

Jamesbury™ Emission-Guard™ flanged ball valves Series 5000 & 6000

Series 5000, Reduced bore, Class 150 & 300,
1/2" - 4" (DN 15 - 100);

Series 6000, Full bore, Class 150 & 300, 3/4" - 4" (DN 20 - 100)

Installation, maintenance and
operating instructions

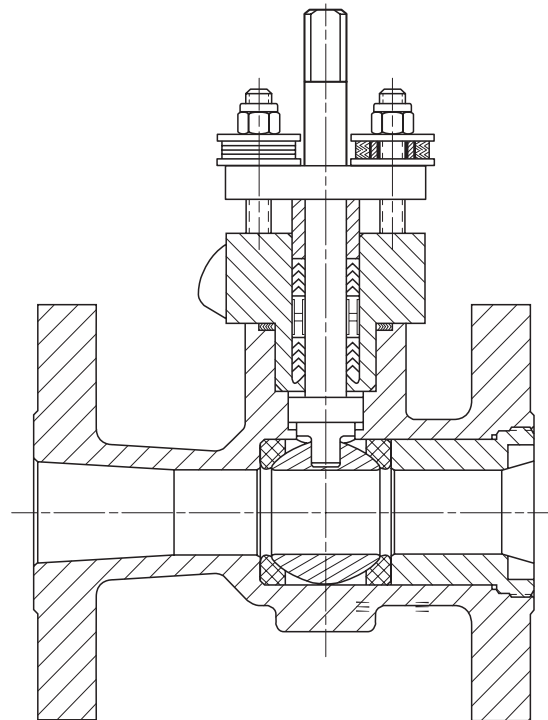


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Subject to change without prior notice.

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

This instruction manual contains information regarding the installation, operation and troubleshooting of the Jamesbury™ 1/2" – 4" (DN 15 – 100) Class 150 and 300 Reduced and Full Port *Emission-Guard* Flanged Ball Valves. Please read these instructions carefully and save them for further reference.

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 VALMET FOR MORE INFORMATION.

1.1 SAFETY PRECAUTIONS

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 PIPELINE. 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 SPRINGRETURN 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:

WHEN HANDLING THE VALVE OR VALVE/ACTUATOR ASSEMBLY, TAKE ITS WEIGHT INTO ACCOUNT! REFERENCE THE APPLICABLE TECHNICAL BULLETIN FOR VALVE WEIGHTS.

NEVER LIFT THE VALVE OR VALVE/ACTUATOR ASSEMBLY BY THE ACTUATOR, POSITIONER, LIMIT SWITCH OR THEIR PIPING. PLACE LIFTING DEVICES SECURELY AROUND THE VALVE BODY. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN DAMAGE OR PERSONAL INJURY FROM FALLING PARTS.

2. INSTALLATION

2.1 GENERAL

Refer to the **MAINTENANCE** Section for stem packing 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. Leaktight performance will be restored by a simple packing adjustment described in the **MAINTENANCE** Section.

Flow through this *Jamesbury* valve can be in either direction. It is recommended, however, that the valve be installed with the insert facing upstream.

WARNING:

THE VALVE SHOULD BE TIGHTENED BETWEEN FLANGES USING APPROPRIATE GASKETS AND FASTENERS COMPATIBLE WITH THE APPLICATION, AND IN COMPLIANCE WITH APPLICABLE PIPING CODES AND STANDARDS. CENTER THE FLANGE GASKETS CAREFULLY WHEN FITTING THE VALVE BETWEEN FLANGES. DO NOT ATTEMPT TO CORRECT PIPELINE MISALIGNMENT BY MEANS OF FLANGE BOLTING!

3. MAINTENANCE

3.1 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. Valmet recommends inspecting valves at least every five (5) years. The inspection and maintenance frequency depends on the actual application and process condition.

WARNING

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

- 1. WEAR ANY PROTECTIVE CLOTHING OR EQUIPMENT NORMALLY REQUIRED WHEN WORKING WITH THE FLUID INVOLVED.
- 2. DEPRESSURIZE THE LINE AND CYCLE THE 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.

Routine maintenance consists of torquing the packing nuts (15) periodically to compensate for disc spring deflection and stem seal wear. Check the disc spring height as described in the **STEM SEAL AND BEARING REPLACEMENT** Section before torquing packing nuts. All torquing should be done with a calibrated torque wrench.

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

TABLE 1							
Class 150 and 300 Full Port				Class 150 and 300 Reduced Port			
Valve Size	1/2" (DN 15)	3/4" (DN 20)	1" (DN 25)	1-1/2" (DN 40)	2" (DN 50)	3" (DN 80)	4" (DN 100)
PTFE Seats	RKN-300TT	RKN-301TT	RKN-302TT	RKN-303TT	RKN-304TT	RKN-305TT	RKN-306TT
Filled PTFE Seats	RKN-300MT	RKN-301MT	RKN-302MT	RKN-303MT	RKN-304MT	RKN-305MT	RKN-306MT

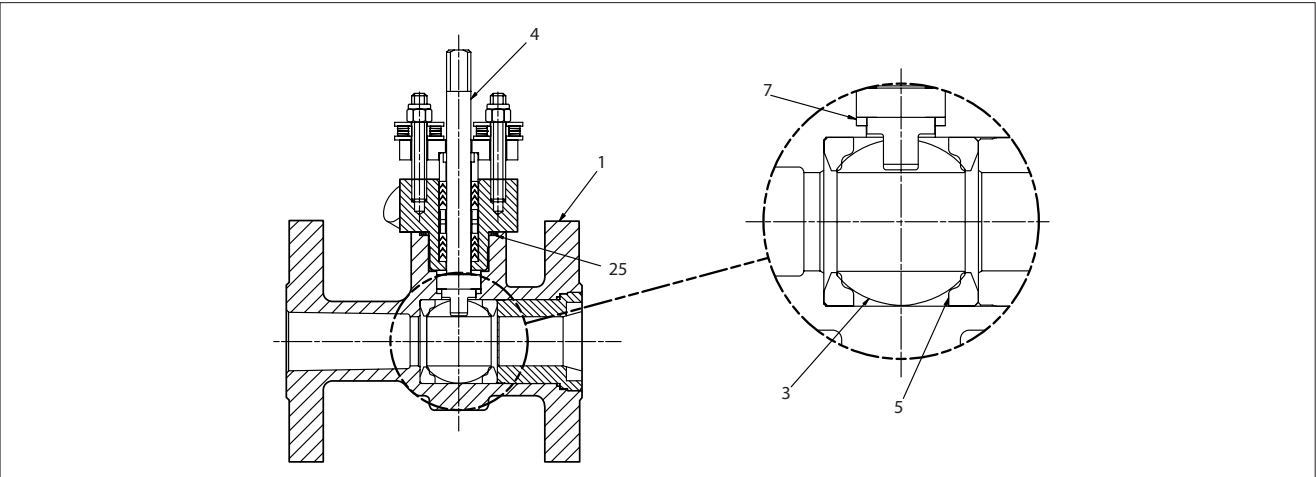


Figure 1.

3.2 DISASSEMBLY

NOTE: If complete disassembly becomes necessary, replacement of all seats and seals is recommended. Refer to the repair kit chart (see **Table 1**).

1. Read the **WARNING** Section before performing any work.
2. Be sure to cycle the valve and leave it in the closed position.
3. (Refer to **Figure 10**). Remove the stop nut (H5) on 1/2" – 2" (DN 15 – 50) sizes or hex head cap screw (H15) and flat washer (H16) on 3" and 4" (DN 80 and 100) sizes and handle (H2).
4. Remove the handle bracket (H1).
5. **WARNING:** It is possible that there may be trapped media under pressure in between the stem retainer subassembly and the body. Refer to the **WARNING** Section at the front of these instructions and exercise the same precautions for protection from the media.

Loosen the four hex head cap screws (18), and then tap the stem retainer subassembly to break the seal. Rotate the stem at least one full "open to closed" cycle, and continue to work the loosened stem retainer subassembly. Once the stem retainer subassembly is loose and vented, remove the fasteners and lift it off. When disassembling the stem retainer, follow the instructions under **STEM SEAL AND BEARING REPLACEMENT** Section.

WARNING: It is possible that there may be trapped media inside the stuffing box.

6. Remove the stem retainer seal (25) and the lower stem bearing (7).
7. Unscrew and remove the insert (2).

NOTE: Use caution when loosening the insert, especially during the initial break.

8. Remove and discard the body seal (6).
9. Slowly place the valve in a vertical position, insert end down, on a clean surface such as a folded rag or a piece of cardboard. The ball (3) and one seat (5) should fall out. If they don't, use a piece of wood or some other soft material to gently tap the ball (from the end of the valve opposite the insert). This will unseat the parts without damaging them.
10. Carefully pry the bottom seat (5) out of the body, being careful not to scratch the body sealing surface behind the seat.

3.3 ASSEMBLY

It is advisable to replace seats and seals if complete disassembly and reassembly become necessary. A good lubricant compatible with the flow medium should be applied lightly to seats, seals and the ball to facilitate assembly and for initial operation. Refer to repair kit chart (see **Table 1**).

1. 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 1**) will be adjacent to the ball (3), being careful not to cut or scratch the seat.
2. Place the stem retainer seal (25) on the body and the lower stem bearing (7) in the bottom of the stem bore in the valve body.

3. Place stem retainer sub-assembly (Refer to the **STEM SEAL AND BEARING REPLACEMENT** Section for assembly of stem retainer subassembly.) onto the body and assemble using hex head cap screws (18). Using an alternating method (see **Figure 2**), tighten the cap screws evenly with the required torque in (**Table 2**), until stem retainer (30) is seated properly on the valve body (1). Use a calibrated torque wrench. No gaps will be present between the stem retainer (30) and the valve body (1) around the entire surface.

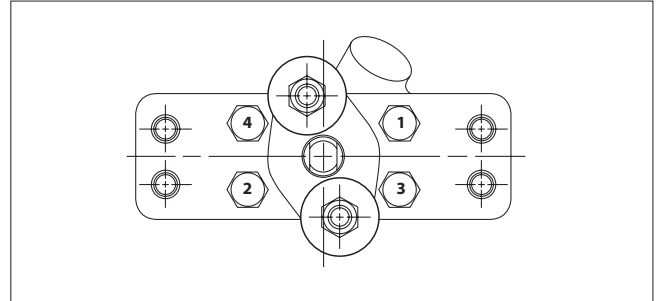


Figure 2.

TABLE 2			
Stem Retainer / Cap Screw Torque			
Valve Size Inches (DN)	Material Code	Identification	Torque FT•LBS (N•m)
1/2 – 1 (15 – 25)	6C	L7M	13 – 19 (18 – 26)
	71	71 or K	15 – 21 (20 – 28)
1-1/2" & 2" (40 & 50)	6C	L7M	22 – 32 (30 – 43)
	71	71 or K	27 – 36 (37 – 49)
3" & 4" (80 & 100)	6C	L7M	58 – 78 (79 – 106)
	71	71 or K	70 – 89 (95 – 121)

4. Screw the insert (2) into the body until it is fully seated, and then mark its position as (shown in **Figure 3**). Counting the number of turns, remove the insert.

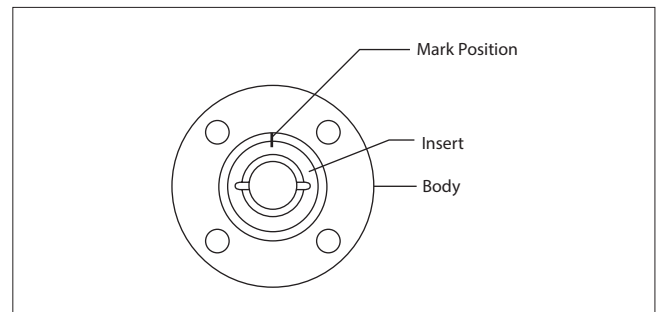


Figure 3.

5. 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.
6. Insert the second seat (5) so that the sealing surface of the seat is towards the ball (see **Figure 1**).
7. Insert the body seal (6) and gently press it into the groove in the body.

8. Using a thread lubricant compatible with the media, screw the insert (2) into the body and tighten with the required torque (per **Table 2**). If a torque wrench is not available, tighten the insert the same number of turns as in step 4, until the marks line up according to dimension "A" (shown in **Table 3**) and illustrated in (**Figure 4**). The insert must be tightened until the spacing between the marks is no more than dimension "A".

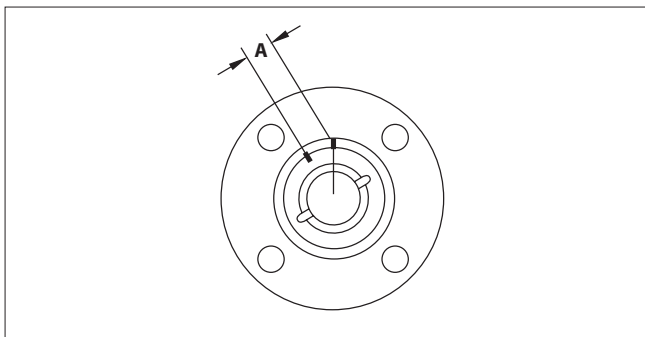


Figure 4.

TABLE 3			
Insert Assembly Torque			
Valve Size Inches (DN)	Torque FT•LBS (N•m)	"A" Reduced Port	Full Port
1/2 (15)	125 – 150 (170 – 203)	—	7/32" (5.5 mm)
3/4 (20)	125 – 150 (170 – 203)	—	5/16" (7.9 mm)
1 (25)	125 – 150 (170 – 203)	—	11/32" (8.7 mm)
1-1/2 (40)	250 – 275 (339 – 373)	3/8" (9.5 mm)	—
2 (50)	250 – 275 (339 – 373)	7/16" (11.11 mm)	—
3 (80)	450 – 500 (610 – 678)	1/64" (.39 mm)	—
4 (100)	600 – 650 (814 – 881)	1/64" (.39 mm)	—

9. Place the handle bracket (H1) on the valve and fasten with the proper mounting hardware according to the valve size (see **Figure 10**).
10. Place handle (H2) on the valve stem and secure with the stop nut (H5) for 1/2" – 2" (DN 15 – 50) valve sizes or hex head cap screw (H15), and flat washer (H16) for 3" and 4" (DN 80 and 100) valve sizes.
11. Cycle the valve slowly with a gentle back and forth motion to build gradually to the full quarter turn. By cycling slowly, the seat lips will seat against the ball. A fast turning motion at this point may cut the seats before they have a chance to form the proper seal.
12. Refer to the **HANDLE ADJUSTMENT** Section to set open and closed position stops properly. Position stops should be adjusted every time the valve is assembled.

3.4 HANDLE ADJUSTMENT

Adjustment of the handle cam adjusters (H3) is required to ensure that the ball is properly aligned in both the open and closed positions.

1. With the valve in the open position, the misalignment of the ball port in relation to the body port should not exceed 1/32" (.79 mm) for 1/2" – 2" (DN 15 – 50) valve sizes and 1/16" (1.6 mm) for 3" and 4" (DN 80 and 100) valve sizes.
2. If open position adjustment is necessary, loosen hex head cap screw (H6) and lock nut (H7) and rotate cam adjuster (H3) until the correct open position of the ball is obtained. Retighten hex head cap screw (H6) and lock nut (H7). Cycle the valve and recheck the open position ball alignment.
3. Cycle the valve to the closed position. Scribe a pencil mark on the ball as shown in (**Figure 5**). Open the valve and measure dimension "C" between scribe mark and edge of ball. Loosen hex head cap screw (H6) and locknut (H7) and adjust the cam adjuster (H3) as in step 2 according to dimension "C" in (**Table 4**).
4. Cycle valve and check closed position again as in Step 3.

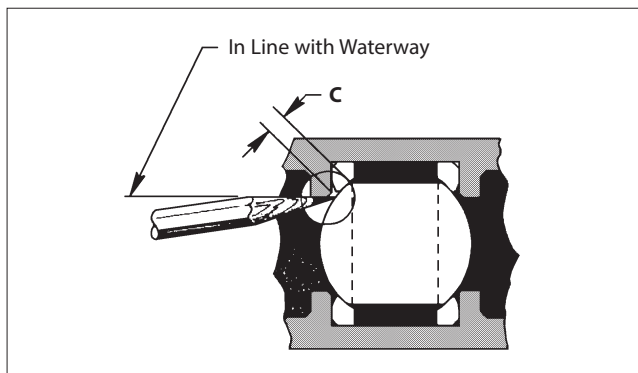


Figure 5.

TABLE 4		
Valve Size	"C"	
	Reduced Port	Full Port
1/2 (15)	3/32" (2.4 mm)	3/32" (2.4 mm)
3/4 (20)	1/8" (3.2 mm)	1/8" (3.2 mm)
1 (25)	11/64" (4.4 mm)	11/64" (4.4 mm)
1-1/2 (40)	1/4" (6.35 mm)	1/4" (6.35 mm)
2 (50)	9/32" (7.1 mm)	9/32" (7.1 mm)
3 (80)	3/8" (9.5 mm)	1/2" (12.7 mm)
4 (100)	1/2" (12.7 mm)	3/4" (19.05 mm)

3.5 STEM SEAL AND BEARING REPLACEMENT

WARNING: It is possible that there may be trapped media under pressure in between packing sets. Refer to the **WARNING** Section at the front of these instructions and exercise the same precautions for protection from the media.

Loosen the stem packing lock nuts (15) enough to release the load on the packing. Cycle the stem several times to promote the release of any trapped, potentially pressurized media in the packing set.

1. Remove the hex head cap screws (18) and lift stem retainer subassembly off the valve body (1).
2. Remove the lock nuts (15), flat washers (57), disc springs (35) and disc spring spacers (34). Remove compression plate (10) and compression ring (9). The studs (14) do not have to be removed.
3. Slide the stem (4) out of the stem retainer (30) from the bottom using a twisting motion. Gently tapping on the top of the stem with a soft mallet will help in removal. Remove the upper stem bearing (8).
4. Pry out the upper stem seals (23A, 24 & 23B) taking care not to scratch the stem bore inside the stem retainer (30).
5. Remove the lantern ring (26) and pry out the lower stem seals (23C, 24 & 22) taking care not to scratch the stem bore inside the stem retainer (30) or the bottom sealing lip where the lower stem seal (22) is seated.
6. Place the upper stem bearing (8) onto the stem (4) and slide into the stem retainer (30).
7. Place the stem retainer in a suitable fixture or vise so that the stem (4) and upper stem bearing (8) are flush with bottom of the stem retainer (see **Figure 6**).
8. Lightly apply a lubricant compatible with the flow medium to the ID and OD of packing seals. Place lower stem seals (22, 24 & 23C) over stem and press down into stem retainer until they are seated in the bottom of the stem bore. (**See Figure 6 for proper orientation of lower stem seals.**)

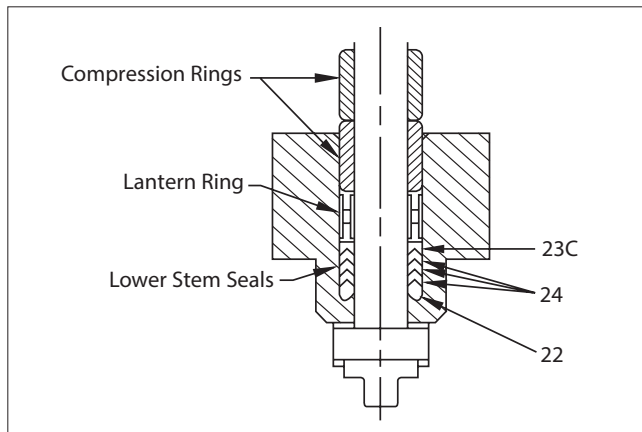


Figure 6.

9. Place lantern ring (26) in the stem bore.
10. Place two compression rings (9) (see **Figure 6**) in the stem bore. Place compression plate (10) over stem resting on top of compression rings.
11. Mount flat washers (57), disc spring spacers (34) and disc springs (35) over studs with orientation of disc springs (as shown in **Figure 9**).
12. Assemble lock nuts (15) on studs and tighten evenly alternating between locknuts until disc springs are compressed to the correct height "B" (as given in Table 5). Height "B" is determined from the height of the disc spring spacers (34). Proper load is achieved when the spacers (34) contact the flat washers (57). Over-tightening may damage seals and hamper sealing performance.

TABLE 5			
Disc Spring Height			
Valve Size		"B"	
Inches	DN	Inches	mm
1/2 – 1	15 – 25	.249 – .259	6.3 – 6.6
1-1/2 & 2	40 & 50	.246 – .256	6.2 – 6.5
3 & 4	80 & 100	.369 – .379	9.4 – 9.6

13. Remove lock nuts (15), flat washers (57), disc springs (35) and disc spring spacers (34).
14. Remove compression plate (10) and compression rings (9).
15. Lightly apply a lubricant compatible with the flow medium to the ID and OD of packing seals. Slide the upper stem seals (23B, 24 & 23A) over stem and pressdown into stem retainer until they are resting on the lantern ring (26). (See **Figure 7** for orientation of upper stem seals.)

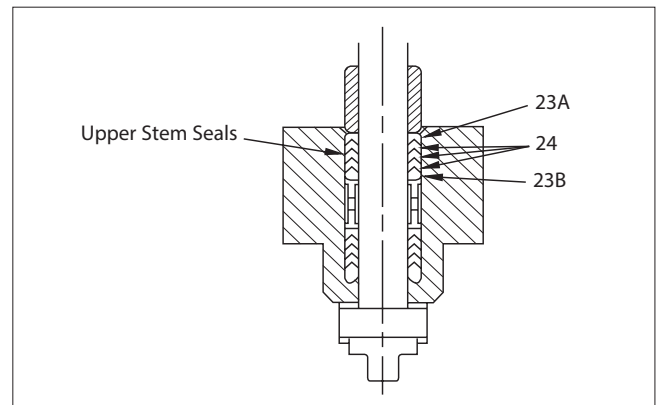


Figure 7.

Item #23, consists of three (3) pieces as indicated.

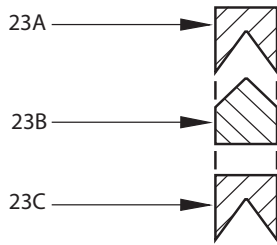


Figure 8.

16. Place the compression ring (9) and compression plate (10) over the stem.
17. Reassemble flat washers (57), disc spring spacers (34), disc springs (35) and lock nuts (15) per steps 11 and 12 above. (See **Figure 9** for orientation of disc springs.)

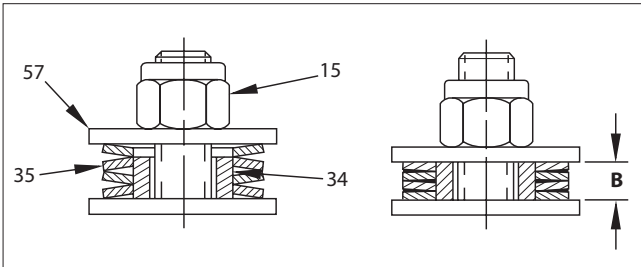


Figure 9.

18. Check disc spring heights against dimension (given in **Table 5**). Also check height between compression plate and stem retainer. Compression plate height should be parallel from one side to the other within .030" (.76 mm) when properly assembled. Cycle stem several times to set the seals. Tighten lock nuts (15) if adjustments are necessary to maintain spring height "B" (in **Table 5**).

4. SERVICE / SPARE PART

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. Send valves to the service center in the half open position.

For further information on spare parts and service or assistance visit our web-site at www.valmet.com/flowcontrol/valves.

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

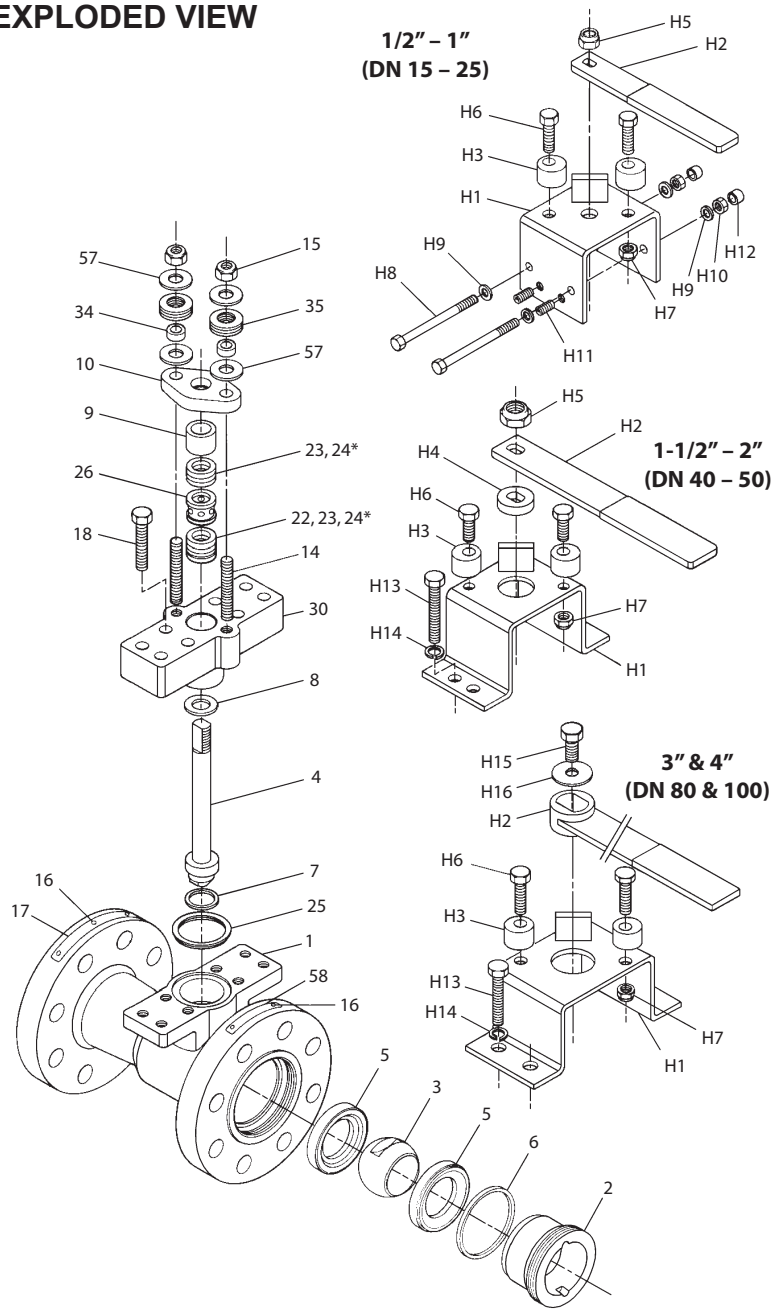
- a. Valve catalog code from identification plate,
- b. If the valve is serialized – the serial number (from identification plate),
- c. From **Figures 6-9**, the ballooned part number, part name and quantity required.

5. WELDING WARNING

WARNING:

WELDING AND/OR GRINDING OF STAINLESS STEEL AND OTHER ALLOY STEELS CONTAINING CHROMIUM METAL MAY CAUSE THE RELEASE HEXAVALENT CHROMIUM. HEXAVALENT CHROMIUM, CHROMIUM(VI) OR CR(VI), IS KNOWN TO CAUSE CANCER. BE SURE TO USE ALL APPROPRIATE PPE WHEN WELDING METALS CONTAINING CHROMIUM. IF YOU HAVE ANY QUESTIONS CONSULT YOUR SUPERVISOR.

EXPLODED VIEW



* See Figures 6, 7 and 8 for seal orientation

VALVE PARTS LIST		
ITEM	PART NAME	QTY
1	Body	1
2	Insert	1
3	Ball	1
4	Stem	1
5	Seat	2
6	Body Seal	1
7	Lower Stem Bearing	1
8	Upper Stem Bearing	1
9	Compression Ring	1
10	Compression Plate	1
14	Stud	2
15	Lock Nut	2
16	Drive Screw	5
17	Identification Tag	1
18	Hex Head Cap Screw	4
22	Seal	1
23	Stem Seal Adapters	1
24	Stem Seal V-rings	2
25	Stem Retainer Seal	1
26	Lantern Ring	1
30	Stem Retainer	1
34	Disc Spring Spacer	2
35	Disc Spring	*
57	Flat Washer	4
58	Serial Number Tag	1
* 12 required on 1/2" – 1" (DN 15 – 25)		
8 required on 1-1/2" – 4" (DN 40 – 100)		

HANDLE PARTS LIST		
ITEM	PART NAME	QTY
H1	Bracket	1
H2	Handle	1
H3	Cam Adjuster	2
H4	Handle Spacer	1**
H5	Esna Nut	1
H6	Hex Head Cap Screw	2
H7	Esna Nut	2
H8	Hex Head Cap Screw	2*
H9	Flat Washer	4*
H10	Center Lock Nut	2*
H11	Set Screw	2*
H12	Protection Cap	2*
H13	Hex Head Cap Screw	4+
H14	Lock Washer	4+
H15	Hex Head Cap Screw	1++
H16	Flat Washer	1++
* 1/2" – 1" (DN 15 – 25) Only		
** 1-1/2" & 2" (DN 40 & 50) Only		
+ 1-1/2" – 4" (DN 40 – 100) Only		
++ 3" & 4" (DN 80 & 100) Only		

Figure 10.

Valmet Flow Control Oy

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