



SHANGHAI YUANGAO VALVES INDUSTRY CO., LTD

Gate Valves Installation, Operation & Maintenance Manual



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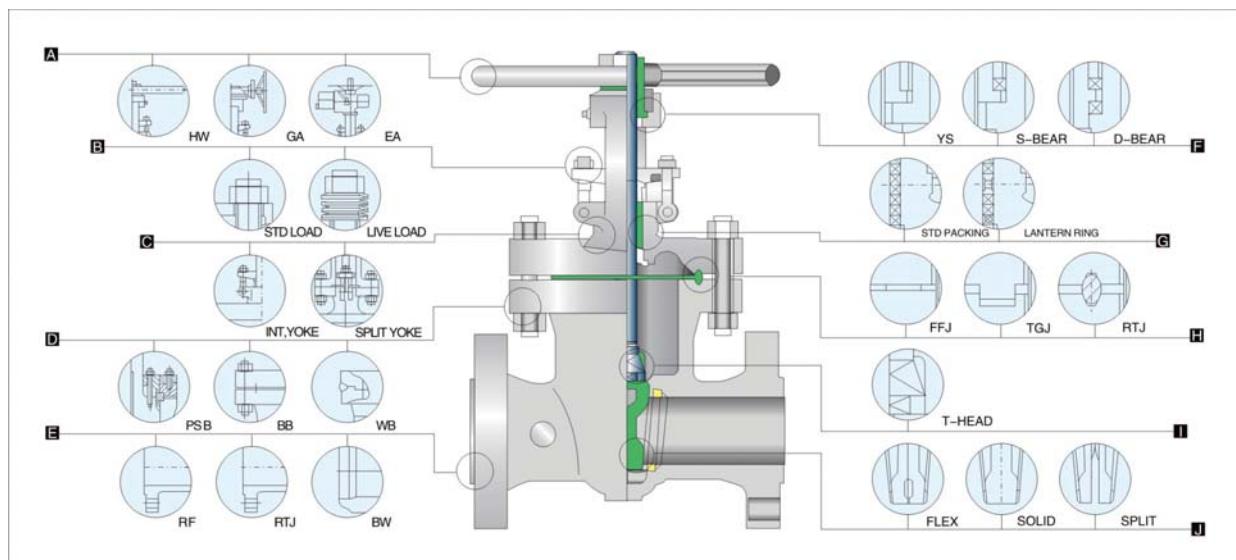


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1. Typical Gate valves

Standard LEAD gate valves are multi-turn valves with rising stem and non-rising handwheel. Fluid flow is in a straight line in a gate valve. This Construction offers minimum pressure drop in service.



2. Identification Plate marking

Every valve is provided with a stainless steel identification plate fixed to the yoke or the bonnet flange. The details on the identification plate are as follows:



Valves shall not be used for more than the pressure indicated with temperature as indicated in identification plate.

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3. Storage / Handling

- a. All Gate valves are shipped in the closed position with the end flange protectors in place. In all direct handwheel operated valves, the handwheel is fitted to the valve, while in gear operated valves, the handwheel is sent separately and needs to be assembled at site.
- b. Valves shall be stored in a clean dry environment and suitably covered to prevent ingress of moisture and dust.
- c. All valves shall be handled with slings across the body of the valve.

3.1 Planning & Responsibilities

When installing or maintaining valves.

- a. Conduct a risk assessment and eliminate or reduce hazards to an acceptable level.
- b. Follow safe systems of works.
- c. Observe all site health and Safety rules.
- d. Due to the variety of duties in which this product can be employed, it is the end users responsibility to ensure the compatibility of the media with the material of construction of product for each specific application.
- e. Before equipment is installed in areas, which may be subject to extreme seismic activity, consult LEAD sales with data. (To be done at enquiry stage)

3.2 Do's & Don'ts

- a. Wear all necessary protective equipment for conducting the work.
- b. Never remove or maintain a valve or joint unless the line has been fully and de pressurized and drained.
- c. Always operate the valve to the open position to ensure that no trapped pressure exists within the cavity.
- d. Ensure that the valves are used within the pressure temperature service conditions as per ASME B16.34 Sec 2. Also refer identification plate for pressure and temperature limits. In case of additional assistance, consult with LEAD .
- e. The valve handwheels are designed only for operation. The handwheel must not be used for handling the valve.
- f. Do not lift the valve by the bypass arrangement, gear unit or actuator, which would lead to damage of valve operating elements.

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4. Preparation for Installation

- a. When shipped, rust preventive oil is applied on the valve bore and other exposed machined surfaces. This can be removed with a commercial solvent if necessary.
- b. Operate the valve to open position and check valve internals are clean and free of dirt, grit and other extraneous particles.
- c. In flanged end valves the raised face should be cleaned and free of any damage / score mark.
- d. In BW end valves ensure that the end preparation is in line with the mating part and free from any damage / nicks etc.
- e. Ensure that the pipeline has been flushed free of dirt, weld spatter etc before installation.
- f. Use proper gaskets and bolting as per the standard recommendations for installing the valves on the line.
- g. For BW end valves, field joints connecting valves & pipes shall be done by qualified welders using approved WPS/PQR to recognized standards like ASME Sec IX.

Warnings:

All valves are pressure tested at the factory. Should customer desire a test before installation, ensure test pressures are as per the ASME B16.34 section 7 and API 598 requirements.

5. Installation

- a. Standard valves can be installed in either direction. Valves identified with "high pressure side" and upstream hole are unidirectional and must be installed in the direction with the label on the upstream side.
- b. The valve shall be kept in the closed position when installing on the pipeline.
- c. Valves shall be installed with the stem in a vertical position or in a position above the horizontal. Use of valves with the stem position in vertically down below is not recommended.
- d. Installation of flanged valves shall follow prevailing site standards. The following will also be considered.

e. Installation of valves with Flanged End Construction

- e1. The valve ends and the pipe ends / flanges should be aligned.
- e2. Pipe work in flanged construction shall have the correct gap to allow for the valve face-to-face and assembled gasket thickness.
- e3. Flange fasteners for end flanges shall be of the correct size, length and material for the service conditions. As a minimum the material shall be compatible to one used for valve bonnet / bolting

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- e4. Assemble all bolts and hand tight. Evenly tighten the bolts at diametrically opposite end to the correct torque required for the specific gasket material.

f. Installation of valves with BW End Construction

- f1. The valve ends and the pipe ends shall be aligned.
- f2. Pipe work in BW end construction shall also have the correct gap to allow the end-to-end dimension of the valve.
- f3. Correct welding material shall be used as per approved procedures for welding.

Warning:

Valves shall be kept in the closed position during welding.

- g. Ensure that there is access to the handwheel for convenient operation of the valve. When required, necessary extension arrangements such as chain wheel and extension arrangements can be considered.

6. Operation

Gate valves should be used in the fully closed or fully open position only. Gate valves must never be used for regulation duty.

Valves are opened by turning the handwheel in the anti-clockwise direction and closed by rotating in the clockwise direction. An arrow mark is provided in the handwheel for easy identification. Personnel protection equipment e.g. gloves shall be used when operating the valve.

Gear operated valves are fitted with fully enclosed water proof gear units. Gear housing is filled with lubricant and under normal operating condition, no maintenance is required.

For electrically operated valves.

- a. Ensure correct phase connection to avoid failure of the actuator
- b. Do not disturb the torque and position setting as set in the factory. (Close position is done on torque and open limit is done by position setting.)

Warning:

In electrically operated valves, do not set the open limits switch with torque, since the back seat will get damaged

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Reorientation of Gear Unit

In actual installation if the gear unit requires reorientation, it is necessary to proceed as follows

To start with unscrew the stem protector / enclosure.

- 1) Unscrew the bolts holding the gear unit to the bonnet/yoke flange.
- 2) Lift the gear unit by proper winch and perform the rotation every 90°.
- 3) Reinstall the gear unit on valve.
- 4) Tighten the bolts and nuts of valve-gear unit connection.

Warning:

In services where there is a possibility of pressure built up in entrapped liquid in the body cavity, it is necessary to address cavity relief either by an upstream hole or other relieving devices. These valves are unidirectional and should be installed with the pressure relief to the upstream side only.

In valves fitted with PTFE gland packing, and gasket with PTFE filler, which have been exposed to an external fire, it is recommended that the packing and the gasket be changed immediately before further use of the valve.

For Ferritic steel materials (ASTM A105, ASTM A216 Gr. WCB, ASTM A216 Gr. WCC etc), if the lowest scheduled operating temperature is above 0°C, but due to climatic conditions (e.g., during startup) the valve is subjected to operating temperatures below 0°C, a lower pressure than the design pressure should be ensured until the metal temperature has risen above 0°C. This is to deal with risk of brittle failure.

7. Maintenance

LEAD gate valves are of rugged construction. The following checks would help ensure good performance of the valve over an extended period.

7.1 Lubrication

- a. Ensure that the stem threads are smeared with adequate amount of lubricant (commercial grease) which would ensure smooth operation
- b. Regular lubrication of the yoke sleeve with commercial grease would help reduce friction and ensure smooth operation. The frequency of lubrication would depend on the frequency of operation of the valve and ambient service conditions. This lubrication is done by injecting through the grease nipple provided in the bonnet/yoke of the valve.

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- c. For certain graphite gland packing, in the event of high torque, it is suggested that a drop of light oil be smeared on the plain shank of the stem.

7.2 Gland

In the event of leakage of line fluid through the gland area, check the gland nut for tightness. Tighten evenly if necessary. The Gland Tightening Torque should be as follows

Size	Class 150		Class 300		Class 600	
	Ibf.ft	Nm	Ibf.ft	Nm	Ibf.ft	Nm
2"	9	13	9	13	12	16
3"	9	13	9	13	15	20
4"	12	16	12	16	27	37
6"	21	29	23	31	52	71
8"	23	31	25	34	56	75

7.3 Bonnet Gasket

In high temperature services, there is a possibility of creep in the bonnet studs. Regular checking of the bonnet – studs for tightness, would help prevent leakage through the bonnet gasket. Tightening should be done evenly in a sequence of diametrically opposite nuts. The Tightening Torque for Bonnet studs should be as follow

Stud Size, in	Thread Details	B7 / B16 / L7		B7M / L7M		B8 CL.2 / B8M CL.2	
		Ibf.ft	Nm	Ibf.ft	Nm	Ibf.ft	Nm
3/8	16 UNC	20	27	16	20	20	27
7/16	14 UNC	30	40	25	35	25	35
1/2	13 UNC	55	75	45	60	45	60
9/16	12 UNC	65	90	55	75	65	90
5/8	11 UNC	100	135	80	110	85	115
3/4	10 UNC	190	260	145	200	150	205
7/8	9 UNC	290	390	210	285	200	270

8. Repair Kits

- a. Spares are available for all LEAD gate valves, consisting of a set of gland packing and bonnet gasket. This shall be supplied upon ordering.
- b. Dismantling of valves for attending for gland packing replacement as well as bonnet gasket replacement shall be done under expert supervision, after depressurizing the line valve cavity and evacuating all line fluid from the valve



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