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SuperNova SX-Series

All actuators are factory lubricated for life, but still should be protected from the elements and stored indoors until ready for use. The ports of the actuator are plugged as supplied from the factory. If actuators are stored for a long period of time prior to installation, the units should be stroked periodically to prevent the seals from taking a set.

Prior to assembly, check the mounting surfaces, the stem adaptor and the bracket to assure proper fit. Manually open and close the valve to insure freeness of operation. Be sure the valve and Automax actuator rotate in the same direction and are in the same position (i.e., valve open, actuator open). Secure the valve with the stem vertical. Bolt the bracket to the valve and place the stem adaptor on the valve stem. Position the actuator over the valve and lower to engage the stem adaptor to the actuator shaft. Continue to lower until the actuator seats on the bracket mounting surface. In order to align the bolt holes, it may be necessary to turn or stroke the actuator a few degrees and/or adjust the actuator's travel stops. Bolt the actuator to the bracket.

After consulting the valve manufacturer's recommendations, adjust the travel stop bolts of the actuator for the proper open and closed valve positions. Pneumatically stroke the actuator several times to assure proper operation with no binding of the stem adaptor. If the actuator is equipped with an UltraSwitch or other accessories, adjust them at this time.

To prolong actuator life use only clean, dry plant air. Lubricated air is not required, however it is recommended particularly for high cycle applications. Do not use lubricated air with positioners.

Travel Stop Adjustments Both Directions

The SuperNova Series actuators have unique, travel stop adjustments in both the clockwise and counterclockwise directions. All actuated valves require accurate travel-stop adjustments at both ends of the stroke to obtain optimum performance and valve seat life. The accumulation of tolerances in the adaption of actuators to valves is such that there must be a range of adjustment for both ends of the stroke to achieve the expected performance.

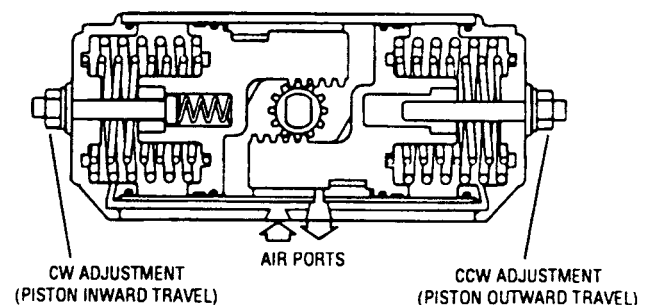
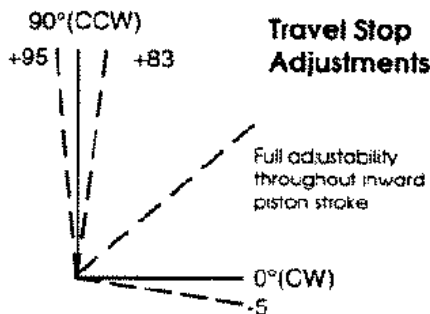
Ball and Plug Valves require precise adjustment at the open (CCW) position to protect the seat from the flow media and the closed (CW) position to assure absolute shut-off.

Butterfly Valves require precise adjustment at the closed position to assure full shut-off, to prevent disc overtravel and damage to the seat at the closed position and to assure maximum flow in the open position.

Tandem Valves, where two valves are operated in tandem through a single solenoid valve (eg., a 3-Way configuration), absolutely require precise adjustment at both ends of the stroke to assure the seating of both valves.

Stop Adjustments and Locations

View the actuator with the Air Ports facing you.



Actuator	Endcap Screw Socket Size	Adjustment Bolt Socket Size	Spring Color Code
SX050	4mm	3mm	white
SX063	5mm	4mm	lt. green
SX085	6mm	5mm	blue
SX100	6mm	6mm	red
SX115	6mm	6mm	yellow
SX125	8mm	6mm	grey
SX150	8mm	8mm	dk. green

Adjustment Bolt Location

Actuator Type	Fail Position	Clockwise (CW)	Counterclockwise (CCW)
Double Acting		Left End Cap	Right End Cap
Spring Return	CW	Left End Cap	Right End Cap
Spring Return	CCW*	Right End Cap	Left End Turn

*The pistons are rotated 180° for CCW fail position

Maintenance Instructions

Disassembly Procedures

1. Disconnect all air and electrical supplies from actuator.
2. Remove all accessories from actuator and dismount actuator from valve.
3. Position actuator with air supply ports facing you. Apply air pressure to Port 2 to release spring pressure from the Stop Bolt (9).
4. Remove the Stop Bolt Retaining Nut (14), Washer (15), and O-ring (16) on the Left Endcap (19) and turn the Stop Bolt (9) clockwise into the Body (1) until it is flush with the Endcap (19).
5. Exhaust air from Port 2, the Stop Bolt (9) should now turn freely. Continue turning Stop Bolt (9) clockwise until it is disengaged from the Endcap.

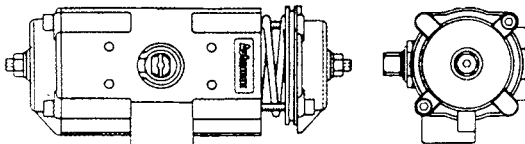
CAUTION: *Unload springs before removing pinion to eliminate possible spring side loading that could scratch the pinion bore.*

6. Spring Return Actuator:

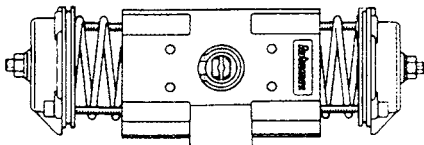
CAUTION: *Follow step 4 to relieve force on inward travel stop before proceeding.*

CAUTION: *Do not use impact wrench to remove endcap screws. Failure to follow this precaution could result in bolts binding in the body.*

To remove Spring Return Endcap, first completely remove two diagonal Endcap Screws (21) from one Endcap. The two remaining Endcap Screws should be removed evenly. As the Screws are removed, the springs will push the Endcap out. Repeat for opposite side. **The springs will be totally unloaded before the screws are completely unthreaded.** Remove the springs (23,24,25.)



Actuator with springs partially disarmed (right side)



Actuator with springs totally disarmed

Double Acting Actuator: Remove the 8 Endcap Screws (21). Step 7 will push the Endcaps (18,19) from the Body (1).

CAUTION: *Do not use impact wrench to remove endcap screws. Failure to follow this precaution could result in bolts binding in the body.*

7. Rotate Pinion (3) counterclockwise (DA & SR-FCW) or clockwise (DR & SR-FCCW) to drive the Pistons (2) off the end of the rack. Pull the Left Piston (2) from the body (1) by

pulling on the Stop Bolt (9).

8. Remove the Right Piston (2) by pushing out through inside of Body (1).
9. Remove the Pinion Snap Ring (5) and Pinion Washer (4), and pinion thrust washer (26).
10. Tap Pinion (3) lightly with plastic mallet to remove.

Reassembly Procedures

1. Inspect all parts for wear and replace any worn parts as needed. Replace all 'O'-rings.
2. Clean all components and lightly grease cylinder bore, pinion and seals with a high performance grease such as Dow 55. Lubricate endcap screw (21) threads with similar grease.
3. Reverse the disassembly procedures to reassemble.
4. The standard Pinion (3) orientation is with the flats on top of pinion perpendicular with the body (1) in the CW position.
5. When fitting the Pistons (2) ensure the teeth engage the Pinion (3) at the same time by measuring in from the edge of the body (1) the same distance from each end. Note: the orientation of the pistons will determine the operation of the actuator. Refer to the diagrams under "Operation" for correct piston position.
6. Test the actuator for smooth operation and air leakage at service pressure before installing.

Changing Number of Spring

1. Follow the Disassembly Procedures through step 5.
2. Determine nested spring combination of inner, middle and outer springs. Consult catalog torque charts, distributor or factory. Insert appropriate springs into cylinder. Springs must be properly seated against piston and endcap to assure that springs do not bind.
3. Re-assemble the actuator.

Spring chart SX063-SX150

Spring Group	Spring Combination		
	#1 Spring (inner)	#2 Spring (middle)	#3 Spring (outer)
4		2	
5		1	1
6			2
7	1		2
8	2		2
9	1	1	2
10		2	2
11		2	2
12	2	2	2

Spring chart SX050

Spring Group	Spring Combination		
	#1 Spring (inner)	#2 Spring (middle)	#3 Spring (outer)
4	1	1	
5		2	
6	2	1	
7	1	2	
8	2	2	
9	2		2

Note: #1 Spring has one color code dot
#2 Spring has two color code dots
#3 Spring has three color code dots

SX050 has maximum of 2 springs per endcap
Install springs on opposite sides

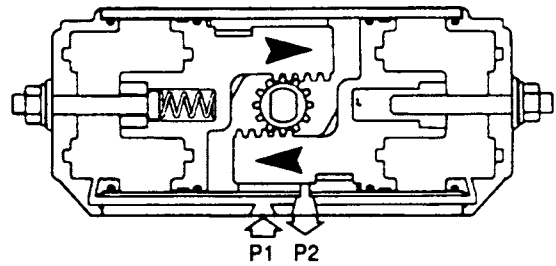
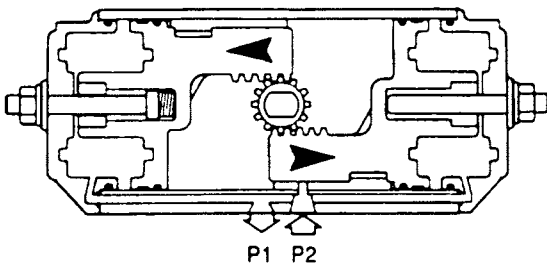
Operation

(as viewed from top of actuator)

Double Acting

Applying air pressure to Port 2 drives the pistons outward, which turns the pinion counterclockwise as the air volume on the outside of the pistons exhausts through Port 1.

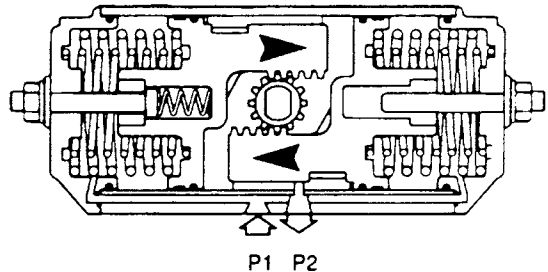
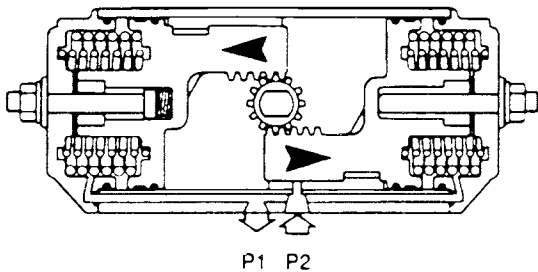
Applying air pressure to Port 1 drives the pistons inward, which turns the pinion clockwise as the air volume on the inside of the pistons exhausts through Port 2.



Spring Return (Fail CW)

Applying air pressure to Port 2 drives the pistons outward, which compresses the springs and turns the pinion counterclockwise as the air volume on the outside of the pistons exhausts through Port 1.

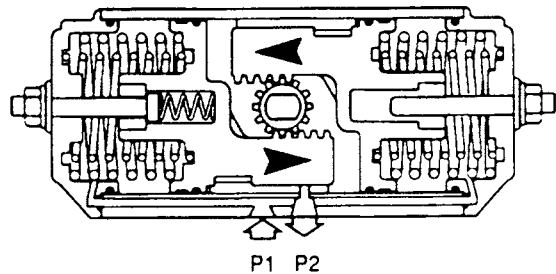
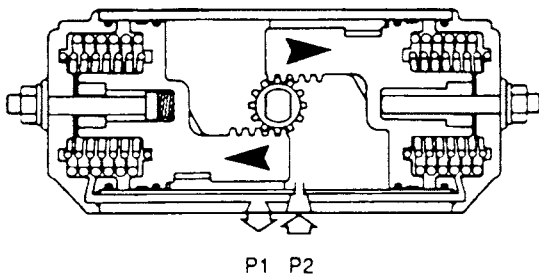
Exhausting the air pressure from Port 2 allows stored energy of the springs to drive pistons inward, turning the pinion clockwise. Air volume on outside of pistons vents through Port 1.



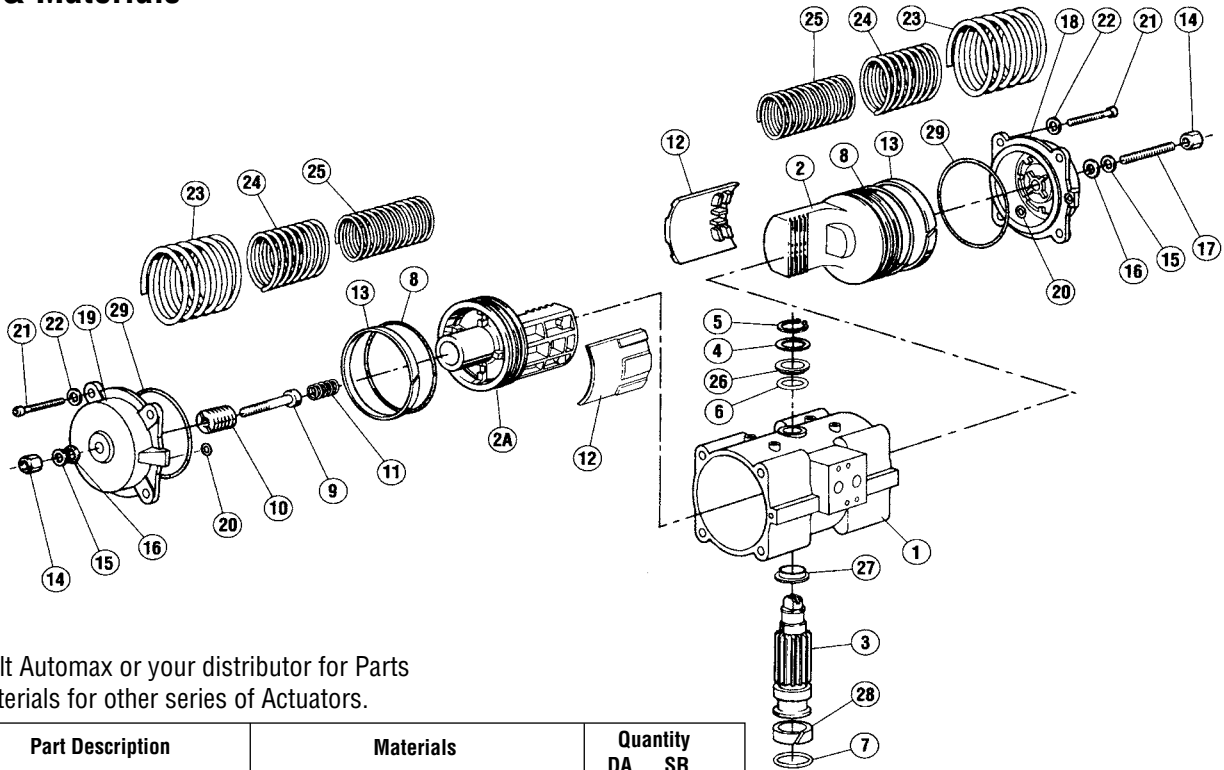
Spring Return (Fail CCW)

Applying air pressure to Port 2 drives the pistons outward, which compresses the springs and turns the pinion clockwise as the air volume on the outside of the pistons exhausts through Port 1.

Exhausting the air pressure from Port 2 allows stored energy of the springs to drive pistons inward, turning the pinion counterclockwise. Air volume on outside of pistons vents through Port 1.



Parts & Materials



*Consult Automax or your distributor for Parts and Materials for other series of Actuators.

Item No.	Part Description	Materials	Quantity	
			DA	SR
1	Body	Type 316 Stainless Steel	1	1
2	Pistons	Die Cast Aluminum	2	2
3	Pinion	Type 303 Stainless Steel	1	1
4	Pinion Washer 1	Stainless Steel	1*	1*
5	Pinion Snap Ring 1	Stainless Steel	1	1
6	Upper Pinion O-Ring 1	Viton	1	1
7	Lower Pinion O-Ring 1	Viton	1	1
8	Piston O-Ring 1	Viton	2	2
9	Inward Travel Stop Bolt	Type 304 Stainless Steel	1	1
10	Inward Travel Retaining Nut	Steel/Plated	1	1
11	Inward Travel Spring	Steel/Plated	1	1
12	Piston Guide 1	Nylon and Molybdenum Disulfide	2	2
13	Piston Guide Band 1	Nylon and Molybdenum Disulfide	2	2
14	Stop Bolt Retaining Nut	Stainless Steel	2	2
15	Stop Bolt Washer	Stainless Steel	2	2
16	Stop Bolt O-Ring 1	Viton	2	2
17	Stop Bolt	Type 304 Stainless Steel	1	1
18	Right End Cap	Type 316 Stainless Steel	1	1
19	Left End Cap	Type 316 Stainless Steel	1	1
20	End Cap Supply O-Ring 1	Viton	2	2
21	End Cap Screw	Stainless Steel	8	8
22	End Cap Screw Washer	Stainless Steel	8	8
23	Outer Spring	Spring Steel Coated	0	2max. 2
24	Middle Spring	Spring Steel Coated	0	2max. 2
25	Inner Spring	Spring Steel Coated	0	2max. 2
26	Pinion Thrust Washer 1	Reinforced Nylon	1	1
27	Upper Pinion Bearing 1	PEEK Composite	2	2
28	Lower Pinion Bearing 1	PEEK Composite	1	1
29	End Cap O-Ring 1	Viton	2	2

Seal Kits

Viton Seal Kit Number	KX (Actuator Model No.) CH
Low Temp Seal Kit	KX (Actuator Model No.) CL

KS kits consist of all sealing parts, pinion bearings, piston guides, snap ring, and washer.

Pressure Rating

120 psig maximum

Temperature Rating

Standard	Viton	0°F to +300°F
Low Temp	Silicon-based	-55°F to +175°F

Lubricate seals with high performance grease such as DOW

- Note:**
- 1 Parts included in a Seal Kit
 - 2 See Spring chart for required spring combination.
- *Qty (2) for 5X050 & 5X063,
(1) external & (1) internal