

# Installation & Maintenance Instructions

2 - WAY INTERNAL PILOT - OPERATED SOLENOID VALVES  
NORMALLY CLOSED OPERATION  
2" OR 2 1/2" NPT

BULLETIN  
8210  
8211

## IMPORTANT

**▲ WARNING** To reduce the risk of death, serious injury, or property damage:

- Personnel installing, maintaining, or operating this equipment must be **qualified** and **follow these instructions**. See separate solenoid installation and maintenance instructions for information on: **Wiring, Solenoid Temperature, Cause of Improper Operation, Coil or Solenoid Replacement**. Keep this document.
- Before installing or maintaining the valve, turn off electrical power, depressurize valve, extinguish all open flames and avoid any type of sparking or ignition. Vent hazardous or combustible fluid to a safe area.

**▲ AVERTISSEMENT** Pour réduire les risques de décès, de blessures graves ou de dommages matériels:

- Le personnel qui installe, entretient ou exploite cet équipement doit être qualifié et suivre les instructions qui s'y rapportent. Consultez les instructions d'installation et de maintenance de la bobine pour avoir plus d'informations sur son câblage, sa température, les causes d'un mauvais fonctionnement ou son remplacement. Gardez ce document.
- Avant d'installer ou d'intervenir sur la vanne, couper le courant, dépressuriser la vanne, éteindre toutes les flammes nues et éviter tout type d'étincelle ou d'ignition. Évacuer les liquides dangereux ou combustibles vers un endroit sûr.

## DESCRIPTION

Series 8210 valves are 2-way normally closed, internal pilot operated solenoid valves designed for general service. These valves are made of rugged forged brass or die cast stainless steel and have an integral adjustable bleed device for controlling the opening and closing speed of the piston. Series 8210 valves are supplied with general purpose, or explosionproof/watertight solenoids.

Series 8211 valves are the same as Series 8210 except that they are provided with a metal explosionproof/watertight solenoid enclosure.

**NOTICE: Standard brass valves are not certified as lead-free under the Safe Drinking Water Act SDWA 1417 and are not intended for use on drinking water systems. They are intended for control of water in industrial applications. Consult ASCO for valves rated for use in potable water applications.**

**NOTICE: Constructions with an "LF" suffix meet the lead free-brass requirement of SDWA 1417 having 0.25% or less lead (Pb) in brass. Due to the variety of operating conditions and applications of these products, the user, through analysis and testing, is solely responsible for making the final selection of the products and assuring that all performance, safety, and warning requirements of the applications are met.**

## OPERATION

Normally Closed: Valve is closed when solenoid is de-energized; open when energized.

**IMPORTANT: Minimum operating pressure differential required is 5 psi.**

### Adjustable Bleed Device

Series 8210 valves have an integral adjustable bleed device for controlling the opening and closing speed of the piston. When valve leaves the factory, the bleed adjusting screw (metering pin) has been preset to provide quick shockless closing for most applications. If faster or slower closing is required, adjust the screw (metering pin) as follow:

- Turn metering pin in (clockwise) as far as possible without over tightening. Back out tightening. Back out metering pin (counterclockwise) two complete turns. From this point, adjustments may be made to suit system.
- Turn metering pin clockwise for slower closing.
- Turn metering pin counterclockwise for faster closing.

### Manual Operation (Optional Feature)

Valve with suffix **MO** in the catalog number are provided with a manual operator which allows manual operation when desired or during an electrical power outage.

To engage manual operator, rotate stem fully clockwise (approximately 180°).

Valve will now be in the same position as when the solenoid is energized. To disengage manual operator, rotate stem fully counterclockwise (approximately 180°) before operating electrically.

**▲ CAUTION** For valve to operate electrically, manual operator stem/lever must be fully rotated counterclockwise.

**▲ ATTENTION** Afin que la vanne fonctionne électriquement, la commande manuelle doit être complètement tournée dans le sens inverse des aiguilles d'une montre.

## INSTALLATION

### Product verification

Check nameplate for correct catalog number, pressure, voltage, frequency, and service. Never apply incompatible fluids or exceed pressure rating of the valve – contact ASCO or your supplier for more information about this valve or other valve options if this valve is not suitable for your application. Installation and valve maintenance to be performed by qualified personnel.

### Future Service Considerations

Provision should be made for performing seat leakage, external leakage, and operational tests on the valve with a nonhazardous, noncombustible fluid after disassembly and reassembly.

### Temperature Limitations

For maximum valve ambient and fluid temperatures, refer to chart below or as limited by solenoid approvals. See solenoid installation and maintenance instructions. Check catalog number prefix and watt rating on nameplate.

Watt Rating AC/DC	Catalog Number Prefix	Solenoid Class	Maximum Ambient Temp.	Maximum Fluid Temp.
6 AC	None or DF	F	122 °F (50 °C)	180 °F (82 °C)
	HT	H	140 °F (60 °C)	180 °F (82 °C)
6.1 AC	None, KF, SF or SC	F	125 °F (52 °C)	180 °F (82 °C)
	HT, KH, ST or SU	H	140 °F (60 °C)	180 °F (82 °C)
11.2 DC	None or HT	F or H	77 °F (25 °C)	150 °F (65 °C)
11.6 DC	None, HT, KF, KH, SC, SF or ST	F or H	104 °F (40 °C)	150 °F (65 °C)

### Positioning

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertically and upright to reduce the possibility of foreign matters accumulating in the solenoid base sub-assembly area.

### Piping

Connect piping or tubing to valve according to markings on valve body. Apply pipe compound sparingly to male pipe threads only. If applied to valve threads, the compound may enter the valve and cause operational difficulty. Avoid pipe strain and valve damage by properly supporting and aligning piping. When tightening the pipe, do not use valve or solenoid as a lever. Locate wrenches applied to valve body or piping as close as possible to connection point. To avoid damage to the valve body, DO NOT OVERTIGHTEN PIPE CONNECTIONS. If PTFE tape, paste, spray, or similar lubricant is used, use extra care when tightening due to reduced friction.

### Strainer or filter requirement

**▲ CAUTION** To protect the solenoid valve, install a strainer or filter, suitable for the service involved, in the inlet side as close to the valve as possible. Clean periodically depending on service conditions. See ASCO Series 8600 and 8601 for strainers.

**⚠ ATTENTION** Afin de protéger l'électrovanne ou l'actionneur, installer une crépine ou un filtre adapté le plus proche possible en amont de l'électrovanne ou de l'actionneur. Nettoyer périodiquement le filtre en fonction des conditions d'utilisation. Se référer aux séries 8600 et 8601 pour les crépines.

#### Wiring

**⚠ WARNING** To reduce the risk of electrocution, fire, or property damage, wiring must comply with Local and National Electrical Codes.

**⚠ AVERTISSEMENT** Pour réduire les risques d'électrocution, d'incendie ou de dommages matériels, le câblage doit être conforme aux codes électriques locaux et nationaux.

Housing is provided with 7/8 diameter hole to accommodate 1/2 inch conduit. The general purpose solenoid enclosure may be rotated to facilitate wiring by removing the retaining clip.

On some solenoids, a grounding wire (green or green with yellow stripes) is provided.

**⚠ WARNING** The solenoid must be grounded with grounding wire (if included) or rigid metallic conduit - do not rely on pipe as ground.

**⚠ AVERTISSEMENT** La bobine doit être mise à la terre avec un fil de terre (le cas échéant) ou via un conduit métallique rigide – n'utilisez pas la tuyauterie comme masse.

#### MAINTENANCE

**⚠ WARNING** To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize valve, and vent fluid to a safe area before servicing the valve.

**⚠ AVERTISSEMENT** Pour éviter tous danger de mort, de blessure grave ou de dommage matériel, avant d'intervenir sur la vanne, couper le courant, purger la vanne dans une zone sécurisée.

NOTE: It is not necessary to remove the valve from the pipeline for repairs.

#### Cleaning

All solenoid valves should be cleaned periodically. The time between cleanings will vary depending on the medium 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. In the extreme case, faulty valve operation will occur and the valve may fail to open or close. Clean valve strainer or filter when cleaning the valve.

#### Preventive Maintenance

- Perform internal leakage tests at least annually in accordance with NFPA 86 or original equipment manufacturer recommendations.
- Keep medium flowing through the valve as free from dirt and foreign material as possible.
- Periodic exercise of the valve should be considered if ambient or fluid conditions are such that corrosion, elastomer degradation, fluid contamination build up, or other conditions that could impede solenoid valve shifting are possible. The actual frequency of exercise necessary will depend on specific operating conditions. A successful operating history is the best indication of a proper interval between exercise cycles.
- Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. If parts are worn or damaged, install a complete rebuild kit.

#### Causes of Improper Operation

- **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
- **Excessive Leakage:** Disassemble valve and clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

#### Valve Disassembly (Refer to Figure 3 on page 4)

1. Disassemble valve in an orderly fashion. Use exploded view for identification and placement of parts.
2. Remove solenoid, see separate instructions.
3. If the valve being serviced has a manual operator, *suffix MO* in the catalog number, refer to section on *Manual Operator Disassembly*.

4. Unscrew solenoid base sub-assembly and remove solenoid base gasket, core assembly with core spring.
5. For normal maintenance, it is not necessary to remove the valve seat. However, if valve seat removal is required, use a 7/16" socket wrench.
6. Dislodge retainer from metering pin passageway and remove metering pin with gasket. Then remove metering pin gasket from metering pin.
7. Remove bonnet screws, valve bonnet, piston spring, piston assembly, support, lip seal, body gasket, and body passage gasket.
8. Remove aspirator tube and disc with disc gasket from piston.
9. All parts are now accessible to clean or replace. If parts are worn or damaged, install a complete ASCO Rebuild kit.

#### Valve Reassembly

1. Reassemble valve using exploded views for identification and placement of parts.
2. Lubricate the solenoid base gasket, body gasket, body passage gasket, metering pin gasket, and the surface of the piston which contacts the lip seal with MOLYKOTE® 200 Fluid lubricant.
3. Lubricate disc and disc gasket with MOLYKOTE® 111 Compound lubricant or an equivalent high-grade silicone grease.
4. Position body gasket, body passage gasket, and support in valve body.
5. Install aspirator tube and disc with disc gasket in piston.
6. Position lip seal, flanged end out, onto piston assembly. Install piston assembly with lip seal into support in valve body cavity.
7. Replace piston spring, valve bonnet, and bonnet screws. Torque bonnet screws in a crisscross manner to 144 ± 15 in-lbs [16,3 ± 1,7 Nm].
8. Replace valve seat with a small amount of thread compound on the seat threads. Torque valve seat to 65 ± 15 in-lbs [7,3 ± 1,7 Nm].
9. Install metering pin with metering pin gasket into valve body. Replace retainer and refer to *Adjustable Bleed Device* section for metering pin adjustment.
10. If the valve being service has a manual operator, refer to *Manual Operator Reassembly* section.
11. Replace solenoid base gasket, core assembly, core spring, and solenoid base sub-assembly. Torque solenoid base sub-assembly to 175 ± 25 in-lbs [19,8 ± 2,8].
12. Install solenoid, see separate instructions and make electrical hookup.

**⚠ WARNING** To prevent the possibility of death, serious injury or property damage, check valve for proper operation before returning to service. Also perform internal seat and external leakage tests with a nonhazardous, noncombustible fluid.

**⚠ AVERTISSEMENT** Afin d'éviter le risque de mort, de blessure ou de dommage matériel, vérifier le bon fonctionnement de l'électrovanne avant de la remettre en service. Contrôler aussi les fuites externe et interne avec un fluide non dangereux.

13. Restore line pressure and electrical power supply to valve.
14. After maintenance is completed, operate the valve a few times to be sure of proper operation. A metallic *click* signifies the solenoid is operating.

#### Manual Operator Disassembly

1. Refer to *Valve Disassembly* section and follow step 1 and 2.
2. For AC construction refer to Figure 1 on page 3; DC construction Figure 2 on page 3.
3. Unscrew solenoid base sub-assembly from manual operator body.
4. Unscrew manual operator body and remove this assembly intact. Remove body gasket from main valve body.
5. Before removing the stem retainer from the manual operator body, note the location of captive spacing washer on the stem/lever sub-assembly. The captive spacing washer will be on the *inside* of the fork on the stem retainer for AC construction and on the *outside* for DC construction. Location of this captive spacing washer is important for reassembly.
6. Remove stem/lever sub-assembly with stem gasket from manual operator body. Remove solenoid base gasket, core assembly with core spring.
7. Refer to *Valve Disassembly* sections, step 5 for further disassembly.

#### Manual Operator Reassembly

Refer to steps 1 through 9 of *Valve Reassembly* then proceed as follows:

1. Position stem gasket on stem/lever sub-assembly.

2. Preassemble manual operator parts as follows: Position core assembly with core spring into manual operator body from the bottom. Install stem/lever sub-assembly into manual operator body. Install stem retainer and be sure the captive spacing washer on the stem/level sub-assembly is located on the **inside** of the fork on the stem retainer for AC construction and on the **outside** of the fork on the stem retainer for DC construction.
3. Replace body gasket in valve body.
4. Screw manual operator body intact into valve body. Torque manual operator body to  $175 \pm 25$  in-lbs [ $19,8 \pm 2,8$  Nm].

## ORDERING INFORMATION FOR ASCO REBUILD KITS

Parts marked with an asterisk (\*) in the exploded view are supplied in Rebuild Kits.

- \* When Ordering Rebuild Kits for ASCO valves, order the Rebuild Kit number stamped on the valve nameplate.
- + If the number of the kit is not visible, order by indicating the number of kits required, and the Catalog Number and Serial Number of the valve(s) for which they are intended.

## Torque Chart

Part Name	Torque Value in Inch-Pounds	Torque Value in Newton-Meters
Solenoid Base Sub-Assembly Manual Operator Body	$175 \pm 25$	$19,8 \pm 2,8$
Valve Seat	$65 \pm 15$	$7,3 \pm 1,7$

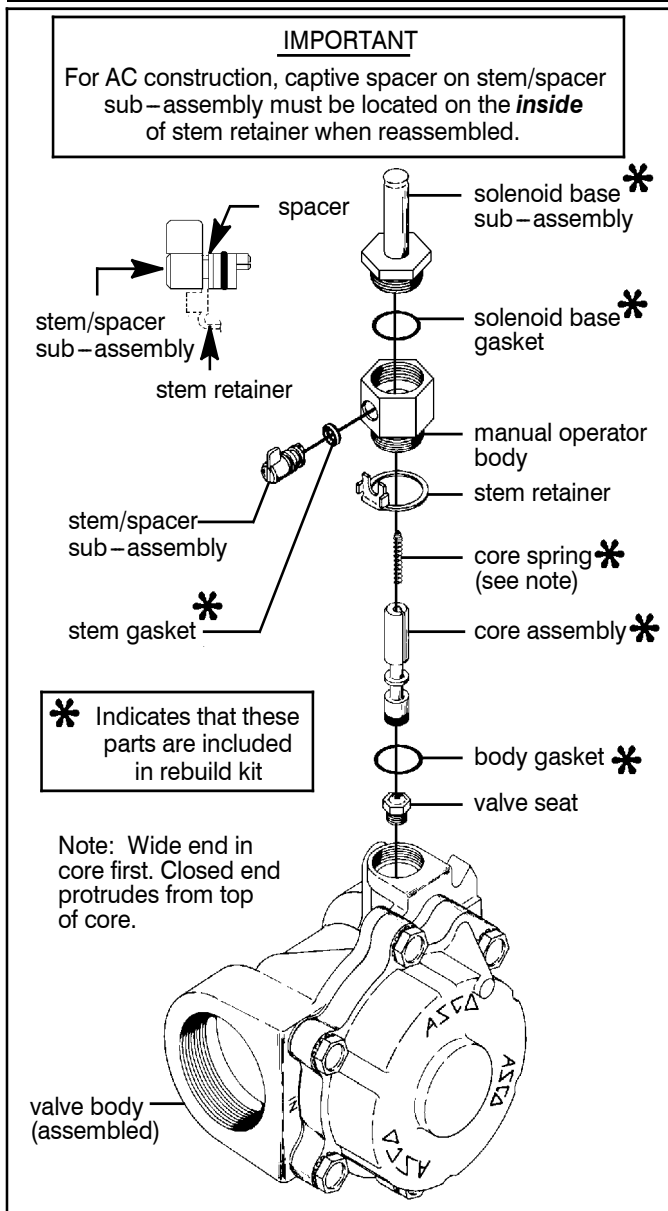


Figure 1. Manual Operator Assembly, AC Construction.

NOTE:  
Constructions with "LF" suffix will be identified with "LF" mark on body and bonnet.

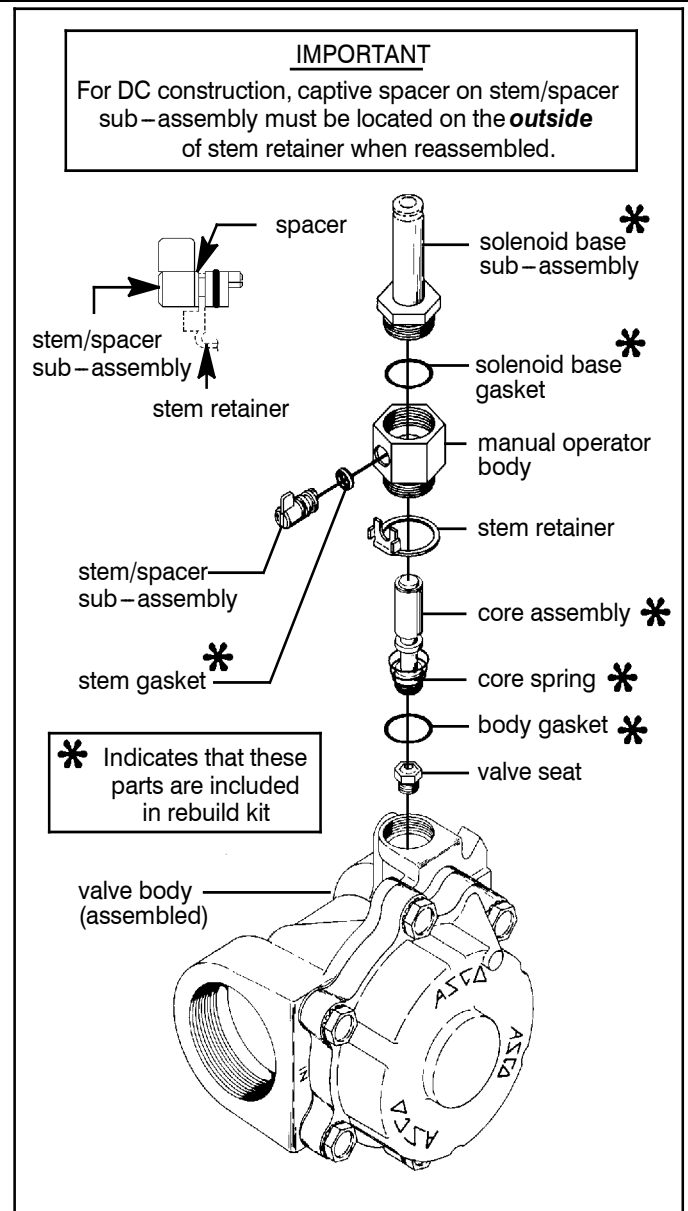


Figure 2. Manual Operator Assembly, DC Construction.

NOTE:  
Constructions with "LF" suffix will be identified with "LF" mark on body and bonnet.

## Torque Chart

Part Name	Torque Value in Inch-Pounds	Torque Value in Newton-Meters
Solenoid Base Sub-Assembly	$175 \pm 25$	$19,8 \pm 2,8$
Bonnet Screws	$144 \pm 15$	$16,3 \pm 1,7$
Valve Seat	$65 \pm 15$	$7,3 \pm 1,7$

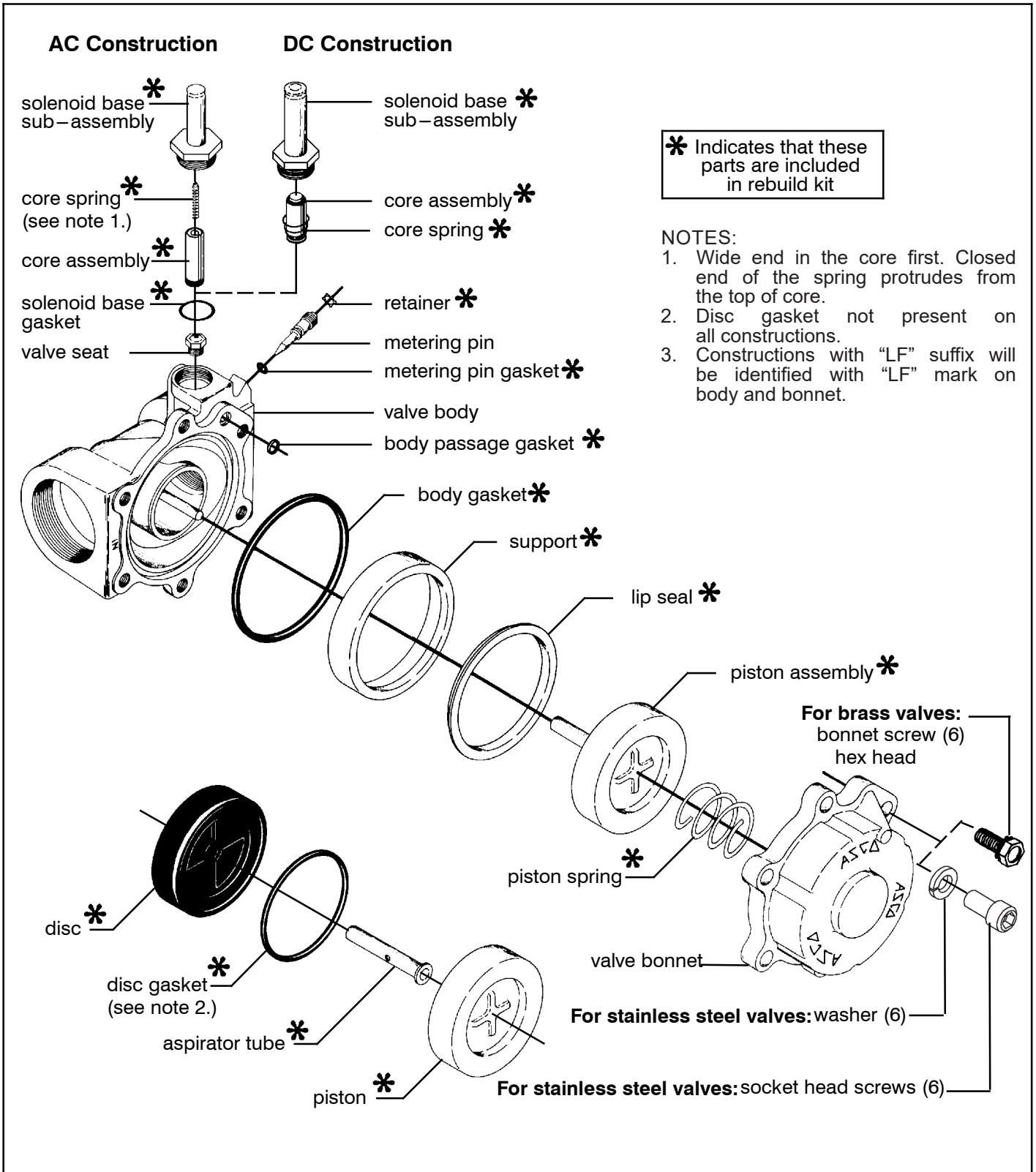


Figure 3. Series 8210 valve without solenoid.