

Installation & Maintenance Instructions

2-WAY INTERNAL PILOT-OPERATED SOLENOID VALVES
NORMALLY CLOSED OPERATION – 3/4", 1", 1 1/4", 1 1/2" OR 2" NPT
FUEL GAS SERVICE

SERIES

8214

I&M No.V6766R6—Sec. 1
(Section 1 of 2)

NOTICE: See separate solenoid installation and maintenance instructions for information on: Wiring, Solenoid Temperature, Causes of Improper Operation, and Coil Replacement.
For exploded views, see I&M No. V6766R6 – Section 2.

DESCRIPTION

Series 8214 valves are 2-way normally closed diaphragm-type solenoid valves designed for fuel gas service. Valve bodies are made of rugged aluminum with trim and internal parts made of steel and stainless steel. Series 8214 valve may be provided with a general purpose, general purpose junction box or watertight/explosionproof solenoid depending upon basic valve construction.

Valve catalog numbers with **Suffix C** have an integral electrical and visual position indicator and proof of closure construction. Valves with **Suffix VI** (in the catalog number) have a visual only position indicator. The position indicator gives visual indication of **Open** and **Shut** positions by means of a small ball. The ball travels up and down in a transparent holder between labels **Open** and **Shut**. Electrical indication is accomplished by the operation of a single pole single throw reed switch. Reed switch contact is closed when solenoid is de-energized; open when energized.

Note: Position indicators not supplied with DC valve construction.

Provisions for Pressure and Seat Leakage Testing

(See Figure 1.)

Series 8214 valves are provided with four 1/8" KNIT tapped and plugged holes, two on either side of valve body. Two upstream for pressure testing; two downstream for seat leakage testing. Leakage testing frequency shall be at least annually in accordance with NFPA-86 or original equipment manufacturer recommendations. Testing is also required after valve disassembly and reassembly for inspection, cleaning or rebuilding.

OPERATION

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

Operating Pressure Differential

- Minimum 0 psig
- Maximum 5 psig

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.

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Temperature Limitations

For valve ambient and fluid temperatures, refer to chart below.

| Catalog Numbers ‡ | Service AC or DC | Insulation Class | Minimum and Maximum Ambient and Fluid Temperatures |
|--|------------------|------------------|--|
| 821435 821450 821460 821470 821480 | AC ‡ | F | -40°F (-40°C) to 125°F (54°C) |
| | | H | -40°F (-40°C) to 140°F (60°C) |
| | DC | B or H | -20°F (-29°C) to 77°F (25°C) |

‡ Includes catalog numbers with or without **Suffix C** or **VI**.

Positioning

Valve must be mounted with solenoid vertical and upright.

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, 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. Valve should be checked for external leakage at piping connections after installation, see **Testing for External Leakage** section.

⚠ CAUTION: To avoid damage to the valve body, **DO NOT OVERTIGHTEN PIPE CONNECTIONS.** If Teflon* tape, paste, spray, or similar lubricant is used, use extra care when tightening due to reduced friction.

⚠ 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, 8601 and 8602 for strainers.

Testing for External Leakage

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, 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 before servicing the valve.

1. Block gas flow on downstream side of valve.
2. Apply pressure to valve within nameplate rating and energize solenoid.
3. Apply a soapy solution or a commercially available leak detecting solution to the pipe connections and check for bubbles. If the valve has been tested for seat leakage or disassembled and reassembled for inspecting, cleaning, or rebuilding apply the solution around solenoid base sub-assembly, bonnet/body joint and pipe plugs.

4. If leakage exists, depressurize valve and turn off electrical power supply. Tighten connections as required and retest following the above steps.

Wiring (Electrical Position Indicator)

Wiring must comply with local codes and the National Electrical Code. Switch housing has a 1/2" conduit connection. The position indicator switch has been preset at the factory. This switch is not to be field adjusted. Position indicator housing assembly can be rotated 360° for desirable visual position. Position indicator is furnished standard with one reed switch having a single contact to open when the valve is in the open position. The switch rating is 1 amp maximum, 120/60 AC maximum and 15 volts—amps maximum (Resistive Load) or 1 amp maximum, 120 volts DC maximum and 15 watts maximum (Resistive Load). For lamp and inductive loads, contact protection is required.

MAINTENANCE

▲ WARNING: To prevent the possibility of death, severe injury or property damage, 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 before servicing the valve.

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 the 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. Rebuild Kits are not available for valves with Electrical Position Indicator Switch (Suffix 'C').

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 rebuild kit. Rebuild Kits are not available for valves with Electrical Position Indicator Switch (Suffix 'C').

Valve Disassembly

NOTE: Determine valve construction AC (Figure 2 on page 4) or DC (Figure 5 on page 7) then proceed as follows:

1. Remove solenoid enclosure, see separate instructions. If position indicator construction is present, refer to appropriate instructions regarding disassembly, reassembly or adjustment.
2. For AC Construction, unscrew solenoid base sub—assembly. For DC Construction, unscrew solenoid base sub—assembly with special wrench adapter provided in ASCO Rebuild Kit. For wrench adapter only, order kit No. 218949. NOTE: For

alternate type open end wrench, order kit No. 168146—001 which is available for solenoid base sub—assembly removal or replacement.

3. Remove bonnet screws, valve bonnet, bonnet gasket, core/diaphragm sub—assembly, and body gasket.
4. All parts are now accessible to clean or replace. If parts are worn or damaged, install a complete rebuild kit. Rebuild Kits are not available for valves with Electrical Position Indicator Switch (Suffix 'C').

Valve Reassembly

1. Lubricate bonnet gasket and body gasket with a light coat of DOW CORNING® 200 Fluid lubricant or an equivalent high—grade silicone fluid.
2. Apply a light coat of RemGrit TFL 50® Dry Lubricant to:
 - Valve seat
 - Valve body flange where diaphragm assembly contacts the valve body and body gasket.
 - Internal surface of valve bonnet where diaphragm assembly contacts bonnet when valve is in the energized (open position).

IMPORTANT: If valve has been disassembled for inspection and cleaning only and a Rebuild Kit is not being installed, lubricate the following with RemGrit TFL 50® Dry Lubricant:

- Diaphragm assembly on both sides.
- Main disc at base of core/diaphragm sub—assembly.
- Pilot disc at base of core assembly.

▲ CAUTION: Do not distort hanger spring between core assembly and diaphragm assembly when lubricating pilot disc.

3. Replace body gasket and core/diaphragm sub—assembly with closing spring attached. Locate bleed hole in core/diaphragm sub—assembly approximately 30° from the valve inlet.
4. Replace valve bonnet and bonnet screws (6). Torque screws in a crisscross manner to 100 ± 10 in—lbs [11,3 ± 1,1 Nm].
5. For AC construction, replace bonnet gasket and solenoid base sub—assembly and torque solenoid base sub—assembly to 45 ± 5 ft—lbs (61,1 ± 6,8 Nm). For DC construction refer to separate *Solenoid Installation and Maintenance Instructions* for lubrication instructions; then install bonnet gasket, housing and solenoid base sub—assembly, position solenoid base sub—assembly into housing and then engage with valve body using special wrench adapter and torque solenoid base sub—assembly to 30 ± 5 ft—lbs (40,7 ± 6,8 Nm).
6. Replace solenoid (see separate instructions) and make electrical hookup.

▲ WARNING: To prevent the possibility of severe personal 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 if practical).

7. Check valve for external leakage as indicated under the *Piping* section, and for internal (seat) leakage as follows.

Testing for Internal (Seat) Leakage

▲ CAUTION: Be sure valve can be tested without affecting other equipment.

1. Using a 3/16 hex key wrench, remove the 1/8" NPT pipe plug from the downstream side of the valve body. Then install suitable test piping (e.g.; two short nipples and an elbow or tubing) to check for leakage.
2. Block flow downstream of valve.
3. Restore electrical power supply and pressurize valve to nameplate rating.

4. With valve de-energized, immerse end of test piping in a cup of water for 20–30 seconds and look for bubbles, which would be indicative of seat leakage. Repeat this procedure several times. Between each test, remove cup of water and operate valve.
5. If seat leakage is detected, turn off electrical power and depressurize valve. Disassemble and check for proper placement of parts, or any foreign matter that may have entered the valve. Clean as necessary, reassemble and re-test valve for both external and internal leakage.
6. If no seat leakage is detected, remove test piping. Apply a small amount of Loctite Corporation's PST® Pipe Sealant 567 (or equivalent) to the pipe plug threads. Reinstall the pipe plug and tighten securely.
7. Test for external leakage as described in *Piping* section.
8. When maintenance is complete, operate the valve a few times to be sure of proper operation. A metallic *click* indicates the solenoid is operating.

Electrical Position Indicator Switch

The optional electrical position indicator switch is set at the factory. This switch is not to be field adjusted.

Disassembly and Reassembly of (Suffix VI) Visual Only Position Indicator (Refer to Figure 3)

1. Remove retaining clip and slip end cap, holder, position indicator ball, end cap and spring washer off tube assembly.
2. Unscrew tube assembly and remove tube gasket. All parts are now accessible for cleaning or replacement.
3. Reassemble in reverse order of disassembly paying careful attention to exploded view provided in Figure 3 for identification and placement of parts.
4. Lubricate tube gasket with DOW CORNING® 200 Fluid lubricant or an equivalent high-grade silicone fluid.
5. Torque tube assembly to 175 ± 25 in-lbs [$19,8 \pm 2,8$ Nm].
6. After reassembly, operate the valve a few times to be sure of proper visual indication.

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 and Lubrication Chart

| ① Part Name Tool | Torque Value | Torque Value Newton–Meters |
|---|--|--|
| Solenoid base sub-assembly | AC Construction 45 ± 5 ft-lbs DC Construction 30 ± 5 ft-lbs | AC Construction $61,1 \pm 6,8$ DC Construction $40,7 \pm 6,8$ |
| Tube assembly | 175 ± 25 in-lbs | $19,8 \pm 2,8$ |
| Bonnet screws | 100 ± 10 in-lbs | $11,3 \pm 1,1$ |
| Lubrication | Parts to be lubricated | |
| DOW CORNING® 200 Fluid lubricant or an equivalent high-grade silicone fluid | Solenoid base gasket, body gasket and tube gasket | |
| RemGrit TFL 50® Dry Lubricant or equivalent | Valve seat Valve body flange where diaphragm assembly seats against valve body and body gasket. Internal surface of valve bonnet where diaphragm assembly seats when valve is in the energized (open position). ② Diaphragm assembly on both sides ② Main disc at base of core/diaphragm sub-assembly ② Pilot disc at base of core assembly | |

Notes: ① Thread all parts by hand as far as possible. Then torque evenly in a crisscross manner where applicable.
 ② Lubricate these parts if a rebuild kit is not installed.

Partial side view of valve body showing location of tapped and plugged holes for pressure and seat leakage testing

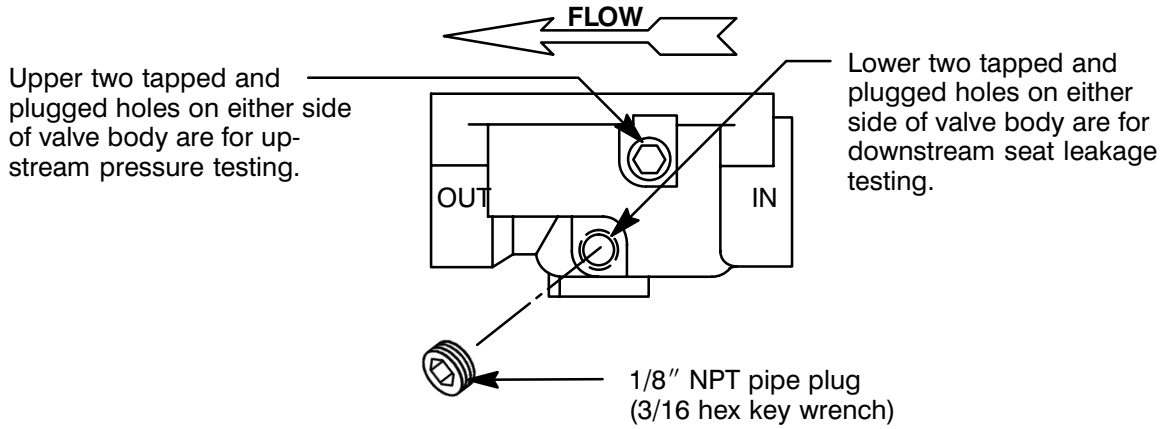


Figure 1. Provisions for pressure and seat leakage testing.

* Indicates parts supplied in ASCO Rebuild Kit.

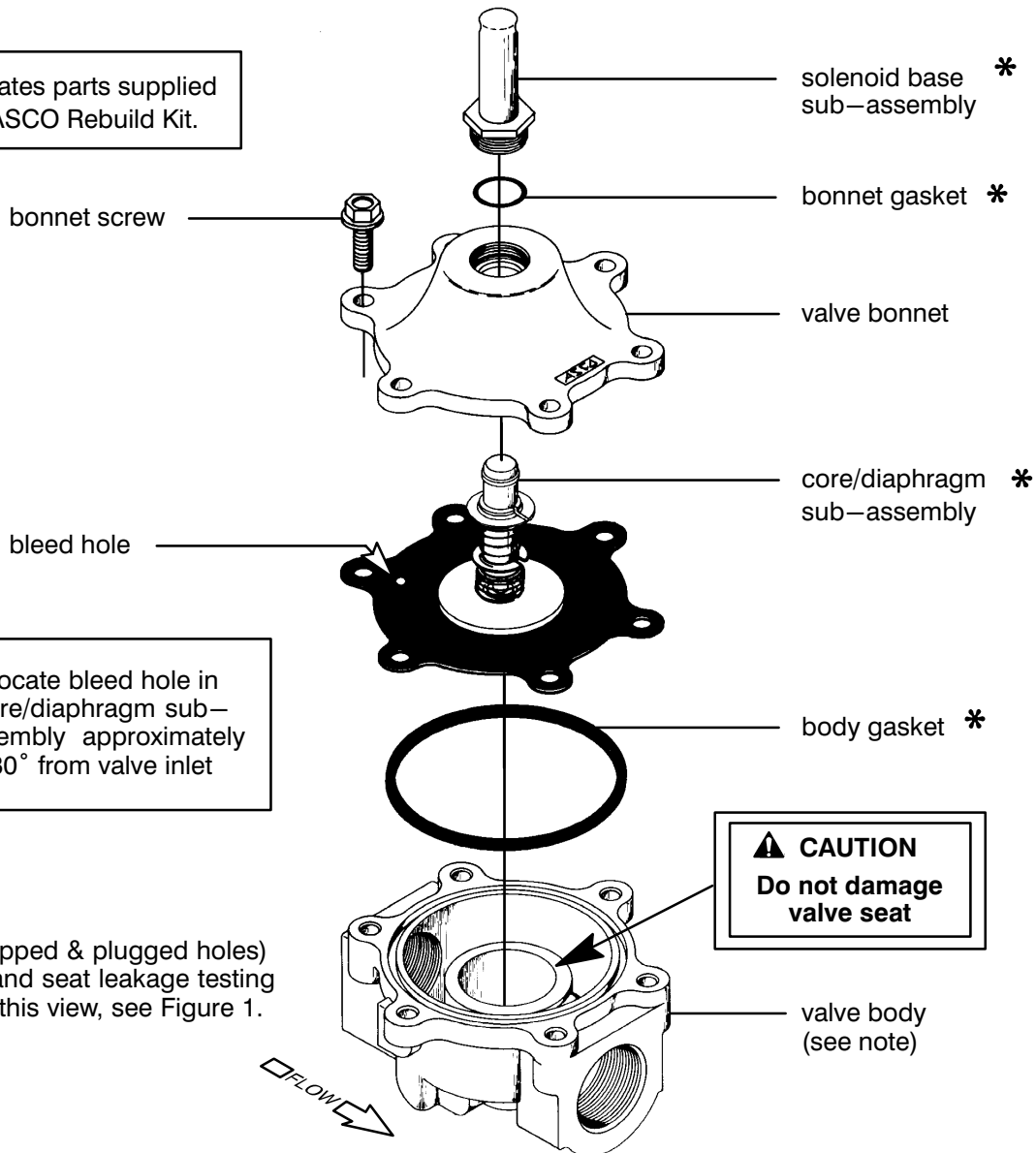


Figure 2. Series 8214 valve without solenoid, AC construction.

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NORMALLY CLOSED OPERATION — 3/4", 1", 1 1/4", 1 1/2" OR 2" NPT
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SERIES

8214

I&M No.V6766R6—Sec. 2
(Section 2 of 2)

NOTICE: For instructions and exploded view, see I&M No. V6766R6— Section 1.

IMPORTANT

See Torque and
Lubrication Chart

* Indicates parts supplied
in ASCO Rebuild Kit

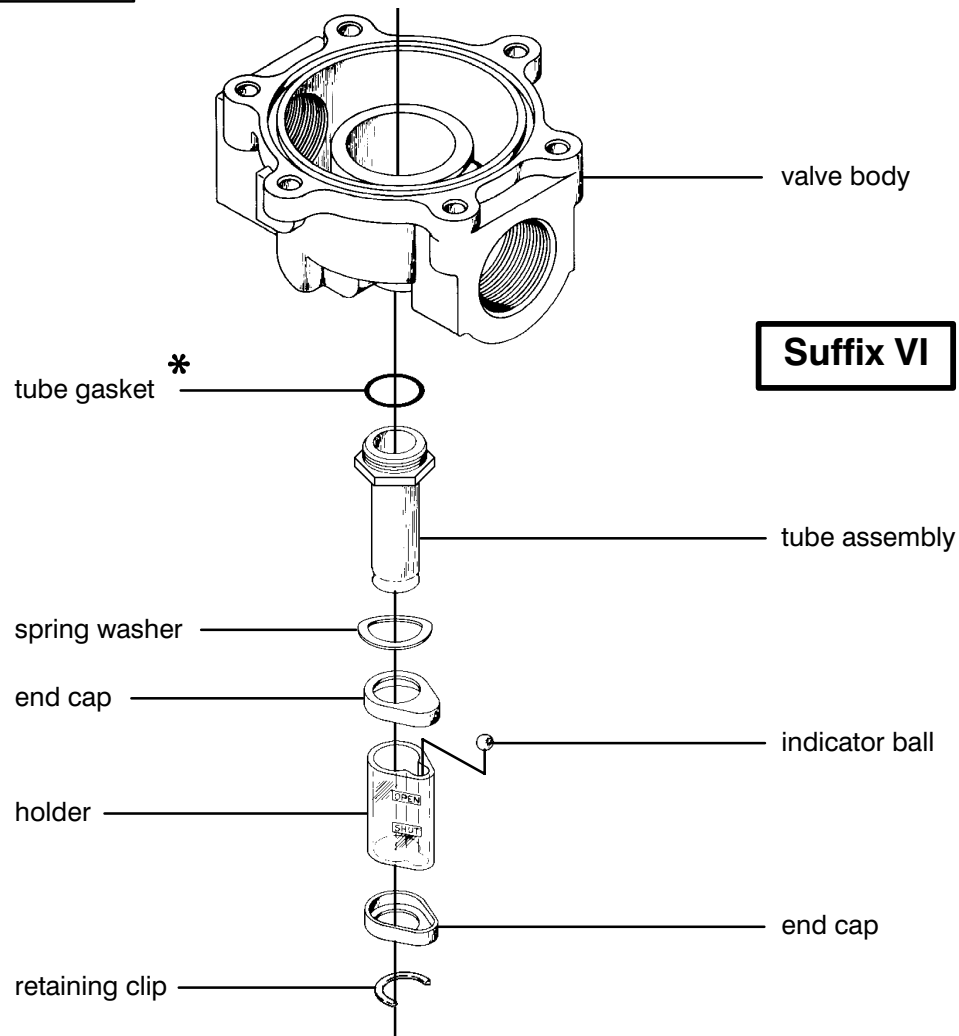
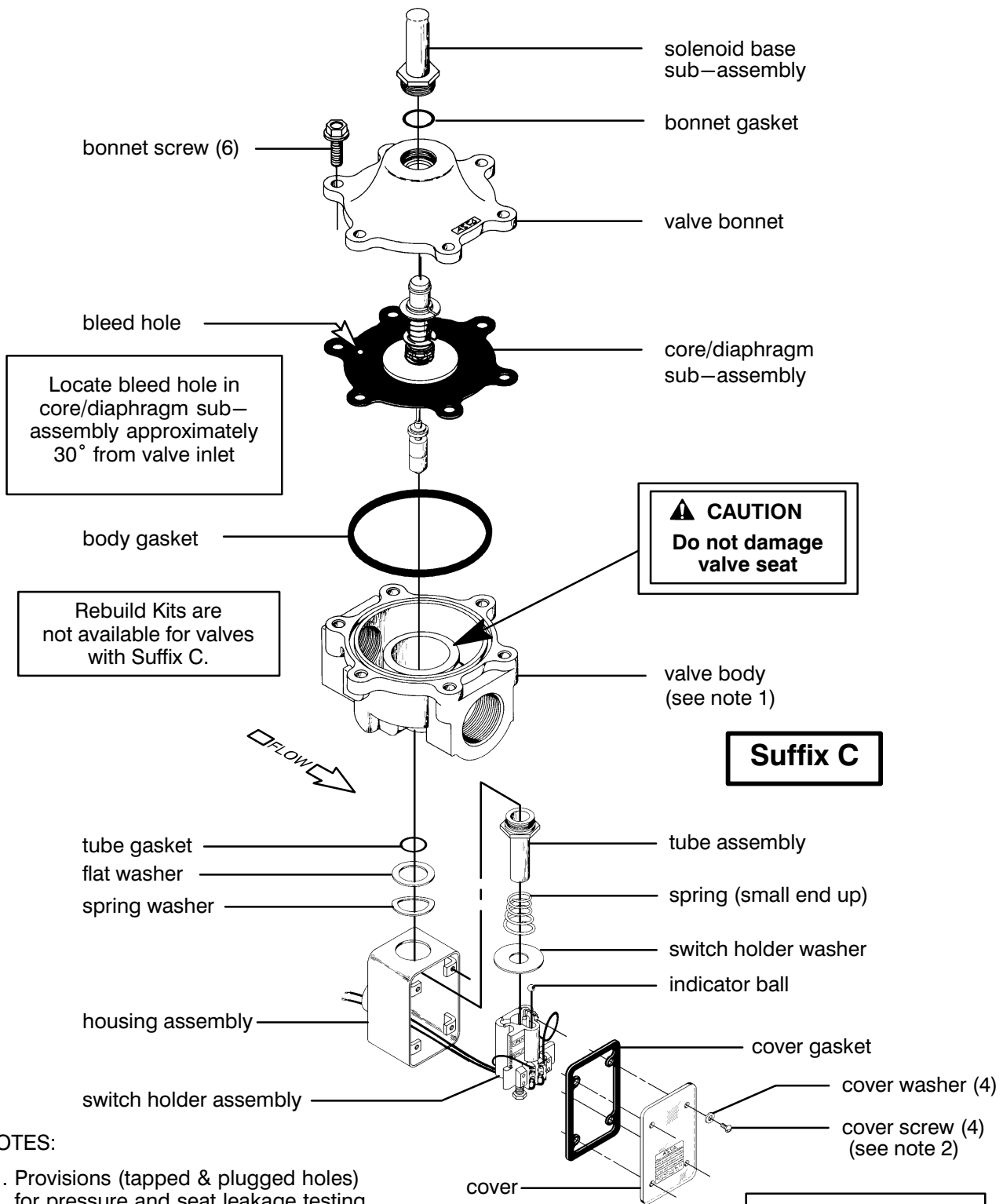


Figure 3. Visual position indicator (partial view).



NOTES:

1. Provisions (tapped & plugged holes) for pressure and seat leakage testing not shown in this view, see Figure 1.
2. Tamper seal applied to bottom 2 screws to prevent field access to electrical enclosure.

IMPORTANT
See Torque and Lubrication Chart

Figure 4. Series 8214 with electrical and visual position indicator.

