

STD-BFV-MGA
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INSTRUCTION MANUAL

for

BUTTERFLY VALVES

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SECTION I

ORDERING INFORMATION

Spare parts or replacements for equipment in this manual must be ordered from:

Flowserve U.S. Inc
Flow Control Division
1900 South Saunders Street
P.O. Box 1961
Raleigh, NC 27603

To order spare parts or replacement parts the purchase order must contain the following information:

- 1.) Customer's original purchase order number
- 2.) Flowserve Corporation Shop Order Number
- 3.) Flowserve Corporation Assembly Drawing Number and Part Number
- 4.) Valve Tag Number (if applicable)
- 5.) Valve Serial Number
- 6.) Name of Manufacturer or Equipment or Part
- 7.) Reference to applicable section of this manual
- 8.) Definitive description of equipment or part as contained in the applicable section of this manual

For information regarding the parts list and recommended spare parts refer to Section III.

SECTION II

BUTTERFLY VALVES

FOR USE WITH MANUAL GEAR ACTUATORS

The Flowserve 150 Class Butterfly Valve contains improvements and refinements not found in any other extended performance Butterfly Valve. These features serve to ensure a long and trouble free life as well as making maintenance much simpler and less expensive when it is finally required. This section of the manual is divided into seven (7) sections: (1) Design Features, (2) Installation, (3) Operation, (4) Disassembly Instructions, (5) Assembly Instructions, (6) Maintenance Instructions and (7) Long Term Storage. (NOTE: The piece numbers referred to in this section are detailed on drawing.

Operation and Maintenance Instructions for the Manual Gear Actuator is located in Section IV

1.0 DESIGN FEATURES

1.1 Seat Design

The Flowserve Butterfly Valve employs a pressure energized spring seat design which seals proportionally tighter as the pressure increases. In addition the spring seat design is self-compensating for any slight misalignment which may occur. When the valve is closed the disc is squeezed into the seat for initial sealing. There upon upstream pressure amplifies the seat bearing pressure against the disc to further effect a tighter seal. The higher the pressure the tighter the seal.

1.2 Body Design

Flowserve Butterfly Valve employs a rugged one-piece body design with installation bolt holes for flange bolts. These bolt holes (if provided) have sufficient clearance to allow flexibility for misalignment of mating flanges.

1.3 Gland Design

Flowserve Gland Packing is a preformed Grafoil Design. These packings offer excellent sealing characteristics along with minimum torque build-up. Adjustment, when necessary, can be accomplished by tightening the gland retainer nuts with simple hand tools.

1.4 Disc Design

The Flowserve Butterfly Disc is of rugged construction with a sealing edge which is a segment of a ball. Once the disc is squeezed into the seat, a leak tight seal is affected. Any minor change of position of the disc, once it is squeezed into the seat, will not affect performance. The result being that (within the width of the edge) an exact stop position is not critical. In addition, if the edge of the disc should become damaged it may be possible to reposition away from the damage area, thus avoiding a valve overhaul or replacement.

2.0 **INSTALLATION OF VALVE ASSEMBLY**

This valve is shipped in the closed position.

In handling of the valve assembly, care should be taken to protect flange sealing surfaces and disc sealing surfaces from abrasion. The assembly should be carefully lifted by an adequately rated hoist utilizing nylon lifting straps or slings, or mount yoke vertical lifting eye bolts. The approximate weight of the complete valve assembly is shown on drawing. There are no special tools required to properly position and install the valve assembly. Standard wrenches, mallets, alien drives, rigging, etc. are all that is necessary to achieve successful installation.

The valve assembly is designed to be assembled between two (2) ANSI pipe flanges, using flange gaskets compatible with operational conditions.

3.0 **OPERATION**

Before valve operation, this manual should be reviewed and understood, especially Subsection 1.0 of Section II. Operational problems and their solutions are addressed in Subsection 6.0 of Section II.

Following installation and check-out (Subsection 2.1 of Section II) the valve may be actuated.

4.0 **DISASSEMBLY INSTRUCTIONS**

4.1 **Valve / Actuator Disassembly Instructions**

CAUTION

Any Disassembly of the actuator from the valve must be done with the valve vertically upright as shown on drawing.

- (A) Securely support Valve/Actuator Assembly in a manner which protects body seal faces, preferably by bolting to mount fixture through pipe mount holes in valve body (if holes are provided).
- (B) Cycle Actuator to preferred valve position.

4.0 **DISASSEMBLY INSTRUCTIONS** (Continued)

4.1 Valve / Actuator Disassembly Instructions (Continued)

- (C) Remove Actuator Cap Screws/Washers (Part Nos. 218/293) holding underside of actuator to top of yoke.
- (D) With sling/hoist or using eye bolts carefully lift actuator up off valve Yoke (Part No.010).
- (E) Remove Yoke Cap Screws / Washers (Part No. 217 / 251) from lower side of yoke.
- (F) Remove Pin (Coupling)/Actuator Coupling/Stem Coupling (Part Nos. 257/074/073 - as applicable) from shaft.
- (G) Carefully lift Yoke (Part No. 010) from valve.

4.2 Valve Disassembly Instructions:

- (A) Remove Gland Stud Nuts (Part No. 234)
- (B) Lift off Gland Retainer (Part No.130), take out Gland Ring (Part No.107).
- (C) Remove Gland Studs (Part No. 205).
- (D) Repeat for opposite end of valve.
- (E) Remove all Seat Retainer Cap Screws (Part No. 215).
- (F) Insert two (2) Capscrews (Seat Retainer) into two (2) jack screw holes provided in Seat Retainer (Part No. 015) tighten down screws, lifting retainer out of Body (Part No.001).
- (G) Remove Seat Ring (Part No. 013) and "O" Ring - if applicable (Part No. 300) from retainer.
- (H) Remove Pins (Disc) (Part No. 274) from disc and shaft assembly.
- (I) Slide Stem (Part No. 024) from valve assembly.
- (J) Lift out Disc (Part No. 004) and Thrust Spacers (Part No.168).
- (K) Remove Packing Rings (Part No.110/112) and Packing Washer - if applicable (Part No. 113). Once removed, packing should not be re-used.
- (L) Repeat for other end of valve.
- (M) Carefully press out Bushings (Part No. 060 or 061).

5.0 ASSEMBLY INSTRUCTIONS

5.1 Valve Assembly Instructions:

- (A) Carefully press Bushings (Part No. 060 or 061) into shaft bore of valve Body (Part No. 001) until bushings are flush with shoulder inside bore.
- (B) While holding the Thrust Spacers (Part No. 168) against the milled spot faces on the O.D. of the disc, insert the Disc (Part No. 004) into the valve body and align the disc stem bore with the body bore. NOTE: Be sure that the disc is oriented such that the dowel pin holes are located as shown on drawing.
- (C) Insert the Stem (Part No. 024) through the assembly. The stem key way or milled head shall be oriented as shown on drawing.
- (D) Align the disc and stem and press the Pins (Disc) (Part No. 274) in place and stake or peen to secure them.
- (E) Install the "O" Ring if applicable (Part No. 300) around Seat Ring (Part No. 013).
- (F) With the valve in the closed position and laying flat on a safe working surface, insert the "O" Ring and seat assembly into the retainer and then place this assembly into the valve body as shown on drawing.
- (G) Install seat retainer into valve body, carefully positioning seat ring and disc so as not to pinch or damage them.
- (H) Install and tighten Capscrews (Seat Retainer) (Part No. 215) making sure that the retainer is bottomed in body. Retainer will be flush to .010 above valve body.
- (I) Install Packing washer - if applicable (Part No. 113) into shaft bore.
- (J) Install Packing Rings (Part No. 110/112) one at a time in accordance with drawing.
- (K) Screw both Gland Studs into place (Part No. 205). Insert Gland Ring (Part No. 107) into bore. Install Gland Retainer (Part No. 130) and secure finger tight with Gland Stud Nuts (Part No. 234) (Tighten as required when placed into service).
- (L) Repeat for opposite end of valve.

5.0 **ASSEMBLY INSTRUCTIONS** (Continued)

5.2 Valve / Operator Assembly:

CAUTION

Any assembly of the actuator to the valve must be done with the valve vertically upright as shown on drawing located in Section IV. Actuator must be assembled and operated in accordance with Section IV of this manual.

- (A) Securely support valve in manner which protects body seal faces, preferably by bolting valve body to support fixture through pipe mount holes in valve body (if holes are provided).
- (B) Align valve disc position and Actuator Coupling (074) to same position.
- (C) Install Key (256) in key slot in stem (if applicable).
- (D) Carefully assemble Yoke (Part No. 010) to valve top boss with Yoke Cap Screws (Part No. 217).
- (E) With sling/hoist carefully lift actuator onto valve Yoke (Part No. 010) and Stem (Part No. 024).
- (F) Insert Actuator Cap Screws/Washers (Part No. 218/293) to hold underside of actuator to top of Yoke (Part No. 010).
- (G) Check and adjust actuator travel stops for valve position control in accordance with Section IV.
- (H) Install Pin (Coupling) (Part No. 257) and stake or peen to secure in place.

6.0 MAINTENANCE

6.1 Valve Maintenance Instructions

The Flowserve Butterfly Valve is relatively maintenance free with the exception of periodic tightening of the Gland Stud Nuts. This tightening should be performed as soon as any evidence of shaft leakage occurs. The following is a list of some of the common malfunctions of extended performance Butterfly Valves:

1. Shaft Packing Leakage:
 - A. Tighten Gland Stud Nuts
 - B. Replace Gland Packings

2. Leakage between Flange and Valve:
 - A. Tighten Flange Bolts
 - B. Replace Flange Gaskets

3. Leakage through Valve Seat:
 - A. Clean Seat and Retainer Groove
 - B. Replace Seat Replace Disc and Shaft

4. Excessive Torque:
 - A. Check alignment of valve actuator and adjust if required
 - B. Replace bushings if slight galling has occurred on shaft
 - C. Replace bushings and shaft if galling is excessive

If questions arise on the preceding instructions, contact the factory.

7.0 **LONG TERM STORAGE**

- 7.1 The valves have been shipped in the closed position. Upon receipt of the valves at destination, the crates should be examined thoroughly for signs of mishandling or damage during shipment. With the valves strapped to the shipping skids, all bolting should be checked to ensure that the joints are secure. Bolting on occasion, may become loosened during shipment and handling.
- 7.2 The valves should then be stored in a sheltered area to protect them from the elements, dirt and foreign material. They should not be exposed to the atmosphere, uncrated or removed from the shipping skids except in a clean area just prior to installation.
- 7.3 If the valves are not to be installed within a short period of time after receipt, and will require long-term storage, the following should be adhered to:
- (a) They should be stored in an upright position, shaft vertical and where there is minimal temperature variations and the temperature does not drop below 50°F.
 - (b) In their storage condition, the valves should be wrapped in polyethylene to prevent accumulation of dust or foreign matter.
 - (c) A check-off tag should be affixed to each unit and should be dated and signed off by the inspector witnessing the inspection which is recommended at six (6) month intervals.

The shelf life for grafoil and graphite filament packing is indefinite when stored under the proper conditions.

SECTION III

SPARE PARTS INFORMATION

1.0 SPARE PARTS INFORMATION:

1.1 Parts List-Valve Subassembly:

The parts list for the valve subassembly is given on the Flowserve Drawing. When referring to parts, please reference Assembly Drawing Number and Part Number.

1.2 Parts List-Operator Subassembly:

The parts list for the Manual Actuator is shown in the Maintenance Manual located in Section IV of this manual.

1.3 Recommended Spare Parts-Valve Subassembly:

The following part numbers from the drawing located in Section IV are recommended spare parts:

<u>PART NO.</u>	<u>DESCRIPTION</u>
013	Seat Ring
110 / 112	Packing
300	O-Ring