



Quadrant Valve & Actuator Engineering Specification

Number: IOM- 14

Date: 9-28-2004

Title: 5-Piece NPT Multi-Port Ball Valve IOM, for:

3W-SS and 4W-SS Multiport Ball Valves

I. Initial Inspection

- A. Remove valve from packaging; remove thread protectors and discard, if so equipped.
- B. Inspect pipe threads for any damage caused in shipment or handling.
- C. Confirm Valve Size is correct for installation.

II. Installation

- A. Confirm Male NPT threads on piping to be assembled to valve meet gauging specifications of ASME B1.20.1 (NPT) or B1.20.3 (NPTF).
- B. Thread sealant/lubricant is required to establish a bubble-tight seal between piping threads and valve threads. It will not be possible to establish a leak-free seal without thread sealant.
- C. Check porting of ball and marking on "Stop Plate" if so equipped. "L-Port" and "T-Port" design valves have (4) available flow positions-see 3W-SS/4W-SS literature on website at www.QUADRANTVALVE.com.
- D. Installer must establish handle stop position and ball orientation as part of valve installation. Stop plates are available for 90 degree & 180 degree handle operation.
- E. Hand-engage piping to each side of valve, and hand tighten.
- F. Attach an adjustable wrench (NOT a pipe wrench) to the flats provided on the valve tailpieces having the NPT thread being engaged. Do not hold the body while torqueing pipe into tailpiece or vice-versa.
CAUTION: Valve will be permanently damaged or destroyed if tailpiece is rotated relative to body, or body is rotated relative to tailpiece!!
- G. Tighten piping into valve thread using reasonable torque to seal - **DO NOT OVER-TORQUE**.
- H. Use same method to install piping into other valve NPT ports.

III. Operation:

- A. After Installation, confirm handle has adequate clearance by rotating 90, 180, 270 or 360 degrees depending upon port orientation selected.
- B. Quadrant 3W and 4W ball valves are designed for flow diverting service from one port to any other port. DO NOT attempt to “throttle” with the Quadrant 3W-SS or 4W-SS ball valves, unless they are specifically designed for and tagged “FOR THROTTLING SERVICE”.
- C. If application is in STEAM PIPING, be cautious when operating valve-handle will be HOT!

IV. Initial Pressurization of System

- A. Upon initial pressurization of piping system, check all connections for leaks and correct if required.
- B. The 3W-SS and 4W-SS Series has a “live-loaded” stem sealing system that is non-adjustable and self-compensating for wear and operating temperature changes- do not attempt to adjust or modify the stem packing system.

V. Maintenance

- A. Quadrant Ball Valves require no maintenance.
- B. In high-cycle applications, check stem packing area regularly to confirm there is no leakage from stem packing. If leakage occurs, valve will require rebuilding and replacement of stem packing parts.

VI. Repair

- A. Obtain a copy of 3W-SS/4W-SS literature from Quadrant or website.
- B. Purchase correct size 3W-SS/4W-SS repair kit from Quadrant, which will contain all seats and seals required for rebuilding 3W or 4W ball valve.
- C. Remove Handle (Part #13) and Stop Plate.
- D. Place valve in a vise equipped with protective jaws, clamping on the ends of (2) Tailpieces (Part #2).
- E. Remove the (2) Tailpieces that are not clamped in vise jaws.
- F. Re-clamp body in vise with protective jaws, clamping on the Body ends, exposing the other (2) Tailpieces.
- G. Remove remaining Tailpieces.
- H. Remove Ball (Part #4) being careful not to damage outside spherical surface.
- I. Remove Retaining Ring (Part #11) from Stem (Part #5), remove Belleville Washers (Part #10). Push Stem down into Body (Part #1) and remove.
- J. Inspect Stem (Part #5) and Ball (Part #4) for damage or wear.
- K. Install new O-Ring (Part #12) and lower Stem Packing (Part #9) on Stem.
- L. Push Stem (Part #5) up into stem bore from inside Body cavity.
- M. Install upper Stem Packing (Part #9), Belleville Washers (Part #10) being careful to “stack” the Belleville Washers as shown on cross-sectional drawing, then install Retaining Ring (Part #11) while pushing Stem up and compressing Belleville Washers.

VI. Repair (continued)

- N. Install new Tailpiece Seals (3 of Part #7 & 1 of Part #8) on Tailpieces (Part #2 and Part #3). Note that (1) Tailpiece and (1) Tailpiece Seal is larger than the other three.
- O. Push (4) new Seats (Part # 6) into Tailpiece seat recesses.
- P. Insert Ball (Part #4) into Body cavity and engage Stem flats into Ball slot.
- Q. Hand-tighten Tailpieces (Part #2 & Part #3) into Body threads, taking care to insure Seats (Part #6) remain in Tailpiece seat recesses, and noting that one Tailpiece has larger retaining threads than the other (3) Tailpieces.
- R. Place valve assembly in vise with protective jaws, clamping on (2) Tailpiece ends.
- S. Torque unclamped Tailpieces to torques shown below.
- T. Re-clamp valve assembly on ends of torqued Tailpieces.
- U. Torque the final (2) Tailpieces to torques shown below.
- V. Attach Stop Plate and Handle, taking care to properly establish ball porting desired.
- W. Re-install per Section II.

| SIZE | TAILPIECE TORQUE (IN-LBS) |
|-----------|------------------------------|
| 1/4"-3/8" | 960 |
| 1/2" | 960 |
| 3/4" | 1000 |
| 1" | 1050 |
| 1-1/4" | 1150 |
| 1-1/2" | 3600 |
| 2" | 4500 |

VII. Modification of Piping Layout

- A. Many times, the reason valves are purchased is to allow modifications to the original piping layout sometime in the future. In these cases, the valve is "closed", sometimes with full pressure on the "upstream" side of the valve, and pressure/line fluid is drained from the downstream side of the valve.
- B. **CAUTION:** This is a **VERY DANGEROUS** operation on a Multi-Port Ball Valve, because an error in ball/stem position can cause inadvertent pressurization of "downstream" ports. We **STRONGLY RECOMMEND DEPRESSURIZATION OF ENTIRE SYSTEM** before working on any portion of the valve.