which is scheduled to occur at 510 seconds, record the measured roll or shaft revolutions and reset the counter or switch to a second counter. As soon as possible transfer the "transient" exhaust and dilution air samples to the analytical system and process the samples according to §86.140 obtaining a stabilized reading of the bag exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample collection phase of the test.

(14) Turn the engine off 2 seconds after the end of the last deceleration (at 1,369 seconds).

(15) Five seconds after the engine stops running, simultaneously turn off gas flow measuring device No. 2 and if applicable, turn off the hydrocarbon integrator No. 2, mark the hydrocarbon recorder chart, turn off the No. 2 particulate sample pump and close the valves isolating particulate filter No. 2, and position the sample selector valves to the "standby" position (and open the valves isolating particulate filter No. 1, if applicable). Record the measured roll or shaft revolutions (both gas meter or flow measurement instrumentation readings), and reset the counter. As soon as possible, transfer the "stabilized" exhaust and dilution air samples to the analytical system and process the samples according to §86.140, obtaining a stabilized reading of the exhaust bag sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample collection phase of the test.

(b)(16)–(b)(24) [Reserved]. For guidance see §86.137–90.
(time=0 minutes) \(C_{\text{HC}}\) and \(C_{\text{CH}_3\text{OH}}\), for the hot soak test.

(2) If the vehicle must be moved to a different enclosure, the following steps must be taken:

(i) The enclosure for the hot soak test shall be purged for several minutes prior to completion of the running loss test. WARNING: If at any time the concentration of hydrocarbons, of methanol, or of methanol and hydrocarbons exceeds 15,000 ppm \(C\) the enclosure should be immediately purged. This concentration provides at least a 4:1 safety factor against the lean flammability limit.

(ii) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

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

(iv) If not already on, the mixing fan(s) shall be turned on at this time. Throughout the hot soak test, the mixing fan(s) shall circulate the air at a rate of \(0.8 \pm 0.2 \text{ cfm per cubic foot of the nominal enclosure volume}\).

(v) Begin sampling as follows:

(A) Analyze the enclosure atmosphere for hydrocarbons and record. This is the initial (time = 0 minutes) hydrocarbon concentration, \(C_{\text{HC}}\), required in §86.143. Hydrocarbon emissions may be sampled continuously during the test period.

(B) Analyze the enclosure atmosphere for methanol, if applicable, and record. The methanol sampling must start simultaneously with the initiation of the hydrocarbon analysis and continue for 4.0±0.5 minutes. This is the initial (time = 0 minutes) methanol concentration, \(C_{\text{CH}_3\text{OH}}\), 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.

(vi) If not already closed, the cooling fan shall be moved. The vehicle shall be disconnected from the dynamometer and any sampling system, and then driven at minimum throttle to the enclosure for the hot soak test. These steps should be done as quickly as possible to minimize the time needed to start the hot soak test.

(vii) The vehicle’s engine must be stopped before any part of the vehicle enters the enclosure.

(viii) The vehicle shall enter the enclosure; the enclosure doors shall be closed and sealed within 2 minutes of engine shutdown and within seven minutes after the end of the running loss test.

(ix) The test vehicle windows and any luggage compartments shall be opened (if not already open). The vehicle engine compartment cover shall be closed (if not already closed).

(c) [Reserved]

(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±10 °F. For the remainder of the hot soak test, the ambient temperature shall be maintained at 95±5 °F (95±2 °F on average).

(f) The 60±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±0.5 minute test period:

(1) Analyze the enclosure atmosphere for hydrocarbons and record. This is the final (time=60 minutes) hydrocarbon concentration, \(C_{\text{HC}}\), 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±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), perform a hot soak test as described in this section, except that the test shall be conducted within seven minutes after completion of the hot start exhaust test and temperatures throughout the hot soak measurement period must be between 68 ° and 86 °F. This hot soak test is followed by two consecutive diurnal heat builds, described in §86.133–96(p).

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

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

§ 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:

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

2) 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_e) is the gross weight minus the tare weight.

[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_2, CH_4, NO_x, 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_2, CH_4, and NO_x 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 HPID is used) diesel vehicle HC: