

Installation, Operation & Maintenance Manual

TOP Series (TBC) Threaded Ball Valve



1. Introduction

TOP Valve series “TBCC & TBCS” threaded ball valves are designed and manufactured in accordance with standard industry specifications. A wide variety of body materials are available. Users should read the installation and operations manual (IOM) to understand the valves storing, installation, operation and/or maintenance.

2. Valve Handling & Storage

- 2.1 While loading or unloading, special care should be taken to adhere to any special instructions listed on the box/crate.
- 2.2 Be careful to avoid hitting valves against each other when handling.
- 2.3 All ball valves should be stored or shipped in the open position.
- 2.4 Valves should be fitted with protective plastic end-caps and stored in a dry place.
- 2.5 TOP grease and plastic end-cap protectors are good for storing up to six months if properly stored.
- 2.6 For longer storage times. Implement an inspection process to assure the valves quality is maintained and stored in good conditions.

WARNING: Never lift the valve by the handle or other appendages. Doing so may result in damage to the valve and/or injury to the installer. End-cap protectors should always be left in place until the valve is actually being used or installed.

3. Installation

- 3.1 Ensure that the grease fittings (if applicable) are not damaged before installation.
- 3.2 Before installation, remove the plastic end protectors and thoroughly clean the valve ends and bore.
- 3.3 While handling the valve without plastic end-cap protectors, the lever is to be in the open position to help minimize the possibility of damaging an exposed ball surface.
- 3.4 If the valves are to be painted prior to installation, appropriate steps must be taken to prevent any debris from entering the valve.
- 3.5 TOP series TBCC / TBCS are bi-directional and may be installed with flow from either direction. Vertical or horizontal installation of the valves is recommended with the stem pointing up or in the horizontal position. NEVER install the valve in a horizontal stem-down position. When installing vertically, it is preferred that the upstream pressure be located above the valve. This installation allows the weight of the ball to assist in sealing against the downstream seat.
- 3.6 If actuators are to be used or mounted it should be adequately supported.
- 3.7 For thread NPT installation. Use the appropriate thread sealant compound to minimize the risk of a leak. TOP’s threaded end ball valves should be installed using two pipe wrenches, one on the flats of the adapter, and the other on the adjacent pipe. **DO NOT..** apply a wrench to the body section when installing. This may result in damaging the body or breaking loose the threaded adapter connection.

WARNING: During installation, verify the line is clean of all foreign debris, weld slag, etc. If debris is present, completely flush the system of such debris prior to valve installation. Failure to do so may result in soft seat, and/or metal seat damage during operation.

4. Operation

- 4.1 Users should choose the material and pressure rating of the valve. In accordance to the working temperature, working pressure, and conditions of the service.
- 4.2 TOP's Series TBCC/TBCS ball valves are intended only to work in the fully closed or fully open position.
- 4.3 To achieve a fully open position turn the lever counter clockwise, and turn clockwise for a fully closed position
- 4.4 The lever should be turned completely until travel stops.
- 4.5 The valve bore position may be noted by the position of the stop plate, open or close with directional arrows.
- 4.6 Alignment of the handle with the pipeline indicates an OPEN position. Alignment of the 90° across the pipeline indicates a CLOSED position.
- 4.7 It is recommended that no extensions be used for operating the valve.

WARNING: These valves shall never be operated partially open or partially closed. Throttling (partial opening) or "pinching" flow may cause non-uniform and premature wear on seats and ball over the sealing surfaces, and ultimately failure.

4.1 Hydrostatic Testing

- 4.1.1 When TOP's Series "TB" ball valve are installed in a system requiring hydrostatic testing, the customer/user should use the below procedure to minimize damage to the valve.
 - A) Open the valve fully prior to introducing any media/test fluid to allow the flushing of any debris through the valve bore and/or system.
 - B) Once media is completely filled the valve should be positioned in a partially opened position (20°) to allow the body cavity to fill with the preferred media/test fluid.
 - C) Hydrostatically shell test to a maximum pressure not exceeding 1.5 times the rated working pressure of the valve.
 - D) Bleed pressure from the system.
 - E) Completely close the valve.
 - F) The valve seats may be tested by introducing pressure, first from one side, and then from the other. Do not exceed 1.1 times the working pressure of the valve. Never attempt to test both seals at the same time with pressure from both sides.
 - G) Upon hydrostatic test completion, purge the valve of all test fluid and open valve fully.

5. Maintenance

TOP's series "TB" ball valve is manufactured and designed for continuous operation with minimal maintenance required. The zerk fitting should be greased

5.1 Disassembly

Should the valve components need to be inspected or replaced, the valve can be disassembled and reassembled as follows.

- 5.1.1 Mount the valve in a vice or other holding fixture, with the adapter positioned on top.
- 5.1.2 Remove the handle or lever.
- 5.1.3 Utilize the proper size wrench or pipe wrench, loosen the adapter and spin it free from the body.

- 5.1.4 Remove the body seal from the end adapter.
- 5.1.5 Rotate the stem, until the ball is in the closed position. Remove the ball and then remove the seat from the seat pocket in the body. Remove the remaining seat from its pocket in the adapter.
- 5.1.6 Remove the stem by first removing the retaining ring and lift the stop plate (if included) and spacer off the top of the stem.
- 5.1.7 Remove the stem, with stem seals and thrust washer intact, by pushing the stem into the body cavity and out of the body. Remove the stems seals and thrust washer from the stem.
- 5.1.8 Clean all parts and inspect them for wear.

WARNING: Prior to disassembly, the valve must first be isolated from system pressure and flow. Operate the valve at least two times to make sure there is no pressure trapped into the body.

5.2 Reassembly

Inspect the body and adapter for damage/wear. Visible wear of the metal surface in the seat pockets, or valve body will likely cause continued leakage. Clean and inspect all components, replacing them if necessary.

- 5.2.1 Position the body and the adapter with the threaded ends down on a clean surface.
- 5.2.2 Apply a thin coating of grease to the cleaned or new seats and install them into the cleaned seat pockets in the body and the adapter.
- 5.2.3 Lightly grease the new thrust washers and stem seals. Install them in place on the stem. Apply light grease to the stem between the three seal grooves. Reach into the body opening, gently installing the stem/seal assembly into the cleaned stem opening, taking care not to cut the stem seals. Continue pressing the stem into position.
- 5.2.4 Place the spacer over the stem, flowed by the stop plate (if included) and finally, reinstall the retainer ring in its groove on the stem. If the retainer ring groove is not visible, the stem is not fully pressed into place inside the body.
- 5.2.5 Rotate the stem assembly to the closed position with the ball-engaging key aligned with the bore of the body.
- 5.2.6 Apply a light coat of grease to ball and slide it into the body, engaging the stem key with the ball's keyway as the ball drops into place, resting on the seat (ball will be in closed position).
- 5.2.7 Apply a light coat of grease to the body seal and install it in place in the appropriate groove on the adapter.
- 5.2.8 Position the adapter (with seat and body seal installed) on the body, and turn clockwise until hand tight. Complete with a wrench. Be sure not to pinch the body seal or cut during this reassembly.
- 5.2.9 Reattach the handle or lever and cycle the valve from open to closed position several times to assure smooth operation.

WARNING: It is prohibited to weld or repair the valve in production line. Valves should be inspected and maintained every according to the user's quality management system.

6. Technical Info & Troubleshooting

6.1 Troubleshooting

Malfunction	Probable cause	Solution
Valve will not operate (open or close)	<ol style="list-style-type: none"> Foreign material in valve Iced up due to pressure drop or low temp 	<ol style="list-style-type: none"> Flush line to remove debris. Valve may have to be removed from line to facilitate cleaning. Flush line with warm liquid.
Valve is difficult to operate	<ol style="list-style-type: none"> Debris in valve Stem seized Seats/seals swollen 	<ol style="list-style-type: none"> Flush valve to remove debris. Valve may have to be removed from line to facilitate cleaning. Inject cleaner/lubricant into stem grease fitting. Valve may have to be disassembled and parts cleaned/dressed or replaced if greasing stem does not alleviate problem. Trim is incompatible with flow media. Reevaluate trim choice and replace with compatible seats/seals.
Leakage through valve when in a closed position	<ol style="list-style-type: none"> Downstream seat is damaged or trapped debris inhibiting seal 	<ol style="list-style-type: none"> Clean/inspect and/or replace seat. Inspect ball for wear and replace if necessary. NOTE: It is possible that the upstream seat and ball surface to be good, then switching the components to the downstream side will facilitate a quick-fix if spare parts are not readily available. Check when the travel stops and adjust as described.
Leakage from stem	<ol style="list-style-type: none"> Foreign matter impeding stem seal Stem seal(s) damaged 	<ol style="list-style-type: none"> Inject new grease into the grease fitting to dislodge debris and renew lubrication. Remove valve from line and disassemble. Clean stem and stem journal. Inspect stem seals and thrust bearing, replacing worn parts as necessary.
Leakage from body adapter seal	<ol style="list-style-type: none"> Body seal damaged 	<ol style="list-style-type: none"> Remove valve from line and disassemble. Remove body seal, clean O-ring groove in adapter. Install new body seal.