

NELES

Wafer-sphere™

butterfly valve

series 830W 18" - 24" (DN 450 - 600)

series 830L 18" - 48" (DN 450 - 1200)

model A

Installation, maintenance and
operating instructions

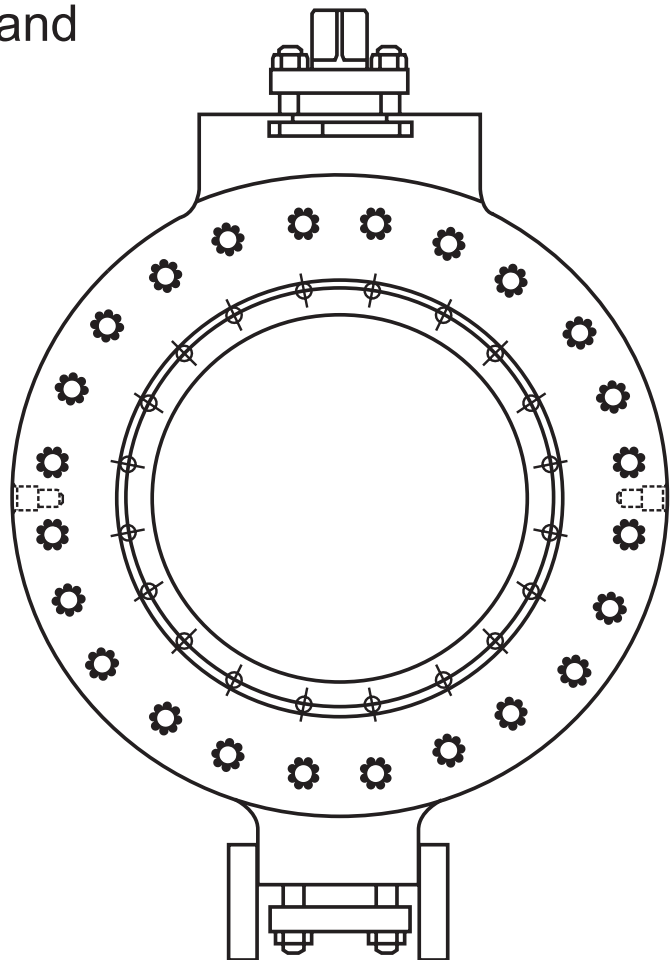


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READ THESE INSTRUCTIONS FIRST!

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.

1. GENERAL

1.1 Scope of the Manual

This instruction manual contains important information regarding the installation, operation and maintenance of the Jamesbury® Model A 18" – 24" (DN 450 - 600) 830W & 18" – 48" (DN 450 - 1200) 830L *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 NELES 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 HANDLE OR AN ACTUATOR DO NOT PRESSURIZE. UNRESTRAINED DISC MAY OPEN OR CLOSE DUE TO PIPELINE PRESSURE.

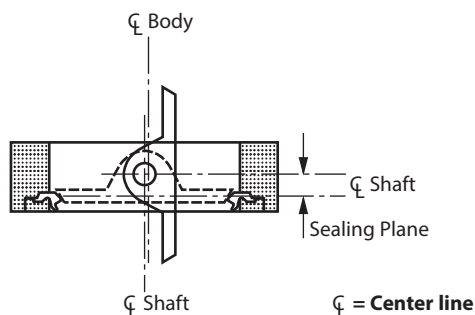


Figure 1 Offset Shaft Operation

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

Some wafer designs (See **Figure 2**) contain flange bolt holes or slots in the body to hold the valve and assist with correct alignment during installation in the line. The centering holes or slots 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 Wafer Valve Inserts

Inserts on wafer style valves (830W) must be clamped before cycling the valve when out of the pipeline. Use soft-faced clamps across the body to avoid damaging the gasket surface. Damage can result if the inserts are not clamped when valve is cycled.

Series 830W 18" – 24" (DN 450 – 600) *Wafer-Sphere* Valves ANSI Class 300 Wafer Design

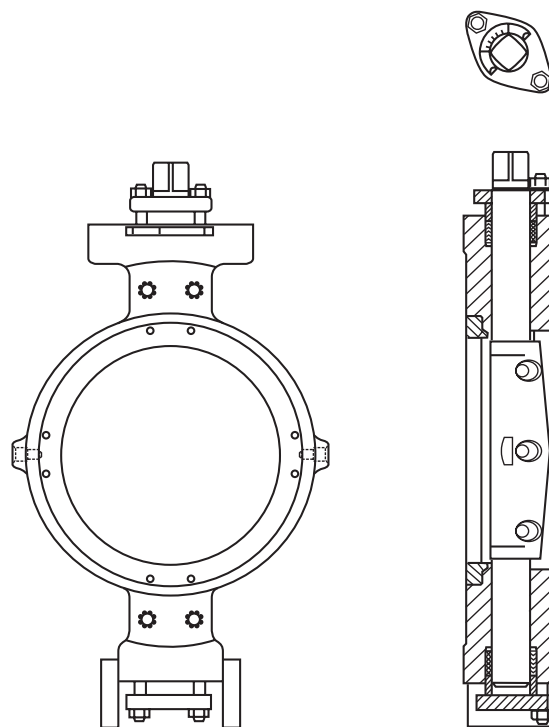


Figure 2 Wafer Body Design

Series 830L 18" – 48" (DN 450 – 1200) Wafer-Sphere Valves ANSI Class 300 Single Flanged Lugged Design

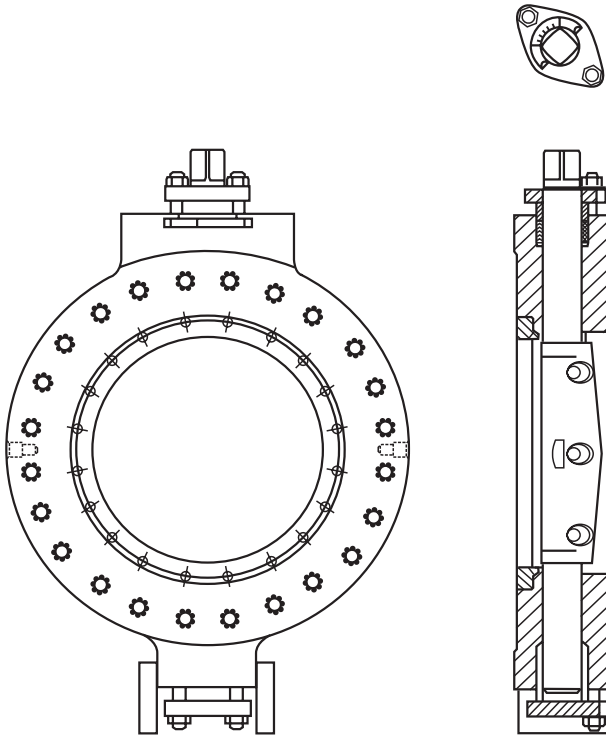


Figure 3 Single Flange Body Design

1.6 Valve Markings

The valve has an identification plate attached to the valve body (see **Figure 4**).

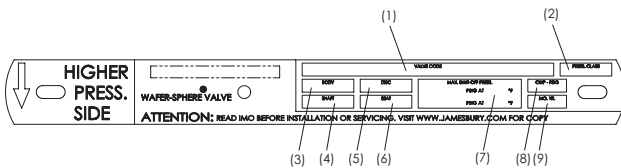


Figure 4 Identification Plate

Identification plate markings:

1. Valve catalog code
2. Pressure Class
3. Body material
4. Shaft material
5. Disc material
6. Seat material
7. Maximum/minimum shut-off pressure/temperature
8. Body rating
9. Assembly date

1.7 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 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:

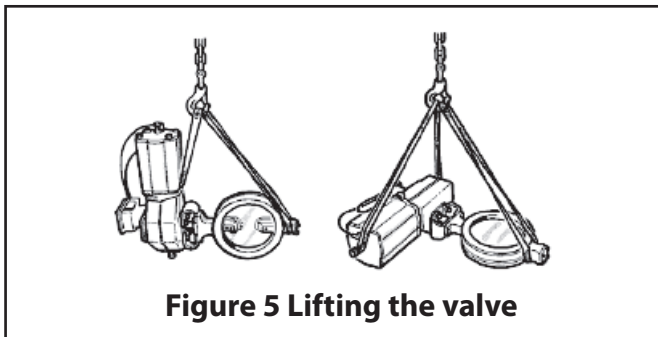
WHEN HANDLING THE VALVE OR VALVE/ACTUATOR ASSEMBLY, TAKE ITS WEIGHT INTO ACCOUNT!

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 (SEE **FIGURE 5**)

WARNING:

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.



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

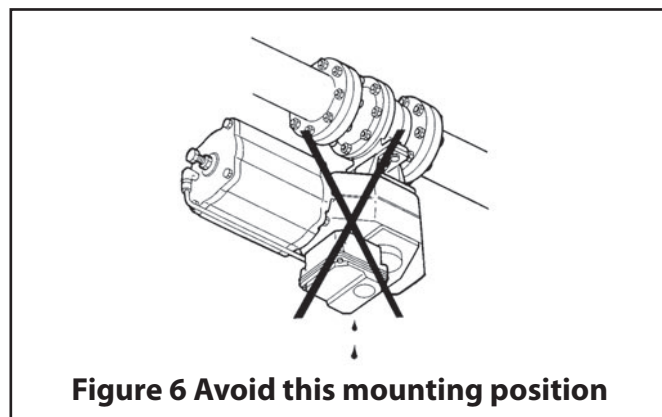
WARNING:

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).

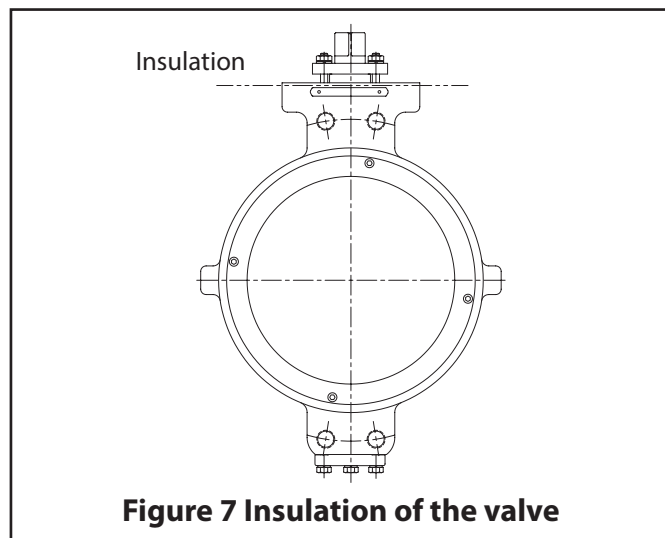
1. Read all **WARNINGS!**
 2. **IMPORTANT:** Only actuator stop screws must be used to stop the disc position. **DO NOT** use the "positive stop" by itself to limit travel.
 3. Visually check the position of the disc when valve is in the closed position and the insert is fully compressed. The disc should be parallel to the flanges within 1/32" (0.79mm).
 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 6**).

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 7**).



3.4 Actuator

WARNING:

WHEN INSTALLING THE ACTUATOR ON THE VALVE, MAKE SURE THAT THE VALVE ASSEMBLY FUNCTIONS PROPERLY. INFORMATION ON ACTUATOR INSTALLATION IS GIVEN IN SECTION 6 OR IN THE SEPARATE ACTUATOR INSTRUCTIONS.

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

The upright position is recommended for the actuator.

The actuator must not touch the pipeline, because pipeline vibration may interfere with its operation.

In certain cases it may be considered advantageous to provide additional support to the actuator. These cases will normally be associated with large actuators, extended stems, or where severe vibration is present. Please contact Neles for advice.

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. Actuator adjustment is explained in **Section 6**. To adjust any accompanying device(s) refer to the separate control equipment instruction manuals.

4. MAINTENANCE

4.1 General

Although Neles *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. Neles recommends inspecting the 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 12**) 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 Neles 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 AND CYCLE THE VALVE AS FOLLOWS:
 - A. PLACE THE VALVE IN THE OPEN POSITION AND DRAIN THE PIPELINE.
 - B. CYCLE THE VALVE TO RELIEVE RESIDUAL PRESSURE IN THE BODY CAVITY BEFORE REMOVAL FROM THE PIPELINE.
 - C. AFTER REMOVAL AND BEFORE ANY DISASSEMBLY, CYCLE THE VALVE AGAIN SEVERAL TIMES.

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

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.

4.4 Seat Replacement

NOTE: For Fire-Tite® seat replacement see **Section 4.10**.

Numbers in () refer to items shown in **(Figure 12)**.

1. After removing the valve from the line, place it on a bench. 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.
8. Verify the disc is in the level position and install the seat (5) and insert (2) (See **Figure 8**).
9. Install the insert screws. 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.

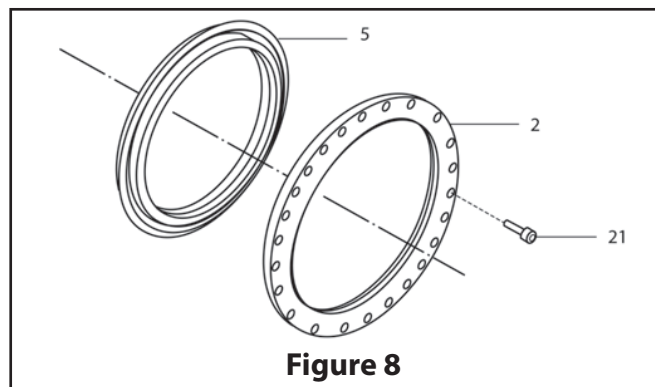


Figure 8

Table 1						
Insert Screw Torque Table						
ANSI Class 150/300		Screw Size	Torque C'Stl.		Torque St. Stl.	
Inches	DN		90/132	122/179	30/44	41/60
18	450	1/2"	90/132	122/179	30/44	41/60
20	500	1/2"	90/132	122/179	30/44	41/60
24	600	1/2"	90/132	122/179	30/44	41/60
30	750	1/2"	90/132	122/179	30/44	41/60
36	900	1/2"	90/132	122/179	30/44	41/60
42	1050	1/2"	90/132	122/179	30/44	41/60
48	1200	1/2"	90/132	122/179	30/44	41/60

10. Set the actuator stops as described in the **MOUNTING INSTRUCTION** Section. 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.

4.5 Shaft Seal Replacement

Upper Shaft Seals Replacement

Numbers in () refer to items shown in **(Figure 12)**.

NOTE: See IMO-317 for live loaded shaft seals.

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

1. Remove the actuator and the actuator coupling. Remove the indicator pointer (29). Pull it straight out with a pair of pliers to avoid breakage.
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.
3. Remove the compression ring (9).
4. Remove the old shaft seal (8) segments. **CAUTION:** Do not score the shaft or body bore!
5. The spacer (7) need not be removed for shaft seal replacement.
6. 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 12)**. This orientation is preferred for all applications, including vacuum.

7. Reinstall the compression ring (9), the compression plate (10), the washers (16) nuts (15) and indicator pointer (29). **NOTE:** If the compression ring initially sits too high to install the indicator pointer, it may be necessary to precompress the shaft seals somewhat. In that case, install the compression plate and tighten the nuts enough to accomplish the precompression. Install the indicator pointer and then complete the reassembly.
8. Close the valve.
9. 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.

Lower Shaft Seals Replacement

Numbers in () refer to items shown in **(Figure 12)**.

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

1. Remove the nuts (15) and washers (16) from above the compression plate (33). The studs (14) do not have to be removed.
2. Remove the compression plate (33). Remove the compression ring (32).
3. Remove the old shaft seal (8) segments. **CAUTION:** Do not score the shaft or body bore!
4. The spacer (7) need not be removed for shaft seal replacement.
5. 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 12)**. This orientation is preferred for all applications, including vacuum.
6. Reinstall the compression ring (32), the compression plate (33), the washers (16) and nuts (15).
7. Close the valve.
8. 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.

4.6 Valve Disassembly

Numbers in () refer to items shown in **(Figure 12)**.

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

1. Place the valve on a bench or other suitable working space.
2. If the seat is to be replaced or removed, follow Steps 2, 3, 4 and 5 in the **SEAT REPLACEMENT** Section. **NOTE:** It is good practice to replace the seat, shaft and body seals and bearings any time a valve is disassembled.

3. Remove the shaft seal compression hardware as detailed in Steps 1-3 in the **SHAFT SEAL REPLACEMENT** Sections. The seal material itself can be more easily removed after the shaft has been removed from the valve.
4. Remove the disc pin welds by grinding or machining off the welds. Drive out the pins (13) opposite the installation direction shown in **(Figure 12)**.
5. Remove the shaft (4) through the top of 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).

4.7 Checking Parts

1. Clean all disassembled parts.
2. Check the shaft (4) 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. Replace any damaged parts.
5. Replace any fastener where the threads are damaged or have been heated, stretched or corroded.
6. Replace any 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 12, the ballooned part number, part name and quantity required.

4.8 Valve Assembly

Numbers in () refer to items shown in **(Figure 12)**

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, shaft, 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.
7. Position disc (3) in the body between the thrust bearing (64) and slide the shaft (4) through the body and 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 **(Figures 12 & 15)**, and drive them into place. The pins must be driven so that both pins are the same depth within 1/16" (1.56 mm). Weld both ends of the pins, small end first, grounding the shaft only (body on blocks of wood). 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) with chamfered side toward disc, the shaft seal (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 12)**.
10. If the studs (14) have been removed from the valve, reinstall them in the holes shown in **(Figure 12)**, using LOCTITE® or other locking compound to prevent vibration loosening.
11. Place the compression plate (10) over the shaft (4) and studs (14). Orient the plate so that the indicator pointer will be over the indicator plate. Install the washers (16) and nuts (15), but do not tighten. Install the indicator pointer.
12. Slide the spacer (7), shaft seals (8) and compression ring (32) onto the shaft at the bottom of the valve.
13. Place compression plate (33) over studs (14). Install washers (16) and nuts (15). Do not tighten.
14. Cycle the valve fully closed. Install new unused seat. See the **SEAT REPLACEMENT** Sections for details.
15. With the valve still closed, tighten the nuts (15) on the compression plates (10 & 33) 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.
16. Set the actuator stops as described in the **ACTUATOR MOUNTING INSTRUCTIONS** Section.

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. 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 100 psi (6.9 bar) to the valve. Check the shaft seals, 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 100 psi (6.9 bar). 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.

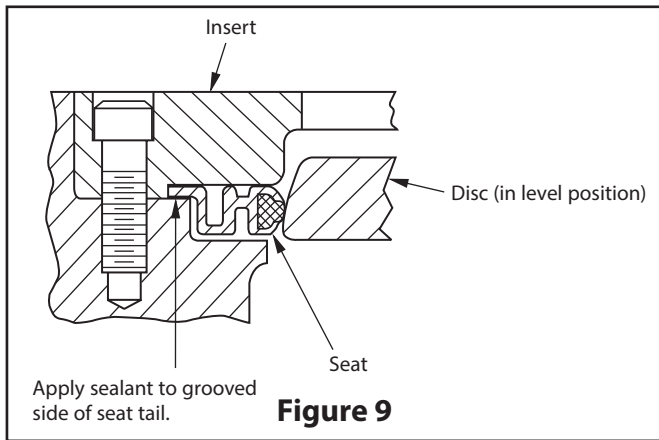
10. If leakage is detected, vent the valve and make an actuator close-stop adjustment as described in the appropriate Jamesbury actuator IMO, listed in **Table 2**.

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*)

Numbers in () refer to items shown in (**Figure 12**).

1. After removing the valve from the line, place it on a bench. 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.
8. A sealant is required between the seat tail and the body as shown in (in **Figure 9**). The valve uses PTFE paste sealant. This is installed in accordance with the following steps:

- a. **IMPORTANT:** Exercise care at all times not to damage the seat or its sealing mishandle or surfaces.
- a. The bottom surface of the insert must be free of all foreign particles. Clean thoroughly with suitable solvent.
- a. 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 9**).
10. Install the insert and screws. Tighten the screws uniformly. 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.
11. Set the actuator stops as described in the **MOUNTING INSTRUCTION** Section. 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.

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.

Caution: 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.

NOTE: When a single-acting STMS pneumatic spring-return actuator is mounted to a *Wafer-Sphere* valve, it can be mounted only in the spring-to-close mode (air-to-open).

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 10)**. Tighten to torque listed in **(Table 3)**.
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 11**).
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 13, Step 3A**.)
5. Tighten the no-play coupling screws to torques shown in **(Figure 13, 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 13, Step 3C)**.

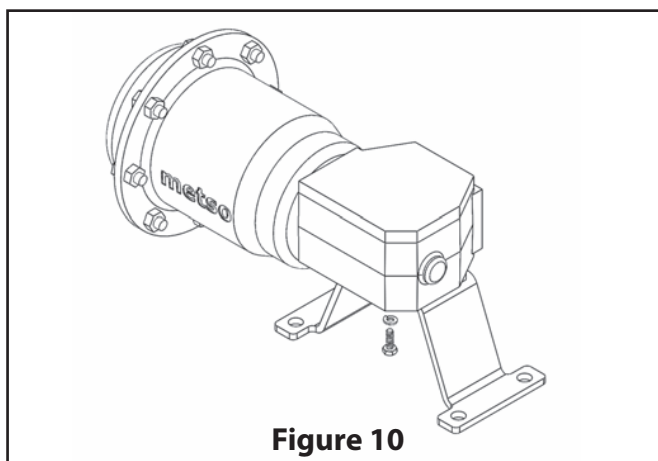


Figure 10

Table 2	
Actuator	IMO
Quadra-Powr®	IMO-31, 32
ST-50	IMO-22
ST-60, 90, 115, 17 5MS	IMO-23
ST-200/400	IMO-26
ST-600/1200	IMO-24, 38
ST-160, 240, 290, 440MS	IMO-27, 39
ST-1800	IMO-506
Manual Gears	IMO-63
SP	IMO-512
BC, B1C	5 BC 70-A
BJ, B1J	5 BJ 70-A
EU Series	IMO-515
ER Series	IMO-515

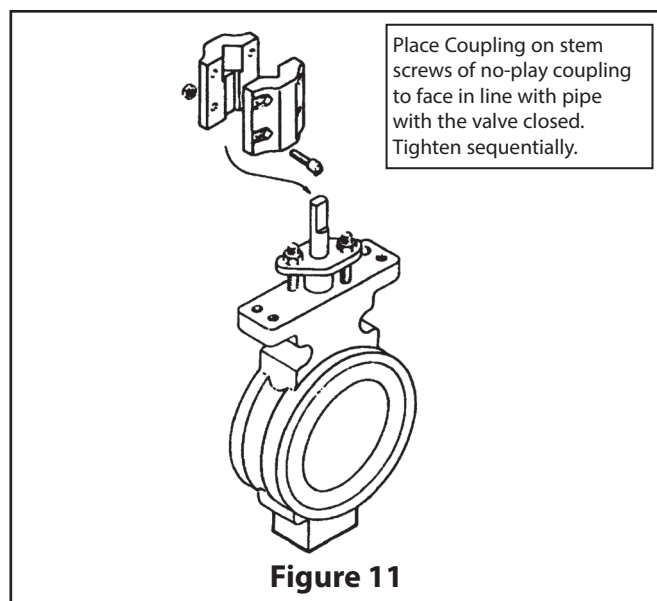


Figure 11

8. Recheck no-play coupling screw torques, using the torques in **(Figure 13, 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 Paragraph 5.1 except for coupling assembly. (See **Figure 14**).

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 6,35 mm.

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 12**, the ballooned part number, part name and quantity required

7. EXPLODED VIEW

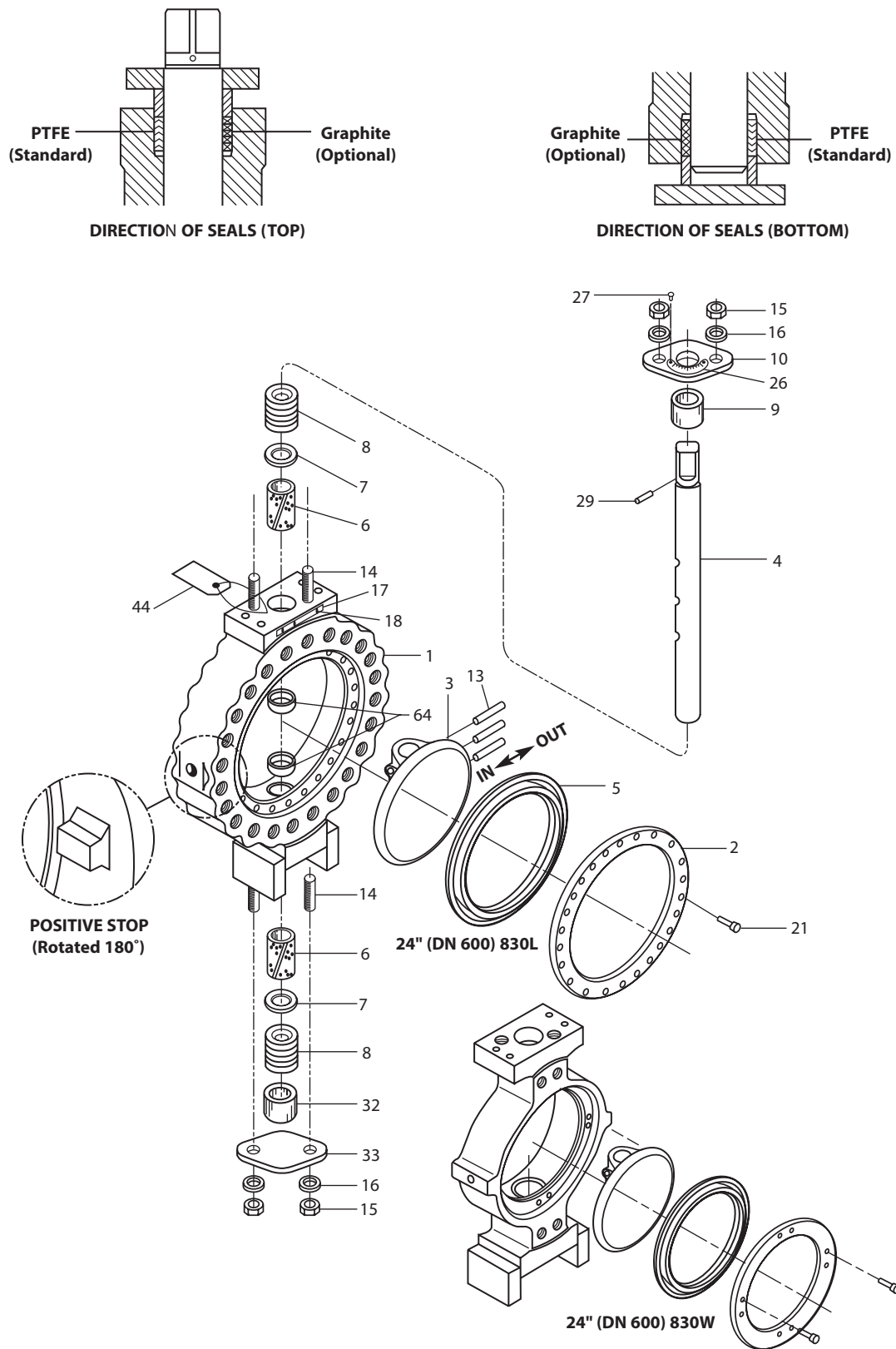


Figure 12

Parts List			
ITEM	PART NAME		QTY
1	Body		1
2	Insert		1
3	Disc		1
4	Shaft		1
5	Seat		1
6	Shaft Bearing		2
7	Spacer		2
8	Shaft Seal		2
9	Compression Ring (Top)		1
10	Compression Plate (Top)		1
13	Wedge Pin		3 or 4
14	Stud		4
15	Jam Nut		4
16	Lockwasher		4
17	Name Plate		1
18	Drive Screw		3
21	Socket Head Cap Screw		*
26	Indicator Plate		1
27	Drive Screw		2
29	Indicator		1
32	Compression Ring (Bottom)		1
33	Compression Plate (Bottom)		1
44	Tag		1
64	Thrust Bearing		2
* Item #21 Quantity varies with Size:			
830W	Quantity	830L	Quantity
18" (DN 450)	8	18" (DN 450)	20
20" (DN 500)	8	20" (DN 500)	20
24" (DN 600)	8	24" (DN 600)	24
30" (DN 750)	8	30" (DN 750)	28
36" (DN 900)	8	36" (DN 900)	32
42" (DN 1050)	8	42" (DN 1050)	36
48" (DN 1200)	8	48" (DN 1200)	44

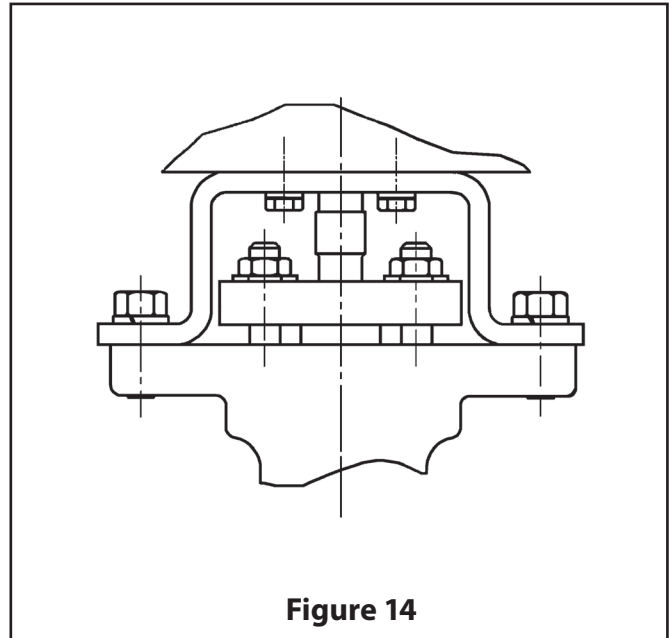
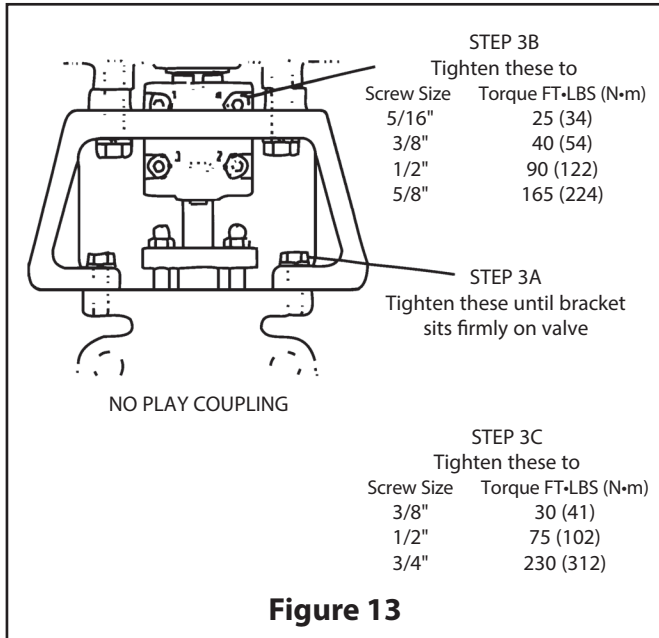
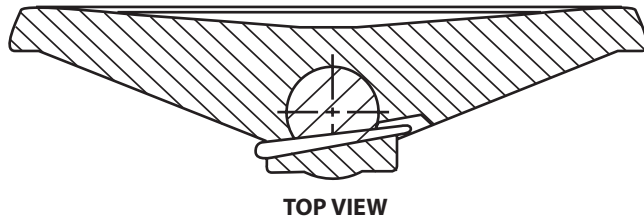


Table 3
Bracket Bolting Torques for GR.5 Hex Cap Screws

	Torque to Aluminum Body Actuators		Torque to Cast/Ductile Body Actuators	
Bolt Size	No Lubrication to Screws			
inches	FT•LBS	N•m	FT•LBS	N•m
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	–	990	–
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



NOTES:

1. INSERT LOCATING PINS "A". DRIVE IN SECURELY AND EVENLY.
2. INSERT PINS "B". DRIVE IN ALTERNATELY AND SECURELY.
3. PINS TO BE INSERTED IN DIRECTION OF ARROW CAST ON DISC HUB.

AFTER FINAL ASSEMBLY OF SHAFT AND DISC INTO BODY, TACK WELD ON BOTH SIDES OF PINS, SMALL END FIRST. NO PLAY MUST EXIST BETWEEN SHAFT AND WAFER PRIOR TO OR AFTER WELDING.

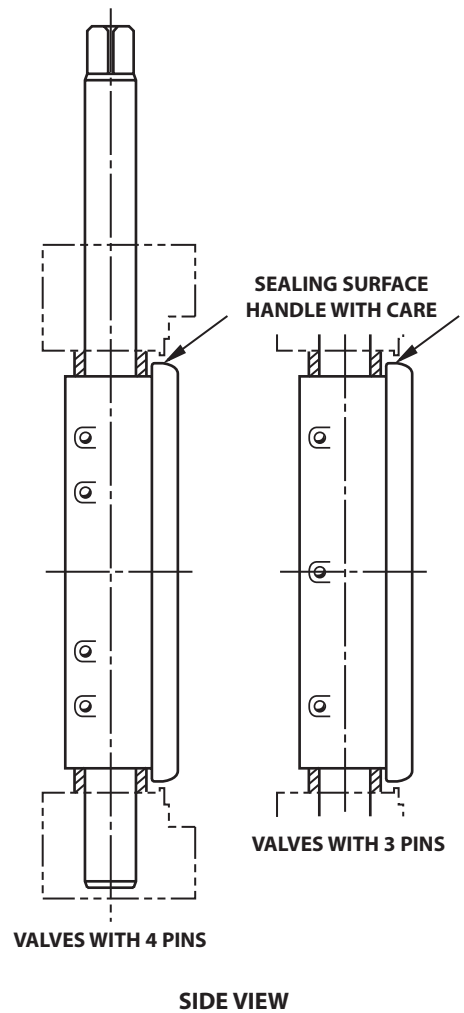


Figure 15

8. JAMESBURY SERIES 830 WAFER-SPHERE VALVES MOD. A

1	2	3	4	5	6	7	8	9
18	830	W	–	11	36	HB	XZ	–

1. sign	VALVE SIZE (inch / mm)
INCHES	18, 20, 24, 30, 36, 42, 48
DN	450, 500, 600, 750, 900, 1050, 1200

2. sign	VALVE SERIES & STYLE
830	Standard ASME Class 300
F830	Fire-tite ASME Class 300

3. sign	BODY STYLE
W	Wafer
L	Single-flange Lugged

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

5. sign	SEAT TYPE
11	Standard (non Fire-tite)
13	Fire-tite

6. sign	BODY MATERIAL
22	Carbon Steel
35	Alloy 20 (CN7M)
36	Stainless Steel (CF8M)
37	Stainless Steel (CG8M)
71	Monel® (M-35-1)
73	Hastelloy® C

7. sign	DISC and SHAFT MATERIAL
00 ¹	Same as body material
HB	316 Stainless Steel disc, 17-4 PH shaft
35	Alloy 20 disc and shaft
36	316 Stainless Steel disc and shaft
37	317 Stainless Steel disc and shaft
71	Monel disc and K-Monel shaft
73	Hastelloy C disc and shaft

1. Not available with 22 body material

8. sign	SEAT AND SEAL MATERIAL
STANDARD	
TT	PTFE seat and seals
MT	Filled PTFE seat, PTFE seal
UU	UHMW polyethylene seat and seals
FITE-TITE	
AE	PTFE/Stainless Steel seat, Graphite seal
AF	PTFE/Alloy 20 seat, Graphite seal
AH	PTFE/Monel seat, Graphite seal
XE	Xtreme®/Stainless Steel seat, Graphite seal
XF	Xtreme/Alloy 20 seat, Graphite seal
XH	Xtreme/Monel seat, Graphite seal

9. sign	MODIFIER CODE
–	Standard
QY	Live-loaded Shaft Seals
MM	High Cycle Construction

Monel® is a registered trademark of Special Metals Corporation
Hastelloy® is a registered trademark of Haynes International, Inc.

Other materials available on application

*Valve size 18, 20 & 24 only

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Neles

Vanha Porvoontie 229, 01380 Vantaa, Finland.
Tel. +358 10 417 5000.

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