



OPERATION AND MAINTENANCE MANUAL

NUTRON BALL VALVE

Model T3

1/2" FP – 4" RP 150# - 2500#

1/4" FP – 4" RP 1000 WOG – 6000 WOG

FLANGED, FNPT and WELD END

For technical questions, please contact the following:

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OPERATION

The Nutron Model T3 ball valve is a floating ball, quarter turn valve designed for shut off service. The ball valve construction is a three piece threaded design. The handle direction corresponds with the valve position. When the handle is inline with the body, the valve is open and if at a right angle to the body, the valve is closed. The valve should be operated until the capscrew head travel stop limits the handle's movement. Operating the valve in a partially open or partially closed position will damage and/or shorten the life of the valve seats.

Due to the critical nature of pressurized piping systems it is recommended that the compatibility to the service of the metallic and non-metallic components be confirmed prior to installation.

CAUTION

READ CAREFULLY BEFORE INSTALLING OR OPERATING THE VALVE

Hazards are inherent with the construction, operation and maintenance of high pressure piping systems. The following information and precautions are provided to minimize these hazards:

- 1. The valve's nameplate indicates maximum operating pressure, as well as minimum and maximum operating temperatures. The valve may be safely operated within these limits.*
- 2. The valve's end connections are provided in accordance with ASME flanged end, threaded end or weld end requirements.*
- 3. T3 valves are firesafe, and are in accordance with API 607 requirements.*
- 4. The valve has been factory pressure tested based on the nameplate maximum operating pressure.*
- 5. The valves may be lifted using slings. Fittings and other devices, which may be attached to the valve, are not intended to be used as lifting points. Always follow local safety regulations when lifting heavy valves.*
- 6. Nutron valves are designed, manufactured and tested under a certified quality system. Only quality parts and materials are used in the assembly of Nutron valves. Pressure containing components are suitable for the minimum temperature marked on the nameplate. Factory certification is available. (Note: Some NPT valves may be marked only with maximum temperature.)*
- 7. If the valve, in service, is exposed to hazards such as traffic, wind or earthquake loading contact the factory, if it is necessary, to confirm that the valve design is suitable for the application. The factory requires a complete description of the hazard before making any recommendations.*
- 8. If the valve, in service, is exposed to hazards such as excessive piping system reaction forces and moments contact the factory, if it is necessary, to confirm that the valve design is suitable for the application. The factory requires a complete description of the hazard before making any recommendations.*
- 9. If the valve, in service, is exposed to hazards such as corrosive or abrasive fluids or atmospheric conditions contact the factory, if it is necessary, to confirm that the valve design is suitable for the application. The factory requires a complete description of the hazard before making any recommendations.*
- 10. The valve has been designed and manufactured so that under normal operation conditions hazards such as material fatigue, brittle fracture, creep rupture or buckling*

will not occur. Do not operate the valve beyond the pressures and temperatures marked on the nameplate. The factory requires a complete description of the hazard before making any recommendations.

11. *The user is responsible for minimizing other hazards associated with the construction, operation and maintenance of high pressure piping systems, such as:*
 - a. *Possibility of decomposition of unstable fluids*
 - b. *Provisions for the release or blow off of pressure*
 - c. *Prevention of physical access to system under pressure*
 - d. *Prevention of physical access to surfaces at extreme temperature*
 - e. *Provisions for inspection*
 - f. *Provisions for draining and venting*
 - g. *Provisions for filling*
 - h. *Provision for equipment access*
 - i. *Prevention of over-pressurization, over-heating and over-filling*
 - j. *Provision for fault indication*
12. *The user is responsible for meeting applicable local safety regulations.*

INSTALLATION

All valves are shipped in the open position with protective covers on the end connections to prevent contaminants from entering the valve cavity and potentially damaging the ball or resilient seat surfaces during storage. The covers should be repaired or replaced if damaged and not removed until the valve is to be installed.

For handling the valve, proper slings and rigging procedures must be used. Attached fittings, gearboxes, actuators, handles and pipe handles are not to be used as lifting points. The valves should be rigged such that the slings safely clear all fittings, gearboxes, actuators, handles and pipe handles.

When installing the valve, it must remain in the fully open position to protect the seal surfaces of the ball from damage. Leave the valve in the open position and do not operate until the line has been thoroughly cleaned and flushed. Valves, which need to be positioned either fully opened or fully closed, can be locked in place with optional locking device.

The valve may be installed with flow in either direction. It may be positioned horizontally, vertically or at a gradient without impairing the operation of the valve.

Valves installed at the end of a line require that all appropriate and necessary safety practices be followed.

For actuated valves, please refer to the actuator manufacturer's specifications for the valve's orientation to ensure optimal performance.

If system hydrostatic tests are to be performed at pressures exceeding the rated working pressure of the valve, the ball should be left in the partially opened position. This prevents seats from experiencing these pressures while the body cavity can accept up to 150% rated working pressure.

After pressure tests, with the valve in the half open position and all test pressure relieved, the body cavity should be completely drained via the attached piping system to prevent corrosion. The valve may then be placed in the required operating position.

Flanged Connections

Care must be taken not to damage the flange seal faces and that they are clean for assembly. The end-user must provide gaskets and mating flanges of equal ratings to that of the valve for proper installation. When bolting the flanges together, bolt threads should be lubricated to obtain maximum loading on the bolts. The bolts should be tightened using a criss-cross pattern for even loading. When ring type joints are supplied the ring number is marked on the rim of the RTJ flange.

MAINTENANCE

CAUTION: *Safety practices for pressurized equipment must be followed and address hazards inherent in pressurized systems. Extreme caution and safety procedures are to be exercised whenever a valve, or fitting in a valve, are serviced or maintained.*

The valve requires no periodic maintenance. If the valve leaks by the stem seal (Key 9), tighten both capscrews (Key 13) equally to re-compress the stem packing.

TOOLS REQUIRED FOR DISASSEMBLY AND ASSEMBLY

List for all valve sizes:

Allen Keys: 5/32, 3/16, 1/4 or 5/16

Wrench sizes for handle nuts: 7/16, 1/2, 11/16 or 15/16

2-1/2" Chain Wrench or Vice

6" Screwdriver

20" Adjustable Wrench

Lubricant Jetlube KOPR-KOTE or equivalent

Loctite 549 or equivalent

DISASSEMBLY

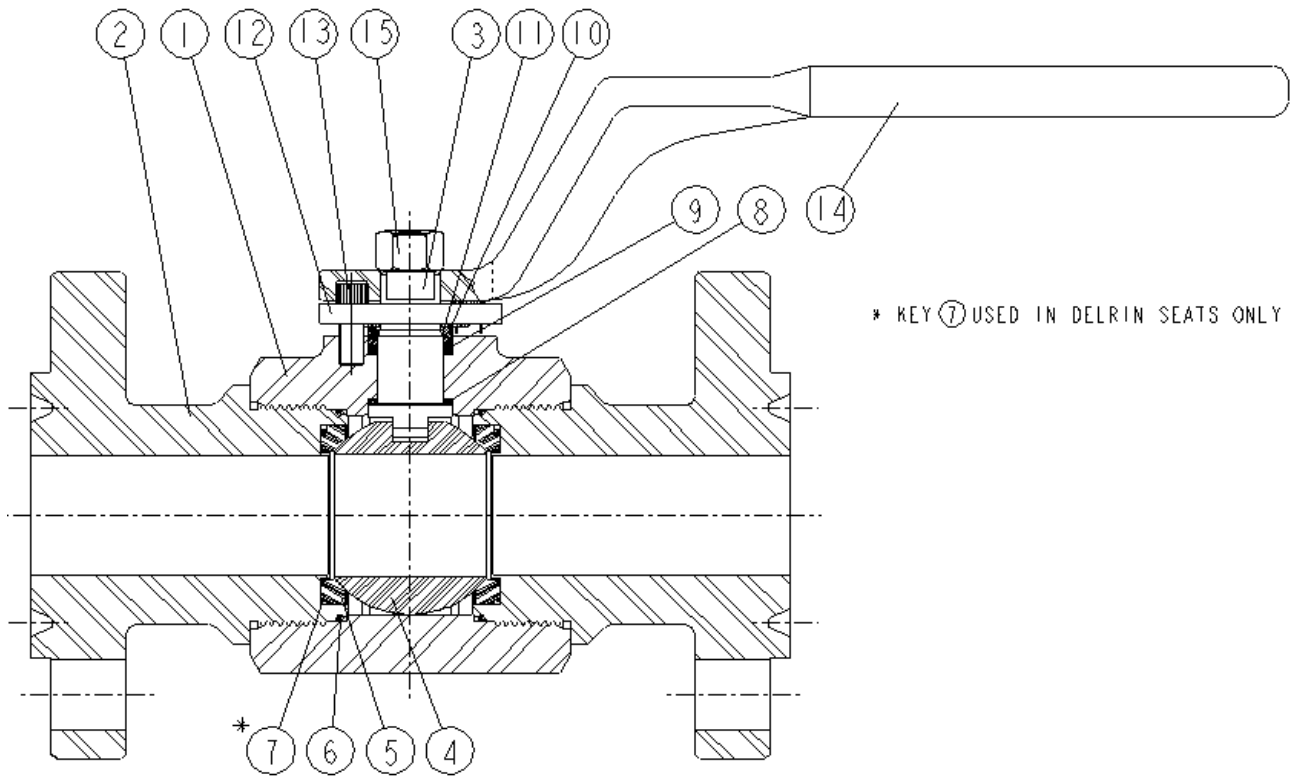
- 1. **CAUTION:** Before removal from the line and before disassembly isolate the valve from line pressure. With the valve in the half open position ensure all pressure is bled from the valve body via the attached piping system.*
- 2. Remove handle capscrew (Key 15) or nut followed by the handle (Key 14).*
- 3. Remove the gland flange capscrews (Key 13), gland flange (Key 12), belleville washer (Key 11), and packing follower (Key 10) from the valve.*
- 4. For flange connections, scribe line-up marks on the body and caps. Mark the caps to determine which side of the valve they are removed from. This ensures the caps are fully tightened upon reassembly and installed on proper side.*
- 5. Unscrew 1st cap (Key 2) from the body (Key 1). Remove the body seal (Key 6), seat (Key 5) and seat seal¹ (Key 7) from cap (Key 2). NOTE: Heat may be required to remove cap from body as Loctite was used in assembling the valve.*
- 6. Remove the ball (Key 4) from the valve. The ball must be in the closed position.*
- 7. Remove the stem (Key 3), stem packing (Key 9) and the stem thrust washer (Key 8) from the body (Key 1).*

8. *Clean and inspect all components for wear and/or damage:*
 - ~ *replace ball if it has nicks, pits, or scars in the sealing areas or if damage has occurred where the stem inserts into the ball*
 - ~ *replace seats if there are nicks, cuts, or deformation of the sealing surface*
 - ~ *inspect thrust washer (Key 8) for wear or damage*
 - ~ *remove all o-rings and replace if broken, nicked, stretched, swollen, hard, brittle or sticky*

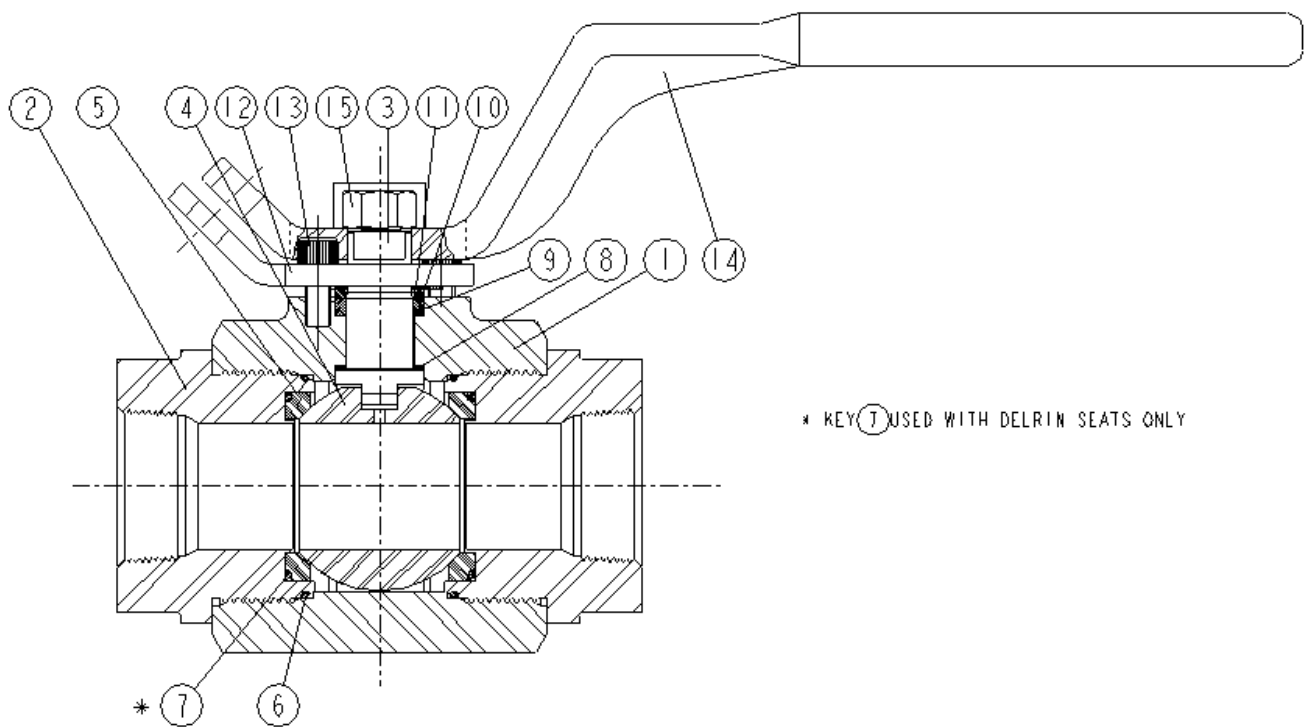
ASSEMBLY

1. *Ensure all components for the assembly are clean of dirt and contaminants. Install seats (Key 5) and seat seals¹ (Key 7), if required, on to the end connections. Ensure that the correct sealing surface of the seat is facing the ball. Apply a compatible light grease to the seat or seat/o-ring assembly, and its mating bore.*
2. *Install body seal (Key 6) onto 1st cap and apply grease to seal. Apply Loctite to the threads of the cap and screw cap fully into the valve body. Tighten with chain wrench, on flanged ends, until scribed line of body and cap are lined up.*
3. *Apply Jetlube KOPR-KOTE or equivalent to stem (Key 3). Place the thrust washer (Key 8) on the stem (Key 3) and insert into the valve body (Key 1).*
4. *Install the ball (Key 4) into the valve body. NOTE: Ball to be in closed position when tightening caps.*
5. *Install body seal (Key 6) on 2nd cap and grease the seal.*
6. *Screw the cap (Key 2) fully onto the valve body and tighten with a chain wrench, on flanged ends, until scribed line of body and cap line up.*
7. *Place the stem packing (Key 9) followed by the packing follower (Key 10) on the valve stem (Key 3).*
8. *Place the belleville washer (Key 11) on the valve stem. Ensure the washer is installed correctly.*
9. *Install the gland flange (Key 12) and capscrews (Key 13) and tighten equally until the belleville washer is flattened fully. Ensure that the gland flange is installed so that the valve closes clockwise. When necessary, gland flange may be turned 90 degrees to allow clockwise opening of the valve.*
10. *Place the handle (Key 14) on the valve stem and secure with the handle nut (Key 15).*
11. *Ensure valve operates properly and leave in the full open position.*
12. *Valve should be tested to the appropriate specifications.*

¹ *Only applicable in some Delrin Seated Valves*



Nutron - T3 Ball Valve – Flanged



Nutron - T3 Ball Valve – FNPT