Rebuilding the High-Pressure Swivel

Use the following instructions to disassemble and replace worn components in a high-pressure swivel.

Contents

Figure C-1: High-pressure Swivel used in OMAX Model 2626\|xp

Tools and Materials Needed

- Lubriplate grease (P/N 201304)
- Soft jaws vice
- 5 and 6 mm Allen wrenches
- Arctic Grease (P/N 202335)
- inch/pound torque wrench
- Spanner wrench (P/N 304512)
- Seal removal tool (P/N 201726)
- Blue Goop anti-galling compound (P/N 200365)
- Seal Replacement Kit (P/N 305088)

Additional Requirements for Bearing Removal:

- Arbor press
- Bearing puller
- Bearing assembly (P/N 202964)
- Pry bars

Removing the High-pressure Swivel

Figure C-2 illustrates a typical high-pressure swivel installation.

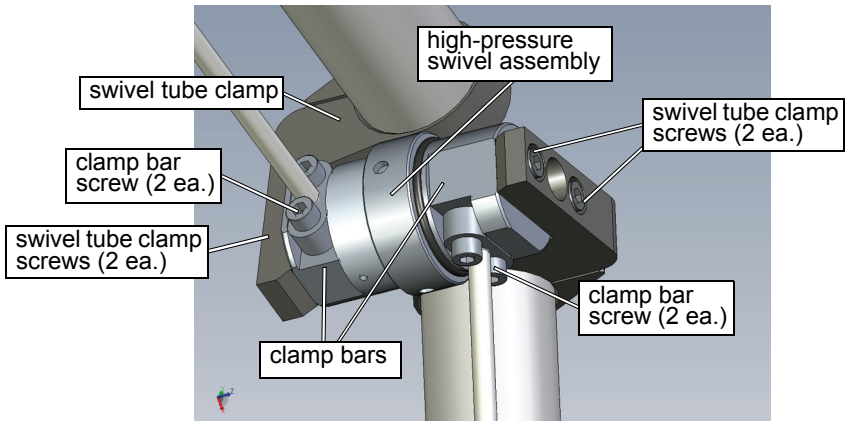

Figure C-2: Typical High Pressure Swivel Installation

To remove a high-pressure swivel:

1. As necessary, move the **nozzle** to a location providing easy access to the swivel(s) being serviced.
2. Switch OFF the AC power for both the pump and table. Disconnect their main AC power breakers. Attach an “Out of Service” tag on each breaker and observe all applicable electrical safety requirements.
3. Prior to removal, carefully wash off the entire high pressure swivel assembly using water and compressed air. Be especially careful to remove all grit and abrasive.
4. Use the 6 mm Allen wrench to remove both clamp bars (4 screws) from the swivel assembly, releasing the plumbing tubes.

Caution: ***Be very careful while removing swivel components! The high-pressure support structure will become unsupported and can fall once key components are removed.***

5. Remove the four screws securing the swivel tube clamps (Figure C-2) and the four clamp bar screws.
6. Remove the high-pressure swivel assembly from the table and take it to a clean room environment for rebuilding.

Caution: ***The swivel assembly and the rebuild location must be thoroughly cleaned prior to rebuilding.***

Disassembling the High-pressure Swivel

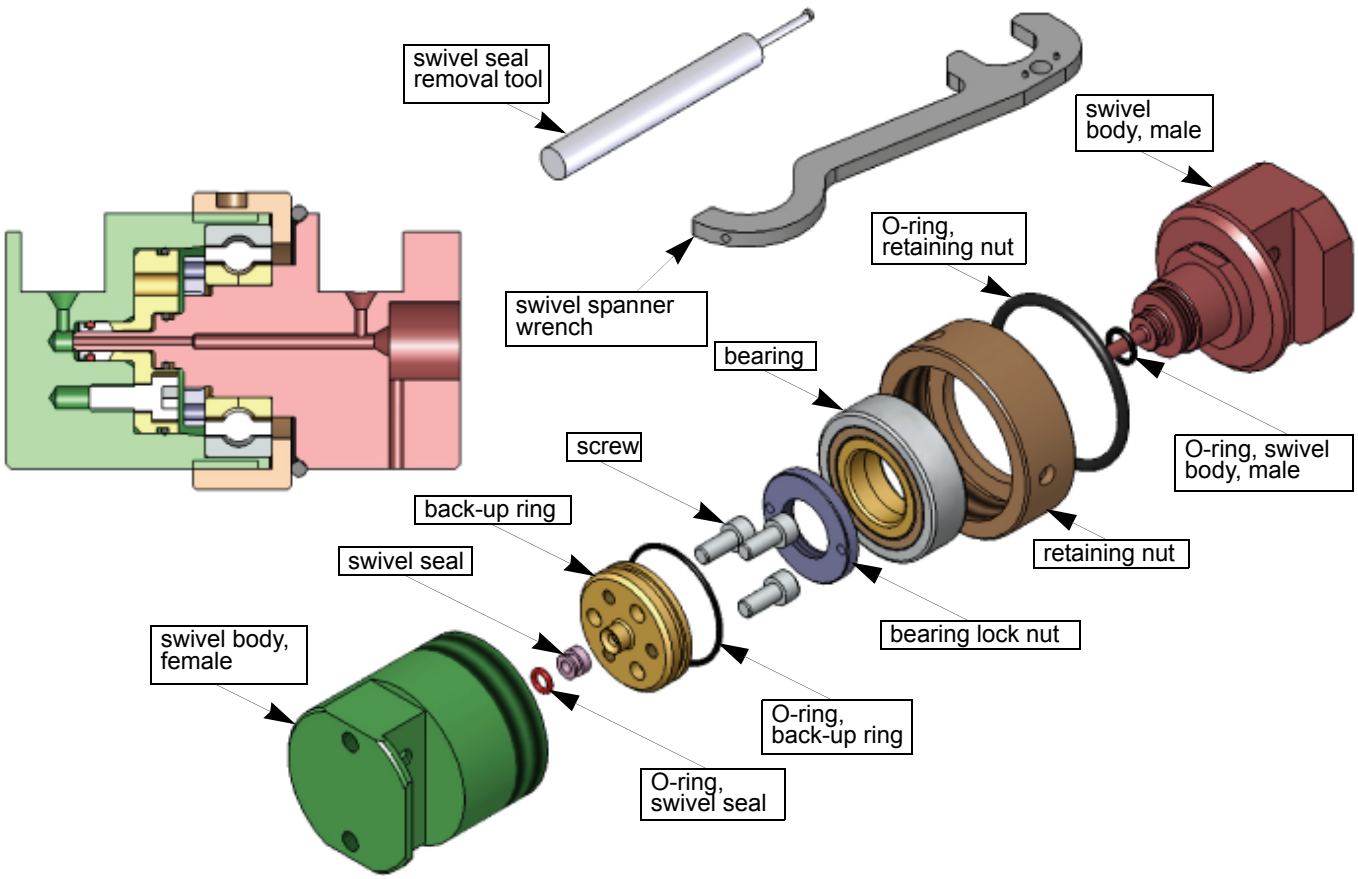

Figure C-3: Components of the High-pressure Swivel Assembly

To disassembly the High-Pressure Swivel

1. Clamp the cleaned **swivel assembly** in a soft jaws vice as illustrated in Figure C-4:

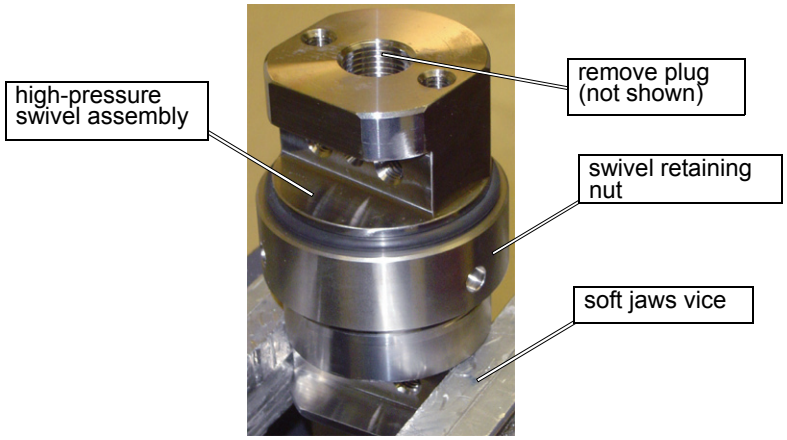

Figure C-4: Clamp the Swivel Assembly in a Soft Jaws Vice

Note: *When clamping the assembly, ensure that the two flat sides of the female swivel body are aligned flush to the jaws of the vice.*

2. If present, remove the top plug on the swivel assembly (Figure C-4).
3. Unscrew the **swivel retaining nut** using the swivel spanner wrench (Figure C-5) by rotating it counterclockwise:

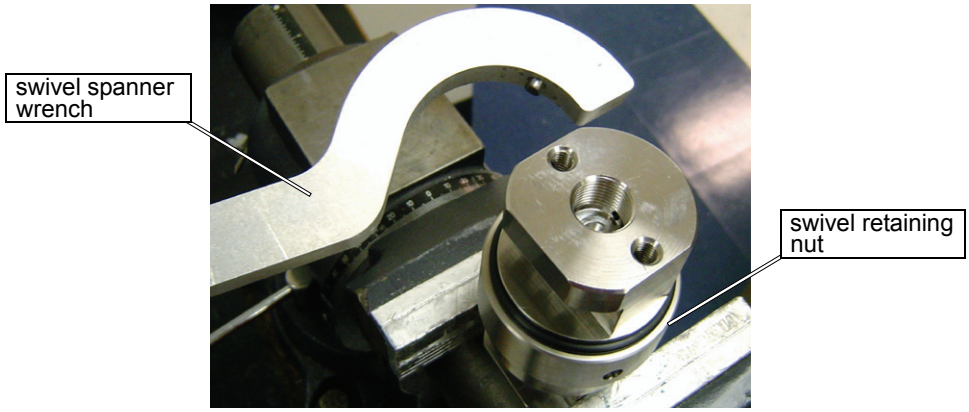

Figure C-5: Use the Swivel Spanner Wrench to Unscrew the Swivel Retaining Nut

4. Separate the **swivel assembly** into its two halves: a **male** and the **female** half.

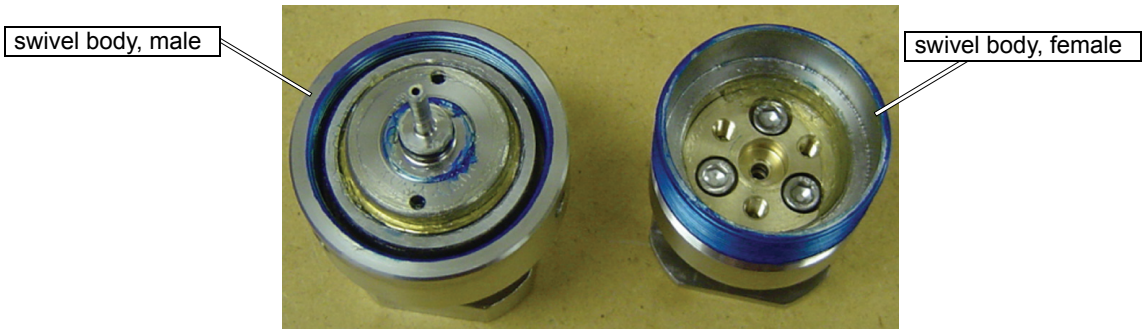

Figure C-6: Separate the Swivel Assembly into its Male and Female Halves

Replacing the Seals and O-Rings

1. Clamp the **female half** of the swivel assembly into the soft jaws vice and use the 5mm Allen wrench to remove the three internal screws:

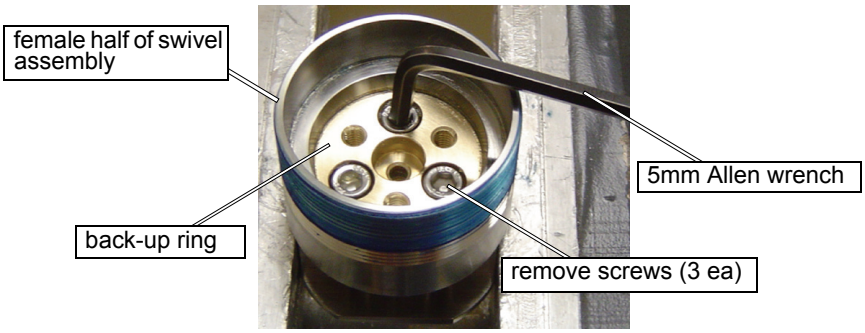

Figure C-7: Remove the Three Swivel Assembly Screws with the 5mm Allen Wrench

2. Once all three screws are removed, use one of the removed screws as a “jacking screw” to help remove the swivel backup ring and O-ring seal by screwing it down into one of the threaded holes in the back-up ring. This will lift the backup ring for easy removal:

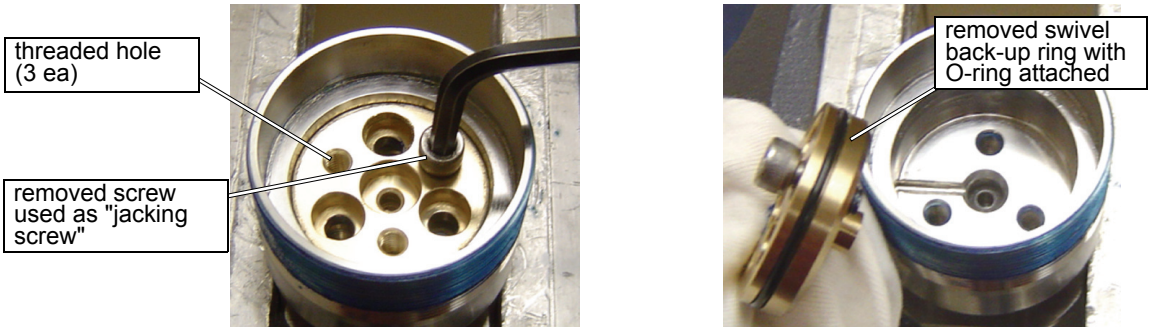

Figure C-8: Remove the Swivel Back-up Ring from the Swivel Assembly

3. Remove the **swivel seal** with the attached **O-ring**, using the swivel seal removal tool (Figure C-9). Insert the tool into the hole in the swivel seal and catch the bottom side of the seal with the tool. When caught, pull the tool upwards, removing the swivel seal and O-ring.

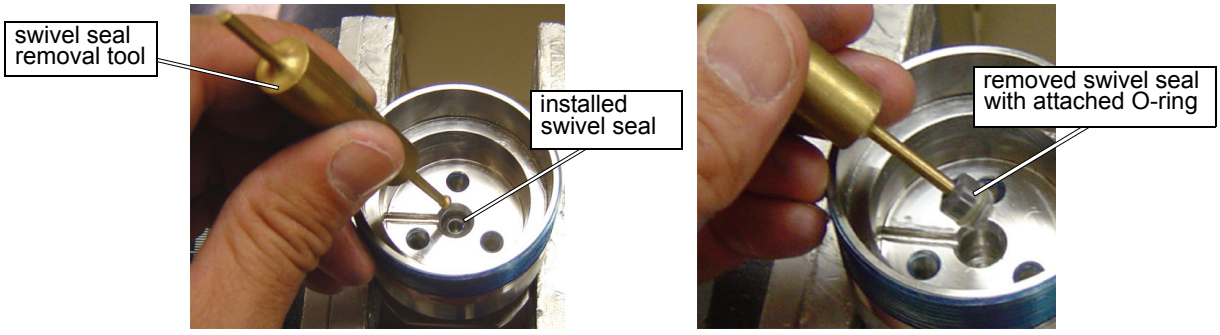

Figure C-9: Use the Removal Tool to Take Out the Swivel Seal and O-ring

4. Clean the **backup ring** and female **swivel body** in an ultrasonic cleaner.

5. Lubricate the new **swivel seal** and **O-ring** with Lubriplate and insert them into the **swivel body** (Figure C-10). Ensure that the O-Ring end of the seal goes into the hole first.

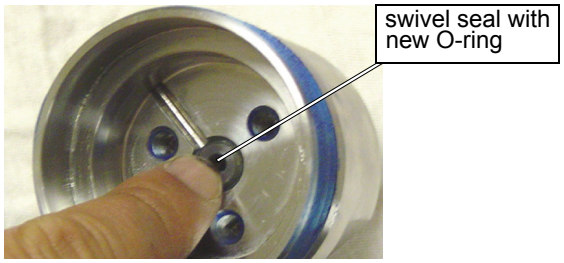

Figure C-10: Insert the Swivel Seal with New O-ring into the Swivel Body

6. Lubricate with Libriplate and install the new **O-ring** onto the **swivel back-up ring**. Press the swivel backup ring into the **swivel body** (Figure C-11), aligning the three screw holes in the swivel back-up ring with those in the swivel body.

Figure C-11: Insert the Swivel Back-up Ring with a New O-ring Installed into the Swivel Body

7. Insert and tighten the **three screws** (removed earlier in step #1) to 48.7 inch pounds (5.5 Nm) using the 5mm Allen wrench (ensure that the screws were inserted into the three countersunk holes, not the threaded holes):

Figure C-12: Tighten the Three Screws to the Swivel Back-up Ring

Replacing the Bearing

Note: *It is not necessary to remove the swivel bearing assembly if only the swivel seals require servicing. Bearing removal is necessary only when the bearing itself must be replaced, cleaned, or regreased.*

1. Place the male half of the **swivel body** into the soft jaws vice and use the **swivel spanner wrench** to remove the **bearing lock nut**.

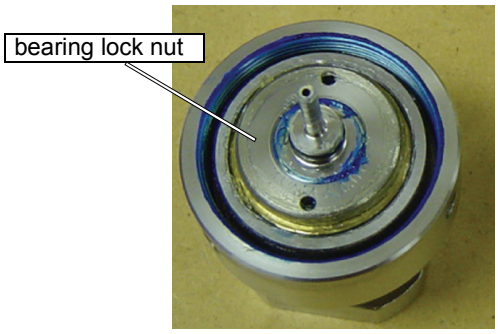

Figure C-13: Remove the bearing lock nut

2. With the **bearing lock nut** removed, place a 9/16" or 14 mm deep well socket over the **swivel body shaft** and onto the **swivel seal**.

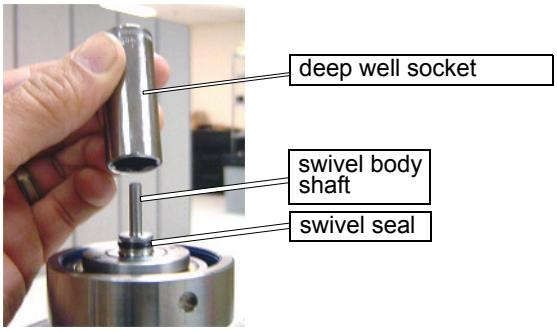

Figure C-14: Place a Deep Socket over the Swivel Body Shaft

3. Center the socket over the **swivel body shaft** to provide a uniform contact with the surface of the swivel body and protect the swivel body shaft.

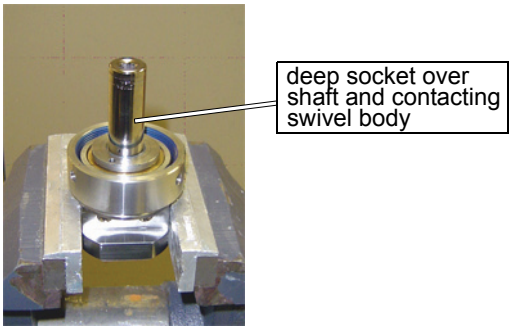

Figure C-15: Center the Socket Over the Surface of the Swivel Body

4. Attach the **bearing puller** as illustrated below and pull the **bearing assembly** free from the swivel body.

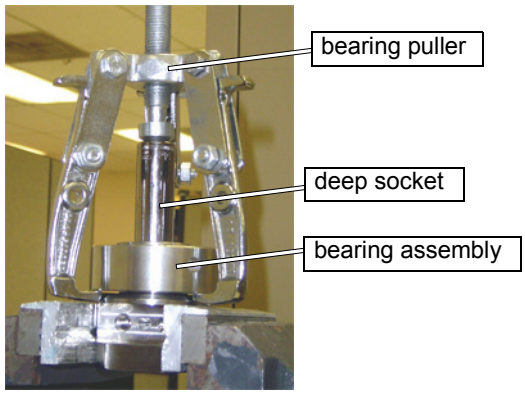

Figure C-16: Use the Bearing Puller to Remove the Bearing Assembly

5. The bearing's **inner race** may not pull out with the bearing. If this happens, two **pry bars** can be used to remove the inner race as follows:
   a. Reposition the **swivel body** in the soft jaws vice to allow a better leverage as shown below:

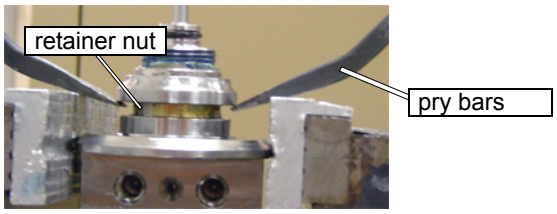

Figure C-17: Use Pry Bars to Remove the Inner Race from the Swivel Body

   b. Slide the two pry bars under the flat surface on the swivel body just below the race (Figure C-17 above). Evenly and carefully pry the race free from the swivel body.
6. Gather the replacement bearing components as illustrated below:

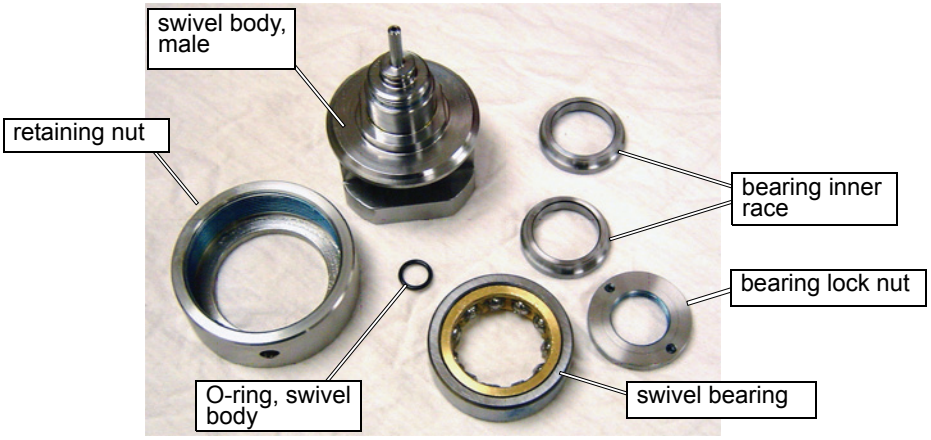

Figure C-18: Male Swivel Body Bearing Components

7. Thoroughly clean grease and foreign debris from all parts being reused using an ultrasonic cleaner.
8. With both **inner bearing races** removed, pack the **bearing assembly** with OMAX Arctic Grease (PN 202335).

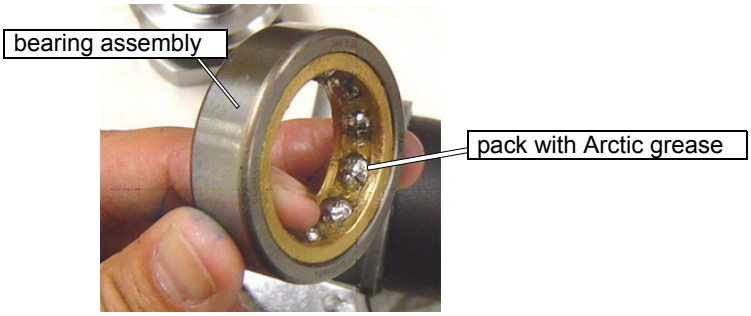

Figure C-19: Pack the Bearing Assembly with Arctic Grease

9. After packing the **bearing assembly** with **Arctic grease**, re-install the two inner races:

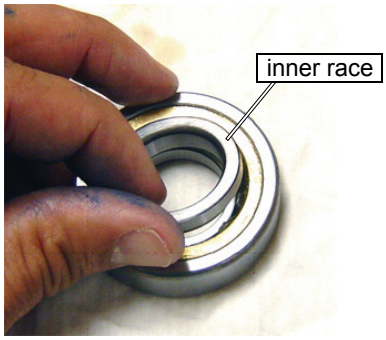

Figure C-20: Reinstalling the Bearing Inner Race

10. Install the **bearing assembly** onto the male **swivel body**:
    a. Place the **male swivel body** in the **arbor press**.
    b. Place the **swivel retaining nut** onto the male swivel body.
    c. Lightly grease the **swivel body bearing mount** where the bearing assembly installs.
    d. Position the **bearing assembly** onto the swivel body shaft. Place a 1 inch (2.54 cm) deep well socket on top of the bearing assembly (Figure C-21). This will be used to press the bearing assembly into the swivel body. Make sure the socket presses against only the inside bearing race:

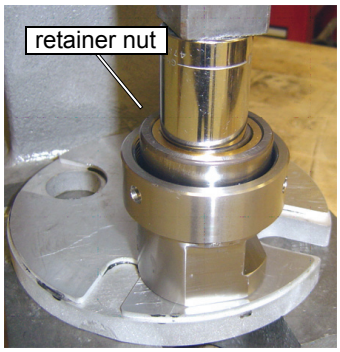

Figure C-21: Installing the Bearing Assembly with the Arbor Press

    e. Press the **bearing assembly** onto the **swivel body** using the **arbor press** until fully seated.
    f. Remove the **swivel body** from the **arbor press**.
11. Lightly coat the **O-ring** with Lubriplate. Install the **O-ring** onto the **swivel body**.

Caution: ***Be careful to not scratch or damage the stem!***

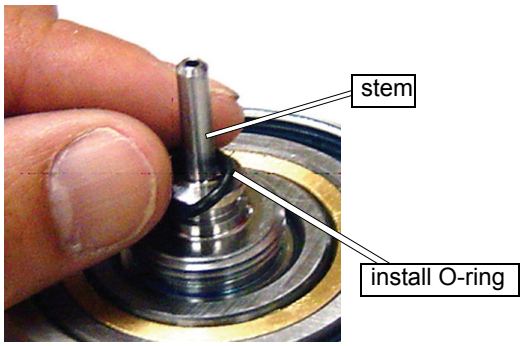

Figure C-22: Replace the O-ring on the Swivel Body

12. Apply a light coat of **Blue Goop** and thread the **bearing lock nut** onto the swivel body by hand until tight.

Figure C-23: Hand Tighten the Bearing Lock Nut

13. Use the **swivel spanner wrench** to tighten the bearing lock nut securely.

Figure C-24: Fully Tighten the Bearing Lock Nut using the Swivel Spanner Wrench

14. Apply OMAX **Arctic Grease** (P/N 202335) to the top of the **swivel body bearing assembly**:

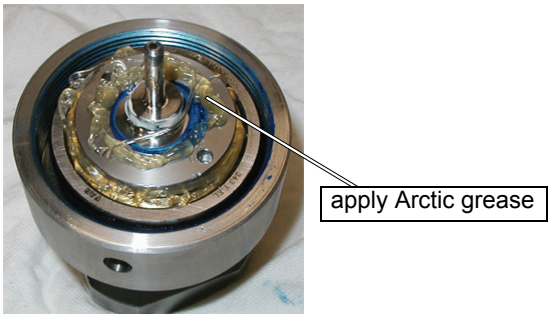

Figure C-25: Apply Arctic Grease to Top of Bearing Assembly

Reassembling the High Pressure Swivel Halves

1. Place the female half of the **swivel body** in the soft jaws vice (Figure C-26), apply **Blue Goop** and assemble the two **swivel body halves**.

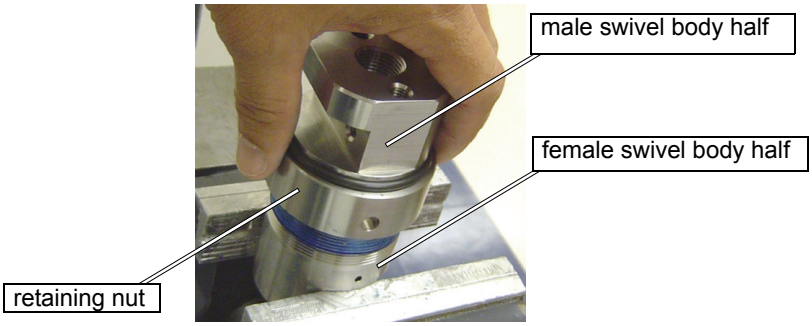

Figure C-26: Assemble the Two Swivel Body Halves

Note: *When clamping the assembly in the vice, ensure that the two flat sides of the female swivel body are aligned flush to the jaws of the vice.*

2. Use the swivel **spanner wrench** to tighten the **retaining nut**:

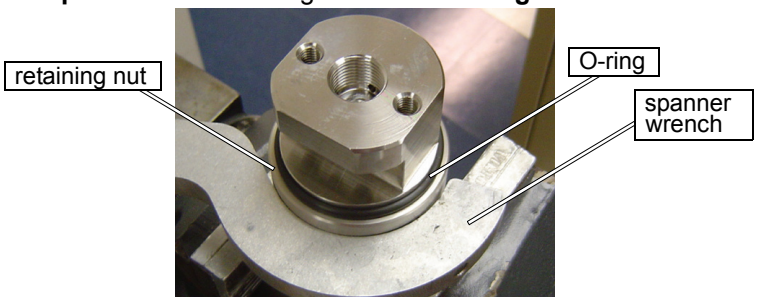

Figure C-27: Tightening the Retaining Nut with the Spanner Wrench

3. Remove the large **O-ring** (Figure C-28), replacing it with a new O-Ring:

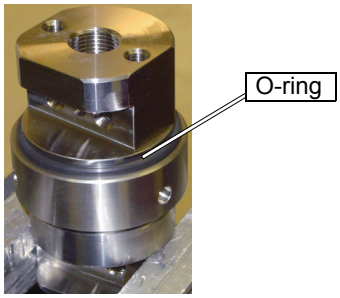

Figure C-28: Replace the O-ring with New One

4. Wipe off any excess grease from the swivel. The high-pressure swivel rebuild is finished.

Installing the High-pressure Swivel

Once rebuilt, swivel installation is the reverse of the removal instructions. During installation, it is important to torque gland nuts as follows:

1/4" tube, coning and threading, 60 kpsi:	25 ft-lb, 34 N·m
3/8" tube, coning and threading, 60 kpsi:	50 ft-lb, 68 N·m

For Assistance

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