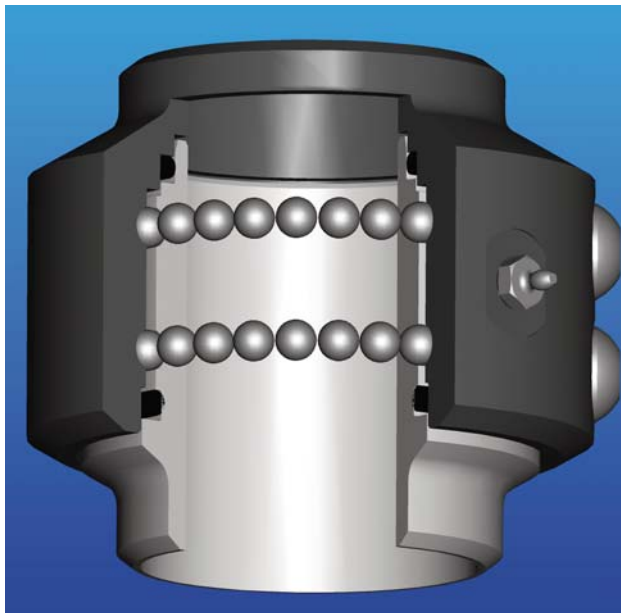


3000 Series Swivel Maintenance



MAINTENANCE

Tools Needed:

- Socket Wrench Set
- Degreaser
- Small Magnet
- Manual Grease Gun
- OPW 885 Lubricant
- Hex Key Set



Consider the following when servicing the Swivel:

- When the Swivel is overloaded / installed, it must be inspected thoroughly
- After maintenance is performed, it must be tested before the next use
- Periodic inspection (every 3 months) for leakages (especially with toxic or hazardous mediums)
- Maintenance must be performed by authorized personnel
- Periodic maintenance (once a year) is required according to the maintenance instructions
- In case of (parts of) Swivels being redirected,

the initiator must provide information about the mediums, which have been in contact with (parts of) the Swivel

- During maintenance (partial) dismantling could be necessary, the same risks and procedures apply
- Before maintenance the full installation must be shut down/off before proceeding

SEAL KIT PART NUMBERS

3001K - 1200	
Seal Materials	Size
1 - Buna-N	10 - 3/4" & 1"
2 - Fluorocarbon	15 - 1-1/4" & 1-1/2"
3 - PTFE/Silicone	24 - 2"
4 - EPDM	30 - 3"
5 - FDA Nitrile	40 - 4"
9 - Kalrez [®]	60 - 6"
	80 - 8"

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SEAL REPLACEMENT

Warning: Support outboard weight and relax spring balance (if part of a loading arm) before attempting to do any work.

For replacement of all seals

- Clean area around gap between body and tail to avoid contamination.
- Remove swivel from piping.
- Dismantle swivel.
- Clean and inspect sealing surfaces after removing seals.
- Install new seals and re-assemble swivel
- Re-attach swivel to piping.
- Make sure to use adequate personal protection at all times.
- Relieve all pressure from the system.
- Barricade the surrounding area so no unauthorized people can access the work floor.
- Arrange the necessary permits or paperwork with the plant holder, owners or local authorities, before taking any action.
- **When the swivel is clean and dry and the necessary precautions have been taken, the swivel can be disassembled from whatever device to which it is attached.**

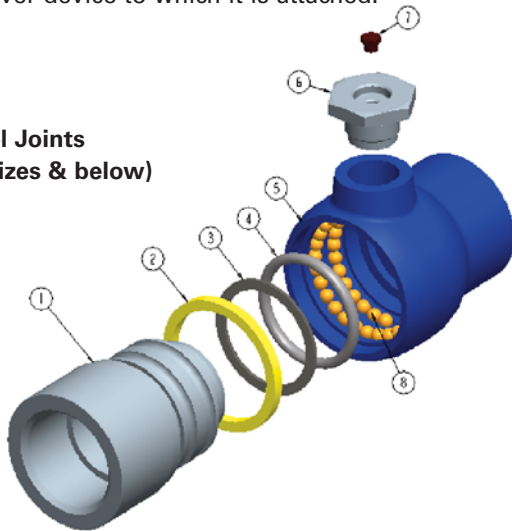
Before dismantling Swivel take necessary precautions.

- Secure Swivel to Loading Arm or other loading device.
- Relax the spring balance.
- **Make sure to use adequate personal protection at all times during the operation.**
- Clear the surrounding area and shut off any working devices.
- Relieve all pressure from the system.
- Make sure the surrounding area is clear from obstacles.
- Barricade the surrounding area so no unauthorized people can access the work floor.
- Arrange the necessary permits or paperwork with the plant holder, owners or local authorities, before taking any actions.

When Swivel is clean and dry and the necessary precautions have been taken, the Swivel can be disassembled from whatever device to which it is attached.

Cast

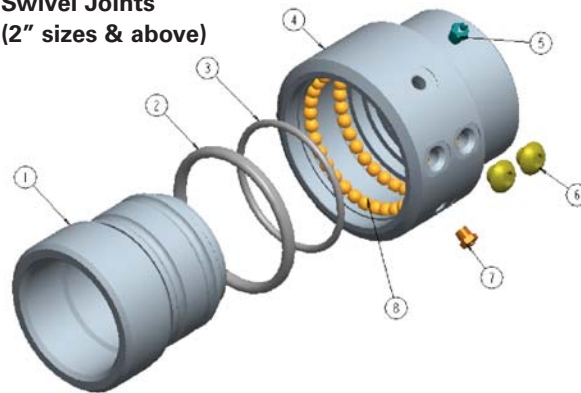
Swivel Joints (1½" sizes & below)



Item	Description
1	Tail
2	Environmental Seal
3	Spacer (3200 Series ONLY)
4	Main Seal
5	Body
6	Ball Plug
7	Pressure Relief
8	Ball Bearings

Fabricated

Swivel Joints (2" sizes & above)



Item	Description
1	Tail
2	Environmental Seal
3	Main Seal
4	Body
5	Grease Fitting
6	Ball Plug
7	Pressure Relief
8	Ball Bearings

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DETAILED DISASSEMBLY

(for seal replacement)

Attention: Dismantling must be performed by authorized and trained personnel only.

At some time (at the end of its lifetime) it may become necessary to transplant the Loading Arm, which may require removal of Swivel, or possible relocation from one loading mechanism to another.

Swivel removal can be achieved easily when Swivel is attached through flanges welded to the body and tail.

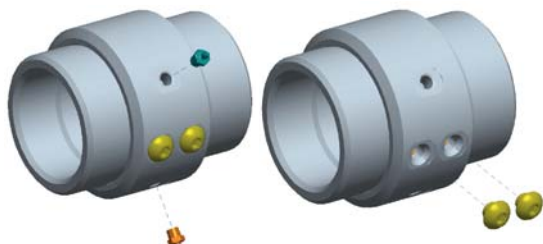
If the Swivel is welded directly to the piping, then the approach would be to disassemble the entire loading assembly.

If the Swivel is connected to the piping through threaded end connectors, a different approach should be taken.

Attention: The same risks and procedures of initial installation apply.

Warning: Reading the manuals provided, verify what kind of medium is loaded with this Swivel. When the medium is nuclear, hazardous or toxic, one is obligated to clean parts with the help of specialized personnel, companies or governments.

NOTE: The following procedure applies for both dual (2" and above) and single ball plug units.



Step 1:

Remove the grease fitting and pressure relief plug. Remove both ball plugs.



Step 2:

Rotate body and tail to cause balls to fall out. Gaps will develop as more and more balls are removed, making it difficult to remove the last few.

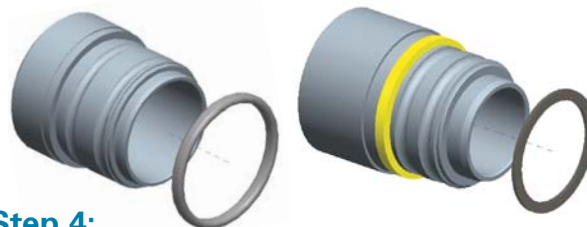
TIP 1: A degreaser may be helpful if balls stick in the races.

TIP 2: A small magnet may help in removing ball bearings.



Step 3:

Once all bearings have been removed, separate tail from body.



Step 4:

Remove seals from tail.

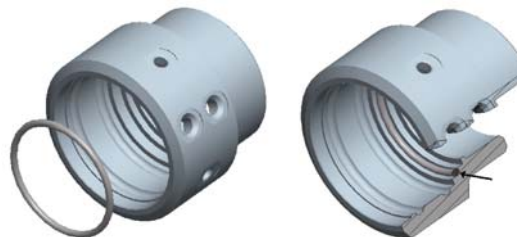
Disassembly Complete

DETAILED REBUILD



Step 1:

Make sure all surfaces of tail are clean. Lightly grease Environmental O-Ring Seal and seat up against shoulder of tail. For units with felt environmental seal, hold dust seal in groove so that it will completely enter environmental seal chamber. For 3200 Series Cast Steel swivels, insert spacer onto nose of tail as shown above.

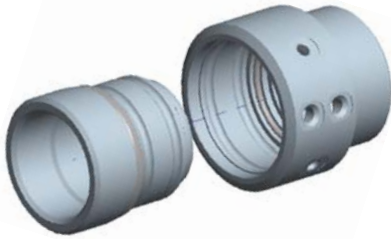


Step 2:

Lightly grease Main O-ring Seal and press into the shoulder inside the body.

DETAILED REBUILD

(continued from page 5)



Step 3:

Insert tail into body, being careful to align swivel tail and body during assembly. Slight rotation may be helpful to facilitate even seal.



Step 4:

Drop bearings into bearing holes while rotating tail to distribute bearings evenly.

- Gaps will begin to form between bearings. To install the last few, it may require you to rotate the tail and body to find where the gaps exist. **Note:** There should be no gaps when all balls have been installed.



Step 5:

Install bearing port plugs.



Step 6:

Thread grease relief and grease plug into the 2 remaining holes. Fill chamber with appropriate grease using a **manual grease gun**. **TIP:** Rotating swivel while greasing will help distribute grease.

Assembly Complete

TESTING AFTER SERVICE

When servicing has occurred and parts have been replaced, it is necessary to test the Swivel for a safe and secure use. The test procedure consists of checking to see that full rotation is possible.

Warning: Parts attached to the Swivel can be very heavy, and may cause serious injury or death if improperly installed. While testing mechanism, make sure all personnel are clear.

The OPW Engineered Systems also recommends to check the Swivel periodically for proper functioning.

When any leakages are found, have seals replaced immediately to obtain a safe and correct use of the Swivel. If leakages continue, contact the OPW distributor or **OPW Engineered Systems** for consultation.

For maintenance and adjustment of the individual components, see relevant instruction sheets.



WARNING

Failure to follow these warnings could result in serious personal injury, property damage or product failure.

1) Do not attempt any maintenance service while the equipment is in operation. System pressure must be relieved and the product drained before attempting any service on the unit. The line must be locked out while service is in progress. Proper thermal relief must be provided at all times while equipment is in service.

2) OPW products do not eliminate possible exposure to hazardous substances. The conditions of handling and use are beyond our control, and we make no guarantee and assume no liability for damages or injuries related to the use of our products. Follow the safety precautions outlined in the Material Safety Data Sheets for the material being used. It is the responsibility of the user to comply with all federal, state and local regulations. Always employ proper safety precautions and handling techniques.

3) Proper seal and wetted material part selection is critical for safe operation. To assure maximum life for the service intended, use only those materials compatible with the fluids being handled. Please note material being supplied and make certain that it is suited for the intended service.