



FLANGED AND GROOVED BALL VALVES

INSTALLATION, OPERATION, & MAINTENANCE GUIDE

GENERAL INFORMATION

American Valve's 4000 Series Ball Valves are produced in both flanged and grooved connection ends.

American Valve Inc. assumes no liability for any damages or injuries resulting from non-compliance with installation instructions or standard good practices when installing, operating, or maintaining the valves, even if not explicitly mentioned in this document.

This document covers the following model families:

4000	3700
4000D	3700V
4000DV	
4001	

VALVE SELECTION

American Valve offers ball valves made of different materials: brass, lead free* brass, Dezincification Resistant (DZR) brass, lead free DZR brass, bronze, iron, ductile iron, and stainless steel. We recommend using valves made of a material suitable for the specific application. Proper valves selection is the first step in any successful installation. For application guidance or further detailed assistance, contact your distributor or the factory.

PRESSURE & TEMPERATURE RATINGS

Specific information on pressure and temperature ratings of each valve model are provided in the American Valve technical sheets, those can be obtained through American Valve's website or by contacting American Valve. All contact information is provided in the last page of these instructions.

Ratings given in the technical sheets are intended for non-shock operating conditions. Applications subject to water hammer, impacts, stress loads, corrosive or erosive external environmental elements, or the transport of fluids with abrasive properties will reduce the life expectancy of the valve, and could lead to unexpected failure.

VALVE INSTALLATION

Prior to installation, confirm that the valve is suitable for the pressures, temperatures, operating fluids and environment in which it will be installed. It is the responsibility of the installer and/or of the facility designer to ensure that the application does not exceed the limits of pressure and temperature of the valve and is carried out in accordance with local current laws and regulations.

All models referred to in the above table can be installed in any position (vertical, horizontal, inclined), with flow going in either direction. The position chosen for the installation should allow for accessibility to the valve during operation, inspection and maintenance. Please note that the 4000 Series employs floating ball construction, which relies on line pressure on the ball against the downstream seat in order to seal. For vertical installations with an upward flow direction, ensure there is adequate line pressure to create a seal. This is particularly important in larger pipe diameters, where the valve's ball is heavier.

Inspect the piping system prior to valve installation to insure that it has been properly flushed and cleared of any 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 prior to installation.

Remove the valve from its packaging and inspect the flow bore for debris. All American Valve ball valves are shipped in the open position to prevent damage to the seating surface. Any foreign matter must be removed.

FLANGED END VALVE INSTALLATION

After inspecting the valve, attention should be given to the flange face surfaces. Models 4000 and 3700 have serrated class 125 flat flange faces. Models 4000D and 4001 have class 150 serrated raised face flanges. These valves may be installed in any position using standard pipe fitting practices. Special considerations are required when bolting cast iron flanged valves to steel flanges. When Cast Iron class 125 valves are to be bolted to class 150 steel flanges, the steel flanges shall be flat faced.

Flange misalignment, unsupported pipes, and excessive flange bolt torque are the most frequent causes of failure in cast iron valves.

GROOVED END VALVE INSTALLATION

OPERATION

American Valve 4000 Series Ball Valve features a quarter-turn operation, full open to full close. Standard operation is clockwise to close and counterclockwise to open. The position of the lever handle will indicate the valve position. When the handle is in-line the pipe, the valve is open. When the lever handle is perpendicular to the pipe, the valve is in the closed position.

Ball valves are designed shut-off valves. They should be used only in the fully open or closed position. Throttling will damage the seats and over time compromise the valve's ability to seal.

American Valve bears no responsibility for improper use, tampering, modification, or disassembly of its valves.

MAINTENANCE

Due to its simplicity, the only preventive maintenance is to periodically inspect for leaks and ease of operation. **Do not disassemble or remove any part from the valve while under pressure.** Before removing the valve from service, place the valve in the half-open position to remove any line pressure or pressure trapped in the body cavity.

VALVE ADJUSTMENTS

The stem packing has been adjusted at the factory to provide a leak-tight seal when the valve is delivered, but compaction can occur within these seals that could require re-adjustment. Stem leakage should be stopped with incremental quarter turns to each gland packing bolt, as soon as a leak is detected.

Do not over tighten the gland packing bolts. Over-tightening will result in excessive operating torque. If stem leakage persists, or the operating torque becomes excessive, de-pressurize the valve and replace the stem seals. If necessary, request a seal repair kit from the factory.

Valves with high operating torque and/or leakage past the seats may have internal damage to the seats or ball surfaces or foreign objects trapped inside. These valves should be de-pressurized, removed from the piping system and inspected for damage.

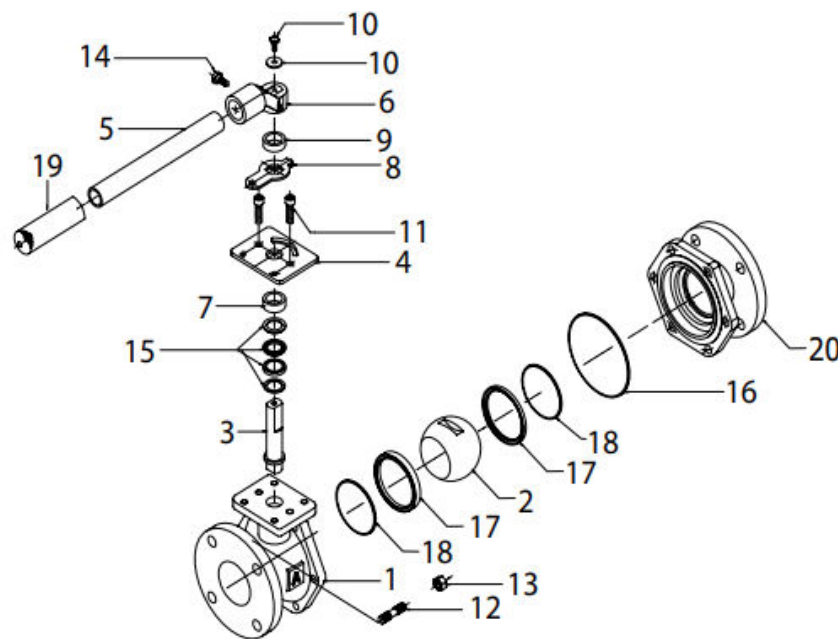
ACTUATOR INSTALLATION

Gear operators and automation packages should only be mounted with the valve removed and by a factory-authorized distributor. pneumatic, electric, and manual gear operators contain travel stops that must be calibrated precisely with the valve's internal parts exposed to view and available for pneumatic testing. Failure to follow this procedure can lead to premature deterioration of the seating surfaces, stem seals, or failure of the valve body itself, leading to damage, injury, or death.

VALVE OVERHAUL

From time to time the seating surfaces or soft seals may need replacement. The first step is to contact your distributor to acquire an appropriate rebuild kit. These kits contain a complete set of seats, seals and gaskets. While models 3700 and 3700V are not field serviceable, models 4000, 4000D, 4000DV, and 4001 can be repaired in the field.

Refer to the diagram below for part numbers:



DISASSEMBLY PROCESS

- A. Ensure that appropriately sized wrenches and lifting devices are available.
- B. Place the valve in the partially open position, assuring no pressure is trapped in the valve body.
- C. Remove the handle bracket (6), spacer (9), indicator (8), Gland bolts (11), gland plate (4), and packing follower (7).
- D. Remove the body nuts (13) and remove the tail piece (20) from the valve body (1).
- E. Remove the ball (2), taking care not to drop, scratch, or otherwise damage the ball. A hoist or chain lift may be necessary for larger valves.
- F. Remove the stem (3) through the inside of the valve body (1). A soft mallet can be used to gently tap the top of the stem to loosen it.

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INSPECTION

Note: If replacement of the body or ball is required, we recommend replacing the entire valve.

- A. Thoroughly clean all components in preparation for inspection.
- B. Examine the seating surfaces within the body. If these surfaces are pitted or are deeply scratched, the valve should be replaced. (A scratch is anything that can be felt with your fingernail.)
- C. Examine the body cavity around the stem packing for grit or deep scratches. Damage will require replacement of the valve.
- D. Examine the stem for dents, pits or longitudinal scratches. Damage will require replacement of the valve.
- E. If the ball is scratched or pitted, it should be replaced.
- F. Inspect the replacement parts to assure that they are correct and undamaged.

RE-ASSEMBLY

- A. Place the Thrust Washer (15) on the stem (3) and insert into body from the inside.
- B. Place the three-piece "Chevron" Packing (15) over the end of the stem and press into the body from the outside.
- C. Place the packing follower (7) over the end of the stem. Install the gland plate (4) and secure it to the body mounting pad with the two gland bolts (11). Hand-tighten the bolts evenly.
- D. Install the seat ring (17) and backseat O-Ring (18) into the seat area of the body.
- E. Carefully slide the ball onto the stem and into the valve body.
- F. Install the body seal O-Ring (16) into the machined groove of the valve body.
- G. Install the seat ring (17) and backseat O-Ring (18) into the seat area of the tailpiece.
- H. Align the tailpiece with the body studs and place the tailpiece into its proper position on the valve body. (Make certain that the pipe flange holes on the tailpiece are properly aligned with the pipe flange holes on the valve body.)
- I. Replace the body nuts. Tighten them evenly and securely, alternating in criss-cross pattern.
- J. Install the handle assembly and cycle the valve three to five times and then re-check the body nuts for tightness.
- K. Tighten the gland plate bolts using an allen wrench.
- L. Pressure test the valve prior to installation.

Seal Kits (each kit contains 1 set 3 pcs #15, 1 pc #16, 2 pcs #17, 2 pcs #18)

1 ½"	04015SK
2"	0402SK
2 1/2"	04025SK
3"	0403SK
4"	0404SK
6"/8"	0406SK
10"	04010SK