



## Apollo 2 Piece Threaded 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 threaded end 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 pipe line expansions and contractions and the media expansion and contractions within the piping system.

#### **Threaded End Valves**

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



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debris that could prevent positive valve shutoff. Two wrenches must be used when making up pipe joints to these valves. 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 pipe make-up is 1-1/2 turns after installing the pipe hand-tight.

### 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 attack or corrosion generally occurs gradually.

### 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 of 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 assure 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.

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- 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.**

**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	-

**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

**Parts Illustration**

