



OPERATION AND MAINTENANCE MANUAL

NUTRON BALL VALVE

MODEL B3

1 1/2" FP – 6" RP 150# - 2500#

For technical questions, please contact the following:

*Engineering Department
2125 - 64 Avenue
Edmonton, Alberta, Canada
T6B 1Z4
Phone: (780) 468-2732
Fax: (780) 450-1359*

OPERATION

The Nutron Model B3 ball valve is a floating ball, quarter turn valve designed for shut off service. The ball valve construction is a three piece bolted non-welded 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 cap screw 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 or threaded end requirements.*
- 3. B3 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.*
- 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 cap screws equally (Key 13) to re-compress the stem packing.

TOOLS REQUIRED FOR DISASSEMBLY AND ASSEMBLY

1-1/16", 1-1/4", 1-7/16", 1-5/8", 1-13/16" or 2" Wrench

12 Oz Hammer

3/8" Allen Key

6" Screwdriver

O-Ring grease

Brush

Lubricant KOPR-KOTE or equivalent

Loctite 549 or equivalent

1/8" Allen Key for handle nut

DISASSEMBLY

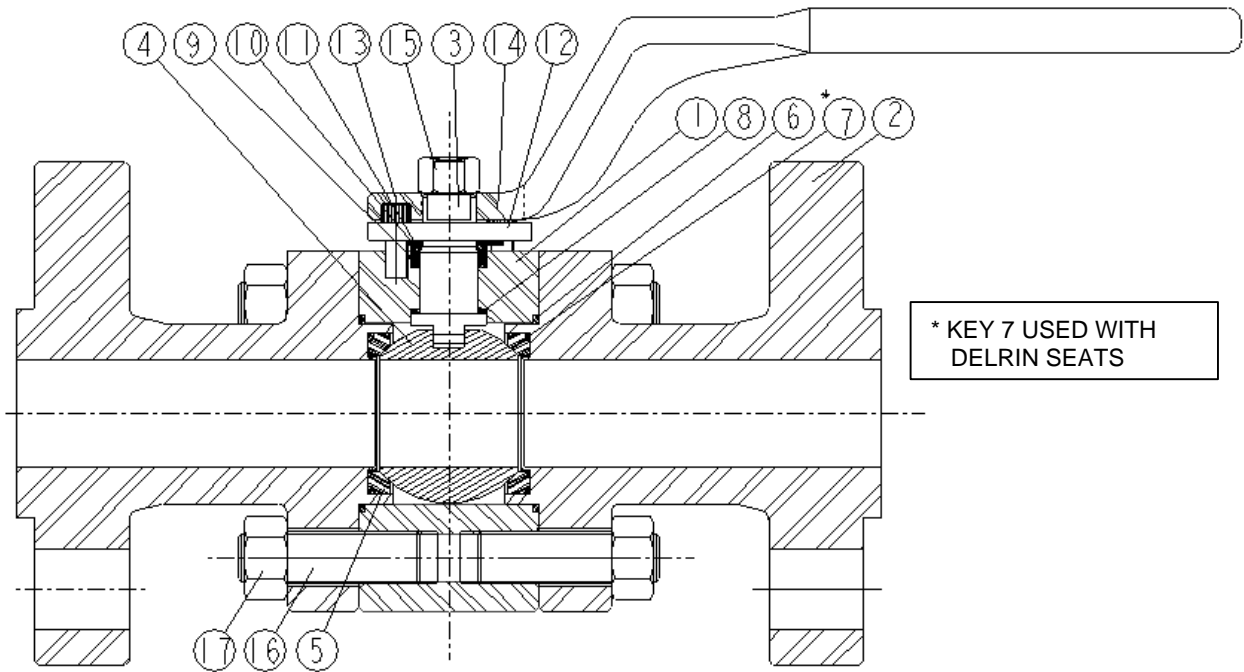
1. **CAUTION:** Before removal from the line and before disassembly isolate the valve from the line pressure. With the valve in the half open position ensure all pressure is bled from the valve body via the attached piping system.
2. 3" FP & 4" RP 600 ANSI and up: Remove thumbscrew (Key 20), set screw (Key 19), handle bar (Key 15) and handle nut (Key 14). 4" FP & 6" RP only: Remove capscrew (Key 15) and handle assembly (Key 14) from the stem (Key 3). Up to 3" RP & FNPT only: Remove handle nut (Key 15) followed by the handle (Key 14).
3. 3" FP, 4" RP, 4" FP & 6" RP: Remove stem key (Key 18), capscrews (Key 13), gland flange (Key 12), belleville washer (Key 11) and packing follower (Key 10) from the valve.
4. Remove nuts/studs or capscrews (Key 16/17) from the body cap (Key 2) using a criss-cross pattern.
5. Remove the 1st cap (Key 2) from the body (Key 1). Remove the body seal (Key 6) and seat (Key 5) seat o-ring¹ (Key 7) from the cap.
6. Rotate the ball to the closed position by using the stem. Lift the ball (Key 4) out of the body (Key 1) being careful not to damage the surface. Remove the stem (Key 3) by pushing down onto it.
7. Remove the stem packing (Key 9) from the body (Key 1) and the stem thrust washer (Key 8) from the stem (Key 3).
8. Remove 2nd cap as in steps #4 and #5.

9. *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.*

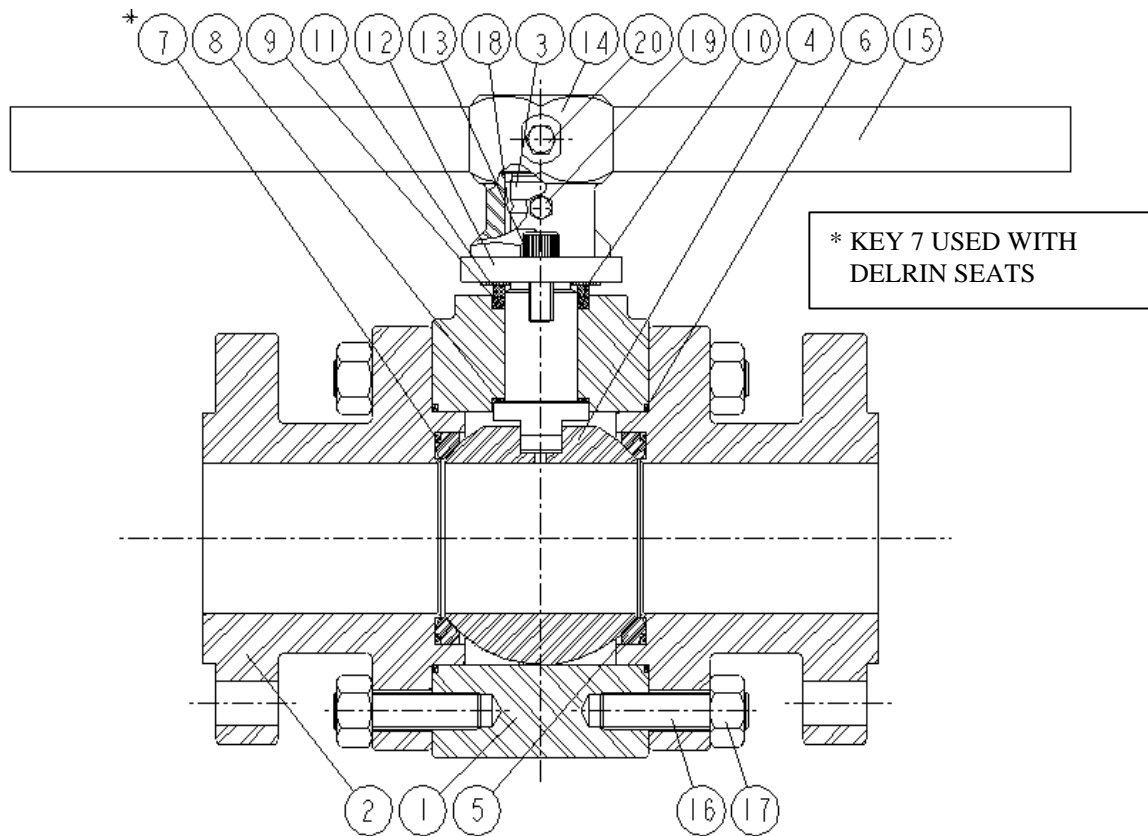
ASSEMBLY

1. *Ensure all components for the assembly are clean of dirt and contaminants.*
2. *Install seat (Key 5) and ¹seat seals (Key 7) into the 1st cap. Ensure that the correct sealing surface of the seat is facing the ball. Apply compatible light grease to the seat or seat/o-ring assembly and its mating bore.*
3. *Install body seal (Key 6) onto cap and grease seal. Apply Loctite to threads of studs/nuts or capscrews. Bolt the cap onto the body with studs/nuts or capscrews (Key 16/17). Tighten bolts securely.*
4. *Apply Jetlube KOPR-KOTE to stem (Key 3). Place thrust washer (Key 8) on the stem (Key 3) and insert into the valve body (Key 1).*
5. *Install ball (Key 4) into body. Keep in closed position when tightening end cap using a criss-cross pattern.*
6. *Install 2nd cap as in steps #2 and #3.*
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 them equally until the belleville washer is fully flattened.*
10. *1-1/2" FP to 3" RP only: Place the handle (Key 14) on the valve stem and secure with handle nut (Key 15). 3" FP & 4" RP 600 ANSI and up: Place stem key (Key 18) in valve stem (Key 3). Place handle nut (Key 14) on valve stem. Insert setscrew (Key 19) and tighten. Place handle bar (Key 15) through hole on handle nut. Use screw (Key 20) to tighten handle. 4" FP & 6" RP only: Place stem key (Key 18) in valve stem (Key 3). Place handle assembly (Key 14) on valve stem. Use capscrew (Key 15) to tighten handle. NOTE: Do not lift valve by the handle.*
11. *Ensure valve operates properly and leave in the full open position.*
12. *Valve should be tested to the appropriate specifications.*

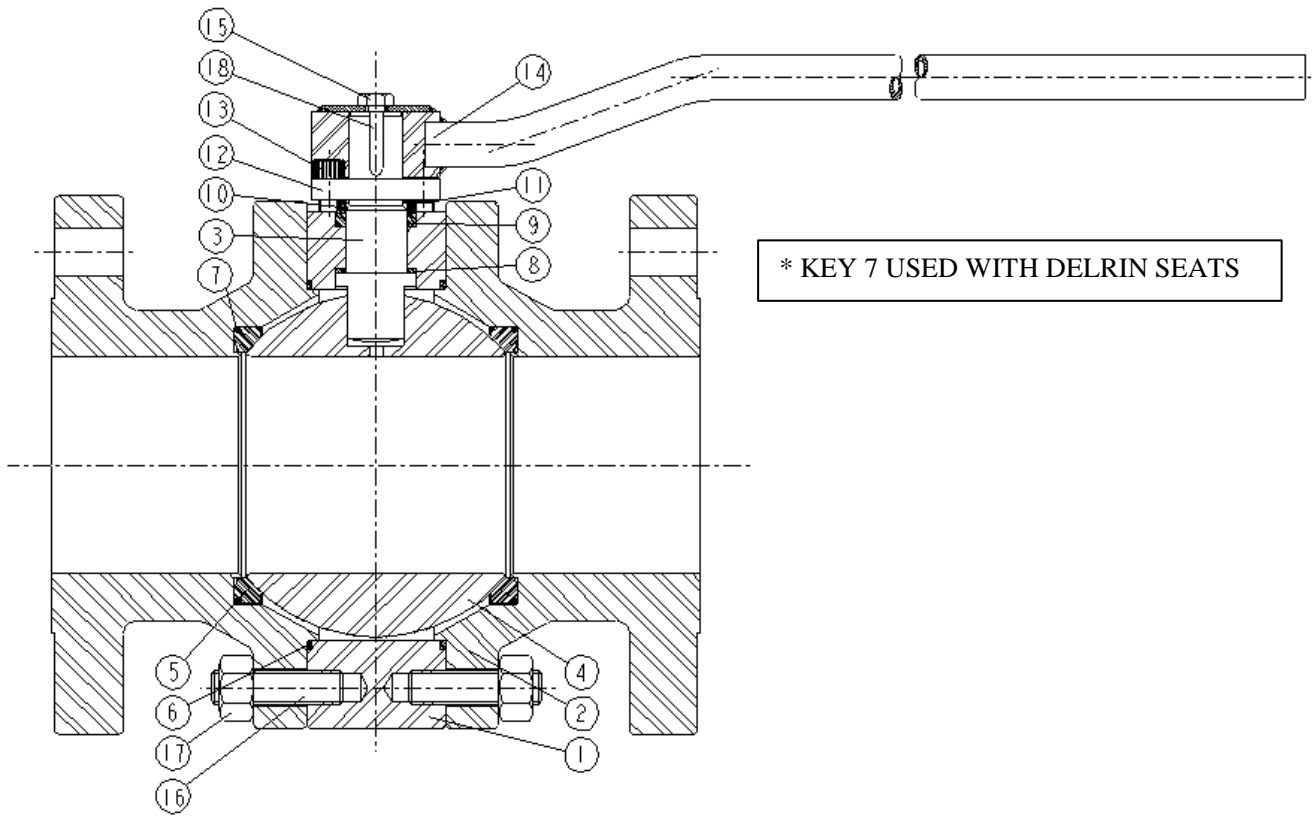
¹ Only applicable in Delrin Seated Valves



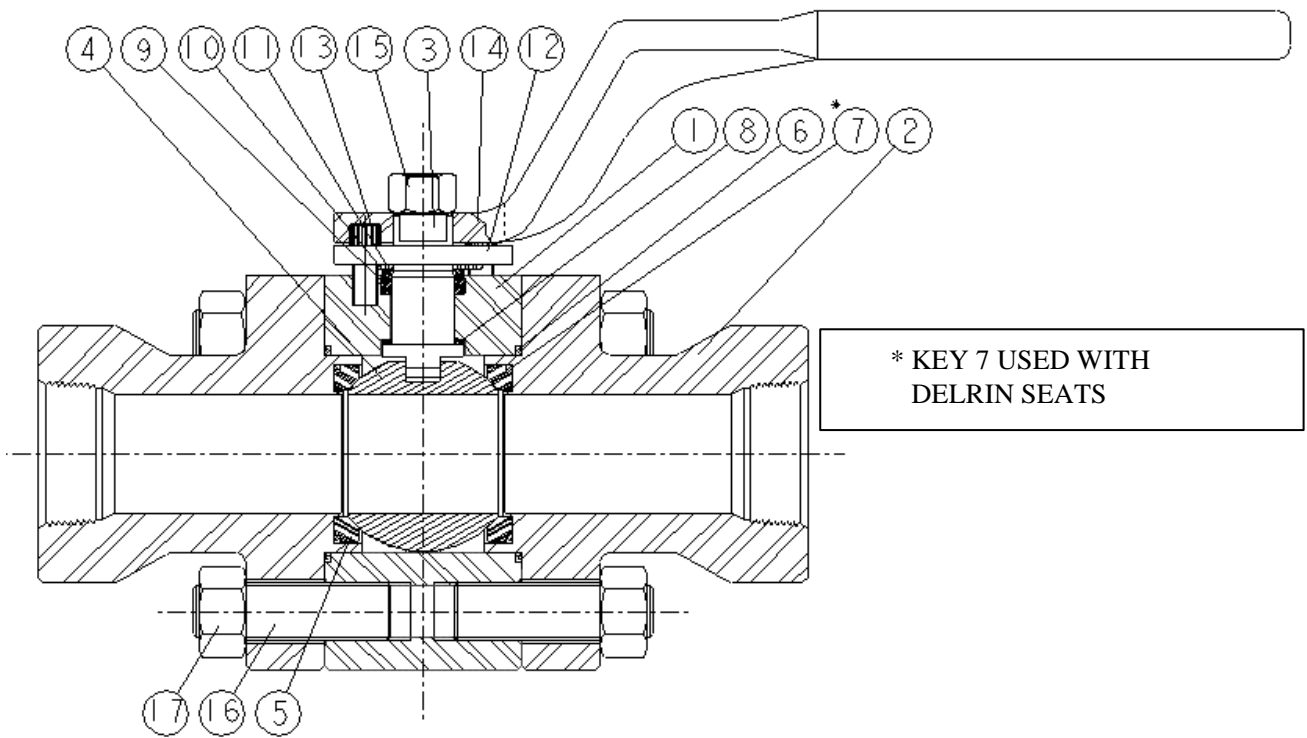
Nutron - B3 Ball Valve – Up to 3” RP



Nutron - B3 Ball Valve - 3” FP & 4” RP 600 ANSI and up



Nutron - B3 Ball Valve – 4” FP & 6” RP



Nutron - B3 Ball Valve - FNPT