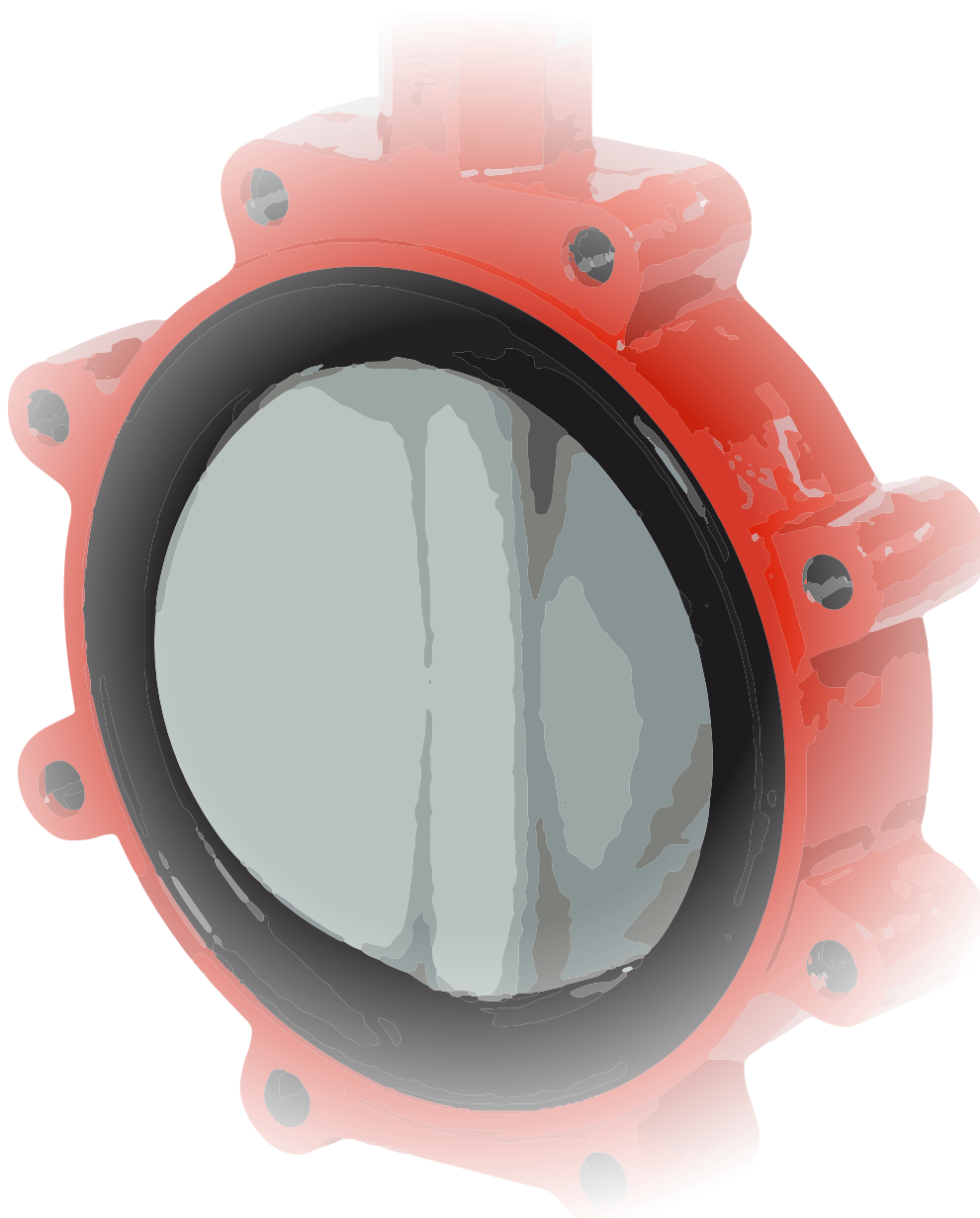


## NYL Resilient Seated Butterfly Valves

4/28/17

### Operation and Maintenance Instructions



# TABLE OF CONTENTS:

	PAGE
SAFETY INSTRUCTIONS: DEFINITION OF TERMS .....	1
INTRODUCTION .....	1
SHIPMENT & STORAGE.....	1
INSTALLATION CONSIDERATIONS.....	2
VALVES WITH SPRING RETURN ACTUATORS .....	2
FAIL OPEN ASSEMBLY .....	2
FAIL CLOSED ASSEMBLY.....	2
VALVE LOCATION AND ORIENTATION IN PIPING .....	3
VALVE ORIENTATION DIAGRAMS.....	4-6
INSTALLATION PROCEDURE.....	6-9
MAINTENANCE & REPAIR .....	9
NYL DISASSEMBLY /ASSEMBLY INSTRUCTIONS .....	10-11

FOR INFORMATION ON THESE PRODUCTS AND OTHER BRAY PRODUCTS  
PLEASE VISIT US AT OUR WEB PAGE - [www.braycommercial.com](http://www.braycommercial.com)

## SAFETY INSTRUCTIONS - DEFINITION OF TERMS

### READ AND FOLLOW THESE INSTRUCTIONS SAVE THESE INSTRUCTIONS



#### WARNING

indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.



#### CAUTION

indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

#### NOTICE

used without the safety alert symbol indicates a potential situation which, if not avoided, may result in an undesirable result or state, including property damage.

## Introduction

### Historical Experience

Based on over twenty years experience in the butterfly industry, Bray can state without question the majority of all field problems for resilient seated butterfly valves are directly related to poor installation procedures. For this reason, it is very important all distributor salespeople educate their customers regarding proper installation of resilient seated butterfly valves.

### Butterfly Valve Seat / Disc Function

Before reviewing the proper installation, maintenance, and repair procedures for resilient seated butterfly valves, let's discuss the seat-disc function of a butterfly valve. The seat in a resilient seated butterfly valve has molded o-rings on its flange face. **As a result, no gaskets are required as these o-rings serve the function of a gasket.** The flange face and molded o-rings of the seat extend beyond the body face-to-face to ensure sealing at the flange faces. The seat material, which extends past the face is compressed in installation and flows toward the center of the valve seat I.D.

In essence, the elastomer seat acts as a liquid, and the displaced elastomer moves toward the point of least resistance. The seat I.D. of all resilient seated butterfly valves is smaller than the disc O.D. This difference, the disc-seat interference, plus the increased interference due to the elastomer movement toward the seat center after installation, has been engineered so as to be the basis for pressure rating capability and the related seating/unseating torques. **Any**

**change in this interference due to improper installation directly affects the pressure rating and seating/unseating torques.**

Finally, unlike many valve types, the resilient seated butterfly valve's disc actually extends beyond the face of the valve body at given angles of opening (say, 30° or more) when installed between flanges.



#### CAUTION

It is very important before installation to ensure the critical chord dimension of the disc at the full open position is less than the adjacent pipe flange I.D.

### Shipment & Storage

- The seat, disc, stem and bushing of the resilient seated butterfly valve should be coated with silicone lubricant unless specified otherwise as recommended by Bray Technical Bulletin 1028.
- The disc should be positioned at 10° open. **Note:** See page 2 for special considerations for valves with spring return actuators.
- Valves should be stored indoors with a preferred temperature range from 40° F (4°C) to 85° F (29°C).
- When valves are stored for a long time, open and close the valves once every 3 months.
- Ship and store valves so that no heavy loads are applied to the bodies.

## **Installation Considerations – Piping and Valve Orientation and Placement**

### **Piping and Flanged Compatibilities**

#### **Piping**

These valves have been engineered so that the critical disc chord dimension at the full open position will clear the adjacent inside diameter of most types of piping, including Schedule 40, lined pipe, heavy wall, etc.

#### **Metal Flanges**

Resilient seated butterfly valves have been designed to be suitable for all types of flanges (ASME, DIN, JIS and other international flange standards), whether flat-faced, raised face, slip-on, weld-neck, etc. Proper alignment of any butterfly valve between flanges is critical to good performance of the valve. The flange bolts must also be evenly tightened around the circumference of the valve, providing consistent flange compression of the molded o-ring in the seat face.

Since Bray does not recommend the use of gaskets between flanges on resilient seated butterfly valves, a uniform flange face is critical to proper valve sealing. Most weld-neck and slip-on flanges conforming to ASME specifications have an appropriate flange face. Types A and B butt-weld stub-end flanges also provide a suitable mating surface for the molded o-ring.

It should be noted that Type C butt-weld stub-end flanges have an “as formed” flange face. The varying surface of this flange face can create sealing problems between any resilient-seated butterfly valve and the flange face. For this reason, Type C flanges are not recommended for use with resilient-seating butterfly valves.

#### **Non-Metallic Flanges**

When non-metallic flanges, such as plastic or PVC, are used with resilient seated butterfly valves, care must be taken not to over-tighten the flange bolts. The inherent flexibility of these non-metallic flange materials allow them to be over-tightened relatively easily. Flexing caused by this over-tightening can actually reduce the compression of the valve between the flanges, causing leaks between the valve and the flange face. Proper alignment and firm, even, but not excessive tightening of flange bolts

are especially important with non-metallic flanges. In some cases, non-metallic flanges of low quality will not mate tightly with butterfly valves regardless of the care taken during installation.

### **Valves with Spring Return Actuators**

#### **1. Fail Closed Assemblies**

If the valve is supplied with an actuator, the butterfly valve is shipped in the full closed position (as no air pressure is present to compress the springs and open the disc).



#### **CAUTION**

Installing the valve with the disc in the full closed position may create a compression set on the seat causing higher than expected torques or premature seat failure. It is recommended to:

- Remove the actuator. Be sure to scribe the valve and actuator to ensure the re-installed actuator is in the exact same quadrant as originally configured
- Install the valve per the attached installation tag instructions
- Re-install the actuator ensuring it is in the proper quadrant

#### **2. Fail Open Assemblies**

If the valve is supplied with an actuator, the butterfly valve disc is shipped in the full open position (as no air pressure is present to compress the springs and close the valve disc.) The sealing surface, or disc edge, is therefore exposed. Damage to that surface will cause premature seat failure.



#### **CAUTION**

Use caution installing the valve being careful not to damage the disc edge. It is recommended to:

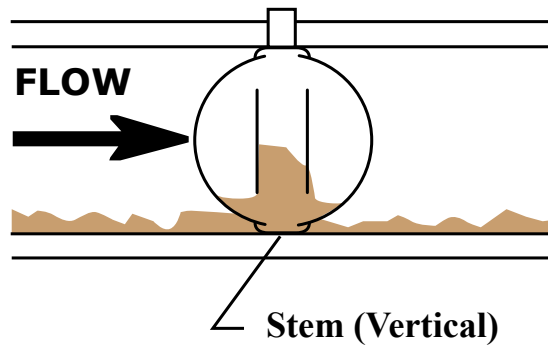
- Remove the actuator. Be sure to scribe the valve and actuator to ensure the re-installed actuator is in the exact same quadrant as originally configured
- Install the valve per the attached installation tag instructions
- Re-install the actuator ensuring it is in the proper quadrant

### 3. Valve Location

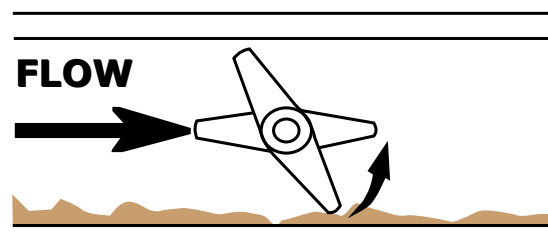
- a. Resilient seated butterfly valves should be installed if possible a minimum of 6 pipe diameters from other line elements, i.e., elbows, pumps, valves, etc. of course, 6 pipe diameters are not always practical, but it is important to achieve as much distance as possible.
- b. Where the resilient seated butterfly valve is connected to a check valve or pump, use an expansion joint between them to ensure the disc does not interfere with the adjacent equipment.

### 4. Valve Orientation

- a. In general, Bray recommends the resilient seated valve be installed with the stem in the vertical position and the actuator mounted vertically directly above the valve; however, there are those applications as discussed below where the stem should be horizontal.  
**NOTE:** Bray does not recommend valves be installed in an upside-down position.
- b. For slurries, sludge, mine tailing, pulp stock, dry cement, and any media with sediment or particles, Bray recommends the resilient seated valve be installed with the stem in the horizontal position with the lower disc edge opening in the down - stream direction.



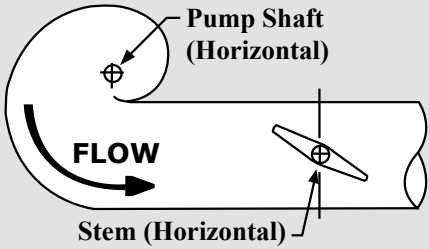
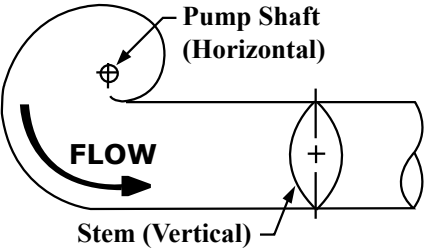
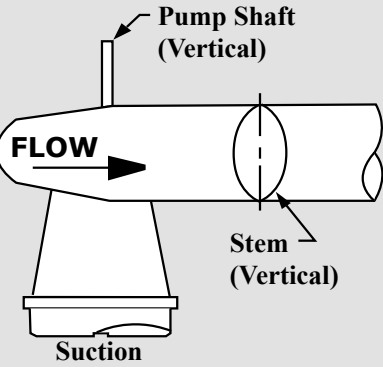
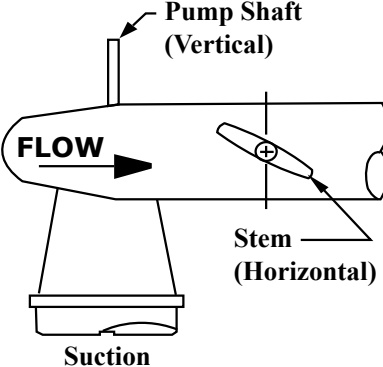
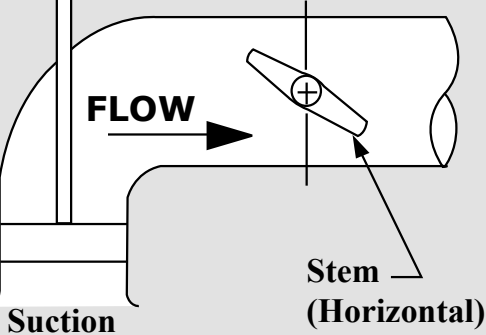
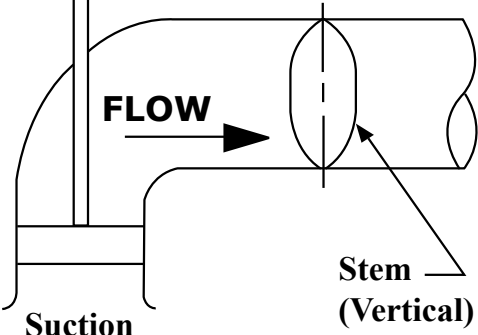
**INCORRECT INSTALLATION**  
Sludge builds up on disc



**CORRECT INSTALLATION**  
Sludge passes under disc

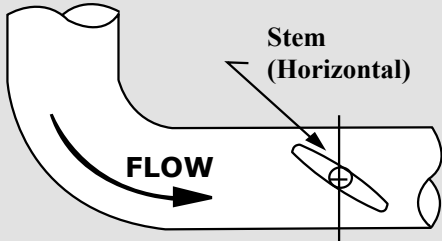
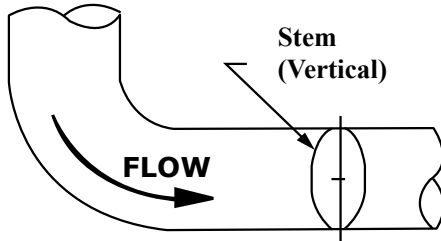
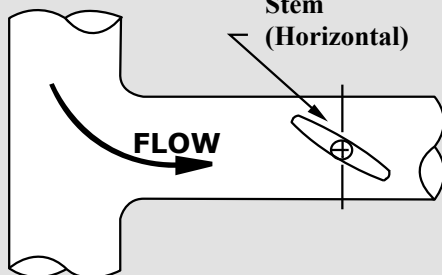
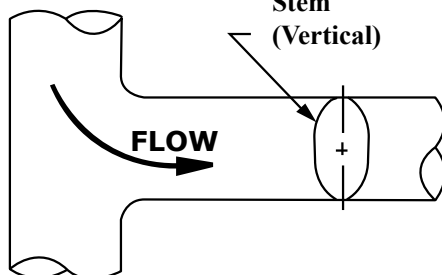
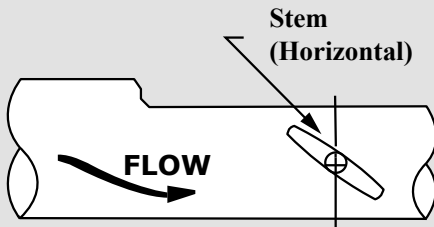
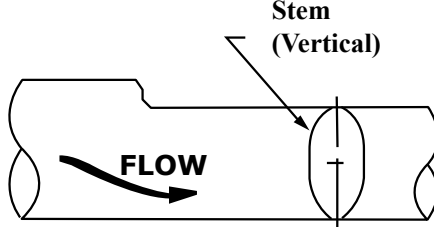
**Valve Orientation (Continued)**

c. Resilient seated butterfly valve located at the discharge of a pump should be oriented as follows:

	INCORRECT INSTALLATION	CORRECT INSTALLATION
i.) For centrifugal Pump – Pump shaft horizontal and stem vertical		
ii.) Centrifugal Pump – Pump shaft vertical & stem horizontal		
iii.) Axial Pump – Pump shaft vertical & stem vertical		

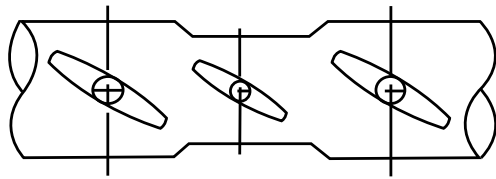
**Valve Orientation (Continued)**

d. Butterfly valves located downstream of a bend or pipe reducer should be oriented as follows:

	INCORRECT INSTALLATION	CORRECT INSTALLATION
i.) Bend	 <p>Stem (Horizontal)</p>	 <p>Stem (Vertical)</p>
ii.) Tee	 <p>Stem (Horizontal)</p>	 <p>Stem (Vertical)</p>
iii.) Pipe Reducer	 <p>Stem (Horizontal)</p>	 <p>Stem (Vertical)</p>

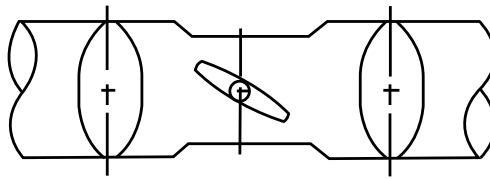
### Valve Orientation (Continued)

e. Butterfly valves in combination for control/isolation applications should be installed as follows:



**INCORRECT INSTALLATION**

Combination with all valve stems in the same direction accelerates possible noise, vibration, & erosion problems.



**CORRECT INSTALLATION**

Combination with the stem of the control valve at right angle to those of other valves tends to cancel the drift of the fluid, and reduces noises, vibration, and erosion.

## Installation Procedure

### A. General Installation

1. Make sure the pipeline and pipe flange faces are clean. Any foreign material such as pipe scale, metal chips, welding slag, welding rods, etc., can obstruct disc movement or damage the disc or seat.
2. The Bray elastomer seat has molded o-rings on the face of the seat. **As a result, no gaskets are required as these o-rings serve the function of a gasket.**
3. Align the piping and then spread the pipe flanges a distance apart so as to permit the valve body to be easily dropped between the flanges without contacting the pipe flanges (*see figure 1 page 6*).

4. Check to see that the valve disc has been positioned to a partially open position, with the disc edge about 1/2 inch to 3/8 inch inside the face of the seat, (approximately 10° open) (*see figure 1 page 6*)  
**Note: See page 2 for special consideration for valves with spring return actuators.**
5. Insert the valve between the flanges as shown in figure 1 of page 6, taking care not to damage the seat faces. Always pick the valve up by the locating holes or by using a nylon sling on the neck of the body.

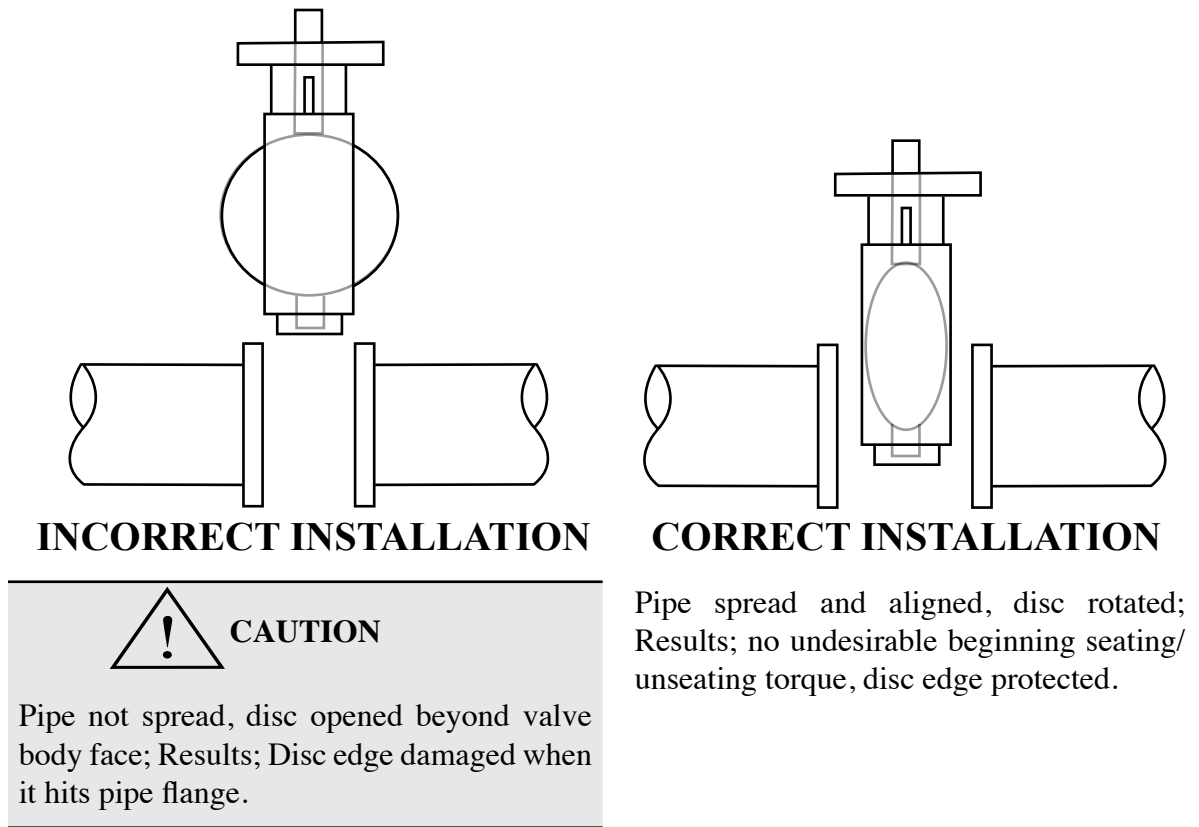


### WARNING

Never pick up the valve by the actuator or operator mounted on top of the valve.



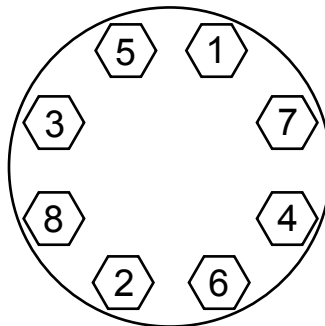
**Figure 1 – Insert Resilient Seated Butterfly Valve Between Flanges**



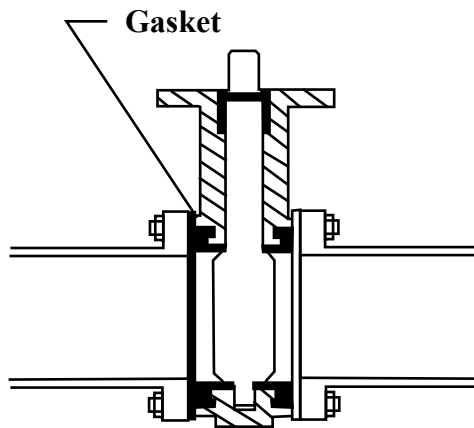
6. Place the valve between the flanges, center it, and then span the valve body with all flange bolts, but do not tighten the bolts. Carefully open the disc to the full open position, making sure the disc does not hit the adjacent pipe I.D. Now systematically remove jack bolts or other flange spreaders, and hand-tighten the flange bolts as shown in **Figure 2**

below. Very slowly close the valve disc to ensure disc edge clearance from the adjacent pipe flange I.D. Now open the disc to full open and tighten all flange bolts per specification as shown in **Figure 2**. Finally, repeat a full close to full open rotation of the disc to ensure proper clearances (*See figures 3 & 4 page 7*).

**Figure 2 – Flange Bolt Tightening Pattern**

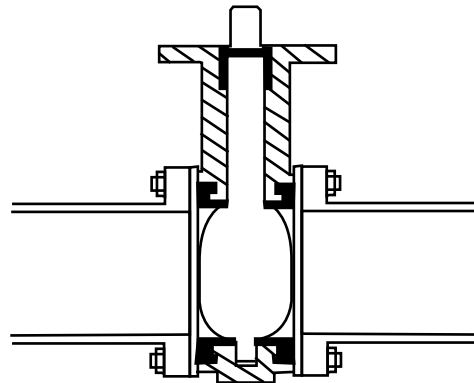


**Figure 3 – Initial Centering & Flanging of Valve**



**INCORRECT INSTALLATION**

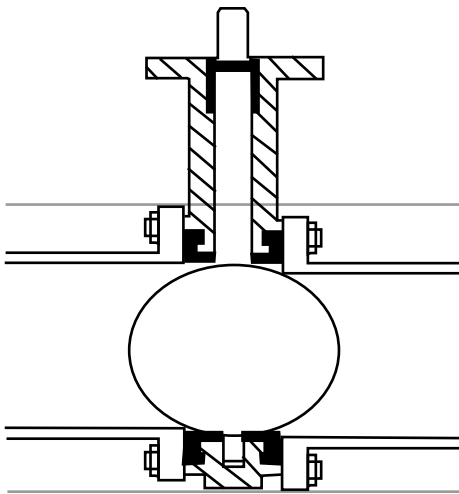
Disc in closed position; gaskets used; Results – Seat distorted and over-compressed causing high initial unseating torque problems.



**CORRECT INSTALLATION**

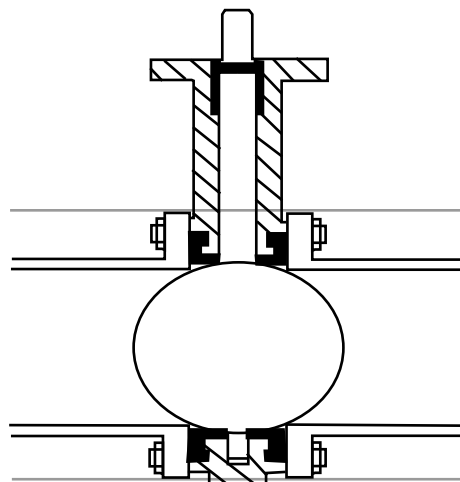
Bolts snugged, not torqued tight, disc edge within body face-to-face but not fully closed, no flange gaskets; Results: No disc edge damage, proper sealing allowed.

**Figure 4 – Final Aligning & Tightening of Flange Bolts**



**INCORRECT INSTALLATION**

Piping misaligned; Results Disc O.D. strikes pipe I.D. causing disc edge damage, increased torque & leakage. Seat face o-rings will not seal properly with incorrectly aligned piping.



**CORRECT INSTALLATION**

Piping aligned properly when bolts tightened, disc in full open position; Results – disc clears adjacent pipe I.D., seat face seals properly, no excessive initial torque.

When resilient seated butterfly valves are to be installed between ASME welding type flanges, care should be taken to abide by the following procedure to ensure no damage will occur to the seat:

1. Place the valve between the flanges with the flange bores and valve body aligned properly. The disc should be in the 10° open position.
2. Span the body with the bolts.
3. Take this assembly of flange-body-flange and align it properly to the pipe.
4. Tack weld the flanges to the pipe.
5. When tack welding is complete, remove the bolts and the valve from the pipe flanges and complete the welding of the flanges. Be sure to let the pipe and flanges cool before installing the valve.



#### CAUTION

Never complete the welding process (after tacking) with the valve between pipe flanges. This causes severe seat damage due to heat transfer.

## Maintenance and Repair

The many Bray features minimize wear and maintenance requirements. No routine lubrication is required. **All components – stem, disc, seat, bushing, stem seal, etc., are field replaceable, no adjustment is required.** If components require replacement, the valve may be removed from the line by placing the disc in the near closed position, then supporting the valve and removing the flange bolts.



#### WARNING

No valve maintenance, including removal of manual or power actuators, should be performed until the piping system is completely depressurized.

## Disassembly/Assembly Instructions

### NYL Series Resilient Seated Butterfly Valves

#### Disassembly –

1. Remove the handle, gear operator, or power actuator from actuator mounting flange.
2. Remove the “Spirolox”® retaining ring and the two C-ring stem retainers from the stem hole.
3. Then remove the stem, bushing and seal.
4. Remove the disc from the seat, protecting the disc edge at all times.
5. Push the seat into an oval shape, and then remove the seat from the body.
6. Remove the disc from the seat, protecting disc edge at all times.
7. Push the seat into an oval shape, and then remove the seat from the body.

**Note: Valves 54” and larger are provided with the seat bonded to the body and therefore is not easily field replaceable. Please contact your local Bray representative for seat replacement.**

#### Assembly –

1. Push the valve seat into an oval and push it into the body with seat stem holes aligned to body stem holes.

<b>NOTICE</b>	When installing the seat the larger hole should be on top and the smaller hole should be on bottom.
---------------	---

2. Insert stem seal and bushing.
3. Push stem into the stem hole of the body until the bottom of the stem is flush with the inner top edge of the seat.
4. Install a light coating of silicone or grease on the I.D. of seat. Insert the disc into the seat by lining up the disc holes with the stem holes of the seat.

**Note: The broached double “D” flats in the disc must be toward the bottom of the valve body.**

5. With a downward pressure and rotating the stem back and forth, push the stem until the stem touches the bottom of the body stem hole.
6. Make certain that when pushing the stem through the disc bottom, the broached flats of stem and disc are aligned.
7. Replace the stem bushing and two stem retainers, then replace the “Spirolox”® retaining ring back into position.
8. Replace handle, manual gear operator or power actuator on the actuator mounting flange.
9. Replace manual gear operator or power actuator on the actuator mounting flange.

# ***NYL Series***

## ***RESILIENT SEATED BUTTERFLY VALVES***

- 1 BODY (S30 WAFER STYLE SHOWN)
- 2 SEAT
- 3 DISC
- 4 STEM
- 5 STEM SEAL
- 6 STEM BUSHING
- 7 STEM RETAINER
- 8 THRUST WASHER
- 9 RETAINING RING

