

MAINTENANCE INSTRUCTIONS

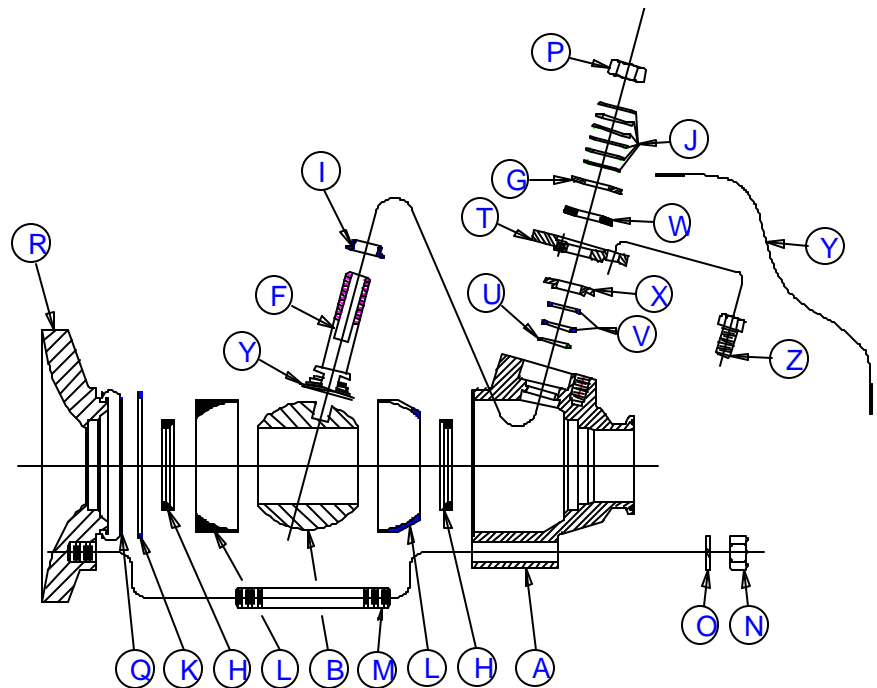


Angle Stem Flush Tank Ball Valves

Factory-Actuated, Fire-Test Design, AF Series 3

API-607, 4th Edition

COMPONENT LIST	
Item	Description
A	Body
B	Ball
F	Stem
G	Follower
H	Seat
I	PTFE Packing
J	Spring Washers
K	Graphite Gasket
L	Cavity Filler
M	Body Fasteners
N	Hex Nut
O	Lock Washers
P	Jam Nut
Q	End Fitting O-Ring
R	Tank Pad
T	Gland Plate
U	Stop Ring
V	Graphite Packings
W	Thrust Bearing
X	Packing Plate
Y	Grounding Spring & Wire
Z	Gland Plate Fastener



Follow instructions to ensure optimum performance:

Adjusting for Packing Wear

1. If the valve shows signs of leakage in the stem area due to normal stem packing wear, loosen the upper jam nut on the stem then tighten the lower jam nut to fully compress the spring washers, then back off the nut $\frac{1}{8}$ turn. For 4" and 6" valves tighten this nut until the distance between adjacent spray washers is about 0.1". Then, tighten the top jam nut. Leakage should stop, and the valve should continue to operate smoothly.
2. 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 depressurize any fluid trapped in the body. Drain and close the valve. Disconnect and remove the adjacent piping.
2. De-energize and disconnect all electrical and pneumatic power to the actuator assembly. Remove the actuator and associated parts.
3. Loosen and remove the body nuts and lock washers. Remove the body assembly from the flush tank pad.
4. Remove the seat, gasket and O-ring from the tank pad.
5. Remove the outer cavity filler, if any, from the body.
6. With the ball in the closed position, slide the ball out of the body, taking care not to nick or scratch the ball. Remove the internal ground spring (if any) from the bottom of the stem.
7. Remove the inner seat and inner cavity filler, if any.
8. Loosen and remove the jam nut from the top of the stem.
9. Remove spring washers, external ground wire (if any), follower, and thrust bearing. Loosen and remove the gland plate fasteners. Remove the gland plate.
10. Push down on the top of the stem and force it into the body cavity. Remove the stem from the body.
11. Remove the PTFE packing from the stem or body.
12. Remove the packing plate from the stem counterbore in the body.
13. Remove graphite packings from the stem counterbore in the body.
14. Remove the stop ring from the stem counterbore in the body (smaller size valves do not have a stop ring).
15. Wash and clean all metal parts, as necessary.
16. Place a new packing on the stem so that the flanged surface of packing is seated on top of the ledge on stem.
17. 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 on the body bore.
18. Slide two new graphite packings over the stem and into the body counterbore.
19. Install the packing plate down over the stem until it rests on the top graphite packing.
20. Install the gland plate over stem until it rests on the packing plate. The protruding set screws should rest on the packing plate. Apply anti-galling lubricant to gland plate bolts. Bolt the gland plate onto top of the body until tight.
21. Install the thrust bearing over the stem until it rests in the counterbore of the gland plate.
22. Install follower over stem until it rests on thrust bearing.
23. 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.
24. Apply anti-galling lubricant, to threads of jam nut and thread the nut onto stem. Tighten nut to completely compress spring washers then back off $\frac{1}{8}$ turn. For 6" valves, tighten this nut until the distance between adjacent spring washers is about 0.1".
25. Insert a new seat into the body and insert the inner cavity filler, if any. With the stem in the closed position and the indexed end of the stem tang facing the open end of the body, install the internal ground spring, (if any) on the bottom of the stem.

26. Insert the ball into the body, taking care not to scratch or nick the ball. Engage the stem tang in the ball slot. The index on stem tang must match the index on ball.
27. Ensure that rotating the stem counterclockwise 90° aligns the ball ports when the valve is 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 open port alignment. Insert the outer cavity filler, if any, into the body.
28. Install a new 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 in order to hold the parts in place.)
29. Install studs (if removed) into the tapped holes in the flush tank pad until they bottom. If practical, lubricate the stud threads with an anti-galling lubricant before assembly.
30. Lubricate O-ring installed on the end fitting and the first inch of the body bore with a lubricant compatible with the process fluid.
31. Lubrication minimizes the potential for O-ring damage when end fitting is inserted into the body.
32. Assemble the body to the flush tank pad. If heat shields, which cover the studs, are used install them over the studs before

- installing the body. Allow studs to enter the holes in the body. Install body nuts and lock washers. Install the loose end of the external ground wire (if used) to one of the body fasteners to ground the stem and ball. Hand-tighten nuts.
33. With the valve in the closed position, wrench-tighten the end fitting fasteners in sequence shown in Table 2.
34. Open valve by rotating stem 90° counterclockwise. Recheck the open ball port alignment.
35. Rotate the stem 90° clockwise to close the ball.
36. Cycle the valve several times to ensure smooth operation.
37. If practical, check the valve seats and seals for leaks.
38. Install the actuator.
39. If practical, cycle the valve with the actuator to verify proper assembly.

Notes:

1. Instructions apply to valves with actuation operating clockwise. If actuation operates counter-clockwise, all references to "clockwise" and "counter-clockwise" must be reversed.
2. 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 or "2" for a Box.

1. Standard Repair Kits and Replacement Parts are RTFE:
 - a. For VTFE, add "C" to the code. Example: a 1" kit would become AFVTE3--C--1.
 - b. For S/STFE, add "H" to the code. Example: a 1" kit would become AFHTE3--H--1.
 - c. For PLUS, add "E" to the code. Example: a 1" kit would become AFPLE3--E--1.

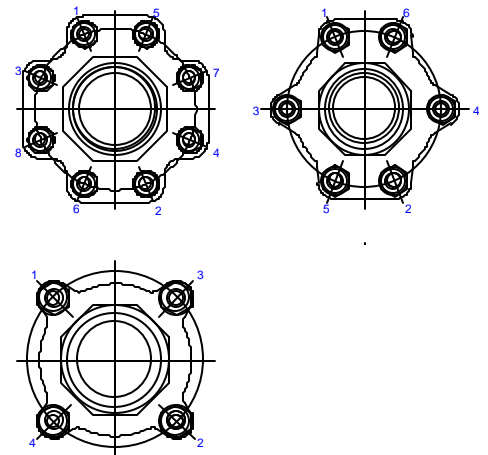
2. Repair kits include 2 seats, 1 graphite gasket, 1 PTFE packing, 2 graphite packings, and 1 O-ring. (EPR O-rings, Viton O-rings and other materials are also available.)
3. Cavity filler kits include 2 cavity fillers, 1 graphite gasket, and 1 O-ring.

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
TF	TFM	Teflon, modified

TABLE 2: TIGHTENING PROCEDURE FOR BODY FASTENERS

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



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