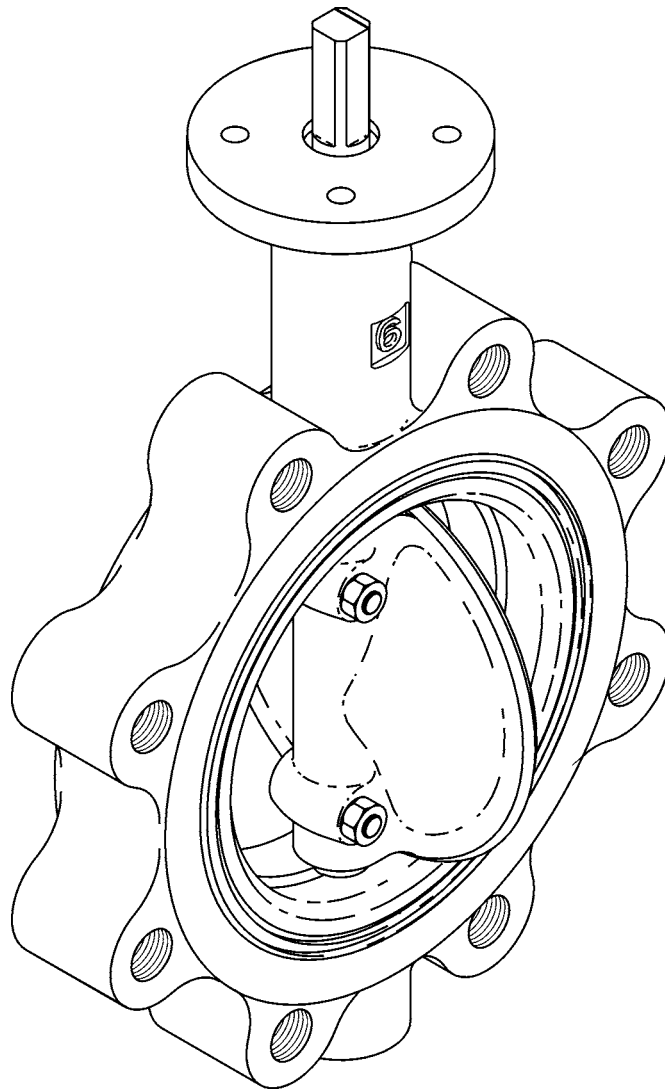




# 2-20" BRS BUTTERFLY VALVES



# DeZURIK 2-20" BRS Butterfly Valves

## Description

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**Instructions** These instructions provide information about DeZURIK BRS butterfly valves. They are for use by personnel who are responsible for installation, operation and maintenance of BRS butterfly valves.

**Safety Messages** All safety messages in the instructions are flagged with an exclamation symbol and the word Caution, Warning or Danger. These messages must be followed exactly to avoid equipment damage, personal injury or death.

Safety label(s) on the product indicate hazards that can cause equipment damage, personal injury or death. If a safety label becomes difficult to see, or if a label has been removed, please contact DeZURIK for replacement label(s).



### **WARNING!**

**Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves, which have been removed from service with suitable protection for any potential pipeline material in the valve.**

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**Inspection** Your BRS butterfly valve has been packaged to provide protection during shipment, however, it can be damaged in transport. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

**Parts** Recommended spare parts are listed on the assembly drawing. These parts should be stocked to minimize downtime.

Order parts from your DeZURIK sales representative, or directly from DeZURIK. When ordering parts, please include the 7-digit part number and 4-digit revision number (example: 9999999R000) located on the data plate attached to the valve assembly. Also include the part name, the assembly drawing number, the balloon number and the quantity stated on the assembly drawing.

**DeZURIK Service** DeZURIK service personnel are available to install, maintain and repair all DeZURIK products. DeZURIK also offers customized training programs and consultation services. For more information, contact your local DeZURIK sales representative or visit our website at [www.dezurik.com](http://www.dezurik.com)

**Description** The DeZURIK BRS butterfly valve is a resilient-seated valve for general industrial applications. The valve features two seating surfaces. The disc may be transferred from the first surface to the second to extend the seat life. Lugged or wafer end connections are offered, with a choice of disc, seat, and shaft materials. Pressure and temperature ratings are shown on the valve data plate.

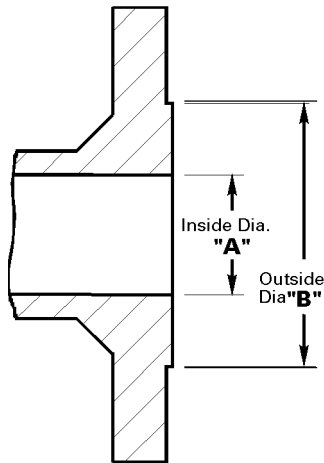
# DeZURIK 2-20" BRS Butterfly Valves

## Installation Requirements

### Installation Requirements

Refer to the valve installation drawing for dimensional information.

- ◆ Installing the valve in the wrong location may cause excessive dynamic torque and damage the valve. Install the valve at least 8 pipe diameters downstream from the nearest pump or elbow.
- ◆ Valves with an undrilled seat retainer are not suitable for dead-end service without a downstream flange.
- ◆ Pipeline flow may be in either direction through the valve. Install the valve so that the flat side of the closed disc will be on the higher pressure side. If possible, install the valve with the shaft horizontal to provide a self-cleaning action on the seat.
- ◆ Use pipeline flanges that conform to ASME/ANSI B16.1 Class 125 or ASME/ANSI B16.5 Class 150, and ensure that the flanges meet the dimensional requirements in Table A.



**Table A: Dimensional Requirements for Flanges**

Valve Size		Inside Diameter A		Maximum	Outside Diameter B Minimum
		Minimum			
in	mm	in	mm		
2	50	2.07		2.44	3.76
2½	60	2.44		2.94	4.22
3	75	3.05		3.57	4.70
4	100	4.00		4.57	5.62
5	125	5.00		5.66	6.68
6	150	5.96		6.72	7.72
8	200	7.83		8.72	9.71
10	250	9.80		10.88	11.86
12	300	11.64		12.88	13.88
14	350	12.88		14.14	15.12
16	400	14.82		16.16	17.17
18	450	16.77		18.18	19.28
20	500	18.70		20.20	21.21

- ◆ Each valve includes two FLS flange seals that are installed between the valve and each pipeline flange, with the metal side of each seal against the valve. Do not use other seals or gaskets. FLS flange seals must be used with all pipeline flanges except weld neck flanges and size 4" and smaller slip-on flanges. Flange seals, or other gaskets, are not required with weld neck flanges or with size 4" and smaller slip-on flanges.

## **Installing Valve**



### **CAUTION!**

**Lifting larger size valves incorrectly can damage it. Do not fasten lifting devices to the actuator or disc, or through the seat opening in the body. Lift the valve with slings fastened around the valve body, or attach them to bolts or rods run through holes for the pipeline flanges.**

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Mount wafer body valves to the pipeline flanges with either bolts or studs that extend through both flanges:

- ◆ **On sizes 2-18"** — four of the fasteners must pass through the locating holes in the valve body.
- ◆ **On the 20" size** — four of the fasteners must be bolts threaded into the tapped locating holes.

Mount lugged body valves to the pipeline flanges with bolts only. Studs are not recommended.

1. If the valve has been ordered without an actuator, mount the actuator on the valve.
  - ◆ For a DeZURIK actuator, refer to the Actuator Instructions.
  - ◆ For an actuator other than DeZURIK, the dimensional requirements for the actuator interface are shown on the Installation Drawing for the valve.
2. Before installation, remove all foreign material such as weld spatter, oil, grease, and dirt from the valve, flanges, and pipeline.
3. Open the valve, and clean the seat and the sealing edge of the disc.
4. Place the valve in the pipeline with the valve closed. Handle the valve carefully so that the flange gasket sealing surfaces do not get scratched or damaged.
5. Ensure that the valve, the pipeline and the mating connections are aligned and centered before tightening the pipeline bolts.
6. Open the valve slowly to ensure that there is adequate clearance between the open disc and the pipeline.
7. Tighten the bolts evenly, in a crisscross pattern.

## **Operation**

Clockwise rotation of the valve shaft closes the disc into the seat. The valve is fully closed when the flat side of the disc is parallel with the flange sealing surface on the body. The valve is fully open when the disc is 90° counterclockwise from the closed position. A line on the top of the valve shaft corresponds to the flat side of the disc. The line may be used to determine the approximate position of the disc when the disc is not visible.

The valve actuator is connected to the valve shaft, and positions the disc at the open, closed, or intermediate positions. The adjustable open and closed position stops in the valve actuator are set to match the open and closed positions of the valve. Refer to the Actuator Instructions for actuator stop adjustment information.

### Lubrication

The valve is lubricated at the factory, and does not require routine lubrication. Refer to the actuator instructions for actuator lubrication requirements.

If the valve is disassembled, lubricate the shaft seals and the shaft bearings with the following lubricant:

- ◆ For oxygen service valves, use Hooker Fluorolube GR-362.
- ◆ For other valves with RS66 seat material, use a silicone lubricant such as Dow Corning Molykote 44.
- ◆ For other valves with RS47, RS49, RS50, RS59, RS63, or RS78 seat material, use a medium aluminum complex lubricant such as Keystone Vetostane.

### Using The Second Seating Surface

The seat has two seating surfaces. After normal seat life, the disc may be transferred from the first seating surface to the second seating surface by following the steps below.



#### WARNING!

**Pipeline pressure with the actuator removed can cause the valve disc to rotate suddenly and cause personal injury or equipment damage. Relieve the pressure in the pipeline before removing the actuator.**

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1. Relieve the pressure in the pipeline, and drain the pipeline.



#### WARNING!

**Moving parts from accidental operation of a powered actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.**

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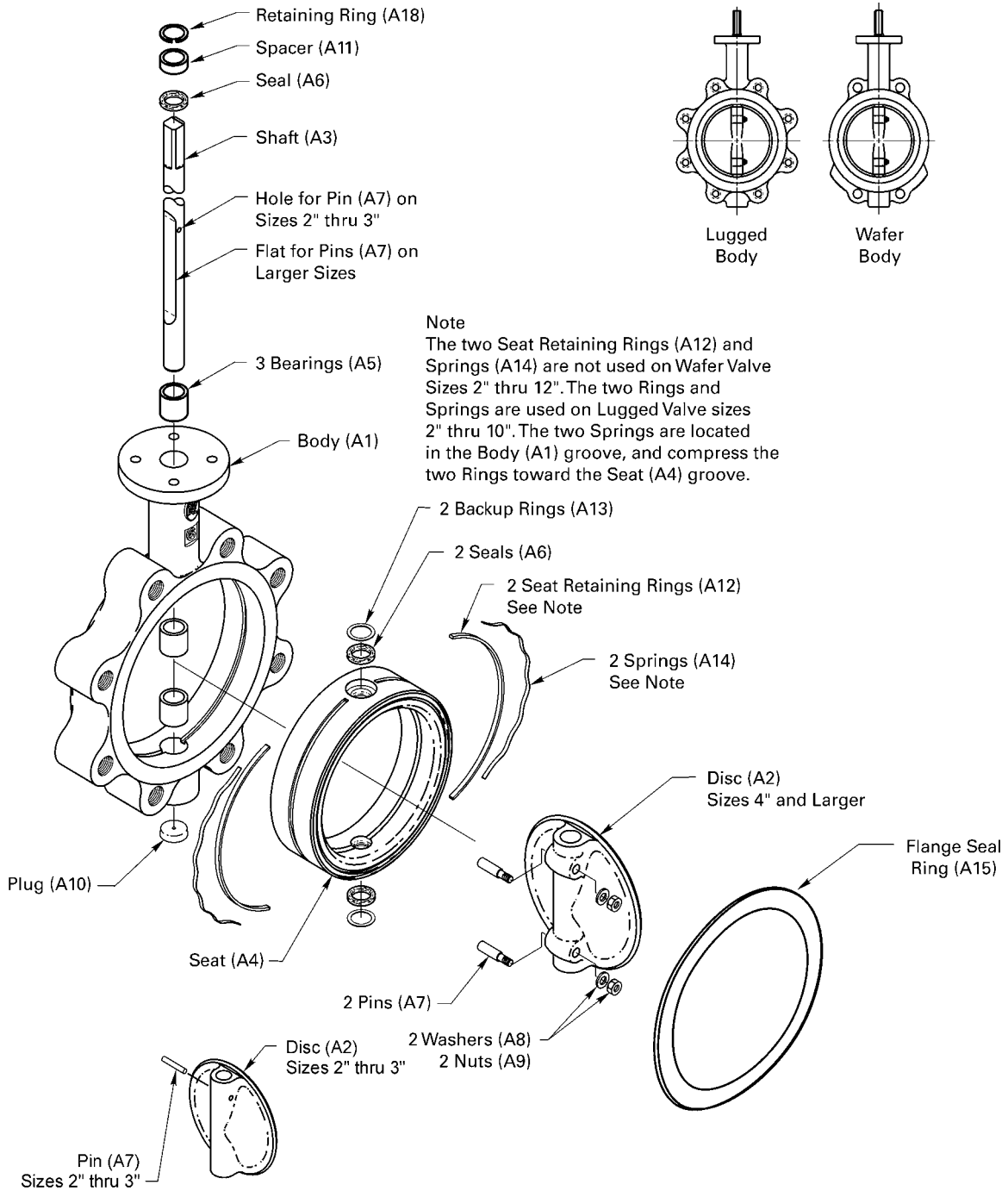
2. If the actuator is powered, disconnect and lock out the pneumatic, hydraulic, or electrical power to prevent accidental operation of the actuator.
3. Remove the actuator from the valve as described in the actuator instructions.
4. Rotate the valve shaft 180°.
5. Replace the actuator on the valve as described in the actuator instructions.
6. If the actuator is powered, reconnect power to the actuator.

**Note:** As recommended in the Installation section, the valve should be installed in the pipeline with the higher pressure against the flat side of the disc. If applicable, remove the valve from the pipeline as described in the Removing Valve From Pipeline section, rotate the entire valve 180°, and re-install the valve as described in the Installation section.

# DeZURIK 2-20" BRS Butterfly Valves

## Drawings

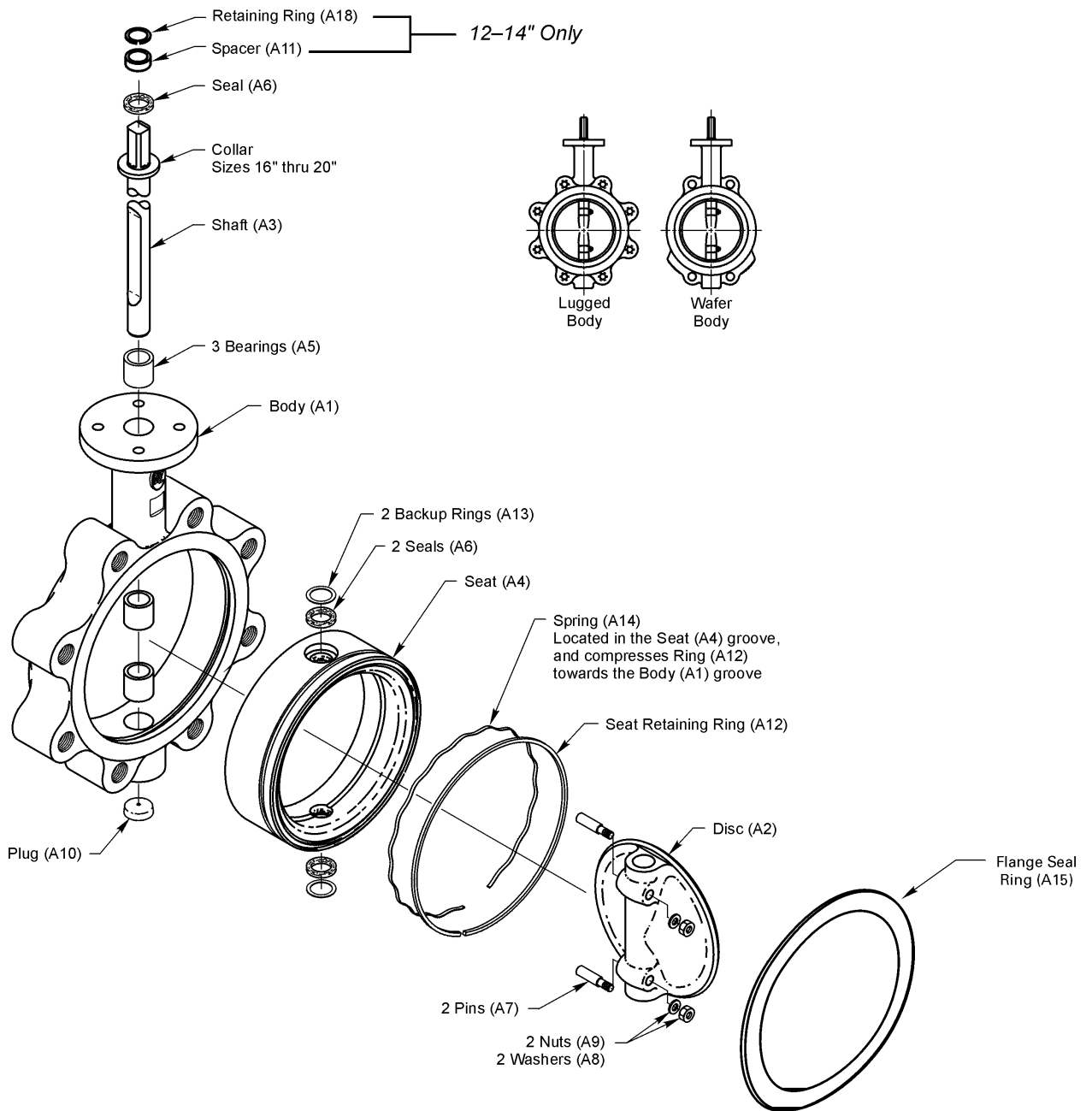
### Drawings



**Figure 1—Wafer Valve 2-12" Lugged Valve 2-10"**

# DeZURIK 2-20" BRS Butterfly Valves Drawings

## Drawings



**Figure 2—Wafer Valve 14-20" Lugged Valve 12-20"**

# DeZURIK 2-20" BRS Butterfly Valves

## Removing Valve from Pipeline

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### Removing Valve from Pipeline

Follow the steps below to remove the valve from the pipeline.



#### WARNING!

**Loosening the flange bolts on a pressurized valve can allow the valve to suddenly shift position and release uncontrolled pipeline fluid. To avoid personal injury or pipeline damage, relieve the pressure in the pipeline before loosening the pipeline flange bolts.**

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1. Relieve pressure in the pipeline, and drain the pipeline and close the valve.
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#### WARNING!

**Moving parts from accidental operation of a powered actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.**

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2. If the actuator is powered, disconnect and lock out the pneumatic, hydraulic, or electrical power to prevent accidental operation.
3. Support the valve, remove the flange bolting, and remove the valve from the pipeline. Refer to the lifting requirements in the Installation section.

### Disassembling the Valve

Refer to appropriate Figure for parts identification.

1. Remove the valve from the pipeline as described in the Removing Valve From Pipeline section.
2. Remove the actuator as described in the Actuator Instructions.
3. Rotate the valve disc (A2) to the open position.
4. Remove the disc retainer — as determined by valve size and body style — as shown below:
  - ◆ **For valve sizes 2–3"**, drive out the disc pin (A7).
  - ◆ **For valve sizes 4–20"**, remove the two nuts (A9) and washers (A8), and drive out the two disc pins (A7).
5. While supporting the disc (A2), pull the shaft (A3) upwards, and remove the shaft from the body (A1).
6. Remove the disc (A2) from the seat (A4) — as determined by valve size and body style — as shown below:
  - ◆ **For wafer valve sizes 2–12"**, slide the seat (A4) out of the body (A1).
  - ◆ **For wafer valve sizes 14–20"**, and all lugged valves, cut through the seat at either shaft hole location with a hacksaw. Pry one cut end towards the center of the seat until the seat is released from the retaining ring(s) (A12), and remove the seat from the body.
7. If the three shaft bearings (A5) require replacement, heat the bearings with a torch to break the Loctite seal, and drive the bearings out of the body.

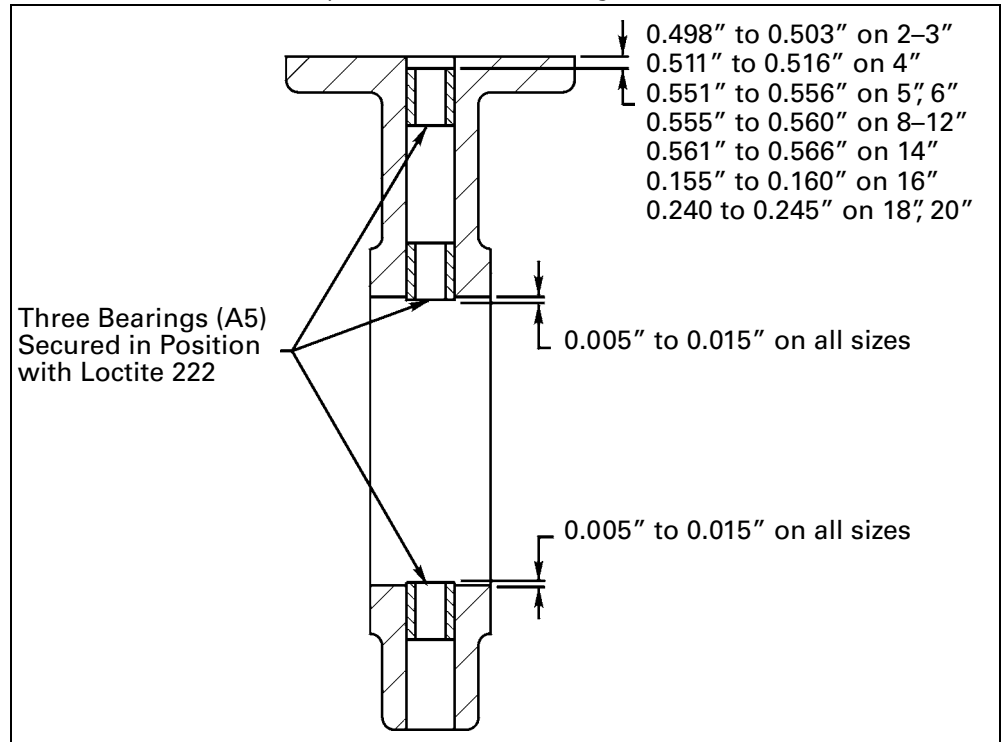
# DeZURIK 2-20" BRS Butterfly Valves

## Reassembling Valve

### Reassembling Valve

Clean and inspect all parts, and replace worn parts. Refer to appropriate — as determined by valve size and body style — for parts identification.

1. If the three shaft bearings (A5) were removed, apply Loctite 222 to the outside diameters of the new bearings, and press the bearings into location in the body (A1) as shown in Figure 3.



**Figure 3—Shaft Bearing Locations**

2. Use the lubricant specified in the Lubrication section, and apply a paint-like coating of lubricant to the following surfaces: the two shaft holes and seal grooves in the seat (A4); the three shaft seals (A6); the inside diameters of the three shaft bearings (A5); and the round end of the shaft (A3).
3. Place one shaft seal (A6) and then one back-up ring (A13) into each of the two shaft seal grooves in the seat (A4).
4. Install the seat retainer — as determined by valve size and body style — as shown below:
  - ◆ **For wafer valve sizes 2-12"**, slide the seat (A4) into position in the body (A1) with the word "top" on the seat towards the top of the valve. Align the shaft holes in the seat with the shaft bearings (A5) in the body.
  - ◆ **For lugged valve sizes 2-10"**, place one of the springs (A14) and then one of the seat retainer rings (A12) into the groove on each side of the seat bore in the body (A1). Center the rings and the springs between the 6 and 12 o'clock positions. Compress the retainer rings flush with the body bore. With the word "top" on the seat towards the top of the body, slide the seat (A4) into the body until the retainer rings snap audibly into position in the mating groove in the seat.

# DeZURIK 2-20" BRS Butterfly Valves

## Reassembling Valve

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Rotate the seat, if necessary, so that the shaft holes in the seat are aligned with the shaft bearings (A5) in the body.

- ◆ **For wafer valve sizes 14–20" and lugged valve sizes 12–20"**, place the spring (A14) and the seat retainer ring (A12) into the groove on outside of the seat (A4). Compress the retainer ring flush with the seat. With the word "top" on the seat towards the top of the body (A1), slide the seat into in the body until the retainer ring snaps audibly into position in the mating groove in the body. Rotate the seat, if necessary, so that the shaft holes in the seat are aligned with the shaft bearings (A5) in the body.
5. With the word "top" on the disc (A2) towards the top of the body (A1), place the opened disc into the opening of the seat (A4), and align the shaft hole in the disc with the shaft bearings (A5) in the body.
  6. Support the disc in the position described in the previous step, and insert the lubricated round end of the shaft (A3) into the top bearing (A5) in the body (A1). Push the shaft slowly and carefully with a rotary motion through the seat (A4), disc (A2), and bottom bearing (A5).
  7. Align the disc — as determined by valve size and body style — as shown below:
    - ◆ **For valve sizes 2–3"**, align the groove on the top end of the shaft with the flat side of the disc, and align the pin hole in the shaft with the pin hole in the disc.
    - ◆ **For valve sizes 4–14"**, align the groove on the top end of the shaft with the flat side of the disc, and position the shaft so that the top end extends 1-3/4" ± 1/32" above the top of the body.
    - ◆ **For valve sizes 16–20"**, align the groove on the top end of the shaft with the flat side of the disc, and position the shaft so that the collar on the shaft is in contact with the top of the body.
  8. Attach the disc to the shaft — as determined by valve size and body style — as shown below:
    - ◆ **For valve sizes 2–3"**, install the pin (A7) from the left hand side. Pin must be installed with the grooves on the left hand side. Tap the pin flush with the disc (A2).
    - ◆ **For valve sizes 4–20"**, push the two disc pins (A7) into the holes in the left side of the disc so that the flat side of each pin in is in contact with the mating flat on the shaft. Tap each pin lightly with a hammer to seat the pin in position. Place a washer (A8) and nut (A9) on each pin, and tighten the nuts as shown in Table B.

**Table B: Disc Pin Nut Torque**

ValveSize	Torque
4	22 ± 3 inch pounds
5–8	5 ± 1 foot pounds
10–14	9 ± 1 foot pounds
16 and 18	17 ± 2 foot pounds
20	27 ± 3 foot pounds

9. Place the third seal (A6) on the top of the shaft, and carefully slide the seal down the shaft into position against the top bearing (A5).
10. Install the spacer (A11) and the retaining ring (A18).

# DeZURIK 2-20" BRS Butterfly Valves Troubleshooting

- Note:** Ensure the retaining ring is seated in the groove in the body.
11. Mount the actuator on the valve as described in the actuator instructions.
  12. Install the valve as described in the Installation section. If the actuator is a powered actuator, re-connect the power and other connections.

## Troubleshooting

Condition	Possible Cause	Corrective Action
Valve does not fully close.	Object is wedged between disc and seat	Open valve, and allow flow to remove object
	Closed position stop is not adjusted correctly.	Adjust closed stop.
	Disc-to-shaft connection has failed.	Replace disc pin(s), shaft, and/or disc.
Valve leaks when closed.	Closed position stop is not adjusted correctly.	Adjust closed stop.
	Seat is worn or damaged.	Replace seat.
	Sealing edge of disc is worn or damaged.	Replace seat.
Valve does not fully open.	Open position stop is not adjusted correctly.	Adjust open stop.
	Disc-to-shaft connection has failed.	Replace disc pin(s), shaft, and/or disc.
Opening or closing torque is excessive.	Bearings, shaft, disc or seat are dirty or worn	Clean or replace dirty or worn components.
	Shaft is bent.	Replace shaft.
Valve leaks between body and flanges.	Mating flanges are not correct configuration.	Replace flange.
	Flange seal is damaged.	Replace seat.
	Flange bolts are tightened incorrectly.	Tighten the flange bolts evenly, in a crisscross pattern.
Media leaks between actuator and top of valve	Flange seal (A15) leaking	Replace flange seals.
	Seal (A6) leaking at top of shaft.	Inspect and replace flange seal (A6).
	Seat seal (A6) damaged.	Inspect and replace seat (A4) and seals (A6)

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