

E-Series Two-Piece, Flanged-End Ball Valves

2"-12" Classes 150 & 300 Regular and Full Port, Models ERP1, ERP3, EFP1, EFP3 Installation, Operation and Maintenance Instructions

1. Installation

These valves may be installed in any position using good pipe fitting practices. Flanges conform to ANSI Standards B16.5 Class 150 or Class 300.

- A. Periodically check and tighten nuts (15). (See Table 1 for torque requirements.)

▲ WARNING: Extreme care must be exercised during adjustment of stud nuts to make sure that complete engagement of studs with body flange is maintained. There should be at least one thread of stud exposed on each side of the joint.

2. Stem Seal Adjustment

If leakage is evident in stem packing area, tighten the adjusting nut $\frac{1}{4}$ turn. If leak still persists, repeat above. Replacement of stem seals (10) is indicated if the leak is still apparent after $\frac{1}{2}$ turn.

3. Disassembly for Seal Replacement

▲ WARNING

- A. Begin with the valve partially open in a depressurized line.

- B. Remove flange bolts and nuts (not provided) and lift body (11) from line for servicing.

NOTE: Care should be taken to avoid scratching or damaging gasket surface on flange face.

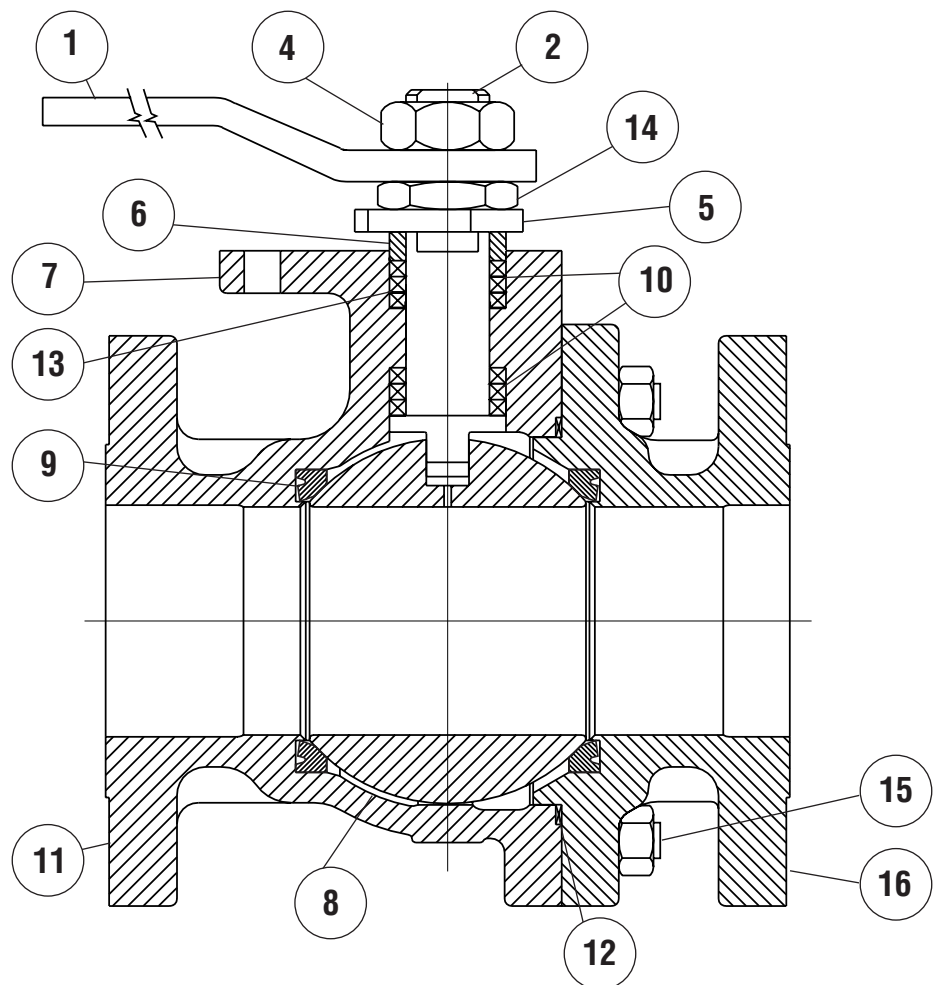


Figure 1

No.	Description
1	Handle
2	Stem
3	Stop Pin (not shown)
4	Handle Retainer Nut
5	Travel Stop
6	Gland Ring
7	Actuator Mounting Flange
8	Ball

No.	Description
9	Seat (2)
10	Stem Seals (Table 3)
11	Body
12	Body Seal
13	Grounding Washer
14	Adjusting Nut
15	Studs and Nuts
16	Body End

NOTE: Valves are heavy. They should be adequately supported before removal from the line is begun.

- C. Remove studs and nuts (15) using proper wrench size (See Table 1 for Regular-Port and Table 2 for Full-Port). Lift body end (16). One seat (9) should come out with body end (16).

▲ WARNING: Valve must be properly secured to withstand the high loads imposed during disassembly.

- D. Remove Body Seal (12).
- E. To take out the ball (8), rotate stem (2) so that ball (8) is in fully closed position, and insert wooden dowel (not metal) in port opposite threaded end. Tap gently on ball (8), thereby rocking it out of engagement with the stem (2).
- NOTE:** Extreme caution should be taken to avoid damage to the ball (8). Remove the ball (8).
- F. Take out the other seat (9).
- G. Remove the handle retainer nut (4), handle (1), adjusting nut (14), travel stop (5) and the gland ring (6).

Push the stem (2) down through the body (11) and out the open end of the body (11). Remove the upper and lower stem seals (10) and the grounding washer (13). Grounding washer (13) is not used with FIRE-GARD® valves. Save the grounding washer (13) for reassembly.

- H. Flowserve strongly recommends replacement of all soft parts whenever the valve is disassembled for reconditioning. This is the surest protection against subsequent leakage after valve assembly. The replacement parts can be ordered in kit form.

4. Reassembly

NOTE: Prior to reassembly, all metallic sealing faces must be carefully cleaned and inspected for damage. A smooth, nick-free surface is required for effective sealing.

- A. Put one seat (9) in body (11).

NOTE: Seats (9) are to be installed with spherical surface positioned toward the ball.

- B. Lightly grease the stem seals (10) and the seal area and threads of the stem (2). Insert stem seal(s) (10) into the lower stem seal cavity with the raised outer edge facing into the counter-bore. (FIRE-GARD seals are square-cut seals.) Insert stem (2) through the installed stem seals (10) and the body (11). Place the travel stop (5) on the stem (2) so that it rests on the top surface of the body (11). Thread the adjusting nut (14) on the stem (2) and torque to ¾ of the final torque value for the adjusting nut. Remove the adjusting nut (14) and the travel stop (5) without moving the stem (2). Place the grounding washer (13) (if used) into the upper seal cavity with the raised fingers pointing up. Push the upper stem seal(s) (10) into the counter-bore with the raised outer edge pointing into the valve. Add the gland ring (6), the travel stop (5) and the handle retainer nut (4). Make sure the travel stop (5) is installed so that the valve can close in a clockwise direction and open counterclockwise. If the rotation is not correct, the travel stop (5) must be inverted. Torque the adjusting nut (14)

to the value shown in Table 3. Cycle several times and check the adjusting nut torque.

- C. Turn the stem (2) to a position with the lower stem tang flats parallel to the pipeline axis of the body. (Stem and ball should stay in this position through steps D, E, and F).
- D. Install the ball (8), being careful not to damage it. A sling through the waterway can aid insertion. **NOTE:** Ball should be carefully examined for nicks, scratches, pitting or corrosion, and replaced as necessary.
- E. Place the second seat (9) into body end (16) with spherical surface of seat positioned against the ball (8).
- F. Put body seal (12) into shoulder counter-bore at flange in valve body (11).
- G. Put body end (16) into body (11) and line up end flange. Because the body flange bolt pattern is different from the line flange bolt pattern, it is possible to assemble the valve such that the bolt holes in the line flanges do not line up. Be certain to align end flange bolt holes to straddle valve center lines. **NOTE:** Be careful not to damage the body seal when putting body end into body.

▲ WARNING: Valve must be properly secured to withstand the high loads imposed during reassembly.

- H. Install body end nuts (15) and tighten in a star pattern to the torque specified in Table 1 (regular-port) or Table 2 (full-port).

▲ WARNING: Extreme care must be exercised during adjustment of body end nuts (15) to make sure that complete engagement of studs with body flange is maintained. There should be at least one stud thread exposed on each side of the completed joint.

- I. Install handle (1), and handle retainer nut (4).

5. Testing

Prior to placing the valve back into line position, test as follows:

▲ WARNING: If not properly secured, the valve can separate from the pressure source resulting in possible injury. Always join the valve to companion flanges of same pressure rating as valve, and secure with a full set of flange bolts.

- A. Secure valve to a test fixture by means of a mating flange with full bolting and a suitable gasket. Orient valve so seat to be tested is facing up.
- B. Introduce 50 to 100 psig air into the end of the closed valve which is attached to the fixture. Pour water into the upper port to cover the ball and visually check for bubbles. If bubbles appear, pour the water out, cycle the valve several times and recheck. To check for leakage in the other port, reverse the valve and repeat the process.
- C. In the event of stem seal leakage, adjust as described under Section 2, "Stem Seal Adjustment".

Table 1

Wrench Size Valve	Torque Requirement (Across Flats)	(Ft.-Lbs.)
6" Class 150 ERP1	1 $\frac{1}{4}$ "	263
6" Class 300 ERP3	1 $\frac{1}{16}$ "	424
8" Class 150 ERP1	1 $\frac{1}{16}$ "	148
8" Class 300 ERP3	1 $\frac{1}{4}$ "	263
10" Class 150 ERP1	1 $\frac{1}{16}$ "	424
10" Class 300 ERP3	1 $\frac{1}{4}$ "	263
12" Class 150 ERP1	1 $\frac{1}{16}$ "	424

Table 3

Torques SIZE	(lb-ft) TORQUE	Number of Seals	
		UPPER	LOWER
2"	10	1	2
3" & 4"	15	3	3
6"	20	3	3
8"	20*	3	3
10"	25*	3	3
12"	25*	3	3

* Graphite stem seals should be compressed to 85% of their original height. Torques should be applied after the seals have been compressed.

Table 2

Wrench Size Valve	Torque Requirement (Across Flats)	(Ft.-Lbs.)
2" Class 150 EFP1	$\frac{5}{8}$ "	32
2" Class 300 EFP3	$\frac{7}{8}$ "	74
3" Class 150 EFP1	1 $\frac{5}{16}$ "	107
3" Class 300 EFP3	1 $\frac{1}{16}$ "	148
4" Class 150 EFP1	1 $\frac{1}{16}$ "	148
4" Class 300 EFP3	1 $\frac{1}{16}$ "	148
6" Class 150 EFP1	1 $\frac{1}{16}$ "	148
6" Class 300 EFP3	1 $\frac{1}{4}$ "	263
8" Class 150 EFP1	1 $\frac{1}{4}$ "	263
8" Class 300 EFP3	1 $\frac{7}{16}$ "	424
10" Class 150 EFP1	1 $\frac{1}{4}$ "	263
10" Class 300 EFP3	1 $\frac{5}{8}$ "	636
12" Class 150 EFP1	1 $\frac{1}{4}$ "	263
12" Class 300 EFP3	1 $\frac{1}{8}$ "	195

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