



# CONTROL VALVES

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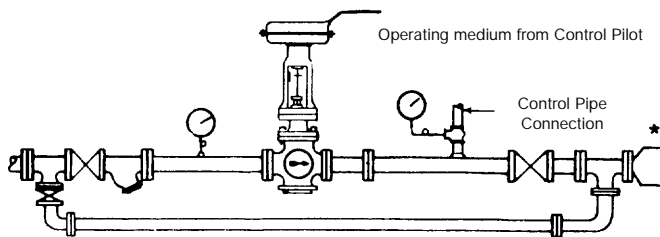
Drawing - Manual Control Valve .....16

**FOR ADDITIONAL CONTROL VALVE DATA CONSULT PROPER INSTRUCTION SECTION BELOW:**

- Where noise is a factor follow recommendations for piping and fittings per 5/0.3.1.

**SECTION I — INSTALLATION**

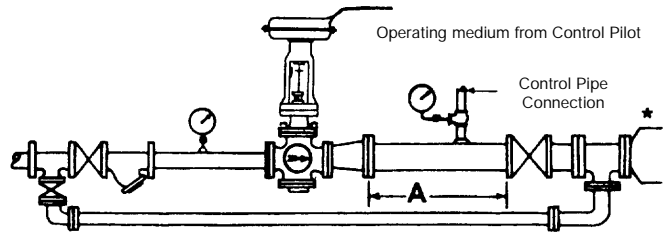
1. Valve Position  
Install control valve in the highest horizontal line of piping, in an accessible location and with arrow on side of valve body in direction of fluid flow. Control valve may be placed in any position, but upright is preferable for ease of maintenance.



• Figure 1 — Typical Installation  
\* Expand as required for fluid flow.

2. Problem Preventing Procedures
  - Provide removal space above, below and around control valve for easy removal of parts during maintenance. See proper Dwg. for dimensions.
  - Blow or flush out pipe lines thoroughly before installing control valve.
  - Protect control valve and following equipment with a LESLIE SELF-CLEANING STRAINER.
  - Install stop valves and gauges in inlet and outlet lines to provide means for checking adjustment and operation of equipment.
  - Provide proper inlet and outlet drainage in steam service to prevent water hammer or possible erosion in equipment.
  - Adhere to good piping practice. Install a bypass around the control valve.
3. Connect operating medium tubing from control pilot, instrument or loading device to diaphragm chamber connection of control valve or to valve positioner, if one is in use.
4. Important:  
If control valve is fitted with a Thermo-Isolating bonnet, do not lag or insulate bonnet or paint it other than dull black, otherwise its heat emitting efficiency will be impaired and packing will be submitted to excessive temperature.

5. Recommended Piping for Control of Compressible Fluids at Values of 25% or Less of Inlet Pressure.
  - Expand outlet pipe to twice control valve inlet pipe size. Use tapered expander.
  - Connect control pipe for control pilot ahead of outlet stop valve and at least 2' to 3' downstream from end of expander.
  - Make control pipe connection at least 18" to 2' from outlet stop valve, any elbow or other flow direction changing fitting.



• Fig. 2 — Typical Control Valve Station For Control of Compressible Fluids at 25% or Less of Inlet Pressure.

\* Expand as required for fluid flow.

NOTE: Where sensing impulse is taken 2' to 3' downstream from control valve (expander), dimension "A" minimum of 6' to 10' will provide lowest noise and velocity factors, accurate pressure sensing, and reasonable bypass length.

**SECTION II - OPERATION**

1. Close inlet and outlet stop valves.
2. Check that control valve responds properly through rated travel in relation to changes in operating pressure on the diaphragm. Rated travel is shown by position of travel indicator on valve stem relative to travel indicator scale on yoke.
3. Manually operate control valves fitted with manual operating devices through rated travel to check freedom of movement.
4. Place control valve in operation in accordance with instructions furnished with control pilot or other operating device.

## SECTION III — MAINTENANCE

To reduce maintenance time refer to proper drawing and follow steps shown below for applicable maintenance operation.

TO RENEW VALVE PLUG STEM PACKING	SECTION III
TO DISMANTLE CONTROL VALVE - INSPECT PARTS REPLACE OR REFUND VALVE PLUG/SEAT RING(S)	SECTION III DISMANTLING
TO REASSEMBLE CONTROL VALVE	SECTION III REASSEMBLY
TO PRELOAD ADJUSTING SPRING: SET RATED TRAVEL	SECTION III REASSEMBLY 3 THRU 10
TO REPLACE DIAPHRAGM AND/OR STEM SEAL	SECTION IV
TO CHANGE VALVE ACTION NORMALLY OPEN TO NORMALLY CLOSED OR VICE-VERSA	SECTION IV

### RENEWING VALVE PLUG STEM PACKING

Renew valve plug stem packing if control valve has been in service beyond normal maintenance and packing shows signs of wear. Wear will be indicated by leakage which cannot be corrected by minor tightening of packing flange.

Where LESLIE "LUBRISOFT" packing is in use, additional packing rings can be installed to overcome minor leakage without dismantling the control valve or breaking valve plug connection.

### TO INSTALL A COMPLETE SET OF PACKING

1. Disassemble control valve as far as necessary for the work required (See "DISMANTLING"). Remove old packing. Clean valve plug stem and packing box thoroughly. Polish valve plug stem with crocus cloth. Use approved, non-residue forming solvent for cleaning. Wipe dry with clean cloth.
2. Insert a new set of packing in packing box in the order shown on the packing wrapper. Packing wrapper contains complete installation instructions and a photograph of an installed set of packing. Each wrapper shows the order in which the various pieces of packing are to be inserted in the particular valve in which they are to be used.
3. After packing is installed, assemble packing follower, packing box flange and bolts to bonnet Tighten bolts as shown in instructions on wrapper.

## DISMANTLING

1. Close inlet and outlet stop valves. Operate system on bypass, if necessary.
2. Shut off operating medium and relieve pressure from diaphragm by disconnecting tubing at diaphragm case.
3. Remove Actuator From Valve Body Assembly Loosen valve plug stem nut. Use wrench on flats of valve plug stem and turn valve plug stem out of actuator stem threads until it is disengaged. (In large control valves support valve plug stem to prevent valve plug from suddenly falling downward as valve plug stem clears actuator stem). Take travel indicator off valve plug stem.

Remove capscrews holding actuator to bonnet and lift actuator off bonnet.

## SECTION IV — ACTUATOR MAINTENANCE REPLACING DIAPHRAGMS, STEM SEALS, ETC.

FOR ADDITIONAL CONTROL VALVE DATA CONSULT PROPER INSTRUCTION SECTION BELOW:

### GENERAL

1. Remove compression on actuator spring by screwing spring adjustor counterclockwise until actuator spring is free.

### SIZES 35, 55, 85, 135—DISMANTLING—(See Fig. 3)

Remove bolts/nuts (23/22), upper diaphragm case (20) and old diaphragm (21).

To examine, clean or replace other internal components lift out diaphragm plate (24) assembled with actuator stem (31), actuator spring (28), washer (34), and unscrew spring adjustor from adjustor sleeve(36).

### REASSEMBLY

Replace internal parts. Install new diaphragm. In sizes 35, 55 and 85 line up holes with those in lower diaphragm case. In size 135 place bead on diaphragm in recess in lower diaphragm case. Replace upper diaphragm in recess in lower diaphragm case. Replace upper diaphragm case on diaphragm.

Assemble four bolts and nuts through parts (90° apart). Finger-tighten. Assemble balance of bolts/nuts to actuator. Tighten evenly and alternately across diaphragm case. (Before tightening bolts in 35 actuators or where flat stock diaphragm material is used in other sizes as an emergency measure) consult note relating to preforming diaphragms.

Assemble four bolts and nuts through parts (90° apart). Finger tighten. Assemble balance of bolts/nuts to actuator. Tighten evenly and alternately across diaphragm case. (Before tightening bolts in 35 actuators or where flat stock diaphragm material is used in other sizes as an emergency measure) consult note relating to pre-forming diaphragms.

**SIZES 35R, 55R, 85R & 135R—DISMANTLING—**  
(See Fig. 4)

Remove bolts/nuts (19/18) and upper diaphragm case (15). Insert rod through holes in yoke (34) and actuator stem (35) to prevent twisting of stem seal (29) when removing self-locking nut (16). (In size 35R use wrench on flats on actuator stem) Remove self-locking nut (16), diaphragm plate (17), diaphragm (20), collar (22) and stem seal (29). Remove stem seal as follows; — In 35R and 135R Actuators, remove stud nuts (24) in 135R; capscrews (23) in 35R and disassemble lower diaphragm base (21) from yoke (34). Lift out stem seal. In 55R and 85R DO NOT remove lower diaphragm base unless gasket (26) is to be replaced. Stem seal (29) is held in place by seal ring (27) and screws (28). Take out these parts and lift out stem seal.

*NOTE: To check actuator spring and other components in size 135R disassemble spacer (33) and lift out parts. In 35R, 55R and 85R parts are taken out from the underside.*

**REASSEMBLY**

Reassemble spring adjustor (40), washer (39), actuator spring (36), top spring seat (30) to actuator stem (35) (if they have been removed). Replace assembled parts in yoke (34). Place stem seal collar (31) on actuator stem (35). Reassemble spacer (33) to yoke in 135R. Position stem seal (29) on stem seal collar (22). In sizes 55R, 85R and 135R place bead of stem seal in recess of stem seal collar.

In 35R and 135R actuators reassemble lower diaphragm base (21) to yoke (34). Assemble nuts (24) to space studs (32) in 135R. Tighten. In 35R insert capscrews (23) through holes in lower diaphragm case and diaphragm and into threads in yoke. Tighten after presetting stem seal as described below.

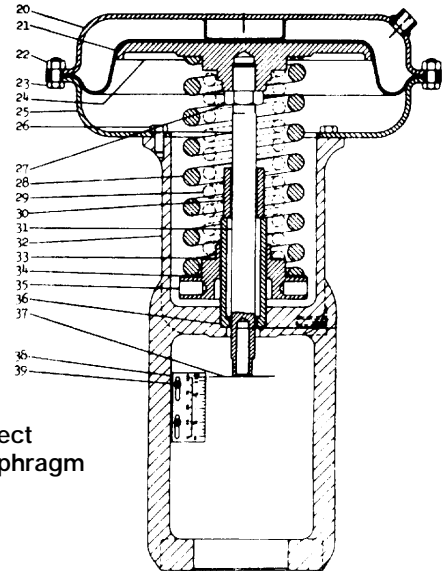
In 55R and 85R actuators replace sealing ring (27) and screws (28). Tighten.

**Pre-setting Stem Seal — (55R, 85R, & 135R)**

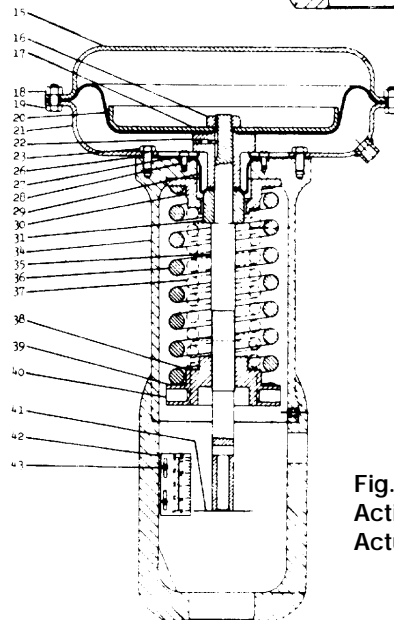
Place collar (22) on stem seal (29) making sure that bead on stem seal enters recess in collar. Reassemble diaphragm (20) over actuator stem (35). Fit center hole in diaphragm around raised face of collar (22). Replace diaphragm plate (17), and self-locking nut (16). Hold actuator stem steady with rod through yoke and stem (55R, 85R, 135R) or with wrench on flats on actuator stem (35R) then tighten self-locking nut. Replace upper diaphragm case (15) and bolts/nuts. Tighten as described previously. See Instruction Sheet 10/0.5.8 — for precautions to observe when replacing seals.

**Pre-setting Stem Seal — (35R)**

Place collar (22) on stem seal (29), assemble self-locking nut (16) to actuator stem (35) and tighten down against parts. Then press actuator stem downward to make stem seal move to taut position. Tighten capscrews and remove self-locking nut (16).



**Fig. 3—Direct Acting Diaphragm Actuator**



**Fig. 4—Reverse Acting Diaphragm Actuator**

## **ALL ACTUATORS**

Set preload on actuator spring, reassemble actuator to valve body assembly, if it has been removed, adjust valve for rated travel and reconnect operating medium tubing.

### **SOME IMPORTANT NOTES**

#### **FLAT SHEET RUBBER MATERIAL**

Flat sheet rubber material may be used in 55(R), 85(R) and 135(R) actuators as emergency replacement material but for guaranteed results it should be replaced at the earliest opportunity with the LESLIE ROLLING ACTION DIAPHRAGM designed specifically for these actuators. When flat material is used in emergency preform as described below.

#### **PREFORMING 35(R) ACTUATOR DIAPHRAGMS**

Flat stock material is used for diaphragms in 35(R) actuators. When assembling, first finger tighten all diaphragm case bolts. Then compress actuator spring sufficiently to move diaphragm through full travel to the upper or lower diaphragm case (depending on whether actuator is direct or reverse acting). This preforms diaphragm and permits full movement through rated travel without resistance from a taut diaphragm.

#### **TO CHANGE VALVE ACTION FROM NORMALLY OPEN TO NORMALLY CLOSED OR VICE-VERSA.**

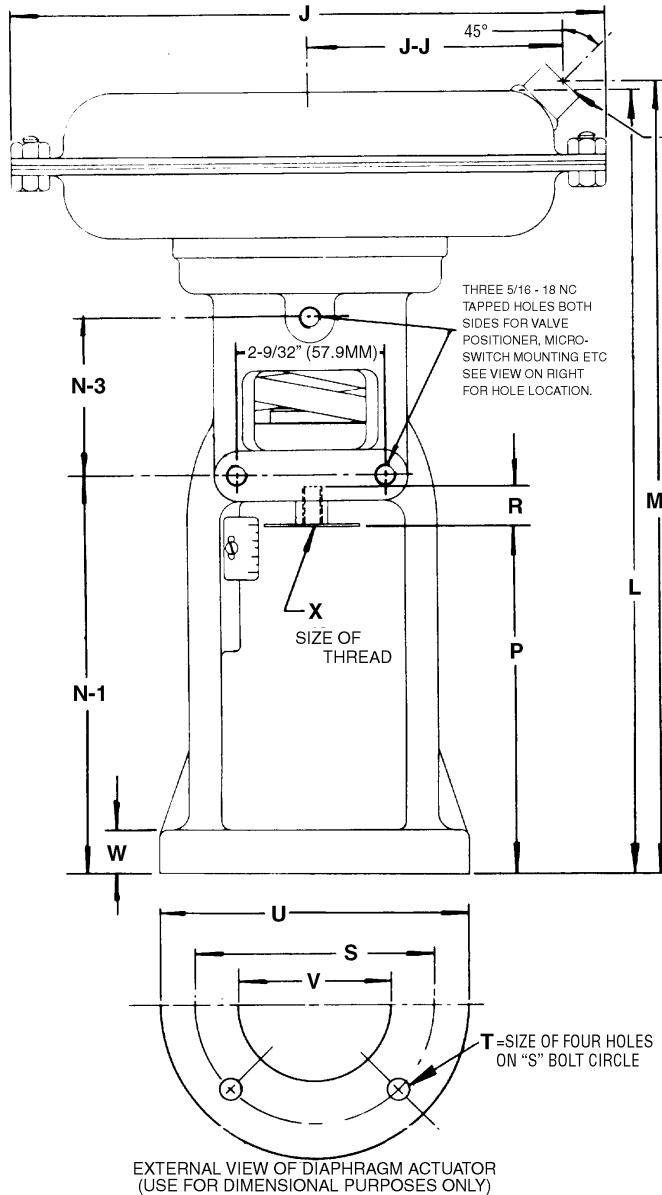
To reverse the action of a single ported diaphragm control valve it is only necessary to replace the actuator in use with one having the opposite action. A single "D" in the control valve class indicates actuator is "DIRECT ACTING" — Air moves diaphragm downward. A double D ("DD") indicates actuator is "REVERSE ACTING" — Air moves diaphragm upward. Note: Final valve action in response to air signal on diaphragm depends on whether valve plug is positioned above or below the seat ring.

### **PROCEDURE**

To change actuator, loosen valve plug stem locknut under travel indicator and turn valve plug stem all the way out of the actuator stem. Remove capscrews securing actuator to bonnet. Replace actuator with one having desired action. Re-insert and tighten capscrews. Reconnect valve plug stem all the way out of the actuator stem. Remove capscrews securing actuator to bonnet. Replace actuator with one having desired action. Re-insert and tighten capscrews. Reconnect valve plug stem to actuator stem. Adjust actuator spring preload and set valve for rated travel. For more detailed instruction consult general instruction pertaining to the particular type of control valve.

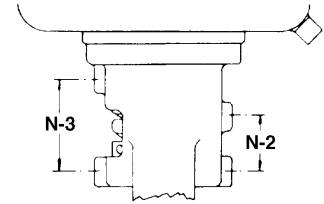
# DIAPHRAGM CONTROL VALVE DIAPHRAGM ACTUATORS DIRECT ACTING

SUPERCEDES DWG. NO. CV-12695-F, ALT. 3  
MAXIMUM ALLOWABLE AIR PRESSURE FOR ALL  
DIAPHRAGM ACTUATORS IS 60 PSI



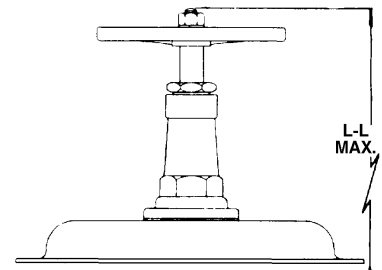
OPERATING MEDIUM  
PIPE CONNECTION  
Z NPT

SIZE		N-2	N-3
35	in mm	2-1/2 63.5	2-1/2 63.5
55 & 85A	in mm	2-1/2 63.5	3" 76.2
85 & 85A	in mm	2-1/2 63.5	4-1/8 104.8
135	in mm	2-1/2 63.5	5-5/8 142.9



VIEW SHOWING TAPPED HOLE LOCATION  
FOR VALVE POSITIONER, MICRO-SWITCH  
MOUNTING, ETC.

SIZE DIAPHRAGM ACTUATOR		MAX. TRAVEL
35	in mm	3/4 19.1
55 & 85A	in mm	1-1/2 38.1
85 & 85A	in mm	2-1/8 54.0
135	in mm	3 76.2



EXTERNAL VIEW OF HAND OPERATING DEVICE  
(USE FOR DIMENSIONAL PURPOSE ONLY)

SIZE DIAPHRAGM ACTUATOR		DIMENSIONS IN INCHES AND MILLIMETERS					
		L - L (MAX.)		NET WT. lb/kg* WITH H.O.D.		NET WT. lb/kg* WITH HANDJACK	
		HAND OPERATING DEVICE	TWO DIRECTIONAL HANDJACK	ALUM.	CAST IRON	ALUM.	CAST IRON
35	in	17-7/8	23	23 lb	38 lb	30 lb	45 lb
	mm	454.0	584.2	10.4 kg	17.2 kg	13.6 kg	20.4 kg
55	in	24-7/8	35-5/8	28 lb	55 lb	38 lb	65 lb
	mm	631.8	904.9	12.7 kg	24.9 kg	17.2 kg	29.5 kg
55A	in	24-7/8	35-5/8	28 lb	55 lb	38 lb	65 lb
	mm	631.8	904.9	12.7 kg	24.9 kg	17.2 kg	29.5 kg
85	in	29-1/4	40	48 lb	101 lb	60 lb	115 lb
	mm	743.0	1016.0	21.8 kg	45.8 kg	27.2 kg	52.2 kg
85A	in	31-7/8	42-5/8	53 lb	121 lb	65 lb	138 lb
	mm	809.6	1082.7	24.0 kg	54.9 kg	29.5 kg	62.6 kg
85 (135)	in	29-7/8	40-5/8	50 lb	118 lb	62 lb	135 lb
	mm	758.8	1031.9	22.7 kg	53.5 kg	28.1 kg	61.2 kg
135	in	39-3/4	54	114 lb	197 lb	137 lb	220 lb
	mm	1009.7	1371.6	51.7 kg	89.4 kg	62.1 kg	99.8 kg

SIZE DIAPHRAGM ACTUATOR		DIMENSIONS IN INCHES AND MILLIMETERS														NET WT. lb/kg*	
		J	J-J	L	M	N-1	P	R	S	T	U	V	W	X	Z	ALUM.	CAST IRON
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
35	in	9-1/4	3-15/16	12-3/8	12-3/8	6-1/4	5-1/2	1-3/8	3-13/16	9/16	4-13/16	2.687	11/16	3/8-24	1/4"	20 lb	35 lb
	mm	235.0	100.0	314.3	314.3	158.8	139.7	34.9	96.8	14.3	122.2	68.2	17.5	NPT	9.1 kg	15.9 kg	
55	in	12	5-1/16	15-1/4	15-1/4	7	5-1/2	1-3/8	3-13/16	9/16	4-13/16	2.687	1	3/8-24	1/4"	23 lb	50 lb
	mm	304.8	128.6	387.4	387.4	177.8	139.7	34.9	96.8	14.3	122.2	68.2	25.4	NPT	10.4 kg	22.7 kg	
55A	in	12	5-1/16	15-1/4	15-1/4	7	5-1/2	1-3/8	3-13/16	9/16	4-13/16	2.687	1	1/2-20	1/4"	23 lb	50 lb
	mm	304.8	128.6	387.4	387.4	177.8	139.7	34.9	96.8	14.3	122.2	68.2	25.4	NPT	10.4 kg	22.7 kg	
85	in	14-3/4	6-1/4	19-5/8	19-5/8	8-1/2	6-7/16	1-3/4	3-13/16	9/16	4-13/16	2.687	1-1/4	1/2-20	1/4"	43 lb	96 lb
	mm	374.7	158.8	498.5	498.5	215.9	163.5	44.5	96.8	14.3	122.2	68.2	31.8	NPT	19.5 kg	43.5 kg	
85A	in	14-3/4	6-1/4	22-1/4	22-1/4	11-1/8	8-9/16	2-1/2	4-3/4	11/16	6	3.500	1-5/16	1/4"	48 lb	116 lb	
	mm	374.7	158.8	565.2	565.2	282.6	217.5	63.5	120.7	17.5	152.4	88.9	33.3	NPT	21.8 kg	52.6 kg	
85 (135)	in	14-3/4	6-1/4	20-1/4	20-1/4	9-1/8	7-1/16	1-3/4	4-3/4	11/16	6	3.500	1-5/16	1/2-20	1/4"	45 lb	113 lb
	mm	374.7	158.8	514.4	514.4	231.8	179.4	44.5	120.7	17.5	152.4	88.9	33.3	NPT	20.4 kg	51.3 kg	
135	in	18	9	27-3/8	24-5/8	11-1/8	8-9/16	2-1/2	4-3/4	11/16	6	3.500	1-5/16	3/8"	104 lb	187 lb	
	mm	457.2	228.6	695.3	625.5	282.6	217.5	63.5	120.7	17.5	152.4	88.9	33.3	NPT	47.2 kg	84.8 kg	
135 (1-1/4) Dia. Stem	in	18	9	27-3/8	24-5/8	11-1/8	8-9/16	2-1/2	5-3/4	11/16	7	4.500	1-5/16	3/8"	104 lb	187 lb	
	mm	457.2	228.6	695.3	625.5	282.6	217.5	63.5	146.1	17.5	177.8	114.3	33.3	NPT	47.2 kg	84.8 kg	

\* Approximate  
Note - 85 (135) Actuator is Standard 85 Actuator with identical mounting dimensions of the 135 Standard Actuator

WHEN ORDERING PARTS, PLEASE GIVE PART NAME AND PAT REFERENCE NUMBER FROM TABLE BELOW, USE PART NUMBER ONLY TO LOCATE PART ON DRAWING.

## HAND OPERATING DEVICE

PART NO.	PART NAME	MATERIAL	QTY. PER UNIT	REFERENCE NUMBER - EACH SIZE			
				35	55 & 55A	85 & 85A	135
1	Nut	Steel	1	13243	13243	13243	3677
2	Lock Washer	Steel	1	10392	10392	10392	7049
3	Handwheel	Cast Aluminum	1	43064	23649	23649	31470
4	Handscrew	Stainless Steel	1	43016	49228	49228	42140
5	Packing Gland	(NOTE 1)	1	38644	34859	34859	34860
6 *	Packing Ring	Teflon	1	69609	A69597	A69597	69608
7	Washer	(NOTE 1)	1	38658	35760	35760	35761
8 *	O-Ring	Synthetic Rubber	1	38664-94	27293-94	27293-94	27251-94
9	Bonnet, Complete, Iron Actuator	(NOTE 2)	1	38635	42228	42228	42229
9	Bonnet, Complete, Aluminum Actuator	(NOTE 3)	1	39069	42228	42228	42229
15	Handscrew Disc, Complete	(NOTE 6) Stainless Steel	1	43008	42077	42077	42152
16 *	Gasket	Sheet Packing	1	38657-95	37845-95	37845-95	16513-67
17	Lock Nut, Iron Actuator	(NOTE 2)	1	38655	37710	37710	--
17	Lock Nut, Aluminum Actuator	(NOTE 3)	1	39070	37710	37710	--
18	Diaphragm Case, Upper	Pressed Steel	1	38661	37764	37770	--
18	Diaphragm Case, Upper	(NOTE 4) Cast Iron	1	--	--	--	36224
18	Diaphragm Case, Upper	(NOTE 5) Cast Aluminum	1	--	--	--	36220

PART NO.	PART NAME	MATERIAL	UNIT	QTY. PER 35	REFERENCE NUMBERS - EACH SIZE						
					55	55A	85	85A	85* (135)	135	135 FOR 1-1/4" STEM
20	Diaphragm Case, Upper	Pressed Steel	1	38369	37795	37795	37791	37791	37791	--	--
20	Diaphragm Case, Upper (NOTE 4)	Cast Iron	1	--	--	--	--	--	--	36195	36195
20	Diaphragm Case, Upper (NOTE 5)	Cast Aluminum	1	--	--	--	--	--	--	36191	36191
21 *	Diaphragm	Synthetic Rubber	1	38399-94	37810-94	37810-94	37819-94	37819-94	37819-94	36027-94	36027-94
22	Nut	Steel	(NOTE 7)	13901	26585	26585	26585	26585	26585	26585	26585
23	Bolt	Steel	(NOTE 7)	38420	37797	37797	37797	37797	37797	24313	24313
24	Diaphragm Disc (NOTE 4)	Cast Iron	1	38393	37838	37838	37843	37843	37843	23947	23947
24	Diaphragm Disc (NOTE 5)	Cast Aluminum	1	38877	37839	37839	37844	37844	37844	34636	34636
25	Diaphragm Case, Lower	Pressed Steel	1	38345	37672	37672	37678	37678	37678	--	--
25	Diaphragm Case, Lower (NOTE 4)	Cast Iron	1	--	--	--	--	--	--	31624	31624
25	Diaphragm Case, Lower (NOTE 5)	Cast Aluminum	1	--	--	--	--	--	--	34629	34629
26	Cap Screw	Steel	(NOTE 8)	38420	37796	37796	23400	23400	23400	9130	9130
28	Adjusting Spring	Steel, Plated	1								
29	Inner Adjusting Spring	Steel, Plated	1	--	--	--	--	--	--	--	--
30	Limit Stop	Steel	1								
31	Upper Stem	Stainless Steel	1	38398	23263	61386	24273	57521	24273	23949	23949
32	Yoke (NOTE 10) (NOTE 4)	Cast Iron	1	38335	37693	37693	37995	57554	37822	34855	38594
32	Yoke (NOTE 10) (NOTE 5)	Cast Aluminum	1	38876	37692	37692	37994	57553	37821	34702	43383
33	Washer, Inner Spring (NOTE 9)	Stainless Steel	1	--	--	--	--	25393	25393	25393	25394
34	Washer	Stainless Steel	1	38401	23260	23260	24271	24271	24271	23951	23951
35	Adjusting Nut (NOTE 4)	Cast Iron	1	38394	23262	23262	24274	24274	24274	23948	23948
35	Adjusting Nut (NOTE 5)	Cast Bronze	1	38349	27978	27978	30081	30081	30081	30070	30070
36	Adjusting Sleeve	Stainless Steel	1	38397	37694	37694	37766	37766	37766	34655	34655
37	Travel Indicator	Stainless Steel	1	38405	38920	15672	38921	58012	38921	38922	38922
38	Travel Indicator Scale	Aluminum	1	38404							
39	Screw	Steel, Cad. Plated	(NOTE 11)	34728	34728	34728	34728	34728	34728	34728	34728

**\* RECOMMENDED SPARE PARTS**

- NOTE 1 - Material is Brass for size 35 Actuator and Aluminum for 55, 85, 85A and 135 Actuators.
- NOTE 2 - Material is Cast Iron for 35 Actuator and Cast Aluminum for 55, 55A, 85, 85A and 135 Actuators.
- NOTE 3 - Material is Cast Bronze for 35 Actuator and Cast Aluminum for 55, 55A, 85, 85A, and 135 Actuators.
- NOTE 4 - Used on Cast Iron Actuators only.
- NOTE 5 - Used on Cast Aluminum Actuators only.
- NOTE 6 - Includes one each, Handscrew Disc, Retainer Insert, and two each Split Ring.
- NOTE 7 - Quantities are: Twelve (12) for the 35 size, Fourteen (14) for the 55 & 55A sizes, Sixteen (16) for the 85 & 85A sizes and Twenty-four (24) for the 135 size Actuator.
- NOTE 8 - Quantities are: Eight (8) for the 35, 55, & 55A sizes and Six (6) for the 85, 85A and 135 size Actuators.
- NOTE 9 - Used only when Inner Adjusting Spring, Part No. 29 is used.
- NOTE 10 - Yoke, Part No. 32, is furnished complete with Adjusting Sleeve, Part No. 36.
- NOTE 11 - Quantities are: One (1) for 35 Actuator and Two (2) for all other sizes.

PART NO. 28 ADJUSTING SPRING **					
VALVE TRAVEL		ACTUATOR SIZE			
		35	55 & 55A	85 & 85A	135
5/8 in	15.9 mm	38422	41969	35014	
3/4 in	19.1 mm	38422	41968	37719	
7/8 in	22.2 mm	--	23239	24299	42489
1 in	25.4 mm	--	24296	35014	23996
1-1/8 in	28.6 mm	--	43078	41970	--
1-1/4 in	31.8 mm	--	24297	24299	41971
1-1/2 in	38.1 mm	--	24298	24300	24303
2 in	50.8 mm	--	--	24301	42489
2-1/8 in	54.0 mm	--	--	42488	41972
2-1/4 in	57.2 mm	--	--	--	24303
2-3/4 in	69.9 mm	--	--	--	23996
3 in	76.2 mm	--	--	--	23996

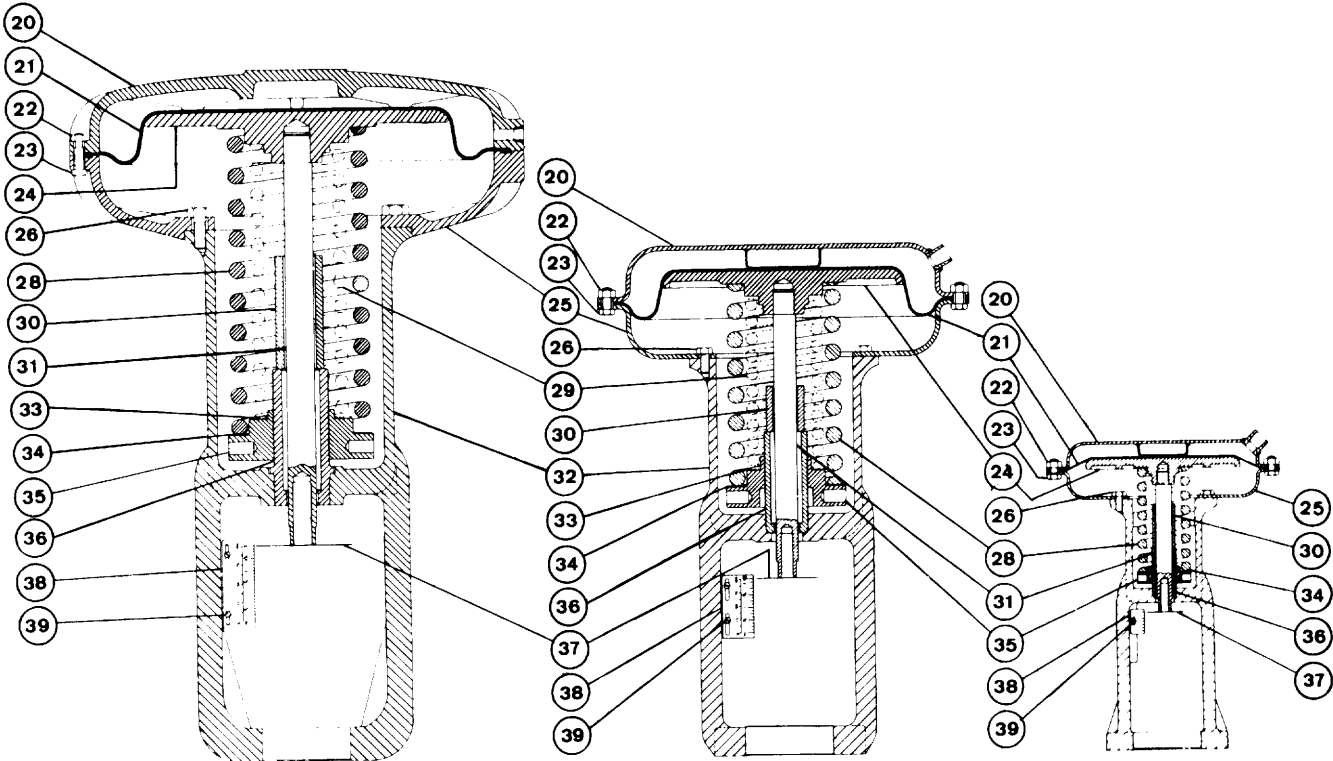
PART NO 30 LIMIT STOP						
VALVE TRAVEL		ACTUATOR SIZE				
		35	55 & 55A	85 & 85A	135	
5/8 in	15.9 mm	38403	44077	24482	--	
3/4 in	19.1 mm	--	23393	46890	36349	
7/8 in	22.2 mm	--	23393	24482	36349	
1 in	25.4 mm	--	23394	24483	36349	
1-1/8 in	28.6 mm	--	23395	23366	--	
1-1/4 in	31.8 mm	--	23395	23366	30908	
1-1/2 in	38.1 mm	--	23997	23367	25396	
2 in	50.8 mm	--	--	23368	36350	
2-1/8 in	54.0 mm	--	--	23368	25399	
2-1/4 in	57.2 mm	--	--	--	25399	
2-3/4 in	69.9 mm	--	--	--	36351	
3 in	76.2 mm	--	--	--	23993	

PART NO. 38 TRAVEL INDICATOR SCALE		
INDICATOR SCALES SUBJECT TO ACTUATOR MAXIMUM TRAVEL LIMIT		
VALVE TRAVEL		REF. NO.
1/4 in	6.4 mm	48224
3/8 in	9.5 mm	48048
1/2 in	12.7 mm	48047
5/8 in	15.9 mm	38904
3/4 in	19.1 mm	38905
7/8 in	22.2 mm	38906
1 in	25.4 mm	38907
1-1/8 in	28.6 mm	38908
1-1/4 in	31.8 mm	38909
1-1/2 in	38.1 mm	38910
1-3/4 in	44.5 mm	49641
2 in	50.8 mm	38911
2-1/8 in	54.0 mm	38912
2-1/4 in	57.2 mm	38913
2-3/4 in	69.9 mm	38914
3 in	76.2 mm	38915

PART NO. 29 INNER ADJUSTING SPRING			
VALVE TRAVEL		ACTUATOR SIZE	
		85 & 85A	135
5/8 in	15.9 mm	37718	--
7/8 in	22.2 mm	24481	25389
1 in	25.4 mm	--	25389
1-1/4 in	31.8 mm	--	25390
1-1/2 in	38.1 mm	--	25390

\*\* Springs listed are based on Standard Spring that will give the nearest range to 3-15 psi for the travel indicated. This is based on zero pressure drop through valve. For various pressure drops or ranges, these Springs can be interchanged any way in each particular size. Consult Leslie Co. when special range is required.

# DIAPHRAGM ACTUATOR

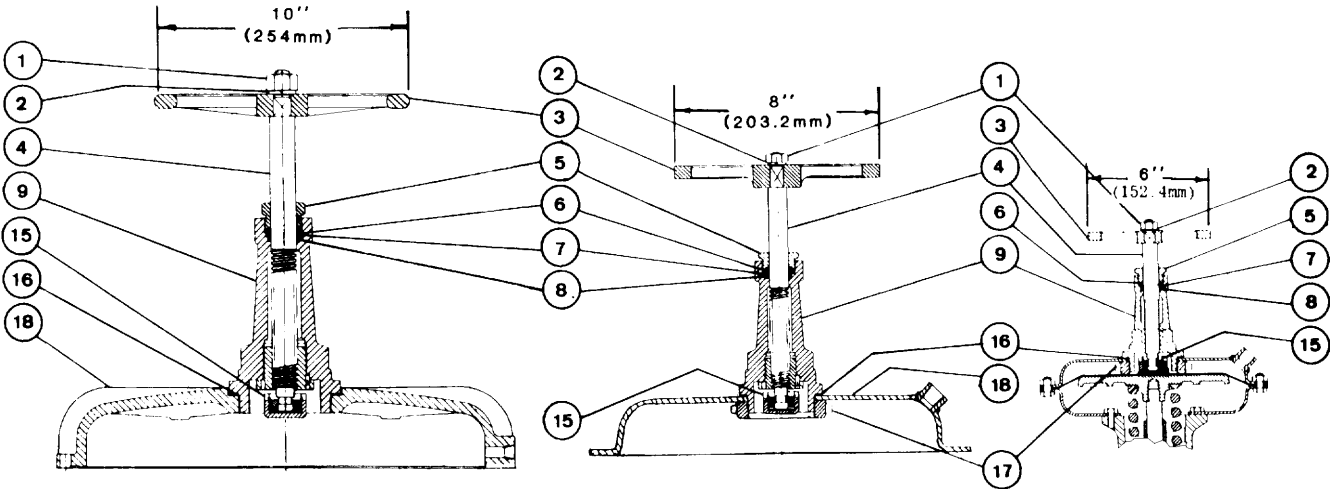


VIEW SHOWING SIZE 135 DIAPHRAGM ACTUATOR

VIEW SHOWING SIZE 55, 55A, 85 & 85A DIAPHRAGM ACTUATORS

VIEW SHOWING SIZE 35 DIAPHRAGM ACTUATOR

# HAND OPERATING DEVICE



VIEW SHOWING SIZE 135 HAND OPERATING DEVICE

VIEW SHOWING SIZES 55, 55A, 85 & 85A HAND OPERATING DEVICES

VIEW SHOWING SIZE 35 HAND OPERATING DEVICE

# DIAPHRAGM ACTUATOR

## TWO - DIRECTIONAL HANDJACK

WHEN ORDERING PARTS, PLEASE GIVE PART NAME AND PART REFERENCE NUMBER FROM TABLE BELOW, USE PART NUMBER ONLY TO LOCATE PART ON DRAWING.

PART NO.	PART NAME	MATERIAL	QTY. PER UNIT	REF. NO. - EACH SIZE			
				35	55	85	135
1	Nut	Steel	1	13243	13243	13243	3676
2	Lock Washer	Steel	1	10392	10392	10392	10513
3	Handwheel	Aluminum	1	43064	56321	56321	53834
4	Lock Pin	Steel	1	57440	57441	57441	57442
5	Upper Bushing	Aluminum	1	56205	56317	56317	56362
6 *	Gasket	Synthetic Rubber	1	16506-67	33874-67	33874-67	56364-67
7	O-Ring	Synthetic Rubber	1	24773-94	24773-94	24773-94	55561-94
8	Hand Screw Bearing Assy.	Stainless Steel	1	56194	56306	56306	56355
9	Bonnet	Aluminum	1	56193	56305	56305	56348
10	Lower Bushing	Stainless Steel	1	56206	42082	42082	42138
11	Diaphragm Nut, Complete	Steel & Stainless Steel	1	56196	56310	56310	56349
12 *	Bonnet Gasket	Synthetic Rubber	1	56204-95	56320	56320	56359-95
13	Lock Washer	Steel	(NOTE 13)	24757	13077	13077	10392
14	Cap Screw	Steel	(NOTE 13)	40087	39637	39637	40090
15	Groov-Pin	Stainless Steel	1	56210	30334	30334	30334
16	Diaphragm Case, Upper (4)	(NOTE 11)	1	56208	56214	56216	56347
16	Diaphragm Case, Upper (5)	(NOTE 12)	1	56208	56213	56215	56377
17 *	Diaphragm	Synthetic Rubber	1	38400-94	37809-94	37818-94	36026-94
18	Diaphragm Disc (NOTE 4)	Cast Iron	1	56201	56319	56316	56354
18	Diaphragm Disc (NOTE 5)	Cast Aluminum	1	56200	56318	56315	56353
19	Upper Stem	Stainless Steel	1	56202	56333	56314	56352
20	Bolt	Steel	(NOTE 4)	--	23399	23399	--
21	Spring Clip	Stainless Steel	1	57420	57420	57420	57421
22	Retaining Ring	Copper	2	40327	40327	40327	40327
23	Th'd Sealing Washer	Steel & Synthetic Rubber	8	--	59811	59811	--

NOTE 4 - Used on Cast Iron Actuators only.

NOTE 5 - Used on Cast aluminum Actuators only.

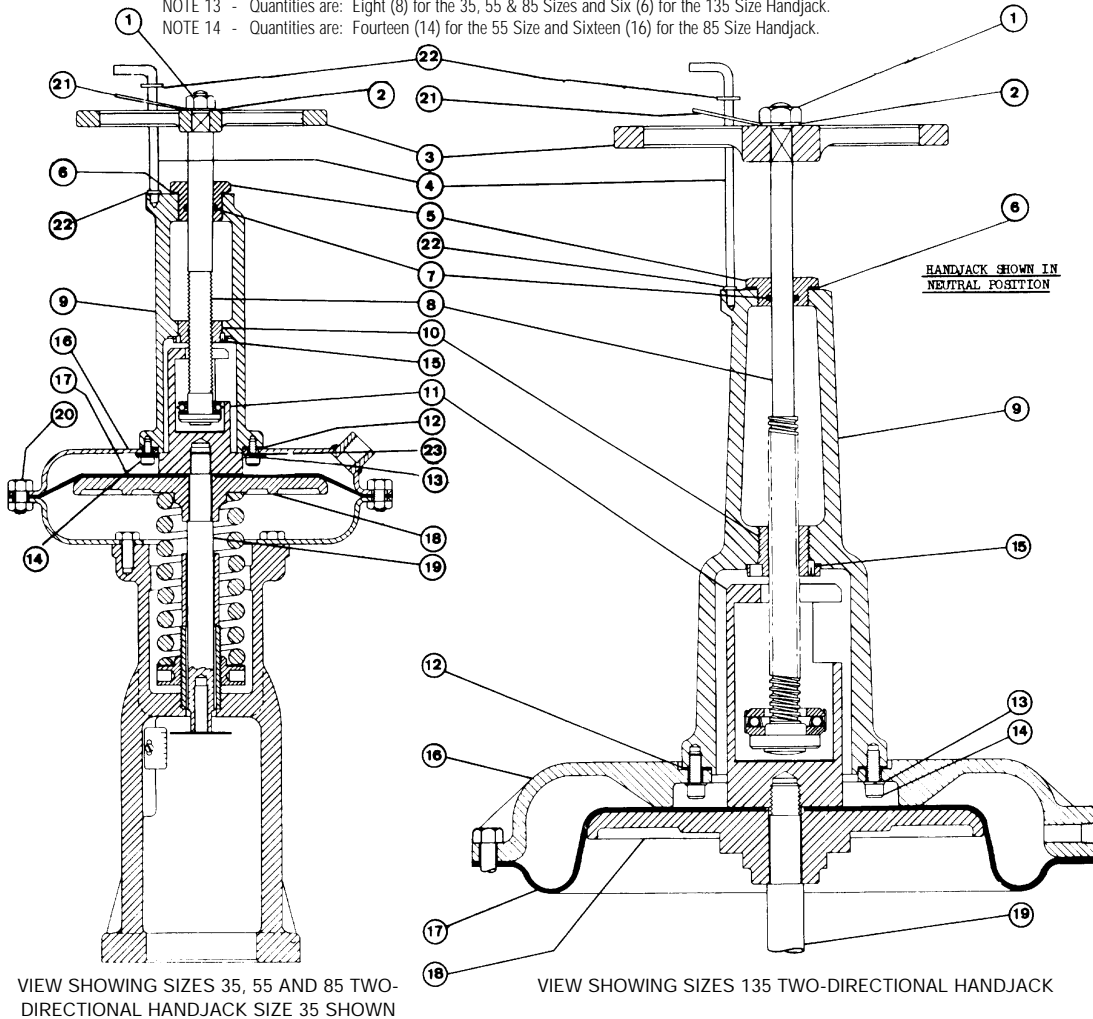
NOTE 11 - Material is Pressed Steel for 35 Handjack and Cast Iron for 55, 85 and 135 Handjacks.

NOTE 12 - Material is Pressed Steel for 35 Handjack and Cast Aluminum for 55, 85 and 135 Handjack.

NOTE 13 - Quantities are: Eight (8) for the 35, 55 & 85 Sizes and Six (6) for the 135 Size Handjack.

NOTE 14 - Quantities are: Fourteen (14) for the 55 Size and Sixteen (16) for the 85 Size Handjack.

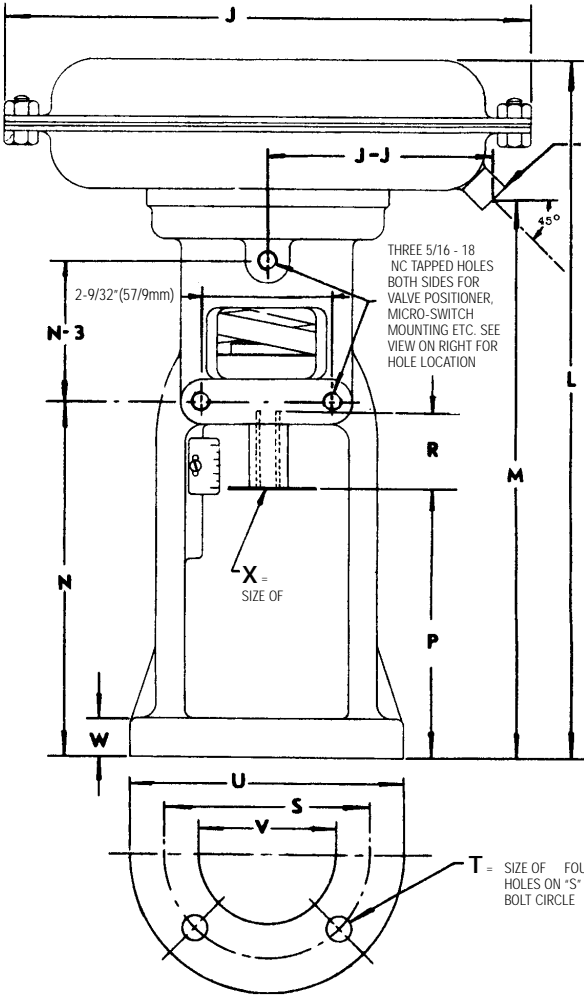
### \* RECOMMENDED SPARE PARTS



# DIAPHRAGM CONTROL VALVE DIAPHRAGM ACTUATORS - REVERSE ACTING

MAXIMUM ALLOWABLE AIR PRESSURE FOR ALL  
DIAPHRAGM ACTUATORS IS 60 PSI

SUPERSEDES DWG. NO. CV-12700-F, ALT 2

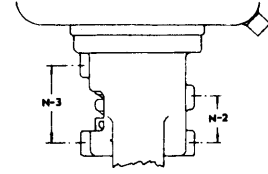


EXTERNAL VIEW OF REVERSE ACTING DIAPHRAGM ACTUATOR  
(USE FOR DIMENSIONAL PURPOSES ONLY)

OPERATING MEDIUM  
PIPE CONNECTION  
Z NPT

THREE 5/16 - 18  
NC TAPPED HOLES  
BOTH SIDES FOR  
VALVE POSITIONER,  
MICRO-SWITCH  
MOUNTING ETC. SEE  
VIEW ON RIGHT FOR  
HOLE LOCATION

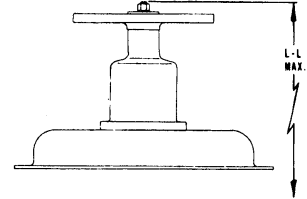
SIZE	DIAPHRAGM ACTUATOR	MAX TRAVEL
35R	in mm	3/4 19.0
55R & 55AR	in mm	1-1/2 38-1
85R & 85AR	in mm	2-1/8 54.0
135R	in mm	3 76.2



VIEW SHOWING TAPPED HOLE LOCATION FOR VALVE POSITIONER, MICRO-SWITCH MOUNTING, ETC.

SIZE		N-2	N-3
35R	in	2-1/2	2-1/2
	mm	63.5	63.5
55R & 55AR	in	2-1/2	3
	mm	63.5	76.2
85R & 85AR	in	2-1/2	4-1/8
	mm	63.5	104.8
135R	in	2-1/2	5-5/8
	mm	63.5	142.9

EXTERNAL VIEW OF HAND OPERATING DEVICE  
(USE FOR DIMENSIONAL PURPOSES ONLY)



ACTUATOR SIZE		DIMENSIONS IN INCHES AND MILLIMETERS					
		L - L (MAX.)		NET WT.** WITH H.O.D.		NET WT.** WITH HANDJACK	
		HAND OPERATING DEVICE	TWO DIRECTIONAL HANDJACK	CAST IRON	ALUM.	CAST IRON	ALUM.
35R	in	16-3/4	22	38	20	45	27
	mm	425.5	558.8	17.2	9.1	20.4	12.2
55R	in	26-3/8	37	65	35	70	40
	mm	26-3/8	939.8	29.5	15.9	31.7	18.1
55AR	in	26-3/8	37	65	35	70	40
	mm	669.9	939.8	29.5	15.9	31.7	18.1
85R	in	31-5/8	42	122	54	136	66
	mm	803.3	1066.8	55.3	24.5	61.7	29.9
85R*	in	32-1/4	42-5/8	125	56	142	68
	mm	819.2	1082.7	56.7	25.4	64.4	30.8
85AR	in	34-1/4	44-5/8	128	59	145	71
	mm	870	1133.5	58.1	26.8	65.8	32.2
135R	in	43-5/8	59	207	165	230	178
	mm	1108.1	1498.6	93.9	74.8	104.3	80.7

ACTUATOR SIZE		DIMENSIONS IN INCHES AND MILLIMETERS													NET WT.**		
		J	L	M	J-J	N	P	R	S	T	U	V	W	X	Z	IRON	ALUM.
35R	in	9-1/4	12-3/8	9-7/8	3-15/16	6-1/4	4	1-3/4	3-13/16	9/16	4-13/16	2.687	11/16	3/8-24	1/4	35	20 lb
	mm	235.0	314.3	250.8	100.0	158.8	101.6	44.5	96.8	14.3	122.2	68.2	17.5	1 NPT	15.9	9.1 kg	
55R	in	12	18	14-1/4	5-1/16	6-7/8	4	1-3/4	3-13/16	9/16	4-13/16	2.687	1	3/8-24	1/4	60	30 lb
	mm	304.8	457.2	362.0	128.6	174.6	101.6	44.5	96.8	14.3	122.2	68.2	25.4	1 NPT	27.2	13.6 kg	
55AR	in	12	18	14-1/4	5-1/16	6-7/8	4	1-3/4	3-13/16	9/16	4-13/16	2.687	1	1/2-20	1/4	60	30 lb
	mm	304.8	457.2	362.0	128.6	174.6	101.6	44.5	96.8	14.3	122.2	68.2	25.4	1 NPT	27.2	13.6 kg	
85R	in	14-3/4	23-1/4	18-3/4	6-1/4	8-9/16	4-5/16	2-1/4	3-13/16	9/16	4-13/16	2.687	1-1/4	1/2-20	1/4	117	54 lb
	mm	374.7	590.6	476.3	158.8	217.5	109.5	57.2	96.8	14.3	122.2	68.2	31.8	1 NPT	53.1	24.5 kg	
85R*	in	14-3/4	23-7/8	19-3/8	6-1/4	9-3/16	4-15/16	2-1/4	4-3/4	11/16	6	3.500	1-5/16	1/2-20	1/4	120	56 lb
	mm	374.7	606.4	492.1	158.8	233.4	125.4	57.2	120.7	17.5	152.4	88.9	33.3	1 NPT	54.4	25.4 kg	
85AR	in	14-3/4	25-7/8	21-3/8	6-1/4	11-1/8	5-9/16	3-1/8	4-3/4	11/16	6	3.500	1-5/16	3/4-16	1/4	123	59 lb
	mm	374.7	657.2	542.9	158.8	282.6	141.3	79.4	120.7	17.5	152.4	88.9	33.3	1 NPT	55.8	26.8 kg	
135R	in	18	32-1/4	28-3/8	9	11-1/8	5-9/16	3-1/8	4-3/4	11/16	6	3.500	1-5/16	3/4-16	3/8	197	155 lb
	mm	457.2	819.2	720.7	625.5	282.6	141.3	79.4	120.7	17.5	153.4	88.9	33.3	1 NPT	89.4	70 kg	
135R(1-1/4)	in	18	32-1/4	28-3/8	9	11-1/8	5-9/16	3-1/8	5-3/4	11/16	7	4.500	1-5/16	3/4-16	3/8	197	155 lb
	mm	457.2	819.2	720.7	228.6	282.6	141.3	79.4	146.1	17.5	177.8	114.3	33.3	1 NPT	89.4	70.3 kg	

▲ DIRECT REPLACEMENT FOR 50R ACT.

\* Mounting Flange Dimensions same as 135R Yoke.

\*\* Approximate

WHEN ORDERING PARTS, PLEASE GIVE PART NAME AND PART REFERENCE NUMBER FROM TABLE BELOW,  
USE PART NUMBER ONLY TO LOCATE PART ON DRAWING.

PART NO.	PART NAME	MATERIAL	QTY. PER UNIT	REF. NOS. - EACH SIZE			
				35R	55R & 55 AR	85R & 85AR	135R
1	Nut	Steel	1	13243	13243	13243	3676
2	Lockwasher	Steel	1	10392	10392	10392	10513
3	Handwheel, Complete	Cast Aluminum	1	43064	42226	42226	42227
4	Handscrew Bearing Assy.	Stainless Steel	1	43043	51456	51456	42183
5	Lockwasher	Steel	(NOTE 3)	11467	13077	13077	10392
6	Screw	Stainless Steel	(NOTE 3)	17186	41933	41933	40090
7	Bonnet, Complete (Note 4)	(Note 1)	1	38720	42224	42224	42225
7	Bonnet, Complete (Note 5)	(Note 2)	1	39077	42224	42224	42225
8	Diaphragm Nut	Steel	1	38696	42220	41793	42169
14	Diaphragm Case, Upper	Pressed Steel	1	38748	41788	41787	--
14	Diaphragm Case, Upper (4)	Cast Iron	1	--	--	--	42145
14	Diaphragm Case, Upper (5)	Cast Aluminum	1	--	--	--	42144

NOTE 1 - Material is Cast Iron for 35R Iron Actuator and Cast Aluminum for 55R, 55AR, 85R, 85AR & 135R Iron Actuators.  
 NOTE 2 - Material is Cast Bronze for 35R Aluminum Actuator and Cast Aluminum for 55R, 55AR, 85R, 85AR & 135R Aluminum Actuators.  
 NOTE 3 - Quantities are: Four (4) for 35R Actuator and Six (6) for 55R, 55AR, 85R, 85AR & 135R Actuator.  
 NOTE 4 - Used on Cast Iron Actuators only.  
 NOTE 5 - Used on Cast Aluminum Actuators only.

PART NO.	PART NAME	MATERIAL	QTY. PER UNIT	REFERENCE NUMBERS - EACH SIZE							
				35R	55R	55AR	85R	85AR	85R* (135)	135R	135R WITH 1-1/4" STEM
15	Diaphragm Case, Upper	Pressed Steel	1	38392	37832	37832	37833	37833	37833	--	--
15	Diaphragm Case, Upper (NOTE 4)	Cast Iron	1	--	--	--	--	--	--	36194	36194
15	Diaphragm Case, Upper (NOTE 5)	Cast Aluminum	1	--	--	--	--	--	--	36189	36189
16	Nut	Steel	1	24005	36229	36229	36229	36229	36229	36228	36228
17	Diaphragm Disc	NOTE 6	1	--	--	--	--	--	SEE TABLE	--	--
18	Nut	Steel	NOTE 7	13901	26585	26585	26585	26585	26585	26585	26585
19	Bolt	Steel	NOTE 7	38420	37707	37797	37797	37797	37797	24313	24313
20*	Diaphragm	Synthetic Rubber	1	38400-94	37809-94	37809-94	37818-94	37818-94	37818-94	36026-94	36026-94
21	Diaphragm Case, Lower	Pressed Steel	1	38391	37774	37774	38081	38081	38081	--	--
21	Diaphragm Case, Lower (NOTE 4)	Cast Iron	1	--	--	--	--	--	--	23940	23940
21	Diaphragm Case, Lower (NOTE 5)	Cast Aluminum	1	--	--	--	--	--	--	34713	34713
22	Collar, Comp. (NOTE 4)	NOTE 11	1	38412	37760	37760	38113	38113	38113	28268	28268
22	Collar, Comp. (NOTE 5)	NOTE 11	1	38412	37760	37760	38113	38113	38113	52261	52261
23	Cap Screw	Steel	NOTE 8	38420	37796	37796	23400	23400	23400	--	--
24	Nut, Spacer Stud	Steel	6	--	--	--	--	--	--	3676	3676
26*	Diaphragm Base Gasket	Synthetic Rubber	1	--	37761	37761	38107	38107	38107	--	--
27	Stem Seal Ring	Steel	1	--	37731	37731	37731	37731	37731	--	--
28	Screw	Stainless Steel	6	--	30501	30501	30501	30501	30501	--	--
29*	Stem Seal	Synthetic Rubber	1	38417	37740-95	37740-95	37740-95	37740-95	37740-95	28135	28135
29	Stem Seal	Viton Replacement	1	--	58045	58045	58045	58045	58045	--	--
30	Top Spring Seal	NOTE 9	1	--	NOTE 9	NOTE 9	NOTE 9	NOTE 9	NOTE 9	--	--
31	Stem Seal Collar	Cold Rolled Steel	1	38416	28177	28177	28177	28177	28177	28270	28270
32	Spacer Stud	Steel	6	--	--	--	--	--	--	28154	28154
33	Spacer (NOTE 4)	Cast Iron	1	--	--	--	--	--	--	28267	28267
33	Spacer (NOTE 5)	Cast Aluminum	1	--	--	--	--	--	--	34731	34731
34	Yoke (NOTE 4)	Cast Iron	1	38343	37728	37728	37973	57556	38160	34855	38594
34	Yoke (NOTE 5)	Cast Aluminum	1	38940	37727	37727	37972	57555	38161	34702	43383
35	Upper Stem	Stainless Steel	1	38408	37758	61387	38085	57522	38085	30254	30254
36	Adjusting Spring	Steel, Black Japanned	1	--	--	--	--	SEE TABLE	--	--	--
37	Inner Adjusting Spring	Steel, Black Japanned	1	--	--	--	--	SEE TABLE	--	--	--
38	Washer, Inner Adj. Spring (NOTE 10)	Stainless Steel	1	--	--	--	25393	25393	25393	25394	25394
39	Washer	Stainless Steel	1	38401	23260	23260	24271	24271	24271	23951	23951
40	Adjusting Nut (NOTE 4)	Cast Iron	1	38395	31641	31641	28174	57523	28174	28265	28265
40	Adjusting Nut (NOTE 5)	Cast Bronze	1	58350	30623	30623	31592	57524	31592	30056	30056
41	Indicator Disc	Stainless Steel	1	38406	38920	15672	38921	58012	28921	38922	38922
42	Indicator Scale	Aluminum	1	38404	--	--	--	SEE TABLE	--	--	--
43	Screw	Steel, Plated	NOTE 12	34728	34728	34728	34728	34728	34728	34728	34728
45	Washer	Steel	1	39784	--	--	--	--	--	--	--

NOTE 4 - Used on Cast Iron Actuators only.

\* RECOMMENDED SPARE PARTS

NOTE 5 - Used on Cast Aluminum Actuators only.

NOTE 6 - Material is Steel for the 35R, 55R, 85R and 85AR Iron and Aluminum Actuators and 135R Aluminum Actuator, and Cast Iron for the Iron Actuator.

NOTE 7 - Quantities are: Twelve (12) for the 35R size, Fourteen (14) for the 55R & 55AR sizes, Sixteen (16) for the 85R & 85AR sizes and Twenty-four (24) for the 135R Actuator.

NOTE 8 - Quantities are: Eight (8) for the 35R, 55R & 55AR sizes and Six (6) for the 85R & 85AR size Actuators.

NOTE 9 - Material is steel for the 55R & 55AR, Ref. No. 37802; Cast Iron for the 85R & 85AR Iron Actuator, Ref. No. 38116 and Cast Aluminum for the 85R & 85AR Aluminum Actuator, Ref. No. 38117.

NOTE 10 - Used only when Inner Adjusting spring, Part No. 37 is used.

NOTE 11 - Material is Steel for 35R Iron and Aluminum Actuators, Aluminum Alloy for 55R, 55AR, 85R Aluminum and Iron Actuators, Cast Iron for 135R Iron Actuator and Stainless Steel for 135R Aluminum Actuator.

NOTE 12 - Quantity is One (1) for 35R size and Two (2) for all other size Actuators.

\* Mounting Flange dimensions same as 135R Yoke. Size 85R is completely interchangeable with 135R Actuator Trim.

PART NO. 17 DIAPHRAGM DISC					
VALVE TRAVEL	ACTUATOR SIZE				
	35R	55R & 55AR	85R & 85AR	IRON	ALUM.
5/8	38351	37683	37686	49247	49239
3/4	38351	37683	37686	49247	49239
7/8	--	37683	37686	49247	49239
1	--	37683	37686	28264	34637
1-1/4	--	49950	38699	28264	34637
1-1/2	--	37684	38699	28263	34645
2	--	--	37685	28262	34646
2-1/8	--	--	37685	28262	34646
2-1/4	--	--	--	36075	36070
2-3/4	--	--	--	36075	36070
3	--	--	--	36075	36070

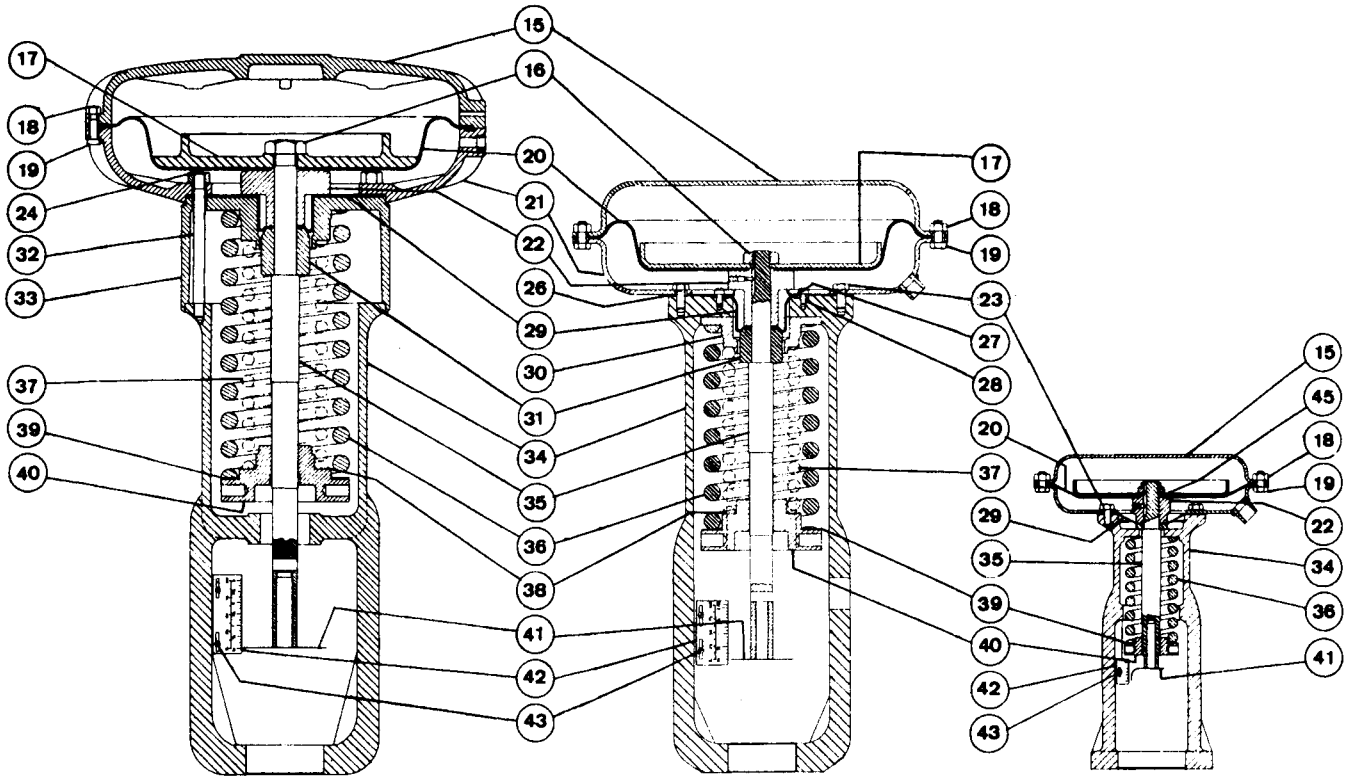
PART NO. 37 INNER ADJUSTING SPRING				
VALVE TRAVEL	ACTUATOR SIZE			
	35R	55R & 55AR	85R & 85AR	135R
5/8	--	--	37718	--
7/8	--	--	24481	25389
1	--	--	--	25389
1-1/4	--	--	--	25390
1-1/2	--	--	--	25390

PART NO. 36 DIAPHRAGM DISC				
VALVE TRAVEL	ACTUATOR SIZE			
	35R	55R & 55AR	85R & 85AR	135R
5/8	38422	41969	35014	--
3/4	38422	41968	37719	42489
7/8	--	23239	24299	42489
1	--	24296	35014	23996
1-1/8	--	43078	41970	--
1-1/4	--	24297	24299	41971
1-1/2	--	24298	24300	24303
2	--	--	24301	42489
2-1/8	--	--	42488	41972
2-1/4	--	--	--	24303
2-3/4	--	--	--	23996
3	--	--	--	23996

PART NO. 42 INDICATOR SCALE	REF. NO.
INDICATOR SCALES SUBJECT TO ACTUATOR MAXIMUM TRAVEL LIMIT	
VALVE TRAVEL	
1/4"	48224
3/8"	48048
1/2"	48047
5/8"	38904
3/4"	38905
7/8"	38906
1"	38907
1-1/8"	38908
1-1/4"	38909
1-1/2"	38910
1-3/4"	49641
2"	38911
2-1/8"	38912
2-1/4"	38913
2-3/4"	38914
3"	38915

# DIAPHRAGM CONTROL VALVE DIAPHRAGM ACTUATORS - REVERSE ACTING

## DIAPHRAGM ACTUATOR

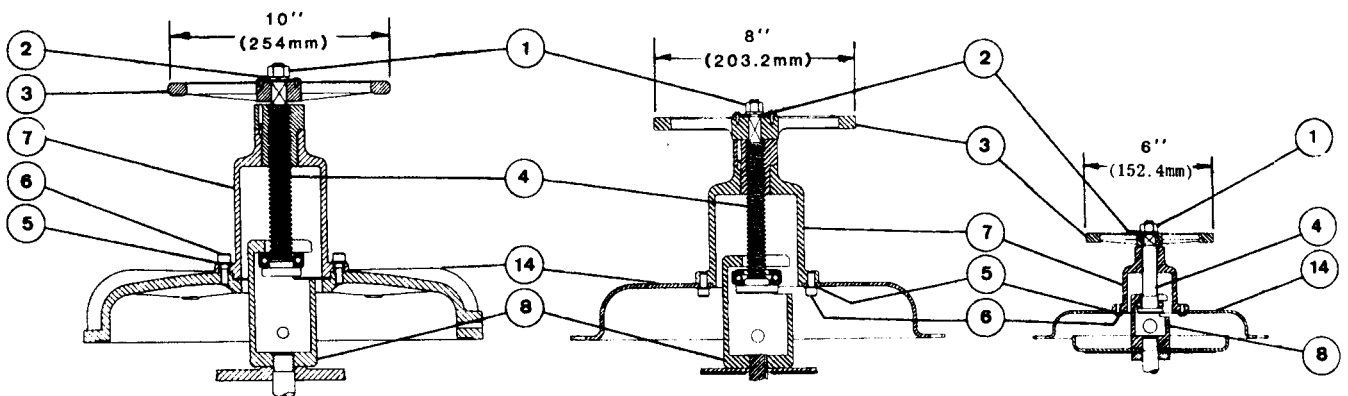


VIEW SHOWING SIZE 135R DIAPHRAGM ACTUATOR

VIEW SHOWING SIZES 55R, 55AR, 85R & 85AR  
DIAPHRAGM ACTUATORS

VIEW SHOWING SIZES 35R  
DIAPHRAGM ACTUATORS

## HAND OPERATING DEVICE



VIEW SHOWING SIZE 135R HAND OPERATING  
DEVICE

VIEW SHOWING SIZES 55R, 55AR, 85R & 85AR  
HAND OPERATING DEVICE

VIEW SHOWING SIZES 35R  
HAND OPERATING DEVICE

# DIAPHRAGM CONTROL VALVE DIAPHRAGM ACTUATORS - REVERSE ACTING

## TWO - DIRECTIONAL HANDJACK

WHEN ORDERING PARTS, PLEASE GIVE PART NAME AND PART REFERENCE NUMBER FROM TABLE BELOW,  
USE PART NUMBER ONLY TO LOCATE PART ON DRAWING.

PART NO.	PART NAME	MATERIAL	QTY. PER UNIT	REF. NOS. - EACH SIZE			
				35R	55R-55AR	85R-85AR	135R
1	Nut	Steel	1	13243	13243	13243	3676
2	Lock Washer	Steel	1	10392	10392	10392	10513
3	Handwheel	Cast Aluminum	1	43064	56321	56321	53834
4	Lock Pin	Steel	1	57440	57441	57441	57442
5	Upper Bushing	Aluminum	1	56205	56317	56317	56362
6	Gasket	Sheet Packing	1	16506	33874	33874	56364
7	O-Ring	Synthetic Rubber	1	24773	24773	24773	55561
8	Hand Screw, Complete	Stainless Steel	1	56194	56306	56306	56355
9	Bonnet	Cast Aluminum	1	56193	56305	56305	56348
10	Lower Bushing	Stainless Steel	1	56206	42082	42082	42138
11	Diaphragm Nut, Complete	Steel	1	56196	56310	56310	56349
12	Bonnet Gasket	Sheet Packing	1	56204	56320	56320	56359
13	Lockwasher	Stainless Steel	(NOTE 11)	24757	13077	13077	10392
14	Cap Screw	Steel	(NOTE 11)	40087	39637	39637	40090
15	Groov-Pin	Stainless Steel	1	56210	30334	30334	30334
16	Diaphragm Case, Upper (4)	(NOTE 12)	1	56192	56214	56216	56526
16	Diaphragm Case, Upper (5)	(NOTE 13)	1	56192	56213	56215	59527
17	Upper Stem	Stainless Steel	1	56199	--	--	--
18	Bolt	Steel	(NOTE 14)	--	23399	23399	--
19	Spring Clip	Stainless Steel	1	57420	57420	57420	57421
20	Retaining Ring	Copper	2	40327	40327	40327	40327
21	Thrd Sealing Washer	Steel & Synthetic Rubber	8	--	59811	59811	--

NOTE 4 - Used on Cast Iron Actuators only.

NOTE 5 - Used on Cast Aluminum Actuators only.

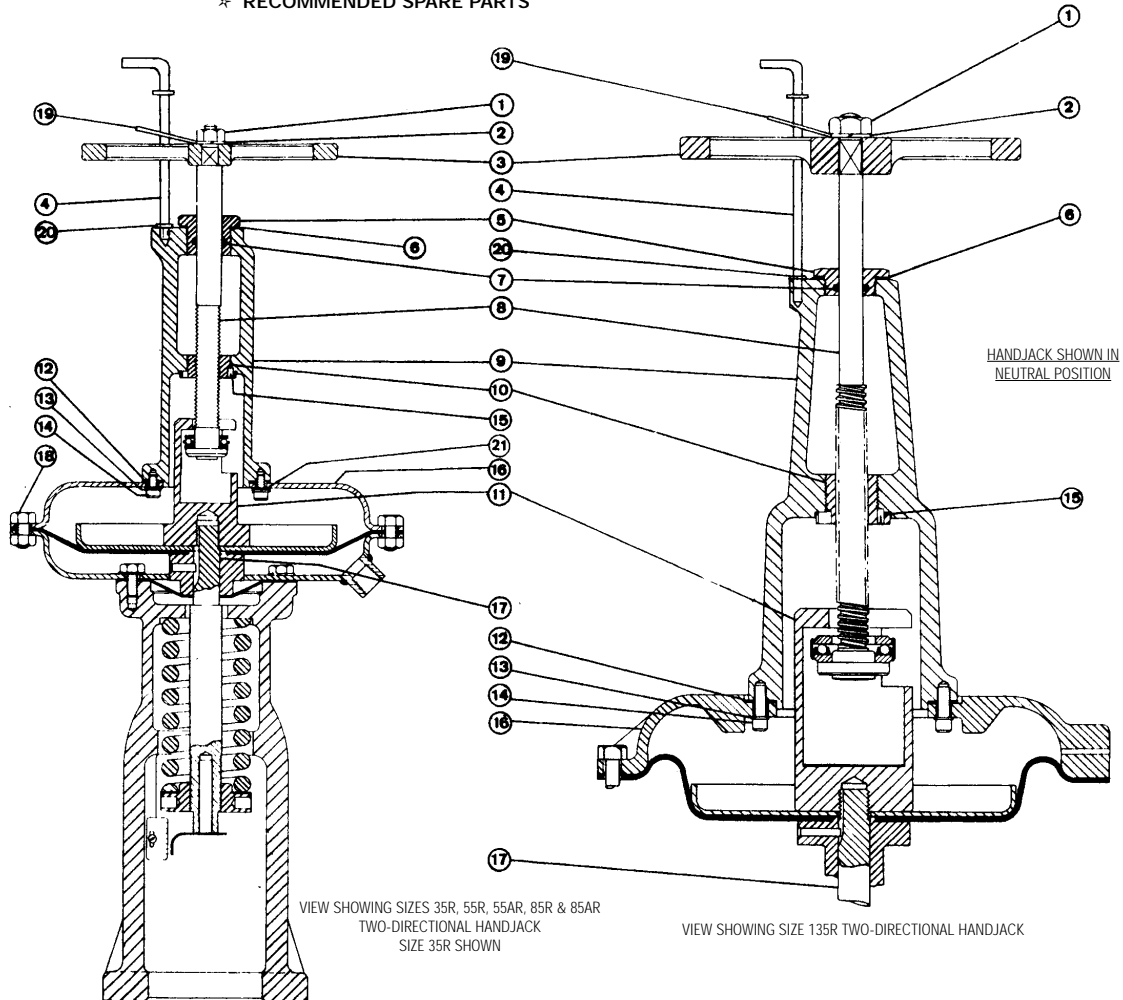
NOTE 11 - Quantities are: Eight (8) for the 35R, 55R, 55AR, 85R, 85AR and Six (6) for the 135R Actuator.

NOTE 12 - Material is Pressed Steel for 35R Actuator and Cast Iron for 55R, 55AR, 85R, 85AR & 135R Iron Actuators.

NOTE 13 - Material is Pressed Steel for 35R Actuator and Cast Aluminum for 55R, 55AR, 85R, 85AR & 135 Aluminum Actuators.

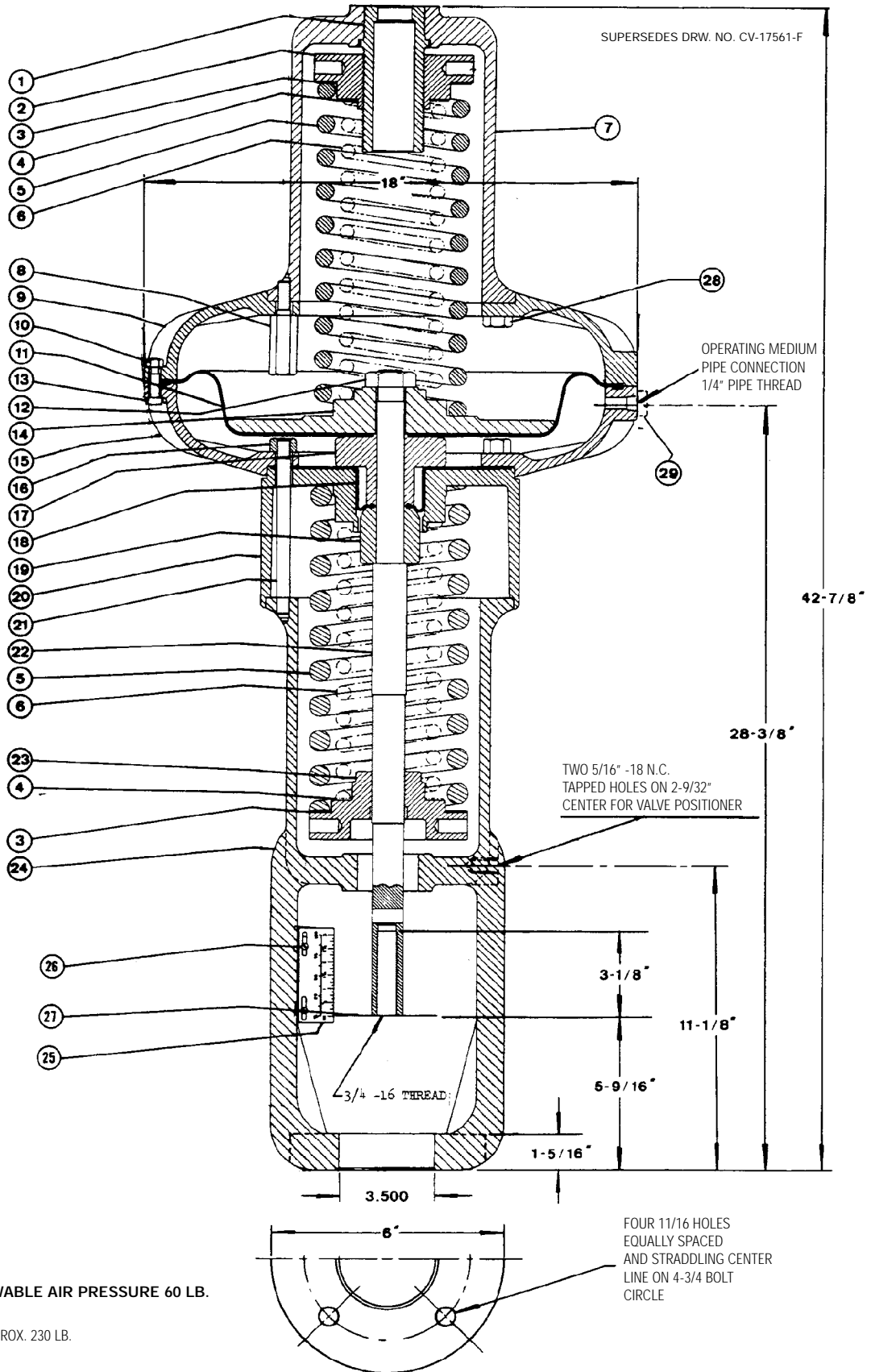
NOTE 14 - Quantities are: Fourteen (14) for the 55 sizes and Sixteen (16) for the 85 size Handjack.

### \* RECOMMENDED SPARE PARTS



# DIAPHRAGM CONTROL VALVE 135 RH HIGH THRUST ACTUATOR

SUPERSEDES DRW. NO. CV-17561-F



MAXIMUM ALLOWABLE AIR PRESSURE 60 LB.

NET WT. APPROX. 230 LB.

## DIAPHRAGM CONTROL VALVE 135 RH HIGH THRUST ACTUATOR

DRAWING NUMBER 10/0.4.5, SIZE 135RH HIGH THRUST ACTUATOR  
WHEN ORDERING PARTS, PLEASE GIVE PART NAME AND PART REFERENCE NUMBER FROM TABLE BELOW  
USE PART NUMBER ONLY TO LOCATE PART ON DRAWING.

PART NO.	PART NAME	MATERIAL	QTY. PER UNIT	REF. NO.
1	Adjustor Sleeve	Stainless Steel	1	34655
2	Spring Adjustor (NOTE 1)	Cast Iron	1	23948
2	Spring Adjustor (NOTE 2)	Cast Aluminum	1	30070
3	Washer	Stainless Steel	2	23951
4	Washer, Inner Spring	Stainless Steel	2	25394
5	Actuator Spring, Outer	Steel, Black Japanned	2	(NOTE 4)
6	Actuator Spring, Inner	Steel, Black Japanned	2	(NOTE 4)
7	Spring Housing (NOTE 1)	Cast Iron	1	49835
7	Spring Housing (NOTE 2)	Cast Aluminum	1	52335
8	Travel Stop	Cold Rolled Steel	3	SEE TABLE
9	Diaphragm Case, Upper (NOTE 1)	Cast Iron	1	49838
9	Diaphragm Case, Upper (NOTE 2)	Cast Aluminum	1	52334
10	Nut	Steel	24	26585
11	Diaphragm	Synthetic Rubber	1	36026
12	Nut	Steel	1	36228
13	Bolt	Steel	24	24313
14	Diaphragm Plate (NOTE 1)	Cast Iron	1	49836
14	Diaphragm Plate (NOTE 2)	Cast Aluminum	1	52333
15	Diaphragm Case, Lower (NOTE 1)	Cast Iron	1	23940
15	Diaphragm Case, Lower (NOTE 2)	Cast Aluminum	1	34713
16	Nut	Steel	6	3676
17	Collar (NOTE 1)	Cast Iron	1	28268
17	Collar (NOTE 2)	Stainless Steel	1	52261
18	Stem Seal	Synthetic Rubber	1	28135
19	Stem Seal Collar	Cold Rolled Steel	1	28270
20	Spacer (NOTE 1)	Cast Iron	1	28267
20	Spacer (NOTE 2)	Cast Aluminum	1	34731
21	Stud	Steel	6	28154
22	Actuator Stem	Stainless Steel	1	49804
23	Spring Adjustor (NOTE 1)	Cast Iron	1	28265
23	Spring Adjustor (NOTE 2)	Cast Aluminum	1	30065
24	Yoke (NOTE 1)	Cast Iron	1	34855
24	Yoke (NOTE 2)	Cast Aluminum	1	34702
25	Travel Indicator Scale	Aluminum	1	SEE TABLE
26	Screw	Stainless Steel	2	34728
27	Travel Indicator	Stainless Steel	1	38922
28	Cap Screw	Steel	(NOTE 3)	24002
29	Reducing Bushing (NOTE 2)	Stainless Steel	1	34727

NOTE 1 - Used on Cast Iron Actuators only.

NOTE 2 - Used on Cast Aluminum Actuators only.

NOTE 3 - Quantity Three (3) for travels up to 2-1/8" and  
Quantity Size (6) for travels over 2-1/8"

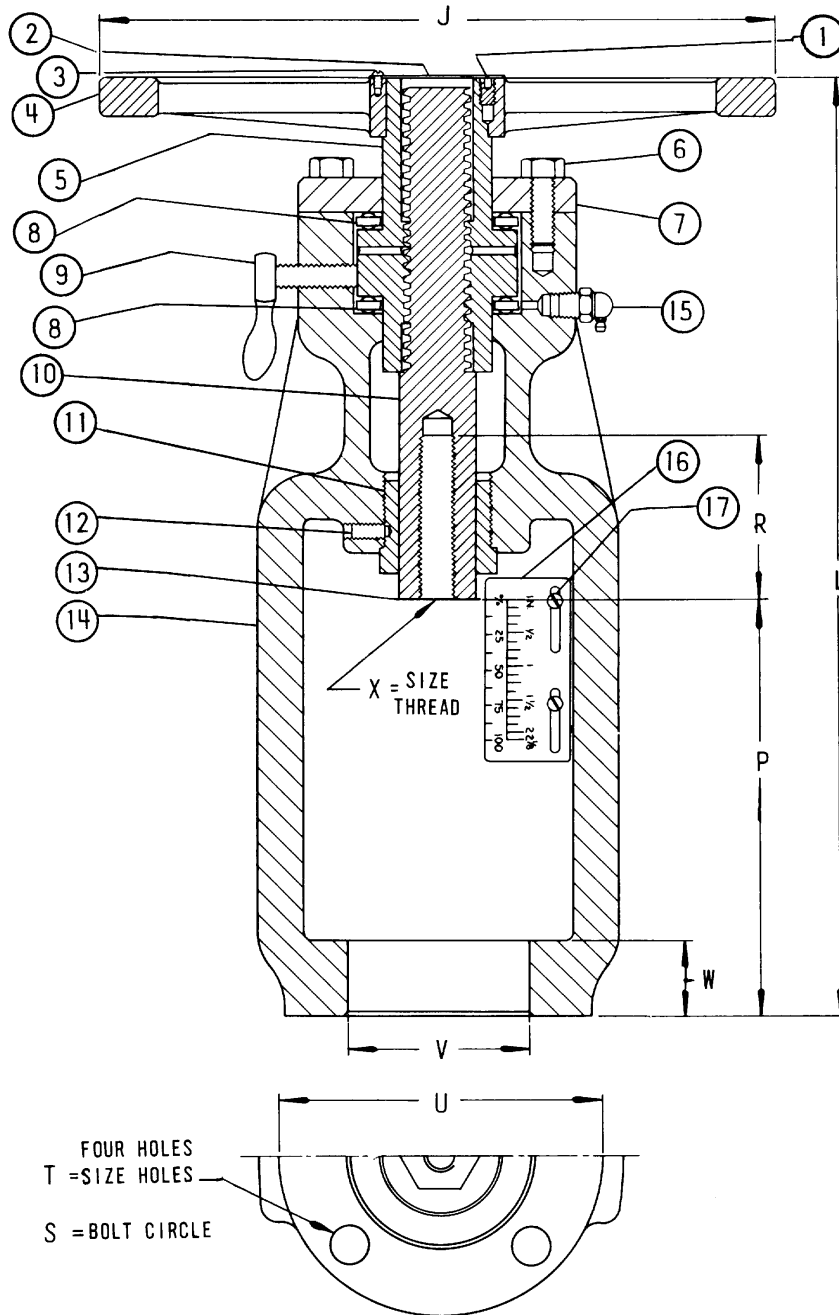
NOTE 4 - Springs selected by Leslie Co., based on Thrust and Travel requirements.

VALVE TRAVEL	TRAVEL STOP PART NO. 8	TRAVEL INDICATOR SCALE PARTS NO. 25
3/4"	50299	38905
7/8"	50300	38906
1"	50300	38907
1-1/8"	50300	38908
1-1/4"	50301	38909
1-1/2"	50301	38910
1-3/4"	50302	49641
2"	50302	38911
2-1/8"	50302	38912
2-1/4"	--	38913
2-3/4"	--	38914
3"	--	38915

# MANUAL CONTROL VALVE ACTUATOR SIZES 55, 85 & 85A

ACTUATOR SIZE	MAX. TRAVEL	J	L	P	R	S	T	U	V	W	X	NET WT. LB.(1)
55	1-1/2	8	11-7/8	5-1/2	1-3/4	3-13/16	9/16	4-13/16	2.687	7/8	3/8 - 24	18
85	2-1/8	10	14-5/16	6-7/16	2-1/4	3-13/16	9/16	4-13/16	2.687	1-1/8	1/2 - 20	24
85A	2-1/8	10	16-7/16	8-9/16	3	4-3/4	11-16	6	3.500	1-3/16	3/4 - 16	30

(1) APPROXIMATE



## MANUAL CONTROL VALVE ACTUATOR SIZES 55, 85 & 85A

WHEN ORDERING PARTS, PLEASE SPECIFY PART NUMBER, PART NAME AND INCLUDE SIZE, CLASS, CODE AND SERIAL NUMBER STAMPED ON DATA PLATE

PART NO.	PART NAME	MATERIAL	SIZE		
			55	85	85A
1	SET SCREW	STEEL	13780	13778	13778
2	COVER PLATE	ALUMINUM	39406	39058	39058
3	SCREW	STEEL , PLATED	38062	34728	34728
4	HANDWHEEL	CAST ALUMINUM	39407	39053	39053
5	SLEEVE, RIGHT HAND	COLD ROLLED STEEL	39397	39040	39040
5	SLEEVE, LEFT HAND	COLD ROLLED STEEL	39400	39041	39041
6	CAP SCREW	STEEL	13852	13853	13853
7	BEARING COVER	COLD ROLLED STEEL	39401	39043	39043
8	THRUST BEARING	STAINLESS STEEL	38721	38722	38722
9	LOCK SCREW, COMPLETE	BRONZE AND STEEL	38937	38937	38937
10	JACK SCREW, RIGHT HAND	BRONZE	39391	39036	57628
10	JACK SCREW, LEFT HAND	BRONZE	39392	39037	57629
11	GUIDE BUSHING	STAINLESS STEEL	39402	39048	39048
12	SCREW	STAINLESS STEEL	34753	34753	34753
13	INDICATOR DISC	STAINLESS STEEL	39157	39065	57915
14	YOKE	CAST IRON	39144	39010	57638
15	GREASE FITTING	STEEL, PLATED	35437	35437	35437
16	INDICATOR PLATE	ALUMINUM	SEE TABLE		
17	SCREW	STEEL, PLATED	34728	34728	34728

PART NO. 16 INDICATOR PLATE INDICATOR PLATES SUBJECT TO MAXIMUM TRAVEL LIMIT	
VALVE TRAVEL	REF. NO
5/8"	38904
3/4"	38905
7/8"	38906
1"	38907
1-1/8"	38908
1-1/4"	38909
1-1/2"	38910
2"	38911
2-1/8"	38912

IN ORDER TO ESTABLISH THE PROPER SIZE MANUAL ACTUATOR TO USE, CALCULATE THE SIZE DIAPHRAGM ACTUATOR THAT WOULD BE REQUIRED AND THEN USE THE EQUIVALENT SIZE MANUAL ACTUATOR.

THIS IS NECESSARY SO AS TO KEEP THE HAND-WHEEL TORQUE WITHIN NORMAL LIMITS. FOR EXAMPLE, FOR LOW PRESSURE DROPS, IT IS POSSIBLE TO USE A SMALLER SIZE ACTUATOR BECAUSE THE FORCE PRODUCED BY THE SMALLER EFFECTIVE AREA IS SUFFICIENT TO OPERATE THE VALVE. FOR THE SAME REASON IT WILL BE POSSIBLE TO USE THE SMALLER SIZE MANUAL ACTUATOR WHICH HAS A SMALLER HANDWHEEL, YET THE FORCE REQUIRED AT THE END OF HANDWHEEL WILL BE WITHIN THE LIMITS OF WHAT A MAN CAN EXERT ON THE END OF THE HANDWHEEL.

IF SIZE 35 DIAPHRAGM ACTUATOR WOULD BE REQUIRED, USE SIZE 55 MANUAL ACTUATOR.

SIZE 135 MANUAL ACTUATOR NOT AVAILABLE. SIZE 85A COMPLETELY INTERCHANGEABLE WITH 135 ACTUATOR. USE 85A IN PLACE OF 135 UP TO MAXIMUM OPERATING LIMITS OF 85A ACTUATOR.

CODE DESIGNATION FOR CAST IRON MANUAL ACTUATOR WILL BE:

SIZE 55 - AZ  
SIZE 85 - BZ  
SIZE 85A - BZA

CLASS WILL USE A Z AT THE SUFFIX TO DESIGNATE THE MANUAL ACTUATOR.

FOR EXAMPLE:

D-5 WITH MANUAL ACTUATOR = CLASS DZ-2  
DB-3 WITH MANUAL ACTUATOR = CLASS DBZ-1  
DBS-3 WITH MANUAL ACTUATOR = CLASS DBSZ-1  
DBY-1 WITH MANUAL ACTUATOR = CLASS DBYZ-1  
DBYS-1 WITH MANUAL ACTUATOR = CLASS DBYSZ-1  
DL-3 WITH MANUAL ACTUATOR = CLASS DLZ-1  
DLA-3 WITH MANUAL ACTUATOR = CLASS DLAZ-1  
DLAS-1 WITH MANUAL ACTUATOR = CLASS DLASZ  
DLS-1 WITH MANUAL ACTUATOR = CLASS DLSZ  
DLT WITH MANUAL ACTUATOR = CLASS DLTZ  
DLTS WITH MANUAL ACTUATOR = CLASS DLTSZ  
DOAS WITH MANUAL ACTUATOR = CLASS DOASZ  
DOS WITH MANUAL ACTUATOR = CLASS DOSZ  
DOUF WITH MANUAL ACTUATOR = CLASS DOUFZ  
DOUS WITH MANUAL ACTUATOR = CLASS DOUSZ  
DS-4 WITH MANUAL ACTUATOR = CLASS DSZ-1  
DV WITH MANUAL ACTUATOR = CLASS DVZ  
DVS-1 WITH MANUAL ACTUATOR = CLASS DVSZ-1  
DVSS-1 WITH MANUAL ACTUATOR = CLASS DVSSZ-1