September 2012

Types C401, C402, C407, C421, C427, C403, and C831 Jet Bleed Internal™ Valve Retrofit Kits

WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.

Fisher® equipment must be installed, operated, and maintained in accordance with federal, state, and local codes and Emerson Process Management Regulator Technologies, Inc. (Regulator Technologies) instructions.

Only personnel trained in the proper procedures, codes, standards, and regulations of the LP-Gas industry should install and service this equipment.

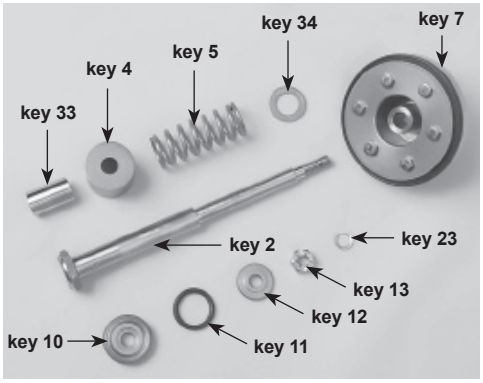


Figure 1. *Jet Bleed Internal Valve Parts Kit, Packing Components Not Shown*

Introduction

Scope of the Manual

This manual provides instructions for the installation of the Jet Bleed Internal Valve Retrofit Kit and packing for the Fisher Types C401, C402, C407, C421, and C427 Threaded Internal Valves and for the Fisher Types C403 and C831 Double Flange Internal Valves.

Section I: Types C401, C402, C407, C421, C427, and C831 Retrofits - See Pages 1 to 11.

Section II: Type C403 Retrofit - See Pages 12 to 19.

CAUTION

Using old parts in the retrofit rebuild can result in improper operation, leakage and incorrect excess flow rating.

The retrofit kit does not contain a new excess flow spring. This must be ordered separately to match the desired rate of the valve being rebuilt.

Use only new parts supplied with this kit. Do not attempt to re-use old parts or substitute non-Fisher specified parts.

D450232T012

SECTION I: TYPES C401, C402, C407, C421, C427, and C831 RETROFITS

Description

The Jet Bleed Internal Valve Retrofit Kit shown in Figure 1 is designed to decrease the time-to-open and increase overall valve durability. **NOTE: Excess Flow Spring is NOT included in Retrofit Kit.** Please consult the proper Fisher C Series Internal Valve Instruction Manual for the proper part number.

This kit contains Nitrile (NBR) Main disc (key 7) and Bleed disc (key 11). Should you require alternate materials, those will need to be purchased separately and installed according to the directions.

Recommended Tools List

- 7/16-inch / 11 mm Drive Socket
- 1/2-inch / 13 mm Drive Socket
- 3/4-inch / 19 mm Drive Socket
- 6-inch / 152 mm Drive Socket Extension
- Needle Nose Pliers
- Adjustable Wrench
- Torque Wrench

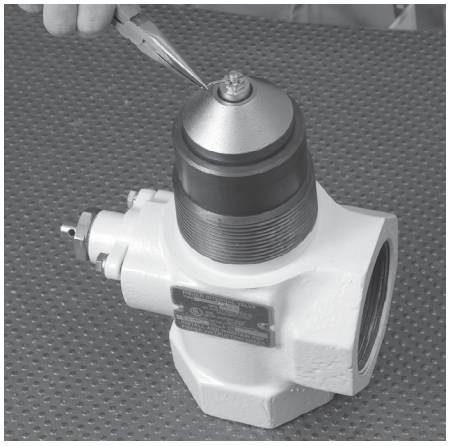
JET BLEED INTERNAL™ VALVE RETROFIT KIT INSTALLATION INSTRUCTIONS

HOW TO INSTALL A JET BLEED INTERNAL VALVE RETROFIT KIT ON TYPES C401, C402, C407, C421, C427, AND C831.

Step 1 (No Picture) - Remove valve from tank.

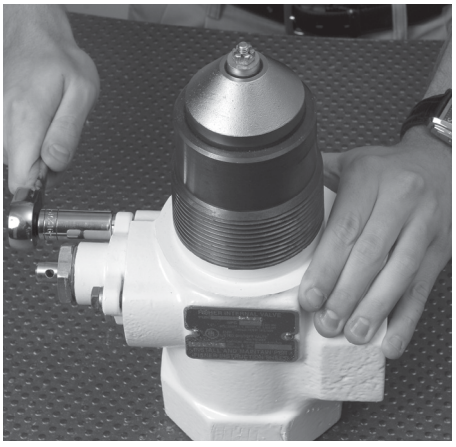
WARNING

Tank Pressure must be released before removing the valve from the container. Failure to do so could result in personal injury.



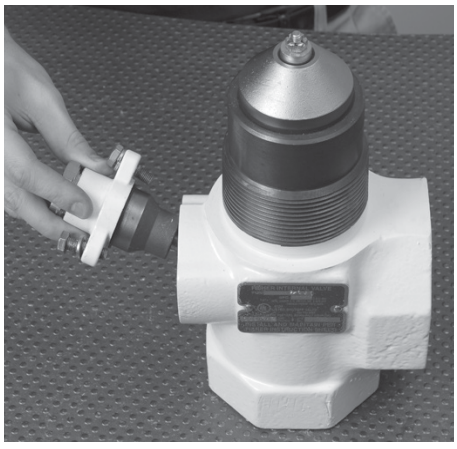
P1598

Step 2 - Remove cotter pin.



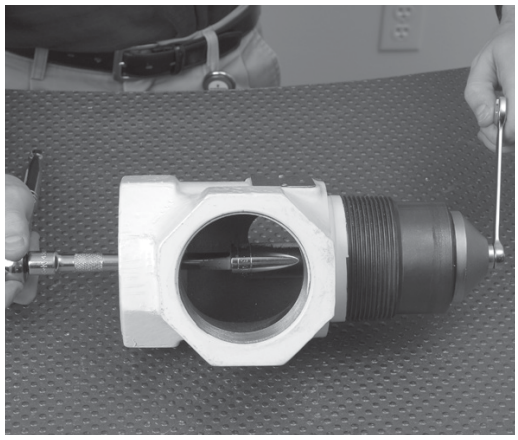
P1599

Step 3 - Remove packing gland assembly cap screws.



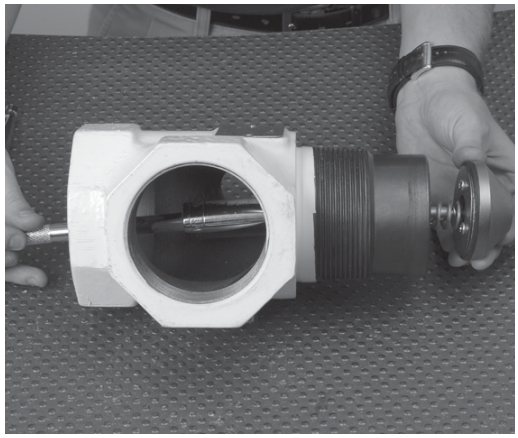
P1600

Step 4 - Tilt packing gland assembly to remove from body; see section regarding packing repair and reassembly.
IMPORTANT: If packing assembly will not be repaired, removal of packing assembly and cam assembly is not required.



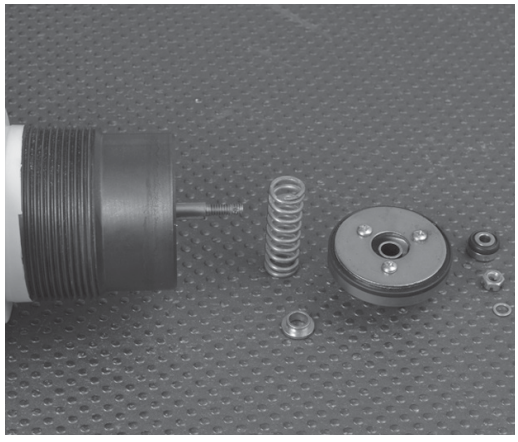
P1601

Step 5 - Secure stem assembly with 3/4-inch / 19 mm socket and drive socket extension at the Polytetrafluoroethylene (PTFE) wear pad and remove crown nut.



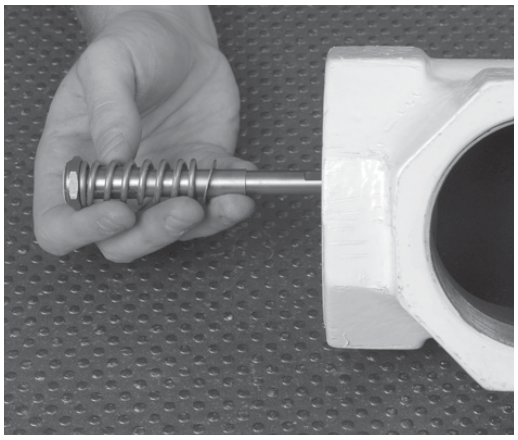
P1602

Step 6 - Remove bleed seat assembly and main disc holder assembly.



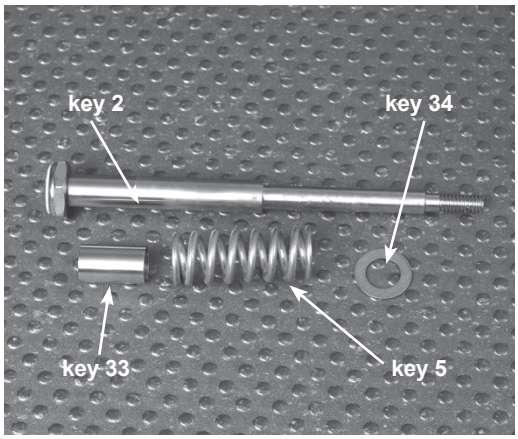
P1603

Step 7 - Remove excess flow spring and spring seat.



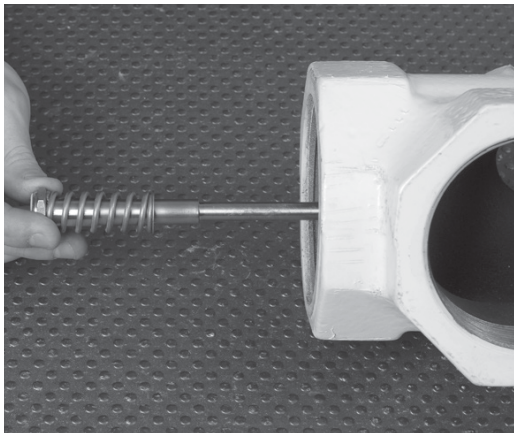
P1604

Step 8 - Remove stem assembly; leave guide in place.



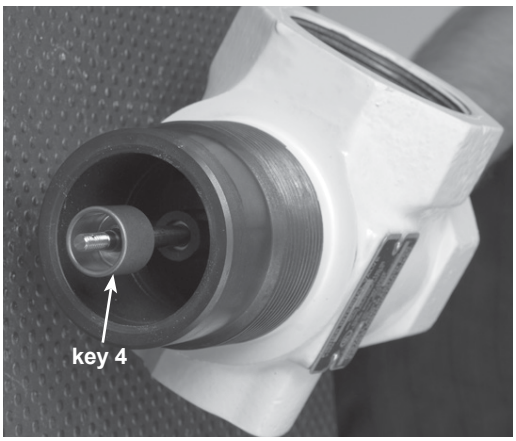
P1605

Step 9 - Place supplied travel stop (key 33), then closing spring (key 5), then washer (key 34) onto new stem assembly (key 2).



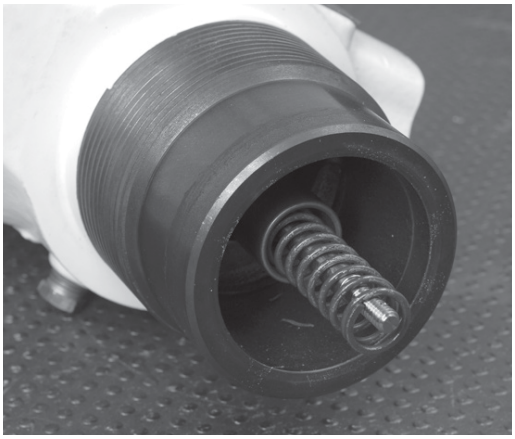
P1606

Step 10 - Insert new stem assembly into stem guide.



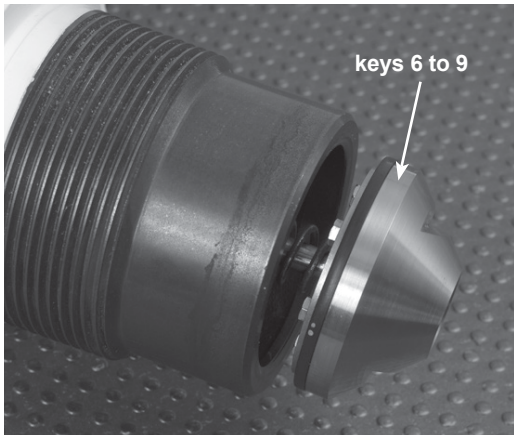
P1607

Step 11 - Place new excess flow spring seat (key 4) onto top of stem with open end of cup facing top of valve body as shown.



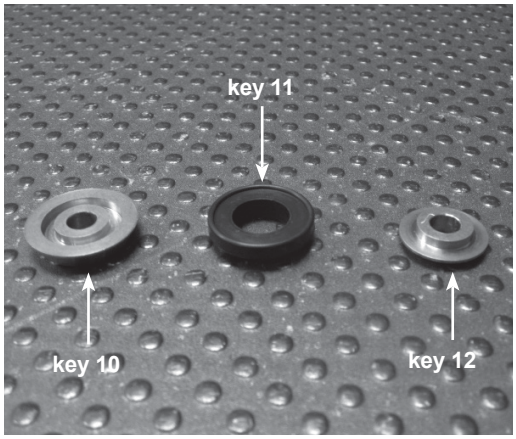
P1608

Step 12 - Place new excess flow spring (sold separately) into spring seat.
IMPORTANT: A new excess flow spring is required and sold separately from the retrofit kit.



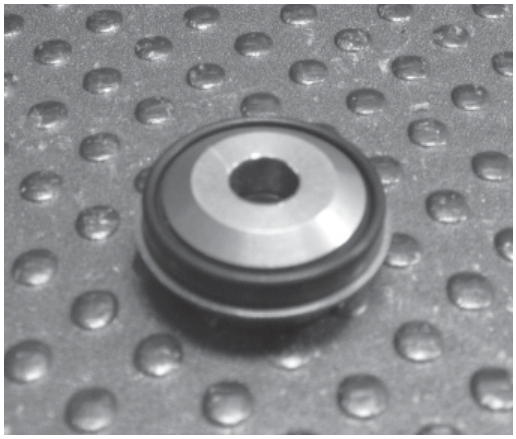
P1609

Step 13 - Place new main disc holder assembly (keys 6 to 9) onto stem with main disc against body.



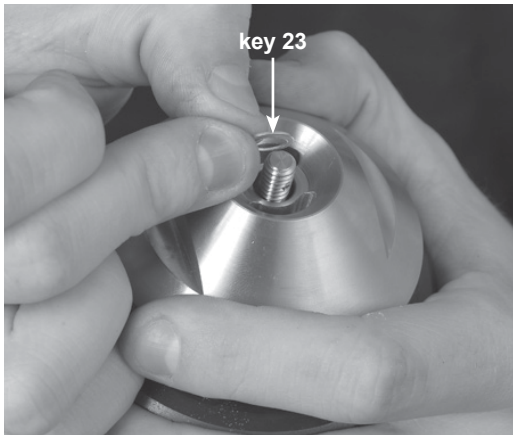
P1610

Step 14 - Ensure components of new bleed seal assemble are present (keys 10 to 12).



P1611

Step 15 - Place bleed disc (key 11) in bleed disc seat (key 10), then place bleed disc retainer (key 12) into bleed disc seat with extrusion first.
IMPORTANT: The retainer can only go into the seat one way, with the extruded edge facing down as shown.



P1612

Step 16 - Place new crush washer (key 23) onto stem.



P1613

Step 17 - Place new bleed seat assembly on stem with bleed disc oriented towards body.



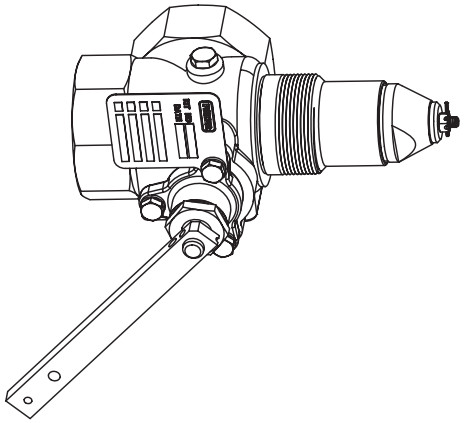
P1616

Step 20 - Insert and secure cotter pin (key 19).

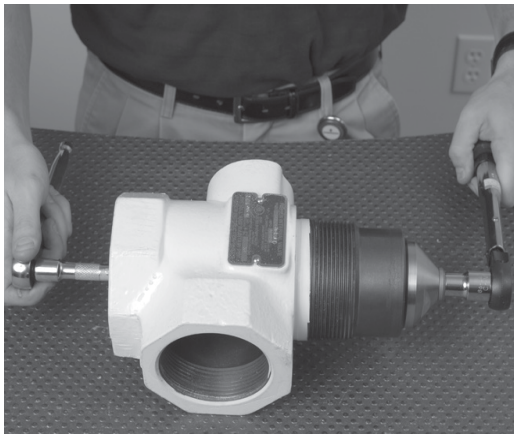


P1614

Step 18 - Install new castle nut (key 13) to secure assembly.

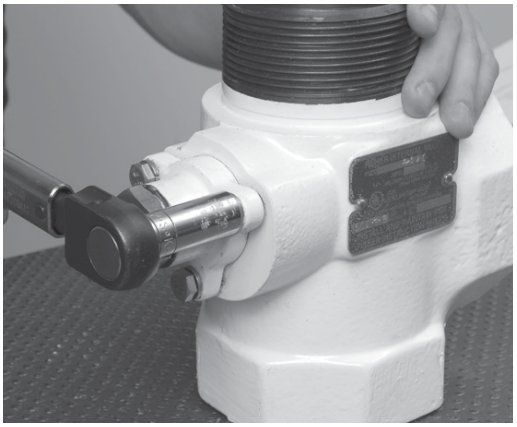


Step 21a - Install retrofit tag as shown in the above graphic. If an actuator will be installed, place tag in front of actuator bracket to be fully visible. Mark the appropriate box on the label denoting the excess flow spring rating of the valve.



P1615

Step 19 - Torque nut (key 13) to 50 inch-lbs / 5.6 N•m, then turn castle nut to align with cotter pin hole on the stem. Do not exceed 75 inch-lbs / 8.5 N•m.



P1617

Step 21b - After consulting packing repair section, reinstall packing gland assembly and torque 3 bolts evenly until snug.

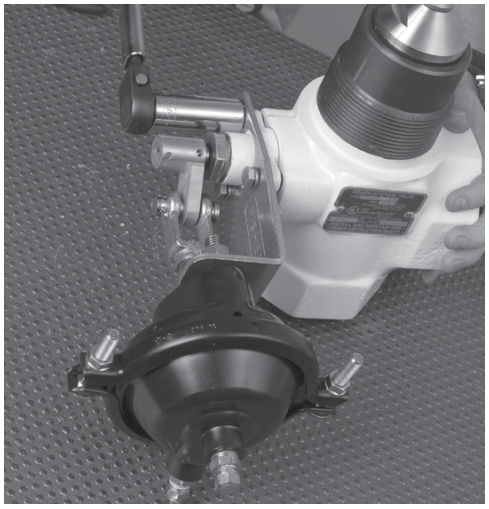
CAUTION

Possible hand and finger pinch points between disc holder and body. Use caution when proceeding with the following steps for testing valve functions.



P1619

Step 22 - With hand in open position, insure disc holder assembly does not bind.



P1618

Step 22b - If applicable, reinstall actuator.

CAUTION

Properly pressure test valve at 10 and 400 psig / 0.69 and 27.6 bar to insure no leakage is detected across the main seat, the bleed seat, and at the packing gland BEFORE reinstalling valve into service.

To Replace Packing

1. Remove the three cap screws (key 17) holding the bonnet assembly to the body.
2. Rotate the entire bonnet assembly slightly to remove it from the body.
3. Unscrew the cap screw (key 15R) from the stub shaft (key 15J), and remove the operating lever by taking out the cotter pin (key 19).
4. Unscrew the retaining nut (key 15M) from the bonnet. Pushing on the stub shaft (key 15J) will expose the bonnet parts including the packing.
5. Besides the packing, the liner bushings (keys 15B and 15K) should be replaced. Lubricate the packings with Multi-purpose PTFE lubricant.
6. Reassemble in reverse order. Replace cap screw (key 15R) using 30 to 25-inch-pounds / 3.4 to 4.0 Newton-meter torque.
7. Make sure the operating lever can move freely after the new parts are installed. Conduct a leak test under pressure with a soap solution.
8. Orient cam and stub shaft. (See Figure 2):

   Before reassembling the gland assembly into the body, correctly orient the cam to the stub shaft.

Incorrect orientation will result in either.

a. Not being able to open the internal valve or
b. Only being able to partially open the internal valve which will cause the valve's excess flow feature to close prematurely.

Refer to Figure 2. Looking at the end of the stub shaft (a) that the lever or actuator attaches to:

- The cam profile on the opposite end of the shaft should be up and the cam pointing to the left.
- The hole (b) through the stub shaft that the lever actuator attaches to should be oriented in a NE to SW position with N being at the top.
- The 2 gland wings should be at the top as shown in Figure 2.
- The lever should be oriented as shown and the cotter pin run through hole (b).

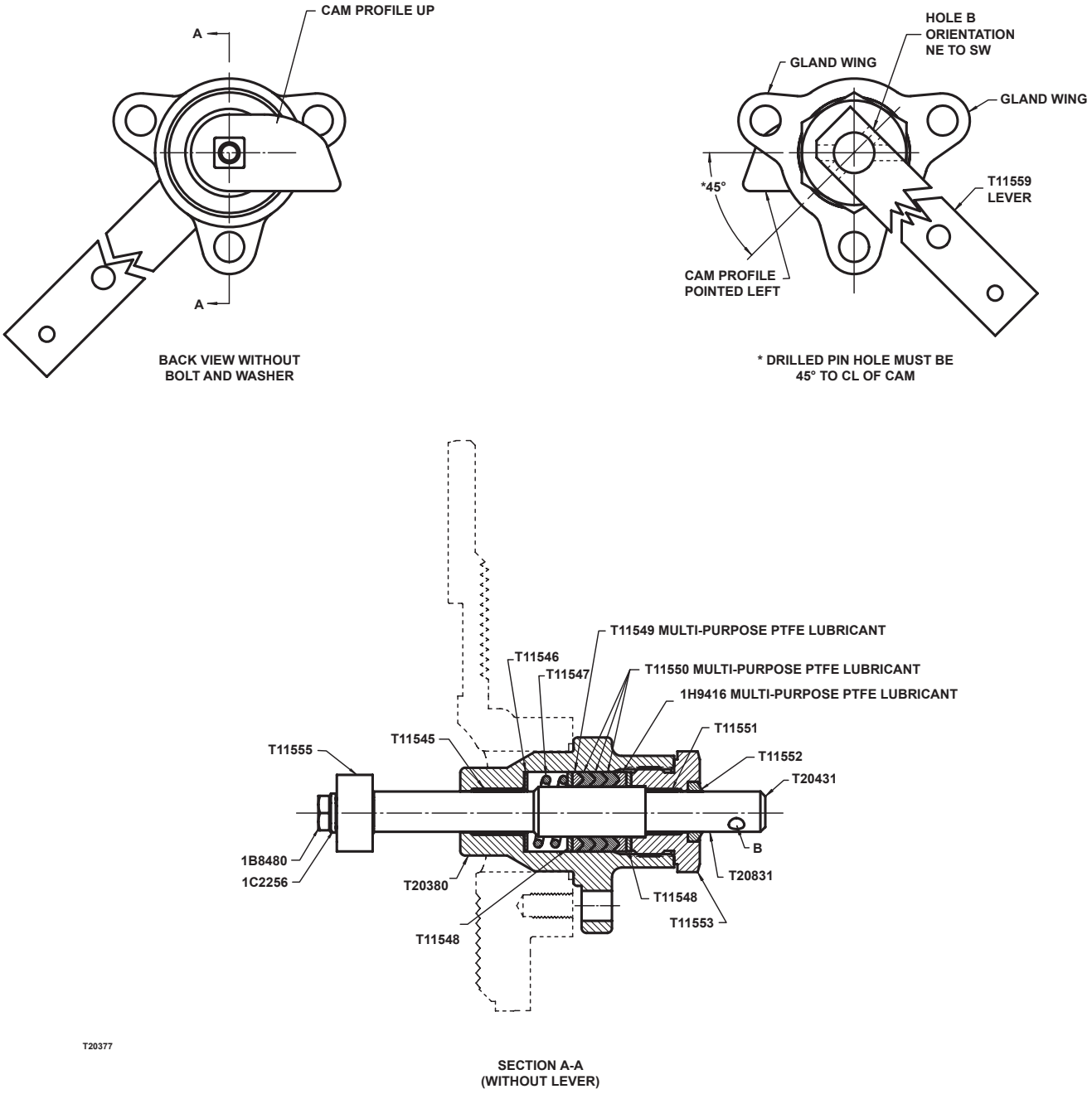


Figure 2. *Stub Shaft Orientation*



P1582

Figure 3. *Use Spring Seat (Key 4) and Stem Assembly (Key 2) to Align Disc Retainer (Key 8)*

To Replace Seat Discs

In the event that replacement of the standard Nitrile (NBR) discs is needed, follow these steps:

1. Remove the valve from the tank.
2. Remove the cotter pin (key 14) and unscrew the hex nut (key 13).
3. Remove both disc holders (keys 6 and 12) from the stem (key 2).
4. Unscrew the screws (key 9, 4 for 2-inch / 51 mm and 6 for 3-inch / 76 mm) holding the disc retainer (key 8) to replace the main seat disc.
5. Examine both seat discs (keys 7 and 11) and replace if necessary.
6. If the excess flow spring (key 3) is changed, replace the nameplate or stamp the body with the new type number.
7. Always replace the sealing washer (key 23).
8. a. Reassemble in reverse order using 15 to 20 foot-pounds / 20 to 27 N•m torque to install the disc retainer (key 8).

Important

During replacement of the seat disc, use P/N GE450790X12 to center the disc retainer to the disc holder (See Figure 3). Line up holes and insert screws. Keep the alignment tool inserted until all of the screws are tightened to specification.

Alternately, the stem assembly (key 2) and spring seat (key 4) may be used as shown in Figure 3 to perform this alignment. After assembly, check to make sure there is no interference of the spring seat and disc retainer when the valve is in the excess flow position.

b. Apply medium-strength threadlocker on the stem threads before installing the hex nut (key 13).

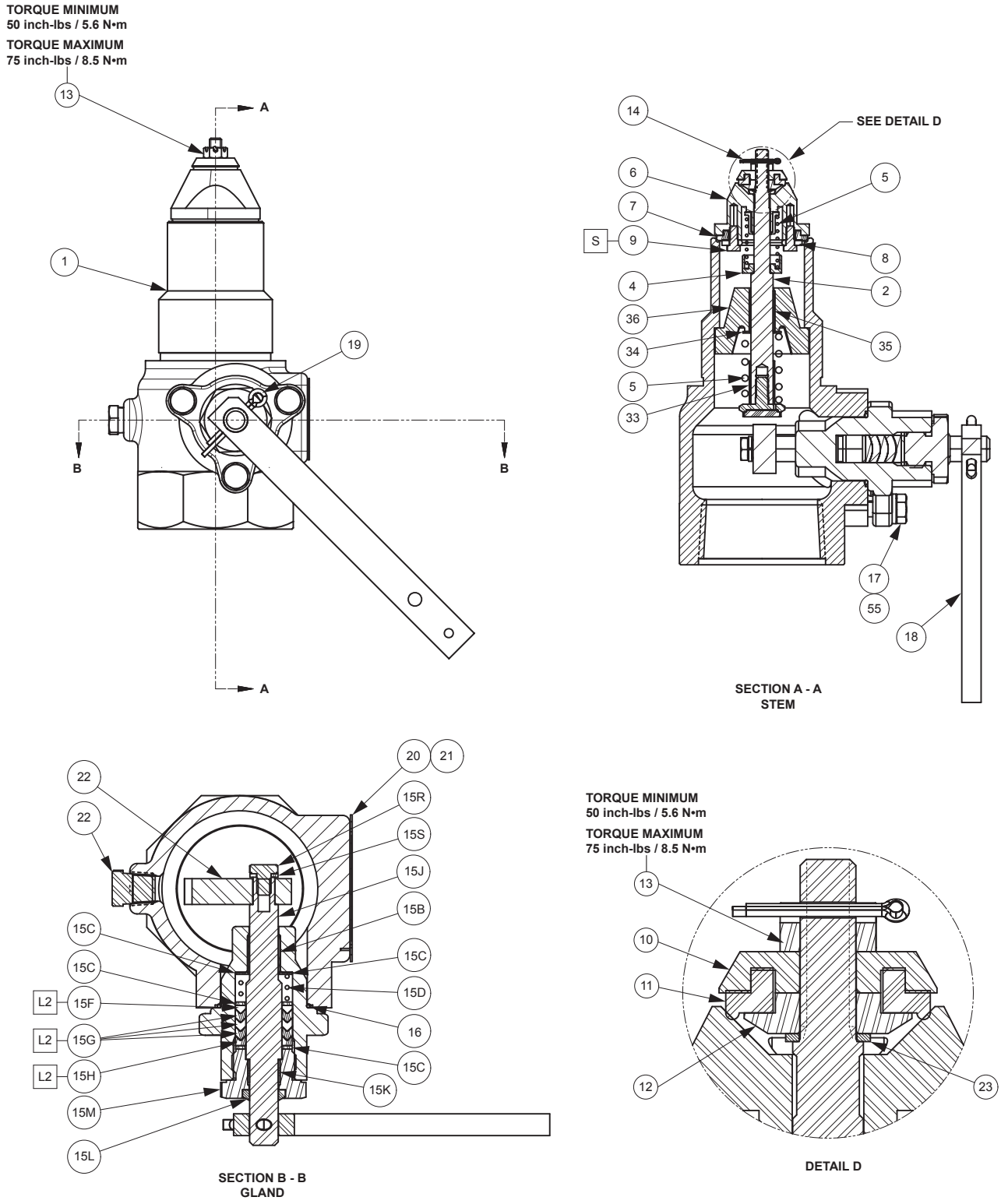
Parts List

RFC4716T012
Types C471-16, C477-16, and C891
(2-inch / 51 mm Internal Valves)

Key	Description	Part Number
2	Stem Assembly	GE41520T012
4	Spring Seat	GE35317T012
5	Closing Spring	T1153737022
10	Bleed Disc Seat	ERAA00325A0
11	Bleed Disc	ERAA00328A0
12	Bleed Disc Retainer	ERAA00324A0
13	Nut	GE04678T012
14	Cotter Pin	T1241338992
15B	Liner Bushing	T1154506992
15C	Washer	T1154625072
15E	Washer (2 required)	T1154825072
15F	Male Packing Adaptor	T1154901012
15G	Packing Ring (3 required)	T1155001012
15H	Female Packing Adaptor	1H941601012
15K	Liner Bushing	T1155106992
15L	Rod Wiper	T1155206992
16	O-ring	T1155706562
19	Cotter pin	1H837128982
23	Washer	T1188228982
33	Travel stop	T1240838072
34	Washer	T1221236152
35	Guide Liner Bushing	T1221306992
53	Instruction Manual	D450232T012
	Main Disc Holder Assembly	GE44962T012
	Main Disc Holder	GE35315T012
	Main Disc	T1154003202
	Disc Retainer	GE35313T012
	Screw (4 required)	13B3513X022
	Multi-Purpose PTFE Lubricant (2 required)	T13049T0012
	Retrofit Tag	GE44878X012

RFC4724T012
Types C471-24, C477-24, and C891
(3-inch / 76 mm Internal Valves)

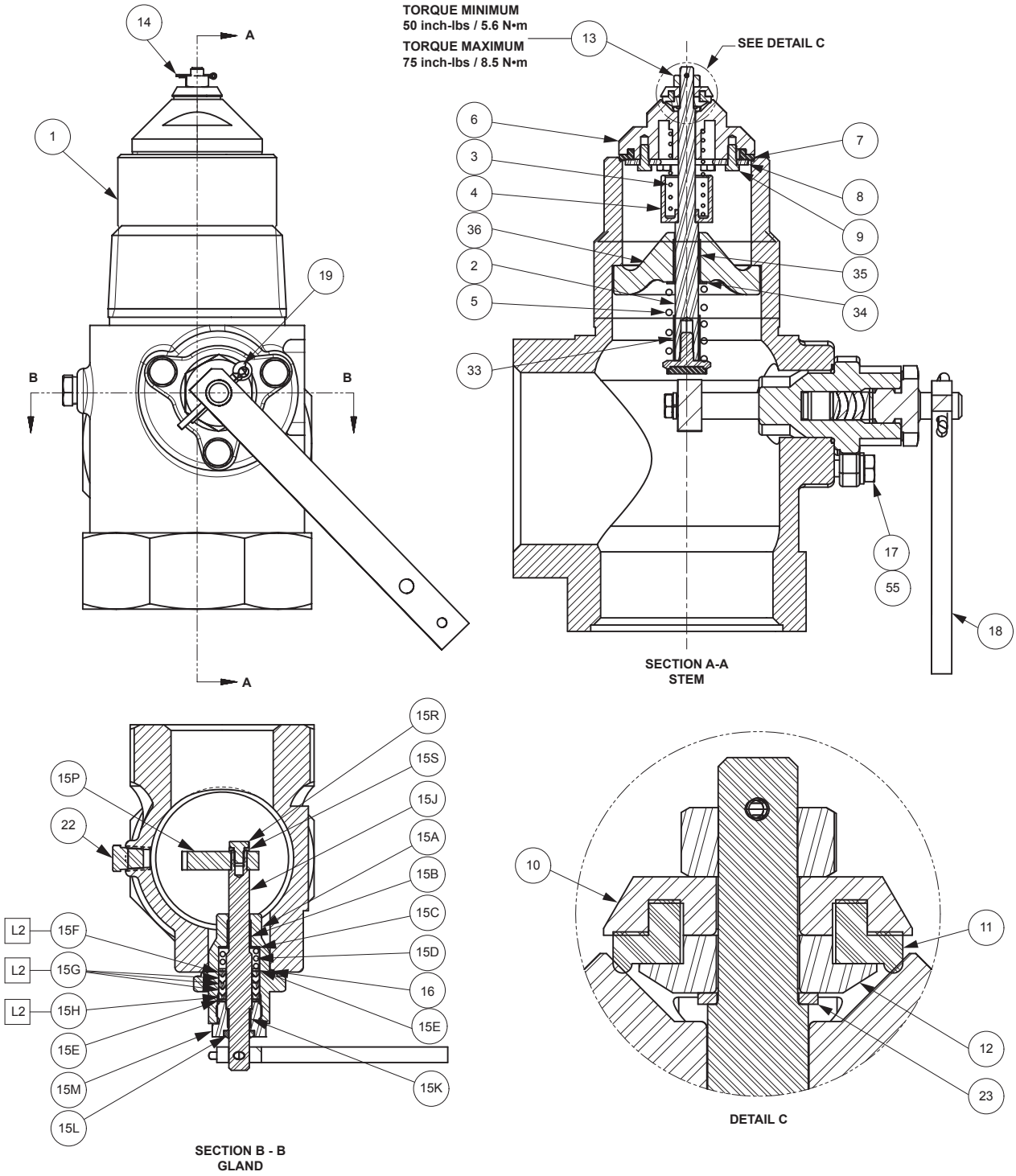
Key	Description	Part Number
2	Stem Assembly	GE41522T012
4	Spring Seat	GE35317T012
5	Closing Spring	T1153737022
10	Bleed Disc Seat	ERAA00325A0
11	Bleed Disc	ERAA00328A0
12	Bleed Disc Retainer	ERAA00324A0
13	Nut	GE04678T012
14	Cotter Pin	T1241338992
15B	Liner Bushing	T1154506992
15C	Washer	T1154625072
15E	Washer (2 required)	T1154825072
15F	Male Packing Adaptor	T1154901012
15G	Packing Ring (3 required)	T1155001012
15H	Female Packing Adaptor	1H941601012
15K	Liner Bushing	T1155106992
15L	Rod Wiper	T1155206992
16	O-ring	T1155706562
19	Cotter pin	1H837128982
23	Washer	T1188228982
33	Travel stop	T1240838072
34	Washer	T1221236152
35	Guide Liner Bushing	T1221306992
53	Instruction Manual	D450232T012
	Main Disc Holder Assembly	GE44961T012
	Main Disc Holder	GE35316T012
	Main Disc	T1177403032
	Disc Retainer	GE35314T012
	Screw (6 required)	13B3513X022
	Multi-Purpose PTFE Lubricant (2 required)	T13049T0012
	Retrofit Tag	GE44878X012



☐ **APPLY LUBRICANT OR SEALANT(1)**
L2 = MULTI-PURPOSE PTFE LUBRICANT
S = THREADLOCKER

1. Lubricants and sealants must be selected such that they meet the temperature requirements.

Figure 4. *Type C477 Assemblies*

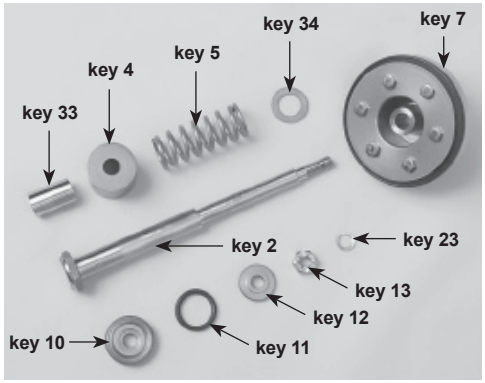


PARTS NOT SHOWN: 20 AND 21

☐ **APPLY LUBRICANT(1)**
L2 = MULTI-PURPOSE PTFE LUBRICANT
1. Lubricants must be selected such that they meet the temperature requirements.

Figure 5. *Type C471 Assemblies*

SECTION II: TYPE C403 RETROFIT



P1597

Figure 6. *Jet Bleed Internal™ Valve Parts Kit, Packing Components Not Shown*

Description

The Jet Bleed Internal Valve Retrofit Kit shown in Figure 1 is designed to decrease the time-to-open and increase overall valve durability. **NOTE: Excess flow spring is NOT included in retrofit kit.** Please consult the proper Fisher® C Series Internal Valve Instruction Manual for the proper part number.

Recommended Tools List

- 5/16-inch / 7.9 mm Drive Socket
- 3/8-inch / 9.5 mm Drive Socket
- 7/16-inch / 11 mm Drive Socket
- 1/2-inch / 13 mm Drive Socket
- 3/4-inch / 19 mm Drive Socket
- 6-inch / 152 mm Drive Socket Extension
- Needle Nose Pliers
- Adjustable Wrench
- Torque Wrench

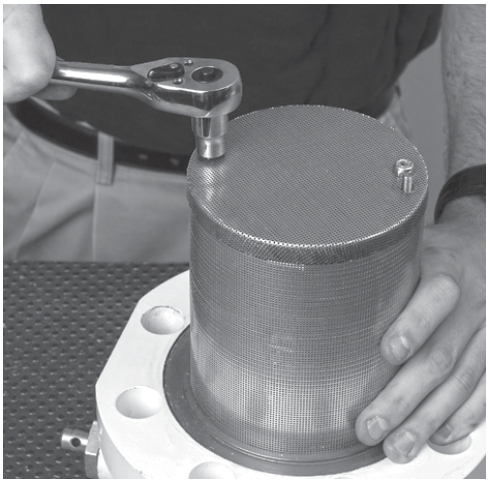
JET BLEED INTERNAL VALVE RETROFIT KIT INSTALLATION INSTRUCTIONS

HOW TO INSTALL A JET BLEED INTERNAL VALVE RETROFIT KIT ON A TYPE C403.

Step 1 (No Picture) - Remove valve from tank.

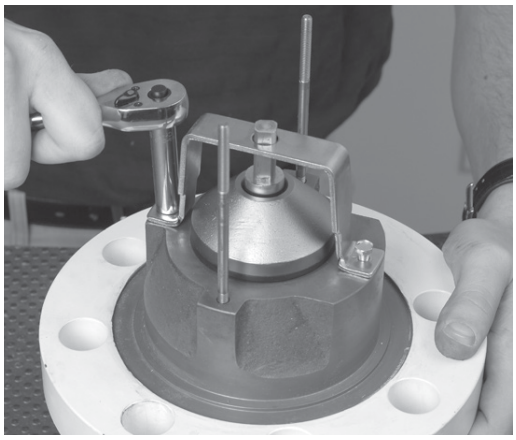
WARNING

Tank Pressure must be released before removing the valve from the container. Failure to do so could result in personal injury.



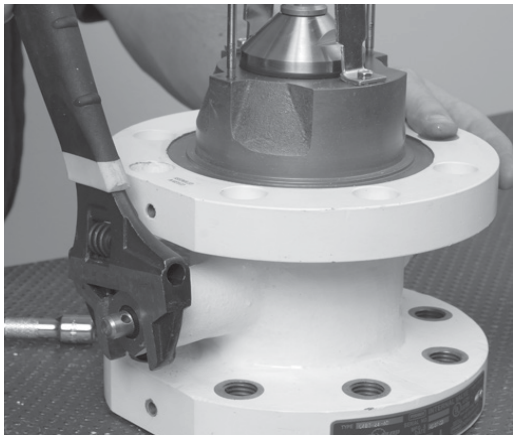
P1620

Step 2 - Remove cap screws and strainer from valve using the 3/8-inch / 9.5 mm drive socket.



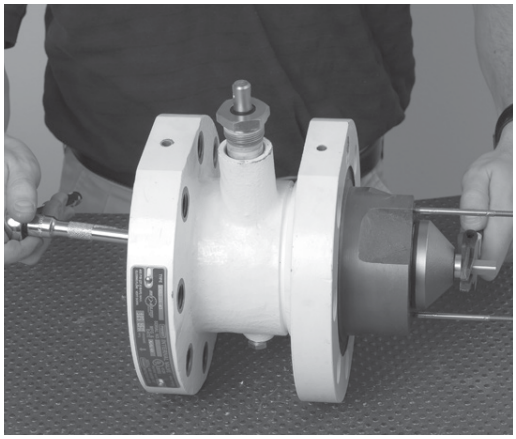
P1621

Step 3 - Remove cap screws and guide bracket from valve.



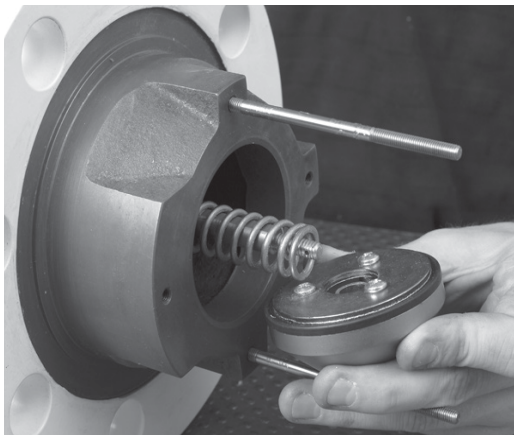
P1622

Step 4 - Refer to packing repair section to remove packing assembly and cam assembly. **IMPORTANT: If packing assembly will not be repaired, removal of packing assembly and cam assembly is not required.**



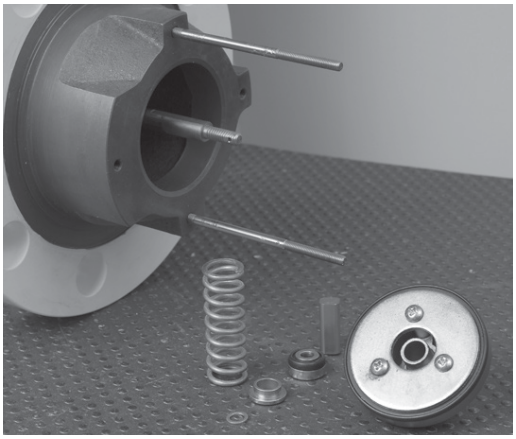
P1623

Step 5 - Secure PTFE wear pad with 6-inch / 152 mm socket and driver extension and remove nut that secures disc holder.



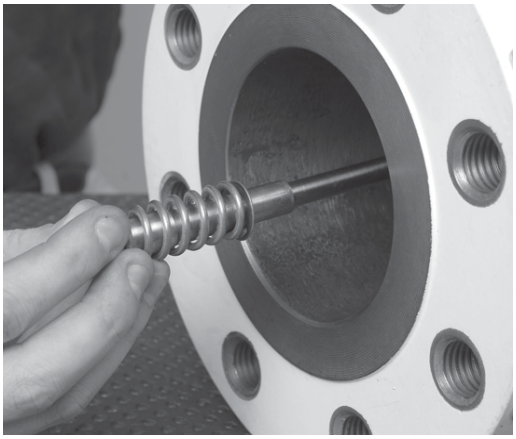
P1624

Step 6 - Remove bleed seat assembly and main disc holder assembly.



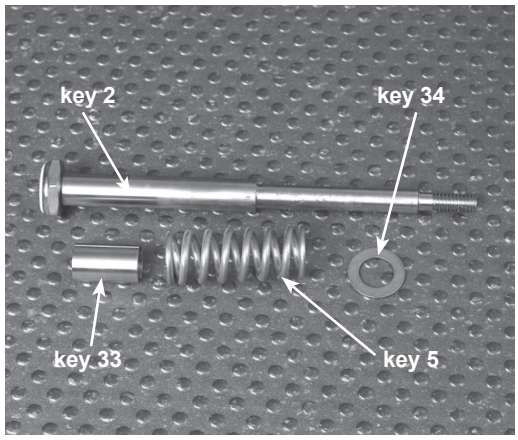
P1625

Step 7 - Remove excess flow spring and spring seat.



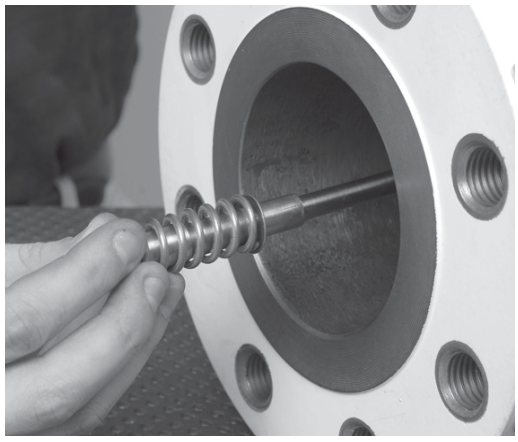
P1626

Step 8 - Remove stem assembly.



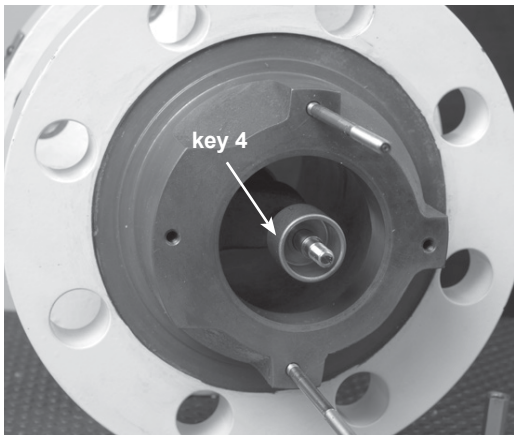
P1627

Step 9 - Place supplied travel stop (key 33), then closing spring (key 5), then washer (key 34) onto new stem assembly (key 2).



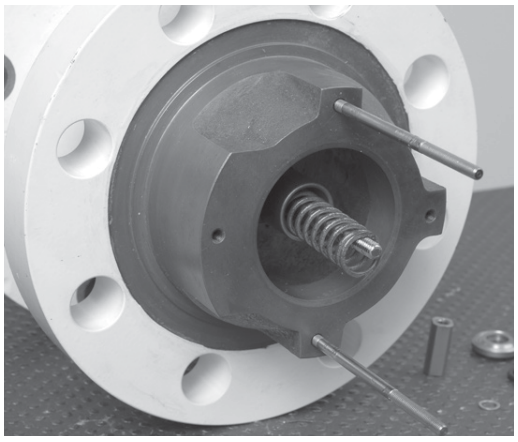
P1628

Step 10 - Insert new stem assembly into stem guide.



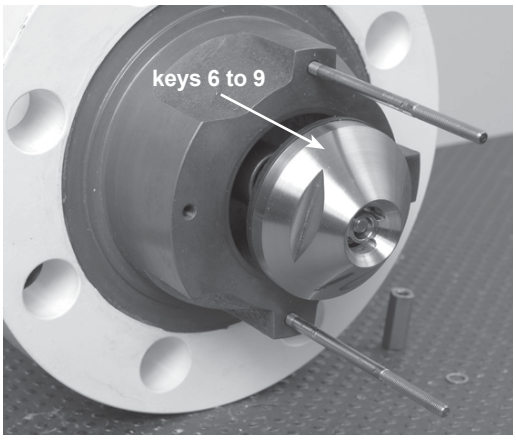
P1629

Step 11 - Place new excess flow spring seat (key 4) onto top of stem with open end of cup facing top of valve body as shown.



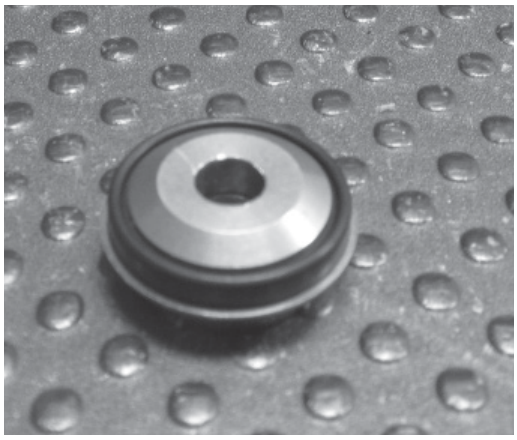
P1630

Step 12 - Place new excess flow spring (sold separately) into spring seat.
IMPORTANT: A new excess flow spring is required and sold separately from the retrofit kit.



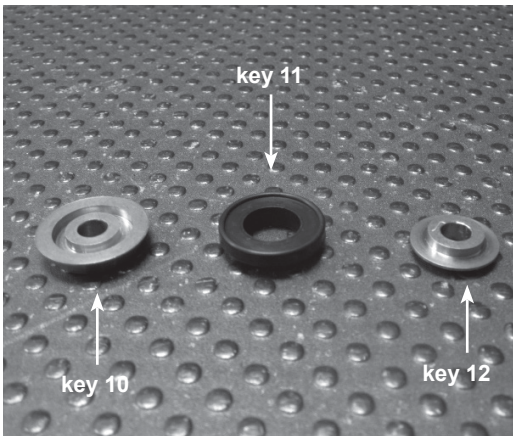
P1631

Step 13 - Place new main disc holder assembly (keys 6 to 9) onto stem with main disc against body.



P1633

Step 15 - Place bleed disc (key 11) in bleed disc seat (key 10), then place bleed disc retainer (key 12) into bleed disc seat with extrusion first.
IMPORTANT: The retainer can only go into the seat one way, with the extruded edge facing down as shown.



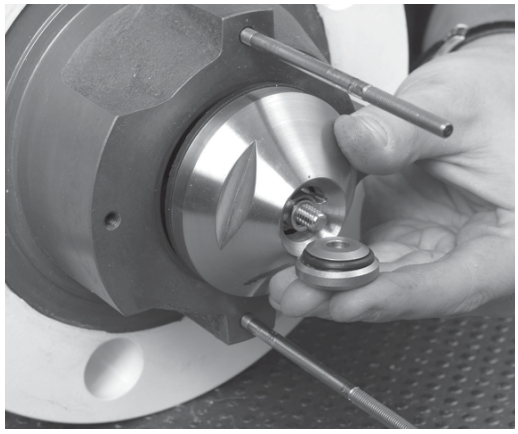
P1632

Step 14 - Ensure components of new bleed seal assemble are present (keys 10 to 12).



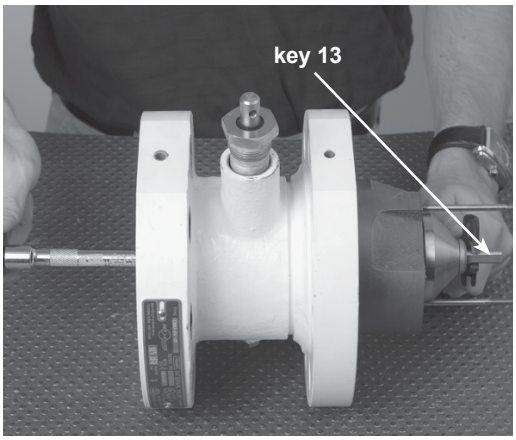
P1634

Step 16 - Place new crush washer (key 23) onto stem.



P1635

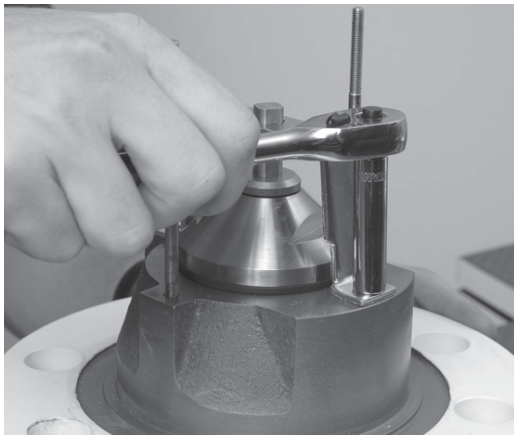
Step 17 - Place new bleed seat assembly on stem with bleed disc oriented towards body.



P1636

Step 18 - Torque nut (key 13) to 50 inch-lbs / 5.6 N•m before reinstalling packing. Do not exceed 75 inch-lbs / 8.5 N•m.

Step 19 (No Picture) - Refer to packing repair for reinstallation procedures.



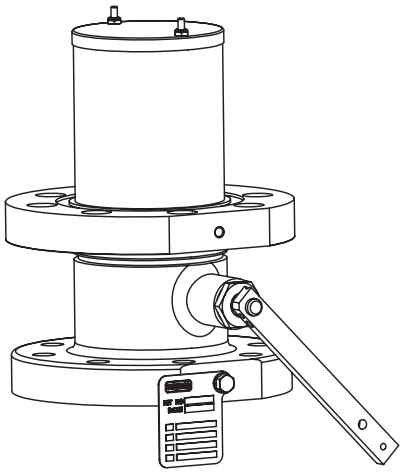
P1637

Step 20 - Reinstall guide bracket.

CAUTION

Possible hand and finger pinch points between disc holder and body. Use caution when proceeding with the following steps for testing valve functions.

Step 21 (No Picture) - With handle in open position, insure disc holder assembly is free to move along stem. Reinstall strainer (if applicable).



Step 22 - Install retrofit tag as shown in the above graphic. If an actuator will be installed, place tag in front of actuator bracket to be fully visible. Mark the appropriate box on the label denoting the excess flow spring rating of the valve.

CAUTION

Properly pressure test valve at 10 and 400 psig / 0.69 and 27.6 bar to insure no leakage is detected across the main seat, the bleed seat, and at the packing gland BEFORE reinstalling valve into service.

To Replace Packing (keys 15F, 15G, and 15H), bushings (keys 15B and 15K) or cam (key 15P):

1. With the valve in the tank, close the operating lever (key 18, not shown) and remove the downstream pressure in the system.
2. **For Type C403-24:** Remove the pipe plug (key 22). Using a 3/16-inch / 4.8 mm Allen wrench, unscrew the cap screw (key 15R). Remove the washer (key 15S) and the cam (key 15P).
3. After removing the operating lever (key 18), the packing can be reached by unscrewing the bonnet nut (key 15M) and removing the stub shaft (key 15J). Inspect and replace if necessary, the packings (keys 15F, 15G, and 15H), bushings (keys 15B and 15K). Lubricate the packings with Multi-purpose PTFE lubricant and the bonnet nut (key 15M) with anti-seize compound.
4. Reassemble in the reverse order. Replace the cap screw (key 15R) with 30 to 35 inch-pounds / 3 to 4 N•m torque.
5. Make sure the operating lever (key 18) can move freely after the new parts are installed. Conduct a leak test under pressure with a leak detection solution.
6. Orient cam and stub shaft. (See Figure 2 on page 7):

   Before reassembling the gland assembly into the body, correctly orient the cam to the stub shaft.

   Incorrect orientation will result in either:

   a. Not being able to open the internal valve or

   b. Only being able to partially open the internal valve which will cause the valve's excess flow feature to close prematurely.

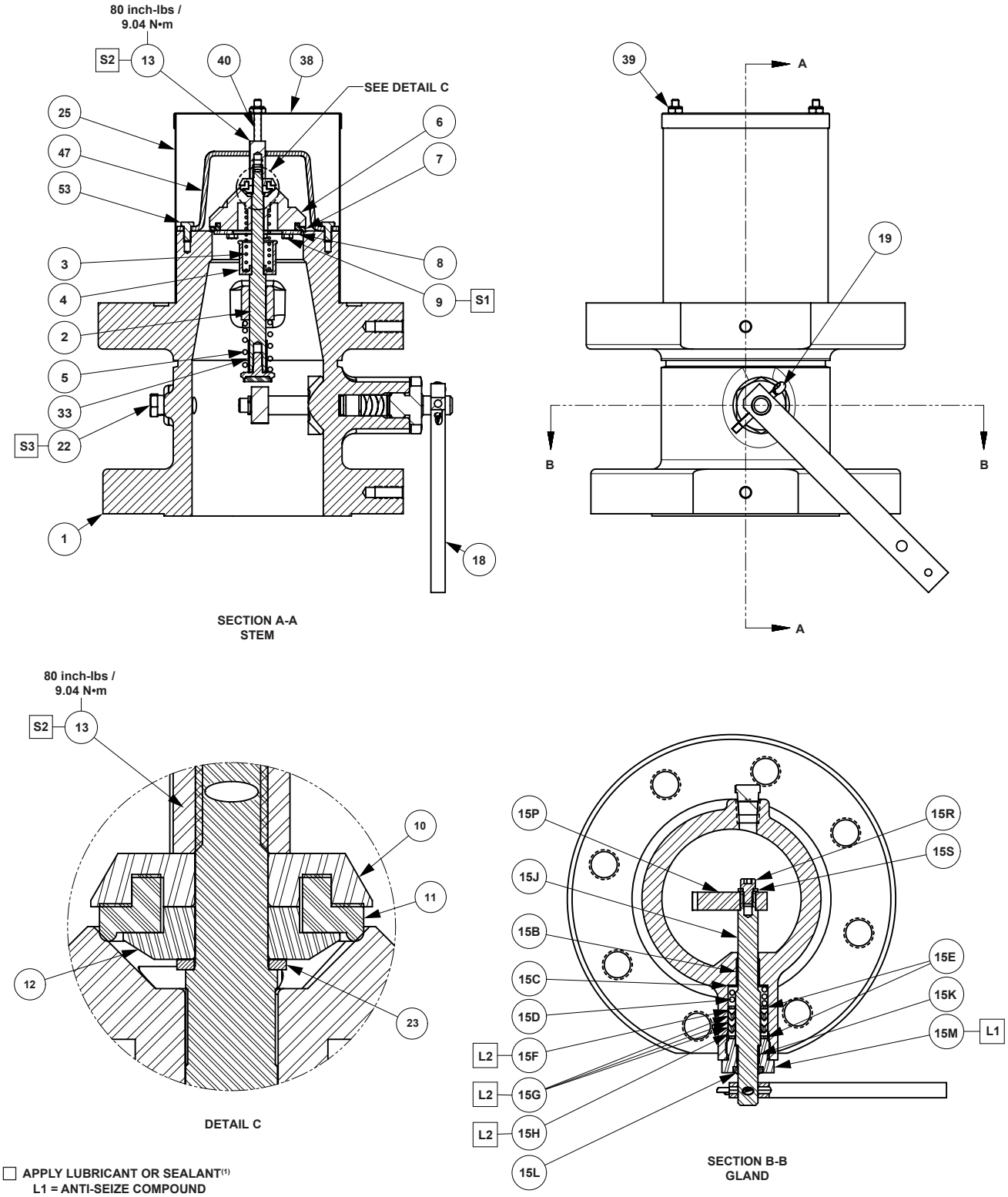
   Refer to Figure 2. Looking at the end of the stub shaft (a) that the lever or actuator attaches to:

   - The cam profile on the opposite end of the shaft should be up and the cam pointing to the left.
   - The hole (b) through the stub shaft that the leveractuator attaches to should be oriented in a NE to SW position with N being at the top.
   - The 2 gland wings should be at the top as shown in Figure 2.
   - The lever should be oriented as shown and the cotter pin run through hole (b).

Parts List

Type C403-24 (3-inch / 76 mm Double Flange Internal Valves)

Key	Description	Part Number
2	Stem Assembly	GE41522T012
4	Spring Seat	GE35318T012
5	Closing Spring	T1153737022
10	Bleed Disc Seat	ERAA00325A0
11	Bleed Disc	ERAA00328A0
12	Bleed Disc Retainer	ERAA00324A0
13	Nut	GE04678T012
15B	Liner Bushing	T1154506992
15C	Washer	T1154625072
15E	Washer (2 required)	T1154825072
15F	Male Packing Adaptor	T1154901012
15G	Packing Ring (3 required)	T1155001012
15H	Female Packing Adaptor	1H941601012
15K	Liner Bushing	T1155106992
15L	Rod Wiper	T1155206992
16	O-ring	T1155706562
19	Cotter pin	1H837128982
23	Washer	T1188228982
33	Travel stop	T1240838072
34	Washer	T1221236152
35	Guide Liner Bushing	GE39719T012
43	Spiral Wound, Lower Gasket	T13603T0012
44	Spiral Wound, Lower Gasket	T1056138992
44	Spiral Wound, Lower Gasket	1P877699152
53	Instruction Manual	D450232T012
54	Instruction Manual (For Retrofit Kit)	D450231T012
	Main Disc Holder Assembly	GE44961T012
	Main Disc Holder	GE35316T012
	Main Disc	T1177403032
	Disc Retainer	GE35314T012
	Screw (6 required)	13B3513X022
	Multi-Purpose PTFE Lubricant (2 required)	T13049T0012



☐ APPLY LUBRICANT OR SEALANT(1)
L1 = ANTI-SEIZE COMPOUND
L2 = MULTI-PURPOSE PTFE LUBRICANT
S1 = MEDIUM-STRENGTH THREADLOCKER
S2 = HIGH-STRENGTH THREADLOCKER
S3 = PIPE THREAD TAPE

1. Lubricants and sealants must be selected such that they meet the temperature requirements.

Figure 7. *Type C403-24 Internal Valve*

Types C401, C402, C407, C421, C427, C403, and C831

LP-Gas Equipment

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