Inspection Procedure **GDF-03**

Gasoline Dispensing Facilities

PRESSURE INTEGRITY PERFORMANCE VERIFICATION FOR VACUUM ASSIST SYSTEMS

[SQUEEZE BULB TEST]

1. PURPOSE

1.1 Air ingestion caused by a leaking nozzle or vapor check valve degrades vapor collection during vehicle refueling and increases pressure-related fugitive emissions by promoting gasoline evaporation in the vapor recovery system. This inspection procedure provides a method to determine if "bootless" Phase II vacuum assist vapor recovery nozzles or remote vapor check valves allow air ingestion into the vapor recovery system. The procedure is applicable to those bootless systems that utilize a remote vapor check valve; it is **not** applicable to systems that utilize nozzles with built-in check valves. The procedure is designed to produce virtually no testing-related emissions. When used in conjunction with Inspection Procedure GDF-01 (Bag Test) this procedure can isolate certain sources of air leakage.

2. PRINCIPLE

2.1 A compression fitting, or Air-to-Liquid (A/L) adaptor, is placed over the nozzle spout, isolating all of the vapor collection holes. A squeeze bulb is used to create a vacuum of fifteen (15.0) plus or minus one ($\pm$1.0) inches H_2O at the vapor collection holes on the nozzle spout. A toggle valve is closed, isolating the squeeze bulb and eliminating it as a possible decay source. A pressure/vacuum gauge, connected to the test assembly is used to determine the rate of vacuum decay. If the vacuum decreases by more than one (1.0) inch H_2O in ten (10) seconds, there is an unacceptable leak between the nozzle spout and the remote vapor check valve, inclusive.

3. INTERFERENCES

3.1 If the nozzle spout is deformed such that the vapor collection ports cannot be isolated, the inspection procedure will be biased to indicate noncompliance.

3.2 This procedure cannot be used on passive systems such as a balance system.

4. EQUIPMENT

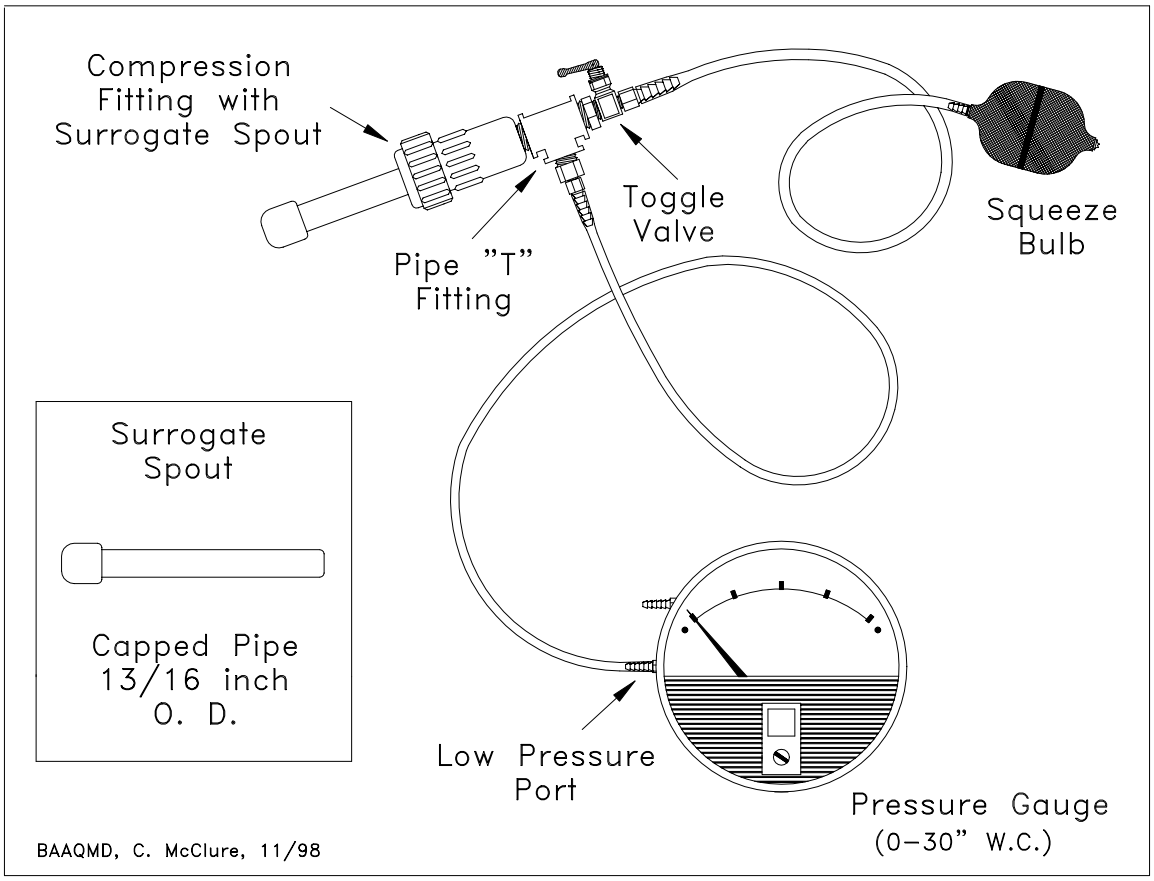
4.1 **Pressure Integrity Assembly.** Use a compression fitting, or applicable A/L adaptor equipped with a "T" fitting, squeeze bulb with a check valve, toggle valve, flexible tubing and a 0-30 inches H_2O pressure/vacuum gauge. Examples of acceptable designs are shown in Figure 2 and Figure 3. The compression fitting, or A/L adaptor, shall be capable of isolating all of the vapor collection holes on the nozzle spout.

4.2 Data Sheet. Use a data sheet to keep track of which nozzles have been tested. This data sheet will help ensure and verify that all nozzles have been checked on a routine basis. An example of a data sheet is shown in Figure 4.

4.3 Grease. Use an appropriate lubricant on the compression fitting gasket. Alternatively, spray lubricant can be applied to the nozzle spout tip prior to insertion into the compression fitting. If an A/L adaptor is used for this procedure, the O-rings shall be lubricated prior to use.

Figure 1

Pressure Integrity Assembly with Surrogate Nozzle Spout



4.4 Pressure/Vacuum gauge. Use a Dwyer Instrument Company Magnehelic differential pressure gauge, or equivalent, with a full scale range of 30 inches H_2O. The connection from the Pressure Integrity Assembly to the pressure/vacuum gauge shall be such that a vacuum causes a positive deflection of the gauge.

4.5 Surrogate Spout. Use a capped piece of 13/16 (±1/16) inch outside diameter (O. D.) rigid tubing to verify that no leaks are present in the connections of the Pressure Integrity Assembly.

4.6 Gas Can. Use an approved gas can to hold any gasoline that can be drained from the nozzle/hose assembly prior to connecting the Pressure Integrity Assembly to the nozzle

spout. This will prevent any gasoline present in the nozzle/hose vapor passage from being introduced into the Pressure Integrity Assembly.

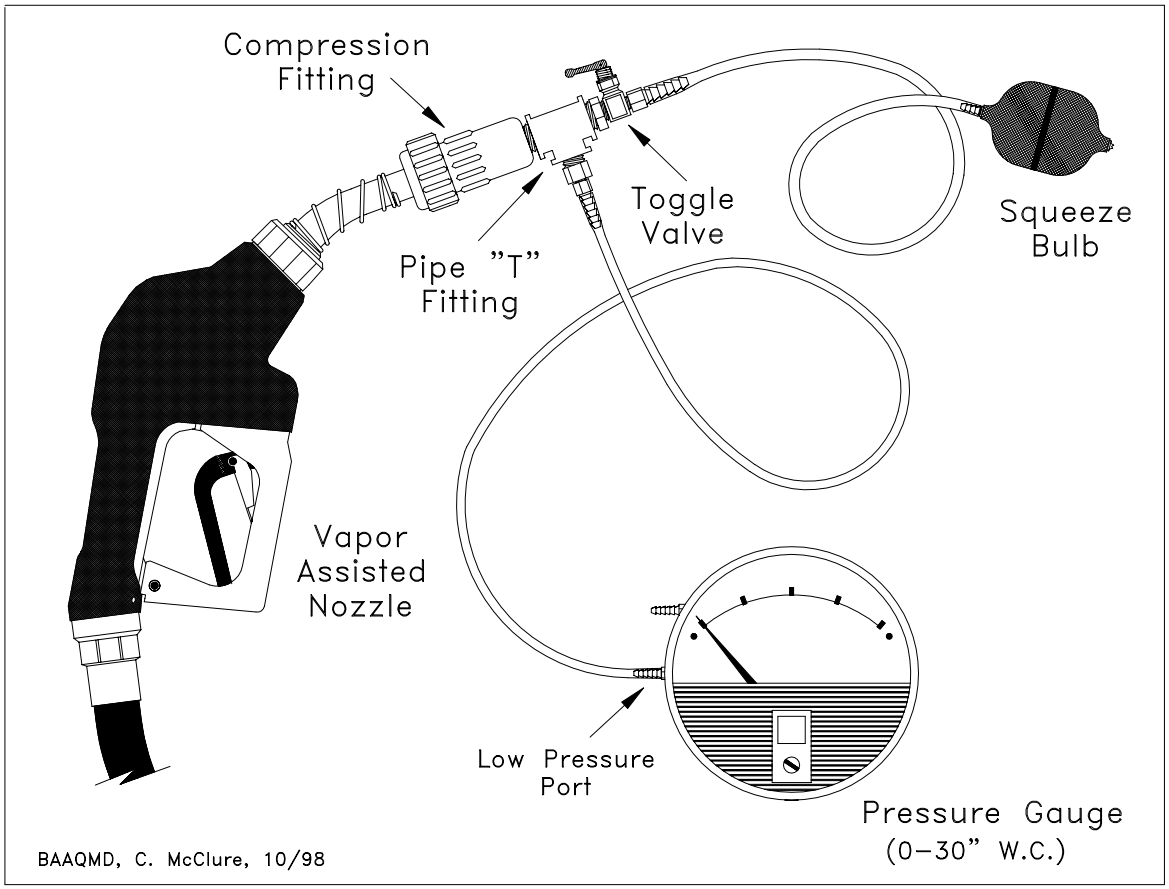
4.7 Stopwatch. Use a stopwatch accurate to within 0.2 seconds.

5. PRE-INSPECTION PROCEDURE

5.1 Pressure Integrity Assembly Pre-inspection Leak Check. The Pressure Integrity Assembly must be tested and found to be leak free before performing the Inspection Procedure. Assemble the Pressure Integrity Assembly on the surrogate nozzle spout as shown in Figure 1.

Figure 2

Pressure Integrity Assembly with Compression Fitting



Apply grease, or other appropriate lubricant, to either the compression fitting gasket, A/L adaptor O-rings, or front ¾ inches of the surrogate nozzle spout. Carefully insert the surrogate nozzle spout into the Pressure Integrity Assembly. Tighten the compression fitting, or A/L adaptor. Open the toggle valve, and use the squeeze bulb to create a vacuum of twenty five (25.0) plus or minus two (±2.0) inches H_2O in the Pressure Integrity Assembly. Close the toggle valve and start the stopwatch. The vacuum shall not degrade by more than two (2.0) inches H_2O within sixty (60) seconds. If a Pressure

Integrity Assembly fails this pre-test leak check, it shall not be used to conduct pressure integrity performance verifications for the purpose of determining compliance.

6. INSPECTION PROCEDURE

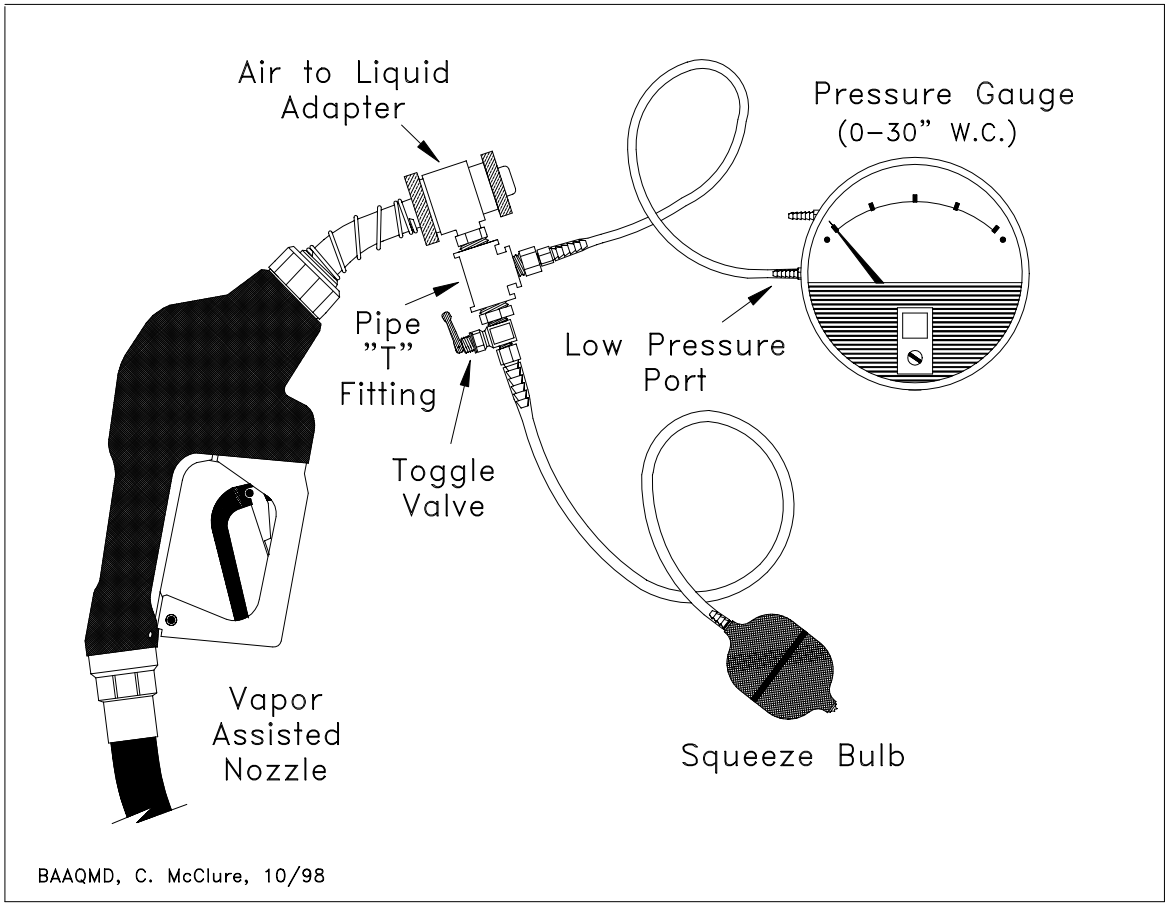
6.1 Examine the nozzle to be tested. Note the model number stamped on the nozzle. Use the model number to verify the nozzle **does not** contain a vapor check valve.

6.2 Carefully drain any residual liquid from the nozzle/hose assembly to be inspected into the gas can. Ensure the dispenser is not activated and do not engage the nozzle trigger.

6.3 Assemble the Pressure Integrity Assembly as shown in Figure 2 or Figure 3, insuring the compression fitting, or A/L adaptor, is compatible with the nozzle to be inspected.

Figure 3

Pressure Integrity Assembly with Air to Liquid Adapter



6.4 Apply grease, or other appropriate lubricant, to either the compression fitting gasket, A/L adaptor O-rings, or the front ¾ inches of the nozzle spout. Carefully insert the nozzle spout into the Pressure Integrity Assembly. Tighten the compression fitting, or A/L adaptor, ensuring the vapor collection holes are completely isolated.

6.5 Open the toggle valve on the Pressure Integrity Assembly. Use the squeeze bulb to produce a vacuum of fifteen (15.0) plus or minus one (±1.0) inches H_2O. Close the toggle valve, to ensure no leaks occur in the squeeze bulb assembly. Start the stop watch.

6.6 If the vacuum degrades by more than one (1.0) inch H_2O within ten (10) seconds, it verifies an inadequate level of pressure integrity in the system. The following additional procedure may be used to determine where the leak is occurring:

6.6.1 Use a bag, as specified in Inspection Procedure GDF-01. Cut a hole approximately ¾ inch long in the sealed end of the bag. Remove the Pressure Integrity Assembly from the nozzle. Insert the nozzle into the bag and carefully slip the spout through the ¾ inch cut hole. Insert the nozzle tip far enough so the Pressure Integrity Assembly can be reinstalled on the nozzle spout without interference. Seal the open end of the bag at the nozzle/hose connection. Seal the cut area of the bag around the nozzle shaft. Observe the bag for any evidence of collapse while repeating sections 6.4, 6.5 and 6.6. If there is no evidence of bag collapse, the system leak may be at the vapor check valve at the dispenser. Collapse of the bag indicates a failure of the vapor path integrity within the nozzle.

6.7 Complete the data sheet, recording all requested information and the results of the inspection. Retain the data sheet as a record of nozzles inspected, corrective actions taken and re-inspections performed.

6.8 Repair or replace the component that caused the leak. After repairing or replacing the defective components, retest the nozzle/hose/valve assembly using this procedure to ensure that the problem is corrected.

7. POST-INSPECTION PROCEDURES

7.1 **Pressure Integrity Assembly Post-inspection Leak Check.** At the conclusion of testing at the facility, a post-inspection leak check of the Pressure Integrity Assembly must be performed. Repeat Section 5.1. The vacuum shall not degrade by more than two (2.0) inches H_2O within sixty (60) seconds. Data collected during this inspection procedure is invalid if the Pressure Integrity Assembly fails this post-inspection leak check.

8. RECORDING DATA

8.1 Results of this inspection procedure shall be tabulated on the data sheet to provide a record of nozzles checked and a reminder to take corrective action to fix nozzle leaks found. An example data sheet is shown in Figure 4.

8.2 Routine inspections using this procedure will help minimize the emissions of gasoline vapors and reduce evaporation of liquid gasoline.

FIGURE 4
PRESSURE INTEGRITY PERFORMANCE VERIFICATION DATA SHEET
INSPECTION PROCEDURE GDF-03

STATION NAME _____ **ADDRESS** _____

CITY _____ **PHONE** _____

DISPENSER MODEL # _____ **NUMBER OF NOZZLES** _____

PUMP #	GAS GRADE	NOZZLE BRAND	NOZZLE SERIAL #	VACUUM CHANGE, " H_2O IN 10 SECONDS	PASS/ FAIL	CORRECTIVE ACTION	DATE REPAIRED

TEST CONDUCTED BY _____ DATE _____