

3" 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 suction and discharge manifolds fasteners (16, 17, 18). The check valve seats (26) and check balls (27) are located inside the bottom of the Outer Chamber (28) or inside the Discharge Manifold (22). Remove the seat and balls and inspect for excessive wear, pitting, or other signs of degradation. On models using check valve seats (25) and o-rings (24), check the seats, balls, for excessive wear, pitting, or other signs of degradation.

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.

DIAPHRAGM AND PILOT SLEEVE ASSEMBLY MAINTENANCE

3. To inspect the diaphragms, remove the eight fasteners (16, 17, 18, 33) from the outer chamber. If replacement is necessary due to abrasion or rupture, remove the outer diaphragm plates (52) by turning counter-clockwise. Models built with PTFE elastomers will have PTFE overlays (30) that face the outer chamber (28) and back-up diaphragms (31) on the air side of the pump. Pumps without PTFE will contain only the back-up diaphragms (31).
4. If diaphragm replacement is required, remove the inner diaphragm plate by removing fasteners (55, 56).
5. If a diaphragm has been ruptured and corrosive or viscous fluid has entered the air side of the pump, the complete air system should be cleaned and inspected.
6. After removing the diaphragm-plate assemblies, bumpers (3), & flat washers (47) the pilot sleeve assembly (13, 14, 15, 42, 45, & 48) and diaphragm rod assembly (34, 49) may be removed after removing the retaining plate (46) fasteners (38) and pushing the entire unit out through the bore in the intermediate (41). The diaphragm rod assembly must be unscrewed to remove the pilot sleeve (13).

NOTE: To aid in reassembly apply a non-synthetic, petroleum based lubricating grease without EP additives. Carleton-Stuart MagnaLube G is recommended.

7. 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 (42) and lip seals (14) within bore of intermediate. Make sure that the open side of the lip seals is facing outward toward the diaphragms. Also make sure that the end pilot spacers (45) are at the end on either side of the pilot sleeve assembly and all inner spacers (48) are separated by o-rings (15). Next carefully insert the diaphragm rod assembly with pilot sleeve inside the assembly in the bore. Reattach retaining plates. Do not over tighten self-tapping screws (38).

NOTE: To aid in reassembly of the diaphragms apply a non-synthetic, petroleum based lubricating grease without EP additives to the diaphragm's outside diameter sealing bead. Carleton-Stuart MagnaLube G is recommended.

8. Inspect stud (35) for damage to threads. Replace if necessary by threading into outer plate (52) leaving 7/8" sticking out. Note! Use red (permanent) "Loctite #262" on the threads. Reassemble the diaphragms (31) by placing the "liquid side" on the outer diaphragm plate (52), place the inner diaphragm plate (51) on the opposite side of the diaphragm, insert fasteners (56) with washers (55) and **tighten fasteners to 12.5 ft-lbs (17,0 NM) of torque.**

- NOTE: For models with PTFE overlays (30), position the overlay between the outer diaphragm plate (52) and the diaphragm (31) before attaching the inner diaphragm plate (51).**
9. Invert one diaphragm assembly. Place bumper (3) onto diaphragm rod. Place washer (47) onto stud (35). Attach inverted diaphragm assembly to rod and hand tighten the outer plate. Repeat this process with the second diaphragm assembly. **Note!** It is not necessary to invert the second diaphragm assembly. **Torque the outer plates to a minimum of 10 ft-lbs (13,56 NM).** Position outer chamber (28, dish side up) and secure to workbench. Place the intermediate assembly (center section) onto the chamber with the inverted diaphragm to the top. Note the orientation of the intermediate to the chamber and to the top and bottom of pump. Install all fasteners (16, 17, 18, 33) to inner and outer chambers. **Tighten fasteners to 20 ft-lbs (27,12 NM).** Insert a pry bar into the suction opening of the secured chamber until it contacts the hex boss of the outer diaphragm plate (52). Pry upward until the top diaphragm is as high as it will go. While supporting the pry bar in this up position, slip a second pry bar under the top diaphragm plate and pry upward until it stops. Flip (invert) the top diaphragm down so it is resting on the groove of the inner chamber. Note! When using the pry bar, exercise care not to damage the diaphragms or machined surfaces. Properly orient the second chamber (28) to the intermediate (center section) and repeat installation and torque procedures.
 10. Place the check balls (27) and check valve seats (26) in the discharge manifold (22), position on the outer chamber and reassemble using fasteners (16, 17, 18). Place the check balls (27) and check valve seats (26) in the outer chambers (28), position the suction manifold (23) and reassemble using fasteners (16, 17, 18). **Torque all manifold fasteners to 37 ft-lbs (50,17NM)**
Note! For models using check valve seats (25), and o-rings (24), make sure that the o-rings (24) are facing the machined flanges of the suction manifold (23) and/or discharge manifold (22). Also make sure that the o-rings do not shift from their grooves during reassembly.

AIR VALVE MAINTENANCE

11. To evaluate the air valve components, remove the eight cap screws (11), washers (8, 10) from the air body (7). Inspect the gasket (4), valve plate (5) and shuttle (6) for scratches, surface irregularities, and excessive wear. Replace if necessary. Using needle nose pliers, pull out both of the end plugs. Push the air valve spool (2) out of the valve. Carefully reach in and pull the lip seals (43) and o-rings (44) out of the air valve body. Check the air valve spool, lip seals and o-rings for cracks, splitting, scratches, and wear. Replace and/or clean items as necessary.
12. Lubricate lip seals (43) and o-rings (44). Reinstall the o-rings and lip seals making sure that the lips of the seals are facing each other. Lubricate and insert the air valve spool (2) with the chamfered end entering the air valve body (7) through the end that has the spool image pictured. Press the end plugs into position. Lubricate and reinsert the shuttle valve (6) and valve plate (5). Place the gasket (4) with the words "THIS SIDE UP" facing the valve plate. Reassemble to the intermediate using cap screws (11) and washers (8, 10). Flat washers (8) should be touching the plastic air valve body. **Tighten cap screws to 40 in-lbs (4,52 NM).**

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.

Diaphragm Plates	12.5 ft-lbs	(17,0 NM)
Diaphragm/Rod	10.0 ft-lbs	(13,56 NM)
Chambers	20.0 ft-lbs	(27,12 NM)
Manifolds/Chamber	37.0 ft-lbs	(50,17 NM)
Air Valve Body	40.0 in-lbs	(4,52 NM)

SPECIFICATIONS

CAPACITY:

Adjustable 0-255 GPM (965 LPM)

MAXIMUM TEMP:

3" Metallic - 200°F (93°C)

MAXIMUM AIR PRESSURE:

120 psi (8,2 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:

130 pounds (29 kg)

MAXIMUM SOLIDS:

7/16" (11,1 mm)

AIR SUPPLY:

Inlet - 3/4" NPT Female (BSP compatible)

Outlet - 3/4" NPT Female

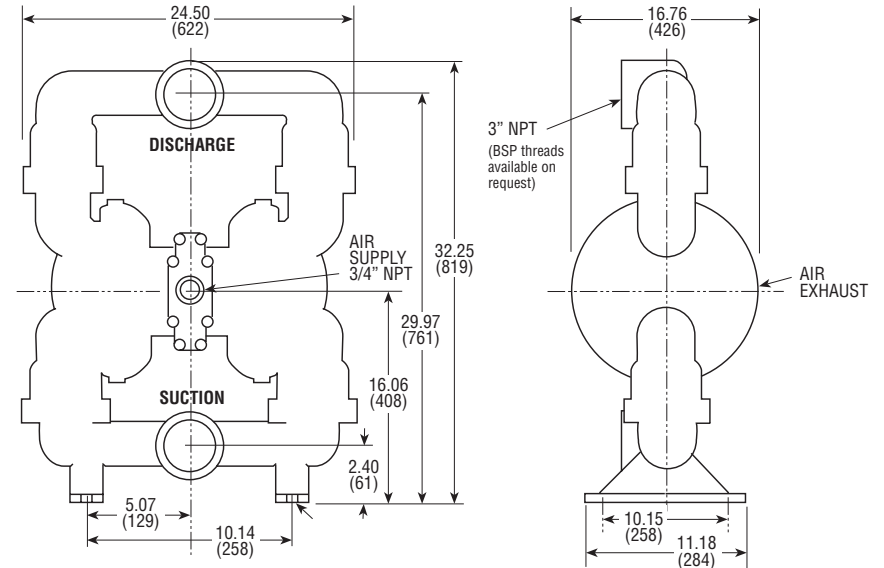
FLUID INLET/DISCHARGE:

3" NPT Female

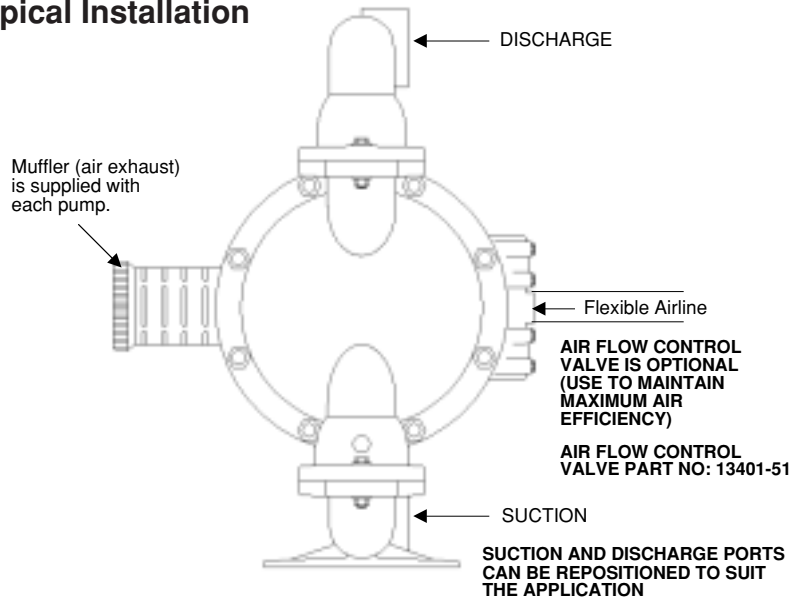
BSP Available

DIMENSIONS

Dimensions in inches and (mm)



Typical Installation



DO NOT USE AIR LINE LUBRICATION

PERFORMANCE CURVE

(Based on water-flooded suction)

