INSTALLATION, OPERATION AND MAINTENANCE MANUAL

RESILIENT SEATED BUTTERFLY VALVES

CARTRIDGE SEAT
4800 / 4802 / 4100

VULCANIZED SEAT
4833 / 4832 / 4133 / 4132



TABLE OF CONTENTS

INSTALLATION RECOMMENDATIONS 3
- Valve Ratings 3
- Valve Seat Position 3
- Disc Clearances 3
- Opening Rotation 3
- Installation Position 3
- Valve and Flange Preparation 3
- Installation Tools 3
- Required Bolting 3
- Unpacking and Storage Instructions 4
- Pre-Installation Procedure 4
- Valve Installation Procedure 4
- Valve Tag 5

INSTALLATION RECOMMENDATIONS - FIGURES 6

MAINTENANCE INSTRUCTIONS 7
- Safety Precautions for Butterfly Valve Assembly 7
- General Maintenance 7

FLANGE BOLTING DATA 8

FLANGE BOLTING DATA - FIGURES 9

FLANGE BOLTING TORQUE CHART - OVC 4800/4802, 4833/4832 10

INSTALLATION RECOMMENDATIONS

VALVE RATINGS

Each valve has a clear pressure rating on the nameplate. Check the valve pressure rating before proceeding with installation.

VALVE SEAT POSITION

All the OVC Resilient Seated Butterfly Valves are completely bi-directional, so installation is not dependent on seat orientation.

DISC CLEARANCES

Before installing the valve, it is important to ensure the pipe's ID and that the pipe flanges are large enough to allow the disc edge to swing into the opening without interference. Damage to the disc edge can severely affect the performance of the valve.

OPENING ROTATION

The OVC Resilient Seated Butterfly Valve disc can rotate 360° without damaging the valve or elastomer seat.

INSTALLATION POSITION

To prevent damage to the disc and seat during installation, the valve disc should be slightly open but not extending beyond the valve liner face. Positioning the disc in this "almost closed" position will reduce seat interference and initial torque build-up during valve installation. In general, it is preferable to install the valves with the shaft in a horizontal orientation. In this position, shaft and disc weights are evenly distributed, minimizing seat wear. OVC Resilient Seated Butterfly Valves are designed to operate between two flanges. If the valve installation calls for the use of one pipe flange only, a Lug type valve with Dead-End Service feature must be used.

VALVE AND FLANGE PREPARATION

If the valve and mating pipe are properly prepared for installation, future problems can be avoided. All valve seat and pipe flange faces should be free of dirt, grit, dents, or surface irregularities which may disrupt flange sealing and cause external leakage. The valve disc sealing surface should also be inspected to eliminate any dirt or foreign material that will adversely affect the operation of the valve.

INSTALLATION TOOLS

The only tool required in the installation of the OVC Resilient Seated Butterfly Valve is a wrench suitable for tightening the flange bolts and/or nuts required to secure the valve in-line. A hoist may be required to help manipulate valves 10" and larger. Smaller-sized valves can usually be installed by hand. Temporary pipe supports may be used to keep mating flange faces parallel to aid in valve installation.

REQUIRED BOLTING

The Flange Bolting Data table outlined on Page 7 is furnished to provide information regarding the size, type, and quantity of bolting recommended for the installation of the OVC Resilient Seated Butterfly Valve. This table is intended for use as a planning and procurement guide. All recommendations are based on pipe flanges in accordance with ANSI B16.5 150 specifications. Flange bolting is not included with the valve shipment.

UNPACKING AND STORAGE INSTRUCTIONS

1. Check the packing list against the valve received to verify that the size, material, and trim are correct.
2. Check to make sure that the valve and operator were not damaged during shipment.
3. When lifting the valve, take care to avoid damage to the flange faces, disc sealing edge, or operator.
4. If the valve is to be stored before being installed, it should be protected from harsh environmental conditions.
5. Store the valve with the disc in the “almost closed” position to protect the sealing edge and the seat.
6. Keep the valve in a clean location, away from dirt, debris and corrosive materials.
7. Keep the valve in a dry area with the flanges protected and on a suitable skid or pallet.
8. Keep the valve in a cool location if possible, out of direct sunlight.

PRE-INSTALLATION PROCEDURE

1. Remove any protective flange covers from the valve.
2. Inspect the valve to be certain that the waterway is free from dirt and foreign matter. Be certain that the adjoining pipeline is free from any foreign material such as rust and pipe scale or welding slag that could damage the seat and disc sealing surfaces.
3. Any actuator should be mounted on the valve prior to installation to facilitate proper alignment of the disc in the valve seat.
4. Check the valve identification tag for materials and operating pressure to be sure they are correct for the application.
5. Check the flange bolts or studs for proper size, threading, and length.
6. Attach gear handwheel with solid pin or spring pin taped to gear shaft. Insert pin through handwheel through shaft through handwheel.

VALVE INSTALLATION PROCEDURE

Position the connecting pipe flanges in the line to insure proper alignment prior to valve installation. Spread the pipe flanges apart enough to allow the valve body to be located between the flanges without actually contacting the flange surfaces (See Figure 1). Exercise particular care in handling the valve so as to prevent possible damage to the disc or seat faces.

For Wafer Type valves:

1. Loosely install the two upper and lower bolts that pass through the body alignment holes.
2. Install the remaining flange bolts, shifting the valve as necessary to permit the bolts to pass by the valve body. Hand tighten all bolts as necessary.
3. Before completing the tightening of any bolts, the valve should be centered between the flanges and then carefully opened and closed to insure free, unobstructed disc movement (see Figure 2) If no obstruction is encountered, return the valve to the 90-95% closed position.
4. Tighten the flange bolts evenly in a cross pattern sequence to assure that the compression is uniform.
5. Cycle the valve from the closed position to the fully open position to insure proper travel and back to the 90-95% closed position.
6. If the valve is geared. Check the gear travel stop settings for proper disc alignment with the gear indicator plate. Should the gear stops require re-adjusting do so at this time.
7. If an actuator is to be used, air hoses or electricity should be connected to the unit as specified by the actuator.
8. The valve is now ready for operation.

For Lug Type valves:

1. Place the valve between the flanges.
2. Install all bolts between the valve and the mating flanges. Hand-tighten bolts as necessary.
3. Before completing the tightening of any bolts, the valve should be centered between the flanges and then carefully opened and closed to insure free, unobstructed disc movement (see Figure 2) If no obstruction is encountered, return the valve to the 90-95% closed position.
4. Tighten the flange bolts evenly in a cross pattern sequence to assure that the compression is uniform.
5. Cycle the valve from the closed position to the fully open position to insure proper travel and back to the 90-95% closed position.
6. If the valve is geared. Check the gear travel stop settings for proper disc alignment with the gear indicator plate. Should the gear stops require re-adjusting do so at this time.
7. If an actuator is to be used, air hoses or electricity should be connected to the unit as specified by the actuator.
8. The valve is now ready for operation.

REMEMBER: Install the valve with the disc in the "ALMOST CLOSED" position. Do not use any flange gaskets.

VALVE TAG:

IOM

Place the valve between the flanges.

Install all bolts between the valve and the mating flanges. Hand-tighten bolts as necessary.

Before completing the tightening of any bolts, the valve should be centered between the flanges and then carefully opened and closed to insure free, unobstructed disc movement. If no obstruction is encountered, return the valve to the 90-95% closed position.

Tighten the flange bolts evenly in a cross pattern sequence to assure that the compression is uniform.

Cycle the valve from the closed position to the fully open position to insure proper travel and back to the 90-95% closed position.

If the valve is geared. Check the gear travel stop settings for proper disc alignment with the gear indicator plate. Should the gear stops require re-adjusting, do so at this time.

INSTALLATION RECOMMENDATIONS - FIGURES

FIGURE 1 - INITIAL INSTALLATION OF VALVE

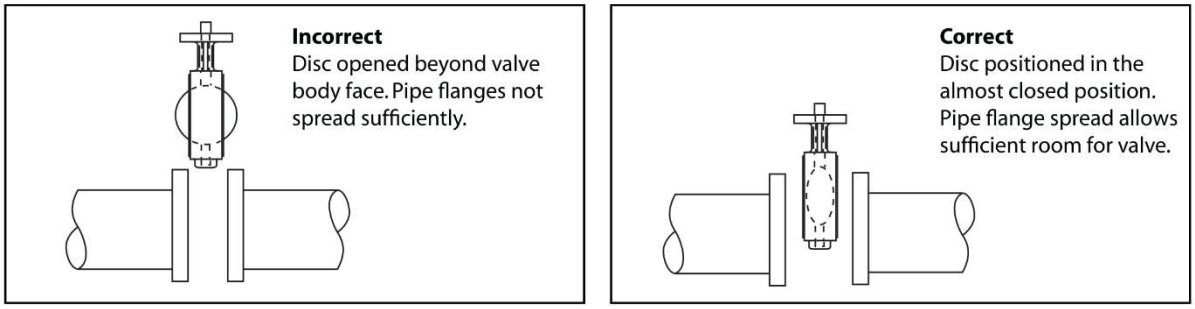


FIGURE 2 - CENTERING AND FLANGING OF VALVE

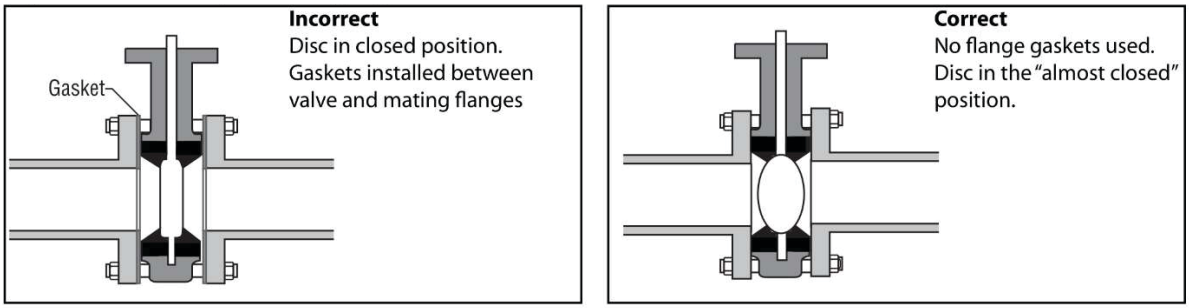
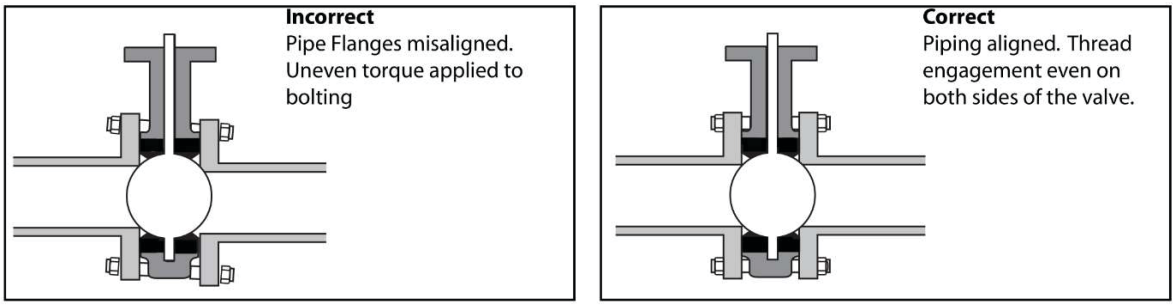


FIGURE 3 - FINAL VALVE ALIGNMENT AND TIGHTENING OF FLANGE BOLTS



MAINTENANCE INSTRUCTIONS

SAFETY PRECAUTIONS FOR BUTTERFLY VALVE ASSEMBLY

Before removing the valve from the line or loosening any bolts, it is important to verify the following conditions:

1. Be sure the line is depressurized and drained.
2. Be sure of the pipeline media. Proper care should be taken for protection against toxic and/or flammable fluids.
3. Never remove the valve without an Operator (manual or automatic) already attached to the valve shaft.
4. Never remove the Operator from the valve while the valve is in the pipeline under pressure.
5. Always be sure that the disc is in the closed position before removing the valve.

GENERAL MAINTENANCE

The following periodic preventative maintenance practices are recommended for all Center Line Butterfly Valves.

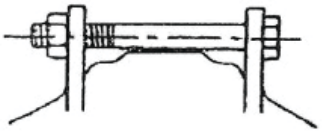
1. Operate the valve from full open to full closed to ensure operability.
2. Check flange bolting for evidence of loosening and correct as needed.
3. Inspect the valve and surrounding area for previous or existing leakage at flange faces or shaft connections.
4. Check piping and/or wiring to actuators and related equipment for looseness and correct as needed.

FLANGE BOLTING DATA

VALVE SIZE	BOLT SIZE	WAFER			LUG	
		NUMBER REQUIRED	BOLT "A" LENGTH	STUD "B" LENGTH	NUMBER REQUIRED	BOLT "C" LENGTH
2"	5/8 - 11	4	4 ¼	4 ¾	8	1 ¼
2 ½"	5/8 - 11	4	4 ¾	5 ¼	8	1 ½
3"	5/8 - 11	4	4 ¾	5 ¼	8	1 ¾
4"	5/8 - 11	4	4 ¾	5 ¾	16	1 ¾
5"	3/4 - 10	8	5 ½	6	16	1 ¾
6"	3/4 - 10	8	5 ½	6	16	2
8"	3/4 - 10	8	6	6 ½	16	2 ¼
10"	7/8 - 9	12	6 ¾	7 ¼	24	2 ¼
12"	7/8 - 9	12	7	7 ¾	24	2 ¾
14"	1 - 8	12	7 ¾	9 ¼	24	2 ¾
16"	1 - 8	16	8 ¼	10	32	3 ¼
18"	1 ⅛ - 7	16	9 ¼	11	32	3 ½
20"	1 ⅛ - 7	20	10	11 ¾	40	4
22"	1 ¼ - 7	20	10	11	40	4
24"	1 ¼ - 7	16 8 (Bolt "C")	11 ½	13 ¼	40	4 ¾
26"	1 ¼ - 7	20 8 (Bolt "C")	CONSULT ENGINEERING WITH FLANGE THICKNESS BEING USED.			
28"	1 ¼ - 7	24 8 (Bolt "C")				
30"	1 ¼ - 7	24 8 (Bolt "C")				
36"	1 ½ - 6	28 8 (Bolt "C")				
48"	1 ½ - 6	40 8 (Bolt "C")				

FLANGE BOLTING DATA - FIGURES

Wafer



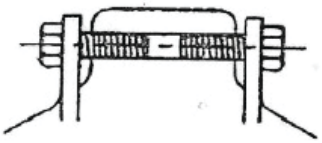
A

Semi-Lug



B

Full Lug



C

FLANGE BOLTING TORQUE CHART - OVC 4800/4802, 4833/4832

ASTM A307				K VALUE					
DIAMETER	TPI	PROOF	CLAMP	0.2	0.18	0.15	0.14	0.12	0.1
5/8	11	7485	4491	47	42	35	33	28	23
3/4	10	11062	6637	83	75	62	58	50	41
7/8	9	15301	9181	134	120	100	94	80	67
1	8	20071	12043	201	181	151	140	120	100
1 ⅛	7	25271	15163	284	256	213	199	171	142
1 ¼	7	32093	19256	401	361	301	281	241	201
1 ½	6	46534	27920	698	628	524	489	419	349
				* TORQUES LISTED ABOVE ARE MAXIMUM VALUES.					

Torque values expressed in (ft/lb) calculated from formula T=KDF / 12, where:

- K = Estimated at 0.13 for TFE coated, 0.15 used for “lubricated” conditions, and 0.20 for “dry” conditions.
- D = Nominal Diameter
- F = Clamp Load

NOTES: K values: waxed (e.g. pressure wax as supplied on high strength nuts) = 0.10; hot dip galvanized = 0.25; plain non-plated bolts (as received) = 0.20.

When using Zinc Plated (lubricated with wax) Top Lock Nuts, the K value can vary between 0.12 - 0.16.

The above estimated torque calculations are only offered as a guide. Use of its content by anyone is the sole responsibility of that person and they assume all risk due to many variables that affect the torque-tension relationship like human error, surface texture, and lubrication.