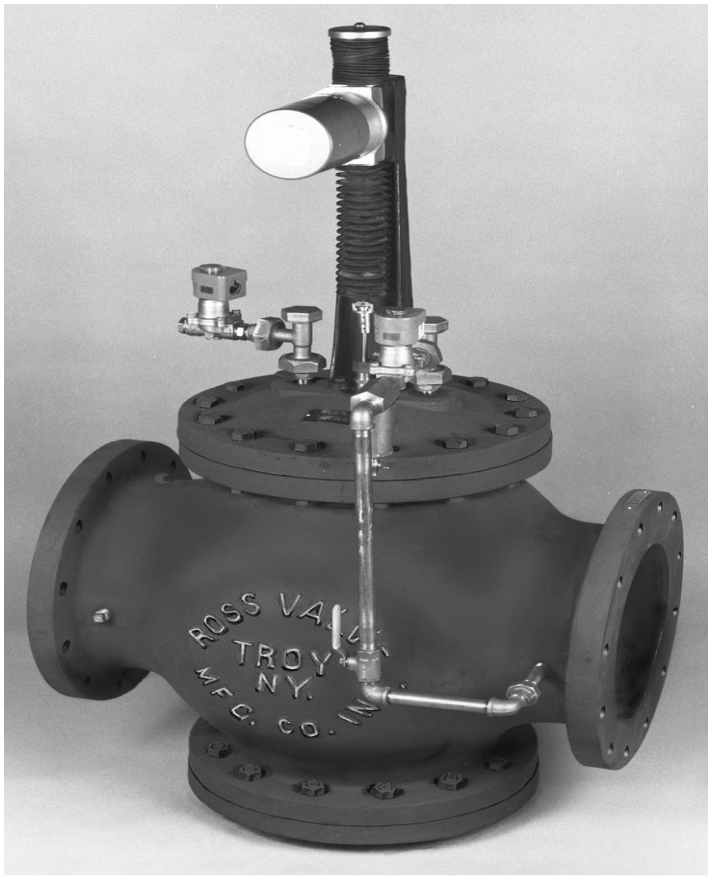
AUTOMATIC FLOW CONTROL VALVE

INSTRUCTIONS

Installation - Operation - Inspection - Maintenance



4" - 36" ROSS MODEL - 42AFCV FIGURE 14A Serial #L_____
AUTOMATIC FLOW CONTROL VALVE

GLOBE FLAT SEAT STYLE

ROSS VALVE Mfg. Co., Inc.

PO BOX 595, TROY, NY 12181 - PHONE 518/274-0961 - FAX 518/274-0210

DESCRIPTION OF OPERATION
ROSS MODEL 42AFCV
AUTOMATIC FLOW CONTROL VALVE

OVERVIEW

The Ross Control Valve is to control flow into the tank via an Electronic Process Controller (controller to be supplied by others).

OPERATION - RATE OF FLOW CONTROL CONDITION

When operating with the Process Controller, the hydraulic controls are isolated by the 2-Way Solenoid, Part No. 30. This Solenoid must be energized at all times when operating electrically.

TO OPEN VALVE: Energize the 2-Way Normally Closed Solenoid Valve, Part No. 27. The speed of opening is controlled by the adjustable Needle Valve, Part No. 32. (A manual operator is supplied on the Solenoid Valve to physically open the Solenoid if desired.) This is a great help in troubleshooting the electrical controls. A field optional "T" connection to drain with appropriate shut off's is provided to eliminate power loss across the valve.

TO CLOSE VALVE: Energize the 2-Way Normally Closed Solenoid Valve, Part No. 26. The speed of closing is controlled by the Adjustable Needle Valve, Part No. 33. (A manual operator is supplied on the Solenoid Valve to physically open the Solenoid if desired.) This is a great help in troubleshooting the electrical controls.

IMPORTANT NOTE: The Controller ***MUST*** be configured so that the normal operating Solenoid Valves, Part No.'s 26 and 27, are electrically interlocked; thereby never able to energize both Solenoids at the same time.

INSTALLATION / START-UP (ROSS PISTON VALVE – GLOBE OR ANGLE STYLE)

Shipment:
Prior to shipment, each valve is thoroughly tested and pre-adjusted at the factory to the expected field conditions. Any visible damage to the crate or packaging should be immediately brought to the attention of the shipping company and documented with photographs.

Depending upon the valve size, external controls may be attached or in a separate box. The inlet of the main valve is identified with a metal tag. When controls are shipped separately, connections are tagged.

Storage:
If it is necessary to store the valve before installation, it should be protected from the elements. Inside storage is recommended. If this is not possible, the valve should be protected from dirt, heat, freezing, and direct sunlight.

Installation:
1. Carefully remove all shipping materials and check the valve for any other foreign objects.
2. If possible, flush the line before inserting the valve.
3. The valve is tagged with a model and serial number. It is recommended that the serial number be noted in your records as this will be requested by the factory when any technical support or parts replacement is required. **Valve serial number: L_____.**
4. Place the valve in line with the flange marked "INLET" facing the high pressure or supply line.

   CAUTION: Do not obstruct the vent hole in the center of the bottom cap (#16 for Globe Body valves) or in the differential cylinder bracket (#27 for Angle Body valves). Allow enough clearance above the valve for removal of the stem assembly.
5. If external piping and controls are not attached to the valve when shipped, connect couplings identified with tags that are numbered. The arrow on the pilot valve body points in the direction of flow through the pilot valve. Flow is always away from the top cap of the main valve. The indicator rod (#20) shows the position of the main stem.
6. Attach gauge cocks to the back side of the valve.
7. Complete any necessary wiring on solenoid valves (if applicable).

Start-Up:
1. Close the isolation valves (#18) in the control piping.
2. Open the main line gate valve (if installed) on the discharge/downstream side of the valve.
3. *Slowly* open the main line gate valve (if installed) on the inlet/upstream side of the valve.
4. Open the isolation valves (#18) in the control piping.
5. Loosening the union of the control piping on the top cap side of the speed control valve will help bleed air and give a positive indication when the operating chamber is full. It may be necessary to apply pressure to the valve indicator rod (if provided) with a wrench handle or block of wood until the valve operating chamber is pressurized.
6. No lubrication or adjustment to the valve is required or recommended. The valve has been thoroughly tested at the factory and set to the expected field conditions.

SOLENOID CONTROLLED THROTTLING VALVE

Purpose: Control system level, flow or pressure **Model Number: 42AFCV**

Sizes: 2" - 48"
Type: Throttling
Primarily Controlled By: Electricity
Located: In line/In line near storage
Purpose: To control system level, flow or downstream/upstream pressure
Piston: Can be locked in any position
Inlet Pressure: Maximum: 300 psi
Inlet Pressure: Minimum: 5 psi
Construction: Body: 2" - 36" - Cast iron (semi-steel) with bronze trim
40" - 48" - Ductile iron, with bronze/ stainless steel trim
Voltages: AC or DC
Manual Control: To open or close the valve in case of a power failure.
Control Devices:
Strainer: Model 5F-2
Valves:
Needle: Two Speed Control - in series with solenoid pilot valves
Pilot: Solenoid - Two 2 Way

Options

1. Angle body design (90 degree)
2. Cast steel or ductile iron body and stainless steel trim
3. Feed back potentiometer - to indicate precise valve position or to match with an input signal through an electronic bridge to hold a command position.
4. Spring assist - to either open or close valve
5. Teflon coated cylinders

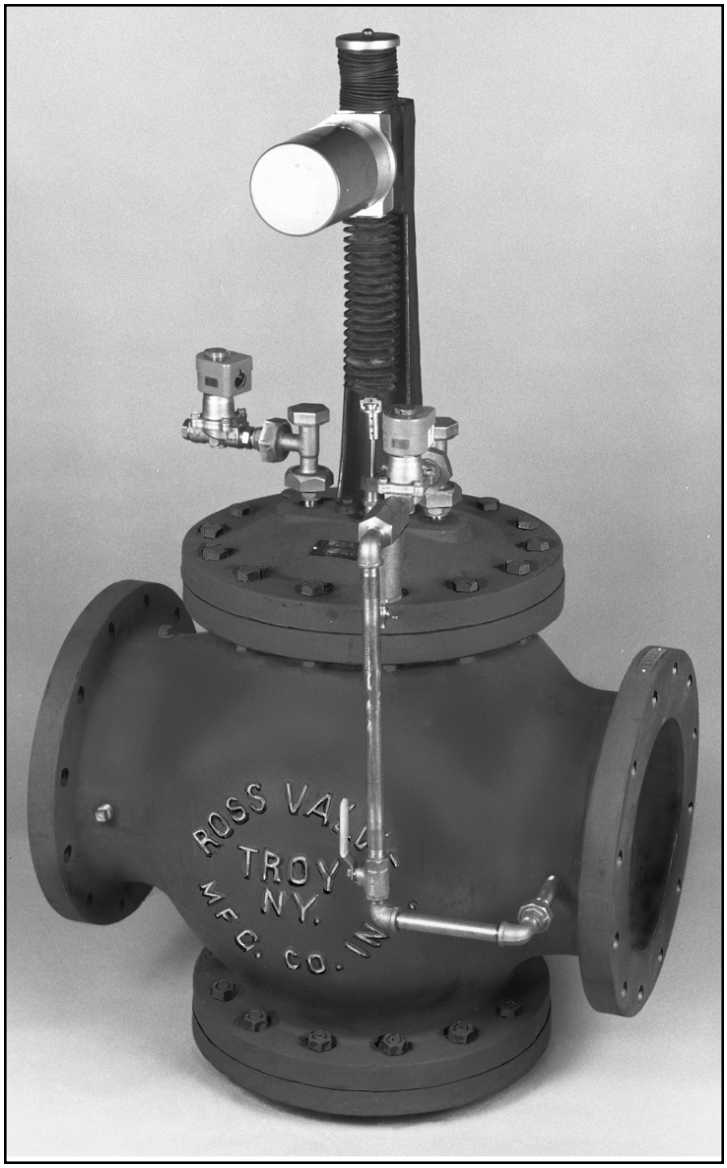
Customized Features

Any one or a selection of features can be added to the solenoid controlled, throttling valve.

Code

Computer Based Panels

MC2000L - Level Control Panel
MC2000F - Flow Control Panel
MC2000PT - Pressure Control Panel



Ross engineers customize the basic **42AFCV** to accommodate individual needs.

Mechanical Options

ACAV - Anti-cavitation Trim
CI - Check Feature (Internal)
ES - Higher Efficiency Strainer

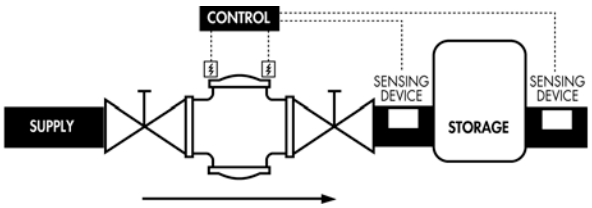
Factory: Telephone (518) 274-0961; Fax (518) 274-0210

SOLENOID CONTROLLED THROTTLING VALVE

Basic Applications **Model Number: 42AFCV**

Basic Applications: Storage Flow Maintenance

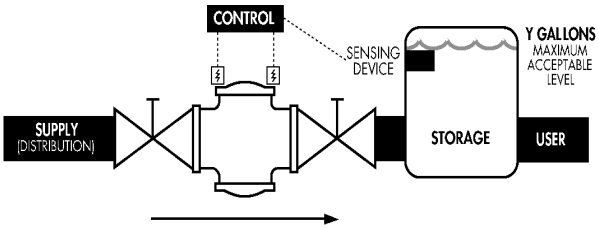
1. Control flow into a reservoir, tank or basin in direct proportion to draw down.
2. Control flow in a line when monitored and positioned from a remote point.



If: Flow rate filling storage needs to be controlled
Ross Main Valve will: Position piston to maintain the desired flow.
If: Flow into storage needs to be in direct proportion to flow out
Ross Main Valve will: Position piston to control the desired flow.
If: Supply needs to be isolated from the user
Ross Main Valve will: Full close to stop flow.

Basic Applications: Storage Level Maintenance

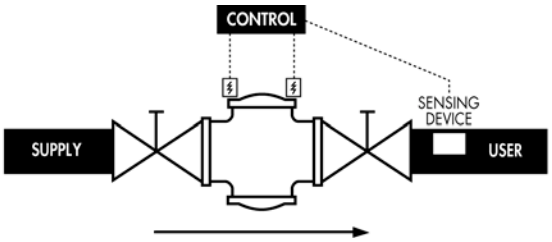
Controls levels in tanks, basins, reservoirs, deep wells, etc.



If: Storage level falls below Y Gallons
Ross Main Valve will: Open proportional to drawdown to allow greater flow into storage.
If: Storage level reaches Y Gallons
Ross Main Valve will: Full close to stop the flow.

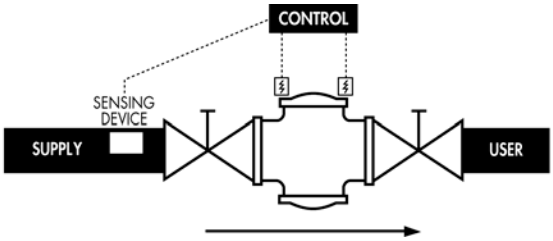
Basic Applications: Pressure Maintenance

Downstream

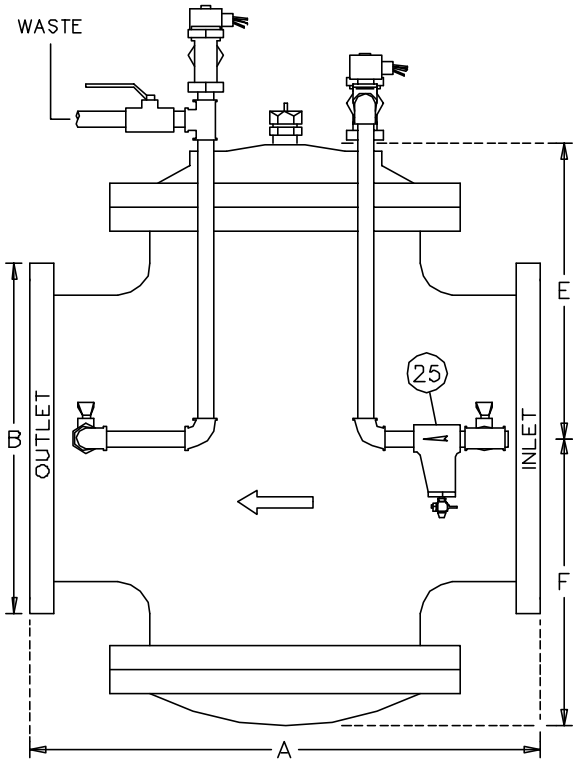


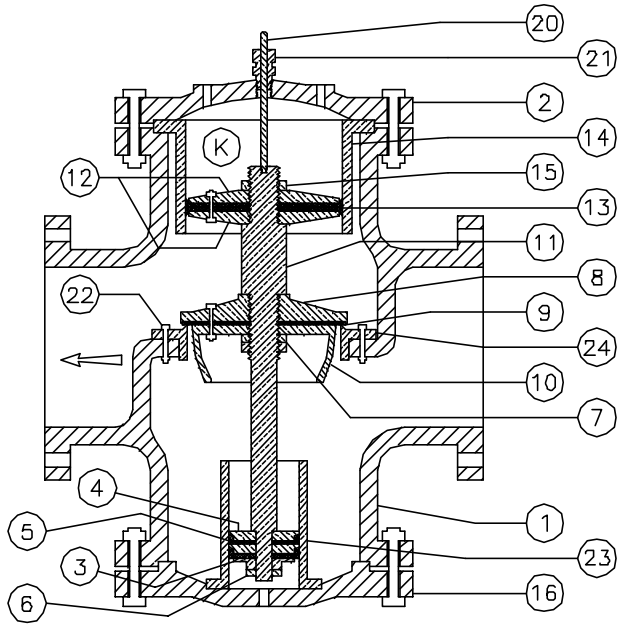
If: Downstream pressure needs to be maintained at a set pressure
Ross Main Valve will: Position piston to maintain the desired pressure.

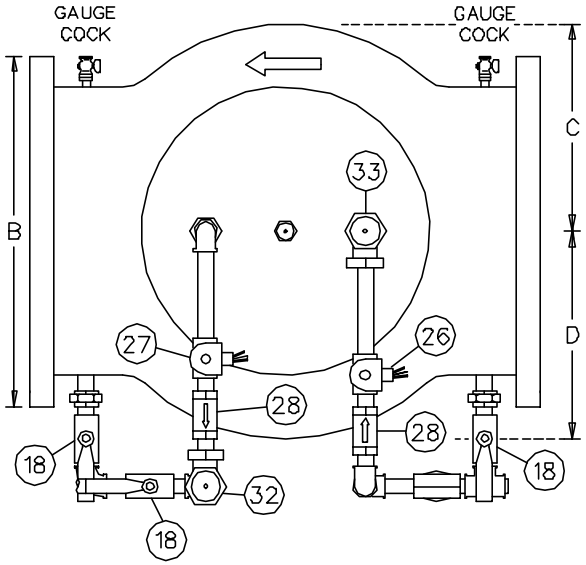
Upstream



If: Upstream pressure needs to be maintained at a set pressure
Ross Main Valve will: Position piston to maintain the desired pressure.







VALVE SIZE (IN)	ANSI B.16.1 CLASS	SHIPPING WEIGHT (LBS)	DIMENSIONS (INCHES) A	B	C&D	E&F
4	125 250	235 275	14 14–5/8	9 10	4–3/4 4–3/4	7 7
6	125 250	375 430	17–3/4 17–3/4	11 12–1/2	6–5/8 6–5/8	9 9
8	125 250	690 750	24 24–13/16	13–1/2 15	8–3/4 8–3/4	12–1/2 12–1/2
10	125 250	920 1000	24–7/8 26–1/4	16 17–1/2	10 10	14–1/4 14–1/4
12	125 250	1375 1475	30 31–1/2	19 20–1/2	12 12	15–1/2 15–1/2
14	125 250	1770 1850	34–1/4 35–3/4	21 23	14 14	18 18
16	125 250	2400 2600	37–7/8 39–1/4	23–1/2 25–1/2	15 15	21–1/2 21–1/2
18	125 250	3300 3500	41–7/8 41–7/8	25 28	18–3/8 18–3/8	24 24
20	125 250	3550 3800	42–3/8 42–3/8	27–1/2 30–1/2	18–3/8 18–3/8	24 24
24	125 250	5200 5500	47 47	32 36	20 20	25 25
30	125 250	13000 13500	63–3/4 65–1/16	38–3/4 43	26–1/4 26–1/4	34 34
36	125 250	16000 18700	65 65	46 50	26–1/4 26–1/4	34 34

PART	DESCRIPTION	QTY.	MATERIAL
1	VALVE SHELL	1	CAST IRON
2	TOP CAP	1	CAST IRON
3	BOTTOM STEM GUIDE NUT	1	BRONZE
4	BOTTOM CUP FOLLOWERS (SET OF 2)	1	BRONZE
5	PISTON CUP PACKING	2	LEATHER
6	BOTTOM STEM LOCK NUT	1	BRONZE
7	STEM NUT	1	BRONZE
8	SEAT DISC	1	BRONZE
9	SEAT PACKING	1	POLYURETHANE
10	SEAT PACKING SUPPORT	1	BRONZE
11	STEM	1	BRONZE
12	MAIN CUP PLATES (SET OF 2)	1	BRONZE
13	MAIN CUP PACKING	2	LEATHER
14	MAIN BUSHING	1	BRONZE
15	TOP STEM NUT	1	BRONZE
16	BOTTOM CAP	1	CAST IRON
18	ISOLATION VALVE	3	BRONZE
20	INDICATOR ROD	1	BRONZE
21	INDICATOR STUFFING BOX	1	BRONZE
22	BOLTS & NUTS (SEAT RING)	VARY	BRONZE
23	BOTTOM CAP CYLINDER	1	BRONZE
24	SEAT RING	1	BRONZE
25	STRAINER	1	BRONZE/STAINLESS
26	2–WAY SOLENOID (N.C.) – CLOSING	1	BRONZE/STAINLESS
27	2–WAY SOLENOID (N.C.) – OPENING	1	BRONZE/STAINLESS
28	CHECK VALVE	1	BRONZE
32	NEEDLE VALVE – OPENING CONTROL	1	BRONZE
33	NEEDLE VALVE – CLOSING CONTROL	1	BRONZE
	BOLTS & NUTS (TOP & BOTTOM CAP)	VARY	STEEL
	BOLTS & NUTS (CUP PLATES)	VARY	BRONZE
	BOLTS & NUTS (SEAT DISC)	VARY	BRONZE
	INDICATOR ROD PACKING (SET)	1	TEFLON
	MAIN STUFFING BOX PACKING (SET)	1	TEFLON
	COVER & MAIN BUSHING GASKETS	3	COMPOSITION
	STEM GASKETS	3	COMPOSITION

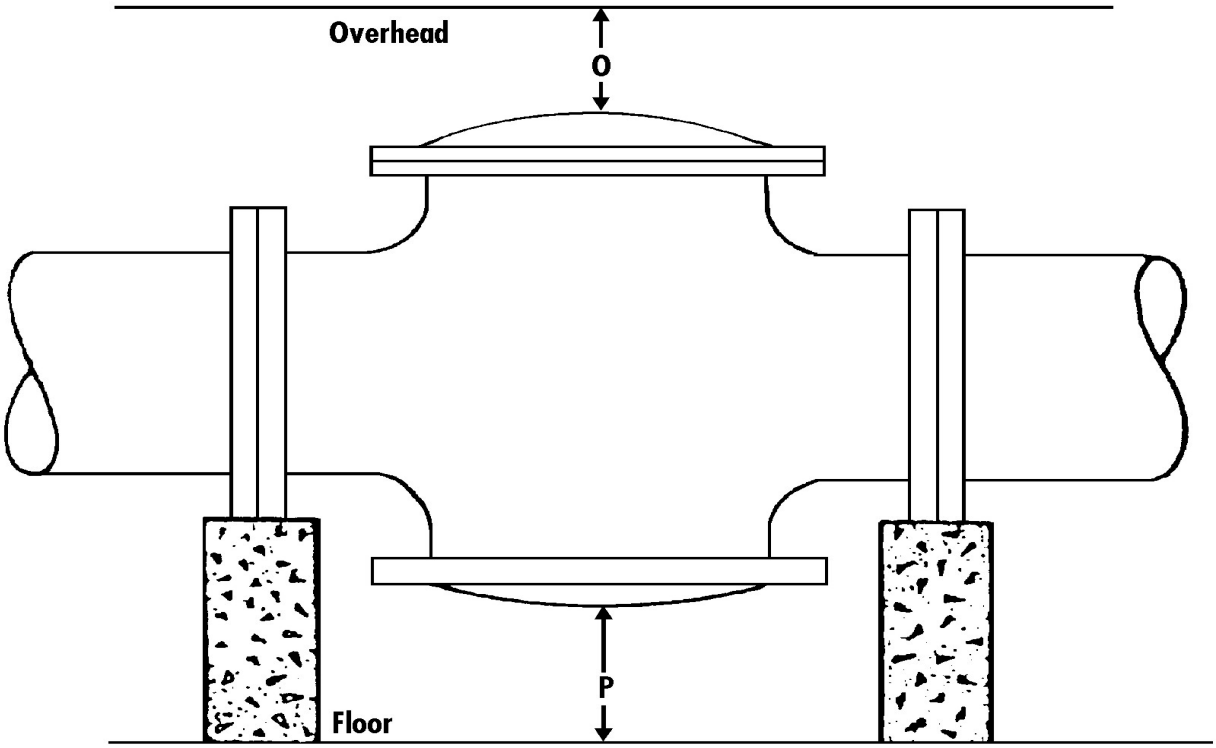
ROSS VALVE Mfg. Co., Inc.
6 OAKWOOD AVENUE - TROY, NEW YORK, 12180 - TEL. (518) 274 0961
POST OFFICE BOX 595 - TROY, NEW YORK, 12181 - FAX (518) 274 0210
WEBSITE: www.rossvalve.com - E-MAIL: sales@rossvalve.com

DRAWING	42AFCV	DATE	3/27/00 RJC
GLOBE BODY	4" – 36"	NO SCALE	FIGURE 14A

Model 42AFCV
AUTOMATIC FLOW CONTROL VALVE

DIMENSIONS

Globe Body Minimum Clearances — Piston Valve Sizes: 4″ - 48"



Size (Inches)	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	42"	48"
O	14	16	18	21	23	28	28	33	33	36	43	46	54	60
P	4 1/2	5 1/2	6 1/2	1	1	1	1	1	1	1	1	1	1	1

Note

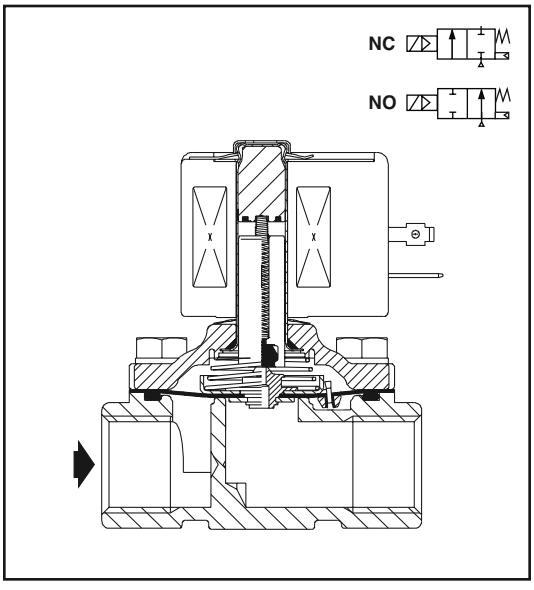
1. Dimension "O" is clearance for removal of the top cap and piston for repacking the main valve. Additional working space for the convenience of the service man should be considered above as well as around the valve.
2. Dimension "P" as listed is the desirable clearance under the valve for removal of the STANDARD bottom cap. This dimension may be reduced to 1 inch for all valves on special applications.

Note

A. **Do not obstruct vent hole located at the center of the bottom cap.**
B. Consideration should be given for installation of valves 14" or larger under manhole in the roof of the valve vault or for additional clearance above the valve since a mechanical hoist will probably be required for removal of the piston. An eye bolt or hook cast in the cover slab over the center of the valve is useful.
C. If clearance under the valve is limited, dimensions "O" and "P" can be modified. Consult the factory concerning special applications.

Features

- Wide range of pressure ratings, sizes, and resilient materials provide long service life and low internal leakage
- High Flow Valves for liquid, corrosive, and air/inert gas service
- Industrial applications include:
  - Car wash
  - Laundry equipment
  - Air compressors
  - Industrial water control
  - Pumps



Construction

Valve Parts in Contact with Fluids		
Body	Brass	304 Stainless Steel
Seals and Discs	NBR or PTFE	
Disc-Holder	PA	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Springs	302 Stainless Steel	
Shading Coil	Copper	Silver

Electrical

Standard Coil and Class of Insulation	Watt Rating and Power Consumption				Spare Coil Part Number			
		AC			General Purpose		Explosionproof	
	DC Watts	Watts	VA Holding	VA Inrush	AC	DC	AC	DC
F	-	6.1	16	40	238210	-	238214	-
F	11.6	10.1	25	70	238610	238710	238614	238714
F	16.8	16.1	35	180	272610	97617	272614	97617
F	-	17.1	40	93	238610	-	238614	-
F	-	20	43	240	99257	-	99257	-
F	-	20.1	48	240	272610	-	272614	-
H	30.6	-	-	-	-	74073	-	74073
H	40.6	-	-	-	-	238910	-	238914

Standard Voltages: 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering.
Other voltages available when required.

Solenoid Enclosures

Standard: RedHat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; RedHat - Type I.

Optional: RedHat II - Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9; Red-Hat - Explosionproof and Watertight, Types 3, 4, 4X, 7, and 9.

(To order, add prefix "EF" to catalog number, except Catalog Numbers 8210B057, 8210B058, and 8210B059, which are not available with Explosionproof enclosures.)
See Optional Features Section for other available options.

Nominal Ambient Temp. Ranges

RedHat II/
RedHat AC: 32˚F to 125˚F (0˚C to 52˚C)

RedHat II DC: 32˚F to 104˚F (0˚C to 40˚C)
RedHat DC: 32˚F to 77˚F (0˚C to 25˚C)
(104˚F/40˚C occasionally)

Refer to Engineering Section for details.

Approvals

CSA certified. RedHat II meets applicable CE directives.
Refer to Engineering Section for details.

Installation & Maintenance Instructions

2-WAY INTERNAL PILOT-OPERATED SOLENOID VALVES
DIAPHRAGM TYPE – 3/8, 1/2 AND 3/4 NPT
NORMALLY OPEN OPERATION

BULLETINS
8210
8211

I&M No.V5983R3

DESCRIPTION

Bulletin 8210 valves are 2-way, normally open internal pilot operated solenoid valves. Valve bodies and bonnets are of brass or stainless steel construction. Standard valves have a General Purpose, NEMA Type 1 Solenoid Enclosure.

Bulletin 8211's are the same as the 8210's except the solenoids are equipped with an enclosure which is designed to meet NEMA Type 4 - Watertight, NEMA Type 7 (C or D) Hazardous Locations - Class I, Groups C or D and NEMA Type 9 (E, F or G) Hazardous Locations - Class II, Groups E, F or G. Installation and Maintenance Instructions for Explosion-Proof/Watertight Solenoid Enclosures are shown on Form No. V-5709.

OPERATION

Normally Open: Valve is open when solenoid is de-energized. Valve closes when solenoid is energized.

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage and service.

TEMPERATURE LIMITATIONS

For maximum valve ambient and fluid temperatures, refer to chart below. For higher ambient and fluid temperature limitations, consult factory. Check catalog number on nameplate to determine maximum temperatures.

Construction	Coil Class	Catalog Number Prefix	Maximum Ambient Temp. °F	Maximum Fluid Temp. °F
A-C Construction (Alternating Current)	A	None	77	200
	F	FT	122	200
	H	HT	140	200
D-C Construction (Direct Current)	A, F or H	None, FT or HT	77	180

POSITIONING

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertical and upright so as to reduce the possibility of foreign matter accumulating in the core tube area.

MOUNTING

For mounting bracket (optional feature) dimensions, refer to Figure 1.

PIPING

Connect piping to valve according to markings on valve body. Apply pipe compound sparingly to male pipe threads only; if applied to valve threads, it may enter the valve and cause operational difficulty. Pipe strain should be avoided by proper support and alignment of piping. When tightening the pipe, do not use valve as a lever. Wrenches applied to valve body or piping are to be located as close as possible to connection point.

IMPORTANT: For the protection of the solenoid valve, install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Periodic cleaning is required depending on service conditions. See Bulletins 8600, 8601 and 8602 for strainers.

WIRING

Wiring must comply with Local and National Electrical Codes. Housings for all solenoids are provided with connections or accommodations for 1/2 inch conduit. The general purpose solenoid enclosure may be rotated to facilitate wiring by removing the retaining cap or clip. CAUTION: When metal retaining clip disengages, it will spring upward. Rotate enclosure to desired position. Replace retaining cap or clip before operating.

NOTE: Alternating Current (A-C) and Direct Current (D-C) solenoids are built differently. To convert from one to the other, it is necessary to change the complete solenoid including the solenoid base sub-assembly, core, plugnut assembly and coil.

SOLENOID TEMPERATURE

Standard catalog valves are supplied with coils designed for continuous duty service. When the solenoid is energized for a long period, the solenoid enclosure becomes hot and can be touched with the hand only for an instant. This is a safe operating temperature. Any excessive heating will be indicated by the smoke and odor of burning coil insulation.

MAINTENANCE

WARNING: Turn off electrical power supply and depressurize valve before making repairs. It is not necessary to remove the valve from the pipe line for repairs.

CLEANING

A periodic cleaning of all solenoid valves is desirable. The time between cleanings will vary depending on media and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. Clean valve strainer or filter when cleaning solenoid valve.

PREVENTIVE MAINTENANCE

1. Keep the medium flowing through the valve as free from dirt and foreign material as possible.
2. While in service, operate the valve at least once a month to insure proper opening and closing.
3. Periodic inspection (depending on media and service conditions) of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

IMPROPER OPERATION

1. **Faulty Control Circuit:** Check the electrical system by energizing the solenoid. A metallic click signifies the solenoid is operating. Absence of the click indicates loss of power supply. Check for loose or blown-out fuses, open-circuited or grounded coil, broken lead wires or splice connections.
2. **Burned-Out Coil:** Check for open-circuited coil. Replace coil if necessary.
3. **Low Voltage:** Check voltage across the coil leads. Voltage must be at least 85% of nameplate rating.
4. **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
5. **Excessive Leakage:** Disassemble valve and clean all parts. Replace worn or damaged parts with a complete Spare Parts Kit for best results.

COIL REPLACEMENT (Refer to Figure 1)

Turn off electrical power supply and disconnect coil lead wires. Proceed in the following manner:

1. Remove retaining cap or clip, spacer, nameplate and housing. CAUTION: When metal retaining clip disengages, it will spring upward.
2. Slip spring washer, insulating washer, coil and insulating washer off the solenoid base sub-assembly. Insulating washers are omitted when a molded coil is used.
3. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.

CAUTION: Solenoid must be fully reassembled as the housing and internal parts are part of and complete the magnetic circuit. Place an insulating washer at each end of the coil, if required.

VALVE DISASSEMBLY

Depressurize valve and turn off electrical power supply. For brass construction, refer to Figure 2. For stainless steel construction, refer to Figure 3. Proceed in the following manner:

1. Disassemble valve in an orderly fashion paying careful attention to exploded views provided for identification of parts.
2. Remove retaining cap or clip and slip the entire solenoid enclosure off the solenoid base sub-assembly. CAUTION: When metal retaining clip disengages, it will spring upward.
3. Unscrew solenoid base sub-assembly and remove core, plugnut gasket, plugnut assembly and solenoid base gasket.
4. For stainless steel construction, remove adapter and adapter gasket.
5. Remove bonnet screws (4), valve bonnet, disc holder sub-assembly, disc holder spring, diaphragm/spring sub-assembly and body gasket.
6. All parts are now accessible for cleaning or replacement. Replace worn or damaged parts with a complete Spare Parts Kit for best results.

VALVE REASSEMBLY

1. Reassemble in reverse order of disassembly paying careful attention to exploded views provided for identification and placement of parts.
2. Replace body gasket and diaphragm/spring sub-assembly. Locate bleed hole in diaphragm/spring sub-assembly approximately 45° from valve outlet. NOTE: Should diaphragm/spring sub-assembly become disassembled, be sure to replace the diaphragm/spring support with lip facing upward towards the valve bonnet.
3. Replace disc holder spring and disc holder sub-assembly.
4. Replace valve bonnet and bonnet screws. Torque bonnet screws in a crisscross manner to 95 ± 10 inch-pounds.
5. For stainless steel construction, replace adapter gasket and adapter. Torque adapter to 175 ± 25 inch-pounds.
6. Install solenoid base gasket, plugnut assembly and plugnut gasket. Position core (small end up for A-C Construction) on plugnut assembly. For D-C Construction, be sure plugnut assembly and core are installed with mated ends together.
7. Replace solenoid base sub-assembly and torque to 175 ± 25 inch-pounds.
8. Replace solenoid enclosure and retaining cap or clip.
9. After maintenance, operate the valve a few times to be sure of proper opening and closing.

SPARE PARTS KITS

Spare Parts Kits and Coils are available for ASCO valves.
Parts marked with an asterisk (*) are supplied in Spare Parts Kits.

ORDERING INFORMATION FOR SPARE PARTS KITS
When Ordering Spare Parts or Coils, Specify Valve Catalog Number, Serial Number and Voltage.

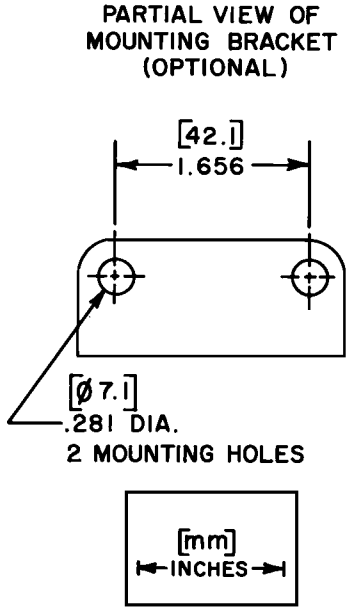
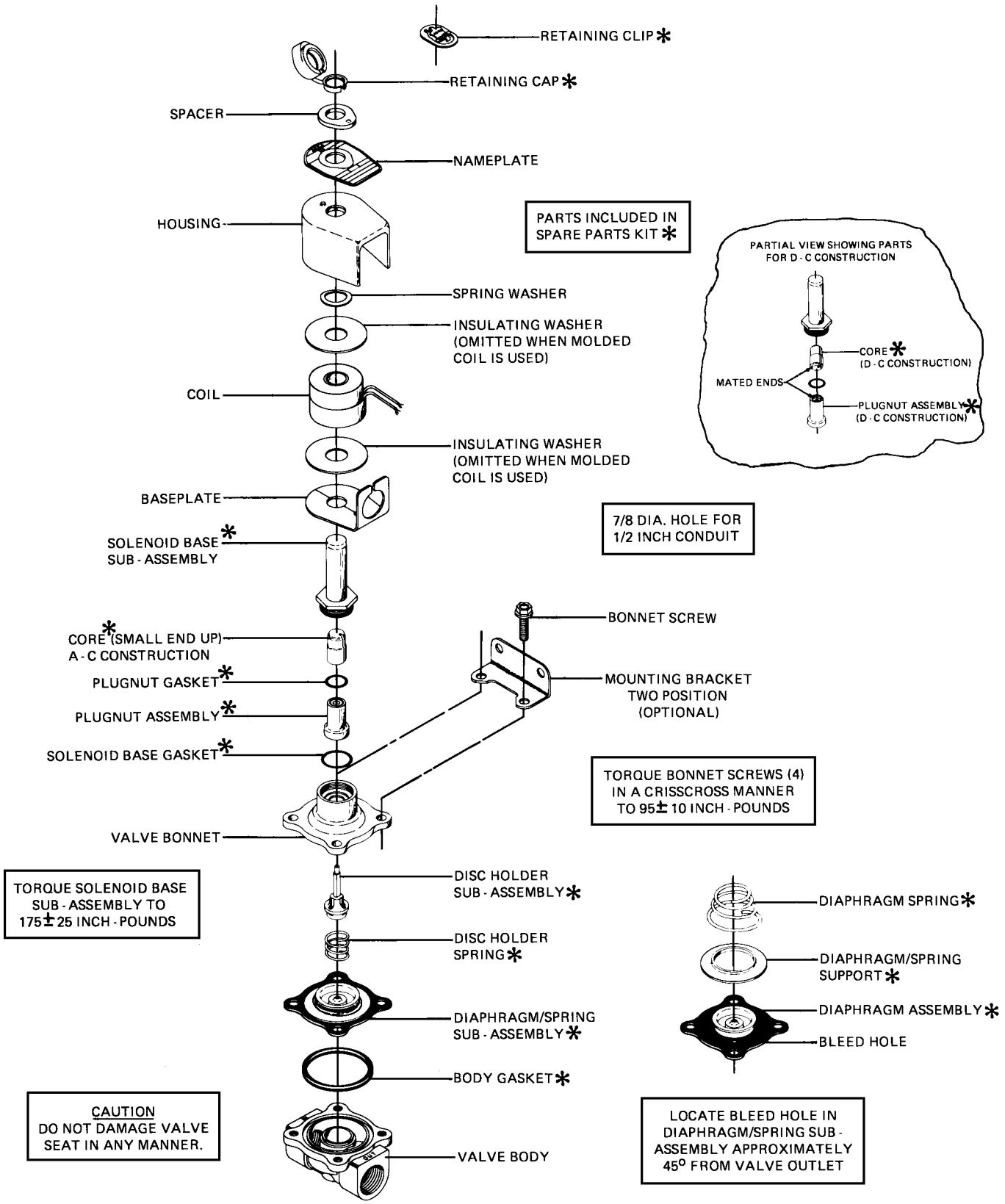
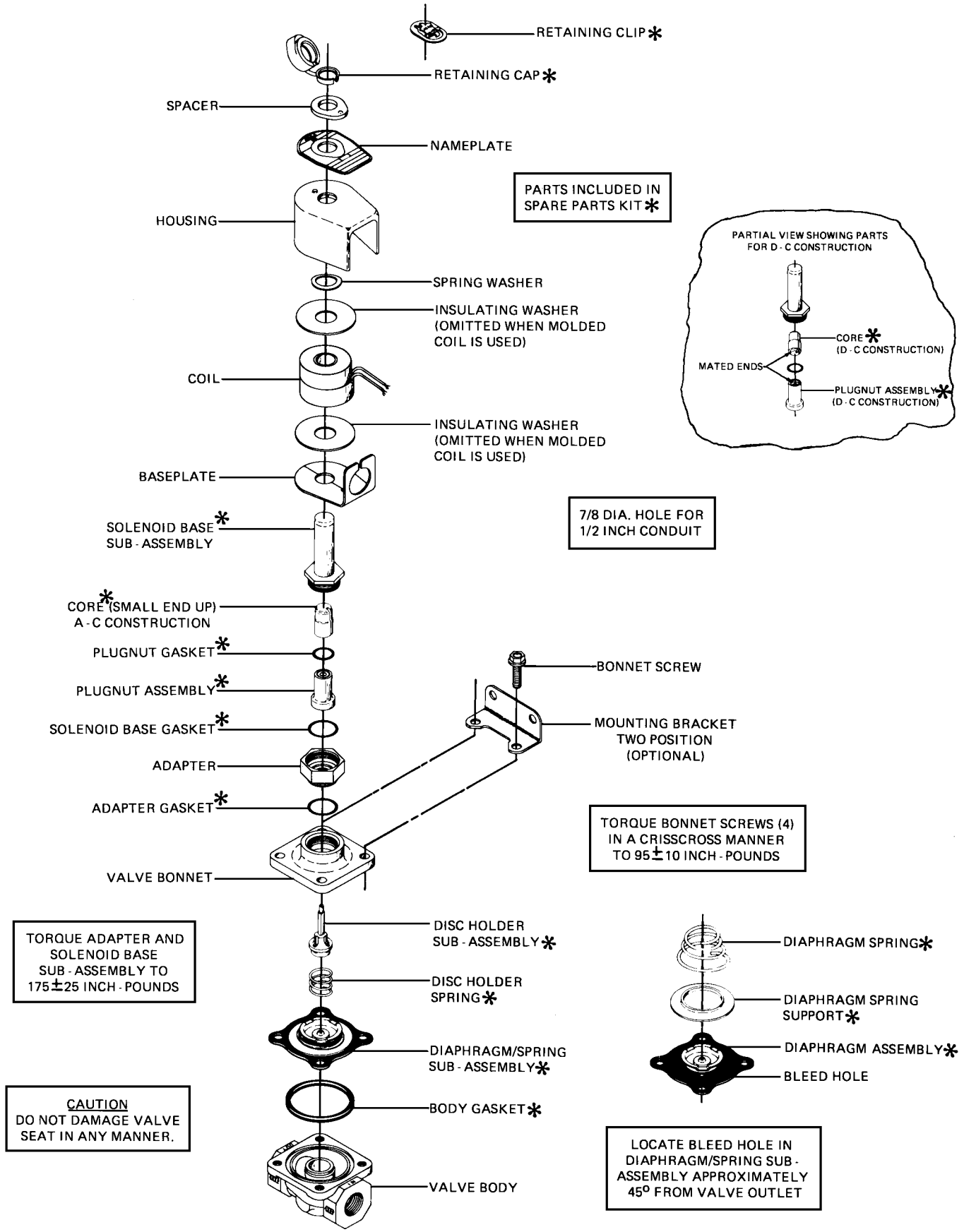


Figure 1. **Dimensions for Mounting Bracket (Optional Feature)**



Bulletin 8210 - 3/8, 1/2 and 3/4 N.P.T. - Brass Construction
General Purpose Solenoid Enclosure Shown.

Figure 2. **For Explosion-Proof/Watertight Solenoid Enclosure used on Bulletin 8211, See Form No. V-5709.**



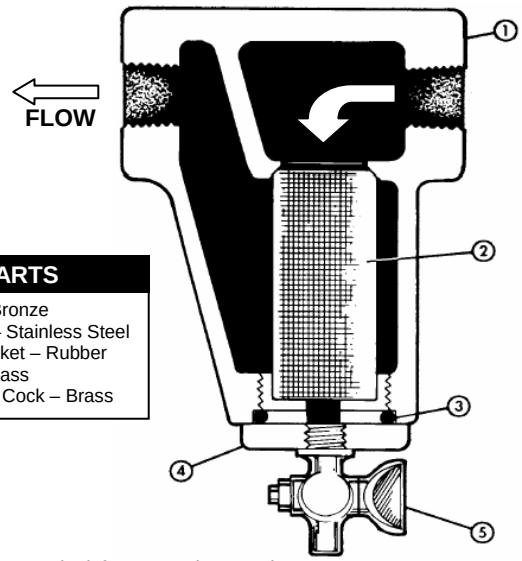
Bulletin 8210 - 1/2 and 3/4 N.P.T. - Stainless Steel Construction
General Purpose Solenoid Enclosure Shown.

Figure 3. **For Explosion-Proof/Watertight Solenoid Enclosure used on Bulletin 8211, See Form No. V-5709.**

STRAINER

Model Number: 5F-2

Sizes: ½" – 1"
Located: On any external piping
Purpose: To protect external piping and control devices from fouling or damage from foreign particles
Screen: Cylindrical Dutch weave stainless steel wire mesh
Piping Connection: Standard pipe thread



PARTS

1. Body – Bronze
2. Screen – Stainless Steel
3. Cap Gasket – Rubber
4. Cap – Brass
5. Flushing Cock – Brass

Operation

1. Water enters the cylindrical screen (#2) from the top and passes out through the sides of the cylinder.
2. Any particle too large to pass through .012 inch openings gets trapped in the cylinder, where, unless there is unusual turbulence, they settle at the bottom.

Recommendation

1. Strainer should be "blown down" frequently to remove collected foreign material from the sediment chamber.
2. Strainer screen should be removed occasionally for inspection and thorough cleaning.

Note

1. To clean without shutting down the line, open the flush cock (#5) in the bottom cap (#4) for several seconds.
2. To remove the screen (#2), which requires shutting down the line, unscrew the bottom cap assembly (#5).

Option

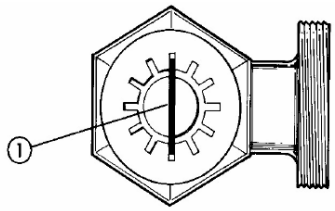
Two strainers installed in parallel (with the appropriate isolation valves) to permit uninterrupted service while cleaning.

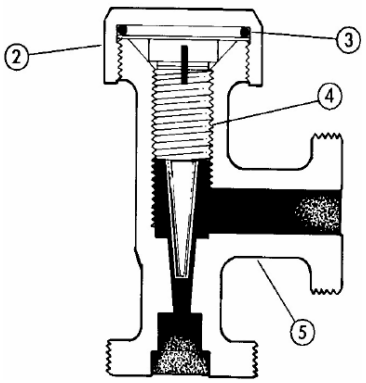
NEEDLE VALVE

Sizes: One size fits all piston valves
Primarily Controlled By: Manually Adjusted
Located: On external control circuit of the main valve
Purpose: To limit flow in and out of the operating chamber
Standard Shipped Adjustment:
Course Needle: 5/6 to 2 turns off the seat
Fine Needle: Based on individual specifications

PARTS

1. Lock – Brass
2. Cap – Bronze
3. Cap Gasket – Rubber
4. Needle – Brass
5. Body – Bronze





Operation

The simple construction reliably limits maximum flow through the external piping, depending on the position of the adjustable stem/needle (#4) relative to the seat.

1. When the needle (#4) is adjusted counter-clockwise to a raised position,
   a. More water can pass through the needle valve.
   b. Water enters (leaves) the operating chamber more quickly.
   c. The main valve piston moves up and down more quickly.
2. When the needle (#4) is adjusted clockwise to a lowered position,
   a. Less water can pass through the needle valve.
   b. Water enters (leaves) the operating chamber more slowly.
   c. The main valve piston moves up and down more slowly.

Adjustment

To adjust needle valve, which can be done without shutting down the main valve:

1. Remove the hex cap (#2) and lock(#1).
2. With a screw driver;
   a. Turn the needle (#4) counter-clockwise to raise it
   b. Turn the needle (#4) clockwise to lower it
3. Once the optimum position is determined, no further adjustment of the needle should be required.

Note

It is advisable to occasionally remove the cap (#2) and lock (#1) and change the position of the needle (#4) momentarily to insure against gradual plugging.

Option

Two separate needle valves on one main valve – Provides independent control of opening and closing speeds.

TROUBLESHOOTING - Globe Body Valves

The following troubleshooting procedure is designed to isolate the main valve from its controls, in order to determine the cause of malfunction. By controlling the pressure of the operating chamber, one can simulate pilot control and determine if the main valve is operational, despite the response of the pilot.

CAUTION: Before manually opening or closing the valve substantially, the effects on the inlet and outlet system pressures must be considered. To test valve response, it is usually sufficient to momentarily perform the following manual tests:

To manually close the main valve...

- Pressurize the operating chamber by slowly closing the isolation valve in series with the pilot valve.
- Water from the inlet side of the main valve should still enter the operating chamber through the strainer and needle valve, causing the operating chamber to fill.
- This should force the piston down, causing the valve to close.

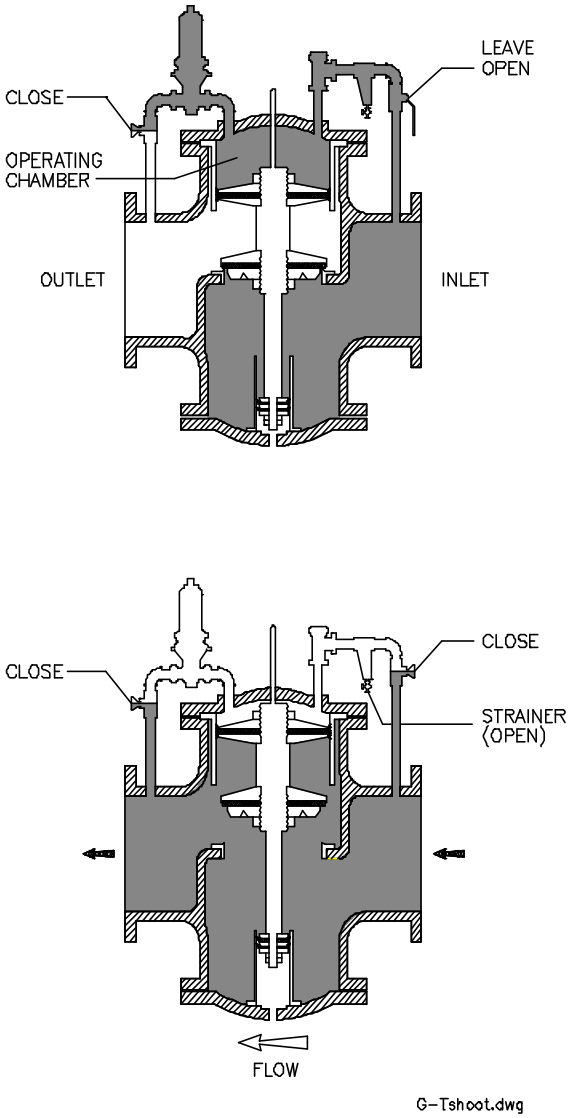
If the main valve fails to close and continues to pass water, it may indicate the following:

- Worn packings - Part Numbers 5 (piston cup packings), 9 (seat packing), and 13 (main cup packings).
- Fouled or incorrectly set needle valve - Needle should be free of debris and adjusted between 3/4 to 1-1/2 turns from full closed position.
- Plugged Strainer Screen - Screen should be free of debris.
- Mechanical blockage within valve body.

To manually open the main valve...

- De-pressurize the operating chamber by slowly closing both isolation valves in the control piping, then opening the strainer flush cock.
- This should prevent any additional water from entering the operating chamber, and allow it to drain.
- The force of the inlet pressure should force the piston up, causing the valve to open.

If the main valve fails to open, it may indicate worn main cup packings (part number 13).



If the main valve does not respond to manual operation, it usually indicates that the packings need to be replaced. Typically, the condition of the packings can be accurately gauged by observing the leakage through the vent hole in the bottom cap of the main valve. Negligible leakage usually indicates that the packings are serviceable.

If the main valve does respond consistently to manual operation with a steady stroke of the piston, it may indicate the external controls need adjustment or repair.

ROSS VALVE MFG. CO., INC. - P.O. BOX 595, 6 OAKWOOD AVE, TROY, NY 12181 - TEL 518-274-0961 - FAX 518-274-0210

MODEL 42AFCV AUTOMATIC FLOW CONTROL VALVE
OPERATION & MAINTENANCE MANUAL
TROUBLESHOOTING

When valve does not close:

Cause A: Closing Needle Valve fouled.
Correction: With closing Solenoid Valve energized, flush Needle Valve, remove Needle Valve cap and locking device. Using a screwdriver, turn needle *clockwise* ½ turn, then *counter-clockwise* 2 full turns. Restore needle to its original position by turning *clockwise* 1-1/2 turns. This correction should be made with water passing through the valve.

Cause B: Inlet isolation valve closed (½" Ball Valve).
Correction: Open valve.

Cause C: Strainer fouled.
Correction: Dismantle strainer and replace screen.

Cause D: Solenoid Valve opening seat leaking.
Correction:
A. Close opening Needle Valve until valve moves.
B. Close ½" Ball Valve in opening section of valve control piping.
C. Inspect Solenoid Valve :
1. Check valve coil.
2. Disassemble and inspect valve seats.

Cause E: Internal leakage by upper main cup leather.
Correction: Disassemble and repack valve.

Cause F: Foreign material lodged under or on seat of main valve.
Correction: Dismantle main valve and remove material.

Cause G: Leaking Indicator Stuffing Box.
Correction: Tighten packing nut or replace packing and rod.

When valve does not open:

Cause A: Opening Needle Valve closed.
Correction: Open Needle Valve to desired working speed.

Cause B: Opening Isolation Valve closed.
Correction: Open ½" Ball Valve.

Cause C: Solenoid Valve failed.
Correction:
A. Check valve coil.
B. Disassemble and inspect valve.

Cause D: Internal leakage by lower main cup leather.
Correction: Disassemble and repack valve.

ROSS GLOBE VALVE

INSPECTION - SERVICE RECORD

VALVE LOCATION/I.D. _____

SIZE _____ MODEL _____ SERIAL NO. _____

VALVE - OPEN ~ CLOSED ~ INDICATOR ROD EXPOSED ___ INCHES ABOVE STUFFING BOX CAP

MAIN VALVE OPERATED MANUALLY YES ~ . . . NO ~

OPERATING PRESSURES - INLET (SUPPLY)_____ OUTLET (DOWNSTREAM) _____

EXTERNAL LEAKS	NONE	SLIGHT	MAJOR
INDICATOR STUFFING BOX	~	~	~
BOTTOM CAP VENT HOLE	~	~	~
DIAPHRAGM VENT-HYDRAULIC PILOT	~	~	~
SOLENOID PILOT EXHAUST PORT	~	~	~

OTHER CONDITIONS _____

STRAINER FLUSHED . . . . . YES ~ . . . . . NO ~

. . . . . SCREEN EXAMINED . YES ~ . . . . . NO ~ . . . . . CLEANED ONLY ~

. . . . . SCREEN CONDITION GOOD ~ . . . . . POOR ~ . . . . . INSTALLED NEW SCREEN ~

NEEDLE VALVE(S) (EXAMINE NEEDLE & SEAT FOR WEAR)

. . . . . OPENING CONTROL . CLEANED ~ . . . . . ADJUSTED ~ . . . . SET POINT _____

. . . . . CLOSING CONTROL . . . . . CLEANED ~ . . . . . ADJUSTED ~ . . . . SET POINT _____

HYDRAULIC PILOT ADJUSTED . . . . . NO ~ . . . . . YES ~ . . . . _____ TURNS

. . . . . CLOCKWISE ~ . . COUNTER-CLOCKWISE ~ . . . . SET POINT _____

. . . . . REBUILT . . . . AT FACTORY DATE _____ . IN FIELD DATE _____

. . . . . NEW HYDRAULIC PILOT REPLACEMENT . . . . . DATE _____

SOLENOID - COIL TESTED . . . . . NO ~ . . . . . YES ~ . . . . . REPLACED ~

. . . . . SEATS - INSPECT & CLEAN _____

. . . . . REBUILT . . . . AT FACTORY DATE _____ . IN FIELD DATE _____

. . . . . NEW SOLENOID REPLACEMENT . . . . . DATE _____

MAIN VALVE INTERNAL CONDITION -

. . . . . MAIN CYLINDER (14) _____

. . . . . BOTTOM CAP CYLINDER (23) _____

. . . . . SEAT DISC/SUPPORT/RING _____

. . . . . BODY TAP CONNECTIONS _____

. . . . . MAIN VALVE REPACKED _____ DATE _____

ACTION RECOMMENDED _____

_____

REPORT BY _____ DATE _____

ROSS VALVE MFG. CO., INC., TROY, NY 12180 @ PHONE 518/274-0961 @ FAX 518/274-0210

REPAIR INSTRUCTIONS - GLOBE BODY VALVES

When entering a valve pit to inspect a valve, all regulations regarding Confined Space Entry should be observed.

So some recommendation may guide the operator, we suggest periodic inspections in order to check for proper valve operating pressures as well as any visual leaks. Should the operator encounter any external leakage or find any abnormalities in the operating pressures which appear to be caused by the valve, the valve should be scheduled for service.

A reliable indication of internal packing condition can be obtained by observing any leakage from the vent hole in the center of the bottom cap. When leakage becomes significant, packing replacement should be made. As a general statement, the overall average life of a set of packings is 7 to 10 years. This may vary considerably because of specific operating conditions.

After observing pressures and inspecting for external leakage, the flush cock on the strainer should be opened momentarily to remove accumulated material. The needle valve cap should be removed and the needle closed 1/2 turn, opened 1 full turn, and then closed 1/2 turn to its original position.

STEPS FOR INTERNAL REPAIRS:

All repairs and parts replacement may be made without removing the valve from the line. Internal repairs are made by removing the top cap of the valve. All internals are accessible through the top.

Shut inlet main line isolation valve, then shut outlet main line isolation valve. Open gauge cocks to de-pressurize the valve.

Remove indicator rod by inserting a nail through hole and unscrewing. Do not pull through stuffing box. Then remove top cap bolts and top cap. Be careful not to bend indicator rod.

In 8" and larger valves, withdraw piston by either removing two 3/8" bronze bolts in top stem nut and installing lifting device (horseshoe shaped piece of steel with two holes) over nut; or by looping a cable or nylon rope around these bolts. **Be sure lifting device is secure before removing piston.** In 4" and 6" valves, a threaded eyebolt should be screwed in the indicator rod hole.

Inspect both main bushing (Part No. 14) and bottom cylinder (Part No. 23) for mineral build-up or scoring. Smooth with emery or replace if necessary. Inspect seat ring for damage. Repair as necessary.

Secure main piston on a pipe threading stand (or lay piston on floor on rags or a similar cushioning material). Loosen top stem nut (Part No. 15) which holds the cup plate assembly. Remove cup plate bolts, nuts and copper washers on 8" cups and larger. Replace the leather cups (one faces up, one faces down). Re-install with new packings in the reverse order as outlined above.

Caution - The clamping bolts should be tight so that the packings are held securely and no leak occurs. Do not over-tighten so that the packing is deformed, however. All cup packings are impregnated with lubricants so that no external lubrication is necessary or desirable.

To replace the seat packing, it is necessary to determine if the valve is constructed with a "sliding" or a "flat" type seat. The sliding type seat has the seal or seat packing clamped in the valve body underneath the iron wall that separates the inlet and outlet valve chambers. It consists of a flanged packing held in place by a split bronze seat support ring. The lip of the packing "looks down" and care should be taken that the packing is concentric with the valve bore before the clamping bolts are tightened. In the "flat" type seat, the seat packing is located on the valve piston, where it is clamped between two plates and held by a stem nut (Part No. 7). Removal of this nut allows the plates to be separated and the packing replaced.

Replacement of the bottom cups (Part No. 5) is accomplished by removing the bottom stem lock nut (Part No. 6) and the flanged bottom guide nut (Part No. 3). Install the seals with the lip of both cups "looking up". Again, when re-assembling, be careful not to over tighten so that the cups are deformed.

Re-insert the piston being careful not to crimp the lower main cup when it enters the main bushing. The piston should move freely and drop of its own weight.

Replace the top cap and control piping (being sure to thread in the indicator rod), then restore water pressure. Be sure to open the discharge isolation valve first so that high inlet pressure is not trapped against a closed outlet valve.

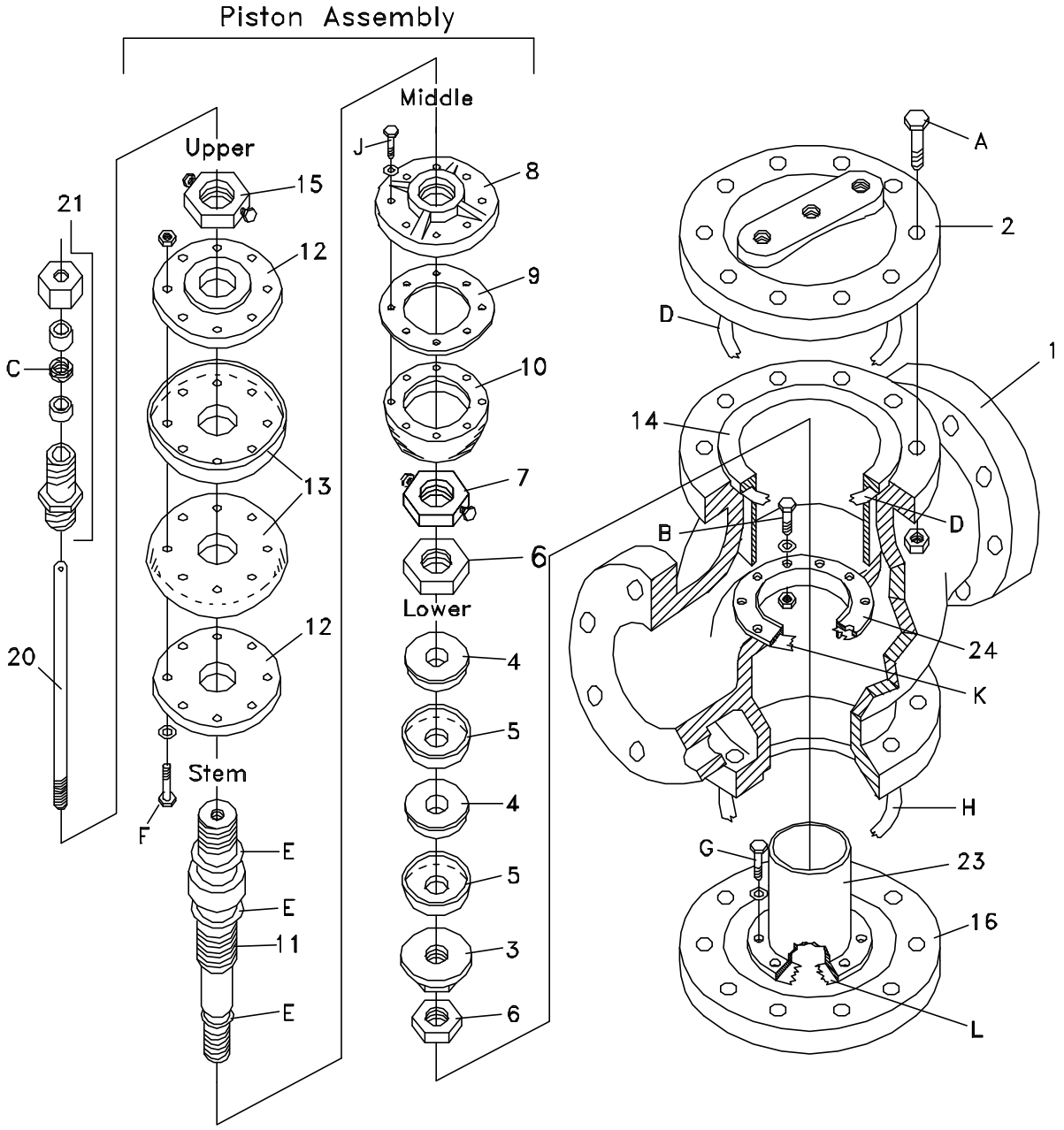
All replaceable packings and gaskets are stock items and may be ordered as a repair kit for valve serial number _____. They are available for regular UPS delivery or next day service.

All spare parts are available from: Ross Valve Mfg. Co., Inc., 6 Oakwood Avenue, Troy, New York, 12180
Phone: (518) 274-0961, Fax: (518) 274-0210

ROSS VALVE Mfg. Co., Inc.

6 OAKWOOD AVENUE – P.O. BOX 595 – TROY, NEW YORK, 12181 – TEL. (518) 274 0961

STANDARD VALVE ASSEMBLY – FLAT PARABOLIC STYLE SEAT
PISTON STYLE GLOBE BODY (4"–36")



PART	DESCRIPTION	QUANTITY	MATERIAL
1	SHELL	1	CAST IRON
2	TOP CAP	1	CAST IRON
3	BOTTOM STEM GUIDE NUT	1	BRONZE
4	PISTON CUP FOLLOWERS	1 SET	BRONZE
*5	PISTON CUP PACKING	2	LEATHER
6	BOTTOM STEM LOCK NUT	2	BRONZE
7	STEM NUT W/SET SCREWS	1	BRONZE
8	SET DISC	1	BRONZE/CAST IRON
*9	SEAT PACKING	1	POLYURETHANE
10	SEAT PACKING SUPPORT	1	BRONZE
11	STEM	1	BRONZE
12	MAIN CUP PLATES	1 SET	BRONZE/CAST IRON
*13	MAIN CUP PACKING	2	LEATHER
14	MAIN BUSHING	1	BRONZE
15	UPPER STEM NUT W/SET SCREWS	1	BRONZE
16	BOTTOM CAP	1	CAST IRON
*20	INDICATOR ROD	1	BRONZE

PART	DESCRIPTION	QUANTITY	MATERIAL
21	INDICATOR STUFFING BOX	1	BRONZE/TEFLON
23	BOTTOM CAP CYLINDER	1	BRONZE
24	SEAT RING	1	BRONZE
A	BOLT & NUT – TOP & BOTTOM CAP	VARY	STEEL
B	BOLT, NUT & WASHER – SEAT RING	VARY	BRONZE
*C	PACKING – INDICATOR STUFFING BOX	1 SET	NYLON
*D	GASKET – TOP CAP & MAIN BUSHING	2	COMPOSITON
*E	GASKET – STEM	3	COMPOSITION
■F	BOLT, NUT & WASHER – CUP PLATES	VARY	BRONZE
G	BOLT & WASHER – BOTTOM CAP CYLINDER	VARY	BRONZE
H	GASKET – BOTTOM CAP	1	COMPOSITION
■J	BOLT, NUT & WASHER – SEAT DISC	VARY	BRONZE
K	GASKET – SEAT RING	1	COMPOSITION
L	GASKET – BOTTOM CAP CYLINDER	1	COMPOSITION

* INDICATES ITEMS INCLUDED IN A STANDARD VALVE REPAIR KIT, INCLUDING:
■WASHERS ONLY
■STRAINER CREEN ONLY – STRAINER NOT SHOWN

Fpar1