



MODELS 55D, 75D, 115D and 55R, 75R & 115R

SPRING/DIAPHRAGM LINEAR PNEUMATIC ACTUATORS

I. DESCRIPTION AND SCOPE

SECTION I

Models 55D, 55R, 75D, 75R, 115D, and 115R are single acting, spring opposed, linear actuators used with Cashco sliding stem (linear), globe-style control valves. The "R" denotes "reverse" acting arrangement; the "D" denotes "direct" acting arrangement. The numeric characters denote

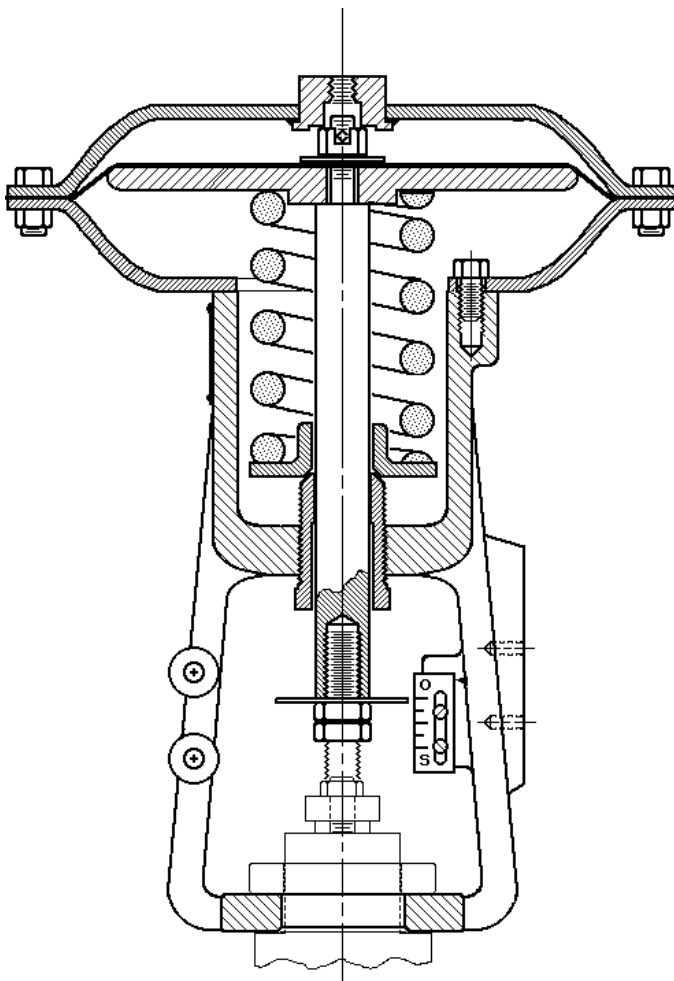
actuator size. The "D" and "R" indicates that this family of actuators DOES NOT allow action reversibility in the field.

"D" = Direct action; on increasing air loading pressure, the actuator stem extends. Fail-safe position is with the stem retracted.

"R" = Reverse action; on increasing air loading pressure, the actuator stem retracts. Fail-safe position is with the stem extended.

When coupled with a globe-style control valve with push down to close action, (other than Model 964), a "D" - direct acting actuator will provide valve "fail open" action; "D" = ATC-FO. When coupled with an "R" - reverse acting actuator, will provide valve "fail closed" action; "R" = ATO-FC.

Reference the technical bulletin of the valve body model the actuator is unitized with for operating/installation/selection specifications; i.e. available bench settings, strokes, etc.



ABBREVIATIONS

ATO-FC	Air-to-Open, Fail Closed
ATC-FO	Air-to-Close, Fail Open
CCW	Counter Clockwise
CW	Clockwise
D	Direct Acting
DIR	Direct Acting
IAS	Instrument Air Supply
IOM	Installation, Operation, and Maintenance Manual
LOAD	Positioner output air pressure
R	Reverse Acting
REV	Reverse Acting



TABLE 1
ACTUATOR MODEL NO. vs VALVE BODY MODEL (Continued from Page 2)

Full Actuator Model No.		Available Bench Settings		Air Supply Pressure		Unitized Products *
Basic Actuator Model No.	Modifier No.	psig	(Barg)	psig	(Barg)	
75R or 75D	-00	4-15	(.28-1.03)	20	(1.4)	1-1/2" (40) – 521; 1.500" (38.1) orifice
	-02	4-15	(.28-1.03)	20	(1.4)	2" (50) – 520; 1.500" (38.1) orifice 2" (50) – 520; 2.000" (50.8) orifice 2" (50) – 521; 1.500" (38.1) orifice 2" (50) – 521; 1.750" (44.4) orifice
75R	-10	5-15 10-30	(.34-1.03) (.69-2.07)	20	(1.4)	3/4", 1" & 1-1/2" – 988; (20, 25, 40) – 988 All orifice sizes
	-11	8-30 7-30	(.55-2.07) (.48-2.07)	35	(2.4)	
	-12	5-15	(.34-1.03)	20	(1.4)	2" (50) – 988 All orifice sizes
	-13	10-30 8-30	(.69-2.07) (.55-2.07)	35	(2.4)	
		7-30	(.48-2.07)			
	-30	5-15	(.34-1.03)	20	(1.4)	1-1/2" (40) – 988-MB; 1.250" (31.8) orifice
	-31	5-15	(.34-1.03)	20	(1.4)	2" (50) – 988-MB; All orifice sizes
-32	10-30	(.69-2.07)	35	(2.4)	2" (50) – 988-MB; 1.688" (42.9) orifice	
75D	-10	3-13	(.21-.90)	20	(1.4)	1-1/2" (40) – 988 All orifice sizes
	-11	6-26 6-28	(.41-1.79) (.41-1.93)	35	(2.4)	
		6-29	(.41-2.00)			
	-13	3-13	(.21-.90)	35	(2.4)	2" (50) – 988 All orifice sizes
		6-26 6-28 6-29	(.41-1.79) (.41-1.93) (.41-2.00)			
	-30	3-13	(.21-.90)	20	(1.4)	1-1/2" (40) – 988-MB; 1.250" (31.8) orifice
	-31	3-13	(.21-.90)	20	(1.4)	2" (50) – 988-MB; All orifice sizes
-32	6-26	(.41-1.79)	35	(2.4)	2" (50) – 988-MB; 1.688" (42.9) orifice	
115R or 115D	-00	4-15	(.28-1.03)	20	(1.4)	2" (50) – 520; 1.500" (38.1) orifice 2" (50) – 520; 2.00" (50.8) orifice 2" (50) – 521; 1.500" (38.1) orifice 2" (50) – 521; 1.750" (44.4) orifice
115R	-10	5-15 10-30	(.34-1.03) (.69-2.07)	20	(1.4)	2" (50) – 988; All orifice sizes
	-11	9-30 8-30	(.62-2.07) (.55-2.07)	35	(2.4)	
		-30	5-15			(.34-1.03)
115D	-10	3-13	(.21-.90)	20	(1.4)	2" (50) – 988; All orifice sizes
	-11	6-26 6-27	(.41-1.79) (.41-1.86)	35	(2.4)	
		6-28	(.41-1.93)			
-30	3-13	(.21-.90)	20	(1.4)	2" (50) – 988-MB; 1.688" (42.9) orifice	

* Metric body size and orifice size in parenthesis

SECTION III

III. INSTALLATION

A. Orientation:

Body Model.

1. Recommended actuator major axis orientation with any model of Cashco control valve body is upwards in a horizontal pipe.
2. If the installation is in a vertical pipe with the actuator major axis oriented horizontally, the model of control valve body and actuator size may be important.

See Table 1 for complete listings of actuator Model No. vs

- a. Model 988. Metal-bodied valves require no special orientation considerations; i.e. Model 988 may be installed with the actuator major axis horizontal with no problems expected.
- b. Models 520/521. TFE-bodied valves (even though metal-jacketed) may be installed with the actuator major axis horizontal only when Model 55D, 55R, 75D or 75R actuators are the unitized sizes.

If the Model 115D or 115R actuators are installed with the major axis horizontal, an external field support is recommended. This support should be fabricated as indicated in Figure 1, and allows the cantilevered actuator's weight to be supported with a hanger similar to those supporting the piping; i.e. if spring hangers support the piping, then spring hangers should support the actuator.

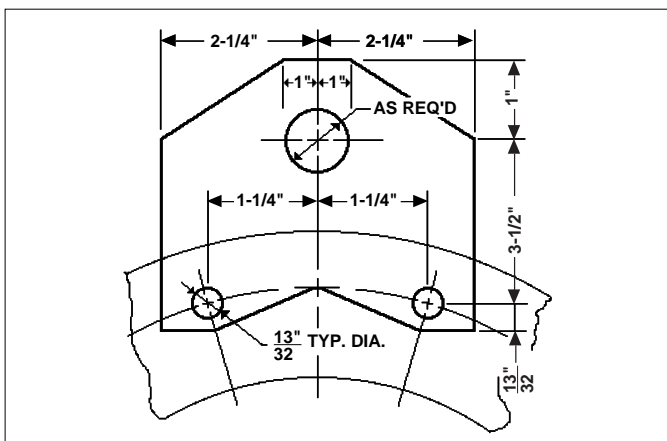


Figure 1 – 115 Hanger Bracket

If required, relocate the two longer cap screws (24) used to bolt the diaphragm casings (2) (3) together as necessary.

- c. Outdoors, all installations must be oriented any angle from horizontal-to-vertical. (Orient vent cap to not collect rainwater that might freeze.)
- d. Models 55, 75, and 115 are not recommended for installation oriented downwards in either "D" or "R" action.
- e. In no case is additional weight to be applied to the actuator when installed in an orientation other than vertical; i.e. the valve is unsafe as a "step" to support personnel.

B. Air Supply:

1. Recommendation is that a desiccant dried, instrument quality air supply be used. Such a supply is recommended for outdoors installations, and is required in areas of freezing weather conditions.
2. If air supply contains moisture and/or lubricating oil, the air should be filtered with a coalescing type of filter prior to use in stroking the actuator.
3. Failure to remove moisture will cause internal corrosion to the actuator casings (2)(3).
4. Connections for the air supply are 1/4" female NPT. A suitable pipe thread sealant is recommended to be used when installing the pipe or tube fitting. Exhibit care to prevent the sealant from getting inside the tube/pipe.

SECTION IV

IV. MAINTENANCE

A. General:

1. Hereafter, all maintenance, disassembly, etc. is assumed to be done in an indoor shop.
2. Most actuators are a sub-assembly that is unitized with a body sub-assembly. Reference should be made to the IOM for the correct body utilized.
3. Where the body is not being disassembled, special care **MUST** be exhibited to prevent valve stem rotation during any disassembly or re-assembly for all types of valves. Following this procedure will assure not damaging seating surfaces.
4. Remove all instrument tubing.
5. All indicated Item Numbers that are with respect to IOM-520, IOM-521, IOM-988, IOM-988-MB or IOM-685 will be in parenthesis and underscored; i.e. (20); the same is true for positioner parts. All Item

Numbers that are with respect to this IOM 55/75/115 are not underscored; i.e. (19).

B. Diaphragm Removal/ Replacement:

1. Remove all air pressure from the casings (2)(3) prior to any disassembly.
2. Securely fasten the actuator/body unit into a vise or similar securing means. Orient with the casings (2)(3) upwards.
3. Using a pencil or similar device, scribe a mark on the position indicator plate (21) at the top edge of the position indicator disc (20). Location should be at full "O" for "open", or full "S" for "shut".
4. Figure 2 indicates the different types of actuator stem (19)- to -valve stem connection used on Model 520/521 TFE control valves (swivel-type), and all other types (non-swivel types).

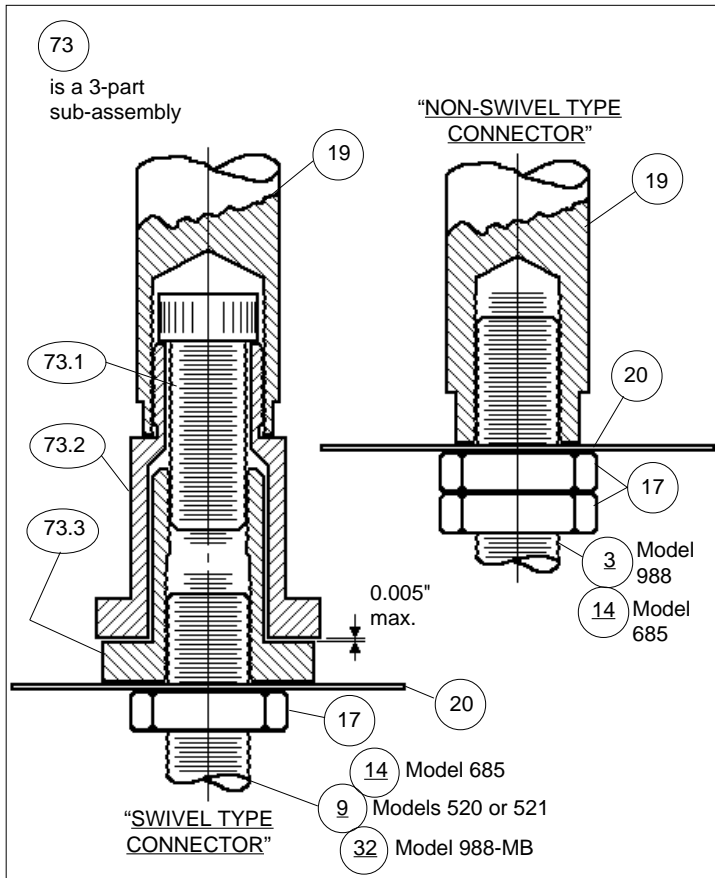


Figure 2 – Stem Connectors

5. The following steps apply to “direct-acting ATC-FO” arrangements; i.e. 55D, 75D or 115D.

WARNING

a. **SPRING UNDER COMPRESSION.** Prior to removing flange bolting (10, 24 & 11) relieve range spring (6) compression by rotating the spring adjustor (4) CCW (viewed from body end) until all spring compression is relieved. Failure to do so may result in flying parts that could cause personal injury.

Keep count of the number of revolutions loosened. Record revs here:

No. of revs to loosen spring adjustor (4) _____

- b. Remove all upper and lower casing (2)(3) flange cap screws (10)(24) and nuts (11).
- c. Remove the upper casing (2) from the diaphragm (7), as the two may be “stuck” together.

- d. Remove the diaphragm (7) from the lower casing (3), as they too may be “stuck” together.
- e. Remove rolled spring pin (90), Models 55D and 115D only.
- f. Holding, by wrench, the actuator stem (19) at the “flats” (top or bottom), remove slotted nut (9) and washer (8).
- g. Remove diaphragm (7) and examine for area and reason of failure. Discard diaphragm (7).
- h. Examine the internal surface of the upper housing (2). Remove any oil, rust, scale, et cetera. Clean flanges of upper and lower casing (2)(3). Remove and clean the diaphragm plate (5).
- i. Replace the diaphragm plate (5), assuring that the range spring (6) is aligned and setting on the “hub” properly. (Assure that the “hub” is installed on the underneath side. **DO NOT REVERSE!**)
- j. Apply a silicone rubber adhesive/sealant similar to Dow-Corning “Silastic” #732RTV at the juncture of the diaphragm plate (5) and the actuator stem (19).
- k. Place the new diaphragm (7) into position. Place several cap screws (10) thru the diaphragm (7) holes and the lower casing (3) to hold alignment. Apply sealant of Step j. above, at the juncture of the diaphragm (7) and the actuator stem (19). Refer to proper item-cutaway-arrangement drawing for proper diaphragm (7) orientation.
- l. Place washer (8) into position, and apply sealant also to juncture of washer (8) and stem (19).
- m. Securing the stem (19) by wrench, install slotted nut (9) and tighten to 35 ft-lbs of torque, and then on to allow placement of roll pin (90).
- n. As in Step a. preceding, continue to turn the spring adjustor (4) CCW until the diaphragm (7) is level between the lower casing (3) flange and the diaphragm plate (5). Count the number of additional revolutions loosened and record here:

Added No. of revs to loosen spring adjustor (4) _____

- o. Position the upper casing (2) into place, aligning bolt holes as necessary. (For Model 115D used with 520/521 TFE control valves, a hanger bracket may be required to be positioned and secured at this step.) Install and hand-tighten all cap screws (10)(24) and nuts (11). Wrench-tighten to 20-25 ft-lbs torque in an alternating 180° cross pattern.

- p. Securing actuator stem (19) by wrench, tighten spring adjustor (4) by rotating CW to the sum total of revolutions as recorded for steps a. and n. The position indicator disc (20) should be at "O" corresponding to full open. Check location referenced in Step IV.B.3. previous. If alignment is not where it should be, disassemble and determine the problem. If alignment is within 1/16" (1.5 mm), adjust the travel indicator plate (21).

6. The following steps apply to "reverse-acting, ATO-FC" arrangements; i.e. 55R, 75R or 115R.

WARNING

a. **SPRING UNDER COMPRESSION.** Prior to removing flange bolting (10, 24 & 11) relieve range spring (6) compression by rotating the spring adjustor (4) CCW (viewed from body end) until all spring compression is relieved. Failure to do so may result in flying parts that could cause personal injury.

Keep count of the number of revolutions loosened. Record revs here:

No. of revs to loosen spring adjustor (4) _____.
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- b. Remove all upper and lower casing (2) (3) flange cap screws (10)(24) and nuts (11).
- c. Remove upper casing (2). (Note: If equipped with handwheel assembly, rotate handwheel fully down, push sideways on upper casing (2) until handwheel stem (78) slides out of handwheel coupling (92). Lifting the valve stem (3) by hand may help uncouple the mechanism.)
- d. Remove rolled spring pin (90), Models 55R and 115R only.
- e. Holding by wrench the actuator stem (19) at the "flats" or "hex" (top or bottom), remove slotted nut (9) or handwheel coupling (92). (Note: nut (9) for Model 75R is not slotted.)
- f. Remove washer (94) (Model 75R only), diaphragm plate (5), diaphragm (7), and washer (8). (These parts may be "stuck" to the actuator stem (19); pull up if necessary).
- g. Examine diaphragm (7) as to area/reason for failure. Discard diaphragm (7).
- h. Examine the internal surface of the lower casing (3). Remove any oil, rust, scale, et cetera. Clean flanges of upper and lower casing (2) (3). Clean the diaphragm plate (5).
- i. Remove brass stem guide (84) with TFE tape

guide bushing (25) and U-cup seal (85). Discard bushing (25) and U-cup seal (85). Clean U-cup seal (85) and bushing (25) recess slots of brass stem guide (84). (See Section IV.D.)

- j. Apply a "thin" film of adhesive/sealant (same as IV.5.j.) to the outer edge of a new U-cup seal (85) only. (See Figure 3.) Insert the U-cup seal (85) into the recess of the brass guide (84). Insert new bushing (25) into guide (84).

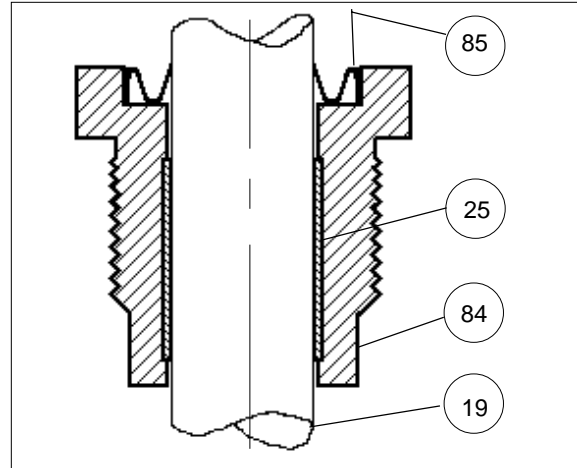


Figure 3 – U-Cup Seal

- k. **Note:** Remove and replace O-ring (87) only if leaking or if disturbed by loosening cap screws (23). If O-ring (87) is replaced, follow procedure of Section IV.D.
- l. Replace washer (8) over actuator stem (19).
- m. Apply a silicone rubber adhesive/sealant (same as IV.5.j.) to the juncture of the washer (8) and the actuator stem (19).
- n. Place the new diaphragm (7) into position. Place several cap screws (10) thru the diaphragm (7) holes and the lower casing (3) to hold alignment. Apply sealant at the juncture of the diaphragm (7) and the actuator stem (19).
- o. Replace diaphragm plate (5), assuring that the "hub" is upwards.
- p. Securing the stem (19) by wrench, install slotted nut (9) and tighten to approximately 35 ft-lbs of torque, and aligning to allow placement of roll pin (90).
- q. Using vice-grips, grasp slotted nut (9) and lift the actuator stem (19) until the bottom edge of the diaphragm plate (5) is level with the lower casing's (3) flange; this is the "neutral" position. Using any type of "spacer" (wood, bolt, etc.), block up the stem (19) in the area of the position indicator disk (20), hold the diaphragm plate (5) at the "neutral" position.

- r. Position the upper casing (2) into place, aligning bolt holes as necessary. (For Model 115R used with 520/521 TFE control valves, a hanger bracket may be required to be positioned and secured at this step.) Install and hand tighten all cap screws (10)(24) and nuts (11). Wrench tighten to 20-25 ft-lbs torque in an alternating 180° cross pattern.
 - s. Securing actuator stem (19) by wrench, tighten spring adjustor (4) by rotating CW to the sum total of revolutions as recorded for step a). The position indicator disc (20) should be at "S" corresponding to full shut. Check location referenced in Step IV.B.3. previous. If alignment is not where it should be, disassemble and determine the problem. If alignment is within 1/16" (1.5 mm), adjust the travel indicator plate (21).
7. Reinstall all removed instrument tubing.
 8. Calibrate control valve/actuator unit as indicated in body subassembly IOM.

C. Removal of Actuator Stem, Stem Guide and Guide Bushing (Reverse Action Units Only):

1. The following procedure assumes the actuator assembly (AA) is removed from the body assembly (BA).
2. Remove diaphragm (7) per Section IV.A. and IV.B., including washer (8).
3. Withdraw stem (19) thru yoke (1) lower opening.
4. Remove stem guide (84) and nested guide bushing (25). Discard used guide bushing (25).
5. Examine stem (19) for wear at location where U-cup seal (85) rides. If necessary, restore the stem (19) surface in this area to 20RA finish using a centerless grinder. If badly scored, replace stem (19); attempt to determine the cause of undue wear and correct upon re-installation.
6. Follow procedure from IV.B.6.h to conclusion for re-installation of stem guide (84), guide bushing (25), diaphragm (7) and upper casing (2).

D. Removal of Lower Case and Yoke O-ring (Reverse action units only):

1. Remove diaphragm (7) per Sections IV.A and IV.B.
2. Loosen (do not remove) all yoke bolting (23).
3. Using a flat screwdriver or similar tool, pry the lower case (3) apart from the yoke (1) all around the joint's circumference.
4. Remove all yoke bolting (23).

5. Lift lower casing (3) over the stem (19) to removal. Remove O-ring (87) and discard.
6. Clean O-ring (87) groove on yoke (1). Lubricate new O-ring (87) with lithium grease and set in groove on yoke (1).
7. Reposition the lower case (3) back into proper orientation on the yoke (1).
8. Align bolt holes of yoke (1) and lower casing (3). Insert bolts (23) and hand-tighten; wrench-tighten in an alternation 180° cross-pattern.

E. Removal of Manual Handwheel O-rings (Direct Action units only):

1. Remove upper case (2) per Sections IV.A and IV.B. Remove the remaining assembly from the vise.
2. Place the "flats" of the handwheel bonnet (77) into a vise with the handwheel (78.2) oriented downwards. Using a sharp tool, scribe a matchmark between the handwheel bonnet (77) and the upper case (2) that can be seen/reached while in the vise.
- 3a. Model 55D Only – Place a wrench or spanner bar onto handwheel bonnet nut (76), and rotate CCW (when viewed from nut-end) to loosen; remove nut (76). Lift upper case (2) to removal.
- 3b. Model 75D Only – Remove cap screw (95).
- 3c. Model 115D – No O-ring in design; disregard.
4. If installed, remove O-ring (51) and discard. Clean O-ring groove in handwheel bonnet (77).
5. Loosen locknut (79), grasp handwheel (78.2) and rotate CW (viewed from handwheel-end) until the handwheel (78.2) is touching the handwheel bonnet (77).
6. Handwheel stem O-ring (81) should be exposed. Remove O-ring (81) and discard.
7. Rotate handwheel stem (78.1) inwards and outwards several times while filling the void between the handwheel bonnet (77) and the handwheel stem (78.1) with a cleaning/lubricating oil similar to "Bostik Penetrating Oil", or equal, to clean Acme threads. Loosen handwheel sub-assembly from the vise, turn upside down to drain off penetrating oil. Blow dry with clean compressed air. Replace the handwheel sub-assembly back into the vise as originally oriented.
8. Place a small amount of lithium grease in the void between the handwheel bonnet (77) and the handwheel stem (78.1), and also grease a new stem O-ring (81). Install O-ring (81) into its groove on the stem (78.1). Again, rotate the handwheel

stem (78.1) inwards and outwards to lubricate the inside surface of the handwheel bonnet (77).

- 9a. For Models 55D and 75D with Handwheel only – Lubricate new O-ring, (51) for Model 55D, (87) for Model 75D, with lithium grease and place into groove on handwheel bonnet (77).
- 9b. For Model 115D – No O-ring in design; disregard.
- 10a. For Model 55D only – Clean portion of upper case (2) where O-ring (51) seals. Reposition upper case (2) to match marks of Step 2. preceding. Position the bonnet handwheel nut (76) with the groove away from the upper case (2) surface, and manually rotate the bonnet handwheel nut (76) CW until hand tight. Wrench-tighten the nut (76) assuring that the handwheel bonnet (77) is fully

drawn down to the upper casing (2), and that the matchmarks remain aligned. Hammer rap the wrench or spanner used to tighten nut (76). Remove assembly from vise.

- 10b. For Model 75D only – Clean portion of upper case (2) where O-ring (87) seals. Reposition upper case (2) to matchmarks of Step 2. preceding. Install cap screws (95) assuring that the handwheel bonnet (77) is fully drawn down to the upper casing (2). Remove assembly from vise.
- 10c. For Model 115D only – Nothing required; disregard.
- 11. Replace the lower actuator assembly (of Step 1. above) into the vise. Reinstall the assembly of Step 10. above, i.e. rejoin upper case (2) to lower case (3) as per Section IV.B.5.

SECTION VII

V. Trouble Shooting Guide:

- 1. Air Leakage; reverse action units. Diaphragm removal/replacement per Section IV. MAINTENANCE in its entirety.

Symptom	Cause-Remedy
A. Leakage at vent cap (88) continuous while not stroking.	A1. Diaphragm failure; replace diaphragm. A2. Sealant failure at stem; remove diaphragm and reseal.
B. Leakage at diaphragm-to-lower casing flange.	B1. Overpressure. Check source of air supply and determine if pressure is greater than indicated in Table 1; reset airset pressure as required. B2. Tighten flange bolting. B3. Faulty seat at stem-diaphragm-washer joint. Remove upper case and diaphragm. Install new sealant at washer.
C. Leakage at lower case-to-yoke.	C1. O-ring failure. Remove diaphragm and lower case and replace O-ring (87).
D. Leakage coming from spring enclosure zone of yoke.	D1. Failure of u-cup seal (85); remove diaphragm. Follow paragraph IV.E for procedures. D2. Failure of O-ring (87). Remove diaphragm, bolts (23) and O-ring (87). Reinstall O-ring using lithium grease.

NOTE: *Cashco, Inc. recommends that if the casings are unbolted, the diaphragm, u-cup seal, and TFE tape guide bushing should always be replaced.*

2. Air Leakage; direct action units. Diaphragm removal/replacement per Section IV. MAINTENANCE in its entirety.

Symptom	Cause-Remedy
A. Leakage at diaphragm-to-upper casing flange joint.	A1. Overpressure. Check source of air supply and determine if pressure is greater than indicated in Table 1; reset airset pressure as required. A2. Tighten flange bolting. A3. Faulty seal at stem-diaphragm-washer joint. Remove upper case and washer. Install new sealant at washer.
B. Leakage from spring enclosure zone of yoke.	B1. Failure of diaphragm (7); remove and replace diaphragm.
C. Leakage at manual handwheel threads.	C1. Faulty O-ring (81); replace O-ring.
D. Leakage at manual handwheel bonnet-to-upper case joint.	D1. Faulty O-ring (51); replace O-ring.

3. Unstable stroking.

Symptom	Cause-Remedy
A. Intermittent screeching noise, jumpy motion; positioner/controller loading stable	A1. Excessive valve packing friction. Maintain valve packing per valve instructions. A2. Misalignment of valve stem-to-actuator stem; realign per valve instructions. A3. Excessive valve guide wear. Maintain valve per valve instructions. A4. Flow induced instability thru valve. Stabilize process. A5. Install high range spring in actuator; i.e. increase bench setting level.
B. Positioner output unstable; positioner input signal stable.	B1. Refer to the positioner IOM B2. Reduce positioner gain. B3. Re-calibrate positioner.
C. Controller output signal unstable.	C1. Stabilize controller by increasing proportional band, adding reset, adding rate, or combinations of all. C2. Unstable process. Snub process if able. Stabilize process.

4. Actuator can not deliver full stroke.

Symptom	Cause-Remedy
A. Valve can not fully close for "Direct Action-ATC-FO" arrangement; or valve can not fully open for "Reverse Action-ATO-FC" arrangement.	A1. Insufficient air supply pressure. Check Table 1 herein for proper air supply pressure. A2. Manual handwheel out of "neutral" position. A3. If equipped with a pneumatic positioner, positioner may be in "bypass" mode. A4. Excessive pressure drop. Check technical bulletin of control valve for maximum allowable ΔP . A5. Bench range not properly calibrated. Check calibration or stem overall length and re-calibrate per valve instructions. A6. Restriction in air supply line limiting volume available A7. Restriction in valve. Gain access to the valve's internals for any debris.
B. Valve can not fully open for "Direct Action-ATC-FO" arrangement; or valve can not fully close for "Reverse Action-ATO-FC" arrangement.	B1. Insufficient air supply pressure. Check Table 1 herein for proper air supply pressure. B2. Manual handwheel out of "neutral" position. B3. If equipped with a pneumatic positioner, positioner may be in "bypass" mode. B4. Excessive pressure drop. Check technical bulletin of control valve for maximum allowable ΔP . B5. Bench range not properly calibrated. Check calibration or stem overall length and re-calibrate per valve instructions. B6. Restriction in air supply line limiting volume available B7. Restriction in valve. Gain access to the valve's internals for any debris.

SECTION VI

VI. PARTS ORDERING INFORMATION:

There are three methods to obtain parts ordering information/numbers. These methods are listed below, in order of ease of entering. The least expensive method is to utilize parts in kits where possible.

METHOD A – USE OF PRODUCT CODE.

Step 1. If available, obtain the 18 character product code number from the Bill of Materials sheet attached in the Valve Body IOM.

□□□□ – □□□□ 7 – □□□□□□□□□□□□□□

Step 2. Identify which kits or parts are desired from the Bill of Materials sheet or refer to the cross-sectional drawings. **NOTE:** Actuator Kit packaged with a selection of parts suitable for general overhaul of either the “Direct” or “Reverse” acting units with or without a handwheel.

Step 3. Contact your local Cashco, Inc., Sales Representative and specify the product code number and any part numbers not included in desired kits. Costs of required parts can be given by the Sales Representative.

METHOD B – NO PRODUCT CODE AVAILABLE – DISASSEMBLED VALVE.

- Step 1. Determine all available information from valve’s metal tag.
- a. Serial number.
 - b. Valve “Type” or “Model” number.
 - c. Size (may have to observe body tap).
 - d. Body material.
 - e. Fail position.

- f. Trim designation number (if available).
- g. Cv or port size
- h. Bench set.

Step 2. Determine construction of trim (metal or composition (soft) seat).

Step 3. With the information from Steps 1 and 2 above, contact your local Cashco, Inc., Sales Representative.

Step 4. Sales Representative will contact the factory to determine the original internal construction. Factory will relay information to the Sales Representative.

Step 5. Await the Sales Representative’s return contact with the proper part numbers and cost.

METHOD C – NO PRODUCT CODE AVAILABLE – ASSEMBLED VALVE IN SERVICE.

Step 1. Determine all available information from valve tag using Step 1, Method B.

Step 2. Contact your local Cashco, Inc., Sales Rep with the above information.

Step 3. Sales Representative will contact the factory to determine the original internal construction. Factory will relay information to the Sales Representative.

Step 4. Await the Sales Representative’s return contact with the proper part numbers and cost.

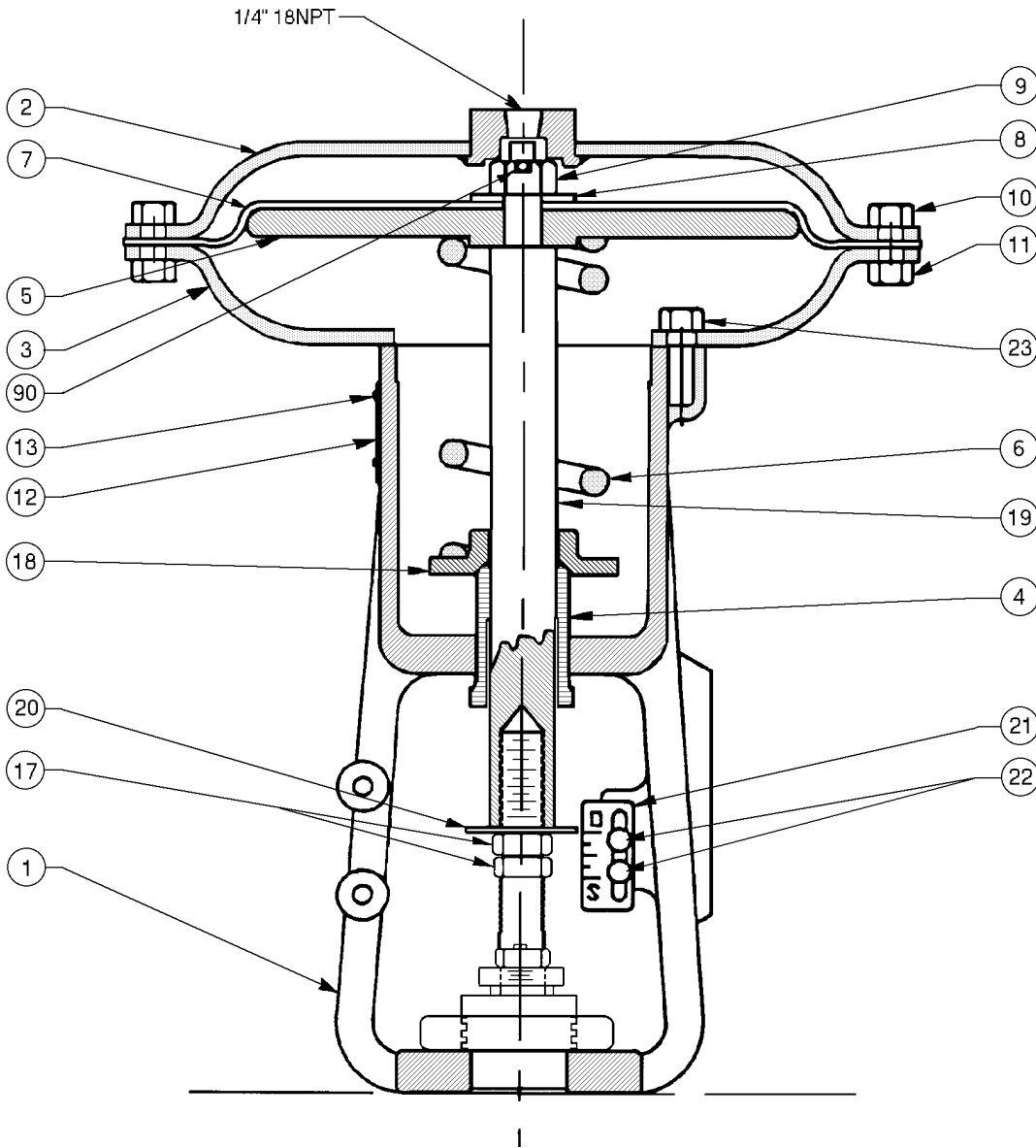
MODELS 55D, 75D, and 115D and 55R, 75R and 115R ACTUATORS
PARTS KIT NUMBERS *
(Kit Nos. Shaded)

The shaded parts kit numbers below represent an abbreviated identification number for a basic actuator (no options).

Model Number	Kit Abbreviation	Kit Number
55D and 55R	A	AU3-300K-0A
75D and 75R	A	AU3-400K-0A
115D and 115R	A	AU3-500K-0A

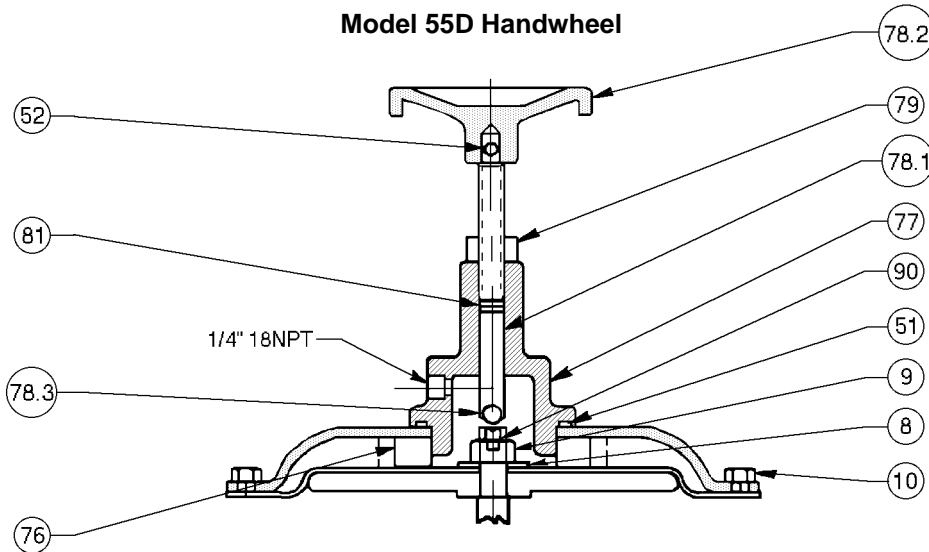
* For the proper selection of kit numbers to overhaul the main valve body and trim, refer to the individual VALVE BODY IOM'S (i.e. 520/521, 988, etc.)

Model 55D Actuator

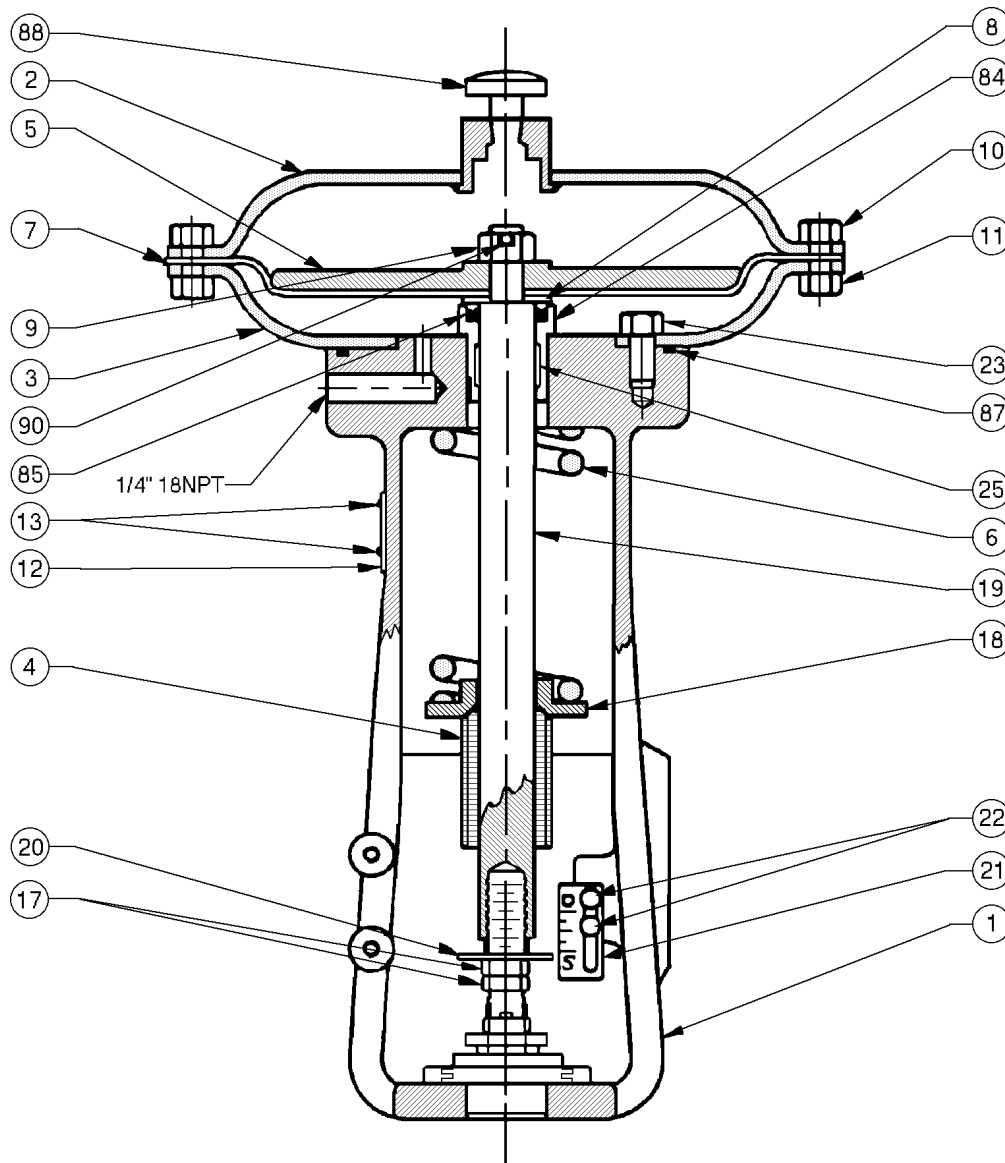


ITEM NO.	DESCRIPTION
1	Yoke
2	Upper Case
3	Lower Case
4	Spring Adjustor
5	Diaphragm Plate
6	Range Spring
7	Diaphragm
8	Diaphragm Washer
9	Diaphragm Washer Nut
10	Cap Screw (Case Bolt)
11	Case Bolt Nut
12	Name Plate
13	Name Plate Screw
17	Stem Jam Nut
18	Spring Seat
19	Actuator Stem or Actuator Stem Assy.
20	Position Indicator Disc
21	Indicator Plate
22	Indicator Plate Screw
23	Yoke Bolt
24	Hex. Head Cap Screw
25	Guide Bushing
39	Bonnet Nut
40	Handwheel Stop
50	Yoke Bolt Nut
51	Packing or O-Ring
52	Pin
59	Pin (Roll)
73	Stem Adaptor Assembly
75	Stop Screw
76	Handwheel Bonnet Nut
77	Handwheel Bonnet
78	Handwheel Adjusting Screw Assembly
78.1	Handwheel Adjusting Screw
78.2	Handwheel
78.3	Ball
79	Hex. Nut ACME
80	Cotter Pin (Reverse Hand-wheel)
81	O-Ring
82	Handwheel Nut
83	Thrust Washer
84	Stem Guide
85	U-Cup Seal
87	O-Ring
88	Bug Proof Vent
90	Rolled Spring Pin
91	Thrust Bearing
92	Handwheel Coupling
94	Washer
95	Hex. Head Cap Screw

Model 55D Handwheel

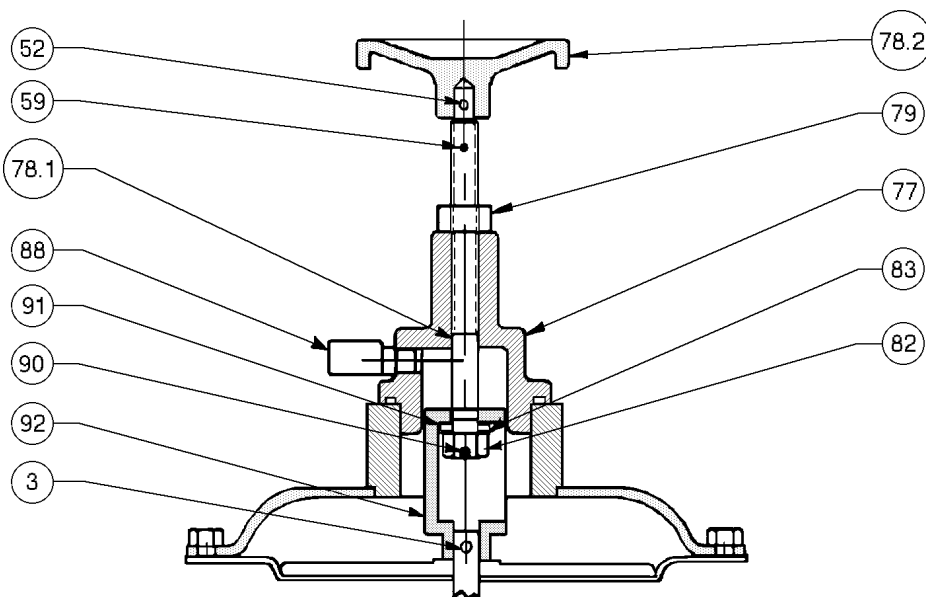


Model 55R Actuator

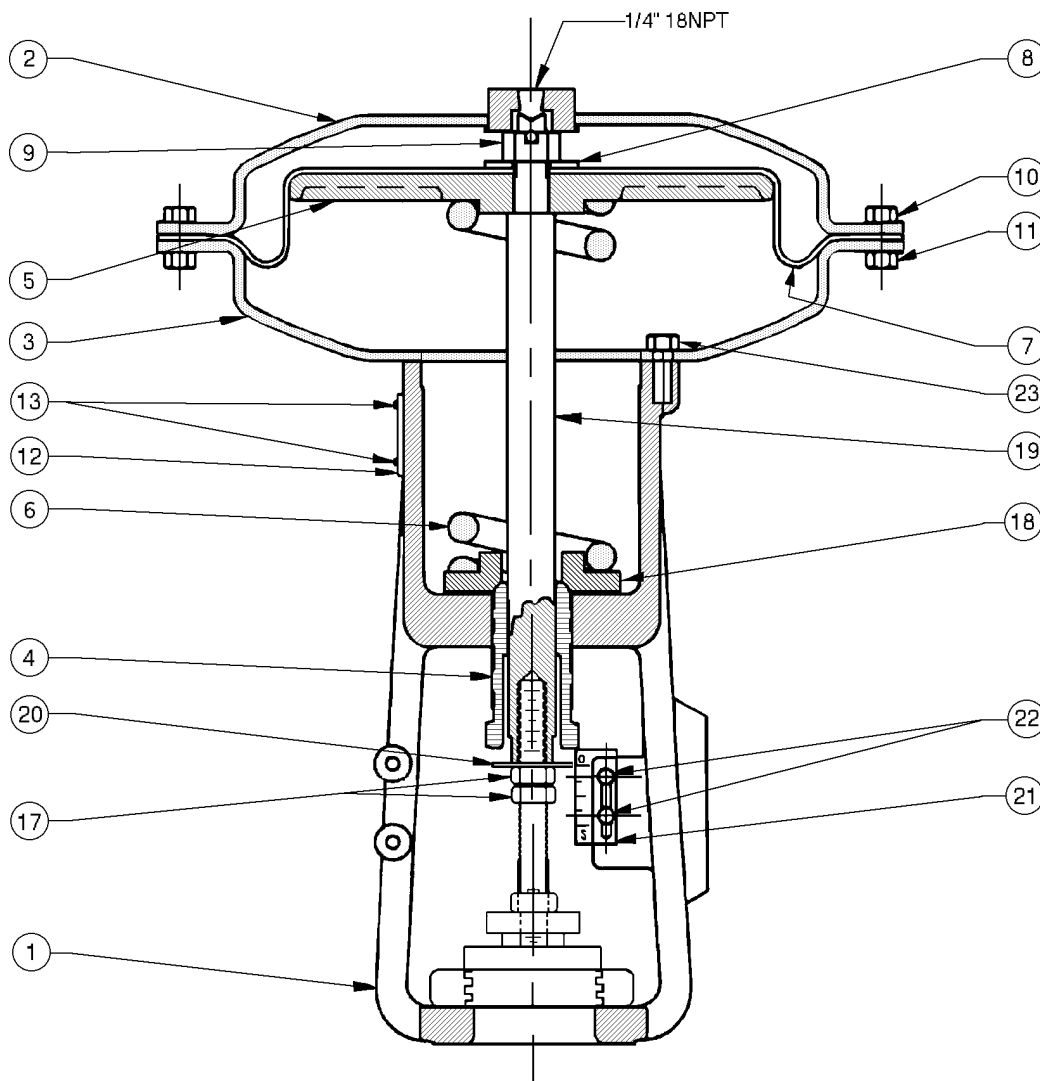


ITEM NO.	DESCRIPTION
1	Yoke
2	Upper Case
3	Lower Case
4	Spring Adjustor
5	Diaphragm Plate
6	Range Spring
7	Diaphragm
8	Diaphragm Washer
9	Diaphragm Washer Nut
10	Cap Screw (Case Bolt)
11	Case Bolt Nut
12	Name Plate
13	Name Plate Screw
17	Stem Jam Nut
18	Spring Seat
19	Actuator Stem or Actuator Stem Assy.
20	Position Indicator Disc
21	Indicator Plate
22	Indicator Plate Screw
23	Yoke Bolt
24	Hex. Head Cap Screw
25	Guide Bushing
39	Bonnet Nut
40	Handwheel Stop
50	Yoke Bolt Nut
51	Packing or O-Ring
52	Pin
59	Pin (Roll)
73	Stem Adaptor Assembly
75	Stop Screw
76	Handwheel Bonnet Nut
77	Handwheel Bonnet
78	Handwheel Adjusting Screw Assembly
78.1	Handwheel Adjusting Screw
78.2	Handwheel
78.3	Ball
79	Hex. Nut ACME
80	Cotter Pin (Reverse Hand-wheel)
81	O-Ring
82	Handwheel Nut
83	Thrust Washer
77	Stem Guide
84	U-Cup Seal
87	O-Ring
88	Bug Proof Vent
90	Rolled Spring Pin
91	Thrust Bearing
92	Handwheel Coupling
94	Washer
95	Hex. Head Cap Screw

Model 55R Handwheel

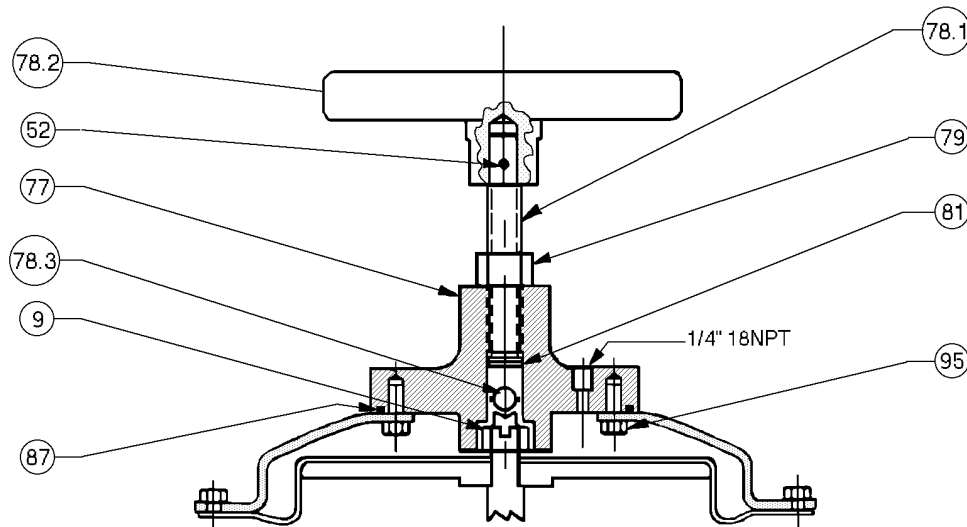


Model 75D Actuator

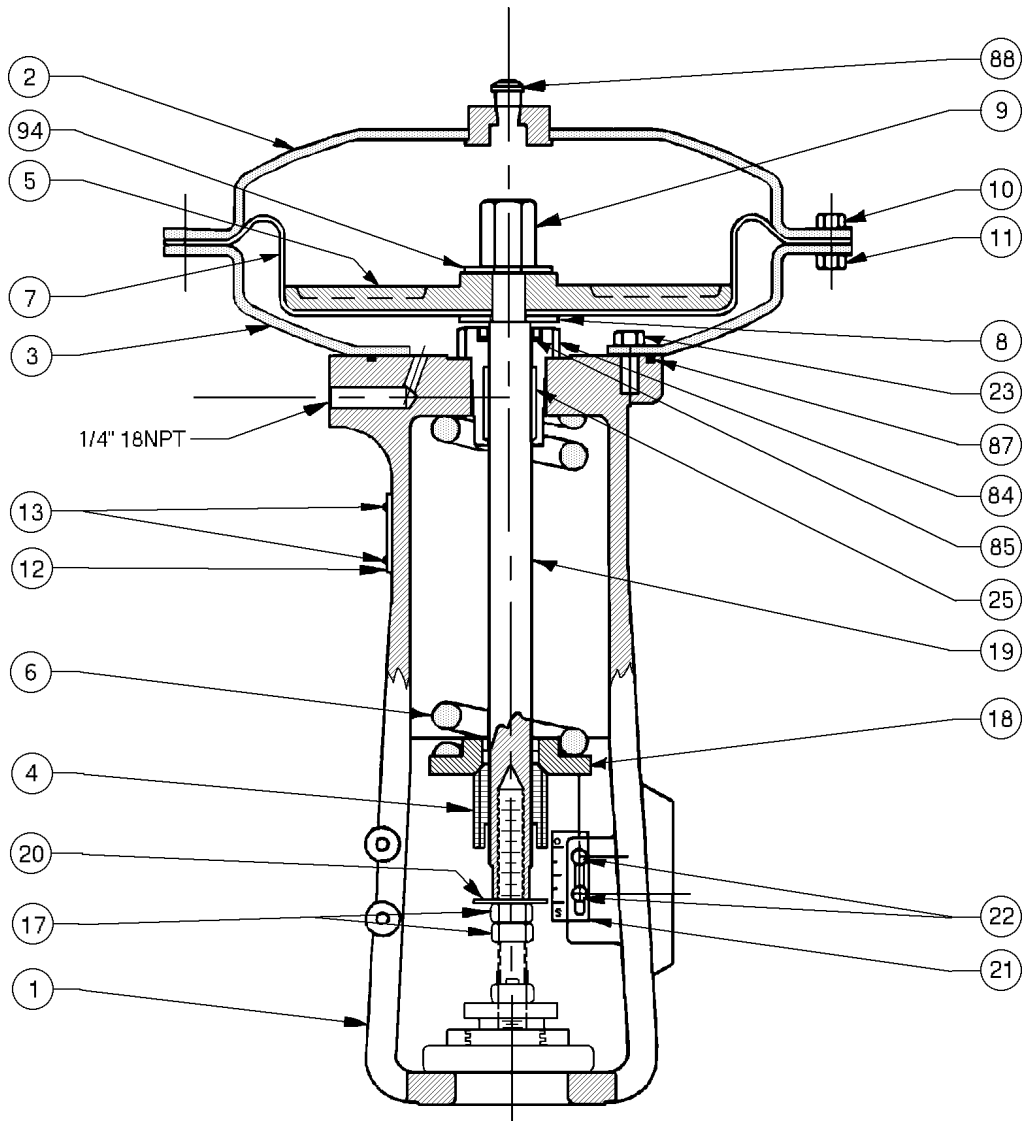


ITEM NO.	DESCRIPTION
1	Yoke
2	Upper Case
4	Spring Adjustor
5	Diaphragm Plate
6	Range Spring
7	Diaphragm
8	Diaphragm Washer
9	Diaphragm Washer Nut
10	Cap Screw (Case Bolt)
11	Case Bolt Nut
12	Name Plate
13	Name Plate Screw
17	Stem Jam Nut
18	Spring Seat
19	Actuator Stem or Actuator Stem Assy.
20	Position Indicator Disc
21	Indicator Plate
22	Indicator Plate Screw
23	Yoke Bolt
24	Hex. Head Cap Screw
25	Guide Bushing
39	Bonnet Nut
40	Handwheel Stop
50	Yoke Bolt Nut
51	Packing or O-Ring
52	Pin
59	Pin (Roll)
73	Stem Adaptor Assembly
75	Stop Screw
76	Handwheel Bonnet Nut
77	Handwheel Bonnet
78	Handwheel Adjusting Screw Assembly
78.1	Handwheel Adjusting Screw
78.2	Handwheel
78.3	Ball
79	Hex. Nut ACME
80	Cotter Pin (Reverse Hand-wheel)
81	O-Ring
82	Handwheel Nut
83	Thrust Washer
84	Stem Guide
85	U-Cup Seal
87	O-Ring
88	Bug Proof Vent
90	Rolled Spring Pin
91	Thrust Bearing
92	Handwheel Coupling
94	Washer
95	Hex. Head Cap Screw

Model 75D Handwheel



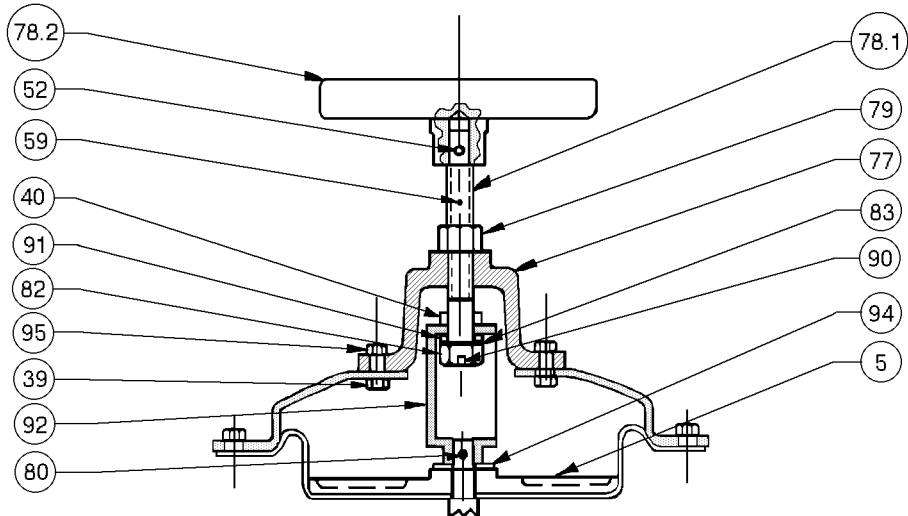
Model 75R Actuator



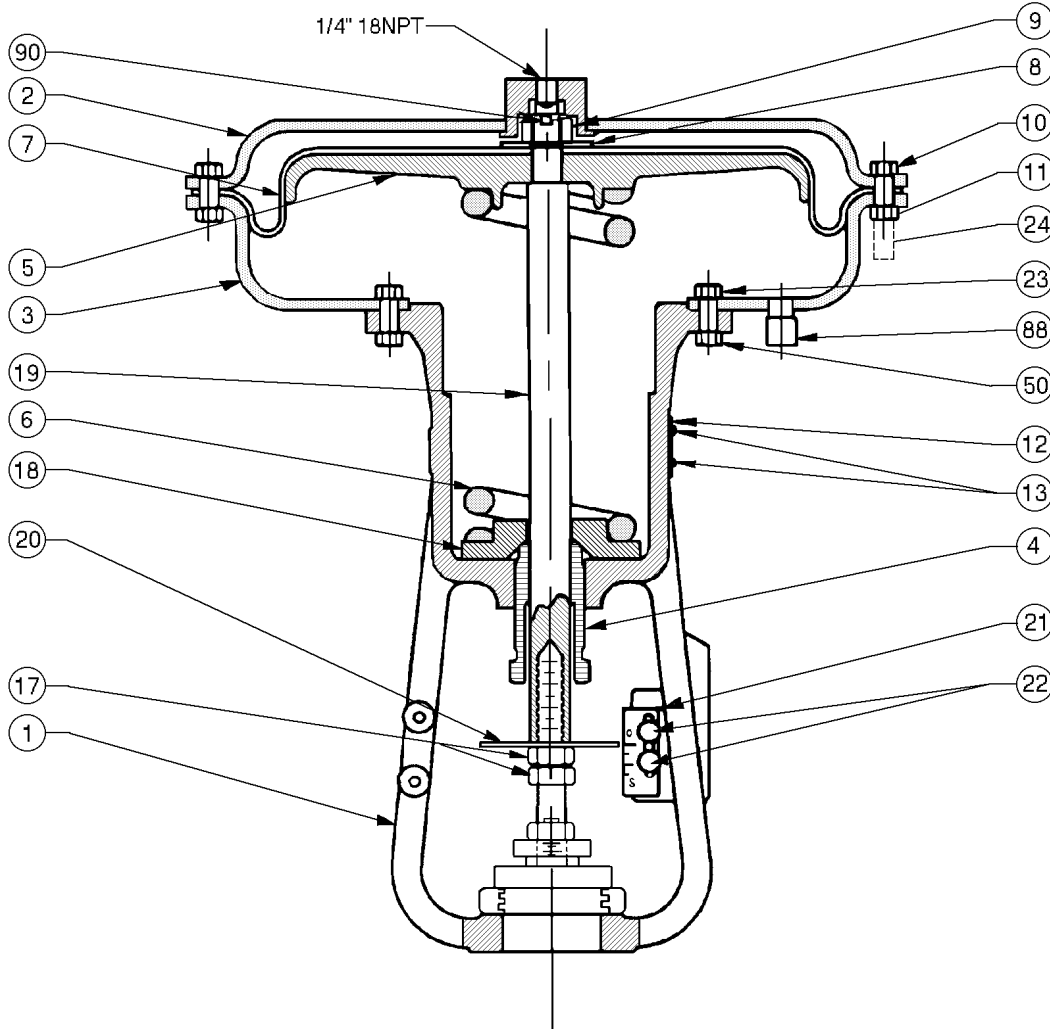
ITEM NO. DESCRIPTION

- 1 Yoke
- 2 Upper Case
- 3 Lower Case
- 4 Spring Adjustor
- 5 Diaphragm Plate
- 6 Range Spring
- 7 Diaphragm
- 8 Diaphragm Washer
- 9 Diaphragm Washer Nut
- 10 Cap Screw (Case Bolt)
- 11 Case Bolt Nut
- 12 Name Plate
- 13 Name Plate Screw
- 17 Stem Jam Nut
- 18 Spring Seat
- 19 Actuator Stem or Actuator Stem Assy.
- 20 Position Indicator Disc
- 21 Indicator Plate
- 22 Indicator Plate Screw
- 23 Yoke Bolt
- 24 Hex. Head Cap Screw
- 25 Guide Bushing
- 39 Bonnet Nut
- 40 Handwheel Stop
- 50 Yoke Bolt Nut
- 51 Packing or O-Ring
- 52 Pin
- 59 Pin (Roll)
- 73 Stem Adaptor Assembly
- 75 Stop Screw
- 76 Handwheel Bonnet Nut
- 77 Handwheel Bonnet
- 78 Handwheel Adjusting Screw Assembly
- 78.1 Handwheel Adjusting Screw
- 78.2 Handwheel
- 78.3 Ball
- 79 Hex. Nut ACME
- 80 Cotter Pin (Reverse Hand-wheel)
- 81 O-Ring
- 82 Handwheel Nut
- 83 Thrust Washer
- 84 Stem Guide
- 85 U-Cup Seal
- 87 O-Ring
- 88 Bug Proof Vent
- 90 Rolled Spring Pin
- 91 Thrust Bearing
- 92 Handwheel Coupling
- 94 Washer
- 95 Hex. Head Cap Screw

Model 75R Handwheel

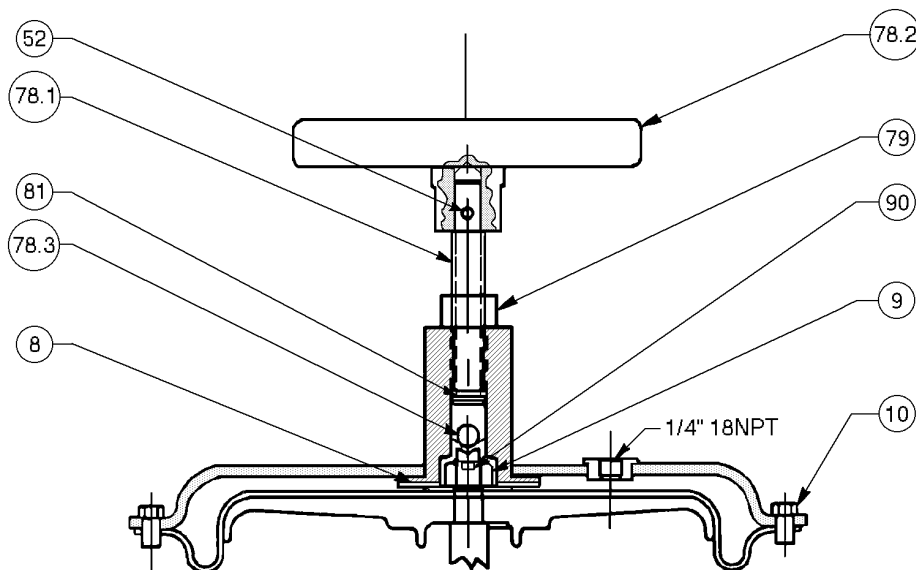


Model 115D Actuator

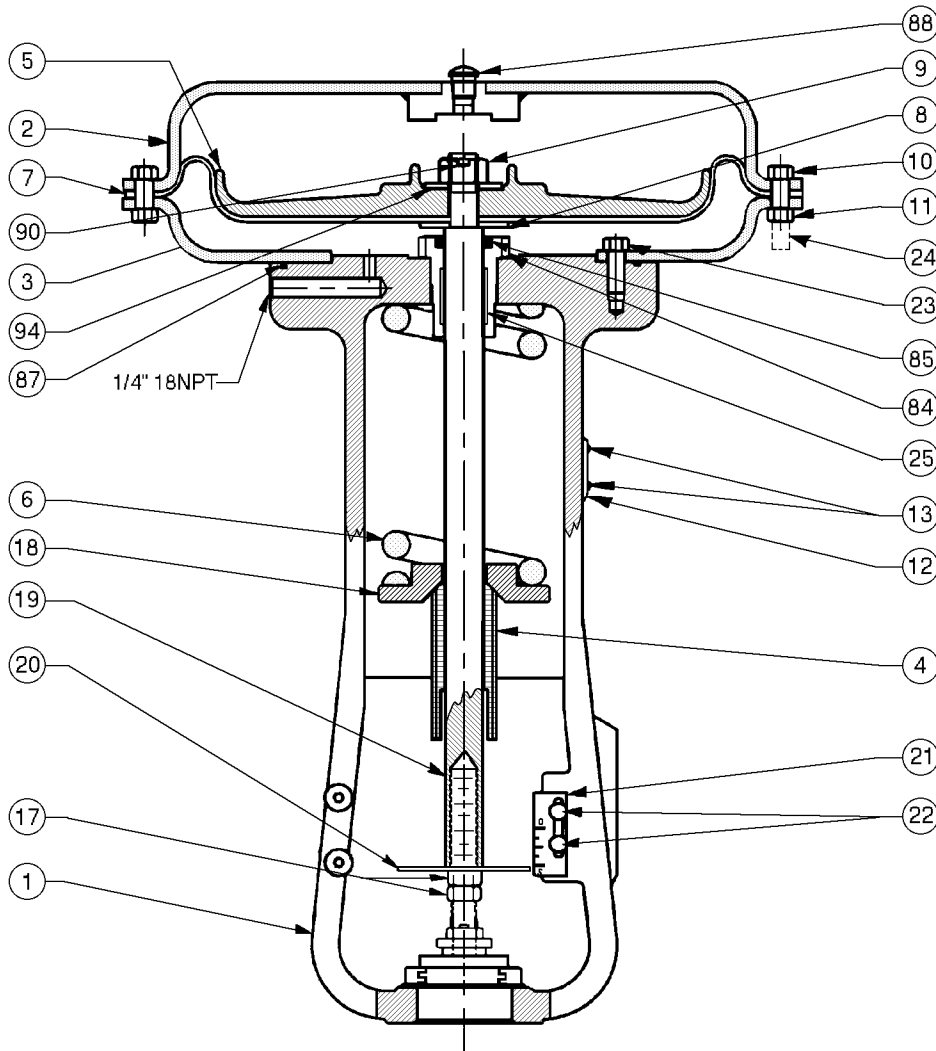


ITEM NO.	DESCRIPTION
1	Yoke
2	Upper Case
3	Lower Case
4	Spring Adjustor
5	Diaphragm Plate
6	Range Spring
7	Diaphragm
8	Diaphragm Washer
9	Diaphragm Washer Nut
10	Cap Screw (Case Bolt)
11	Case Bolt Nut
12	Name Plate
13	Name Plate Screw
17	Stem Jam Nut
18	Spring Seat
19	Actuator Stem or Actuator Stem Assy.
20	Position Indicator Disc
21	Indicator Plate
22	Indicator Plate Screw
23	Yoke Bolt
24	Hex. Head Cap Screw
25	Guide Bushing
39	Bonnet Nut
40	Handwheel Stop
50	Yoke Bolt Nut
51	Packing or O-Ring
52	Pin
59	Pin (Roll)
73	Stem Adaptor Assembly
75	Stop Screw
76	Handwheel Bonnet Nut
77	Handwheel Bonnet
78	Handwheel Adjusting Screw Assembly
78.1	Handwheel Adjusting Screw
78.2	Handwheel
78.3	Ball
79	Hex. Nut ACME
80	Cotter Pin (Reverse Handwheel)
81	O-Ring
82	Handwheel Nut
83	Thrust Washer
84	Stem Guide
85	U-Cup Seal
87	O-Ring
88	Bug Proof Vent
90	Rolled Spring Pin
91	Thrust Bearing
92	Handwheel Coupling
94	Washer
95	Hex. Head Cap Screw

Model 115D Handwheel



Model 115R Actuator



ITEM NO.	DESCRIPTION
1	Yoke
2	Upper Case
3	Lower Case
4	Spring Adjustor
5	Diaphragm Plate
6	Range Spring
7	Diaphragm
8	Diaphragm Washer
9	Diaphragm Washer Nut
10	Cap Screw (Case Bolt)
11	Case Bolt Nut
12	Name Plate
13	Name Plate Screw
17	Stem Jam Nut
18	Spring Seat
19	Actuator Stem or Actuator Stem Assy.
20	Position Indicator Disc
21	Indicator Plate
22	Indicator Plate Screw
23	Yoke Bolt
24	Hex. Head Cap Screw
25	Guide Bushing
39	Bonnet Nut
40	Handwheel Stop
50	Yoke Bolt Nut
51	Packing or O-Ring
52	Pin
59	Pin (Roll)
73	Stem Adaptor Assembly
75	Stop Screw
76	Handwheel Bonnet Nut
77	Handwheel Bonnet
78	Handwheel Adjusting Screw Assembly
78.1	Handwheel Adjusting Screw
78.2	Handwheel
78.3	Ball
79	Hex. Nut ACME
80	Cotter Pin (Reverse Hand-wheel)
81	O-Ring
82	Handwheel Nut
83	Thrust Washer
84	Stem Guide
85	U-Cup Seal
87	O-Ring
88	Bug Proof Vent
90	Rolled Spring Pin
91	Thrust Bearing
92	Handwheel Coupling
94	Washer
95	Hex. Head Cap Screw

Model 115R Handwheel

