

Maintenance Instructions

TB & TBX Series Ball Valve

WARNING
Before servicing any valve, you must depressurize the system and cycle the valve. Residual material may be left in the valve and system.

Kit Contents

Seat Carrier Assembly (2)	Stem Back-up Ring (2)	End Screw Seal (2)
Seat Carrier O-Ring (2)	Stem Secondary Back-up Ring	Lubricant
Seat Springs (6 or 12)	Trunnion Bearing	Material Safety Data Sheet
Stem	Carrier Back-up Ring (4)	Instruction Sheet
Stem Bearing	Carrier Gland (2)	
Stem O-Ring	Ball	

Disassembly

End Screws

- Remove both end screws (17) from valve body (3) and separate the seat carrier assembly (11) from end screws.
- Discard the following components: Seat carrier assemblies (11), seat springs (12), seat carrier glands (13), carrier backup rings (14), seat carrier O-rings (15), and end screw seals (16).

Ball and Stem

- Straight pattern only - remove plug (18) from bottom of valve body (3). Clean components and set aside for later re-installation.
- Remove the set screw in handle (1) and remove handle. For X-pattern assemblies, note the position of the handle for reassembly.
- Remove the ball (9) assembly through the bottom of the valve body (3). For X-pattern assemblies, note the position of the ball orifice for reassembly. Discard the ball (9) and trunnion bearings (8). The ball must also be replaced to ensure a leak-tight seal with the new seat assemblies.
- Remove stem (4) through bottom of the valve body by pressing down on the top of the stem.
- Remove and discard the stem O-ring (5), stem back-up rings (6), stem secondary back-up ring (7), stem bearing (8) and stem (4).
- Remove all lubricants and contaminants from the valve body.

Reassembly

Seat Carrier Subassembly (two per valve)

- PEEK SEATS - Assemble six seat springs (12) onto the shaft of the seat carrier (11) in three groups of two. The first two springs should be assembled "concave out" with the concave side facing away from the head of the seat carrier, the next two concave in, and the final two concave out.
- PTFE SEATS - Assemble three seat springs (12) onto the shaft of the seat carrier (11). The first spring should be assembled "concave out" with the concave side facing

- away from the head of the seat carrier, the next spring concave in, and the final spring concave out.
- Assemble the carrier gland (13) onto the shaft of the seat carrier.
- Lightly lube one carrier back-up ring (14) with LT-CL-111 lubricant and assemble it onto the shaft of the seat carrier.
- Lightly lube the carrier O-ring (15) with LT-CL-111 lubricant and assemble it onto the shaft of the seat carrier.
- Lightly lube a second carrier back-up ring (14) with LT-CL-111 lubricant and assemble it onto the shaft of the seat carrier on the other side of the O-ring.

Stem Subassembly (one per valve)

- Lightly lube the stem back-up rings (6), the secondary stem back-up ring (7), the stem O-ring (5) and the stem bearing (8) with LT-CL-111 lubricant.
- Assemble the stem bearing (8) onto the stem (4) so that it rests flush against the hub.
- Assemble the stem O-ring (5) into the lower (widest) groove on the stem.
- Assemble the stem back-up ring (6) onto the stem in the lower groove just above the stem O-ring (5).
- Assemble the stem secondary back-up ring (7) onto the stem in the lower groove just above the primary stem back-up ring.
- Assemble a second stem back-up ring (6) onto the stem in the upper (narrowest) groove.

Ball Subassembly (one per valve)

- Lightly lube the trunnion bearings (10) with LT-CL-111 lubricant and assemble them into the grooves in the trunnions of the ball (9).

End screw Subassembly (two per valve)

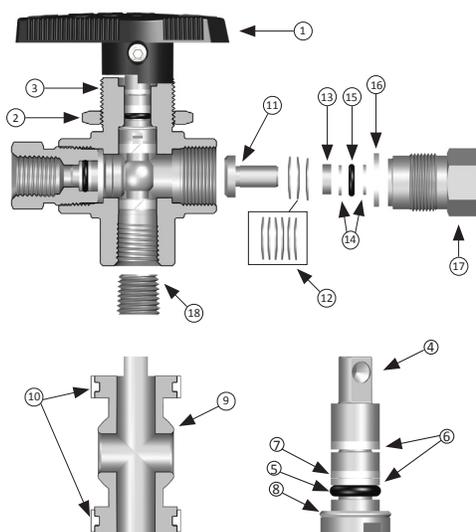
- Clean all lubricants and/or contamination from the end screws (17) (reusable).
- Insert one of the finished seat carrier subassemblies (11-15),

- shaft end first, into the main bore of the end screw. The seat spring stack will make contact with the face of the end screw when the seat carrier subassembly is fully inserted.
- Lightly lube the end screw seal (16) with LT-CL-111 lubricant and assemble onto the nose of the end screw (17).

Valve Assembly

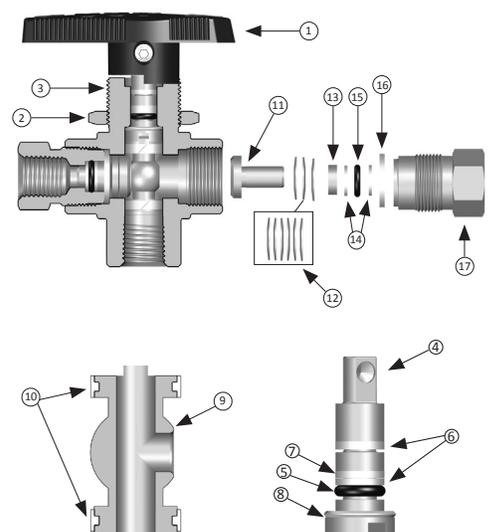
- Insert the stem subassembly (4-8) up through the bottom of the valve body (3). A blunt instrument may be used to insure that the stem subassembly is fully seated against the internal shoulder of the body bore. Care must be taken when installing the stem into the body to prevent scoring of the body bore or clipping of the stem O-ring (5). The stem flats should be parallel to the end screw holes and the stem hole should be facing the front of the valve body allowing for proper alignment with the handle (1).
- Assemble the Handle (1) onto the stem (4) and attach it firmly with the set screw. The handle can only be installed on the stem in one direction.
- Insert the ball subassembly (tang end up) into the bottom bore of the valve body. Push the ball into the valve body until the ball tangs engage the stem slot. Rotate the handle to insure that the ball tang is engaged in the stem slot. Be certain that the X-pattern ball orifice is facing the same direction as the handle (1) flow arrow.
- Valve handle must be placed in the fully closed position (straight pattern) or center-off (X-pattern) to prevent seat damage when torquing the end screws.
- Moderately lube the threads of the end screw subassemblies (11-17) and insert them into the side bores of the body. Torque each end screw subassembly to 500 in-lbs (56.5 N-m).
- Straight pattern valve assemblies only: Wrap plug (18) with two complete wraps of PTFE tape or use system compatible thread sealant. Install plug in bottom port of valve body and torque to 300 in-lbs (33.9 N-m).

2-Way



Item	Components
1	Handle
2	Panel Nut
3	Body
4	Stem
5	Stem O-Ring
6	Stem Back-Up Ring
7	Stem Secondary Back-up Ring
8	Stem Bearing
9	Ball
10	Trunnion Bearing
11	Seat Carrier Assembly
12	Seat Springs
13	Seat Carrier Gland
14	Carrier Back-up Rings
15	Carrier O-Ring
16	End Screw Seal
17	End Screw
18	Plug (2-Way Only)

3-Way



Maintenance Instructions

HTB & HTBX Series Ball Valve

WARNING
Before servicing any valve, you must depressurize the system and cycle the valve. Residual material may be left in the valve and system.

Kit Contents

Seat Carrier Assembly (2)	Stem Back-up Ring (2)	End Screw Seal (2)
Seat Carrier O-Ring (2)	Stem Secondary Back-up Ring	Lubricant
Seat Springs (12)	Trunnion Bearing	Material Safety Data Sheet
Stem	Carrier Back-up Ring (4)	Instruction Sheet
Stem Bearing	Carrier Gland (2)	
Stem O-Ring	Ball	

Disassembly

End Screws

1. Remove both end screws (17) from valve body (3) and separate the seat carrier assembly (11) from end screws.
2. Discard following components: seat carrier assemblies (11), seat springs (12), seat carrier glands (13), carrier backup rings (14), seat carrier O-rings (15), and end screw seals (16).

Ball and Stem

3. Straight pattern only - remove plug (18) from bottom of valve body (3). Clean components and set aside for later re-installation.
4. Remove the set screw in handle (1) and remove handle. For X-pattern assemblies, note the position of the handle for reassembly.
5. Remove the ball (9) assembly through the bottom of the valve body (3). For X-pattern assemblies, note the position of the ball orifice for reassembly. Discard the ball (9) and trunnion bearings (8). The ball must also be replaced to ensure a leak-tight seal with the new seat assemblies.
6. Remove stem (4) through bottom of the valve body by pressing down on the top of the stem.
7. Remove and discard the stem O-ring (5), stem back-up rings (6), stem secondary back-up ring (7), stem bearing (8) and stem (4).
8. Remove all lubricants and contaminants from the valve body.

Reassembly

Seat Carrier Subassembly (two per valve)

1. Assemble six seat springs (12) onto the shaft of the seat carrier (11) in three groups of two. The first two springs should be assembled "concave out" with the concave side facing away from the head of the seat carrier, the next two concave in, and the final two concave out.

2. Assemble the carrier gland (13) onto the shaft of the seat carrier.
3. Lightly lube one carrier back-up ring (14) with LT-CL-130 lubricant and assemble it onto the shaft of the seat carrier.
4. Lightly lube the carrier O-ring (15) with LT-CL-130 lubricant and assemble it onto the shaft of the seat carrier.
5. Lightly lube a second carrier back-up ring (14) with LT-CL-130 lubricant and assemble it onto the shaft of the seat carrier on the other side of the O-ring.

Stem Subassembly (one per valve)

1. Lightly lube the stem back-up rings (6), the secondary stem back-up ring (7), the stem O-ring (5) and the stem bearing (8) with LT-CL-130 lubricant.
2. Assemble the stem bearing (8) onto the stem (4) so that it rests flush against the hub.
3. Assemble the stem O-ring (5) into the lower (widest) groove on the stem.
4. Assemble the stem back-up ring (6) onto the stem in the lower groove just above the stem O-ring (5).
5. Assemble the stem secondary back-up ring (7) onto the stem in the lower groove just above the primary stem back-up ring.
6. Assemble a second stem back-up ring (6) onto the stem in the upper (narrowest) groove.

Ball Subassembly (one per valve)

1. Lightly lube the trunnion bearings (10) with LT-CL-130 lubricant and assemble them into the grooves in the trunnions of the ball (9).

End screw Subassembly (two per valve)

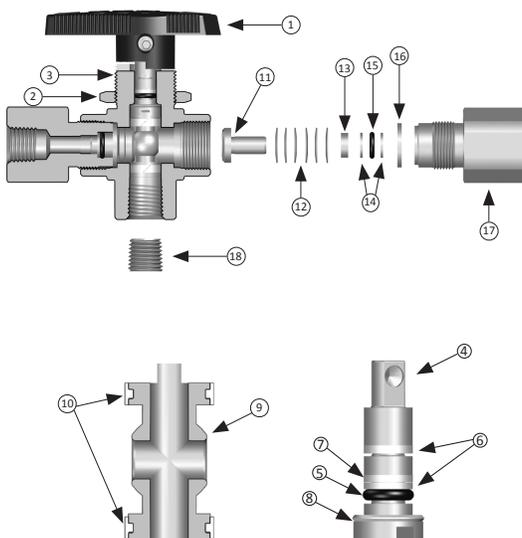
1. Clean all lubricants and/or contamination from the end screws (17) (reusable).
3. Insert one of the finished seat carrier subassemblies

- (11-15), shaft end first, into the main bore of the end screw. The seat spring stack will make contact with the face of the end screw when the seat carrier subassembly is fully inserted.
2. Lightly lube the end screw seal (16) with LT-CL-130 lubricant and assemble onto the nose of the end screw (17).

Valve Assembly

1. Insert the stem subassembly (4-8) up through the bottom of the valve body (3). A blunt instrument may be used to insure that the stem subassembly is fully seated against the internal shoulder of the body bore. Care must be taken when installing the stem into the body to prevent scoring of the body bore or clipping of the stem O-ring (5). The stem flats should be parallel to the end screw holes and the stem hole should be facing the front of the valve body allowing for proper alignment with the handle (1).
2. Assemble the Handle (1) onto the stem (4) and attach it firmly with the set screw. The handle can only be installed on the stem in one direction.
3. Insert the ball subassembly (tang end up) into the bottom bore of the valve body. Push the ball into the valve body until the ball tangs engage the stem slot. Rotate the handle to insure that the ball tang is engaged in the stem slot. Be certain that the X-pattern ball orifice is facing the same direction as the handle (1) flow arrow.
4. Valve handle must be placed in the fully closed position (straight pattern) or center-off (X-pattern) to prevent seat damage when torquing the end screws.
5. Moderately lube the threads of the end screw subassemblies (11-17) and insert them into the side bores of the body. Torque each end screw subassembly to 600 in·lbs (56.5 N·m).
6. Straight pattern valve assemblies only: Wrap plug (18) with two complete wraps of PTFE tape or use system compatible thread sealant. Install plug in bottom port of valve body and torque to 300 in·lbs (33.9 N·m).

2-Way



Item	Components
1	Handle
2	Panel Nut
3	Body
4	Stem
5	Stem O-Ring
6	Stem Back-Up Ring
7	Stem Secondary Back-up Ring
8	Stem Bearing
9	Ball
10	Trunnion Bearing
11	Seat Carrier Assembly
12	Seat Springs
13	Seat Carrier Gland
14	Carrier Back-up Rings
15	Carrier O-Ring
16	End Screw Seal
17	End Screw
18	Plug (2-Way Only)

3-Way

