



2 3/4" x 20" Rectangular Gate Valve  
Maintenance Manual



## 2 3/4" x 20" Rectangular Gate Valve Maintenance Manual

### BELLOWS REPLACEMENT INSTRUCTIONS

#### TOOLS AND MATERIALS REQUIRED

Large adjustable wrench capable of opening up to 2"

1-1/8" socket

Plastic O-ring Pick

IPA

Torque wrench 50 ft. lbs.

Rubber Gloves

Lint Free Wipe

1/4" 12 pt. wrench

Allen Wrench 1/8" to 3/8"

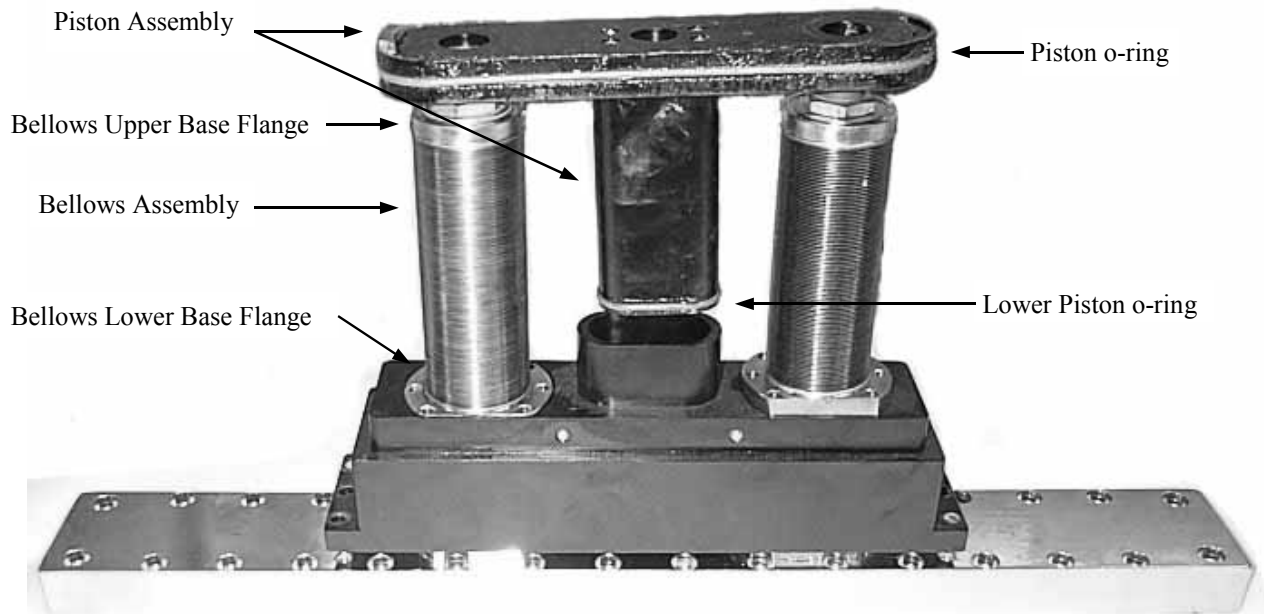
Small plastic or rubber mallet

High temp anti-seize compound

#### **SPECIAL INSTRUCTIONS**

Be careful not to scratch the O-ring groove. Apply only a thin layer of vacuum grease. Avoid twisting, stretching or deforming the O-ring.

ALWAYS WEAR RUBBER GLOVES WHEN HANDLING THE VALVE



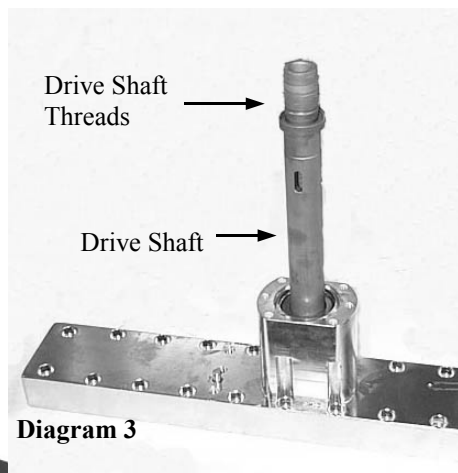
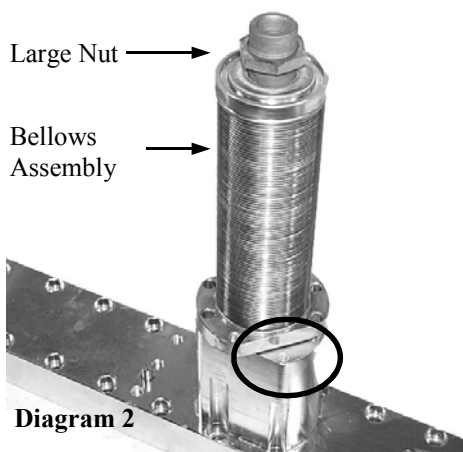
**Diagram 1—Exploded View For Part Identification Only**

1. Vent station and Valve to atmosphere.  
**WARNING: NEVER PUT HANDS OR ANY OTHER OBJECT IN THE GATE VALVE - SERIOUS INJURIES WILL OCCUR AND VALVE WILL BE DAMAGED.**
2. Remove air to actuator.
3. Remove adjustment cap on air cylinder using a 3/8" Allen wrench.
4. Remove button head screws on all four sides of the air cylinder.



BELLOWS REPLACEMENT INSTRUCTIONS—continued

5. Carefully remove air cylinder keeping it straight. Avoid pulling it off at an angle as this may permanently damage bellows assembly.
6. Remove two nuts holding piston assembly down.
7. Remove piston assembly in a rocking motion.
8. Using 1/4" 12 pt. Wrench, carefully remove 6 12-pt screws located on each bellows base flange of each bellows assembly. CAUTION: Align wrench on bolts so if the wrench slips it will be away from the bellows.
9. Remove large nut at the top of each bellows assembly (diagram 2).
10. Remove bellows assembly. Save 6 12-pt screws, nut and large washer. Discard copper base gasket and top gasket.
11. Clean all surfaces on the bellows assemblies with a lint free wipe and IPA.
12. Install new copper gaskets in base and shaft of each assembly.
13. Place bellows assembly over the drive shaft.
14. Apply a liberal amount of high temperature anti-seize compound to threads of drive shaft and both sides of large washer.
15. Hand tighten large nut on shaft.
16. Position bellows assembly base flange approximately 2-3 degrees (distance exaggerated in diagram 2, circle) counter-clockwise to the aligned position, this will allow a final "straight" adjustment after final tightening of the large nut.
17. Using a torque wrench, and large adjustable open ended wrench, apply pressure on the nut while holding top of bellows assembly being careful not to slip or let bellows assembly rotate past alignment. Torque to 30 ft. lbs.
18. Tighten nut to 45 fl. lbs., allowing bellows assembly to turn into perfect alignment (step 16). If assembly is not in perfect alignment with base, tap very lightly on the end of the adjustable wrench until it is. Then add slightly more torque to nut.





## 2 3/4" x 20" Rectangular Gate Valve Maintenance Manual

---

19. Apply anti-seize to 12-pt. screws. Tighten 6 screws on base of bellows base flange in a criss-cross pattern tightening in sequence until tightened evenly around or approximately 15 ft. lbs.
20. Re-install piston assembly being careful not to pinch lower piston o-ring. Tighten 2 nuts on top of piston. Make sure magnet on piston is on the same side as position indicator leads of air cylinder.
21. Install air cylinder. Air cylinder must be held as straight as possible to avoid cutting piston o-ring. Use flashlight to make sure o-ring is not being pinched during assembly.
22. Tighten button head screws and adjustment cap.
23. Test for leaks.

### GATE AND BONNET O-RING REPLACEMENT INSTRUCTIONS

#### TOOLS AND MATERIALS REQUIRED

1/4" 12pt wrench

Allen Wrenches 1/8" to 3/8"

IPA

High temp anti-seize compound

1-1/8 socket

Plastic O-ring Pick

Lint Free Wipe

Torque wrench >50 ft lbs

Rubber Gloves

Two clean blocks approximately 8" high x 3" wide. (2 4x4's wrapped in masking tape would work)

Vacuum grease - Castol Microcoat 296 or equiv.

#### **SPECIAL INSTRUCTIONS**

Be careful not to scratch the O-ring groove. Apply only a thin layer of vacuum grease. Avoid twisting, stretching or deforming the O-ring.

1. Vent station and Valve to atmosphere.  
**WARNING: NEVER PUT HANDS OR ANY OTHER OBJECT IN THE GATE VALVE - SERIOUS INJURIES WILL OCCUR AND VALVE WILL BE DAMAGED.**
2. Remove air to actuator.
3. Remove adjustment cap on air cylinder using a 3/8" Allen wrench.
4. Remove button head screws on all four sides of the air cylinder.
5. Carefully remove air cylinder straight down. Avoid pulling it off at an angle as this may permanently damage bellows assembly.
6. Remove two nuts holding piston assembly down.
7. Remove piston assembly in a rocking motion.
8. Remove intermediate plate by removing 6 button head screws. It may be necessary to remove lower speed control fitting to get access middle button head on one side.
9. Using a 3/8 drive socket, remove 1/4-28 12-pt screws on bonnet plate. You will need to use a 1/4" drive socket on the end of a 6" extension to gain access to the bolts surrounding the shaft bushings. A universal adaptor in place of the extension will also work.
10. Remove entire assembly from case. It may be necessary to use a slight rocking motion to remove assembly.
11. Discard copper gasket.
12. Remove o-ring from gate being extremely careful not to damage Kalrez o-ring.
13. Mount assembly on blocks so that blocks are supporting each end of the bonnet plate (gate up).



## 2 3/4" x 20" Rectangular Gate Valve Maintenance Manual

---

14. Clean bonnet plate seal, case seal area, inside case area and o-ring groove on gate.
15. Clean Kalrez o-ring using IPA. Blow off o-ring with CDA.
16. Apply small quantity of Microcoat 296 or equivalent and apply evenly to o-ring.
17. Carefully re-insert o-ring.
18. Remove copper gasket from foil and ensure that it is relatively straight and free of any kinks. Clean with IPA.
19. Place gasket on channel of bonnet plate making sure that gasket is away from the edge of channel.
20. Note small "buttons" on inside of case. These are contact points for the wheels on carriage. Gate side is opposite buttons.
21. Pick up case and gently lower case onto assembly being careful not to disturb gasket.
22. Apply high temp anti-seize compound to 1/4-28 12-pt screws and start several screws by hand.
23. Snug down several of the screws enough to be able to turn valve over and finish the tightening process.
24. Snug down all the screws and begin the torquing sequence. Be sure to work in a zig-zag tightening pattern starting from the middle and working out. Begin by tightening to 10 ft lbs.
25. Continue the sequence to 30 ft lbs, and then the final of 50 ft lbs. Note that you will need to use the 1/4" drive socket with an adaptor to torque bolts around shaft bushing. We recommend having several sockets, adaptors and/or extensions on hand as they can break fairly easily.
26. When all bolts are tightened properly, bonnet plate and case should be metal to metal. There should not be a gap.
27. Note air bypass on one side of bonnet plate and one side of bottom of intermediate plate. Install intermediate plate making sure these bypass holes are on the same side. If o-rings are dirty or dry, pull out, clean and re-grease with Teflon, silicone, or vacuum type grease.
28. Re-install piston assembly being careful not to pinch o-ring. Tighten 2 nuts on top of piston. Make sure magnet on piston is on the same side as position indicator leads of air cylinder.
29. Install air cylinder. Air cylinder must be held as straight as possible to avoid cutting piston o-ring. Use a flashlight to make sure o-ring is not being pinched during assembly.
30. Tighten button head screws and adjustment cap.
31. Test for leaks.