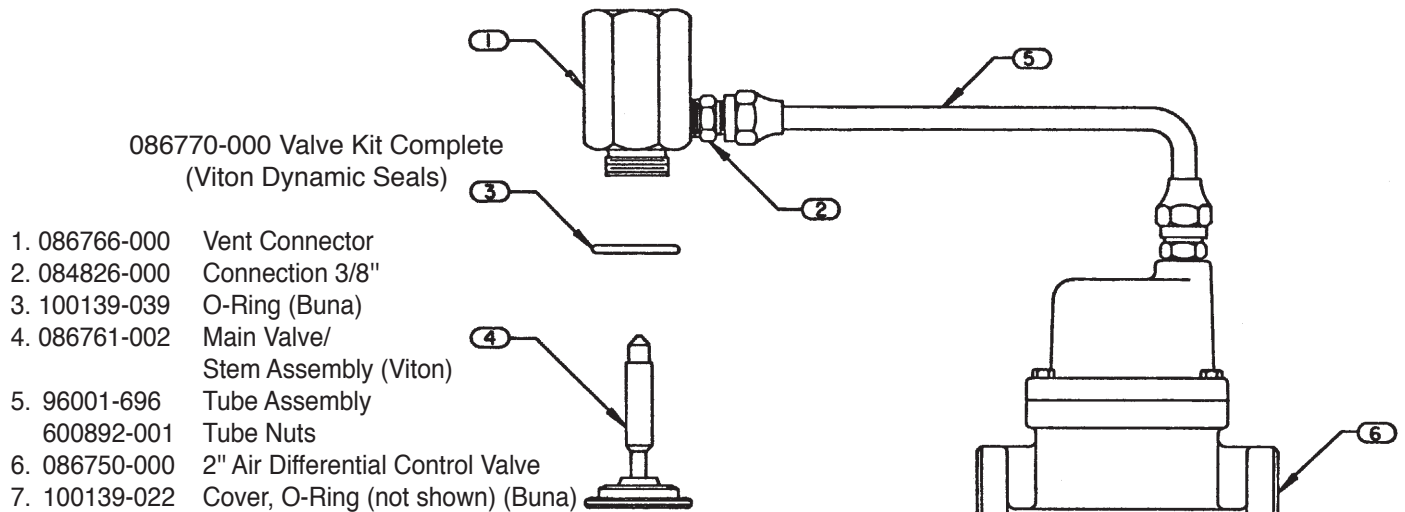


## Installation Manual For The **neptune** Petroleum Differential Air-Control Valve



The Differential Air-Control Valve (DACV) is a high performance air elimination system that works in conjunction with the air release of a petroleum tank truck meter to substantially reduce measured air through the meter, and also reduce spitting. The DACV was designed to meet air elimination challenges which are present when delivering product from multiple compartment tank trucks using a common manifold and having high capacity pumps. Small accumulations of air, or large slugs of air which can occur when draining a compartment, will cause the flow to be shut off, preventing incorrect measurement. After the air has been vented and liquid supply restored, the flow automatically resumes.

The differential valve is designed for use downstream of the 1½" and 2" Refined Fuel Flowmeters. When mounted directly to the flowmeter the valve adds approximately 4⅞" to the lay length of the meter. The valve is recommended to be mounted in a horizontal line but may be mounted vertically if necessary. All necessary conversion parts (see Fig. 1) are included in the kit.

### INSTALLATION

1. Mount the valve downstream of the flowmeter. The valve is designed to be bolted directly to the preset valve outlet (see Fig. 2). However, the valve may be mounted anywhere downstream. Standard 2" 150lb. ANSI type flanges (installer supplied) can be bolted directly to the valve as required for mounting.
2. Disconnect the vent line from the present Air-Release connection, remove the Air-Release cover screws, and then remove the cover.
3. Remove the float mechanism mounting screws, and separate the cover, piston seal, sleeve, main valve, and lower housing. (Refer to Operating and Maintenance Manual for the flowmeter.)
4. Mount the new vent connector and o-ring on the cover of the Air-Release, screwing the connector all the way in to ensure metal-to-metal-seating.
5. Install the pilot control valve stem assembly, making certain that the pilot valve engages the stem of the float linkage.
6. Install the sleeve and piston seal, then reassemble the float mechanism into the cover.
7. Install the cover on the Air-Release body, and connect the vent line.
8. Cut the ⅜" OD tubing to size, and assemble to the differential air-control valve only.

FIGURE 1

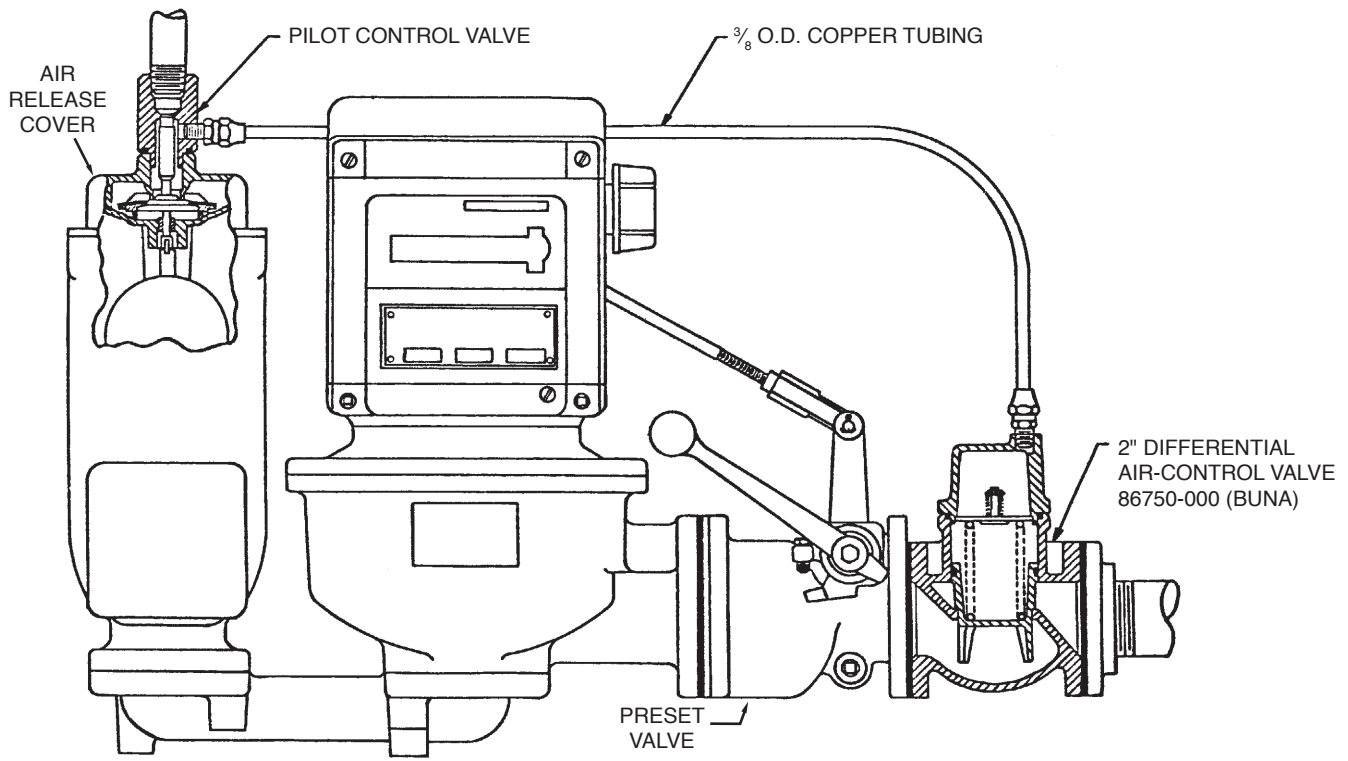


FIGURE 2

9. Remove air from the valve and valve cover and replace with process fluid as follows:

**Horizontal Installation (See Fig. 3)**

- a. Remove cover (Item 3). (CAUTION: spring-loaded). Check valve assembly (Item 8) is located on top of the spring.
- b. Fill the top of piston with approximately 6.5 fl. oz. of process fluid or to the bottom of the o-ring (Item 2) groove.
- c. Reassemble the valve.

**Vertical Installation (See Fig. 3)**

- a. Verify threaded opening in the cover (Item 3) is uppermost. If not, remove cover (CAUTION: spring-loaded) and change position.
- b. Start the pump to apply pressure to open the valve. This action forces air out of the cover.
- c. Through the free end of the tubing fill the valve cover with the process fluid.
- d. Stop the pump to remove pressure from the line and allow the valve to close. This will cause fluid to be drawn from the tubing into the valve cover.
- e. Repeat above steps until no more air is expelled from the tubing.
- f. Connect the tubing to the air release vent connector. (Fig. 1, Item 1)

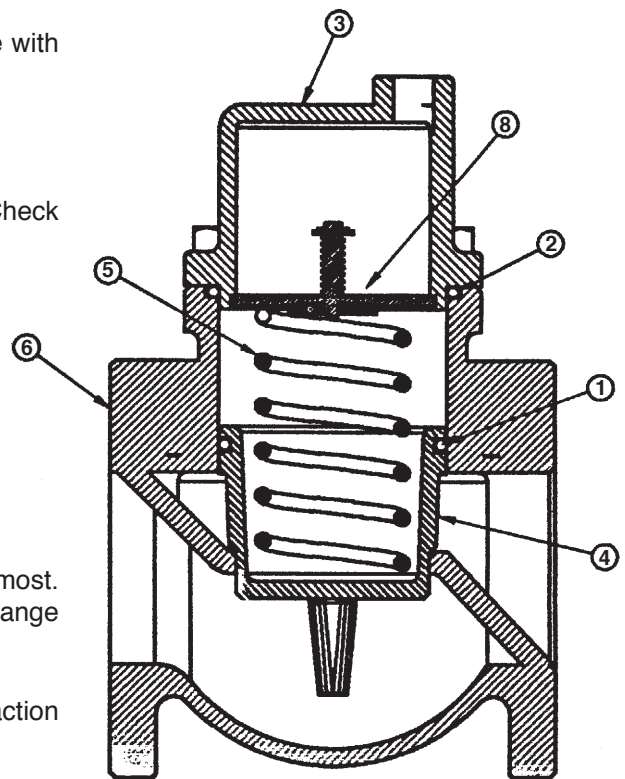


FIGURE 3

**086750-000 2" Differential Air-Control Valve**

- 1. 100133-003 Quad Ring (Viton)
- 2. 100139-010 O-Ring
- 3. 086752-000 Cover
- 4. 086758-000 Piston
- 5. 086759-000 Spring
- 6. 086760-000 Valve Body
- 7. 100067-053 Screw (not shown)
- 8. 086753-000 Check Valve Assembly

## CHECK VALVE ADJUSTMENT

Differential Air-Control Valve Systems manufactured after November 1997 have an easily removed check valve assembly (see Fig. 3, Item 8). The opening speed of the valve is controlled by the orifice in the disk assembly (See Fig. 4, Item 3). If the orifice is too large, the process fluid will flow too freely out of the piston area, causing the valve to open quickly. This results in more air flowing through the meter. If the orifice is too small, the process fluid cannot flow out of the piston area and the valve locks up. The standard 0.031" diameter orifice works well under most conditions. If using lube oils, or under extreme cold conditions, the orifice may be enlarged to increase the opening speed of the valve to prevent the valve from locking up and causing a no-flow condition. If it is necessary to enlarge the orifice, the following diameters are recommended:

Standard Orifice	0.031" diameter
Fuel Oil, Gasoline, Diesel Fuel	0.047" diameter
Lube Oil	0.063" diameter

Note: Use the smallest orifice for better air elimination.

### Adjusting the Orifice (See Figure 4)

To enlarge the orifice, remove the check valve assembly (See Fig. 3, Item 8). Disassemble the check valve assembly and remove the disk assembly (Item 3). Ream the hole to the desired size. Remove all burrs and reassemble. Run flow tests to verify the performance of the Differential Air-Control Valve. If the orifice has been enlarged too much, the hole may be soldered and re-drilled to the desired size.

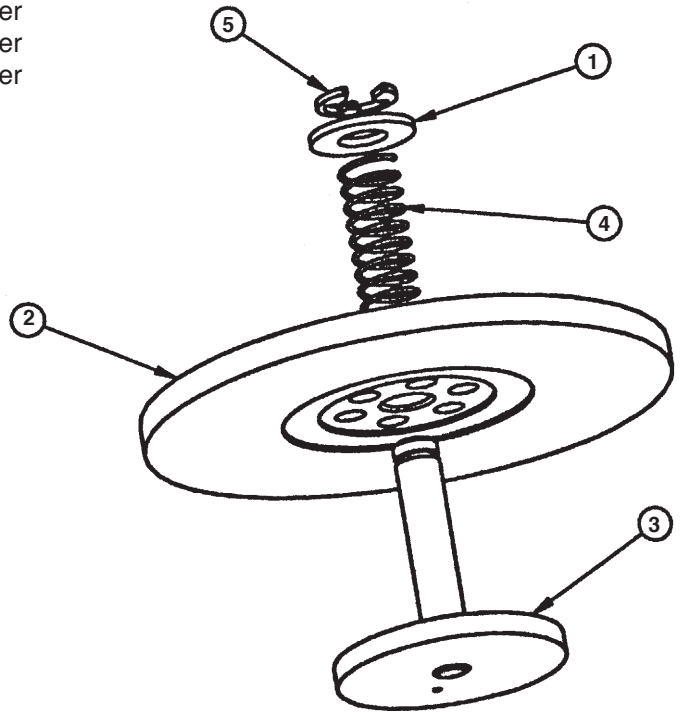


FIGURE 4

#### 086753-000

#### Check Valve Assembly

1.	041989-000	Washer
2.	086754-000	Plate
3.	086755-000	Disk Assembly
4.	088405-000	Spring
5.	088462-000	Retaining Ring

**U.S.A./International**  
1310 Emerald Road  
Greenwood, SC 29646-9558  
Tel.: Toll-Free (800) 833-3357  
(864) 223-1212  
Fax: (864) 223-0341

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