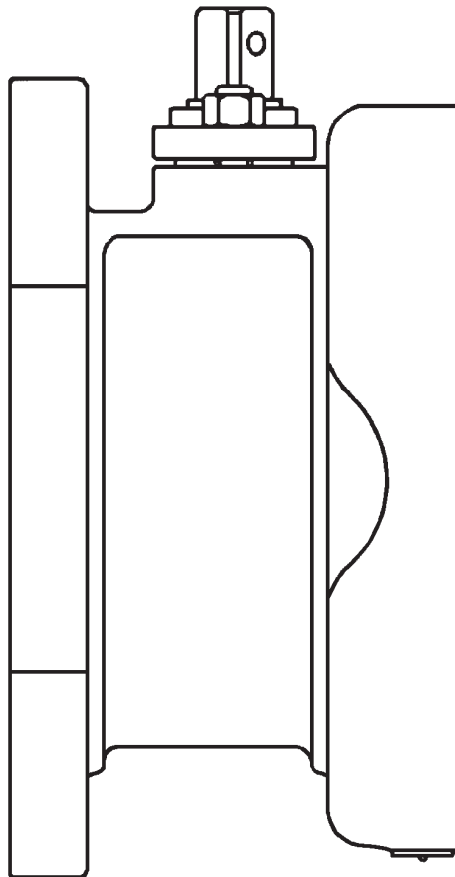


# 4" (DN 100) AZFRC and 6" (DN 150) DZFRC Tank Car Fire-Tite® Bottom-Unloading Valves

Installation, Maintenance and  
Operating Instructions



## Table of Contents

<b>1</b>	<b>GENERAL .....</b>	<b>3</b>
1.1	Warning .....	3
<b>2</b>	<b>INSTALLATION .....</b>	<b>3</b>
2.1	Disassembly .....	3
2.2	Assembly .....	3
<b>3</b>	<b>MAINTENANCE.....</b>	<b>4</b>
<b>4</b>	<b>REPAIR KITS/SPARE PARTS .....</b>	<b>4</b>

### **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](http://www.metso.com/valves) for the latest documentation.

### **SAVE THESE INSTRUCTIONS!**

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## 1 GENERAL

This instruction manual contains important information regarding the installation, operation, and troubleshooting of Jamesbury 4" (DN 100) AZFRC and 6" (DN 150) DZFRC Tank Car *Fire-Tite* bottom-unloading valves. Please read the instructions carefully and save them for future reference.

### 1.1 WARNING

FOR YOUR SAFETY, IT IS IMPORTANT THAT THE FOLLOWING PRECAUTIONS BE TAKEN PRIOR TO REMOVAL OF THE VALVE FROM THE TANK CAR OR BEFORE ANY DISASSEMBLY.

1. EXERCISE NORMAL SAFETY PRECAUTIONS TO PROTECT YOURSELF AGAINST BOTH THE FLUID AND POSSIBLE UNRELIEVED PRESSURES IN THE VALVE ITSELF.
2. DO NOT REMOVE THE VALVE FROM A LOADED TANK CAR.
3. TURN THE VALVE FROM FULLY CLOSED TO FULLY OPEN AND BACK AGAIN TWO TIMES BEFORE REMOVAL FROM THE EMPTY TANK CAR. THIS RELIEVES ANY RESIDUAL PRESSURES.
4. AFTER REMOVAL AND BEFORE DISASSEMBLY, CYCLE THE VALVE AGAIN SEVERAL TIMES (AS IN NO. 3).
5. VALVE CAVITY MUST BE DRAINED TO PREVENT FREEZING.

## 2 INSTALLATION

Refer to **MAINTENANCE** Section for stem packing adjustment.

Follow the recommended practices of the gasket manufacturer when tightening flange bolts.

If there is weepage past the stem seals upon installation, it means the valve may have been subject to wide temperature variations in shipment. Tight sealing will be restored by a simple packing adjustment described in the **MAINTENANCE** Section.

**NOTE:** These valves are optionally available with steam-jacketed bodies. These instructions also apply to these stem-jacketed units.

### 2.1 DISASSEMBLY

1. Read the instructions in the **WARNING** Section.
2. Place the valve in the open position.
3. Remove the hex head cap screw (24) and washer (25), or handle pin (28) and handle (15) if present.
4. Remove the retaining ring (32), bonnet plate nuts (10), indicator stop (12) and bonnet plate (9).
5. Pull out the stem (4) with the compression ring (18), emergency stem seal (13) and stem seals (7).
6. Place the valve in the vertical position with the insert end up.
7. Remove the body insert cap screws (20) and jack the insert (2) out of the valve body by tightening the jacking screws (26) evenly and alternately.

8. Reinsert the stem (4) and turn the ball (3) to the closed position. Remove the stem.
9. Lift out the body seal (6) and the seat (5). If the seat did not come out with the insert (2) lift out the ball (3).
10. Pry the bottom seat (5) out of the body cavity. Use care to prevent damage to the seat face and sealing surface of the body.

### 2.2 Assembly

A good lubricant compatible with the flow medium should be applied lightly to seats, seals, ball and stem to facilitate assembly and for ease of initial operation.

1. Slide the first valve seat (5) into the body (1) to below the stem opening and tilt it into place so that the bevel surface (**Figure 2**) will be adjacent to the ball (3).
2. Place the ball (3) into the valve in the closed position. Insert the stem (4) as a temporary means of holding the ball.
3. Insert the second seat (5) with the insert (2) again so the bevel surface will be adjacent to the ball. Insert the body seal (6) into the machined sealing area of the body with the chamfer on the I.D. facing away from the ball.
4. Adjust the jacking screws (26) so they do not protrude through the insert or above the insert face.
5. Fit the insert (2) into the valve body, aligning the mounting holes in the insert with threaded holes in the body.
6. Compress the insert into the body with the body insert cap screws (20) by tightening them evenly and alternately until the insert is bottomed and all cap screws are tight.
7. Remove the stem (4) and insert a stem seal (7) with the chamfer on the I.D. facing up. Place the emergency stem seal (13) on top of the stem seal. Lubricate the stem with a compatible lubricant and insert it into the stem hole. The stem should be tapped into place gently to avoid cutting the seal. **NOTE:** With 6" (DN 150) valves, make sure the stem is inserted so that the slot in the top of the stem points in the direction of the ball port.
8. Slide the second stem seal (7) over the stem. The chamfer on the I.D. of this stem seal should also be facing down.
9. Place the compression ring (18) on the stem. Fit the bonnet plate over the stem and the two bonnet studs.
10. Tighten the bonnet nuts (10) evenly until they contact the bonnet plate (9). Then tighten another 3/4 of a turn.

11. Place the indicator stop (12) over the stem, positioning it so that counterclockwise rotation will open the valve. For valves with "FO" option, the indicator stop (12) is marked with "FO". When placing indicator stop over stem, "FO" marking shall be face up. At this point, the stem with the indicator stop mounted and located between the stop bushing is positioned so clockwise rotation of the stem will open the valve.
12. Place the retaining ring (32) over the stem and into the groove on the stem.
13. Place the valve handle on the valve stem and rotate the ball slowly with a gentle back and forth motion to build gradually to the full quarter turn. By rotating slowly, the seat lips will flow into place to maintain a permanent seal against the ball. A quick turning motion at this point may cut the seats before they have a chance to flow into place.
14. Install the handle (15) on the stem (4) so that the handle points in the direction of the ball port. Secure the handle with the handle pin (28) or hex head cap screw (24) and washer (25).

### 3 MAINTENANCE

Good operating procedure requires periodic observation to ensure that the valve is functioning well. The frequency of observation will depend on the application.

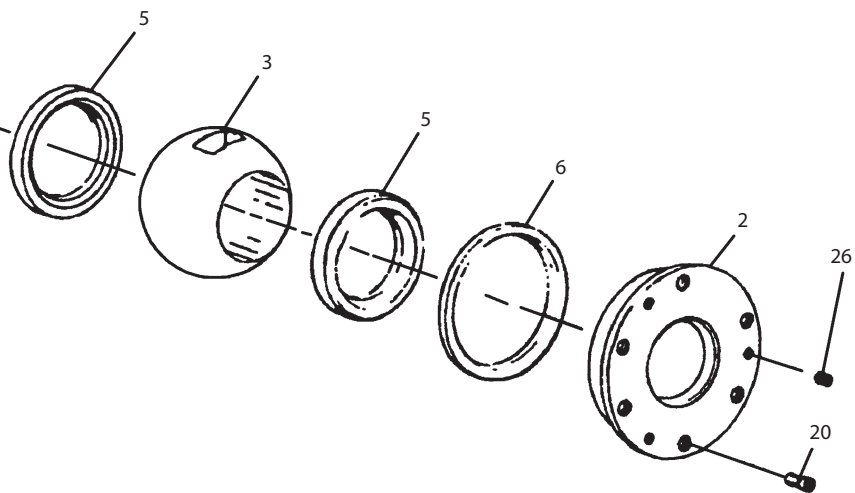
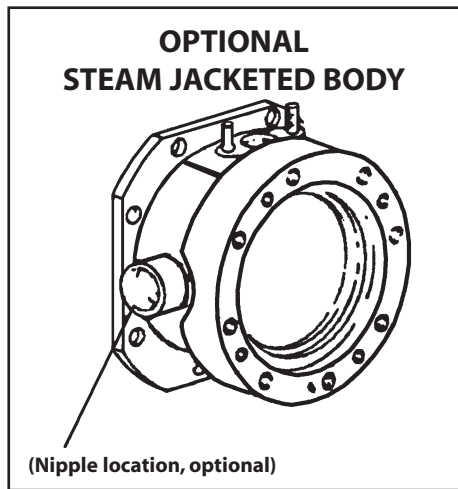
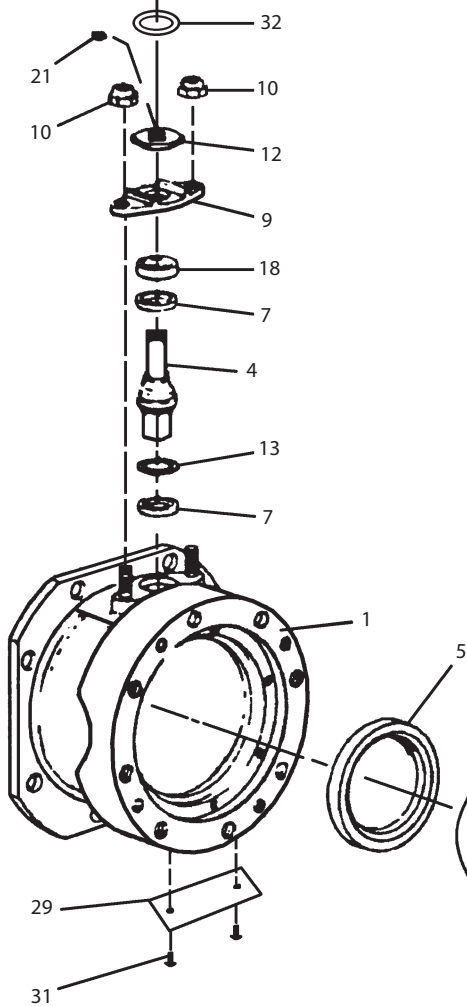
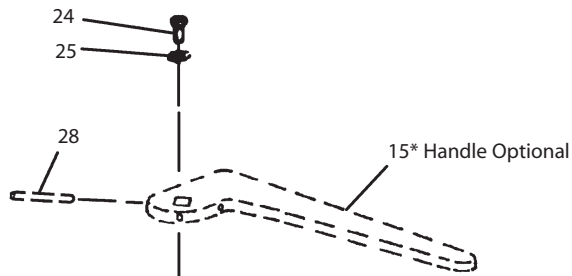
**Stem Packing Adjustment** - Routine maintenance consists of tightening the two elastic stop nuts (10) periodically to compensate for the wear caused by the stems turning against the resilient PTFE seals. Tighten the nuts equally 1/2 turn. If weepage still occurs, tighten another 1/2 turn. The bonnet nuts should not be tightened down too severely, since this will destroy the seals and permanently deform them.

Overhaul maintenance consists of replacing seats and seals. A standard Service Kit consisting of these parts may be obtained from Metso Automation. (See Table 1) for kit designations.

TABLE 1		
SERVICE KITS		
VALVE	4" (DN 100) AZFRC	6" (DN 150) DZFRC
PTFE Seats	RKR-3TT	RKR-5TT
Filled PTFE Seats	RKR-3MT	-----

### 4 REPAIR KITS/SPARE PARTS

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

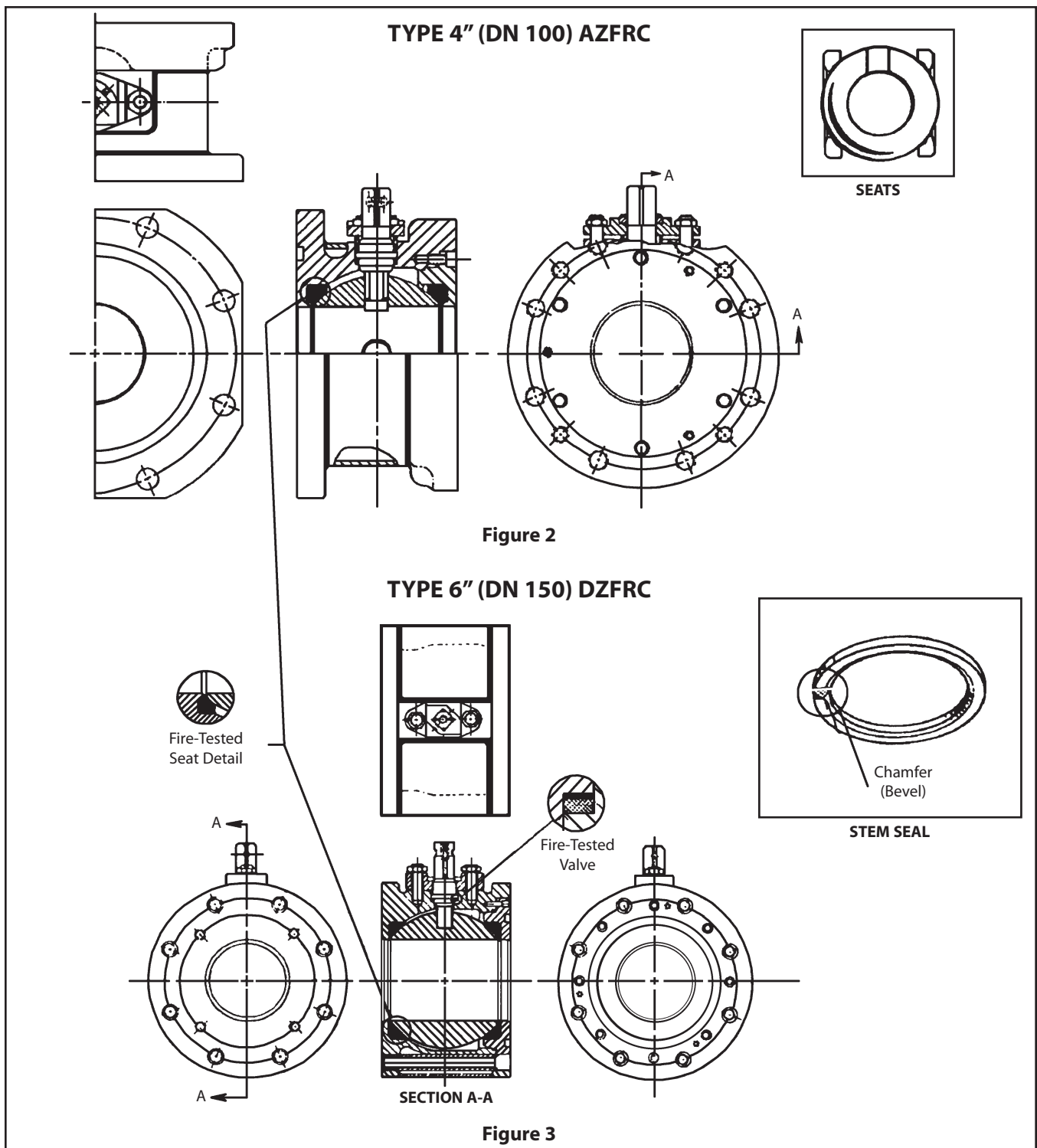


PARTS LIST		
Item	Part Name	Qty.
1	Body Sub-Assembly	1
2	Insert	1
3	Ball	1
4	Stem	1
5	Seat	2
6	Body Seal	1
7	Stem Seal	2
9	Bonnet Plate	1
10	Elastic Stop Nut	2
12	Indicator Stop	1
13	Emergency Stem Seal	1
15*	Handle	1
18	Compression Ring	1
20	Socket Head Cap Screw	**
24*	Hex Head Cap Screw	1
25*	Washer	1
26	Set Screw	3
28*	Handle Pin	1
29	Identification Tag	1
31	Drive Screw	2
32	Retaining Ring	1

\*\* Six (6) in 4" (DN 100) valve, eight (8) in 6" (DN 150) valve.

\* Handle Optional

Figure 1



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