SINGER VALVE
Result-Based Solutions. Globally.™

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SINGER MODEL 106/206-PR-SM

Pressure Reducing Valve with Downstream Overpressure Protection Schematic A-7697D
Installation, Operating and Maintenance Instructions

DESCRIPTION:

Model 106/206-PR-SM is a pilot operated pressure reducing valve designed to reduce a high inlet pressure into a lower outlet pressure. The valve will maintain a relatively steady downstream pressure regardless of fluctuations in the supply pressure or the flow rate. This function is performed by the Primary Pilot System connected to the valve main chamber (or bonnet) at **port 'a'.**

Superimposed on the Primary Valve is a secondary operator, designated by the "M" in the model number. This secondary operator has a separate and independent pilot system which monitors the outlet pressure through Surge Pilot (4). If the outlet pressure rises to the set point of Pilot (4), Pilot (4) will open to connect the inlet pressure of the Main Valve to the bonnet (connection 'b') of the Secondary operator. This closes the Main Valve rapidly and positively to keep the outlet pressure from rising further.

Unless otherwise specified, the valve will be assembled for service temperatures to 180°F (80° C).

DESCRIPTION OF OPERATION:

Main Valve (1) is normally open when pressure is applied to the valve inlet. When this same pressure is applied to the main bonnet through ***port "a",*** via the ***PRIMARY PILOT SYSTEM***, the Main Valve closes tight. By controlling the pressure in the bonnet, the Main Valve can be made to open fully, close tight, or open partially.

The pressure in the Main Valve bonnet (and therefore the position of the Main Valve) is controlled by a pilot circuit consisting of Fixed Restriction (5), Flow Stabilizer (6), if so equipped and Pressure Reducing Pilot (7).

When there is no demand, and the downstream pressure is at the setting of Pressure Reducing Pilot (7), Pilot (7) is closed.

Pressure from the inlet side of the valve is directed to the bonnet at ***port "a"*** through Fixed Restriction (5) and Flow Stabilizer (6), if so equipped. The Main Valve closes.

When flow is required, Pilot (7) senses a drop in downstream pressure and opens. The flow through Pilot (7) is greater than the flow through Fixed Restriction (5). This reduces the pressure in the Main Valve bonnet. The Main Valve opens to supply demand. The speed of opening is determined by the setting of Flow Stabilizer (6), if so equipped. Refer to Model 26 instructions for adjustment.

Under flow conditions, Pilot (7) reacts to small changes in downstream pressure and modulates the pressure in the Main Valve bonnet as required to keep the downstream pressure constant. Main Valve position follows the position of Pilot (7). When Pilot (7) is closed the Main Valve closes, and when Pilot (7) opens the main valve opens.

Model 106/206-PR-SM is equipped with a second and independent pilot system consisting mainly of Surge Pilot (4). This pilot has a sensing connection to the downstream of the Main Valve. If the downstream pressure rises above the setting of Pressure Reducing Pilot (7) and reaches the setting of Surge Pilot (4), Pilot (4) opens. This directs pressure to the secondary valve chamber and the backup diaphragm at ***port "b"*** maintaining modulation of the Main Valve.

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INSTALLATION:

1. Refer to 106/206-PGM Instructions.
2. Installation where there is loosely held piping and/or elbows close to the valve may cause the valve to pulsate.

ADJUSTING PROCEDURE:

MAIN PRESSURE REDUCING VALVE

1. Open Isolating Valve (2A) in the primary pilot system.
2. Crack open the downstream mainline stop valve, and slowly open the upstream mainline stop valve. (Note, by mainline stop valve we mean the gate or butterfly valve in line before and after the Singer valve)
3. Open Isolating Valve (8) and bleed air from the Main Valve bonnet.
4. Open Isolating Valve (9A).
5. Open downstream mainline stop valve wide.
6. Set downstream pressure by turning Pilot (7) adjusting screw: to increase pressure, turn adjusting screw clockwise, counter-clockwise to reduce pressure.
7. ***NOTE THAT THERE MUST BE FLOW THROUGH THE VALVE WHEN PRESSURE IS ADJUSTED.***
8. If the valve does not open (downstream pressure remains low), check the adjustment of Flow Stabilizer (6), if so equipped. SEE MODEL 26 INSTRUCTIONS.

SECONDARY PILOT SYSTEM

NOTE: On initial startup of this valve always set the primary pressure reducing valve first before proceeding to the secondary pilot system.

1. Open Isolating Valves (2B) and (9B). Observe Fixed Restriction (11) for flow. If there is no flow, Pilot (4) is set higher than Pressure Reducing Pilot (7) and you can proceed with the instructions in No. 2 below.
- If there is flow from Restriction (11), turn the adjusting screw of Surge Pilot (4) clockwise until the flow stops. Make this adjustment in 1/2 turn increments with a short pause between each adjustment.
- When the stem on the top of the valve begins to rise, there is no need for further adjustment. Wait until the stem has fully risen and all flow from Restriction (11) has stopped.

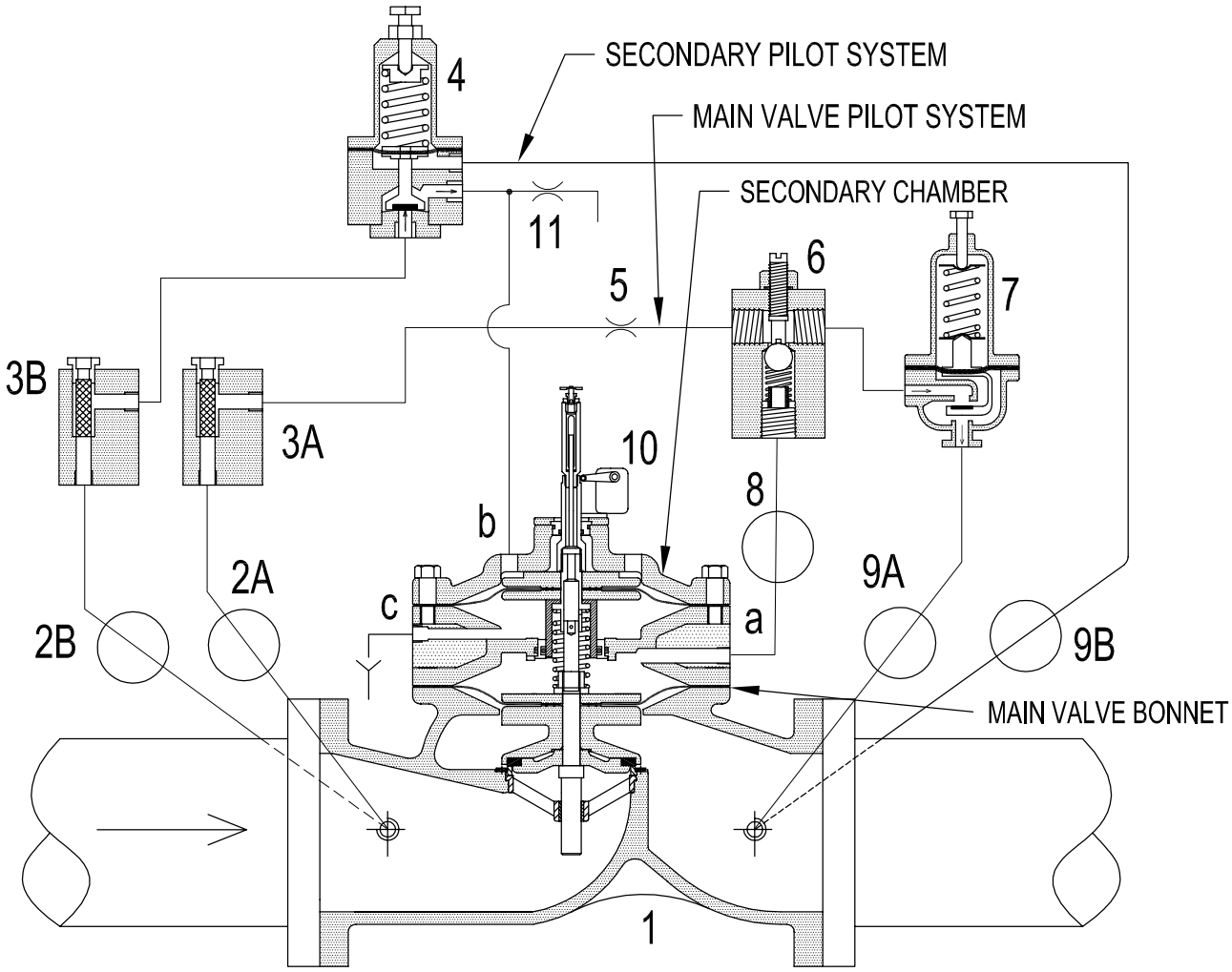
2. Turn the adjusting screw on Pilot (4) counter-clockwise until flow just starts to appear at Fixed Restriction (11). Pilot (4) and Pressure Reducing Pilot (7) are now set approximately the same.
3. Increase the setting of Surge Pilot (4) to 5-10 psi higher than Pilot (7).

NOTE THERE MUST BE FLOW THROUGH THE VALVE WHEN MAKING THIS ADJUSTMENT.

4. Check the range of Normally Closed Pilot (4) and turn the adjusting screw clockwise to set. If pilot spring range is: turn adjusting screw:
   a. 5 - 50 psi 1 turn
   b. 10 - 80 psi 1/2 turn
   c. 20 -200 psi 1/3 turn

NOTE : NORMALLY CLOSED PILOT (4) MUST BE SET HIGHER THAN PRESSURE REDUCING PILOT (7) FOR PROPER OPERATION OF THIS VALVE.

A-7697D



1. Main Valve - Model 106/206-PGM c/w X107 Indicator.
2. Isolating Valves .
3. Strainer - 40 Mesh - Model J0098A.
4. Surge Pilot - Model 81-RP - Secondary System Pilot.
5. Fixed Restriction.
6. Flow Stabilizer (opening speed control) - Model 26 - 8"106/10" 206 and smaller only.
7. Pressure Reducing Pilot - Model 160 - Primary System Pilot.
8. Isolating Valve.
9. Isolating Valve.
10. Limit Switch - OPTIONAL - S.P.D.T.
11. Fixed Restriction - 1/16".

Pressure Reducing Valve with
Downstream Overpressure Protection.

Model 26 removed from 10" 106/12" 206 and larger April 25, 2008.

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Date:	Drawing:
May 1, 2000	A-7697D

Model 106 or 206-PR-SM