

MODEL 106/206-BPC Booster Pump Control Valve

Series 106 Sizes: 2-1/2" to 8"

Series 206 Sizes : 4" to 10"

Schematic A-0426G

Installation, Operating and Maintenance Instructions

DESCRIPTION:

Model 106/206-BPC is designed for installation on the discharge side of booster pumps to prevent starting and stopping surges. The main valve is a single seated, double chambered, hydraulically operated globe or angle pattern valve with a built-in check valve.

Unless otherwise specified, 106/206-BPC is assembled for service temperatures to 140 deg.F (60 deg.C).

DESCRIPTION OF OPERATION:

The pump is started and stopped against a closed valve. On pump start up the solenoid is energized. The solenoid valve connects the operating pressure below the diaphragm and vents the top of the diaphragm to atmosphere. Speed of opening is determined by the setting of the opening speed controller, which restricts the flow out of the bonnet (above the diaphragm). Slow opening of the valve introduces the flow into the system gradually and prevents starting surges.

On shutdown the solenoid valve is de-energized; the operating pressure is directed above the diaphragm and the bottom side of the diaphragm is vented to atmosphere. The valve closes at a speed determined by the setting of the closing speed control, which restricts the flow out of the bottom chamber. While the valve closes, the pump is kept running by the limit switch on the valve. When the valve is almost closed, the limit switch stops the pump.

Power Failure: This valve will not prevent surges caused by power failure. This valve has a built-in 'silent' check valve, meaning that the valve closes as soon as the flow drops to zero, not allowing any reverse velocity to develop. Power failure surges are normally handled by Anticipating Surge Relief Valves, such as Singer Model 106 (or 206) RPS-L&H. Contact Singer Valve for details or other options.

INSTALLATION:

1. See 106/206-PTC 'Installation' in this manual.
2. Connect solenoid and limit switch to the pump starting circuit. Check solenoid valve name plate for correct pressure. Check side of solenoid coil for correct voltage and service. Check limit switch name plate for switch rating. Connections in the limit switch should

3. be to common and normally closed terminals. See suggested wiring diagram. Note that the limit switch assembly can be rotated by loosening Jam Nut (71).

4. Isolate the valve by closing main line isolating valves on the inlet and outlet of the valve. Pressurize the valve using the procedure below.

5. INITIAL PRESSURIZING AND VENTING OF AIR:

- DO NOT START THE PUMP before air has been vented from the bonnet.
- When the installation is ready for start-up and there is pressure available at either inlet or outlet side of the valve, crack open one of the main line isolating valves to pressurize the valve slowly.
- With the solenoid valve de-energized (valve in the closing mode), loosen the Bleed Screw (Item 63 on drawing A0707A) to vent air from the bonnet. Close the bleed valve when water appears.

ADJUSTING PROCEDURE:

1. Close both opening and closing speed controls.
2. Start the pump.
3. Open the opening speed control until desired opening speed is achieved. Avoid needlessly slow opening speed because such slow speeds make the speed control prone to plugging.
4. When the valve is fully open, turn pump switch to off position. The pump should continue to run.
5. Open the closing speed control until desired closing speed is achieved. Avoid needlessly slow closing speed for reason explained above.
6. When the valve approaches the closed position, observe carefully when the limit switch stops the pump. This should happen when the valve is about 1/8" (3 MM) open. If the valve is open more, a noticeable surge may be created, if the valve is open less, there is a possibility that the pump may be kept running. To adjust the valve opening where the limit switch stops the pump, adjust the Adjusting Collar (61). Move the collar down to stop the pump at a higher valve opening.

TROUBLESHOOTING:

VALVE FAILS TO OPEN OR OPENS PARTIALLY:

1. The solenoid valve should be energized, the operating pressure should be directed to the lower chamber (below the diaphragm) and the bonnet should be vented to atmosphere.
2. Remove the line between the opening speed control and the solenoid valve. There should be no flow from the solenoid valve. There should be no flow from the opening speed control unless the valve is now opening. If the valve opens fully, there is likely a problem with the solenoid valve. If there is flow from the solenoid valve, the solenoid valve is either not energized (i.e. the valve is in the closing mode) or there is a problem in the solenoid valve. If there is continuous flow from the opening speed control, the main valve diaphragm may be faulty.
3. If there is no flow from the opening speed control and no flow from the solenoid valve, open the opening speed control fully. If there is still no flow, carefully loosen a tube fitting between the solenoid valve and the closing speed control to see if the operating pressure is being directed to the lower chamber. If there is no pressure, check the pilot system to make sure that there is operating pressure in the pressure port of the solenoid. Check strainers, pilot check valves, make sure that pilot isolating valves are open. Finally, if it is clear that the solenoid valve is not operating as it should, measure the voltage at the solenoid valve and if correct, test the coil of the solenoid valve. If the coil is sound and voltage is correct and present, inspect (or replace) the solenoid valve.

VALVE FAILS TO CLOSE OR CLOSES PARTIALLY:

1. The solenoid valve should be de-energized, the operating pressure should be directed to the bonnet (above the diaphragm) and the lower chamber (below diaphragm) should be vented to atmosphere.
2. Remove the line between the closing speed control and the solenoid valve. There should be no flow from the solenoid valve. There should be no flow from the closing speed control unless the valve is now closing. If the valve closes fully, there is likely a problem with the solenoid valve. If there is flow from the solenoid valve, the solenoid valve is either energized (i.e. the valve is in opening mode) or there is a problem in the solenoid valve. If there is continuous flow from the closing speed control, the main valve diaphragm may be faulty or there may be leakage through the Adapter Bushing (9), meaning that Adapter Bushing Seal (19) is worn.
3. If there is no flow from the closing speed control and no flow from the solenoid valve, open the closing speed control fully. If there is still no flow, carefully loosen a tube fitting between the solenoid valve and the opening speed control to see if the operating pressure is being directed to the bonnet (above the diaphragm). If there is no pressure, check the pilot system to make sure that there is operating pressure in the pressure port of the solenoid. Check strainers, pilot check valves, make sure that pilot isolating valves are open. Finally, if it is clear that the solenoid valve is not operating as it should, check that there is no power applied to the solenoid coil. Inspect (or replace) the solenoid valve.

