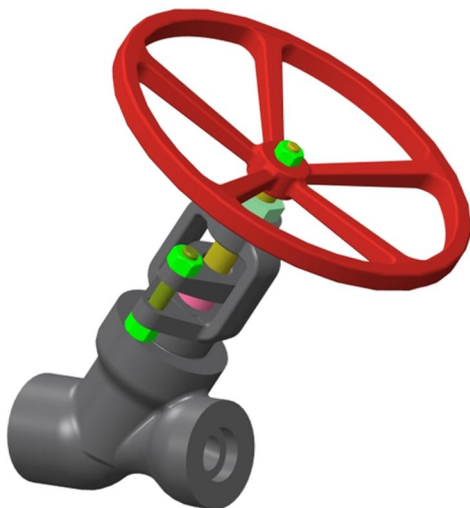
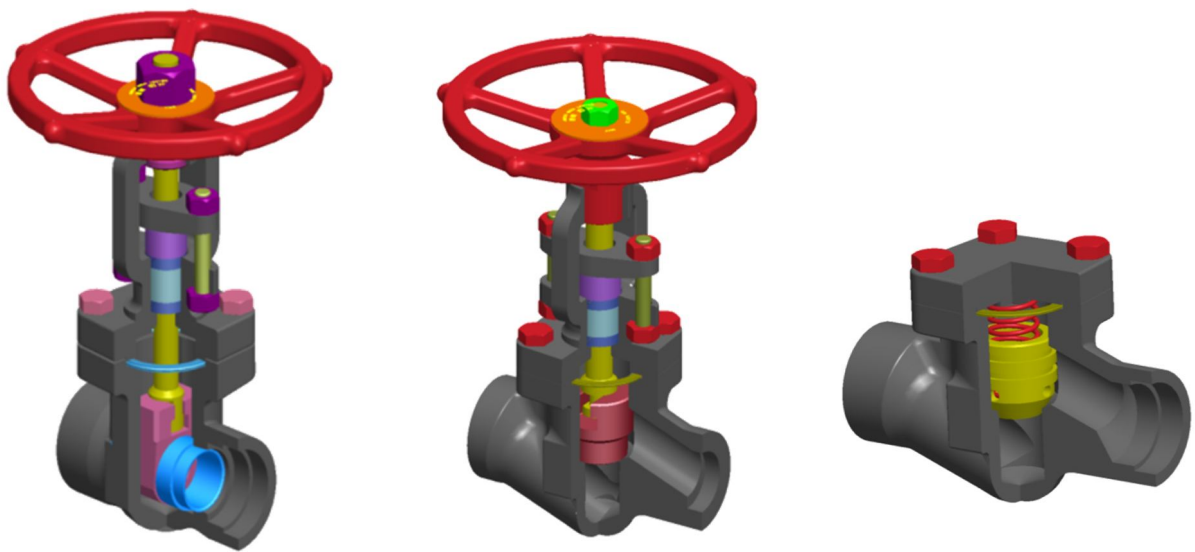


Installation, Operation and Maintenance Manual of Forged Steel Gate, Globe & Check Valves



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Note

This manual shall be read in conjunction with manual LTV-566, "Instruction, Operation and Maintenance Manual - Important Points".



L&T Valves

L&T Valves Limited (formerly Audco India Limited) is a wholly-owned subsidiary of L&T and one of the largest valve manufacturers in the world.

The company has three modern manufacturing facilities, in Chennai (Manapakkam), Coimbatore and Kancheepuram, in Tamil Nadu, India. The company leverages its world-class capabilities in design, quality assurance and manufacturing to ensure that their products consistently meet customer expectations.

Product Range:

- Gate, Globe & Check Valves
- Valves for Power
- Pipeline & Process Ball Valves
- Triple-offset Butterfly Valves
- Rubber lined Butterfly Valves
- Valves for Water Service
- Double Block & Bleed Valves
- Control Valves
- Customised Solutions

Designs for the valves are created by an experienced team of valve experts who have deep understanding of user-industry processes. Extensive manufacturing and quality assurance infrastructure ensure that world-class designs are transformed into high performance products. Every phase of manufacture is governed by an institutionalised environment, health and safety policy.

L&T Valves distribution network spans across the globe, partnering some of the largest valve distribution companies in the world. In India, L&T Valves has a presence in every industrial center through a network of offices, stockists, automation centers and service franchisees

Forged Steel Gate Valves

Gate valves are multi-turn valves with rising stem i.e. they required a number of turns of rotation of hand wheel for full closing or full opening of valve. All Gate valves shall be used only in full open or full close position. If used in slight or half open position, the gate may vibrate/chatter and also cause wire drawing at the seating area. Therefore Gate valves shall not be used for flow regulation.

All valves close by rotating the hand wheel clockwise and open by rotating counter-clockwise.

For hand wheel operated valves the projection of stem above the hand wheel indicates whether the valve is in open or close position.

The valve is closed by driving the disc down into the corresponding taper in the body. The disc and body seat rings are matched and lapped for perfect sealing. When the valve is fully open the stem back seats in the bonnet .

Range

| Size | Pressure Rating |
|----------------|-----------------|
| 15 mm to 50 mm | Class 150 |
| 15 mm to 50 mm | Class 300 |
| 15 mm to 50 mm | Class 600 |
| 8 mm to 50 mm | Class 800 |
| 15 mm to 50 mm | Class 1500 |
| 15 mm to 50 mm | Class 2500 |

Forged Steel Globe Valves

Globe valves can be installed either with flow over or under the disc as influenced by the service condition. However, when used in hot services (including drain lines) Globe valves must be installed with flow over the disc to avoid unseating caused by differential thermal expansion resulting in leakage and consequent wire drawing.

However, in lines where continuous flow is desired, it is safer to have pressure under the disc. For example, a disc may become separated from its stem and automatically shut-off flow if pressure is above the disc. If this is not acceptable for certain installation, then the pressure should be under the disc.

Range

| Size | Pressure Rating |
|----------------|-----------------|
| 15 mm to 50 mm | Class 150 |
| 15 mm to 50 mm | Class 300 |
| 15 mm to 50 mm | Class 600 |
| 8 mm to 50 mm | Class 800 |
| 10 mm to 65 mm | Class 1500 |
| 10 mm to 65 mm | Class 2500 |
| 10 mm to 50 mm | Class 4500 |

Forged Steel Lift Check Valves

Lift Check Valves automatically open by velocity pressure of the flow and close by the gravitational force when the flow reverse or stops.

Range

| Size | Pressure Rating |
|----------------|-----------------|
| 15 mm to 50 mm | Class 150 |
| 15 mm to 50 mm | Class 300 |
| 15 mm to 50 mm | Class 600 |
| 8 mm to 50 mm | Class 900 |
| 10 mm to 65 mm | Class 1500 |
| 10 mm to 65 mm | Class 2500 |
| 10 mm to 50 mm | Class 4500 |

Exploded Views

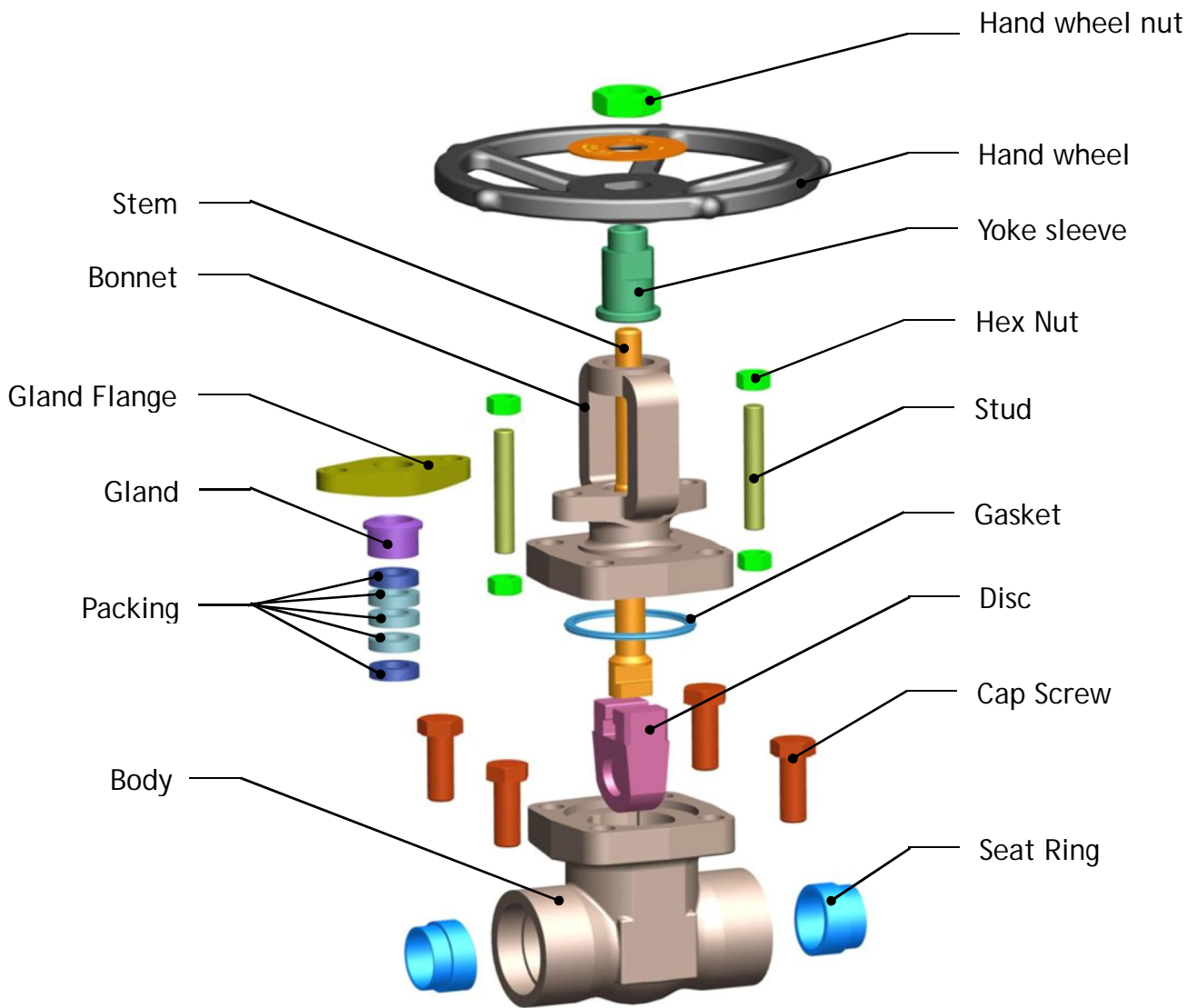


Fig. 1 Forged steel Gate Valve

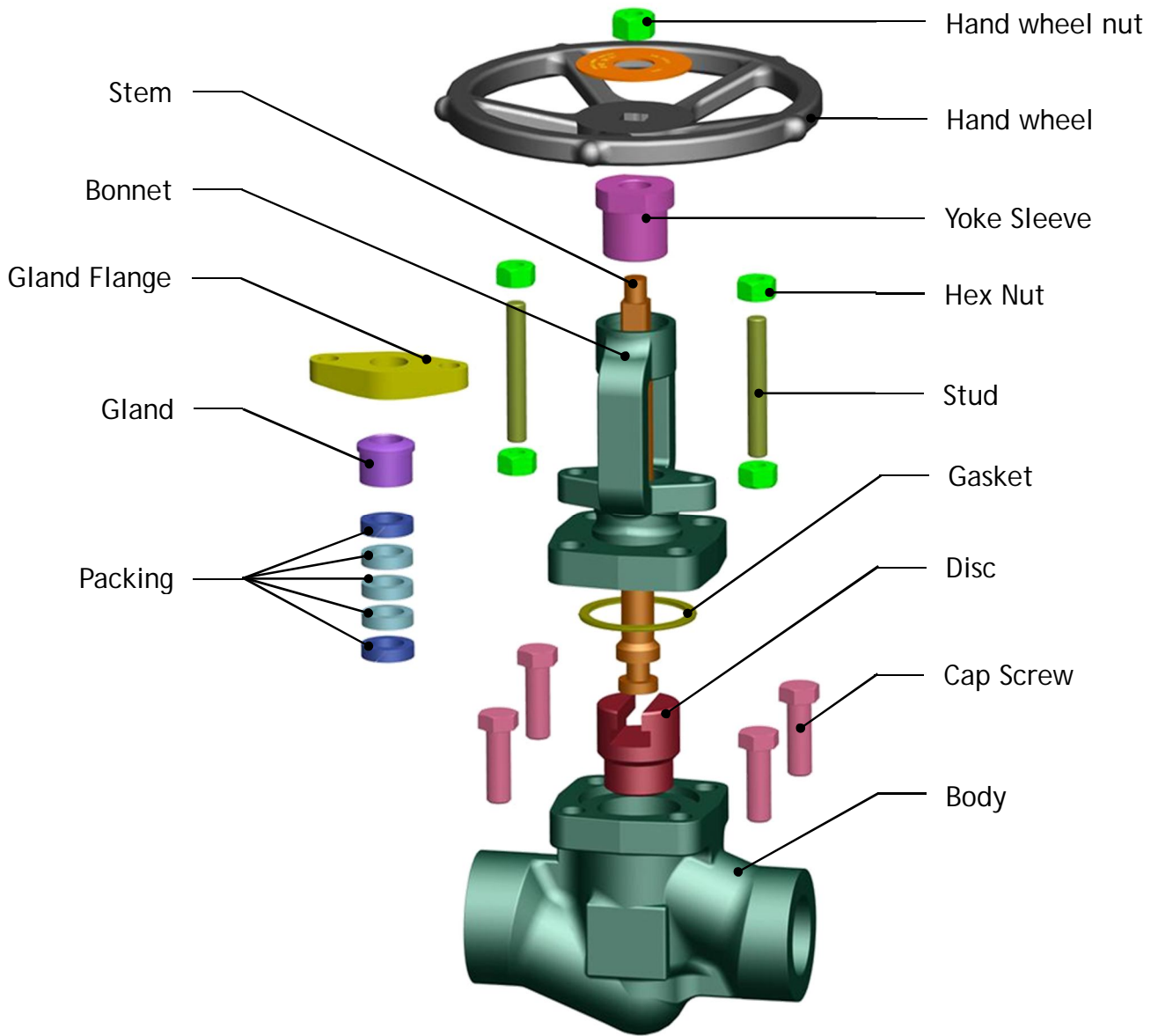


Fig. 2 Forged steel Globe Valve

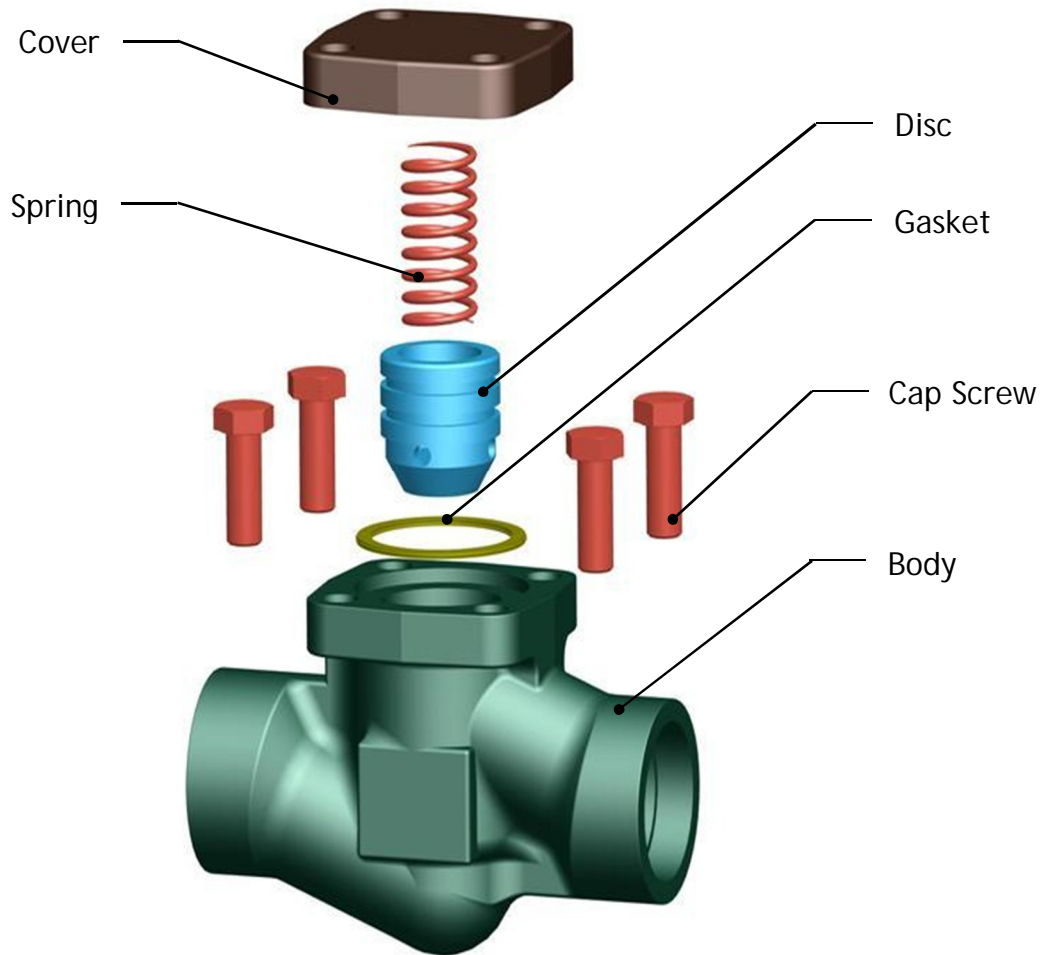


Fig. 3 Forged Steel Lift Check Valve

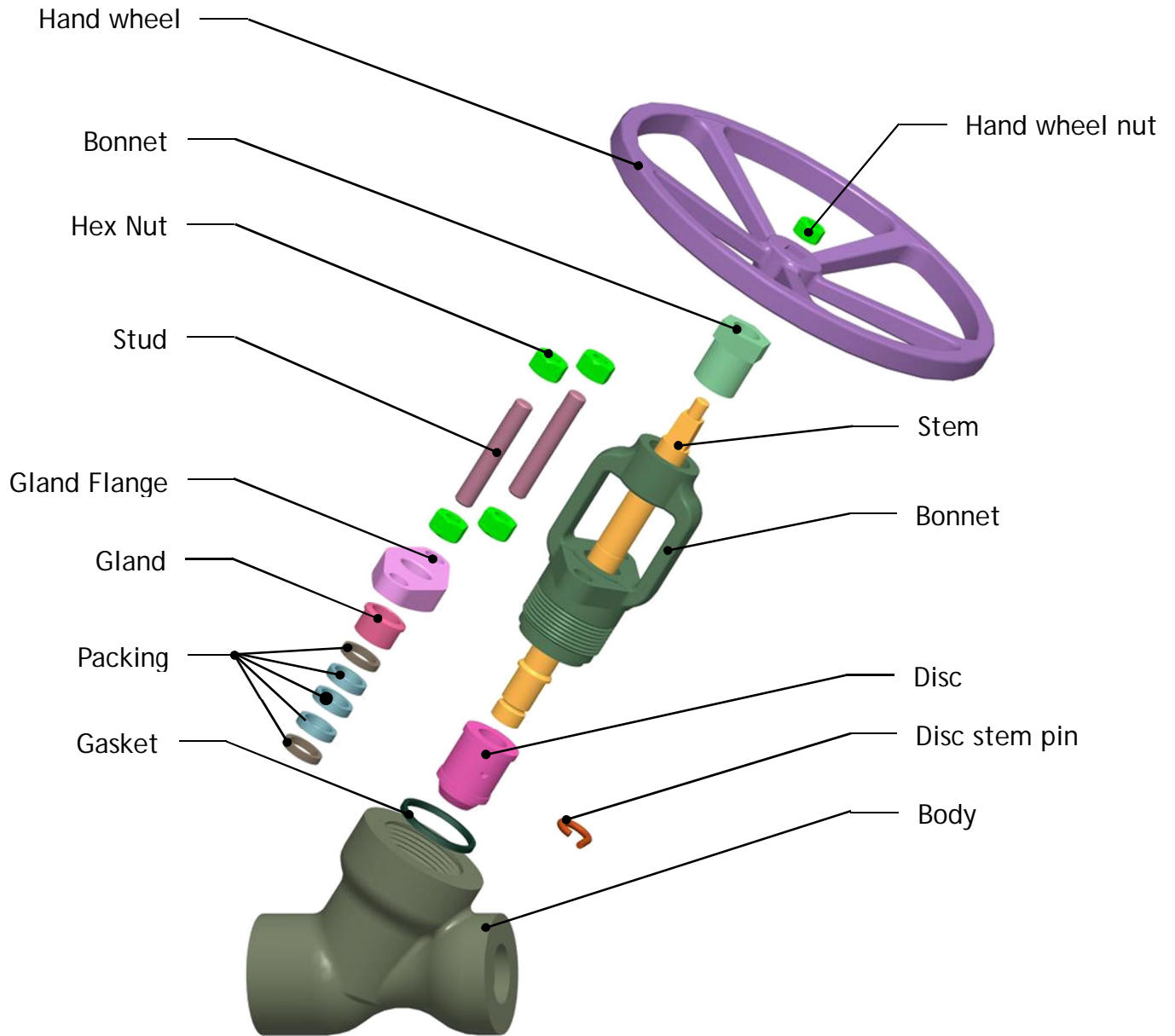


Fig. 4 Forged steel Y Pattern Globe Valve

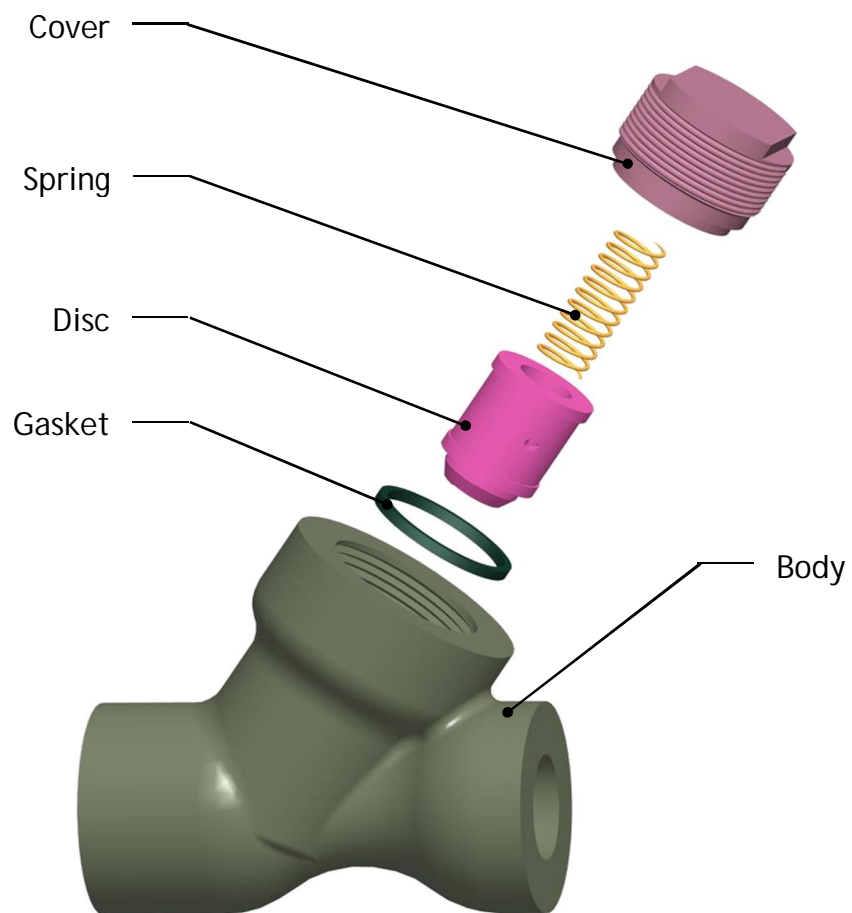


Fig. 5 Forged steel Y Pattern Check Valve

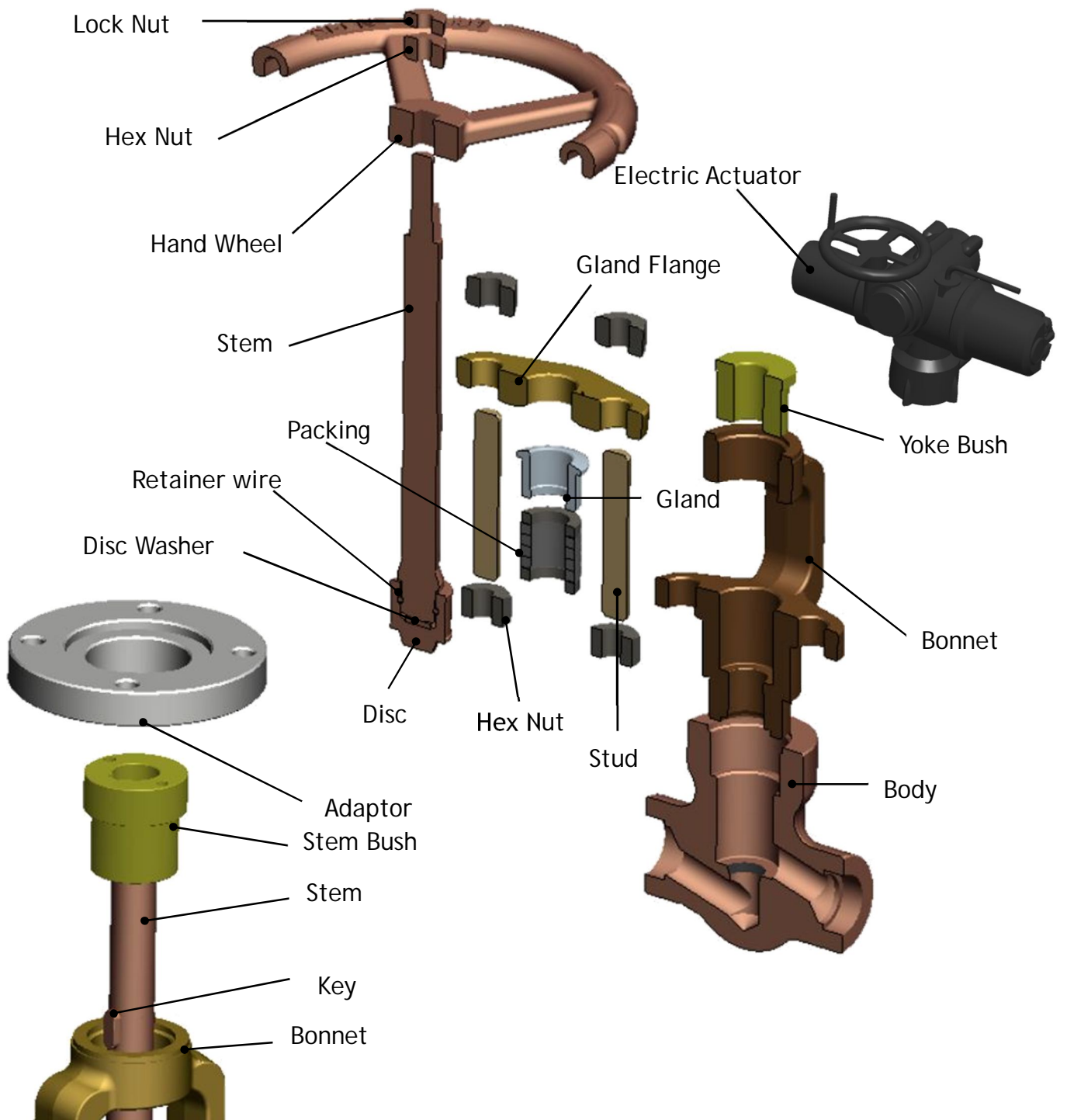


Fig.6 Forged Steel T-Globe Valve

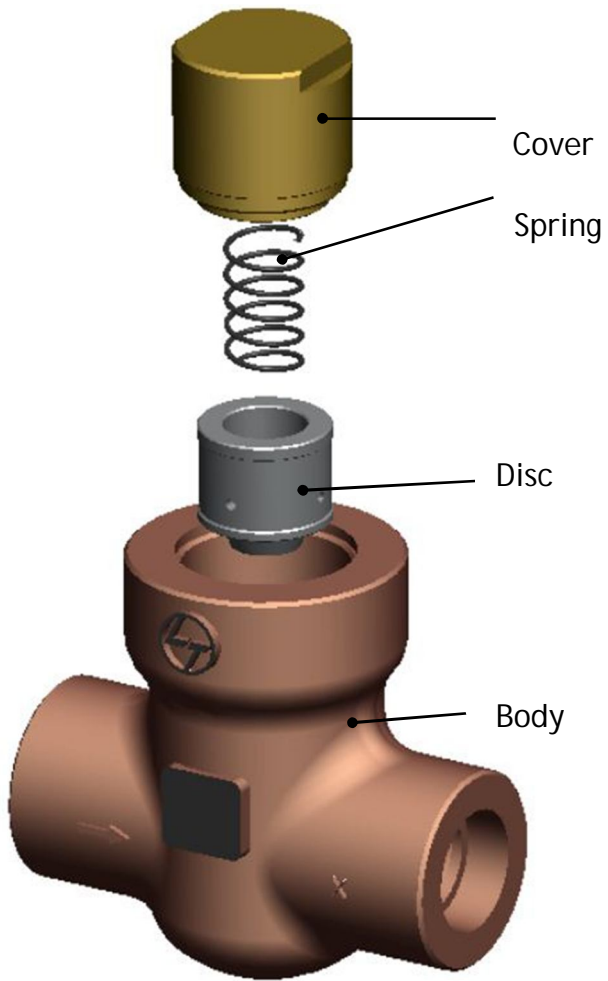


Fig.7 Forged Steel Lift Check Valve

Shipment

Orientation of the valve in the packing may be either horizontal or vertical depending on the shipped valve dimensions. Please check the packing slip attached to the container before opening the same. The valves and accessories shall be examined for any damages that might have happened during transportation and handling.

Valve identification details can be found on the identification plate and on the body of the valve. Typical identification plates are shown in Fig. 8, 9, 10, 11 & 12.

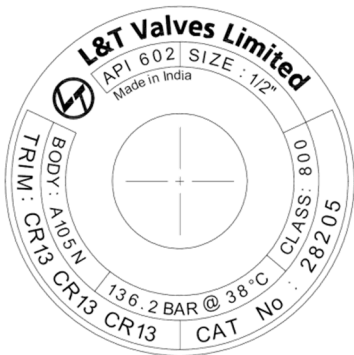


Fig. 8 Identification Plate FS Gate Valve

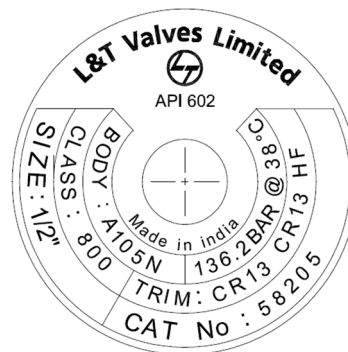


Fig. 9 Identification Plate FS Globe Valve

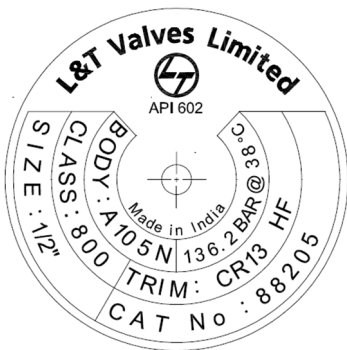


Fig. 10 Identification Plate FS Check Valve

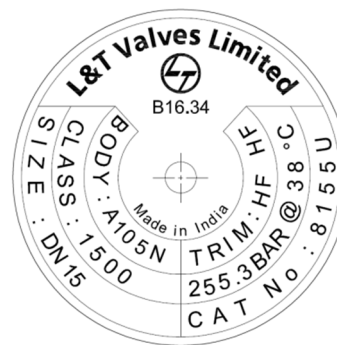


Fig. 11 Identification Plate FS Y-Check Valve

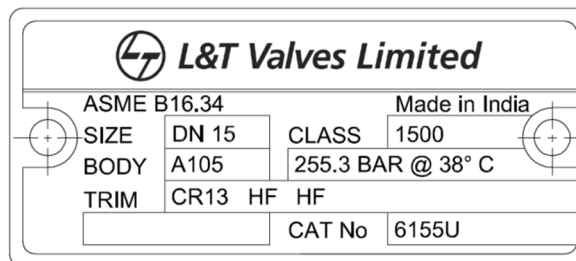


Fig. 12 Identification Plate FS Y-Globe Valve

Valves are provided with end protectors for avoiding damage to internals.

Note:

Refer Appendix B for valves with CE & ATEX certification requirements.

Handling and Storage

Handling

Valve shall be properly supported and secured before moving, to prevent possible damage to valve, property or harm to personnel.

Do not drag the valve on the ground while transporting. A minimum of one foot height from the ground is to be maintained while moving the valve.

Valve shall not be slung around the valve port for transportation. For large size valves lifting lugs are provided for this purpose.

The crane wire shall not be slung around the actuator to avoid any load acting on it. Also, ensure that the while handling the valve, no external load acts on the actuator.

Valves shall not be handled with the hand wheel keyed. The hand wheel shall be dismantled before handling and transporting the valve.

Storage

Valves shall be stored in covered area which is dust free, least humid and well ventilated. Ensure that the end protectors are in place before the valve is stored, as dry contaminants like dust, sand, grit etc. can scratch metal seating surfaces and the soft parts, leading to leakage during operation.

If the valve end protectors are opened for any check or testing, the same preservation and protection shall be done after the check or testing.

The valve shall always be maintained in an ambience with temperature higher than the dew point temperature at the storage location, so as to avoid collection of water droplets on the valve surface.

Do not keep the valve directly on the floor. Valve shall be placed on wooden pallet such that it is at least at a height of 6 inch from the floor.

Care shall be exercised not to damage the extended portion of the adaptor, actuator while storage.

Do not apply tar, grease or any other material inside the valve, as it could impair the performance of the valve.

Improper storage and /or handling may cause disc/seal damage or deformation of shaft or seat, which will affect sealing and operational performance of the valve.

Planning & Responsibilities

When installing or maintaining valves

- Conduct a risk assessment and eliminate or reduce hazards to an acceptable level.
- Work in accordance with safe systems of work site.
- Observe all site health and safety rules.
- Wear all necessary personal protective equipment.
- Never use a valve on a duty which exceeds its prescribed operating parameters. Refer to L&T Valves for further information.
- The valve shall not be subjected to frequently occurring disturbances.
- End user to ensure there are no external disturbances (e.g. Shocks, vibrations, electromagnetic fields etc.).
- Misuse of valves / valve components shall be avoided.
- Maximum surface temperature of the equipment will be same as the line media temperature. The end user must take account of the line media temperature.
- If the processes or environment that the valves are used in are likely to cause temperatures (high or low) that may cause injury to personnel if touched, then adequate insulation / protection must be fitted.
- Adequate safety measures shall be made for valves similar to pipe lines.
- Due to variety of duties in which these valves can be employed, it is the end user's responsibility to ensure the compatibility of media with the material of construction of the product for each specific application (i.e. corrosion and erosion which may affect integrity of the pressure containing envelope).
- Before valves are installed in areas which may be subject to seismic activity or extreme climatic conditions, consult L&T Valves with data.
- All exposed parts shall be cleaned to prevent dust deposit or insulation is needed similar to pipe line.
- Valves shall be protected by other devices to prevent over-pressurisation. (i.e., caused by temperature, fire etc.).

Valve Installation

General

Carefully unpack the valve and check for identification plates or tags etc.

- It is recommended to install Gate and Globe valves with stem vertical up. For other orientations of stem, consult factory.
- The performance of the valve will be better if the flow is smooth. It is suggested to avoid installation of valves where turbulence is expected (Example: Immediate after elbows, bends, pumps etc.)
- It is recommended to install check valves at a distance equal to 10 times or more the pipe diameter from the upstream elbows for better performance.
- If the identification plate / arrow plate / tag is lost or destroyed during the shipment or while in storage or if it is not legible, contact your distributor or L&T Valves.
- Look for any special warning tags or plate attached to or accompanying the valve and if any, take appropriate action.
- Some of the valves may be uni-directional, it shall be ensured that the valves are installed in the direction as marked in the body (Example: Check valves, Gate valves with cavity relief hole in disc, Cryogenic gate valves etc.).
- It is recommended to remove all foreign particles from the pipe line by flushing it with a suitable fluid. Corrosion inhibitors shall be added to the flushing medium to prevent any corrosion due to trapped fluids.
- Remove the end protectors and protective sheath within the flow bore valve, wherever provided.
- Gasket contact faces of the valve and pipe flanges shall be inspected thoroughly for scratches / defects. Scratches, if any, shall be corrected by grinding the surfaces or by rubbing with emery sheet.
- After cleaning, operate the valve for at least two complete cycles before installing.
- Ensure that the valve is in fully closed position during installation
- The pipes/flanges shall be properly aligned and provisions made to minimize stresses from external load/thermal expansion. Always review pipe manufacturer's recommendation.
- In case of pipes with long overhangs, adequate support/jacks shall be provided at the flange ends of the pipe so as to avoid bending of pipes due to weight of the valve.
- The fasteners on the valves might have loosened or relaxed during transportation or long storage. It is highly recommended that all fasteners (Body-bonnet/cover joint, yoke, gland, actuator) shall be retightened to the required torque provided in appendix A.

The improper alignment of the pipe and the valve during installation can lead to unbalanced tightening of the flanges which may cause excessive stress on the flanges and bolts and lead to leakage.

Screwed Ends

- Refer Appendix A1 for applicable standards
- Check the threads on both the valve and the mating pipe for thread form and cleanliness. Check for any indication of an impact that might have deformed the thread either out-of-round or by a local indentation. Ensure no chips or grit is present.
- Threaded pipe joints depend on a good fit between the external and internal pipe threads for tight sealing. Apply an appropriate thread tape or thread compound to the external pipe threads except when dry seal threading is specified. Avoid getting the thread tape or thread compound into the internal flow area.

Because there is no clear limit on the torque that may be developed in a tapered thread joint, it is possible to damage the valves or piping by applying excessive twisting forces through the body of the valve. If at all possible a wrench should be used on the same end of the valve to which the pipe is being threaded into.

Socket and Butt welding Ends

- The valves provided with socket-welding ends preparation are as per standard ASME B16.11 or as per customer requirements. Please refer to the general assembly drawings for the exact socket-welding ends dimensions.
- The valves provided with butt-welding ends preparation are as per standard ASME B16.25 or as per customer requirements. Please refer to the general assembly drawings for the exact butt-welding ends dimensions.
- When welding socket weld end valves, be sure to leave 1.6 mm gap between end of pipe and bottom of valve socket.
- The welding of valves onto the pipeline shall be performed by qualified welders using qualified procedures.
- Valves shall be kept in the closed position during welding.
- As the valves are of small size and the sealing surfaces are close to the weld ends, care shall be taken to ensure that there is no excessive heat input/ temperature increase
- Care shall be taken to avoid weld spatter from falling onto the seating surfaces to prevent damage and maintain sealing effect between the metallic contacts.
- Local post weld heat treatment (PWHT) on the weld and heat affected zone (HAZ) shall be carried out if required by the procedure.
- It is recommended that the pipeline be flushed again after welding to avoid damage to disc and seat(s). The valve shall be kept fully open during flushing.
- After flushing is completed, operate the valve three times and ensure that it is smooth. It is recommended to carry out pressure testing of the joints.

Flanged Ends

- Refer Appendix A1 for applicable standards
- Clean valve flanges and companion flanges and remove protective grease from the valve flanges. Clean the valve interiors adjacent piping prior to mounting of the valve pipe joint.
- Align the bolt holes of the valve end flange and pipe flange.
- Fasteners shall be lubricated for ease of installation
- Insert the gasket (not supplied with valve) and tighten the fasteners. Flange fasteners shall be tightened evenly. Using suitable device, in cross rotation to prevent damage to the flange.
- For sequence of tightening fasteners, refer Appendix A2

If valve is not cleaned or if cleaning is done after valve installation, cavities may form a natural trap in the piping system. Any impurity not dissolved or washed out by the flushing fluid/line fluid may settle in such cavities and adversely affect valve performance.

Valve Operation

General

- Operational life of the valve can be maximized if the valve is used within the rated range, in accordance with design parameters.
- For understanding the internal construction refer to the catalogue and general assembly drawing of the valve.

Operation Mechanism

Gate and Globe valve opening/closing is achieved using Hand wheel / Electrical/ Hydraulic/ Pneumatic Actuator.

Hand wheel

Hand wheel are provided on valves for easier operation. Clockwise operation is for closing and anti-clockwise for opening of the valve (Fig. 13).

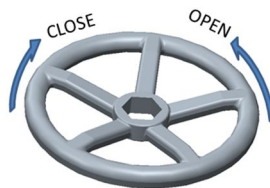


Fig. 13

Forcing the hand wheel, Chain wheel against the stops will not provide tighter shutoff of the valve and may damage the valve.

Electric Actuator

It gives multi-turn output and is directly mounted on valve. The actuator drives the stem nut and because of this Gate / Globe valve stem travels linearly. Electrically actuated valves are provided with declutching mechanism for manual operation of the valve. For electric actuators, L&T Valves recommends to strictly adhere to the instructions as per actuator's manual. Actuator settings are done at factory and normally resetting at site will not be required.

In Gate and Globe valves, electrically actuated valves shall be set as below:

Open : Position

Close : Torque

Pneumatic / Hydraulic Actuator

Pneumatic/hydraulic actuators are fitted directly on the valve. It is recommended to strictly adhere to the instructions as per actuator manual.

In case, valves are supplied as bare stem, as per customer requirement, ensure that connecting devices for actuators do not exert any axial or radial loads on the valve stem, as it may lead to bending of the stem and excessive loading on the disc. This in turn can cause the torque to increase and may lead to problem in valve operation

Do's

Before taking valve for erection, make sure that is cleaned properly from inside and outside and there are no foreign particles or metallic chips sticking on to sealing element.

While installing the operating mechanism, make sure that the valve is in fully closed position.

Make sure to remove the entire rust preventive on the machined surface in the flow area before a valve is put in the pipe line.

Carefully read the identification plate details and install the valve in the right place and for the correct duty conditions for which it is designed and manufactured. Gate with pressure relief arrangement, Globe and Check valves have preferred sealing direction marked by an arrow on the valve body beneath the identification plate.

Make sure to supply rated voltage and frequency to the electrical actuator.

Don'ts

Do not lift the valve by the hand wheel, actuator or bypass arrangement.

DO NOT use the lifting points located on the actuator, if any, to lift the valve. These lifting points are for the actuator only.

DO NOT over-tighten packing gland nuts. Over-tightening will increase the torque required to operate the valve.

DO NOT use impacting devices to tighten up the bolting on the body/bonnet (cover). Use suitable mechanical devices for tightening.

Do not tighten the body/bonnet nuts when the disc is in the fully closed position.

DO NOT keep the Gate valves in partial open condition to regulate flow.

Maintenance

Introduction

For enhanced life of the valve and better operability, it is recommended to do a periodic inspection and maintenance of the valves as per the procedure explained below:

The frequency of observation depends on its application. L&T Valves recommends that valve shall be inspected every 50 cycles or three months (whichever earlier) for smooth operation and leak free performance. This is recommended even for stored valves also. It is advisable to maintain a record of the performance of the valve.

Safety Procedure

Always depressurize the pipeline when taking up any maintenance activity on the valve/ actuator. Always disconnect the electrical supply to the electrical actuator before carrying out any maintenance activity on the valve/actuator.

Study carefully and understand the instructions outlined in the installation, operation & maintenance manual of the valve & actuator before taking up any maintenance.

Routine Maintenance

The following activities can be carried out during the routine maintenance of the valves.

1. Gland Leak

Check the tightness of the gland eye bolts and tighten evenly if required. If the leak persists, the packing shall be renewed. The pipeline shall be shut off so that there is no pressure inside the valve before the gland eye bolts are loosened.

Caution: Do not replace gland packing when the line is under pressure. Most of the packing rings are already cut so that they can be inserted around the stem. In case of solid moulded packing like graphite rings, use a sharp knife and cut the rings at 30° angle. Then slightly twist the ring and insert it around the stem. Do not open up the ring as it could break.

2. Body Bonnet/Cover joint leak

Check the tightness of the bolting and tighten the bolts at the vicinity of the leak. If the leak still persists, renew the gasket. The section of the pipe shall be shut off to ensure no pressure is trapped in the line, before dismantling the bonnet. Spirally wound stainless steel with graphite filler gaskets is used.

3. Lubrication

Grease the stem threads and Yoke sleeve in Gate and Globe valves regularly (Grease: Copper gel or equivalent).

4. Hot Torque

For the valves which are used at high temperature application, it is recommended to retighten the flange bolts after one month of operation to avoid the leak through joints.

Dismantling and Assembly Procedure

Dismantling Procedure

- All valves are designed to permit inspection without removing the body from the pipeline. The section of the pipe shall be shut off to ensure no pressure is trapped in the line, before dismantling the valve for inspection.
- Gate and Globe valves can be inspected by removing the bonnet assembly. However, the valves shall be kept in fully open or partially open position to relieve body cavity pressure before removing the bonnet assembly.
- Check valves can be inspected by removing the cover assembly.
- In case of Check valve, there is no stem and hence only the cover is to be removed. The disc is inside the body. For ease of illustration only the word bonnet is used below in the dismantling and reassembly procedure. This may be changed to read as cover with respect to Check valves.
- Keep the valve in mid position and remove the hand wheel / actuator from the top of the valve (Fig. 14).
- Loosen the body-bonnet bolting and remove the cap screw.
- Lift the bonnet assembly including stem and disc out of the body (Fig. 15). Care shall be taken not to drop the gate/disc while lifting out.
- Mark the matching surfaces of the gate and body seat rings of Gate valves so that they are not interchanged during assembly.
- Remove the bonnet gasket.
- Carry out the required replacement of the parts and reassemble the valve with new parts
- For actuator orientation change, refer Appendix A3.

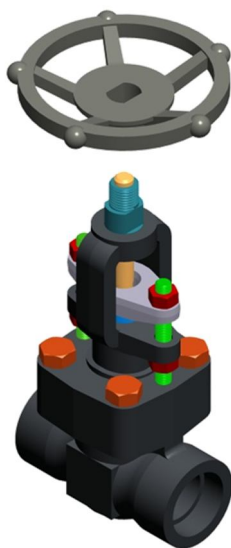


Fig. 14

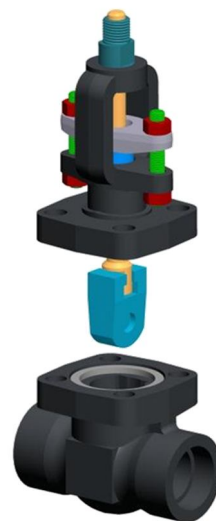


Fig. 15

Assembly Procedure

- Place the gasket on body correctly. It is recommended to use fresh gasket.
- Lower the bonnet assembly including the disc smoothly into the body, keeping the disc in open position. Remember to match the marking done earlier on disc and body seat rings.
- A blue bearing test will confirm if there is a uniform contact between disc and body seat rings.
- If required replace the gland packing, tighten the bolt as per torque given in Table 2.
- Fit the bonnet studs and tighten the nuts as per torque figures shown in Table 1, evenly working at diagonally opposite pairs. Do not over tighten as the gasket may get damaged.
- Assemble the Hand wheel.
- Operate the valve from fully closed to fully open position manually and ensure smooth operation.

Troubleshooting

| Problem | Reason | Action |
|--------------------------------------|------------------------------|----------------------------------|
| Valve Leaking | Valve not closed fully | Re-tighten the handwheel |
| | Valve seating damage | Dismantle and lap the seating |
| Leakage through Gland | Packing loosened | Tighten the gland |
| | Packing worn out | Replace the packing |
| Leakage through Bonnet / Cover joint | Bonnet / Cover bolting loose | Tighten the bolting |
| | Gasket damage | Dismantle and replace the gasket |
| Not closing fully | Debris inside the valve | Clean the pipeline |

Appendix A

A1 - References

Face to Face Dimensions

ASME B16.10 Face-to-Face and End-to-End Dimensions of Valves

End Connections

ASME B16.5 Pipe Flanges and Flange Fittings (NPS ½ through NPS 24)

ASME B16.11 Forged Fittings, Socket-Welding and Threaded ends.

ASME B16.25 Buttwelding ends

ASME B1.20.1 Pipe thread, general purpose

Testing Standard

API 598 Valve Inspection and Testing

EN12266 PART-1 Industrial Valves - Testing Of Valve

A2 - Tightening Sequence & Torque

The tightening sequence for all possible number of bolting, the logic to be followed is explained below:

- Tighten the first four nuts in the sequence shown Fig.16. This helps in correct location of the mating parts.
- Ensure that the recommended torque (refer Table1 & 2) is maintained in all bolting.

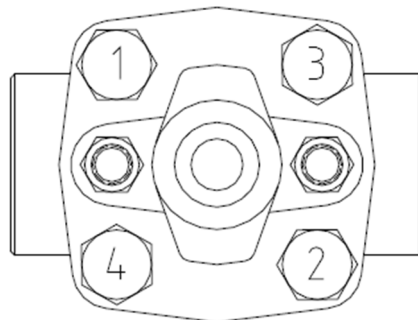


Fig. 16 Sequence of Tightening

Table 1 Tightening Torque

| THREAD SIZE, inch-TPI | TORQUE, Nm | | |
|--------------------------|--|--|-----------------|
| | B7/B7M/B16/L7/L7M/ L43/660 CI.A/UNS N07718/UNS 09925 | B8 CI.2/B8C CI.2/ B8M CI.2/B8T CI.2/ XM-19 | UNS N06625 Gr 1 |
| 1/4-20 UNC | 7 | 7 | 5 |
| 5/16-18 UNC | 15 | 15 | 10 |
| 3/8-16 UNC | 25 | 25 | 15 |
| 7/16-14 UNC | 40 | 40 | 25 |
| 1/2-13 UNC | 60 | 60 | 40 |
| 9/16-12 UNC | 90 | 90 | 60 |
| 5/8-11 UNC | 120 | 120 | 80 |
| 3/4-10 UNC | 215 | 215 | 145 |
| 7/8- 9 UNC | 345 | 315 | 230 |
| 1-8 UNC | 520 | 475 | 345 |
| 1.1/8-8 UN | 765 | 625 | 510 |

lbf.ft = Nm / 1.35582

Table 2 Gland Tightening Torque

| VALVE SIZE | TORQUE, Nm | | | | | | | | |
|-------------------|-------------|----------|------|------|--------------|----------|------|------|------|
| | GATE VALVES | | | | GLOBE VALVES | | | | |
| | CLASS | | | | | | | | |
| | 800 (RP) | 800 (FP) | 1500 | 2500 | 800 (RP) | 800 (FP) | 1500 | 2500 | 4500 |
| 1/4" | 8 | 8 | - | - | 8 | 8 | | | |
| 3/8" | 8 | 8 | - | - | 8 | 8 | | | 80 |
| 1/2" | 8 | 8 | 17 | | 8 | 8 | 18 | 18 | 80 |
| 3/4" | 8 | 10 | - | - | 8 | 20 | 20 | 20 | 80 |
| 1" | 10 | 23 | 40 | 85 | 20 | 24 | 28 | 28 | 80 |
| 1.1/4 & 1.1/2" | 23 | 24 | 49 | 205 | 24 | 40 | 46 | 46 | 120 |
| 2" | 24 | 40 | 96 | 500 | 40 | 52 | 46 | 46 | 230 |

lbf.ft = Nm / 1.35582

RP- Reduced port

FP- Full port

A3 - Actuator Reorientation Procedure:

Actuator orientation change procedure is given below,

- Depressurize the line and keep the valve in half open position.
- Remove actuator bottom screws.
- Rotate the actuator and change orientation to required position, match holes in the yoke to that of the actuator.
- Insert the bottom screws & tighten to required torque.
- Operate the valve 2 to 3 times before pressurizing line.
- In order to dismount actuator from valve, after unscrewing the bottom screws of yoke, lift the actuator slightly and rotate it for few turns in counter-clock wise direction so as to remove the stem from actuator bush. Thus actuator can be dismantled from valve. (Fig.17)

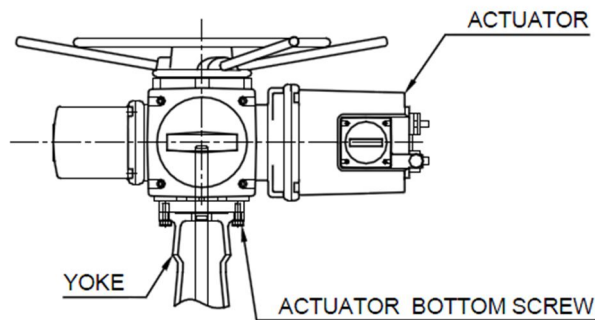
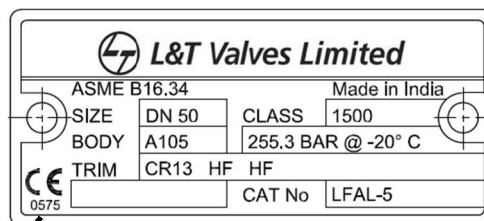


Fig. 17

Appendix B

For valves with CE & ATEX certification requirements

- Each valve has a stainless steel Identification plate fixed to the body. The Identification plate is marked with details of "catalogue number", along with various other details such as the materials of construction, Limiting temperatures, pressure rating as shown below



According to PED 97/23/EC

Fig.B.1. 'CE' Marking Identification Plate

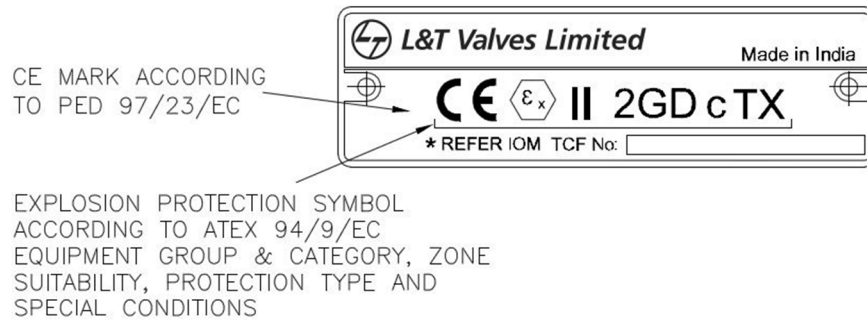


Fig.B.2. ATEX Name Plate

Definition of name plate marking above:

- 'II' = Equipment group
- '2' = Equipment category
- 'G' = Gas zone suitability (Zones 1 & 2)
- 'D' = Dust zone suitability (Zones 21 & 22)
- 'c' = Type of protection (i.e.) constructional safety (EN 13463-5)
- 'X' = Special conditions (EN 13463-1).
- Special Condition: X

Surface temperature: As per EN 13463-1:2001(E) paragraph 14.2.g, the temperature class or maximum surface temperature cannot be marked on the product as it is dependent on the operating conditions. However the maximum allowable operating temperature for the product is marked on the identification plate.

- Material tractability markings are hard marked on the valve body

CAUTIONARY NOTES



When installing or maintaining valves

- Observation shall be made for safety codes and working practices relevant to gas zones 1 & 2 and dust zones 21 & 22 (as defined in EN 1127-1:1998).
- The equipment shall not be subjected to frequently occurring disturbances.
- End user to ensure there is no external disturbances (e.g. Shocks, vibrations, electromagnetic fields etc.)
- Misuse of valves / valve components are strictly prohibited.
- If the processes or environments that the products are used in are likely to cause temperatures (high or low) that may cause injury to personnel if touched, then adequate insulation / protection must be fitted.

- Adequate safety measures shall be made for valves similar to pipe lines.
- Before equipment is installed in areas which may be subject to seismic activity or extreme climatic conditions consult L&T Valves with data.
- Maximum surface temperature of the equipment will be same as the line media temperature. The end user must take account of the line media temperature.
- All exposed parts shall be cleaned to prevent dust deposit or insulation is needed similar to pipe line.
- This equipment should be protected by other devices to prevent over-pressurization. (i.e. caused by external fire etc.).
- End user to ensure that the accessories (actuator, limit switches, solenoid valve, etc.) if fitted with valve are of ATEX qualified as per the directive.
- Valves are not suitable for terminal connections. In such cases, valves shall be fitted with blind flanges.



*L&T Valves Limited
Mount - Poonamallee Road, Manapakkam, Chennai 600 089, INDIA
Tel. : + 91 44 2249 8201 Fax: +91 44 2249 2794 contactus@Lntvalves.com
www.Lntvalves.com*

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