

250L™ Cartridge Dual Seal

Installation, Operation and Maintenance Instructions



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Seal Data Reference

(from Box Label)

ITEM # _____

SEAL _____

(example 250L-15 SSC/CB)

INSTALLATION DATE _____

1.0 CAUTIONS

These instructions are general in nature. It is assumed that the installer is familiar with seals and certainly with the requirements of their plant for the successful use of mechanical seals. If in doubt, get assistance from someone in the plant who is familiar with seals or delay the installation until a seal representative is available. All necessary auxiliary arrangements for successful operation (heating, cooling, flushing) as well as safety devices must be employed. These decisions are to be made by the user. The decision to use this seal or any other Chesterton seal in a particular service is the customer's responsibility.

Do not touch the mechanical seal for any reason while it is operating. Lockout or uncouple the driver prior to personal contact with the seal. Do not touch the mechanical seal while it is in contact with hot or cold fluids. Ensure that all the mechanical seal materials are compatible with the process fluid. This will prevent possible personal injury.

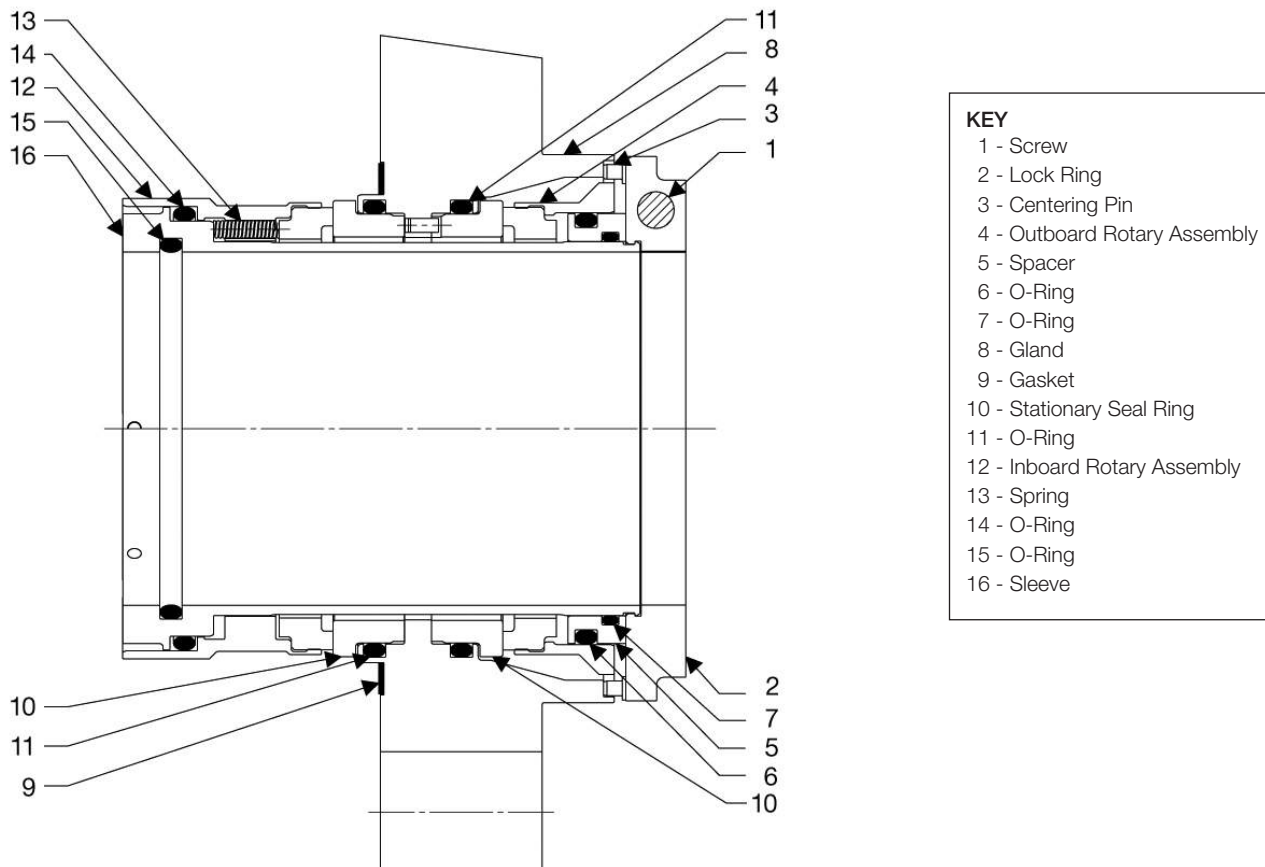
2.0 TRANSPORT AND STORAGE

Transport and store seals in their original packaging. Mechanical seals contain components that may be subject to alteration and ageing. It is therefore important to observe the following conditions for storage:

- Dust free environment
- Moderately ventilated at room temperature
- Avoid exposure to direct sunlight and heat
- For elastomers, storage conditions according to ISO 2230 should be observed

3.0 DESCRIPTION

3.1 Parts Identification



3.0 DESCRIPTION cont.

3.2 Operating Parameters

Pressure:

Up to 6.9 bar g (100 psig)

Speed Limits:

Over 3600 RPM consult Seal Applications Engineering

Temperature Limits:**Elastomers**

To 150°C (300°F) EPDM

To 205°C (400°F) FEPM, FKM

Seal Faces

To 150°C (300°F) Silicon Carbide

To 205°C (400°F) Carbon

Standard Materials*

All Metal Parts: 316 SS / EN 1.4401

Springs: Alloy C276 / EN 2.4819

Rotary Face: Carbon; Silicon Carbide

Stationary Face: Silicon Carbide

Elastomers: FKM; EPDM; FEPM; FFKM

**Other materials available upon request.*

3.3 Intended Use

The 250L mechanical seal is specifically designed for the intended application and is to be operated within the operating parameters as specified. For use beyond the intended application and/or outside the operating parameters, consult Chesterton to confirm the suitability of the mechanical seal prior to putting the mechanical seal in operation.

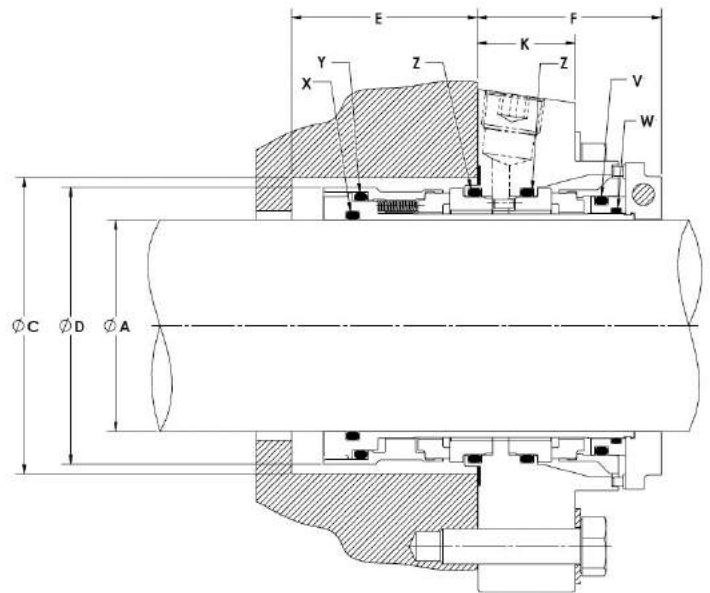
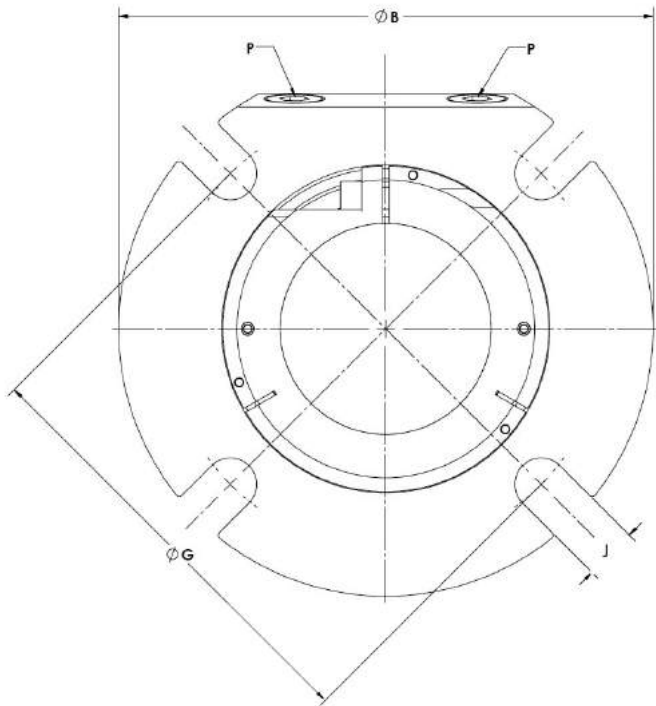
3.0 DESCRIPTION cont.

3.4 Dimensional Data

SEAL SIZE	SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SEAL OD	SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE			SLOT WIDTH	SB TO BOLT SURFACE	PORT SIZE	O-RINGS				
	A	B	C	C	D	E	F	G MIN			J	K	P	V	W	X	Y	Z
		MAX	MIN	MAX	MAX	MIN	MAX	0.375	0.500	0.625		MAX		SPACER	SPACER	SLEEVE	ROTARY	GLAND
1.125	1.125"	4.11	1.75	2.04	1.73	1.63	1.95	3.29	–	–	0.43	1.10	1/4-18 NPT	125	124	122	028	129
1.125	1.125" OS	4.48	2.50	2.75	1.73	1.56	2.02	4.17	–	–	0.43	1.17	1/4-18 NPT	125	124	122	028	129
1.375	1.375"	4.48	2.00	2.33	1.98	1.63	1.95	3.96	–	–	0.43	1.12	1/4-18 NPT	129	128	126	030	132
1.375	1.375" OS	5.23	2.68	3.00	1.98	1.63	1.95	4.54	–	–	0.43	1.12	1/4-18 NPT	129	128	126	030	132
1.750	1.750"	5.48	2.50	2.81	2.48	1.58	2.07	4.54	4.67	–	0.56	1.00	3/8-18 NPT	137	134	132	138	139
1.750	1.750" OS	6.63	3.37	3.75	3.33	1.58	2.07	5.92	6.04	–	0.56	1.00	3/8-18 NPT	137	134	132	138	139
1.875	1.875"	5.48	2.63	2.94	2.60	1.58	2.07	4.17	–	–	0.43	1.00	3/8-18 NPT	138	136	134	140	141
1.875	1.875" OS	6.75	3.42	3.81	2.60	1.58	2.07	6.42	6.54	–	0.56	1.00	3/8-18 NPT	138	136	134	140	141
2.000	2.000"	5.48	2.75	3.19	2.73	1.58	2.07	4.67	4.79	–	0.56	1.00	3/8-18 NPT	141	138	136	142	143
2.125	2.125"	5.48	2.88	3.44	2.85	1.58	2.07	4.92	5.04	–	0.56	1.00	3/8-18 NPT	143	140	138	144	145
2.125	2.125" OS	6.98	3.75	4.25	3.71	1.58	2.07	5.67	5.79	5.92	0.71	1.00	3/8-18 NPT	143	140	138	144	145
2.250	2.250"	5.98	3.00	3.56	2.98	1.58	2.07	5.34	5.46	–	0.56	1.00	3/8-18 NPT	145	142	140	146	147
2.500	2.500"	6.73	3.25	3.81	3.23	1.61	2.04	5.17	5.29	5.42	0.71	1.00	3/8-18 NPT	149	146	145	150	151
2.500	2.500" OS	7.98	4.37	4.75	4.33	1.64	2.01	6.42	6.54	6.67	0.71	1.00	3/8-18 NPT	149	146	145	150	151
2.625	2.625"	6.44	3.38	3.94	3.35	1.58	2.07	5.73	5.86	–	0.65	1.00	3/8-18 NPT	150	148	146	151	151
2.625	2.625" OS	7.73	4.38	4.78	3.35	1.64	2.01	6.42	6.54	6.67	0.71	1.00	3/8-18 NPT	150	148	146	151	151
3.000	3.000"	7.61	4.00	4.69	3.98	2.22	2.63	6.67	6.79	6.92	0.74	1.41	1/2-14 NPT	237	152	234	238	240
3.000	3.000" OS	9.45	4.93	5.39	3.98	2.18	2.67	7.67	7.79	7.92	0.74	1.41	1/2-14 NPT	237	152	234	238	240
3.375	3.375"	7.98	4.38	5.06	4.36	2.10	2.75	7.11	7.24	7.36	0.80	1.41	1/2-14 NPT	240	153	237	241	243
3.750	3.750"	8.71	4.75	5.39	4.73	2.22	2.63	7.42	7.54	7.67	0.74	1.41	1/2-14 NPT	243	155	240	244	245

*OS = oversize

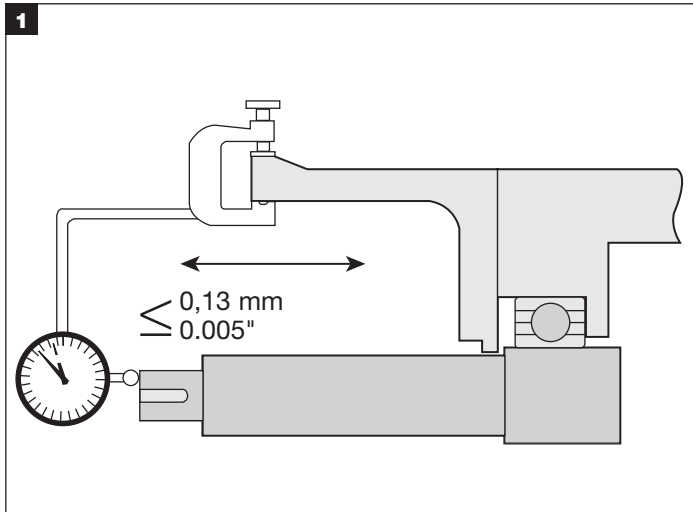
**1.125" and 1.875" Standard Bore bolts should be socket head cap screws to avoid interference with lock ring OD (hex bolts should not be used for these two sizes)



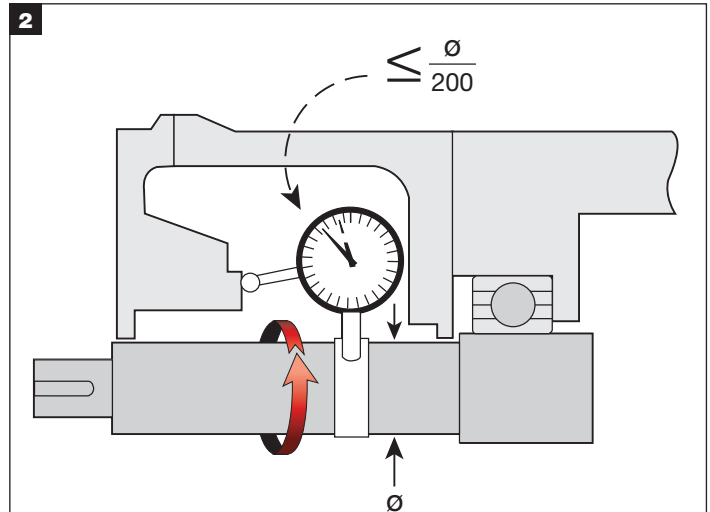
SEAL SIZE	Min. BC w/ SHCS	Min. BC w/ Hex
**1.125	2.875	2.896
**1.875	3.750	3.772

4.0 PREPARATION FOR INSTALLATION

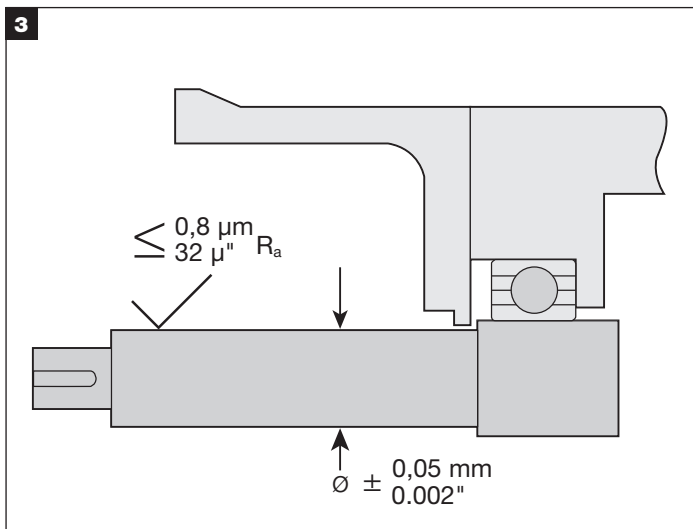
4.1 Equipment



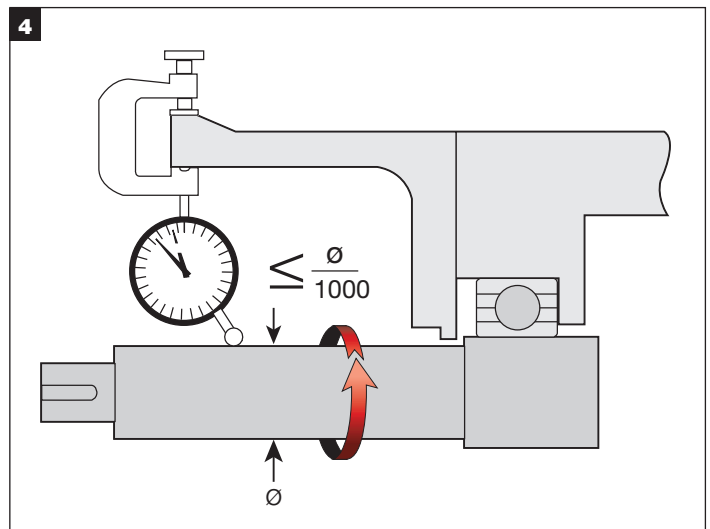
If practical, place the dial indicator tip on the end of the shaft sleeve or on a step in the shaft to measure end play. Alternately push and pull the shaft in the axial direction. If the bearings are in good condition, end play should not exceed 0,13 mm (.005").



If possible, attach a base dial indicator to the shaft and rotate both the indicator and shaft slowly while reading the runout of the stuffing box face. Misalignment of the stuffing box face relative to the shaft should not exceed 0,13 mm (.005"). The stuffing box face must be flat and smooth enough to seal the gland. Surface roughness should be 3,2 microns (125 microinch) Ra maximum for gaskets and 0,8 micron (32 microinch) Ra for O-Rings. Steps between halves of split case pumps should be machined flat. Make sure the stuffing box is clean and clear along its entire length.



Remove all sharp corners, burrs, and scratches on the shaft, especially in areas where the O-Ring will slide, and polish if necessary to achieve a 0,8 micron (32 microinch) Ra finish. Make sure the shaft or sleeve diameter is within 0,05 mm (.002") of nominal.

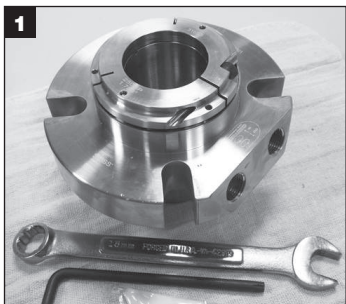


Use a dial indicator to measure the shaft runout in the area where the seal will be installed. Runout should not exceed 0,03 mm (.001") TIR per inch of shaft diameter.

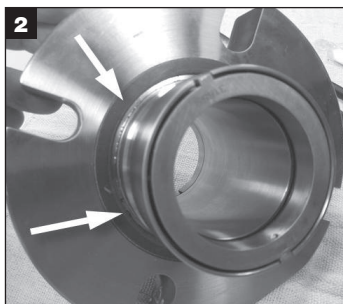
4.2 Mechanical Seal

1. Check the chemical listing to determine if the O-Rings installed in this seal are compatible with the fluid being sealed.

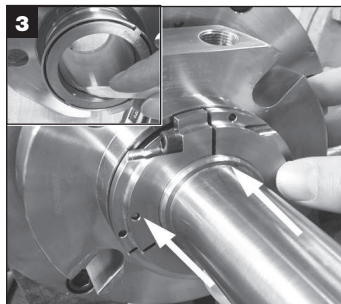
5.0 SEAL INSTALLATION



Tools required for installation: Torx wrench and grease (supplied with seal); open end or socket wrench (size dependent on mounting bolt size; supplied by customer).



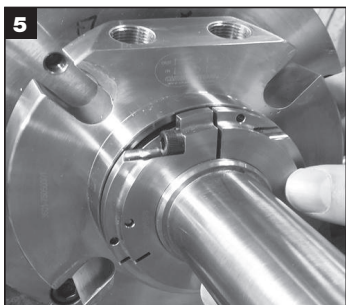
Ensure that the gland face gasket is fixed in the gland gasket groove.



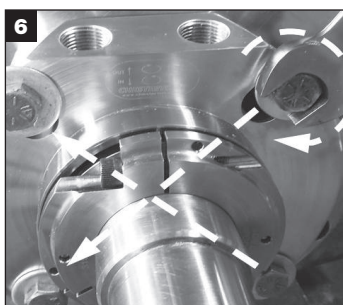
Apply a thin film of grease to the shaft O-Ring and slide seal onto the shaft by pushing on the lock ring.



Reassemble the pump and make necessary shaft alignments and impeller adjustments. The impeller can be reset at any time, as long as the lock ring Torx head cap screw is loosened while the shaft is being moved.



Orient the barrier/buffer ports to the location required. The ports are capped prior to shipping.



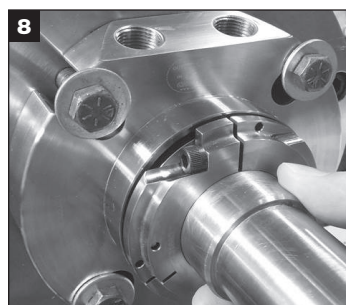
Tighten the gland bolts evenly.

IMPORTANT: The gland bolts must be tightened before tightening the TORX head cap screw on the drive ring.

IMPORTANT: Piping connections should not be made prior to tightening the gland bolts.



Tighten the lock ring TORX head cap screw.

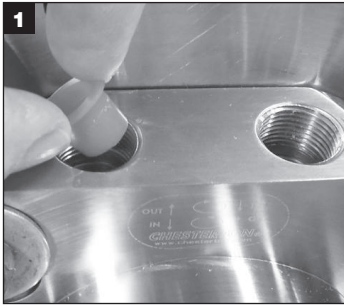


IMPORTANT: To ensure that the gland is properly centered over the sleeve turn the shaft by hand to make sure the seal turns freely. This seal is self centering. If you hear metal-to-metal contact within the seal, it is Improperly centered. If metal to metal contact is occurring check the centering of the stuffing box.

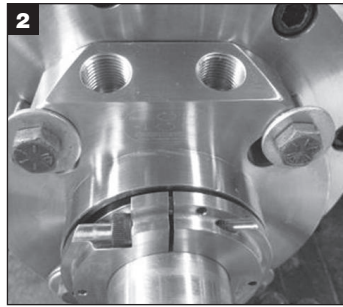
A (SHAFT SIZE)	1.125" – 1.375"	1.750" – 2.625"	3.000" – 3.750"
P – NPT Size	1/4 – 18 NPT	3/8 – 18 NPT	1/2 – 14 NPT
R – Torque Value	13,5 - 16,3 Nm (10 – 12 ft-lb)	13,5 - 16,3 Nm (10 – 12 ft-lb)	24,4 - 28,5 Nm (18 – 21 Ft-lb)
TORX KEY SIZE	TORX IP30	TORX IP30	TORX T45

6.0 COMMISSIONING / EQUIPMENT START-UP

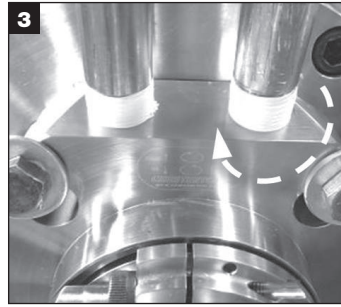
6.1 Attach appropriate plumbing/environmental controls to the seal.



To connect barrier/buffer fluid: Remove plastic cap plugs from gland to allow for installation of barrier fluid connections.



Identify the shaft rotation (clockwise or counter-clockwise) to determine the required fluid flow direction; connections will be made as identified on the gland.



Install necessary environmental controls and other piping as required.



Take all necessary precautions and follow normal safety procedures before starting the equipment.



**DO NOT CONNECT
TO PROCESS; BARRIER
FLUID ONLY**

Please Contact Chesterton Mechanical Seal Application Engineering for assistance regarding cartridge dual seals.

7.0 DECOMMISSIONING / EQUIPMENT SHUT DOWN

Ensure that the equipment is electrically isolated. If the equipment has been used on toxic or hazardous fluids, ensure that the equipment is correctly decontaminated and made safe prior to commencing work. Ensure that the pump is isolated and check that the stuffing box is drained from any fluid and pressure is fully released. Disassemble the seal and

remove from equipment in the reverse order from installation instructions. In case of disposal, ensure the local regulations and requirements for disposal or recycling of the different components in the seal are adhered to.

8.0 SPARE PARTS

Use only Chesterton original spare parts. Use of non-original spare parts represents risk of failure, danger to persons/ equipment and voids the product warranty.

Spare Parts Kit can be purchased from Chesterton, referencing the recorded seal data from cover page.

9.0 SEAL MAINTENANCE AND REPAIR

9.1 Intended Use

A correctly installed and operated mechanical seal requires little maintenance. It is recommended to periodically check the seal for leakage. Wearing components of a mechanical seal such as seal faces, O-Ring, etc., require replacement over time. While a seal is installed and operating, maintenance is not possible.

A correctly installed and operated barrier support systems require only minor maintenance. Sealing or barrier liquid should always be available in adequate amounts. Adherence to maintenance intervals identified in the vendor's barrier support system installation instructions is recommended.

Therefore it is recommended that a spare seal unit or a spare parts kit be held in stock to allow for quick repair.

Note the condition of the parts, including elastomer surfaces and gland springs. Analyze the cause of failure and correct the problem, if possible, before reinstalling the seal.

Clean all elastomer and gasket surfaces with cleaning solvent.

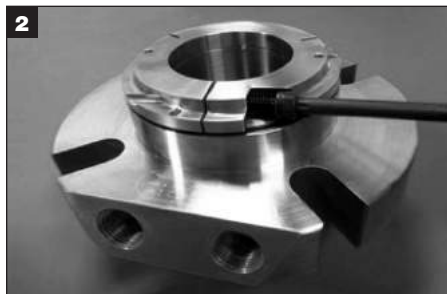
9.2 Seal Repair

The following items, in addition to wrenches, grease and cleaning wipes (supplied with the seal), will be required for rebuild:

- Arbor Press
- Flat Head Screw Driver
- Clean lint-free cloth
- Non-acetone cleaning solvent (to clean O-Ring and gasket surfaces).



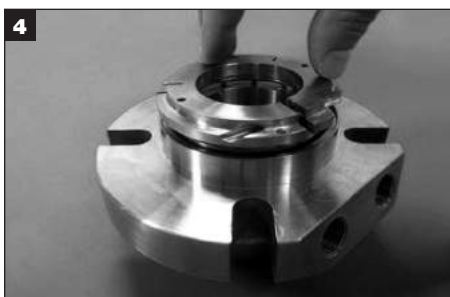
1 Prepare a clean work surface for seal disassembly. (See above for tools required).



2 Remove lock ring socket head cap screw.



3 Using a leverage device, carefully disengage lock ring from sleeve.



4 Remove lock ring assembly from seal and discard.



5 Separate gland assembly from sleeve assembly.



6 Remove outboard rotary seal ring assembly from gland.

9.0 SEAL MAINTENANCE AND REPAIR *cont.*



7 Separate spacer from outboard rotary seal ring assembly. Discard rotary seal assembly.



8 Remove two spacer O-Rings and discard.



9 Remove both inboard stationary seal rings from gland assembly and discard.



10 Remove both O-Rings from gland assembly and discard.



11 Remove the inboard rotary assembly and discard (including springs and O-Ring).



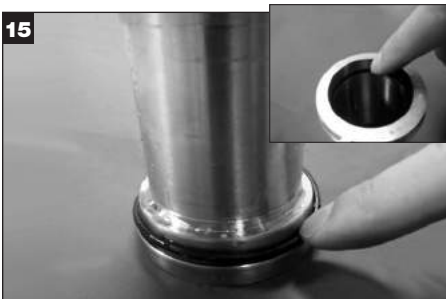
12 Remove O-Ring from sleeve assembly and discard.



13 Remove gasket from gland assembly and discard.



Clean the sleeve, gland assembly, and spacer, removing debris and residual material from all surfaces and holes. Use cleaning solvent to clean O-Ring and gasket surfaces. Remove new components from the spare kit and place all components on a clean work surface in preparation for seal assembly.



15 Apply a thin film of grease to the rotary and shaft O-Rings and install on the outside diameter and the inside diameter sleeve O-Ring grooves.



16 Apply a thin film of grease to one end of each spring and install springs in the inboard rotary assembly.



17 Slide rotary holder assembly over sleeve. Align slot in rotary holder assembly with lug in sleeve and compress.



Remove backing and install gasket on clean surface of gland assembly.



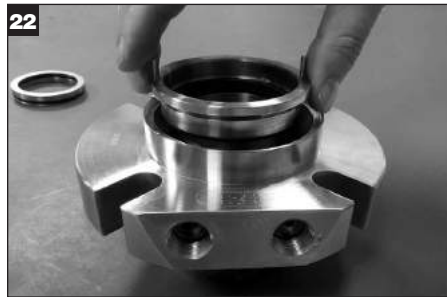
Apply a thin film of grease to the stationary O-Rings (2x) and install into the gland O-Ring grooves.



Apply grease to outside diameter of stationary seal faces. Align two slots in stationary seal face with two pins in gland and install stationary seal face. Wipe both seal faces with a clean dry cloth.



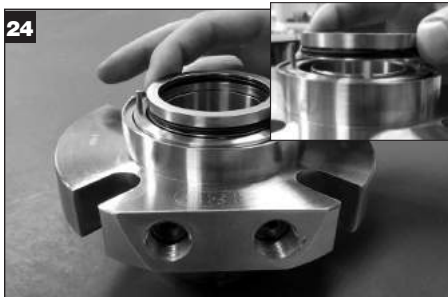
Place gland assembly over sleeve assembly; apply even pressure to gland to ensure faces are seated.



Wipe outboard rotary face with a clean dry cloth. Slide the outboard rotary assembly over the sleeve, ensuring the face mates with the outboard stationary seal face.



Apply a thin film of grease to the adapter O-Rings (2x) and install into the adapter O-Ring grooves.



CAUTION: Spacer orientation is critical; SEE INSET IMAGE for correct orientation during installation. Slide the spacer onto the sleeve leading with the outside diameter O-Ring end of the spacer.

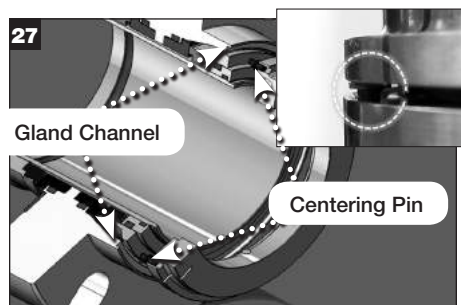


Install centering pins in lock ring.

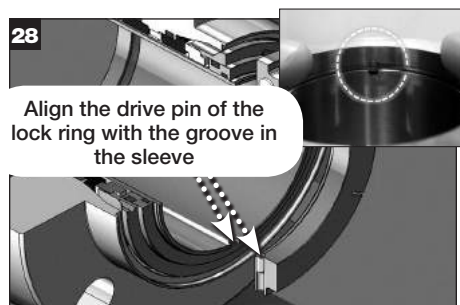


Apply a thin film of grease to one end of each spring and install springs in the lock ring.

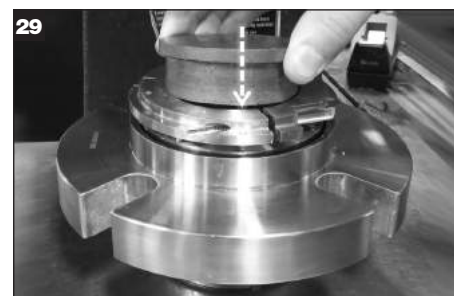
9.0 SEAL MAINTENANCE AND REPAIR *cont.*



Align centering pins with channel in gland assembly. **(CAUTION: Ensure the pins are aligned and fit into the channel. Ensure springs do not buckle or fall out of lock ring assembly.)**



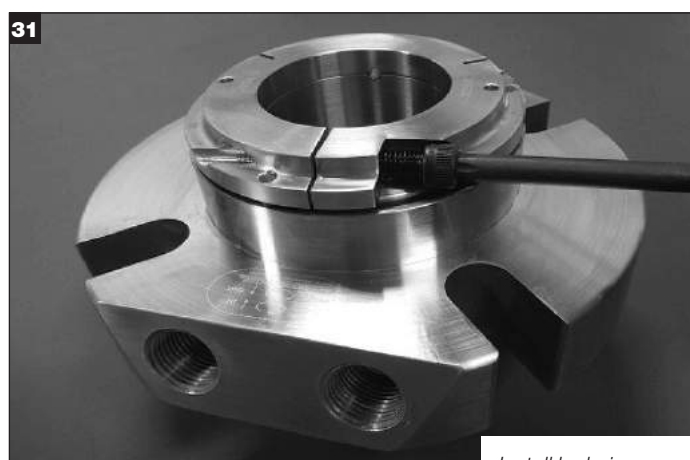
Align the drive pin of the lock ring with the groove in the sleeve. Firmly press top of lock ring manually.



Align the sleeve with the lock ring by inserting a flanged plug (plug shaft to match shaft diameter) into sleeve.



Using an arbor press, firmly press down on the top of the stub shaft to seat the lock ring. The lock ring will audibly snap into place.



Install lock ring screw; **consult Section 5.0 Seal Installation.**

9.3 Returning Seals for Repair and Hazard Communication Requirements

Any mechanical seal returned to Chesterton that has been in operation, must comply with our Hazard Communication requirements. Please go to our web page at www.chesterton.com/Mechanical_Seal>Returns to obtain information required for returning seals for repair or seal analysis.



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