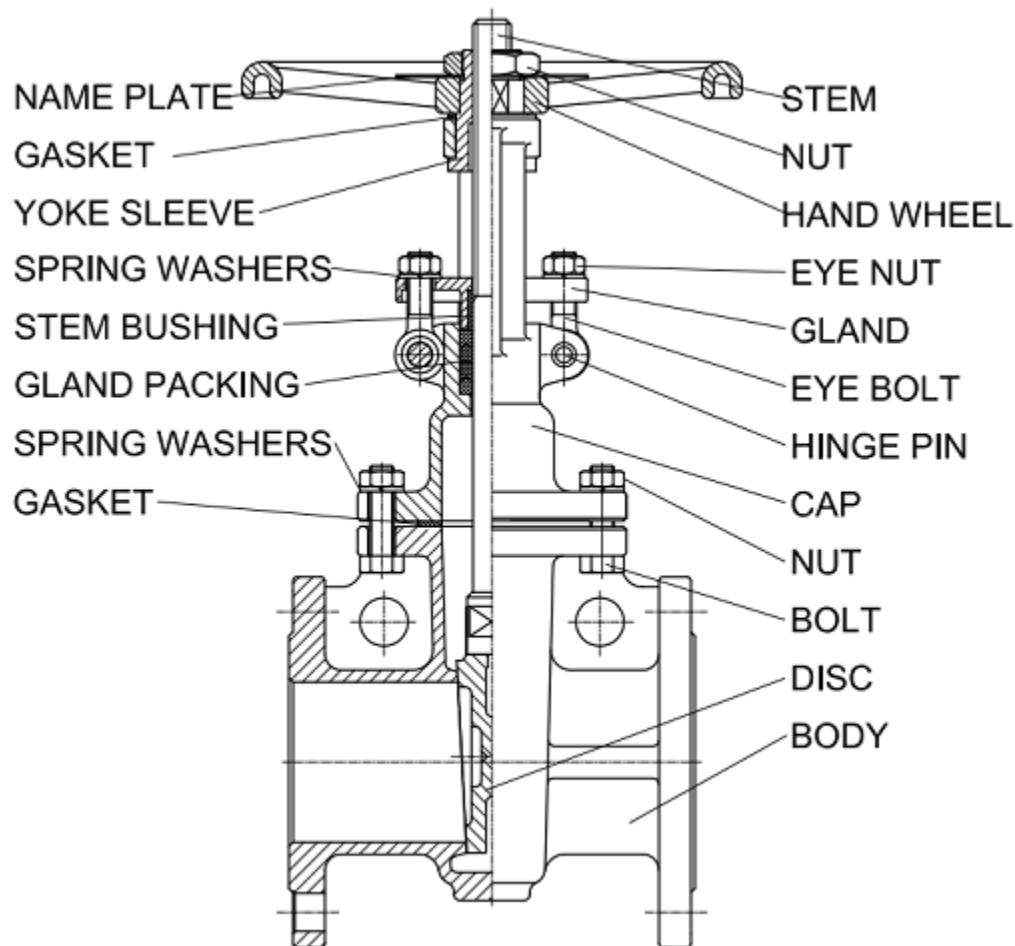


Installation, Operation, and Maintenance Instructions
Cast and 316 Stainless Gate Valves
Series 21 and 216



1. Operation

- 1.1. When it is working, to open or close the wedge fully it mustn't open the wedge partly to adjust the flow, so it can prevent the high-speed fluid from damaged the seal surface.
- 1.2 When the Valve is being used actively, occasionally inject some lubricating oil into the stem, and location of acme thread on stem nut.
- 1.3 The hand wheel of the manual operating valve shall be designed and manufactured according to the open and close torque that can operate the valve, the end customer mustn't enlarge the open and close torque by using another lever or tool.

2. Disassembly

- 2.1 Before disassembling, remove all the pressure that is in between the inlet and the outlet.
- 2.2 Once confirmed there is no pressure on the pipeline, disassemble the bonnet bolt and nut, and lift the bonnet component including the wedge. Care should be taken to avoid damaging backseat.
- 2.3 Take gasket out of bonnet.
- 2.4 Turn around stem, take out the stem, then disassemble the bonnet component.

3. Maintenance

To check and maintain the valve that it is being used period, the main items as the following:

- 3.1 check the wear of the seal surface. Once it is damaged, it shall be repaired or replaced.
- 3.2 check the wear of the stem and the stem nut's acme thread.
- 3.3 check the bolts and nut, find whether it is connected effectively.
- 3.4 check the gasket, packing, find whether it is damaged or invalid. Once it is damaged or invalid, it shall be replaced in time. But is mustn't be replaced under the pressure.
- 3.5 Replace packing
 - a. turn around hand wheel, lift stem to counter closure, and confirm there is no pressure.

- b. if using a sharp tool to disassemble packing that needs to be replaced. It mustn't scrape the surface of stem.
- c. take out the packing, calculate the specification and ring number of it, then assemble the related new packing until stuffed up the stuffing box.
- d. tighten gland and lock the eye nut.
- e. Loosen the hand wheel to make stem dropped and check whether the packing is leaking, if there is leakage, lock the eye nut continue until there is no leakage.
- f. After the valve is disassembled and repaired, then reassembled again. A seat test should be done to see if any leakage is occurring. The test shall be carried out according to the related standard and recorded properly.

Problem, Cause, Solution Chart

Problem	Cause	Solution
Packing is leakage	1. gland isn't tightened 2. packing ring number is not sufficient 3. packing is invalid	1. tighten the gland nut evenly, press the packing 2. add the packing ring number 3. replace packing
Seal surface is leakage		1. get rid of the dirt on seal surface 2. re-repair the seal surface or re-replace the wedge, seat
Leakage between the body and bonnet		1. tighten the connected bolt evenly 2. repair the flange seal surface or the pressure seal body, bonnet seal surface 3. replace gasket or repair metal seal ring
hand wheel isn't turned flexible or the wedge can't be closed	1. packing is tightened over 2. gland is aslant 3. stem nut is damaged or dirty 4. thread of stem nut is worn seriously or cracked 5. the stem is winding	1. loose the packing gland nut suitable 2. check gland 3. repair the thread of stem nut, and get rid of the dirt 4. replace the stem nut 5. check stem
Problem of electrical actuator	See the electrical actuator instruction	



Torque Tables for Bonnet Bolt/Nut

A193 B7

Diameter of bolt (in)	Torque (In-lb)	Diameter of bolt (in)	Torque (In-lb)
1/4	39	1	3080
5/6	79	1-1/8	4380
3/8	140	1-1/4	6120
7/16	238	1-3/8	8415
1/2	340	1-1/2	10830
9/16	510	1-5/8	13840
5/8	697	1-3/4	18000
3/4	1290	1-7/8	21500
7/8	2065	2	26860

A320 B8

Diameter of bolt (in)	Torque (In-lb)	Diameter of bolt (in)	Torque (In-lb)
1/4	16	1	1250
5/6	31	1-1/8	1770
3/8	56	1-1/4	2480
7/16	93	1-3/8	3380
1/2	133	1-1/2	4350
9/16	203	1-5/8	5470
5/8	280	1-3/4	7100
3/4	520	1-7/8	8585
7/8	829	2	10760

