

## VAPOR RECOVERY SYSTEMS FIELD COMPLIANCE TESTING

### Discussion

This Examination Procedures Outline is directed primarily at those systems/nozzles requiring an "intended tight seal" and use of the "Field Compliance Test Unit".

### Systems

Stage II vapor recovery systems are designed to control motor vehicle fuel vapors. The principle types of systems include:

1. Balance System - Where the fuel nozzles include a bellows and face plate designed to make an "intended tight seal" with the vehicle fill opening. Liquid entering a fuel tank displaces vapor which returns to storage.
1. Assist System - These systems may include more than one type of fuel delivery nozzle. One includes a bellows and face plate, but does not require a "tight seal". The other system includes a coaxial fill spout with perforations in the outer tube near its tip. Both systems allow visual observation of vehicle fill opening while filling, if desired, and both rely on some external mechanism to create a vacuum to remove fuel vapors.  
**4054, A1.1, A1.2**

### Nozzles

All the systems utilizing vapor recovery type nozzles shall contain in each nozzle adequate and automatic means to prevent measured liquid from either recirculating, entering the vapor return line, or overflowing a vehicle fill opening. **4054.1, S.1**

All nozzle types shall have a primary shut-off device which automatically activates when liquid covers the primary shut-off sensing mechanism. **4054.1, S.1.1(a)**

### Balance Type

These nozzles shall have a secondary shut-off device or other effective means to prevent liquid recirculation. These automatically activate after liquid has entered the vapor return line upon primary shut-off failure.

**4054.1, S.1.1(b)**

### Assist Type

These nozzles may have a secondary shut-off or some other effective means to avoid liquid overflowing a vehicle fuel tank because of primary shut-off failure. "Other effective means" include, but are not limited to, permitting liquid to be seen either by observing the vehicle pipe opening or hearing and seeing liquid overflow spillage.

**4054.1, S.1.1(c)**

### Pre-Test Inspection

#### 1. Identification.

1.1. Manufacturer's or distributor's name or trademark, model number and serial number.

**Health & Safety Code 41958**

(a) Systems may have an I.D. plate.

(b) Nozzles may have this information cast in the nozzle body or on a metal I.D. tag depending on manufacturer.

#### 2. Type approval. **B&P 12500.5**

(a) Systems. **DMS Notice D-86-2**

(b) Nozzles (new or rebuilt). **DMS Notice D-94-1**

### Pre-Test Determinations

#### 1. Equipment.

1.1. Field Compliance Test Unit built as specified in California Code of Regulations, Section 4054.1, S.2.2. Design. **4055, N.1**

**NOTE:** These units should be tested against Division of Measurement Standards area specialist Field Compliance Units for uniformity of performance.

#### 2. Tolerances. **4005, N.2.1**

2.1. Performance accuracy - primary shut-off devices.

Primary shut-off device overrides. The required, additional attempts, in total, to override any nozzle primary shut-off device shall not increase the dispenser volume indication by more than 1/10 gallon.

**4054.3**

## Tests

**SAFETY NOTE:** Use grounding wires between Field Compliance Unit, nozzle, and dispenser prior to testing.  
4055, N.2

### 1. Initial test - primary shut-off.

- 1.1. Dispense fuel into the Field Compliance Test Unit in accordance with common public usage. The nozzle shall shut-off automatically when the primary shut-off sensing mechanism is covered by liquid. After the initial primary shut-off device activates, dispense enough additional fuel into the test unit to immerse the nozzle primary shut-off sensing mechanism in liquid.
- 1.2. Record the dispenser indicator gallons.
- 1.3. Make 6 additional, consecutive override attempts duplicating a full range of potential customer usage and record the new indicated gallons. All 6 attempts shall result in automatic nozzle shut-off before the dispenser volume indicator increases more than the 1/10 gallon limit.

**NOTE:** A test unit must be used for this procedure so the primary shut-off device sensing mechanism can be immersed in liquid.

### 2. Secondary shut-off device.

- 2.1. Introduce sufficient fuel into the vapor return line (approximately 1/10 gallon) to block the return of vapors through the line.
- 2.2. Hold in place a "U-shaped" configuration of the fuel discharge hose at a level lower than the nozzle to concentrate the liquid. Make one or more attempts to dispense fuel into an empty Field Compliance Test Unit (balance-type nozzles must make their intended tight seal at the fill pipe opening).
- 2.3. The nozzles shall shut-off automatically before the dispenser volume indicator increases more than 3/10 gallon limit for each attempt as specified.

**NOTE:** This test is not usually performed except for customer complaints regarding nozzle performance.

# FIELD COMPLIANCE TEST UNIT

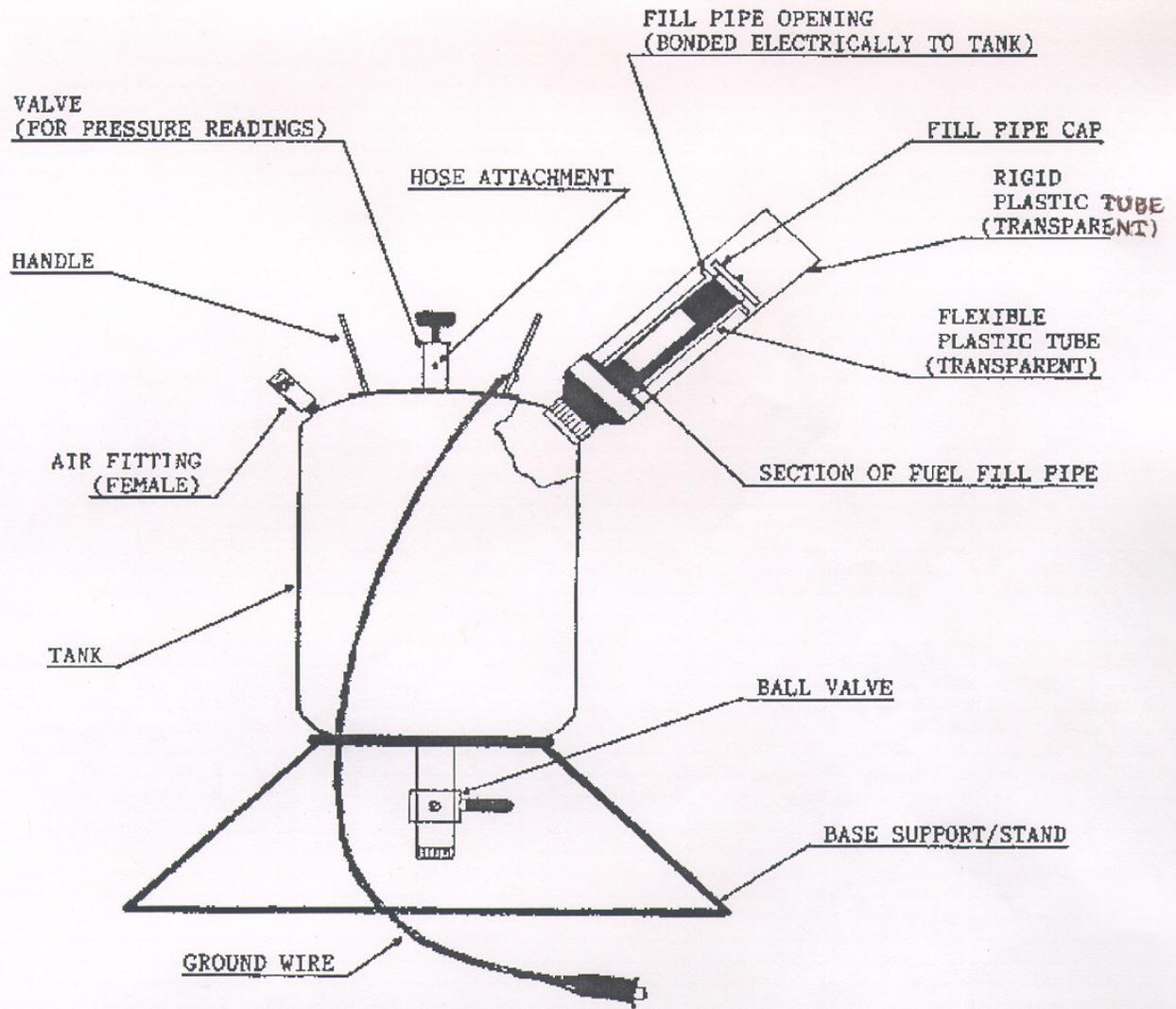


FIGURE 1