Railroad Ball Valves
Series 6RIB3
4" (DN100)

Installation, Maintenance and Operating Instructions
# Table of Contents

1 GENERAL .................................................. 3  
   1.1 Scope of the Manual .............................. 3  
   1.2 Valve Markings .................................. 3  
   1.3 Safety Precautions ............................... 3  

2 TRANSPORTATION AND STORAGE ............... 3  

3 INSTALLATION .......................................... 4  
   3.1 General ............................................. 4  
   3.2 Installing on the Tank car ....................... 4  
   3.3 Commissioning .................................... 4  

4 MAINTENANCE ........................................... 4  
   4.1 General ............................................. 4  
   4.2 Disassembly ....................................... 4  
   4.3 Checking Parts .................................... 5  
   4.4 Assembly ........................................... 5  
   4.5 Pressure Testing the Valve ..................... 6  

5 SERVICE KITS ........................................... 6  

6 SERVICE / SPARE PARTS .............................. 6  

7 HOW TO ORDER .......................................... 6  

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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. Addresses and phone numbers are printed on the back cover. See also www.metso.com/valves for the latest documentation.

**SAVE THESE INSTRUCTIONS!**

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1 GENERAL

1.1 Scope of the Manual

This instruction manual contains important information regarding the installation, operation and maintenance of the Jamesbury® 4” (DN100) Series 6RIB3 Railroad Ball Valves. Please read these instructions carefully and save them for future reference.

1.2 Valve Markings

The valve has an identification plate attached to the mounting flange (see Figure 1).

Identification plate markings:

1. Ball/Stem material
2. Valve catalog code
3. Seat Material
4. Body Material
5. Maximum operating pressure
6. Maximum/minimum shut-off pressure/temperature
7. Approvals/Special Service marking
8. Model
9. Assembly date

1.3 Safety Precautions

WARNING

AS THE USE OF THE VALVE IS APPLICATION SPECIFIC, A NUMBER OF FACTORS SHOULD BE TAKEN INTO ACCOUNT WHEN SELECTING A VALVE FOR A GIVEN APPLICATION. THEREFORE, SOME OF THE SITUATIONS IN WHICH THE VALVES ARE USED ARE OUTSIDE THE SCOPE OF THIS MANUAL.

IF YOU HAVE ANY QUESTIONS CONCERNING THE USE, APPLICATION OR COMPATIBILITY OF THE VALVE WITH THE INTENDED SERVICE, CONTACT METSO FOR MORE INFORMATION.

WARNING

DO NOT EXCEED THE VALVE PERFORMANCE LIMITATIONS! EXCEEDING THE PRESSURE OR TEMPERATURE LIMITATIONS MARKED ON THE VALVE IDENTIFICATION PLATE MAY CAUSE DAMAGE AND LEAD TO UNCONTROLLED PRESSURE RELEASE. DAMAGE OR PERSONAL INJURY MAY RESULT.

WARNING

SEAT AND BODY RATINGS!

THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE SEAT AND BODY RATINGS. READ THE IDENTIFICATION PLATE AND CHECK BOTH RATINGS. THIS PRODUCT IS AVAILABLE WITH A VARIETY OF SEAT MATERIALS. SOME OF THE SEAT MATERIALS 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!

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. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY!

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 location 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 the 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 Installing on the Tank car

NOTE: Service kits include stem seals (8), secondary stem seal (7), seats (5), body seal (6). Refer to the Section 5 - Service Kits.

WARNING

DO NOT EXCEED THE VALVE PERFORMANCE LIMITATIONS! EXCEEDING THE PRESSURE OR TEMPERATURE LIMITATIONS MARKED ON THE VALVE IDENTIFICATION PLATE MAY CAUSE DAMAGE AND LEAD TO UNCONTROLLED PRESSURE RELEASE. DAMAGE OR PERSONAL INJURY MAY RESULT.

Open the valve

The valve is installed into the bottom of the tank car.

Refer to the 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 simple stem seal adjustment described in the MAINTENANCE section.

3.3 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, fittings, and cables are properly fastened.

4 MAINTENANCE

4.1 General

Good operating procedure requires periodic observation to ensure that the valve is functioning well. The frequency of observation will depend on the application. Routine maintenance consists of tightening the stem nut (item 15 in Figure 3) periodically to compensate for stem seal wear.

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

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

1. Follow the steps in all the WARNING sections above before performing any work on the valve.
2. Open and close the valve and leave in the closed position.
3. Remove the two spring pins (28), lock nuts (27) and hex head cap screws (26).
4. Remove the pipe handle (17) and screw retainer (25).
5. Loosen and remove the hex head cap screw (18), and remove washer (19) and indictor stop (12).
6. Remove the stem nut (15) and compression ring (21).
7. Place the valve in the vertical position with the body cap end up.
8. Mark the body joint flanges to assure correct body (1) and body cap (2) orientation during assembly. Remove body bolts (10) and remove body cap (2). BE CAREFUL NOT TO SCRATCH THE BALL.
9. Remove the body seal (6) and the first seat (5) from the body cap.
10. If the ball (3) does not swing free 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 the body cap). This should loosen the ball so that it can be pivoted free of the stem (4).
4. If the ball is slightly damaged, it may be possible to smooth the sealing surface with crocus cloth or equivalent. If deep scratches are present, replace the ball.

5. With the body cap side facing up, slide one valve seat (5) sideways into the body (1) to below the stem bore, and tilt it into place so that the proper surface (see Figure 2) will be adjacent to the ball (3), being careful not to cut or scratch the seat.

6. From inside the body (1), insert the secondary stem seal (7), and the bottom stem seal (8) into the stem bore (see Figure 3).

7. Insert the stem (4) through the body cap end of the body, being careful not to scratch the stem sealing surface; and press it gently up into the stem bore until resistance is felt from the stem seal.

8. Hold the stem in place from the bottom and insert the top stem seal (8) over the stem (4).

9. Place compression ring (21) over stem (4). Screw the stem nut (15) with the side marked “TOP” being up. Place the stem (4) in the closed position and tighten the stem nut (15) to 70-80 FT · LBS (95-108 N · m).

10. Insert the ball (3) rotating it onto the stem (4) in the closed position. If necessary, turn the stem blade to align with the ball slot. Make certain that the stem blade is in the middle of the ball slot; i.e. equal distance from the ends of the slot. Rotate the ball if necessary (see Figure 2).

11. Gently place the body seal (6) into the machined recess of the body (1).

12. Place the second seat (5) into the body cap (2) with the proper surface adjacent to the ball. (see Figure 2).

13. Align the body cap (2) over body bolt holes being careful to properly orient body cap and body as originally assembled by matching orientation marks made prior to disassembly. Take care not to damage body seal (6) or seat (5) during this operation.

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).
4. Replace any damaged parts.

**NOTE:** When ordering spare parts not included in service kits, always include the following information:

a. Valve catalog code from Identification plate,

b. If the valve is serialized – the serial number (stamped on the valve identification plate),

c. From Figure 3, the ballooned part number, part name and quantity required.

4.4 Assembly

It is advisable to replace seats and seals if complete disassembly and reassembly become necessary. Refer to the Section 5 - Service Kits.

1. Clean all valve components if not done previously.
2. Re-inspect all components for damage before reassembling the valve. Look for damage to the sealing areas of the stem, body and body cap; and look for wear in the bearing areas. Replace any damaged parts.
3. Carefully clean and polish the ball (3) sealing surface: It should be free of all scratches and grooves.

4.2 Checking Parts

**NOTE:** For detailed instructions on visual inspection of critical components, refer to IMO-R26.
14. Lubricate the threaded portion of body bolts (10) with NeverSeez® or equivalent. Install body bolts (10) and tighten sequentially as shown in the diagram in Figure 3, to the recommended torques as shown in the torque chart (Table 1).

<table>
<thead>
<tr>
<th>Bolt Material</th>
<th>Bolt Identification</th>
<th>Assembly Torque FT-LBS (N-m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>B7</td>
<td>65 - 70 (88 - 95)</td>
</tr>
<tr>
<td>31</td>
<td>B8</td>
<td>35 - 40 (47 - 54)</td>
</tr>
</tbody>
</table>

15. Place the indicator stop (12) as shown in Figure 3, and fasten with washer (19) and hex head cap screw (18). Be sure the washer is orientated as shown. Torque the hex head cap screw to 35 FT·LBS (47 N·m).

16. Place the screw retainer (25) on the hex head cap crew (18) inside of the indicator stop (12). Position the screw retainer so that the hole in the screw retainer lines up with the bottom slot on the indicator stop.

17. Insert the lower hex head cap screw (26) through the indicator stop (12) and screw retainer (25). Assemble lock nut (27) and tighten until the lock nut makes contact with the indicator stop.

18. Drive the spiral spring pin (28) into the hole on the cap screw (26) below the lock nut. Position the spiral pin so that equal amount protrudes on either side of the cap screw.

19. Insert the pipe handle (17). Line up the hole in the pipe handle in the indicator stop (12), and repeat steps 17 and 18 with the upper hex head cap screw (26), lock nut (27) and spiral spring pin (28) for pipe handle assembly.

20. Cycle the valve slowly with a gentle back and forth motion building gradually to the full quarter turn. By cycling slowly, the seat lips will seat against the ball. Take care to avoid scratching the ball O.D.

4.5 Pressure Testing the Valve

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

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

**WARNING**

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

5 SERVICE KITS

Service kits contain one pair of seats, a body seal, stem seals and a secondary stem seal. When ordering service kits for your 6RIB3 valve order RKR-33TT or RKR-33MT depending on your valve’s seat material. Refer to Section 1.2, Valve Markings and check area “3” on your valve’s identification plate to determine the correct seat material for your valve.

6 SERVICE / SPARE PART

For further information on spare parts and service or assistance visit our web-site at [www.metso.com/valves](http://www.metso.com/valves).

**NOTE:** When ordering spare parts not included in the service kits, always include the following information:

a. Valve catalog code from identification plate,

b. If the valve is serialized – the serial number (from identification plate)

c. From Figure 3, the ballooned part number, part name and quantity required.

7 HOW TO ORDER 6RIB3 BALL VALVES

Carbon steel body with 316 stainless steel trim:

4” 6RIB322HBTT

316 stainless steel body and trim:

4” 6RIB336HBTT

For PTFE seats, simply substitute ‘MT’ for ‘TT’.

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

Figure 3

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>PART NAME</th>
<th>QTY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Body Cap</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Ball</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Stem</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Seat</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Body Seal</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Secondary Stem Seal</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Stem Seal</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Hex Head Cap Screw</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>Indicator Stop</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>Hex Head Cap Screw</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Stem Nut</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>Pipe Handle</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>Hex Head Cap Screw</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>Washer</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>Compression Ring</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>Identification Tag</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>Pop Rivet</td>
<td>3</td>
</tr>
<tr>
<td>25</td>
<td>Screw Retainer</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td>Hex Head Cap Screw</td>
<td>2</td>
</tr>
<tr>
<td>27</td>
<td>Lock Nut</td>
<td>2</td>
</tr>
<tr>
<td>28</td>
<td>Spiral Spring Pin</td>
<td>2</td>
</tr>
</tbody>
</table>

Proper Orientation of Washer (19)