SINGER VALVE
Result-Based Solutions. Globally.

12850-87th Avenue
Surrey, BC. Canada. V3W 3H9
Ph: 604-594-5404
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www.singervalve.com

SINGER MODEL S106/S206-PGM

Power Operated Globe Valve with Integrated Back-up Operating System
Sizes 20" to 24" S106, 28" to 36" S206 Drawing A0937A and A0954A
Installation, Operating and Maintenance Instructions

DESCRIPTION:

This valve is a variation of the basic valve (S106/S206-PG) used as the main valve for most automatic control valves. The integral, secondary operating chamber can operate the primary valve, using a separate and independent pilot system.

OPERATION:

The primary valve [everything below Adaptor (3)] is normally open when a pressure of 5 PSI or greater is applied to the inlet and the bonnet [above Diaphragm (18)] is vented to the atmosphere. When the inlet pressure is directed to the bonnet [above Diaphragm (18)], the valve closes because the area of the Diaphragm is greater than the area of the seat.

By varying the pressure in the bonnet with a SINGER Automatic Pilot Circuit the primary valve can be made to open, close or modulate. This varies the flow to suit any particular service such as pressure reduction, relief, level control, etc.

In some cases the line media is unsuitable (viscous, dirty, etc.) for control. Under these conditions it will be necessary to use external water pressure for controlling. External pressure must be equal to, or greater than maximum line pressure.

The secondary operating chamber and pilot system is operated by (upper) Diaphragm (17). The bottom side of (upper) Diaphragm (17) is at atmospheric pressure. Connecting the inlet pressure of the Main Valve above Diaphragm (17) produces a high closing force, which will close the primary valve under most circumstances. This high and positive closing force is used for various functions, most often as a back up for component failure or a requirement for fast closing.

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

Storage: This valve must be stored indoors, away from direct sunlight.

INSTALLATION:

1. **This valve must be installed in a horizontal line with the stem vertical.**
2. **It is possible that diaphragms may take a set after shipping and storage. It is highly recommended that Bonnet and Body Bolts or Nuts be tightened after installation but before pressurizing the valve. Torque to 250 lb-ft (340 N-m). If a leak develops after pressurizing, de-pressurize the valve and tighten the bolts or nuts.**
3. For most convenient operation and maintenance, manual shut off valves should be installed in the mainline, upstream and downstream of the Singer PGM valve.

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Installation (Cont.):

4. A suitable bypass should be provided to allow for servicing of the valve without interrupting the flow.
5. Install pressure gauges upstream and/or downstream of the valve as appropriate. This will facilitate setting the pilot system.
6. A strainer with a suitable basket should be installed ahead of the valve to protect it from foreign material.
6. Sufficient space should be provided around the valve for disassembly.
7. Flush system of all foreign matter before installing the valve.
8. Check direction of flow (inlet of valve is marked OR an arrow on the side of body indicates flow direction) and install the valve accordingly.
9. Bleed air from the bonnet. Use Bleed Valve (76).

NOTE REGARDING FREEZING:

This valve does not drain completely when inlet and outlet pipes are drained. Where freezing conditions are expected, one of the following must be performed:

1. Drain valve and pilot system completely.
2. Provide insulation and/or heating to keep the valve from freezing.

SERVICE SUGGESTIONS:

FAILS TO OPEN

1. Insufficient inlet pressure.
2. Pressure in the bonnet is not released:
- Isolating valves on pilot lines closed.
- Pilot components not functioning. Refer to specific instructions on pilot components.
- Foreign material in pilot system.

FAILS TO CLOSE

1. Lack of pressure in bonnet due to:
- Pilot components not functioning. Refer to specific instructions on pilot components.
- Foreign material in pilot system.
- Ruptured Diaphragm.
2. Obstruction in the valve.
3. Worn Main Valve Resilient Disc (12).

PULSATIONS

1. Air in the bonnet.
2. Improper adjustment to pilot components. Refer to specific instructions on pilot components.
3. Valve over sized (improper sizing if valve operates on wide range of flow rates. Install a smaller valve in parallel to handle low flow rates.

MAINTENANCE:

The SINGER Model S106/S206-PGM requires a minimum of maintenance. All parts are accessible for inspection and repair without removing the valve from the line.

1. **A crane or other device that allows precise lifting and positioning of valve components is an absolute must when dis-assembling this valve. Any attempt to dis-assemble this valve without such equipment is likely to cause damage to the valve and/or personnel.**
2. Close upstream and downstream isolating gate valves. De-pressurize the valve.
3. Disconnect all pilot lines.
4. If valve is equipped with position indicator, limit switch or position transmitter, remove any parts that prevent removal of the secondary operator assembly.
5. Refer to Drawing A0937A.

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Dis-assembly/assembly of secondary operator:

Note: Avoid wrench marks on O-ring seal surfaces. Refer to Drawing A0954A.

DIS-ASSEMBLY:

1. Remove four Upper Bonnet Bolts (29) that are spaced between the lifting eye bolts. See Sketch #1 on Drawing A0954A.
2. Install the four jacking studs in threaded holes made available, tapered end up.
3. Place washers over the jacking studs and install the nuts until they seat on the bonnet flange face. (Photo #1).
4. Remove the remaining bonnet bolts.
5. Remove Bonnet Plate Bushing (61). (Photo #2).
6. Remove Bonnet Plate Bolts (31) and Bonnet Plate (60). (Photo #3). Mark Adaptor (3) and Bonnet (2) with a marker pen for future reference when re-installing bonnet.
7. Install bonnet assembly removal tool, by placing over stem and threading onto upper stem threads. [***LUBRICATE THREADS BEFORE INSTALLATION*]** (Photo #4). This connects bonnet and upper piston assembly for disassembly.
8. Remove the nuts on the jacking studs and slowly lift the bonnet, using the jacking studs as guides. (Photo #5).
9. Place the bonnet on blocks, or in prepared stand, to support the piston and protect the upper stem from damage. **DO NOT DAMAGE EXPOSED STEM.**
10. Remove the bonnet assembly removal tool and remove bonnet. (Photo #6).
11. Remove upper stem nut and replace diaphragm. A hammer and ring wrench is recommended to tighten stem nut.

    Remove adaptor and continue with standard PG disassembly for lower diaphragm or seat access.

ASSEMBLY:

1. Place bonnet over the piston assembly using lifting eyes and crane.
2. Thread bonnet assembly removal tool into place.[**LUBRICATE THREADS BEFORE INSTALLATION].**
3. Lift bonnet slowly to take up the slack between bonnet assembly removal tool and bonnet. Place the bonnet and upper piston assembly over valve assembly.
4. Align bonnet assembly over valve before lowering the bonnet. (Photo #7).
5. Lower the bonnet assembly aligning four bonnet holes over jacking studs, and the indicator mark made when removing the bonnet. (Photo #8).
6. Keep lowering the bonnet slowly until the lowering cables go slack, making sure that the upper stem bushing aligns with the lower stem.
7. Install the Diaphragm alignment tool by threading into upper stem bushing threads in the upper stem, (Photo #9), and rotate to align the pin holes in the diaphragm with the pins on the adaptor.
8. Use four or more bonnet bolts to pull the bonnet down flush to the adaptor, making sure the diaphragm and pins align.
9. Remove diaphragm alignment tool & bonnet assembly removal tool.
10. Install top cover and top cover bushing.
11. Install bonnet bolts / washers and torque to 284ft-lbs.
12. Remove jacking studs and store for future use, replace with remaining bonnet bolts.
13. Install top cover screws and tighten.
14. Install upper stem bushing.

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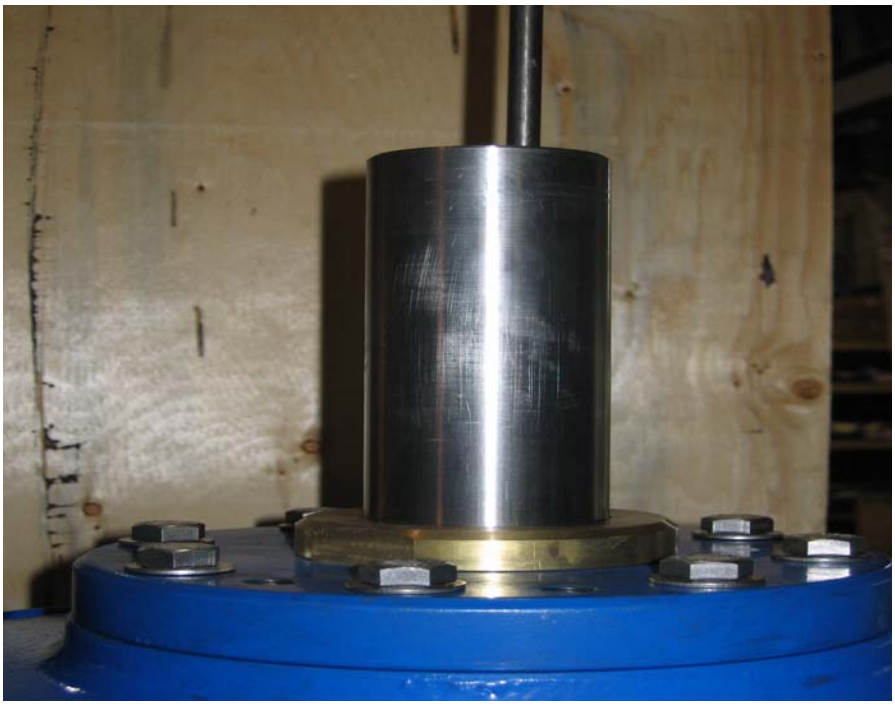
Photograph #1



Photograph #2



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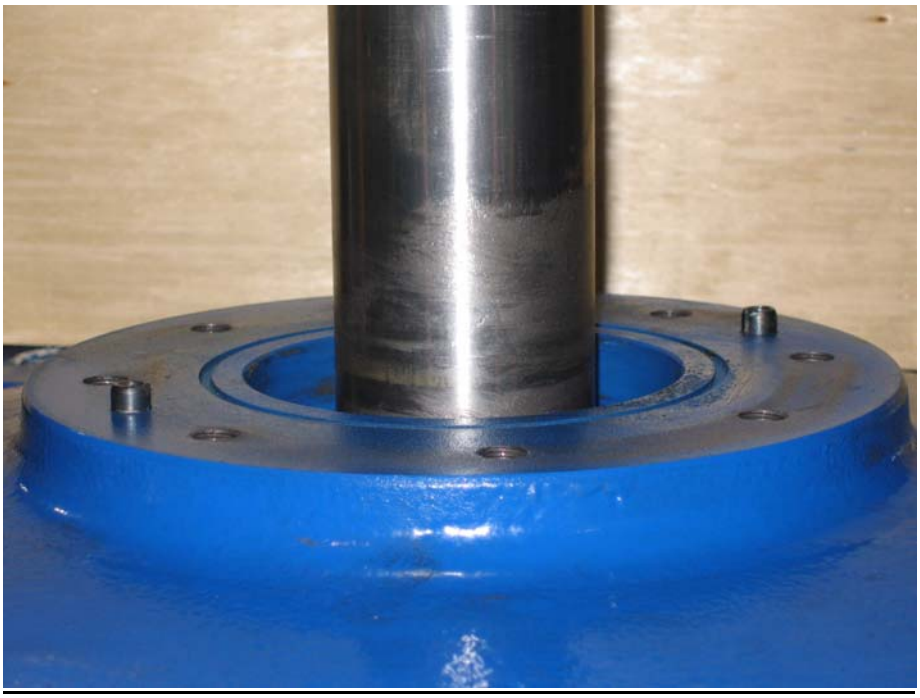
Photograph #3



Photograph #4



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Photograph #5



Photograph #6



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Photograph #7



Photograph #8



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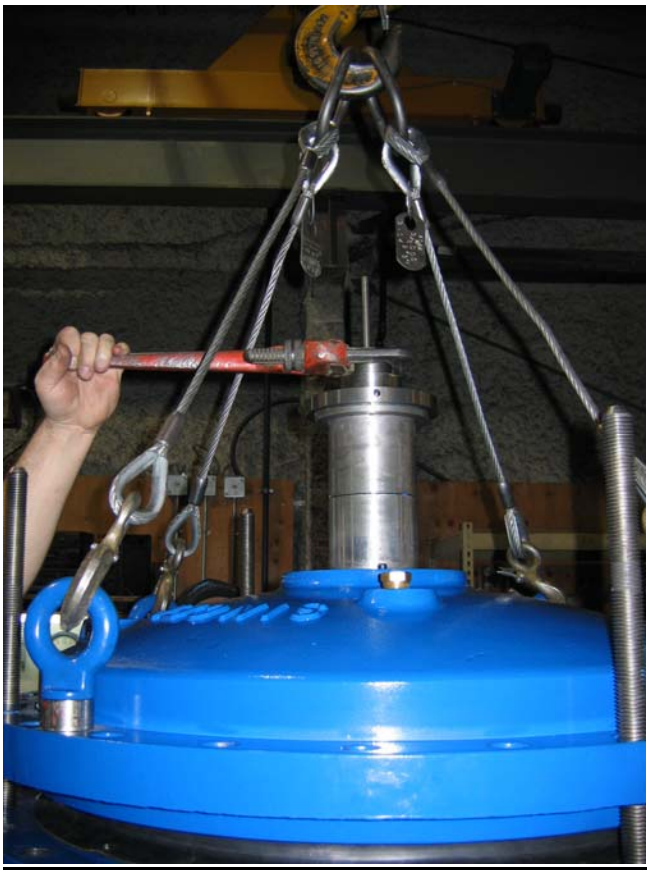
Photograph #9



WRENCH ON ALIGNMENT TOOL ONLY