

Executive Order G-70-187

Exhibit 5

Fillneck Vapor Pressure Regulation Fueling Test

1 Applicability

This test procedure is used to verify proper operation of the nozzle boot pressure regulation unique to the Healy Model 400 ORVR nozzle.

2 Principle

The nozzle vapor pressure regulation is verified during refueling into a tight simulated vehicle fuel tank with saturated vapors (Procedure 1) or into an actual non-ORVR equipped vehicle (Procedure 2). Pressure readings are taken with a mechanical gauge during a fueling of at least 5 gallons, excluding the first two gallons and last one gallon dispensed in order to eliminate the interferences due to vapor growth or contraction. A vacuum which exceeds $\frac{1}{2}$ inches wc, or a pressure which exceeds $\frac{1}{4}$ inches wc, except during the excluded beginning and ending gallons, indicates a defective nozzle.

3 Interferences

Vacuum or pressure levels outside of the specified range may occur during the beginning or end of the refueling operation when properly functioning equipment is affected by the following conditions: (1) gasoline dispensed into a vehicle fuel tank which is significantly warmer than the dispensed fuel may cause a vacuum of several inches water column; and, conversely, (2) gasoline dispensed into a vehicle tank which is significantly cooler than the dispensed fuel may temporarily cause a pressure greater than $\frac{1}{4}$ inches water column. The effect of the temperature differential will be most pronounced at the beginning of the fueling operation and tends to gradually disappear toward the end of the fueling operation as fuel and vapor temperatures in the vehicle fuel tank equalize.

4 Apparatus

Mechanical Pressure Gauge - the full scale range of the gauge shall be 1 inch water column pressure to 1 inch water column vacuum (-1.0" wc – +1.0" wc). Maximum incremental graduations of the pressure gauge shall be 0.25 inches wc and the minimum accuracy of the gauge shall be three percent (3%) of full scale. The minimum diameter of the pressure gauge shall be four inches.

4.1 Procedure 1. Use a gauge mounted on the test tank fillneck to measure vapor pressure during fueling of a simulated fuel tank (see Figure 1). Any test tank as approved in Air Resources Board, Source Test Methods, Volume 2, TP-201.5, "Determination (by Volume Meter) of Air to Liquid Volume Ratio of Vapor Recovery Systems of Dispensing Facilities" may be used in lieu of the setup shown in Figure 1.

4.2 Procedure 2. Use a gauge mounted on a stand and placed level on the vehicle during fueling of actual vehicles (see Figure 2).

- 4.3 All pressure measuring device(s) shall be bench calibrated using either a reference gauge or an inclined manometer. Calibration shall be performed at 20, 50 and 80 percent of full scale. Accuracy shall be within two percent (2%) at each calibration point. Instrument Calibrations shall be conducted and a certification report filed periodically every 90 days (or less).

5 Pre-Test Procedures

Verify that the system vacuum source is operating in the 65" to 85" WC operating range. No tears or holes are allowed in or on the nozzle boot or face seal.

Ensure that the high vacuum vapor return lines are tight (see Exhibit 4).

5.1 **Procedure 1 – simulated vehicle fuel tank** (Figure 1).

- a. Position test tank next to dispenser nozzle being tested.
- b. Dispense 1-2 gallons of gasoline into test tank.
- c. Remove nozzle and replace fill cap.
- d. Roll tank back and forth vigorously for thirty seconds to splash saturate the vapor head space in the tank.

5.2 **Procedure 2 – Torus Pressure Test with actual vehicle** (Figure 2).

- a. Place the gauge assembly on the vehicle in a level position.

6 Testing

6.1 **Procedure 1**

- a. Remove the fillpipe cap and insert nozzle, making a seal between the nozzle boot and the test tank fillpipe opening. Dispense gasoline (minimum 5 gallons).
- b. Observe pressure gauge during fueling.
- c. Repeat test for additional nozzles. Drain test tank as necessary.

6.2 **Procedure 2**

- a. Remove the fillpipe cap and position the torus centered over the vehicle fillpipe. Insert nozzle, making a seal between the nozzle boot and the torus and between the torus and fillpipe. Dispense gasoline (minimum 5 gallons).
- b. Observe pressure gauge during fueling.
- c. Repeat test for additional nozzles.

7 Reporting

Record observed operating levels measured for each nozzle tested along with type and model of pressure measuring device used including: range, accuracy and date of last calibration.

Exhibit 5
Figure 1

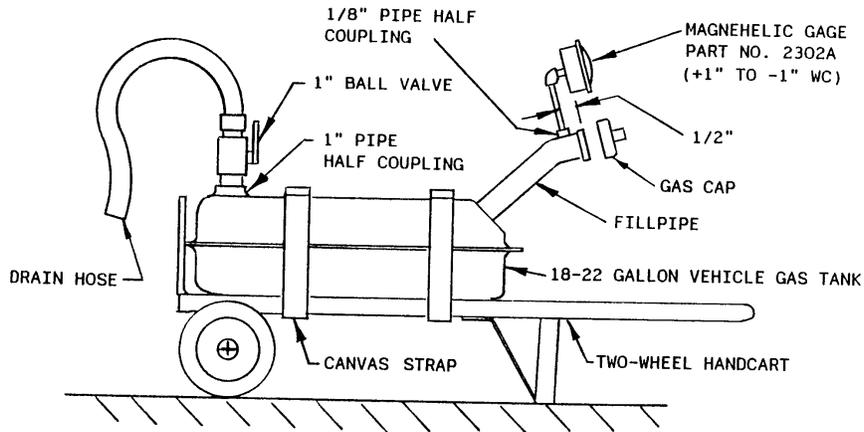


Exhibit 5
Figure 2

