Installation & Maintenance Instructions

REVERSE–ACTING SOLENOIDS

GENERAL PURPOSE AND RAINTIGHT/WATERTIGHT/EXPLOSIONPROOF

SERIES 8014

Form No.V5414R7

IMPORTANT: See separate valve installation and maintenance instructions for information on: Operation, Positioning, Mounting, Cleaning, Preventive Maintenance, Causes of Improper Operation, Disassembly, and Reassembly of basic valve.

DESCRIPTION

Solenoid Catalog numbers 80141 and 80142 solenoids have a Type 1, General Purpose Solenoid Enclosure. Solenoid Catalog numbers EF80141, EF80142, 80143, and 80144 comply with the requirements of Enclosure Type 3 – Raintight, Type 7 (C & D) Explosionproof, and Type 9 (E, F, & G) Dust – Ignitionproof. When constructed with a cover gasket and solenoid bonnet gasket, they also comply with the requirement of Enclosure Type 4 – Watertight. Series 8014 solenoids (when installed as a solenoid and not as part of an ASCO valve) are supplied with a disc holder assembly incorporating a resilient disc.

OPERATION

When the solenoid is energized, the disc holder assembly seats against orifice. When solenoid is de–energized, the disc holder assembly returns.

IMPORTANT: Initial return force for disc holder assembly, whether developed by disc holder spring, pressure or weight, must exert a minimum force of 1 lb. 12 oz. to overcome residual magnetism created by the solenoid.

INSTALLATION

Check nameplate for correct catalog no, voltage, frequency, wattage, service.

Enclosure Types 3, 4, 7, and 9 Only

⚠ CAUTION: To prevent fire or explosion, do not install solenoid and/or valve where ignition temperature of hazardous atmosphere is less than 160° C. On valves used for steam service or when a class "H" solenoid is used, do not install in hazardous atmosphere where ignition temperature is less than 180° C. See nameplate for service. Open circuit before disassembling. Reassemble before operating.

When used in–40°C Ambient Temperature Applications

⚠ WARNING: To prevent fire or explosion, use only conduit runs ½″ in size with a sealing fitting connected within 3 feet of the solenoid enclosure.

IMPORTANT: To protect a solenoid valve, install a strainer or filter, suitable for the service involved in the inlet side as close to the valve or operator as possible. Clean periodically depending on service conditions. See ASCO Series 8600, 8601, and 8602 for strainers.

Wiring

Wiring must comply with local codes and the National Electrical Code.

⚠ CAUTION: Do not use the solenoid enclosure as a splice box.

The general purpose solenoid housing has a 7/8″ diameter hole to accommodate 1/2″ conduit. To facilitate wiring, the general purpose solenoid enclosure may be rotated 360° by removing the retaining cap or clip.

⚠ CAUTION: When metal retaining clip disengages, it springs upward.

Rotate solenoid enclosure to desired position. Then replace retaining cap or clip before operating. On some solenoids, a grounding wire which is green or green with yellow stripes is provided. Use rigid metallic conduit to ground all enclosures not provided with a green grounding wire. For the raintight/watertight/explosionproof solenoid enclosure, electrical fittings must be approved for use in hazardous locations. This enclosure has a 1/2″ conduit connection and may be rotated 360° to facilitate wiring.

⚠ WARNING: To prevent the possibility of personal injury or property damage from accidental disengagement of solenoid from valve body, hold housing securely by wrenching flats while removing or replacing housing cover.

To rotate enclosure, loosen housing cover using a 1″ socket wrench. Two wrenching flats are provided on the housing to hold it securely in place while the cover is being loosened or tightened. Rotate housing to desired position and tighten cover before operating. Torque housing cover to 135 ± 15 in–lbs [15,3 ± 1,7 Nm].

NOTE: Alternating current (AC) and direct current (DC) solenoids are built differently. To convert from one to the other, it is necessary to change the complete solenoid including the core and solenoid base sub–assembly, not just the coil. Consult ASCO.

Solenoid Enclosure Assembly

Solenoids may be assembled as a complete unit. Tightening is accomplished using a hex flange at the base of the solenoid enclosure.

Solenoid Temperature

Standard solenoids 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 by 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: 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.

Cleaning

All solenoid operators and valves should be cleaned periodically. The time between cleaning will vary depending on 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. Clean strainer or filter when cleaning the valve.

Preventive Maintenance

- Keep the medium flowing through the solenoid operator or valve as free from dirt and foreign material as possible.
- While in service, the solenoid operator or valve should be operated at least once a month to ensure proper opening and closing.
- Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

Causes of Improper Operation

- **Faulty Control Circuit:** Check the electrical system by energizing the solenoid. A metallic *click* signifies that the solenoid is operating. Check for loose or blown fuses, open–circuited or grounded coil, broken lead wires or splice connections.
- **Burned–Out Coil:** Check for open–circuited coil. Replace if necessary. Check supply voltage; it must be the same as specified on nameplate and as marked on the coil.
- **Low Voltage:** Check voltage across the coil leads. Voltage must be at least 85% of nameplate rating.

COIL REPLACEMENT

Solenoid Catalog Numbers 80141 and 80142

General Purpose Enclosure (Refer to Figures 1 & 2)

1. Disconnect coil lead wires and grounding wire if present.
2. Remove retaining cap or clip from top of solenoid.

⚠ CAUTION: When metal retaining clip disengages, it springs upward.

3. Remove nameplate (if present) spacer, cover, and spring washer (alternate construction only).

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4. For AC construction, slip yoke containing coil, sleeves, insulating washers, and grounding wire (if present) off solenoid base sub−assembly. For DC construction, slip grounding wire (if present), flux washer, insulating washer, and coil off the solenoid base sub−assembly. NOTE: Insulating washers are omitted when a molded coil is used.
5. Unscrew solenoid base sub−assembly with special wrench adapter for complete disassembly of solenoid. Special wrench adapter for solenoid base sub−assembly supplied in valve rebuild kits. For special wrench adapter only, order ASCO Wrench Kit No.K218950.
6. Remove solenoid base sub−assembly, core, plugnut assembly, and upper bonnet gasket.
7. Unscrew adapter and remove disc holder assembly, disc holder spring, and lower bonnet gasket.
8. Reassemble solenoid in reverse order of disassembly. Use exploded views for identification and placement of parts.
9. Torque solenoid base sub−assembly to 175 ± 25 in−lbs [19,8 ± 2,8 Nm].

⚠ **CAUTION: Solenoid must be fully reassembled because the housing and internal parts complete the magnetic circuit. Place an insulating washer at each end of non−molded coil.**

Solenoid Catalog Nos. EF80141, EF80142, 80143, 80144 Raintight/Watertight/Explosionproof Enclosure

(Refer to Figures 3 & 4)

1. Disconnect coil lead wires and grounding wire, if present.

⚠ **WARNING: To prevent the possibility of death, serious injury or property damage from accidental disengagement of solenoid from valve body, hold housing securely by wrenching flats while removing or replacing housing cover.**

2. Unscrew housing cover with retaining ring and nameplate attached. Two wrenching flats are provided to hold the housing securely in place while the cover is being removed or replaced.
3. For AC construction, slip yoke containing coil, sleeves, insulating washers, and grounding wire (if present) off the solenoid base sub−assembly. For DC construction, remove yoke, grounding wire (if present), insulating washer, and coil. NOTE: Insulating washers are omitted when a molded coil is used.
4. Unscrew solenoid base sub−assembly with special wrench adapter. Special wrench adapter for solenoid base sub−assembly supplied in valve rebuild kits. For special wrench adapter only, order ASCO Wrench Kit No.K218950.
5. Remove solenoid base sub−assembly, core, plugnut assembly, and upper bonnet gasket.
6. Unscrew adapter and remove disc holder assembly, disc holder spring, and lower bonnet gasket.
7. Reassemble solenoid using exploded views for identification and placement of parts. Before reassembly, see note below for cleaning and greasing requirements.
8. Torque solenoid base sub−assembly to 175±25 in−lbs [19,8±2,8 Nm].
9. Torque housing cover to 135 ± 15 in−lbs [15,3 ± 1,7 Nm].

⚠ **CAUTION: Solenoid must be fully reassembled because the housing and internal parts complete the magnetic circuit. Place an insulating washer at each end of non−molded coil.**

NOTE: Catalog Nos. EF80141, EF80142, 80143, and 80144 only—Installation and maintenance of raintight/watertight/explosionproof equipment requires more than ordinary care to insure safe performance. All finished surfaces of the solenoid are constructed to provide flame−proof seal. Be sure that the surfaces are wiped clean before reassembling. Grease the cover gasket, solenoid bonnet gasket, and the joints of the raintight/watertight/explosionproof solenoid enclosure with DOW CORNING® 111 Compound lubricant or an equivalent high−grade silicone grease. Grease all joints thoroughly including the underside of the solenoid base sub−assembly flange and internal threads of the housing cover.

ORDERING INFORMATION FOR ASCO SOLENOID ENCLOSURE KITS OR COILS

When ordering, specify Catalog Number, Serial Number, Voltage, and Frequency.

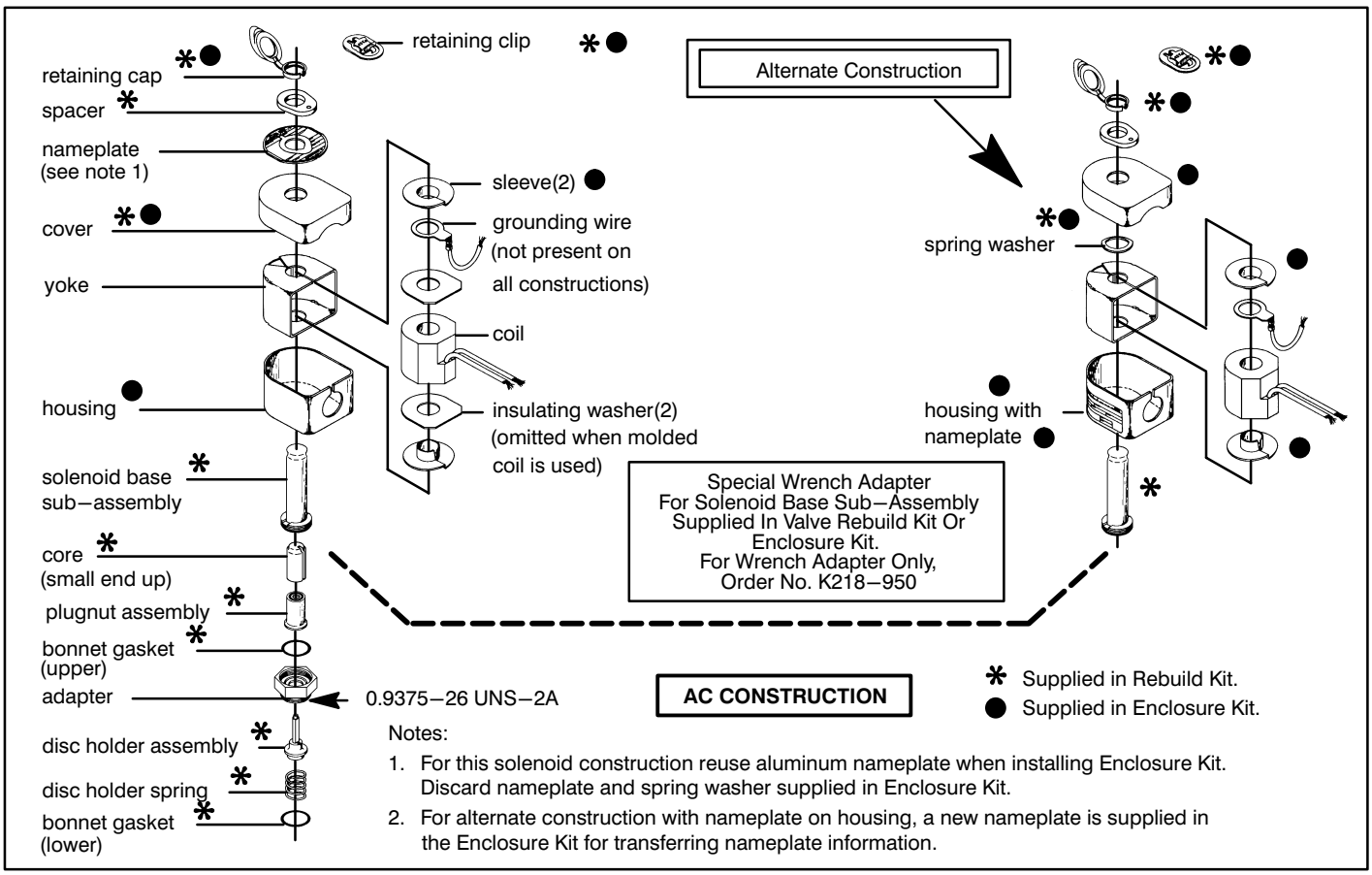

Figure 1. Catalog Nos. 80141 and 80142 General Purpose Solenoid Enclosure, AC Construction.

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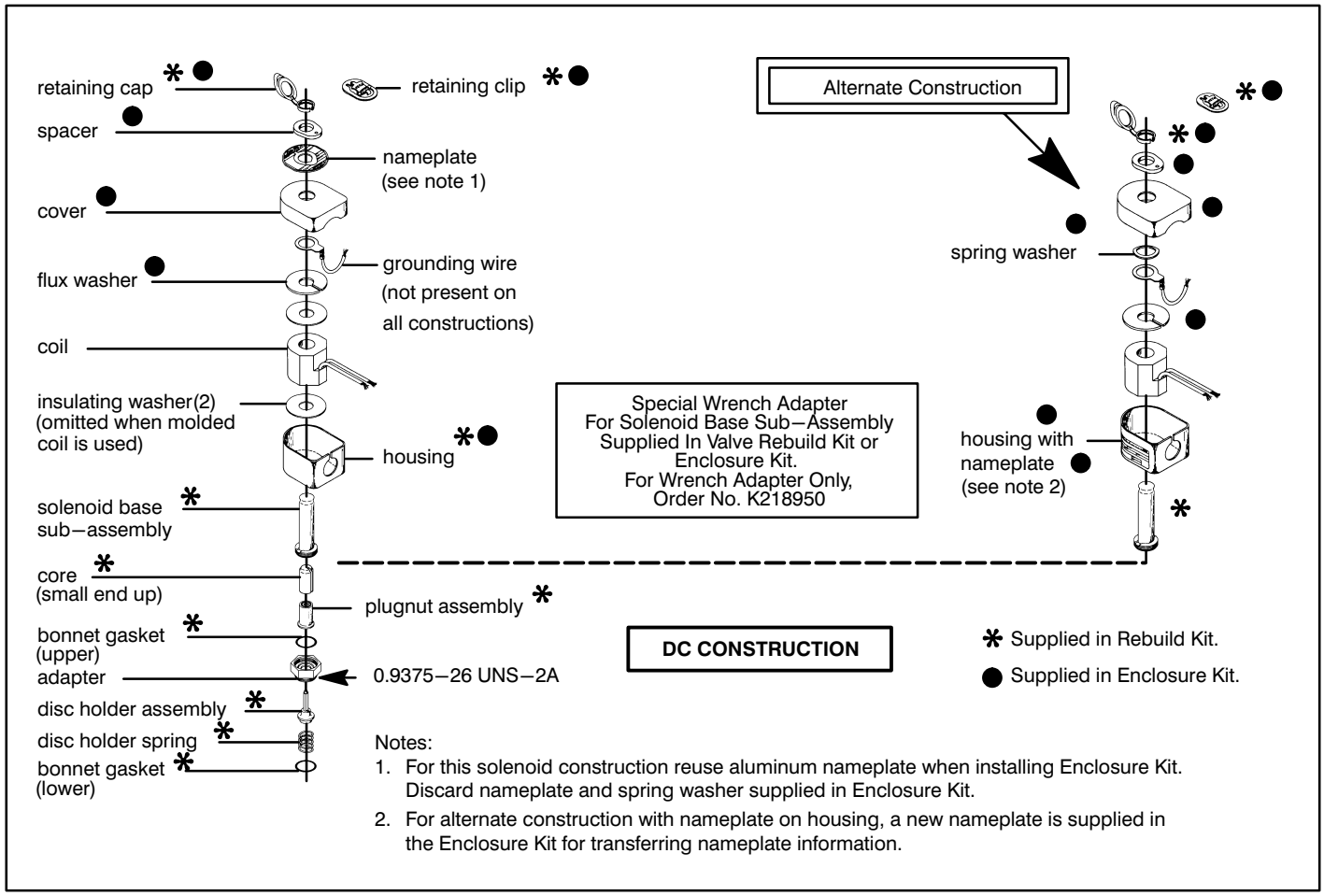

Figure 2 Catalog Nos. 80141 and 80142 General Purpose Solenoid Enclosure, DC Construction.

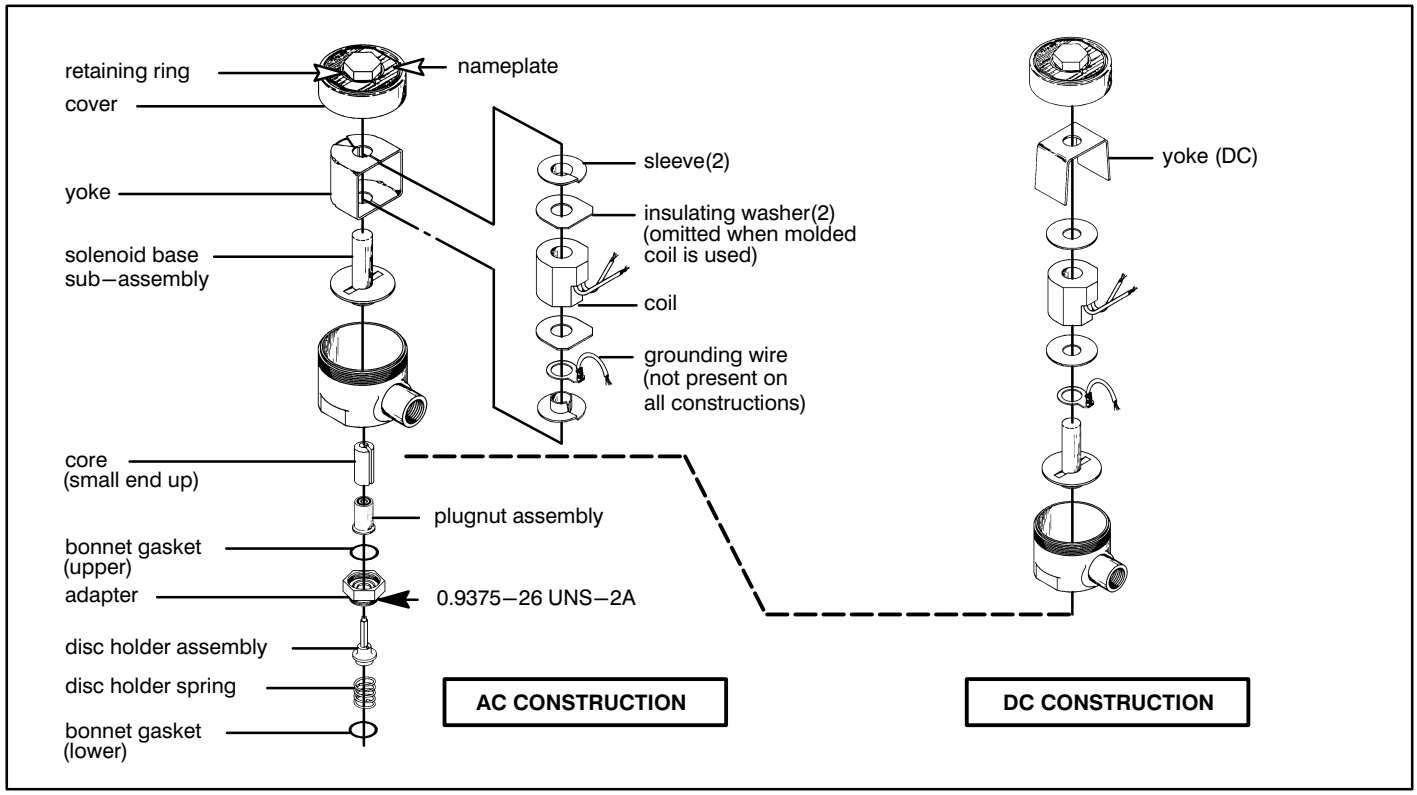

Figure 3. Catalog Nos. EF80141, EF80142, 80143, and 80144 Raintight/Explosionproof Solenoid Enclosure.

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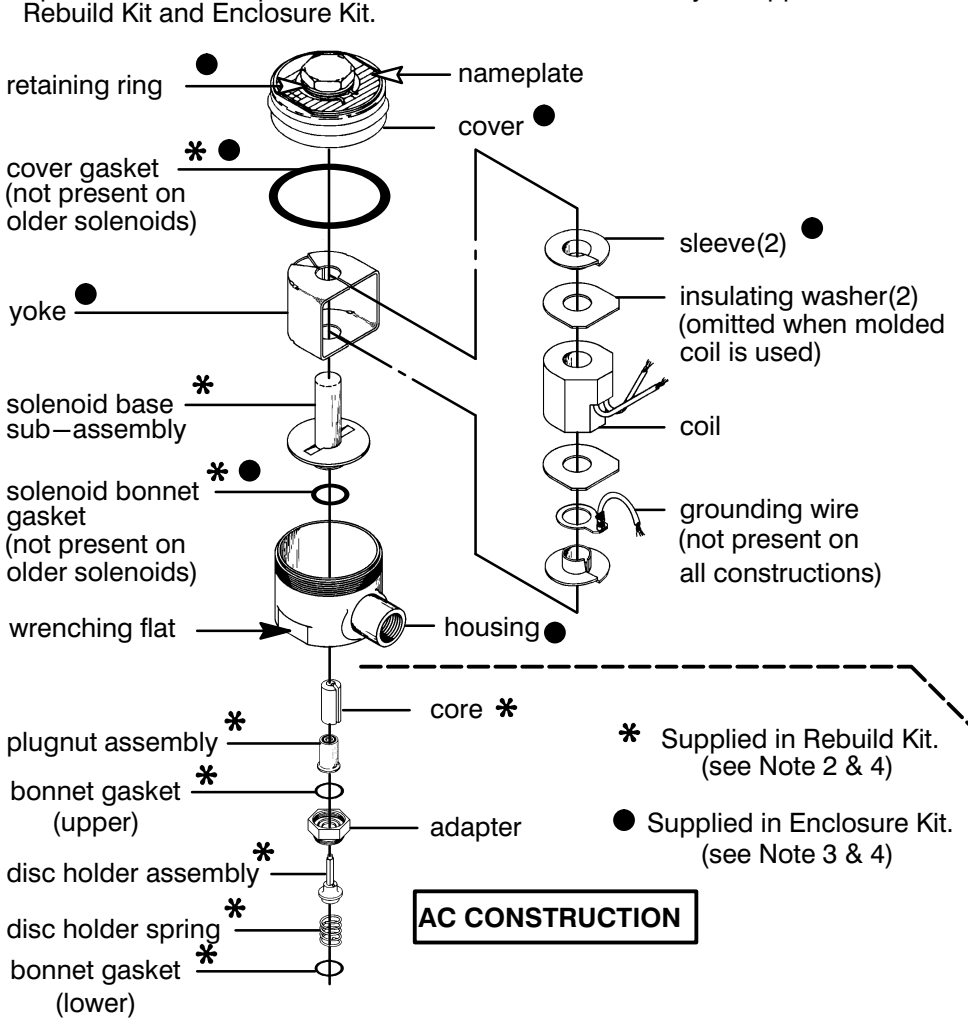
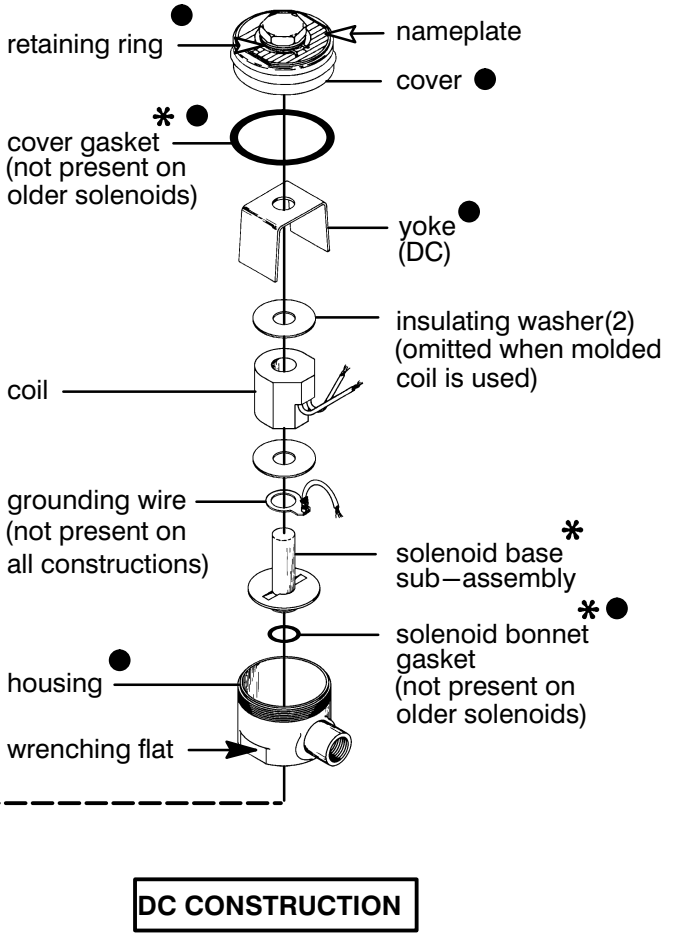
Notes:

1. These catalog numbers meet watertight requirements only when cover gasket and solenoid bonnet gasket are used.
2. A solenoid base sub−assembly with a solenoid bonnet gasket will be supplied in the Rebuild Kit. These two parts are a direct replacement for the existing solenoid base sub−assembly.
   The cover gasket will be supplied in Rebuild Kit, but may be omitted if cover does not use a gasket.
3. Install all parts supplied in Enclosure Kit except omit the solenoid bonnet gasket if the existing solenoid base sub−assembly does not use a gasket.
4. Special wrench adapter for solenoid base sub−assembly is supplied in Rebuild Kit and Enclosure Kit.

Torque Chart		
Part Name	Inch−Pounds	Newton−Meters
cover	135 ±15	15,3 ±1,7
solenoid base sub−assembly▲	175 ± 25	19,8 ± 2,8
▲ To order special wrench adapter for solenoid base sub−assembly, specify Kit No. K218950		





* Supplied in Rebuild Kit. (see Note 2 & 4)

● Supplied in Enclosure Kit. (see Note 3 & 4)

Figure 4. Catalog Nos. EF80141, EF80142, 80143, and 80144 Raintight/Watertight/Explosionproof Solenoid Enclosure Shown.