

MAINTENANCE INSTRUCTIONS

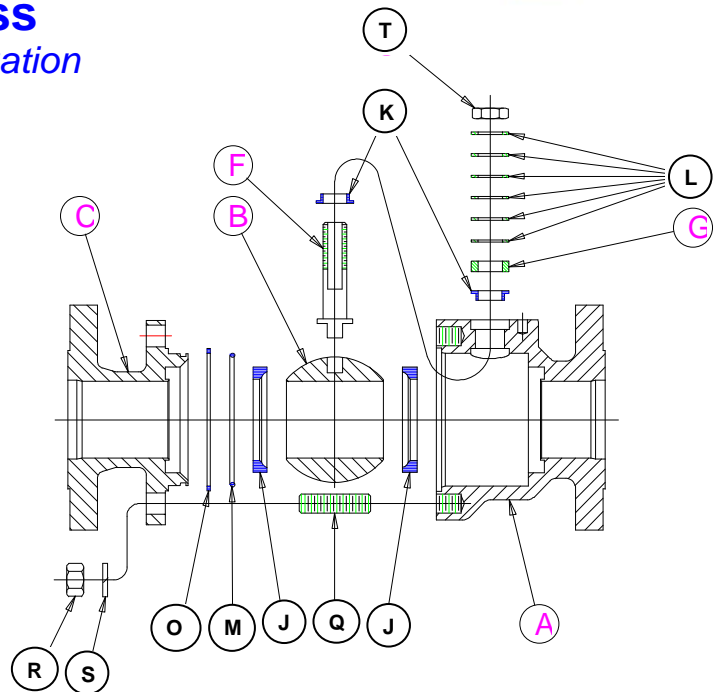
ASME B16.10 Full Port Flanged Ball Valves

AN Series 1, ANSI 150# Class

Factory Actuated or Prepared for Actuation



COMPONENT LIST	
Item	Description
A	Body
B	Ball
C	End Fitting
F	Stem
G	Follower
J	Seat
K	Stem Packing
L	Spring Washers
O	End Body Gasket
Q	End Fitting Fasteners
R	Hex Nut
S	Lock Washers
T	Jam Nut
M	O-Ring for End Fitting



Follow instructions to ensure optimum performance:

Adjusting for Normal Wear

- PBM ball valves are designed with the Adjust-O-Seal® feature. If the valve shows signs of leakage due to normal seat wear, tighten the end fitting fasteners evenly, alternating fasteners as illustrated in Table 2, until the leakage stops and the valve operates smoothly.
 - Initially, there should be a space between the end fitting and the body. This space is key to the Adjust-O-Seal feature and allows in-line adjustment of the seats and gasket.
 - End fitting fasteners should be tightened only until the breakaway torque on the valve stem (as shown in Table 1) is reached.
- If the valve shows signs of leakage in the stem area due to normal stem packing wear, tighten the jam nut on the stem to fully compress the spring washers, then back off the nut $\frac{1}{8}$ turn. For 4" and 6" valves, tighten the nut until there is a 0.1" gap between the spring washers. Leakage should stop, and the valve should continue to operate smoothly.
- After all adjustments have been made to the seats, or if packing leakage cannot be stopped, a repair kit will be required.

Installing Replacement Parts

- Isolate and depressurize the associated piping system. Cycle the valve to drain any trapped fluid from the body cavity.
- Remove all air and electrical power from the actuator, solenoid valve, and switch box, if any.
- Remove the actuator, solenoid valve, and switch box, if any. Remove valve from piping.
- Loosen and remove the end fitting fasteners.
- Pull the end fitting free from the body. It may require force to remove. Remove the seat, gasket, O-ring, and outer cavity filler, if any.
- Turn the stem to close the ball. Then, slide the ball out of the body, taking care not to nick or scratch the ball.
- Loosen and remove the jam nut from the stem. Remove the spring washers and follower.
- Push the stem into the body and out 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 bottom packing.

- Remove top packing and, if applicable, inner cavity filler, from body. Remove the seat from the body recess.
- Before reassembling the valve, examine all parts and repair or replace any damaged or worn parts. Clean all metal parts, as necessary, using a solvent compatible with the process fluids and a non-abrasive cloth. **PBM recommends using new seats and seals at each assembly.**
- Insert a seat into the body recess, with the seating side facing the valve's centerline.
- Insert the inner cavity filler, if any, into the body.
- Place a new packing on the stem such that the flanged surface of the packing seats on top of the ledge on the stem.
- Insert the stem into the body bore and through the stem bore in the body.
- Place a second packing over the stem, with the flanged surface facing upward, and into the body counterbore.
- Lubricate the stem threads with an anti-galling lubricant.
- Install the follower over the stem until it seats on the packing.
- Install a spring washer with its concave side facing *upward*. Install remaining spring washers, alternating convex with concave curves and with convex side of the top spring washer facing upward. Spring washers should not be "nested" (curving in the same direction).
- Place the jam nut on the stem. For 3" and smaller valves, tighten to completely compress the spring washers, then back off $\frac{1}{8}$ turn. For 4" and 6" valves, tighten the nut until the gap between spring washers is 0.1".
- Position the stem to close the valve. Insert the ball into the body. Slide the stem tang into the ball slot, being careful not to nick or scratch the ball.
- If applicable, install the outer cavity filler into the body.
- Place a new seat, gasket, and O-ring in their mating cavities in the end fitting. Lubricate the O-ring and first inch of the body bore with a lubricant compatible with the process fluid.
- Lubricate the external threads of the body bolting with an anti-galling lubricant.
- With valve closed, insert the end fitting into the body bore.
- Install and hand-tighten the body bolting.
- Wrench-tighten the bolting, according to the procedure shown in Table 2, and the stem torque shown in Table 1, to draw end fitting tightly against body gasket. First, measure the stem

torque with the valve moving from the closed position. Then, measure the stem torque at the valve stem for several cycles to verify repeatability.

27. If practical, check the valve seats and seals for leaks.
28. Install the valve into the piping system.

29. Install the actuator, solenoid valve, and switch box, if any. Reconnect air and electrical power.

Notes:

1. PBM recommends replacement of a valve if exposed to fire.

TABLE 1: STEM TORQUE VALUES (IN.-LB.)

Valve Size	Size Code	Valve Stem Breakaway Torque by Seat & Seal Material		
		RT, PL, UT	HT	VT
		1/2"	C1	48
3/4"	D1	60	72	54
1"	E1	72	96	60
1 1/2"	G1	168	204	132
2"	H1	192	240	156
3"	K1	420	528	336
4"	L1	780	936	624
6"	M1	1200	1500	960

TABLE 2: TIGHTENING PROCEDURE FOR END FITTING FASTENERS

1. Hand-tighten in the sequence illustrated at right.
2. Wrench-tighten each fastener in the sequence illustrated until the lock washers begin to compress.
3. Continue tightening each bolt 1/8 turn until the recommended torque value (Table 1) is achieved when measuring the torque at the valve stem.

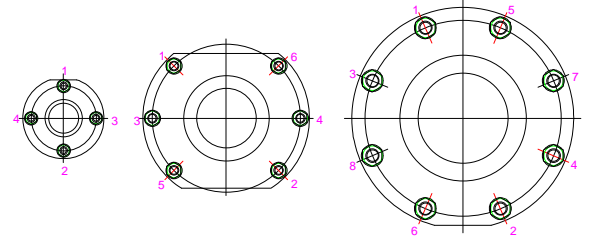


TABLE 3: REPLACEMENT PARTS

Valve Size	Repair Kit (See Note 1)	Replacement Parts							
		Ball	Stem	Seat	Packing	End Gasket	O-Ring	Cavity Filler Kit	
1/2"	ANRTC1--A--1	SPH-C102	SPHLC105	ANRTC008	SPRTC109	ANRTC013	ORVI--12--2026	ANRTC1--B--3	
3/4"	ANRTD1--A--1	SPH-D102	SPHLC105	ANRTD008	SPRTC109	ANRTD013	ORVI--12--2029	ANRTD1--B--3	
1"	ANRTE1--A--1	SPH-E102	ANHLE105	ANRTE008	ANRTE109	ANRTE013	ORVI--12--2031	ANRTE1--B--3	
1 1/2"	ANRTG1--A--1	SPH-G102	SPHLH105	ANRTG008	SPRTH109	ANRTG013	ORVI--12--2145	ANRTG1--B--3	
2"	ANRTH1--A--1	SPH-H102	SPHLH105	ANRTH008	SPRTH109	ANRTH013	ORVI--12--2152	ANRTH1--B--3	
3"	ANRTK1--A--1	SPH-K402	SPHLK105	ANRTK008	SPRTK109	ANRTK013	ORVI--12--2246	ANRTK1--B--3	
4"	ANRTL1--A--1	ANHLL102	ANHLL105	ANRTL008	ANRTL109	ANRTL013	ORVI--12--2262	ANRTL1--B--3	
6"	ANRTM1--A--1	ANHLM102	SPHLM105	SPRTM008	SPRTM109	SPRTM013	ORVI--12--2377	ANRTM1--B--3	

Notes for Table 1:

1. Stem torque values shown are minimum values and represent ideal conditions (100 psig or less, ambient temperature, with fluid free of suspended solids and comparable in viscosity to water).
2. Torque values are measured at the stem, NOT at the body bolts.
3. For PEEK and KYNAR® seat and seal material torque values, consult PBM.

Material Definitions:

RT	RTFE	Glass Reinforced Polytetrafluoroethylene
PL	PLUS	Glass & Carbon Reinforced Polytetrafluoroethylene
UT	UHMWPE	Ultra High Molecular Weight Polyethylene
HT	S/STFE	Stainless Steel Reinforced Polytetrafluoroethylene
VT	VTFE	Virgin Polytetrafluoroethylene
PK	PEEK	Polyetheretherketone
KY	KYNAR	Polyvinylidene Fluoride

Notes for Table 3:

1. Standard repair kits and replacement parts are RTFE:
 - a. For VTFE, replace 'RT' with 'VT'. Example: a 1" kit would be ANVTE1--A--1.
 - b. For S/STFE, replace 'RT' with 'HT'. Example: a 1" kit would be ANHTE1--A--1.
 - c. For UHMWPE, replace 'RT' with 'UT'. Example: a 1" kit would be ANUTE1--A--1.
- Note:** The "A" in position nine of the Repair Kit part number represents the appropriate single character designation from the Seat/Seal column of the PBM Part Number Manual (LT-PN98). It identifies the proper material for seats and seals or cavity fillers. Please consult the Part Number Manual to obtain the proper letter code for position nine, or consult PM directly for assistance.
2. Repair Kits include 2 seats, 1 end gasket, 2 packings, and 1 O-ring.
3. Cavity Filler Kits include 2 cavity fillers, 1 end gasket, and 1 O-ring.
4. Replacement parts are one each per part number. Order appropriate quantity for repair or replacement.

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