

# 1" CLASSIC PERFORMANCE MAINTENANCE MANUAL

## CHECK VALVE AND O-RING MAINTENANCE

1. Flush and neutralize the pump to be certain all corrosives or hazardous materials are removed prior to any maintenance. This procedure should always be followed when returning pumps for factory service also.
2. Remove the nuts (24) and washers (25) from the four long pumping cap screws (35). Suction check valve seats (26) and check balls (27) are located inside of the bottom of the outer chamber (28). Gently remove and inspect for excessive wear, pitting or other signs of degradation. Inspect valve seat o-rings (22). Replace if necessary. Discharge check valves are located inside of the bottom of the discharge elbows (32). Repeat procedure for discharge check valves.
3. To inspect the manifold o-rings (22) remove the band clamps (20) on either side of the manifold (21) evaluate and replace if necessary. Then reassemble the manifold assemblies. Lightly tighten fasteners making sure that two tension washers (9) have been put into place under nuts. Concave side of tension washers should face each other. Tighten all external fasteners to final torque requirement after pump is completely assembled. The check ball should fit into the curved portion of the valve seat and be facing upward when reinserted into the valve seat location.

**NOTE: When using pumps built with PTFE o-rings always replace with new PTFE o-rings, since the original o-rings will not reseal the pump. PVDF pumps need additional gaskets (34).** These gaskets are adhesive backed. Remove paper backing and apply to upper surface of valve seats as shown.

## DIAPHRAGM AND PILOT SLEEVE ASSEMBLY MAINTENANCE

4. To inspect diaphragms remove the band clamps (16) from the outer pumping chambers (28). If replacement is necessary due to abrasion or rupture unscrew the outer diaphragm plates (29). Models that are built with PTFE elastomers will have a PTFE overlay (30) that faces the outer pumping chamber and a back-up diaphragm (31) on the air side of pump. Pumps without PTFE will contain only the back-up diaphragms.
5. If there has been a diaphragm rupture and corrosive or viscous fluid has entered the air side of pump the complete air system should be inspected. After removing diaphragms and inner diaphragm plate (33), the pilot sleeve assembly (14, 42, 45-48) and diaphragm rod assembly (13, 15) may be removed by removing the retaining plates (49) (you may only need to remove one retaining plate) and pushing the entire unit out through the bore in the intermediate (41). Diaphragm rod assembly must be unscrewed to remove pilot sleeve.  
**NOTE: To aid in reassembly use a non-synthetic, petroleum based lubricating grease without EP additives. Carleton-Stuart MagnaLube G is recommended.**
6. Clean or replace any components that have excessive wear, dirt build-up, or chemical attack. Lube all components prior to reassembling. Reassemble pilot sleeve spacers, o-rings and lip seals (48) within bore of intermediate. Make sure that the open side in the lip seals is facing outward toward the diaphragms. Also make sure that the end pilot spacers (14) are at the end on either side of the pilot sleeve assembly and all inner spacers (47) are separated by o-rings (46). Next carefully insert the diaphragm rod assembly with pilot sleeve inside the assembly in the bore. Reattach retaining plates. Screws (38) are self tapping. Do not over tighten.
7. Assemble diaphragm (and optional PTFE overlay) and inner diaphragm plate onto outer diaphragm plate stud. Then screw assembly into diaphragm rod. Push diaphragm rod to opposite side of intermediate and add the opposite diaphragm assembly. **Apply 165 in-lbs. (18,65 NM) of torque to outer diaphragm plates.**
8. Position outer diaphragm chambers onto intermediate making sure that witness lines are matching.

**NOTE: If air valve has been removed, proper orientation of air system with fluid chambers must be observed. The top of the intermediate has a single vertical air passage slot on the air valve mounting face while the outer chamber check ball cavity should be pointing downward.**

9. When positioning band clamps use soapy water or a compatible lubricating spray on the inside of band clamps to aid assembly. Tap with a mallet on the outside of clamp to help position the clamp while tightening the fasteners. The band clamp fasteners are stainless steel. To prevent galling always apply an anti-seize compound to the thread. Apply light torque to fasteners and level and realign pump prior to applying final torque.
10. Position the reassembled manifolds making sure of the proper orientation in relation to the air valve for your application. Also make sure that the valve seat o-rings do not shift from their grooves during reassembly. Lightly tighten fasteners on long pumping chamber bolts making sure that two tension washers (9) have been put into place under nuts. Concave side of tension washers should face each other.

## EXTERNAL FASTENER TORQUE REQUIREMENTS

**NOTE: When reassembling loosely tighten all external fasteners adjusting and aligning and gradually, in an alternating fashion, tighten to torque requirements listed below.**

AIR VALVE CAP SCREWS, 40 in-lbs (4,52 NM)  
BAND CLAMPS (Outer Chamber), 16.7 ft-lbs (22,6 NM)  
BAND CLAMPS (Manifolds), 80 in-lbs (9,04 NM)  
OUTER CHAMBER CAP SCREWS, 20 in-lbs (2,26 NM)

## AIR VALVE MAINTENANCE

11. To evaluate air valve components, remove the four cap screws (11), washers, (8, 10) and nuts from the air valve body (7). The valve plate (5) and shuttle (6) may be inspected by removing them from their location in the slot in the back of the air valve. Inspect for scratches or surface irregularities. Replace if necessary. To remove the plug (1) at the bottom of the air valve, point the bottom of the air valve safely away from people, direct compressed air through one of the lower holes in the back of the air valve body and the plug will shoot out. Next push the air valve spool (2) out of the air valve body. Gently reach in and pull lip seals (43) out of inside bore of the air valve body. Check for cracks, splitting or scratches. Clean components if replacement is not necessary. Inspect plug o-ring (44) for any damage and replace if necessary and reinsert in o-ring groove.  
**NOTE: Make sure that the open sides of the two lip seals face each other when reassembling air valve. Lube all components with suggested maintenance grease as an aid in reassembly.**
12. Reinsert air valve spool inside of air valve body. Place shuttle on middle rib of air valve spool through the square slot in back of air valve. If using original valve plate lubricate side of plate that was facing the shuttle (or if new valve plate is used lubricate the lapped and polished side of plate) and place the lubricated side next to the shuttle in the slot. Press valve plug into air valve body, chamfered end first.
13. Check that gaskets (3, 4) are not cracked. If damaged replace.
14. After gaskets are pressed back into position align air valve onto intermediate and reinsert the four cap screws with lock washer and flat washers. **Apply 40 in-lbs (4,52 NM) of torque to fasteners.**

## DUAL MANIFOLD CAPABILITY

1. Remove the four long pumping chamber cap screws along the sides of the pump.
2. Remove existing manifolds.  
**Note: There is a female 1" NPT thread inside the elbows.**
3. Rotate elbows 180° and realign and secure pumping chamber cap screws.
4. Pump is now ready for dual side suction and discharge through the elbows.

## SPECIFICATIONS

### CAPACITY:

Adjustable 0-40 GPM (152 LPM)

### MAXIMUM TEMP:

PVDF models – 200°F (93°C)

Other models – 150°F (66°C)

Metallic models – 200°F (93°C)

**MAXIMUM AIR PRESSURE:** 100 psi (6,8 bar)

**MINIMUM AIR PRESSURE:** 20 psi (1,3 bar)

### DRY LIFT:

Models with PTFE balls – 10 feet (3 meters)

Other Models – 15 feet (4,5 meters)

### WEIGHT:

PVDF – 22 pounds (9,9 kg)

Other Non-Metallic – 19 pounds (8,6 kg)

Stainless Steel – 42 pounds (19,1 kg)

Aluminum – 19 pounds (8,6 kg)

### MAXIMUM SOLIDS:

1/4" (3,2 mm)

### AIR SUPPLY:

Inlet – 1/4" NPT Female (BSP compatible)

Outlet – 3/4" NPT Female

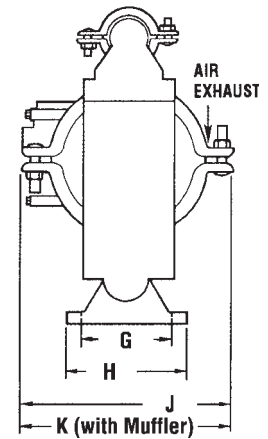
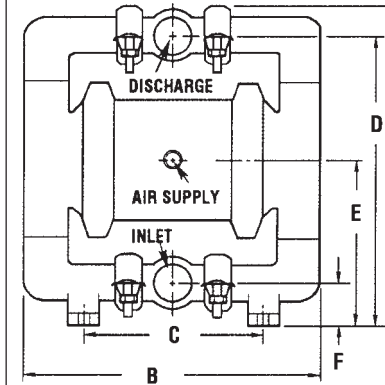
### FLUID INLET/DISCHARGE:

1" NPT Female (BSP compatible)

## DIMENSIONS

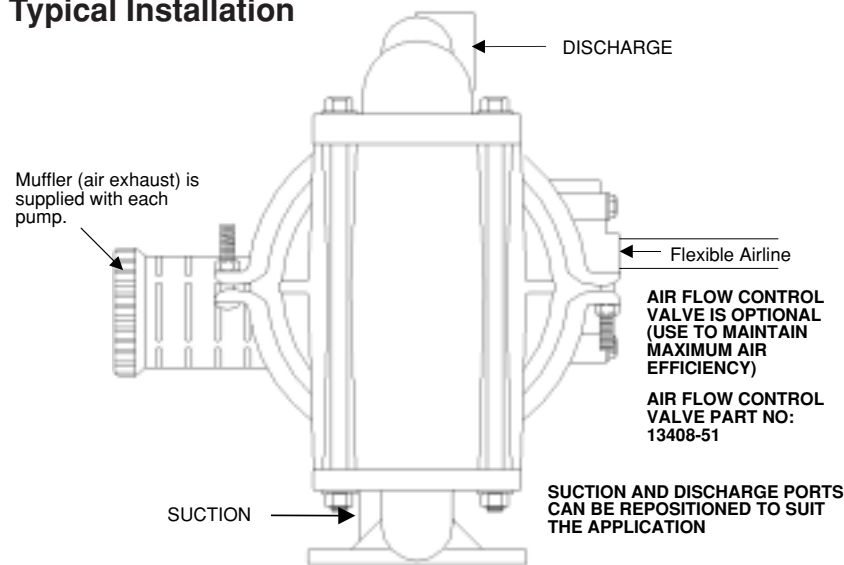
Dimensions in inches and (mm)

	Non-metallic	Metallic
A	15.00 (381)	12.69 (322)
B	12 (305)	12 (305)
C	5.75 (146)	6.75 (171)
D	13.50 (343)	11.78 (299)
E	8.30 (211)	5.68 (144)
F	2.00 (51)	1.44 (37)
G	5.0 (127)	4.18 (106)
H	6.0 (152)	5.0 (127)
J	9.9 (251)	9.30 (236)
K	11.56 (293)	11.56 (293)



Dimensions in inches and (mm), BSP Threads available on request, Air Exhaust (rear).

## Typical Installation



**DO NOT USE AIR LINE LUBRICATION**

## PERFORMANCE CURVE

(Based on water-flooded suction)

