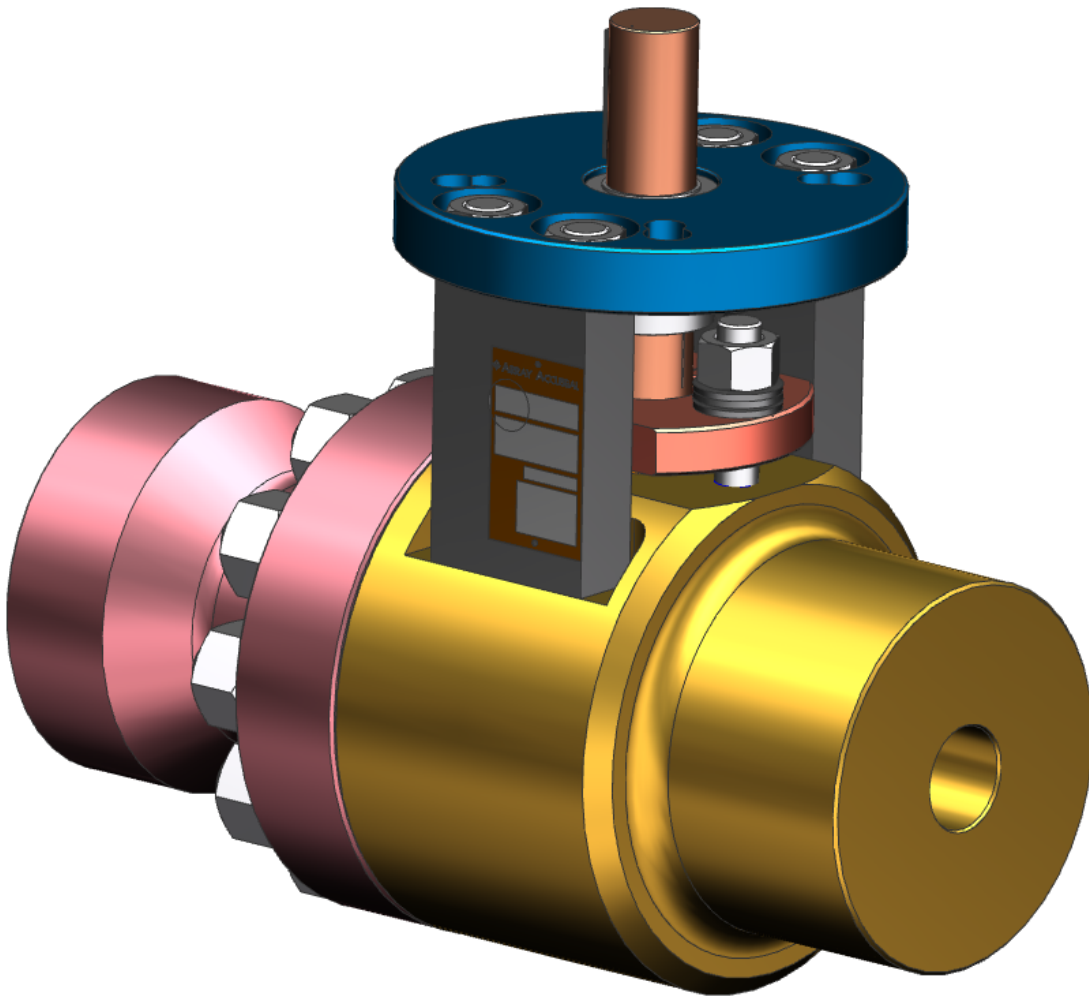




Array Accuseal

Installation, Operations & Maintenance Manual



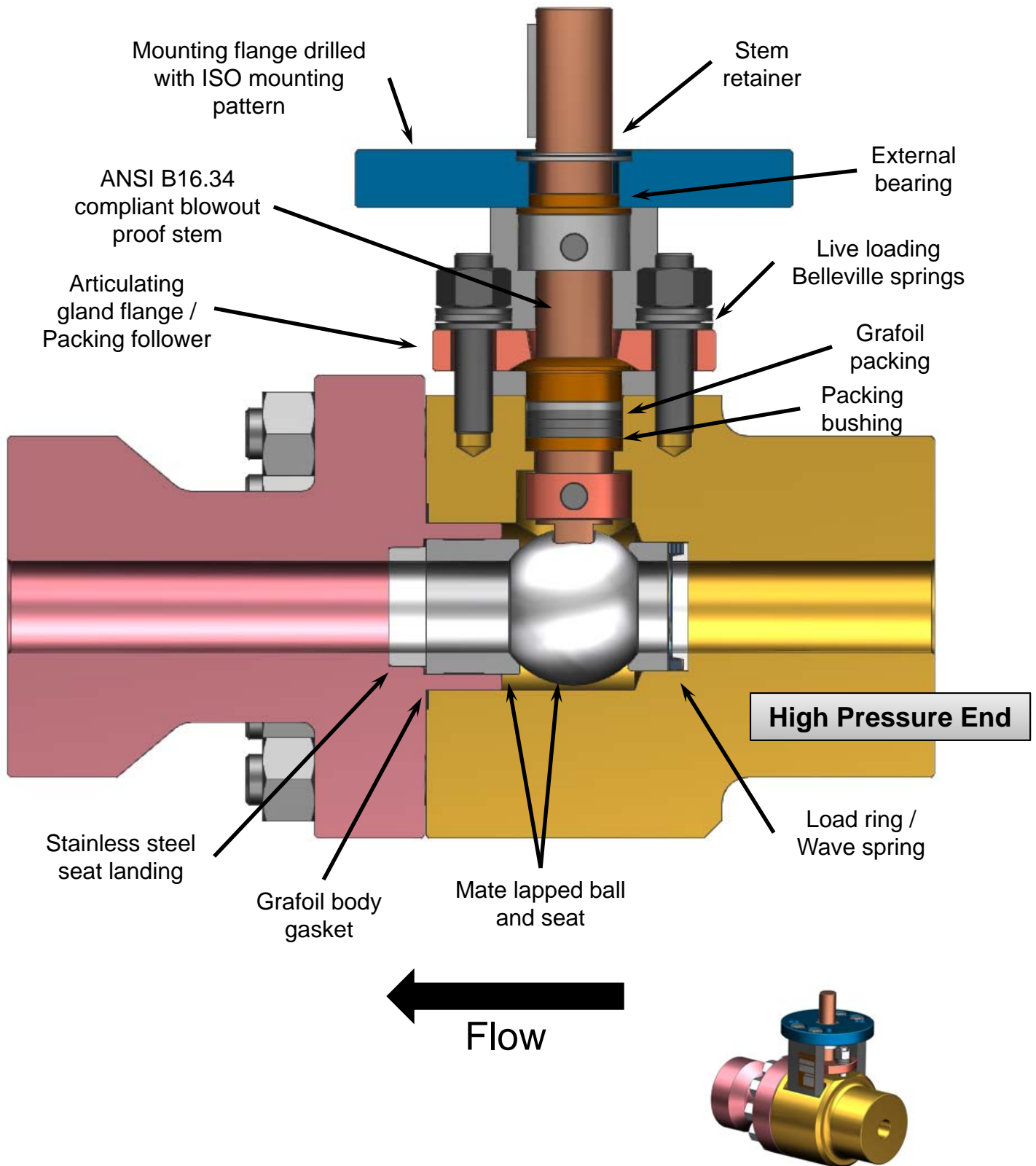
IBV – Isolation Ball Valve

Array Accuseal

16680 Air Center Blvd, Suite 100
Houston, TX 77032
281-821-8258

www.arrayproducts.com

IBV – Isolation Ball Valve



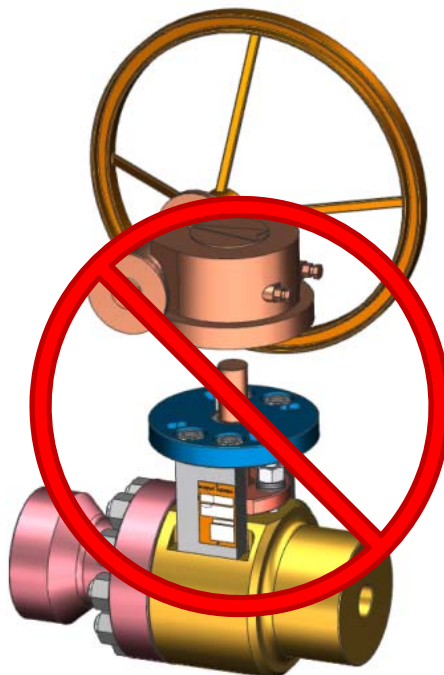
This manual describes the procedures for the safe and efficient installation and operation of Array Accuseal metal seated ball valves. **Failure to follow the procedures in this manual may result in Array Accuseal warranties being voided.** Problems with valve operation and maintenance should be directed to Array Accuseal approved repair facilities.

Installation

	Warning! Never use the valve as a structural member!	
-----------------------------------------------------------------------------------	----------------------------------------------------------------	-------------------------------------------------------------------------------------

	Warning! Valve is not designed for end of line use!	
-----------------------------------------------------------------------------------	---------------------------------------------------------------	-------------------------------------------------------------------------------------

Worm Gear Operator



Caution!

Actuators shall not be mounted, removed, adjusted or re-installed on Array Accuseal valves except by properly trained personnel.

Orientation

Caution!

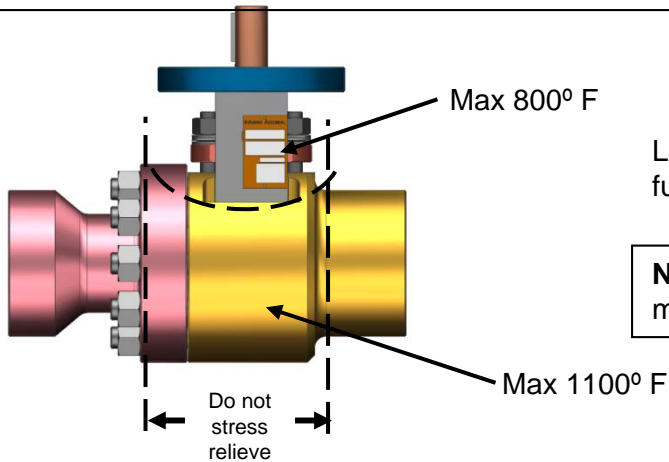
Valves must be installed with the FLOW ARROW pointing from high pressure to low pressure with the valve in the closed isolating position. The high pressure end of the valve will be labeled.

Welding, Stress Relieving and Insulation

- **Valve must be OPEN during welding!**
- Radiation shields are advised if heat damage to the worm gear operator 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.



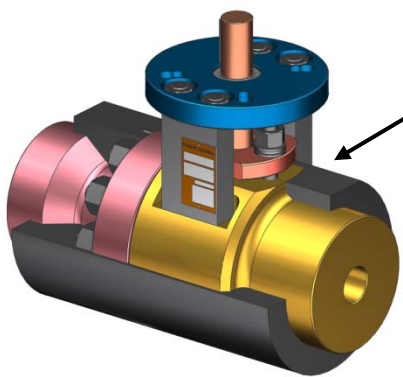
Localized Stress Relief is acceptable. Do not furnace relieve without consulting Array Accuseal.

Note: The valve pictured throughout this manual is shown without butt weld preps.

Caution!

Valve insulation is prohibited during stress relieving.

Valve service insulation is recommended when the valve is expected to experience temperature differentials greater than 400 ° F.



Caution!

Do not apply insulation above the body flange.



Warning!

Upon installation, process temperatures can be hazardous.



Post insulation procedures

- Piping system shall be cleaned and flushed prior to valve installation.

Operation

Valve Lubrication

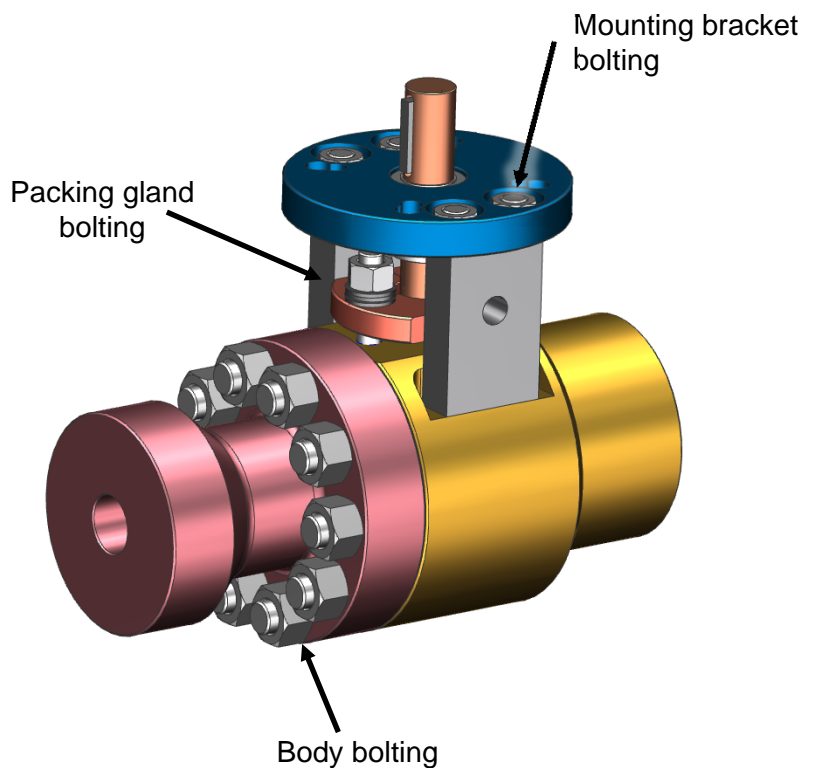
- Array Accuseal ball valves require no lubrication.
- Body bolting and gland packing bolting may be re-tightened if necessary. The system must be depressurized before re-tightening.
- Required body stud torques are given in Table 1. Contact Array Accuseal for gland torques.
- Copper-based anti-seize grease for stud lubrication and Molybdenum Disulfide anti-seize grease for packing lubrication may be used.

Bolting Torque

- Contact Array Accuseal approved service centers for packing gland stud torque values.
- Packing gland stud torques may differ due to application and environment.

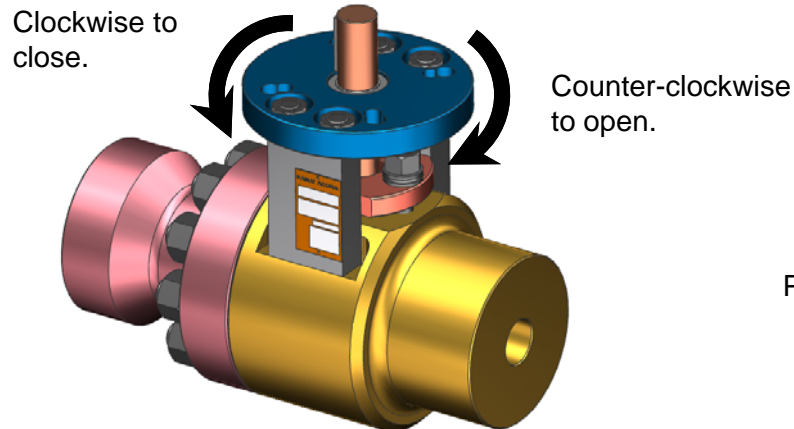
Stud size (inch)	Torque (ft-lb)
1/2-13 UNC	60
5/8-11 UNC	118
3/4-10 UNC	209
7/8-9 UNC	337
1-8 UNC	505
1-1/8 - 8 UN	741
1-1/4 - 8 UN	1042
1-3/8 - 8 UN	1413
1-1/2 - 8 UN	1865

Table 1 – Bolting Torque Values



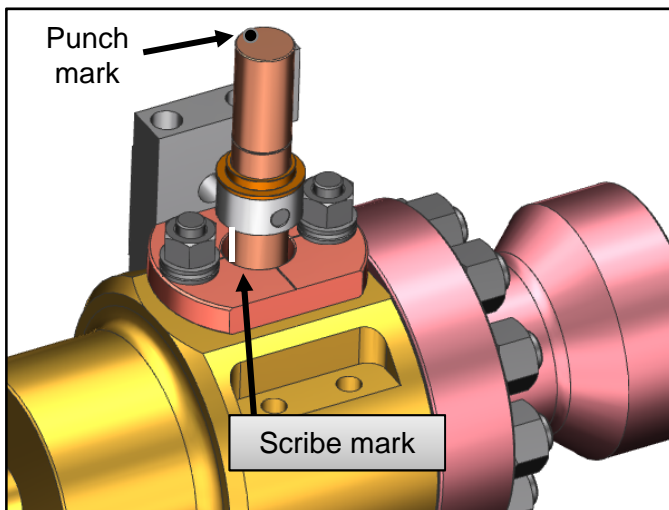
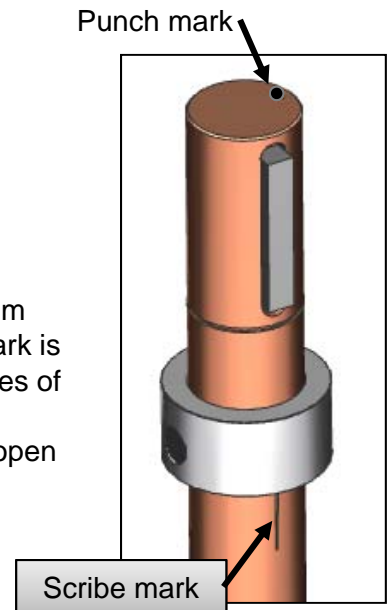
Stem rotation direction

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

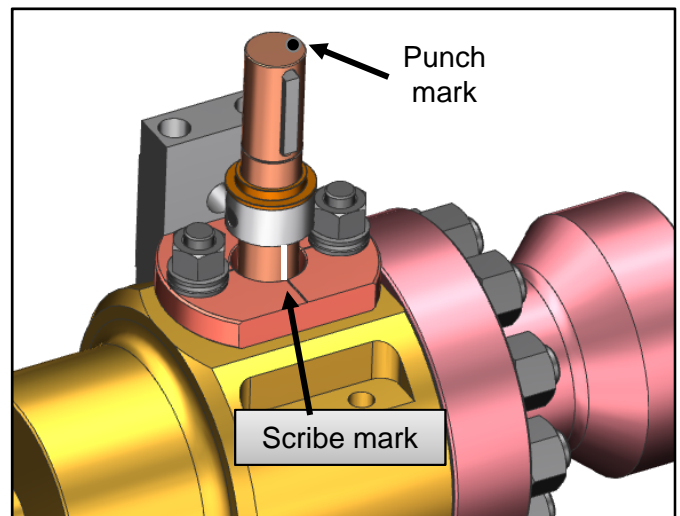


Valve position indication

- 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. The punch mark is 90° away from the key. The scribe marks are in line with the key on both sides of the stem.
- In addition to the punch and scribe marks, lever operated valves are shown open when the lever is in line with the flow.



High Pressure end **Valve Open**



High Pressure end **Valve Closed**

Worm Gear Actuators

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

Valve worm gear 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.

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.

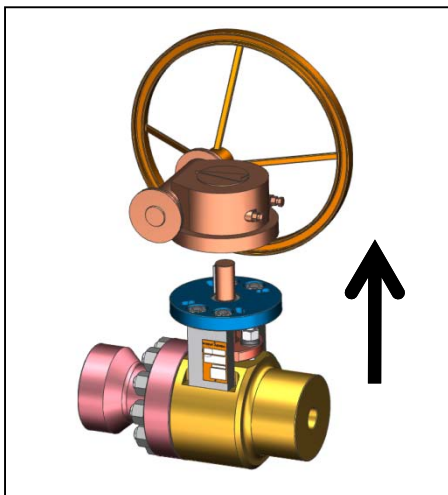
3 – Marking should be indelible to the valve cleaning process, but should not damage the parts (No Stamping).

Warning!
Disassembly and repair of Array Accuseal valves to be done with OEM only.

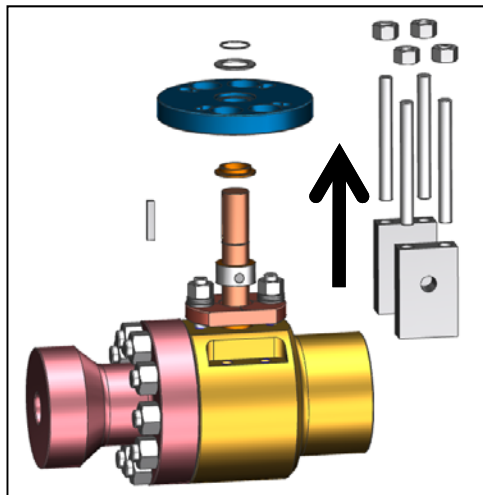
Warning!
Repairs performed by welding on valve body are not permitted.

Caution!
During disassembly take care to not damage the mating and sealing surfaces, or the packing area.

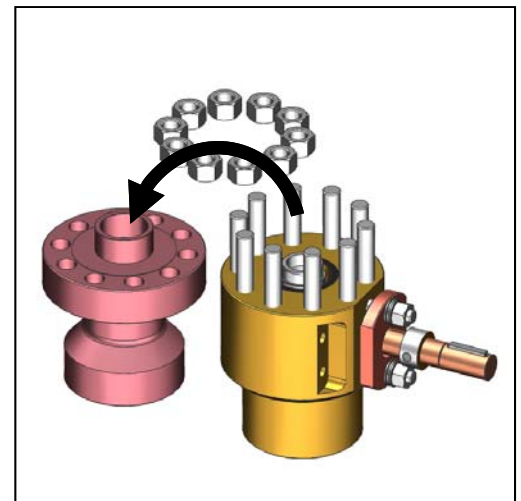
Caution!
Packing must be replaced if gland nuts are loose. Only approved Array Accuseal packing shall be used.



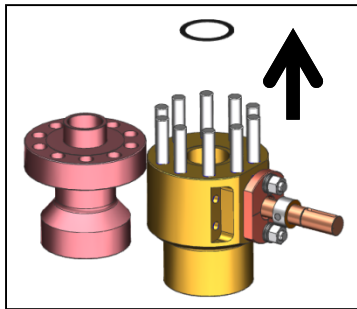
4 – Remove the worm gear actuator. Do not use excessive force.



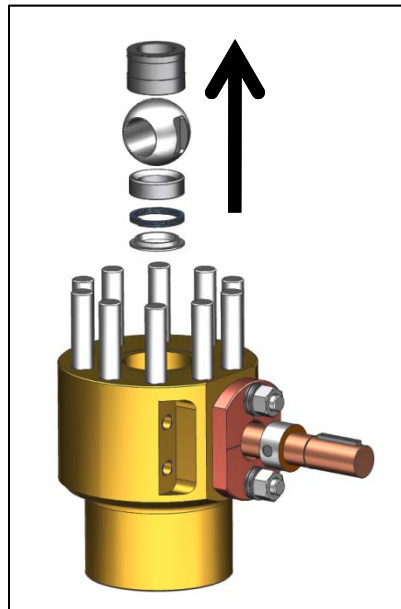
5 – Remove key, stem snapping, retainer ring, mounting leg nuts & studs, mounting flange, mounting leg, and stem bearing.



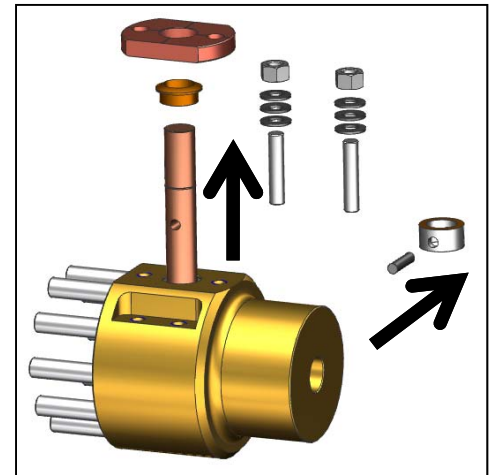
6 – Remove body nuts and studs, and low pressure end piece.



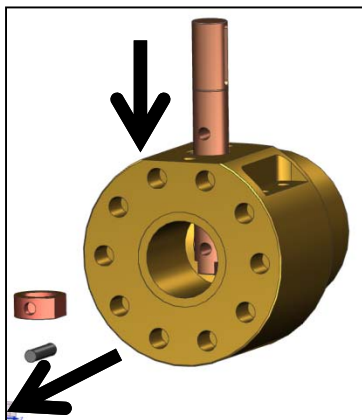
7 – Remove body gasket.



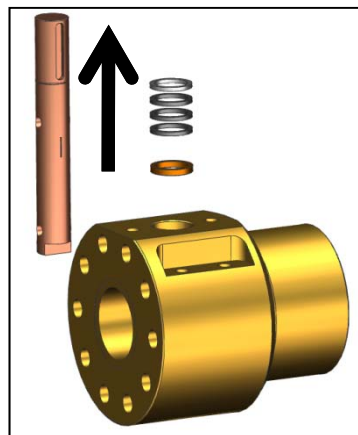
8 - Remove ball, seat, load ring, spring, and spring spacer. Mark orientation of ball (**no stamping**). Protect ball and seats from damage.



9 - Remove pin, collar, gland nuts, gland springs, gland flange, and packing follower. Mark the orientation of the bearing side of the collar (**no stamping**).





10 – Push stem down into valve, remove pin and inner collar. Note which side is the “top” of the collar.



11 – Remove stem, packing, and packing bearing. Take care not to scratch the stem in the area where it contacts with the packing.

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

	<p>Warning!</p> <p>Sand blasting on or near sealing areas is not permissible.</p>	
-------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------

Repair and rework

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

- Packing (replace – do not reuse)
- Body gasket (replace – do not reuse)
- Spring
- Ball and seats
- Stem
- Stem bearing

Ball and seats: If no damage is evident the ball may be relapped to the seat. If the ball or seat has evidence of damage then they must be re-machined, re-coated, and re-lapped. This work must be done by an Array Accuseal approved repair facility.

Seat landing: The low pressure side (downstream) seat landing 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 an Array Accuseal approved repair facility.

Other valve parts: Other valve parts may be cleaned and returned to service. Contact an Array Accuseal approved repair facility if there is a doubt regarding the suitability of cleaned parts.

Ball and seat lapping instructions

- The ball is lapped to the seat using a diamond lapping compound. Final lapping should be done using a 3 micron diamond lapping compound.
- The seat should be rotated on a platform while the ball is moved in a Figure-8 pattern motion against the seat. Care should be taken to avoid creating a “groove” in the ball by overlapping the ball.
- The ball and seat must be tested using Prussian Blue or equivalent (e.g. “bluing” compound). A solid blue ring indicates a good seal. A non-continuous blue ring indicates further lapping is required. Contact an Array Accuseal approved repair facility for further details.

Seat to seat landing lapping instructions:

- The backside of the seat ring is lapped to the seat landing to establish a metal-to-metal seal. This operation is done using diamond lapping compound. The final lapping should be done using a 3 micron diamond lapping compound.
- The seat ring should be rotated against the seat landing until an even seal band is established.
- Prussian Blue or equal can be used to test the seal band. A solid blue ring indicates a good seal. A non-continuous blue ring indicates further lapping is required. Contact an Array Accuseal approved repair facility for further details.

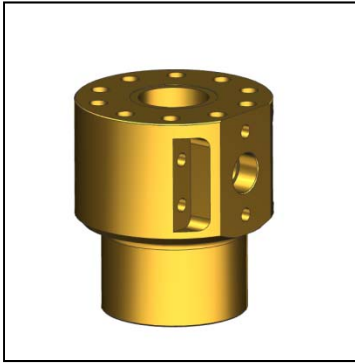
Reassembly

Caution!

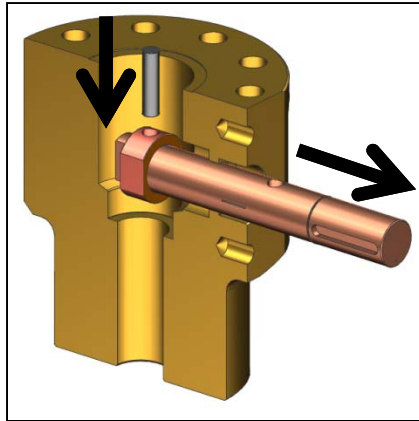
Only approved Array Accuseal components should be re-assembled in the valve.

Caution!

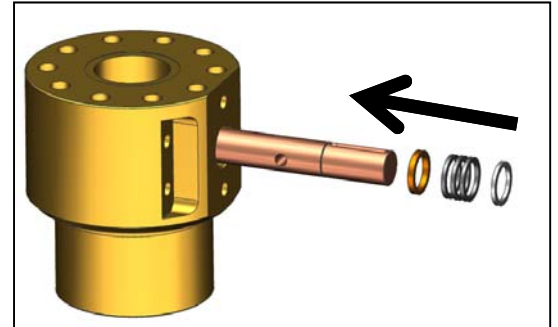
It is recommended that all carbon steel parts be coated with a light motor oil.



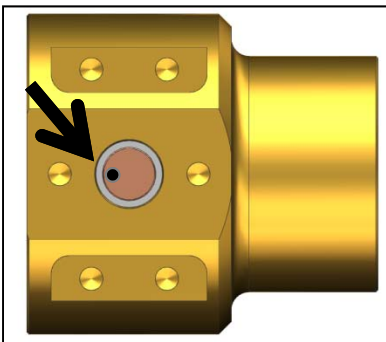
1 – The body portion of the valve must be placed as shown. Be certain to secure the workpiece.



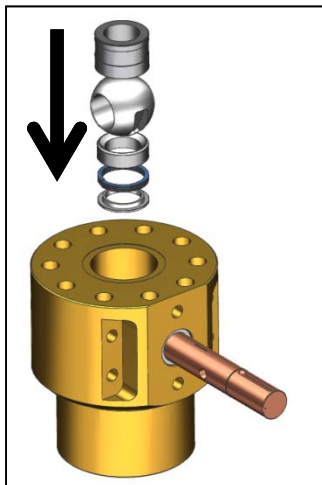
2 – Insert the stem in the valve. Insert the collar as shown. Note that the flat on the collar OD is in line with the stem key slot. Insert the pin into the stem/collar. Slide stem and collar outward to trap the collar.



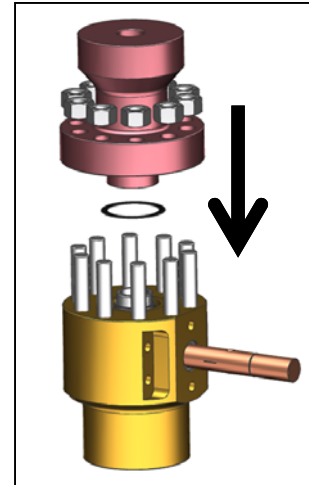
3 – Insert the packing bearing. Insert new packing and anti-extrusion ring (do not reuse packing). The packing will hold the stem in place for subsequent operations.



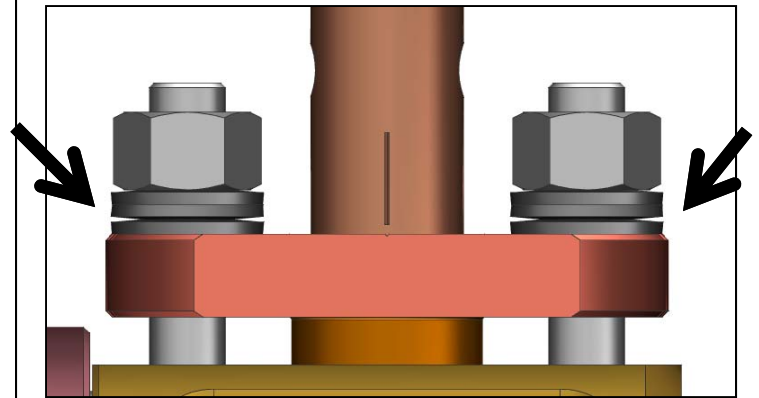
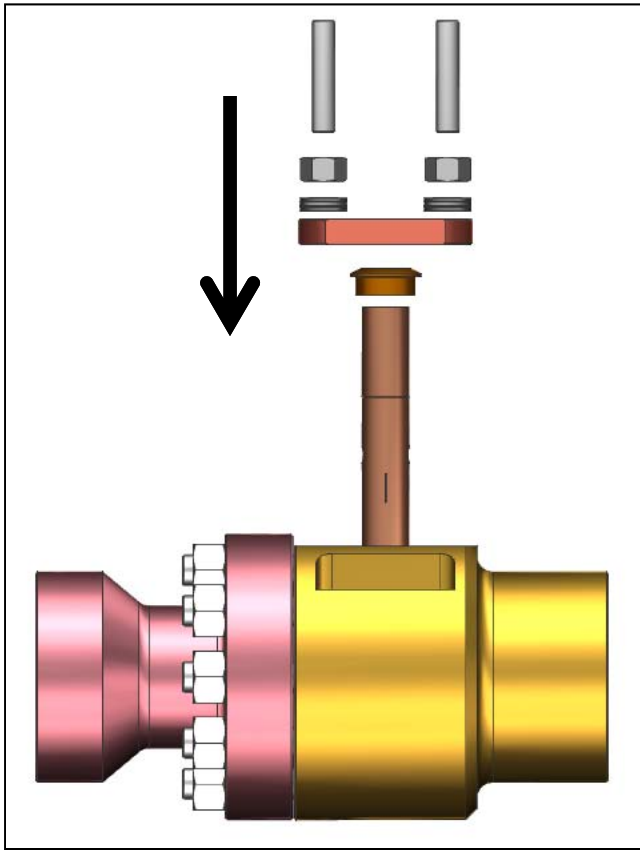
4 – The stem alignment punch mark must be placed in the orientation shown.



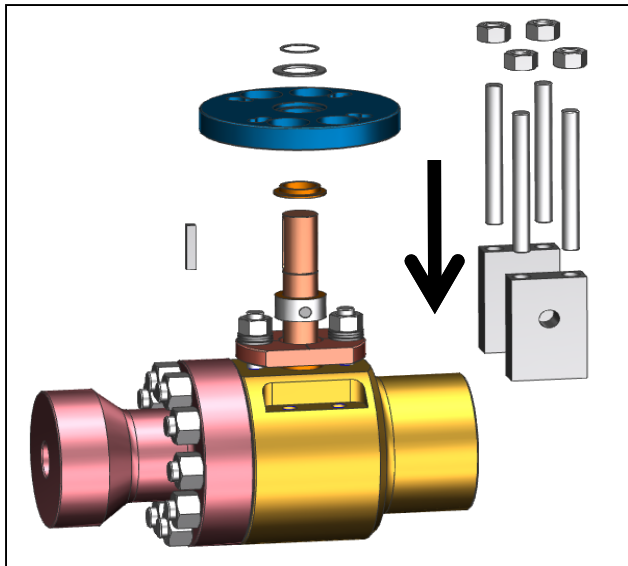
5 – Install the spring spacer, spring, load ring, ball, and seat. The ball will need to be tipped as shown to engage the stem.



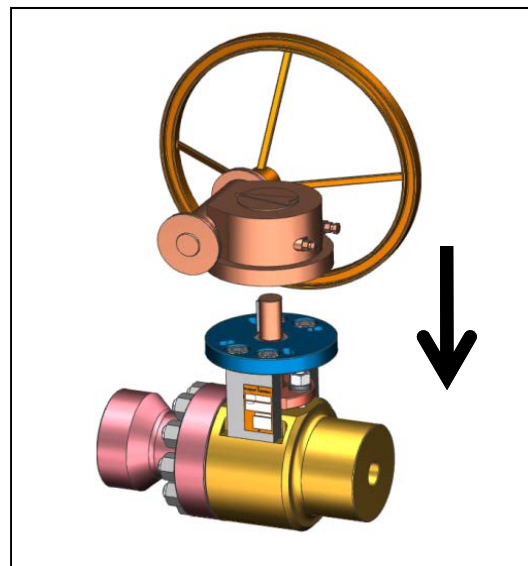
6 - Install new body gasket (do not reuse gasket), body studs, end connect, and nuts. Refer to table 1 for required torque values.



7 – Reorient the valve on the workspace (as shown) and secure in place. Install packing follower studs, packing gland flange, gland springs, and nuts. Gland springs must be installed in the orientation shown. Use a copper based anti-seize lubricant on the studs. Contact Array Accuseal for required torques.



8 – Assemble studs, mounting legs, mounting flange, nuts, stem bearing, stem retainer ring, and snap ring. Use anti-seize compound on studs. Refer to Table 1 for the required torque values. Install key.



9 – Install worm gear actuator. Refer to actuator manufacturers instructions for details. Actuator and valve must be in closed position.

Caution!

The valve **must** be tested after mounting the worm gear actuator to ensure no leaks.

- 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 MSS-SP61 test procedures.