INSTALLATION, OPERATION, MAINTENANCE INSTRUCTIONS

DOUBLE DISC PARALLEL SLIDE GATE VALVES

BOLTED AND PRESSURE SEAL BONNET

<table>
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<td>First issue</td>
<td>Ing. A.Rossi</td>
<td>P.Gustin</td>
<td>Ing. A.Rossi</td>
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<td>01</td>
<td>22/02/12</td>
<td>General review</td>
<td>Ing. A.Righini</td>
<td>Ing. A.Spagnolo</td>
<td>Ing. B.Cecchini</td>
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<td>02</td>
<td>20/04/12</td>
<td>Maintenance implemented</td>
<td>Ing. A.Righini</td>
<td>Ing. A.Spagnolo</td>
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<td>Ing. A.Righini</td>
<td>Ing. A.Spagnolo</td>
<td>Ing. A.Rossi</td>
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1 General information

1.1 Scope

The following instructions are designed to assist in unpacking, installing and performing maintenance as required on Orion products. Product users and maintenance personnel should thoroughly review this bulletin prior to unpacking, installing, operating, or performing any maintenance. In most cases, Orion valves, actuators and accessories are designed for specific applications (e.g. with regard to medium, pressure, and temperature). For this reason, they should not be used in other applications without first contacting the manufacturer. The product Installation, Operation, and Maintenance Instructions provides important additional safety information.

1.2 Applicability

The following instructions are applicable to the maintenance and installation of Orion double-disc type gate valves. These instructions cannot claim to cover all details of all possible product variations, nor can they provide information for every possible example of installation, operation or maintenance. This means that the instructions normally include only the directions to be followed by qualified personal using the product for its defined purpose. If there are any uncertainties in this respect, particularly in the event of missing product-related information, clarification must be obtained via the appropriate Orion sales office.

To avoid possible injury to personnel or damage to valve parts, WARNING and CAUTION notes must be strictly adhered to. Modifying this product, substituting non-factory parts, or using maintenance procedures other than outlined could drastically affect performance and be hazardous to personnel and equipment, and may void existing warranties.

1.3 Protective Clothing

DANGER: Orion products are often used in problematic applications (e.g. under extremely high pressures with dangerous, toxic or corrosive mediums). When performing service, inspection, or repair operations, always ensure that the valve is depressurized and that the valve has been cleaned and is free from harmful substances. In such cases, pay particular attention to personal protection (e.g. protective clothing, gloves, glasses etc.).

1.4 Qualified Personnel

Qualified personnel are people who, on account of their training, experience and instruction and their knowledge of relevant standards, specifications, accident prevention regulations and operating conditions, have been authorized by those responsible for the safety of the plant to perform the necessary work and who can recognize and avoid possible dangers.

1.5 Spare Parts

Use only Orion original spare parts. Orion cannot accept responsibility for any damages that occur from using spare parts or fastening materials from other manufactures. If Orion products (especially sealing materials) have been on store for long periods of time check them for corrosion or deterioration before putting them into use.

1.6 Service / Repair

To avoid possible injury to personnel or damage to products, safety terms must be strictly adhered to. Modifying this product, substituting non-factory parts, or using maintenance procedures other than those outlined in these Installation, Operation, and Maintenance Instructions could drastically affect performance,
be hazardous to personnel and equipment, and may void existing warranties. Apart from the operating instructions and the obligatory accident prevention directives valid in the country of use, all recognized regulations for safety and good engineering practices must be followed.

1.7 **Storage**

In many cases, Orion products are manufactured from stainless steel. Products not manufactured from stainless steel are provided with proper coating. This means that Orion products are well protected from corrosion. Nevertheless, Orion products must be stored adequately in a clean, dry environment. Plastic caps or plywood protectors are fitted to help protect the flange faces and prevent the ingress of foreign materials. These caps should not be removed until the valve is actually mounted into the system.

2 **Valve description**

Orion double-disc type gate valves are designed to provide isolation of a piping system or a component when closed. They are not suitable for modulation of flow; i.e., throttling, and should not be used for that purpose.

2.1 **Principle of operation**

The principle parts of a double disc valve are the body, bonnet, disc assembly, stem and topworks (Fig. 1). The body and bonnet contain the fluid within the system. The disc assembly is positioned by the stem to either block flow through the body or is raised to leave an unobstructed flow passage.

The disc to seat seal in the double disc gate valve is created by a combination of internal pressure and mechanical wedging force. The inclined plane mounted between the two discs converts downward stem force into axial force and presses the parallel discs firmly against the valve seats sealing the two openings. The central carrier provides strength to the stem and the transmission of the torque seal. This feature provides **Double Block and Bleed** effect.

![Fig1](image)

2.2 **Design features**

2.2.1 Bonnet seals

Orion double-disc type gate valves are supplied with two basic types of body/bonnet closures; bolted bonnet or pressure seal.

The bolted bonnet closure (Fig. 2) is a bolted flange tongue and groove joint with spiral-wound, groove metal, stainless steel gasket with graphite filler or ring-joint coupling. The seal depends on the bolt preload to maintain sufficient compressive force on the gasket.

Pressure seal type closure (Figs. 3) utilizes a tapered soft metal or graphite gasket for sealing. The gasket is contained within the body neck bore by four pieces ring. The tapered inner surface of the gasket bears against a mating annular surface on the valve bonnet. Under internal pressure, the bonnet is forced against the pressure seal gasket, wedging it against the body neck wall. A slight interference angle produces a line contact and high sealing pressure. The greater the valve pressure the tighter the seal. No bolting force is required to maintain the seal although the bonnet is initially drawn into contact with the pressure seal by cap screws or studs.
### Disc Assembly

Orion double-disc assembly (Fig. 4) consists of dual floating discs with a two piece wedging mechanism between them.

In the double-disk parallel-seat type, the valve is closed by lowering the disks from the valve neck to a height equal to that of the valve seats, assured by a disc stopper on the body that fix only one disc and leave free the second: once so positioned, an inclined plane mounted between the two disks converts *downward stem force into axial force* and presses the parallel disks firmly against the valve seats sealing the two openings (Fig.4). This is the main features that makes the sliding and expanding method safer and more comfortable than the spring-loaded one, that is not susceptible to stem force.

These types of valve design can also accommodate asymmetric or angularly misaligned valve seats. This characteristic results in a *double block and bleed (DBB) effect* that allows the valve to be used in many applications and installation.

The easy unseating operation is assured by a Belleville spring preload screw that, when the stem force is released, exerts an axial downward force resulting, trough the inclined plane, in the horizontal unseating effect. This feature allows also the valve to be mounted in any position/inclination.

A seal weld is provided between the body and the rings. This weld is for sealing only and is not structural. The seat rings are replaceable.

<table>
<thead>
<tr>
<th>Bolted bonnet</th>
<th>Pressure seal bonnet</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Fig.2" /></td>
<td><img src="image" alt="Fig.3" /></td>
</tr>
</tbody>
</table>

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**Fig.4**

*INSTALLATION, OPERATION & MAINTENANCE MANUAL FOR DOUBLE DISC GATE VALVE*
2.2.3 Valve Actuation (Topworks)

Orion double-disc type gate valve is actuated by moving the disc assembly in and out of the seats with the stem. The necessary thrust for opening or closing is imparted to the stem by the valve actuator which is supported and restrained by the yoke structure. Five (5) types of actuators are normally supplied; handwheel, manual gear, electric motor, pneumatic cylinder and hydraulic cylinder. The first three impart rotary motion to a stem nut which converts the rotary motion to linear stem movement via the acme stem threads.

The pneumatic and hydraulic cylinder actuators provide direct linear motion to the stem. Always consult the maintenance manual for the specific actuator or actuator accessory before using or performing maintenance on these components. Sealing of the bonnet-stem penetration is accomplished by a bolted gland stuffing box containing ring type packing. An emergency back-up seal is provided in the form of a backseat rigidly mounted in the bonnet.

3 Unpacking

While unpacking the valve, check the packing list against the materials received. Lists describing the valve and accessories are included in each shipping container.

Be aware that some parts, like the handwheel, are supplied loose from the valve assembly, and are placed inside each shipping container. As soon as the valve is removed from the crate and put in service, provide to install each accessory or component. Be advised that the handwheel may interfere with the lifting operations, so far it can be installed after the slings are removed from valve.

When lifting the valve from shipping container, use straps through the yoke legs, or the lifting lugs attached to the body bolting for valves over four inch, or the adjusting screw for valves four inch and under. On larger valves, lift the valve using straps through the yoke legs or if provided, lifting brackets bolted to bonnet stud. Take care to position lifting straps to avoid damage to the tubing, mounted accessories.

**WARNING:** When lifting a valve be aware that the centre of gravity may be above the lifting point. Therefore, support must be given to prevent the valve from rotating. Failure to do so can cause serious injury to personnel and damage to the valve and nearby equipment.

**WARNING:** Only main valve lifting lugs are designated for complete assembly lifting operations. Any accessories’ lifting points eventually provided (on gearbox or actuator) shall not be used to lift the entire assembly weight. Never hoist the valve through handwheel!

Contact your shipper immediately if there is shipping damage.

Should any problem arise, call Orion representative.

4 Installation

Prior to install the valves, all packaging protections fitted by Orion shall be removed. Inspect the internal of the valve for any dirt or foreign element accidentally entered. Clean if necessary blowing it with compressed air.

Prior to place the valve on the line it’s necessary to verify the axial alignment of the valve to the line and the line flanges to valve flanges parallelism, where the valve shall be positioned.
Once placed the valve, the nuts of line bolting shall be slowly screwed in a diametrically manner all-around the flanges such that the connection results perfect on the whole flanges circumference. On the same way the line bolting shall be tightened. End user shall verify the correct application of the Torque values to be applied for the valve – pipeline installation. Whenever the valves are employed for high temperature services, it’s necessary, after a service period, to verify the bolting tightness of valve’s line flanges, the valve body / bonnet flanges connections and the tightness at the packing gland. Avoid as much as possible any additional stress to be imparted to the valve body, resulting from pipeline bending / thermal expansion, weights. Devices like bellows or pipe supports shall be provided, to avoid such stresses to interest the valve body. Once installed, the valve internal components (seating areas) are particularly vulnerable to physical damages due to foreign elements that could flow inside the plant piping, e.g. sand, rust, welding residuals etc. To minimize such occurrence, the piping shall be completely flushed before to start the plant and operate the valves; during this operation the valves shall be left in the fully opened position.

The standard and the best (in terms of performance and service affordability) installation of a Double Disc Gate Valve is on horizontal pipelines, with the stem in vertical position. A light lateral tilting of stem from vertical axis is tolerated but shall be avoided to give the maximum in terms of reliability. In any case any deviation from the vertical stem installation shall be clearly mentioned during purchase. In case pressure relieving accessories are provided (disc holes, external relief, etc), check the flow direction indicated by the arrow which is on the side of the body, on a riveted tag. Ensure that the valve is installed accordingly to the line flow direction. In such cases the pressure relieving system shall be able to communicate to the upstream side of the valve. Contact Orion to check whether the purchased valve is suitable for an installation different from the original one prior to putting it in service, in case any doubt is raised.

5 Troubleshooting

If difficulty is experienced with the valve, check the following:

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leakage from line flange gaskets</td>
<td>Loosen bolting</td>
<td>Check bolting tightness and restore the correct torque. Replace damaged or excessively corroded bolts.</td>
</tr>
<tr>
<td></td>
<td>Damaged sealing surfaces or gaskets</td>
<td>Remove the valve from the line, replace gaskets and inspect sealing surfaces. Recover surfaces if necessary</td>
</tr>
<tr>
<td>Leakage past the disc and seat assembly</td>
<td>Disc and seat assembly is worn</td>
<td>Remove the valve from the line. With reference to para 8, disassemble the disc and seats assembly. Repair the worn surfaces or replace disc and seats assembly</td>
</tr>
<tr>
<td>Leakage around the valve stem</td>
<td>Stem packing is worn</td>
<td>Replace the stem packing</td>
</tr>
<tr>
<td></td>
<td>CAUTION: Do not overtighten the packing. This can cause excessive packing and stem surface quick wear</td>
<td></td>
</tr>
</tbody>
</table>

INSTALLATION, OPERATION & MAINTENANCE MANUAL FOR DOUBLE DISC GATE VALVE
Leakage at the bonnet flange

<table>
<thead>
<tr>
<th>Condition</th>
<th>Solution</th>
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</thead>
<tbody>
<tr>
<td>Bonnet seal ring is worn</td>
<td>Replace the seal ring</td>
</tr>
<tr>
<td>Bonnet and body flange are not correctly aligned</td>
<td>Check the bonnet flange for perpendicularity to the body. Gaps between the bonnet flange and body flange must be uniform for proper operation. If the assembly is out of alignment, loosen the body bolting and tighten according to steps in the “Reassembly” section.</td>
</tr>
<tr>
<td>Loosen bolting</td>
<td>Check bolting tightness and restore the correct torque. Retighten bonnet nuts. Replace damaged or excessively corroded bolts.</td>
</tr>
<tr>
<td>Bonnet or body ring groove is damaged</td>
<td>Remove the valve from the line. Disassemble as per Para 8. Remachine the damaged surfaces and replace the correct geometry in acc with ORION drawings.</td>
</tr>
</tbody>
</table>

**CAUTION: Do not overtighten the packing. This can cause excessive packing wear and high stem wear.**

If the valve does not function properly, check the bonnet flange and lower body flange-for squareness to the body. Gaps between the bonnet flange and lower body flange must be uniform for proper operation. If the assembly is out of alignment, loosen the body bolting and tighten according to steps in the “Reassembly” section.

If problems still exist, disassemble the valve according to the “Disassembly” section.

### 6 Valve Maintenance

When Orion Double Disc Gate Valves are used in the proper application and operated correctly, they will provide reliable operation for many years. Refer to chapter 7 for ordinary maintenance, and to chapter 8 for extraordinary maintenance operations.

### 7 Ordinary Maintenance

When Orion Double Disc Gate valves are used in the proper application and operated correctly, they will provide reliable operation for many years. The only area that is expected to require regular attention is the adjustment and (if necessary) replacement of the stem packing. At least once every six months, check for proper operation by following the preventative maintenance steps outlined below. These steps can be performed while the valve is in-line and, in some cases, without interrupting service. If an internal problem is suspected, refer to Section Disassembling double-disc type gate Valves.

The most important aspect of valve maintenance is periodic inspection. The early detection of a malfunction can, in many cases, prevent a minor defect from becoming a major problem. It is very important that leakage from any of the major seals (packing, disc/seat, body-bonnet) be addressed immediately. The smallest weepage can quickly become a major problem if it is not treated promptly.

Look for signs of gasket leakage through the end flanges and bonnet. Re-torque flange and bonnet bolting (if required). Refer to Table 1 for bonnet bolt torque values.

Examine the valve for damage caused by corrosive fumes or process drippings.

Clean valve and repaint areas of severe oxidation.

Check packing box bolting for proper tightness and packing leakage. If packing leakage is noticed, packing maintenance is required.
CAUTION: Do not over tighten packing. This can cause excessive packing wear and high stem friction that may impede stem movement. Packing that is tightened too tight will typically not seal correctly.

If the valve is supplied with a lubricator fitting, check lubricant supply and add lubricant if necessary. If possible, stroke the valve and check for smooth, full stroke operation. Unsteady stem movement could indicate an internal valve problem.

<table>
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<tr>
<th>Bolt Size (inches)</th>
<th>Bolt/Stud Material (as machined) (1)</th>
<th>Bolt/Stud Material (as machined) (1)</th>
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<tr>
<td></td>
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<td>Stainless Steel Nm</td>
</tr>
<tr>
<td></td>
<td>Carbon Steel Ftlb</td>
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</tr>
<tr>
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<td>63</td>
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<td>94</td>
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<tr>
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</table>

Note: for a PTFE coated bolt apply a 0.8 reduction factor to above values
for a zinc coated apply a 0.9 reduction factor to above values
for a grease-lubricated nut apply a 0.7 reduction factor to above values

| 7.1 Packing replacement. |

A stem packing leak can be solved with an attempt to re-tighten the packing bolts, anyway in some cases it becomes necessary to replace the graphite packing.

This operation can be performed with the valve installed on the line, and the "double block and bleed" feature could avoid to bleed the entire pipeline to atmospheric pressure, even if the valve is not capable of a backseating position. Where a bleeding device is provided, this allows to drain all the valve cavity and check whether the gate seating is effective and safe, then a repacking could be attempted. Anyway, this remains an emergency situation solution and doesn't allow the user to consider it as a safe operation, so far Orion recommends to bleed the system pressure to atmospheric value before any operation on the stem seal.
**WARNING:** Depressurize line to atmospheric pressure and drain all fluids before working on valve. Not observing this recommendation can cause serious injury.

Slowly loosen the gland nuts until free, lift the gland flange and secure it in position, lift the packing gland and secure it as well above the packing area.

Remove with a hooked tool all the old packing from the stuffing box, avoiding to damage the stem and box surfaces. Blow with air the cavity if needed, to remove all the residuals.

Insert a new graphite packing, cutting 45° each ring with a sharp cutter in order to let him slide over the stem, eventually driving it in the stuffing box with the packing gland.

Lower the gland flange back to original position, ensuring that the packing gland is entering the stuffing box for 3 mm approximately.

Tighten by hand the nuts and adjust the assembly to a correct alignment, without any contact of the gland and the flange with the stem. Tighten the nuts with a quarter of turn each, stroking the stem as well to settle the new packing, if possible.
7.2 **Maintenance Schedule**

<table>
<thead>
<tr>
<th>Operation</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>General external visual check</td>
<td>12 months</td>
</tr>
<tr>
<td>Bolting tightening check (*)</td>
<td>6 months</td>
</tr>
<tr>
<td>Packing tightening</td>
<td>6 months</td>
</tr>
<tr>
<td>Bearing greasing (where applicable)</td>
<td>6 months</td>
</tr>
<tr>
<td>Stem thread lubrication (**)</td>
<td>6 months</td>
</tr>
<tr>
<td>Operating check</td>
<td>3 months</td>
</tr>
</tbody>
</table>

(*) to be increased to twice this frequency in case of high temperatures thermal cycling
(**) to be increased to twice this frequency in case of dusty environment or rainfall washing action.

8 **Extraordinary Maintenance**

In case a major failure is interesting the valve, and it is not possible to solve with the aforementioned actions, the valve should be removed from service and fully overhauled, to investigate the failure and solve the problem.

**CAUTION:** Any warranty covering the product is invalidated as the valve is disassembled by anyone other than the manufacturer. Always contact Orion in case the valve needs servicing during warranty period, before any intervention on the valve.

To disassemble Double Disc Gate valves, refer to Fig.5 and Fig.6 drawings and proceed as follows:

**WARNING:** Depressurize line to atmospheric pressure and drain all fluids before working on valve. Failure to do so can cause serious injury.

8.1 **Actuator removal**

Valve are supplied with several variety of actuating mechanism as:
- handwheel
- gear units
- electric motor units
- pneumatic and hydraulic units

8.1.1 Handwheel

The handwheel can be removed by removing the handwheel nuts, the washer and pulling the handwheel off the yoke sleeve. Be careful not to lose the handwheel key.
8.1.2 Gearbox

Gearbox actuator can be separated from the yoke by removing the actuator capscrews. If a stem protector is provided, it should be removed. With the actuator properly supported, it may be raised off the yoke either by turning the handwheel or rotating the entire unit.

8.1.3 Electric Motor Actuator

Prior to remove, provide to disconnect from the actuator all power and control wiring. As same as the gear actuator, the electric one can be separated from the yoke by removing the capscrews. If a stem protector is provided, it should be removed. With the actuator properly supported, it may be raised off the yoke either by turning the handwheel or rotating the entire unit.

8.1.4 Pneumatic and hydraulic units

To remove these units, may require specialized skills; their removal and disassembly should only be attempted by trained personnel. More detailed information will be provided in a separate manual when applicable.

**CAUTION:** Prevent the disc from dropping into the seat ring when the actuator is removed. Heavy actuators may require a hoist. If a lifting ring is not provided, use lifting straps. Be aware that the center of gravity may be above the lifting straps.

8.2 Flanged Bonnet removal

Remove gland nuts; holding the gland to the bonnet. Remove bonnets nuts.

Lift now the bonnet clear of the valve body and stem.

**CAUTION:** Be careful to not damage the stem during the operation. Heavy yoke and heavy bonnet may require a hoist. If a lifting ring is not provided, use lifting straps. Be aware that the center of gravity may be above the lifting straps.

Remove the gasket from its groove.
Remove the packing.

Be careful not to scratch the seating gasket surfaces.
8.3 **Pressure seal Bonnet removal**

Remove gland studs and nuts.
Remove yoke studs and nuts; holding the yoke to the bonnet.
Now, yoke, gland flange and gland may be lifted off the bonnet.
Remove the bonnet studs and nuts and then lift off the bonnet retainer.

Tap the bonnet to break the seal between it and the pressure seal gasket.
The bonnet will drop downward against its stop, uncovering the gasket retainer

**CAUTION:** *Be careful to not damage the pressure seal area in the body.*

The gasket retainer is a ring segmented into four pieces. Remove the segments.
In some cases, it may be necessary to loosen the segments by tapping with a rubber hammer or applying air into the body hole (Ref Fig.6).
Remove the spacer ring and the pressure seal gasket, if they are loose enough to move; if not they will be removed as a single unit with the bonnet. The bonnet is now ready to be removed.

**CAUTION:** The tight clearances between body, bonnets and the other components require that the bonnet be withdrawn squarely from the body neck bore.

The slightest cocking of the bonnet during withdrawal can cause it to bind and can damage the pressure seal area of the body.

![Diagram](Image)
8.4 Disc and stem

The discs group and stem assembly can be lifted out of the body using a couple of slings. Before the disc assembly is free from the body guides, provide to secure the stem and disc assembly in order to move in safety condition all the assembly; at the same time, a pair of C-clamps should be installed to prevent the disengaging of the discs from the central disc.

Once the assembly is safely laid down and supported, the disc can be separated from the wedge assembly. To remove the spring retaining screw it may be necessary to remove the side safety dowel from the disc, then it will be possible to disassembly all the springs stack and the central disc.

**CAUTION:** If the disc surface is in good condition and lapping is not required, the seating surfaces should be covered with protective material to prevent scratching.
8.5 Reassembling Double Disc Gate valves

To reassemble Double Disc Gate valves, refer to Fig.5 and Fig.6 drawings and proceed as follows:
Clean all gasket surfaces.

**NOTE: Use new gaskets whenever the valve is disassembled.**

Engage the stem with the disc package

**IMPORTANT: The disc package has to be engaged with the same orientation had before disassembling operations**

Retain the discs with a C-clamp and lower the assembly into the body.
Once the discs are secured by the guides in the body, remove the C-clamp and lower the disc package.

8.6 Flanged Bonnet Reassembly

Prior to lowering the bonnet into position, a new gasket should be placed in the gasket groove on the body flange.

**CAUTION: Carefully insert the stem into the backseat bushing in the bonnet and lower it into position on the body.**

*In lowering the bonnet, be careful that neither the backseat or the stem are scratched or gouged.*

*Damage to either of these surfaces can impair their sealing capability.*

Insert packing into the bonnet.
If orientation of actuator is important, the bonnet should be rotated to its proper position prior to lowering it onto the gasket.
With the bonnet in place, studs and nuts can be installed; prior to installation, studs and nuts should be cleaned and lubricated with a high quality lubricant

**CAUTION: Any nuts and studs with damaged threads must be replaced.**

Hand tighten the bonnet flange bolting.
Check the bonnet for a perfect horizontal alignment with the body flange, adjust if necessary acting on the bolting and proceed with a sequential cross bolt tightening as per following schematic and procedure. Refer to table 1 for the correct bolt torques.

4 to 12 Bolts Flanges
First round – 30% of final torque (flange sequential order)
Second round- 60% of final torque (flange sequential order)
Third round – 100% of final torque (flange sequential order)
One final time - clockwise or counter clockwise sequentially around the flange.

12 Bolts Flanges and More
First round – 20% of final torque (flange sequential order)
Second round- 40% of final torque (flange sequential order)
Third round – 80% of final torque (flange sequential order)
Fourth round – 100% of final torque (sequential order)
One final time - clockwise or counter clockwise sequentially around the flange.

Lower the actuator/gear-box and gland flange into place. Screw the stem into the actuator stem by rotating the actuator/gear-box in a clockwise direction.
Tighten the gland flange nuts slightly more than finger tight.

**CAUTION**: Do not over tighten packing. This can cause excessive packing wear and high stem friction.

Stroke disc two or three times to center seat rings.
When reinstalling the valve in the line, make sure the flow is in the proper direction.
It’s essential that the flange faces remain parallel and all the bolt has uniform tension.

### 8.7 Pressure Seal Bonnet Reassembly

Lower the bonnet over the stem and into the neck of the body.
Care must be taken in lowering the bonnet on the stem, so that neither the backseat nor any surface of the stem is damaged.
With the bonnet resting on the counterbore in the body neck, a new gasket and the spacer ring can be inserted. The sector ring can be placed with the same position it had in the new valve.

**CAUTION**: The gasket must be handled with care

The bonnet retainer flange can be lowered over the stem and placed in its position on top of body neck.

**IMPORTANT**: before proceeding, be sure that the orientation of bonnet retainer flange has the same original orientation it had before disassembly (Ref. Fig.6)

The bonnet capscrews/studbolts should then be inserted through the bonnet retainer and threaded into their holes in the bonnet.
By turning each capscrews a couple of turns, proceeding to the adjacent capscrew, turning it and then repeating this around the bolt circle ; the bonnet will be raised squarely until it’s firmly in contact with the gasket.

**WARNING**: Ensure that the bonnet engages completely over the four sectors ring.

Although gasket sealing is achieved by operating pressure pushing the bonnet tightly against the gasket, it may be necessary to torque the studbolts / capscrews to obtain a tight seal at low pressures.

Insert a new packing into the stuffing box and the packing gland, gland flange and related bolts.
Install the yoke and bolt it on the body top.
Lower the actuator/gear-box and gland flange into place. Screw the stem into the actuator stem by rotating the actuator/gear-box in a clockwise direction.
Tighten the gland flange nuts slightly more than finger tight.

**CAUTION**: Do not over tighten packing. This can cause excessive packing wear and high stem friction.
9 Gear box rotation

When a gear box is installed on a gate valve, this can be rotated around the vertical axis of the valve to offer the more comfortable position of the handwheel for the operator. This simple operation doesn't require to de-pressurize the line, and doesn't need to replace any part.

If the valve is already installed and under pressure, the only requirement needed is to open it fully until a contact of the backseat is obtained. The stem will be locked in the upper position and the gearbox unloaded.

Undo and remove the retaining screws below the yoke flange and conserve them carefully.

If a rod-type indicator is installed as per figure on the right, there is no need to remove it.

Gently rotate the gearbox until the desired position is obtained, eventually turning the handwheel to help and to adjust it to the new direction. Of course the possible gearbox positions are limited to the ones allowed by the number of screws.

A minimum of 90 degrees is in any case possible.

Reinstall the screws and tighten them to the proper torque.

Check the valve for correct operating through some turns of the handwheel in both directions.

10 Nameplate Information

The nameplate attached to your ORION Double Disc Gate Valve provides you with the rated working pressure, temperature range that gate valve was designed to handle.

The nameplate also provides you with the serial number that has been assigned to each valve by ORION.

When ordering replacement parts, reference to the information provided on the nameplate will aid in ensuring that you receive correct component parts for your gate valve.