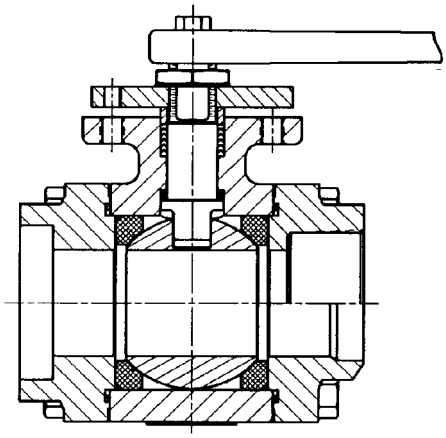
JAMESBURY
NELES CONTROLS GROUP



IMO - 203

ISSUE 12/95

2-1/2" REDUCED BORE

2" FULL BORE

SERIES 4000

3-PIECE BALL VALVES

INSTALLATION, MAINTENANCE AND OPERATING INSTRUCTIONS

WARNING

FOR YOUR SAFETY, TAKE THE FOLLOWING PRECAUTIONS BEFORE REMOVING THE VALVE FROM THE LINE, OR BEFORE ANY DISASSEMBLY:

1. DURING REMOVAL AND DISASSEMBLY, WEAR ANY PROTECTIVE EQUIPMENT NORMALLY REQUIRED TO PROTECT AGAINST DISCHARGE OF TRAPPED FLUID.

2. DEPRESSURIZE THE LINE AND VALVE AS FOLLOWS:

A. PLACE THE VALVE IN THE OPEN POSITION AND DRAIN THE LINE.

B. CYCLE THE VALVE TO RELIEVE RESIDUAL PRESSURE IN THE BODY CAVITY BEFORE REMOVAL FROM THE LINE.

C. AFTER REMOVAL, AND BEFORE ANY DISASSEMBLY, CYCLE THE VALVE AGAIN SEVERAL TIMES.

3. SEAT AND BODY RATINGS - THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE SEAT AND BODY RATING. READ THE NAME TAG AND CHECK BOTH RATINGS. THIS PRODUCT IS AVAILABLE WITH A VARIETY OF SEAT MATERIALS. SOME OF THE SEAT MATERIALS MAY HAVE PRESSURE RATINGS THAT ARE LESS THAN THE BODY RATINGS. ALL OF THE BODY AND SEAT RATINGS ARE DEPENDENT ON VALVE TYPE AND SIZE, SEAT MATERIAL, AND TEMPERATURE. DO NOT EXCEED THESE RATINGS.

INSTALLATION

1. **Screwed End Style -** Use standard piping practices to install valves with threaded end caps. When tightening valve to pipe, apply wrench to end cap nearest the pipe being worked.

2. **Weld End Style -** All standard weld end valves must be partially disassembled prior to welding. Follow steps 1, 2, 4 and 5 of the Disassembly section. Socket weld ends are per ANSI B16.11, and butt weld ends are per ANSI B16.25. Welding should be done using procedures and welders qualified under Section IX of the ASME Boiler and Pressure Vessel Code. **IMPORTANT:** If the two body seals (6) are removed for welding, do not mix them. When reassembling the valve, put each seal back into the groove from which it was removed.

CAUTION: WHEN THE VALVE IS BEING DISASSEMBLED FOR WELDING, DO NOT CUT OR SCRATCH THE SEATS, SEALS AND SEALING SURFACES.

MAINTENANCE

Routine maintenance consists of tightening the stem nut 1/4 turn periodically to compensate for the wear caused by the stem turning against the stem seals. When tightening stem seals on actuated valves where the valve is connected to the actuator with a no-play (clamped) coupling, loosen the coupling before tightening the stem nut. Re-tighten the coupling. Overhaul maintenance consists of replacing seats and seals. A standard service kit consisting of these parts may be obtained from your Neles-Jamesbury distributor or representatives (see Table 2).

File Name:
Jamesbury_BallValve_4000Reducebore_imo203_D1295

DISASSEMBLY

The Series 4000 ball valve is designed to be serviced in or out of the line. The following instructions are for in-line disassembly. (For bench disassembly, which may be more convenient, follow a similar sequence).

1. Comply fully with the instructions in the **WARNING** section.

2. Be sure to cycle the valve. Leave in the open position. The body center section will not swing out in the closed position.

3. Remove the cap screw (21) and the handle (15).

4. Loosen all eight body bolts (20). Pick two bolts (closest to the top of the valve) that are in line and opposite each other, and back them off at least 5/16". Remove the remaining six bolts.

5. For positive alignment and ease of in-line assembly, each end cap is interlocked approximately 3/32" into the body as shown in Figure 3. To overcome this feature during in-line disassembly, it is necessary to separate each cap at least 3/32" from the body. Sharply rap body and caps with a block of wood or plastic mallet to break the body seal loose. Spread end caps and swing the body out of the line. If the pipe does not allow simple spreading, remove the remaining body bolts and rotate center section per Figure 1. This will improve access to the end cap flange for ease of spreading. Swing the valve body (1) out from between the end caps (2). Be careful not to damage the sealing surfaces "A" (see Figure 3) at each end of the valve.

6. Turn the stem (4) so that the valve is fully closed. Remove body seals (6) and seats (5). Body seals may be tightly compressed in their grooves. Use extreme care when prying them out. Damage such as scratches to the bottom of the groove will cause leaks. If the seats are not easily removed, gently tap the ball (3) with a piece of wood or other soft material.

7. Remove the ball (3).

8. Remove and save the stem nut (16), Shakeproof® washer (9), indicator stop (12), and compression ring (18).

9. Press the stem (4) from the top into the valve body (1), and remove it through the end of the body.

10. Carefully pry out and discard the old stem seals (7) the stem bearings (8) and the secondary seal (13), being careful not to damage the bearing surfaces.

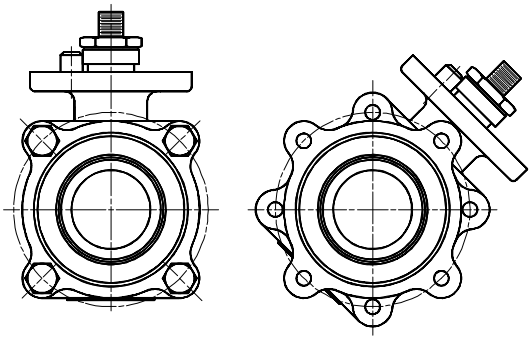


Figure 1

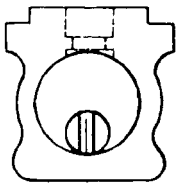


Figure 2a

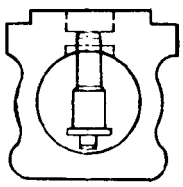


Figure 2b

ASSEMBLY

The following instructions are for in-line assembly. For bench assembly, which may be more convenient, follow a similar sequence by holding the valve in a vise by one end cap. Use care not to cut or scratch the seats, seals or sealing surface.

1. With the valve swung to the out-of-line position, insert from the inside of the body a stem bearing (8), a secondary seal (13), then another stem bearing (8) into the stem bore.

2. Insert the stem (4) horizontally into the body bore (threaded end first). The blade at the ball end of the stem must be vertical (see Figure 2A and B). Guide the stem into the stem hole being careful not to scratch the bearings.

3. Holding the stem in place from the bottom, install the top stem seal (7), a compression ring (18), indicator stop (12), Shakeproof® washer (9), and thread on stem nut (16) until the stem starts to turn.

4. Place a wrench through the body on the bottom stem blade to hold the stem stationary. Place another wrench on the stem nut and turn the nut down until the seals are bottomed and the stem comes snugly into place. Tighten an additional 1/4 to 1/2 turn.

5. Align the stem blade with the ball slot. Insert the ball (3) and rotate the stem (4) to the ball closed position.

6. Working at either end of the body (1), place a seat (5) into the body. Fit it snugly against the closed ball. **NOTE:** The sealing surface of the seat is toward the ball (See Figure 3).

7. Place a body seal (6) into the machined sealing groove of the end cap (2) (See Figure 3). Be certain the groove and seal are clean.

8. Repeat instructions 6 and 7 for assembly at the opposite end.

9. Turn the stem to the full ball open position.

10. Swing the entire body assembly back into the properly aligned and interlock position between the end caps, being careful not to scratch the body seals. Caps may have to be spread slightly to accept the body.

11. Close the valve.

12. Bolt the valve together with lubricated body bolts (20). Using a calibrated torque wrench, tighten these bolts evenly and alternately. (See Table 1 for the torques and lubricant.) Failure to properly tighten the bolting may result in leakage.

13. Attach the handle (15); secure it with the cap screw (21).

14. On manual valves be sure item (38), socket head cap screw, is not loose.

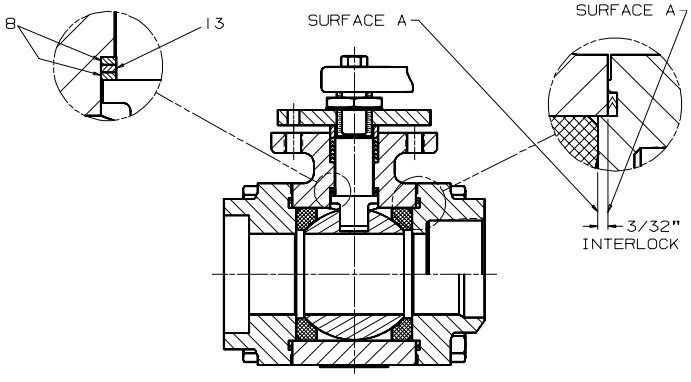


Figure 3

Parts		
Item	Part Name	Qty.
1	BODY	1
2	BODY CAP	2
3	BALL	1
4	STEM	1
5	SEAT	2
6	BODY SEAL	2
7	STEM SEAL	1
8	STEM BEARING	2
9	SHAKEPROOF® WASHER	1
12	INDICATOR STOP	1
13	SECONDARY STEM SEAL	1
15	HANDLE	1
16	STEM NUT	1
18	COMPRESSION RING	1
20	BODY BOLT	8
21	HEX CAP SCREW	1
25	WELD END TAG*	1
29	IDENTIFICATION PLATE	1
38	SOCKET HEAD SCREW	1

* Socket weld or butt weld only.

Table 1

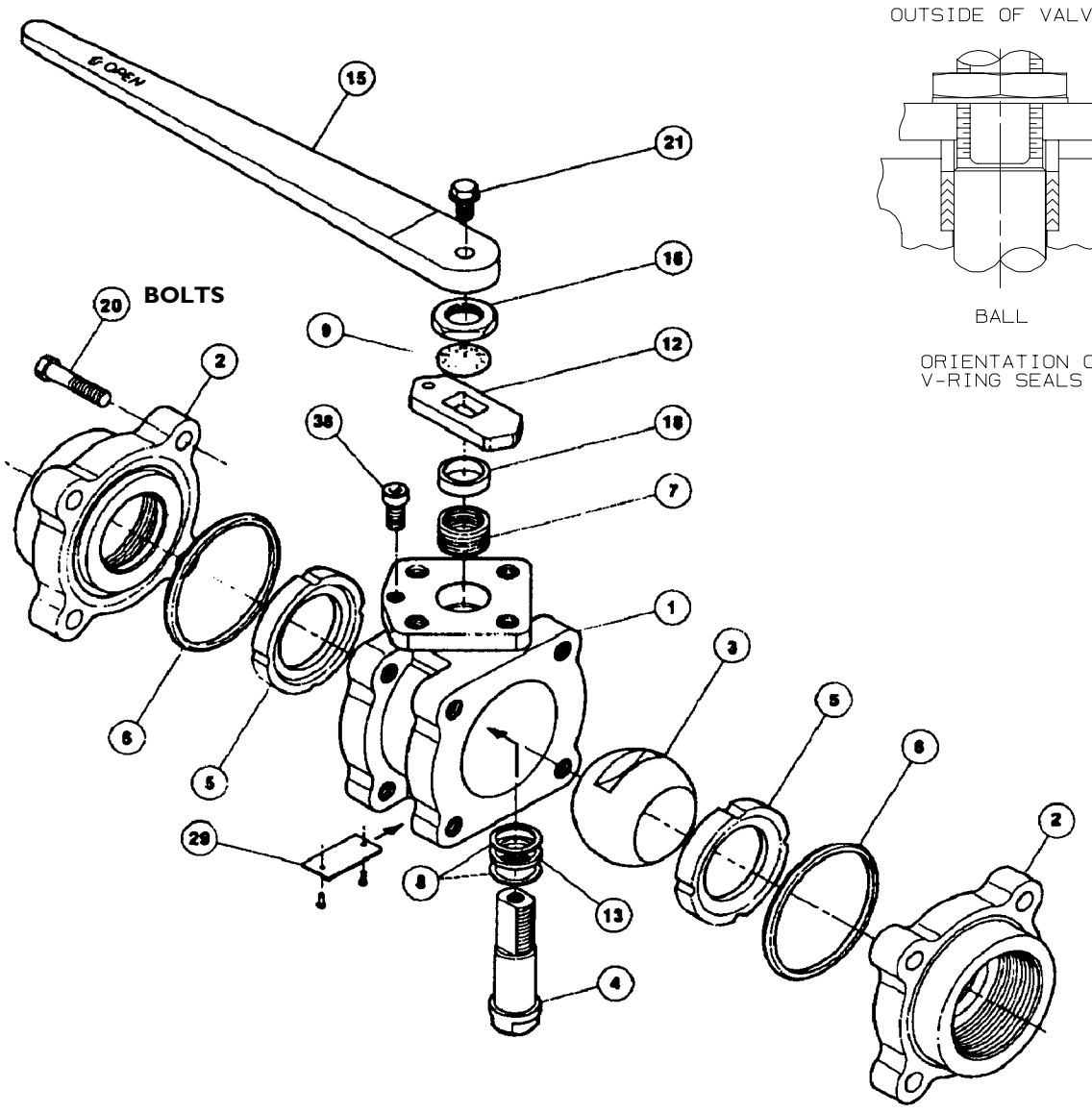
Required Fastener Torques, LB. - FT.

FASTENER (LAST DIGIT IN FIG. NO.)		- 1	- 2	-4	-5	-7	-8
Valve Size - Full Port Size IN ( )	FASTENER MATERIAL	A193 GR.B7	A194 GR.B8	K-MONEL+	A193 GR.B7M	A320 GR.L7M	A453 GR.660
	FASTENER IDENT. MARK	B7	B8	K	B7M	L7M	660A OR 660B
Body Bolt Torque (lb. - ft.)		74-93	71-89	64-80	60-75	57-71	60-75

NOTES:

1. Lubricate threads with Never-Seez or equivalent.
2. Fastener materials have different corrosion, thermal and strength properties, and should not be mixed. The fastener identification and coding must be in agreement with the valve Identification Plate, item 29.

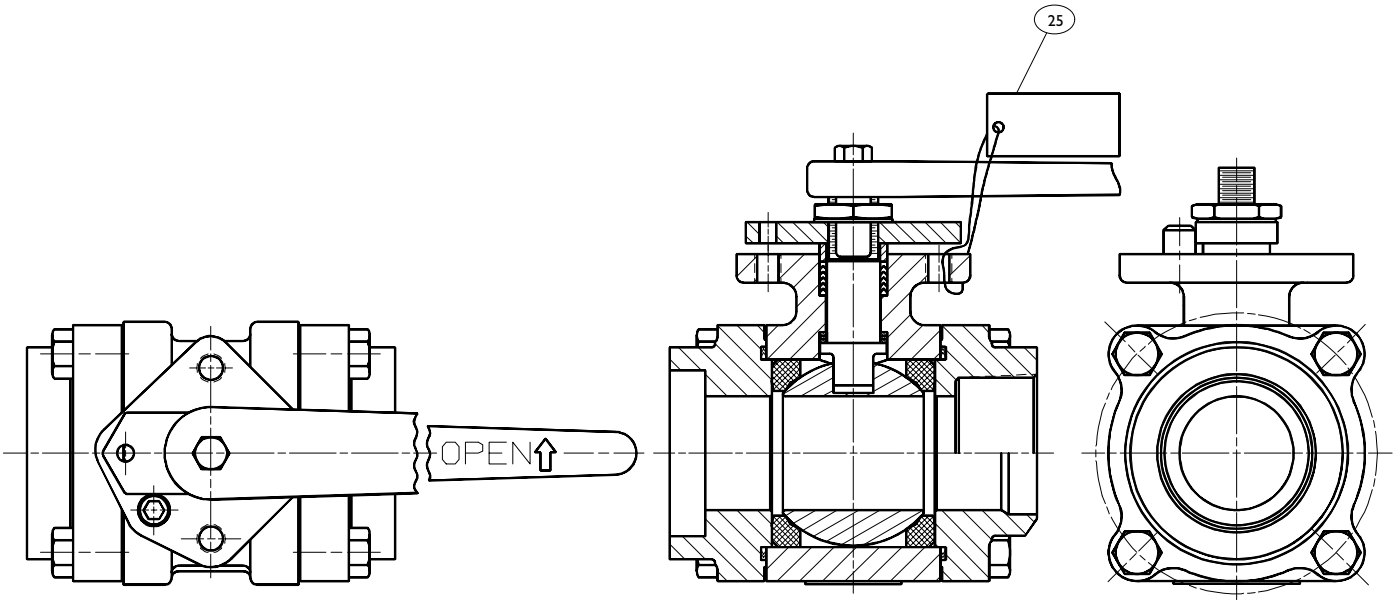
\+ Monel is a registered trademark of INCO.



SERVICE KITS

NOTE: **FIRE-TESTED** service kits include two seats (5), one stem seal (7), two stem bearings (8), a secondary seal (13) and two 316 stainless steel/graphite body seals (6). The body seals are suitable for valves with carbon steel or 316 stainless steel trim.

Table 2	
Service Kits	**For Fire-Tested Valves**
TFE SEATS	RKN-150TT
FILLED TFE SEATS	RKN-150MT
PEEK SEATS	RKN-150LT
METAL SEATS	RKN-150DH
Service Kits	**For Non Fire-Tested Valves**
TFE SEATS	RKN-151TT
FILLED TFE SEATS	RKN-151MT
UHMW POLY SEATS	RKN-151UB



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