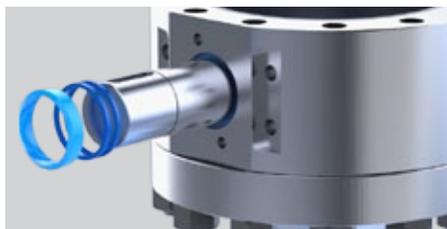


# COOPER® Valves



## Accuseal® CSV Installation, Operation, and Maintenance



### Accuseal® CSV

|                                 |   |
|---------------------------------|---|
| Individual Parts Breakdown..... | 3 |
| CSV Cutaway.....                | 4 |

### Accuseal® CSV Installation

|  |   |
|--|---|
| Installation.....                              | 5 |
| Actuators.....                                 | 5 |
| Orientation.....                               | 5 |
| Welding, Stress Relieving, and Insulation..... | 6 |
| Post-insulation Procedures.....                | 6 |

### Accuseal® CSV Operation

|                                |   |
|--------------------------------|---|
| Valve Lubrication.....         | 7 |
| Stem Torque.....               | 7 |
| Stem Rotation Direction.....   | 7 |
| Valve Position Indication..... | 8 |
| Actuator Operation.....        | 8 |

### Accuseal® CSV Maintenance

|   |    |
|---|----|
| Disassembly.....                        | 9  |
| Ball and Seat Lapping Instructions..... | 11 |
| Reassembly.....                         | 11 |
| Repair and Rework.....                  | 11 |
| Ball and Seats.....                     | 11 |
| Seat Landing.....                       | 11 |
| Return Merchandise Authorizations.....  | 14 |
| Service Department.....                 | 14 |
| Contact Information.....                | 14 |



### **Quality Policy**

We will consistently manufacture high quality valves while focusing on meeting customer requirements and industry standards ensuring on-time delivery and a reduction in total cost of ownership. Our organization is committed to continually improving our overall quality system, while checking the effectiveness of overall customer satisfaction to provide value added products and services.

**“Quality Without Compromise”**

### 1. Body/End Connection

- Machined from forgings for material structural integrity.
- End Connections: RFF - raised face flange – Standard.
- Options available on request: BW- Butt Weld, SW-Socket Weld, RTJ, Hub Connectors, Threaded, Wafer, etc.
- Weld overlay of wetted surfaces to protect from corrosion and erosion – available upon request.

### 2 & 3. Ball + Seat = the sealing assembly

- Omni-Lap 360°™ optimizes the matched roundness of the ball and seat for 100% seal, regardless of positioning. The sealing surface is maximized, providing the widest metal to metal seal possible. The seal is consistently reliable.
- Corrosion resistant materials with matched rates of thermal expansion are used on the sealing components to maintain seal integrity and reliability.
- Coatings are robotically applied with HP-HVOF (high velocity oxygen fueled) or Spray and Fuse processes for uniform surface thickness, coating density and maximum metallurgical bond to withstand extreme service conditions.
- Self-cleaning – the seat removes all debris from the ball with every on/off cycle, extending valve life.
- Field repair is simpler and faster, when required. The ball and seat assembly is vacuum seal verified at the factory and easily replaced on site.

### 4. Dual Bellville Springs

- Energizes ball into sealing seat
- Mitigates differences in thermal expansion

### 5. Stem

- Surface modification eliminates galling during rotation.
- Blow-out proof per ASME B16.34.

### 6. Inner Stem Seal

- Provides primary metal-to-metal stem seal.

### 7. Packing Bushing

- Prevents stem packing intrusion into body
- Works with stem bearing to prevent lateral stem motion.

### 8. Packing Rings

- Reinforced graphite.

### 9. Anti-extrusion Rings

- Prevents packing extrusion.

### 10. Packing Follower

- Thermally matched to stem material
- Prevents galling and contains upper packing.

### 11. Articulating Gland Flange

- Spherically engages the packing follower to prevent stem binding and galling during adjustments.

### 12. Belleville Springs

- Live load on the bolted joint eliminates routine gland adjustments.
- Reduces maintenance.

### 13. Stem Retaining Ring

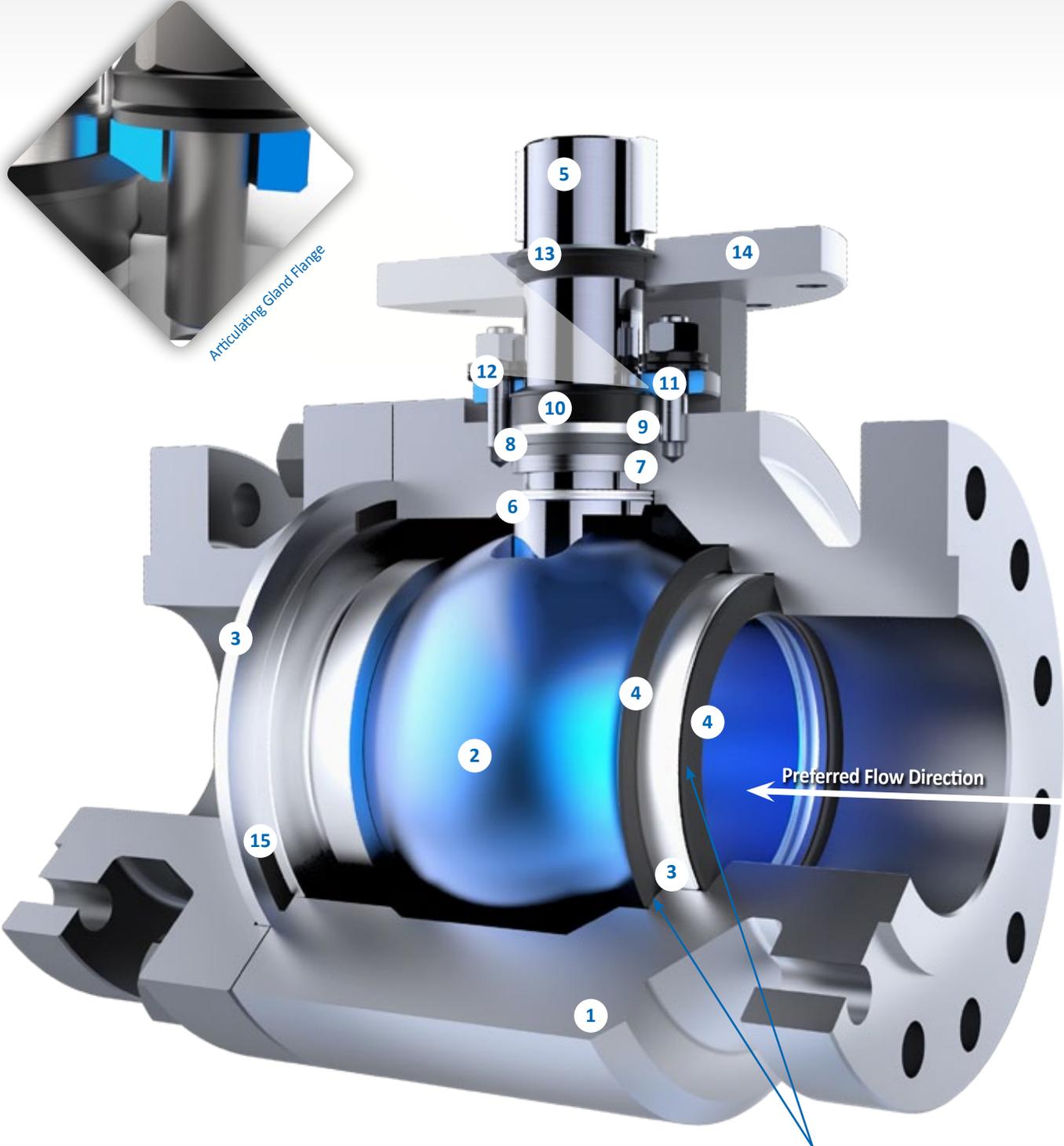
- Prevents stem misalignment during actuator installation.
- Stem cannot be forced into ball stem slot.

### 14. Mounting Flange

- Precision machined to ISO 5211.
- External mounting flange provides rigid mounting for ease of adjustment.
- Direct mounting option reduces hysteresis and stem deflection.

### 15. Body Gasket

# Accuseal® Critical Service Ball Valve Cutaway



Articulating Gland Flange

Preferred Flow Direction

Dual Belleville load springs provide effective particulate exclusion of critical annular area between load ring and body.

ACCUSEAL® CSV SHOWN ABOVE: FLANGED SEAT DUAL SPRINGS

## Installation

This manual describes the procedures for the safe and efficient installation and operation of COOPER's Accuseal<sup>®</sup> metal seated ball valves. Failure to follow the procedures in this manual may result in COOPER<sup>®</sup> Valves warranties being voided. Problems with valve operation and maintenance should be directed to COOPER<sup>®</sup> Valves approved repair facilities.

### Receiving and Preparation Procedure

- 1 – Inspect the valve for transportation damage.
- 2 – Inspect the valve bore and remove any debris.
- 3 – Cycle the valve and inspect for smooth operation.
- 4 – Piping system shall be cleaned and flushed prior to valve installation.

### Actuators

#### IMPORTANT!!

Valves mounted with electric actuators should be cycled to the mid-stroke position before cycling under power.



#### CAUTION!

Actuators shall not be mounted, removed, adjusted or re-installed on Accuseal<sup>®</sup> valves except by trained COOPER<sup>®</sup> Valve personnel.

### Orientation



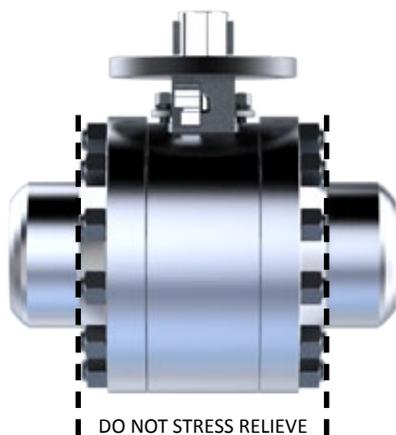
**VALVES MUST BE INSTALLED WITH THE FLOW ARROW POINTING FROM HIGH PRESSURE TO LOW PRESSURE WITH THE VALVE IN THE CLOSED ISOLATING POSITION.**

Bi-directional valves have a preferred high pressure end and should be installed with the flow arrow pointing from high pressure to low pressure.

**Note:** Uni-directional valves should not be installed in lines where a differential back pressure (from low to high pressure) of 200psig or more may exist.

## Welding, Stress Relieving, and Insulation

- Valve must be **OPEN** during welding!
- Radiation shields are advised if heat damage to the actuator is a concern.
- Care should be taken to minimize weld slag and splatter within the valve.
- Do not strike arcs on the valve.
- Do not ground across the valve or damage may occur.
- Stress relieve as per ANSI B31.1, ANSI B31.3 or ASME Section IX requirements.



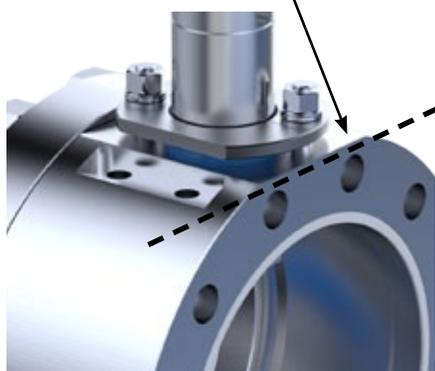
### CAUTION!

Excessive temperature and incorrect insulating or stress relieving technique may damage the valve and void the warranty. Upon installation, process temperatures can be hazardous!



**DO NOT APPLY INSULATION ABOVE THE BODY FLAT.**

DO NOT APPLY INSULATION ABOVE THE BODY FLAT



### CAUTION!

Valve insulation is prohibited during stress relieving. Localized Stress Relief is acceptable. Do not furnace relieve without consulting COOPER® Valves.

## Post-insulation Procedures

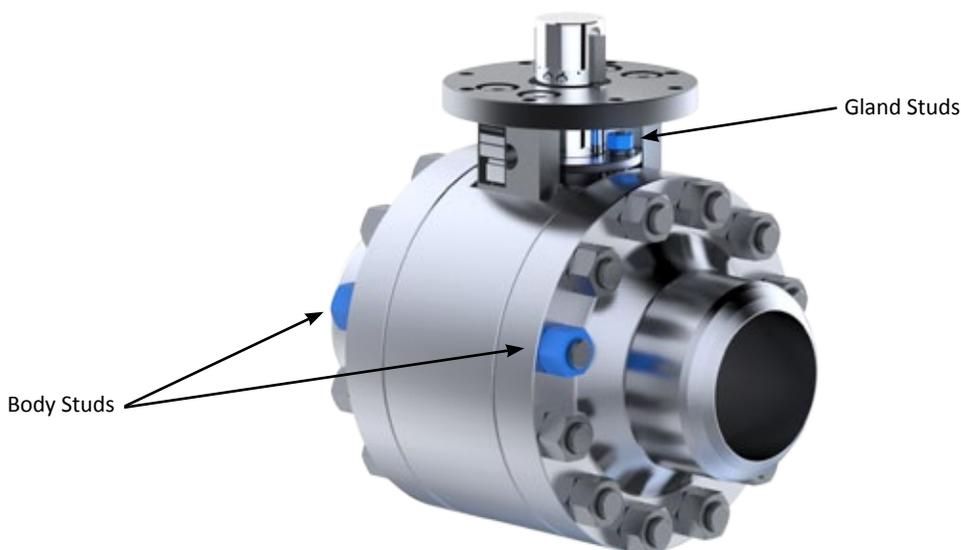
- Limit switch and position indicator operation should be observed as the valve is cycled several times.
- Valve service insulation is recommended when the valve is expected to experience temperature differentials greater than 400°F.

### Valve Lubrication

- Accuseal® ball valves require no lubrication.
- Gland packing bolting should be re-tightened after first elevated pressure and temperature (1/4 turn on packing gland nuts).

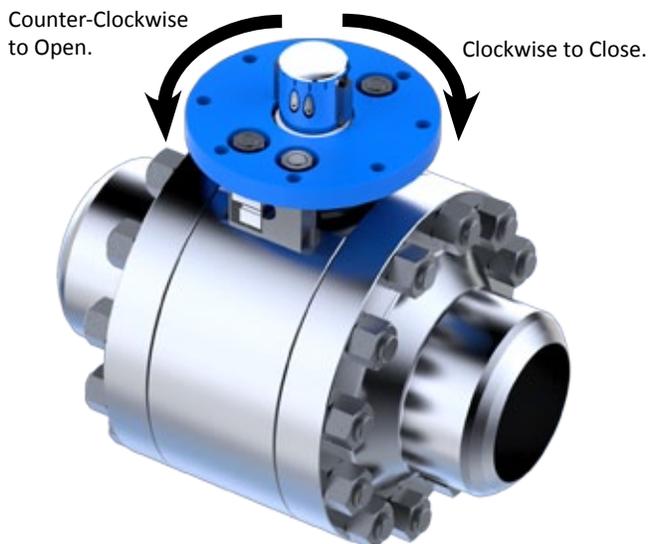
### Stem Torque

- Contact COOPER® Valves approved service centers for stem torque values.
- Stem torques may differ due to application and environment.



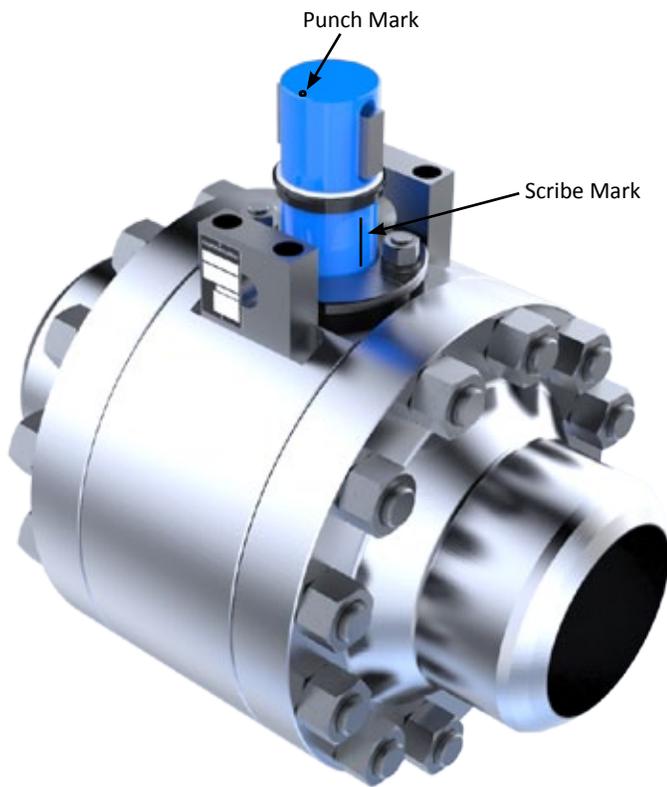
### Stem Rotation Direction

- Accuseal® valves are operated clockwise to close and counter-clockwise to open.



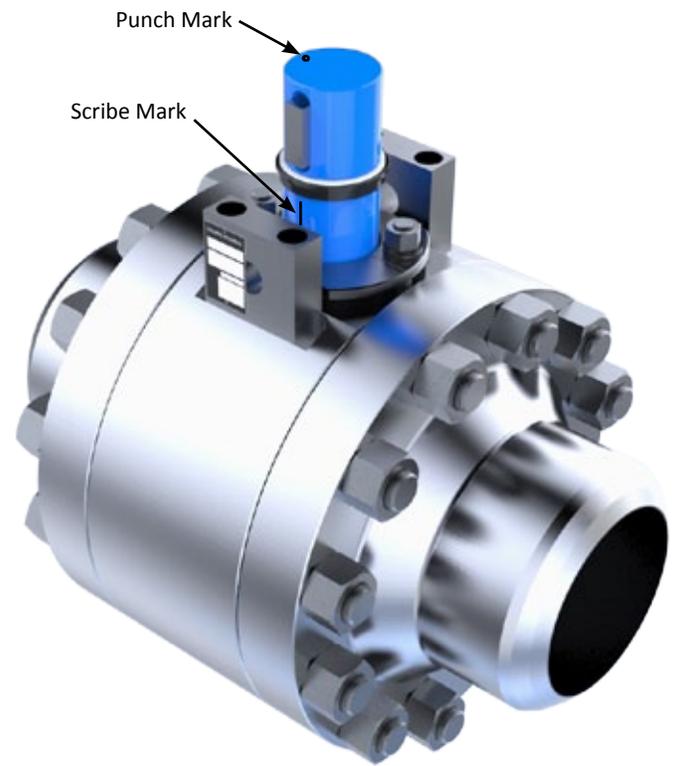
## Valve Position Indication

- A punch mark on the top of the stem and a scribe mark on the side of the stem indicate whether the valve is open or closed as shown below.
- In addition to the punch and scribe marks, lever operated valves are shown open when the lever is in line with the flow.
- Caution: Key position does not indicate valve position.



**Valve Open**

*High Pressure End*



**Valve Closed**

*High Pressure End*

## Actuator Operation

- Valve actuators must be installed, operated, and maintained as per the manufacturers written instructions.
- Worm gear lubricant should be inspected and replenished or replaced every 3 months, or as instructed by the manufacturers written instructions.

### Disassembly

- 1 – Valve must be in the CLOSED position
- 2 – Orientation and position must be marked on valve components, particularly the side of the ball matched to the seat, prior to removal.
- 3 – Marking should be indelible to the valve cleaning process, but should not damage the parts (No Stamping).



**DURING DISASSEMBLY TAKE CARE TO NOT DAMAGE THE MATING AND SEALING SURFACES, OR THE PACKING AREA. SAND BLASTING ON OR NEAR SEALING AREAS NOT PERMISSIBLE**



**PACKING MUST BE REPLACED IF GLAND NUTS ARE LOOSE.  
ONLY APPROVED COOPER<sup>®</sup> PACKING SHALL BE USED.**

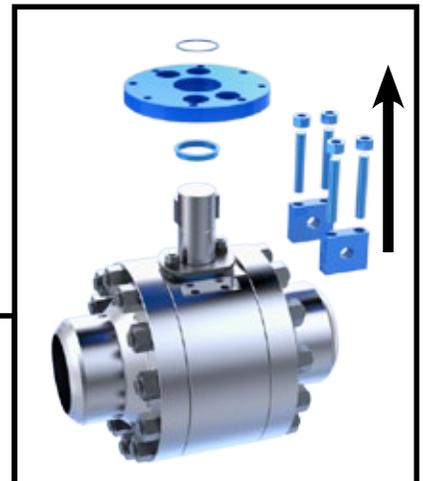
#### **WARNING!**

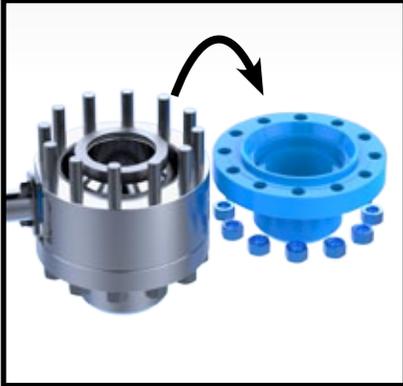
Disassembly and repair of Accuseal<sup>®</sup> valves by unauthorized personnel may be hazardous and void the warranty.



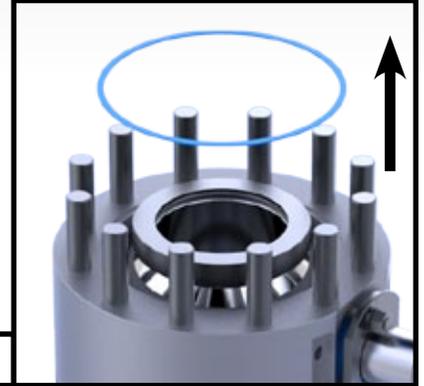
**4 – Remove the actuator and any actuator mounting bracketry. Do not use excessive force.**

**5 – Remove stem retainer ring, mounting leg nuts and studs, mounting flange, and mounting legs.**

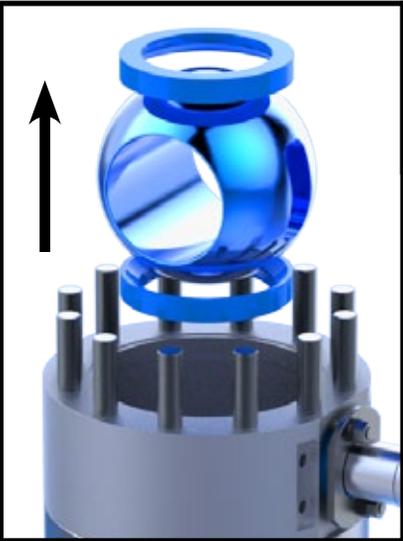




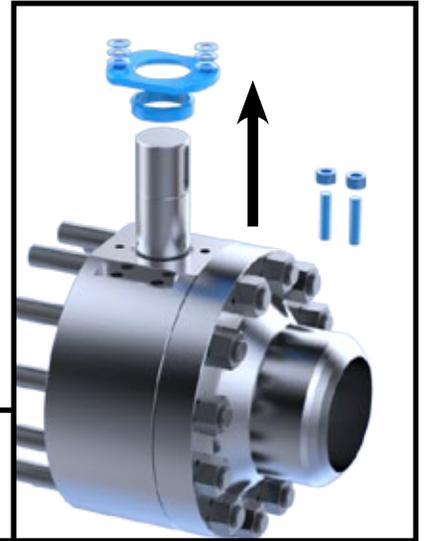
6 – Remove body nuts and low pressure end piece.



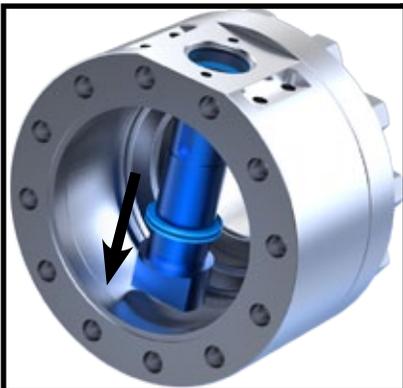
7 – Remove the body gasket.



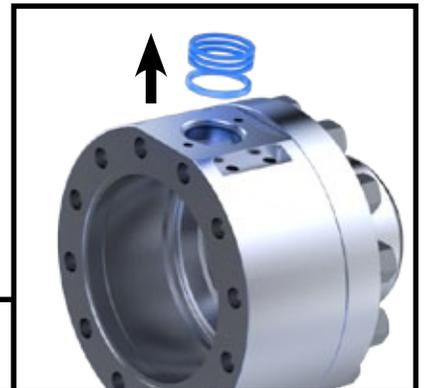
8 – Remove ball, seats, and spring. Mark orientation of ball (**NO STAMPING**). Protect the ball and seats from any damage.



9 – Remove gland nuts, gland springs, gland flange, and packing follower.



10 – Remove stem and bearing. Take care to not scratch the area on the stem that is in contact with the valve packing.



11 – Remove packing and packing bushing.

12 – Inspect all components, note defects and replace if necessary. De-grease as required.

## Repair and Rework

Prior to reassembly the following components should be replaced or inspected and verified as acceptable:

- Packing
- Body gasket
- Spring
- Ball and seats
- Stem
- Stem Bearings

### Ball and seats

If no damage is evident the ball may be re-lapped to the seats. If the ball or seats have evidence of damage then they must be re-machined, re-coated, and re-lapped. This work must be done by a COOPER<sup>®</sup> Valves approved repair facility. DOWN STREAM SIDE OF BALL IS INDICATED BY THE ALPHA CHARACTER IN STEM SLOT. CORRESPONDING DOWN STREAM SEAT HAS ALPHA CHARACTER IN SERIAL NUMBER.

### Seat landing

The low pressure side (downstream) seat landing (and high pressure side seat landing on bi-directional valves) must be inspected before returning to service. If there is evidence of damage then the seat landing can be reworked. This work must be done by a COOPER<sup>®</sup> Valves approved repair facility.

Other valve parts: Other valve parts may be cleaned and returned to service. Contact a COOPER<sup>®</sup> Valves approved repair facility if there is a doubt regarding the suitability of cleaned parts.

### Ball and seat lapping

- All ball and seat lapping should be performed by Cooper Accuseal. Repair kits are supplied with all ball and seat lapping completed and vacuum testing performed to ensure FCI 70-2 Class VI sealing capabilities.

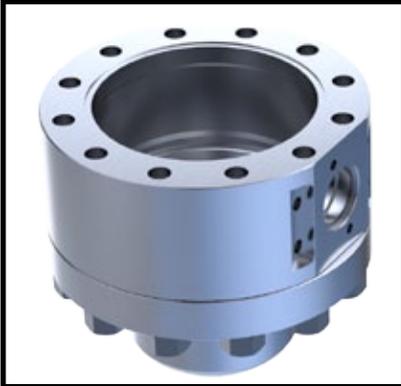
### Seat to seat landing lapping

- The backside of the seat ring is lapped to the seat landing to establish a metal-to-metal seal.
- Thoroughly clean the seat and seat landing of all dirt and grease.
- Apply a small amount of lapping compound to the seat landing.
- Place the seat on to the seat landing and evenly rotate the seat. The seat should rotate freely. If grinding is felt remove the seat and apply more compound.
- Remove the seat from the seat pocket and thoroughly clean the seat and seat landing of all lapping compound.
- Repeat the lapping process using the same grit compound until an even seal band can be seen on both components.
- Once an even seal band can be seen switch to a finer compound and repeat the process.
- Final lapping should be done using a 3 micron lapping compound.

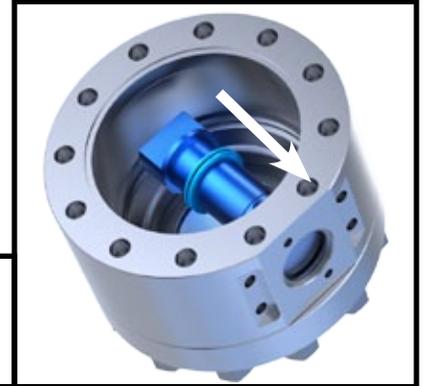
# Accuseal® CSV Reassembly



**ONLY APPROVED COOPER® VALVES COMPONENTS SHOULD BE RE-ASSEMBLED IN THE VALVE. IT IS RECOMMENDED THAT ALL CARBON STEEL PARTS BE COATED WITH A LIGHT MOTOR OIL.**



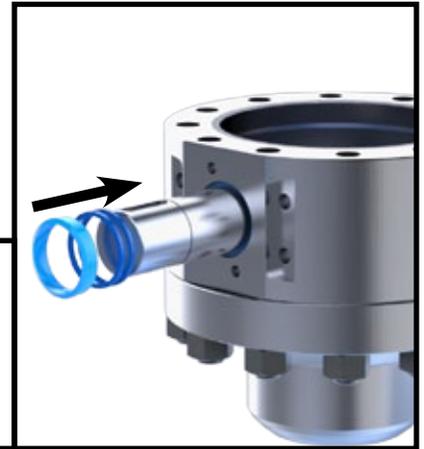
**1** – The body portion of the valve must be placed in the upright position as shown.



**2** – The stem (and bearings if applicable) must be inserted into the body stem hole.



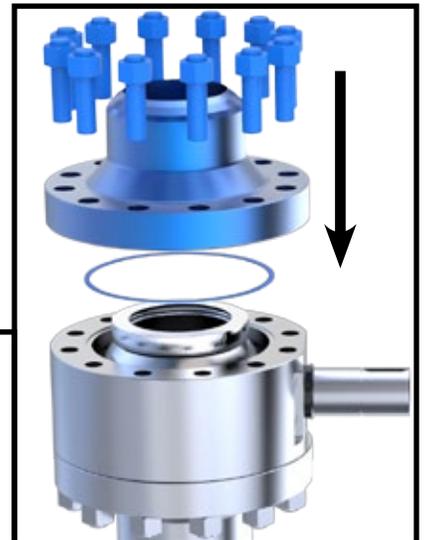
**3** – The stem alignment punch mark must be placed in the orientation shown. Note that the key slots should not be used to indicated stem position.



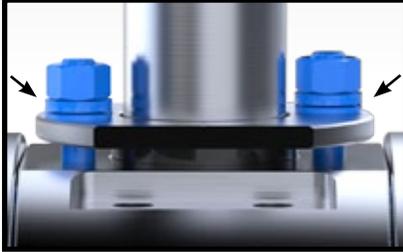
**4** – Replace the stem bearing and install new packing (do not reuse packing). The packing will help to hold the stem in place during subsequent operations.



**5** – Install the spring, high pressure seat, ball, and low pressure seat. The ball will need to be tipped as shown to engage the stem. Note alpha character on down stream seat and down stream side of ball.

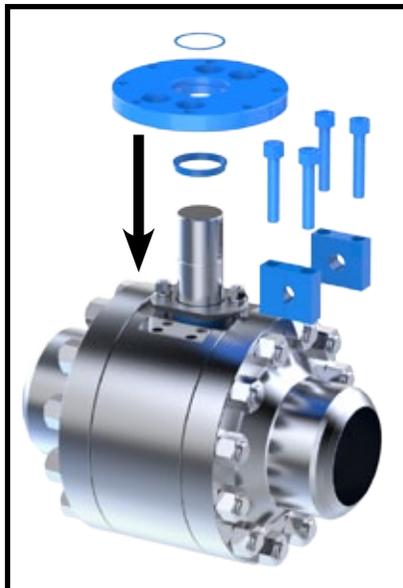


**6** – Install a new body gasket (do not reuse gasket), end connect, studs, and nuts. Use a copper based anti-seize compound. Contact COOPER® Valves for torque values.

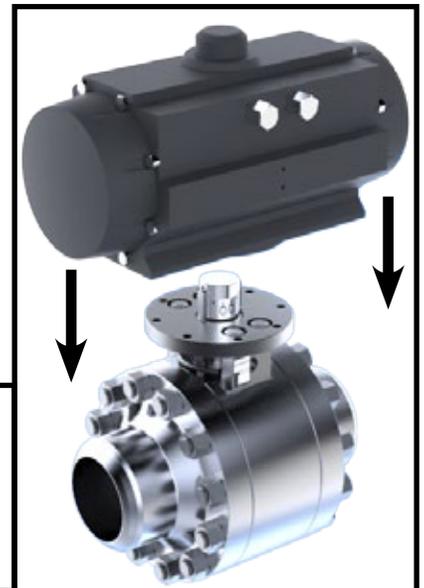


**7** – Reorient the valve stem upward on the workspace and secure in place. Install packing follower, gland, gland springs, studs, and nuts. Gland springs must be installed in the orientation shown. Use a copper based anti-seize compound on the studs.

Contact COOPER® Valves for torque values.



**8** – Assemble mounting legs, mount flange, stem bearing, stem retainer ring, studs, and nuts. Use a copper based anti-seize compound on the studs.



**9** – Assemble actuator or lever and accompanying bracketry. Refer to actuator manufacturer's instructions for details.



**ACTUATORS MUST BE INSTALLED BY COOPER® VALVES APPROVED PERSONNEL. THE VALVE MUST BE TESTED AFTER MOUNTING THE ACTUATOR TO ENSURE NO LEAKAGE.**

### WARNING!

Care must be taken during actuator installation to prevent pushing the stem down into the valve possible damaging the ball.

**10** – Set operator closed stop with ball precisely in closed position.

**11** – Cycle the valve several times and re-torque packing gland nuts.

**12** – Test valve in accordance with COOPER Accuseal test procedures.

## RETURN MERCHANDISE AUTHORIZATIONS (RMA)

All valves returned must have a RMA. Please provide the following information when submitting your RMA request.

- End user (Valve owner)
- Representative
- Serial number
- Media (service)
- Estimated cycles per day
- Temperature
- Pressure
- Method of operation
- Position of valve during service

## SERVICE DEPARTMENT

COOPER® Valves delivers authorized factory service solutions to our partners around the globe.

We understand that proper valve maintenance is essential to keeping your plant operating safely, reliably, and efficiently. As a commitment to our customers we offer an experienced team of valve service professionals which are available 24/7 for rapid response.

Our valve service professionals are grounded on values of safety, integrity, and quality.

Contact the COOPER® Valves Service/Engineering department to obtain a RMA.

Phone: +1.281.566.5640 or +1.800.480.0832

E-mail: [service@coopervalves.com](mailto:service@coopervalves.com)

COOPER Valves, LLC  
4659 Wright Road  
Stafford, TX 77477 USA

# COOPER<sup>®</sup> Valves

Quality Without Compromise

