XOMOX®

brands you trust.

Maintenance & Repair Instructions

CRANE ChemPharma Tufline® Sleeved Plug Valves

CRANE

ChemPharma Flow Solutions

www.cranechempharma.com

Trouble-free operation.

Tufline® valves have proven themselves with long-term, trouble-free service in a wide variety of applications. Properly installed, adjusted and operated, these valves should require minimum attention.

Questions?

If there are any questions, contact your CRANE ChemPharma, Xomox representative, Xomox Service Center, or the factory.

CRANE ChemPharma, Xomox Automation & Service Center addresses and phone numbers are listed on the back cover.

You may also contact the factory at 513-745-6000.

Contents **Page**

Important Information

Read carefully.

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

⚠WARNING

READ INSTRUCTIONS BEFORE SERVICING VALVE. Failure to follow instructions could result in death or serious injury. If there is any question, contact the factory at 513-745-6000.

⚠WARNING

MASSIVE LEAKAGE. DO NOT attempt to repair valve or its accessories while pressurized! Death or serious injury could result.

NOTICE

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 you have the correct repair parts and instructions.

Field repair or factory repair?

⚠CAUTION

assumes all responsibility for valve performance on valves rebuilt in the field by non-CRANE ChemPharma, Xomox personnel. Warranty of repair parts is limited to replacement of parts due to defects in material and workman ship of the parts themselves.

Proper installation of repair parts plays an important role in their performance. These parts may be damaged if improper installation occurs.

Field repair of valves may be performed by carefully following the instructions in this book. However, this should be weighed against the advantages of returning valves to a CRANE ChemPharma, Xomox Service Center for repair.

Because of the specialized equipment available at service centers, repairs can often be performed more economically, even considering transportation costs.

Further, factory and service center repaired valves are tested to the same specifications as new valves and carry the standard new valve warranty.

Field repair of in-line 10 and 12 inch valves is not recommended except by CRANE ChemPharma, Xomox personnel. For information on repair of these valves, consult one of the CRANE ChemPharma, Xomox Service Centers listed on the back cover.

Maintenance Instructions for All CRANE ChemPharma, Tufline Sleeved Plug Valves

Replacement Parts.

Replacement parts are designed for maximum interchangeability between valve sizes, types and models. However, some are not interchangeable; and, to ensure receiving correct parts, the following information must be supplied when ordering replacement parts.

1. Specify if repair is in-line or out-of-line on all 1/2 and 3/4 inch valves as well as 1 inch ductile iron valves.

2. Specify valve identification number (six digit number found on hub washer or flow indicator).

If you cannot supply the I.D. number, provide the following information:

a. Size

b. Body and plug material

c. Class (150, 300, 600)

d. Is valve for use on toxic service such as Chlorine or HF? If yes, specify.

e. Does valve have hex head bolts or allen head adjustment screws? If allen head, advise if a "T" is stamped on the cover.

f. Is valve manual or actuated? If actuated, specify type of actuator.

CRANE ChemPharma, Tufline valves are designed and built to give long, trouble-free service. Properly applied, adjusted and operated, these valves should require minimum attention.

The following procedures and illustrations have been prepared to assist you in the maintenance and repair of your Tufline valves. Please read instructions carefully. If there are any questions, consult your Tufline valve representative or the factory at 513-745-6000.

Adjustments

Loss of seal

All CRANE ChemPharma, Tufline valves are factory adjusted and normally further adjustment is not required. However, if seepage does occur at the plug stem or downstream, the following adjustments can be made.

Tighten each of the three adjustment bolts (or screws) 1/4 turn. Operate valve and check for leakage. Repeat as necessary to stop the seepage.

The need for frequent adjustment of the bolts, and/or many adjustment turns indicates the seals are worn to the point of needing replacement (see page 4). Excessive tightening of the adjustment bolts will cause an increase in the valve stem torque.

Valve Torque.

Valve should be operated under service conditions for at least twelve hours before any torque adjustments are made, since the initial breakaway torque normally reduces with usage and temperature.

Running Torques

Normal running torque may be less than the valves shown in the tables below.

Valve torque may be greater if the valve is used to control a highly viscous or abrasive medium.

Size (Inches)	PTFE sleeve Foot-Pounds at stem	UHMWPE sleeve Foot-Pounds at stem
1/2	7	14
3/4	7	14
1	15	30
1 1/2	40	80
2	46	92
3	55	110
4	100	200

Size (Inches)	PTFE sleeve Foot-Pounds at stem		UHMWPE sleeve Foot-Pounds at stem	
	EG	Wormgear**	EG	Wormgear**
6	13	34	22	58
8	18	45	30	118
10	33	109	48	124
12	48	90	33	58

*Values at the plug can be greater.
** Torque at the input shaft less handwheel or crank.

Top Seal Replacement Instructions

⚠WARNING

MASSIVE LEAKAGE. DO NOT attempt to repair a valve or its accessories while pressurized! Death or serious injury could result.

Static Eliminator (1/2 - 4 inch only)

Thrust Collar

Metal Diaphragm

Formed PTFE Diaphragm

Assembly Cone Tool

Wedge Ring

Plug (Not included in kit)

Disassembly.

⚠WARNING

MEDIA EXPOSURE. Depressurize, clean and neutralize any media that may remain in the valve and pipe line. If the valve is in the pipeline, you must follow your line entry procedures. Always wear appropriate safety attire. Failure to follow this warning could result in death, personal injury, or property damage.

Loosen the cover bolts (or nuts) approximately 4 turns each, being careful not to allow the release of the valve cover.

Rotate the plug 1/4 turn to release any trapped pressure within the valve.

Remove the hub (or E.G. actuator and bracket).

Remove the valve cover.

Using a wrench to turn the plug, remove the plug and top seal parts. Top seal parts must be discarded.

Inspection.

See drawing below.

For best sealing results inspect the following components:

1. The seal surface on the plug stem.

2. The plug surface.

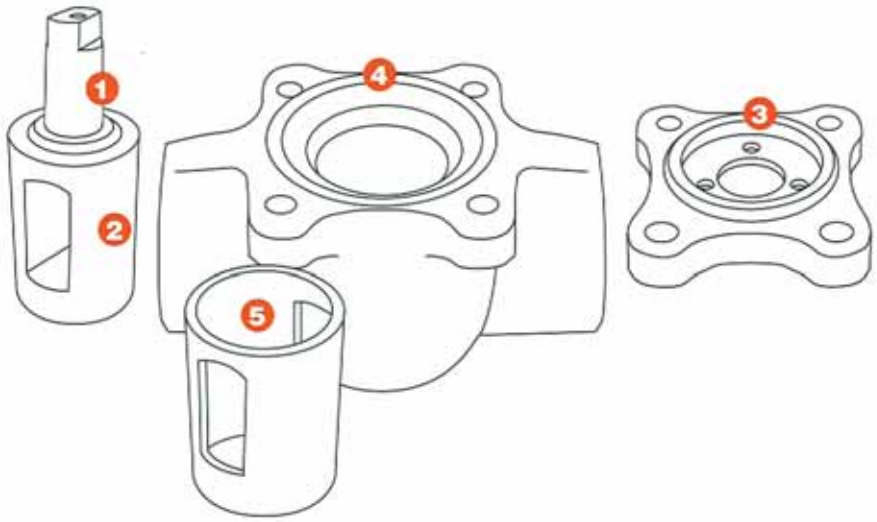
3. The seal surface on the cover.

4. The body seal surface that mates with the cover.

5. The sleeve.

These surfaces should be free from defects, which are typically caused by corrosion, erosion, improper handling, or improper storage of a disassembled valve.

If defects are found on any of these parts, the valve must not be repaired.



Reassembly

1. Replace the plug in the valve body with the ports in the open position.

2. Install wedge ring onto plug stem. The small diameter end must be upward.

3. Place assembly cone tool with formed PTFE diaphragm over plug stem. (In valves that have a threaded stud atop the plug stem it will be necessary to make a 5/16-inch diameter
hole through the crown of the assembly cone tool to allow the cone to rest on top of the plug stem.)

4. Push the formed PTFE diaphragm over taper on assembly cone tool and onto plug stem, being sure to evenly distribute the pushing force on the crown of the diaphragm to prevent back rolling and damage to the sealing lip.

When installing the formed PTFE diaphragm, the thrust collar may be used as a pushing tool to push the diaphragm over the taper and onto the largest diameter of the assembly cone tool.

The thrust collar can now be set aside.

Continue pushing the diaphragm over assembly cone tool and onto plug stem.

5. Check to see that the wedge ring has seated properly inside the crown of the formed PTFE diaphragm.

6. Remove and discard assembly cone tool.

7. Install metal diaphragm.

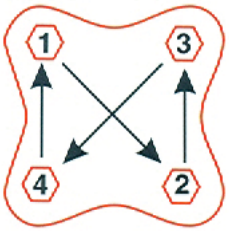
8. Install the thrust collar with flat side facing up.

9. On 1/2 through 4 inch valves, install the static eliminator with thin lip facing down. (Not required on actuated valves.)

10. Back out adjustment screws to within one thread of bottom of cover bore.

11. Install the cover. To facilitate tightening of the cover bolts, press the plug into the body with an arbor press until the bottom of the plug port opening is 1/16 inch above the bottom of the valve body port opening. Do not apply force to the cover as this may damage the formed PTFE diaphragm.

12. Check to see that the metal diaphragm is centered in the valve body counter bore.



13. Tighten the cover bolts alternately (crisscross pattern) and incrementally until the following torque values are reached:

Bolt Size (Inches)	Foot-Pounds
5/16	10 - 15
3/8	15 - 25
7/16	30 - 40
1/2	40 - 50
5/8	90 - 100
3/4	125 - 135

⚠CAUTION

VALVE DAMAGE. DO NOT exceed maximum torque values. Personal injury and property damage may result.

14. Tighten the adjusting bolts uniformly in 1/4 turn increments until contact is made, then tighten an additional 1/4 turn.

15. Replace the hub and wrench (or bracket and E.G. actuator) and rotate the plug.

16. Compare the valve torque against the valves listed under Running Torque on Page 3.

If satisfactory results have not been obtained, consult the nearest CRANE ChemPharma, Xomox Service Center.

Repair Instructions for 1/2 & 3/4 Inch Valves In-Line & Out-Of-Line

⚠WARNING

MASSIVE LEAKAGE. DO NOT attempt to repair a valve or its accessories while pressurized! Death or serious injury could result.

⚠WARNING

MEDIA EXPOSURE. Depressurize, clean and neutralize any media that may remain in the valve and pipeline. If the valve is in the pipeline, you must follow your line entry procedures. Always wear appropriate safety attire. Failure to follow this warning could result in death, personal injury or property damage.

Before proceeding with valve repair, you must read pages 2 and 3 carefully.

Typical valve ready for repair

Sizing plug

Special tool
Available from your CRANE ChemPharma, Xomox Service Center.

Valve repair kit
Do not remove tape from sleeve until ready for use.
Do not remove formed PTFE diaphragm from assembly cone tool.

1. Loosen cover bolts four turns each. Rotate the plug approximately 1/4 turn to release any trapped pressure within the valve.

Remove the cover bolts. Lift plug-cover-handle assembly from valve.

Remove handle retaining nut and disassemble washers, handle, and cover from the plug.

Remove and discard the top seal parts from the plug.

2. To remove the sleeve, cut though the sleeve with a sharp knife at top and bottom side of the port. Care must be taken not to score the valve body during sleeve removal.

⚠CAUTION

Discard and replace valve body if scored. With a scored body, in-line leakage may occur.

3. After the sleeve has been cut, insert a screwdriver behind the sleeve and curl the sleeve away from the valve body. Remove the sleeve by prying it out of the body. Discard old sleeve. Clean the body, plug and cover. Check all parts for erosion and replace if necessary. Check the finish of the sealing surfaces on the plug. Replace the plug if not smooth.

4. The replacement sleeve has been sized and taped at the factory. Do not remove the tape until ready for use.

(Sleeve port openings have been pre-drilled in kits for in-line repair.)

Remove the tape and insert the sleeve in the valve body with the heavier wall section of the sleeve toward the bottom of the valve. Note: On sleeves with vent holes, the vent holes must be positioned 90∞ from the port openings.

5. Place the sizing plug in the sleeve and press the sizing plug to the bottom of the valve body. Remove the sizing plug, using a jackscrew if necessary.

6. When the sleeve is in the body, the upstream and downstream ports must be drilled out. Use a standard drill, and drill out the ports in the sleeve by drilling through the ports of the valve body. (This pertains only to sleeves not pre-drilled.)

7. Trim the burrs and excess sleeve material from the ports with a sharp knife. Care must be taken not to mar the sealing area of the sleeve or leakage may result.

Insert the standard plug with the ports in an open position. The top of the plug should drop within approximately 1/4 inch of the counter bore. If it does not, resize with the sizing plug.

8. Install the wedge ring onto plug stem. The small diameter end must be upward.

Place assembly cone tool with formed PTFE diaphragm over plug stem.

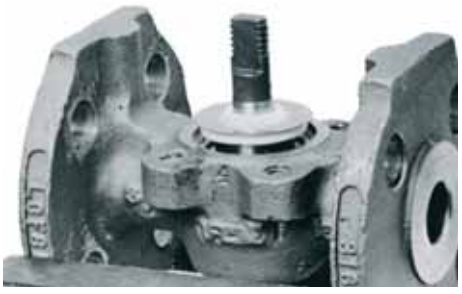
9. Push the formed PTFE diaphragm over taper on assembly cone tool and onto plug stem, being sure to evenly distribute the pushing force on the crown of the diaphragm to prevent back rolling and damage to the sealing lip.

When installing the formed PTFE diaphragm, the thrust collar may be used as a pushing tool to push the diaphragm over the taper and onto the largest diameter of the assembly cone tool.

10. The thrust collar can now be set aside. Continue pushing the diaphragm over assembly cone tool and onto plug stem.

Check to see that the wedge ring has seated properly inside the crown of the formed PTFE diaphragm.

Remove and discard assembly cone tool. Install metal diaphragm.

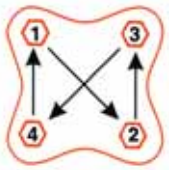


11. Install thrust collar with flat surface facing up. Install static eliminator with thin lip facing down. (Not required on actuated valves.)

12. On the valve cover, back out adjusting screws to within one thread of bottom cover bore.

13. Install the cover. To facilitate tightening of the cover bolts, press the plug into the body with an arbor press until the bottom of the plug port opening is 1/16 inch above the bottom of the valve body port opening.

Do not apply force to the cover, as this may damage the formed PTFE diaphragm. Check to see that the metal diaphragm is centered in the valve body counter bore.



Tighten the cover bolts alternately (crisscross pattern) and incrementally until the following torque values are reached:

Bolt Size (Inches)	Foot-Pounds
5/16	12
3/8	20

⚠CAUTION

VALVE DAMAGE. DO NOT exceed torque values. Personal injury and property damage may result.

14. Tighten the adjustment screws uniformly in 1/4 turn increments until contact is made; then tighten an additional 1/4 turn.

Replace the handle, washers, and retaining nut. Rotate the plug and compare the valve torque against the valves listed under Running Torque on page 3.

If satisfactory results have not been obtained, consult your nearest CRANE ChemPharma, Xomox Service Center.

⚠WARNING

MASSIVE LEAKAGE. DO NOT attempt to repair a valve or its accessories while pressurized! Death or serious injury could result.

Repair Instructions for 1 through 8 Inch Valves, Out-Of-Line

Special tool
Available from your CRANE ChemPharma, Xomox Service Center

Valve repair kit
Do not remove tape from sleeve until ready for use.
Do not remove formed PTFE diaphragm from assembly cone tool.

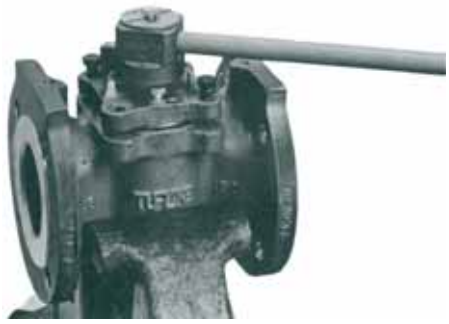
⚠WARNING

MEDIA EXPOSURE. Depressurize, clean, and neutralize any media that may remain in the valve and pipeline. If the valve is in the pipeline, you must follow your line entry procedures.
Always wear appropriate safety attire. Failure to follow this warning could result in death, personal injury, or property damage.

Before proceeding with valve repair, you must read pages 2 and 3 carefully.

⚠WARNING

MASSIVE LEAKAGE. DO NOT attempt to repair a valve or its accessories while pressurized! Death or serious injury could result.



1. Loosen the cover bolts (or nuts) four turns each. Rotate the plug approximately 1/4 turn to release any trapped pressure within the valve. Remove the hub (or EG actuator and bracket). Remove the cover bolts. Remove cover. Remove plug and top seal parts by turning plug with a wrench. Remove and discard the old top seal parts from plug.

2. To remove the sleeve, cut through the sleeve with a sharp knife at top and bottom side of the ports. Care must be taken not to score the valve body during sleeve removal.

⚠CAUTION

MEDIA LEAKAGE. Discard and replace valve body if scored. With a scored body, in-line linkage may occur.

3. After the sleeve has been cut, insert a screwdriver behind the sleeve and curl the sleeve away from the valve body. Remove the sleeve by prying it out of the body. Discard old sleeve. Clean the body and plug. Check parts for erosion and replace if necessary. Check the finish of the sealing surfaces on the plug. Replace the plug if not smooth.

4. The replacement sleeve has been sized and taped at the factory.

Do not remove the tape until ready for use.

Place the loading ring in the couter bore of the valve body.

Remove the tape from the sleeve. Insert the sleeve so that its ports are 90∞ from being aligned with the waterway of the valve body.

Press the sleeve through the loading ring until the bottom of the sleeve is past the top of the retaining lips of the valve body (1/16 inch wide protruding metal rib that surrounds the valve port).

Manually rotate the sleeve until the ports of the sleeve are aligned with the ports of the body.

5. Place the large end of the plunger on top of the sleeve. Press the sleeve into the valve body with an arbor press.

Reverse the plunger and use the small end of the plunger to press through the loading ring.

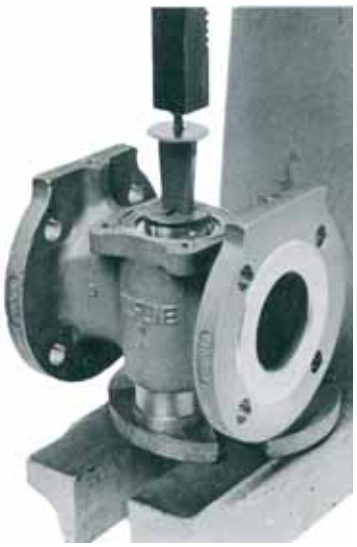
Remove the plunger and loading ring.

6. When the sleeve is in the body, use a screwdriver (or pry bar) through the port of the valve to tuck the edge of the sleeve port behind the retaining lip of the valve body. Repeat on the other port opening.

7. Tuck the bottom and top edges of the sleeve port opening into position behind the retaining lip of the valve body.

If properly installed, the edges of the sleeve ports should now be in perfect alignment and locked behind the retaining lips of the body.

Also the bottom of the sleeve should be resting on the lower ledge of the body and the top of the sleeve should be tucked under the upper ledge of the body.



8. Insert the spreading tool into the sleeve and press to the bottom of the valve. This presses the sleeve to the valve body around the ports to prevent tearing of the sleeve during sizing.

9. Place the sizing plug into the valve body and press the sizing plug to the bottom of the valve.

Remove the sizing plug, using a jackscrew if necessary. There may be a small excess of sleeve material around the ports which should be trimmed with a sharp knife. Do not mar the sealing areas of the sleeve or leakage may result.

10. Insert the standard plug with the ports in the open position. The top pf the plug should drop within approximately 1/4 inch of the body counter bore. If it does not, resize with the sizing plug.

11. Install the wedge ring onto plug stem. The small diameter end should be upward.

Place assembly cone tool with formed PTFE diaphragm over plug stem.

12. Push the formed PTFE diaphragm over taper on assembly cone tool and onto plug stem, being sure to evenly distribute the pushing force on the crown of the diaphragm to prevent back rolling and damage to the sealing lip.

When installing the formed PTFE diaphragm, the thrust collar may be used as a pushing tool to push the diaphragm over the taper and onto the largest diameter of the assembly cone tool.

13. The thrust collar can now be set aside. Continue pushing the diaphragm over assembly cone tool and onto plug stem. Check to see that the wedge ring has seated properly inside the crown of the formed PTFE diaphragm.

Remove and discard assembly cone tool. Install metal diaphragm.

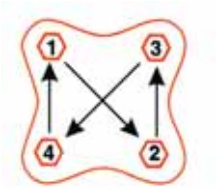
14. Install the thrust collar with flat side facing up. On 1 inch through 4 inch valves, install the static eliminator with thin lip facing down. (Not required on actuated valves.)

15. On the valve cover, back adjusting bolts out to within one thread of bottom cover bore.

16. Install the cover. To facilitate tightening of the cover bolts, press the plug into the body with an arbor press until the bottom of the plug port opening is 1/16 inch above the bottom of the valve body port opening.

Do not apply force to the cover, as this may damage the formed PTFE diaphragm.

17. Check to see that the metal diaphragm is centered in the valve body counter bore.



Tighten the cover bolts alternately (criss-cross pattern) and incrementally until the following torque values are reached:

Bolt Size (Inches)	Foot-Pounds
3/8	20
7/16	35
1/2	45
5/8	95

⚠CAUTION

VALVE DAMAGE. DO NOT exceed torque values. Personal injury and property damage may result.

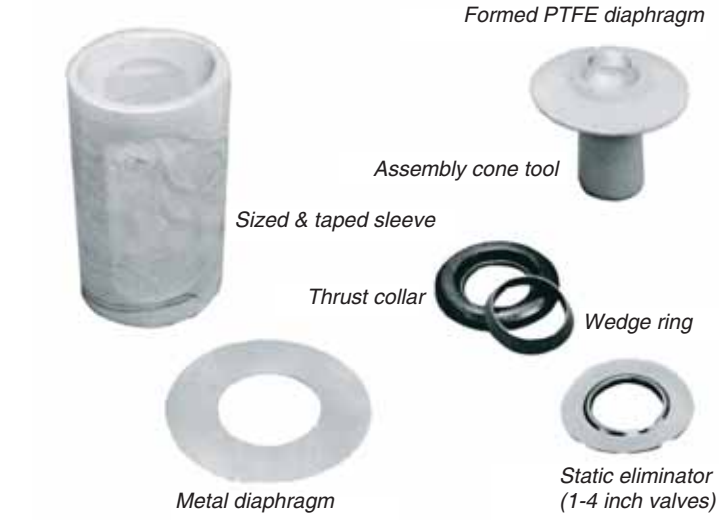
18. Tighten the adjustment bolts uniformly in 1/4 turn increments until contact is made; then tighten an additional 1/4 turn.

Replace hub (or E.G. actuator and bracket). Rotate the plug and compare the valve torque against the valves listed under Running Torque on page 3.

If satisfactory results have not been obtained, consult your nearest CRANE ChemPharma, Xomox Service Center.

Repair Instructions for 1 through 8 Inch Valves, In-Line

Special tool
Available from your CRANE ChemPharma, Xomox Service Center



Valve repair kit
Do not remove tape from sleeve until ready for use.
Do not remove formed PTFE diaphragm from assembly cone tool.

Typical valve ready for repair

1. Loosen the cover bolts (or nuts) four turns each. Rotate the plug approximately 1/4 turn to release any trapped pressure within the valve. Remove the hub or EG actuator and bracket. Remove the cover bolts. Remove cover. Remove plug and top seal parts by turning plug with a wrench. Remove and discard the old top seal parts from plug.

2. To remove the sleeve, cut through the sleeve with a sharp knife at the top and bottom side of the port. Care must be taken not to score the body during sleeve removal.

⚠WARNING

MEDIA EXPOSURE. Depressurize, clean, and neutralize any media that may remain in the valve and pipeline. If the valve is in the pipeline, you must follow your line entry procedures. Always wear appropriate safety attire. Failure to follow this warning could result in death, personal injury, or property damage.

Before proceeding with valve repair, you must read pages 2 and 3 carefully.

⚠WARNING

MASSIVE LEAKAGE. DO NOT attempt to repair a valve or its accessories while pressurized! Death or serious injury could result.

⚠CAUTION

Discard and replace valve body if scored. With a scored body, in-line leakage may occur.

3. Insert a screwdriver behind the sleeve and curl the sleeve away from the valve body. On larger valves a pry bar may be used.

Remove the sleeve by prying it out of the body. Discard the old sleeve. Clean the body and plug.

Check parts for erosion and replace if necessary.

Check the finish on the sealing surfaces of the plug. Replace the plug if not smooth.

4. The replacement sleeve has been sized and taped at the factory.

Do not remove the tape until ready for use.

Place the loading ring in the counter bore of the valve body.

Remove the tape from the sleeve. Insert the sleeve so that its ports are 90∞ from being aligned with the waterway ports of the valve body.

Press the sleeve through the loading ring until the bottom of the sleeve is past the top of the retaining lips of the valve body (1/16 inch wide protruding metal rib that surrounds the valve body waterway ports.

Manually rotate the sleeve until the ports of the sleeve are approximately aligned with the ports of the body.

5. Using two threaded rods and a metal strap, make a press arrangement over the top of the valve body. Place the plunger on top of the sleeve. With a porta-power unit, press the sleeve into the valve body, using the large diameter of the plunger.

Reverse the plunger and use the small end of the plunger to press through the loading ring.

Remove the plunger and loading ring.

6. When the sleeve is in the body, insert the locating tool, press firmly, and rotate it to position the edges of the sleeve behind the lips. You should be able to hear the sleeve “pop” into place, as well as feel it through the locating tool.

The sleeve should now be in perfect alignment and the edges at the port should be against the body behind the lips. The bottom of the sleeve should be resting on the lower ledge of the body, and the top of the sleeve should be tucked under the upper ledge of the body.

7. Insert the spreading tool into the sleeve and press to the bottom of the valve. This presses the sleeve to the valve body around the ports to prevent tearing of the sleeve during sizing.

8. Place the sizing plug into the valve body. Using the porta power unit, press the sizing plug to the bottom of the body. Remove the sizing plug, using a jackscrew if necessary. There may be a small excess of PTFE around the ports which should be trimmed with a sharp knife.

⚠CAUTION

MEDIA LEAKAGE. DO NOT mar the sealing areas of the sleeve, media leakage may result.

Insert the standard plug with the ports in the open position. The top of the plug should drop within approximately 1/4 inch of the body counter bore. If it does not, resize with the sizing plug.

9. Install the wedge ring onto plug stem. The small diameter end should be upward.

Place assembly cone tool with formed PTFE diaphragm over plug stem.

10. Push the formed PTFE diaphragm over taper on assembly cone and onto plug stem, being sure to evenly distribute the pushing force on the crown of the diaphragm to prevent back rolling and damage to the sealing lip.

When installing the formed PTFE diaphragm, the thrust collar may be used as a pushing tool to push the diaphragm over the taper and onto the largest diameter of the assembly cone tool.

11. The thrust collar can now be set aside. Continue pushing the diaphragm over assembly cone tool and onto plug stem.

Check to see that the wedge ring has seated properly inside the crown of the formed PTFE diaphragm.

Remove and discard assembly cone tool.

12. Install the metal diaphragm.

Install the thrust collar with the flat side facing up.

On 1 through 4 inch valves, install the static eliminator with thin lip facing down. (Not required on actuated valves.)

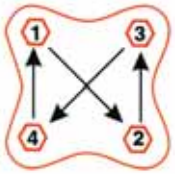
13. On valve cover, back out adjusting bolts to within one thread of bottom of cover bore.

Install the cover.

To facilitate tightening of the cover bolts, press the plug into the body with the porta power unit.

Do not apply force to the cover as this may damage the formed PTFE diaphragm.

14. Check to see that the metal diaphragm is centered in the valve body counter bore.



15. Tighten the cover bolts alternately (criss-cross pattern) and incrementally until the following torque values are reached:

Bolt Size (Inches)	Foot-Pounds
3/8	20
7/16	35
1/2	45
5/8	95

⚠CAUTION

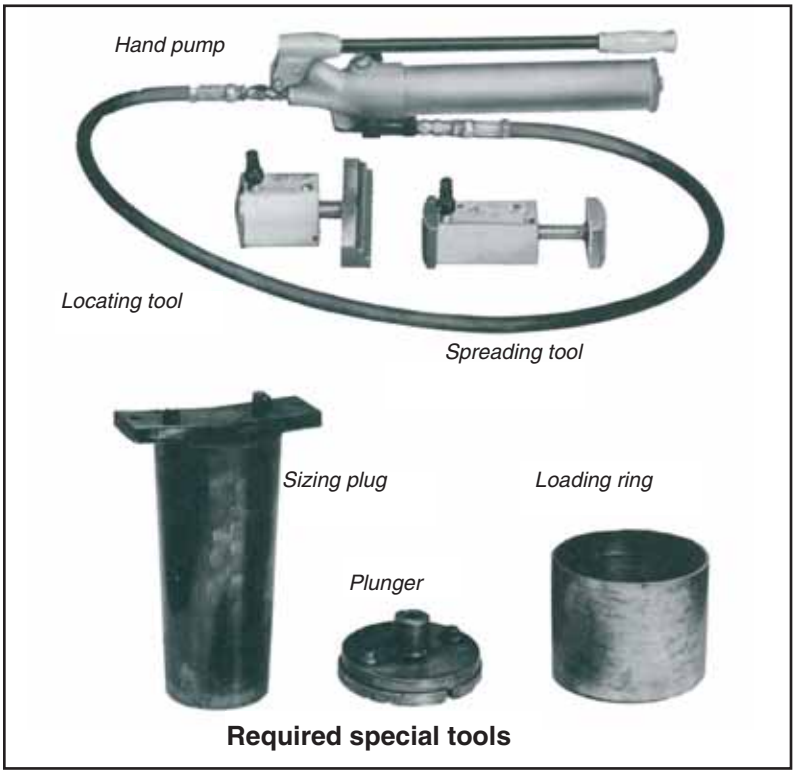
VALVE DAMAGE. DO NOT exceed torque values. Personal injury and property damage may result.

16. Tighten the adjustment bolts uniformly in 1/4 turn increments until contact is made; then tighten an additional 1/4 turn.

Replace hub (or EG actuator and bracket). Rotate the plug and compare the valve torque against the values listed under Running Torques on page 3.

If satisfactory results have not been obtained, consult your nearest CRANE ChemPharma, Xomox Service Center.

Repair Instructions for 10 & 12 Inch Valves, Out-Of-Line



Required special tools

Valve repair kit
Do not remove tape from sleeve until ready for use.
Do not remove formed PTFE diaphragm from assembly cone tool.

Before proceeding with valve repair, you must read pages 2 and 3 carefully.

⚠WARNING

MASSIVE LEAKAGE. DO NOT attempt to repair a valve or its accessories while pressurized! Death or serious injury could result.

⚠WARNING

MEDIA EXPOSURE. Depressurize, clean, and neutralize any media that may remain in the valve and pipeline.

If the valve is in the pipeline, you must follow your line entry procedures.

Always wear appropriate personal protective equipment.

Failure to follow this warning could result in death, personal injury, or property damage.

Typical valve ready for repair.

1. Loosen cover nuts four turns each. Rotate the plug approximately 1/4 turn to release any trapped pressure within the valve. Remove the cover nuts.

Remove gear assembly by removing the four flange bolts. Remove compensator and cover from the valve.

2. Using a crowbar through the waterway of the valve body, raise the plug by pressing up on the inside of the plug. From the top of the valve a crowbar can then be used to remove the plug from the valve body. Remove and discard the old top seal parts.

3. To remove the sleeve, cut through it with a sharp instrument at the top and bottom side of the port.

Care should be taken not to score the body during sleeve removal.

⚠CAUTION

MEDIA LEAKAGE. Discard and replace valve body if scored. With a scored body, in-line leakage may occur.

4. After the sleeve has been cut, insert a screwdriver behind the sleeve and curl the sleeve away from the valve body.

Remove the sleeve by prying it out of the valve body. Discard the old sleeve.

Clean the body and plug.
Check parts for erosion and replace if necessary.

Check the finish on the sealing surfaces of the plug. Replace the plug if not smooth.

5. The replacement sleeve has been sized and taped at the factory. Do not remove the tape until ready for use.

Place the loading ring in the counter bore of the valve body.

Remove the tape from the sleeve.

Insert the sleeve in the loading ring so that its ports are offset approximately 1/4 inch from perfect alignment with the valve body ports.

6. Place the plunger on top of the sleeve. Drive the plunger through the loading ring using a mallet. Remove the plunger and loading ring.

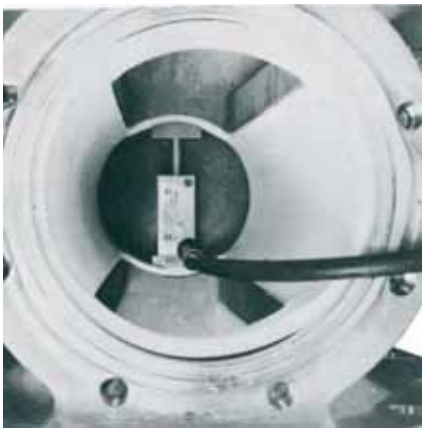
7. Place the locating tool in the waterway of the valve body with the formed end against the inside port of the sleeve, and the opposite end braced against the side of the valve body port.

8. Using the hand pump, expand the locating tool until the edges of the sleeve are positioned behind the retaining lips in the body (1/16 inch wide protruding metal rib that surrounds the valve body ports).

Repeat this procedure along the length of the port. Repeat complete process on other port.

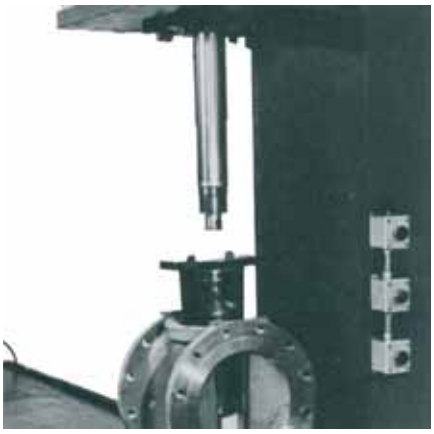
The sleeve should now be in perfect alignment and its edges at the ports should be against the valve body and locked behind the lips.

The bottom of the sleeve should rest on the lower ledge of the body, and the top of the sleeve should be tucked under the upper ledge of the body.



9. Place the spreading tool in the bottom of the valve under the ports.

Expand the spreading tool with the hand pump, pressing the sleeve into the valve body beneath the ports.



10. Place the sizing plug into the valve body and press the sizing plug to the bottom of the valve.

For ease of insertion, the sizing plug may be sprayed with a silicone lubricant.

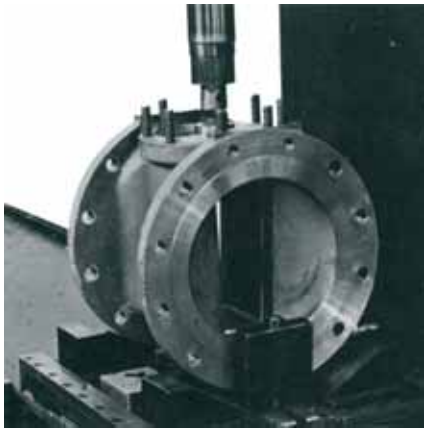
⚠CAUTION

LUBRICATION. Lubricants should NOT be used if the valve is in some specialized services such as chlorine, fluorine, oxygen, and food.

11. Excess sleeve material should be trimmed with a knife around the ports and at the top of the sleeve.

⚠CAUTION

MEDIA LEAKAGE. DO NOT mar the sealing areas of the sleeve, media leakage may result.



12. Insert the standard plug in the valve with the ports in open position.

The top of the plug should drop within approximately 1/2 inch of the body counter bore.

If it does not, resize the sizing plug.

13. Install the wedge ring onto plug stem. The small diameter end should be upward.

Place assembly cone tool with formed PTFE diaphragm over plug stem.

14. Push the formed PTFE diaphragm over taper on assembly cone tool and onto plug stem, being sure to evenly distribute the pushing force on the crown of the diaphragm to prevent back rolling and damage to the sealing lip.

When installing the formed PTFE diaphragm, the thrust collar may be used as a pushing tool to push the diaphragm over the taper and onto the largest diameter of the assembly cone tool.

15. The thrust collar can now be set aside. Continue pushing the diaphragm over assembly cone tool and onto plug stem.

Check to see that the wedge ring has seated properly inside the crown of the formed PTFE diaphragm.

Remove and discard assembly cone tool.

16. Install the metal diaphragm. Install the thrust collar with the flat surface facing up.

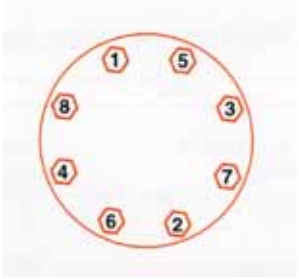
Adjusting bolts in cover should be backed out to within one thread of bottom of cover bore.

17. Install the cover. To facilitate tightening of the cover bolts, press the plug into the body with an arbor press until the bottom of the plug port opening is 1/16 inch above the bottom of the valve body port opening.

Do not apply force to the cover as this may damage the formed PTFE diaphragm.

18. Check to see that the metal diaphragm is centered in the valve body counter bore.

19. Tighten the cover bolts uniformly and alternately (in the order indicated in the drawing in the following column) incrementally until 130 ft-lbs torque is reached.



⚠CAUTION

VALVE DAMAGE. DO NOT exceed torque requirement. Personal injury and property damage may result.

20. Tighten the adjustment bolts uniformly in 1/4 turn increments until contact is made; then tighten an additional 1/4 turn.

21. Replace the compensator and the EG assembly.

Rotate the plug and compare the valve torque against the values listed under Running Torque on page 3.

If satisfactory results have not been obtained, consult your nearest CRANE chemPharma, Xomox Service Center.

XOMOX®

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