

ICON VALVES & ENGINEERING PVT LTD



INSTALLATION OPERATION AND MAINTENANCE MANUAL

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INTRODUCTION

“IVE” FLUSH BOTTOM VALVES have been designed and manufactured to give you long, excellent and trouble free service.

This manual provides you with all the relevant information to install, operate and maintain the valve for long trouble free life. Please note that all the drawings provided in this manual are typical views.

1.0 PRIOR TO INSTALLATION

- 1.1. On receipt of material check for any damage during transportation.
- 1.2. Wrapping and protection applied should be left in place until the valve is installed.
- 1.3. If the valves are left exposed, they should be protected against entry of foreign material in the valve parts.
- 1.4. Flush the Tank clean before mounting the valve at the Bottom Outlet of the Tank. Impurities such as sand and parts of welding electrodes could damage the seats & surfaces of the Valves.
- 1.5. If the valves are stored for a long time, they should be cleaned, lubricated and tested prior to installation. It is advisable to store the valve in full open position.
- 1.6. In Lever operated valve, the position of Handle is an indication of whether the valve is open or closed. When the Handle is aligned with axis of the pipe the valve is **open**. When it is Perpendicular to the pipe, the valve is **closed**. While in the Hand Wheel Operated Valves, you can identify the open & close positions by checking it in Clock wise & Anticlock wise directions.
Clockwise :- Close & Anticlock wise :- Open

2.0 INSTALLATION

- 2.1 Flush Bottom Valves are generally installed below the Tank however avoid stem position on sides. It is recommended to mount the valve having stem in vertical position.
- 2.2 Valve should not carry the weight of the Tank & piping. Proper support of the pipeline will minimize strain on the valve caused by shock in the pipe system. Do not fasten supporting structure to the valve flanges.
- 2.3 Do not attempt to correct pipe misalignment by means of flange bolts.
- 2.4 Do not allow the valves to carry the weight of pipeline to avoid distortion and jamming.
- 2.5 If necessary, tighten the gland packing uniformly during the trial operation of the valve.

2.6 A qualified welder must perform all welding operations and the welding procedure shall be in accordance with relevant standards.

2.7 When mounting the screwed end, butt weld end, socket weld end and flanged end type valves the following respective procedures must be followed, for better performance.

2.8 SCREWED END VALVE INSTALLATION

2.8a Clean both the mating parts before assembly.

2.8b Sealant if necessary should be applied only to the pipe or male threads.

2.8c Use correct size wrenches with flat jaws on hexagon or octagon ends.

2.8d Do not use undersized threads on section of pipe where the valves are to be installed.

2.9 BUTT WELD END VALVE INSTALLATION

2.9a Keep the valve in 'Full Open' position.

2.9b Space the joint apart, co-axially with a 2 to 3 mm gap.

2.9c Use an internal welding backing ring where practical.

2.9d After finishing the welding operation clean the pipeline and valve parts by flushing or pigging to remove the impurities formed during welding.

2.9e Do not allow rapid application of excess welding material.

2.9f Do not allow the temperature of valve body seat area to exceed 120° C (248° F) to prevent seat and seal damage.

2.9g When butt weld end valves are purchased with no extended nipple, before welding, remove the central body assembly along with ball and seats, place a spacer of same dimensions and then weld the ends.

2.10 SOCKET WELD END VALVE INSTALLATION

2.10a Keep the valve in 'Full Open' position.

2.10b First insert the pipe to full depth of socket then pull out about 1.5mm and weld.

2.10c Provide adequate support to the pipe on each side or to the valve prior to welding.

- 2.10d Weld each end of the valve with a continuous bead. The welding rod should not exceed 3.2 mm diameter.
- 2.10e Remove the spacer and reassemble the valve body assembly when the system cools down to ambient temperature.
- 2.10f Do not allow the temperature of valve body seat area to exceed 120° C (248° F) to prevent seat and seal damage.
- 2.10g When socket end valves are purchased with no extended nipple, before welding, remove the central body assembly along with ball and seats, place a spacer of same dimensions and then weld the ends.

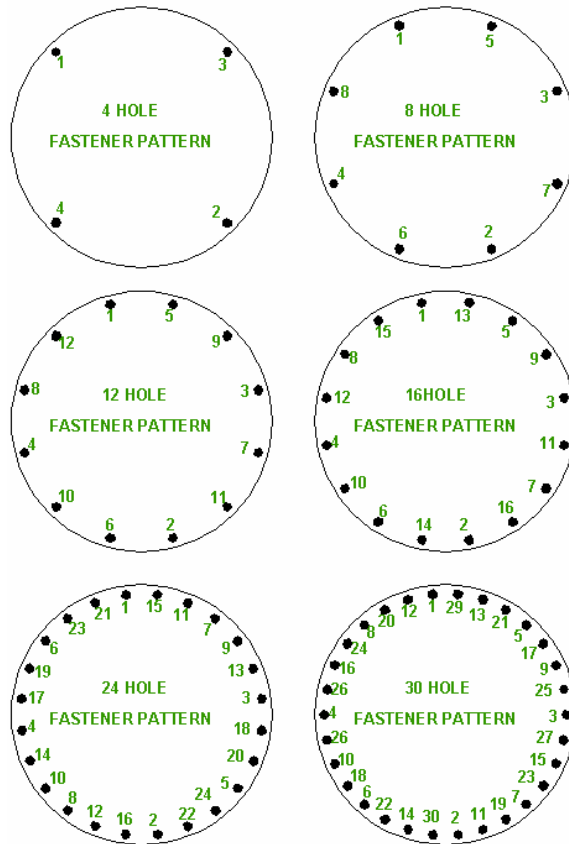
2.11 FLANGED END VALVE INSTALLATION

- 2.11a Be sure that flange gaskets and fasteners are suitable for the operating conditions.
- 2.11b Insert the valve (fully open position) along with suitable gasket between the mating flanges, align the flange boltholes & hold it in place.
- 2.11c Hold the nuts first on backside of the valve flange and then insert the bolts.
- 2.11d Tighten all the bolts to finger tight.
- 2.11e Use two spanners to tighten the joint, in the sequence as shown in Figure 1.

: 5 :

BOLTING SEQUENCE CHART

Figure -1



3.0 OPERATION AND MAINTENANCE

- 3.1 Flush the pipeline carefully once more when the valves are mounted to remove all the possible impurities. Before flushing keep the valve open fully in case of Ball Valves & partly in case of “y” type Valves.
- 3.2 Valves should be opened and closed slowly to avoid hammering effect on the valve and pipeline.
- 3.3 Valve should be “fully opened” or “fully closed” to prevent damage to the seat and ball caused by wire drawing.
- 3.4 Flush Bottom valves is intended for on-off service only, it should not be used for throttling services.
- 3.5 If stem leak develops, tighten the gland nut until leakage has been stopped. If the stem leak cannot be stopped then replacement of stem packing is necessary.
- 3.6 If a through leak occurs, ensure that the valve is fully closed. Don't use extra leverage or extra force on the stem to prevent leakage. If leakage persists, replacement or Lapping of seats is necessary.
- 3.7 After a long service life, when through valve leakage is observed, the seats should be replaced by new ones.
- 3.8 The ball valve needs no regular maintenance or lubrication.
- 3.9 Replacement of stem packing:

When replacing the packing, be sure that the valve is not under pressure. Remove all accessories including actuator to give access to the packing. After loosening and removing the gland nut, the packing can be removed by means of a hooked wire.
- 3.10 Do not try to correct the through valve leakage by giving packing pieces behind the seat to make it tight. Instead replace the packing.
- 3.11 If a body seal leak develops, do not over tighten the body end cover studs and nuts. This may damage the valve. Instead body seal should be removed and replaced by new one.
- 3.12 Flush Bottom Valves (“Y” Type”) are Generally made to Order Valves & the size of all the Parts Differ from Customer to Customer. Hence the parts to be changed or replaced needs to be send to us for making a duplicate ones or the whole valve. We recommend the valve to be send to us for overhauling if needed.

4.0 DISASSEMBLY

For your safety and protection, it is important that the following precautions be taken prior to removing the valve from service or before any disassembly of the valve.

4.1 DISASSEMBLY FROM PIPE LINE

- 4.1a Keep hands out, since remotely actuated valves could close at any time. Disconnect all auxiliary piping of jackets and pneumatic or electric connections.
- 4.1b Wear any protective clothing or equipment normally required when working with media involved.
- 4.1c De-pressurize all the lines and drain the system fluid. Cycle the valve several times to relieve any pressure still inside the valve.
- 4.1d Keep the valve in full open position. Remove the valve and place it on a level surface in vertical position.

WARNING!

VALVES SHALL NOT BE DISMANTLED IN CLOSED POSITION

4.2 DISASSEMBLY OF THE FLUSH BOTTOM BALL VALVE (REFER FIGURE-2)

- 4.2a Flush the valve to remove the residuals in the valve.
- 4.2b Support the valve on a platform.
- 4.2c Remove all accessories if fitted and also adapter, lever or gear operator.
- 4.2d Remove check nut / gland nut, spring, locking plate and gland.
- 4.2e Unscrew the body end connection studs and separate the body and end pieces/tail piece.
- 4.2f Place the disassembled parts on clean wooden or cardboard surface. Do not keep ball and seats on cement or metal surfaces to avoid damage.
- 4.2g Take out the seat rings and body seal. Body seal to be replaced during re-assembly.
- 4.2h Keep the valve in CLOSED position and remove the ball.
- 4.2i Push the stem into the body cavity and then takeout through the end port. Remove the stem washer and stem seal.

4.2j Clean all parts carefully. If necessary use suitable solvent.

4.2k Check all the sealing surfaces and parts for damage or uneven wear. Minor scratches or flashes on the ball surface can be removed using a fine abrasive cloth.

4.2l Check the condition of the stem.

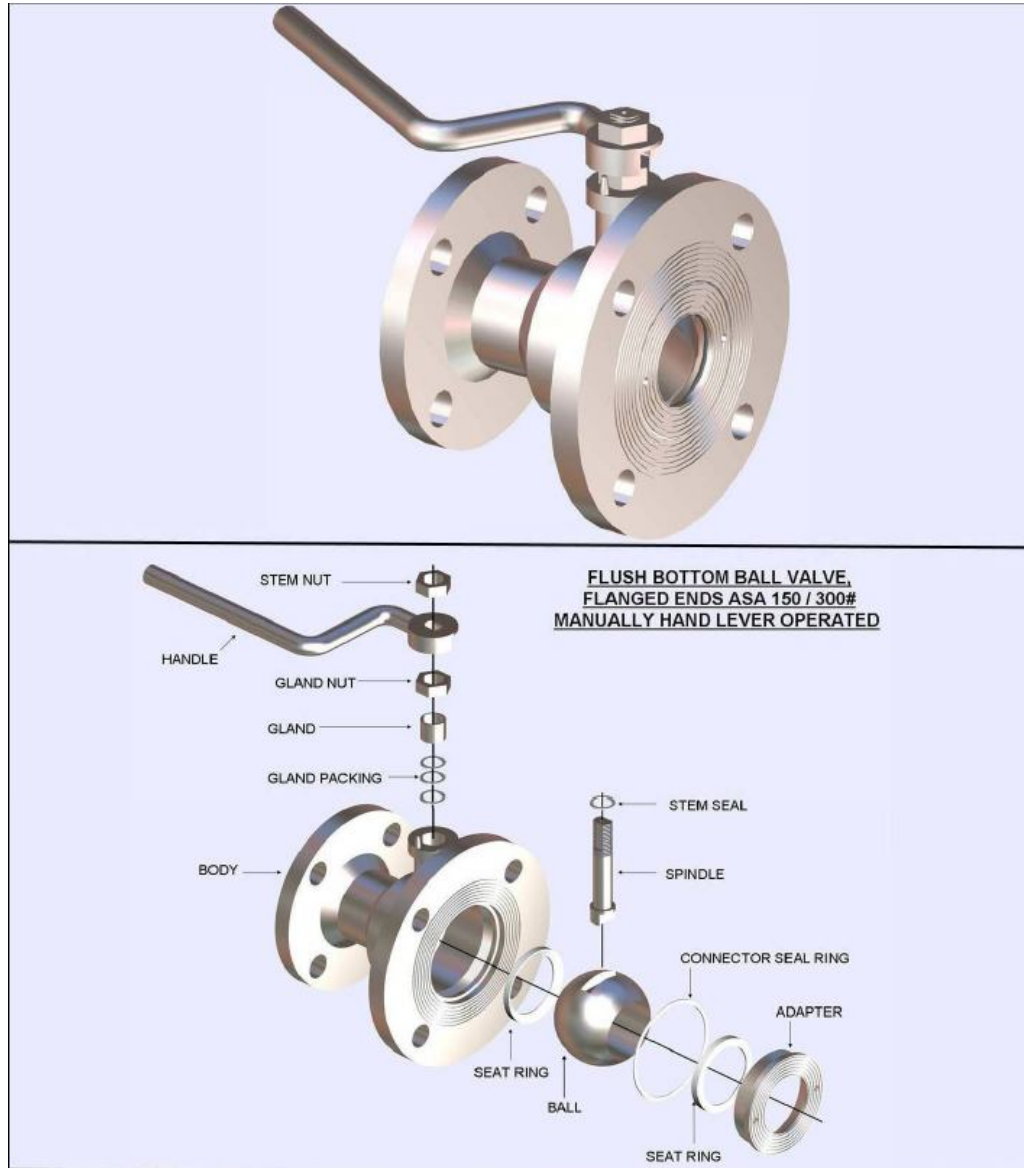
4.2M Check for the wear or any damage at all the sealing area of stem, ball, seat, bearings and stuffing box bore. Correct / replace the damaged parts if necessary.

5.0 ASSEMBLY

Using the parts contained in complete repair kit, reverse the disassembly procedure. **NEVER REUSE PACKING, BODY SEALS, STEM SEAL AND STEM WASHER.**

Incase of damage/wear/corrosion to the parts of the valve, they need to be replaced during re-assembly.

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FIGURE - 2



4.3 DISASSEMBLY OF THE FLUSH BOTTOM VALVE “Y” TYPE (REFER FIGURE-3 & FIGURE -4)

- 4.3a Flush the valve to remove the residuals in the valve.
- 4.3b Support the valve on a platform OR on a Vice
- 4.3c Remove all accessories if fitted (Actuator, Gear, Solenoid Etc)
- 4.3d Remove check nut / gland nut, spring, locking plate and Hand wheel
- 4.3e Unscrew the body end & connecting Pillars or Bonnet and separate the body and end pieces/tail piece.
- 4.3f Place the disassembled parts on clean wooden or cardboard surface. Do not keep ball and seats on cement or metal surfaces to avoid damage.
- 4.3g Un screw the seat from the Body if it is screwed or loosen if it is fixed to the body & check for Dents on the sealing area. If Dents are present Lapping is to be done.
- 4.3h Un screw the Disc from the spindle & check for Dents on the sealing area. If Dents are present Lapping is to be done. If the Valve is soft Seated (PTFE seated) replace the Disc seat
- 4.3i Clean all parts carefully. If necessary use suitable solvent.
- 4.2k Check all the sealing surfaces and parts for damage or uneven wear. Minor scratches or flashes on the ball surface can be removed using a fine abrasive cloth.
- 4.2l Check the condition of the stem.
- 4.2M Check for the wear or any damage at all the sealing area of stem, Disc, seat, bearings and stuffing box bore. Correct / replace the damaged parts if necessary.

5.0 ASSEMBLY

Using the parts contained in complete repair kit, reverse the disassembly procedure. **NEVER REUSE PACKING, BODY SEALS, STEM SEAL AND STEM WASHER.**

Incase of damage/wear/corrosion to the parts of the valve, they need to be replaced during re-assembly.

FIGURE -3

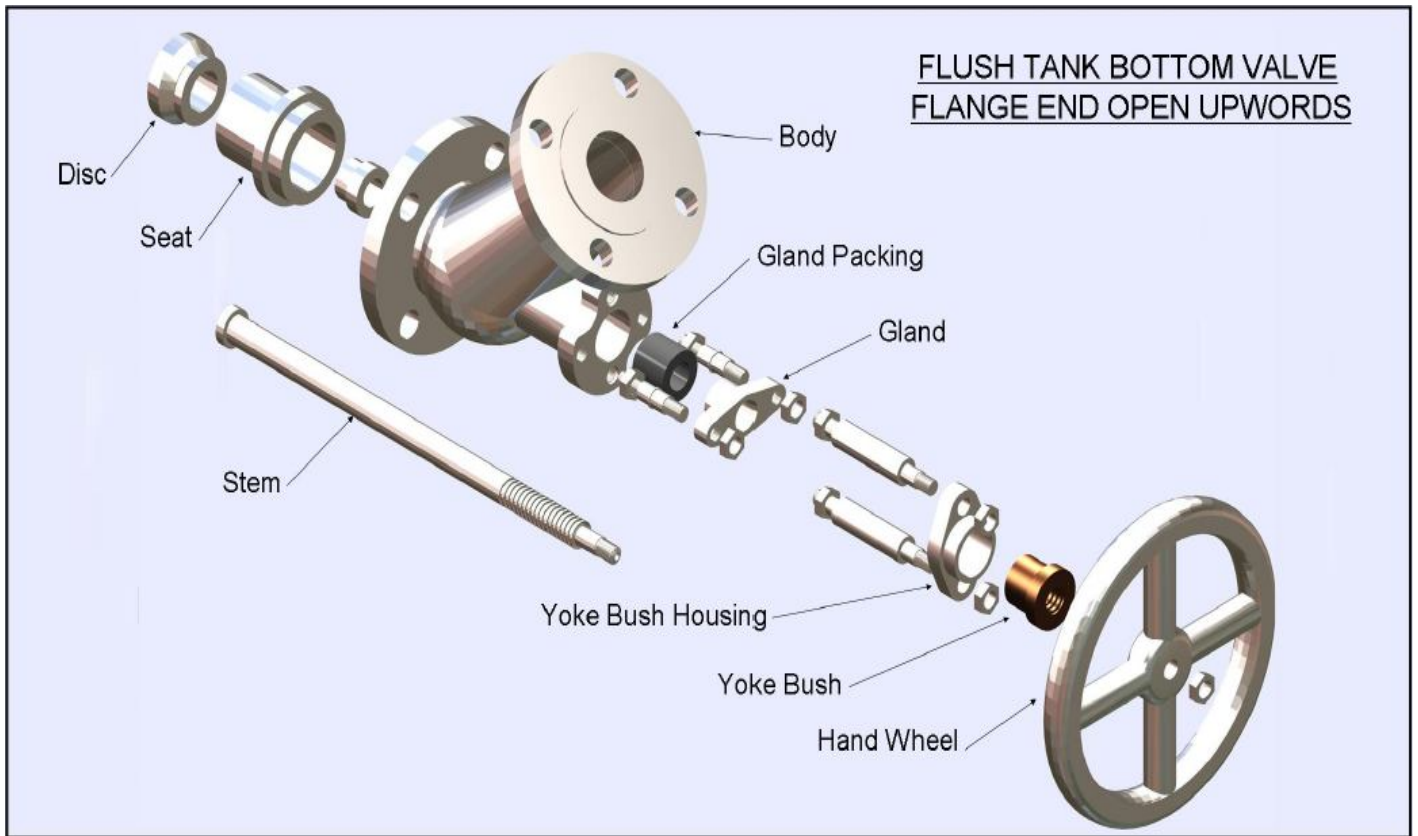
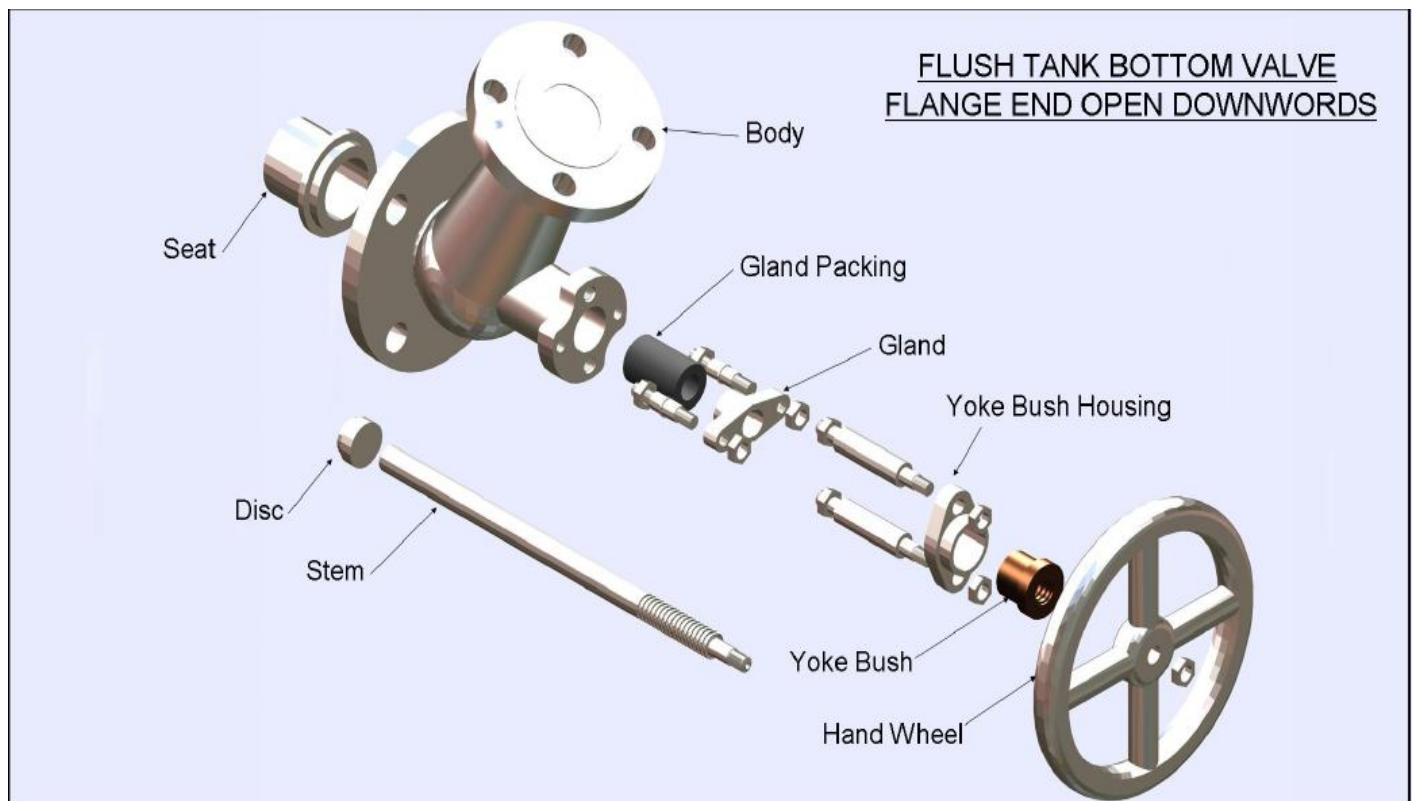


FIGURE -4



TROUBLESHOOTING

	Nature of Defect	Cause	Remedy
1	Seat Leakage	<ol style="list-style-type: none"> 1. Damage of Seat due to presence of foreign particles. 2. Damage of seal Ring at the seat/retainer. 3. Damage of seat in weld end valves due to improper precautions. 4. Damage of seat at high temperature. 5. Improper closing of actuator operated valves. 6. Damage of seat due to rust at body of seat retainer. 	<p>Dismantle, clean & replace by new seats</p> <p>Dismantle, clean & replace by new seal Rings</p> <p>Suggest following right steps as per IOM manual.</p> <p>Check for suitability of seat material and design.</p> <p>Ensure correct closing of actuator.</p> <p>Dismantle, clean & reassemble/replace.</p>
2	Gland Leakage	<ol style="list-style-type: none"> 1. Loosening of check nut or locking bolt. 2. Damage of stem seal/stem washer 3. Misalignment of actuator, bracket & stem. 	<p>Tighten the check nut & locking bolts</p> <p>Replace the stem seal/stem washer.</p> <p>Ensure correct alignment.</p>
3	Body Seal Leakage	<ol style="list-style-type: none"> 1. Improper tightening of Body bolting. 2. Improper precautions in case of weld end valves. 3. Misalignment of pipe line mating flanges. 	<p>Ensure proper tightening of Body bolting.</p> <p>Suggest following right steps as per our IOM manual.</p> <p>Ensure correct alignment of flanges.</p>
4	High Torque operation	<ol style="list-style-type: none"> 1. High temperature of fluid handled. 2. Highly viscous fluid handled. 3. Insufficient air supply pressure in case of pneumatic operated valves 4. Reducing of lever length by user due to less space. 5. Pipeline flange pressure in case of single piece valves. 	<p>Check for suitability of material and design.</p> <p>Check for suitability of material and design.</p> <p>Ensure sufficient air pressure.</p> <p>Suggest using levers of correct length.</p> <p>Face the seat or seat seal to relieve extra pressure.</p>
5	Jerky operation	<ol style="list-style-type: none"> 1. Presence of foreign particles at seat contact area. 2. Peeling of plating of Disc in case of metal seated valves. 3. Insufficient air supply pressure in case of pneumatic operated valves 	<p>Dismantle, Clean & Reassemble.</p> <p>Check for service condition/replace.</p> <p>Ensure sufficient air pressure.</p>
6	Gear Operator Damage	<ol style="list-style-type: none"> 1. Very high torque operation. 2. Poor material of construction & design. 3. Transit damage 	<p>Check for causes as covered in SI.No.4</p> <p>Check for suitability.</p> <p>Replace the damaged spares & report accordingly.</p>