

XOMOX®

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Maintenance & Repair Instructions
For 3 Piece Weld End Ball Valves

CRANE ChemPharma, Tuflin®
Process Ball Valves

CRANE®

ChemPharma Flow Solutions

www.cranechempharma.com

Trouble-free operation.

Tufline Figure 500 Process Ball Valves have proven themselves with long-term, trouble-free service in a wide variety of applications.

Applied within their pressure and temperature limitations, properly installed, adjusted, and operated, these valves should require minimum attention.

Read carefully.

The following procedures and illustrations have been prepared to assist you in the maintenance and repair of your Tufline Process Ball Valves. Please read these instructions carefully.

⚠ WARNING

READ AND UNDERSTAND INSTRUCTIONS BEFORE SERVICING VALVE. Failure to follow instructions could result in death or serious injury. If you have any questions, contact the factory at 513-745-6000.

⚠ CAUTION

These instructions have been prepared for valves as they are currently manufactured. If you have an older design valve that needs repair, contact either the factory or your nearest Service Center to make sure that you have the correct repair parts and instructions.

Maintenance.

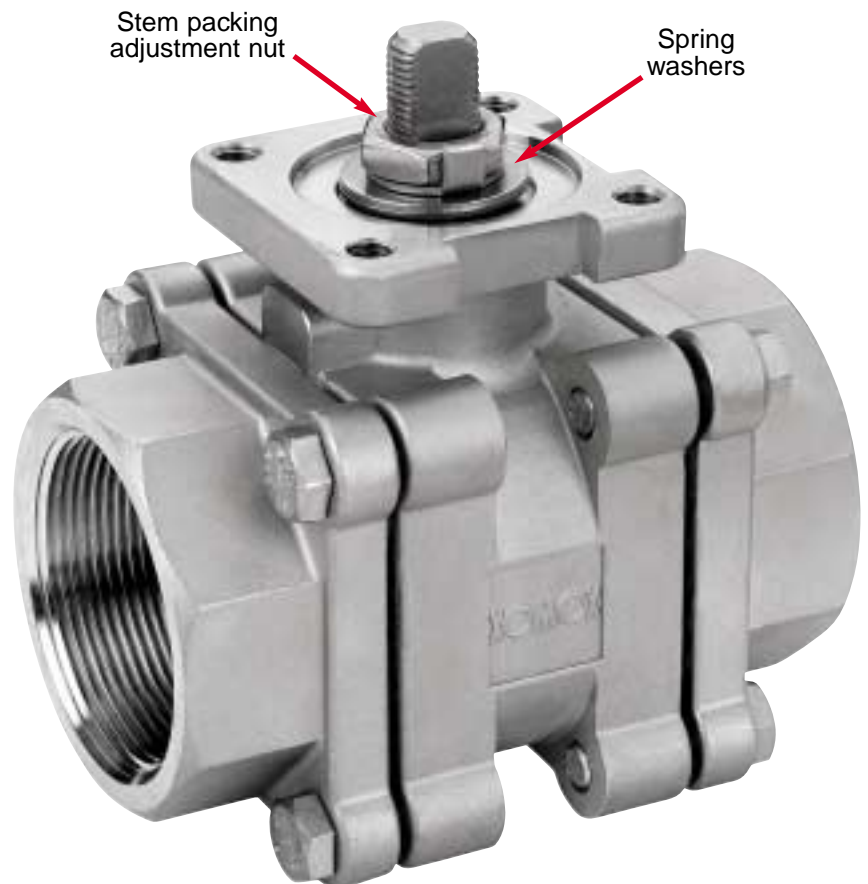
All Tufline Process Ball Valves are factory tested for tight shutoff. Standard valves with a stem packing adjustment nut are live-loaded and normally no further adjustment is necessary.

If leakage should occur along the stem, follow the simple adjustment instructions at the right.

Stem seal adjustment.

To adjust for leakage along the valve stem, bend the tab on the locking washer down. Turn the stem nut clockwise in approximately 1/4-turn increments to compress the spring washers.

Do not over-tighten, flattening the spring washers. Bend the tab on the locking washer to hold the position of the jam nut. If a tight seal cannot be obtained, continue with the instructions for valve repair.



⚠ WARNING

The procedures on these pages must be followed carefully. Failure to do so could result in equipment damage, serious injury, or death.

Installation of threaded valves.

1. Use conventional sealant, such as hemp core, Teflon®, etc. on the threads.
2. Apply wrench on the hexagon end of the valve only. Tightening by using the valve body or handle can seriously damage the valve.
3. For applications where screwed end valves are back-welded on site, these valves must be dismantled according to instructions for weld end valves.

Installation of weld-end valves.

1. Tack-weld the valve on the pipe in four points on both end caps, with the ball valve in the open position.

Extended butt-weld end ball valves allow direct welding.

Short butt-weld or socket-weld end valves require the following steps.

2. Remove all body bolts except any opposing two. Loosen the remaining two body bolts and swing out the center body.
3. Finish welding both end caps on the pipe.
4. When the valve has cooled, clean both end caps and body surface.
5. Swing the body back in position and replace the bolts. Tighten all nuts slightly. This operation is very important to keep body and end caps perfectly parallel and to prevent distortion of the end caps. Follow Steps 10 and 11 under the **Reassembly** instructions on next page.

⚠ CAUTION

The body gaskets are fully encapsulated in the body groove and compressed by the end cap. This allows direct welding (WIP) as long as the end cap heat in the body gasket area can be controlled to remain under 400°F during the welding process.

Repair.

It is important that leakage be attended to promptly. If leakage is allowed to persist, the valve top works could be damaged by corrosive media.

Before disassembly.

1. Open the valve to the 45-degree position. This will allow any trapped pressure within the valve to escape. Turn the valve to the open position.
2. If valves have been used with hazardous fluids, make certain the valves are thoroughly cleaned before disassembly.

Disassembly.

1. Remove the body connecting bolts. Remove the valve center body from the pipeline.
 - 1A. For in-line repair, remove all body bolts except any opposing two. Loosen the remaining two body bolts and swing out the center body.

Note: For Fire-Tested valves, the space between the body end connectors must be widened to permit removal of the valve center body.

2. Remove the seats from the valve center body.
3. Bend the tab on the locking washer down and remove the stem nut by turning it counter-clockwise.
4. Turn the ball to the closed position and remove it from the valve center body.
5. Remove the stem by pressing it down into the body cavity.
6. Remove the stem packing and stem seal from the valve center body.



Inspection.

Inspect the valve components for wear or damage.

Be sure to carefully inspect the following components for nicks, cracks, breaks, or other defects:

1. Valve seats
2. Ball
3. Stem
4. Packing rings
5. Spherical stem seal

The parts listed above, along with the body gaskets, are the only components that should require replacement.

Reassembly.

1. Place the spherical stem seal over the stem with the conical surface facing the spherical stem shoulder.
2. Insert the stem through the valve center body cavity.
3. Install the packing rings over the stem with the concave side down (orientation is important only for PTFE packing), pushing the rings into the body packing chamber.

For the **PTFE packing**, orientation is important. For the **graphite packing**, it is important to firmly compress each graphite ring independently as it is installed.

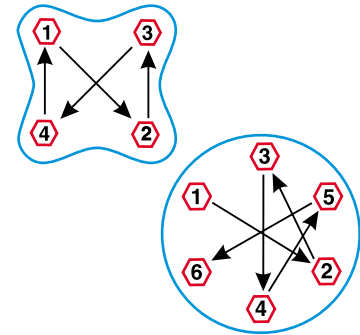
4. Place the packing gland over the valve stem.
5. Install the two (2) spring washers over the stem with the concave surfaces face to face.

6. Place the locking washer over the stem. Thread the stem nut over the stem, tightening the nut clockwise to compress the spring washers. Do not over-tighten, flattening the spring washers. (See table below.) Bend the tab on the locking washer to hold the position of the jam nut.

| Valve Size (Inches) | Stem Nut Torques (in-lbs) | |
|---------------------|---------------------------|--------------|
| | Full Port | Reduced Port |
| 1/2 | 60 - 80 | --- |
| 3/4 | 60 - 80 | 60 - 80 |
| 1 | 90 - 110 | 60 - 80 |
| 1 1/4 | 90 - 110 | 90 - 110 |
| 1 1/2 | 130 - 150 | 90 - 110 |
| 2 | 130 - 150 | 130 - 150 |

7. Insert the ball into the body cavity with the port opening in the closed position. Turn the ball to the open position.
8. Insert the replacement seats with the conical surface facing the ball.
9. Install the body joint gaskets. Then install the body between the valve end connectors.

10. Install the body bolts. Tighten the body bolts in the crossing pattern shown below to the torque values listed.



2-inch Full Port

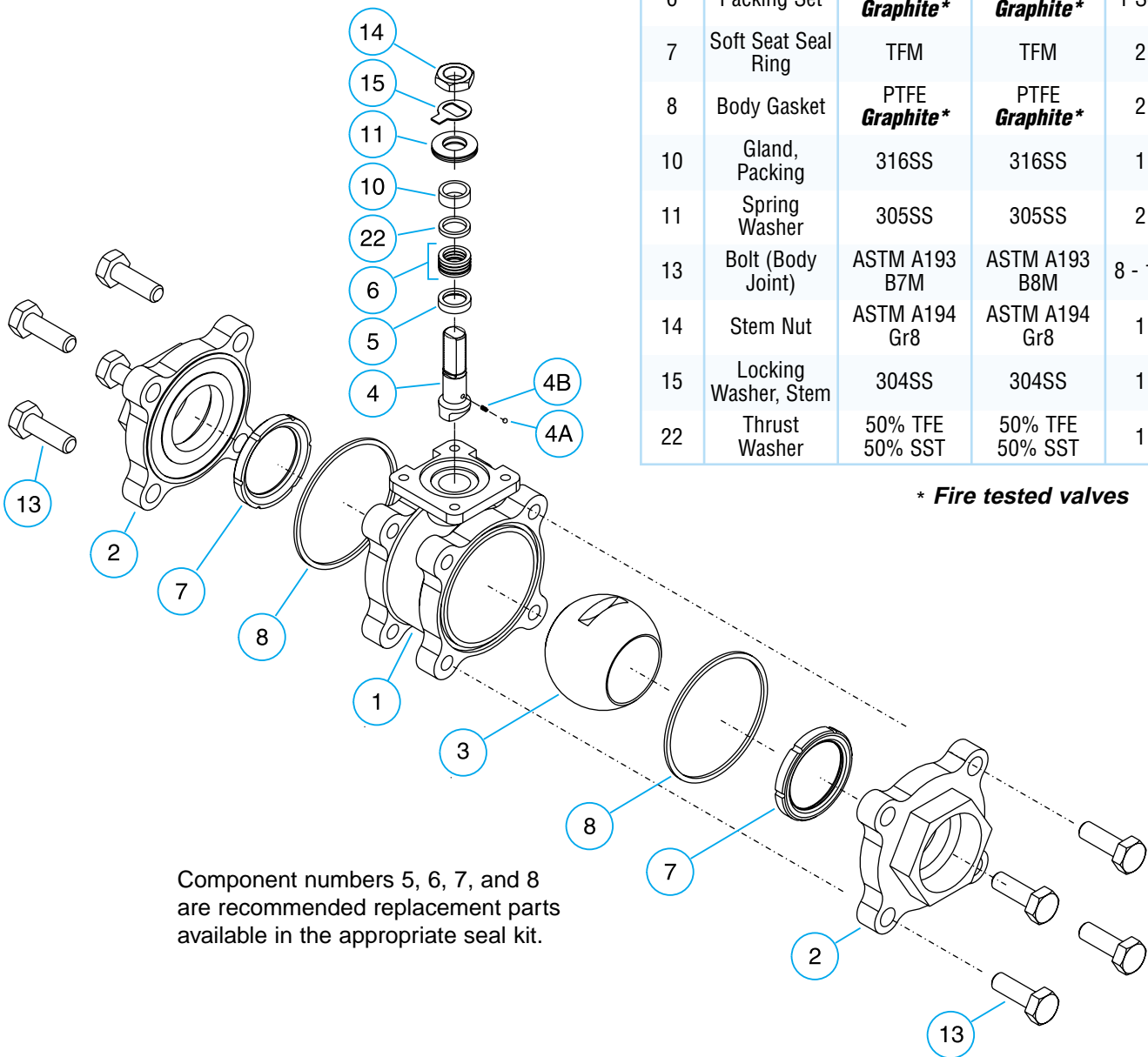
| Valve Size (Inches) | Body Bolt Torques (in-lbs) | |
|---------------------|----------------------------|--------------|
| | Full Port | Reduced Port |
| 1/2 | 160 | --- |
| 3/4 | 160 | 160 |
| 1 | 160 | 160 |
| 1 1/4 | 345 | 160 |
| 1 1/2 | 345 | 345 |
| 2 | 345 | 345 |

When tightening in the crossing pattern, cycle through the pattern at least three (3) times to assure proper and uniform torque.

11. Open and close the valve two (2) or three (3) times to be sure the valve operates properly.
12. Pressure test valve after repairs have been completed to assure that all seals are working properly.

3-Piece Ball Valve - Parts & Materials

| Part No. | Part Description | Carbon | Stainless | Qty. |
|----------|----------------------|-----------------------|-----------------------|--------|
| 1 | Body | ASTM A216, WCB | ASTM A351 CF8M | 1 |
| 2 | End Caps | ASTM A216, WCB | ASTM A351 CF8M | 2 |
| 3 | Ball | 316SS | 316SS | 1 |
| 4 | Stem | 316SS | 316SS | 1 |
| 4A | Anti-Static Ball | 316SS | 316SS | 1 |
| 4B | Anti-Static Spring | 316SS | 316SS | 1 |
| 5 | S2 Stem Seal Ring | PTFE | PTFE | 1 |
| 6 | Packing Set | PTFE Graphite* | PTFE Graphite* | 1 Set |
| 7 | Soft Seat Seal Ring | TFM | TFM | 2 |
| 8 | Body Gasket | PTFE Graphite* | PTFE Graphite* | 2 |
| 10 | Gland, Packing | 316SS | 316SS | 1 |
| 11 | Spring Washer | 305SS | 305SS | 2 |
| 13 | Bolt (Body Joint) | ASTM A193 B7M | ASTM A193 B8M | 8 - 12 |
| 14 | Stem Nut | ASTM A194 Gr8 | ASTM A194 Gr8 | 1 |
| 15 | Locking Washer, Stem | 304SS | 304SS | 1 |
| 22 | Thrust Washer | 50% TFE 50% SST | 50% TFE 50% SST | 1 |



Component numbers 5, 6, 7, and 8 are recommended replacement parts available in the appropriate seal kit.

*** Fire tested valves**

Service Center Repair.

Before attempting field repair, you may wish to consider sending the valve to a Xomox Service Center for repair.

Specialized equipment and experienced personnel at Xomox Service Centers can often provide repairs more economically than repairs performed in the field.

New valve warranty.

Valves repaired at Xomox Service Centers are tested to the same specifications as new valves and carry the standard new valve warranty.

Xomox Service Center locations are listed on the back page.

Shipping precautions.

When shipping valves to a service center, I.C.C. regulations require that all valves be thoroughly decontaminated and depressurized prior to shipment.

The customer must provide certification that these regulations have been adhered to, and that valves shipped to Xomox Service Centers are completely free from hazardous liquids or gases.

Shipments to Xomox Service Centers must be prepaid. Return shipments will be f.o.b. Xomox Service Center. Xomox Service Center locations are listed on the back page.

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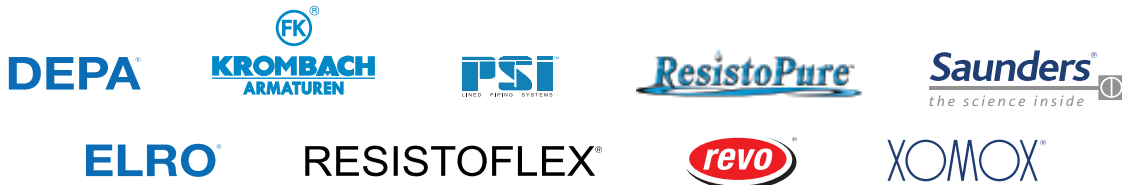
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