



## INSTRUCTIONS FOR ASSEMBLY AND DISASSEMBLY DUAL PLATE CHECK VALVES

### 1. OBJECT AND SCOPE

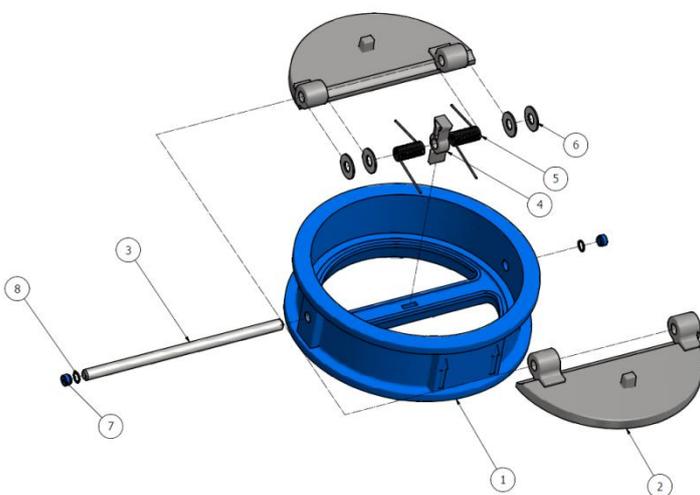
The object of following instruction is to establish the procedure for assembly, disassembly and mounting in pipeline of the dual plate check valve produced by Castflow Valves SL.

### 2. MAINTENANCE

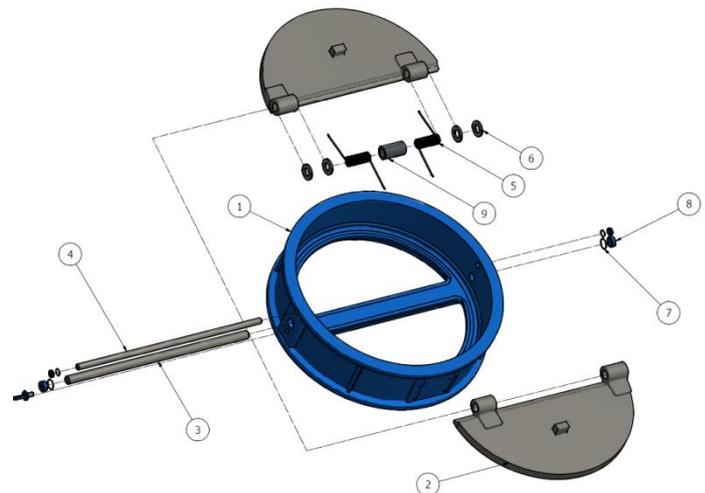
Castflow Dual plate check valves do not require any special maintenance. In certain cases it might be possible to replace the internals (springs, shafts and washers), caused by natural wear of the components or the accelerated wear as cause of the non-appropriate installation in the pipeline (such like not respecting the precautions for assembly in pipeline or the application with very corrosive or aggressive fluids). For general recommendations, please consult our [mounting instructions and maintenance for the check valves](#).

#### 2.1. ASSAMBLY DUAL PLATE CHECK VALVES

1. Place the body (1) in horizontal position with the arrows (flow indicator) indicating upwards.
2. Install the plates (2) inside the body (1) and center the plates with the hinge (3). For manipulation of the plates > DN-600, lifting plugs can be fixed in the threaded holes, that are located in the center of the plates.
3. Once centered the plates (2) place the washers (6) between the plates (2).
4. Introduce the hinge pin (3) by passing the first earring of the plate, the spring (5) must be placed in torque position, after passing the 1st spring, the stop plug (4) must be introduced (for the sizes DN-40 to DN-300) or spring block (9) (DN-350 and superior) and continuously the 2nd spring must be installed. Finally we pass the hinge pin until reaching the end of the shaft passages of the body.
5. Install corresponding plugs (7) and O-rings (8) at both ends of shaft passages.
6. For sizes DN350 and above also install the stop pin (4) and plugs (7) and O-rings (8) at both ends of shaft passages.



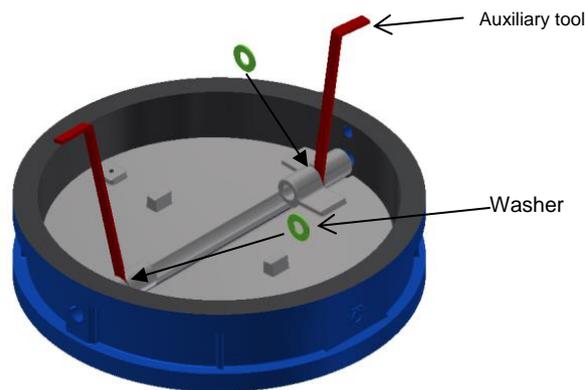
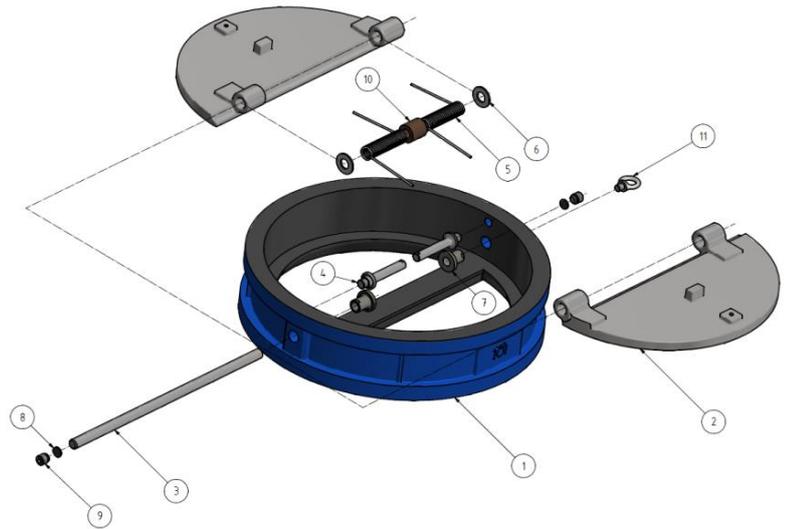
DN-50 A DN-300



DN-350 AND ABOVE

For rubber lined valves:

1. Place the body (1) in horizontal position with the arrows (flow indicator) indicating upwards.
2. Introduce the hinge bushings (7) in the holes of the body (1).
3. Install the plates (2) inside the body (1) and center the plates with the hinge (3). For manipulation of the plates > DN-600, lifting plugs can be fixed in the threaded holes, that are located in the center of the plates.
4. Once centered the plates (2) place the washers (6) between the plates. Usually the space between the plates is not enough to introduce the washers. In this case, insert an auxiliary wedge-shaped tool (e.g. screwdriver, lever) between the earrings of the plates, as shown in the drawing below. Use the tools to create a space sufficient for the introduction of the washers.
5. Introduce the hinge pin (3) by passing the first earring of the plate, the spring (5) must be placed in torque position, after passing the 1st spring and the spring block (13), the 2nd spring must be installed. Finally we pass the hinge pin until reaching the end of the shaft passages of the body.
6. Install corresponding plugs (9) and joints (8) at both ends of shaft passages.
7. Finally, install both stop pin (4).



## 2.2. DISASSEMBLY DUAL PLATE CHECK VALVES

1. Place the body (1) in horizontal position with the arrows (flow indicator) indicating upwards.
2. For sizes DN-350 and above withdraw the stop pin (4) remove the plugs (7) and O-rings (8).
3. Remove plugs (7) and O-rings (8). Then start removing slowly this hinge pin (3) while holding carefully the springs (5) resisting the force of the spring torque.
4. Remove the spring block (9), for DN-350 and superior; the plates (2), in sizes DN-600 and above use lifting plugs that can be fixed in the threaded holes, which are located in the center of the plates; and the washers (6).

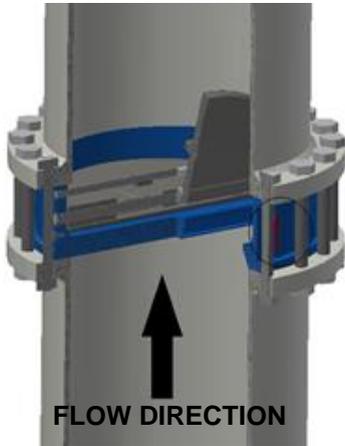
For rubber lined valves:

1. Place the body (1) in horizontal position with the arrows (flow indicator) indicating upwards.
2. Remove the stop pins (4).
3. Remove plugs (9) and joints (8) of the hinge pin (3). Then start removing it slowly while holding carefully the springs (5) resisting the force of the spring torque.
4. Remove the spring block (10), the plates (2), in sizes DN-600 and above use lifting plugs that can be fixed in the threaded holes, which are located in the center of the plates, and the washers (6).
5. Finally take out the bushings (7) of the hinge holes.

**General precautions:**

**Note that springs are preloaded and can eject out of the valve during assembly and disassembly. Therefore during manipulation the worker must take special precaution in order to avoid any injuries to hands, arms and face.**

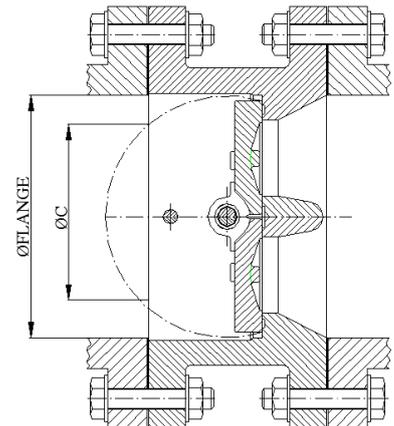
**3. MOUNTING IN PIPELINE**



For mounting in pipeline the direction of the arrows that are located on the body should be equal to the flow direction.

The internal  $\varnothing$  of the pipe flange must not be inferior to the minimum value C which appears in the dimensional drawings, so that the plates can open correctly.

**General recommendation:** The minimum velocity for standard springs should be 2,5m/s and maximum 4m/s, all other values outside this range request different torque springs that must be inquired to our technical department.



Depending on the directions of the fluid circulating in the pipeline, following considerations must be taken.

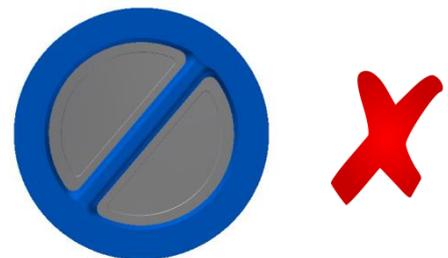
- a) For pipelines with ascending vertical circulation standard valves up to DN-150. However for sizes DN-200 and above the use of **low torque** springs is recommended.
- b) For pipelines with descending vertical circulation standard valves up to DN-150. However for sizes DN-200 and above the use of **high torque** springs is recommended.

**4. PRECAUTIONS FOR INSTALLING DUAL PLATE CHECK VALVES**

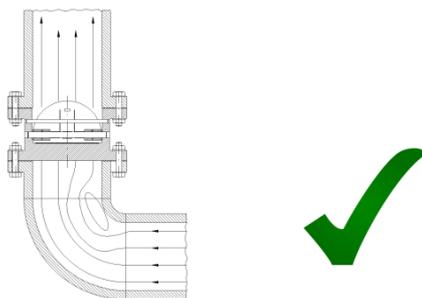
- a) For valves with soft seat (rubber) be careful when welding is made near to the valves. Extreme temperatures (+80°C) can damage the rubber coating of the valves.
- b) Do not install the valves in pipeline with intermittent flow (pulsations).
- c) The position of the plates must be as indicated below.



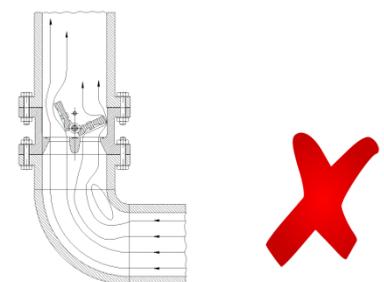
Correct position in horizontal pipe



Incorrect position in horizontal pipe



Correct position in vertical pipe (upstream or downstream)

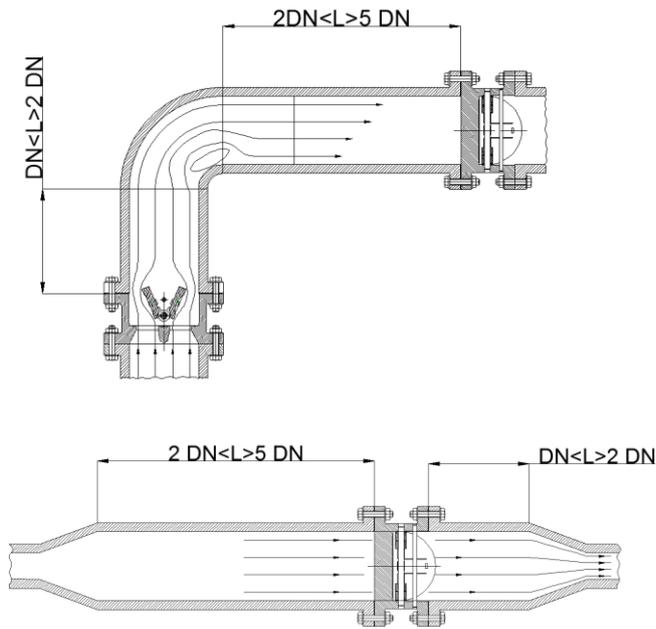


Incorrect position in vertical pipe (upstream or downstream)

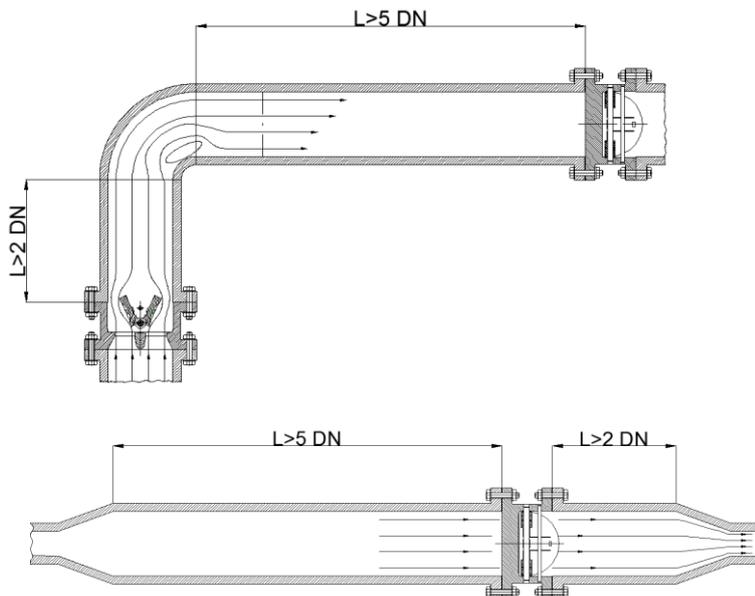
d) Installation of the dual plate check valves (DP) immediately after the exit of pumps, elbows, reducers, etc... can cause unstable flow at the entry of the dual plate CV (turbulence). Damage on the internal elements (shafts, springs, etc..) will be caused as the plates are not full opening continuously. In some cases cavitations can appear. Cavitation will accelerate corrosion in the area where it is produced. This phenomenon can be extremely serious in equipment with corrosive fluids.

In case the valves are installed at the outlet of a pump, reducing cone or elbow, the distance should be calculated considerable in order to avoid turbulences at the entry of the valves. We recommend installing the valve upstream with a minimum distance of 5 times the diameter away from any perturbing element to avoid wear on the internal parts and 2 times the diameter for downstream in order to assure full pressure recovery after the valve.

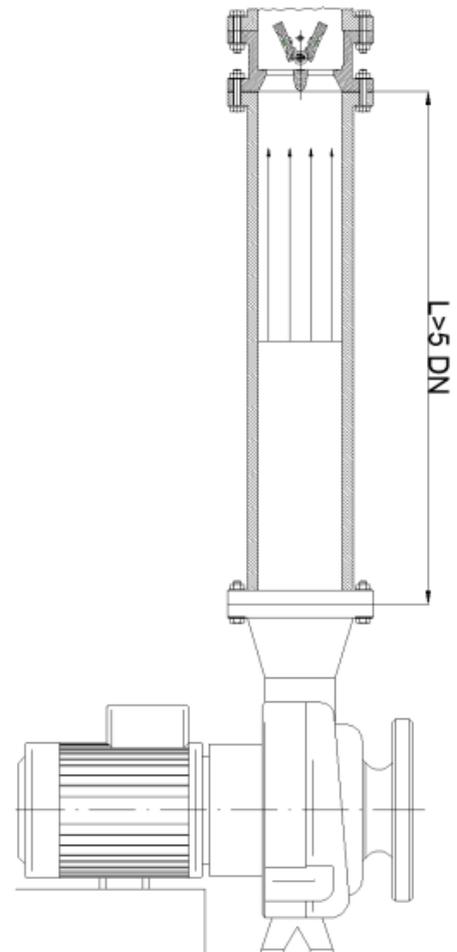
**Acceptable position <sup>(Note)</sup>**



**Ideal position**



**Position with pump**



Check valves should be installed as indicated on the above drawing. With these precautions we will achieve:

- Ensure the valves are in a stabilized flow (laminar).
- Avoid choked flow that prevents the continuous full opening of the plates.
- Avoid as much as possible cavitations at the inside of the valve.

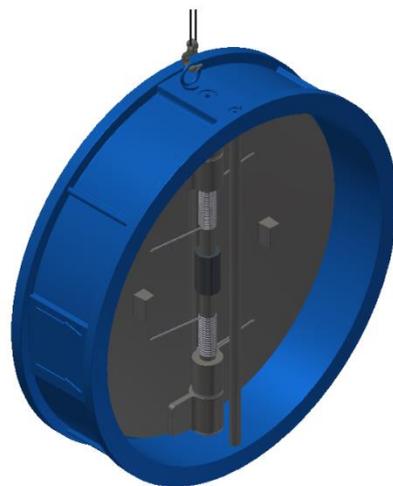
**Note:** In case the valves cannot be installed as recommended, the customer must assure a stable fluid at the valve entry. Or the installation must be evaluated and validated by the manufacturer. More frequent maintenance is required when valves cannot be installed according to our instructions.

**IMPORTANT ADVICE FOR RUBBER LINED VALVES:**

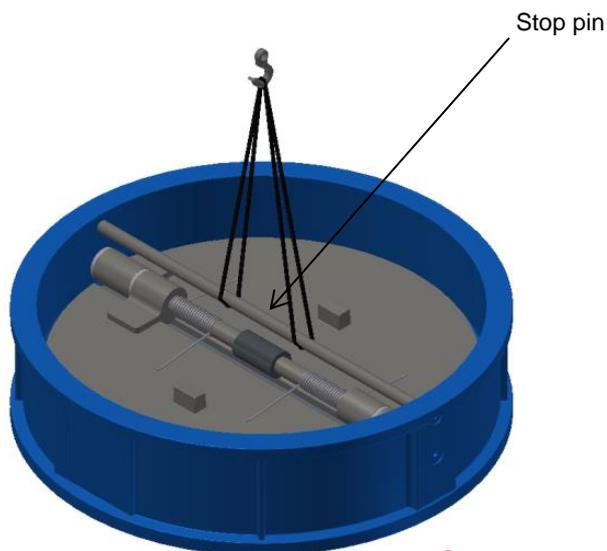
In order to avoid deformation in excess of the rubber between the surface of the flanges and the valve body, the tightening of the bolting shall not be superior than the values corresponding to PN10 flanges. Independent of the rating the valves are installed between. Rubber lined valves are limited to maximum 10 bar working pressure.

**5. MANIPULATION OF THE DUAL PLATE CHECK VALVE**

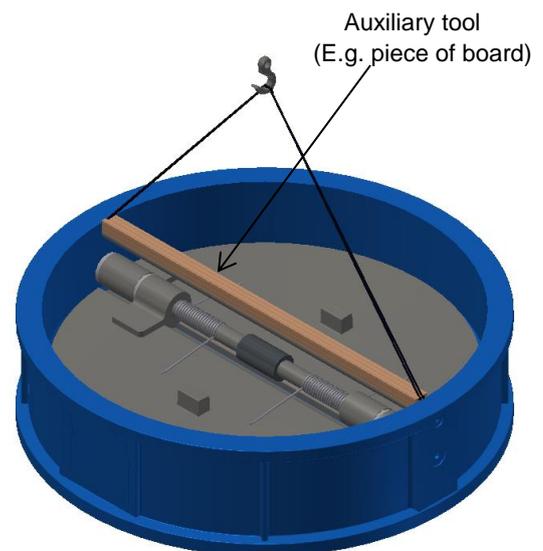
1.-Always try to elevate the valves with the lifting lug situated on top of the valve. If necessary it is recommendable to open the side of the boxes to make easier manipulation.



2.-If the valves are elevated by the stop pin, it is necessary to use an auxiliary tool (table of wood) like shown on the photo. The valve must never be elevated by hooking in the center of the stop pin.



Incorrect



Correct

