

California Environmental Protection Agency



Vapor Recovery Test Procedure

Proposed 2nd Modified: TP-201.2

Efficiency and Emission Factor
for Phase II Systems

Adopted: April 12, 1996
Amended: _____

Proposed 15-day changes (September 29, 2000) are shown as underline for new text and ~~strike-out~~ for deleted text.

Proposed 15-day changes (December 12, 2000) are shown as ***bold italics*** for additions and ~~SMALL-CAP-STRIKEOUT~~ for deletions.

The modified version of TP-201.2, released on September 29, 2000, consisted of 113 pages of regulatory text and figures. This second modified version of TP-201.2 includes only pages 9, 22 and 49 because only the regulation text on these pages is further modified.

Alternatives to the required equipment can be as good or better in certain testing circumstances. Such alternatives shall only be used subject to prior written approval by the ARB Executive Officer, as required in Section 13.

5.1(1) Hydrocarbon (HC) Analyzer(s). Depending on the test point location of the HC measurement, the HC analyzer shall be capable of continuously measuring HC concentrations as follows:

5.1.1 100 ppm to 80 percent by volume using propane as a calibration gas, or 75 ppm to 60 percent by volume using butane as a calibration gas.

5.1.2 Analyzers at test points 1, 3 and 4_{outlet} MAY **shall** use a destructive detection principle, such as a flame ionization detector (FID). The analyzer at test points 2 and 4_{inlet} shall use a non-destructive detection principle, such as non-dispersive infrared (NDIR). A sufficient number of hydrocarbon analyzers shall be used to provide for simultaneous, and continuous, measurements at all applicable test points. **The Executive Officer may allow other measurement methods if it is determined that equivalent results can be obtained.**

The default mode of determining hydrocarbon (HC) concentrations in this procedure is a determination of non-methane hydrocarbon concentration as propane. Alternative test procedures for determining non-methane hydrocarbons (NMHC), methane (CH₄) and total hydrocarbon (THC) concentrations have been validated for some applications and may be used, subject to the approval of the ARB Executive Officer. Such procedures typically measure the concentration of two of the three classes of hydrocarbon species with the third being calculated by addition or subtraction. (e.g. NMHC + CH₄ = THC or THC - CH₄ = NMHC).

Table 1 presents a selection of HC analyzers that are appropriate for measurement of the nozzle sleeve and vent sleeve sample concentration. A wide variation in the concentrations from less than 100 ppm to greater than 10 % by volume may occur in the vent or nozzle sleeve sample. the wide range of concentration requires the use of an array of analyzers (typically two or three) with overlapping ranges. (e.g. 100 ppm to 4900 ppm, 4000 ppm to 7.6%, and 4% to 76%) The notes following the table provide estimates of the minimum and maximum mass emission rates that can be quantified over the typical range of volumetric sweep rates utilized for the nozzle and vent sleeve sample collection devices.

The range and sensitivity of any hydrocarbon analyzer shall be selected such that the maximum concentration to be measured is no more than 98 percent of the range and the minimum concentration that must be quantified is not less than 2 percent of the range. Accurate and repeatable analysis over the range of concentrations measured shall be demonstrated by a successful multi-point

~~The vent sleeve volume meter may be under significant vacuum if installed upstream of the sweep air pump. This will necessitate consideration of the meter vacuum when correcting the measured volume to the standard pressure condition of 29.92 " Hg. However, if the meter is downstream of the pump and the meter discharges directly to atmosphere the measurement of pressure at the meter inlet may be eliminated because the volume correction due to the maximum allowed BPL is insignificant (i.e. 1.1/13.6 << 29.92).~~

~~5.5.6 Temperature~~

~~A thermocouple and a temperature readout device with a range of 0—200 degrees Fahrenheit is suitable for use. The thermocouple shall be located in the sample flow passing through the sample manifold coupling attached to the inlet of the nozzle sleeve volume meter.~~

~~5.7.5 Ball Valve: Installed upstream of volume meter to allow closing off vent pipe for testing purposes.~~

~~5.86 Equipment for Vapor Processor (Test Point 4 (Vapor Processor Exhaust))~~

~~5.8.1 Processor inlet sample pump: Carbon vane, metal bellows or other pump design which do not provide a source or sink for hydrocarbon vapors, capable of 2 cfm during sampling.~~

~~5.8.2 Processor outlet sample probe: Use equipment specified in TP-201.1A.~~

~~5.9 Pressure Related Fugitive Emissions (Test Point 5). Use equipment specified in TP-201.2F.~~

~~5.10 Ambient Temperature Measurement: Use a temperature measurement device capable of measuring ambient temperature with a resolution of 2 deg F.~~

~~5.11 Ambient Pressure Measurement: Use a pressure measurement device capable of measuring atmospheric pressure to within 2.5 mm Hg.~~

~~5.12 Gasoline Containers for RVP Samples: As specified in Section 2296 of title 13, CCR.~~

~~5.13 Stopwatch: Use a stopwatch accurate to within 0.2 seconds to measure the dispensing rate.~~

~~5.14 Vehicle Fillpipe Check Equipment: A rod, **level, protractor and clearance gauge to determine compliance** with ~~DIMENSIONS AS DEFINED IN~~ the "Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks", title 13, CCR, section 2235.~~

~~(b) Remove the cap in a quick, repeatable, and controlled manner and listen for a sound of vapor de-compression from the vehicle tank and fill pipe. Record a positive or negative result for the occurrence of such sound when the cap is removed.~~

~~(c) If an audible sound of pressure release from the vehicle tank is heard compliance with the vehicle leak standard has been demonstrated.~~

8.1 Vehicle Fueling with Nozzle Sleeve

8.1.1 If necessary, move sleeve to nozzle grade desired by customer. Turn on the nozzle sleeve sampling pump. Record the initial volume meter reading. Hydrocarbon concentration data collection for a dispensing episode begins with the insertion of the nozzle into the vehicle.

9.4.2 The Executive Officer shall conduct the fueling. **The fueling shall be conducted "hands off" at the high clip rate with no top-offs. Fuel is dispensed until the first nozzle shutoff after a minimum of six gallons is dispensed.**

9.4.2.1 Start the stopwatch when the dispenser volume meter begins to move.

9.4.2.2 During the fueling, check that the sleeve is capturing emissions effectively using the portable hydrocarbon analyzer (see Figure 7). The sleeve flow rate must be high enough to prevent the presence of hydrocarbon vapors at concentrations greater than 10% of the LEL (2,100 ppm as propane as determined by USEPA Method 21, "Determination of Volatile Organic Compounds Leaks", 40 CFR Ch.1, Part 60, App. A or TP-204.3) at the air inlet ports near the top of the vent sleeve. If this concentration is exceeded, the data collected is invalid.

9.4.2.3 Stop the stopwatch when the dispenser volume meter stops moving. Record the volume dispensed and time elapsed during dispensing. Invalidate data if volume dispensed is less than six gallons and the dispensing flow rate is outside the range of 6.0 to 10.0 gallons/minute. **Invalidate data if more than one premature shut-off occurs before a minimum of six gallons is dispensed.**