
Hersey

BACKFLOW PREVENTER

MAINTENANCE MANUAL

BEECO REDUCED PRESSURE PRINCIPLE
BACKFLOW PREVENTERS

MODELS 6,6C,10 AND 12



BEECO AND HERSEY
DOUBLE CHECK VALVE ASSEMBLIES

MODELS VC AND NO. 1

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(Beeco Reduced Pressure Principle Backflow Preventers)

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OPERATION AND INSTALLATION INSTRUCTIONS

BEECO REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTERS

DESCRIPTION (see Fig. 1)

The BEECO Reduced Pressure Principle Backflow Preventer operates on the principle that water will not flow from a zone of lower pressure to one of higher pressure. It provides protection against backflow caused by both backpressure and backsiphonage.

The device consists of two spring-loaded check valves (A and B) and a spring-loaded, diaphragm-actuated differential pressure relief valve (C) located in the zone between the check valves.

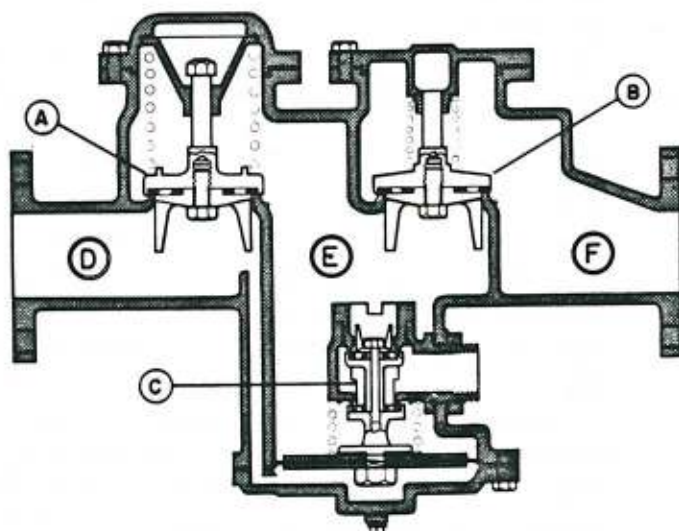


FIGURE 1
3" MODEL 6C BEECO DEVICE ILLUSTRATED

NORMAL OPERATION

The first check valve (A) causes all water passing through it to be automatically reduced in pressure by approximately 8 psi.

The second check valve (B) is lightly spring-loaded and forms the "double check" feature of the device. It acts to prevent unnecessary drainage of the domestic system in case a backflow condition occurs.

The relief valve (C) is spring-loaded to remain open, and diaphragm actuated to close by means of differential pressure.

To illustrate the operation, assume water, having a supply pressure of 60 psi, is flowing in a normal direction through the device. If all valves beyond area F are closed, creating a static condition, the water pressure in area D will be 60 psi and water pressure between the check valves (E) will be 52 psi.

The inlet pressure of 60 psi is transmitted through a cored passageway to the underside of the diaphragm of the relief valve (C). This valve is spring-loaded to remain in an open position until the differential pressure amounts to approximately 4 psi across the relief valve.

During normal operation, therefore, the 8 psi differential pressure produced by the first check valve (A) exceeds the spring-loading of the relief valve (C) and causes the relief valve (C) to remain closed.

BACKFLOW

There are two conditions that tend to produce backflow:

Backsiphonage – where the pressure in the drinking water system becomes less than atmospheric due to a vacuum or partial vacuum in that system.

Backpressure – where the pressure in the non-potable system exceeds that in the drinking water system.

BACKSIPHONAGE

As the supply pressure drops in area D, it also drops in the area below the diaphragm of the relief valve (C). When the pressure differential across the diaphragm decreases to approximately 4 psi, the relief valve (C) will start to open. This happens because the spring above the diaphragm of the relief valve (C), which is trying to force the valve open, is designed to compress with a differential pressure of 8 psi. When that differential is decreased to 4 psi, the spring will extend and cause the relief valve (C) to start to open.

This spring-loaded relief valve is designed to eliminate intermittent discharges and "spitting" with normal minor fluctuations in the line pressure.

As the supply pressure continues to drop, the relief valve (C) automatically continues to drop, the relief valve (C) automatically continues to drain and, regardless of the pressure on the supply side, approximately 4 psi less pressure will be maintained between the check valves (zone E). This will cause continual drainage which will be readily visible at the drain outlet.

BACKPRESSURE

Assume that pressure at the discharge side (F) increases to 80 psi, while the supply pressure (D) remains at 60 psi:

1. *If the second check valve (B) does not leak,* water under higher pressure in area F will not enter the area between the check valves (zone E), and the pressure in this zone will remain at 52 psi. Under these conditions, the relief valve (C) will remain closed since the 8 psi differential pressure is still being maintained between the supply pressure (area D) and the area of reduced pressure between the check valves (zone E).

2. *If the second check valve (B) does leak,* water under high pressure (area F) will flow into zone E. If the pressure in this zone increases to approximately 56 psi – still 4 psi lower than the supply pressure (area D) – the relief valve will start to open and discharge this reversely flowing water to atmosphere, maintaining the pressure in zone E approximately 4 psi lower than supply pressure. The relief valve will automatically continue to drain as long as this backflow condition exists and as long as the second check valve (B) is leaking.

If for any reason the first check valve (A) should leak during a shutoff beyond area F, the water under higher pressure in area D will leak into zone E. This will cause the relief valve to open as previously described and, again, provide visual indication at the drain outlet.

In the unlikely event that the relief valve diaphragm should rupture, an unbalanced condition between area D and zone E will occur, and the relief valve will immediately discharge to atmosphere.

INSTALLATION – GENERAL COMMENTS

A. WARM CLIMATE ABOVE GROUND INSTALLATION (Fig. 2)

Reduced pressure backflow preventers should be installed only where there is adequate drainage. At no time should they be placed where any part of the unit could be submerged in standing water.

The most satisfactory installation is above ground. This type of installation is recommended wherever practical. Support should be provided for the larger sizes (3" and up). A concrete slab under the unit is sometimes desirable.

Normally, any discharge from the relief valve is spilled onto the ground through the drain elbow. Drainage may be piped away from the location, in which case an air gap should be used between the relief valve port elbow and the drain line.

B. COLD CLIMATE INDOOR INSTALLATION (Fig. 3)

In climates where freezing conditions are likely or where it is impractical to install the backflow preventer above ground, the installation should be made in an easily accessible location inside a building.

The unit should be placed above the floor at a distance great enough to allow clearance for repair work. If the backflow preventer is positioned against a wall, care should be taken to be sure that the four test cocks are easily accessible. Proper drainage should be provided for the relief valve. An air gap should be used between the relief valve outlet and the drain line if drainage is to be piped away.

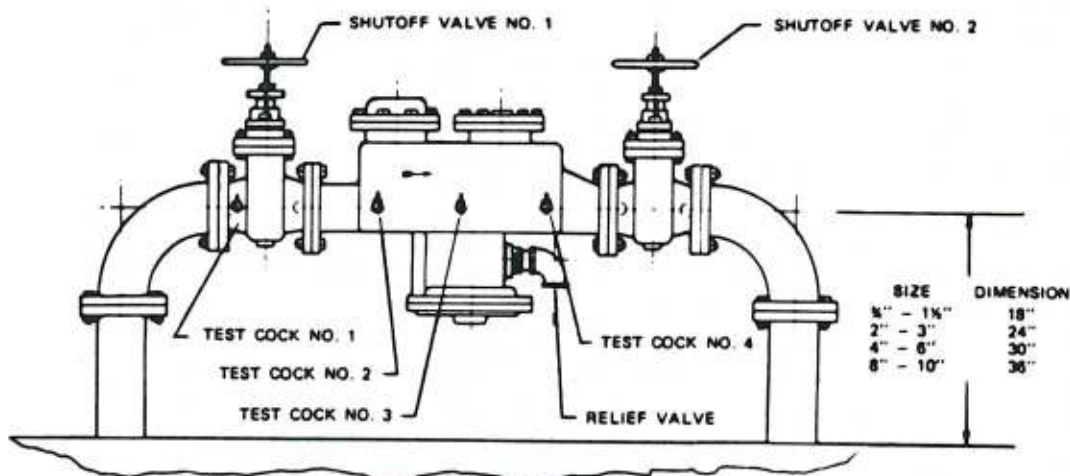
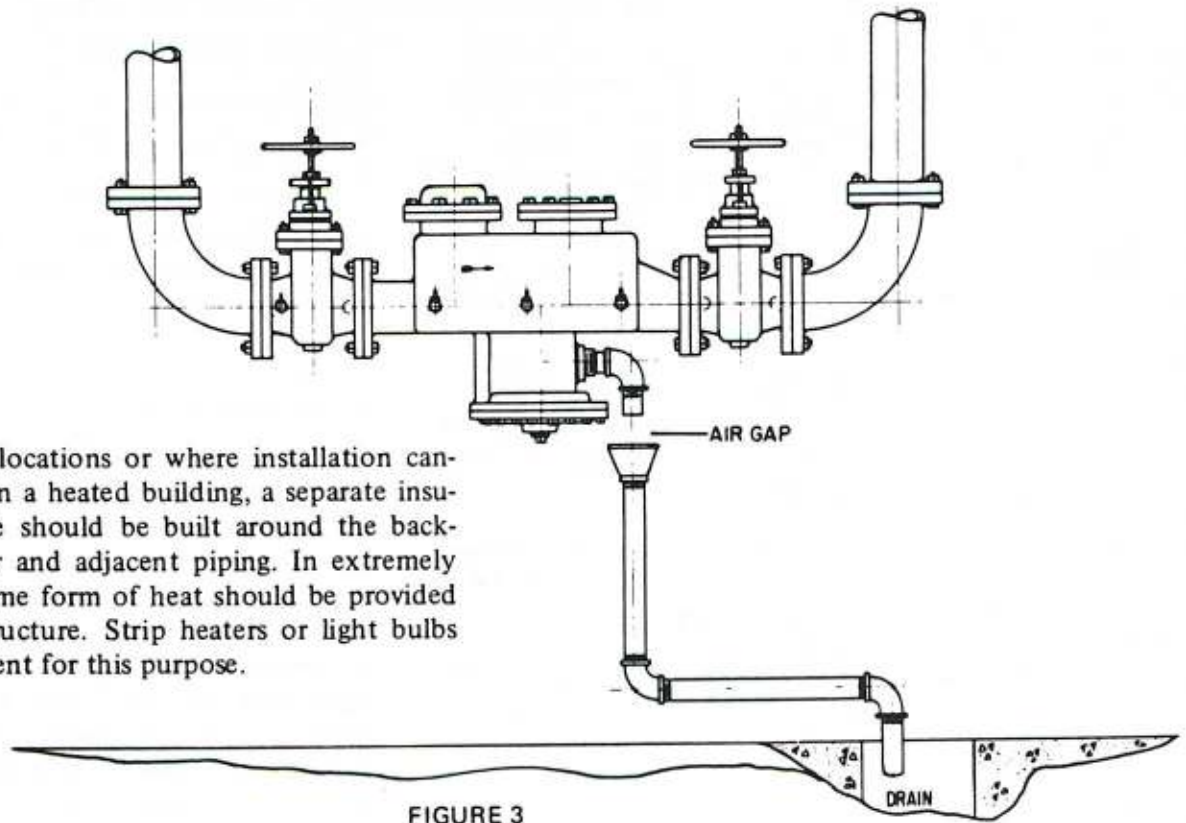


FIGURE 2
ABOVE GROUND INSTALLATION



In remote locations or where installation cannot be made in a heated building, a separate insulated structure should be built around the backflow preventer and adjacent piping. In extremely cold areas, some form of heat should be provided within the structure. Strip heaters or light bulbs may be sufficient for this purpose.

FIGURE 3
INDOOR INSTALLATION

C. MODIFIED PIT INSTALLATION (Fig. 4)

Unless absolutely necessary, it is strongly recommended that backflow preventers *not* be placed in pits. In the event installation must be made in a pit, the modified pit type installation (Fig. 4) is preferable. The relief valve drain should be piped to the outside of the vault and discharged no less than 12" above the grade line.

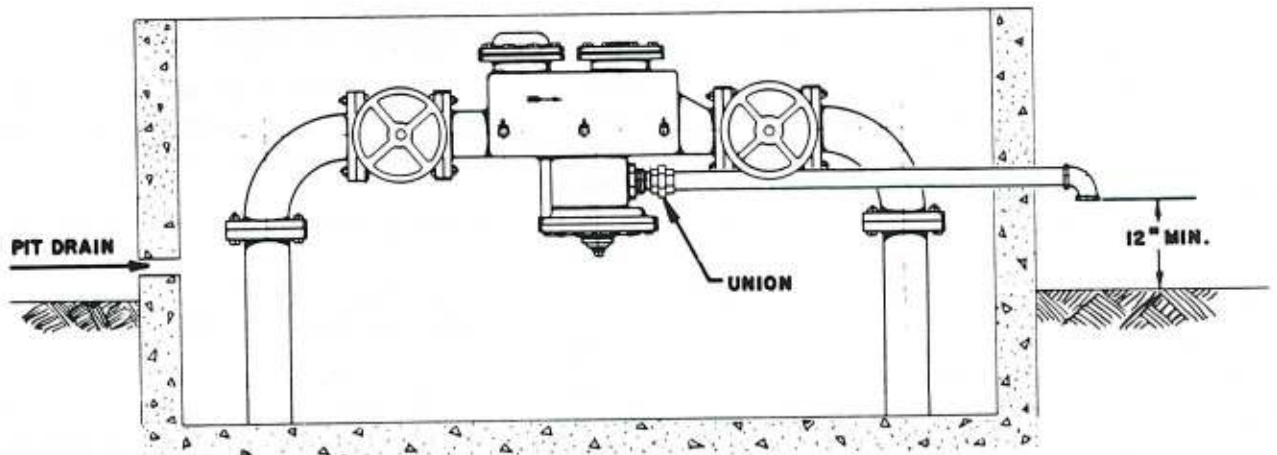


FIGURE 4
MODIFIED PIT INSTALLATION

BEECO REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTERS

INSTALLATION – SPECIFIC PROCEDURES

GENERAL INSTRUCTIONS

1. Devices should be installed in an accessible location to facilitate testing and repairs.
2. Devices should be installed in a horizontal position above the ground or floor level as shown in Figure 2.
3. In no case should the relief valve discharge be solidly piped into a sump, sewer, drainage ditch, etc.
4. If not already provided, shut off valves should be installed at each end of the device so that it can be tested and maintained.
5. BEFORE INSTALLING THE DEVICE, PIPELINES SHOULD BE THOROUGHLY FLUSHED TO REMOVE FOREIGN MATERIAL.
6. After installation, *with flow through the device*, continual discharge from the relief valve opening usually indicates that there is foreign material holding the relief valve open. To remove foreign material, flush relief valve as follows:
 - a. Close inlet shutoff valve.
 - b. Open test cock No. 2 Relief valve should fully open and discharge.
 - c. Close test cock No. 2.
 - d. Open inlet shutoff valve.If relief valve continues to leak, repeat procedure. If flushing does not stop discharge with flow through the device, close shutoff valves, remove and clean the relief valve.
7. After installation, *with no flow through the device* (inlet shutoff valve open, outlet shutoff valve closed) continual discharge from the relief valve indicates a leaking first check valve, probably caused by foreign material under the seat. If flushing (substantial flow through the device) will not clear the device, close shutoff valves, remove and clean the first check valve.
8. Occasional "spitting" or momentary discharge from the relief valve can be expected, if line pressure drops approximately 4 psi, due to operation of flushometers, quick opening valves, or similar devices and valves.

REPAIR PROCEDURES

INTRODUCTION

A. GENERAL COMMENTS

Usually, it is possible to determine which internal subassemblies require maintenance by observing or testing the backflow preventer. Complete subassemblies, where time is limited, may be installed.

B. RUBBER PARTS

Check valve discs are made of soft neoprene; relief valve discs of a harder, or less resilient, neoprene. Two thicknesses of neoprene – coated duck are used for the relief valve diaphragm (except for the 3/4" Model 12 which has a single thickness). Rubber parts should be replaced every five years, or sooner if necessary. These include two check valve discs, two relief valve discs, one or two cover plate gaskets (on models equipped with cover plates), relief valve housing gasket, clamp bolt gasket (1" – 6" sizes), upper and lower seat gaskets (8" and 10" sizes) and relief valve diaphragm (set of 2 except 1 on 3/4" Model 12).

C. SPRINGS

Springs rarely require replacement. However, it is advisable to inspect springs for corrosion, pitting or breakage.

D. VALVE SEATS

Check valve and relief valve seats should be smooth and clean. The rubber valve discs will seal properly on seats with minor imperfections. If seats are worn considerably, pitted or corroded, they should be replaced or refaced.

E. OTHER WORKING PARTS

Inspect disc holders, spacers, and valve guides for evidence of excessive wear or corrosion. Replace worn or corroded parts.

REPAIR PROCEDURE – MODEL 6C

A. REPLACEMENT OF MAIN VALVE RUBBER DISC (See Figs. 5, 6, 7, 8, 9).

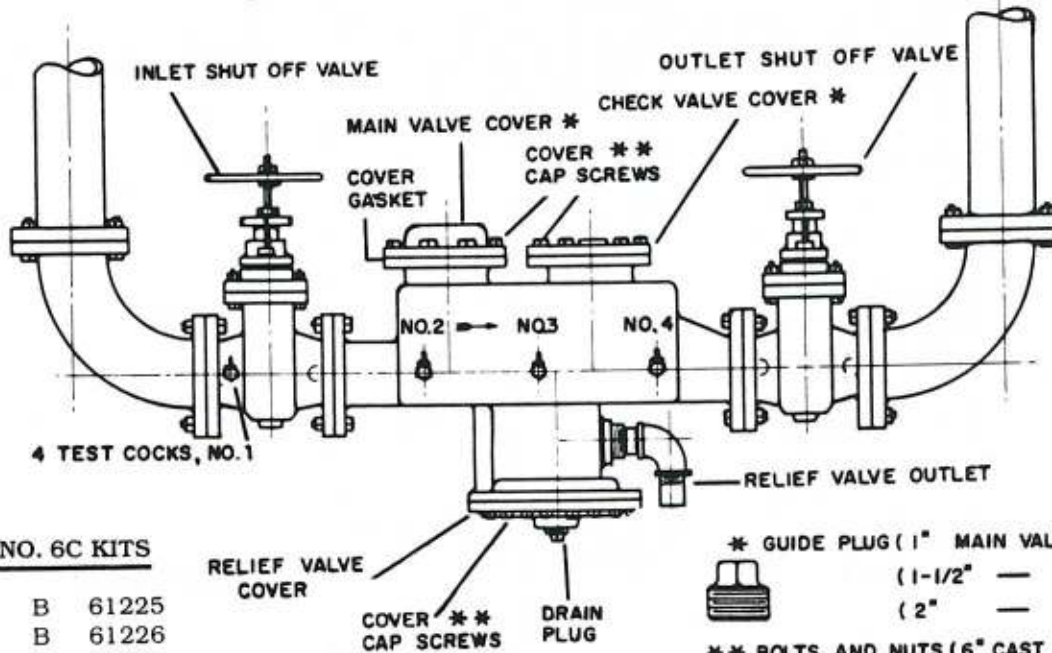
1. Close inlet and outlet shutoff valves.
2. Open test cocks 2, 3, 4, to release pressure and drain the backflow preventer.
3. Remove cover cap screws or bolts and nuts,

valve cover and cover gasket or guide plug (1" size). Remove spring (1" size) (3). Caution! Valve spring exerts force directly against plug.

4. Remove main valve assembly (Fig. 7).
5. Remove disc cap screw (1" and 1-1/2" sizes) (7B) or stud nut (2" - 10" sizes) (8). This releases the guide (6A) and guide

washer (8" - 10" sizes) (6B) from disc holder (1" - 6") (4A, 4B), or from disc holder assembly (8", 10") (4C). Stem (8" and 10" sizes) (9) can also be replaced, if necessary (see Fig. 8).

6. Replace disc (5) and reassemble valve guide (6A) to disc holder (4A, 4B) or disc holder assembly (4C).



MODEL NO. 6C KITS

1"	B	61225
1 1/2"	B	61226
2"	B	61227
2 1/2"	B	61228
3"	B	61229
4"	B	61230
6"	I	61231
6"	B	61232
8"	I	61233
10"	I	61234

FIGURE 5
TYPICAL ASSEMBLY (1" - 6" SIZES) - BEECO MODEL 6C DEVICE

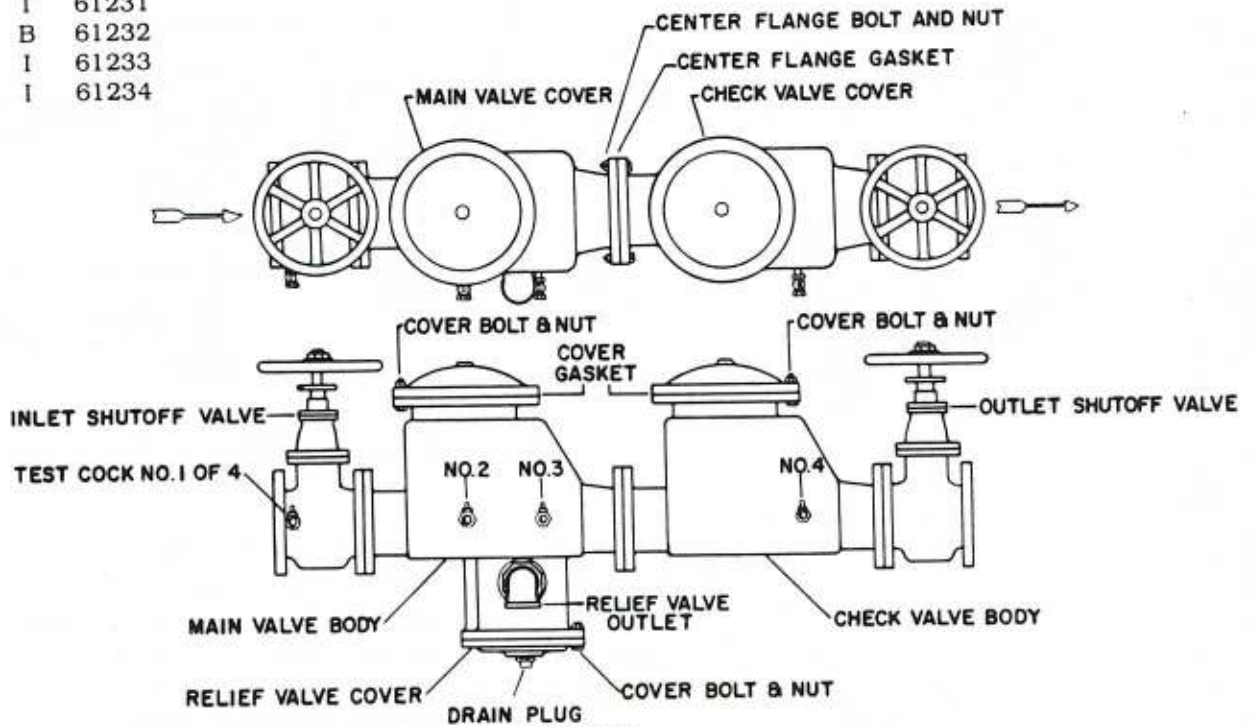


FIGURE 6
TYPICAL ASSEMBLY (8", 10" SIZES) - BEECO MODEL 6C DEVICE

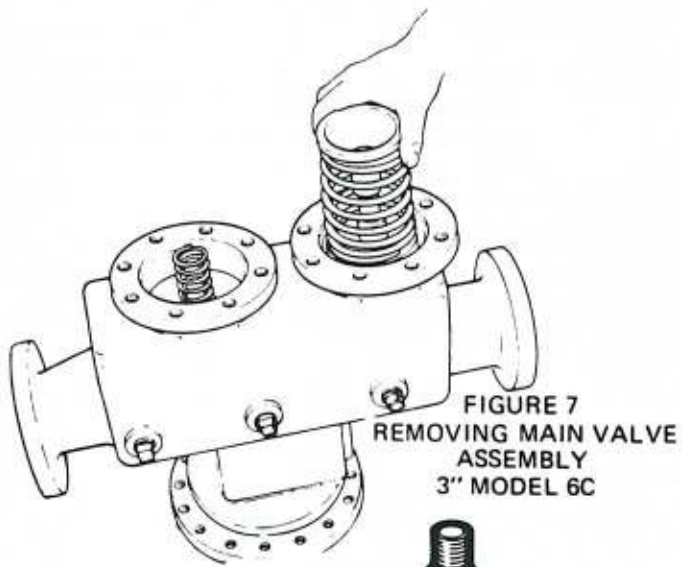


FIGURE 7
REMOVING MAIN VALVE
ASSEMBLY
3" MODEL 6C

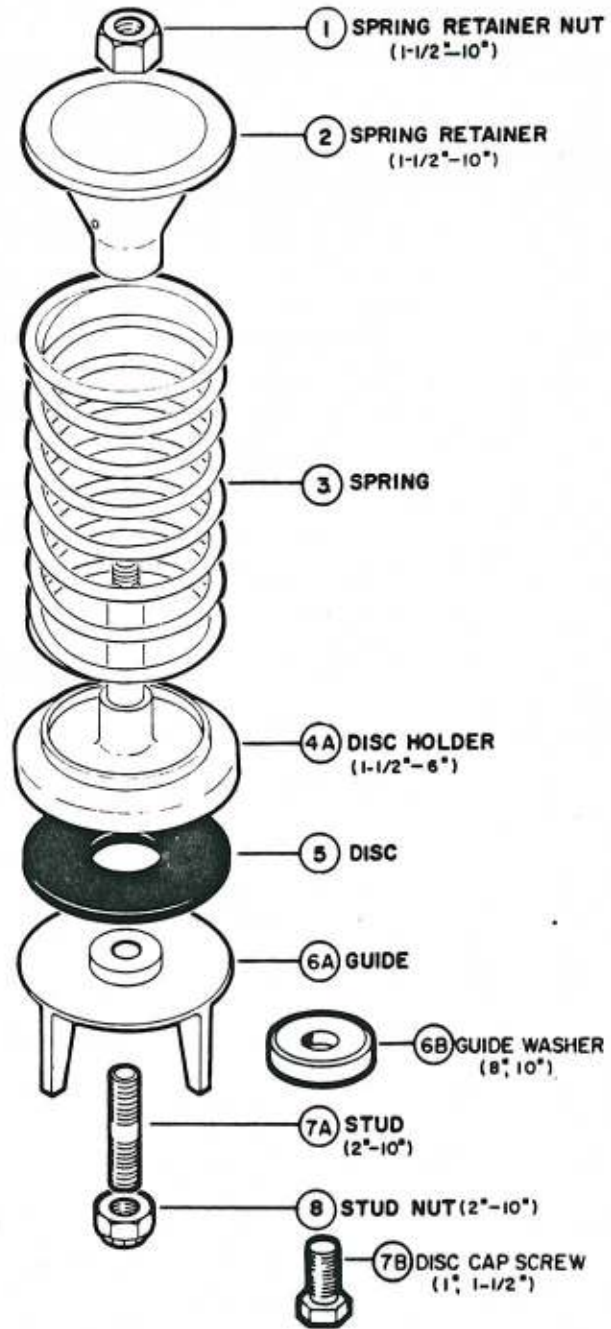
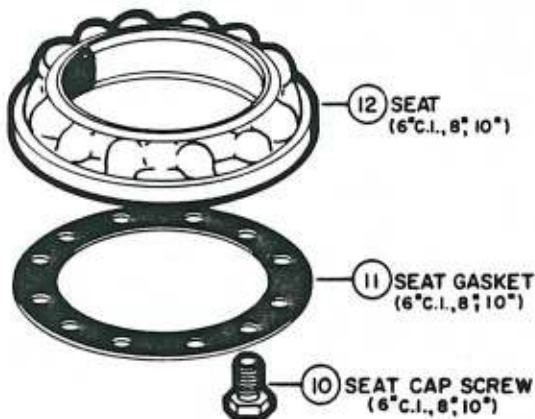
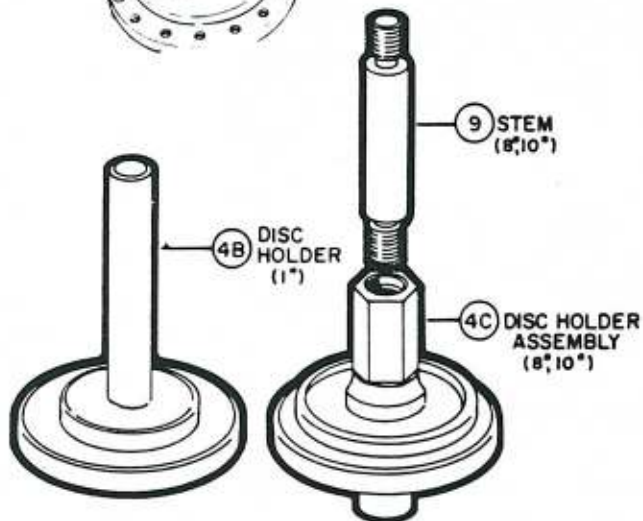


FIGURE 8
TYPICAL MAIN VALVE ASSEMBLY - BECO MODEL 6C

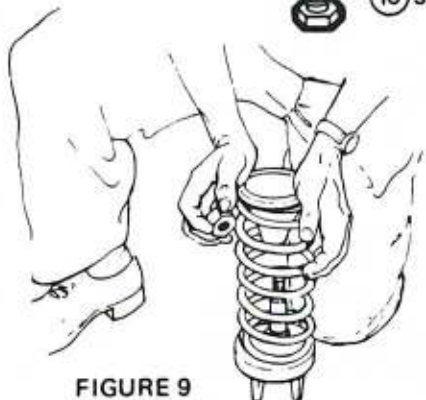


FIGURE 9
REMOVING MAIN VALVE SPRING
(1-1/2" - 3" MODEL 6C)

7. To replace seat gasket (6" CI, 8", 10" sizes), remove seat cap screws (10), seat gasket (11), and seat (12). Install new gasket and replace seat and cap screws.
8. Place valve assembly in body.
9. Replace spring (1" size) (3).
10. Replace plug or cover, using new gasket (1-1/2" - 10" sizes).
11. Replace cap screws or bolts and nuts.

B. REPLACEMENT OF CHECK VALVE RUBBER DISC (and Seat Gasket – 6" CI, 8", 10" sizes) (see Fig. 10).

1. Remove guide plug (1", 1-1/2", 2" sizes) or cover (2-1/2" – 10" sizes). Caution! Valve spring (1", 1-1/2", 2", 3", 4" and 6" bronze case model) exerts force directly against plug or cover.
2. Remove spring (1) (1", 1-1/2", 2", 3", 4" sizes and 6" bronze case model) and valve assembly, or valve assembly including spring (2-1/2", 6" CI, 8", 10" sizes).
3. Remove disc cap screw (3B) (1", 1-1/2" sizes) or stud nut (6). This releases the

- guide (5A) and guide washer (8", 10" sizes) (5B).
4. Replace disc (4) and reassemble guide to disc holder (2A, 2B, or 2C).
5. To replace seat gasket (6" CI, 8", 10" sizes) remove seat cap screws (9), seat gasket (10), and seat (11). Install new gasket and replace seat and cap screws.
6. Place valve assembly in body. Replace spring (1) if separate from valve assembly.
7. Replace guide plug or cover, using new cover gasket. Replace cap screws or bolts and nuts.

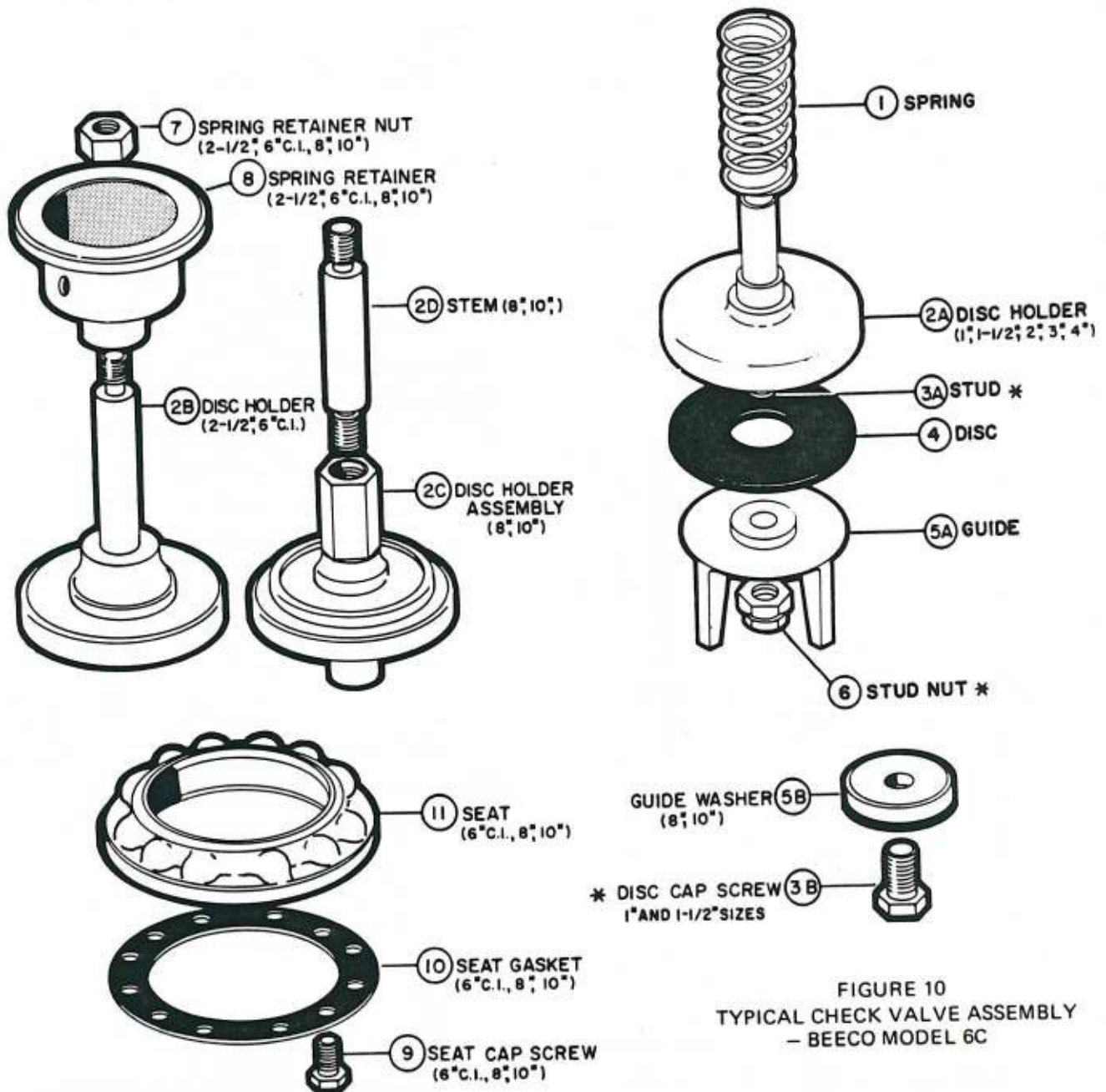


FIGURE 10
TYPICAL CHECK VALVE ASSEMBLY
– BEECO MODEL 6C

C. REPLACEMENT OF MAIN VALVE SPRING (1-1/2" - 10").

1. 1-1/2" - 3" (refer to Figs. 8 and 9).
 - a. Loosen spring retainer nut (1).
 - b. Compress spring retainer (2) by hand. Remove spring retainer nut (1).
 - c. Release hand and remove retainer (2) and spring (3).
2. Replacement of Main Valve Spring (4" - 10") (Method optional for 3".)
 - a. Remove cover; leave valve assembly in body.
 - b. Place spring removal plate on main valve spring retainer (refer to chart, Fig. 61 for proper size).
 - c. Attach threaded rods (see chart for proper size) to plate and body flange with nuts provided. On 4" size, screw rod into flange. On 6" - 10" sizes, engage bottom nuts fully. Tighten top nuts against plate.
 - d. Compress spring slightly by tightening top rod nuts. This forces retainer downward to release spring retainer nut.
 - e. Remove spring retainer nut (Fig. 12).
 - f. Gradually loosen top rod nuts to allow spring to relax (Fig. 11).

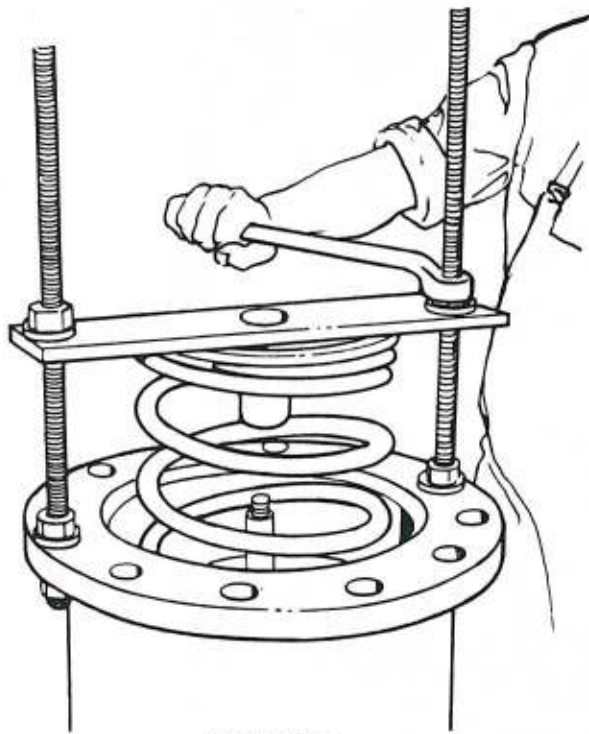


FIGURE 11
LOOSENING TOP ROD NUTS TO ALLOW
8" MAIN VALVE SPRING TO RELAX

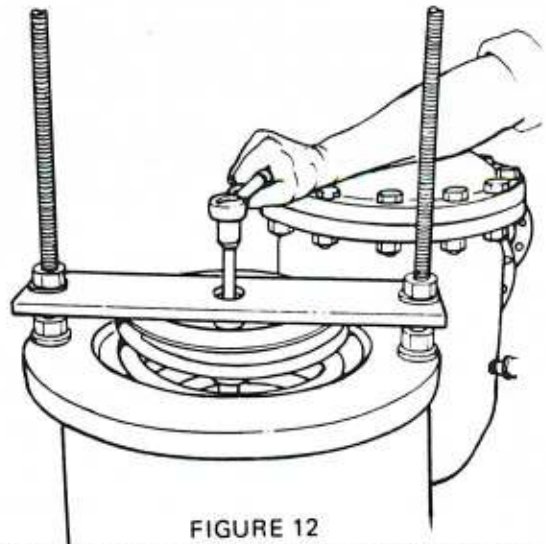


FIGURE 12
REMOVING 8" MAIN VALVE SPRING RETAINER
NUT FOLLOWING INSTALLATION OF SPRING
REMOVAL PLATE AND THREADED RODS

- g. Remove plate, spring retainer and spring. Remove remainder of valve assembly (Fig. 13 and 14).

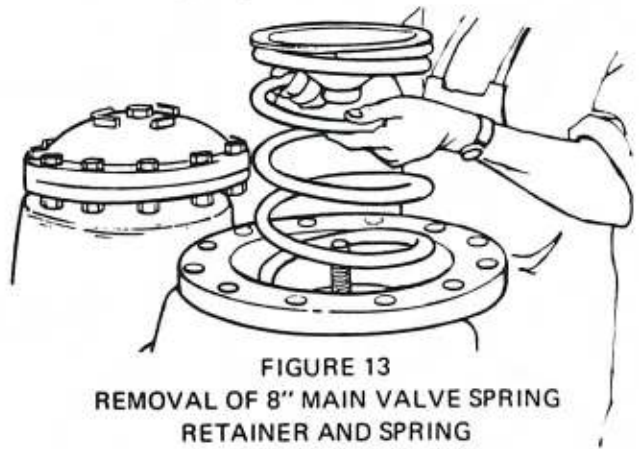


FIGURE 13
REMOVAL OF 8" MAIN VALVE SPRING
RETAINER AND SPRING

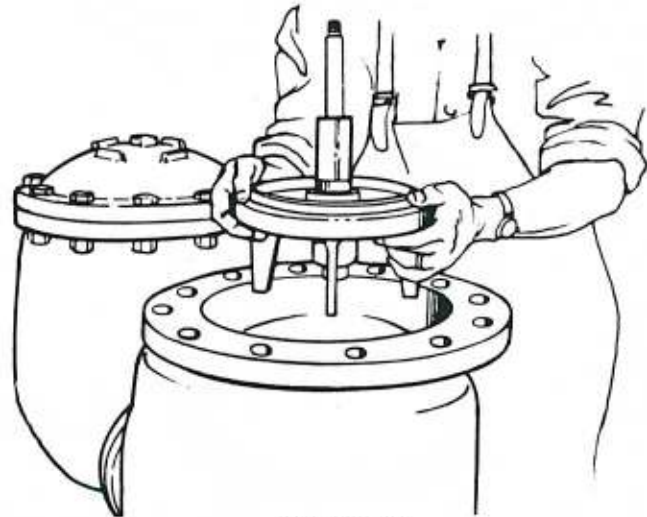


FIGURE 14
REMOVING 8" DISC HOLDER ASSEMBLY

D. REPLACEMENT OF CHECK VALVE SPRING
(2-1/2", 6" CI, 8", 10" sizes) (See Fig. 10.)

1. Remove valve assembly from body (Fig. 15).
2. Loosen spring retainer nut (7).
3. Compress spring retainer (8) by hand. Remove spring retainer nut.
4. Release hand and remove retainer and spring (1).

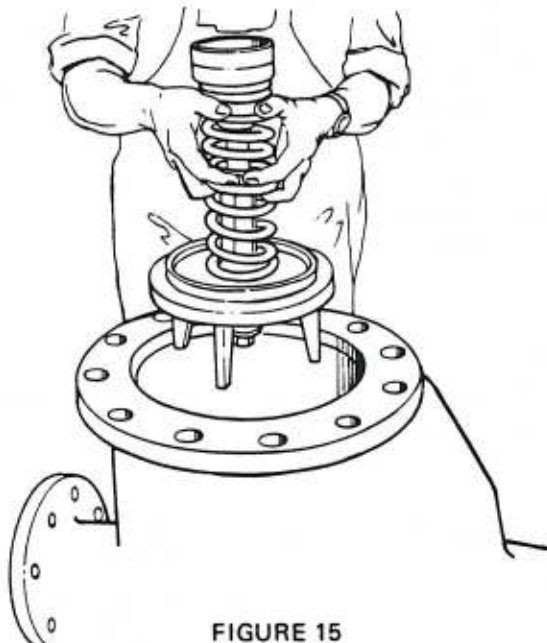


FIGURE 15
REMOVING 8" CHECK VALVE ASSEMBLY

E. REPLACEMENT OF CHECK VALVE SPRING
(1", 1-1/2", 2", 3", 4", 6" bronze sizes). Spring is released when plug or valve cover is removed.

NOTE: In all sizes, the heavier spring is used on the main or first check valve.

F. REPAIR OF RELIEF VALVES – 1" – 6" SIZES (see Fig. 16 and 5).

1. Removal
 - a. Remove relief valve cover.
 - b. Separate diaphragm (11) from body. (Use knife blade to separate it if it adheres).
 - c. Remove relief valve lock nut (15).

NOTE: If elbow or other fittings are connected to outlet, remove them first.

- d. Support relief valve from beneath. Tap projecting end of housing (6) at discharge port with soft-faced hammer to

disengage locating pins. Valve assembly will drop through opening at base of body.

NOTE: Should locating pins start to disengage before lock nut is completely removed, support valve assembly before unthreading lock nut completely.

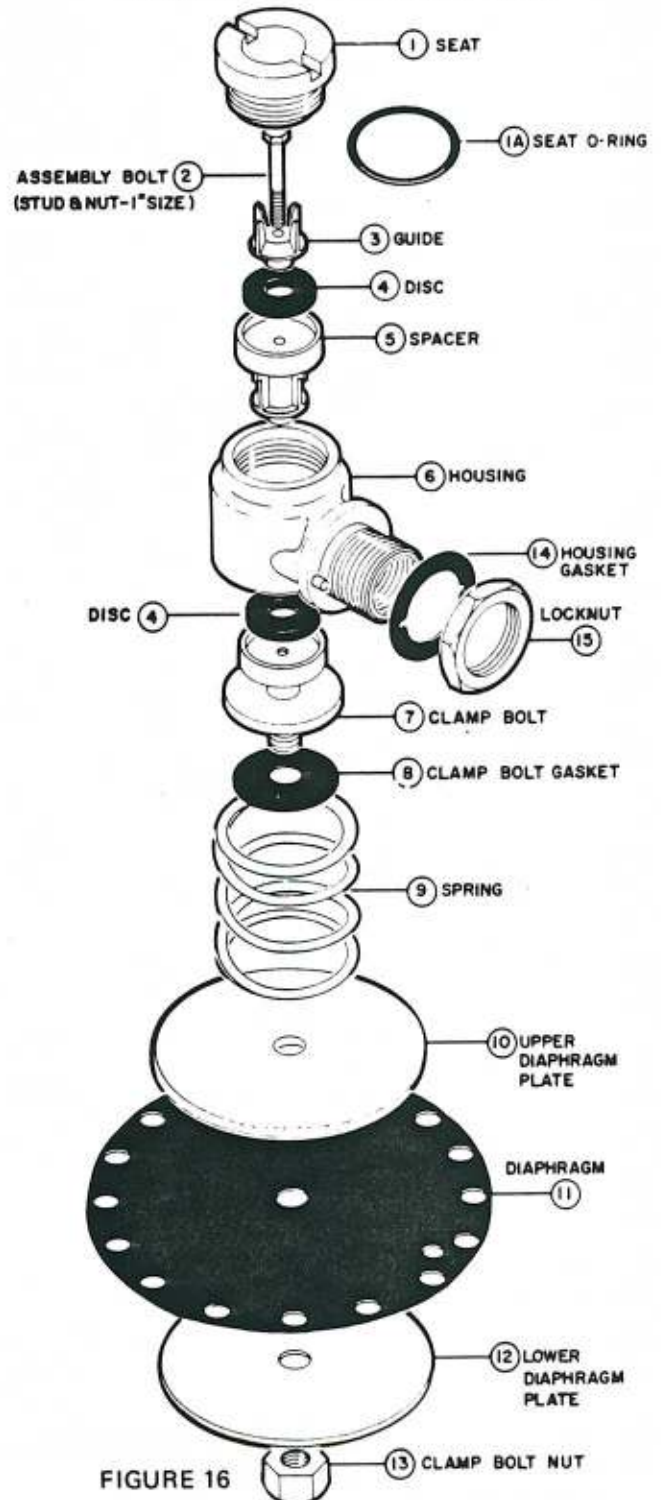


FIGURE 16
RELIEF VALVE ASSEMBLY – BEECO MODEL 6C
(1" – 6" SIZES)

2. Disassembly

- a. Loosen clamp bolt nut (13) slightly. If nut cannot be released by hand, or if clamp bolt turns with nut when wrench applied, disassemble spring as follows:
- (1) Insert Allen wrench into hexagonal opening at bottom end of clamp bolt.
 - (2) Rest valve assembly on seat, and remove clamp bolt nut with second wrench. Hold Allen wrench to prevent clamp bolt from turning. (Fig. 17) *A second person must press down on lower diaphragm plate at the same time to prevent sudden release of nut.* After releasing nut, remove wrenches and allow spring to relax.



FIGURE 17
REMOVING CLAMP BOLT NUT
(2-WRENCH METHOD)

- b. Rest assembly on top of seat (1). Compress relief valve spring (9) by pressing down on lower diaphragm plate (12).
- c. Partially remove clamp bolt nut, and gradually release spring. Caution! If lower diaphragm plate does not rest against nut, clamp bolt gasket (8) is adhering to upper diaphragm plate (10) and preventing spring release. Tap top plate to release spring. Compress spring again, remove nut completely, and release spring (Fig. 18).
- d. Remove the lower diaphragm plate (12), diaphragm (11), upper diaphragm plate (10) and spring (9).

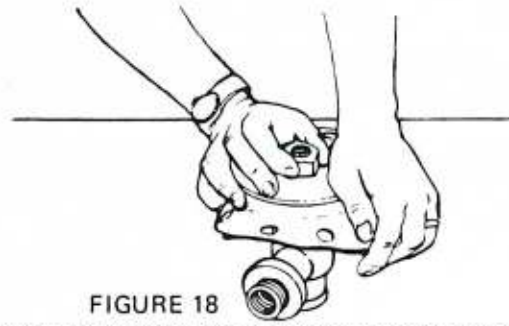


FIGURE 18
RELEASING SPRING TENSION AFTER REMOVING
CLAMP BOLT NUT

- e. Select a piece of bar stock that will fit in slot on top of relief valve seat (1) and place in vise.
- f. Position slot in seat over bar stock. Turn housing (6) counterclockwise, using an 18" or longer length of pipe, threaded into the housing, to remove seat.

NOTE: Use 3/4" pipe for 1" and 1-1/2" backflow preventer. Use 1-1/4" pipe for 2", 2-1/2" and 3" sizes. For 4" and 6" sizes use 2" pipe. (Standard pipe thread). (Fig. 19).

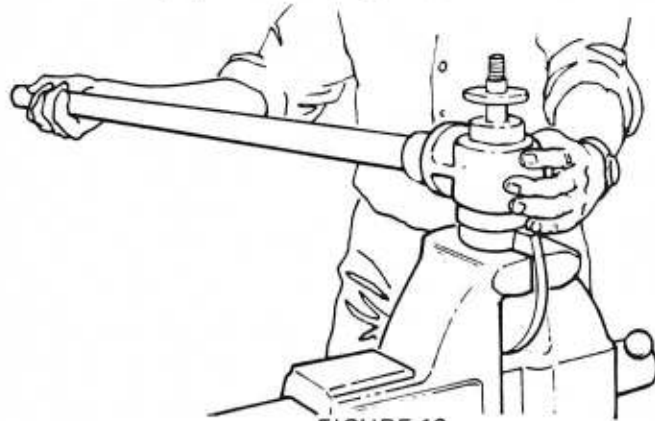


FIGURE 19
REMOVING SEAT FROM HOUSING

- g. On 1" size, unscrew the clamp bolt (7) from the lower end of the stud. (Stud may remain attached to clamp bolt). The guide (3), spacer (5), and stud (2) can then be removed through the top of the housing for final disassembly. Remove upper and lower relief valve discs (4) from the spacer and clamp bolt (7).
On larger sizes, remove the assembly bolt. This releases the guide (3), spacer (5), and clamp bolt (7). Withdraw the guide and spacer through the top of the housing (6).

3. Reassembly

- a. Insert new relief valve discs (4) into the spacer (5) and clamp bolt (7).
- b. Insert the assembled spacer, disc, guide and assembly bolt (or stud), into the housing (6) through the top opening.
- c. Apply pipe joint compound to threads of relief valve seat (1) and assemble to the housing (6). (If seat is equipped with an O-ring, apply vaseline to O-ring to hold it in slot).

Turn housing over and screw clamp bolt into position over bottom seat of housing. Tighten firmly by using socket wrench on assembly bolt and Allen wrench in end of clamp bolt (Fig. 20).

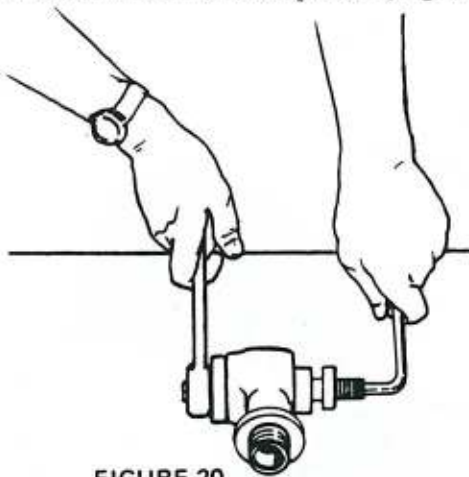


FIGURE 20
REPLACING CLAMP BOLT IN POSITION

NOTE: On 1" and 1-1/2" devices, insert 1/2" drive socket wrench, without socket attached, between projections of relief valve guide. On larger sizes, use appropriate socket on assembly bolt.

- d. Place pencil or ink mark on side of clamp bolt and a matching mark on side of housing bottom seat (see Fig. 21).
- e. Tighten seat by placing slot over bar held in vise, using pipe inserted into housing opening, as in step f, disassembly.
- f. Continue tightening until pencil marks *just* separate. This assures simultaneous seating of the upper and lower valve discs, for correct operation of the relief valve.

- g. Rest partially assembled valve on top of seat (1).
- h. Place diaphragm (two thicknesses – 11) between upper (thicker – 10) and lower (thinner – 12) diaphragm plates, aligning diaphragm holes (in particular the hole for water passage through the cored inlet). Install new clamp bolt gasket (8).
- i. Place relief valve spring (9) on housing.
- j. Center diaphragm (11) and plates (10, 12) over clamp bolt (7). Press down on lower diaphragm plate to compress spring, and replace clamp bolt nut (13). Tighten firmly with wrench.

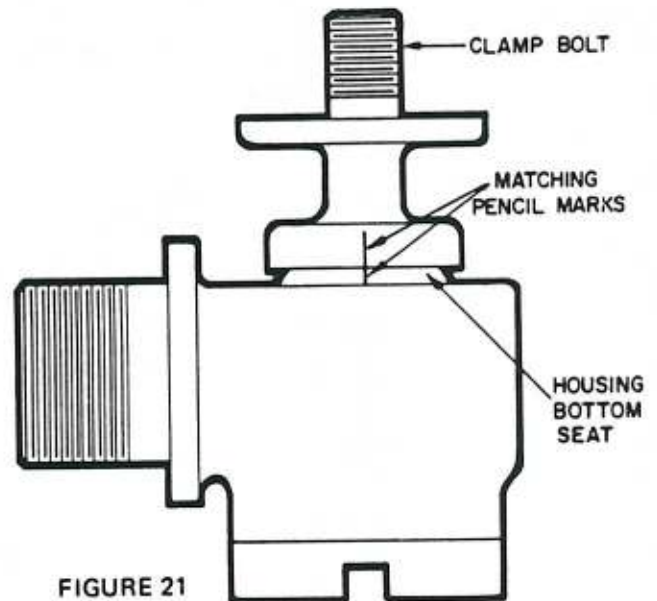


FIGURE 21
MARKING CLAMP BOLT AND HOUSING
BOTTOM SEAT FOR CORRECT DISC SEATING
ADJUSTMENT (1" – 6" MODEL 6C)

G. REPAIR OF RELIEF VALVES – 8" AND 10" SIZES (see Fig. 22).

1. Removal
 - a. See step F-1. Repair of relief valves (1" – 6" sizes).
NOTE: On 8" and 10" sizes, body may be inverted and relief valve lifted from opening (Fig. 23).
2. Disassembly
 - a. Loosen assembly bolt (6).
 - b. Compress spring (12) by pushing down on relief valve housing (3).
 - c. Remove assembly bolt (6) with socket wrench. This releases guide (7) and

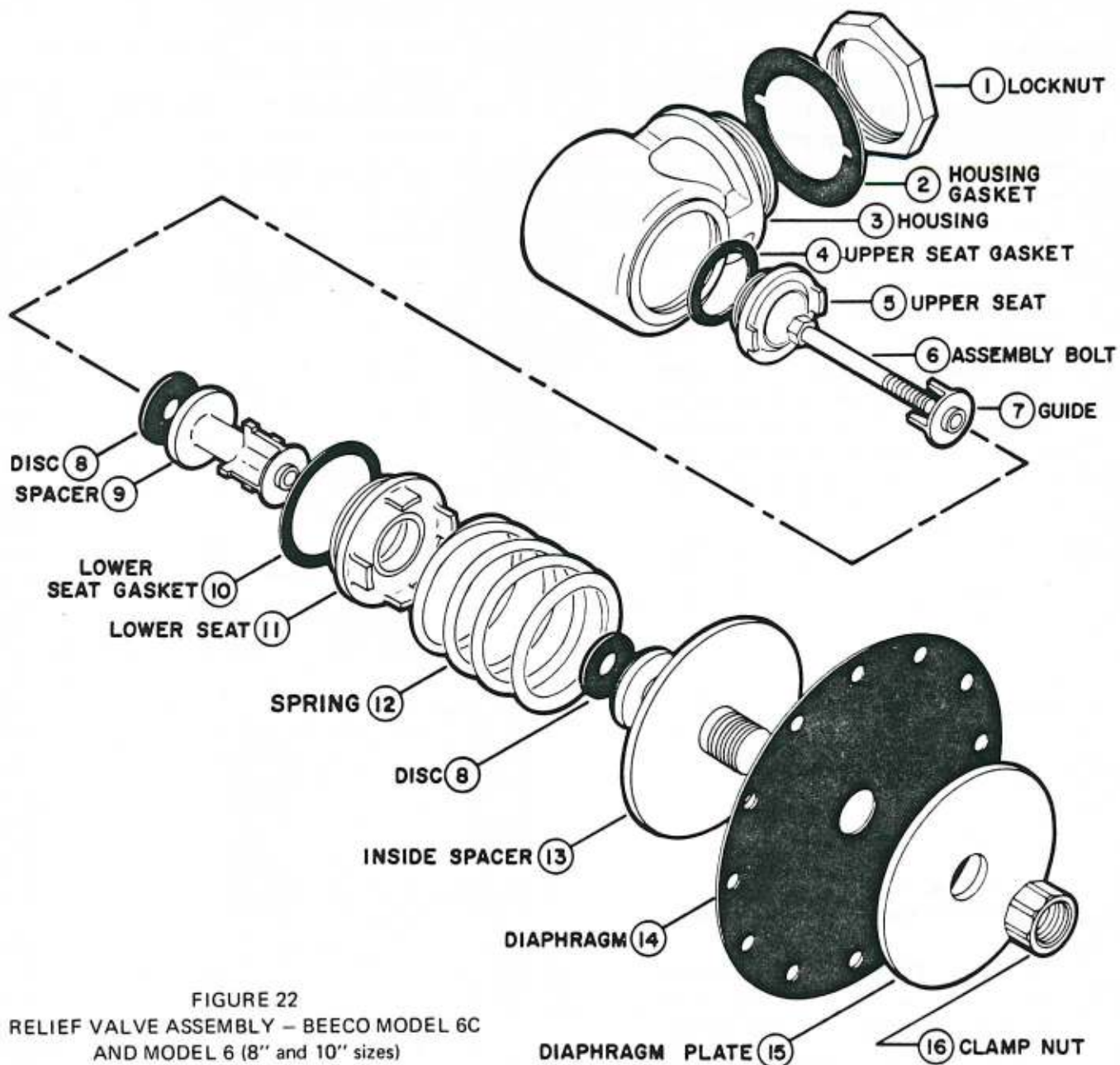


FIGURE 22
RELIEF VALVE ASSEMBLY – BEECO MODEL 6C
AND MODEL 6 (8" and 10" sizes)

- spacer (9). Allow spring to extend. The housing will now lift away from the inside spacer (13) (Fig. 24).
- d. Loosen lower seat (11) with seat wrench.
- e. Remove lower seat and spacer from housing.
- f. Loosen and remove upper seat (5) with seat wrench.
- g. Loosen and remove clamp nut (16), diaphragm plate (15) and diaphragm (14).

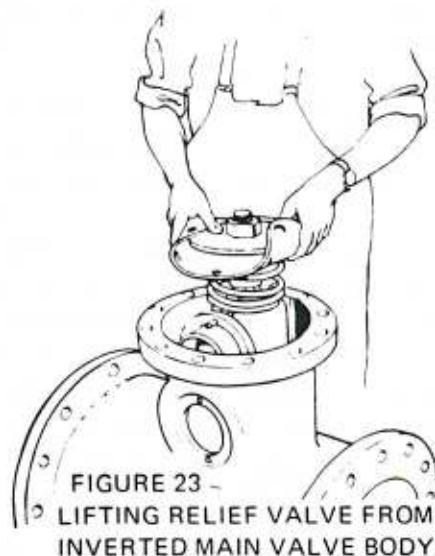


FIGURE 23 –
LIFTING RELIEF VALVE FROM
INVERTED MAIN VALVE BODY

3. Reassembly

- a. Replace upper and lower seat gaskets (4 and 10).
- b. Screw upper seat (5) into relief valve housing (3), using seat wrench.
- c. Insert new discs (8) into spacer (9) and inside spacer (13).
- d. Place spacer into relief valve housing (3), and screw lower seat (11) into housing, using seat wrench.

NOTE: To assure correct spacing of the seats, the bottom flange of the spacer should be within $\pm .005''$ of being level with the face of the lower seat (Fig. 25). Lay a straight edge across lower seat with feeler gauge. Check clearance between straight edge and disc spacer with feeler gauge. Back off or tighten lower seat until correct clearance is attained.

- e. Reassemble inside spacer (13), diaphragm (14), diaphragm plate (15) and clamp nut (16). Position diaphragm hole for water passage in proper relation to opening of cored passageway.
 - f. Place spring (12) on inside spacer, set housing assembly on this spring, and insert assembly bolt (6) through the guide (7) and spacer.
 - g. Compress spring, engage assembly bolt in threads of inside spacer, and tighten bolt. Release spring tension.
- ### 4. Assembly of Relief Valve into Body
- a. Replace housing gasket (2) and insert relief valve assembly into body through base, positioning housing outlet in body opening. Engage locating pins.
 - b. Screw locknut on housing. Strike cut-out with driver to seat tightly.
 - c. Replace relief valve cover, making sure that the inlet water passage holes in the body, diaphragm and cover are aligned.

NOTE: If holes are misaligned, remove valve from body, disassemble diaphragm plates, and spring. Rotate diaphragm to correct position, reassemble valve and place in body.

- d. Replace cover plate and tighten bolts.



FIGURE 24
REMOVING ASSEMBLY BOLT

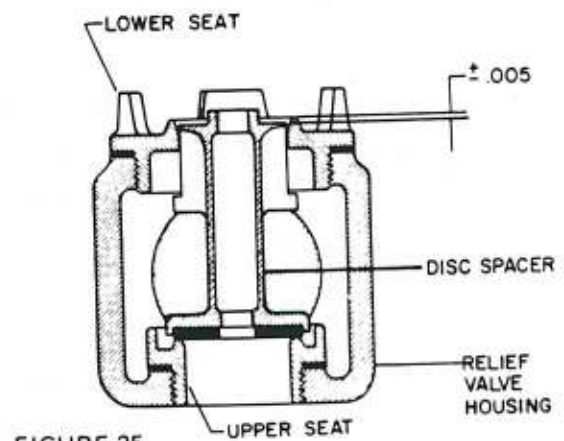
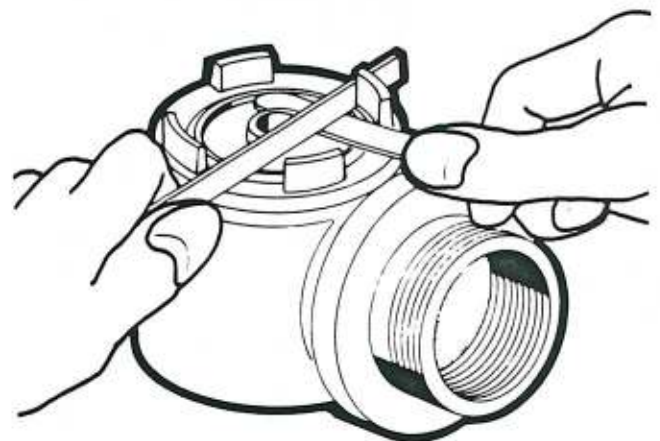


FIGURE 25
GAUGING OPERATION FOR CORRECT SEAT SPACING
(8" AND 10" MODEL 6C)

MODEL 6 AND 6-U

A. DESCRIPTION

The model 6 (and 6-U) BEECO Reduced Pressure Backflow Preventer is manufactured in 4", 6", 8" and 10" sizes. In October 1969 the 1-1/2", 2", 2-1/2", 3" and 16" sizes were discontinued. Parts will, of course, still be available for units in service.

All sizes have galvanized cast iron bodies — one-piece (1-1/2" – 6") or three-piece (8", 10"). Check valves are mounted in a horizontal position. External piping is used to direct line pressure beneath the relief valve diaphragm, rather than a cored passage within the body, as on the model 6-C. The relief valve opening is located on the right side of the device, in the direction of flow.

The 6-U designation is used to denote Underwriters Laboratories, Inc. acceptance of the device for use in fire lines.

B. DISASSEMBLY OF CHECK VALVES, 1-1/2" – 6" SIZES, MODEL 6 (see Figs. 26, 27 and 28)

1. Close inlet and outlet shutoff valves. Drain the backflow preventer by opening test cocks No. 2, 3, and 4.
2. In order to remove the check valves, the backflow preventer must be removed from the line. In the 1-1/2" – 6" sizes, however, it is possible to remove all but one bolt at each body end flange; and then roll the backflow preventer enough to allow the check valve wrenches to be inserted in the ends.
3. Using a check valve wrench (Fig. 62), remove main and check valve assemblies.

4. Remove stud nut (1), using spring compressing tool as follows: (see Fig. 63).

The spring compressing tool consists of 2 threaded rods, each with a loop or hook at one end, a round plate with 3 holes, 2 rod washers and 2 rod nuts.

The plate has two holes through which the threaded ends of the rods are passed, and a center hole large enough to pass over the spring retainer nut.

To install, rest valve assembly on vise, gripping disc holder projection (9) in vise jaws. Break stud nut (1) loose with wrench. Drop hooked ends of rods down inside spring (3) between cross-members of spring guide (2).

Engage hooks in cross-members of seat (5) and tighten rod nuts enough to release stud nut (1).

5. To release spring from seat, back off (loosen) rod nuts until spring has relaxed. Remove rod, nuts, washers and plate. (Rods are long enough to allow complete spring extension, or long enough to allow removal of plate with slight compression of spring by hand).
6. Lift spring retainer from spring; remove rods and spring from seat.
7. Remove spring guide (2), spring (3), and spacer (10) on second check valve, and seat (5).
8. Loosen the stud (4) with pipe wrench.
9. Remove the stud (4), valve guide (7), and disc (8) from the disc holder (9).

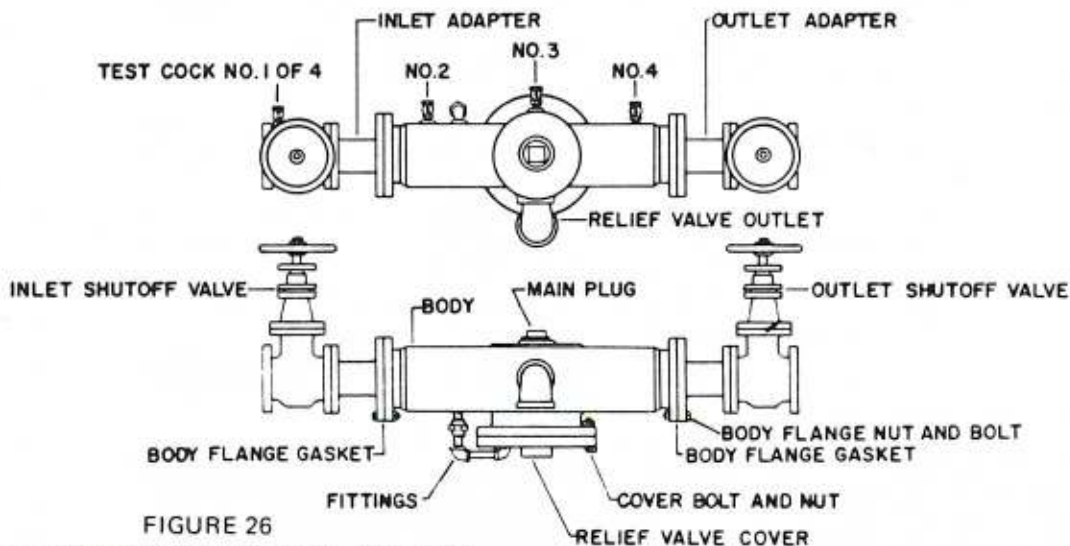


FIGURE 26
BEECO MODEL 6C DEVICE (1/2" – 6" SIZES)

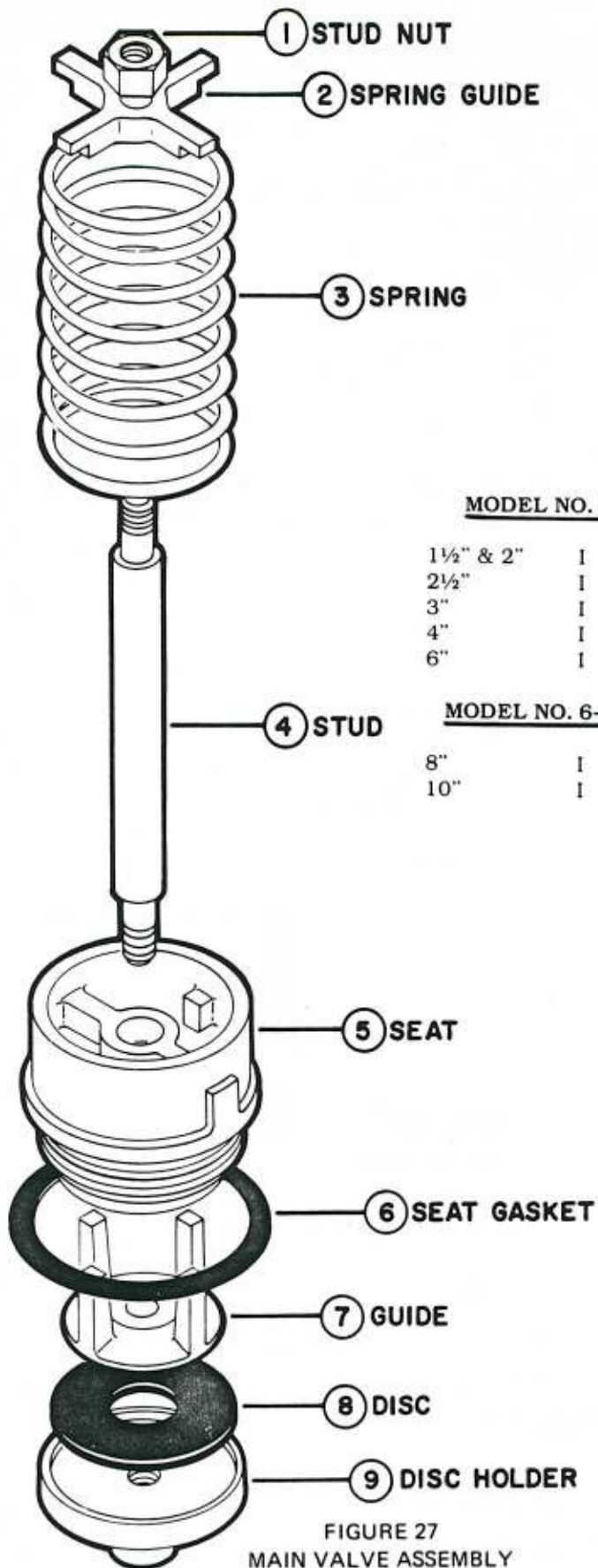
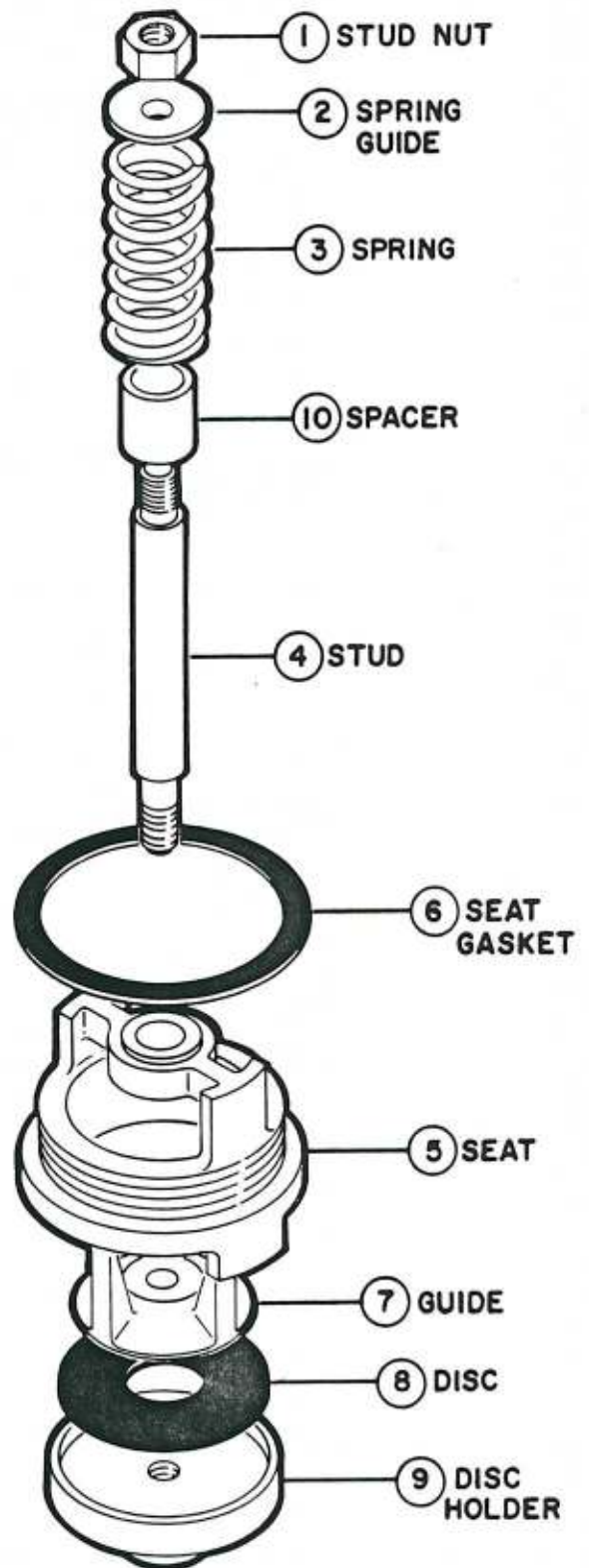


FIGURE 27
 MAIN VALVE ASSEMBLY
 BEECO MODEL 6 (1-1/2" - 6" SIZES)

MODEL NO. 6 KITS			
1 1/2" & 2"	1	61235	
2 1/2"	1	61236	
3"	1	61237	
4"	1	61238	
6"	1	61239	
MODEL NO. 6-6U KITS			
8"	1	61240	
10"	1	61241	

FIGURE 28
 CHECK VALVE ASSEMBLY
 BEECO MODEL 6 (1-1/2" - 6" SIZES)



C. REASSEMBLY OF CHECK VALVES,
1-1/2" - 6" SIZES, MODEL 6

1. Place new disc (8) in disc holder (9) and assemble guide (7) and stud (4) to it. (Insert *longer* machined end of stud into disc holder; except on 4" main valve only, insert *shorter* machined end).
2. Tighten stud with pipe wrench.
3. Place seat (5), spring (3), spacer (10) (second check valve only), and spring guide (2) over the stud.
4. Compress spring with spring compressing tool. Screw on stud nut (1) and tighten.
5. Replace check valve assemblies in the body, using new seat gaskets (6).
6. Tighten into position, using check valve wrench.

D. DISASSEMBLY OF CHECK VALVES,
8" - 10" SIZES, MODEL 6, Figs. 29 and 30).

1. Remove the backflow preventer from the line.
2. Remove the check valve assemblies from the backflow preventer as follows:
 - a. Stand the backflow preventer upright on the inlet flange.

- b. Remove outlet adapter flange bolts, and lift off the outlet adapter (see Fig. 31).
- c. Remove the 8 seat cap screws (5) adjacent to the legs of the spring retainer (3) and lift the check valve assembly off with a hoist, or disassemble in place. (See Step 3.)
- d. Turn the body upright onto its outlet flange and remove inlet adapter flange bolts.
- e. Break union in control line and lift off inlet adapter with a hoist (Fig. 32).
- f. Remove the 8 seat cap screws (5) adjacent to the legs of the spring retainer, and lift the valve assembly off the inlet adapter with a hoist or disassemble in place. (See Step 3.) Both check valves are now ready to be disassembled.

3. Disassemble check valves as follows:
 - a. Remove the valve stem nut (1) and valve stem (8) (Fig. 33).
 - b. Insert 1" threaded steel rod, 2 feet long, into top of disc holder (9). The rod must have machined "flats" on the end for attachment of a wrench (see Fig. 64).

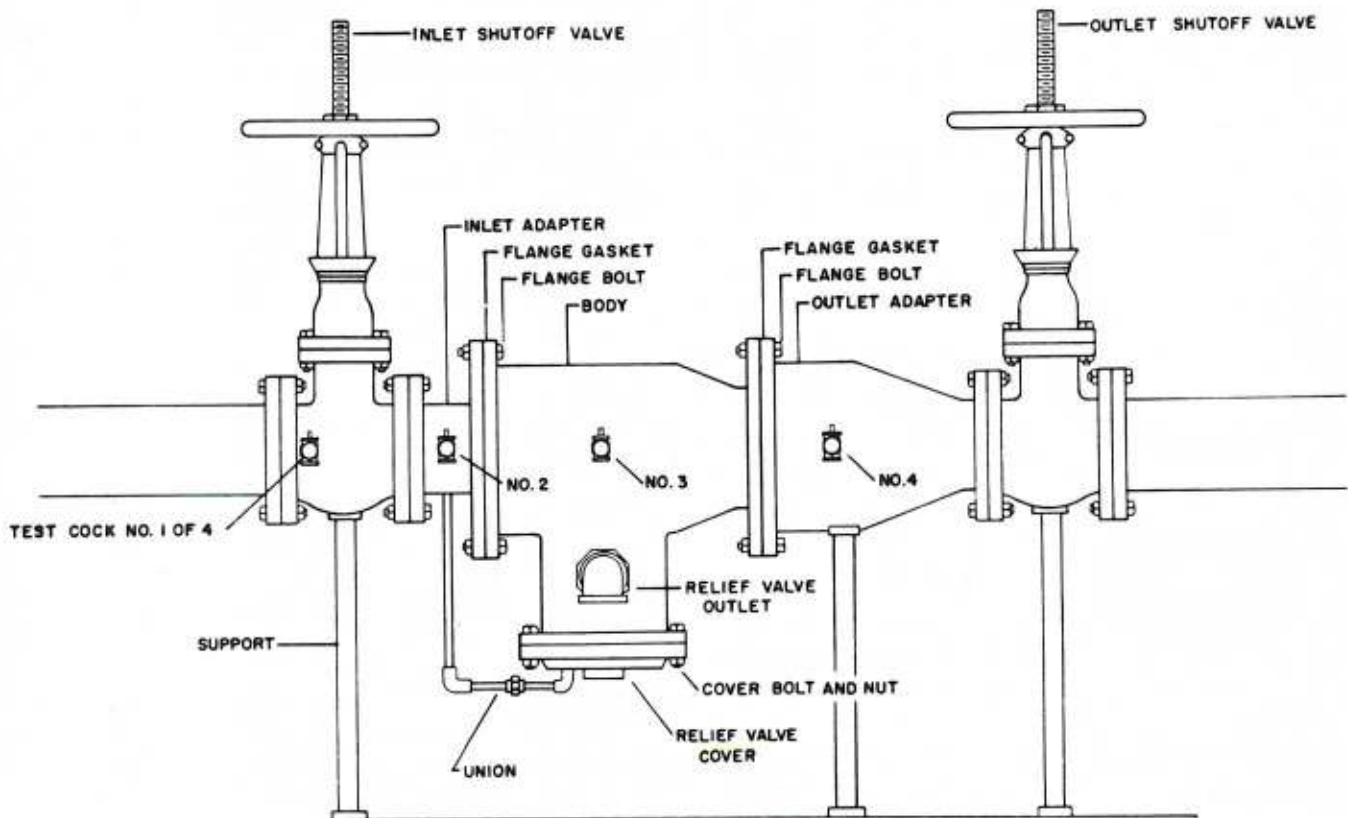
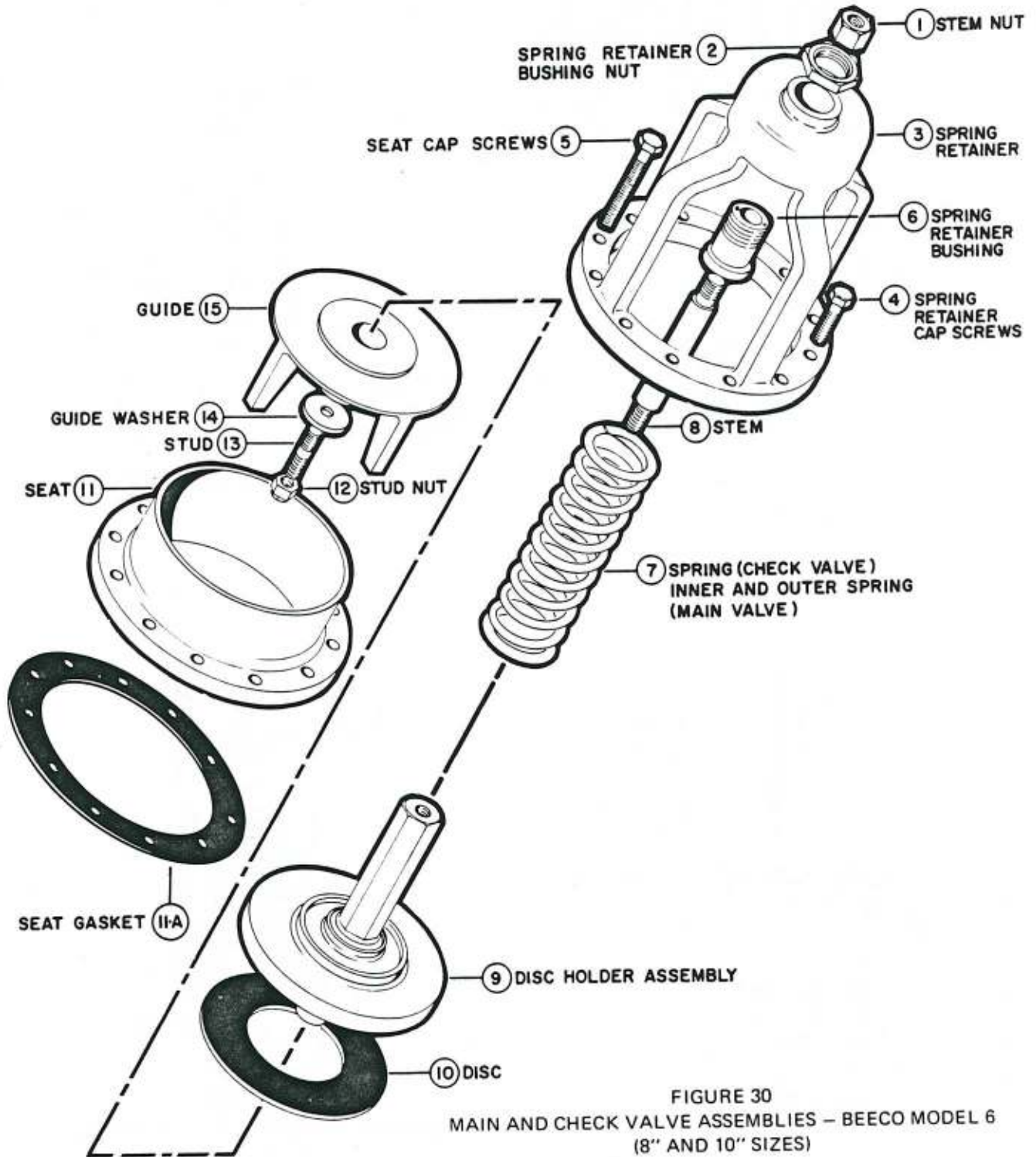


FIGURE 29
BEECO MODEL 6 DEVICE (8" AND 10" SIZES)



- c. Place wrench on "flat" and tighten rod firmly.
- d. Place a heavy washer, 2-1/2" in diameter, with a 1-1/16" hole over the steel

- e. Run a 1" nut far enough down the rod so that it bears on the washer.

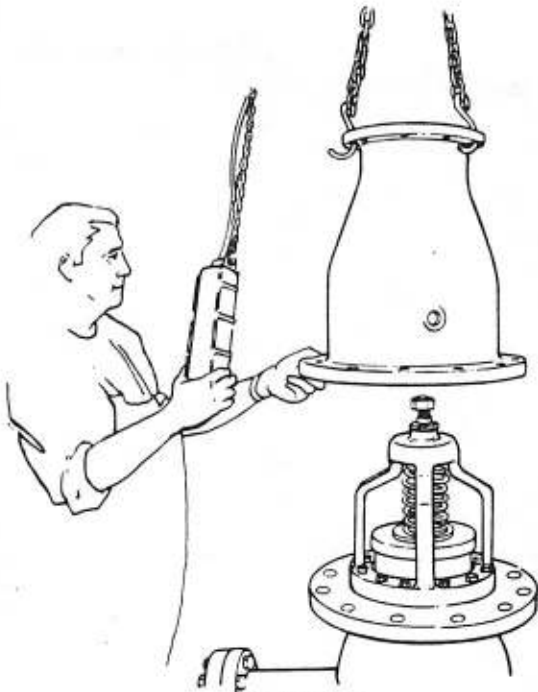


FIGURE 31
REMOVING OUTLET ADAPTER

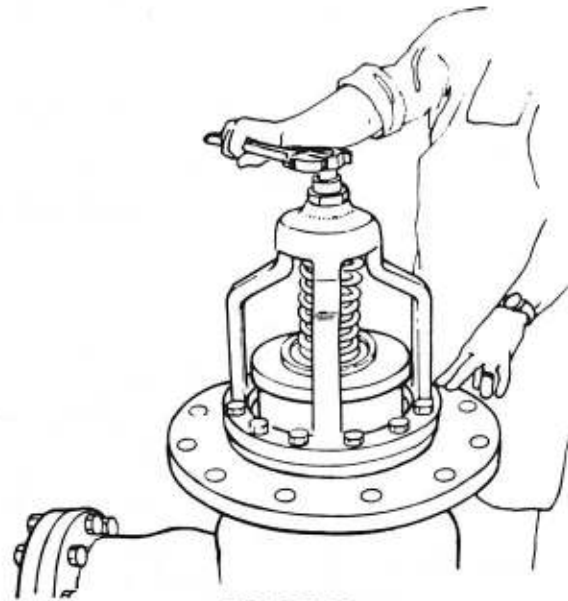


FIGURE 33
REMOVING VALVE STEM NUT, CHECK VALVE

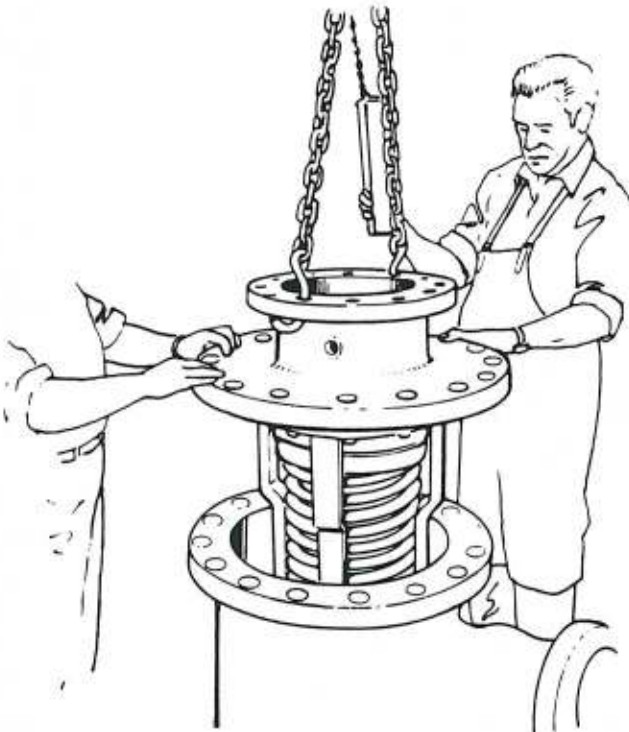


FIGURE 32
REMOVING INLET ADAPTER WITH
MAIN VALVE ASSEMBLY

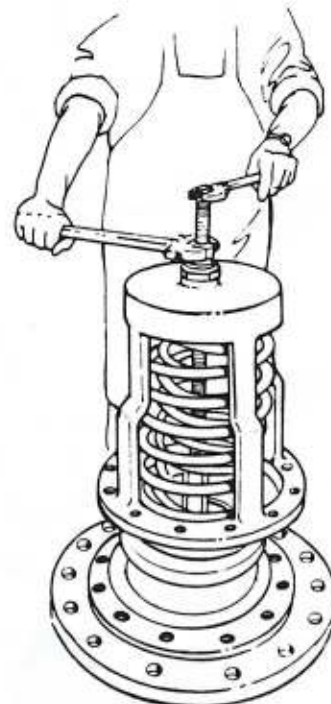


FIGURE 34
BACKING OFF NUT TO EXTEND SPRING,
MAIN VALVE

- f. Remove the 4 spring retainer cap screws (4) and back off the nut on the threaded rod until the spring (7) (check valve; inner and outer springs – main valve) is fully extended. Prevent rod from turning with wrench placed on flats (Fig. 34).

- g. Remove the nut; then remove the spring retainer (3) and spring (7) (Fig. 35 and 36).

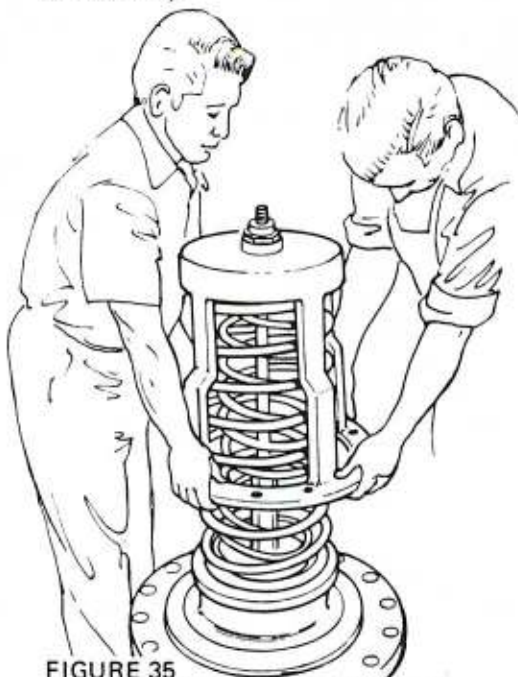


FIGURE 35
REMOVING SPRING RETAINER
MAIN VALVE

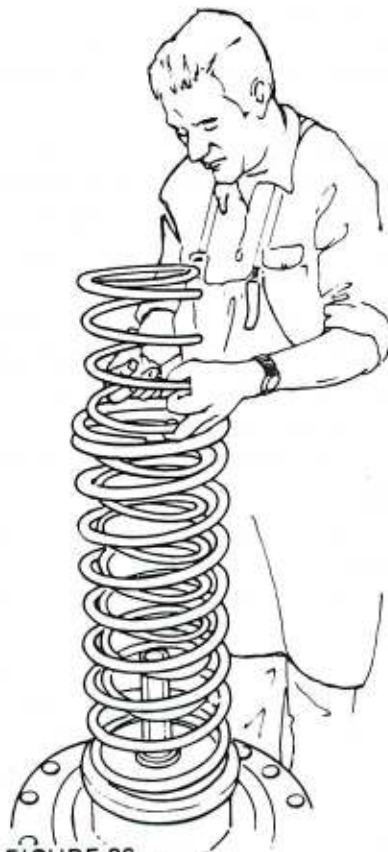


FIGURE 36
REMOVING SPRINGS, MAIN VALVE

- h. Lift the disc holder assembly away from the seat (11) (Fig. 37).



FIGURE 37
REMOVING DISC HOLDER ASSEMBLY FROM SEAT,
MAIN VALVE

- i. Remove the stud nut (12), guide washer (14), guide (15), and disc (10) from disc holder (9).
- j. Inspect spring retainer bushing (6). Replace if worn. (Remove nut (2) to release.)

NOTE: Before reassembling the check valves and adapters to the body, it is advisable to remove, repair and reassemble the relief valve into the body. (See relief valve repairs, 8" and 10" model 6C. Relief valves in both models are identical.)

4. Reassemble check valves as follows:
- Insert new disc (10) into disc holder (9) and reassemble guide (15), washer (14), and stud nut (12).
 - Rest the disc holder assembly on the face of the seat (11) and position the spring (7) and spring retainer (3) over it (Fig. 38). Locate the spring retainer so that its flange bolt holes are matched and aligned with the holes in the seat.
 - Install the threaded rod into the disc holder (see disassembly procedures). Place washer and nut on rod.

- d. Tighten down the nut to compress the spring enough to allow the spring retainer to be fastened to the seat with the 4 spring retainer cap screws (4). Avoid contact of spring with legs of spring retainer, as damage to plastic coating of spring may result (Figs. 39 and 40).

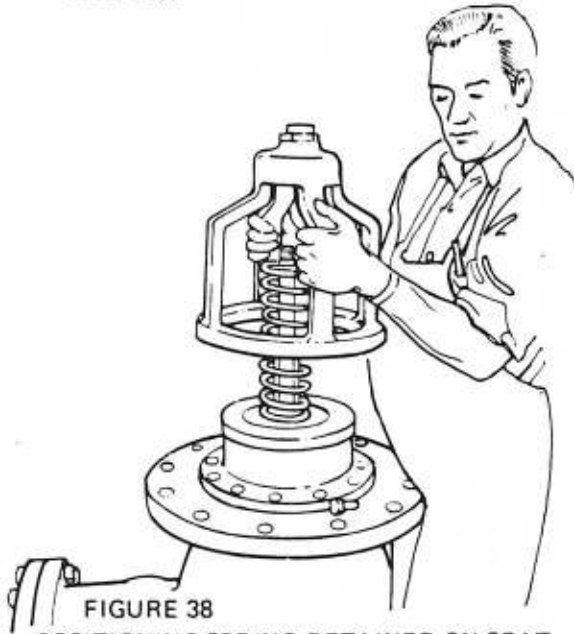


FIGURE 38
POSITIONING SPRING RETAINER ON SEAT,
CHECK VALVE

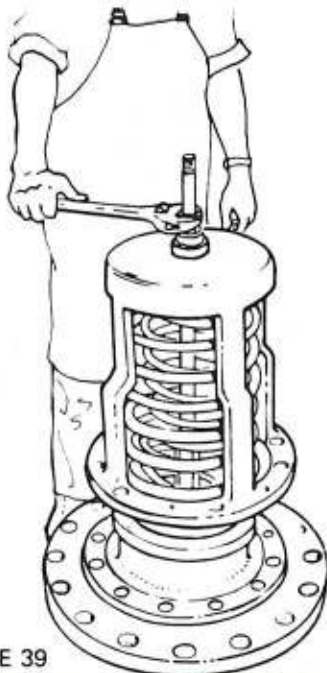


FIGURE 39
TIGHTENING NUT TO COMPRESS SPRINGS,
MAIN VALVE

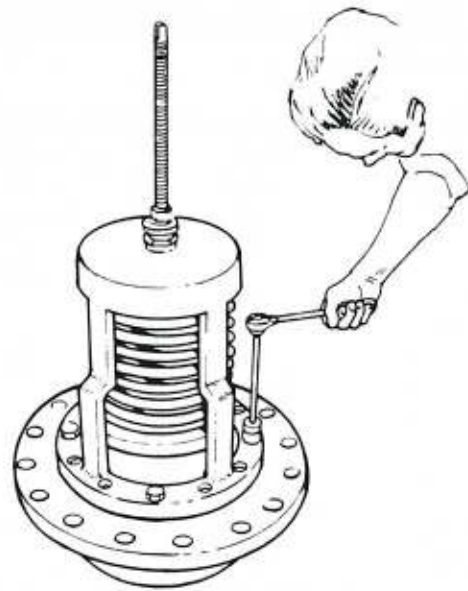


FIGURE 40
REPLACING SPRING RETAINER CAP SCREWS

- e. Remove the nut, washer and threaded rod.
 - f. Reassemble the valve stem (8) and tighten down the stem nut (1).
5. Reassembly of check valves and adapters to body:
- a. Stand inlet adapter on its inlet flange.
 - b. Assemble first check valve assembly to the inlet adapter with the 8 seat cap screws (5). Use a new seat gasket (11A).
 - c. Rest the body on its outlet flange and set the assembled inlet adapter and check valve down on the body. Use a new flange gasket.
 - d. Bolt the body and inlet adapter together.
 - e. Rest body and inlet adapter on inlet flange.
 - f. Assemble second check valve assembly to the outlet flange of the body with the 8 seat cap screws. Use a new gasket.
 - g. Lift the outlet adapter over the second check valve assembly and set it down on the body with the flange gasket in place.
 - h. Bolt the body and outlet adapter together.

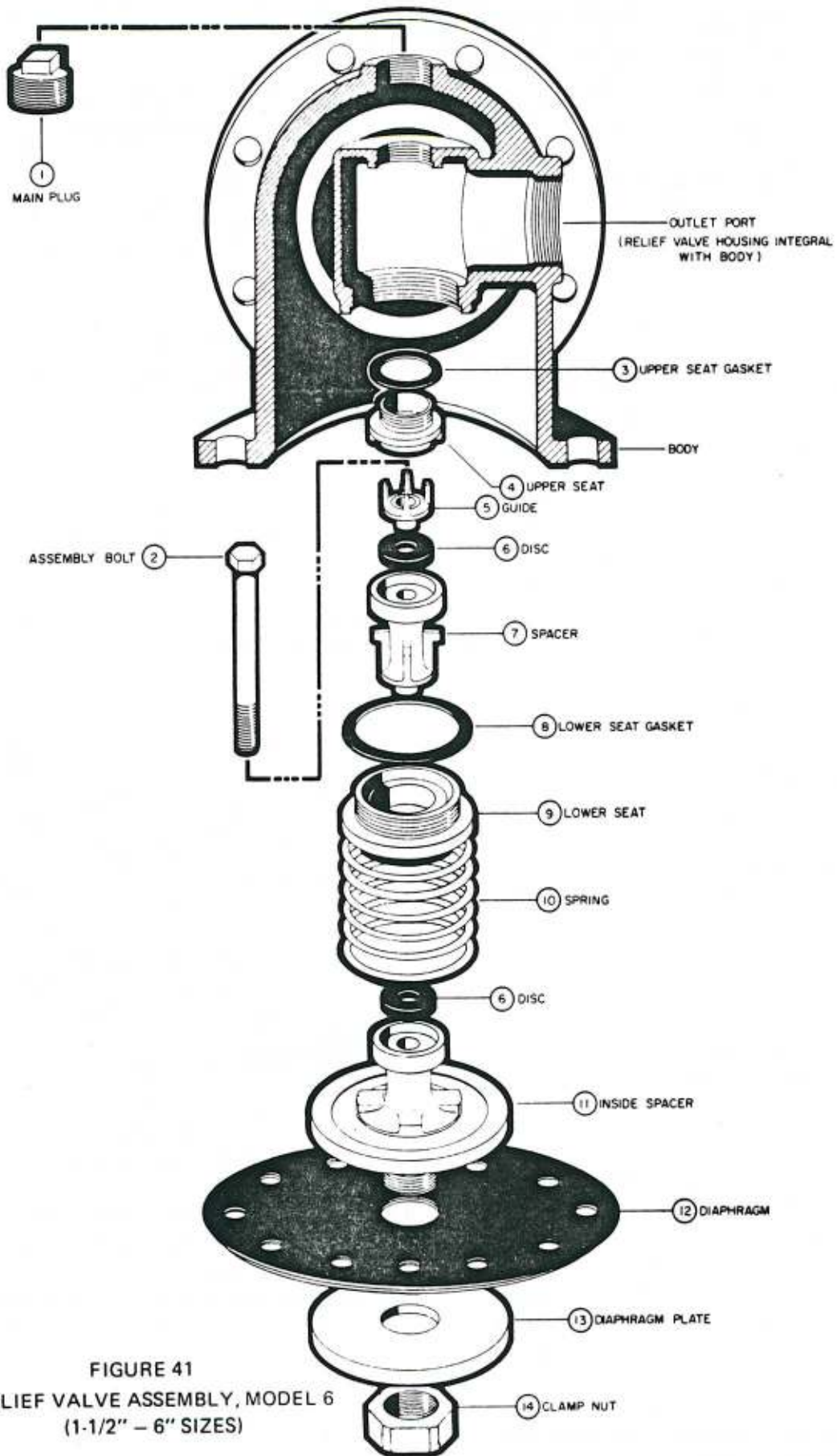
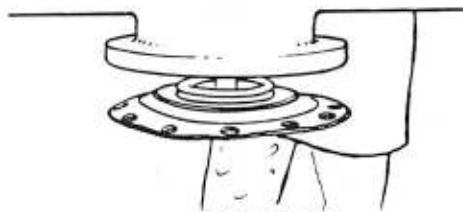


FIGURE 41
 RELIEF VALVE ASSEMBLY, MODEL 6
 (1-1/2" - 6" SIZES)

E. DISASSEMBLY, RELIEF VALVE, 1-1/2" – 6" SIZES, MODEL 6 (see Fig. 41).

1. Remove main plug (1) from top of back-flow preventer.
2. Remove the assembly bolt (2) through the main plug hole.
3. Screw threaded steel rod into the inside spacer (11) (see Fig. 65).
4. Place pipe plug bushing over the threaded rod, and screw it into the main plug hole.
5. Tighten rod with wrench placed on flats.
6. Run nut down the rod, and compress the spring (10) slightly by tightening the nut.
7. Break the union connection on the control line and remove the cover.
8. Back off the nut on the threaded rod to allow the spring to extend. Keep rod from turning by holding wrench on flats. This also releases the diaphragm assembly (6, 11, 12, 13, 14) (Fig. 42).



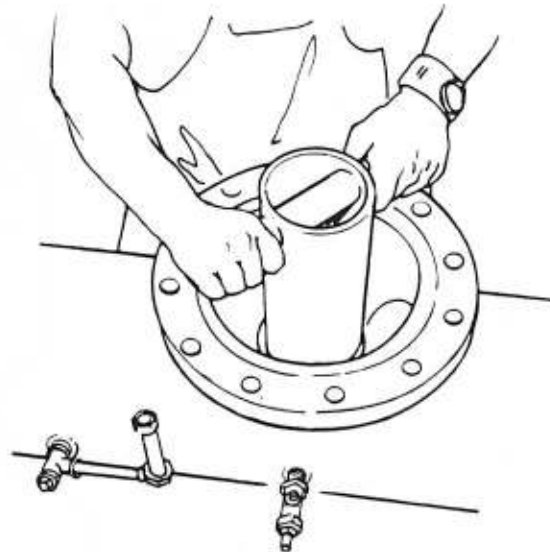
**FIGURE 42
BACKING OFF NUT TO EXTEND SPRING,
RELIEF VALVE**

9. Support diaphragm assembly and remove nut completely to release assembly, spring and rod from body. (If possible, roll back-flow preventer to an inverted position and lift diaphragm assembly, spring and rod from the body) (Fig. 43).
10. Detach rod from diaphragm assembly with wrench placed on flats.



**FIGURE 43
REMOVING RELIEF VALVE
DIAPHRAGM ASSEMBLY**

11. Remove lower seat (4) with special seat wrench (Fig. 44).



**FIGURE 44
REMOVING TOP SEAT**

12. Remove the spacer, upper disc (6), and guide (5) (Fig. 45A). Using a seat wrench, remove the upper seat (4).
13. Remove clamp nut (14), diaphragm plate (13), and diaphragm (12) from inside spacer (11).

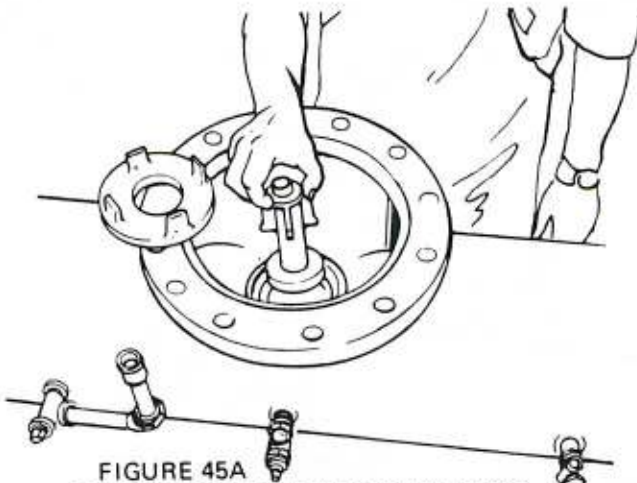


FIGURE 45A
REMOVING SPACER AND LOWER DISC,
TOP SEAT ON FLANGE

F. REASSEMBLY, RELIEF VALVE, 1-1/2" – 6" sizes, Model 6.

1. Place new diaphragm and the diaphragm plate on inside spacer and tighten the clamp nut.
2. Insert new disc into inside spacer.
3. Reassemble the upper seat into the housing, using a new seat gasket (3). Tighten with seat wrench.
4. Insert new disc into spacer and place this assembly into the relief valve housing.
5. Using a new gasket (8), reassemble the lower seat into the housing with a seat wrench. To assure proper spacing of the seats, the bottom flange of the spacer must be within .005" above or below the face of the lower seat. (See gauging procedure 8" and 10" Model 6C. The upper seat may also be loosened or tightened to achieve correct spacing of the seats.) (see Fig. 45B)
6. Screw threaded rod into inside spacer and, with spring in place, insert the rod, with diaphragm assembly attached, through the disc spacer, bushing and pipe plug bushing.
7. Place nut on rod and tighten to compress the spring and draw the discs snugly against the upper and lower seats.
8. Bolt on the relief valve cover, making sure that the control line is in alignment.
9. Turn unit upright.
10. Loosen the nut on the threaded rod to release spring tension.
11. Place wrench on flats and remove rod.
12. Set the guide on the upper disc; insert and tighten the assembly bolt.
13. Apply pipe joint compound and replace the main plug.
14. Tighten union on control line.

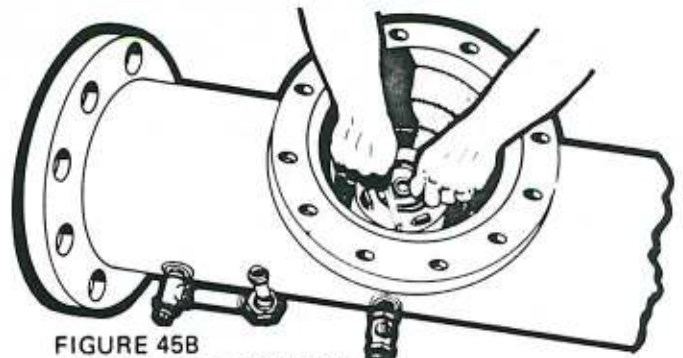


FIGURE 45B
GAUGING OPERATION FOR
CORRECT SEAT SPACING (8" AND 10" MODEL 6)

**BEECO REDUCED PRESSURE
BACKFLOW PREVENTER, 3/4" Model 12
DISASSEMBLY – MAIN AND RELIEF VALVES
(see Figs. 46A and 46B)**

1. Remove 8 cap screws (1) to release cover (2) from body (16).
2. Lift main and relief valve assembly and main valve spring (10) from body. Caution! Spring (10) exerts force directly on cover (2)
3. Unscrew relief valve holder (13) from main valve disc holder (3). This releases disc holder (3), main valve disc (4), main valve guide (5) and relief valve spring (12).
4. Unscrew main valve stem guide (11) from main valve seat (6). This releases the two diaphragm plates (8), diaphragm (9) and main valve seat gasket (7).
5. Remove main valve disc (4) from holder (3) and replace with new disc. Discard old disc, diaphragm and gasket.

REASSEMBLY

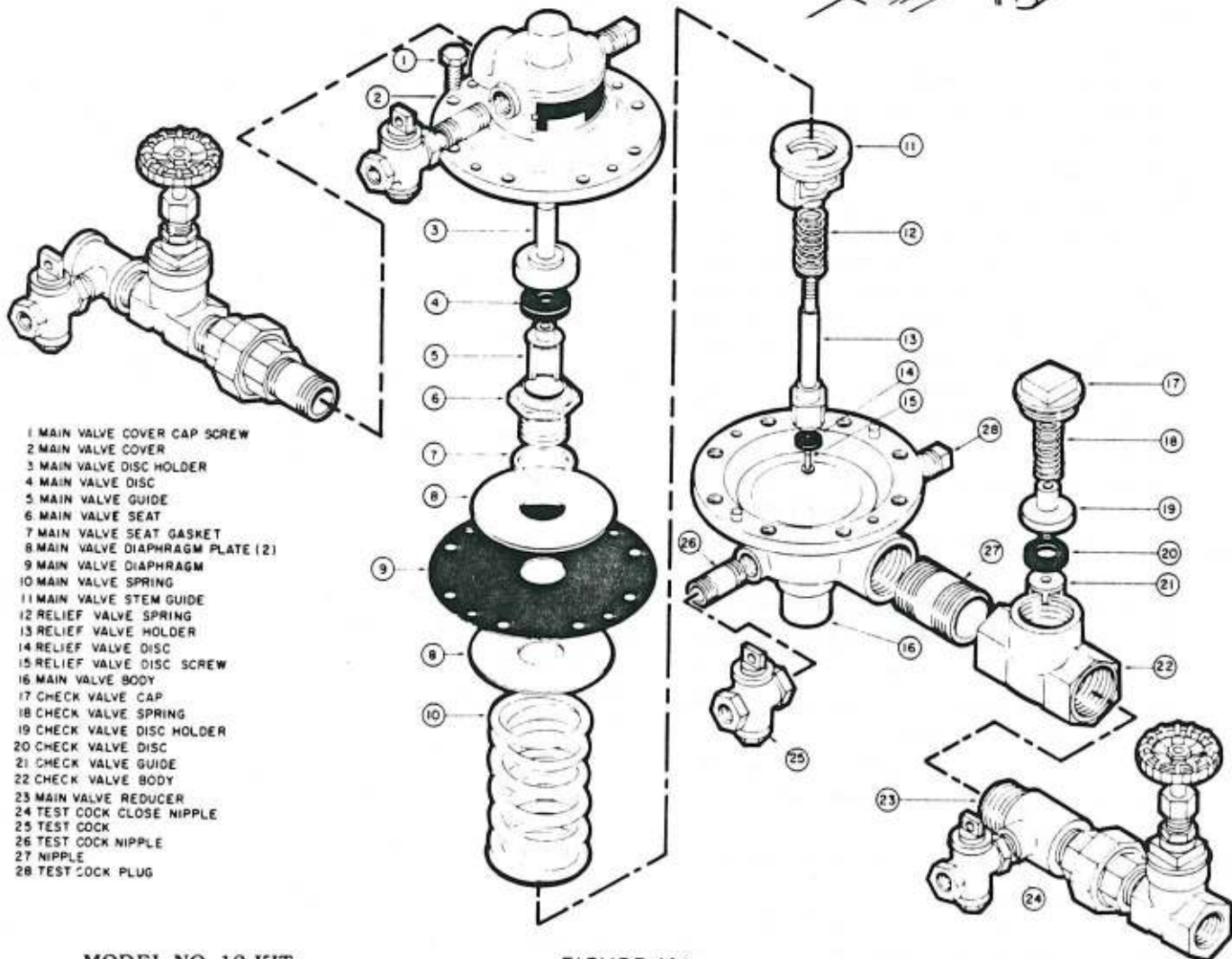
1. Place new gasket (7) on main valve seat (6).
2. Insert new diaphragm (9) between plates (8).
3. Insert main valve seat (6) through plate opening and assemble to stem guide (11).
4. Place relief valve spring (12) over holder (13). Insert holder through hole in stem guide (11) and hole in main valve guide (with guide projecting into main valve seat) (6). Assemble relief valve holder to disc holder (3).
5. Attach new relief valve disc (14) with screw (15).
6. Replace main valve spring (10), and position valve assembly in body.
7. Turn assembly so that diaphragm holes align with bolt holes. Replace cover (2) and fasten with cap screws (1).

DISASSEMBLY – CHECK VALVE

1. Remove cap (17). This releases spring (18), disc holder (19), disc (20) and guide (21).
2. Release disc (20) by unscrewing guide (21). Discard old disc.
3. Place new disc on holder and screw guide in place.
4. Insert disc holder assembly in body, replace spring and screw cap in place.



FIGURE 46B
REMOVING MAIN AND RELIEF
VALVE ASSEMBLY



- 1 MAIN VALVE COVER CAP SCREW
- 2 MAIN VALVE COVER
- 3 MAIN VALVE DISC HOLDER
- 4 MAIN VALVE DISC
- 5 MAIN VALVE GUIDE
- 6 MAIN VALVE SEAT
- 7 MAIN VALVE SEAT GASKET
- 8 MAIN VALVE DIAPHRAGM PLATE (2)
- 9 MAIN VALVE DIAPHRAGM
- 10 MAIN VALVE SPRING
- 11 MAIN VALVE STEM GUIDE
- 12 RELIEF VALVE SPRING
- 13 RELIEF VALVE HOLDER
- 14 RELIEF VALVE DISC
- 15 RELIEF VALVE DISC SCREW
- 16 MAIN VALVE BODY
- 17 CHECK VALVE CAP
- 18 CHECK VALVE SPRING
- 19 CHECK VALVE DISC HOLDER
- 20 CHECK VALVE DISC
- 21 CHECK VALVE GUIDE
- 22 CHECK VALVE BODY
- 23 MAIN VALVE REDUCER
- 24 TEST COCK CLOSE NIPPLE
- 25 TEST COCK
- 26 TEST COCK NIPPLE
- 27 NIPPLE
- 28 TEST COCK PLUG

MODEL NO. 12 KIT

FIGURE 46A
3/4" BEECO MODEL 12

3/4"

B 61243

REPAIR PROCEDURE – MODEL 10 (1" and 1-1/4" sizes)

A. PRELIMINARY STEPS

1. Close inlet and outlet shutoff valves.
2. Open test cocks 2, 3, and 4 to release pressure and drain the Backflow Preventer.

B. REPAIR OF MAIN VALVE

1. Disassembly (see Figs. 47, 48 and 49)
 - a. Remove cover by unscrewing cover cap screws.

NOTE: Main valve spring (3) exerts pressure against cover. When cap screws are removed, cover will be lifted about 3/8" (spring travel is stopped by spring retainer (2)).
 - b. Break spring retainer nut (1) free with wrench, holding spring to prevent valve assembly from turning.
 - c. Screw threaded rods into flange of device (Refer to Fig. 66).
 - d. Place spring removal plate over rods and rest on spring retainer (2).
 - e. Install washers and rod nuts. Tighten nuts against plate enough to compress spring (3) slightly. This forces spring retainer downward to release spring retainer nut (1).

- f. Remove spring retainer nut, and back off (loosen) rod nuts until spring is completely extended.
- g. Remove plate, threaded rods, spring retainer, spring and balance of valve assembly.
- h. Remove disc cap screw (11). This releases guide (10) and disc (9).
- i. Remove clamp nut (4). This releases spring guide washer (5), diaphragm plate (6), and diaphragm (7) from disc holder (8).

2. Reassembly

- a. Place new diaphragm (7) on disc holder (8). Replace diaphragm plate (6) and spring guide washer (5). Install clamp nut (4) and tighten firmly.
- b. Install new disc (9) in disc holder (8), replace guide (10) and tighten cap screw (11) firmly in place. Place assembly in body.
- c. Place spring (3) on diaphragm plate (6).
- d. Place spring retainer (2) on spring (3).
- e. Install plate and threaded rods. Compress spring enough to permit replacement of spring retainer nut (1).

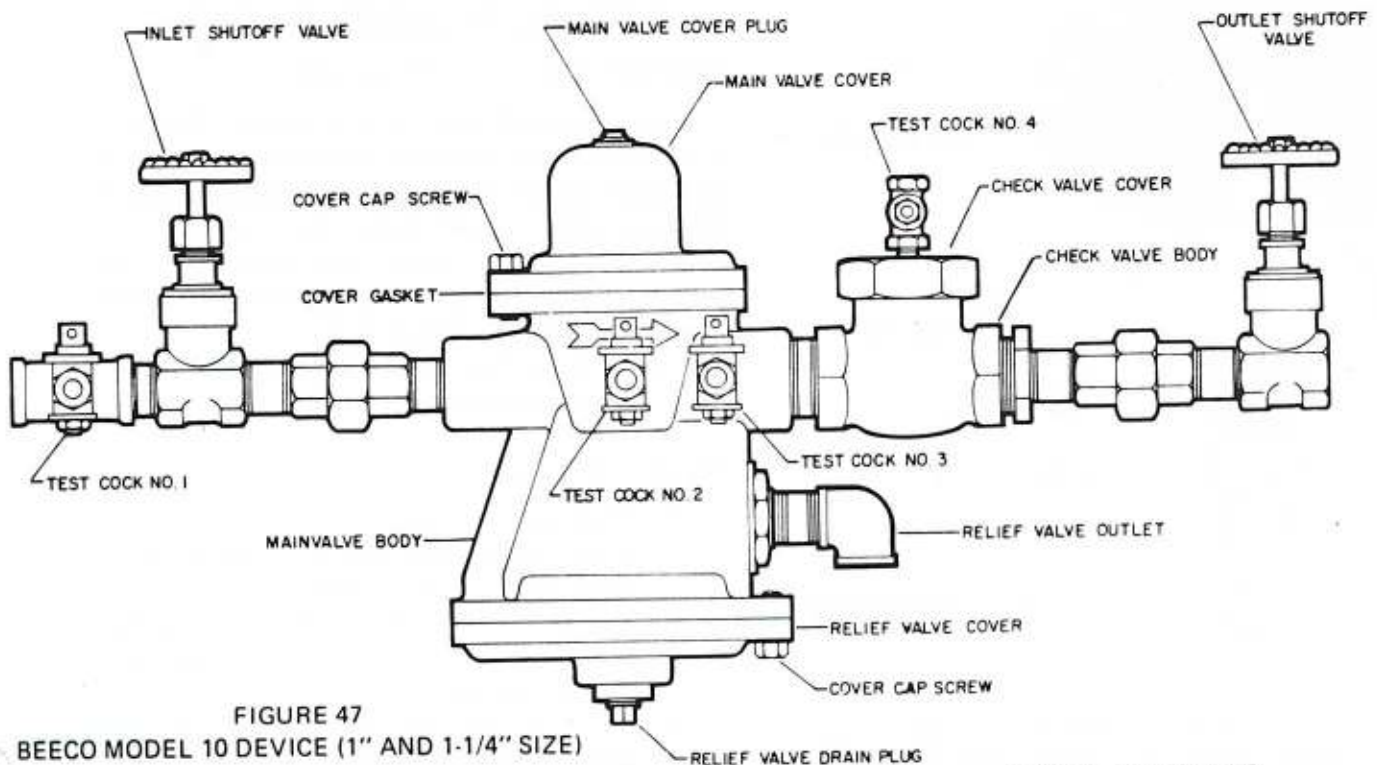


FIGURE 47
BEECO MODEL 10 DEVICE (1" AND 1-1/4" SIZE)

MODEL NO. 10 KITS

1" & 1 1/4"	B	61242
2"	B	61247

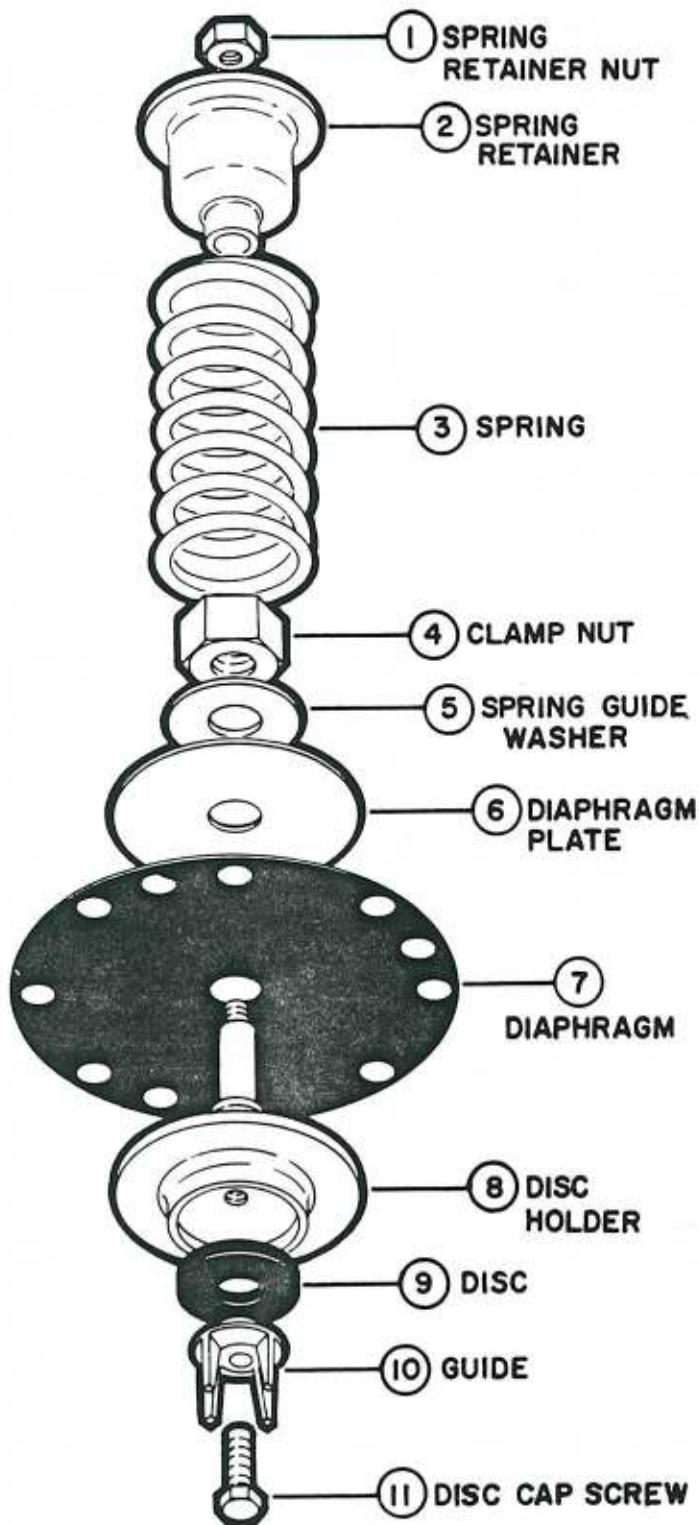


FIGURE 48
MAIN VALVE ASSEMBLY
BEECO MODEL 10 (1" AND 1-1/4" SIZES)

- f. Remove plate and rods; tighten nut firmly with wrench.
- g. Align bolt holes on diaphragm with holes on body, paying particular attention to hole for cored passageway to zone of reduced pressure.
- h. Replace cover.

C. REPAIR OF CHECK VALVE

1. Disassembly (see Fig. 49)
 - a. Unscrew cap nut (5).
 - b. Remove cap (6).
 - c. Lift out spring (1) and disc holder (2).
 - d. Unscrew disc guide (4).
 - e. Remove disc (3).
2. Reassembly
 - a. Install new disc (3).
 - b. Replace disc guide (4).
 - c. Install disc holder (2) and spring (1).
 - d. Replace cover and retaining nut.

D. REPAIR OF RELIEF VALVE

As relief valve is identical to relief valve used in the Model 6C, 1" – 6" sizes, refer to Model 6C section for procedure.

BEECO MODEL VC DOUBLE CHECK VALVE ASSEMBLIES

DESCRIPTION AND OPERATION

These assemblies are used to prevent backflow of polluted water or other contaminants into potable water supply lines, where no health hazard or potential health hazard exists. They consist of two spring-loaded check valves, two gate valves and four test cocks. The check valves open and permit flow in the normal direction of flow. A spring on each valve holds the valve closed against any flow in the opposite direction of normal flow.

INSTALLATION

1. Flush out inlet lines.
2. Allow ample clearance for testing and removal from line for repairs.
3. This unit should be installed above ground level, but may be installed in pits with proper drainage.
4. The assembly may be installed horizontally, or vertically, if the direction of flow is *upward*.

REPAIR OF 2" BEECO MODEL VC DOUBLE CHECK VALVE ASSEMBLIES

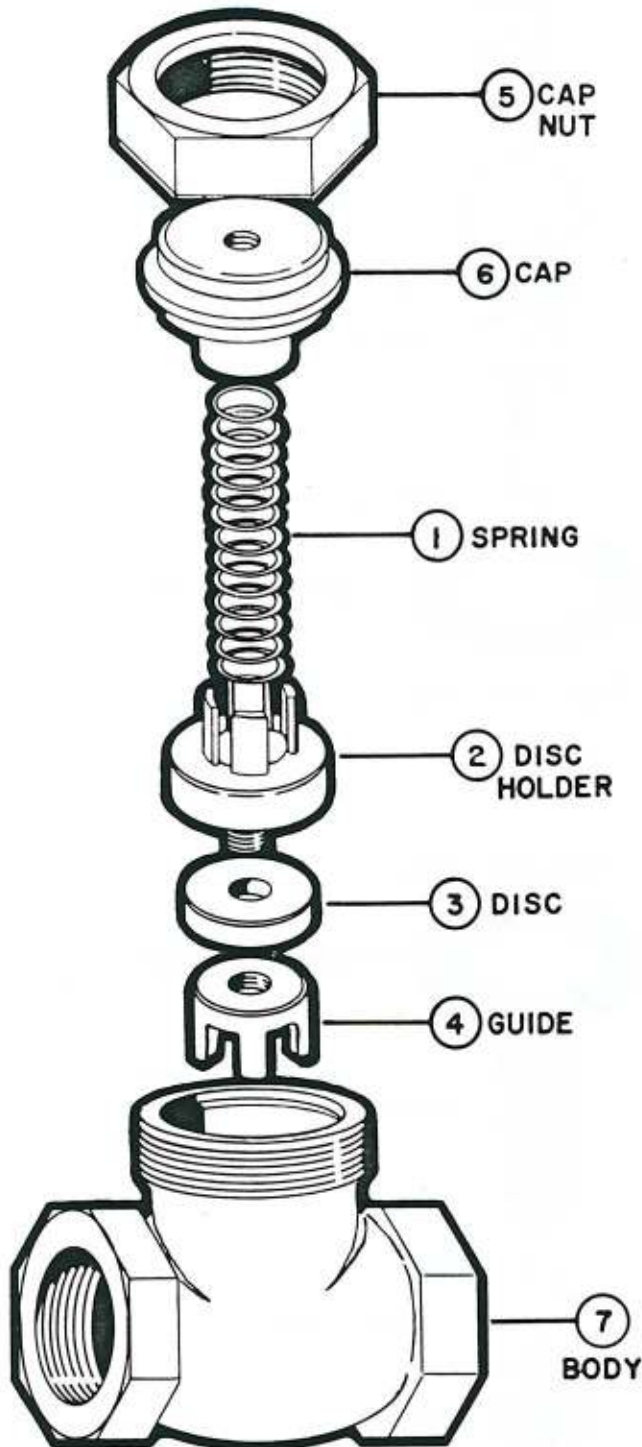


FIGURE 49
CHECK VALVE ASSEMBLY, BEECO MODEL 10
(1" AND 1-1/4" SIZES)

A. PRELIMINARY STEPS (see Fig. 50)

1. Close shutoff valves (1, 6)
2. Break the two union connections (2).
3. Remove valves and adapters.

B. REPAIR OF FIRST CHECK VALVE

1. Disassembly (see Fig. 50)
 - a. Remove inlet adapter (5). This releases valve assembly, including spring (7).
 - b. Remove stud nut (12). Leave stud in place. This releases guide (10).
 - c. Remove disc (9) from disc holder (8).
2. Reassembly
 - a. Install new disc (9).
 - b. Install guide (10).
 - c. Install stud (11).
 - d. Install disc holder assembly.
 - e. Install spring (7).
 - f. Stand valve assembly on outlet adapter.
 - g. Replace body flange gasket (13).
 - h. Assemble inlet adapter to body (4).
 - i. Install cap screws.

C. REPAIR OF SECOND CHECK VALVE

1. Disassembly (see Fig. 50)
Follow same procedure used for first check valve, after removing outlet adapter.
2. Reassembly
Follow same procedure used for first check valve; then attach outlet adapter.

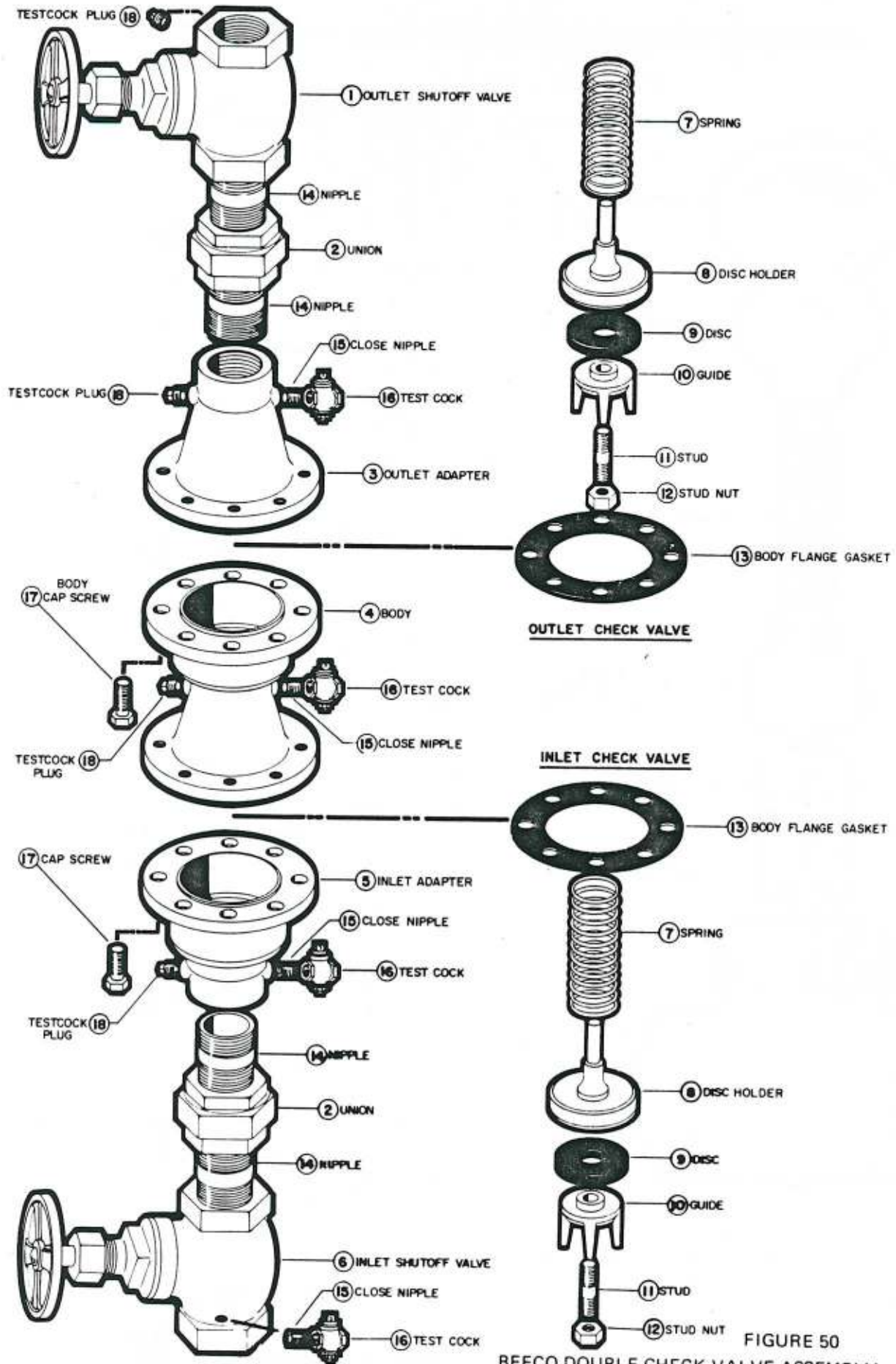
D. FINAL STEPS

1. Connect valves and adapters to union connections.
2. Open shutoff valves.

MODEL VC KIT

2"

B 61244



REPAIR OF 3" BEECO MODEL VC DOUBLE CHECK VALVE ASSEMBLIES

A. PRELIMINARY STEPS

1. Close shutoff valves.
2. Unbolt assembly from valves. Or, remove all but one bolt from each end of outlet check valve only and roll it out of line. This permits access to internal parts.

B. REPAIR OF CHECK VALVES

1. Disassembly (see Fig. 51)
 - a. Unscrew retainer (1) by inserting 1/2" square piece of bar stock in end slot and turning with wrench; or, strike end slot with driver to loosen.
 - b. Remove balance of valve assembly, including spring (2).
 - c. Unscrew stud nut (7). This releases guide (5).
 - d. Remove disc (4) from disc holder (3).
2. Reassembly
 - a. Replace disc (4) and install guide (5) and stud nut (7).
 - b. Place above assembly in body.
 - c. Replace spring and screw retainer in place.
 - d. Reassemble check valve to shutoff valve and other check valve, using new gasket (14) if necessary.

C. FINAL STEPS

1. Reassemble check valve to shutoff valve and other check valve, replacing flange gaskets if necessary.
2. Open shutoff valves.

REPAIR OF 4" BEECO MODEL VC DOUBLE CHECK VALVE ASSEMBLIES

A. PRELIMINARY STEPS

1. Close shutoff valves.
2. Unbolt assembly from valves. Or, remove all but one bolt from each end of outlet check valve only and roll it out of line. This permits access to internal parts.

B. REPAIR OF CHECK VALVE

1. Disassembly (see Fig. 51)

- a. Unscrew retainer (1) by inserting 1/2" square piece of bar stock in end slot and turning with wrench; or, strike end slot with driver to loosen.
- b. Grasp stop (3A) and remove entire valve assembly.
- c. Rest assembly on guide (5).
- d. Press down on retainer (1) to compress spring (2).
- e. Unscrew stop and gradually release pressure on retainer. Remove retainer and spring.
- f. To replace disc (4), unscrew stud nut (7). This releases guide (5). Remove disc (4).

2. Assembly

- a. Place new disc (4) on disc holder (3).
- b. Place guide (5) on disc holder and install stud nut (7).
- c. Place spring on disc holder.
- d. Place retainer (1) on spring (2). Compress spring to permit assembly of stop (3A) to disc holder.
- e. Install valve assembly in body.
- f. Press retainer, compressing spring to allow engagement of retainer threads. Screw retainer in place, tightening firmly.

C. FINAL STEPS

1. Reassemble check valves to each other and to shutoff valves, replacing flange gaskets if necessary.
2. Open shutoff valves.

MODEL VC KITS

3"	B	61245
4"	B	61246

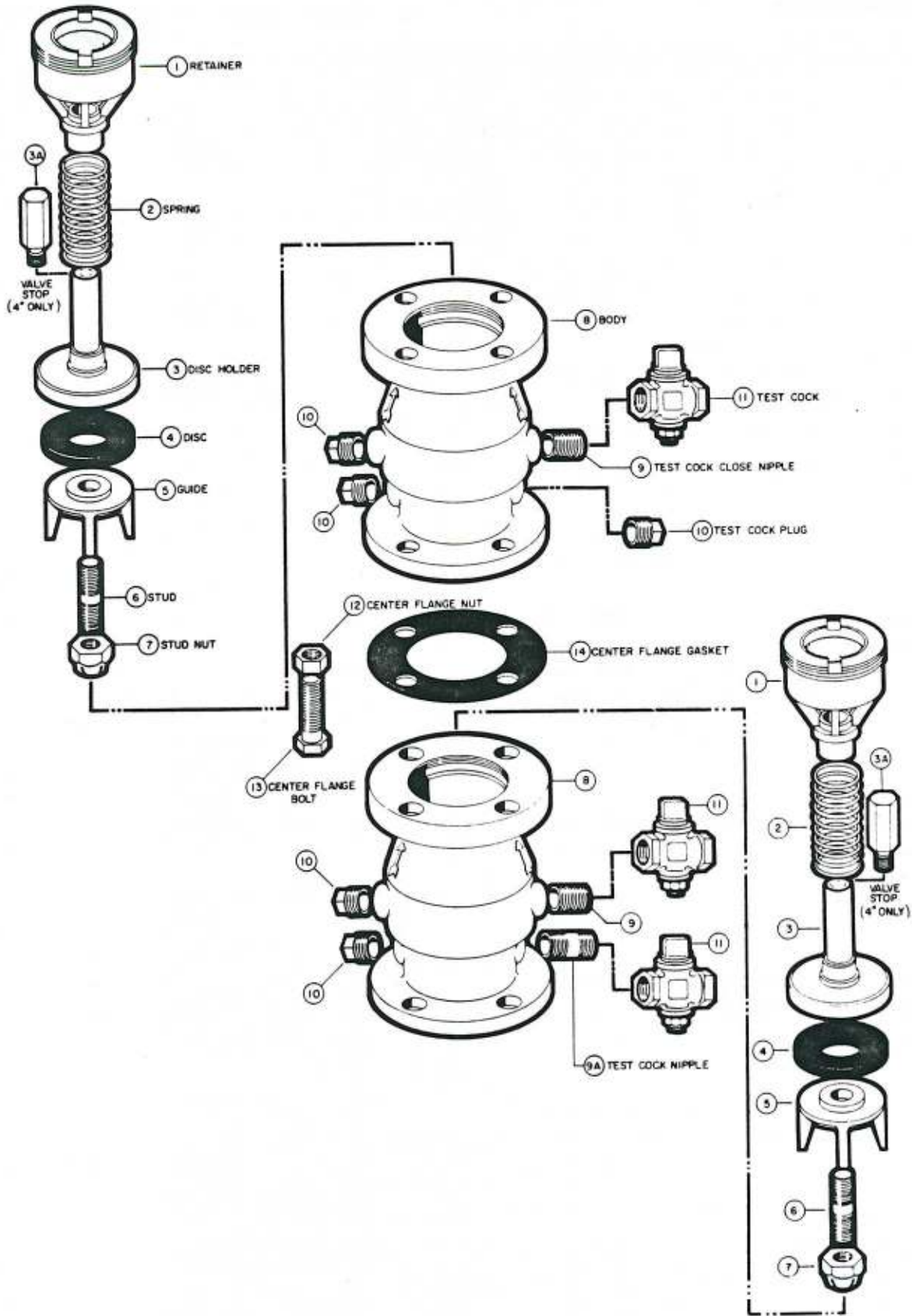


FIGURE 51
 BEECO DOUBLE CHECK VALVE ASSEMBLY (3" AND 4" SIZES)

REPAIRS – HERSEY NO. 1 CHECK VALVE ASSEMBLY

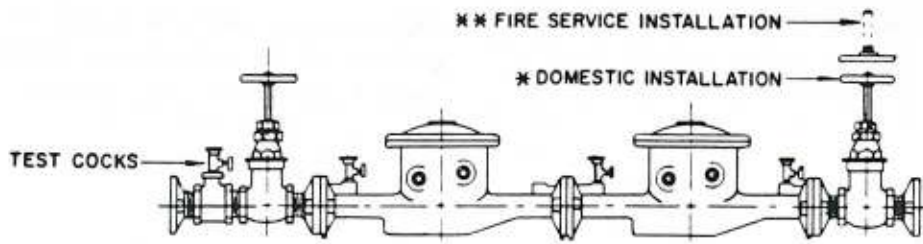
DISASSEMBLY (see Figs. 52 and 53)

1. Remove top case.
2. Check lever valve mechanism, on smaller sizes, by lifting weight (18) as far as it will go. The swing arm (7) should be lifted until the roller (17) comes in contact with roller path on weight. Allow valve to close slowly to make sure it does not hang up at any point.
3. On larger sizes, lift weight alone. It should move freely and rest against roller at flat of roller path on weight.
4. Remove the weight.
 - a. Remove hinge spindle plugs (9).
 - b. Support weight, either with hands, or larger sizes, with a hoist.
 - c. With bronze driver (or using an old spindle), tap spindle (11) out from one side. When it extends from the bottom case, it can be pulled the rest of the way.
If corrosion deposits are present, remove with emery cloth to prevent jamming spindle in bushings (10).
5. Lift weight from case. Inspect the rubber bushings (8), bronze case bushings (10), and spindle (11) for wear.
6. On larger sizes, check operation of swing arm (7). It should move freely.
7. Remove swing arm, following procedure outlined above for weight.
8. Check rubber swing arm and roller bushings (8, 16) for wear, as well as the bronze case bushings and spindle.
9. To remove worn case bushings, insert a driver made of bronze or steel from outside case, and drive out of position.
10. Drive new bushings into place from inside case, using a lead hammer or a bronze driver inserted from opposite side (see Fig. 54).
11. Remove worn rubber weight, swing arm and roller bushings with a bronze driver. Use a plastic or lead hammer to install new bushings.

12. The clapper rubber (4) should be resilient and free of any indentation. Remove worn clapper rubbers by disassembling in order the clapper bolt cotter pin (1), clapper bolt nut (2), clapper disc (3), clapper (6), clapper rubber (4), and clapper bolt (13). If the rubber is still resilient and has not been deformed, it can be reversed to lengthen its useful life. Inspect rubber O-ring (5) in the clapper, and replace if defective. Assemble parts in reverse order.
13. To disassemble roller (17), remove pin clips (12) and slide pin (14) to one side. This releases roller and two roller washers (15).
14. To assemble roller, place roller and washers in position, pass pin through washers and roller bushing, and replace pin clips.
15. Check screw seat (19) for looseness, dents and corrosion. If screw seat has been dented or corroded, remove by turning counterclockwise, with chain wrench. Do not use a "prong" wrench, as it may distort the seat.
16. Place graphite grease on new seat gasket (20) and install gasket on threaded end.
17. Screw seat in place and tighten firmly with chain wrench.

REASSEMBLY

1. Hold swing arm in position.
2. Insert spindle through case and swing arm bushings.
3. Rest weight on swing arm and replace spindle in the same manner.
4. Apply pipe joint compound to spindle plugs, and tighten in place.
5. Install new top case gasket, and replace top case.



2" - ALL BRONZE CASES, 3"-10" ALL IRON CASES.

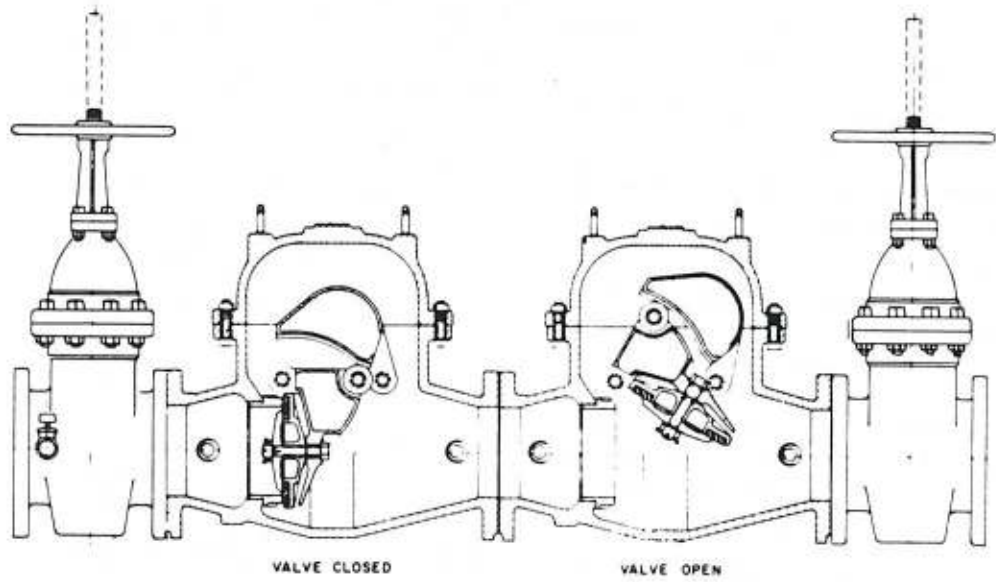
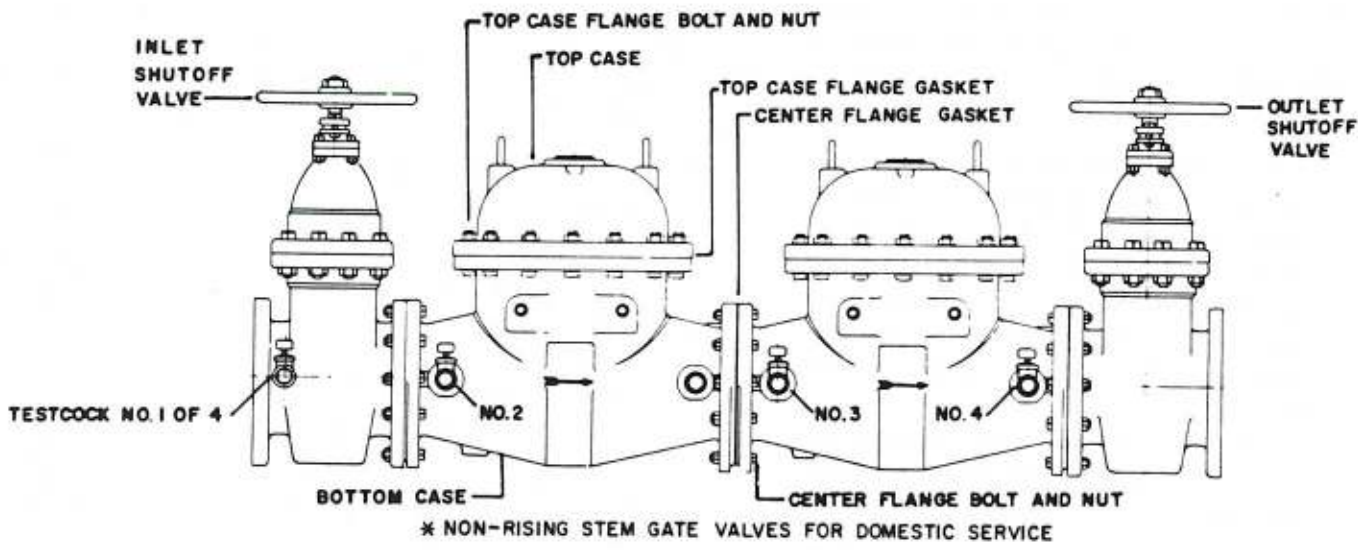


FIGURE 52 **** RISING STEM GATE VALVES FOR FIRE SERVICE**
HERSEY NO. 1 DOUBLE CHECK VALVE ASSEMBLY
 (SIZES 2" - 10" x 12")

MODEL NO. 1 & DDC I KITS

2"	B	53955
3" old style	I	54455
3" new style	I	54456
4" old style	I	55655
4" new style	I	55656
6"	I	65455
8"	I	57455
10"	I	58455
10" x 12"	I	58455

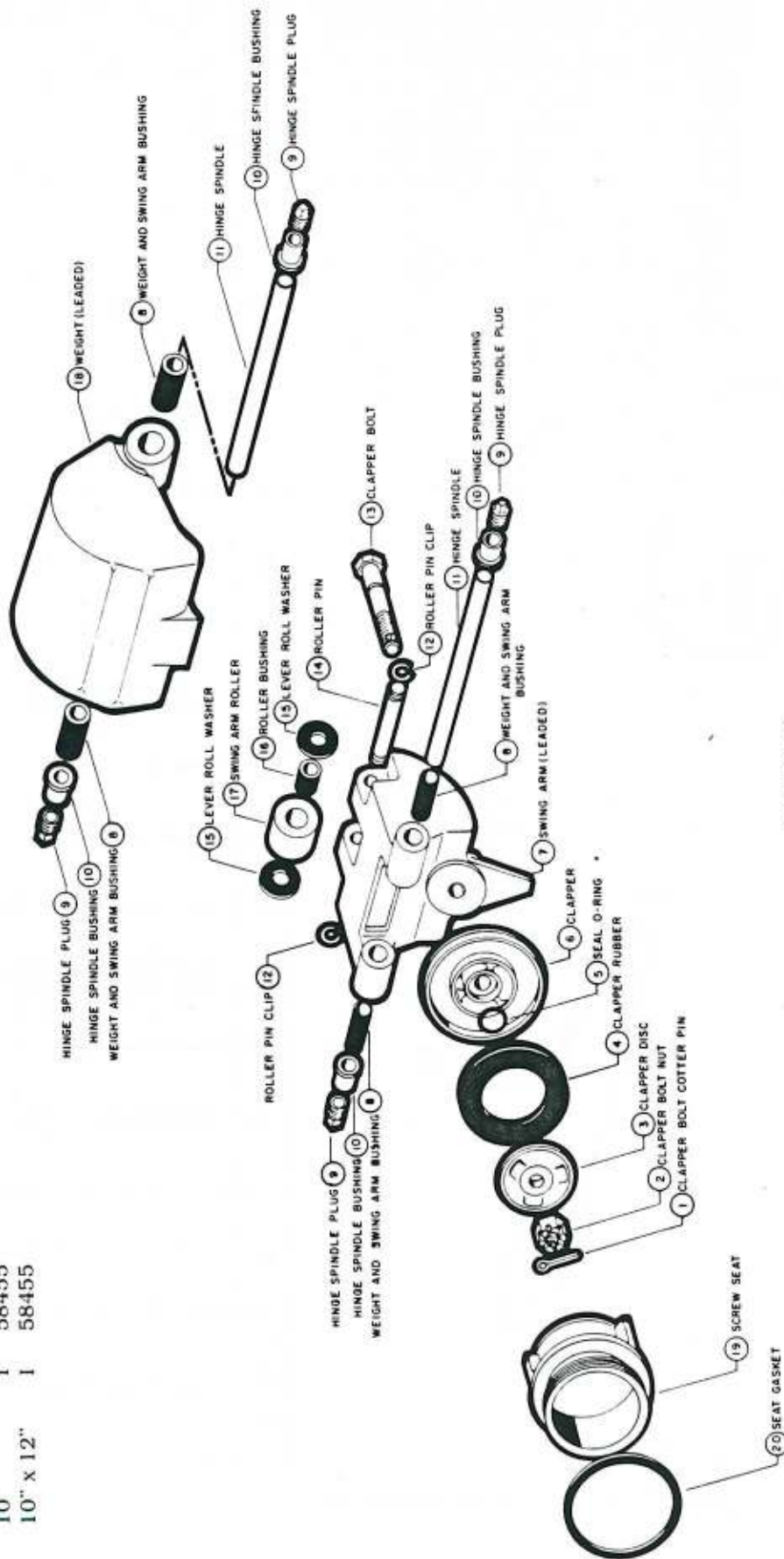
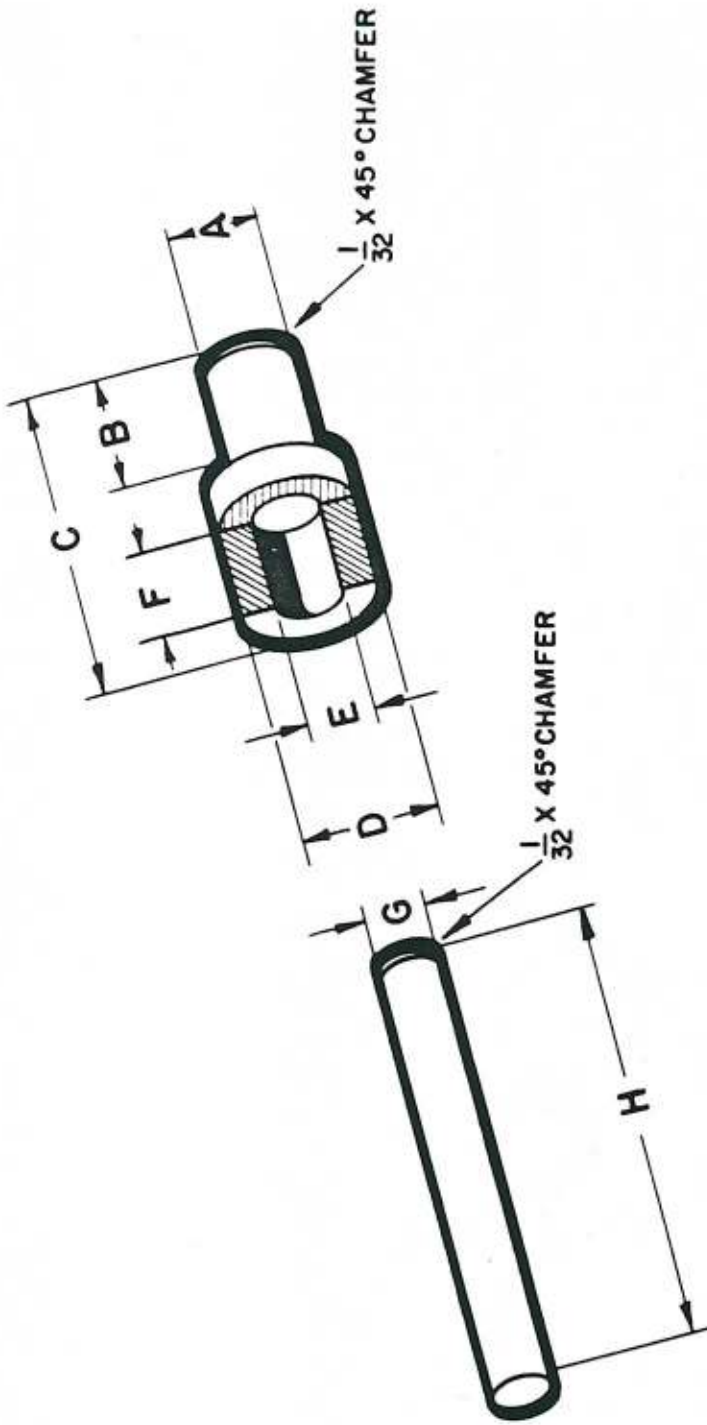


FIGURE 53
HERSEY NO. 1 CHECK VALVE ASSEMBLY
 (2" - 10" x 12" SIZES)



SIZE"	A	B	C	D	E	F	G	H
2	$\frac{5}{16}$	$\frac{21}{32}$	$1\frac{29}{32}$	$\frac{5}{8}$	$\frac{11}{32}$	$\frac{1}{2}$	$\frac{5}{16}$	$8\frac{1}{2}$
3	$\frac{3}{8}$	$\frac{21}{32}$	$1\frac{29}{32}$	$\frac{5}{8}$	$\frac{11}{32}$	$\frac{1}{2}$	$\frac{5}{16}$	$8\frac{1}{2}$
4	$\frac{15}{32}$	$\frac{5}{16}$	$2\frac{9}{16}$	1	$\frac{17}{32}$	$\frac{1}{2}$	$\frac{1}{2}$	$11\frac{1}{2}$
6	$\frac{3}{4}$	$\frac{5}{16}$	$2\frac{9}{16}$	1	$\frac{17}{32}$	$\frac{1}{2}$	$\frac{1}{2}$	$11\frac{1}{2}$
8	$\frac{15}{16}$	$\frac{7}{8}$	$3\frac{1}{8}$	$1\frac{5}{8}$	$1\frac{11}{32}$	$\frac{1}{2}$	1	17
10	$1\frac{1}{4}$	$\frac{7}{8}$	$3\frac{1}{8}$	$1\frac{5}{8}$	$1\frac{11}{32}$	$\frac{1}{2}$	1	17

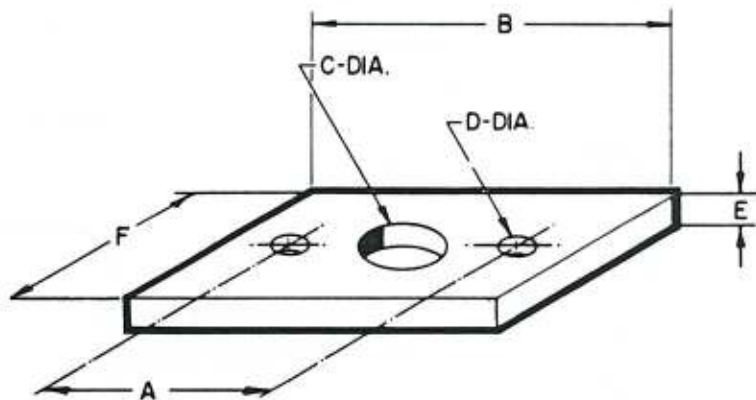
FIGURE 54
SPINDLE BUSHING DRIVER

MODEL 6C MAIN VALVE SPRING REMOVAL TOOL

Part No.	Size Device	Plate Dimensions						Rod Dimensions		Threads/ Inch
		A	B	C	D	E	F	Dia.	Length	
62361	3"	6 1/4"	8 1/4"	1 3/4"	5/8"	1/2"	4"	1/2"	14"	13
62362	4"	7 1/4"	9 1/4"	2"	5/8"	1/2"	4"	1/2"	19"	13
62363	6"	12 1/2"	14 1/2"	2"	7/8"	1/2"	6"	3/4"	23"	14
62364	8"	17"	19"	2"	7/8"	1/2"	6"	3/4"	26"	14
62365	10"	18 3/4"	20 3/4"	2 1/2"	7/8"	1/2"	6"	3/4"	34"	14

Washer and Nut Specifications:

Use commercially-available steel nuts and washers corresponding to rod diameter and thread.



This tool consists of a steel plate, 2 threaded steel rods and 3 nuts and washers for each rod. Parts may be obtained locally, or a complete set can be ordered from the Hersey Products Inc.

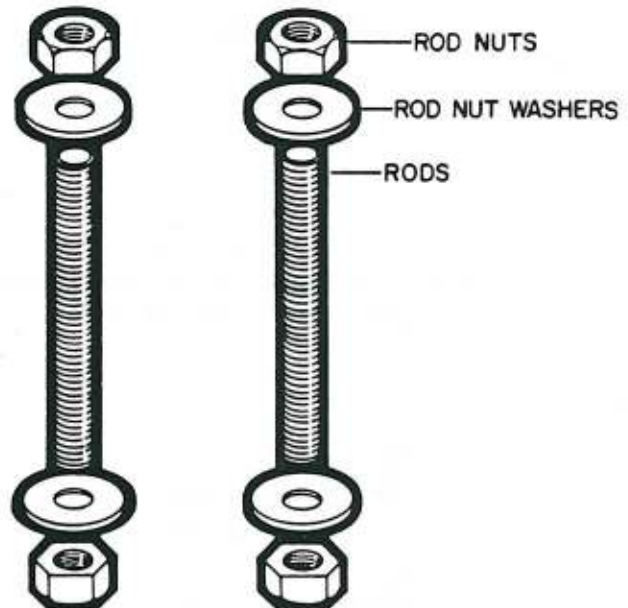


FIGURE 61
MAIN VALVE SPRING REMOVAL TOOL, BEECO MODEL 6C
(3" - 10" SIZES)

**SPECIAL MAIN, CHECK AND RELIEF VALVE WRENCHES
MODELS 6 AND 6C**

A. Model 6

<u>No.</u>	<u>Description</u>	<u>Application</u>	<u>Part No.</u>
1.	Main and check valve wrench	2" device	61264
2.	Main and check valve wrench	2 1/2" device	61265
3.	Main and check valve wrench	3" device	61266
4.	Main and check valve wrench	4" device	61267
5.	Main valve wrench	6" device	61777
6.	Check valve wrench	6" device	61776
7.	Relief valve wrench Upper and Lower Seat	2", 2 1/2", 3" device	61260 61261
8.	Relief valve wrench Upper Seat	4", 6", 8", 10" device	61262
9.	Relief valve wrench Lower Seat	4", 6", 8", 10" devices	61263

On 8" and 10" devices, special main and check valve wrenches are not required.

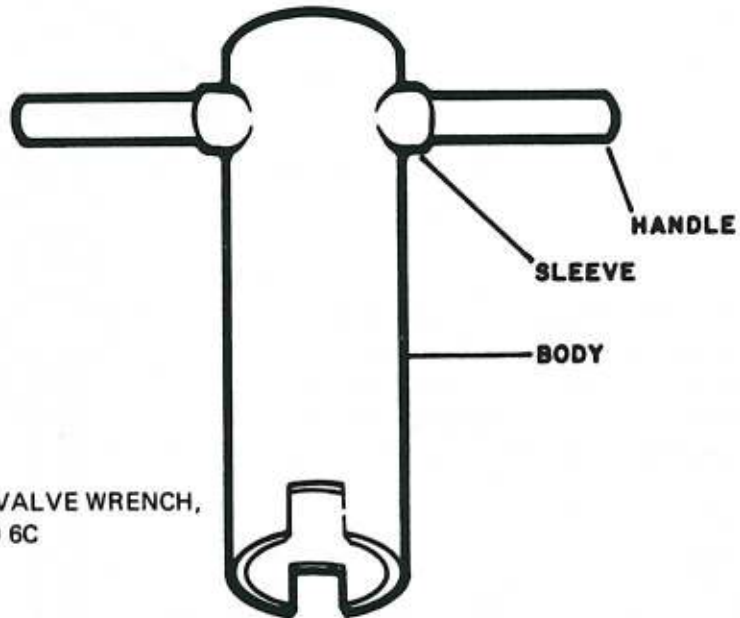


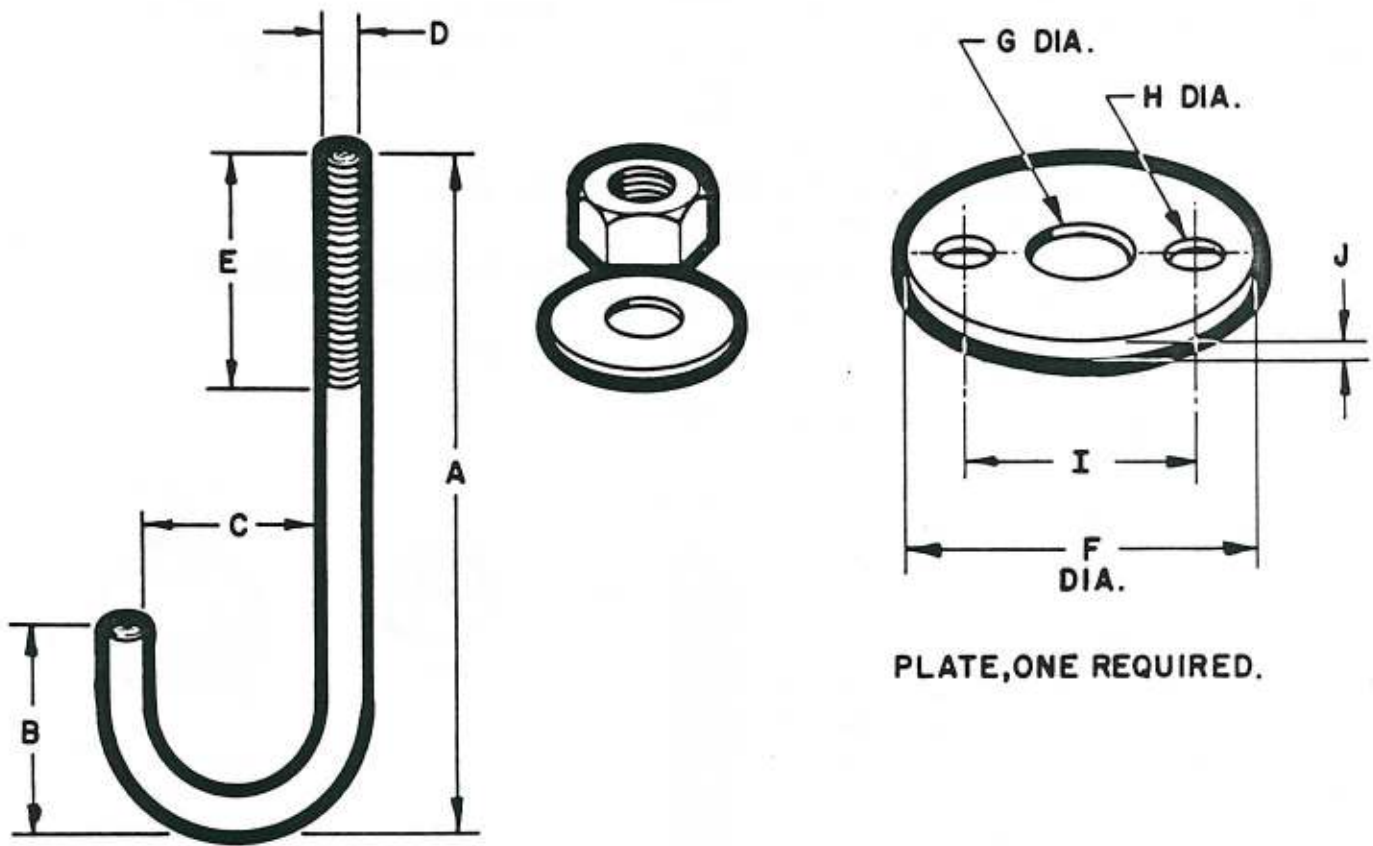
FIGURE 62
MAIN, CHECK AND RELIEF VALVE WRENCH,
MODELS 6 AND 6C

B. Model 6C

<u>No.</u>	<u>Description</u>	<u>Application</u>	<u>Part No.</u>
1.	Relief Valve Wrench Upper Seat	8", 10" devices	61262
2.	Relief Valve Wrench Lower Seat	8", 10" devices	61263

MODEL 6 MAIN AND CHECK VALVE SPRING REMOVAL TOOL (2" – 6" SIZES)

Part No.	Size Device	Rod Dimensions						Plate Dimensions			Rods Threads/in.	
		A	B	C	D	E	F	G	H	I	J	
62369	2"	14"	1/2"	7/16"	3/8"	7"	3"	1 1/8"	1/2"	2"	1/4"	16
62370	2 1/2"	12"	1/2"	3/8"	3/8"	5"	3 1/2"	1 1/8"	1/2"	2 3/8"	1/4"	16
62371	3"	12"	5/8"	3/8"	3/8"	5"	4"	1 5/8"	1/2"	2 5/8"	1/4"	16
62372	4"	20"	1"	1/2"	1/2"	9"	5 1/2"	2"	5/8"	3 1/2"	3/8"	13
62373	6"	26"	1"	1/2"	1/2"	12"	7 1/2"	2"	5/8"	5 3/4"	3/8"	13



THREADED HOOK ROD WITH NUT & WASHER, TWO REQUIRED.

FIGURE 63
MAIN AND CHECK VALVE SPRING REMOVAL TOOL, MODEL 6
(2" TO 6" SIZES)

MODEL 6 MAIN AND CHECK VALVE SPRING REMOVAL TOOL (8" AND 10" SIZES)

Part No.	Rod Dimensions	Washer Dimensions
62366	A - 1/2"	A - 1 1/16"
	B - 24"	B - 2 1/2"
	C - 1"	

This tool consists of a threaded steel rod, rod nut and washer. "Flats" (see dimension A) are machined on the rod to accommodate a wrench. Parts may be obtained locally, or a complete set can be ordered from the Hersey Products Inc.

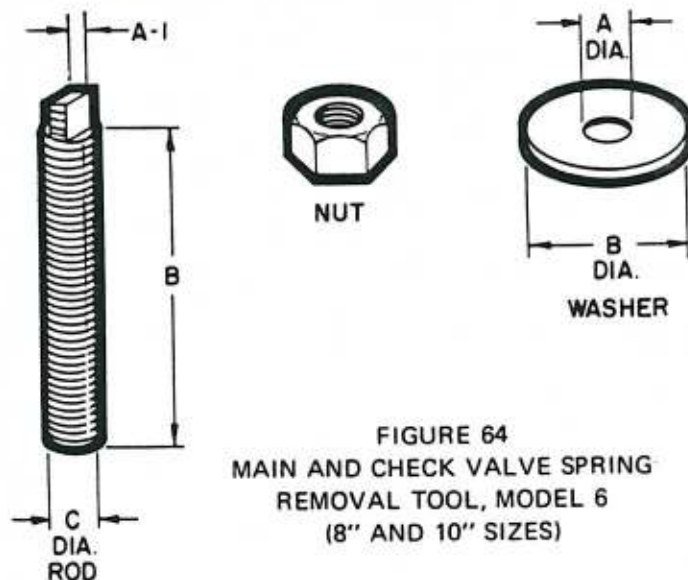


FIGURE 64
MAIN AND CHECK VALVE SPRING
REMOVAL TOOL, MODEL 6
(8" AND 10" SIZES)

MODEL 6 RELIEF VALVE SPRING REMOVAL TOOL (2" - 6" SIZES)

Part No.	Size Device	Rod Dimensions			Pipe Plug Bushings Dimensions	
		A	B	C	A	B
62367	2", 2 1/2", 3"	1/4"	24"	1/2"	5/8"	2"
62368	4", 6"	1/2"	24"	3/4"	7/8"	3"

Size Device	Thread
2", 2 1/2", 3"	1/2" - 13 NC
4", 6"	3/4" - 10 NC

This tool consists of a threaded steel rod, rod nut and pipe plug bushing. "Flats" (see dimension A) are machined on the rod to accommodate a wrench.

Parts may be obtained locally, or a complete set may be ordered from the Hersey Products Inc.

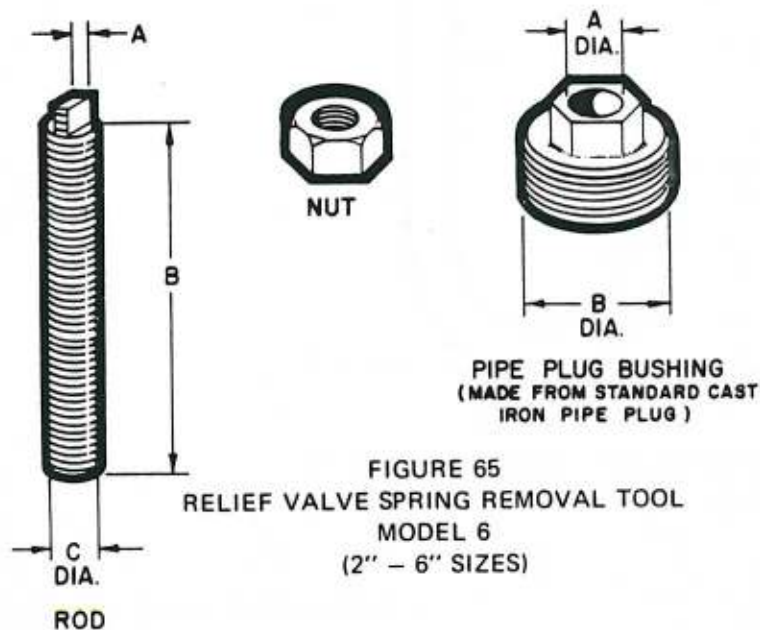
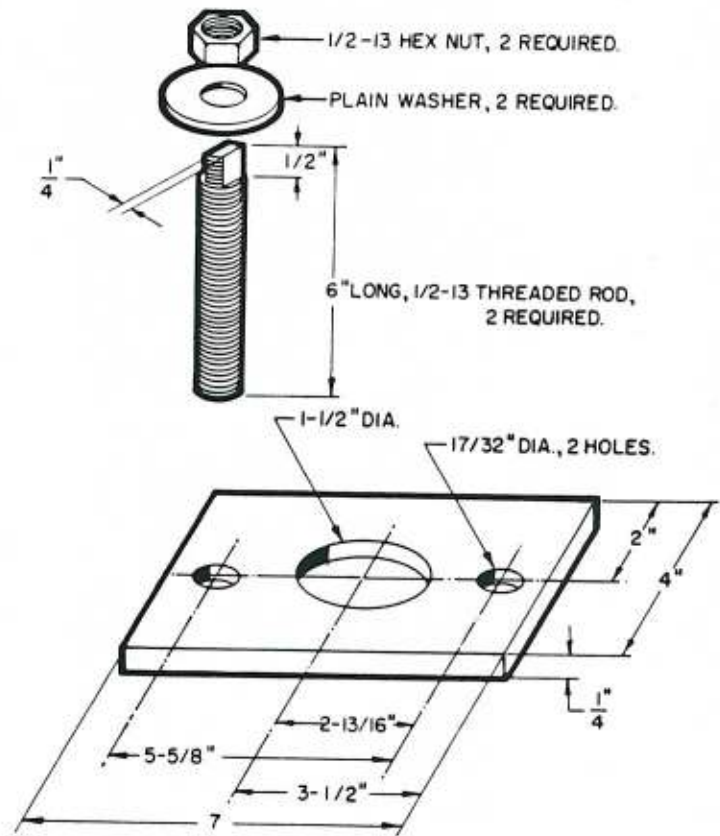


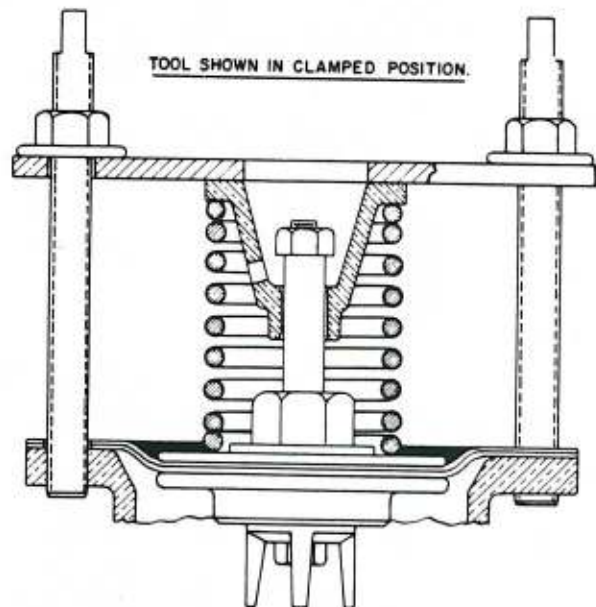
FIGURE 65
RELIEF VALVE SPRING REMOVAL TOOL
MODEL 6
(2" - 6" SIZES)

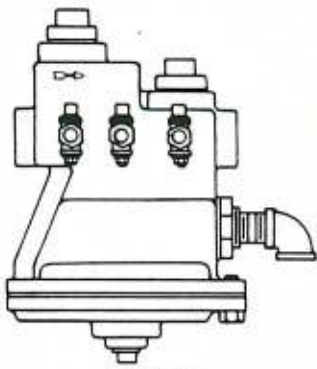
1" MODEL 10 MAIN VALVE SPRING REMOVAL TOOL



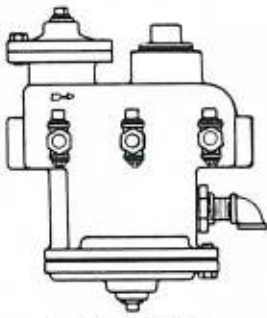
This tool consists of a steel plate, two threaded steel rods; and one nut and washer for each rod. Parts may be obtained locally, or a complete set can be ordered from the Hersey Products Meter Company. (Part No. 62374.) See Figure 66 for specifications.

FIGURE 66
MAIN VALVE
SPRING REMOVAL TOOL
1" MODEL 10





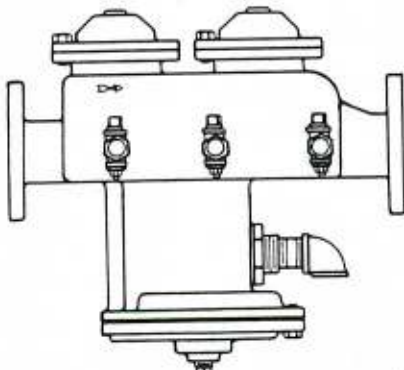
1" SIZE



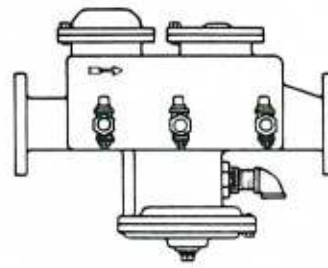
1-1/2" SIZE



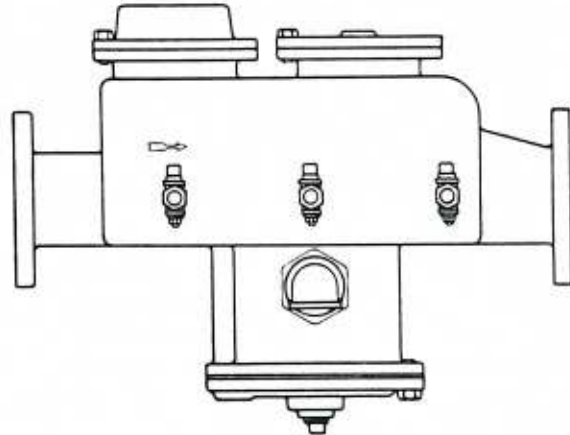
2" SIZE



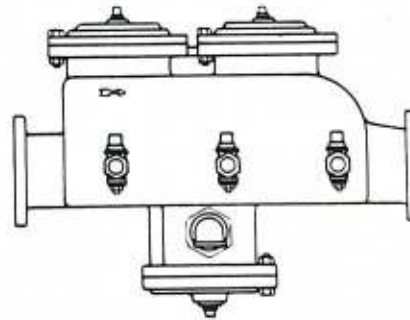
2-1/2" SIZE



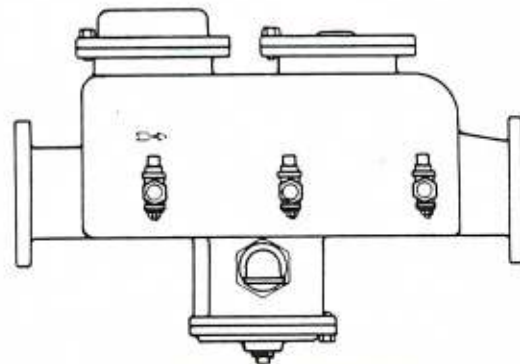
3" SIZE



4" SIZE



6" SIZE (IRON BODY)



6" SIZE (BRONZE BODY)

FIGURE 67
MODEL 6C REDUCED PRESSURE
PRINCIPLE BACKFLOW PREVENTERS
(EXTERIOR VIEWS)