Installation of John Crane Type 3740 Split Mechanical Seal

General

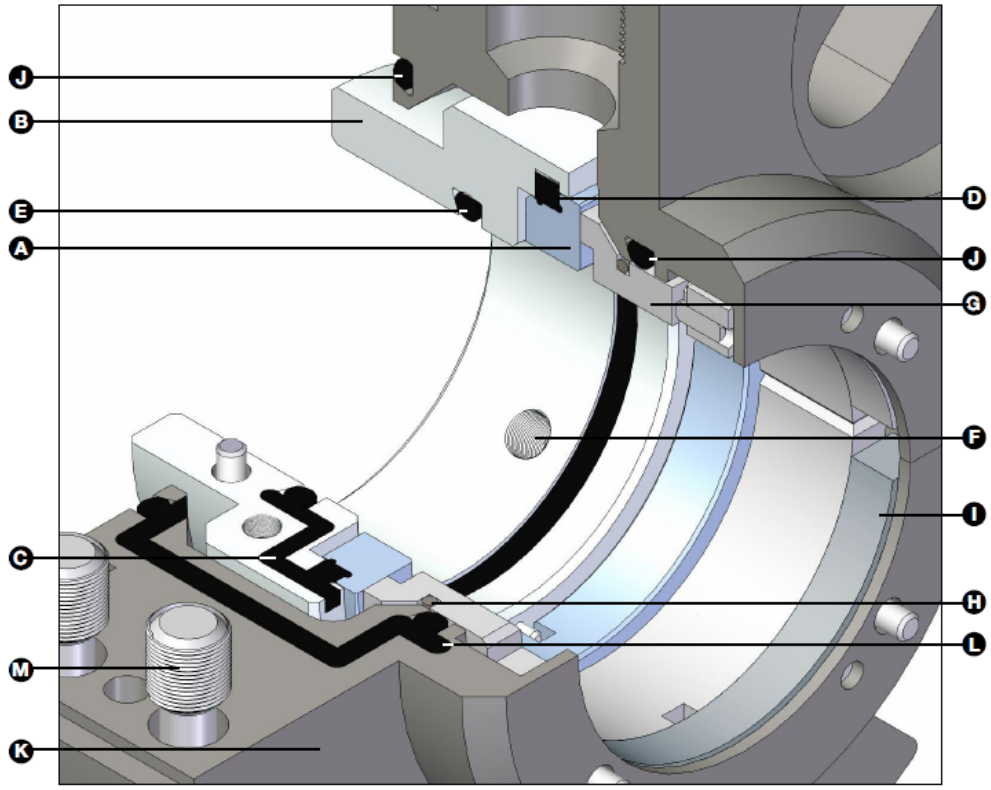
Be sure to read all instructions carefully before installing seal to prevent the potential mismatch of the two sealing halves. Consult the general arrangement drawing and applicable notes included with the actual seal.

The John Crane Type 3740 Seal is a precisions product. To assure satisfactory operation, handle seal with care. Take particular caution to see that the lapped sealing faces are not scratched or marred.

Absolutely no grease or lubricant is to be used on the shaft during installation.

Part Name

A- Mating Ring
B- Mating Ring Adapter Assy.
C- Sealing Element Gasket
D- Sealing Element Strip
E- Sealing Element Oring
F- Set Screw
G- Primary Ring
H- Retaining Ring
I- Spring Adapter Assy. Set
J- O-Ring (Split)
K- Gland Plate Assemb
L- Gland Plate Gasket
M- Captive Socket Head Cap Screws



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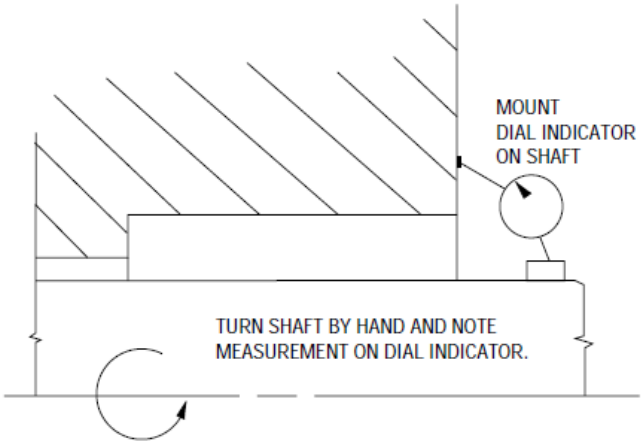
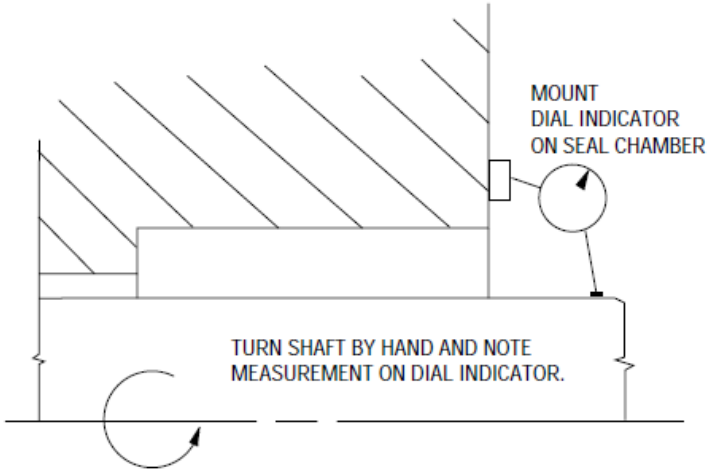
Preparing the Equipment

A. Determine squareness of seal chamber face to shaft.

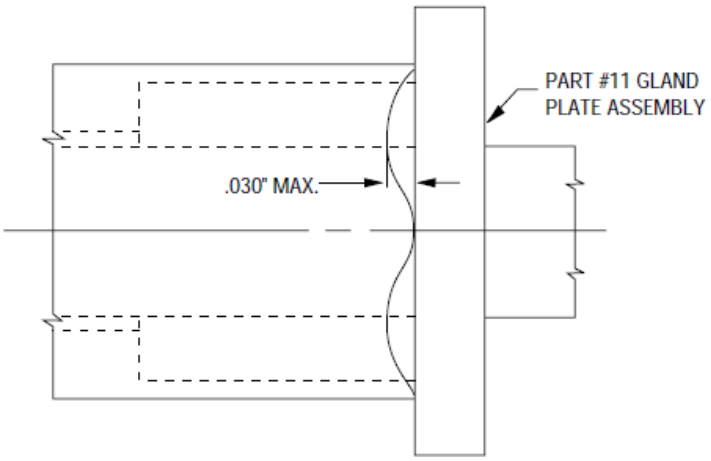
Carbon vs. Silicon = 0.050” T.I.R. Max.
Carbon vs. Ceramic = 0.050” T.I.R. Max.
Silicon vs. Silicon = 0.100” T.I.R. Max.



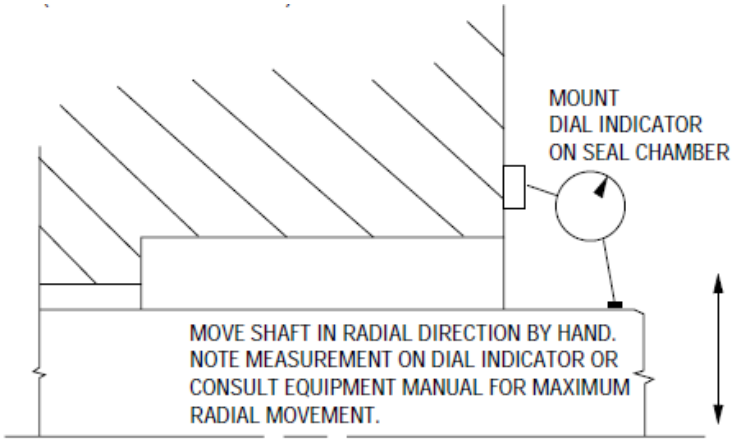
B. Measure shaft run out (0.010” T.I.R max.)



C. Check stuffing box face waviness (0.030” T.I.R. max).



D. Maximum radial shaft movement (.124” T.I.R. max).



Installation of John Crane Type 3740 Split Mechanical Seal

A. Seal Assembly

1. Remove the mating ring adapter assembly halves from the packaging.

ATTENTION Do not fit the mating ring adapter assembly halves together before actual installation. Damage to the mating ring split joints may occur.

NOTE: Ensure the set screws are not threaded past the inside diameter of the mating ring adapter assembly halves as they will interfere with the shaft during installation.

NOTE: Ensure the mating ring halves are properly assembled in the mating ring adapter assembly halves. The mating ring halves should be engaged with the sealing element strip as shown in *figure 1 and 2A.* The mating ring halves may be adjusted if necessary by pushing on the mating ring halves as shown in *figures 2A and 2B.*

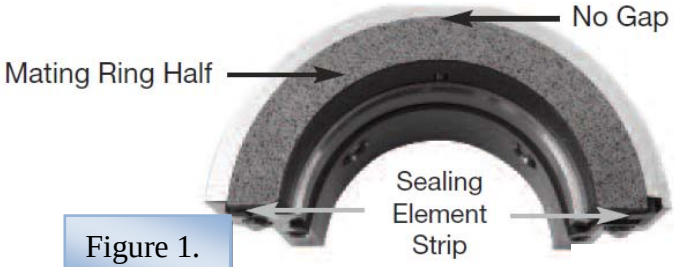


Figure 1.

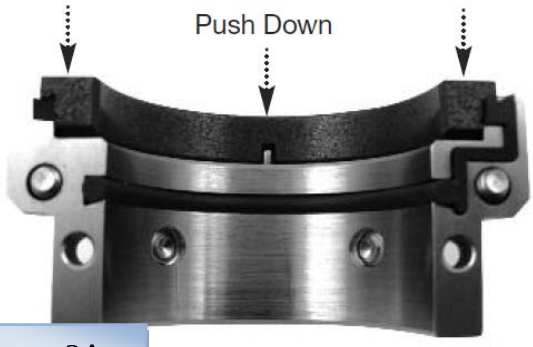


Figure 2A.

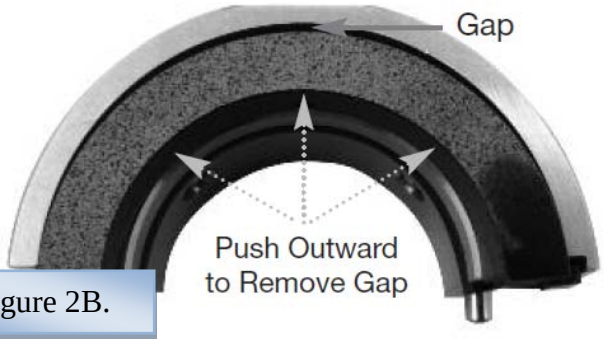


Figure 2B.

NOTE: Ensure the gasket and opposite side O-ring and strip free ends of the sealing element are properly extend as shown in figure 3. They can be pushed in or out to adjust if necessary.

2. Lightly lubricate the exposed inside diameter surface of the shaft O-ring with the provided lubricant on each mating ring adapter assembly half. *Figure 4.*

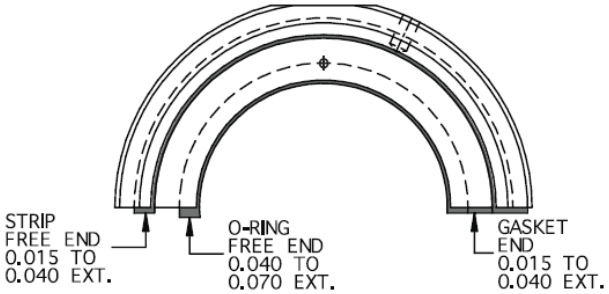


Figure 3.

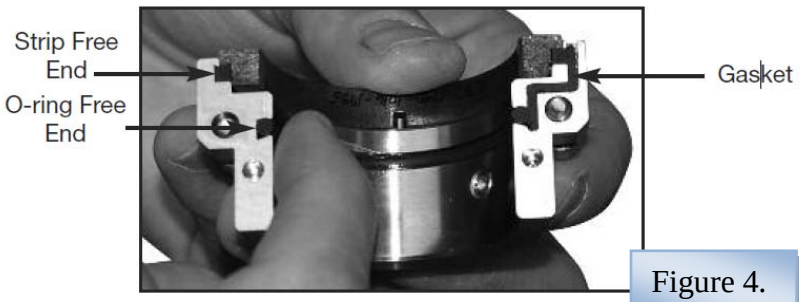


Figure 4.

3. Lightly lubricate the exposed surfaces of the gasket and the opposite side O-ring and strip free ends of the sealing element with the provided lubricant on each mating ring adapter assembly half. *Figure 5*

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ATTENTION Be careful not to apply lubricant to the mating ring s

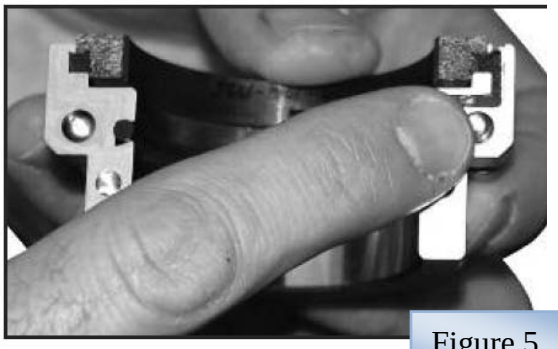

Figure 5.

4. Place the mating ring adapter assembly halves around the shaft with the mating ring point away from the equipment's seal chamber. Bring the halves together to begin engagement of the alignment pins. Evenly tighten the cap screws until approximately a 1/32"/0.8MM gap exist at each split joint. *Figure 6.*

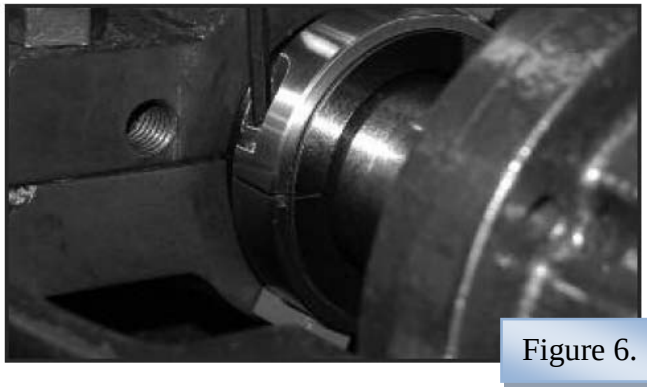

Figure 6.

5. Slide the mating ring adapter assembly on the shaft toward the seal chamber until the setting spacers contact the seal chamber face. *Figure 7.*

Figure 7.

6. Continue evenly tightening the cap screws until the mating ring halves begin to contact. Check that the mating ring split joints are light at the lapped sealing surface. If a step exists, push on the high side of the step to correct. *Figure 8.*

Figure 8.

NOTE: seal faces are flat to within 0.000035"/0.00089mm. As with any split seal, assuring the seal face halves are properly aligned is extremely important to assure optimal performance.

Installation of John Crane Type 3740 Split Mechanical Seal

7. Fully tighten the cap screws and again check the mating ring split joints for steps at the lapped sealing surface and the outside diameter. If a step exists at the lapped sealing surface or outside diameter, push on the high side of the step to correct. A seating spacer may be temporarily removed and used to push against the high side of a step at the outside diameter. *Figure 9.*

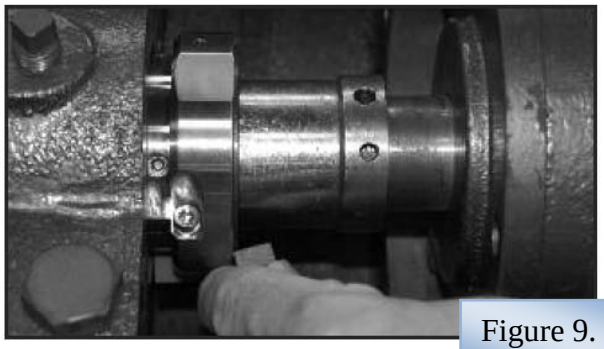

Figure 9.

8. Ensure the setting spacers are contacting the seal chamber face then evenly tighten the set screws.

9. Remove the two plastic setting spacers from the mating ring adapter assembly using the small screwdriver provided.

10. Clean the mating ring sealing surface with the provide alcohol pads. *Figure 11*.

Figure 11.

NOTE: Completed mating ring adapter assembly should look like this → *Figure 12.*

Figure 12.

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B. STEP 2

1. Remove the primary ring halves and retaining ring from the packaging.

ATTENTION Do not fit the primary ring halves together before actual installation. Damage to the primary ring split joints may occur.

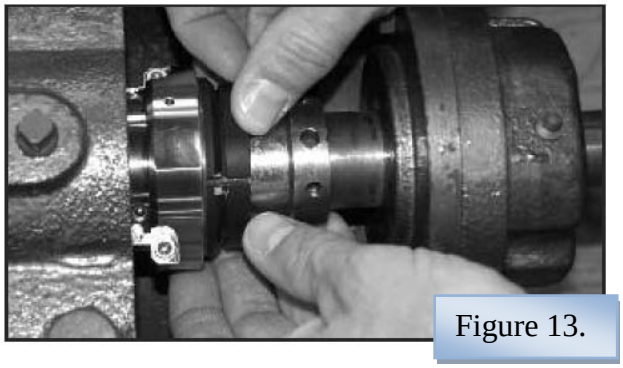

Figure 13.

2. Place the primary ring halves around the shaft, with the sealing surface facing the mating ring adapter assembly, and bring the halves together. (Note: placing the primary ring halves against the mating ring face while bringing the halves together will help to steady the primary ring halves and make aligning the split joints easier.) *Figure 13.*

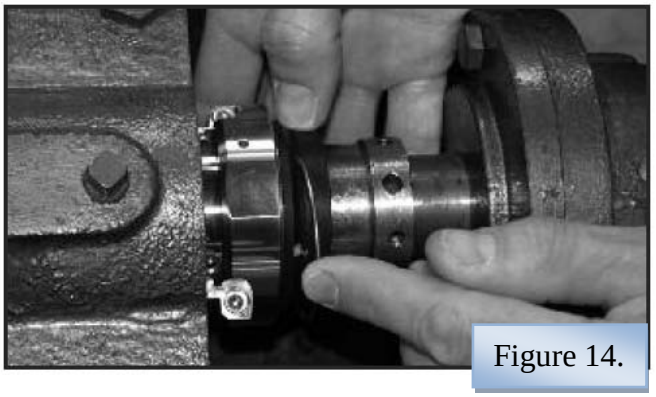

Figure 14.

3. While holding the primary ring halves together with the split joints aligned, center the retaining ring over one of the split joints of the primary ring and slide it into the groove on the primary ring outside diameter. *Figure 14.* Check the primary ring split joints for steps at the lapped sealing surface and outside diameter. Adjust the split joint alignment if necessary.

NOTE: seal faces are flat to within 0.000035”/0.00089mm. As with any split seal, assuring the seal face halves are properly aligned is extremely important to assure optimal performance.

4. Apply a thin, even film of lubricate to the O-ring contact surface of the primary ring with the provided lubricant. *Figure 15.*

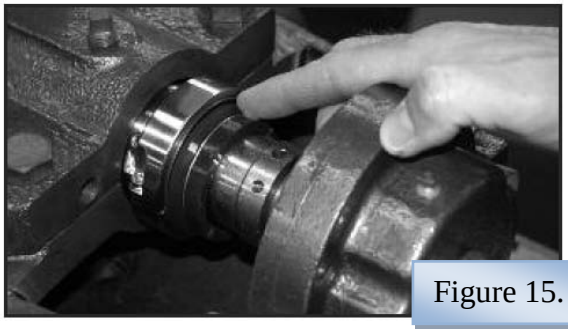

Figure 15.

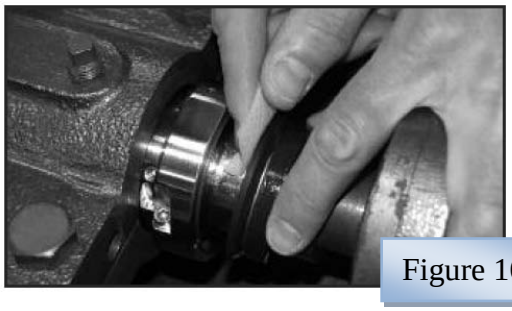

Figure 16.

5. Clean the primary ring sealing surface with the provide alcohol pads. Slide the primary ring face against the mating ring face. *Figure 16.*
NOTE: completed primary ring assembly should look like this → *Figure 17.*

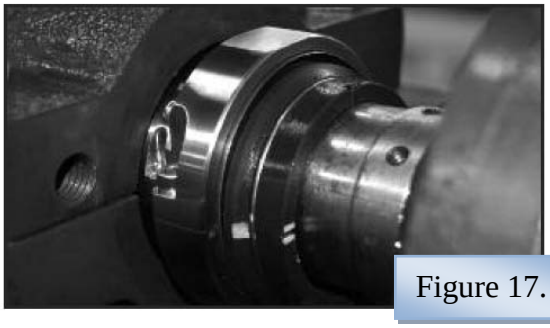

Figure 17.

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C. STEP 3

1. Removed the gland plate assembly halves from the packaging.

   NOTE: Ensure the ends of the primary ring O-rings and gland face O-rings are properly extended as shown in *Figure 18.* Also ensure even extensions on both ends. They can be pushed in or out to adjust if necessary.

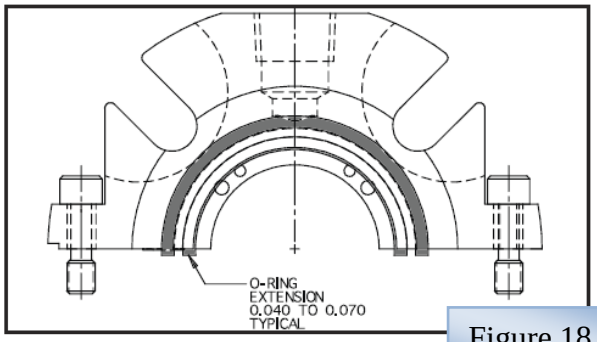

Figure 18.

2. Plug any unused flush connection taps with the provided pipe plugs.

3. Lightly lubricate the exposed surfaces of the split joint gasket and the O-ring free ends with the provide lubricant on each gland plate assembly half. *Figure 19.*

   ATTENTION Do not lubricate the exposed inside diameter surface of the primary ring O-ring or the exposed face surface of the gland face O-ring.

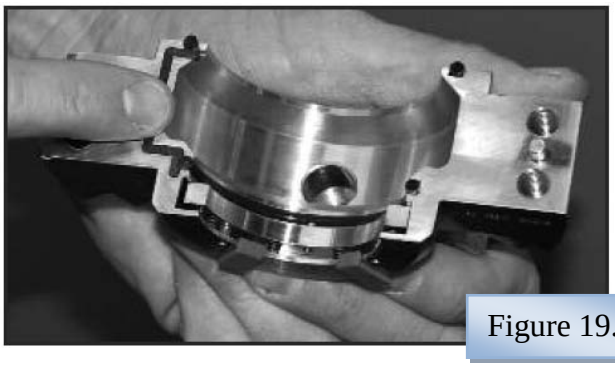

Figure 19.

4. Locate the white alignment marks at the primary ring split joints so that they will line up with the gland plate assembly split surfaces when the first half of the gland plate assembly is installed.

   EXAMPLE: Place the first gland plate assembly half around the shaft so that the split joints are at the 3 and 9 o'clock positions, locate the primary ring white alignment marks at the 3 and 9 o'clock positions.

5. Bring the first half of the gland plate assembly, with the gland face O-ring facing the equipments' seal chamber, around the rotating assembly and primary ring assembly so that the gland plate inside diameter angled lip gently engages and goes around the beveled edge of the rotating assembly. *Figure 20.*

6. While holding the exposed half of the primary ring assembly, bring the gland plate assembly half toward the primary ring ensuring the gland plate assembly split surfaces align with the primary ring white alignment marks. *Figure 20.*

   NOTE: with the split surface and white alignment marks aligned, the gland plate assembly anti-rotation pin will be closely aligned with the primary ring slot and should easily engage.

Figure 20.

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7. Lightly Push the opposite opposed half of the primary ring inward towards the gland plate assembly ID and try to slightly rotate in either direction to verify engagement of the anti-rotation pin. The anti-rotation pin is properly engage when the primary ring will not rotate relative to the gland plate assembly half.

8. Bring the second half of the gland plate assembly around the shaft and towards the first half to engage the alignment pins. *Figure 21.*

   NOTE: Be careful to bring the two halves together even gaps at each split joint. Bringing the halves together with uneven gaps that vary by more than 1/8”/3.2mm, may prevent proper engagement of the second gland plate assembly half anti-rotation pin and result in damage to the primary ring.

Figure 21.

9. Evenly tighten the cap screws until approximately a 1/8”/3.2mm gap exist at each split joint, while feeling for an resistance that may be due to an improperly aligned gland plate anti-rotation pin. Continue evenly tightening the cap screws until the split joints are contacting and the cap screws are only snug. Avoid fully tightening the cap screws at the point as this will case the gland assembly to tilt/rock from side to side and may result in damage to primary ring split surfaces. *Figure 22.*

10. Install the seal mounting bolts (typically not supplied). Evenly tighten the bolts but do not fully tighten at this time. Tighten the bolts until the gland plate assembly begins to contact the seal chamber and then back off bolts on-quarter turn. *Figure 23.*

Figure 22.

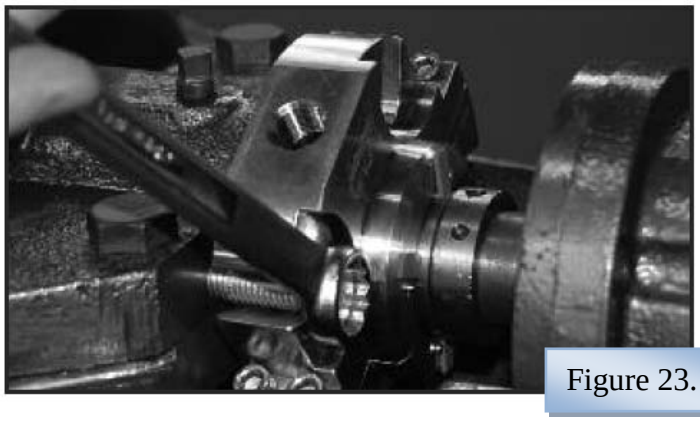

Figure 23.

11. Fully tighten the gland plate assembly cap screws. *Figure 24*

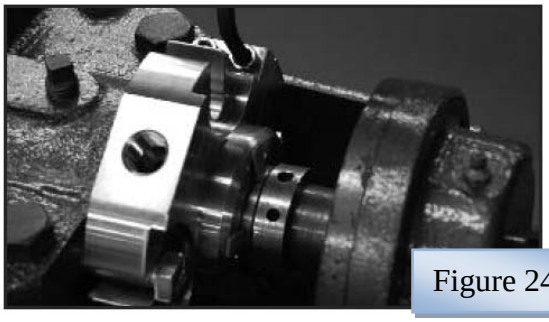

Figure 24.

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12. Evenly tighten the seal mounting bolts ensuring metal to metal contact between the gland plate assembly and seal chamber face is made. Do not over tighten the bolts; doing so may cause gland plate distortion which could result in excessive leakage.

13. Removed the four plastic centering spacers from the outboard end of the gland plate using the small screwdriver provided. *Figure 25.*

Figure 25.

14. Connect seal flush and/or vent connections to the seal gland plate if required. *Figure 26.*

NOTE: the completed seal installation should look like this →

Figure 26.

D. <u>Before Staring Unit.</u>

1. Check the pump at the coupling for proper alignment of the driver or motor.
2. Ensure that the gland plate is bolted securely as describing Install Gland Plate Assembly
3. Complete the assembly of the pump, and turn the shaft (by hand if possible) to ensure free rotation.
4. Consult all available equipment operating instruction to check for correctness of all piping and connections, particularly regarding seal recirculation/flush, heating or cooling requirements, and services external to the seal.

ATTENTION The Type 3740 Wet running seal is designed to operate in a liquid so the heat energy it creates is adequately removed. Therefore, the following check should be carried out not only after seal installation, but also after any periods of equipment inactivity.

5. For the Type 3740 Wet Running split seal, check what the seal chamber fluid lines are open and free of any obstruction, and ensure that the seal chamber is properly vented and filled with liquid – refer to the pump instruction manual.

ATTENTION Dry Running the Type 3740 Wet Running split seal will cause overheating and scoring or other damage to the sealing surfaces, resulting in excessive leakage or a much shortened seal life.

WARNING: Before startup, ensure that all personnel and assembly equipment have been moved to a safe distance so there is no contact with rotation parts on the pump, seal, coupling or motor.
Seal installation should be handled only by qualified personnel, if questions arise, contact the local John Crane Sales/Service Engineer. Improper use and/or installation of this product could result in injury to the person and /or harmful emissions to the environment, and may affect any warranty on the product.