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**Operation and Maintenance
Manual
Series 9000A**



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Operations & Maintenance

DESCRIPTION

Series 9000 swing check valves are of self-contained, free-swinging disc style with outside lever and weight or outside lever and spring. Valves conform to all standards set forth in AWWA C508. Suitable for use in wastewater, water, sewage, oil, and gas applications. Valves are produced in cast iron body, bronze or stainless steel seat rings, Buna-N or EPDM disc inserts, and hinge pins of corrosion resistant stainless steel. Internal and external epoxy coating conforming to AWWA C550 is a standard. Valves are designed for horizontal or vertical installations and for uninterrupted continuous service.

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THEORY OF OPERATION

The Milliken/CCNE check valve is a non-return valve that allows the fluid to pass through the disc, but will not allow it to return because the disc closes and stops the flow.

This valve requires approximately $\frac{1}{2}$ psi to open. The valve can be equipped with weight on the arm or a spring.

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PRE START-UP CHECK

All valves should be inspected at time of delivery for shipping damage and to confirm compliance with specifications. Whenever possible, the valves and all apparatus should be protected from the weather. Water and debris should not collect in the valve. Note; these instructions are guidelines for use by experienced piping and mechanical personnel.

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SAFETY

Valves are to be handled by experienced installers. They should never be used as structural members and should be appropriately rigged for lifting. Valves are heavy and include various accessories, which should be handled with caution.

TOOLS AND EQUIPMENT NEEDED:

STANDARD BOX WRENCHES

PIN DRIVERS

BALL PEEN HAMMER

RIGGING EQUIPMENT

PACKING PULLER

PACKING CUTTER

CHAIN HOIST

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STORAGE

Store valves closed. Store on end flange or in the horizontal position. They should be stored inside or covered away from weather. If valves must be stored outside, protect them from weather. Valves on jobsites should be protected to avoid physical damage from heavy equipment or tools.

Outside lever and spring components should be protected to avoid inadvertent contact.

Make sure valves are kept drained of water in freezing weather to prevent cracking of iron parts. All coatings shall be protected to avoid damage from handling, weather, and light rays.

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INSTALLATION INSTRUCTIONS

A) Check that valve end joints conform to the mating pipe and verify that ends are clean and sound. All 9001 series valves are supplied with flat faced flanges with ANSI class 125 drilling. Do not mate these valves to pipe or fittings with raised face flanges.

B) Remove any material used to restrain the flow control device, lever or pin during shipment and storage. Attach any outside closing mechanism in proper position manually.

C) The flow control device and closing mechanism should be checked to insure freedom of motion and proper operation. Cover bolts shall be checked for any loose joints.

D) When handling the valve, do not use the outside mechanisms for lifting.

E) It is necessary to install the valve in proper orientation with regard to flow direction. Please note flow arrow on side of body.

F) Prepare pipe ends per pipe manufactures instruction and install valve as per appropriate instructions for the specific joint. All piping should be properly supported to avoid line stress on the valve. Do not use valves as a jack to force a pipeline in position.

G) Standard wrenches and/or sockets are to be used to tighten all nuts and bolts. Fasteners are to be tightened in a star pattern to insure balance loading of bolts.

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MAINTENANCE INSTRUCTIONS

The system is designed to be trouble free with minimum care. Frequency of inspection should be based on the operational characteristics of the system i.e. systems of high cycles should be inspected frequently.

At a minimum, semi-annual inspections are recommended, points of inspection should be at a minimum:

- 1) All end joints, cover joints, and packing boxes should be inspected for leakage.
- 2) Bolts should be checked for tightness, a torque of 90 foot pounds is recommended for gasketed joints.
- 3) Inspection of the valve during operations is recommended so that the outside linkages can be inspected for proper operation.
- 4) Inspection of the packing box is required to assure no leakage is evident. If leakage exists, replace o rings (part 351). Do not tighten end plug to stop leak. Caution: o rings should not be changed or added in an active valve. Valve should be isolated to prevent injury or damage to valve and operator.
- 5) Inspection of interior of valve is not necessary unless improper operation is witnessed or leakage beyond the allowable rate is experienced. The interior of the valve and the internal components can be inspected by removing the valve cover. Cover gasket should be replaced any time this joint is broken. Never re-installed a used cover gasket.

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OPERATING INSTRUCTIONS

Once in the pipeline, the swing check valve will operate as flow conditions dictate. The valve will open as the pressure on the upstream side of the disc overcomes the downstream side. The valve will close as the situation reverses itself or the pressure equalizes.

The adjustment of weight and/or the addition of springs to assist closure may be necessary.

These valves are self contained units. Outside levers, weights, springs, or hinge pins should never be used to manually operate the valve or restrict its operation.

External shields and surrounding piping should not interfere with the free operation of external apparatus of the valves.

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TROUBLESHOOTING

POSSIBLE MALFUNCTION	SYMPTOMS/ CAUSE	CORRECTIVE ACTION
End Joint Leakage	Tension on bolts relaxed	Tighten bolts in Star pattern
Cover Gasket Leakage	Relaxed Cover bolts tension	Tighten Bolts in Star Pattern. Should leakage Continue, replace Gasket
Valve Slams While Closing	Weight needs adjustment	Adjust weight location/ Addition of spring kit req'd
Seat Leakage	Seats Dirty	Remove inspection Cover and flush
	Disc Seat Damaged	Replace Buna-N Insert or Replace Disc
Leak by Hinge Pin	Cracked or Broken O Rings	Replace O Rings

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LUBRICATION

Under normal operation, lubrication is not required to maintain proper operation of components or assembled units.

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SERIES 9001 RECOMMENDED SPARE PARTS

<u>PART</u>	<u>MATERIAL</u>	<u>QTY PER VALVE</u>	<u>PART #</u>
COVER GASKET	BUNA-N	1	90-324
O RING KIT*	BUNA-N	1	90-351/352-KIT

*Includes (2) internal and (2) external O rings