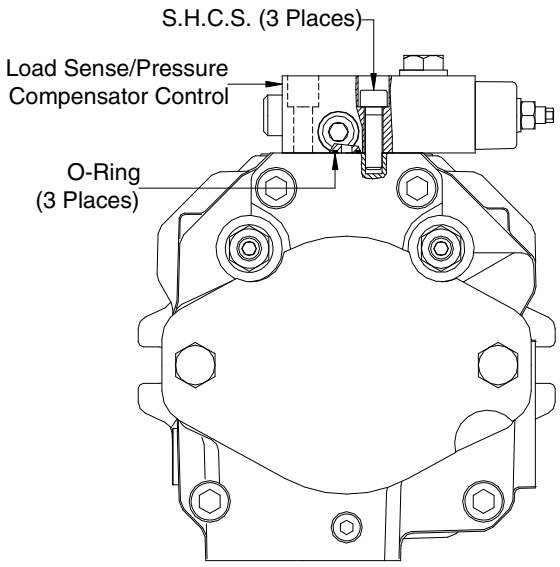
Exchanging Control Types LP, E1L and H1L

Set-up and Procedure

Important

This procedure is for control types LP, E1L and H1L only.

A LP control type



Procedure to Exchange Pump Controls

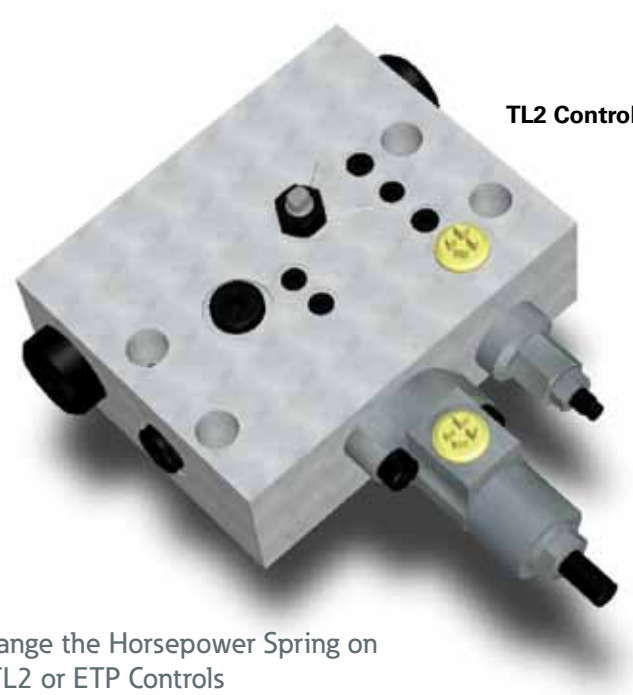
1. Remove the three S.H.C.S. with the 6mm Allen wrench and keep them for reuse.
2. Remove the existing control from the pump. Make sure to remove all O-Rings along with the existing control.
3. Make sure that all the O-Rings are in good condition (i.e. undamaged) and are properly placed in the o-ring grooves on the new control.
4. Align the passages in the new pump control with those on the pump rear head, then install the new control onto the pump and fasten it with the three S.H.C.S. from step #1.
5. Tighten the S.H.C.S. with the 6mm Allen wrench and torque each one to 23 N-m (17 ft-lb).

Exchanging the Horsepower Spring with TL2 or ETP Controls

Set-up and Procedure

⚠ Important

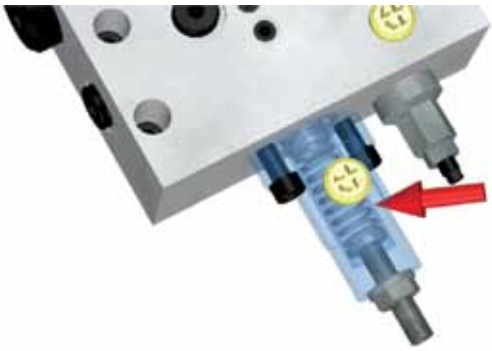
This document is valid for HPR pumps with TL2 and ETP controls. This document uses a TL2 control type to demonstrate all necessary steps for the conversion but it is also valid for ETP control type.



TL2 Control for HPR Pump

Procedure to Exchange the Horsepower Spring on HPR Pumps with TL2 or ETP Controls

1 The horsepower spring is shown in this image.



2 Use a 6mm Allen wrench to remove the two bolts that attach the spring housing to the control block.

3 Remove the spring housing as shown here.

4 Remove the spool as shown here.

⚠ **Note**: Loosening the yellow plastic plug shown in this image will make the spool removal easier.

Exchanging the Horsepower Spring with TL2 or ETP Controls

Procedure Continued

⚠ Important

Pay attention to the o-ring between the spring housing and the control block. Make sure that it is installed correctly.

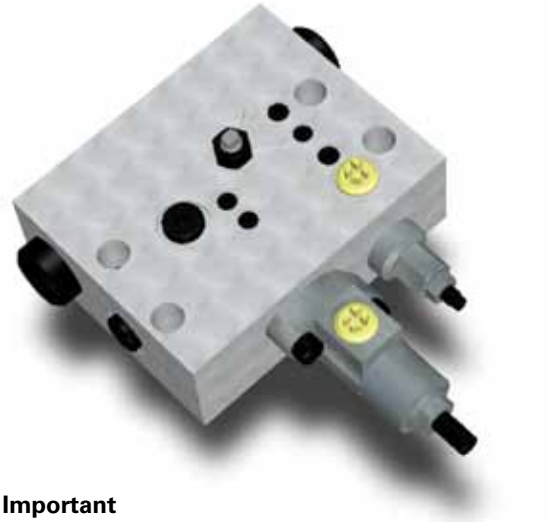
5. Use a 21mm wrench to loosen the lock nut as shown here.

6. Once the lock nut is loose, remove the spring and the two spring hats as shown here.

7. Replace the spring with the new one.
8. Place the new spring between the two spring hats as shown here.
9. Install the spring hats, spring and the lock nut back into the spring housing.
10. Hand tight the lock nut to keep it in position.
11. Torque the lock nut to 45 ft-lb (61 Nm).

12. Install the spool back into the spring housing as shown here. Please note the spool orientation

13. Install the spring housing back on the control block.
14. Use the existing bolts to secure the spring housing and Torque them to 17ft-lb (23 N-m).



⚠ Important

At the end of this procedure, this unit must be functionally tested to insure the proper horsepower setting.

Activating the Z1 and Z2 Ports on HPR Pumps with TL2 or ETP Controls

Set-up and Procedure

Important

This document was created using an HPR pump with TL2 control; it is also valid for HPR pumps with ETP controls.

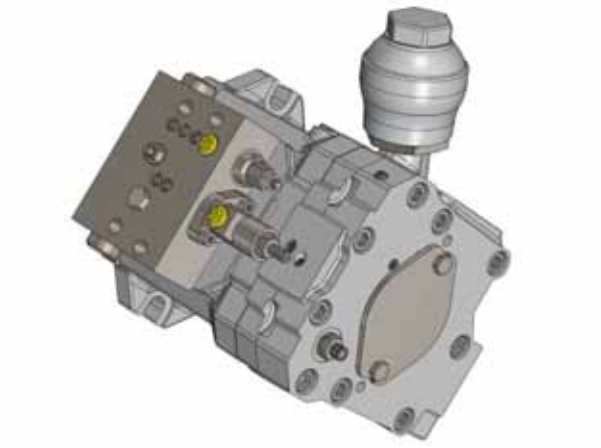
For a better view, some of the images in this document show the pump control only. It is not necessary to remove the control from the pump in order to complete this procedure.

This procedure must be performed in a clean environment using clean Parts, Tools and Lubricants.

The following chart shows necessary steps and changes required for different states of operation with the Mechanical Horsepower control:

Operating State	Z1 Port	Z2 Port	Internal Plug	External Connection between Z1 and Z2
Z1 and Z2 are disabled	Externally connected to Z2	Externally connected to Z1	No Plug	An External connection between Z1 & Z2 is required
Only Z1 is enabled	Controlling pressure is required	Metal Plug	No Plug	No External connection required
Only Z2 is enabled	Must be connected to tank	Controlling pressure is required	Internal plug must be installed	No External connection required
Both Z1 and Z2 are enabled	Controlling Pressure is required	Controlling Pressure is required	Internal Plug must be installed	No external connection required

Procedure to Install the Internal Plug to Enable Z2 Function



1. Remove the two bolt holding the horsepower adjustment assembly as shown here.

2. Remove the horsepower adjustment assembly as shown here.

3. Inspect the o-ring on the horsepower adjustment assembly, replace it if necessary.

Activating the Z1 and Z2 Ports on HPR Pumps with TL2 or ETP Controls

Set-up and Procedure

4 Install the M4X6 plug (P/N 9133339061) in the threaded passage and torque it to 1.70 N-m (15 in-lb) shown here.

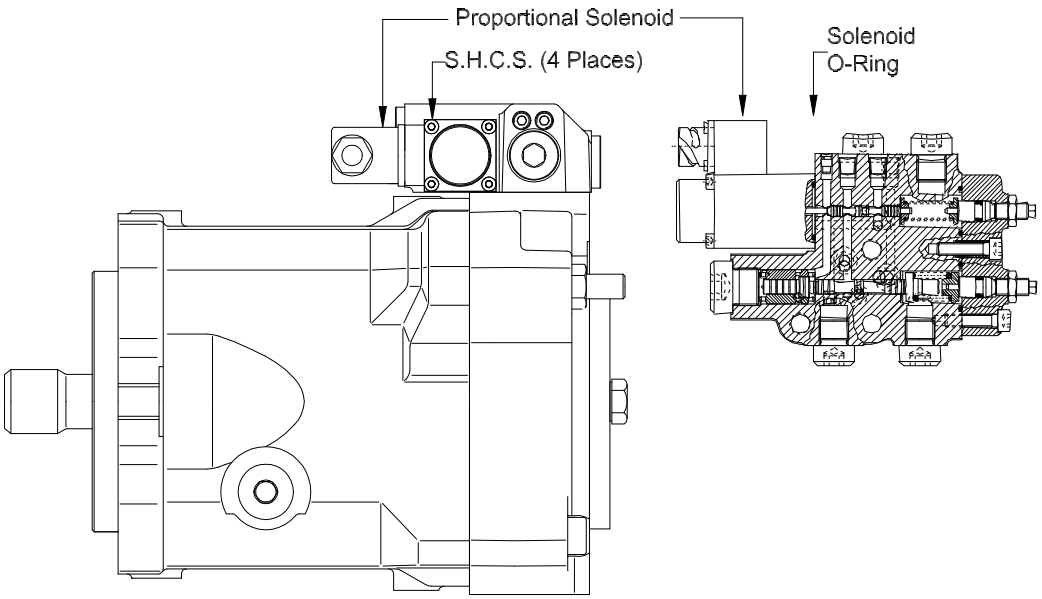
A better view of the control block with the plug installed.

5 Install the horsepower adjustment assembly as shown here.

6 Install the two bolts and torque them to 23 N-m (17 ft-lb).

Exchanging Solenoids on E1L Controls

Set-up and Procedure



Procedure to Exchange Solenoids

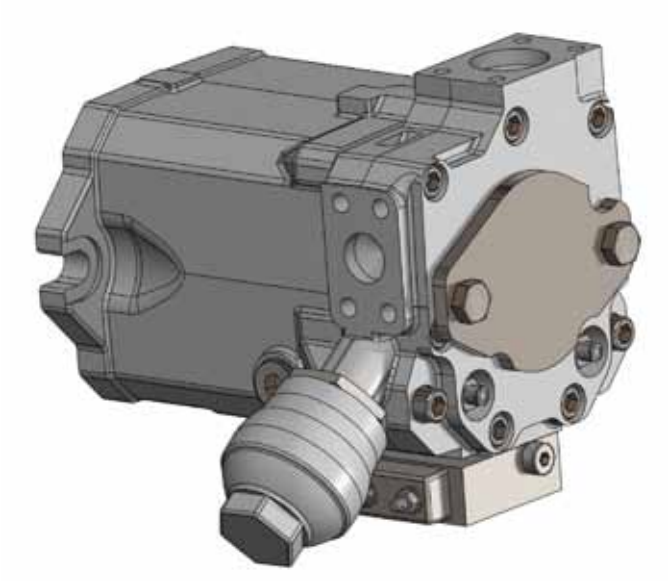
1. Remove the four S.H.C.S. from the Proportional Solenoid with the 3mm Allen wrench. Keep the four S.H.C.S. with the existing solenoid as an assembly.
2. Remove the existing Solenoid O-Ring and keep it with the existing solenoid as an assembly.
3. Make sure that the new Solenoid O-Ring is in good condition (i.e. undamaged) and is properly placed in the o-ring groove on the new solenoid.
4. Install the new Proportional Solenoid onto the pump control and fasten it with the four new S.H.C.S. that came with the new solenoid.
5. Tighten the S.H.C.S. with the 3mm Allen wrench and torque each one to 2.7 N-m (2.0 ft-lb).

Installing a PTO Kit Directly (Without Auxiliary Pump)

Set-up and Procedure

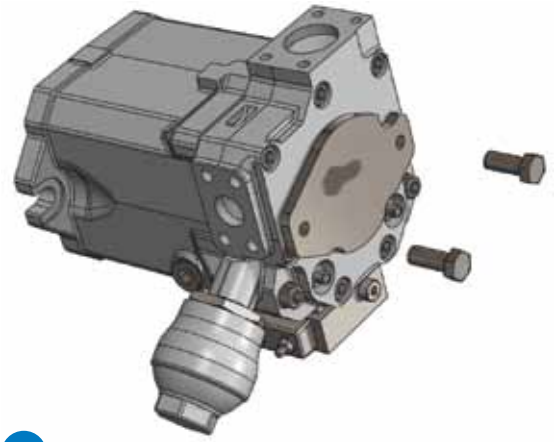
Important

This procedure is valid for all sizes of HPR pumps (without auxiliary pumps) and various sizes of PTO kits. The steps in this document are performed using an HPR135 with LP control type and an SAE C PTO kit.



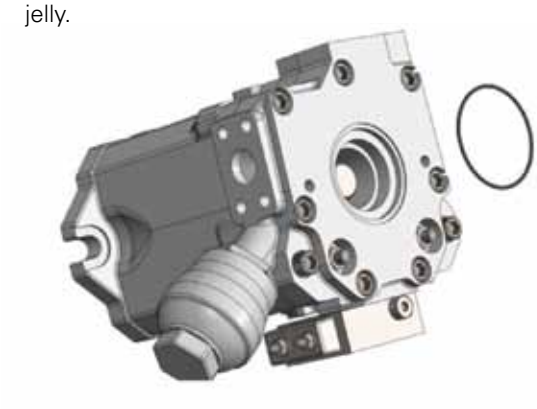
Procedure to Install a PTO Kit onto HPR Pumps Directly (Without Auxiliary Pump)

1. Remove the two bolts that secure the PTO cover on the back of the HPR pump.



2. Remove the PTO cover as shown here.

3. Remove the o-ring and inspect it to make sure that it is not damaged.
4. Install the o-ring back on the pump using petroleum jelly.



Important

This procedure must be performed in a clean environment using clean Parts, Tools and Lubricants.

Installing a PTO Kit Directly (Without Auxiliary Pump)

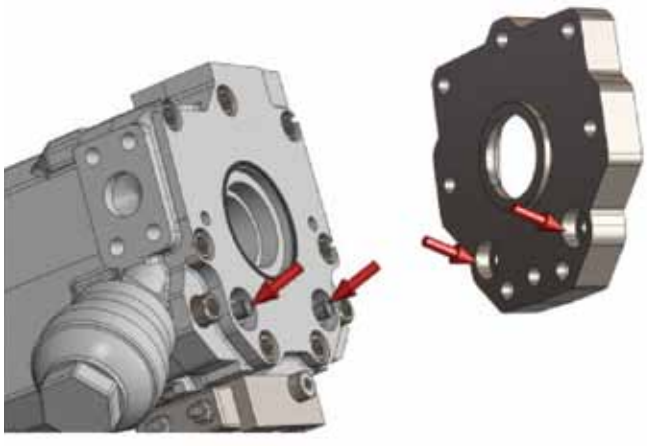
Procedure Continued

Important

This procedure is valid for all sizes of HPR pumps (without auxiliary pumps) and various sizes of PTO kits. The steps in this document are performed using an HPR135 with LP control type and an SAE C PTO kit.

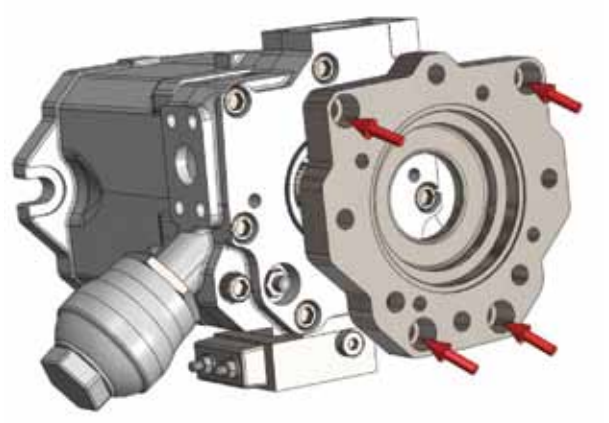
Procedure to Install a PTO Kit onto HPR Pumps Directly (Without Auxiliary Pump)

5 Position the PTO plate as shown here.



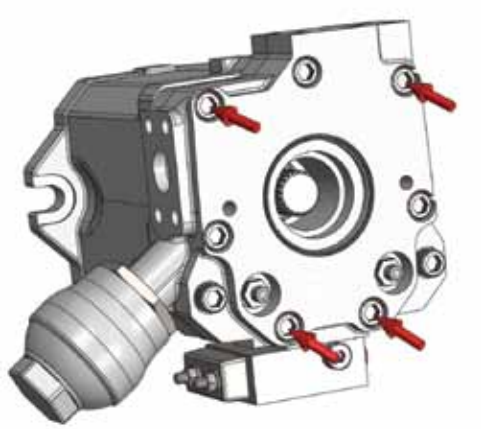
Important PTO plates used with HPR pumps differ in look and size. In order to install the PTO plate properly, you must align the two cavities marked in this image with the minimum and maximum displacement adjustments on the HPR pump.

6 Identify the bolts on the HPR pump's rear head that match with the bolt holes on the PTO plate.

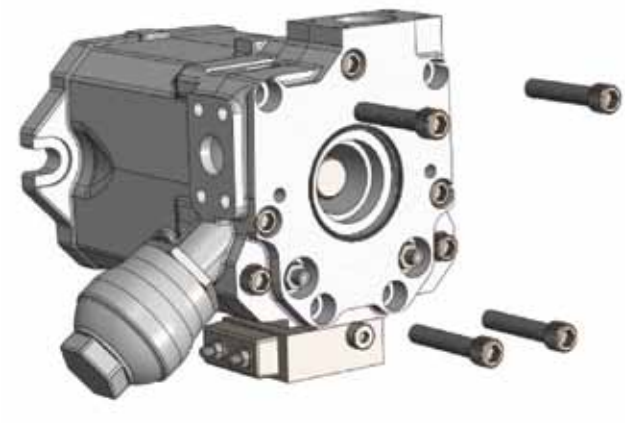


7 In order to install the PTO plate, the identified bolts must be removed.

Important Do not remove all the bolts from the rear head; this will result in separating the rear head from the housing which will require further disassembly of the pump to correct.



Important The location and number of removed bolts may vary depending on the HPR pump's size and the PTO kit selected.



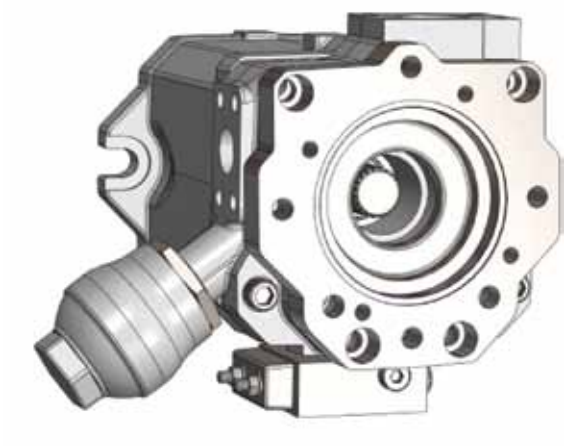
Installing a PTO Kit Directly (Without Auxiliary Pump)

Procedure Continued

Important

This procedure is valid for all sizes of HPR pumps (without auxiliary pumps) and various sizes of PTO kits. The steps in this document are performed using an HPR135 with LP control type and an SAE C PTO kit.

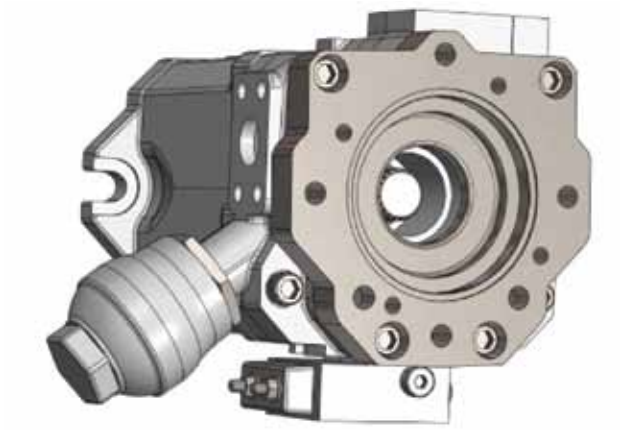
8. Install the PTO plate on the HPR pump's rear head as shown here.



Important Pay attention to the o-ring on the rear head to prevent damages.

9. Align bolt holes on the PTO plate with the holes on the rear head.

10. Install the new bolts on the PTO plate as shown here.

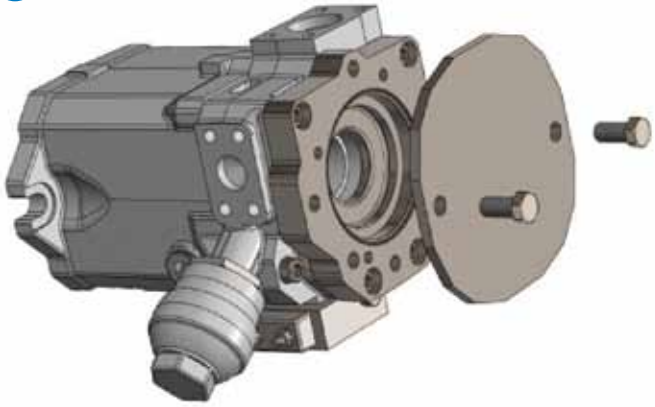


Important These new bolts are longer than the original bolts removed from the rear head. For the correct bolt length and part number refer to Lindos.

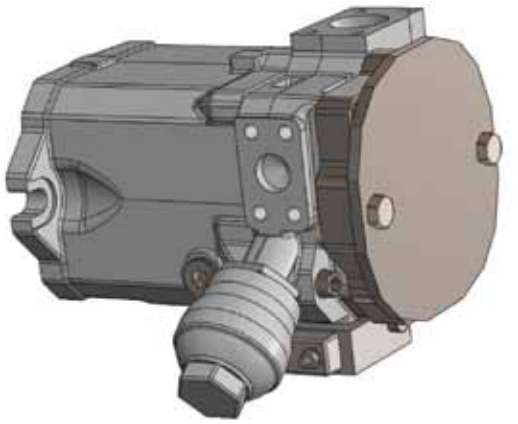
11. Torque the bolts. (See torque chart at the end of this document).

12. Install the new o-ring on the back of the PTO Plate using petroleum jelly.

13. Install the new PTO Cover as shown here.



14. Tighten the bolts on the PTO cover.



Installing a PTO Kit Directly (Without Auxiliary Pump)

Torque Chart

Torque Chart

	Dimension	Tourque (ft/lb)						
		4.6	4.8	5.8/22H/45H	6.8	8.8	10.9	12.9
Standard Thread	M4	0.7	1.0	1.3	1.5	2.0	2.8	3.4
	M5	1.5	2.0	2.5	3.0	4.1	5.9	7.0
	M6	2.7	3.5	4.4	5.2	7.0	9.6	11.8
	M8	6	8	10	13	17	24	29
	M10	13	17	21	25	34	47	57
	M12	22	30	37	44	59	81	100
	M14	35	46	58	69	92	133	159
	M16	54	74	90	108	144	203	243
	M20	107	140	177	213	284	398	479
	M24	184	243	302	365	487	686	811
	M30	376	498	620	738	996	1364	1659
	M36	649	863	1084	1298	1733	2434	2876
Fine Pitch Thread	M8 X 1	7	9	12	14	18	26	31
	M10 X 1	15	19	24	29	38	53	70
	M10 X 1.25	13	18	22	27	36	50	60
	M12 X 1.25	24	32	41	49	65	92	111
	M12 X 1.5	23	30	38	46	61	85	103
	M14 X 1.5	38	52	64	77	103	144	173
	M16 X 1.5	58	77	96	116	155	218	258
	M18 X 1.5	85	111	140	170	225	313	376
	M20 X 1.5	118	155	195	236	313	443	531
	M22 X 1.5	159	210	262	313	420	590	708
	M24 X 2	199	266	332	398	531	738	885
	M27 X 2	291	387	483	579	774	1106	1328
	M30 X 2	398	535	667	800	1069	1512	1844
	M36 X 3	686	922	1151	1379	1844	2581	3024

Maximum Displacement Adjustment Procedure

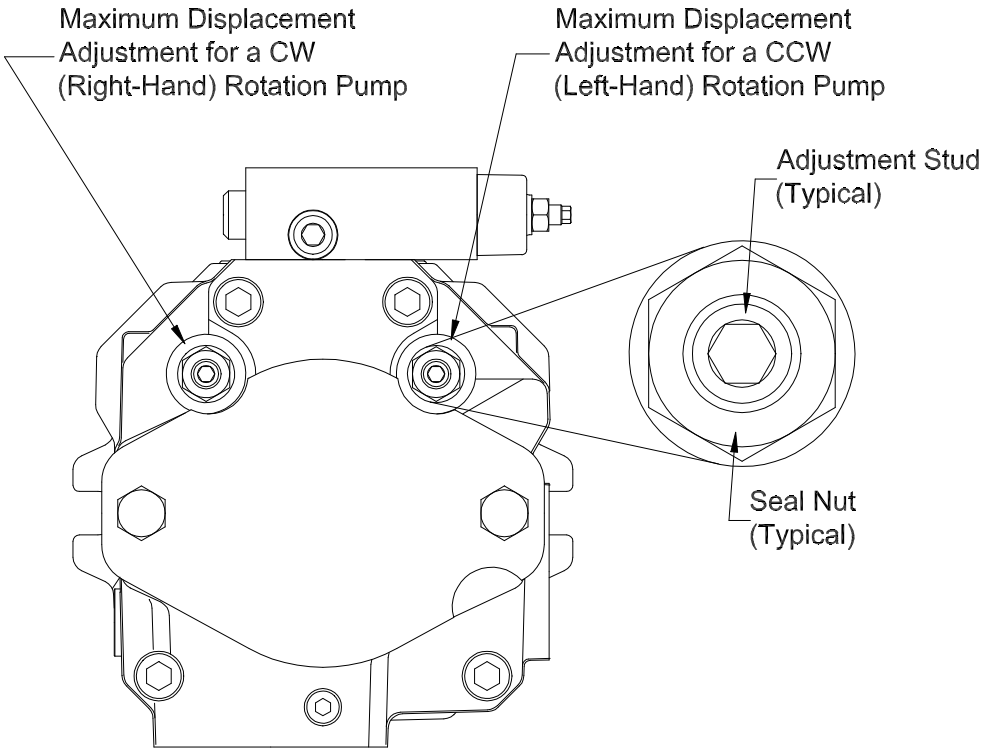
Set-up and Procedure

Important

If performing this procedure on a vehicle, care must be taken. The pump will be put on stroke during this procedure, hence all personnel should be removed from the area of the machine. If using the pump for a propelling function, then the vehicle must be safely elevated to allow the propel motor to free-wheel.

Important

These instructions are ONLY valid for single HPR pumps.



Adjustment Procedure to Set the Pump at Maximum Displacement

Note: The prime mover can be OFF for this procedure.

1. Use the figure above to determine where the "Maximum Displacement Adjustment" is for the rotation of your pump.
2. Hold the adjustment stud stationary with the 6mm Allen wrench and loosen the seal nut with the 19mm wrench.
3. Turn the adjustment stud OUT until you feel it lose contact with the stroking piston inside of the pump.
4. Slowly turn the adjustment stud IN until you feel it just touch the stroking piston inside of the pump, then turn the adjustment stud IN 1/4 turn.
5. Hold the adjustment stud stationary with the 6mm Allen wrench and tighten the seal nut with the 19mm wrench (The proper torque for the seal nut is 60 N-m [44 ft-lb]).

Adjustment Procedure to Destroke the Pump

1. Use the figure above to determine where the "Maximum Displacement Adjustment" is for the rotation of your pump.
2. Start the prime mover and actuate a function that this pump supplies flow to. Make sure that the function you select can accommodate the full flow of the pump.
3. Hold the adjustment stud stationary with the 6mm Allen wrench and loosen the seal nut with the 19mm wrench.
4. Slowly turn the adjustment stud IN until the desired pump flow is acquired.
5. Hold the adjustment stud stationary with the 6mm Allen wrench and tighten the seal nut with the 19mm wrench (The proper torque for the seal nut is 60 N-m [44 ft-lb]).

Note: To decrease the maximum pump flow, turn the adjustment stud IN.

To increase the maximum pump flow, turn the adjustment stud OUT.

Minimum Displacement Adjustment Procedure

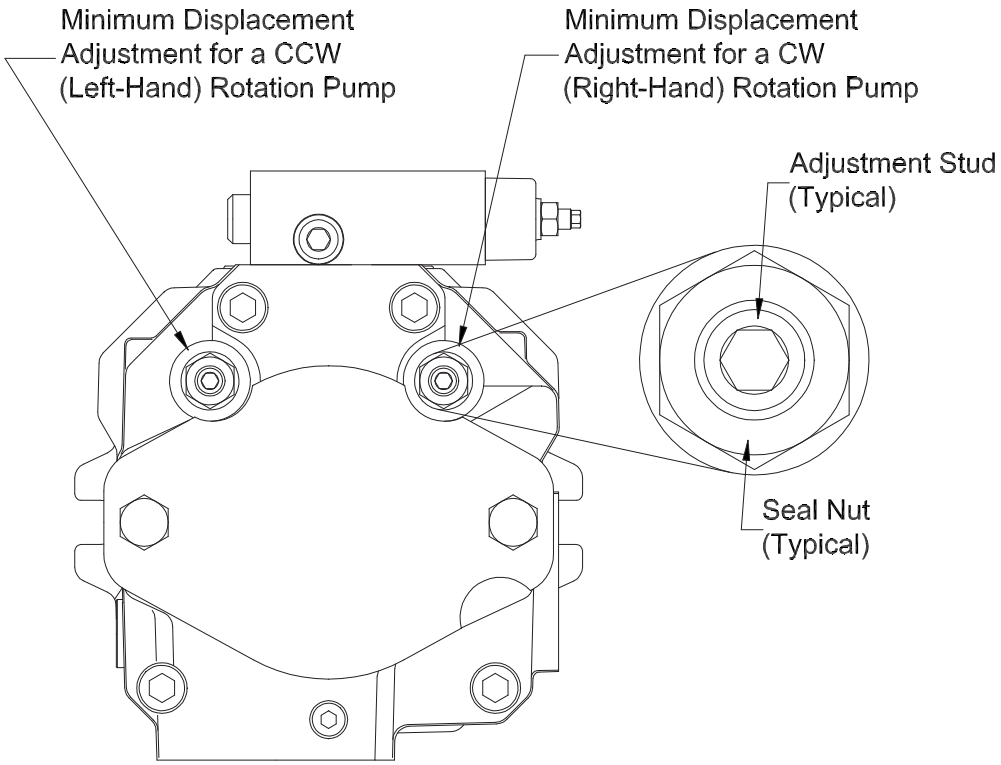
Set-up and Procedure

⚠ Note

This procedure is ONLY intended to be used if the pump minimum displacement setting has been altered or if the stand-by pressure is unusually high.

⚠ Important

These instructions are ONLY valid for single HPR pumps.



Adjustment Procedure to Set the Pump at Minimum Displacement

1. With the prime mover OFF, disconnect the load sense line from the pump control block.
2. Securely plug the end of the load sense line.
3. Leave the load sense port on the pump control block vented to atmosphere.
4. Start the prime mover and adjust it to high idle.
5. To Adjust the Pump Minimum Displacement:

   a Use the figure above to determine where the "Minimum Displacement Adjustment" is for the rotation of your pump.

   b Hold the adjustment stud stationary with the 6mm Allen wrench.

   c Loosen the seal nut with the 19mm wrench.

   d Slowly turn the adjustment stud OUT until you feel it lose contact with the stroking piston inside of the pump.

Warning! The minimum displacement adjustment stud is NOT restricted from being removed completely from the pump. Care must be taken to insure you do not remove the adjustment stud completely from the pump.

e Slowly turn the adjustment stud IN until it just touches the stroking piston inside of the pump.

f Then turn the adjustment stud OUT 1/4 turn.

g Hold the adjustment stud stationary with the 6mm Allen wrench and tighten the seal nut with the 19mm wrench (The proper torque for the seal nut is 60 N-m [44 ft-lb]).

h Turn the prime mover OFF.

i Unplug the end of the load sense line and reconnect it to the load sense port on the pump control block.

Note: To decrease the minimum displacement, turn the adjustment stud OUT

To increase the minimum displacement, turn the adjustment stud IN

Operational Parameters

Life Time Recommendations

Eaton high pressure units are designed for excellent reliability and long service life. The actual service life of a hydraulic unit is determined by numerous factors. It can be extended significantly through proper maintenance of the hydraulic system and by using high-quality hydraulic fluid.

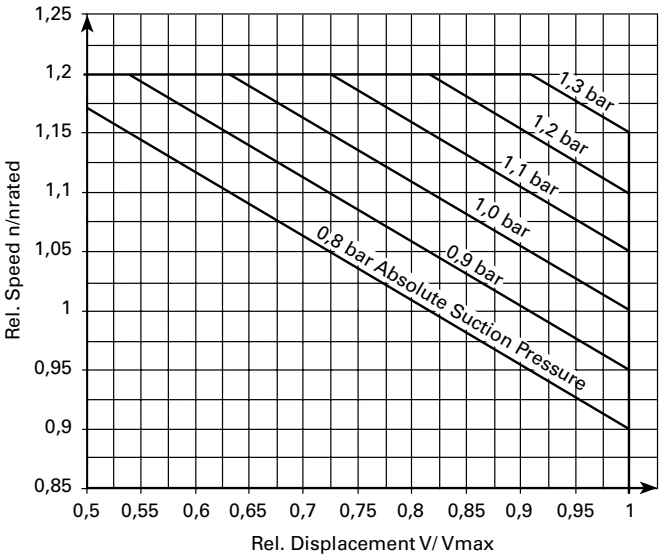
Beneficial Conditions for Long Service Life

Speed	Lower continuous maximum speed
Operating Pressure	Less tan 300 bar Δp on average
Max. Pressure	Only at reduced displacement
Viscosity	15...30 cSt
Power	Continuous power or lower
Purity of Fluid	18/16/13 in accordance with ISO 4406 or better

Adverse Factors Affecting Service Life

Speed	Between continuous maximum speed and intermittent maximum speed
Operating pressure	More than 300 bar Δp on average
Viscosity	Less than 10 cSt
Power	Continuous operation close to maximum power
Purity of fluid	Lower than 18/16/13 in accordance with ISO 4406

Operational Parameters. HPR Suction Speed



Tank connection

The leakage and decompression oil generated during pump operation is drained from the rotating group into the pump housing.

Excessive housing pressure must be avoided through suitably dimensioned piping between the housing and the tank.

Operational Parameters. Filtration

In order to guarantee long-term proper function and high efficiency of the hydraulic pumps the cleanliness level of the lubricant must comply with the following criteria according to Eaton Hydraulic Fluid Recommendation 03-401-2010. Maintaining the recommended cleanliness level can extend the service life of the hydraulic system significantly.

For reliable proper function and long service life

18/16/13 in accordance with ISO 4406 or better

Commissioning

The minimum cleanliness level requirement for the hydraulic oil is based on the most sensitive component. For commissioning we recommend a filtration in order to achieve the required cleanliness level.

Filling and operation of hydraulic systems

The required cleanliness level of the hydraulic oil must be ensured during filling or topping up. When drums, canisters, or large-capacity tanks are used the oil generally has to be filtered. We recommend the implementation of suitable filters to ensure that the required cleanliness level of the oil is achieved and maintained during operation.

International standard

Code Number According to ISO 4406
18/16/13

Operational Parameters

Pressure Fluids

In order to ensure the functional performance and high efficiency of the hydraulic pumps the viscosity and purity of the operating fluid should meet the different operational requirements. Eaton recommends using only hydraulic fluids which are confirmed by the manufacturer as suitable for use in high pressure hydraulic installations or approved by the original equipment manufacturer.

Permitted Pressure Fluids

- Mineral oil HLP to DIN 51 524-2
- Biodegradable fluids in accordance with ISO 15 380 on request
- Other pressure fluids on request

Eaton offers an oil testing service in accordance with VDMA 24 570 and the test apparatus required for in-house sesting. Prices available on request.

Recommended Viscosity Ranges

Pressure Fluid Temperature Range	**[°C]**	**-20 to +90**
Working viscosity range	[mm²/s] = [cSt]	10 to 80
Optimum working viscosity	[mm²/s] = [cSt]	15 to 30
Max. viscosity (short time start up)	[mm²/s] = [cSt]	1000

In order to be able to select the right hydraulic fluid it is necessary to know the working temperature in the hydraulic circuit. The hydraulic fluid should be selected such that its optimum viscosity is within the working temperature range (see tables).

The temperature should not exceed 90 °C in any part of the system. Due to pressure and speed influences the leakage fluid temperature is always higher than the circuit temperature. Please contact Eaton if the stated conditions cannot be met or in special circumstances.

Viscosity Recommendations

Working Temperature [°C]	**Viscosity [mm²/s] = [cSt] at 40 °C**
Approx. 30 to 40	22
Approx. 40 to 60	32
Approx. 60 to 80	46 or 68

Further information regarding installation can be found in the operating instructions.

Eaton Part Numbers

HPR
Self-regulating Pump for
Open Loop Operation

Controls - E1L, ISO Port, 12V DIN p. 8

Part #	Description	Qty
5853400783	E1L, ISO port, 12V DIN	1
9045348186	Cap Screw	3

Controls - E1L, ISO Port, 24V DIN p. 8

Part #	Description	Qty
5853400792	E1L, ISO port, 24V DIN	1
9045348186	Cap Screw	3

Controls - E1L, ISO Port, 12V AMP p. 8

Part #	Description	Qty
5853400787	E1L, ISO port, 12V AMP	1
9045348186	Cap Screw	3

Controls - E1L, ISO Port, 24V AMP p. 8

Part #	Description	Qty
5853400784	E1L, ISO port, 24V AMP	1
9045348186	Cap Screw	3

Horsepower Spring - TL2/ETP p. 9

Part #	Description	Qty
0009218401	Spring	1

E1L Solenoid - 12V AMP p. 11

Part #	Description	Qty
0009736084	Coil, 12V AMP	1
9045371087	Cap Screw	4
0009632216	O-ring	1

E1L Solenoid - 12V DIN p. 11

Part #	Description	Qty
0009736025	Coil, 12V DIN	1
7915001590	Seal	1
0009750508	DIN Plug	1
9045311080	Cap Screw	4
0009632216	O-ring	1

Controls - H1L, ISO Port p. 8

Part #	Description	Qty
5853400793	H1L, ISO port	1
9045348186	Cap Screw	3

Controls - LP, ISO Port, 125-230 bar Press. Comp. p. 8

Part #	Description	Qty
5853900728	LP, ISO port, 125-230 bar Press. Comp.	1
9045348186	Cap Screw	3

Controls - LP, ISO Port, 231-350 bar Press. Comp. p. 8

Part #	Description	Qty
5853900727	LP, ISO port, 231-350 bar Press. Comp.	1
9045348186	Cap Screw	3

Controls - LP, ISO Port, 351-420 bar Press. Comp. p. 8

Part #	Description	Qty
5853900726	LP, ISO port, 351-420 bar Press. Comp.	1
9045348186	Cap Screw	3

E1L Solenoid - 24V AMP p. 11

Part #	Description	Qty
0009736125	Coil, 24V AMP	1
9045371087	Cap Screw	4
0009632216	O-ring	1

E1L Solenoid - 24V DIN p. 11

Part #	Description	Qty
0009736026	Coil, 24V DIN	1
7915001590	Seal	1
0009750508	DIN Plug	1
9045311080	Cap Screw	4
0009632216	O-ring	1

Eaton Part Numbers

HPR
Self-regulating Pump for
Open Loop Operation

HPR055 Auxiliary Flange -
SAE "A" Flange W/ 9T Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
2533051204	9T Coupling	1
2533061300	Cover	1
9008311295	Cap Screw	2

HPR055 Auxiliary Flange -
SAE "B" Flange W/out Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR055 Auxiliary Flange -
SAE "B" Flange W/ 13T Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
2633051208	13T Coupling	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR055 Auxiliary Flange -
SAE "B" Flange W/ 15T Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
2633051207	15T Coupling	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR055 Auxiliary Flange -
SAE "C" Flange W/out Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341308	Cap Screw	4
2632311402	Flange, SAE C	1
9045341318	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
9008311406	Cap Screw	2

HPR055 Auxiliary Flange -
SAE "C" Flange W/ 14T Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341308	Cap Screw	4
2632311402	Flange, SAE C	1
9045341318	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
2533051205	14T Coupling	1
9008311406	Cap Screw	2

Eaton Part Numbers

HPR
Self-regulating Pump for
Open Loop Operation

HPR075 Auxiliary Flange - SAE "A" Flange W/ 9T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2533051204	9T Coupling	1
2533061300	Cover	1
9008311295	Cap Screw	2

HPR075 Auxiliary Flange - SAE "B" Flange W/ 13T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2633051208	13T Coupling	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR075 Auxiliary Flange - SAE "C" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341308	Cap Screw	4
2632311402	Flange, SAE C	1
9045341318	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
9008311406	Cap Screw	2

HPR075 Auxiliary Flange - SAE "C" Flange W/ 21T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341308	Cap Screw	4
2632311402	Flange, SAE C	1
9045341318	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
5973051201	21T Coupling	1
9008311406	Cap Screw	2

HPR075 Auxiliary Flange - SAE "B" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR075 Auxiliary Flange - SAE "B" Flange W/ 15T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2633051207	15T Coupling	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR075 Auxiliary Flange - SAE "C" Flange W/ 14T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341308	Cap Screw	4
2632311402	Flange, SAE C	1
9045341318	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
2533051205	14T Coupling	1
9008311406	Cap Screw	2

Eaton Part Numbers

HPR
Self-regulating Pump for
Open Loop Operation

HPR105 Auxiliary Flange - SAE "A" Flange W/ 9T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2543051201	9T Coupling	1
5813061302	Cover	1
9008311241	Cap Screw	2

HPR105 Auxiliary Flange - SAE "B" Flange W/ 13T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2543051202	13T Coupling	1
2713061301	Cover	1
9008311304	Cap Screw	2

HPR105 Auxiliary Flange - SAE "C" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341310	Cap Screw	5
2642311411	Flange, SAE C	1
9045341318	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
9008311408	Cap Screw	2

HPR105 Auxiliary Flange - SAE "C" Flange W/ 21T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341310	Cap Screw	5
2642311411	Flange, SAE C	1
9045341318	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
2643051203	21T Coupling	1
9008311408	Cap Screw	2

HPR105 Auxiliary Flange- SAE "B" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311304	Cap Screw	2

HPR105 Auxiliary Flange- SAE "B" Flange W/ 15T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2643051208	15T Coupling	1
2713061301	Cover	1
9008311304	Cap Screw	2

HPR105 Auxiliary Flange - SAE "C" Flange W/ 14T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341310	Cap Screw	5
2642311411	Flange, SAE C	1
9045341318	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
2643051206	14T Coupling	1
9008311408	Cap Screw	2

HPR105 Auxiliary Flange - SAE "C" Flange W/23T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341310	Cap Screw	5
2642311411	Flange, SAE C	1
9045341318	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
2643051201	23T Coupling	1
9008311408	Cap Screw	2

Eaton Part Numbers

HPR
Self-regulating Pump for
Open Loop Operation

HPR135 Auxiliary Flange - SAE "A" Flange W/ 9T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2553051203	9T Coupling	1
2733061300	Cover	1
9045311236	Cap Screw	2

HPR135 Auxiliary Flange - SAE "B" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311304	Cap Screw	2

HPR135 Auxiliary Flange - SAE "B" Flange W/ 13T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2653051210	13T Coupling	1
2713061301	Cover	1
9008311304	Cap Screw	2

HPR135 Auxiliary Flange - SAE "B" Flange W/ 15T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2622311411	Flange, SAE B	1
0009631058	O-ring	1
2653051208	15T Coupling	1
2713061301	Cover	1
9008311304	Cap Screw	2

HPR135 Auxiliary Flange - SAE "C" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341367	Cap Screw	5
5992311408	Flange, SAE C	1
9045341372	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
9008311408	Cap Screw	2

HPR135 Auxiliary Flange - SAE "C" Flange W/ 14T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341367	Cap Screw	5
5992311408	Flange, SAE C	1
9045341372	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
5993051209	14T Coupling	1
9008311408	Cap Screw	2

Eaton Part Numbers

HPR
Self-regulating Pump for
Open Loop Operation

HPR135 Auxiliary Flange - SAE "C" Flange W/ 21T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341367	Cap Screw	5
5992311408	Flange, SAE C	1
9045341372	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
5993051207	21T Coupling	1
9008311408	Cap Screw	2

HPR135 Auxiliary Flange - SAE "C" Flange W/23T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341367	Cap Screw	5
5992311408	Flange, SAE C	1
9045341372	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
5993051206	23T Coupling	1
9008311408	Cap Screw	2

HPR135 Auxiliary Flange - SAE "D" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341367	Cap Screw	5
5992311411	Flange, SAE D	1
9045341397	Cap Screw	4
0009631126	O-ring	1
0009646548	Cover	1
9045316524	Cap Screw	2

HPR135 Auxiliary Flange - SAE "D" Flange W/13T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341367	Cap Screw	5
5992311411	Flange, SAE D	1
9045341397	Cap Screw	4
0009631126	O-ring	1
0009646548	Cover	1
2553051207	13T Coupling	1
9045316524	Cap Screw	2

HPR135 Auxiliary Flange - SAE "D" Flange W/17T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341367	Cap Screw	5
5992311411	Flange, SAE D	1
9045341397	Cap Screw	4
0009631126	O-ring	1
0009646548	Cover	1
2653051205	17T Coupling	1
9045316524	Cap Screw	2

HPR135 Auxiliary Flange - SAE "D" Flange W/27T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341367	Cap Screw	5
5992311411	Flange, SAE D	1
9045341397	Cap Screw	4
0009631126	O-ring	1
0009646548	Cover	1
5993051211	27T Coupling	1
9045316524	Cap Screw	2

Eaton Part Numbers

HPR
Self-regulating Pump for
Open Loop Operation

HPR165 Auxiliary Flange - SAE "A" Flange W/ 9T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2563051200	9T Coupling	1
5813061302	Cover	1
9008311233	Cap Screw	2

HPR165 Auxiliary Flange - SAE "B" Flange W/ out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2712311402	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR105 Auxiliary Flange - SAE "B" Flange W/ 13T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2712311402	Flange, SAE B	1
0009631058	O-ring	1
5993051214	13T Coupling	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR165 Auxiliary Flange - SAE "C" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341373	Cap Screw	4
2562311403	Flange, SAE C	1
9045341385	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
9008311408	Cap Screw	2

HPR165 Auxiliary Flange - SAE "C" Flange W/14T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341373	Cap Screw	4
2562311403	Flange, SAE C	1
9045341385	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
5993051213	14T Coupling	1
9008311408	Cap Screw	2

HPR165 Auxiliary Flange - SAE "C" Flange W/23T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341373	Cap Screw	4
2562311403	Flange, SAE C	1
9045341385	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
5993051212	23T Coupling	1
9008311408	Cap Screw	2

HPR165 Auxiliary Flange - SAE "D" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341373	Cap Screw	4
2562311405	Flange, SAE D	1
9045341378	Cap Screw	4
0009631126	O-ring	1
0009646548	Cover	1
9045316524	Cap Screw	2

HPR165 Auxiliary Flange - SAE "D" Flange W/27T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341373	Cap Screw	4
2562311405	Flange, SAE D	1
9045341378	Cap Screw	4
0009631126	O-ring	1
0009646548	Cover	1
2563051202	27T Coupling	1
9045316524	Cap Screw	2

Eaton Part Numbers

HPR
Self-regulating Pump for
Open Loop Operation

HPR210 Auxiliary Flange - SAE "A" Flange W/ 9T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2573051211	9T Coupling	1
5813061302	Cover	1
9008311233	Cap Screw	2

HPR210 Auxiliary Flange - SAE "A" Flange W/ 11T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2573051201	11T Coupling	1
5813061302	Cover	1
9008311233	Cap Screw	2

HPR210 Auxiliary Flange - SAE "A" Flange W/ 13T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2573051207	13T Coupling	1
5813061302	Cover	1
9008311233	Cap Screw	2

HPR210 Auxiliary Flange - SAE "B" Flange W/ out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2712311402	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR210 Auxiliary Flange - SAE "B" Flange W/ 13T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2712311402	Flange, SAE B	1
0009631058	O-ring	1
2573051209	13T Coupling	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR210 Auxiliary Flange - SAE "C" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341372	Cap Screw	5
2572311405	Flange, SAE C	1
9045341385	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
9008311408	Cap Screw	2

HPR210 Auxiliary Flange - SAE "C" Flange W/14T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341372	Cap Screw	5
2572311405	Flange, SAE C	1
9045341385	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
2573051205	14T Coupling	1
9008311408	Cap Screw	2

HPR210 Auxiliary Flange - SAE "C" Flange W/21T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341372	Cap Screw	5
2572311405	Flange, SAE C	1
9045341385	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
2573051212	21T Coupling	1
9008311408	Cap Screw	2

Eaton Part Numbers

HPR
Self-regulating Pump for
Open Loop Operation

HPR210 Auxiliary Flange -
SAE "C" Flange W/23T Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341372	Cap Screw	5
2572311405	Flange, SAE C	1
9045341385	Cap Screw	4
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
2573051206	23T Coupling	1
9008311408	Cap Screw	2

HPR210 Auxiliary Flange -
SAE "D" Flange W/out Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341372	Cap Screw	5
2572311407	Flange, SAE D	1
9045341379	Cap Screw	4
0009631126	O-ring	1
0009646548	Cover	1
9045316524	Cap Screw	2

HPR210 Auxiliary Flange -
SAE "D" Flange W/27T Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341372	Cap Screw	5
2572311407	Flange, SAE D	1
9045341379	Cap Screw	4
0009631126	O-ring	1
0009646548	Cover	1
2573051202	27T Coupling	1
9045316524	Cap Screw	2

HPR210 Auxiliary Flange -
SAE "E" Flange W/out Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341372	Cap Screw	4
2672311406	Flange, SAE E	1
9045341378	Cap Screw	5
0009631102	O-ring	1
0009180164	Cover	1
9045316524	Cap Screw	4

HPR210 Auxiliary Flange -
SAE "D" Flange W/27T Coupling p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045341372	Cap Screw	4
2672311406	Flange, SAE E	1
9045341378	Cap Screw	5
0009631102	O-ring	1
0009180164	Cover	1
2573051208	27T Coupling	1
9045316524	Cap Screw	4

Eaton Part Numbers

HPR
Self-regulating Pump for
Open Loop Operation

HPR280 Auxiliary Flange - SAE "A" Flange W/ 13T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2223051201	13T Coupling	1
5813061302	Cover	1
9008311233	Cap Screw	2

HPR280 Auxiliary Flange - SAE "B" Flange W/ out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2712311402	Flange, SAE B	1
0009631058	O-ring	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR280 Auxiliary Flange - SAE "B" Flange W/ 13T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2712311402	Flange, SAE B	1
0009631058	O-ring	1
2223051207	13T Coupling	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR280 Auxiliary Flange - SAE "B" Flange W/ 15T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
2712311402	Flange, SAE B	1
0009631058	O-ring	1
2223051209	15T Coupling	1
2713061301	Cover	1
9008311302	Cap Screw	2

HPR280 Auxiliary Flange - SAE "C" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045371424	Cap Screw	7
2222311405	Flange, SAE C	1
9045371431	Cap Screw	2
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
9008311408	Cap Screw	2

HPR280 Auxiliary Flange - SAE "C" Flange W/14T Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045371424	Cap Screw	7
2222311405	Flange, SAE C	1
9045371431	Cap Screw	2
0009631107	O-ring	1
0009611084	Seal	1
0009646551	Cover	1
2223051210	14T Coupling	1
9008311408	Cap Screw	2

HPR280 Auxiliary Flange - SAE "D" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045371424	Cap Screw	4
2222311406	Flange, SAE D	1
9045371431	Cap Screw	5
0009631126	O-ring	1
0009646548	Cover	1
9045316524	Cap Screw	2

HPR280 Auxiliary Flange - SAE "E" Flange W/out Coupling

p. 12

Part #	Description	Qty
0009630840	O-ring	1
9045371424	Cap Screw	4
2222311404	Flange, SAE E	1
9045371431	Cap Screw	5
0009631102	O-ring	1
0009180164	Cover	1
9045316524	Cap Screw	4

Eaton
Hydraulics Group USA
14615 Lone Oak Road
Eden Prairie, MN 55344
USA
Tel: 952-937-9800
Fax: 952-294-7722
www.eaton.com/hydraulics

Eaton
Hydraulics Group Europe
Route de la Longeraie 7
1110 Morges
Switzerland
Tel: +41 (0) 21 811 4600
Fax: +41 (0) 21 811 4601

Eaton
Hydraulics Group Asia Pacific
Eaton Building
No.7 Lane 280 Linhong Road
Changning District, Shanghai
200335 China
Tel: (+86 21) 5200 0099
Fax: (+86 21) 2230 7240

Powering Business Worldwide

Printed in USA
Document No. E-PUPI-TM019-E
July 2012