

# TT VALVES (UK) LTD

## OPERATION AND MAINTENANCE MANUAL

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### 1. General

This manual is to cover Floating ball valves.

### 2. Installation

1.The above listed standard valves are bi-directional and as such, can be installed for flow in either direction.

2.When installing a flanged valve, always be sure that new flange gaskets of the proper material for the intended service media are used.

3.When installing flange bolts, always tighten bolts in a sequential pattern as indicated in Figure 1.Bolts should be tightened to the appropriate torque as specified for the bolting material used.

**Note:** After bolts have been tightened, it is good practice (particularly when stainless steel bolting is used), to recheck flange bolt torque's one-half to one hour after initial tightening.

**Warning:** As is the case with most valve types, valves available on the market today (regardless of manufacturer), with valve stem seals may require periodic adjustment, therefore, installations, that do not allow access to the valve stem should be avoided.

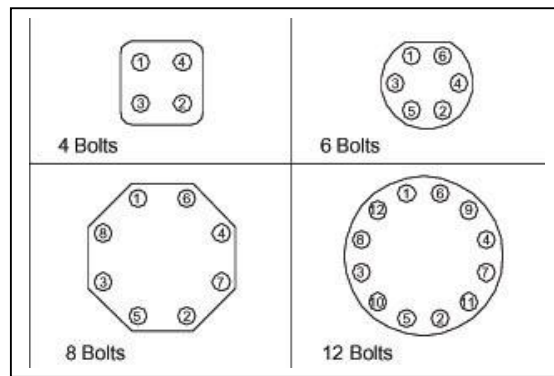


Figure 1

### 3.Valve Operation

All ball valves feature quarter-turn operation. Turning the valve handle 90° counter-clockwise rotation will fully open the valve. The valve handle also serves as a ball orifice position indicator. When the valve handle is parallel is to the pipe, the valve is open, when perpendicular to the pipe, the valve is closed.

All ball valves are designed to provide optimum bubble tight performance when properly selected.

To provide the longest possible service life, a hand-operated ball valve should be operated in either its fully open or fully closed position. Excessive pressure drops could have an adverse affect on the service life of the valve.

All ball valves are assembled using an FDA approved non-silicone based lubricant. If the presence of this lubricant is objectionable it can be removed by thoroughly flushing the valve with a solvent.

The below listed torques are the normal expected breakaway torques. These values represent the maximum force required to begin to open the valve. Typically, this breakaway torque is the maximum torque requirement of the valve during a closed-to open, open-to-closed cycle. Bear in mind that these values have been

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confirmed by laboratory testing of each valve size. While pressurized with water to its maximum pressure rating. Certain highly viscous or abrasive services could cause an increase in torque requirements.

**TABLE 1. MAXIMUM EXPECTED BREAKAWAY TORQUES**

| VALVE SIZE       | CLASS 150   | CLASS 300   |
|------------------|-------------|-------------|
| 1" FP            | 130in-lbs   | 130in-lbs   |
| 1-1/2" FP, 2" RP | 280in-lbs   | 280in-lbs   |
| 2" FP, 3" RP     | 500in-lbs   | 500in-lbs   |
| 3" FP, 4" RP     | 780in-lbs   | 1000in-lbs  |
| 4" FP, 6" RP     | 2500in-lbs  | 3500in-lbs  |
| 6" FP, 8" RP     | 5500in-lbs  | 12000in-lbs |
| 8" FP, 10" RP    | 12000in-lbs | 27000in-lbs |
| 10" FP, 12" RP   | 23000in-lbs |             |

### 4. Maintenance

During its normal service life, the only maintenance that may be required by your ball valve should be periodic stem seal adjustment. If leakage at the stem is noted, simply tighten the gland plate bolts evenly until leakage subsides. **DO NOT OVERTIGHTEN AS PREMATURE WEAR COULD RESULT.**

It is impractical to predict frequency of stem adjustment as it is influenced by such factors as frequency of cycling and service media.

**Important:** As is the case with ANY valve on the market today, it is important that stem leaks do not go unattended. Lack of maintenance of stem leakage could cause a premature need to replace stem seals.

**Note:** If operating temperature of system is substantially higher or lower than 80 °F, initial stem seal adjustment may be required to prevent leakage.

### 5.Rebuiding

**WARNING:** Most standard bi-directional ball valves on the market today, regardless of manufacture, can trap fluids in the valve cavity when closed. If your ball valve has been used to conduct a hazardous media, the following steps must be taken prior to removal from line and disassembly.

1.Relieve the pressure.

2.Place valve in its half-open position and flush the line to remove the hazardous material from the valve cavity. The valve can now be removed from the line.

NOT: ALWAYS advise maintenance personnel when they are maintaining or rebuilding a valve that has been conducting hazardous material.

Proper protective clothing and eye protection should always be utilized.

3.To replace seats and seals:

- Having assured that BOTH line and valve cavity pressures have been relieved, remove the valve from the line.
  - Place the valve in a vice or other suitable retention tool that will adequately support the valve while it is being disassembled.
  - Remove all body bolts.
  - Place valve in its close position and remove body seal, ball and seats.
  - NOTE: If condition of the ball surface allows for its reuse, be sure to handle and store the ball in such a fashion as to prevent subsequent damage to its critical surfaces.
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- Remove the valve handle, gland-packing plate, and remove the valve stem through the body cavity.
  - f. Remove the stem thrust washer from the stem (or the valve body cavity of the washer did not remove with the stem).

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- g. Remove stem seats.
- h. Examine all metallic sealing surfaces such as ball, stem shank, and surfaces within the valve halves that contact the back face of the seats.

In some cases, slight scratches across the sealing surfaces of the body halves and stem can be removed using a light emery cloth. If scratches across sealing surfaces of the body halves are severe and cannot be removed, the entire valve must be replaced. If ball and/ or stem is excessively damaged, ball and stem kits can be ordered. Consult your Agent.

### RE-ASSEMBLY

Having assured that all critical surfaces have been inspected, cleaned, and/ or replaced, re-assembly can begin.

- Lightly lubricate seats and body seal using lubricant that is compatible with the service media.
- Install body side seat (larger body portion that contains the ball).
- Place the new thrust washer on the stem and install the stem through the body cavity.
- Install stem seals.
- Tighten gland plate bolts in accordance with the torques listed on Table # 2.
- Re-install ball.
- Install the second seat and body seal and tighten valve body bolts in accordance with the torques listed on Table # 2.
- Re-install handle.

TABLE 2.RE-ASSEMBLY TORQUES

| Valve Size             | Body Bolt Torque (Ft-Lbs) Minimum * | PTFE Gland Plate Nut Torque (In- Lbs) | GRAFOIL Gland Plate Nut Torque (In- Lbs) |
|------------------------|-------------------------------------|---------------------------------------|--|
| 1"bore cl. 150/300     | 13"                                 | 17/63                                 | 42/84                                    |
| 1-1/2"bore cl. 150/300 | 32"                                 | 17/63                                 | 42/84                                    |
| 2"bore cl. 150/300     | 32"                                 | 17/63                                 | 42/84                                    |
| 3"bore cl. 150/300     | 36"                                 | 50/192                                | 128/255                                  |
| 4"bore cl. 150/300     | 71"                                 | 56/217                                | 145/290                                  |
| 6"bore cl. 150         | 64"                                 | 33/204                                | 206/406                                  |
| 6"bore cl. 300         | 109"                                | 109/424                               | 283/565                                  |
| 8"bore cl. 150         | 171"                                | 45/424                                | 283/565                                  |
| 8"bore cl. 300         | 280"                                |                                       |  |
| 10"bore cl. 150        | 132"                                |                                       |  |

\* During re-assembly, tighten the body stud nuts until there is no gap between the body and adapter.