

Installation, Operation, and Maintenance Instructions ASME B16.10 Full Port Flanged Ball Valves AN Series 1, 1/2" thru 6", ANSI 150# & 300# Class Non-Adjust-O-Seal®



IMI PBM



WARNING:

For your safety and protection it is important that the following precautions be taken prior to working on the valve.

1. Depressurize and drain the line.
2. Cycle the valve to relieve any pressure trapped in the valve.
3. Disconnect any air and electrical connections to the valve assembly.
4. Know what the media is in the line and wear appropriate protective clothing and equipment. Obtain appropriate MSDS sheets.
5. To ensure safe product selection and operation, it is the responsibility of the process system designer and end user to determine the appropriate compatible materials of construction and adequate product ratings for the process system. Process system designer, installer, and end user are responsible for proper installation, operation, and maintenance.
6. When disposing of Teflon parts, do not incinerate or subject to open flames.

1. General

This Installation, Operation, and Maintenance manual is for the safe use of PBM 2-piece, Non-Adjust-O-Seal®, Bi-Directional, AN Series 1 ball valves. Please read the instructions carefully and save them for future reference.

2. Installation

AN valves may be installed in either direction with the valve in the "open" position. For flanged end valves, it is not necessary to disassemble the valves before installation.

3. Operation

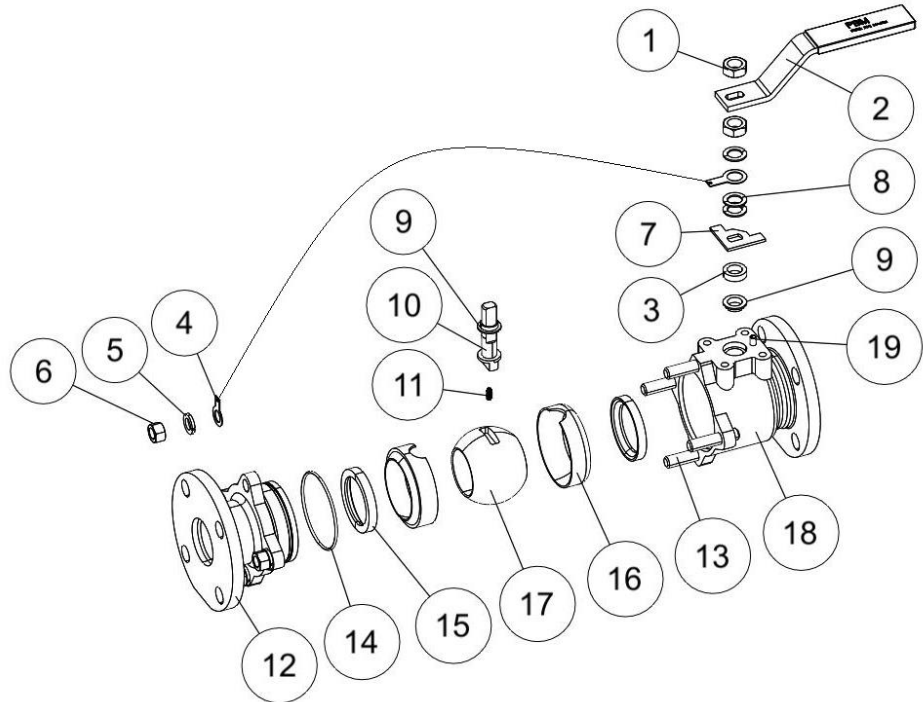
For manual valves, operation consists of turning the handle 1/4 turn to close or open the valve. When handle is parallel with the pipeline, the valve is in the open position. These valves may also be automated with actuators and other valve automation equipment. Mechanical handle stops must be removed if manual valves are converted to automated valves. For automated valves, operation is controlled by the actuator placed on top of the valve. Valve stops are an integral part of the actuators. Good operating procedure requires periodic inspection of the valves and replacement of parts as required. Always use PBM factory authorized replacement parts.

Follow instructions to ensure optimum performance:

Adjusting for Normal Wear

1. If valve shows signs of leakage in stem area due to normal stem packing wear, loosen the upper jam nut on the stem, then tighten the lower jam nut as follows:
 - a. For valves 2" and smaller, tighten the nut to completely compress the spring washers, then loosen nut 1/2 turn.
 - b. For valves 3", tighten the nut until a gap of about 0.05" (1.3 mm) exists between the adjacent spring washers.
 - c. For valves 4" and larger, tighten the nut until a gap of about 0.10" (2.5 mm) exists between the adjacent spring washers.Leakage should stop, and the valve should continue to operate smoothly.
2. After adjustments have been made and the packing leakage cannot be stopped or if there is leakage past the non-adjusting ring, a repair kit will be required.

PARTS LIST	
ITEM	DESCRIPTION
1	Stem Nut
2	Handle
3	Follower
4	Ground Wire (If Any)
5	Lock Washers
6	Body Hex Nuts
7	Stop Disc (manual only)
8	Spring Washers
9	Stem Packings
10	Stem
11	Ground Spring (If Any)
12	End Fitting
13	Body Bolts
14	O-Ring
15	Seats
16	Cavity Filler (If Any)
17	Ball
18	Body
19	Stop Pin (manual only)



Disassembly of valve:

1. Isolate and depressurize the associated piping system. Cycle the valve to ensure there is no trapped pressure or fluid in the valve cavity. The valve should be left fully open or fully closed.
2. **For Automated Valves Only:** Remove all air and electrical power from the actuator, solenoid valve, and switchbox, if equipped. Then remove the automation assembly from the valve. Retain coupling and mounting bracket.
3. **For Manual Valves Only:** Loosen and remove the upper jam nut from the stem and then remove the handle.
4. Loosen and remove the flange bolting and remove the valve from the piping.
5. Remove the end fitting hex nuts or fasteners, lock washers, and tag, if equipped.
6. Pull the end fitting free from the body. It may require force to remove.
7. Remove the seat, o-ring, and cavity filler, if equipped.
8. Rotate the stem to orient the ball to the closed position. Remove the ball out, taking care not to nick or scratch the ball.
9. Remove the internal ground spring, if equipped, from the bottom of the stem.
10. Remove the jam nut, spring washers, stop disc (if applicable), and follower. For valves with gear operators, remove the gear operator, bracket, and coupling.
11. Push the stem into the body and out through the open end of the body. The bottom packing may come off with the stem. If not, reach into the body counterbore and remove the packing.
12. Remove the top packings from the body, the inner cavity filler, if equipped, and the seat from the body recess.

Reassembly of valve:

1. Before reassembling the valve, examine the parts and repair or replace damaged or worn parts. Clean metal parts, as necessary, using a solvent compatible with the process fluid and a non-abrasive cloth. PBM recommends using new seats, body gaskets, and seals at each assembly.
2. Insert a new seat and cavity filler, if equipped, into the body recess with the seating surface facing towards the ball cavity.
3. Install a new packing onto the threaded end of the stem and slide it down until it contacts the shoulder.
4. Insert the stem into body bore and through the stem bore in the body. Install the remaining packings onto the stem with the S-TEF® (gray) packing installed last. Push the packings into the body counterbore. Install the follower onto the stem.
5. Install a spring washer onto the stem with the concave side facing upward. Install the stop disc (if applicable) such that clockwise rotation of the stem closes the valve. Ensure that the stop disc clears the top of the body. Install the external ground wire terminal onto the stem, if applicable, such that the ground wire extends towards the end fitting side of the body
6. Install a second spring washer onto the stem with the concave side facing downward. Install the remaining spring washers onto the stem in an alternating or *series* arrangement. No two adjacent spring washers should be facing the same direction or in a *parallel* arrangement
7. Lubricate the stem threads with an anti-galling lubricant.
8. Thread a stem hex nut onto the stem. For valves 2" and smaller, tighten the nut to completely compress the spring washers, then back off 1/2 turn. For 3" valves, tighten the nut until a gap of about 0.05" (1.3 mm) exists between the adjacent spring washers. For valves 4" and larger, tighten the nut until a gap of about 0.10" (2.5 mm) exists between the adjacent spring washers.
9. **For Manual Valves Only:** Install the handle on the stem. Install and tighten the remaining hex nut to secure the handle to the stem. This step does not apply to valves with gear operators.
10. Rotate the stem to the closed position of the valve. Insert the ground spring, if equipped, into the hole in the bottom of the stem. Rotate the stem to the closed position of the valve. Then, while holding the ball directly over the entrance to the valve body, orient the ball to the closed position, rotate the slotted end of the ball toward the stem tang located inside the valve, and insert the ball into the body. Take care not to scratch or nick the ball.
11. Rotate the stem until the ball is in the open position. Install the remaining cavity filler into the body, if equipped. Lubricate the O-ring and approximately the first 1-1/2" of the body bore with a lubricant compatible with the process fluid. Install the o-ring into the groove in the end fitting.
12. Lubricate the threads of body bolting with anti-galling lubricant.
13. Install the end fitting onto the body. Install the external ground wire, if equipped, onto one of the adjacent end fitting fasteners. Install tagging, lock washers, and hex nuts. Hand-tighten the hex nuts.
14. Torque the body / end fitting fasteners in a staggered and incremental sequence as per the instructions on the following page. Cycle the valve to verify freedom of operation. If practical, check the valve seats and seals for leaks.
15. Reinstall the valve into the piping using appropriate gaskets and fasteners.
16. For valves with gear operators, reinstall the bracket, coupling, and gear operator.
17. **For Automated Valves Only:** Reinstall the automation assembly with the bracket and coupling. Then reconnect air and electrical power.
18. Insulate the valve, if applicable.

Tightening Procedure for Body / End Fitting Fasteners:

1. Hand-tighten fasteners.
2. Wrench-tighten each fastener in a staggered and incremental sequence as illustrated below until the recommended torque value in Table 2 on Page 4 is achieved.

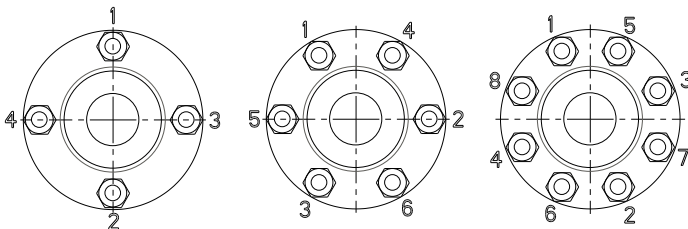


Table 1 - Replacement Kits and Parts						
Valve Size	Repair Kit (RTFE)	Cavity Filler Kit (VTFE)	Ball (316L S/S)	Stem (316L S/S)	Spring Washers	Follower
1/2"	ANRTC1 -- VN	ANVTC1 -- D -- 3	SPH-C102	SPHLC105	SPK-E110	SPK-C106
3/4"	ANRTD1 -- VN	ANVTD1 -- D -- 3	SPHLD102	SPHLC105	SPK-E110	SPK-C106
1"	ANRTE1 -- VN	ANVTE1 -- D -- 3	SPHLE102	ANHLE105	ANK-E110	ANK-E106
1-1/2"	ANRTG1 -- VN	ANVTG1 -- D -- 3	SPHLG102	SPHLH105	SPK-H110	SPK-H106
2"	ANRTH1 -- VN	ANVTH1 -- D -- 3	SPHLH102	SPHLH105	SPK-H110	SPK-H106
3"	ANRTK1 -- VN	ANVTK1 -- D -- 3	SPHLK402	SPHLK105	SPK-K110	SPK-K106
4"	ANRTL1 -- VN	ANVTL1 -- D -- 3	ANHLL102	ANHLL105	MPK-L110	MPK-L106
6"	ANRTM1 -- VN	ANVTM1 -- D -- 3	ANHLM102	SPHLM105	SPK-M110	SPK-M106

Notes for Table above:

- Standard repair kits include 2 RTFE seats, 2 RTFE stem packings, and 1 o-ring.
Cavity filler kits include 2 VTFE fillers.
- Standard repair kits and replacement parts are RTFE.
- Replacement parts are one each per part number.
- For materials other than RTFE, substitute the correct material ID and code.
- For valves with grounding, add "G" to the end of the stem part number.

Material Definitions:

TF	V-TEF™	Chemically modified polytetrafluoroethylene
VT	VTFE	Virgin Polytetrafluoroethylene
HT	S-TEF®	Stainless steel reinforced polytetrafluoroethylene
RT	RTFE	Glass reinforced polytetrafluoroethylene
PK	PEEK™	Polyetheretherketone
UT	UHMWPE	Ultra High Molecular Weight Polyethylene
KY	KYNAR	Polyvinylidene Fluoride

Table 2 - Fastener Torque		
Valve Size	Fastener Torque Body / End Fitting	
	in – lbs.	N - m
1/2"	50	5.6
3/4"	50	5.6
1"	50	5.6
1-1/2"	100	11.2
2"	250	28.2
3"	250	28.2
4"	750	84.7
6"	1000	112



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