

## Environmental Protection Agency

## § 86.139-90

(d) The temperature recording system shall be started and the time of engine shutoff shall be noted on the evaporative emission hydrocarbon data recording system.

(e) For the first 5 minutes of the hot soak test, the ambient temperature shall be maintained at  $95 \pm 10$  °F. For the remainder of the hot soak test, the ambient temperature shall be maintained at  $95 \pm 5$  °F ( $95 \pm 2$  °F on average).

(f) The  $60 \pm 0.5$  minute hot soak begins when the enclosure doors are sealed (or when the running loss test ends, if the hot soak test is conducted in the running loss enclosure).

(g) The FID (or HFID) hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the test.

(h) Fresh impingers shall be installed in the methanol collection system immediately prior to the end of the test, if applicable.

(i) [Reserved]

(j) At the end of the  $60 \pm 0.5$  minute test period:

(1) Analyze the enclosure atmosphere for hydrocarbons and record. This is the final (time=60 minutes) hydrocarbon concentration,  $C_{HCF}$ , required in § 86.143.

(2) Analyze the enclosure atmosphere for methanol and record, if applicable. The methanol sampling must start simultaneously with the initiation of the hydrocarbon analysis and continue for  $4.0 \pm 0.5$  minutes. This is the final (time=60 minutes) methanol concentration,  $C_{CH_3OH}$ , required in § 86.143. Record the time elapsed during this analysis. If the 4-minute sample period is inadequate to collect a sample of sufficient concentration to allow accurate GC analysis, rapidly collect the methanol sample in a bag and then bubble the bag sample through the impingers at the specified flow rate. The time elapsed between collection of the bag sample and flow through the impingers should be minimized to prevent any losses.

(k) For the supplemental two-diurnal test sequence (see § 86.130-96), the hot soak test described in § 86.138-90 shall be conducted immediately following the hot transient exhaust emission test. This test requires ambient temperatures between 68° and 86 °F at all

times. The equipment and calibration specifications of §§ 86.107-90 and 86.117-90 may apply for this testing. Enclosures meeting the requirements of §§ 86.107-96 and 86.117-96 may also be used. This hot soak test is followed by two consecutive diurnal heat builds, described in § 86.133-96(p).

(l) If the vehicle is to be tested for diurnal emissions, follow the procedure outlined in § 86.133-96.

[58 FR 16042, Mar. 24, 1993, as amended at 59 FR 48510, Sept. 21, 1994; 60 FR 43897, Aug. 23, 1995]

### § 86.139-90 Particulate filter handling and weighing.

(a) At least 8 hours, but not more than 56 hours before the test, place each filter in an open, but protected, petri dish and place in the weighing chamber which meets the humidity and temperature specifications of § 86.112.

(b) At the end of the 8 to 56 hour stabilization period, weigh the filter on a balance having a precision of one microgram. Record this weight. This reading is the tare weight.

(c) The filter shall then be stored in a covered petri dish which shall remain in the weighing chamber until needed for testing.

(d)(1) If the filter is not used within one hour of its removal from the weighing chamber, it shall be reweighed.

(2) The one hour limit may be replaced by an eight-hour limit if one or both of the following conditions are met:

(i) A stabilized filter is placed and kept in a sealed filter holder assembly with the ends plugged, or

(ii) A stabilized filter is placed in a sealed filter holder assembly, which is then immediately placed in a sample line through which there is no flow.

(e) After the test, and after the sample filter is returned to the weighing room, condition it for at least 1 hour but not more than 56 hours. Then weigh a second time. This latter reading is the gross weight of the filter. Record this weight.

(f) The net weight ( $P_c$ ) is the gross weight minus the tare weight.

NOTE: Should the sample on the filter contact the petri dish or any other surface, the test is void and must be rerun.

[54 FR 14532, Apr. 11, 1989]

#### § 86.140-94 Exhaust sample analysis.

The following sequence shall be performed in conjunction with each series of measurements:

(a) For CO, CO<sub>2</sub>, CH<sub>4</sub>, NO<sub>x</sub>, and for Otto-cycle and methanol-fueled, natural gas-fueled and liquefied petroleum gas-fueled (if non-heated FID option is used) diesel vehicle HC:

(1) Zero the analyzers and obtain a stable zero reading. Recheck after tests.

(2) Introduce span gases and set instrument gains. In order to avoid errors, span and calibrate at the same flow rates used to analyze the test sample. Span gases should have concentrations equal to 75 to 100 percent of full scale. If gain has shifted significantly on the analyzers, check the calibrations. Show actual concentrations on chart.

(3) Check zeroes; repeat the procedure in paragraphs (a) (1) and (2) of this section if required.

(4) Check flow rates and pressures.

(5) Measure THC, CO, CO<sub>2</sub>, CH<sub>4</sub>, and NO<sub>x</sub> concentrations of samples.

(6) Check zero and span points. If difference is greater than 2 percent of full scale, repeat the procedure in paragraphs (a) (1) through (5) of this section.

(b) For petroleum-fueled, natural gas-fueled and liquefied petroleum gas-fueled (if HFID is used) diesel vehicle HC:

(1) Zero HFID analyzer and obtain a stable zero reading.

(2) Introduce span gas and set instrument gains. Span gas should have concentration equal to 75 to 100 percent of full scale.

(3) Check zero as in paragraph (b)(1) of this section.

(4) Introduction of zero and span gas into the analyzer can be accomplished by either of the following methods:

(i) Close heated valve in THC sample (see Figures B94-5 or B94-6) and allow gases to enter HFID. Extreme care should be taken not to introduce gases under high pressure.

(ii) Connect zero and span line directly to THC sample probe and introduce gases at a flow rate greater than 125 percent of the HFID flow rate with the CVS blower operating (see Figures B94-5 or B94-6). Excess flow must be allowed to exit probe inlet.

NOTE: In order to minimize errors, HFID flow rate and pressure during zero and span (and background bag reading) must be exactly the same as that used during testing.

(5) Continuously record (integrate electronically if desired) dilute THC emission levels during test. Background samples are collected in sample bags and analyzed as in paragraphs (b)(4) (i) or (ii) of this section.

(6) Check zero and span as in paragraphs (b) (1) through (4) of this section. If difference is greater than 2 percent of full scale, void test and check for THC "hangup" or electronic drift in analyzer.

(c) For CH<sub>3</sub>OH (methanol-fueled vehicles), introduce test samples into the gas chromatograph and measure the concentration. This concentration is C<sub>MS</sub> in the calculations.

(d) For HCHO (methanol-fueled vehicles), introduce formaldehyde test samples into the high pressure liquid chromatograph and measure the concentration of formaldehyde as a dinitrophenylhydrazine derivative in acetonitrile. This concentration is C<sub>FS</sub> in the calculations.

(e) For CH<sub>4</sub> analysis:

(1) In the event that the procedure results in negative NMHC<sub>wm</sub> values (as may occur with high methane fractions), any negative NMHC<sub>wm</sub> value whose absolute value is less than 10 percent of the NMHC standard shall be rounded to zero. Negative NMHC<sub>wm</sub> values whose absolute value is more than 10 percent of the NMHC standard shall require sample remeasurement. If the 10 percent criterion cannot be met after remeasurement, the test will be void.

(2) Other sampling procedures may be used if shown to yield equivalent or superior results and if approved in advance by the Administrator.

[56 FR 25777, June 5, 1991, as amended at 59 FR 48510, Sept. 21, 1994; 60 FR 34347, June 30, 1995]