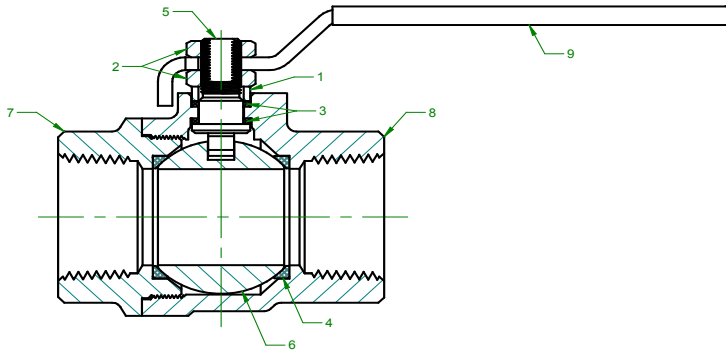


- 11) With the ball in the closed position, thread the retainer into the body and apply the following torque to secure the body joint.

Valve Size	Retainer Torque (ft.-lbs.)
1/4" & 3/8"	25
1/2"	25
3/4"	50
1"	100
1-1/4"	200
1-1/2"	300
2"	600

- 12) Cycle the valve to the open position and verify proper operation and alignment of handle and/or mechanism.

PARTS ILLUSTRATION

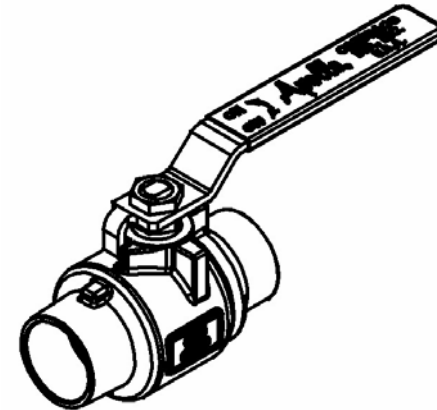
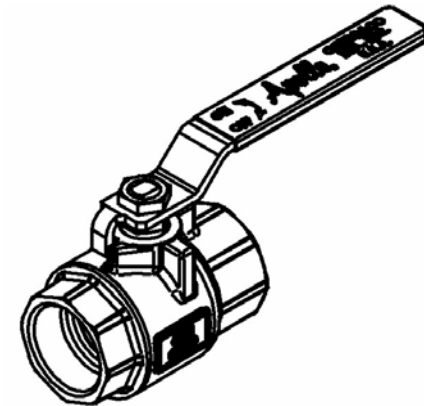


NO	DESCRIPTION
1	PACKING GLAND
2	STEM NUT
3	BEARING/PACKING
4	SEAT
5	STEM
6	BALL
7	RETAINER
8	BODY
9	HANDLE



A Division of Conbraco Industries, Inc. Matthews, NC Pageland, SC Conway, SC

**77GUL SERIES
77B100, 77BL100 SERIES
77C100, 77C200, 77CL100 and 77CL200 SERIES
BRONZE BALL VALVES
INSTALLATION, OPERATION, & MAINTENANCE GUIDE**



INSTALLATION

The 77B/77C/77GUL 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. PTFE pipe tape is recommended for use as the pipe joint sealant. 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.

Solder End (Sweat In) Valves

Caution: Use only solders with melt points below 500°F.

Caution: Valves should only be soldered in the fully open position.

During soldering, the mid-portion of the valve body should not exceed 300°F. This can be monitored using Tempilstik® or an infra-red temperature sensor. Depending on the fuel selected and the orientation of the installation it may be necessary to wrap the valve body with wet rags or employ other heat absorbing techniques. The flame must be directed away from the valve body, concentrated on the solder cup. The cup should be heated evenly. Once one of the joints is complete, the valve should be allowed to cool until "cool to the touch" before beginning the second joint.

Fuel	Flame temp w/Oxygen
Propane	5122°F (2828°C)
Propylene	5245°F (2896°C)
MAPP Gas	5389°F (2976°C)
Acetylene	5720°F (3160°C)

Warning: Excessive heat input will damage the body seal resulting in leaks at the valve body joint. In extreme cases, seats and stem packing may also be damaged.

OPERATION

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).

MAINTENANCE

Regular Maintenance

Normal stem packing wear can be compensated for by tightening the packing gland nut. There are two nuts on the stem. The top nut retains the lever. The top nut and the lever may need to be removed for easy access to the packing nut. The packing nut is the lower nut on the stem. (Wrench part number H371400 is available to ease this operation.) Tighten the packing nut clockwise in 1/8 turn increments until observed leakage stops. Do not exceed the values shown in the table under Re-Assembly section 5. Reinstall the handle and handle nut.

Major Overhaul

This type of valve is not normally re-built, but rather replaced. However, where execution of a major repair is preferred, the following guidelines should be adhered to:

Order Repair Kits

Before any work begins, order the appropriate seal repair kit(s):

Valve Size	Kit Number	Valve Size	Kit Number
1/4" and 3/8"	77C00201	1 1/4"	77C00601
1/2"	77C00301	1 1/2"	77C00701
3/4"	77C00401	2"	77C00801
1"	77C00501		

Disassembly

- 1) Operate the valve fully open 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 the two stem 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 bottom packing ring or bearing on 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 top bearing (packing) over stem and fit into body recess.
- 4) Install gland ring over stem and position above top bearing.
- 5) Secure the stem, thread bottom packing nut on stem and tighten to the following torque values:

Valve Size	Stem Thread	Packing Nut Torque (in-lbs.)
1/4" - 1/2"	5/16 - 24 UNF	35
3/4" - 1"	3/8 - 24 UNF	50
1 1/4" - 2"	5/8 - 18 UNF	150

- 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.