DEUBLIN

Deublin Mechanical Seal Washpipe Manual

Deublin Mechanical Washpipe Assembly Instruction Guidances for Users / OEMs

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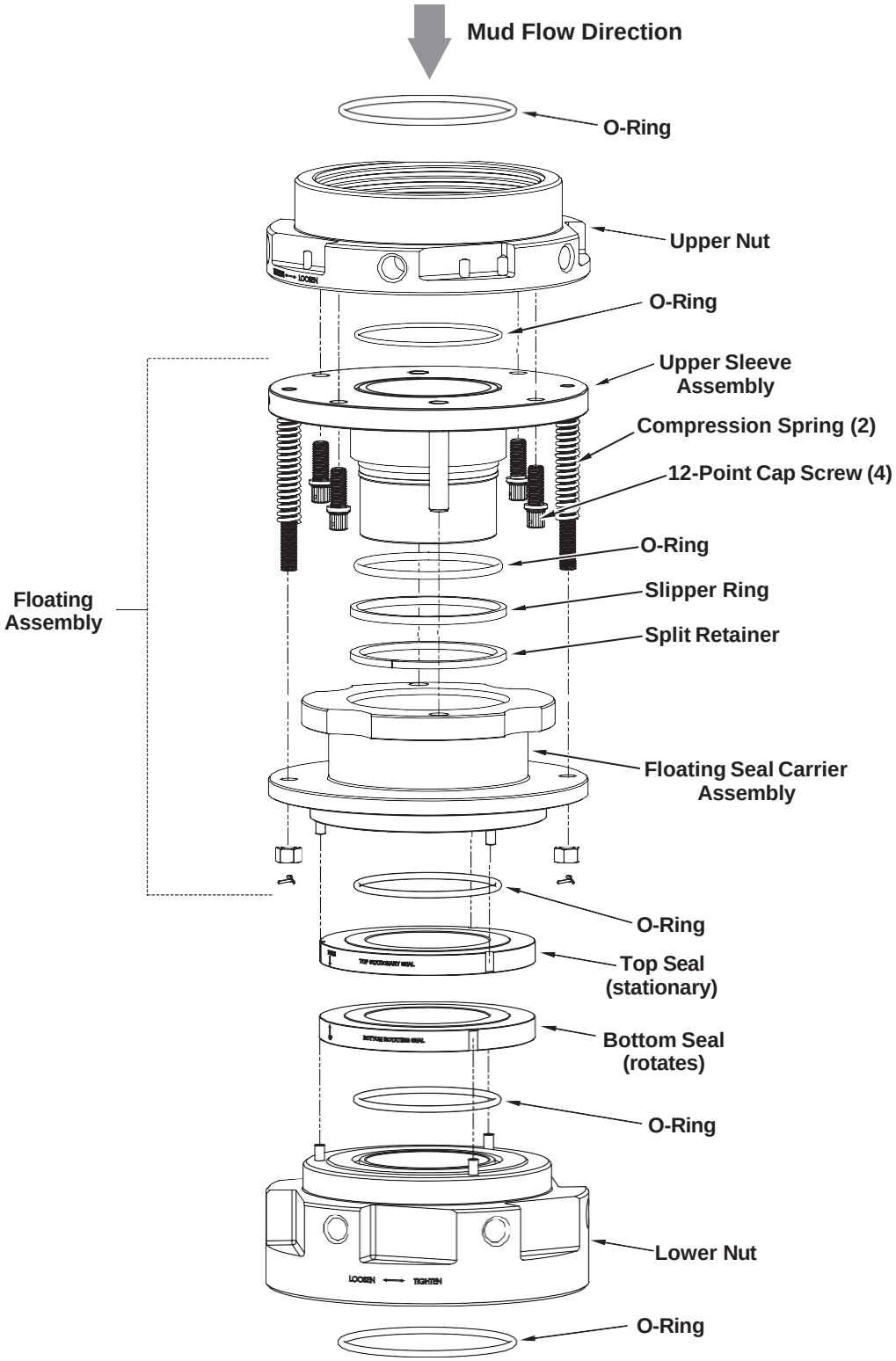
DEUBLIN MECHANICAL SEAL WASHPIPE MANUAL



Deublin Standard Mechanical Washpipe Assembly (Exploded View)

Dry Running

Operating the top drive with no mud circulating can damage Deublin mechanical washpipe.

When the main shaft rotates during drilling operations, the top mechanical seal in the washpipe remains stationary and the bottom mechanical seal rotates. Circulating mud provides the lubrication and cooling for the contact surfaces between the two mechanical seals. Extreme wear on the mechanical seals occurs any time the main shaft rotates without mud circulation.

*Remove the two mechanical seals in the washpipe prior to dry running the top drive for **five minutes or longer**.*

If the seals have been damaged, they will need to be replaced prior to normal drilling operations.

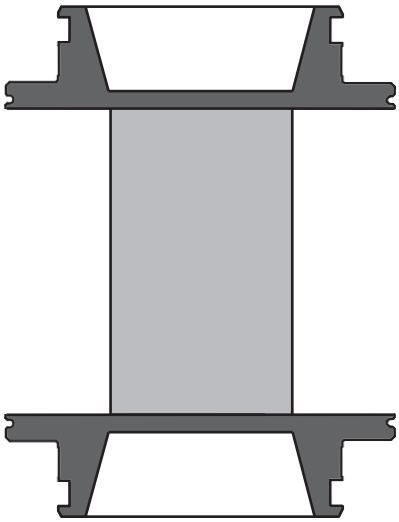
Pre-Installation Preparation

Review the information in this section prior to starting washpipe installation procedures.

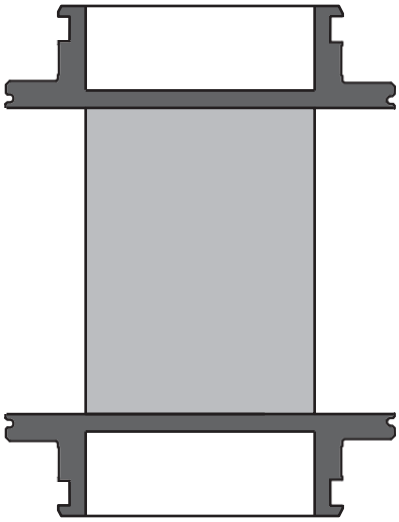
Check Upper and Lower Stem Liners

Before installing the mechanical washpipe, tapered liners must be replaced with **straight liners**.

Tapered Stem Liners



Straight Stem Liners



Verify Maximum Run-Out and End Float

Inspect the equipment to verify that the following **run-out** and **end float** measurements are within acceptable limits suggested below:

- **Main Shaft** end float: — .003” maximum
- **Main Shaft Face** run-out — .002” maximum
- **Stationary Face** run-out — .006” maximum
- **Radial** run-out — .020” maximum

The pressure-balancing feature designed for this washpipe promotes longer seal life. If the equipment is not in alignment, the mechanical sealing system will not perform as designed and the seals will be damaged.

Verify Sealing Face Alignment

Using a dial indicator, verify the proper alignment of sealing faces as shown in the following pictures.

Pre-Installation Preparation

Check Threads and Surfaces

Clean the threads and sealing surfaces for both the main shaft and the gooseneck face (the upper and lower sealing surfaces). Make sure they are not damaged.

Check Bonnet Opening Width

The width of the bonnet opening for some top drive models may require that a modified installation procedure be used. Measure the bonnet opening before starting to install the washpipe.

The bonnet opening width should be equal to or greater than **10.5 inches** (**26.7 cm**).

Check Bail Position

Make sure to check the position of the top drive bails and the bonnet opening prior to beginning the installation. For some top drive models, a bail may be directly in front of the bonnet opening. In this case, the installer may require additional help to carefully maneuver the washpipe components into position for installation.

Washpipe Installation

This section provides instructions for installing the mechanical washpipe.

Standard Installation Procedure

First Step: Install the Lower Nut

1. Clean the swivel stem (the main shaft sealing surface and threads).
2. Apply a small amount of general purpose grease to the swivel stem.
3. Clean the top and bottom of the lower nut. While cleaning the lower nut, make sure there is an O-ring in both the top and bottom O-ring grooves.
4. Apply a small amount of general purpose grease to the inside threads of the lower nut.
5. Install the lower nut. Use the tightening bar (provided) to tighten the lower nut to 200 ft-lbs of torque (minimum).

Do not use a hammer on the washpipe. *Using a hammer will damage washpipe components. Use the tightening bar provided with the mechanical washpipe. This tightening bar is designed specifically for tightening and loosening washpipe components.*

If the nuts are completely stuck, a hammer may be used for ***loosening only****. Make sure to hit the nut on one of the angled notches provided specifically for this purpose.*

Both the upper nut and lower nut have left-handed threads. Counterclockwise rotation tightens these nuts.

Washpipe Installation

Standard Installation Procedure

First Step: Install the Lower Nut

6. Clean the top surface of the lower nut and make sure the top surface O-ring is in place.

Do not use a hammer on the washpipe. *Using a hammer will damage washpipe components. Use the tightening bar provided with the mechanical washpipe. This tightening bar is designed specifically for tightening and loosening washpipe components.*

If the nuts are completely stuck, a hammer may be used for ***loosening only****. Make sure to hit the nut on one of the angled notches provided specifically for this purpose.*

Washpipe Installation

Standard Installation Procedure

First Step: Install the Lower Nut

7. Check Face run-out and Radial run-out. Refer to the section titled "Pre-Installation Preparation" for the allowed variance for each measurement.

The pressure-balancing feature designed for this washpipe promotes longer seal life. If the equipment is not in alignment, the mechanical sealing system will not perform as designed.

Washpipe Installation

Standard Installation Procedure

Second Step: Install the Upper Nut

1. Install the temporary installation plate. This plate protects the surface of the lower nut.

2. Clean the gooseneck sealing surface and threads.
3. Apply a small amount of general purpose grease to the gooseneck face and threads.
4. Make sure there is an O-ring properly installed in the top of the upper nut.
5. Apply a small amount of general purpose grease to the inside threads of the nut.
6. Install the upper nut. **Hand tighten only** at this step.

Do not fully tighten the upper nut. You will need to rotate (unscrew) the upper nut later in the installation procedure to access the other side.

Both the upper nut and lower nut have left-handed threads. Counterclockwise rotation tightens these nuts.

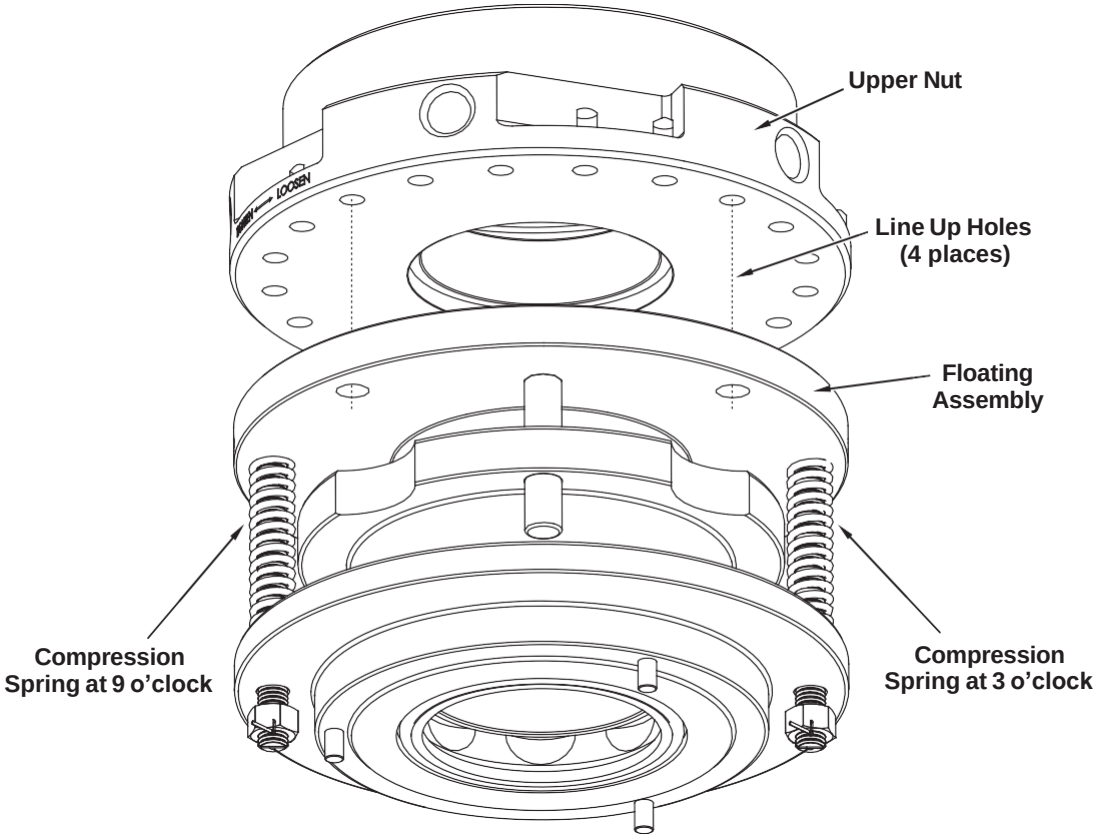
Washpipe Installation

Standard Installation Procedure

Third Step: Install the Floating Assembly

1. Clean the bottom surface of the upper nut with a clean cloth.
2. Apply a small amount of general purpose grease to the Floating Assembly surface.
3. Position the Floating Assembly on the temporary installation plate.
4. Align the holes in the Floating Assembly with any four threaded holes in the upper nut flange. There are multiple tapped holes in the upper nut. Choose holes that are evenly spaced apart and that work best for the installation.

When aligning the four holes, make sure the compression springs are positioned as close as possible to 3 and 9 o'clock when facing the front of the washpipe.



Washpipe Installation

Standard Installation Procedure

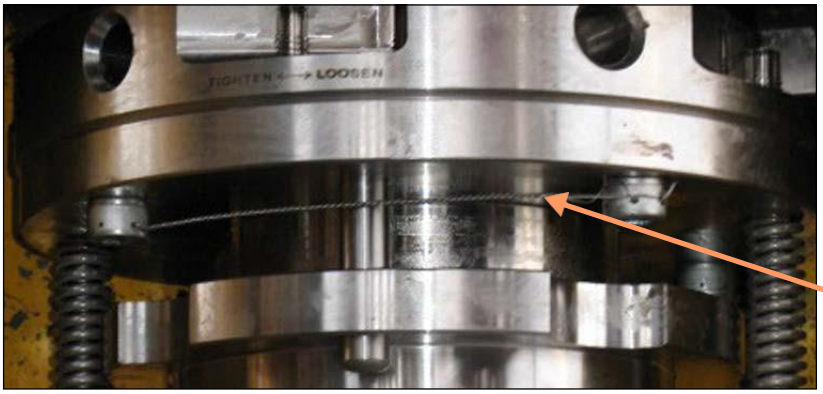
Third Step: Install the Floating Assembly

5. Using the 1/2” ratchet wrench provided, install the front two cap screws.
6. Rotate (unscrew) the upper nut until the back two cap screws can be installed. This should be a 180 degree turn.
7. Using the 1/2” ratchet wrench provided, install the back two cap screws.
8. Tighten all four cap screws to 45 to 50 ft-lbs of torque.

Washpipe Installation

Standard Installation Procedure

Third Step: Install the Floating Assembly



9. Install safety wire on all cap screws. Rotate (unscrew) the upper nut until all safety wire can be installed on all cap screws
10. Using the tightening bar (provided), tighten the upper nut to 200 ft-lbs of torque (minimum).
11. Remove the temporary installation plate and store it for future use.

Washpipe Installation

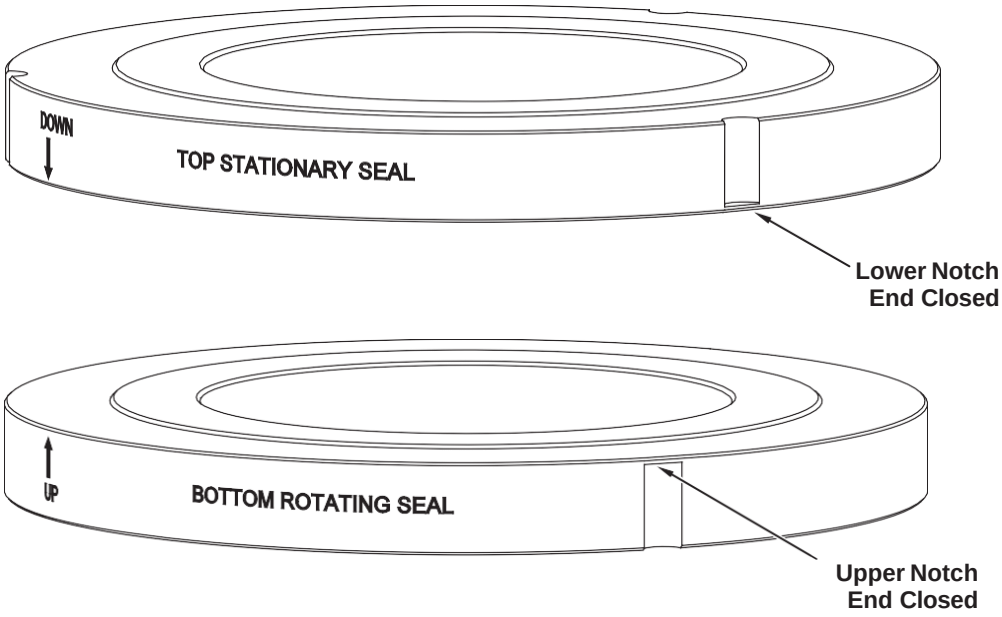
Standard Installation Procedure

Final Step: Install the Mechanical Seals

*Keep the mechanical seals in their shipping containers until needed for installation. When handling the mechanical seals, **use extreme care** not to scratch the seal surfaces.*

Each mechanical seal has the following identifiers that assist with correct seal orientation.

- **Top Stationary Seal** or **Bottom Rotating Seal** is stamped on the seal.
- A directional arrow points to the side of the seal that should face up or down.
- The notches on the seals that mate with the three dowels are closed on one end. This ensures that the seal can only be placed over the dowels in the correct direction.



Depending on the washpipe equipment option ordered, there may be up to 12 notches in the mechanical seals.

Washpipe Installation

Standard Installation Procedure

Final Step: Install the Mechanical Seals

Complete the following procedure to install the seals.

1. Identify the Bottom Rotating Seal.
2. Carefully clean both sides of the Bottom Rotating Seal.
3. Carefully clean the mating surface on top of the lower nut.
4. Apply **clean**, light oil to the top of the lower nut. (SAE 30 motor oil or hydraulic oil can be used in place of general purpose light oil.)
5. Cover both sides of the Bottom Rotating Seal with clean, light oil.
6. Check that the orientation is correct and then carefully place the Bottom Rotating Seal on top of the lower nut. Make sure the dowels align with the notches in the seal.

Use extreme care *when handling the seals. The seal rings are very hard and brittle. They may chip and crack if mishandled.*

Washpipe Installation

Standard Installation Procedure

Final Step: Install the Mechanical Seals

7. Carefully clean both sides of the Top Stationary Seal.
8. Apply clean, light oil to the bottom exposed surface of the Floating Assembly. Make sure the O-ring is in the O-ring groove.
9. Cover both sides of the Top Stationary Seal with **clean**, light oil.
10. Make sure that the seal orientation is correct and then **carefully** place the Top Stationary Seal on top of the installed Bottom Rotating Seal. (Make sure to be extremely careful when handling the mechanical seals.)
11. Align the Top Stationary Seal notches with the dowels on the Floating Assembly.

Washpipe Installation

Standard Installation Procedure

Final Step: Install the Mechanical Seals

12. Slowly and alternately, loosen each compression nut. The Floating Assembly will expand and engage the Top Stationary Seal.

*Make sure to **alternately loosen** each nut slowly so the Floating Assembly is lowered straight. If it engages the Top Stationary Seal at an angle, the seals could be damaged.*

13. Continue to alternately loosen the hex nuts all the way to the end of the two threaded rods. (There are cotter pins that ensure the hex nuts do not come off the end of the threaded rods.)