



MILLIKEN AWWA SWING CHECK VALVE OPERATION AND MAINTENANCE MANUAL



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OPERATION & MAINTENANCE

MILLIKEN AWWA SWING CHECK VALVES

STORAGE

Valves should be stored in a suitable sheltered place to prevent contamination by weather, dirt or dampness. Valves should remain with original shipping containers or skids, or valves stored on a flat surface with valve weight supported evenly by the flange face. Do not store valves on the shaft ends or bushing housing.

RECOMMENDED STORAGE NOT MORE THAN (2) UNITS IN HEIGHT

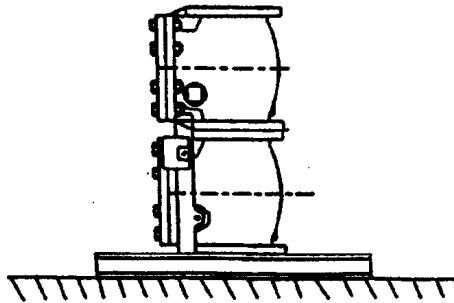


FIGURE #1

OPERATIONS

GENERAL

All valves require checking before being put into operation.

- a. Visually inspect valve to insure it has been properly installed.
- b. Are gaskets properly installed between flanges?
- c. Does valve move smoothly during operations?
- d. If furnished with dashpot, "dampener" fluid level should be checked.
- e. No fluid leakage should be visible.

In addition, regular inspection is recommended during operation. Prompt attention should be given when trouble arises. As a general rule valves should be subjected to scheduled maintenance or inspection.

OPERATION

Lubrication of valves with optional dampeners or lever operated systems and lubrication fittings should be performed frequently, at least every six months.

OPERATION & MAINTENANCE

INSTALLATION

End protectors must be removed and connections checked for cleanliness before installing a check valve. Any visible foreign matter must be removed from the end connections of the piping system. The valve should be flushed with water and seat checked for damage.

Special Instructions for Check Valve Types

Check type valves must be installed with the inlet in direction of arrow and with the hinge horizontal and disc vertical. This has to be checked carefully before installing the valve. The placing of a check valve in the opposite direction to the flow will prevent the disc from swinging free and, therefore prevent normal operation of the valve.

Make sure the correct gaskets and bolting are available before beginning installation. Keep the valve weight supported by the hoist and align the flange gaskets and install bolting. Pipe must be adequately supported in the valve site to prevent pipe loads from being transmitted to the valve.

The valve should not be installed between pipe flanges that do not align with the valve. Do not attempt to correct misalignment by tightening of flange bolting, as this will place excessive stress on the valve assembly.

Tighten the bolting by the “cross sequence method” to provide uniform seating of the flange gasket (see Figure #3).

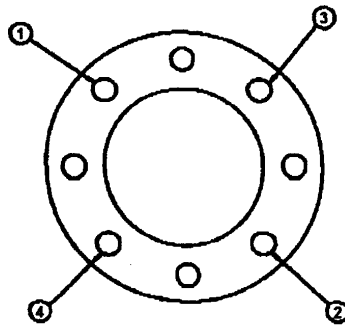


FIGURE #3

OPERATION & MAINTENANCE

MAINTENANCE

TROUBLESHOOTING CHART

TABLE #1

AREA	PROBLEM	PROCEDURE FOR REPAIR
Packing leakage	Packing worn	Replace O-Ring packing
Valve seat	Leakage past seat Damaged seat	Disc seat adjustment Disc seat replacement
Dampener or lever operated options	Difficulty operating	Check for obstruction in line Dampener misalignment Disc or seat adjustment Worn bearings – contact Service Representative
Vibrations and noise	Flow rate greater than anticipated Using valve outside its normal operation range Loose disc pin connection Loose damper or lever to valve mounting	Tighten
Gasket leakage	Pipe misalignment Unsupported pipe loads Improper gasket or installation Uneven torques applied during bolting	See installation

OPERATION & MAINTENANCE

Body/Bonnet & Body/Cover Leakage

GENERAL

It is essential that sufficient bolt tension exist at all times by having the proper torque on the nuts. The original torque might be lost due to vibration, relaxation of material caused by frequent temperature and pressure fluctuation or by creep in high temperature application. We recommend that the joint bolt tension be checked at approximately one-year intervals.

TORQUING PROCEDURE

1. Clean all studs and nuts. Visually inspect all threads to ensure removal of all foreign matter, rust, corrosion, burrs and previous lubricants.
2. Liberally cover the stud threads and surface under the nut head with Felpro, type C5A Hi-tempo anti-seize compound or equal. Also, lubricate the female threads of the nuts and wipe off any excess lubricant.
3. Follow the bolt tightening sequence shown in Figure #4. This sequence is dependent upon the number of bolts employed and the sketch is only an illustration as to possible tightening sequence. The bolts shall be torqued to recommended values in Table 2.

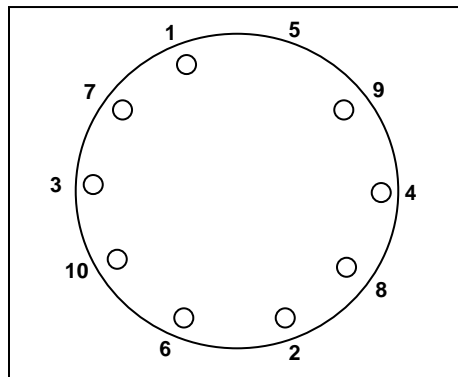


FIGURE #4

APPLICATION OF TORQUES

Each bolt should be torqued in steps of approximately 20% of the final torque. It will be found that as the final torque is approached, the required step will become much less than 20%.

PRECAUTION:

1. The tightening sequence must be followed to ensure that the gasket will be compressed evenly.
2. Do not over-torque as this can cause deformation of the bonnet or cover flange.
3. Impact wrenches that are not properly calibrated will result in improper tightening of the connection.

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TORQUE VALUES

TABLE #2

TORQUE VALUES (FT/LB)		
STUD SIZE	BOLTING MATERIAL	
	B7.630	660
	100%	100%
3/8-16UNC	20	20
7/16-14UNC	30	30
1/2-13UNC	50	45
9/16-12UNC	70	62
5/8-11UNC	95	85
3/4-10UNC	170	150
7/8-9UNC	270	240
1-8UNC	410	360
1-1/8-8UN	600	535
1-1/4-8UN	845	750
1-3/8-8UN	1150	1020
1-1/2-8UN	1520	1350
1-5/8-8UN	1955	1740
1-3/4-8UN	2475	2200
1-7/8-8UN	3075	2735
2-8UN	3765	3345
2-1/8-8UN	4500	4045
2-1/4-8UN	5440	4835
2-1/2-8UN	7545	6710

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SEAT LEAKAGE

GENERAL

Valve seat leakage may be the result of a distorted seat caused by improper installation of the valve into the pipeline.

Seats may be “fluid cut.” When the valve fails to close tightly, this can be caused by debris, pit marks or other surface irregularities on the mating faces.

DISC REPAIRS

1. Disassemble valve as described in Section 500 and inspect the disc for scratches or damages.
2. Polishing with very fine emery cloth on a perfectly flat surface can sometimes restore scratched seating faces.
3. Deep scratches or pits will require the disc be lapped. However, only slight pitting, grooving or indentations not deeper than .005” can be removed by lapping. Defects that cannot be corrected by lapping must be ground and then lapped. We recommend that a maximum of only .005” be removed per side.
4. A flat plate, preferably cast iron, should be used and an abrasive lapping compound (150 grit) Mixed with light oil evenly distributed over the plate surface. A light even pressure should be applied on the plate, lifting the disc as often as possible to prevent accumulation of particles in one area and to allow for proper distribution of lapping compound. The lapping plate position should be turned slightly every few strokes to keep a flat surface. The part should be lapped until seating faces are smooth.
5. Thoroughly clean off the lapping compound with a suitable cleaning fluid, such as acetone or alcohol. Do not use chloride or fluoride bearing solvents.

SEAT REPAIRS

Swing Check / Machine Repair

Automatic grind and lapping machines are available such as the following:

- a) Dexter Gate Valve Reseater
- b) Unislip Gate and Parallel Slide Valve Grinders

These machines can be mounted directly onto a valve, which is already installed in the pipeline. Both machines automatically set themselves to the correct seat surface angle. These two types of machines are available for different sizes of valves.

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SWING CHECK / ALTERNATE REPAIR

Seat faces must be repaired by using a lapping plate when an automatic grinding and lapping machine is not available. A plate of cast iron that is large enough to cover the face of the seat is required. Apply lapping compound mixed with light oil and evenly distribute on plate. Lap seat by moving lapping plate in a circular motion on seat face. Lift the plate as often as possible to prevent accumulation of particles in one area and to allow for proper distribution of the lapping compound. Lap until both seats have smooth faces and then clean off the lapping compound very thoroughly with a suitable cleaning fluid, such as acetone or alcohol.

FITTING

Repaired Parts – Swing Check

The seating faces of the discs or seats must be checked with “Machinist Bluing” before reassembly. A bluing ink should be placed smoothly and equally over the full circumferential surface of both sides of the disc. Place the marked up side of the disc together with the marked tip side of the seat. Slowly lower the part into the body and find the correct mating point of the faces. Contact points should be shown along entire seating surface.

Fitting of New Disc – Swing Check Valves

Damage on the disc seating face, which cannot be removed by grinding or lapping, indicates the disc must be replaced. All new discs coming from the factory are already ground and should be lapped before installation. See installation procedures described in “Reassembly of Swing Check” in this section.

BEARINGS

The bearings used in our check valves are self-lubricating and require no additional lubrication. Occasionally, a customer may have specified optional lubrication fittings. When lube fittings are encountered, we recommend maintenance every six months.

OPERATION & MAINTENANCE

DISASSEMBLY / REASSEMBLY

DISASSEMBLY

General Disassembly

There are two basic methods by which valves can be disassembled:

- a. Total disassembly.
- b. Partial disassembly to allow access to the area which requires maintenance.

The decision on which method to use depends on the nature of the problem and the space availability.

First determine where the problem lies. Maintenance problems for these valves can be divided into two major areas.

1. Valve internal problems: gasket, disc, seat, etc.
2. Valve top works: dampener or lever

CAUTION: ALL PRESSURE MUST BE RELIEVED FROM BOTH SIDES OF THE VALVE BEFORE ANY SPECIFIC DISASSEMBLY WORK IS STARTED.

OPERATION & MAINTENANCE

REASSEMBLY

General Reassembly

1. The reassembly procedures are not as detailed as the disassembly procedures since, in most cases, the reverse procedure is required.
2. 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 have been removed with suitable solvents.
3. All threaded parts (cap screw, nuts, studs) should be well lubricated. The stem and yoke nut threads should be clean of old grease before a new application of grease is applied to the threads. Recommended lubricants are silicone-based grease.
4. 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 to insure they will fit the valve being serviced.
5. All orientation marks assigned during disassembly must be observed so that correct orientation is maintained.

Reassembly of Check Valves

1. Hold disc in place on valve seat in body. Insert hinge pin through plugholes in body and then disc hinge. On units with keys and key-ways, make sure key is aligned with key-way slot on pin during reassembly.
2. Check the rotation of the disc on the hanger and the alignment between the disc and seat. After installation is completed, movement should be free and unobstructed.
3. Install new gasket on cover; apply lubrication (a light coat of oil).
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 accordance with torquing procedure.

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AWWA SWING CHECK VALVES

CAUTION:

Do not, under any circumstances, use the indicator shaft or pointer on series RCH style valves to cycle the valve or override disc movement. This shaft is not designed to withstand full weight of the disc.

