



**Flexflo® Model 829S1  
MAINTENANCE INSTRUCTIONS**

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**WARNING**

**No Work shall be performed on the valve in any manner without the proper work permits being obtained and compliance with pertinent National Occupational Health and Safety requirements are strictly adhered to. The valve contains high-pressure fluids, which may be toxic or flammable. Operation of the valve without these instructions constitutes abuse of the product, unless alternative instructions have been approved by Dresser Pressure Regulation Group.**

**Purpose**

This manual is intended to be used as a guide for disassembly and maintenance of the RedQ 829S1 Pilot. A brief description of the unit and operating principle is provided. For instructions on installation, operation and troubleshooting, refer to the Flexflo-829S Installation and Operating Procedures.

**Scope**

This manual provides instructions for disassembly, cleaning, inspection, replacement, lubrication and reassembly of RedQ Model 829S1 pilots. This manual is applicable to Model 829S1 reducing and back pressure pilots with control ranges of 3-10, 8-25, 20-75, 60-150, 125-130 & 300-600 psig.

**General Specifications**

- Model No.: 829S1
- Basic Figure No.: 11571
- Variable Orifice: 5/64" (std) & 1/8"
- Temperature: 0° F to 150° F
- Weight: 5.0 lbs.
- Rotor: M1 (std) or L1

**Table 1 - Spring Ranges and Ratings**

Control Range	Spring Code	Spring Color	Max. Pressure Rating	
			Inlet/Jacket Port	Other Ports
3-10	K	Grey	1500 psig	300 psig
8-25	L	White	1500 psig	300 psig
20-75	M	Brown	1500 psig	300 psig
60-150	N	Nickel	1500 psig	1000 psig
125-130	Q	Yellow	1500 psig	1000 psig
300-600	S	Black & Orange	1500 psig	1000 psig

**Service Recommendations**

RedQ recommends disassembling, cleaning and inspecting the unit once a year.

Complete replacement of soft goods is advised. Note that in some instances it may be desired to limit maintenance to switching the working and spare poppet until such time when complete overhaul is possible. Kits are available which provide all the recommended replacement parts. See tables 2, 3 & 4 for part number and ordering information. Contact your local RedQ representative for ordering information.

**Functional Description**

(Reference Figures 1 and 3)

The Model 829S1 pilot is an adjustable, spring loaded, diaphragm operated valve with an integral variable orifice designed for use as a reducing or back pressure pilot for RedQ Flexflo regulators.

The Model 892S1 may be used in either gas or liquid systems. The spring range, variable orifice and internal orifice can be changed to suit application requirements.

There are four main cavities in the pilot. The Spring Barrel is open to atmosphere and holds the control spring which is set to the desired control pressure. The Sense cavity is connected to a point upstream or downstream of the Flexflo where pressure control is desired. The Inlet/Jacket cavity allows upstream line pressure to the Flexflo jacket. The Outlet cavity normally connects to the outlet of the Flexflo body but may be connected to the downstream piping. The Sense cavity balances the pressure exerted by the spring to open and close the valve (poppet).

**Reducing service:**

When the sense pressure is lower than the set pressure, the operating spring force pushes open the valve. The restriction of inlet flow across the variable orifice allows Flexflo to open. Conversely, when the sense pressure is higher than the set pressure, the pilot valve closes which causes Flexflo jacket pressure to increase thereby closing jacket Flexflo.

**Back Pressure service:**

When the sense pressure is low the spring force keeps the pilot valve and the Flexflo closed. Conversely, when the sense pressure is high the pilot valve is open, venting the Flexflo jacket and allowing the Flexflo to open.

**Disassembly Procedure**

<b>CAUTION</b>
<b>Before removing or disassembling the pilot isolate and blowdown the Flexflo/Pilot valve assembly. Loosen all three tubing connections at the pilot to insure that all press is bled from the unit.</b>

Refer to Figure 2 and 4 for locations of the item numbers referred to below. In a reducing assembly, the internal orifice (valve seat) faces downward toward the Closure (3); in a back pressure assembly, the body is inverted and the seat is facing upward towards the Barrel (1). Prior to disassembly locate and note the orientation of the word "SEAT" on the Body (2). Disassembly for 300-600 psig spring range will also include a second Operating Spring (7b).

## NOTE

**Maintenance may be done with the pilot mounted on the Flexflo or by clamping in a vise. If a vise is used, the jaws should be a soft type or the pilot held between wood block to protect the port faces.**

- A. Loosen Lock Nut (9) and back-off the Adjusting Screw (10) fully to release spring compression. The Adjusting Screw (10) may be completely removed from the Spring Barrel (1) and Nut (9) to gain access to the Washer (28) and Seal Washer (11) if needed.
- B. Remove the four Bolts (19) holding the Spring Barrel (1) to the Body (2). Lift the Spring Barrel (1) off the Body (2). Lift out the Spring Button (8) and the Control Spring (7a). For 300-600 psig pilots, there will be an inner Control Spring (7b) to remove.
- C. Remove the four Bolts (19) holding the Closure (3) to the Body (2). Remove the Closure (3), Lower Spring (13), and Dampening Disc (27).
- D. Remove the Poppet Retainers (37) holding the Diaphragm Plate (36) and Diaphragm (4) to the Piston Head (16).
- E. Remove the Socket Head Screws (17) to disconnect the Piston Heads (16) from each side of the body.
- F. Remove Orifice (15) from Body (2).
- G. Remove O-Ring (14) from Orifice (15).
- H. Remove the worn Poppet (22) from the Poppet Retainer (37).
- I. Disconnect Rotor (23) from Retainer Nut (21) and remove from Body (2).

## Cleaning & Inspection

- A. All parts should be thoroughly cleaned before inspection. Metal parts may be cleaned with a petroleum solvent. Non-metallic parts should be cleaned in mild alkaline solution with a water rinse.

## CAUTION

**If Pilot is mounted to Flexflo, use caution not to let solvent drain into jacket port and possibly damage tube.**

- B. Inspect Diaphragms (4) for wrinkles, tears or cracks. Replace if damaged.
- C. Examine all O-Rings and replace if damaged.
- D. Examine all fasteners and tapped holes for damage.
- E. Examine all o-ring sealing surfaces for damage and any debris which might impair sealing.
- F. Examine the seating surface on the Orifice (15) for damage or scratches that could affect valve performance.
- G. Examine the diaphragm clamping surfaces on the Body (2), the Barrel (1) and the Closure (3) for roughness that might affect diaphragm sealing.

Identify and discard parts to be replaced. If additional items that are not provided with the maintenance kit need replacing, locate the item on Figure 2 or 4 as appropriate and obtain the part number on table 2. Contact your RedQ representative for ordering assistance.

## Lubrication

- A. Lubricate Bolts (19) and recess in Spring Button (8) with "Lubriplate" #105 or other suitable grease.
- B. Lubricate sparingly O-Rings (14) and (24) with Parker Super-O-Lube. If Hydrocarbons cannot be tolerated in the system, it is permissible to use Kel-F-90, Fluorolube LG-160 grease, or Fluorolube FS-5 oil.

Pilot parts are now ready for assembly.

## Re-assembly Procedure

- A. Install O-Ring (14) on the Orifice (15) and then install orifice in the body. Torque per Table 4.
- B. If not already installed, insert chamfered end of Poppets (22) into the Poppet retainers (37). (V-groove along length of Poppet assists in its proper seating.) Press the Poppet firmly to ensure contact with the bottom of the Popper Retainer. Inspect the Poppet for squareness with the retainer. Measure the height of the Poppet per Figure 5.
- C. Install the Poppet Retainer Seal (6), Diaphragm Plate (36), Diaphragm (4) onto the Poppet Retainer (37). (Bump of Diaphragm should be toward Diaphragm Plate.)
- D. Install the diaphragm assembly into the Piston Heads (16). Torque the Poppet retainers (37) per Table 4. Rotate the piston assembly within the body so that no sliding metal to metal contact will occur in operation.

- E. Place the Dampening Disc (27) and Lower Spring (13) within the Closure (3).
- F. Secure the Closure (3) with the four Bolts (19) on the side of the body marked “SEAT” for reducing assemblies or on the opposite side marked :SEAT” for back-pressure assemblies. Ensure that the lower spring is centered over the spring follower and the diaphragms are centered within the sealing area of the body. Torque Bolts per Table 4.
- G. If the Washer (28) and the Seal Washer (11) were removed in step A above, reinstall the Nut (9), Washer (28), and Seal Washer (11) on the Adjusting Screw (10). Screw the Adjusting Screw (10) into the Spring Barrel (1) approximately 1/2 inches.
- H. Place the appropriate Operating Spring(s) (7a and 7b) and Spring Button (8) over the spring follower. Insure that the upper diaphragm is centered and flat within the body sealing area. Place the spring barrel assembly over the operating spring and attach to the body with four Bolts (19). Align vent port with outlet port. Torque bolts per Table 4.
- I. Install O-Ring (24) on the Rotor (23) and insert the rotor into the Pilot Body (2) such that the rotor arrow is on the same side of the body as the Spring Barrel (1). Attach Retainer Nut (21) and O-Ring (24) to the rotor snug.
- RedQ Model 829S1 Pilot is now ready for service.

**Table 2 - Parts List for Model 829S1 Pilot, Standard Trim is Code A, all Pressure Ranges**

Basic Figure Number 11571 Figure Number Extensions. See Table 3 for Trim Code Variations.									
Reducing			KRA	LRA	MRA		NRA	QRA	SRA
Back Pressure			KBA	LBA	MBA		NBA	QBA	SBA
Control Pressure Range			3-10	8-25	20-75		60-150	125-350	300-600
Item	Part Name	Qty	Part No.	Part No.	Part No.	Qty	Part No.	Part No.	Part No.
1	Spring Barrel	1	101-04829						
2	Body	1	101-04828						
3	Closure	1	101-04825						
4	Diaphragm	4	090-02108	090-02108	090-02108	2	090-02107	090-02107	090-02107
6	Poppet Retainer Seal	2	025-00317						
#7	Operating Spring Set	1	101-90078	101-90079	101-90080	1	101-90081	101-90082	101-90083
	<b>Color Code</b>		<b>Grey</b>	<b>White</b>	<b>Brown</b>		<b>Nickel Coat</b>	<b>Yellow</b>	<b>Black/Orange</b>
8	Spring Button	1	101-04821						
9	Nut	1	N66-58131						
10	Adjusting Screw	1	N50-58481						
11	Seal Washer	1	021-01007						
13	Spring (Lower)	1	015-81204						
14	O-Ring (Seat)	1	025-00204-814						
15	Orifice – 5/64”	1	101-04802-1						
16	Piston Head	2	101-04836						
17	Screw-Socket Head	2	N15-10105						
19	Bolt Hex Head	8	001-21205						
21	Retainer Nut	1	106-00503-1						
*22	Poppet	2	101-04839						
23	Rotor – M1	1	106-00526						
24	O-Ring (Rotor)	2	N90-82805						
25	Nameplate	1	049-00349						
27	Dampening Disc	1	101-04811						
28	Washer	1	011-00405						
36	Diaphragm Plate	2	101-04837-261A1						
*37	Poppet Retainer	2	101-04838-26700						
# Item 7, includes the following parts (not sold separately)									
Control Range (PSIG)			3-10	8-25	20-75		60-150	125-350	300-600
Item	Part Name	QTY	Part No.	Part No.	Part No.		Part No.	Part No.	Part No.
7A	Spring Outer	1	015-92409	10914-2	015-82403		10928-1	015-92402-3	015-92405-2
7B	Spring Inner	1	N/A	N/A	N/A		N/A	N/A	015-61304
25	Nameplate	1	049-00349						

- Note:** 1. Part numbers and quantities are the same as for the 3-10 PSIG control range unless otherwise specified.  
 2. Refer to Figures 2 and 4 for item location.  
 \* Items 22 & 37 included in Poppet Retainer Assembly 101-04840.

**Table 3 - Special Trim Variations (Last Character of the Pilot's Figure #)**

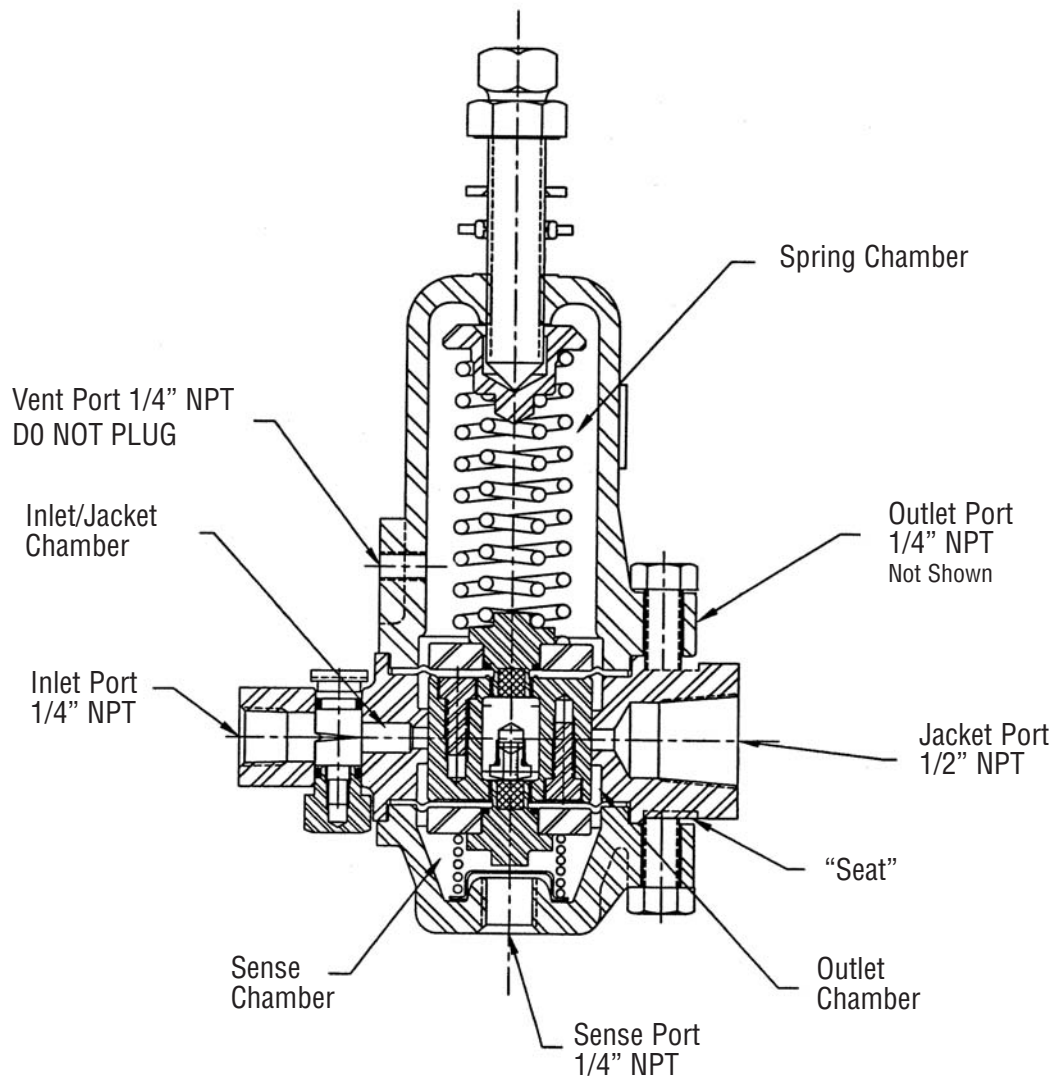
Item	Part	Size	Material	Part No.	A	D
15	Orifice	5/64	T303	101-04802-1	X	
		1/8 <sup>(1)</sup>	T316	101-04814-2		X
23	Rotor	M1	T303	106-00526	X	X
		L1	T303	106-00531		

NOTES: (1) Use 1/8" orifice for faster closing or liquid service.  
 "A" is the standard option for gas service.  
 "X" indicates use of these part numbers.

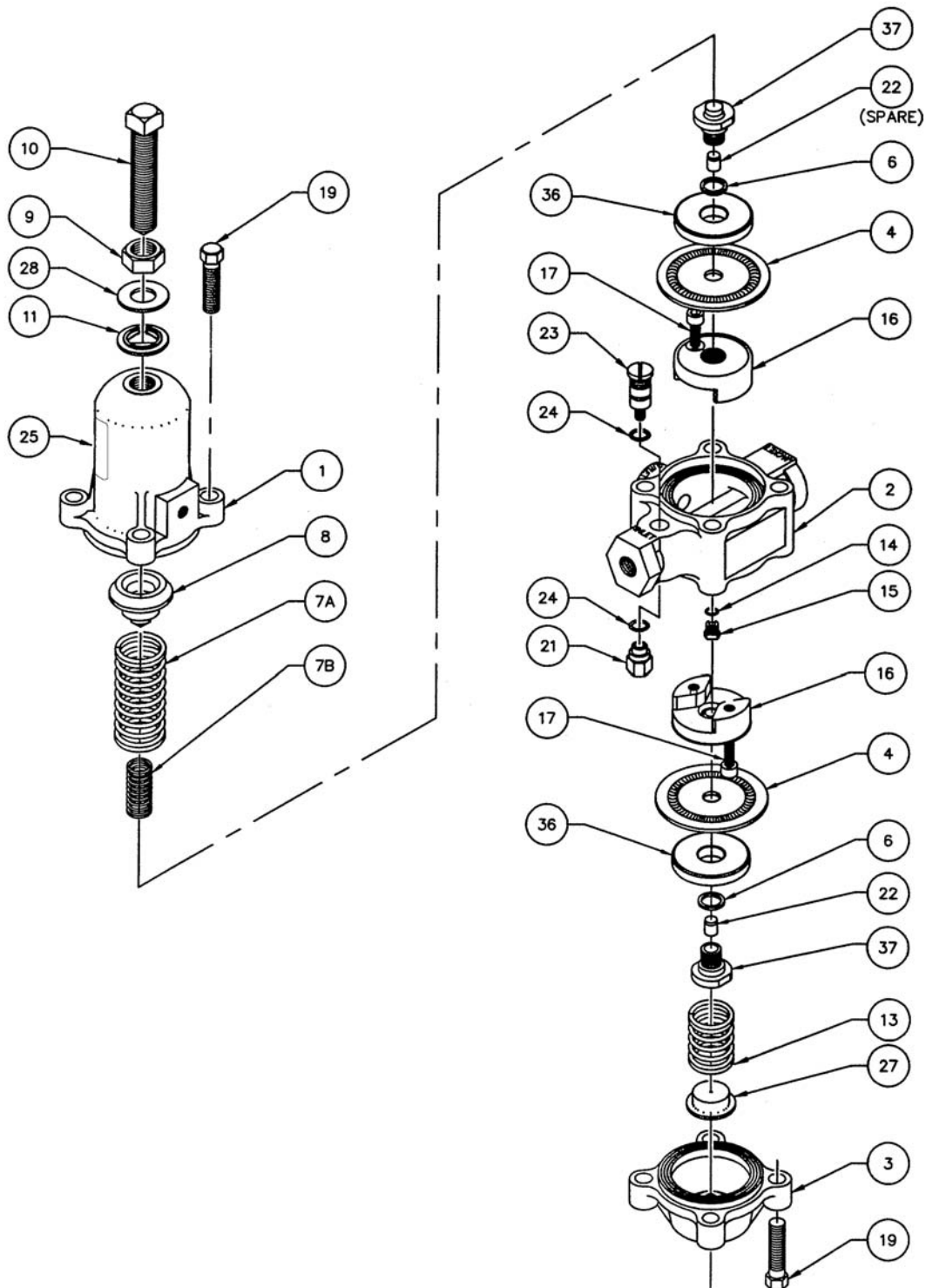
**Table 4 - Kits, Torques, and Tools**

	Conversion Kits		101-90084	101-90085				
	Soft Good Kits		101-90086	101-90087				
	Spring Code		K	L	M	N	Q	S
	Spring Range (PSIG)		3-10	8-25	20-75	60-150	125-350	300-600
Item	Description	Tools	Torque					
15	Orifice 5/16" Hex	5/16" Socket Wrench	10-15 in. lb.					
17	Screw Socket Head	5/32" Allen Hex. Wrench	60-85 in. lb.					
19	Bolt, Hex Head.	1/2" Socket Wrench	95-100 in. lb.					
37	Poppet Retainer	11/16" Open-end Wrench	150-160 in. lb. (13 ft. lb.)					

**Figure 1** - Typical Cross-Section Pressure Reducing Pilot

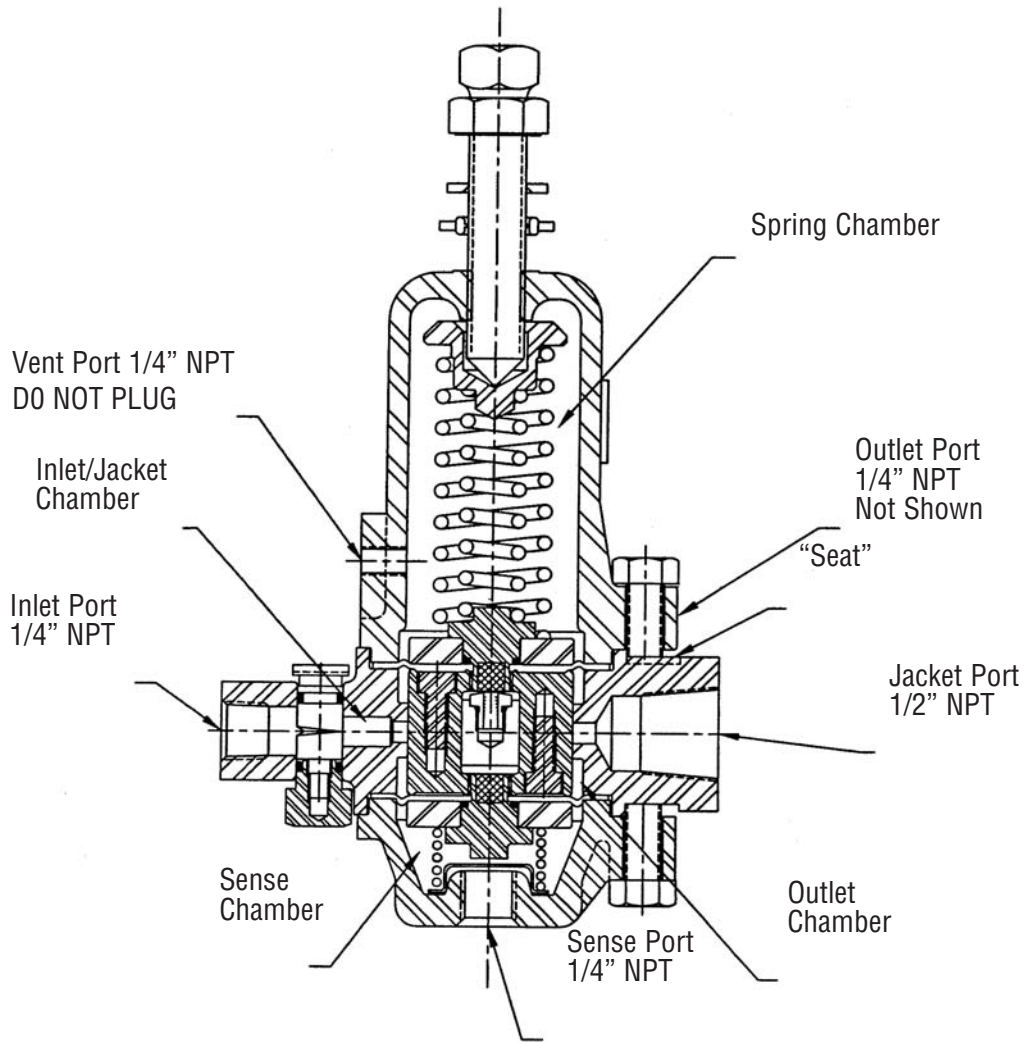


**Figure 2 - Exploded Assembly of Pressure Reducing Pilot**

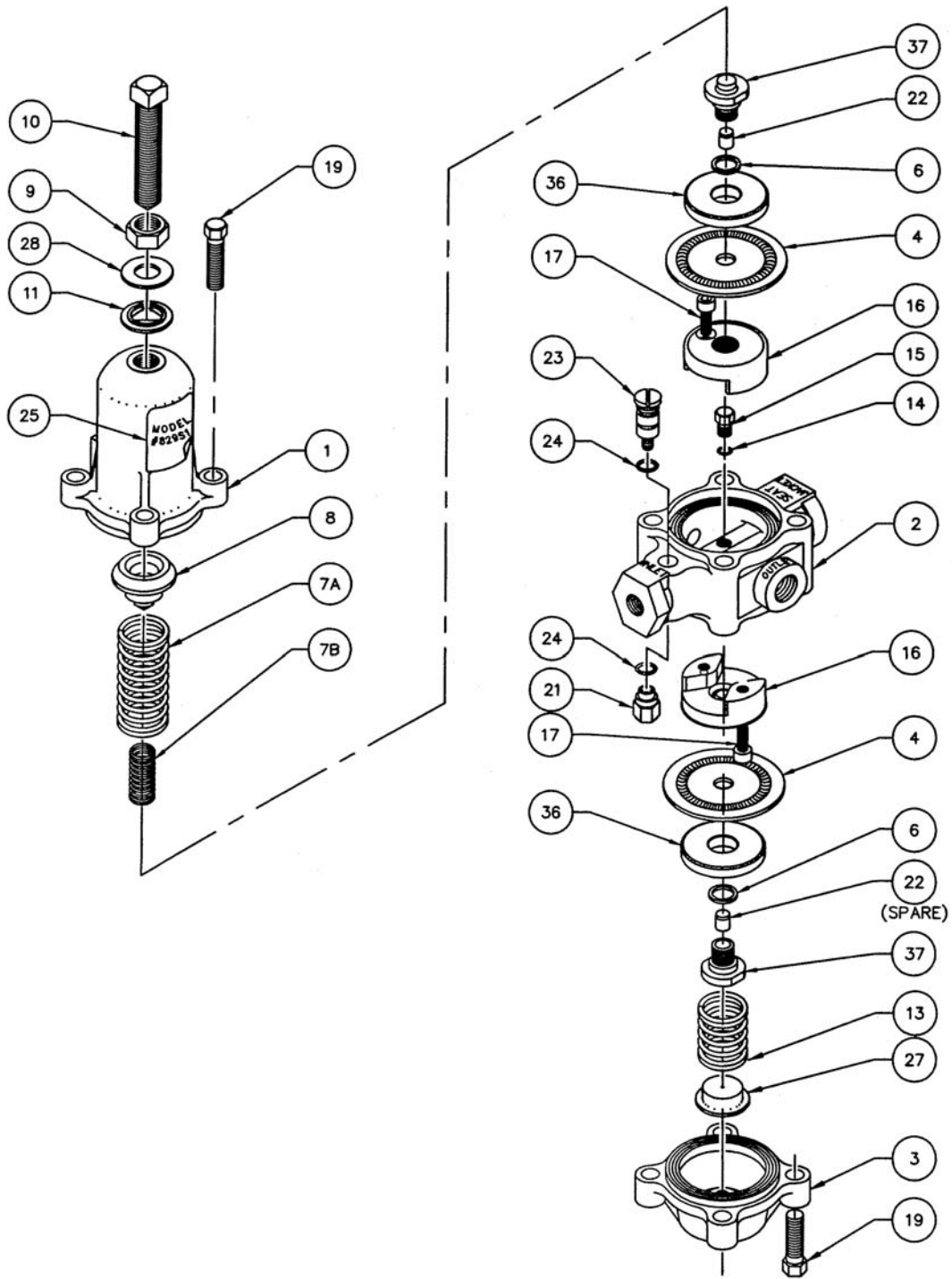


- NOTES:**
1. Item 7B only used with 300-600 PSI Control Assembly.
  2. See Table 2 for Part Numbers.
  3. Low Pressure Pilots K, L, & M utilize two thinner Diaphragms for each Poppet Assembly.

**Figure 3 - Typical Cross-Section Back Pressure Pilot**

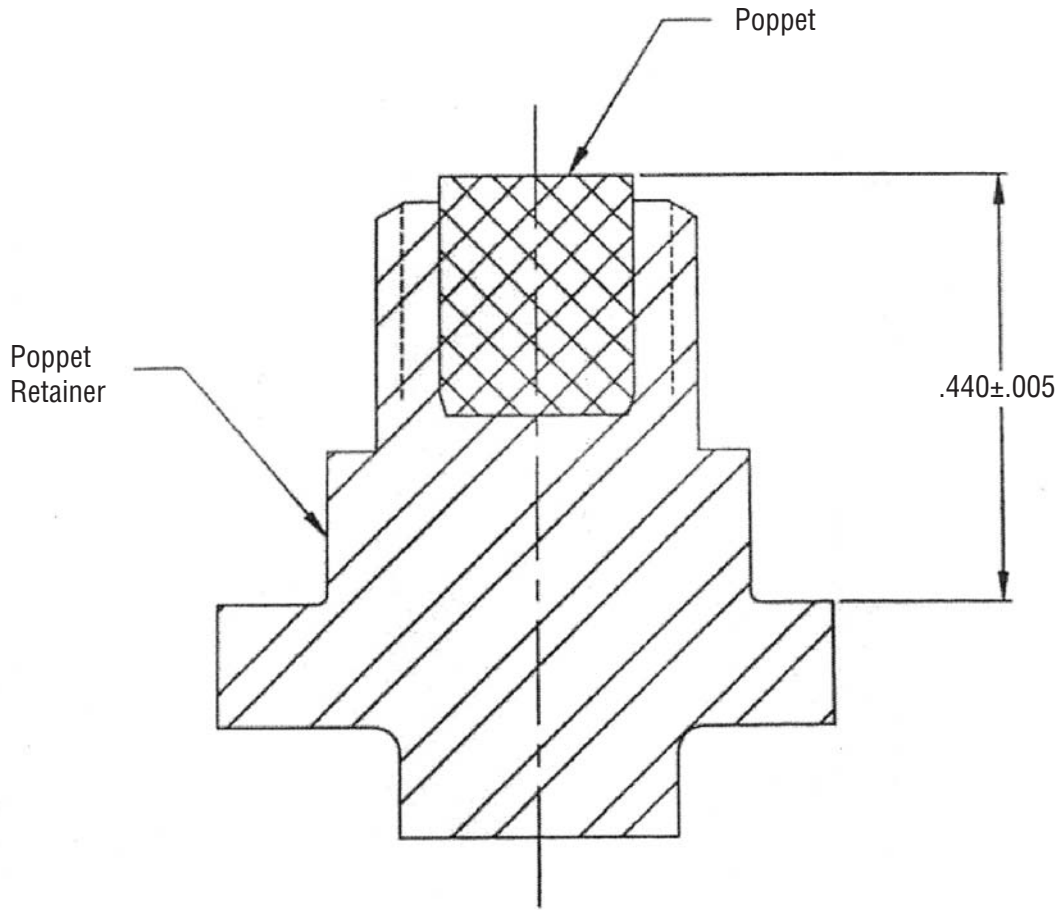


**Figure 4 - Exploded Assembly of Back-Pressure Pilot**



- NOTES:**
1. Item 7B only used with 300-600 PSI Control Assembly.
  2. See Table 2 for Parts Numbers.
  3. Low Pressure Pilots K, L, & M utilize two thinner Diaphragms for each Poppet Assembly.

Figure 5



- NOTES:**
1. Seat chamfer end to bottom of Poppet Retainer.
  2. Poppet face should appear flat when compared to the Poppet Retainer.
  3. Measure the height of the Poppet as shown above.

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