

HENRY PRATT COMPANY

HANDLING, INSTALLATION, OPERATION AND MAINTENANCE OF PRATT RUBBER-SEATED VALVES

GENERAL

Valves are a significant component of any piping system. Failure due to faulty handling, installation, improper operation or maintenance in such systems could result in damage, down time and costly repairs. In buried underground installations, problems or malfunctions can result in extensive, costly unearthing operations to correct the problem. Many problems with valves can be traced to improper handling, installation, operation, or maintenance procedures.

UNLOADING

Inspect valves on receipt for damage in shipment and conformance with quantity and description in the shipping notice and order. Carefully unload all valves to the ground without dropping. On valves larger than 36 inches, use fork trucks or slings under skids. On smaller valves, do not lift valves with slings or chain around operating shaft, actuator, or through waterway. Instead, lift smaller valves with eye bolts or rods through flange holes.

STORAGE

Whenever practical, store valves indoors. If not, protect valves and actuators from weather and accumulation of water, dirt, rocks and debris. When valves fitted with power actuators and controls are stored, energize electric actuator or otherwise protect electrical control equipment to prevent corrosion of electrical contacts due to condensation resulting from temperature variation. Do not expose rubber seats to sunlight or ozone for any extended period. Valves should be stored with the valve disc or closure member slightly open.

INSPECTION PRIOR TO INSTALLATION

Make sure flange faces and joint sealing surfaces, body seats and disc seats are clean. Check bolting attaching actuator to valve for loosening in transit and handling. If loose, tighten firmly. Open and close valve to make sure it operates properly and that stops or limit switches are correctly set so that the valve seats fully. Check that valve rotation direction is correct and close valve before installing.

INSTALLATION

The following items must be performed during installation to ensure proper function.

- Carefully place valves into position avoiding contact or impact with other equipment, vault walls or trench walls.
- Valves are to be installed in accordance with the General Arrangement Drawings furnished for the order. Valves with flow direction arrows are to be installed accordingly.
- For rectangular and Model 1200 Nuclear valves only, install the seats adjustment side of the valve for access and adjustment in service.

- Foreign material in a valve can damage the rubber seat when valves are operated. Be sure valve interiors and adjacent piping are clear of foreign material prior to mating valve to pipe joint.
- Prepare pipe ends and install valves in accordance with the pipe manufacturer's instructions for the joint used. Do not deflect pipe/valve joint. Do not use valve as jack to pull pipe into alignment.
- In plant piping, install so as to minimize bending of valve connection with the pipe loading.
- In case of wafer type butterfly valves, concentrically center the valve disc between the mating flanges.
- Make sure valve disc, when opened, will not contact pipe port. This is especially necessary on pipe with linings and when wafer valves are used. Check manufacturer for minimum pipe I.D. required for clearance.

WARNING

It is recommended that valves be installed into piping system in accordance with AWWA M-11 in order to prevent any undue piping stress, deflections or bending that may affect the performance of the valve.

WARNING

Valve disc without actuator may open or close at any time and cause injury to persons or damage to valve and other property. The shaft/disc clamping device when furnished is intended for temporary use during shipping, handling and valve installation only. Do not subject valve to flow conditions before actuator is mounted and tested for performance and clamping device is removed.

Buried valves installed with valve boxes must be so installed that the valve box does not transmit shock or stress to the valve actuator as a result of shifting soil or traffic load.

When valves are installed in vaults, the vault design must provide space for purpose of repair. The valve operating nut should be accessible from the top opening of the vault with a tee wrench.

MECHANICAL JOINT INSTALLATION

The successful operation of the mechanical joint requires that the plain end be centrally located in the bell and that adequate anchorage be provided where abrupt changes in direction and dead end occur. The rubber gasket will seal more effectively if the surfaces with which it comes in contact are thoroughly cleaned (for example, with a wire brush) just prior to assembly in order to remove all loose rust or foreign material. Lubrication and additional cleaning should be performed by brushing both the gasket and the plain end with soapy water or pipe lubricant just prior to slipping the gasket into the plain end and assembling the joint.

Special Note for 10" and 12" MJ valves: When used with Class 200 C900 pipe, the inside diameter of the pipe must be beveled to assure adequate clearance for the maximum O.D. of the valve disc. Beveling is also recommended when using Class 150 C900 pipe with 10" valves. Maximum disc O.D.-10" valve 9.83", 12" valve 11.6".

(Mechanical Joint Installation cont.)

In all cases, fully cycle each valve through open and close positions before burying or putting valve into service to verify disc clears the pipe end.

For water and gas service, the recommended range of bolt torques to be applied are given in TABLE 1.

When tightening bolts, it is essential that the gland be brought up toward the pipe flange evenly, maintaining approximately the same distance between the gland and the face of the flange at all points around the socket. This may be achieved by partially tightening the bottom bolt first, then the top bolt; next the bolts at either side; and finally, the remaining bolts. This process should be repeated until all bolts are within the range of torques shown in TABLE 1. (In larger sizes [30-48 in.], as many as five repetitions may be required.) If effective sealing is not attained at the maximum torque indicated, then the joint should be disassembled, thoroughly cleaned, and reassembled. Overstressing of bolts or mechanical joint flanges to compensate for poor installation practice is to be avoided.

TABLE 1

Size In.	Bolt Size In.	Range of Torque ft.-lb.	Length of Wrench* In.
3	5/8	45 – 60	8
4 – 24	3/4	75 – 90	10
30 – 36	1	100 – 120	14
42 - 48	1-1/4	120 – 150	16

*The torque loads may be applied with torque-measuring or torque-indicating wrenches, which may also be used to check the application of approximate torque loads applied by a person trained to give an average pull on a definite length of regular socket wrench.

TESTING

When rubber seated valves are used to isolate sections of line for test, it is important to realize that these valves are designed or factory adjusted to hold rated pressure only. Test pressure may cause leakage past the rubber seat or damage to the valve.

In order to prevent time lost in searching for leaks, it is recommended that excavations for buried valves not be back-filled until after hydrostatic pressure tests have been made.

Seat leakage can occur due to foreign material in the line. If this occurs, open valve 5 – 10 degrees to get high velocity flushing action. Close and repeat several times to clear seats for tight shutoff.

Seat leakage can occur due to rotational shift in position of the disc with relation to the body seat. Readjust closing stop in accordance with manufacturer's instructions.

RECORDS

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

OPERATION

Do not permit use and operation of any valve at pressure above the rated pressure of the valve.

Do not exceed 300 ft-lb input torque on actuators with wrench nuts, 200 lb. rim pull input torque for handwheels or chainwheels. If portable auxiliary actuators are used, size the actuator or use a torque limiting device to prevent application of torque exceeding 300 ft-lbs. If an oversize actuator with no means of limiting torque is used, stop the actuator before valve is fully opened or closed against stops and complete the operation manually. Be sure to check actuator directional switch against direction indicated on wrench nut, handwheel or records before applying opening and closing torque.

If a valve is stuck in some intermediate position between open and closed, check first for jamming in the actuator. If nothing is found, the interference is inside the valve. In this case, do not attempt to force the disc open or closed since excessive torque in this position can severely damage internal parts. Contact the Pratt Service Department.

WARNING

Fluids exposed to freezing temperatures may cause valve to fail resulting in injury to persons or damage to valves and other property. Do not use in applications that are exposed to freezing temperatures unless sufficient flow is maintained through the valve to prevent freezing, or other protection is provided.

MAINTENANCE

Maintenance of rubber-seated valves by owner is generally limited to actuators and shaft seals. In some instances, valve design permits field adjustment or replacement of rubber seats when leakage occurs. Seat adjustment should be made in accordance with field service manuals. Unless the owner has skilled personnel and proper equipment, any major rework will probably require removal of the valve from the line. Depending on condition, valve may require return to the manufacturer.

WARNING

Removal of actuator from valve shaft will cause disc to rotate, striking persons or objects in the disc path, causing injury to persons and damage to valve. Block or lock disc before removing actuator.

Normal maintenance would be shaft packing replacement and actuator adjustment. Seal leakage, broken parts and difficult operation should be discussed with Pratt's Service Department before valve repairs are attempted. Pratt Service Engineers are available to perform or supervise valve repairs in the field.

Stop line flow and isolate from line pressure prior to performing any corrective maintenance.

After completing repair, cycle valve through one complete operating cycle and after line pressure has been restored, inspect for leakage.

If major repairs require removal or closure of the valve, notify all interested personnel in the water department and fire department that the valve and line are out of service. Upon completion of repair and reinstallation, notify the same personnel of the return of the valve and line to service.