

Installation & Maintenance Instructions

2-WAY INTERNAL PILOT-OPERATED SOLENOID VALVES
NORMALLY CLOSED OPERATION — SOFT CLOSING
1", 1¼", 1½", 2" OR 2½" NPT

SERIES
8221

NOTICE: See separate solenoid installation and maintenance instructions for information on: **Wiring, Solenoid Temperature, Cause of Improper Operation, Coil or Solenoid Replacement.**

DESCRIPTION

Series 8221 valves are 2-way normally closed internal pilot-operated solenoid valves designed for soft closing. Valves are made of forged brass with internal parts of brass or stainless steel and elastomers of Buna N, or ethylene propylene, depending upon service requirements. Valves may be provided with a general purpose, explosionproof or explosionproof/watertight solenoid enclosures.

Notice: Brass valves are not certified as lead-free under the Safe Water Drinking Act SWDA 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.

OPERATION

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

IMPORTANT: Minimum operating pressure differential required is 5 psi. Valve will remain open down to 3psi differential.

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage, frequency, and service. Never apply incompatible fluids or exceed pressure rating of the valve. 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. Check catalog number prefix and suffix on nameplate to determine the maximum temperatures. See example following chart.

Construction	Catalog Number Prefix	Catalog Number Suffix	Maximum Temperature, °F	
			Ambient	Fluid
AC	None	None	125	180
	HT	None	140	180
	None	HW	125	210
	HT	HW	140	210
DC	None, or HT	None	77	150

EXAMPLES:

- For Catalog No. **HT8221G19**, AC construction the maximum ambient temperature is 140°F with a maximum fluid temperature of 180°F.
- For Catalog No. **8221G13HW**, AC construction the maximum ambient temperature is 125°F with a maximum fluid temperature of 210°F.

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 matter accumulating in the solenoid base sub-assembly area.

Piping

Connect piping to valve according to markings on valve body.

CAUTION: Valves with suffix "HW" in the catalog number are equipped with ethylene propylene elastomers which can be attacked by oils and greases. Use on oil-free systems only. Wipe the threads clean of cutting oils.

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 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.

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.

MAINTENANCE

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

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 strainer or filter when cleaning the valve.

Preventive Maintenance

- 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

Note: Refer to Figure 1 for AC construction and 1", 1 1/4" or 1 1/2" NPT (pipe size). Refer to Figure 2 for DC Construction and 2" and 1 1/2" NPT (pipe size)

1. Disassemble valve in an orderly fashion using exploded views for identification and placement of parts.
2. Remove solenoid enclosure. See separate instructions

CAUTION: Do not remove body plug on 2" or 2 1/2" NPT valves. The body plug has been sealed in place at the factory. Removal is not necessary for cleaning or rebuilding.

3. Unscrew solenoid base sub-assembly from valve body. Then remove core assembly with core spring and solenoid base gasket.
4. For normal maintenance (cleaning) it is not necessary to remove the valve seat. However, for valve seat removal use a 7/16" thin wall socket wrench. For DC Construction 2" or 2 1/2" NPT only (Figure 2), remove seat washer.
5. Remove bonnet screws and valve bonnet from valve body then remove the following parts:
 - piston spring
 - lip seal
 - support
 - piston
 - disc
 - aspirator tube †
 - snubber
 - body gasket
 - bleed gasket
 - bleed washer
 - flow control
 - lower bleed washer †
6. All parts are now accessible for cleaning or replacement. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

Valve Reassembly

1. Lubricate the disc and all gaskets with DOW CORNING® 111 Compound lubricant or an equivalent high-grade silicone fluid.
2. On 2" and 2 1/2" NPT valve constructions, install lower bleed washer (small diameter) into valve body. Then position the flow control into valve body with concave end outward; facing the valve bonnet. Position bleed washer and gasket over the flow control.

3. Reassemble aspirator tube (2" or 2 1/2" NPT construction only), snubber, disc and piston.
4. Position lip seal, flanged end up, onto piston. Position body gasket and support in valve body cavity. Install piston assembly with lip seal into support in valve body cavity.
5. Replace piston spring, valve bonnet and bonnet screws. Torque bonnet screws in a crisscross manner to 144 ± 15 in-lbs [$16,3 \pm 1,7$ Nm].
6. If removed, replace seat washer (used only with 2" or 2 1/2" NPT, DC valve constructions) and valve seat. Use a small amount of thread sealing on male threads. Torque valve seat to 65 ± 15 in-lbs [$7,3 \pm 1,7$ Nm].
7. Replace solenoid base gasket, core assembly, core spring, and solenoid base sub-assembly.

Note: For AC construction (Figure 1), position wide end of core spring in core first, closed (tapered) end protrudes from top of core.

8. Torque solenoid base sub-assembly to 175 ± 25 in-lbs [$19,8 \pm 2,8$ Nm].
9. Install solenoid, see separate solenoid instructions. Then make electrical hookup to solenoid.

⚠ 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 non-hazardous, noncombustible fluid.

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

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 Inch-Pounds	Torque Value Newton-Meters
Solenoid base sub-assembly	175 ± 25	19,8 ± 2,8
Bonnet screw	144 ± 15	16,3 ± 1,7
Valve seat	65 ± 15	7,3 ± 1,7

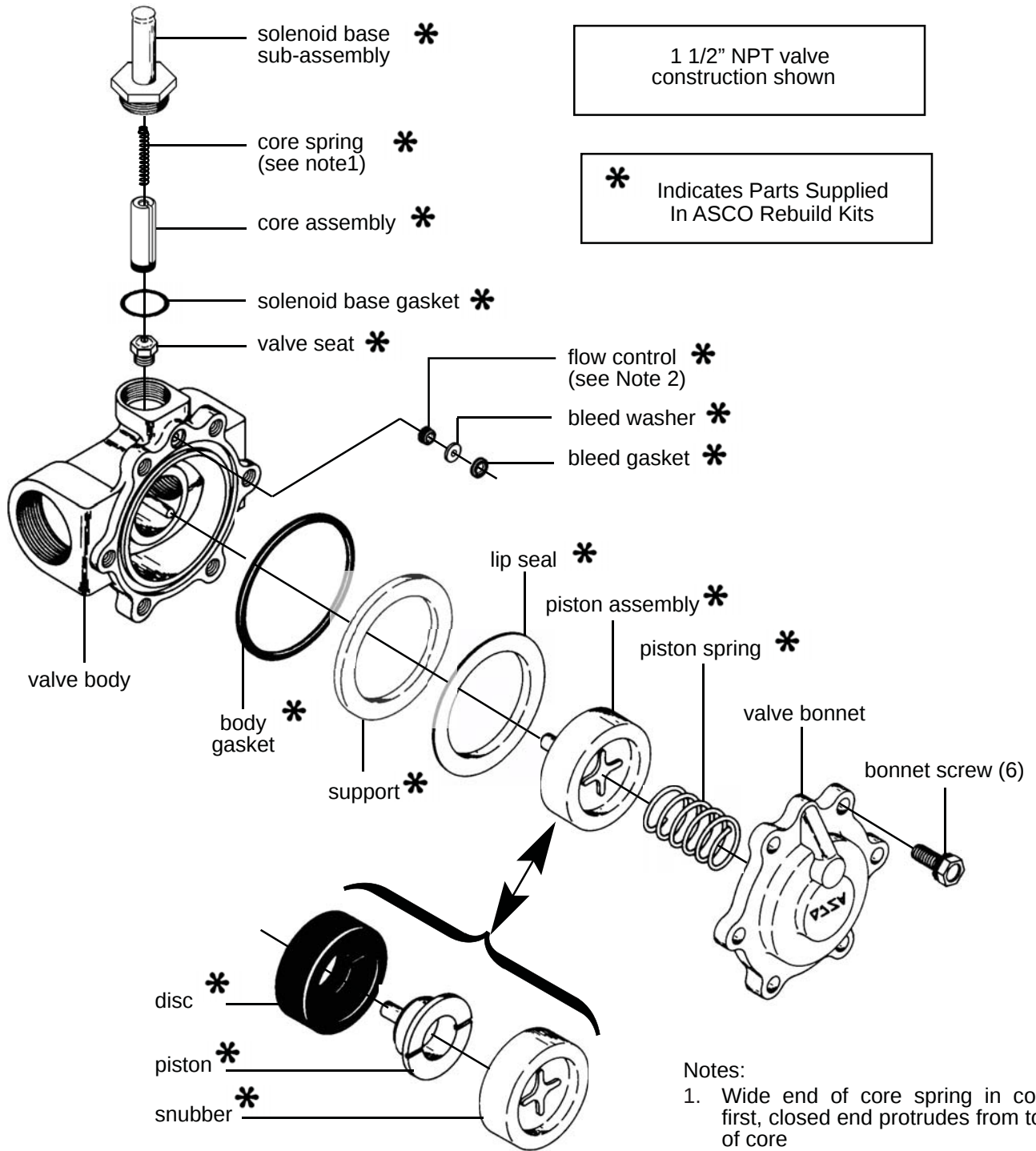


Figure 1. Series 8221 1", 1 1/4" or 1 1/2" NPT AC construction

Torque Chart

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Bonnet screw	144 ± 15	16,3 ± 1,7
Valve seat	65 ± 15	7,3 ± 1,7

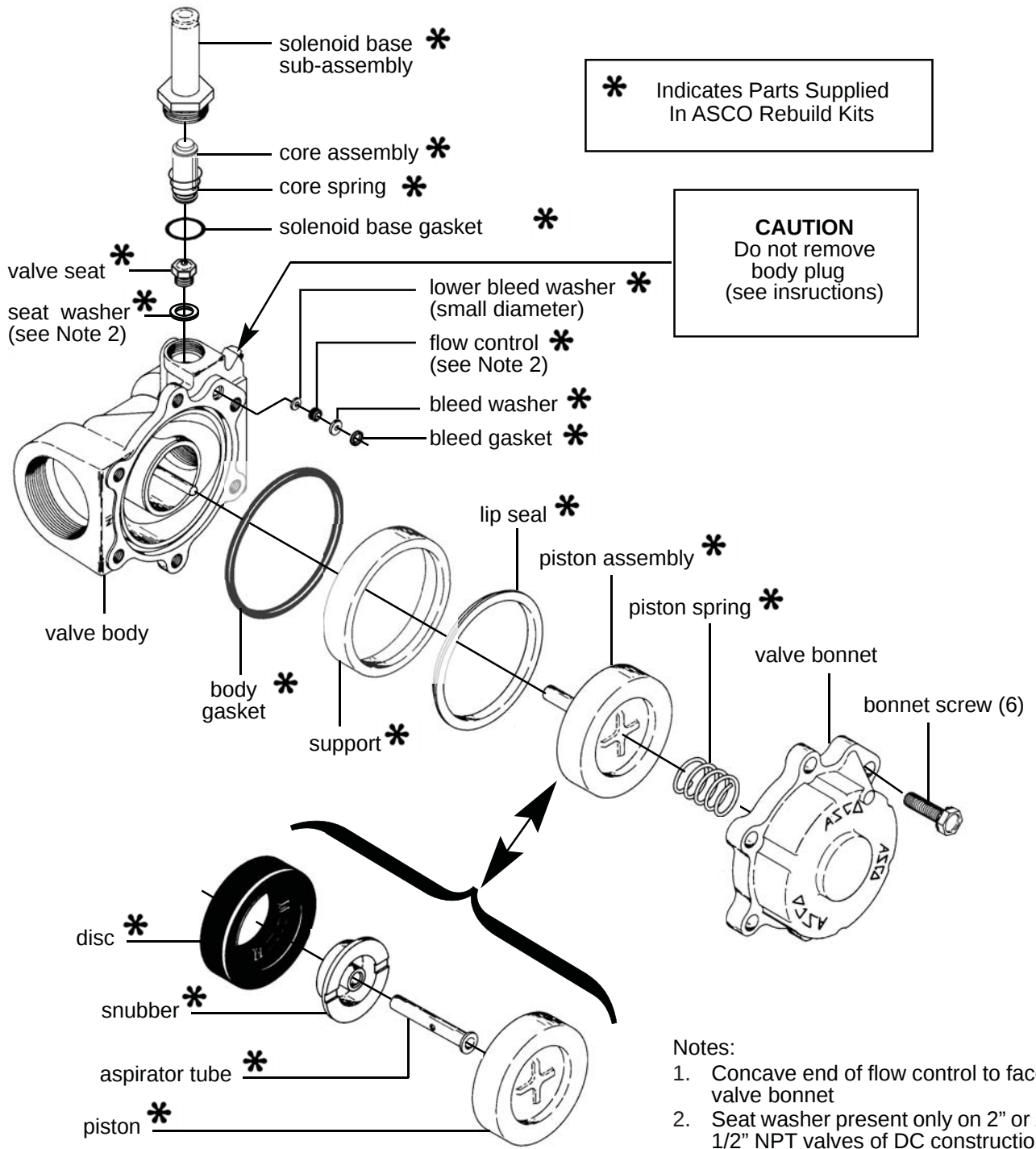


Figure 2. Series 8221, 2" or 2 1/2" NPT DC construction