# Installation & Maintenance Instructions

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

BULLETINS
8210
8211

Form No.V5983R1

## 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.

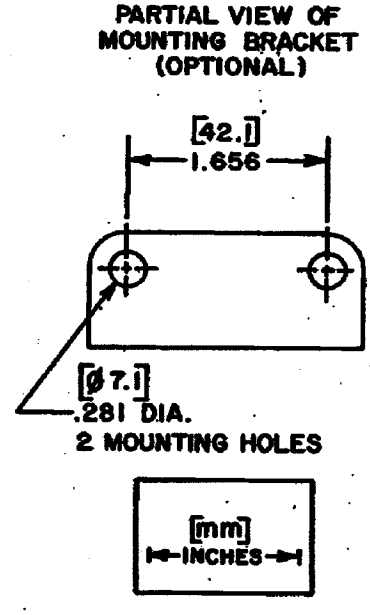
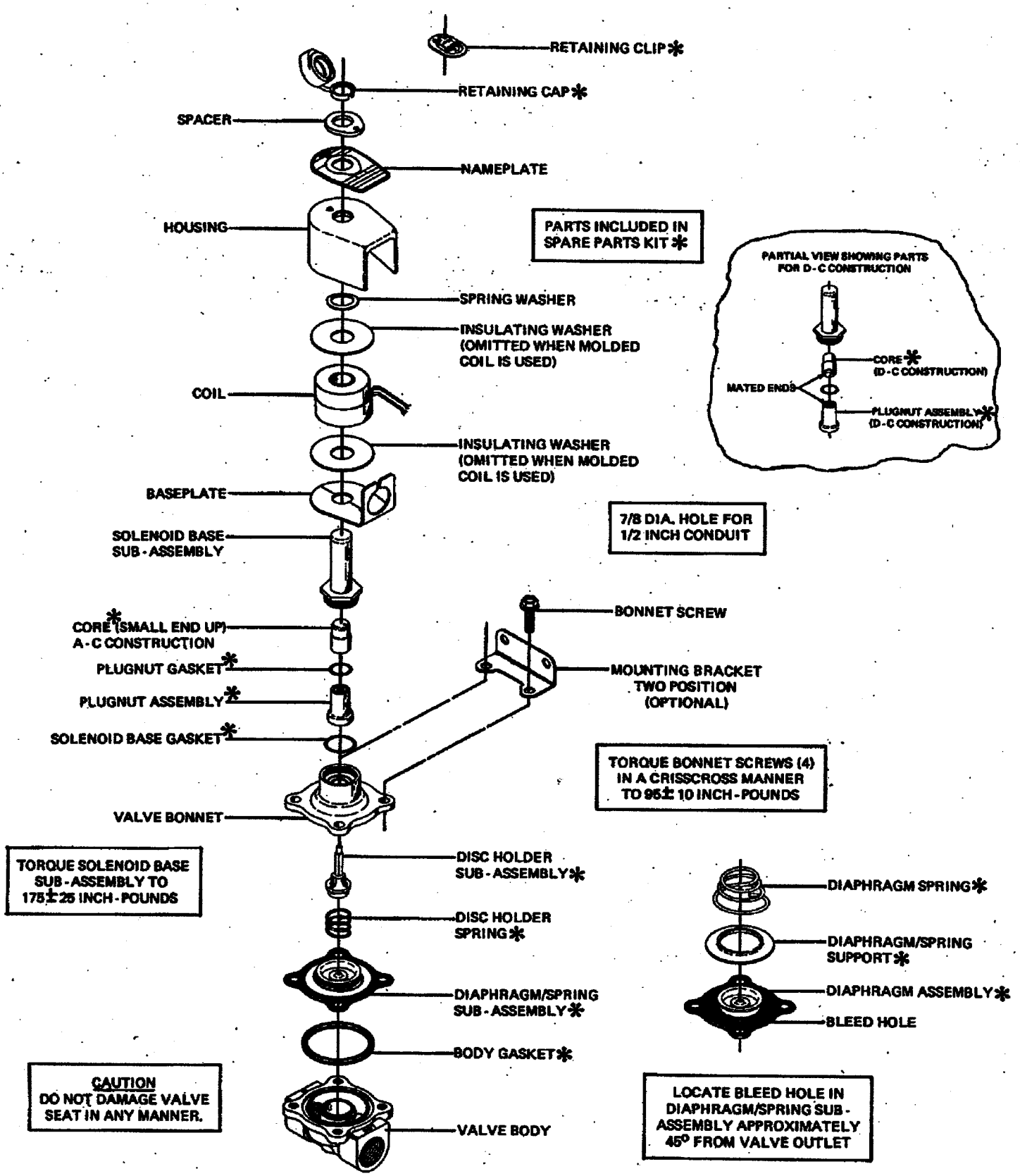



**Figure 1.** Dimensions for Mounting Bracket (Optional Feature)




**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.**



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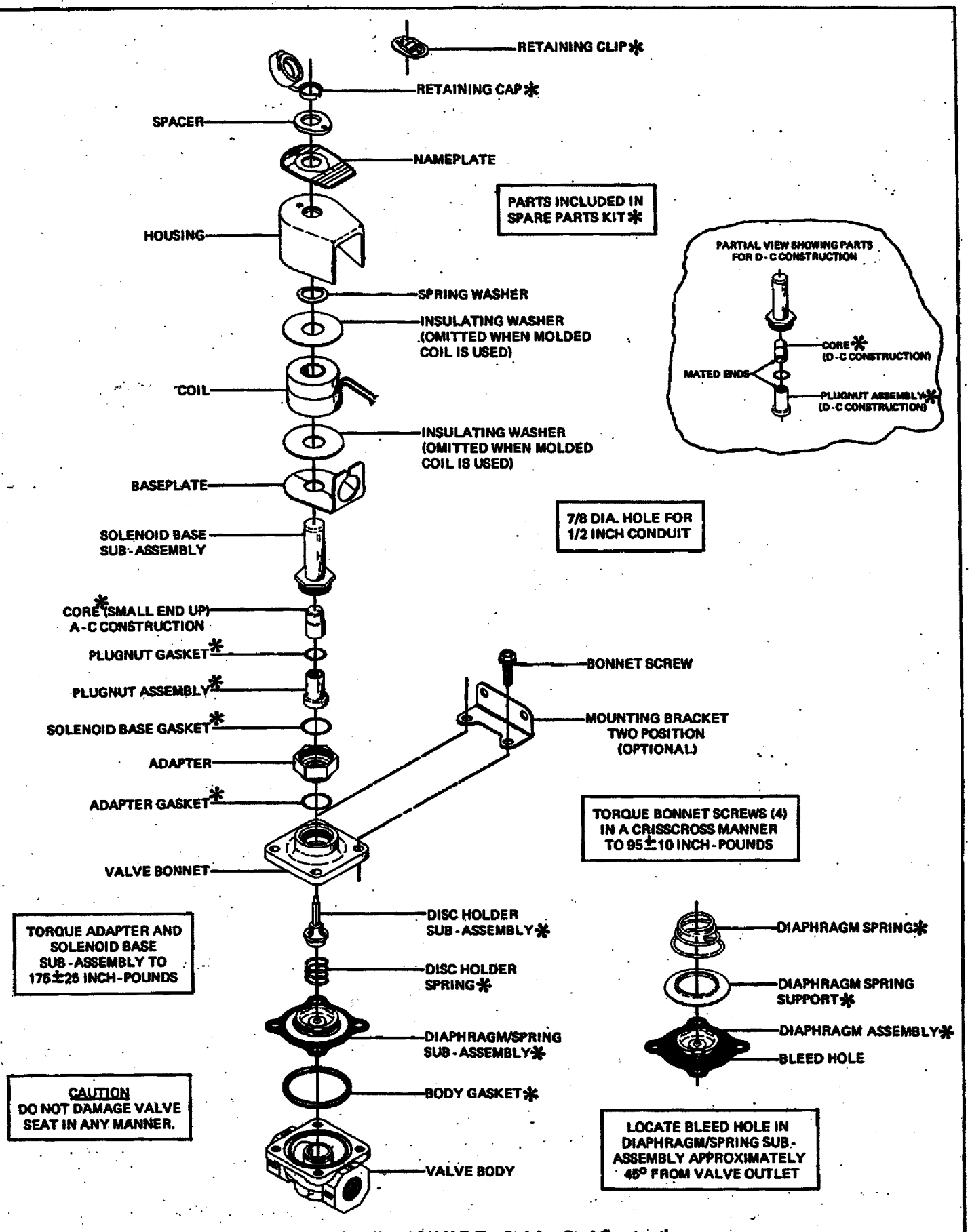


**Bulletin 8210 - 1/2 and 3/4 N.P.T. - Stainless Steel Construction**
**General Purpose Solenoid Enclosure Shown.**
**For Explosion-Proof/Watertight Solenoid Enclosure used on Bulletin 8211, See Form No. V-5709.**

**Figure 3.**



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