

Letter to N. C. Moseley from Tennessee Valley Authority dated May 16, 1975.  
This is a supplemental response.

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Reply to IEB - 75-03

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LB



831 Power Building  
TENNESSEE VALLEY AUTHORITY  
CHATTANOOGA, TENNESSEE 37401

May 16, 1975

Mr. Norman C. Moseley, Director  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Region II - Suite 818  
230 Peachtree Street, NW.  
Atlanta, Georgia 30303

Dear Mr. Moseley:

OFFICE OF INSPECTION AND ENFORCEMENT BULLETIN 75-03 - IE:II:NCM  
50-259, -260, -296, -327, -328, -390, -391, -438, -439 - BROWNS  
FERRY UNITS 1, 2, AND 3, SEQUOYAH, WATTS BAR, AND BELLEFONTE  
NUCLEAR PLANT UNITS 1 AND 2

This is in further response to your March 14, 1975, letter,  
which transmitted IE Bulletin 75-03 concerning Incorrect Lower  
Disc Spring and Clearance Dimension in Series 8300 and 8302 ASCO  
Solenoid Valves. An interim report was submitted on April 16, 1975.  
This is submitted as a final response to IE Bulletin 75-03.

The results of our investigation into this matter show that we do  
use Automated Switch Company (ASCO) valves of the type described in  
IE Bulletin 75-03 in safety-related systems.

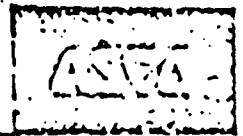
We have contacted ASCO concerning this problem and enclosed is their  
reply and recommended adjustment instructions. Each project will be  
furnished a copy of this information for inclusion in their inspection  
program. The program will be completed before the restart of Browns  
Ferry units 1 and 2 and before fuel loading for Browns Ferry unit 3.  
At Sequoyah, Watts Bar, and Bellefonte, the inspection will be  
included as part of the construction checks and will be completed  
before preoperational testing.

Very truly yours,

J. E. Gilleland  
Assistant Manager of Power

Enclosure

Automatic Switch Co.

Manufacturers of  
DEPENDABLE CONTROL  
Since 1883

RHAM PARK, NEW JERSEY 07932 • N.J. (201) 958-2000 / N.Y. (212) 344-3765

April 9, 1975

Tennessee Valley Authority  
400 Millers Building  
Knoxville, Tennessee 37902

Attention: H. C. Russell, Project Manager  
Browns Ferry

Subject: Inspection and Enforcement Bulletin 75-03 Dated  
March 14, 1975 Regarding Bulletin 8300 and 8302 Valves

Gentlemen:

We reviewed the Inspection and Enforcement Bulletin 75-03 and find the contents to be somewhat misleading in regard to the causes of a possible malfunction of this type valve.

We inspected Catalog HB8302C25F with Serial No. 96681R1 from the Point Beach Nuclear Plant and found it contained a lower disc spring stronger than specified. However, the actual cause of the malfunction was found to be insufficient clearance (gap between the lower surface of the lever and the lower disc when the valve was energized. When the clearance was adjusted to the minimum .008, the valves functioned normally in every respect. This may have occurred in this one case if the valve was serviced, that is, the lower disc replaced without checking the gap.

The reports of incorrect springs in the spare parts kits is misleading since the springs in the spare parts kits do not always match the color of the springs in some of the valves, especially if the valves are several years old. During the normal process of product improvement, the springs in some of the Bulletin 8300 and 8302 valves were changed to improve their operation in going to the energized position at the catalog maximum pressure rating. Spare parts kits include the current springs so that all valves serviced in the field will then contain springs the same as valves of current construction. The springs in the older valves need not be changed unless the valves are being completely rebuilt with spare parts kits.

For valves in service, the lower stroke can be checked per the attached I & M Sheet V5503, which is included in all spare parts kits. Another method is to remove the end cap, energize the valve and check the gap by using a piece of .008 sheet stock. This can be done during normal plant shutdown.

April 9, 1975

8300 and 8302 valves with suffix letters RF, RG or RU contain resilient seats. Inasmuch as rubber parts do age, we suggest they be replaced at least every three years. This does not apply to valves having metal-to-metal seating.

To provide longer life, we suggest all valves having an 'R' suffix letter in the catalog number be converted to metal-to-metal seating. This can be accomplished by installing a kit per the attached listing.

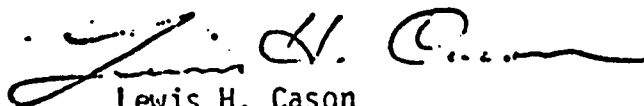
We suggest the following action be taken by licensees:

1. Confirm sufficient clearance of gap between the lever and the lower disc stem end is .008" to .016" on all valves on the attached list.
2. Licenses having valves with resilient seats (Suffix RF, RG, RU) on the attached list in service on safety related systems should supply the quantity of each catalog number and serial number including all letters. ASCO will supply, at no charge, the required parts to convert the valves to metal to metal seating at the next normal shut down. This conversion would provide greater life and less maintenance.

We trust the above will explain the problem, however, if any additional information is required, please contact us at (201) 956-2065.

Very truly yours,

AUTOMATIC SWITCH COMPANY



Lewis H. Cason  
Technical Service Specialist

LHC:jed

cc: U. S. Nuclear Regulatory Commission  
Mr. Vincent Thomal  
Mr. Jesse Crews  
ASCO Atlanta  
Nuclear Power Plants

April 9, 1975

ASCO 8300-8302 VALVES

(ALL D/C SERVICE & OTHER 8300 & 8302 CATALOG NUMBERS NOT APPLICABLE)

<u>VALVES WITH CATALOG NO. SUFFIX</u> <u>RF, RG OR RU (RESILIENT SEATS)</u>		<u>A/C</u> <u>SPARE PARTS KIT</u> <u>METAL-TO-METAL SEATS</u>
830080	830280	103-804
830081	830281	103-804
830082	830282	103-804
*830083	*830283	158-089
8300C3	8302C1	103-802
8300C6	8302C3	164-653
8300C9	8302C4	164-653
*8300A32	*8302A8	158-088
*8300A41	*8302A46	158-089
8300C55	8302C24	103-800
8300C58	8302C25	103-802
8300C61	8302C26	164-653
8300C64	8302C27	103-807
8300C68	8302C29	103-807
8300C72	8302C31	103-809
8300C76	8302C33	103-809
*8300A89	*8302A38	102-687
*8300A98	*8302A42	102-688
8300C102	8302C5	103-802
*8300A203	*8302A203	102-687
*8300A204	*8302A204	102-688
*8300A403	*8302A403	102-647
*8300A404	*8302A404	102-648

\* - Steel or stainless steel bodies, all others brass.

1. Only above valves need be checked for proper lower disc clearance. All other 8300 or 8302 catalog numbers are O.K.
2. Any of above valves having only Suffix F, G or U are metal-to-metal seating.
3. Above valves with Suffix RF, RG or RU have resilient seats and can be converted to metal-to-metal seating by installing kit listed.

LHC:jed

# MAINTENANCE INSTRUCTIONS

## 3-WAY DIRECT ACTING SOLENOID VALVES

8302  
8315

### DESCRIPTION

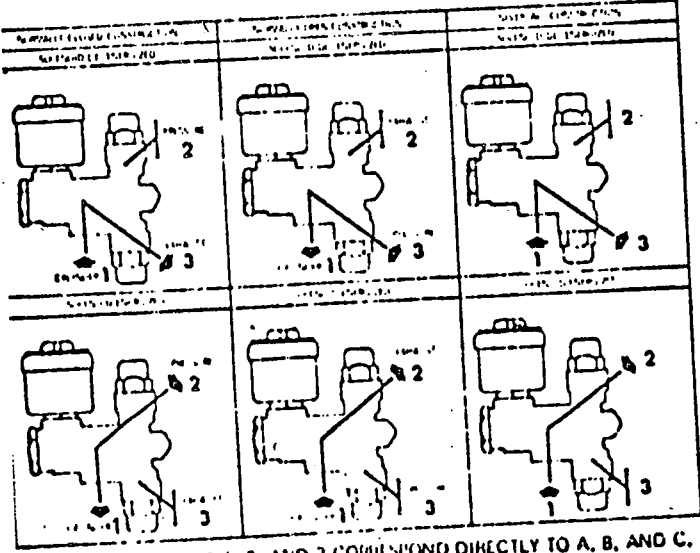
Bulletins 8300, 8302 and 8315, 3-way direct acting solenoid valves, only four moving parts, a core, a lever and two poppet type valve. Bulletin 8315 valves are identical to Bulletin 8300 valves except high temperature coil and high temperature baskets for use on service. Standard valves are supplied with stainless steel seats and However, Bulletin Nos. 8300 and 8302 only can be supplied with ant seats and stainless steel discs. Two types of bodies are supplied, the larger version with 1/8", 1/4" and 3/8" N.P.T. connections (Type '37') and the smaller version with 3/8" and 1/2" N.P.T. connections (Type '38'). The standard valves have a General Purpose, Type 1 Solenoid Enclosure. Valves may also be equipped with a watertight enclosure which is designed to meet NFMA Type 4 - Watertight, Class I, Group C or D and Class II, Group E, F or G.

### OPERATION

- Normally Closed (Suffix Letter 'F') (Refer to Figure 1)**  
Solenoid De-energized: Flow is from Cylinder Connection (1) to Exhaust Connection (3). Pressure Connection (2) is closed.  
Solenoid Energized: Flow is from Pressure Connection (2) to Cylinder Connection (1). Exhaust Connection (3) is closed.
- Normally Open (Suffix Letter 'G') (Refer to Figure 1)**  
Solenoid De-energized: Flow is from Pressure Connection (3) to Cylinder Connection (1). Exhaust Connection (2) is closed.  
Solenoid Energized: Flow is from Cylinder Connection (1) to Exhaust Connection (2). Pressure Connection (3) is closed.
- Universal (Suffix Letter 'U') (Refer to Figure 1)**  
Solenoid De-energized: Flow is from Connection (3) to Connection (1). Connection (1) to Connection (3). Connection (2) is closed.  
Solenoid Energized: Flow is from Connection (1) to Connection (2) or Connection (2) to Connection (1). Connection (3) is closed.

**NOTE:** Operation forms are identified by catalog suffix letters as follows:  
 Suffix Letter 'F' - Normally Closed Construction  
 Suffix Letter 'G' - Normally Open Construction  
 Suffix Letter 'U' - Universal Construction  
 Normally closed (F) and normally open (G) valves cannot be used for a different form unless internal parts are changed. Universal valves ('U') may be used for any form without internal changes.

**IMPORTANT:** No minimum operating pressure is required.



NOTE: PORT MARKINGS 1, 2, AND 3 CORRESPOND DIRECTLY TO A, B, AND C.

Figure 1.

### MANUAL OPERATOR (Optional) (Refer to Figure 7)

#### DESCRIPTION

Valves with suffix 'MO' after catalog number are provided with a manual operator which allows operation when desired or during an interruption of electrical power.

#### OPERATION

To actuate valve manually, push knob upward and rotate one half (1/2) turn. Valve will now be in same position as when solenoid is energized. To disengage manual operator, rotate manual operator approximately one half (1/2) turn until guide pin in manual operator stem engages slots in stuffing box bonnet and drops down.

**CAUTION:** For valve to operate electrically manual operator stem must be fully retracted.

#### INSTALLATION

Check nameplate for correct catalog number, pressure, voltage and service.

#### POSITIONING

Valve must be mounted with the solenoid vertical and upright.

#### PIPING (Refer to Figure 1)

Connect piping to valve according to markings on the valve body and the form of flow indicated by the suffix letter ('F', 'G' or 'U') following the valve catalog number on the nameplate. Refer to flow diagram provided. Apply pipe compound sparingly to male pipe threads only. If applied to valve threads it may enter valve and cause operational difficulty. Pipe strain should be avoided by proper support and alignment of piping. When tightening pipe, do not use valve as a lever.

**IMPORTANT:** For protection of the solenoid valve install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Periodic cleaning is required depending on the service conditions. See Bulletins 8600, 8601 and 8602 for strainers.

#### WIRING

Wiring must comply with Local and National Electrical Codes. For valves equipped with an explosion-proof, watertight enclosure (NFMA 4, 7 and 9) the electrical fittings must be approved for use in the approved hazardous locations. Housings for all solenoids are made with connections for 1/2 inch conduit. The general purpose enclosure (NFMA 1) may be rotated to facilitate wiring by removing the retaining cap. After rotating to the desired position, be certain to replace cap before operating.  
**NOTE:** Alternating Current (A-C) and Direct Current (D-C) Solenoids are built differently. To convert from one to the other, it is necessary to change the complete solenoid and not just the coil.

#### SOLENOID TEMPERATURE

Standard valves 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 for only an instant. This is a safe operating temperature. Any excessive heat will be indicated by the smoke and odor of burning coil insulation.

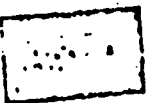
#### MAINTENANCE

**WARNING:** Turn off electrical power and line pressure to valve before making repairs. It is not necessary to remove valve from pipe line for repairs.

#### CLEANING

A periodic cleaning of all solenoid valves is desirable. The time between cleanings will vary, depending on the media and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation or excessive leakage will indicate that cleaning is required.

ASCO Valves



operate the valve periodically to insure proper opening and closing. Periodic inspection (depending on media and service conditions) of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

## PROPER OPERATION

**Control Circuit:** Check the electrical system by energizing the solenoid. A metallic click signifies solenoid is operating. Absence of the click indicates loss of power supply. Check for loose or blown-out fuses, open-circuited or grounded coil, broken lead wires or loose connections.

**Worn-Out Coil:** Check for open-circuited coil. Replace coil if necessary.

**Low Voltage:** Check voltage across the coil leads. Voltage must be at least 85% of nameplate rating.

**Incorrect Pressure:** Check pressure at the solenoid valve. Pressure at the valve must not exceed that stamped on nameplate.

**Incorrect Pressure Connection:** Refer to valve catalog suffix letter in nameplate and flow diagram (Figure 1).

**Excessive Leakage:** Disassemble valve and clean all parts and passageways. Leakage between the seats and discs is usually caused by bedding of foreign material on the valve seating surfaces. The foreign material, though not present upon examination, may have damaged the seating surfaces enough to cause leakage.

**Leakage thru the stainless steel (metal to metal) seats can usually be corrected by regrinding and lapping (see section on grinding and lapping). If leakage should still exist, the seating surfaces may be worn more than grinding and/or lapping can correct. In that case, replace both seats and discs. NOTE: New seats and discs must be checked and adjusted for proper stroke where necessary. See section on seat and disc installation.**

**Leakage thru resilient seats can only be corrected by installing new seat assemblies. When new seats are installed, the strokes must be rechecked and adjusted where necessary. See section on seat and disc installation.**

## SOLENOID REPLACEMENT (Refer to Figure 4)

Turn off electrical power. Disconnect coil lead wires.

Remove retaining cap, retaining clip, nameplate and solenoid cover. Slip yoke containing coil, sleeves and insulating washers off the solenoid base sub-assembly. NOTE: Insulating washers are omitted when molded coil is used. In some D-C Constructions, a single flux plate over the coil replaces yoke, sleeves and insulating washers. Reassemble in reverse order of disassembly.

**CAUTION:** The solenoid must be fully reassembled as the housing is closed and completes the magnetic circuit. Be careful to place insulating washers at each end of the coil if required.

## VALVE DISASSEMBLY (Refer to Figure 4)

Depressurize valve and turn off electrical power.

Solenoid may be removed intact by loosening and removing solenoid base sub-assembly.

Remove end cap and end cap gasket.

Slip core off end of valve lever and lift out thru solenoid base sub-assembly opening.

Remove honnet gasket.

Unscrew disc guide caps (both ends). Remove disc guide cap gaskets (both ends), upper and lower springs and upper and lower discs. CAUTION: Tag springs and discs. They are not interchangeable and must be returned to original locations.

Remove upper and lower seats using a thin wall socket wrench. CAUTION: Tag seats as they are not interchangeable and must be returned to original locations.

Remove pin bearing screw and bearing gasket.

Slide valve lever out thru end cap opening of valve body.

All parts and passageways are now accessible for cleaning and/or replacement. Replace worn or damaged parts with a complete "Spare Parts Kit" for best results.

## VALVE REASSEMBLY (Refer to Figure 4)

Clean all parts and passageways thoroughly.

Reassemble valve in reverse order of disassembly. Parts must be installed in the same cavity that they were removed from. NOTE: Refer to sections on "New Seat and Disc Installation", "Grinding/Lapping Seats and Discs" and "New Spring Installation" where applicable.

Lubricate all rubber parts (gaskets) with Dow Corning's Valve Seal or equivalent silicone grease.

1. Unscrew disc guide caps (both ends). Remove disc guide cap gaskets (both ends), upper and lower springs and upper and lower discs. CAUTION: Tag springs and discs. They are not interchangeable and must be returned to original locations.
2. Apply a small amount of fine grinding compound to the beveled seating surface of the disc and insert the disc in the proper valve seat (do not remove valve seat from body) (a fine grade of grinding compound grit size 900 is recommended).
3. Use a screwdriver in the slot provided in the disc and grind by rotating the disc back and forth using light pressure. After an evenly lapped surface has been obtained, repeat the grinding operation on the other disc.
4. Wipe all parts clean of grinding compound.
5. Reassemble parts in reverse order of removal replacing discs and springs in original positions. Be sure the shorter disc and weaker spring are located at the bottom (Connection '3'). If discs or springs are incorrectly reassembled the valve will not function properly. To determine which spring is the weaker, consult paragraph on New Spring Installation.

## NEW SPRING INSTALLATION (Refer to Figures 2 & 3)

When it is desired to change to a different form of flow or operating conditions, new upper and lower springs corresponding to the new requirements must be installed. Also, if the springs have relaxed from repeated flexing they should be replaced.

Depressurize valve. Remove the two disc guide caps and old springs. Install new springs in their proper location as indicated on the factory labeled tags and replace disc guide caps. The smaller diameter end of the Type '38" springs faces the discs.

**NOTE:** The lower spring is always the weaker of the two and should always be located at the bottom (Connection '3'). If the springs are installed in the wrong position the valve will not function properly.

A method to determine which spring is the weaker is by placing the two springs on the shaft of a screwdriver or similar tool and compressing them. The spring which compresses to the 'L' dimension (Figure 2) first is the weaker of the two springs and should be placed on the bottom.

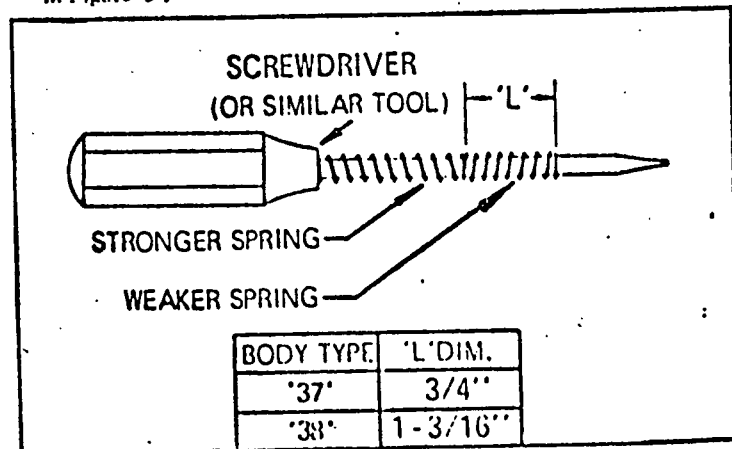
## NEW SEAT AND DISC INSTALLATION

(Refer to Figures 3, 5 & 6)

Depressurize valve.

New seats and discs cannot be installed without making some minor adjustments. It is important that the stroke of the valve discs be set carefully in order to obtain proper orifice opening and reliable operation of the valve.

1. Remove the two disc guide caps, disc guide cap gaskets, upper and lower springs, upper and lower discs and upper and lower seats. Use a thin walled socket wrench to remove the seats.
2. Install new seats. A small amount of pipe compound should be used on the seat threads to avoid possible leakage.
3. With the valve in the de-energized position, install a new upper disc and using a depth gage measure the distance 'A' from the top of the valve body to the top of the upper disc as illustrated in Figure '5'.
4. Energize the solenoid or hold the valve in the energized position by lifting up the core. Do not disassemble the solenoid base sub-assembly from the valve body. Remove the end cap and lift the core thru end cap opening until it seats solidly in solenoid base sub-assembly. With the valve in the energized position measure the distance 'B' from the top of the valve body to the top of the upper disc as illustrated in Figure '5'.



METHOD TO DETERMINE WEAKER SPRING

Figure 2.

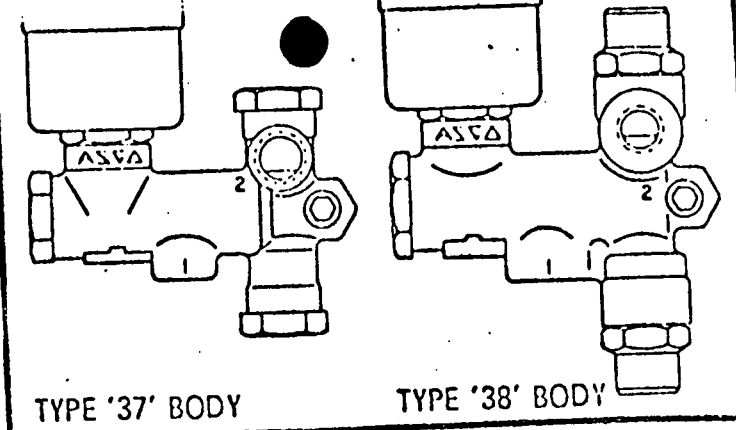
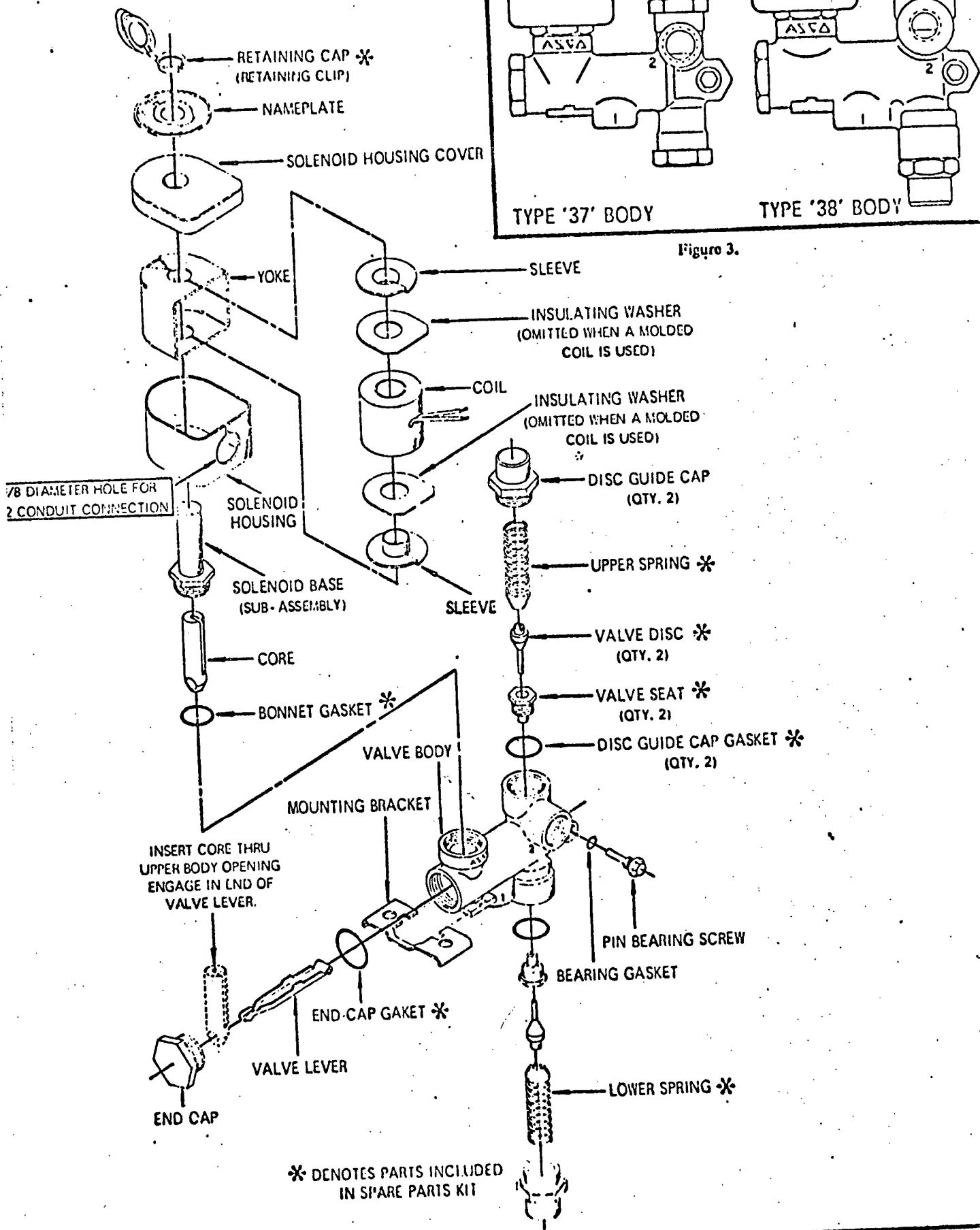


Figure 3.

Figure 4.



size and body type, the small diameter end of the disc must be ground out until the proper stroke is obtained. After grinding, the end of the disc stem must be rounded slightly and polished smooth.

Follow the same procedure used in setting the upper disc stroke to set the lower disc stroke 'C'-'D'. Refer to Figure 5 and Figure 6 (table). After setting both upper and lower strokes check for clearance between the upper disc and valve lever when the solenoid is de-energized. Also check for clearance between the lower disc and valve lever when the solenoid is energized. This clearance should be approximately 1/64 (.016) inch.

The discs must be ground/lapped to the seats to obtain tight seating on the stainless steel construction. (Do not grind/lap seat on resilient construction.) See section on grinding/lapping of seats and discs. Reassemble parts in reverse order of disassembly. Refer to section on valve reassembly.

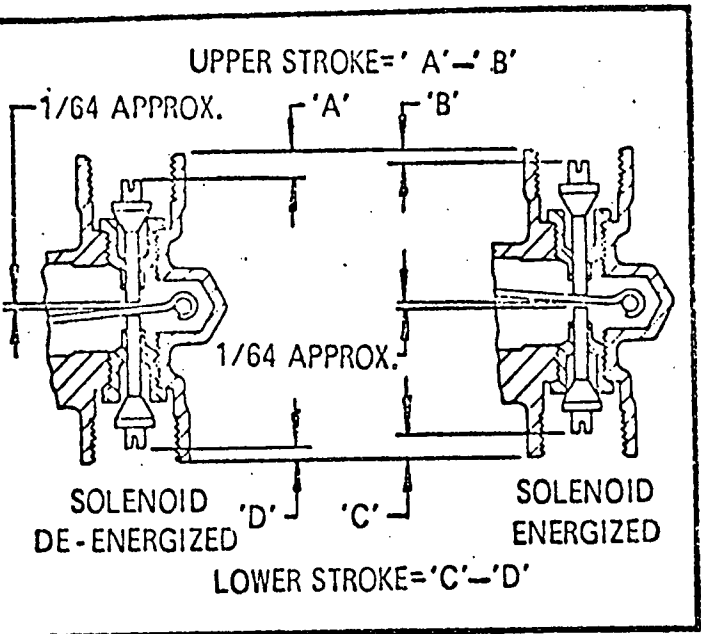


Figure 5.

Constr.	ORIFICE	TYPE BODY (Ref to Fig. 5)	A - C STROKES		D - C STROKES	
			Upper Disc	Lower Disc	Upper Disc	Lower Disc
Stainless Steel Seats	1/8	37	.062 ± .010	.047 ± .010	.047 + .010	.031 + .010
				-.005	-.005	-.005
	3/16	37	.062 ± .010	.047 ± .010	.047 + .010	.031 + .010
				-.005	-.005	-.005
	3/16	38	.072 ± .010	.058 ± .010	.072 ± .010	.058 ± .010
	1/4	37	.062 ± .010	.047 ± .010	.047 + .010	.031 + .010
			-.005	-.005	-.005	
1/4	38	.072 ± .010	.058 ± .010	.072 ± .010	.058 ± .010	
5/16	38	.072 ± .010	.058 ± .010	.072 ± .010	.058 ± .010	
3/8	38	.101 ± .010	.078 ± .010	.072 ± .010	.058 ± .010	
Resilient Seats	3/16	37	.062 ± .010	.047 ± .010	.047 ± .010	.031 ± .010
	1/4	37	.052 ± .010	.040 ± .005	.060 + .005	.045 + .005
					-.010	-.010
5/16	38	.072 ± .010	.058 ± .010	.072 ± .010	.058 ± .010	

Figure 6.

To actuate valve manually, turn knob upward and rotate one half (1/2) turn. Valve will now be in the position as when solenoid is energized. To disengage manual operator, rotate manual operator approximately one half (1/2) turn until guide pin in manual operator stem engages slots in stuffing box bonnet and drops down.

**CAUTION:** For valve to operate electrically manual operator stem must be fully retracted.

**MANUAL OPERATOR DISASSEMBLY AND REASSEMBLY**  
(Refer to Figure 7)

1. Unscrew stuffing box bonnet from valve body. (Be certain manual operator stem is fully retracted.) Remove the manual operator intact.
2. Remove gasket from stuffing box bonnet.
3. Press or drive out knob/stem pin from operating knob and stem. **CAUTION:** When removing (knob/stem) pin from knob/stem sub-assembly do not let parts fly apart.
4. Remove spring and slide stem out of stuffing box bonnet. **CAUTION:** Before sliding stem thru stuffing box bonnet be certain there are no burrs on stem from removing knob/stem pin. Do not damage captive gasket seal ('O' ring) in stuffing box sub-assembly.
5. All parts are now accessible for cleaning and/or replacement. Replace worn or damaged parts with a complete "Spare Parts Kit" for best results.
6. Reassemble in reverse order of disassembly paying careful attention to exploded view provided.

**SPARE PARTS KITS**

Spare parts Kits and Coils are available for ASCO valves. Parts marked with an asterisk (\*) are included in Spare Parts Kits.

**ORDERING INFORMATION FOR SPARE PARTS KITS**

When Ordering Spare Parts Kits or Coils Specify Valve Catalog Number, Serial Number and Voltage.

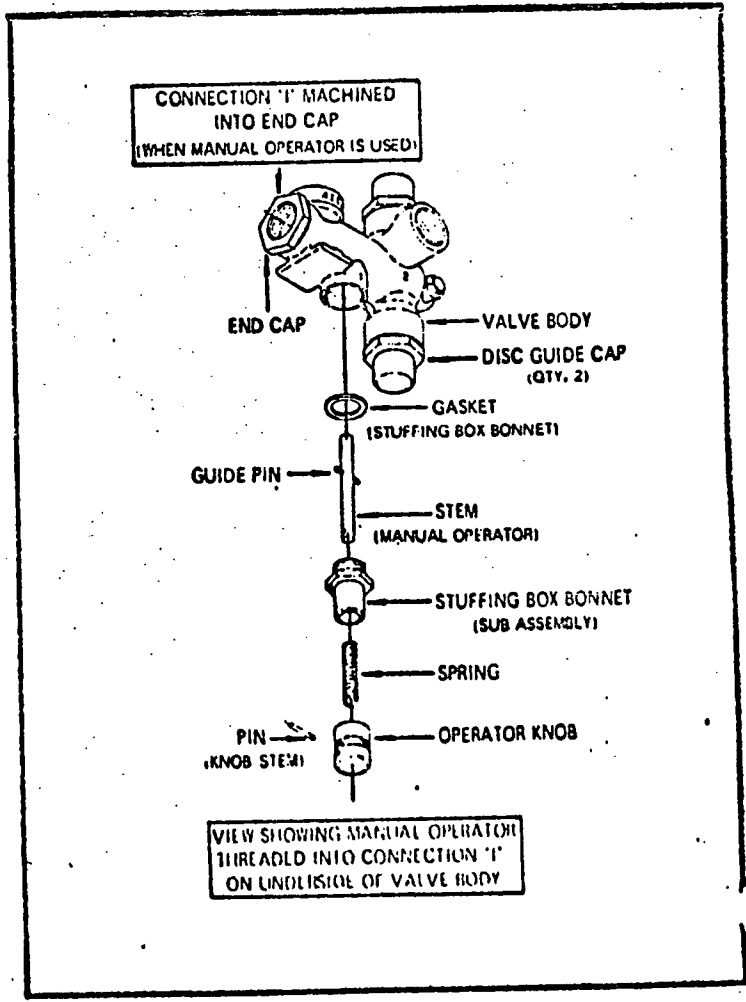


Figure 7.

**MANUAL OPERATOR**