

SINGER MODEL 106/206-RPS-RR, ANTICIPATING RELIEF VALVE

SCHEMATIC A-7340F (up to 6" 106/8" 206)

SCHEMATIC A-7340F1 (8" 106/10" 206 and larger)

considerable vibration. The supports for the valve must be designed accordingly.

DESCRIPTION:

Model 106/206-RPS-RR is an anticipating relief valve designed to dissipate surges caused by power failure or other sudden stoppage of a pump.

The valve opens when the header pressure rises faster than the rate determined by the pilot system. The valve also opens if the header pressure reaches the setpoint of the relief pilot.

MODEL 106/206-RPS-RR:

- Anticipates the surge by opening as soon as the pressure starts to rise.
- Closes after the surge has been dissipated and the header pressure is stable.
- Handles initial filling of the system automatically.
- Is not affected by over sizing the way standard anticipating surge valves are.

DESCRIPTION OF OPERATION:

Main valve (1) closes when **BOTH** pilots (12) and (13) are closed. The main valve opens when **EITHER** pilot (12) or (13) opens. On larger valves (schematic A-7340F1), pilot (12) acts through a booster pilot (18) to increase rate of reaction.

When the header pressure increases slowly, the two pressures sensed by pilot (12) remain equal and pilot (12) remains closed. When the header pressure increases rapidly, the pressure in the spring casing (above the diaphragm) of pilot (12) lags behind the pressure below the diaphragm. The pilot opens. The rate of pressure rise required to open pilot (12) depends on accumulator (11) and the size of the restriction (15).

For schematic A7340F, pilot (12) opens the main valve (1) as soon as the header pressure starts increasing after a power failure (pump stoppage). This gives the main valve sufficient time to be fully open before the pressure rises to destructive levels.

For schematic A-7304F1, pilot (12) operates the main valve by opening booster valve (18). When booster (18) opens, the main valve opens. When booster (18) closes, the main valve closes.

Pilot (13) opens the valve if the header pressure reaches the set point of pilot (13).

INSTALLATION:

Model 106/206-RPS-RR is installed on a "Tee" from the main line (header) into atmosphere.

1. Refer to 106/206-PG "installation". Bypass and strainer are normally not used.
2. Model 106/206-RPS-RR operates under conditions which cause very high velocities and severe cavitation. These conditions may cause

3. **CONNECT THE PILOT SENSING (6) TO THE HEADER.**

4. Open isolating valves (7), (14 A) and (14 B).

ADJUSTMENT AND TEST PROCEDURE:

1. Setting of pilot (12) and pre-charge of accumulator (11) should not be changed without a clear understanding of the consequences. These are factory set and should not require adjustment.
2. The relief pilot (13) can be set approximately by removing the tubing from the outlet of the pilot and observing the pilot under maximum pumping pressure. The pilot should be set about one turn of the adjusting screw higher than the point where it starts leaking.
3. If a more exact pressure setting is required, a hydrostat pump or other source of pressure should be connected to the sensing line of pilot (13).
4. To test accumulator (11), check valve (16) and restriction (15):
 - a) Close isolating valve (14 B).
 - b) Close ball valve (7).
 - c) Open ball valve (4). Water should flow for one or two seconds and should then stop suddenly. There should not be any appearance of air in the flow.
 - d) Close ball valve (4).

- e) Observe pressure gauges (9) and (10) and open ball valve (7). Gauge (9) should jump to line pressure but gauge (10) should rise slowly and steadily over several seconds. The rate at which the gauge rises is the rate of pressure rise that triggers pilot (12).

If it is desired to test the differential pilot (12) and main valve (1), repeat above procedure with isolating valve (14 B) open. The main valve should open fast and close slowly after the pressure readings in gauges (9) and (10) have equalized.

NOTE: DO NOT ADJUST PILOT (12) TO ADJUST THE RATE OF RISE SETTING. If a different rate is required, restriction (15) must be changed.

If the closing speed of the main valve (1) needs adjustment, restriction (5) must be changed.

Accumulator loading should be approximately 20% of the maximum pumping pressure. This loading can be tested **IF REQUIRED** at the fitting on top of the accumulator. The loading should not be checked too frequently, as some nitrogen will be lost on each test. Only nitrogen should be used for charging the accumulator.

After testing, check to make sure that valves are in the proper position:

- Valves 7, 14 A and 14 B - **OPEN**
- Valve 4 - **CLOSED**