



Procedure to Install Power Take-Off (PTO) Kits onto HPV-02 Pumps

Document No: 1064

Rev. 1

Conversion Bulletin

Page 1 of 14

The instructions contained in the following Conversion Bulletin are valid for all size HPV-02 pumps. Appearances and dimensions of the illustrations in this Conversion Bulletin will vary according to the size HPV-02 pump the user is working with.

There are two(2) procedures included in this Conversion Bulletin:

Procedure "A": How to install an SAE "A" PTO Kit on an HPV-02 pump

Procedure "B": How to install an SAE "B" or "C" PTO Kit on an HPV-02 pump

Tools/Equipment Required for Procedure "A":

- metric wrenches
- torque wrench (setting as specified)

Tools/Equipment Required for Procedure "B":

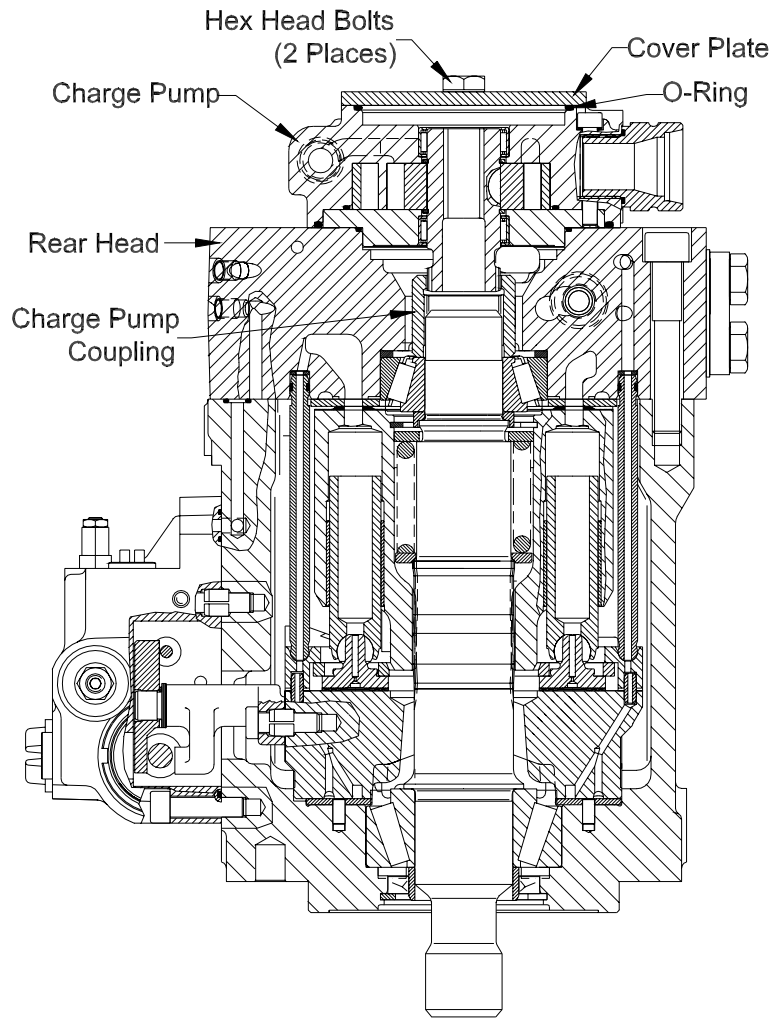
- metric wrenches
- metric Allen wrenches
- PTO Kit for HPV-02 (please refer to Linde Price and Policy Guide for part numbers)
- snap ring wrench (to open or expand a snap ring)
- torque wrench capable of setting between 13 N-m (10 ft-lb) and 85 N-m (63 ft-lb)

Procedure "A":

1. The illustration on the following page highlights some key items that will be referenced throughout *Procedure "A"*.

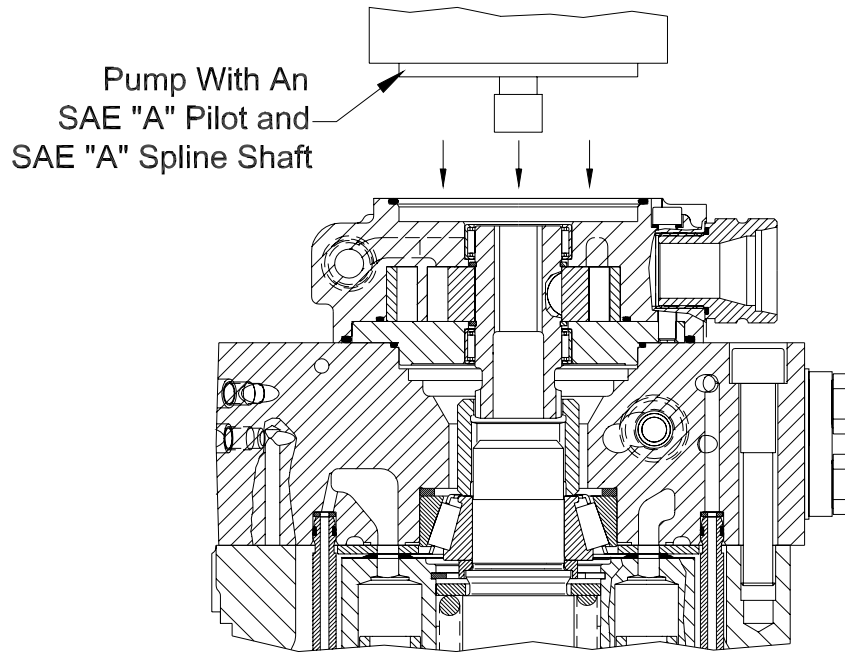
Note:

All HPV-02 pumps supplied from Linde **with** a Linde charge pump is already equipped with an SAE "A" PTO Kit. As explained on the following page, there is no additional hardware required to have an SAE "A" PTO.



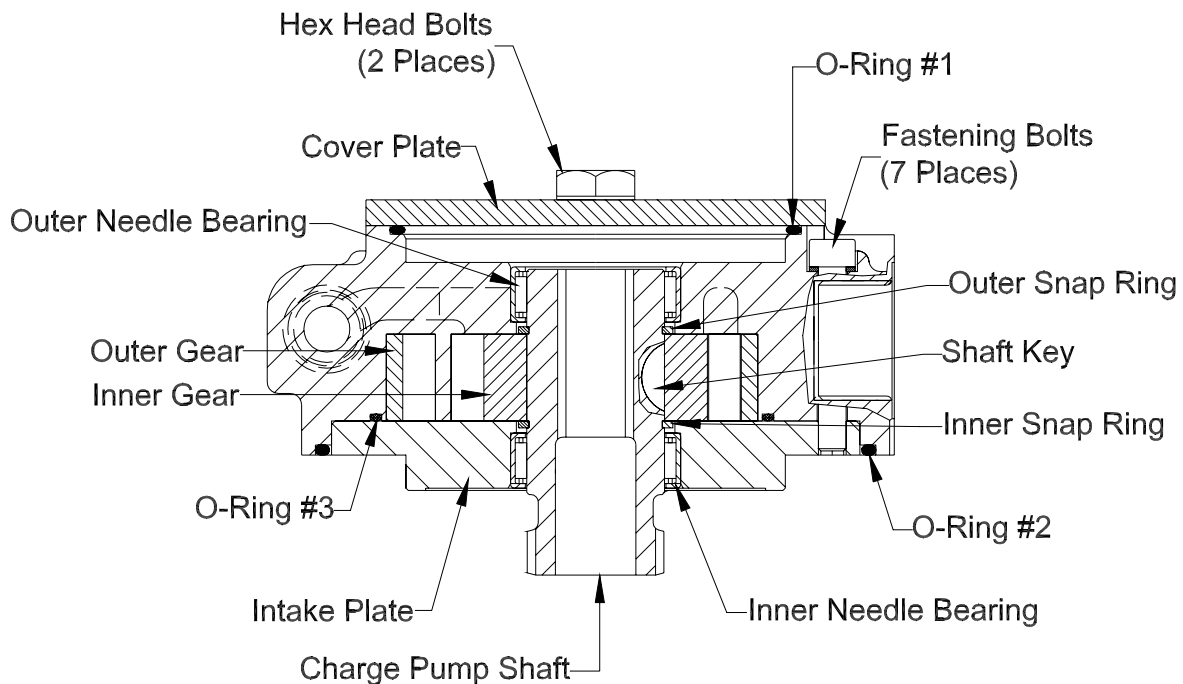
2. Remove and discard the two(2) *Hex Head Bolts* from the back of the pump.
3. Remove and discard the *Cover Plate* from the back of the pump.
4. Inspect the *O-Ring* to ensure that it is good condition (i.e. undamaged) - Replace if damaged. Make sure that the *O-Ring* is properly positioned in the o-ring groove. You can use a little grease to help hold it in position.
5. As illustrated on the following page, install the pump with an SAE "A" pilot and SAE "A" spline drive shaft into the back of the HPV-02 charge pump. You may have to rotate the new pump drive shaft to allow its splines to align with the splines in the charge pump coupling.

Fasten the new pump to the HPV-02 charge pump with threaded bolts (not supplied by Linde) and torque accordingly.

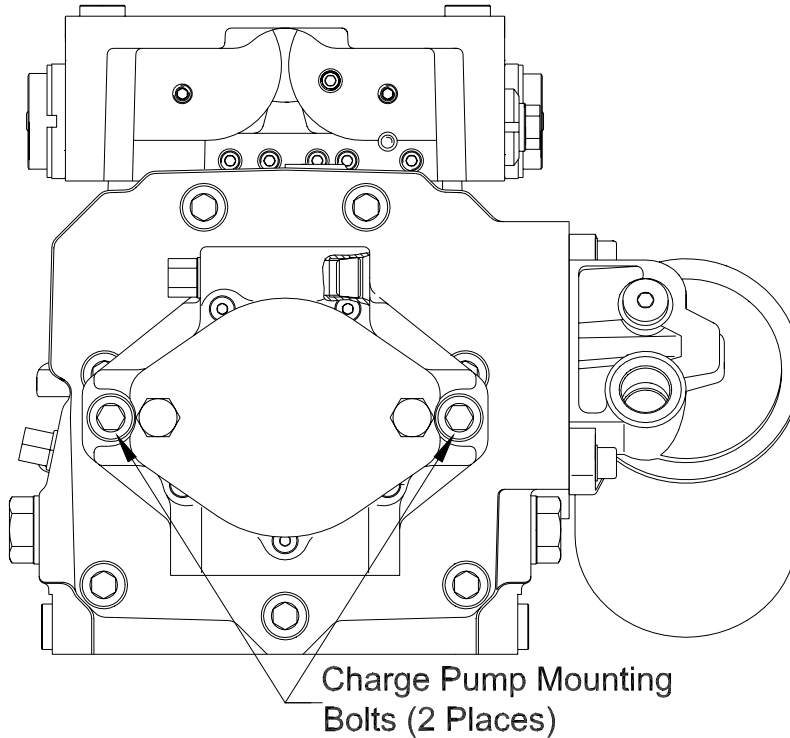


Procedure "B":

1. The illustration below highlights some key items that will be referenced throughout *Procedure "B"*.

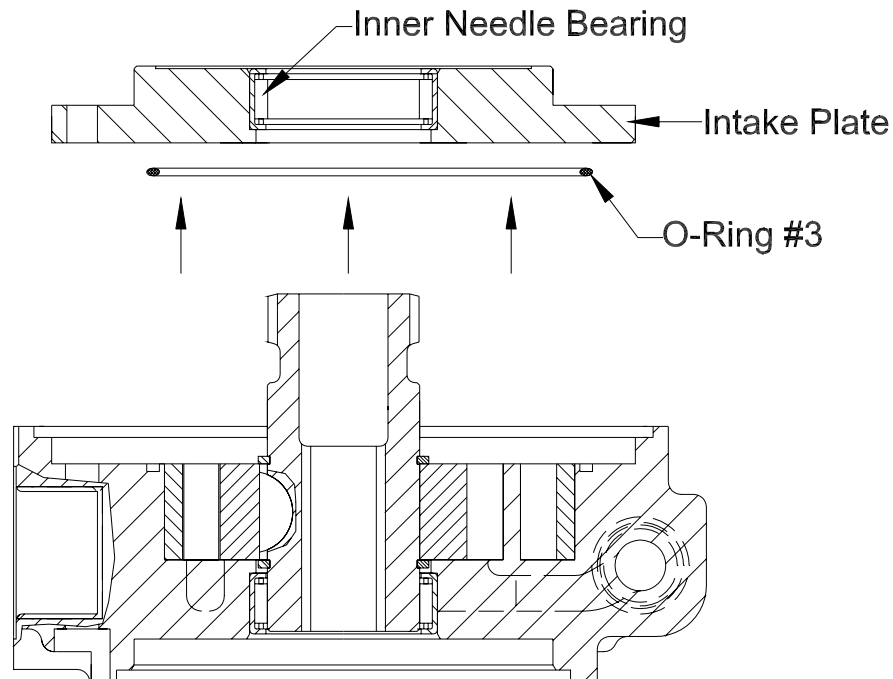


2. Remove and discard the two(2) *Charge Pump Mounting Bolts*. Remove the *Charge Pump* and *Charge Pump O-Ring* from the back of the HPV-02. Keep the *Charge Pump O-Ring* for reuse.

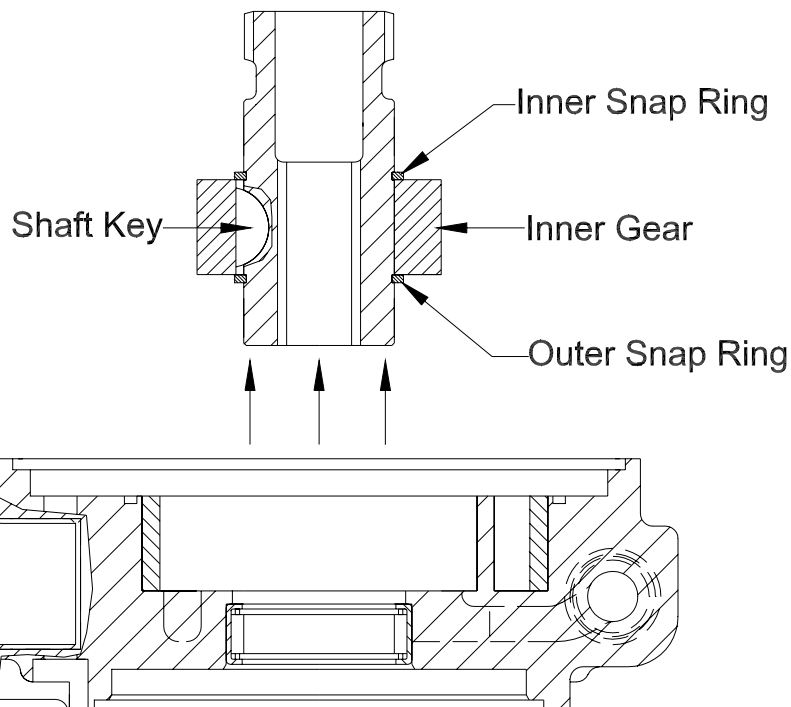


3. Remove the two(2) *Hex Head Bolts*.
4. Remove the *Cover Plate*.
5. Remove *O-Ring #1* and inspect it for damage. Replace it if damaged, otherwise keep it for reuse.
6. Remove *O-Ring #2* and inspect it for damage. Replace it if damaged, otherwise keep it for reuse. Remove the seven(7) *Fastening Bolts* and *Washers* and keep them for reuse.
7. Position the *Charge Pump* as illustrated on the following page. Pull the *Intake Plate* out of the *Charge Pump* (it should just slide off of the drive shaft). When doing this, please note the the *Inner Needle Bearing* will slide off still inserted in the *Intake Plate*.

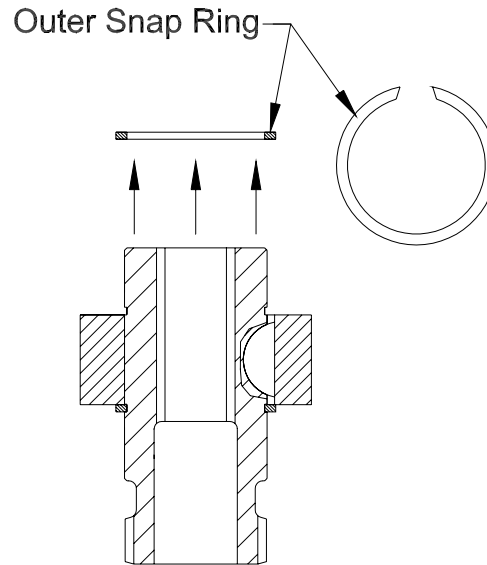
Remove *O-Ring #3* from the *Charge Pump* and inspect it for damage. Replace it if damaged, otherwise keep both the *Intake Plate* and *O-Ring #3* for reuse.



8. Pull the drive shaft straight out of the *Charge Pump* as illustrated below. Please note that the *Inner Gear* and two *Snap Rings* will be removed along with the drive shaft.



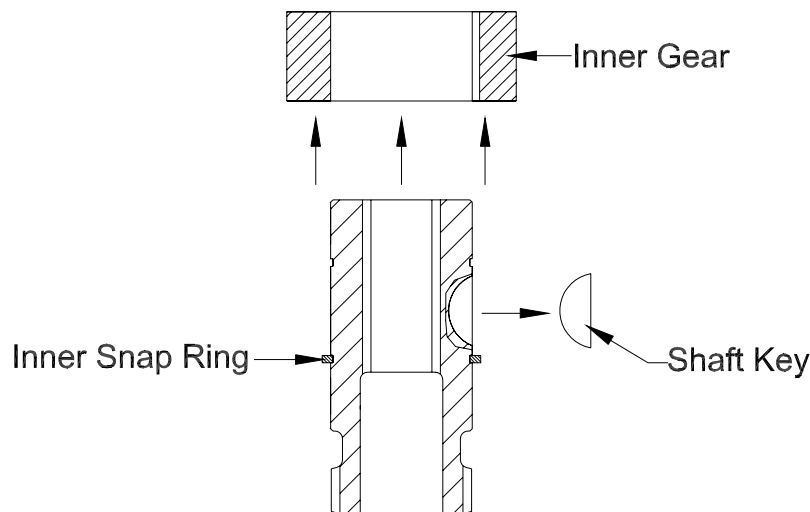
9. Flip the drive shaft over so that it is oriented as shown below. Using a snap ring wrench, remove the *Outer Snap Ring* from the drive shaft and keep it for reuse.



10. Slide the *Inner Gear* off of the drive shaft as illustrated below. Once the *Inner Gear* is removed, the *Shaft Key* will slide out of the drive shaft. Keep both the *Inner Gear* and *Shaft Key* for reuse.

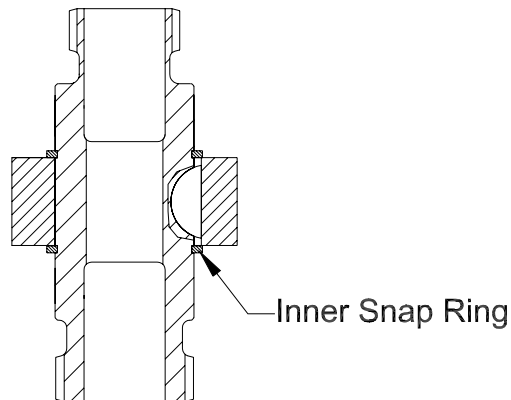
Using a snap ring wrench, remove the *Inner Snap Ring* from the drive shaft and keep it for reuse.

The drive shaft is no longer needed for this Conversion Bulletin - Set it aside.

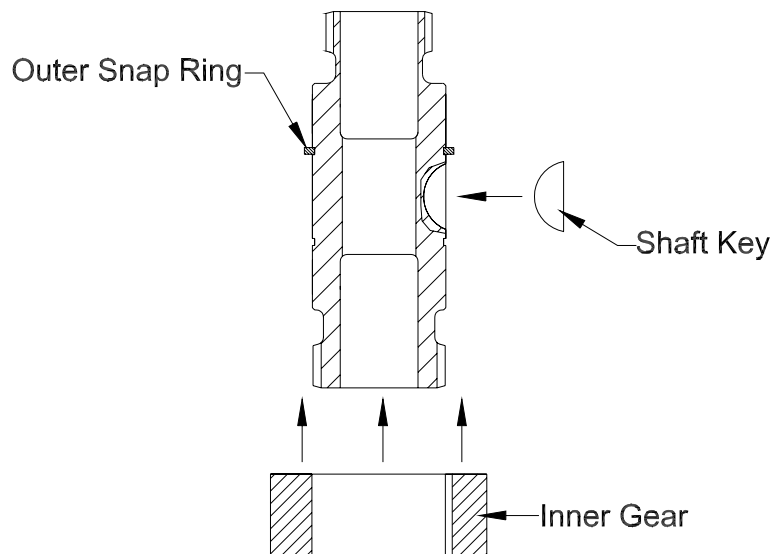


11. Use the illustration below for the following steps:

- a. Acquire the new charge pump drive shaft. You will notice that it has two spline ends. The spline ends are different from each other. One end is identical to the drive shaft from step #10. The other end is a little larger. As shown below, the end that is identical to the drive shaft in step #10 is pointing downward.
- b. Reinstall the *Outer Snap Ring* from step #9.
- c. Reinstall the *Shaft Key* from step #10.
- d. Reinstall the *Inner Gear* from step #10 making sure to capture the *Shaft Key*.

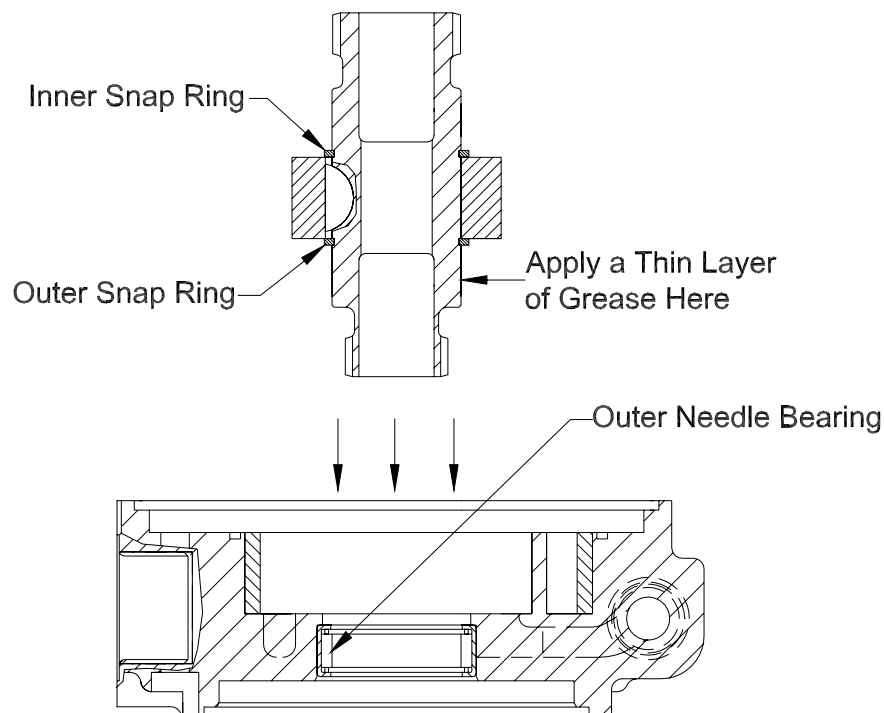


12. As illustrated below, reinstall the *Inner Snap Ring* from step #10.



13. Use the illustration below for the following steps:

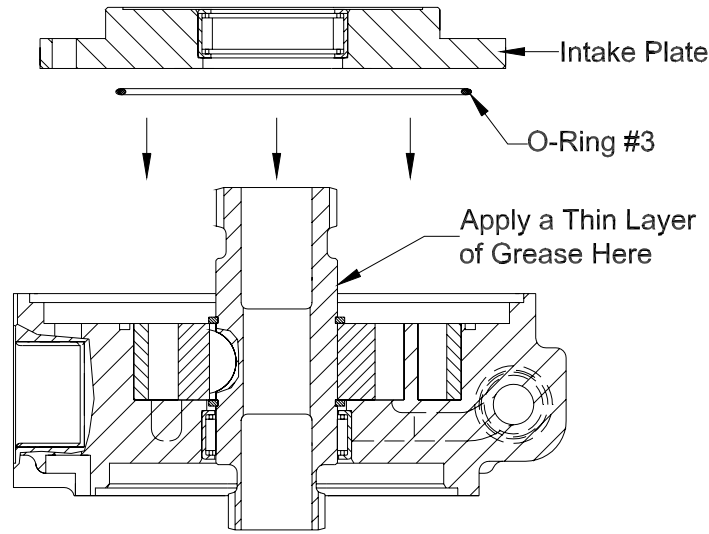
- a. Position the *Charge Pump* as shown.
- b. Flip the new drive shaft 180° from its orientation in step #12.
- c. Apply a thin layer of grease to the designated surface of the drive shaft.
- d. Install the drive shaft into the *Charge Pump*. Please note that the drive shaft must be installed into the *Outer Needle Bearing*.



14. Use the illustration on the following page for the steps below:

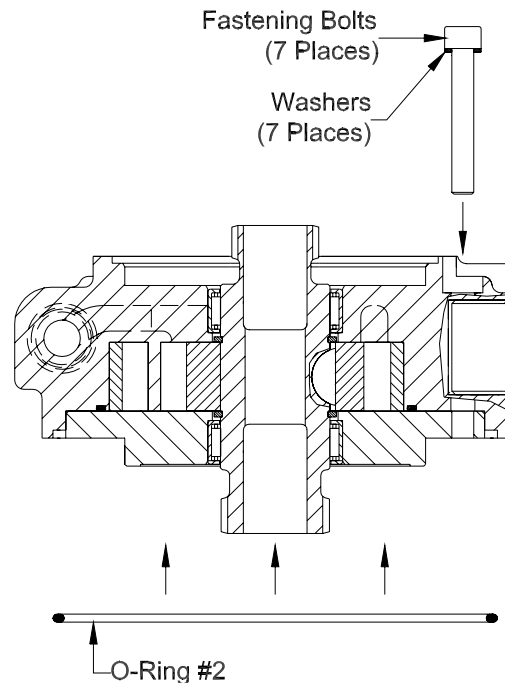
- a. Reinstall *O-Ring #3* from step #7. Make sure that it is properly positioned in the o-ring groove. Use a small amount of grease to help hold it in position.
- b. Apply a thin layer of grease to the designated surface of the drive shaft.
- c. Align the seven(7) threaded holes in the *Intake Plate* with the holes in the charge pump housing. Then install the *Intake Plate* into the charge pump.

The seven(7) holes in the *Intake Plate* and charge pump housing are NOT evenly spaced. The *Intake Plate* can only be mounted with all seven *Fastening Bolts* when oriented in one particular position - The correct position.



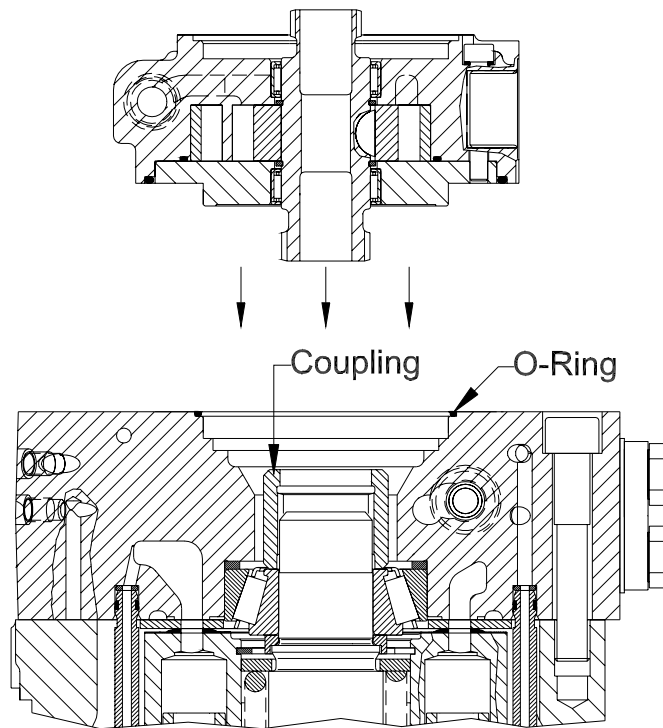
15. Use the illustration below for the following steps:

- a. Reinstall the seven(7) *Fastening Bolts* and *Washers* from Step #6 to fasten the *Intake Plate* to the *Charge Pump*. Torque each *Fastening Bolt* to 13 N-m (10 ft-lb).
- b. Reinstall *O-Ring #2* from step #6 into the *Charge Pump*. Make sure that the o-ring is properly positioned in the o-ring groove. Use a small amount of grease to help hold the o-ring in position.



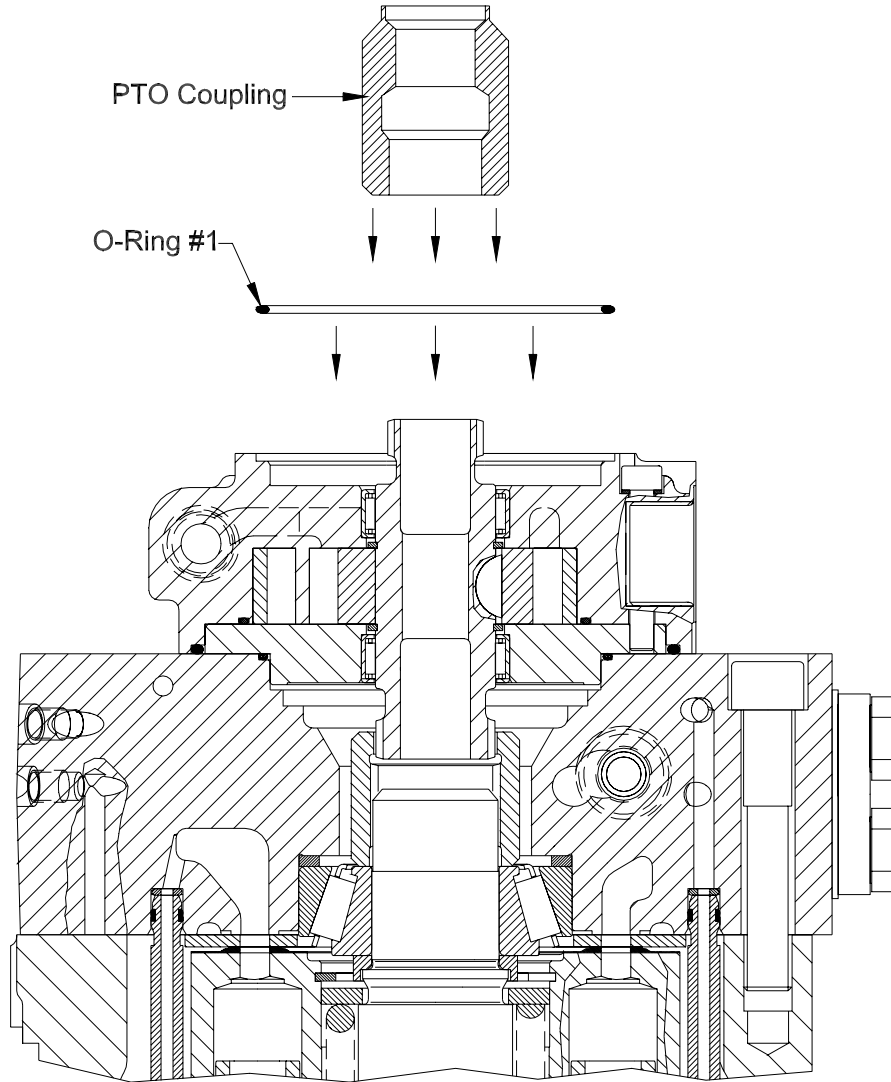
16. As illustrated below, reinstall the *O-Ring* into the HPV-02 o-ring groove. Use a small amount of grease to help hold the o-ring in position.

Reinstall the *Charge Pump* back into the HPV-02. You may have to rotate the charge pump drive shaft to allow the mating splines to align. Once aligned, the *Charge Pump* should easily slide into the HPV-02.



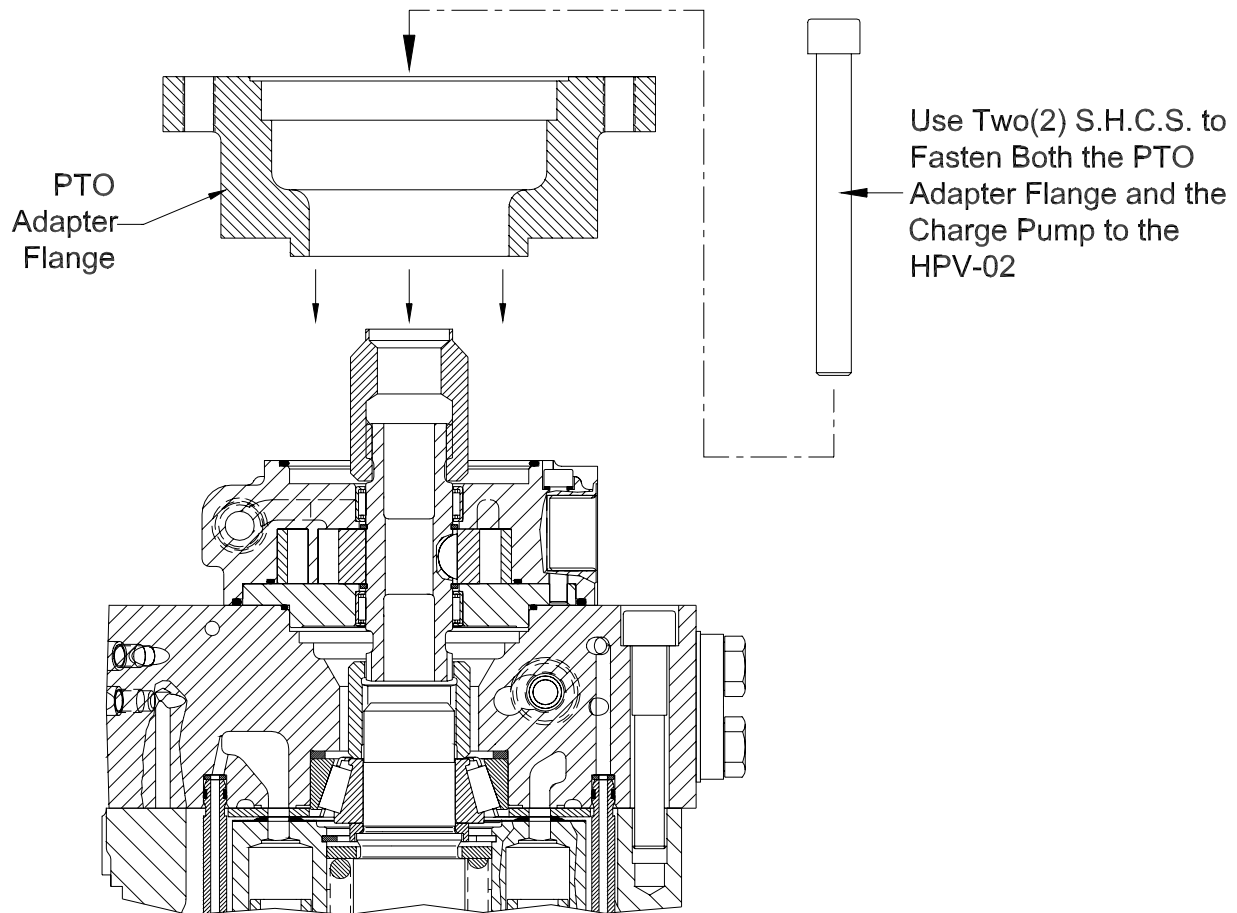
17. As illustrated on the following page, reinstall *O-Ring #1* into the charge pump o-ring groove. Use a small amount of grease to help hold the o-ring in position.

Then install the *PTO Coupling* onto the charge pump drive shaft.



18. As illustrated on the following page, install the *PTO Adapter Flange* onto the *Charge Pump*. The *PTO Adapter Flange* will have two mounting holes (unthreaded and countersunk) and two attachment holes (threaded) [Refer to the illustration on the last page of this Conversion Bulletin for hole identification]. Align the *PTO Adapter Flange* so that the two mounting holes align with the two mounting holes in the *Charge Pump*.

Fasten the *PTO Adapter Flange* to the *Charge Pump* and HPV-02 by using two long S.H.C.S. Torque each S.H.C.S. to 85 N-m (63 ft-lb).



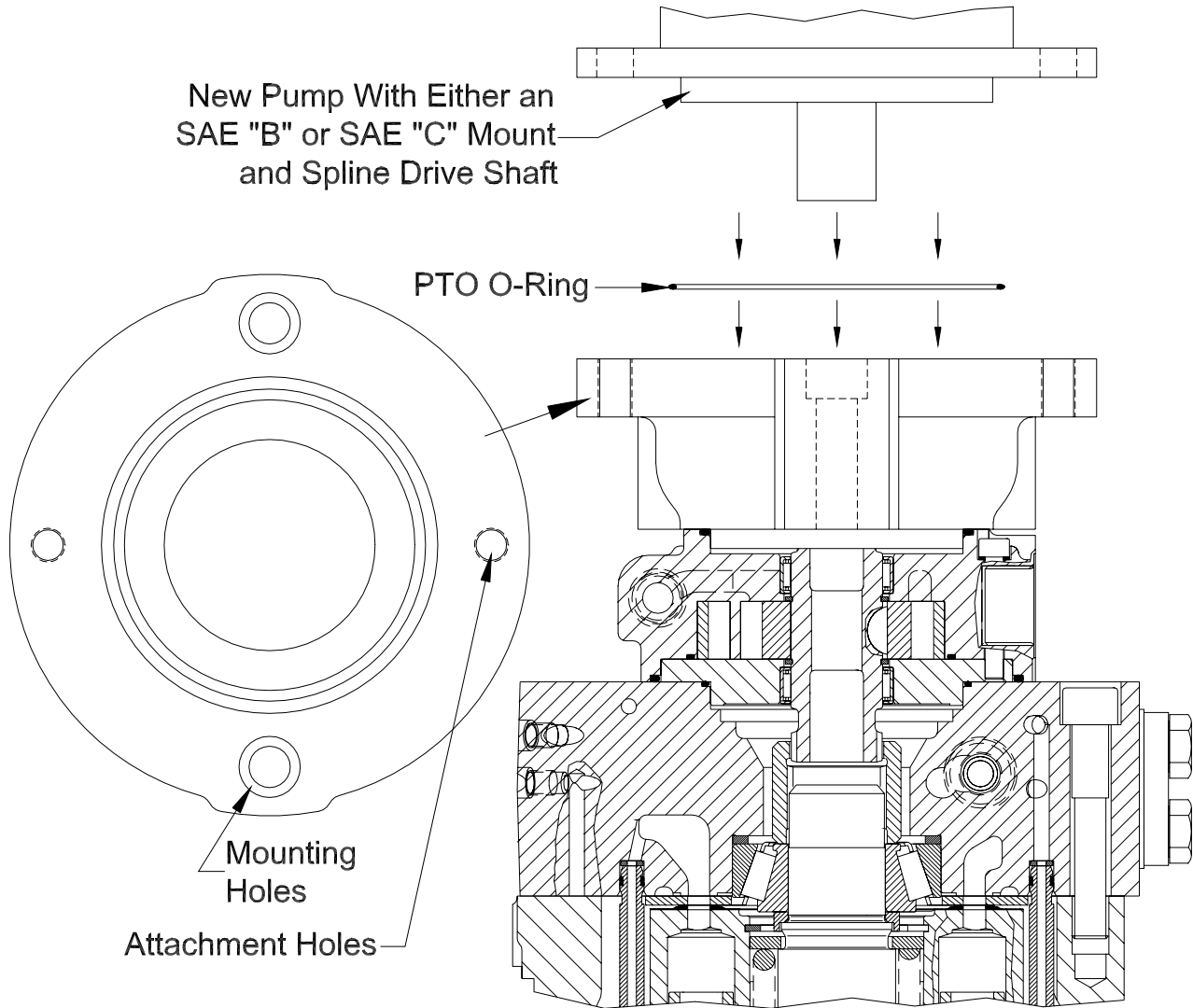
19. As illustrated on the following page, install the *PTO O-Ring* into the *PTO Adapter Flange* o-ring groove. Use a small amount of grease to help hold the o-ring in position.

At this point, there are two options to finish:

- a. As illustrated on the following page, install the new pump onto the *PTO Adapter Flange*. The new pump must have an SAE "B" mount and SAE "B" spline drive shaft or an SAE "C" mount and SAE "C" spline drive shaft (depending on the PTO Kit installed). Mount the pump with bolts (not supplied by Linde) and torque accordingly.

OR

- b. You can install a cardboard or plastic cover (not supplied by Linde) over the opening in the PTO flange.





*******ATTENTION*******

You have been provided information on conversion, repair and/or service of Linde components. Proper application of the information requires specific training and may require use of specialized tooling and equipment. If you choose to proceed with the conversion, repair and/or service of the Linde component(s) absent the necessary training and/or these specialized tools, you do so at your risk.

Linde Hydraulics Corporation will accept no claim for warranty or other consideration resulting from deficiencies in the conversion, repair and/or service done in accordance with the guidance offered herein when the necessary training has not been conducted and/or required specialized tooling and equipment has not been utilized.

All requests for training must be coordinated through your Linde Account Manager. He can also provide you price and availability of any specialized tooling.

Questions regarding the information provided or this disclaimer should be addressed to the Warranty & Service Department, Linde Hydraulics Corporation.

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