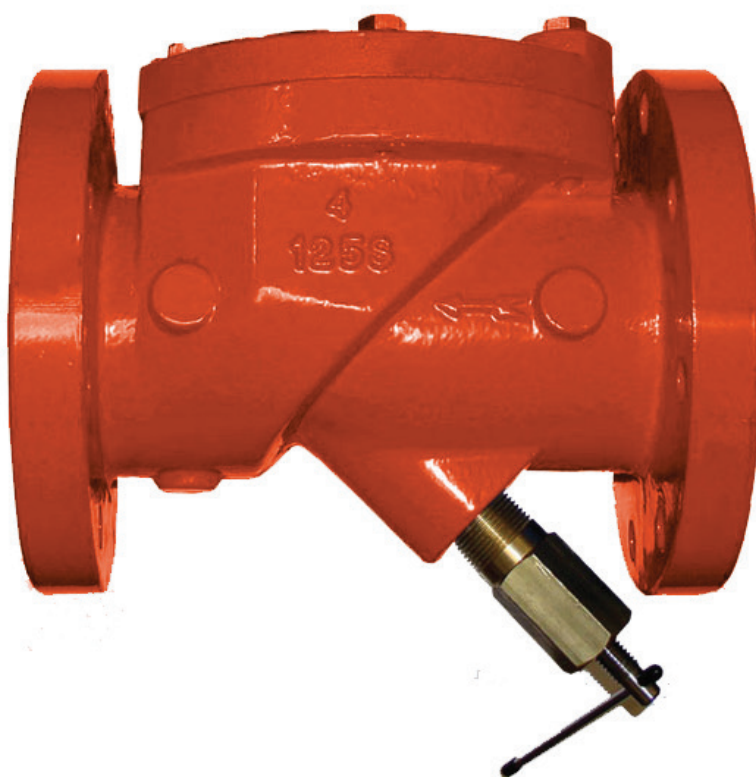




VSI AWWA C508 RUBBER FLAPPER CHECK VALVE

VSI Waterworks
**2" - 48" AWWA C508
RUBBER FLAPPER CHECK VALVE**

INSTALLATION, OPERATION AND MAINTENANCE MANUAL



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SCOPE:

This installation, operation, and maintenance manual covers the VSI AWWA C508 rubber flap check valve and should be read and understood thoroughly by all parties responsible for installation and continued use/maintenance.

WARNINGS:

The critical safety messages within this manual are labeled with an exclamation symbol within a red triangle flag. Care should be taken to thoroughly read and understand these warnings before proceeding to ensure no damage to equipment occurs. Failure to follow all warnings could result in injury or death.

WARNING!

All parties that take part in any installation or continued use/maintenance are cautioned to be vigilant in the possible exposure to media that is contained within the valve and its pipeline. Because of the vast range of media that could be within the valve, protection from pipeline media is not within the scope of this manual. All personnel should be aware of the media within the valve and take appropriate precautions when exposure is possible while installing or servicing the valve.

INSPECTION:

The VSI AWWA C508 rubber flap check valve is rugged and will be packaged to provide protection during most shipping incidents, however care should be taken to inspect the valve on receipt for any possible shipping damage. Inspection should be performed as soon as practical. Failure to promptly notify VSI of any shipping damage may invalidate any claim for shipping damage. Most shipments from VSI will be made FOB Origin, unless noted on the sales documents, the purchaser will own the freight while in transit, assumes all risk while in transit, and will be responsible for reporting shipping damage promptly to the carrier.

PARTS:

Order parts from your Valve Solutions Inc. sales representative. Please include the serial number, located on the valve tag, when ordering parts.

WARNING!

Read all applicable instructions and directions prior to any maintenance, installation or troubleshooting.



SECTION 1 - GENERAL

Rubber Flapper check valves form a significant component part of many firefighting or water-distribution systems. Failure of a Rubber Flapper Swing Check Valve in such systems, either caused by faulty installation or improper maintenance, could result in extensive damage and costly repairs. Problems with or malfunctions of the Valves caused by faulty installation or improper maintenance can result in extensive and costly unearthing operations to effectively correct or eliminate the problem. Many Rubber Flapper Swing Check Valves problems and failures can be traced back to improper handling, storage, installation, operation, or maintenance procedures.

SECTION 2 - UNLOADING

All valves should be unloaded carefully; a soft sling around the body is recommended to prevent damage to the valve and its protective coating. Each valve should be carefully lowered from the truck to the ground; it should not be dropped. Valves should not be lifted or unloaded using chains, slings, or forklift fork(s) engaging the valve accessories or passing through the valve waterway. In the case of larger valves, forklifts or slings around the body of the valve or under the skids should be used for unloading. Only hoists and slings with adequate load capacity to handle the weight of the valve or valves should be used. Hoists should not be should not be hooked through the seat opening in the body. Failure to carefully follow these recommendations is likely to result in damage to the valve.

SECTION 3 - INSPECTION PRIOR TO INSTALLATION

Rubber Flapper Swing Check Valves should be inspected at the time of receipt for damage in shipment. The initial inspection should verify compliance with specifications, direction of opening, size, and operator(s). A visual inspection of the seating surfaces should be performed to detect any damage in shipment or scoring of the seating surfaces. Inspection personnel should look for bent rod(s), cracked parts, loose bolts, missing parts and accessories, and any other evidence of mishandling during shipment. Each valve should be operated through one complete opening-and-closing cycle in the position in which it is to be installed.

SECTION 4 - STORAGE

Whenever practical, valves should be stored indoors. If outside storage is required, valves should be protected from the weather, sunlight, ozone, and foreign materials. In colder climates where valves may be subject to freezing temperatures, it is absolutely essential to prevent water from collecting in the valves. Failure to do so may result in a cracked valve casting or deterioration of the disc material.

SECTION 5 - INSTALLATION

Instructions supplied by manufacturers should be reviewed in detail before valves are installed. At the jobsite prior to installation, each valve should be visually inspected and any foreign material in the interior portion of the valve should be removed. A detailed inspection of the valve as outlined in Sec. 3 should be performed prior to installation.

Sec. 5.1 Bolts

All bolts should be checked for proper tightness and protected by the installer to prevent corrosion, either with a suitable paint, by polyethylene wrapping, or other suitable means of corrosion protection.

Sec. 5.2 Installation

Valves in water-distribution lines shall, where practical, be located in easily accessible areas.

5.2.1 During installation, there is the possibility of foreign materials inadvertently entering the valve. Foreign material can damage internal working parts during operation of the Check Valves. For this reason, Check Valves should be installed in the closed position with the embossed flow arrow on the valve body pointing in the direction of flow. Each valve should be placed on firm footing in the trench to prevent settling and excessive strain on the connection to the pipe. Piping systems should be supported and aligned to avoid damage to the valve.

Sec. 5.3 Inspection

After installation and before pressurization of the valve, all pressure-containing bolting (top cover plate, seals, and end connections) should be inspected for adequate tightness to prevent leakage. In addition, an inspection should be made for adequate tightness of all tapped and plugged openings to the valve interior. Proper inspection at this time will minimize the possibility of leaks after pressurization of the piping system.

Sec. 5.4 Hydrostatic testing

To prevent time lost searching for leaks, it is recommended that valve excavations not be backfilled until after pressure tests have been made. After installation, it is desirable to hydrostatically test newly installed piping sections, including Valves, at some pressure above the system design pressure. The test pressure should not exceed the rated working pressure of the Valve. After the test, steps should be taken to relieve any trapped pressure in the body of the valve. The Rubber Flapper Swing Check Valve should not be operated in either the opening or closing direction at differential pressures above the rated working pressure. It should be noted that Valves seat better at or near the rated working pressure of the valve. It is also recognized that wear or foreign material may damage valve seating surfaces and may cause leakage (Ref. AWWA C600).

Sec. 5.5 Records

Upon completion of the installation, valve location, size, make, type, date of installation, number of turns to open, direction of opening, and other information deemed pertinent should be entered on permanent records.

Sec. 5.6 Application Hazards

Rubber Flapper Swing Check Valves should not be installed in applications or for service other than those recommended by the manufacturer. The following subsections for precautions are not all inclusive but will help avoid some application hazards.

- a. Rubber Flapper Swing Check Valves should not be installed in lines where service pressure will exceed the rated working pressure of the valve.
- b. Rubber Flapper Swing Check Valves should not be used in applications that are exposed to freezing temperatures.
- c. Thrust blocks, restrained joints, or other means of restraint are needed on or adjacent to valves on pipelines or where unusual conditions exist, such as high internal pressures, adjacent fittings, or unstable soils.



SECTION 6: INSPECTION AND MAINTENANCE

Sec. 6.1 Valve Exercising

Each Valve should be operated through a full cycle and returned to its normal position on a time schedule designed to prevent a buildup of tuberculation or other deposits that could render the Valve. The interval of time between operations of Valves in critical locations, or Valves subjected to severe operating conditions, should be shorter than that for less important installations, but can be whatever time period is found to be satisfactory based on local experience. Maintenance should be performed at the time a malfunction is discovered. A recording system should be adopted that provides a written record of valve location, condition, maintenance, and each subsequent inspection of the valve

Sec. 6.2 Spring Return Attachment Option

Rubber Flapper Swing Check Valves is designed to minimize or eliminate slam in high head applications where rapid flow reversal causes the Swing Check Valve to slam. The Valve has a 35° disc stroke, leaving 80° to 90° of travel. Having the spring return attachment option causes the disc to accelerate valve closure. Having the Valve closed before reverse flow occurs can in many instances drastically reduce or even eliminate Valve slam.

Sec. 6.3 Inspection

Each valve should be operated through one complete operating cycle. With the Check Valve in the partially open position, a visual inspection should be performed, where practical, to check for leakage at all joints, connections, and areas of seals. If leakage is observed, all defective O-rings, seals, gaskets, or end connection sealing members should be replaced. If the leakage cannot be corrected immediately, the nature of the leakage should be reported promptly to those who are responsible for repairs. If the valve is inoperable or irreparable, its location should be clearly established to save time for repair crews. The condition of the valve and, if possible, the position, should be reported to personnel responsible for repairs. In addition, the appropriate municipal departments should be informed that the valve is out of service.

Sec. 6.4 Maintenance

ATTENTION: DO NOT WORK ON ANY VALVE UNDER PRESSURE

Rubber Flapper Swing Check Valves does not require routine maintenance, but should be included as part of the normal facility equipment inspections for any malfunction while under normal usage conditions.

- a. Relieve the pressure in the line.
- b. Isolate the Rubber Flapper Swing Check Valve from the system before loosening the cover bolts to remove the cover.
- c. Loosen each cover bolt only three to four full turns, tapping the side of the cover with a rubber mallet to separate only Valve cover from the cover gasket. By doing so, this will relieve any pressure in the Valve.
- d. Loosen to remove all cover bolts and lift the cover. After removing the cover of the valve, the Flapper will be fully exposed and freely removed. The Flapper, the cover gasket, and the body surfaces of the Check Valve should be fully examined for wear. If replacement parts are needed, contact the manufacture with Valve type, size, and the appropriate parts.
- e. Reassemble, replace the cover gasket.
- f. Replace Flapper and be sure that the Flapper rests flat and centered against the body seat surfaces.



Sec. 6.5 Maintenance - Spring Return

The spring adjusting mechanism where all components are made of stainless steel and a Rubber Flapper encapsulates a reinforcing plate. The Rubber Flapper Swing Check Valve requires no maintenance.

Sec. 6.6 Record Keeping

To carry out a meaningful inspection and maintenance program, it is essential that the location, make, type, size, and date of installation of each valve be recorded. Depending on the type of record-keeping system used, other information may be entered in the permanent record. When a Rubber Flapper Swing Check Valve is inspected, an entry should be made in the permanent record indicating the date of inspection and condition of the valve. If repair work is necessary, it should be indicated, and on completion of the work, the nature of the repairs and date completed should be recorded.

SECTION 7: REPAIRS

Leakage, broken parts, hard operation, and other major defects should be corrected by a repair crew as soon as possible after the defect has been reported. If repairs are to be performed in the field, the repair crews should take a full complement of spare parts to the jobsite. Provisions should be made to isolate the defective valve from water pressure and relieve internal trapped pressure prior to performing any corrective maintenance. Disassembly of the valve should be performed in accordance with the procedure supplied by the manufacturer. After repair of the valve, the operating mechanism should be cycled through one complete operating cycle. With full line pressure applied to the valve in the open position, an inspection should be made to detect leakage in the areas around the cover, seals, and body-end connections. A record should be made to indicate that the valve has been repaired and is in working condition. Any markings indicating that the valve is inoperable should be removed. In addition, the appropriate municipal departments should be informed of the satisfactory repair of the valve.



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SECTION 8: TROUBLESHOOTING

Problem	Cause	Correction
The valve will not seal	Interference between valve disc and seating surface	Follow instructions for disassembly(maintenance section) and check for any interference
	Uneven tightening of the cover or accessories	Loosen then retighten bolts and nuts evenly
	Corrosion or debris in accessories	Follow instructions for disassembly(maintenance section) and clean accessories
	Debris under disc	Follow instructions for disassembly(maintenance section) and clean out debris
Leakage between the body and cover of the valve	Bolts and nuts may be loose or tightened irregularly	Loosen then retighten bolts and nuts evenly
	Cover Gasket may be damaged	Follow instructions for disassembly(maintenance section) and replace gasket
	RARE: Crack in body or cover	Inspect and replace if necessary
Leakage at accessories	Damaged operator	Replace accessory in its entirety
	Damaged o-rings	
Valve fails pressure test	Valve is not completely closed	Close valve completely
	Debris trapped under disc	Throttle valve from fully closed to approximately 25% open several times under line flow to clear debris. If unsuccessful follow instructions for disassembly and remove debris
	Disc encapsulation or seat is damaged	Follow disassembly instructions and inspect for damage. If present replace damaged parts.

SECTION 9: DISASSEMBLY AND REASSEMBLY



ATTENTION: DO NOT WORK ON ANY VALVE UNDER PRESSURE

Sec. 9.1 Basic Valve Disassembly and Reassembly

1. Shut off line flow fully and equalize pressure across valve by backflush attachment or other means
2. Remove bonnet cover bolts and washers
3. Remove disc from valve body
4. Inspect and replace disc if it is damaged. There should be no cracks or deformation.
5. Clean all seating and mating surfaces before beginning reassembly
6. Replace disc into valve body
7. Replace bonnet cover using new seal
8. Reinstall cover bolts and washers
9. Tighten to 90 ftlbs using a criss-cross pattern
10. Return valve to service and check for leaks

Sec. 9.2 Backflush Attachment Disassembly and Reassembly

1. Shut off line flow fully.
2. Screw backflush attachment fully inward by rotating in a clockwise direction to equalize pressure across valve.
3. Loosen and remove the entire backflush attachment at its hex base.
4. Inspect for bends, nicks, or other damage. Replace if damaged.
5. Replace backflush attachment using new seal and teflon thread sealant
6. Screw backflush attachment fully outward by rotating in a counterclockwise direction
7. Return valve to service and check for leaks

Sec. 9.3 Indicator Attachment Disassembly and Reassembly

1. Shut off line flow fully.
2. Equalize pressure across valve by backflush attachment or other means
3. Remove packing seal nut from cover of valve by loosening hex counterclockwise
4. Inspect and replace o-rings if necessary
5. Lift indicator shaft and disc and polish with extra fine 800 grit or higher sand paper to remove nicks or damage
6. Reinstall packing seal nut using new seal and teflon thread sealant
7. Return valve to service and check for leaks.