Resilient-Seated Gate Valve
OS&Y: 3299 / 3199 Series
NRS: 3288 / 3188 Series

Installation, Operation & Maintenance

In line with our policy of continuous product improvement LIFECO reserves the right to modify specifications without prior notice.

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GENERAL INTRODUCTION

Resilient-seated gate valves recognize a significant component of many fire-fighting and water-distribution systems. Failure of a resilient-seated gate valve in such systems, either due to faulty installation or improper maintenance, could result in extensive damage and costly repairs. Also, many resilient-seated gate valves are installed in buried-service or underground applications. Problems with or malfunctions of the valves due to faulty installation or improper maintenance may result in extensive and costly unearthing operations to effectively correct or eliminate the problem. Many resilient-seated gate-valve difficulties and failures can be traced back to improper installation, process, or maintenance procedures.

UNLOADING

All valves should be unloaded carefully from the truck to the ground. It should not be dropped. For larger valves, forklifts or slings around the body of the valve or under the skids can be used for unloading. Only hoists and slings with an adequate load capacity should be used. Hoists should not be hooked into, or chains fastened round yokes, gearing, motors, cylinders, or handwheels. Failure to carefully follow these recommendations is likely to result in damage to the valve.

INSPECTION BEFORE INSTALLATION

Resilient-seated gate valves should be inspected at the time of receipt for damage in shipment. The initial inspection should verify compliance with specifications, the direction of opening, size and shape of the operating nut, number of turns to open or close, and type of end connections. A visual inspection of the seating surfaces should be performed to detect any damage in shipment or seating surfaces' scoring. Related individuals should look for bent stems, broken handwheels, 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.

STORAGE

Valves should be stored in a fully closed position to prevent foreign material entry, damaging the seating surface. As recommended, valves should be stored indoors. If outside storage is required, it is important to protect the operating mechanism from weather elements. Valves should be protected from the weather, sunlight, ozone, and foreign materials during outside storage. In colder climates where valves may be subject to freezing temperatures, it is essential to remove the water from the valve interior and close the valve before storage. Failure to do so may result in a cracked valve casting and or deterioration of the resilient seat material.

INSTALLATION

1. At the jobsite before 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 before installation.
2. All bolts should be checked for proper tightness and protected by the installer to prevent corrosion, either with a suitable paint or by polyethylene wrapping.
3. **Underground Installation** Valves in water-distribution lines shall, where practical, be located in easily accessible areas.
   - 3.1. During installation, there is the possibility of foreign materials inadvertently entering the valve. Foreign material can damage internal working parts during the operation of the gate valve. For this reason, gate valves should be installed in a closed position. Each valve should be placed on firm footing in the trench to prevent settling and excessive strain on the pipe's connection. Pipe systems should be supported and aligned to avoid damage to the valve.
   - 3.2. A valve box or vault should be provided for each valve used in a buried-service application. The valve box should be installed so as not to transmit shock loads or stress to the valve. The valve box should be centered over the operating nut of the valve with the box cover flush with the surface of the finished area or other level directed by the owner. Valve boxes should be of such design that a traffic load on the top is not transmitted to the valve.
   - 3.3. Valves buried in unusually deep trenches should have special provisions for operating the valve — either a riser on the stem to permit using a normal key or a notation on the valve records that a long key will be required.
   - 3.4. When valves with exposed gearing or operating mechanisms are installed belowground, a vault designed to allow pipe clearance and prevent settling on the pipe should be provided. The operating nut should be accessible from the top opening of the vault with a valve key. The vault's size should allow easy removal of the valve bonnet and internal parts of the valve. Users should consider the possible entry of groundwater and/or surface water and the need to provide for the disposal of such water.

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4. For aboveground installation or installation in a plant piping system, it should be supported and aligned to avoid damage to the valves. The valve should not be used to correct the misalignment of piping.
5. Inspecting after installation and before pressuring the valve, all pressure-containing bolting (bonnet, seal plate, packing gland, and end connections) should be inspected for adequate tightness to prevent leakage. An inspection should also be made for sufficient tightness of all tapped and plugged connections to the valve interior. Proper assessment at this time will minimize the possibility of leaks after the pressurization of the piping system.
6. It is recommended that the valve excavations are not backfilled until after pressure tests have been made for saving time. After installation, it is desirable to 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 stress in the body of the valve. The resilient-seated gate valve should not be operated in either the opening or closing direction at different pressures above the rated working pressure. It is also recognized that wear or foreign material may damage valve seating surfaces and may cause leakage.
7. The completion of the installation, valve location, size, make, type, date of installation, number of turns to open, the direction of opening, and other information deemed pertinent should be entered on permanent records.
   7.1. **Application Hazards.** Resilient-seated gate valves should not be installed for service other than those recommended by the manufacturer.
   7.2. Resilient-seated gate valves should not be installed in lines where service pressure will exceed the valve's rated working pressure.
   7.3. Resilient-seated gate valves should not be used for throttling service unless the design is specifically recommended for that purpose or approved in advance by the manufacturer.
   7.4. Resilient-seated gate valves should not be used in applications exposed to freezing temperature unless sufficient flow is maintained through the valve or other protection is provided to prevent freezing.
   7.5. Gate valves should not be installed at a dead-end or near a bend in a pipeline without proper and adequate restraint to support the valve and prevent it from blowing off the end of the line.
   7.6. 4″ and below size NPS resilient-seated gate valves should not be operated with input torques greater than 200 ft-lb (270 N.m) for avoiding damage. Gate valves 6″ to 12″ NPS should not be operated with input torques greater than 300 ft-lb (406 N.m).

INSPECTION AND MAINTENANCE

Each valve should be operated through a full cycle and returned to its normal position on a schedule to prevent a buildup of tuberculation or other deposits. The interval of time between operations in critical locations, or valves subjected to severe operating conditions, should be shorter than that for less important installations but can be whatever period is found to be satisfactory based on local experience. The number of turns required to complete the operation cycle should be recorded and compared with permanent installation records to ensure full gate travel.

When using portable auxiliary power actuators with input torque capacities exceeding the maximum operating torques recommended in Sec. 5.7.5, extreme care should be taken to avoid excessive torque applied to the valve stem. If the actuator has a torque-limiting device, it should be set below the values in Sec. 5.7.5. If there is no torque-limiting device, the recommended practice is to stop the power actuator three or four turns before the valve is fully opened or fully closed and then complete the operation manually.

Maintenance should be performed when a malfunction is discovered to avoid a return trip to the same valve and prevent forgetting about it altogether. A recording system should be adopted that provides a written record of valve location, condition, maintenance, and each subsequent inspection of the valve.

1. Inspecting every valve should through one complete operating cycle. If the stem action is tight due to “hard-water” buildup on the stem threads, the operation should be repeated several times until the opening and closing actions are smooth and free. If the gate is partially open, a visual inspection should be performed to check for leakage at all joints, connections, and areas of packing or seals. If leakage is observed, all defected O-rings, seals, gaskets, or end-connection sealing members should be replaced. If leakage can not be repaired immediately, it is necessary to report promptly 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 gate position should be reported for repairs. Fire departments and other appropriate municipal departments should also be informed that the valve is out of service.
2. To keep a record of carrying 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 kind of record-keeping system used, other information may be entered into the permanent record. When a resilient-seated gate valve is inspected, an entry should be made in the permanent form indicating the inspection date and condition of the valve. If repair work is necessary, it should be indicated. After completing the work, the nature of the repairs and the date completed should be recorded.

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REPAIRS

Leakage, broken parts, challenging operation, and other significant defects should be repaired by a repair crew as soon as possible after the fault 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 stress before performing any corrective maintenance. Disassembly of the valve should be accomplished following the procedure supplied by the manufacturer. After repairing 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 seal plate, bonnet, packing gland, 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. Also, fire departments and other appropriate municipal departments should be informed of the valve's satisfactory repair.

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