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Installation, Operation and Maintenance Manual

Xomox®FK Soft Seated Ball Valves
Trunnion Ball Design

CRANE

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Xomox®FK Soft Seated Ball Valves

⚠ CAUTION

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

⚠ WARNING

Proper installation plays an important role in valves performance. Installation must be performed by qualified technicians only. Customer assumes all responsibility for valve performance on valves installed in the field by non-Crane ChemPharma & Energy personnel. Improper installation will result in damage to the valve.

⚠ WARNING

Fitting work on pressurized parts of the valve may only be carried out when the pipeline is depressurized. To prevent pressure and/or medium being trapped inside the ball valve, put the valve in the half open position. The valve must have cooled down to ambient temperature before work is started.

⚠ WARNING

Fitting work on pressurized parts of valves for caustic or toxic flow media may only be carried out following additional emptying and bleeding of the valve and the respective pipeline.

XOMOX®FK BALL VALVES
TYPE K21F-T & K23F-T
SIZES 8"-12"
TRUNNION BALL DESIGN

TROUBLE-FREE OPERATION.

The Xomox®FK Ball Valves, applied within their pressure and temperature limitations, properly installed, adjusted, and operated, these valves should require minimum attention supplying long-term, trouble-free service in a wide variety of applications.

READ CAREFULLY.

The following procedures and illustrations have been prepared to assist you in the maintenance and repair of your 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.

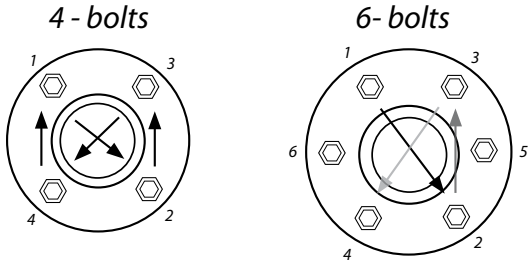
All Xomox FK process ball valves stem seals are adjusted and factory tested for tight shutoff, normally no further adjustment is necessary. If leakage should occur along the stem, follow the simple adjustment instructions at the right.

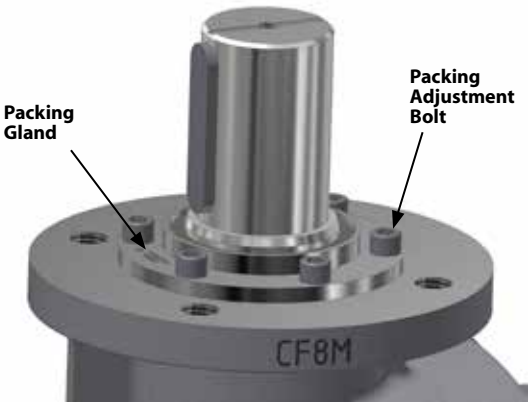
STEM SEAL ADJUSTMENT (bolted packing gland) Sizes: 8”-12” (K21F-T, K23F-T)

To adjust for leakage along the valve stem, turn the packing adjustment bolts (#32) (4pcs or 6pcs) clockwise, in approximately 1/2-turn increments to compress packing gland (#8) and packing (#13). Do not over-tighten. (when tighten packing bolts, use proper crisscross adjustment pattern as shown below)

Note: If a tight seal cannot be obtained, continue with the instructions for valve repair.

Packing adjustment



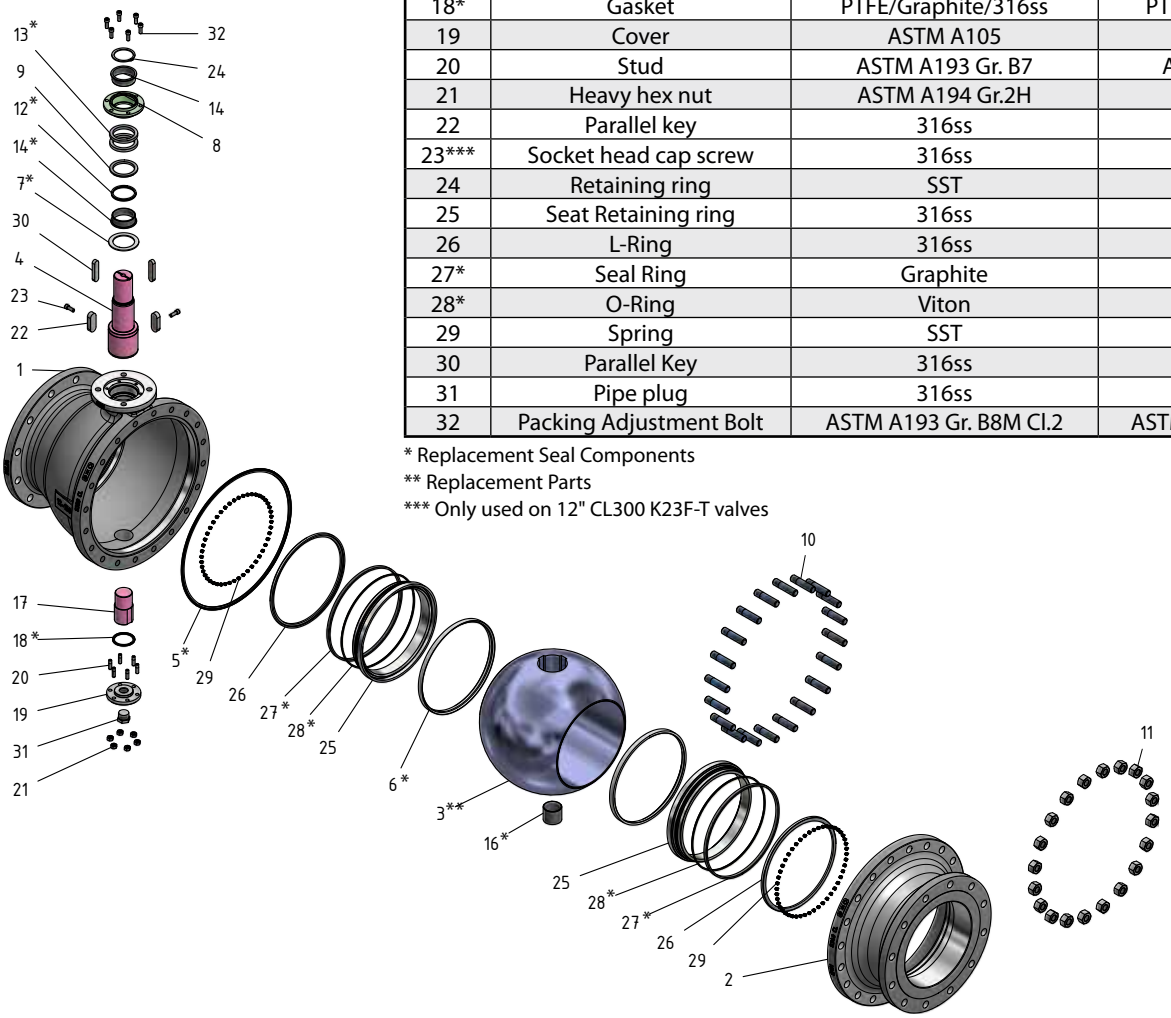


Xomox®FK Soft Seated Ball Valves

Item	Description	Carbon Steel	Stainless Steel
1	Body	ASTM A216 Gr WCB	ASTM A351 Gr. CF8M
2	Tail	ASTM A216 Gr WCB	ASTM A351 Gr. CF8M
3**	Ball	316ss	316ss
4**	Stem	UNS S31803	UNS S31803
5*	Body Gasket	PTFE/Graphite/316ss	PTFE/Graphite/316ss
6*	Seat	TFM	TFM
7*	Stem Seal	TFM	TFM
8	Packing Gland	316ss	316ss
9	Support Ring	316ss	316ss
10	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B8M Cl.2
11	Heavy hex nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 8M
12*	Spring energized Lip Seal	PTFE Filled/SST	PTFE Filled/SST
13*	Packing	Graphite	Graphite
14*	Flange bearing	Reinforced Thermoplastic	Reinforced Thermoplastic
16*	Sleeve bearing	Reinforced Thermoplastic	Reinforced Thermoplastic
17	Bottom Stem	316ss	316ss
18*	Gasket	PTFE/Graphite/316ss	PTFE/Graphite/316ss
19	Cover	ASTM A105	316ss
20	Stud	ASTM A193 Gr. B7	A193 Gr. B8M Cl.2
21	Heavy hex nut	ASTM A194 Gr.2H	A194 Gr. 8M
22	Parallel key	316ss	316ss
23***	Socket head cap screw	316ss	316ss
24	Retaining ring	SST	SST
25	Seat Retaining ring	316ss	316ss
26	L-Ring	316ss	316ss
27*	Seal Ring	Graphite	Graphite
28*	O-Ring	Viton	Viton
29	Spring	SST	SST
30	Parallel Key	316ss	316ss
31	Pipe plug	316ss	316ss
32	Packing Adjustment Bolt	ASTM A193 Gr. B8M Cl.2	ASTM A193 Gr. B8M Cl.2

* Replacement Seal Components
** Replacement Parts
*** Only used on 12" CL300 K23F-T valves

Xomox FK Ball Valve
Exploded View



Please read the warning and caution statements on pg 2 prior to installation.

DISASSEMBLY

1. Remove Operator from valve taking care to remove Parallel Keys (#30) from slots in stem (#4).

2. Separate the body halves (#1 Body & #2 Tail) by turning the body stud nuts (#11) counter-clockwise and remove.

3. Remove the body joint gasket (#5).

4. Remove Retainer Ring (#24) from stem (#4)

5. Remove the packing adjustment bolts (#32) by turning counter-clockwise and remove from the body (#1), remove Packing Gland (#8) and Sleeve Bearing (#14) by lifting off stem (#4)

6. Remove the Stem (#4) by pressing it down into the body cavity and through the ball, taking care to remove the Parallel Keys (#30) from slots in stem (#4) and ball (#3)

7. Remove the Packing (#13), Support Ring (#9) and Spring Energize Lip Seal (#12) from the body.

8. Remove the bottom cover Nuts (#11) by turning counter-clockwise.

9. Remove the bottom Cover (#19)

10. Remove the bottom cover Gasket (#18)

11. Remove the Bottom Stem (#17).

Note: using the 16mm threaded hole in stem can be used to help remove the stem by threading a bolt into hole and using it to pull stem from body.

12. Rotate the ball (#3) to the closed position and remove it from the valve body.

13. Remove the Stem Seal (#7) and Flange Bearing (#14) from body (#1)

14. Remove the Seats (#6), Seat Retainer Ring (#25), L-Ring (#26), Seal Ring (#27), O-Ring (#28) and Springs (#29) from the body (#1) and tail (#2)

INSPECTION

Inspect the valve components for wear or damage.

Be sure to carefully inspect the following components for nicks, cracks, breaks, or other defects: • Valve Soft Seat parts (#6,#25,#26,#27,#28,#29) • Ball (#3) • Stem (#4 & #17) • Spring Energized Lip Seal (#12) • Packing Rings (#13) • Flange Bearing (#14) • Sleeve Bearing (#16) (as shown in Exploded View)

The parts listed above, along with the Body Gasket (#5 & #18), are the only components that should require replacement. In addition, carefully inspect the Valve Body and Tail,

Inspect the seat pockets, stem bore, packing chamber and body joint gasket areas.

Clean all areas thoroughly to remove all signs of corrosion and media build-up.

REASSEMBLY

When reassembling valves, it is recommended that new seal components be used to minimize the chance of internal and external leakage. Seal kits are available containing new seals for repairing Xomox FK Ball Valves.

The components included in each kit are indicated on the exploded view.

1. Place seat Springs (#29) into holes in body (#1) and tail (#2). See Fig. 1

Note: All holes must be free of any media or foreign debris.

Figure 1

Please read the warning and caution statements on pg 2 prior to installation.

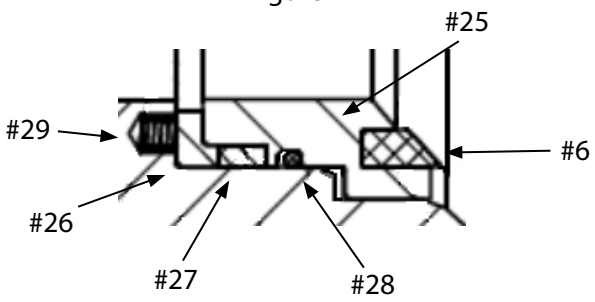
2. Insert the L-Ring (#26) with the flat face against the seat springs (#29)

3. Seat Assembly (use light oil as needed, recommend Bayslione M100)

a. Install O-Ring (#28) onto the seat retainer ring (#25) groove on OD

b. Install Seal Ring (#27) onto seat retainer ring (#25) OD)

Figure 2



4. Install the Seat Assembly into body (#1) and tail (#2).

Note: carefully press the seat assembly into pocket until it goes metal to metal fully compressing the graphite seal (#27) and springs (#29)

5. Install Seat (#6) into the groove on the seat retainer ring (#25)

Note: use light oil as needed, recommend Bayslione M100

6. Install the parallel Keys (#22) into the slots located on the Stem (#4) large Dia. end and fasten to stem using Socket Head Cap Screw (#23) as required (12" CL300) only.

Note: check the fit between the stem and the ball to ensure a good fit with the parallel keys and the grooves in the ball.

Figure 3

7. Install the Sleeve Bearing (#16) into the ball (#3) lower stem hole.

8. Install the Flange Bearing (#14) into the Body (#1) stem bore through the body cavity.

9. Install the Ball (#3) into the body (#1) in the closed position, then rotate Ball (#3) to the open position.

Note: lightly coat the ball with oil, recommend Bayslione M100

10. Install the Stem Seal (#7) over the top stem (#4) and seat on stem shoulder.

11. Insert the top Stem (#4) through the ball waterway into the body stem bore. (see Fig. 4)

Carefully align the key ways in the ball with the keys on the stem.

Note: lightly coat the stem with oil, recommend Bayslione M100

Figure 4

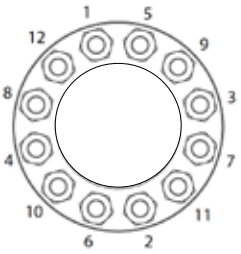
Please read the warning and caution statements on pg 2 prior to installation.

12. Insert the Bottom Stem (#17) through the body cover hole, align Bottom Stem with the stem hole in the ball (#3) and gently push into sleeve bearing in ball.

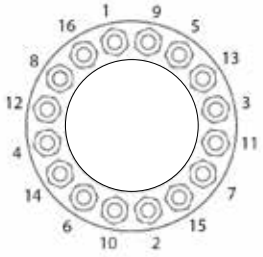
13. Install spiral wound Body Gasket (#5) in the groove in the body.

14. Join the Body (#1) and Tail (#2), (lettering on the halves face the same direction), Install and tighten the body stud Nuts (#11) in the appropriate crossing pattern as shown in Figure 5.

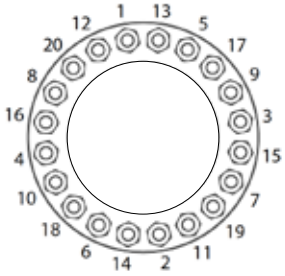
12 - bolts



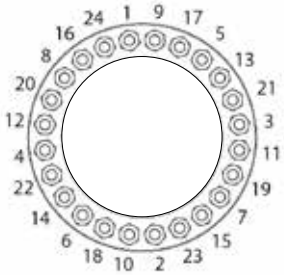
16 - bolts



20 - bolts



24 - bolts



28 - bolts

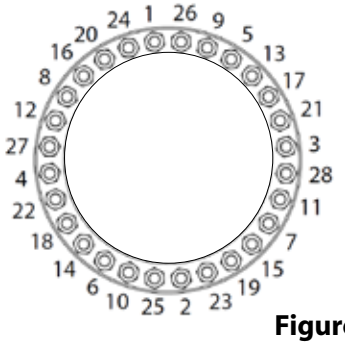


Figure 5

Tighten the Nuts (#11) to the torque values listed in Table A. When tightening in the crossing pattern, cycle through the pattern at least three (3) times to assure proper and uniform torque.

Note: When the valve is reassembled, be sure the studs protrude through the nut a minimum of one (1) thread.

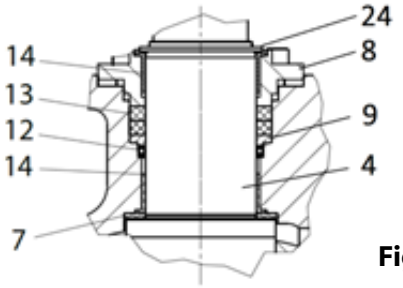
Class 150		Class 300		Bolt Size	Bolt Torque (ft/lb)
Valve Size	Bolt Qty.	Valve Size	Bolt Qty.		
		8"	20	3/4"-10UNC	240
10"	16			3/4"-10UNC	240
12"	20	10"	24	7/8"-9UNC	336
		12"	28	1"-8UNC	504

Table A

15. Place the Spring Energized Lip Seal (#12) (Fig. 6) over the Stem (#4) with the spring side facing downward into the body (as shown in Fig. 7) and gently push into position below the packing chamber.

Figure 6

Figure 7



Detail view of top stem

Figure 8

Please read the warning and caution statements on pg 2 prior to installation.

Xomox®FK Soft Seated Ball Valves

16. Install the Support Ring (#9) over the Stem (#4) with the raised step facing downward until it bottoms out at the bottom of the packing chamber. (See Fig. 7)

17. Install the Graphite Packing (#13) over the Stem (#4), pushing the graphite ring into the body packing chamber. (it is important to firmly compress each graphite ring independently as it is installed.)

18. Install the Packing Gland (#8) over the valve stem:

19. Insert the Flange Bearing (#14) over the Stem (#4) and into Packing Gland (#8).

20. Install the Packing Adjustment Bolts (#32) through the holes in the Packing Gland (#8)

a. Turn the packing adjustment bolts (#32) (4pcs or 6pcs) clockwise to compress packing gland (#8) and packing (#13).

Note: when tighten packing bolts, use proper crisscross adjustment pattern as shown in Figure 9

b. Initial packing adjustment/setting see Fig. 10 and Table B.

Packing adjustment

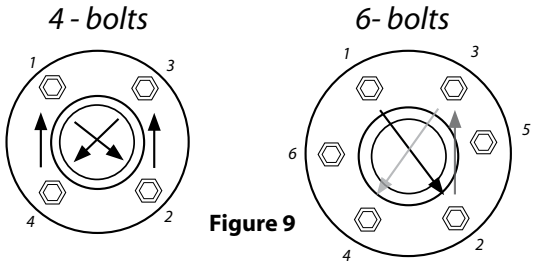


Figure 9

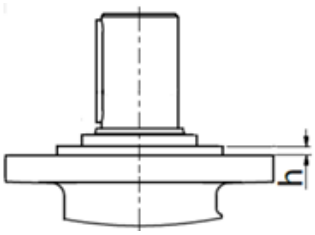


Figure 10

Dim h.
8" 150/300 = .31/.25
10" 150/300 = .31/.25
12" 150 = .31/.25
12" 300 = .20/.14

Table B

21. Install retaining ring (#24) around stem (#4) just above flange bearing (#14)

22. Install bottom cover Gasket (#18) into body bore stem hole.

Note: make sure bottom stem is pressed completely into Ball (#3) stem bore.

23. Install bottom Cover (#19) onto body (#1), align bolt holes.

24. Install and tighten the body stud Nuts (#21) in the appropriate crossing pattern as shown in Figure 5.

Tighten the nuts to the torque values listed in Table C. When tightening in the crossing pattern, cycle through the pattern at least three (3) times to assure proper and uniform torque.

Note: When the valve is reassembled, be sure the studs protrude through the nut a minimum of one (1) thread.

Valve Size	Bolt Qty.	Valve Size	Bolt Torque (ft/lbs)
8"	6	3/8-16 UNC	21
10"	6	3/8-16 UNC	21
12"	6	3/8-16 UNC	21

Table C

25. Install PTFE pipe tape around the Pipe Plug (#31) threads and install Pipe Plug (#31) into bottom cover (#19).

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