Installation, Operation and Maintenance Instructions

Rotary Actuators

Spring-Cylinder Type

15

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1.1 - GENERAL INFORMATION

The following instructions are designed to assist in the installation, operation and maintenance of Valtek Sulamericana's spring-cylinder rotary actuators.

Users and maintenance personnel should read this bulletin carefully before the installation, operation or servicing of the actuator, positioner or any other accessory installed on the actuator. Separate maintenance instructions cover additional characteristics such as declutchable handwheel, fail-safe systems, etc.

Reading the maintenance bulletin of the valve or equipment where the actuator is installed is also recommended.

WARNING !

If it is necessary to store the products before field installation, Valtek Sulamericana recommends that actuators be stored in dry, fresh, closed places. Do not store actuators in places where relative humidity is higher than 85% or the room temperature is lower than 41°F or higher than 113°F (5 to 45°C). Environments containing excessive UV radiation, acid or alkaline mist or ozone sources must be avoided.

Product storage in non-recommended places may void the manufacturer warranty.

1.2 - UNPACKING

- When removing the actuator from its package, check the packing list or the actuator datasheet, comparing it with the received material. A specification sheet of the actuator and assembled accessories is shipped inside each shipping container.
- When lifting the actuator from shipping container, position the lifting straps properly in order to avoid damages to the tubings and accessories assembled in the actuator. Actuators with sizes 25 and 50 may be lifted by the lifting rings provided on the top of the cylinder. In case there is no lifting ring provided, lift the actuator using straps attached to the transfer case neck.
- In case of damages during transport, immediately contact the shipper.
- In case of any problem, call your Valtek Sulamericana representative.

1.3 - SAFETY WARNINGS

To avoid potential injury and/or damage to the actuator parts, WARNING and CAUTION notes must be strictly observed.

Changing this product characteristics, using non-original spare parts or using maintenance procedures different from those presented herein may affect the performance of the actuator, be hazardous to personnel and equipment and may void the manufacturer warranty.

WARNING

Standard industry safety practices must be applied when using this equipment. Industrial safety standards for personal protection and for equipment handling must also be observed.

CAUTION

When lifting an actuator using straps passed through the transfer case neck, take care when the center of gravity is above the lifting point. An adequate support must be provided to prevent the actuator from turning. A failure in this procedure may cause severe injuries, as well as damage to the actuator and to the equipment nearby.

CAUTION

Consider the total weight before lifting or transporting the actuator. A failure to observe this warning may result in serious injury.

1.4 - INSTALLATION

Before installing the actuator on a valve or equipment, make sure that a free space is left above and on the side of the assembly to allow the removal of the actuator and to provide the adequate maintenance.

Note: if the actuator is attached to a Valtek Sulamericana control valve, refer to the maintenance bulletin of the valve to check the free space above and on the side of the actuator, required for the disassembly. If the actuator is mounted in other equipment, use the generic spaces listed in Table I.

Table I: Free Spaces Necessary to Disassemble the Actuator

Actuator size	Required Clearance			
	Vertical		Side	
	in.	mm	in.	mm
25	6	152	7.8	198
50	8	203	7.8	198
100 & 200	11	280	10.2	260

Note: even though actuator sizes 25, 50 and 100 can be installed in any position, the assembly with cylinder in the upright position is preferable as it facilitates the maintenance.

- Install the actuator in a valve or mechanical equipment that requires a 0 to 90º rotating motion.
- Connect air supply and instrument signal (throttling actuators are generally equipped with positioners). The air ports are identified indicating the air supply and the instrument signal. The actuator can operate with air supply pressure up to 150 psi (10.3 Bar). However, the sticker attached to the cylinder must be checked for maximum pressure allowed. Air filter is recommended, unless the instrument air is clean and dry.

Note: Under special circumstances, the maximum air supply pressure must be limited to 80 or 100 psi depending on the actuator size and the positioner installed.

CAUTION

Do not exceed the maximum pressure indicated on sticker: people may be injured and damage to the equipment may be occur.

WARNING

For transport reasons, the air filter may be installed out of the vertical position. Before operating the actuator, position the air filter pointing down.

CAUTION

Never pressurize the actuator if the transfer case cover or the yoke are out of their respective places. Failure to follow this instruction may cause damages to the assembly.

- Use a soap solution to confirm that there are no leaks through the compressed air connections.

1.5 - PREVENTIVE MAINTENANCE

Check if the actuator is working properly at least every six months following the preventive maintenance steps indicated below.
This sequence can be performed with the actuator in service and, in some cases, without disturbing operation. In case there is a potential problem inside the actuator, refer to the section “Disassembly and Reassembly”:

- Inspect signs of leakage through the pneumatic fittings. Tighten loosen pneumatic fittings and replace leaking ferrules.
- Observe if corrosive vapors or process fluid dripping is damaging the actuator.
- Clean the actuator and repaint areas of severe oxidation.
- If possible, operate the actuator and check if the actuator travels its full stroke in a smooth and uniform way.

CAUTION

When operating the actuator, keep your hands, hair, clothes, etc. away from moving parts. Failure to follow this warning may result in serious injury.

- In case of actuators provided with the locking device of the splined lever arm, depressurize the actuator and, if possible, remove the transfer case cover to make sure that the locking device bolt is properly tightened.

Notes:
a) If the valve is equipped with an HPP2000 positioner, check also the mechanical link of the positioner to the actuator splined lever arm.
b) If the valve is equipped with an HPP3500 positioner (or another type installed parallel to the transfer case cover), it is necessary to remove the positioner and its bracket, and the transfer case cover to check the tightening of the locking device bolt. In this case, proceed as indicated in the “Disassembly and Reassembly” section.

WARNING

Do not remove the actuator transfer case cover with the valve in operation. If this happens, unsupported shaft may cause damages.

- Make sure that all accessories, brackets and bolts are firmly secured.
- If possible, shut-off air supply and observe the position indicator, located in the transfer case cover, to check if the specified failsafe position is reached.
- Apply a soap solution around the cylinder retaining ring and the adjusting screw and check if there are air leaks through the O-rings and gasket.
- Remove any contaminant or other foreign material from the exposed areas of valve shaft.
- If an air filter is supplied, check and replace cartridge if necessary.

DISASSEMBLY AND REASSEMBLY

In case any internal problem is suspected with the actuator and its removal is necessary, follow the steps below to remove the valve from the pipeline and to remove the actuator from the valve body (or from the equipment).

- Before disconnecting the actuator from the valve for maintenance or removing the entire valve from the pipeline, observe the following note:

CAUTION

Removing the valve for maintenance: piping must be completely depressurized and process fluid drained. In case of toxic, caustic or hazardous fluid services, the valve must be decontaminated to avoid accidents.

- As a general rule, it is recommended that rotary valves are in closed position before being removed from the pipeline (this procedure is particularly important in case of butterfly-type valves).
- Remove the valve (closed) from the pipeline. In case of valves with air-to-open configuration (fail closed), it is recommended to pressurize the upper chamber of the actuator; in case of valves with air-to-close configuration (fail open), it is recommended to pressurize the bottom chamber (mandatory for butterfly-type valves) before removing the valve from the pipeline.
- With the valve removed from the pipeline, disconnect the wiring and pneumatic fittings that are still connected to the actuator.

Removal of Actuators from Valtek Sulamericana Rotary Valves

- Once the valve has been removed from the pipeline, hold the actuator by the lifting ring (or by the transfer case neck) before removing it from the valve assembly.
- With the valve over a workbench and keeping the actuator securely supported, loose the actuator adjusting screw to release the spring pressure completely. To loosen the adjusting screw, use an open wrench on the flat faces of the screw head.

WARNING

Do not use a screwdriver, bar, etc. to turn the adjusting screw since this procedure may cause damages to the lifting ring weld. Use an adequate open wrench on flat surfaces of the screw head.

CAUTION

The spring compression must be completely relieved before disassembling the actuator. If this is not done, the cylinder may be ejected out of the transfer case when the retaining ring is removed from the cylinder, causing serious injury.

- If the actuator is equipped with a Valtek Positioner Series HPP3500 or other positioner installed parallel to the transfer case cover (see Figure 2), remove the positioner with its corresponding bracket, the feedback link and/or the adapting shaft from the actuator.
- Remove the transfer case cover bolts. Gently slide the cover through the end of the lever arm.
- Loosen the locking device of the actuator splined lever arm (if applicable).
- For B$\overline{\text{XL}}$, E$\overline{\text{XL}}$ and V$\overline{\text{XL}}$ valves, remove the gland flange.
- Remove the actuator from the valve assembly. This is done removing the nuts that secure the actuator yoke: in the split bracket assembled in the body of TB$\overline{\text{V}}$ valves; in the body of B$\overline{\text{XL}}$ valves or; in the bonnet of E$\overline{\text{XL}}$/V$\overline{\text{XL}}$ valves.

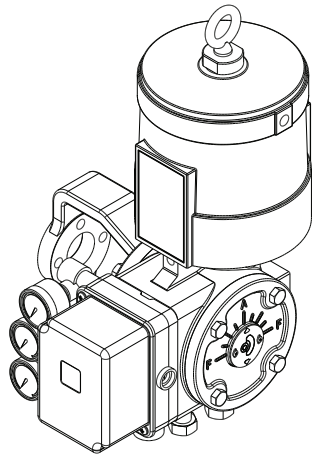


Figure 1 - Assembly of Valtek HPP2000 Positioner in the Rotary Actuator

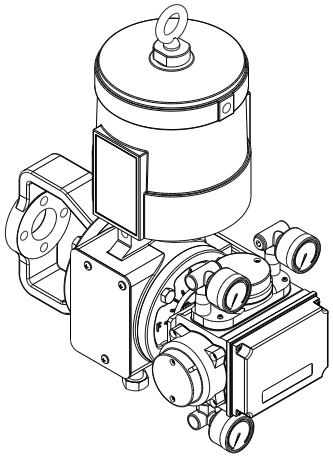


Figure 2 - Assembly of Valtek HPP3500 Positioner in the Rotary Actuator

1.6 - DISASSEMBLING THE ACTUATOR

To disassemble the rotary actuator, observe figures 3 and 4[1] (TB$\overline{v}$ valves) or figures 5 and 6[2] (B$\overline{xL}$, E$\overline{xL}$ and V$\overline{xL}$ valves) and proceed as follows:

- Disconnect tubings and electrical wiring that are still connected to the actuator. If applicable, remove the positioner and other accessories installed in the actuator. Reading the maintenance bulletins of positioner and other accessories installed is highly recommended.
- Remove the retaining ring from the groove at the base of the cylinder using two screwdrivers. Introduce the tip of a screwdriver in the slot on the ring and remove the ring out of its channel. Use the other screwdriver to help the operation of removing the ring.
- Pull the cylinder out of the transfer case and piston (some O-ring resistance may be felt).

CAUTION

Do not use air pressure to remove cylinder. This may cause the cylinder to be ejected out of the transfer case, causing serious injury.

- Remove the spring button and the spring.

WARNING

During the removal of the actuator stem, special care must be taken to avoid damaging the sliding collar and the O-ring of the actuator stem.

- Remove the locknut from the actuator stem. The piston and the piston stem O-ring can be removed now from the actuator stem.
- Remove the spiral snap-ring that retains the sliding collar assembly in the transfer case.
- Remove the retaining washer and the sliding collar assembly. Generally, these components can be removed by hand or gently prying the external surface of the collar upwards.

WARNING

Do not scratch the bottom surface of the sliding collar with a screwdriver or other sharp object. Scratches on this area may accelerate the wear of the sealing and may cause leaks.

- If the transfer case cover is still installed, loosen the four bolts and remove the cover.
- Loosen the four bolts and detach the yoke from the transfer case.
- Remove the retaining rings that maintain the pivot pin in the actuator lever arm and remove the pin.
- Now, the actuator stem can be easily removed from the transfer case.
- Remove the actuator lever arm.
- If the lever arm bearings, located in the yoke and in the transfer case cover need to be replaced, press them out of the yoke and the transfer case cover using a press and a punch with the proper dimensions.

[1] Observe also the Figure 7 if the actuator is equipped with heavy-duty spring. [2] Idem.

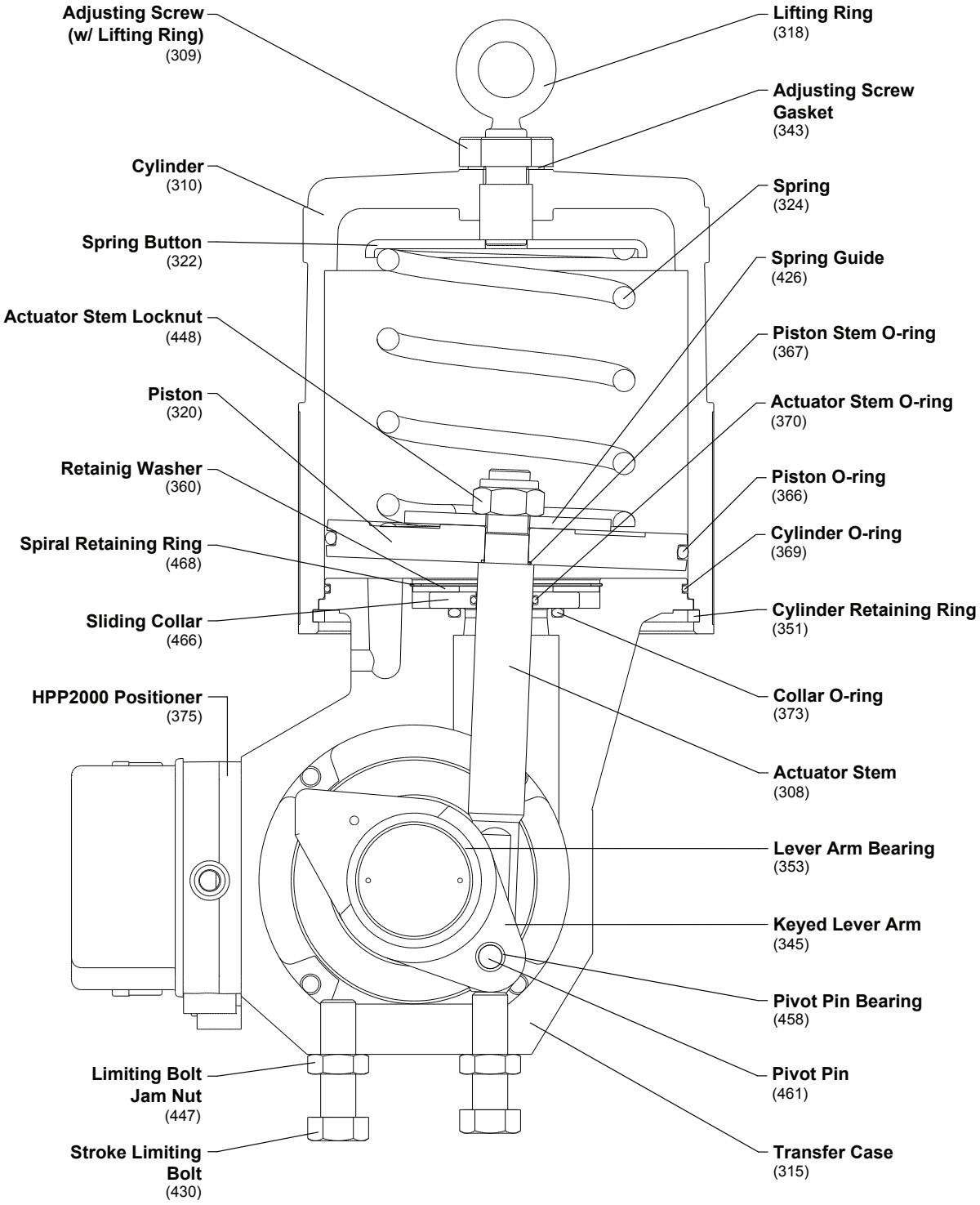


Figure 3 - Spring-Cylinder Rotary Actuator (Version with Keyed Lever Arm for TBv̄ Valves)

[1] As standard, the lifting rings are provided just for actuators sizes 25 and 50.

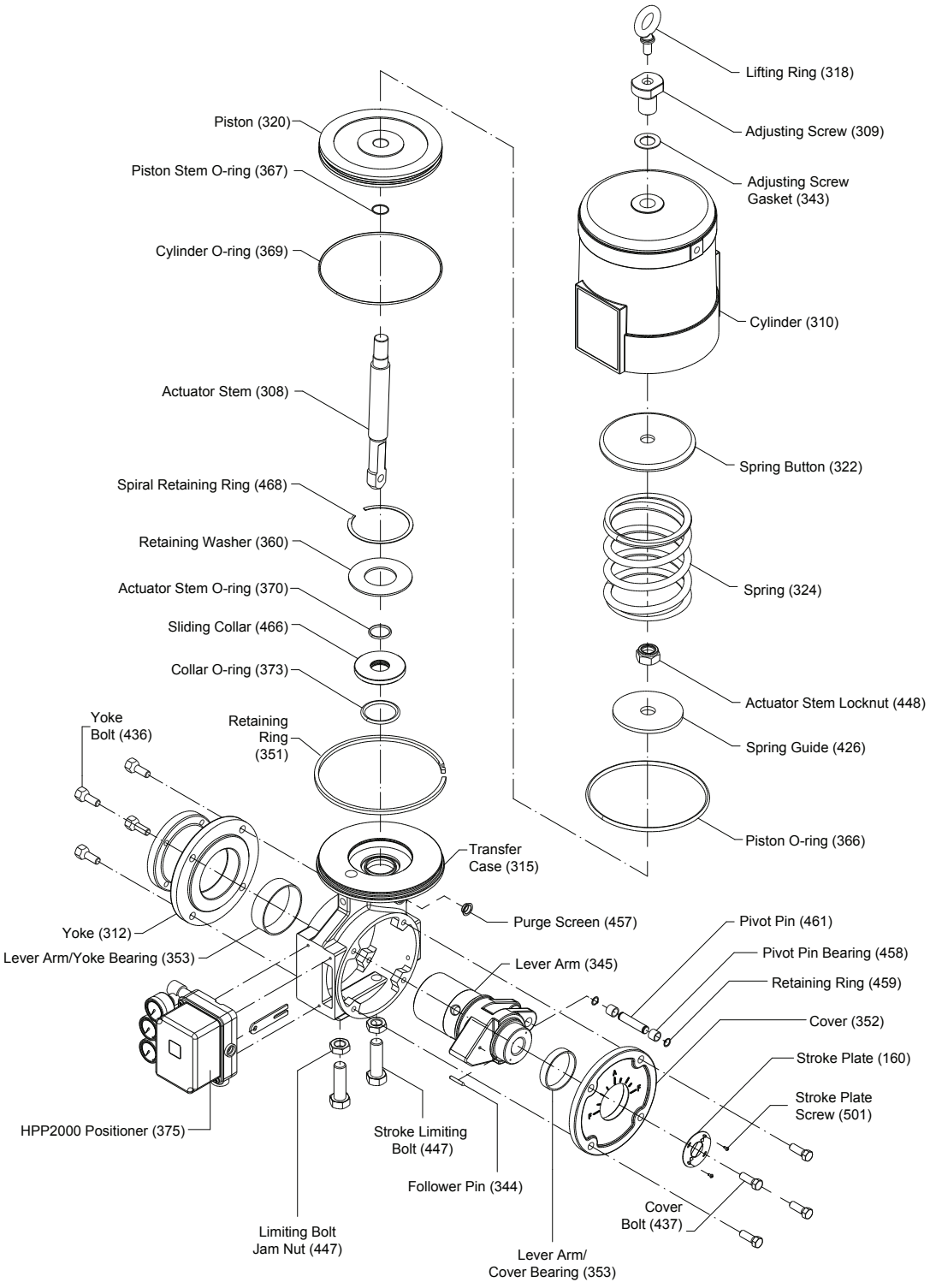


Figure 4 - Exploded View, Spring-Cylinder Rotary Actuator with Keyed Lever Arm

[1] Item numbers above correspond directly to the actuator's bill of material.
[2] As standard, the lifting rings (item No. 318) are provided just for actuators sizes 25 and 50.

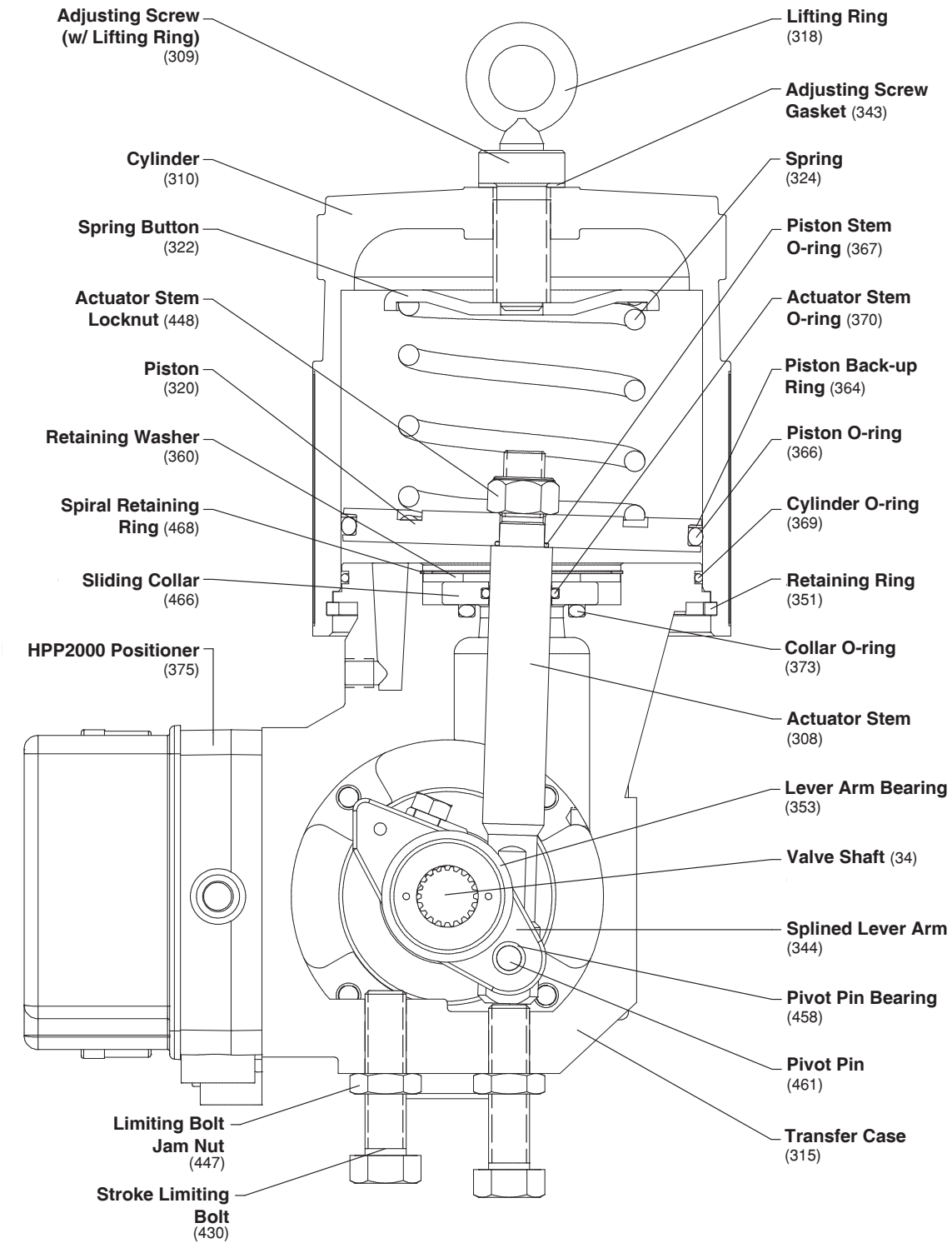


Figure 5 - Spring-Cylinder Rotary Actuator (Version with Splined Lever Arm for B$\overline{\text{XL}}$, E$\overline{\text{XL}}$ & V$\overline{\text{XL}}$ Valves)

[1] As standard, the lifting rings are provided just for actuators sizes 25 and 50.

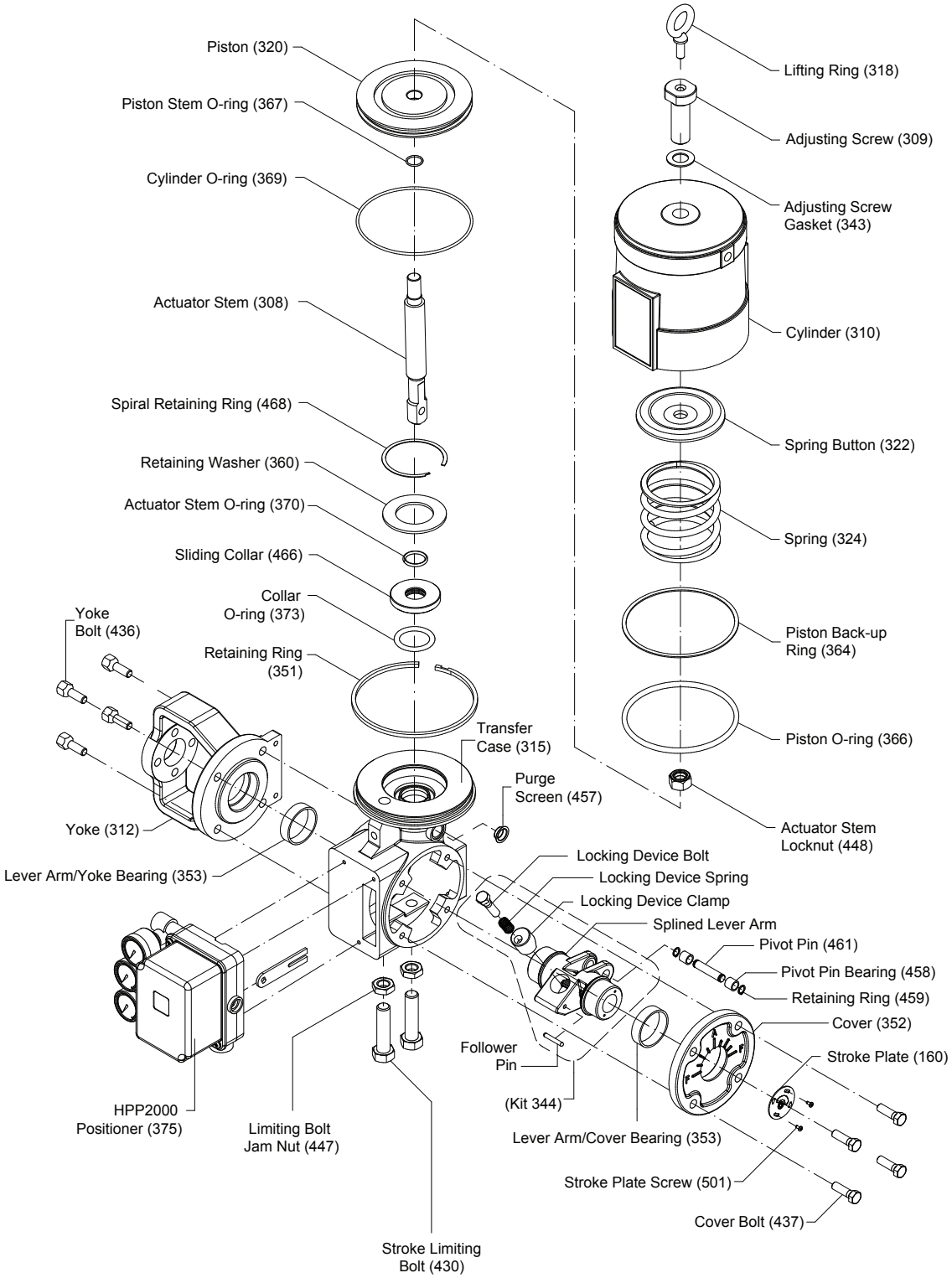


Figure 6 - Exploded View, Spring-Cylinder Rotary Actuator with Splined Lever Arm

[1] Item numbers above correspond directly to the actuator's bill of material.
[2] As standard, the lifting rings (item No. 318) are provided just for actuators sizes 25 and 50.

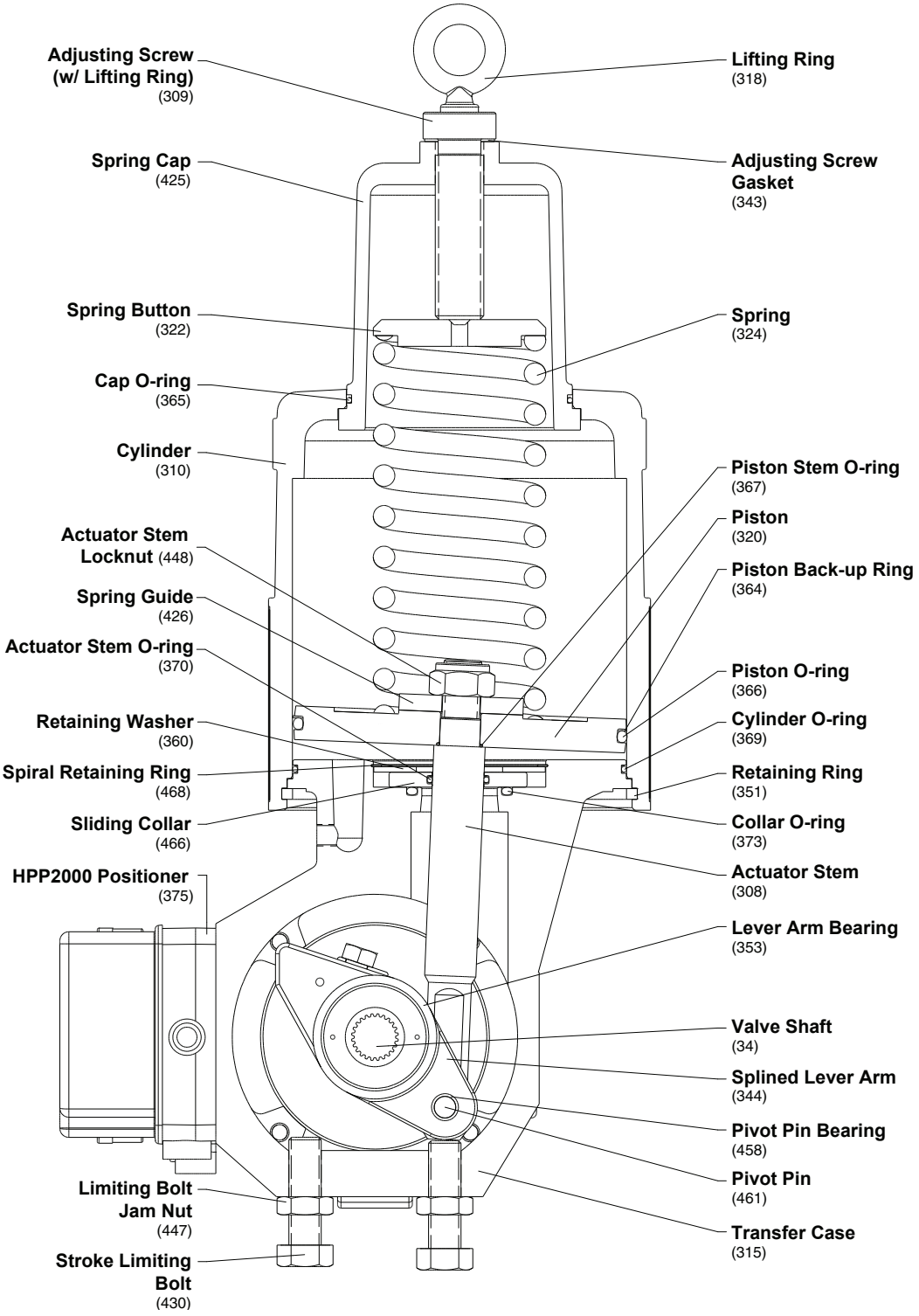


Figure 7 - Spring-Cylinder Rotary Actuator with Heavy-Duty Spring

[1] As standard, the lifting rings (Item No. 318) are provided just for actuators sizes 25 and 50.
[2] Actuators equipped with heavy-duty springs are available either with keyed lever arms or splined lever arms.

1.7 – REASSEMBLING THE ACTUATOR

To reassemble the rotary actuator, observe Figures 3 and 4[1] (TBV valves) or Figures 5 and 6[2] (BXL, EXL and VXL valves) and proceed as follows:

- Clean and inspect all surfaces of the components mounted inside the cylinder. The inner surface of the cylinder and the surface of the sliding collar housing must be free of scratches.
- All the O-rings must be replaced and the new ones must be lubricated. The majority of the O-rings can be lubricated with silicone lubricant (Dow Corning 55M or equivalent). Silicone O-rings must be lubricated with Magnalube-G or equivalent (do not use silicone lubricant on silicone O-rings).
- If the lever arm bearings have been removed, install new bearings by pressing them into their housing with the help of a press and a punch with appropriate dimensions. Since these bearings are usually manufactured with composite material, be careful not to damage their edges during the assembly.
- Install the lever arm into the transfer case through the openings of the yoke or the transfer case cover.
- Slide the actuator stem through the opening at the top of the transfer case, connecting it to the lever arm with the pivot pin and two retaining rings.
- In actuators equipped with a locking device on the lever arm, tighten the bolt of the device firmly.
- Install the cover and the yoke in the transfer case. The four tapered lug bolts are used to mount the yoke and the four standard hex bolts are used to secure the cover.
- Install the collar O-ring into sliding collar groove machined in the transfer case.
- Install the actuator stem O-ring into the sliding collar. Next, slide the collar over the actuator stem.

  Note: The sliding collar assembly must be replaced whenever it is damaged.

- Place the retaining washer over the collar and install the spiral retaining ring in the transfer case.
- Install the piston O-ring and its respective back-up ring, making sure that the back-up ring is assembled in the piston upwards of the O-ring (toward the top of the cylinder).

  Note: 200 in² actuators use two back-up rings. In this case, the piston O-ring is mounted between the back-up rings.

- Install the piston stem O-ring and the piston in the actuator stem.
- Install the spring guide (50, 100 and 200 square-inch actuators only) and the actuator stem locknut onto the actuator stem. Tighten securely the actuator stem locknut.
- Install the cylinder O-ring in the machined groove of the transfer case.
- Install the spring and the spring button.
- Slide the cylinder down, over the piston and the transfer case.

WARNING

During the assembly of the cylinder, this component must be perpendicular to the piston, otherwise, the piston O-ring may be damaged.

- Insert the retaining ring into the cylinder groove, by steps, until it is fitted in place. Using a hammer and a drift rod, tap gently on the retaining ring, already fitted in place, to confirm that it is securely installed.

CAUTION

The cylinder retaining ring must be securely fixed into the groove so that the cylinder does not escape when pressurized, causing personal injury. During installation, avoid damaging or deforming the edge of the retaining ring square section.

- Make sure that the spring button hole is centered directly under the adjusting screw hole. The tip of the adjusting screw must be fitted into the spring button.
- Reinstall the adjusting screw, using a new adjusting screw gasket.
- Tighten the adjusting screw sufficiently so that the

[1] Observe also the Figure 7 if the actuator is equipped with heavy-duty spring. [2] Idem.

gasket provides a leak proof sealing. Do not overtighten it.

WARNING

Do not use a screwdriver, bar, etc. to turn the adjusting screw since this procedure may cause damages to the lifting ring weld. Use an adequate open wrench on flat surfaces of the screw head.

- If the actuator has been supplied with a positioner and/or accessories such as limit switches and solenoids, check to see if these accessories were tightly and securely installed. Reinstall the tubings and check if it is necessary to calibrate the accessories mounted in the actuator before putting it into operation.
- If the actuator has been supplied with an air filter, make sure that it is mounted upright, with the bowl pointing down.

WARNING

The transfer case cover and the yoke must be correctly installed before the actuator is operated. Never pressurize an actuator with these components out of place. Failure to follow this instruction may cause damage to the assembly.

- Install the actuator in the valve or mechanical equipment as indicated in the section “Installation”.

Reassembling Actuators in Rotary Valves

When reassembling actuators in Valtek Sulamericana rotary valves refer to the maintenance bulletin of TBV (IOM 50), BXL (IOM 37), EXL (IOM 16) or VXL (IOM 22) valves.

When reassembling rotary actuators in valves or equipments from other manufacturers refer to their specific literature.

Adjustment of the Stroke Limiting Bolts of the Transfer Case

After disassembling and reassembling the actuator, it may be necessary to readjust the stroke limiting bolts of the transfer case to avoid leakage or valve overstroke. These limiting bolts must be adjusted before the valve is reinstalled in the pipeline. To adjust the stroke limiting bolts, proceed as follows:

- Move the valve (or equipment) where the actuator is mounted up to a point just beyond the closed position. During the adjustment, supply the actuator with 10 to 15 psig (0.7 to 1.0 Barg) air pressure.
- Turn the limiting bolt clockwise (when seen from the end) until resistance can be felt. Then, turn the limiting bolt clockwise an additional 1/8 turn. Check if the valve is properly seated, without exceeding the closing stroke. If necessary, repeat this procedure until you are sure that the valve is properly seated.
- Move the valve to the open position and adjust the other stroke limiting bolt until the valve is 90º from the closed position.
- Cycle the valve several times, making sure that the position indicator returns to the same position after each cycle.
- Tighten the jam nuts of the stroke limiting bolts.

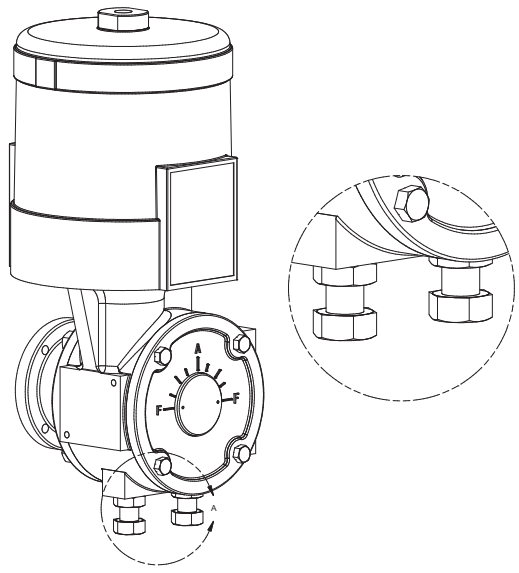


Figure 8 - Stroke Limiting Bolts

1.8 – REVERSING THE AIR ACTION

TBv̄ Valves

The transfer case of the rotary actuator with the keyed lever arm used on TBv̄ valves allows for two different mounting options for each type of action (air-to-open or air-to-close). To reverse the actuator action it is not necessary to change the connection of tubings or the mounting position of the spring in the actuator. Before reversing the actuator action, make sure that the process piping is depressurized and the actuator is securely supported by the lifting ring (available in sizes 25 and 50) or by lifting straps passed around the transfer case neck. Refer to Figures 9, 10 and 11 and proceed as follows:

CAUTION

When lifting or keeping the actuator assembly lifted using straps passed through the transfer case neck, take care when the center of gravity is above the lifting point. An adequate support must be provided to prevent the actuator from turning. A failure in this procedure may cause severe injuries, as well as damage to the actuator and to the equipment nearby.

CAUTION

Heavy actuators may require the use of a hoist for their removal. In case the actuator has a lifting ring, use it to lift the actuator; otherwise, use lifting straps passed through the transfer case neck to lift the assembly.

WARNING

Some actuator sizes should not be mounted with the cylinders operating in the horizontal position. Refer to the manufacturer in this case.

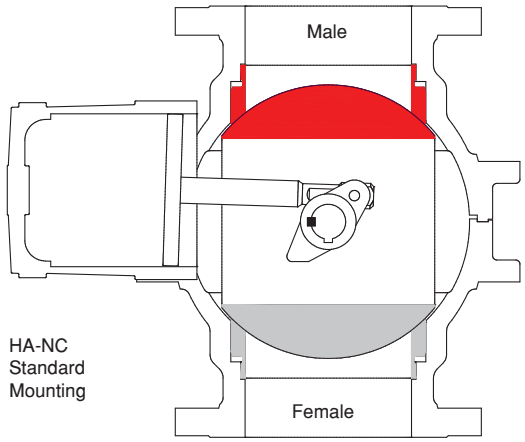
- To change the valve action from air-to-open to air-to-close, remove the actuator from the valve as indicated in the “Disassembly and Reassembly” section.
- Turn the ball 90° clockwise[1] as indicated in Figures 9 and 10. Thus, the ball will remain seated over the same seat in which it was previously seated, helping the smoothness of operation and the sealing of the valve (especially in valves equipped with metal seats).
- Fit the key in the valve shaft, according to the lever arm groove that will be used in the new mounting position desired (HB-NO or VA-NO).
- If the original mounting position is HA-NC type and the new desired position is HB-NO, there may not be enough space to accommodate the actuator into the new position. In this case, if the valve is installed, it must be removed from the pipeline. Remove the valve, reverse the mounting position of the body in the pipeline (male side and female side) and then install the actuator (see Figure11).
- To change the valve action from air-to-close to air-to-open, remove the actuator from the valve, as indicated in the “Disassembly and Reassembly section”, turn the ball 90° counter-clockwise and follow the same procedure as described above.
- If there are space problems to accommodate the new assembly position of the actuator, the valve must be removed from the pipeline. In this case, remove the valve, reverse the mounting position of the body in the pipeline (male side and female side) and then install the actuator (see Figure 11).
- In case of doubt, a line marked on the top of the shaft, parallel to the flow direction, will help to confirm the position of the ball.

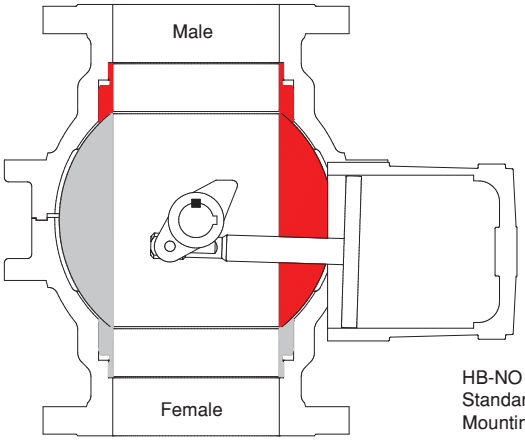
WARNING

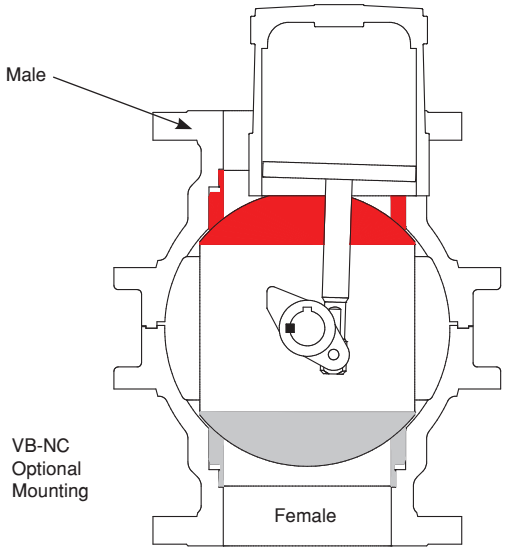
Whenever possible, install the valve actuator in an upright position, with the cylinder pointing up. Mounting positions HA-NC and HB-NO must be used preferentially when the valve is installed in horizontal pipelines. Mounting positions VB-NC and VA-NO must be used preferentially when the valve is installed in vertical pipelines.

[1] The reference point is the valve shaft, viewed from the top.

Assembly and Reversal of Air Action – Actuators with Keyed Lever Arms Used on TBV Valves







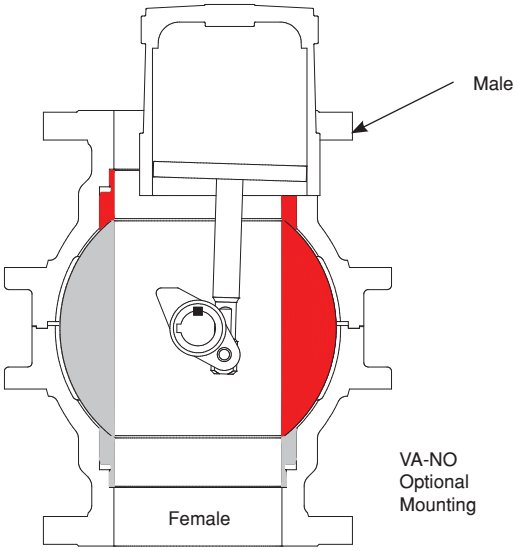
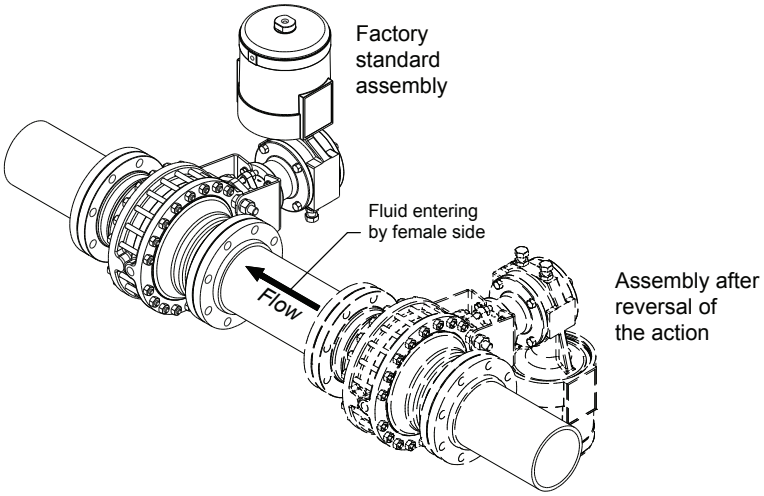


Figure 9 - Air-to-Open Configuration (or Signal-to-Open)

Figure 10 - Air-to-Close Configuration (or Signal-to-Close)

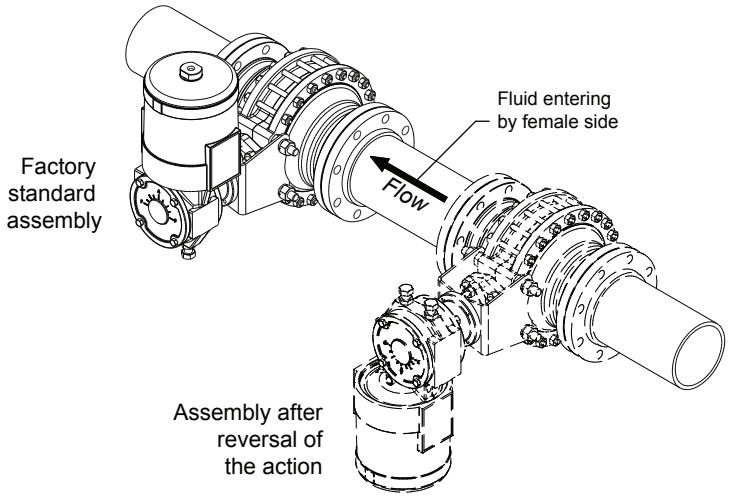
Factory standard assembly (HA-NC), with the actuator at the right side of the pipeline for the air-to-open / fail-closed configuration[1]

(Assembly after reversal of the action, at field, for the air-to-close / fail-open configuration[2])



Factory standard assembly (HB-NO), with the actuator at the left side of the pipeline for air-to-close / fail-open configuration[1]

(Assembly after reversal of the action, at field, for the air-to-open / fail-closed configuration[2])



NOTES:

[1] **The TBv valve can work with flow in both directions without affecting its performance or affecting the required actuating torques.** Illustrations shown with solid lines indicate assembly positions at the factory. The flow direction indicated above has been adopted only as a way to establish an assembly standard for valves and actuators.

[2] Illustrations shown with dotted lines indicate the assembly positions that the actuators will take in case the reversal of air action is carried out at field and the valve body is not inverted in the pipeline, e.g., in case the fluid continues to enter at the same side of the body (male or female) as it was entering before the reversion. If there are space or layout problems with this new assembly position of the actuator, it is recommended that the valve position in the pipeline be inverted (in this case the fluid will enter in the valve at the side of the body where it was exiting).

Figure 11: Mounting Orientations of TBv Valve Actuators

B$\overline{XL}$, V$\overline{XL}$ & E$\overline{XL}$ Valves

The transfer case of rotary actuator with the splined lever arm allows for four different mounting positions and an operation in case of air supply lack, either fail-closed or fail-open, without retubing or changing the mounting position of the spring in the actuator. Before reversing the actuator action, make sure that the process piping is depressurized and the actuator is securely supported by the lifting ring (available in sizes 25 and 50) or by lifting straps passed around the transfer case neck. Refer to Figures 12 and 13 and proceed as follows:

- Disconnect the air supply and relieve the spring compression completely.
- If the actuator is equipped with a Valtek Positioner Series HPP3500 or other positioner installed parallel to the transfer case cover (see Figure 2), remove the positioner with its corresponding bracket, the feedback link and/or the adapting shaft from the actuator.
- Remove the transfer case cover bolts. Gently slide the cover through the end of the lever arm.
- Loosen the locking device of the actuator splined lever arm (if applicable).
- Loosen the nuts of the packing gland flange.
- Remove the bolts that secure the transfer case in the actuator yoke.
- Remove the actuator assembly (without the yoke) from the valve body, sliding the assembly carefully until the actuator lever arm is disconnected from the valve shaft.
- Place the valve in the failsafe position desired, rotating it manually 90º. If the valve is in its closed position, rotate it to the open position and vice versa.
- Reverse the mounting position of the transfer case in the yoke, turning it 180º. The yoke side now becomes the cover side and the cover side becomes the yoke side. Since this changes the direction of the actuator's rotation, it may be necessary to change the mounting position of the valve in the pipeline to achieve the proper mounting orientation of the assembly (see Figures 12 and 13).

  Note: Before reconnecting the actuator to the valve, check to see if the valve rotation matches the actuator rotation and complies with the required failsafe position.

- Reconnect the actuator to the valve or to the mechanical equipment, making sure that the piston stem is centered in the transfer case. In actuators equipped with a locking device on the lever arm, tighten the bolt of the device firmly.
- Certify that the packing follower is in the correct position. Then, tighten the nuts of the packing gland flange.

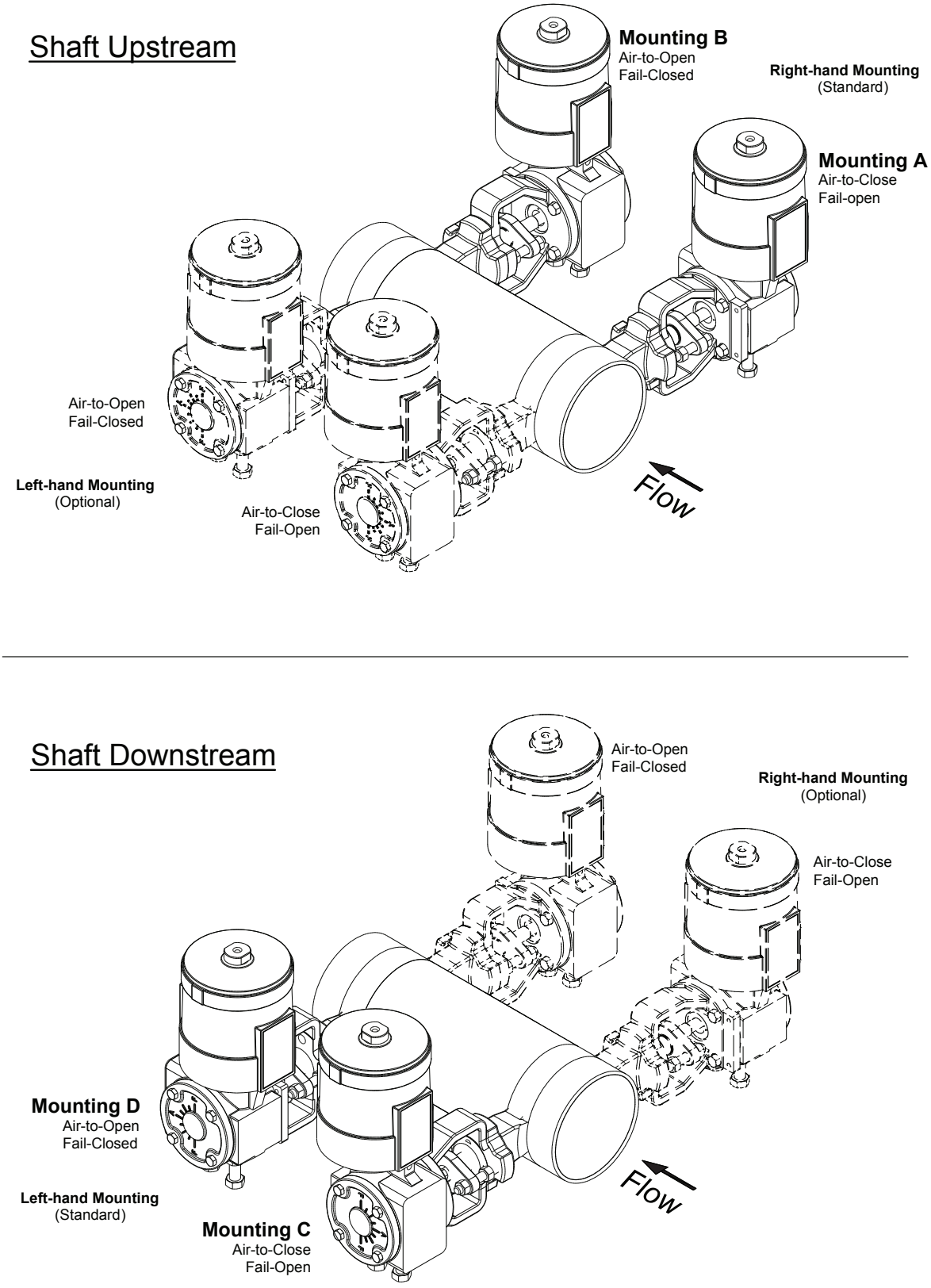
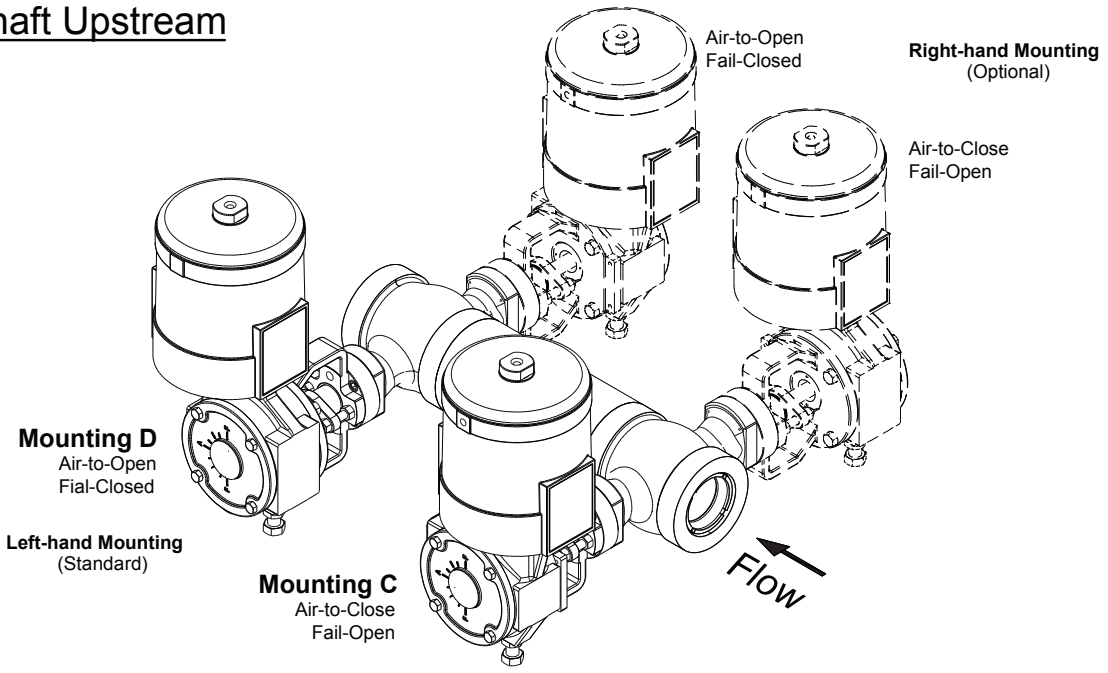


Figure 12 - Actuator Orientations for B$\overline{XL}$ & V$\overline{XL}$ Control Valves

Shaft Upstream



Shaft Downstream

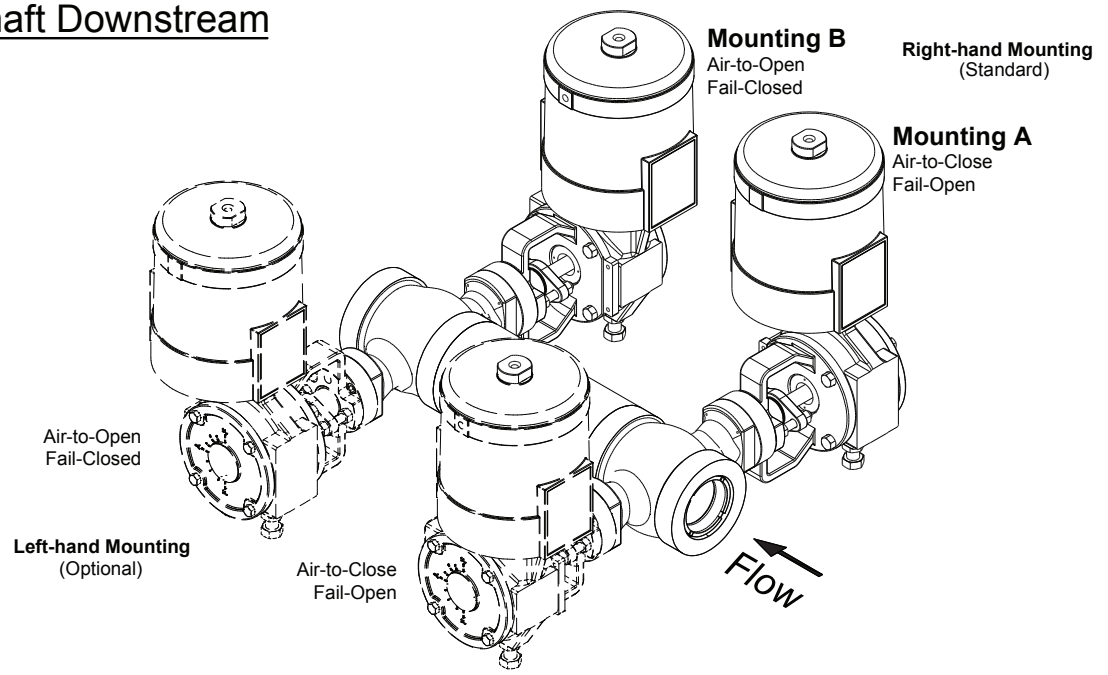
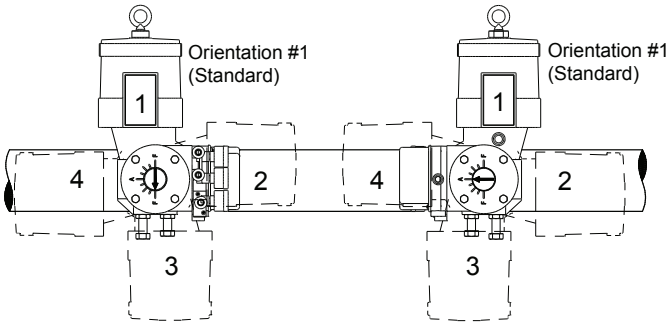


Figure 13 - Actuator Orientations for EXL Control Valves

Cylinder Orientations



Note: Orientations 2 and 4 are not recommended for some actuators sizes. Consult factory.

Handwheel Orientations

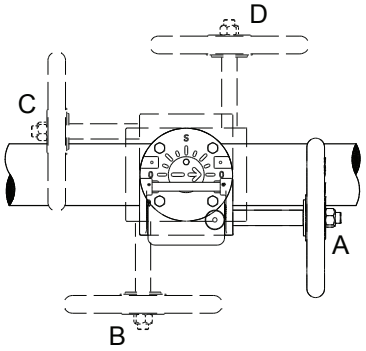


Figure 14: Cylinder and Manual Handwheel Orientations

1.9 - ROTARY ACTUATOR TROUBLESHOOTING CHART

Problem	Probable Cause	Corrective Action
Excessive air consumption	• Leaks in air supply or instrument signal system • Malfunctioning positioner • Leaks through O-rings or adjusting screw gasket • O-rings of the sliding collar assembly worn out or damaged	• Tighten the fittings and replace any leaking ferrule • See positioner IOM • Replace O-rings and/or gasket • Replace the O-rings and/or the complete sliding collar assembly
Jerky shaft rotation movement	• Overtightened packing • Incorrect adjustment of lever arm • Unlubricated cylinder wall • Piston O-ring and/or corresponding back-up ring worn out, making the piston scratching cylinder wall • Actuator stem O-ring worn out, making the actuator stem scratching the sliding collar • Packing follower, shaft bearings or stationary post bearings of rotary valves worn out (or damaged)	• Correct the tightening of the packing as indicated in the valve IOM • The lever arm must keep the actuator stem centralized inside the transfer case • Lubricate cylinder wall with the proper lubricant • Replace the O-ring and/or the back-up ring. If damages have occurred, replace damaged parts • Replace the actuator stem O-ring; If the stem is scratched, replace it • Disassemble the valve according to the respective IOM and check these components. Replace all parts damaged or worn out
Actuator operates, but the shaft does not rotate	• Broken actuator stem • Broken pivot pin • Connection broken between the lever arm and the valve shaft	• Replace the actuator stem • Replace the pivot pin • Replace the actuator lever arm and/or the valve shaft, as the case may be

1.10 – SEALING OF THE RETAINING RING

If the actuator is installed in environments with extremely high relative humidity or potentially very corrosive, the sealing of the cylinder retaining ring (made from zinc plated carbon steel) is recommended to avoid permanent contact with the aggressive atmosphere. In cases like this, RTV silicone sealant must be applied between the transfer case and the cylinder as indicated on Figure 15 below.

In case of exceptionally aggressive atmospheres, cylinder retaining rings made from stainless steel are available as optional item.

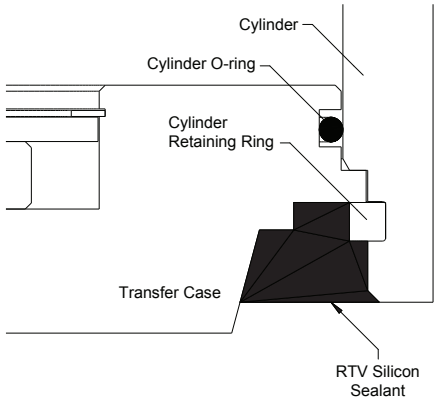


Figure 15 - Sealing of the Retaining Ring

1.11 - SPARE PARTS

For the supply of spare parts it is necessary to inform Valtek Sulamericana the name and the part number of the required item and/or the name of the required component and the actuator serial number. To facilitate this task, lists containing all actuator components part numbers are provided inside each transport packaging.

In case the actuator is disassembled the user may also check the component part number marked in a permanent way in all metallic components of the actuator.

1.12 - RECYCLING INFORMATION

Rotary actuators supplied by Valtek Sulamericana may present a very long operational life depending on the application they are provided for and the proper maintenance care.

However, at the end of their operational life the part number marked on all metallic components may help the user to adopt the best procedure for disposal of the materials that may be recycled.

In case of doubt, please contact your Valtek Sulamericana representative.

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