

MAINTENANCE INSTRUCTIONS

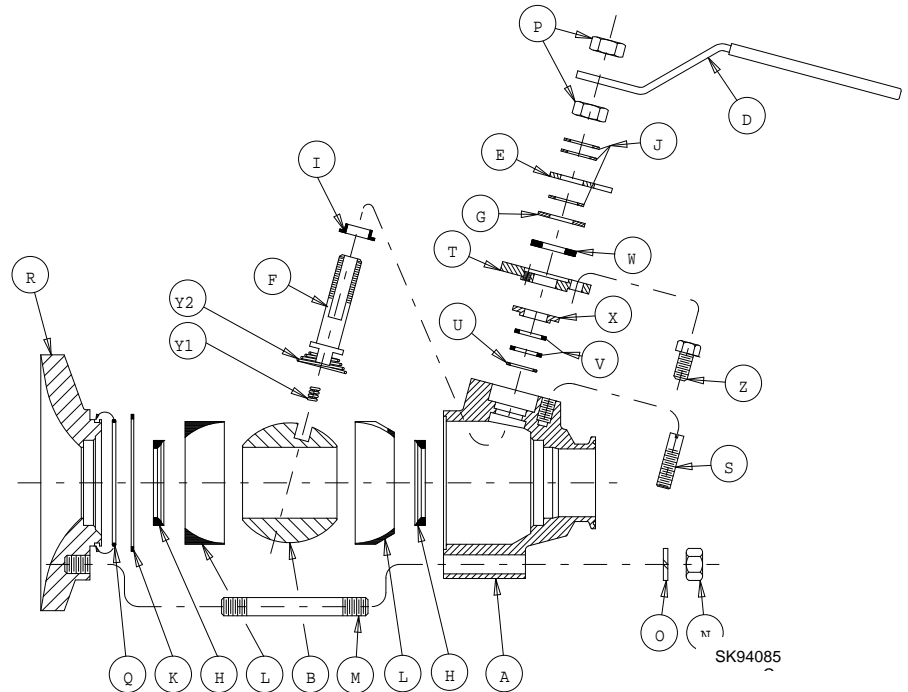


Angle Stem Flush Tank Ball Valves

Manually Operated, Fire-Test Design, AF Series 3

API 607, 4th Edition

COMPONENT LIST	
Item	Description
A	Body
B	Ball
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	Lock Washer
P	Jam Nut
Q	O-Ring
R	Tank Pad
S	Stop Pin
T	Gland Plate
U	Stop Ring
V	Graphite Packings
W	Thrust Bearing
X	Packing Plate
Y ₁	Outer Ground Spring
Y ₂	Inner Ground Spring
Z	Gland Plate Fastener



Follow instructions to ensure optimum performance:

Installing Replacement Parts

- Depressurize the piping at the valve. Then, partially open the valve to depressurize any fluid trapped in the body. Allow the valve to drain, then close it. Disconnect and remove the adjacent piping.
- Loosen and remove the body fasteners and lock washers. Remove the body assembly from the tank pad.
- Remove the seat, gasket and O-ring from the tank pad.
- Remove the outer cavity filler, if any, from the body.
- With the handle in the closed position, slide ball out of the body, taking care not to nick or scratch the ball. Remove the inner and outer ground springs (if any) from the bottom of the stem. Remove the inner seat and inner cavity filler, if any.
- Loosen and remove the jam nut from the top of the handle and remove the handle.
- Loosen and remove the remaining jam nut.
- Remove spring washers, follower, thrust bearing, and stop disc. Loosen and remove gland plate fasteners and remove the gland plate.
- Push down on the top of the stem and force it into the body cavity. Remove the stem from the body.
- Remove the PTFE packing from the stem or body.
- Remove packing plate from stem counterbore in body.
- Remove the graphite packings from the stem counterbore in the body.
- Remove the stop ring from the stem counterbore in the body (smaller size valves do not have a stop ring).
- Wash and clean all metal parts, as necessary.
- Place a new packing on the stem so that the flanged surface of packing is seated on top of the ledge on stem.
- Insert the stem into the body port and through the stem bore in the body. While supporting the stem, install the stop ring (if any) over the stem until it rests on the ledge of the body bore.
- Slide two new graphite packings over the stem and into the body counter bore.
- Install the packing plate over the stem until it rests on the top graphite packing.
- Install the gland plate over the stem until it rests on the packing plate. The protruding set screws should rest on the packing plate. Apply anti-galling thread lubricant to gland plate bolts. Bolt the gland plate on top of the body until tight.
- Install the thrust bearing over the stem until it rests in the counterbore of the gland plate. Install follower over stem until it rests on thrust bearing.
- Position the stem in the closed position with the indexed end of the stem tang facing the open end of the body. Install the stop disc above the follower such that clockwise rotation of the stem closes the valve.
- 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).
- Apply anti-galling thread lubricant to the threads of jam nut. Thread the nut onto the stem. On valves 3" and

smaller, tighten the nut to completely compress spring washers, then back off 1/8 turn. On valves 4" and larger, tighten the nut until the gap between adjacent spring washers is about 0.01".

24. Install handle and second jam nut. Tighten jam nut.
25. Insert the inner seat into the body and insert the inner cavity filler, if any.
26. With the stem in the closed position, install the inner ground spring and outer ground spring (if any) on the bottom of the stem.
27. Hold the ball with the stem slot in the ball aligned with the stem. Insert the ball into the body, taking care not to scratch or nick the ball. Engage stem tang in the ball slot. The index on stem tang must match the index on ball.
28. Rotate the stem counterclockwise 90° and check that the ports align in the open position. Rotate the stem clockwise to position the ball in the closed position. If the ports do not align in the open position, rotate the stem 180°. Then recheck port alignment.
29. Insert the outer cavity filler, if applicable.
30. Lubricate O-ring and first 1/2" of body entrance diameter with a lubricant compatible with the process fluid. Install

the graphite gasket, O-ring, and seat into the flush tank pad. (In vertical installations, it may be necessary to apply a lubricant to the back of the seat and gasket to hold the parts in place.)

31. Install the studs (if removed) into the tapped holes in the flush tank pad until they bottom. Lubricate the stud threads with an anti-galling lubricant before assembly.
32. Assemble the body to the flush tank pad. Allow fastener to enter the holes in the body.
33. Install lock washers and nuts. Install the loose end of external ground wire (if used) to one of the body fasteners to ground the stem and ball. Hand-tighten nuts.
34. With the valve in the **closed** position, wrench-tighten the fasteners in sequence shown in Table 2.
35. Cycle the valve several times to ensure smooth operation.
36. Ensure that the ports align with seats when valve is open.
37. If practical, check the valve seats and seals for leaks.

Notes:

1. PBM recommends replacing 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)
1"	E3	AFRTE3--x-z	ANPKE335	SPRTE208	SPGRE213	ANGRE309A	ANRTE309	ORVI--12---2031	ASVTE213F1	ASVTE213F2
1½"	G3	AFRTG3--x-z	ANPKH335	SPRTG208	SPGRG213	SPGRH209A	SPRTH209	ORVI--12---2145	ASVTG213F1	ASVTG213F2
2"	H3	AFRTH3--x-z	ANPKH335	SPRTH208	SPGRH213	SPGRH209A	SPRTH209	ORVI--12---2152	ASVTH313F1	ASVTH313F2
3"	K3	AFRTK3--x-z	ANPKK335	SPRTK308	SPGRK213	SPGRK209	SPRTH209	ORVI--12---2249	ASVTK313F1	ASVTK313F2
4"	L3	AFRTL3--x-z	ANPKK335	SPRTL308	SPGRL213	SPGRK209	SPRTH209	ORVI--12---2255	ASVTL313F1	ASVTL313F2

Notes for Table 1:

- ** When ordering a repair kit, substitute the following for x and z above:
- x = Enter appropriate character from Seat/Seal column in PBM Part Number Manual (LT-PN98).
 - z = Enter "1" for Each, "2" for a Box of 10, or "3" for a Filler Kit.
1. Standard Repair Kits and Replacement Parts are RTFE:
 - a. For VTFE, add "VT" to the code. Example: a 1" kit would become AFVTE3--x--z.
 - b. For S/STFE, add "HT" to the code. Example: a 1" kit would become AFHTE3--x--z.
 - c. For PLUS, add "PL" to the code. Example: a 1" kit would become AFPLE3--x--z.

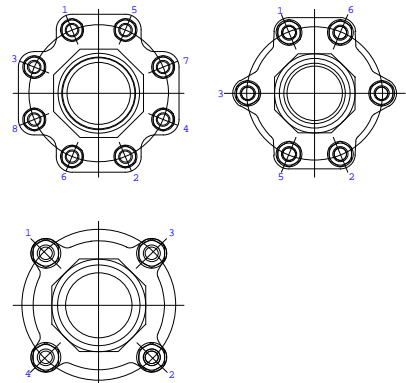
2. Repair kits include 2 seats, 1 graphite gasket, 1 PTFE packing, 2 graphite packings, and 1 O-ring. (EPR O-rings, Viton O-rings and other materials are also available.)
3. Cavity filler kits include 2 cavity fillers, 1 graphite gasket, and 1 O-ring.

Material Code Definitions:

RT	RTFE	Glass Reinforced Polytetrafluoroethylene
PL	PLUS	Glass & Carbon Reinforced Polytetrafluoroethylene
HT	S/STFE	Stainless Steel Reinforced Polytetrafluoroethylene
VT	VTFE	Virgin Polytetrafluoroethylene

TABLE 2: TIGHTENING PROCEDURE FOR BODY FASTENERS

1. Hand-tighten in the sequence illustrated.
2. Wrench-tighten in sequence shown until lock washer begins to compress.
3. Continue tightening each bolt 1/8 turn until the body and pad are drawn tight with each other.



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