

A 3D wireframe model of a J123 Regulator, showing the internal components and the external body. The model is rendered in a light gray color with a grid pattern.

**Catalogue,
Maintenance &
Commissioning
Instructions for
2", 3" & 4"**

**J123
Regulator**



J123

50, 80 & 100mm Regulator

Catalogue

General Information

CS2301C

Commissioning Instructions

How to install the unit

E2301C

General Arrangements

50mm & 80mm L.P. Units

50mm & 80mm H.P. Units and other details

100mm Units

Parts List

General Parts List (all sizes)

Spring Table

Loading Springs Available

Spares Kits

Soft Spares Kits Available

Maintenance Instructions

50mm and 80mm sizes

100mm size

CONTROL INSTRUMENTS



J123 Industrial / Distribution Regulator

APPLICATION

The J123 is a spring loaded distribution and industrial regulator that can also be operated by auxiliary systems and is suitable for use as a monitor or active regulator. It is designed for use in installations complying with the requirements of BGC/PS/E26 (formerly DIR6) and IGE/TD/10.

All units are suitable for operation on natural, liquid petroleum and manufactured gases and can be installed in horizontal or vertical pipelines. The regulator must be externally impulsed from the downstream main at a point of minimum turbulence. A distance of 15 pipe diameters is recommended for the impulse tapping.

High sensitivity is assured by a high pressure rolling secondary diaphragm which maintains a constant effective area over the complete inlet pressure range. In addition the valve spindle and annular valve spindle guide provide impulsing for dynamic pressure compensation at all flow rates. A valve travel indicator and breather hole dust cap are fitted as standard on all units.

A comprehensive range of loading springs is available for outlet pressures up to 0.34Bar (5 psig).

Modular Construction

The J123 has been designed on a modular basis which allows the regulator mechanism to be removed without disturbing the pipework. By removing only four nuts the J123 module can be withdrawn from the body. This allows routine servicing and maintenance to be undertaken under workshop conditions.

SIZES

50mm, 80mm and 100mm

NORMAL OPERATING TEMPERATURE

-20°C to +70°C.

CONNECTIONS

Flanged connections to BS EN 1092-2 NP16 unless otherwise requested.

CAPACITY

The flow rate can be calculated using:

$$Q = K \sqrt{P_o (P_i - P_o)} \quad \text{when } P_i / P_o < 1.894$$

$$Q = K P_i / 2 \quad \text{when } P_i / P_o > 1.894$$

where Q = Flow Rate m³ / hr (SG = 0.6)

P_i = Inlet Pressure Absolute (Bar)

P_o = Outlet Pressure Absolute (Bar)

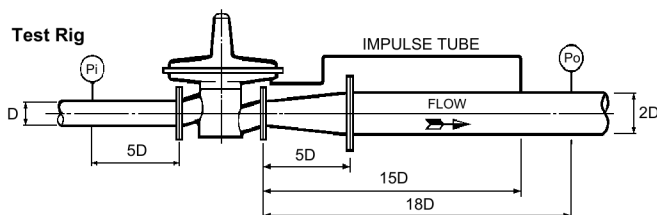
K = Flow Constant (see table)

Assuming absolute pressure = 1.014 Bar

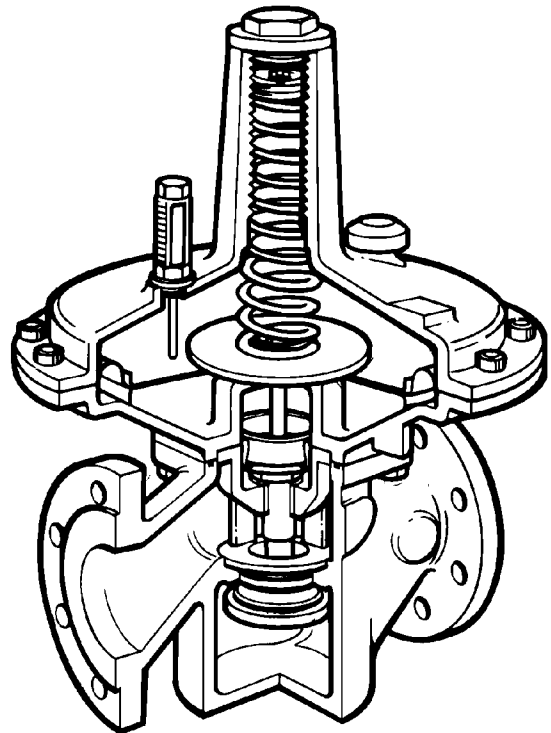
To convert to ft³ / hr multiply by 35.315

To convert to specific gravities other than 0.6 multiply by

$$\sqrt{\frac{0.6}{\text{specific gravity of gas}}}$$



Inlet Pressures up to 4 Bar (60 PSIG)



APPROVAL

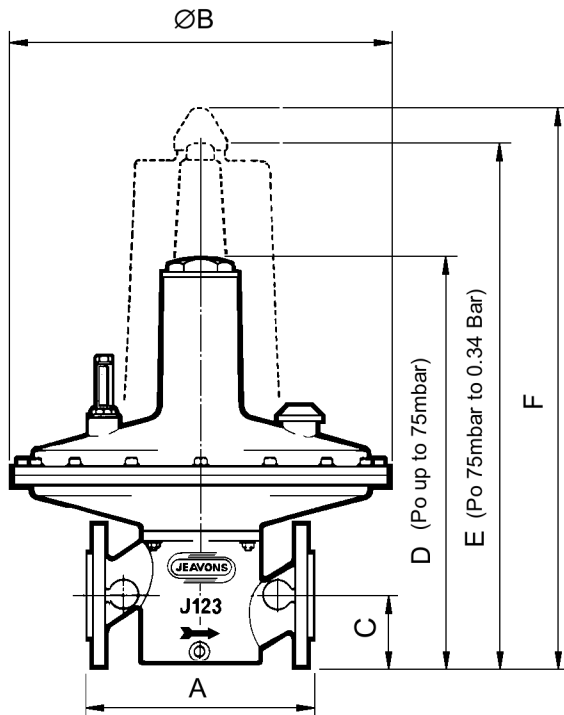
The J123 has been approved to modules B + D of the PED 97/23/EC by BSI (Notified body No. 0086). It is classified as Category IV equipment and a pressure accessory.

CAPACITIES in SCMh 0.6 s.g.

Inlet Pressure	Outlet Pressure	Size		
		50mm	80mm	100mm
75 mbar	50 mbar	300	800	1105
150 mbar	50 mbar	600	1590	2210
200 mbar	50 mbar	730	1950	2710
300 mbar	50 mbar	945	2515	3500
350 mbar	50 mbar	1035	2760	3830
700 mbar	50 mbar	1520	4060	5640
1.00 bar	50 mbar	1840	4905	6815
1.25 bar	50 mbar	2070	5524	7675
1.50 bar	50 mbar	2300	6134	8520
1.75 bar	50 mbar	2530	6745	9370
2.00 bar	50 mbar	2670	7355	10220
2.50 bar	50 mbar	3215	8575	11910
3.00 bar	50 mbar	3670	9795	13610
3.50 bar	50 mbar	4130	11015	15300
Valve Factor "K"		1830	4880	6780



J123 Industrial / Distribution Regulator



MATERIAL SPECIFICATION

COMPONENTS	SPECIFICATION
Body and Valve Seat Holder	Nodular Iron
Diaphragm Case and Top Cover	Aluminium Alloy
Main and Rolling Secondary Diaphragm	Reinforced Nitrile Synthetic Rubber
Valve Spindle, Valve Seat, Annular Valve Spindle Guide	Stainless Steel
Main Diaphragm Clamping Plates, Valve Disc Clamping Washer and Holder	Mild Steel, Zinc Plated and Passivated
Secondary Diaphragm Clamping Plates and Top Spring Holder	Aluminium Alloy
Valve Disc and "O" rings	Nitrile Synthetic Rubber
Loading Springs	Carbon Steel, Zinc Plated and Passivated

DIMENSIONS AND WEIGHTS

SIZE	A	B	C	D	E	F	Weight (Kg)
50	250	426	83	489	638	-	25
80	320	426	105	545	694	-	36
100	350	540	125	-	-	756	80

OUTLET PRESSURE SPRINGS All springs are colour coded for ease of identification

	Spring Range	50mm and 80mm		100mm	
		Part Number	Colour Code	Part Number	Colour Code
Low Pressure	10 - 25mbar (4 - 10"wg)	J12311-024	Dark Blue / Gold	J12312-025	Red / Gold
	20 - 40mbar (8 - 16"wg)	J4811-029	White	J12312-026	Red / Silver
	35 - 50mbar (14 - 20"wg)	J4811-030	White / Red	J12312-027	Red / Pink
	45 - 75mbar (18 - 30"wg)	J12311-023	Dark Blue / Yellow	J12312-028	Red / Light Green
High Pressure	70 - 100mbar (28 - 40"wg)	J12311-022	Dark Blue / Orange	J12312-029	Red / Dark Blue
	100 - 150mbar (40 - 60"wg)	J12311-021	Dark Blue / Dark Green	J12312-030	Red / Dark Green
	0.15 - 0.20 bar (2.2 - 3 psig)	J12311-020	Dark Blue / Light Blue	J12312-031	Red / Light Blue
	0.20 - 0.34 bar (3 - 5 psig)	J12311-019	Dark Blue / Brown	J12312-032	Red / Brown

QUALITY

Elster Jeavons is committed to a programme of continuous quality enhancement. All equipment designed and manufactured by Elster Jeavons benefits from the company's quality assurance standards which are approved to BS EN ISO 9001 : 1994.

A Soft Spares Kit is Available for each Model

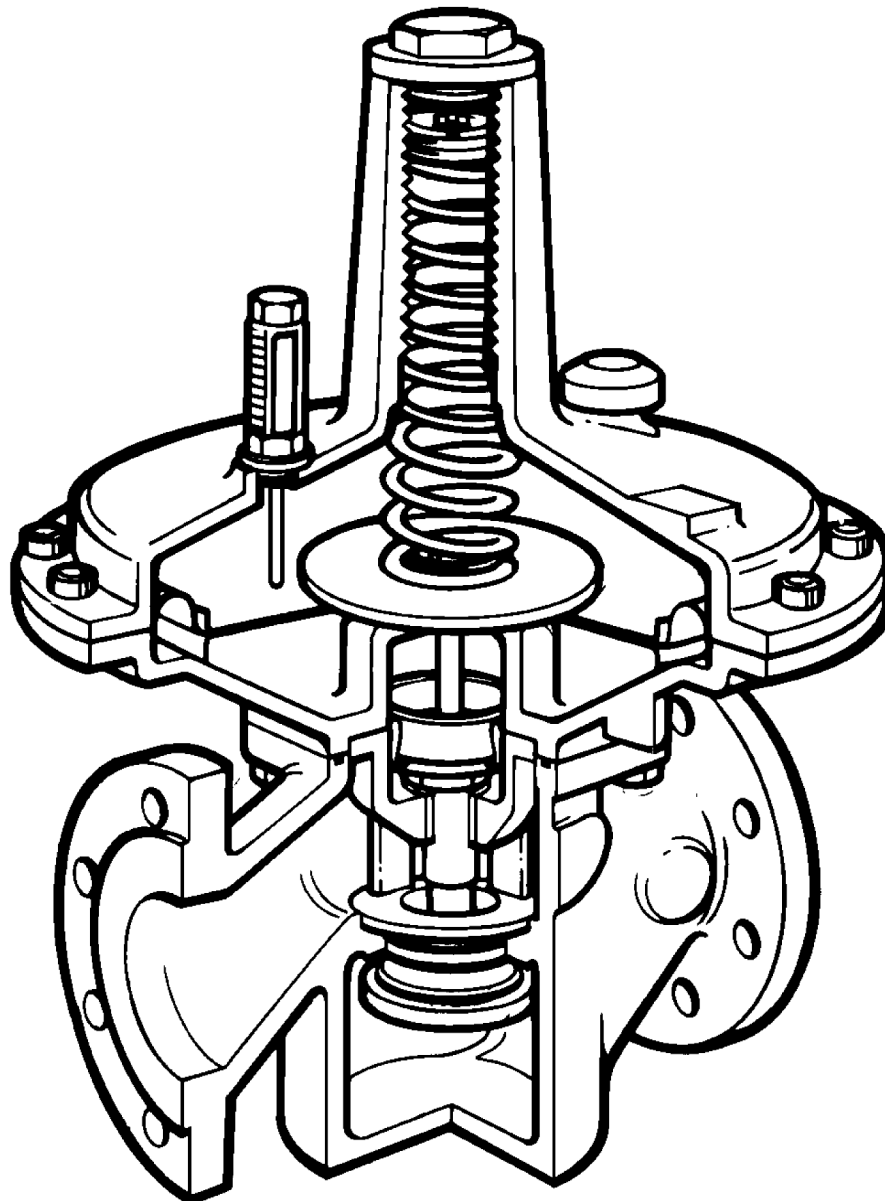
Elster Jeavons has a programme of continuous product development and improvement and in consequence the information in this leaflet may be subject to change or modification without notice.



CONTROLS SUPPLY CHAIN
VALVES ACTUATORS INSTRUMENTATIONS

J123 REGULATOR 50, 80 & 100mm

COMMISSIONING AND MAINTENANCE INSTRUCTIONS



DATA SHEET: E2301 ISSUE C JULY 2002



COMMISSIONING INSTRUCTIONS FOR J123 REGULATOR

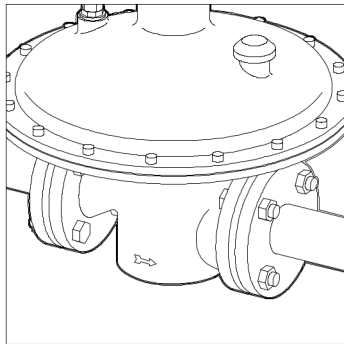


Fig. 1.

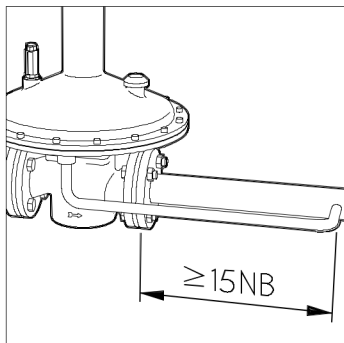


Fig. 2.

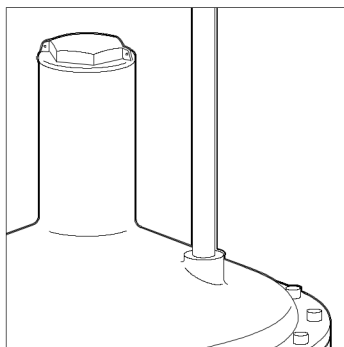


Fig. 3.

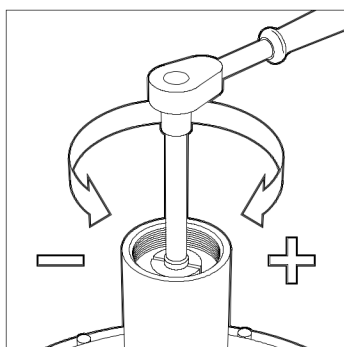


Fig. 4.

FITTING UNITS INTO PIPEWORK

- 1) The unit should not be installed in a corrosive environment.
- 2) The ambient temperature (surface temperature) should be within the limits stated on the regulator catalogue.
- 3) Check the maximum allowable pressure on the regulator nameplate against the installation specification.
- 4) Remove the protection from the inlet and outlet ports.
- 5) Ensure that the installation pipework is thoroughly clean.
- 6) The direction of gas flow must be the same as the arrows on the regulator body. See Fig. 1.
- 7) Install regulator into pipework.

INSTALLATION OF IMPULSE LINE

- 1) Remove the plastic protection plug.
- 2) Connect the impulse line ($\frac{1}{2}$ "), using a jointing compound approved to national standards, and lead to a point downstream not less than fifteen times the nominal pipe diameter from the outlet. See Fig. 2.

INSTALLATION OF VENT LINE. (If Required)

- 1) Remove breather cover from regulator top case / cover.
- 2) Connect the vent line ($\frac{1}{2}$ "), using a jointing compound approved to national standards, and lead to atmosphere in accordance with national standards. Ensure that no water can penetrate vent pipe. See Fig. 3.
- 3) If vent connection is to be used for top loading or other similar use refer to your own installation instructions.

SETTING THE OUTLET PRESSURE.

- 1) Turn off inlet and outlet valves.
- 2) Remove top cap.
- 3) For L.P. 50mm and 80mm unit insert $\frac{1}{2}$ " square socket extension piece into square hole, or flat blade screwdriver into slot in spring adjuster. See Fig. 4.
- 4) For H.P. 50mm and 80mm unit, slacken locknut on spring adjusting stem and connect suitable spanner (24mm A/F) to hexagon of spring adjusting stem. See Fig. 5.
- 5) For 100mm unit connect suitable spanner (27mm A/F) to hexagon of spring adjusting nut. See Fig. 6.
- 6) Turn spring adjustment anticlockwise to reduce pressure on loading spring.
- 7) Slowly turn on inlet supply.
- 8) Increase loading on spring by turning spring adjustment clockwise until the required outlet pressure, plus approximately 2.5mbar, is obtained.



COMMISSIONING INSTRUCTIONS FOR J123 REGULATOR

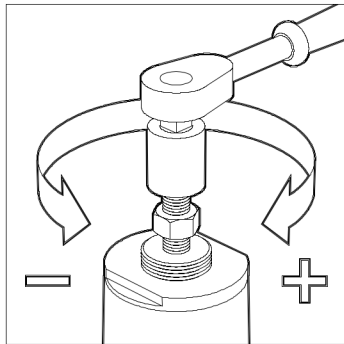


Fig. 5.

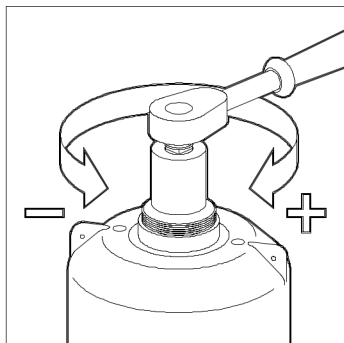


Fig. 6.

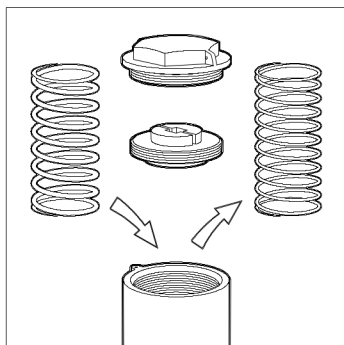


Fig. 7.

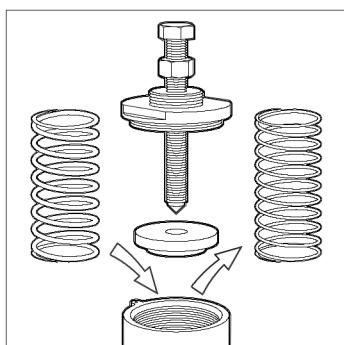


Fig. 8.

SETTING THE OUTLET PRESSURE (Cont.)

- 9) Commission downstream appliance(s).
- 10) Trim the outlet pressure of the regulator, if necessary, when normal working flow rates have been achieved.
- 11) Replace the top cap.

IF THE REQUIRED OUTLET PRESSURE CAN NOT BE ACHIEVED WITH THE SPRING FITTED.

- 1) Choose a loading spring from the catalogue that will give the required outlet pressure range.

For L.P. 50mm and 80mm units: See Fig. 7.

- 2) Remove top cap.
- 3) Fully unscrew and remove the spring holder.
- 4) Remove loading spring.
- 5) Insert new loading spring.
- 6) Screw spring holder back in place ensuring that spigot is located in loading spring.
- 7) Adjust the outlet pressure, as described earlier, until the required setting is achieved.
- 8) Replace top cap.

For H.P. 50mm and 80mm units: See Fig. 8.

- 9) Remove top cap.
- 10) Slacken locknut on spring adjusting stem.
- 11) Turn spring adjuster anticlockwise to reduce loading on spring.
- 12) Unscrew spring adjusting bush.
- 13) Remove top spring holder and loading spring.
- 14) Insert new loading spring.
- 15) Place top spring holder over spring ensuring that spigot is located in loading spring.
- 16) Screw spring adjusting bush into top cover making sure that the end of the stem is located in the recess in the top spring holder.
- 17) Adjust the outlet pressure, as described earlier, until the required setting is achieved.
- 18) Tighten locknut.
- 19) Replace top cap.



COMMISSIONING INSTRUCTIONS FOR J123 REGULATOR

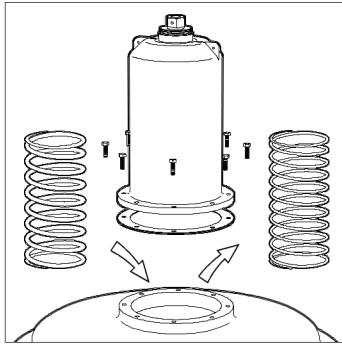


Fig. 9.

For 100mm units: See Fig. 9.

- 20) Remove top cap.
- 21) Turn spring adjusting nut anticlockwise to reduce loading on spring.
- 22) Remove 8 hexagon head screws that secure top cover to top diaphragm case. Carefully lift off top cover assembly and gasket.
- 23) Remove loading spring.
- 24) Install new loading spring over spring location washer in centre of diaphragm.
- 25) Replace gasket and top cover assembly and secure with 8 hexagon head screws.
- 26) Adjust the outlet pressure, as described on earlier, until the required setting is found.
- 27) Replace top cap.

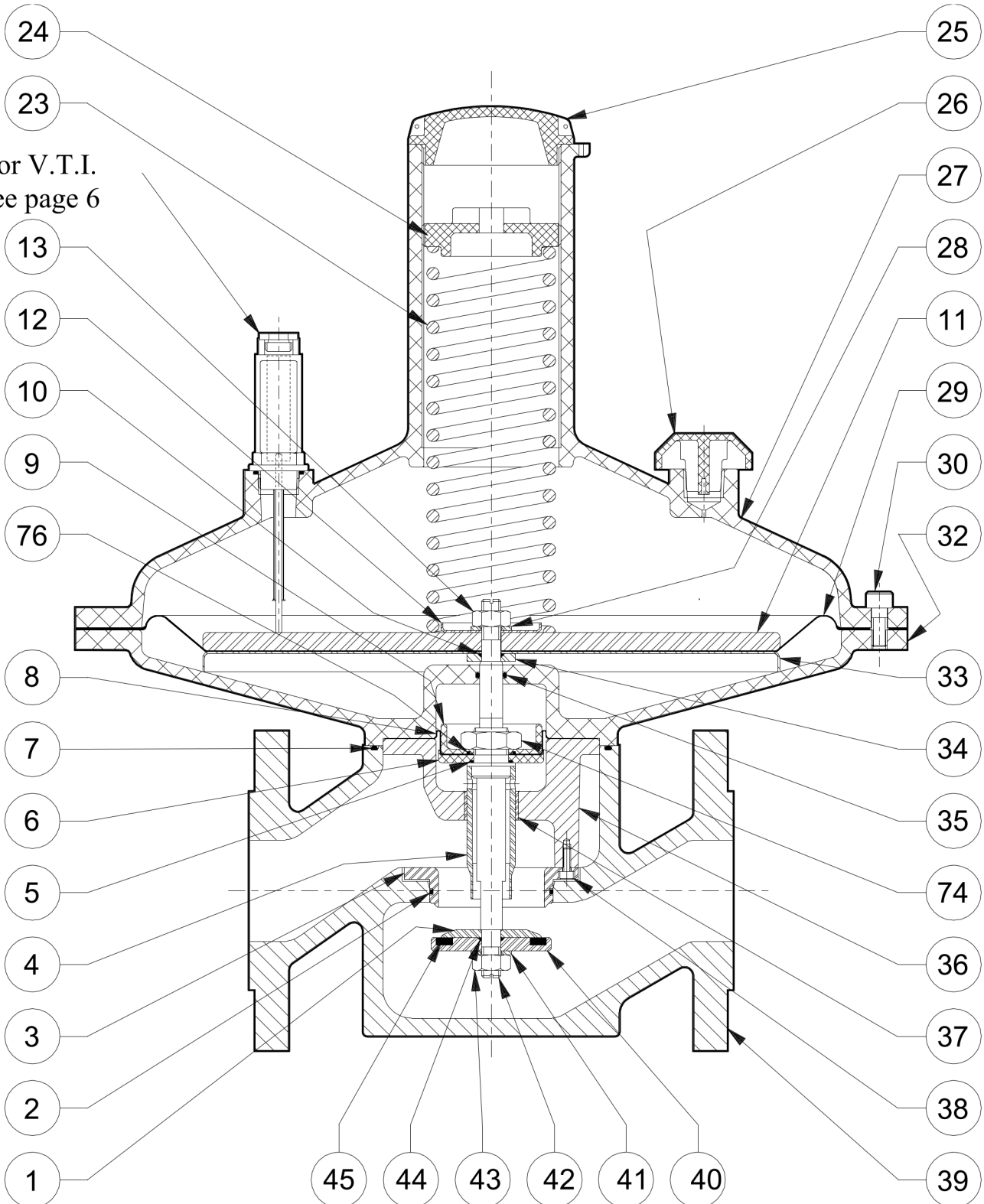
These setting instructions are for direct acting applications. If other control systems are to be used please refer to your own installations instructions.



J123 REGULATOR

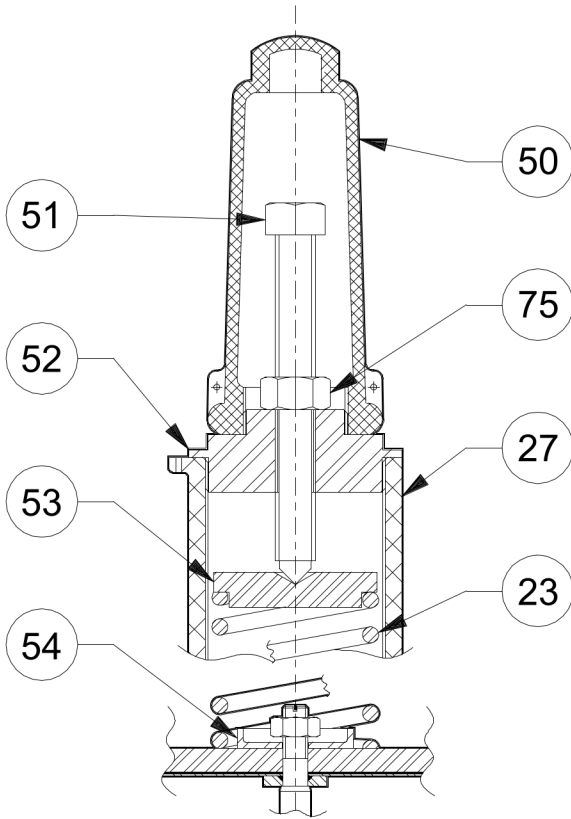
50mm & 80mm

For V.T.I.
see page 6

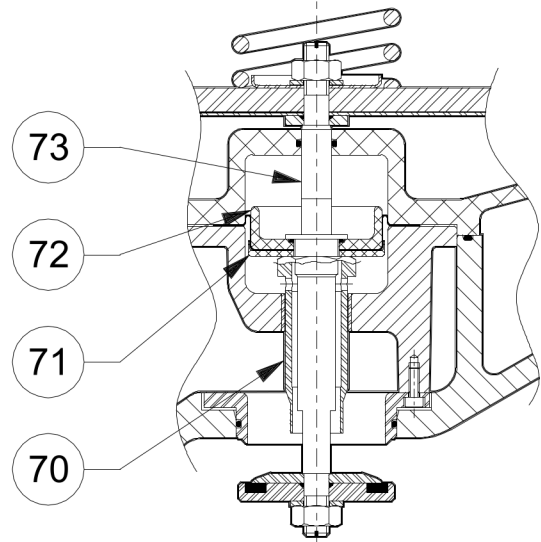




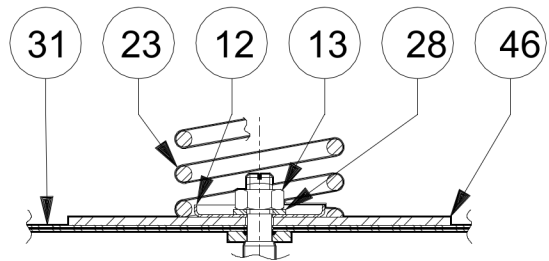
J123 REGULATOR 50mm & 80mm



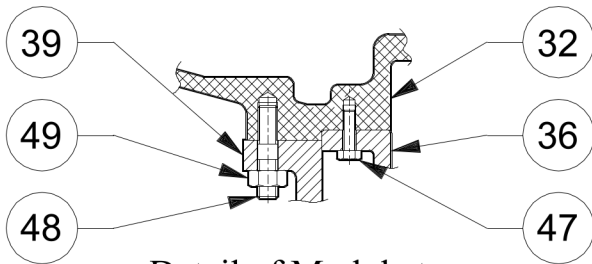
Details of High Pressure
Spring Adjustment



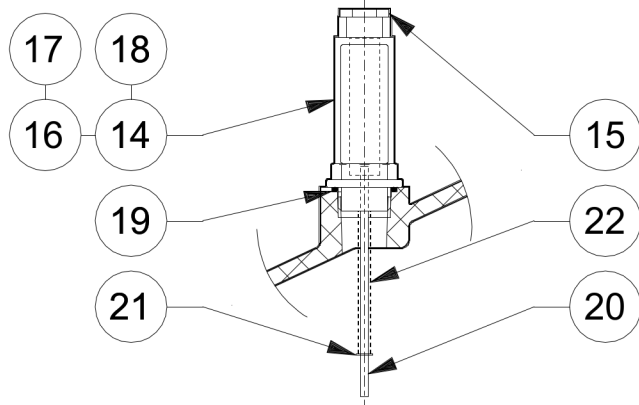
Early Pattern Secondary
Diaphragm Assembly.
(Before Dec 1986)



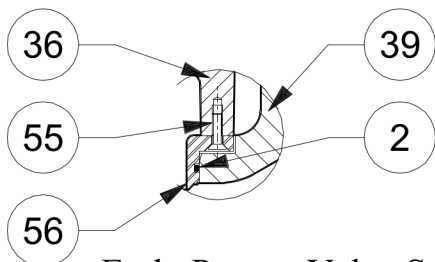
Early Pattern Main Diaphragm Assembly
(Before Sept 1986)



Detail of Module to
Body Clamping



Detail of V.T.I.
(All Sizes)

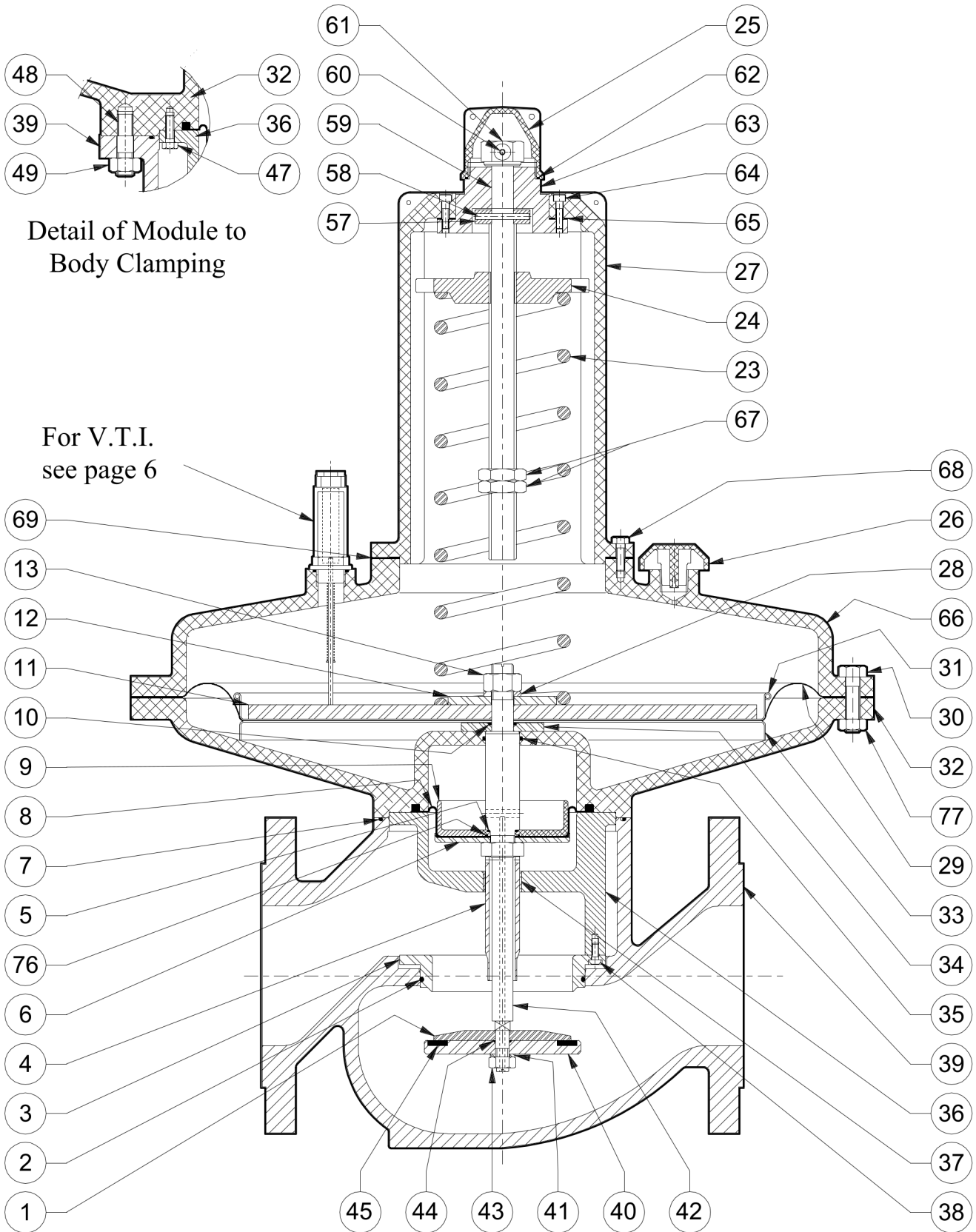


Early Pattern Valve Seat
Clamping
(Before Jan 1982)





J123 REGULATOR 100mm





PARTS LIST FOR J123 REGULATOR

Sizes 50,80 & 100mm

ITEM	DESCRIPTION	50mm	No.Off	80mm	No.Off	100mm	No.Off
1	Valve Disc Clamping Washer	J12309-009	1	J12311-009	1	J12312-009	1
2	"O" Ring Seal	JORM0596-24	*1	JORM0845-30	*1	JORM1145-30	*1
3	Valve Seat	J12309-006	1	J12311-011	1	J12312-011	1
4	Valve Spindle Guide	J12309-016 (Part of item 42)		J12311-017 (Part of item 42)		J12312-018	1
5	"O" Ring Seal	JORM0181-16	*1	JORM0181-16	*1	JORM0181-16	*1
6	Lower Secondary Diaphragm Plate	J12309-012	1	J12311-014	1	J12312-014	1
7	"O" Ring Seal	JORM1195-30	*1	JORM1395-30	*1	JORM1745-30	*1
8	Secondary Diaphragm	J12309-031	*1	J12311-005	*1	J12312-006	*1
9	Upper Secondary Diaphragm Plate	J12309-011	1	J12311-013	1	J12312-013	1
10	"O" Ring Seal	JORM0091-16	*1	JORM0091-16	*1	JORM0156-24	*1
11	Main Diaphragm Reinforcing Plate	J12309-041	1	J12309-041	1	J12312-024Z04	1
12	Spring Locating Washer LP	J4811-018	1	J4811-018	1	J3312-052	1
13	Full Nut M10 or M16	JNA10FZD	1	JNA10FZD	1	JNB16FZD	1
14	Valve Travel Indicator Body	J8112-099Z01	1	J8112-099Z01	1	J8112-019Z01	1
15	V.T.I. Top Cap	J8112-100	1	J8112-100	1	J8112-100	1
16	V.T.I. Tube	J8112-101	1	J8112-101	1	J8112-101	1
17	V.T.I. Nameplate	J8112-124	1	J8112-124	1	J8112-124	1
18	V.T.I. "O" Ring Seal	JORM0091-16	*2	JORM0091-16	*2	JORM0091-16	*2
19	V.T.I. "O" Ring Seal	JORM0216-24	*1	JORM0216-24	*1	JORM0216-24	*1
20	V.T.I. Spindle	J12309-032	1	J12309-032	1	J8111-070	1
21	Starlock Washer	JW1/8B&F7025	2	JW1/8B&F7025	2	JW1/8B&F7025	2
22	V.T.I. Spring	J8112-119	1	J8112-119	1	J8112-119	1
23	Loading Spring	SEE TABLE	1	SEE TABLE	1	SEE TABLE	1
24	Spring Holder LP	J4811-052Z01	1	J4811-052Z01	1	J8112-049Z01	1
25	Top Cap LP	J4811-017Z01	1	J4811-017Z01	1	J12312-036Z01	1
26	Breather Hole Cover	J12309-029	1	J12309-029	1	J12309-029	1
27	Top Cover	J12309-048 +	1	J12309-048 +	1	J8112-048 +	1
28	Spring Washer M10 or M16	JWM10BS4464BM	1	JWM10BS4464BM	1	JWM16BS4464BM	1
29	Main Diaphragm	J12309-020	*1	J12309-020	*1	J12312-005	*1
30	Cap Hd Screws M8 / Hex Hd Bolts M10	JSA825SANZI	16	JSA825SANZI	16	JBA1040HEXZG	20
31	Upper Main Diaphragm Plate	J12309-022	1	J12309-022	1	J12312-021	1
32	Bottom Diaphragm Case	J12309-002 +	1	J12311-002 +	1	J12312-023 +	1
33	Lower Main Diaphragm Plate	J12309-022	1	J12309-022	1	J12312-016	1
34	Main Diaphragm Washer	J12309-017	1	J12309-017	1	J12312-019	1
35	"O" Ring Seal	JORM0116-24	*1	JORM0146-24	*1	JORM0246-24	*1
36	Valve Seat Holder	J12309-003Z01	1	J12311-004Z01	1	J12312-003Z01	1
37	Glacier Du Bush	JDUMB2515DU	1	JDUMB2515DU	1	JDUMB2515DU	1
38	Skt Hd Cap Screw M4x12	JSA412SANZI	3	JSA412SANZI	3	JSA512SBNZH	3
39	Body	J12309-001 +	1	J12311-001 +	1	J12312-001 +	1
40	Valve Disc Holder	J12309-008	1	J12311-010	1	J12312-010	1
41	Spring Washer	JWM10BS4464BM	1	JWM10BS4464BM	1	JWM10BS4464BM	1
42	Spindle	J12309-043	1	J12311-025	1	J12312-007	1
43	Full Nut M10 Zn	JNA10FZD	1	JNA10FZD	1	JNA10FZD	1
44	"O" Ring Seal	JORM0091-16	*1	JORM0091-16	*1	JORM0091-16	*1
45	Valve Disc	J12309-010	*1	J12311-018	*1	J12312-017	*1
46	Diaphragm Reinforcing Plate	J12309-030	1	J12309-030	1		
47	Hex Hd Screw M5 & M6	JSA516HHNZG	6	JSA520HHZNG	6	JSA620HHNZG	6
48	Stud M8 x 37 or M12 x 45	J12309-044	4	J12309-044	4	J12312-034	4
49	Full Nut M8 or M12	JNA8FZD	4	JNA8FZD	4	JNA12FZD	4
50	H.P. Top Cap	JC085-017Z01	1	JC085-017Z01	1		
51	H.P. Spring Adjusting Stem	J3309-016	1	J3309-016	1		
52	H.P. Spring Adjusting Bush	J12309-046	1	J12309-046	1		
53	H.P. Top Spring Holder	J12309-045	1	J12309-045	1		
54	H.P. Lower Spring Holder	J12309-040	1	J12309-040	1		
55	C/sk Hd Screw M4 x 12	JSA412SKNZI	3	JSA412SKNZI	3	JSA412SKNZI	3
56	Valve Seat	J12309-006 Iss 3	1	J12311-011 Iss 0	1	J12311-011 Iss 0	1
57	Thrust Washer					J8112-051	1
58	Tension Pin 4 x 40					JTP4X40	1



PARTS LIST FOR J123 REGULATOR

Parts list continued for J123 Regulator Sizes 50,80 & 100mm

ITEM	DESCRIPTION	50mm	No. Off	80mm	No. Off	100mm	No. Off
59	Spring Adjusting Screw					J8112-103	1
60	Tension Pin 4 x 25					JTP4X25	1
61	Spring Adjusting Nut					J8112-052	1
62	"O" Ring Seal					JO200032-4475	*1
63	Spring Adjusting Bush					J8111-071	1
64	Cap Head Screw M5 x 20					JSA520SANZI	2
65	Gasket					J8111-072	*1
66	Top Diaphragm Case					J12312-022 +	1
67	Lock Nut					J8112-105	2
68	Hexagon Head Screw M6 x 20					JSA620HHNZG	8
69	Gasket					J8112-012	*1
70	Valve Spindle Guide	J12309-016 Iss 1	1	J12311-017 Iss 1	1		
71	Lower Secondary Diaphragm Plate	J12309-012 Iss 3	1	J12311-014 Iss 2	1		
72	Upper Secondary Diaphragm Plate	J12309-011 Iss 6	1	J12311-013 Iss 13	1		
73	Spindle	J12309-004 Iss 8	1	J12311-007 Iss 10	1		
74	Secondary Diap Clamping Nut M18	J12309-042	1	J12309-042	1		
75	H.P. Full Nut M16	JNA16FZD	1	JNA16FZD	1		
76	"O" Ring Seal			JORM0221-16	*1	JORM0221-16	*1
77	Full Nut M10					JNA10FZD	20

Regulator Springs

	SPRING RANGE		50 & 80mm	100mm
LOW PRESSURE	10 - 25mb	4 - 10" wg	J12311-024 Dark Blue / Gold	J12312-025 Red / Gold
	20 - 40mb	8 - 16" wg	J4811-029 White	J12312-026 Red / Silver
	35 - 50mb	14 - 20" wg	J4811-030 White / Red	J12312-027 Red / Pink
	45 - 75mb	18 - 30" wg	J12311-023 Dark Blue / Yellow	J12312-028 Red / Light Green
MED PRESSURE	70 - 100mb	28 - 40" wg	J12311-022 Dark Blue / Orange	J12312-029 Red / Dark Blue
	100 - 150mb	40 - 60" wg	J12311-021 Dark Blue / Dark Green	J12312-030 Red / Dark Green
	0.15 - 0.2bar	2.2 - 3 Psi	J12311-020 Dark Blue / Light Blue	J12312-031 Red / Light Blue
	0.20 - 0.34bar	3 - 5 Psi	J12311-019 Dark Blue / Brown	J12312-032 Red / Brown

Spares Kits

Spares kit contents are marked * on parts list above.

Each Spares Kit comprises all diaphragms, valve seats, gaskets and "O" ring seals all packed in one plastic bag. Precise

details of contents will be on the outside of each bag.

SPARES KIT CODE	SIZE
SK2309-01	50mm Low & Medium Pressure
SK2311-01	80mm Low & Medium Pressure
SK2312-01	100mm Low & Medium Pressure



Drawing Reference: Page 5 and 6

Parts List Reference: Page 8

Note: Numbers in brackets identify items on drawing.

Dismantling Instructions.

Note: Regulator can be serviced with body still in pipeline. Ensure that pressure is isolated and exhausted.

1. Check external surfaces for excessive corrosion.
2. Remove 4 nuts (49) to separate regulator module assembly from body (39).
3. Take "O" ring (7) from body (39).
For MP unit go to instruction No.5.
4. Unscrew and remove top cap (25).
5. Unscrew spring holder (24) (to reduce load spring force to a minimum) and remove from chimney of top cover (27). Remove loading spring (23). Go to instruction No.9.
6. Unscrew MP top cap (50).
7. Loosen nut (75) and remove MP stem (51) and nut (75).
8. Unscrew MP spring adjusting bush (52).
9. Remove MP top spring holder (53) and loading spring (23).
10. Unscrew Valve Travel Indicator assembly (14 - 22), and carefully remove "O" ring seal (19).
11. Invert regulator assembly, remove valve retaining nut (43) from top end of valve spindle (42).
12. Remove spring washer (41), Valve disc holder (40) including valve disc (45), "O"ring seal (44) and clamping plate (1) from valve spindle (42).
13. Unscrew 3 socket head screws (38) and remove valve seat (3) from valve seat holder (36).
14. Take "O" ring seal (2) from valve seat (3).
15. Remove 6 hexagon head screws (47) and lift valve seat holder (36) from bottom diaphragm case (32). DO NOT remove bush (37) from valve seat holder unless necessary.
16. Unscrew 16 screws (30), remove the top cover (27) from the bottom diaphragm case (32).
17. Insert a flat bladed screwdriver into slot on top of valve spindle (42), and slacken off main diaphragm assembly retaining nut (13).
18. Remove retaining nut (13), Spring washer (LP only)(28), location washer LP (12) or MP (54), main diaphragm reinforcing plate(11), main diaphragm (29) & lower main diaphragm plate (33).
19. Remove main diaphragm washer (34) taking care not to damage "O" ring seal (10).
20. The valve spindle assembly (42) can now be removed from the bottom diaphragm case (32), taking care not to damage "O" ring seal (35).
21. The valve spindle guide (4) MUST NOT be separated from the valve spindle (42) as this will affect the performance of the assembly.
22. Unscrew retaining nut (74) so secondary diaphragm assembly consisting of, upper secondary diaphragm plate (9), "O" ring seal (76) (80mm only), secondary diaphragm (8), lower secondary diaphragm plate (6), and "O" ring seal (5) can be removed.
23. Carefully remove "O" ring seal (35) from bottom diaphragm case (32).
24. Remove breather hole cover (26) from top cover (27) and check that hole in top cover is clear.
25. If required the valve travel indicator can be disassembled by unscrewing the top cap (15) and withdrawing the tube (16) with "O" ring seals (18).



Drawing Reference: Page 5 and 6
Parts List Reference: Page 8

Note: Numbers in brackets identify items on drawing.

Rebuilding Instructions.

Note: Inspect all sealing "O" rings, diaphragms and discs and replace where necessary.
(A soft spares kit is available for this purpose - see page 9).

The use of Dow Corning Molycote 111 "O" ring lubricant is recommended during the rebuild
(unless the unit was originally supplied with alternative lubricant for special conditions).

1. Carefully fit "O" ring seal (5) into groove on lower secondary diaphragm plate (6).
2. For 80mm unit only carefully fit "O" ring seal (76) into groove in upper secondary diaphragm plate (9).
3. With lip facing upwards replace lower secondary diaphragm plate (6) over valve spindle (42) with M18 thread end facing upwards.
4. Place secondary diaphragm (8) on top of lower secondary diaphragm plate (6), ensure correct orientation .
5. With lip facing upwards replace upper secondary diaphragm plate (9) on top of secondary diaphragm (8).
6. Screw together secondary diaphragm assembly using retaining nut (74).
7. Carefully replace "O" ring seal (35) in lower diaphragm case (32).
8. Insert valve spindle assembly (42) with M18 end first, into lower diaphragm case (32).
9. Fit "O" ring seal (10) into groove on main diaphragm washer (34).
10. Replace main diaphragm washer (34) (with "O" ring facing upwards) on top of valve spindle (42).
11. With lip facing downwards replace lower main diaphragm plate (33) on top of main diaphragm washer (34).
12. Carefully replace main diaphragm (29) on top of lower main diaphragm plate (33). ensure holes align with lower diaphragm case (32).
13. Fit main diaphragm reinforcing plate (11) over main diaphragm (29).
14. With lip facing upwards replace location washer LP (12) or MP (54) on top of main diaphragm reinforcing plate (11).
15. Place spring washer (28) on top of location washer LP (12) or MP (54).
16. Screw nut (13) over valve spindle assembly (42) and tighten.
17. Carefully fit top cover (27) on top of main diaphragm (29) and bottom diaphragm case (32) ensuring hole align correctly, then screw together using 16 socket head screws (30).
18. Reposition the valve seat holder (36) over the bottom of the valve spindle (42), ensuring that the secondary diaphragm (8) is fully home in the lower diaphragm case (32), and that the 3 location pillars provide a unobtrusive gasway when fitted, in relation to the inlet port of the body (39).tighten evenly in place using 6 hexagon head screws (47).



Rebuilding Instructions continued

19. Using 3 socket head screws (38) secure valve seat (3) to valve seat holder (36).
20. Refit "O" ring seal (2) onto valve seat holder (3).
21. With flat face facing downwards, fit valve disc clamping washer (1) over bottom end of valve spindle (42).
22. Ensure valve disc (45) is attached to valve disc holder (40).
23. Refit "O" ring seal (44) into valve disc holder (40).
24. With valve disc (45) facing upwards replace valve disc holder (40) and "O" ring (44) onto valve disc clamping washer (1).
25. Replace spring washer (41) over valve disc holder (40).
26. Using flat bladed screwdriver in slot in valve spindle (42), screw together valve disc assembly with retaining nut (43). Tighten to a torque of 16 - 20 Nm.
27. Carefully replace main "O" ring seal (7) in body (39).
28. Replace regulator assembly into body (39), ensure in correct position i.e. unrestricted inlet porting.
29. Secure together regulator assembly and body (39) using 4 studs (48) and nuts (49).
30. Replace loading spring (23) inside chimney of top cover (27). For MP unit go to instruction No.32.
31. Screw LP top spring holder (24) with spigot locating into loading spring (23), into chimney of top cover (27). Go to instruction (36).
32. Replace MP top spring holder (53) with spigot locating into loading spring (23).
33. Screw MP spring adjusting bush (52) into chimney of top cover (27).
34. Screw MP nut (75) on to shaft of MP spring adjusting stem (51).
35. Screw MP spring adjusting stem (51) into spring adjusting bush (52), with the end of the stem (51) locating into the recess in the top spring holder (53).
36. Set Regulator to correct outlet pressure then screw MP top cap (50) on to MP spring adjusting bush (52).
37. Set Regulator to correct outlet pressure then screw LP top cap (25) into top cover (27).
38. Replace breather cover (26).
39. If taken apart - reassemble valve travel indicator by inserting tube (16), with "O" rings (18) at either end, into V.T.I. body (14). replace V.T.I. top cap (15).
40. Screw valve travel indicator assembly (14-22) into hole in top cover (27).



Drawing Reference: Page 7

Parts List Reference: Page 8

Note: Numbers in brackets identify items on drawing.

Dismantling Instructions.

Note: Regulator can be serviced with body still in pipeline. Ensure that pressure is isolated and exhausted.

1. Check external surfaces for excessive corrosion.
2. Remove 4 nuts (49) and separate regulator module assembly from body (39). Take care as this unit is heavy. Remove "O" ring seal (7) from body (39).
3. Take off top cap (25) and turn spring adjusting nut (61) anticlockwise to reduce loading spring force to a minimum.
4. Remove 8 hexagon head screws (68) from top diaphragm case (66) and lift off top cover assembly (27), loading spring (23) and gasket (69). If top cover assembly does not require dismantling go to instruction No.8.
5. Drift out pin (60), remove spring adjusting nut (61) and withdraw spring adjusting stem (59).
6. Unscrew locknuts (67) - first noting their position, and spring holder (24) from spring adjusting stem (59).
7. Drift out pin (58) and remove thrust washer (57) from spring adjusting stem (59).
8. Take out 2 socket head screws (64) and remove spring adjusting bush (63) and gasket (65).
9. Unscrew valve travel indicator (14-20) and breather hole cover (26). Check that hole in top diaphragm case (66) is clear.
10. Invert assembly and slacken off valve retaining nut (43) from lower end of valve spindle (42).
11. Remove spring washer (41), valve disc holder (40) - including valve disc (45), sealing "O" ring (44) and clamping plate (1) from valve spindle (42).
12. Unscrew 3 socket head screws (38) and remove valve seat (3) from valve seat holder (36).
13. Take "O" ring seal (2) from valve seat (3).
14. Remove 6 hexagon head screws (47), remove valve seat holder (36) from lower diaphragm case (32). DO NOT remove bush (37) from valve seat holder unless necessary.
15. Unscrew 20 hexagon head bolts (30) and nuts (77) and separate top diaphragm case (66) from lower diaphragm case (32).
16. With a flat bladed screwdriver inserted into slot on top of valve spindle (42), slacken off main diaphragm assembly retaining nut (13).
17. Remove nut(13), spring washer(28), spring location plate (12), diaphragm reinforcing plate(11), upper diaphragm plate (31), diaphragm (29) & lower diaphragm plate (33) from spindle (42).
18. Remove main diaphragm washer (34), taking care not to damage sealing "O" ring (10).
19. Valve spindle assembly (42) may then be removed complete.
20. Unscrew valve spindle guide (4) from spindle (42) and remove lower diaphragm plate (6), rolling diaphragm (8) & upper diaphragm plate (9) together with sealing "O" rings (5) and (76).
21. Remove sealing "O" ring (35) from lower diaphragm case (32) for inspection if required.
22. If required the valve travel indicator can be disassembled by unscrewing the top cap (15) and withdrawing the tube (16) with "O" ring seals (18).



Drawing Reference: Page 7
Parts List Reference: Page 8

Rebuilding Instructions.

Note: Inspect all sealing "O" rings, diaphragms and discs and replace where necessary.
(A soft spares kit is available for this purpose - see page 9).

The use of Dow Corning Molycote 111 "O" ring lubricant is recommended during the rebuild
(unless the unit was originally supplied with alternative lubricant for special conditions).

1. Replace upper secondary diaphragm plate 'O' ring seal (5) on main valve spindle (42).
2. The secondary diaphragm assembly is now replaced in the following sequence:- upper secondary diaphragm plate (9), "O" ring seal (76), rolling secondary diaphragm (8) - ensuring correct orientation, lower secondary diaphragm plate (6).
3. The secondary diaphragm plate assembly is clamped in place using the valve spindle guide (4).
4. Replace sealing "O" ring (35) in lower diaphragm case (32).
5. Insert spindle assembly (42) into lower diaphragm case (32).
6. Position main diaphragm washer (43) together with "O" ring seal (10) on spindle (42).
7. Fit lower diaphragm plate (33), main diaphragm (29), upper diaphragm plate (31), diaphragm reinforcing plate (11), spring location plate (12), spring washer (28) and retaining nut (13). Fully tighten assembly.
8. Position main diaphragm (29) in relation to clamping holes on lower diaphragm case (32).
9. Fit top diaphragm case (66) and secure in place by 20 hexagon head bolts (30) and nuts (77).
10. Reposition valve seat holder (36), ensuring that the secondary diaphragm (8) is full home in lower diaphragm case (32) and that the 3 location pillars provide an unobstructed gasway when fitted in relation to the inlet port of the body (39). Tighten evenly in place using 6 hexagon head screws (47).
11. Using 3 socket head screws (38) secure valve seat (3) to valve seat holder (36).
12. Position valve clamping washer (1) on spindle (42), followed by sealing 'O' ring (44), valve disc holder (40) - including valve disc (45), spring washer (41) and clamping nut (43). Tighten assembly to a torque of 16 - 20 Nm using slot at top end of spindle (42) to stop spindle rotating.
13. Replace main sealing 'O' ring (7) in regulator body (39) and "O" ring seal (2) on valve seat (3) and grease appropriately.
14. Replace module assembly into body (39) ensuring correct orientation, i.e. unrestricted inlet porting.
15. Replace and tighten 4 retaining nuts (49) onto studs (48), securing module to body.
If top cover assembly has not been dismantled go to instruction No.23.
16. Insert spring adjusting bush (63) and gasket (65), ensuring correct alignment of holes, into top cover (27).
17. Secure spring adjusting bush (63) in place with 2 socket head screws (64).
18. Push thrust washer (57) onto stem (59) and refit pin (58).
19. Screw spring holder (24) onto stem (59) with smaller boss facing thrust washer (57).
20. Replace locknuts (67) onto stem (59) and tighten in their previously noted position.



Rebuilding Instructions continued.

21. Insert stem assembly (59) into top cover (27) and push smaller end through spring adjusting bush (63).
22. Reposition spring adjusting nut (61) over spring adjusting stem (59) and secure with pin (60).
23. Replace loading spring (23), top cover assembly (27) and gasket (69) using 8 hexagon head screws (68).
24. If taken apart - reassemble valve travel indicator by inserting tube (16), with "O" rings (18) at either end, into V.T.I. body (14). replace V.T.I. top cap (15).
25. Replace breather hole cover (26) and valve travel assembly (14) with 'O' ring (19) in top diaphragm case (66).
26. Set regulator to required outlet pressure (see commissioning instructions) and replace top cap (25).



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