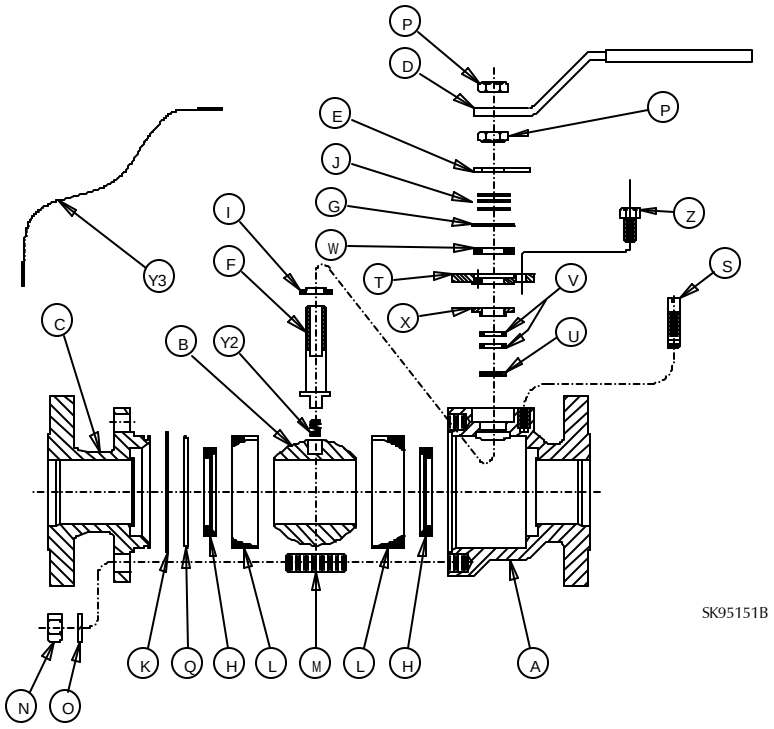
MAINTENANCE INSTRUCTIONS

ASME B16.10 Full-Port Flanged Ball Valves
AN Series 3, ANSI Class 150#, ½" - 6"
Manually Operated, Fire-Test Design API-607, 4th Edition

COMPONENT LIST	
Item	Description
A	Body
B	Ball
C	End Fitting
D	Handle
E	Stop Disc
F	Stem
G	Follower
H	Seat
I	PTFE Packing
J	Spring Washers
K	Graphite Gasket
L	Cavity Filler
M	Body Fastener
N	Hex Nut
O	Lockwasher
P	Jam Nut
Q	End Fitting O-ring
S	Stop Pin
T	Gland Plate
U	Stop Ring
V	Graphite Packings
W	Thrust Washer
X	Packing Plate
Y_2	Inner Ground Spring
Y_3	Ground Wire



Follow instructions to ensure optimum performance:

Adjusting for Normal Packing Wear

1. 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 and side fitting fasteners evenly, in the sequence shown in Table 2, until leakage stops and the valve operates smoothly:
   a. Initially, there should be a space between the end fittings and the body, and the side fittings and the body. This space is key to the Adjust-O-Seal feature, and allows in-line adjustment of the seats and gaskets.
   b. End and side fitting fasteners should be tightened only until the valve stem breakaway torque is reached (Table 1).
2. If the valve shows signs of leakage in the stem area due to normal stem packing wear, tighten the locking jam nut on the stem. For 3" and smaller valves, tighten the nut to fully compress the spring washers, then back off the nut $^{1}/_{8}$ turn. Leakage should stop, and the valve should continue to operate smoothly. For 4" and 6" valves, tighten the locking jam nut until the gap between adjacent spring washers is about 0.1".
3. After adjustments have been made to the seats, or if packing leakage cannot be stopped, a repair kit will be required.

Installing Replacement Parts

1. Depressurize the piping at the valve. Then, cycle the valve to drain any trapped fluid from the body cavity. The valve should be left either fully open or fully closed.
2. Loosen and remove the flange bolting, and remove the valve from the piping.
3. Loosen and remove the hex nuts and lock washers from the body bolts or studs, and remove the body bolts or studs.
4. Pull the end fitting free from the body. Remove the seat, graphite gasket, O-ring, and outer cavity filler (if any).
5. Turn the stem to close the ball. Slide the ball out of the body, taking care not to nick or scratch the ball.
6. Remove the internal ground spring (if any) from the bottom of the stem.
7. Remove the inner seat and inner cavity filler (if installed).
8. Loosen and remove the jam nut from the top of the handle. Remove the handle.
9. Loosen and remove the remaining jam nut.
10. Remove spring washers, external ground wire (if any), follower, thrust bearing, and stop disc.
11. Loosen and remove the gland plate fasteners and remove the gland plate.
12. Push down on the top of the stem and force into the body cavity. Remove the stem from the body.
13. Remove the PTFE packing from the stem or body. Remove the packing plate from the stem counterbore in the body.
14. Remove the graphite packings from the stem counterbore in the body.
15. Remove the stop ring from the stem counterbore in the body (smaller size valves do not have a stop ring).
16. The valve is now completely disassembled.
17. Before assembling the valve, examine all parts. Repair or replace any damaged or worn parts. Clean all metal parts, as necessary, using a solvent compatible with the process fluid and a non-abrasive cloth.
18. Insert a seat into the body recess, and install the inner cavity filler (if any).
19. Place a new packing on the stem such that the flanged surface of the packing seats on top of ledge on stem.
20. Insert stem into body bore and through the stem bore in body. While supporting the stem, install the stop ring (if any) over the stem until it rests on the ledge of the body bore.

21. Slide two new graphite packings over the stem and into the body counterbore.
22. Install the packing plate over the stem until it rests on the top graphite packing.
23. Install gland plate over the stem until it rests on packing plate. The protruding set screws should rest on packing plate. Apply anti-galling thread lubricant to gland plate bolts. Bolt the gland plate onto the top of the body until it is tight.
24. Install the thrust bearing over the stem until it rests in the counterbore of the gland plate.
25. Install the follower over the stem until it rests on the thrust bearing.
26. Install the stop disc above the follower such that clockwise rotation of the stem closes the valve.
27. Install a spring washer over the stem with its concave side facing upward. Install the remaining spring washers, alternating convex with concave curves. Spring washers should not be "nested" (curving in the same direction). When installing the spring washers, install the external ground wire (if any) between any two spring washers.
28. Apply anti-galling thread lubricant to the threads of jam nut. Thread nut onto stem. For valves 3" and smaller, tighten nut to completely compress the spring washers, then back off $^{1}/_{8}$ turn. For 4" and 6" valves, tighten the nut until the gap between the adjacent spring washers is about 0.1".
29. Install the handle, install and tighten the second jam nut.
30. Position stem to close valve. Install the internal ground spring (if any) on bottom of the stem. Insert ball into body in closed position. Slide stem tang into ball slot, being careful not to nick or scratch the ball.
31. Place a new seat, graphite gasket, and O-ring in their mating cavities in the end fitting.
32. Lubricate the external threads of the body bolting with an anti-galling lubricant.
33. Lubricate O-ring installed on the end fitting and the first inch of the body bore with a lubricant compatible with the process fluid. Lubrication minimizes the potential for O-ring damage when the end fitting is inserted into the body.
34. With the ball closed, insert end fitting into the body bore, taking care not to damage the O-ring.
35. Install body bolting with lock washers. Install the loose end of external ground wire (if any) to one of the body fasteners to ground stem and ball. Hand-tighten body bolts.
36. Wrench-tighten the hex nuts, according to the procedure shown in Table 2. Cycle the valve several times to ensure smooth operation.
37. If practical, check the valve seats and seals for leakage.
38. Install the valve into the piping system.

Notes:
1. PBM recommends replacement of a valve exposed to fire.

TABLE 1: REPLACEMENT PARTS

Valve Size	Size Code	Repair Kit**	Replacement Parts							
			Thrust Washer	Seat	Body Gasket	Graphite Packing	RTFE Packing	O-Ring (Viton)	Cavity Filler (VTFE)	Cavity Filler (VTFE)
½"	C3	ANRTC3--x--z	ANPKC335	ANRTC308	SPGRD313	SPGRE209A-	SPRTE209	ORVI--12---2029	ANVTC313F1	ANVTC313F2
¾"	D3	ANRTD3--x--z	ANPKC335	ANRTD308	SPGRD313	SPGRE209A-	SPRTE209	ORVI--12---2029	ANVTD313F1	ANVTD313F2
1"	E3	ANRTE3--x--z	ANPKE335	ANRTE308	ANGRE313	ANGRE309A-	ANRTE309	ORVI--12---2032	ANVTE313F1	ANVTE313F2
1½"	G3	ANRTG3--x--z	ANPKH335	ANRTG308	ANGRG213	SPGRH209A-	SPRTH209	ORVI--12---2145	ANVTG313F1	ANVTG313F2
2"	H3	ANRTH3--x--z	ANPKH335	ANRTH308	ANGRH213	SPGRH209A-	SPRTH209	ORVI--12---2152	ANVTH313F1	ANVTH313F2
3"	K3	ANRTK3--x--z	ANPKK335	ANRTK308	ANGRK313	SPGRK209	SPRTK109	ORVI--12---2248	ANVTK313F1	ANVTK313F2
4"	L3	ANRTL3--x--z	ANPKL335	ANRTL308	ANGRL213	ANGRL209	ANRTL109	ORVI--12---2262	ANVTL313F1	ANVTL313F2
6"	M3	ANRTM3--x--z	ANPKM335	ANRTM308	ANGRM313	ANGRM209A-	ANRTM309	ORVI--12---2377	ANVTM113F2	ANVTM113F1

Notes for Table 1:

** When ordering a repair kit, substitute the following for x and z above:
- x = Enter the appropriate character from Seat/Seal column in PBM Part Number Manual (LT-PN98). "A" (RTFE) is standard for AN Series 3 valves.
- z = Enter "1" for Each or "2" for a Box.

For example, the part number for a single repair kit for a 1" AN Series 3 ball valve with RTFE seats and seals would be ANRTE3--A--1.

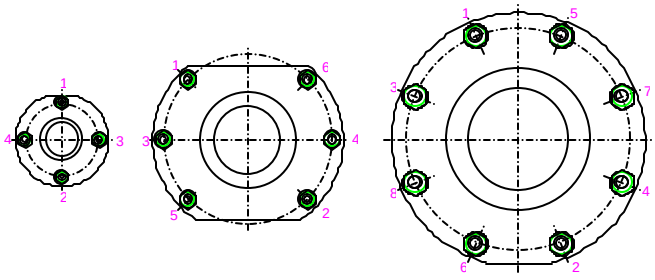
1. Standard Repair Kits and Replacement Parts are RTFE:
   a. For VTFE, add "VT" to the code. Example: a 1" Kit would become ANVTE3--x--z.
   b. For S/STFE, add "HT" to the code. Example: a 1" Kit would become ANHTE3--x--z.
   c. For PLUS, add "PL" to the code. Example: a 1" Kit would become ANPLE3--x--z.
2. Repair Kits include 2 seats, 1 graphite body gasket, 1 RTFE and 2 graphite packings, and 1 O-ring. (EPR O-rings, Viton O-rings, and other materials are also available.)
3. Cavity filler kits include 2 cavity fillers, 1 O-ring, and 1 graphite body gasket.

Material Code Definitions

RT	RTFE	Glass Reinforced Polytetrafluoroethylene
VT	VTFE	Virgin Polytetrafluoroethylene
HT	S/STFE	316 Stainless Steel Reinforced Polytetrafluoroethylene
PL	PLUS	Glass, Carbon and Graphite Reinforced Polytetrafluoroethylene
TF	TFM	Teflon, modified

TABLE 2: TIGHTENING PROCEDURE FOR END FITTING

1. Wrench-tighten in the staggered sequence illustrated until lock washer begins to compress.
2. Continue to tighten bolts $^{1}/_{8}$ turn in this staggered sequence until body and end fitting are drawn tight with each other.



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