

# Rack & Pinion T-Valve Installation, Operation & Maintenance

**CRITICAL: Telescoping valve slip tube assembly and valve operator must be plumb for proper operation. Stand pipe flange must be level before connecting telescoping valve companion flange.**

## Slip Tube Assembly

### Installation

The first step in the installation of your t-valve should be the slip tube assembly. To begin with, the wiper gasket tension is preset. Install the slip tube assembly in receiving pipe in completely vertical line.

Attach the companion flange of the assembly to the receiving pipe flange with necessary hardware (not provided).

Gravity may pull the slip tube down. Block/prop up the slip tube in preparation for operator installation.

\*NOTE: If the slip tube doesn't fall, the gasket tension may be too tight. Proper adjustment must be made before proceeding. Contact Troy Valve for additional "tension washers." When you receive them, remove the nuts from the compression ring, lift the ring and add one washer to each stud. Removing too many washers and then over-tightening the compression ring will over-tighten the gasket and make the valve hard to operate. Be sure that the slip tube is greased with a food grade grease before moving it up and down. Replace the compression ring and tighten nuts until bottomed out. Test to ensure slip tube falls gradually. If issues persist, do not proceed and contact us for further instructions.

### Operation & Maintenance

- Ensure the slip tube assembly is adequately greased before operation is initiated. It is best to grease the tube/gasket at least quarterly.
- Be alert for symptoms of wear or of adjustments being necessary, such as hearing or feeling abnormal friction or the water level dropping below slip tube elevation.
- If you are having difficulty turning the operator/hand wheel, check to confirm proper tension of the assembly.
- If the wiper gasket must be replaced, remove the nuts from the compression ring, lift the

ring and remove the split MJ gasket. You will need to order a replacement gasket using the diameter of the receiving pipe flange. Once the replacement arrives, install and readjust per the installation instructions above.

- Addition or subtraction of tension washers may be necessary throughout the life of the valve to keep proper compression of the gasket.

## Operator

### Installation

If supplied with a floor stand mounting bracket, install this component first, ensuring the bracket is level in all directions. Telescoping valves and the receiving pipe must be installed completely vertical and in line. The slip tube must be able to travel up and down the receiving tube without hitting or scraping the inside of the receiving pipe. Do not fully tighten mounting bolts at this time as fine adjustment may be needed later. If the floor stand is shipped with an anti-rotation plate, install the floor stand with the anti-rotation plate on the bottom.

Unscrew the lift rod from its shipping location inside the slip tube. Grease the rack, then place it into the top of the gearbox while turning the hand wheel to engage the teeth. Caution must be taken when inserting the rack so as not to damage the nylon tipped rack guide set screws. Move the rack all the way down while adjusting the two rack guide set screws. Proper adjustment is 1/16" of clearance on each side of the rack. The two guide set screws are intended to guide the rack and should not be in constant contact. Thread the short threaded end of the lift rod with the washer and jam nut into the bottom of the rack. Use a plumb-bob to adjust the floor stand in order to obtain proper axial alignment. Once alignment is achieved, tighten mounting bolts of floor stand fully.

Install slip tube assembly to the riser pipe. The slip tube assembly includes the slip tube and the wiper gasket and companion flange assembly. Start by removing the bail riser crossbar, then remove the jam nut from the lift rod and thread the bail riser crossbar onto it. Then, replace the jam nut. Adjust the slip tube to an elevation above low water, but below high water. Operate the gearbox to adjust the height of the lift rod so that the bail riser crossbar can be remounted. Tighten the jam nut on the bail riser crossbar fully. Operate the valve between high and low water elevations to ensure both are achieved. If not achieved, fine adjustment can be made by removing the crossbar and turning it to adjust the height. Then, replace the bail riser crossbar and ensure the jam nut is tight. Operate the valve again to check elevations and readjust if necessary. Operate the valve back down to low water elevation.

Grease the rack and gear box and install the rack cover. Apply a Mylar strip on the exterior of the clear

rack cover tube. Then, install the clear rack cover tube into the aluminum tube housing on the top of the gearbox by embedding it into silicone sealant. Grease the slip tube with food-grade grease. Operate the valve to critical elevations and mark the Mylar strip/clear rack cover tube accordingly for quick reference.

\*NOTE: It cannot be stressed enough that the valve should operate extremely freely with little to no resistance in the hand wheel. If you have to use excessive force to operate the valve, STOP! Check that all steps of this procedure have been performed properly and readjust for proper alignment and compression as necessary.

## Safety

The Troy Valve Safety Lock Telescoping Valve has a self-locking gear operator that prevents the valve from traveling unless the hand wheel is intentionally turned by the operator. To prevent any possibility of pinching, the valve should not be operated unless the clear slip tube is in place over the rack.

## Operation

Telescoping valves travel vertically to regulate the water level in either the tank they are located in or in an adjacent tank. The range of travel is dictated by the tank design and specifications.

- To lower the valve (open it) turn the operator counterclockwise
- To raise the valve (close it) turn the operator clockwise

The Troy Valve Telescoping Valve Operator has no separate locking mechanism to engage or disengage. There is no adjustment required either. Operation is simply to use hand wheel to adjust height of tube as required. Do not operate telescoping valve “dry”—lubricate slip tube with food-grade grease before traveling the tube up and down.

The see-through slip tube allows the operator to mark setting heights that are regularly used, directly on the acrylic cover.

### Maintenance

The gearbox should be greased monthly via the grease fitting on the gearbox using a standard heavy machine grease. Grease the rack whenever it does not show obvious signs of grease being present with a standard heavy machine grease.

Routinely check the nylon tipped rack guide set screws for wear and replace/adjust as necessary. In addition, routinely do a visual inspection of the rack for any abnormal debris (i.e. metal chips, dirt, etc.).

If the wiper gasket must be replaced, simply remove the nuts holding down the gasket gland, slide the gland up, remove the split gasket and replace with a new split gasket from Troy Valve. Readjust the companion flange per the installation instructions. Order replacement gaskets by the diameter of the slip tube. Parts are available through Troy Valve, 800-232-4442.

## Troubleshooting

If the t-valve is hard to operate:

- Ensure that the operator and slip tube are completely vertical and in line.
- Gear box and rack should be well greased. On non-rising stem operators, the stem should be well greased.
- The gasket retainer should not be tightened too tight or the split gasket may bind the tube. Only tighten the gasket retainer tight enough to hold the split gasket in place.
- Check adjustment of rack guide screws, per installation instructions.

## Parts List and Predicted Life

See Troy Valve Telescoping Valve literature for a parts list. Although the life of the unit and parts are dependent on the type of usage and maintenance it receives, it is designed to last for many years of operation.

## Wear Parts

The split gasket is the only predicted wear part of the valve. The life of this gasket is dependent on the amount of usage and conditions it sees. Before replacement is necessary, the gasket may be adjusted by tightening the gasket retainer.

## Long Term Storage Prior to Installation

The valves and operator should be protected from excess sun exposure as the gaskets, which are normally submerged, may deteriorate if exposed to too much direct sunlight. The valves should not be stacked and the slip tube should be protected from crushing so that they do not go out of round.