SINGER VALVE
Result-Based Solutions. Globally.™

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# SINGER MODEL 106/206-RPS-SC

Pressure Relief or Sustaining Valve with Solenoid Override  Schematic A-7434B
Installation, Operating and Maintenance Instructions

## DESCRIPTION:

This valve is a pilot operated pressure relief or pressure sustaining valve designed to open when the inlet pressure exceeds a predetermined setting.

A three-way solenoid valve in the sensing line of Relief Pilot (6) closes Main Valve (1) when the sensing is vented to atmosphere or allows the valve to operate as described above when the sensing is connected to the Main Valve inlet.

## DESCRIPTION OF OPERATION:

Main Valve (1) is normally open when pressure is applied to the valve inlet. When the same pressure is applied to the bonnet, the Main Valve closes tight because the area of the diaphragm is greater than the area of the seat. By controlling the bonnet pressure, the Main Valve can be made to open, close or throttle.

Unless otherwise specified, the valve will be assembled for service temperatures to 180$^{O}$F (80$^{O}$C).

Bonnet pressure of the Main Valve is controlled with a pilot circuit consisting primarily of Closing Speed Control (5) and Relief Pilot (6). Pilot (6) senses the upstream pressure of the Main Valve. When this pressure is less than the spring setting, Pilot (6) is closed. Pressure from the upstream side of Main Valve (1) is directed to the bonnet through Closing Speed Control (5), keeping the Main Valve closed. When the upstream pressure is greater than the spring setting, Relief Pilot (6) opens to allow flow. This flow is greater than the flow coming through Closing Speed Control (5), bonnet pressure of Main Valve (1) is reduced, allowing the Main Valve to open.

Once the high pressure has been released and the inlet pressure drops to less than the spring setting, Pilot (6) closes. This results in the building up of pressure in the bonnet and the Main Valve closes. Closing speed is controlled by the setting of the Closing Speed Control (5).

On pressure sustaining service, where the valve is to maintain a predetermined inlet pressure, Pilot (6) modulates the Main Valve as required. If the inlet pressure rises, Pilot (6) opens a little wider and causes the Main Valve to open further. If the inlet pressure drops, Pilot (6) closes slightly and the Main Valve will also close slightly. Thus, the valve reacts to maintain its upstream pressure with varying flows.

Solenoid Valve (10) is in the sensing line of Pilot (6). The Solenoid Valve either connects the sensing connection of Pilot (6) to the Main Valve inlet or vents the sensing connection to atmosphere. When the sensing connection is connected to the Main Valve inlet, the valve operates as described above. When the sensing connection is vented to atmosphere, Pilot (6) remains closed and the Main Valve remains closed.

**OPTIONAL** Opening Speed Control (9) controls flow out of the bonnet of the Main Valve, thereby controlling the opening speed.

## INSTALLATION:

1. See 106/206-PG “Installation”.
2. Check Solenoid Valve (10) pressure rating at the Solenoid Valve name plate and check voltage at **side of solenoid coil.** Connect the solenoid as required.

## ADJUSTING PROCEDURE:

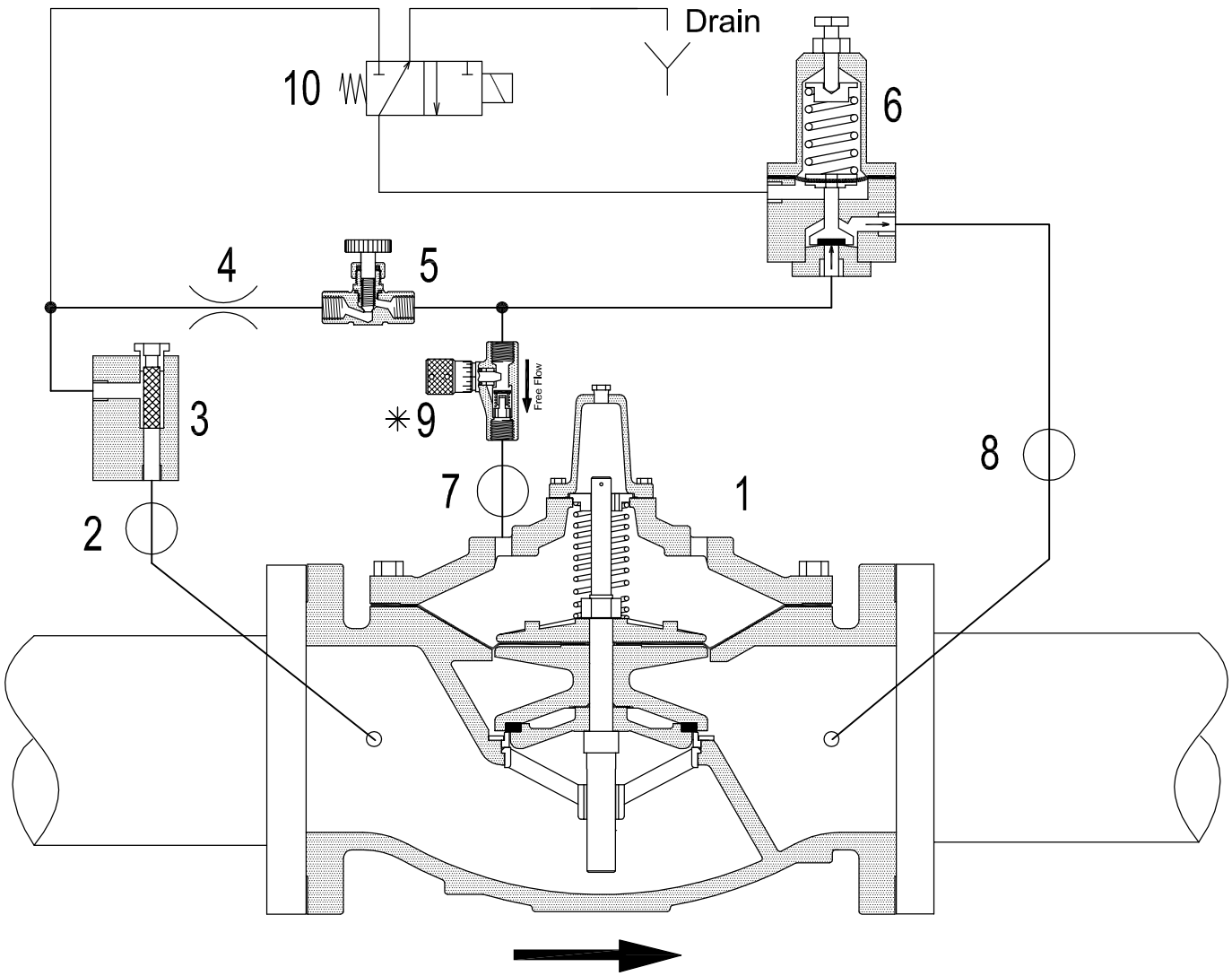
1. Turn adjusting screw of Relief Pilot (6) counterclockwise until spring is free.
2. Apply pressure to valve inlet. Valve should be wide open.
3. Turn adjusting screw of Relief Pilot (6) slowly clockwise until pressure at the Main Valve inlet reaches desired point.
4. Lock adjusting screw in place. Valve is now set to relieve at the desired pressure.

## TEST PROCEDURES:

1. Main Valve (1) should be closed tight if line pressure is less than the setting of Pilot (6).
2. Increase pressure in the upstream line gradually to beyond set point of Pilot (6). Valve should open slowly and modulate to maintain the set pressure.
3. Increase pressure in the upstream line suddenly to beyond set point of Relief Pilot (6). Valve should open further immediately and close slowly as pressure is restored to set point.
4. Repeat this procedure several times. Valve must function smoothly and open and close at same pressure each time.

To increase pressure setting of Pilot (6) - turn adjusting screw clockwise.

A-7434B




1. Main Valve - Model 106/206-PG.
2. Isolating Valve - 4" and larger ONLY.
3. Strainer - 40 mesh - J0098A.
4. Fixed Restriction - 1/8".
5. Closing Speed Control.
6. Relief Pilot - Model 81-RP.
7. Isolating Valve - 4" and Larger ONLY.
8. Isolating Valve - standard on all sizes.

✳ 9. OPTIONAL Opening Speed Control.

10. Solenoid Valve - Normally Closed.

## Pressure Relief or Sustaining Valve with Solenoid Override.

As shown, valve closes when Solenoid Valve (10) is de-energized and becomes a relief/sustaining valve when Solenoid Valve is energized.


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| Date: | Drawing: |
| January 16, 2005 | A-7434B |

Model 106 or 206-RPS-SC-NC (or NO)