

Jamesbury™ Wafer-Sphere™ butterfly valve series 835W & 835L 30" – 60" (DN750-1500) model B

Installation, maintenance and
operating instructions

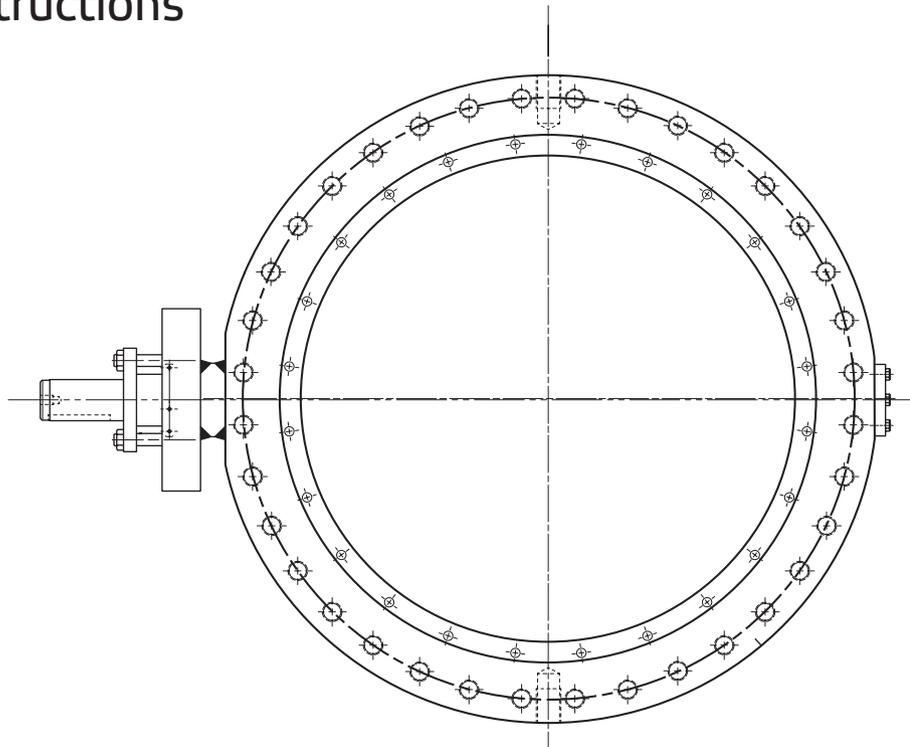


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READ THESE INSTRUCTIONS FIRST!

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.

INTRODUCTION

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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.valmet.com/flowcontrol/valves for the latest documentation.

SAVE THESE INSTRUCTIONS!

The following instructions should be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment. Throughout the text, safety and/or caution notes will appear and must be strictly adhered to, otherwise, serious injury or equipment malfunction could result.

Valmet has highly skilled personnel available for startup, maintenance and repair of our valves and component parts.

Arrangements for this service can be made through your local Valmet representative or sales department. When performing maintenance use only Valmet replacement parts. Parts are obtainable through your local representative or spare parts department.

When ordering parts, always include Model and Serial Number of the unit being repaired.

1. GENERAL

These installation and maintenance instructions apply to 30"–60" (DN750-1500), 835 Model B series regardless of the type of material used. The 800 series valves are designed with built in versatility making them well-suited to handle a wide variety of process applications.

Recommended spare parts required for maintenance refer to section 6. The model number, size, rating and serial number of the valve are shown on the identification tag located on the valve.

1.1 SCOPE OF THE MANUAL

This instruction manual contains important information regarding the installation, operation and maintenance of the Jamesbury™ Model B 30" – 60" (DN750-1500) 835W & 835L *Wafer-Sphere* Butterfly Valves. Please read these instructions carefully and save them for future 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

1.2 OFFSET SHAFT DESIGN

One of the design features of the *Wafer-Sphere* valve that is responsible for its superior performance is the valve's offset shaft design. The shaft is offset in two planes: (1) away from the valve disc centerline and (2) behind the disc sealing plane. Offset shaft design makes the rotating disc "cam" back and away from the seat, completely eliminating the usual wear points at the top and bottom of the seat. Because the disc rotates off the seat in an eccentric arc, it operates in one quadrant only (See **Figure 1**).

WARNING

IF THE VALVE DOES NOT HAVE EITHER A FULLY OPERATIONAL ACTUATOR OR A HANDLE, **DO NOT PRESSURIZE THE VALVE**. AN UNRESTRAINED DISC MAY OPEN OR CLOSE DUE TO PIPELINE PRESSURE.

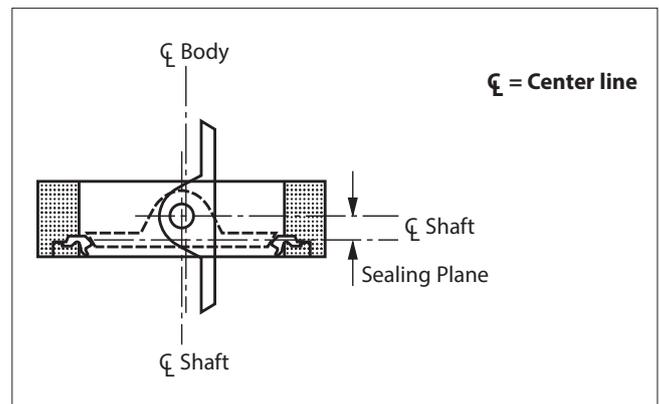


Figure 1. Offset Shaft Operation

1.3 POSITIVE STOP FEATURE

To prevent seat damage from over-travel of the disc beyond the closed position (usually during field mounting of an actuator), a "positive stop" feature has been designed into the *Wafer-Sphere* butterfly valve. The "positive stop" feature also makes it possible to adjust the actuator travel stops in-line.

1.4 WAFER BODY DESIGN

Wafer designs, and valves with "DV" modification (see Valve Codes, page 14) contain flange bolt holes in the body to hold the valve and assist with correct alignment during installation in the line. The centering holes in wafer bodies alone are not suitable, or intended for containing line pressure, and are only for use in conjunction with a fully bolted pipeline flange.

1.5 VALVE MARKINGS

The valve has an identification plate attached to the valve body (see Figure 2).

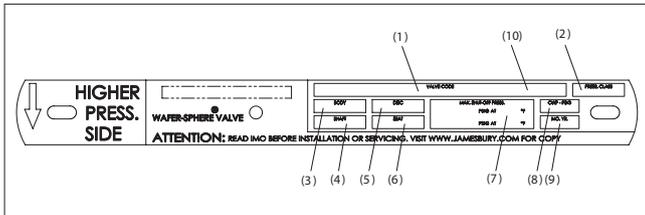


Figure 2. Identification plate

Identification plate marking:

1. Size
2. Pressure class
3. Type code
4. Body material
5. Seat material
6. Model number
7. Date
8. Trim material
9. Shaft material
10. Maximum shut-off pressure
11. Maximum temperature
12. Certification and approvals, eg. CE, Atex etc.

1.6 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:

DO NOT DISMANTLE THE VALVE OR REMOVE IT FROM THE PIPELINE WHILE THE VALVE IS PRESSURIZED!

Dismantling or removing a pressurized valve will result in uncontrolled pressure release. Always isolate the relevant part of the pipeline, release the pressure from the valve and remove the medium before dismantling the valve. Be aware of the type of medium involved. Protect people and the environment from any harmful or poisonous substances. Make sure that no medium can enter the pipeline during valve maintenance. Failure to do this may result in damage or personal injury.

WARNING

BEWARE OF DISC 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 DISC 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:

WHEN HANDLING THE VALVE OR VALVE/ACTUATOR ASSEMBLY, TAKE ITS WEIGHT INTO ACCOUNT!

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.

Please consult separate document: instructions for lifting Valmet products. (See Valmet document id: 10LIFT70EN.PDF).

CAUTION:

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. This can be measured or calculated using Neles Nelprof software.

1.7 WELDING NOTES

WARNING:

Welding and/or grinding stainless steel and other alloys containing chromium metal may cause the release of hexavalent chromium. Hexavalent chromium(VI) or Cr(VI), is known to cause cancer. Be sure to use all appropriate personal protective equipment (PPE) when welding metals containing chromium.

NOTE:

A qualified welder must do the installation welding. The welder and welding procedure should be qualified in accordance with the ASME Boiler and Pressure Vessel Code Section IX or other applicable regulation.

CAUTION:

To prevent damage to the seat and seals, do not allow the temperature of the seat and body seal area to exceed 94 °C (200 °F).

It is recommended that thermal chucks be used to check the temperature in these areas during welding.

CAUTION:

Ensure that any weld splatter does not fall onto the valve closing members eg. trim or seats. This may damage critical seating surfaces and cause leaks.

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 closed position.

If the valve(s) are to be stored for a long duration, follow the recommendations of IMO-S1.

3. INSTALLATION

3.1 GENERAL

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

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

3.2 INSTALLING IN THE PIPELINE

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! RECOMMENDED FASTENER LENGTHS ARE LISTED IN BULLETIN T104-1.

The valve may be installed in any position and offers tightness in both directions. For lowest operating torque it is recommended, however, that the valve be installed with the body insert towards the higher pressure, (shaft downstream).

1. Read all **WARNINGS!**
2. **IMPORTANT:** Only actuator stop screws must be used to stop the disc position. DO NOT use the “positive stop” by itself to limit travel.
3. Visually check the position of the disc when valve is in the closed position and the insert is fully compressed. The disc should be parallel to the flanges within 1/32” (0.79 mm).
4. Before installing a closed valve in the pipeline, be sure that the actuator is attached so that a counter-clockwise rotation, viewed from above, opens the valve (**See Figure 1**). Fully close the valve again before installing in the pipeline.
5. **THE PIPELINE:** The *Wafer-Sphere* butterfly valve must be centered between flanges to avoid disc-pipe contact which could damage the disc and shaft. Any flange or pipeline welding should be done prior to installation of the valves. If this is impossible, protective covering or shields must be placed in the pipeline between the valve and the area being welded prior to welding. Not only must the valve be protected against weld slag, but also against any excessive heat, which could cause seat damage. It is essential that all weld slag, rods, debris, tools, etc., be removed from the pipeline before valves are installed or cycled.
6. Secure the valve between flanges. Compress the flange gaskets **EVENLY** by tightening the fasteners in an alternating sequence.

NOTE: DO NOT use thick rubber, or other gaskets of a “spongy” consistency!

7. It is not recommended to install the valve with the stem on the underneath side because dirt in the pipeline may then enter the body cavity and potentially damage the stem packing (see **Figure 4**).

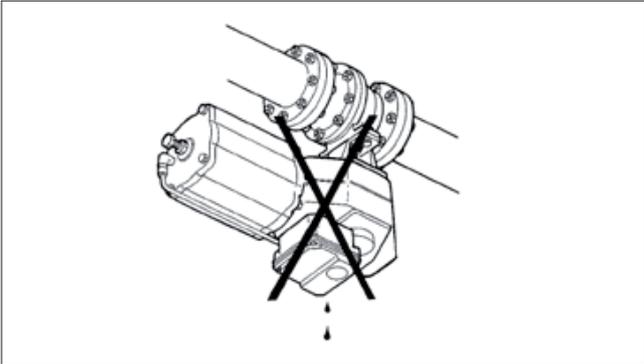


Figure 3. Avoid this mounting position

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 VALVE INSULATION

If necessary, the valve may be insulated. Insulation must not continue above the upper level of the valve (see **Figure 5**).

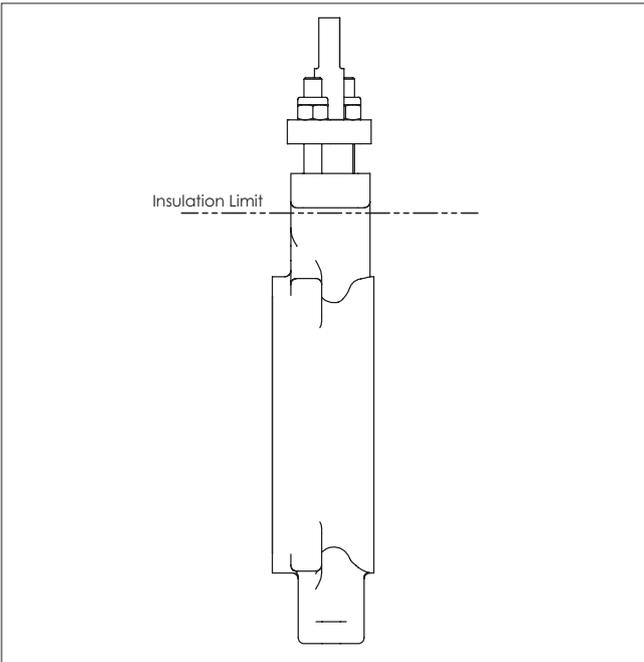


Figure 4. Insulation of the valve

3.4 ACTUATOR

CAUTION:

The actuator must not touch the pipeline, because pipeline vibration may damage it or interfere with its operation. In some certain cases, when a large-size actuator is used, extended stems are required or when the pipeline vibrates heavily, supporting the actuator is recommended.

When installing the actuator on the valve, make sure that the valve package functions properly. See instructions for installing in Section 5.

Observe the space needed for removal of the actuator. The actuator should be installed in a manner that allows plenty of room for its removal.

The upright position is recommended for the actuator cylinder.

In some cases, e.g. when a large-size actuator is used or when the pipeline vibrates heavily, supporting the actuator is recommended.

Please contact Valmet for further information.

3.5 COMMISSIONING

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

Ensure that all nuts, fittings, and cables are properly fastened.

If so equipped, check that the actuator positioner and/or switch are correctly adjusted. To adjust actuator or any accompanying device(s) refer to the separate control equipment instruction manuals.

4. MAINTENANCE

WARNING:

Observe the safety precautions mentioned in Section 1.6 before maintenance!

CAUTION:

When handling the valve or the valve package as a whole, be mindful of the weight of the valve or the entire package.

WARNING:

For safety reasons the shaft seals MUST always be installed according to Section 4.5.

Numbers in () refer to items shown in Figures 8, 9, & 12.

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. Valmet recommends inspecting valves at least every five (5) years. The inspection and maintenance frequency depends on the actual application and process condition. Routine maintenance consists of tightening the hex nuts (15) in (Figure 10) periodically to compensate for stem seal wear. The valve should be fully closed during the tightening.

CAUTION: Tightening hex nuts (15) too severely will shorten the life of the shaft seals.

Overhaul maintenance consists of replacing seats and seals. These parts may be obtained through your authorized Valmet Distributor.

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. Wear any protective clothing or equipment normally required when working with the fluid involved.
2. Depressurize the pipeline by placing the valve in the open position and draining the pipeline.

After removal and before any disassembly, cycle the valve again several times.

NOTE:

When sending goods to the manufacturer for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. For safety reasons, inform the manufacturer of the type of medium used in the valve (include material safety datasheets (MSDS)).

NOTE:

In order to ensure safe and effective operation, always use original spare parts to make sure that the valve functions as intended.

NOTE:

For safety reasons, replace pressure retaining bolting if the threads are damaged, have been heated, stretched or corroded.

4.2 ACTUATED VALVE

It is generally most convenient to detach the actuator and its auxiliary devices before removing the valve from the pipeline. If the valve package is small or if it is difficult to access, it may be more practical to remove the entire assembly.

NOTE: To ensure proper reassembly, observe the position of the actuator and positioner/limit switch with respect to the valve before detaching the actuator.

WARNING

ALWAYS DISCONNECT THE ACTUATOR FROM ITS POWER SOURCE, PNEUMATIC, HYDRAULIC OR ELECTRICAL, BEFORE ATTEMPTING TO REMOVE IT FROM THE VALVE!

WARNING

DO NOT REMOVE A SPRING-RETURN ACTUATOR UNLESS A STOP-SCREW IS CARRYING THE SPRING FORCE!

1. Detach the air supply, electrical supply, hydraulic supply and control signal cables or pipes from their connectors.
2. Loosen screws of no-play coupling.
3. Unscrew the actuator mounting bracket screws.
4. Lift the actuator straight up in line with the valve stem until the coupling between actuator drive and valve stem is completely disengaged.
5. Place actuator in a safe location to avoid damage or personal injury.

4.3 VALVE REMOVAL

WARNING:

Do not dismantle the valve or remove it from pipeline while the valve is pressurized.

1. Read all **WARNINGS!**
2. Valve must be fully closed before removing it from the pipeline.
3. **CAUTION:** Valves equipped with spring-to-open (air-to-close) actuators must be disconnected from the actuators and then closed. Valves must be closed while removing them from the pipeline.

Ensure that the valve is not pressurized and the pipeline is empty. Ensure that the medium cannot flow into the section where servicing is to take place. Support the valve carefully with a hoist. Place ropes carefully and unscrew the pipe flange bolts. Ensure that the ropes are positioned correctly.

4.4 SEAT REPLACEMENT – NON FIRE-TITE® VALVES

NOTE: For *Fire-Tite* seat replacement see section 4.10

WARNING:

Do not dismantle the valve or remove it from pipeline while the valve is pressurized.

1. After removing the valve from the line, place it on a suitable workspace. Cycle the valve open just enough to lift the disc off the seat: **Take care not to damage the sealing edge of the valve disc.**
2. Remove the insert screws (21) and the insert (2). If the insert does not lift out easily, tap it out from the shaft side using a wooden or plastic rod and a hammer. Do not strike the valve directly with a hammer.

- Remove the seat (5) and discard.

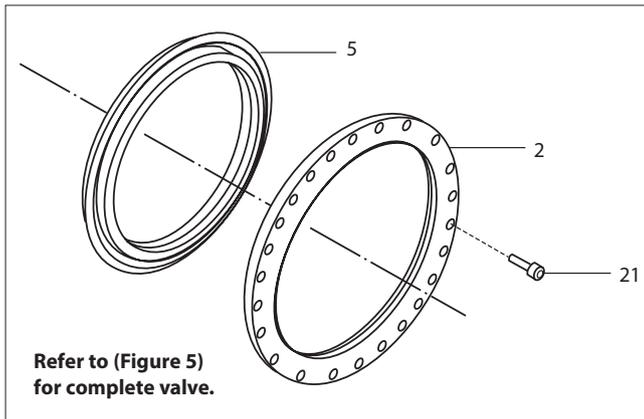


Figure 5.

- Carefully clean the gasketing surfaces with a suitable solvent. They should be free of all grooves and scratches. If deep scratches are present, polish or repair is required.
- Clean the valve and insert.
- Carefully clean and polish the disc sealing surface. It should be free of all grooves and scratches. If the disc is slightly damaged, it may be possible to smooth the sealing surface with crocus cloth, a fine stone, or the equivalent. If deep scratches are present, replace disc or return the valve to the factory for service.
- Cycle the valve closed.
- Verify the disc is in the level position and install the seat (5) and insert (2) (See **Figures 6**).
- Install the insert screws (21). Tighten the screws uniformly in an alternating pattern. Torque values are given in (**Table 1**). Open the valve and retorque the insert screws per (**Table 1**). Take care not to damage the sealing edge of the disc. Close the valve.

TABLE 1					
Insert Screw Torque Table					
Valve Size	Screw Size	Torque C'Stl.		Torque St. Stl.	
		lb.-ft.	Nm	lb.-ft.	Nm
All Sizes	1/2"	90/132	122/179	33/44	45/60

Torque values shown are lower/upper limits.

- Set the actuator stops as described in the **ACTUATOR Section 5**. Do not install and tighten flanges on a newly resealed valve until the actuator stops are properly set and the valve is fully closed. Incorrect disc positioning may cause damage to a new seat when the valve is compressed between flanges for the first time. **NOTE:** After installation of a new seat, torque will be higher for a few cycles.

4.5 SHAFT SEAL REPLACEMENT

WARNING:

Do not dismantle the valve or remove it from pipeline while the valve is pressurized.

CAUTION: Read all **WARNINGS** before proceeding.

- Remove the actuator and the actuator coupling as described in **Section 4.2**.
- Remove the nuts (15) and washers (16) from above the compression plate (10). Remove the compression plate (10). The studs (14) do not have to be removed.
- Remove the compression ring (9)*.
- Remove the old shaft seal (8) segments. **CAUTION:** Use extreme care to not damage the shaft or body bore!
- The spacers (7) and (65) need not be removed for shaft seal replacement.
- Replace the old shaft seal with a new shaft seal. **NOTE:** If the seal is of the PTFE V-ring type, keep the seal rings stacked in the same order as removed from kit. Note the orientation in (**Figure 10**). This orientation is preferred for all applications, including vacuum.
- Reinstall the compression ring (9)*, the compression plate (10), and the washers (16). Install nuts (15) finger tight only.
- Close the valve.
- With the valve closed, tighten the nuts (15) on the compression plate evenly until the packing is adequately compressed to prevent leakage. This should require tightening the nuts approximately 1-1/2 to 2 full turns after they have both come into contact with the compression plate.

* **Compression ring (9) is only provided on sizes 42"-60" (DN1050 – 1500)**

4.6 VALVE DISASSEMBLY

WARNING:

Do not dismantle the valve or remove it from pipeline while the valve is pressurized.

NOTE: If complete disassembly becomes necessary, replacement of seats and all seals is recommended.

- Place the valve on a suitable working space.
- If the seat is to be replaced or removed, follow instructions given in **Sections 4.4 or 4.10**. **NOTE:** It is good practice to replace the seat, shaft and body seals and bearings any time a valve is disassembled.
- Remove the shaft seal compression hardware as detailed in Steps 1-4 in **Section 4.5**. The seal material itself can be more easily removed after the shaft has been removed from the valve.
- Remove the wedge pins (13) welds by grinding or machining off the welds. Drive out the pins opposite the installation direction shown in (**Figure 10**). Remove the cap screws (55) and lock-washers (56). Remove cover plate (53) and gasket (54).

5. Use a soft rod and hammer to tap the end of the non-bonnet shaft (37) from inside the valve through the bottom of the valve. **NOTE: The disc will need to be supported in order to remove the shafts. Each disc is equipped with lifting holes for this purpose.** After removal of the non-bonnet shaft (37), repeat the procedure with the bonnet end shaft (4); again tapping the shaft from inside the valve. **CAUTION:** When removing the shaft and freeing the disc, be careful not to scratch the sealing surface of the disc.
6. Remove the disc (3) and upper and lower thrust bearings (64).
7. Remove the top bearing (6) either through the top of the valve or the waterway.
8. Remove the bottom bearing (6) either through the bottom of the valve or the waterway.
9. Remove any remaining shaft seals (8) and spacers (7).
7. Position disc (3) in the body between the thrust bearings (64) and slide the bonnet-end shaft (4) through the body and into the disc. Next, insert the non-bonnet-end shaft (37) through the bottom of the valve and into the disc. Use caution to prevent damage to the shaft bearings and disc sealing surface. An arrow and the word "bonnet" on the disc indicate correct orientation.
8. Insert the disc pins (13), as shown in (Figure 10), and drive them into place. The pins must be driven so that all pins are the same depth within 1/16" (1.56 mm). Weld both ends of the pins, small end first. After the disc cools, clean the welds with a wire brush. **CAUTION:** Use care to keep contamination out of the valve.
9. Install the spacer (7) and (65) and the shaft packing (8), and the compression ring (9). If the shaft seal is of the PTFE V-ring type, be certain that it is installed in the orientation shown in (Figure 10).
10. If the studs (14) have been removed from the valve, reinstall them in the holes shown in (Figure 10), using LOCTITE® or other locking compound to prevent vibration loosening.
11. Place the compression plate (10) over the shaft (4) and studs (14). Install the washers (16) and nuts (15), but do not tighten.
12. Place gasket (54) and cover plate (53) on bottom of valve. Center gasket with cap screws (55) and lock washers (56). Torque cap screws (55) per Table 2.

4.7 CHECKING PARTS

1. Clean all disassembled parts.
2. Check the shafts (4) and (37), and disc (3) for damage. Pay particular attention to the sealing areas.
3. Check all sealing and gasket surfaces of the body (1) and insert (2).
4. Check all bearing areas on shafts (4 & 37), body (1), disc (3) and thrust bearings (64).
5. Replace any damaged parts.
6. Replace any fastener where the threads are damaged or have been heated, stretched or corroded.
7. Replace ant parts that have cracks, gouges or pits that will affect sealing.

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 (stamped on the valve body),
- c. From Figure 10, the ballooned part number, part name and quantity required.

4.8 VALVE ASSEMBLY

NOTE: If complete disassembly becomes necessary, replacement of seats and seals is recommended.

1. Clean all valve components, if not previously done.
2. Inspect all components for damage before assembling the valve. Look for damage to the sealing areas on the disc, shafts, and body, and for wear in the bearing areas.
3. Carefully clean and polish the disc sealing surface. It should be free from all grooves and scratches.
4. If the disc is slightly damaged, it may be possible to smooth the sealing surface with crocus cloth, a fine stone, or the equivalent. If deep scratches are present, replace the disc or return the valve to the factory for service.
5. Install the bottom bearing bearings (6) into the lower body bores. Install the top shaft bearing (6) into the upper body bore.
6. To ease assembly of the shaft into the disc, it may be necessary to coat the shaft and the disc bore lightly with a lubricant compatible with the media to be handled by the valve.
13. Cycle the valve fully closed. Install new unused seat. See the **SEAT REPLACEMENT** Sections for details.
14. With the valve still closed, tighten the nuts (15) on the compression plate (10) evenly until the shaft seals are adequately compressed to prevent leakage. This should require tightening the nuts approximately 1-1/2 to 2 full turns after they have both come into contact with the compression plate.
15. Set the actuator stops as described in the **ACTUATOR Section 5**. Do not install and tighten flanges on a newly reseated valve until the actuator stops are properly set and the valve is fully closed. Incorrect disc positioning may cause damage to a new seat when the valve is compressed between flanges for the first time. **NOTE:** After installation of a new seat, torque will be higher for a few cycles.

TABLE 2		
Cover Plate Torque Table		
Screw Size	Torque (upper/lower)	
	lb.-ft.	Nm
1/4"	10/7	14/9
5/16"	20/14	27/19
3/8"	33/23	45/31
7/16"	55/38	75/52
1/2"	83/56	113/76
9/16"	121/83	164/113
5/8"	165/113	224/153
3/4"	275/188	373/255
7/8"	413/281	560/381
1"	638/435	865/590

4.9 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.

Should it become necessary to perform a leak test of the valve prior to its installation in the pipeline, follow the procedure outlined below.

1. In the following test, suitable gaskets are required between the faces of the valve and the test hardware.
2. Before pressurizing the valve be sure all actuator linkage fasteners are tight, and that the power or pressure is applied to the actuator to maintain the valve in the closed position. The offset design on the valve may cause it to rotate when the test pressure is applied to one side of the disc.
3. The valve should be installed between flanges or in a testing apparatus. If flanges are used, refer to **INSTALLATION Section 3**. If a testing device other than flanges is used, the clamping force of the device must be comparable with flange bolt loads on the valve.
4. Slightly open the valve. Verify that you do not have a seal between the seat and the disc. Exercise caution when cycling a valve in the test apparatus to avoid possible disc damage from the disc striking the test fixture.
5. Cap the downstream vent and apply 50 psi (3.45bar) to the valve. Check the shaft seals, cover plate and flange gaskets for leakage. This can be done by applying a liquid mixture of soap and water at all seal joints and watching for bubbles.

IMPORTANT: If leakage is detected between the valve and flanges **STOP IMMEDIATELY**. Mark the area of leakage. Vent the valve, and when it has returned to 0 psi (0 bar), retighten the flange bolts in the area. Repressurize the valve checking the gasket again. If leakage persists, disassemble and inspect for damage.

6. If leakage is detected at the shaft seals, tighten the bonnet nuts (15) only enough to stop the leak.
7. Vent the valve, and when it has returned to 0 psi (0 bar), cycle the valve closed.
8. Attach a small tube or hose to the downstream flange (shaft side of the valve).
9. Be sure power/pressure is still applied to the actuator. Pressurize the upstream flange (insert side of valve) to 50 psi (3.45bar). Check for leakage passing through the free end of the tube/hose.

NOTE: Initial downstream movement of the disc can be mistaken for leakage. Wait at least 5 minutes after applying pressure before checking for leakage.

10. If leakage is detected, vent the valve and make an actuator close-stop adjustment as described in the appropriate Neles actuator IMO, listed in **Table 3**.
11. Repressurize the valve and check the leakage. If valve still leaks, repeat step 10. If leakage cannot be stopped, adjust the actuator stop so that leakage is minimized.

12. Rebuilt valves may have some minor leakage due to damage to the disc. With the valve still pressurized, insert the free end of the tube/hose into a beaker of water and check for bubbles. In the absence of other test standards, observe leakage after it has reached a stable condition. Because of the volume of air that must be exhausted from a cycled valve, it may be necessary to wait several minutes for the leakage to stabilize or stop. One bubble per inch (25.4 mm) of valve diameter per minute may be considered acceptable for rebuilt solid or composite seated valves.

4.10 COMPOSITE SEAT REPLACEMENT (*FIRE-TITE*)

NOTE: For non-*Fire-Tite* seat replacement see **Section 4.4**

WARNING:

Do not dismantle the valve or remove it from pipeline while the valve is pressurized.

1. After removing the valve from the line, place it on a suitable workspace. Cycle the valve open just enough to lift the disc off the seat: **Take care not to damage the sealing edge of the valve disc.**
2. Remove the insert screws (21) and the insert (2). If the insert does not lift out easily, tap it out from the shaft side using a wooden or plastic rod and a hammer. Do not strike the valve directly with a hammer.
3. Remove the seat (5) and discard.
4. Carefully clean the gasketing surfaces with a suitable solvent. They should be free of all grooves and scratches. If deep scratches are present, polish or repair is required.
5. Clean the valve and insert.
6. Carefully clean and polish the disc sealing surface. It should be free of all grooves and scratches. If the disc is slightly damaged, it may be possible to smooth the sealing surface with crocus cloth, a fine stone, or the equivalent. If deep scratches are present, replace disc or return the valve to the factory for service.
7. Cycle the valve closed.

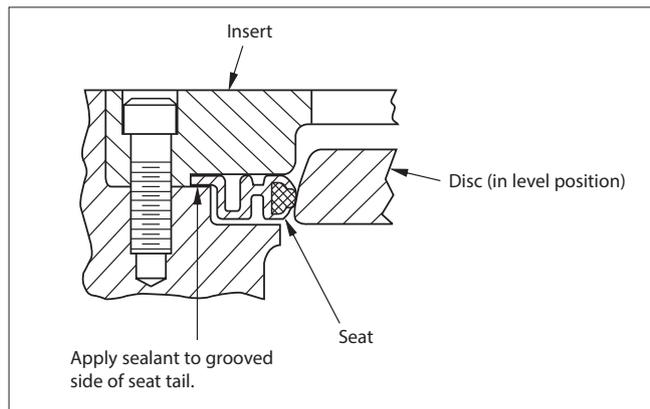


Figure 6.

8. A sealant is required between the seat tail and the body as shown in **Figure 7**. The valve uses PTFE paste sealant. This is installed in accordance with the following steps:
 - a. **IMPORTANT:** Exercise care at all times not to mishandle or damage the seat or its sealing surfaces.
 - b. The bottom surface of the insert must be free of all foreign particles. Clean thoroughly with suitable solvent.
 - c. Apply the sealant to the grooved side of the seat tail in an even continuous bead, completely around the circumference of the seat.
9. Verify the disc is in the level position and install the seat (5) and insert (2) (See **Figure 7**).
10. Install the insert screws (21), see **Figure 3**. Tighten the screws uniformly in an alternating pattern. Torque values are given in (**Table 1**). Open the valve and retorquing the insert screws per (**Table 1**). Take care not to damage the sealing edge of the disc. Close the valve.
11. Set the actuator stops as described in the **ACTUATOR Section 5**. Do not install and tighten flanges on a newly resealed valve until the actuator stops are properly set and the valve is fully closed. Incorrect disc positioning may cause damage to a new seat when the valve is compressed between flanges for the first time. **NOTE:** After installation of a new seat, torque will be higher for a few cycles.

4.11 HIGH CYCLE CONSTRUCTION

Valves with High Cycle construction [Modifier Code = MM] use Xtreme® seat (5), special shaft bearings (6), and special thrust bearings (64) and include excluder rings, see **Figure 13**.

Excluder rings must be installed between the shaft bearing (6) and thrust bearing (64) with the open side towards the disc (3), see **Figure 13**.

CAUTION: When installing bonnet end shaft (4) and non-bonnet shaft (37) take extreme care to not damage excluder rings.

WARNING

HIGH CYCLE CONSTRUCTION IS NOT SUITABLE FOR APPLICATIONS WHERE PIPELINE MEDIA CONTAINS ACIDS, CHLORINE, BROMINE, SULFUR DIOXIDE OR STEAM; OR TEMPERATURES ABOVE 325°F (163°C).

5. ACTUATOR

WARNING

BEFORE INSTALLING THE VALVE AND ACTUATOR, BE SURE THAT THE INDICATOR POINTER ON TOP OF THE ACTUATOR IS CORRECTLY INDICATING THE VALVE POSITION. FAILURE TO ASSEMBLE THESE PRODUCTS TO INDICATE CORRECT VALVE POSITION COULD RESULT IN DAMAGE OR PERSONAL INJURY.

CAUTION: When installing a linkage or servicing a valve/actuator assembly, the best practice is to remove the entire assembly from service.

CAUTION: An actuator should be remounted on the valve from which it was removed. The actuator must be readjusted for proper open and close position each time it is remounted.

WARNING:

The linkage has been designed to support the weight of Neles actuators and recommended accessories. Use of this linkage to support additional equipment such as people, ladders, etc. may result in the failure of the linkage, valve or actuator and may cause personal injury.

WARNING:

WHEN MOUNTING THE ACTUATOR MAKE SURE THAT THE VALVE AND ACTUATOR ARE BOTH IN THE SAME POSITION. MOUNTING AN OPEN ACTUATOR TO A CLOSED VALVE MAY RESULT IN VALVE STEM DAMAGE.

CAUTION:

Before dismantling, carefully observe the position of the valve with respect to the actuator and positioner/limit switch so as to ensure that the package can be properly reassembled. Mounting an open actuator to a closed valve may result in valve stem damage.

CAUTION:

When handling the valve or the valve package, bear in mind its weight!

WARNING:

Do not detach a spring-return actuator unless a stopscrew is carrying the spring force!

CAUTION:

Do not turn the disc more than 90° as this could damage the seat. The valve is so constructed that the disc operates only between 0-90°.

NOTE:

When Valmet supplies whole valve-actuator assembly, the actuator is mounted at Valmet factory on the valve and the stroke limit stops are adjusted by Valmet.

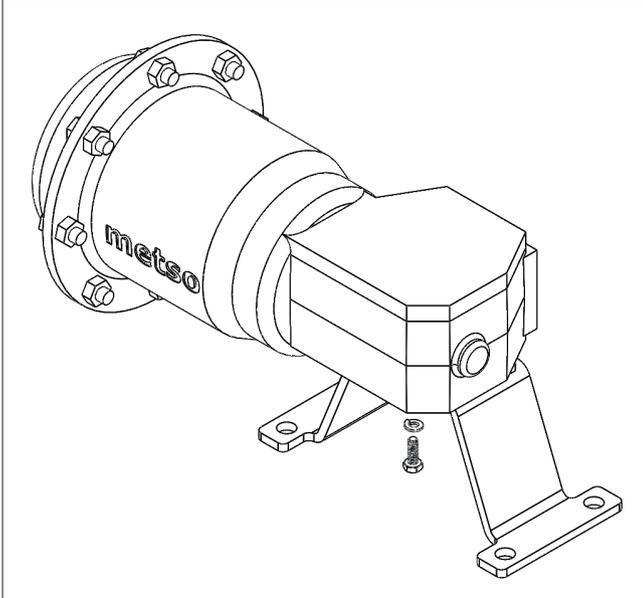


Figure 7.

5.1 ACTUATOR MOUNTING INSTRUCTIONS

1. When a spring-return actuator is being mounted, the valve should be in the closed position for spring-to-close operation or in the open position for the spring-to-open operation. When an electric or double-acting pneumatic actuator is being mounted, the valve position should correspond to the indicated actuator position.
2. Assemble bracket to actuator as shown in (Figure 8). Tighten to torque listed in (Table 4).
3. Place the coupling onto the valve stem. If the valve has a two-piece “no-play” bolted coupling, assemble the coupling loosely on the valve stem. Use socket head cap screws and lock nuts. (See Figure 9)
4. Lower actuator and bracket onto valve while engaging actuator stem driver into coupling. Tighten screws just enough to firmly mate bracket to valve. This should allow bracket to shift, allowing the coupling to align the valve and actuator shafts (See Figure 11, Step 3A).

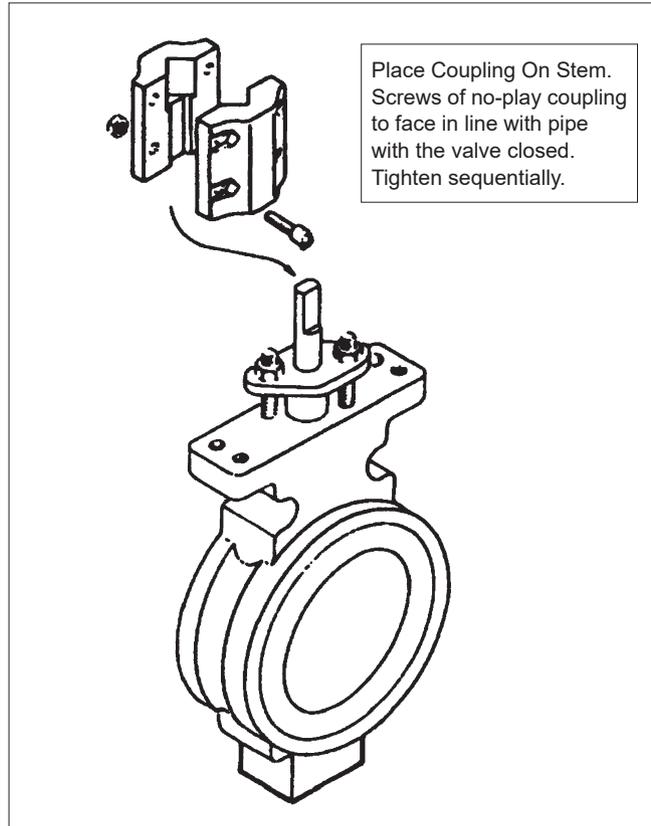


Figure 8.

TABLE 3	
Actuator	IMO
Quadra-Powr®	IMO-215
Manual Gears	IMO-63
B1C	5 BC 70 A
B1J	5 BJ 70 A

5. Tighten the no-play coupling screws to torques shown in (Figure 11, Step 3B). Use alternating sequence shown.
6. Cycle actuator. See actuator instructions.
7. Fully tighten the screws holding the bracket to the valve, as shown in (Figure 11, Step 3C).
8. Recheck no-play coupling screw torques, using the torques in (Figure 11, Step 3B). Use alternating sequence shown.
9. Adjust the actuator travel stops as described in the actuator instructions to these proper valve open and closed positions:

Valve Open:

Disc face (or shaft blade) perpendicular with the flange face.

Valve Closed:

Disc face parallel to flange face within 1/32" (.79 mm).

5.2 DIRECT DRIVE MOUNTING

Follow instructions per **Section 5.1** except for coupling assembly (See **Figure 12**).

6. 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.

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

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 **Figure 10**, the ballooned part number, part name and quantity required.

7. EXPLODED VIEW AND PARTS LIST

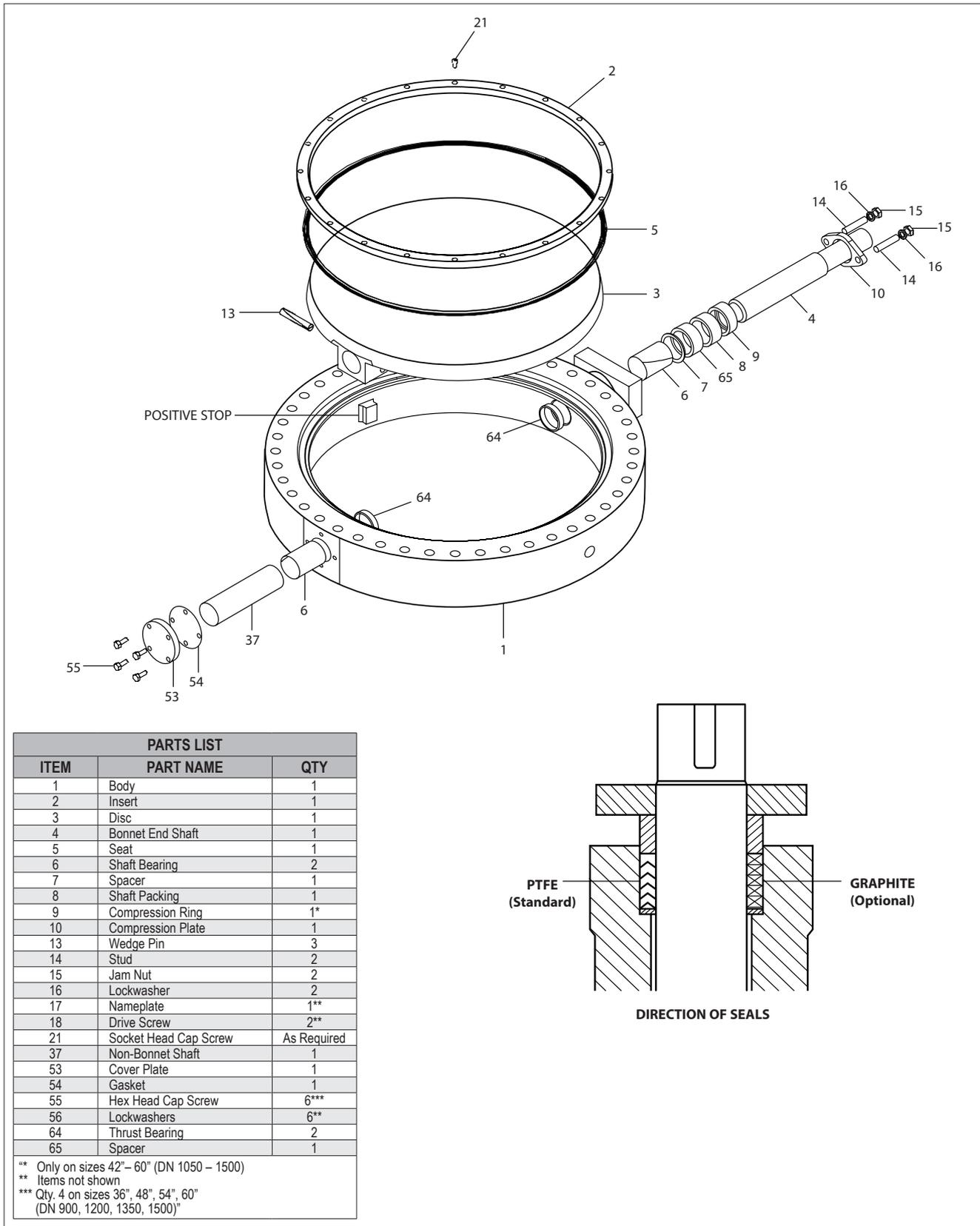


Figure 9.

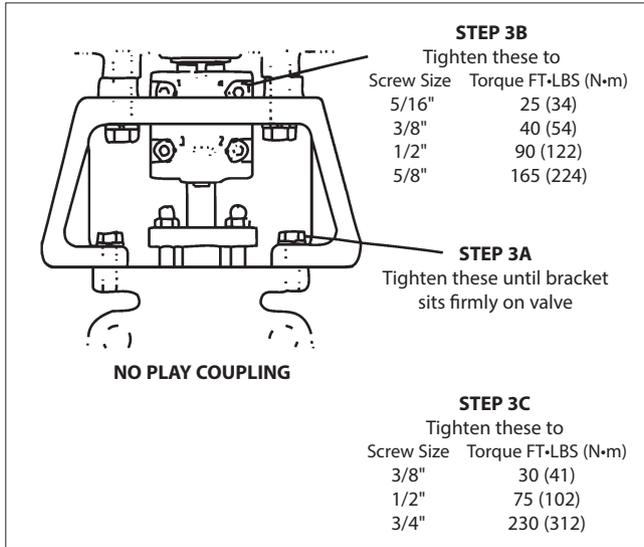


Figure 10.

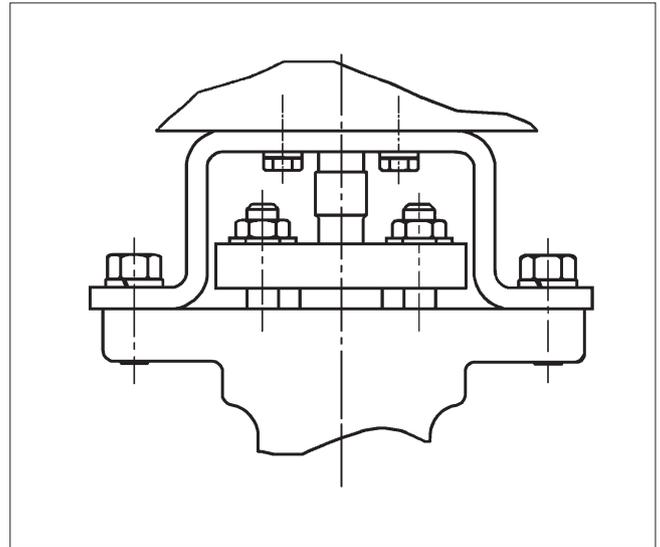


Figure 11.

TABLE 4
Bracket Bolting Torques for GR.5 Hex Cap Screws

Bolt Size	Torque to Aluminum Body Actuators		Torque to Cast/Ductile Body Actuators	
	FT·LBS	N·m	FT·LBS	N·m
	No Lubrication to Screws			
Inches				
1/4	6	—	8	—
5/16	12	—	16	—
3/8	20	—	27	—
7/16	30	—	45	—
1/2	50	—	67	—
9/16	70	—	100	—
5/8	90	—	135	—
3/4	160	—	225	—
7/8	250	—	335	—
1	360	—	520	—
1-1/8	520	—	700	—
1-1/4	700	—	900	—
M6	—	6.8	—	9.5
M8	—	14.9	—	19.0
M10	—	30	—	38
M12	—	52	—	65
M16	—	122	—	156
M20	—	230	—	305
M30	—	773	—	1062
M36	—	1288	—	1826

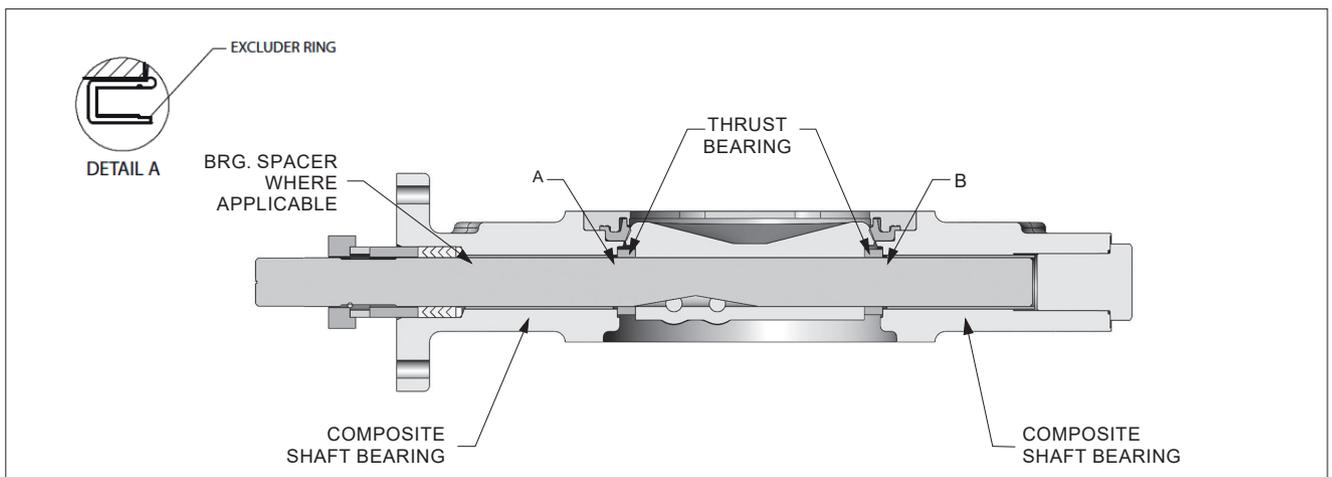


Figure 12.

8. TYPE CODE

JAMESBURY SERIES 835 WAFER-SPHERE VALVES Mod. B

1	2	3	4	5	6	7	8	9
30	835	L	-	11	36	HB	XZ	-

1. sign	VALVE SIZE (inch / mm)
INCHES	30, 36, 42, 48, 54, 60
DN	750, 900, 1050, 1200, 1350, 1500

6. sign	BODY MATERIAL
22	Carbon Steel (WCB)
36	Stainless Steel (CF8M)

2. sign	VALVE SERIES & STYLE
830	Standard
83P	Standard with CE Marking & Documentation
F830	<i>Fire-Tite</i>
F83P	<i>Fire-Tite</i> with CE Marking & Documentation

7. sign	DISC AND SHAFT MATERIAL
00	Same as body material
HB	316 Stainless Steel disc, 17-4 PH shaft
36	316 Stainless Steel disc and shaft

3. sign	BODY STYLE
L	Single-flange Lugged

8. sign	SEAT AND SEAL MATERIAL
STANDARD	
XZ	<i>Xtreme</i> seat & carbon-filled enhanced PTFE seal
OPTIONAL	
TT	PTFE seat/
UU	PEEK/Graphite/Graphite
FIRE-TITE	
AE	PTFE/Stainless steel seat, Graphite seal
XE	<i>Xtreme</i> /Stainless steel seat, Graphite seal

4. sign	CONSTRUCTION / SPECIAL SERVICE
-	Standard (no entry)
O	Oxygen
HV	High Vacuum
HVC	High Vacuum Certified

5. sign	SEAT TYPE
11	Standard (non- <i>Fire-Tite</i>)
31	<i>Fire-Tite</i>

9. sign	MODIFIER CODE
-	Standard
DV	Through-drilled Flange Holes
MM	High Cycle Construction

9. GENERAL SAFETY WARNINGS AND DISCLAIMERS

General safety warnings

Lifting

1. Always use a lifting plan created by a qualified person to lift this equipment. Lifting guidance is provided in this IMO (Installation, Maintenance and Operation manual) to assist in lifting plan development. Think about the center of gravity (CG) of the equipment being lifted. Make sure the CG is always under the central lifting point.
2. Valves may be equipped with lifting threads on the body or on the flanges. These are intended to be used with the lifting plan.
3. Use only correct and approved lifting devices. Ensure that lifting devices and straps are securely attached to the equipment prior to lifting.
4. Check, that lifting devices are not damaged and in good condition with a valid check stamp prior to use.
5. Workers must be trained for lifting and handling valves.
6. Never lift an assembly by the instrumentation (solenoid, positioner, limit switch, etc.) or by the instrumentation piping. Straps and lifting devices should be fitted to prevent damage to instrumentation and instrumentation piping. Failure to follow the lifting guidance provided may result in damage and personal injury from falling objects.

Work activities on the valve

1. Wear your personal safety equipment. Personal safety equipment includes but is not limited to protective shoes, protective clothing, safety glasses, helmet, hearing protection and working gloves.
2. Always follow the local safety instructions in addition to the Valmet instructions. If Valmet instructions conflict with local safety instructions, stop work and contact Valmet for more information.
3. Before beginning service on the equipment, make sure that the actuator is disconnected from any kind of power source (pneumatic, hydraulic, and/or electric), and no stored energy is applied on the actuator (compressed spring, compressed air volumes, etc.). Do not attempt to remove a spring return actuator unless the stop screw is carrying the spring force.
4. Make sure that there is a LOTOTO (Lock Out / Tag Out / Try Out) procedure in place for the system in which the valve is installed and strictly follow it.
5. Always make sure that the pipeline is depressurized and in ambient temperature condition before maintenance work is started.
6. Keep hands and other body parts out of the flow port when the valve is being serviced and the actuator is connected to the valve. There is a high risk of serious injury to hands and/or fingers due to malfunction if the valve suddenly starts to operate.
7. Beware of Trim (Disc, Ball or Plug) movement even when the valve is disassembled. Trim may move simply due to the weight of the part or change in position of the valve. Keep hands or other body parts away from locations where they may be injured by movement of the trim. Do not leave objects near or in the valve port which may fall in and need to be retrieved.

General disclaimers

Receiving, handling and unpacking.

1. Respect the safety warnings above!
2. Valves are critical components for pipelines to control high pressure fluids and must therefore be handled with care.
3. Store valves and equipment in a dry and protected area until the equipment is installed.
4. Do not exceed the maximum storage temperatures given in the IMO (installation, maintenance, and operating instructions).
5. Keep the original packaging on the valve as long as possible to avoid environmental contamination by dust, water, dirt, etc.
6. Remove the valve endcaps just before mounting into the pipeline.
7. FOR YOUR SAFETY IT IS IMPORTANT TO FOLLOW THESE PRECAUTIONS BEFORE REMOVAL OF THE VALVE FROM THE PIPELINE OR ANY DISASSEMBLY:
 - Be sure you know what flow medium is in the pipeline. If there is any doubt, confirm with the proper supervisor.
 - Wear any personal protective equipment (PPE) required for working with the flow medium involved in addition to any other PPE normally required.
 - Depressurize the pipeline, bring to ambient temperature, and drain the pipeline flow medium.
 - Cycle the valve to relieve any residual pressure in the body cavity.
 - After removal but before disassembly, cycle the valve again until no evidence of trapped pressure remains.
 - The valves with offset shaft (Butterfly, eccentric rotary plug) have greater trim area on one side of the shaft. This will cause the valve to open when pressurized from the preferred direction without a locking handle or an actuator installed.
 - **WARNING: DO NOT PRESSURIZE THE ECCENTRIC VALVE WITHOUT A HANDLE OR AN ACTUATOR MOUNTED ON IT!**
 - **WARNING: DO NOT REMOVE A HANDLE OR AN ACTUATOR FROM AN ECCENTRIC VALVE WHILE PRESSURIZED!**
 - Before installing the eccentric valve in or remove it from the pipeline, cycle the valve closed. Eccentric valves must be in the closed position to bring the trim within the face to face of the valve. Failure to follow these instructions will cause damage to the valve and may result in personal injury.

Operating

8. The identification plate (ID-plate, type plate, nameplate, or engraved markings) on the valve gives the information of max. process conditions to the valve.
9. (For soft seats) The practical and safe use of this product is determined by both the temperature and pressure ratings of the seat and body. Read the identification plate and check both ratings. This product is available with a variety of seat materials. Some seat materials have pressure ratings that are lower than the body ratings. All body and seat ratings are dependent on the valve type, size and material of the body and seat. Never exceed the marked rating.

10. Temperatures and pressures must never exceed values marked on the valve. Exceeding these values may cause uncontrolled release of pressure and process medium. Damage or personal injury may result.
11. The operating torque of the valve may rise over time due to wear, particles or other damage of the seat. Never exceed the actuator torque preset values (air supply, position). Application of excessive torque may cause damage to the valve.
12. Valmet valves typically are designed to be used in atmospheric conditions. Do not use valves under external pressurized conditions unless specifically designed and explicitly marked for this service.
13. Avoid Pressure shocks or water hammer. Systems with high pressure valves should be equipped with a bypass to reduce the differential pressure before opening the valve to avoid pressure shock.
14. Avoid thermal shock. High temperature, Low temperature and cryogenic valves should be operated in a way that limits the rate of increase or decrease in temperature. The valve should be thermally stabilized before being pressurized.
15. Materials of the valve are carefully selected for the process conditions. Changes to the process media can have a major impact on function and safety of the valve. Always confirm the materials are suitable for the service prior to installation.
16. As the use of the valve is application specific, several factors should be considered when selecting a valve for a given application. Therefore, some situations in which the valves are used are outside the scope of this manual.
17. It is the end user's responsibility to confirm compatibility of the valve materials with the intended service, however if you have questions concerning the use, application, or compatibility of the valve for the intended service, contact Valmet for more information.
18. Never use a valve with enriched or pure oxygen if the valve is not explicitly designed and cleaned for oxygen. Selected materials and design have a major impact on the safety to operate the valve with oxygen.
19. Valves intended for use in or with explosive atmospheres must be equipped with a grounding device and marked according ATEX (or equivalent international standards).
20. Manual handles are available for specific butterfly valve sizes and maximum line pressures. Do not operate a valve with a handle or wrench outside the size and pressure limits stated in the IMO. High line pressure may create a large enough force to pull the handle from the operator's hands. Damage or personal injury may result.
25. Always check the position of the valve before starting maintenance work. Follow the Lock out /tag out (LOTO) rules at the site before starting any maintenance activity.
 - See IMO for the correct stem position.
 - Consider that the positioner may give the wrong signals.
26. Sealing materials (soft sealing parts) should be changed when the valve in maintenance. Always use original equipment manufacturers (OEM) spare parts to ensure proper performance of the repaired valve.
27. All pressure containing parts must be inspected visually for damage or corrosion. Damaged parts must be replaced.
28. Valve pressure retaining parts and all internals must be inspected for corrosion or erosion which may result in reduced wall thickness on pressure retaining parts. Damaged pressure retaining parts must be replaced with original equipment manufacturer's (OEM) replacement parts or repaired to factory specifications by an authorized Valmet service partner in order to maintain the warranty.
29. Do not use sharp tools, grinding machines, or files to work on functional surfaces such as sealing, seating or bearing surfaces as this can damage these surfaces.
30. Check the condition of sealing surfaces on the seats, trim (disc, ball, plug, etc.), body and body cap. Replace parts if there are significant wear, scratches, or damage.
31. Check the wear of bearings and bearing contact surfaces on the shaft and replace damaged parts if necessary.
32. Do not weld on pressure retaining parts without an ASME and PED qualified procedure and personnel.
33. Pressure retaining parts of valves in high temperature applications must be carefully examined for the effects of material creep and fatigue.
34. Make sure that the valve is positioned in the correct flow direction into the pipeline.
35. If the valves are marked to be suitable for explosive atmospheres, the correct function of the discharging device must be tested before returning to service.
36. Always work in a clean environment. Avoid getting particles inside the valve due to machining, grinding, or welding nearby.
37. Never store a valve in maintenance without flow port protection.
38. When pressure testing valve seats, never exceed the maximum operating pressure of the system or the maximum shut-off pressure marked on the valve identification plate.
39. Actuator mounting and unmounting:
 - Before installing the actuator on to the valve, be sure the actuator is properly indicating the valve position. Failure to assemble these to indicate correct valve position may result in damage or personal injury.
 - When installing or removing a linkage kit, best practice is to remove the entire linkage assembly, including couplings which may fall off the valve during lifting or when position changes.
 - Mounting sets have been designed to support the weight of the Valmet actuator and recommended accessories either as is or with additional actuator support. Use of the linkage to support additional equipment or additional weight such as people, ladders, etc. may result in equipment damage or personal injury.

Maintenance

21. Respect the safety warnings above!
22. Plan service and maintenance actions, that spare parts, lifting devices and service personnel is available.
23. Maintain the valve within the recommended minimum maintenance intervals or within the recommended maximum operating cycles.
24. Always make sure that the valve and the pipeline is depressurized before starting any kind of maintenance work at a valve.

40. The valve should be installed between flanges using appropriate gaskets and fasteners that are compatible with the application, and in compliance with applicable piping codes and standards. Center the gaskets carefully when fitting the valve between the flanges. Do not attempt to correct pipeline misalignment by means of the flange bolting.
41. Repairs on valves for special service like Oxygen, Chlorine, and Peroxide, have special requirements.
 - Parts must be cleaned appropriate to the service and protected from contamination prior to assembly.
 - Assembly areas and tools must be clean and dry to prevent contamination of the parts during assembly.
 - Test equipment must be clean and dry to prevent contamination during testing. This includes the test equipment internals that may allow particles or other contamination into the test medium during the test.
 - Lubrication shall be used only if specifically required in the instructions. Where lubrication is required, the lubricant must be approved for the service by the end user.

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