FLOWSERVE

Repair Instructions

PSS II

Split Seal



Experience In Motion

These instructions are to be used in conjunction with the PSS II Repair Kit. The Repair Kit contains replacement seal faces, secondary seals, Loctite® [1] 430 adhesive, and Dow Corning® [2] 111 Silicone grease. Other small parts are shown in Figure 1. The repair should be done in a clean, well lit area. The tools you will need to do the repair include:

- Suitable solvent and rinse
- Alcohol
- Paper towels and/or swabs
- Single edged razor blade or Exacto style knife
- Common screw driver
- Hex key wrenches
- Paper clip
- Anti-seize™ thread compound

These instructions require the gluing of elastomers into position with Loctite 430. As with any cyanoacrylate, extreme care must be used when handling Loctite 430. See the enclosed Material Safety Data Sheet for details.

For special problems encountered during the repair procedure, contact your nearest Flowserve Sales and Service Representative or Authorized Distributer.

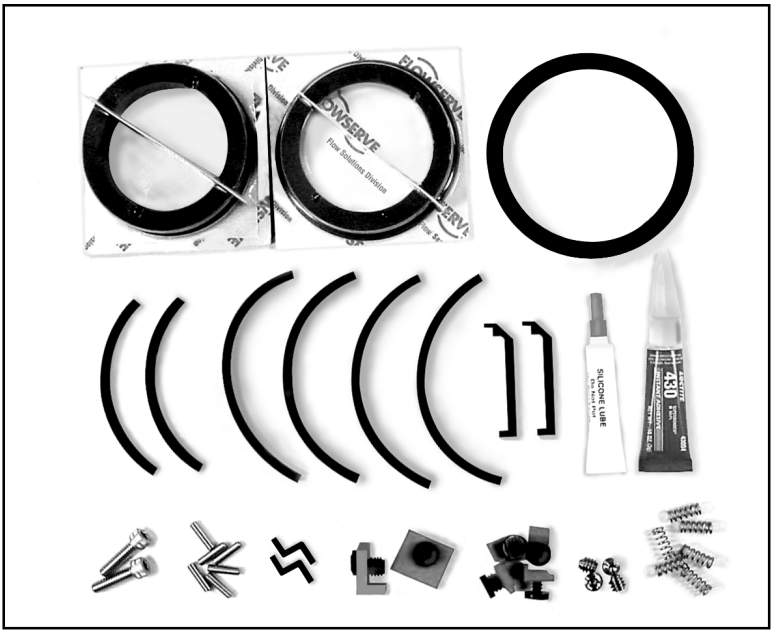


Figure 1

1 Registered Trademark of Loctite Corporation
2 Registered Trademark of Dow Corning Corporation

1 Disassemble and Clean

1.1 Remove the cap screws from the seal drive and gland.

1.2 Remove the rotating and stationary face halves by lifting the center of each face up above their drive or lock pins and sliding the face away from the seal drive or gland.

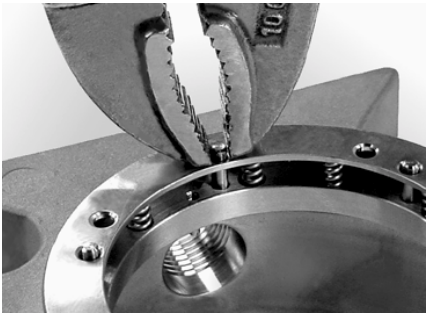


Figure 2

1.3 Remove the spring holder by pulling out the lock pins. See Figure 2.

1.4 Soak the parts in a solvent to remove the secondary seals, adhesive, grease, etc. Suggested solvents include:

- Loctite X-NMS 768
- Acetone
- Trichloroethane (chlorothene)

Note: Follow all Material Safety Data Sheet (MSDS) recommendations when handling these fluids.

1.5 Remove any remaining adhesive by brushing or lightly scraping.

1.6 Wash parts in hot soapy water. **Rinse thoroughly in clean water.** Let parts dry.

Caution: **Do not** sand or bead blast gasket and joint surfaces in the seal drive and gland to avoid damaging them. Glue, rubber, or heavy deposits must be carefully scraped off these surfaces before gasketing.

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2 Ongoing Inspection

During the assembly process follow these inspection procedures to avoid errors which may not be correctable later.

2.1 **Check Adhesion** - Gently tug at the gaskets to be sure they are properly secured. If they come loose easily, it is likely that the surfaces were not adequately cleaned or rinsed. Clean the surface again and reapply adhesive per the instructions. Apply small dots of adhesive only where specified. Dot size should be 0.040 to 0.080 inch (1.00 to 2.00 mm) in diameter.

2.2 **Gasket Length** - Be sure that the rotating face gasket, stationary face seat gasket, and seal drive sleeve gasket are 0.025 to 0.035 inch (0.65 to 0.90 mm) longer than the surfaces where they end. See Figure 3. If they are not, reposition them accordingly.

Note: All circumferential gaskets are cut to the proper length at the factory and require no further trimming. The circumferential gaskets will appear to be too long for the groove. The extra length of the gasket will be compressed into the groove between the glued points at each joint during seal assembly.

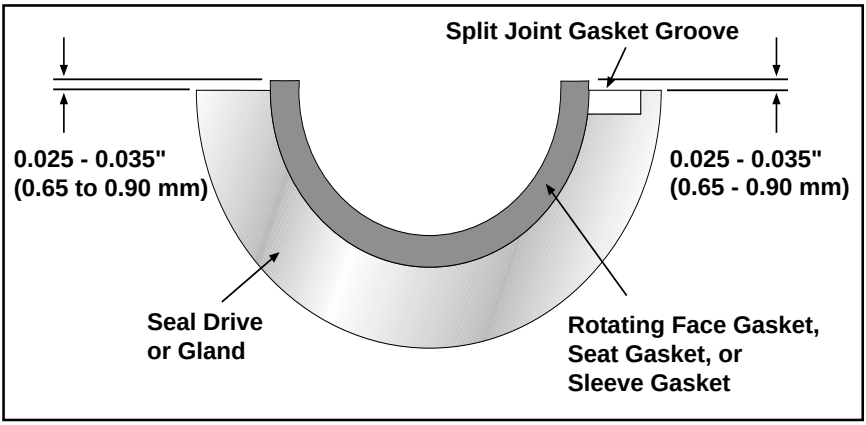


Figure 3

2.3 **Seal Drive Split Joint Gasket**
Position
The split joint gaskets should be positioned flush with the groove surfaces indicated in Figure 4. The gasket end should be flush to 0.030 inch (0.76 mm) shorter than the groove as shown.

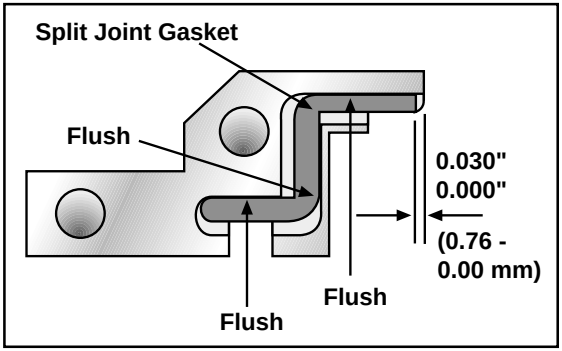


Figure 4

2.4 **Gland Split Joint Gasket**
Position
The gland split joint gaskets must be positioned as shown in Figure 5. If they are not, reposition them as needed.

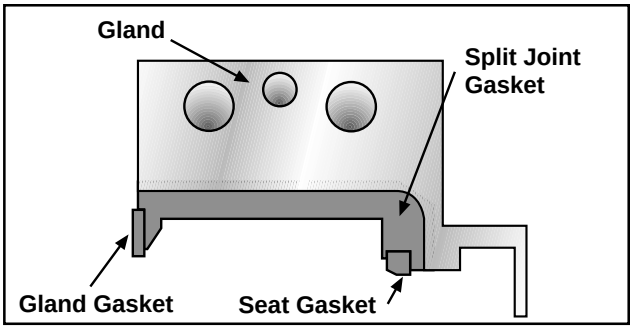


Figure 5

2.5 **Gasket Chamfers** - The seat gasket, rotating face gasket, and sleeve gasket are all chamfered on one side and must be positioned as shown in Figure 6.

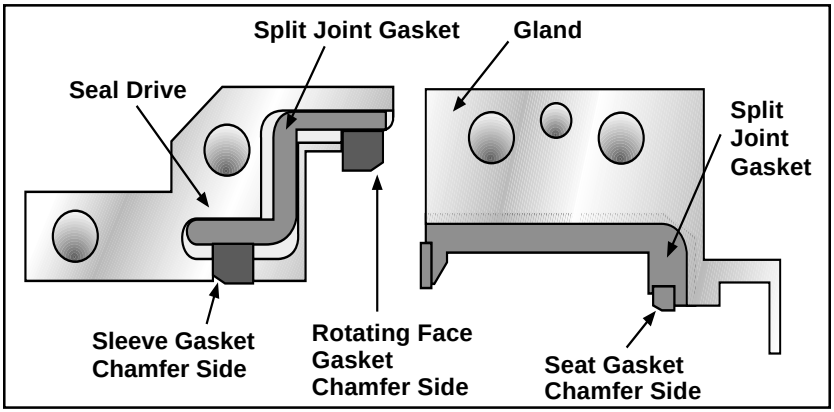


Figure 6

3 Sleeve Gasket and Rotating Face Gasket Installation

3.1 Wipe the sleeve gasket groove clean with alcohol.

Caution: Consult material safety data sheets for proper handling of alcohol.

3.2 Install the sleeve gasket into the groove. Hold the gasket in the groove and adjust it so the end extends 0.025 to 0.035 inch (0.65 to 0.90 mm) past the seal drive joint surface. See Figure 7.



Figure 7

3.3 Check the gasket extension with the 0.030 inch (0.76 mm) thick "Proud" gauge. See Figure 8.

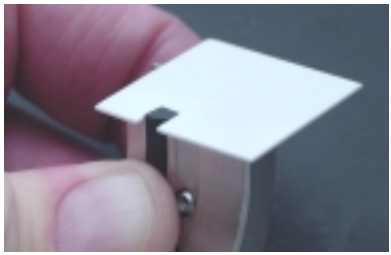


Figure 8

Note: All circumferential gaskets are cut to the proper length at the factory and require no further trimming. The circumferential gaskets will appear to be too long for the groove. The extra length of the gasket is compressed into the groove between the glue points.

3.4 Pull back 0.50 inch (12.7 mm) of the sleeve gasket and use a paper clip to put two dots of adhesive in the groove approximately 0.25 inch (6.35 mm) and 0.50 inch (12.7 mm) from the seal drive joint surface. See Figure 9.

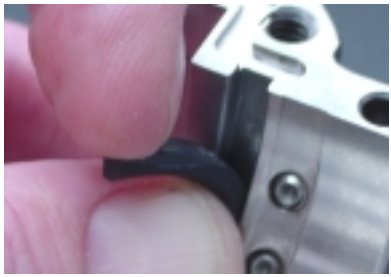


Figure 9

3.5 Push the end into the adhesive and check the gasket extension with the "Proud" gauge. Hold it in place for 10 seconds. See Figure 10.

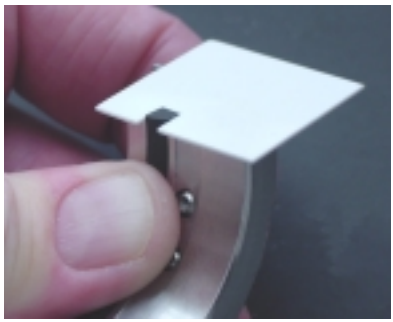


Figure 10

3.6 Glue the other end of the sleeve gasket in the groove using the same procedure.



Figure 11

3.9 Repeat this procedure for the other seal drive half.

4 Seal Drive Split Joint Gasket Installation

4.1 Wipe the seal drive's split joint gasket groove clean with alcohol.

Caution: Consult material safety data sheets for proper handling of alcohol.

4.2 Put one dot of adhesive near the inner corner. See Figure 12.

4.3 Put one dot of adhesive near the outer corner. See Figure 13.

4.4 Place the split joint gasket in the groove and position it as shown in Figure 4. Hold it in place for 10 seconds. See Figure 14.

4.5 Repeat this procedure for the other seal drive half.

3.7 Repeat these steps for the rotating face gasket.

3.8 Push the draped middle of the sleeve gasket and rotating face gasket into their grooves. **Do not** apply adhesive.
See Figure 11.

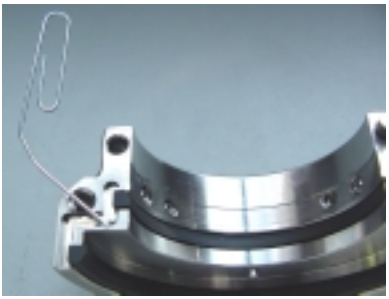


Figure 12

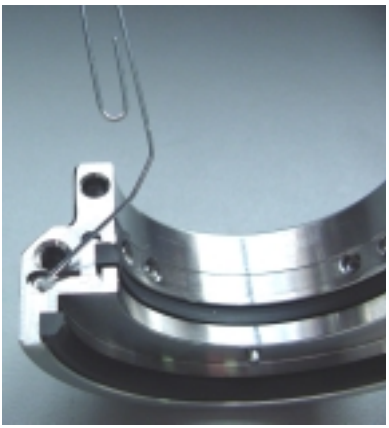


Figure 13



Figure 14

5 Spring Holder Installation

5.1 Place the coil springs in the spring holes. See Figure 15.



Figure 15

5.2 Set the gland half face down on the table and insert half of the spring holder into the gland. See Figure 16.

5.3 Lubricate one end of the lock pins and set them into the lock pin holes in the gland and align them with the holes in the spring holder.



Figure 16

5.4 Keep the spring holder snug in the gland bore and press the lock pins into the spring holder until the pins extend 0.06 inch (1.5 mm) out of the gland. See Figure 17.

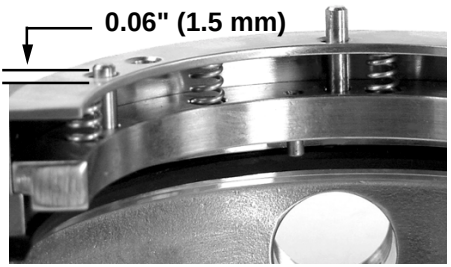


Figure 17

5.5 Repeat this procedure for the other gland half.

6 Seat Gasket Installation

6.1 Wipe the gland seat gasket groove clean with alcohol.

Caution: Consult material safety data sheets for proper handling of alcohol.

6.2 Install the seat gasket into the groove. Hold the seat gasket in the groove and adjust it so the end extends 0.025 to 0.035 inch (0.65 to 0.90 mm) past the gland joint surface. See Figure 18.

6.3 Check the gasket extension with the 0.030 inch (0.76 mm) "Proud" gauge. See Figure 19.

6.4 Pull back 0.50 inch (12.7 mm) of the seat gasket. Use a paper clip to put two dots of adhesive in the groove approximately 0.25 inch (6.35 mm) and 0.50 inch (12.7 mm) from the gland joint surface. See Figure 20.

6.5 Push the end into the adhesive and check the gasket extension with the "Proud" gauge. Hold it in place for 10 seconds. See Figure 21.

6.6 Glue the other seat gasket end into the groove using the same steps.

6.7 Push the middle of the gasket into the groove. **Do not** apply adhesive.

6.8 Repeat this procedure for the other gland half.

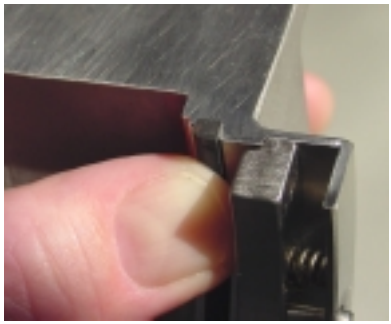


Figure 18

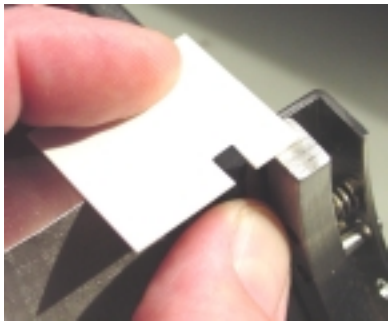


Figure 19

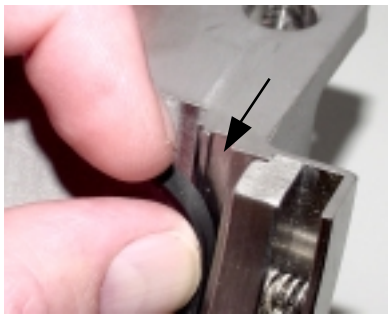


Figure 20

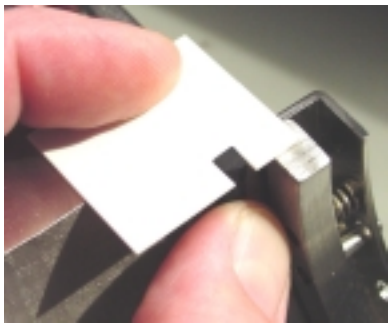


Figure 21

7 Gland Gasket Installation

7.1 The gland gasket should be installed with one dot of adhesive every 0.50 inch (12.7 mm) with an extra dot of adhesive 0.25 inch (6.35 mm) both sides of the gland joint.

7.2 Coat the cap screws with anti-seize and assemble the gland halves. Tighten the cap screws until the gland joints are metal to metal.

7.3 Wipe the gland gasket groove clean with alcohol.

Caution: Consult material safety data sheets for proper handling of alcohol.

7.4 Apply one dot of adhesive to the gland gasket groove about 0.25 inch (6.35 mm) from a gland joint. See Figure 22.

7.5 Center the gland gasket in the gasket groove and hold it in place for 10 seconds.

7.6 Apply another dot of adhesive 0.50 inch (12.7 mm) from the first dot and hold the gland gasket at that dot for 10 seconds. Repeat this step every 0.50 inch (12.7 mm) around the groove circumference. See Figure 23.

7.7 Loosen the cap screws about 1/2 turn. Spread the gland joints and cut the gland gasket at these locations. See Figure 24.

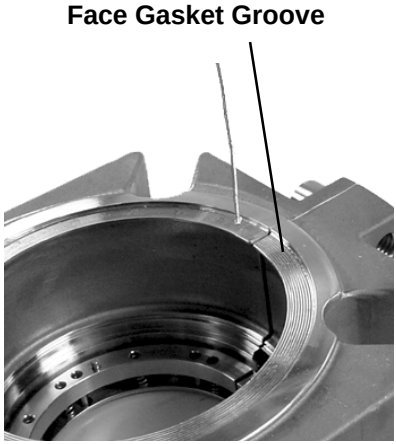


Figure 22



Figure 23

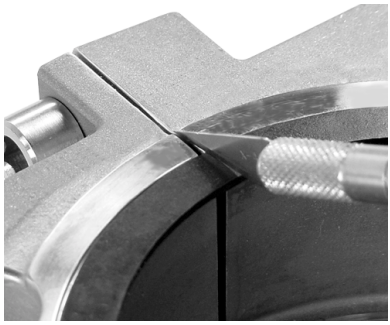


Figure 24

8 Gland Split Joint Gasket Installation

8.1 Wipe the gland split joint gasket groove clean with alcohol.

Caution: Consult material safety data sheets for proper handling of alcohol.

8.2 Put one dot of adhesive in the groove as shown in Figure 25.



Figure 25

8.3 Place the split joint gasket in the groove. Make sure it is flush with the back of the gland gasket, the back and top of the seat gasket, and the top of the split joint gasket groove. Hold it in place for 10 seconds. See Figure 26.

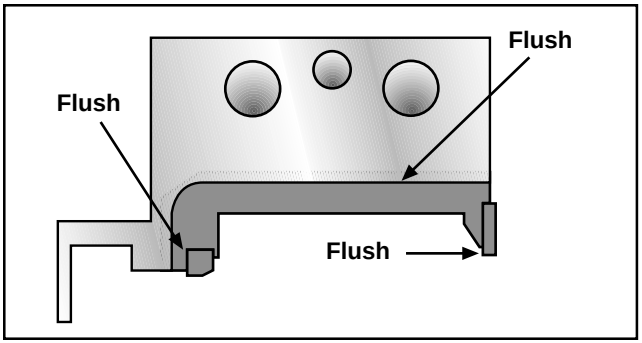


Figure 26

8.4 Apply two more dots of glue as shown in Figure 27.

8.5 Align the split joint gasket with the seat gasket and gland gasket as shown in Figure 26. Hold it in place for 10 seconds.

8.6 Repeat this procedure for the other gland half.

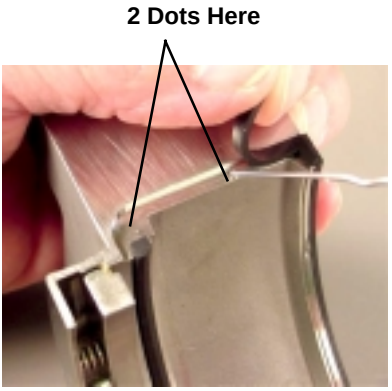


Figure 27

9 Rotating Face Installation

9.1 Lubricate the exposed surfaces of the rotating face gasket including the ends and the rotating face shoulder with silicone grease.



Figure 28

9.2 With the seal drive sitting on the bench, set the rotating face on it. See Figure 28.

9.3 Align the drive pin and drive slot.

9.4 Push the rotating face radially into the seal drive and then down as the drive pin slips into the drive slot.

9.5 Repeat this procedure to install the other rotating face half.

9.6 Lubricate the exposed surfaces of each sleeve gasket including the ends and the split joint gaskets with silicone grease.

9.7 Loosely cap screw the havles together.

9.8 Align the rotating faces and wipe clean with alcohol.

Caution: Consult material safety data sheets for proper handling of alcohol.

10 Stationary Face Installation

10.1 Lubricate the exposed surfaces of the seat gasket including the ends and the stationary face shoulder with silicon grease.

10.2 With the gland sitting on the bench, set the stationary face on the spring holder as shown in Figure 29.

10.3 Align the lock pin and lock pin slot.



Figure 29

10.4 Push the stationary face radially into the gland and then down as the lock pin slips into the lock pin slot. The stationary face should sit flush with the spring holder.

10.5 Repeat this procedure for the other gland half.

10.6 Lubricate the exposed surfaces of the split joint gaskets with silicon grease.

10.7 Loosely cap screw the halves together.

10.8 Align the stationary faces and wipe them clean with alcohol.

Caution: Consult material safety data sheets for proper handling of alcohol.

11 Centering Device Installation

11.1 Place the gland assembly on the table face down.

11.2 Set one centering device on the gland and press the centering device fastener through the centering device and into the locating hole in the gland. The locating holes are located 45 degrees from the split joints and are even with the bolt slots.
See Figure 30.

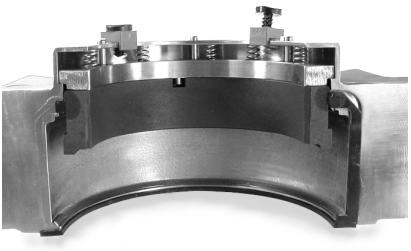


Figure 30

Note: Newer PSS II seal designs use a one piece centering device that can be pressed into place without a separate fastener.

11.3 Repeat this procedure for all four centering devices.
See Figure 31.

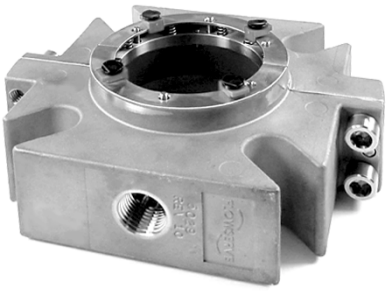


Figure 31

12 Setting Device Installation

12.1 Push the plastic fastener through the hole in a setting device as shown in Figure 32.

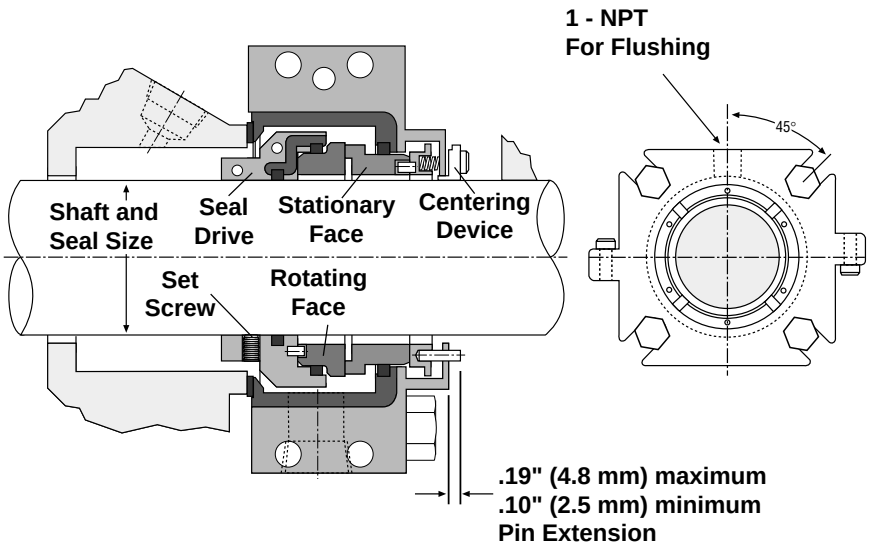


Figure 32

12.2 Push the fastener into the side hole of the seal drive. See Figure 32.

12.3 Repeat this procedure for the other setting device.

13 Seal Reference



For proper seal installation, please refer to Flowserve publication FIS145, PSS II Installation Instructions.

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