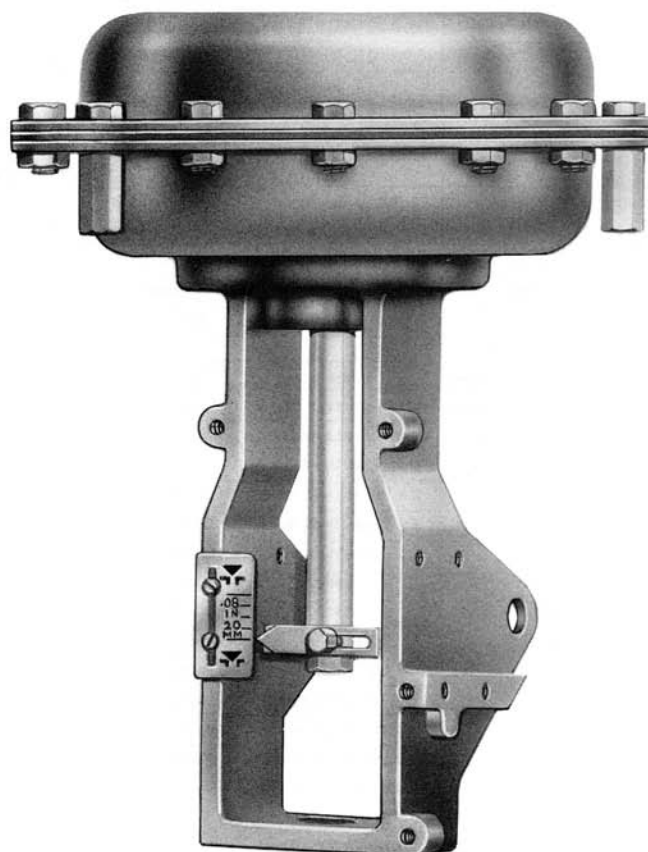


Parts Supplement for 87/88 Series Pneumatic Spring Diaphragm Actuator

NOTE: This parts supplement lists standard construction parts only. Refer to the specifications stamped on the **unit serial plate** and always provide the serial number when ordering parts to ensure that the correct items are supplied.



Include serial number when ordering.

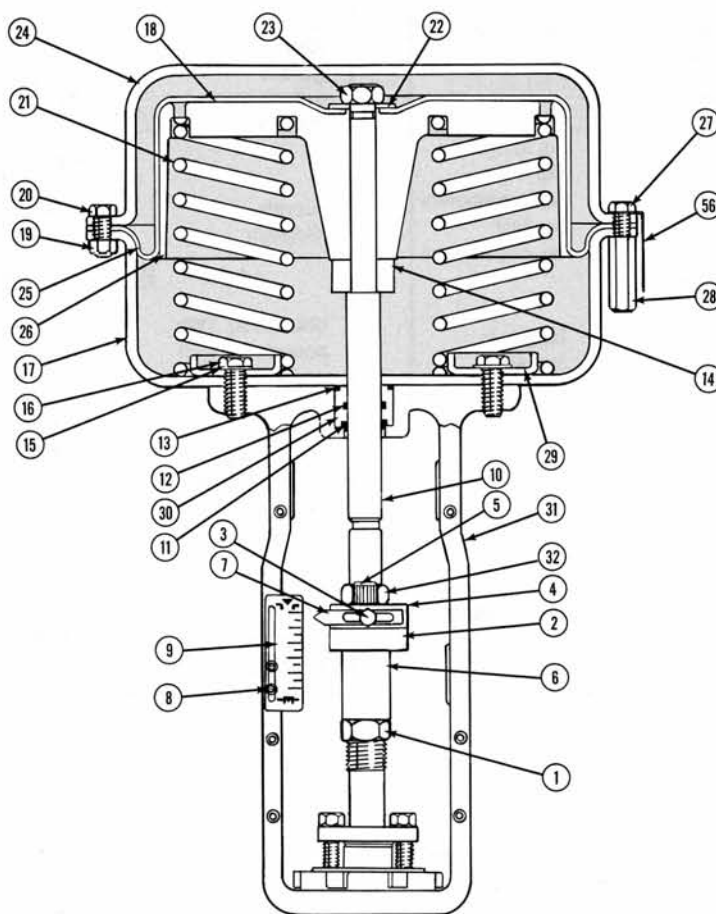
Ref. No.	Description	Remarks	Material	Part Number							
				6	Qty	10	Qty	16	Qty	23	Qty
1	Hex Nut	.75-16 UNF	Carbon Steel			971514-006-110	1	971514-006-110	1	971514-006-110	1
		.62-18 UNF	Carbon Steel			971514-005-110	1	971514-005-110	1	971514-005-110	1
		.50-20 UNF	Carbon Steel	971514-004-110	1	971514-004-110	1	971514-004-110	1	971514-004-110	1
2	Stem Flange Stem Connector (Bottom)		C.S. Rc35 Zinc Plt.	010864-013-779	1						
		.50 Valve Stem	C.S. Rc35 Zinc Plt.			010865-014-779	1				
		.62 Valve Stem	C.S. Rc35 Zinc Plt.			010865-018-779	1				
		.75 Valve Stem	C.S. Rc35 Zinc Plt.			010865-019-779	1				
			C.S. Rc35 Zinc Plt.					010866-014-779	1	010866-014-779	1
3	Hex Head Cap Screw	.312-18 UNC x .25 LG	Carbon Steel	971002-001-110	1	971002-001-110	1	971002-001-110	1	971002-001-110	1
4	Stem Connector, Top		C.S. Rc35 Zinc Plt.			010865-013-779	1	010866-013-779	1	010866-013-779	1
5	Soc. Head Cap Screw		Alloy Steel			971159-007-109	2	971167-002-109	2	971167-002-109	2
6	Connector Insert		C.S. Rc35 Zinc Plt.			010865-043-779	1				
		For .50 Valve Stem						010866-043-779	1	010866-043-779	1
		For .62 Valve Stem						010866-044-779	1	010866-044-779	1
		For .75 Valve Stem						010866-045-779	1	010866-045-779	1
		For 1.00 Valve Stem						010866-047-779	1	010866-047-779	1
7	Pointer		Stainless Steel	010864-031-250	1	010864-031-250	1	010864-031-250	1	010864-031-250	1
8	Screw, Pan Head	No. 6-32 UNC x .38 Long	Carbon Steel	971287-005-110	2	971287-005-110	2	971287-005-110	2	971287-005-110	2
9	Scale - Travel	0.8 Travel	Stainless Steel	010864-062-250	1	010864-062-250	1	010864-062-250	1	010864-062-250	1
		1.5 Travel	Stainless Steel			010864-063-250	1	010864-063-250	1	010864-063-250	1
		2.0 Travel	Stainless Steel					010864-064-250	1	010864-064-250	1
		2.5 Travel	Stainless Steel					010864-065-250	1	010864-065-250	1
10	Actuator Stem		C.S. Rc 35, Chr Plt	010864-009-779	1	010865-009-779	1	010866-009-779	1	010866-009-779	1
11	Stem Wiper	INCO Rod Wiper Size Z-22 x 30	Polyurethane	972001-010-789	1	972001-010-789	1	972001-011-789	1	972001-012-789	1
12	O-Ring		Buna N	971886-311-680	1	971886-311-680	1	971886-317-680	1	971886-312-680	1
13	O-Ring		Buna N	971886-312-680	1	971886-312-680	1	971886-318-680	1	971886-319-680	1
14	Spacer		Carbon Steel	010864-011-002	1	010865-011-002	1	010866-011-002	1	010867-011-002	1
15	Seal Washer			971508-031-888	6	971508-031-888	6	971508-032-888	6	971508-032-888	6
16	Hex Head Cap Screw	metric	Carbon Steel	971008-042-110	6	971008-043-110	6	971012-043-110	6	971012-043-110	6
17	Lower Diaphragm Case	Cold Rolled C.S. Sheet	Carbon Steel	010864-002-320	1	010865-002-320	1	010866-002-320	1	010867-002-320	1
18	Spring Spacer	Use only w/1.5 Trvl Sprgs at 10-22 or 21-45 Range	Carbon Steel			010865-046-002	6				
		2.5 Travel 21-45 Spring	Gray Cast Iron					010866-046-301	6	010867-046-301	6
		2.0 Travel 21-45 Spring	Gray Cast Iron					010866-059-301	6	010867-059-301	6
		1.5 Travel 21-45 Spring	Gray Cast Iron					010866-060-301	6	010867-060-301	6
19	Hex Nut	Metric	Carbon Steel	971511-150-110	9	971511-150-110	9	971511-150-110	12	971511-150-110	16
20①	Hex Head Cap Screw	Metric	Carbon Steel	971004-040-110	9	971004-040-110	9	971008-044-110	12	971008-044-110	16
21②	Spring	0.8 Travel, Red	Carbon alloy/spring	000042-209-130	3/6	000043-115-130	3/6	000044-078-130	3/6	000044-029-130	3/6
		1.5 Travel, Blue	Carbon alloy/spring			000043-117-130	3/6	000044-079-130	3/6	000044-030-130	3/6
		2.0 Travel, Green	Carbon alloy/spring					000044-080-130	3/6	000044-031-130	3/6
		2.5 Travel, Yellow	Carbon alloy/spring					000044-081-130	3/6	000044-032-130	3/6
22	Washer	16 Metric Size 30mm OD, 17mm I.D., 3mm Thick	Carbon Steel	971502-053-110	1						
		20 Metric Size 37mm OD, 21mm ID, 3mm Thick	Carbon Steel			971502-057-110	1				
		22 Metric Size 39mm OD, 23 mm ID, 3mm Thick	Carbon Steel					971502-054-110	1		
		24 Metric Size 44mm OD, 25mm ID, 4mm Thick	Carbon Steel							971502-055-110	1
23	Hex Head Cap Screw	M16x1.5x110 Long Metric Fully Threaded	Carbon Steel	971013-043-110	1						
	Nut, Jam	Metric	Carbon Steel			971514-050-110	1	971514-051-110	1	971514-052-110	1
24	Upper Diaphragm Case	Cold Rolled C.S. Sheet	Carbon Steel	010864-001-320	1	010865-001-320	1	010866-001-320	1	010867-001-120	1
25	Diaphragm		Buna N w/Polyester	010864-003-779	1	010865-003-779	1	010866-003-779	1	010867-003-779	1

① One additional Cap Screw with optional Handwheel

② Four standard spring ranges are achievable by varying spring quantity and placement

Include serial number when ordering.

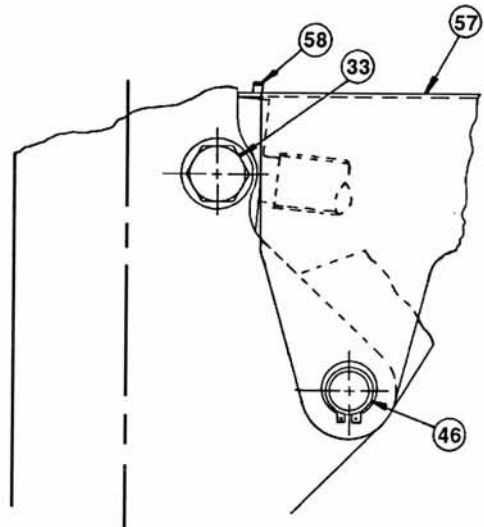
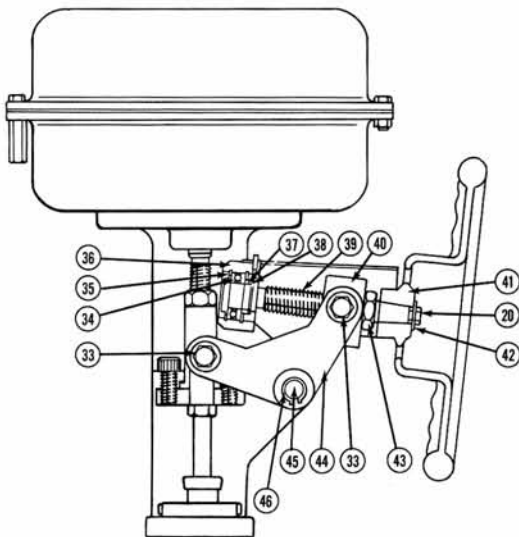
Ref. No.	Description	Remarks	Material	6	Qty	10	Qty	16	Qty	23	Qty
26	Diaphragm Plate, Mach.		Aluminum-356	010864-004-612	1	010865-004-612	1	010866-004-612	1	010867-004-612	1
	Diaphragm Plate, Cast.		Aluminum-356	010864-005-612	1	010865-005-612	1	010866-005-612	1	010867-005-612	1
27	Hex Head Cap Screw	Metric	Carbon Steel	971004-041-110	3	971004-042-110	3	971008-045-110	4	971008-045-110	4
28	Compression Nut		Carbon Steel	010864-016-110	6	010865-016-110	3	010866-016-110	4	010866-016-110	4
29②	Spring Guide		Carbon Steel	010864-015-002	1	010865-015-002	6	010866-015-002	3/6	010867-015-002	3/6
30	Stern Bushing		Tin/Lead Bronze	010864-012-485	1	010864-012-485	1	010866-012-485	1	010867-012-485	1
31	Yoke, Machining	2.25" Spud	Grey Cast Iron	010864-006-301	1	010865-006-301	1	010866-006-301	1	010867-006-301	1
	Yoke, Machining	3.31 Spud	Grey Cast Iron			010865-007-301	1	010866-007-301	1	010867-007-301	1
	Yoke, Machining	3.75 Spud	Grey Cast Iron					010866-010-301	1	010867-010-301	1
	Yoke, Casting		Grey Cast Iron	010864-008-301	1	010865-008-301	1	010866-008-301	1	010867-008-301	1
32	Lock Nut	M24 X 2 Metric	Carbon Steel			010864-040-110	1	010866-034-110	1	010866-034-110	1



Size 16 Actuator

Size 6 and 10 Handwheel

Ref. No.	Description	Remarks	Material	6	Qty	10	Qty
33	Pivot Pin		C.S., Rc 35, Zinc Pltd	010864-032-779	6	010864-032-779	6
34	Thrust Bearing	Andrews No. 51205		971704-051-888	1	971704-051-888	1
35	Retaining Ring	Truarc N5000-187	High Carbon Steel	971881-157-053	2	971881-157-053	2
36	Handwheel Pivot		Carbon Steel	010864-029-002	1	010865-029-002	1
37	Bearing Ring		Carbon Steel	010864-030-002	1	010864-030-002	1
38	Retaining Ring	Truarc 5160-98	High Carbon Steel	971881-088-053	1	971881-088-053	1
39	Handwheel Stem		C.S., Rc 35, Zinc Pltd	010864-028-779	1	010864-028-779	1
40	Traveling Nut		Leaded Steel	010864-038-117	1	010864-038-117	1
41	Handwheel, mach.		Gray Cast Iron	010864-069-301	1	010865-069-301	1
	Handwheel, cast.		Gray Cast Iron	010864-079-301	1	010865-079-301	1
		Mach. Alternate Mat'l	Aluminum 319	010864-025-616	1	010865-025-616	1
		Cast. Alternate Mat'l	Aluminum 319	010864-027-616	1	010865-027-616	1
42	Washer, Flat	10 Metric Size 21mm OD 10.5mm ID 2mm Thick	Carbon Steel	971502-051-110	1	971502-051-110	1
43	Lock Nut	.88-6 ACME	Carbon Steel	010864-040-002	1	010864-040-002	1
44	Handwheel Lever Assy		Steel Fabrication	010864-078-999	1	010864-078-999	1
	Shaft - handwheel lever		Carbon Steel	010864-077-002	1	010864-077-002	1
	Arm - handwheel lever		Carbon Steel	010864-076-002	1	010864-076-002	1
	Handwheel lever	Mach. Alternate Mat'l	Aluminum 356 T6	010864-020-612	1	010864-020-612	1
	Handwheel lever	Cast. Alternate Mat'l	Aluminum 356 T6	010864-021-612	1	010864-021-612	1
45	Lever Pin		C.S., Rc 35, Zinc Pltd	010864-033-779	1	010865-033-779	1
46	Retaining Ring	Truarc 5100-75	High Carbon Steel	971881-152-053	2	971881-152-053	2
57	Handwheel Cover		Carbon Steel	010864-066-002	1		
58	Groove Pin	4mm x 16 Metric	Carbon Steel	971344-034-002	1		

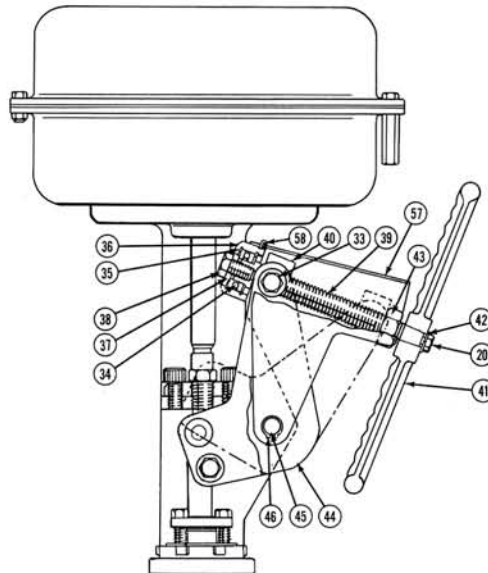


Handwheel Cover

Size 10 Actuator
with optional handwheel

Size 16 and 23 Handwheel

Ref. No.	Description	Remarks	Material	16	Qty	23	Qty
33	Pivot Pin		C.S., Rc 35, Zinc Pltd	010866-032-779	6	010866-032-779	6
34	Thrust Bearing	Andrews No. 51207		971704-052-888	1	971704-052-888	1
35	Retaining Ring	Truarc N5000-244	High Carbon Steel	971881-156-053	2	971881-156-053	2
36	Handwheel Pivot		Carbon Steel	010866-029-002	1	010866-029-002	1
37	End Flange		C.S., Rc 35, Zinc Pltd	010866-030-002	1	010866-030-002	1
38	Cap Screw, Hex Head	M20 x 2.5 x 30 long metric	Carbon Steel	971014-046-110	1	971014-046-110	1
39	Handwheel Stem		C.S., Rc 35, Zinc Pltd	010866-028-779	1	010867-028-779	1
40	Traveling Nut		Leaded Steel	010866-038-117	1	010866-038-117	1
41	Handwheel, Mach.		Gray Cast Iron	010866-069-301	1	010866-069-301	1
	Handwheel, Cast		Gray Cast Iron	010866-079-301	1	010866-079-301	1
		Mach. Alternate Mat'l	Aluminum 319	010866-025-616	1	010866-025-616	1
		Cast. Alternate Mat'l	Aluminum 319	010866-027-616	1	010866-027-616	1
42	Washer, Flat		Carbon Steel	971502-052-110	1	971502-052-110	1
43	Lock Nut	1.12 - 5 ACME	Carbon Steel	010866-040-002	1	010866-040-002	1
44	Handwheel Lever Assy		Steel Fabrication	010866-078-999	1	010867-078-999	1
	Shaft - Handwheel lever		Carbon Steel	010866-077-002	1	010866-077-002	1
	Arm - Handwheel lever		Carbon Steel	010866-076-002	1	010867-076-002	1
	Handwheel lever	Mach. Alternate Mat'l	Aluminum 356 T6	010866-020-612	1	010867-020-612	1
	Handwheel lever	Cast. Alternate Mat'l	Aluminum 356 T6	010866-021-612	1	010867-021-612	1
45	Lever Pin		C.S., Rc 35, Zinc Pltd	010866-033-779	1	010866-033-779	1
46	Retaining Ring	Truarc 5100-87	High Carbon Steel	971881-005-053	2	971881-005-053	2
57	Handwheel Cover		Carbon Steel	010866-066-002	1	010867-066-002	1
58	Groove Pin	4mm x 16 Metric	Carbon Steel	971344-034-002	1	971344-034-002	1



**Size 23 Actuator
with optional handwheel**

USEFUL EQUIVALENTS

U.S. CUSTOMARY UNITS

Specific gravity of air G = 1 (reference for gases)

Specific gravity of water = 1 (reference for liquids)

U.S. gallon of water = 8.33 lbs @ std. cond.

1 cubic foot of water = 7.48 gallons

Air specific volume = 1/density = 13.1 cubic feet/lb

G of any gas = density of gas/0.076

1 cubic foot of water = 62.34 lbs @ std. cond. (= density)

1 cubic foot of air = 0.076 lbs @ std. cond. (= air density)

Air molecular weight M = 29

G of any gas = molecular wt. of gas/29

$$G \text{ of gas at flowing temp.} = \frac{G \times 520}{T + 460}$$

Standard conditions (U.S. customary) are at 14.69 psia & 60°F

Flow conversion of gas

$$\text{SCFH} = \frac{\text{Lbs/hr}}{\text{density}} \quad \text{SCFH} = \frac{\text{Lbs/hr} \times 379}{M} \quad \text{SCFH} = \frac{\text{Lbs/hr} \times 13.1}{G}$$

Flow conversion of liquid

$$\text{GPM} = \frac{\text{Lbs/hr}}{500 \times G}$$

Temperature Conversion

$$F \text{ (Fahrenheit)} = C(9/5) + 32$$

$$C \text{ (Celsius)} = (F - 32) 5/9$$

METRIC CONVERSION TABLES

Multiply	By	To Obtain
<u>LENGTH</u>		
millimeters	0.039	inches
centimeters	0.394	inches
inches	2.54	centimeters
feet	30.48	centimeters
feet	0.304	meters
<u>AREA</u>		
sq. centimeters	0.155	sq. inches
sq. centimeters	0.001076	sq. feet
sq. inches	6.452	sq. centimeters
sq. inches	0.00694	sq. feet
sq. feet	929	sq. centimeters
<u>FLOW RATES</u>		
gallons US/minute (GPM)	3.785	liters/min
gallons US/minute	0.133	ft ³ /min
gallons US/minute	0.227	m ³ /hr
cubic feet/minute	7.481	GPM
cubic feet/hour	0.1247	GPM
cubic feet/hour	0.01667	ft ³ /min
cubic meters/hour	4.403	GPM
cubic meters/hour	35.31	ft ³ /hr
<u>VELOCITY</u>		
feet per second	0.3048	meters/second
feet per second	1.097	km/hr
feet per second	0.6818	miles/hr

Multiply	By	To Obtain
<u>VOLUME & CAPACITY</u>		
cubic feet	28.32	liters
cubic feet	7.4805	gallons
liters	61.02	cubic inches
liters	0.03531	cubic feet
liters	0.264	gallons
gallons	3785.0	cubic cm
gallons	231.0	cubic inches
gallons	0.1337	cubic feet
<u>WEIGHT</u>		
pounds	0.453	kilogram
kilogram	2.205	pounds
<u>PRESSURE & HEAD</u>		
pounds/sq. inch	0.06895	bar
pounds/sq. inch	0.06804	atmosphere
pounds/sq. inch	0.0703	Kg/cm ²
pounds/sq. inch	2.307	ft of H ₂ O (4°C)
pounds/sq. inch	0.703	m of H ₂ O (4°C)
pounds/sq. inch	5.171	cm of Hg (0°C)
pounds/sq. inch	2.036	in of Hg (0°C)
atmosphere	14.69	psi
atmosphere	1.013	bar
atmosphere	1.033	Kg/cm ²
atmosphere	101.3	kPa
bar	14.50	psi
kilogram/sq. cm	14.22	psi
kiloPascal	0.145	psi

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