



Apollo 2 Piece Steel and Steel Alloy Ball Valves Installation, Operation, & Maintenance Guide

Installation

Pre-Installation Inspection

Inspect the piping system prior to valve installation whenever possible, to ensure that it has been properly flushed and cleared of construction and fabrication debris. The seating surfaces in soft seated valves are particularly susceptible to weld slag and sand blasting grit. Pipe scale, metal chips, and other foreign materials should be removed.

Just prior to installation, remove each valve from its packing and remove any end covers. Examine the flow bore for debris. All Apollo ball valves are shipped in the open position to prevent damage to the ball surface. Any grit or foreign matter must be removed. Scratched or dented balls must be replaced. Do not install a damaged valve.

Two piece Apollo Ball valves are bi-directional. They may be installed in vertical or horizontal pipe runs without regard to flow direction and without regard to stem orientation.

Note: Valves must be installed in piping systems that comply with the applicable portions of the ASME B31 standards. Special considerations must be taken with respect to pipeline expansions and contractions and the media expansion and contractions within the piping system.

Threaded End Valves

Threaded connections should be accurately threaded, clean, and free of foreign material or metal shavings. Apply pipe sealant compound or PTFE tape to male tapered threads only. Do not use sealant on female threads as excess compound may be forced into the valve body. This could cause sticking of the ball or encourage the



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accumulation of dirt and debris that could prevent positive valve shutoff.

For straight threads, position the bonded seal on the male thread shoulder/underface before assembling the connection. Ensure the seal is properly seated and undamaged to achieve a reliable leak-tight joint. Hand-tighten the connection until the bonded seal contacts the mating surface. Once seated, apply additional tightening torque as required to compress the seal and complete the joint.

Two wrenches must be used when making up pipe joints. Apply one wrench on the valve end closest to the pipe joint being tightened and the other wrench to the pipe to prevent transmitting torque through the valve body joint. Typical NPT pipe make-up is 1-1/2 turns after installing the pipe hand tight.

Weld-End Valves

WARNING

Excessive welding heat can damage valve seats and seals. Maintain valve body temperatures below 400°F (204°C) during welding operations.

Installation welding shall be done in accordance with the applicable Code or regulation covering the system into which the valve is installed. Both butt-weld and socket-weld valves require special consideration for installation. In addition to the general cautions already discussed, the heat of welding may damage seats and seals.

1. Only personnel qualified per ASME BPVC Section IX should weld pressure-containing components. Only qualified weld procedures should be employed.
2. Place the valve in the fully open position. Remove handles, operators or actuators. For valves with one hose cap end, remove the hose cap and seal.
3. Align in the piping system. For socket-weld valves, slip into the piping system retracting the pipe approximately 1/16" (1.5mm) from the bottom of socket weld connections.
4. Wrap the center section of valve with wet rags to minimize heat transfer to the seats and seals. Do not allow the valve body/retainer section temperature to exceed 400°F (204°C)

as monitored by either a Tempil® Stick or other suitable method.

5. Do not attach the welding ground clamp to the valve body or trim. Attach the ground clamp directly to the piping to prevent current from passing through the valve.
6. Use multiple passes with a bead size of 1/8" (3mm) or less. Stop after each weld pass and allow the valve to cool to prevent exceeding the body temperature limit noted above. Maintain wet rags and minimize heat input.
7. After the valve has fully cooled, reinstall the handle, operator, or actuator.
8. Cycle the valve to ensure smooth operation.

Operation

Ball valves are intended to be on-off devices operating through 90° of stem rotation. The valve handle is marked showing proper rotation direction for "ON" and "OFF" positions. Rotation is clockwise for "OFF" (closed) and counterclockwise for "ON" (open).

The most common service failures not related to the installation and start-up processes are:

- Exceeding the operating temperature or pressure limits of the valve due to a process upset condition.
- A chemical attack on valve components due to either misapplication or changes in the service.

Violating temperature and pressure limits can result in immediate valve failure where chemical attacks or corrosion generally occurs gradually.

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Maintenance

Valve Adjustments

Normal stem packing wear can be compensated for by tightening the packing gland screw. (Wrench part number H371400 is available to ease this operation.) Tighten the packing gland screw clockwise in 1/8 turn increments until observed leakage stops. Do not exceed the values shown in Table 1. If all the adjustments to the packing gland screw have been made, remove the handle nut, handle and packing gland screw and add one or two replacement bearings on top of the old packing. Reinstall the handle and handle nut.

Caution: Do not disassemble valve while under pressure nor with entrapped hazardous fluids therein.

Disassembly

- 1) Operate the valve fully opened to fully closed to ensure there are no trapped fluids or pressure in the body cavity. Leave the valve in the closed position.
- 2) Remove the handle nut, handle and packing nut. Set aside for reuse.
- 3) Install pipe plugs in the body and retainer ports of NPT valves to prevent collapsing those areas.
- 4) Remove the retainer from the body. It may be necessary to heat the body joint above 450°F to breakdown the sealant used to secure the valve halves.
- 5) Remove the ball from the body cavity. Inspect the ball. If it is scarred, it is recommended that the whole valve be replaced, but replacement balls are available. Clean and set aside good balls for reuse.
- 6) Push the stem from the outside into the body cavity. Inspect the stem. If it is scarred or has damaged threads, replacements are available. Clean and set aside good stems for reuse.
- 7) Remove all seals and seats from the body and retainer, then discard. Inspect the body and retainer for damage. If damaged, scrap the valve as replacements of these components are not offered.

Re-Assembly

- 1) Install stem bearing on to stem.
- 2) Fit stem into body from the retainer end and position the stem with the handle flats perpendicular to the flow axis.
- 3) Install stem packing over stem and fit into body recess.
- 4) Install packing gland screw into the threaded stem area.
- 5) Tighten the gland screw to manufacturing torque specifications, shown in Table 1.
- 6) Install the handle and handle retaining hardware.
- 7) Apply suitable light lubricant to seat and fit into the seat pocket of the body.
- 8) Install the ball in the closed position.
- 9) Apply suitable light lubricant to seat and fit into the seat pocket of the retainer.
- 10) Apply an adequate amount of thread locking compound (Loctite® 609, 648 or 680) to the retainer threads so that it covers no less than two complete threads opposite of the retainer shoulder.
- 11) With the ball in the closed position, thread the retainer into the body and torque to manufacturing specification to secure the body joint. Torque values are provided in Table 2.
- 12) Cycle the valve to the open position and verify proper operation and alignment of handle and/or mechanism.

Note: Valves in oxygen or other like services should be assembled with compatible thread sealant and lubricants.

Note: Always test valve and system before putting the system into service.

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Table 1: Gland Nut Torque Requirements (ft-lbs.)

Valve Size	Gland Nut Torque
1/4" - 3/8"	12-18
1/2"	12-18
3/4"	20-25
1"	20-25
1-1/4"	61-100
1-1/2"	61-100
2"	61-100
2-1/2"	61-100
3"	61-100

Table 2: Retainer Torque Requirements, min. (ft-lbs.)

Valve Size	72, 73A, 74, 76, 89, 399, 489	7H, 76F	72-A
1/4" - 3/8"	25	15	-
1/2"	25	15	50
3/4"	25	20	100
1"	70	50	130
1-1/4"	110	95	230
1-1/2"	130	230	260
2"	200	230	450
2-1/2"	300	450	-
3"	960	1800	-

Parts Illustration

