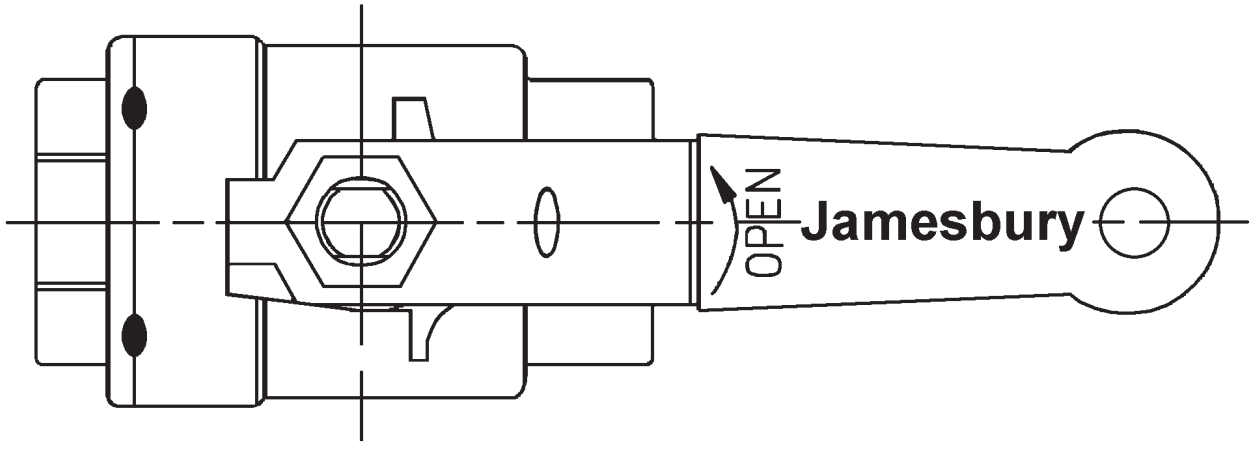
Jamesbury valves
2-piece ball valves
series 6FR Value-Line™
1/2” - 3” (DN 15 - 80)

Installation, maintenance and
operating instructions



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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

1. GENERAL

1.1 SCOPE OF THE MANUAL

This instruction manual contains important information regarding the installation, maintenance, and troubleshooting of Jamesbury™ 1/2” - 3” (DN 15 - 80) Series 6FR *Value-Line* 2-piece Ball Valve. Please read these instructions carefully and save them for further reference.

WARNING

THE USE OF A VALVE IS APPLICATION SPECIFIC. BE SURE THE VALVE IS SUITABLE FOR ITS INTENDED SERVICE. IF YOU HAVE ANY QUESTION OR DOUBT, ASK YOUR SUPERVISOR. MIS-APPLIED VALVES CAN RESULT IN THE SUDDEN RELEASE OF PRESSURE, DAMAGE OR PERSONAL INJURY.

1.2 VALVE MARKINGS

The valve has an identification marking stamped on bottom of valve. (**See Figure 1**).

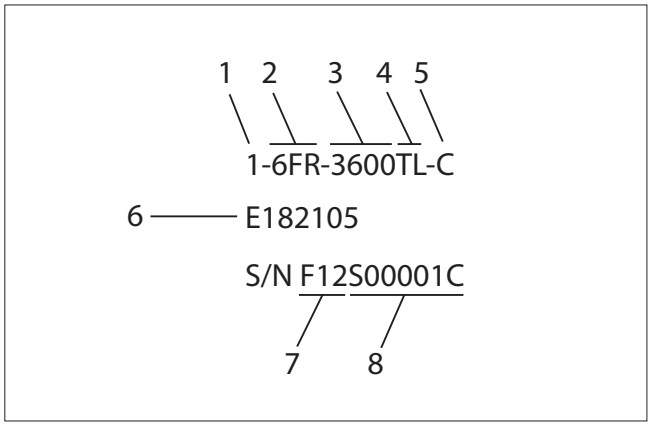


Figure 1.

Identification markings:

1. Size
2. Valve Series
3. Body/Trim Material
4. Seat/Seal Material
5. Model
6. AAR number
7. Assembly date
8. Serial number

1.3 SAFETY PRECAUTIONS

WARNING

DOUBLE-SEATED BALL VALVE DESIGNS, LIKE THE SERIES 6FR, CAN UNDER CERTAIN CONDITIONS TRAP FLUID IN THE BALL CAVITY. RAISING THE TEMPERATURE OF THE TRAPPED FLUID CAUSES THE INTERNAL VALVE PRESSURE TO RISE. EXTREME TEMPERATURE RISE CAN BUILD UP EXCESSIVE PRESSURE WHICH COULD LEAD TO UNCONTROLLED PRESSURE RELEASE. DAMAGE OR PERSONAL INJURY MAY RESULT!

WARNING

DO NOT EXCEED THE VALVE PERFORMANCE LIMITATIONS!

EXCEEDING THE PRESSURE OR TEMPERATURE LIMITATIONS MARKED ON THE VALVE IDENTIFICATION PLATE, OR BODY, MAY CAUSE DAMAGE AND LEAD TO UNCONTROLLED PRESSURE RELEASE. DAMAGE OR PERSONAL INJURY MAY RESULT!

WARNING:

SEAT AND BODY RATINGS! (NON-ASME RATED VALVES)

THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE CWP RATINGS: CAREFULLY CHECK BOTH RATINGS. THIS IS THE SAFE USE PRESSURE FOR THE VALVE BETWEEN -20 TO +100°F (-29 TO +38°C). DO NOT EXCEED THESE RATINGS! FOR INSTALLATION TEMPERATURES BELOW AND ABOVE THESE LIMITS, CONTACT VALMET.

WARNING:

BEWARE OF BALL MOVEMENT!

KEEP HANDS, OTHER PARTS OF THE BODY, TOOLS AND OTHER OBJECTS OUT OF THE OPEN FLOW PORT. LEAVE NO FOREIGN OBJECTS INSIDE THE TANK CAR. WHEN THE VALVE IS ACTUATED, THE BALL FUNCTIONS AS A CUTTING DEVICE. DISCONNECT ANY PNEUMATIC SUPPLY LINES, ANY ELECTRICAL POWER SOURCES AND MAKE SURE SPRINGS IN SPRING-RETURN ACTUATORS ARE IN THE FULL EXTENDED/ RELAXED STATE BEFORE PERFORMING ANY VALVE MAINTENANCE. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY!

WARNING:

BEWARE OF NOISE EMISSIONS!

THE VALVE MAY PRODUCE NOISE IN THE PIPELINE. THE NOISE LEVEL DEPENDS ON THE APPLICATION. OBSERVE THE RELEVANT WORK ENVIRONMENT REGULATIONS ON NOISE EMISSION

2. TRANSPORTATION AND STORAGE

Check the valve and the accompanying devices for any damage that may have occurred during transport.

Store the valve carefully. Storage indoors in a dry place is recommended.

Do not remove the flow port protectors until installing the valve.

Move the valve to its intended locations just before installation.

The valve is usually delivered in the open position.

If the valve(s) will be stored for a long period, follow the recommendations in IMO-S1 to maintain valve's integrity.

3. INSTALLATION

3.1 GENERAL

Remove the flow port protectors and check that the valve is clean inside. Clean valve if necessary.

Flush the tank car carefully before installing the valve. Foreign objects, such as sand or pieces of welding electrodes, will damage the ball and seats.

3.2 HANDLES

If the valve handle (15) has to be removed for any reason, the handle must be remounted in the same orientation.

WARNING:
FAILURE TO PROPERLY MOUNT THE HANDLE MAY RESULT IN IMPROPER VALVE OPERATION, DAMAGE OR PERSONAL INJURY.

3.3 INSTALLING ON TANK CAR

The valve may be installed in any position and offers tightness in both directions. It is recommended, however, that the valve be installed with the cap (2) towards the tank car. Use standard piping practices when installed valves with threaded parts. When tightening the valve to the tank car, apply a wrench to the end nearest the pipe being worked. (See **Figure 2**) Refer to **Section 4**, **MAINTENANCE**, for stem seal adjustment. If there is weepage past the stem seals upon installation, it means the valve may have been subject to wide temperature variations in shipment. Leak-tight performance will be restored by a simply stem seal adjustment described in the **MAINTENANCE** section.

3.4 COMMISSIONING

Ensure that there is no dirt or foreign objects left inside the valve or tank car. Flush the tank car carefully. Make sure that the valve is fully open when flushing.

Ensure that all nuts and fittings are properly fastened.

WARNING:
GOOD PRACTICE DICTATES THAT ONCE INSTALLED, BUT PRIOR TO FIRST USE, THE VALVE IS LEAK TESTED IN PLACE TO ASSURE LEAK-TIGHTNESS HAS NOT BEEN COMPROMISED BY THE INSTALLATION PROCESS. INSTALLATION ACTIONS THAT CAN CAUSE LEAKAGE INCLUDE, BUT ARE NOT LIMITED TO; WRENCHING, SOLDERING, WELDING AND/OR HOISTING.

4. MAINTENANCE

4.1 GENERAL

Although *Jamesbury* valves are designed to work under severe conditions, proper preventative maintenance can significantly help to prevent unplanned downtime and in real terms reduce the total cost of ownership. Routine maintenance consists of tightening the hex nut (19) in (**Figure 6**) periodically to compensate for stem seal wear. The inspection and maintenance frequency depends on the actual application and process condition.

Overhaul maintenance consists of replacing seats and seals. A standard repair kit consisting of these parts may be obtained through your authorized Valmet Distributor.

NOTE: Repair kits include stem bearings (8), secondary stem seal (13), seats (5), body seal (6) and stem seals (7). Refer to the Repair Kit chart (**see Table 1**).

WARNING:
FOR YOUR SAFETY, IT IS IMPORTANT THE FOLLOWING PRECAUTIONS BE TAKEN PRIOR TO REMOVAL OF THE VALVE FROM THE PIPELINE OR BEFORE ANY DISASSEMBLY:

1. BE SURE YOU KNOW WHAT FLUID IS IN THE PIPELINE. IF THERE IS ANY DOUBT, DOUBLE-CHECK WITH THE PROPER SUPERVISOR.
2. WEAR ANY PPE (PROTECTIVE CLOTHING OR EQUIPMENT) NORMALLY REQUIRED WHEN WORKING WITH THE FLUID INVOLVED.
3. DEPRESSURIZE THE PIPELINE AND CYCLE THE VALVE AS FOLLOWS:
   A) PLACE THE VALVE IN THE OPEN POSITION AND DRAIN THE PIPELINE.
   B) CYCLE THE VALVE TO RELIEVE RESIDUAL PRESSURE IN THE BODY CAVITY BEFORE REMOVAL FROM THE PIPELINE.
   C) AFTER REMOVAL, AND BEFORE DISASSEMBLY, CYCLE THE VALVE AGAIN SEVERAL TIMES.

Repair Kits include two seats (5), two stem seals (7), two stem bearings (8), a secondary seal (13), and one body seal (6) (**see Table 1**).

TABLE 1
REPAIR KITS

Valve Size	T Seats	M Seats
1/2" (DN 15)	RKN107-TT	RKN107-MT
3/4" (DN 20)	RKN109-TT	RKN109-MT
1" (DN 25)	RKN110-TT	RKN110-MT
1-1/2" (DN 40)	RKN112-TT	RKN112-MT
2" (DN 50)	RKN198-TT	RKN198-MT
3" (DN 80)	RKN225-TT	RKN225-MT

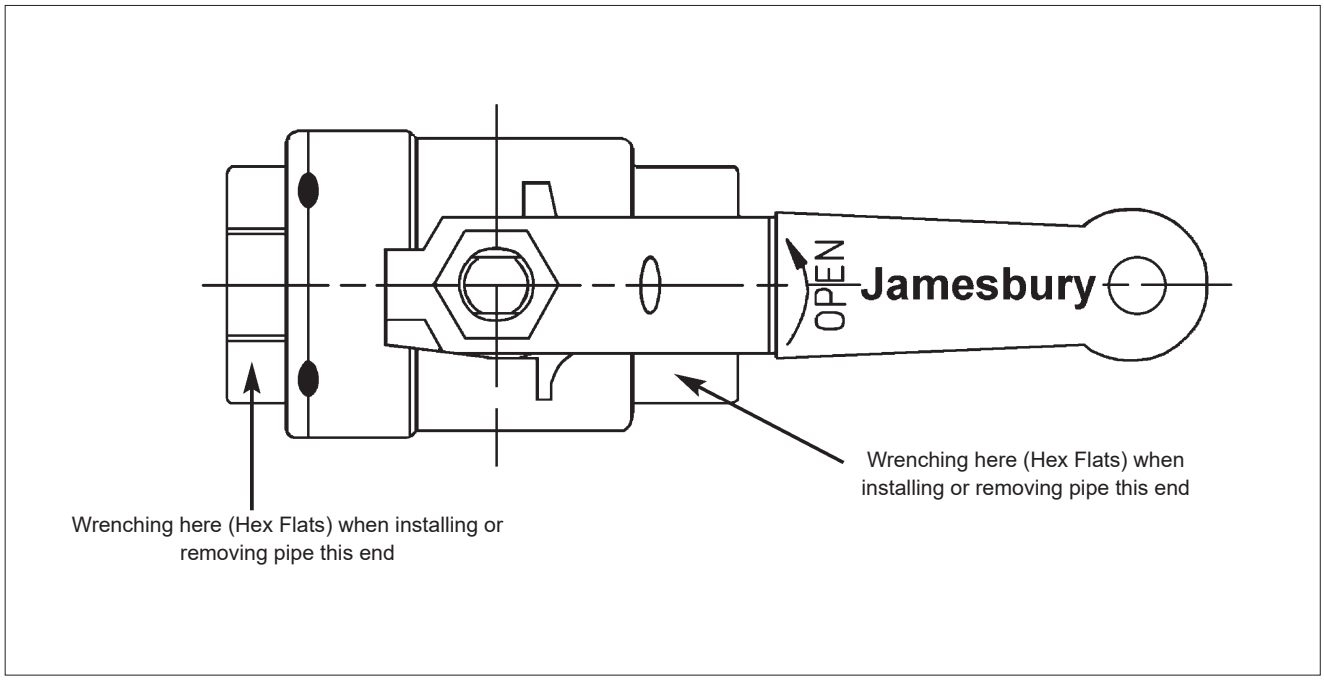


Figure 2.

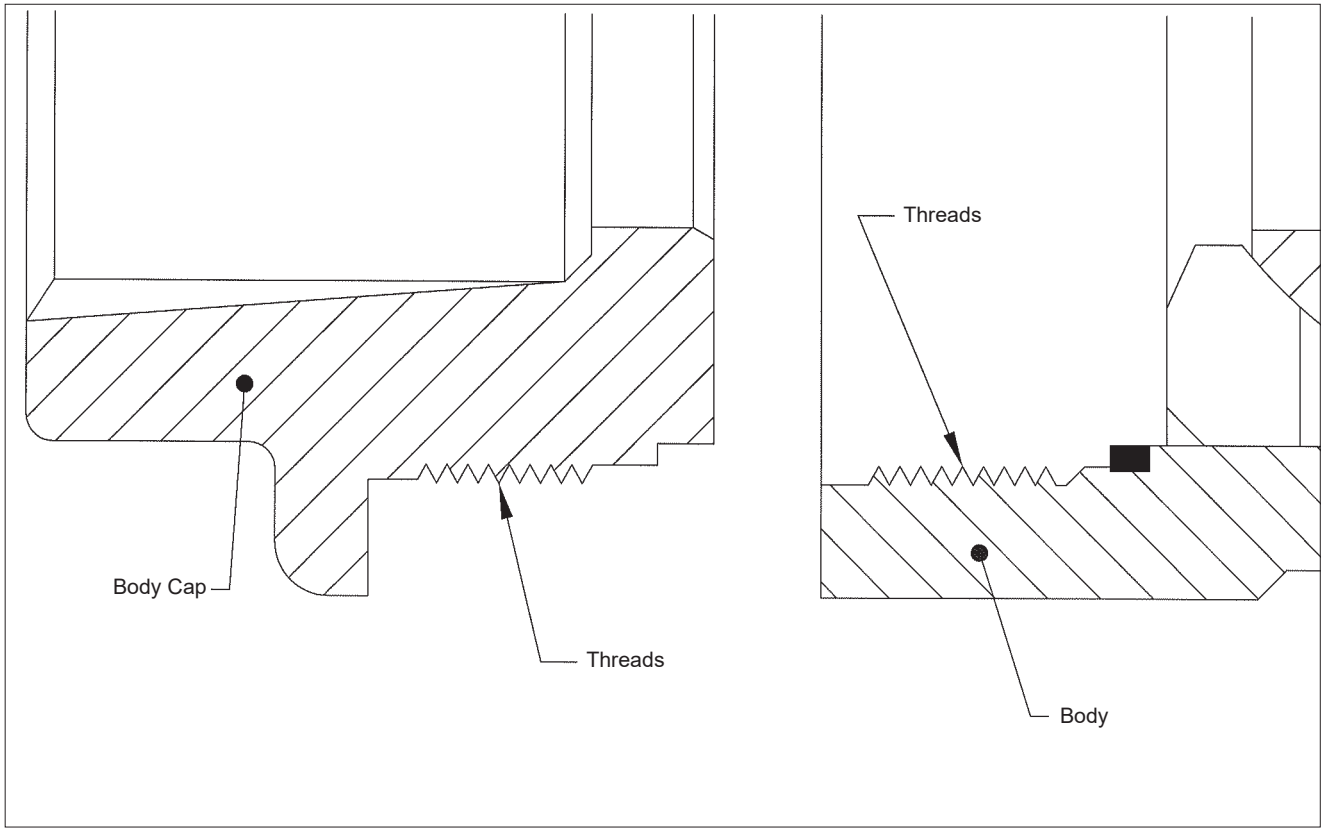


Figure 3.

4.2 DISASSEMBLY

NOTE: If complete disassembly becomes necessary, replacement of all seats and seals is recommended. (Refer to Repair Kits, **Table 1**).

NOTE: Always use original OEM parts to make sure the valve functions properly.

1. Comply fully with **ALL WARNINGS** prior to working on the valve.
2. Open and close the valve and leave in the half open position.
3. Remove the handle nut (16), handle (15) and lower stem nut (19).
4. Remove the compression ring (18).
5. Hand grind the existing welds, and then chisel, to break the remaining weld. Unscrew and remove the body cap (2) and body seal (6).
6. If the ball (3) and seats (5) do not fall from the body with the ball in the fully closed position, use a piece of wood or some other soft material to gently tap the ball (from the end opposite body cap). This will unseat these parts without damaging the ball.
7. Press the stem (4) from the top into the valve body and remove it through the body cap end of the body.
8. Using a wire brush, clean the internal body cap thread and internal body threads (**see Figure 3**).
9. Remove and discard the old stem seals (7), stem bearings (8) and sec. stem seal (13). Be very careful not to scratch any sealing surfaces in the valve body (surfaces on which seats and seal rest).

NOTE: If complete disassembly becomes necessary; it is recommended to replace all seats and seals. Refer to the Repair Kit chart (see **Table 1**).

NOTE: Always use original OEM parts to make sure that the valve functions properly.

10. Remove and discard the old body seal (6). **BE CAREFUL NOT TO DAMAGE THE SEALING SURFACES**.
11. With the ball in the closed position, remove ball (3) and seats (5). **NOTE:** A piece of wood or other soft material may be used to unseat the parts from the opposite side by gently tapping the ball from the end opposite the insert. **BE CAREFUL NOT TO DAMAGE THE BALL OR SEATING SURFACES IN THE BODY**.
12. Press the stem (4) into the body (1) and remove it through the insert side of the valve. It may be necessary to tap it with a piece of wood or some other soft material. **BE CAREFUL NOT TO DAMAGE THE STEM OR BODY SEALING SURFACES**.
13. Carefully remove and discard the stem seal (8) and stem bearings (13) and secondary stem seal (7). **BE CAREFUL NOT TO DAMAGE THE SEALING SURFACES**.

WARNING:
DAMAGING SEALING SURFACES WILL NEGATIVELY AFFECT VALVE SEALABILITY AND PERFORMANCE.

4.3 CHECKING PARTS

NOTE: For detailed instructions on visual inspection of critical components, refer to IMO-R26.

1. Clean all disassembled parts.
2. Check the stem (4) and ball (3) for damage. Pay particular attention to the sealing areas.
3. Check all sealing and gasket surfaces of the body (1) and body cap (2). Also sealing surfaces should be clean, with no corrosion, old seal material or commodity residue.
4. Replace any damaged parts.
5. Replace any parts that have cracks.

4.4 ASSEMBLY

Refer to standard repair kit shown in **Table 1** for replacement seats and seals. Apply lubricant compatible with the flow medium lightly to insert (2) and bonnet cap screws (29) threads to facilitate assembly.

1. Clean all valve parts, if not previously cleaned.
2. Inspect the parts to ensure sealing surfaces are in good condition and all parts are properly cleaned and prepared for assembly. Look for damage to the seating areas, body and insert. Check stem finish in the sealing area. If there are marks, use 600 or greater grit sand paper and polish circumferentially not up and down. Replace any damaged parts.
3. Clamp the valve body (1) lightly but securely in a vise.
4. Apply grease, MolyKote III or equivalent to both seats. Drop one seat (5) into valve body (1) with flat surface on the bottom. See **Figure 4** for proper seat orientation.

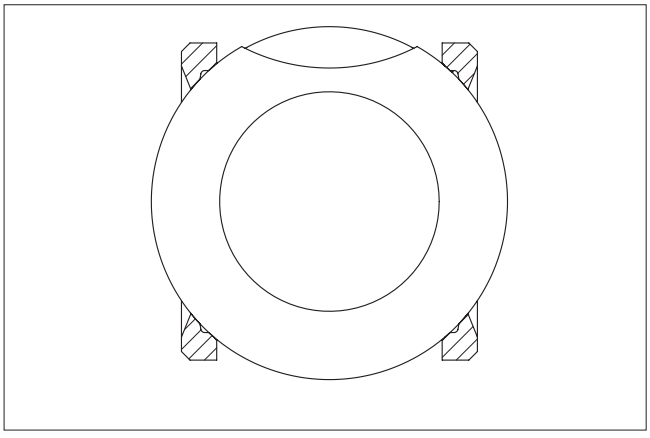


Figure 4. Seats should be in this position at Assembly

5. Insert, from the inside, a stem bearing (8), a sec. stem seal (13), and another stem bearing (8) into the lower stem bore of the body.
6. Insert the stem (4) through the open end of the body (1), being careful not to scratch the stem bearings and stem bearing surfaces. Press it gently up into the stem hole.
7. Holding the stem in place from inside the valve, install two stem seals (7), the compression ring (18), and thread on the stem nut (19) until the stem starts to turn.

8. Place a wrench through the body on the bottom of the stem blade to hold the stem stationary. Place another wrench on the stem nut (19), and turn the nut down until the seals bottom and the stem comes snugly in place. Tighten the stem nut (19) until snug, plus an additional 1/4 - 1/2 turn. Also see **Table 3**.
9. Align the stem blade inside the valve body (1) with the ball (3). Insert the ball (3) and rotate the stem (4) to the ball fully closed position.
10. Insert second greased seat (5) into the body (1) so that the sealing surface of the seat is towards the ball. Insert the body seal (6). See **Figure 4** for proper seat orientation.
11. Insert the body cap (2), screw it down and tighten to the required torque (**see Table 2 for Body Cap Torque specifications**).
12. Place the handle (15) and handle nut (16) over the stem (4). Tighten the handle nut (16) until snug.

TABLE 2	
BODY CAP ASSEMBLY TORQUE	
Valve Size	**Body Cap Torque**
1/2” (DN 15)	100 FT•LBS (136 N•m)
3/4” (DN 20)	225 FT•LBS (305 N•m)
1” (DN 25)	250 FT•LBS (203 N•m)
1-1/2” (DN 40)	350 FT•LBS (475 N•m)
2” (DN 50)	600 FT•LBS (814 N•m)
3” (DN 80)	600 FT•LBS (814 N•m)

Table 3	
STEM NUT TORQUE	
Valve Size	**Torque**
3/4” ((DN 20)	175 IN.-LBS.
1” (DN 25)	200 IN.-LBS.
1-1/2” (DN 40)	220 IN.-LBS.
2” (DN 50)	240 IN.-LBS.
3” (DN 80)	600 IN.-LBS.

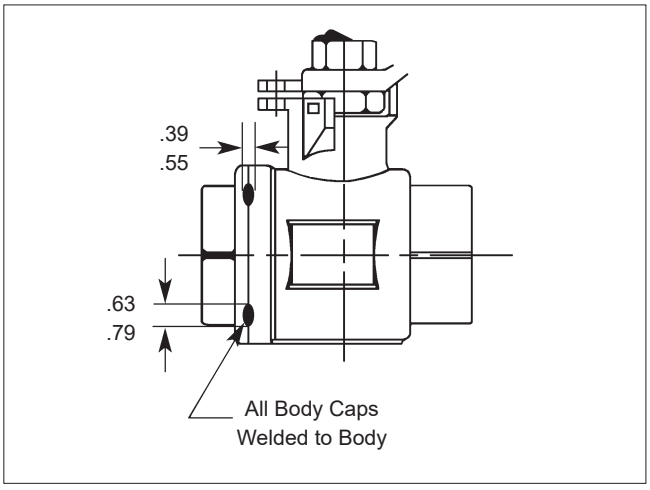


Figure 5.

TABLE 4	
NUMBER OF WELDS	
Valve Size	**No. of Welds Required**
1/2” (DN 15)	2
3/4” (DN 20)	2
1” (DN 25)	3
1-1/2” (DN 40)	4
2” (DN 50)	
3” (DN 80)	

TABLE 5	
WELD ROD REQUIRED	
Valve Material	**Welding Rod Required**
Carbon Steel	AWS 80SD-2 or E70S-2 or E71T-1
Stainless Steel	AWS ER 316/312 or E316LTX-X

13. Cycle the valve slowly twice to ensure permanent position of the ball between the two seats.
14. Weld the body cap to the body following the instructions in **Figure 5 and Table 4**. Welds must be equally spaced ±10°. Weld not to exceed 1/8” (3.175 mm) depth of penetration.

4.5 PRESSURE TESTING THE VALVE

WARNING:

WHEN PRESSURE TESTING, EXERCISE CAUTION AND MAKE SURE ALL EQUIPMENT USED IS IN GOOD WORKING CONDITION AND APPROPRIATE FOR THE INTENDED PRESSURE.

If the valve is to be tested prior to returning to service, make sure the test pressures are in accordance with an applicable standard.

When testing the valve for external tightness, keep the ball in the half open position.

If testing the valve seat tightness, please contact Valmet for advice.

WARNING:

WHEN PERFORMING ANY TESTS, NEVER EXCEED THE MAXIMUM OPERATING PRESSURE OR MAXIMUM SHUT-OFF PRESSURE LISTED ON THE IDENTIFICATION PLATE OR VALVE BODY!

5. REPAIR KITS

Standard repair kits are listed in (**Table 1**). When ordering repair kits for for your valve refer to **Section 1.2**, Valve Markings and check area “4” on your valve’s identification plate to determine the correct seat material for your valve.

6. SERVICE/SPARE PARTS

We recommend that valves be directed to our service centers for maintenance. The service centers are equipped to provide rapid turn-around at a reasonable cost and offer new valve warranty with all reconditioned valves.

NOTE: When sending goods to the service center for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. Include the material safety datasheet(s) (MSDS) for all media flowing through the valve. Valves sent to the service center without MSDS datasheet(s) will not be accepted.

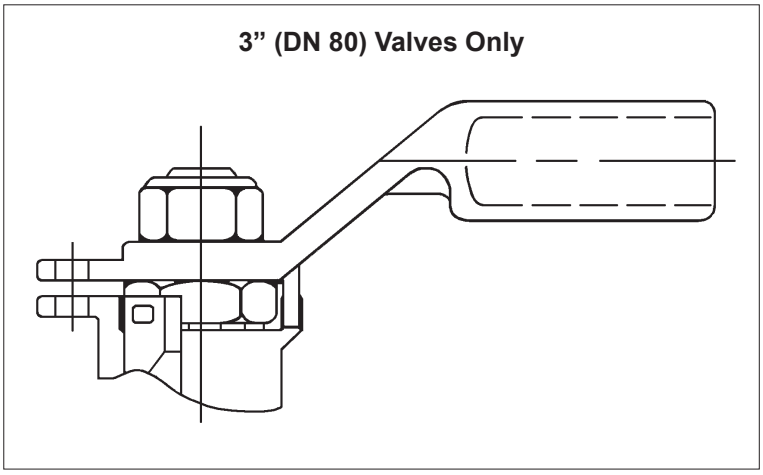
For further information on spare parts and service or assistance visit our web-site at **www.neles.com/products/valves/railroad-valves/catalogue-of-tank-car-valves/**.

NOTE: When ordering spare parts, always include the following information:

a. Valve catalog code from identification marking stamp

b. If the valve is serialized – the serial number (stamped on the valve body)

c. From **Figure 6**, the ballooned part number, part name and quantity required.



VALVE PARTS LIST		
ITEM	PART NAME	QTY
1	Body	1
2	Body Cap	1
3	Ball	1
4	Stem	1
5	Seat	2
6	Body Seal	1
7	Stem Seal	2
8	Stem Bearing	2
13	Sec. Stem Seal	1
15	Handle	1
16	Self Locking Nut	1
18	Compression Ring	1
19	Nut	1

EXPLODED VIEW

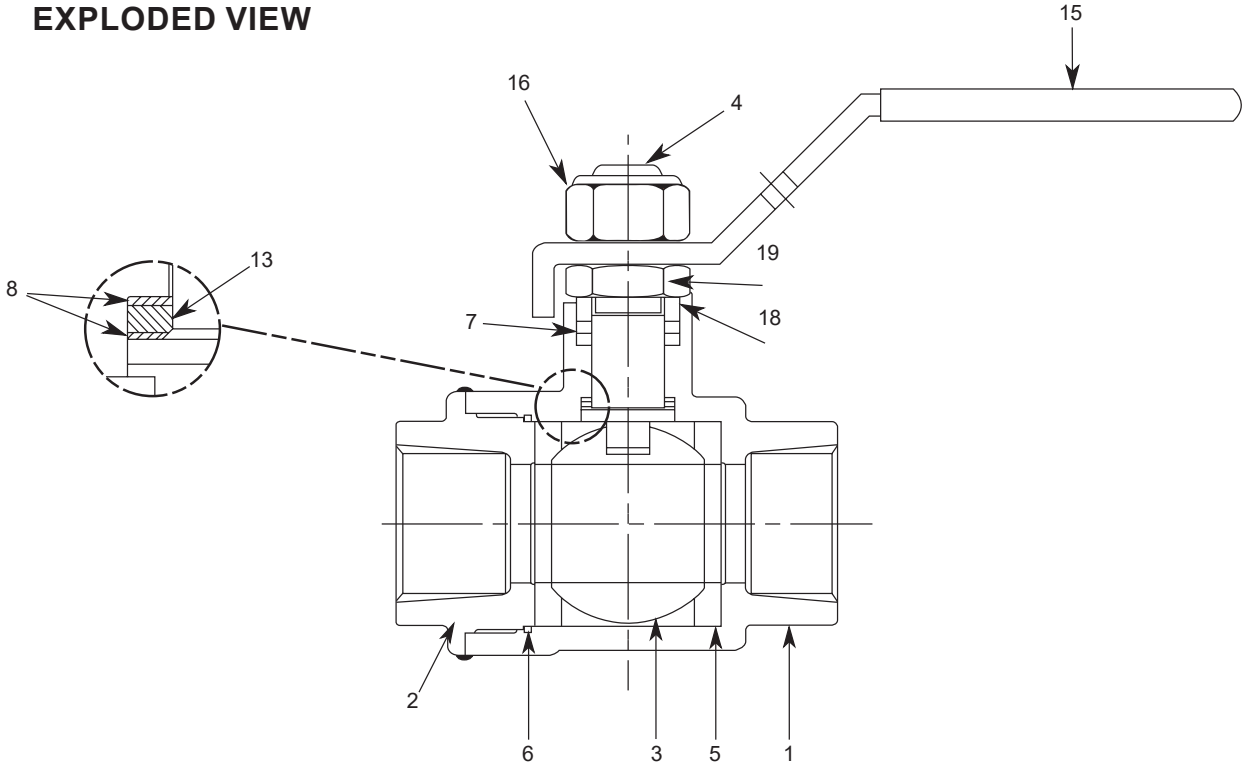


Figure 6.

HOW TO ORDER SERIES 6FR BALL VALVES

To specify Series 6FR ball valves, choose the appropriate code from each of the boxes shown at right.

EXAMPLE:

The valve specified is a 2” Series 6FR Full-bore threaded ball valve constructed of carbon steel body, 316 stainless steel ball and stem, and PTFE seats and seal.

1		2		3		4
2”		6FR	–	2236		TT

1	Size
3/4	3/4” (DN 20)
1	1” (DN 25)
1-1/2	1-1/2” (DN 40)
2	2” (DN 50)
3	3” (DN 80)

2	Series
6FR	Series 6FR Full-bore Ball Valve

3	Body / Trim Material
2236	Carbon Steel Body / 316 Stainless Steel Trim
3600	316 Stainless Steel Body / Trim

4	Seat / Seal Material
TT	PTFE/PTFE*
MT	Filled PTFE/PTFE*

*With graphite secondary stem and body seal.

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