

MODEL 106/206-PG POWER OPERATED GLOBE VALVE

Sizes 1/2" to 8" (106-PG) 3" to 10" (206-PG)
Installation, Operating and Maintenance Instructions

DESCRIPTION:

This valve is the basic component used for most Singer Model 106/206 Automatic Valves. It is a hydraulically operated valve.

DESCRIPTION OF OPERATION:

The valve opens when the bonnet (area above the diaphragm) is connected to the downstream side of the valve AND a pressure drop of 5 psi (35 kPa) is available across the valve. The valve also opens when the bonnet is vented to atmosphere, regardless of pressure drop, provided that the line pressure is 5 psi (35 kPa) or more.

The valve closes when the inlet pressure is directed to the bonnet.

The valve can be made to modulate by varying the bonnet pressure between inlet pressure and outlet pressure. This is done by the pilot circuit.

In some cases the line media is unsuitable for use in the pilot system. In these circumstances external water pressure can be used in the pilot system. The external pressure must be equal to or higher than the line pressure.

If available pressure drop is less than 5 psi (35 kPa), spring lift and external water pressure must be used (consult factory).

Unless otherwise specified, the valve is assembled with components suitable for water service up to 180° F (80° C). For other service conditions, contact your Singer Valve representative.

STORAGE:

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

INSTALLATION:

Use washers under nuts when bolting valve flanges to pipe flanges to protect the Epoxy Coating.

Control valves must be installed in a horizontal pipe with the bonnet up. Smaller valves (6" and smaller) can be installed in a vertical pipe if the order states the orientation. Disassembly is difficult but not impossible in valves installed in vertical pipe.

A stable, non-failing source of pressure is necessary to operate a pilot operated control valve.

Operating fluid must be clean and free of air.

Under high velocity conditions the pressure signal, when the pick-up point is located on the main valve inlet, may be adversely affected. As an example, a relief valve will operate more effectively and control more accurately if the operating pressure and sensing pressure is connected to the header.

Ideally, six pipe diameters of straight pipe is required on the inlet of any control valve but

- Fully open **Gate Valve** can be installed on the inlet of a valve, provided it is used as an isolating valve and never used in partially open condition.
- A **Butterfly Valve** with stem horizontal can not be installed in the inlet of a control valve unless operating pressure and sensing lines are connected upstream of the butterfly valve, in a location that gives true system pressure.
- A **Butterfly Valve** with stem vertical can be installed in the inlet of a control valve as long as velocity does not exceed 15 ft/sec. The butterfly valve can not be used for throttling. If problems develop at high flows, operating pressure and possible sensing can be connected upstream of the butterfly valve, in a location that gives true system pressure.
- A control valve can be installed with no straight pipe on the inlet if the operating and sensing lines are connected to a location that gives true system pressure.

The connection point should be made at the pipe centerline to avoid air pick-up at the top of the pipe.

1. **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. If a leak develops after pressurizing, de-pressurize the valve and tighten the bolts or nuts.**
2. For most convenient operation and maintenance, line isolation valves should be installed.
3. A suitable bypass should be provided to allow for servicing of the valve without interrupting the flow.

Installation (Cont.):

4. Install pressure gauges upstream and/or downstream of valve as appropriate. This will facilitate ease of setting the pilot system.
5. 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. **VENT AIR FROM THE BONNET.** After installation, when the valve is pressurized, vent air from the bonnet:
 - a) Valves installed in horizontal piping with bonnet up (NO LIMIT SWITCH):
Sizes up to 2" where pilot connection is to the guide bushing at the center of the valve do not require venting (they vent automatically).
Sizes up to 2" with position indicator: use bleed-cock on indicator.
Sizes 2-1/2" and larger, loosen pipe plug at the center of the bonnet to bleed air. If equipped with position indicator, use bleed-cock on indicator.
 - b) Valves installed in horizontal piping with bonnet up (WITH LIMIT SWITCH): Refer to Drawing A0707A. Use bleed screw (63) to vent air.
 - c) Valves installed in vertical pipe: The pilot connection will be to the highest point on the bonnet if the orientation and flow direction were specified on the order. Some sizes vent automatically. Some sizes are provided with a small screw to facilitate bleeding (do not remove completely).
 - d) Valves that do not have the bleed screw and do not bleed completely from existing connections must be bled by loosening the bonnet bolts.

SERVICE SUGGESTIONS:

POSSIBLE CAUSE / REMEDY

FAILS TO OPEN

1. Insufficient inlet pressure. / Increase pressure

2. Pressure in the bonnet is not released:

- Isolating valves on pilot lines closed. - Open valves
 - Pilot components not functioning. - Refer to specific instructions on pilot components
 - Foreign material in pilot system. - Clear obstruction
- FAILS TO CLOSE**

Lack of pressure in the bonnet due to:

- Pilot components not functioning. - Refer to specific instructions on pilot components.
- Foreign material in pilot system.
- Ruptured diaphragm.
- Obstruction in the valve.
- Worn main valve disc.

PULSATIONS

- Air in the bonnet. - Vent air. Refer to "Installation (9)" above.
- Improper adjustment to pilot components. - Refer to specific instructions on pilot components.
- Valve oversized. A smaller valve in parallel may be required.

MAINTENANCE:

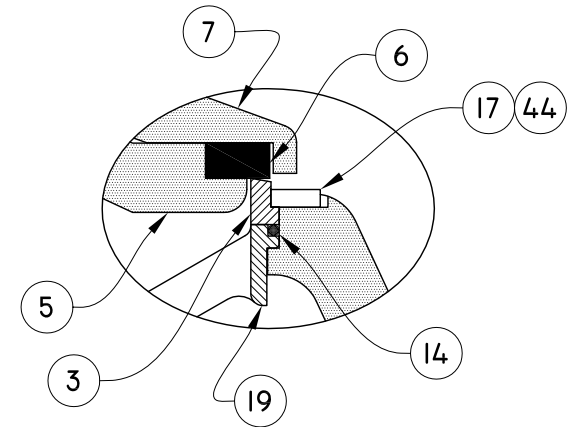
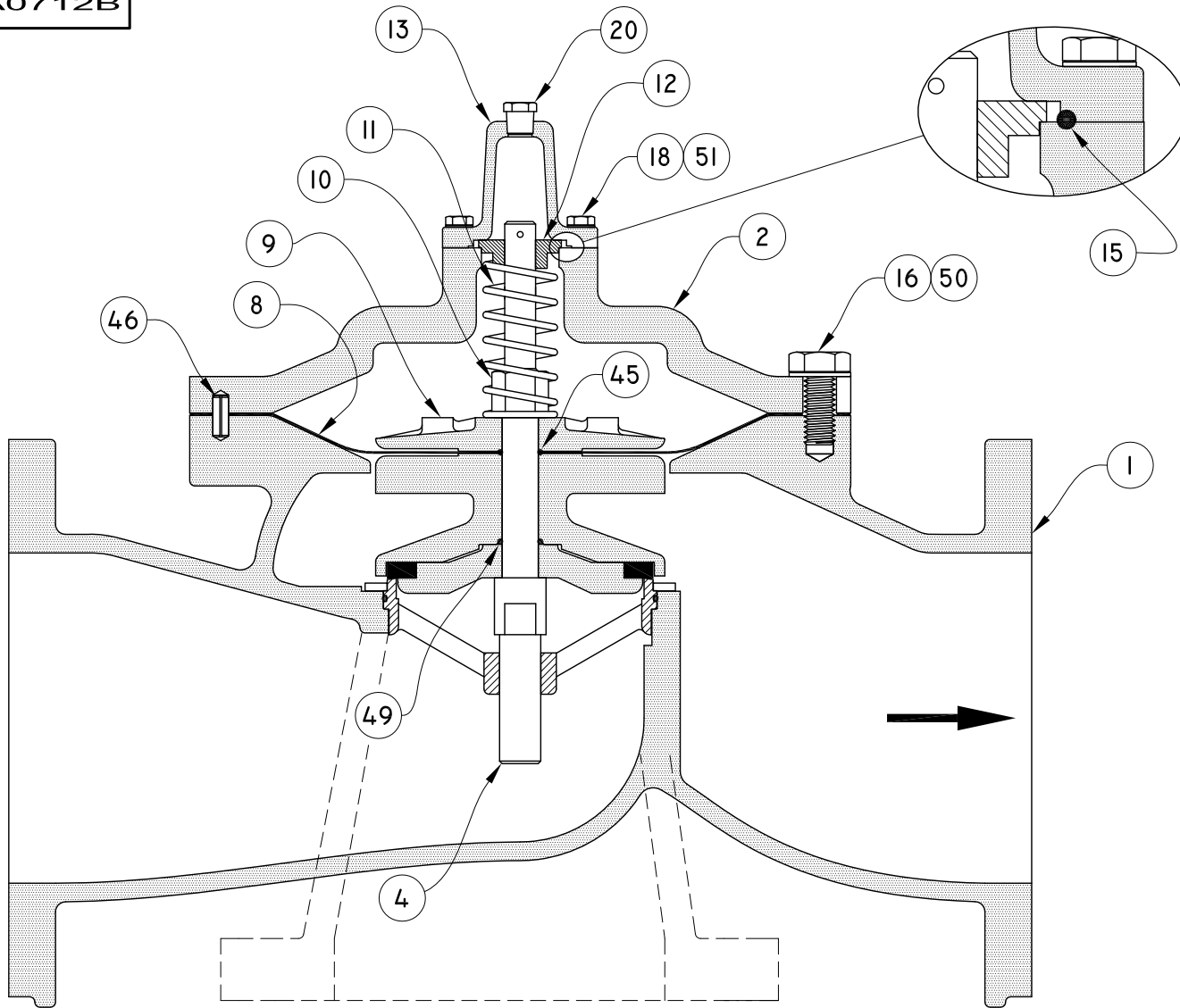
The SINGER Model 106/206-PG requires a minimum of maintenance. All parts are accessible for inspection and repair without removing the valve from the line.

1. Close upstream and downstream isolating gate valves.
2. Disconnect body and bonnet pilot lines.
3. Remove bonnet. If bonnet does not come free readily, it can be pried loose with a small pry-bar.
4. Remove main valve assembly for inspection. Do not remove seat ring unless inspection shows that it is damaged.
5. Replace worn or defective parts and reassemble.

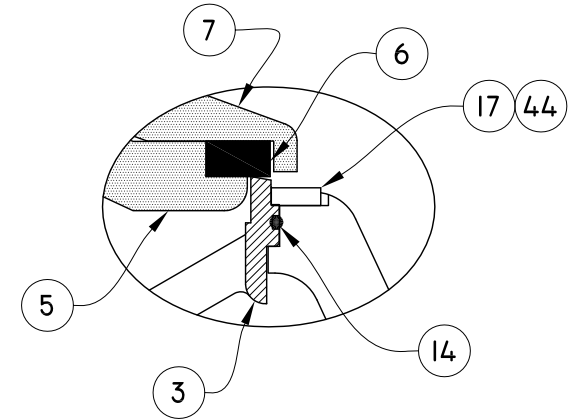
NOTE REGARDING FREEZING:

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:

- Drain valve and pilot system completely.
- Add suitable anti-freeze to valve and pilot system (**Non-potable water service only**).
- Provide insulation and/or heating to keep the valve from freezing.



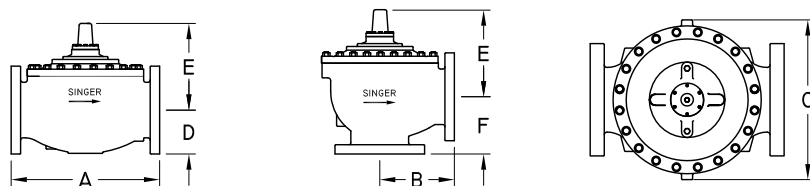
TWO PIECE SEAT & BOTTOM GUIDE DETAIL



ONE PIECE SEAT & BOTTOM GUIDE DETAIL

SINGLE CHAMBER MAIN VALVE

SIZES 3" to 10" (80MM to 250MM) 206-PG
 SIZES 4" to 8" (100MM to 200MM) A206-PG



REV: ADDED ONE AND TWO PIECE SEAT DETAILS, JUNE 5, 2008.

SINGER VALVE
Result-Based Solutions. Globally.™

www.singervalve.com 12850-87th Avenue, Surrey, B.C. V3W 3H9

Drawn By: Scott Grover	Approved By:
Date: January 20, 2006	Drawing: A0712B
Model 206-PG & A206-PG	

Material Specifications & Dimensions

 3" to 10" (80mm to 250mm) 206-PG
 4" to 8" (100mm to 200mm) A206-PG
 For Drawing A0712B

Item	Part Name	Material	Item	Part Name	Material
1	Body	Ductile Iron	16	Body Capscrew	Stainless Steel
2	Bonnet	Ductile Iron	17 %	Seat Ring Screw	Stainless Steel
3	Seat Ring	Stainless Steel	18	Stem Cap Capscrew	Stainless Steel
4	Stem	Stainless Steel	19 Φ	Bottom Guide	Ductile Iron & Bronze
5	Disc Retainer	Brass on 3" & 4" Bronze on 6" Cast Iron on 8" and 10"	44 %	Retaining Washer	Stainless Steel
6 **	Resilient Disc	EPDM or Buna-N	45 **	Diaphragm Seal	Buna-N
7	Inner Valve	Cast Iron	46	Locating Pin	Steel
8 **	Diaphragm	EPDM or Buna-N	49 **	Disc Retainer Seal	Buna-N
9	Clamp Plate	Cast Iron	50	Body Washer	Stainless Steel
10	Stem Nut	Brass	51	Stem Cap washer	Stainless Steel
11	Spring	Stainless Steel			
12	Guide Bushing	Brass			
13	Stem Cap	Ductile Iron			
14 **	Seat Ring Seal	Buna-N			
15 **	Stem Cap Seal	Buna-N			

** Recommended spare parts (included in the Rebuild Kit)

 Φ Bottom guide includes bronze bearing bushing

% Not required on size 3", (One piece seat ring and guide, shown as item 3)

206-PG & A206-PG		Globe			Globe & Ang	Angle		
		A	D	E	C	B	E	F
3" 80mm	150F / PN16	12"	4"	7.50"	8.19"	-	-	-
		305mm	102mm	191mm	208mm			
4" 100mm	150F / PN10, PN16, PN25, PN40	15"	4.60"	9.62"	10"	7.56"	7.75"	5.94"
		381mm	117mm	244mm	254mm	192mm	197mm	151mm
	300F	15.63"	5"	9.62"	10"	7.88"	7.75"	6.25"
		397mm	127mm	244mm	254mm	200mm	197mm	159mm
6" 150mm	150F / PN10, PN16	20.12"	5.50"	10.50"	12.50"	10.19"	8.82"	6.19"
		511"	140mm	267mm	318mm	259mm	224mm	157mm
	300F / PN25, PN40	21"	6.25"	10.50"	12.50"	10.63"	8.82"	6.81"
		533mm	159mm	267mm	318mm	270mm	224mm	173mm
8" 200mm	150F / PN10, PN16	25"	6.75"	14.12"	16"	12.50"	11.30"	9"
		635mm	171mm	359mm	406mm	318mm	287mm	229mm
	300F / PN25, PN40	26"	7.50"	14.12"	16"	13"	11.30"	9.50"
		660mm	191mm	359mm	406mm	330mm	287mm	241mm
10" 250mm	150F / PN10, PN16	24.50"	8"	18.63"	20"	-	-	-
		622mm	203mm	473mm	508mm			
	300F / PN25, PN40	25.88"	8.63"	18.63"	20"	-	-	-
		657mm	219mm	473mm	508mm			

MODEL S106/S206-PG POWER OPERATED GLOBE VALVE

Sizes 6" to 16" (S106-PG) 12" to 24" (S206-PG)
Installation, Operating and Maintenance Instructions

DESCRIPTION:

This valve is the basic component used for most Singer Automatic Valves. It is a hydraulically operated valve.

DESCRIPTION OF OPERATION:

The valve opens when the bonnet (area above the diaphragm) is connected to the downstream side of the valve AND a pressure drop of 5 psi (35 kPa) is available across the valve. The valve also opens when the bonnet is vented to atmosphere, regardless of pressure drop, provided that the line pressure is 5 psi (35 kPa) or more.

The valve closes when the inlet pressure is directed to the bonnet.

The valve can be made to modulate by varying the bonnet pressure between inlet pressure and outlet pressure. This is done by the pilot circuit.

In some cases the line media is unsuitable for use in the pilot system. In these circumstances external water pressure can be used in the pilot system. The external pressure must be equal to or higher than the line pressure.

Unless otherwise specified, the valve is assembled with components suitable for water service up to 180° F (80° C). For other service conditions, contact your Singer Valve representative.

STORAGE:

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

INSTALLATION:

Use washers under nuts when bolting valve flanges to pipe flanges to protect the Epoxy Coating.

Control valves must be installed in a horizontal pipe with the bonnet up. Smaller valves (6" and smaller) can be installed in a vertical pipe if the order states the orientation. Disassembly is difficult but not impossible in valves installed in vertical pipe.

A stable, non-failing source of pressure is necessary to operate a pilot operated control valve.

Operating fluid must be clean and free of air.

Under high velocity conditions the pressure signal, when the pick-up point is located on the main valve inlet, may be adversely affected. As an example, a relief valve will operate more effectively and control more accurately if the operating pressure and sensing pressure is connected to the header.

Ideally, six pipe diameters of straight pipe is required on the inlet of any control valve but

- Fully open **Gate Valve** can be installed on the inlet of a valve, provided it is used as an isolating valve and never used in partially open condition.
- A **Butterfly Valve** with stem horizontal can not be installed in the inlet of a control valve unless operating pressure and sensing lines are connected upstream of the butterfly valve, in a location that gives true system pressure.
- A **Butterfly Valve** with stem vertical can be installed in the inlet of a control valve as long as velocity does not exceed 15 ft/sec. The butterfly valve can not be used for throttling. If problems develop at high flows, operating pressure and possible sensing can be connected upstream of the butterfly valve, in a location that gives true system pressure.
- A control valve can be installed with no straight pipe on the inlet if the operating and sensing lines are connected to a location that gives true system pressure.

The connection point should be made at the pipe centerline to avoid air pick-up at the top of the pipe.

1. **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. If a leak develops after pressurizing, de-pressurize the valve and tighten the bolts or nuts.**

Installation (Cont.):

2. For most convenient operation and maintenance, line isolation valves should be installed.
3. A suitable bypass should be provided to allow for servicing of the valve without interrupting the flow.
4. Install pressure gauges upstream and/or downstream of valve as appropriate. This will facilitate ease of setting the pilot system.
5. 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. VENT AIR FROM THE BONNET After installation, when the valve is pressurized, vent air from the bonnet:
 - Valves with no Limit Switch: Loosen pipe plug at the centre of the bonnet to bleed air. If equipped with position indicator, use bleed-cock on indicator.
 - Valves with Limit Switch: Refer to Drawing A0707A. Use bleed screw (63) to vent air.

SERVICE SUGGESTIONS:

POSSIBLE CAUSE / REMEDY

FAILS TO OPEN

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

FAILS TO CLOSE

Lack of pressure in the bonnet due to:

- Pilot components not functioning. - Refer to specific instructions on pilot components.
- Foreign material in pilot system. - Clear obstructions.
- Ruptured diaphragm. - Replace worn parts.
- Obstruction in the valve. - Remove obstructions.
- Worn main valve disc. - Replace disc.

PULSATATIONS

- Air in the bonnet. - Vent air. Refer to "Installation (9)" above.
- Improper adjustment to pilot components. - Refer to specific instructions on pilot components.
- Valve oversized. A smaller valve in parallel may be required.

MAINTENANCE:

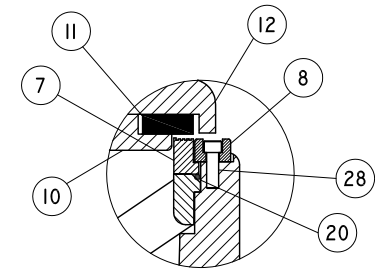
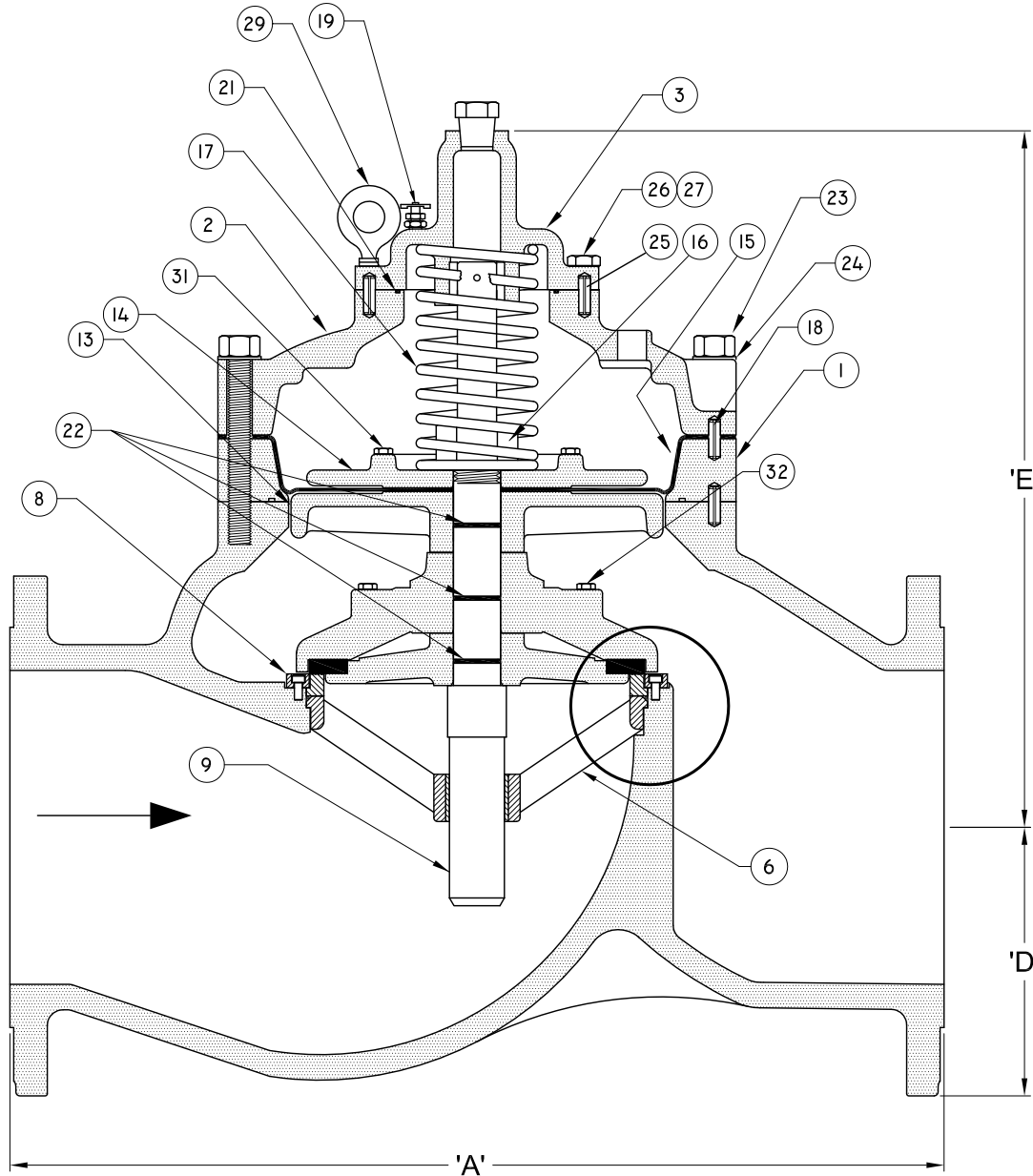
The SINGER Model S106/S206-PG requires a minimum of maintenance. All parts are accessible for inspection and repair without removing the valve from the line.

1. Close upstream and downstream isolating gate valves.
2. Disconnect body and bonnet pilot lines.
3. Remove bonnet. If bonnet does not come free readily, it can be pried loose with a small pry-bar.
4. Remove inner valve assembly for inspection. Do not remove seat ring unless inspection shows that it is damaged. **Be very careful not to damage the epoxy coating when removing and installing the inner valve assembly.**
5. Replace worn or defective parts and reassemble.

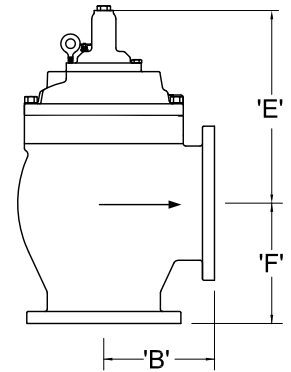
NOTE REGARDING FREEZING:

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:

- Drain valve and pilot system completely.
- Add suitable anti-freeze to valve and pilot system (**Non-potable water service only**).
- Provide insulation and/or heating to keep the valve from freezing.



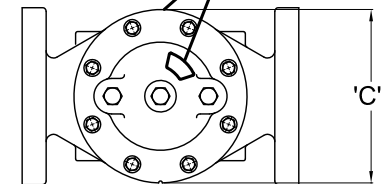
SEAT RING DETAIL



ANGLE CONFIGURATION

BRASS ID PLATE

SINGER VALVE INC.		REV.
MODEL		
SIZE		MAX INLET PSI
SERIAL NO.		



SINGER SI06/S206-PG MAIN VALVE

MODEL SI06-PG : 10" TO 16" GLOBE AND ANGLE STYLE FULL PORT MAIN VALVE
 MODEL S206-PG : 12" TO 24" GLOBE STYLE REDUCED PORT MAIN VALVE

SINGER VALVE

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Drawn By:	Approved By:
Scott Grover	
Date:	Drawing:
January 20, 2006	A0867C
Model S106-PG & S206-PG	

Material Specifications & Dimensions

 10" to 16" (250mm to 400mm) S106-PG & SA106-PG
 12" to 24" (300mm to 600mm) S206-PG
 For Drawing A0867C

Item	Part Name	Material	Item	Part Name	Material
1.	Body	Ductile Iron	19.	Bleed Valve	Stainless Steel
2.	Bonnet	Ductile Iron	20.**	Seat Ring Seal	Buna-N
3.	Spring Casing	Ductile Iron	21.**	Spring Casing Seal	Buna-N
6.	Bottom Guide	Ductile Iron & Stainless Steel	22.**	Stem Seals	Buna-N
7.	Seat Ring	Stainless Steel	23.	Bonnet Bolts	Stainless Steel
8.	Seat Ring Washers	Stainless Steel	24.	Bonnet Washers	Stainless Steel
9.	Stem	Stainless Steel	25.	Spring Casing Locating Pins	Steel
10.	Disc Retainer	Ductile Iron	26.	Spring Casing Screw	Stainless Steel
11.**	Resilient Disc	EPDM or Buna-N	27.	Spring Casing Washers	Stainless Steel
12.	Inner Valve	Ductile Iron	28.	Seat Ring Screw	Stainless Steel
13.	Piston	Ductile Iron	29.	Eye Bolt	Steel
14.	Clamp Plate	Ductile Iron	31.	Clamp Plate Screw	Stainless Steel
15.**	Diaphragm	EPDM or Buna-N	32.	Inner Valve Screw	Stainless Steel
16.	Stem Nut	Stainless Steel			
17.	Spring	Stainless Steel			
18.	Bonnet Locating Pins	Steel			

** Recommended spare parts (included in the Rebuild Kit)

S106-PG & SA106-PG		Globe			Globe & Ang	Angle		
		A	D	E	C	B	E	F
10" 250mm	150F / PN10, PN16	29.75" 756mm	8.56" 217mm	23.31" 592mm	22.13" 562mm	11.50" 292mm	20" 508mm	12.50" 318mm
	300F / PN25, PN40	31.12" 790mm	9.56" 243mm	23.31" 592mm	22.13" 562mm	12.19" 310mm	20" 508mm	13.19" 335mm
12" 300mm	150F / PN10, PN16	34" 864mm	9.50" 241mm	26.75" 679mm	26" 660mm	13.75" 349mm	23.75" 603mm	12.50" 318mm
	300F / PN25, PN40	35.50" 902mm	10.25" 260mm	26.75" 679mm	26" 660mm	14.50" 368mm	23.75" 603mm	13.25" 337mm
14" 350mm	150F / PN10, PN16	31" 787mm	10.50" 267mm	26.80" 681mm	26" 660mm	-	-	-
	300F / PN25, PN40	32.50" 826mm	11.50" 292mm	26.80" 681mm	26" 660mm	-	-	-
16" 400mm	150F / PN10, PN16	41.38" 1051mm	11.75" 298mm	31.40" 798mm	32" 813mm	18" 457mm	28.50" 724mm	15.69" 399mm
	300F / PN25, PN40	43.50" 1105mm	12.75" 324mm	31.40" 798mm	32" 813mm	18.81" 478mm	28.50" 724mm	16.50" 419mm

S206-PG		Globe			Globe & Ang	Angle		
		A	D	E	C	B	E	F
12" 300mm	150F / PN10, PN16	27.50" 699mm	9.50" 241mm	23.35" 593mm	22.12" 562mm	-	-	-
	300F / PN25, PN40	29" 737mm	10.50" 267mm	23.35" 593mm	22.12" 562mm	-	-	-
16" 400mm	150F / PN10, PN16	36" 914mm	11.75" 298mm	26.75" 679mm	26" 660mm	-	-	-
	300F / PN25, PN40	37.63" 956mm	12.75" 324mm	26.75" 679mm	26" 660mm	-	-	-
18" 450mm	150F / PN10, PN16	42" 1067mm	12.50" 318mm	31.38" 797mm	30.31" 770mm	-	-	-
	300F / PN25, PN40	43.63" 1108mm	14" 356mm	31.38" 797mm	30.31" 770mm	-	-	-
20" 500mm	150F / PN10, PN16	45" 1143mm	13.75" 349mm	31.38" 797mm	30.50" 775mm	-	-	-
	300F / PN25, PN40	46.38" 1178mm	15.25" 387mm	31.38" 797mm	30.50" 775mm	-	-	-
24" 600mm	150F / PN10, PN16	50.50" 1283mm	16" 406mm	31.38" 797mm	36" 914mm	-	-	-
	300F / PN25, PN40	52.25" 1327mm	18" 457mm	31.38" 797mm	36" 914mm	-	-	-