

# Instructions Manual - Swing Check Valve

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## 1.1 SWING CHECK VALVE

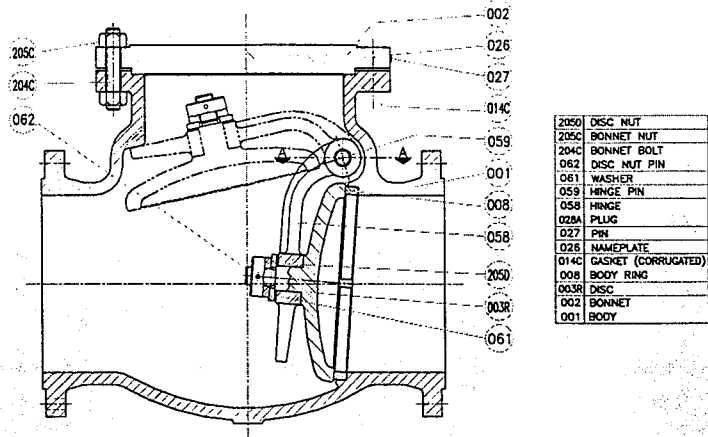


FIG. 1A

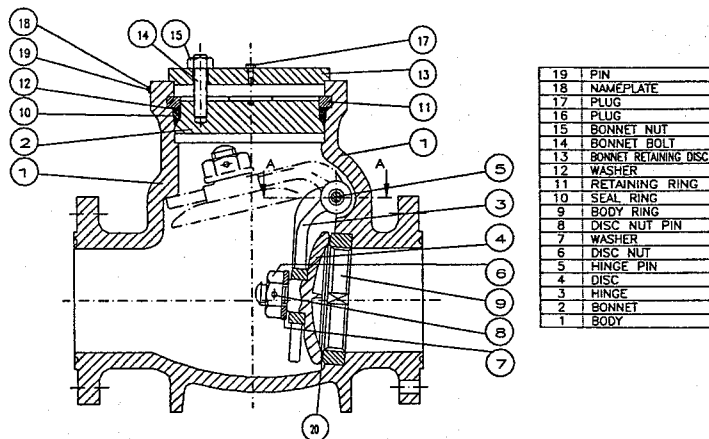
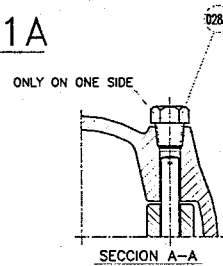
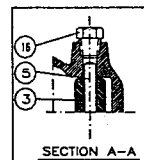
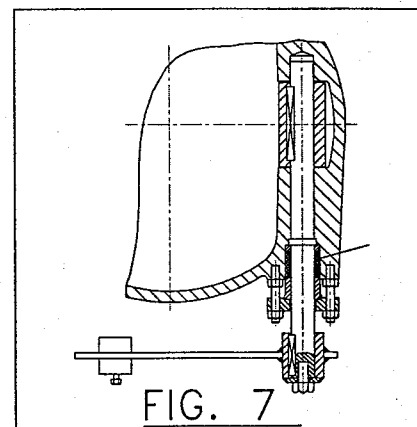
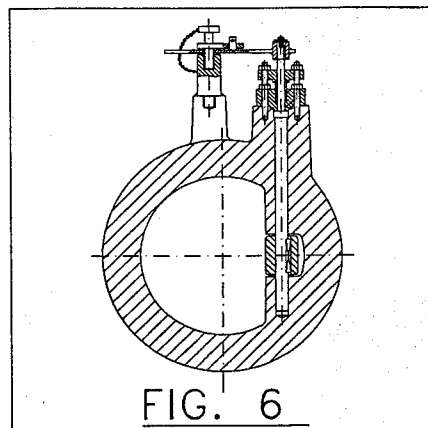
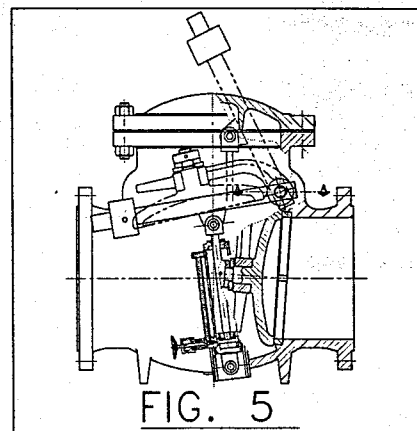
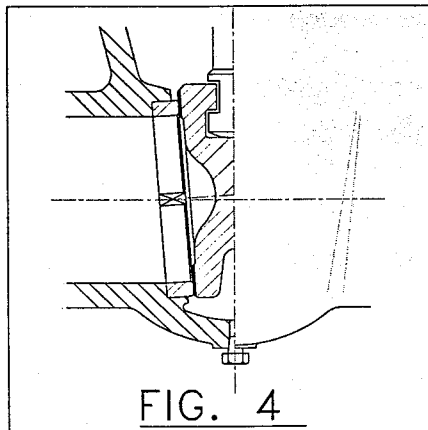
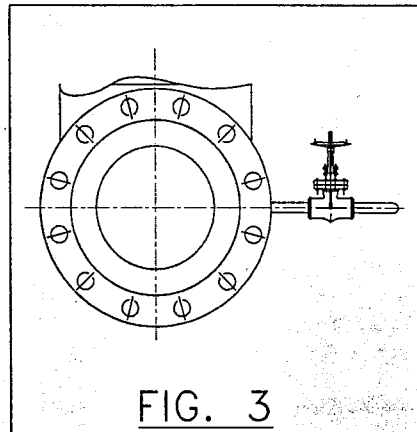
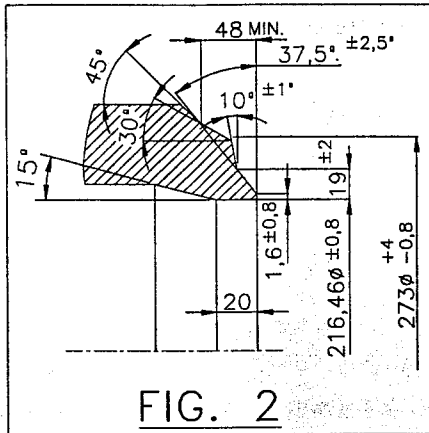


FIG. 1B



## 1.2 OPTIONAL ACCESSORIES




## **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.

  
This instructions manual describes the most suitable procedures for a correct handling, installation and maintenance for the valves. 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 swing check valve, bolted bonnet, including a direct actuation with a wheel and flanged.
- *Figure 1B* ► it represents a pressure-seal swing check 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 by-pass.
- *Figure 4* ► it represents a plug of drain connection its location will be done according to the customer's requirements.
- *Figure 5* ► it represents a swing check valve with dashpot for slow down the drop of the disc.
- *Figure 6* ► it represents a swing check valve with blocked system by lever, opened or closed according to the customer's requirements.
- *Figure 7* ► it represents a swing check valve with counter weight for:
  - to keep disc balanced. It 's reduce the stroke in the drop of the disc and the time of the closing is larger.
  - in horizontal piping this system is used to keep the disc against the closing surfaces of the valve.

### **3. - SERVICE REQUIREMENT AND USE**

#### **3.1.- SERVICE REQUIREMENT**

Check valves are used as unidirectional valves that are opened by the flow in one direction and will automatically stop flow in the opposite direction when the fluid in the line stops or reserves.

#### **3.2.- USER INDICATIONS**

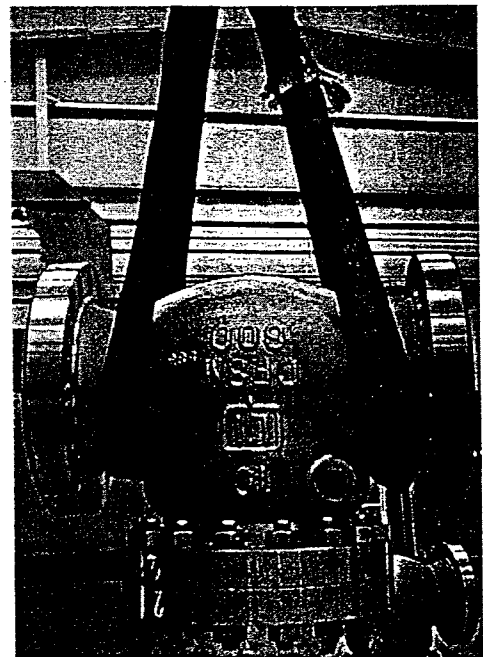
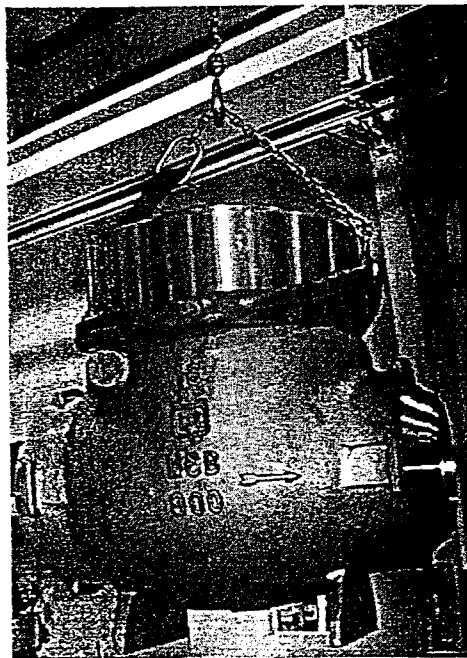
- The user will have to select the adequate material to avoid corrosion risks.
- The user will have to select the valve's "class" according to pressure and temperature data in accordance to standards (ASME B16.34 or any applicable standard) in order not to produce efforts above the acceptable limits.
- 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 454°C or lower than -24°C, the user will have to select the adequate material for the bolting.
- The valve should not be subject to pressures and temperatures higher than those indicated by standards (ASME B16.34 or any applicable standard).
- In the case of valves with counter weight (see figure 7 in page 4 of 13), the customer will have to indicate the application of the valve, the pressure and temperature service. In some cases, depending of the application and size of the valve, that element is not possible.
- The Cv value of the valve is given with the valve completely open. In the case of check valves, due that the fluid open the disc, it's recommended the minimum speed of the fluid  $v \geq 60\sqrt{v_{esp}}$ , with  $v_{esp}$  = specific volume of the fluid (pie<sup>3</sup>/lb).
- The recommended speed of the fluid is:  $60\sqrt{v_{esp}} \leq v < 240\sqrt{v_{esp}}$ , with v (pie/s).
- The swing check valves operate in better conditions when the fluid is stable, the fluid open the disc and does not cause oscillations in the disc. That oscillations could origin erosions in the hinge and the hinge pin.
- After any element that can origin turbulences in the fluid, for example the exit of a pump, it's required an straight length of piping before the fluid come in to the valve. This straight length of piping might be between 4 or 5 times larger the diameter of the piping.

#### 4. HANDLING AND STORAGE

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

##### 4.1.- HANDLING

When the valve is going to be handled with lifting lugs , the two pictures shown the correct handling through the flange ends (picture at the right side) when the valve is in reversed position, or trough the neck (picture at the left side).



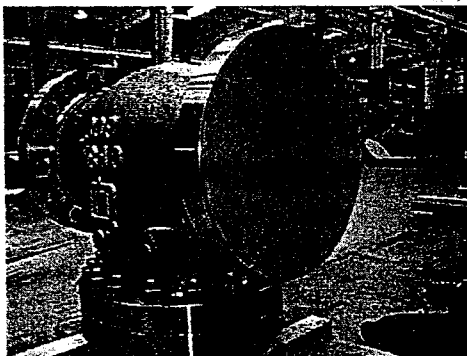


In order to avoid damage in any part of the valve, we recommend the use of a polyester lifting lug . Using a steel lifting lug, you must especially pay attention that steel in contact with the important parts of the valves. The choice of the lifting lug must be adequate with the weight of the valve.

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

#### **4.2.- STORAGE BEFORE INSTALLATION**

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.



When the valve is going to be stored during a long time, it's recommendable the packing of the valves in cases protected by waterproof and introduce in the same bags non-humidity.

## **5. INSTALLATION**

A wrong valve installation can bring serious consequences, a bad handling can require expensive services to repair it. When receiving the valve, check the state of the packing in order to note possible external damages which will could have damage 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.
- All the precautions necessary must be taken to avoid the introduction of external elements into the valve which can caused serious damage on the seat surface before and after installation.
- The end's protections must be withdrawn in order to clean the close 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 mechanics stress to the valve. Therefore, it can originate 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 unreasonable stress.
- Once the valve is placed in the piping, you will process with a partial tightening of all bolting, per pair opposed diametrically around the support. You will proceed of the same manner for the total tightening .
- The final tightening will be the corresponding to the size and material of the bolting.

### **5.3.- BUTT WELDING CONECTIONS**

- For the simple circuit valve, 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.
- 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 post weld heat treatment.

### **5.4.- CONSIDERATIONS AFTER INSTALLATION**

- Once the valve is installed, the seat surfaces are still vulnerable to foreign particles like sands or deposit of welding in the system of piping. Therefore it is recommended to carry out cleaning of the system with all the valves open before the plant functions.
- When the valve is installed in high temperature systems, it is advised to verify the closing of nuts after a short initial operate period.

## **6. MAINTENANCE**

By programming a periodic maintenance of the valve, potential problems it 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 of the following parts:

### ***BOLTING:***

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

## **7. RECOMMENDED SPARE PARTS**

The gaskets are the recommended spare parts by Lázaro Ituarte Internacional, S.A.

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

- type, size and rating swing check valve
- valve serial number

Above information is stamped on valve nameplate.