

ACTUATOR MAINTENANCE MANUAL, E-TYPE

Size 8 to 150



PA Ventiler AB

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Precautions - Warning

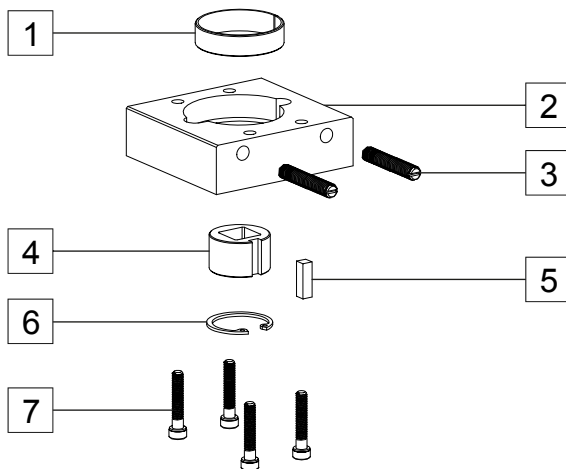
- Always take care to follow this manual in order to correctly maintain the TruTorq actuators.
- Before removing the actuator, insure that you follow the correct procedure to properly isolate the valve in the piping system.
- Never disassemble a unit that is pressurized.
- Always isolate the actuator pneumatically and electrically.
- Always remove all accessories and mounting hardware prior to maintenance.
- Check if it is a Spring Return (SR) or Double Acting (DA) actuator that you shall disassemble. If it is an SR actuator you must consider the power from the springs.

Please contact your nearest TruTorq representative if you have any questions regarding this manual.

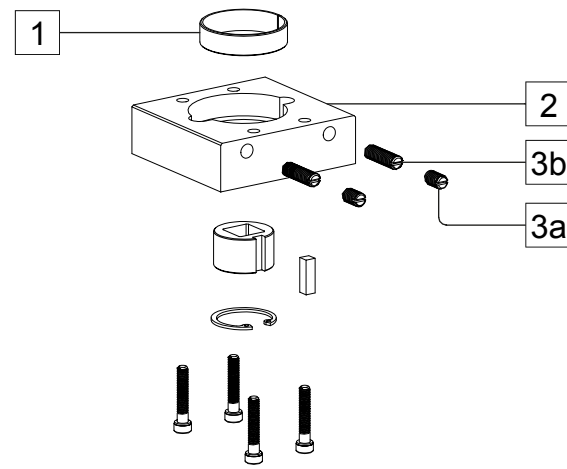
Other information

- The End Cap bolts on all TruTorq actuators are long enough in order to fully relax the springs. The bolts are the same at Double Acting (DA) and Spring Return (SR) actuators.
- Larger actuators may require more than one person to perform maintenance.
- TruTorq supplied Repair Kits include all soft components and bearings. We recommend that all parts, of the Repair Kit, are replaced when the actuator is disassembled.
- It is highly recommended that springs are to be replaced in complete sets only.
- Always use the type of lubricant we have recommended
- Always use the correct safety equipment that is stipulated by your local organizations, applicable laws and SHE guidelines.
- Always remove the BAK, on the bottom of the actuator, before starting to disassembly the actuator.

Body Adaptor Kit (BAK) - Disassembly



New version



First version

- A1. Remove the BAK before disassembling the rest of the actuator.
- A2. Remove retainer circlip (6) to allow removal of insert sleeve (4) and insert key (5).
- A3. First version: Unscrew 2 x lock screws (3a) from body adaptor and partially unscrew 2 x adjustment screws (3b).
- A4. New version: Unscrew 2 x Nuts and partially unscrew 2 x adjustment (3) screws.
- A5. Remove 4 x bolts (7) from body adaptor (2).
- A6. Gently remove body adaptor (2) ensuring stop adjustment bearing (1) is also removed and placed into body adaptor (2) after disassembly.

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Actuator - Disassembly



- B1. Check/note the shaft position (top and bottom), when the actuator is in a unpressurized state, in relation to the actuator before the dismantling. The intention is to ensure that the actuator has the same function after reassembly (Fail Closed or Fail Open).



- B2. Spring Return (SR) actuators: Unscrew the End Cap screws diagonally (opposite pair) one full turn at a time until fully relaxed. The End Cap screws are long enough to fully relax springs.
- B3. Double Acting (DA) actuators: Once loosen, unscrew at will.
- B4. Remove the End Caps.



- B5. Check/note the position of the pistons and the shaft Cam before you take these out of the actuator. The intention is to ensure that the actuator has the same function after reassembly

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- B6. Remove the pistons out of the body by turning the top of the shaft, anti-clockwise*, by using an appropriate tool.



- B7. Remove the Circlip at the top of the driveshaft by using external drop nose Circlip pliers. Then remove the washer.



- B8. Gently loosen the shaft by tapping the top of it with a rubber or wooden mallet. Turn the actuator upside down and remove the driveshaft from the bottom.
B9. After all soft parts have been removed; use cleanser to thoroughly clean all the parts prior to reassembly.

* Fail Open (FO), clockwise

Actuator - Assembly

- C1. Ensure that all parts are cleaned and free from dirt prior to assembling.
- C2. Lubricate all soft parts, driveshaft “pinions” and rack “teeth” prior to assembling. For Spring Return (SR) actuators; insure springs are generously lubricated prior to assembly/insertion. Use the grease we recommend (different to soft and hard parts).
- C3. Check that driveshaft and piston rack teeth/gears do not have excessive wear. If worn, replace driveshaft, pistons and guidebars.
- C4. Check that the piston wearpads, shaft bearings and piston backup bearings do not have excessive wear. If worn, replace the relevant bearings.
- C5. For Spring Return (SR) actuators; check that the springs not are damaged. If damage, replace springs. Do not mix old and new springs, shall be replaced as a complete Spring Kit.
- C6. Check that internal bore of the actuator body is not scored/scratched. If there is any damage, replace the body.
- C7. Place lower bearing on shaft, followed by lower “O” seal. Grease well.
- C8. Place upper “O” seal on shaft, followed by upper bearing. Grease well.



- C9. Insert the driveshaft into the bottom of the body (bigger hole than at the top). Be careful not to “pinch” the “O” seals on insertion.



- C10. Place the washer over the top of the driveshaft. Place and fasten the upper Circlip around the top of the driveshaft by using external drop nose Circlip pliers.

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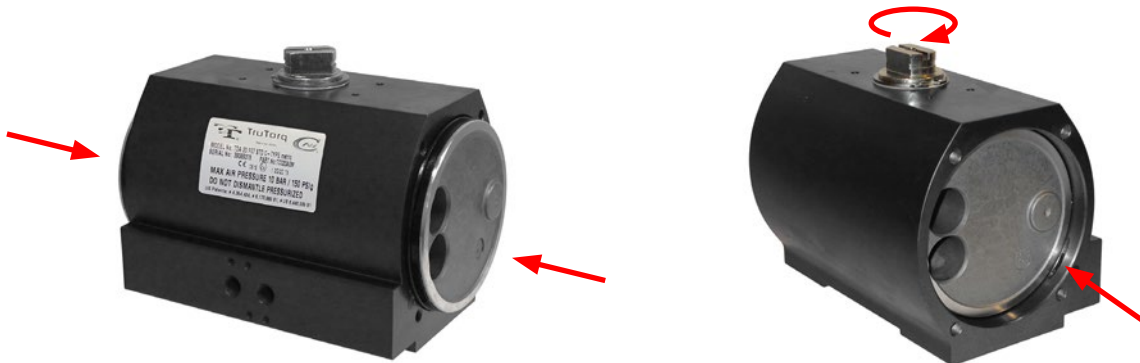
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- C11. Insert the piston wearpads into the grooves on the back of the piston rack. Place the “O” seals into the piston circumference groove, followed by the backup bearing, insuring that it is placed to the back of the piston with the “O” seal nestled inside the groove of the backup bearing.



- C12. Turn the top of the shaft until it is aligned (parallel) with the body of the actuator. The CAM shall be to the left when facing the air ports.



- C13. Insert the pistons into the body (same position as when disassembly). Turn the top of the shaft anti-clockwise **, with an appropriate tool, until the teeth of the shaft have “jumped over” the pistons three to four (3-4) times, depending on size. After that, turn the top of the shaft so that the pistons are drawn into the body.
- C14. Check that the position of the top of the shaft is 90° vs. the body of the actuator when the pistons are fully retracted into the body.
- C15. Check the position of the pistons, when they are in the extended position, that the shaft is in line with the body. The pistons must be just behind the first groove in the house.
- C16. If it is a Spring Return (SR) actuator; assemble the BAK before mounting the springs.
- C17. If it is a Spring Return (SR) actuator; assembly the springs.
- C18. Assembly the End Caps. To avoid damage of the O-rings when fitting the end caps; screw the end cap bolts diagonally (opposite pair) one full turn at a time until these are fully screwed.

** Fail Open (FO), clockwise. Driveshaft top 90° vs. actuator and the cam to the right when facing the front of the actuator.

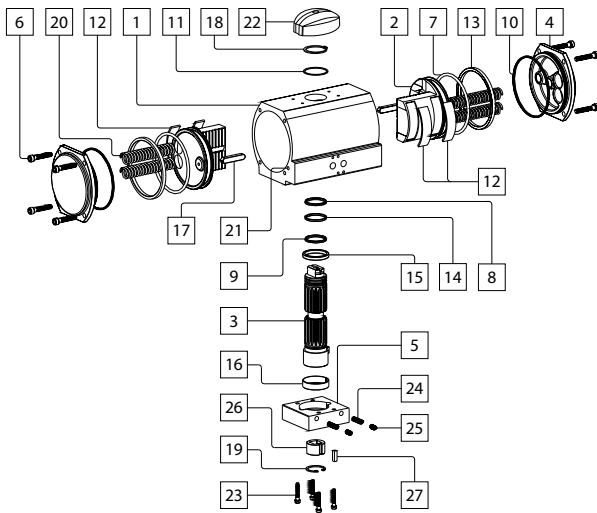
Body Adaptor Kit (BAK) - Assembly

- D1. Insert body adaptor bearing (1) into body adaptor (2) and apply a small amount of grease.
- D2. Place body adaptor (2) over driveshaft ensuring stop screw holes is facing the front of the actuator (same position as air inlet ports).
- D3. Insert 4 x body adaptor bolts (7) into body adaptor (2) and fasten.
- D4. First version: Insert 2 x stop screws (3b) and adjust to required position, then secure with 2 x lock screws (3a).
- D5. New version: Insert 2 x adjustment screws (3) with washers and nuts and adjust to required position.
- D6. Place insert sleeve (4) and key (5) ensuring it is in the correct orientation (in-line or cross mount).
- D7. Replace retainer circlip (6) to ensure insert sleeve (4) and key (5).

Insert Sleeve Adjustment

- E1. There are three keyways that allow for inline, 45° and 90° location of the sleeve.
- E2. Turn the actuator upside down.
- E3. Remove the retaining circlip that holds in the insert sleeve, by using a long nose internal circlip plier.
- E4. Remove the insert sleeve from the driveshaft and relocate as necessary.

Part List



Ref.no.	Description	Quantity
1	Body	1
2	Piston	2
3	Driveshaft	1
4	End Cap	2
5	Body Adaptor	1
6	End Cap Bolt	8
7	Piston O-ring	2
8	Driveshaft upper O-ring	1
9	Driveshaft lower O-ring	1
10	End Cap O-ring	2
11	Washer	1
12	Wear Pads	4
13	Backup Bearing	2
14	Driveshaft upper Bearing	1
15	Driveshaft lower Bearing	1
16	Body Adaptor Bearing	1
17	Guide Bar	2
18	Circlip upper	1
19	Body Adaptor Circlip	1
20	Spring	4
21	Ball Bearing	2
22	Position Indicator	1
23	Body Adaptor Bolts	4
24	Stop Adjustment Screws	2
25	Lock Screws	2
26	Insert	1
27	Insert Sleeve Key	1