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Installation of Actuator

Triac actuators are mounted directly to valves or mounted to the valve using a bracket and coupler. The coupler adapts the output of the actuator to the valve shaft. Standard mounting kits provide mounting of the actuator in the direction of the pipe. When mounting the actuator to a valve using a mounting kit, the pinion drive, coupling device and valve stem should be centered and concentric to prevent any side loading to the bottom pinion radial bearing and valve stem seal area. After mounting, it may be necessary to adjust the end of travel stop for proper open or closed valve position (See "Travel Adjustment" section). Pneumatically stroke the actuator several times to assure proper operation with no binding of the coupler.

Note: Actuators that are not in service for at least a 3 month period should be cycled a minimum of 10 times. This prevents pre-set of seals.

Air Supply

Pneumatic piping to the actuator and associated accessories should follow the best practices for instrument pneumatic piping systems, i.e. line free of water, oil, pipe sealant or other contaminants. The operating medium is light hydraulic oil or filtered dry air/inert gas which is filtered to 50 micron particles size or less. It is extremely important that the actuator be powered with the proper air pressure and air volume. Working pressure is 40 - 150 psi. The spring housing on spring return actuators, if not piped, will breathe through the right hand port (unless it is reverse acting or purposely tubed to avoid this). It is important that it not be exposed to a corrosive atmosphere. Please contact A-T Controls for possible solutions if this condition exists.

Lubrication

Triac actuators are factory lubricated for life and additional lubrication is not normally required. When replacing grease, use CH-218 grease or comparable grease. However, for actuators performing 100,000 cycles or more, an oil mist lubricator is recommended. Oil mist lubrication requires a mineral oil type ISO VG32 Class 1 for usage in temperature range 15 to 158°F. Oil mist lubricator must be set to the lowest setting. Once begun, the oil mist lubrication cannot be discontinued.

Caution: If the actuator is equipped any accessories (i.e. pneumatic positioner or pneumatic controller), oil mist lubricated air cannot be used unless the instrument manufacturer indicates that the instrument is compatible with lubricated air.

Travel Adjustment

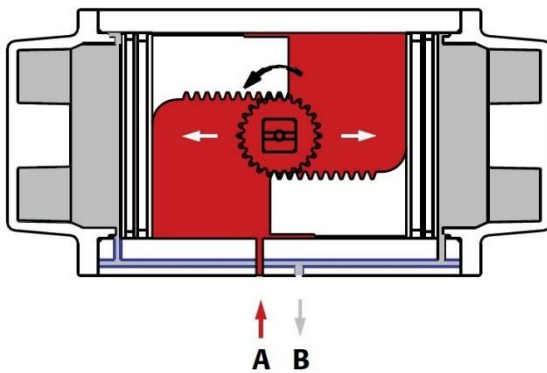
The S2 Series Rack & Pinion actuators have travel stop adjustments in both the clockwise and counterclockwise directions. The $\pm 4^\circ$ adjustment of the end of the travel stop is accomplished by loosening the travel stop nut (Item 16 in BOM) and adjusting the travel stops (Item 17 in BOM) in either direction. All actuated valves require accurate travel stop adjustments at both ends of the stroke to obtain optimum performance and valve seat life.

Operation

Double Acting:

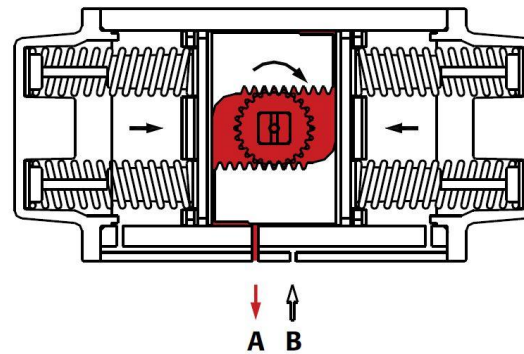
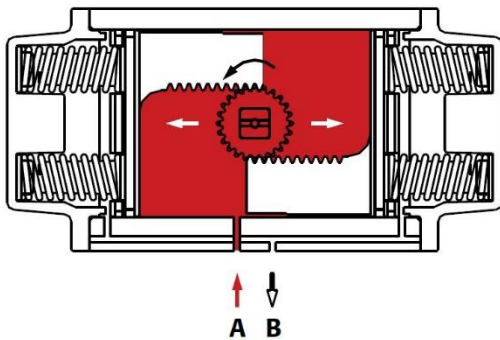
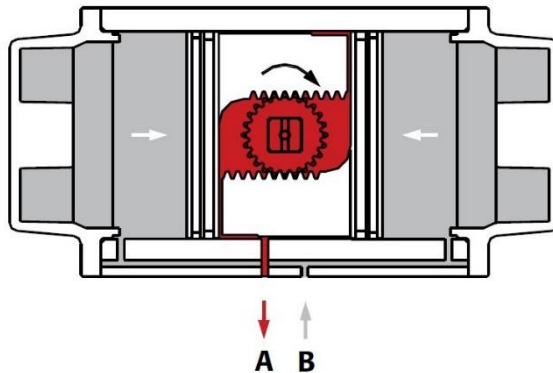
CCW:

Air is supplied to Port A forcing the pistons away from each other (toward ends) which rotates the drive pinion counterclockwise and exhausts the air out of Port B



CW:

Air is supplied to Port B forcing the pistons toward each other (toward center) which rotates the drive pinion clockwise and exhausts the air out of Port A.



Spring Return (Fail CW):

CCW:

Air is supplied to Port A forcing the pistons away from each other (toward ends), which rotates the drive pinion counterclockwise, compresses the springs and exhausts air out of Port B.

FAIL CW:

Air failure (loss of pressure) allows the compressed springs to force pistons toward each other (toward center), which rotates the drive pinion clockwise and exhausts air out of Port A.

*(Unit is capable of failure in counterclockwise direction by reversing pistons inside of housing.)

Disassembly Procedures

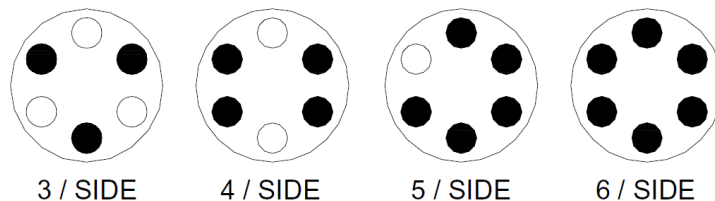
1. Disconnect air supply and electric accessories to depressurize actuators. Ensure that the actuator is in the failed position if it is a spring return style.
2. Remove actuator from valve.
3. Loosen the travel stop nut (Item 16 in BOM) and travel stop bolts (Item 17 in BOM).
4. Apply air to Port B to ensure that pistons are driven to the center.
5. Loosen End Cap Bolts (Item 13 in BOM), remove End Caps (Item 12 in the BOM), and springs (Item 11 in the BOM). If the unit is a spring return unit, use **caution** when removing springs.
6. Remove Snap Ring (Item 3 in BOM).
7. Rotate Pinion (Item 23 in BOM) counterclockwise with a wrench to drive Pistons (Item 7 in BOM) out of the actuator Body (Item 6 in BOM). **Never use air to accomplish this step.**
8. Drive Pinion through the bottom of the actuator using a rubber mallet. Ensure that the pinion does not damage the body of the actuator. Remove the Travel Cam Stop (Item 20) taking note of what direction it was installed. It is recommended to mark this item to identify which direction it was originally installed for ease of reinstallation.
9. Remove the Top and Bottom Pinion bearings (Items 21 and 24 in the BOM).

Changing from “Spring Closed (FCW)” to “Spring Open (FCCW)”

1. Follow “Disassembly Procedures” up to Step 6.
2. Rotate pinion 90° clockwise.
3. Grease cylinder surface with CH-218 grease or comparable grease.
4. Rotate pistons 180° about their axis and reinstall.
5. Rotate shaft 90° degrees clockwise to draw pistons in and confirm proper engagement.
6. Travel stop adjustment will now occur in the “closed” position of the valve. See “Travel Adjustments” for instructions for travel stop adjustment.

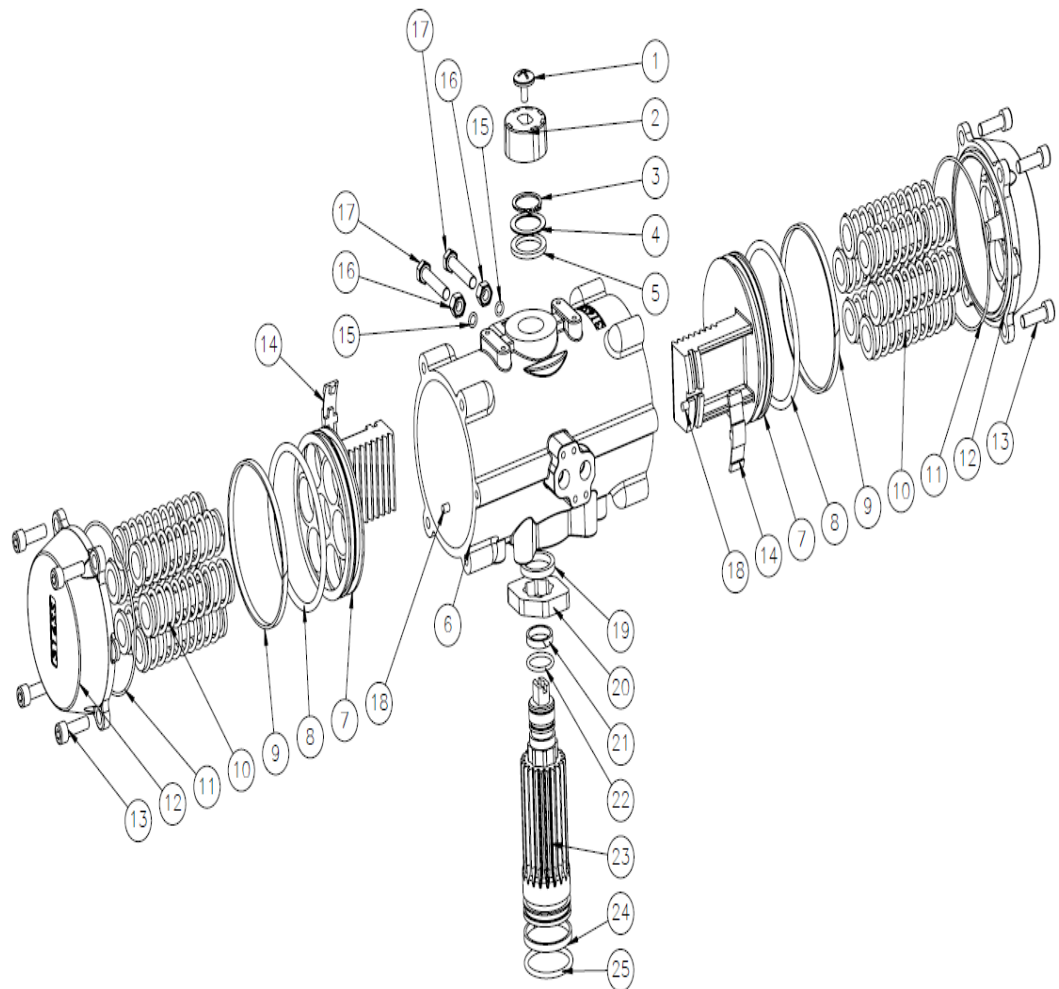
Re-assembly Procedures

1. Inspect all parts for wear and replace any worn parts as needed. Replace all o-rings (Items 8, 11, 22, and 25 in BOM).
2. Clean all components and lightly grease cylinder bore, and seals with multi-purpose grease.
3. Follow steps in “Disassembly Procedures” in reverse order. Be aware and take care to ensure that End Cap O-rings are not pinched. If the Travel Cam Stop was not marked when disassembling the actuator, reference the “Exploded View/Bill of Materials” section for the correct orientation to install. When reinstalling springs, place the springs into the pockets of the piston and end cap balancing the number of springs shown below:



4. After reassembly, pressurize the actuator gradually using 80-100 psi of compressed air. Check seal areas by applying soapy water and checking for the appearance of bubbles and ensure that pinion travel is smooth.
5. Follow steps in "Travel Adjustments" for travel stop adjustments.

Exploded View/Bill of Materials



No.	Part Name	Qty	Standard Material	REPAIR KIT
1	INDICATOR SCREW	1	ABS PLASTIC	
2	INDICATOR	1	ABS PLASTIC	
3	SNAP RING	1	AISI 316	✓
4	THRUST WASHER	1	AISI 316	✓
5	OUTSIDE WASHER	1	POLYOXYMETHYLENE	✓
6	BODY	1	ASTM A351 GRADE CF8M	
7	PISTON	2	AISI 316	
8	PISTON O-RING	2	STANDARD: BUNA-N HIGH TEMP KIT: FKM	✓
9	PISTON BEARING	2	POLYOXYMETHYLENE	✓
10	SPRING	0-12	SPRING: EXPOXY COATED SPRING STEEL RETAINER: NYLON 66 RETAINER CONNECTOR: BRASS	
11	END CAP O-RING	2	STANDARD: BUNA-N HIGH TEMP KIT: FKM	✓
12	END CAP	2	ASTM A351 GRADE CF8M	
13	END CAP BOLT	8	AISI 304	
14	GUIDE PLATE	2	NYLON 66	✓
15	TRAVEL STOP O-RING	2	STANDARD: BUNA-N HIGH TEMP KIT: FKM	✓
16	TRAVEL STOP NUT	2	AISI 304	
17	TRAVEL STOP BOLT	2	AISI 304	
18	PLUG	2	BUNA-N	
19	TOP PINION WASHER	1	POLYOXYMETHYLENE	✓
20	TRAVEL CAM STOP	1	AISI 316	
21	TOP PINION BEARING	1	POLYOXYMETHYLENE	✓
22	TOP PINION O-RING	1	STANDARD: BUNA-N HIGH TEMP KIT: FKM	✓
23	PINION	1	AISI 316	
24	BOTTOM PINION BEARING	1	POLYOXYMETHYLENE	✓
25	BOTTOM PINION O-RING	1	STANDARD: BUNA-N HIGH TEMP KIT: FKM	✓

Spare Parts

S2 Series Spare Parts			
Actuator	Buna Repair Kit	FKM Repair Kit	Spring Cartridges
S2-052	S2-RKB052	S2-RKV052	S2-SP052
S2-063	S2-RKB063	S2-RKV063	S2-SP063
S2-083	S2-RKB083	S2-RKV083	S2-SP083
S2-105	S2-RKB105	S2-RKV105	S2-SP105
S2-125	S2-RKB125	S2-RKV125	S2-SP125
S2-140	S2-RKB140	S2-RKV140	S2-SP140
S2-160	S2-RKB160	S2-RKV160	S2-SP160
S2-210	S2-RKB210	S2-RKV210	S2-SP210



A-T Controls product, when properly selected, is designed to perform its intended function safely during its useful life. However, the purchaser or user of A-T Controls products should be aware that A-T Controls products might be used in numerous applications under a wide variety of industrial service conditions. Although A-T Controls can provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser / user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of A-T Controls products. The user should read and understand the installation operation maintenance (IOM) instructions included with the product and train its employees and contractors in the safe use of A-T Controls products in connection with the specific application.

While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only. Because A-T Controls is continually improving and upgrading its product design, the specifications, dimensions and information contained in this literature are subject to change without notice. Should any question arise concerning these specifications, the purchaser/user should contact A-T Controls.

For product specifications go to <http://download.a-tcontrols.com/>

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