

Instruction
D-Type01P-1NE
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NOR'EAST

— CONTROLS, INC.
A DIVISION OF ALLGASH INTERNATIONAL, INC.



Operator's Manual

TYPE 01 PNEUMATIC ACTUATOR,
USED WITH GLOBE VALVES

Previously manufactured by Dezurik® and Honeywell®

Nor' East

Type 01 Pneumatic Actuator Used With Globe Valves

Instructions

These instructions are intended for personnel who are responsible for installation, operation and maintenance of your DeZURIK Actuator.

Safety Messages

All safety messages in the instructions are flagged with the word Caution, Warning or Danger. These messages must be followed exactly to avoid equipment damage, personal injury or death.

Safety label(s) on the product indicate hazards that can cause equipment damage, personal injury or death. If a safety label becomes difficult to see or read, or if a label has been removed, please contact DeZURIK for replacement label(s).



WARNING!

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves, which have been removed from service with suitable protection for any potential pipeline material in the valve.

Inspection

Your DeZURIK Actuator has been packaged to provide protection during shipment. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

Parts

Order parts from your local sales representative, or directly from DeZURIK, as listed on the back cover. Recommended spare parts are listed on the assembly drawing. These parts should be stocked to minimize downtime.

DeZURIK Service

DeZURIK service personnel are available to install, maintain and repair all DeZURIK products. DeZURIK also offers customized training programs and consultation services.

For more information, contact your local DeZURIK sales representative or visit our website at www.dezurik.com.

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Description

Type 01 Pneumatic Diaphragm Actuators are separated into two groups, spring and springless. The springless actuator provides either Direct or Reverse action from one actuator. An air pressure regulator or reversing relay replaces the spring to maintain constant pressure on the loading side of the diaphragm. On throttling service, a Dezurik valve positioner is automatically supplied with the actuator. The spring actuator is actually two actuators — one direct acting, and the other reverse acting. See Tables A for breakdown.

Table A: Type 01 Pneumatic Actuator

Actuator	Spring				Springless	
	Direct		Reverse		Direct or Reverse	
Yoke Size	Long	Short	Long	Short	Long	Short
9	X	-	X	-	X	-
11	X	-	X	-	X	-
13	X	-	*	X	*	X
15	X	-	*	X	*	X
18S	X	-	*	X	*	X
18L	X	-	-	X	-	X
24	X	-	-	-	-	-

* Used only when side-mounted handwheel is required.

Action

With Type 01 spring actuators, two actions, direct and reverse provide the necessary valve operating force in either of two directions. When air is applied to the diaphragm, a direct acting actuator will push down - while a reverse actuator will push up. See Figure 1.

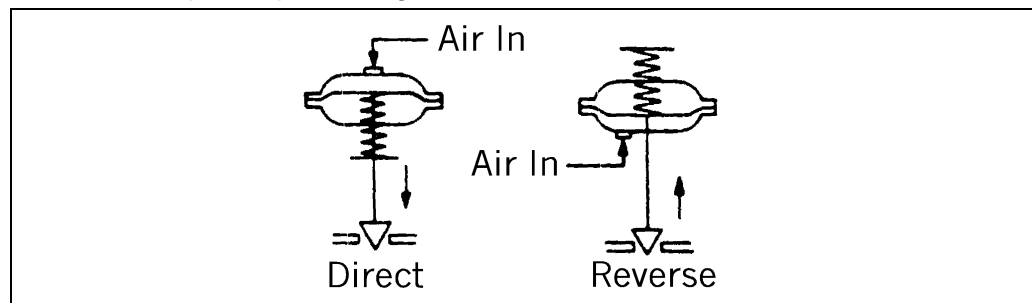


Figure 1 – Direct and Reverse Action

Description
(Continued)

Pressure and Travel

Table B: Pressure and Travel Data

Specification	Action	Actuator Size						
		9	11	13	15	18S	18L	24
Nominal Effective Diaphragm Area (sq. in.)	Direct	45	70	100	145	200	200	350
	Reverse	45	70	100	145	200	200	-
	Springless	45	70	100	145	100	100	-
Maximum Operating Pressure (psig)	Direct	50	50	50	50	50	50	35
	Reverse	50	50	50	50	50	50	35
	Springless	50	50	50	50	50	50	35
Maximum Travel (inches)	Direct	1 1/8	1 1/2	1 1/2	1 1/2	2 1/2	4	4
	Reverse	1 1/8	1 1/2	1 1/2	1 1/2	2 1/2	4	4
	Springless	1	1 1/2	1 1/2	1 1/2	2 1/2	4	4
Operating Pressure Ranges (psig)	Direct	3-15	3-15	3-15	3-15	3-15	3-15	3-15
		6-30	6-30	6-30	6-30	6-30	6-30	6-30
	Reverse	3-15	3-15	3-15	3-15	3-15	3-15	3-15
		6-30	6-30	6-30	6-30	6-30	6-30	6-30
	Springless	-	-	-	-	-	-	-

Maximum Allowable Air Pressure



CAUTION!

Do not exceed the maximum allowable air pressure for actuators as indicated in Table C.

Table C: Maximum Allowable Air Pressure

Valve/Actuator Model Number	Maximum Air Pressure
1001, 1401, 1405*, 1601, 1605*, 1611, 1605*, 1901, 2421, 9101, 9105*, 9201, 9205*, 9131, 9135*, 9501	50 psig
01 Actuator, 05 Actuator*, 01 Air-O-Motor, 05 Air-O-Motor	
4705*, 4805*, 4905*, 8105*, 8205*, 8305*, 8605*, 8905*	35 psig

***NOTES:**

1. When Type 05 actuator is Reverse Acting, the maximum allowable air pressure is 35 psig regardless of the valve model on which it is mounted.

Nor' East

Type 01 Pneumatic Actuator Used With Globe Valves

Description

(Continued)

Air Connections

NOTE: Air supply must be filtered and should never exceed 345 kPa (50 psi). A minimum constant air pressure will increase diaphragm life.

- All air connections are 1/4-inch NPT. Corresponding size tubing and fittings are recommended for the rest of the lines.
- Connect diaphragm case ("INSTRUMENT" Connection if positioner is used) to controller with 1/4-inch tubing.
- Install air pressure regulator in supply line, when positioner is used, to maintain steady air pressure and protect the diaphragm.
- With springless type actuators, connect supply line to air pressure regulator and gage (which should be piped to constant loading side of diaphragm).
- Check all air Connections for leaks.

Parts

Identification

Nameplate Data

The nameplate gives vital information on valve construction and operation. Always reference the serial number when ordering spare parts.

The spring range (on spring diaphragm actuators) is factory set to specifications on the order. Note the type of trim material, packing and lubricant number ("NONE" means packing does not require lubrication.) Remember that a change in operating conditions may mean a change in trim material, packing and lubricant type. Keep a permanent record of all nameplate information.

Parts Identification
(Continued)

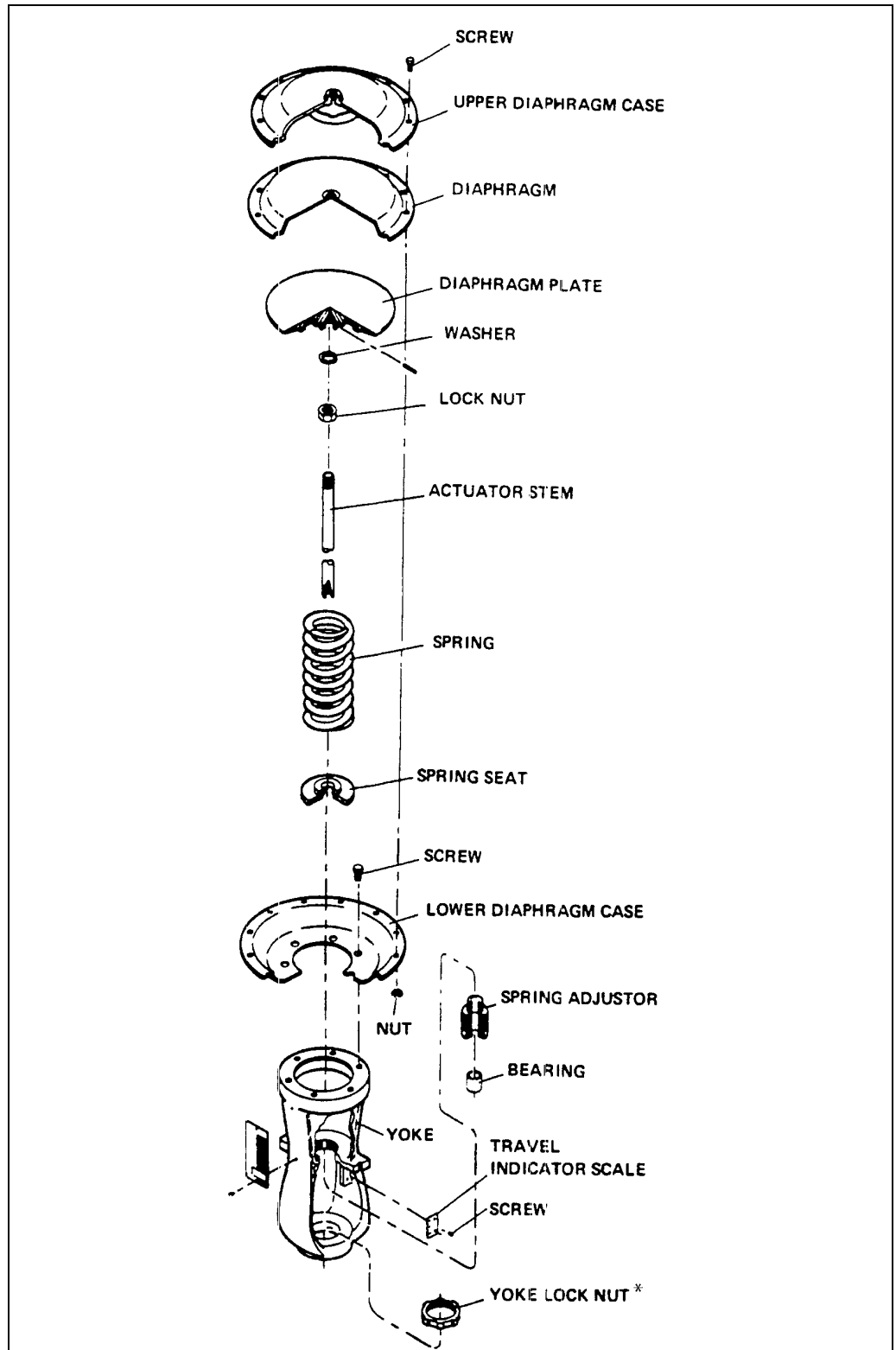


Figure 2 – Typical Air-to-Close (Direct Acting) Actuator Assembly

Parts Identification (Continued)

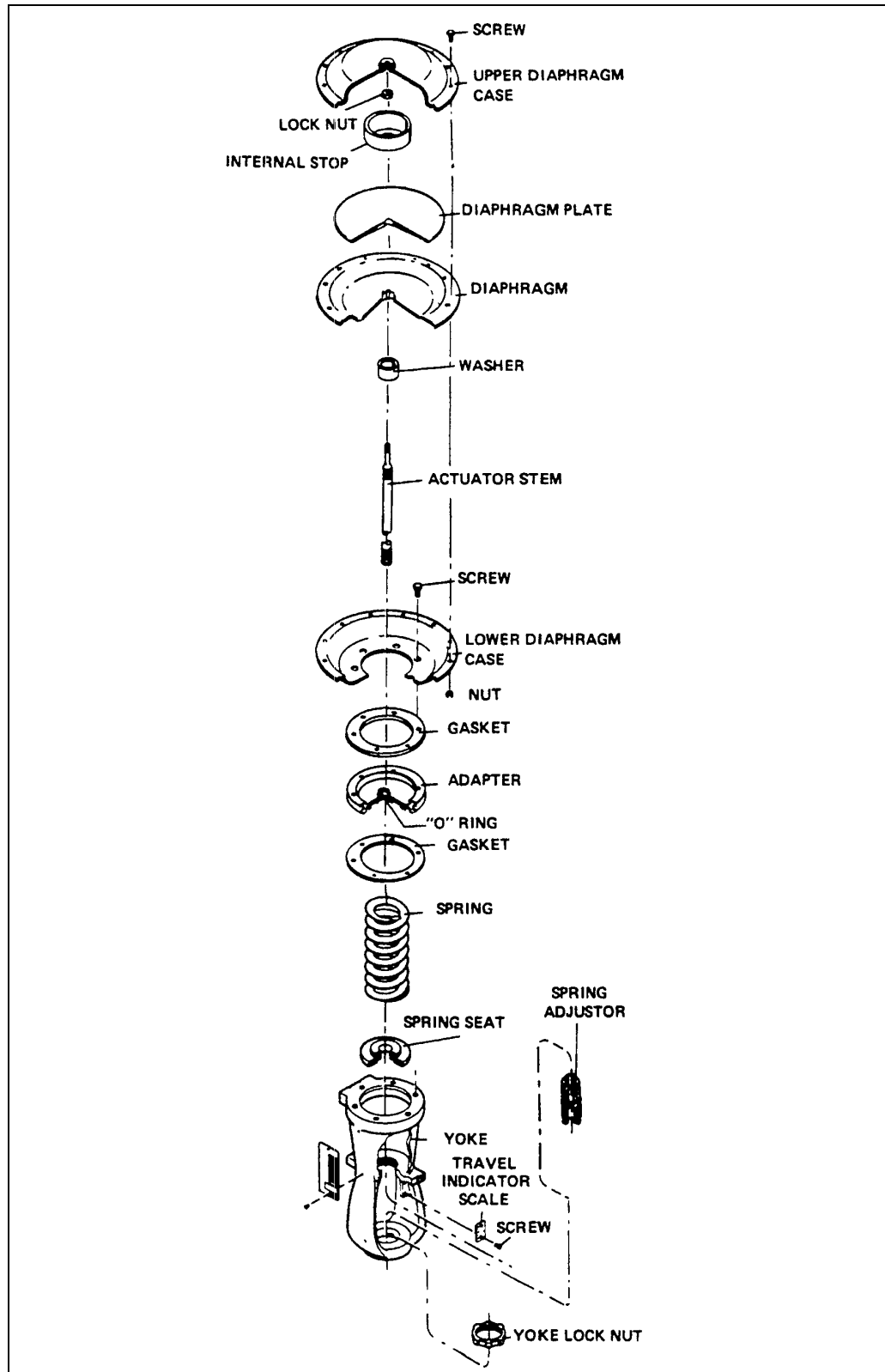


Figure 3 – Typical Air-to-Open (Reverse Acting) Actuator Assembly
(sizes 9 & 11)

Mounting Actuator

Normally the valve and actuator are factory assembled and adjusted before shipment. If the actuator needs to be field mounted, use the following procedures for Reverse or Directing Acting actuator and valve combination.

Single and Double Seated Valves

Air-to-Close Action (Direct Acting) Actuator and Valve

1. Mount actuator onto bonnet and lock in place.
2. With no air pressure on actuator, seat valve plug, raise stem and plug a distance equal to the travel specified on nameplate.
3. Lock valve stem to actuator stem with stem clamp.

Air-to-Open Action (Direct Acting) Actuator and (Reverse Acting) Valve

1. Mount actuator onto bonnet and lock in place.
2. Apply sufficient air pressure to actuator to lower actuator stem 1/16 inch.
3. Pull up valve stem and seat the plug. Lock valve stem to actuator stem with stem clamp.

Air-to-Open (Reverse Acting) Actuator and (Direct Acting) Valve

1. Push valve stem down and seat the plug.
2. Mount actuator onto bonnet and lock in place.
3. Apply sufficient air pressure to actuator to raise actuator stem 1/16 inch.
4. Lock valve stem to actuator stem with stem clamp.

Three-Way Valves

Air-to-Close Action (Direct Acting) Actuator

1. Mount actuator onto bonnet and lock in place.
2. Apply sufficient air pressure to actuator to lower actuator stem 1/16 inch.
3. Pull valve stem up until valve plug seats.
4. Lock valve stem to actuator stem with stem clamp.
5. Reposition travel indicator scale if necessary.

Air-to-Open (Reverse Acting) Actuator

1. Push valve stem down until valve plug seats.
2. Mount actuator onto bonnet and lock in place.
3. Apply sufficient air pressure to actuator to raise actuator stem 1/16 inch.
4. Lock valve stem to actuator stem with stem clamp.
5. Reposition travel indicator scale if necessary.

Actuator Removal

- Stop pipeline flow and completely release pipe line pressure.



WARNING!

This valve is a pressure vessel. The bonnet will blow off the actuator if the bonnet bolts are removed with pressure in the valve. Completely release pressure before disassembling the valve.

- Disconnect and lock out the pneumatic or electrical power to prevent accidental operation of the actuator.



WARNING!

Moving parts from accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before removal.

- Remove actuator from valve. See Figure 4 for actuator removal.

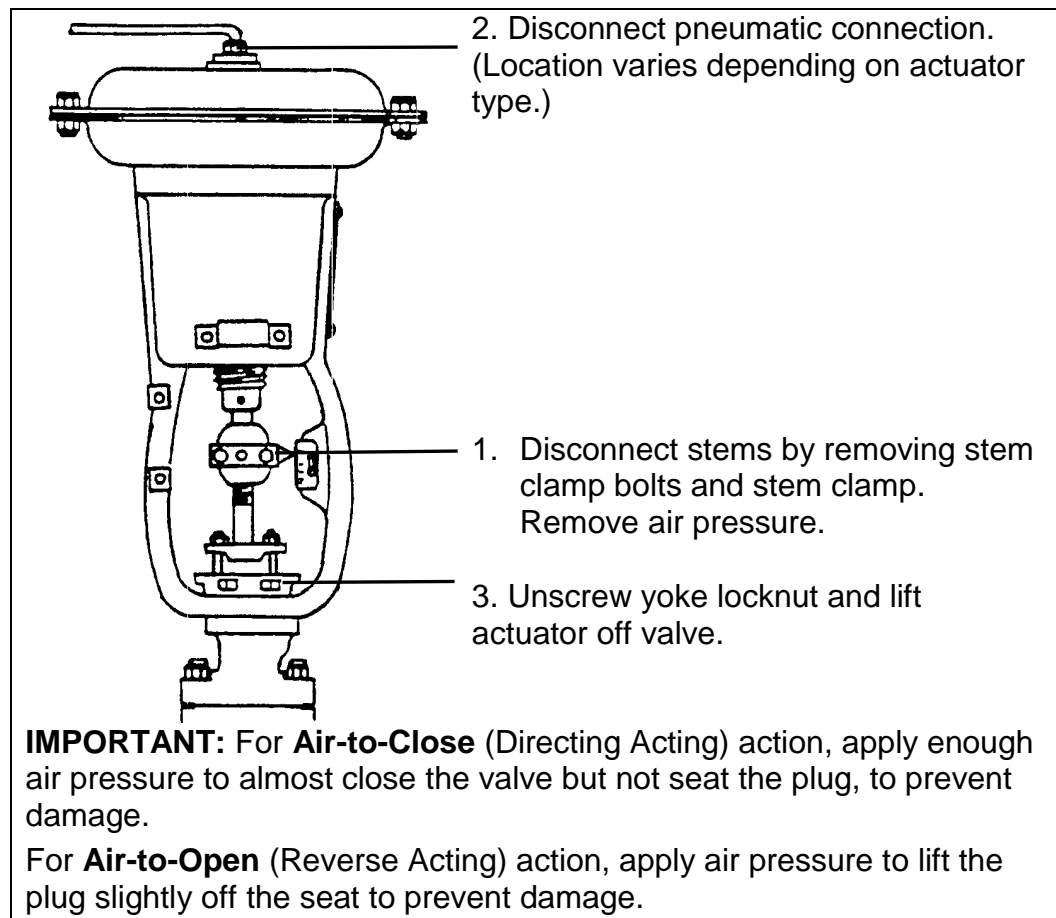
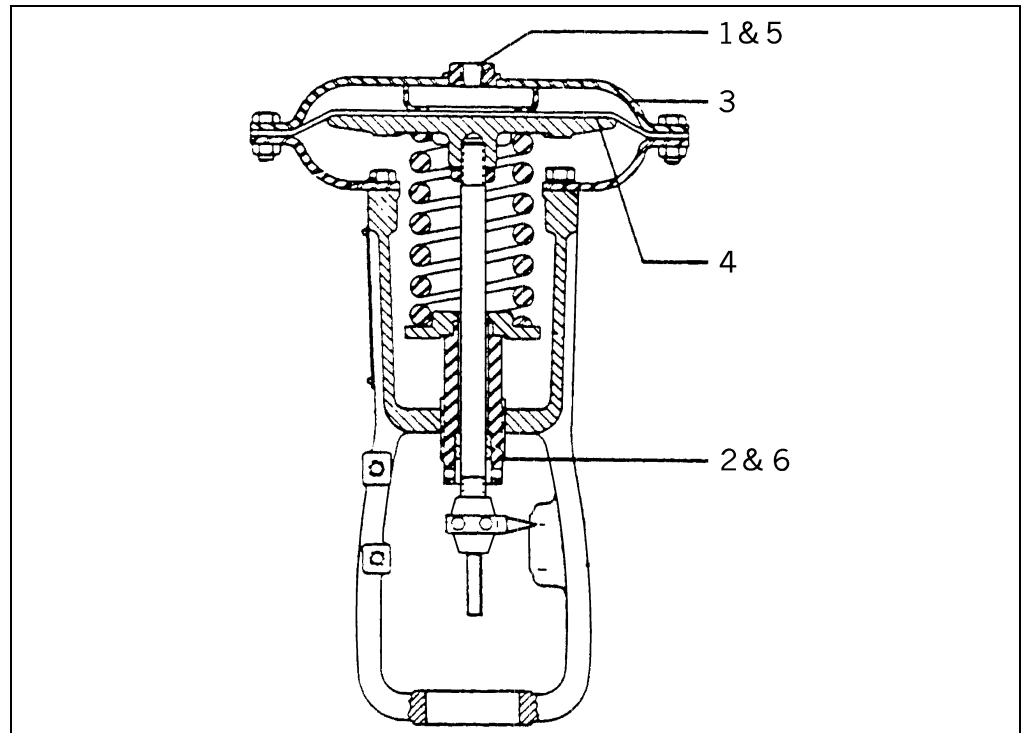


Figure 4 – Actuator Removal

Diaphragm Replacement *Air-to-Close (Direct Acting) Actuator*
 See Figure 5.

1. Disconnect air supply from actuator.
2. Loosen spring adjuster.
3. Remove upper diaphragm case.
4. Remove and replace diaphragm.
5. Replace upper diaphragm case and reconnect air supply to actuator.
6. Re-adjust spring compression. See *Spring Adjustment* section.



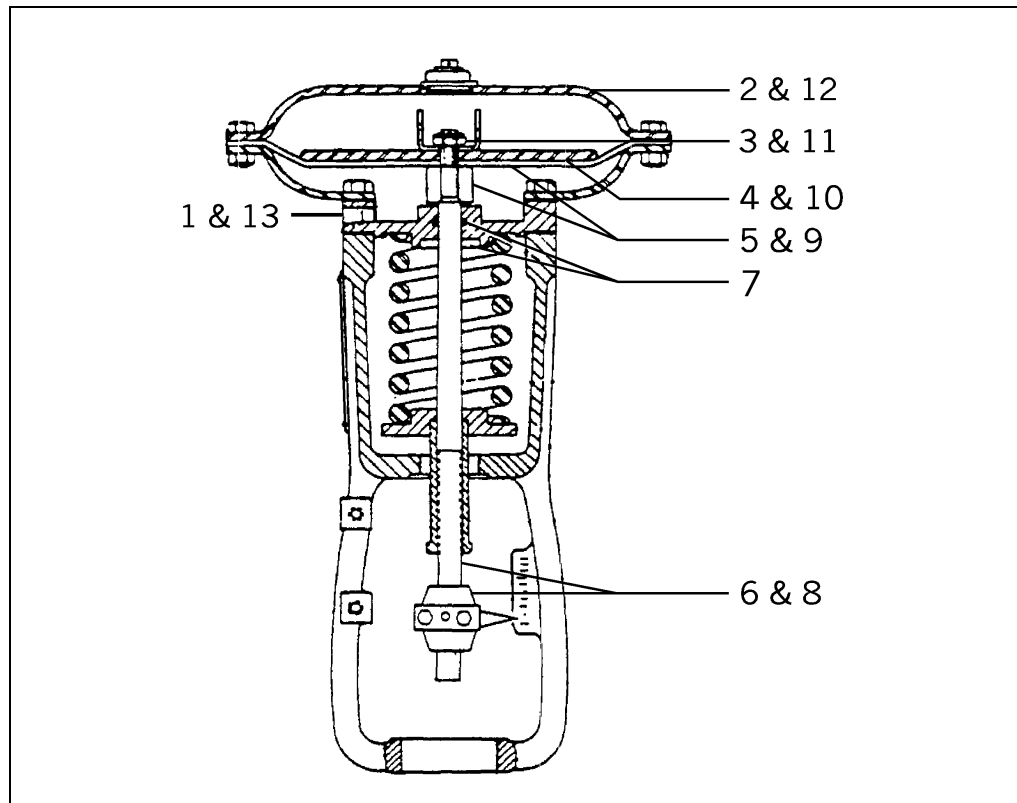
**Figure 5 – Diaphragm Replacement,
 Air-to-Close (Direct Acting) Actuator**

Diaphragm Replacement (Continued)

Air-to-Open (Reverse Acting) Actuator (Sizes 9 & 11)

See Figure 6

1. Disconnect air supply from actuator.
2. Remove upper diaphragm case.
3. Unscrew locknut while holding diaphragm plate to prevent turning.
4. Remove diaphragm plate.
5. Remove old diaphragm and washer.
6. Remove stem clamp and slide stem out of adapter.
7. Remove and replace O-ring and stem seal in adapter.
8. Carefully slide stem through adapter.
9. Replace washer and new diaphragm.
10. Replace diaphragm plate.
11. Screw locknut while holding diaphragm plate to prevent turning.
12. Replace upper diaphragm case.
13. Reconnect air supply to actuator.
14. Re-adjust spring compression. See *Spring Adjustment* section.



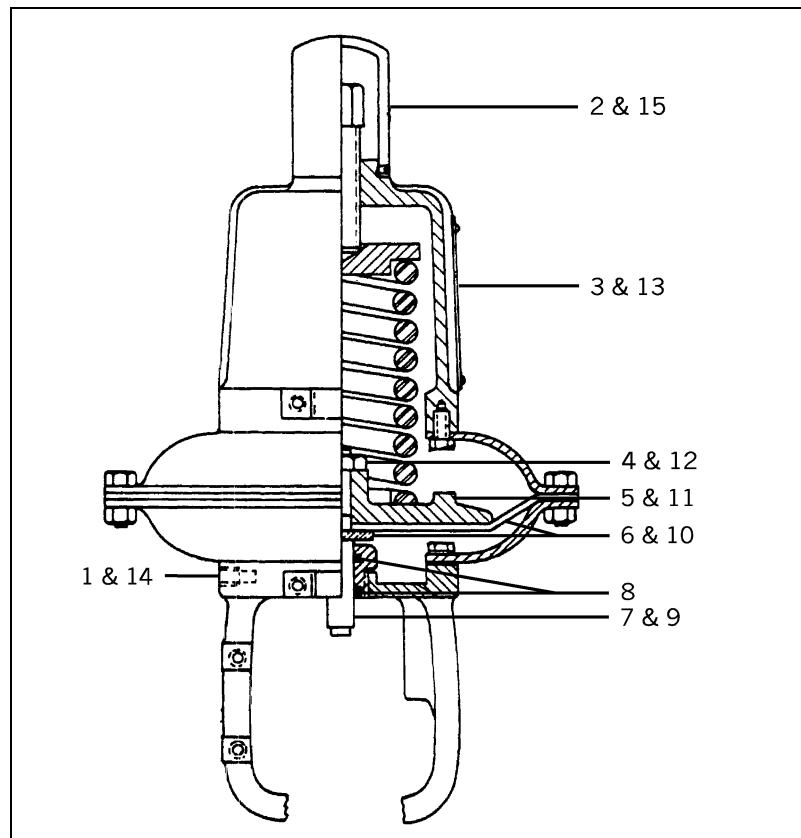
**Figure 6 – Diaphragm Replacement,
Air-to-Open (Reverse Acting) Actuator (Sizes 9 & 11)**

Diaphragm Replacement
(Continued)

Air-to-Open (Reverse Acting) Actuator (Sizes 13, 15, 18S & 18L)

See Figure 7 (includes O-Ring replacement)

1. Disconnect air supply from actuator.
2. Remove spring adjuster cover and loosen spring adjuster.
3. Remove upper diaphragm case and spring.
4. Unscrew locknut while holding diaphragm plate to prevent turning.
5. Remove diaphragm plate.
6. Remove old diaphragm and washer.
7. Remove stem clamp and slide stem out of stem seal housing.
8. Remove and replace O-ring and stem seal in stem seal housing.
9. Carefully slide stem through stem seal housing.
10. Replace washer and diaphragm.
11. Replace diaphragm plate.
12. Screw locknut while holding diaphragm plate to prevent turning.
13. Replace spring and upper diaphragm case.
14. Reconnect air supply to actuator.
15. Re-adjust spring compression. See *Spring Adjustment* section.



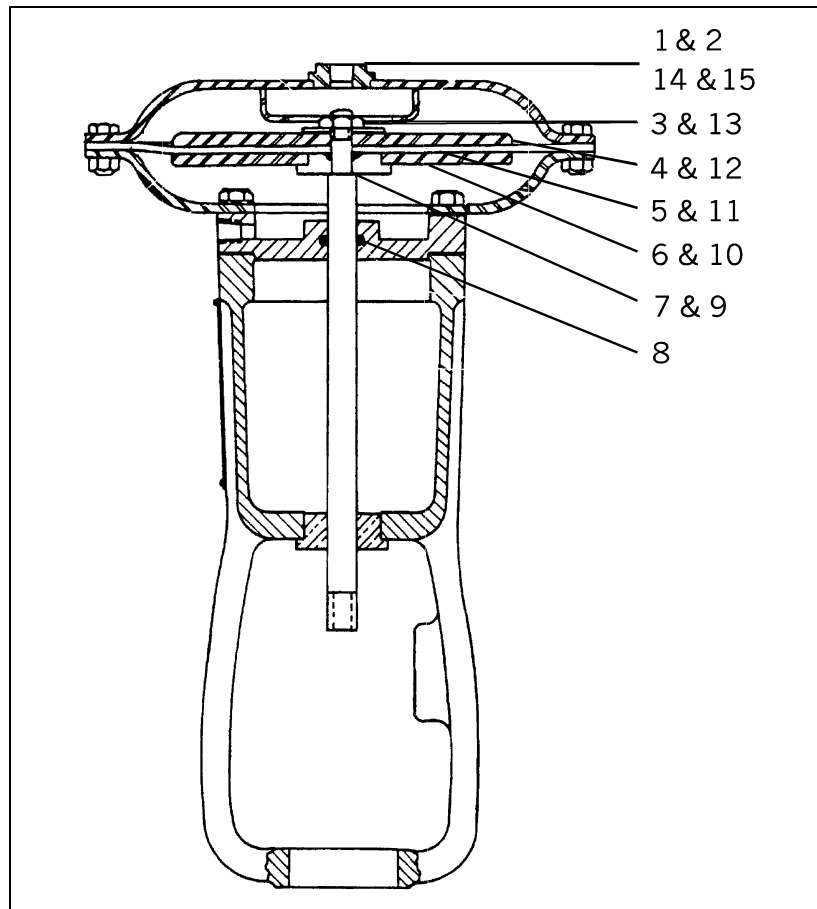
**Figure 7 – Diaphragm Replacement,
Air-to-Open (Reverse Acting) Actuator (Sizes 13, 15,
18S & 18L)**

Diaphragm Replacement (Continued)

Springless Type Actuator

See Figure 8 (includes O-Ring replacement)

1. Disconnect air supply from actuator.
2. Remove upper diaphragm case.
3. Unscrew locknut while holding diaphragm plate to prevent turning.
4. Remove upper diaphragm plate.
5. Remove old diaphragm.
6. Remove lower diaphragm plate.
7. Remove stem washer and pull stem up through O-Ring.
8. Remove and replace O-Ring in adapter.
9. Carefully push stem down through new O-Ring and replace stem washer.
10. Replace lower diaphragm plate.
11. Replace new diaphragm.
12. Replace upper diaphragm plate.
13. Screw locknut while holding diaphragm plate to prevent turning.
14. Replace upper diaphragm.
15. Reconnect air supply to actuator.



**Figure 8 – Diaphragm Replacement,
Springless Type Actuator**

Stem Adjustment

Air-to-Close (Direct Acting) Actuator and Valve

1. With no air pressure in actuator, seat valve plug. Raise stem and plug a distance equal to the travel specified on the nameplate.
2. Lock valve stem to actuator stem with stem clamp.

Note: If necessary, loosen travel indicator scale screws and align scale to travel indicator set at "0". See Figure 9.

Air-to-Open (Reverse Acting) Actuator and (Reverse Acting) Valve

1. Apply sufficient air pressure to actuator to lower actuator stem 1/16 inch.
2. Pull up valve stem and seat the plug. Lock valve stem to actuator stem with stem clamp.

Air-to-Open (Reverse Acting) Actuator and (Direct Acting) Valve

1. Apply sufficient air pressure to actuator to raise actuator stem 1/16 inch.
2. Lock valve stem to actuator stem with stem clamp.

Note: If necessary, loosen travel indicator scale screws and align scale to travel indicator set at "S". See Figure 9.

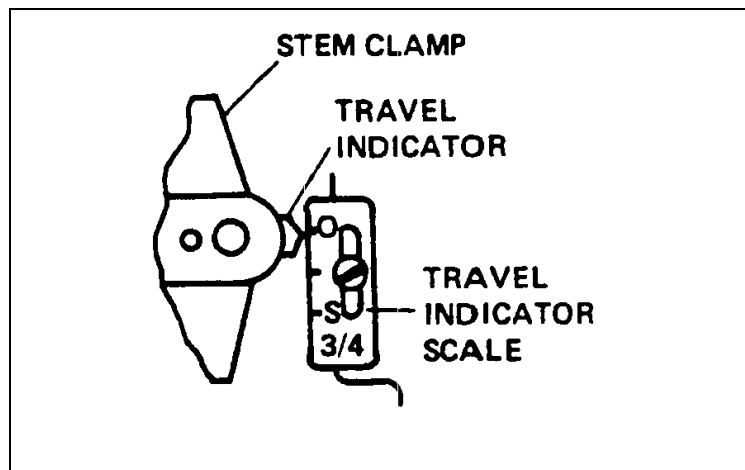


Figure 9 – Travel Indicator and Scale Alignment

Spring Adjustment

Factory adjustment provides for a complete actuator stroke for a pressure change from 21 to 103 kPa (3 to 15 psi) or 41 to 207 kPa (6 to 30 psi) with heavier spring. The operating spring can be shifted up or down if necessary. The starting point, with no external load, should not be adjusted more than 34 kPa (5 psi), for a 21 to 103 kPa (3 to 15 psi) spring, or 69 kPa (10 psi), for a 41 to 207 kPa (6 to 30 psi) spring. Adjustment of less than 1 psi is not recommended.

Air-to-Close (Direct Acting) Actuator

1. Using a 0-60 psig air regulator and gage, gradually apply final air pressure to the actuator, (16 psig for 3-15 psig spring, 30 psig for 6-30 psig spring range, etc.).
2. If actuator stem stops before reaching maximum psig, spring adjuster was not screwed up far enough.
3. Adjust air regulator back to zero psig and turn spring adjuster into yoke.
4. Reapply maximum psig to see if stem stops at this point. When stem stops at maximum psig (not before or after) this adjustment is complete.

Air-to-Open (Reverse Acting) Actuator

1. Using a 0-60 psig air regulator and gage, apply initial psig air pressure to actuator (3 psig is initial for 3-15 psig spring). Actuator will either move up or remain stationary.
2. If the actuator stem moves up, turn the spring adjuster into the housing until the stem starts to move down. Continue turning adjuster until stem stops.
3. If the actuator remains stationary, unscrew the spring adjuster until stem starts to move up.
4. Turn spring adjuster into housing, moving stem down, until stem stops moving.

Trouble-Shooting

If the actuator does not function properly, check the following points while the actuator is still in service.

1. Are air connections tight?
2. Are diaphragm case bolts tight?
3. Is actuator firmly fastened to yoke or base plate?

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Type 01 Pneumatic Actuator Used With Globe Valves

Guarantee

Products, auxiliaries and parts thereof, of Nor'East Controls' manufacture, are guaranteed for a period of one year from the date of shipment against defective workmanship and material only, when properly installed, operated and serviced in accordance with Nor'East Controls' recommendations. Replacement for items of Nor'East Controls' manufacture will be made free of charge if proved to be defective within such time. No claim for special or consequential damages, transportation, or labor shall be allowed. Purchaser shall be solely responsible for determining suitability for use and in no event shall Nor'East Controls be liable in this respect. Equipment or parts manufactured by others but furnished by Nor'East Controls will be repaired or replaced, only to the extent provided in the original manufacturer's warranty to Nor'East Controls. Nor'East Controls does not guarantee resistance to corrosion, erosion, abrasion or other sources of failure, nor does Nor'East Controls guarantee a minimum length of service. Failure of the purchaser to give prompt written notice of any alleged defect under this guarantee forthwith upon its discovery, or use and possession thereof after an attempt has been made and completed by someone other than Nor'East Controls or an authorized representative to remedy defects therein, or failure to return products or parts for replacement as herein provided, of failure to install, operate, and maintain said products or parts according to instructions provided by Nor'East Controls, of failure to pay the entire contract price when due, shall be a waiver of all rights under these representations.

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