



**OPERATION AND MAINTENANCE MANUAL**  
**SERIES 1800: FLANGED BALL VALVE**

*For technical questions, please contact the following:*

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*TBV Inc. ball valves are designed and engineered to provide long lasting, trouble-free service when used in accordance with these instructions and specifications.*

*All TBV Inc. 1800 Series ball valves have been factory lubricated with Fluorolube lubricant for break-in purposes. This may be removed if desired.*

## **INSTALLATION**

- 1. Unless otherwise specified (For example, services such as chlorine or hydrogen peroxide require cavity pressure relief), TBV Inc. valves are bi-directional and may be installed for flow in either direction, with no loss in performance.*
- 2. During installation, it is recommended that the valve ball be left in the open position to prevent possible damage to the ball. In the closed position, the sealing surfaces of the ball are exposed to damage from pipe debris, tools, etc. Before operation, assure that the line and the valve has been flushed clean of all debris.*
- 3. Flanged valves should be installed using flange gaskets appropriate for the intended service. Fire safe valves require high temperature gaskets. Tighten flange bolts evenly to torque values appropriate for the gasket and bolt materials.*
- 4. After installation, cycle the valve several times to assure smooth operation.*

## **OPERATION**

- 1. A quarter turn of the handle clockwise closes the valve and a quarter turn counterclockwise fully opens the valve. Visual indication of the ball position is determined by the handle or stem position: when the handle, or the stem flats, inline with the piping the valve is open; across the line, the valve is closed.*
- 2. Leaving a soft-seated ball valve in a partially open position for an extended period of time may result in leakage due to seat deformation. Consult the factory for recommendations relative to modulating applications, and for valve purging procedures.*
- 3. Any media that might solidify, crystallize or polymerize should not be allowed to stand in the ball valve cavities. In the event that this should happen, DO NOT force the valve in either direction; disassemble and clean before resuming service.*
- 4. Break-away torque (i.e., force which must be exerted to start moving the valve ball) will vary depending on the media, pressure and length of time between cycles, as well as valve seat and packing materials. Consult the factory for specific values.*

## **MAINTENANCE**

*A repair kit containing the appropriate number of components is available for rebuilding each size and configuration of valve. Be sure to specify the complete valve model number, and the TBV Inc. sales order number that is stamped on the valve body, when ordering. Additional components, such as balls, stems, etc. are also available for repair purposes. Refer to illustration for part identification.*

***AT ALL STAGES OF THE FOLLOWING DIS-ASSEMBLY AND RE-ASSEMBLY PROCEDURES, CARE MUST BE TAKEN TO AVOID DAMAGE TO ALL SEALING SURFACES.***

1. *Before removing valve from line, make absolutely certain that line pressure is shut down, and that the line is vented, to remove all pressure from the valve. Operate the valve to assure that there is no pressure or media trapped within the valve body cavity. Flush the line as appropriate to remove harmful chemicals that may be present.*
2. *Remove the valve from the line. Be certain to fully decontaminate the valve, if it has been used in services that have any degree of toxicity. Wear protective gloves and clothing as appropriate to avoid contact with potentially harmful chemicals.*
3. *Remove the body bolts and/or nuts to allow disassembly of the end plate from the body.*
4. *Remove body seal from the end plate.*
5. *Rotate the ball so that it is free to slide out of the body. Remove the seats and ball.*
6. *If it is necessary to replace the stem packing, remove the handle nut, lock washer, handle, packing nut, stop plate, belleville washers, grounding spring, and follower, in order, as appropriate. Lower the stem through the body and remove from valve. Remove thrust bearing; it may be on the stem, or it may have remained in the body back counter bore. Remove the stem packing, taking extreme care so as not to damage the sealing surfaces in the packing bore of the body.*
7. *Clean and inspect all components, paying particular attention to areas that must maintain a seal: ball, seat pockets, finished stem diameters, stem bore, and body seal area. These areas must be free of scratches, pitting and other surface defects.*
8. *Lightly lubricate stem-packing components provided in repair kit with a lubricant that is compatible with the media. Loosely assemble stem packing by reversing the above disassembly procedure.*
9. *Lightly lubricate new seats. Insert seats into seat pockets, taking care that large radius of the seat is facing toward the ball.*
10. *Lightly lubricate ball. Rotate stem so that flats align with body bore. Insert ball, aligning stem slot with stem. Assemble into body cavity.*
11. *Place body seal in groove in end plate. Assemble to valve body-taking care to properly align seat and body seal.*
12. *Install body bolts (or studs) and nuts. Tighten evenly and gradually in a diagonal pattern until the end plate has metal-to-metal contact with the body. Tighten in accordance with good shop practice. General recommendations for torque values are as follows:*

<i>BOLT SIZE</i>	<i>TORQUE</i>
<i>1/4"</i>	<i>10-12 foot-pounds</i>
<i>5/16"</i>	<i>20-24 foot-pounds</i>
<i>3/8"</i>	<i>30-35 foot-pounds</i>
<i>7/16"</i>	<i>45-50 foot-pounds</i>
<i>1/2"</i>	<i>75-80 foot-pounds</i>
<i>5/8"</i>	<i>150-175 foot-pounds</i>
<i>3/4"</i>	<i>225-250 foot-pounds</i>
<i>1"</i>	<i>550-575 foot-pounds</i>

13. Adjust stem packing as follows:

- a) *Tighten packing nut firmly. The following approximate torque values are given as a guide. It is recommended that the packing be compressed, relaxed, and then re-compressed to these same values. This has been found to provide optimum life for the stem packing.*

**NOTE: Periodic stem packing adjustment may be required depending on pressure and temperature and number of cycles. Refer to the recommended stem nut torque chart located below**

<b>VALVE SIZE</b>	<b>STEM NUT TORQUE</b>
<i>1/2" - 3/4"</i>	<i>80-100 inch-pounds</i>
<i>1"</i>	<i>140-180 inch-pounds</i>
<i>1 1/2" - 2"</i>	<i>250-300 inch-pounds</i>
<i>3" - 4"</i>	<i>75-95 foot-pounds</i>
<i>6" - 8"</i>	<i>90-110 foot-pounds</i>

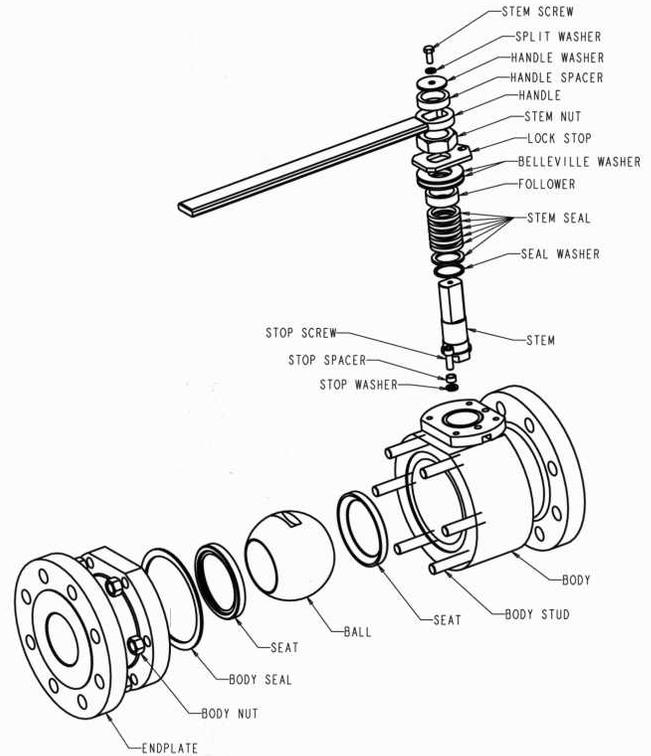
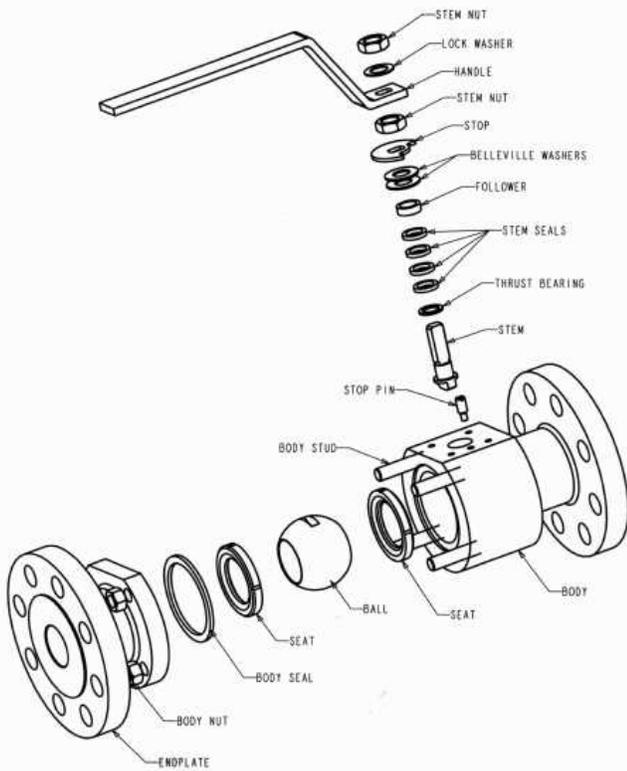
- b) *Cycle valve several times to assure smooth operation.*
- c) *It is recommended that the rebuilt valve be pressure tested prior to re-installation. Perform seat and shell tests using media compatible with the service, checking for any evidence of leakage. If necessary, adjust packing nut in 1/6-turn increments as necessary to stop leakage. Do not over-tighten, as this will shorten the life of the packing. If there is leakage at the flange joint due to body seal leakage, verify proper and consistent body bolt torque. If leakage persists, check for proper installation of the body seals.*
- d) *Install valve in line following procedures described above.*

14. Valve is now ready for service.

## Exploded Views of 1800 Series

1/2" – 2" Series

3" – 8" Series



PART DESCRIPTION	ALLOY 20	HASTELLOY C	MONEL	NICKEL	316L STAINLESS	TITANIUM
Body	ASTM B473	ASTM B574	ASTM B164	ASTM B160	ASTM A479	ASTM B348 Gr.2
Endplate	ASTM B473	ASTM B574	ASTM B164	ASTM B160	ASTM A479	ASTM B348 Gr.2
Ball	ASTM B473	ASTM B574	ASTM B164	ASTM B160	ASTM A479	ASTM B348 Gr.2
Stem	ASTM B473	ASTM B574	ASTM B164	ASTM B160	ASTM A479	ASTM B348 Gr.2
Follower	Same Parent Material as Selected Item					
Seat	PEEK, PTFE, 25% GF PTFE, Ultrafil, UHMWP and Metal					
Stem Seal	PTFE, Grafoil or as Specified					
Body Seal	PTFE or Spiral Wound - (w/Same Parent Material as Body and Graphite or PTFE Laminations)					
Stop	AISI 300 Series Stainless					
Handle	Carbon Steel, Galvanized or 300 Series Stainless Steel as Specified					
Thrust Bearing	25% Glass Filled PTFE or as Specified					
Stop Pin	AISI 300 Series Stainless Steel					
Stem Nut	AISI 300 Series Stainless Steel					
Belleville Washer	17-7 PH Stainless Steel, Carbon Steel Electroless Nickel Plated or Inconel X750 - As Specified					
Lock Washer	AISI 410 Stainless Steel					
Body Nuts	As Specified					
Body Studs	As Specified					
Stop Bolt	AISI 300 Series Stainless Steel					
Seal Washer	Same Parent Material as Stem					
Handle Spacer	AISI 300 Series Stainless Steel					
Retaining Washer	AISI 300 Series Stainless Steel					
Lock Washer	AISI 410 Stainless Steel					
Stem Screw	AISI 300 Series Stainless Steel					

Note: \* Repair kit items: seats, stem seals, body seal and thrust bearing. When ordering a repair kit, customer must provide valve code and sales order number stamped on body of valve.

Example: Repair kit for: 10S 18 1 50 6L36TT 0 (Part Number); S16 754-3 (Sales Order Number)