

Gate Valve Troubleshooting

How many turns does it take to open/close a gate valve?

The AWWA operating formula for opening/closing a gate valve is 3 times the nominal valve size plus 2 or 3 turns of the operating nut.

Example; $6 \times 3 = 18$ plus 2 or 3 = 20 to 21.

Number of turns needed to open/close Mueller Resilient Wedge Gate Valves.

2"	2.5"	3"	4"	6"	8"	10"	12"	14"
8	11	11	14	20.5	26.5	33	38.5	43.5
16"	18"	20"	24"	30"	36"	42"	48"	
49	57	63	75	372*	444*	516*	588*	

* INCLUDES BEVEL GEAR

Number of turns needed to open/close Mueller Double Disc Gate Valves.

2"	2.5"	3"	4"	6"	8"	10"	12"
5.5	6.25	7.5	14.5	20.5	27	33.5	38.5
14"	16"	18"	20"	24"	30"	36"	
46	53	59	65	77	260*	312*	

* INCLUDES BEVEL GEAR

Problem: When closing the valve you do not get the proper number of turns.

Cause: Tuberculation/Debris may have built up in the seat area, particularly in the double disc valve.

Corrective Action: Create flow through the valve (open a nearby downstream hydrant) then exercise the valve to loosen/remove the debris.

Problem: The operating nut continues to rotate even after you have reached the proper number of turns.

Corrective Action: The valve may be larger than shown on the plans. Continue to operate based on the next size valve.

Cause: The valve may have a bevel or spur gear to help during operation.

Corrective Action: Check the plans to see if it a gear was installed on the valve. The typical gear ratio is 4 or 4.5 to 1. Multiply the standard number of turns by the gear ratio.

Cause: Excessive torque may have been applied to the operating nut at some point and damaged the stem or stem nut.

Corrective Action: Expose the valve and inspect the stem and stem nut. Replace if necessary.

Problem: The operating nut will not turn in either direction.

Cause: The valve box may be interfering with the operating key.

Corrective Action: Look down the valve box to see if it is too close to the operating nut. Reposition if necessary.

Cause: The stuffing box bolts and nuts may have been tightened down unevenly during assembly.

Corrective Action: Loosen and retighten stuffing box bolts and nuts evenly.

Cause: Debris/corrosion may have built up between the stem and stuffing box due to lack of operation or gritty backfill.

Corrective Action: Remove the stuffing box (stem if needed) and clean and/or replace the stem and stuffing box.

Cause: Debris could be wedged under the disc.

Corrective Action: Expose the valve. Remove the bonnet. Clean out the debris.

Problem: The gate valve is leaking from between the body and bonnet flange.

Corrective Action: Make sure the bonnet bolts and nuts are tight.

Cause: The bonnet gasket o-ring may be damaged or pinched.

Corrective Action: Remove the bonnet. Replace the gasket

Cause: The body or bonnet flange may be cracked or broken.

Corrective Action: Inspect the valve body and bonnet flanges. Replace damaged items.

Problem: The gate valve will not pass a pressure test.

Corrective Action: Be sure the valve is completely closed. Count the number of turns. Compare to the manufactures published information.

Cause: The disc may have been closed on some debris.

Corrective Action: Create flow through the valve (open a nearby downstream hydrant) then exercise the valve to loosen/remove the debris.

Cause: Air may be trapped in the line.

Corrective Action: Flush the line to remove the trapped air. Add an Air release valve if necessary.

Problem: Water is leaking from the stuffing box area.

Cause: Stuffing box packing is allowing water to leak.

Corrective Action: Remove stuffing box and replace the stem o-rings and the stuffing box packing. Note that o-rings started being used in 1952.