

Petro Double Union End Ball Valve

Model E790: 1/4" – 2" Size

Installation, Operation and Maintenance Instructions

1. Installation

These valves may be installed in any position utilizing standard pipe fitting practices. With the ends installed, the body can be rotated before tightening the union nuts.

Welding Ends (Socket Weld)

To keep from destroying soft parts, loosen and slide away union nuts (12). Remove valve from line, taking care that the end and body seals (15 & 16) are not damaged, and then weld socket ends in position.

NOTE: Prior to removing valve from line, valve may be tack welded in line for line-up purposes.

The base material of valve covered by this procedure conforms to the following:

- Carbon Steel - ASTM A105 (Forged)
- 316 Stainless Steel - ASTM A182 GRF316 (Forged)

Before welding, push pipe snugly into union ends and then back off approximately 1/16".

The socket and at least one inch of the pipe (at the joint) must be free of all foreign material which might prove detrimental to the weld.

Use the smallest electrode and minimum amperage consistent with efficient welding to minimize warpage. Tacks should be ground out before completing the root pass in that area. Weld stringer beads with no weaving and stagger all starts and stops.

Figure 1

Valve Size	Hex Size (Across Flats)
1/4", 3/8", 1/2"	5/8"
3/4"	13/16"
1"	1"
1 1/4"	1 1/4"
1 1/2"	1 1/2"
2"	1 11/16"

Carbon steel ends should be allowed to cool slowly. The valve ends may be covered with a heat resisting blanket to promote slow cooling.

2. Stem Seal Adjustment

If leakage is evident in stem packing area, tighten the adjusting nut (18) 1/8 turn. If leak still persists, repeat above. Replacement of the stem seal (17) is indicated if the leak is still apparent after 1/2 turn.

3. Seal Replacement

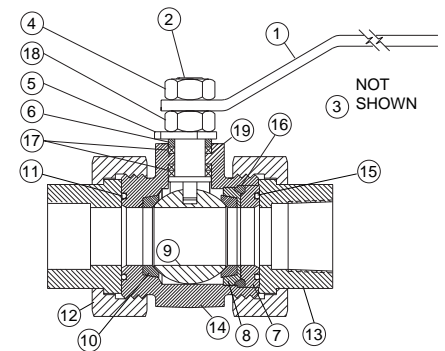
There must be no line pressure on the valve at this time and ball should be partially open.

- Loosen union nuts (12) and slide nuts out of the way. Now the valve body (14) can be removed from the line for servicing.
- Remove end seal (15) and body seal (11). This may be done with a sharp instrument, such as a pocket knife. Care should be taken to avoid damage to the surfaces of the seal groove.
- Remove threaded spacer (7) by using "allen" type wrench or hexagonal bar. (See Figure 1.)
- To take out spacer seal (16), seat socket (8), one seat (10) and the ball (9) – rotate stem (2) so ball (9) is in fully closed position and insert wooden dowel (not metal) in port opposite threaded end and tap gently on ball (9) thereby forcing it out of body (14).

NOTE: Extreme caution should be taken to avoid damage to the ball (9).

- Take out other seat (10).
- Remove the handle retainer nut (4), handle (1), adjusting nut (18), travel stop (5) (part of the handle on sizes 1/2" and 3/4") and the gland ring (6). Push the stem (2)

Figure 2



No.	Description
1	Handle
2	Stem
3	Stop Pin (not shown)
4	Handle Retainer Nut
5	Travel Stop (1" thru 2" sizes only)
6	Gland Ring
7	Threaded Spacer
8	Seat Socket
9	Ball
10	Seat (2)
11	Body Seal
12	Union Nut (2)
13	Union End (2)
14	Body
15	End Seal
16	Spacer Seal
17	Stem Seal
18	Adjusting Nut
19	Grounding Washer

down through the body and out the open end of the body (14). Remove the upper and lower stem seals (17) and the grounding washer (19). Grounding washer (19) is not used with the FIRE-GARD valves. Save the grounding washer (19) for reassembly.

Figure 3

Stem Nut Torques	(lb-ft)	Number of Seals	
SIZE	TORQUE	UPPER	LOWER
½"	5	1	1
¾" to 2"	10	1	2

Flowserve recommends replacement of all soft parts whenever the valve is disassembled for reconditioning. Replacement parts can be ordered in kit form.

4. Reassembly

- A. Put one seat (10) in body (14).

NOTE: Seats (10) are to be installed with concave surfaces positioned against the ball.

CAUTION: The high-pressure valve Model E790K is a uni-directional (one-way) valve and it is extremely important that the unslotted downstream seat and the slotted upstream seat be positioned properly.

The unslotted downstream seat is placed in the solid end of the body and the slotted upstream seat is placed in the spacer end of the body.

- B. Lightly grease the stem seals (17) and the seal area and threads of the stem (2). Insert stem seal(s) (17) into the lower stem seal cavity with the raised outer edge facing into the counterbore. (The ¼" thru ½" size and all sizes of the FIRE-

GARD seals are square cut seals.) Insert stem (2) through the installed stem seals (17) and the body (14). Place the travel stop (5) on the stem (2) so that it rests on the top surface of the body (14). Thread the adjusting nut (18) on the stem (2) and torque to ¾ of the final torque value for the adjusting nut (18). Remove the adjusting nut (18) and the travel stop (5) without moving the stem (2). Place the grounding washer (19) into the upper seal cavity with the raised fingers pointing up. Push the upper stem seal(s) (17) into the counterbore with raised outer edge pointing into the valve. Add the gland ring (6), the travel stop (5) and the adjusting nut (18). 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 (18) to the value shown in Figure 3. Cycle several times and check the stem nut torque.

- C. Turn the stem (2) to a position with the stem tang flats inside the body parallel to the cavity. (Ball will be in the closed position and stay in this position through steps D, E, F and G.)
- D. Install the ball (9). NOTE: Ball should be carefully examined for nicks, scratches, pitting or corrosion and replaced as necessary.
- E. Put other seat (10) into seat socket (8) and fit up against shoulder in body (14). (See note in paragraph 4A.)

- F. Install spacer seal (16).
- G. Install threaded spacer (7) using appropriate allen type wrench or hexagonal bar. (See Figure 1 on page 1).
NOTE: In order to achieve proper seat preload against ball, threaded spacer (7) must come to a complete stop when screwed into body (14).
- H. Press body seal (11) and end seal (15) and threaded spacer (7) into grooves on face of body and threaded spacer.
- I. Place body (14) back into line position and tighten union nuts (12).
- J. Install travel stop (5), if required (see Figure 2), handle (1) and handle retainer nut (4).

5. Testing

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

- A. Place the closed valve in a vise with the pipe run in the vertical position and connect air pressure to lower port. Introduce 50 to 100 psig air. Pour water into 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 introduce air pressure to the port just checked.
- B. In the event of stem seal leakage, adjust as described in Section 2 "Stem Seal Adjustment."

NOTICE: McCanna Valves are designed and manufactured using good workmanship and materials, and they meet all applicable industry standards. Flowserve Corporation is anxious to avoid injuries and property damage which could result from misapplication of the product. Proper valve selection is imperative. Examples of the misapplications or misuse of a valve include but are not limited to use in a service in which the pressure/temperature rating is exceeded or in a chemical service incompatible with the valve materials; use of undersized valve actuators; use of extremely fast valve actuation and/or continuous valve cycling on standard valves; making modifications of the product of any kind; failure to use caution in operating valves in high temperature, high pressure, or highly hazardous services; and the failure to maintain valves as recommended. The right is reserved to change or modify product design or construction without prior notice and without incurring any obligation to make such changes and modification on products previously or subsequently sold.

Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can (and often does) provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of Flowserve products. The purchaser/user should read and understand the Installation Operation Maintenance (IOM) instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.

While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only and should not be considered certified or as a guarantee of satisfactory results by reliance thereon. Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding any matter with respect to this product. Because Flowserve is continually improving and upgrading its product design, the specifications, dimensions and information contained herein are subject to change without notice. Should any question arise concerning these provisions, the purchaser/user should contact Flowserve Corporation at any one of its worldwide operations or offices.

For more information about Flowserve Corporation, contact www.flowserve.com or call USA 1-800-225-6989.

FLOWERVE CORPORATION
FLOW CONTROL DIVISION
 1978 Foreman Drive
 Cookeville, Tennessee 38501 USA
 Phone: 931 432 4021
 Facsimile: 931 432 3105
www.flowserve.com