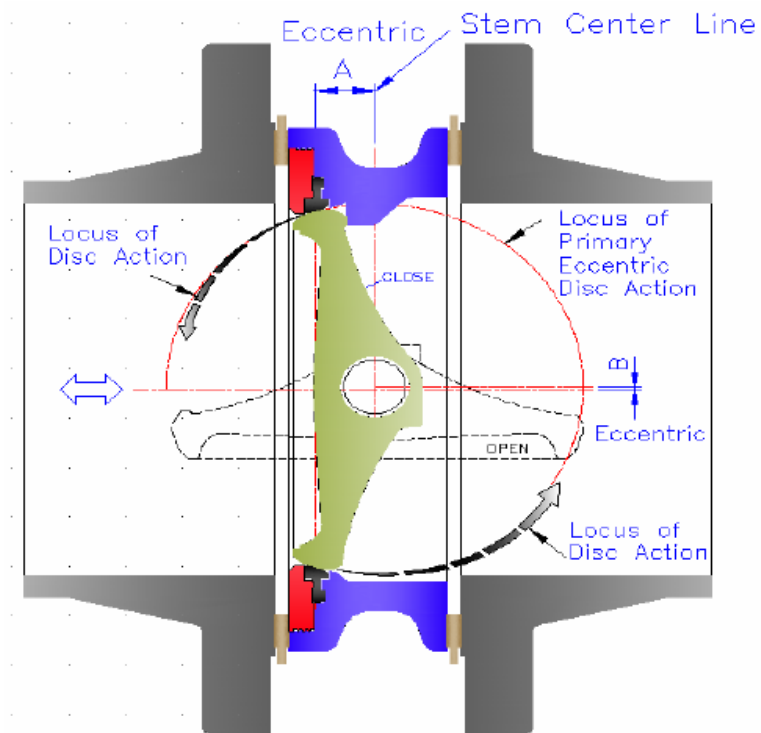
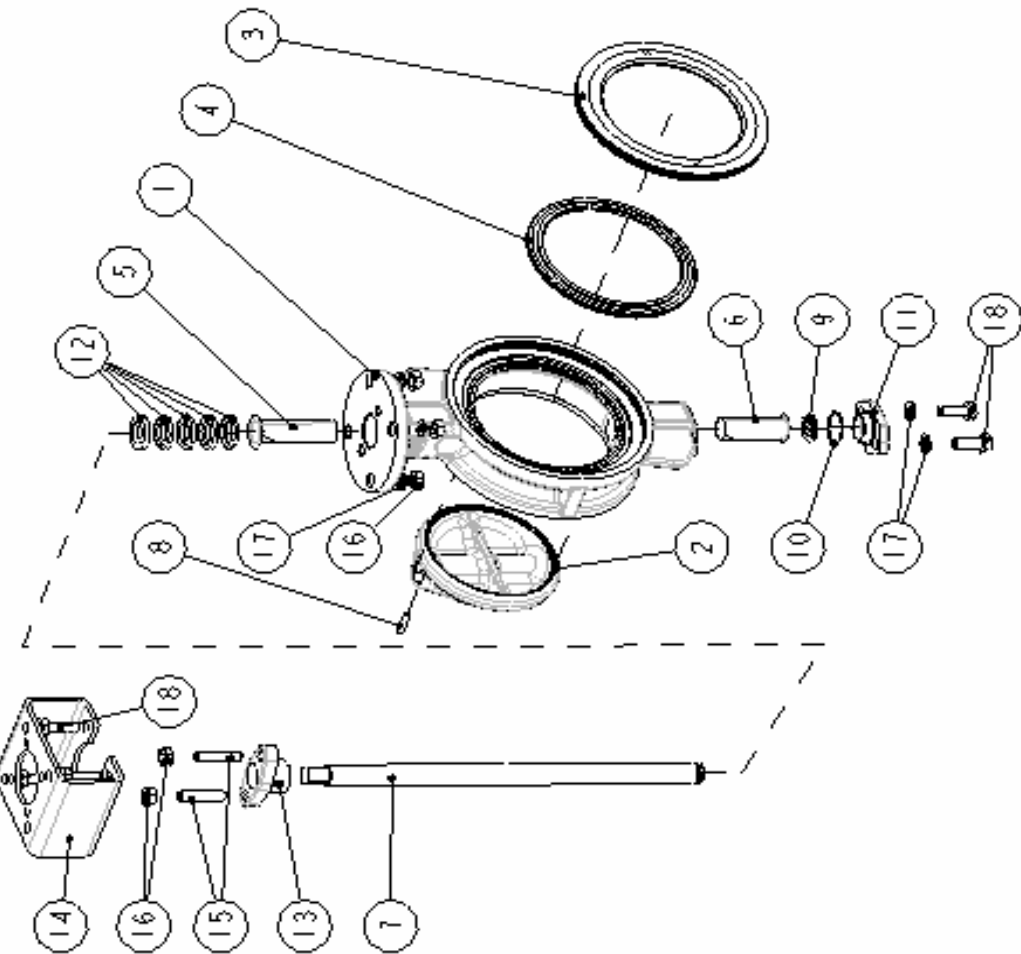


OPERATING MANUAL

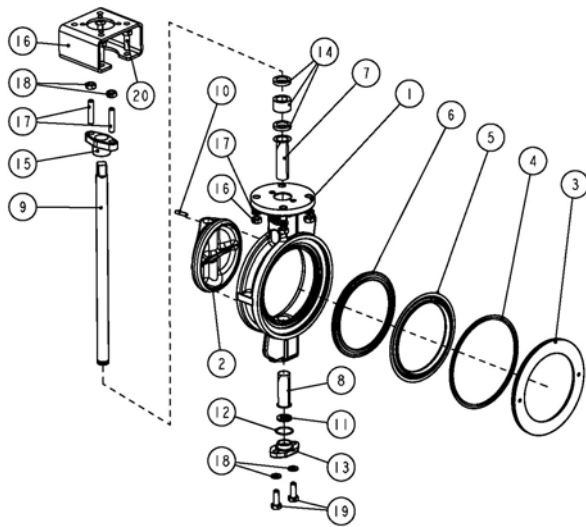
SERIES : VF-91/92/93





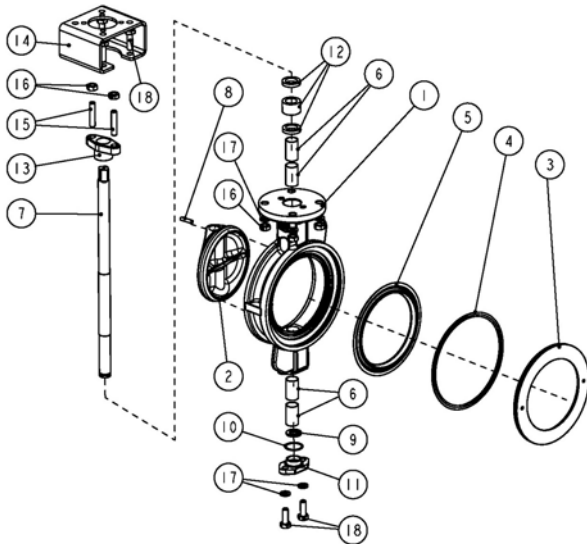
NO.	PART NAME	Q'TY	MATERIAL
18	BOLT	6	ASTM A193 Gr. B8
17	SPRING WASHER	6	ASTM A240 Gr. 304
16	NUT	6	ASTM A194 Gr. 6
15	STUD	2	ASTM A193 Gr. B8
14	YOKE	1	ASTM A240 Gr. 304
13	GLAND	1	ASTM A351 Gr. CF8
12	GLAND PACKING	6	PTFE
11	BOTTOM COVER	1	ASTM A351 Gr. CF8
10	SEAL	1	PTFE
9	THRUST RING	2	ASTM A240 Gr. 316
8	PIN	1	ASTM A182 Gr. F316
7	STEM	1	ASTM A182 Gr. F304
6	BUSHING_2	1	SUS316+PTFE
5	BUSHING_1	1	SUS316+PTFE
4	SEAT	1	PTFE
3	SEAT RING	1	ASTM A351 Gr. CF8
2	DISC	1	ASTM A351 Gr. CF8
1	BODY	1	ASTM A351 Gr. CF8

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20	BOLT	6	ASTM A193 Gr. B8
19	SPRING WASHER	6	ASTM A240 Gr. 304
18	NUT	6	ASTM A194 Gr. 8
17	STUD	2	ASTM A193 Gr. B8
16	YOKE	1	ASTM A240 Gr. 304
15	GLAND	1	ASTM A351 Gr. CF8
14	GLAND PACKING	3	GRAPHITE
13	BOTTOM COVER	1	ASTM A351 Gr. CF8
12	SEAL	1	GRAPHITE
11	THRUST RING	2	ASTM A240 Gr. 316
10	PIN	1	ASTM A182 Gr. F316
9	STEM	1	ASTM A182 Gr. F304
8	BUSHING_2	1	SUS316+PTFE
7	BUSHING_1	1	SUS316+PTFE
6	SEAT	1	PTFE
5	METAL SEAT	1	ASTM A182 Gr. F316
4	PACKING	1	GRAPHITE
3	SEAT RING	1	ASTM A351 Gr. CF8
2	DISC	1	ASTM A351 Gr. CF8
1	BODY	1	ASTM A351 Gr. CF8
NO.	PART NAME	Q'TY	MATERIAL

VF-920



18	BOLT	6	ASTM A193 Gr. B8
17	SPRING WASHER	6	ASTM A240 Gr. 304
16	NUT	6	ASTM A194 Gr. 8
15	STUD	2	ASTM A193 Gr. B8
14	YOKE	1	ASTM A240 Gr. 304
13	GLAND	1	ASTM A351 Gr. CF8
12	GLAND PACKING	3	GRAPHITE
11	BOTTOM COVER	1	ASTM A351 Gr. CF8
10	SEAL	1	GRAPHITE
9	THRUST RING	2	ASTM A240 Gr. 316
8	PIN	1	ASTM A182 Gr. F316
7	STEM	1	ASTM A182 Gr. F304
6	BUSHING	4	ASTM A182 Gr. F316
5	METAL SEAT	1	ASTM A182 Gr. F316
4	PACKING	1	GRAPHITE
3	SEAT RING	1	ASTM A351 Gr. CF8
2	DISC	1	ASTM A351 Gr. CF8
1	BODY	1	ASTM A351 Gr. CF8
NO.	PART NAME	Q'TY	MATERIAL

VF-930

MAINTENANCE

In order to use a butterfly valve for a long period, it is necessary to check and replace the major parts periodically (1 - 2 years). The repair parts have to be always stored in the warehouse or procured ahead of the time.

Design of Retainer

Square thread design between Valve Body and Retainer Ring offers,

1. Wider sealing face between flanges.
2. 100% sealing between retainer ring and valve body.
3. When long time storage, valve was in fully closed position and the seat ring was fixed by retainer ring. Encapsulated seat will not cold flow.

Note : Retainer ring must be upstream for dead end service.

1. Repair parts

Following are the repair parts for ordinary replacement.

Parts Name	No.	VF-910 & VF-913	
		Material	Quantity
Seat	4	PTFE	1 pc
Gland Packing	12	PTFE	1 Set
Gasket	10	PTFE	1 pc
Bushing	5	SS316+PTFE	1 pc
Bushing	6	SS316+PTFE	1 pc

Parts Name	No.	VF-920 & VF-923	
		Material	Quantity
Packing	4	Graphite	1 pc
Metal Seat	5	SS316	1 pc
Soft Seat	6	PTFE	1 pc
Seal	12	Graphite	1 pc
Gland Packing	14	Graphite	1 set
Bushing	7	SS316+PTFE	1 pc
Bushing	8	SS316+PTFE	1 pc

Parts Name	No.	VF-930 & VF-933	
		Material	Quantity
Packing	4	Graphite	1 pc
Metal Seat	5	SS316	1 pc
Seal	10	Graphite	1 pc
Gland Packing	12	Graphite	1 set

Note: In case of replacing the gland packing, **replace all set of the gland packing**, not replace only the damaged packing.

2. Replacement procedure for repair parts

2.1 The replacement procedure for the seat is as follows.

A. Disassembling

Before disassembling the valve, check the open / close indication on the actuator and confirm that the valve is at the closed position. If the valve is not in the closed position, operate the actuator to fully close the valve and make sure the pipeline de-pressure.

- a. Remove the valve from the pipeline.
- b. Place the valve horizontally on the wooden pieces in order not to damage the valve and with the seat retainer facing up (Fig. 1).

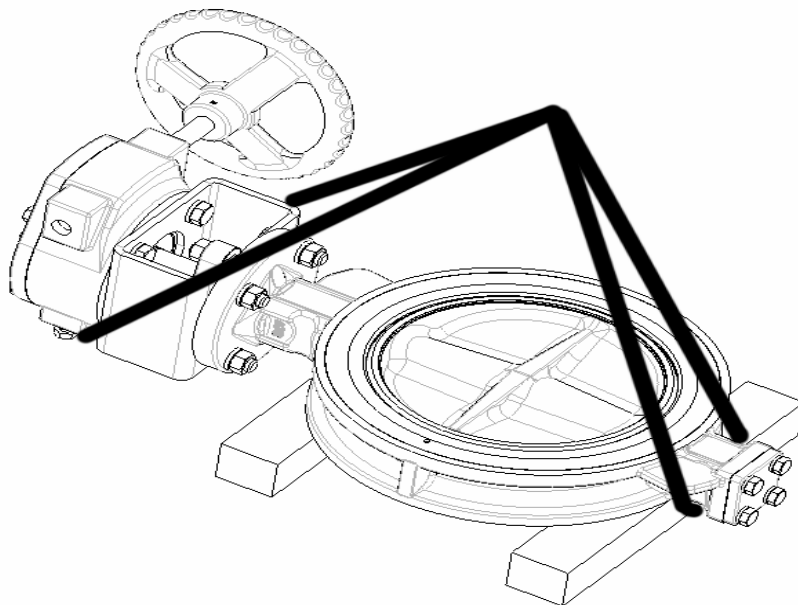


Fig. 1

- c. If the rust or foreign matters are attached around the valve seat (valve seat and valve disc), remove with waste cloth or air blow. It should be taken not to damage the valve seat and disc edge.
- d. Slightly open the valve to 10 degree, loosen the seat retainer in turning it counterclockwise and remove the retainer. If it was stuck then using a hexagonal spanner or “+” screwdriver to hold the holes of retainer and turn it up (Fig. 2).

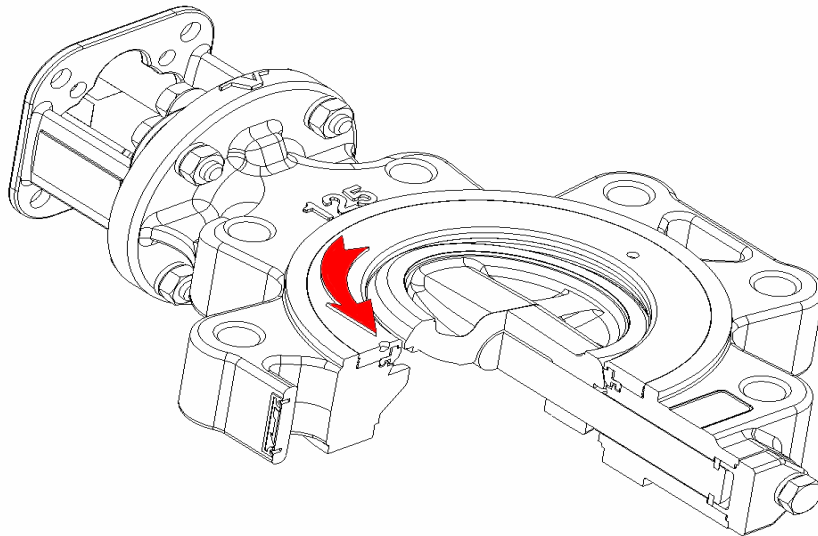


Fig. 2

- e. Remove the seat retainer to disassemble the seat.

B. Attachment of the seat

Before attaching a new seat, confirm again that the rust and foreign particles are not attached around the valve seat. Attachment of rust and foreign particles may damage the seat. Remove them with a waste cloth or an air blow.

- a. First, confirm that the valve disc of the valve is in the fully closed position. If not, operate the actuator so that the valve disc comes to the fully closed position.
- b. Insert the seat to the seat-mounting groove. The seat is somewhat floating because there is an interference of the seat (Fig. 3-1/3-2/3-2).

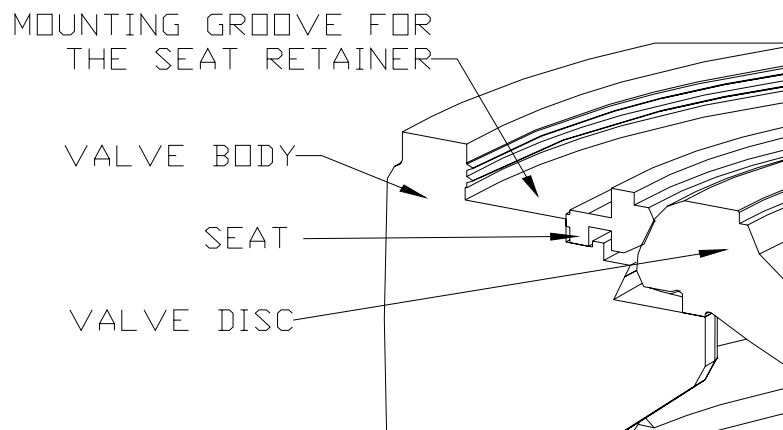


Fig. 3-1 VF-910

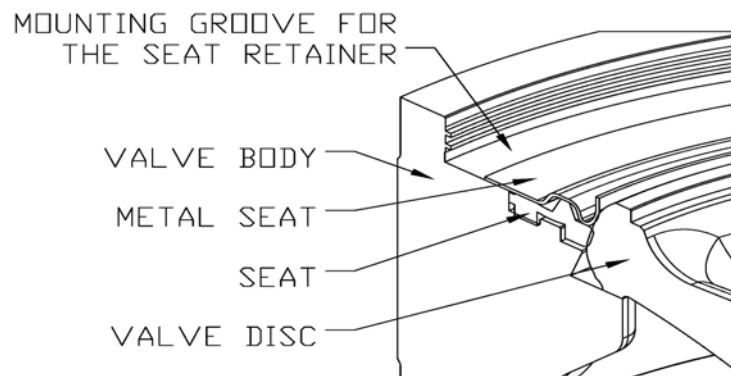


Fig 3-2 VF-920

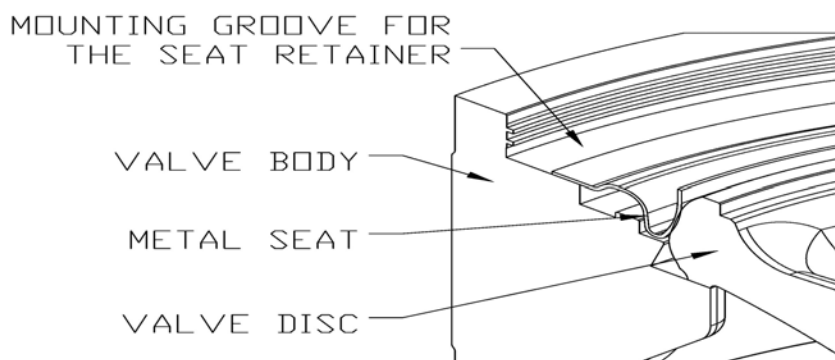


Fig. 3-3 VF-930

- c. Insert the seat retainer to the mounting groove for the seat retainer. Due to the same reason as b, the seat and the seat retainer is somewhat floating (Fig. 4-1/4-2/4-3).

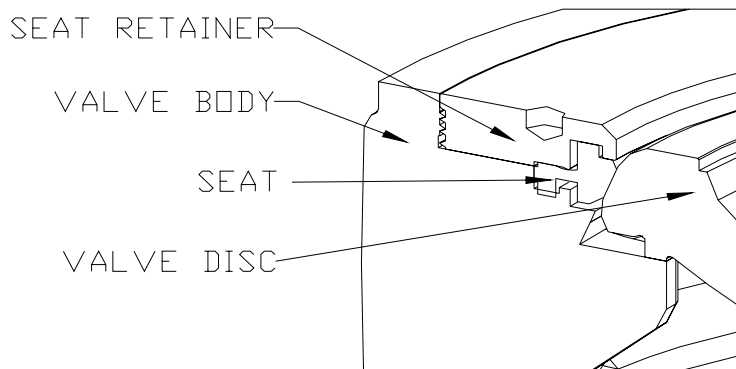


Fig. 4-1 VF-910

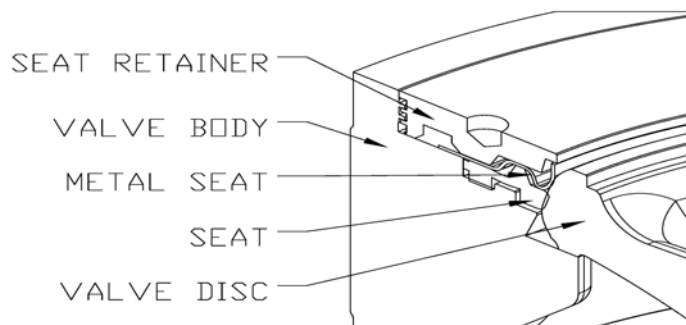


Fig. 4-2 VF-920

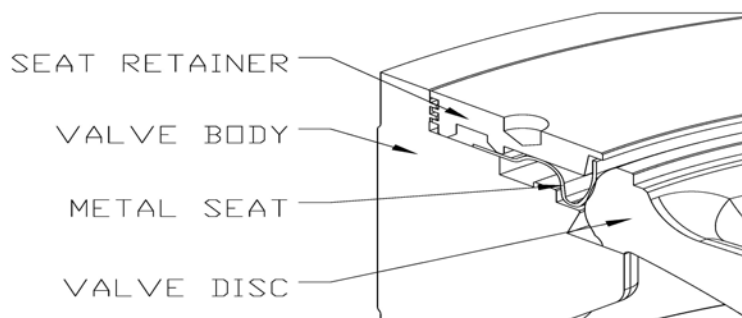


Fig. 4-3 VF-930

- d. Turn and tighten the retainer clockwise.
 e. Since our new design of fixing the retainer, it's a normal condition when the retainer was tightened, and there is a gap (P) less than 1mm

between valve face and retainer face. (See Fig. 5)

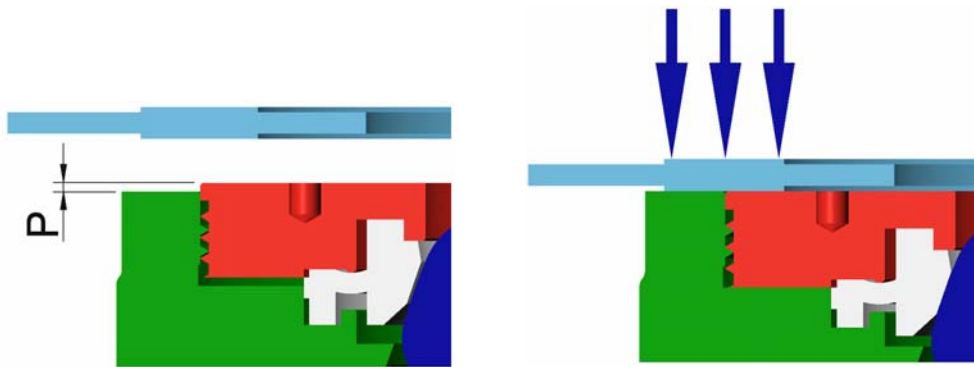


Fig. 5

- f. Slightly open the valve to 10 degrees then tighten the retainer ring again.
- g. Operate the actuator again to bring the disc to the fully closed position before mounting to the piping.

2.2 Observe the following procedure for the replacement of the gland packing

A. Disassembling

Firstly, loosen the bolts which fixed the actuator and the body, and then remove the actuator. If the actuator is too heavy to carry, use a chain block (Fig. 6).

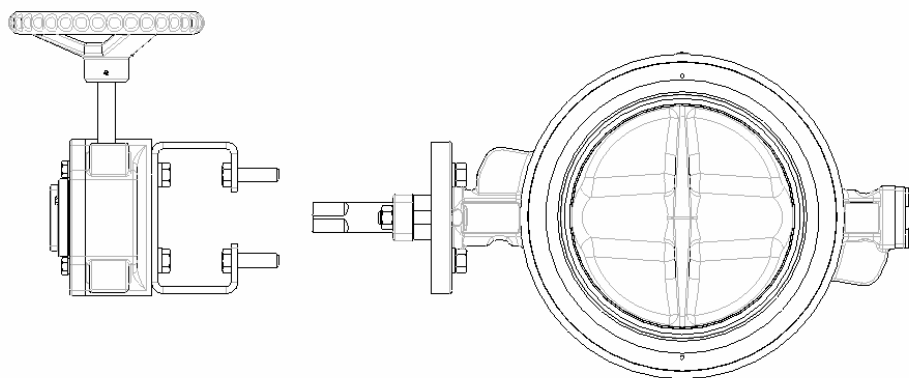


Fig. 6

- a. Remove the gland bush
If it is difficult to remove, lift up the gland bush slightly using a driver and then pull out the gland bush from the valve stem (Fig. 7).

However, since the structure of the gland part varies depending on the valve models, please refer to the "Assembly drawing" as for the details.

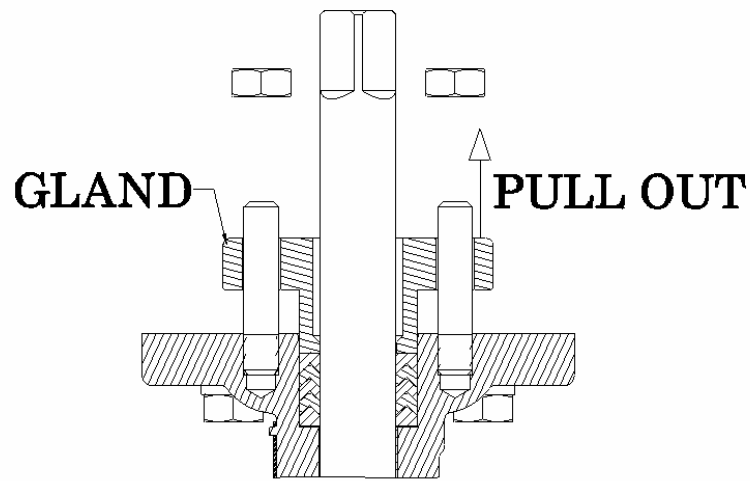


Fig. 7

- b. No matter the gland packing is made of Teflon or Graphite, after having pulled out the gland bush, remove the packing using a packing hook (packing puller). Always remove all the packing. When removing the packing, care should be taken so as not to damage the surface of valve shaft and stuffing box where the packing are attached.
- c. Clean the stuffing box and the valve shaft with waste cloth.

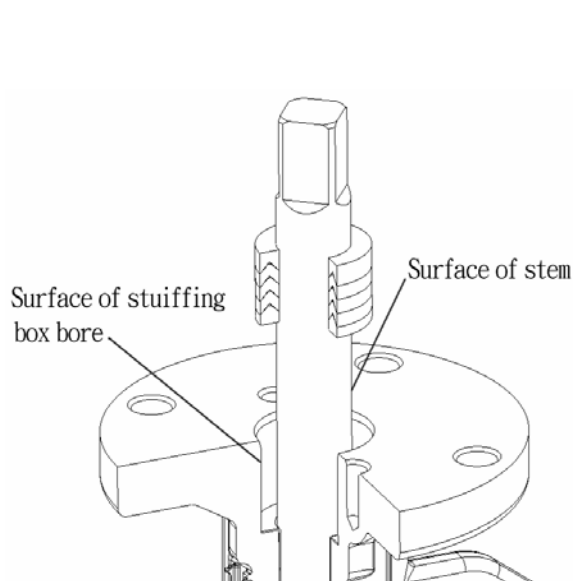


Fig. 8

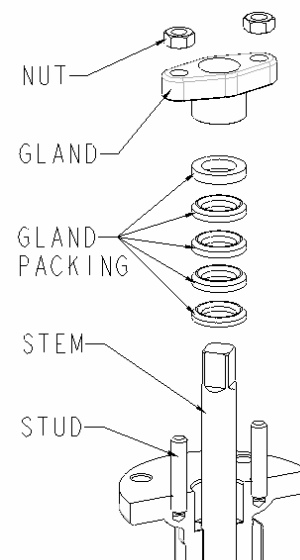


Fig. 9

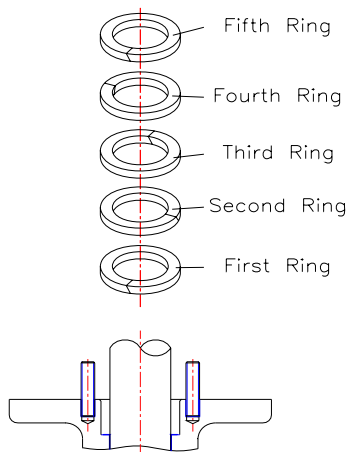


Fig. 10

B. Fitting Procedure

Install each new ring of packing, use the gland follower to push each ring of packing evenly into position after starting it in the stuffing box bore. (See Fig. 8 & 9) Stagger the splice-joints of each packing ring so they are as far as possible from each other (see Fig. 10). For graphite packing, usually rotating each ring until the splice is at 90° from the previous splice is sufficient.

Note:

If the valve was in vacuum service then the V-shaped packing has to be inserted up-side-down like “V” (See Fig. 11).

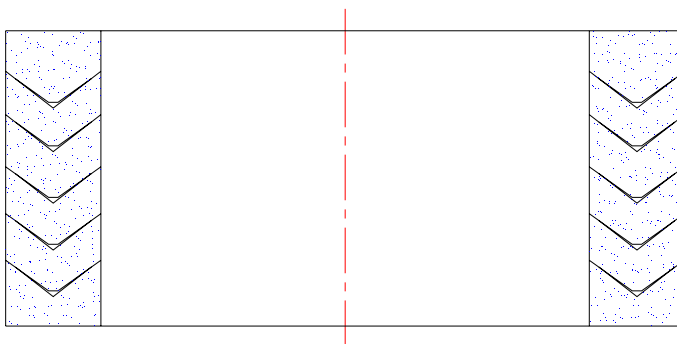


Fig. 11

TROUBLES AND COUNTERMEASURES

Troubles	Causes	Countermeasures
Leak from the seat	The fully closed position of the seat is not correct	Adjust the fully closed position of the stopper (in case of the electric motor type, re-adjust the position limit)
	A foreign particle is caught in the seat.	Check inside of the valve and remove the foreign particle.
	The seat is worn out or damage	Replacement of the seat.
Leak from the gland	The gland packing set was loose.	Re-tighten the gland bolts.
	The gland packing is worn out or damaged.	Replace the gland packing set.
Leak from the bottom cover.	Bottom cover gasket is worn out or damaged.	Replace the bottom cover gasket.
Leak from the gasket of the flange	The gasket is worn out or damaged.	Replace the gasket
Operation is not smooth	A foreign particle is attached or caught in the seat	Disassemble the seat to check and remove the foreign particle.

Note: As to the troubles other than mentioned above, please contact us for overhaul, etc.

3. STORAGE

When the valve is not put into immediate service, it is required that the valve be stored in a heated building that is fire resistant, weather tight and well ventilated. Storage area shall be situated and constructed so that it will not be subject to flooding and any corrosive chemicals present. Value Valves recommends that all valve actuator be cycled approximately every 60 days or as required by the manufacturer of the actuation system. Any spare parts for the valve shall be stored in the original packaging and under the same conditions as the valve will be stored.

For storage greater than 4 months, the storage container should be inspected every four (4) months to ensure it is in good condition, and any

additional protective coverings or materials are in working order. Ensure all parts are plugged, and bare metal is covered with a suitable rust inhibitor.

4. INSTALLATION

The valve must be installed so that pipeline stresses are not transmitted to the valve body. Despite its solid manufacture, such stress may affect valve operation. If pipeline stresses are severe, they should be cushioned by expansion joints or compensators. If supports are necessary for the valve, they should only support the dead weight of the valve and should not serve as base points for the pipeline.

5. STEPS OF INSTALLATION

- 5.1. All valves must be in full closed position during installation or removal. It is not necessary to torque seat the valve, but the disc travel must be restricted to prevent damage.
- 5.2. Please be sure there is no foreign material and clean inside of the pipe and valve.
- 5.3. The shaft side of the disc is considered the high-pressure side of the valve, (as indicated on the drawings by a flow arrow) meaning the best closure performance is obtained on this side of the valve, and a determination as to the best installation should be made, to utilize this feature. This may not necessarily be the normal flow direction of the system. (Fig.12).

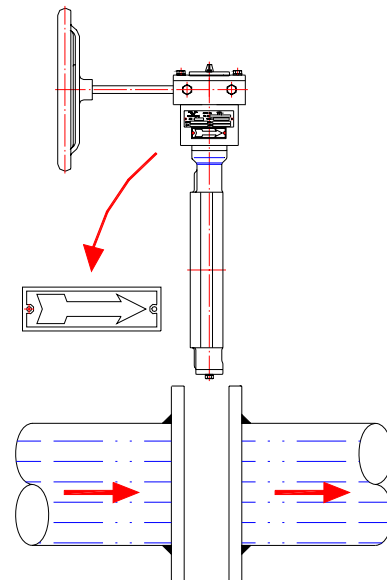


Fig. 12

- 5.4. Please install the valve stem horizontally as (Fig.13), thus could prevent sand and some chips collect around bottom bushing and seat and damage the valve.

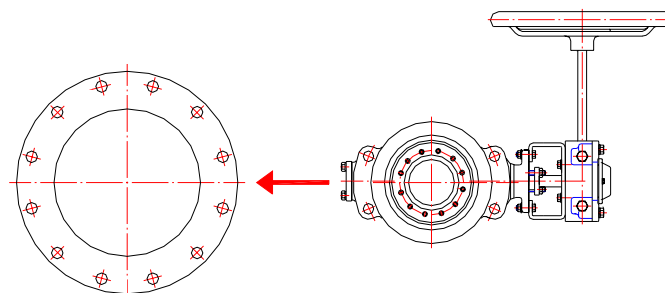


Fig.13

7.5. Install valve and gaskets into pipeline as (Fig. 14).

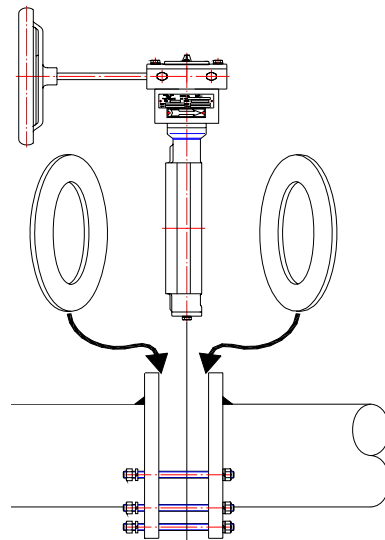


Fig.14

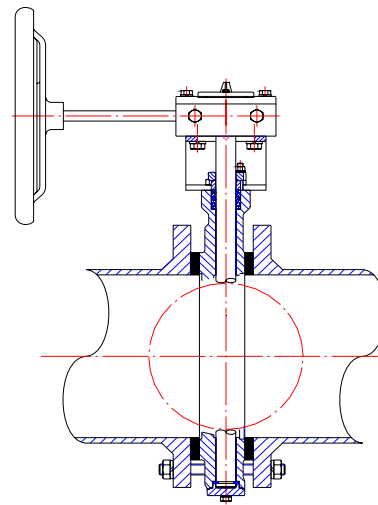


Fig.15

5.6. Make sure the valve to installed between flanges and concentrically with flanges, thus could prevent the disc damaged by the interfering with flange and pipeline (Fig.15)

最好之選擇

次要之選擇

危險之選擇

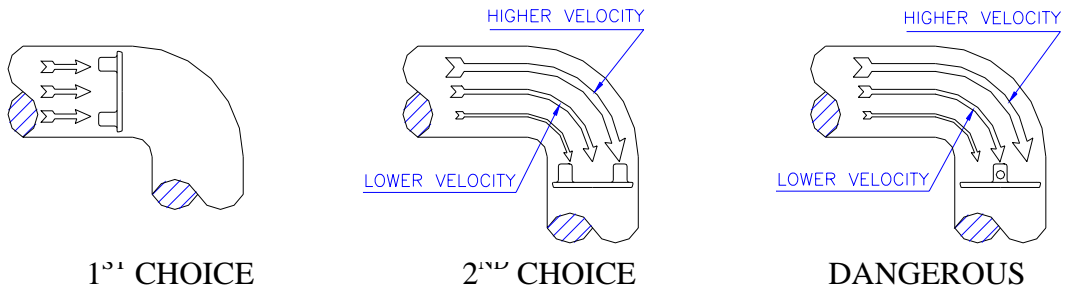


Fig.16

5.7. The typical installation for the butterfly valve connected to an elbow would be to align the shaft axis to allow equal flow on each side of the shaft, minimizing dynamic torque requirements for the valve. (Fig. 16)

5.8. Using an extension tube between wafer check valve and butterfly valve, never connect them directly. (Fig.17)

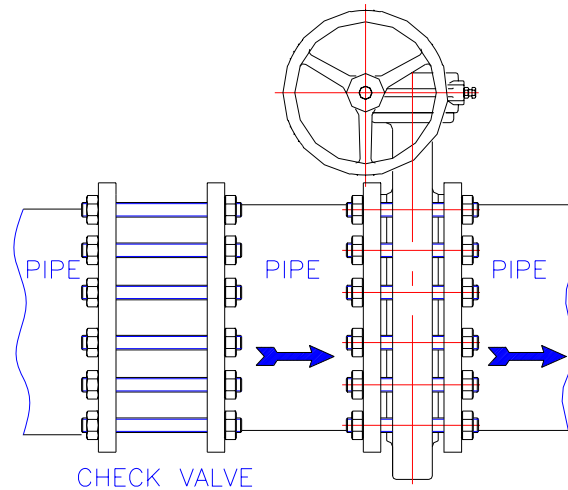


Fig. 17

6. Flange Connecting & Bolting

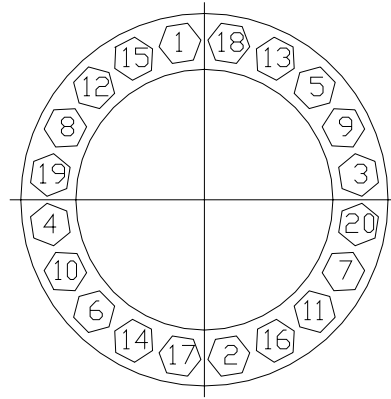
- 6.1. Keep valve protection boards until installation.
- 6.2. Make sure the material and size of gaskets could be suitable for the service, check the faces of flange and valve are smooth and flat. Sandpaper the faces if there was any harm.
- 6.3. Check all the bolts and nuts shall be in good condition.
- 6.4. Apply lubricant such as Molybdenum to all the bolts and nuts before fix them.
- 6.5. The pipe support(s) may now be required to be partially disengaged. A determination as to pipe flange alignment and space between the pipe flange and the valve face must be made at this time. The optimum spacing would be such as to only allow the flange gasket to be installed, at the maximum, and the flange bolt holes would be concentric.
- 6.6. The opposite connecting pipe flange face may not be more than 1/4 inch away from the valve flange face. Alternate methods of alignment, other than using the flange bolts, must be utilized to conform to this requirement.
- 6.7. Install all studs, maintaining uniform clearance between the studs and the mating bolt holes. Additionally the studs spanning the valve assembly should not contact the valve body.
- 6.8. Seat the flange by alternate tightening of four equally-spaced flange bolts no more than 1/4 turn per bolt, until the flange faces seat. During this operation, it is advisable to continually check the relative distance between the flange faces. Torque the bolts to approximately 25% of the final torque value (see table 1).
- 6.9. Inspect the remaining bolts and assure correct alignment. Tighten to the same level as the first four bolts.
- 6.10. Complete the tightening of all flange bolting in a minimum of four increments to the final determined torque value.
- 6.11. Test cycle the valve to be sure that there is no interference or binding.

6.12. Maximum Torque of Flange Bolt

Bolt size	Torque	
	(ft-lb)	(Nm)
5/8" (M16)	110	150
3/4" (M20)	200	270
7/8" (M22)	320	434
1" (M26)	480	650
1-1/8" (M28)	600	815
1-1/4" (M32)	840	1140

Table 1.

※Actual torque shall depend on gasket type, consult gasket manufacturer.



BOLT TIGHTENING SEQUENCE

