

MICROFINISH BALL VALVES

INSTALLATION OPERATION AND MAINTENANCE MANUAL



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INTRODUCTION

Microfinish Ball 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 pipe clean before mounting the valve in the pipeline. Impurities such as sand and parts of welding electrodes could damage the ball surface and the seats.
- 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.
- 1.7. Duly packaged and in dry condition.
- 1.8. To be stored in normal atmospheric temperature.
- 1.9. Indoor storage, not to be stored at outside with direct sun light.
- 1.10. If stored for long time, the seat permanent set may happen, some periodical open and close operation test may be performed to avoid this issue.
- 1.11. Proper lubrication to be done before application, as applicable.
- 1.12. No other extra lever is to be used to operate the valve, which enhance input force other than the MVPL-provided levers or Hand-wheel.
- 1.13. Please use recommended lever length or Hand-wheel diameter to operate the valve.

2.0 INSTALLATION

CAUTION

The valves should be used in a well-designed, adequately supported piping system such that it will not be subjected to undue forces, stresses or shock loads during service.

The valves are not designed to operate during or after earthquakes or under fatigue conditions. It is the responsibility of the owner to determine if fatigue conditions exist.

- 2.1. The valve may be installed in any position, however avoid stem position downwards. It is recommended to mount the valve having stem in horizontal position.
- 2.2. Valve should not carry the weight of the piping. Proper support of the pipeline will minimize strain on the valve caused by shock in the pipe system. The valve can be supported by its body with pipe clamps and supports. 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 ASME Boiler & Pressure Vessel Code Section IX.

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

2.9.1 Pre-welding checks

- Valve body, pup piece, and filler metal must match the specification (MTCs reviewed).
- Use only the qualified welding procedure (WPS/PQR) for that material & thickness with low heat input.
- Ensure proper bevel angle, root face, and root gap co-axially with a 2 to 3 mm gap.
- Ensure all surfaces are clean (no oil, paint, rust, moisture etc..)
- Use backing ring where practical.
- Keep the valve 'Full Open' position to prevent seat damage & distortion particular care should be taken with valves with 'fail-close' actuators- Ball to be protected from welding.
- Check pipe/valve coaxial alignment — No forcing.
- Use proper clamps, not the valve as a load bearing member.
- No hammering or forced fit-up during welding.

2.9.2 During welding

"TIG welding is recommended for root pass to prevent entry of slag, spatter, and debris into valve bore"

- Heat control is critical:
 - Do not allow the temperature of valve body seat area to exceed 120° C (248° F) to prevent seat and seal damage.
 - The temperature during the pipe welding and the heat treatment has to be monitored by a thermocouple.
 - Follow preheat and inter pass temperature requirements.
 - Avoid overheating — valves are sensitive to distortion.
 - Do not allow rapid application of excess welding material.
 - Prefer stringer weld beads, not wide weaving.
 - Forced air-cooling between passes.
 - Use heat sinks / wet rags / thermal blankets on valve body if specified.

2.9.3 Post-welding care

- Cooling:
 - Allow controlled natural cooling (no water quenching unless specified).
- **PWHT (if required):**
 - Ensure valve is PWHT-compatible.
 - Follow heating/cooling rates strictly.
- Cleaning:
 - Remove slag, spatter, and debris from valve bore.
- Inspection:
 - Visual inspection (VT).
 - NDT as per specification (RT / UT / MT / PT).
- Leak & pressure testing:
 - Hydro test / seat test as applicable.

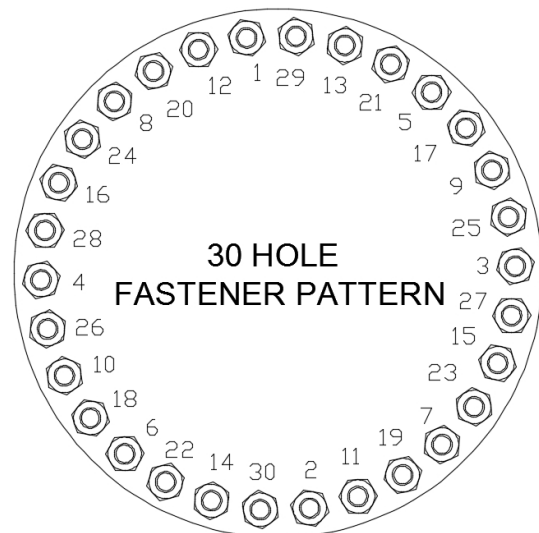
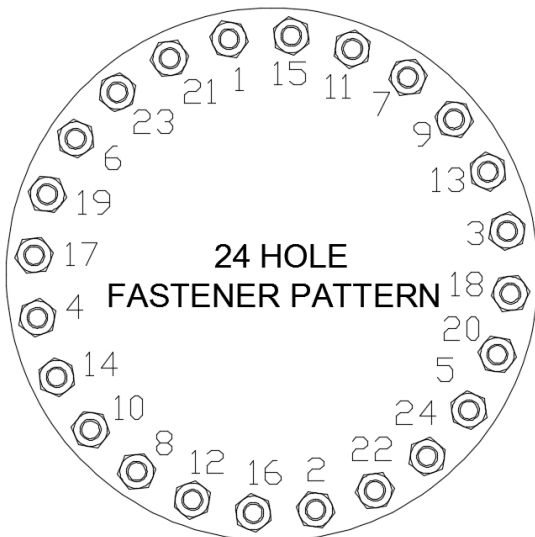
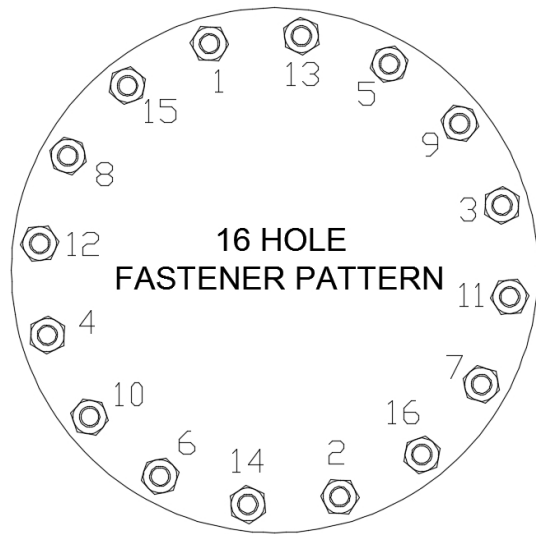
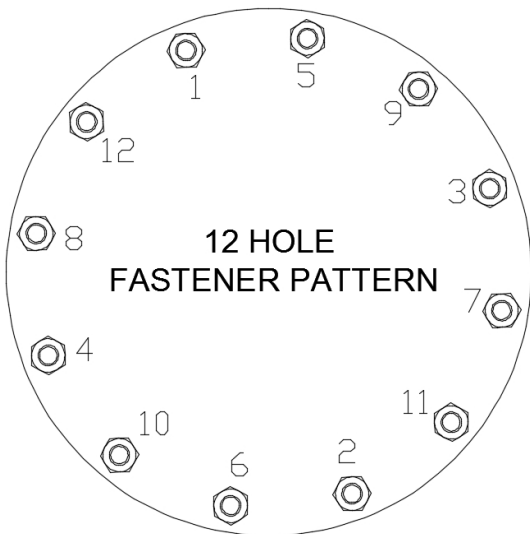
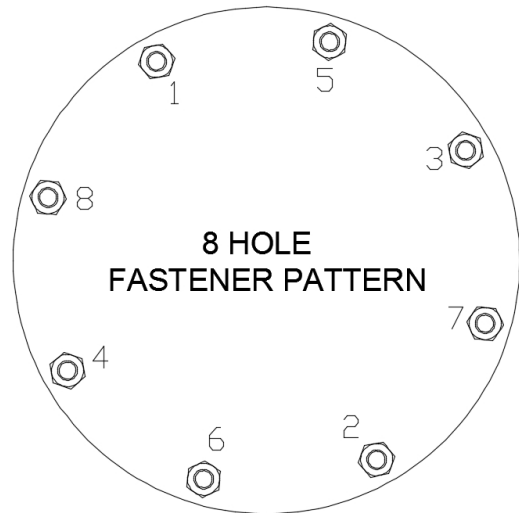
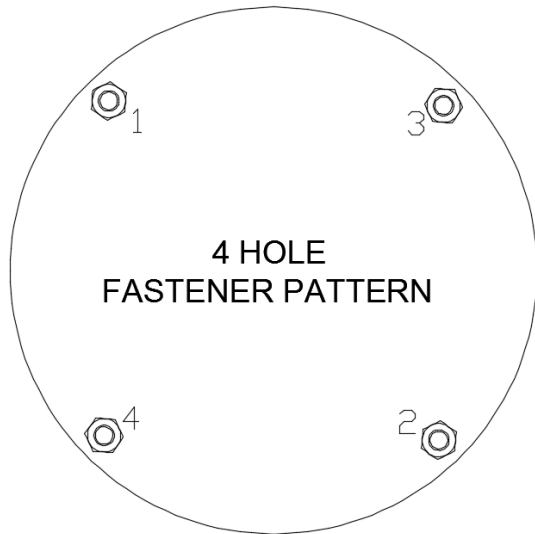
2.10. SOCKET WELD END VALVE INSTALLATION

- 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 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.

2.11. 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 bolt holes & 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.

BOLTING SEQUENCE CHART



TIGHTENING TORQUES FOR FASTENERS

| Thread size x Pitch | Tightening Torque for lubricated fasteners | | | | Tightening Torque for Dry fasteners | | | | | | | |
|------------------------|--|----|--------|--------|-------------------------------------|--------|--------|----|-------|--------|----|--------|
| | N-m | | lbf-in | | N-m | | lbf-in | | | | | |
| M5x0.8 | 3 | to | 4 | 27 | to | 35 | 4 | to | 5 | 35 | to | 44 |
| M6x1 | 5 | to | 6 | 44 | to | 53 | 7 | to | 9 | 62 | to | 80 |
| M8x1.25 | 11 | to | 14 | 97 | to | 124 | 16 | to | 20 | 142 | to | 177 |
| M10x1.5 | 22 | to | 24 | 195 | to | 212 | 30 | to | 33 | 266 | to | 292 |
| M12x1.75 | 37 | to | 39 | 327 | to | 345 | 51 | to | 54 | 451 | to | 478 |
| M14x2 | 55 | to | 57 | 487 | to | 504 | 81 | to | 85 | 717 | to | 752 |
| M16x2 | 83 | to | 87 | 735 | to | 770 | 123 | to | 130 | 1089 | to | 1151 |
| M20x2.5 | 165 | to | 170 | 1460 | to | 1505 | 240 | to | 250 | 2124 | to | 2213 |
| M24x3 | 275 | to | 290 | 2434 | to | 2567 | 410 | to | 430 | 3629 | to | 3806 |
| M27x3 | 415 | to | 438 | 3673 | to | 3872 | 618 | to | 650 | 5465 | to | 5753 |
| M30x3 | 555 | to | 585 | 4912 | to | 5178 | 825 | to | 870 | 7302 | to | 7700 |
| M30x3.5 | 540 | to | 570 | 4779 | to | 5045 | 800 | to | 840 | 7081 | to | 7435 |
| M33x3 | 745 | to | 785 | 6594 | to | 6948 | 1115 | to | 1170 | 9869 | to | 10355 |
| M33x3.5 | 740 | to | 775 | 6550 | to | 6859 | 1100 | to | 1155 | 9736 | to | 10223 |
| M36x3 | 975 | to | 1025 | 8629 | to | 9072 | 1460 | to | 1535 | 12922 | to | 13586 |
| M36x4 | 935 | to | 985 | 8275 | to | 8718 | 1390 | to | 1455 | 12303 | to | 12878 |
| M39x3 | 1260 | to | 1325 | 11152 | to | 11727 | 1890 | to | 1985 | 16728 | to | 17569 |
| M42x3 | 1570 | to | 1650 | 13896 | to | 14604 | 2360 | to | 2475 | 20888 | to | 21906 |
| M42x4.5 | 1490 | to | 1560 | 13188 | to | 13807 | 2210 | to | 2320 | 19560 | to | 20534 |
| M48x3 | 2380 | to | 2500 | 21065 | to | 22127 | 3585 | to | 3765 | 31730 | to | 33323 |
| M48x5 | 2220 | to | 2335 | 19649 | to | 20666 | 3305 | to | 3470 | 29252 | to | 30712 |
| M52x3 | 2170 | to | 2279 | 19207 | to | 20168 | 4555 | to | 4785 | 40315 | to | 42351 |
| M52x4 | 2195 | to | 2305 | 19427 | to | 20399 | 4395 | to | 4615 | 38899 | to | 40846 |
| M56x3 | 2697 | to | 2832 | 23868 | to | 25061 | 5610 | to | 5890 | 49653 | to | 52131 |
| M56x4 | 2766 | to | 2904 | 24480 | to | 25704 | 5725 | to | 6010 | 50671 | to | 53193 |
| M60x3 | 3988 | to | 4187 | 35296 | to | 37061 | 6965 | to | 7310 | 61645 | to | 64699 |
| M60x4 | 4711 | to | 4946 | 41695 | to | 43780 | 7070 | to | 7425 | 62575 | to | 65717 |
| M64x3 | 4852 | to | 5095 | 42948 | to | 45095 | 8300 | to | 8715 | 73461 | to | 77134 |
| M64x4 | 4711 | to | 4946 | 41695 | to | 43780 | 8615 | to | 9050 | 76249 | to | 80099 |
| M72x3 | 6939 | to | 7285 | 61411 | to | 64482 | 12350 | to | 12970 | 109307 | to | 114794 |
| M80x3 | 9113 | to | 9569 | 80656 | to | 84689 | 16240 | to | 17050 | 143736 | to | 150905 |
| M90x3 | 13092 | to | 13746 | 115874 | to | 121662 | 24403 | to | 25624 | 215985 | to | 226792 |
| M100x3 | 18806 | to | 19747 | 166447 | to | 174775 | 33633 | to | 35314 | 297678 | to | 312556 |

2.12. THREE PIECE VALVE DESIGN WITH WELD-END CONNECTIONS WELDING INSTRUCTIONS

2.12.1. General

Please follow the welding instructions and safety precautions carefully before installing Microfinish valve. Spare body seals are provided as part of the valve package, only Microfinish spare parts shall be used.

The working area must be clean and clear from dirt and debris that might contaminate the valve internals. Flush the pipeline from dirt, and weld spatter before valve installation commence.

Standard valves are bi-directional and may be installed in either direction.

Valves with pressure relief hole in the ball are unidirectional and must be installed with the flow arrow pointing the pipeline low pressure side.

2.12.2. DISMANTLING

- 2.12.2.a With the valve in the open position, remove body bolts and separate the valve center section from its tail-piece (ends).
- 2.12.2.b Remove the ball seats and body seals; place the ball seats on a clean surface and discard the used body seals.
- 2.12.2.c Turn the valve handle to the closed position and slide out the ball. Place the ball on a clean surface.

2.12.3. WELDING

- 2.12.3.a Reassemble the tail-piece (ends) to the valve body with two bolts (studs) and nuts.
- 2.12.3.b Align the valve with the pipeline, ensure proper fit to minimize pipe load.
- 2.12.3.c Tack-weld the tail-piece (ends) to the pipeline.
- 2.12.3.d Dismantle the valve fasteners and remove the valve body (see figure A).
- 2.12.3.e Place all parts on a clean surface.
- 2.12.3.f Protect the body connectors sealing faces from welding splatter and complete the welding.
- 2.12.3.g Allow adequate time for cooling and then flush the pipe line.

2.12.4. ASSEMBLY

- 2.12.4.a With the valve in the closed position, carefully slide the ball into the body. Note: The ball will key into the stem only if the valve is in the closed position.
- 2.12.4.b Turn the valve to the fully open position.
- 2.12.4.c Place the new body seals and the ball seats inside the body.
- 2.12.4.d Ease the body center section between the tail-piece (ends).
- 2.12.4.e Care must be taken not to score the tail-piece faces or damage the seals.
- 2.12.4.f Insert the body bolts (or studs) & nuts into the valve.
- 2.12.4.g Tighten the nuts & body bolts according to torque figures shown in table 1, and tightening pattern shown in figure B.
- 2.12.4.h Keep the valve in the open position until flushing process is completed.

2.12.5. FLUSHING THE PIPELINE

It is an important precaution taken to prevent damage to valve ball and seats. While flushing, keep all valves in the fully 'open' position, to allow dirt, sand, grit, welding slag or other debris to be flushed thoroughly from the pipeline. When the flushing media is clean, the valves can be shut off. Actuated valves in the fail-safe 'closed' position, should be activated to the 'open' position during the flushing procedure.

2.12.6. IN-LINE WELDING

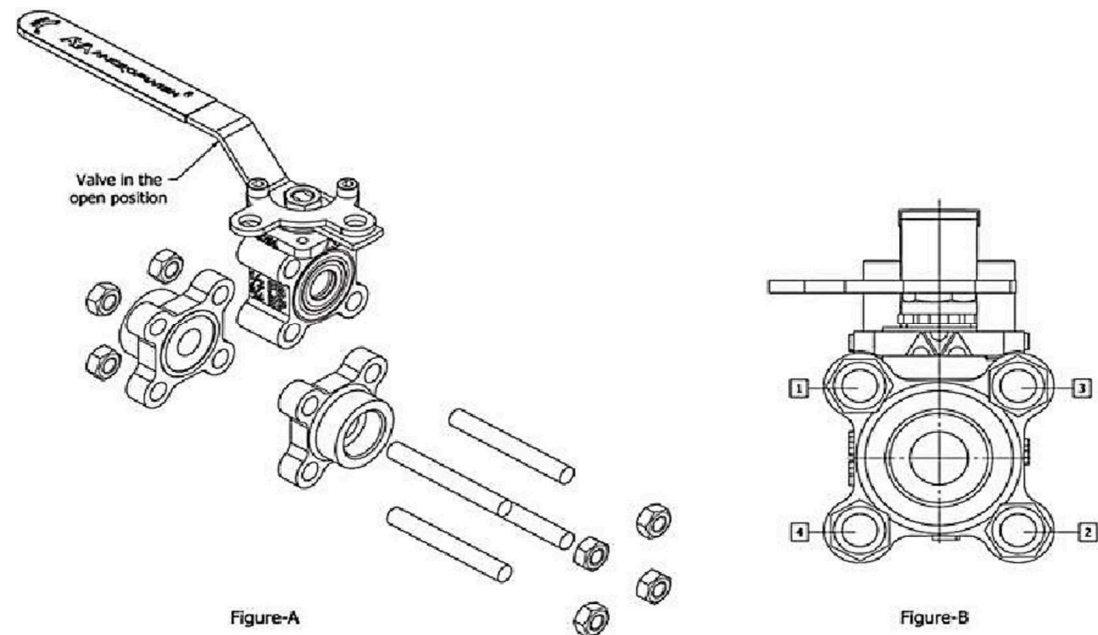
In general Microfinish recommends the use of valves with extended-pups which are designed for in-line welding.

2.12.7. ADVANTAGES:

- 2.12.7.a Reduced installation time.
- 2.12.7.b Valve integrity is kept as per factory procedures.
- 2.12.7.c Maintain valve cleanliness (i.e. Oxygen service).

2.12.8. When welding a valve in-line, certain precautions are required:

- 2.12.8.a Keep the valve in the open position throughout the complete installation process.
- 2.12.8.b Flush the pipeline properly before activating the valve.



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.
- 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 If valve 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 of seats is necessary.
- 3.7 After a long service life, when through valve leakage is observed, the seats can be interchanged.
- 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 seat.
- 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 **Sealant Injection feature in Trunnion Mounted Ball Valves:** Secondary sealant injection system is used only when damage has been caused to the seat rings or stem seals by the hard particles or dirt in the process media and a temporary tight shut off is required for maintenance or other purpose. Use standard grades of the valve sealants, which are suitable for the media in the valve. Sealant is to be pushed with a hand pump on the seat surface through the sealant injection port provided on the valve body and stem housing. Prior to injecting sealant, flush the sealant port with suitable valve cleaner. This will purge old sealant and debris if any, from the valve seats.

Procedure for emergency sealant injection.

Note: Sealant injection is to be carried out only if the valve seats or stem packing are leaking.

Trunnion mounted pipeline valves of sizes 6" NB and above are provided with two sealant injection ports on the body/body adapter for individual seats and one sealant injection port on the stem housing. Each port provided on the body provides sealant entry to the valve seats. The port provided on the stem housing provides sealant entry to the stem sealing area. The ports are fitted with double-check one piece fitting.

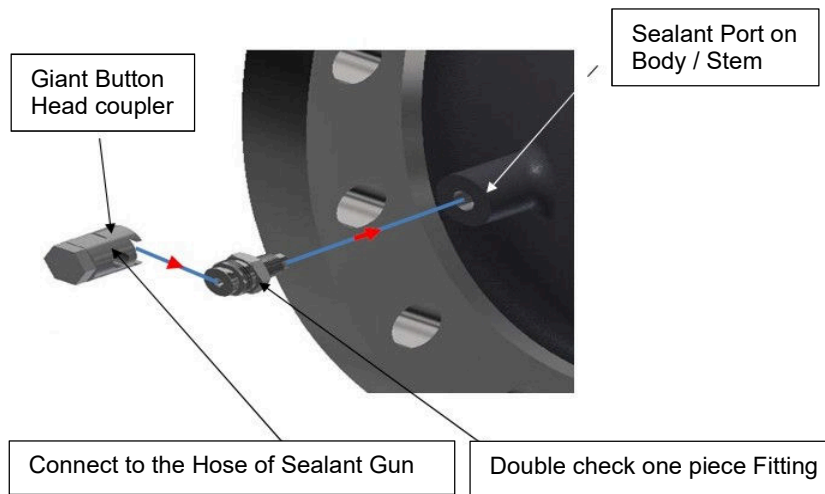
Injecting Handgun: Sealant is injected by connecting the outlet fitting of the handgun to the sealant injection port.

Sealant should be injected only when the valve is in closed position to ensure effective sealing of damaged seat.

Refer sealant injection fitting arrangement is shown in Figure No. 01. Slide the giant button head coupler which is integral with the hose of sealant injection gun, over a double - check one-piece fitting. Now the arrangement is ready for injection of the sealant.

After the completion of sealant Injection operation, slide away the giant button head coupler, which is integral with the hose of sealant Injection gun from the double- check one piece fitting.

FIGURE: 01 Sealant Injection Fitting Arrangement



CAUTION!

Injection Pressure;

- Min. injection pressure shall be 1.1 times the actual working line pressure.
- Max. injection pressure shall be 1.5 times the actual working line pressure but should not exceed the Maximum Cold Working Pressure for the body/bonnet material. Same is applicable when the sealant extension lines are provided.

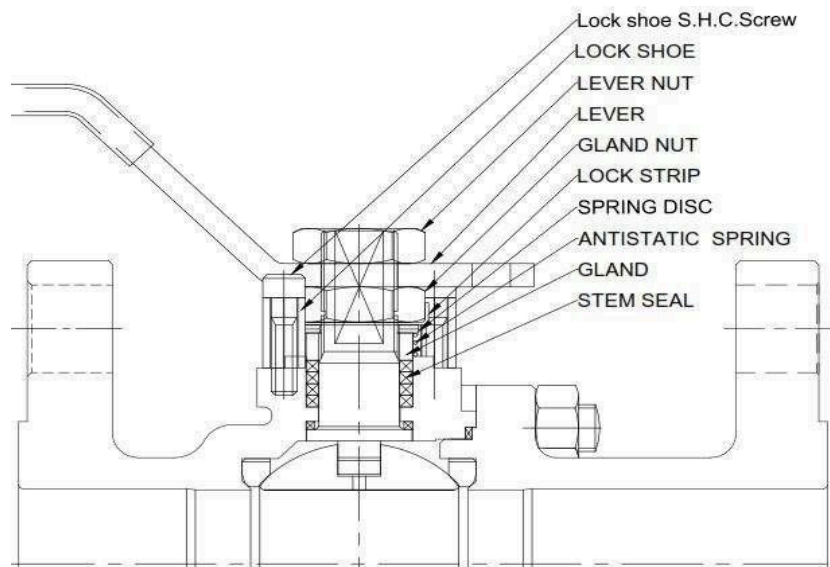
3.13 Stem packing adjustment;

- a. Microfinish valves include the feature of an externally adjustable stem seal in the event there is leakage experienced from the stem area.
- b. If possible, relieve any pressure within the valve during the adjustment process. If this is not possible, it is still safe to perform this adjustment on a valve in the field.
- c. Operate the valve once in the No load condition.
- d. Loose the Gland Nut / Chuck Nut for 2 rounds.
- e. Operate the valve for 3 times.
- f. Tight the Gland Nut / Chuck Nut as per Table (01) column "X".
- g. Again loose the Gland Nut / Chuck Nut.
- h. Operate the valve for 3 times.
- i. Retighten the Gland Nut / Chuck Nut as per Table (01) column "Y".
- j. Operate the valve for 3 times.
- k. Record the No load torque.

- i. If this first action has not stopped the leak, repeat steps “d” to “j”. Only perform this adjustment action a maximum of 3 times. If the leakage has not stopped after three attempts, stop the test as further attempts could be detrimental to elements of the stem packing system.

| BALL VALVE CHECK NUT TIGHTENING TORQUE (Nm) | | | | |
|--|-----------------|----------|-------------|----------|
| CHECK NUT SIZE | GRAPHITE | | PTFE | |
| | X | Y | X | Y |
| M10x1.5 | 10 | 5 | 9 | 5 |
| M12x1.25 | 15 | 7 | 13 | 5 |
| M18x1.5 | 19 | 11 | 17 | 11 |
| M22x2 | 22 | 19 | 20 | 15 |
| M30x2 | 29 | 19 | 27 | 18 |
| M40x2 | 34 | 22 | 32 | 20 |
| M48x2 | 60 | 38 | 40 | 50 |
| M60x2 | 70 | 47 | 90 | 70 |
| M68x2 | 80 | 70 | 120 | 90 |
| M74x2 | 90 | 82 | 140 | 100 |

Table No. 01 Check Nut Tightening Torque



For smaller valves with a double nut design, the Gland nut is held in place by a locking strip. The adjustment of the stem seal to tighten the packing cannot be carried out while this locking clip is firmly in place. It first needs to be loosened by pulling back the tabs from the nut with a flathead screwdriver, so the nut can be rotated and reset the stem seal. When the action is complete, you need to re-secure the locking strip to the nut by pushing back up the tabs.

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 FLOATING 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.
- 4.2h Push the stem into the body cavity and then takeout through the end port. Remove the stem washer and stem seal.
- 4.2i Clean all parts carefully. If necessary use suitable solvent.
- 4.2j 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.
- 4.2k Check the condition of the stem.

4.3 DISASSEMBLY OF TRUNNION MOUNTED VALVE – 2PC

(REFER FIGURE-3 and 4)

- 4.3a Follow the points in clause 4.2a to 4.2c
- 4.3b Remove lever / adapter or gear operator and bracket.
- 4.3c Remove check nut, spring disc, gland and anti-static spring.
- 4.3d Remove stuffing box, stuffing bearing and stuffing box seal.

- 4.3d Pull the stem from top and take out. Remove anti-static spring, stem washer and stem seals.
- 4.3e Remove trunnion and trunnion seal.
- 4.3f Unscrew the body end connection studs and separate the body and tailpiece.4.3h Remove seat retainer from tailpiece and seat springs.
- 4.3g Remove the ball from body and also remove trunnion bearing and thrust washer.4.3h Remove seat retainer from body and springs.
- 4.3h Place all parts on clean soft surface. Do not keep the parts on cement or metal surfaces to avoid damage.
- 4.3i Clean all the parts carefully. If necessary use suitable solvent.
- 4.3j 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.
- 4.3k 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.

4.4 DISASSEMBLY OF TRUNNION MOUNTED VALVE - 3PC (REFER FIGURE-05)

- 4.4 a Follow the points in clause 4.3a to 4.3c
- 4.4b Remove lever / adapter or gear operator and bracket.
- 4.4c Remove gland flange.
- 4.4d Remove stuffing box, stuffing bearing and stuffing box seal.
- 4.4 e Push the stem from top and take out from bottom. Remove anti-static spring, stem washer and stem seals.
- 4.4 f Remove ball support bottom plate, ball support washer and ball bearing.
- 4.4 g Unscrew the body end connection studs and separate the body and both tailpieces.
- 4.4 h Remove seat holder & seat retainer from tailpiece.
- 4.4 i Remove the coil springs.
- 4.4 j Remove the ball from body.
- 4.4 k Place all parts on clean soft surface. Do not keep the parts on cement or metal surfaces to avoid damage.
- 4.4l Clean all the parts carefully. If necessary use suitable solvent.
- 4.4m 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.
- 4.4n 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

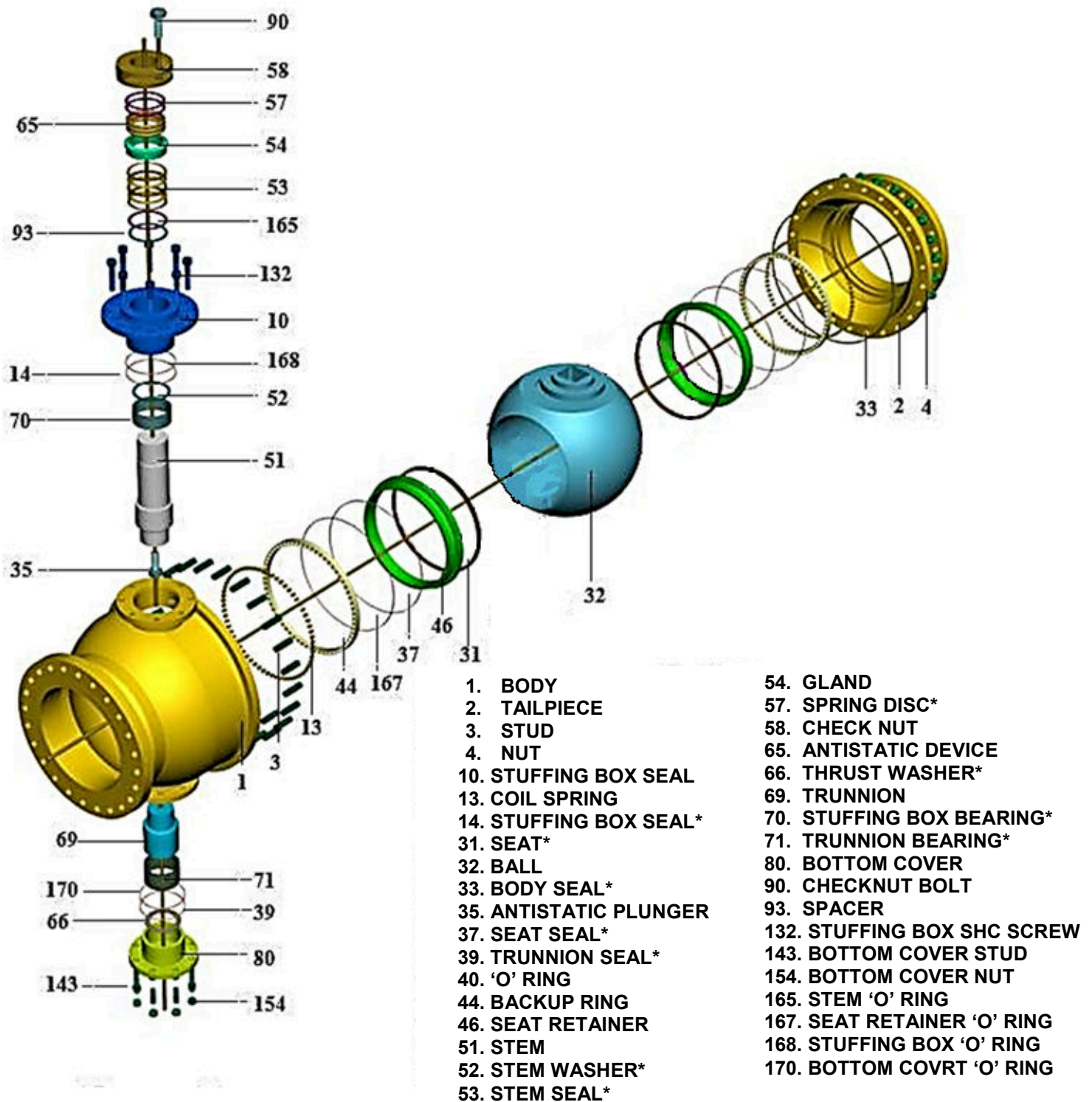
Using the parts contained in complete repair kit, reverse the disassembly procedure. Never reuse Packing, Body Seals, Stem Seal, Stem Washer and dispose the material as per the local government rules in such manner they could not affect the environment.

All the material used for packing of the product such as wood & plastic etc. shall be reused or disposed as per local government rules.

In case of damage / wear / corrosion to the parts of the valve, they need to be replaced during re-assembly and handover the damaged parts to authorized agency for reuse or dispose, so that damaged parts could not affect the environment.

When the valve is declared as scrap handover the valve / E-waste to authorized agency for reuse or dispose, so that scrapped valve could not affect the environment.

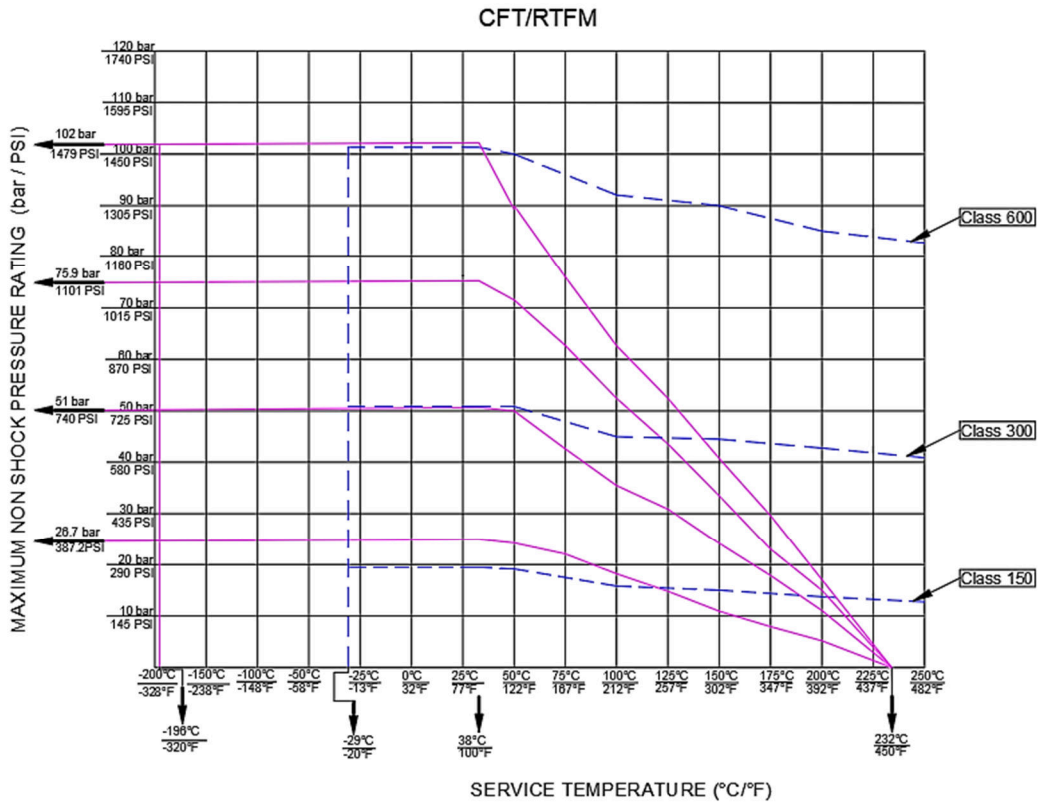
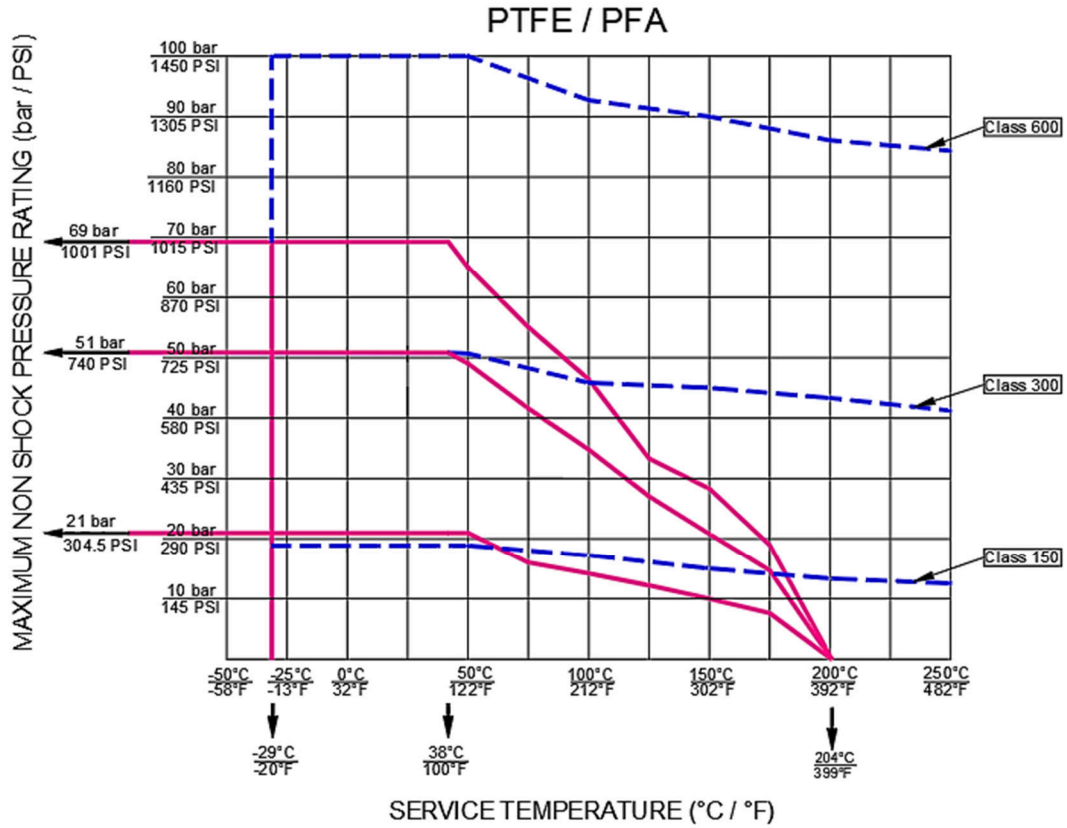
TRUNNION MOUNTED BALL VALVE



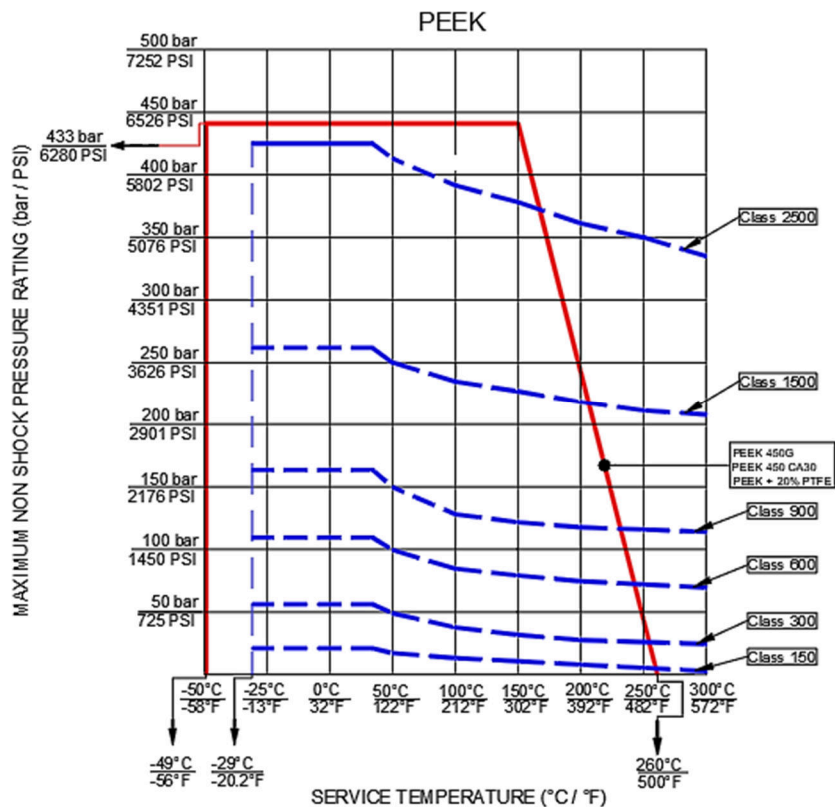
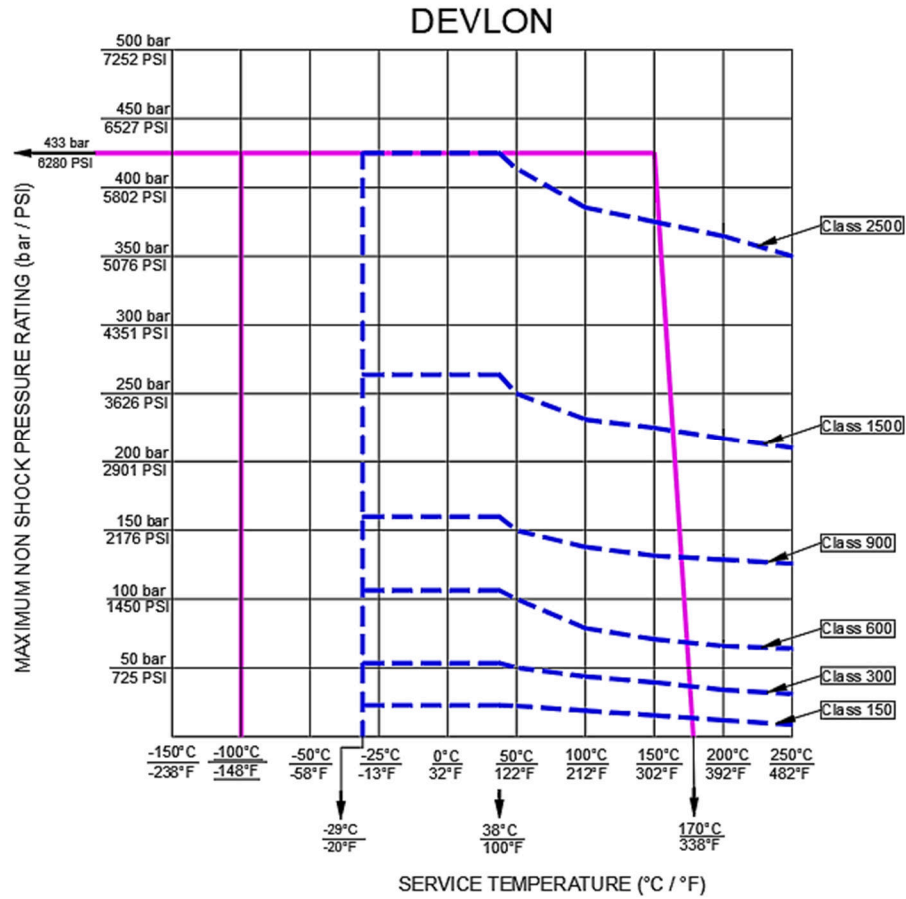
*Recommended spare

FIGURE : 04

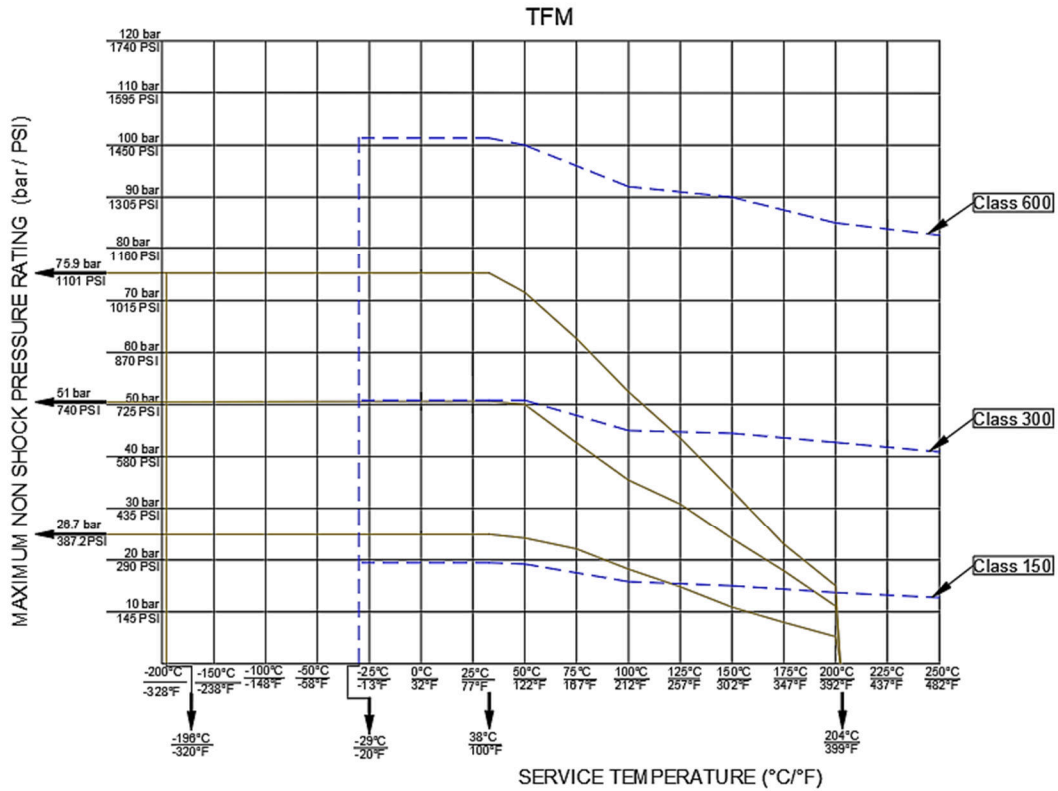
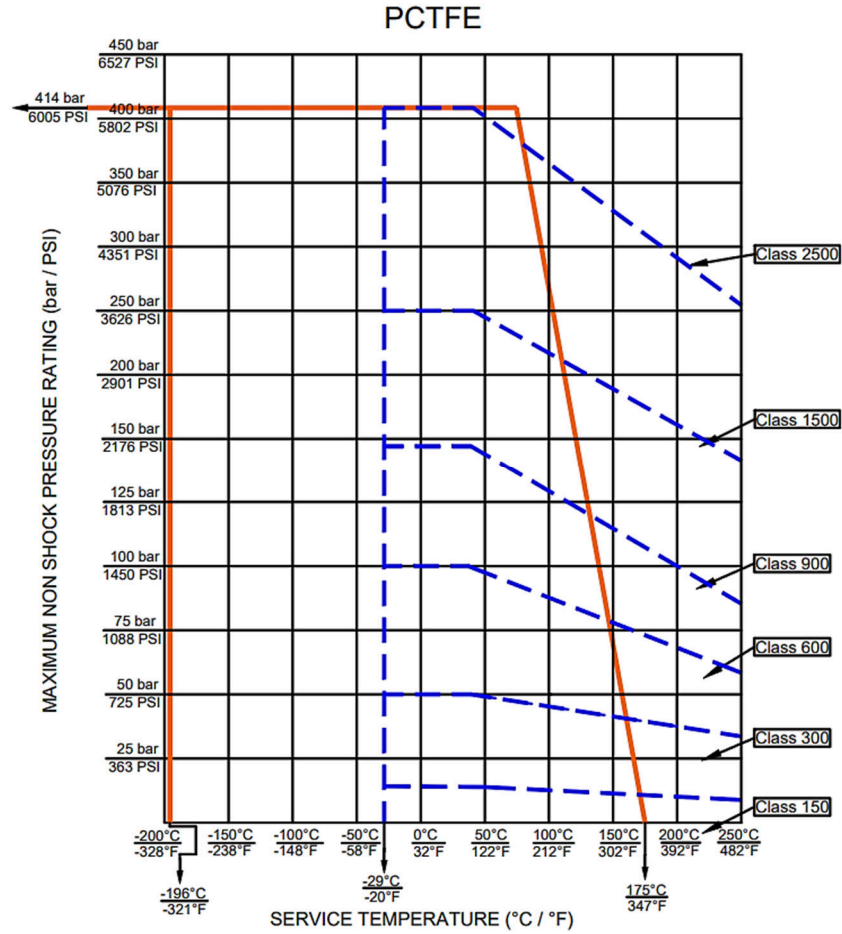
PRESSURE – TEMPERATURE RATINGS FOR FLOATING BALL VALVE SEAT MATERIALS



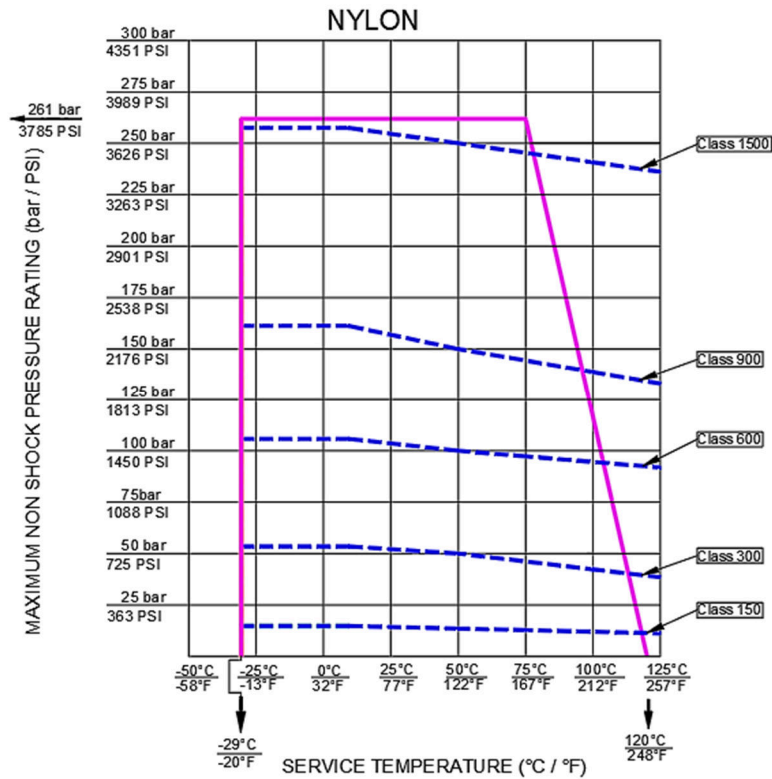
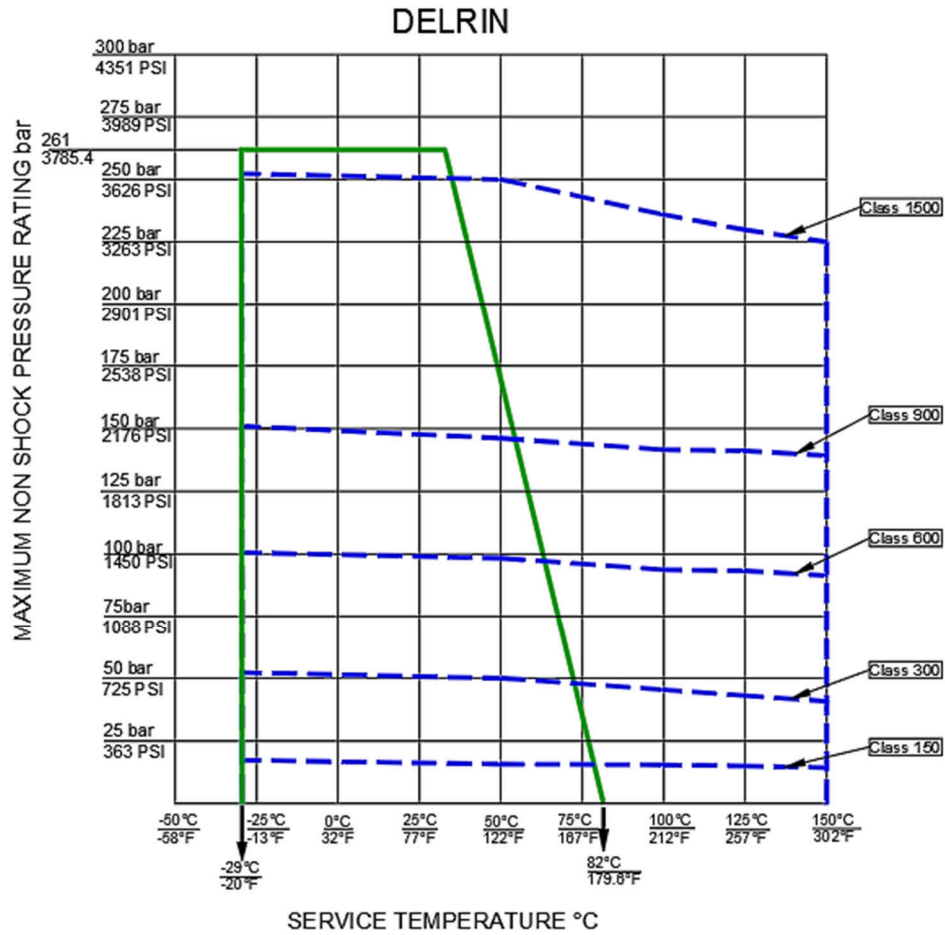
PRESSURE – TEMPERATURE RATINGS FOR FLOATING BALL VALVE SEAT MATERIALS



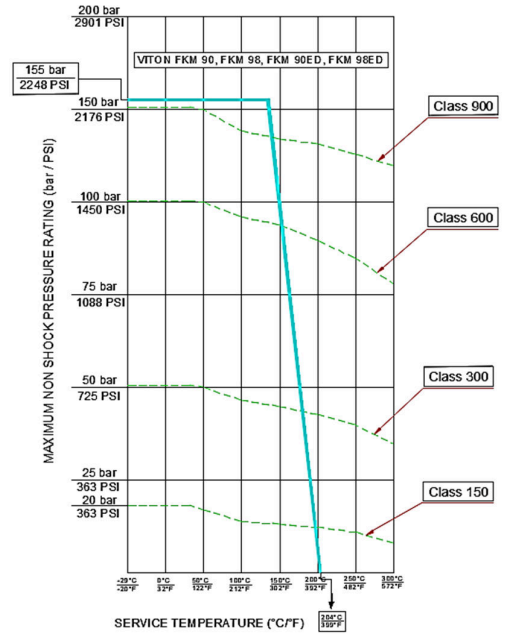
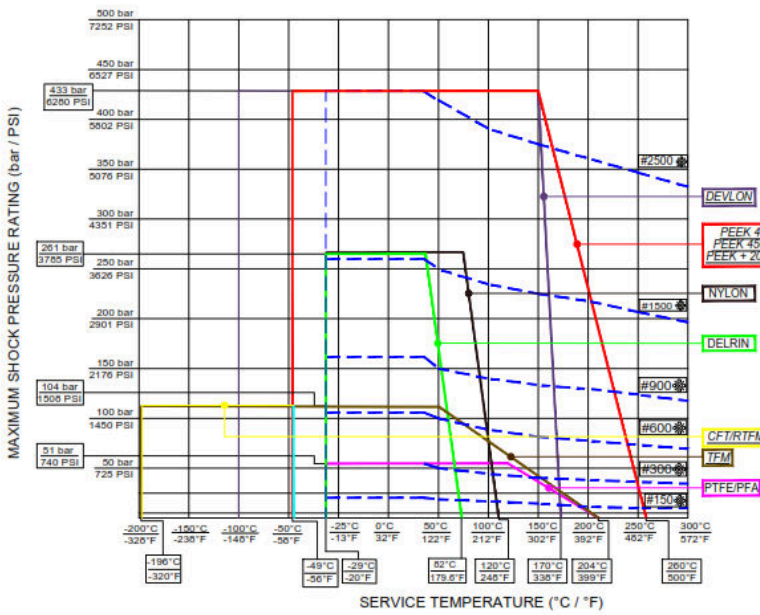
PRESSURE – TEMPERATURE RATINGS FOR FLOATING BALL VALVE SEAT MATERIALS



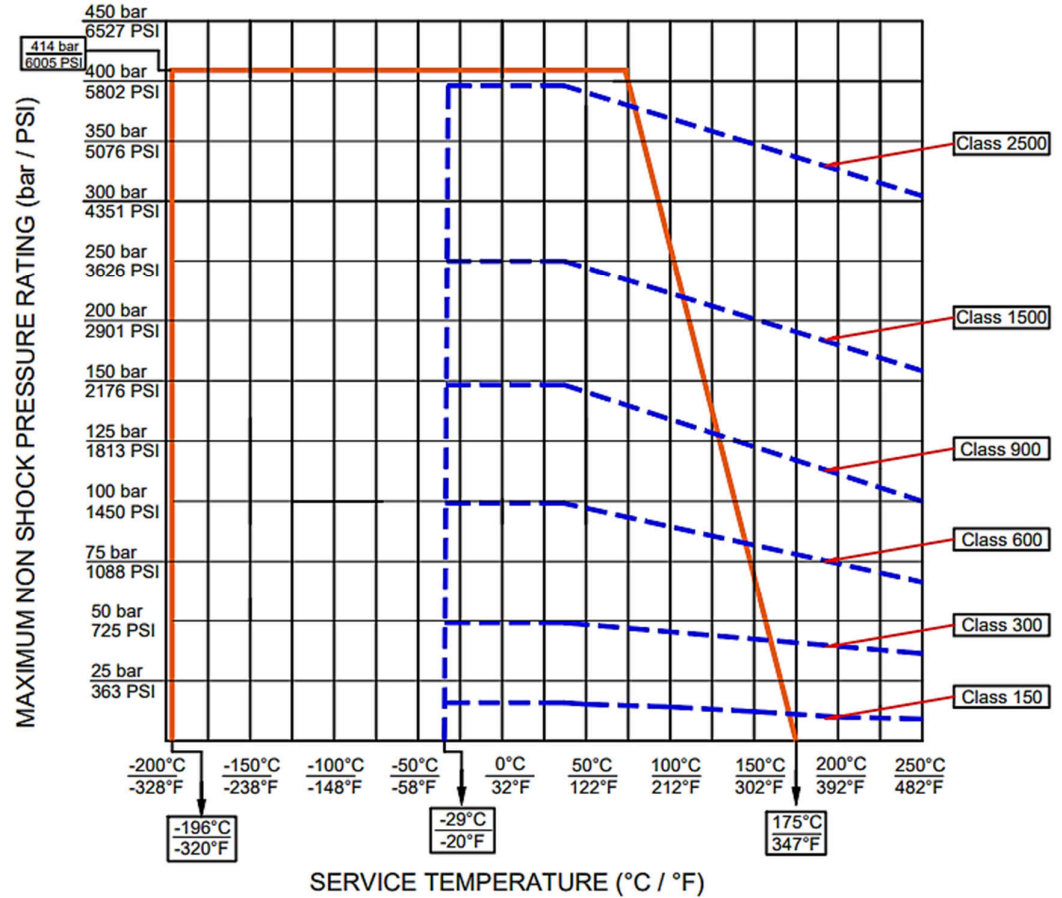
PRESSURE – TEMPERATURE RATINGS FOR FLOATING BALL VALVE SEAT MATERIALS



PRESSURE – TEMPERATURE RATINGS FOR TRUNNION MOUNTED BALL VALVE SEAT MATERIALS






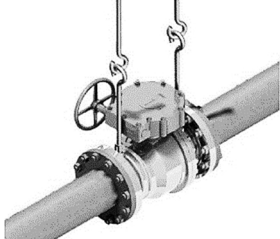




PCTFE

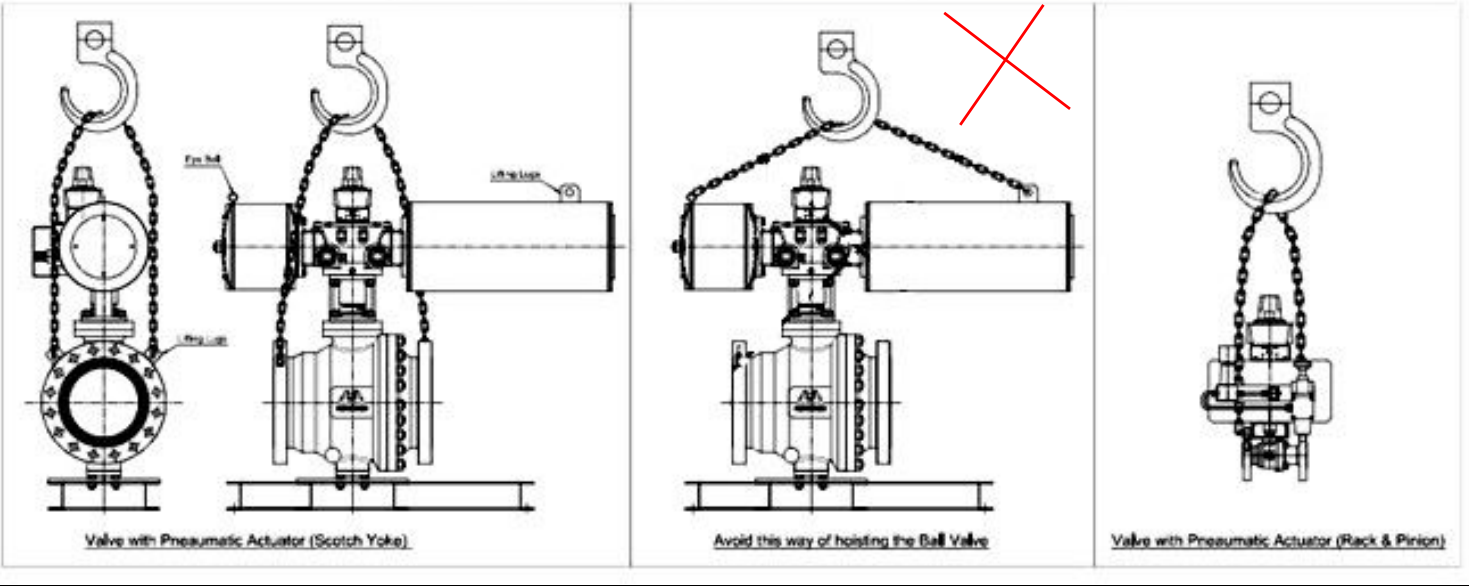


6.0 Lifting instructions

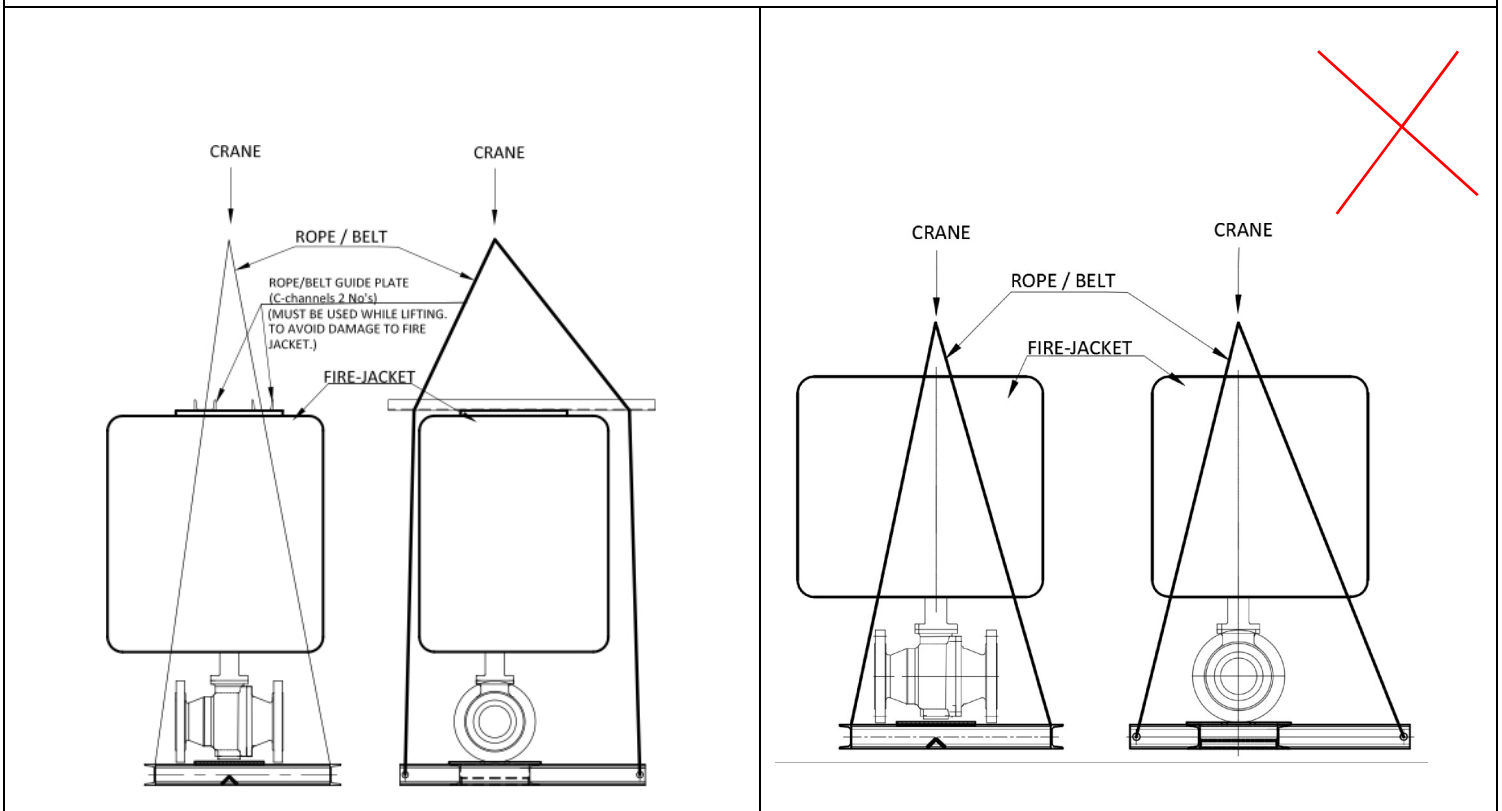
Lifting plates are provided for valve weighing 25KG and above unless otherwise specified by the customer. Lifting plates are verified for suitability through design calculations with respect to valve weight along with the operator assembly and accessories. Lifting sketches and handling instructions for safe lifting operation for valves weighing more than 25KG is as shown in the below figures. The safe working Limit (SWL) of each lifting point is marked on the lifting plate. Lifting plates are to be affixed to the valve flange for valves weighing 25KG and above by balancing with respect to center of gravity of the valve along with the valve accessories if any.

| | |
|---|---|
|  |  |
| <p>Way of Hosting the Ball Valve</p> | <p>Avoid this way of Hosting the Ball Valve</p> |
|  |  |
| <p>Way of Hosting the Ball Valve</p> | <p>Avoid this way of Hosting the Ball Valve</p> |
|  |  |
| <p>Valve ready for Disassembling supported on Platform</p> | <p>Way of supporting the Ball Valve</p> |
|  |  |
| <p>Way of supporting the Ball Valve</p> | <p>Way of supporting the Ball Valve</p> |

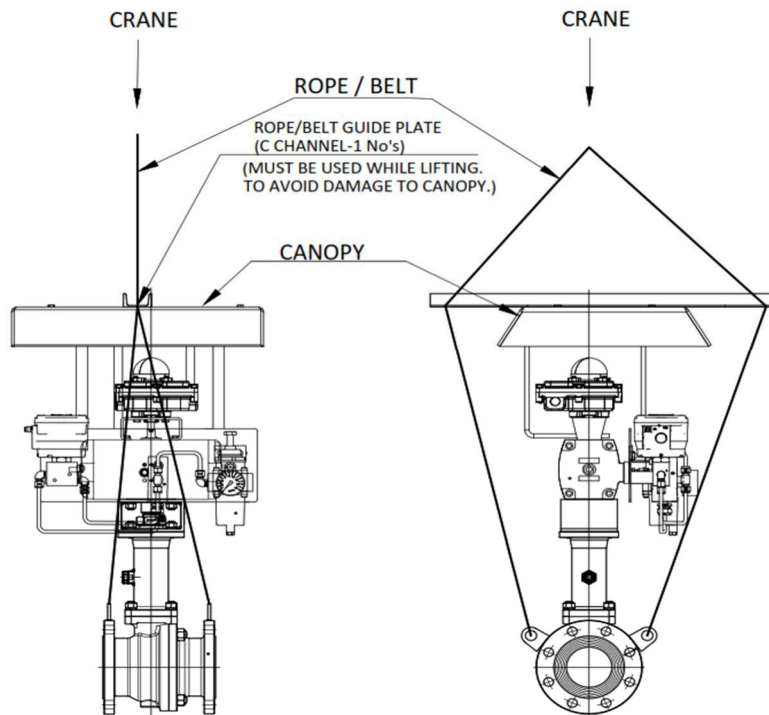
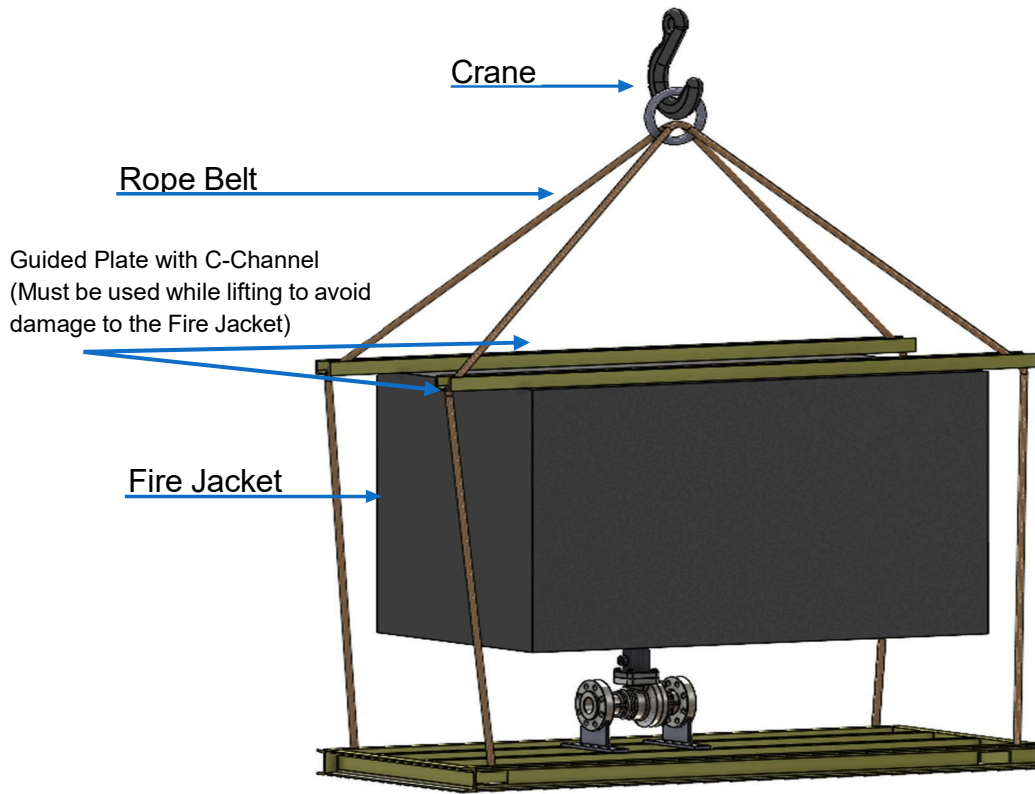
Method of Lifting for Actuated Ball Valves



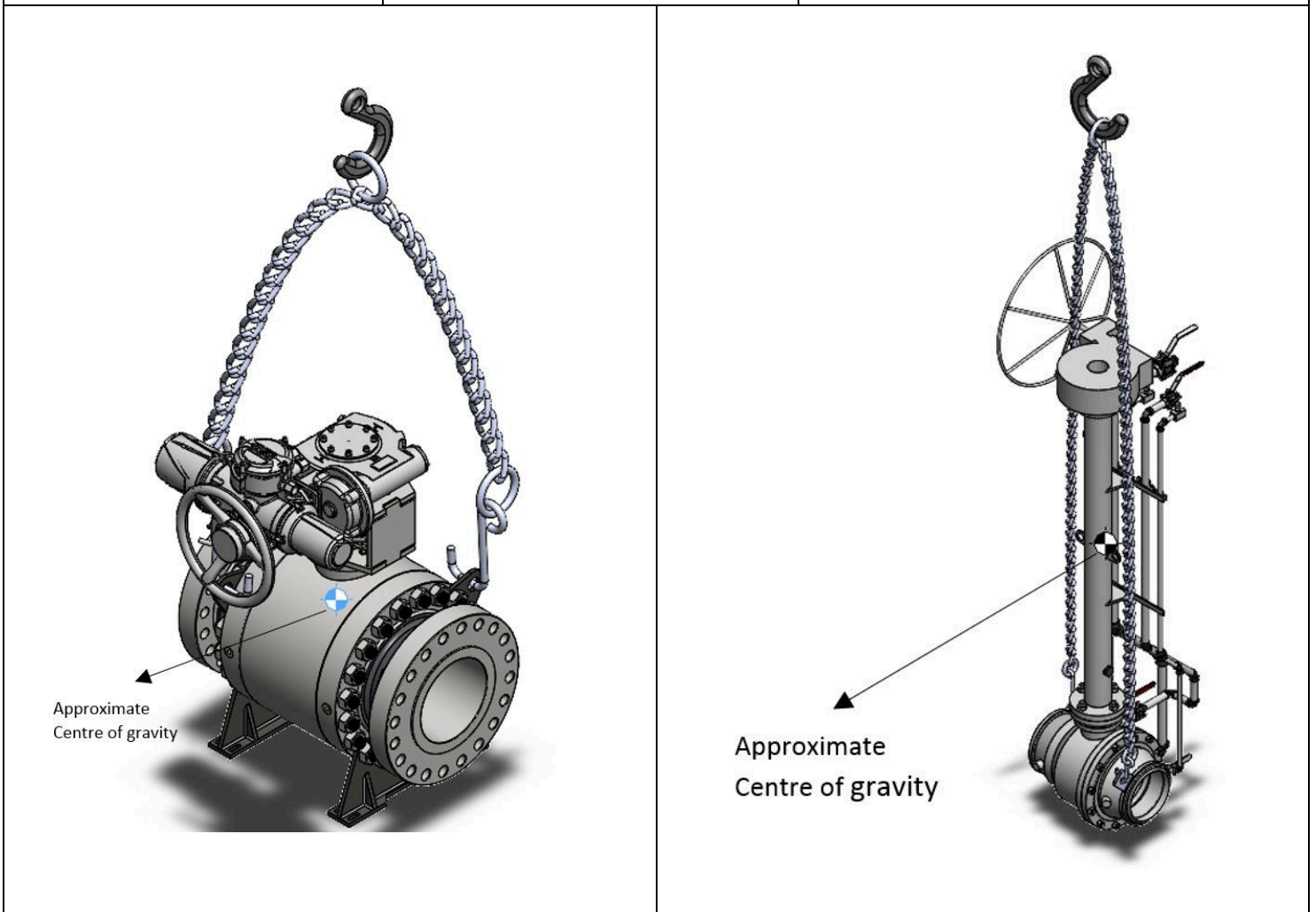
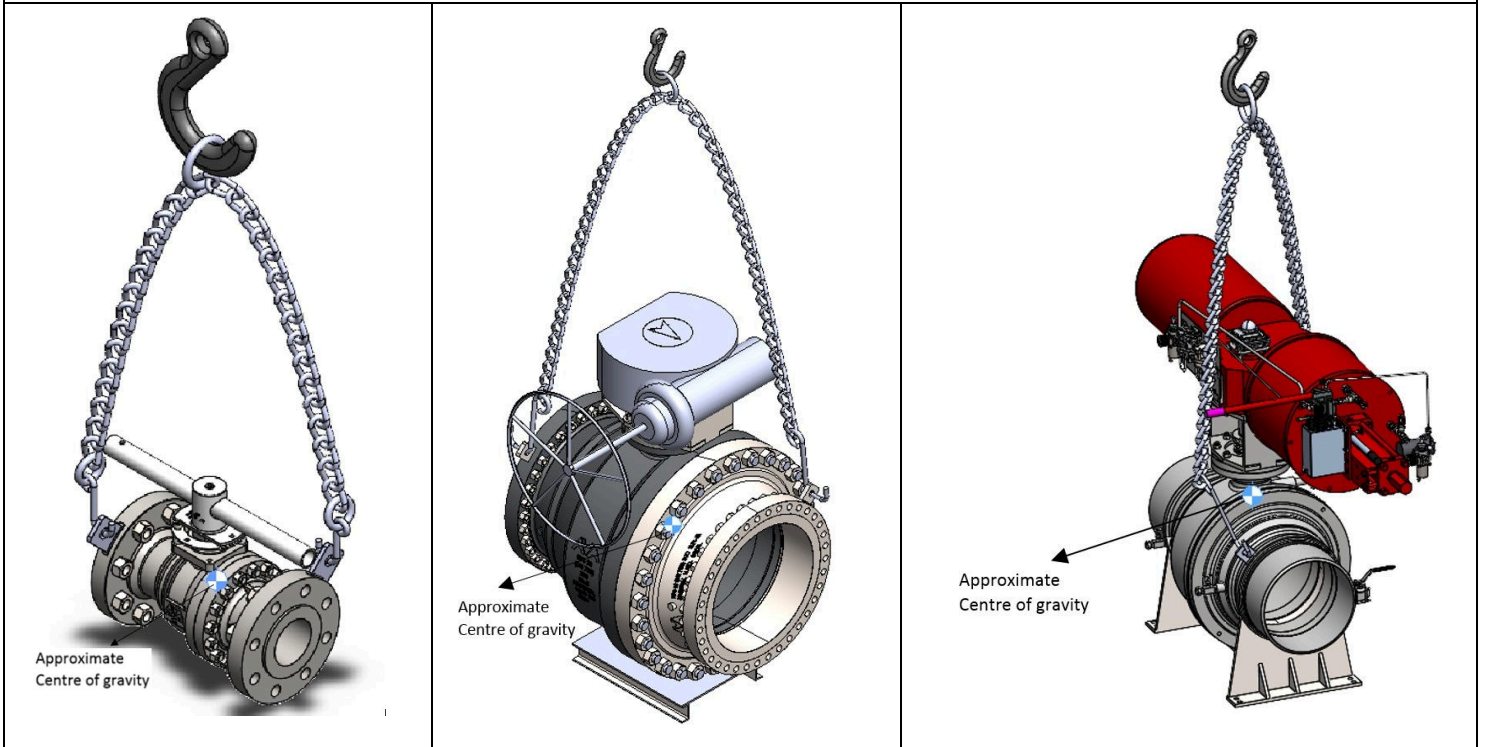
Method of Lifting for Fire Jacketed Ball Valves



Lifting arrangement for Fire Jacketed Ball Valves



Ball Valve lifting arrangements, Centre of gravity of valve with different operators



➤ **Instruction for lifting the valve assembly**

Valve shall be lifted using the lifting lugs provided on the valve. Eye bolts provided on the actuator shall not be used for lifting the entire valve – actuator assembly. Eye bolting actuator shall be used only for lifting the actuator during maintenance if any.

Along with the lifting lugs provided on the valve, eye bolts provided on the actuator may also be used for balancing if needed while lifting.

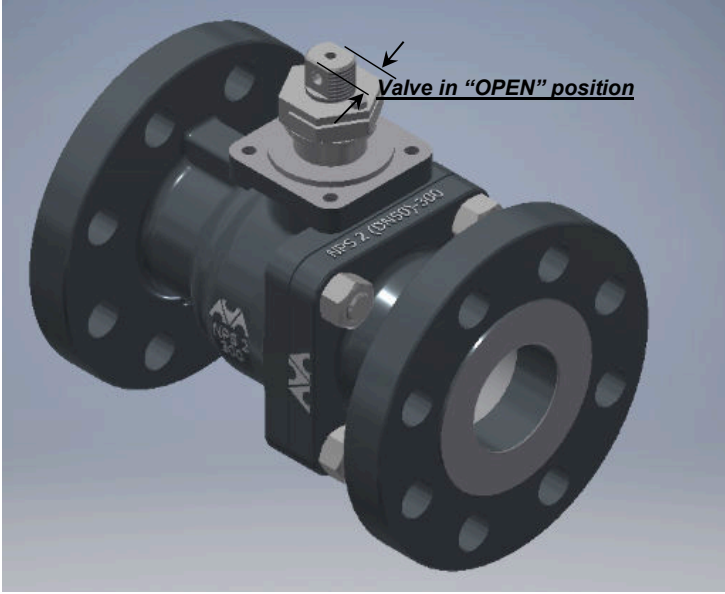
While lifting the valve assembly care should be taken to see that the tubing and accessories mounted on the valve and actuator are not damaged.

CAUTION: Please read the instructions carefully and completely before installation. Microfinish does not take responsibility for any kind of damage occurred due to mishandling the valve. Valve must be installed, used, repaired in accordance with the installation and operation instructions

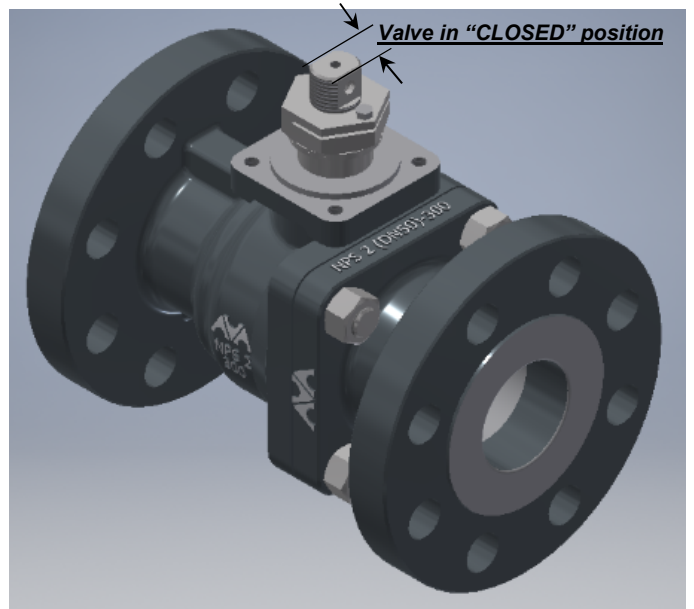
OPEN / CLOSE position indication for Ball Valve when Operator/Actuator removed

Ball Valve – Stem with flat head drive (Double “D”)

Valve is in OPEN Position when across flat portion at the top of the stem flat head drive is parallel to Flow Passage.

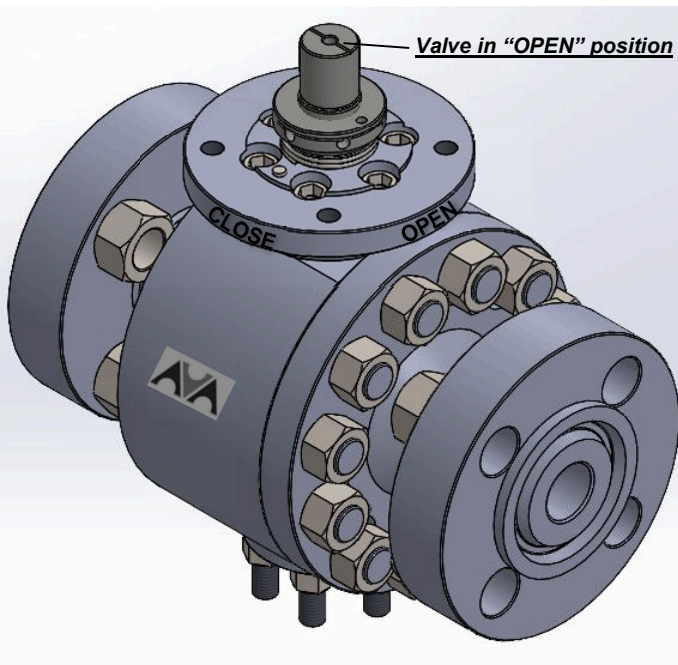


Valve is in CLOSED Position when across flat portion at the top of the stem flat head drive is perpendicular to Flow Passage.

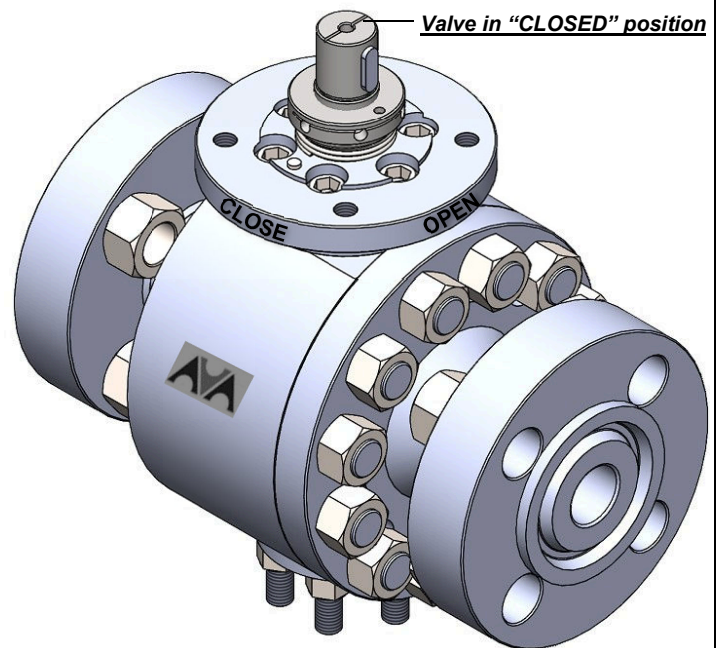


Ball Valve – Stem with Keys

Valve is in OPEN position when line mark at the top of stem is parallel to Flow Passage.



Valve is in CLOSED position when line mark at the top of stem is perpendicular to Flow Passage.



TROUBLESHOOTING

| Sl. No. | 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 'O' 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 'O' 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. 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 incase 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. 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 Ball in case of metal seated valves. 3. Insufficient air supply pressure incase of pneumatic operated valves | <p>Dismantle, Clean & Reassemble.</p> <p>Check for service condition/replace. 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 Sl.No.4</p> <p>Check for suitability.</p> <p>Replace the damaged spares & report accordingly.</p> |

NOTE: Page 29 not printed – (AMENDMENT HISTORY)

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