CAST STEEL VALVES

Bolted Bonnet Non Return Valves

2”–24”, (50–600 mm), 150#-300#

MAINTENANCE MANUAL

DURGA VALVES PVT. LTD.

ICHAPUR ROAD, CANAL SIDE, SANTRAGACHI, HOWRAH-711104

INTRODUCTION -

The swing on the hinge pin which is stationary. The hinge pin is held in place by the hinge pin block, which is bolted to the body by a hex bolt and secured with lock washer. The hinge pin block hole diameter is oversized by approximately 1/16" (1.6 mm) to allow disc adjustment with body seat. Once adjusted, the hinge block, the hinge pin and the body hinge knob a hole is drilled for the dowel pin. This is done at assembly and should not be required in the field unless new spare part hinge block, hinge pin is being replaced. If new parts must be replaced follow tilting disc adjustment procedure.

RECEIVING AND PREPARATION FOR INSTALLATION -

RECEIVING INSPECTION

All valves must be examined for signs of damage that may have occurred during transportation. Any damage should by analyze and a report should be issued. Serious damage should be reported to your local DVPL representative or to the Customer Service Manager so that a suitable arrangement for repairs can be made without delay.

QUALITY CONTROL INFORMATION

For valves purchased with Quality Control (QC) certification, check the package of documents to see that the Quality Control certificates are complete as per the purchase order.

STORAGE

Valves should be stored in a suitably sheltered place to prevent contamination by weather, dirt or dampness. The valve is shipped with end protectors on the inlet and outlet which should stay on the valve until it is ready for installation.

HANDLING AND PREPARATION

On large valves, a hoist is needed to assist installation. A sling should be placed under the valve body or around the valve yoke so that the unit can be lifted vertically to its final destination. End protectors must be removed from all types of valves and connections must be checked for cleanliness. Any visible foreign matter must be removed from end connections on valves. It must be cleaned properly with a suitable solvent such as acetone or alcohol. Do not use solvents containing chloride or fluoride.

INSTRUCTIONS FOR CHECK VALVES -

All DVPL inclined piston check and stop-check valves without springs, when installed in vertical or near vertical line, should have fluid flow upward and the angle of incline of the line not more than 5º past the vertical in the direction of the bonnet. When installed in horizontal or near horizontal lines, the valve bonnet should be up and the angle of incline of the line should be not more than 5º below the horizontal.

GENERAL MAINTENANCE -

General

All valves require examination before being put into operation. Additionally, valves should be inspected regularly during operation and should receive prompt attention when trouble arises. As a general rule, valves should be subjected to scheduled maintenance.

Smoothness of Operation

Stem threads, gearing and other working components outside the fluid area should be lubricated frequently and at least once every six months. Specific lubricants and frequency of application are shown in the recommended lubrication. Valves that are not operated frequently and which may remain open or closed for long periods of time should be worked (even if only partially) about once a month.

RECOMMENDED LUBRICATION

PART	APPLICATION	FREQUENCY
Stem Threads	Directly to threads	When threads appear dry
Yoke Nut	Inject through grease fitting at hub of yoke	Concurrently with stem thread lubrication
All threaded parts except stem and yoke nut	Thin coat on thread	On valve assembly only

GENERAL ASSEMBLY INFORMATION

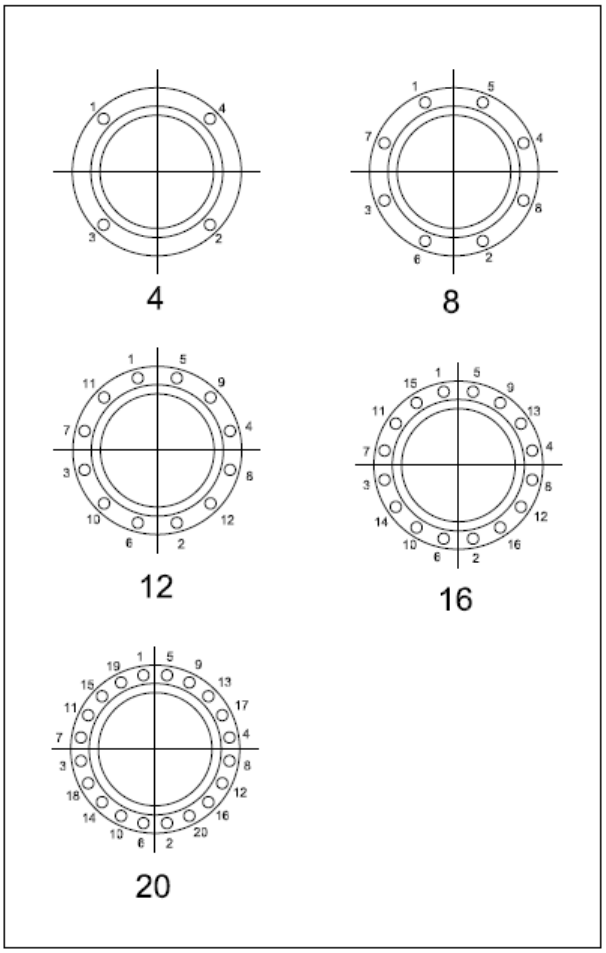
1. The most important fact to be considered is the cleanliness of all parts. All rust and dirt should be removed from all parts with a wire brush or emery cloth. Oil and grease should be removed with suitable solvents.

2. All threaded parts (cap screws, nuts and studs) must be well re-lubricated. The stem and yoke nut threads should be cleaned of all old grease before new grease is applied to the threads.

3. Repaired or replacement parts must be checked to see if all repair procedures have been done and that all replacement parts (e.g. packing rings, gasket, etc.) have been checked for size so that they will fit into the valve you are servicing.

4. All orientation marks assigned during disassembly must be observed so that correct orientation is maintained. Where applicable, orientation marks should be made on parts near the body serial number (e.g., wedge, disc, seat etc.)

BOLT TIGHTNING SEQUENCE



PARTIAL DISASSEMBLY - GASKET REPLACEMENT SWING CHECK -

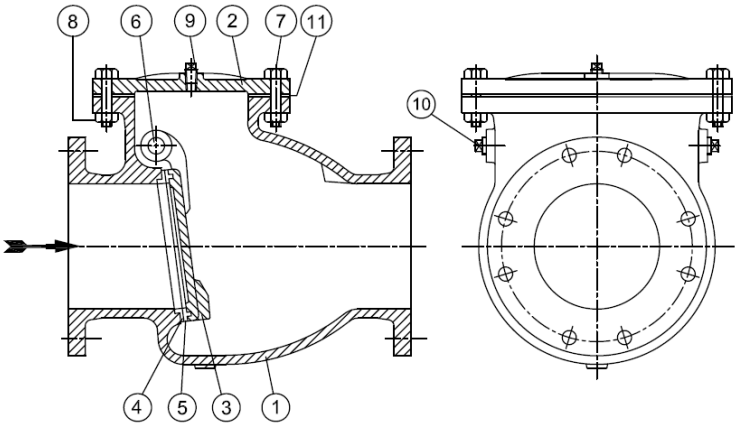
1. Remove body–cover nuts.
2. Once all the nuts are removed, the cover and gasket can be lifted from the valve body.
3. Install new spiral wound gasket.
4. Line up the cover with the body and lower onto the body.
5. Apply the recommended lubricant to the body– cover studs and then install the body–cover nuts. Tighten in strict bolt tightening sequence procedure.

TOTAL DISASSEMBLY - SWING CHECK -

1. The valve is now ready for inspection. At this point in the disassembly procedure, inspect the rotation of the disc on the hanger arm and the alignment between the disc and the seat. Ensure that the hanger arm has free movement, is not binding and is not being restricted by any internal part.
2. After inspecting all points mentioned above, remove all internal parts by unfolding the tab washers around the hex bolt in body.

3. After hex bolts have been removed, the internal assembly can be removed from the body.
4. DVPL has cast swing checks 2" to 24" (50-600 mm) CL-150 to CL-300.

GA DRAWING -



MATERIALS OF CONSTRUCTION			
SL. No.	DESCRIPTION	MATERIAL	SPECIFICATION
1	BODY	CAST STEEL	ASTM A216 Gr.WCB
2	COVER		
3	DISC WITH HINGE		
4	BODY SEAT RING	L.T.BRONZE	IS:318 Gr. LTB 2
5	DISC FACING RING		
6	HINGE PIN	STAINLESS STEEL	ASTM A276 TYPE-410
7	COVER BOLTS/STUDS	CARBON STEEL	IS:1367 CL.-4.6
8	COVER NUTS		IS:1367 CL.-4.0
9	AIR RELEASE PLUG	CARBON STEEL	-
10	SIDE PLUG		
11	GASKET	RUBBER	IS:638, TYPE-B

DETAILED MAINTENANCE SWING CHECK -

Body/Cover (Gasket) Leakage

To maintain the tightness of a factory-tested bolted bonnet valve, it is essential to apply sufficient bolt tension at all times by having the proper torque on the nuts or cap screws. The original torque might be lost due to vibration, relaxation of material caused by frequent temperature and pressure fluctuations, or by creep in high temperature applications. Gasket bolt tension should be checked at approximately one-year intervals (Recheck For Bolt Tightness procedure).

Seat Leakage

Disc Repairs

1. Disassemble the valve and inspect the disc and seat for scratches, pitting marks or other damage.
2. If the seating face of the disc is scratched, it must be lapped. Slight pitting, grooving, or indentations no deeper than 0.005" (0.1 mm) can be removed by lapping. If defects cannot be corrected by lapping, the disc can be ground and/or machined. DVPL recommends that no more than 0.031" (0.80 mm) be removed. After grinding is completed, lap the disc.
3. For the lapping, a flat plate (preferably made of cast iron) should be used. An abrasive lapping compound should be mixed together with olive oil and evenly distributed over the plate. Only light, even pressure should be applied and the disc should be moved on the plate. Lift the disc as often as possible to prevent accumulation of particles in one area and to allow for proper distribution of the lapping compound. The lapping plate should be

turned slightly every few strokes to maintain a flat surface. The part should be lapped until seating faces are smooth.

4. Thoroughly clean off the lapping compound with a suitable cleaning fluid such as acetone or alcohol. Do not use solvents containing chloride or fluoride.

Seat Repairs

If repairs are required on the seat of a swing check valve, these seats is the angle of the seat face. They can be repaired with an automatic grinding or lapping machine or by the manual method.

Examine disc seating area for contact

1. If there is seating contact throughout the whole seating circumference (360°), the disc is well aligned with sufficient disc freedom. This also indicates that the seating surfaces are well mated and free of any damage.
2. If there is contact at the 3 or 9 o'clock position, the disc does not have sufficient freedom of movement in the disc hanger arm bore. The disc should be held, but not constrained, by the hanger arm. The disc should be free to find its own seat. This freedom comes from the clearance between the disc post OD and the hanger arm bore ID, and the gap between the hanger arm and the disc nut washer.
3. Whenever replacing with new hanger, hinge pin, or disc, it may be necessary to align the disc to be approximately in centre with the body seat. This may be accomplished by raising or lowering the disc. To raise the disc determines approximate amount the disc needs to be lifted, places him(s) under the hinge pin as necessary. To lower the disc, determine approximate amount the disc needs to be lowered and machine (mill) bottom of hinge pin flats as necessary.
4. If there is contact at 12 o'clock position, the disc needs to be lifted by machining. To determine the amount to be removed first lift the disc assembly by the hanger back stop then gently and slowly lower the disc. Determine the gap by checking at 6 o'clock with an "L" shaped feeler gauge or shim stock. Equal amount of material must be removed from the base of the disc post and top of the post shoulder, or as necessary to achieve ideal gap between the hanger arm and disc nut washer.
5. If there is contact at 6 o'clock, the disc is too high in the hanger arm, or the seats are too low. This sometimes happens after extensive lapping. To correct the problem, the disc must be lowered. First, lift the disc assembly by the hanger back stop then gently and slowly lower the disc. Determine the gap at 12 o'clock by checking with feeler gauge. Add a washer of equal thickness to the base of the disc post and machine equal amount the top of hanger arm, or as necessary to maintain ideal gap between the hanger arm and disc nut washer.

Fitting of New Disc

When damage to the disc seating face cannot be removed by grinding or lapping, the disc must be replaced. All new discs coming from the factory are already ground and should be lapped before installation.

ASSEMBLY

Disc assembly fit-up

This procedure is to be used when replacement of disc assembly parts or rework is required. Use it after you have made sure that the body and disc seats are clean, smooth, flat and free of any seating surface damage.

1. Preassemble disc unit, making sure that there is sufficient clearance between disc washer and hanger arm, disc post and hanger arm bore. Also ensure that hanger arm rotates freely around hinge pin. The hinge pin should fit comfortably into hanger arm bore and between body recess/spacer washers. A gap up to 0.065”(1.6 mm) is acceptable. A gap exceeding 0.065”(1.6 mm) may be cause for rejection. To determine actual gap.

Internal and Mid-Section Assembly

1. Mount disc on hanger arm, tighten disc nut and lock in place with cotter pin. Check that disc can rotate freely on hanger arm.
2. Place entire assembly carefully back into the body making sure that the hinge pin can move freely in an axial direction.
3. Insert tab washers and tighten down with hex bolts. Lock the bolts by turning up the ears on the tab washers.
4. After installation is finished, check the rotation of the disc on the hanger arm and the alignment between the disc and seat.
5. Install new gasket. On soft iron gaskets, apply lubrication (a light coat of oil).
6. Line up the cover with the body and lower onto the body.
7. Apply the recommended lubricant to the body– cover studs and then install the body–cover nuts. Tighten in strict accordance with Bolt Tightness procedure.

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