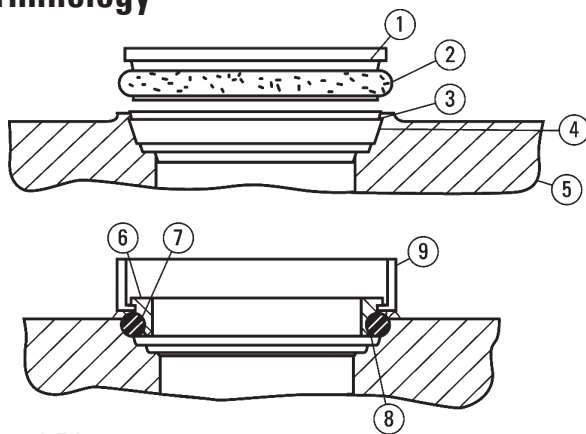# CAT® SEALS

Duo-Cone™ Seals Installation

Cat® Duo-Cone Seal Assembly Contents:
• (2) Metal Seal Rings
• (2) Elastomeric Toric Rings

Terminology

1. Seal Ring
2. Rubber Toric
3. Housing Retainer Lip
4. Housing Ramp
5. Seal Ring Housing
6. Seal Ring Face
7. Seal Ring Ramp
8. Seal Ring Retaining Lip
9. Installation Tool

Handling the Seals
The idea is to protect the seal face. The more precausions taken, the more likely the seals will last in the field.

Staging
When staging, have the seal package on the top shelf of the kit cart or on a flatbed kit cart. (Reasoning: the seals need to be removed from the packaging from the center flaps)

Stacking
Make sure seal packages are not stacked more than 5 high to reduce the risk of tipping during transit. (No banding or wracked straps should be used)

Package Removal
Do not remove the seal from the secondary packaging when transporting the seal. This will help ensure the seal does not get damaged and protects it from contamination.

Remove seal from the center flaps of the packaging, allowing more access to the seal and reduce the risk of the seals sliding against each other or another surface causing damage to the seal. Cut the center tape, making sure the knife point is not going to cut the toric or seal. (Use of a safety knife is the best tool for this procedure)

Housing Preparation
The housing components that contact the rubber toric rings (3 and 4) must be free from foreign material (oil, grease, dirt, metal chips, dust or lint particles, etc.) before installing the seal. This should be done using a lint-free wipe and a non-petroleum based solvent. Dry with a clean wipe.
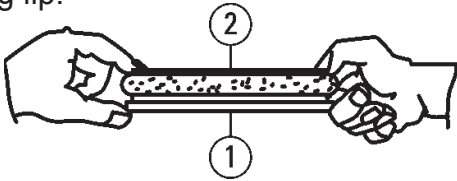
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Remove any foreign material from the rubber torics (2), the ramps (7) and the lips (8) of both seal rings. This should also be done with a lint-free wipe and a non-petroleum based solvent. Dry with a clean wipe.
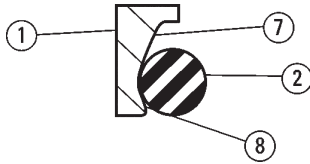
Place the rubber torics on the metal seal ring at the bottom of the seal ring ramp and against the retaining lip.

Make sure the rubber toric is straight on the seal ring and not twisted. Be careful not to nick or cut the torics during the assembly, as this can cause leaks.

Put the installation tool onto the metal seal ring and rubber toric. Lightly dampen the lower half of the rubber toric with the appropriate assembly lubricant.

Techniques to dampen the toric include wiping with a lint-free towel, lubricating using a clean foam brush, or dipping in a container lined with towels saturated in the assembly lubricant (as shown).
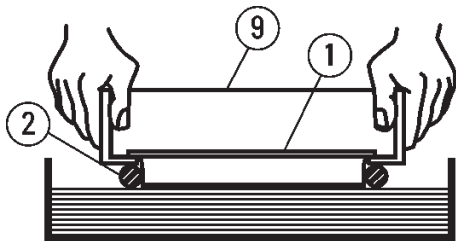
Seal groups with silicone torics can be assembled using a freezer to slightly contract the toric rings. Seal groups should be placed in a freezer for 5 minutes at -40°C to -18°C prior to installation. Contraction will be sufficient to allow installation. Groups should warm to room temperature prior to further assembly.

Approved Assembly Lubricants
• Isopropyl Alcohol*
• Houghto-Grind 60 CT
• Quaker® Solvo Clean 68-RAH

 (*) All applicable safety and disposal guidelines for flammable liquids must be followed.

Note: Do not use Stanosol or any other liquid that leaves an oil film and/or does not evaporate quickly.
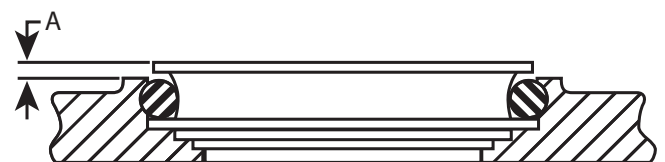
Installation Process
With the lower half of the rubber toric still wet, use the installation tool to position the seal ring and the rubber toric squarely against the application housing (as shown).
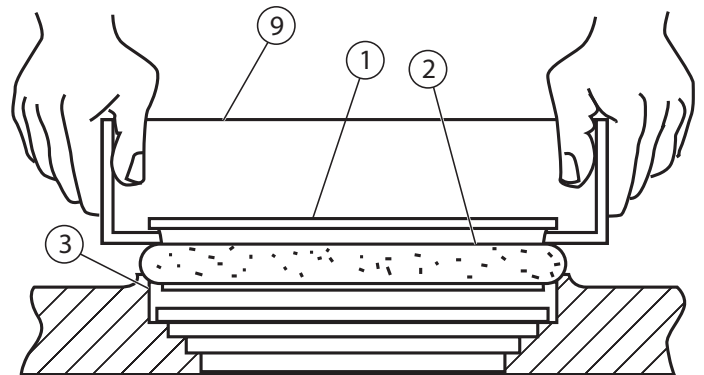
For smaller diameter seals, use sudden and even pressure to push the rubber toric under the retaining lip of the housing. For larger diameter seals, which will not press in with sudden and even pressure, it is acceptable to work the toric past the retaining lip by starting one side and tapping the opposite side of the installation tool with a rubber mallet until it is engaged past the retaining lip of the housing.

Check the assembled height variation (A) in a least four places, 90° apart, use a caliper, toolmakers' ruler or any other calibrated measuring device.

The difference in height around the ring must not be more than 1.0 mm. If small adjustments are necessary, do not push or pull directly on the seal ring. Use the installation tool to push down and your fingers to pull up uniformly on the rubber toric and seal ring.

The rubber toric can twist if it is not wet all around during installation or if there are burrs or fins on the retaining lip of the housing. Twists, misalignment, and bulges of the toric (as shown) will result in seal failure. If correct installation is not obvious, remove the seal from the housing and repeat process.

The rubber torics must never slip on the ramps of either the seal ring or the housing. To prevent slippage, allow adequate evaporation time for the lubricant before proceeding with further assembly.
Once correctly in place, the rubber toric must roll on the ramp only. The following shows incorrect installations resulting in cocked seals.
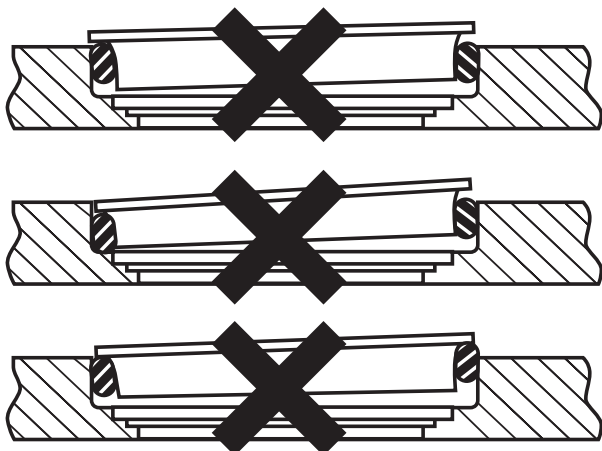

Wipe the face of each seal ring using a lint-free wipe. No particles of any kind are permissible on the sealing surfaces. (Even a hair can hold the seal faces apart and cause a leak)
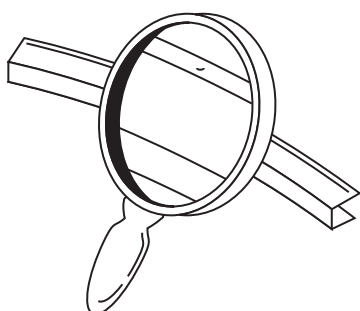
Apply a thin film of oil on the entire seal face of one or both seals using a lint-free applicator. Oil must not contact surfaces other than the sealing face.

Final Assembly
While completing the final assembly of the unit, make sure that both housings are in correct alignment and are concentric. Slowly bring the two housings together. High impact can scratch or break the seal components.
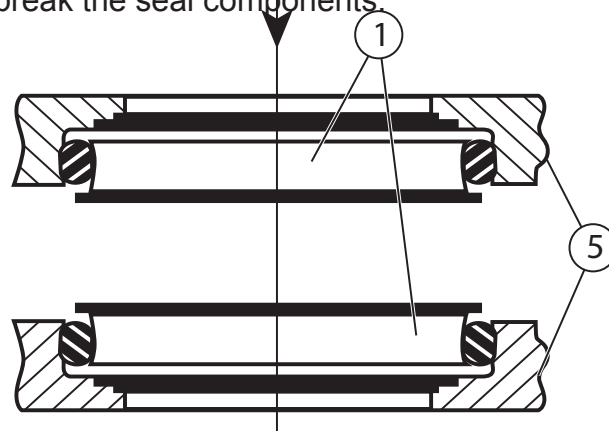

If the rubber toric slips at any location, it will twist, causing the seal rings to cock. Any wobbling motion of the seal is an indication of cocked seals and can cause dirt to enter by pumping mud past the torics.

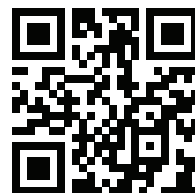The following examples show the effects of a cocked seal group.
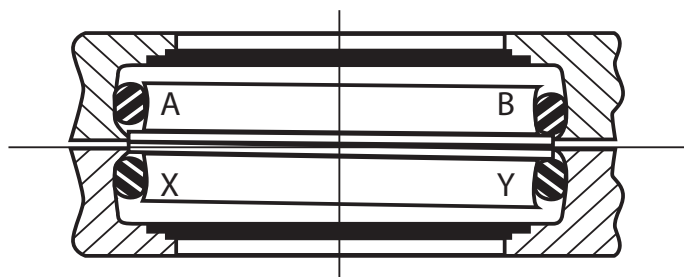
The above depicts how the torics have slipped instead of rolling on the left hand side of the seal. The following shows the same seal after the bottom half is rotated 180°.
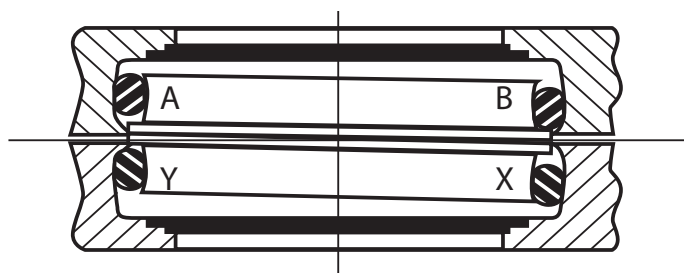
For more information on Cat Seals

www.cat.com/cat-seals

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