Installation & Maintenance Instructions

ASCO RedHat NEXT GENERATION

4–WAY HEAVY DUTY SINGLE SOLENOID VALVES
1/4″, 3/8″, 1/2″, 3/4″ OR 1″ NPT
1/4″, 3/8″ OR 3/4″ ORIFICE

SERIES

8344

I&M No.V7544 –Sec. 1
(Section 1 of 2)

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

DESCRIPTION

Series 8344 valves are packless, solenoid pilot controlled, heavy duty, 4–way valves with forged brass valve bodies and poppet type main discs. The main discs are power driven in both directions by line pressure. No return springs are required. Valves may be provided with a general purpose/watertight, open frame, or watertight/explosionproof solenoids.

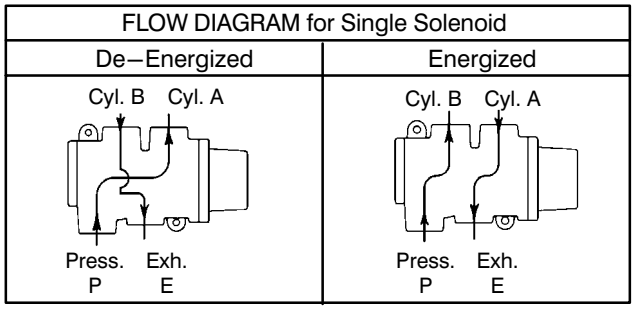
OPERATION

Solenoid De–Energized: Flow is from Pressure P to Cylinder A and from Cylinder B to Exhaust E.

Solenoid Energized: Flow is from Pressure P to Cylinder B and from Cylinder A to Exhaust E.

Minimum on time for valve is 0.3 seconds on air service and 1.0 seconds on liquids

IMPORTANT: Minimum operating pressure differential is 10 psi on air, gas or water and 25 psi on hydraulic oil (300 S.S.U.).



Manual Operator (optional feature)

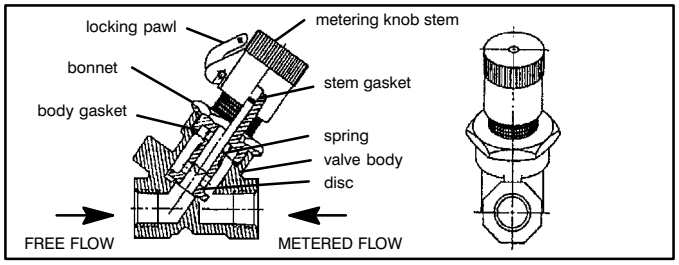
Manual operator allows manual operation when desired or during an electrical power outage. To engage manual operator (open the valve), turn lever clockwise until it hits a stop. Valve will now be in the same position as when the solenoid is energized. To disengage manual operator (close the valve) turn lever counterclockwise until it hits a stop.

⚠ CAUTION: For valve to operate electrically, manual operator lever must be fully rotated counterclockwise.

SPEED/FLOW CONTROL–METERING DEVICE

Speed/flow control valves (2) may be added to allow full unrestricted flow in one direction and controlled flow in the opposite direction. These valves must be in the "A" and/or "B" cylinder piping, between the solenoid valve and the cylinder.

IMPORTANT: Do not install the speed control or any other restrictive device in either the pressure (inlet) connection or the exhaust (outlet) connection of the valve. Restricting either of these lines may cause valve malfunction.



INSTALLATION

Check nameplate for correct catalog number, pressure, and service. Never apply incompatible fluids or exceed pressure rating of the valve. Installation and valve maintenance to be performed by qualified personnel.

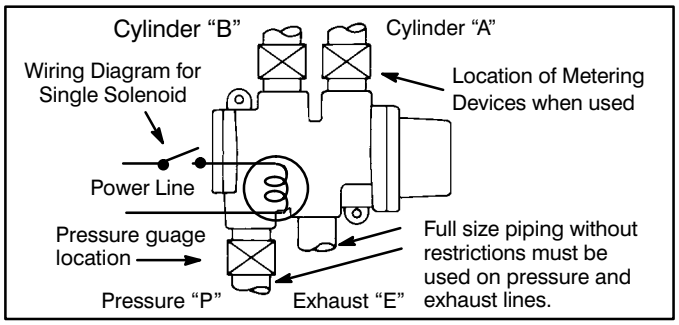
Positioning

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the operator should be mounted vertically and upright to reduce the possibility of foreign matter accumulating in the pneumatic operator.

Piping

Connect piping or tubing to valve according to markings on valve body. Refer to flow diagrams. 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 pneumatic operator as a lever. Locate wrenches applied to valve body or piping as close as possible to connection point.

To insure proper operation of the valve, the pressure and exhaust lines must be full area without restriction. A minimum differential pressure as stamped on the nameplate must be maintained between pressure and exhaust at the moment of shifting. Air reservoirs must have adequate capacity to maintain this minimum pressure during shifting. To check pressure during shifting, install a pressure gauge in the pressure piping as close to the valve as possible.



MAINTENANCE

⚠ WARNING: To prevent the possibility of death, personal injury or property damage, depressurize valve (main and auxiliary pressure lines), and vent fluid to a safe area before servicing the valve.

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

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Temperature Limitations

Valves with design change letter "K" or "P" within the catalog number (example: 8344K074) have a maximum fluid temperature of 180°F. Refer to separate solenoid Installation and Maintenance Instructions for maximum ambient temperature.

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.

Cleaning

All pneumatic operated valves should be cleaned periodically. The time between cleanings will vary depending on the medium and service conditions. In general, 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 shift. Clean stainer or filter when cleaning the valve.

Preventive Maintenance

- Keep the medium flowing through the valve as free from dirt and foreign material as possible.
- While in service, the valve should be operated at least once a month to insure proper opening and closing.
- Depending on the medium and service condition, 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 ASCO 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 install a complete ASCO Rebuild Kit.

Valve Disassembly for 1/4″, 3/8″ and 1/2″NPT Valves

1. Disassemble valve in an orderly fashion using exploded views for identification of parts.
2. Remove solenoid, see separate instructions.
3. Unscrew solenoid base sub−assembly. For AC/DC Construction, remove core assembly with spring, core guide and body gasket.
4. A 4−40 machine screw provided in ASCO Rebuild Kit serves as a self−tapping screw to remove insert from body. Thread screw a few turns into through hole located in flat surface of the insert.

⚠ CAUTION: Do not damage center hole (pilot orifice) in raised surface of insert.

5. Remove insert by using a pair of pliers to grip the head of the screw. Then pull insert with gaskets from body insert cavity.
6. Remove three gaskets from insert. Tag each as they are removed so that they can be reassembled in the same location. Middle and lower gaskets are the same size, however, the lower gasket is a softer material.
7. Remove body screws/lockwashers (4) from piston end body. Slip piston end body off piston/shaft sub−assembly.
8. Slide piston/shaft sub−assembly from main valve body. The piston/shaft sub−assembly is comprised of the main shaft, locknut, shaft gasket, piston, body u−cup, guide u−cup, u−cup o−ring (only present in 3/8″ or 1/2″ NPT valves with 3/8″ orifice), piston end guide, guide gaskets (2) and resilient disc.
9. Remove guide gaskets (2), one from either side of piston end guide.
10. Disassemble piston/shaft sub−assembly by inserting a brass rod (of suitable size) in cross hole in shaft. Rod must be brass or other soft material so as not to burr the edges of hole. Hold piston shaft firmly (with rod) and unscrew locknut. Disassemble piston/shaft sub−assembly in an orderly fashion. Do not damage or mar any of the parts.
11. Remove locknut, shaft gasket, piston with body and guide u−cups (2) attached. Slide piston end guide and resilient main disc off main shaft.
12. Remove body u−cups and guide u−cup from piston. For 3/8″ or 1/2″ NPT valves with 3/8″ orifice, remove u−cup o−ring from guide u−cup.
13. Unscrew seat from opposite end of main body. Remove large and small seat gaskets (2) from seat. Then remove resilient main disc from body bore.
14. All parts are now accessible to clean or replace. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

Valve Reassembly for 1/4″, 3/8″ and 1/2″NPT Valves

1. Lubricate large and small seat gaskets, upper, middle, and lower insert gaskets with DOW CORNING® 200 Fluid lubricant or an equivalent high−grade silicone fluid lubricant.
2. Lubricate all remaining gaskets, u−cups, bores of piston, piston end body, main disc sliding area on the main shaft and valve body insert cavity with a light coat with DOW CORNING® 111 Compound lubricant.

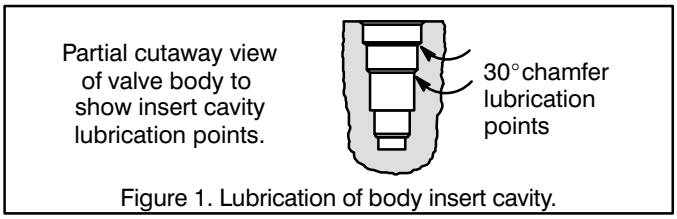

Figure 1. Lubrication of body insert cavity.

3. Preassemble piston/shaft sub−assembly as follows:
   A. Position resilient main disc on main shaft so that resilient side of main disc is facing the piston end guide.
   B. Position piston end guide on main shaft.
   C. Install body u−cup and guide u−cup onto piston. Open end of guide u−cup faces the main valve body, while open end of body u−cup faces the piston end body. For 3/8″ or 1/2″ NPT valves with 3/8″orifice, install a u−cup o−ring inside the guide u−cup.
   D. Position piston assembly on main shaft.
   E. Replace shaft gasket and locknut. Tighten locknut while holding the main shaft as described in ***Valve Disassembly*** section step 10. For 3/8″ and 1/2″ NPT valve with 3/8″orifice, torque locknut to 125 ± 10 in−lbs [14,1 ± 1,1 Nm]. For 1/4″ or 3/8″NPT valve with 1/4″ orifice, torque locknut to 50 ± 5 in−lbs [5,7 ± 0,6 Nm].
   F. Position guide gaskets (2) one on guide facing piston end body, the other in counterbore of main valve body.
4. Install piston/shaft sub−assembly into main valve body.
5. Install small body gaskets (2) into counterbores in piston end body.
6. Slip piston end body over piston/shaft sub−assembly and replace body screws with lockwashers (4). Torque screws in a crisscross manner to 40 ± 5 in−lbs [4,5 ± 0,6 Nm].
7. Install resilient main disc at opposite end of main shaft; be sure resilient side is facing seat.
8. Install seat with large and small seat gaskets attached. Torque seat to 40 ± 5 ft−lbs [54,2 ± 6,8 Nm].
9. Position lower insert gasket and disc holder spring in body insert cavity.
10. Snap upper and middle insert gaskets into grooves of insert. Lower insert gasket fits into the recess between the lower corner of the insert and the lower corner of the body insert cavity. Middle and lower insert gaskets are the same size. However, the lower gasket is made of a softer material.
11. Place disc holder sub−assembly into insert. Install insert (with gaskets and disc holder assembly) into body insert cavity, making certain that the disc holder spring is centered. Rotate this assembly slightly while pushing downward to aid installation.

⚠ WARNING: To prevent the possibility of death, 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.

12. Restore auxiliary and main line pressure to valve.

Valve Disassembly for 3/4″ or 1″ NPT Valves

1. Disassemble valve in an orderly fashion using exploded view for identification and placement of parts.
2. A 4−40 machine screw provided in ASCO Rebuild Kit serves as a self−tapping screw to remove insert from body. Thread screw a few turns into through hole located in flat surface of the insert.

⚠ CAUTION: Do not damage center hole (pilot orifice) in raised surface of insert.

3. Remove insert by using a pair of pliers to grip the head of the screw. Then pull insert with gaskets from body insert cavity.
4. Remove three gaskets from insert. Tag each as they are removed so that they can be reassembled in the same location. Middle and lower gaskets are the same size, however, the lower gasket is a softer material. Then remove disc holder sub−assembly and disc holder spring.
5. Remove long body screws with lockwashers (4) from piston end body. Slip piston end body off piston/shaft sub−assembly.
6. Remove small body gaskets (2) from counterbores in piston end body.
7. Slide piston/shaft sub−assembly from main valve body. The piston/shaft sub−assembly is comprised of the main shaft, shaft nut, shaft washer, piston, body u−cup, guide u−cup, shaft gasket, piston guide, seat gasket, guide gaskets (2) and a resilient main disc.
8. Disassemble piston/shaft assembly by inserting a brass rod (of suitable size) into cross hole in shaft. Rod must be brass or made of another soft material, so as not to burr edges of hole. Hold piston shaft firmly (with rod) and unscrew shaft nut.
9. Disassemble piston/shaft sub−assembly in an orderly fashion. Be careful not to damage or mar any of the parts.
10. Remove shaft nut, shaft washer, piston with body and guide−u−cups (2) attached from shaft. Then remove body u−cup and guide u−cup from piston.
11. Remove shaft gasket, piston guide, guide gaskets (2) seat gasket, and resilient main disc.
12. Remove short body screws with lockwashers (4) from opposite end of main valve body. Remove body/seat gasket and seat gasket from seat. Then remove the other resilient main disc from bore of main valve body.
13. All parts are now accessible to clean or replace. If parts are worn or damaged install a complete ASCO Rebuild Kit.

Valve Reassembly for 3/4″ or 1″ NPT Valves

1. Lubricate body/seat gasket, seat gasket, upper, middle and lower insert gaskets with DOW CORNING® 200 Fluid lubricant or an equivalent high−grade silicone fluid lubricant.
2. Lubricate all remaining gaskets, u−cups, bores of piston, piston end body, main disc sliding area on the main shaft and valve body insert cavity (see Figure 3) with a light coat with DOW CORNING® 111 Compound lubricant.
3. Preassemble piston/shaft sub−assembly as follows:
   A. Position resilient main disc on shaft so that resilient lip side of disc is facing the piston guide.
   B. Install seat gasket and guide gaskets (2) on piston guide.
   C. Slip piston guide with gaskets onto shaft.
   D. Position shaft gasket on shaft.
   E. Install guide u−cup and body u−cup on piston. Make certain that open end of guide u−cup faces, the main valve body, while open end of body u−cup faces the piston end body. Position the piston with u−cups on shaft.
   F. Replace shaft washer and shaft nut. Torque the shaft nut to 125 ± 10 in−lbs [14,1 ± 1,1 Nm] while holding the shaft as described in ***Valve Disassembly*** for 3/4″ or 1″ NPT valves section step 9.
4. Install piston/shaft sub−assembly in main valve body.
5. Position small body gaskets (2) in counterbores in piston end body.
6. Slip piston end body over the piston/shaft sub−assembly. Then install long body screws with lockwashers (4). Torque the long body screws in a crisscross manner to 40 ± 5 in−lbs [4,5 ± 0,6 Nm].
7. Install resilient main disc at opposite end of main shaft. Be sure resilient side of disc is facing seat.
8. Position seat gasket and body/seat gasket on seat.
9. Install seat with gaskets into main valve body. Replace short body screws with lockwashers (4). Torque body screws in a crisscross manner to 40 ± 5 in−lbs [4,5 ± 0,6 Nm].
10. Position lower insert gasket and disc holder spring in body insert cavity.
11. Snap upper and middle insert gaskets into grooves of insert. Lower insert gasket fits into the recess between the lower corner of the insert and the lower corner of the body insert cavity. Middle and lower insert gaskets are the same size. However, the lower gasket is made of a softer material.
12. Place disc holder sub−assembly into insert. Install insert (with gaskets and disc holder assembly) into body insert cavity, making certain that the disc holder spring is centered. Rotate this assembly slightly while pushing downward to aid installation.

⚠ WARNING: To prevent the possibility of death, 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.

13. Restore auxiliary and main line pressure to valve.

Disassembly of Manual Operator

1. Unscrew solenoid base sub−assembly from manual operator body.
2. Unscrew manual operator body from valve body. Then remove stem retainer from base of manual operator body and stem/spacer sub−assembly.
3. Pull stem/spacer sub−assembly with stem gasket from side of manual operator body. Then remove core assembly with core spring, solenoid base gasket and manual operator bonnet gasket.
4. For further disassembly refer to section on ***Valve Disassembly*** step 4.

Reassembly of Manual Operator

1. Lubricate manual operator stem gasket with DOW CORNING® 111 Compound lubricant or an equivalent high−grade silicone grease.
2. For AC/DC construction (Figure 2A), install core assembly with spring and core guide..
3. Holding the manual operator body in a vertical position, install core assembly with core spring from the bottom end.
4. Insert the stem/spacer sub−assembly with the stem gasket into the side hole of the manual operator body. Rotate the lever of the stem/spacer sub−assembly to the 12 o'clock position.
5. Install stem retainer on base of manual operator body and simultaneously engage it into the slot provided on the stem/spacer sub−assembly.

IMPORTANT: The spacer on the stem/spacer sub−assembly *must be outside* of the stem retainer for AC/DC construction (Figure 2B).

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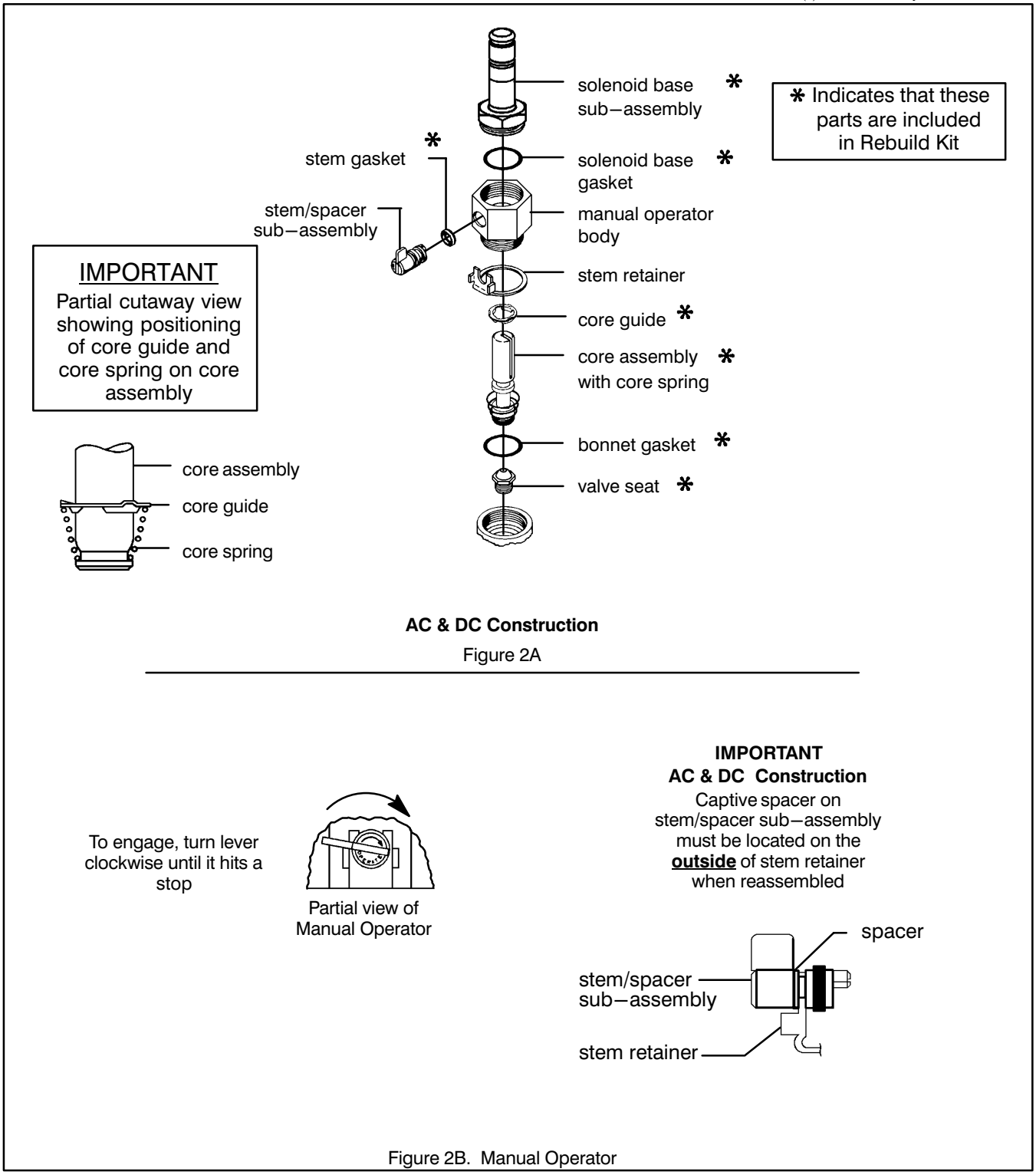
6. Install bonnet gasket and manual operator body with preassembled parts into valve body. Torque manual operator body to 175 ± 25 in−lbs [19,8 ± 2,8 Nm].
7. Replace solenoid base gasket and solenoid base sub−assembly. Torque solenoid base sub−assembly to 175 ± 25 in−lbs [19,8 ± 2,8 Nm].
8. For further reassembly, refer to ***Valve Reassembly*** step 5.

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.



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Installation & Maintenance Instructions

ASCO RedHat NEXT GENERATION

4–WAY HEAVY DUTY SINGLE SOLENOID VALVES
1/4″, 3/8″, 1/2″, 3/4″ OR 1″ NPT
1/4″, 3/8″ OR 3/4″ ORIFICE

SERIES

8344

I&M No.V7544 –Sec. 2
(Section 2 of 2)

Notice: These instructions are divided into two sections. Be sure to read, understand and follow all instructions on I&M No. V7544–Section 1 and 2.

Torque and Lubrication Chart

Part Name	Pipe Sizes (NPT)	Torque Value	Torque Value Newton Meters	Figure Number Where Used
Solenoid base Sub–assembly		175 ± 25 in–lbs	19,8 ± 2,8	Figures 3, 4 & 5
Shaft Nut	[1] 1/4″ or 3/8″	50 ± 5 in–lbs	5,7 ± 0,6	Figure 3
	3/8″, 1/2″ 3/4″or 1″	125 ± 10 in–lbs	14,1 ± 1,1	Figures 4 and 5
Seat	1/4″, 3/8″ or 1/2″	40 ± 5 ft–lbs	54,2 ± 6,8	Figures 3 and 4
Body Screws	All sizes	40 ± 5 in–lbs	4,5 ± 0,6	Figures 3, 4 & 5

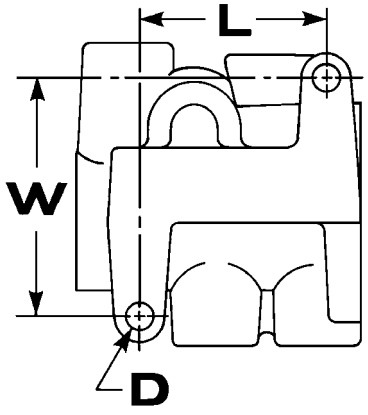
Lubrication	Parts To Be Lubricated
DOW CORNING® 200 Fluid lubricant	upper, middle, and lower insert gaskets body/seat gasket large & small seat gaskets seat gasket
DOW CORNING® 111 Compound lubricant	body gaskets (2) guide gaskets (2) body u–cup u–cup o–ring [2] Main shaft (slide area of main discs) Bores of piston and piston end body Internal 30° chamfers in valve body insert cavity. (See Figure 3 on Form No. V7544–Sec. 1) guide u–cup bonnet gasket

[1] 1/4″ orifice construction [2] When present

MOUNTING DIMENSIONS

Pipe Size	Length "L"		Width "W"		Holes "D" Dia. ∅	
NPT	Inches	mm	Inches	mm	Inches	mm
1/4″	1 7/8	47,6	2 13/32	61,1	9/32	7,1
3/8″†						
3/8″	2 5/8	66,6	3 1/8	79,3	11/32	8,7
1/2″						
3/4″	3 7/8	98,4	3 13/16	96,8	11/32	8,7
1″						

† 1/4″ orifice construction



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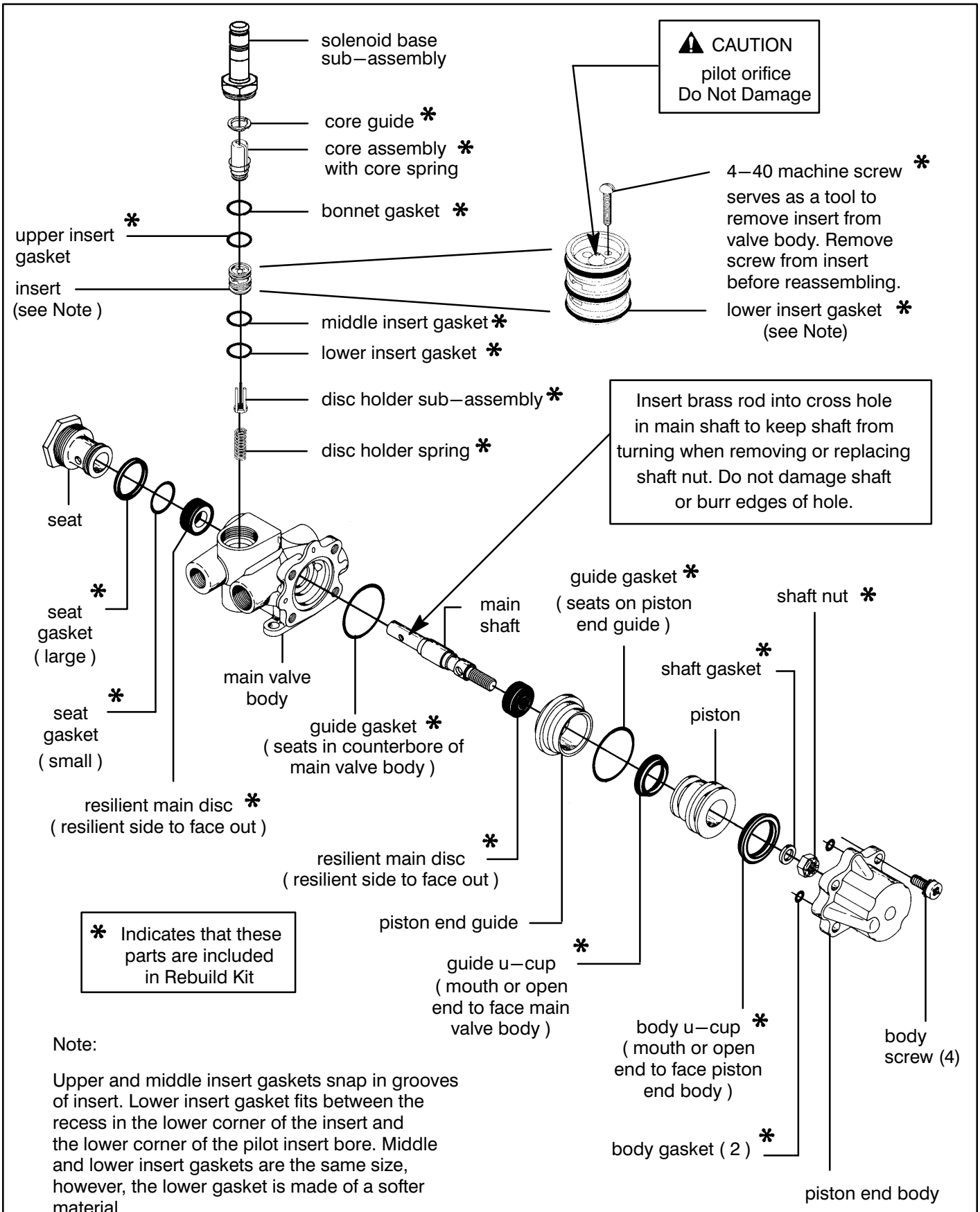

Note:

Upper and middle insert gaskets snap in grooves of insert. Lower insert gasket fits between the recess in the lower corner of the insert and the lower corner of the pilot insert bore. Middle and lower insert gaskets are the same size, however, the lower gasket is made of a softer material.

Figure 3. Series 8344, 1/4″ or 3/8″ NPT valve with 1/4″orifice.

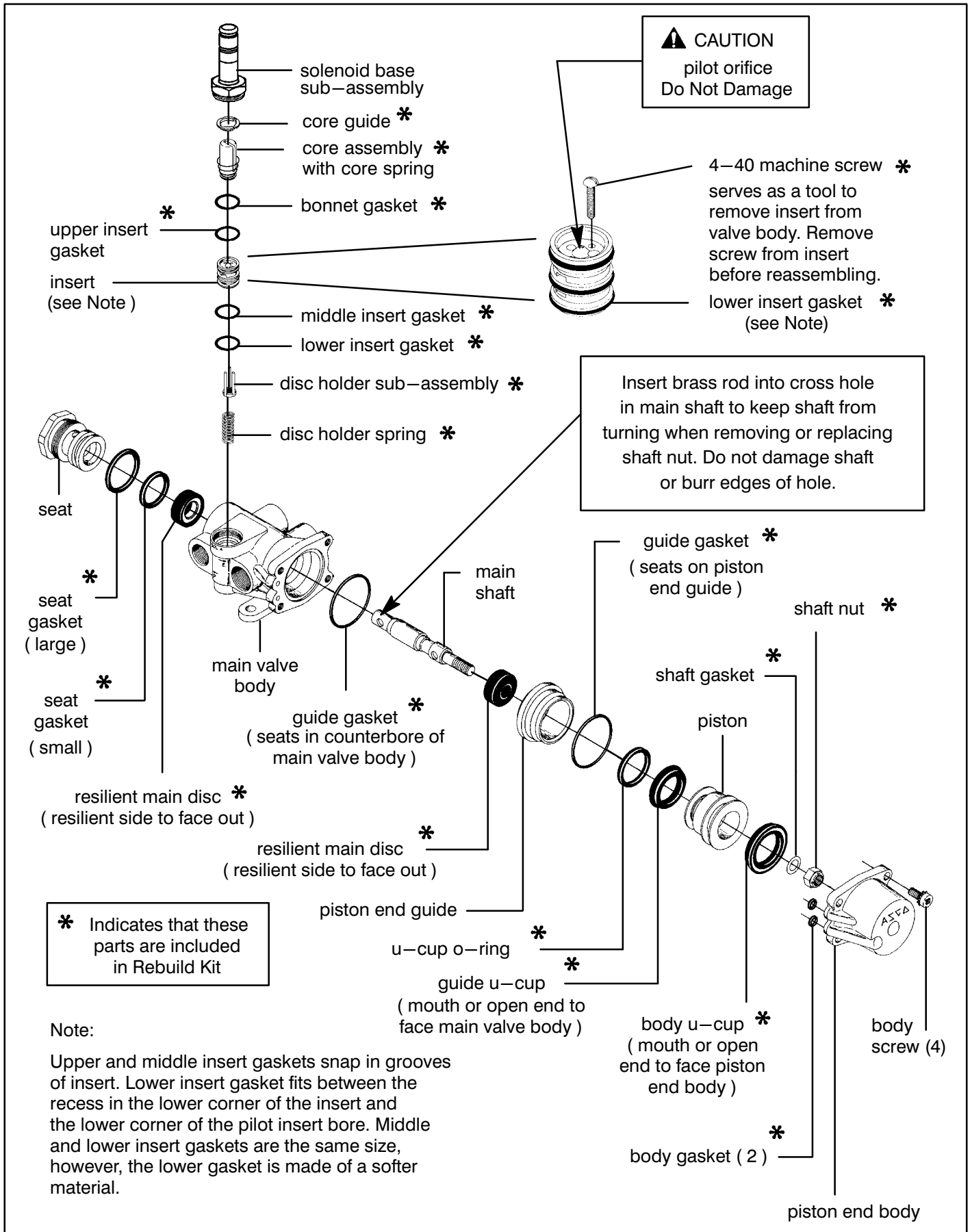

Figure 4. Series 8344, 3/8″ or 1/2″ NPT valve with 3/8″ orifice.

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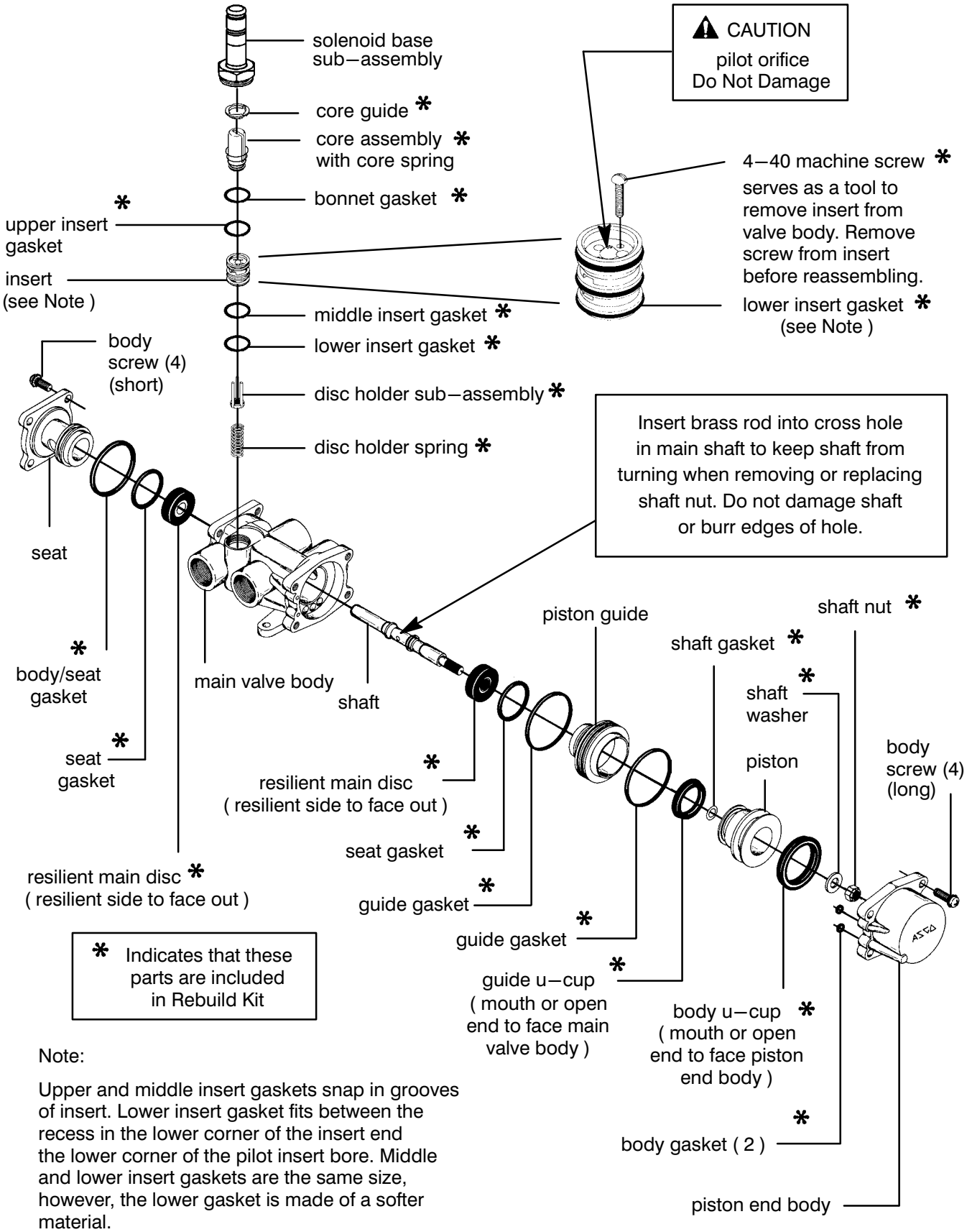

Note:

Upper and middle insert gaskets snap in grooves of insert. Lower insert gasket fits between the recess in the lower corner of the insert end the lower corner of the pilot insert bore. Middle and lower insert gaskets are the same size, however, the lower gasket is made of a softer material.

Figure 5. Series 8344, 3/4″ or 1″ NPT valve with 3/4″ orifice.

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