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I & M Steam Pressure Regulating Valve

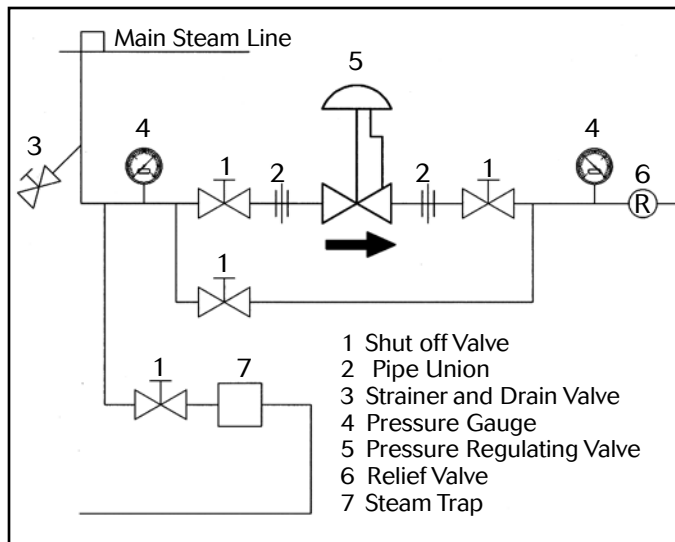
Installation & Maintenance Instructions for Steam Pressure Regulating Valves

Warning: Bestobell Steam pressure regulators must only be used, installed and repaired in accordance with these Installation & Maintenance Instructions. Observe all applicable public and company codes and regulations. In the event of leakage or other malfunction, call a qualified service person; continued operation may cause system failure or a general hazard. Before servicing any valve, disconnect, shut off, or bypass all pressurized fluid. Before disassembling a valve, be sure to release all spring tension.

Please read these instructions carefully!

Your Bestobell product will provide you with long, trouble-free service if it is correctly installed and maintained. Spending a few minutes now reading these instructions can save hours of trouble and downtime later. When making repairs, use only genuine Bestobell parts, available for immediate shipment from the factory.

Ideal Installation



Preferred Installation

- To protect the valve from grit, scale, thread chips, and other foreign matter, all pipe lines and piping components should be blown out and thoroughly cleaned before the valve is installed.
- Shutoff valves, pressure gauges, and bypass piping should be installed as indicated in the Ideal Installation Schematic to provide easier adjustment, operation, and testing.
- In preparing threaded pipe connections, care should be exercised to prevent pipe sealing compound from getting into the pipe lines. Pipe sealing compound should be used sparingly, leaving the two end threads clean. Bestobell uses, and recom-

- mends, thread sealer Teflon ribbon.
- A line strainer should be installed on the inlet side of the regulator to protect it from grit, scale and other foreign matter. A 0.033 perforated screen is usually suitable. Line strainers are available from Bestobell Steam.
- Install the regulator in the highest horizontal line of piping to provide drainage for inlet and outlet piping, to prevent water hammer and to obtain faster regulation.
- The flow arrow on the regulator body must be pointed in the direction of flow. The regulator may be installed vertically or horizontally without affecting its operation.
- For best control, 3'0" straight sections of pipe should be installed on either side of the valve.
- In hot vapor lines, upstream and downstream piping near the regulator should be insulated to minimize condensation.
- If possible, install a relief valve downstream from the valve. Set at 15 psi above the control point of the regulator.
- Expand the outlet piping at least one pipe size if the controlled pressure (downstream) is 25% of the inlet pressure or less. A standard tapered expander connected to the outlet of the regulator is recommended.
- Where surges are severe, a piping accumulator is recommended.
- Operate the regulator within its rated pressure and temperature.

Start-Up

- Fully open the outlet shut-off valve.
- Slowly open the inlet shut-off valve.
- Slowly open and close outlet shut-off valve several times. This fully strokes the valve to insure satisfactory operation.
- With outlet shut-off valve open, slowly screw down adjusting screw until the desired pressure is shown on the outlet pressure gauge.
- To change the controlled pressure, turn the adjusting screw clockwise to increase and counter-clockwise to decrease the pressure.

Warning

Never substitute a longer length adjusting screw. Personal injury and damage to the valve may result.

Maintenance

WARNING

Be sure that there is no pressure in the valve before loosening any fittings or joints. The following steps are recommended:

1. Close the inlet shut-off valve.
2. Allow pressure to bleed off through the downstream piping. Do not attempt to reverse the flow through the valve by bleeding pressure from the upstream side of the valve.
3. When downstream pressure gauge indicates no pressure in the line, close the outlet shut-off valve.

Refer to the drawing for the proper orientation of the parts and for proper nomenclature.

Troubleshooting

Erratic Control

- Oversizing causes cycling and hunting, and reduces the rangeability of the regulator. Make certain that your sizing is correct.
- Steam traps downstream may need attention.
- Safety valve may be jammed open, disrupting the system. Repair as necessary.
- Excessive foreign matter on seat of plug (3)*. Clean them. Inspect seating surface on plug for deterioration.
- Valve stroke may not be moving freely. Check stem (22), bushing (10) or cap bore (2).

Downstream pressure build-up

- Seats deteriorated. Inspect for foreign material between plug (3) and seat (9).
- Diaphragm (11) failed. Use metal seats for tighter shut-off. Consider elastomer seats.

Cannot Maintain Regulated Pressure

- Clogged strainer or lines.
- Inlet pressure low.
- Spring (14) set too low or broken.
- Valve is undersized for rated flow.
- System demand exceeds pump capacity.

* See back page for parts call-out.

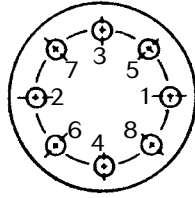
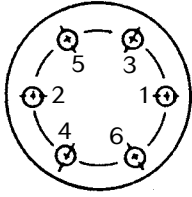
Diaphragm Replacement

1. Remove all pressure from the line as outlined under WARNING.
2. Remove the compression on the adjusting spring (14) by rotating the adjusting screw (19) counter-clockwise.
3. Remove the spring housing (17). Remove the spring (14) and spring seat (15).
4. Lift the diaphragm assembly. This diaphragm assembly consists of the upper diaphragm plate (13), diaphragm (11) and lower diaphragm plate (12).
5. Secure the upper diaphragm plate in a vise. Use a spanner wrench on the lower diaphragm plate and turn counter-clockwise to loosen and remove.
6. Remove the diaphragm, clean the parts and install the new diaphragm in reverse order. Pull the parts up tight when a metal diaphragm is used. When elastomer diaphragms are used, clean and degrease the threads, apply one drop of #290 Loctite to the threads, and assemble. (Loctite Primer T may be used to degrease). Thread the parts together, hand tight, and then tighten 1/8 to 1/4 turn.
7. Clean the diaphragm seating surfaces on the spring housing (17) and on the body (1).
8. Unscrew the cap (2) approximately two turns to retract the stem. Place the diaphragm assembly, spring, spring seat and ball bearing back onto the valve body. (Metal diaphragms nest into the counter-bore in the body).
9. Install spring housing. Tighten bolts (18) evenly per chart.
10. Thread cap back into the body and pull snug.

Seat and Plug Replacement

1. Remove all pressure from the line as outlined in the WARNING.
2. Turn the hex end on the cap (2) counter-clockwise and remove it from the body. The plug (3) and return spring (5) will come out with the cap.
3. Remove the seat (9) with a deep drive socket.
4. Inspect parts for wear and replace as required.
5. Clean all parts in the body and on the cap. Lightly lubricate these surfaces.
6. Reassemble plug spring into cap and check for smooth operation.
7. Install seat with a light coat of Teflon paste on the flat seal area and anti-seize to the threads.
8. Install bottom cap onto the body with a light coat of Teflon paste on the flat seal area and anti-seize on the threads until it bottoms out on the body and tighten.

Torque Procedure



1. Install all bolts hand-tight.
2. Torque the bolts in order of the bolt pattern to a value equal to 1/4 of the recommended torque value.
3. Retorque each bolt to the recommended value using the same bolt pattern as shown.

Torque Chart for Spring Housing Bolts

Elastomer Diaphragm		Metal Diaphragm	
Bolt Size	Torque	Bolt Size	Torque
5/16	200 in-lbs	5/16	300 in-lbs
3/8	300 in-lbs	3/8	300 in-lbs

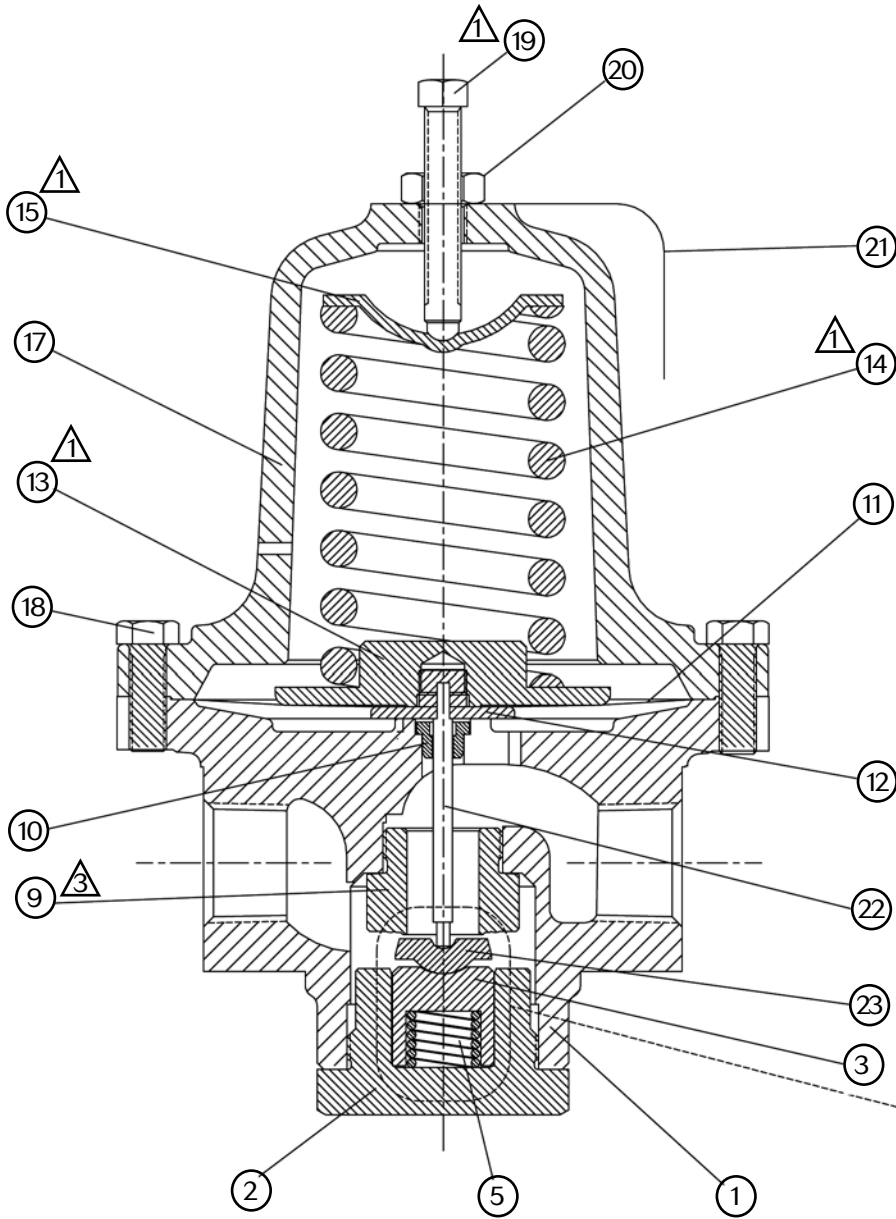
Torque Procedure

Ordering Spare Parts

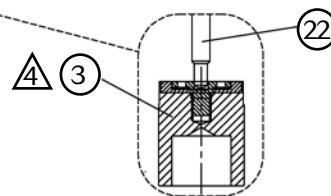
Use only genuine Bestobell Steam Trap parts to keep your valve in good working order. So that we can supply the parts, which were designed for your valve, we must know exactly which product you are using. Please note the following information on the valve's nameplate:

- Serial Number
- Model and Size
- Body Material and End Connections
- Range
- Diaphragm and Seal Materials

Cross Section View



Item	Description	Qty
1	Body	1
2	Bottom Cap	1
3	Plug Assembly	1
5	Return Spring	1
9	Orifice (Seat - Std Cv)	1
10	Bushing	1
11	Diaphragm	1
12	Lower Diaphragm Plate	1
13	Upper Diaphragm Plate	1
14	Range Spring	1
15	Spring Seat	1
17	Spring Housing	1
18	HHCS	10
19	Adjusting Screw	1
20	Jam Nut	1
21	Nameplate	1
22	Stem	1
23	Hart Seat	1



Optional
Soft Seat Trim/Plug Assembly
Seat Detail

Notes:

- These items may vary according to range feature
- 20 HHCS for PRV-MP
- Orifice (seat) is stellited on PRV-MP only
- Soft seat plug assembly - PRV-G only

