

RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL - SERIES GS



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SAFETY INSTRUCTIONS - DEFINITION OF TERMS

READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY. SAVE THIS MANUAL FOR LATER USE.

This manual contains crucial information that you must follow to ensure the safe and effective use of your MPI (McWane Plant & Industrial) valve. It provides detailed instructions on how to operate and maintain your valve correctly, so you can extend its lifespan and avoid accidents or damage to your valve.

Below are examples of safety notices used throughout this manual:



DANGER Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.



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, could 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



WARNING: Read all applicable directions and instructions before performing any maintenance, troubleshooting, disassembly, installation, etc.



WARNING: It is crucial for individuals involved in valve installation and maintenance to stay vigilant and alert for any potential emissions of pipeline material. This is essential to ensure the safety of the personnel and the environment. It is highly recommended that appropriate safety measures are taken, including the use of suitable protective gear, when handling hazardous pipeline materials. These measures will help prevent any harm or damage and ensure the safety of all personnel involved in the installation and maintenance process.

RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS

FUNCTION

The butterfly valve is designed to rotate 1/4 turn to provide a tight shut-off in air or water applications. This type of valve can be used to regulate the flow rate by positioning the disc between 10 and 90 degrees open.

The seat of the valve features molded o-rings on its flange face, which eliminates the need for gaskets 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.

Unlike many valve types, the butterfly valve's disc extends beyond the face of the valve body at opening angles above approximately 30° or more when installed between flanges. Special consideration must be taken during installation if the valve has a fail-open actuator installed.

VALVE CYCLE

Resilient seated butterfly valves can be fully closed with a 90-degree clockwise rotation and fully opened with a 90-degree counter-clockwise rotation of the valve stem via a hand lever, gear operator, or actuator.

STORAGE

The resilient seated butterfly valve requires some specific handling and storage instructions.

- The valve should be stored with the disc positioned at a 10° open angle.
- It's important to store the valves indoors, with a preferred temperature range of 40°F to 85°F.
- Every 3 months, while in storage, the valves should be cycled opened, and closed once.
- The polymer and elastomer parts should not be stored in the presence of sunlight or artificial light with high ultraviolet content or any source of radiation, as these are the primary causes of aging.
- Protect the valves from water, dirt, rocks, and debris.

VALVES WITH SPRING RETURN ACTUATORS

FAIL CLOSE ASSEMBLIES

If the valve is supplied with a spring return 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 fully closed may cause seat damage or high torques. It is recommended to avoid this by closing the valve before installation.

FAIL OPEN ASSEMBLIES:

If the valve comes with a fail-open actuator, the butterfly valve disc is sent in a fully open position as there is no air pressure present to compress the springs and shut the valve disc closed. Due to this, the sealing surface, or the disc edge, remains exposed. Any harm caused to that surface can lead to an early seat failure.

RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS



Caution: When installing the valve, it is important to proceed with caution to avoid damaging the disc edge. Here are the steps to follow:

1. Start by removing the actuator. Make sure to mark the valve and actuator to ensure that the re-installed actuator is in the same quadrant as it was originally configured.
2. Install the valve according to the instructions detailed in this document.
3. Re-install the actuator, ensuring that it is in the proper quadrant.

VALVE LOCATION

It is recommended to install resilient seated butterfly valves at a distance of at least 6 pipe diameters from other line elements such as elbows, pumps, valves, etc. However, this may not always be possible due to space constraints. In such cases, it is important to achieve as much distance as possible.

When installing a butterfly valve next to other equipment such as a check valve or pump, an expansion joint, or a spacer piece at least one pipe diameter should be used between them to ensure that the opening disc does not interfere with the adjacent equipment.

VALVE ORIENTATION

MPI generally recommends installing the resilient seated valve in a vertical position with the actuator mounted directly above the valve. However, there are some specific applications where the valve stem should be installed horizontally instead.

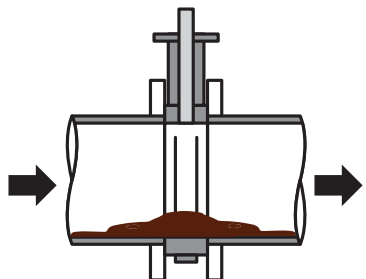


NOTE: MPI does not recommend valves be installed in an upside-down position.

MPI recommends installing the resilient seated valve with the stem in a horizontal position for slurries, sludge, mine tailing, pulp stock, dry cement, and any media that contains sediment or particles. The lower disc edge should open in the downstream direction, as illustrated in the diagram on the right.

✘ INCORRECT

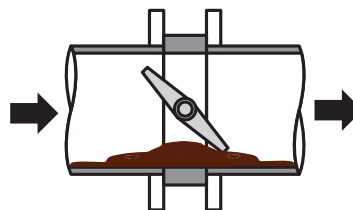
Sediment is prone to building up in the lower disc, shaft and bearing area.



Valve Stem
(vertical)

✔ CORRECT

Sediment is allowed to pass under the disc, valve prone to flushing itself out.



Valve Stem
(horizontal)

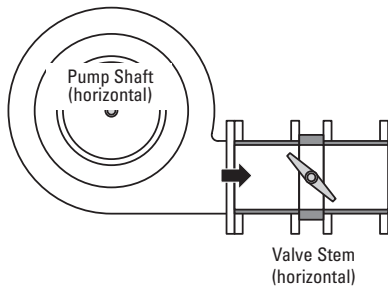
RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS

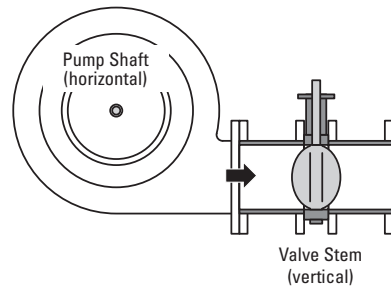
Butterfly valves located at the discharge of a pump should be oriented as follows:

Centrifugal pump (with pump shaft horizontal)

✗ INCORRECT
Valve stem horizontal



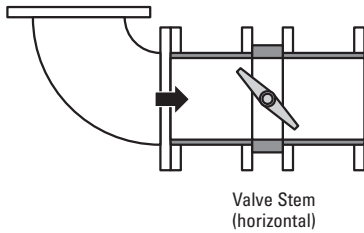
✓ CORRECT
Valve stem vertical



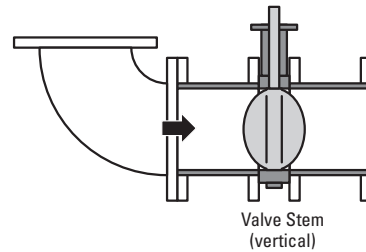
Butterfly valves located downstream of a bend or pipe reducer should be oriented as follows:

Bend

✗ INCORRECT
Valve stem horizontal

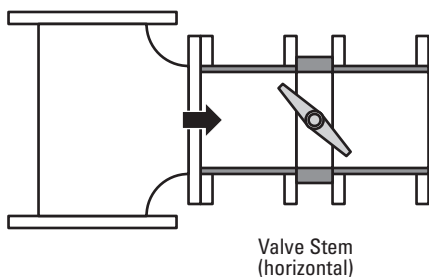


✓ CORRECT
Valve stem vertical

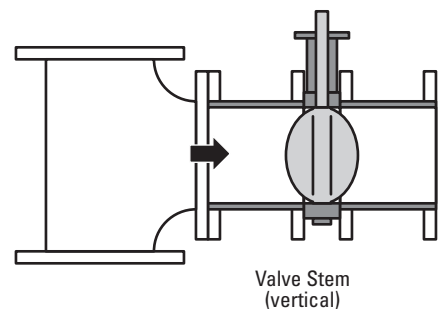


Tee

✗ INCORRECT
Valve stem horizontal



✓ CORRECT
Valve stem vertical

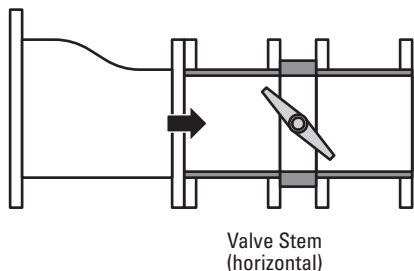


RESILIENT SEATED BUTTERFLY VALVE

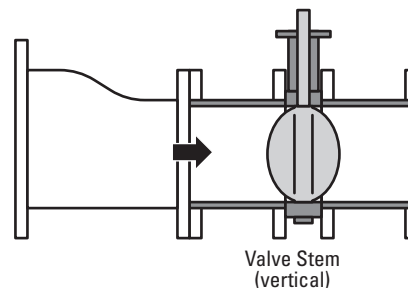
INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS

Reducer

 **INCORRECT**
Valve stem horizontal



 **CORRECT**
Valve stem vertical



INSTALLATION



Note: Ensure the pipeline and pipe flange faces are free of debris, such as pipe scale, metal chips, welding slag, and welding rods, to prevent any obstruction of disc movement or damage to the disc or seat.



Note: The 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.



Note: Align the piping and spread the pipe flanges apart to permit the valve body to be easily dropped between the flanges without contacting the pipe flanges. Check to see that the valve disc has been positioned to a partially open position, with the disc approximately 10° open.



Note: Insert the valve between the flanges taking care not to damage the seat faces. Always pick the valve up by 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

To properly install the valve, follow these steps:

1. Rotate the disc sealing edge until it is 10° open. Ensure that the disc is not fully closed or protruding past the body's face into the pipeline.
2. Spread the flanges by approximately 0.2" inches more than the valve's face-to-face (or lay length) dimension. This will make installation of the valve easier, and prevent damage or distortion to the seating face.
3. Center the valve body between the flanges and span all flange bolts possible. Turn the disc to the fully open position to confirm it does not hit the surrounding piping or equipment.

RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS

4. While gradually removing the flange spreaders, center the valve to the flanges and tighten the bolts half-tight. Slowly close the valve to check for adequate disc clearance between surrounding piping or equipment.
5. Return the disc to the fully open position and cross-tighten all bolting.

By following these steps, you can ensure the proper installation of the valve.



The butterfly valve with its actuator removed can cause injury or damage if the disc opens or closes unintentionally during installation. If a clamp is used to secure the disc during installation, it must be removed before the valve is put into service.



If the actuator is removed from the valve during installation, make sure to:

1. Mark the valve and actuator to ensure that the re-installed actuator is in the same quadrant as it was originally configured.
2. Install the valve according to the instructions detailed in this document.
3. Re-install the actuator, ensuring that it is in the proper quadrant.

TESTING

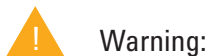
When using rubber seated valves to isolate sections of the line for testing, it's important to note that these valves are designed to hold rated pressure only. Exceeding the rated pressure during testing may cause leakage past the rubber seat or damage to the valve.



Valves must not be operated above their rated pressure.

To avoid wasting time looking for leaks, it is advisable to delay the backfilling of buried valves until after hydrostatic pressure tests have been carried out.

If seat leakage occurs due to foreign material in the line, you can open the valve 5-10 degrees to promote a flushing action. Close and repeat the process several times to clear seats and confirm a tight shut-off is achieved.



Fluids freezing inside the valve can cause the valve to fail, which can result in injury to individuals or damage to valves and other property. It is not recommended to use valves in applications that are exposed to freezing temperatures unless there is sufficient flow maintained through the valve to prevent freezing or if other protection is provided.

RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS



Warning:

Anyone who installs, operates, or adjusts this equipment must read the instructions and drawings carefully. Improper use of the equipment can cause injury or damage to property. It is assumed that those who install this equipment have the necessary knowledge and skills in mechanical or electrical equipment. The manufacturer cannot be held responsible for any misuse of the equipment or information provided, nor can it assume any liability for any resulting damage

MAINTENANCE

The maintenance of valves by their owners is typically limited to actuators and shaft seals. Sometimes, the valve design allows for the adjustment of the seat in the field when there is leakage. However, if the owner lacks skilled personnel and proper equipment, any significant rework will require the removal of the valve from the line. Depending on its condition, the valve may need to be returned to the manufacturer.

ANNUAL MAINTENANCE

Before maintenance work please confirm the following:

1. Personnel should wear proper eye, head, and body protection.
2. Always partially open the valve to safely release pressure.
3. Flush the butterfly valves and the pipelines attached and make sure that no (dangerous) residues are left.

It is not possible to accurately predict the required maintenance interval for the valve. This interval depends on various factors, such as the type of media used, the frequency of valve usage, and the extent of preventative maintenance. It is advisable for the end user to visually inspect the valve regularly to anticipate any potential maintenance requirements.

Please perform the following steps to verify the operation of the valve:

1. Cycle the valve and ensure it operates smoothly without any obstructions in the line.
2. Close the valve and check for any leakage. If leakage is detected, verify that the disc is fully closed by checking the actuator stops. If leakage persists, remove the valve to inspect the seat.
3. Check the flange connections for any leaks and tighten bolts if necessary.
4. Check the packing area for any leakage. If leakage is detected, replace the packing o-rings.
5. If possible, remove any scale that may interfere with disc travel in the line. Inspect the seat for wear and ensure that all screws are tightened.

RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS

TROUBLESHOOTING GUIDE

Problem	Cause	Suggested Remedies
Shaft leakage	Packing o-rings worn, screws loose on locking pad.	Tighten the screws on the locking pad. Replace worn packing o-rings.
High torque	Pinched seats, flange bolts are not evenly torqued, or over-torqued bolts.	Loosen the flange bolts. Manually cycle the disc through the valve a few times to reshape the seat. Tighten the flange bolts in the correct sequence.
	Valve installed too close to the piping, reducer, strainer, elbow, equipment, or obstruction	Change the piping or location of the valve. Confirm the valve is not interfering with adjacent piping or equipment. If you wish to increase the actuator size to overcome higher torque requirements, please consult the factory.
	Obstruction in the pipeline	Remove the valve from the pipeline and remove the obstruction.
	Valve stem or disc bent	Return the valve to the factory for replacement.
	Scale buildup on stem or seat	To remove the scale buildup, try opening and closing the valve multiple times. It's recommended to operate the valve at least once a month to prevent scale buildup. Check the valve seat for any signs of deterioration. Additionally, flush the system periodically. Be cautious while adding chemicals as excessive addition at one time may coat the surface of the valve seat and disc.
	Incorrect actuator installation	Check the alignment of the actuator and adjust if side loading is evident.
Leakage when the valve is in the closed position	The actuator is not properly adjusted	Reset actuator stops
	Line pressure is higher than the valve's rated close-off pressure.	Reduce line pressure to valves rated close-off pressure.
	High torque	See "high torque" section above
Leakage past the flange face	Flange bolts are not evenly torqued	Loosen the flange bolts. Tighten the flange bolts in the correct sequence.
Valve opens only a few degrees and stops	Improper installation. The valve is not aligned properly.	Loosen the flange bolts, realign the valve with flanges, and re-tighten the flange bolts to the correct torque.

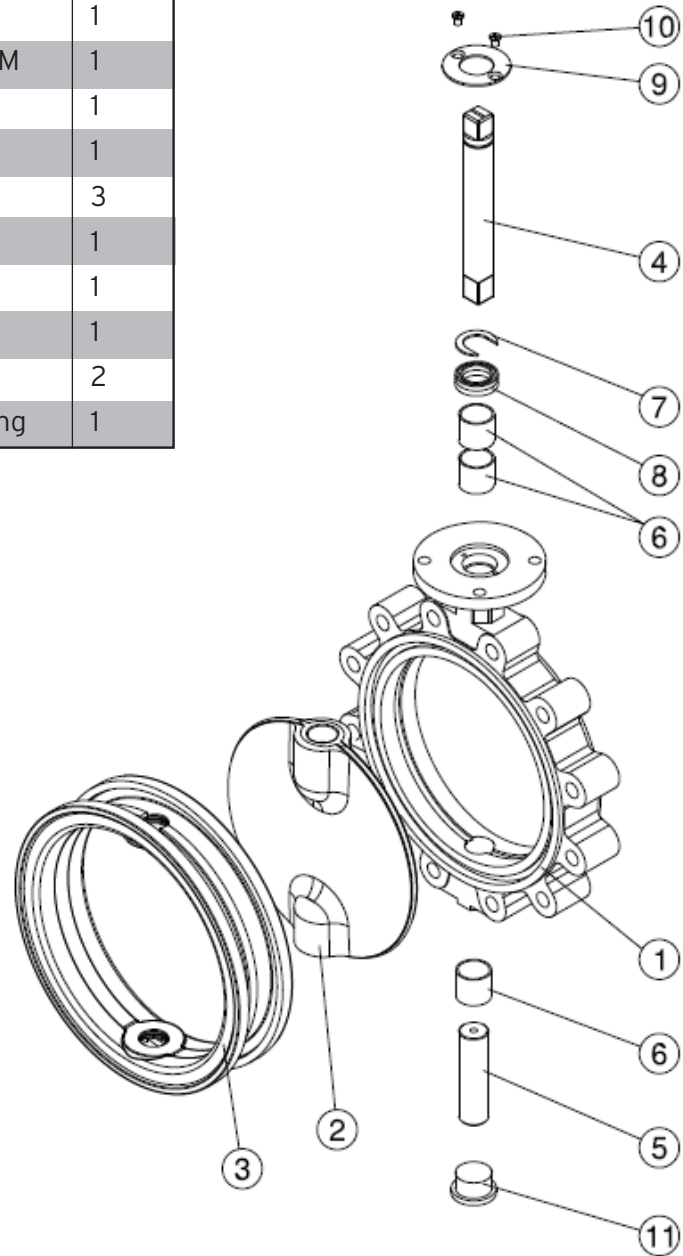
RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS

MATERIALS OF CONSTRUCTION

2" - 12"

NO.	PART NAME	MATERIAL	NO.
1	BODY	DUCTILE IRON	1
2	DISC	CF8M	1
3	SEAT	EPDM/NBR/FKM	1
4	UPPER SHAFT	SS 431	1
5	LOWER SHAFT	SS 431	1
6	BUSHING	SS316+PTFE	3
7	U-RING	SS304	1
8	PACKING	NBR	1
9	LOCKING PAD	SS304	1
10	SCREW	SS304	2
11	PLUG	A105 Zn Planting	1



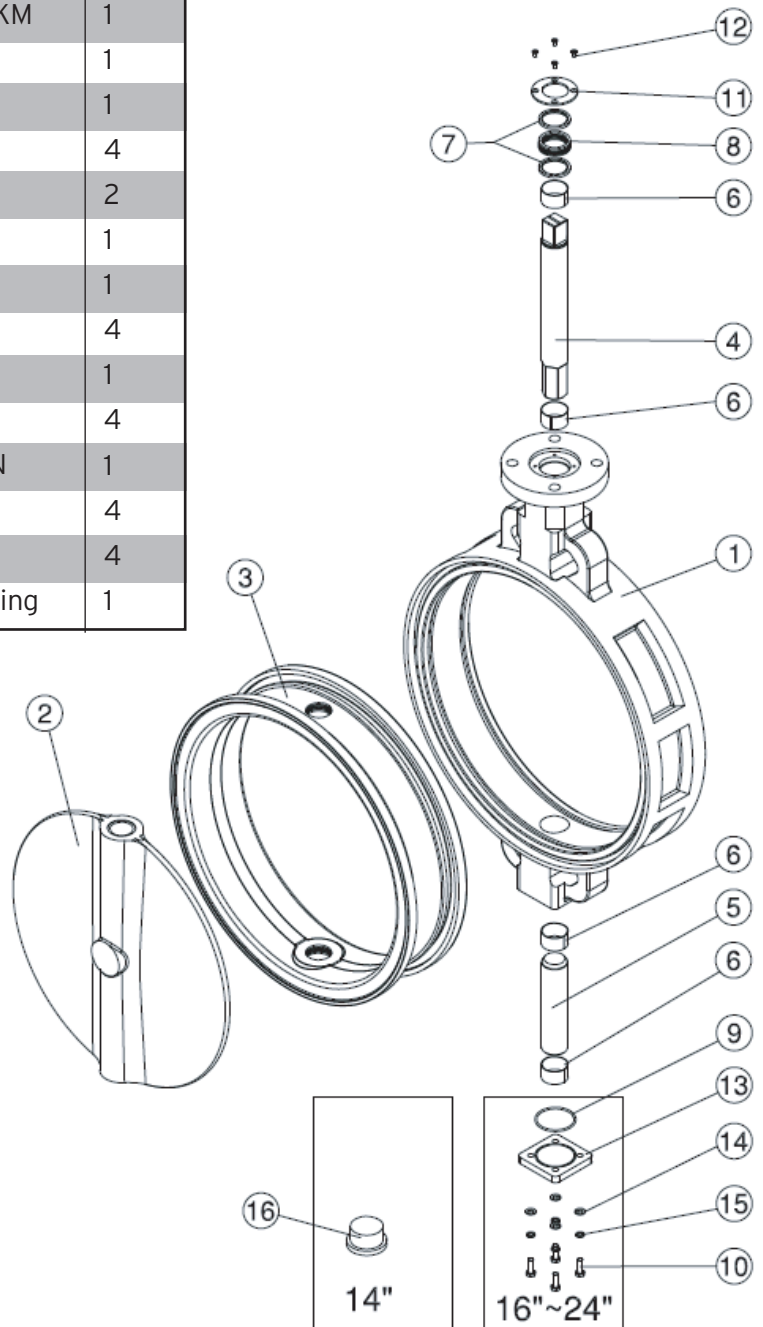
RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS

MATERIALS OF CONSTRUCTION

14" - 24"

NO.	PART NAME	MATERIAL	NO.
1	BODY	DUCTILE IRON	1
2	DISC	CF8M	1
3	SEAT	EPDM/NBR/FKM	1
4	UPPER SHAFT	SS 431	1
5	LOWER SHAFT	SS 431	1
6	BUSHING	SS316+PTFE	4
7	PACKING PAD	PTFE	2
8	PACKING	NBR	1
9	END COVER SEAL	NBR	1
10	SCREW	SS304	4
11	LOCKING PAD	SS304	1
12	SCREW	SS304	4
13	END COVER	DUCTILE IRON	1
14	WASHER	SS304	4
15	SPRING WASHER	SS304	4
16	PLUG (14" ONLY)	A105 Zn Planting	1



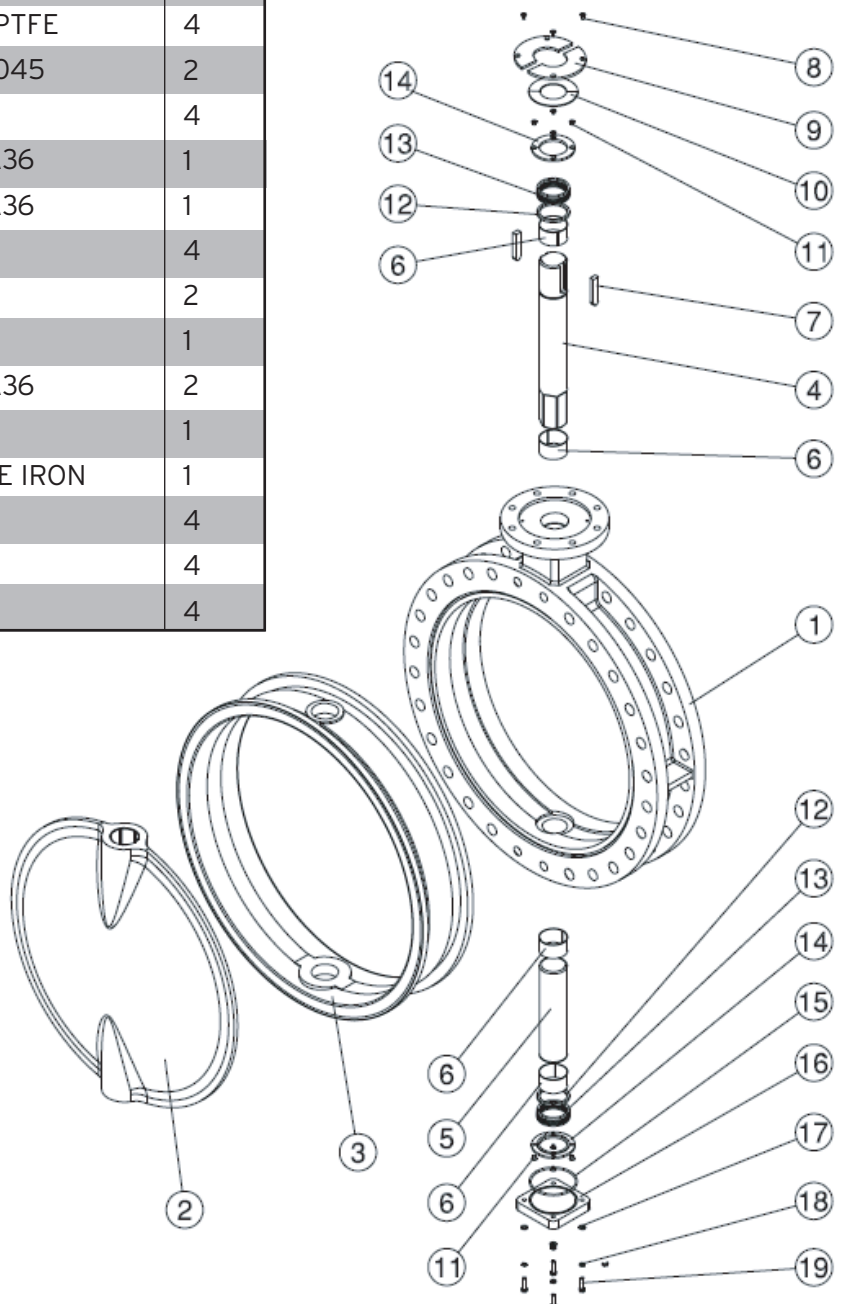
RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS

MATERIALS OF CONSTRUCTION

28" - 36"

NO.	PART NAME	MATERIAL	NO.							
1	BODY	DUCTILE IRON	1							
2	DISC	CF8M	1							
3	SEAT	EPDM / NBR / FKM	1							
4	UPPER SHAFT	SS 431	1							
5	LOWER SHAFT	SS 431	1							
6	BUSHING	SS316+PTFE	4							
7	KEY	ASTM 1045	2							
8	BOLTS	SS304	4							
9	GASKET	ASTM A36	1							
10	LOCKING PAD	ASTM A36	1							
11	BOLTS	SS304	4							
12	PACKING PAD	PTFE	2							
13	PACKING	NBR	1							
14	PACKING GLAND	ASTM A36	2							
15	END COVER SEAL	NBR	1							
16	END COVER	DUCTILE IRON	1							
17	WASHER	SS304	18	SPRING WASHER	SS304	4	19	SCREW	SS304	4
18	SPRING WASHER	SS304	4							
19	SCREW	SS304	4							



RESILIENT SEATED BUTTERFLY VALVE

INSTALLATION, OPERATION AND MAINTENANCE MANUAL - SERIES GS

DISASSEMBLY

1. Partially open the valve to safely release pressure.
2. Confirm the valve is in the closed position.
3. Remove the handle, gear operator, or actuator from the actuator mounting flange.
4. Remove the locking pad and end cover.
5. Remove the upper and lower shaft.
6. Remove the disc from the seat, always protecting the disc edge.
7. Push the seat into an oval shape, and then remove the seat from the body.
8. Remove the shaft bushings and packing o-rings from the valve body.

ASSEMBLY

1. Clean all parts and inspect for any damage or defects.
2. Apply a small amount of silicone grease to the inside surface of the body, including the upper and lower shaft holes.
3. Insert the shaft bushings into the body. Confirm the bushings do not intrude into the body seat bore.
4. Push the valve seat into an oval and push it into the body with seat stem holes aligned to body stem holes.
5. Coat the inside surface of the seat with silicone grease. Insert the disc into the seat making sure to line up the disc holes with the stem holes of the seat.
6. With downward pressure and rotating the stem back and forth, push the upper stem until the stem touches the bottom of the body stem hole. Repeat this process with the lower stem.
7. Install the o-ring and end cover on the lower shaft.
8. Install the packing pad and packing o-rings on the upper shaft. Secure with the locking pad.
9. Reinstall your handle, gear operator or actuator.