Lázaro Ituarte Internacional, S.A.

OPERATION AND MAINTENANCE MANUAL FOR GATE VALVES

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Operation and Maintenance Manual - Gate Valve

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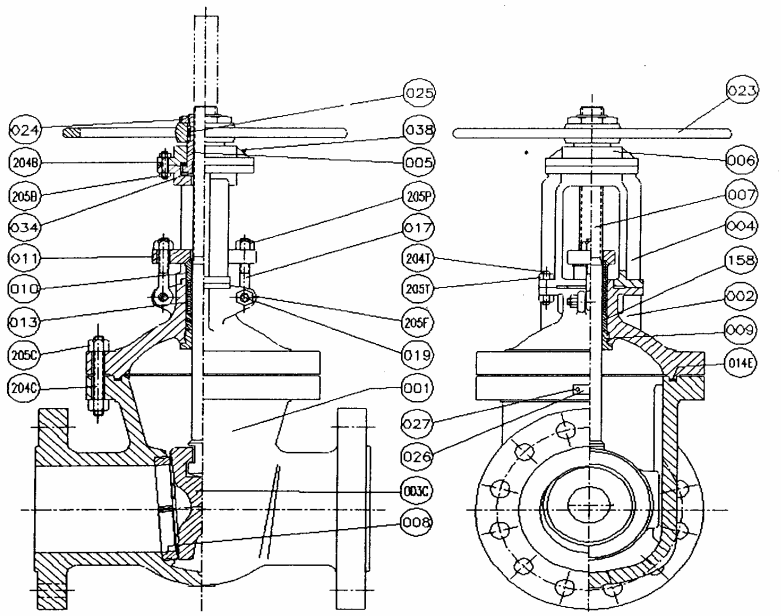
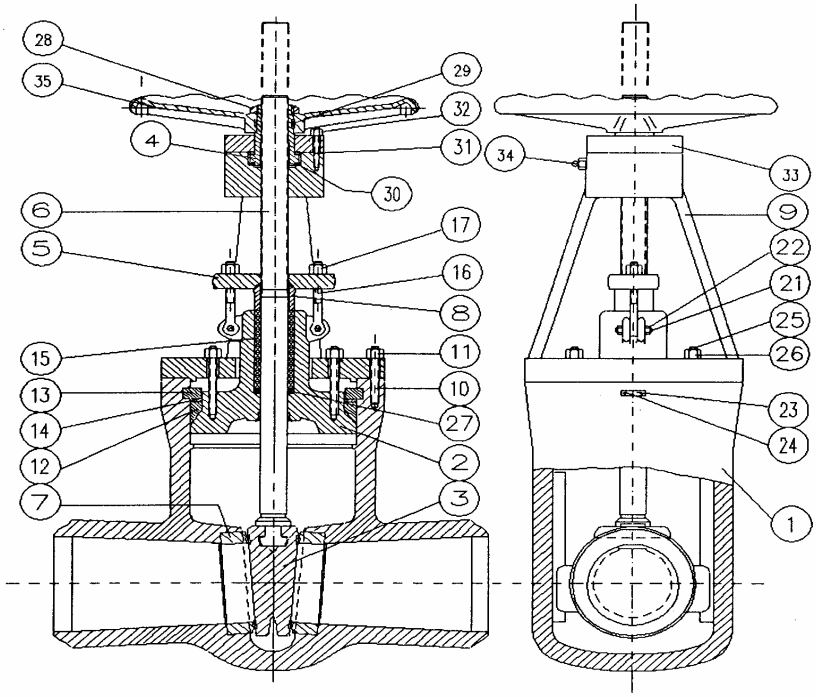
1.1 GATE VALVE



205T	YOKE NUT
205P	EYE BOLT NUT
205F	GLAND LUG NUT
205C	BONNET NUT
205B	YOKE BUSHING NUT
204T	YOKE BOLT
204C	BONNET BOLT
204B	YOKE BUSHING BOLT
158	PACKING BUSHING
038	LUBRICATOR
034	AXIAL BEARING
027	PIN
026	NAMEPLATE
025	KEY
024	HANDWHEEL NUT
023	HANDWHEEL
019	GLAND LUG BOLT
017	EYE BOLT
014E	GASKET
013	PACKING RING
011	GLAND FLANGE
010	GLAND
009	BACKSEAT BUSHING
008	BODY RING
007	STEM
006	YOKE BUSHING
005	STEM NUT
004	YOKE
003C	GATE (FLEXIBLE)
002	BONNET
001	BODY

FIG. 1A



35	HANDWHEEL
34	LUBRICATOR FITTING
33	YOKE BUSHING
32	YOKE NUT
31	YOKE BOLT
30	BEARING
29	KEY
28	HANDWHEEL NUT
27	PACKING WASHER
26	NUT
25	BOLT
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23	NAMEPLATE
22	GLAND NUT
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17	EYE NUT
16	EYE BOLT
15	PACKING RING
14	WASHER
13	RETAINING RING
12	SEAL RING
11	BODY NUT
10	BODY BOLT
9	YOKE
8	GLAND
7	BODY RING
6	STEM
5	GLAND FLANGE
4	STEM NUT
3	GATE (FLEXIBLE)
2	BONNET
1	BODY

FIG. 1B

1.2 OPTIONAL ACCESSORIES

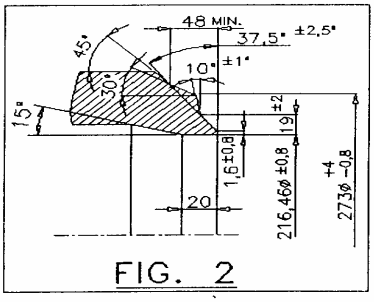
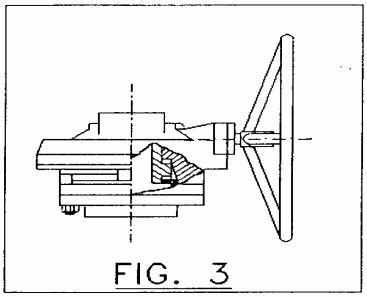


FIG. 2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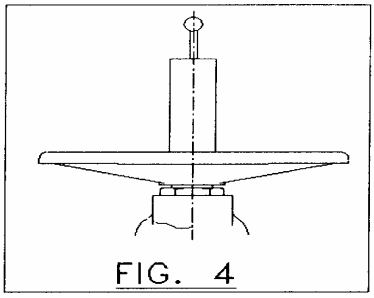
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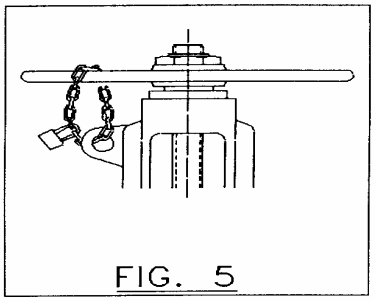
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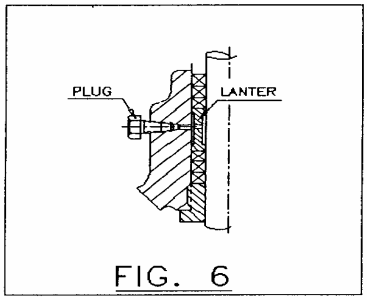

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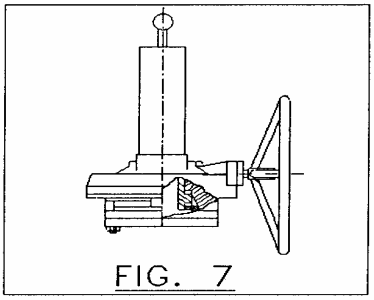
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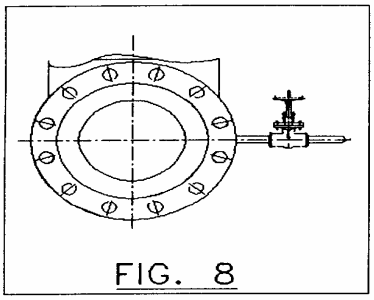
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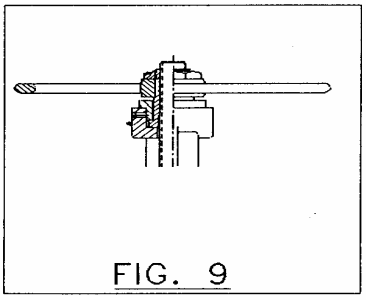
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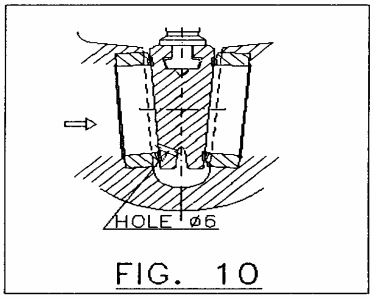

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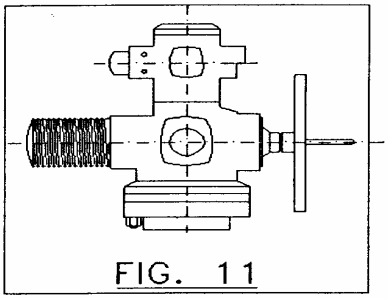
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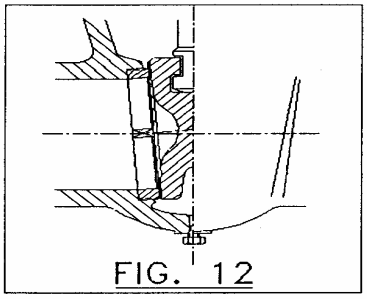
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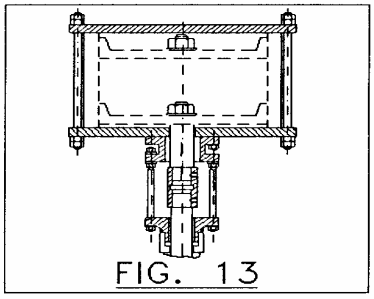


FIG. 13

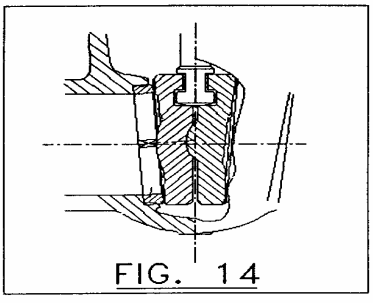
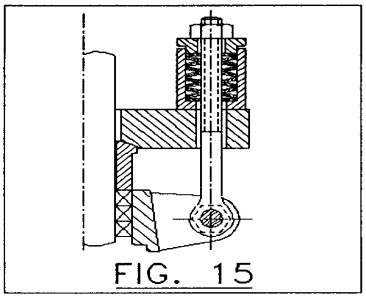


FIG. 14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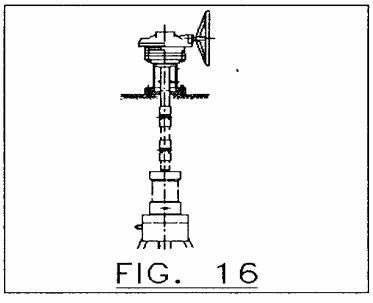


FIG. 16

2.- INTRODUCTION

2.1.- GENERAL NOTES

This Instructions Manual has been prepared by the Engineering Department of *Lázaro Ituarte Internacional, S.A* in order to give to the user the storage, maintenance, handling and installation instructions for the supplied valves .

In case the user may require any scope of manipulation in the valve, it is required to contact firstly and beforehand the manufacturer in order to avoid defects resulting from wrong manipulation of the valve.

WARNING

This instructions manual describes the most suitable procedures for a correct handling, installation and maintenance for the valves manufactured by Lazaro Ituarte. These procedures must be followed step by step and thoughtfully to prevent damage caused by any misuse or manipulation.

The valves as all the equipment subject to pressure can be dangerous if not correctly handled.

Do not dismantle any valve device unless prior approval from the manufacturer.

2.2.- DESCRIPTION IN DETAILS OPTIONAL ACCESORIES:

- *Figure* 1 A► it represents a gate valve, bolted bonnet, including a direct actuation with a wheel and flanged. On this picture the yoke is not integral with the bonnet and the nut: it is pressed on the bearing.
- *Figure* 1B► it represents a pressure-seal gate valve.

Drawings 2 to 14 are options which the user can demand according to his needs:

- *Figure* 2 ► it represents butt weld end.
- *Figure* 3 ► it represents a bevel gear actuator without stem protection.
- *Figure* 4 ► it represents a valve with a direct wheel and position indicator .
- *Figure* 5 ► it represents a detail of a standard locking device.
- *Figure* 6 ► it represents a packing case with a lantern and plug.
- *Figure* 7 ► it represents a valve with actuation by hand wheel.
- *Figure* 8 ► it represents a by-pass.
- *Figure* 9 ► it represents the nut of actuation without presses on bearing. This construction is used with an opening torque and whose size does not require a bearing according to the API standard 600.
- *Figure* 10 ► it represents a valve with hole on wedge to balance the pressure between the body of the valve and the upstream arrival side. In this case the valve becomes unidirectional.
- *Figure* 11 ► it represents a electric actuator in operation.
- *Figure* 12 ► it represents a plug of drain connection its location will be done according to the customer's instructions .
- *Figure* 13 ► it represents a hydraulic or pneumatic actuator.
- *Figure* 14 ► it represents a wedge type "Split" which can be manufactured at the request of the customer.
- *Figure* 15► it represents a detail of live loaded packing.
- *Figure* 16► it represents an extension stem and platform.

3. - SERVICE REQUIREMENT AND USE

3.1.- SERVICE REQUIREMENT

The gate valve is operating to control the flow, and it is actuated by hand wheel, with or without gear box. Other type of actuation by means of direct hydraulic, pneumatic or motor actuators, the gate valves shall work in full open/full close position.
In the case of figures 8 and 10 the gate valve is unidirectional (see page 5 of 14).

3.2.- USER INDICATIONS

- The user will have to select the adequate material to avoid corrosion risks.
- The user will have to select the valve's "class" according to pressure and temperature data in accordance to standards (ASME B16.34 or any applicable standard) in order not to produce efforts above the acceptable limits.
- The user will have to select between standard or special class (according to ASME B 16.34 standard) in order to avoid efforts above the acceptable limits.
- When the valve works at a temperature higher than 454ºC or lower than -24ºC, the user will have to select the adequate material for the bolting.
- In order to avoid an overpressure in the valve body's , caused by fluids , which subsequently have suffer of temperature increase , the user must hold in account these recommendations:
  - hole on wedge
  - safety valve
  - shear disc

In the safety valve or shear disc, the pressure must not reach 10% more than that of the pressure indicated in standards (ASME B16.34 or any applicable standard) for the temperature given.
- The valve should not be subjected to pressures and temperatures higher than those indicated by standards (ASME B16.34 or any applicable standard).
- The gate valve should not be used for throttling purpose, in order to prevent seat damages.
- It should not cause short closing which can cause water hammers.
- When required, the stem of the valve should be protected with covers to prevent solid particles from settling on it and damaging it.
- To prevent a possible liquids mixing, the valve will have to be installed with a blockade system .
- In case of balanced water pre-heating, pressure is necessary. The valves will have to function with a by-pass.
- In case of actuator pneumatic, electric or hydraulic actuators with high speed of closing, is recommended coupling of a damper at the end of the course to avoid impacts which can cause damages in the valve.

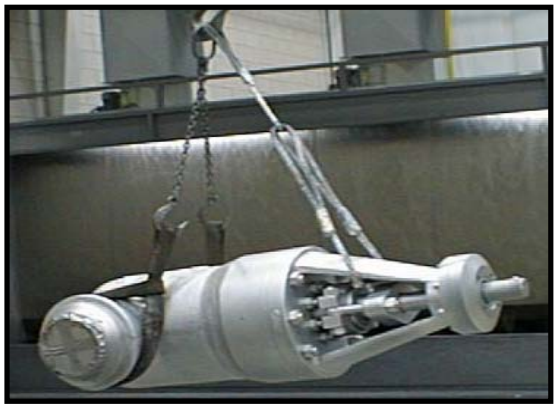
4. HANDLING AND STORAGE

Unless otherwise specified and agreed the valve is packed in closed position in standard pallets.

4.1.- HANDLING

The valves with weight lower than 50kg can be handled manually through the wheel, as it is shown on the picture.

For valves with weight 55 kg. and above correct handling is shown in pictures. Do not attempt to handle the valve from the hand wheel, the gear box or the actuator. In case of left picture the handling is through the yoke , at the right, 3-positions handling shall be used, 2 at the ends and one in the bonnet yoke, near the packing.



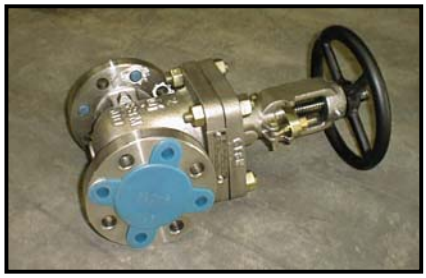
In order to avoid damage in any part of the valve, we recommend the use of a polyester lifting lug . Using a steel lifting lug, you must especially pay attention to steel in contact with the important parts of the valves, especially the stem. The choice of the lifting lug must be adequate with the weight of the valve.

For stainless steel valves never handle, brush or manipulate with material other than stainless steel. The use of dissolvent halogen ad is not permitted .

For valves with wheel, those should not be actuated with bars, key of nut, or others similar.

4.2.- STORAGE BEFORE INSTALLATION

Valve shall be completely closed and both ends calked with plastic or wood protections attached to the valve's body, these protections must be only withdrawn at the time of the installation.



Steam surface shall be well lubricated and protected with adhesive tape and packing paper as on the picture.

When the valve is going to be stored for a long period of time, the valves will be kept in the same packages delivered from the workshop, kept dry, stored in covered or enclosed premises. It's recommended to protect the valves introducing in the packages non-humidity bags.

5. INSTALLATION

A wrong valve installation can bring serious consequences, a bad handling can require expensive services to repair it. When receiving the valve, verify that no external damages exist which could have caused damages in the valve..

5.1.- CHEKING BEFORE INSTALLATION

- Check on the valve's plate: size, class and trim and make sure that those are adequate for the installation.
- Valve with wheel : open and close fully to test the ease of opening.
- All the precautions necessary must be taken to avoid the introduction of external elements into the valve which can cause serious damage on the seat surface before and after installation.
- The end's protections must be withdrawn in order to clean the inner surface by fluxing. At this time the wheel should not be operated.
- It's very important to clean the piping before the installation: small pieces of metal, deposits of welding in the piping can produce a damage on the seat surface of the valve.
- When the valve works with high or low temperature, the valve should not be manipulated before it would be technically equilibrated it could create a loss of seal and in case of galling on stem. and the seats.
- It must be remembered that during the installation the thermal stress piping and the fluid's weight produce considerable mechanical stress to the valve. Therefore, it can produce distortions in the body of the valve causing backlash in the seats and consequently the leaks.
- During the procedure of valve's ends welding to the pipe take attention that metal does not fall on the seat surface. It is also necessary to take into account the high temperature which can deform the seat of the valve.

Once checking made of all those different points, the valve is ready to being installed.

5.2.- ENDS CONNECTIONS

- For unidirectional gate valves, make sure the flow direction according to the valve design.
- The valve's ends will be aligned parallel to the ends of the piping to avoid strong force.
- Once placed you will proceed with a partial tightening of all bolting, per pair opposed diametrically around the support.
- You will proceed with the same manner for the total tightening .
- The final tightening will be corresponding to the size and material of the bolting.

5.3.- BUTT WELDING CONECCTIONS

- For unidirectional valves, make sure the flow direction according to the valve design.
- The ends of the valve will be aligned parallel to the ends it piping to avoid efforts.
- To close the valve before proceeding to the welding for protect surface of base.
- When it has been produced changes material structure and thermal stress in the body of the valve during the ends welding process , it will be done a local post weld heat treatment. That heat treatment must be performed with the valve in open position.

5.4.- CONSIDERATIONS AFTER INSTALLATION

- Once the valve is installed, the seat surfaces are still vulnerable to foreign particles like sand, deposit of welding in the system of piping. For that it is recommended to carry out cleaning of the system with all the valves open (the back seat must be completely closed) before the plant functions.
- The valve should be operated (open/close) until the same temperature is uniform in the entire valve.
- The selection of the actuator should be done according to the service conditions of the valve.
- The setting of the actuator at the factory will be by torque for close operating and by limit for open operating.
- During fluxing process for pipe cleaning, the valve has to be fully open. It means that:
  - *for manually operated valves* (gearbox/hand wheel), the valve must be manually open until the stem gets into contact with backseat (see piece No. 2 Figure 1A / piece No. 009 Figure 1B).
  - f*or motor operated valves*, once actuator reaches to the limit and stops, the valve must be opened manually until the stem gets into contact with backseat (see piece No. 2 Figure 1A / piece No. 009 Figure 1B).
- Check final tightening, bonnet and packing bolting before the installation to avoid problems in the equipment working.

6. MAINTENANCE

By programming a periodic maintenance of the valve, potential problems can be detected and therefore it is possible to extend the life of the valve. The periodic maintenance program must be prepared by the engineering department. The frequency of these revisions must be based on the user's experience who installs the equipment. Lazaro Ituarte International recommends the revision and lubrication of the following parts:

PACKING:

The leaking by the packing box is the most common problem which arrives when the valve is under pressure, regular inspection of this element avoids the leaking through the gland which can damage the stem of the valve. Should leakage be observed through the packing, tightening of the gland nuts is required. Be careful that the gland nuts are not over tightened as this can increase packing friction which can adversely affect the valve performance.

BOLTING:

The systems of piping are subject to certain vibrations which can loosen and disassemble the bolting, therefore, all bolting will have to be checked and inspected regularly.

STEM NUT , PACKING BOLTS:

These parts of the valve should be regularly lubricated to avoid mechanical damage due to the abrasions.
Lubrication fittings situated in the top of the yoke are to facilitate the lubrication.

AUXILIARY EQUIPMENTS:

When the valve is equipped with a bevel gear actuator , electric actuator … this equipment should also be lubricated regularly according to manufacturer's recommendations.

7. RECOMMENDED SPARE PARTS

The packing ring and the gasket are the recommended spare parts by Lázaro Ituarte Internacional, S.A.

When ordering spares or requesting any information about the gate valve ensure that the following information is quoted:

- type, size and rating gate valve
- valve serial number

Above information is stamped on valve nameplate.