

§ 86.1527-84

40 CFR Ch. I (7-1-04 Edition)

§ 86.1527-84 Idle test procedure; overview.

(a) The idle emission test procedure is designed to determine the raw concentration (in percent) of CO in the exhaust flow at idle. The test procedure begins with the engine at normal operating temperature. (For example, the warm-up for an engine may be the transient engine or chassis dynamometer test.)

(b) Raw emission sampling must be made before dilution occurs from a single exhaust pipe in which exhaust products are homogeneously mixed. The configuration for dual-exhaust systems must also allow for raw emission measurements, which will require that an additional "Y" pipe be placed in the exhaust system before dilution.

§ 86.1530-84 Test sequence; general requirements.

(a) The following test sequence lists the major steps encountered during the idle test:

Preparation
Warm-up (or Emission Test)
Preconditioning, 30 seconds minimum, six minutes maximum
Idle Stabilization, 30±5 seconds
Idle Emission Sampling, one minute minimum, six minutes maximum

These steps are described by subsequent procedures.

(b) Ambient test cell conditions during the test shall be those specified in § 86.1330-84 or § 86.130-78.

§ 86.1537-84 Idle test run.

The following steps shall be taken for each test:

(a) Check the device(s) for removing water from the exhaust sample and the sample filter(s). Remove any water from the water trap(s). Clean and replace the filter(s) as necessary.

(b) Set the zero and span points of the CO analyzer with the electrical spanning network or with analytical gases.

(c) Achieve normal engine operating condition. The transient engine or chassis dynamometer test is an acceptable technique for warm-up to normal operating condition for the idle test. If the emission test is not performed prior to the idle emission test, a heavy-

duty engine may be warmed-up according to § 86.1332-84(d)(2) (i) through (iv). A light-duty truck may be warmed up by operation through one Urban Dynamometer Driving Schedule test procedure (see § 86.115-78 and appendix I to this part).

(d) Operate the warm engine at 2500 ±50 rpm, or rated torque speed for diesel-cycle engines, and zero load for a minimum of 30 seconds and a maximum of 6 minutes.

(e) If the CVS sampling system is used, the following procedures apply:

(1) If bag samples are drawn, with the sample selector valves in the standby position connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems.

(2) Start the CVS (if not already on), the sample pumps, integrators, and the raw CO₂ analyzer, as applicable. (The heat exchanger of the constant volume sampler, if used, shall be running at operating temperature before sampling begins.)

(3) Adjust the sample flow rates to the desired flow rate and set the gas flow measuring devices to zero.

(4) Operate the engine or vehicle at curb idle for 30±5 seconds with the clutch disengaged or in neutral gear. A heavy-duty engine may also be disconnected from the dynamometer, or the dynamometer may be shut off.

(5) Begin raw and dilute sampling.

(6) For bag sampling, sample idle emissions long enough to obtain a sufficient bag sample, but in no case shorter than 60 seconds nor longer than 6 minutes. Follow the sampling and exhaust measurements requirements of § 86.340-79(e) for the conducting of the raw CO₂ measurement.

(7) As soon as possible, transfer the idle test exhaust and dilution air samples to the analytical system and process the samples according to § 86.1540-84. Obtain a stabilized reading of the exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test.

(f) If the raw exhaust sampling and analysis technique specified in § 86.309-79 is used, the following procedures apply:

(1) Warm up the engine or vehicle per paragraphs (c) and (d) of this section. Operate the engine or vehicle at the

conditions specified in paragraph (e)(4) of this section.

(2) Follow the sampling and exhaust measurement requirements of § 86.340-79(e). The idle sample shall be taken for 60 seconds minimum, and no more than 64 seconds. The chart reading procedures of § 86.343-79 shall be used to determine the analyzer response.

(g) If the engine or vehicle stalls at any time during the test run, the test is void.

[48 FR 52252, Nov. 16, 1983, as amended at 60 FR 34377, June 30, 1995]

§ 86.1540-84 Idle exhaust sample analysis.

(a) Record the CO idle concentrations in percent.

(b) If the CVS sampling system is used, the analysis procedures for dilute CO and CO₂ specified in § 86.1340-84 apply. Follow the raw CO₂ analysis procedure specified in § 86.343-79 for the raw CO₂ analyzer.

(c) If the continuous raw exhaust sampling technique (§ 86.309-79) is used, the analysis procedures for CO specified in § 86.343-79 apply.

§ 86.1542-84 Information required.

(a) *General data—heavy-duty engines.* Information shall be recorded for each idle emission test as specified in § 86.1344-84 (b), (c), and (d). The following test data is required:

- (1) Date and time of day.
- (2) Test number.
- (3) Engine intake air or test cell temperature.
- (4) Barometric pressure.

NOTE: A central laboratory barometer may be used: *Provided*, That individual test cell barometric pressures are shown to be within ±0.1 percent of the barometric pressure at the central barometer location.

(5) Engine intake or test cell and CVS dilution air humidity.

(6) Curb idle speed during the test.

(7) Idle exhaust CO concentration (dry basis).

(8) Idle exhaust raw CO₂ concentration (if applicable).

(9) Dilute bag sample CO and CO₂ concentrations (if applicable).

(10) Total CVS flow rate with calculated dilution factor for the idle mode (if applicable).

(b) *General data—light-duty trucks.* The following information shall be recorded with respect to each test:

- (1) Test number.
- (2) System or device tested (brief description).
- (3) Date and time of day for the test.
- (4) Instrument operated.
- (5) Vehicle: ID number, manufacturer, model year, standards, engine family, evaporative emissions family, basic engine description (including displacement, number of cylinders, turbo-charger used and catalyst usage), fuel system (including number of carburetors, number of carburetor barrels, fuel injection type and fuel tank(s) capacity and location), engine code, gross vehicle weight rating, inertia weight class and transmission configuration, as applicable.

(6) All pertinent instrument information such as tuning, gain, serial number, detector number and range. As an alternative a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided test cell calibration records show the pertinent instrument information.

(7) Recorder charts or computer printouts: Identify zero, span, exhaust gas and dilution air sample traces or computer readings (if applicable).

(8) Test cell ambient temperature and, if applicable, barometric pressure and humidity.

NOTE: A central laboratory barometer may be used: *Provided*, That individual test cell barometric pressures are shown to be within + 0.1 percent of the barometric pressure at the central barometer location.

(9) Pressure of the mixture of exhaust and dilution air entering the CVS metering device (or pressure drop across the CFV), the pressure increase across the device, and the temperature at the inlet (if applicable). The temperature may be recorded continuously or digitally to determine temperature variations (if applicable).

(10) The number of revolutions of the positive displacement pump accumulated while exhaust samples are being collected (if applicable). The number of standard cubic feet metered by a critical flow venturi would be the equivalent record for a CFV (if applicable).

(11) The humidity of the dilution air.