

OPERATION AND MAINTENANCE INSTRUCTIONS

209F SERIES 2-PIECE FULL PORT FLANGED BALL VALVE

½” – 4”

208F SERIES 2-PIECE FULL PORT FLANGED BALL VALVE

6” – 12”

INLINE ball valves are designed for exceptional performance over a wide range of industrial applications. The 209F and 208F Series valves are available in full port flow configurations with ANSI 150 and 300 Class flanged end connections.

Each 209F and 208F Series ball valve is supplied with plastic flange covers to protect the flange face from damage. Always leave these protective covers in place until installation.

Installation and Operation

Always install your valve according to accepted industry standards and practices and operate only within stated pressure, temperature and fluid media limits. Do not open or disassemble valve unless you intend to replace resilient seat and gasket material. Repair kits are available from your local Inline representative or call 1-800-568-8998.

Your 209F and 208F Series ball valve is supplied with a locking lever operator as standard equipment. In addition, an ISO 5211 actuator mounting pad has been integrally cast into the valve body and machined to allow for pneumatic or electric automation. Product specification sheets and technical drawings are available for dimensional information required for proper installation and automation.

Maintenance

Resilient seated valve products may wear over time resulting in loosening at component boundaries. If leakage is detected, tighten according to the steps and torque values outlined below. If tightening does not correct the problem, it is time to replace your seats and seals.

Repair

Remove and Clean Valve

- A. If valve is in line, make sure system is purged and line, ball and cavity pressure is released before unbolting from piping system.
- B. Remove all add-on components such as actuators and set to the side.
- C. Disassemble valve. Remove old seats and seals and discard them. Clean and dry metal components in preparation for re-assembly.

Install Repair Kit and Reassemble Valve

- A. Arrange cleaned valve parts on workbench. Position body (larger casting with stem assembly) and end cap in front of you with cavities facing up.
- B. Stem Assembly
1. Place thrust washer on stem sliding over threaded end and seating on shoulder at base.
 2. Insert stem into body cavity through side, threaded end first, and glide through the hole in the top of the body until seated.
 3. While holding stem in place, slide stem packing set over threaded end. Stem packing should be stacked with mating concave/convex sides facing each other. Slide over stem, concave piece first, until seated.
 4. Place stem packing bushing over threaded end of the stem and lower over stem packing.
 5. Position two spring washers with concave sides facing each other and lower set over stem bringing them to rest upon stem packing bushing.
 6. Thread stem nut down stem and hand tighten until stem and packing assembly are properly seated, aligned and in a fixed position. Tighten stem nut to the torque specified in **Table 2 (or Table 4)** and rotate slightly more until stem nut flats are perpendicular to stem flats. This will allow you to slide the lock washer down stem and into position over stem nut. Thread second stem nut down over stem nut until resting on lock washer to keep stem assembly locked in place for further valve assembly and adjustments.
- C. Body/Ball Assembly
1. Your 209F and 208F ball valve has a two-piece split body design. Lay the body (larger casting with stem assembly) and end cap in front of you with cavities facing up.
 2. Select the gasket provided. Gently insert the gasket into the step machined into top of the body (side facing upward).
 3. Insert seats into the seat pockets machined into the bottom of both the body and end cap cavities.
 4. Make sure seat is properly positioned in the body. Orient axis of the key at base of stem vertically so as to facilitate ball entry. Carefully lower ball into the body cavity gliding ball keyway over stem key until cradled on seat. Rotate stem 90° to prevent ball from moving.
 5. Select the end cap, turn it over making sure seat remains in place, and carefully lower onto the mating opening on body. Again, make sure seat has stayed in place and that the ball is bearing evenly on the seat. Align the body and end cap bolt holes in preparation for bolting.
 6. If provided, place a washer on each body bolt. Lower each body bolt into through hole in end cap. Loosely hand-tighten each bolt. Continue hand tightening according to pattern in **Figure 1** to insure that each bolt is secured to the same length. Do not over-tighten any one bolt.
 7. Ball should now be loosely secure. Rotate stem 90° to place ball in the open position and inspect to see that the stem is straight and ball orifice is aligned with the end cap bore holes. Use of a cylindrical dowel to properly align the axis of the ball between opposing end caps is highly recommended. Continue to hand tighten according to sequence in **Figure 1** until proper alignment is secured.
 8. Once end cap is on and proper alignment is achieved, tighten body bolts with a torque wrench to the values specified in **Table 1 (or Table 3)** alternating according to **Figure 1**. Bolts should first be hand tightened and then each bolt rotated ¼ turn following the pattern in **Figure 1** until reaching the specified torque. This should ensure proper seating and ball alignment.

D. Final Assembly and Test

1. Your 209F and 208F ball valve is now ready for final assembly, adjustment and testing. Remove top stem nut. Next, slide handle over stem. Hand-tighten stem nut until handle is fixed in place. Secure with wrench.
2. Submit valve to qualified valve test facility for pressure test.

Your repaired 209F and 208F ball valve is now ready for installation and service. Inline Industries makes a number of other fluid processing valves which complement this offering. Please consult your local Inline representative for more information about our products or call 1-800-568-8998 for more details.

Table 1. 208F Suggested maximum torque values of ball valve body and cap.

Bolt Size	Type and size of ball valve		Torque (in.-lbs.)
	208		
	150#	300#	
5/8" – 11 UNC	6"; 8"	--	1,100 (max. 1,400)
3/4" – 10 UNC	10"	6"	1,600 (max. 2,000)
7/8" – 9 UNC	12"	8"	2,450 (max. 2,850)
1" – 8 UNC	--	10"	3,650 (max. 4,250)

Table 2. 208F Suggested maximum torque values of gland nut.

Bolt Size	Type and size of ball valve		Torque (in.-lbs.)
	208		
	150#	300#	
M12	6"	6"	230 (max. 310)
M12	8"	8"	320 (max. 420)
M12	10"	10"	320 (max. 420)
M16	12"	--	450 (max. 550)

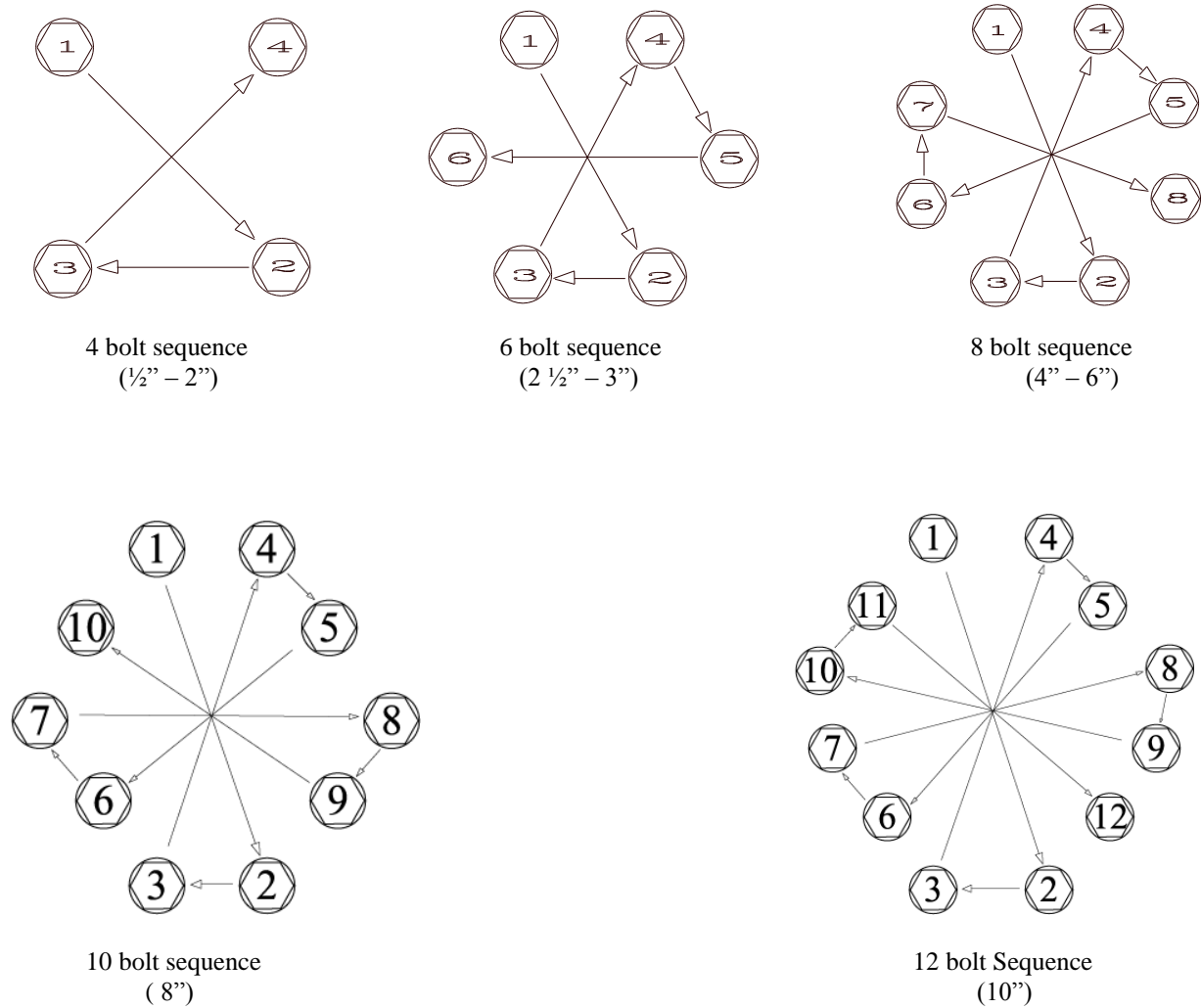
Table 3. 209F Suggested maximum torque values of ball valve body bolts.

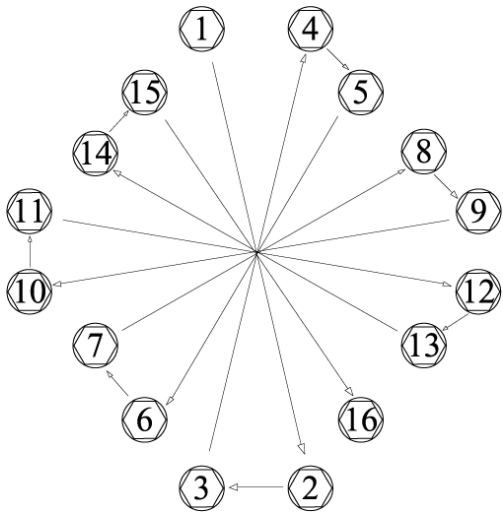
Bolt Size	Type and size of ball valve	Torque (in.-lbs.)
	209	
M8*P1.25	1/2", 3/4"	160
M10*P1.5	1"	320
M12*P1.75	1 1/2" – 4"	550

Table 4. 209F Suggested torque values of gland nut

Gland Nut Size	Type and size of ball valve	Torque (in.-lbs.)
	209	
M10	1/2", 3/4"	40 - 50
M14	1"	85 - 95
M18	1 1/2", 2"	105 - 115
M20	2 1/2", 3"	140 - 155
M24	4"	165 - 180

Figure 1. Suggested body bolting sequence





16 bolt sequence
(12")